

## Chapter 4

# Rigging AAFARS For Low-Velocity Airdrop On Type V Platform

## SECTION I- RIGGING AAFARS WITH THREE 500-GALLON FUEL DRUMS

### DESCRIPTION OF LOAD

4-1. The Advanced Aviation Forward Area Refueling System (AAFARS) is rigged on a 20-foot type V platform with four G-11 cargo parachutes. The AAFARS is designed for forward area refueling of up to four aircraft at a time with a minimum of 55 GPM. There are three collapsible fuel drums as an accompanying load. Each drum is filled with 432 gallons of liquid. When empty, each drum weighs 250 pounds and is 62 inches long and 53 inches in diameter. The total rigged overall length is 258 inches. Width is 108 inches. Height is 88 inches. Center of balance is 121 inches.

- Note:**
1. For drums filled with liquid other than gasoline, use Table 1-1 to recompute the weight.
  2. If the load varies from the one shown, the weight, height, CB, tipoff curve, and parachute requirements must be recomputed.
  3. Do not pressurize drums with air.

### PREPARING PLATFORM

4-2. Prepare a 20-foot type V airdrop platform using two tandem links, eight suspension brackets and 54 tie-down clevises as shown in Figure 4-1.

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

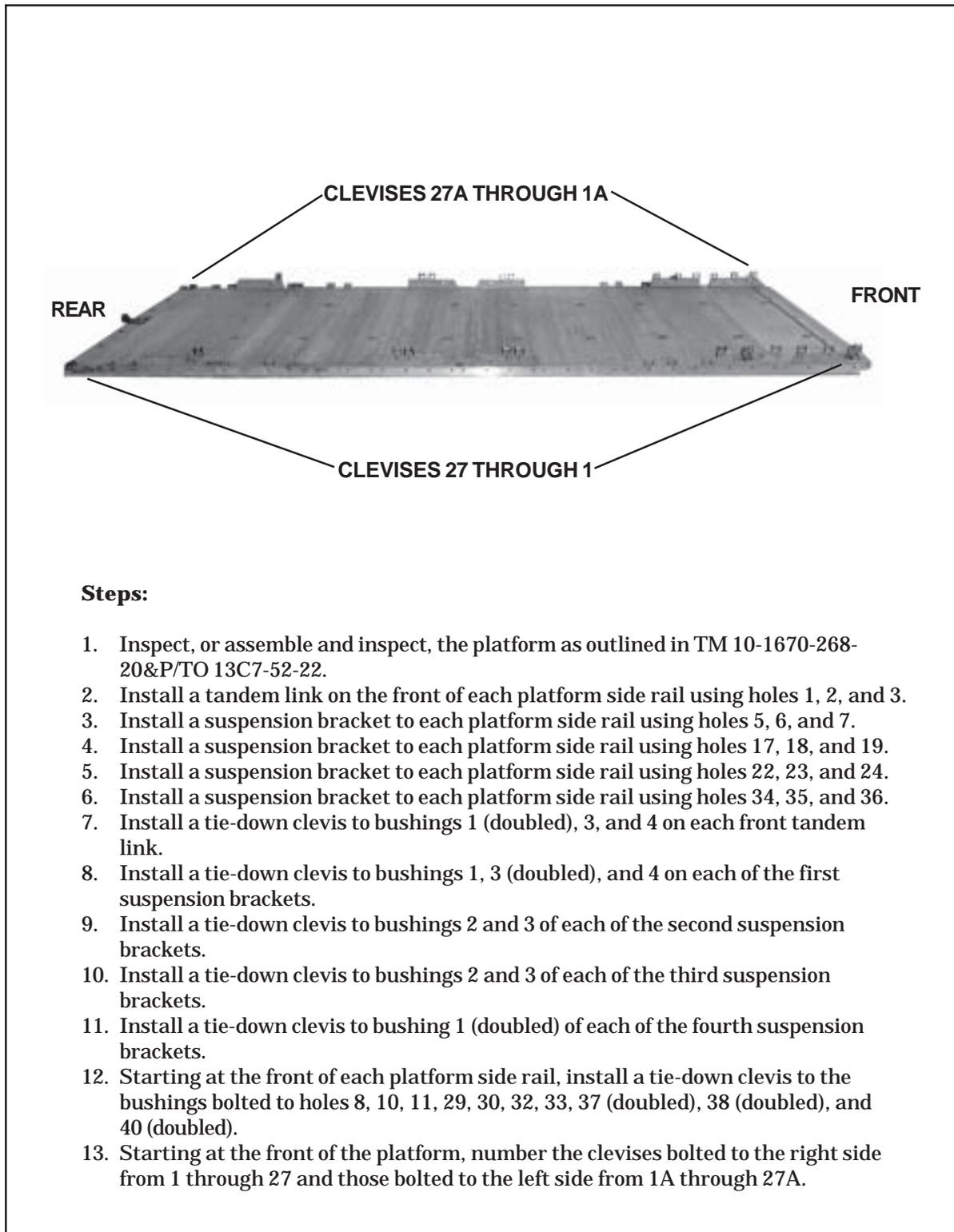
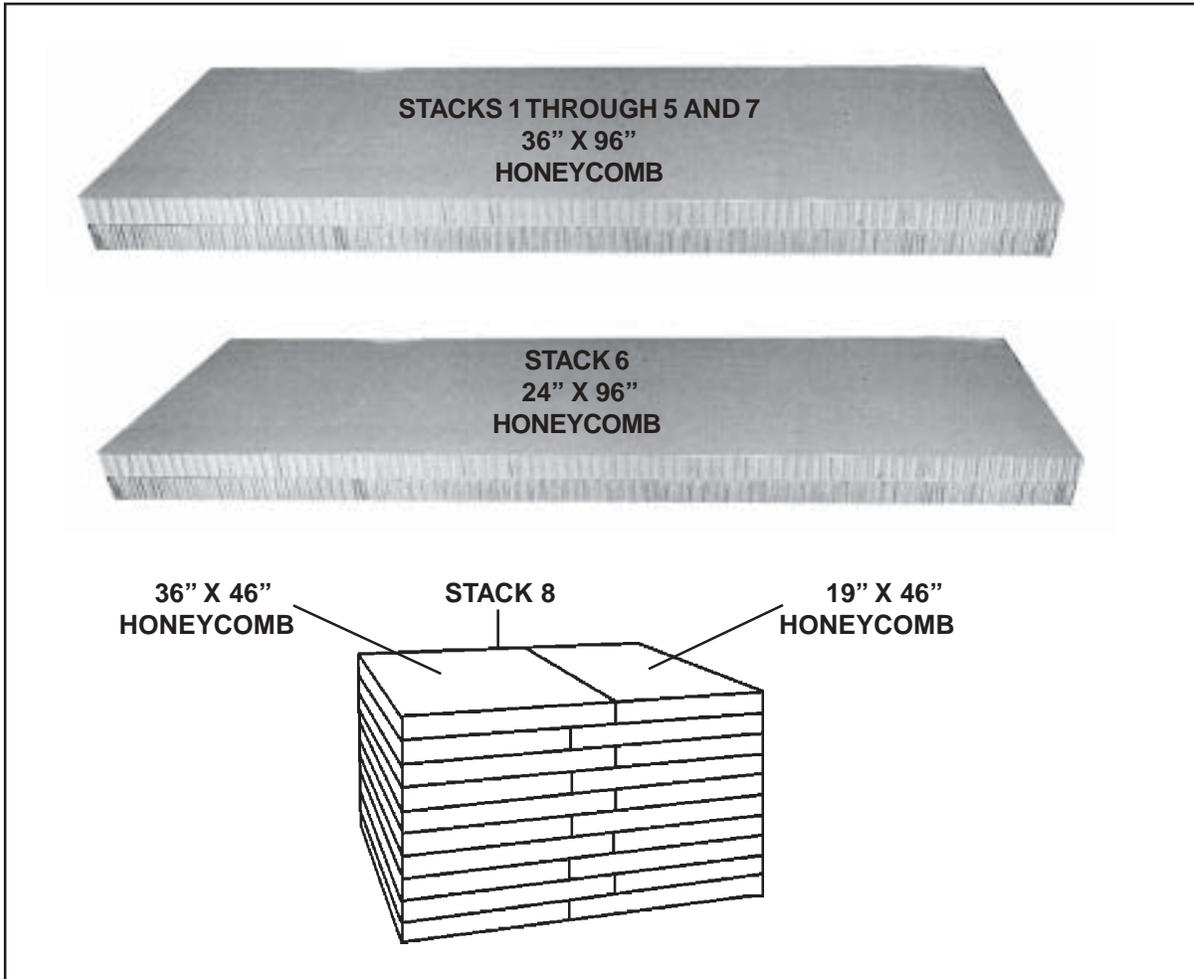


Figure 4-1. Platform Prepared

## PREPARING HONEYCOMB

4-3. Build honeycomb stacks as shown in Figure 4-2.



STACK NUMBER	PIECES	WIDTH (INCHES)	LENGTH (INCHES)	MATERIAL	INSTRUCTIONS
1-5	2	36	96	Honeycomb	Do not glue together.
6	2	24	96	Honeycomb	Do not glue together.
7	2	36	96	Honeycomb	Do not glue together.
8	10	36	46	Honeycomb	Lay on floor beside a 19 x 46 piece forming a 46 x 55 base. Alternate the pieces and glue on top of the base forming a stack of 10 layers. See above.
	10	19	46	Honeycomb	

Figure 4-2. Honeycomb Stacks Prepared

## POSITIONING HONEYCOMB STACKS

4-4. Position honeycomb stacks as shown in Figure 4-3.

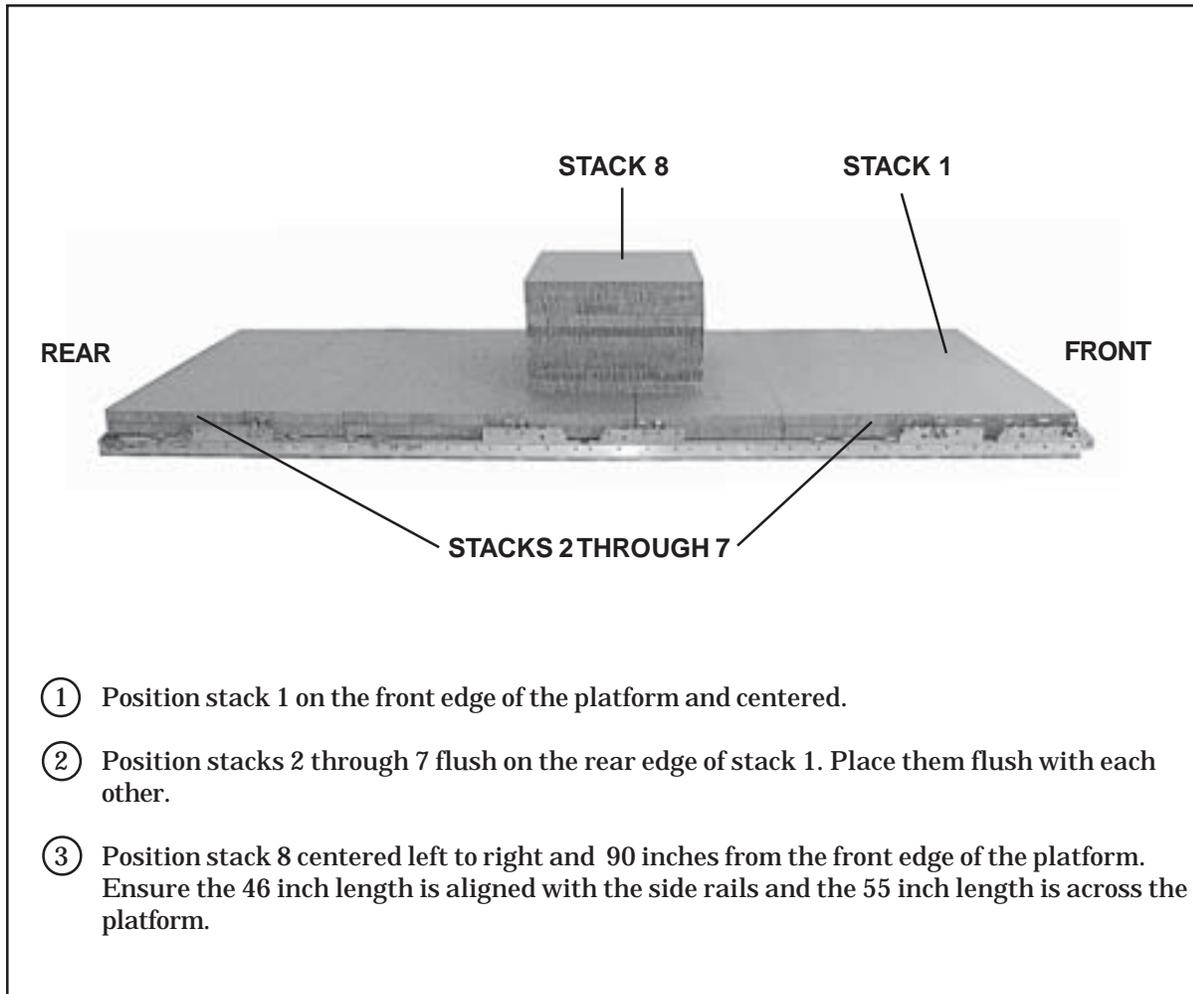


Figure 4-3. Honeycomb Stacks Positioned

## BUILDING THE EQUIPMENT BOXES

4-5. Build the front and rear equipment boxes as shown in Figures 4-4 and 4-5.

a. Build the front equipment box using 16d nails and as shown in Figure 4-4.

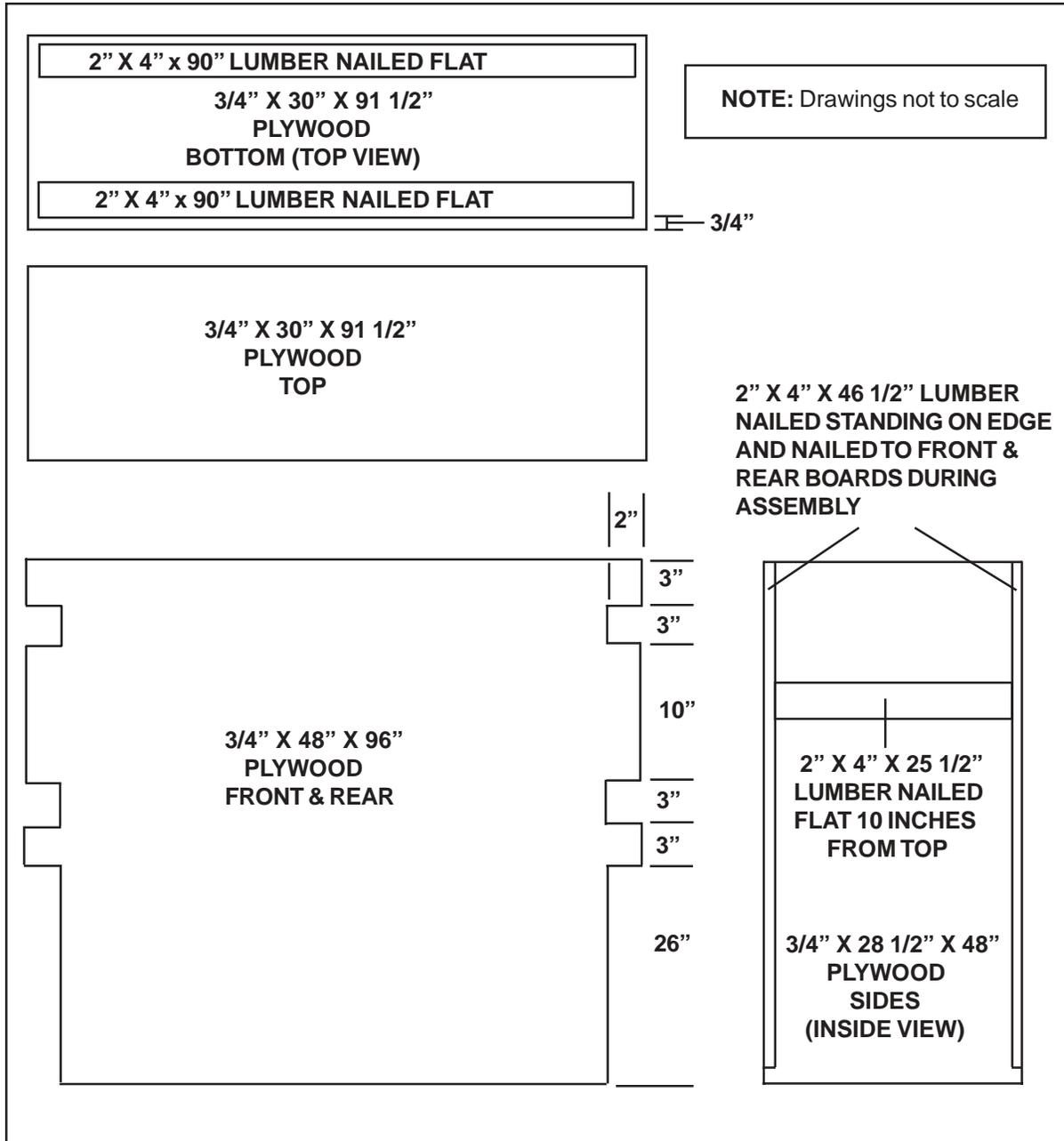
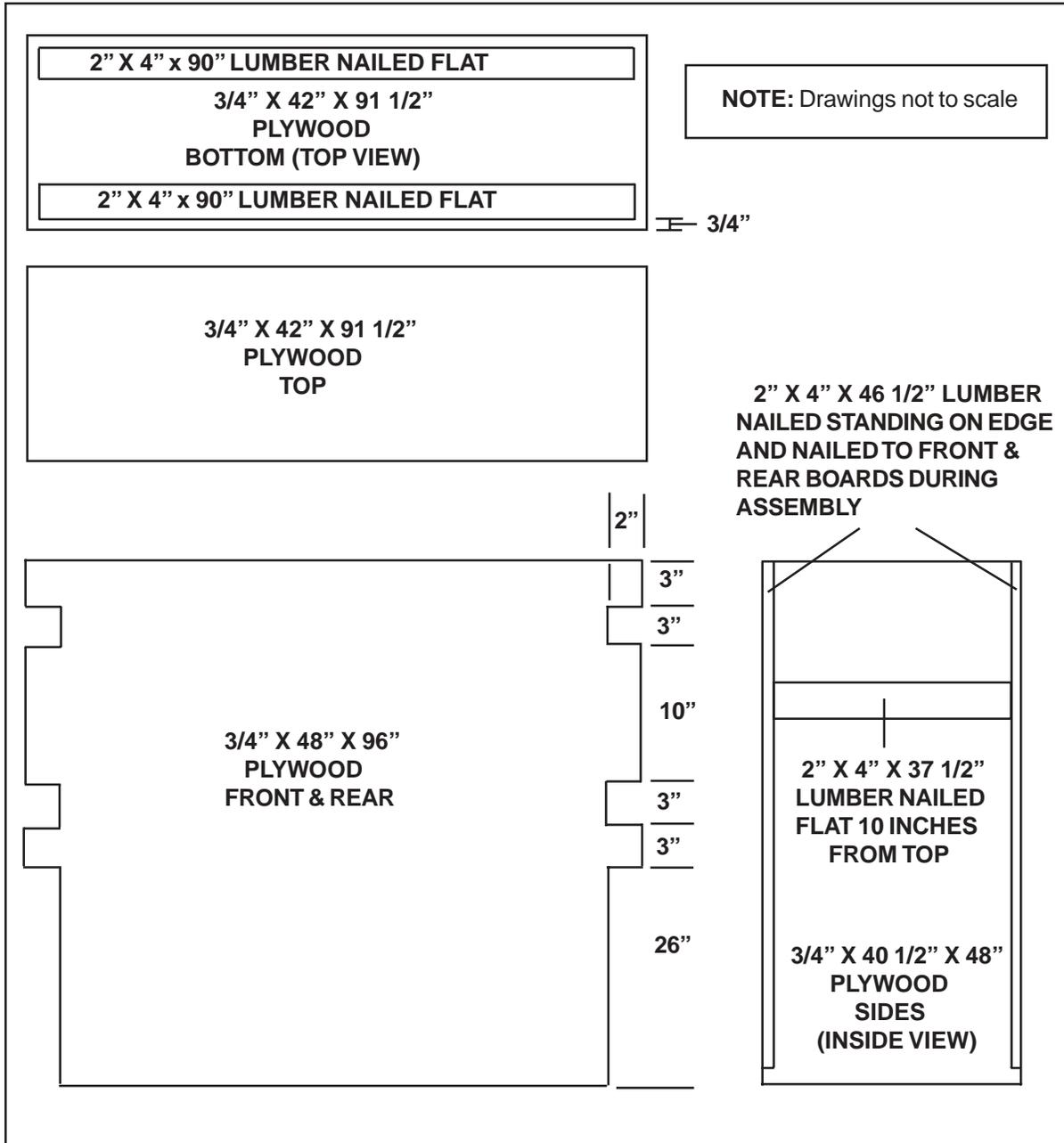


Figure 4-4. Front Equipment Box Built

**b.** Build the rear equipment box using 16d nails and as shown in Figure 4-5.



**Figure 4-5. Rear Equipment Box Built**

## PREPARING EQUIPMENT FOR EQUIPMENT BOXES

4-6. Prepare the equipment for the equipment boxes as shown in Figures 4-6 through 4-12.

a. Prepare and secure five fire extinguishers as shown in Figure 4-6.

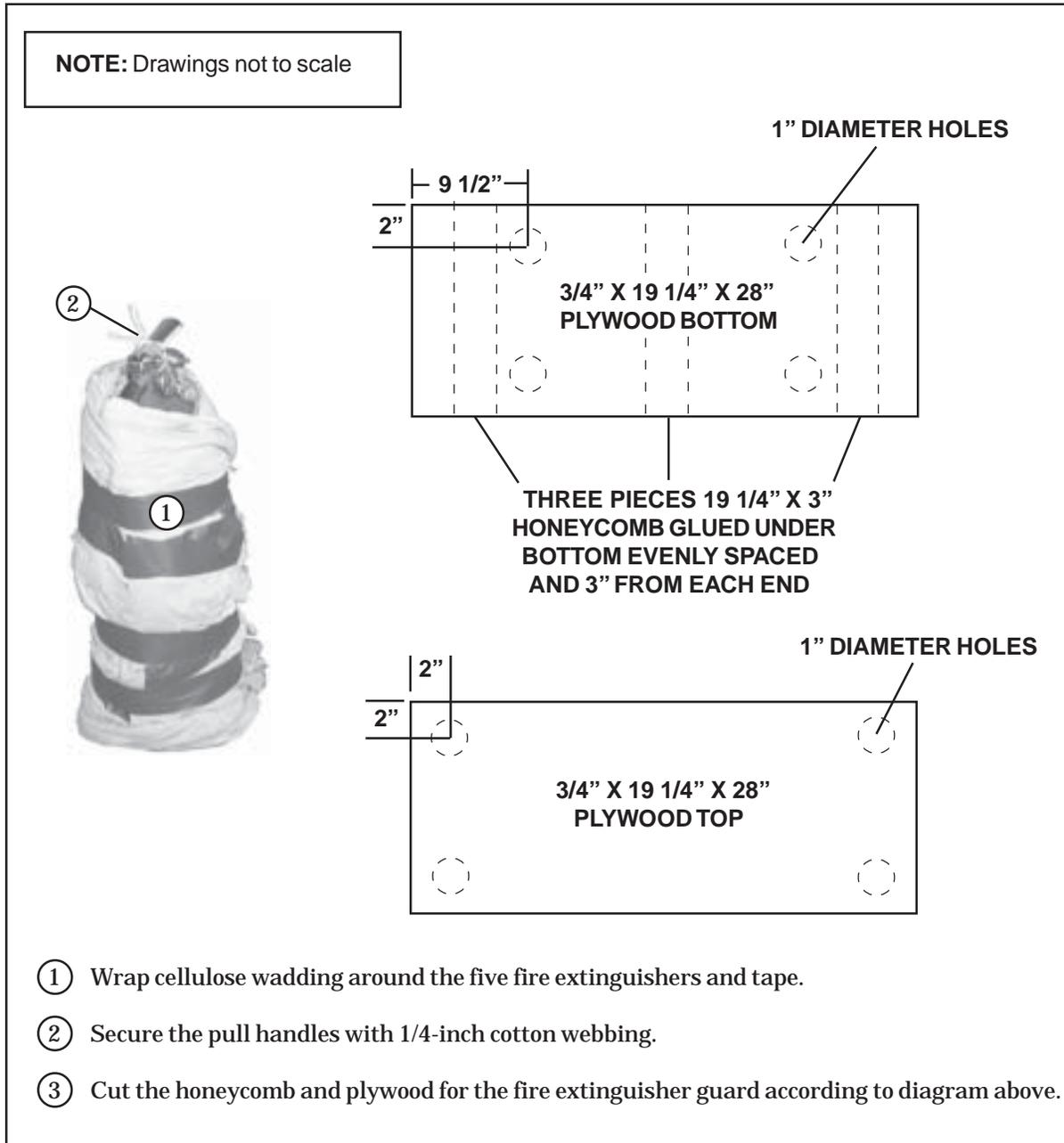
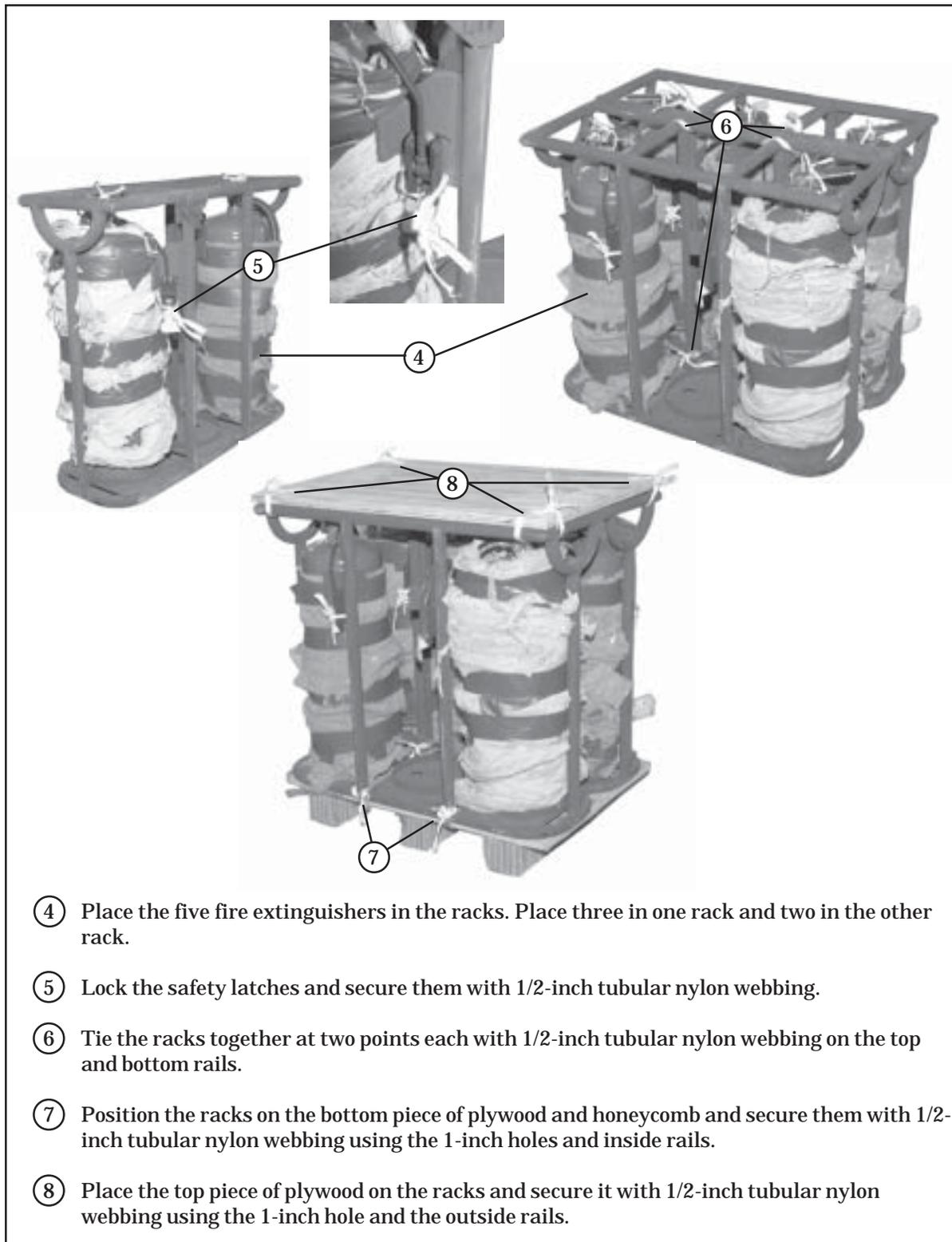


Figure 4-6. Fire Extinguishers Prepared



- ④ Place the five fire extinguishers in the racks. Place three in one rack and two in the other rack.
- ⑤ Lock the safety latches and secure them with 1/2-inch tubular nylon webbing.
- ⑥ Tie the racks together at two points each with 1/2-inch tubular nylon webbing on the top and bottom rails.
- ⑦ Position the racks on the bottom piece of plywood and honeycomb and secure them with 1/2-inch tubular nylon webbing using the 1-inch holes and inside rails.
- ⑧ Place the top piece of plywood on the racks and secure it with 1/2-inch tubular nylon webbing using the 1-inch hole and the outside rails.

Figure 4-6. Fire Extinguishers Prepared (Continued)

b. Prepare and secure the filter separator as shown in Figure 4-7.

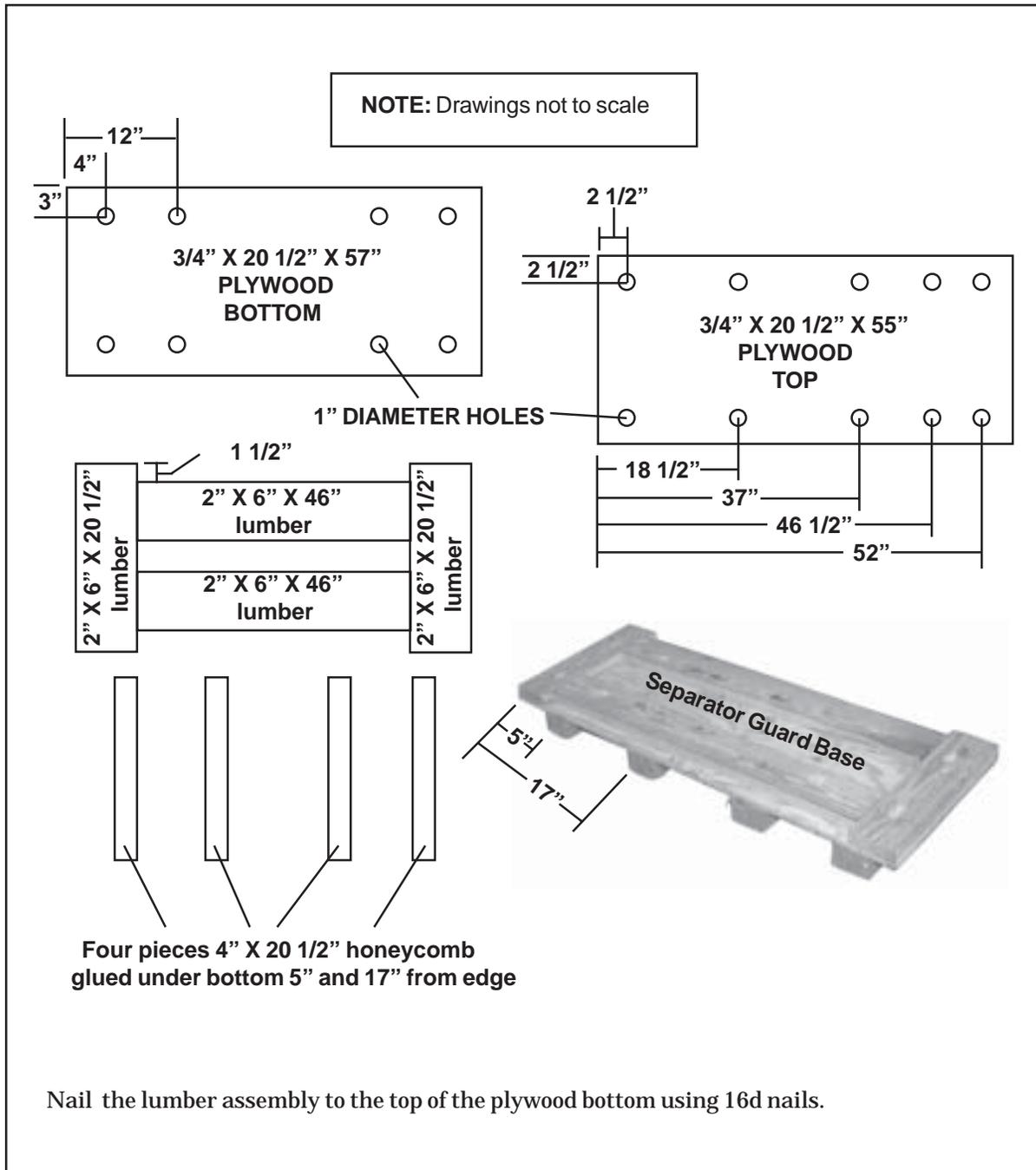
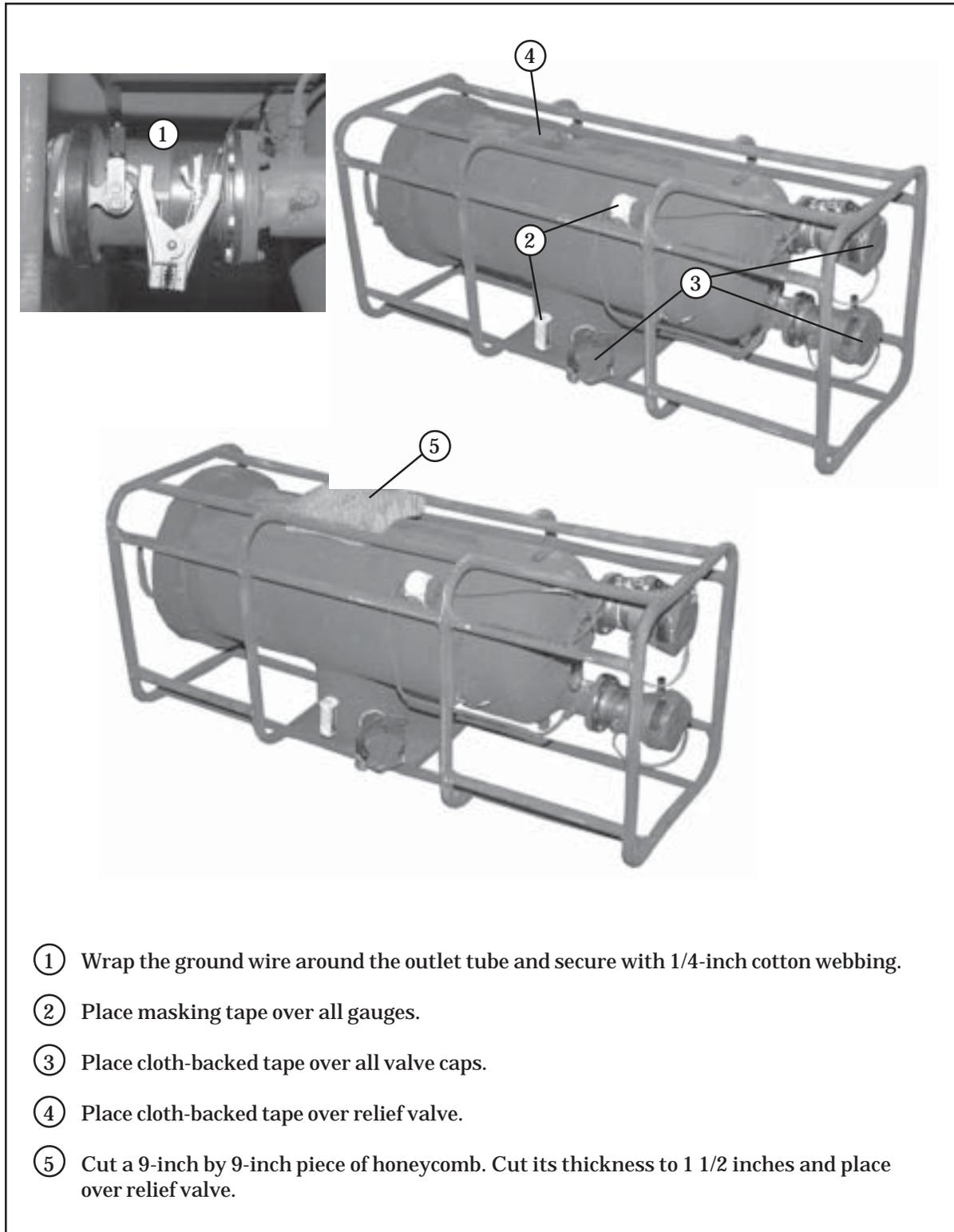
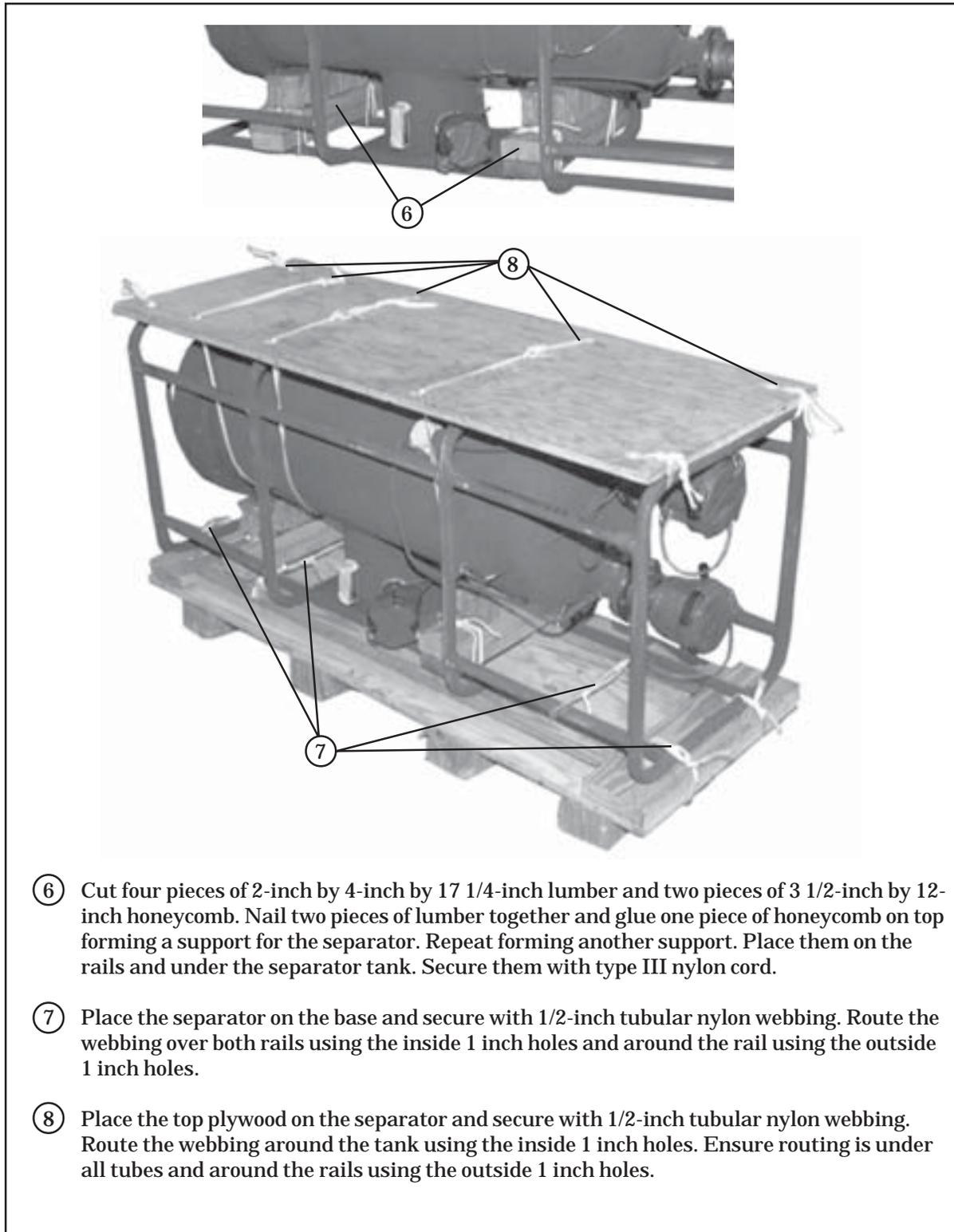


Figure 4-7. Filter Separator Secured



- ① Wrap the ground wire around the outlet tube and secure with 1/4-inch cotton webbing.
- ② Place masking tape over all gauges.
- ③ Place cloth-backed tape over all valve caps.
- ④ Place cloth-backed tape over relief valve.
- ⑤ Cut a 9-inch by 9-inch piece of honeycomb. Cut its thickness to 1 1/2 inches and place over relief valve.

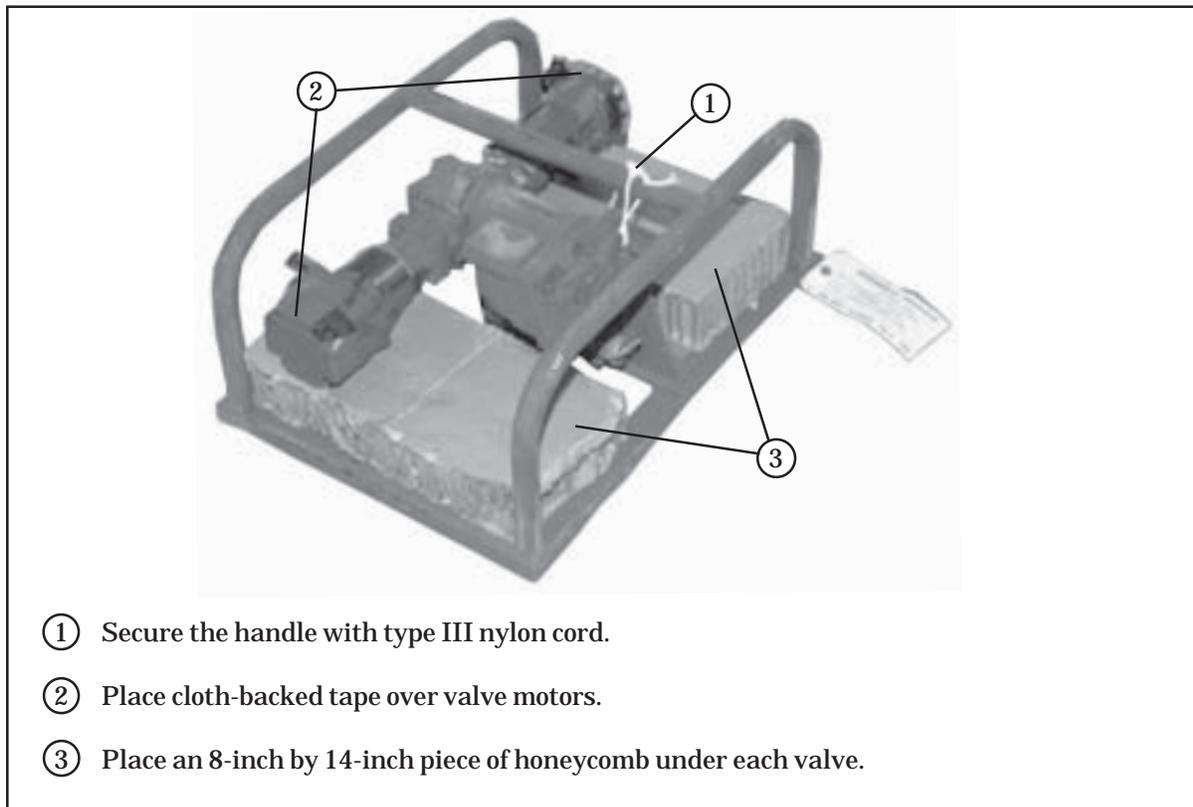
Figure 4-7. Filter Separator Secured (Continued)



- ⑥ Cut four pieces of 2-inch by 4-inch by 17 1/4-inch lumber and two pieces of 3 1/2-inch by 12-inch honeycomb. Nail two pieces of lumber together and glue one piece of honeycomb on top forming a support for the separator. Repeat forming another support. Place them on the rails and under the separator tank. Secure them with type III nylon cord.
- ⑦ Place the separator on the base and secure with 1/2-inch tubular nylon webbing. Route the webbing over both rails using the inside 1 inch holes and around the rail using the outside 1 inch holes.
- ⑧ Place the top plywood on the separator and secure with 1/2-inch tubular nylon webbing. Route the webbing around the tank using the inside 1 inch holes. Ensure routing is under all tubes and around the rails using the outside 1 inch holes.

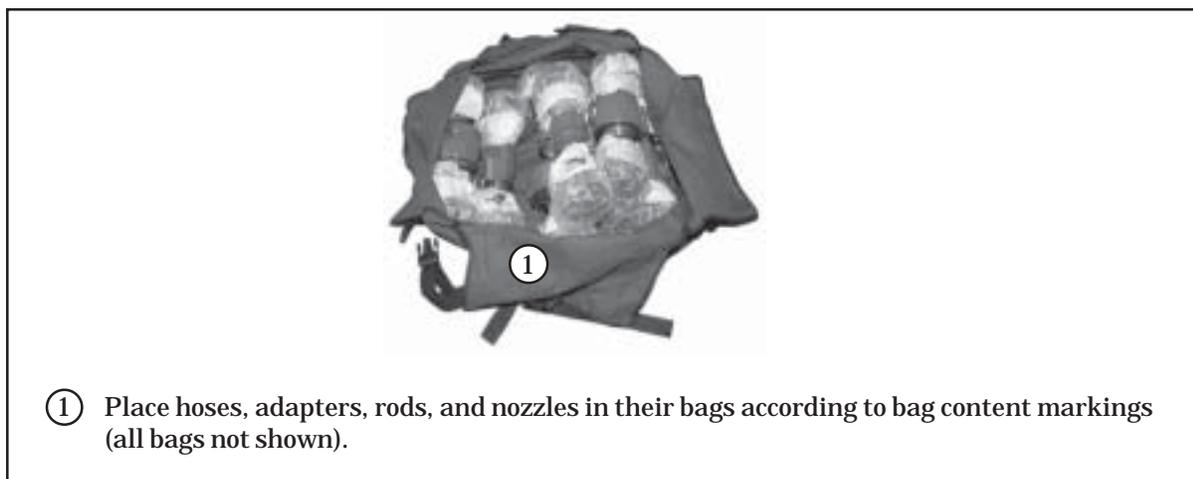
Figure 4-7. Filter Separator Secured (Continued)

*c.* Prepare and secure the explosion-proof motor as shown in Figure 4-8.



**Figure 4-8. Explosion-Proof Motor Secured**

*d.* Prepare and secure the hose and equipment bags as shown in Figure 4-9.



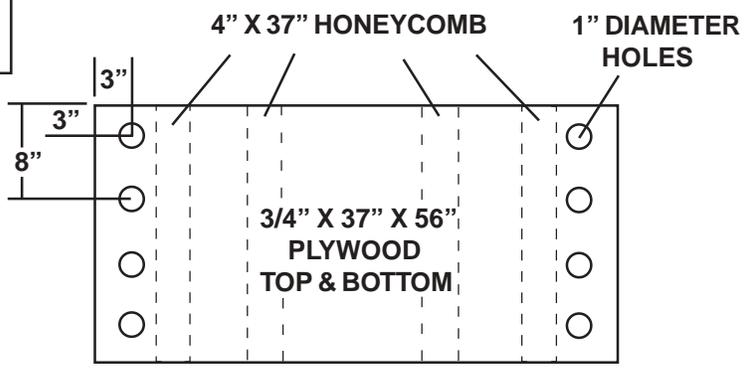
**Figure 4-9. Equipment Bags Secured**

e. Prepare and secure the pump as shown in Figure 4-10.

**NOTE:** Drawings not to scale



**3/4" X 3 1/4" X 7"**  
**PLYWOOD SHIMS**  
**4 EACH**



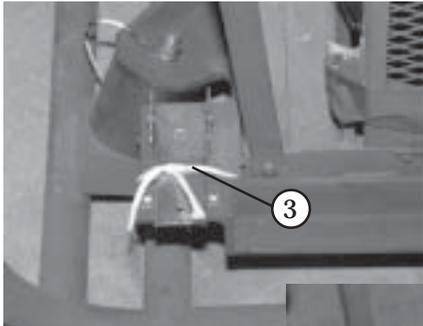
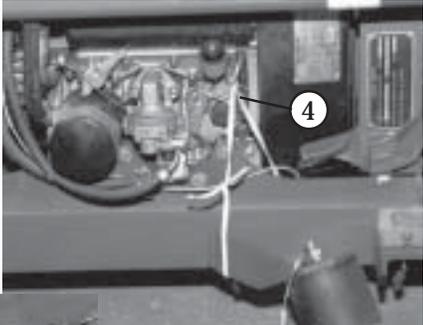
**4" X 37" HONEYCOMB**

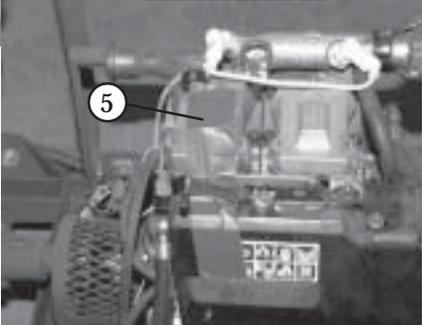
**1" DIAMETER HOLES**

**3/4" X 37" X 56"**  
**PLYWOOD**  
**TOP & BOTTOM**

- ① Cut the plywood for the pump guard as shown above.
- ② Cut four pieces of honeycomb 4 inches by 37 inches and glue evenly spaced to underside of bottom board only.



- ③ Secure all latches with tape or 1/4-inch cotton webbing.
- ④ Secure the dipstick with 1/4-inch cotton webbing.
- ⑤ Secure the flow control handle with tape.

Figure 4-10. Pump Secured

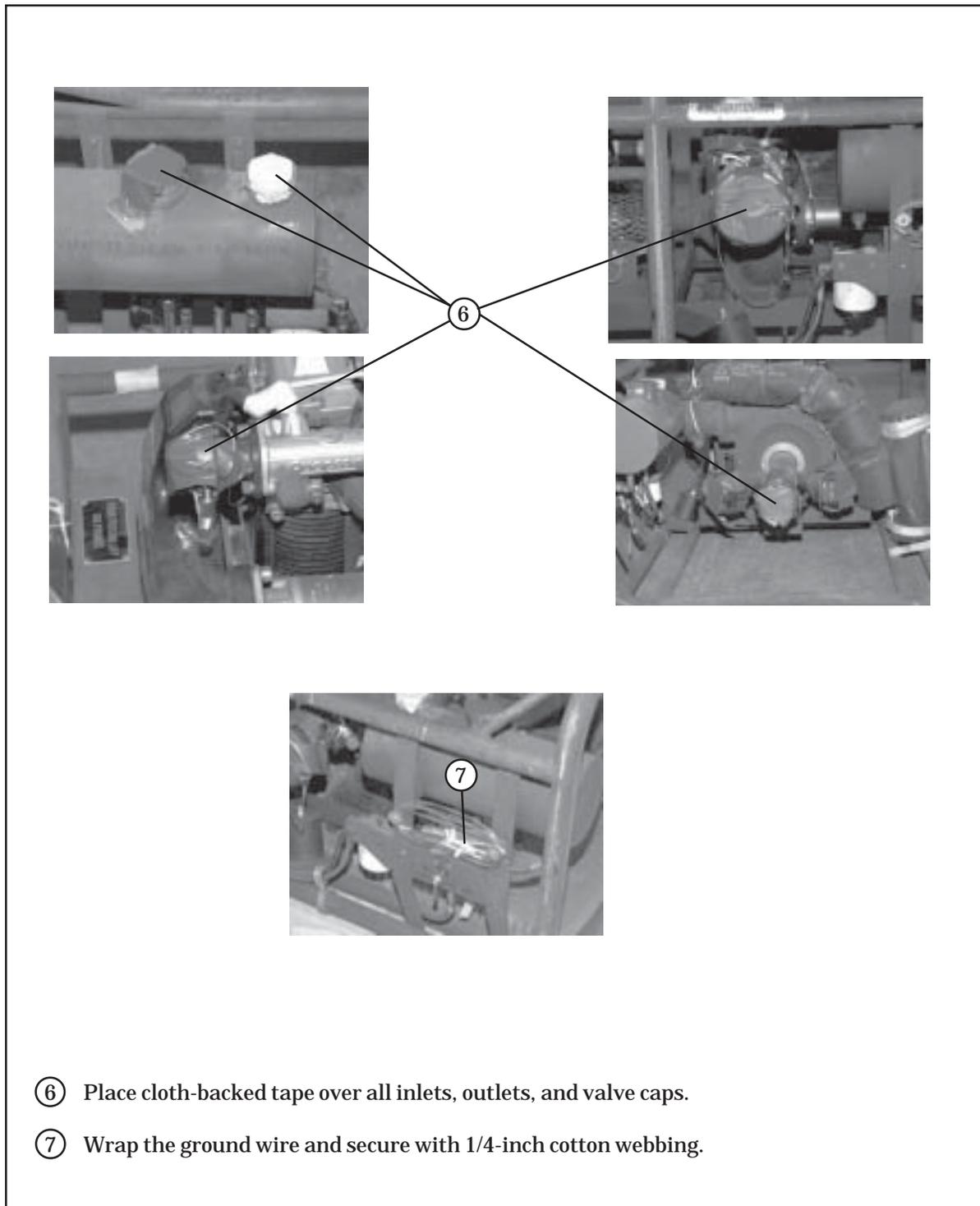


Figure 4-10. Pump Secured (Continued)

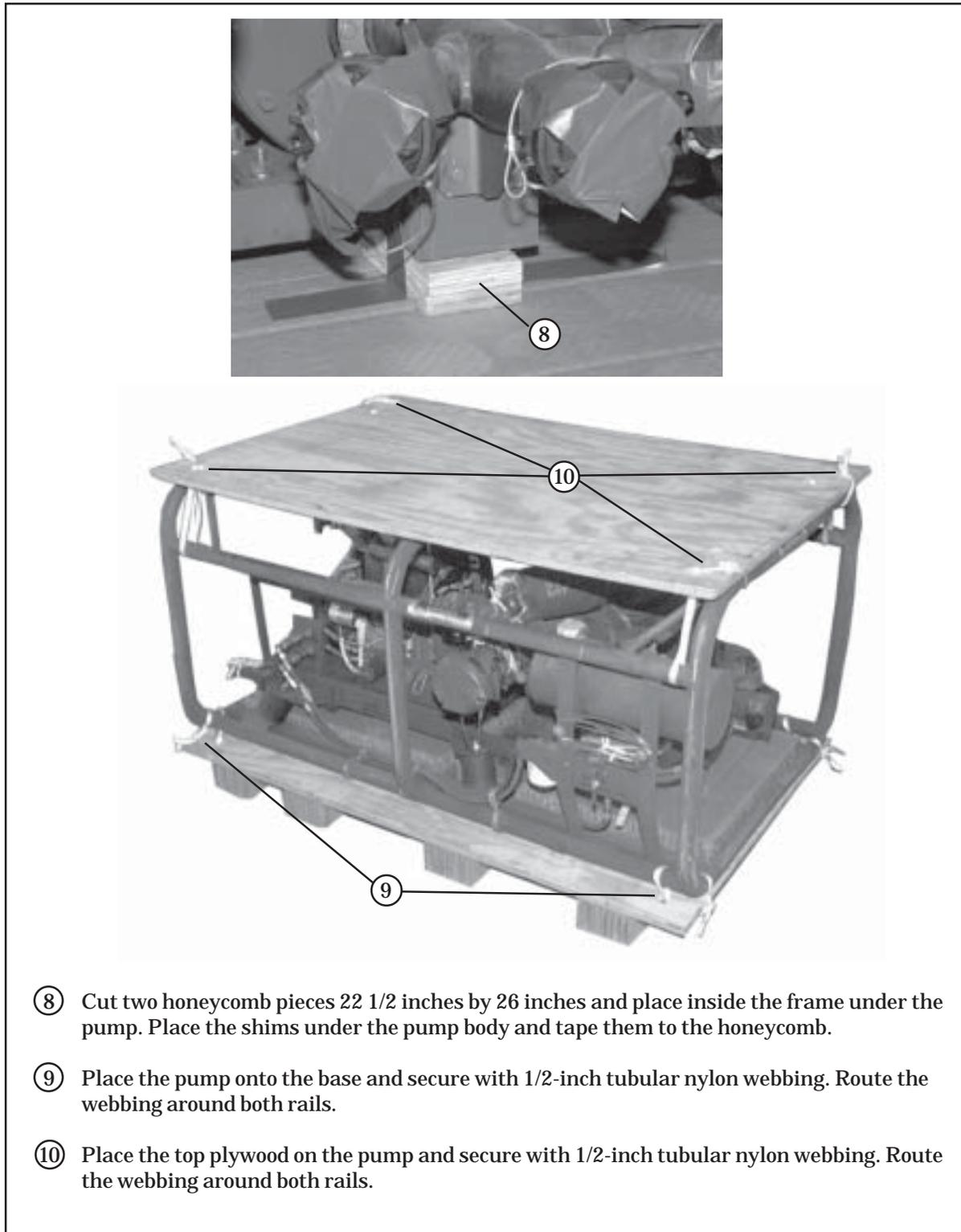
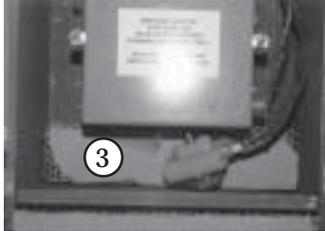
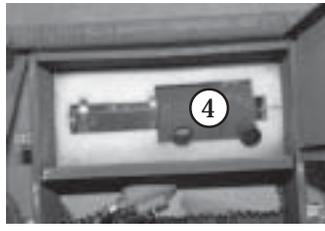
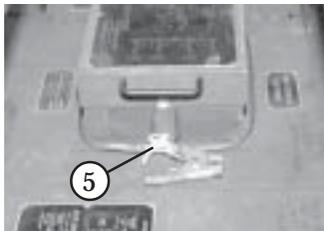


Figure 4-10. Pump Secured (Continued)

f. Prepare and secure the battery box as shown in Figure 4-11.

**NOTE: Drawings not to scale**

- ① Cut the plywood for the battery box as shown above.
- ② Cut three pieces of honeycomb 4 inches x 21 1/4 inches and glue evenly spaced to underside of bottom board only.

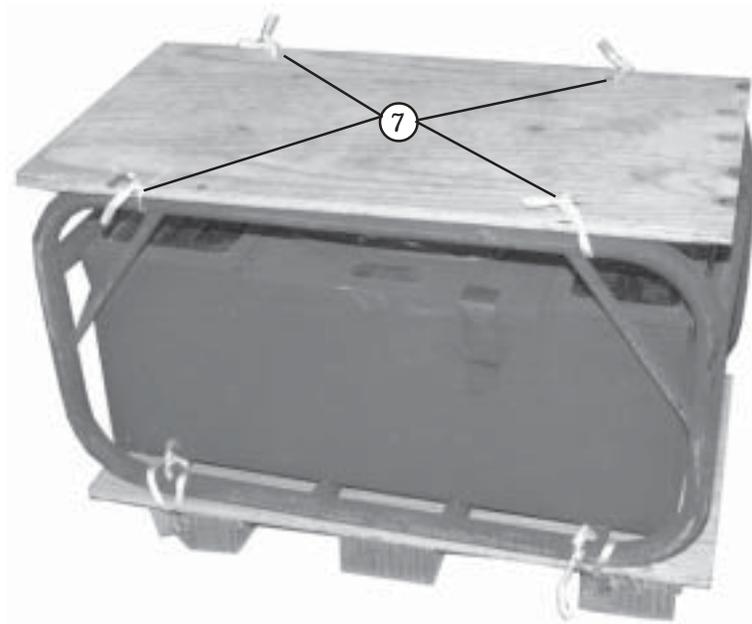




- ③ Place honeycomb filler against the battery to prevent movement.
- ④ Ensure the intake filter is in the Styrofoam. Place a piece of honeycomb on top of it to prevent movement.
- ⑤ Wrap the grounding wire around the top of the box and secure with 1/4-inch cotton webbing. Close all latches and secure them with tape (not shown).

Figure 4-11. Battery Box Secured



- ⑥ Place the battery box on the base plywood and secure with 1/2-inch tubular nylon webbing around the rails.



- ⑦ Place the plywood top on the battery box and secure it with 1/2-inch tubular nylon webbing around the rails.

Figure 4-11. Battery Box Secured (Continued)

*g.* Prepare and secure the manuals and toolkit as shown in Figure 4-12.



① Secure the manuals and toolkit together using cloth-backed tape.

**Figure 4-12. Manuals and Toolkit Secured**

## POSITIONING EQUIPMENT BOXES

4-7. Position the front and rear equipment boxes on the platform as shown in Figure 4-13.

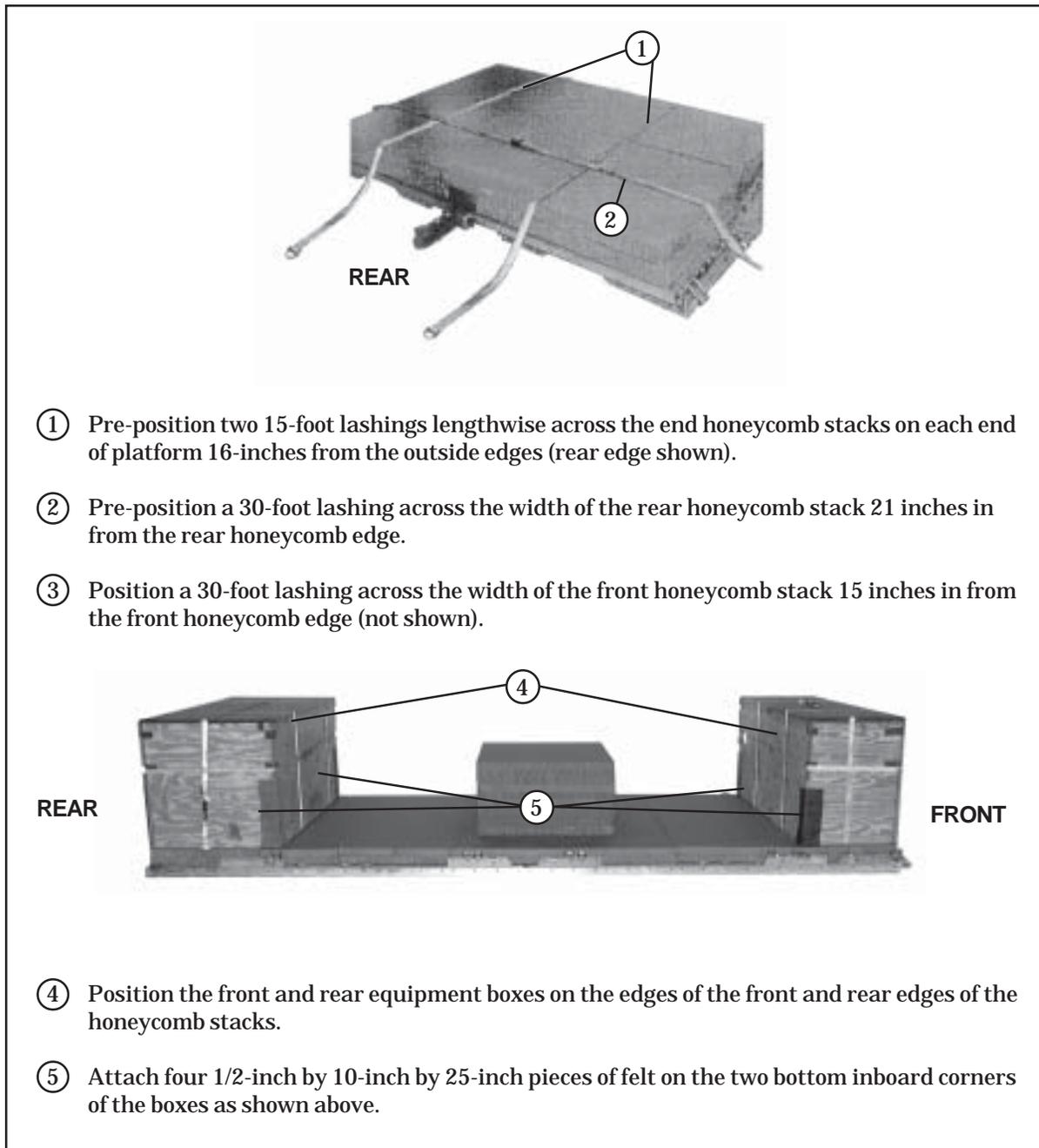


Figure 4-13. Equipment Boxes Positioned

## POSITIONING AND SECURING EQUIPMENT IN EQUIPMENT BOXES

4-8. Position and secure equipment in equipment boxes as shown in Figures 4-14 and 4-15.

*a.* Prepare the front equipment box by placing a 22-inch by 82-inch piece of honeycomb in the floor of the box and a 23-inch by 35-inch piece of honeycomb against each end of box below the 2 x 4 lumber. Position equipment in front equipment box as shown in Figure 4-14.

