

CHAPTER 7

**RIGGING 1 1/4-TON TRUCK
WITH AVENGER AIR DEFENSE WEAPON
SYSTEM FOR LOW-VELOCITY AIRDROP****7-1. Description of Load**

The Avenger is a turret-configured weapon system mounted on a modified M1097 1 1/4-ton HMMWV-series truck. The Avenger is shown in Figure 7-1 in the travel position. The weapons consist of two missile pods, a

50-caliber machine gun, and guidance system. The turret is removed from the truck and rigged on a 28-foot type V platform with the truck. This load requires three G-11B cargo parachutes.

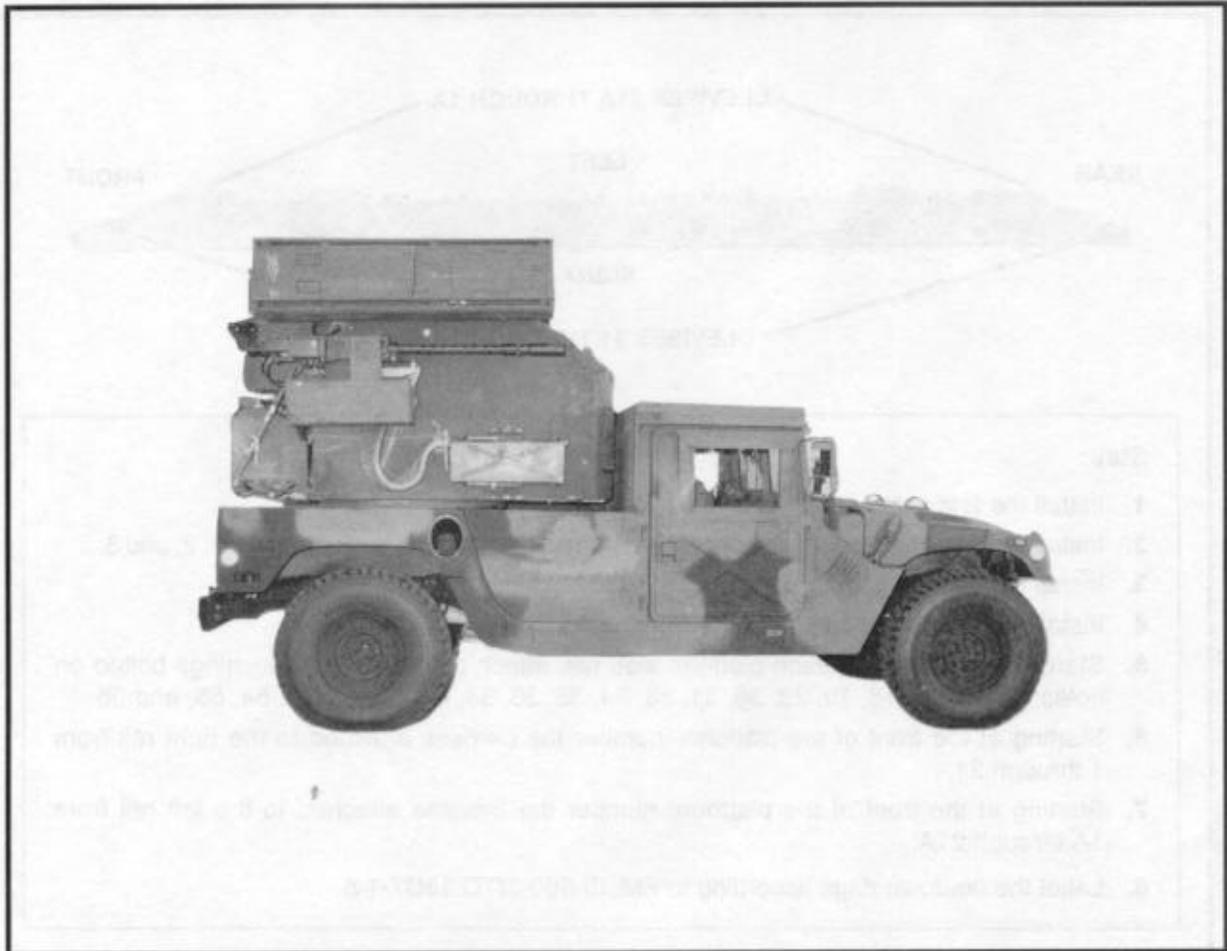


Figure 7-1. Avenger air defense weapon system on M1097 truck

7-2. Preparing Platform

Prepare a 28-foot, type V airdrop platform as given below.

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

NOTE: If the platform must be assembled, install the suspension links when assembling the platform. See Figure 7-2 for the location of the suspension links.

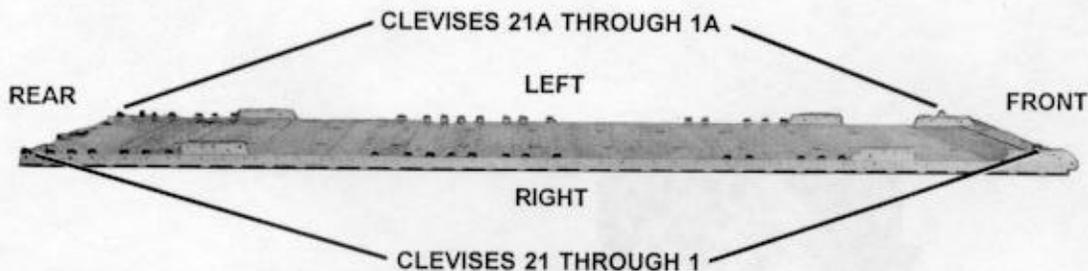
b. Installing Suspension Links. Install four suspension links on assembled

platforms according to FM 10-500-2/TO 13C7-1-5.

c. Installing Tandem Links. Install two tandem links as shown in Figure 7-2.

d. Attaching and Numbering Clevises. Attach and number 42 clevis assemblies as shown in Figure 7-2.

NOTES: 1. The nose bumper must 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.



Step:

1. Install the first set of suspension links to bushing holes 10, 11, and 12.
2. Install a tandem link to the front of each platform side rail using bushing holes 1, 2, and 3.
3. Install the second set of suspension links to bushing holes 45, 46, and 47.
4. Install a clevis to bushing 3 on the front tandem links.
5. Starting at the front of each platform side rail, attach clevises to the bushings bolted on holes 13, 14, 15, 18, 19, 28, 30, 31, 33, 34, 35, 36, 38, 49, 50, 51, 53, 54, 55, and 56.
6. Starting at the front of the platform, number the clevises attached to the right rail from 1 through 21.
7. Starting at the front of the platform, number the clevises attached to the left rail from 1A through 21A.
8. Label the tie-down rings according to FM 10-500-2/TO 13C7-1-5.

Figure 7-2. Platform prepared

7-3. Preparing and Positioning Honeycomb Stacks and Load Spreader

Prepare honeycomb stacks 1, 2, and 3 for the truck as shown in Figures 2-3 and 2-4, FM 10-517/TO 13C7-1-111. Prepare honeycomb stacks 4 and 5 for the turret as shown in Figure 7-3. Position the honeycomb stacks

on the platform as shown in Figure 7-4. Construct the load spreader as shown in Figure 7-5. Position the load spreader on the honeycomb stacks and install the drive-off aids on the platform as shown in Figure 7-6.

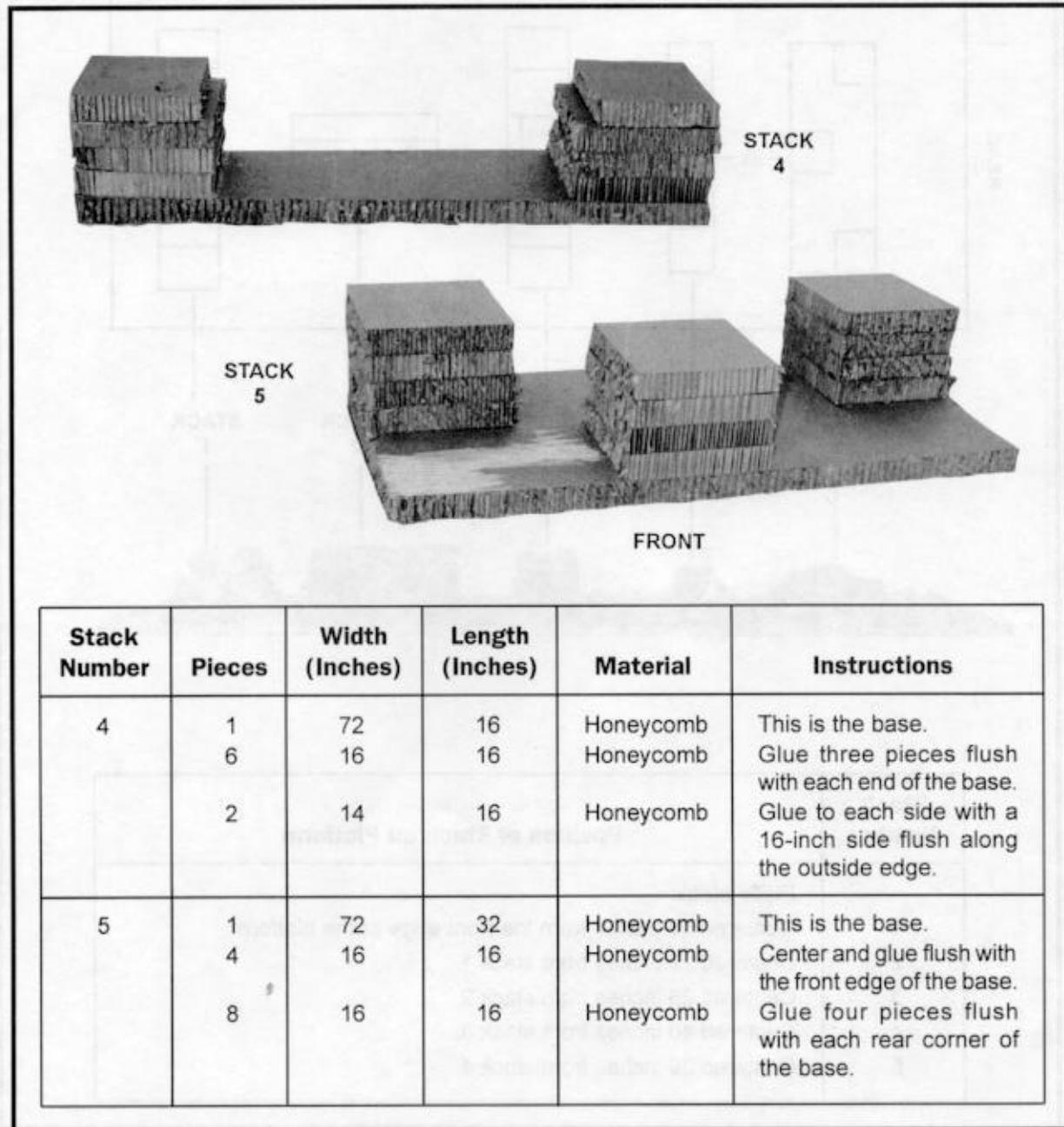
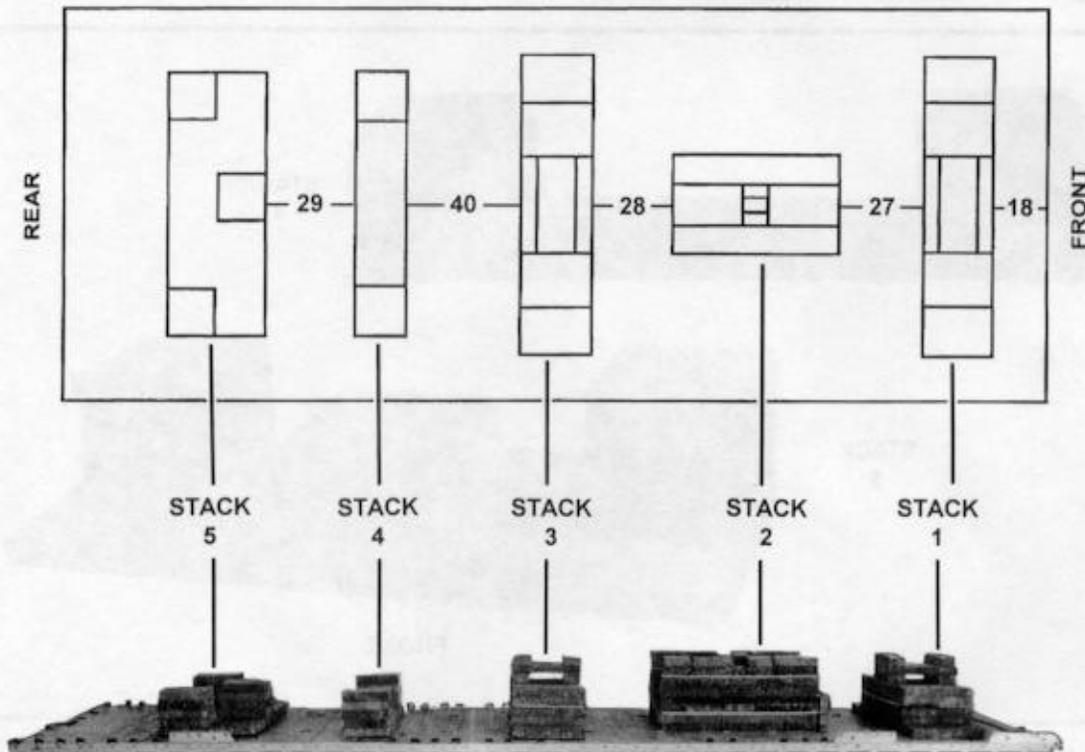


Figure 7-3. Stacks 4 and 5 prepared

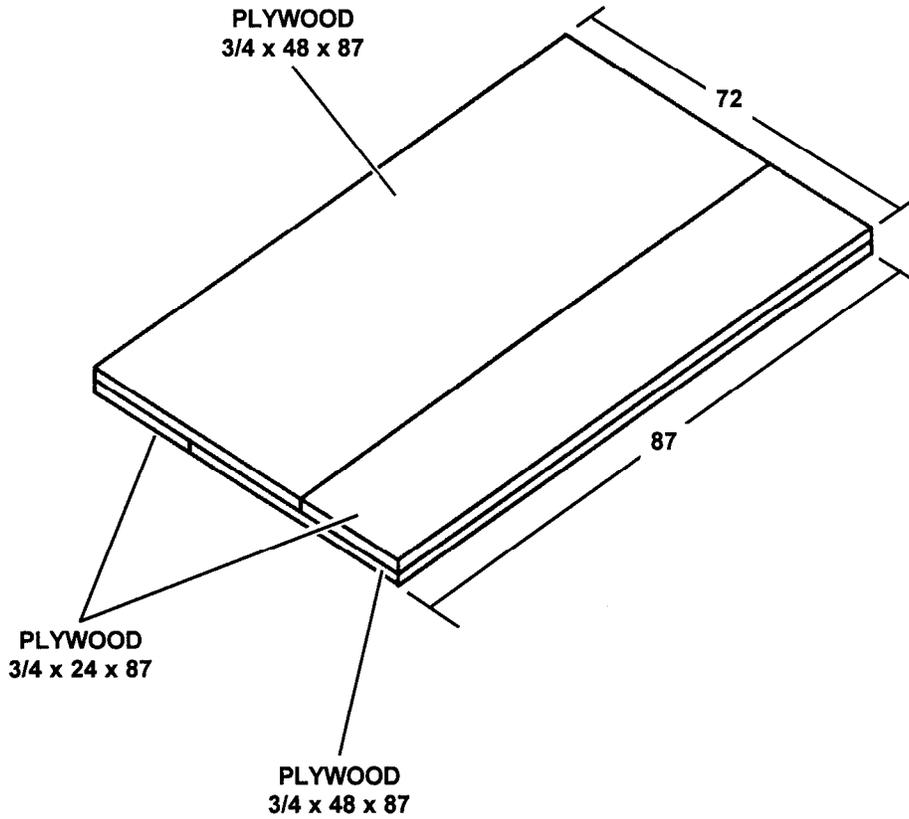
- NOTES:** 1. All measurements are given in inches.
 2. This drawing is not drawn to scale.



Stack Number	Position of Stack on Platform
	Place stack:
1	Centered 18 inches from the front edge of the platform.
2	Centered 27 inches from stack 1.
3	Centered 28 inches from stack 2.
4	Centered 40 inches from stack 3.
5	Centered 29 inches from stack 4.

Figure 7-4. Honeycomb stacks positioned on platform

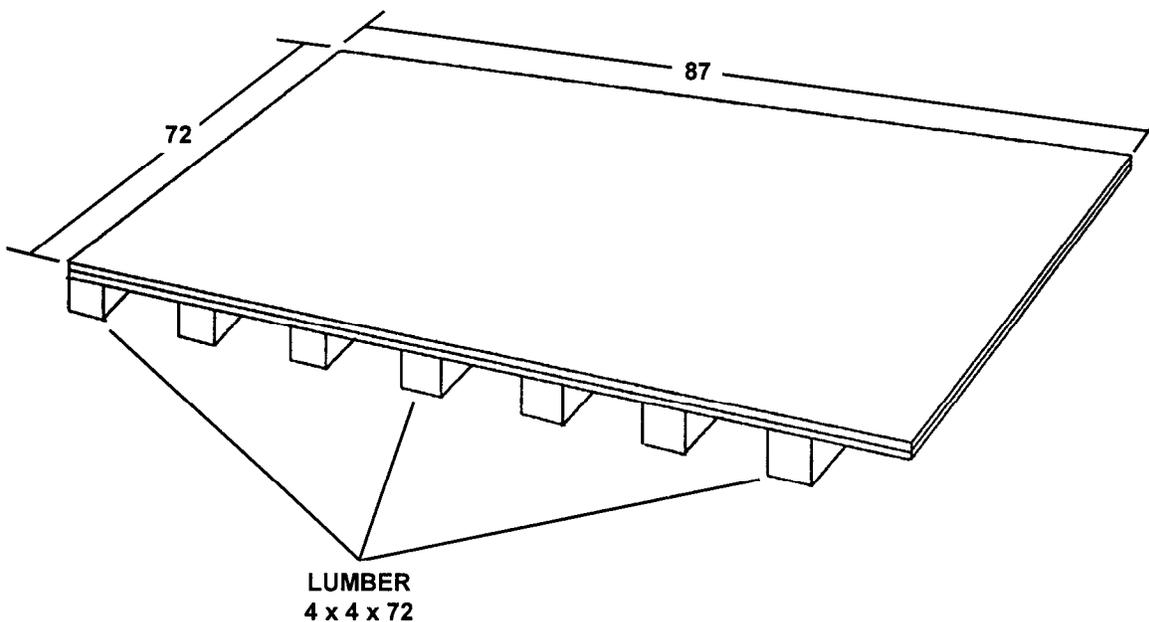
- NOTES:** 1. All measurements are given in inches.
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Pieces	Width (Inches)	Length (Inches)	Material	Instructions
2	48	87	3/4-inch plywood	Alternate pieces and nail together to form a two-layer base 72 by 87 inches.
2	24	87	3/4-inch plywood	

Figure 7-5. Load spreader constructed

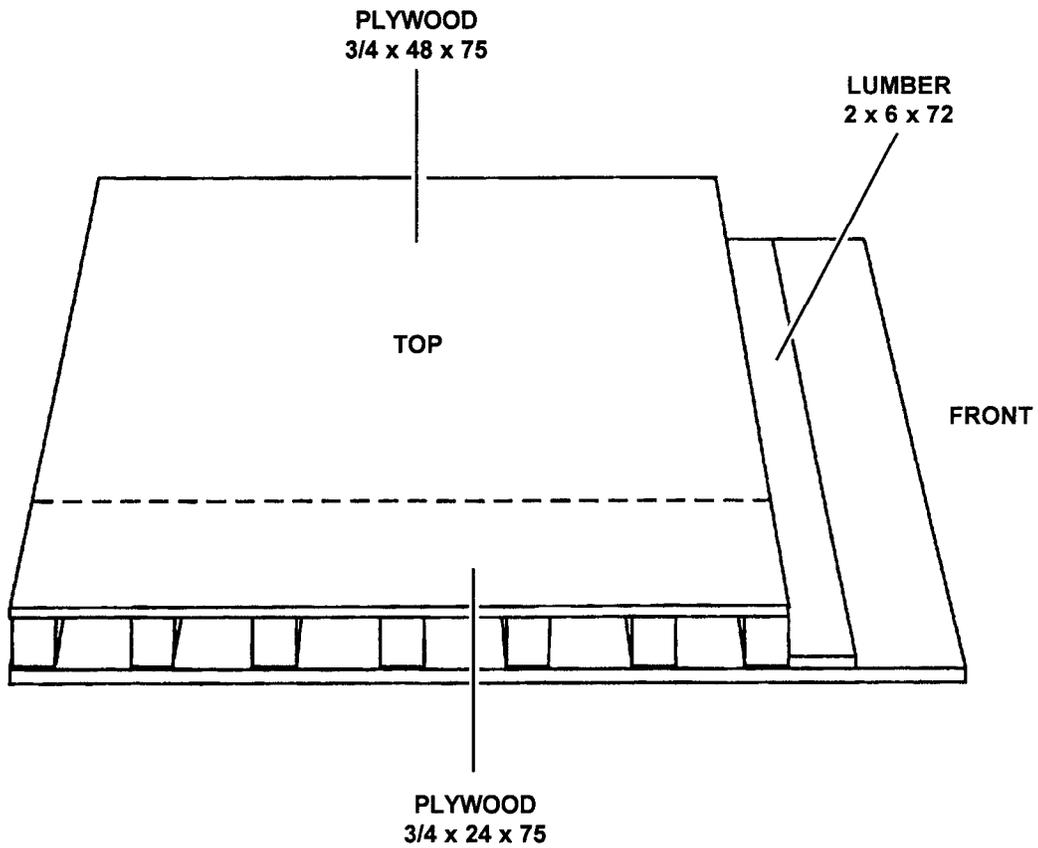
- NOTES:** 1. All measurements are given in inches.
 2. This drawing is not drawn to scale.



Pieces	Width (Inches)	Length (Inches)	Material	Instructions
7		72	4- by 4-inch lumber	Place a piece under the base flush with one end. Place another under the base 12 inches from the opposite end. Space the remaining five pieces evenly between the first two pieces. Align all pieces with the outside edges of the base and nail each piece to the base through the plywood.

Figure 7-5. Load spreader constructed (continued)

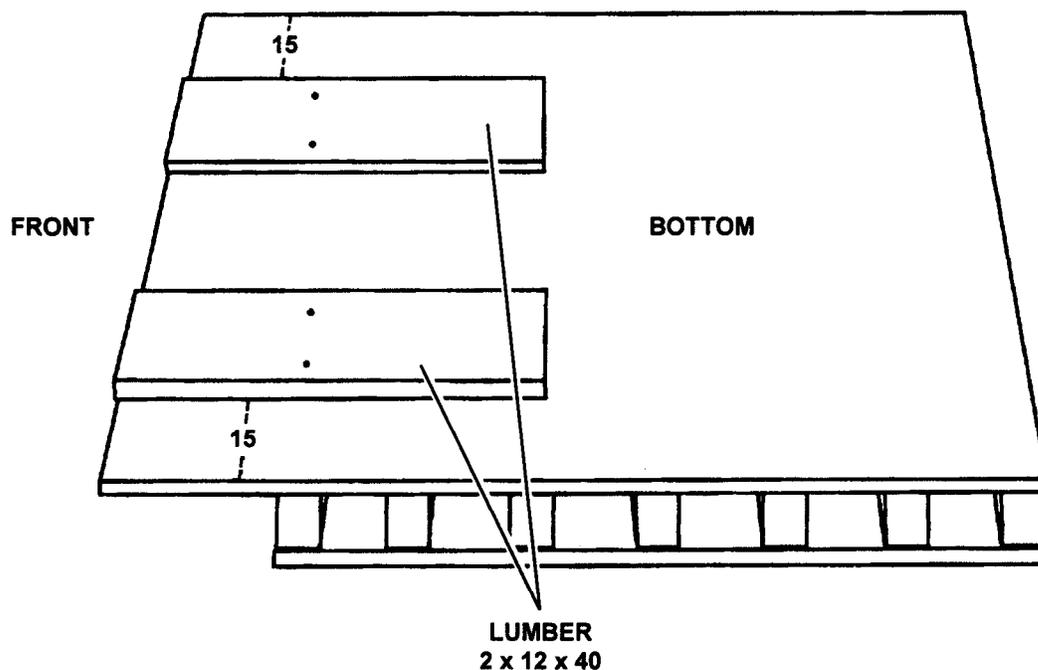
- NOTES:** 1. All measurements are given in inches.
 2. This drawing is not drawn to scale.



Pieces	Width (Inches)	Length (Inches)	Material	Instructions
1	48	75	3/4-inch plywood	Nail flush with lumber and base on one side.
1	24	75	3/4-inch plywood	Nail flush with lumber and base on other side.
1	72	5 1/2	2- by 6-inch lumber	Nail to base flush against first piece of 4- by 4-inch lumber.

