

CHAPTER 9

**RIGGING M101A1 HOWITZER FOR LOW-VELOCITY AIRDROP
ON TYPE V PLATFORM**

9-1. Description of Load

The M101A1, 105-millimeter howitzer is rigged on a 16-foot, type V airdrop platform with two G-11B cargo parachutes. This load includes an accompanying load of 21 boxes of ammunition. The accompanying load must weigh at least 2,000 pounds, but no more than 2,400 pounds. The howitzer is rigged for a low-velocity airdrop from a C-130, C-141, or C-5 aircraft.

9-2. Preparing Platform

Prepare a 16-foot, type V airdrop platform as described below.

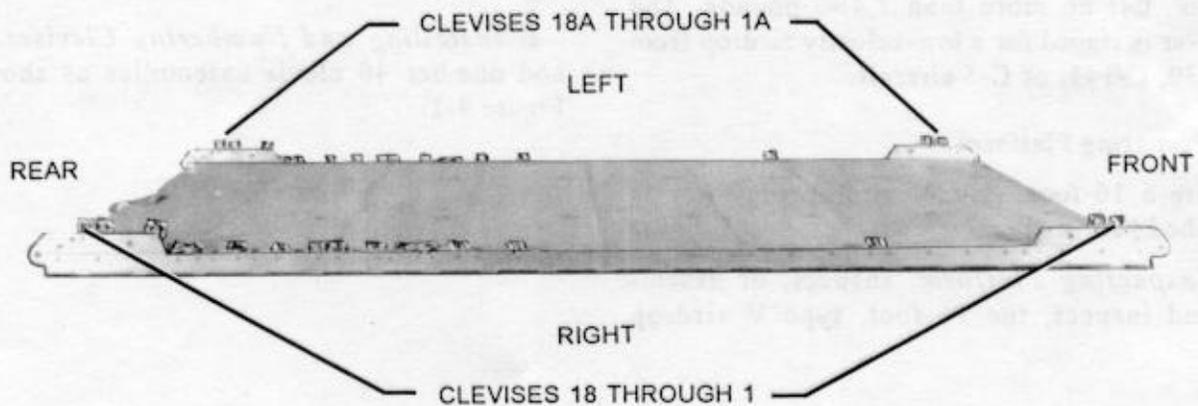
a. Inspecting Platform. Inspect, or assemble and inspect, the 16-foot, type V airdrop

platform as outlined in TM 10-1670-268-20&P/TO 13C7-52-22.

b. Installing Tandem Links. Install tandem links on the front and rear of each rail as shown in Figure 9-1.

c. Installing and Numbering Clevises. Bolt and number 40 clevis assemblies as shown in Figure 9-1.

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



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Step:

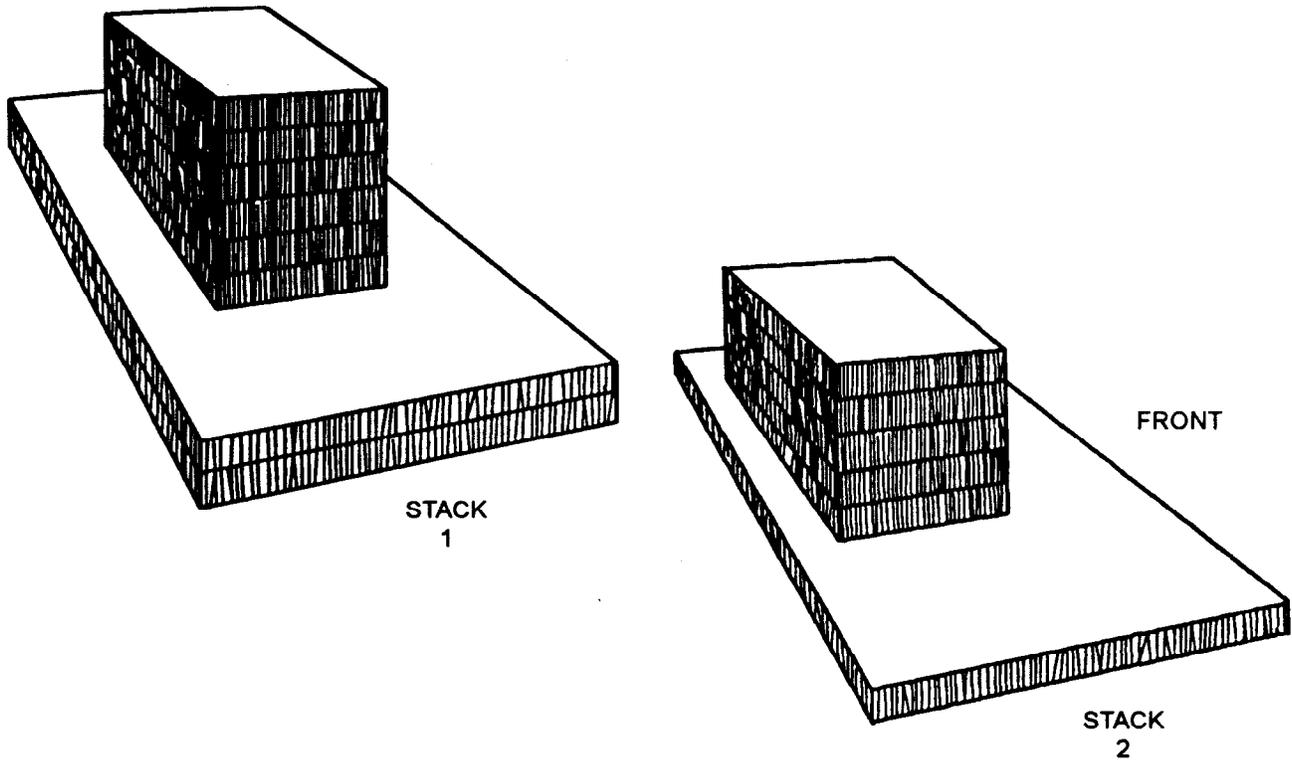
1. Install a tandem link on the front of each platform side rail using holes 1, 2, and 3.
2. Install a tandem link on the rear of each platform side rail using holes 30, 31, and 32.
3. Install clevises on bushings 2 and 3 of each front tandem link.
4. Install clevises on bushings 1, 2, and 3 of each rear tandem link.
5. Starting at the front of each platform side rail, install clevises on the bushings bolted on holes 9, 19, 21, 22, 23, 24, 25, 26, 27, 28, and 29. Reverse the clevises on holes 22 and 29. Install two clevises on each of the reversed clevises as shown.
6. Starting at the front of the platform, number the clevises bolted to the right side from 1 through 18 and those bolted to the left side from 1A to 18A.
7. Label the tie-down rings according to FM 10-500-2/TO 13C7-1-5.

Figure 9-1. Platform prepared

9-3. Building and Placing Honeycomb Stacks

Build the honeycomb stacks as shown in Figure 9-2. Place the stacks on the platform as shown in Figure 9-3.

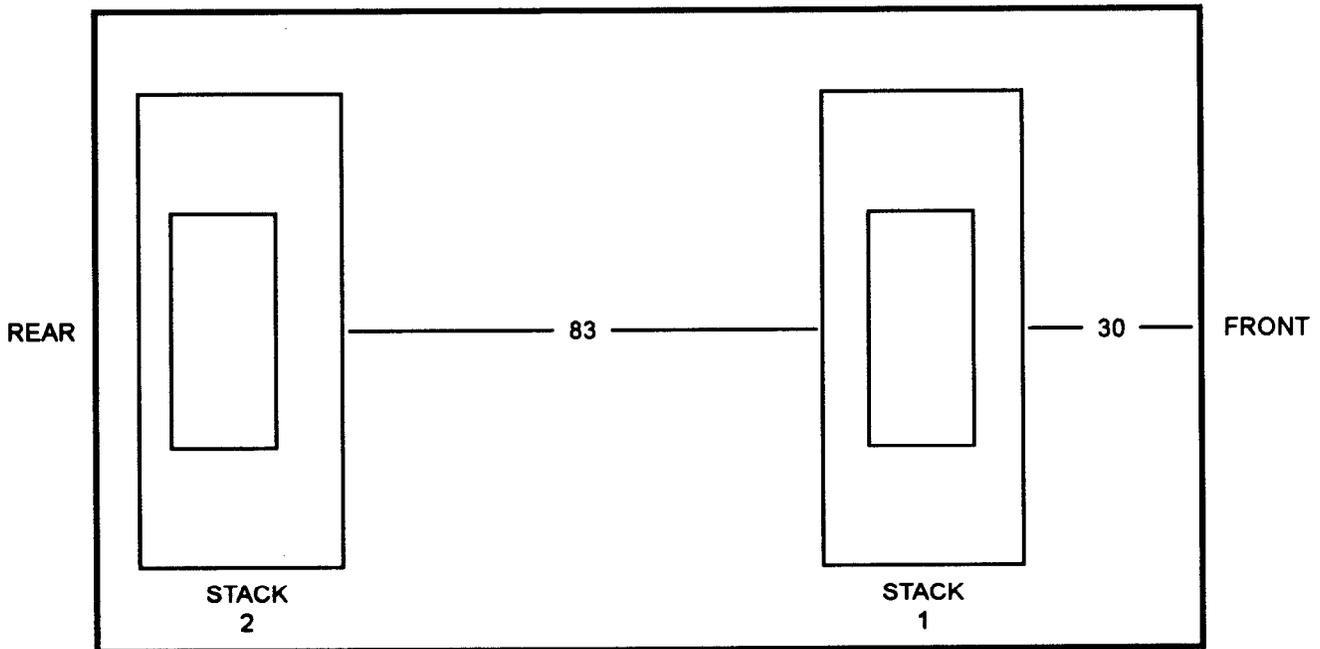
Note: These drawings are not drawn to scale.



