C1, FM 4-20.117/MCRP 4-11.3M/TO 13C7-1-111 HEADQUARTERS DEPARTMENT OF THE ARMY UNITED STATES MARINE CORPS DEPARTMENT OF THE AIR FORCE Washington, DC, 22 July 2005

CHANGE NO.1

AIRDROP OF SUPPLIES AND EQUIPMENT: RIGGING HIGH-MOBILITY MULTIPURPOSE WHEELED VEHICLES

This change incorporates the rigging procedures for the M1151 Armament Carrier and the procedure to mount a driver vision enhancer model number AN/VAS-5 on specific HMMWV series vehicles.

This change also includes a Marine Corps designation. The designation is Marine Corps Reference Publication (MCRP) 4-11.3M. This change reflects the entire manual and not just the rigging procedure in this change.

FM 4-20.117/TO 13C7-1-111, 1 October 2002, is changed as follows:

- 1. New or changed material is identified by a vertical bar in the margin opposite the changed material.
- 2. File the transmittal sheet in front of the publication for reference purpose.
- 3. Remove old pages and insert new pages as indicated below:

Remove old pages	<u>Insert new pages</u>
i through vii	i through vi
1-1 through 1-4	1-1 through 1-3
	4-53 through 4-75
	5-103 through 5-107
References-1	References-1 and References-2

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C1, FM 4-20.117 MCRP 4-11.3M TO 13C7-1-111 22 July 2005

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HEADQUARTERS DEPARTMENT OF THE ARMY UNITED STATES MARINE CORPS DEPARTMENT OF THE AIR FORCE Washington, DC, 22 July 2005

Airdrop of Supplies and Equipment: Rigging High-Mobility Multipurpose Wheeled Vehicles (HMMWV)

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Preface

SCOPE

The manual tells and shows how to rig HMMWV-series trucks in the Army inventory at the time of publication for low-velocity parachute airdrop. Some specialized truck configurations and loads are included.

USER INFORMATION

The proponent of this publication is HQ TRADOC. You are encouraged to report any errors or omissions and to suggest ways of making this a better manual.

Army personnel, send your comments on DA Form 2028 directly to: Director Aerial Delivery and Field Services Department USA Quartermaster Center and School 710 Adams Avenue Fort Lee, Virginia 23801-1502

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Marine Corps personnel, send your comments to:

Marine Corps Combat Development Command Doctrine Division (C398) 3300 Russell Road, Suite 318A Quantico, Virginia 22134-5010

CHAPTER 1

INTRODUCTION

DESCRIPTION OF ITEMS

1-1. The HMMWV-series trucks that can be rigged using the procedures in this manual are listed below.

a. M998 Cargo/Troop Carriers. The M998 truck weighs 5,200 pounds. It is 180 inches long and 85 inches wide. The reduced height of the truck is 54 inches.

The M998A1 truck weighs 5,380 pounds. Its length is 180 inches and its width is 86 inches. The reduced height is 56 inches.

b. M1038 Cargo/Troop Carriers With Winch. The M1038 truck weighs 5,327 pounds. It is 186 inches long and 85 inches wide. The reduced height of the truck is 54 inches.

The M1038A1 truck weighs 5,507 pounds. Its length is 186 inches and its width is 86 inches. The reduced height is 56 inches.

c. M1025 Armament Carriers, Armored. The M1025 truck weighs 5,960 pounds. It is 180 inches long and 85 inches wide. The reduced height of the truck is 74 inches.

The M1025A1 truck weighs 6,140 pounds. Its length is 180 inches and its width is 86 inches. The reduced height is 74 inches.

The M1025A2 truck weighs 6,780 pounds. Its length is 191 inches and its width is 86 inches. The reduced height is 74 inches.

d. M1025A2 Armament Carrier (Modified), With Winch. This is NOT the same carrier as the M1025A2. External and internal modifications have been made to support special operations. The M1025A2 (modified) carrier weighs 7,020 pounds. It is 191 inches long and 86 inches wide.

e. M1026 Armament Carriers, Armored With Winch. The M1026 truck weighs 6,087 pounds. It is 186 inches long and 85 inches wide. The reduced height of the truck is 74 inches.

The M1026A1 truck weighs 6,267 pounds. Its length is 186 inches and its width is 86 inches. The reduced height is 74 inches.

f. M1026 Armament Carrier (Modified). This is NOT the same carrier as the M1026. External and internal modifications have been made to support special operations. The M1026 (modified) carrier weighs 6,087 pounds. It is 185 inches long and 85 inches wide. The reduced height of the truck is 69 inches.

g. M966 TOW Carriers, Armored . The M966 truck weighs 6,051 pounds. It is 180 inches long and 85 inches wide. The reduced height of the truck is 74 inches.

The M966A1 truck weighs 6,231 pounds. Its length is 180 inches and its width is 86 inches. The reduced height is 74 inches.

h. M1036 TOW Carrier, Armored With Winch. The M1036 truck weighs 6,178 pounds. It is 186 inches long and 85 inches wide. The reduced height of the truck is 74 inches.

i. M1121 TOW Carrier, Armored. The M1121 truck weighs 7,900 pounds. It is 180 inches long and 85 inches wide. The reduced height of the truck is 74 inches.

j. M1043 Armament Carriers, With Supplemental Armor. The M1043 truck weighs 6,411 pounds. It is 180 inches long and 85 inches wide. The reduced height of the truck is 74 inches.

The M1043A1 truck weighs 6,591 pounds. Its length is 180 inches and its width is 86 inches. The reduced height is 74 inches.

The M1043A2 truck weighs 7,230 pounds. Its length is 191 inches and its width is 86 inches. The reduced height is 74 inches.

k. M1044 Armament Carriers, With Supplemental Armor and Winch. The M1044 truck weighs 6,411 pounds. It is 186 inches long and 85 inches wide. The reduced height of the truck is 74 inches.

The M1044A1 truck weighs 6,718 pounds. Its length is 186 inches and its width is 86 inches. The reduced height is 74 inches.

I. M1045 Armament Carriers, With Supplemental Armor. The M1045 truck weighs 6,438 pounds. It is 180 inches long and 85 inches wide. The reduced height of the truck is 74 inches.

The M1045A1 truck weighs 6,618 pounds. Its length is 180 inches and its width is 86 inches. The reduced height is 74 inches.

The M1045A2 truck weighs 7,258 pounds. Its length is 191 inches and its width is 86 inches. The reduced height is 74 inches.

m. M1046 TOW Carriers, With Supplemental Armor and Winch. The M1046 truck weighs 6,565 pounds. It is 186 inches long and 85 inches wide. The reduced height of the truck is 74 inches.

