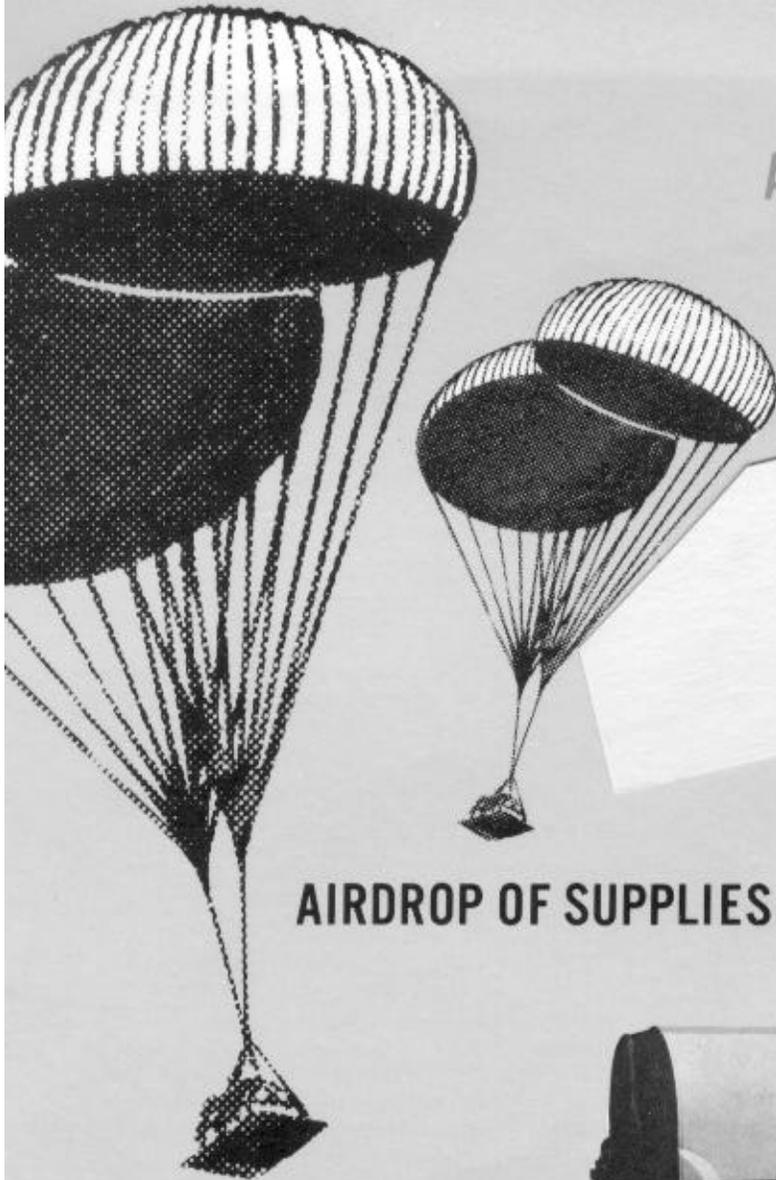
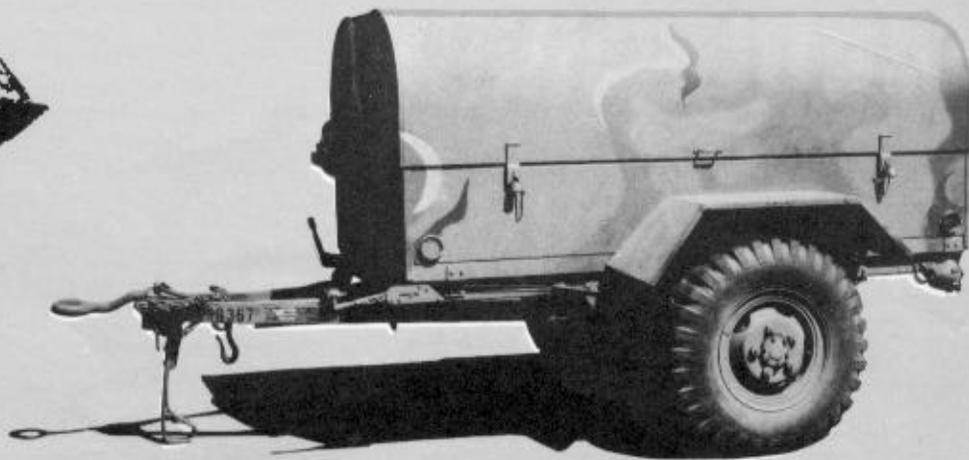


ARMY FM 10-591
AIR FORCE TO 13C7-8-31



AIRDROP OF SUPPLIES AND EQUIPMENT



RIGGING TRAILER MOUNTED ENGINEER ELECTRICAL TOOL OUTFITS

DEPARTMENTS OF THE ARMY AND THE AIR FORCE

CHANGE
No. 1

HEADQUARTERS
DEPARTMENT OF THE ARMY
DEPARTMENT OF THE AIR FORCE
Washington, DC, 19 August 1996

**AIRDROP OF SUPPLIES AND EQUIPMENT:
RIGGING TRAILER-MOUNTED ENGINEER
ELECTRICAL TOOL OUTFITS**

This change adds the procedures for rigging the trailer-mounted engineer electrical tool outfits for low-velocity airdrop on a type V platform.

FM 10-591/TO 13C7-8-31 is changed as follows:

1. New or changed material is identified by a vertical bar in the margin opposite the changed material.
2. Remove old pages and insert new pages as indicated below.

Remove pages	Insert pages
i	i and ii
1-1	1-1
2-13	3-1 through 3-21
	Glossary-1
	References-1

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FIELD MANUAL
NO 10-591
TECHNICAL ORDER
NO 13C7-8-31

HEADQUARTERS
DEPARTMENTS OF THE ARMY
AND THE AIR FORCE
Washington, DC, 17 June 1977

**AIRDROP OF SUPPLIES AND EQUIPMENT:
RIGGING TRAILER-MOUNTED ENGINEER
ELECTRICAL TOOL OUTFITS**

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CHAPTER 1 INTRODUCTION

1-1. Scope

This manual tells and shows how to prepare and rig the trailer-mounted engineer electrical tool outfit for low-velocity airdrop from the C-130, C-141 and C-5 aircraft on the type II and type V platforms.

1-2. Special Considerations

a. The accompanying load may include a hazardous material such as ammunition or gasoline. When hazardous material is included as a part of the load, the material must be packaged, marked, and labeled to comply with AFJMAN 24-204.

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

b. A copy of this manual should accompany the rigged load to the aircraft.

1-3. User Information

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

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CHAPTER 3

**RIGGING TRAILER-MOUNTED ENGINEER ELECTRICAL TOOL
OUTFIT ON A 12-FOOT, TYPE V AIRDROP PLATFORM
FOR LOW-VELOCITY AIRDROP****3-1. Description of Load**

The trailer-mounted engineer electrical tool outfit (NSN 5180-00-289-9569) is rigged on a 12-foot, type V platform with one G-11 cargo parachute and other items of airdrop equipment. The unrigged trailer-mounted tool outfit weighs 2,720 pounds, its length is 147 inches, its width is 75 inches, and its height is 71 inches. Other trailer-mounted engineer electrical tool outfits may also be rigged for airdrop by adapting these procedures.