Stack Number	Pieces	Width (Inches)	Length (Inches)	Material	Instructions
1	2	84	36	Honeycomb	Stack to form a base.
	6	36	18	Honeycomb	Center and glue honeycomb on the base.
2	1	84	36	Honeycomb	Form a base.
	5	36	18	Honeycomb	Center and glue the smaller pieces 14 inches from the front edge of the base.

Figure 9-2. Honeycomb stacks prepared

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



Stack Number	Position of Stack on Platform
1	Place stack: Centered 30 inches from front edge of platform.
2	Centered 83 inches from stack 1.

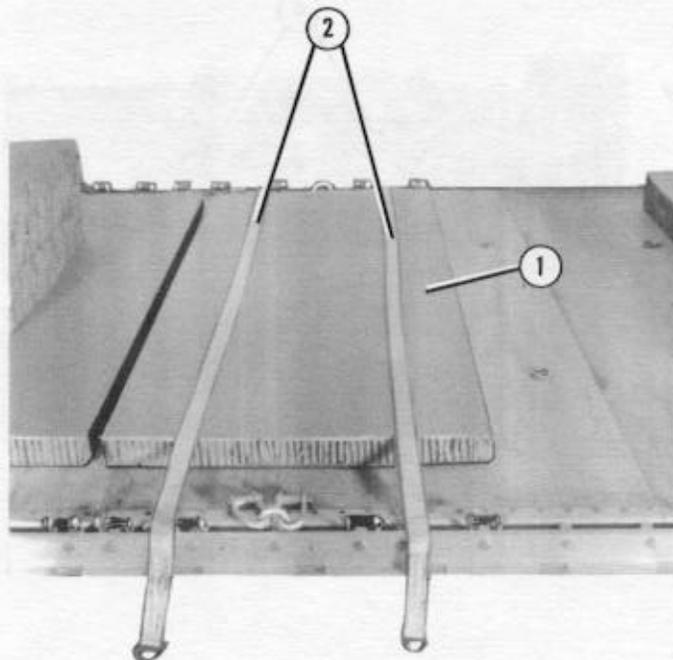
Figure 9-3. Honeycomb stacks placed on platform

9-4. Stowing Accompanying Load

Stow the accompanying load of 21 boxes of ammunition weighing 2,100 pounds as shown in Figures 9-4 and 9-5.

CAUTION: Only ammunition listed in FM 10-500-53/TO 13C7-18-41 may be airdropped.

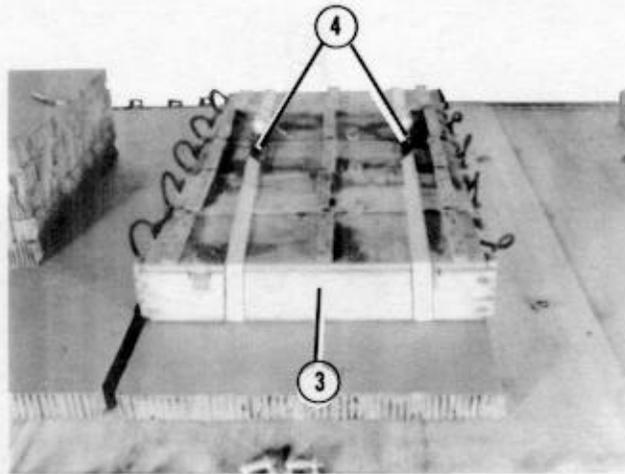
NOTICE OF EXCEPTION: Exception to FM 10-500-2/TO 13C7-1-5 is granted to rig ammunition with one layer of honeycomb.



- ① Place an 84- by 36-inch piece of honeycomb centered and 1 inch in front of stack 2.
- ② Center a 15-foot lashing 7 inches from each end of the honeycomb.

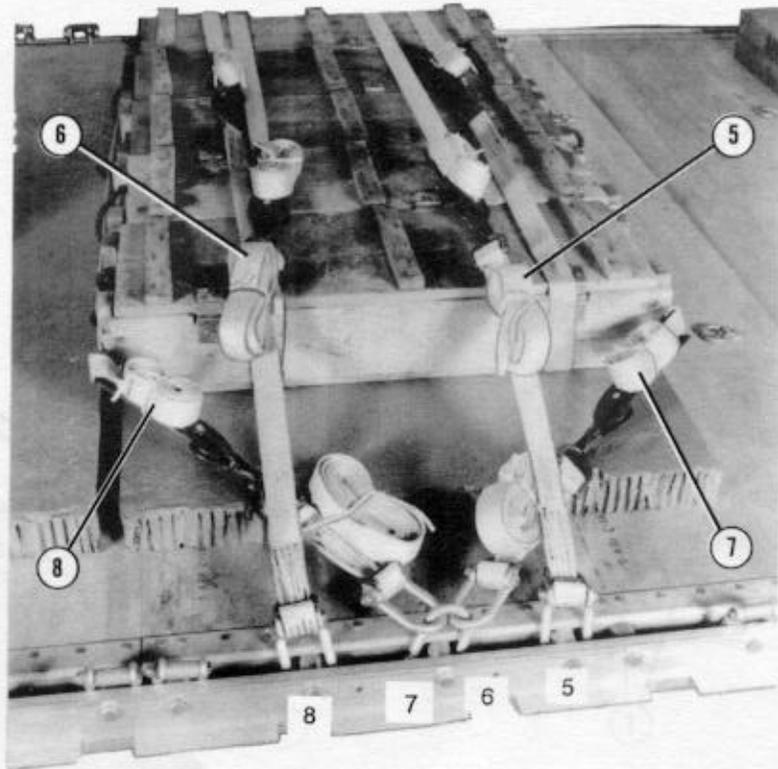
Figure 9-4. First stack of ammunition placed and lashed

NOTICE OF EXCEPTION: Exception to FM 10-500-2/TO 13C7-1-5 is granted to rig ammunition with one layer of honeycomb.



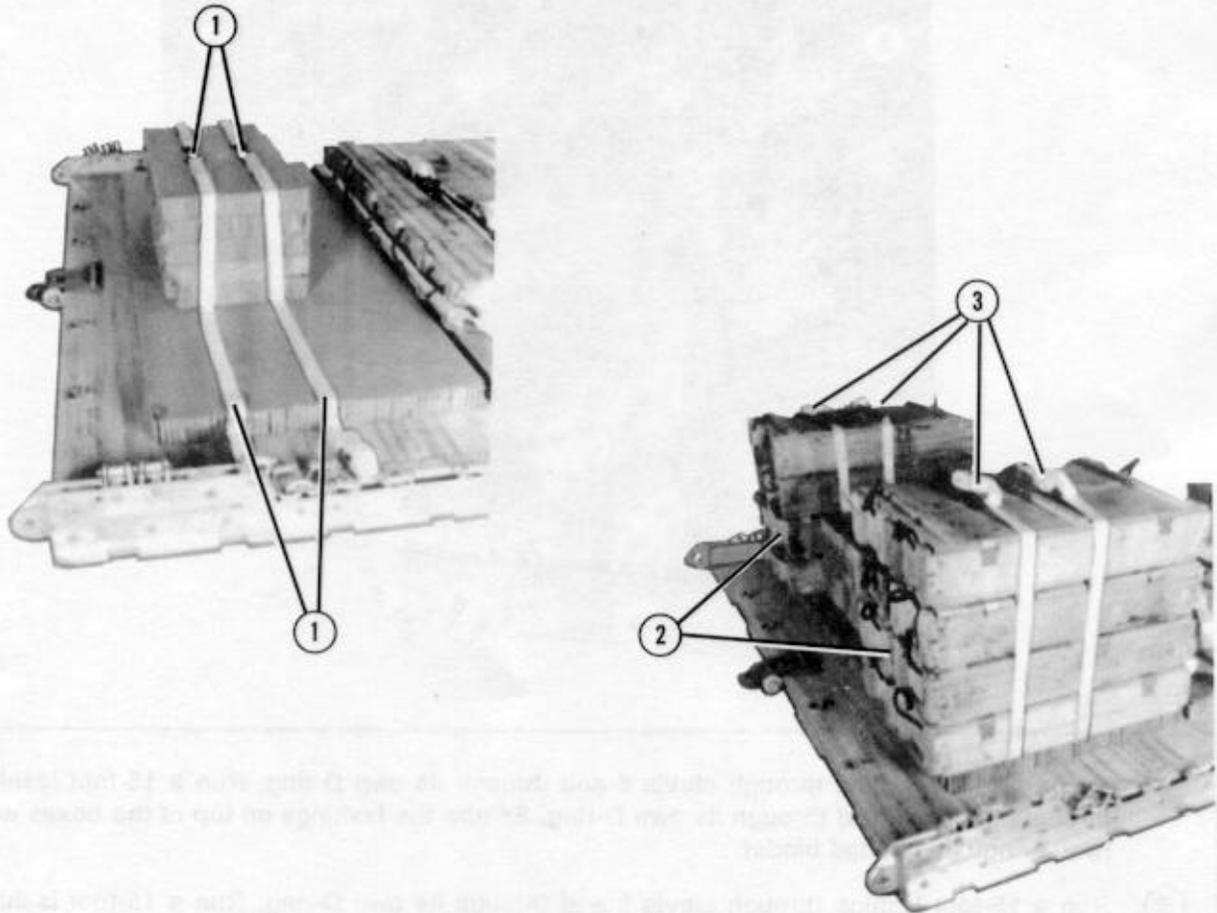
- ③ Center five boxes of ammunition over the lashings.
- ④ Secure the lashings over the boxes.