The M1046A1 truck weighs 6,745 pounds. Its length is 186 inches and its width is 86 inches. The reduced height is 74 inches.

n. M1037 S250 Shelter Carrier. The M1037 truck weighs 5,425 pounds. It is 191 inches long and 85 inches wide. The reduced height, without the shelter, is 54 inches.

o. M1037 Cargo/Troop Carrier (Modified), With Winch. This is NOT the same carrier as the M1037. External and internal modifications have been made to support artillery operations. The M1037 (modified) is 185 inches long and 85 inches wide. The reduced height of the truck is 70 inches.

p. M1042 S250 Shelter Carrier, With Winch. The M1042 truck weighs 5,551 pounds. It is 197 inches long and 85 inches wide. The reduced height, without the shelter, is 54 inches.

q. M1097 Truck, Utility, Heavy Variant. The M1097 truck weighs 5,600 pounds. It is 191 inches long and 86 inches wide. The reduced height of the truck is 56 inches.

The M1097A1 truck weighs 5,600 pounds. Its length is 191 inches and its width is 86 inches. The reduced height is 56 inches.

The M1097A2 truck weighs 5,900 pounds. Its length is 191 inches and its width is 86 inches. The reduced height is 56 inches. This truck may have a winch.

r. M1113 Truck, Utility, Expanded Capacity. The M1113 truck weighs 6,190 pounds. It is 197 inches long and 86 inches wide. The reduced height of the truck is 56 inches. This truck may have a winch.

s. M1114 Armament Carrier, Expanded Capacity, Up-Armored, With Winch. The M1114 truck weighs 9,800 pounds. It is 197 inches long and 86 inches wide. The reduced height of the truck is 74 inches.

t. M1151 Armament Carrier, Expanded Capacity. The M1151 truck weighs 7,300 pounds. It is 193 1/2 inches long and 86 inches wide. The reduced height of the truck is 77 inches.

SPECIAL CONSIDERATIONS

1-2. Special considerations for this manual are listed below.

a. The loads covered in this manual may include hazardous materials as defined in AFMAN 24-204(I)/TM 38-250. If included, the hazardous material must be packaged, marked, and labeled as required by AFMAN 24-204(I)/TM 38-250.

b. A copy of this manual must be available to the joint airdrop inspectors during the before- and after-loading inspections.

CAUTION

Only ammunition listed in FM 4-20.153/MCRP 4-11.3B/TO 13C7-18-41 may be airdropped.

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SECTION III - RIGGING M1151 ARMAMENT CARRIER WITH ACCOMPANYING LOAD ON A 16-FOOT PLATFORM

DESCRIPTION OF LOAD

4-30. The M1151 HMMWV shown in Figure 4-36 is rigged with an accompanying load on a 16-foot, type V platform. The load uses three G-11 cargo parachutes and the accompanying load has a minimum weight of 1,300 pounds and a maximum weight of 2,000 pounds. This load is 93 inches high, 108 inches wide, and 215 inches long.

PREPARING PLATFORM

4-31. Prepare a 16-foot, type V airdrop platform according to TM 10-1670-268-20&P/TO 13C7-52-22. Install four tandem links and platform clevises according to FM 4-20.102/MCRP 4-11.3J/NAVSEA SS400-AB-MMO-010/TO 13C7-1-5 and as shown in Figure 4-37.

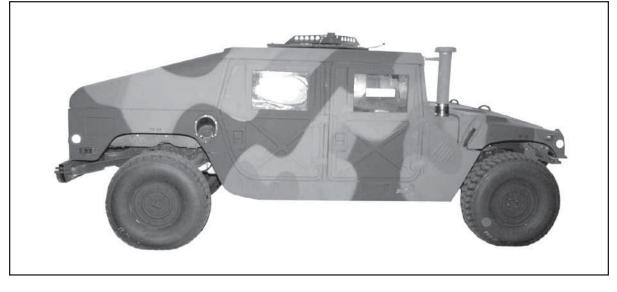


Figure 4-36. M1151 Armament Carrier

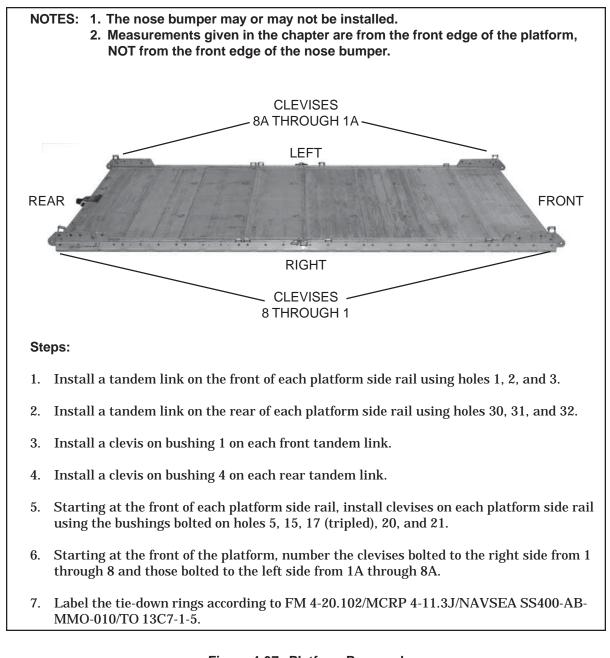
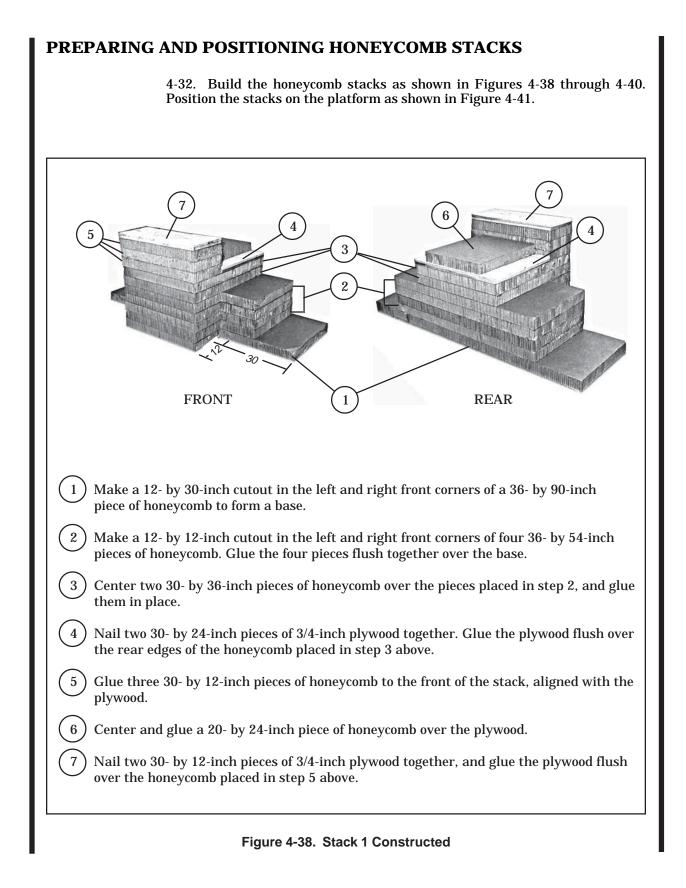
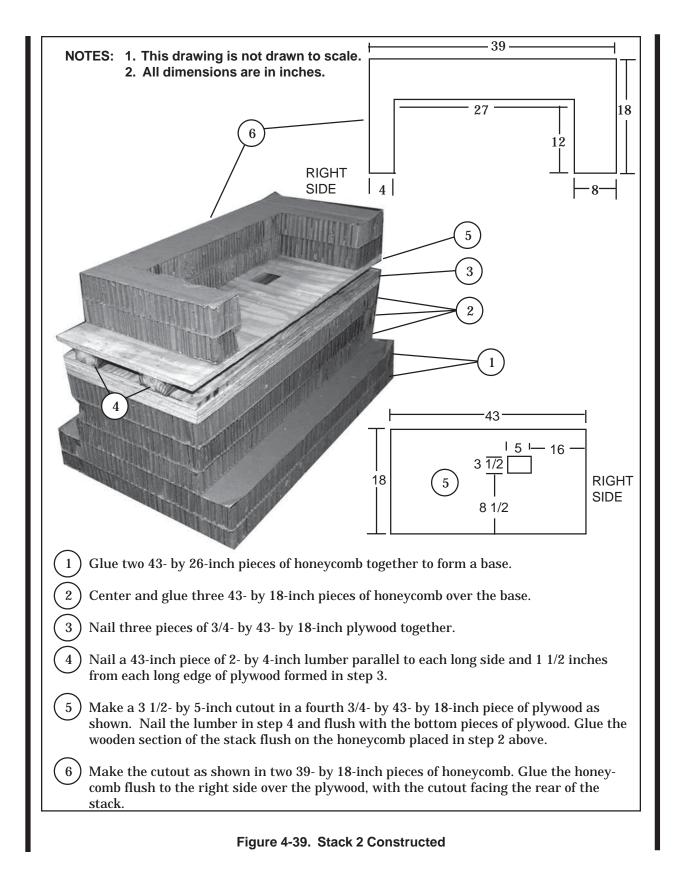