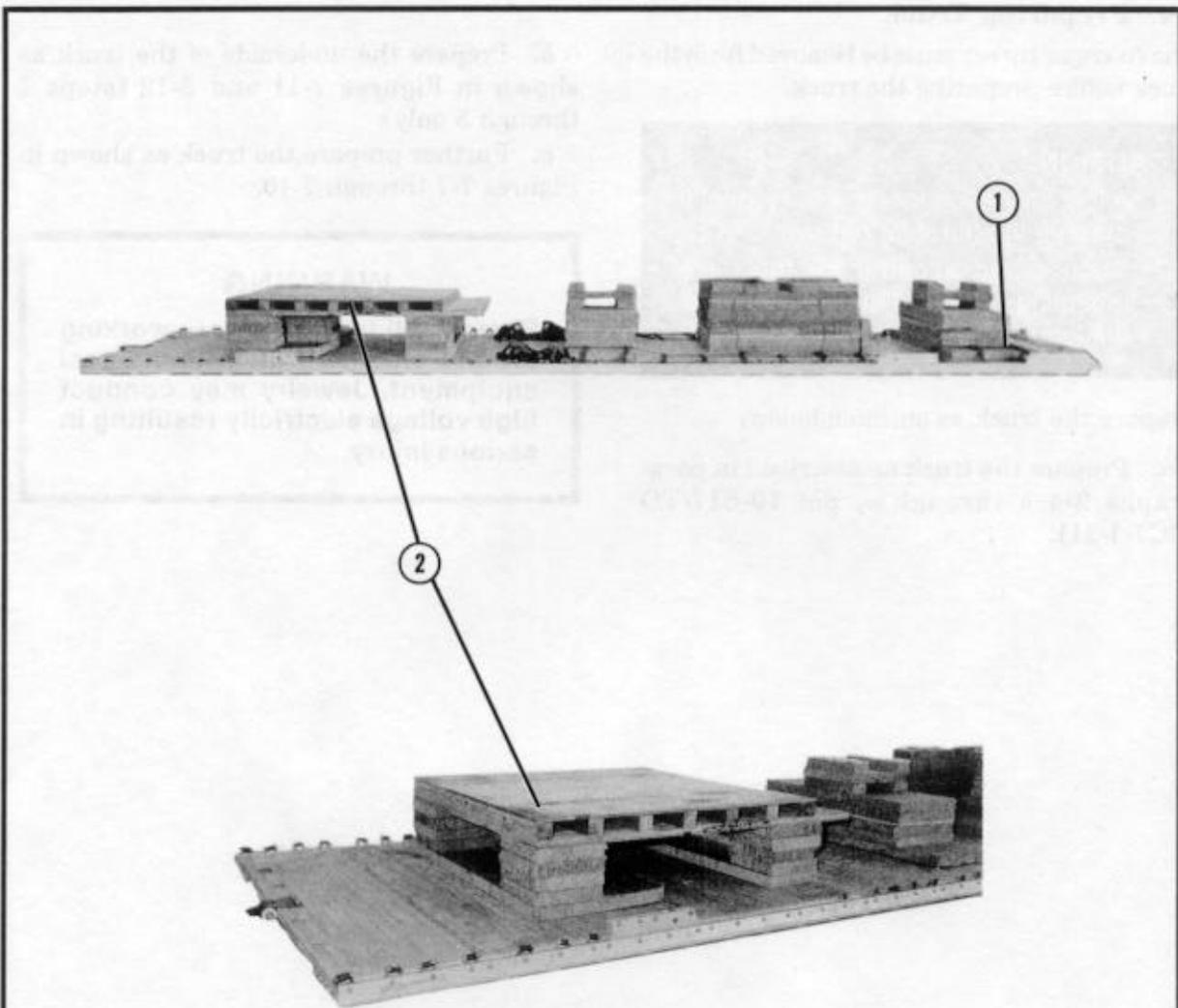
Figure 7-5. Load spreader constructed (continued)

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



Pieces	Width (Inches)	Length (Inches)	Material	Instructions
2		40	2- by 12-in lumber	Place the lumber on the bottom of the load spreader perpendicular to and flush with the front edge and 15 inches from each side. Nail in place and secure with 5-inch lag bolts driven through the lumber, plywood and the first piece of 4- by 4-inch lumber as shown.

Figure 7-5. Load spreader constructed (continued)



- ① Pass a 45-inch length of type V or 1-inch tubular nylon webbing through tie-down ring A1, through the end loop of a drive-off aid, and around the second bushing on the right tandem link. Knot the webbing according to FM 10-500-2/TO 13C7-1-5. Repeat for the left side, using tie-down ring B1. Extend the drive-off aids to the rear, over stacks 1 and 3.
- ② Set the load spreader on stacks 4 and 5. Be sure that the rear corners of the load spreader are flush with the rear corners of stack 5.

Figure 7-6. Load spreader set on stacks 4 and 5 and drive-off aids installed on platform

7-4. Preparing Truck

The Avenger turret must be removed from the truck before preparing the truck.

CAUTION:

1. Allow only Avenger crew personnel to prepare the turret for removal.
2. Secure and account for the turret mounting bolts and stow the bolts on the load (Figure 7-16, step 9).

Prepare the truck as outlined below:

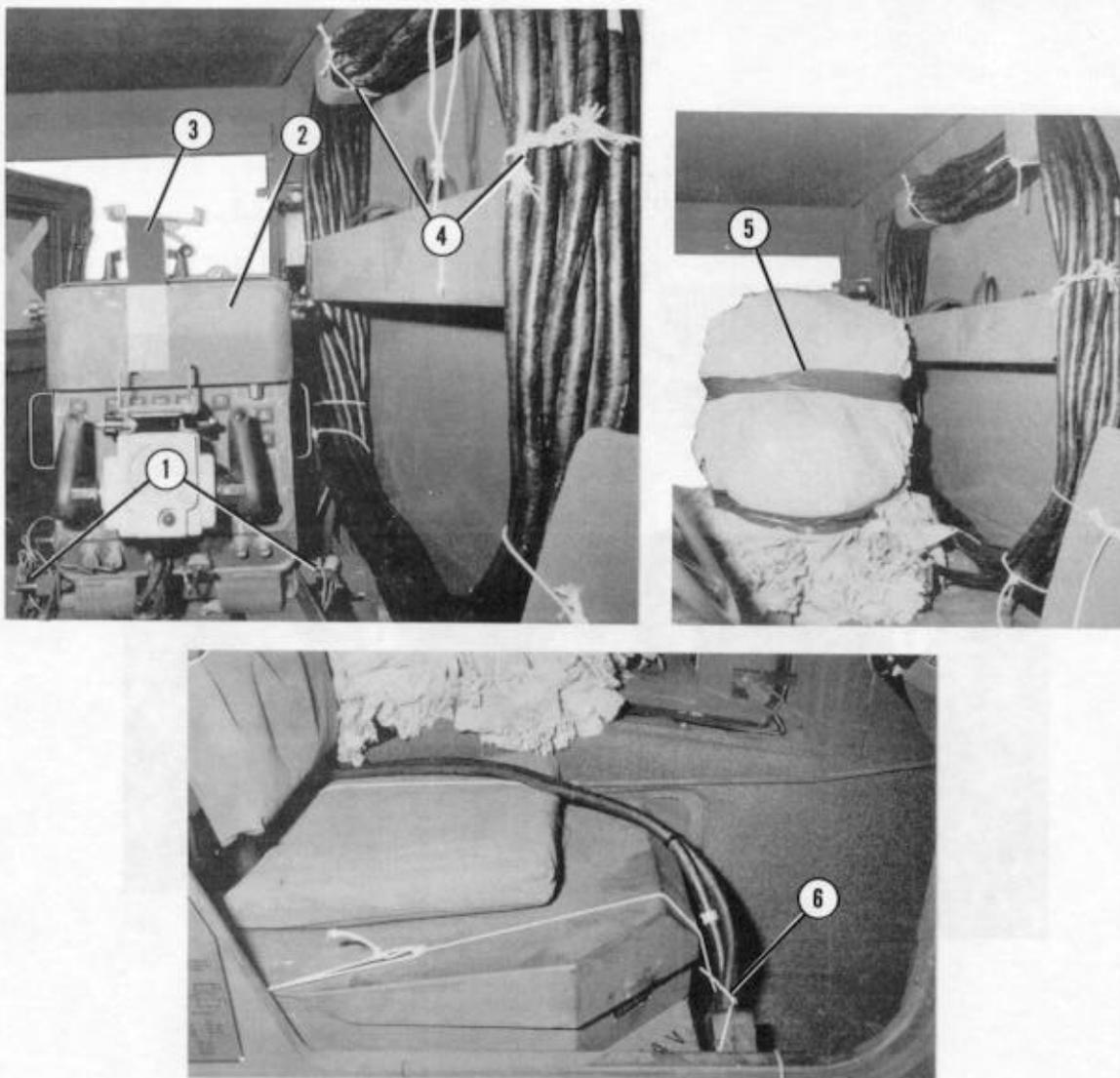
a. Prepare the truck as described in paragraphs 2-4 a through e, FM 10-517/TO 13C7-1-111.

b. Prepare the underside of the truck as shown in Figures 2-11 and 2-12 (steps 1 through 3 only).

c. Further prepare the truck as shown in Figures 7-7 through 7-10.

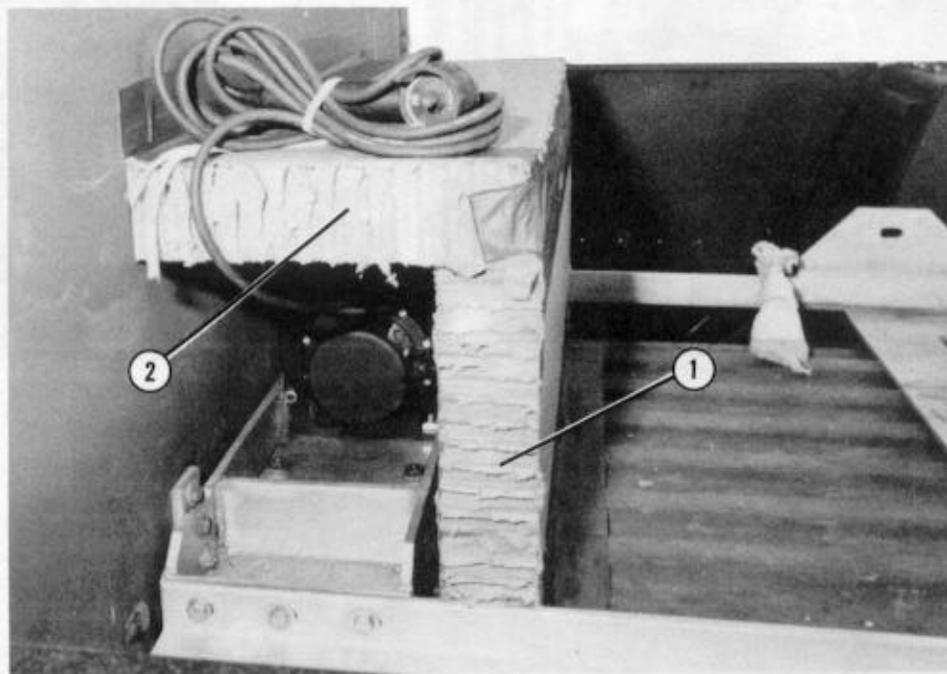
WARNING

Remove all jewelry before working around electrical and mechanical equipment. Jewelry may conduct high voltage electricity resulting in serious injury.



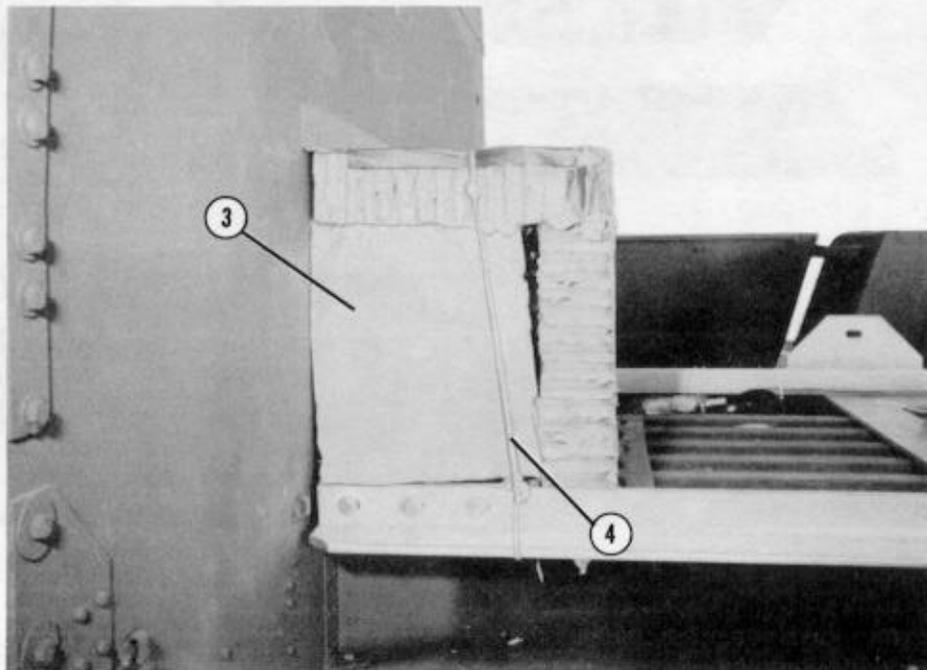
- ① Be sure the remote control unit is firmly secured in place with the pins provided.
- ② Lower the sunshade over the monitor.
- ③ Secure the azimuth indicator and pointer assembly in place with tape.
- ④ Secure the remote control cable to its brackets with type III nylon cord.
- ⑤ Cover the remote control unit with cellulose wadding and tape in place.
- ⑥ Secure the slave cable to the passenger seat frame with type III nylon cord.

Figure 7-7. Remote control unit prepared



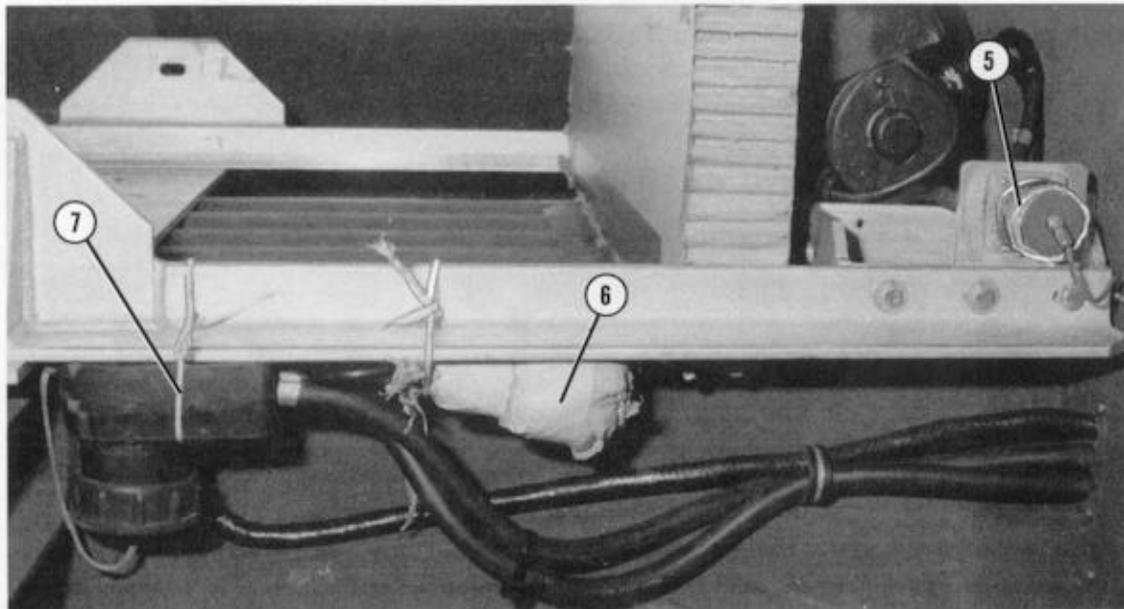
- ① Place a 40- by 13-inch piece of honeycomb on edge against the winch. Tape the bottom edge of the honeycomb to the cargo floor.
- ② Cover the winch and the top edge of the honeycomb placed in step 1 above with a 40- by 12-inch piece of honeycomb. Tape the honeycomb to the cab wall and to the piece placed in step 1 above.

Figure 7-8. Winch and cables prepared



- ③ Fold the winch control cable, stow it to the left of the winch, and fill in empty space in the left side of the box with cellulose wadding. Cut a piece of honeycomb to fit the left box opening.
- ④ Tie a length of type III nylon cord to the left cradle assembly rail and pass it over the box.

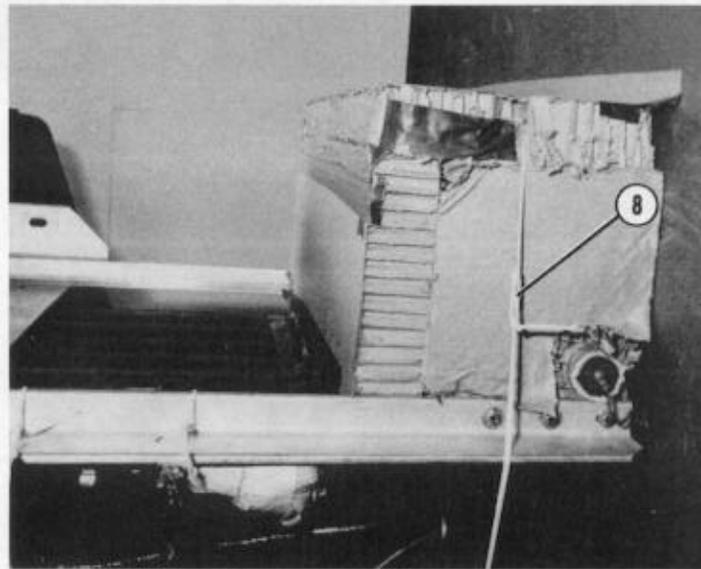
Figure 7-8. Winch and cables prepared (continued)



- ⑤ Place the cover on the connector. Pad the connector with cellulose wadding taped in place.
- ⑥ Cover the connector of the remote control cable with cellulose wadding and tape it in place. Avoid touching the end of the cable with tape adhesive. Tie the cable under the cradle assembly with type III nylon cord.
- ⑦ Secure the large slave cable to the underside of the cradle assembly with type III nylon cord.

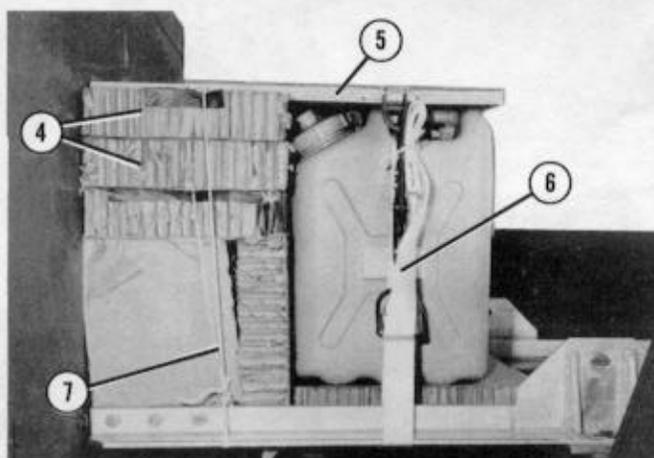
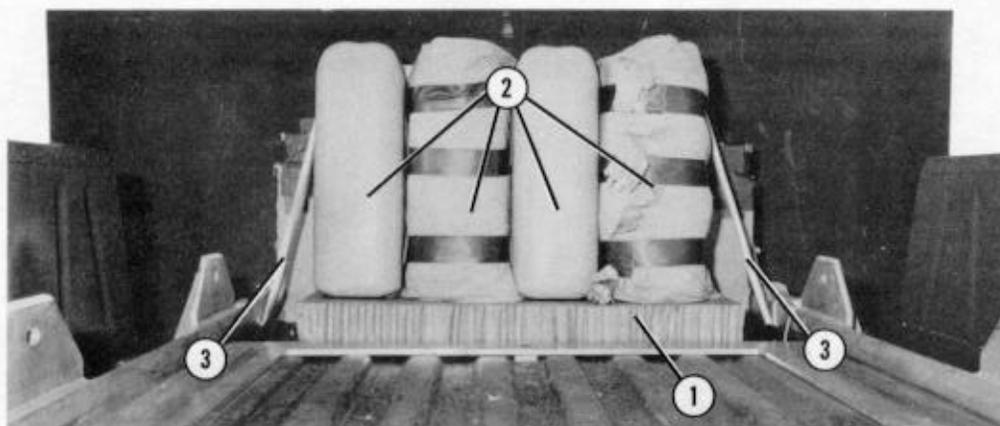
CAUTION: Avoid sharp bends in the cables to prevent breakage.

Figure 7-8. Winch and cables prepared (continued)



- ⑧ Cut a piece of honeycomb to fit the right box opening and to allow for the connector. Tie the type III nylon cord placed in step 4 to the strap hook in the right rear passenger foot well.

Figure 7-8. Winch and cables prepared (continued)



- ① Center a 32- by 16-inch piece of honeycomb against the winch box.
- ② Pad two fuel cans with cellulose wadding taped in place. Place the fuel cans and two water cans flush on the honeycomb.
- ③ Pass a 15-foot lashing through the can handles and under the rails of the cradle assembly on both sides.
- ④ Place two 40- by 12-inch pieces of honeycomb flush over the winch box.
- ⑤ Center a 30- by 26-inch piece of 3/4-inch plywood over the honeycomb and the cans.
- ⑥ Pass the right side of the lashing placed in step 3 above over the plywood. Secure the lashing on the left side.
- ⑦ Tie a length of type III nylon cord over the plywood to the left and right rails.

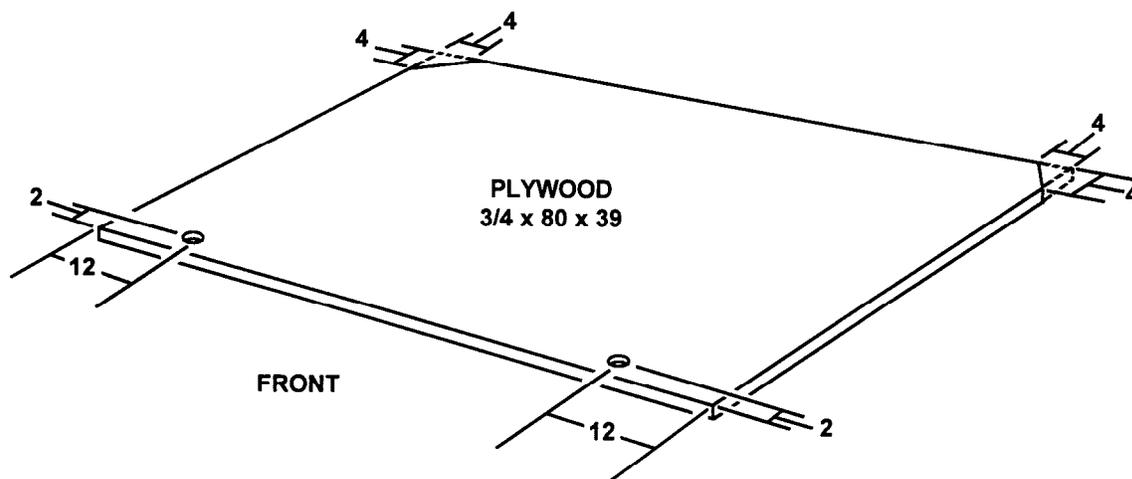
Figure 7-9. Water, fuel, and camouflage net stowed



- ⑧ Place the camouflage net bag against the cans. Tie the net bag to the rails with three lengths of type III nylon cord.

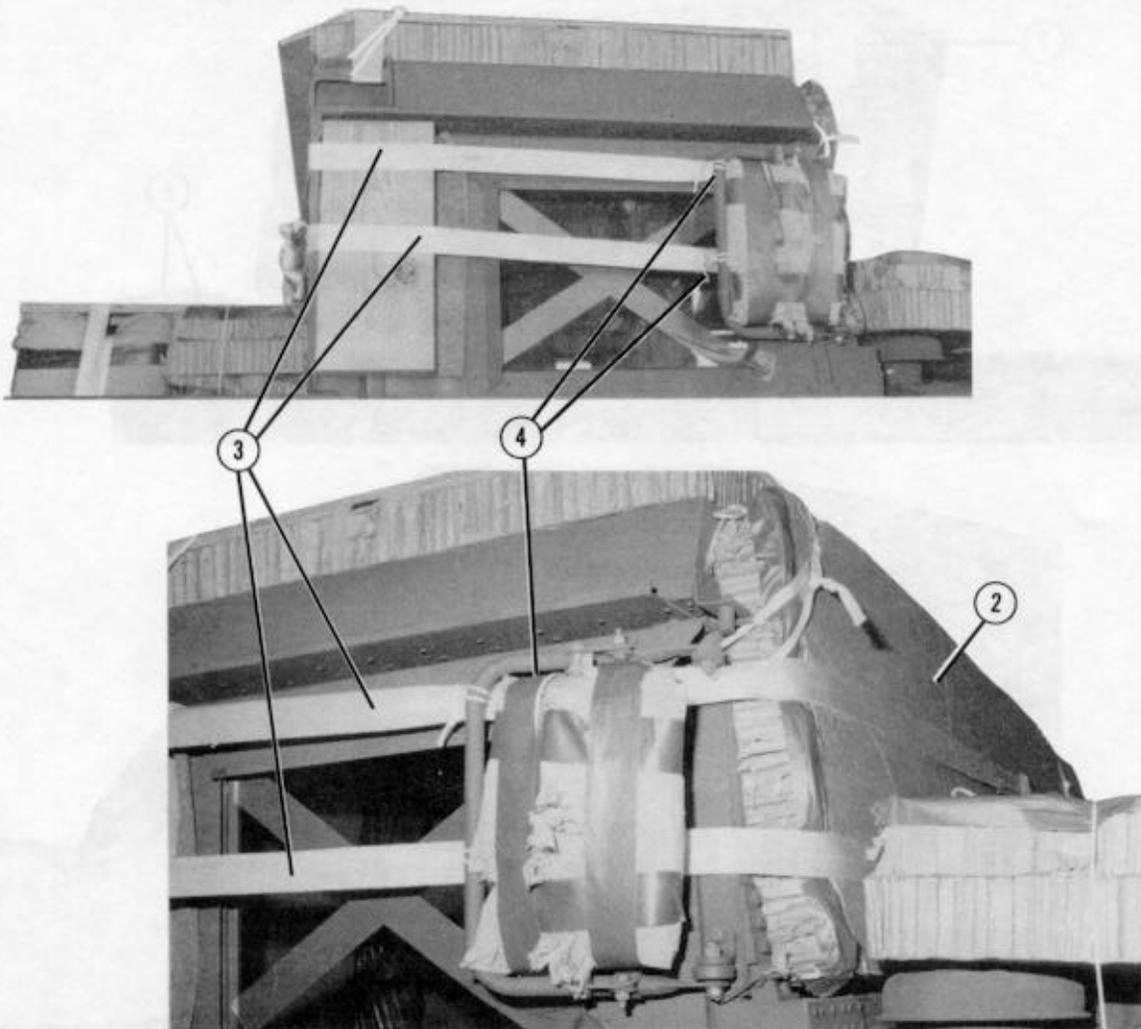
Figure 7-9. Water, fuel, and camouflage net stowed (continued)

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



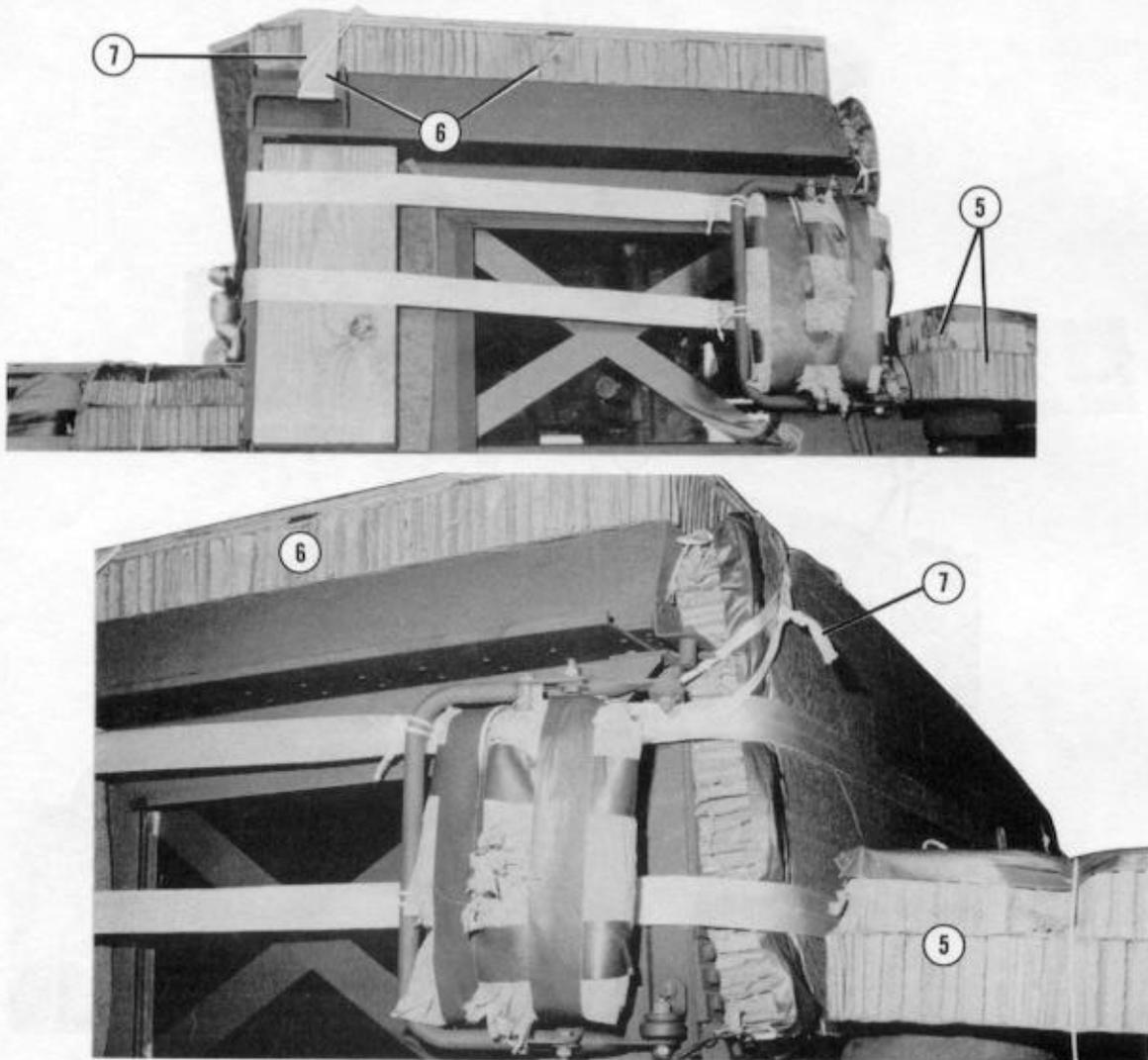
- ① Make cuts and 1/2-inch holes as shown in a 80- by 39-inch piece of 3/4-inch plywood. Glue a 80- by 36-inch piece of honeycomb to the plywood, flush along the front edge. Set the roof protector aside for use later.