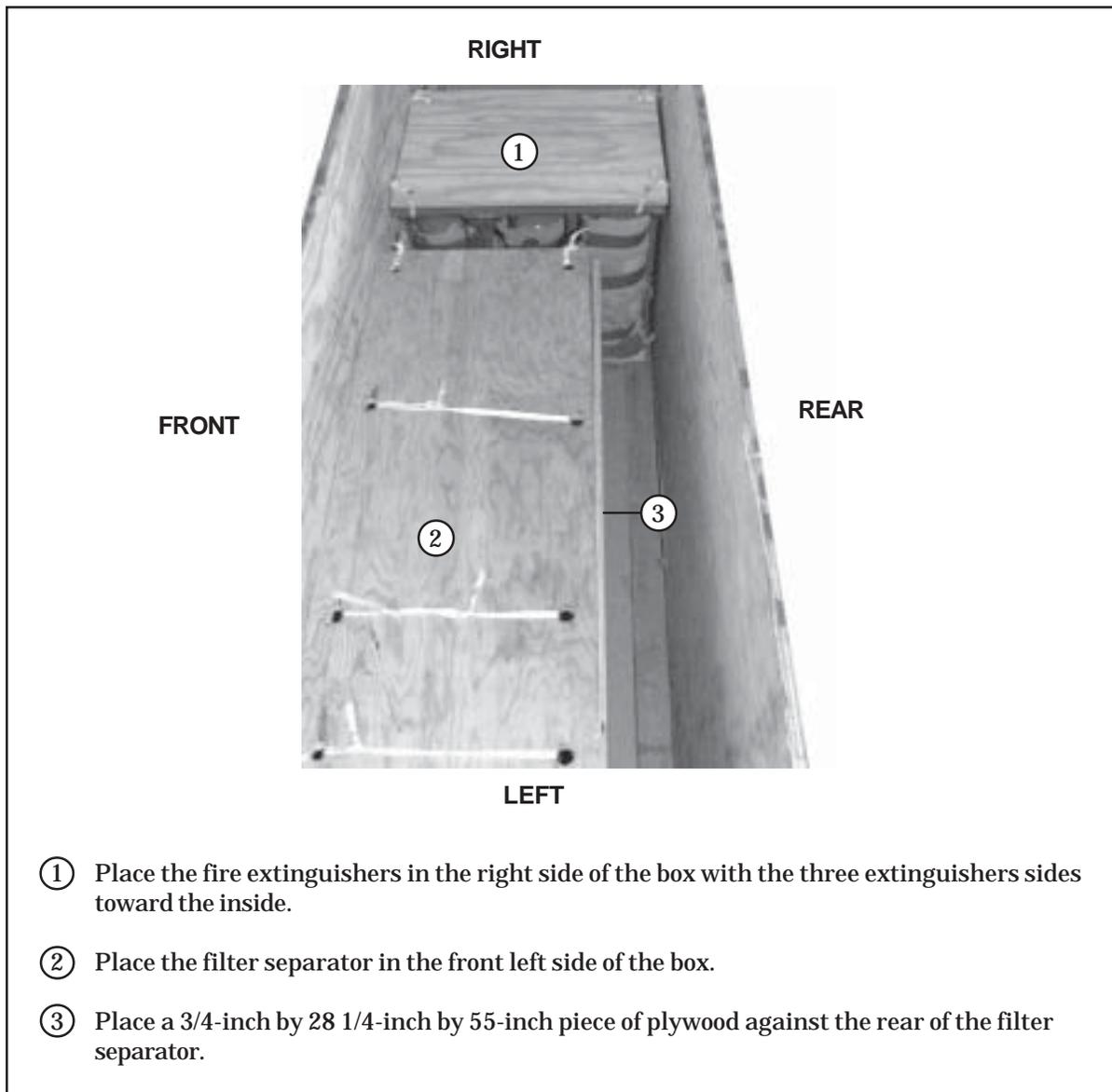
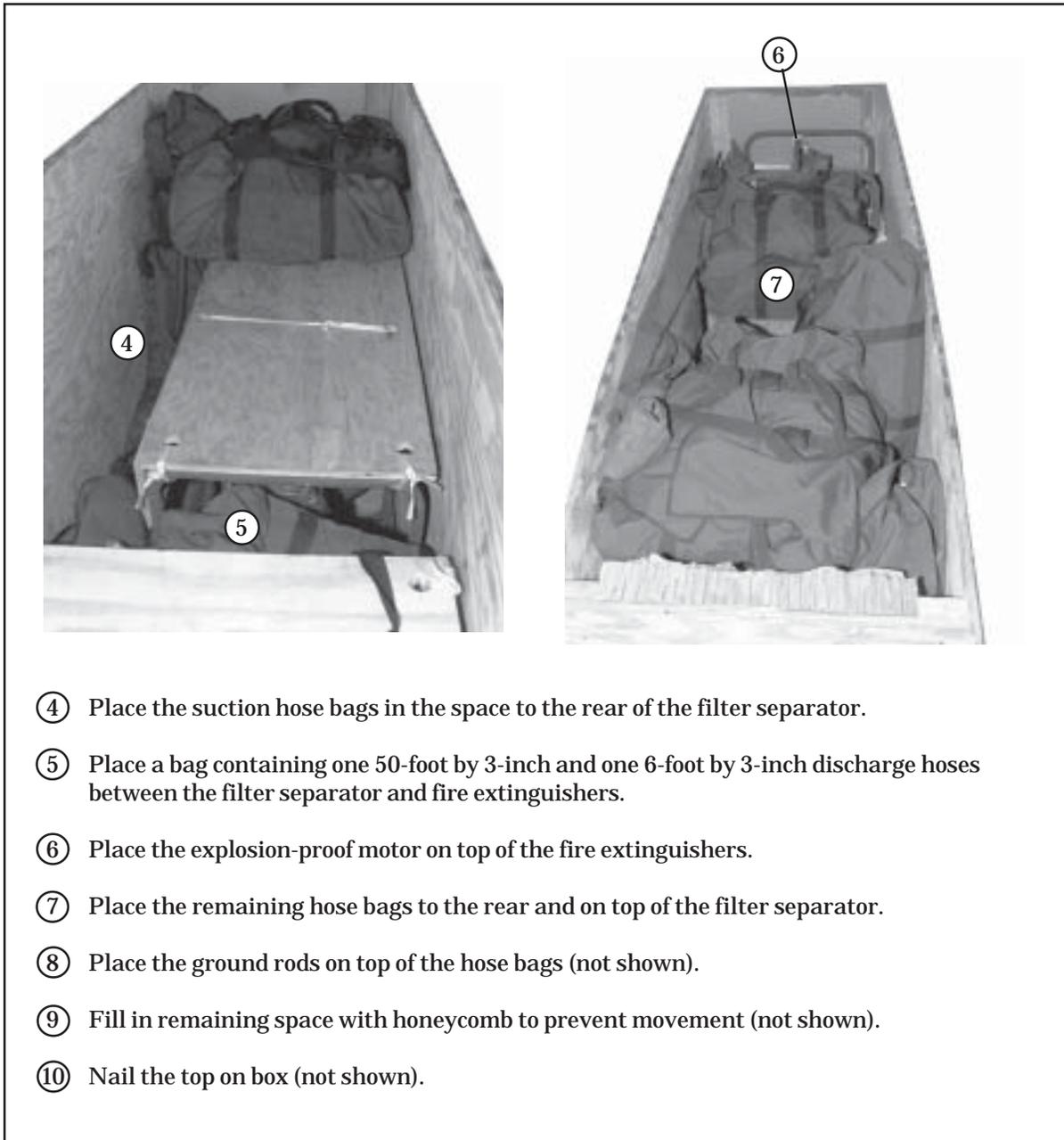


Figure 4-14. Equipment Positioned and Secured in Front Box



**Figure 4-14. Equipment Positioned and Secured in Front Box (Continued)**

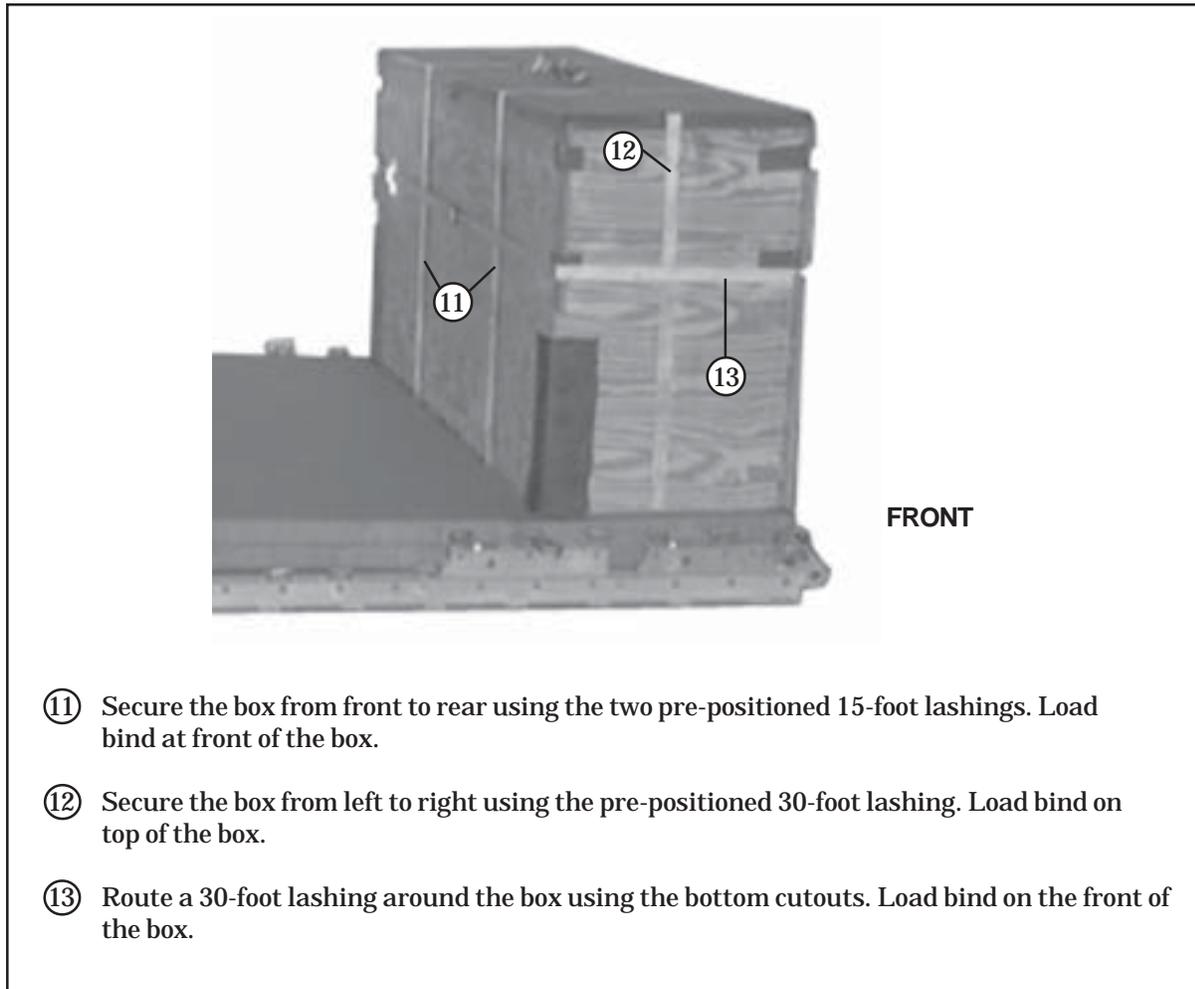
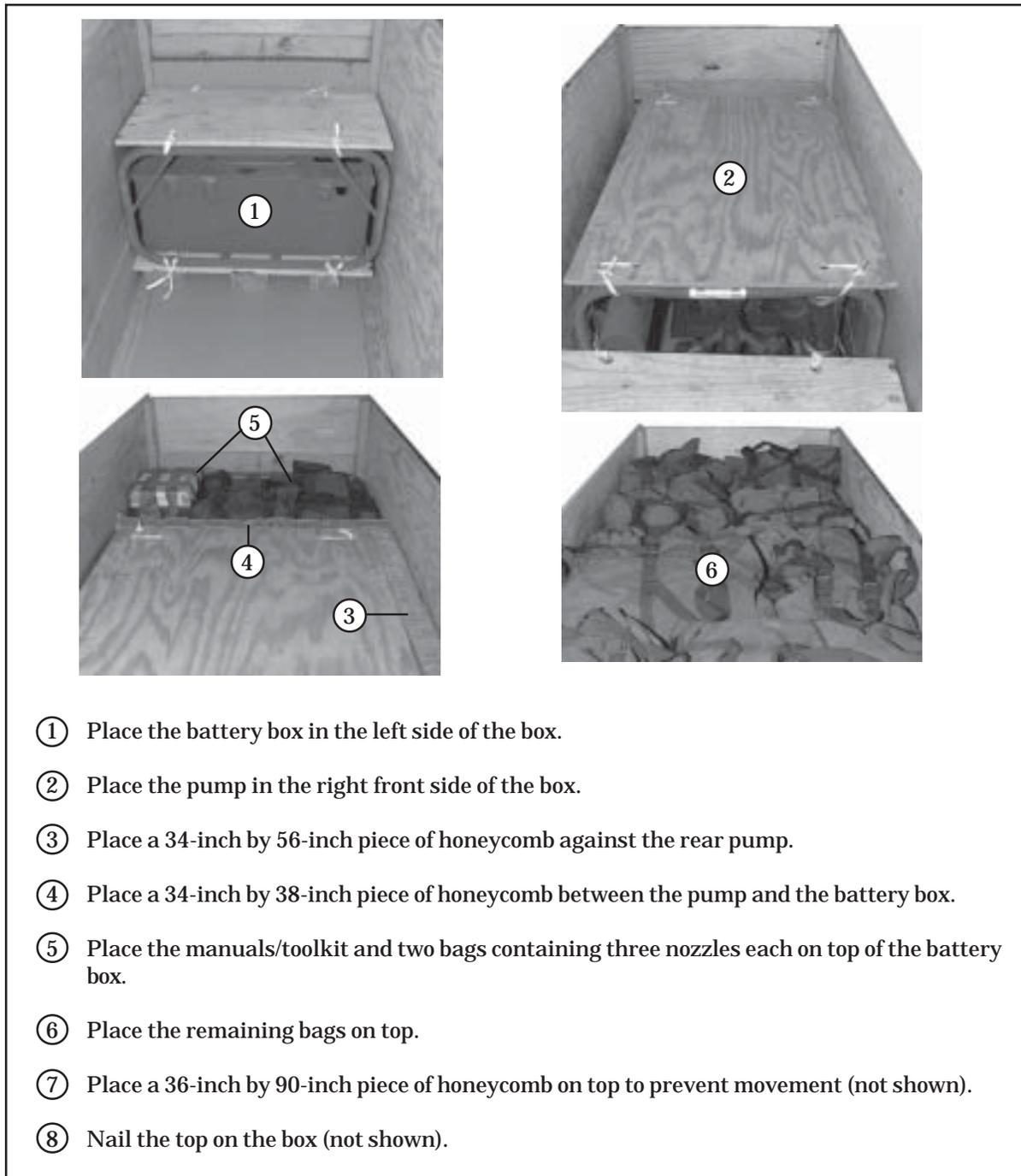
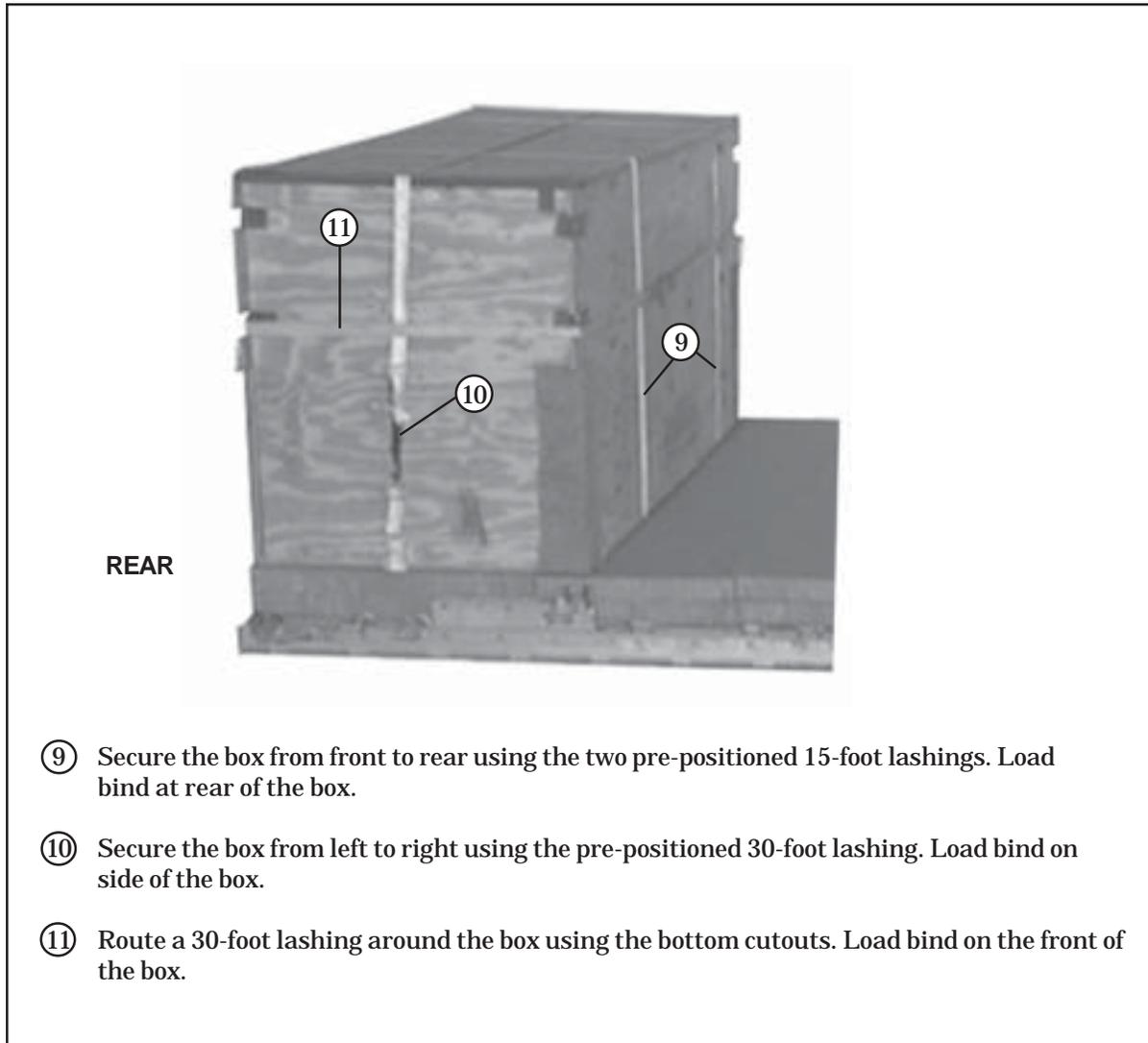


Figure 4-14. Equipment Positioned and Secured in Front Box (Continued)

**b.** Prepare the rear equipment box by placing a 34-inch by 82-inch piece of honeycomb in the floor of the box and a 37 1/2-inch by 35-inch piece of honeycomb against each end of box below the 2 x 4 lumber. Position equipment in front equipment box as shown in Figure 4-15.



**Figure 4-15. Equipment Positioned and Secured in Rear Box**



**Figure 4-15. Equipment Positioned and Secured in Rear Box (Continued)**

## LASHING THE EQUIPMENT BOXES TO THE PLATFORM

4-9. Lash the equipment boxes as shown in Figures 4-16 through 4-21.

**a.** Lash the front equipment box to the platform as shown in Figures 4-16 through 4-18.

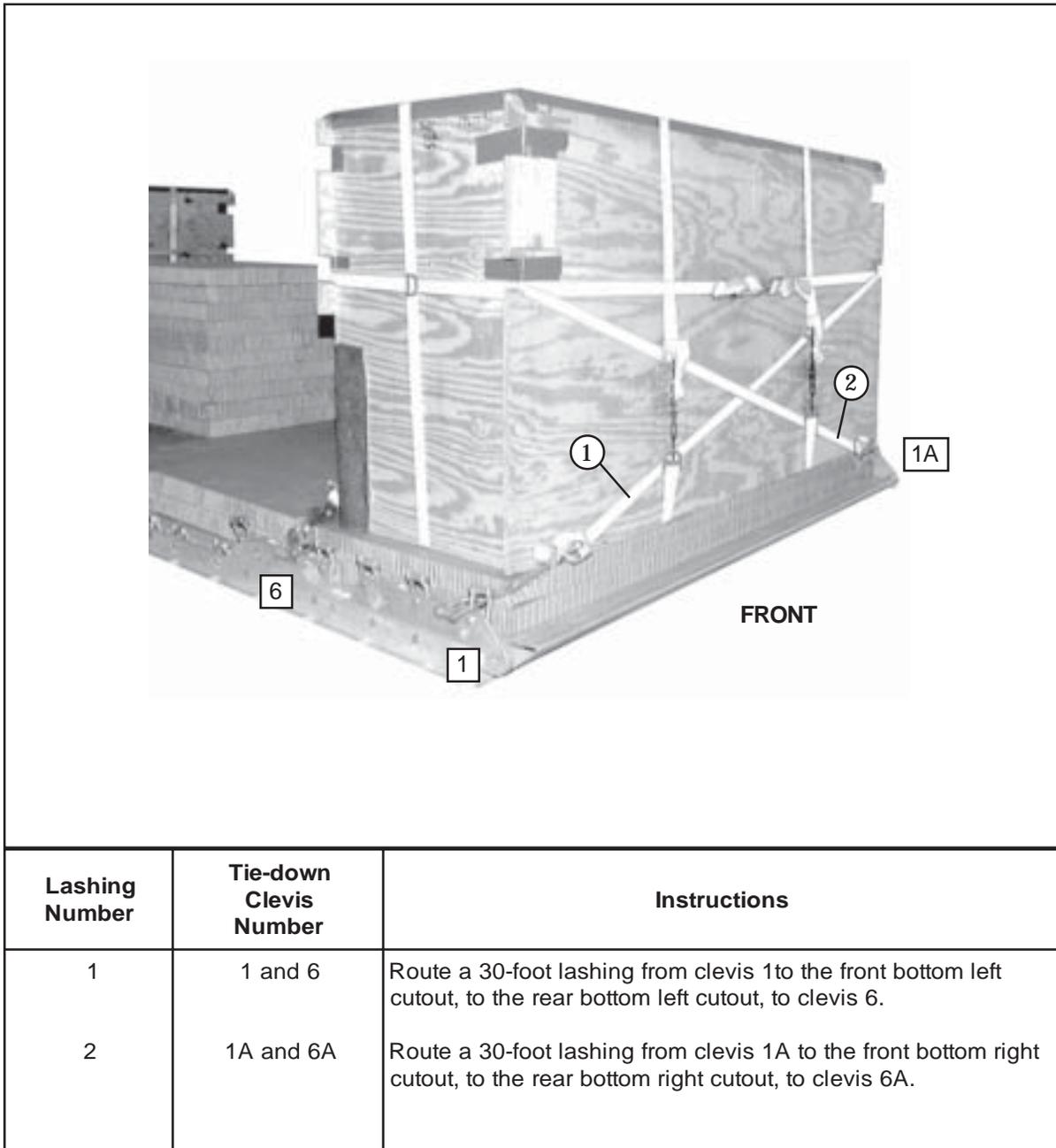


Figure 4-16. Lashings 1 and 2 Installed

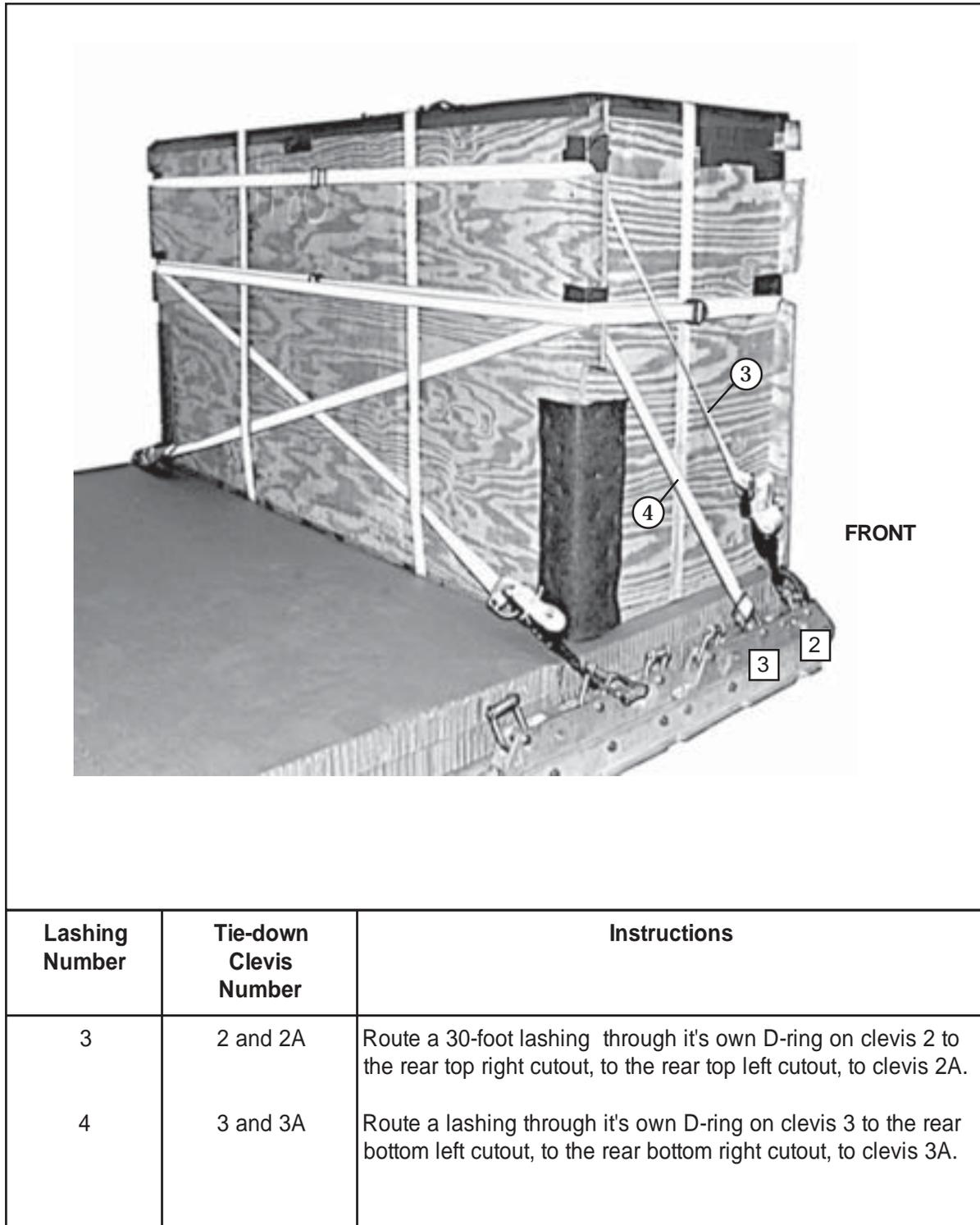
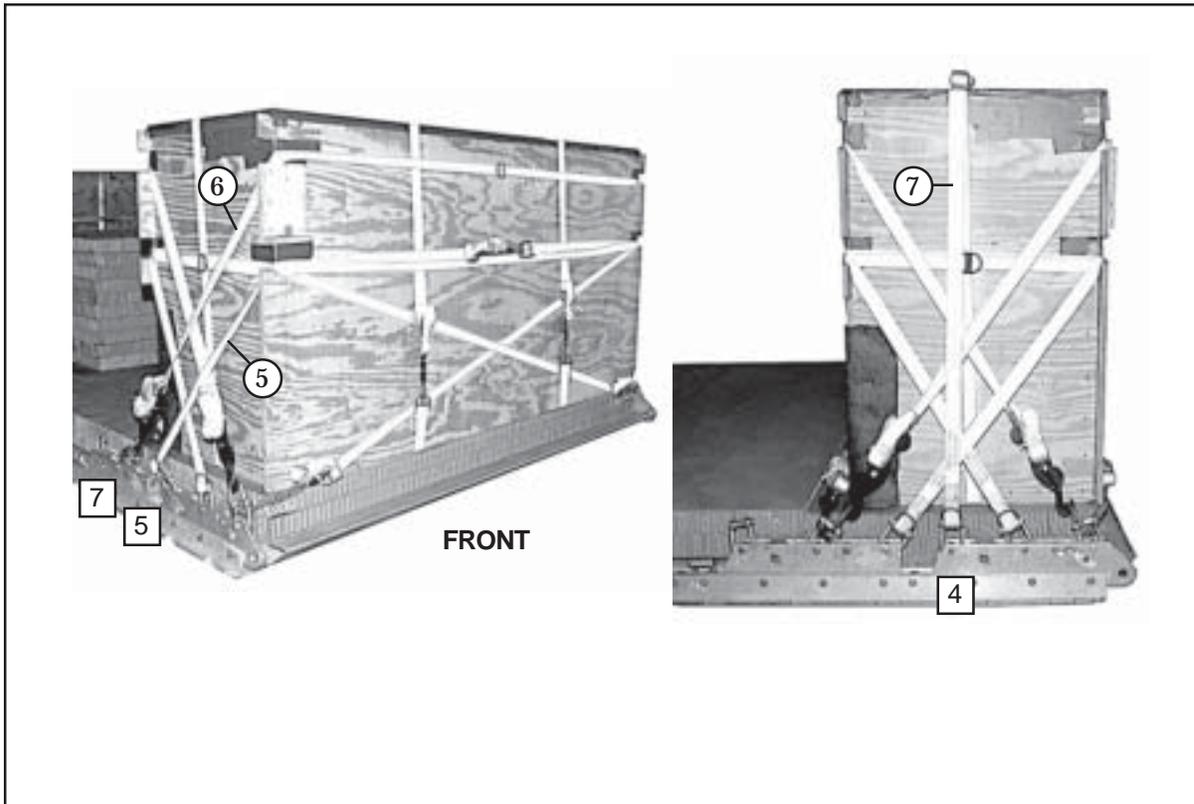


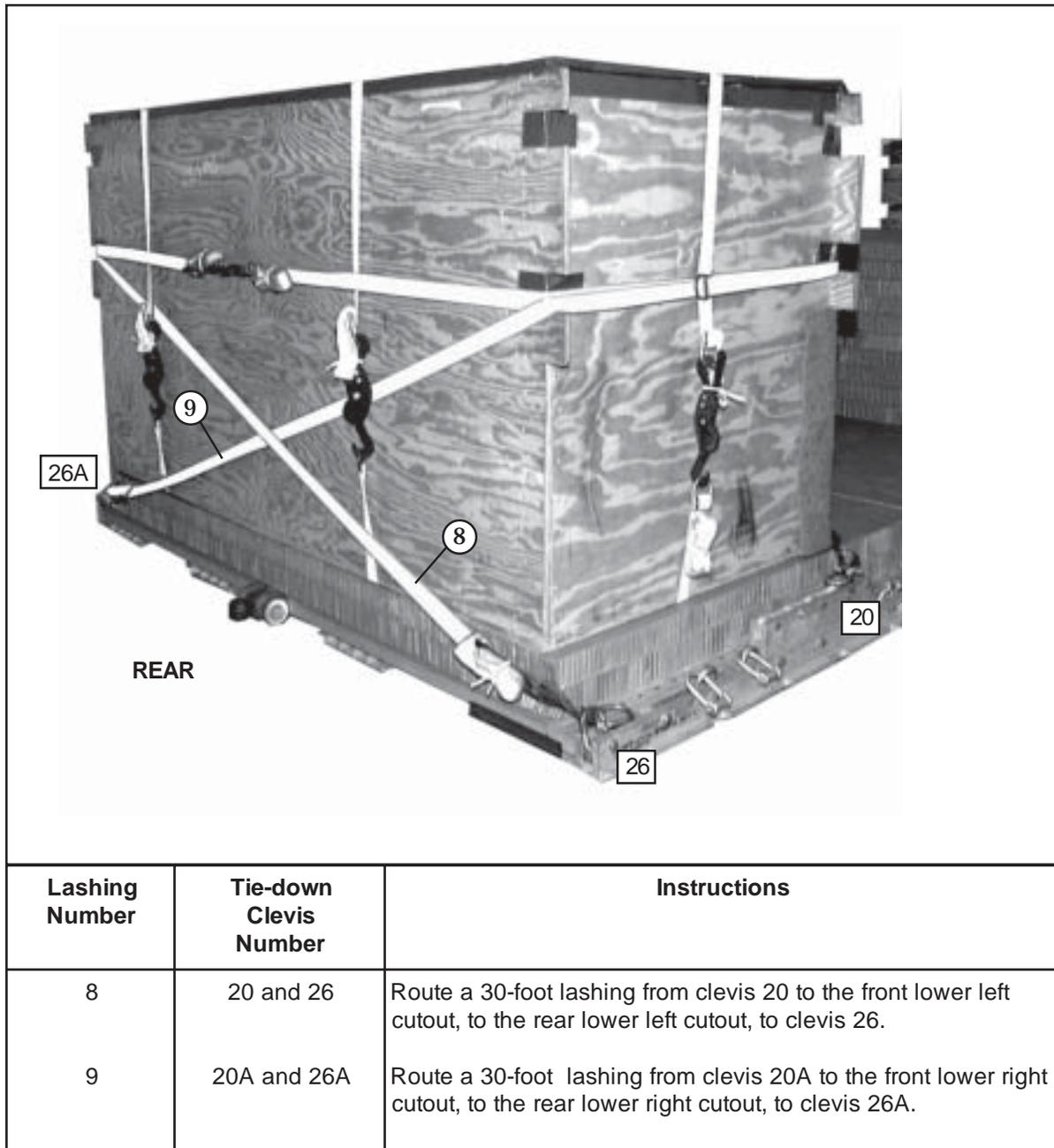
Figure 4-17. Lashings 3 and 4 Installed



Lashing Number	Tie-down Clevis Number	Instructions
5	5 and 5A	Route a lashing through it's own D-ring on clevis 5 to the front bottom right cutout, to the front bottom left cutout, to clevis 5A.
6	7 and 7A	Route a 30-foot lashing from clevis 7 to the front top right cutout, to the front top left cutout, to clevis 7A.
7	4 and 4A	Route a lashing through it's own D-ring on clevis 4, repeat on clevis 4A and load bind them together on top of the box.

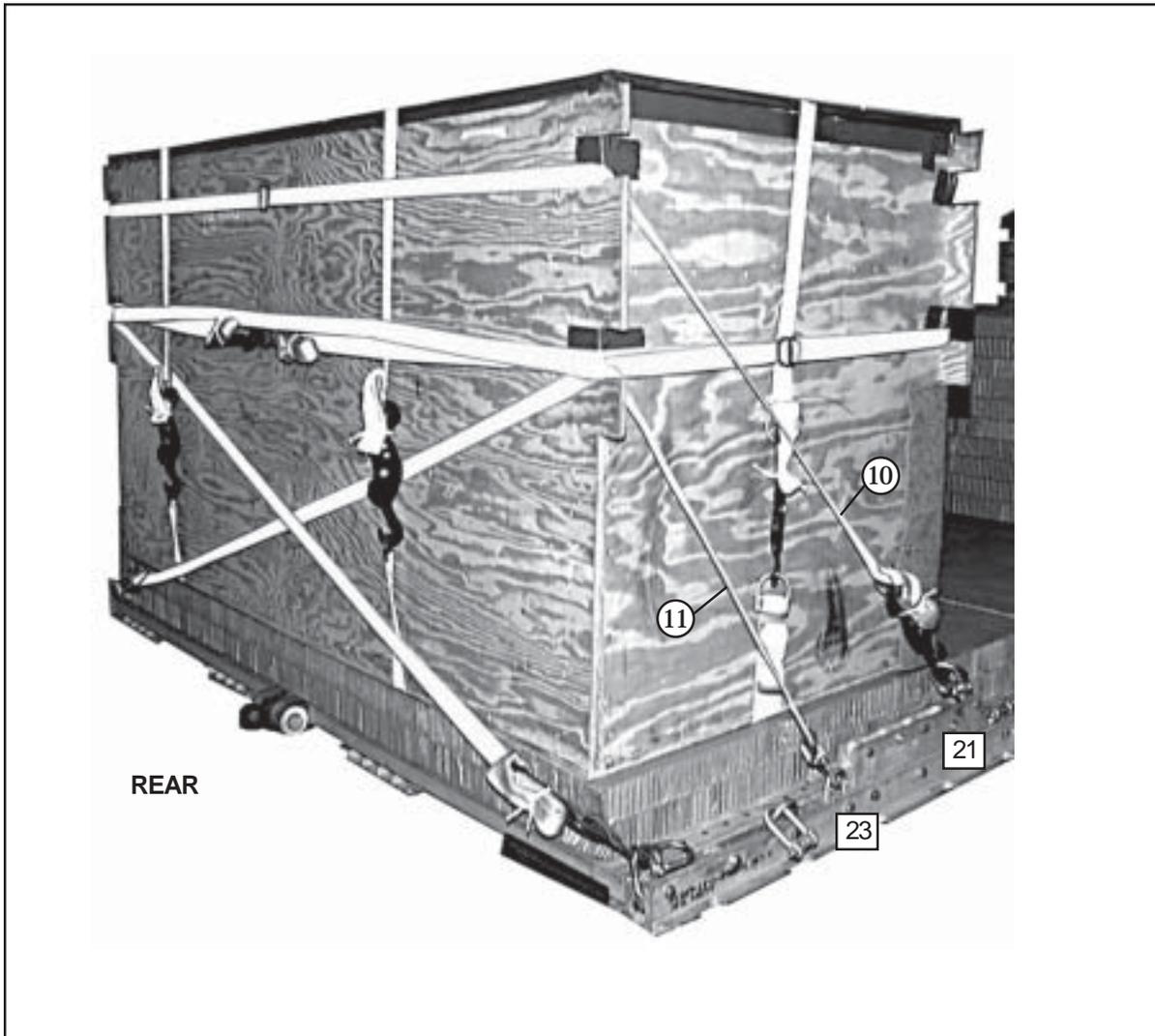
Figure 4-18. Lashings 5 through 7 Installed

**b.** Lash the rear equipment box to the platform as shown in Figures 4-19 through 4-21.



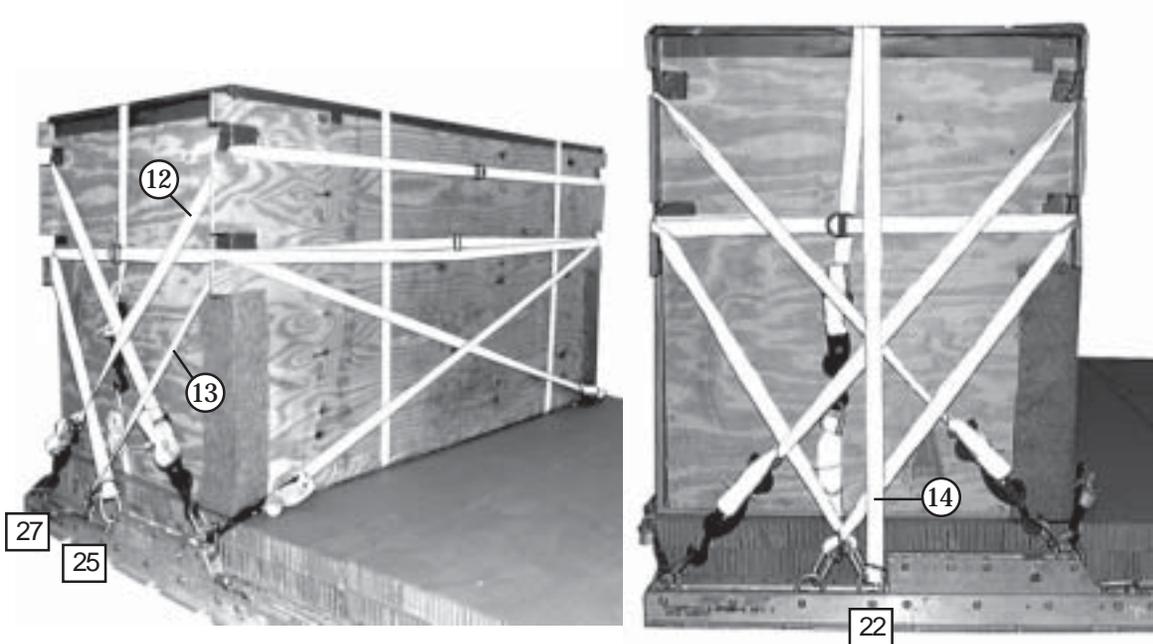
Lashing Number	Tie-down Clevis Number	Instructions
8	20 and 26	Route a 30-foot lashing from clevis 20 to the front lower left cutout, to the rear lower left cutout, to clevis 26.
9	20A and 26A	Route a 30-foot lashing from clevis 20A to the front lower right cutout, to the rear lower right cutout, to clevis 26A.

**Figure 4-19. Lashings 8 and 9 Installed**



Lashing Number	Tie-down Clevis Number	Instructions
10	21 and 21A	Route a 30-foot lashing from clevis 21 to the rear top right cutout, to the rear top left cutout, to clevis 21A.
11	23 and 23A	Route a lashing through it's own D-ring on clevis 23 to the rear bottom right cutout, to the rear bottom left cutout to clevis 23A.

Figure 4-20. Lashings 10 and 11 Installed



Lashing Number	Tie-down Clevis Number	Instructions
12	27 and 27A	Route a 30-foot lashing from clevis 27 to the front top cutouts, to clevis 27A.
13	25 and 25A	Route a lashing through it's own D-ring on clevis 25 to the front bottom right cutout, to the front bottom left cutout to clevis 25A.
14	22 and 22A	Route a lashing through it's own D-ring on clevis 22, repeat on clevis 22A and load bind on the left side of the box.

Figure 4-21. Lashings 12 Through 14 Installed

## POSITIONING AND LASHING THE DRUMS

4-10. Position and lash the fuel drums to the platform as shown in Figures 4-22 through 4-29.

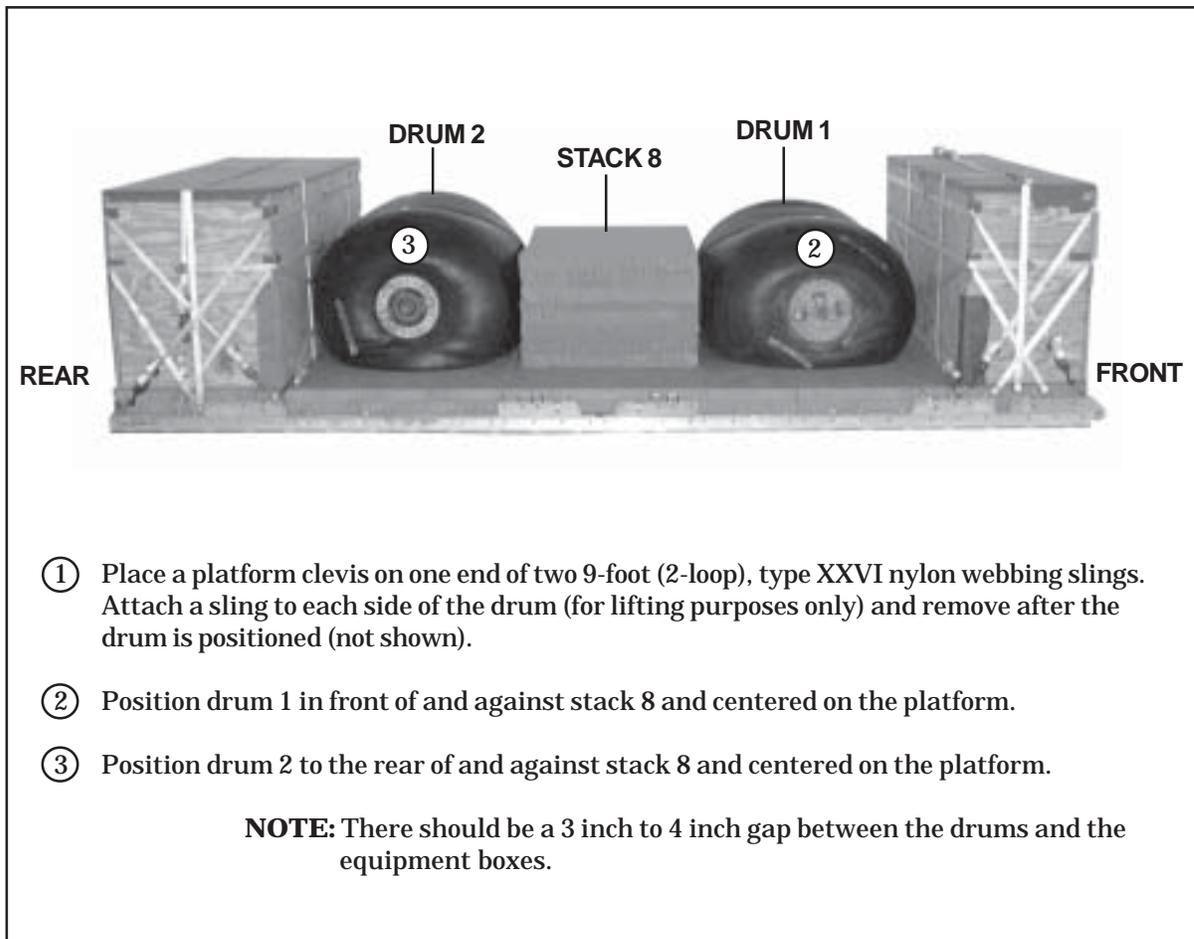
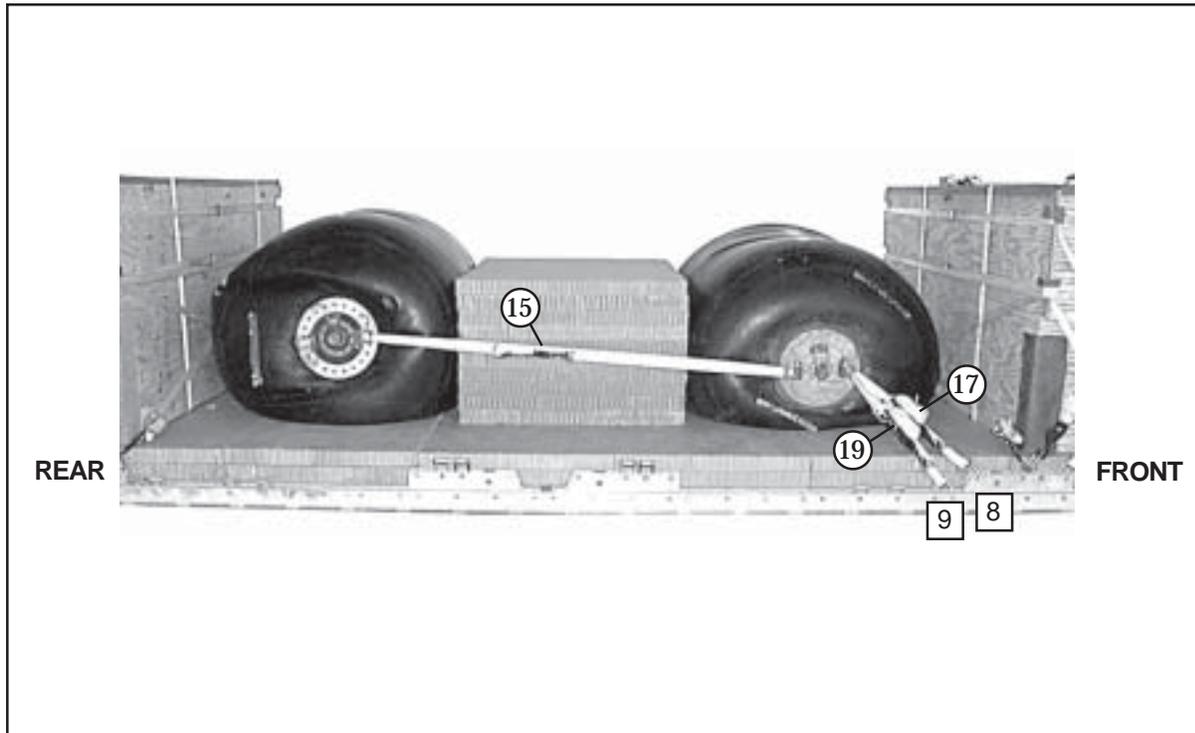
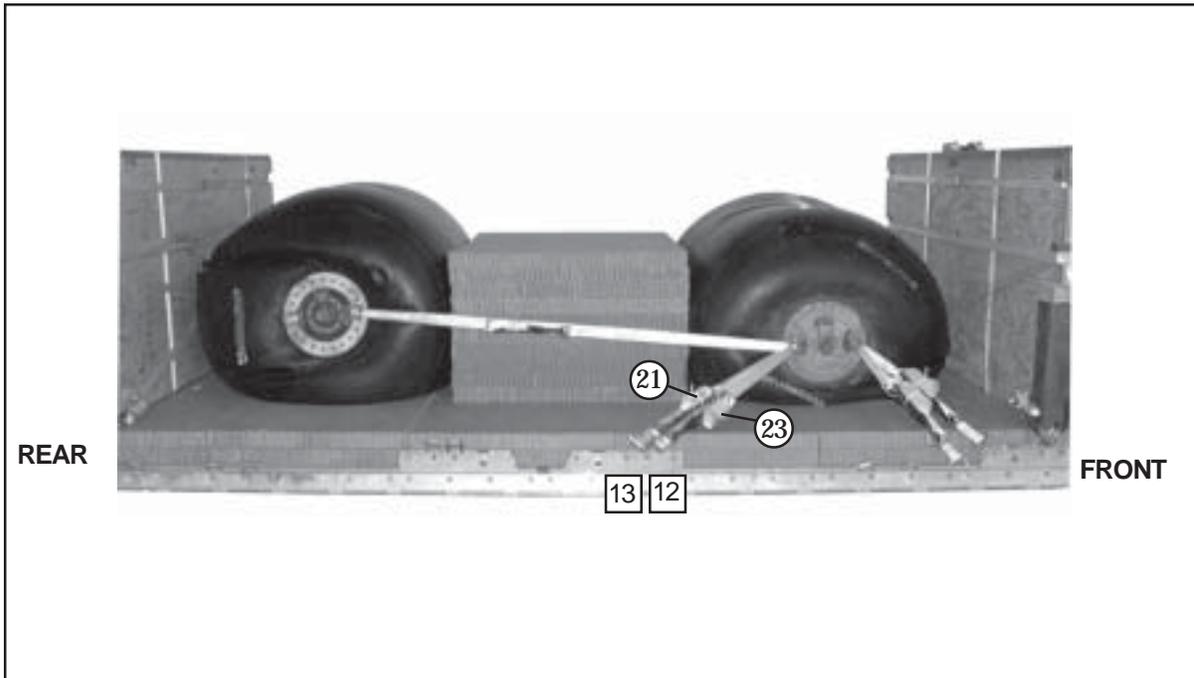


Figure 4-22. Fuel Drums 1 and 2 Positioned



Lashing Number	Tie-down Clevis Number	Instructions
15		Route a lashing from the rear shackle of drum 1 to the front shackle of drum 2 on the right side.
16		Route a lashing from the rear shackle of drum 1 to the front shackle of drum 2 on the left side.
17	8	Route a lashing from clevis 8 to the front right shackle on drum 1.
18	8A	Route a lashing from clevis 8A to the front left shackle on drum 1.
19	9	Route a lashing from clevis 9 to the front right shackle of drum 1.
20	9A	Route a lashing from clevis 9A to the left front shackle of drum 1.

Figure 4-23. Lashings 15 through 20 Installed



Lashing Number	Tie-down Clevis Number	Instructions
21	13	Route a lashing from clevis 13 to the rear right shackle on drum 1.
22	13A	Route a lashing from clevis 13A to the rear left shackle on drum 1.
23	12	Route a lashing from clevis 12 to the rear right shackle on drum 1.
24	12A	Route a lashing from clevis 12A to the rear left shackle on drum 1.

Figure 4-24. Lashings 21 through 24 Installed

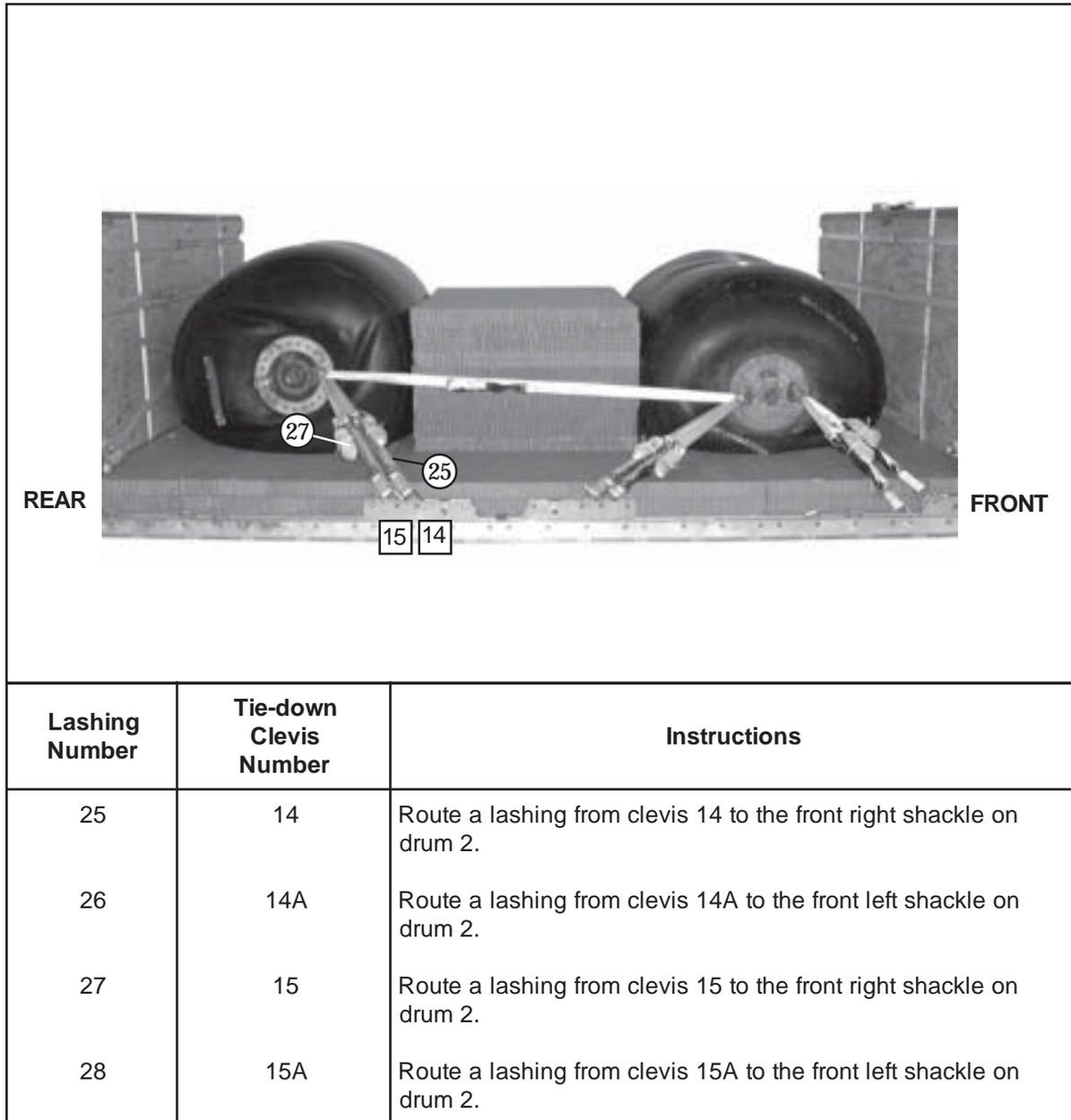
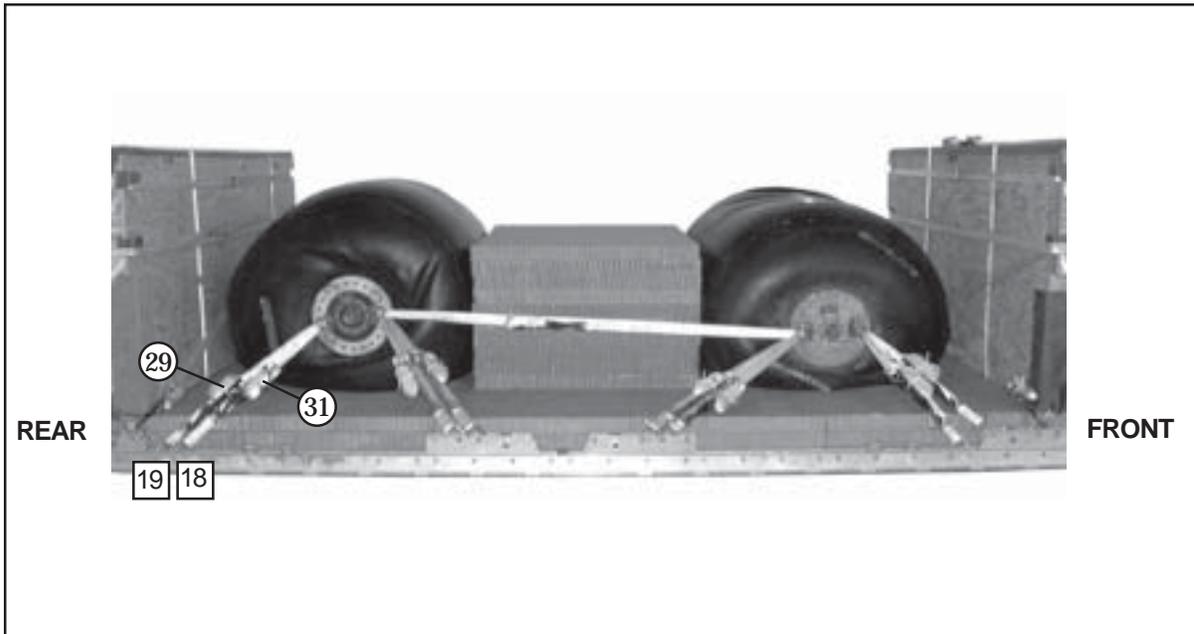


Figure 4-25. Lashings 25 through 28 Installed



Lashing Number	Tie-down Clevis Number	Instructions
29	19	Route a lashing from clevis 19 to the rear right shackle on drum 2.
30	19A	Route a lashing from clevis 19A to the rear left shackle on drum 2.
31	18	Route a lashing from clevis 18 to the rear right shackle on drum 2.
32	18A	Route a lashing from clevis 18A to the rear left shackle on drum 2.

Figure 4-26. Lashings 29 through 32 Installed

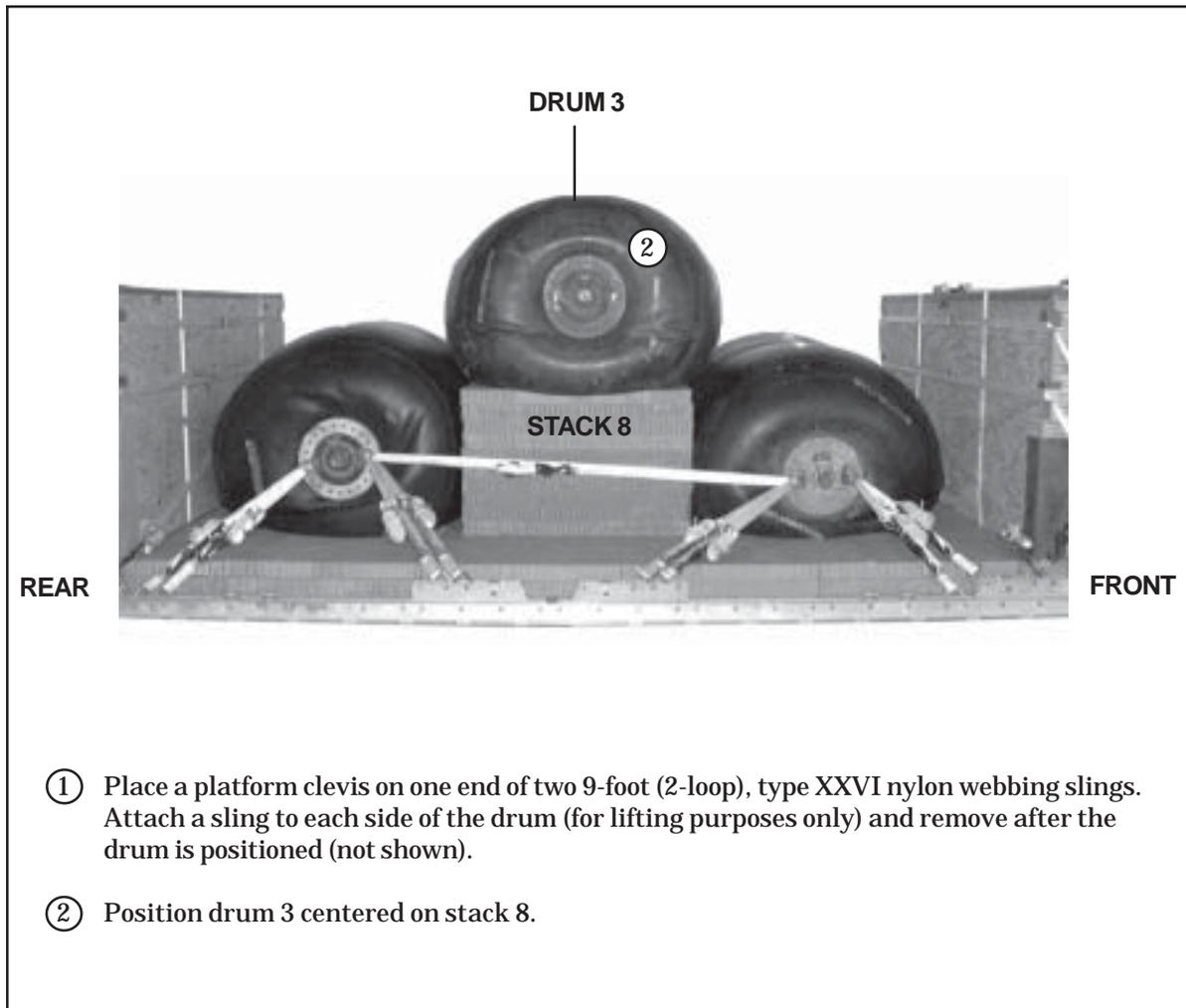
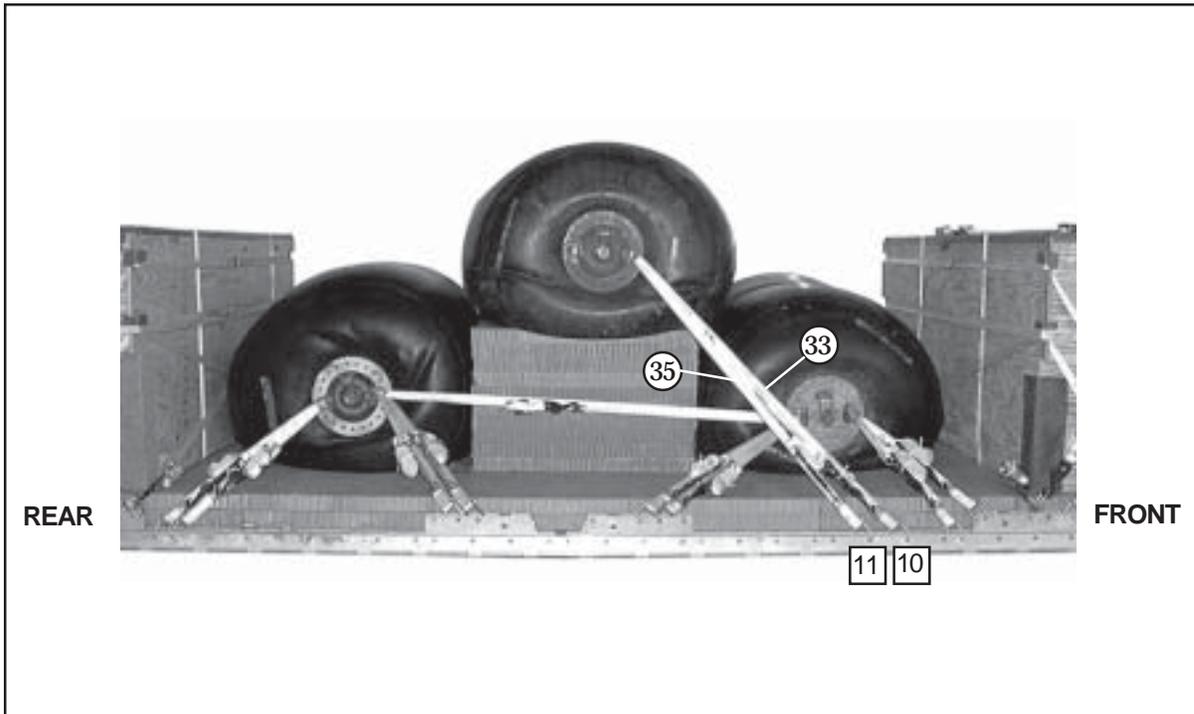


Figure 4-27. Fuel Drum 3 Positioned



Lashing Number	Tie-down Clevis Number	Instructions
33	10	Route a lashing from clevis 10 to the front right shackle on drum 3.
34	10A	Route a lashing from clevis 10A to the front left shackle on drum 3.
35	11	Route a lashing from clevis 11 to the front right shackle on drum 3.
36	11A	Route a lashing from clevis 11A to the front left shackle on drum 3.

Figure 4-28. Lashings 33 through 36 Installed

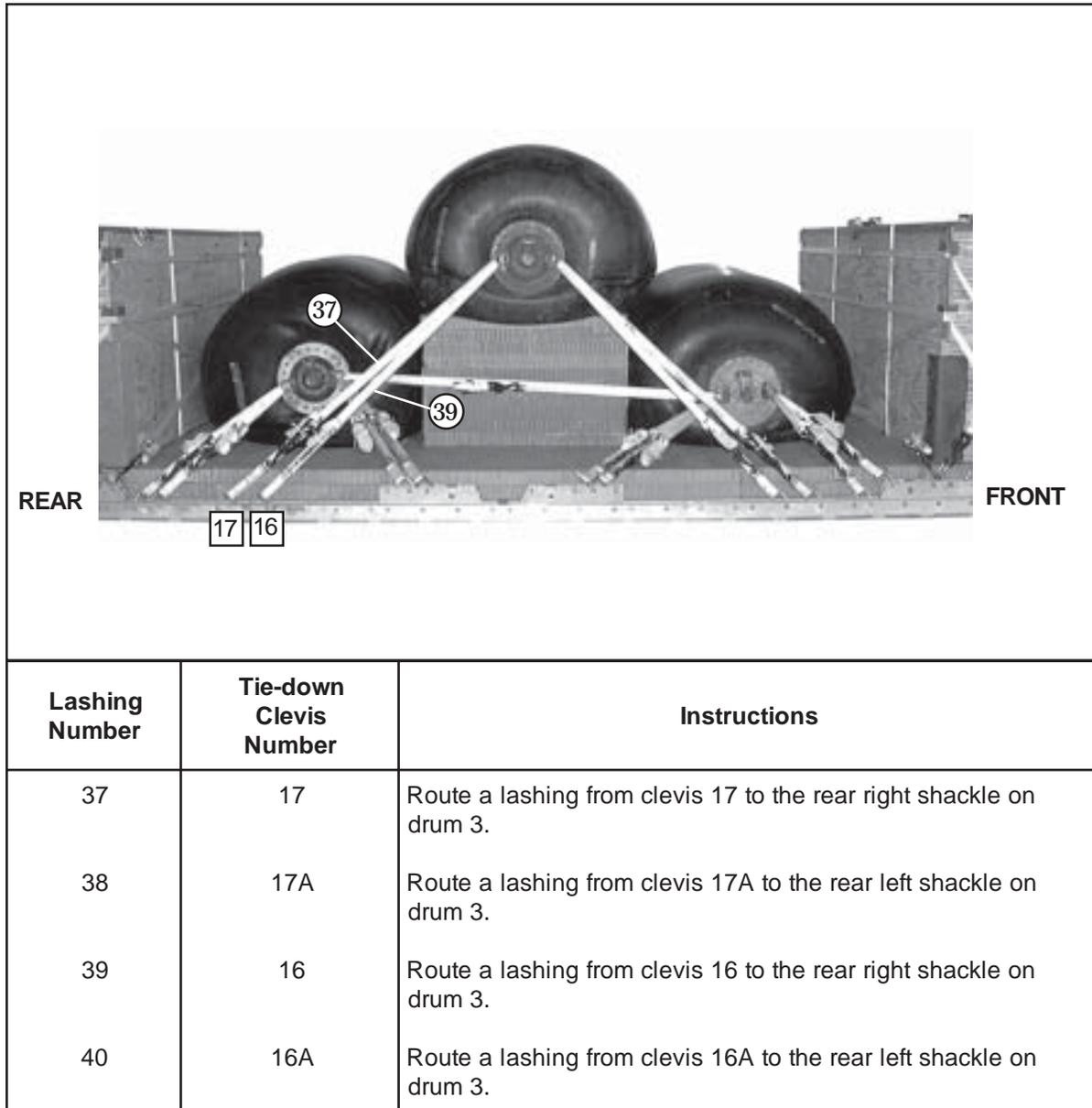


Figure 4-29. Lashings 37 through 40 Installed

## BUILDING AND POSITIONING RELEASE PLATFORM

4-11. Build and position the release platform as shown in Figure 4-30.

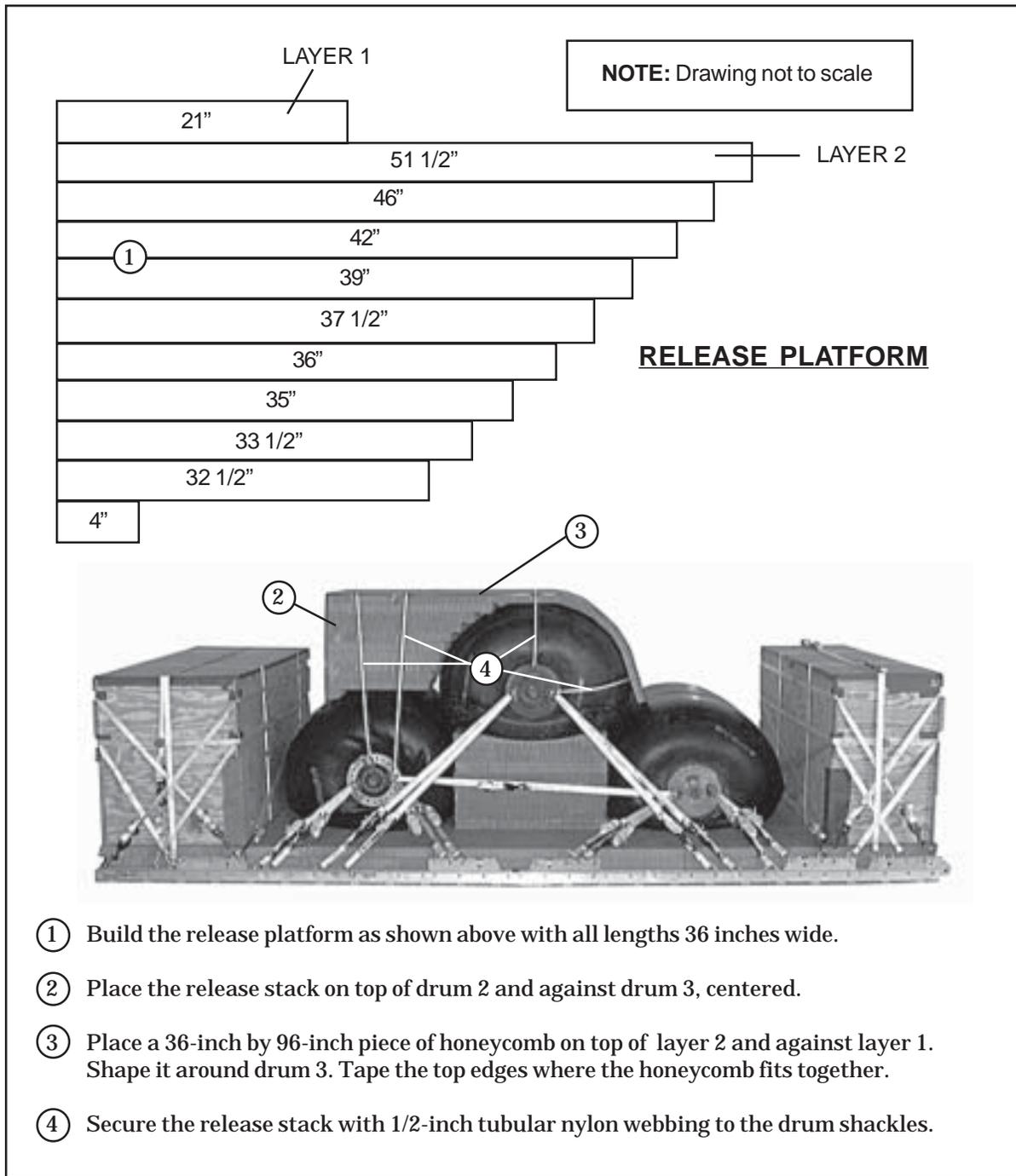


Figure 4-30. Release Platform Built and Positioned

## INSTALLING SUSPENSION SLINGS AND SAFETY TIES

4-12. Install suspension slings and safety ties as shown in Figure 4-31.

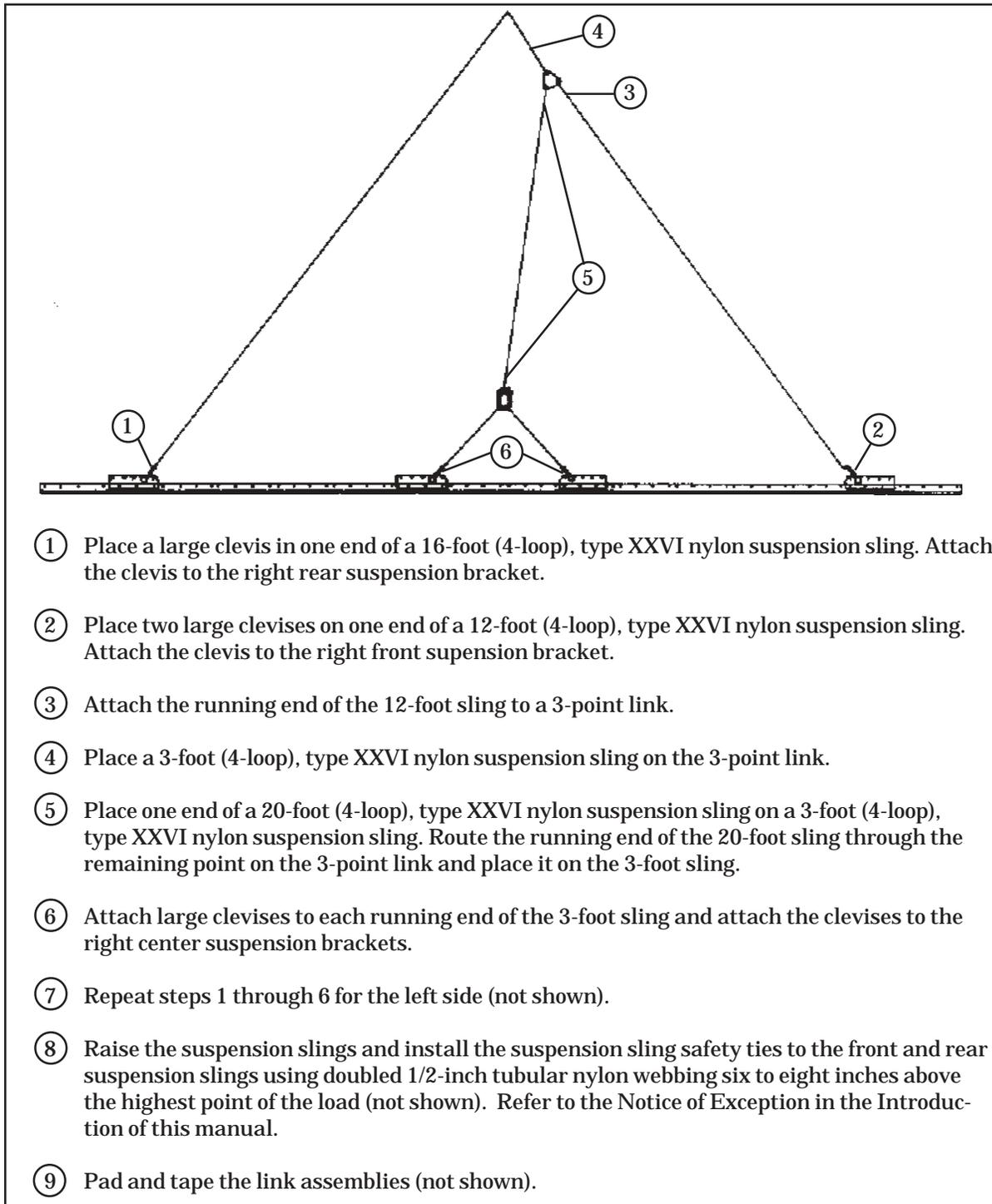


Figure 4-31. Suspension Slings and Safety Ties Installed

## PREPARING AND STOWING CARGO PARACHUTES

4-13. Prepare and stow four G-11 cargo parachutes as shown in Figure 4-32.

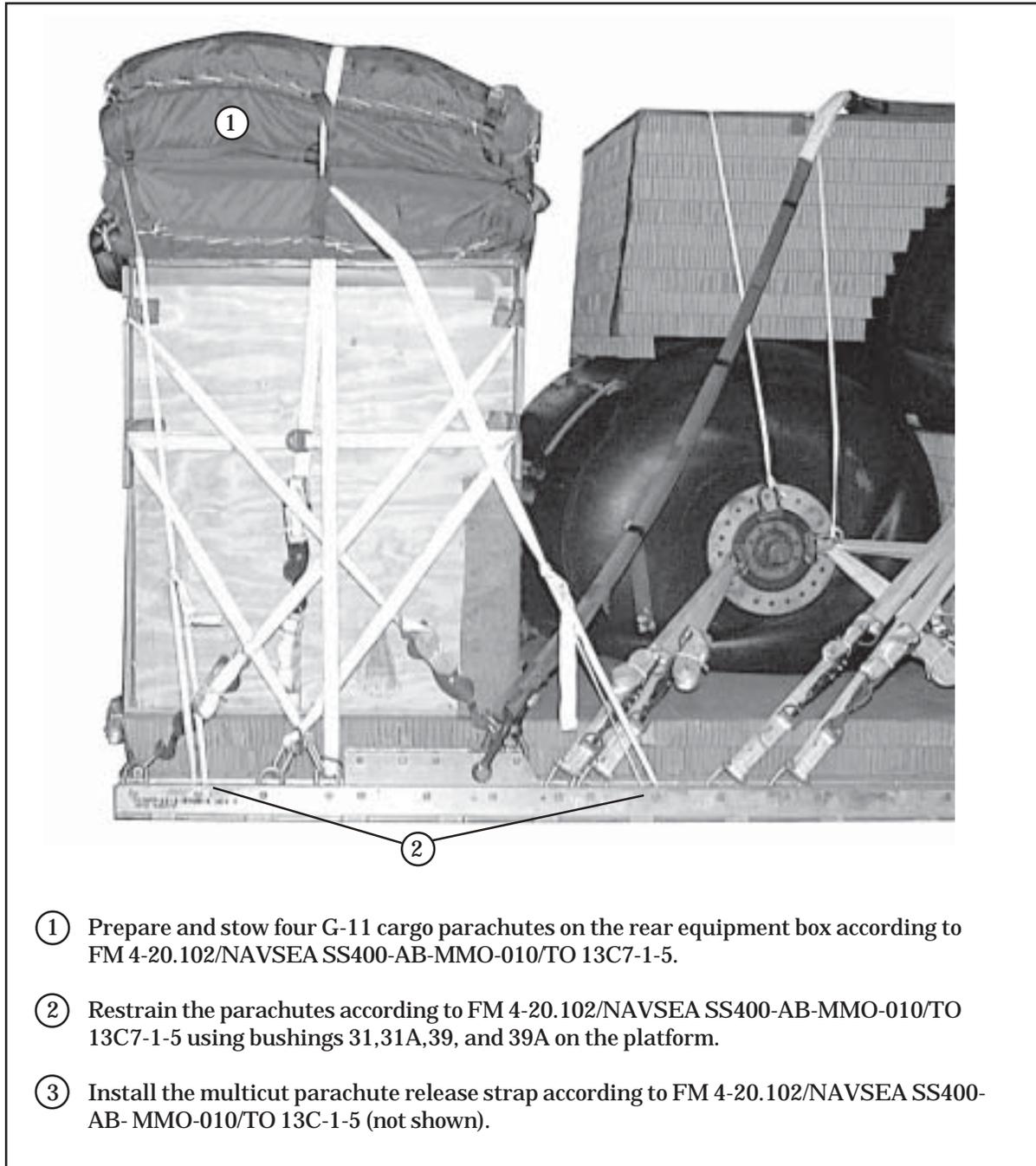


Figure 4-32. Cargo Parachutes Prepared and Stowed

## INSTALLING THE EXTRACTION SYSTEM

4-14. Install the extraction system as shown in Figure 4-33.