Figure 4-37. Platform Prepared





NOTE: This drawing is not drawn to scale.		
$\begin{pmatrix} 7 \\ - \\ - \\ - \\ - \\ - \\ - \\ - \\ - \\ - \\$		
(F)		
RIGHT		
SIDE		
(1) Cut an 80- by 24-inch piece of honeycomb to form a base. Center and glue five 35- by 24-inch pieces of honeycomb on top of the 80- by 24-inch piece of honeycomb.		
2 Nail two 21- by 24-inch pieces of 3/4-inch plywood to each other. Nail two pieces of 2- by 4- by 21-inch lumber flush along each side and in the center of the plywood.		
(3) Nail a 24-inch piece of 2- by 4-inch lumber flush along the right side.		
$\overbrace{4}$ Nail a 17- by 24-inch piece of 3/4-inch plywood flush with the left side.		
5 Nail a 24-inch piece of 2- by 4-inch lumber flush with the left edge of the plywood placed in step 4 above.		
6 Nail a 3 1/2- by 24-inch piece of 3/4-inch plywood flush over the lumber placed in step 5 above.		
7 Glue a 13- by 5-inch piece of honeycomb along the rear edge of the plywood flush against the plywood and lumber placed in steps 5 and 6 above.		
Figure 4-40. Stack 3 Constructed		

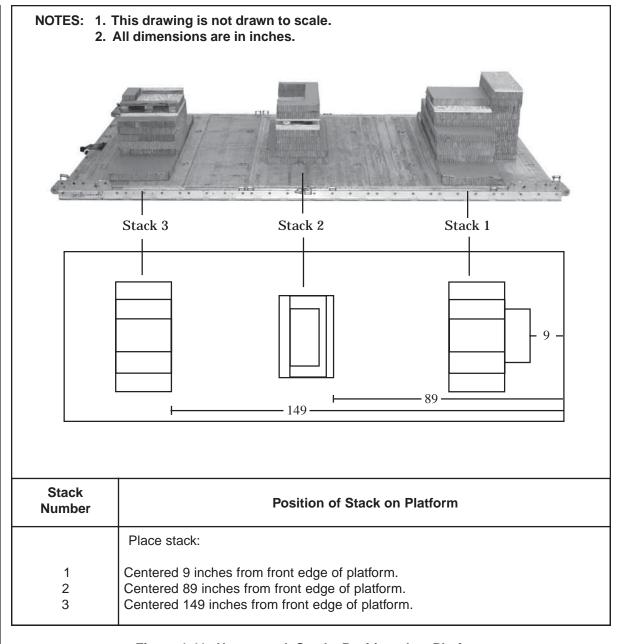
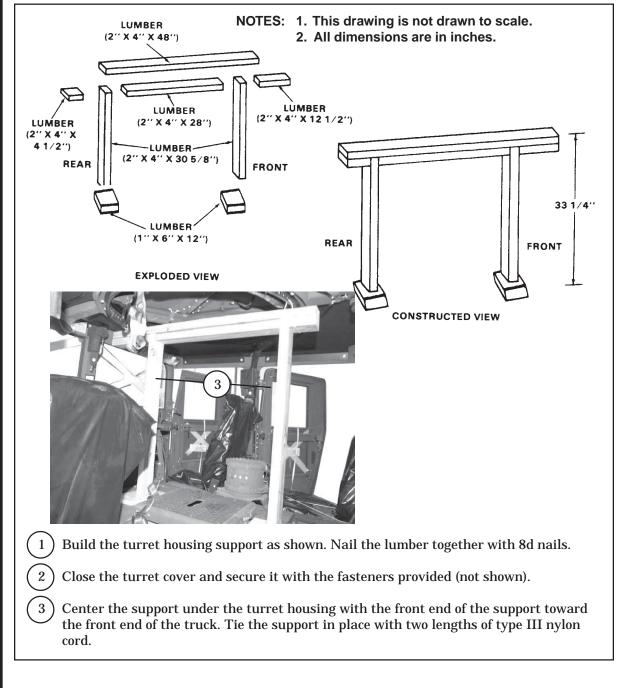