Figure 7-10. Body of truck prepared



- ② Place a 83- by 23-inch piece of honeycomb against the windshield. Tape the outside short edges.
- ③ Pass two 30-foot lashings around the honeycomb placed in step 2 above, through the mirror brackets, and around the truck cab. Make two spacers each of three pieces of 2- by 8- by 18-inch lumber and a layer of 10- by 22-inch felt. Nail the lumber together and glue the felt to one side of the spacer. Place a spacer under the lashings and vertically behind each door window. Secure the lashings behind the cab.
- ④ Pad the mirrors with cellulose wadding taped in place. Fold the mirrors to the side and tie the mirror brackets to the lashings with type III nylon cord.

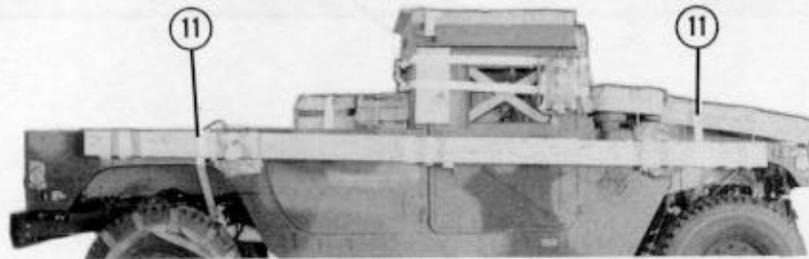
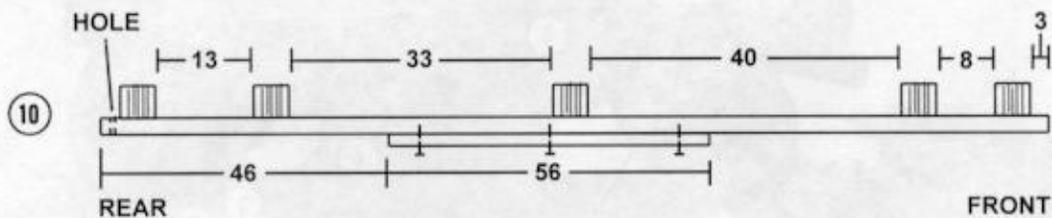
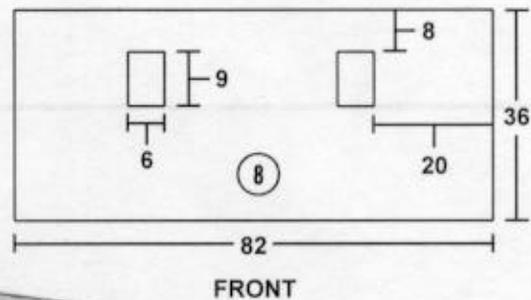
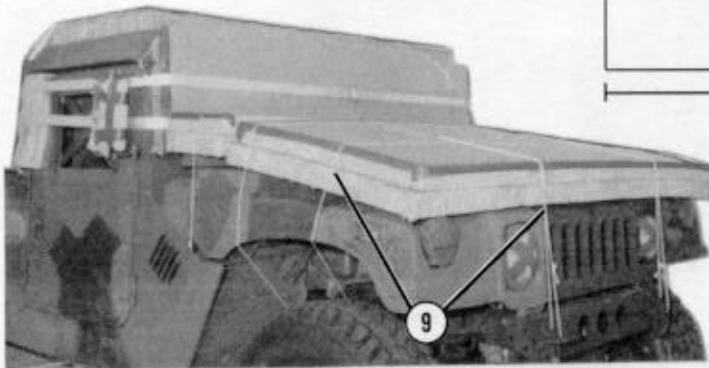
Figure 7-10. Body of truck prepared (continued)



- ⑤ Tie two 82- by 12-inch pieces of honeycomb to the hood in front of the honeycomb covering the windshield with a length of type III nylon cord.
- ⑥ Place the roof protector on the roof, honeycomb side down, with the holes to the front. Pass a 15-foot lashing through the handles on the roof and secure the lashing over the plywood.
- ⑦ Tie the roof protector to the roof with 1/2-inch tubular nylon webbing. Pass the webbing through the left rear handle on the roof and across the plywood and through the right front hole to the base of the mirror bracket. Tie a length of 1/2-inch tubular nylon webbing from the right rear to the left front in the same way.

Figure 7-10. Body of truck prepared (continued)

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

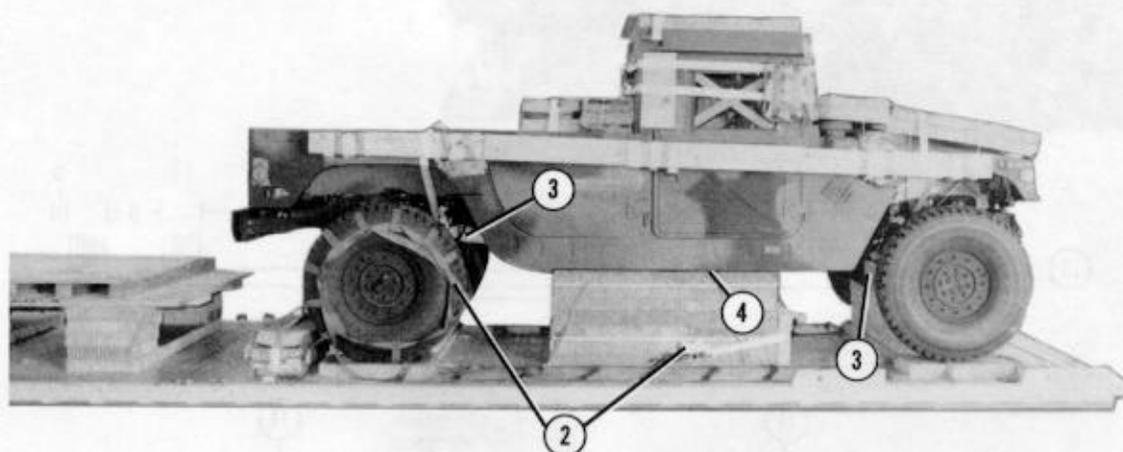


- (8) Make the cutouts shown in two 82- by 36-inch pieces of honeycomb.
- (9) Tie the honeycomb over the hood with type III nylon cord as shown.
- (10) Nail a 2- by 6- by 56-inch piece of lumber flush with and 46 inches from the rear edge of a 2- by 6- by 150-inch piece of lumber. Glue six 5 1/2- by 10-inch pieces of honeycomb to the other side of the 150-inch piece, spaced as shown. Drill a 1/2-inch hole, centered and 2 inches from the rear end of the board.
- (11) Secure the side boards to each side of the truck as shown in Figure 2-13, FM 10-517/TO 13C7-1-111.

Figure 7-10. Truck body prepared (continued)

7-5. Positioning Truck on Platform and Installing Drive-off Aids

Position the truck on the platform and install the drive-off aids as shown in Figure 7-11.

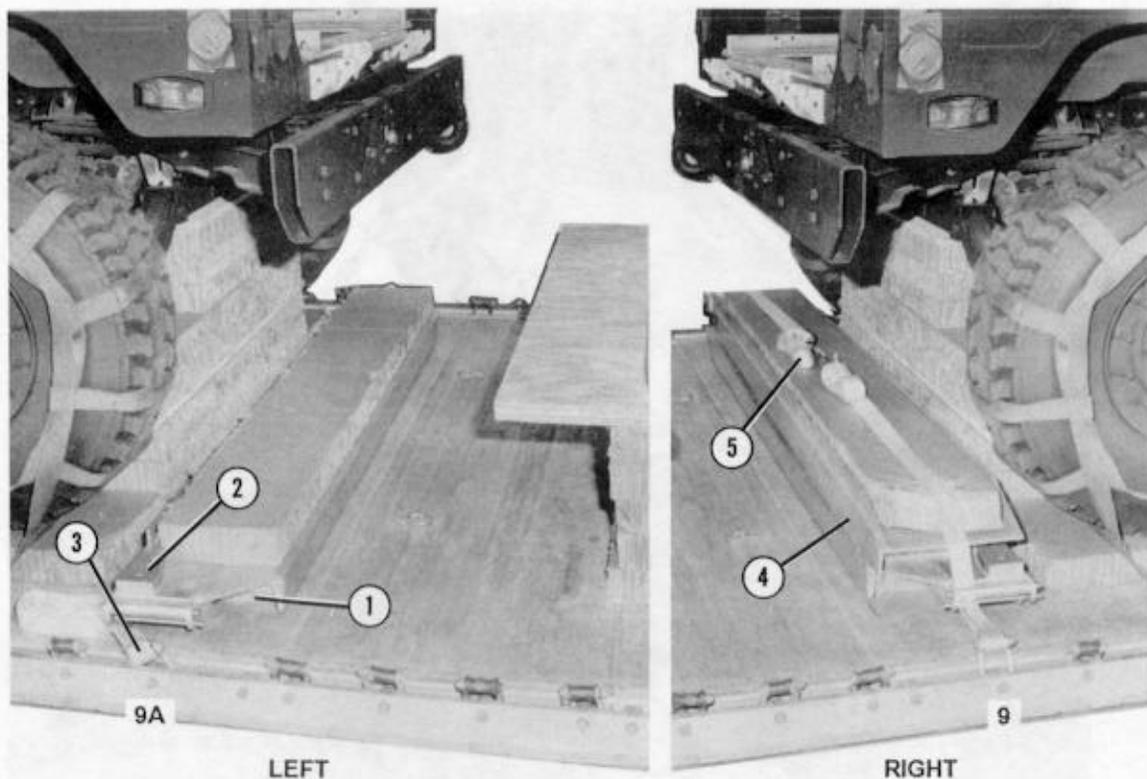


- ① Lift the truck (not shown).
- ② Adapt the procedures shown in Figure 2-18, FM 10-517/TO 13C7-1-111 to install the drive-off aids on the truck, and to place the restraint lashing on stack 2.
- ③ Be sure that the suspension cross members rest solidly on stacks 1 and 3.
- ④ Be sure that the frame rails rest solidly on stack 2.

Figure 7-11. Truck positioned on platform and drive-off aids installed

7-6. Lashing Ramps to Platform

Lash the ramps used for mounting the Avenger turret as shown in Figure 7-12.

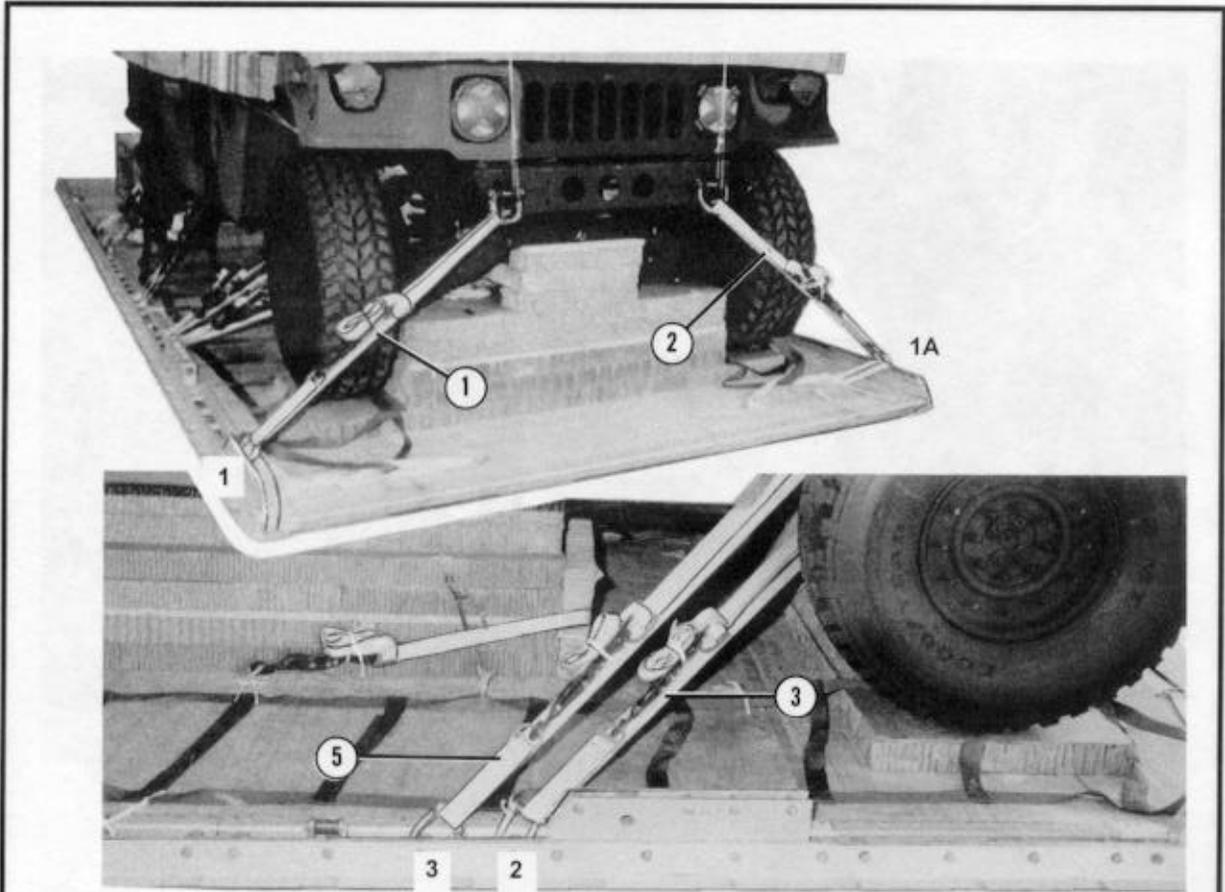


- ① Center a 80- by 10-inch piece of honeycomb between clevises 9 and 9A.
- ② Place one ramp over the honeycomb. Place a second 80- by 10-inch piece of honeycomb on top of the ramp.
- ③ Pass a 15-foot lashing through clevis 9 and through its own D-ring. Pass a 15-foot lashing through clevis 9A and through its own D-ring.
- ④ Place the second ramp over the honeycomb placed in step 2 above, with the pin facing the opposite way from the pin on the first ramp.
- ⑤ Place a 80- by 10-inch piece of honeycomb over the second ramp. Secure the lashings placed in step 3 above on top of the honeycomb with two D-rings and a load binder.

Figure 7-12. Ramps stowed on platform

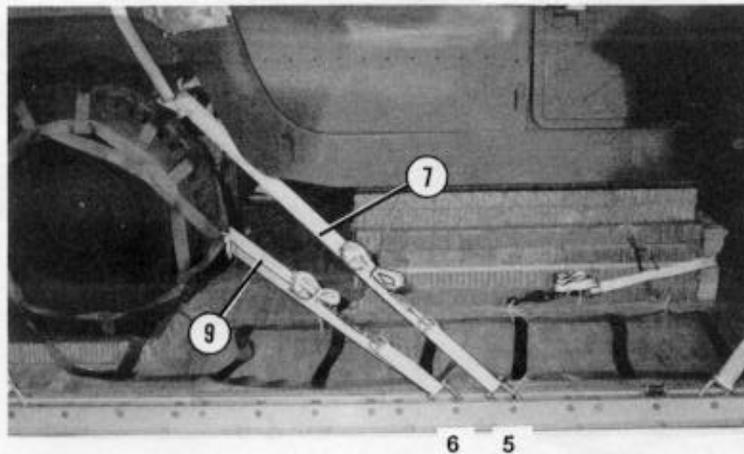
7-7. Lashing Truck

Lash the truck to the platform according to FM 10-500-2/TO 13C7-1-5 and as shown in Figure 7-13.



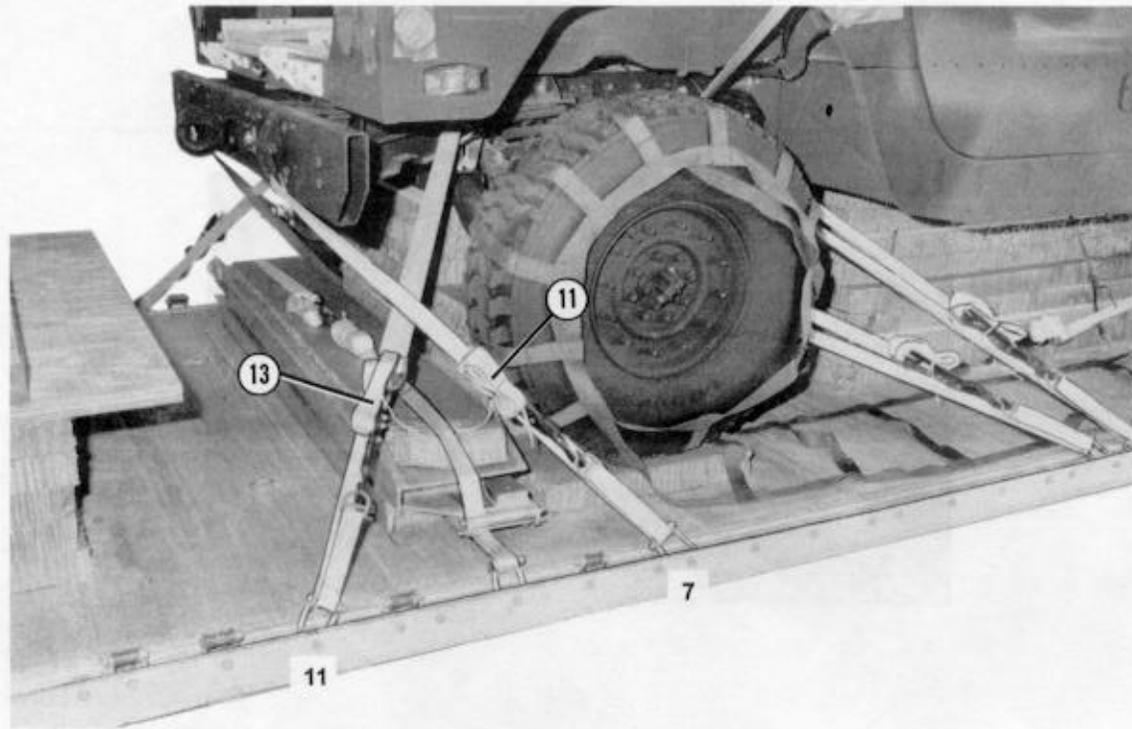
Lashing Number	Tie-down Clevis Number	Instructions
1	1	Pass Lashing: Through right front shackle.
2	1A	Through left front shackle.
3	2	Around right front lower control arm.
4	2A	Around left front lower control arm.
5	3	Around right front upper control arm.
6	3A	Around left front upper control arm.

Figure 7-13. Truck lashed



Lashing Number	Tie-down Clevis Number	Instructions
7	5	Pass lashing:
8	5A	Around right rear upper control arm.
9	6	Around left rear upper control arm.
10	6A	Around right rear lower control arm.
		Around left rear lower control arm.

Figure 7-13. Truck lashed (continued)



Lashing Number	Tie-down Clevis Number	Instructions
11	7	Pass Lashing: Through right rear lifting shackle.
12	7A	Through left rear lifting shackle.
13	11	Through tie-down bracket behind right rear coil spring.
14	11A	Through tie-down bracket behind left rear coil spring.

Figure 7-13. Truck lashed (continued)

7-8. Positioning and Preparing Turret

Position and prepare the turret as described below.

- a. Lift the turret as shown in Figure 7-14.
- b. Position the turret on the load spreader as shown in Figure 7-15.
- c. Prepare the turret as shown in Figures 7-16 through 7-19.