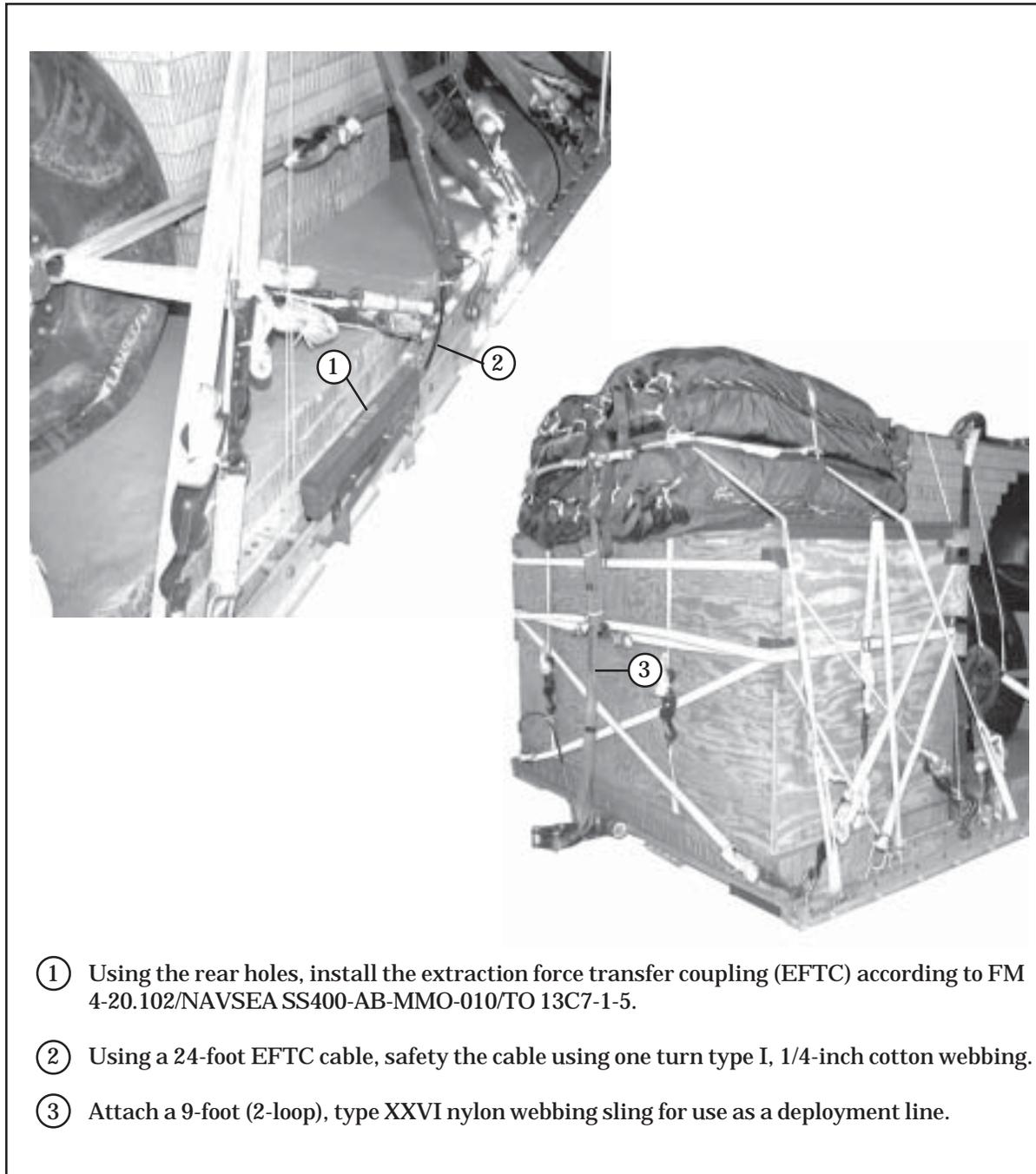
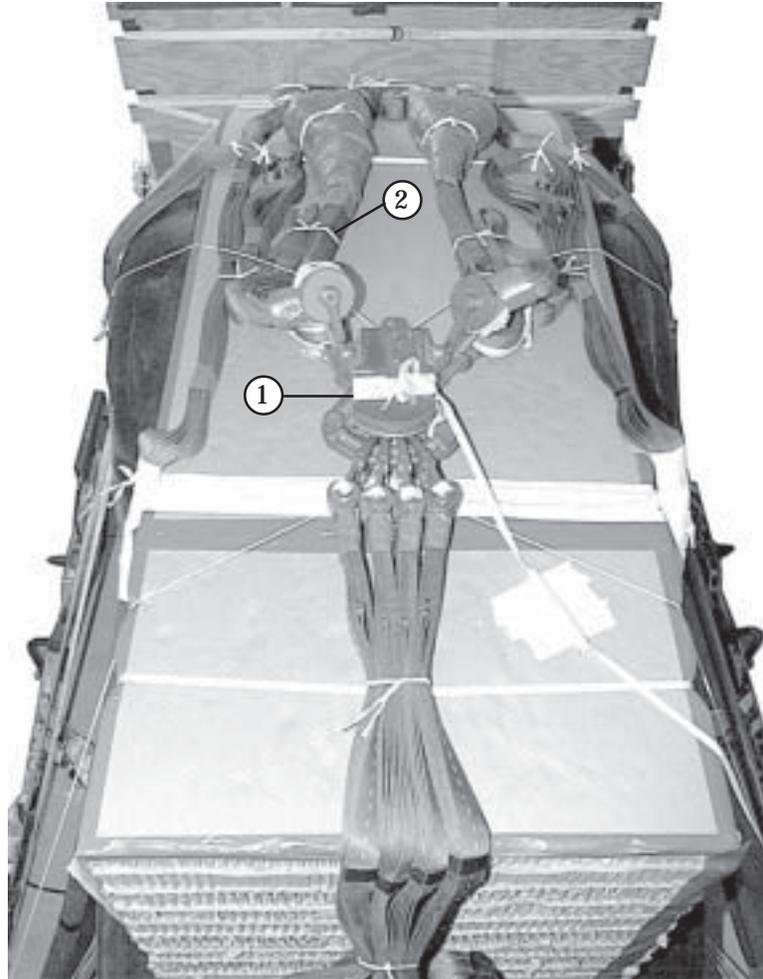


Figure 4-33. Extraction System Installed

## INSTALLING THE CARGO PARACHUTE RELEASE SYSTEM

4-15. Install the M-2 cargo parachute release system as shown in Figure 4-34.



- ① Place the M-2 release on the release platform. Attach the suspension slings and the parachute riser extensions to the M-2 cargo parachute release according to FM 4-20.102/NAVSEA SS400-AB-MMO-010/TO 13C7-1-5. Secure the cargo parachute release with type III nylon cord.
- ② S-fold and tie any slack in the suspension slings with 1/4-inch cotton webbing.

Figure 4-34. Cargo Parachute Release Installed

## **PLACING EXTRACTION PARACHUTE**

4-16. Select the extraction parachute and extraction line needed using the extraction line requirements table in FM 4-20.102/NAVSEA SS400-AB-MMO-010/TO 13C7-1-5. Rig the extraction line in an extraction line bag according to TM 10-1670-286-20/TO 13C5-2-41. Place the extraction parachute and extraction line on the load for installation in the aircraft.

## **INSTALLING PROVISIONS FOR EMERGENCY RESTRAINTS**

4-17. Select and install the provisions for emergency aft restraints according to the emergency aft restraint requirements table in FM 4-20.102/NAVSEA SS400-AB-MMO-010/TO 13C7-1-5.

## **MARKING RIGGED LOAD**

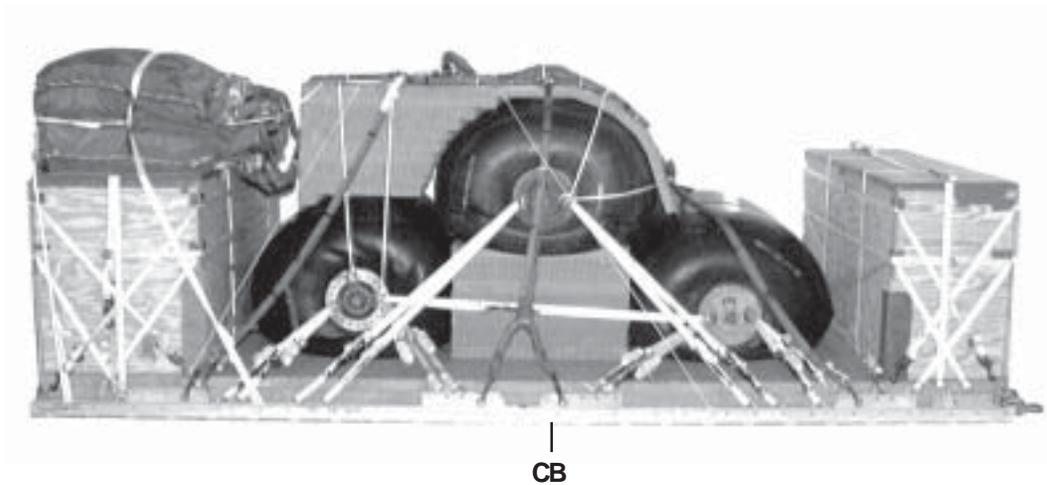
4-18. Mark the rigged load according to FM 4-20.102/NAVSEA SS400-AB-MMO-010/TO 13C7-1-5 and as shown in Figure 4-35. Complete Shipper's Declaration for Dangerous Goods and affix to the load. If the load varies from the one shown, the weight, height, CB, tipoff curve, and parachute requirements must be recomputed.

## **EQUIPMENT REQUIRED**

4-19. Use the equipment list in Table 4-2 to rig the load shown in Figure 4-35.

**CAUTION**

Make the final inspection required by FM 4-20.102/NAVSEA SS400-AB-MMO-010/TO 13C7-1-5 before the load leaves the rigging site.



**RIGGED LOAD DATA**

<b>Weight .....</b>	<b>18,501 pounds</b>
<b>Maximum Weight .....</b>	<b>20,000 pounds</b>
<b>Height .....</b>	<b>88 inches</b>
<b>Width .....</b>	<b>108 inches</b>
<b>Overall Length .....</b>	<b>258 inches</b>
<b>Overhang: Front .....</b>	<b>0 inches</b>
<b>Overhang: Rear .....</b>	<b>18 inches</b>
<b>Center of Balance (CB) (from front edge of platform) .....</b>	<b>121 inches</b>

Figure 4-35. AAFARS with Three 500-Gallon Drums Rigged

Table 4-2. Equipment Required for Rigging AAFARS With Three 500-Gallon Drums

National Stock Number	Item	Quantity
8040-00-273-8713	Adhesive paste, 1-gal	As required
1670-01-035-6054	Bridle, extraction line bag (C-17 only)	1
4030-00-090-5354	Clevis, large	11
4030-00-678-8562	Clevis, medium	4
4020-00-240-2146	Cord, nylon, type III, 550-lb	As required
1670-00-360-0328	Cover, clevis, large	4
8305-00-958-3685	Felt sheet, 1/2-inch	As required
1670-00-003-4391	Knife, parachute bag for DES)	1
1670-01-183-2678	Leaf, extraction line (line bag)(add 1 for DES)	2
1670-01-064-4452	Line, drogue (for C-17) 60-foot (1-loop), type XXVI	1
1670-01-062-6304	Line, deployment: 9-foot (2-loop), type XXVI	1
1670-01-062-6313	Line, extraction: For C-130: 60-foot (3-loop), type XXVI	1
1670-01-107-7651	For C-141: 140-foot (3-loop), type XXVI	1
1670-01-107-7651	For C-17: 140-foot (3-loop), type XXVI	1
	Link assembly:	
	Two-point:	
5306-00-435-8994	Bolt, 1-in diam, 4-in long	2
5310-00-232-5165	Nut, 1-in, hexagonal	2
1670-00-003-3454	Plate, side, 5 1/2-in	2
5365-00-007-3414	Spacer, large	2
	Two-point, 3 3/4-in (for DES)	
5306-00-435-8994	Bolt, 1-in diam, 4-in long	2
5310-00-232-5165	Nut, 1-in, hexagonal	2
1670-00-003-1953	Plate, side, 3 3/4-in	2
5365-00-007-3414	Spacer, large	2
1670-01-307-1055	Three-point	2
1670-01-483-8259	Link, tow release mechanism (H-Block) C-17 aircraft	1

Table 4-2. Equipment Required for Rigging AAFARS With Three 500-Gallon Drums (Continued)

National Stock Number	Item	Quantity
5510-00-220-6146	Lumber: 2- by 4-in	As required
5315-00-753-3885	Nail, steel wire, common, 16d	As required
1670-00-753-3928	Pad, energy dissipating, honeycomb, 3- by 36- by 96-in	24 sheets
1670-01-016-7841	Parachute: Cargo, G-11B	4
1670-00-040-8135	Cargo, extraction, 28ft	1
1670-01-063-3715	Drogue, 15ft (for C-17)	1
1670-01-353-8425	Platform, airdrop, type V, 20-foot: Bracket assembly, component, (EFTC)	(1)
1670-01-247-2389	Bracket, suspension	(8)
1670-01-162-2372	Clevis assembly, type V	(54)
1670-01-353-8424	Extraction bracket assembly	(1)
1670-01-162-2381	Link, tandem, suspension link assembly	(2)
5530-00-618-8073	Plywood, 3/4- by 48- by 96-in	11 sheets
1670-01-097-8817	Release, cargo parachute, M-2	1
1670-01-062-6306	Sling, cargo airdrop For suspension: 3-ft (4-loop), type XXVI nylon webbing	4
1670-01-062-6307	12-ft (4-loop), type XXVI nylon webbing	2
1670-01-062-6308	16-ft (4-loop), Type XXVI nylon webbing	2
1670-01-064-4453	20-ft (4-loop), typeXXVI nylon webbing	2
1670-01-062-6313	For riser extension: 60-ft (3-loop), type XXVI nylon webbing	4
1670-00-040-8219	Strap, parachute release, multicut	2
7510-00-266-5016	Tape, adhesive, 2-in	As required
7510-00-266-6710	Tape, masking, 2-in	As required
1670-00-937-0271	Tie-down assembly, 15-ft	61
8305-00-268-2411	Webbing: 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

## SECTION II - RIGGING AAFARS WITH FOUR 500-GALLON FUEL DRUMS

### DESCRIPTION OF LOAD

4-20. The Advanced Aviation Forward Area Refueling System (AAFARS) is rigged on a 20-foot, type V airdrop platform with five G-11 parachutes. The AAFARS is designed for forward area refueling of up to four aircraft at a time with a minimum output of 55 GPM. There are four collapsible fuel drums as an accompanying load. Each drum is filled with 432 gallons of liquid. When empty, each drum weighs 250 pounds and is 62 inches long and 53 inches in diameter. The overall length of the load is 258 inches. The load is 88 inches high. Its center of balance is 121 inches.

- Notes:**
1. For drums filled with a liquid other than water, use Table 1-1 to recompute the weight.
  2. If the load varies from the one shown, the weight, height, CB, tipoff curve, and parachute requirements must be recomputed.
  3. Do not pressurize drums with air.

### PREPARING PLATFORM

4-21. Prepare a 20-foot type V airdrop platform using two tandem links, eight suspension brackets and 62 tie-down clevises as shown in Figure 4-36.

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

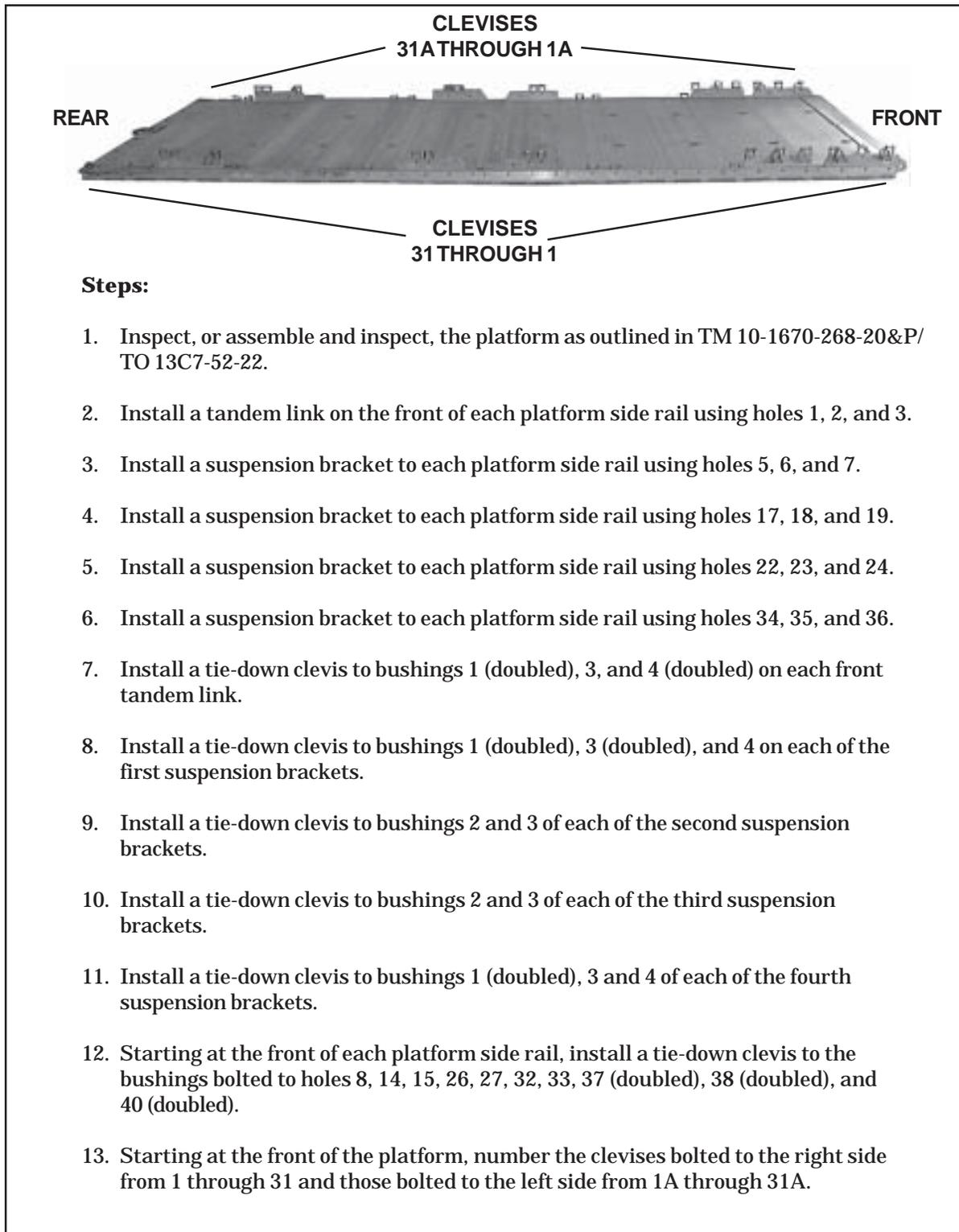


Figure 4-36. Platform Prepared

## **PREPARING AND POSITIONING HONEYCOMB STACKS**

4-22. Prepare the honeycomb stacks as shown in Figure 4-2. Place the honeycomb stacks on the platform as shown in Figure 4-3.

## **BUILDING THE EQUIPMENT BOXES**

4-23. Build the front and rear equipment boxes as shown in Figures 4-4 and 4-5.

## **PREPARING EQUIPMENT FOR EQUIPMENT BOXES**

4-24. Prepare the fire extinguishers, filter separator, explosion proof motor, pumps, battery box, manuals and toolkit as explained and shown in paragraph 4-6. Using the lists printed on the equipment bags, place the equipment indicated on each list into its bag.

## **POSITIONING EQUIPMENT BOXES**

4-25. Pre-position three lashings at each end of the platform as shown in Figure 4-13, steps 1 through 3. Position the equipment boxes flush over the ends of the honeycomb as shown in Figure 4-13, step 4. Pad the inside lower box corners as shown in Figure 4-13, step 5.

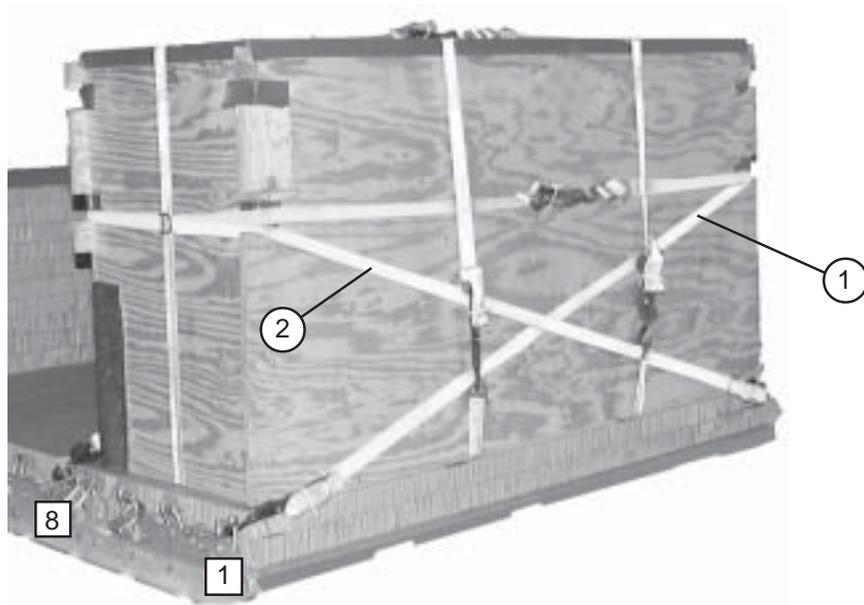
## **POSITIONING EQUIPMENT IN EQUIPMENT BOXES AND SECURING BOXES**

4-26. Position and secure the equipment in the equipment boxes, and secure the boxes and lids as explained in paragraph 4-8, and as shown in Figures 4-14 and 4-15.

## **LASHING THE EQUIPMENT BOXES TO THE PLATFORM**

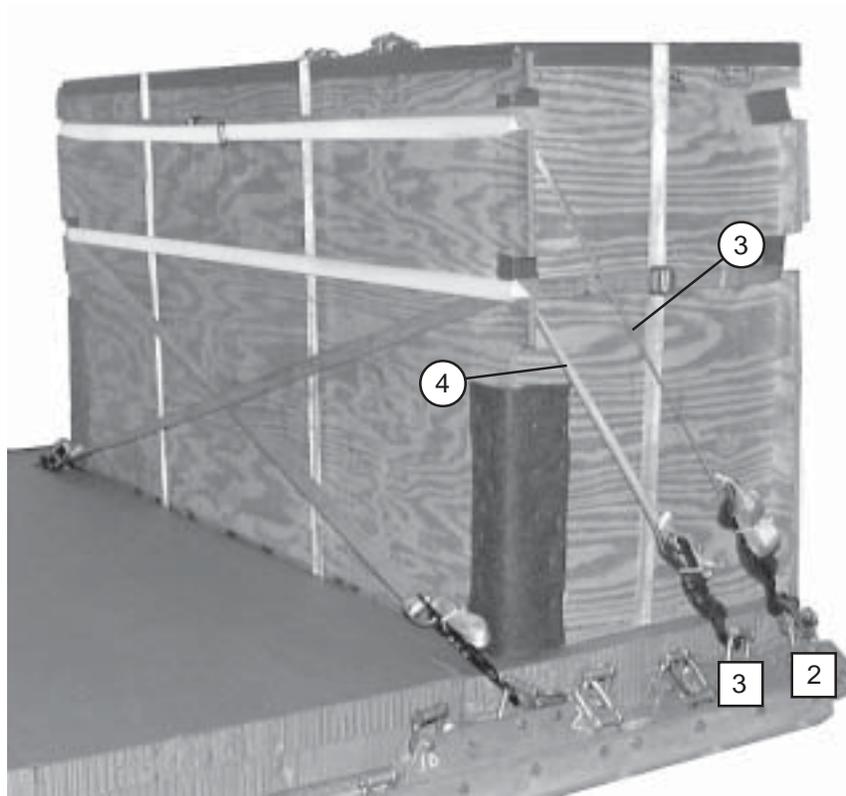
4-27. Lash the equipment boxes to the platform as given below.

- a. Lash the front equipment box to the platform as shown in Figures 4-37 through 4-39.



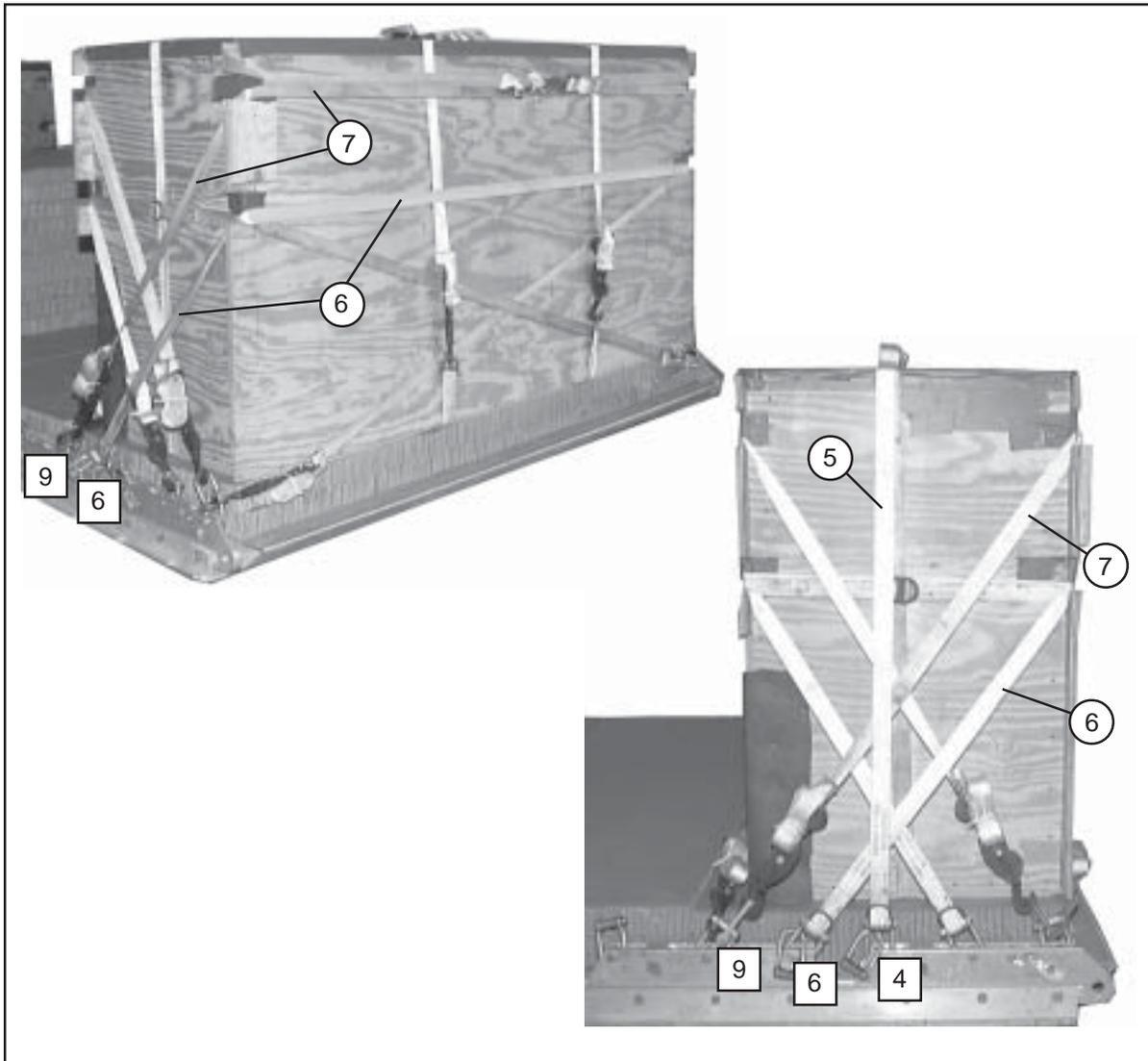
Lashing Number	Tie-down Clevis Number	Instructions
1	1 and 8	Route a 30-foot lashing from clevis 1 to the front bottom left cutout, to the rear bottom left cutout, to clevis 8.
2	1A and 8A	Route a 30-foot lashing from clevis 1A to the front bottom right cutout, to the rear bottom right cutout, to clevis 8A.

**Figure 4-37. Lashings 1 and 2 Installed**



Lashing Number	Tie-down Clevis Number	Instructions
3	2 and 2A	Route a 30-foot lashing from clevis 2 to the rear top right cutout, to the rear top left cutout, to clevis 2A.
4	3 and 3A	Route a lashing from clevis 3A and through its own D-ring to the rear bottom left cutout, to the rear bottom right cutout, to clevis 3.

**Figure 4-38. Lashings 3 and 4 Installed**



Lashing Number	Tie-down Clevis Number	Instructions
5	4 and 4A	Route a lashing through it's own D-ring on clevis 4, repeat on clevis 4A and load bind them together on top of the box.
6	6 and 6A	Route a lashing through it's own D-ring on clevis 6 to the front bottom right cutout, to the front bottom left cutout, to clevis 6A.
7	9 and 9A	Route a 30-foot lashing from clevis 9 to the front top right cutout, to the front top left cutout, to clevis 9A.

Figure 4-39. Lashings 5 through 7 Installed

b. Lash the rear equipment box to the platform as shown in Figures 4-40 through 4-42.

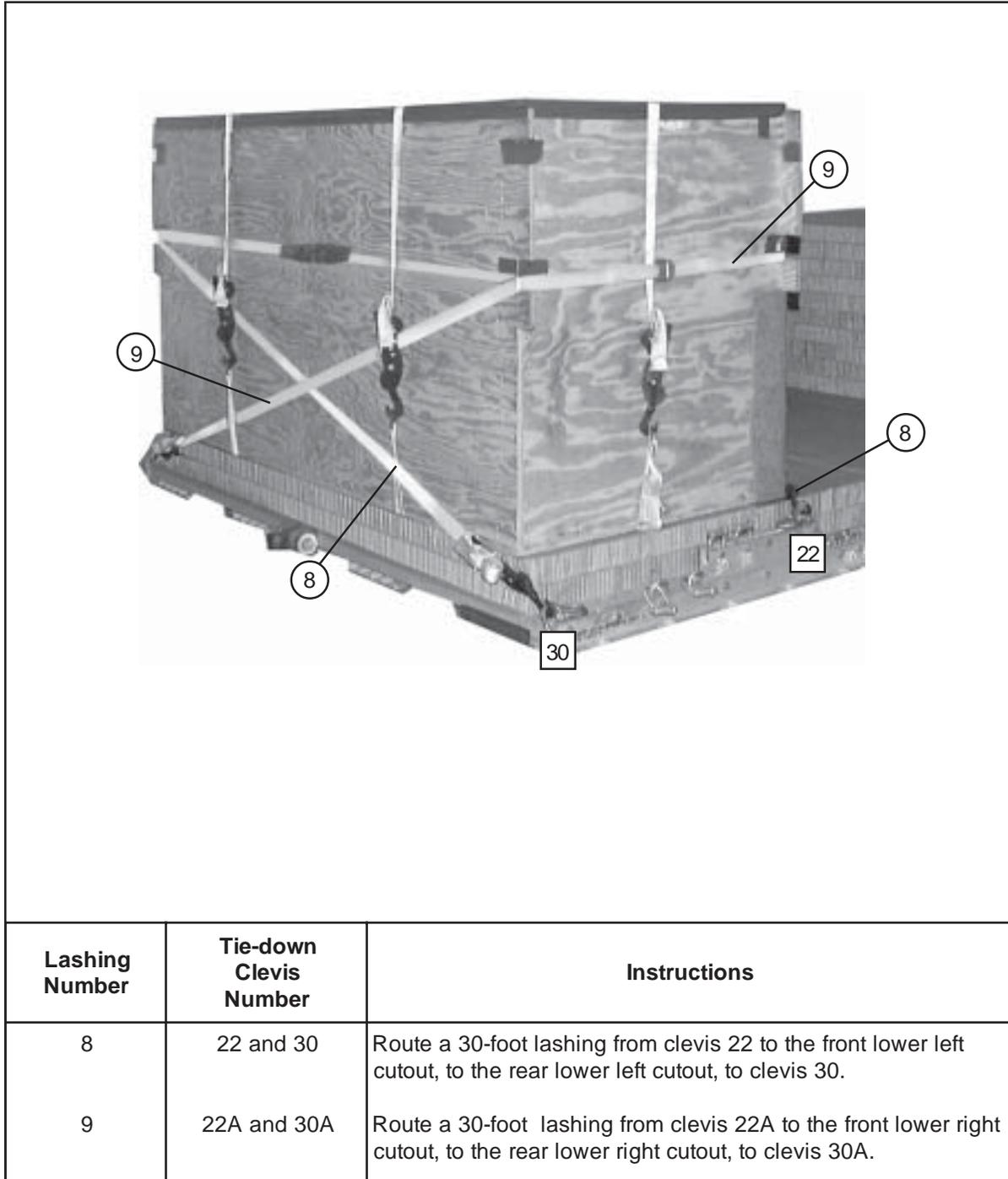
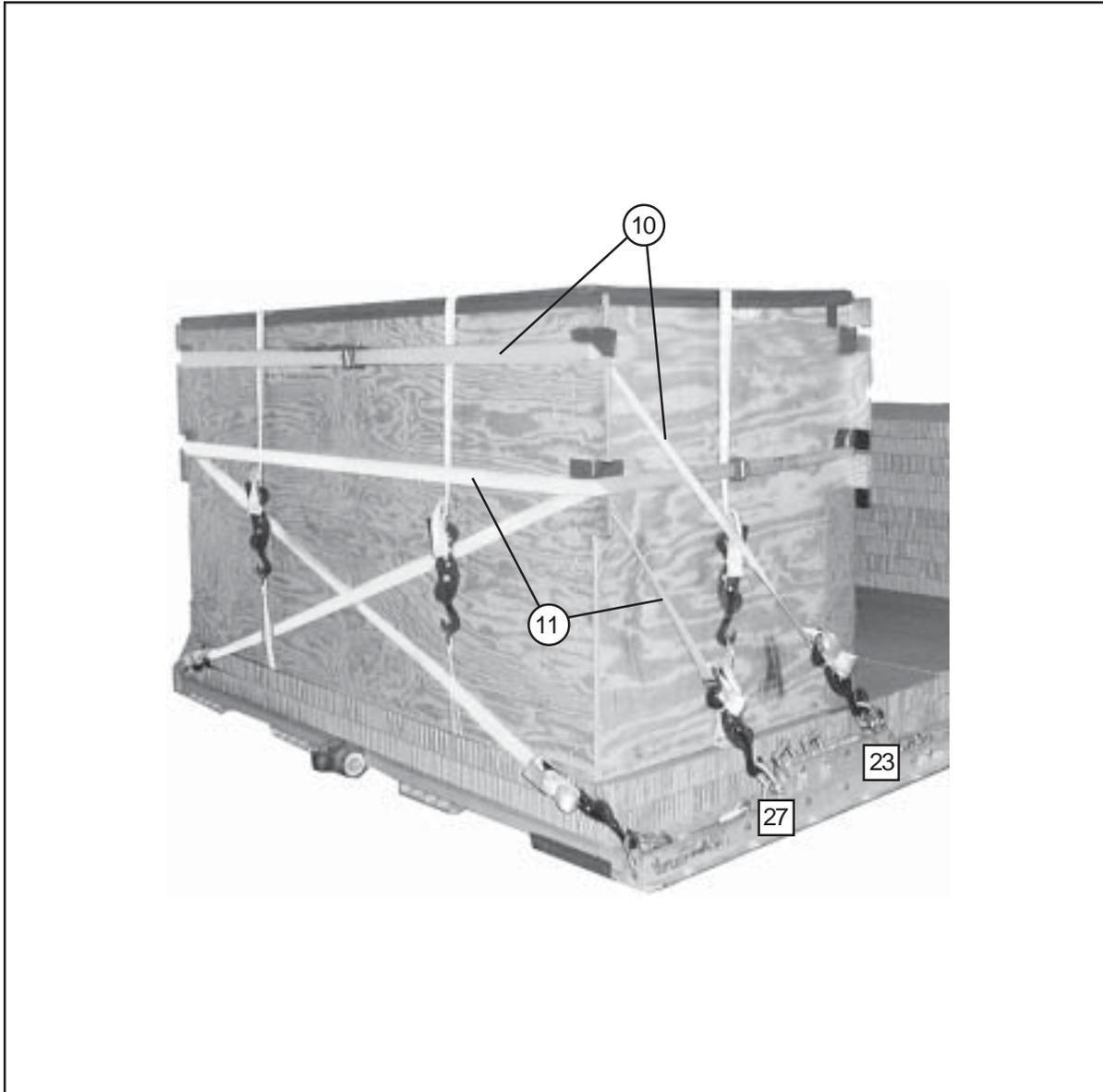
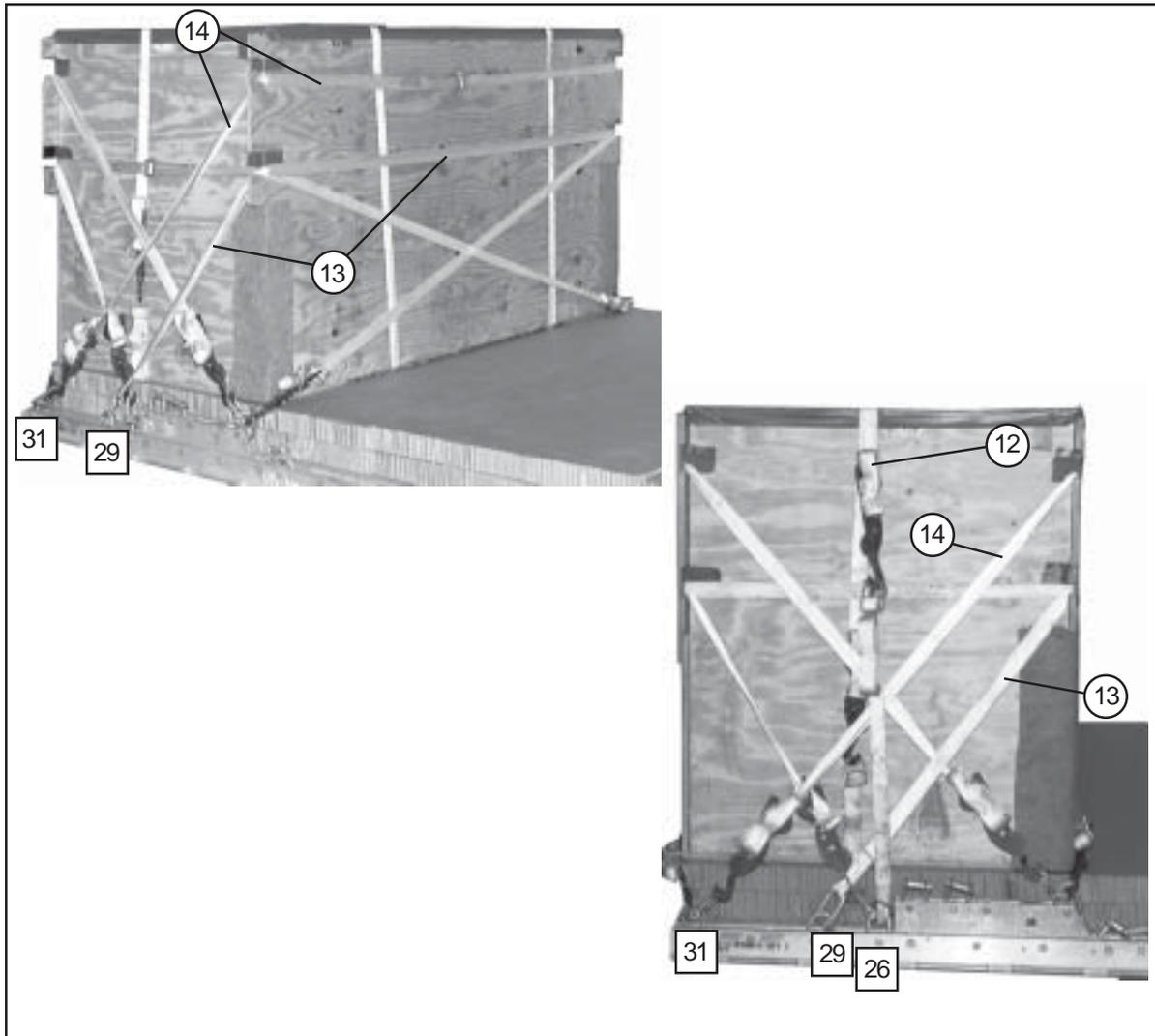


Figure 4-40. Lashings 8 and 9 Installed



Lashing Number	Tie-down Clevis Number	Instructions
10	23 and 23A	Route a 30-foot lashing from clevis 23 to the rear top right cutout, to the rear top left cutout, to clevis 23A.
11	27 and 27A	Route a lashing through it's own D-ring on clevis 27A to the rear bottom left cutout, to the rear bottom right cutout to clevis 27.

Figure 4-41. Lashings 10 and 11 Installed



Lashing Number	Tie-down Clevis Number	Instructions
12	26 and 26A	Route a lashing through it's own D-ring on clevis 26, repeat on clevis 26A and load bind on the side of the box.
13	29 and 29A	Route a lashing through it's own D-ring on clevis 29 to the front bottom right cutout, to the front bottom left cutout to clevis 29A.
14	31 and 31A	Route a 30-foot lashing from clevis 31 to the front top right cutout to the front top left cutout, and to clevis 31A.

Figure 4-42. Lashings 12 through 14 Installed

## POSITIONING AND LASHING DRUMS

4-28. Position four fuel drums and lash them to the platform as shown in Figures 4-43 through 4-49.

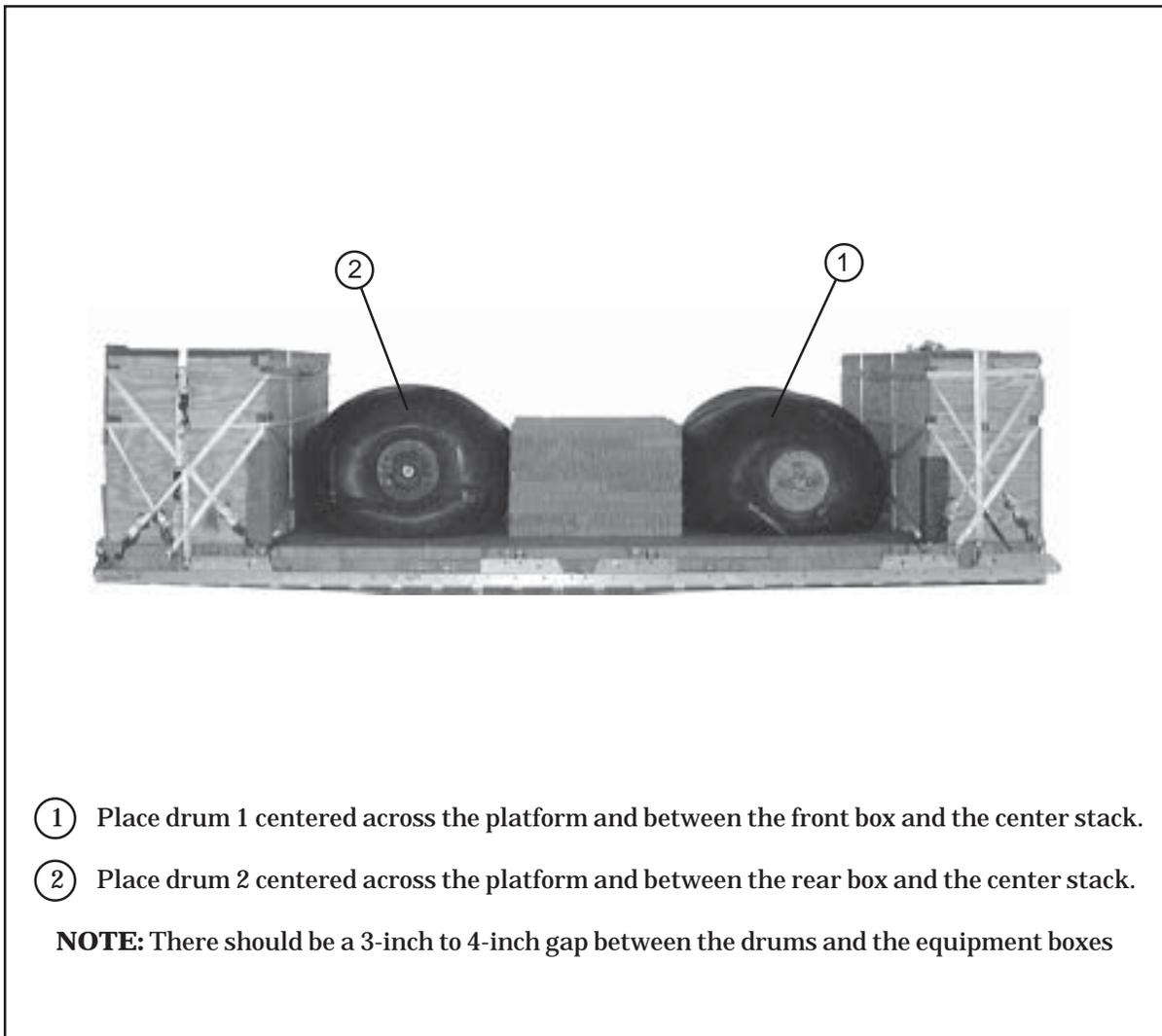


Figure 4-43. Drums 1 and 2 Placed

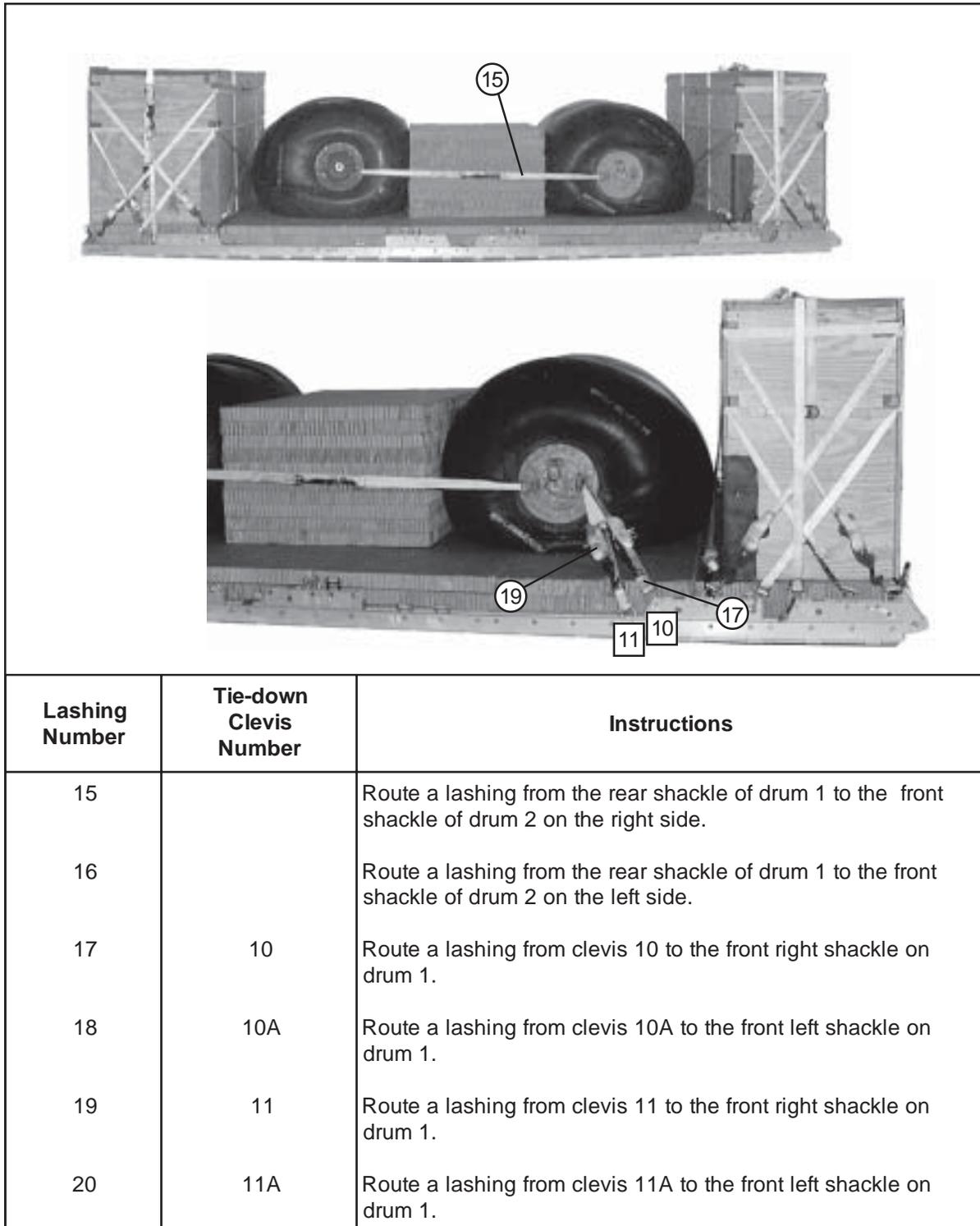
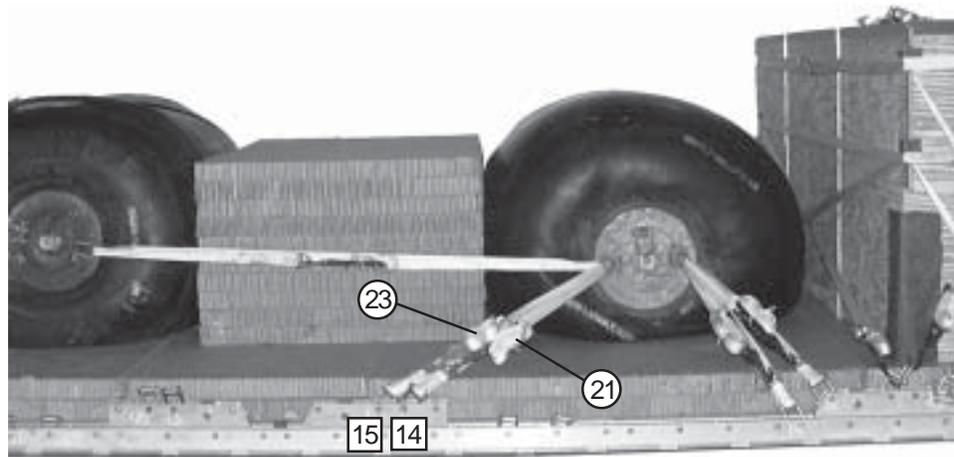
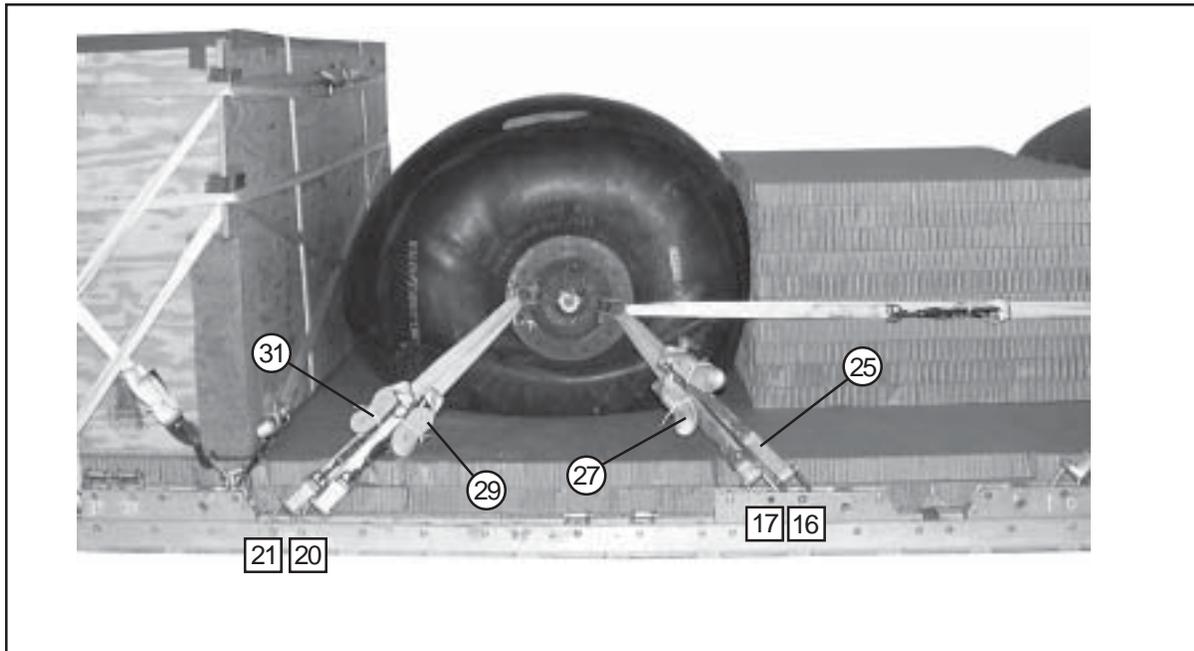


Figure 4-44. Lashings 15 through 20 Installed



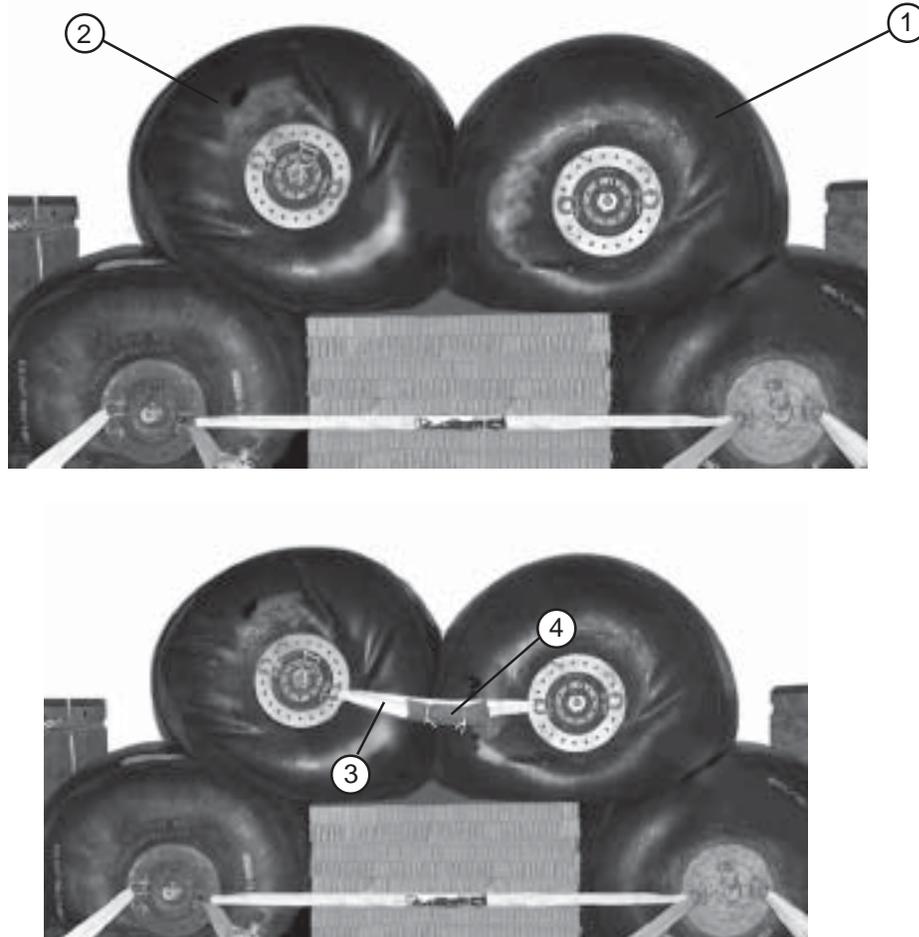
Lashing Number	Tie-down Clevis Number	Instructions
21	14	Route a lashing from clevis 14 to the rear right shackle on drum 1.
22	14A	Route a lashing from clevis 14A to the rear left shackle on drum 1.
23	15	Route a lashing from clevis 15 to the rear right shackle on drum 1.
24	15A	Route a lashing from clevis 15A to the rear left shackle on drum 1.

Figure 4-45. Lashings 21 through 24 Installed



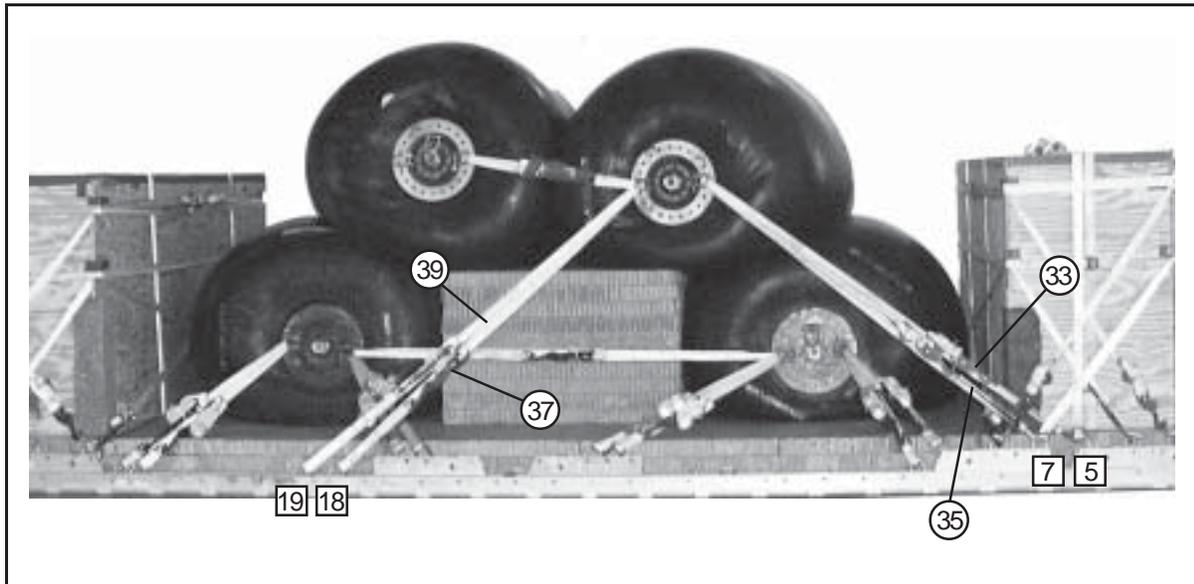
Lashing Number	Tie-down Clevis Number	Instructions
25	16	Route a lashing from clevis 16 to the front right shackle on drum 2.
26	16A	Route a lashing from clevis 16A to the front left shackle on drum 2.
27	17	Route a lashing from clevis 17 to the front right shackle on drum 2.
28	17A	Route a lashing from clevis 17A to the front left shackle on drum 2.
29	20	Route a lashing from clevis 20 to the rear right shackle on drum 2.
30	20A	Route a lashing from clevis 20A to the rear left shackle on drum 2.
31	21	Route a lashing from clevis 21 to the rear right shackle on drum 2.
32	21A	Route a lashing from clevis 21A to the rear left shackle on drum 2.

Figure 4-46. Lashings 25 through 32 Installed



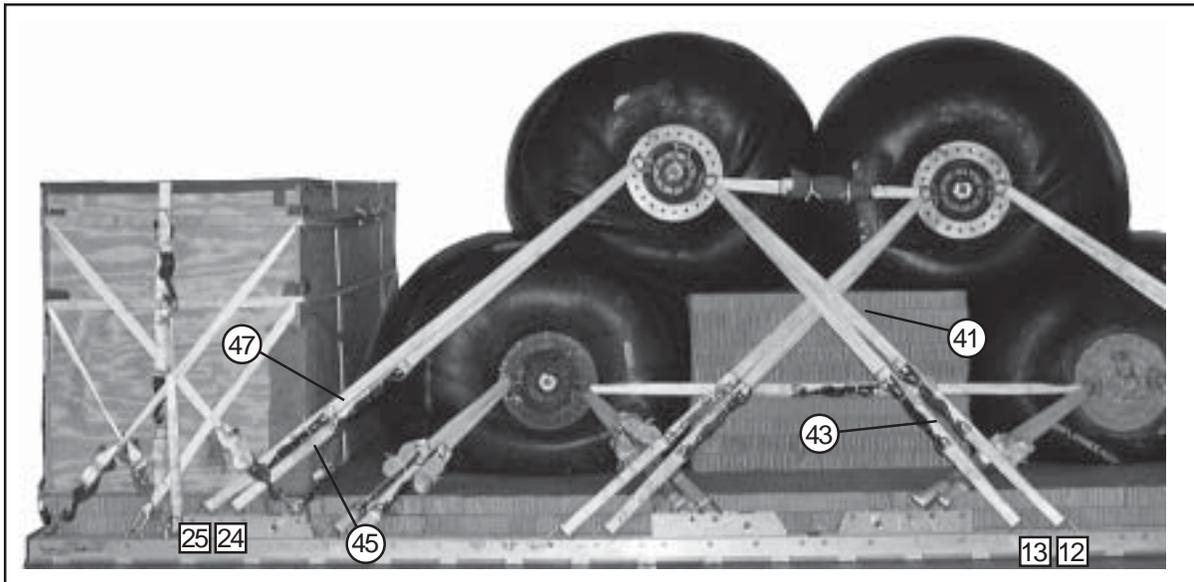
- ① Position drum 3 at the front of the center stack, resting against drum 1.
- ② Position drum 4 at the rear of the center stack, resting against drum 2.
- ③ Lash drums 3 and 4 together on each side, using the inside shackles and a 15-foot lashing.
- ④ Pad each load binder with a 10- by 15-inch piece of felt. Tie the felt in place with two lengths of type I, 1/4-inch cotton webbing.

Figure 4-47. Drums 3 and 4 Positioned



Lashing Number	Tie-down Clevis Number	Instructions
33	5	Route a lashing from clevis 5 to the front right shackle on drum 3.
34	5A	Route a lashing from clevis 5A to the front left shackle on drum 3.
35	7	Route a lashing from clevis 7 to the front right shackle on drum 3.
36	7A	Route a lashing from clevis 7A to the front left shackle on drum 3.
37	18	Route a lashing from clevis 18 to the rear right shackle on drum 3.
38	18A	Route a lashing from clevis 18A to the rear left shackle on drum 3.
39	19	Route a lashing from clevis 19 to the rear right shackle on drum 3.
40	19A	Route a lashing from clevis 19A to the rear left shackle on drum 3.

Figure 4-48. Lashings 33 through 40 Installed

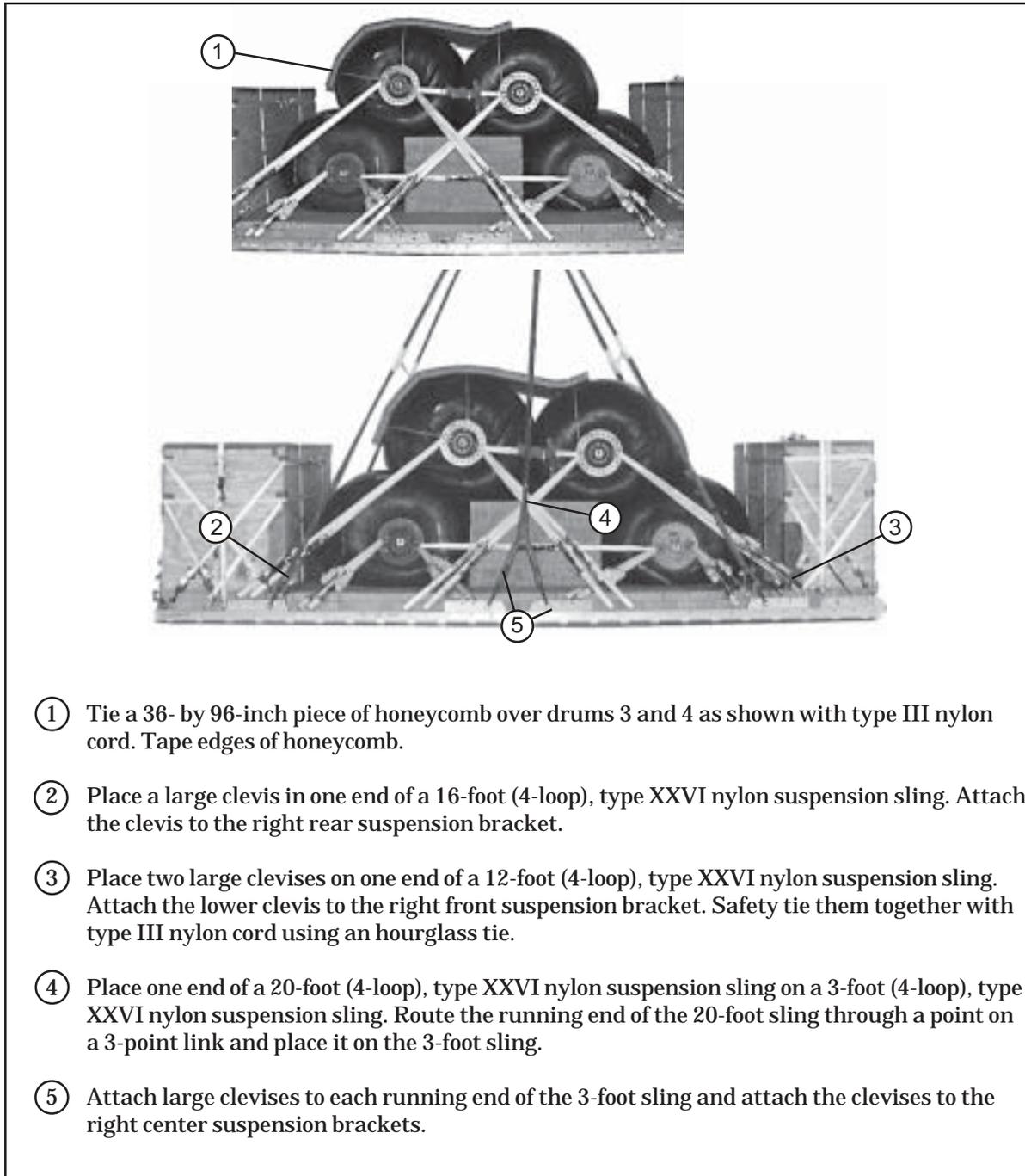


Lashing Number	Tie-down Clevis Number	Instructions
41	12	Route a lashing from clevis 12 to the front right shackle on drum 4.
42	12A	Route a lashing from clevis 12A to the front left shackle on drum 4.
43	13	Route a lashing from clevis 13 to the front right shackle on drum 4.
44	13A	Route a lashing from clevis 13A to the front left shackle on drum 4.
45	24	Route a lashing from clevis 24 to the rear right shackle on drum 4.
46	24A	Route a lashing from clevis 24A to the rear left shackle on drum 4.
47	25	Route a lashing from clevis 25 to the rear right shackle on drum 4.
48	25A	Route a lashing from clevis 25A to the rear left shackle on drum 4.

Figure 4-49. Lashings 41 through 48 Installed

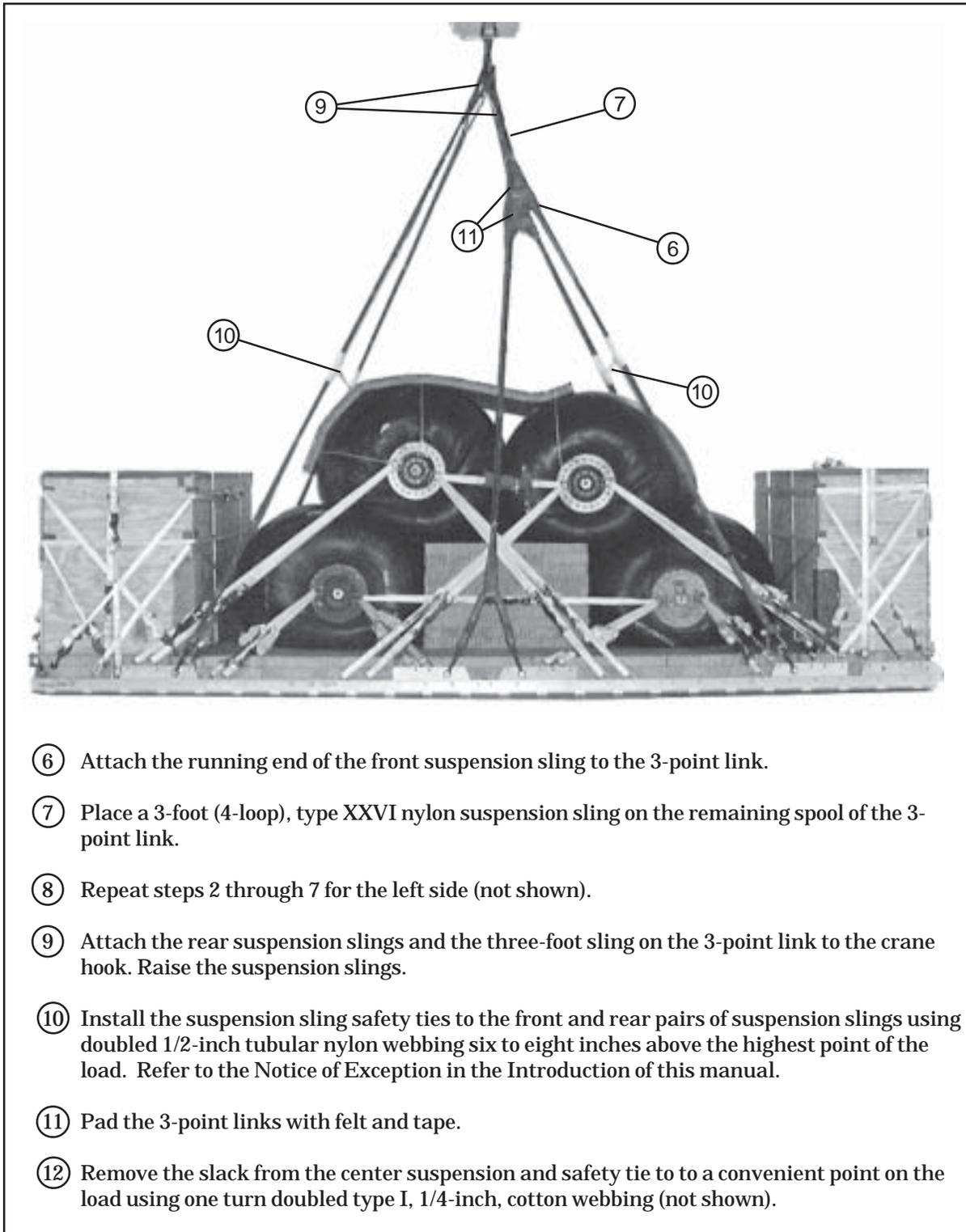
## INSTALLING RELEASE PLATFORM, SUSPENSION SLINGS AND SAFETY TIES

4-29. Install the release platform, suspension slings and safety ties as shown in Figure 4-50.



- ① Tie a 36- by 96-inch piece of honeycomb over drums 3 and 4 as shown with type III nylon cord. Tape edges of honeycomb.
- ② Place a large clevis in one end of a 16-foot (4-loop), type XXVI nylon suspension sling. Attach the clevis to the right rear suspension bracket.
- ③ Place two large clevises on one end of a 12-foot (4-loop), type XXVI nylon suspension sling. Attach the lower clevis to the right front suspension bracket. Safety tie them together with type III nylon cord using an hourglass tie.
- ④ Place one end of a 20-foot (4-loop), type XXVI nylon suspension sling on a 3-foot (4-loop), type XXVI nylon suspension sling. Route the running end of the 20-foot sling through a point on a 3-point link and place it on the 3-foot sling.
- ⑤ Attach large clevises to each running end of the 3-foot sling and attach the clevises to the right center suspension brackets.

Figure 4-50. Release Platform, Suspension Slings and Safety Ties Installed



- ⑥ Attach the running end of the front suspension sling to the 3-point link.
- ⑦ Place a 3-foot (4-loop), type XXVI nylon suspension sling on the remaining spool of the 3-point link.
- ⑧ Repeat steps 2 through 7 for the left side (not shown).
- ⑨ Attach the rear suspension slings and the three-foot sling on the 3-point link to the crane hook. Raise the suspension slings.
- ⑩ Install the suspension sling safety ties to the front and rear pairs of suspension slings using doubled 1/2-inch tubular nylon webbing six to eight inches above the highest point of the load. Refer to the Notice of Exception in the Introduction of this manual.
- ⑪ Pad the 3-point links with felt and tape.
- ⑫ Remove the slack from the center suspension and safety tie to a convenient point on the load using one turn doubled type I, 1/4-inch, cotton webbing (not shown).

**Figure 4-50. Release Platform, Suspension Slings and Safety Ties Installed (continued)**

## PREPARING AND STOWING CARGO PARACHUTES

4-30. Prepare and stow five G-11 cargo parachutes as shown in Figure 4-51.