3-2. Preparing Platform

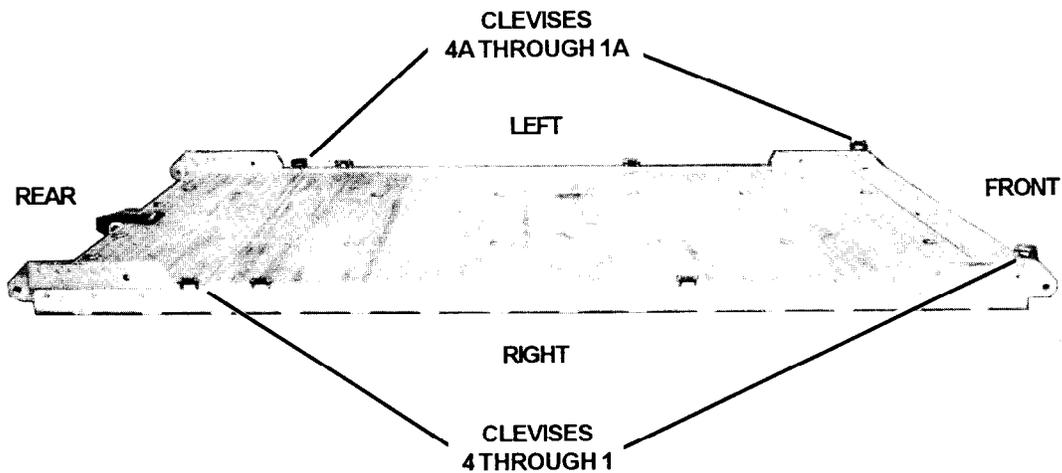
Prepare a 12-foot, type V platform as described below and shown in Figure 3-1.

a. Inspecting Platform. Inspect, or assemble and inspect, the 12-foot, type V airdrop platform according to TM 10-1670-268-20&P/TO 13C7-52-22.

b. Installing Tandem Links. Install a tandem link to the front and rear of each platform side rail as shown in Figure 3-1.

c. Installing and Numbering Clevises. Bolt and number eight clevis assemblies as shown in Figure 3-1.

- NOTES:**
1. Nose bumper may or may not be installed.
 2. Measurements from the front of the platform are taken from the front edge of the first panel or the crease of the nose bumper, NOT from the front edge of the nose bumper.
 3. Measurements from the rear of the platform are taken from the rear edge of the last panel.



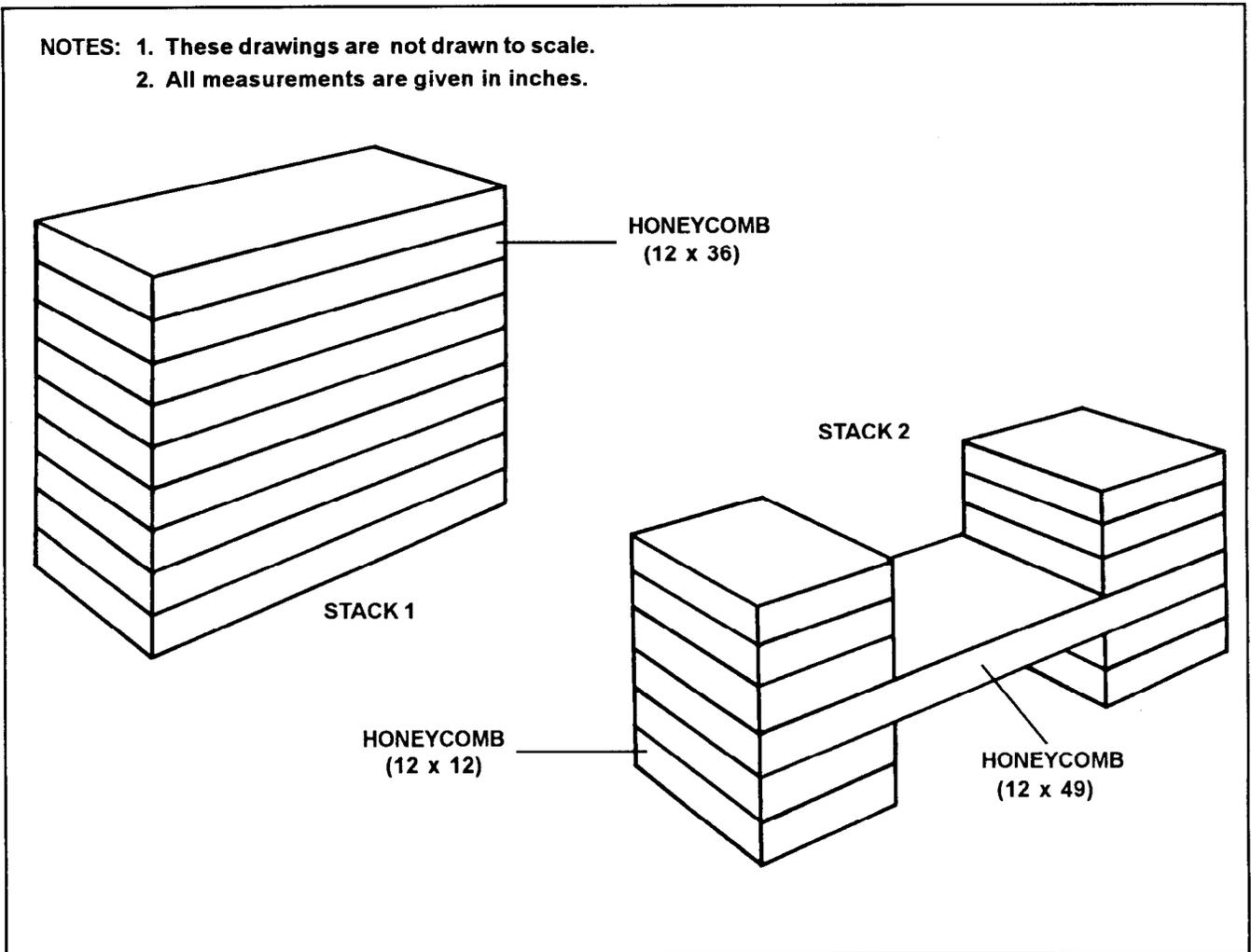
Step:

1. Install a tandem link to the front of each platform side rail using holes 1, 2, and 3.
2. Install a tandem link to the rear of each platform side rail using holes 22, 23, and 24.
3. Install a clevis on bushing 1 of each front tandem link.
4. Starting at the front of each platform side rail, install clevises on the bushings bolted on holes 9, 19, and 21.
5. Starting at the front of the platform, number the clevises 1 through 4 on the right side and 1A through 4A on the left side.
6. Label the tie-down rings according to FM 10-500-2/TO 13C7-1-5.