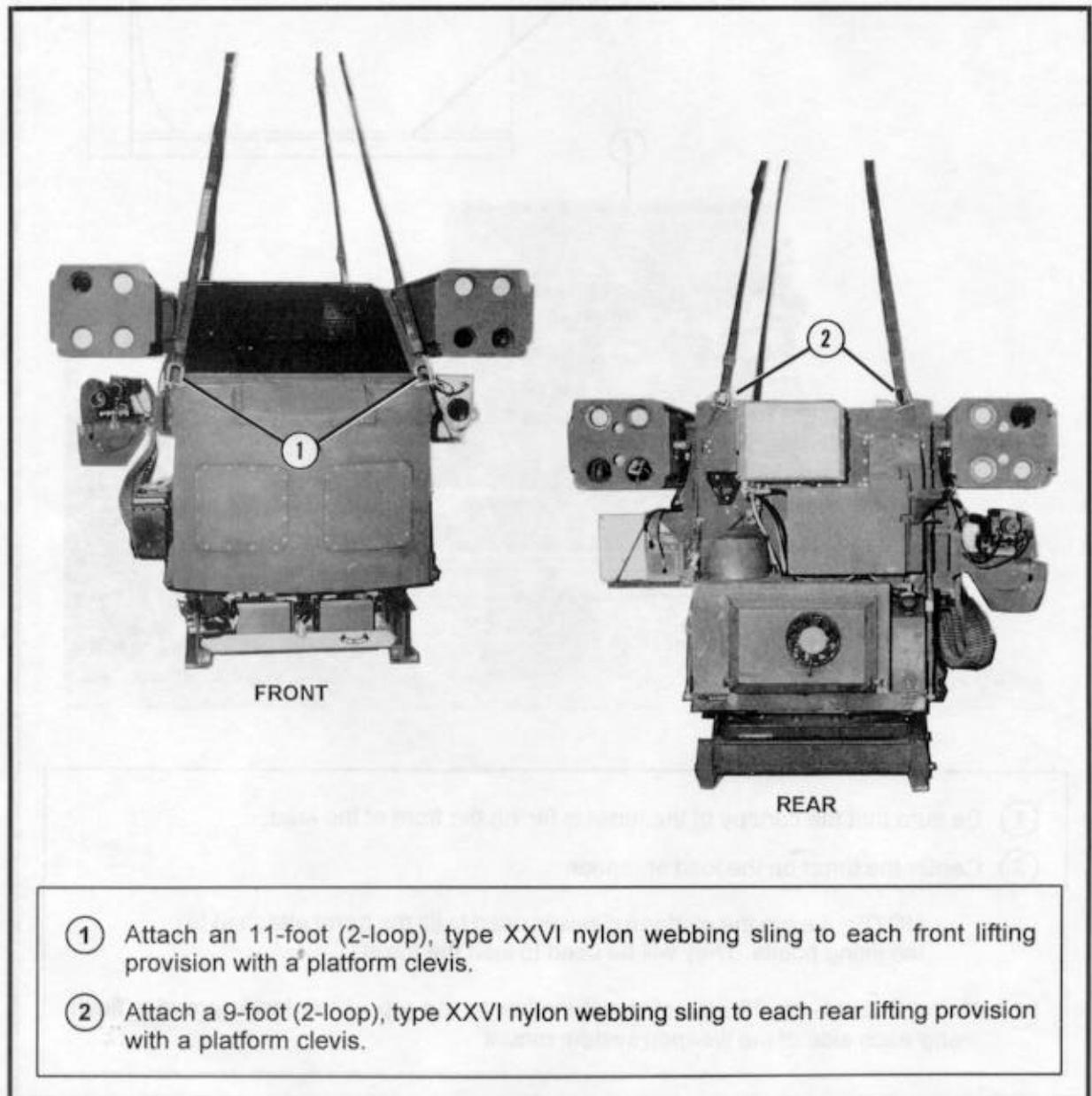
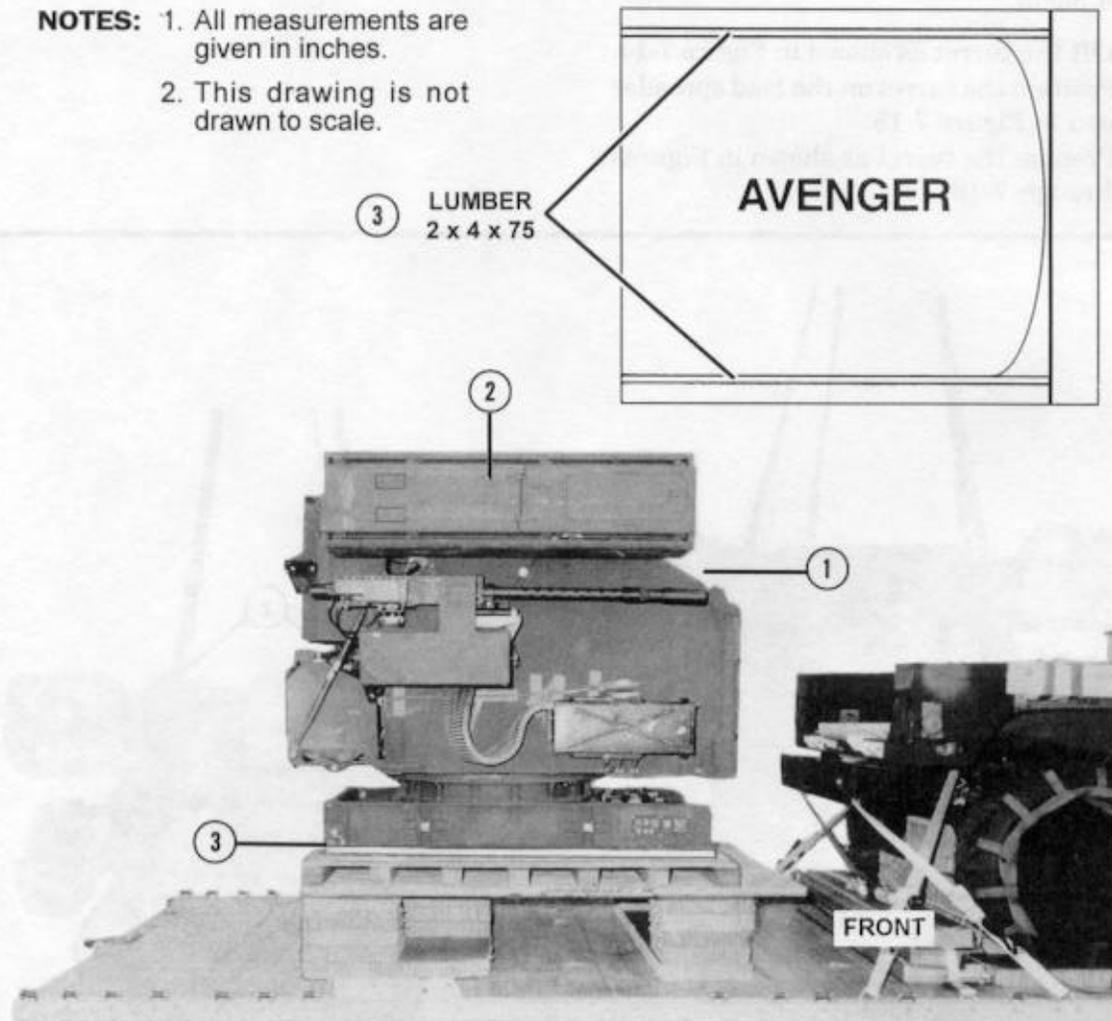


Figure 7-14. Turret lifted

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



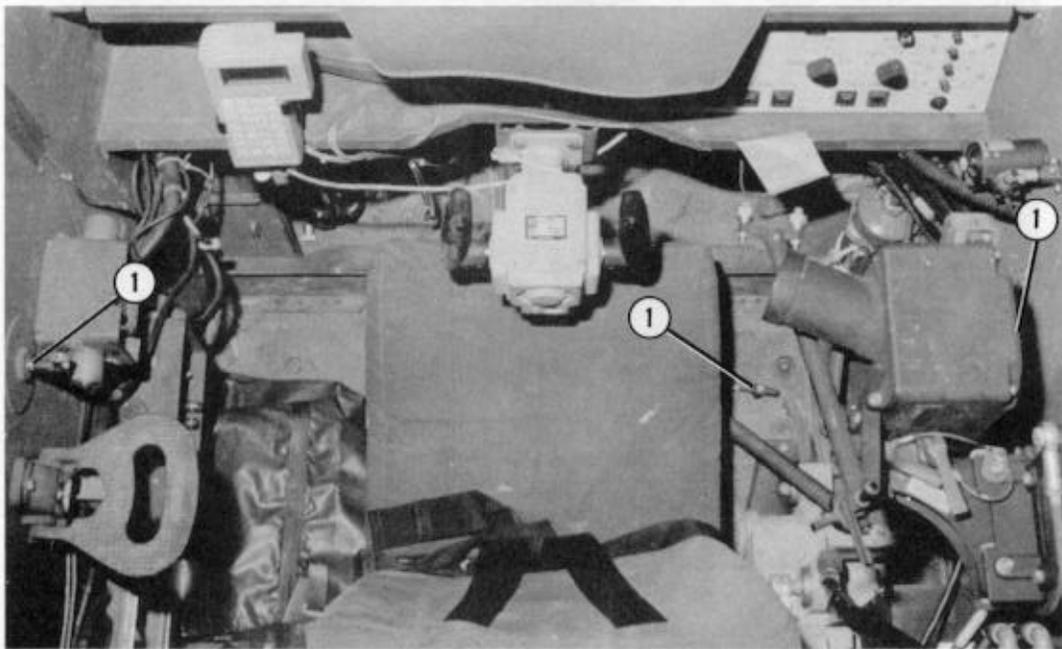
① Be sure that the canopy of the turret is facing the front of the load.

② Center the turret on the load spreader.

NOTE: Leave the platform clevises used to lift the turret attached to the lifting points. They will be used to lash the turret.

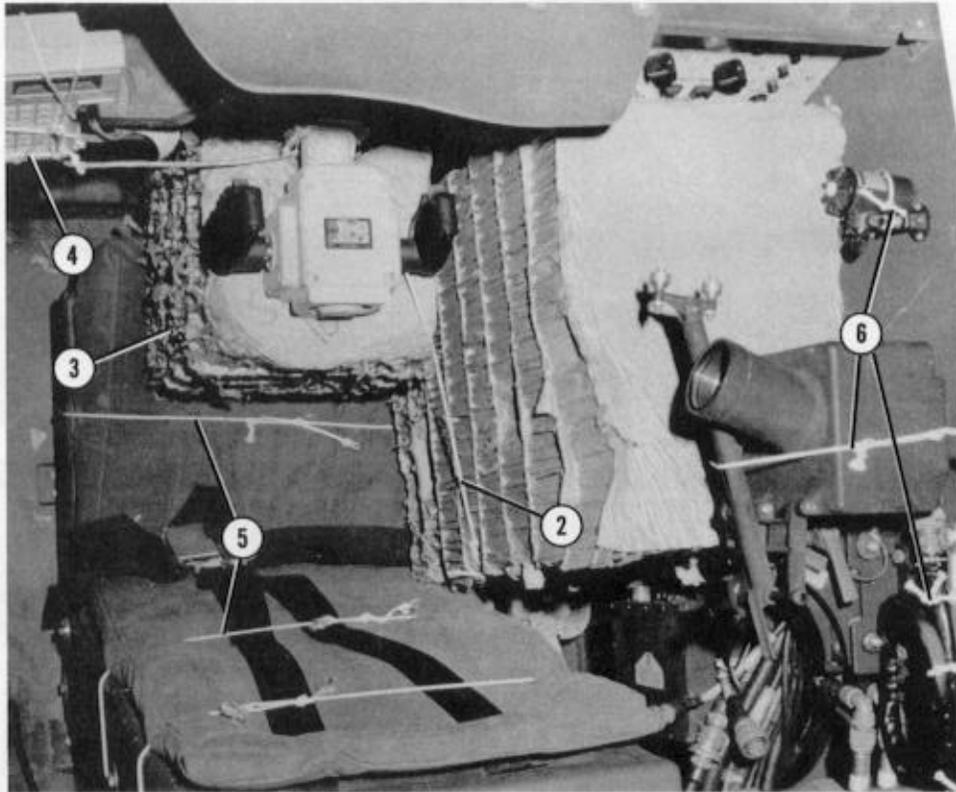
③ Nail a 2- by 4- by 75-inch piece of lumber to the top of the load spreader flush along each side of the weapon system mount.

Figure 7-15. Turret positioned



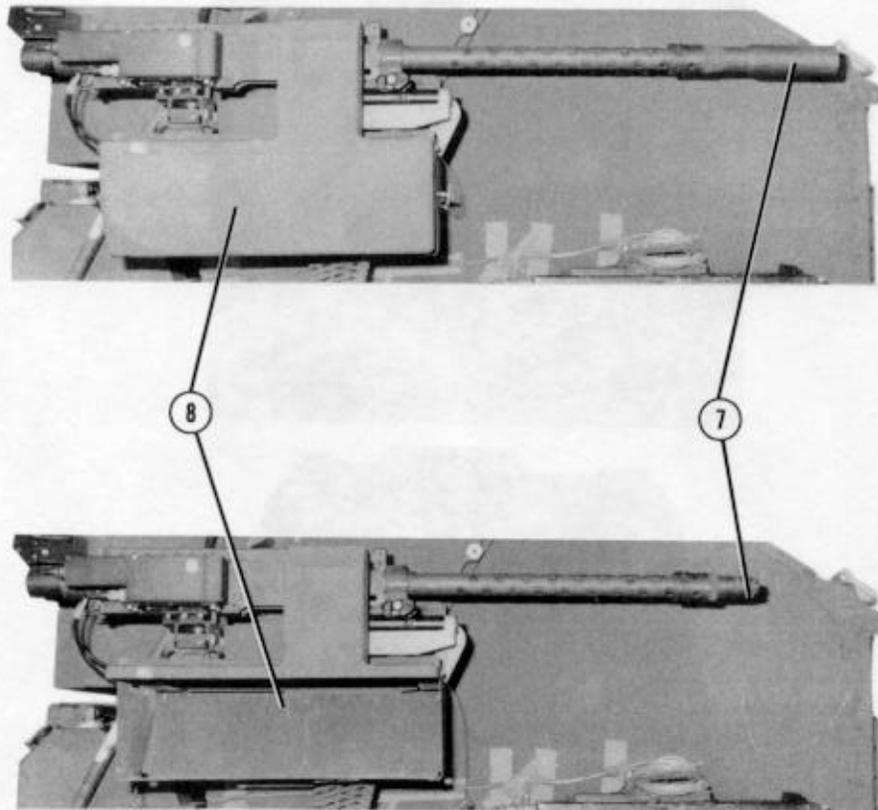
- 1 Remove the azimuth and elevation pins and place them in the clips provided.

Figure 7-16. Turret cab prepared



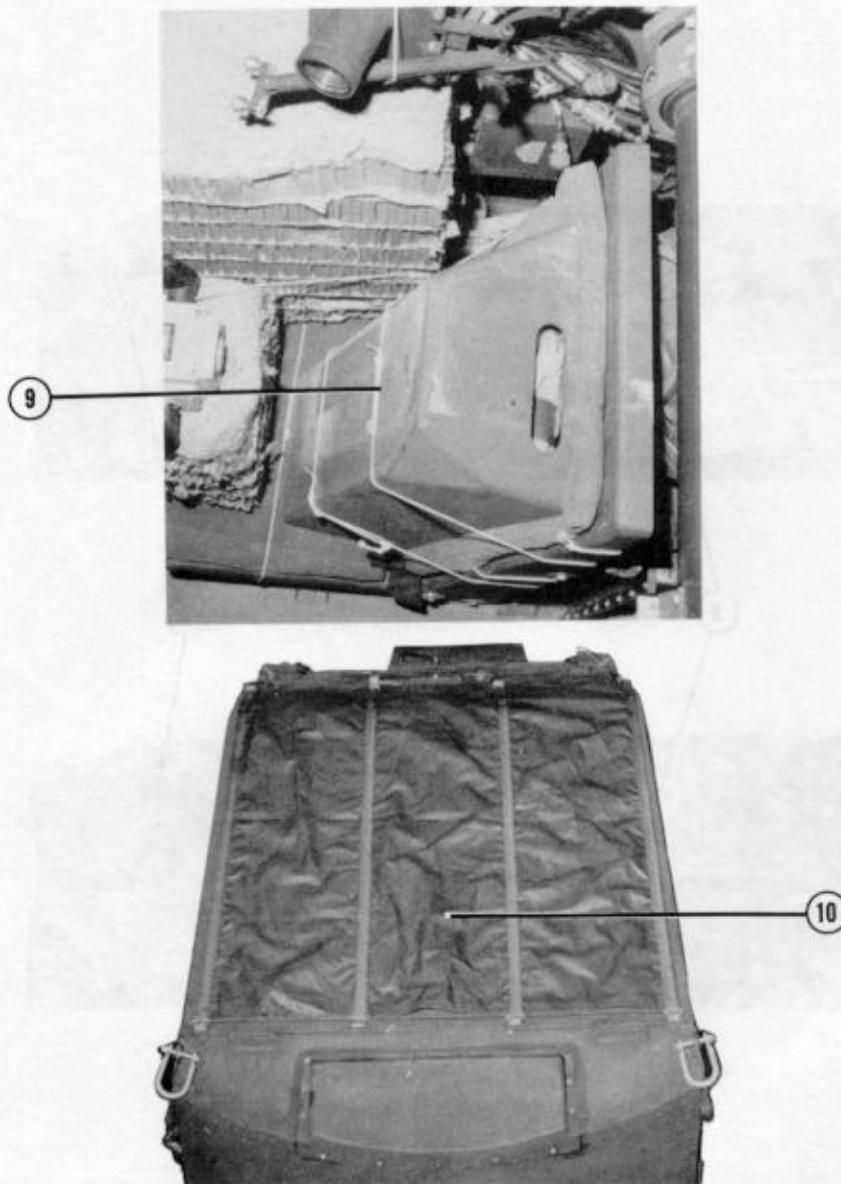
- ② Glue eight 12- by 18-inch pieces of honeycomb together. Place the stack under the optical sight and against the control panel. Tie the honeycomb in place with type III nylon cord.
- ③ Glue together five 10- by 10-inch pieces of honeycomb. Place the stack under the hand station, and secure in place with type III nylon cord.
- ④ Secure the control display terminal in its bracket with type III nylon cord.
- ⑤ Tie the seat and seat back to the seat frame with type III nylon cord.
- ⑥ Secure loose cables and loose objects with type III nylon cord.

Figure 7-16. Turret cab prepared (continued)



- ⑦ Remove the flash suppressor from the 50-caliber machine gun on the right side of the turret.
- ⑧ Remove the brass collection tray under the gun.

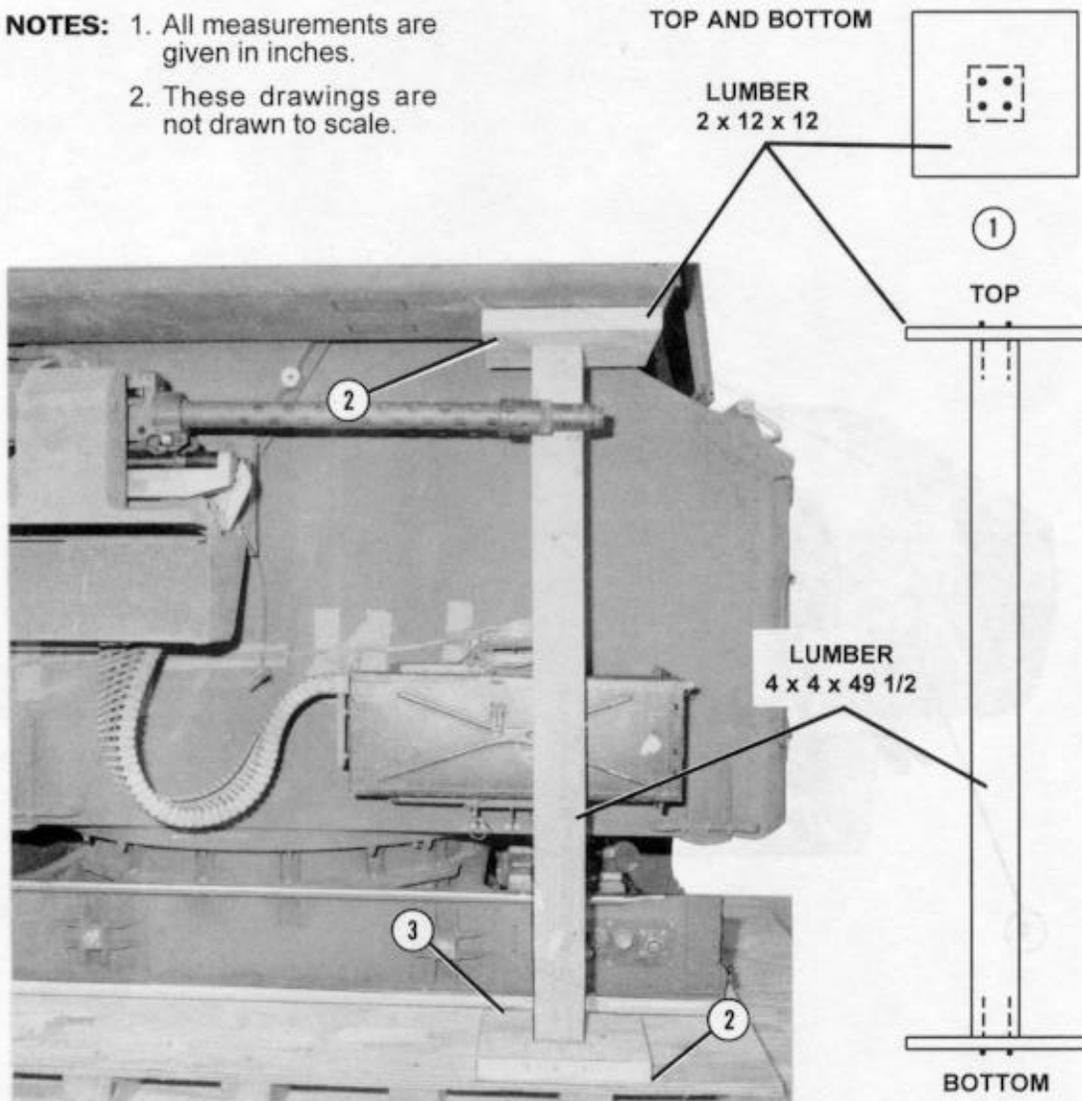
Figure 7-16. Turret cab prepared (continued)



- ⑨ Tape the turret mounting bolts inside the brass collection tray. Secure the flash suppressor to the inside of the tray with a length of type III nylon cord and wrap with cellulose wadding. Secure the tray to the seat back with type III nylon cord.
- ⑩ Close the canopy and install the cover provided.

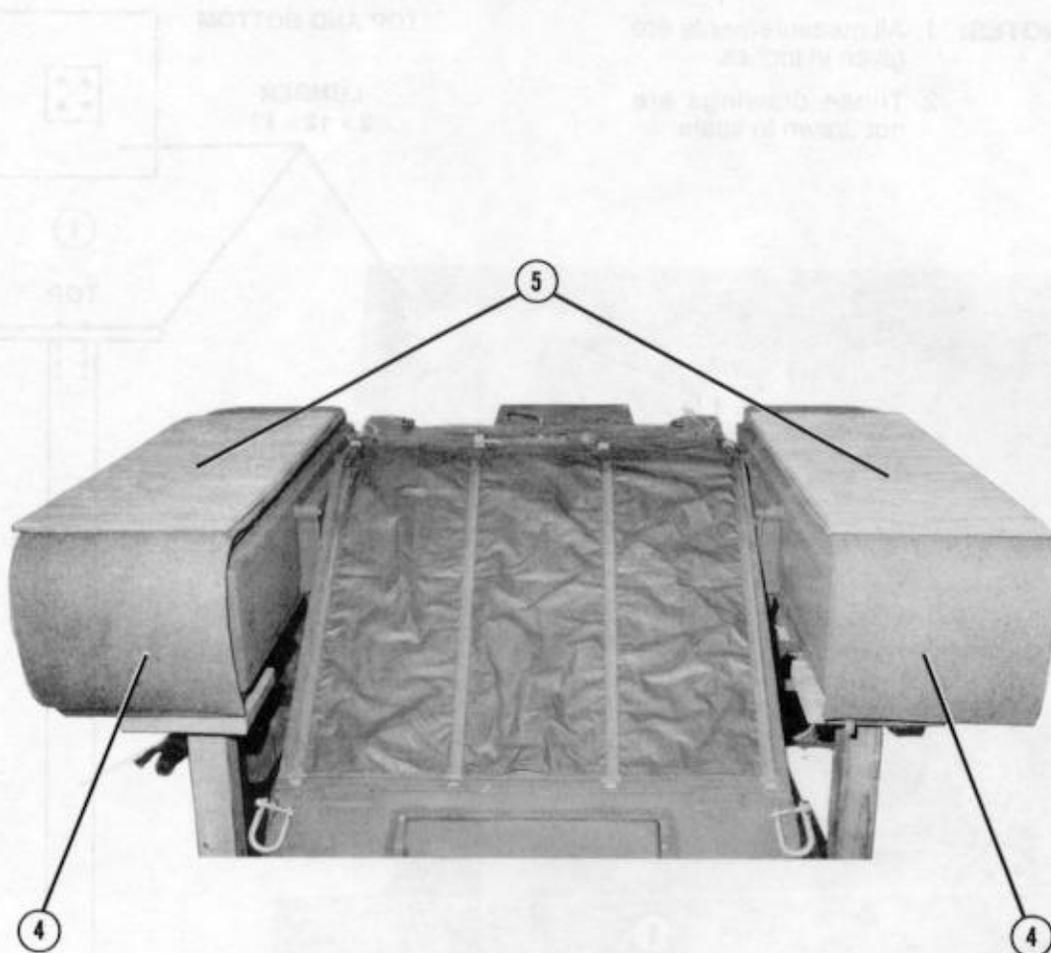
Figure 7-16. Turret cab prepared (continued)

- NOTES:** 1. All measurements are given in inches.
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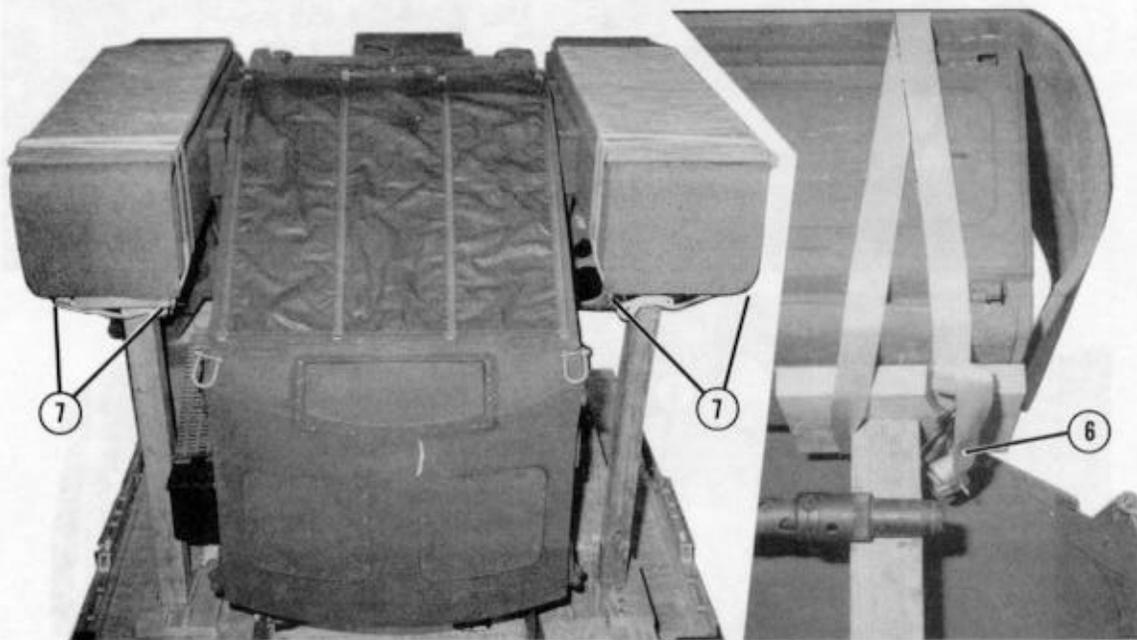
- ① Build two pod supports as shown.
- ② Place a support under each missile pod. Align the front edge of the support with the front edge of the pod. Align the outside edges of the supports with the outside edges of the load spreader.
- ③ Nail the bottoms of the pod supports to the load spreader. Drive a nail through each corner of the support bottoms, and clinch the nails under the top deck of the load spreader.