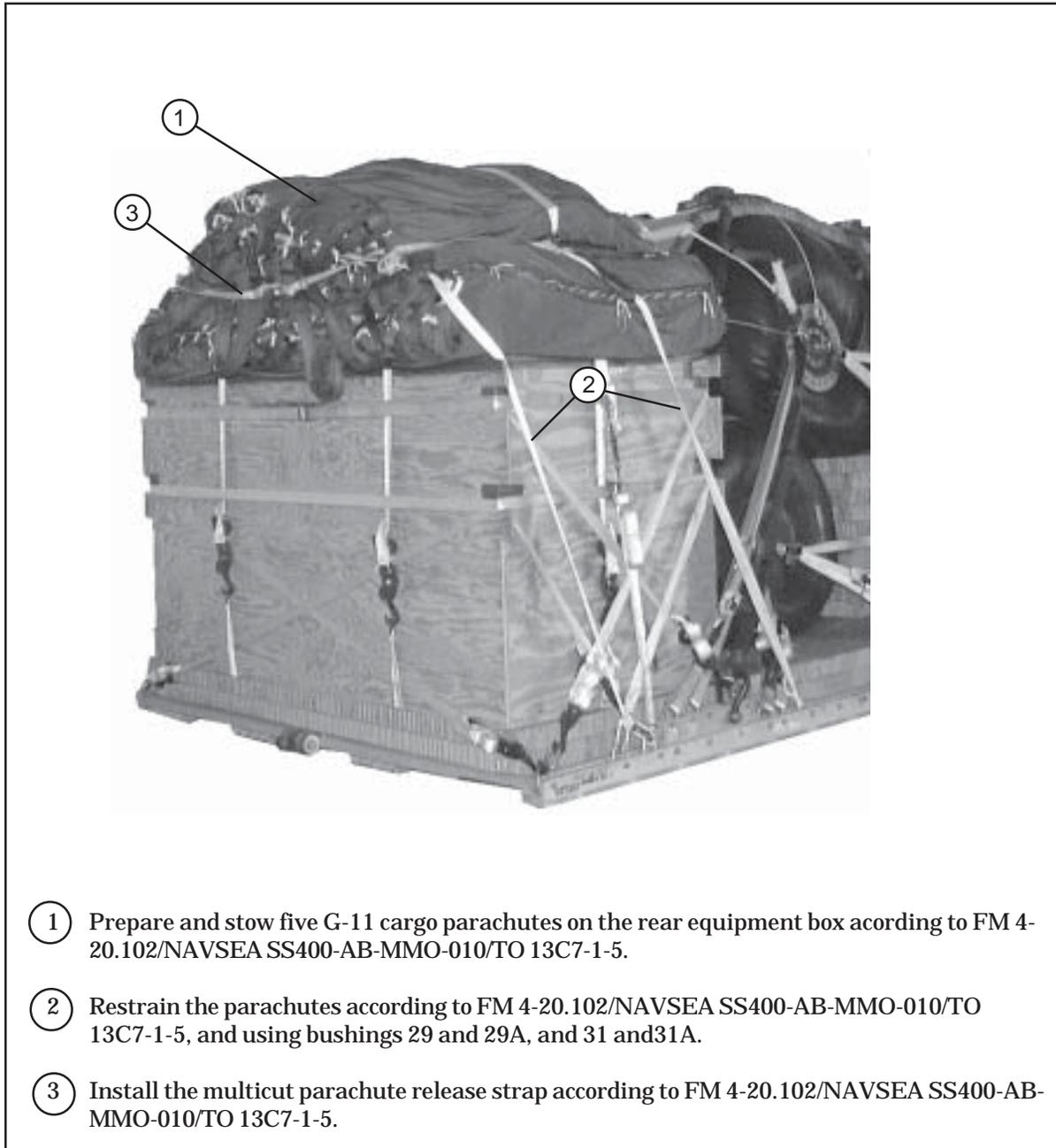


Figure 4-51. Cargo Parachutes Prepared and Stowed

## INSTALLING THE CARGO PARACHUTE RELEASE SYSTEM

4-31. Install the parachute release as shown in Figure 4-52.

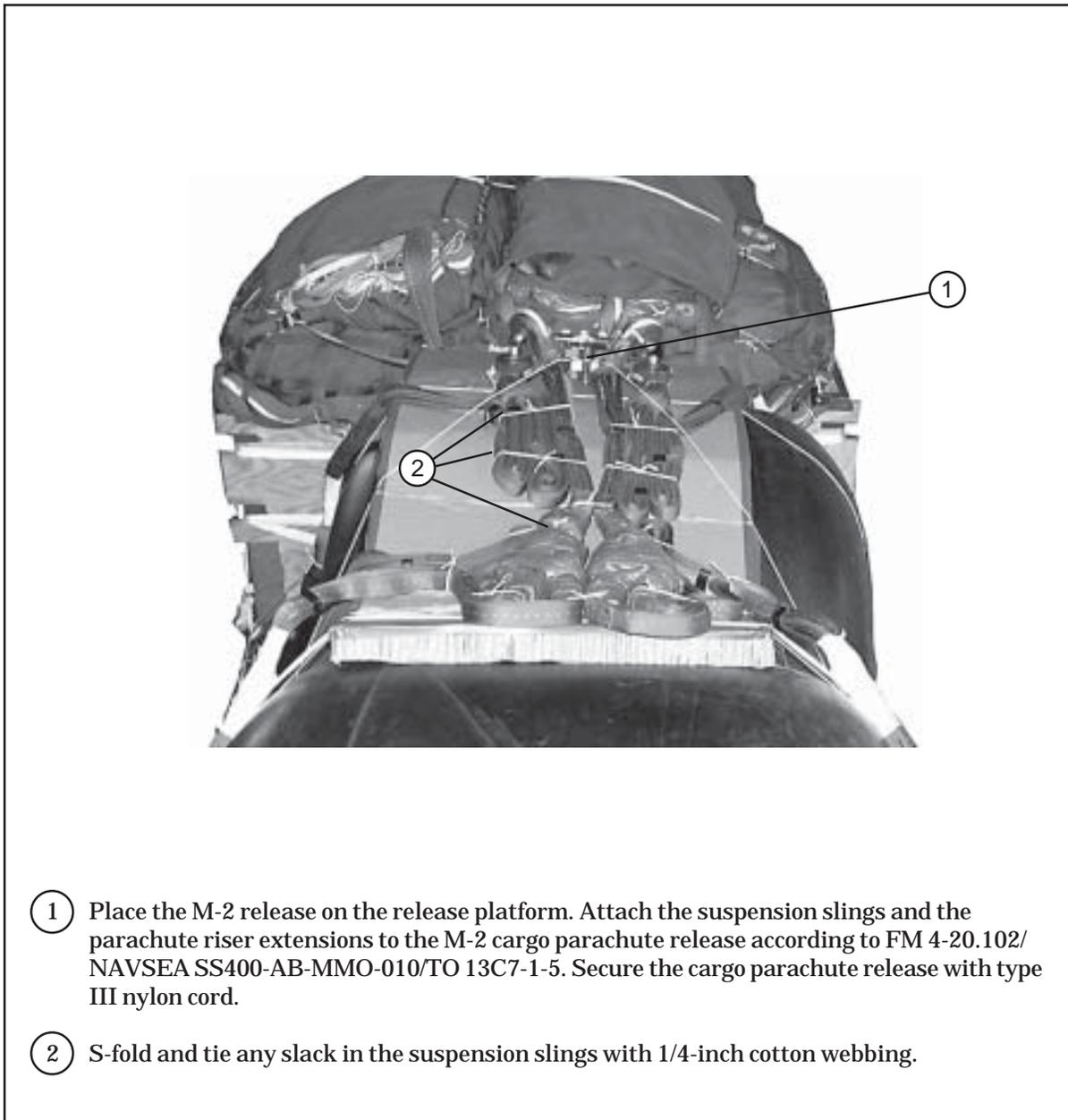


Figure 4-52. Cargo Parachute Release Release Installed

## INSTALLING THE EXTRACTION SYSTEM

4-32. Install the components of the EFTC system as shown in Figure 4-53.

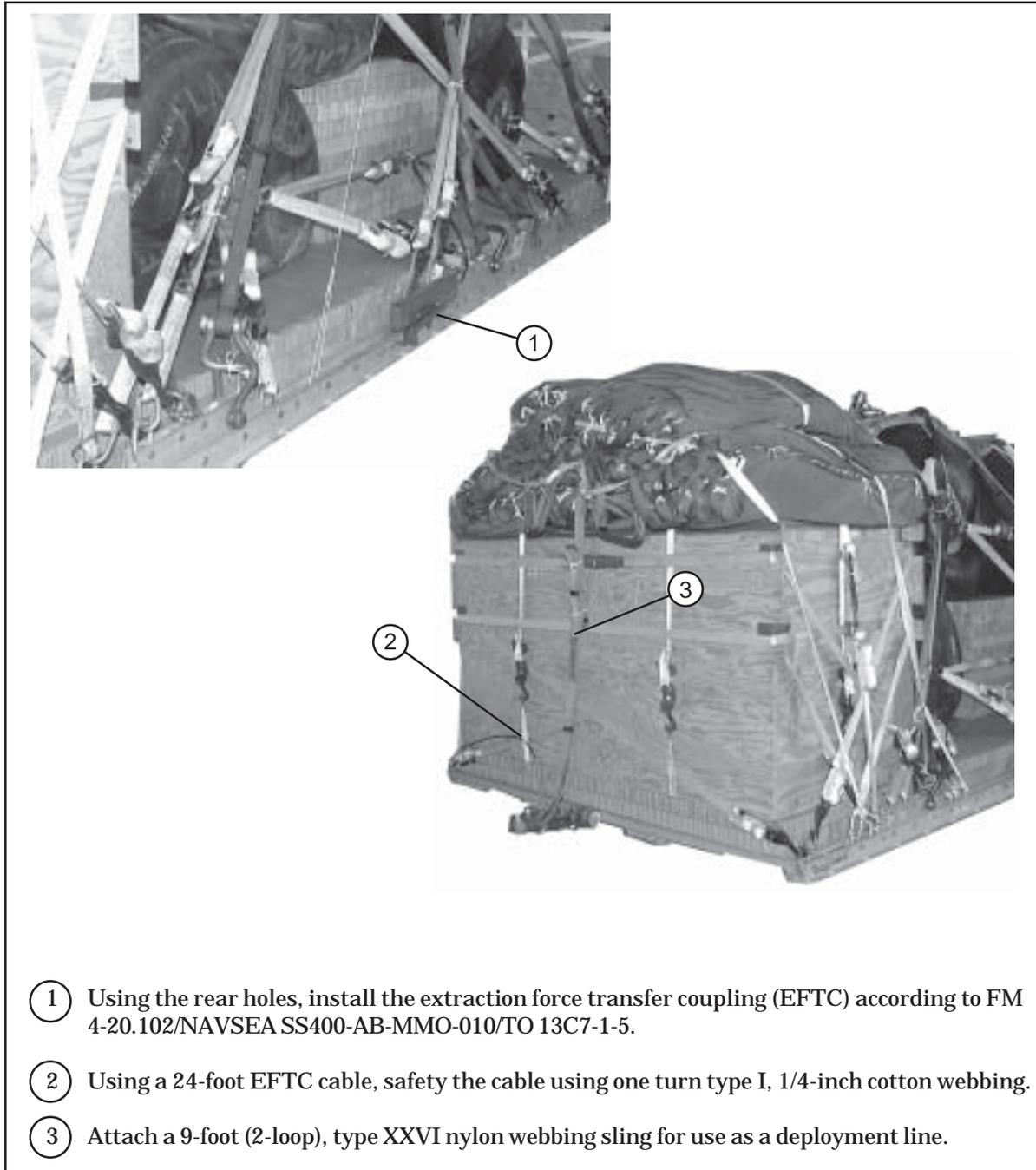


Figure 4-53. Extraction System Installed

## **PLACING EXTRACTION PARACHUTE**

4-33. Select the extraction parachute and extraction line needed using the extraction line requirements table in FM 4-20.102/NAVSEA SS400-AB-MMO-010/TO 13C7-1-5. Rig the extraction line in an extraction line bag according to TM 10-1670-286-20/TO 13C5-2-41. Place the extraction parachute and extraction line on the load for installation in the aircraft.

## **INSTALLING PROVISIONS FOR EMERGENCY RESTRAINTS**

4-34. Select and install the provisions for emergency aft restraints according to the emergency aft restraint requirements table in FM 4-20.102/NAVSEA SS400-AB-MMO-010/TO 13C7-1-5.

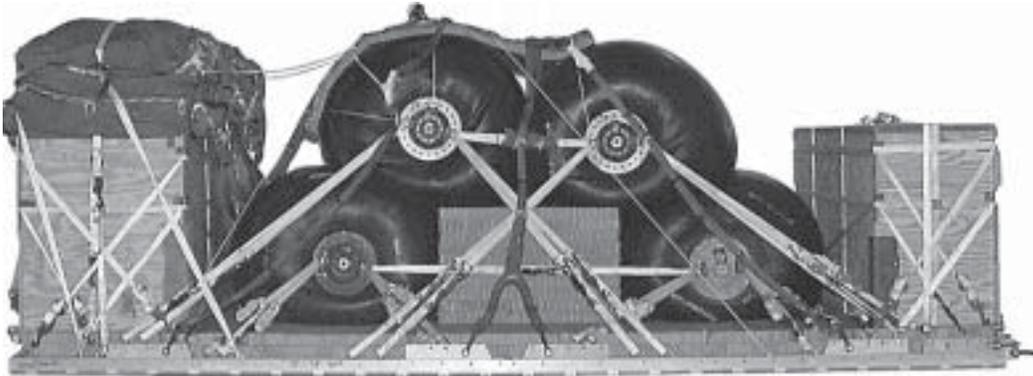
## **MARKING RIGGED LOAD**

4-35. Mark the rigged load according to FM 4-20.102/NAVSEA SS400-AB-MMO-010/TO 13C7-1-5 and as shown in Figure 4-54. Complete Shipper's Declaration for Dangerous Goods and affix to the load. If the load varies from the one shown, the weight, height, CB, tipoff curve, and parachute requirements must be recomputed.

## **EQUIPMENT REQUIRED**

4-36. Use the equipment list in Table 4-3 to rig the load shown in Figure 4-54.

**CAUTION**  
 Make the final inspection required by FM 4-20.102/NAVSEA  
 SS400-AB-MMO-010/TO 13C7-1-5 before the load leaves  
 the rigging site.



CB

**RIGGED LOAD DATA**

**Weight** ..... 22,630 pounds

**NOTE:** The rigged weight for this load is using water as the liquid. Use the weight conversion table for the actual rigged weight for any other liquids used.

**NOTE:** The G-11 requirements may need to be recomputed for lighter liquids.

**Maximum Weight** ..... 24,000 pounds

**Height** ..... 88 inches

**Width** ..... 108 inches

**Overall Length** ..... 258 inches

**Overhang: Front** ..... 0 inches

**Rear (EFTC)** ..... 18 inches

**Center of Balance (CB) (from front edge of platform)** ..... 121 inches

**Figure 4-54. AAFARS Rigged with Four 500-Gallon Drums for Low-Velocity Airdrop**

**Table 4-3. Equipment Required for Rigging AAFARS with Four Drums on 20-foot Type V Platform**

**Table 4-3. Equipment Required for Rigging AAFARS with Four Drums on 20-foot Type V Platform (continued)**

National Stock Number	Item	Quantity
1670-01-307-1055	Link assembly: Three-point	2
1670-01-483-8259	Link, tow release mechanism (H-Block) C-17	1
5510-00-220-6146	Lumber: 2- by 4-in	As required
5510-00-220-6148	2- by 6-in	As required
5315-00-010-4659	Nail, steel wire, common, 8d	As required
5315-00-010-4662	12d	As required
5315-00-753-3885	16d	As required
1670-00-753-3928	Pad, energy dissipating, honeycomb, 3- by 36- by 96-in	25 sheets
1670-01-016-7841	Parachute: Cargo: G-11C	5
1670-00-040-8135	Cargo extraction: 28-foot	1
1670-01-063-3715	Drogue: (for DES) 15-ft	1
1670-01-353-8425	Platform, airdrop, Type V, 20-foot Bracket assembly, EFTC	1
1670-01-162-2376	Bracket assembly, extraction	1
1670-01-162-2372	Clevis assembly	62
1670-01-247-2389	Bracket, suspension	8
1670-01-162-2381	Tandem link assembly (multipurpose link)	2
5530-00-128-4981	Plywood, 3/4-in	11 sheets
1670-01-097-8817	Release, cargo parachute, M-2	1
1670-01-062-6306	Sling, cargo, airdrop For suspension: 3-ft (4-loop), type XXVI nylon webbing	4
1670-01-062-6307	12-ft (4-loop), type XXVI nylon webbing	2
1670-01-062-6308	16-ft (4-loop), type XXVI nylon webbing	2
1670-01-064-4453	20-ft (4-loop), type XXVI nylon webbing	2
1670-01-062-6304	For deployment: 9-ft (2-loop), type XXVI nylon webbing	1
1670-01-062-6311	For riser extension: 120-ft (2-loop), type XXVI	5
5340-00-040-8219	Strap, parachute release, multicut, comes w/ 3 knives	2
7510-00-266-5016	Tape, adhesive, 2-in	As required
7510-00-266-6710	Tape, masking, 2-in	As required
1670-00-937-0271	Tie-down assembly, 15-foot	62
8305-00-268-2411	Webbing: 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

## SECTION III- RIGGING AAFARS WITH FIVE 500-GALLON FUEL DRUM

### DESCRIPTION OF LOAD

4-37. The Advanced Aviation Forward Area Refueling System (AAFARS) is rigged on a 24-foot type, V platform with six G-11 cargo parachutes. The AAFARS is designed for forward area refueling of up to four aircraft at a time with a minimum of 55 GPM. There are five collapsible fuel drums as an accompanying load. Each drum is filled with 432 gallons of liquid. When empty, each drum weighs 250 pounds and is 62 inches long and 53 inches in diameter. The total rigged overall length is 288 inches. Width is 108 inches. Height is 96 inches. Center of balance is 146 inches.

- Notes:**
1. For drums filled with a liquid other than water, use Table 1-1 to recompute the weight.
  2. If the load varies from the one shown, the weight, height, CB, tipoff curve, and parachute requirements must be recomputed.
  3. Do not pressurize drums with air.

### PREPARING PLATFORM

4-38. Prepare a 24-foot type V airdrop platform using two tandem links, eight suspension brackets, and 80 tie-down clevises as shown in Figure 4-55.

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

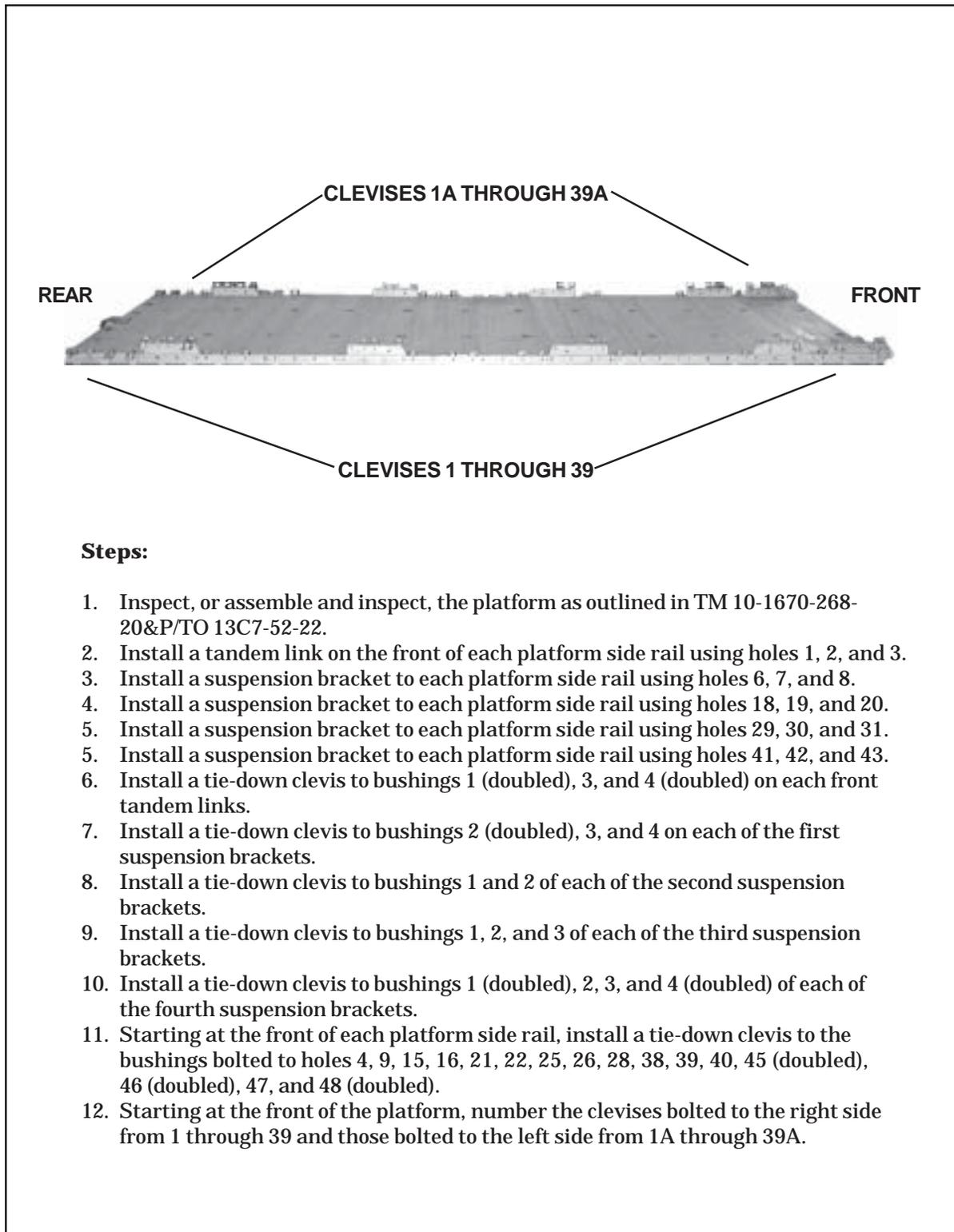
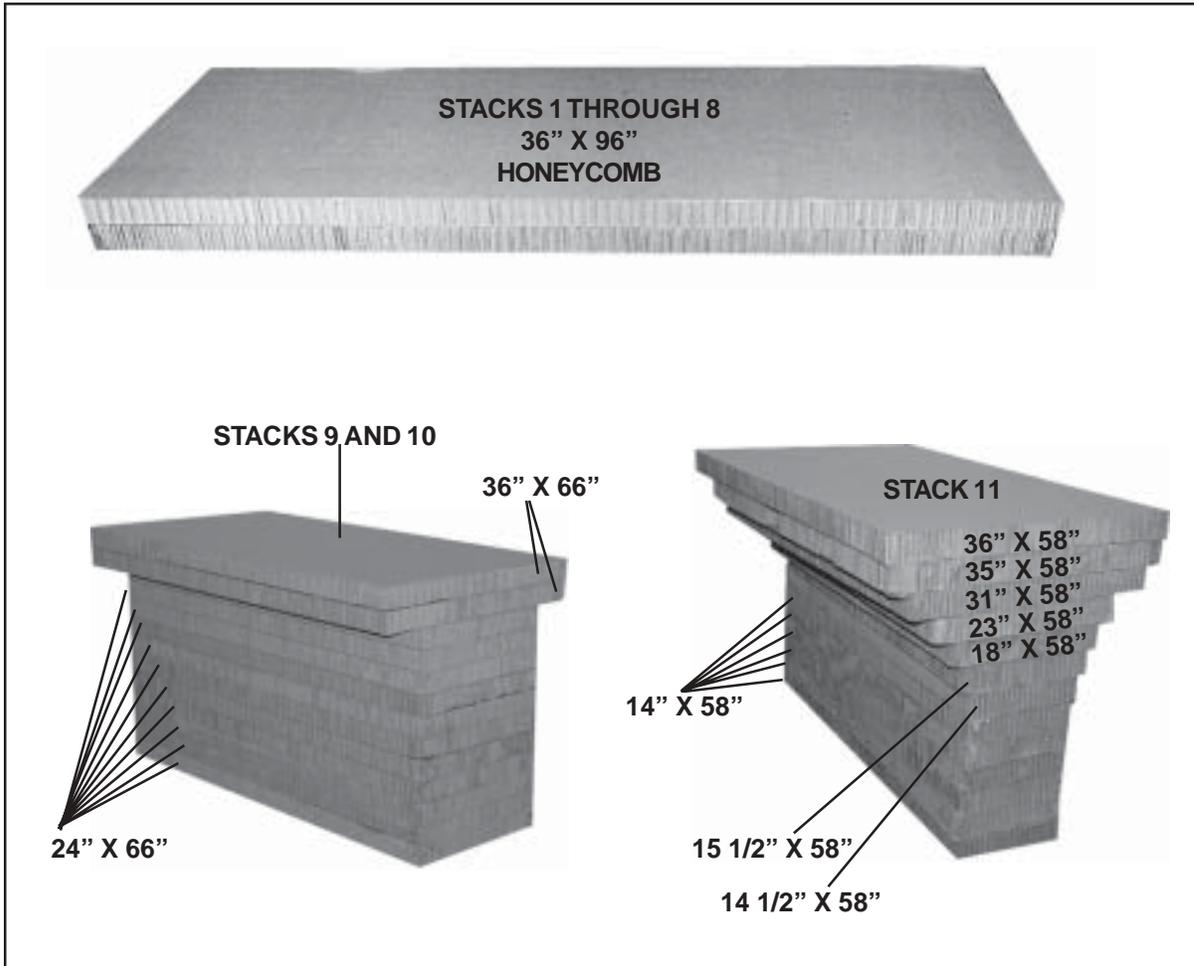


Figure 4-55. Platform Prepared

## PREPARING HONEYCOMB

4-39. Build honeycomb stacks as shown in Figures 4-56 and 4-57.



STACK NUMBER	PIECES	WIDTH (INCHES)	LENGTH (INCHES)	MATERIAL	INSTRUCTIONS
1-8	2	36	96	Honeycomb	Do not glue together.
9 and 10	11	24	66	Honeycomb	Glue together forming a base.
	2	36	66	Honeycomb	Glue together and glue onto base.
11	6	14	58	Honeycomb	Glue together forming a base.
	1	14 1/2	58	Honeycomb	Glue onto base.
	1	15 1/2	58	Honeycomb	Glue onto base.
	1	18	58	Honeycomb	Glue onto base.
	1	23	58	Honeycomb	Glue onto base.
	1	31	58	Honeycomb	Glue onto base.
	1	35	58	Honeycomb	Glue onto base.
	1	36	58	Honeycomb	Glue onto base.

Figure 4-56. Honeycomb Stacks Prepared

## POSITIONING HONEYCOMB STACKS

4-40. Position honeycomb stacks as shown in Figure 4-57.

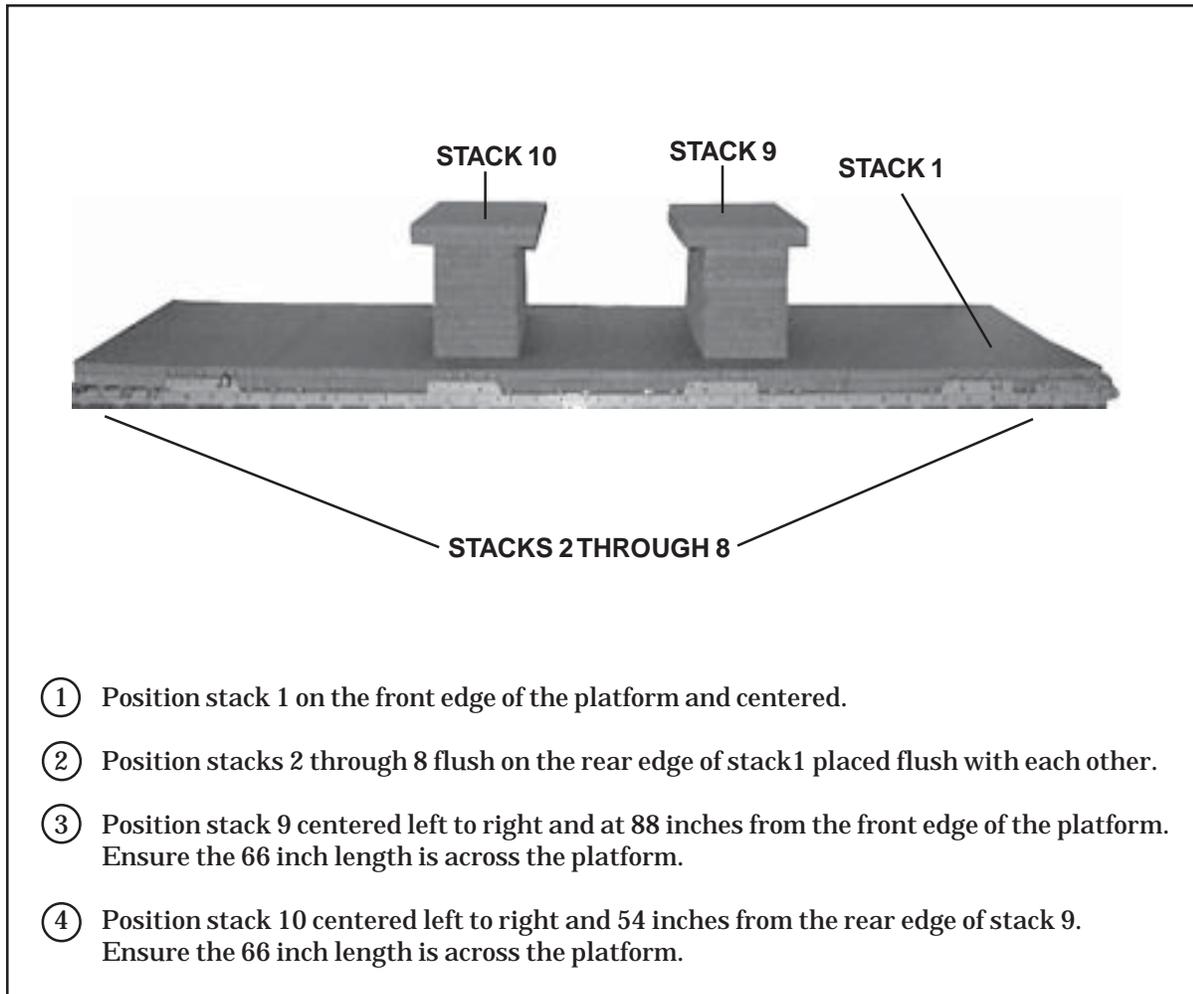


Figure 4-57. Positioning Honeycomb Stacks

## **BUILDING THE EQUIPMENT BOXES**

4-41. Build the front and rear equipment boxes as shown in Figures 4-4 and 4-5.

## **PREPARING EQUIPMENT FOR EQUIPMENT BOXES**

4-42. Prepare the fire extinguishers, filter separator, explosion proof motor, pumps, battery box, manuals and toolkit as explained and shown in paragraph 4-6 and Figures 4-6 through 4-12. Using the list printed on the equipment bags, place the equipment indicated on each list into it's bag.

## **POSITIONING EQUIPMENT BOXES**

4-43. Pre-position lashings described and shown in Figure 4-13, steps 1 through 3. Place the boxes over the lashings and flush with the edges of the honeycomb as described and shown in Figure 4-13, steps 4 and 5.

## **POSITIONING EQUIPMENT IN EQUIPMENT BOXES AND SECURING BOXES**

4-44. Position and secure equipment in equipment boxes as shown in Figures 4-14 and 4-15.

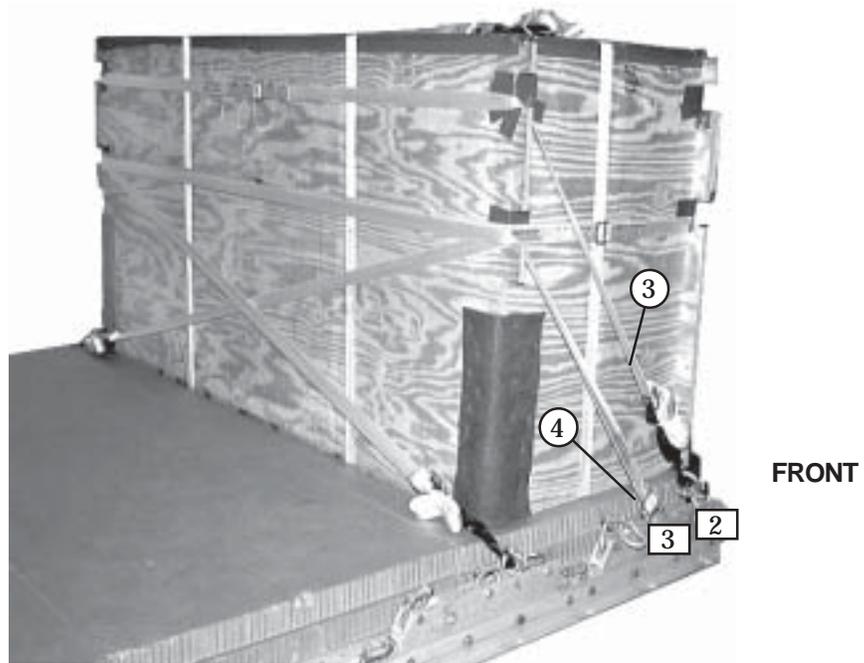
## LASHING THE EQUIPMENT BOXES TO THE PLATFORM

4-45. Lash the equipment boxes as shown in Figures 4-58 through 4-63.

- a. Lash the front equipment box to the platform as shown in Figures 4-58 through 4-60.

Lashing Number	Tie-down Clevis Number	Instructions
1	1 and 7	Route a 30-foot lashing from clevis 1 to the front bottom left cutout, to the rear bottom left cutout, to clevis 7.
2	1A and 7A	Route a 30-foot lashing from clevis 1A to the front bottom right cutout, to the rear bottom right cutout, to clevis 7A.

Figure 4-58. Lashings 1 and 2 Installed



Lashing Number	Tie-down Clevis Number	Instructions
3	2 and 2A	Route a 30-foot lashing from clevis 2 to the rear top right cutout, to the rear top left cutout, to clevis 2A.
4	3 and 3A	Route a lashing through it's own D-ring on clevis 3 to the rear bottom right cutout, to the rear bottom left cutout, to clevis 3A.

Figure 4-59. Lashings 3 and 4 Installed

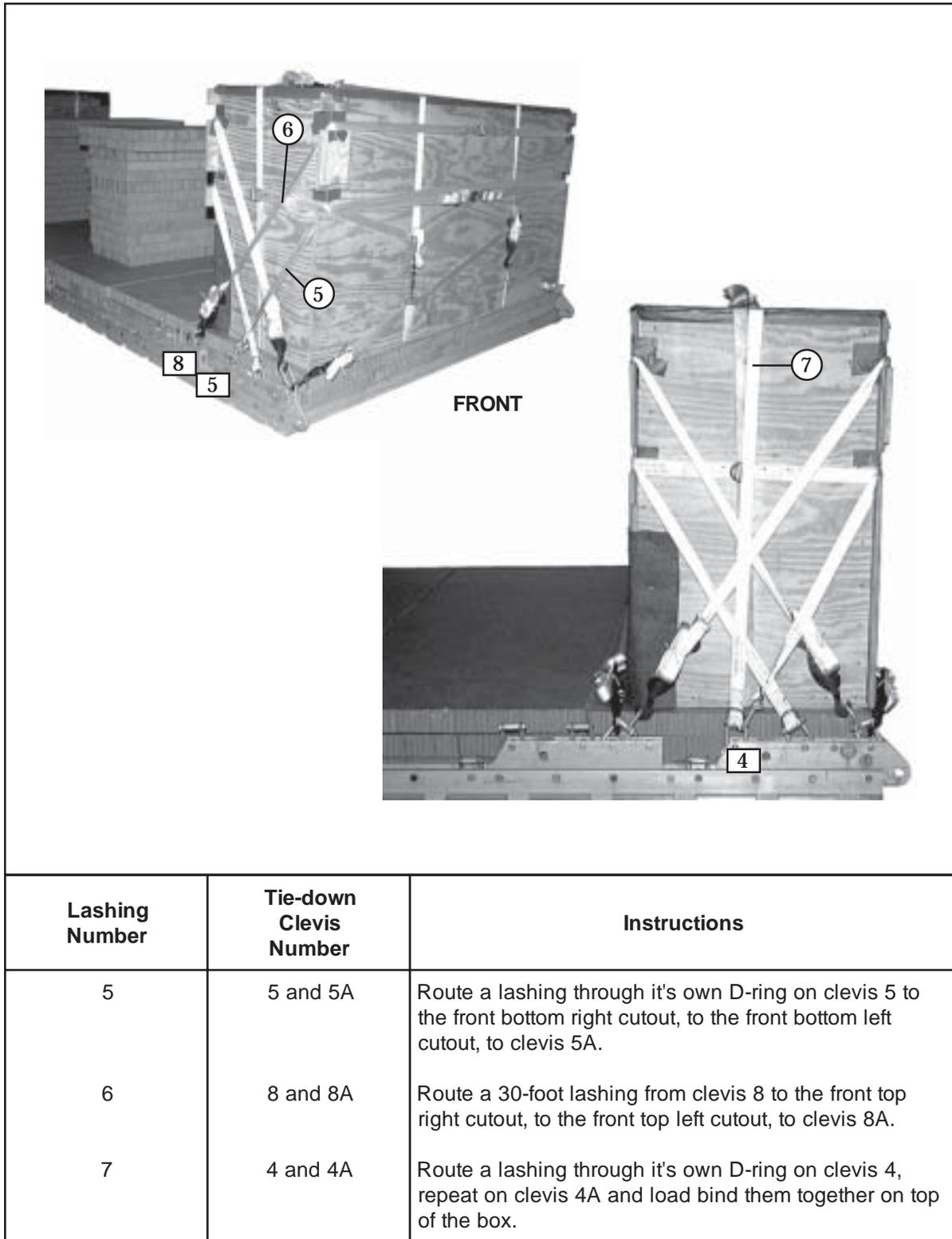
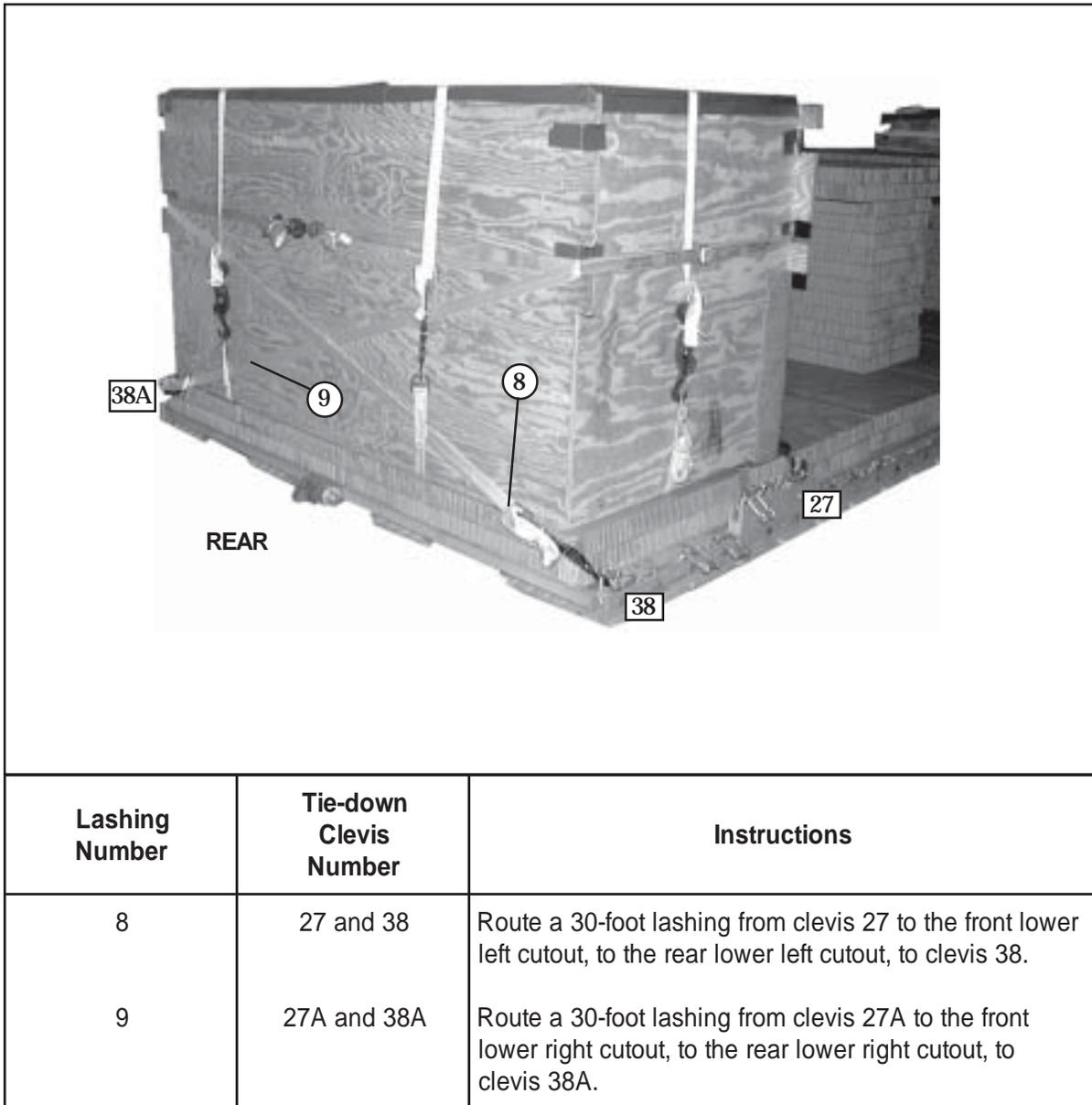
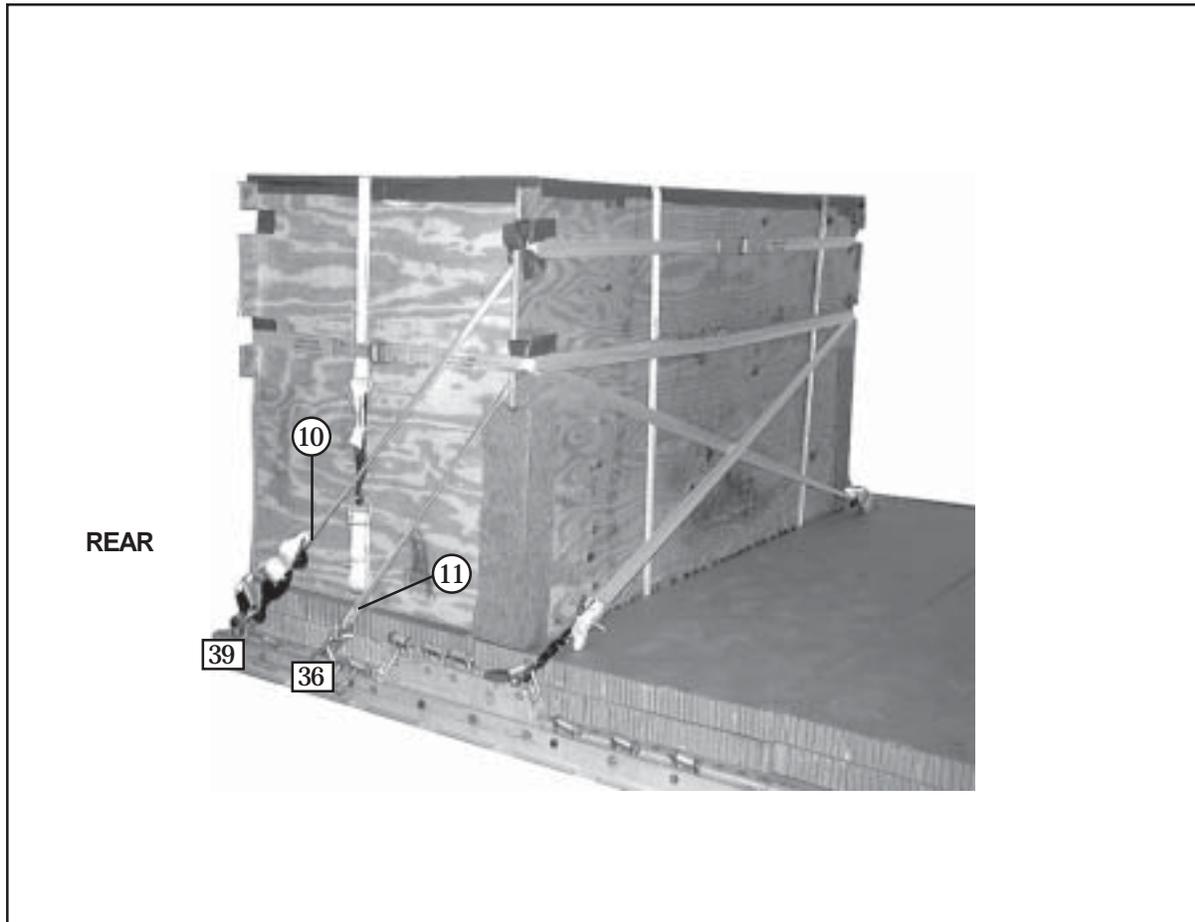


Figure 4-60. Lashings 5 through 7 Installed

**b.** Lash the rear equipment box to the platform as shown in Figures 4-61 through 4-63.

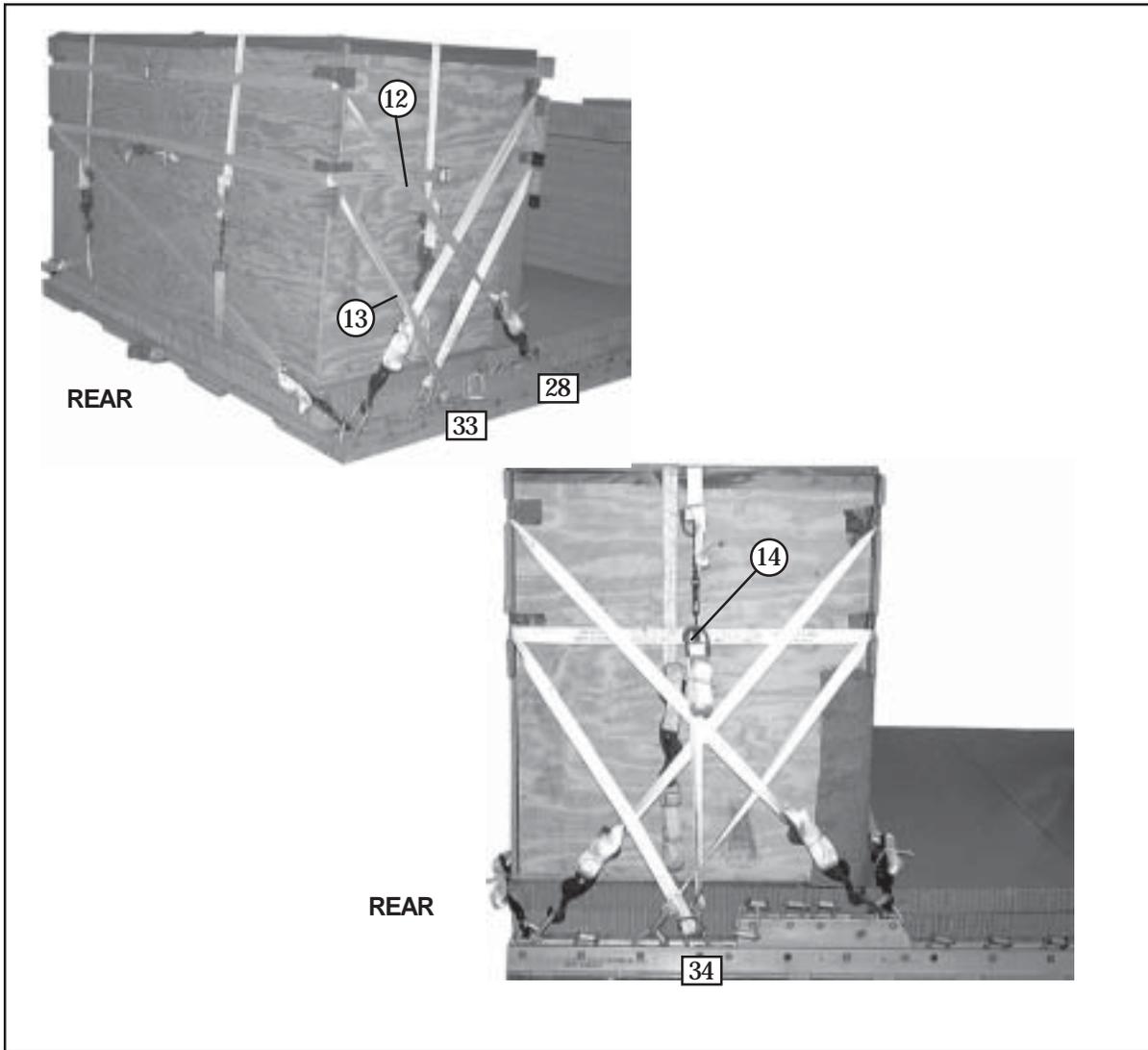


**Figure 4-61. Lashings 8 and 9 Installed**



Lashing Number	Tie-down Clevis Number	Instructions
10	39 and 39A	Route a 30-foot lashing from clevis 39 to the front top right cutout, to the front top left cutout, to clevis 39A.
11	36 and 36A	Route a lashing through it's own D-ring on clevis 36 to the front bottom right cutout, to the bottom left cutout, to clevis 36A.

**Figure 4-62. Lashings 10 and 11 Installed**



Lashing Number	Tie-down Clevis Number	Instructions
12	28 and 28A	Route a 30-foot lashing from clevis 28 to the rear top right cutout, to the rear top left cutout, to clevis 28A.
13	33 and 33A	Route a lashing through it's own D-ring on clevis 33 to the rear bottom right cutout, to the rear bottom left cutout, to clevis 33A.
14	34 and 34A	Route a lashing through it's own D-ring on clevis 34, repeat on clevis 34A and load bind on the right side of the box .

Figure 4-63. Lashings 12 through 14 Installed

## POSITIONING AND LASHING THE DRUMS

4-46. Position and lash the drums to the platform as shown in Figures 4-64 through 4-71.

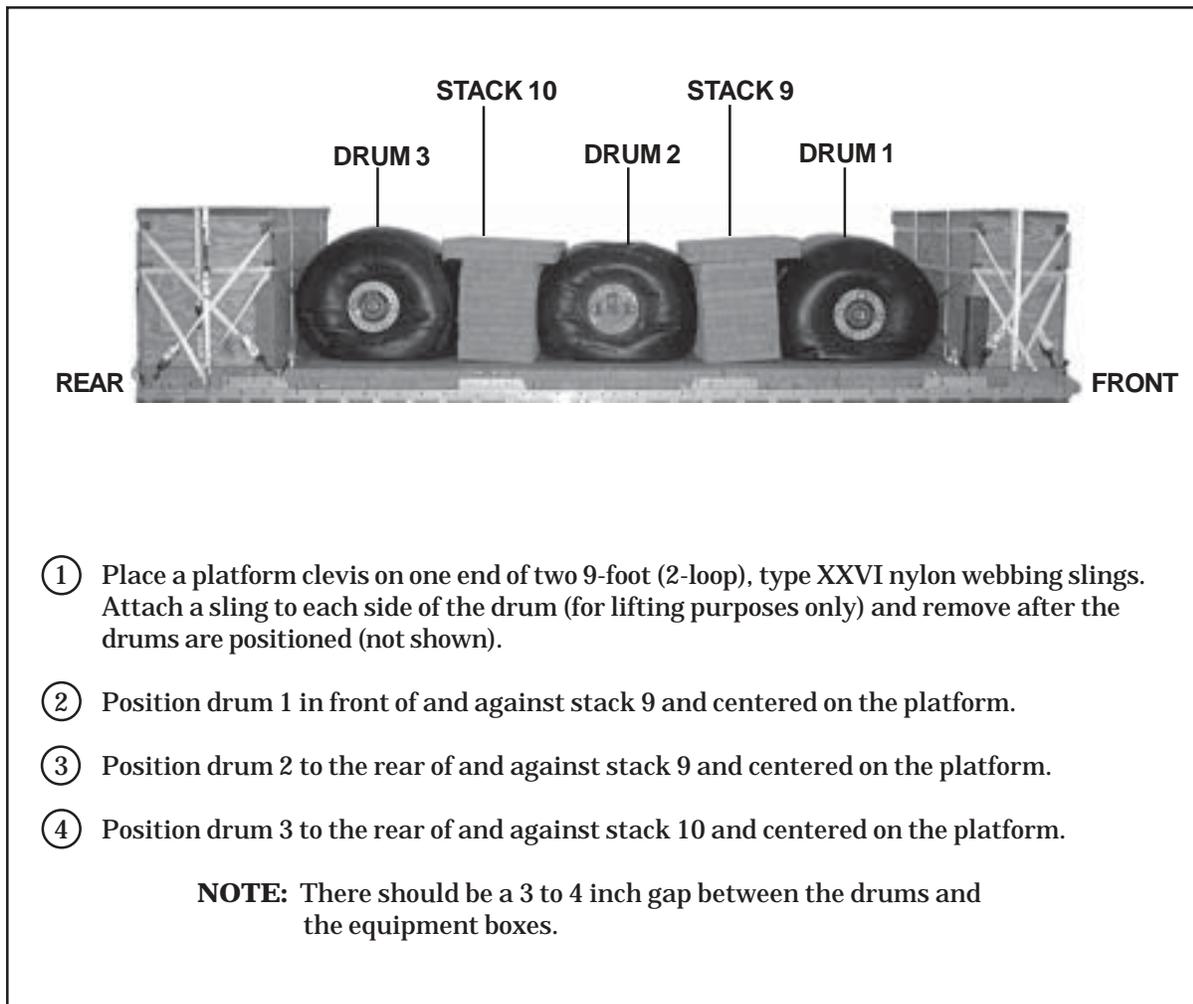
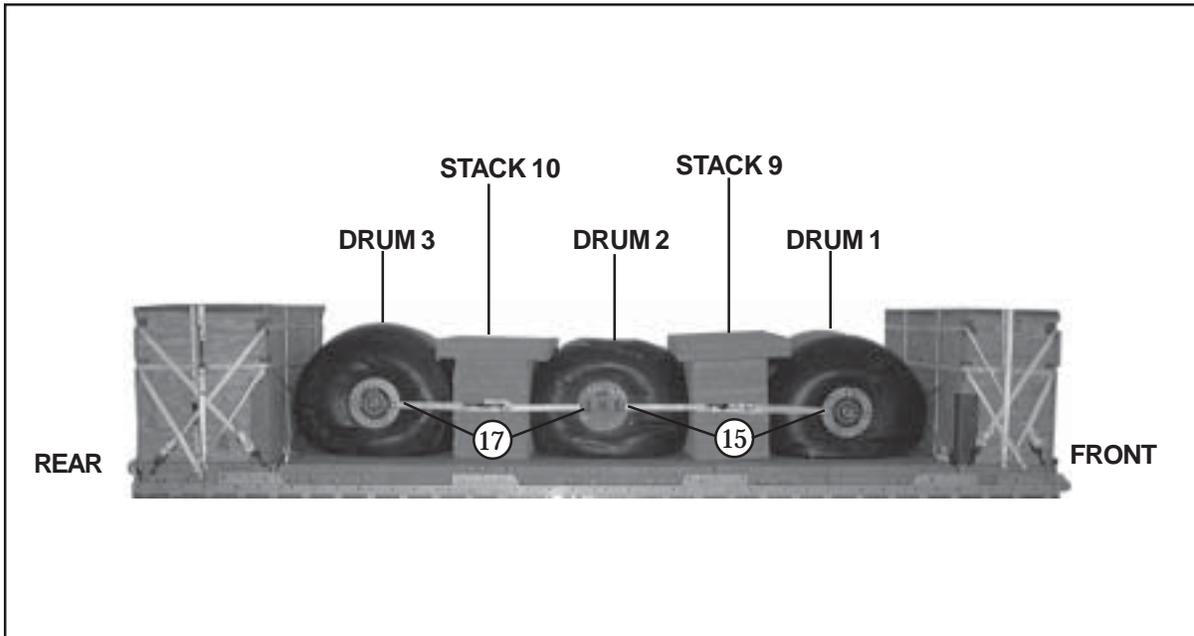
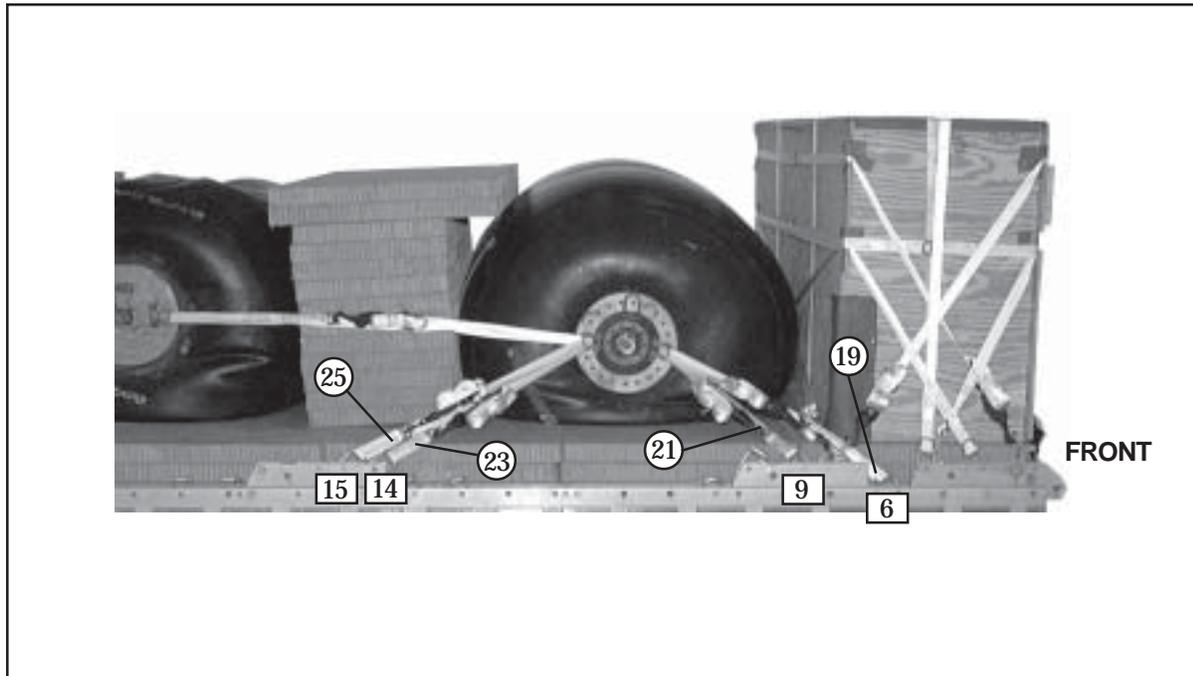


Figure 4-64. Fuel Drums 1 through 3 Positioned



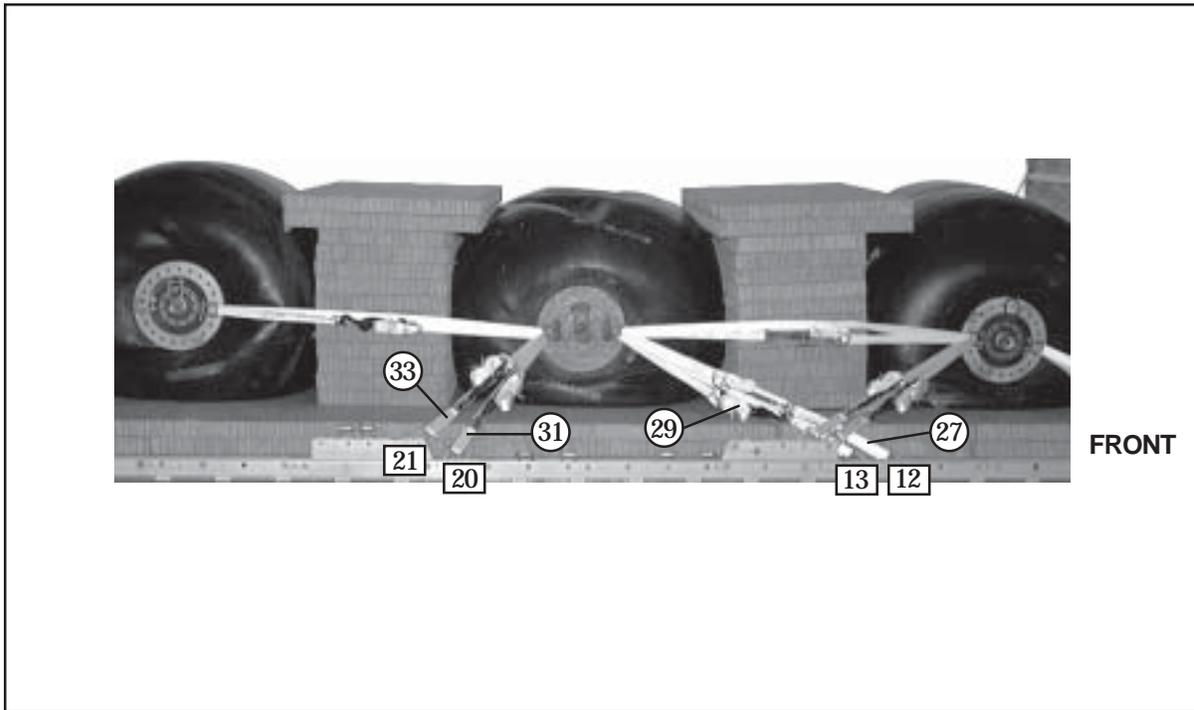
Lashing Number	Tie-down Clevis Number	Instructions
15		Route a lashing from the rear shackle of drum 1 to the front shackle of drum 2 on the right side.
16		Route a lashing from the rear shackle of drum 1 to the front shackle of drum 2 on the left side.
17		Route a lashing from the rear shackle of drum 2 to the front shackle of drum 3 on the right side.
18		Route a lashing from the rear shackle of drum 2 to the front shackle of drum 3 on the left side.

Figure 4-65. Lashings 15 through 18 Installed



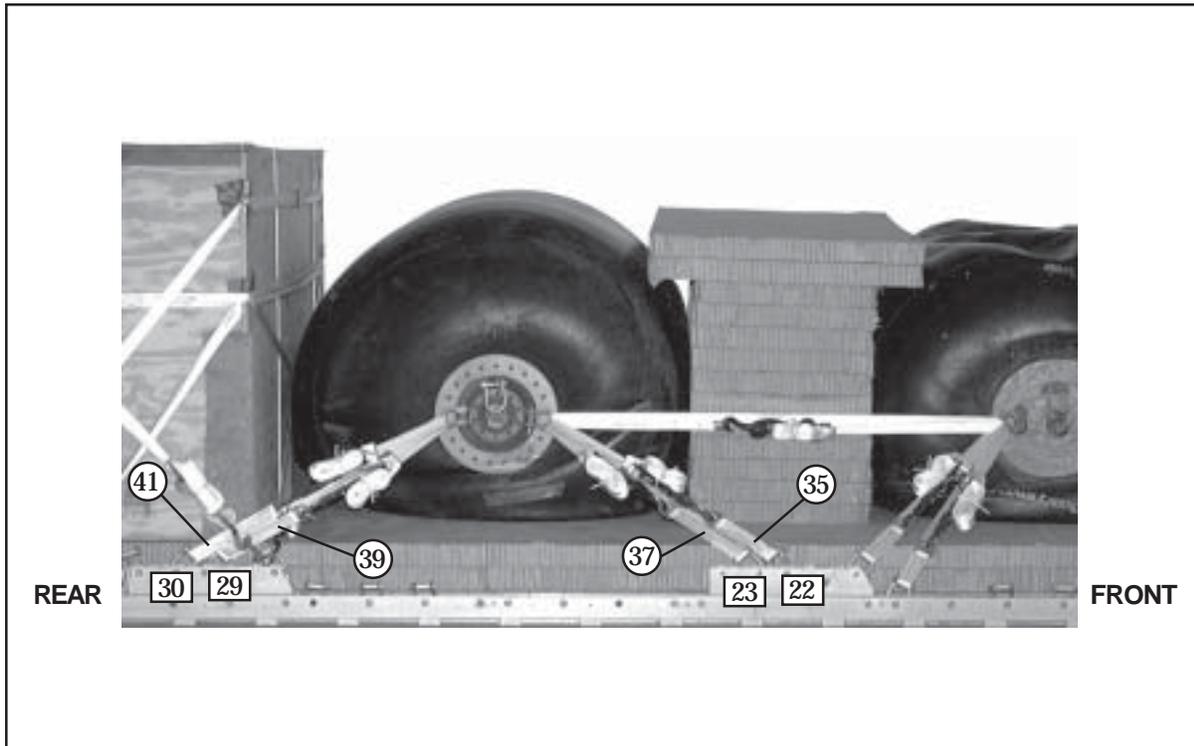
Lashing Number	Tie-down Clevis Number	Instructions
19	6	Route a lashing from clevis 6 to the front right shackle on drum 1.
20	6A	Route a lashing from clevis 6A to the front left shackle on drum 1.
21	9	Route a lashing from clevis 9 to the front right shackle on drum 1.
22	9A	Route a lashing from clevis 9A to the front left shackle on drum 1.
23	14	Route a lashing from clevis 14 to the rear right shackle on drum 1.
24	14A	Route a lashing from clevis 14A to the rear left shackle on drum 1.
25	15	Route a lashing from clevis 15 to the rear right shackle on drum 1.
26	15A	Route a lashing from clevis 15A to the rear left shackle on drum 1.

Figure 4-66. Lashings 19 through 26 Installed



Lashing Number	Tie-down Clevis Number	Instructions
27	12	Route a lashing from clevis 12 to the front right shackle on drum 2.
28	12A	Route a lashing from clevis 12A to the front left shackle on drum 2.
29	13	Route a lashing from clevis 13 to the front right shackle on drum 2.
30	13A	Route a lashing from clevis 13A to the front left shackle on drum 2.
31	20	Route a lashing from clevis 20 to the rear right shackle on drum 2.
32	20A	Route a lashing from clevis 20A to the rear left shackle on drum 2.
33	21	Route a lashing from clevis 21 to the rear right shackle on drum 2.
34	21A	Route a lashing from clevis 21A to the rear left shackle on drum 2.

Figure 4-67. Lashings 27 through 34 Installed



Lashing Number	Tie-down Clevis Number	Instructions
35	22	Route a lashing from clevis 22 to the front right shackle on drum 3.
36	22A	Route a lashing from clevis 22A to the front left shackle on drum 3.
37	23	Route a lashing from clevis 23 to the front right shackle on drum 3.
38	23A	Route a lashing from clevis 23A to the front left shackle on drum 3.
39	29	Route a lashing from clevis 29 to the rear right shackle on drum 3.
40	29A	Route a lashing from clevis 29A to the rear left shackle on drum 3.
41	30	Route a lashing from clevis 30 to the rear right shackle on drum 3.
42	30A	Route a lashing from clevis 30A to the rear left shackle on drum 3.

Figure 4-68. Lashings 35 through 42 Installed

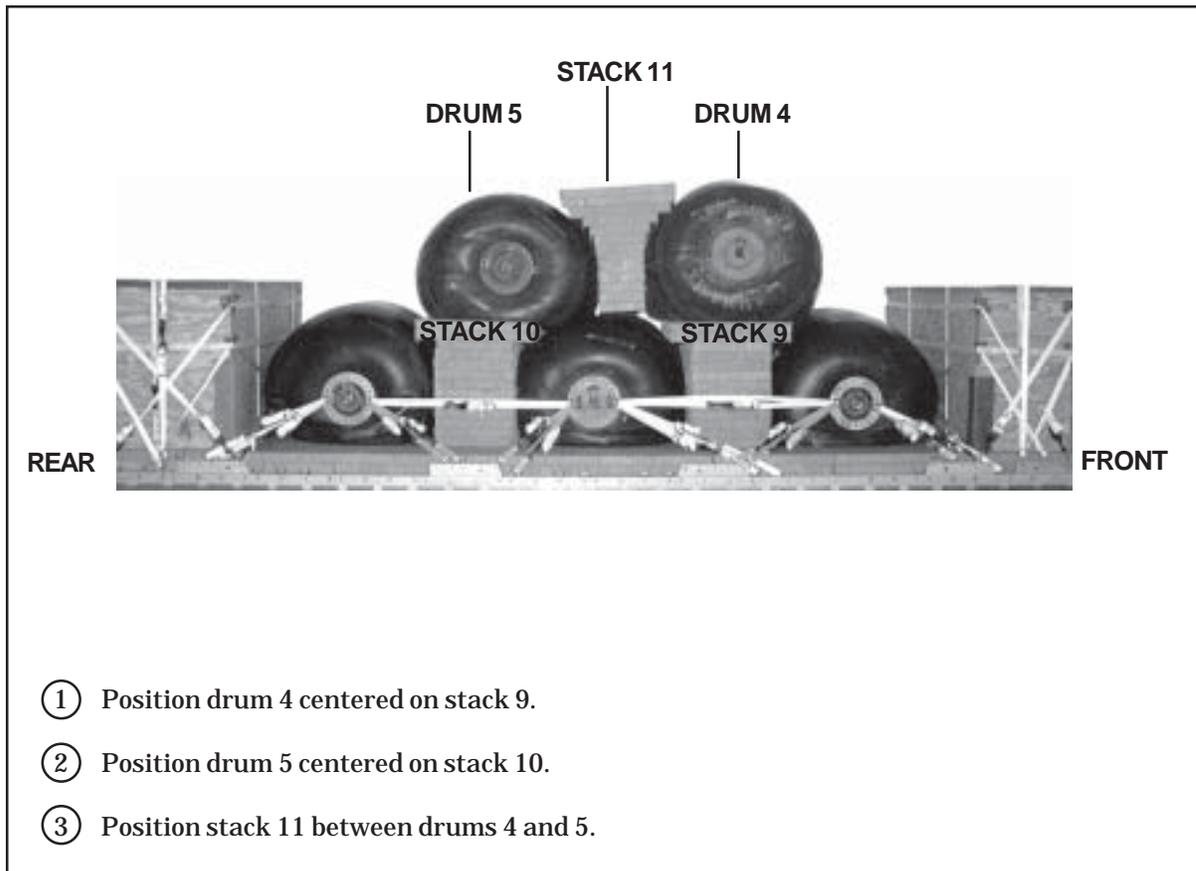
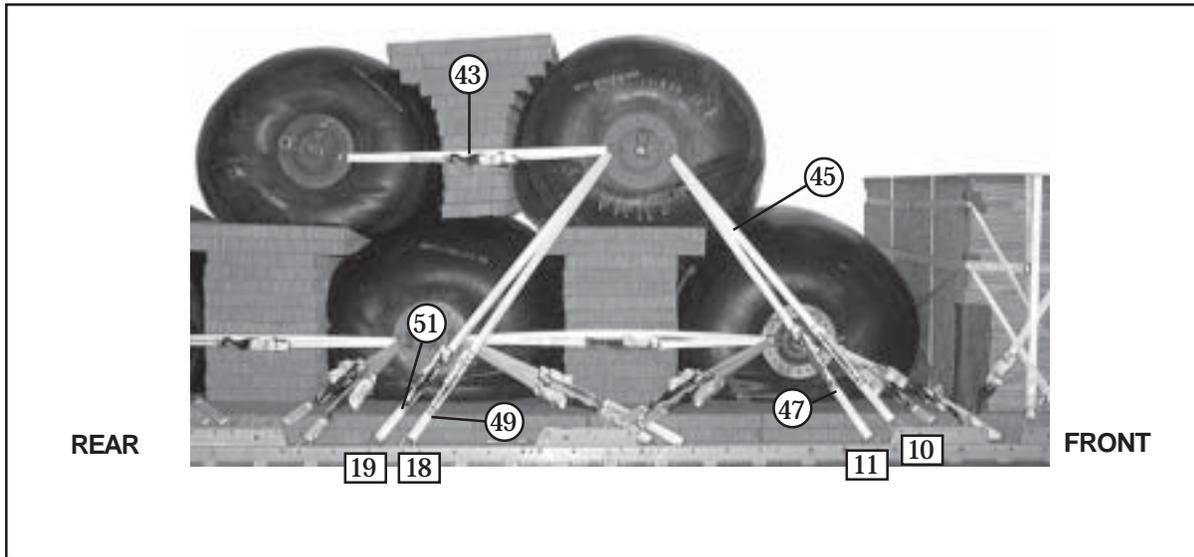
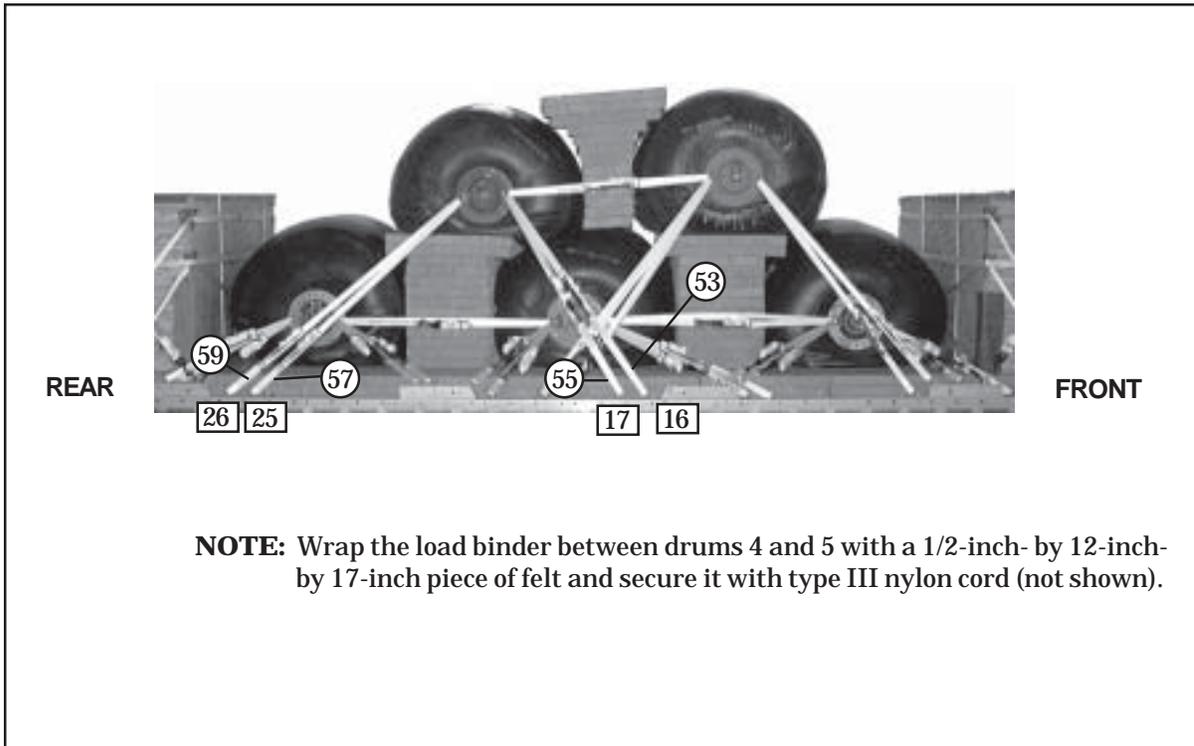


Figure 4-69. Fuel Drums 4 and 5 Positioned



Lashing Number	Tie-down Clevis Number	Instructions
43		Route a lashing from the rear shackle of drum 4 to the front shackle of drum 5 on the right side.
44		Route a lashing from the rear shackle of drum 4 to the front shackle of drum 5 on the left side.
45	10	Route a lashing from clevis 10 to the front right shackle on drum 4.
46	10A	Route a lashing from clevis 10A to the front left shackle on drum 4.
47	11	Route a lashing from clevis 11 to the front right shackle on drum 4.
48	11A	Route a lashing from clevis 11A to the front left shackle on drum 4.
49	18	Route a lashing from clevis 18 to the rear right shackle on drum 4.
50	18A	Route a lashing from clevis 18A to the rear left shackle on drum 4.
51	19	Route a lashing from clevis 19 to the rear right shackle on drum 4.
52	19A	Route a lashing from clevis 19A to the rear left shackle on drum 4.