Figure 3-1. Platform prepared

3-3. Preparing and Positioning Honeycomb Stacks

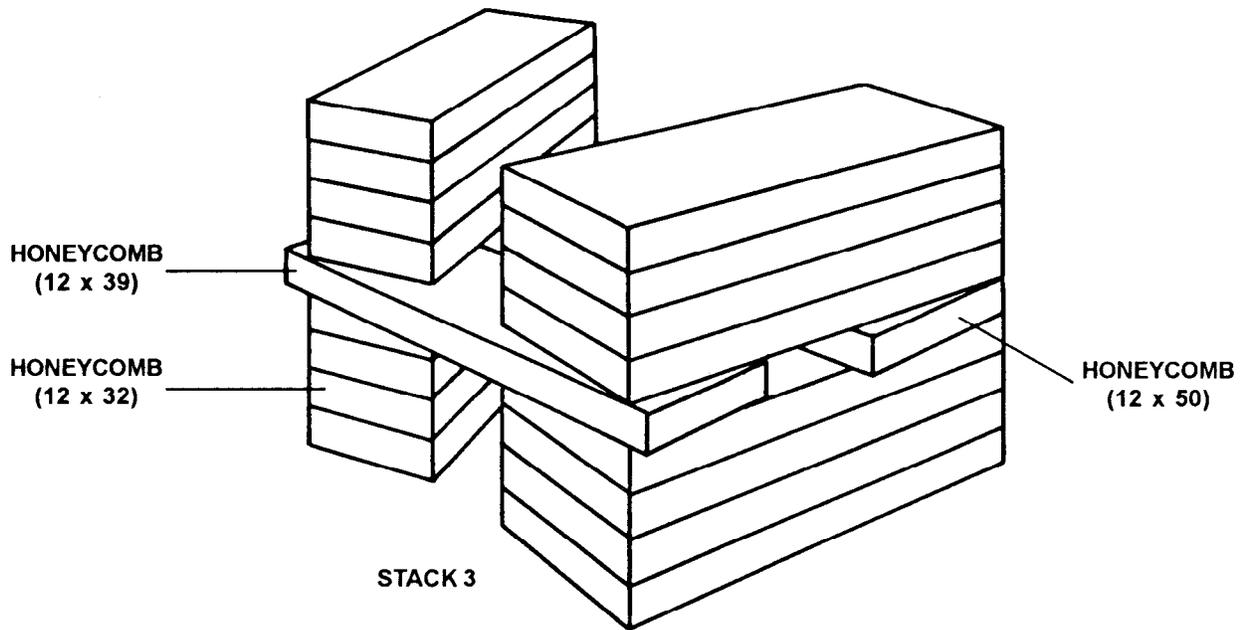
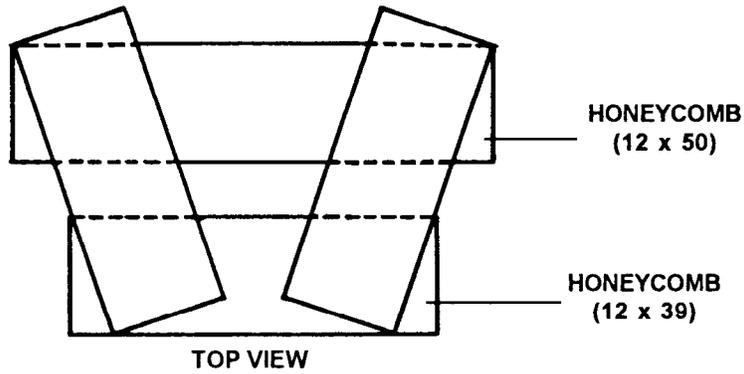
Prepare three honeycomb stacks as shown in Figures 3-2, and 3-3. Position the stacks on the platform as shown in Figure 3-4.



Stack Number	Pieces	Width (inches)	Length (inches)	Material	Instructions
1	9	12	36	Honeycomb	Stack honeycomb flush.
2	10 1	12 12	12 49	Honeycomb Honeycomb	Stack honeycomb flush. Bridge the two stacks between the second and third layers of honeycomb as shown.

Figure 3-2. Honeycomb stacks 1 and 2 prepared

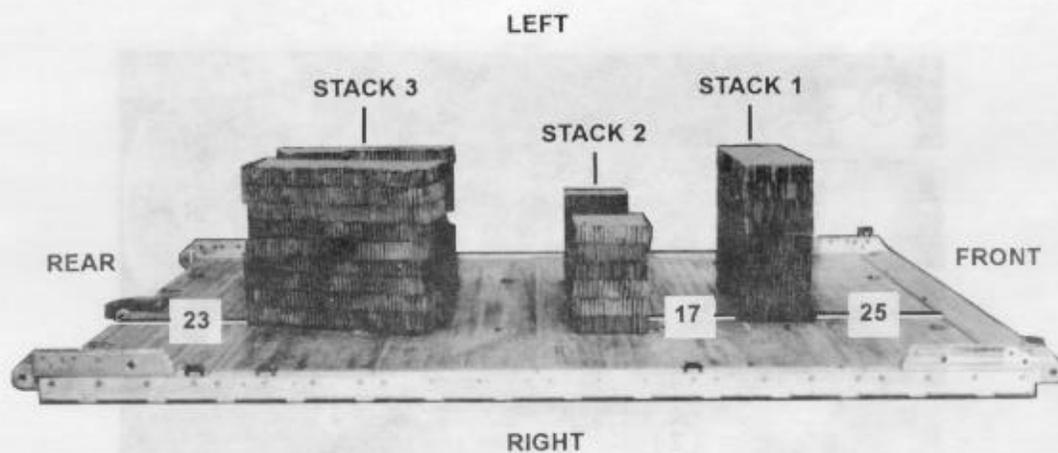
- NOTES: 1. These drawings are not drawn to scale.
 2. All measurements are given in inches.



Stack Number	Pieces	Width (inches)	Length (inches)	Material	Instructions
3	16	12	32	Honeycomb	Make four stacks of four layers each. Place them at an angle as shown. Bridge the two stacks between the fourth and fifth layers of honeycomb on stack 3.
	1	12	39	Honeycomb	
	1	12	50	Honeycomb	

Figure 3-3. Honeycomb stack 3 prepared

NOTE: All measurements are given in inches.



Stack Number	Position of Stack on Platform
1	Center 25 inches from the front edge of the platform.
2	Center 17 inches from stack 1.
3	Center 23 inches from rear edge of platform with the narrow part of the V to the rear.

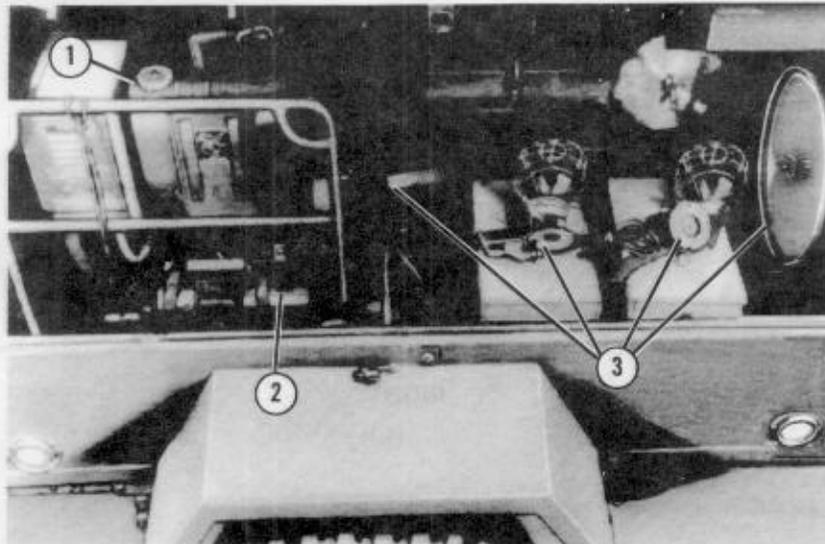
Figure 3-4. Honeycomb positioned

3-4. Preparing Tool Outfit and Trailer

Prepare the trailer and its contents as shown in Figures 3-5, 3-6 and 3-7.

CAUTION

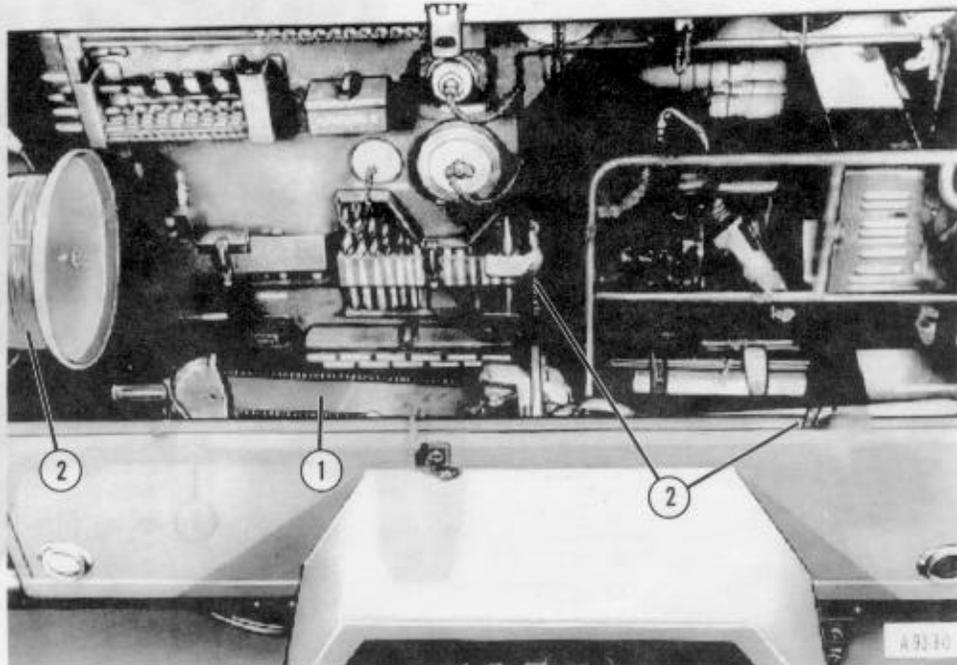
Package, mark, and label gasoline according to AFJMAN 24-204.