Figure 7-17. Missile pods prepared



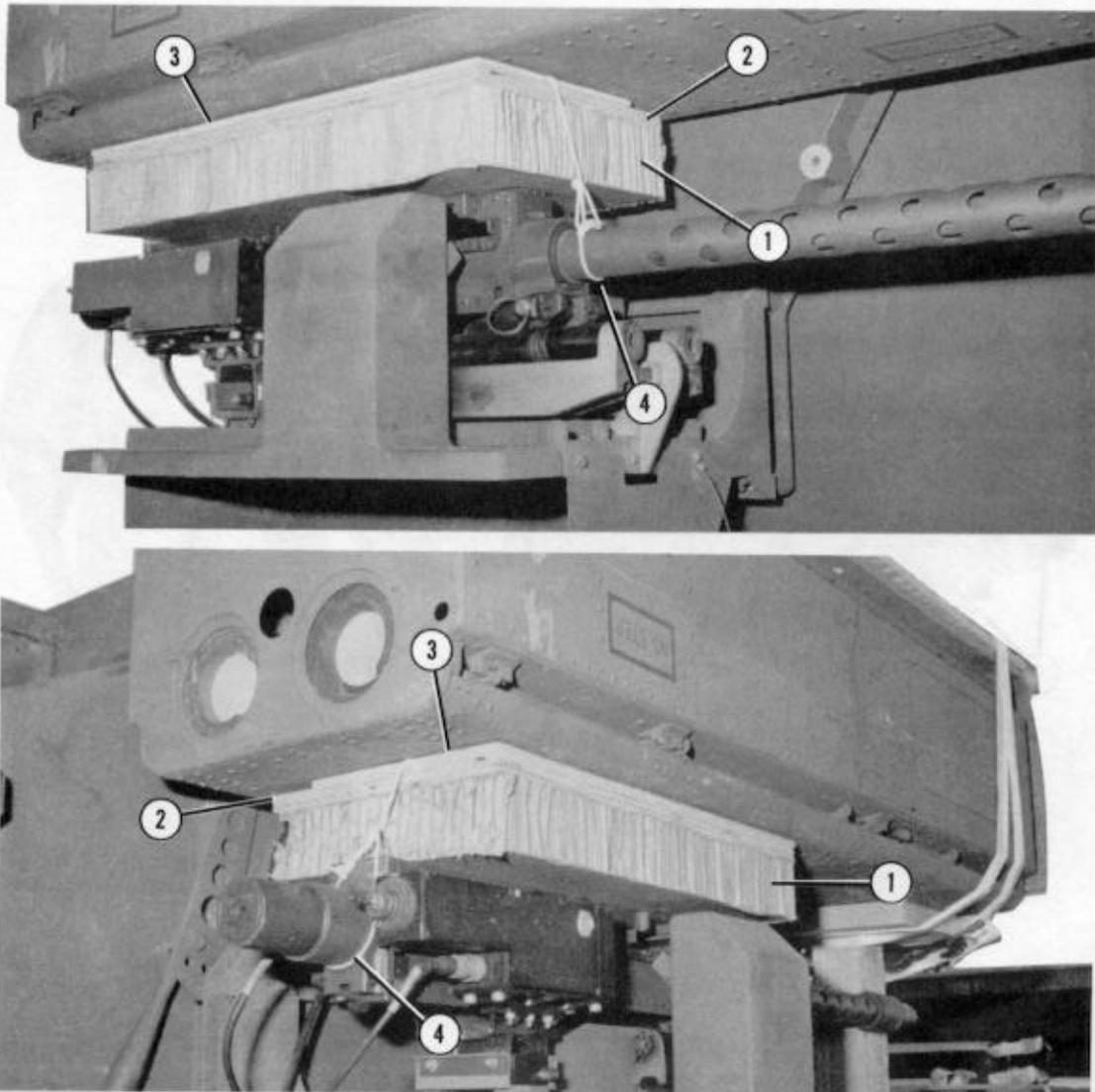
- ④ Place a 72- by 18-inch piece of felt over each pod, extending the front edge of the felt down to the front lower edge of the pod.
- ⑤ Place a 3/4- by 18- by 48-inch piece of plywood over the felt on each pod. Align the front edge of the plywood with the front edge of the pod.

Figure 7-17. Missile pods prepared (continued)



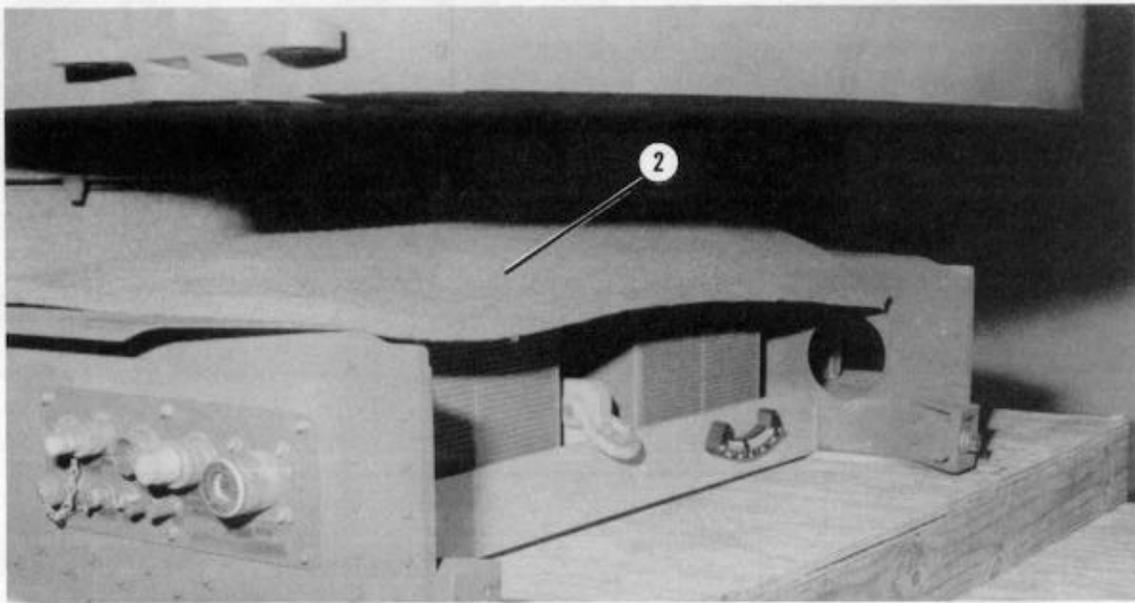
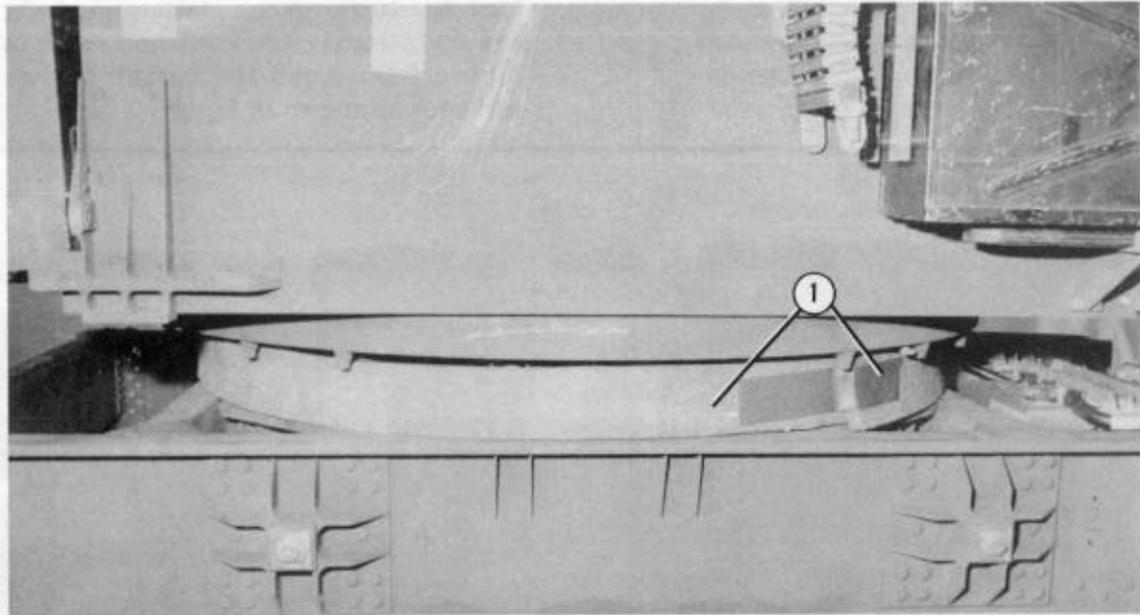
- ⑥ Beginning at the front inside edge of each pod support, wrap a 15-foot lashing over the pod, and behind the support upright. Pass the lashing over the pod and secure it so that the load binder is under the top piece of the support.
- ⑦ Punch a hole in each front corner of the felt placed in step 4 above. Tie the front corners of the felt to the D-rings on the lashings with type III nylon cord.

Figure 7-17. Missile pods prepared (continued)



- ① Center a 24- by 12-inch piece of honeycomb on top of the gun.
- ② Place a 24- by 12-inch piece of 3/4-inch plywood flush on the honeycomb.
- ③ Place a 24- by 9 1/2-inch piece of 1/4-inch plywood over the plywood placed in step 2 above. Place this piece flush with the outside edge of the other pieces.
- ④ Secure these pieces to the gun with type III nylon cord as shown.

Figure 7-18. Gun prepared

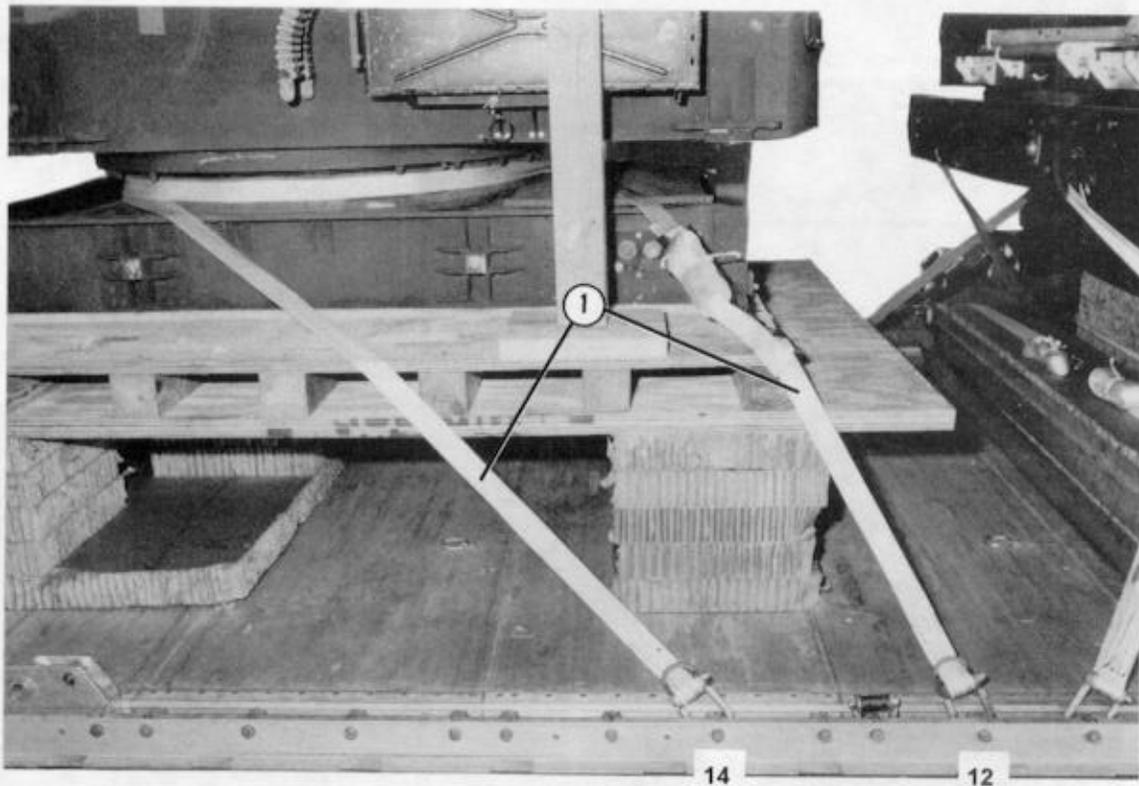


- ① Pad the turret base with three 3- by 48-inch pieces of felt. Overlap the pieces slightly and tape them in place.
- ② Cover the batteries with a 16- by 34-inch piece of felt.

Figure 7-19. Turret base prepared

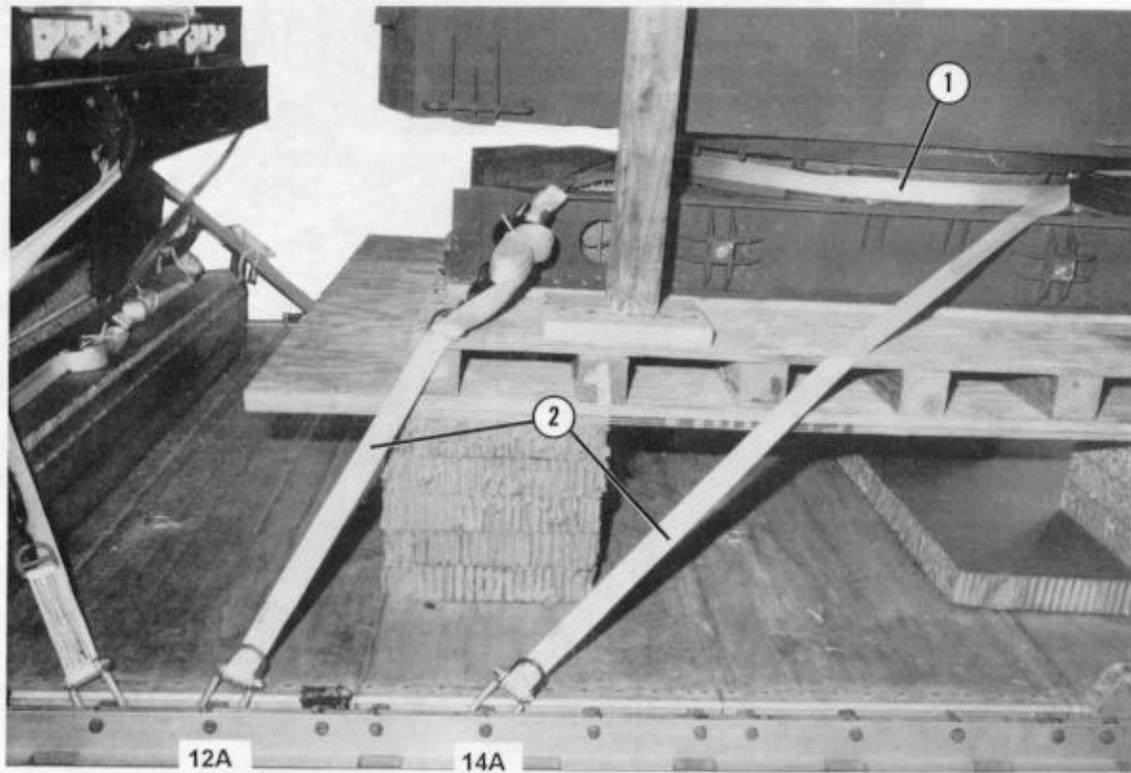
7-9. Lashing Turret

Lash the turret to the platform according to FM 10-500-2/TO 13C7-1-5 and as shown in Figure 7-20. Lash the turret to the load spreader as shown in Figure 7-21.



Lashing Number	Tie-down Clevis Number	Instructions
1	12 and 14	Pass a 15-foot lashing through each clevis and through its own D-ring. Pass the lashing from clevis 14 around the padded portion of the turret mount. Secure both lashings together with two D-rings and a load binder.

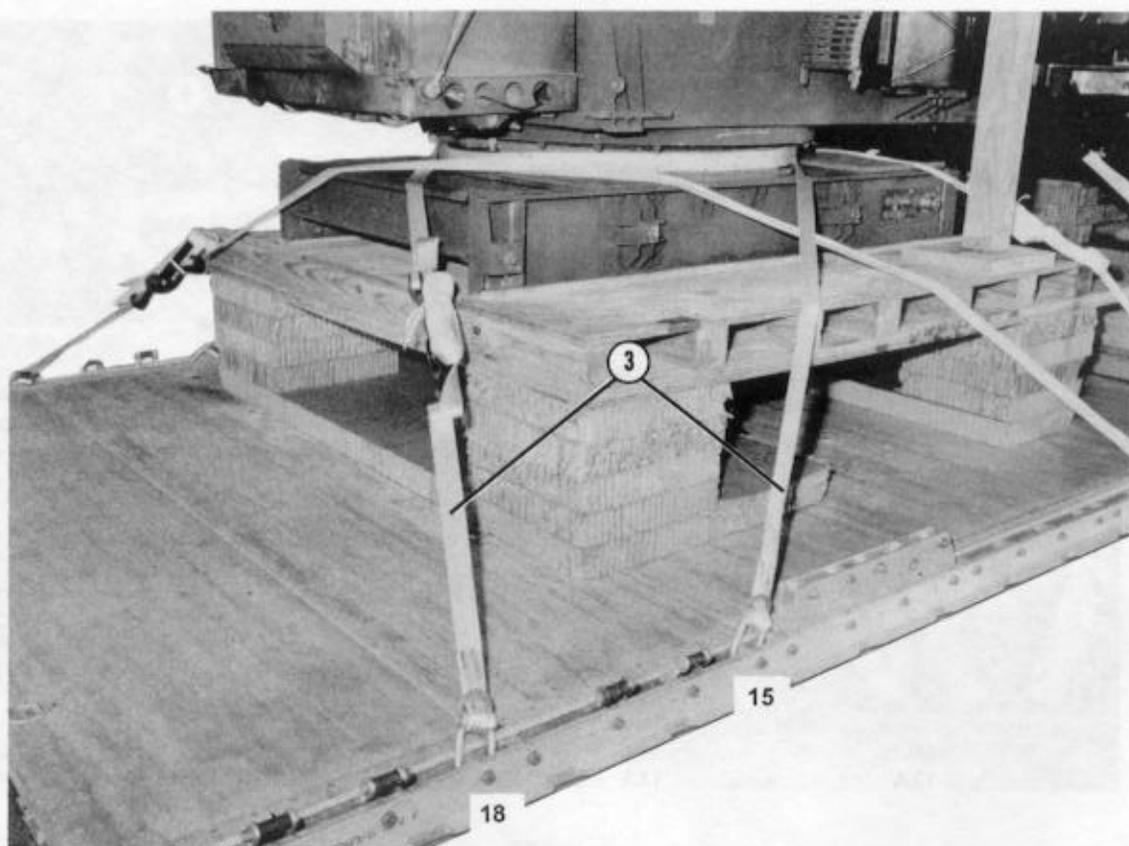
Figure 7-20. Turret lashed



LEFT

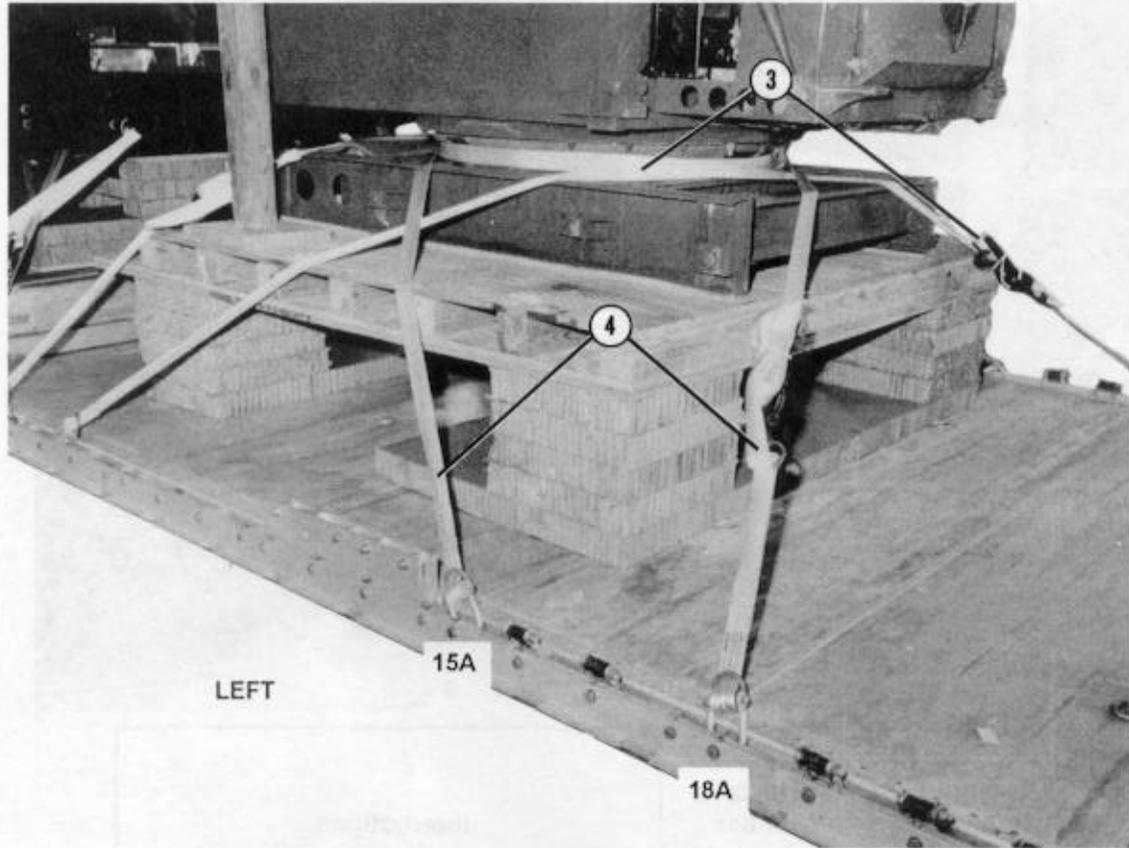
Lashing Number	Tie-down Clevis Number	Instructions
2	12A to 14A	Pass a 15-foot lashing through each clevis and through its own D-ring. Pass the lashing from clevis 14A around the padded portion of the turret mount. Secure both lashings together with two D-rings and a load binder.

Figure 7-20. Turret lashed (continued)



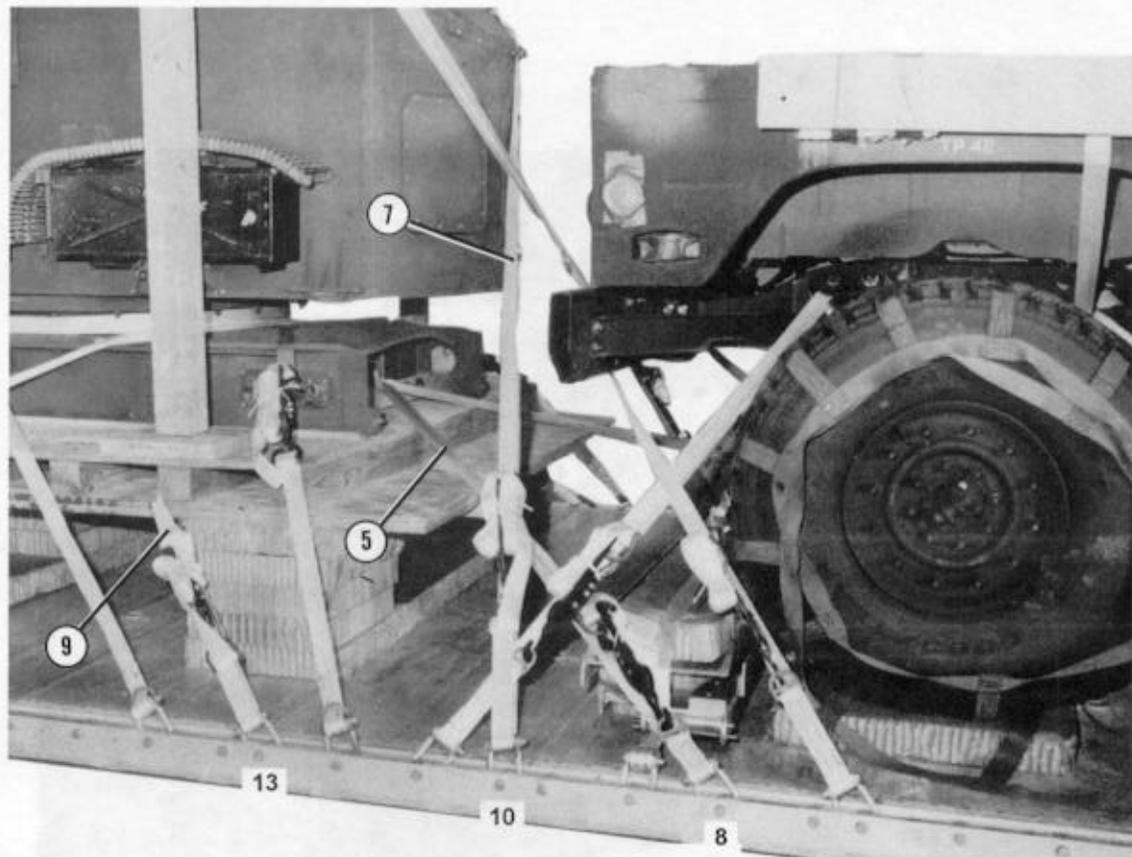
Lashing Number	Tie-down Clevis Number	Instructions
3	15 and 18	Pass a 15-foot lashing through each clevis and through its own D-ring. Pass the lashing from clevis 15 around the padded portion of the turret mount. Secure both lashings together with two D-rings and a load binder.

Figure 7-20. Turret lashed (continued)



Lashing Number	Tie-down Clevis Number	Instructions
4	15A to 18A	Pass a 15-foot lashing through each clevis and through its own D-ring. Pass the lashing from clevis 15A around the padded portion of the turret mount. Secure both lashings together with two D-rings and a load binder.