Figure 4-70. Lashings 43 through 52 Installed



**NOTE:** Wrap the load binder between drums 4 and 5 with a 1/2-inch- by 12-inch- by 17-inch piece of felt and secure it with type III nylon cord (not shown).

Lashing Number	Tie-down Clevis Number	Instructions
53	16	Route a lashing from clevis 16 to the front right shackle on drum 5.
54	16A	Route a lashing from clevis 16A to the front left shackle on drum 5.
55	17	Route a lashing from clevis 17 to the front right shackle on drum 5.
56	17A	Route a lashing from clevis 17A to the front left shackle on drum 5.
57	25	Route a lashing from clevis 25 to the rear right shackle on drum 5.
58	25A	Route a lashing from clevis 25A to the rear left shackle on drum 5.
59	26	Route a lashing from clevis 26 to the rear right shackle on drum 5.
60	26A	Route a lashing from clevis 26A to the rear left shackle on drum 5.

Figure 4-71. Lashings 53 through 60 Installed

## BUILDING AND POSITIONING RELEASE PLATFORM

4-47. Build and position the release platform as shown in Figure 4-72.

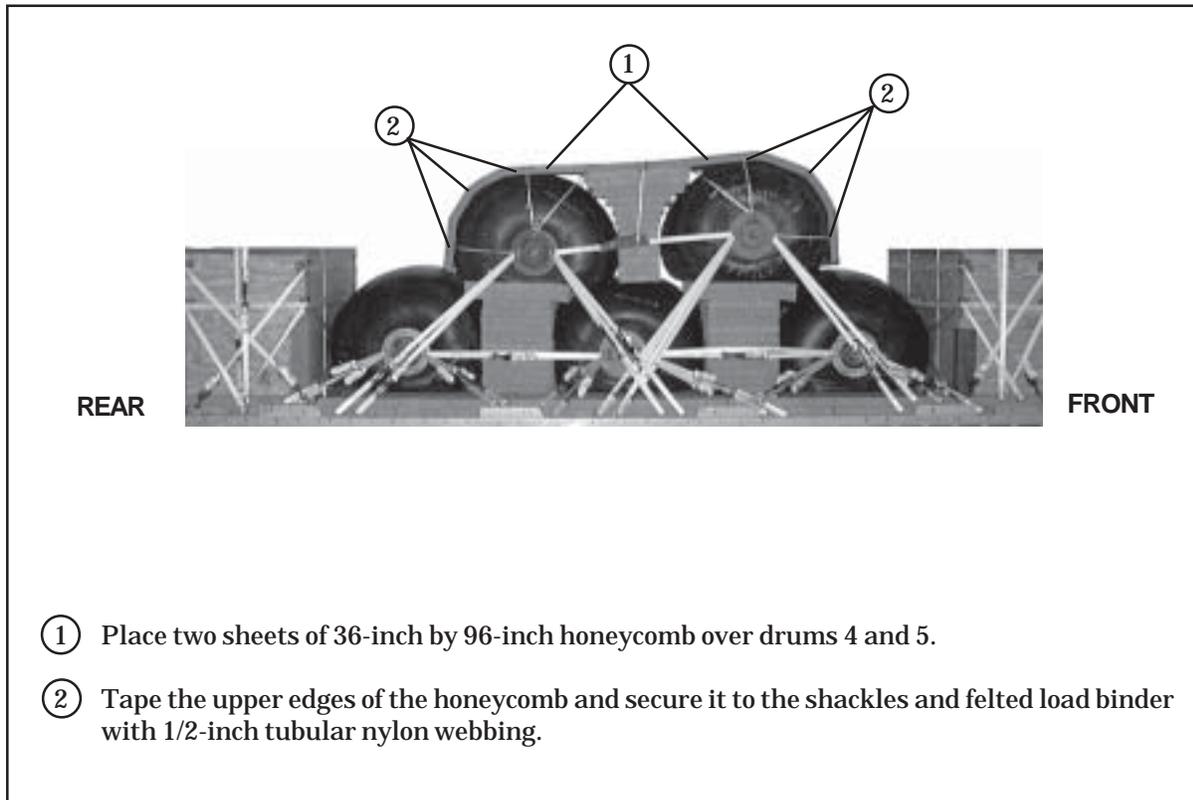
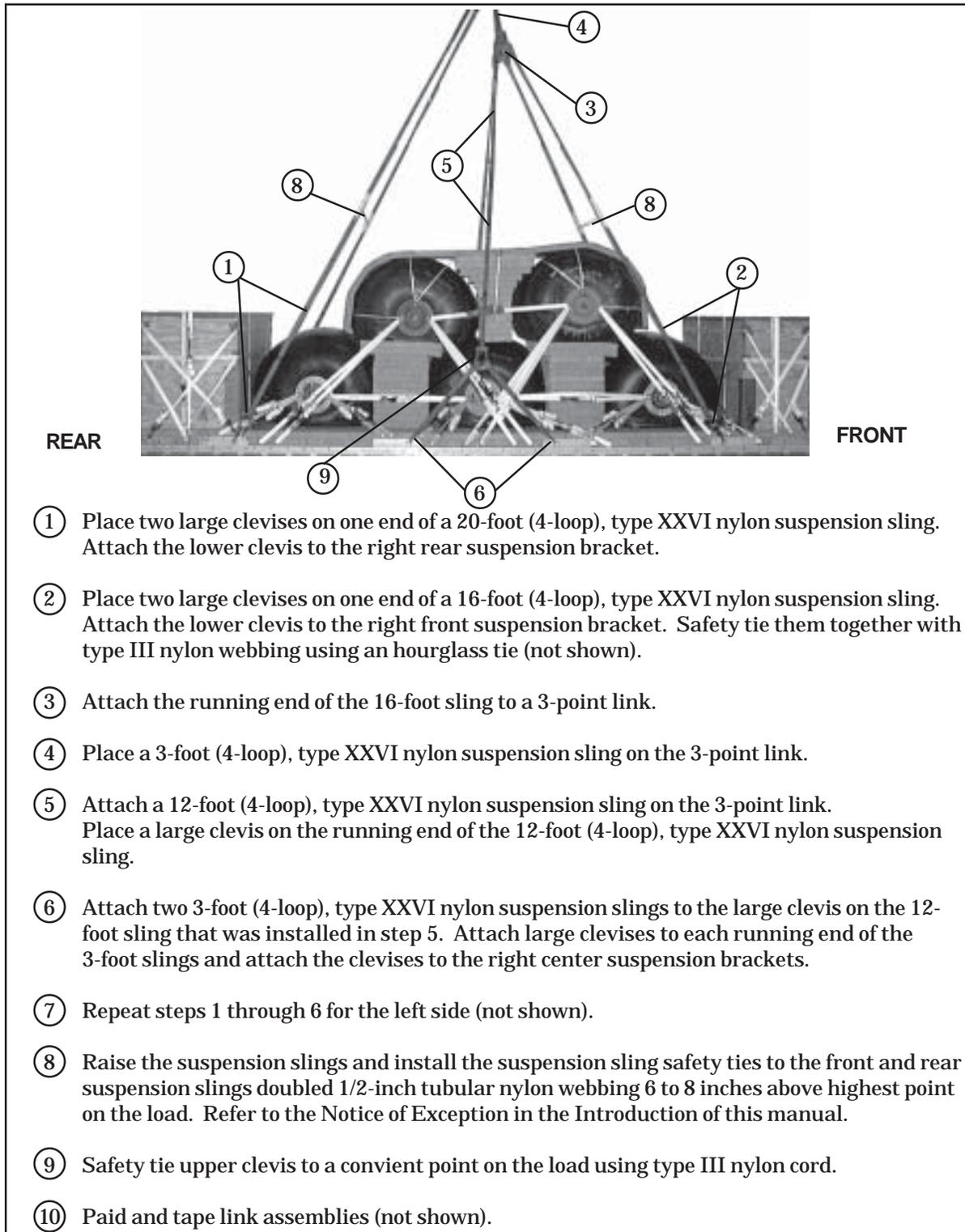


Figure 4-72. Release Platform Built and Positioned

## INSTALLING SUSPENSION SLINGS AND SAFETY TIES

4-48. Install suspension slings and safety ties as shown in Figure 4-73.



- ① Place two large clevises on one end of a 20-foot (4-loop), type XXVI nylon suspension sling. Attach the lower clevis to the right rear suspension bracket.
- ② Place two large clevises on one end of a 16-foot (4-loop), type XXVI nylon suspension sling. Attach the lower clevis to the right front suspension bracket. Safety tie them together with type III nylon webbing using an hourglass tie (not shown).
- ③ Attach the running end of the 16-foot sling to a 3-point link.
- ④ Place a 3-foot (4-loop), type XXVI nylon suspension sling on the 3-point link.
- ⑤ Attach a 12-foot (4-loop), type XXVI nylon suspension sling on the 3-point link. Place a large clevis on the running end of the 12-foot (4-loop), type XXVI nylon suspension sling.
- ⑥ Attach two 3-foot (4-loop), type XXVI nylon suspension slings to the large clevis on the 12-foot sling that was installed in step 5. Attach large clevises to each running end of the 3-foot slings and attach the clevises to the right center suspension brackets.
- ⑦ Repeat steps 1 through 6 for the left side (not shown).
- ⑧ Raise the suspension slings and install the suspension sling safety ties to the front and rear suspension slings doubled 1/2-inch tubular nylon webbing 6 to 8 inches above highest point on the load. Refer to the Notice of Exception in the Introduction of this manual.
- ⑨ Safety tie upper clevis to a convient point on the load using type III nylon cord.
- ⑩ Paid and tape link assemblies (not shown).

Figure 4-73. Suspension Slings and Safety Ties Installed

## PREPARING AND STOWING CARGO PARACHUTES

4-49. Prepare and stow six G-11 cargo parachute as shown in Figure 4-74.

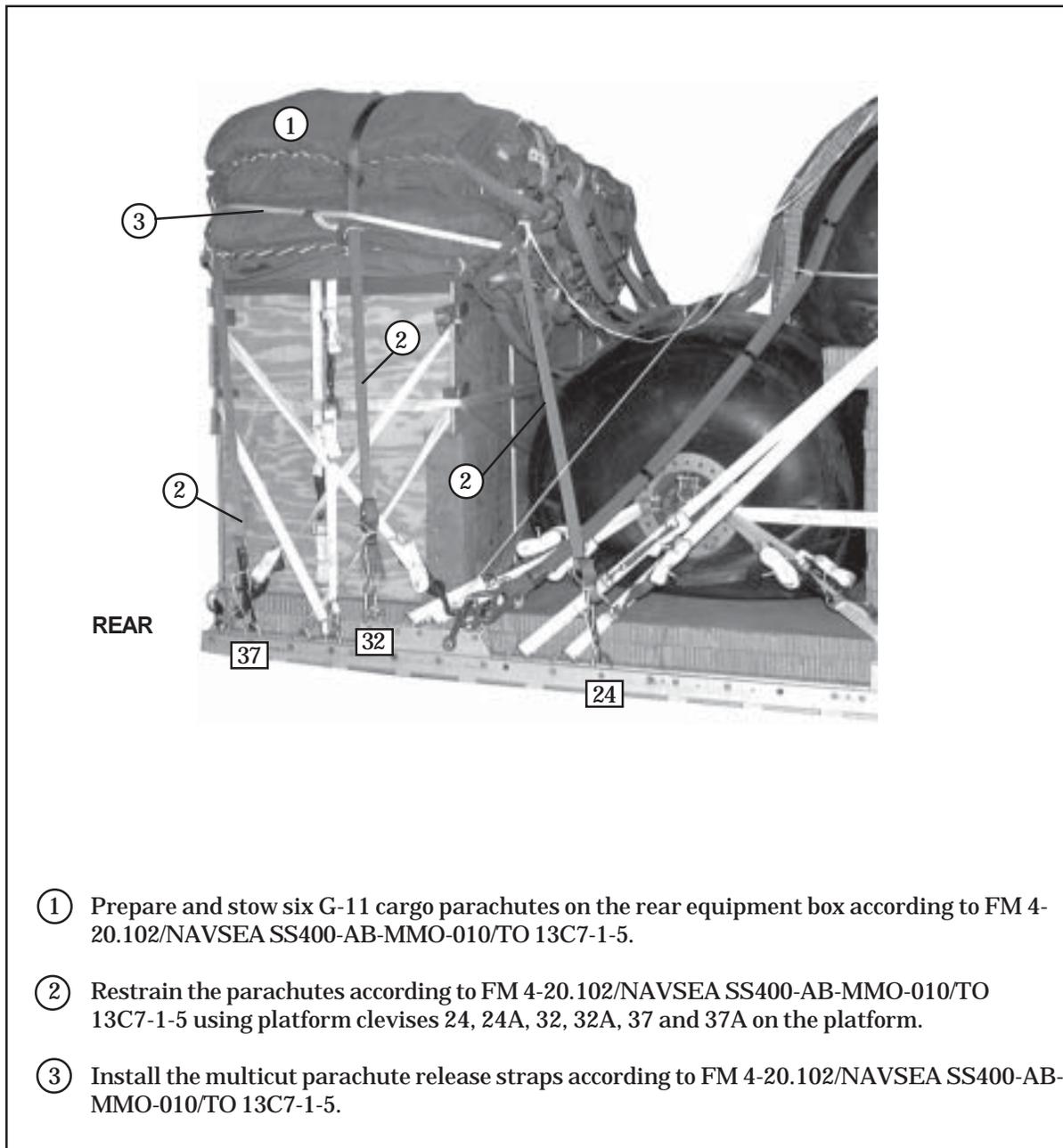
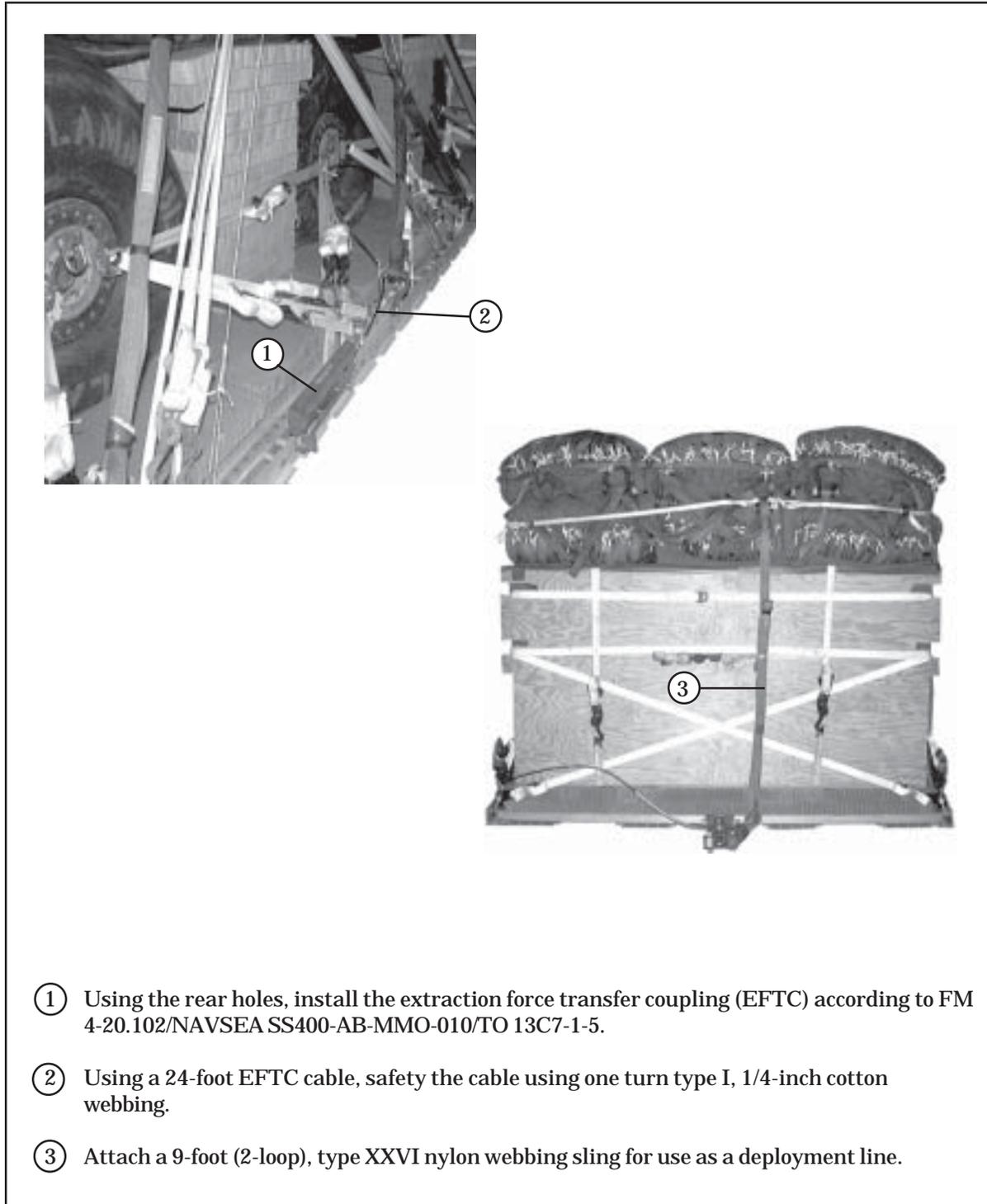


Figure 4-74. Cargo Parachutes Prepared and Stowed

## INSTALLING THE EXTRACTION SYSTEM

4-50. Install the extraction system as shown in Figure 4-75.

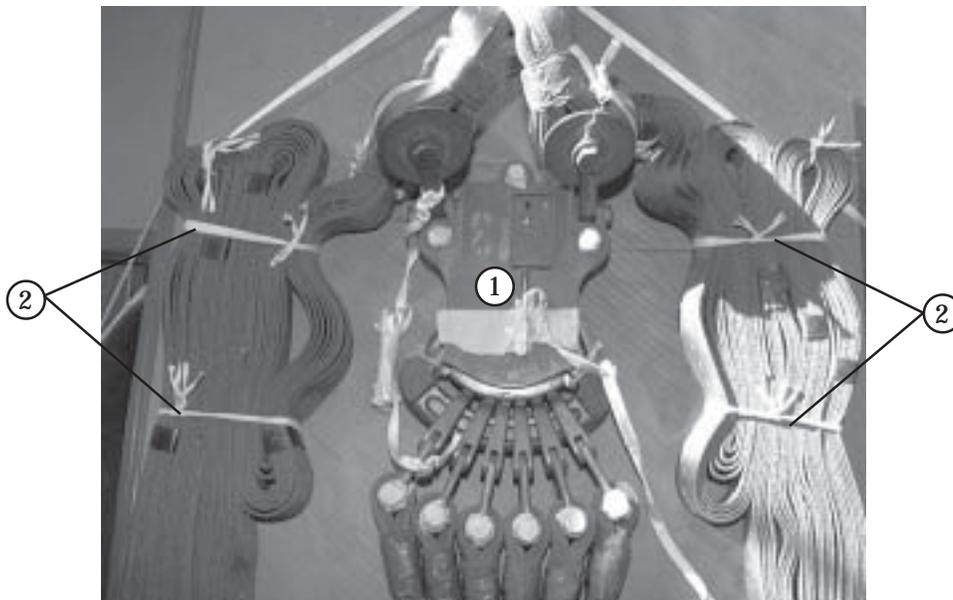


- ① Using the rear holes, install the extraction force transfer coupling (EFTC) according to FM 4-20.102/NAVSEA SS400-AB-MMO-010/TO 13C7-1-5.
- ② Using a 24-foot EFTC cable, safety the cable using one turn type I, 1/4-inch cotton webbing.
- ③ Attach a 9-foot (2-loop), type XXVI nylon webbing sling for use as a deployment line.

Figure 4-75. Extraction System Installed

## INSTALLING THE CARGO PARACHUTE RELEASE SYSTEM

4-51. Install the M-2 cargo parachute release system as shown in Figure 4-76.



- ① Place the M-2 release on the release platform. Attach the suspension slings and the parachute riser extensions to the M-2 cargo release according to FM 4-20.102/NAVSEA SS400-AB-MMO-010/TO 13C7-1-5. Secure the cargo parachute release with type III nylon cord.
- ② S-fold and tie any slack in the suspension slings with type I, 1/4-inch cotton webbing.

Figure 4-76. Cargo Parachute Release Installed

## **PLACING EXTRACTION PARACHUTE**

4-52. Select the extraction parachute and extraction line needed using the extraction line requirements table in FM 4-20.102/NAVSEA SS400-AB-MMO-010/TO 13C7-1-5. Rig the extraction line in an extraction line bag according to TM 10-1670-268-20/TO 13C5-2-41. Place the extraction parachute and extraction line on the load for installation in the aircraft.

## **INSTALLING PROVISIONS FOR EMERGENCY RESTRAINTS**

4-53. Select and install the provisions for emergency aft restraints according to the emergency aft restraint requirements table in FM 4-20.102/NAVSEA SS400-AB-MMO-010/TO 13C7-1-5.

## **MARKING RIGGED LOAD**

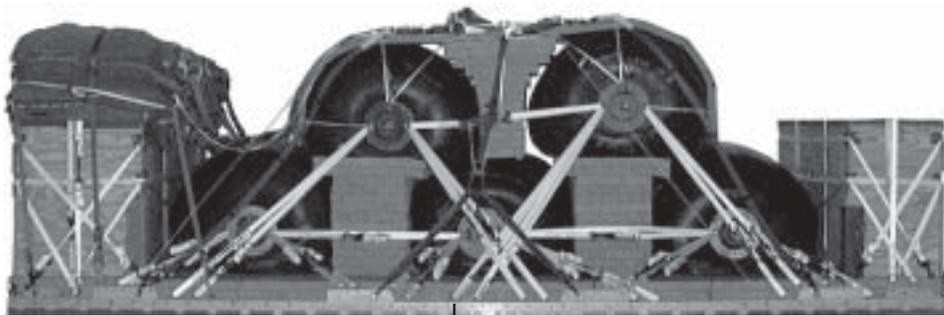
4-54. Mark the rigged load according to FM 4-20.102/NAVSEA SS400-AB-MMO-010/TO 13C7-1-5 and as shown in Figure 4-77. Complete Shipper's Declaration for Dangerous Goods and affix to the load. If the load varies from the one shown, the weight, height, CB, tipoff curve, and parachute requirements must be recomputed.

## **EQUIPMENT REQUIRED**

4-55. Use the equipment list in Table 4-4 to rig the load shown in Figure 4-77.

**CAUTION**

Make the final inspection required by FM 4-20.102/  
NAVSEA SS400-AB-MMO-010/TO 13C7-1-5 before  
the load leaves the rigging site.



CB

**RIGGED LOAD DATA**

Weight .....	27,292 pounds
Maximum Weight .....	30,000 pounds
Height .....	96 inches
Width .....	108 inches
Overall Length .....	306 inches
Overhang: Front .....	0 inches
Overhang: Rear (EFTC) .....	18 inches
Center of Balance (CB) (from front edge of platform) .....	146 inches

Figure 4-77. AAFARS With Five 500-Gallon Drums Rigged for Low Velocity Airdrop

**Table 4-4. Equipment Required for Rigging AAFARS with Five 500-Gallon Drums**

National Stock Number	Item	Quantity
8040-00-273-8713	Adhesive paste, 1-gal	As required
1670-01-035-6054	Bridle, extraction line bag (for DES)	1
4030-00-090-5354	Clevis, large	20
4030-00-678-8562	Clevis, medium	6
4020-00-240-2146	Cord, nylon, type III, 550-lb	As required
1670-00-434-5783	Coupling, airdrop, extraction force transfer with cable, 24-ft	1
1670-00-360-0328	Cover, clevis, large	6
8305-00-958-3685	Felt sheet, 1/2-inch	As required
1670-01-183-2678	Leaf, extraction line (line bag)	2
1670-01-064-4452	Line, drogue (for DES) 60-foot (1-loop), type XXVI	1
1670-01-062-6313	Line, extraction: For C-130: 60-foot (3-loop), type XXVI	1
1670-01-107-7651	For C-141: 140-foot (3-loop), type XXVI	1
1670-01-107-7651	For C-17: 140-foot (3-loop), type XXVI	1
1670-01-062-6313	For C-5: 60-ft, (3-loop), type XXVI	1
1670-01-107-7651	140-ft, (3-loop), type XXVI	1
	Link assembly:	1
	Two-point, 3 3/4-in	2
5306-00-435-8994	Bolt, 1-in diam, 4-in long	2
5310-00-232-5165	Nut, 1-in, hexagonal	2
1670-00-003-1953	Plate, side, 3 3/4-in	2
5365-00-007-3414	Spacer, large	
	Two-point, 3 3/4-in (for DES)	1
5306-00-435-8994	Bolt, 1-in diam, 4-in long	2
5310-00-232-5165	Nut, 1-in, hexagonal	2
1670-00-003-1953	Plate, side, 3 3/4-in	2
5365-00-007-3414	Spacer, large	2
1670-01-307-1055	Three-point	2
1670-01-483-8259	Link, tow release mechanism (H-Block) C-17 aircraft	1
	Lumber:	
5510-00-220-6146	2- by 4-in	As required

**Table 4-4. Equipment Required for Rigging AAFARS with Five 500-Gallon Drums  
(Continued)**

National Stock Number	Item	Quantity
5315-00-753-3885	Nail, steel wire, common, 16d	As required
1670-00-753-3928	Pad, energy dissipating, honeycomb, 3- by 36- by 96-in	32 sheets
	Parachute:	
1670-01-016-7841	Cargo, G-11C	6
1670-00-040-8135	Cargo, extraction, 28ft	1
1670-01-063-3715	Drogue, 15ft (for DES)	1
	Platform, airdrop, type V, 24-foot:	
1670-01-353-8425	Bracket assembly, coupling, (EFTC)	(1)
1670-01-247-2389	Bracket, suspension	(8)
1670-01-162-2372	Clevis assembly, type V	(80)
1670-01-353-8424	Extraction bracket assembly	(1)
1670-01-162-2381	Tandem link assembly	(2)
5530-00-618-8073	Plywood, 3/4- by 48- by 96-in	11 sheets
1670-01-097-8817	Release, cargo parachute, M-2	1
	Sling, cargo airdrop:	
	For deployment line:	
1670-01-062-6304	9-ft (2-loop), type XXVI nylon webbing	1
	For suspension:	
1670-01-062-6306	3-ft (4-loop), type XXVI nylon webbing	6
1670-01-062-6307	12-ft (4-loop), type XXVI nylon webbing	2
1670-01-062-6308	16-ft (4-loop), Type XXVI nylon webbing	2
1670-01-064-4453	20-ft (4-loop), typeXXVI nylon webbing	2
	For riser extension:	
1670-01-062-6311	120-ft (2-loop), type XXVI nylon webbing	6
1670-00-040-8219	Strap, parachute release, multicut	2
7510-00-266-5016	Tape, adhesive, 2-in	As required
7510-00-266-6710	Tape, masking, 2-in	As required
1670-00-937-0271	Tie-down assembly, 15-ft	70
	Webbing:	
8305-00-268-2411	Cotton, 1/4-in, type I	As required
8305-00-082-5752	Nylon, tubular, 1/2-in	As required
8305-00-260-6890	Type X	As required

## SECTION IV- RIGGING AAFARS WITH SIX 500-GALLON FUEL DRUMS

### DESCRIPTION OF LOAD

4-56. The Advanced Aviation Forward Area Refueling System (AAFARS) is rigged on a 32-foot type, V platform with seven G-11 cargo parachutes. The AAFARS is designed for forward area refueling of up to four aircraft at a time with a minimum of 55 GPM. There are six collapsible fuel drums as an accompanying load. Each drum is filled with 432 gallons of liquid. When empty, each drum weighs 250 pounds and is 62 inches long and 53 inches in diameter. The total rigged overall length is 402 inches. Width is 108 inches. Height is 94 inches. Center of balance is 195 inches.

- Notes:**
1. For drums filled with a liquid other than water, use Table 1-1 to recompute the weight.
  2. If the load varies from the one shown, the weight, height, CB, tipoff curve, and parachute requirements must be recomputed.
  3. Do not pressurize drums with air.

### PREPARING PLATFORM

4-57. Prepare a 32-foot type V airdrop platform using two tandem links, eight suspension brackets and 84 tie-down clevises as shown in Figure 4-78.

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

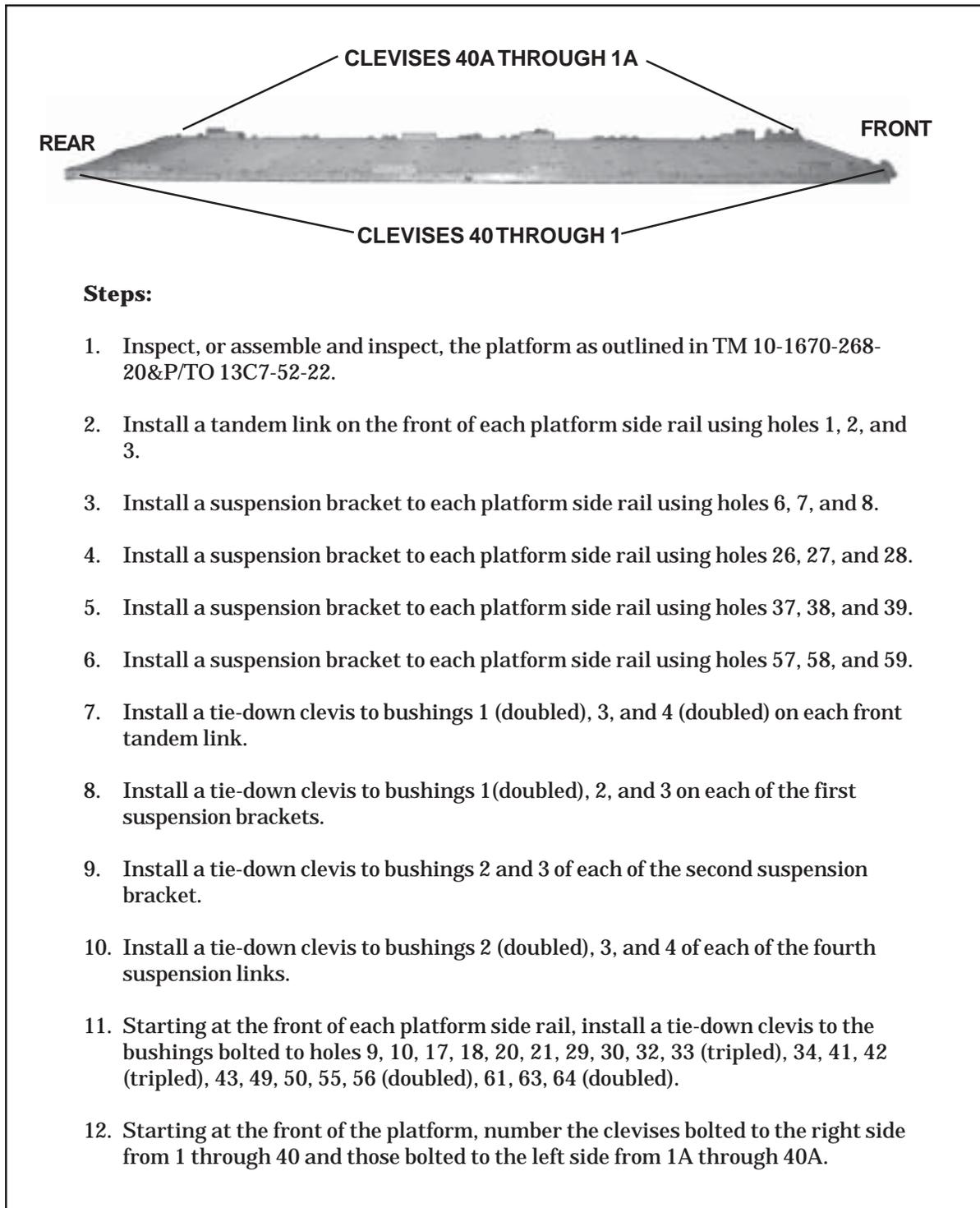


Figure 4-78. Platform Prepared

## PREPARING HONEYCOMB

4-58. Prepare and build honeycomb stacks as shown in Figure 4-79.

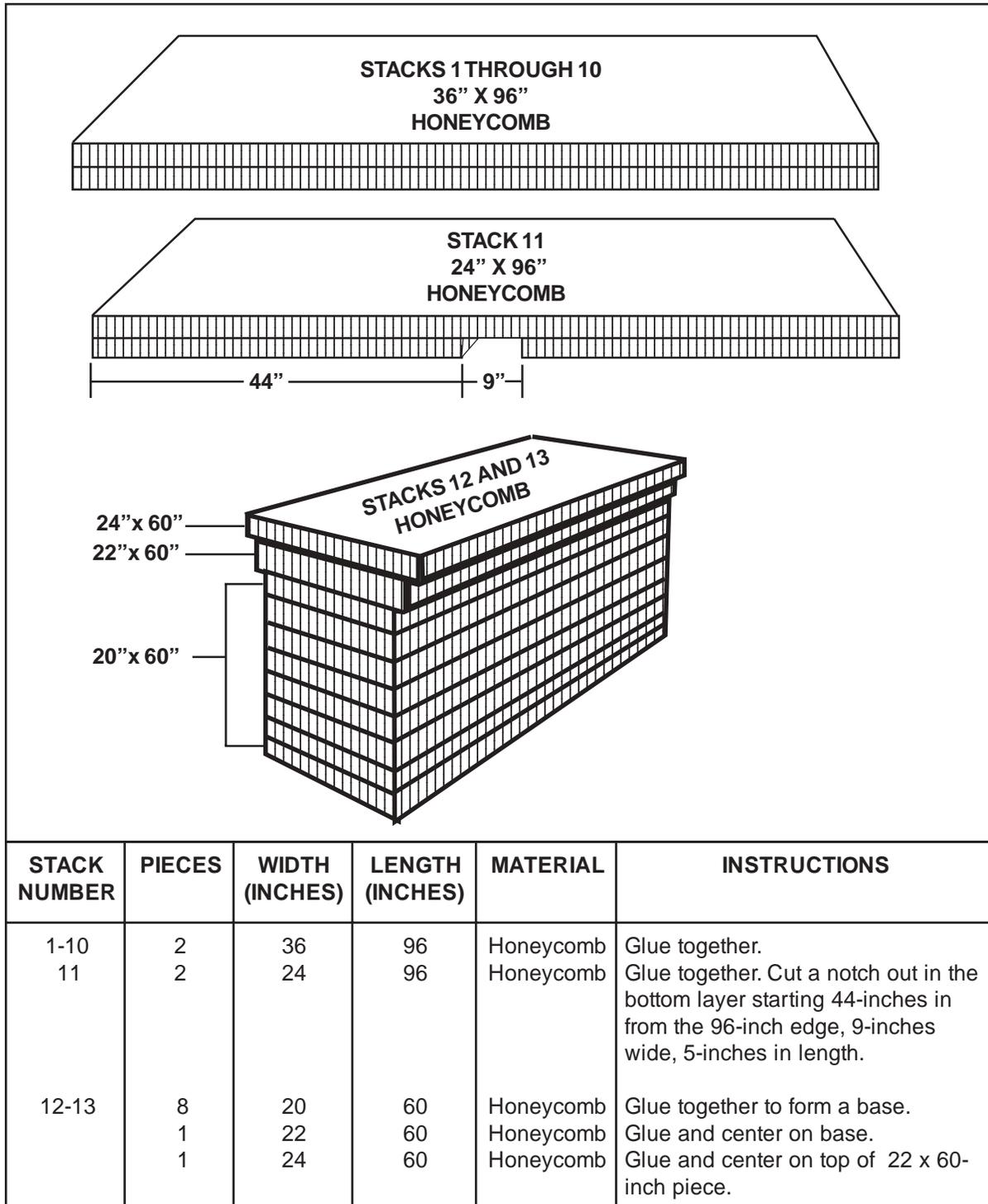


Figure 4-79. Honeycomb Stacks Prepared

## POSITIONING HONEYCOMB STACKS

4-59. Position honeycomb stacks 1 through 11 as shown in Figure 4-80.

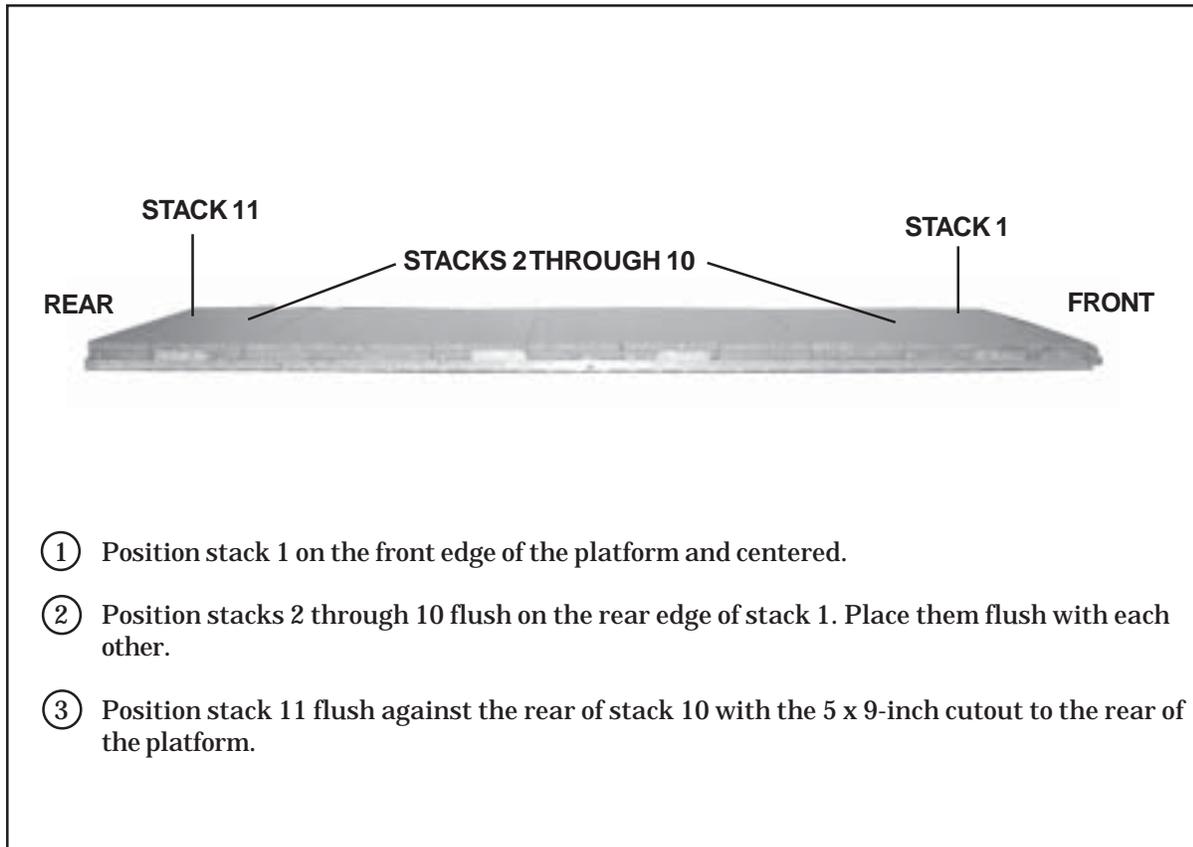


Figure 4-80. Positioning Honeycomb Stacks 1 through 11 Positioned

## POSITIONING AND LASHING THE DRUMS

4-60. Position and lash the drums to the platform as shown in Figures 4-81 through 4-92.

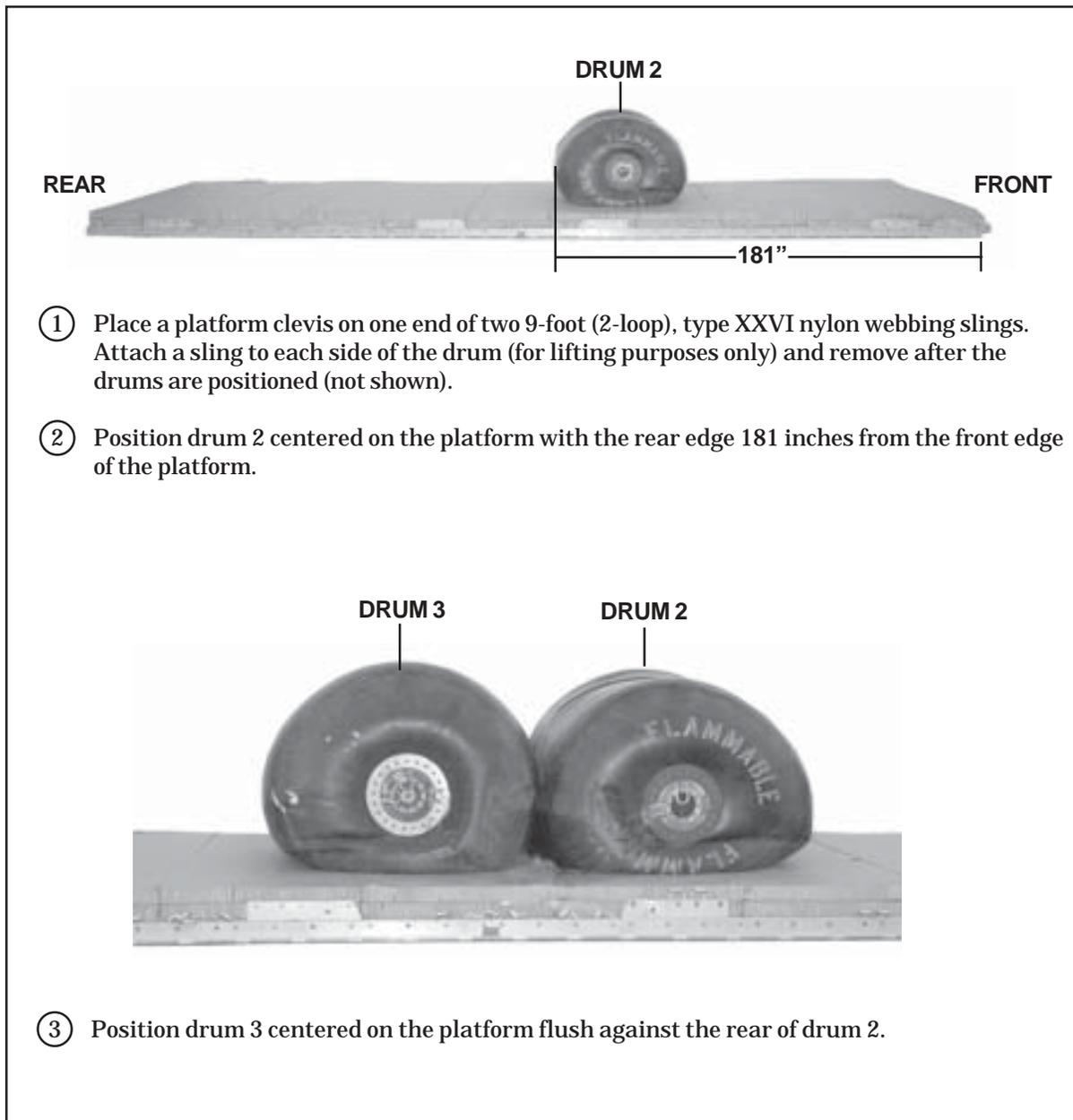
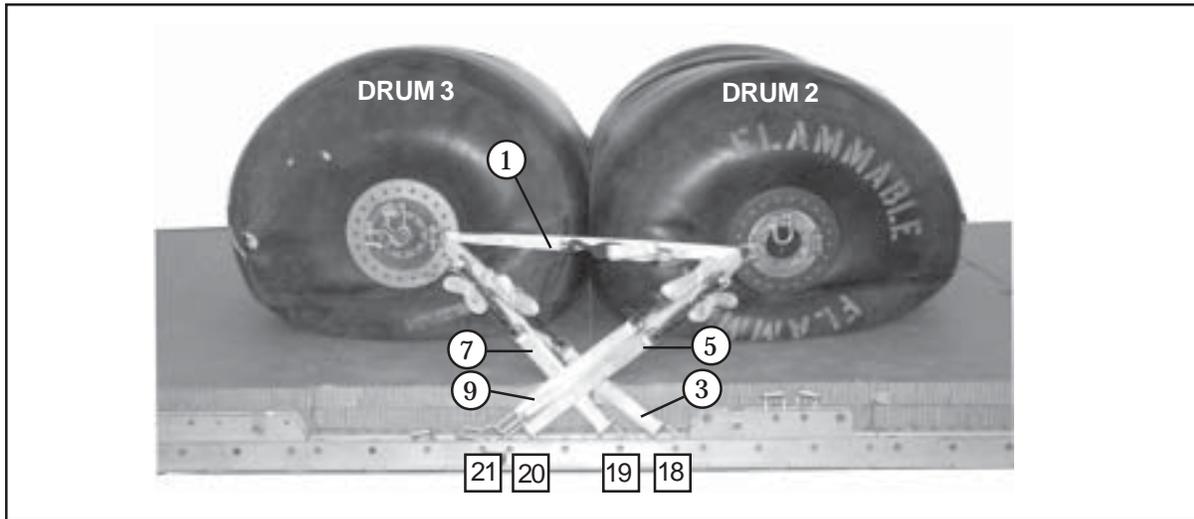
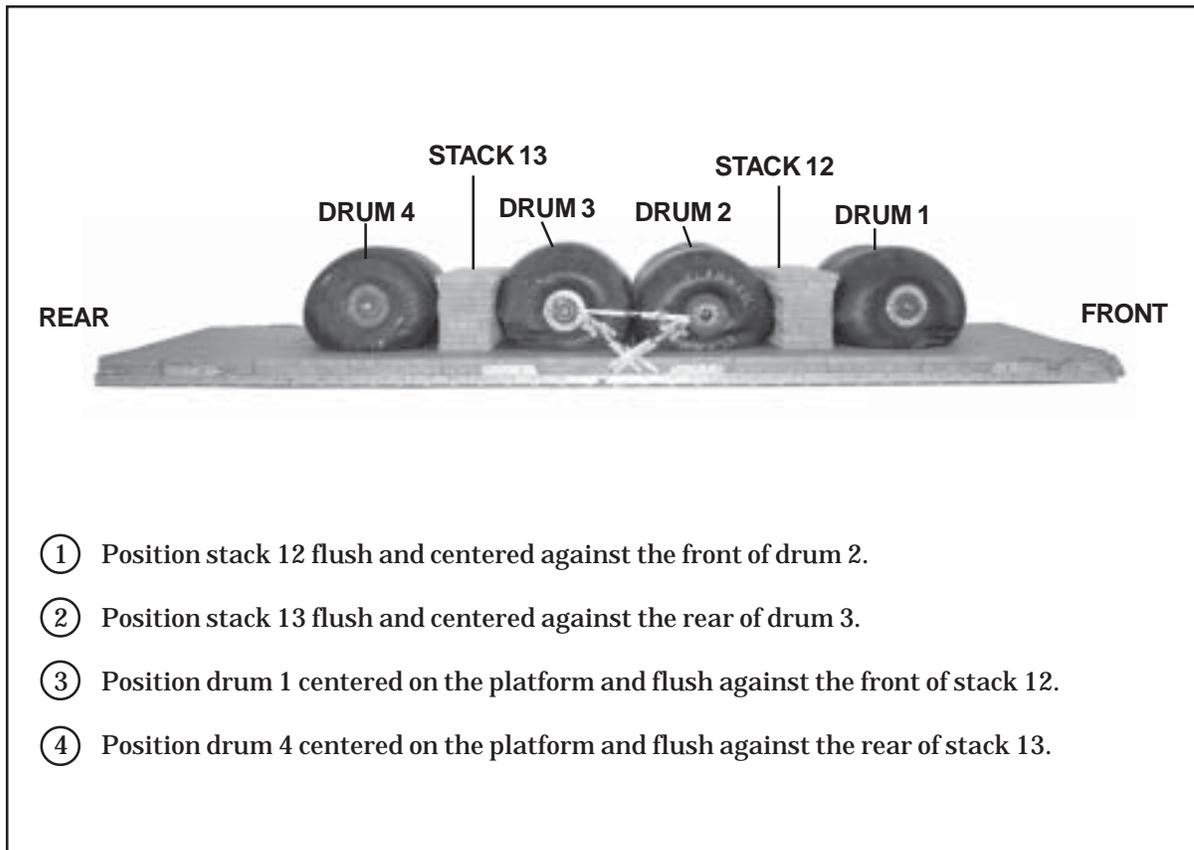


Figure 4-81. Fuel Drums 2 and 3 Positioned



Lashing Number	Tie-down Clevis Number	Instructions
1		Route a lashing from the rear shackle of drum 2 to the front shackle of drum 3 on the right side.
2		Route a lashing from the rear shackle of drum 2 to the front shackle of drum 3 on the left side.
3	18	Route a lashing from clevis 18 to the front right shackle on drum 3.
4	18A	Route a lashing from clevis 18A to the front left shackle on drum 3.
5	20	Route a lashing from clevis 20 to the rear right shackle on drum 2.
6	20A	Route a lashing from clevis 20A to the rear left shackle on drum 2.
7	19	Route a lashing from clevis 19 to the front right shackle on drum 3.
8	19A	Route a lashing from clevis 19A to the front left shackle on drum 3.
9	21	Route a lashing from clevis 21 to the rear right shackle on drum 2.
10	21A	Route a lashing from clevis 21A to the rear left shackle on drum 2.

Figure 4-82. Lashings 1 through 10 Installed



**Figure 4-83. Fuel Drums 1 and 4 Positioned**

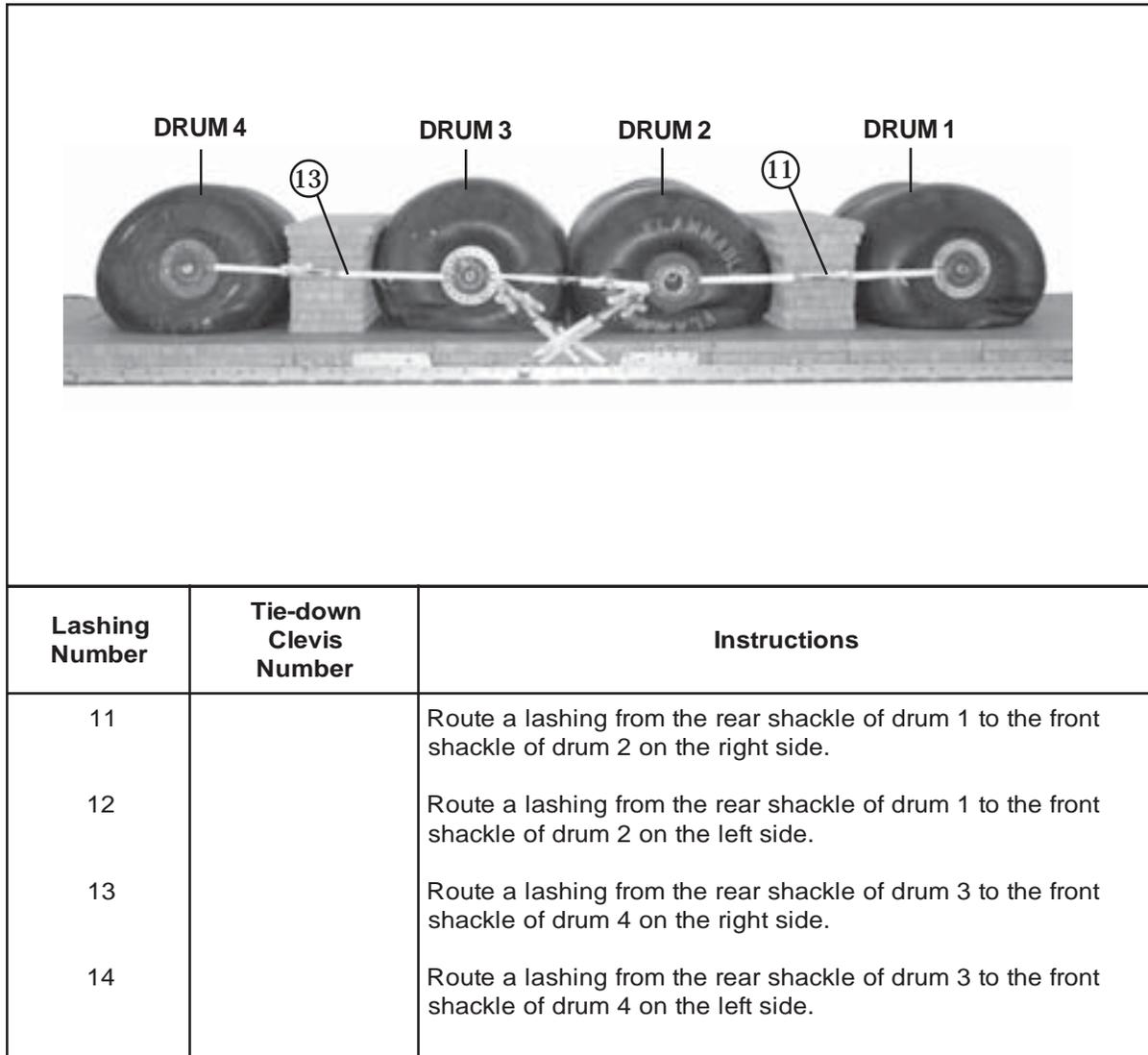
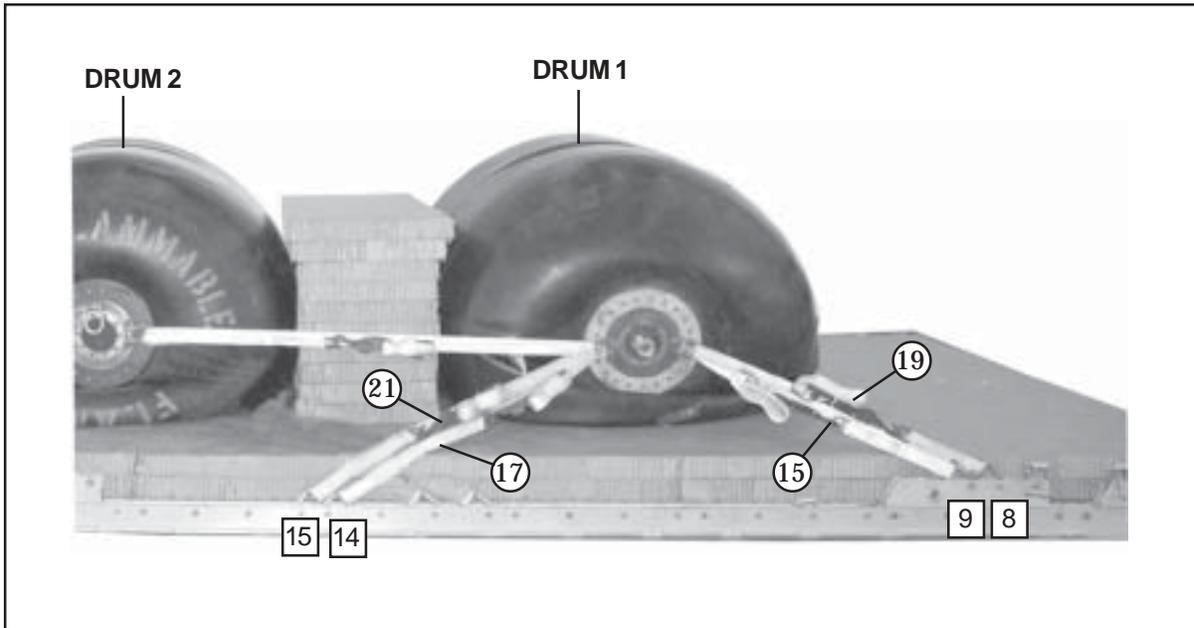
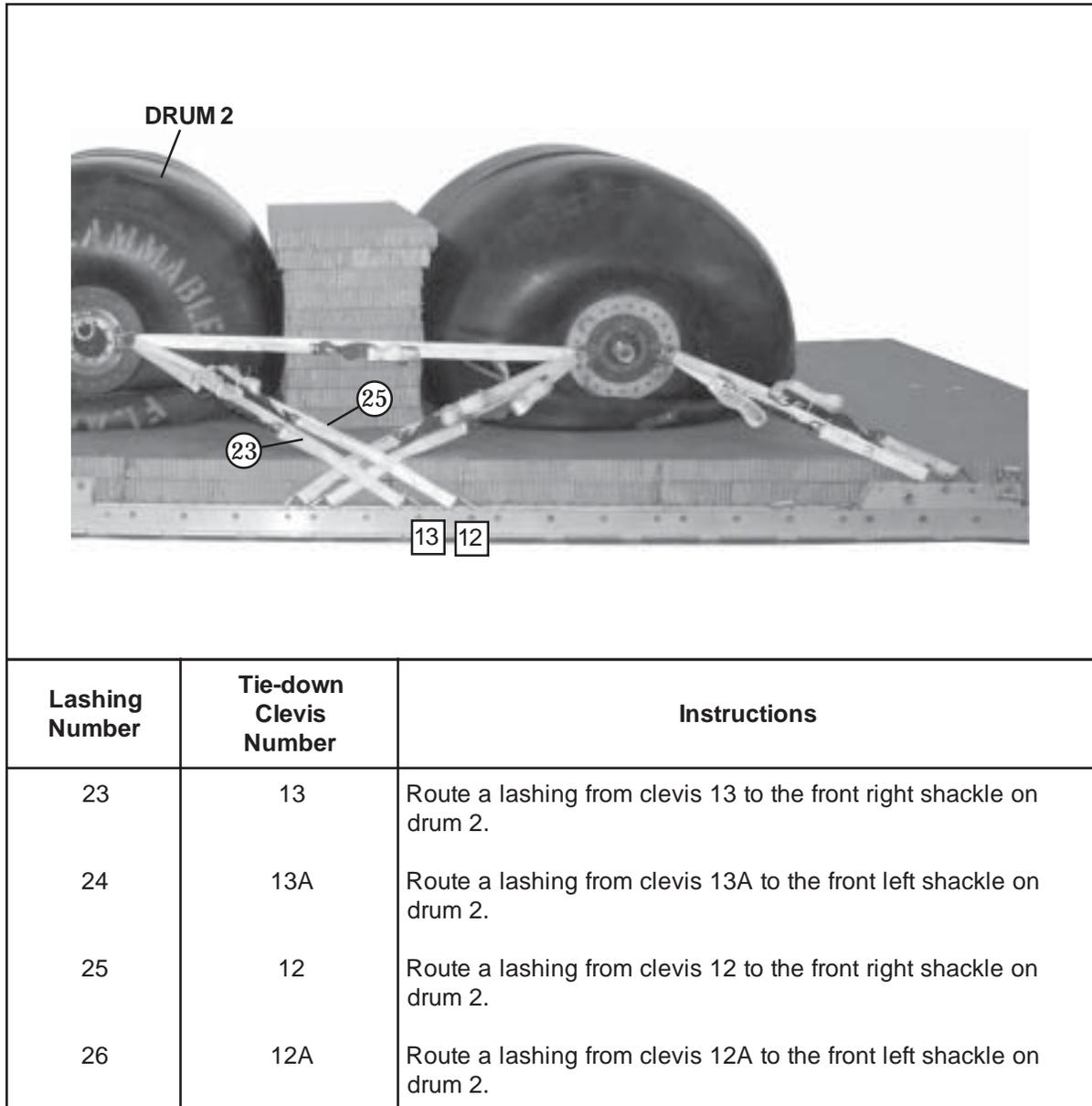


Figure 4-84. Lashings 11 through 14 Installed



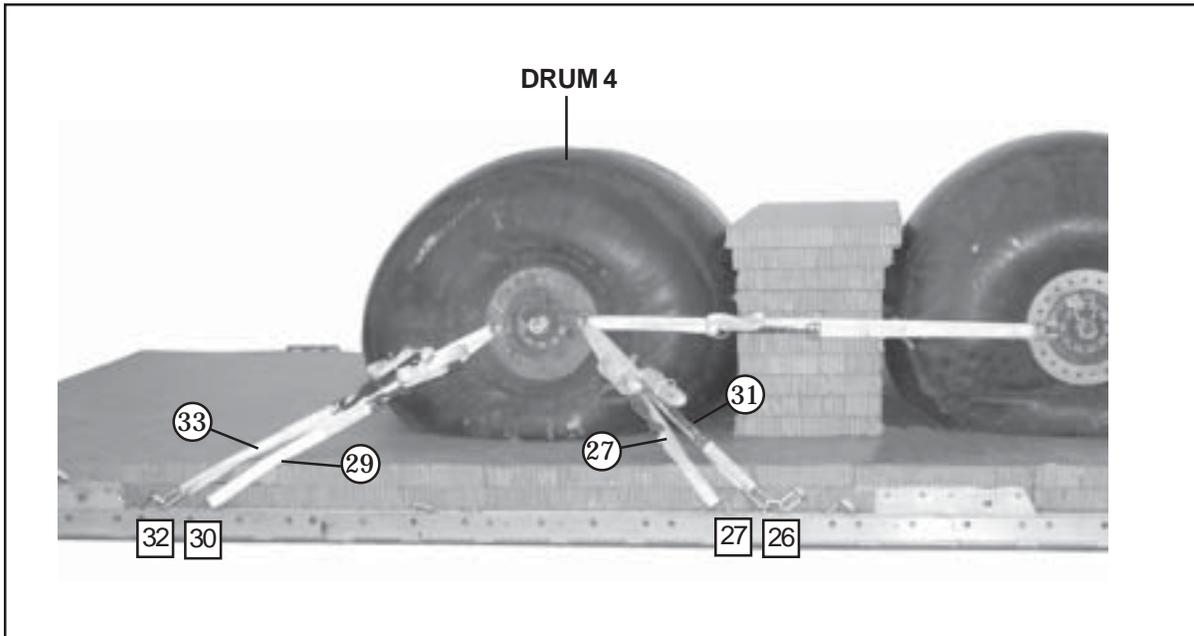
Lashing Number	Tie-down Clevis Number	Instructions
15	9	Route a lashing from clevis 9 to the front right shackle on drum 1.
16	9A	Route a lashing from clevis 9A to the front left shackle on drum 1.
17	14	Route a lashing from clevis 14 to the rear right shackle on drum 1.
18	14A	Route a lashing from clevis 14A to the rear left shackle on drum 1.
19	8	Route a lashing from clevis 8 to the front right shackle on drum 1.
20	8A	Route a lashing from clevis 8A to the front left shackle on drum 1.
21	15	Route a lashing from clevis 15 to the rear right shackle on drum 1.
22	15A	Route a lashing from clevis 15A to the rear left shackle on drum 1.

Figure 4-85. Lashings 15 through 22 Installed



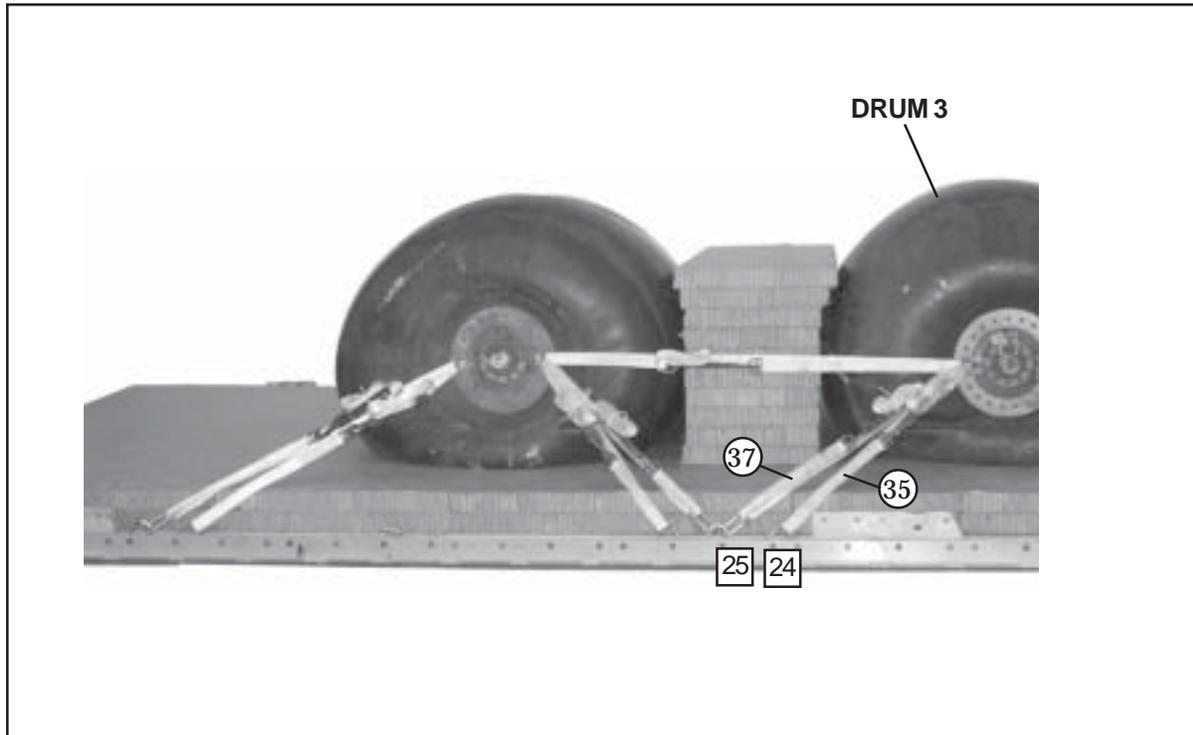
Lashing Number	Tie-down Clevis Number	Instructions
23	13	Route a lashing from clevis 13 to the front right shackle on drum 2.
24	13A	Route a lashing from clevis 13A to the front left shackle on drum 2.
25	12	Route a lashing from clevis 12 to the front right shackle on drum 2.
26	12A	Route a lashing from clevis 12A to the front left shackle on drum 2.

Figure 4-86. Lashings 23 through 26 Installed



Lashing Number	Tie-down Clevis Number	Instructions
27	27	Route a lashing from clevis 27 to the front right shackle on drum 4.
28	27A	Route a lashing from clevis 27A to the front left shackle on drum 4.
29	30	Route a lashing from clevis 30 to the rear right shackle on drum 4.
30	30A	Route a lashing from clevis 30A to the rear left shackle on drum 4.
31	26	Route a lashing from clevis 26 to the front right shackle on drum 4.
32	26A	Route a lashing from clevis 26A to the front left shackle on drum 4.
33	32	Route a lashing from clevis 32 to the rear right shackle on drum 4.
34	32A	Route a lashing from clevis 32A to the rear left shackle on drum 4.

Figure 4-87. Lashings 27 through 34 Installed



Lashing Number	Tie-down Clevis Number	Instructions
35	24	Route a lashing from clevis 24 to the rear right shackle on drum 3.
36	24A	Route a lashing from clevis 24A to the rear left shackle on drum 3.
37	25	Route a lashing from clevis 25 to the rear right shackle on drum 3.
38	25A	Route a lashing from clevis 25A to the rear left shackle on drum 3.

Figure 4-88. Lashings 35 through 38 Installed

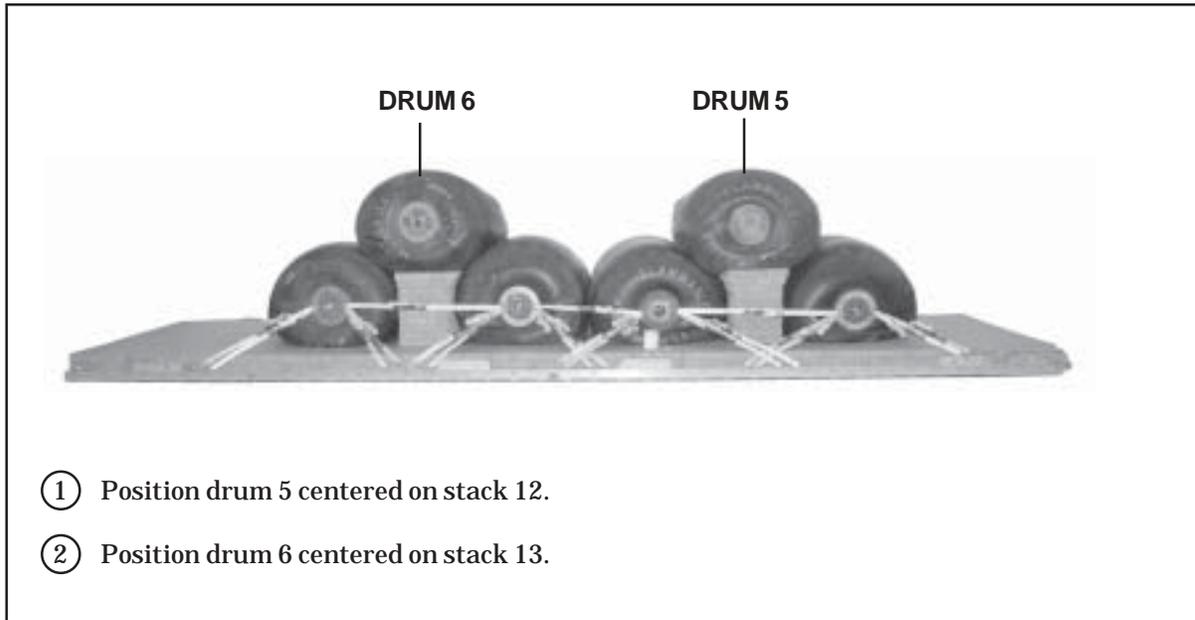
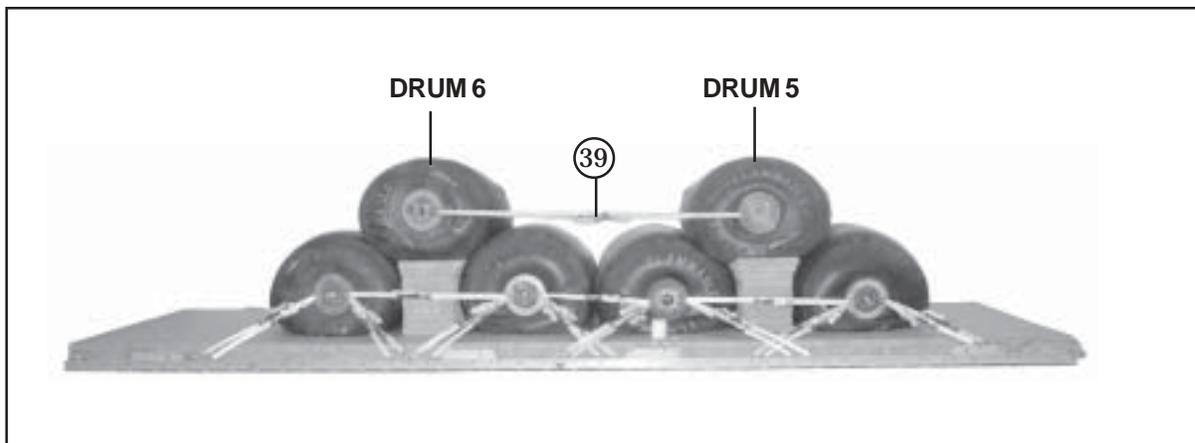
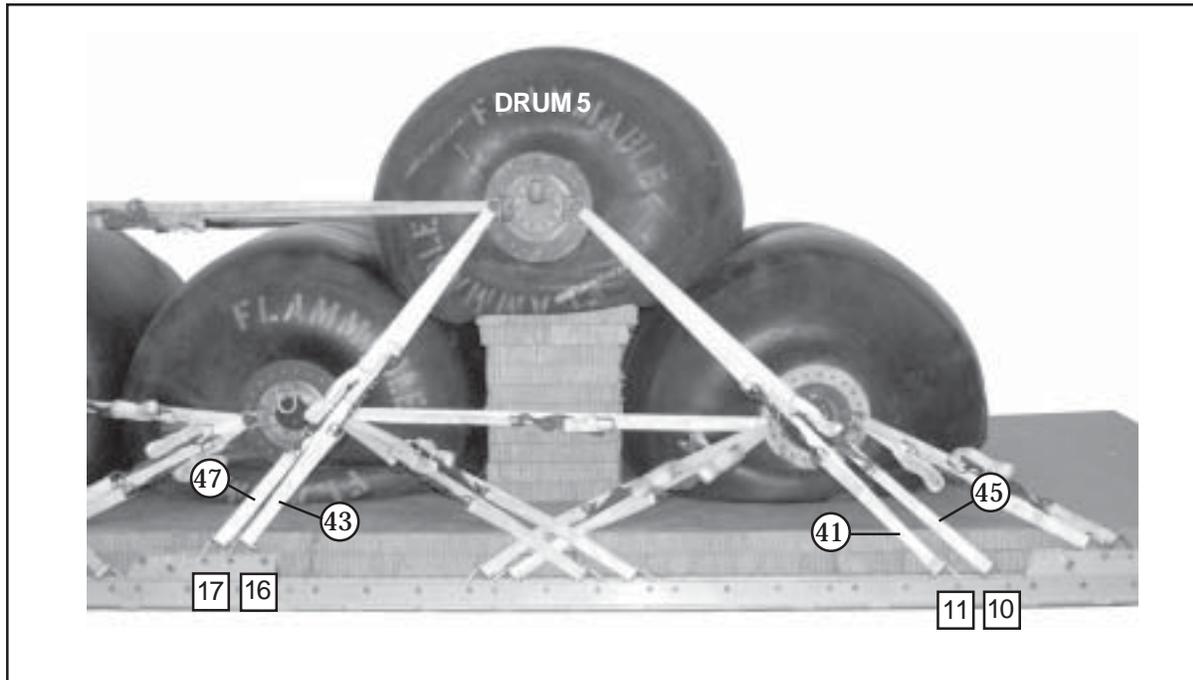


Figure 4-89. Fuel Drums 5 and 6 Positioned



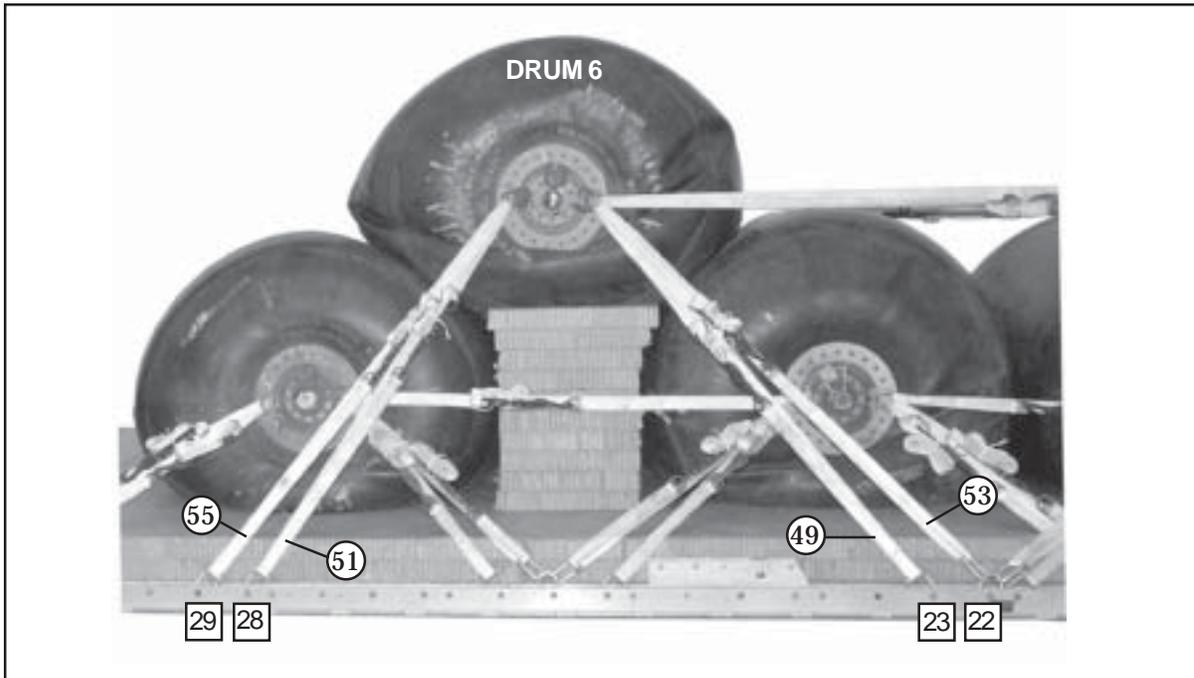
Lashing Number	Tie-down Clevis Number	Instructions
39		Route a lashing from the rear shackle of drum 5 to the front shackle of drum 6 on the right side.
40		Route a lashing from the rear shackle of drum 5 to the front shackle of drum 6 on the left side.