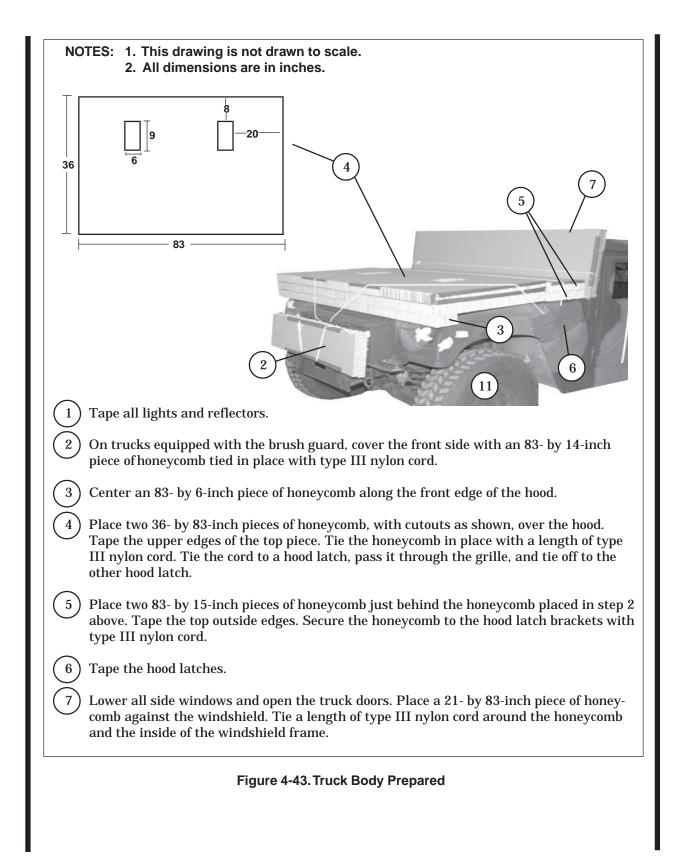
Figure 4-41. Honeycomb Stacks Positioned on Platform

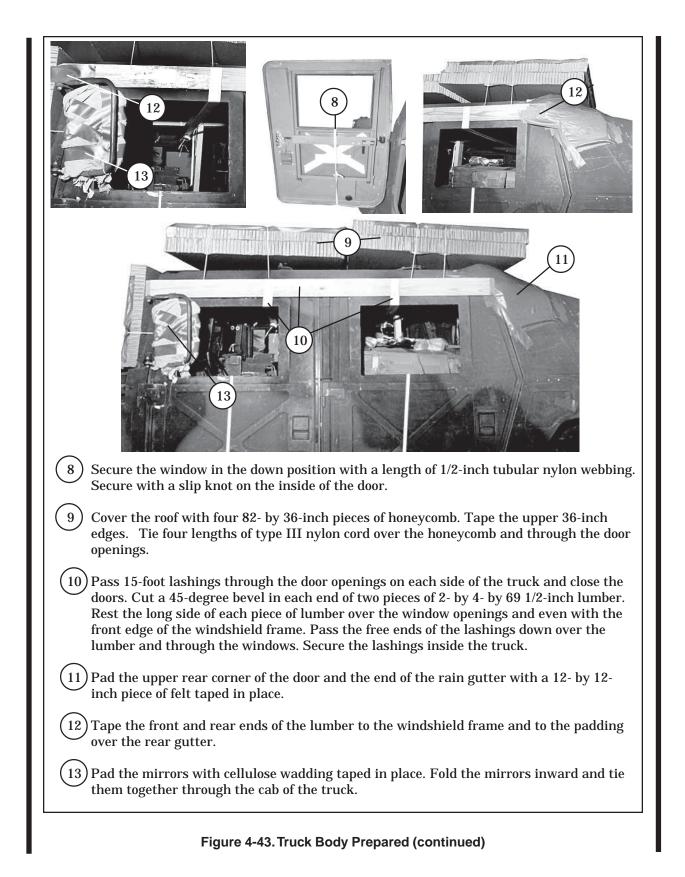
PREPARING THE TRUCK

4-33. Prepare the truck as described in paragraphs 2-4a through e, g, and h, and as shown in Figures 2-6 and 2-7, 2-8 (omit steps 1 and 3), 2-9, 2-11, and 2-12. Further prepare the closed-body HMMWV as shown in Figures 4-42 and 4-43.



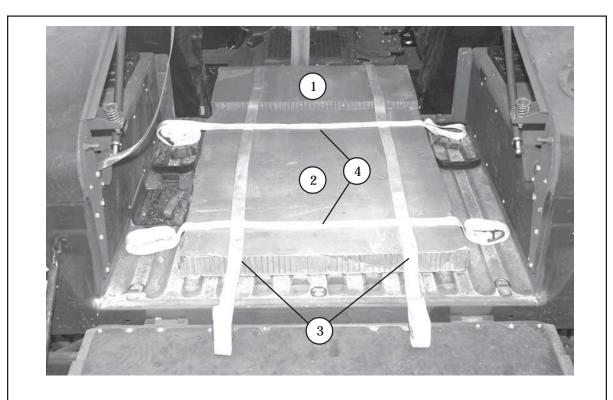






STOWING ACCOMPANYING LOAD

4-34. Stow an accompanying load of 1,300 to 2,000 pounds in the cargo area of the truck. Use or adapt the procedures shown in Figure 4-44. Make sure the accompanying load complies with the restrictions outlined in FM 4-20.102/MCRP 4-11.3J/NAVSEA SS400-AB-MMO-010/TO 13C7-1-5.



-) Cut a 36- by 16-inch piece of honeycomb and position it against the rear turret support.
-) Cut a 36- by 43-inch piece of honeycomb and position it against the honeycomb in step 1.
- Position two 15-foot lashings lengthwise 6 inches from each outside edge of honeycomb.
- Position two 15-foot lashings widthwise 6 inches from the front and rear edge of the honeycomb positioned in step 1 and 2.

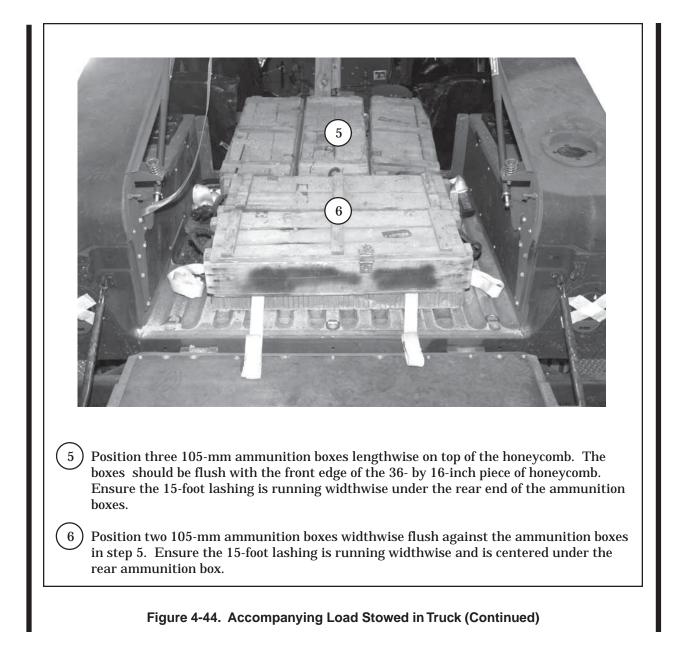
Figure 4-44. Accompanying Load Stowed in Truck