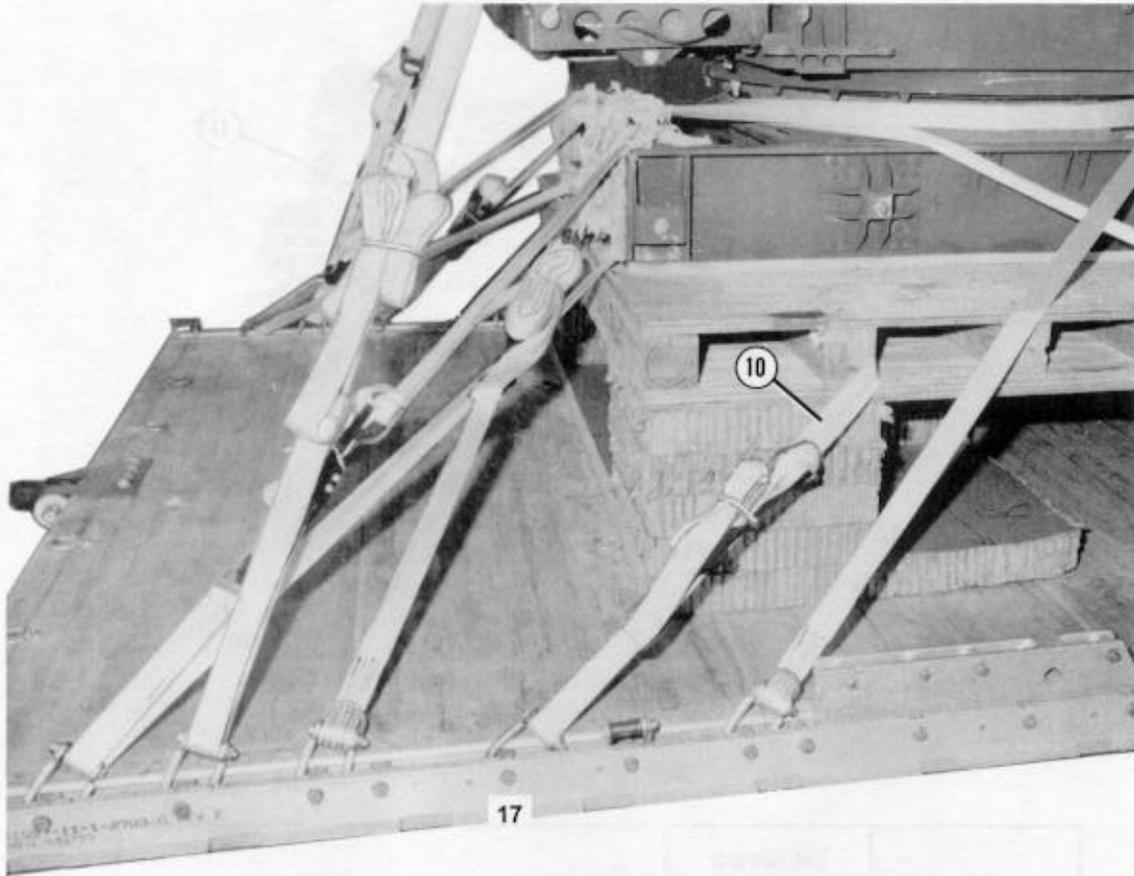
Figure 7-20. Turret lashed (continued)



Lashing Number	Tie-down Clevis Number	Instructions
5	8	Pass lashing through winch clevis.
6	8 A	Pass lashing through winch clevis.
*7	10	Pass lashing through clevis on left front lifting point.
*8	10 A	Pass lashing through clevis on right front lifting point.
*9	13 and 13A	Fit a D-ring and a load binder to the end of the lashing. Pass the other end through clevis 13, through the second hole in the load spreader and through clevis 13A. Pass the lashing back through the load spreader, fit a D-ring to the end, and secure it to the load binder.

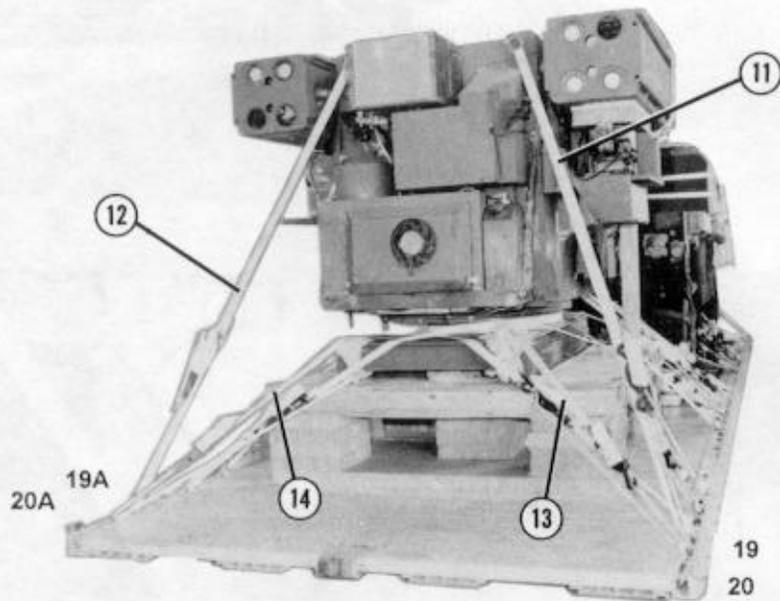
*30-foot lashing

Figure 7-20. Turret lashed (continued)



Lashing Number	Tie-down Clevis Number	Instructions
*10	17 and 17A	Fit a D-ring and a load binder to the end of the lashing. Pass the other end through clevis 17, through the fifth hole in the load spreader and through clevis 17A. Pass the lashing back through the load spreader, fit a D-ring to the end, and secure it to the load binder.
*30-foot lashing		

Figure 7-20. Turret lashed (continued)

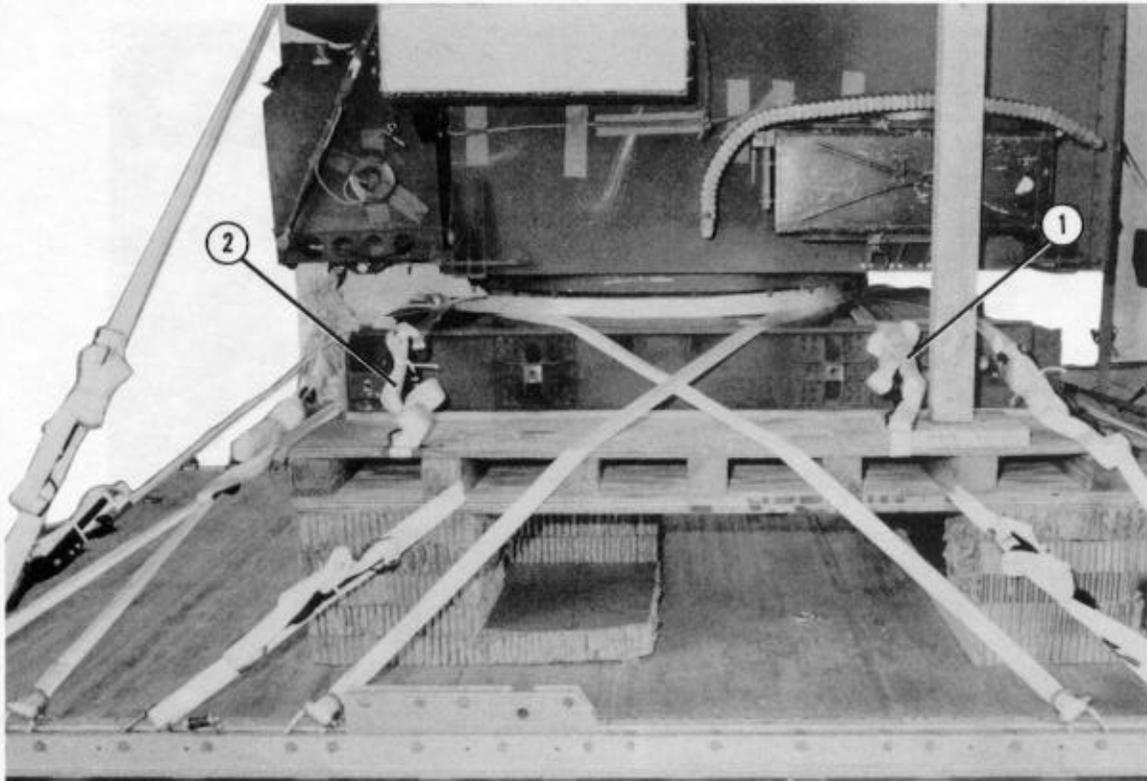


Lashing Number	Tie-down Clevis Number	Instructions
*11	19	Pass lashing through clevis on right rear lifting point.
*12	19A	Pass lashing through clevis on left rear lifting point.
13	20	Pass lashing around crossbeam on turret base, right side.
14	20A	Pass lashing around crossbeam on turret base, left side.

NOTE: Pad under lashings 13 and 14 with cellulose wadding.

*30-foot lashing

Figure 7-20. Turret lashed (continued)



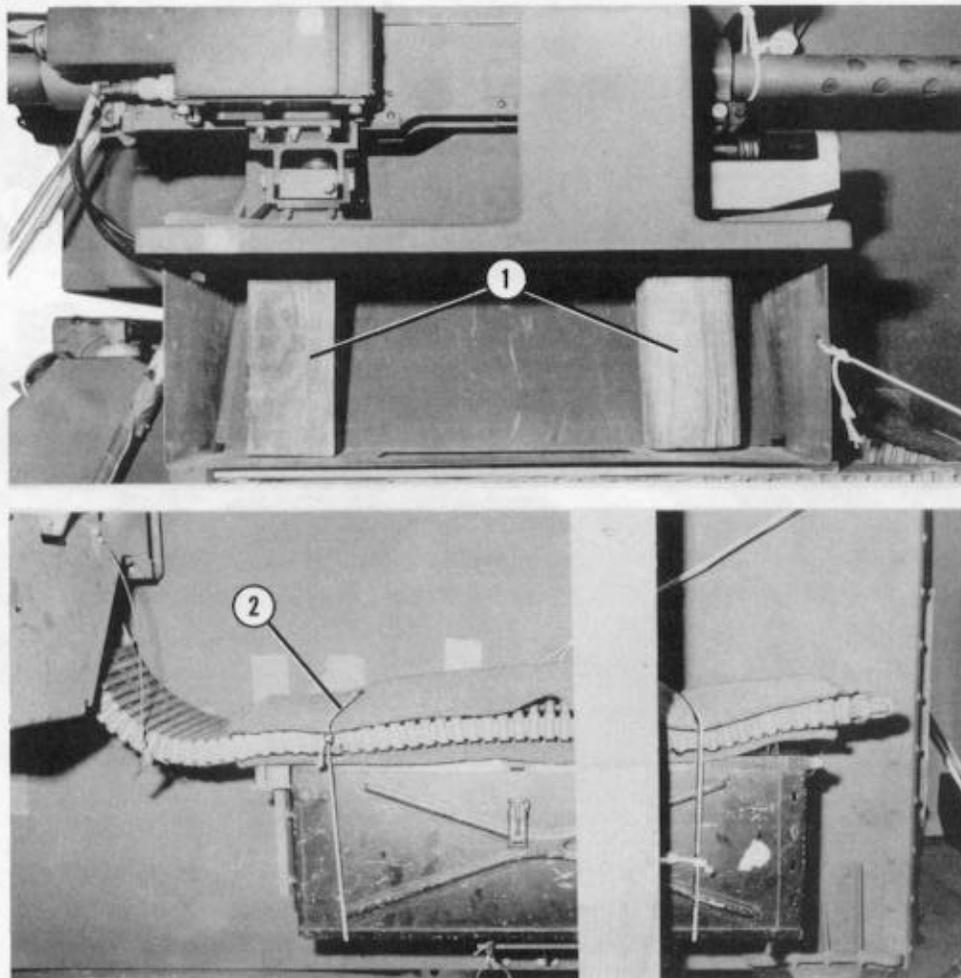
- ① Pass a 30-foot lashing through the second hole in the load spreader and back over the turret base. Secure the lashing on the right with two D-rings and a load binder.
- ② Pass a 30-foot lashing through the sixth hole in the load spreader and back over the turret base. Secure the lashing on the right with two D-rings and a load binder.

Figure 7-21. Turret base lashed to load spreader

7-10. Installing Supports for Gun, Laser Range Finder, and Environmental Control Unit

Install the honeycomb supports for the gun as shown in Figure 7-22. Install the support for the environmental control unit as shown

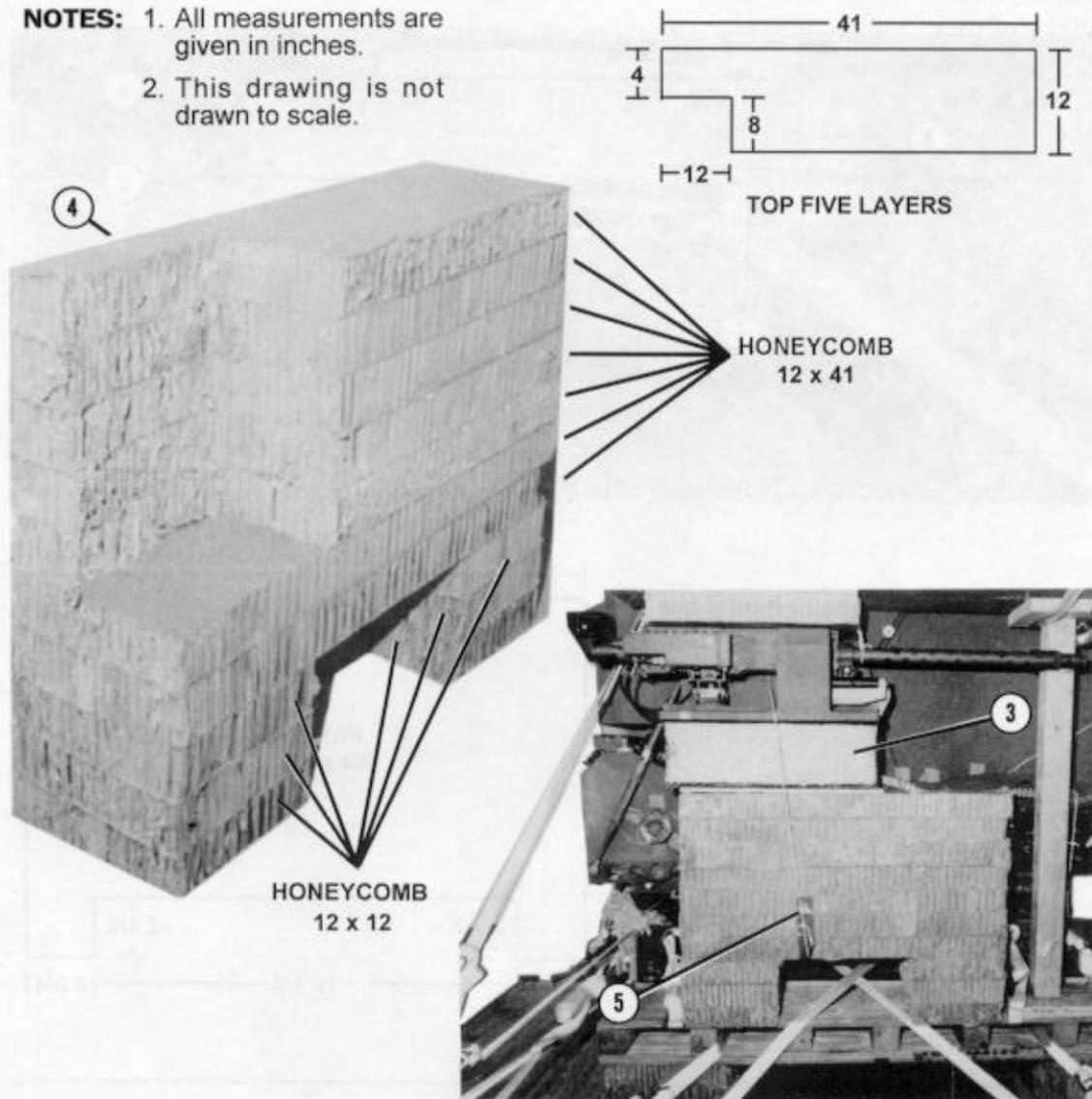
in Figure 7-23. Install the honeycomb supports for the laser range finder (LRF) as shown in Figure 7-24.



- ① Place two 8 1/2-inch pieces of 4- by 4-inch lumber vertically in the brass collection tray bracket.
- ② Disconnect the ammunition feed chute from the gun and the ammunition box. Pad the chute on both sides with felt, and tie it to the top of the box with type III nylon cord.

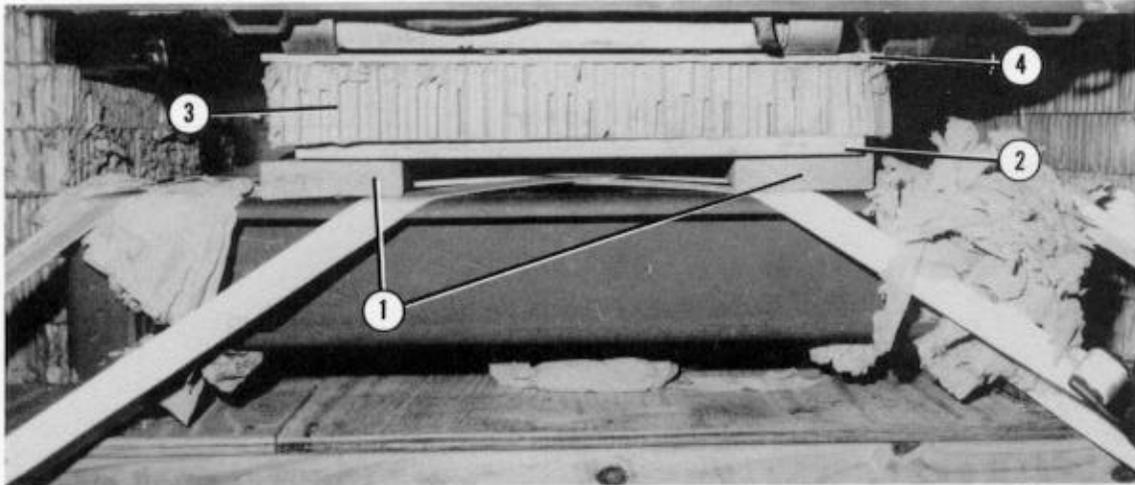
Figure 7-22. Gun supported

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

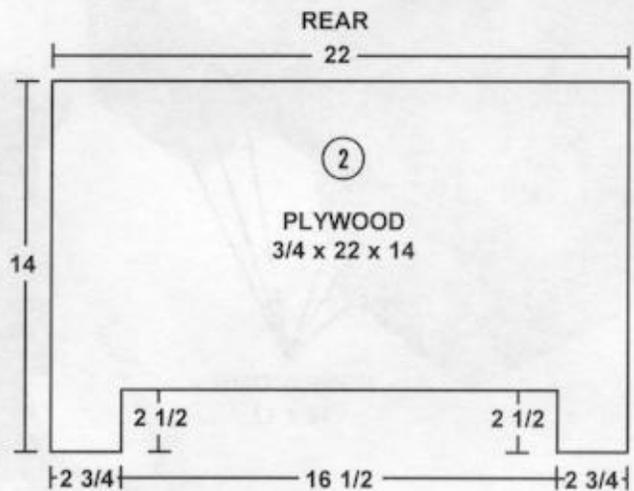


- ③ Place a 7- by 25-inch piece of honeycomb in the brass collection tray, over the lumber placed in step 2, and secure it in place with type III nylon cord.
- ④ Build the gun support stack as shown.
- ⑤ Place the honeycomb stack under the gun, with the cutout area flush against the ammunition box. Place a 20- by 10-inch piece of 1/2-inch plywood between the support stack and the gun. Tie the stack to convenient points with type III nylon cord.

Figure 7-22. Gun supported (continued)

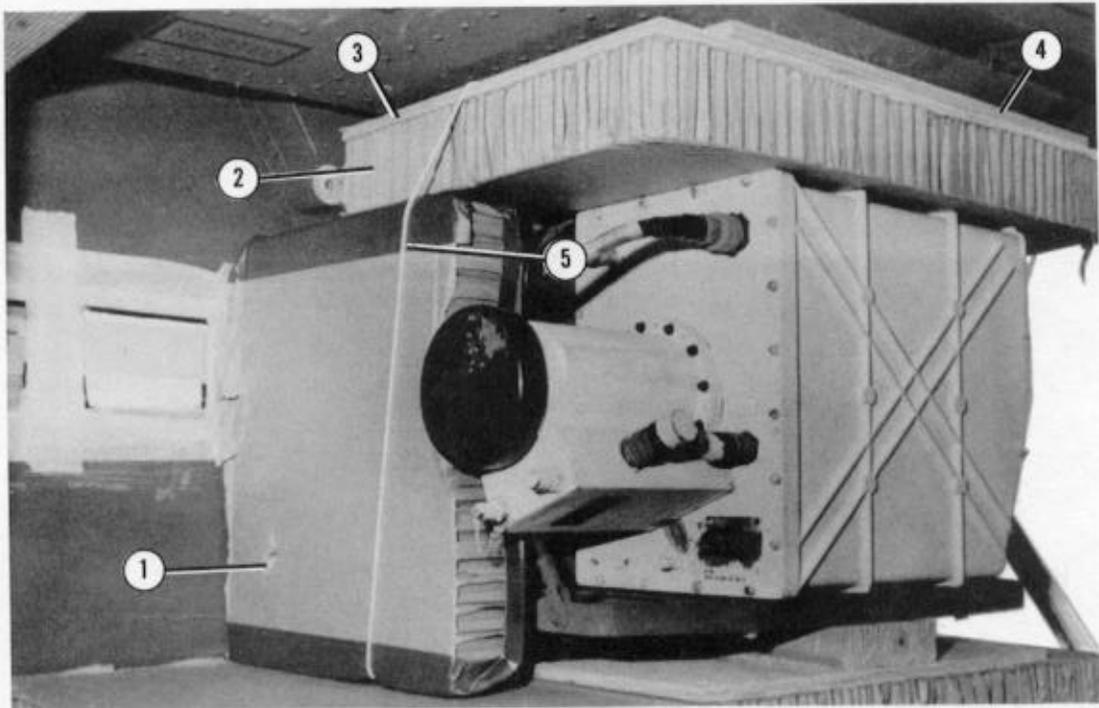


- NOTES:**
1. All measurements are given in inches.
 2. This drawing is not drawn to scale.



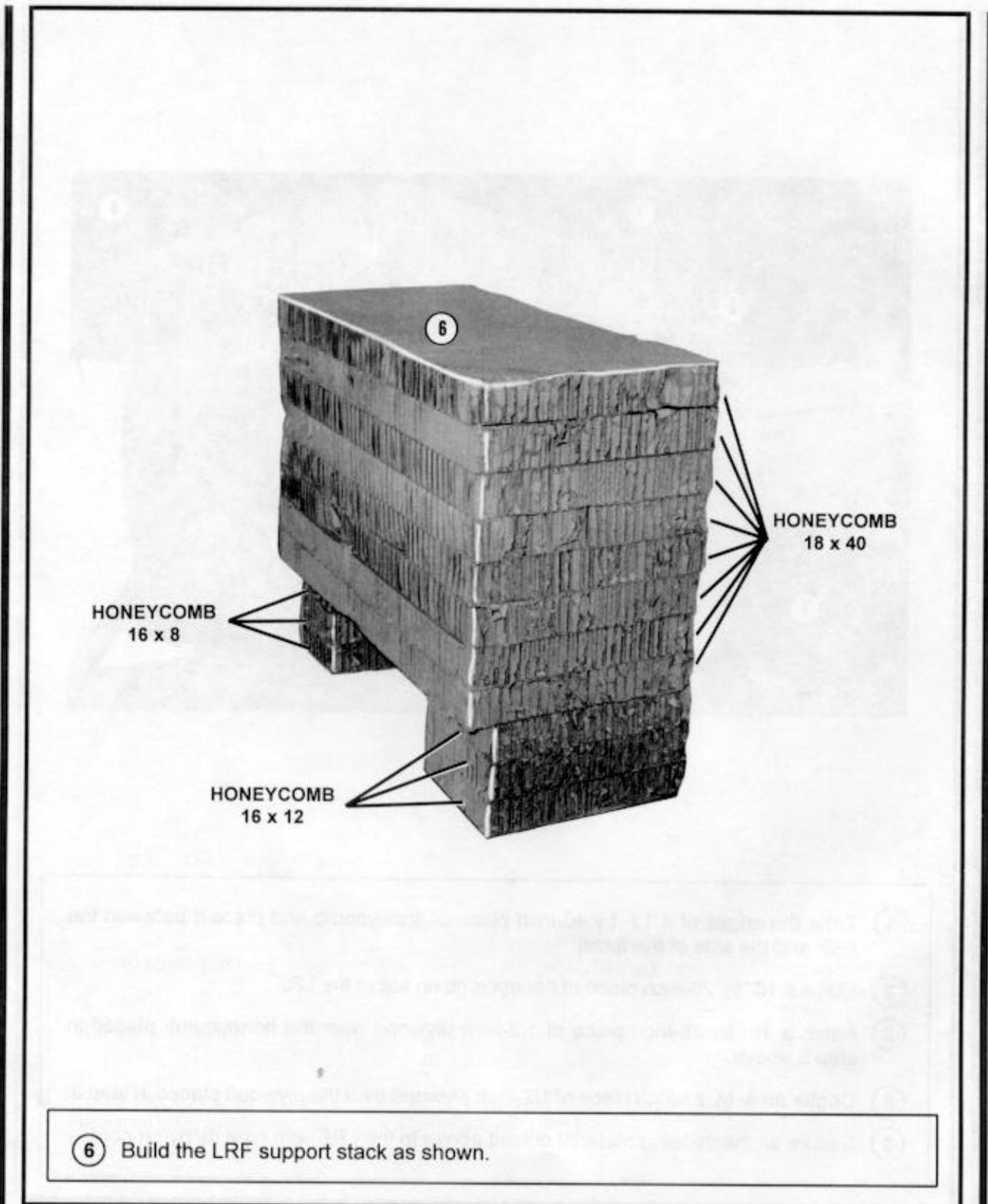
- ① Place two 12-inch pieces of 2- by 6-inch lumber 13 inches apart on the turret base under the ECU.
- ② Center a piece of 3/4-inch plywood cut as shown over the lumber, with the cutout facing the front.
- ③ Center a 10- by 24-inch piece of honeycomb over the plywood.
- ④ Fit a 10- by 24-inch piece of 1/4-inch plywood in the remaining space. Be sure that the fit of these pieces is snug. If not, wedge another piece of 1/4-inch plywood in the space.