NOTE: Be sure the generator is bolted down to the floor of the trailer. If the generator cannot be secured in this way, route a 15-foot lashing through each front tie-down ring and through its own D-ring. Route the lashings through each side of the generator frame. Secure the lashings with a D-ring and load binder. These lashings are shown in later figures.

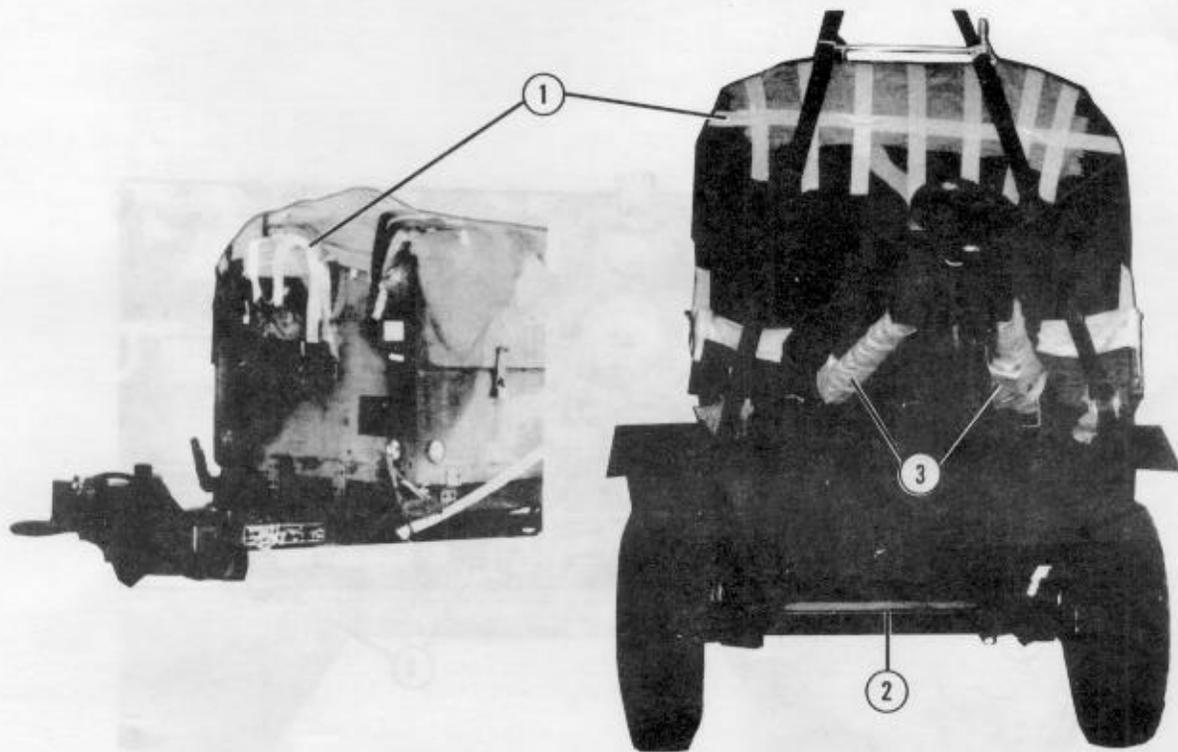
- ① Make certain the generator fuel tank is no more than three-fourths full.
- ② Position and tape two 2- by 4- by 15-inch pieces of lumber under the generator frame on the right and left sides.
- ③ Tape the nozzle, extension cables, and floodlights.
- ④ Tie the ground rods together with type III nylon cord, and place them in the storage area provided for long drill bits (not shown).

Figure 3-5. Right inside of trailer prepared



- ① Place the multipurpose saw on top of the circular saw. Secure it with a tie-down strap around the lower frame of the generator and through the handle of the circular saw.
- ② Tape the nozzle, extension cable, and survey stick.

Figure 3-6. Left inside of trailer prepared

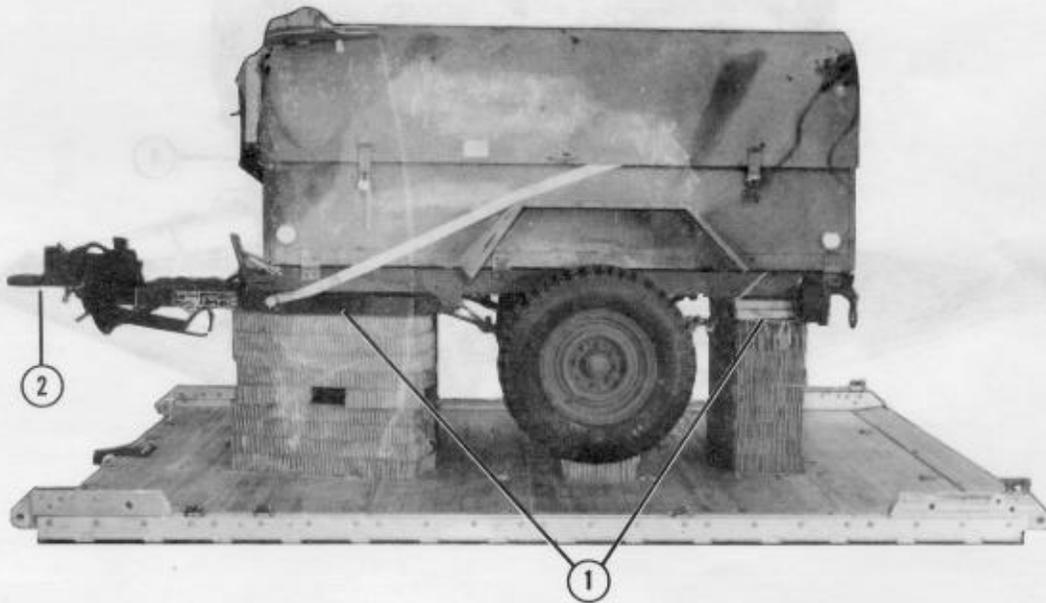


- ① Pad the top edge of trailer first. Check gasoline can and make certain it is filled to a level 1 inch below the bottom of the filler neck threads when the can is in a level position. Stow the can in the bracket provided. Pad the top of the can. If there are no straps to secure the gasoline can, secure it with 1/2-inch tublar nylon.
- ② Position two 2- by 12- by 47-inch pieces of lumber under the trailer frame to the rear of the spring shackles. Tie the pieces of lumber in place with one turn type III nylon cord.
- ③ Secure the intervehicular cable and chains to the drawbar with type III nylon cord and tape. Close and lock the metal canopy and compartments. If there is no lock, securely tie the tool compartments with type III nylon cord.

Figure 3-7. Outside of trailer prepared

3-5. Positioning Trailer

Attach four 12-foot (2-loop) slings and four medium clevises to the tie-down rings to lift the trailer. Position the trailer on the honeycomb stacks as shown in Figure 3-8.