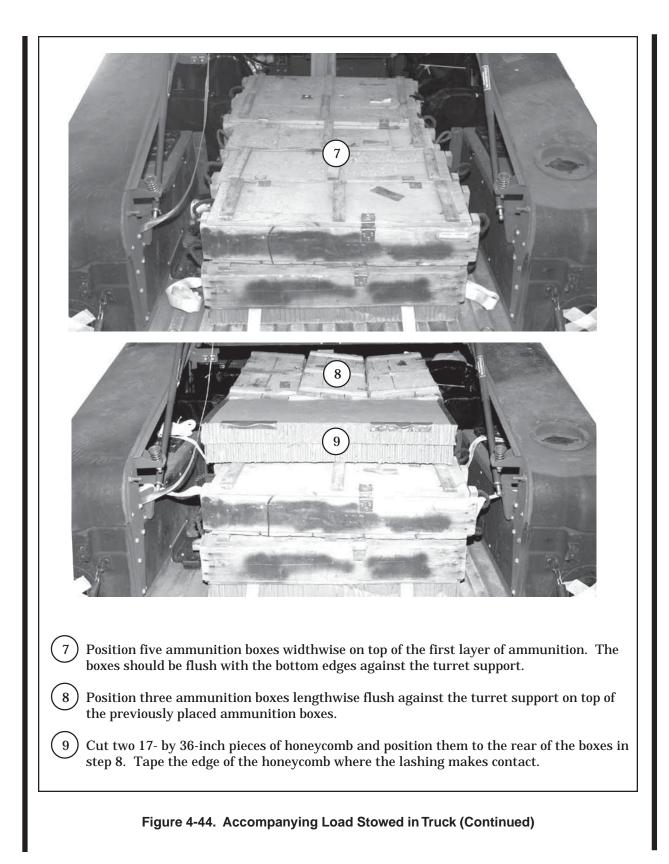
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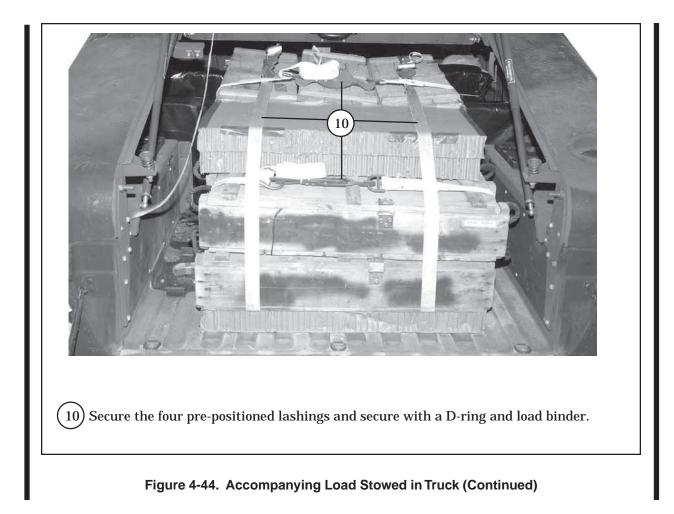
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4







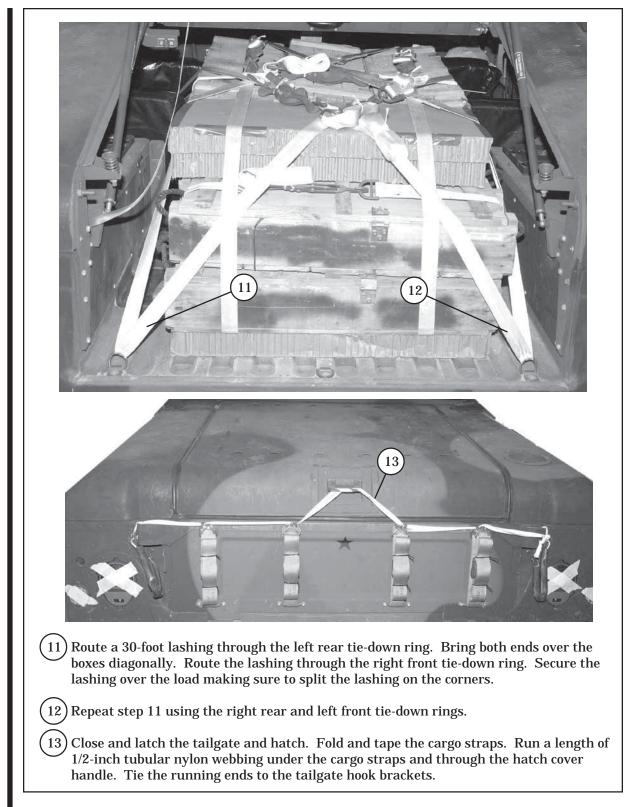


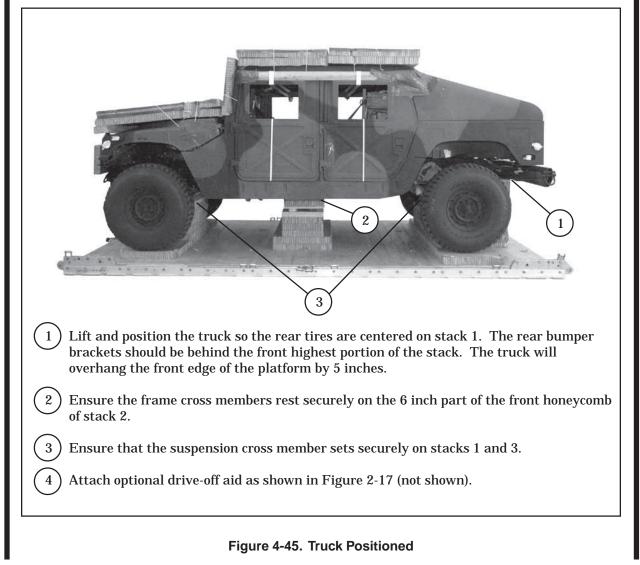
Figure 4-44. Accompanying Load Stowed in Truck (Continued)

LIFTING AND POSITIONING TRUCK AND INSTALLING OPTIONAL DRIVE-OFF AIDS

4-35. Install the optional drive-off aids on the platform as shown in Figure 2-15. Install lifting slings on the truck as shown in Figure 2-16 and position the truck as shown in Figure 4-45.

LASHING TRUCK

4-36. Lash the truck to the platform with fifteen 15-foot tie-down assemblies as shown in Figures 4-46 and 4-47, and according to FM 4-20.102/MCRP 4-11.3J/ NAVSEA SS400-AB-MMO-010/TO 13C7-1-5.