Figure 9-4. First stack of ammunition placed and lashed (continued)



- ⑤ Run a 15-foot lashing through clevis 5 and through its own D-ring. Run a 15-foot lashing through clevis 5A and through its own D-ring. Secure the lashings on top of the boxes with two D-rings and a load binder.
- ⑥ Run a 15-foot lashing through clevis 8 and through its own D-ring. Run a 15-foot lashing through clevis 8A and through its own D-ring. Secure the lashings on top of the boxes with two D-rings and a load binder.
- ⑦ Run a 15-foot lashing through clevis 6A and through its own D-ring. Run the lashing through the box handles on the front side of the boxes. Run a 15-foot lashing through clevis 6 and through its own D-ring. Secure the two lashings on the right side as shown with two D-rings and a load binder.
- ⑧ Run a 15-foot lashing through clevis 7A and through its own D-ring. Run the lashing through the box handles on the rear side of the boxes. Run a 15-foot lashing through clevis 7 and through its own D-ring. Secure the two lashings on the right side as shown with two D-rings and a load binder.

Figure 9-4. First stack of ammunition placed and lashed (continued)

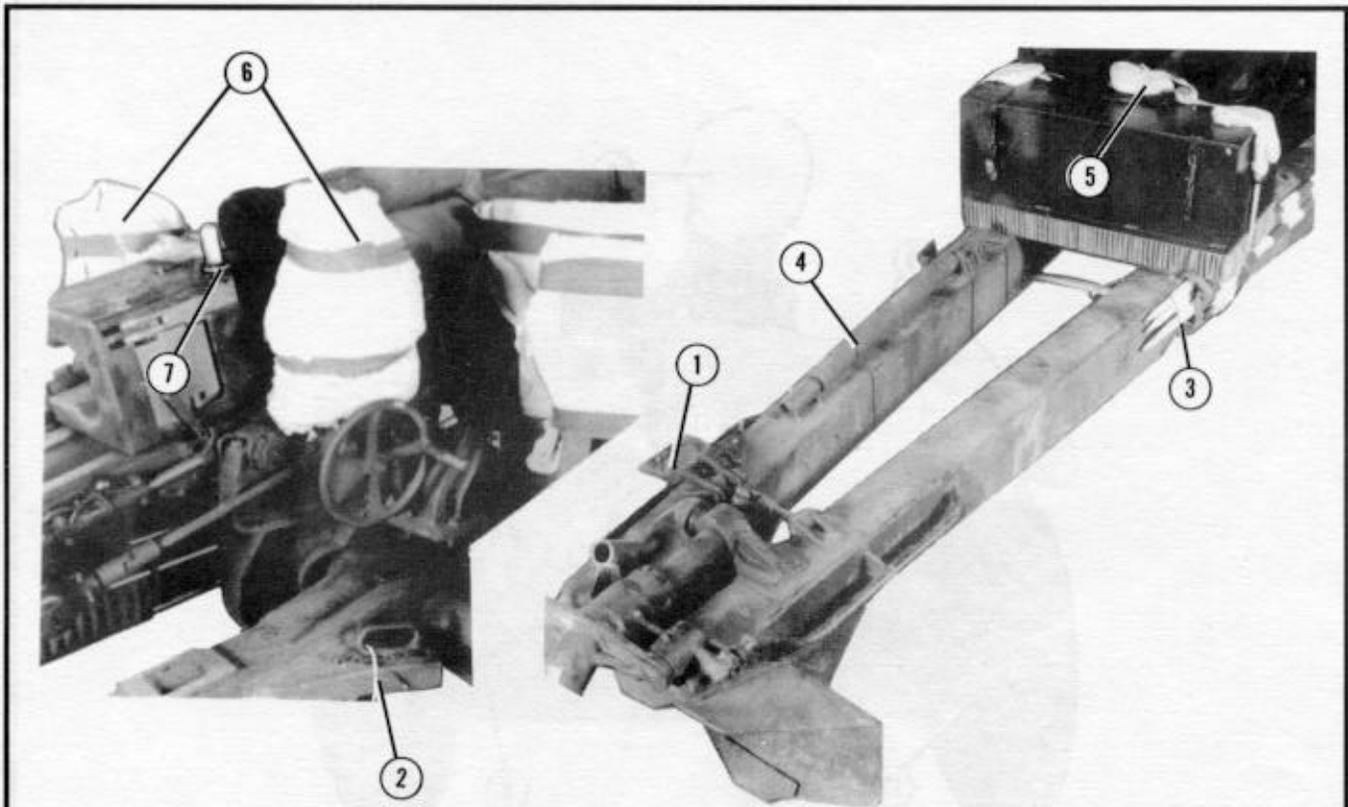


- ① Pre-position four 15-foot lashings on stack 2 as shown, 4 inches from each end of the stack. Place the sewn D-rings 3 inches apart at the top center of the stack.
- ② Place eight ammunition boxes on each side of stack 2. Place the boxes 1/2 inch from the front edge of the honeycomb.
- ③ Secure the pre-positioned lashings on top of the boxes.

Figure 9-5. Ammunition boxes placed on stack 2

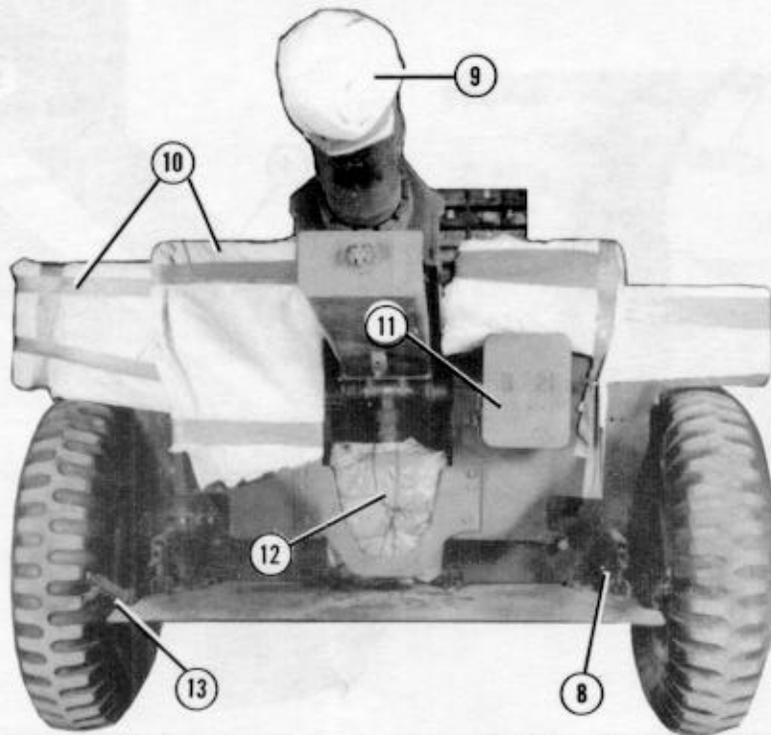
9-5. Preparing Howitzer

Prepare the howitzer as shown in Figure 9-6.



- ① Secure the gun trails together. Safety tie the clamp shut with type III nylon cord.
- ② Secure the trail lock pins in place with type III nylon cord.
- ③ Place the aiming poles in the holders provided. Secure the poles in place with type III nylon cord. Secure the cleaning staffs on the left trail in the same way.
- ④ Place the handling bar in its mounts on top of the left trail. Secure the bar in place with type III nylon cord.
- ⑤ Place a 29- by 14-inch piece of honeycomb across the trails 6 inches behind the recoil slide. Place the section chest on the honeycomb. Pass a 15-foot lashing under the trails and up through the chest carrying handles. Pad the lashing where it touches the trails and the chest corners. Secure the lashing on top of the chest.
- ⑥ Pad the sight mounts and quadrant with cellulose wadding taped in place.
- ⑦ Tie the breech operating handle shut with type III nylon cord.