Figure 4-90. Lashings 39 and 40 Installed



Lashing Number	Tie-down Clevis Number	Instructions
41	11	Route a lashing from clevis 11 to the front right shackle on drum 5.
42	11A	Route a lashing from clevis 11A to the front left shackle on drum 5.
43	16	Route a lashing from clevis 16 to the rear right shackle on drum 5.
44	16A	Route a lashing from clevis 16A to the rear left shackle on drum 5.
45	10	Route a lashing from clevis 10 to the front right shackle on drum 5.
46	10A	Route a lashing from clevis 10A to the front left shackle on drum 5.
47	17	Route a lashing from clevis 17 to the rear right shackle on drum 5.
48	17A	Route a lashing from clevis 17A to the rear left shackle on drum 5.

Figure 4-91. Lashings 41 through 48 Installed



Lashing Number	Tie-down Clevis Number	Instructions
49	23	Route a lashing from clevis 23 to the front right shackle on drum 6.
50	23A	Route a lashing from clevis 23A to the front left shackle on drum 6.
51	28	Route a lashing from clevis 28 to the rear right shackle on drum 6.
52	28A	Route a lashing from clevis 28A to the rear left shackle on drum 6.
53	22	Route a lashing from clevis 22 to the front right shackle on drum 6.
54	22A	Route a lashing from clevis 22A to the front left shackle on drum 6.
55	29	Route a lashing from clevis 29 to the rear right shackle on drum 6.
56	29A	Route a lashing from clevis 29A to the rear left shackle on drum 6.

Figure 4-92. Lashings 49 through 56 Installed

## BUILDING THE EQUIPMENT BOXES

4-61. Build the front and rear equipment boxes as shown in Figures 4-93 and 4-94.

a. Build the front equipment box using 16d nails and as shown in Figure 4-93.

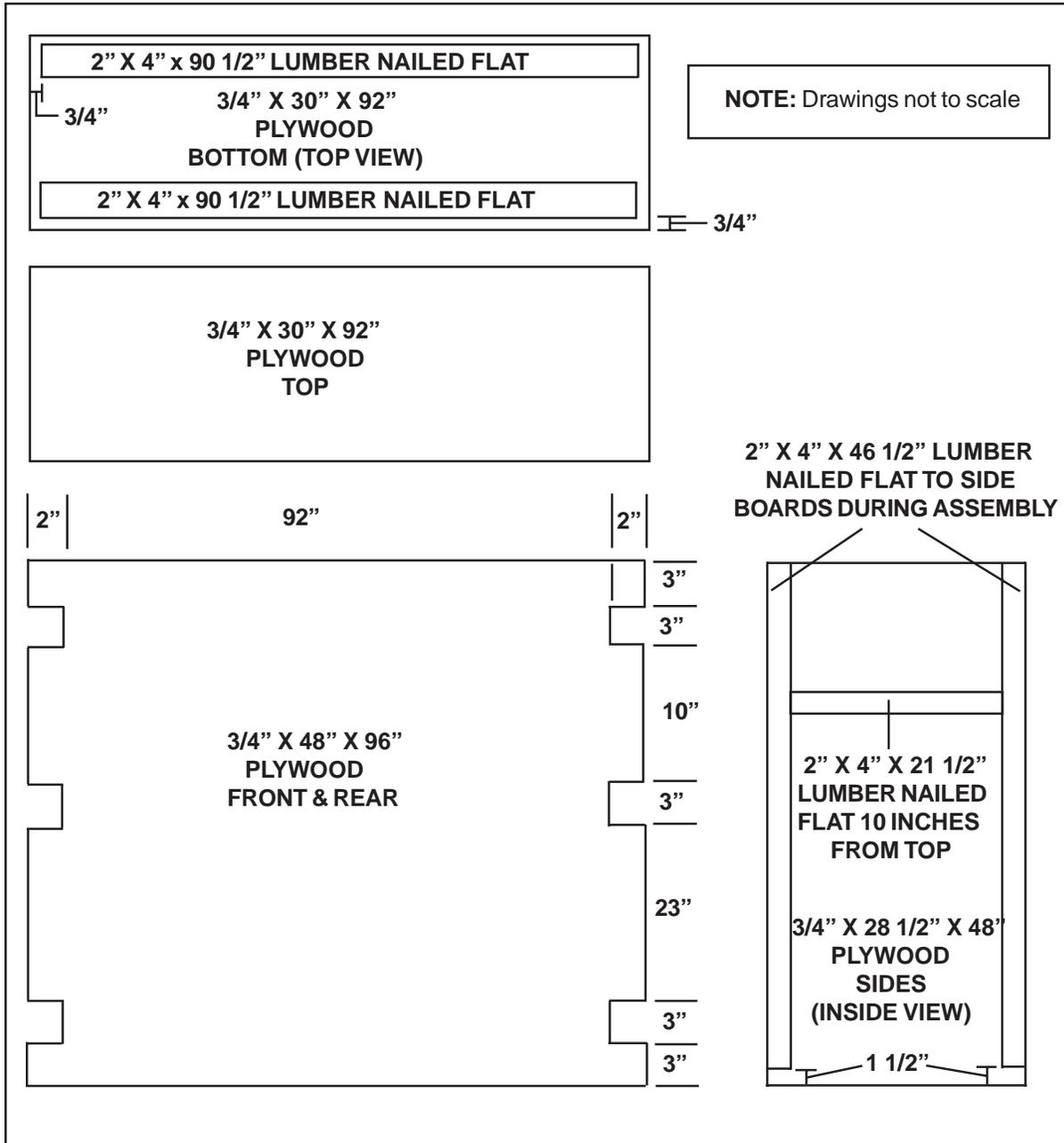
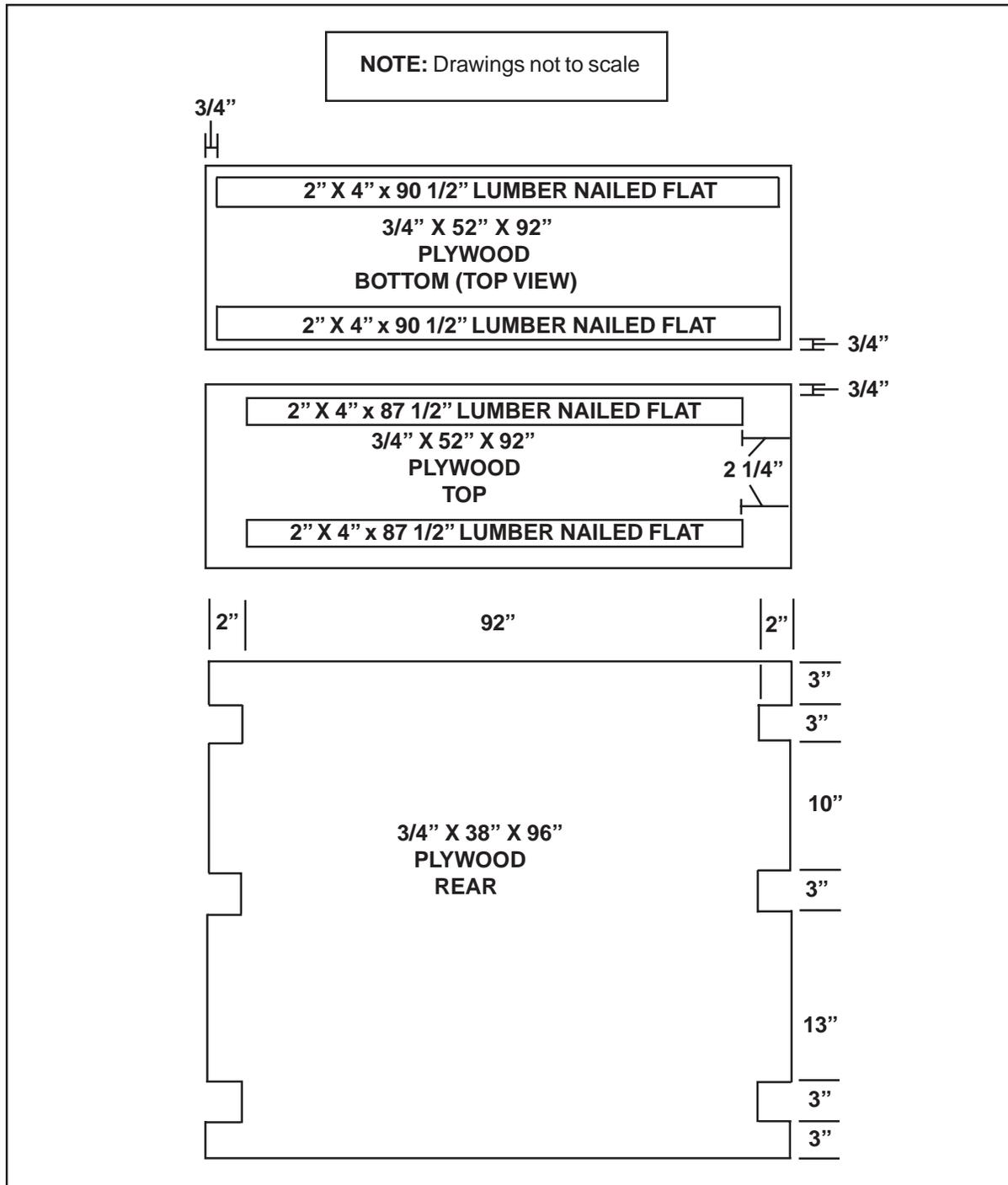


Figure 4-93. Front Equipment Box Built

**b.** Build the rear equipment box using 16d nails and as shown in Figure 4-94.



**Figure 4-94. Rear Equipment Box Built**

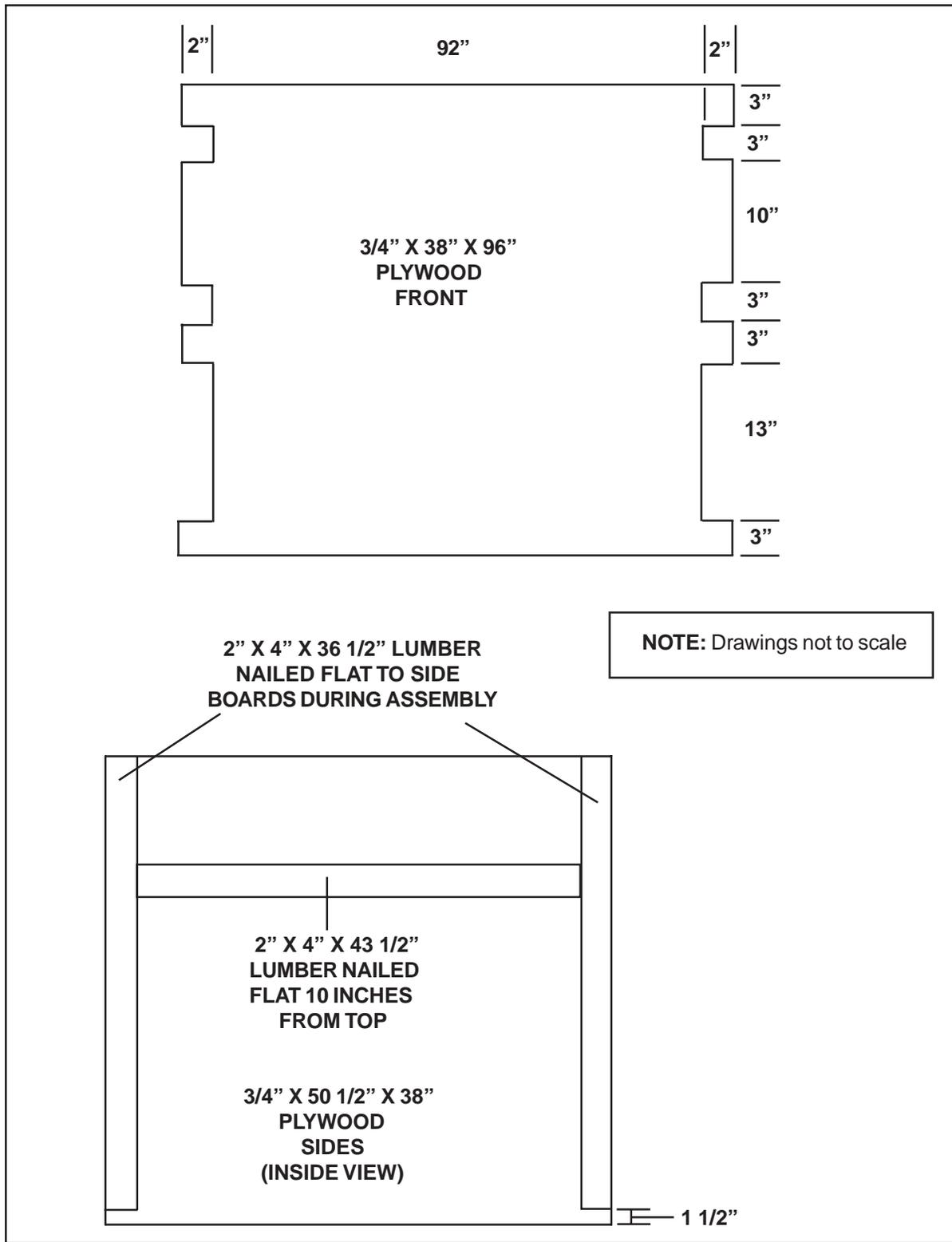
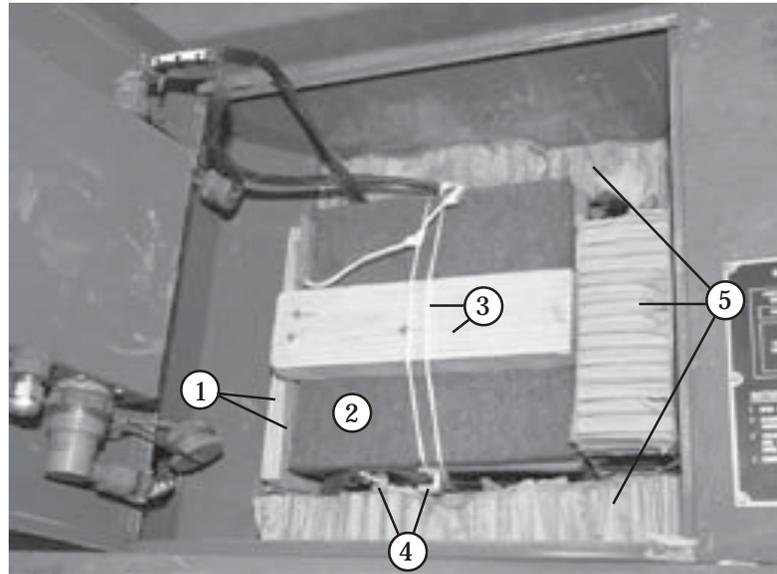


Figure 4-94. Rear Equipment Box Built (Continued)

## PREPARING EQUIPMENT FOR EQUIPMENT BOXES

4-62. Prepare the fire extinguishers, filter separator, explosion proof motor, pumps, manuals and toolkit as explained and shown in paragraph 4-6. Using the lists printed on the equipment bags, place the equipment indicated on each list into its bag. Prepare and secure the battery box as shown in Figure 4-95.



- ① Place a 3/4-inch by 10-inch by 10-inch piece of plywood behind the battery inside the compartment. Place a 1/4-inch by 10-inch by 10-inch piece of felt between the plywood and the battery.
- ② Place a 1/4-inch by 10-inch 10-inch piece of felt on top of the battery.
- ③ Place a 2-inch by 4-inch by 10-inch piece of lumber on top of the felt. Secure it with type III nylon cord.
- ④ Place cellulose wadding around the battery cap. Disconnect the battery, hold down rods and lay aside.
- ⑤ Fill the remainder of the compartment with pieces of honeycomb. Close and secure lid (not shown).
- ⑥ Secure the intake filter and grounding wire as shown in Figure 4-11, steps 4 and 5.

Figure 4-95. Battery Box Secured

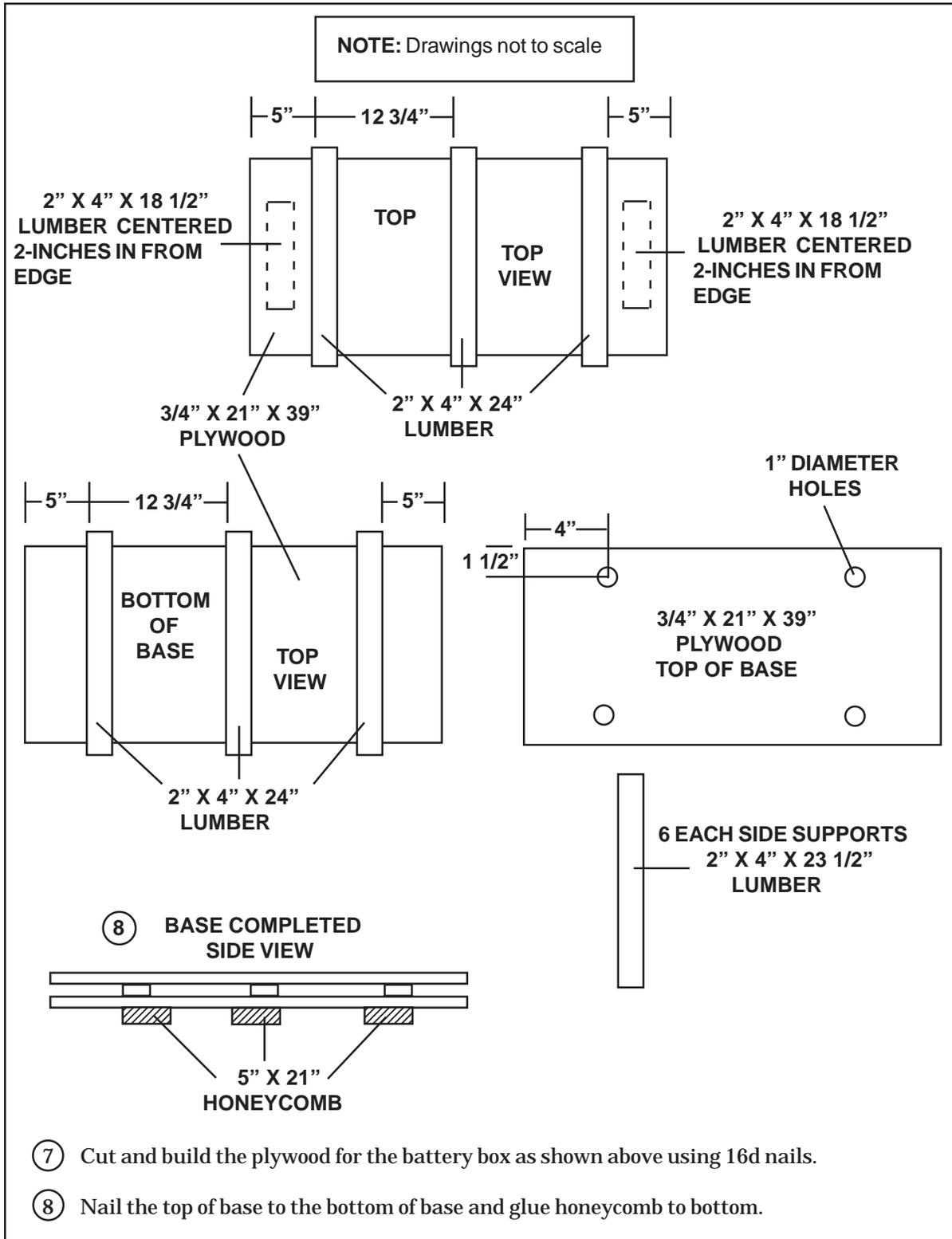


Figure 4-95. Battery Box Secured (Continued)

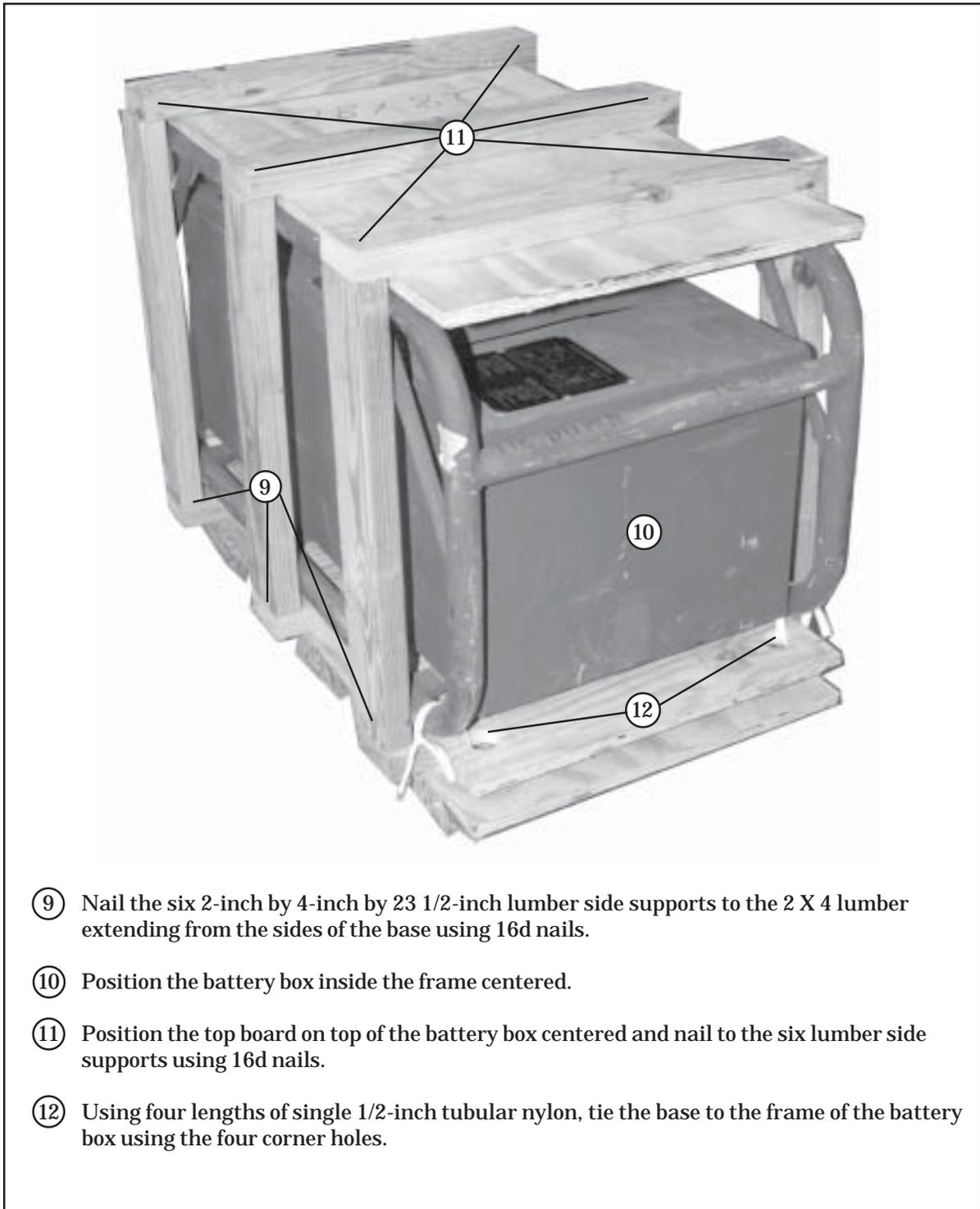
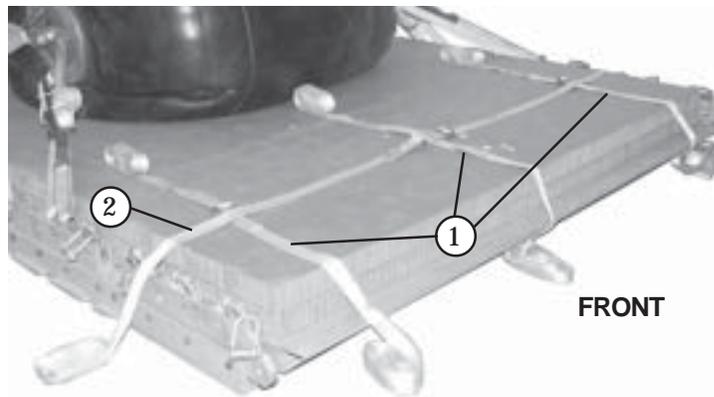


Figure 4-95. Battery Box Secured (Continued)

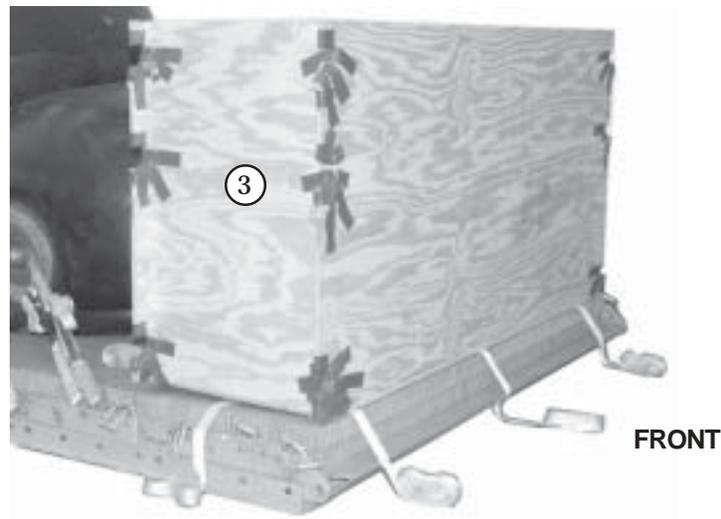
## POSITIONING EQUIPMENT BOXES

4-63. Prepare and position the front and rear equipment boxes as shown in Figures 4-96 and 4-97.

a. Prepare and position the front equipment box as shown in Figure 4-96.



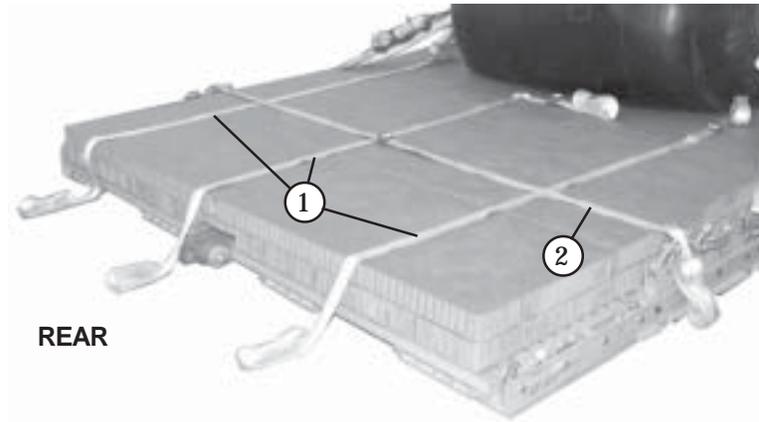
- ① Pre-position three 30-foot lashings lengthwise across the end honeycomb stacks on the front of the platform. Place the two outside lashings 15-inches in from the outside edges of the honeycomb stacks. Place the third lashing centered on the honeycomb stacks.
- ② Pre-position a 30-foot lashing across the width of the front honeycomb stacks 21-inches in from the front honeycomb edge.



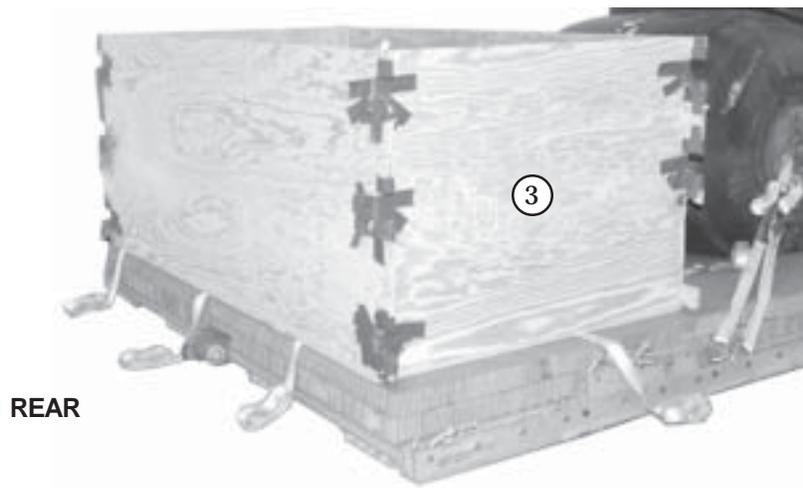
- ③ Position the front equipment box flush with the front honeycomb edge and centered. Pad and tape all cutouts using cellulose wadding.

Figure 4-96. Front Equipment Box Positioned

**b.** Prepare and position the rear equipment box as shown in Figure 4-97.



- ① Pre-position three 30-foot lashings lengthwise across the end honeycomb stacks on the rear of the platform. Place the two outside lashings 15 inches in from the outside edges of the honeycomb stacks. Place the third lashing centered on the honeycomb stacks. Ensure the D-rings are placed behind drum 4 and not under the box.
- ② Pre-position a 30-foot lashing across the width of the rear honeycomb stacks 26 inches in from the front honeycomb edge.



- ③ Position the rear equipment box flush with the rear honeycomb edge and centered. Pad and tape all cutouts using cellulose wadding.

**Figure 4-97. Rear Equipment Box Positioned**

## POSITIONING AND SECURING EQUIPMENT IN EQUIPMENT BOXES

4-64. Position and secure equipment in equipment boxes as shown in Figures 4-98 and 4-99.

*a.* Prepare the front equipment box by placing a 22-inch by 82-inch piece of honeycomb in the floor of the box and a 23-inch by 35-inch piece of honeycomb against each end of the box below the 2x4 lumber. Position equipment in the front equipment box as shown in Figure 4-98.

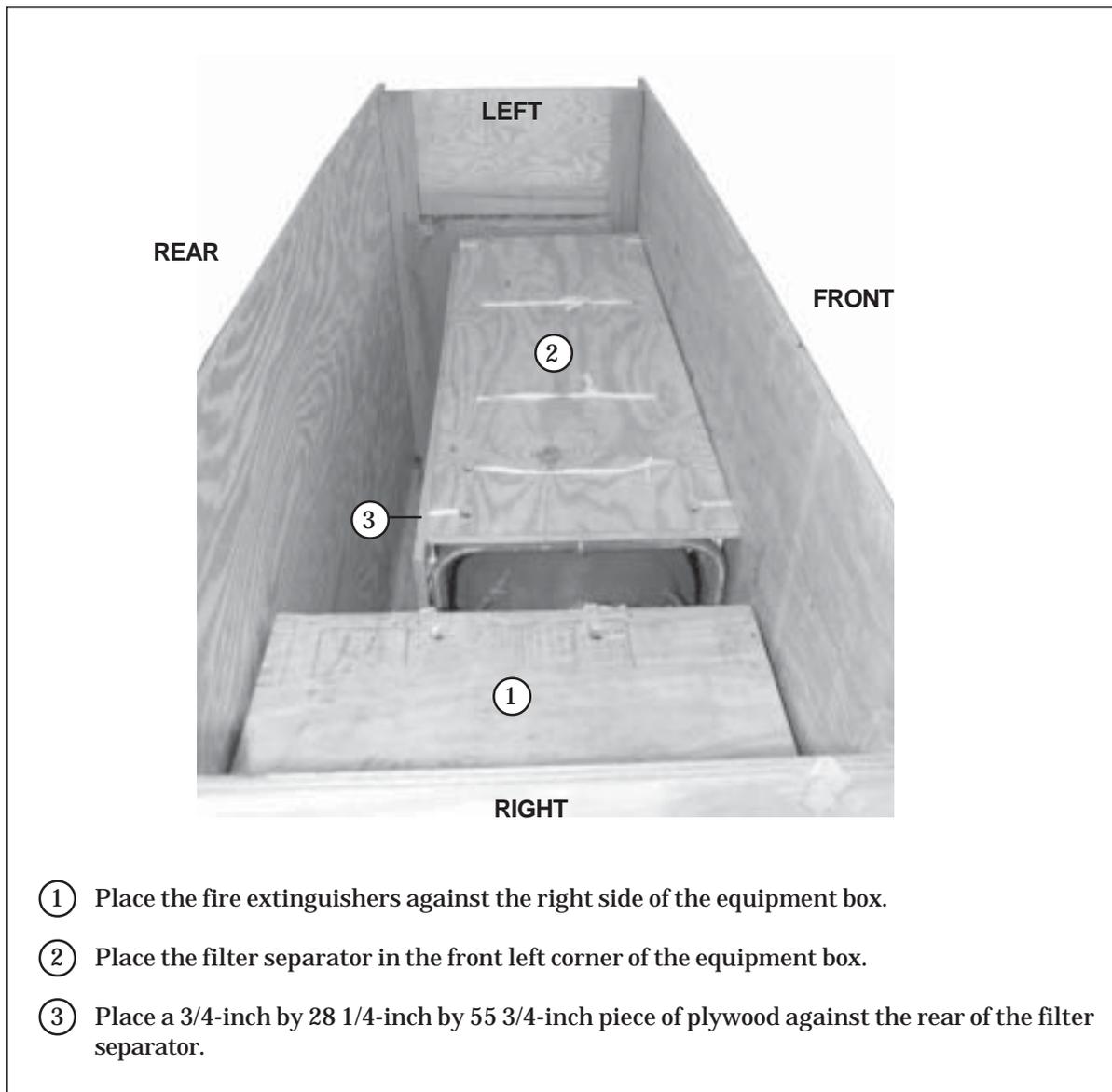
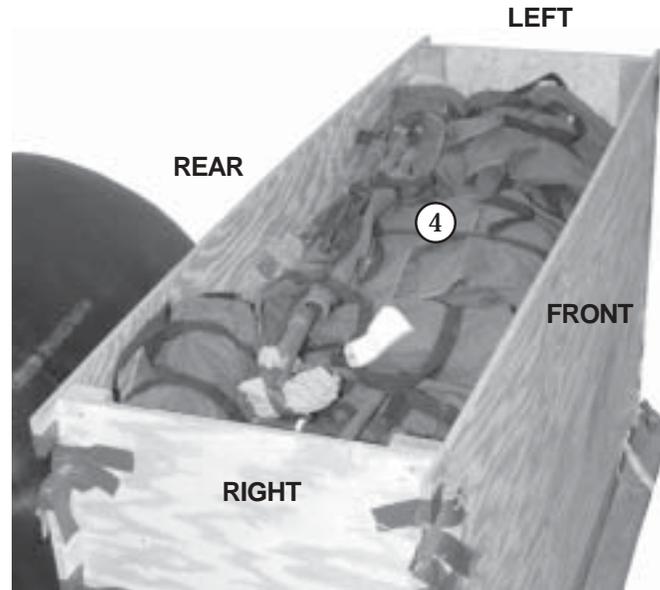
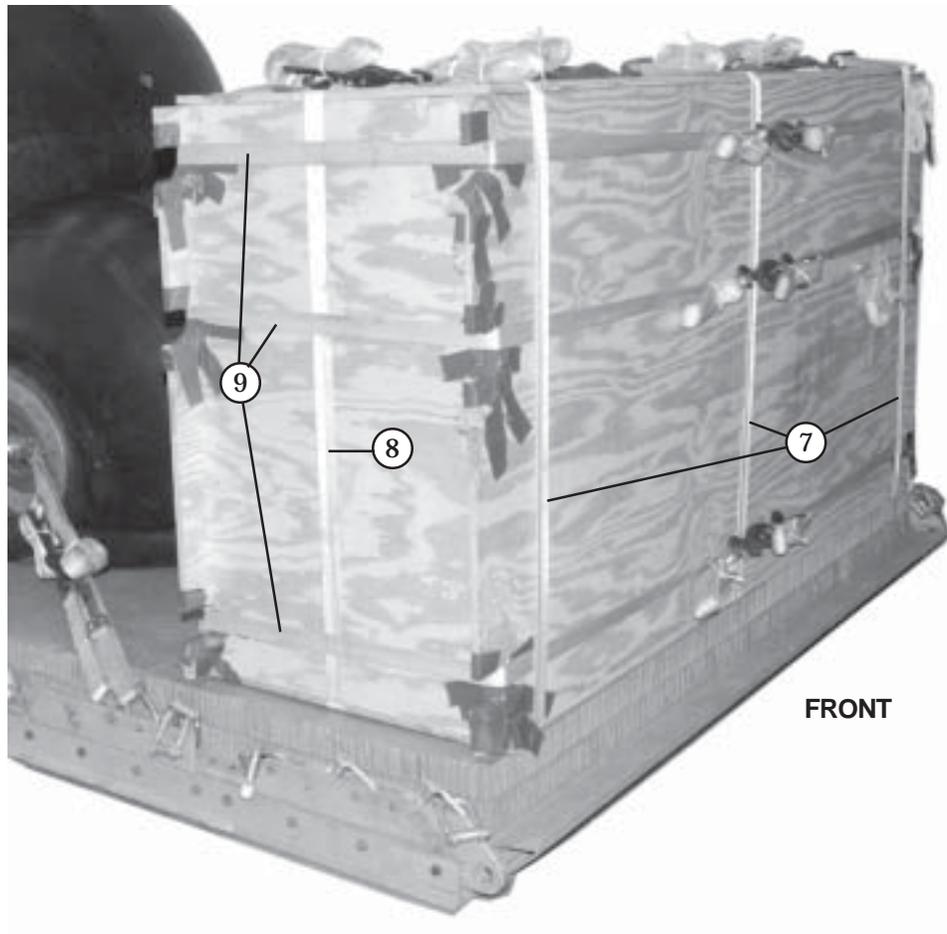


Figure 4-98. Equipment Positioned and Secured in Front Box



- ④ Place the following items in the front equipment box.
  - a) One bag containing three 50-foot x 2-inch hoses.
  - b) Two bags containing one 50-foot x 2-inch and one 12-foot x 2-inch discharge hose in each bag.
  - c) One bag containing a 50-foot x 3-inch discharge fitting.
  - d) Two bags containing five suction hoses each.
  - e) One bag containing four grounding rods.
  - f) Tow bar.
  - g) Four bags containing three nozzles each.
- ⑤ Fill the remaining space with honeycomb to prevent movement (not shown).
- ⑥ Nail the top on the box (not shown).

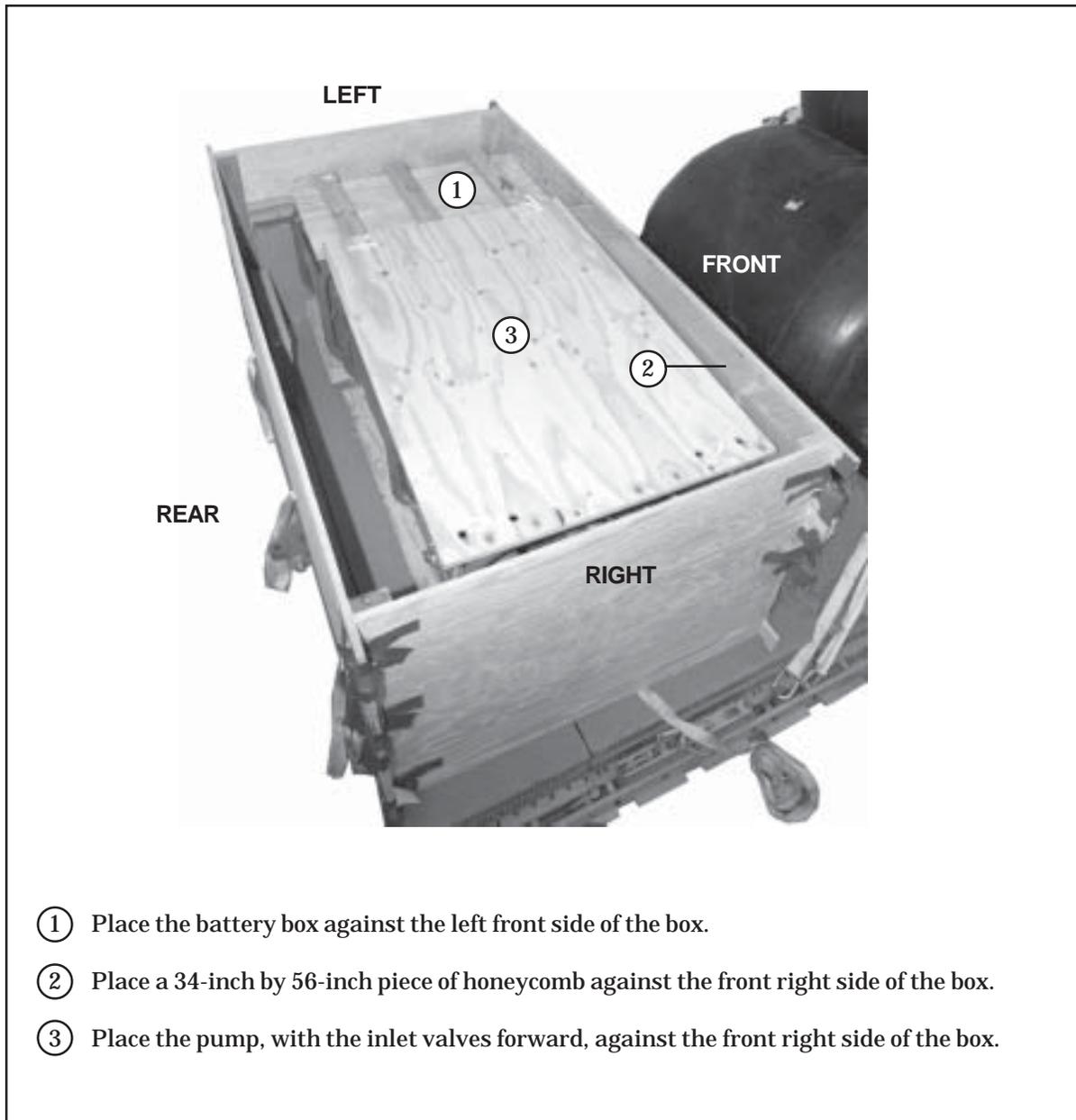
**Figure 4-98. Equipment Positioned and Secured in Front Box (Continued)**



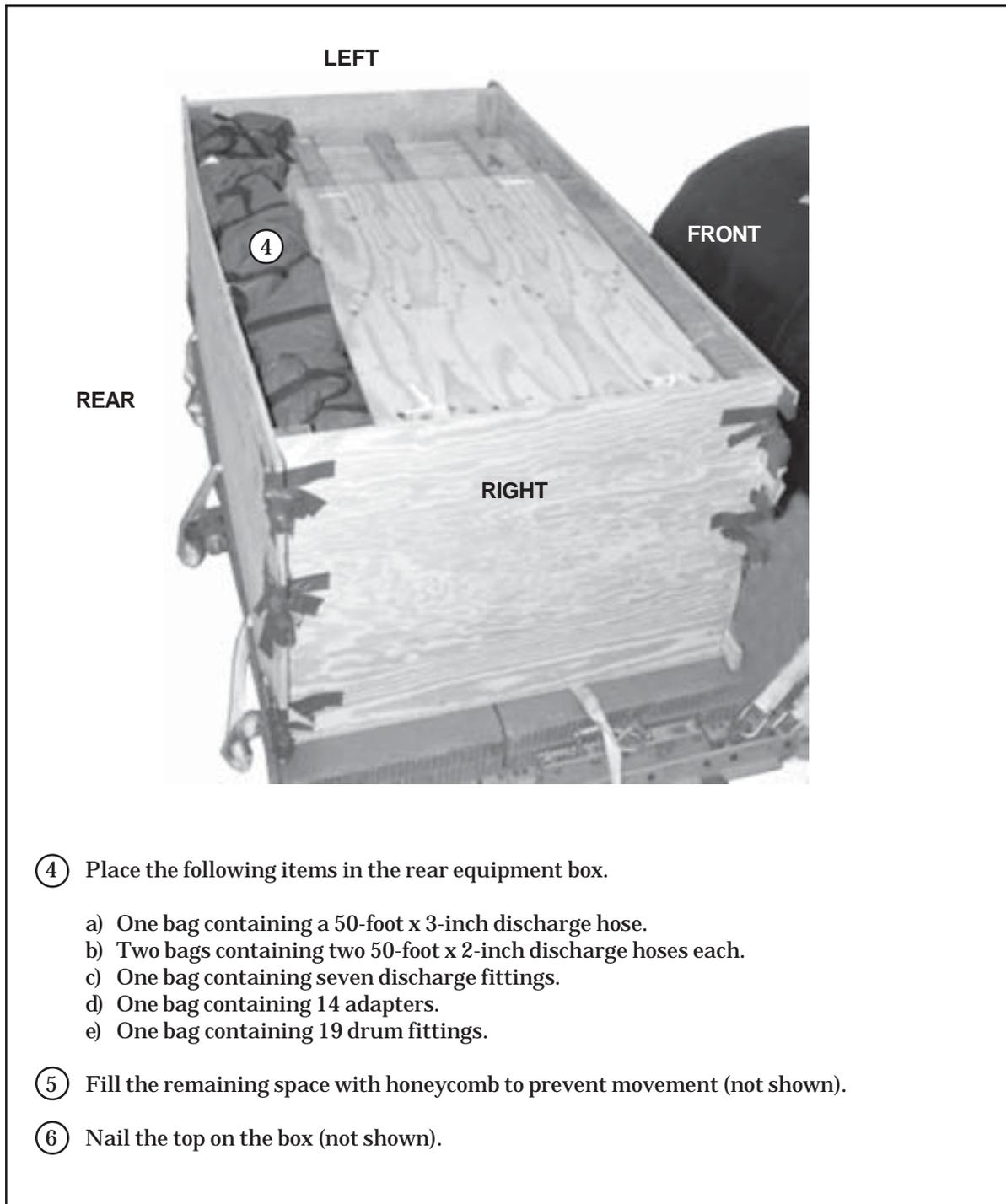
- ⑦ Secure the box from front to rear using the three pre-positioned 30-foot lashings. Load bind on top of the box.
- ⑧ Secure the box from left to right using the pre-positioned 30-foot lashing. Load bind on top of the box.
- ⑨ Route three 30-foot lashings around the box using the bottom, middle, and top cut outs. Load bind on the front of the box.

**Figure 4-98. Equipment Positioned and Secured in Front Box (Continued)**

**b.** Prepare the rear equipment box by placing a 36-inch by 86-inch and a 7-inch by 86-inch piece of honeycomb in the floor of the box. Position a 36-inch by 43-inch piece of honeycomb against each end of the box below the 2x4 lumber. Position equipment in the rear equipment box as shown in Figure 4-99.

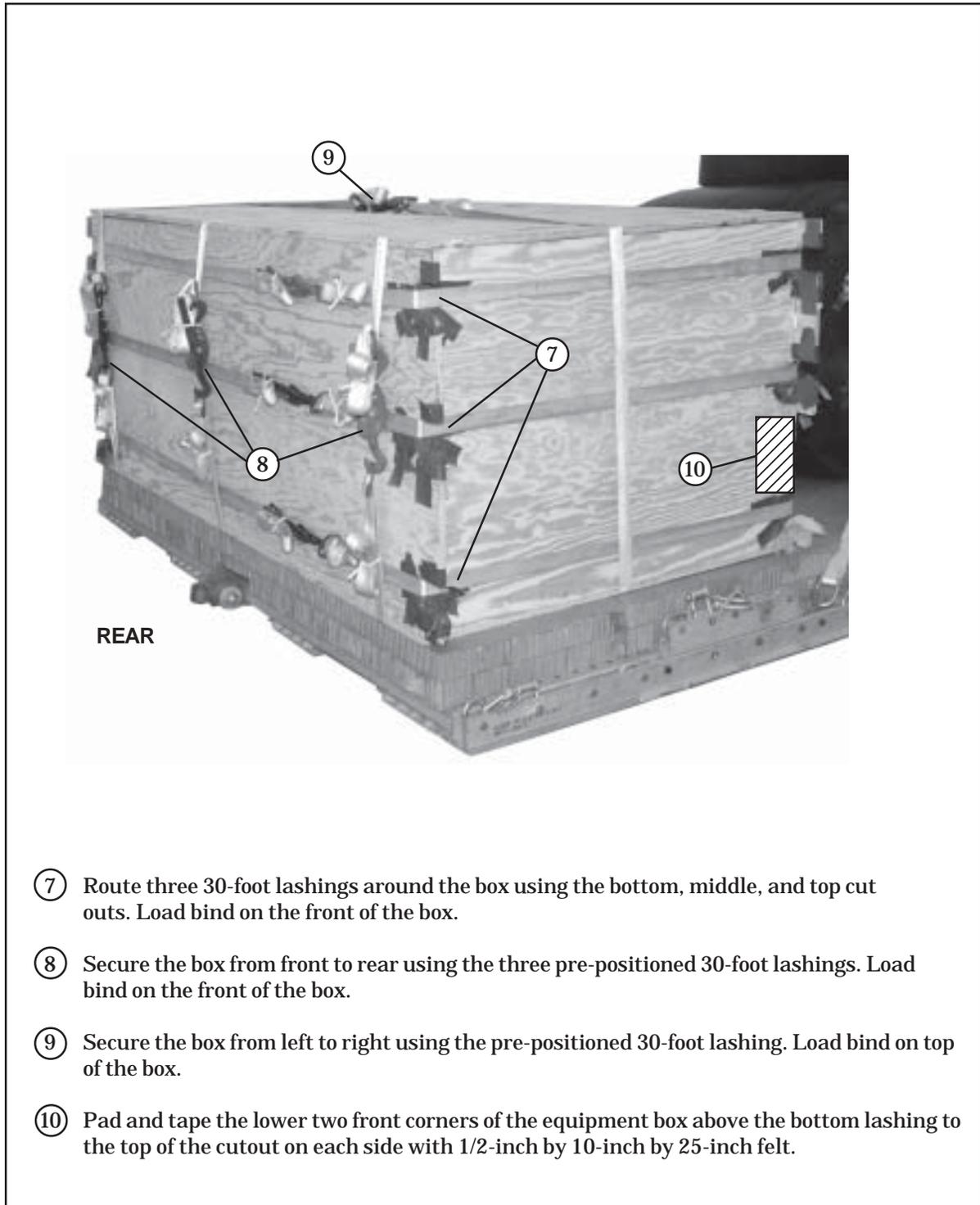


**Figure 4-99. Equipment Positioned and Secured in Rear Box**



- ④ Place the following items in the rear equipment box.
  - a) One bag containing a 50-foot x 3-inch discharge hose.
  - b) Two bags containing two 50-foot x 2-inch discharge hoses each.
  - c) One bag containing seven discharge fittings.
  - d) One bag containing 14 adapters.
  - e) One bag containing 19 drum fittings.
- ⑤ Fill the remaining space with honeycomb to prevent movement (not shown).
- ⑥ Nail the top on the box (not shown).

**Figure 4-99. Equipment Positioned and Secured in Rear Box (Continued)**



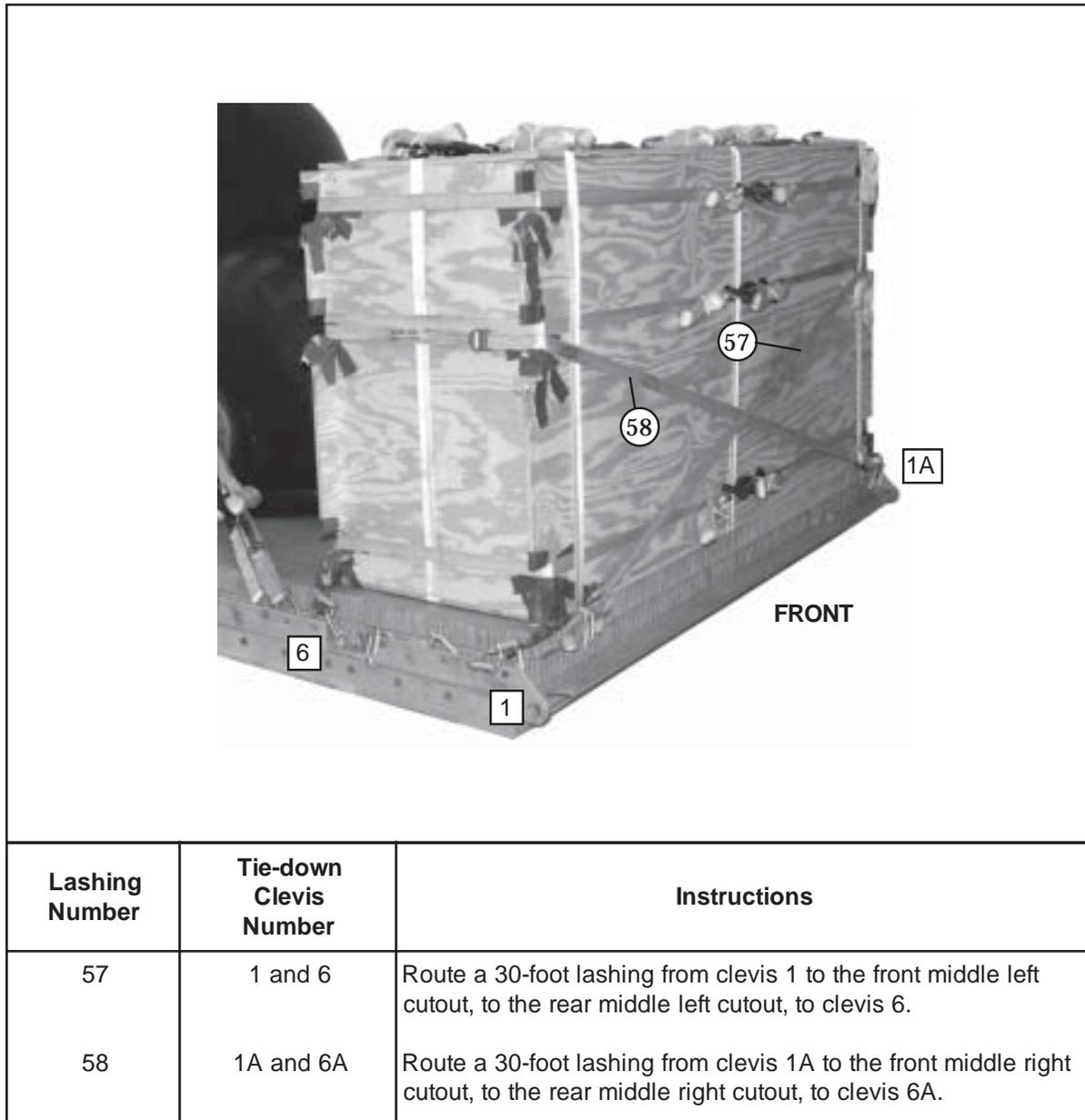
- ⑦ Route three 30-foot lashings around the box using the bottom, middle, and top cut outs. Load bind on the front of the box.
- ⑧ Secure the box from front to rear using the three pre-positioned 30-foot lashings. Load bind on the front of the box.
- ⑨ Secure the box from left to right using the pre-positioned 30-foot lashing. Load bind on top of the box.
- ⑩ Pad and tape the lower two front corners of the equipment box above the bottom lashing to the top of the cutout on each side with 1/2-inch by 10-inch by 25-inch felt.

**Figure 4-99. Equipment Positioned and Secured in Rear Box (Continued)**

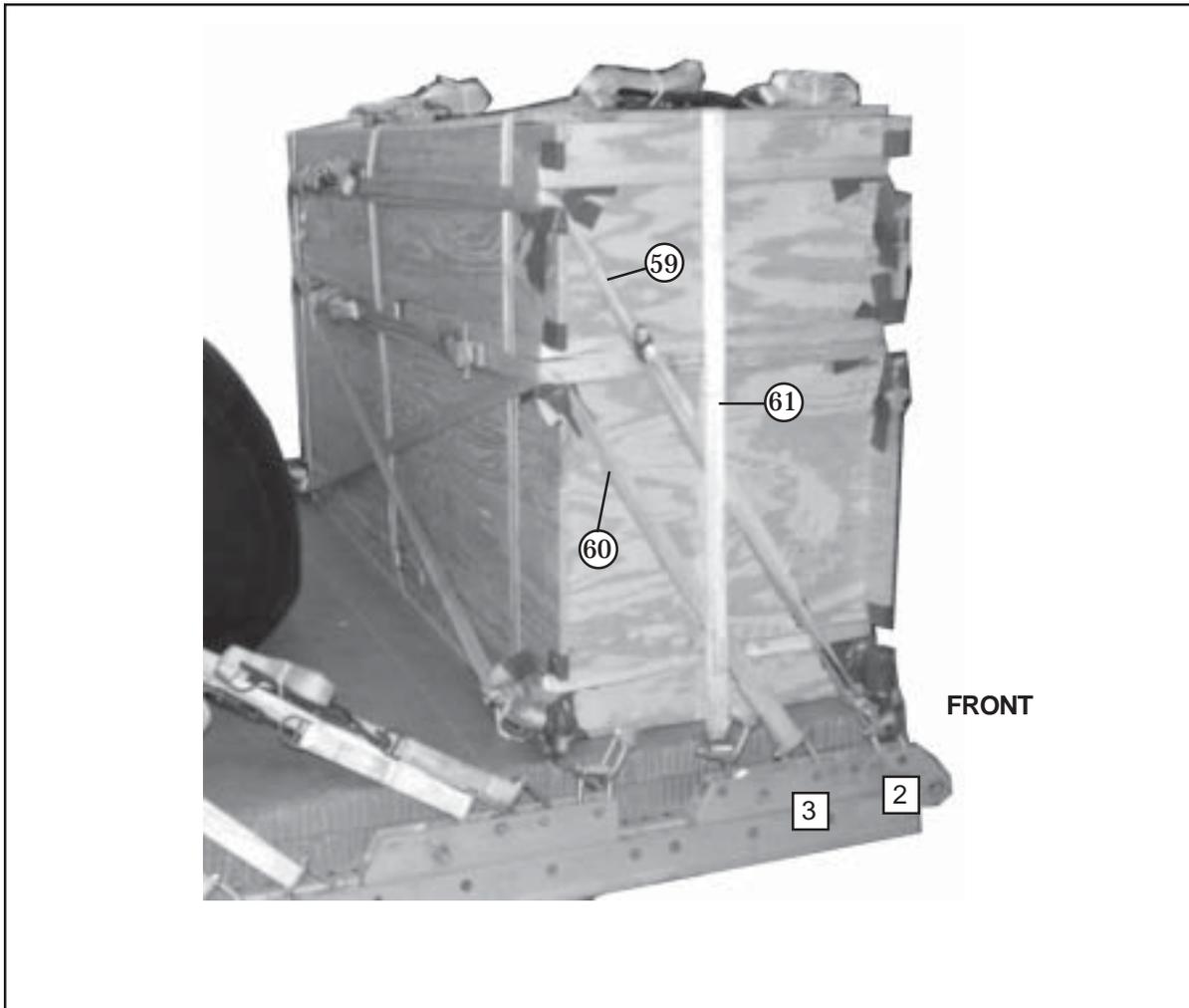
## LASHING THE EQUIPMENT BOXES TO THE PLATFORM

4-65. Lash the equipment boxes as shown in Figures 4-100 through 4-105.

**a.** Lash the front equipment box to the platform as shown in Figures 4-100 through 4-102.

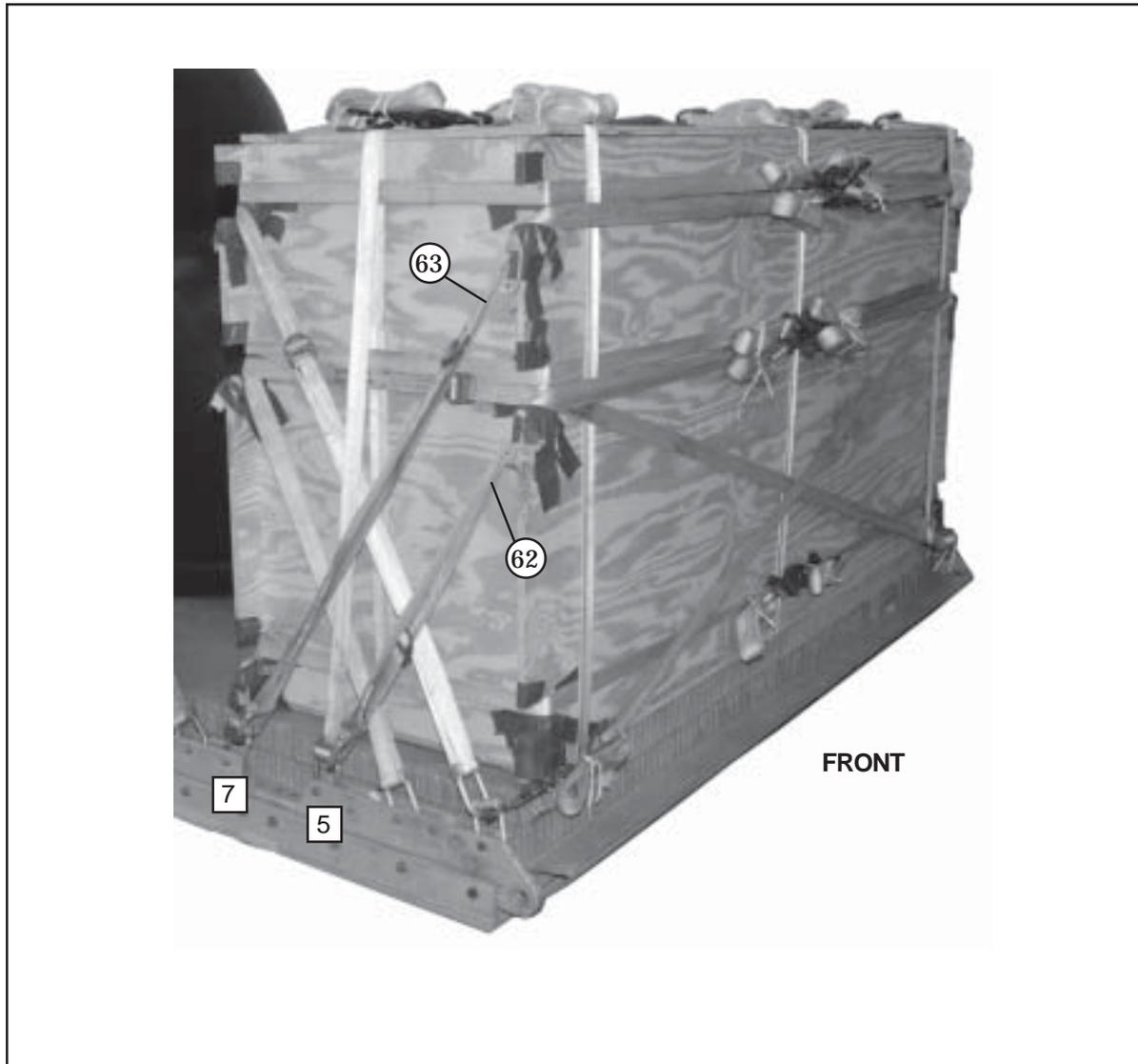


**Figure 4-100. Lashings 57 and 58 Installed**



Lashing Number	Tie-down Clevis Number	Instructions
59	2 and 2A	Route a 45-foot lashing through clevis 2 to the rear top right cutout, to the rear top left cutout, through clevis 2A and load bind on the rear of the box.
60	3 and 3A	Route a 45-foot lashing through clevis 3 to the rear middle right cutout, to the rear middle left cutout, through clevis 3A and load bind on the rear of the box.
61	4 and 4A	Route a lashing through it's own D-ring on clevis 4, repeat on clevis 4A and load bind them together on top of the box.

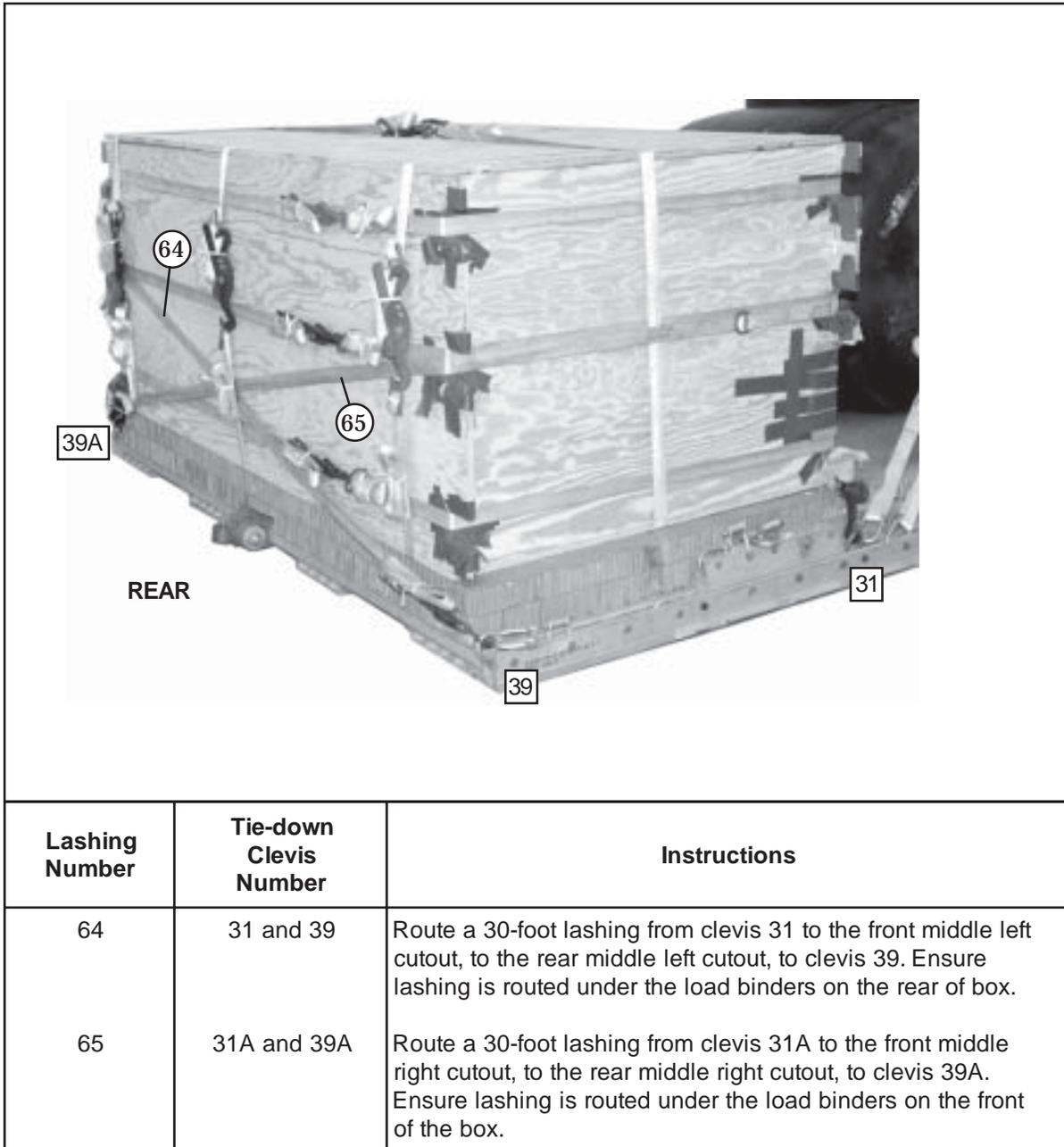
Figure 4-101. Lashings 59 through 61 Installed



Lashing Number	Tie-down Clevis Number	Instructions
62	5 and 5A	Route a 45-foot lashing through clevis 5 to the front middle right cutout, to the front middle left cutout, through clevis 5A and load bind on the front of the box.
63	7 and 7A	Route a 45-foot lashing through clevis 7 to the front top right cutout, to the front top left cutout, through clevis 7A and load bind on the front of the box.