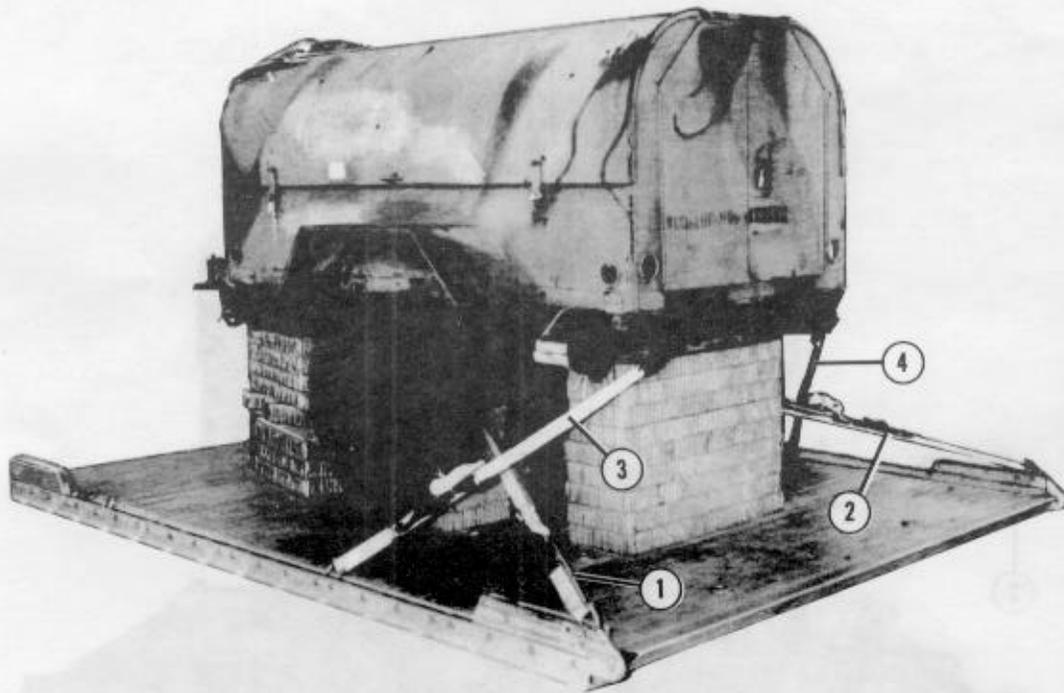


- | Instructions | Tie-down
Cleave
Number | Loading
Number |
|--|------------------------------|-------------------|
| <p>① Set the trailer on the honeycomb stacks so that the lumber pieces rest squarely on stack 1 and the drawbars rest squarely on stack 3.</p> | 1 | 1 |
| <p>② Let the lunette overhang the rear of the platform 20 inches.</p> | 2 | 2 |

Figure 3-8. Trailer positioned

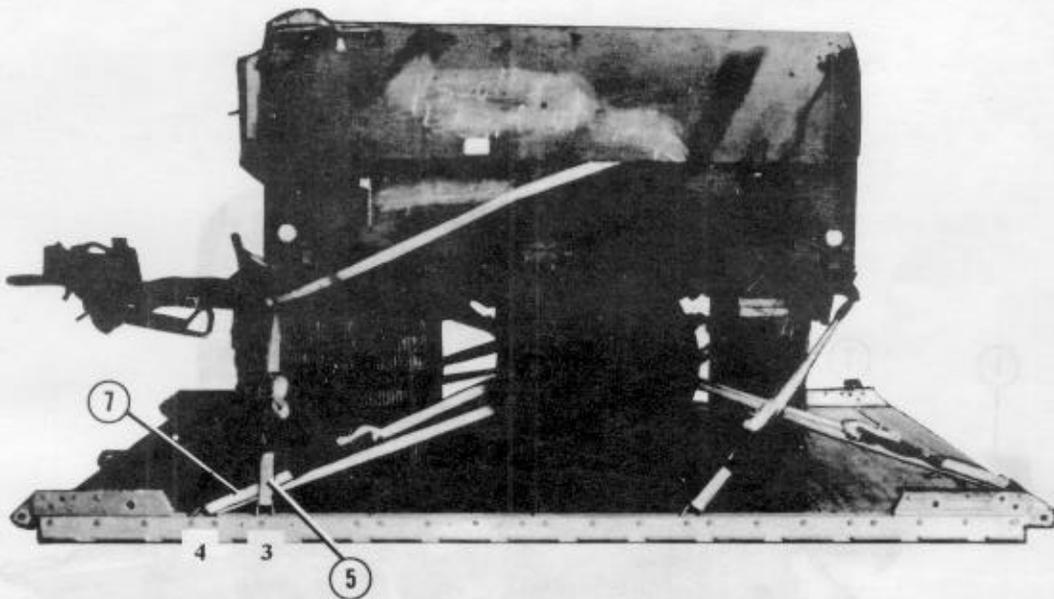
3-6. Lashing Trailer

Lash the trailer to the platform as shown in Figure 3-9.



Lashing Number	Tie-down Clevis Number	Instructions
1	1	Pass lashing: Around axle between shock absorber and spring.
2	1A	Around axle between shock absorber and spring.
3	2	Through left rear tiedown provision.
4	2A	Through right rear tiedown provision.

Figure 3-9. Lashings installed

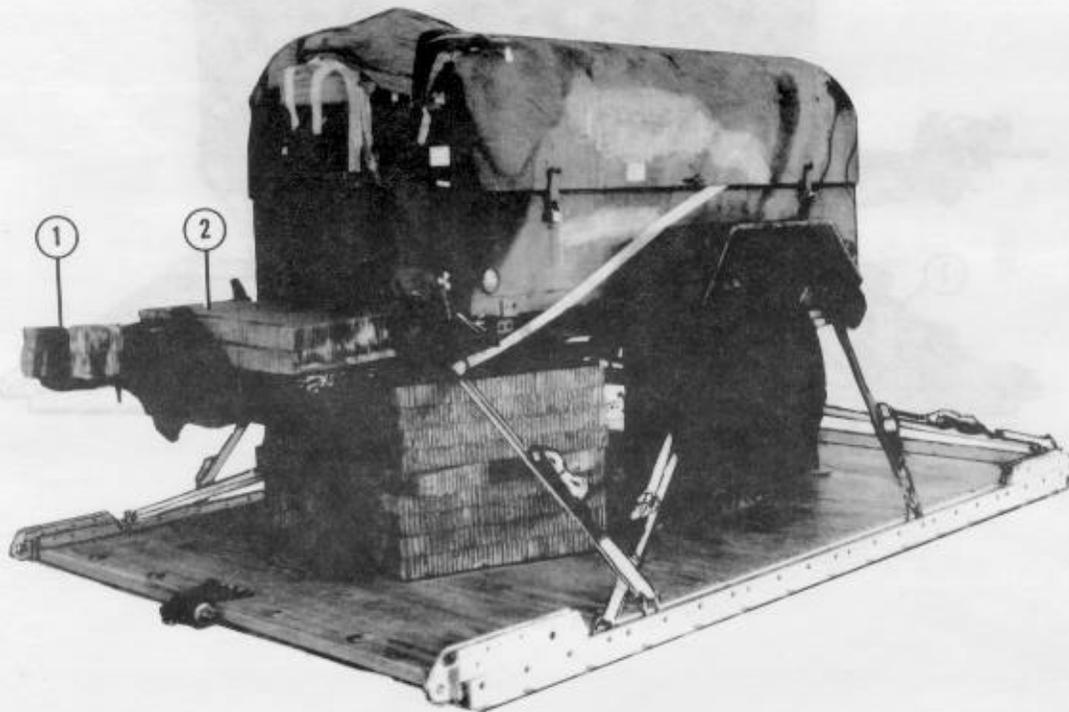


Lashing Number	Tie-down Clevis Number	Instructions
5	3	Pass lashing: Through left front tiedown provision.
6	3A	Through right front tiedown provision.
7	4	Around axle to right of shock absorber.
8	4A	Around axle to left of shock absorber.