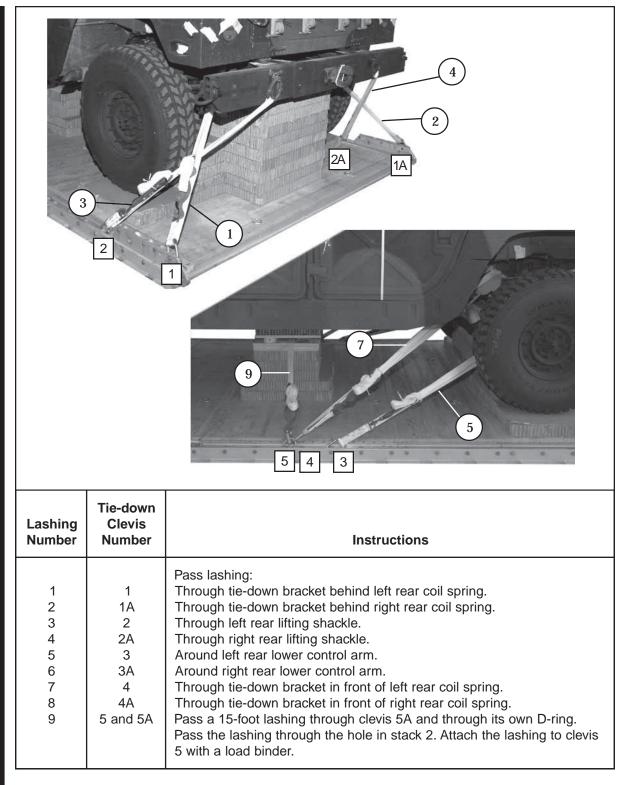


Figure 4-46. Lashings 1 Through 9 Installed

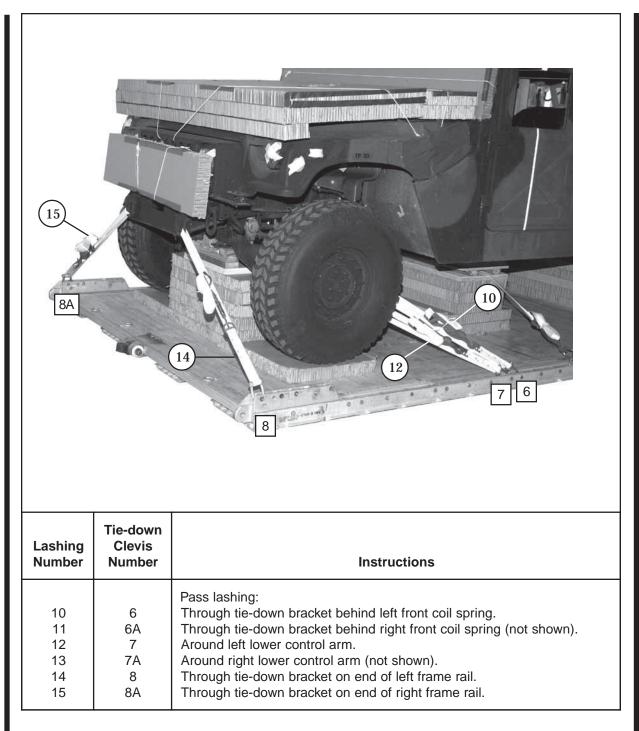


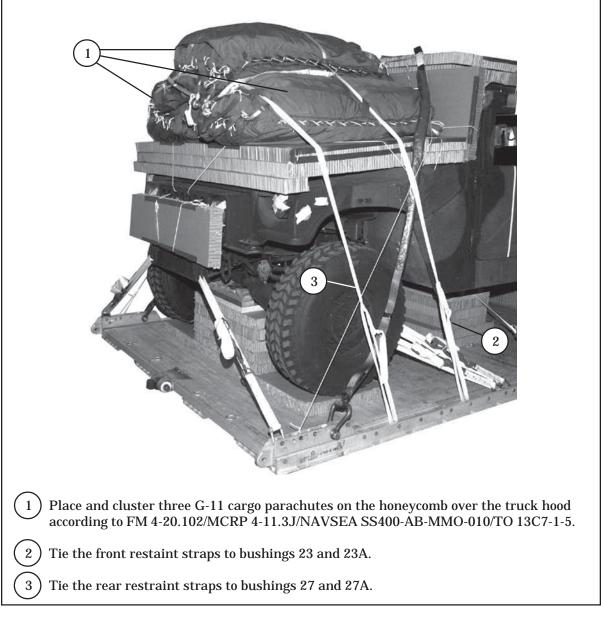
Figure 4-47. Lashings 10 Through 15 Installed

INSTALLING AND SAFETY TYING SUSPENSION SLINGS

4-37. Install, pad and safety tie four 16-foot 2-loop type XXVI nylon suspension slings as shown in Figure 2-20.

STOWING CARGO PARACHUTES

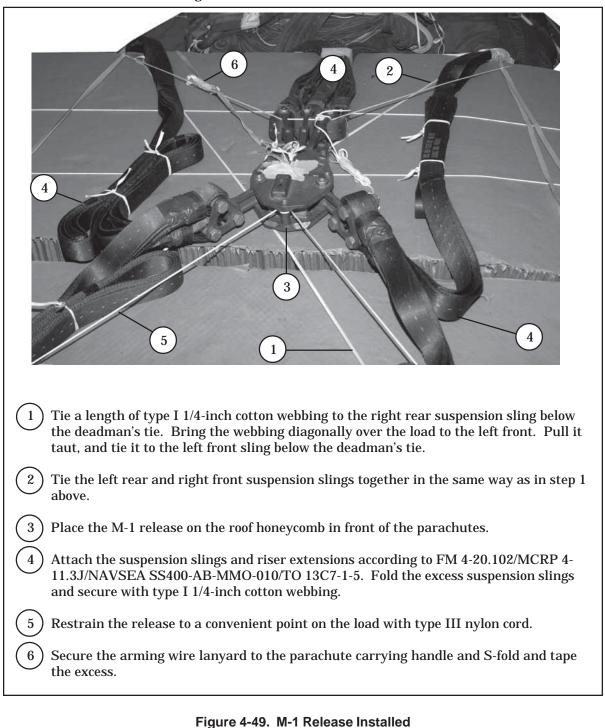
4-38. Stow and restrain three G-11 cargo parachutes on the load according to FM 4-20.102/MCRP 4-11.3J/NAVSEA SS400-AB-MMO-010/TO 13C7-1-5, and as shown in Figure 4-48.





INSTALLING PARACHUTE RELEASE

4-39. Prepare and install an M-1 cargo parachute release according to FM 4-20.102/MCRP 4-11.3J/NAVSEA SS400-AB-MMO-010/TO 13C7-1-5, and as shown in Figure 4-49.