Figure 9-6. Howitzer prepared



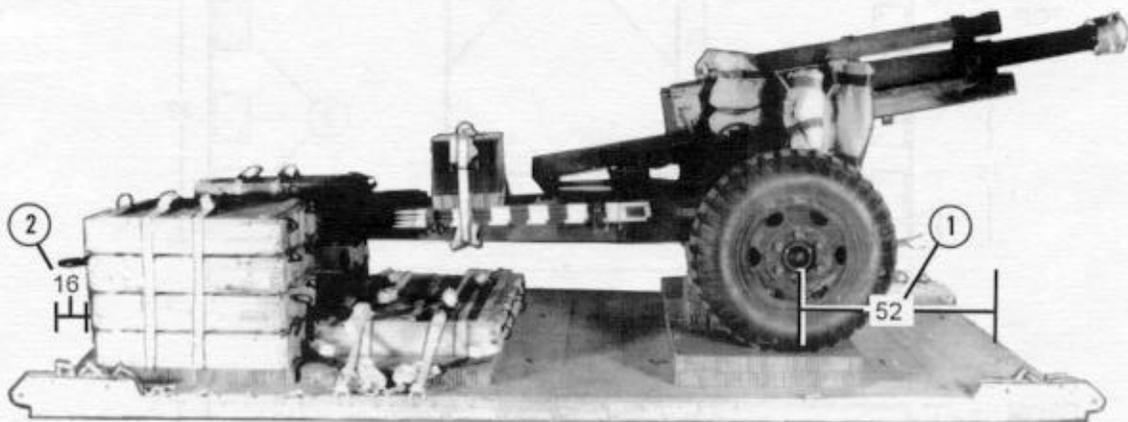
- ⑧ Latch the lower deflector shield down, and safety tie the latches with type III nylon cord.
- ⑨ Pad the muzzle with cellulose wadding taped in place.
- ⑩ Pad the upper edges of the deflector shields with cellulose wadding taped in place.
- ⑪ Pad the sights with cellulose wadding and place them in the sight box. Latch and safety tie the sight box securely shut.
- ⑫ Tie the folded gun cover in place between the deflector shields.
- ⑬ Place the howitzer brake in the lock position. Secure the brake lever with type III nylon cord.

Figure 9-6. Howitzer prepared (continued)

9-6. Placing Howitzer on Platform

Place the howitzer on the honeycomb stacks as shown in Figure 9-7.

Note: Equipment required for lifting the howitzer will be determined by the type of crane or forklift on hand.



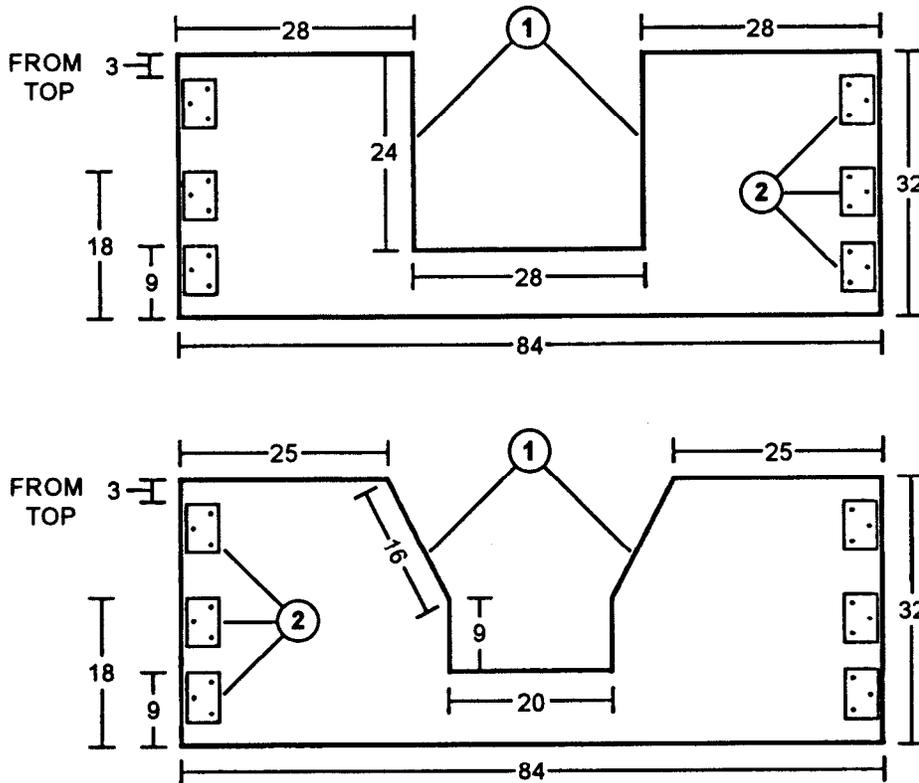
- ① Set the howitzer on the stacks so that the center line between the wheels is 52 inches from the front edge of the platform.
- ② Allow the towing pintle to overhang the rear edge of the platform 16 inches.

Figure 9-7. Howitzer positioned on platform

9-7. Constructing Endboards and Lashing Rear Ammunition Stack to Platform

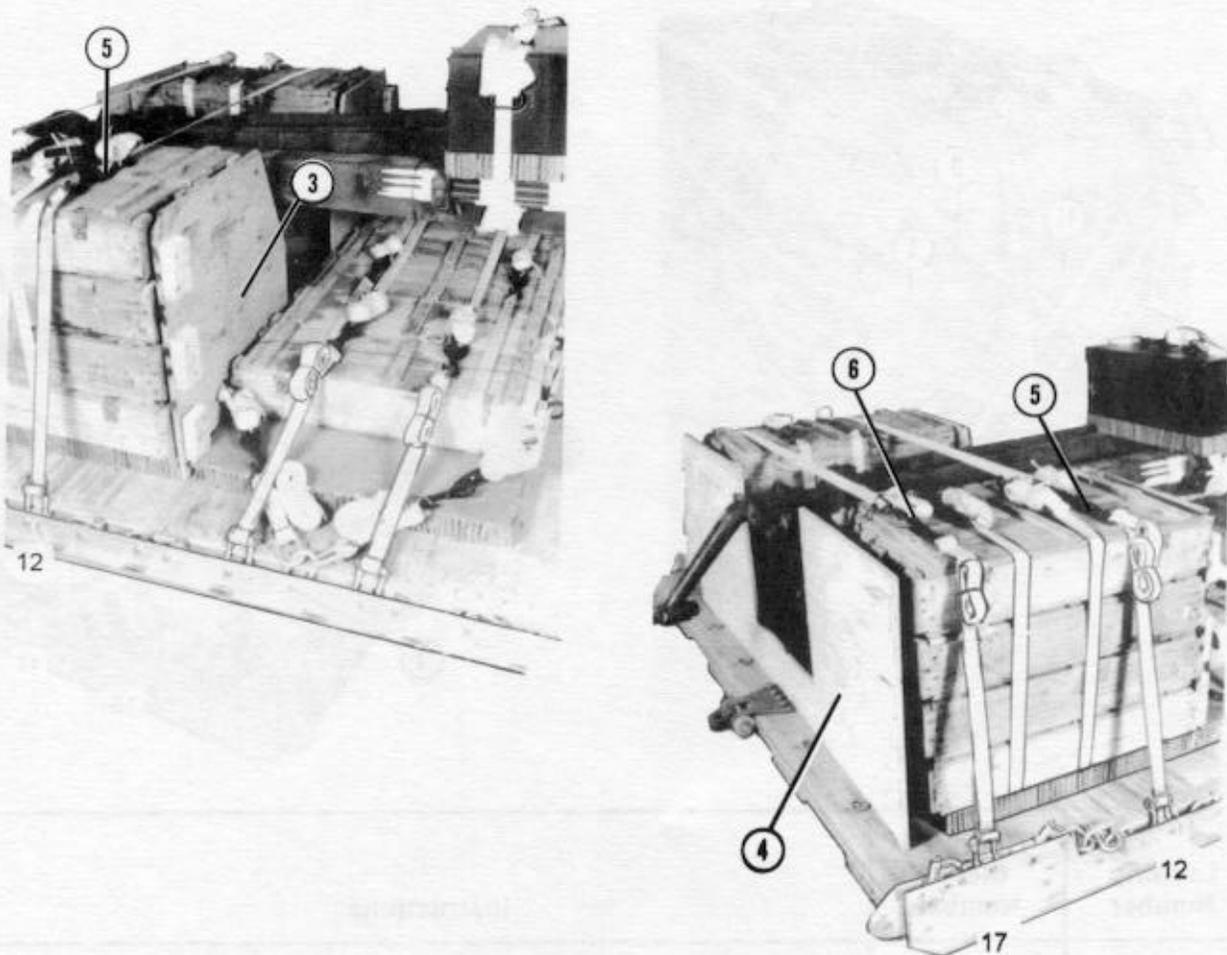
Construct the endboards and place them on the load as shown in Figure 9-8. Lash the ammunition placed on stack 2 to the platform as shown in Figure 9-9.

- Notes:**
1. All measurements are given in inches.
 2. These drawings are not drawn to scale.
 3. Cutouts 2 inches wide and 3 inches deep may be substituted for the nailed cleats shown.
 4. Use 8d nails.