Figure 3-9. Lashings installed (continued)

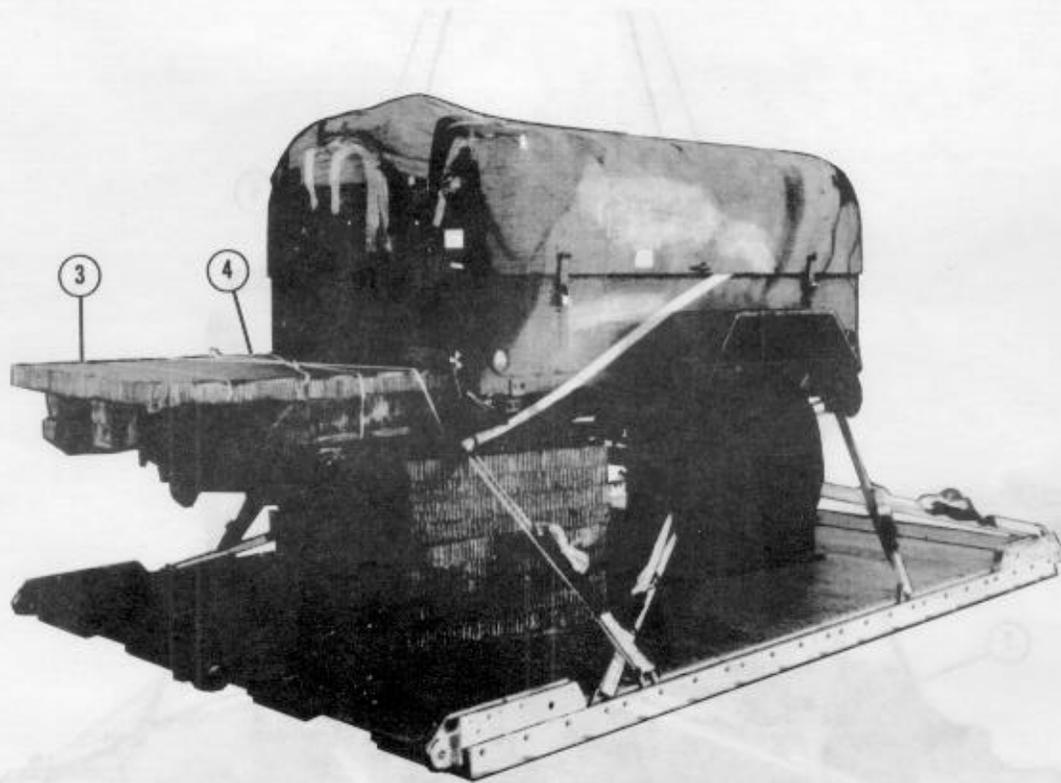
3-7. Constructing and Installing Parachute Stowage Platform

Construct and install the parachute stowage platform as shown in Figure 3-10.



- ① Tape two 12- by 6-inch pieces of honeycomb to the lunette.
- ② Position two 24- by 36-inch pieces of honeycomb on the trailer drawbar. Tape the bottom left and right edges of the honeycomb.

Figure 3-10. Parachute stowage platform constructed and installed

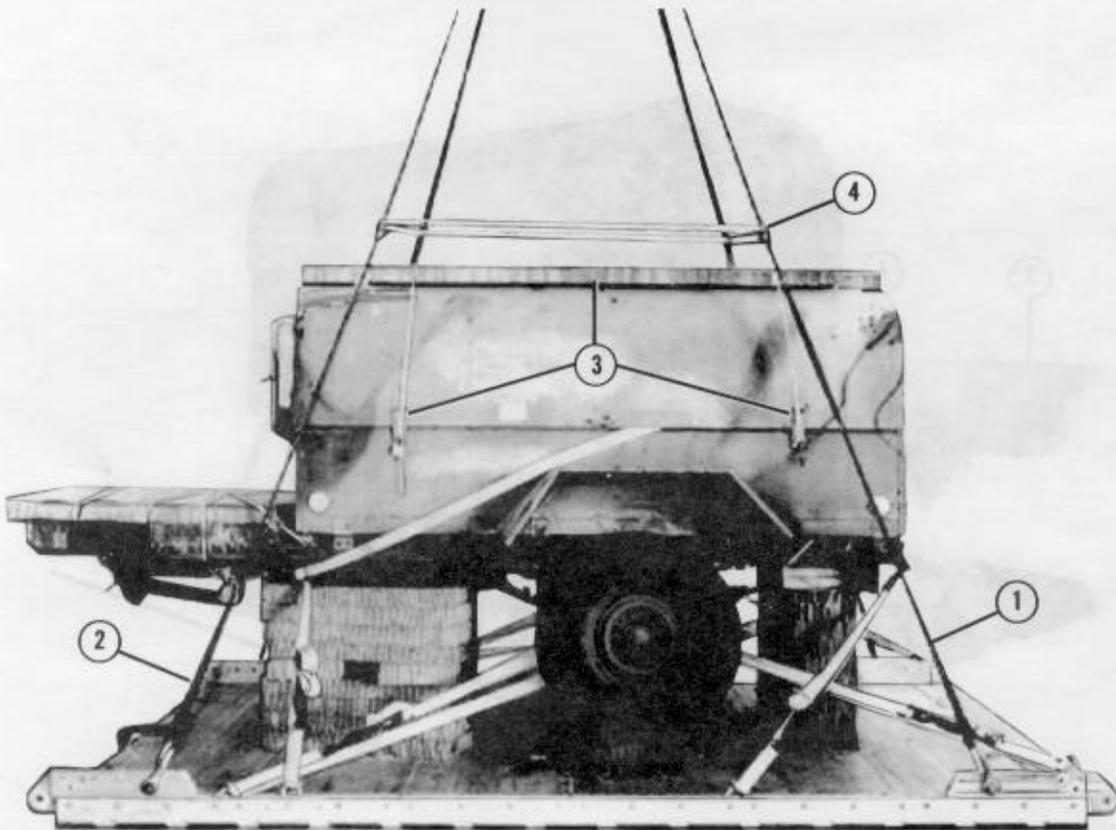


- ③ Position and glue one 36- by 48-inch piece of honeycomb on top of the honeycomb placed in steps 1 and 2. Tape the right and left top edges of the honeycomb.
- ④ Secure the honeycomb with type III nylon cord.

Figure 3-10. Parachute stowage platform constructed and installed (continued)

3-8. Installing and Safetying Suspension Slings

Install and safety the suspension slings as shown in Figure 3-11.