Figure 7-23. ECU supported



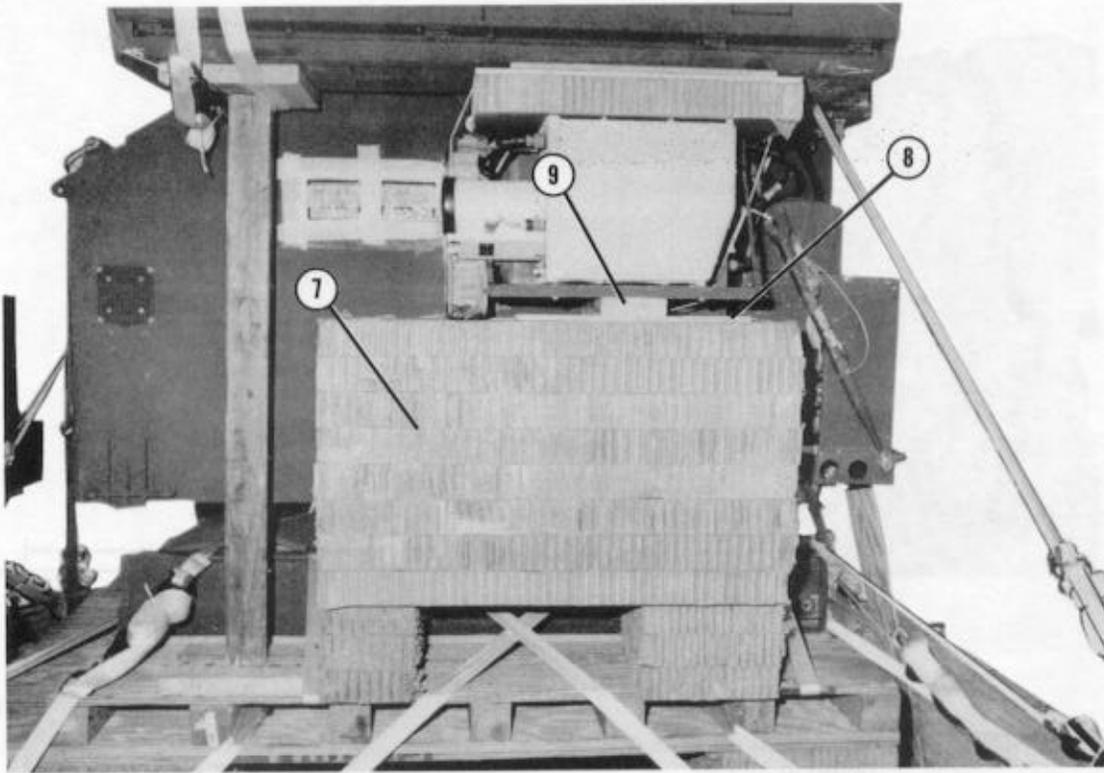
- ① Tape the edges of a 13- by 16-inch piece of honeycomb and place it between the LRF and the side of the turret.
- ② Place a 16- by 26-inch piece of honeycomb on top of the LRF.
- ③ Place a 16- by 26-inch piece of 1/2-inch plywood over the honeycomb placed in step 2 above.
- ④ Center an 8- by 21-inch piece of 1/2-inch plywood over the plywood placed in step 3.
- ⑤ Secure all the padding material placed above to the LRF with type III nylon cord.

Figure 7-24. LRF supported.



⑥ Build the LRF support stack as shown.

Figure 7-24. LRF supported (continued)

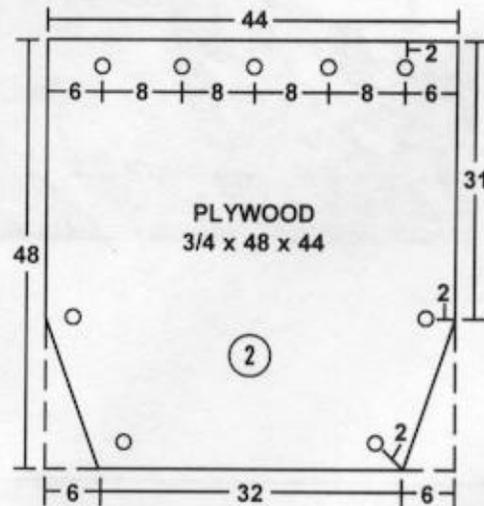
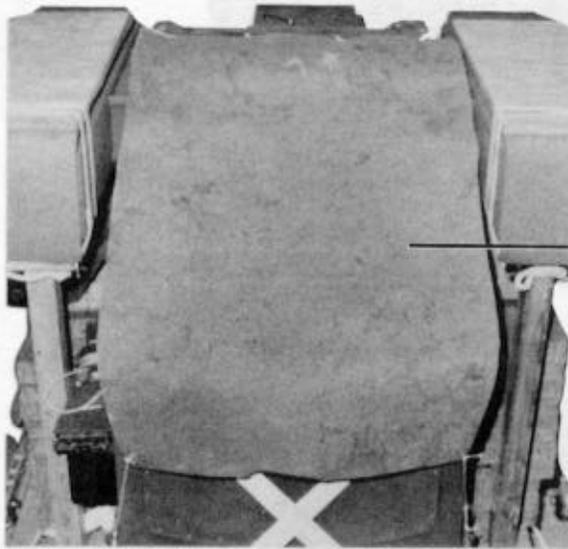


- ⑦ Place the LRF support stack under the camera, with the flat side of the stack toward the turret wall.
- ⑧ Center a 8- by 19-inch piece of 1/2-inch plywood under the LRF. Align the outside edge with the outside edge of the LRF bracket.
- ⑨ Center a 16-inch piece of 2- by 6-inch lumber between the plywood placed in step 8 and the LRF bracket. If the plywood and lumber do not fit snugly, shim with 1/4-inch plywood.

Figure 7-24. LRF supported (continued)

7-11. Covering Turret Canopy

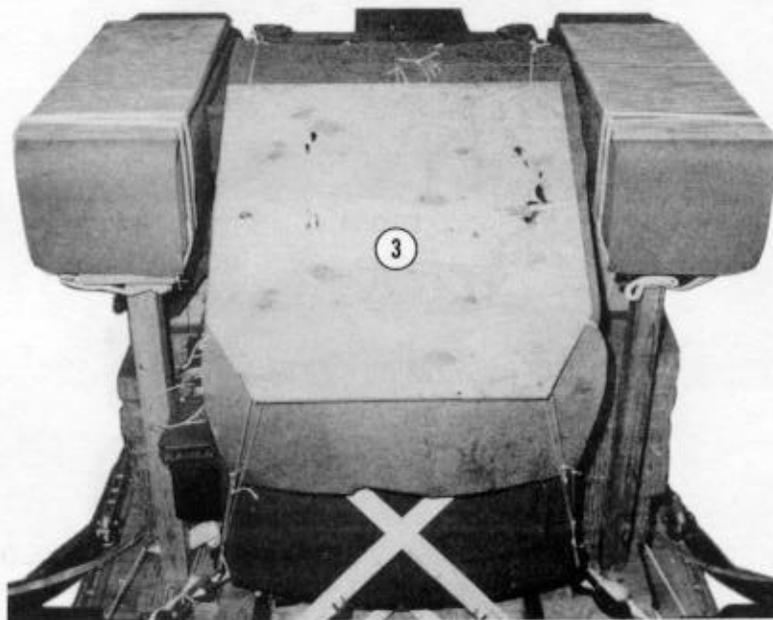
Install the canopy protection board and the load cover as shown in Figure 7-25.



- NOTES:**
1. All measurements are given in inches.
 2. This drawing is not drawn to scale.
 3. All holes are 1/2 inch.

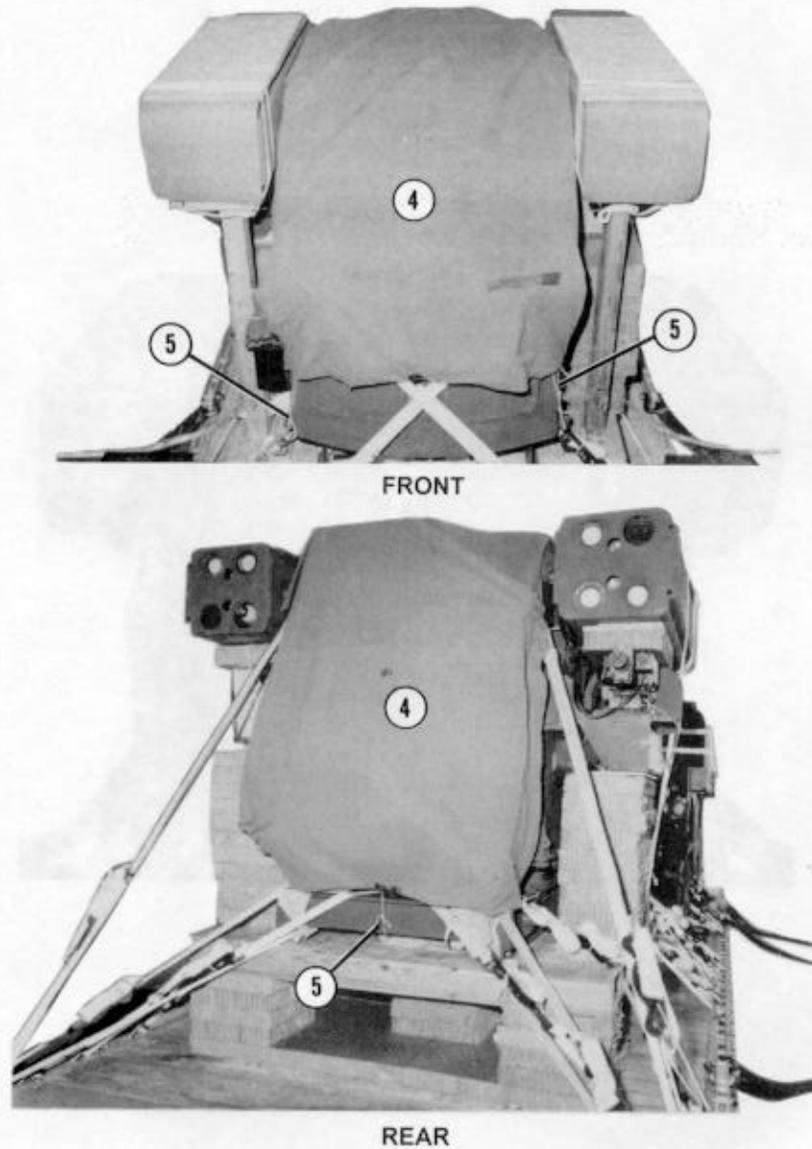
- ① Place a 3/4- by 43- by 72-inch piece of felt over the canopy with the front edge of the felt overhanging the front edge of the turret 16 inches. Punch holes in the corners of the felt and secure it to convenient points with type III nylon cord.
- ② Make the canopy protection board with 3/4-inch plywood as shown.

Figure 7-25. Canopy protected



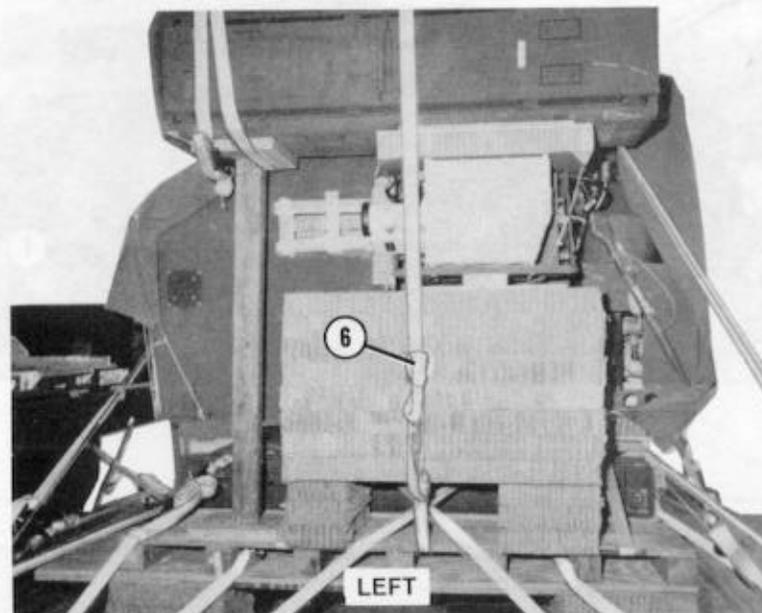
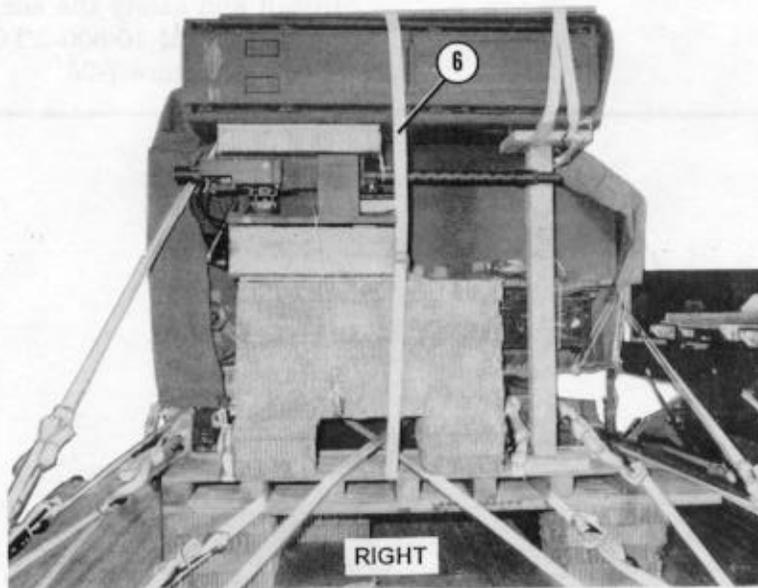
- ③ Place the protection board over the felt as shown. Be sure that the front edge covers the IFF antenna. Secure the protection board to convenient points with type III nylon cord.

Figure 7-25. Canopy protected (continued)



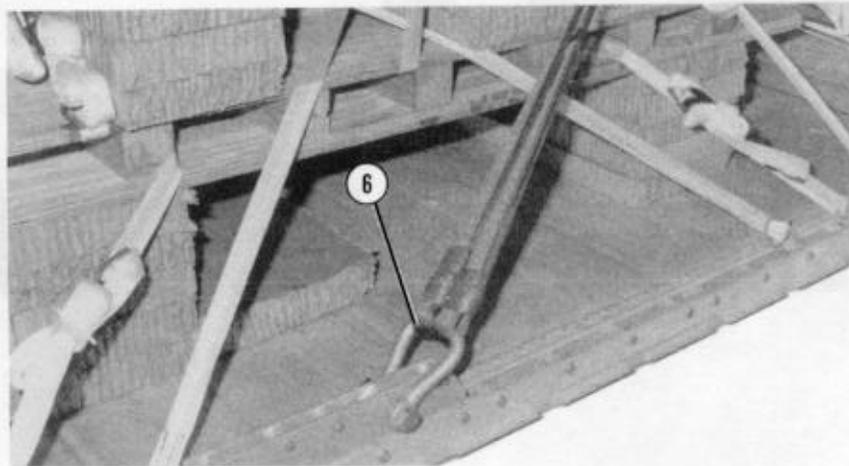
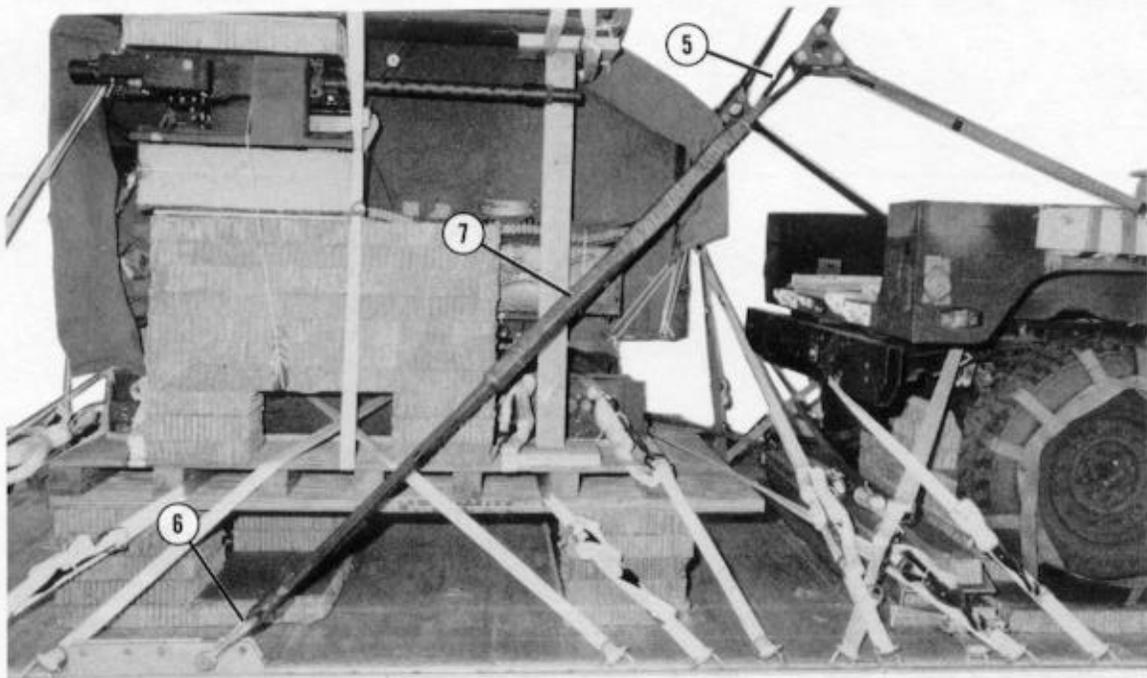
- ④ Place a canvas cover 58 inches wide and 165 inches long over the turret. Extend the rear edge of the cover to the bottom of the ECU unit.
- ⑤ Tie the cover to convenient points on the load with type III nylon cord.

Figure 7-25. Canopy protected (continued)



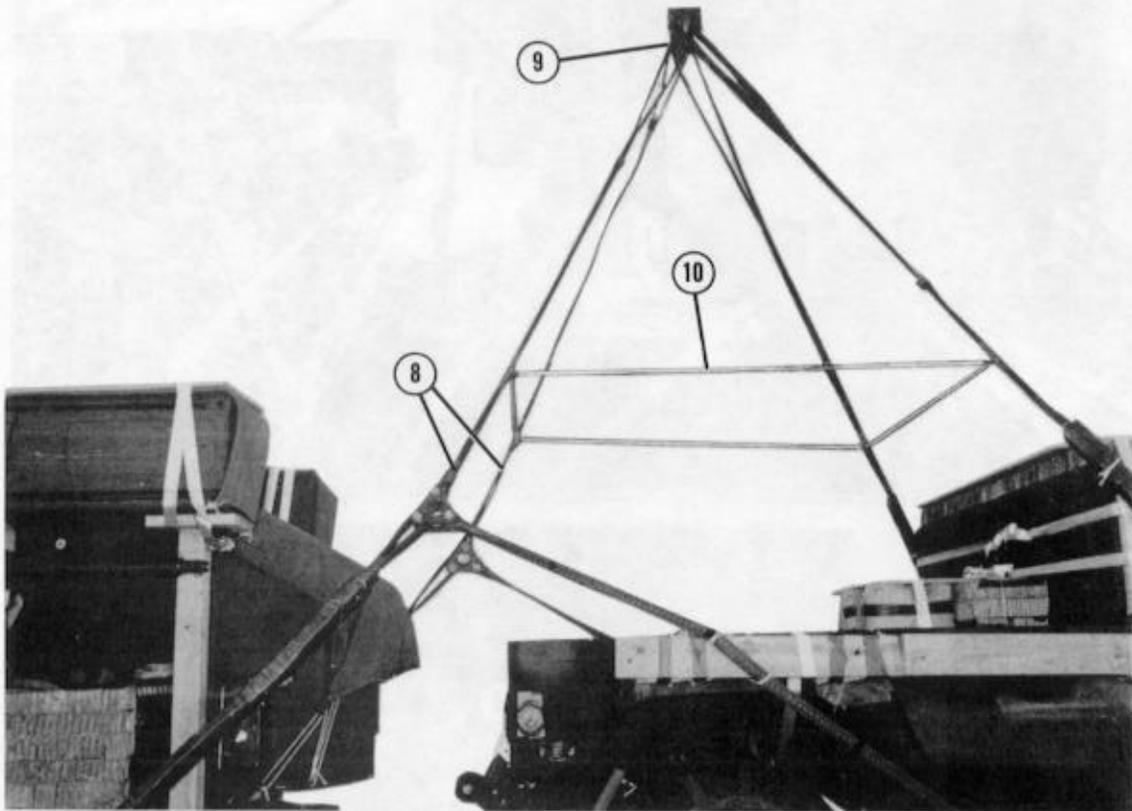
- ⑥ Pass a 30-foot lashing through the fourth hole in the load spreader, and over the top of the turret. Secure the lashing on the left side of the load.

Figure 7-25. Canopy protected (continued)



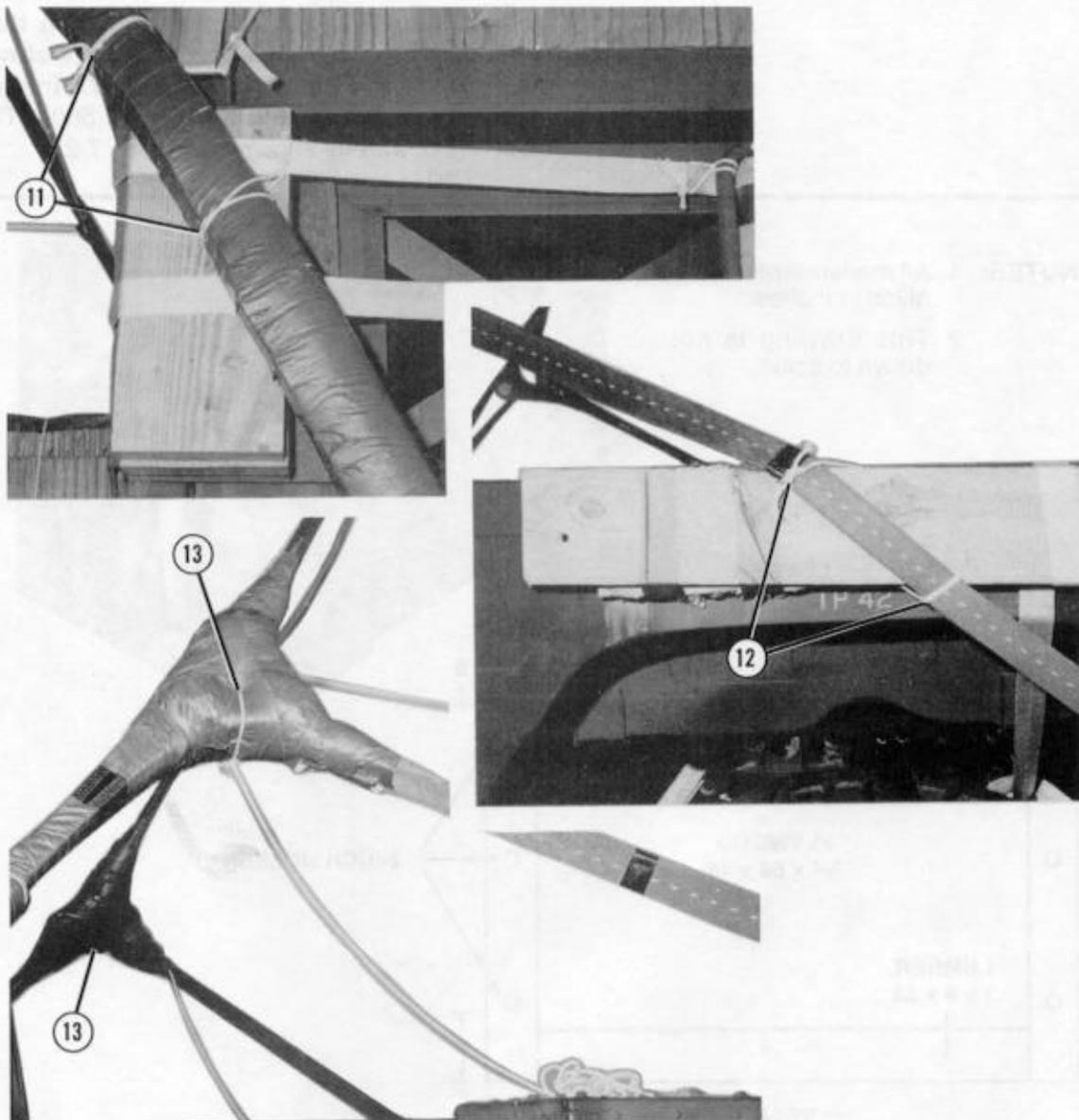
- ⑤ Pass a 16-foot (2-loop), type XXVI nylon webbing sling through each of the 3-point links installed in step 4.
- ⑥ Place both end loops of each sling in the bell portion of a large suspension clevis. Bolt each clevis to a rear suspension link.
- ⑦ Pad the rear suspension slings 36 inches from the clevises with a 48- by 8-inch piece of felt. Tape the felt in place.

Figure 7-26. Suspension slings installed and safetied (continued)



- ⑧ Attach a 9-foot (2-loop), type XXVI nylon webbing sling to the remaining spacer of each three-point link.
- ⑨ Raise the suspension slings. Attach the end loops of the slings installed in step 8 above and the front suspension slings to the crane hook.
- ⑩ Install the deadman's tie to the front and rear suspension slings according to FM 10-500-2/TO 13C7-1-5.