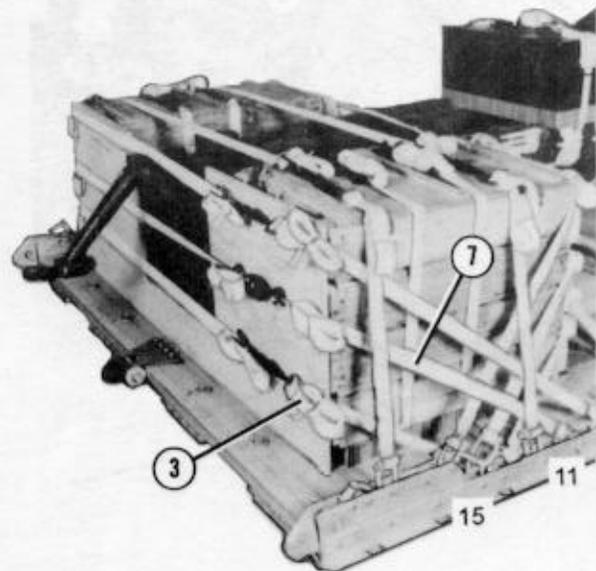
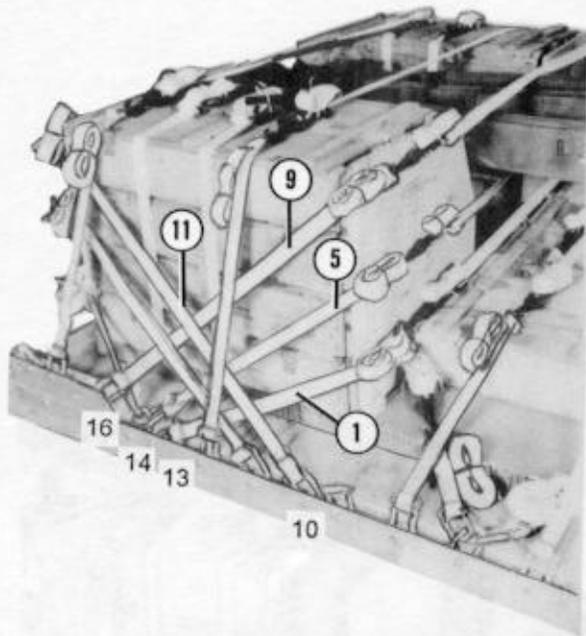
- ① Center cutouts as shown in two 3/4- by 84- by 32-inch pieces of plywood.
- ② Nail 2- by 4- by 6-inch cleats to both sides of each endboard as shown.

Figure 9-8. Endboards constructed and placed



- ③ Place the endboard with the wider cutout between the ammunition stacks with the cleats facing the front.
- ④ Place the rear endboard against the ammunition stack with the cleats facing the rear.
- ⑤ Run a 15-foot lashing through clevis 12 and through its own D-ring. Run a 15-foot lashing through clevis 12A and through its own D-ring. Secure the lashings over the right side of the stack with two D-rings and a load binder.
- ⑥ Run a 15-foot lashing through clevis 17 and through its own D-ring. Run a 15-foot lashing through clevis 17A and through its own D-ring. Secure the lashings over the right side of the stack with two D-rings and a load binder.

Figure 9-8. Endboards constructed and placed (continued)



Lashing Number	Tie-Down Clevis Number	Instructions
1	13	Pass lashing: Through clevis 13 and through its own D-ring.
2	13A	Through clevis 13A and through its own D-ring. Pass lashings 1 and 2 over the lower cleats on the front endboard and secure them together with two D-rings and a load binder.
3	15	Through clevis 15 and through its own D-ring.
4	15A	Through clevis 15A and through its own D-ring. Pass lashings 3 and 4 over the lower cleats on the rear endboard and secure them together with two D-rings and a load binder.
5	14	Through clevis 14 and through its own D-ring.
6	14A	Through clevis 14A and through its own D-ring. Pass lashings 5 and 6 over the center cleats on the front endboard and secure them together with two D-rings and a load binder.

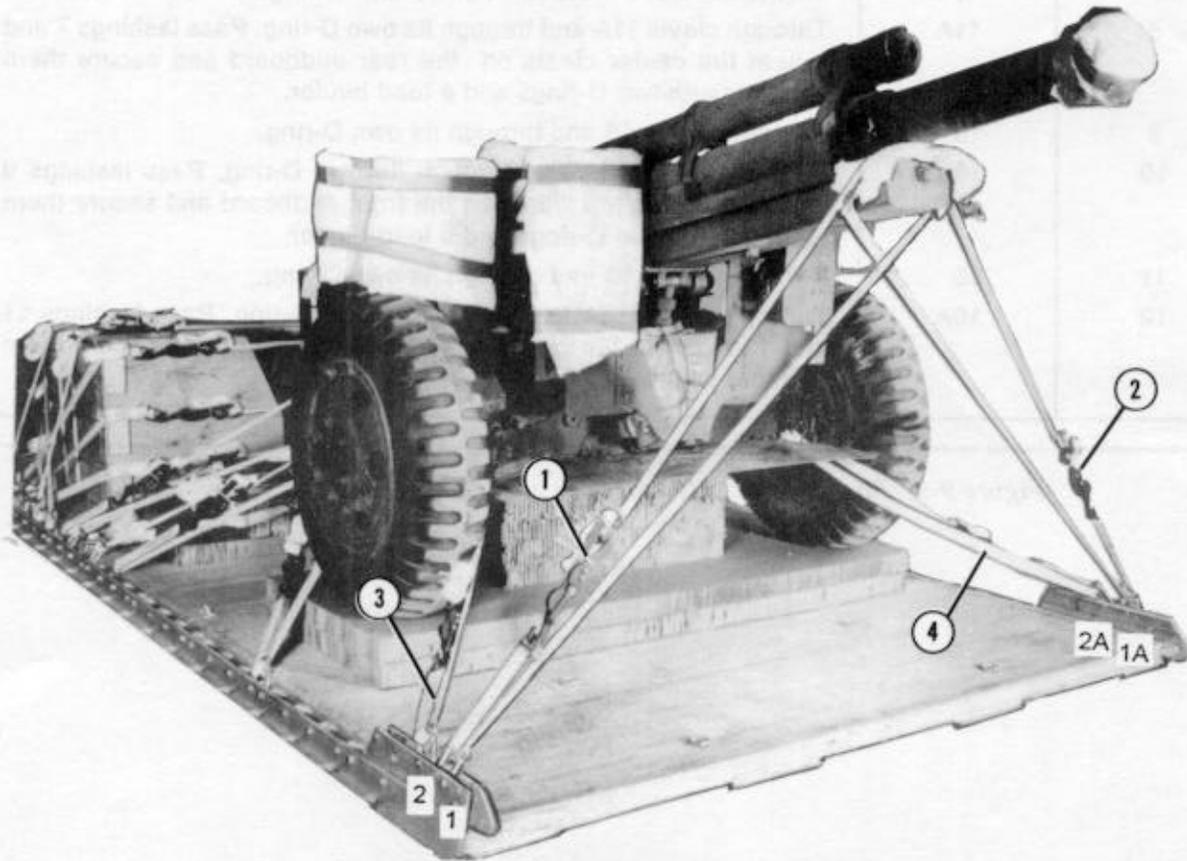
Figure 9-9. Lashings installed for rear ammunition stack

Lashing Number	Tie-Down Clevis Number	Instructions
7	11	Through clevis 11 and through its own D-ring.
8	11A	Through clevis 11A and through its own D-ring. Pass lashings 7 and 8 over the center cleats on the rear endboard and secure them together with two D-rings and a load binder.
9	16	Through clevis 16 and through its own D-ring.
10	16A	Through clevis 16A and through its own D-ring. Pass lashings 9 and 10 over the top cleats on the front endboard and secure them together with two D-rings and a load binder.
11	10	Through clevis 10 and through its own D-ring.
12	10A	Through clevis 10A and through its own D-ring. Pass lashings 11 and 12 over the top cleats on the rear endboard and secure them together with two D-rings and a load binder.

Figure 9-9. Lashings installed for rear ammunition stack (continued)