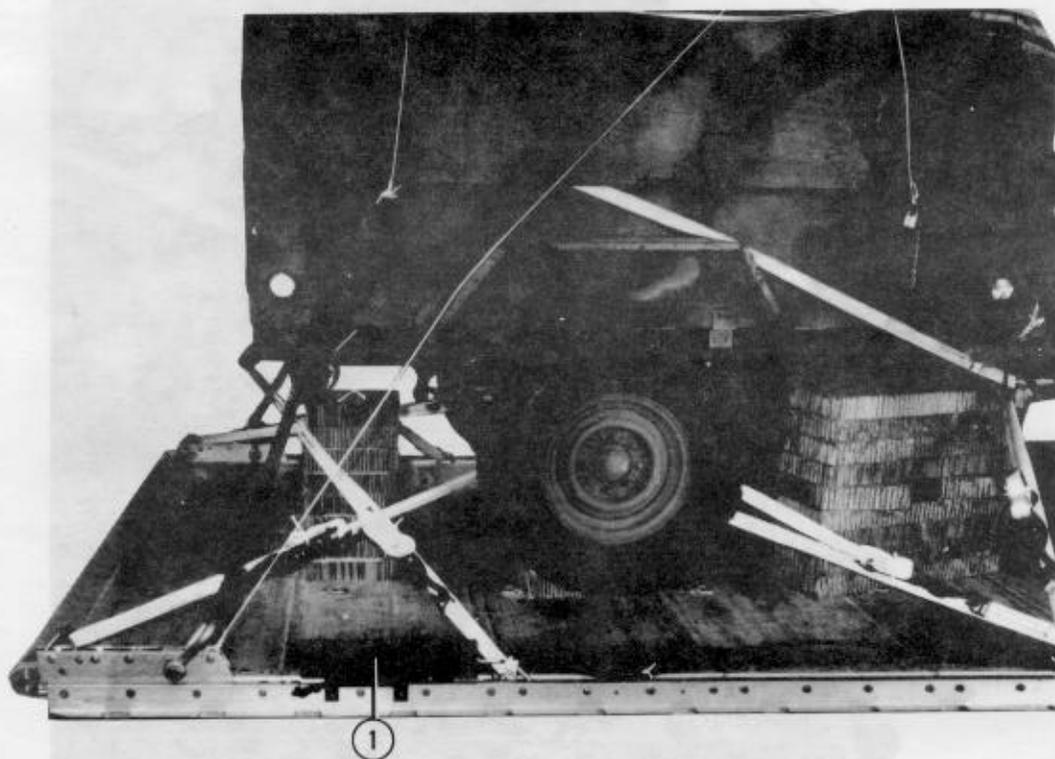


- ① Attach a 16-foot (2-loop), type XXVI nylon suspension sling to each front tandem link with a large clevis.
- ② Attach a 16-foot (2-loop), type XXVI nylon suspension sling to each rear tandem link with a large clevis.
- ③ Place a 36- by 96-inch piece of honeycomb on the top of the trailer. Tape the right and left top edges and secure with type III nylon cord. Pad and tape the cover latches.
- ④ Raise the slings and install the deadman's tie 6 to 8 inches above the highest point on the load according to FM 10-500-2 /TO 13C7-1-5.

Figure 3-11. Suspension slings and deadman installed

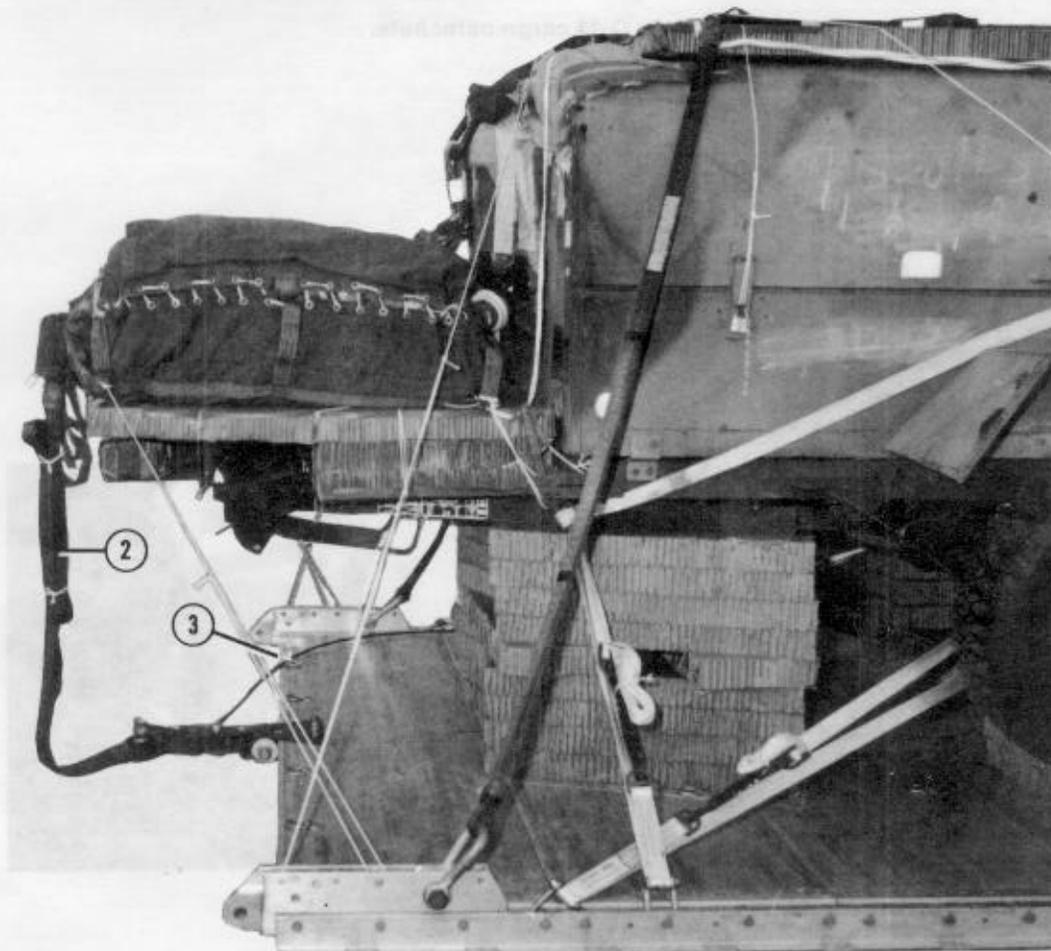
3-10. Installing Extraction System

Install the extraction system as shown in Figure 3-13.



- ① Install the components of the extraction force transfer coupling (EFTC) according to FM 10-500-2/TO 13C7-1-5. Use the forward mounting holes for the EFTC bracket.

Figure 3-13. Extraction system installed



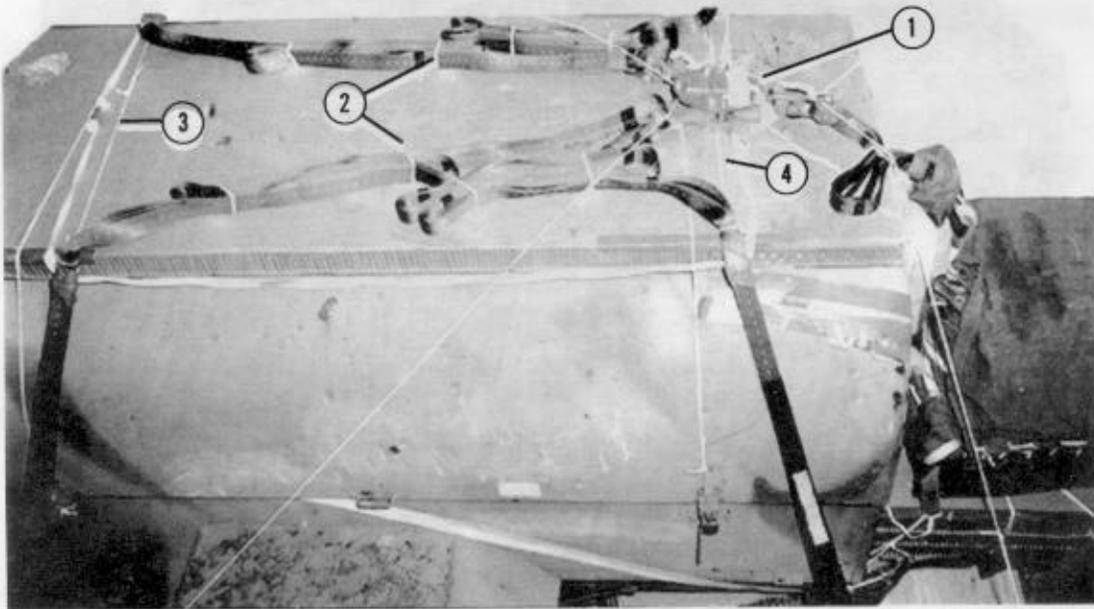
- ② Attach a 9-foot (2 loop), type XXVI nylon sling to be used as a deployment line.
- ③ Safety the EFTC cable to tie-down ring D6 using one turn of type I, 1/4-inch cotton webbing.

Figure 3-13. Extraction system installed (continued)

3-11. Installing Release System

Prepare, attach, and safety an M-1 cargo parachute release according to FM 10-500-2/TO 13C7-1-5 and as shown in Figure 3-14.

NOTE: Place clevis in the protector flap of the G-11 cargo parachute.



- ① Place the M-1 release on top of the honeycomb and safety it to convenient points on the load.
- ② Fold any slack in the suspension slings and tie folds with type I, 1/4-inch cotton webbing.
- ③ Safety the front set of slings together just above the deadman's tie with type III nylon cord.
- ④ Safety the rear set of slings together just above the deadman's tie with type III nylon cord.