INSTALLING EXTRACTION SYSTEM

4-40. Install the EFTC extraction system according to FM 4-20.102/MCRP 4-11.3J/NAVSEA SS400-AB-MMO-010/TO 13C7-1-5 and as shown in Figure 4-34.

INSTALLING PROVISIONS FOR EMERGENCY RESTRAINTS

4-41. Install provisions for emergency restraints according to FM 4-20.102/ MCRP 4-11.3J/NAVSEA SS400-AB-MMO-010/TO 13C7-1-5.

PLACING EXTRACTION PARACHUTE

4-42. Select the extraction parachute and extraction line needed, using the extraction line requirements table in FM 4-20.102/MCRP 4-11.3J/NAVSEA SS400-AB-MMO-010/TO 13C7-1-5. Rig the extraction line in a 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 on the aircraft.

MARKING RIGGED LOAD

4-43. Mark the rigged load according to FM 4-20.102/MCRP 4-11.3J/NAVSEA SS400-AB-MMO-010/TO 13C7-1-5. and as shown in Figure 4-50. Complete Shipper's Declaration for Dangerous Goods according to AFMAN 24-204(I)/TM 38-250. If the load varies from the one shown, the weight, height, CB, and parachute requirements must be recomputed.

EQUIPMENT REQUIRED

4-44. Use the equipment listed in Table 4-3 to rig this load.



Figure 4-50. M1151 Expanded Capacity Armament Carrier

Capacity Armament Carrier for Low-Velocity Airdrop		
National Stock Number	ltem	Quantity
8040-00-273-8713	Adhesive, paste, 1-gal	As required
4030-00-090-5354 4030-00-678-8562	Clevis, suspension: 1-in (large) 3/4-in (medium)	5 2
4020-00-240-2146	Cord, nylon, type III, 550-lb	As required
1670-00-434-5785	Coupling, airdrop, extraction force transfer with cable, 16-ft	1
1670-00-360-0328 8135-00-664-6958	Cover: Clevis, large Cushioning material, packaging, cellulose wadding	3 As required
8305-00-191-1101	Felt, 1/2-in thick	As required
1670-00-003-4391	Knife, parachute bag for C-17	1
1670-01-183-2678	Leaf, extraction line (line bag)	2
1670-01-064-4452	Line, drogue (for C-17) 60-ft (1-loop), type XXVI	1
1670-01-062-6313 1670-01-107-7651	Line, extraction: For C-130: 60-ft (3-loop), type XXVI For C-17: 140-ft (3-loop), type XXVI	1 1
5306-00-435-8994 5310-00-232-5165 1670-00-003-1953 5365-00-007-3414	Link Assembly: Two-point: Bolt, 1-in diam, 4-in long Nut, 1-in, hexagonal Plate, side, 3 3/4-in Spacer, large	2 (4) (4) (4) (4)
5510-00-220-6448 5510-00-220-6274	Lumber: 2- by 6-in 4- by 4-in	As required As required
5315-00-010-4659	Nail, steel wire, 8d	As required

Table 4-3. Equipment Required for Rigging the M1151 Expanded Capacity Armament Carrier for Low-Velocity Airdrop

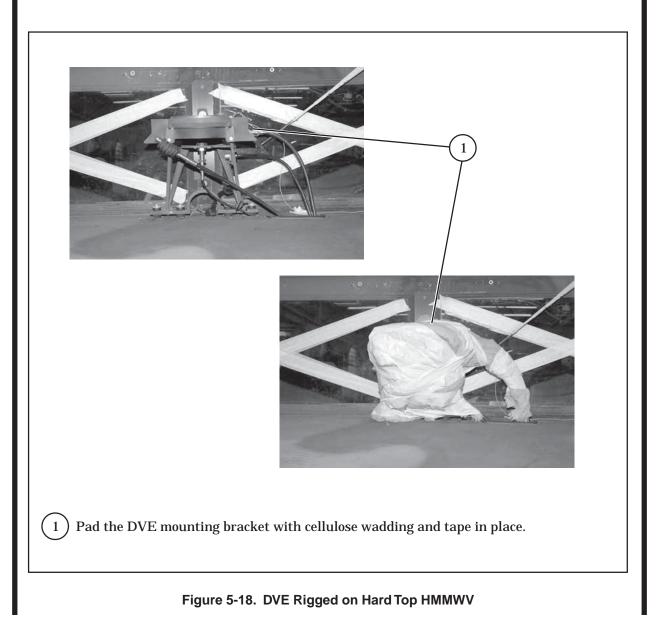
Table 4-3. Equipment Required for Rigging the M1151 Expanded Capacity Armament Carrier for Low-Velocity Airdrop (Continued)		
National Stock Number	Item	Quantity
1670-00-753-3928	Pad, energy-dissipating (honeycomb) 3- by 36- by 96-in	10 sheets
1670-01-016-7841	Parachute: Cargo: G-11B	3
1670-01-063-3716	Cargo extraction: 22-ft	1
1670-01-063-3715	Drogue (for C-17) 15-ft	1
1670-01-353-8425 1670-01-162-2372 1670-01-162-2376 1670-01-162-2381	Platform, airdrop, type V, 16-ft Bracket assembly, coupling Clevis assembly, type V Extraction bracket assembly Tandem link assembly (Multipurpose link)	(1) (18) (1) (4)
5530-00-128-4981	Plywood, 3/4-in	3 sheets
1670-01-097-8816	Release, cargo parachute, M-1	1
1670-01-063-7761 1670-01-062-6304 1670-01-062-6303	Sling, cargo, airdrop For suspension: 16-ft (2-loop), type XXVI nylon webbing For lifting: 9-ft (2-loop), type XXVI nylon webbing 12-ft (2-loop), type XXVI nylon webbing	4 2 2
1670-01-062-6304	For deployment: 9-ft (2-loop), type XXVI nylon webbing For riser extension:	1
1670-01-062-6302	60-ft (3-loop), type XXVI nylon webbing	3
5340-00-040-8219	Strap, parachute release, multi-cut, comes w/ 3 knives	2
7510-00-266-5016	Tape, adhesive, 2-in	As required
1670-00-937-0271	Tie-down assembly, 15-foot	27
1670-01-483-8259	Towplate release mechanism (h-block) (C-17 only)	1
1670-00-431-8486	Vehicle drive-off aid	1
8305-00-268-2411 8305-00-082-5752 8305-00-268-2455 8305-00-263-3591	Webbing: Cotton, 1/4-in, type I Nylon, tubular, 1/2-in Nylon, tubular, 1-in Nylon, Type VIII	As required As required As required As required