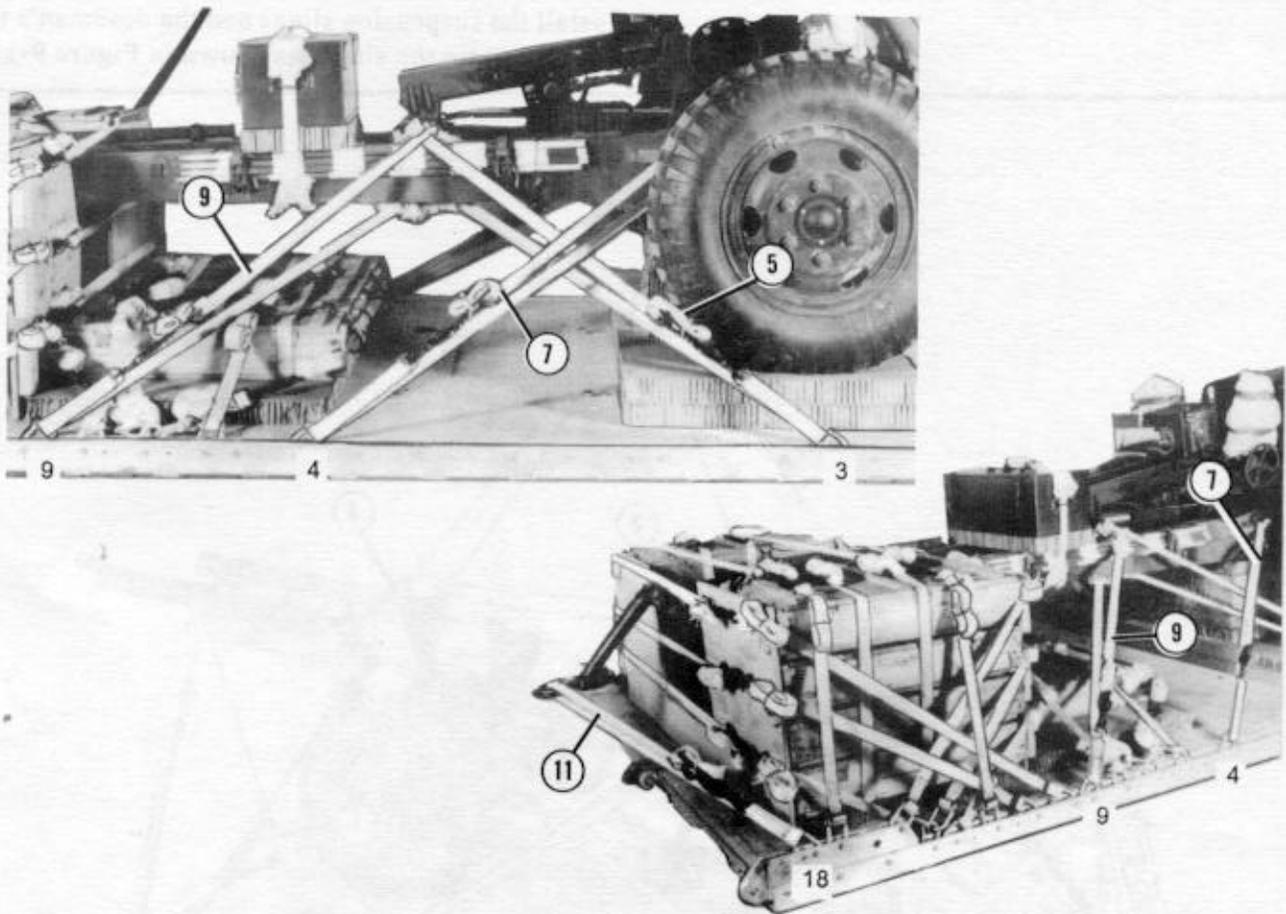
9-8. Lashing Howitzer

Lash the howitzer to the platform as shown in Figure 9-10.



Lashing Number	Tie-Down Clevis Number	Instructions
1	1	Pass lashing: Around cradle.
2	1A	Around cradle.
3	2	Around towing hook.
4	2A	Around towing hook.

Figure 9-10. Lashings installed

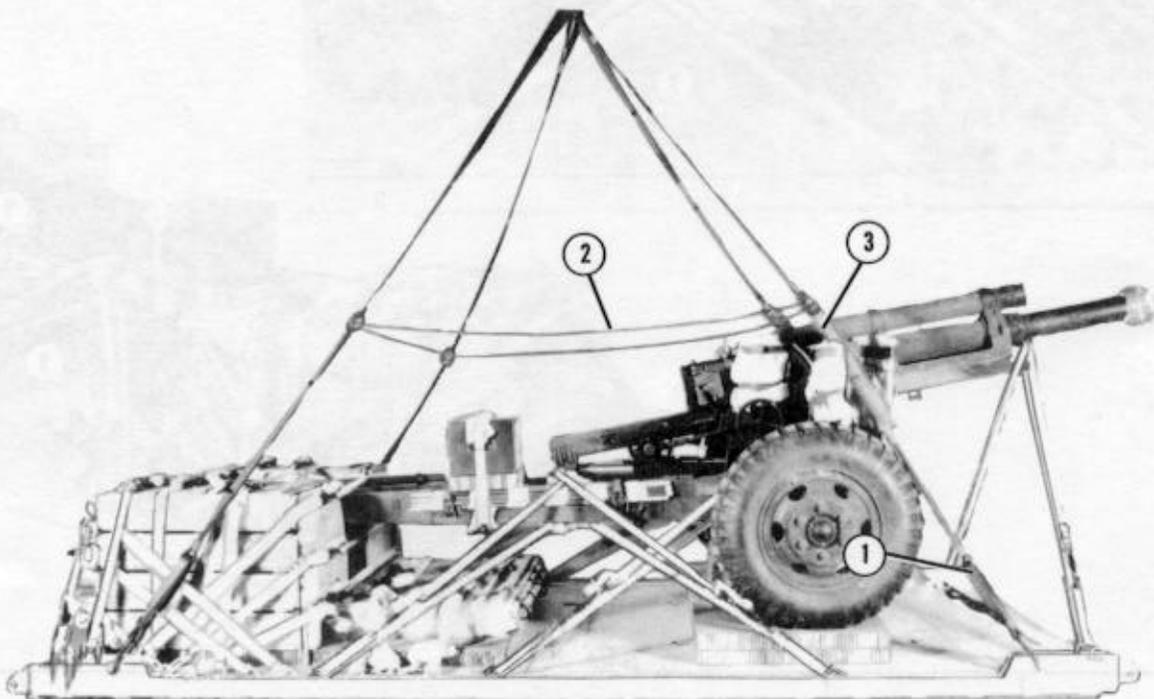


Lashing Number	Tie-Down Clevis Number	Instructions
5	3	Pass lashing: Around right trail and around rear side of travelling lock bracket.
6	3A	Around left trail and around rear side of travelling lock bracket.
7	4	Around trail locking arm.
8	4A	Around trail locking arm.
9	9	Around right trail and around front side of travelling lock bracket.
10	9A	Around left trail and around front side of travelling lock bracket.
11	18	Through towing pintle.
12	18A	Through towing pintle.

Figure 9-10. Lashings installed (continued)

9-9. Installing Suspension Slings.

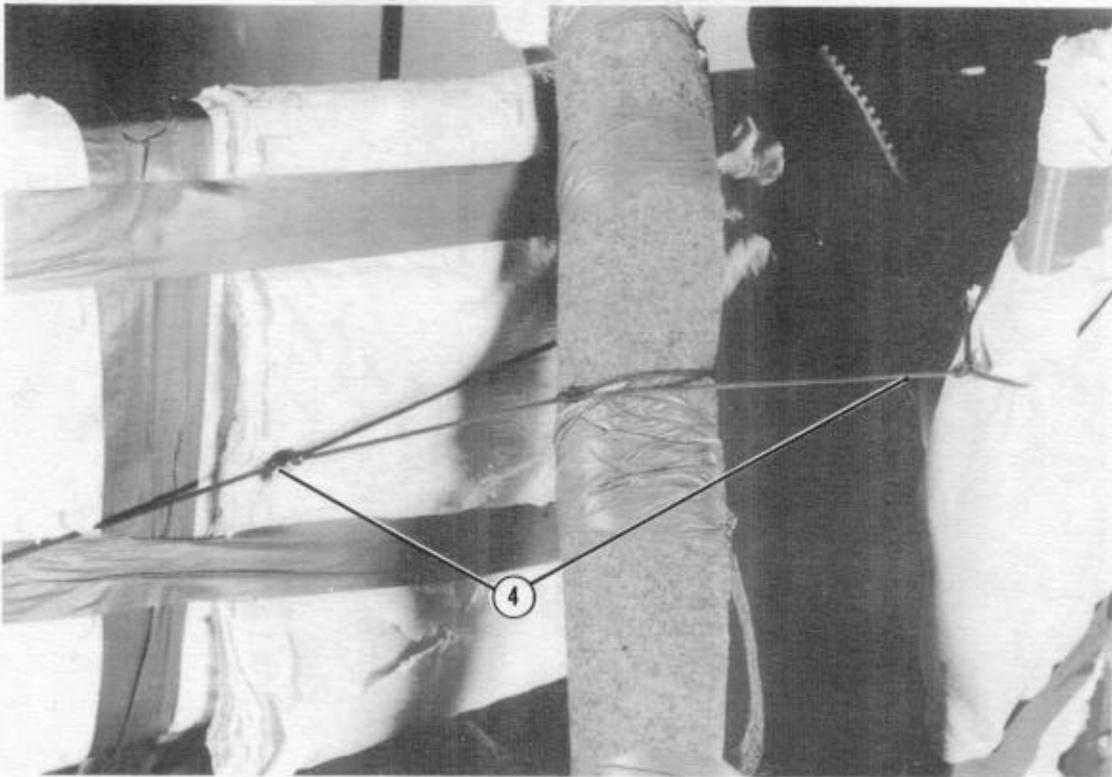
Install the suspension slings and the deadman's tie and safety tie the slings as shown in Figure 9-11.



- ① Pass a 3-foot (2-loop), type XXVI nylon webbing sling through an end loop of a 12-foot (2-loop), type XXVI nylon webbing sling. Place both end loops of the 3-foot sling in the bell portion of a large suspension clevis. Bolt the large clevis to the suspension hole of one of the tandem links. Repeat for the other three suspension slings.
- ② Raise the suspension slings and install the deadman's tie according to FM 10-500-2/TO 13C7-1-5.
- ③ Pad each front suspension sling with an 8- by 32-inch piece of felt padding beginning 30 inches from the lower end loop of the 12-foot sling. Tape the felt in place.

Figure 9-11. Suspension slings and deadman's tie installed

CAUTION: Each front suspension sling must be securely tied to the deflector shield with type III nylon cord.