Figure 3-14. Release system installed

3-12. Placing Extraction Parachute

Select the extraction parachute and extraction line needed using the extraction line requirements table in FM 10-500-2/TO 13C7-1-5. Place the extraction parachute and extraction line on the load for installation in the aircraft.

3-13. Installing Provisions for Emergency Restraint

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

3-14. Marking the Rigged Load

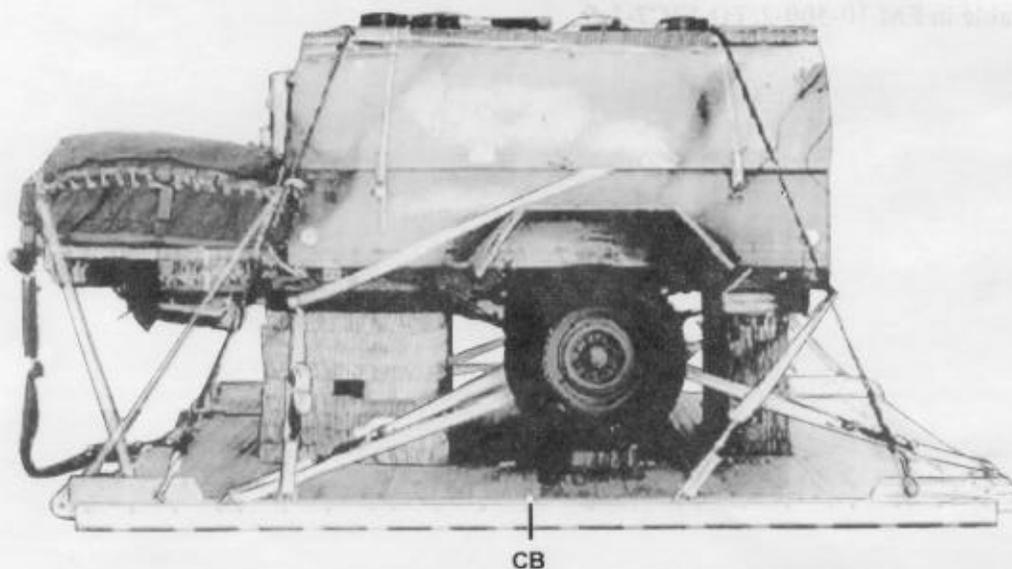
Mark the rigged load according to FM 10-500-2/TO 13C7-1-5 and as shown in Figure 3-15. Complete Shipper's Declaration for Dangerous Goods and securely attach it to the load. If the load varies from the one shown, the weight, height, CB, tip off curve, and parachute requirements must be recomputed.

3-15. Equipment Required

Use the equipment listed in Table 3-1 to rig this load.

CAUTION

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



RIGGED LOAD DATA

Weight: Load shown	4,520 pounds
Maximum allowed	5,000 pounds
Width	108 inches
Height	82 inches
Length	144 inches
Overhang: Front	0 inches
Rear	20 inches
CB (from front edge of platform)	72 inches

Figure 3-15. Trailer-mounted engineer electrical tool outfit rigged on a type V platform for low-velocity airdrop

Table 3-1. Equipment required for rigging trailer--mounted engineer electrical tool outfits for low-velocity airdrop

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
1670-00-434-5783	Coupling, airdrop, extraction force transfer w 12-ft cable	1
1670-00-360-0329	Cover, link assembly, type IV	1
1670-00-360-0328	Cover, clevis, large	1
8135-00-664-6958	Cushioning material, packing cellulose wadding	As required
1670-01-183-2678	Leaf, extraction (line bag)	2
	Line, extraction:	
1670-01-064-4452	60-ft (I-loop), type XXVI nylon webbing	1
1670-01-107-7652	160-ft (1-loop), type XXVI nylon webbing (for C-141)	1
1670-00-783-5988	Link assembly, type IV	2
5510-00-220-6146	Lumber, 2- by 4- by 15-in	4
5510-00-220-6250	Lumber, 2- by 12- by 47-in	2
1670-00-753-3928	Pad, energy-dissipating, honeycomb, 3- by 36- by 96-in	7 sheets
1670-01-016-7841	Parachute, cargo, 100-ft, G-11B	1
1670-01-063-3715	Parachute, cargo extraction, 15-ft	1
1670-01-162-2372	Clevis assembly, type V	8
	Platform, AD, type V, 12-ft:	1
	Bracket:	
1670-01-162-2375	Inside EFTA	1
1670-01-162-2374	Outside EFTA	1
1670-01-162-2376	Extraction bracket assembly	1
1670-01-247-2389	Link, tandem, type V platform	4
1670-01-097-8816	Release, cargo parachute, M-1	1
	Sling, cargo, airdrop:	
	For deployment line:	
1670-01-062-6304	9-ft (2-loop), type XXVI nylon webbing	1
	For suspension:	
1670-01-063-7761	16-ft (2-loop), type XXVI nylon webbing	4
1670-01-062-6301	3-ft (2-loop), type XXVI nylon webbing	1
8305-00-754-5124	Tape, adhesive, 2-in	As required
1670-00-937-0271	Tie-down assembly, 15-ft	10
	Webbing:	
8305-00-268-2411	Cotton, 1/4-in, type I	As required
8305-00-268-2453	Nylon, tubular, 1/2-in, 1,000 lb	As required

GLOSSARY

ACB Attitude control bar	gal gallon
AD airdrop	HQ headquarters
AFB Air Force base	in inch
AFJMAN armed forces joint manual	lb pound
AFR Air Force regulation	no number
AFTO Air Force technical order	NSN national stock number
attn attention	Qty quantity
CB center of balance	rqr requirement
d penny	sq square
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 Doctrines Command
diam diameter	US United States
EFTA extraction force transfer actuator	VA Virginia
EFTC extraction force transfer coupling	w with
FM field manual	yd yard
ft feet	

REFERENCES

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

***AFJMAN 24-204.** *Packaging and Materials Handling: Preparation of Hazardous Materials for Military Air Shipment.* November 1994.

FM 10-500-2/TO 13C7-1-5. *Airdrop of Supplies and Equipment: Rigging Airdrop Platforms.* 1 November 1990.

FM 10-553/TO 13C7-18-41. *Airdrop of Supplies and Equipment: Rigging Ammunition for Low and High Velocity Airdrop.*

TM10-1670-208-20&P/TO 13C3-4-12. *Organizational Maintenance Manual Including Repair Parts and Special Tool Lists for Platforms, Types II Modular and LAPES/Airdrop Modular.* 10 August 1978.

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 10-1670-278-23&P/TO 13C5-28-2/NAVAIR 13-1-27/TM 011090-23 &P/1. *Unit and Intermediate DS Maintenance Manual Including Repair Parts and Special Tools List for Parachute, Cargo Type, 15-Ft Diam, Cargo Extraction.* 6 November 1989.

TM 10-1670-280-23&P/TO 13C5-31-2/NAVAIR 13-1-31. *Unit and Intermediate DS Maintenance Manual Including Repair Parts and Special Tools List for Parachute, Cargo Type, G-11A, G-11B, and G-11C.* 30 August 1989.

AFTO Form 22. *Technical Order Publication Improvement Report.* April 1973.

DA Form 2028. *Recommended Changes to Publications and Blank Forms.* February 1974

****Shipper's Declaration for Dangerous Goods.** Locally Procured Form.

* AFJMAN 24-204 has superseded AFR71-4/TM 38-250 (15 January 1988). Change 1 pages reflect this change. The basic manual pages will still reference the superseded publication. You may wish to make pen and ink changes to update the old reference citations accordingly.

** Shipper's Declaration for Dangerous Goods has superseded DD Form 1387-2 (February 1982). The basic manual pages will still reference the superseded publication. You may wish to make pen and ink changes to update the old reference citations accordingly.

References-1