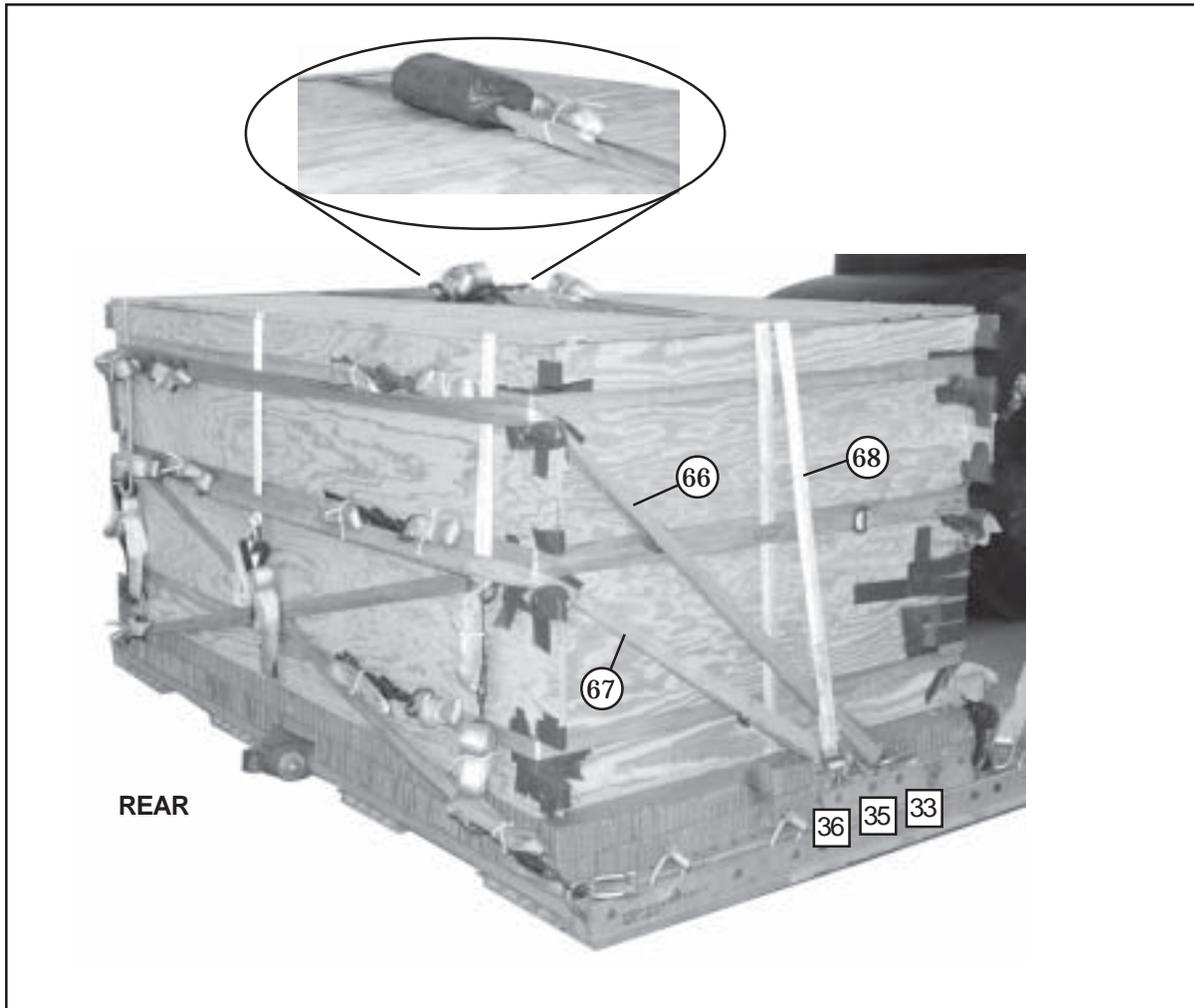
Figure 4-102. Lashings 62 and 63 Installed

**b.** Lash the rear equipment box to the platform as shown in Figures 4-103 through 4-105.



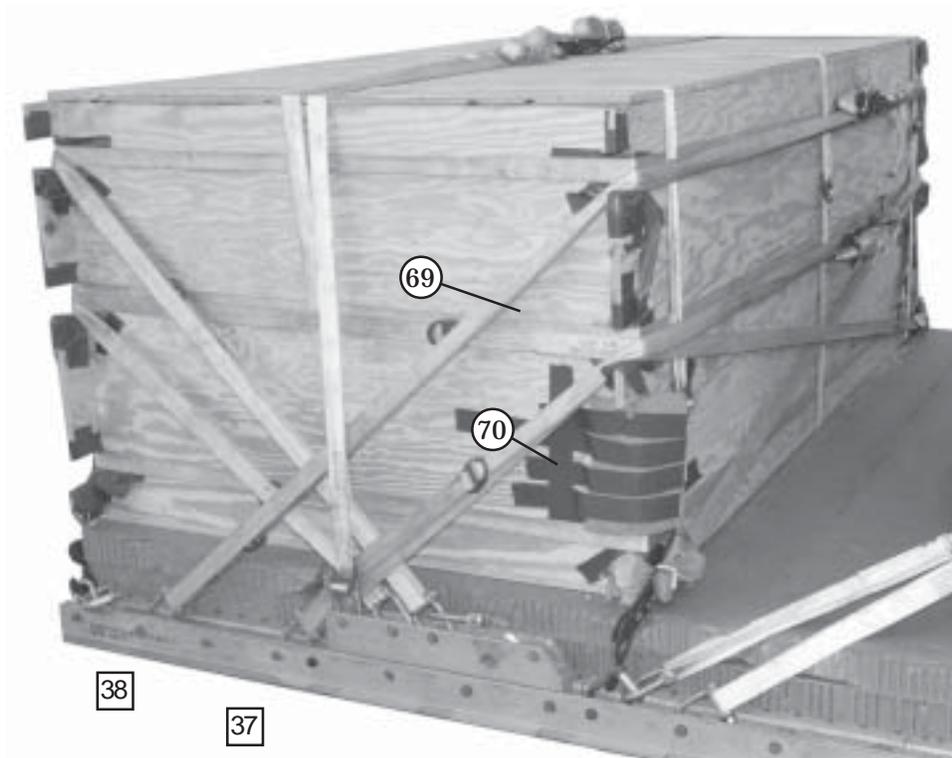
Lashing Number	Tie-down Clevis Number	Instructions
64	31 and 39	Route a 30-foot lashing from clevis 31 to the front middle left cutout, to the rear middle left cutout, to clevis 39. Ensure lashing is routed under the load binders on the rear of box.
65	31A and 39A	Route a 30-foot lashing from clevis 31A to the front middle right cutout, to the rear middle right cutout, to clevis 39A. Ensure lashing is routed under the load binders on the front of the box.

**Figure 4-103. Lashings 64 and 65 Installed**



Lashing Number	Tie-down Clevis Number	Instructions
66	33 and 33A	Route a 45-foot lashing through clevis 33 to the rear top right cutout, to the rear top left cutout, through clevis 33A and load bind on the rear of the box.
67	35 and 35A	Route a 45-foot lashing through clevis 35 to the rear middle right cutout, to the rear middle left cutout, through clevis 35A and load bind on the rear of the box.
68	36 and 36A	Route a lashing through clevis 36 and through it's own D-ring, repeat on clevis 36A and load bind them together on top of box. Wrap 1/4-inch felt around the load binders located on top of the equipment box and secure them with tape.

Figure 4-104. Lashings 66 through 68 Installed



Lashing Number	Tie-down Clevis Number	Instructions
69	37 and 37A	Route a 45-foot lashing through clevis 37 to the front middle right cutout, to the front middle left cutout, through clevis 37A and load bind on the front of the box.
70	38 and 38A	Route a 45-foot lashing through clevis 38 to the front top right cutout, to the front top left cutout, through clevis 38A and load bind on the front of the box.

**Figure 4-105. Lashings 69 and 70 Installed**

## BUILDING AND POSITIONING RELEASE PLATFORM

4-66. Build and position the release platform as shown in Figure 4-106.

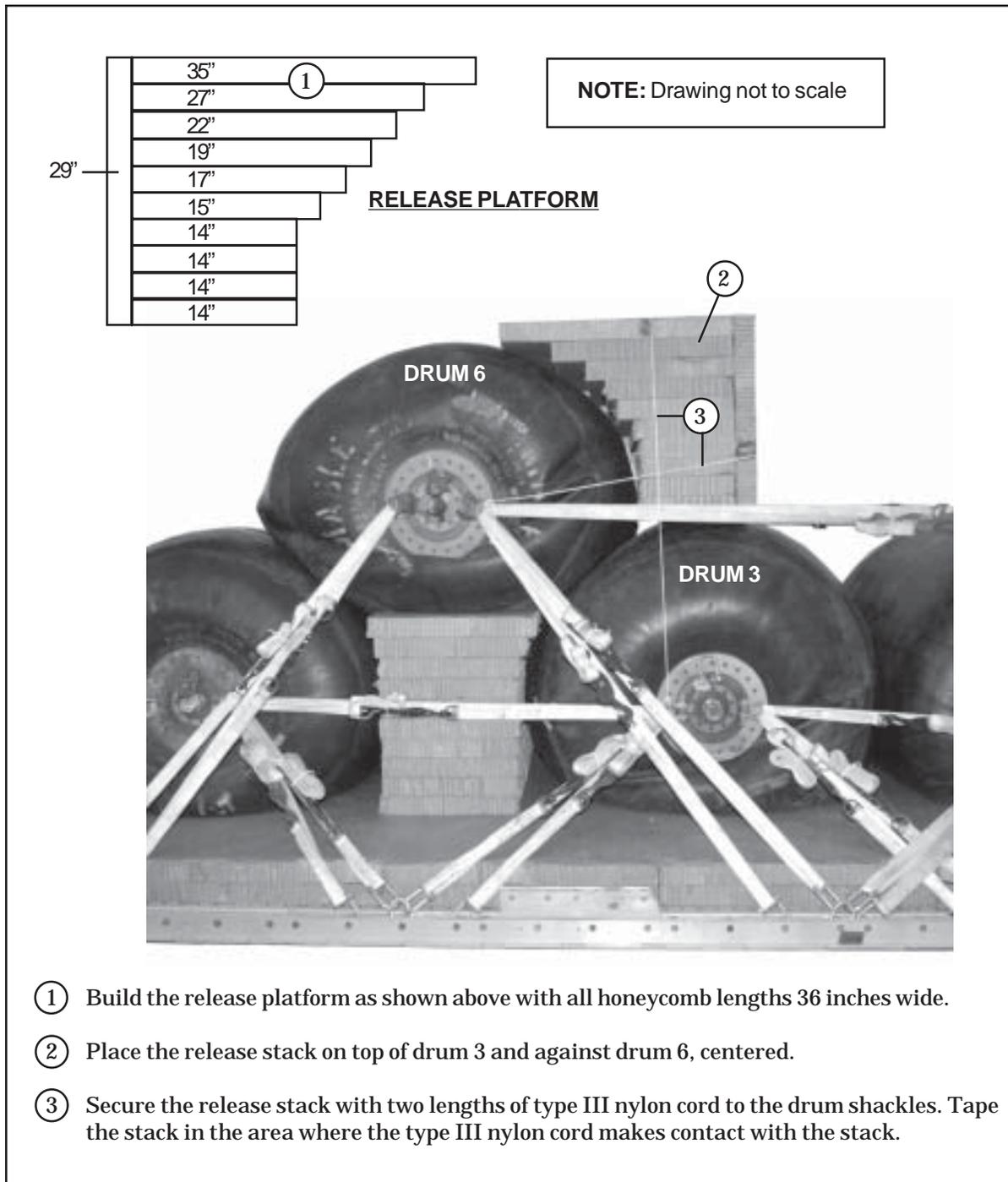


Figure 4-106. Release Platform Built and Positioned

## INSTALLING SUSPENSION SLINGS AND SAFETY TIES

4-67. Install suspension slings and safety ties as shown in Figure 4-107.

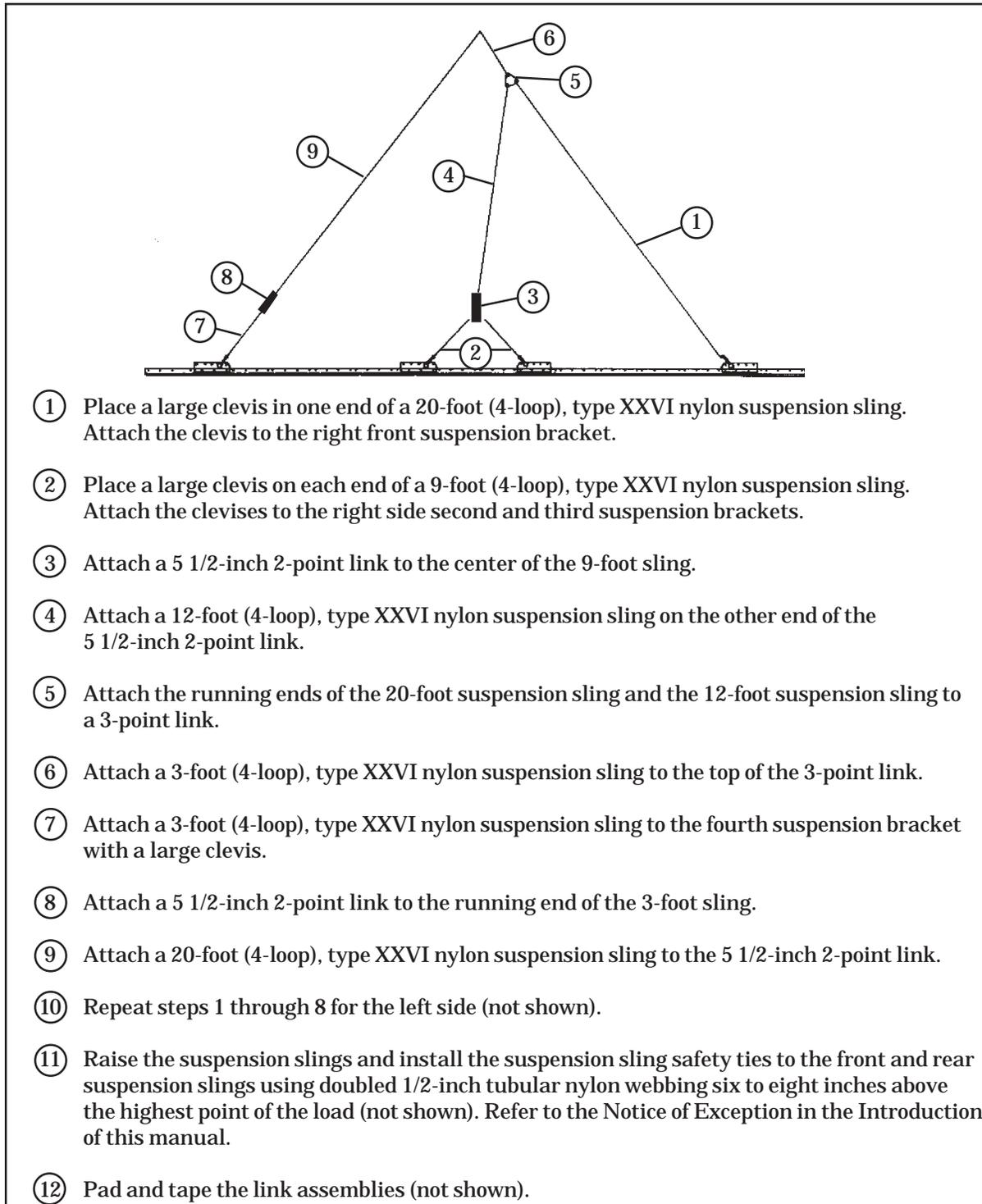


Figure 4-107. Suspension Slings and Safety Ties Installed

## SECURING THE SUSPENSION SLINGS

4-68. Make the following suspension slings securing ties as shown in Figure 4-108.

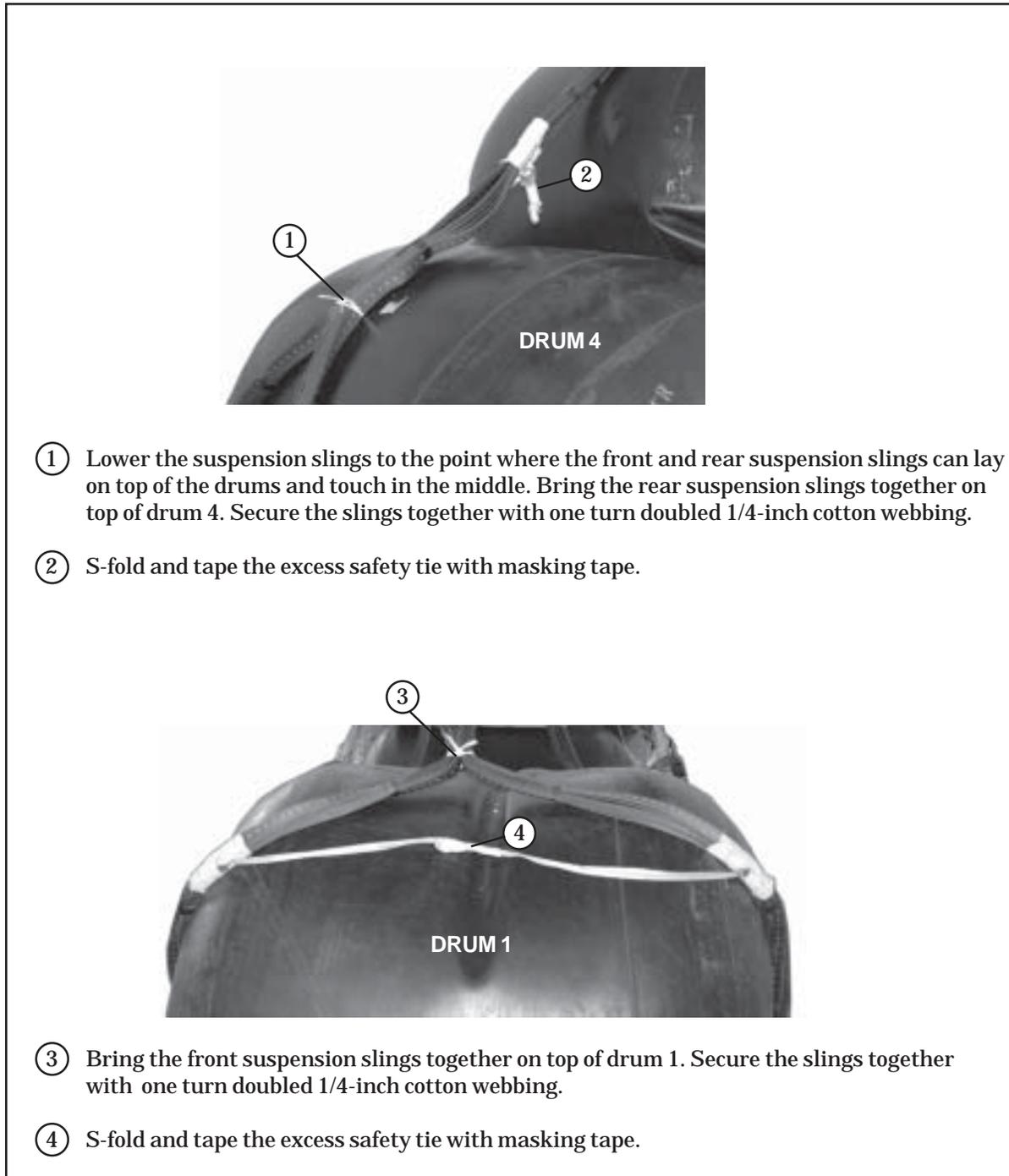
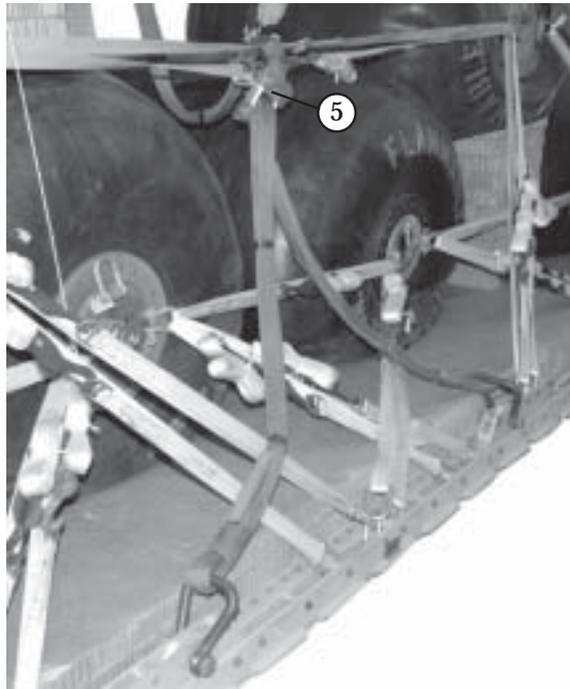
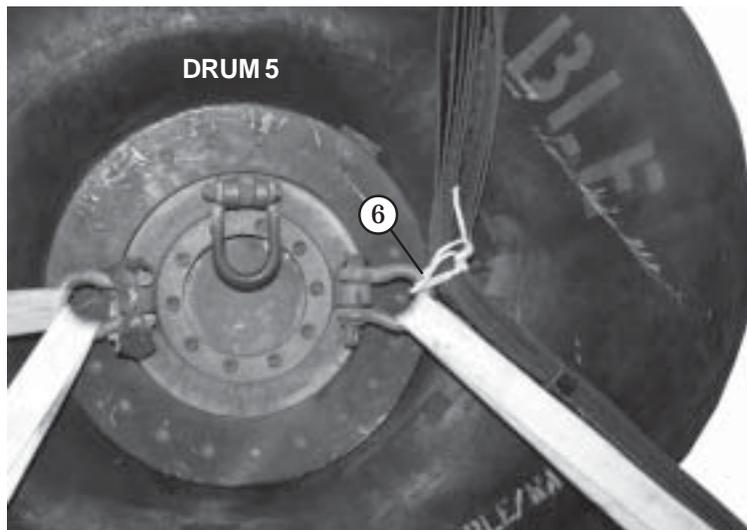


Figure 4-108. Suspension Slings Secured

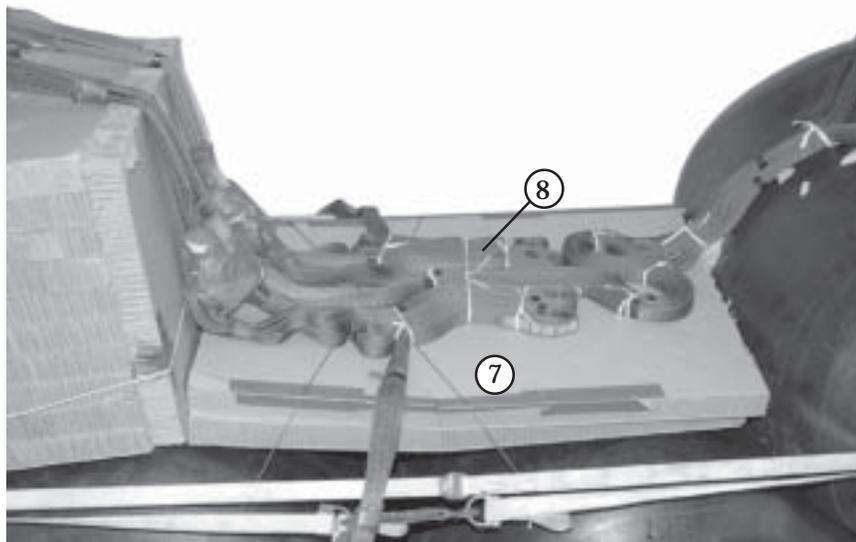


- ⑤ Secure the middle suspension sling and 5 1/2-inch 2-point link on the right and left sides to the top lateral lashing D-rings with one turn doubled 1/4-inch cotton webbing.

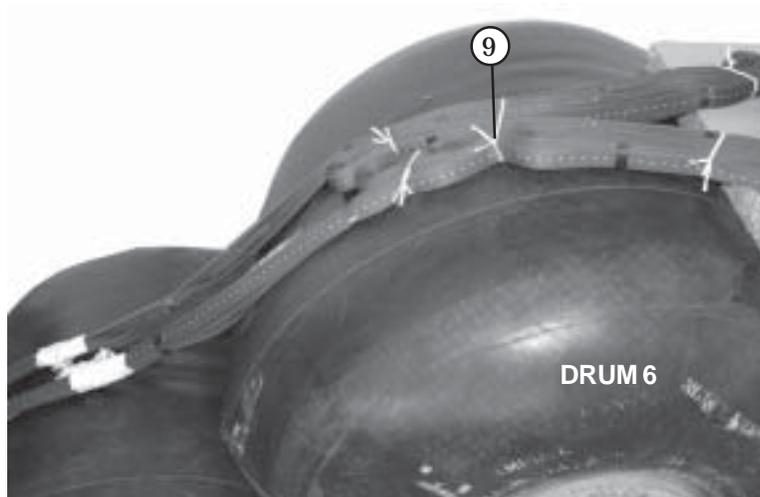


- ⑥ Secure the front suspension slings to the right and left front shackles of drum 5 with one turn doubled 1/4-inch cotton webbing.

Figure 4-108. Suspension Slings Secured (Continued)



- ⑦ Place two 56-inch by 36-inch pieces of honeycomb on top of drums 3 and 4 against the front base of the release platform. Tape the top right and left sides and secure to a convenient point on the load with type III nylon cord.
- ⑧ Lower the suspension slings. S-fold and secure the front suspension slings on the 56-inch by 36-inch piece of honeycomb with one turn single 1/4-inch cotton webbing. Make one tie around both sets of front suspension slings to hold them together with one turn single 1/4-inch cotton webbing.



- ⑨ S-fold the rear suspension slings on top of drum 6 and secure with one turn single 1/4-inch cotton webbing. Make one tie around both sets of rear suspension slings to hold them together with one turn single 1/4-inch cotton webbing.

Figure 4-108. Suspension Slings Secured (Continued)

## PREPARING AND STOWING CARGO PARACHUTES

4-69. Prepare and stow seven G-11 cargo parachutes as shown in Figure 4-109.

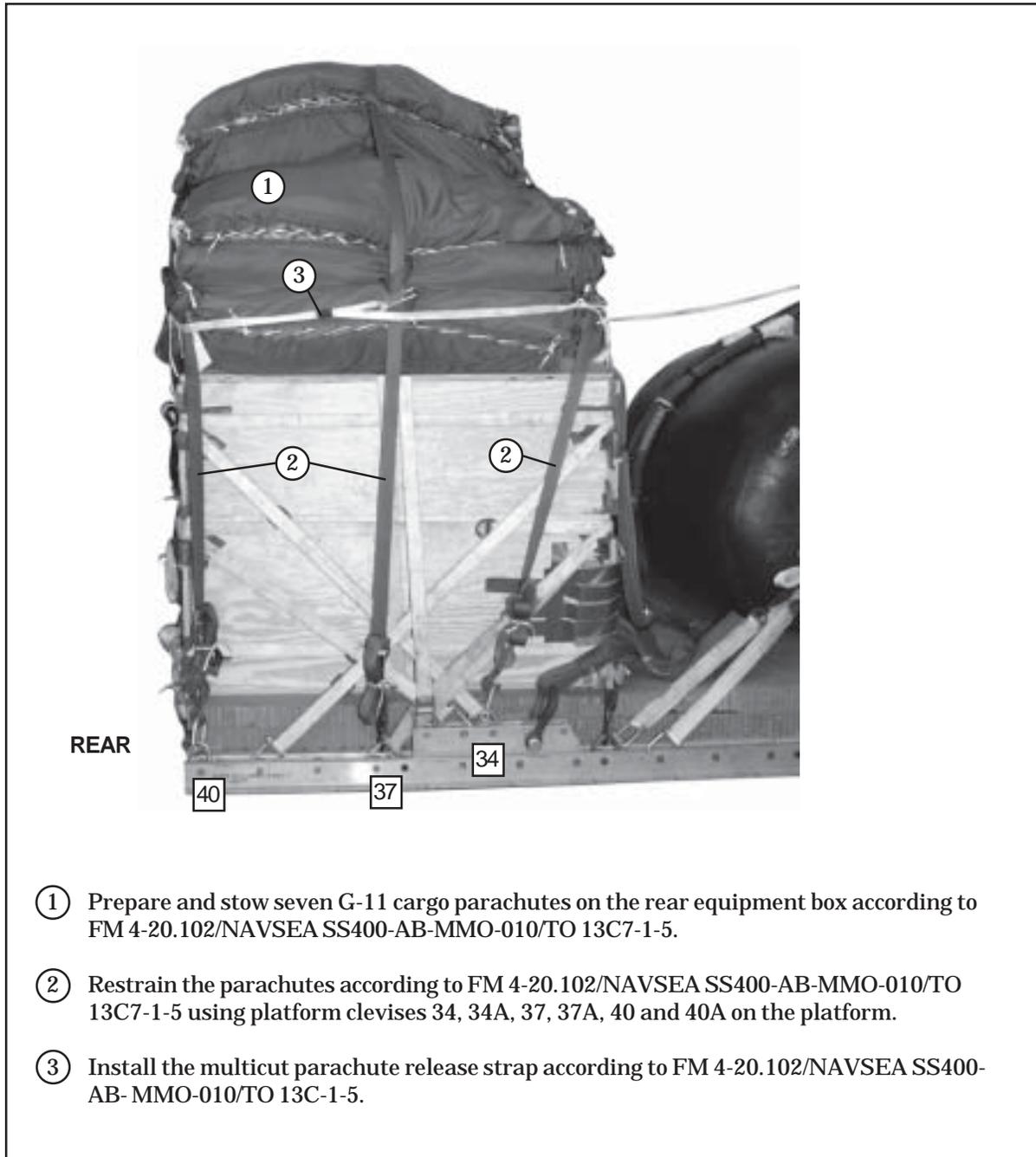


Figure 4-109. Cargo Parachutes Prepared and Stowed

## INSTALLING THE EXTRACTION SYSTEM

4-70. Install the extraction system as shown in Figure 4-110.

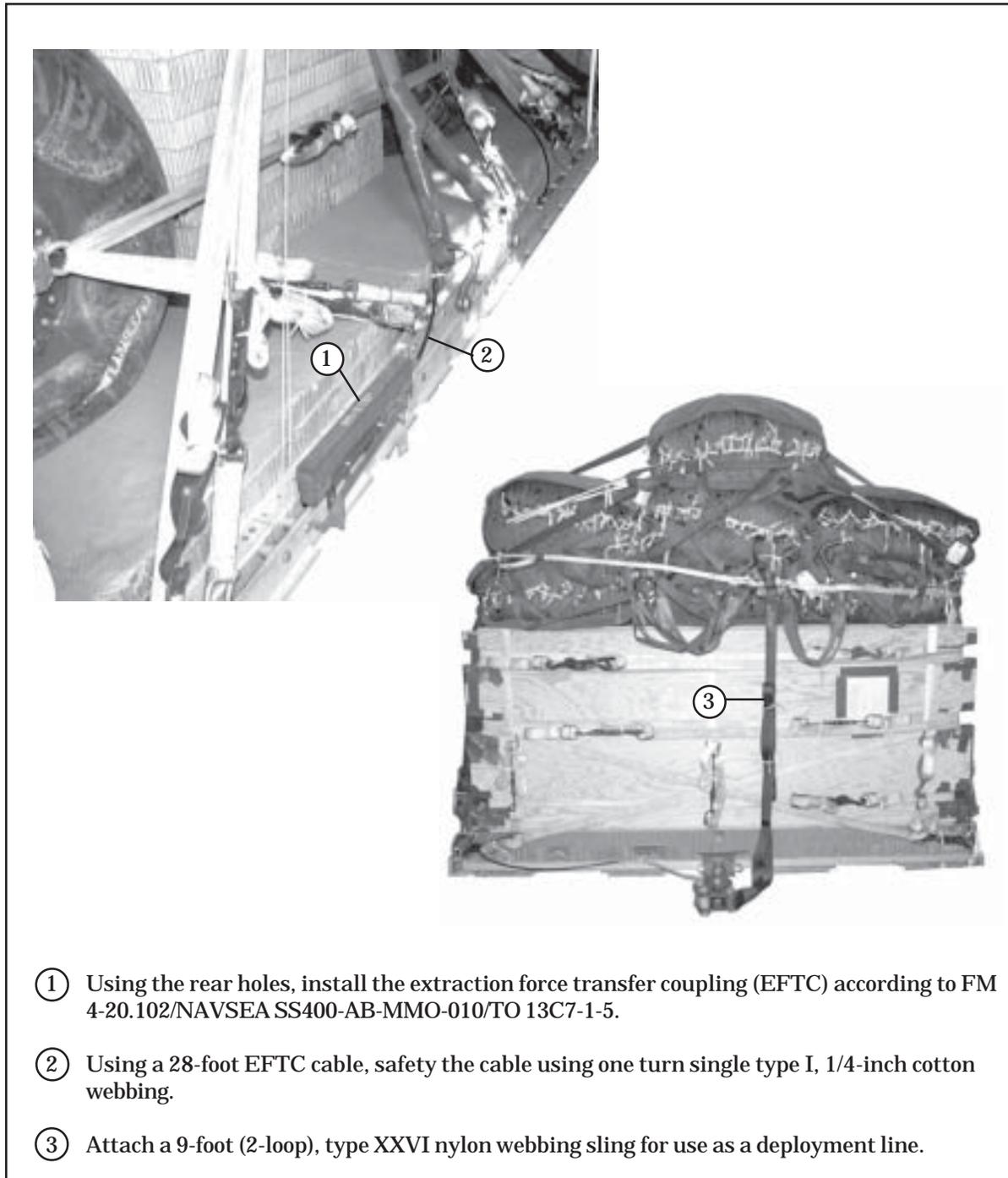


Figure 4-110. Extraction System Installed

## INSTALLING THE CARGO PARACHUTE RELEASE SYSTEM

4-71. Install the M-2 cargo parachute release system as shown in Figure 4-111.

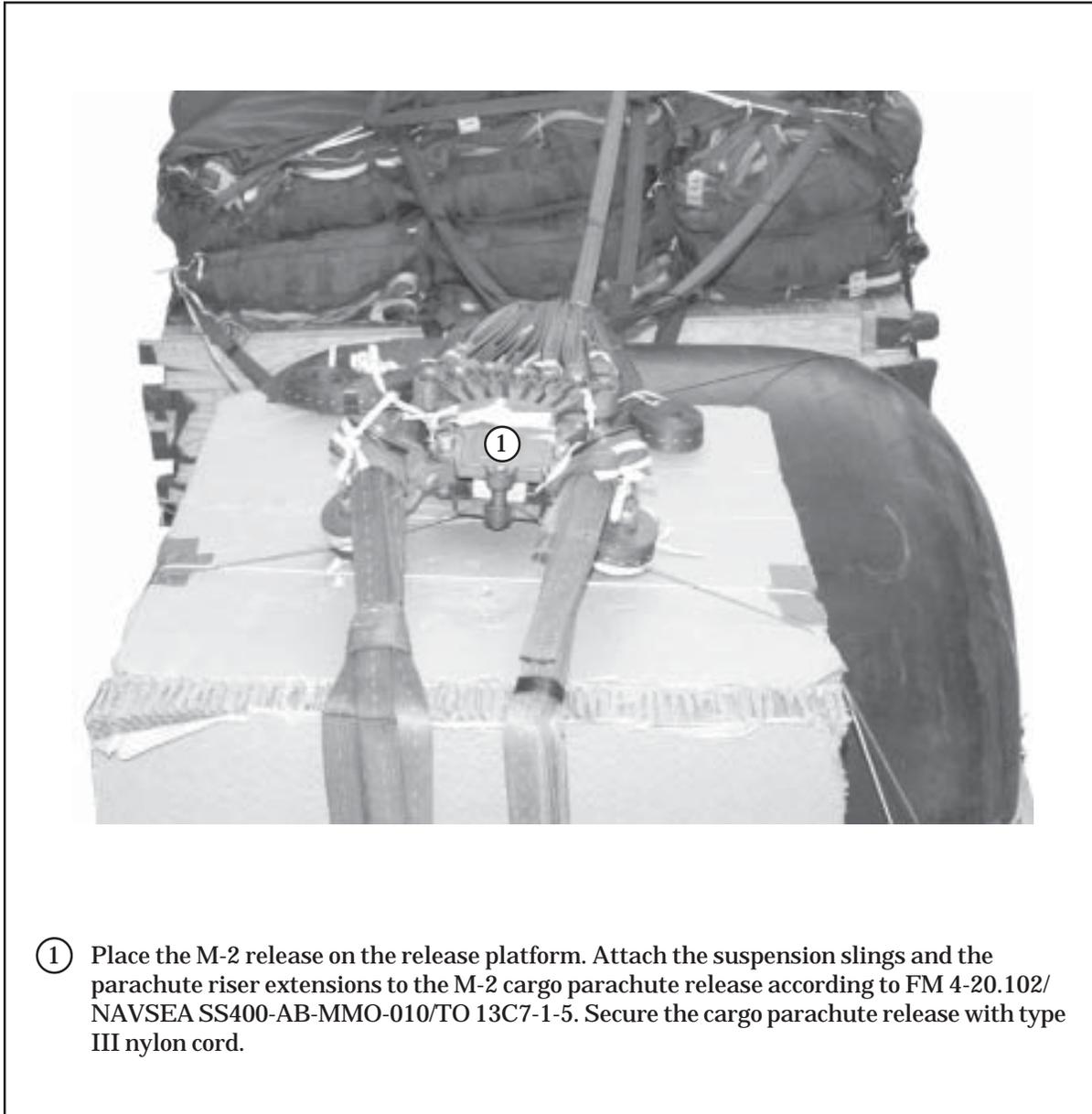


Figure 4-111. Cargo Parachute Release Installed

## **PLACING EXTRACTION PARACHUTE**

4-72. Select the extraction parachute and extraction line needed using the extraction line requirements table in FM 4-20.102/NAVSEA SS400-AB-MMO-010/TO 13C7-1-5. Rig the extraction line in an extraction line bag according to TM 10-1670-286-20/TO 13C5-2-41. Place the extraction parachute and extraction line on the load for installation in the aircraft.

## **INSTALLING PROVISIONS FOR EMERGENCY RESTRAINTS**

4-73. Select and install the provisions for emergency aft restraints according to the emergency aft restraint requirements table in FM 4-20.102/NAVSEA SS400-AB-MMO-010/TO 13C7-1-5.

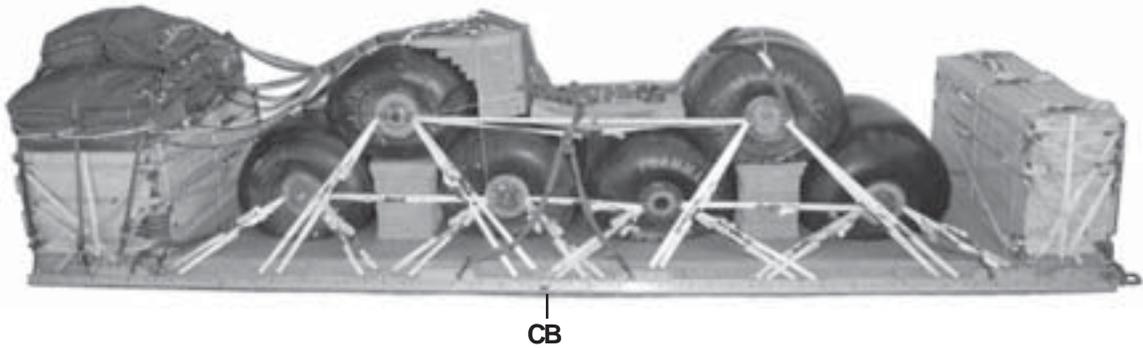
## **MARKING RIGGED LOAD**

4-74. Mark the rigged load according to FM 4-20.102/NAVSEA SS400-AB-MMO-010/TO 13C7-1-5 and as shown in Figure 4-112. Complete Shipper's Declaration for Dangerous Goods and affix to the load. If the load varies from the one shown, the weight, height, CB, tipoff curve, and parachute requirements must be recomputed.

## **EQUIPMENT REQUIRED**

4-75. Use the equipment list in Table 4-5 to rig the load shown in Figure 4-112.

**CAUTION**  
 Make the final inspection required by FM 4-20.102/NAVSEA  
 SS400-AB-MMO-010/TO 13C7-1-5 before the load leaves  
 the rigging site.



**RIGGED LOAD DATA**

**Weight** ..... 32,480 pounds

**NOTE:** The rigged weight for this load is using water as the liquid. Use the weight conversion table for the actual rigged weight for any other liquids used.

**NOTE:** The G-11 requirements may need to be recomputed for lighter liquids.

**Maximum Weight** ..... 34,000 pounds

**Height** ..... 94 inches

**Width** ..... 108 inches

**Overall Length** ..... 402 inches

**Overhang: Front** ..... 0 inches

**Rear (EFTC)** ..... 18 inches

**Center of Balance (CB) (from front edge of platform)** ..... 195 inches

**Figure 4-112. AAFARS Rigged with Six 500-Gallon Drums for Low-Velocity Airdrop**

Table 4-5. Equipment Required for Rigging AAFARS With Six 500-Gallon Drums

National Stock Number	Item	Quantity
8040-00-273-8713	Adhesive paste, 1-gal	As required
1670-01-035-6054	Bridle, extraction line bag (for DES)	1
4030-00-090-5354	Clevis, large	12
4030-00-678-8562	Clevis, medium	6
4020-00-240-2146	Cord, nylon, type III, 550-lb	As required
1670-00-326-7309	Coupling assembly, airdrop, extraction force transfer w/ cable, 28-ft	1
1670-00-360-0328	Cover, clevis, large	7
8135-00-664-6958	Cushioning material, packaging, cellulose wadding	As required
8305-00-958-3685	Felt, 1/2-in thick	As required
1670-00-003-4391	Knife, parachute bag (for DES)	1
1670-01-183-2678	Leaf, extraction line (line bag)(add1 for DES)	2
1670-01-064-4452	Line, drogue (for DES) 60-foot (1-loop), type XXVI	1
1670-01-064-4454	Line, extraction For C-130: 60-ft (6-loop), type XXVI	1
1670-01-062-6312	For C-141: 120-ft (6-loop), type XXVI	1
1670-01-062-6312	For C5: (between fuselage station 1667-1971) 120-ft (6-loop), type XXVI	1
1670-01-062-6312	(between fuselage station 947-1666) 120-ft (6-loop), type XXVI and a	1
1670-01-064-4454	60-ft (6-loop), type XXVI	1
1670-01-062-6312	(between fuselage station 574-947) 120-ft (6-loop), type XXVI	2
1670-01-468-9178	For C-17: 140-ft (6-loop), type XXVI	
	Link assembly:	
	Two-point: (for DES)	
5306-00-435-8994	Bolt, 1-in diam, 4-in long	2
5310-00-232-5165	Nut, 1-in, hexagonal	2
1670-00-003-1953	Plate, side, 3 3/4-in	2
5365-00-007-3414	Spacer, large	2

Table 4-5. Equipment Required for Rigging AAFARS With Six 500-Gallon Drums (Continued)

National Stock Number	Item	Quantity
5306-00-435-8994	Two-point: Bolt, 1-in diam, 4-in long	10
5310-00-232-5165	Nut, 1-in, hexagonal	10
1670-00-003-3454	Plate, side, 5 1/2-in	10
5365-00-007-3414	Spacer, large	10
1670-01-307-1055	Link assembly: Three-point	2
1670-01-483-8259	Link, tow release mechanism (H-Block) C-17	1
5510-00-220-6146	Lumber: 2- by 4-in	As required
5510-00-220-6148	2- by 6-in	As required
5315-00-010-4659	Nail, steel wire, common, 8d	As required
5315-00-010-4662	12d	As required
5315-00-753-3885	16d	As required
1670-00-753-3928	Pad, energy dissipating, honeycomb, 3- by 36- by 96-in	37 sheets
1670-01-016-7841	Parachute: Cargo: G-11C	7
1670-00-040-8135	Cargo extraction: 28-foot	2
1670-01-063-3715	Drogue: (for DES) 15-ft	1
1670-01-353-8425	Platform, airdrop, Type V, 32-foot	1
1670-01-162-2376	Bracket assembly, EFTC	1
1670-01-162-2372	Bracket assembly, extraction	84
1670-01-247-2389	Clevis assembly	8
1670-01-162-2381	Bracket, suspension	2
5530-00-128-4981	Tandem link assembly (multipurpose link)	11 sheets
1670-01-097-8817	Plywood, 3/4-in	1
1670-01-062-6306	Release, cargo parachute, M-2	
1670-01-062-6305	Sling, cargo, airdrop For suspension: 3-ft (4-loop), type XXVI nylon webbing	4
1670-01-062-6307	9-ft (4-loop), type XXVI nylon webbing	2
1670-01-064-4453	12-ft (4-loop), type XXVI nylon webbing	2
	20-ft (4-loop), type XXVI nylon webbing	4

**Table 4-5. Equipment Required for Rigging AAFARS With Six 500-Gallon Drums (Continued)**

National Stock Number	Item	Quantity
1670-01-062-6304	For deployment: 9-ft (2-loop), type XXVI nylon webbing	1
1670-01-062-6311	For riser extension: 120-ft (2-loop), type XXVI	7
5340-00-040-8219	Strap, parachute release, multicut, comes w/ 3 knives	2
7510-00-266-5016	Tape, adhesive, 2-in	As required
7510-00-266-6710	Tape, masking, 2-in	As required
1670-00-937-0271	Tie-down assembly, 15-foot	118
8305-00-268-2411	Webbing: Cotton, 1/4-in, type I	As required
8305-00-082-5752	Nylon, tubular, 1/2-in	As required
8305-00-260-6890	Type X	As required

## SECTION V- RIGGING AAFARS WITH SEVEN 500-GALLON FUEL DRUMS

### DESCRIPTION OF LOAD

4-76. The Advanced Aviation Forward Area Refueling System (AAFARS) is rigged on a 32-foot type, V platform with seven G-11 cargo parachutes. The AAFARS is designed for forward area refueling of up to four aircraft at a time with a minimum of 55 GPM. There are six collapsible fuel drums as an accompanying load. Each drum is filled with 432 gallons of liquid. When empty, each drum weighs 250 pounds and is 62 inches long and 53 inches in diameter. The total rigged overall length is 402 inches. Width is 108 inches. Height is 96 inches. Center of balance is 192 inches.

- Notes:**
1. For drums filled with a liquid other than water, use Table 1-1 to recompute the weight.
  2. If the load varies from the one shown, the weight, height, CB, tipoff curve, and parachute requirements must be recomputed.
  3. Do not pressurize drums with air.

### PREPARING PLATFORM

4-77. Prepare a 32-foot type V airdrop platform using two tandem links, eight suspension brackets and 92 tie-down clevises as shown in Figure 4-113.

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

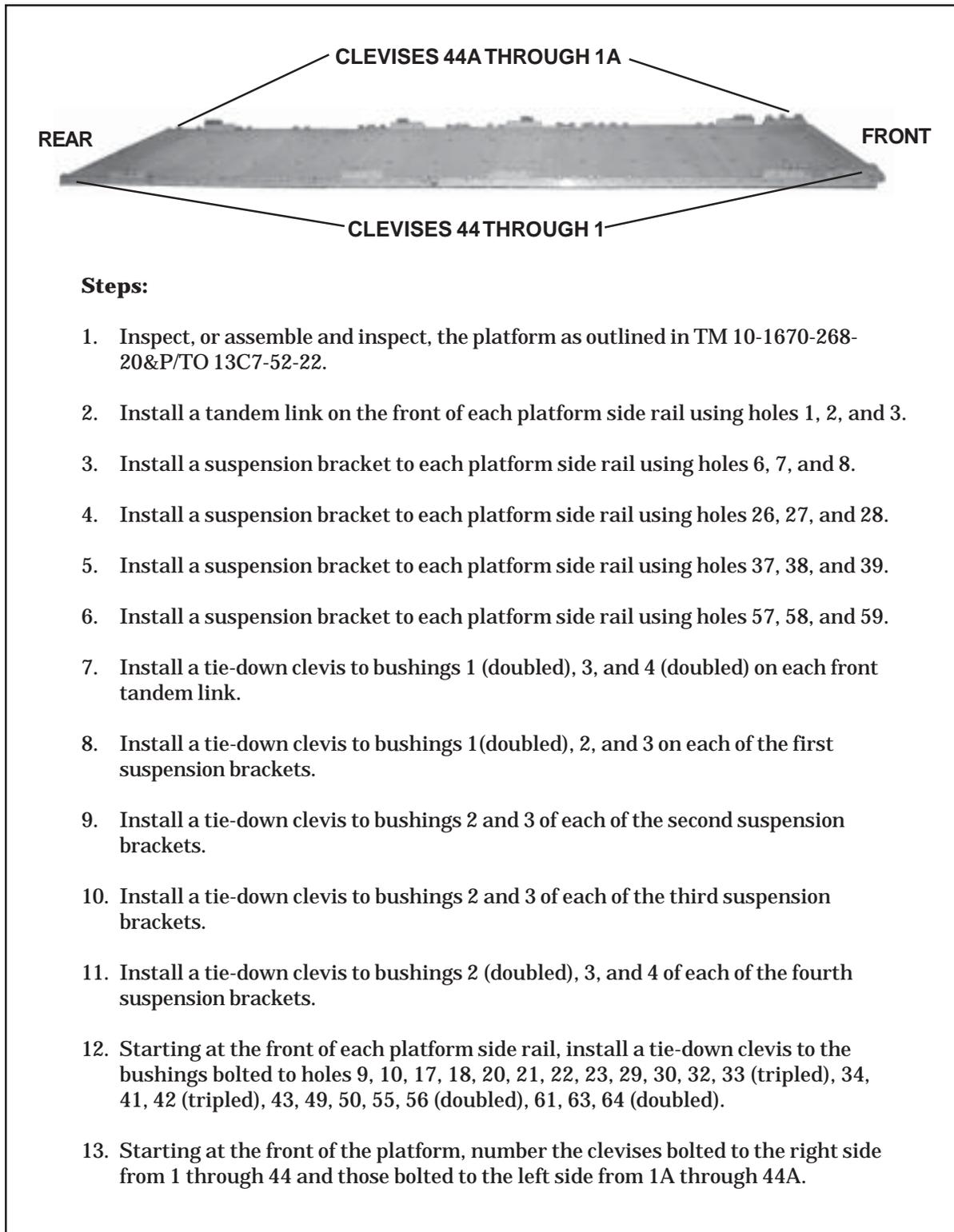


Figure 4-113. Platform Prepared

## PREPARING HONEYCOMB

4-78. Prepare and build honeycomb stacks as shown in Figure 4-114.

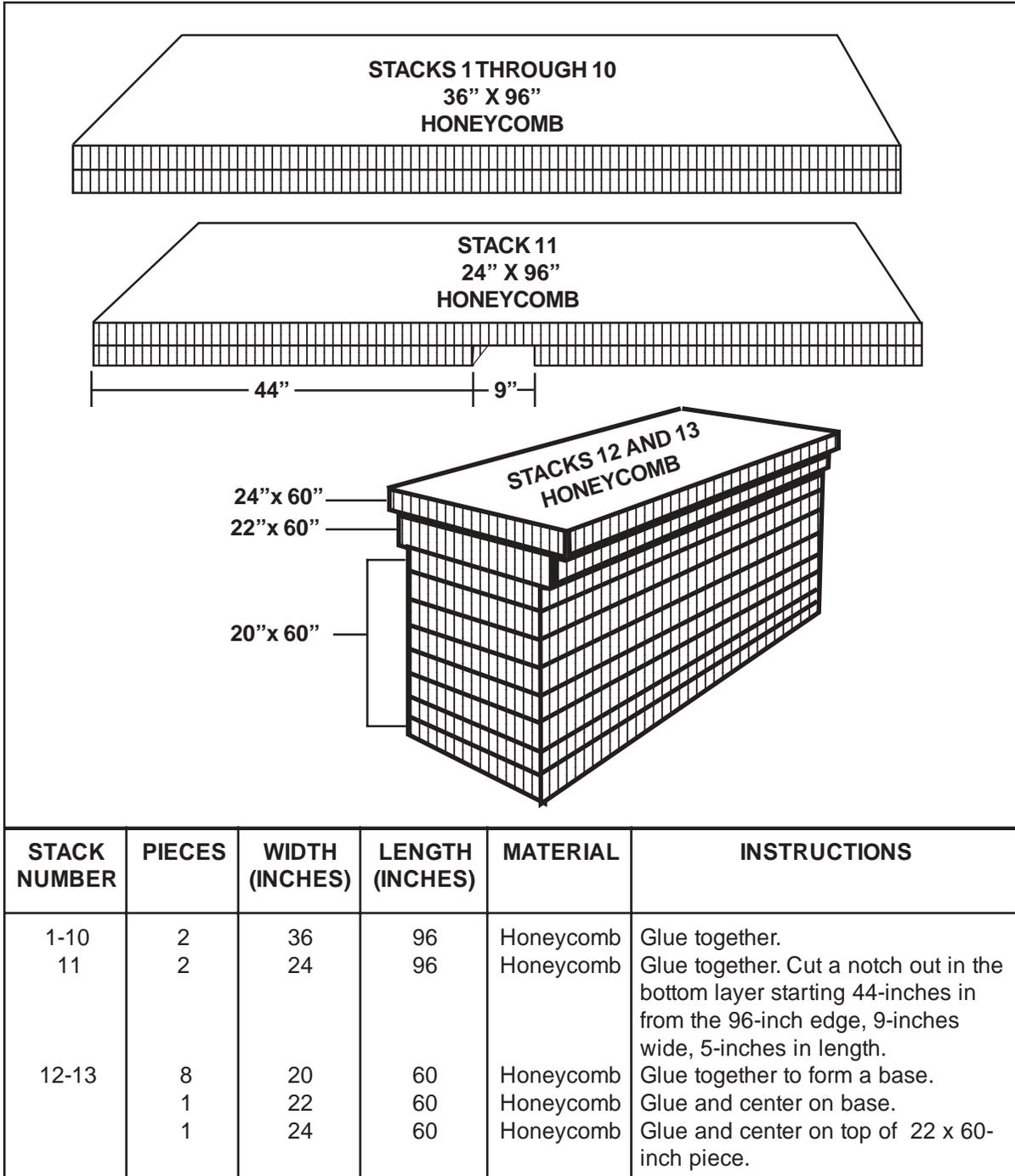


Figure 4-114. Honeycomb Stacks Prepared

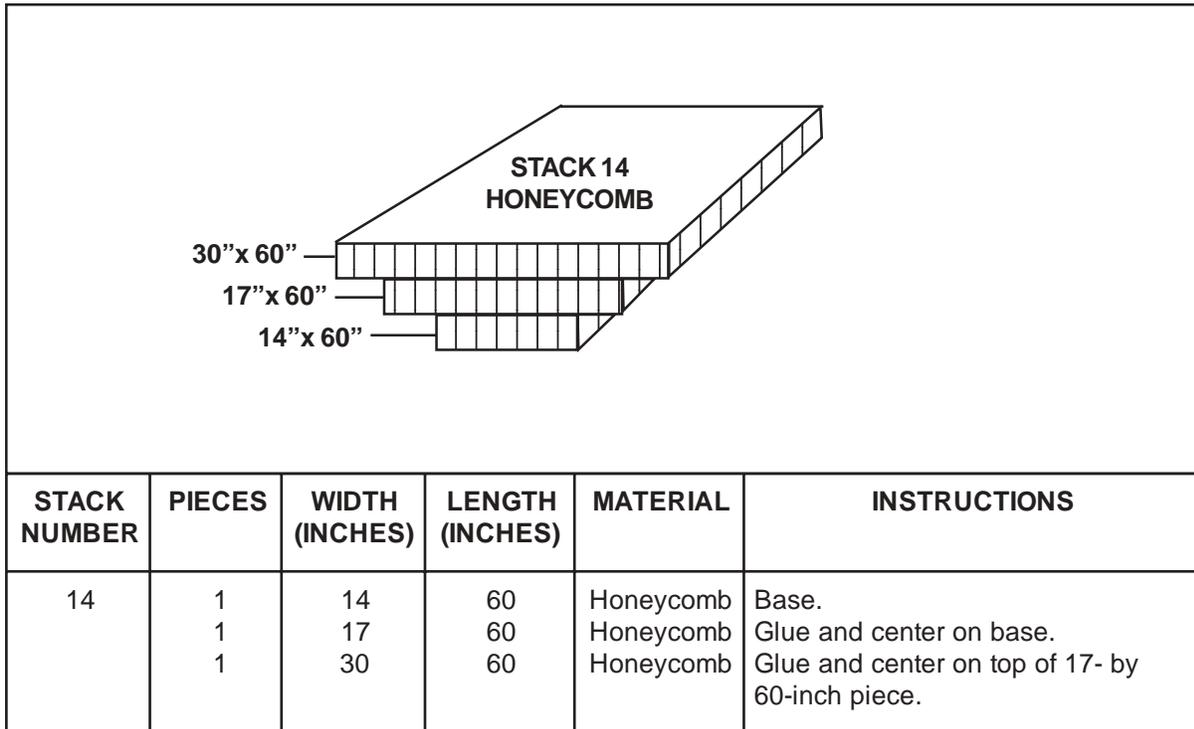


Figure 4-114. Honeycomb Stacks Prepared (Continued)

### POSITIONING HONEYCOMB STACKS

4-79. Position honeycomb stacks 1 through 11 as shown in Figure 4-115.

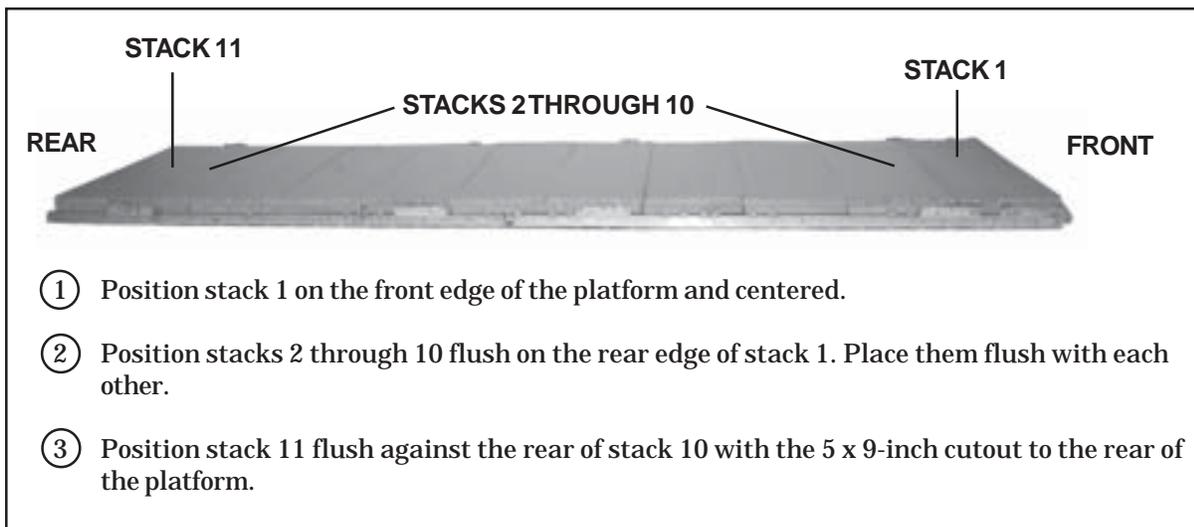


Figure 4-115. Positioning Honeycomb Stacks 1 through 11 Positioned

## POSITIONING AND LASHING THE DRUMS

4-80. Position and lash the drums to the platform as shown in Figures 4-116 through 4-128.

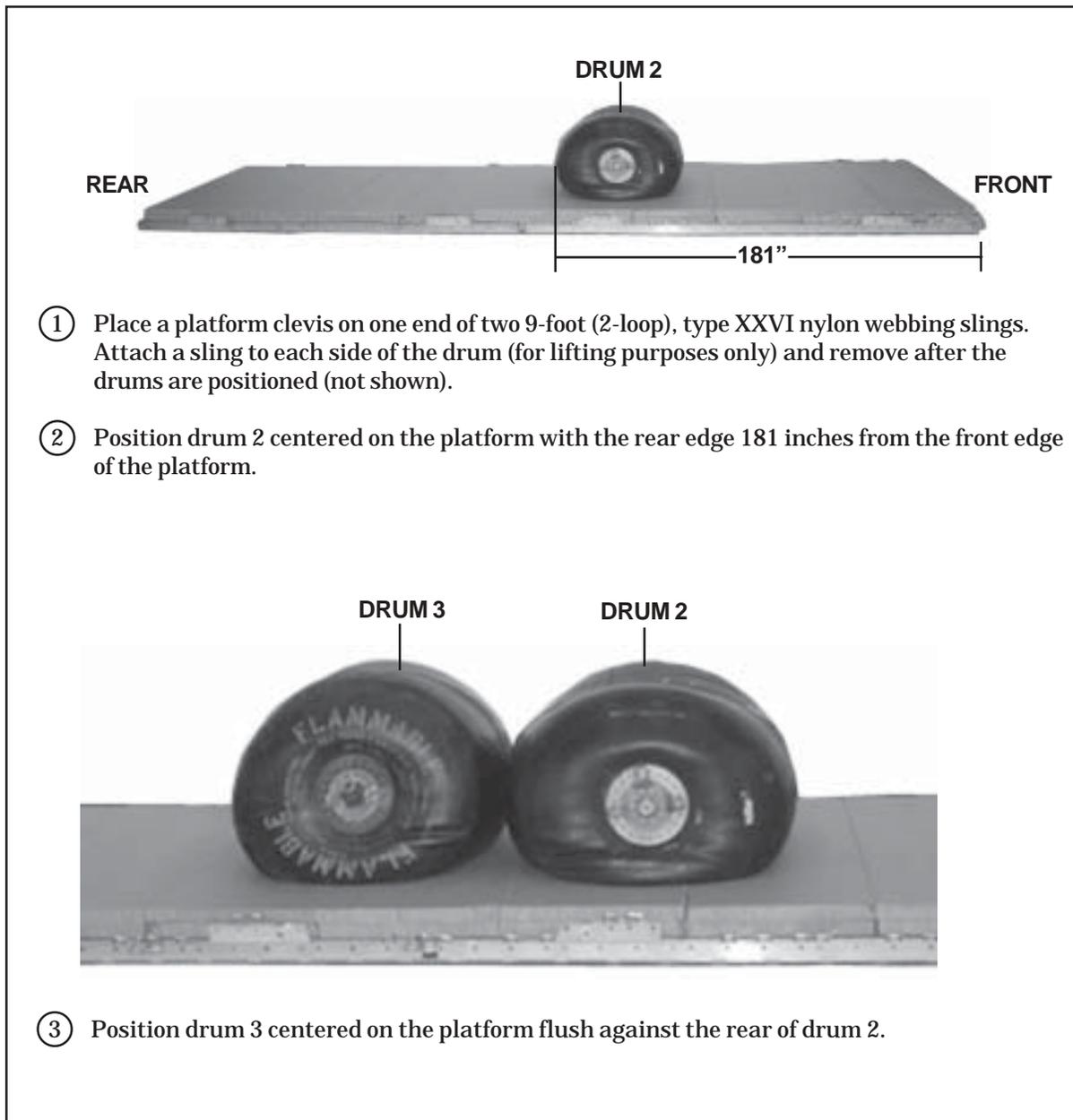
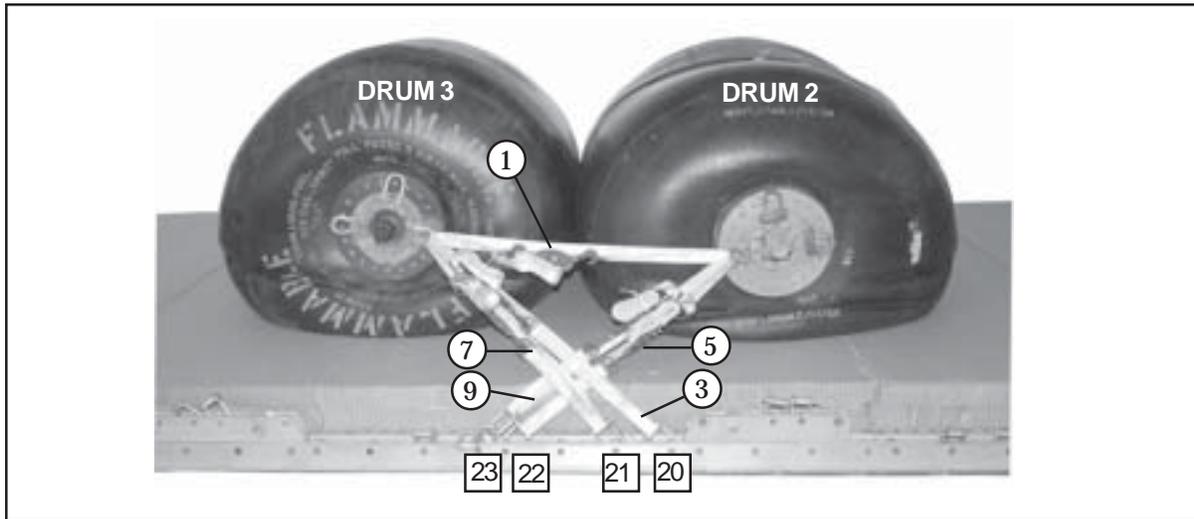


Figure 4-116. Fuel Drums 2 and 3 Positioned



Lashing Number	Tie-down Clevis Number	Instructions
1		Route a lashing from the rear shackle of drum 2 to the front shackle of drum 3 on the right side.
2		Route a lashing from the rear shackle of drum 2 to the front shackle of drum 3 on the left side.
3	20	Route a lashing from clevis 20 to the front right shackle on drum 3.
4	20A	Route a lashing from clevis 20A to the front left shackle on drum 3.
5	22	Route a lashing from clevis 22 to the rear right shackle on drum 2.
6	22A	Route a lashing from clevis 22A to the rear left shackle on drum 2.
7	21	Route a lashing from clevis 21 to the front right shackle on drum 3.
8	21A	Route a lashing from clevis 21A to the front left shackle on drum 3.
9	23	Route a lashing from clevis 23 to the rear right shackle on drum 2.
10	23A	Route a lashing from clevis 23A to the rear left shackle on drum 2.

Figure 4-117. Lashings 1 through 10 Installed

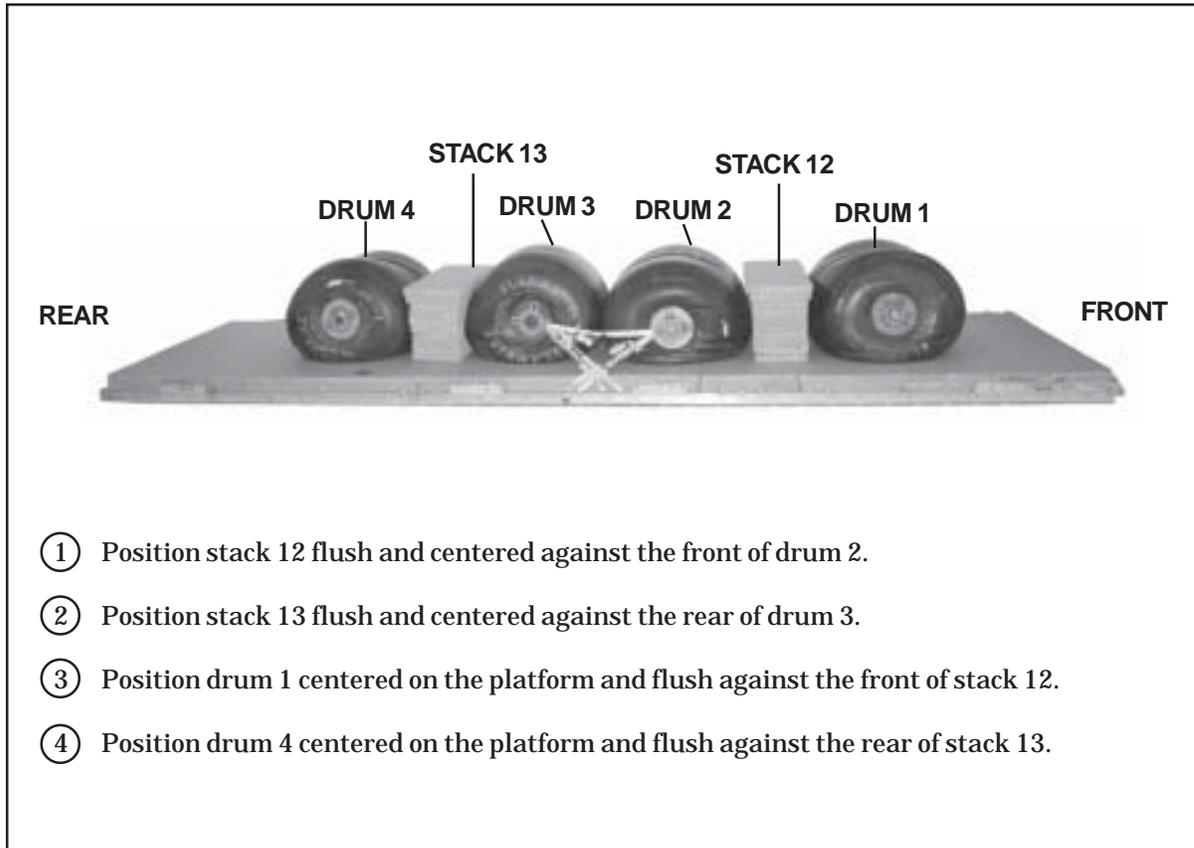


Figure 4-118. Fuel Drums 1 and 4 Positioned

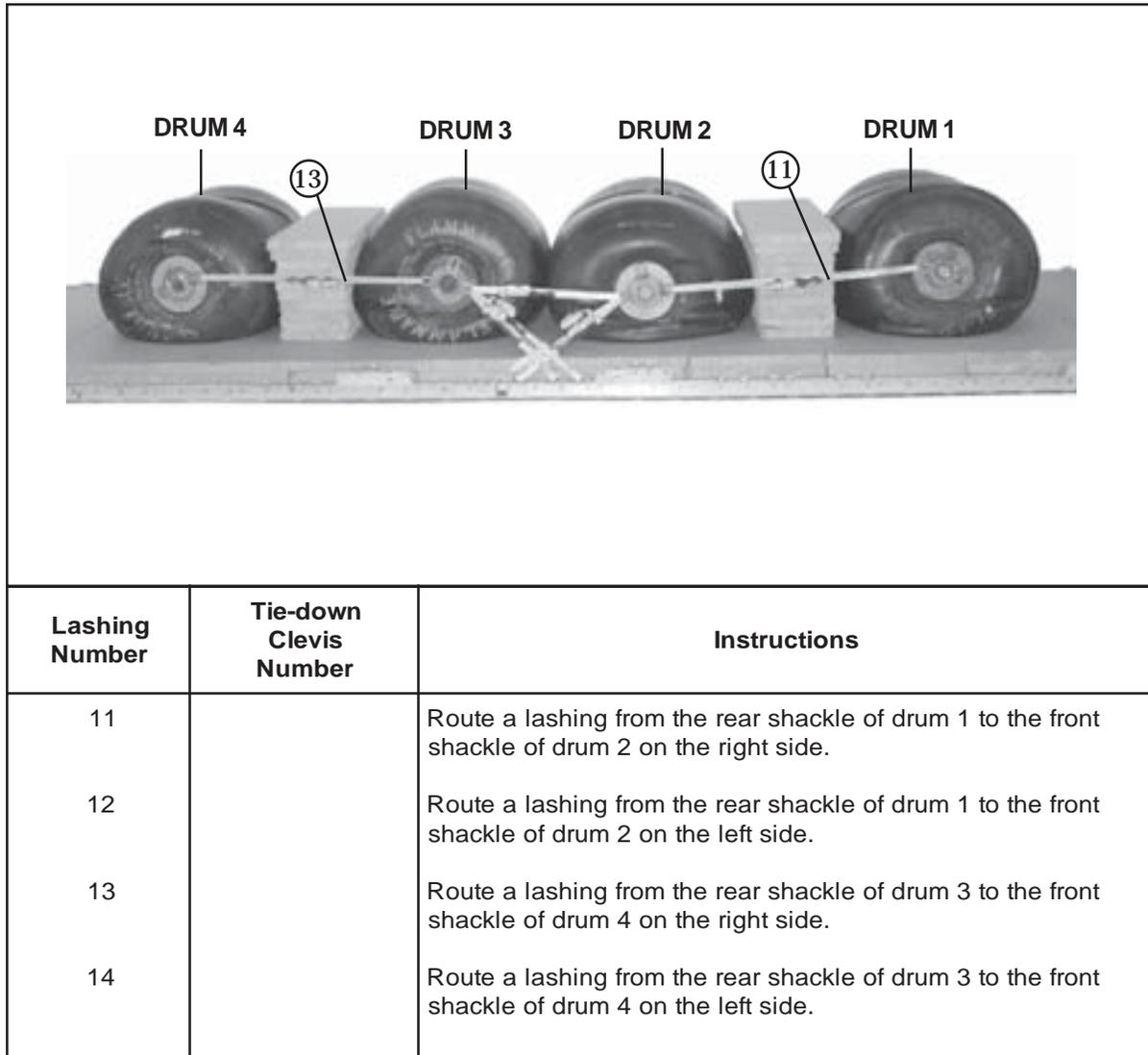
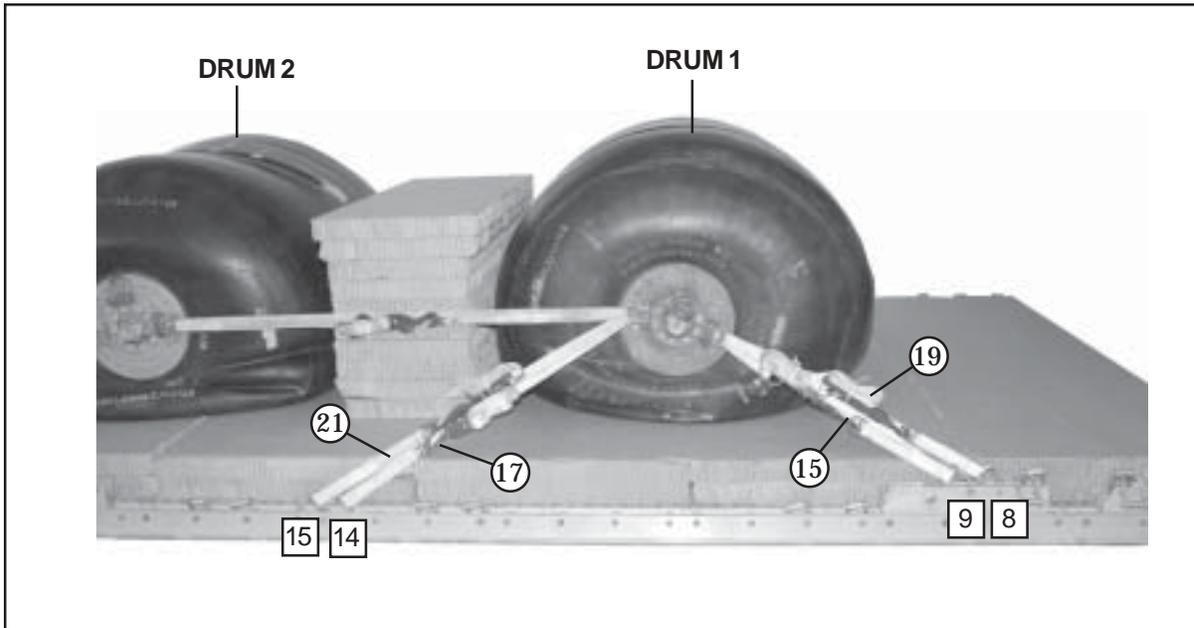


Figure 4-119. Lashings 11 through 14 Installed



Lashing Number	Tie-down Clevis Number	Instructions
15	9	Route a lashing from clevis 9 to the front right shackle on drum 1.
16	9A	Route a lashing from clevis 9A to the front left shackle on drum 1.
17	14	Route a lashing from clevis 14 to the rear right shackle on drum 1.
18	14A	Route a lashing from clevis 14A to the rear left shackle on drum 1.
19	8	Route a lashing from clevis 8 to the front right shackle on drum 1.
20	8A	Route a lashing from clevis 8A to the front left shackle on drum 1.
21	15	Route a lashing from clevis 15 to the rear right shackle on drum 1.
22	15A	Route a lashing from clevis 15A to the rear left shackle on drum 1.