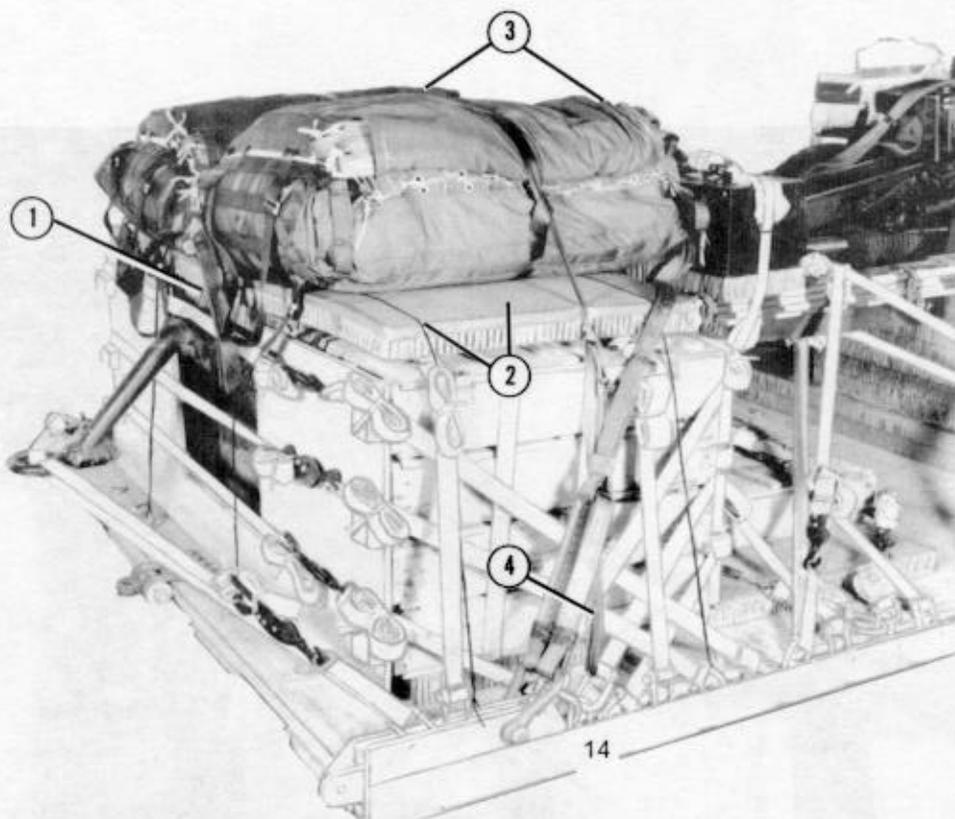


④ Safety tie the front suspension slings to the deflector shield with type III nylon cord.

Figure 9-11. Suspension slings and deadman's tie installed (continued)

9-10. Stowing Cargo Parachutes

Stow the cargo parachutes according to FM 10-500-2/TO 13C7-1-5 and as shown in Figure 9-12.

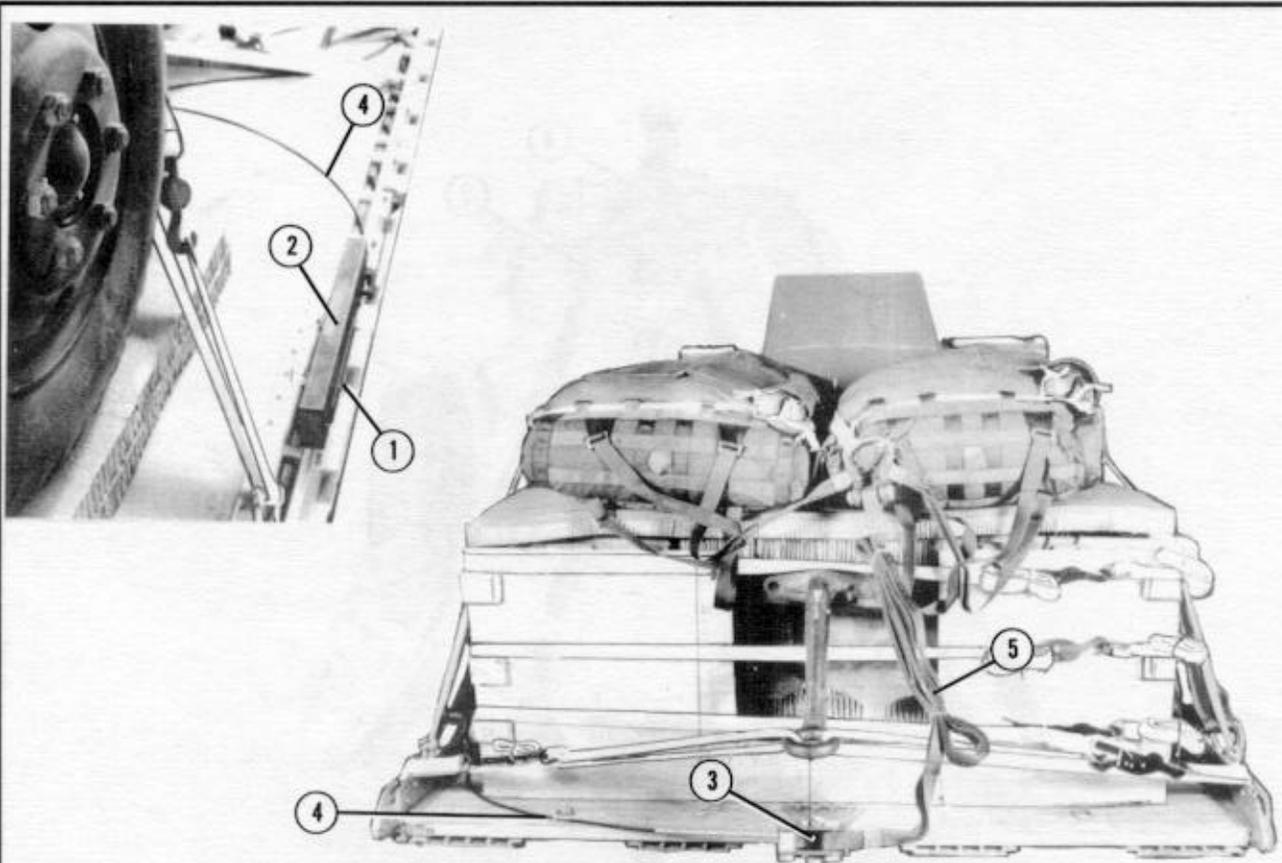


- ① Center a 36- by 36-inch piece of honeycomb over the howitzer trails between the stacks of ammunition boxes.
- ② Tie an 84- by 36-inch piece of honeycomb over stack 2 with type III nylon cord.
- ③ Prepare and install two G-11B cargo parachutes according to FM 10-500-2/TO 13C7-1-5.
- ④ Restrain the parachutes to clevises 14 and 14A.

Figure 9-12. Cargo parachutes stowed

9-11. Installing Extraction System

Install the EFTC extraction system on the load according to FM 10-500-2/TO 13C7-1-5 and as shown in Figure 9-13.

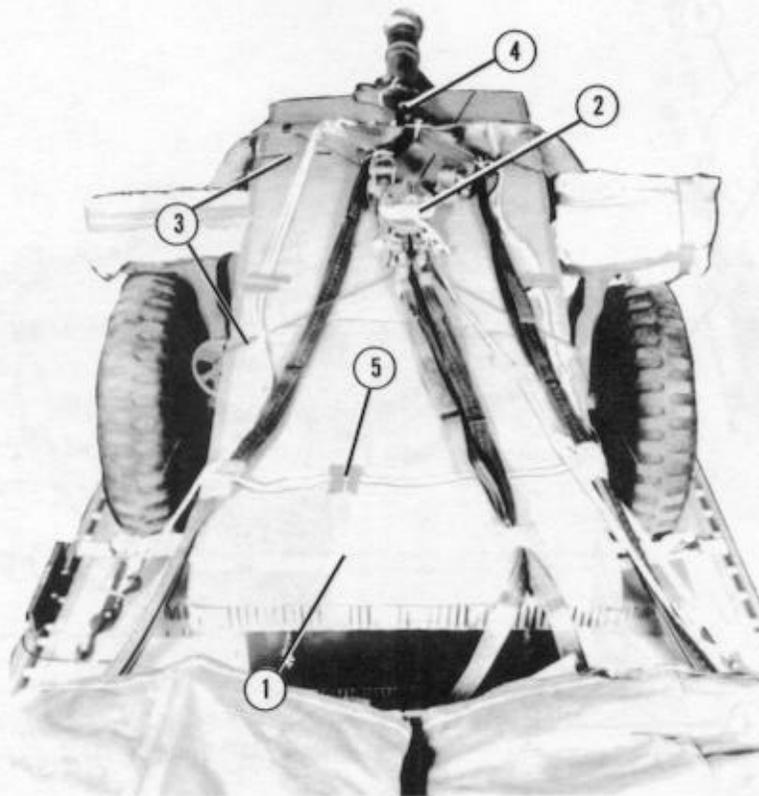


- ① Install the EFTC mounting brackets to the rear set of holes on the left platform side rail.
- ② Install the actuator according to FM 10-500-2/TO 13C7-1-5.
- ③ Install the latch assembly and latch assembly adapter to the extraction bracket according to FM 10-500-2/TO 13C7-1-5.
- ④ Install a 16-foot cable according to FM 10-500-2/TO 13C7-1-5. Safety the cable to tie-down ring D8 with type I, 1/4-inch cotton webbing.
- ⑤ Install a 9-foot (2-loop), type XXVI nylon webbing deployment line. S-fold the slack and tie the folds with type I, 1/4-inch cotton webbing.