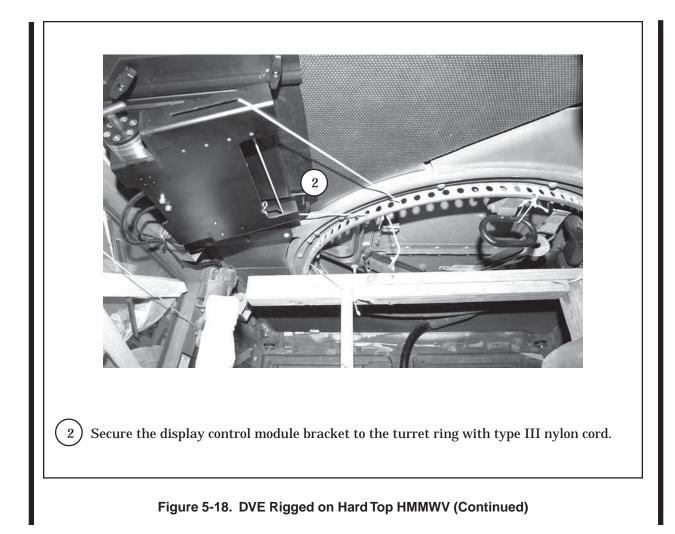
Table 4-3. Equipment Required for Rigging the M1151 Expanded

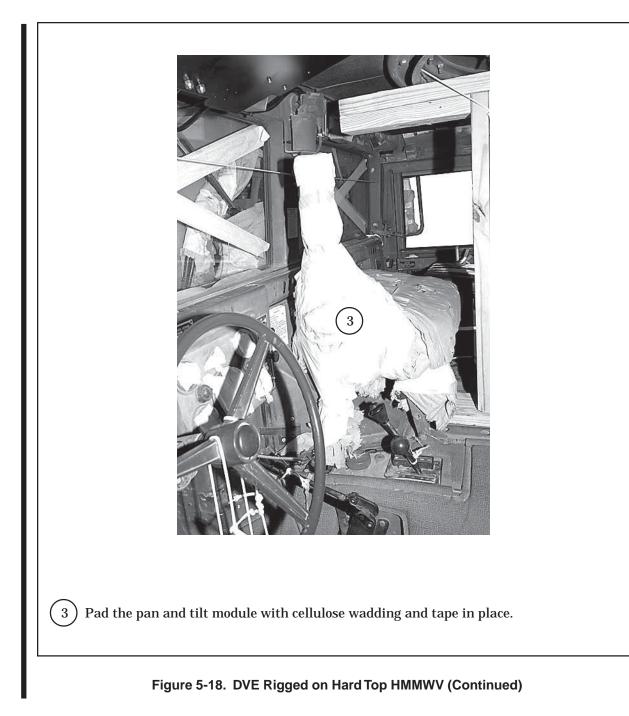
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RIGGING THE AN/VAS-5 DVE MOUNTED ON HMMWV-SERIES TRUCK

5-18. The AN/VAS-5 DVE can be rigged on the following model HMMWV's: M966, M966A1, M1025, M1025A1, M1025A2, M1026, M1026 modified, M1026A1, M1121 and M1151. Use the procedures shown in Figure 5-18 to rig the AN/VAS-5 DVE mounted on HMMWV-series trucks.







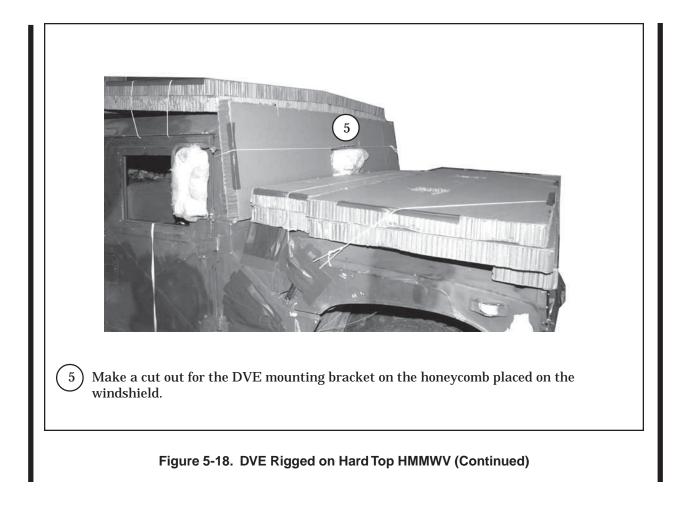
C1, FM 4-20.117/MCRP 4-11.3M/TO 13C7-1-111



) Place the transit case in the passenger seat and secure to the seat with 1/2-inch tubular nylon webbing.

Figure 5-18. DVE Rigged on Hard Top HMMWV (Continued)

4



REFERENCES

AR 59-4/ OPNAVINST 4630.24C AFJ 13-210(I)/ MCO 13480.1B	Joint Airdrop Inspection Records, Malfunction Investigations and Activity Reporting. 1 May 1998.
AFMAN 24-204(I)/ TM 38-250/NAVSUP PUB 505/MCO 4030.19H	Preparing Hazardous Materials for Military Air Shipments. 11 December 2001
FM 4-20.102/ MCRP 4-11.3J/ NAVSEA SS400-AB-MMO- 010/TO 13C7-1-5	Airdrop of Supplies and Equipment: Rigging Airdrop Platforms. 29 August 2001
FM 4-20.153/ MCRP 4-11.3B/ TO 13C7-18-41	Airdrop of Supplies and Equipment: Rigging Ammunition. 1 May 2004
TM 9-2320-280-10/ TO 36A-12-1A-2091-1/ TM 2320-10/6B	Operator's Manual for Truck, 1 1/4-ton. 31 January 1996
TM 10-1670-268-20&P/ TO 13C7-52-22	Organizational Maintenance Manual Including Repair Parts and Special Tools List for Type V Airdrop Platform and Dual Row Row Airdrop Platform. 15 September 2002.
TM 10-1670-277-23&P/ TO 13C5-28-2/ NAVAIR 13-1-30	Unit and Direct Support (DS) Maintenance Manual Including Repair Parts and Special Tools List for Parachute, Cargo Type, 28-ft Diam, Cargo Extraction. 30 April 2002.
TM 10-1670-278-23&P/ TO 13C5-26-2/ NAVAIR 13-1-27/ TM 01109C-23&P/1	Unit and Intermediate Direct Support (DS) Maintenance Manual Including Repair Parts and Special Tools List for Parachute, Cargo Type, 15-ft Diam, Cargo Extraction. 31 December 2004.
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. 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, G-11A, G-11B, and G-11C. 15 September 2002.
TM 10-1670-286-20/ TO 13C5-2-41	Unit Maintenance Manual for Extraction Line Panel (Including Stowing Procedures). 15 March 2001.

C1, FM 4-20.117/MCRP 4-11.3M/TO 13C7-1-111

AFTO Form 22	Technical Order Publication Improvement Report	

DA Form 2028 Recommended Changes to Publication and Blank Forms.

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