Figure 4-120. Lashings 15 through 22 Installed

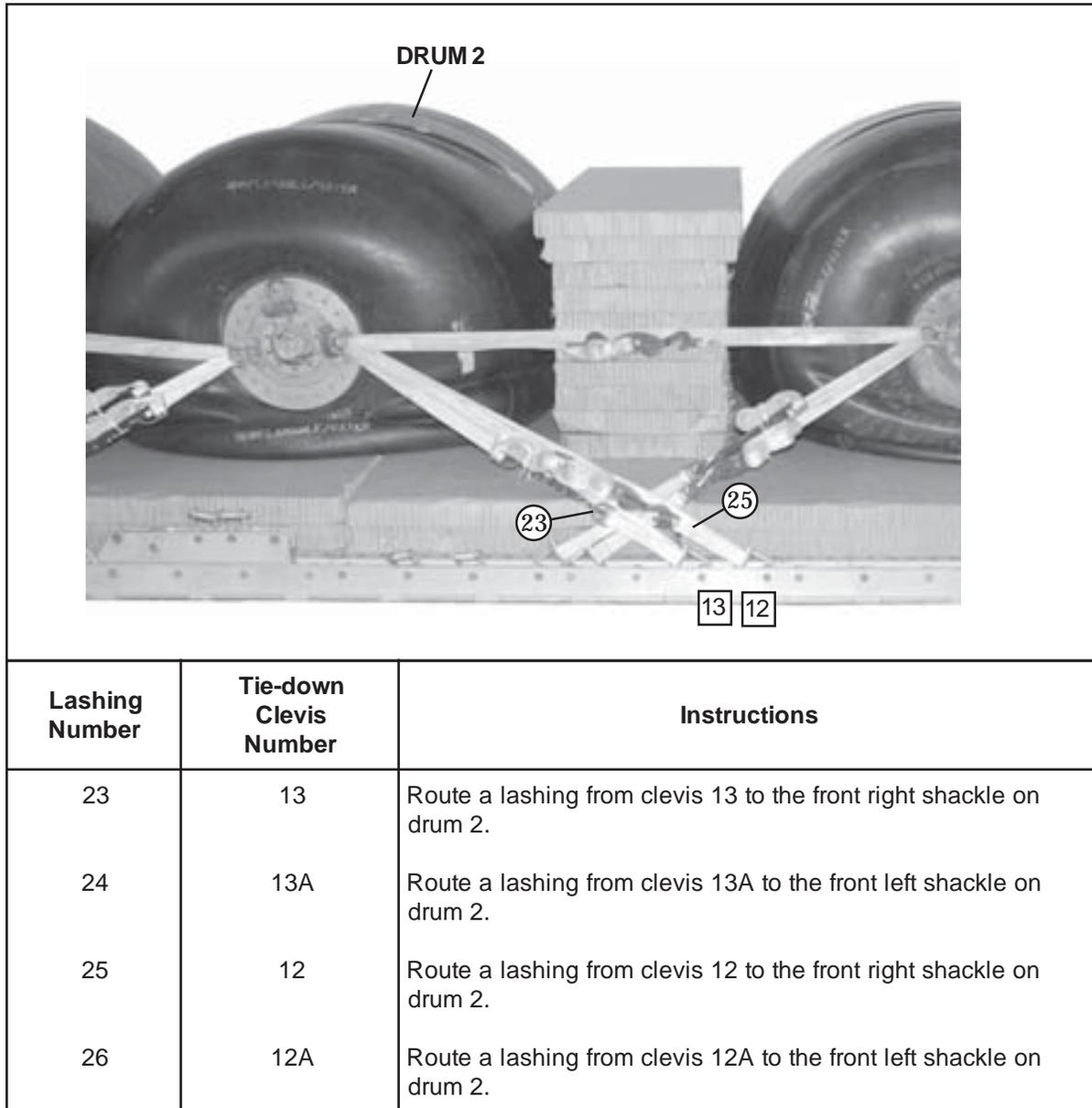
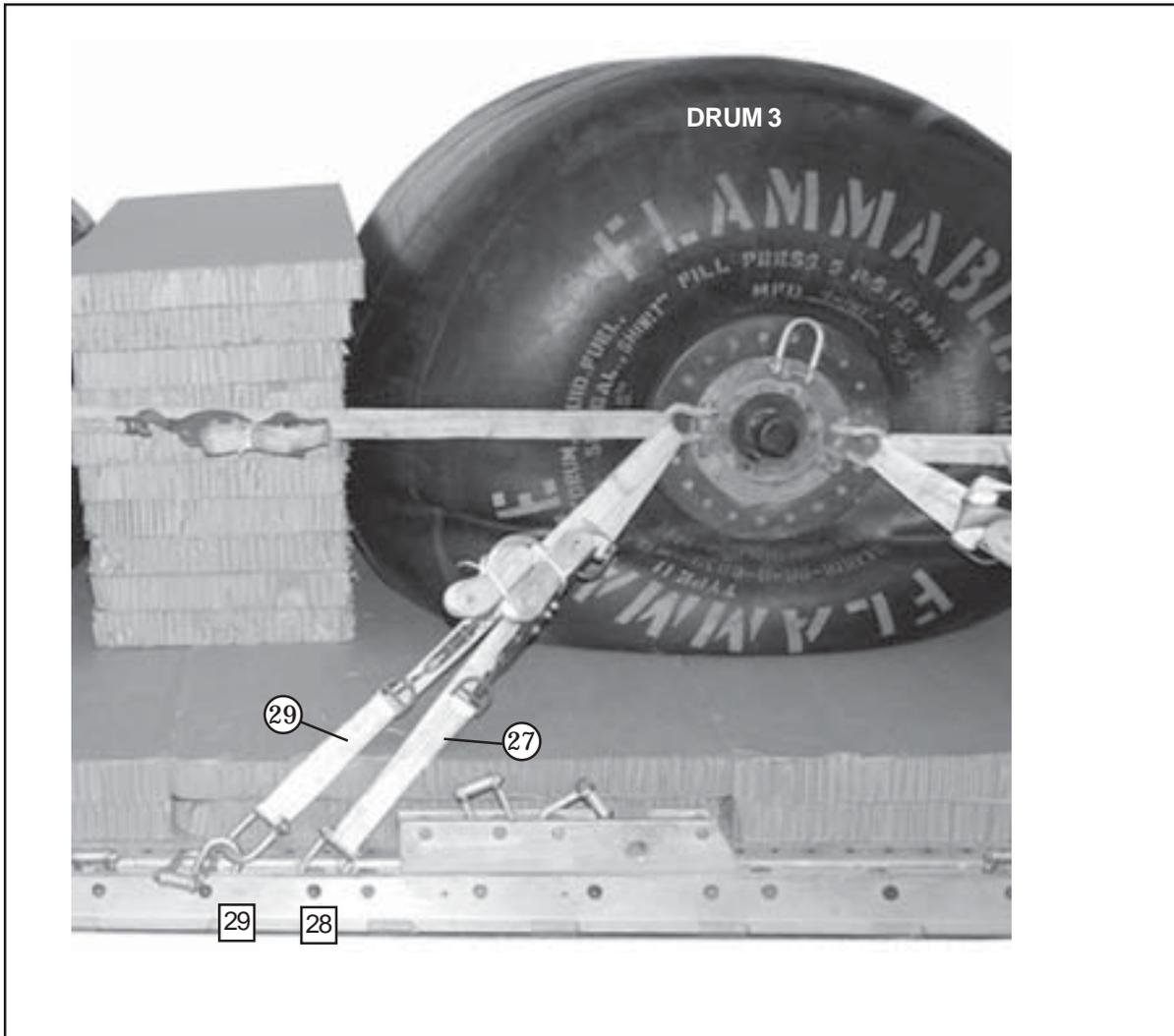
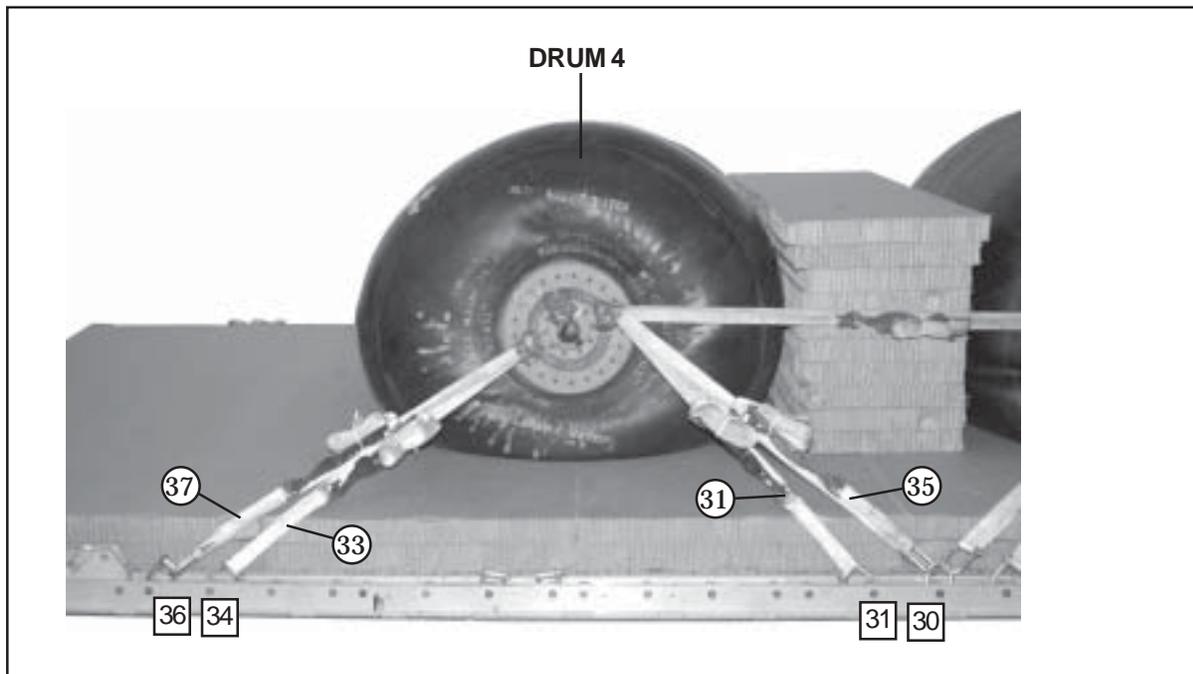


Figure 4-121. Lashings 23 through 26 Installed



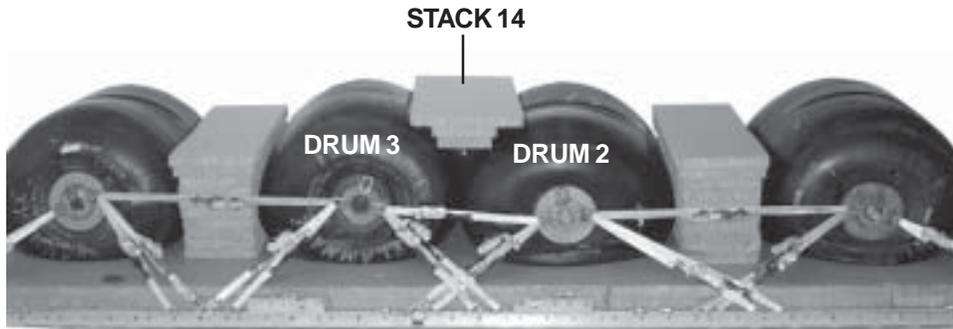
Lashing Number	Tie-down Clevis Number	Instructions
27	28	Route a lashing from clevis 28 to the rear right shackle on drum 3.
28	28A	Route a lashing from clevis 28A to the rear left shackle on drum 3.
29	29	Route a lashing from clevis 29 to the rear right shackle on drum 3.
30	29A	Route a lashing from clevis 29A to the rear left shackle on drum 3.

Figure 4-122. Lashings 27 through 30 Installed

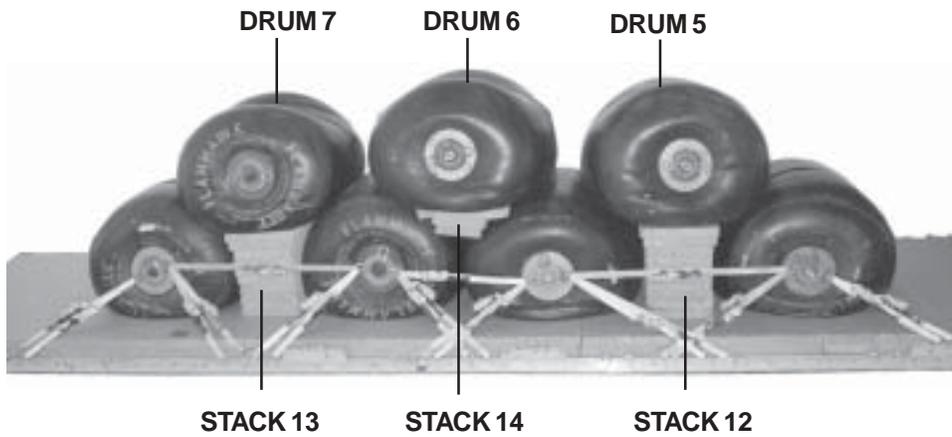


Lashing Number	Tie-down Clevis Number	Instructions
31	31	Route a lashing from clevis 31 to the front right shackle on drum 4.
32	31A	Route a lashing from clevis 31A to the front left shackle on drum 4.
33	34	Route a lashing from clevis 34 to the rear right shackle on drum 4.
34	34A	Route a lashing from clevis 34A to the rear left shackle on drum 4.
35	30	Route a lashing from clevis 30 to the front right shackle on drum 4.
36	30A	Route a lashing from clevis 30A to the front left shackle on drum 4.
37	36	Route a lashing from clevis 36 to the rear right shackle on drum 4.
38	36A	Route a lashing from clevis 36A to the rear left shackle on drum 4.

Figure 4-123. Lashings 31 through 38 Installed

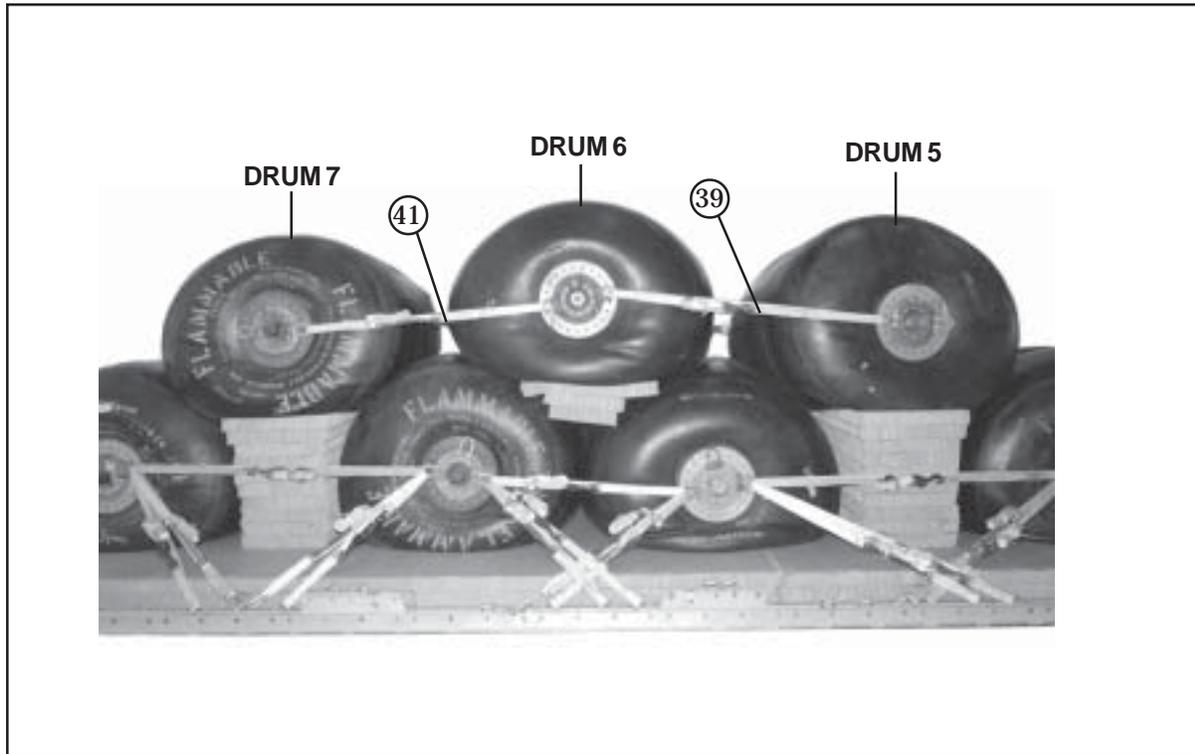


- ① Position stack 14 on top and centered between drums 2 and 3.



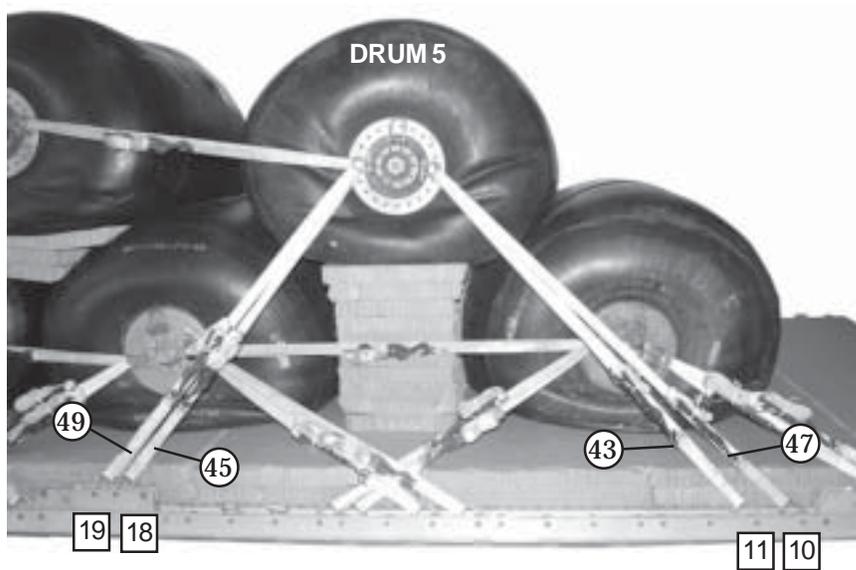
- ② Position drum 5 centered on stack 12.
- ③ Position drum 6 centered on stack 14.
- ④ Position drum 7 centered on stack 13.

Figure 4-124. Fuel Drums 5 through 7 Positioned



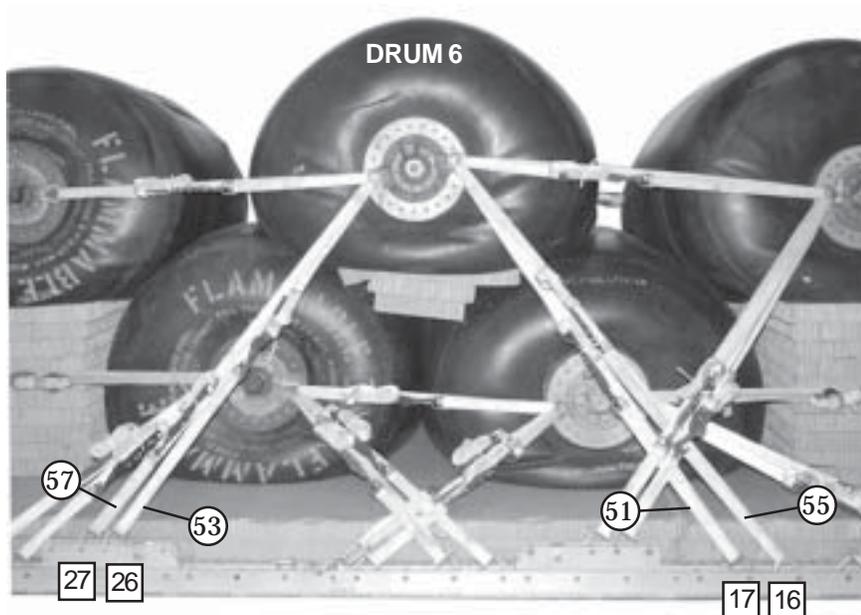
Lashing Number	Tie-down Clevis Number	Instructions
39		Route a lashing from the rear shackle of drum 5 to the front shackle of drum 6 on the right side.
40		Route a lashing from the rear shackle of drum 5 to the front shackle of drum 6 on the left side.
41		Route a lashing from the rear shackle of drum 6 to the front shackle of drum 7 on the right side.
42		Route a lashing from the rear shackle of drum 6 to the front shackle of drum 7 on the left side.

Figure 4-125. Lashings 39 through 42 Installed



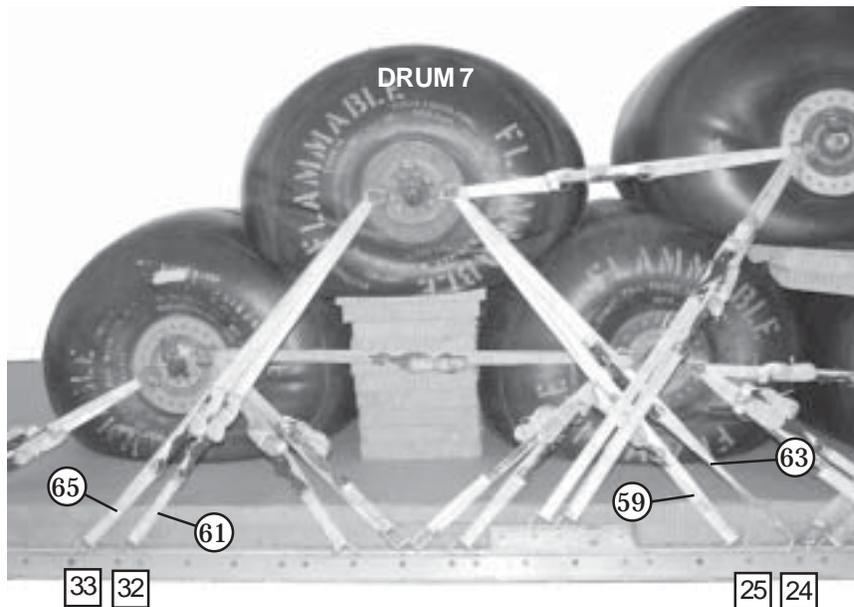
Lashing Number	Tie-down Clevis Number	Instructions
43	11	Route a lashing from clevis 11 to the front right shackle on drum 5.
44	11A	Route a lashing from clevis 11A to the front left shackle on drum 5.
45	18	Route a lashing from clevis 18 to the rear right shackle on drum 5.
46	18A	Route a lashing from clevis 18A to the rear left shackle on drum 5.
47	10	Route a lashing from clevis 10 to the front right shackle on drum 5.
48	10A	Route a lashing from clevis 10A to the front left shackle on drum 5.
49	19	Route a lashing from clevis 19 to the rear right shackle on drum 5.
50	19A	Route a lashing from clevis 19A to the rear left shackle on drum 5.

Figure 4-126. Lashings 43 through 50 Installed



Lashing Number	Tie-down Clevis Number	Instructions
51	17	Route a lashing from clevis 17 to the front right shackle on drum 6.
52	17A	Route a lashing from clevis 17A to the front left shackle on drum 6.
53	26	Route a lashing from clevis 26 to the rear right shackle on drum 6.
54	26A	Route a lashing from clevis 26A to the rear left shackle on drum 6.
55	16	Route a lashing from clevis 16 to the front right shackle on drum 6.
56	16A	Route a lashing from clevis 16A to the front left shackle on drum 6.
57	27	Route a lashing from clevis 27 to the rear right shackle on drum 6.
58	27A	Route a lashing from clevis 27A to the rear left shackle on drum 6.

Figure 4-127. Lashings 51 through 58 Installed



Lashing Number	Tie-down Clevis Number	Instructions
59	25	Route a lashing from clevis 25 to the front right shackle on drum 7.
60	25A	Route a lashing from clevis 25A to the front left shackle on drum 7.
61	32	Route a lashing from clevis 32 to the rear right shackle on drum 7.
62	32A	Route a lashing from clevis 32A to the rear left shackle on drum 7.
63	24	Route a lashing from clevis 24 to the front right shackle on drum 7.
64	24A	Route a lashing from clevis 24A to the front left shackle on drum 7.
65	33	Route a lashing from clevis 33 to the rear right shackle on drum 7.
66	33A	Route a lashing from clevis 33A to the rear left shackle on drum 7.

Figure 4-128. Lashings 59 through 66 Installed

## **BUILDING THE EQUIPMENT BOXES**

4-81. Build the front and rear equipment boxes as shown in Figures 4-93 and 4-94.

## **PREPARING EQUIPMENT FOR EQUIPMENT BOXES**

4-82. Prepare the fire extinguishers, filter separator, explosion proof motor, pumps, manuals and toolkit as explained and shown in paragraph 4-6. Using the lists printed on the equipment bags, place the equipment indicated on each list into its bag. Prepare and secure the battery box as shown in Figure 4-95.

## **POSITIONING EQUIPMENT BOXES**

4-83. Prepare and position the front and rear equipment boxes as shown in Figures 4-96 and 4-97.

## **POSITIONING AND SECURING EQUIPMENT IN EQUIPMENT BOXES**

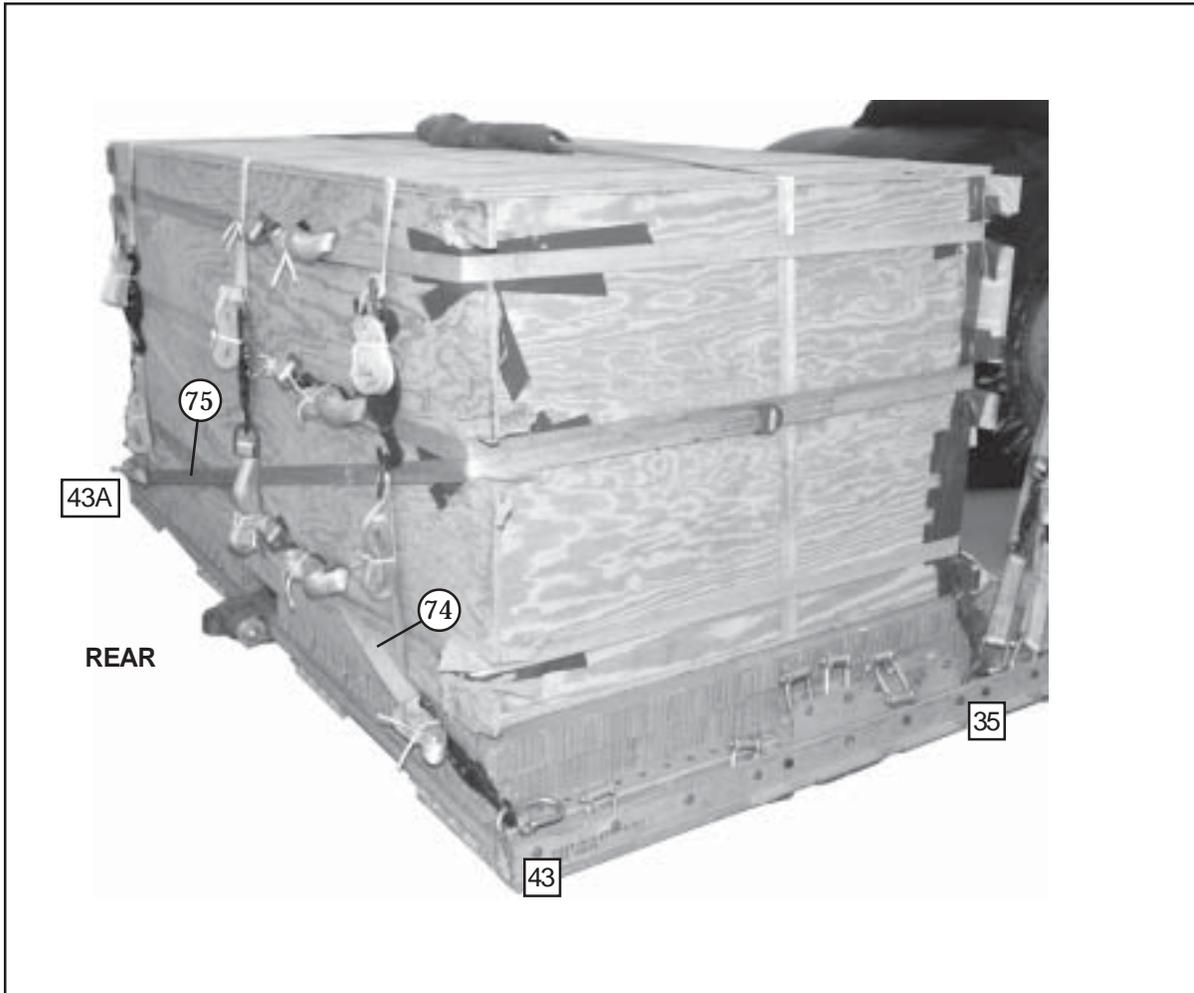
4-84. Position and secure equipment in equipment boxes as shown in Figures 4-98 and 4-99.

## **LASHING THE EQUIPMENT BOXES TO THE PLATFORM**

4-85. Lash the equipment boxes as shown in Figures 4-100 through 4-102 and Figures 4-129 through 4-131.

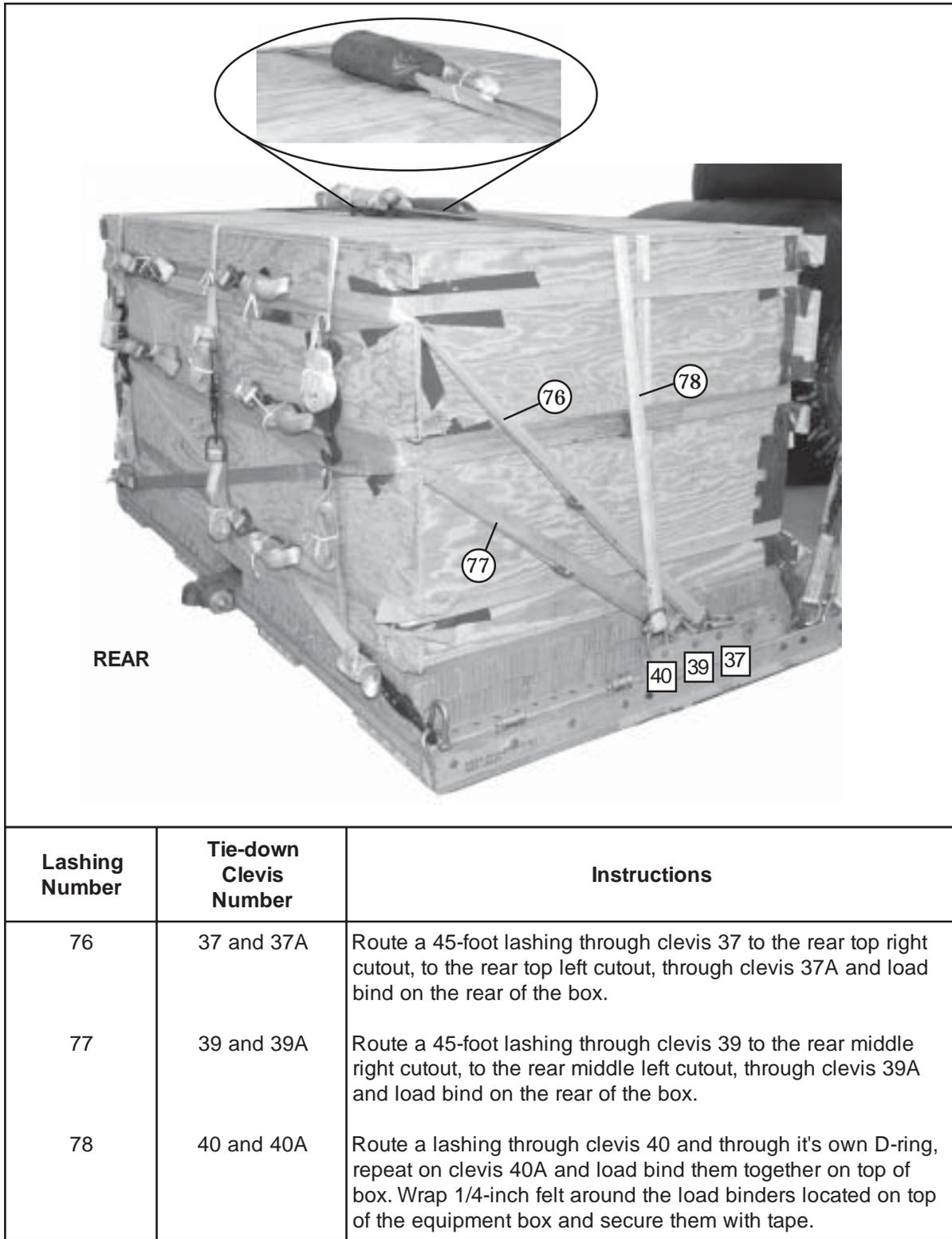
**a.** Lash the front equipment box to the platform as shown in Figures 4-100 through 4-102.

**b.** Lash the rear equipment box to the platform as shown in Figures 4-129 through 4-131.



Lashing Number	Tie-down Clevis Number	Instructions
74	35 and 43	Route a 30-foot lashing from clevis 35 to the front middle left cutout, to the rear middle left cutout, to clevis 43. Ensure lashing is routed under the load binders on the rear of box.
75	35A and 43A	Route a 30-foot lashing from clevis 35A to the front middle right cutout, to the rear middle right cutout, to clevis 43A. Ensure lashing is routed under the load binders on the rear of the box.

**Figure 4-129. Lashings 74 and 75 Installed**



Lashing Number	Tie-down Clevis Number	Instructions
76	37 and 37A	Route a 45-foot lashing through clevis 37 to the rear top right cutout, to the rear top left cutout, through clevis 37A and load bind on the rear of the box.
77	39 and 39A	Route a 45-foot lashing through clevis 39 to the rear middle right cutout, to the rear middle left cutout, through clevis 39A and load bind on the rear of the box.
78	40 and 40A	Route a lashing through clevis 40 and through it's own D-ring, repeat on clevis 40A and load bind them together on top of box. Wrap 1/4-inch felt around the load binders located on top of the equipment box and secure them with tape.

Figure 4-130. Lashings 76 through 78 Installed



Lashing Number	Tie-down Clevis Number	Instructions
79	41 and 41A	Route a 45-foot lashing through clevis 41 to the front middle right cutout, to the front middle left cutout, through clevis 41A and load bind on the front of the box.
80	42 and 42A	Route a 45-foot lashing through clevis 42 to the front top right cutout, to the front top left cutout, through clevis 42A and load bind on the front of the box.

**Figure 4-131. Lashings 79 and 80 Installed**

## INSTALLING SUSPENSION SLINGS AND SAFETY TIES

4-86. Install suspension slings as shown in Figure 4-107. Install the suspension sling safety ties as shown in Appendix A, to the front and rear suspension slings, six to eight inches above drum 1 and drum 4. (not shown)

## SECURING THE SUSPENSION SLINGS

4-87. Make the following suspension slings securing ties as shown in Figure 4-132.

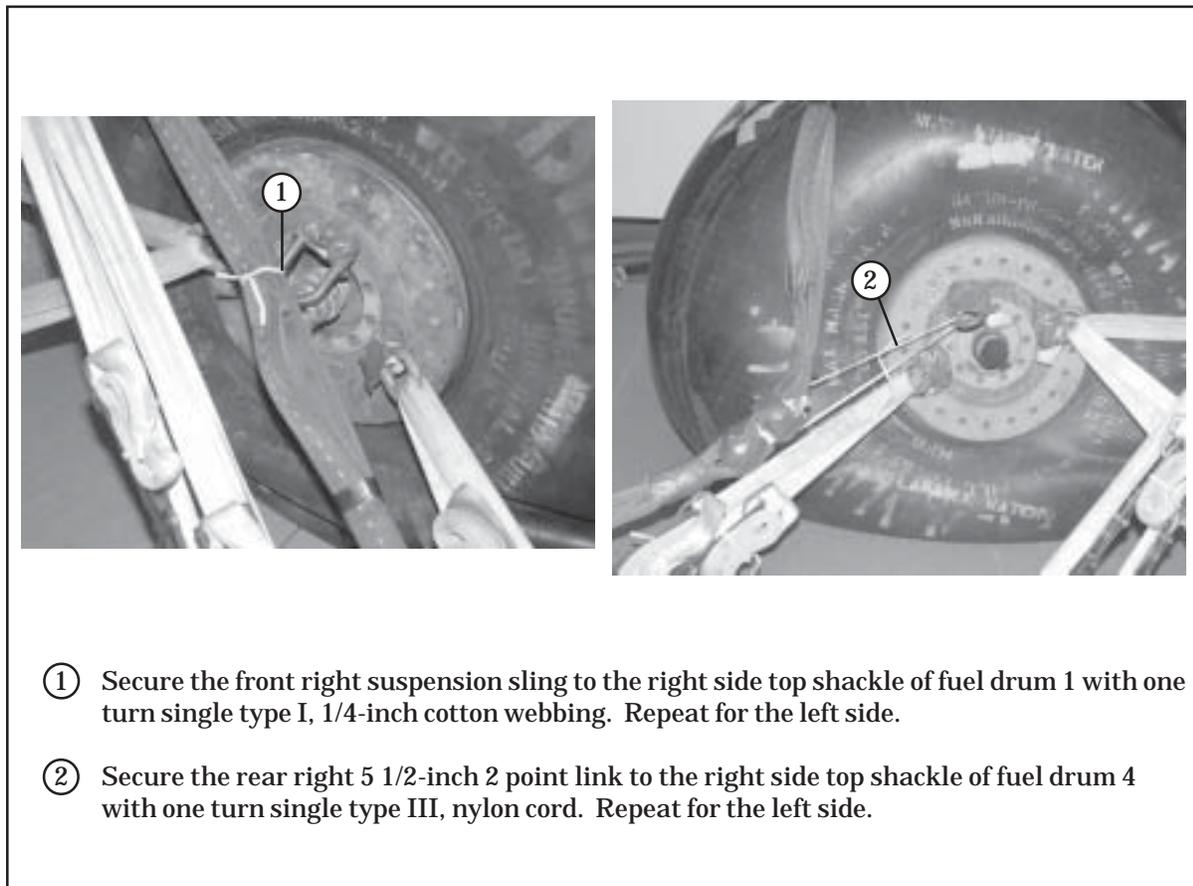
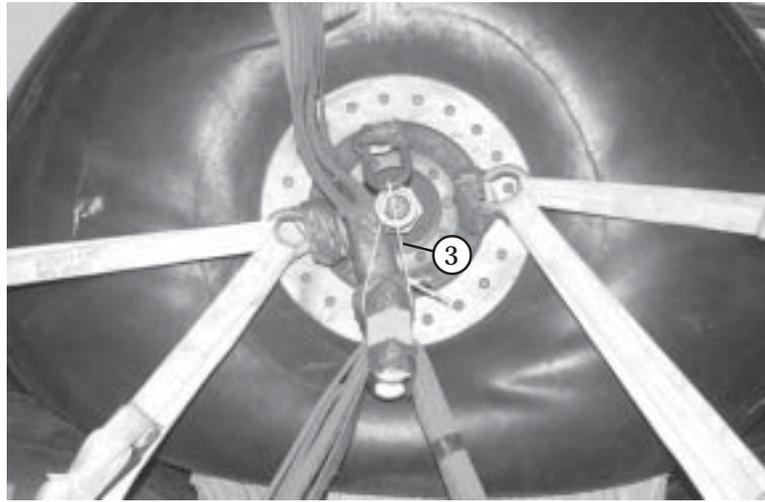
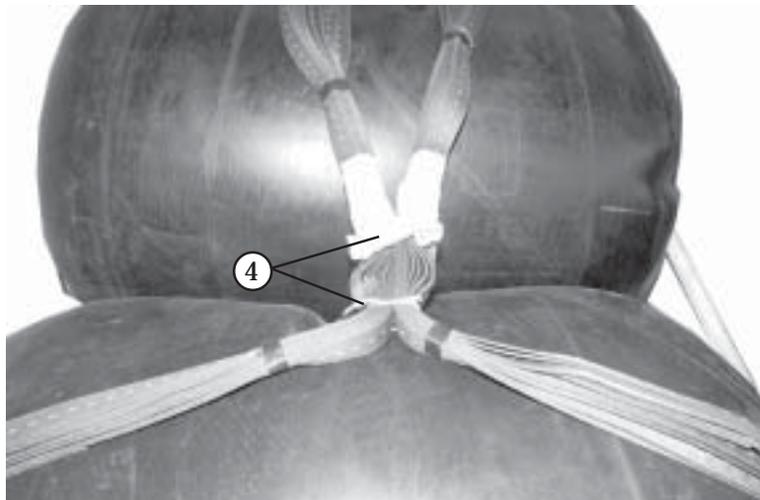


Figure 4-132. Suspension Slings Secured



- ③ Secure the center right 5 1/2-inch 2 point link to the right side top shackle on drum 6 with a single length of type III, nylon cord. Repeat for left side.



- ④ Secure the rear slings together on top of fuel drum 4 with one turn single type I, 1/4-inch cotton webbing. S-fold and secure the safety tie with masking tape.

Figure 4-132. Suspension Slings Secured (Continued)

## PREPARING AND STOWING CARGO PARACHUTES

4-88. Prepare and stow seven G-11 cargo parachutes as shown in Figure 4-133.

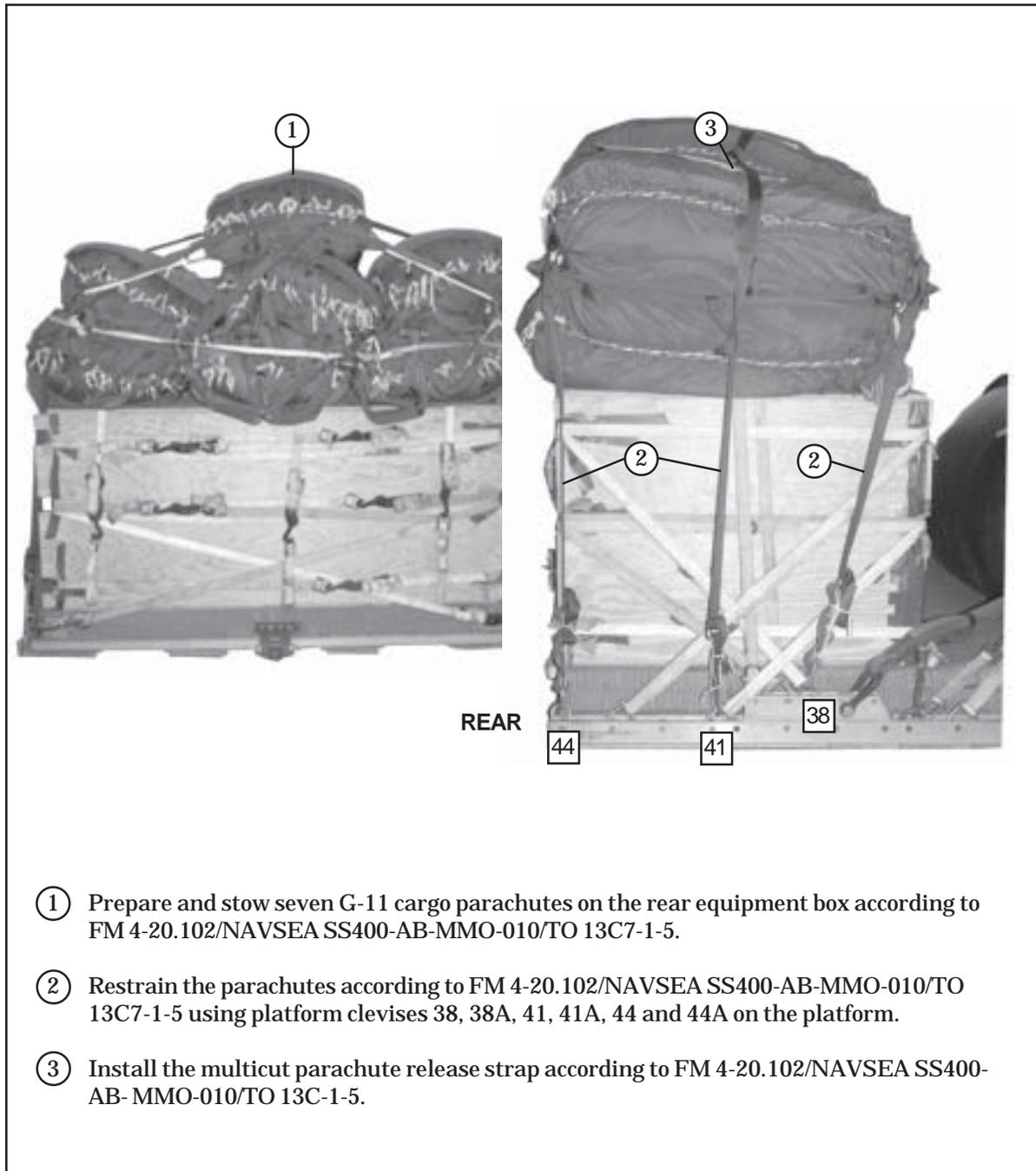


Figure 4-133. Cargo Parachutes Prepared and Stowed

## BUILDING AND POSITIONING RELEASE PLATFORM

4-89. Build and position the release platform as shown in Figure 4-134.

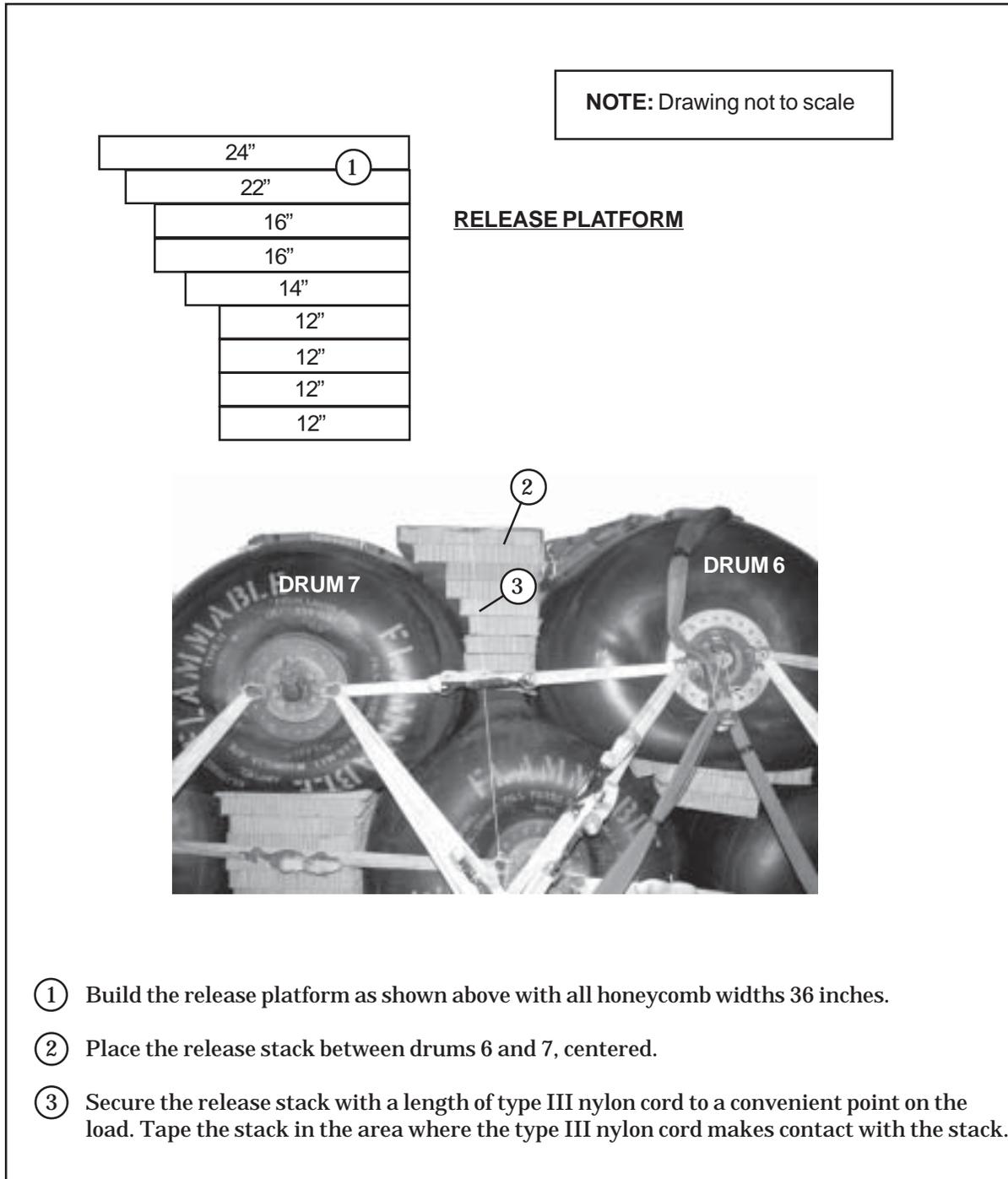


Figure 4-134. Release Platform Built and Positioned

## INSTALLING THE EXTRACTION SYSTEM

4-90. Install the extraction system as shown in Figure 4-135.

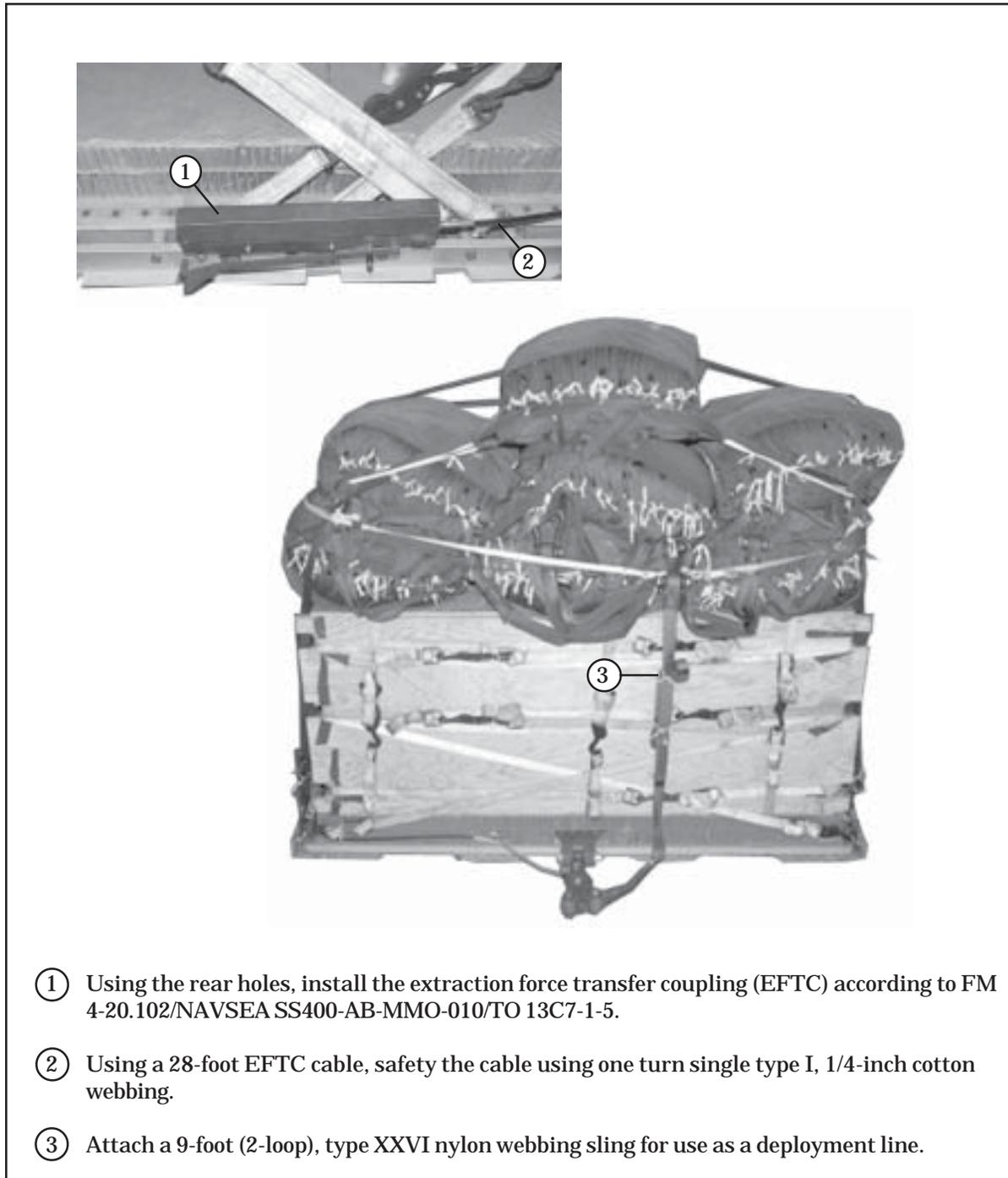
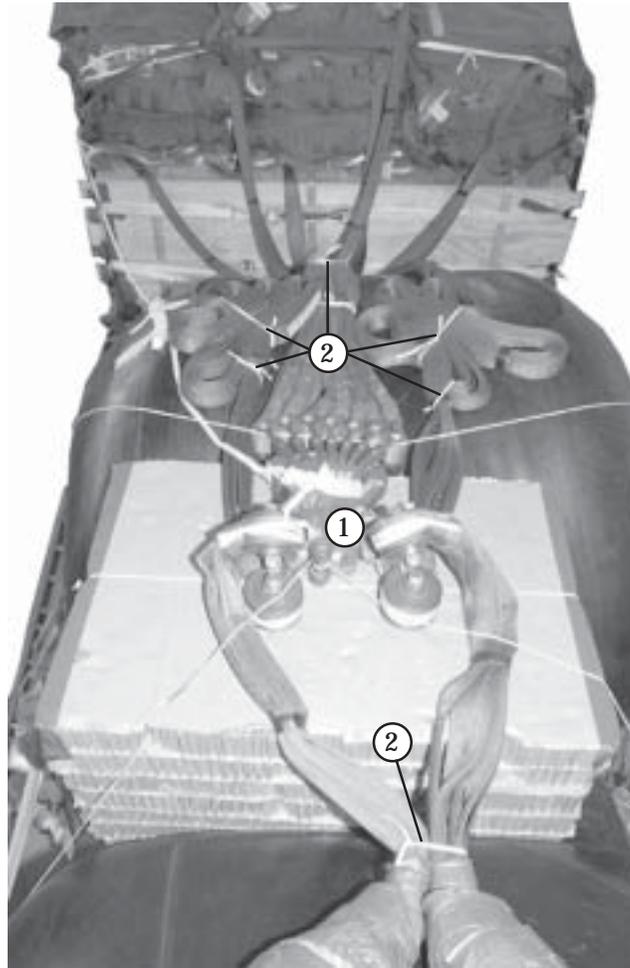


Figure 4-135. Extraction System Installed

## INSTALLING THE CARGO PARACHUTE RELEASE SYSTEM

4-91. Install the M-2 cargo parachute release system as shown in Figure 4-136.



- ① Place the M-2 release on the release platform. Attach the suspension slings and the parachute riser extensions to the M-2 cargo parachute release according to FM 4-20.102/NAVSEA SS400-AB-MMO-010/TO 13C7-1-5. Secure the cargo parachute release with type III nylon cord.
- ② Secure the excess suspension slings and parachute risers extensions with one turn type I, 1/4-inch cotton webbing.
- ③ S-fold and secure the front safety tie with paper tape (not shown).

Figure 4-136. Cargo Parachute Release Installed

## **PLACING EXTRACTION PARACHUTE**

4-92. Select the extraction parachute and extraction line needed using the extraction line requirements table in FM 4-20.102/NAVSEA SS400-AB-MMO-010/TO 13C7-1-5. Rig the extraction line in an extraction line bag according to TM 10-1670-286-20/TO 13C5-2-41. Place the extraction parachute and extraction line on the load for installation in the aircraft.

## **INSTALLING PROVISIONS FOR EMERGENCY RESTRAINTS**

4-93. Select and install the provisions for emergency aft restraints according to the emergency aft restraint requirements table in FM 4-20.102/NAVSEA SS400-AB-MMO-010/TO 13C7-1-5.

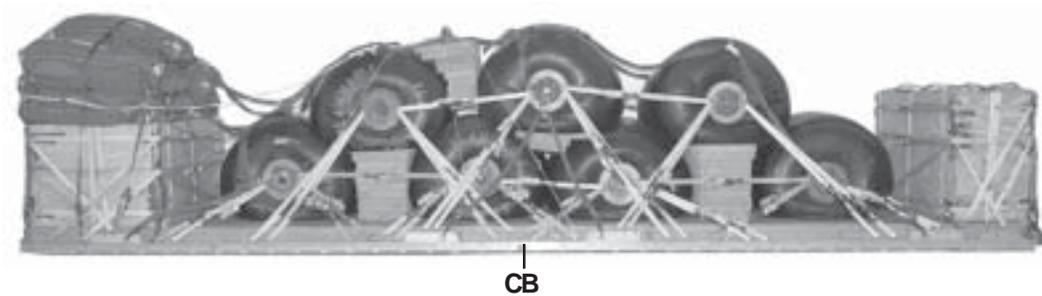
## **MARKING RIGGED LOAD**

4-94. Mark the rigged load according to FM 4-20.102/NAVSEA SS400-AB-MMO-010/TO 13C7-1-5 and as shown in Figure 4-137. Complete Shipper's Declaration for Dangerous Goods and affix to the load. If the load varies from the one shown, the weight, height, CB, tipoff curve, and parachute requirements must be recomputed.

## **EQUIPMENT REQUIRED**

4-95. Use the equipment list in Table 4-6 to rig the load shown in Figure 4-137.

**CAUTION**  
 Make the final inspection required by FM 4-20.102/NAVSEA  
 SS400-AB-MMO-010/TO 13C7-1-5 before the load leaves  
 the rigging site.



**RIGGED LOAD DATA**

**Weight** ..... 36,480 pounds

**NOTE:** The rigged weight for this load is using water as the liquid. Use the weight conversion table for the actual rigged weight for any other liquids used.

**NOTE:** The G-11 requirements may need to be recomputed for lighter liquids.

**Maximum Weight** ..... 36,750 pounds

**Height** ..... 96 inches

**Width** ..... 108 inches

**Overall Length** ..... 402 inches

**Overhang: Front** ..... 0 inches

**Rear (EFTC)** ..... 18 inches

**Center of Balance (CB) (from front edge of platform)** ..... 191 inches

**Figure 4-137. AAFARS Rigged with Seven 500-Gallon Drums for Low-Velocity Airdrop**

Table 4-6. Equipment Required for Rigging AAFARS With Seven 500-Gallon Drums

National Stock Number	Item	Quantity
8040-00-273-8713	Adhesive paste, 1-gal	As required
1670-01-035-6054	Bridle, extraction line bag (for DES)	1
4030-00-090-5354	Clevis, large	12
4030-00-678-8562	Clevis, medium	6
4020-00-240-2146	Cord, nylon, type III, 550-lb	As required
1670-00-326-7309	Coupling assembly, airdrop, extraction force transfer w/ cable, 28-ft	1
1670-00-360-0328	Cover, clevis, large	7
8135-00-664-6958	Cushioning material, packaging, cellulose wadding	As required
8305-00-958-3685	Felt, 1/2-in thick	As required
1670-00-003-4391	Knife, parachute bag (for DES)	1
1670-01-183-2678	Leaf, extraction line (line bag)(add1 for DES)	2
1670-01-064-4452	Line, drogue (for DES) 60-foot (1-loop), type XXVI	1
1670-01-064-4454	Line, extraction For C-130: 60-ft (6-loop), type XXVI	1
1670-01-062-6312	For C-141: 120-ft (6-loop), type XXVI	1
1670-01-062-6312	For C5: (between fuselage station 1667-1971) 120-ft (6-loop), type XXVI	1
1670-01-062-6312	(between fuselage station 947-1666) 120-ft (6-loop), type XXVI and a	1
1670-01-064-4454	60-ft (6-loop), type XXVI	1
1670-01-062-6312	(between fuselage station 574-947) 120-ft (6-loop), type XXVI	2
1670-01-468-9178	For C-17: 140-ft (6-loop), type XXVI	
	Link assembly:	
	Two-point: (for DES)	
5306-00-435-8994	Bolt, 1-in diam, 4-in long	2
5310-00-232-5165	Nut, 1-in, hexagonal	2
1670-00-003-1953	Plate, side, 3 3/4-in	2
5365-00-007-3414	Spacer, large	2

**Table 4-6. Equipment Required for Rigging AAFARS With Seven 500-Gallon Drums (Continued)**

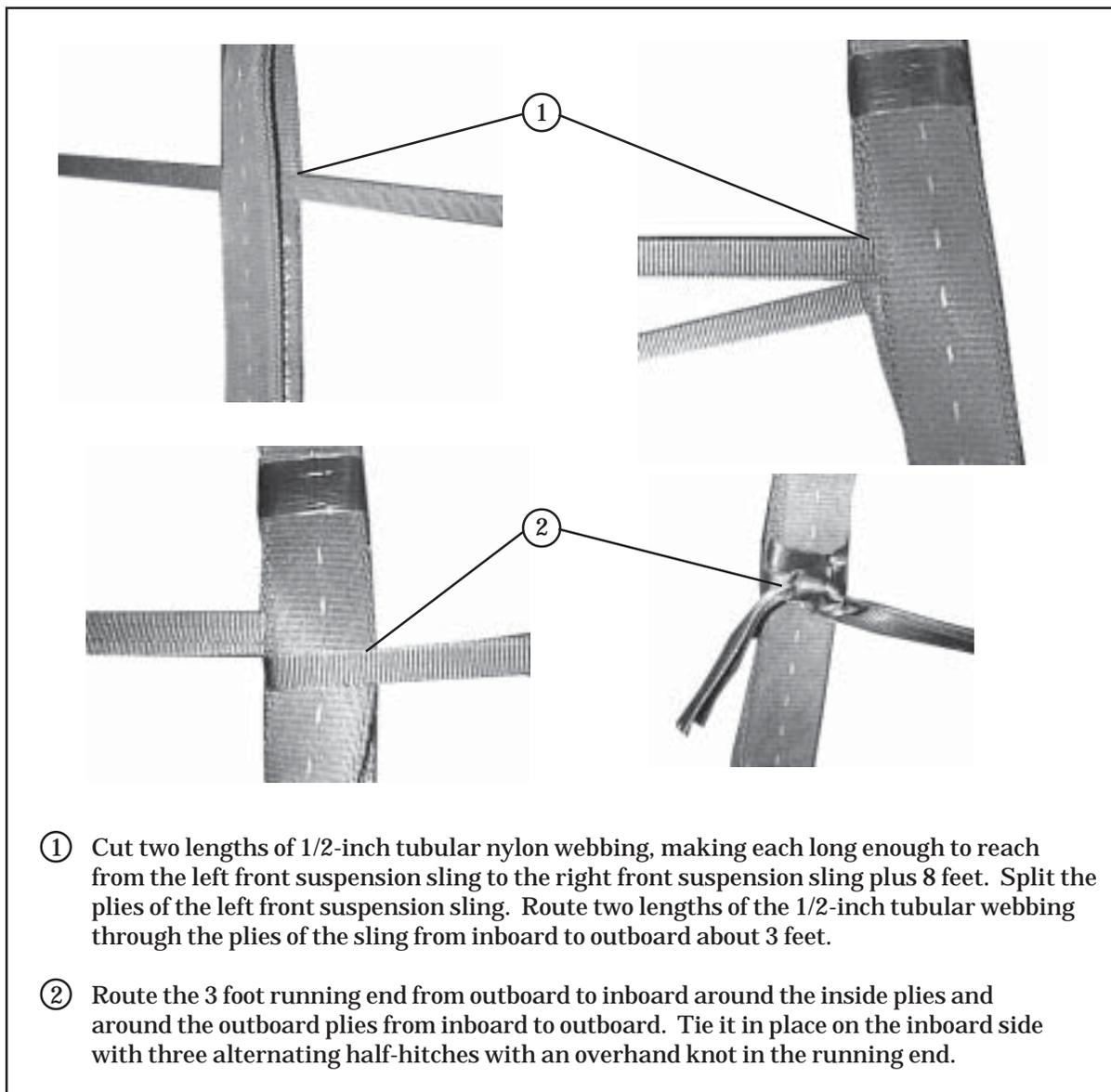
**Table 4-6. Equipment Required for Rigging AAFARS With Seven 500-Gallon Drums (Continued)**

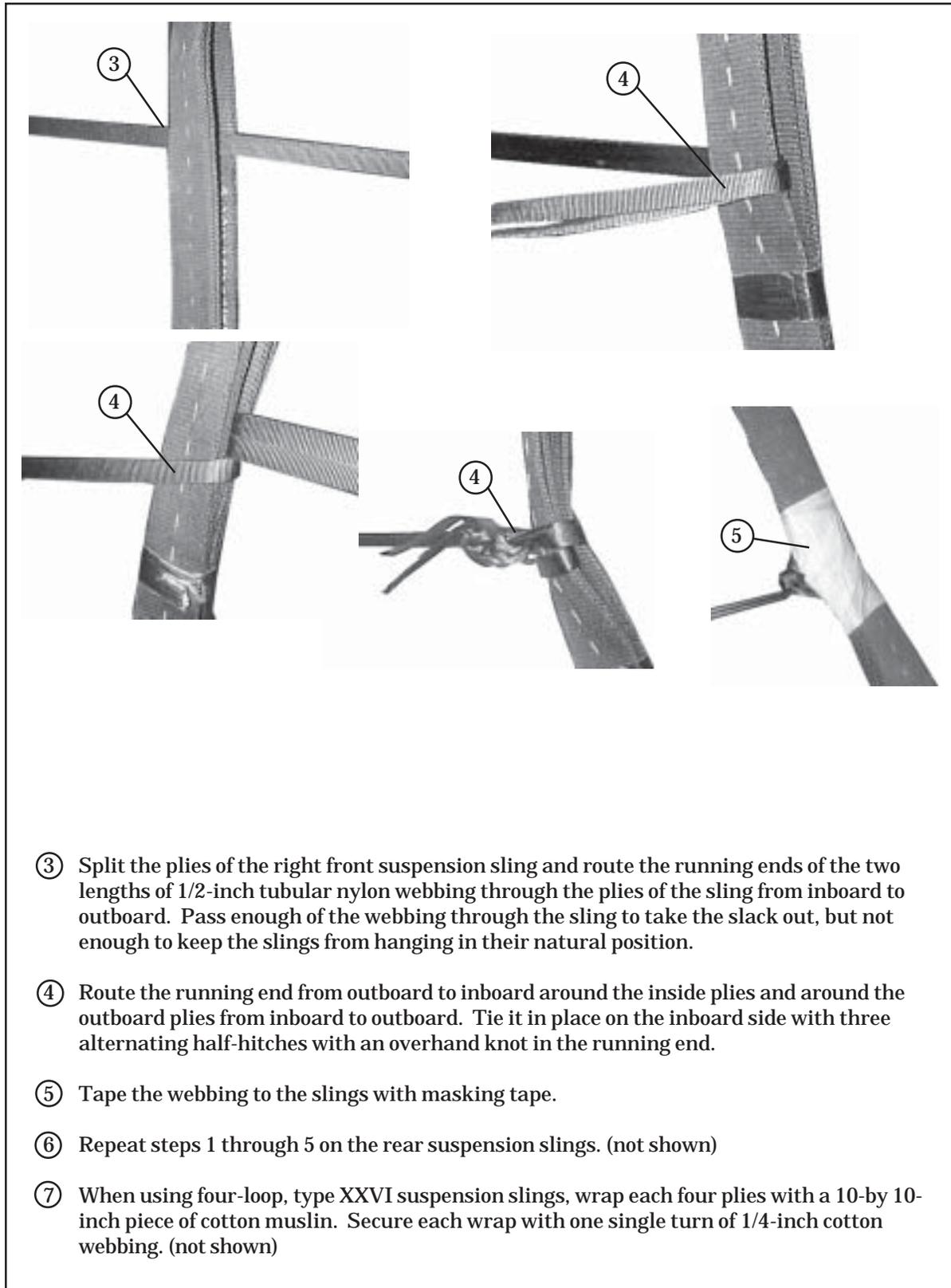
National Stock Number	Item	Quantity
1670-01-062-6304	For deployment: 9-ft (2-loop), type XXVI nylon webbing	1
1670-01-062-6311	For riser extension: 120-ft (2-loop), type XXVI	7
5340-00-040-8219	Strap, parachute release, multicut, comes w/ 3 knives	2
7510-00-266-5016	Tape, adhesive, 2-in	As required
7510-00-266-6710	Tape, masking, 2-in	As required
1670-00-937-0271	Tie-down assembly, 15-foot	128
	Webbing:	
8305-00-268-2411	Cotton, 1/4-in, type I	As required
8305-00-082-5752	Nylon, tubular, 1/2-in	As required
8305-00-260-6890	Type X	As required

## Appendix A

### INSTALLING SUSPENSION SLING SAFETY TIES

Installing the Suspension Sling Safety Ties keeps the suspension slings from making contact with the load. **The procedures in this Appendix are different from those in FM 4-20.102/NAVSEA SS400-AB-MMO-010/TO 13C7-1-5. An exception to FM 4-20.102/NAVSEA SS400-AB-MMO-010/TO 13C7-1-5 is granted. The procedures in this Appendix must be followed.** Safety tie the front and rear suspension slings according to instructions shown below.





## Glossary

<b>AAFARS</b>	Advanced Aviation Forward Area Refueling System
<b>AFB</b>	Air Force Base
<b>AFMAN(I)</b>	Air Force Joint Manual
<b>AFTO</b>	Air Force Technical Order
<b>AFSOC</b>	Air Force Special Operations Command
<b>ALC</b>	Airlift Logistics Center
<b>AMC</b>	Air Mobility Command
<b>CB</b>	center of balance
<b>d</b>	penny
<b>DA</b>	Department of Army
<b>DC</b>	District of Columbia
<b>DES</b>	Drogue Extraction System
<b>diam</b>	diameter
<b>EFTC</b>	extraction force transfer coupling
<b>FARE</b>	forward area refueling equipment
<b>FM</b>	field manual
<b>ft</b>	foot/feet
<b>GPM</b>	gallons per minute
<b>HMMWV</b>	high mobility multipurpose wheeled vehicle
<b>HQ</b>	headquarters
<b>in</b>	inch
<b>lb</b>	pound
<b>No</b>	number

<b>POL</b>	petroleum, oils, and lubricants
<b>TRADOC</b>	US Army Training and Doctrine Command
<b>USA</b>	United States of America
<b>TM</b>	technical manual
<b>TO</b>	technical order

## References

- AFR 55-40/AR 59-4** Joint Airdrop Inspection Records, Malfunction Investigations and Activity Reporting. 1 May 1998.
- \*AFMAN(I) 24-204/  
TM 38-250** Preparing Hazardous Materials for Military Air Shipments. December 2001.
- \*\*FM 4-20.102/NAVSEA  
SS400-AB-MMO-010/  
TO 13C7-1-5** Airdrop of Supplies and Equipment: Rigging Airdrop Platforms. 22 August 2001.
- FM 4-20.117/  
TO 13C7-1-111** Airdrop of Supplies and Equipment: Rigging High-Mobility Multipurpose Wheeled Vehicles. 1 October 2001
- 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, 3/4-Ton, 2 wheel M101A2, M1010 OIA3, Trailer, Chassis, 3/4-Ton, 2-Wheel M116A2, M116A2E1, Trailer, Chassis, 1-Ton, 2-wheel M116A3. May 1997
- TM 10-1670-268-20&P/  
TO 13C7-52-22** Organizational Maintenance Manual with Repair Parts and Special Tools List: Type V Airdrop Platform. 1 June 1986.
- 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-ft Diam, Cargo Extraction Parachute. 10 October 1990.
- TM 10-1670-278-23&P/  
TO 13C5-26-2/NAVAIR 13-  
1-27** Unit and Intermediate Direct Support (DS) Maintenance Manual (Including Repair Parts and Special Tools List) for Parachute, Cargo Type: 15-ft Diam, Cargo Extraction Parachute. 6 November 1989.
- TM 10-1670-279-23&P/TO  
13C5-27-2/NAVAIR 13-1-28** Unit and Intermediate Direct Support (DS) Maintenance Manual (Including Repair Parts and Special Tools List) for Parachute, Cargo Type: 22-ft Diam, Cargo Extraction Parachute 30 August 1989.
- TM 10-1670-280-23&P/TO  
13C5-31-2/NAVAIR 13-1-31** Unit and Intermediate Direct Support (DS) Maintenance Manual (Including Repair Parts and Special Tools List) for Parachute, Cargo Type: 100-ft Diam, Model G-11A, Model G-11B, and Model G-11C, 5 August 1991.
- \*AFMAN(I) 24-204/TM 38-250 has superseded AFJMAN 24-204/TM 38-250 (25 November 1994).**
- \*\* FM 4-20.102/NAVSEA SS400-AB-MMO-010/TO 13C7-1-5 has superseded FM 10-500-2/TO 13C7-1-5 (1 November 1990).**

- |  |  |
|--|--|
| <b>TM 10-1670-286-20/<br/>TO 13C5-2-41</b>             | Unit Maintenance Manual for Sling/Extraction Line Panel (Including Stowing Procedures). 15 March 2001.   |
| <b>TM 10-1670-296-20&amp;P/<br/>TO 13C7-49-2</b>       | Unit Maintenance Manual Including Repair Parts and Special Tools List for Ancillary Equipment for Low-Velocity Airdrop Systems (LVADS). 15 September 1995. |
| <b>AFTO Form 22</b>                                    | Technical Order Publication Improvement Report   |
| <b>DA Form 2028</b>                                    | Recommended Changes to Publication and Blank Forms. February 1974.   |
| <b>* Shipper's Declaration<br/>for Dangerous Goods</b> | Locally Procured Form.   |
- \* Shipper's Declaration for Dangerous Goods has superseded DD Form 1387-2 (February 1982).**