Figure 9-13. EFTC installed

9-12. Installing Release System

Prepare and install an M-1 cargo parachute release according to FM 10-500-2/TO 13C7-1-5 and as shown in Figure 9-14.



- ① Cover the howitzer from the front deflector shield to 6 inches behind the section chest with a full sheet of honeycomb. Tie the honeycomb to convenient points on the load with type III nylon cord.
- ② Prepare and install an M-1 cargo parachute release according to FM 10-500-2/TO 13C7-1-5.
- ③ Place the release assembly on the honeycomb over the breech area and tie the release to convenient points on the load with type III nylon cord.
- ④ S-fold and tie slack in the suspension slings with type I, 1/4-inch cotton webbing.
- ⑤ Tape each section of the deadman's tie to the honeycomb.

Figure 9-14. M-1 release installed

**9-13. Installing Provisions for
Emergency Restraints**

Install provisions for emergency restraints on the front of the platform according to FM 10-500-2/TO 13C7-1-5.

9-14. Placing Extraction Parachutes

Place the extraction parachutes as described below.

a. C-130 Aircraft. Place a 22-foot cargo extraction parachute; a 60-foot (3-loop), type XXVI nylon webbing extraction line; and a two-point, 3 3/4-inch link assembly on the load for installation in the aircraft.

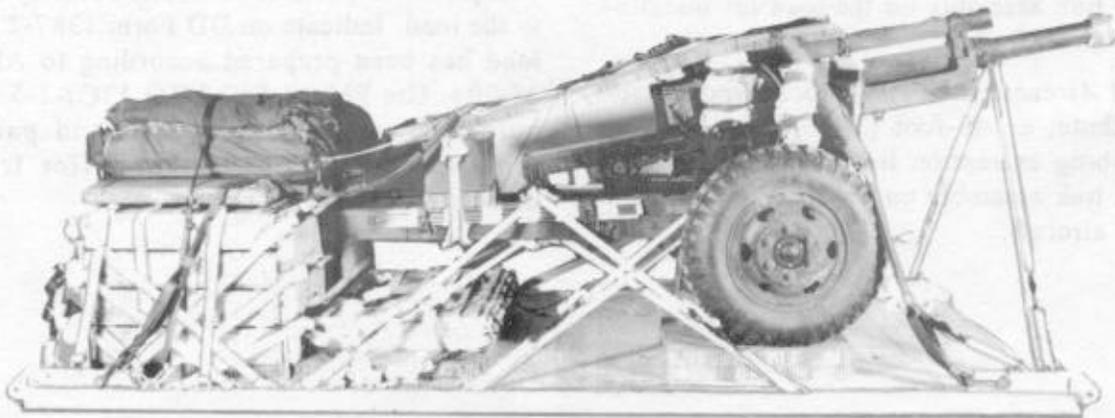
b. C-141 Aircraft. Place a 22-foot cargo extraction parachute; a 140-foot (3-loop), type XXVI nylon webbing extraction line; and a two-point, 3 3/4-inch link assembly on the load for installation in the aircraft.

c. C-5 Aircraft. Place a 22-foot cargo extraction parachute and a two-point, 3 3/4-inch link assembly on the load for installation in the aircraft. See FM 10-500-2/TO 13C7-1-5 for extraction line requirements.

9-15. Marking Rigged Load

Mark the rigged load according to FM 10-500-2/TO 13C7-1-5 and as shown in Figure 9-15. Complete DD Form 1387-2, and securely attach it to the load. Indicate on DD Form 1387-2 that the load has been prepared according to AFJMAN 24-204. Use FM 10-500-2/TO 13C7-1-5 to compute the weight, height, CB, and parachute requirements for loads that differ from the load shown.

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



CB

RIGGED LOAD DATA

Weight: Load shown	9,500 pounds
Maximum load allowed	9,800 pounds
Height	79 inches
Width	108 inches
Length	192 inches
Overhang: Front	25 inches
Rear	18 inches
CB (from front edge of platform)	96 inches
Extraction System	EFTC

Figure 9-15. M101A1 howitzer rigged for low-velocity airdrop on a type V platform

9-16. Equipment Required

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

Table 9-1. Equipment required for rigging the M101A1 howitzer for low-velocity airdrop on a type V platform

National Stock Number	Item	Quantity
8040-00-273-8713	Adhesive, paste, 1-gal	As required
4030-00-090-5354	Clevis, suspension, 1-in (large)	5
4020-00-240-2146	Cord, nylon, type III, 550-lb	As required
1670-00-434-5785	Coupling, airdrop, extraction force transfer w 16-ft cable	1
1670-00-360-0329	Cover, link assembly, type IV	3
8135-00-664-6958	Cushioning material, packaging, cellulose wadding	As required
5365-00-937-0147	D-ring, heavy-duty, 10,000-lb	As required
8305-00-958-3685	Felt sheet, 1/2-in	As required
1670-01-183-2678	Leaf, extraction line	2
	*Line, extraction, type XXVI nylon webbing:	
1670-01-062-6313	60-ft (3-loop) <u>or</u>	1
1670-01-107-7651	140-ft (3-loop)	1
	Link assembly:	
	Two-point, 3 3/4-in:	1
5306-00-435-8994	Bolt, 1-in diam, 4 in long	(2)
5310-00-232-5165	Nut, 1-in,	(2)
1670-00-003-1953	Plate, side, 3 3/4-in	(2)
5365-00-007-3414	Spacer, large	(2)
1670-00-783-5988	Type IV	3
5315-00-010-4657	Nail, steel wire, common, 6d	As required
1670-00-753-3928	Pad, energy-dissipating, honeycomb, 3- by 36- by 96-in:	8 sheets
	29- by 14-in	1
	36- by 18-in	11
	36- by 36-in	1
	36- by 96-in	1
	84- by 36-in	5
	Parachute:	
1670-01-016-7841	Cargo, G-11B	2
1670-01-063-3716	Cargo, extraction, 22-ft	1
	Platform, AD, type V, 16-ft:	1
	Bracket:	
1670-01-162-2375	Inside EFTA	(1)
1670-01-162-2374	Outside EFTA	(1)
1670-01-162-2385	Bumper, nose (optional)	(1)
1670-01-162-2372	Clevis assembly (type V)	(40)

Table 9-1. Equipment required for rigging the M101A1 howitzer for low-velocity airdrop on a type V platform (continued)

National Stock Number	Item	Quantity
1670-01-162-2381	Tandem link (multipurpose)	(4)
1670-01-097-8816	Release, cargo parachute, M-1	1
	Sling, cargo airdrop, type XXVI nylon webbing:	
	For deployment line:	
1670-01-062-6304	9-ft (2-loop)	1
	For suspension:	
1670-01-062-6303	12-ft (2-loop)	4
1670-01-062-6301	3-ft (2-loop)	4
	For riser extension:	
1670-01-062-6302	20-ft (2-loop)	2
1670-00-040-8219	Strap, parachute release, multicut (comes w 3 knives)	2
7510-00-266-5016	Tape, PSA, cloth back, 2-in	As required
1670-00-937-0271	Tie-down assembly, 15-ft	43
	Webbing:	
8305-00-268-2411	Cotton, 1/4-in, type I	As required
	Nylon:	
8305-00-082-5753	Tubular, 1/2-in, olive drab	As required
8305-00-263-3591	Type VIII	As required

*Both extraction lines may be needed for C-5 aircraft.

GLOSSARY

ACB attitude control bar	HQ headquarters
AD airdrop	IL Illinois
AFB Air Force Base	in inch
AFJMAN armed forces joint manual	LAPE low-altitude parachute extraction
AFR Air Force regulation	LAPES low-altitude parachute extraction system
AFTO Air Force technical order	lb pound
APERS antipersonnel	NBC nuclear, biological, chemical
ARNG Army National Guard	no number
attn attention	PEFTC extraction force transfer coupling (platform)
c change	Qty quantity
CB center of balance	rqr requirement
d penny	SL/CS static line/connector strap
DA Department of the Army	TM technical manual
DC District of Columbia	TO technical order
DD Department of Defense	TRADOC United States Army Training and Doctrine Command
diam diameter	TX Texas
DZ drop zone	US United States
EFTA extraction force transfer actuator	USAR United States Army Reserve
EFTC extraction force transfer coupling	VA Virginia
FM field manual	w with
ft foot/feet	yd yard
gal gallon	
HERAP high-explosive rocket-assisted projectile	
HMMWV high mobility multi-purpose wheeled vehicle	

REFERENCES

These documents must be available to the intended users of this publication.

*AFJMAN 24-204. *Packaging and Materials Handling: Preparing of Hazardous Material for Military Air Shipments*. November 1994.

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* AFJMAN 24-204 has superseded AFR 71-4/TM 38-250 (15 January 1988). Change 3 pages reflect this change. The basic manual and change 1 and 2 pages will still reference the superseded publication. You may wish to make pen and ink changes to update the old reference citations accordingly.

C3, FM 10-519/FMFM 7-55/TO 13C7-10-31

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