Figure 7-26. Suspension slings installed and safetied (continued)



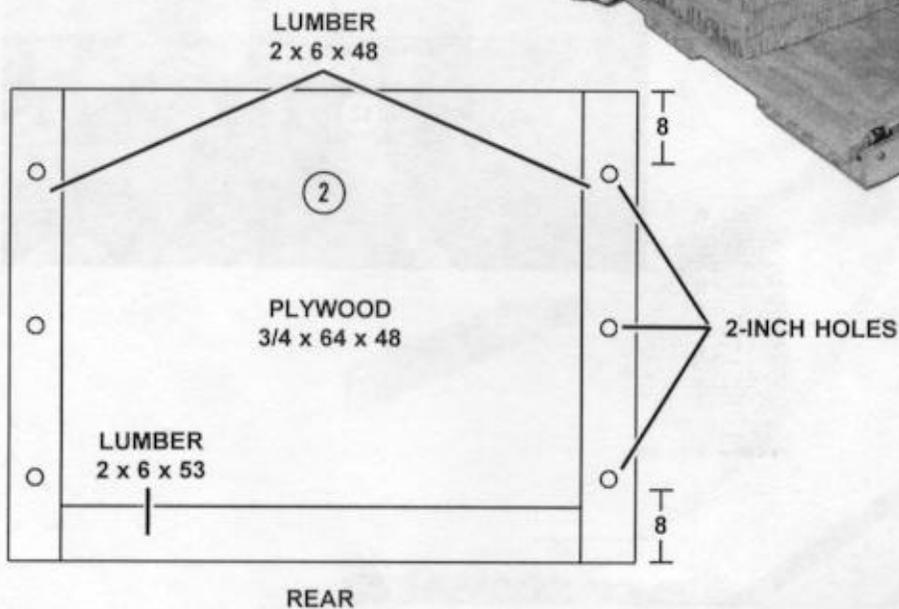
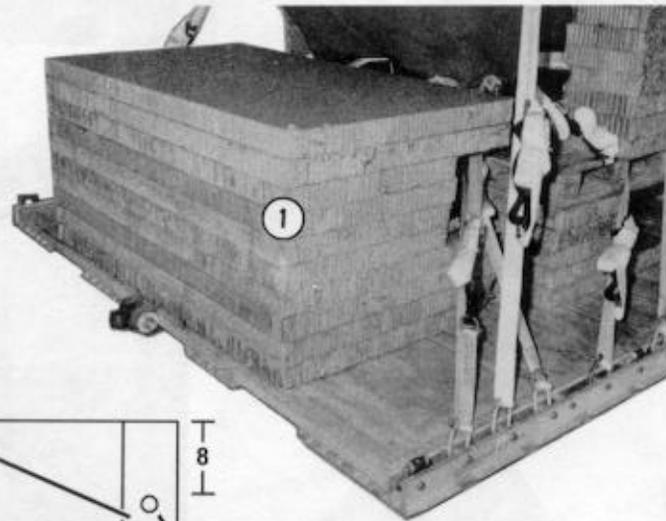
- ⑪ Tie the front suspension slings to the handholds on the rear corners of the truck cab, and to the lashings securing the wood spacers with type III nylon cord.
- ⑫ Tie the center suspension slings to the sideboards on the truck with type III nylon cord.
- ⑬ Pad the three-point links with cellulose wadding and tape. Pass a length of type III nylon cord through a hole centered in each taped link, and tie the cord around the link.

Figure 7-26. Suspension slings installed and safetied (continued)

7-13. Stowing Cargo Parachutes

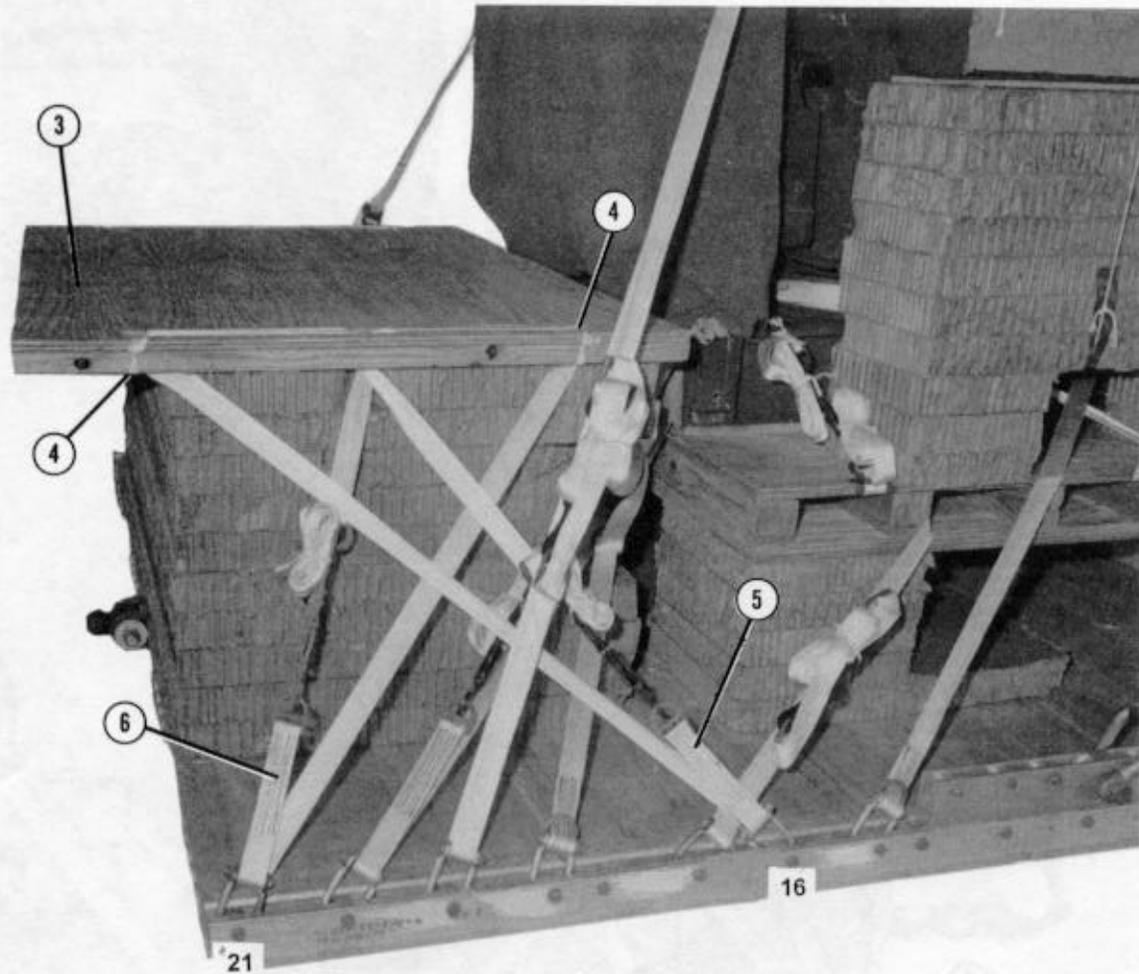
Stow three G-11B cargo parachutes on this load. Build and install the parachute stowage platform as shown in Figure 7-27. Install the parachutes according to FM 10-500-2/TO 13C7-1-5, and as shown in Figure 7-28.

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



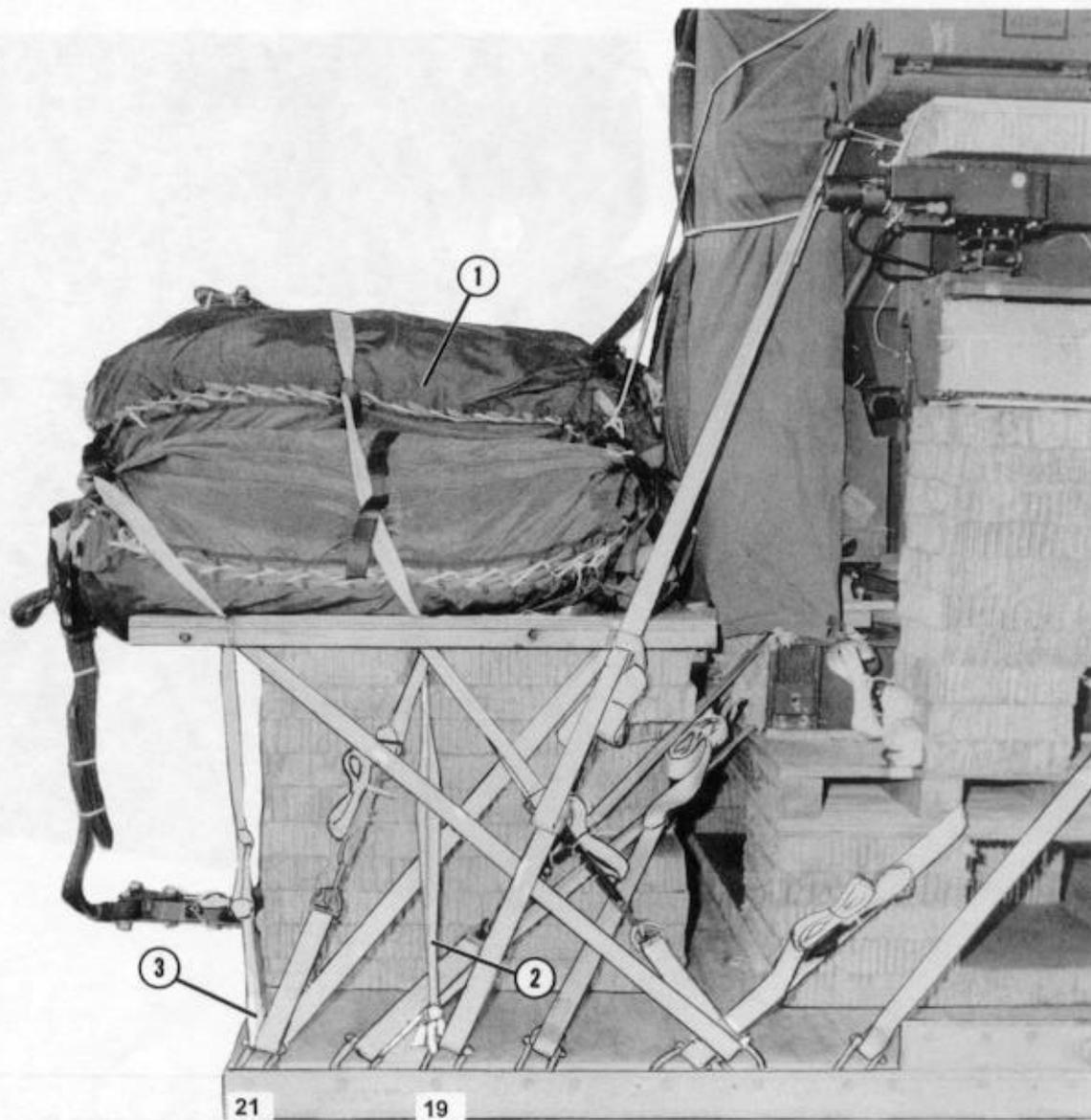
- ① Center ten pieces of 36- by 64-inch honeycomb along the rear edge of the platform. Cut the rear corners from the 5th, 6th, 7th, and 8th layers to allow for the lashings. Glue the layers together.
- ② Build the parachute stowage platform with 3/4-inch plywood and 2- by 6-inch lumber as shown.

Figure 7-27. Parachute stowage platform built and installed



- ③ Place the parachute stowage platform on the honeycomb so that it overhangs the rear edge of the honeycomb 10 inches.
- ④ Tie the lumber to the plywood through the corner holes with 1/2-inch tubular nylon webbing.
- ⑤ Lash the parachute stowage platform to clevises 16 and 16A through the center and rear holes on each side.
- ⑥ Lash the parachute stowage platform to clevises 21 and 21A through the center and front holes on each side.

Figure 7-27. Parachute stowage platform built and installed (continued)

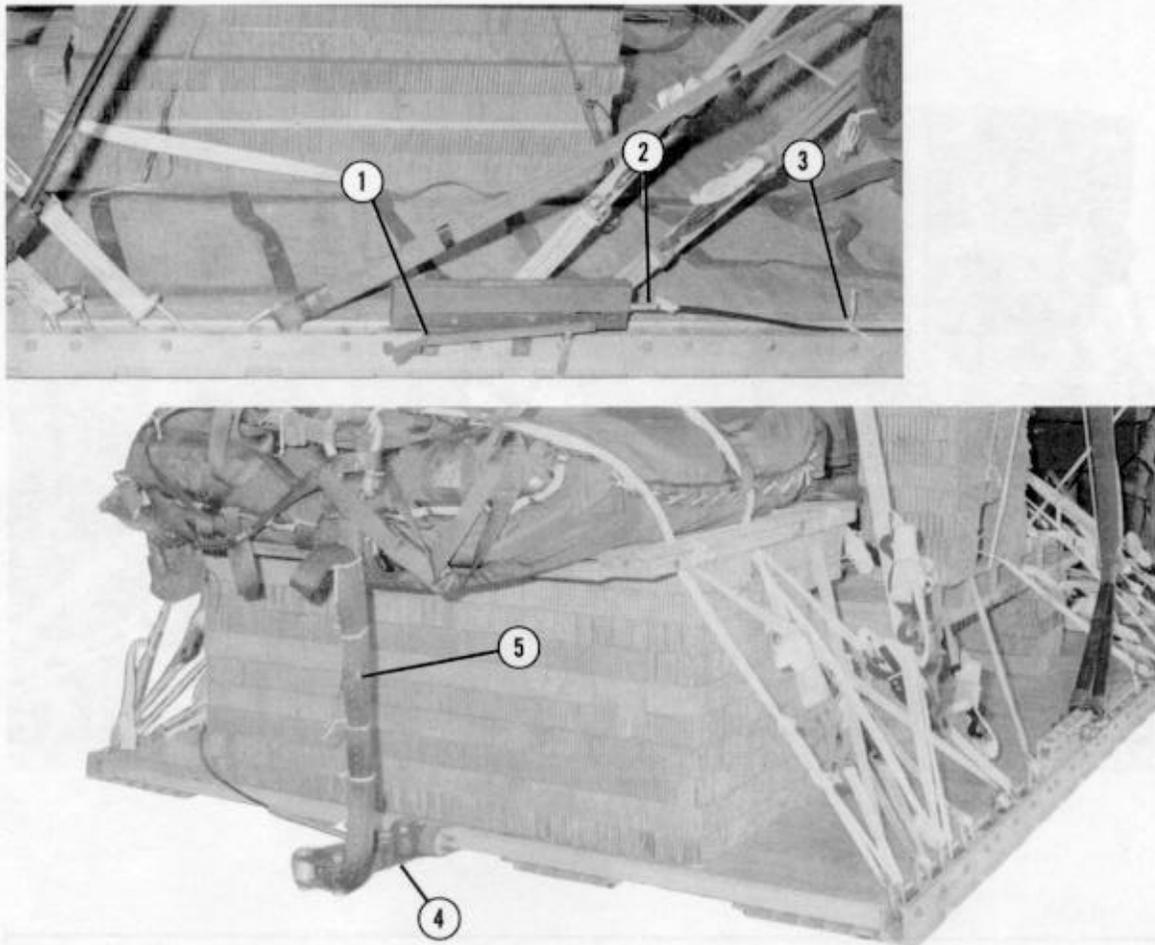


- ① Prepare and install three G-11B cargo parachutes.
- ② Tie the front parachute restraint strap to clevises 19 and 19A.
- ③ Tie the rear parachute restraint strap to clevises 21 and 21A.

Figure 7-28. Cargo parachutes installed

7-14. Installing Extraction System

Install the EFTC extraction system according to FM 10-500-2/TO 13C7-1-5 and as shown in Figure 7-29.

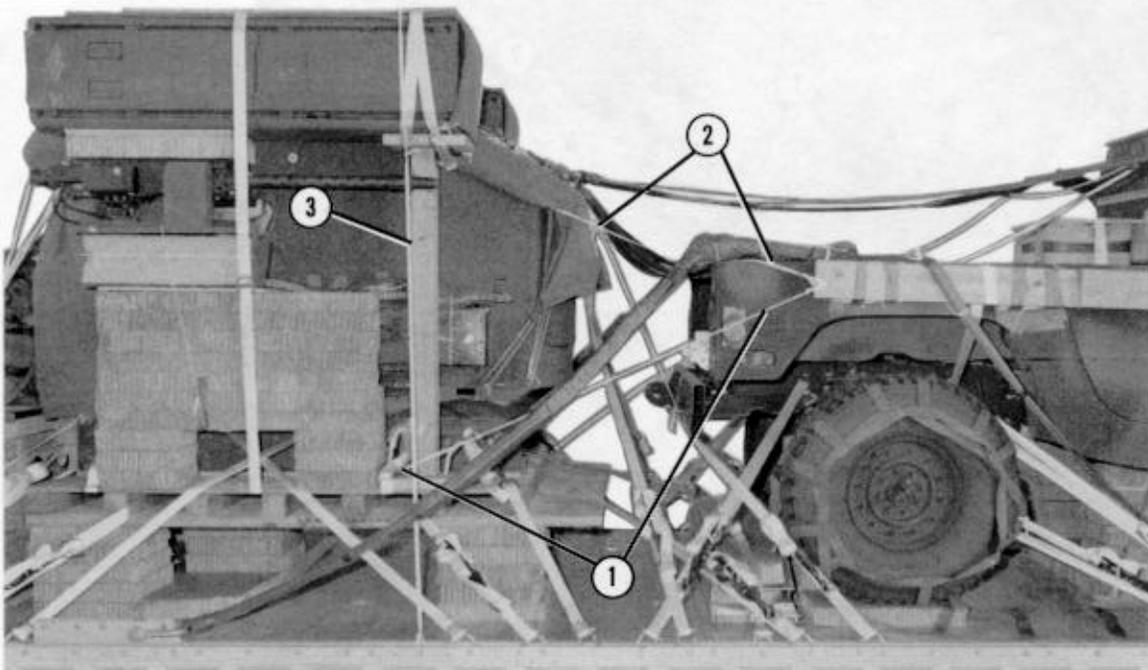


- ① Attach the mounting brackets to the rear mounting holes on the left platform side rail.
- ② Install a 28-foot cable to the actuator. Install the actuator to the brackets.
- ③ Safety the cable to platform clevises or bushings with type I, 1/4-inch cotton webbing.
- ④ Attach the latch assembly to the extraction bracket. Attach the cable to the latch assembly.
- ⑤ Install a 9-foot (2-loop), type XXVI nylon webbing sling as the extraction line.

Figure 7-29. EFTC installed

7-15. Installing Release System

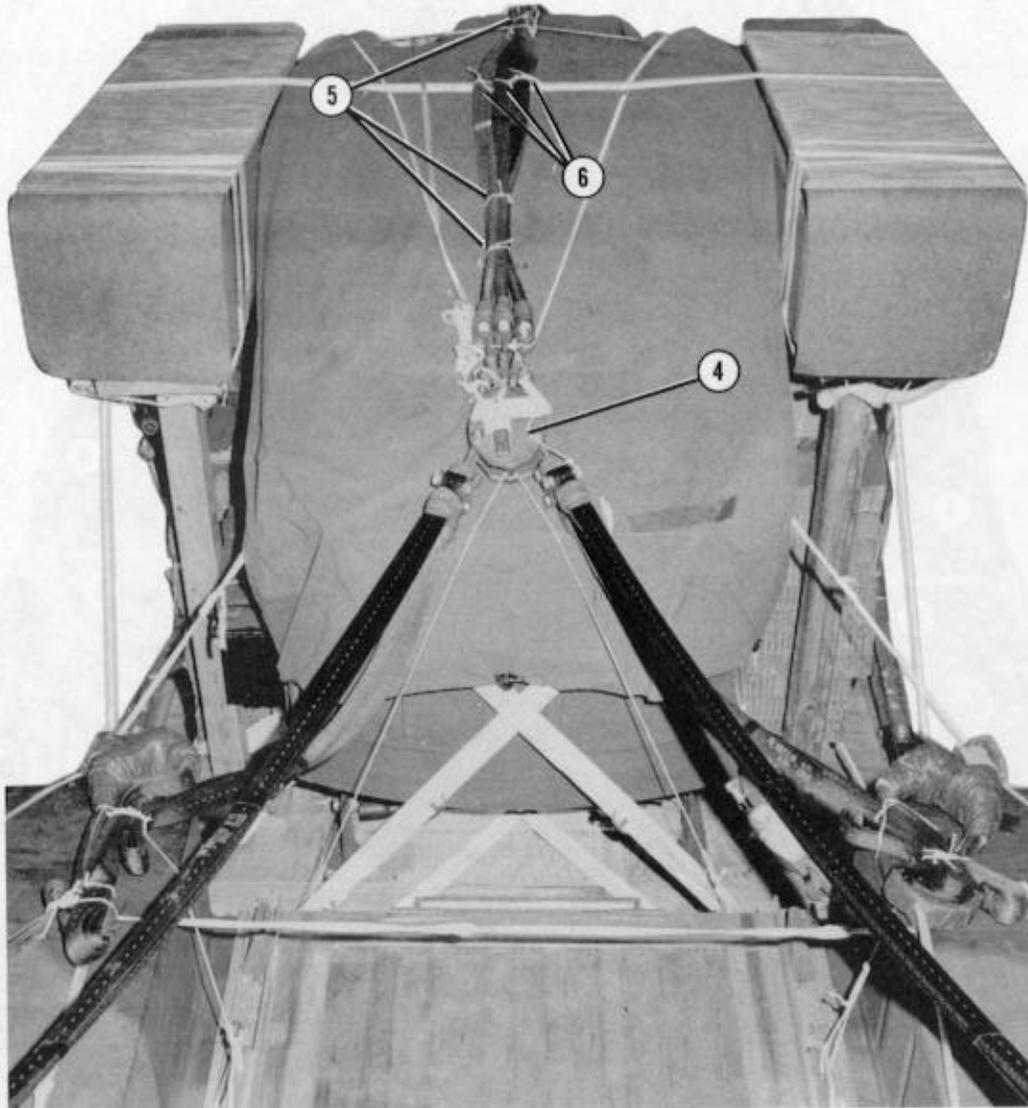
Prepare and install an M-1 cargo parachute release according to FM 10-500-2/TO 13C7-1-5, and as shown in Figure 7-30.



- ① Tie a length of 1/2-inch tubular nylon webbing from the hole in the truck sideboard to the D-ring on the lashing immediately behind the pod support on each side.
- ② Tie a second length of 1/2-inch tubular nylon webbing from the hole in the sideboard to the front lifting provision on the turret on each side.
- ③ Tie a length of 1/2-inch tubular nylon webbing around the pod on each side and straight down to a platform bushing.

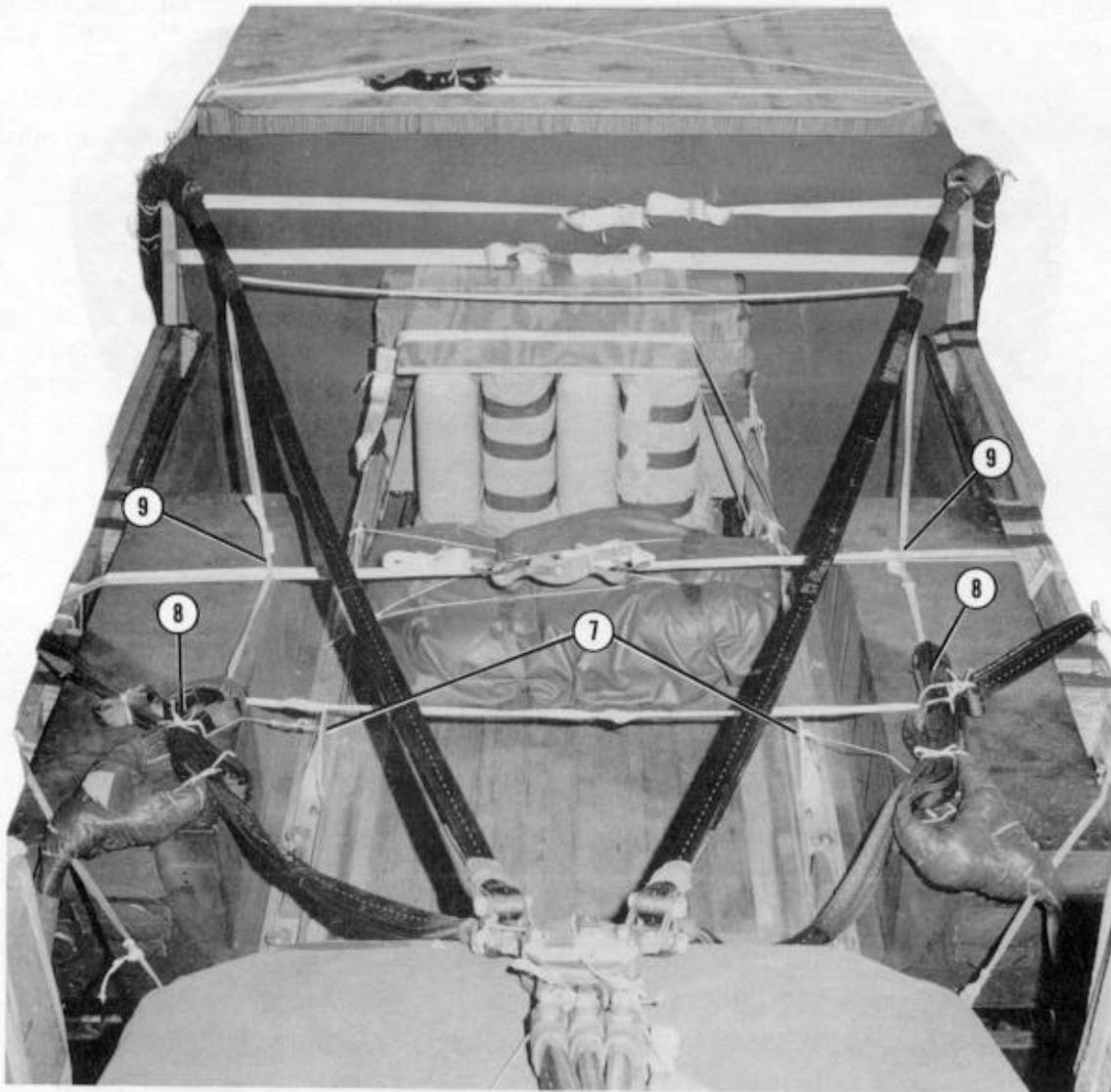
NOTE: Be sure that all the ties made in the steps listed above pass to the inside of the rear suspension slings.

Figure 7-30. Release system installed



- ④ Prepare an M-1 cargo parachute release, attach it to the suspension slings and parachute risers, and tie it to convenient points on the load with type III nylon cord.
- ⑤ Tie the parachute risers together in three places with type I, 1/4-inch cotton webbing.
- ⑥ Tie each of the riser extensions to the lashing running across the top of the turret with type I, 1/4-inch cotton webbing.

Figure 7-30. Release system installed (continued)



- ⑦ Use the type III nylon cord placed in Figure 7-26, step 13 to tie the three-point links to the turret mounting brackets on the rails in the truck.
- ⑧ S-fold the suspension slings and secure the folds with type I, 1/4-inch cotton webbing.
- ⑨ Safety the deadman's tie to the lashing securing the sideboards to the truck with type I, 1/4-inch cotton webbing.

Figure 7-30. Release system installed (continued)

**7-16. Installing Provisions for
Emergency Restraints**

Install provisions for emergency restraints according to FM 10-500-2/TO 13C7-1-5.

**7-17. Placing Cargo
Extraction Parachute**

Place the extraction parachute as described below.

a. C-130 Aircraft. Place a 22-foot cargo extraction parachute and a 60-foot (3-loop), type XXVI nylon webbing extraction line on the load for installation in the aircraft.

b. C-141 Aircraft. Place a 22-foot cargo extraction parachute and a continuous 140-foot (3-loop), type XXVI nylon webbing extraction line on the load for installation in the aircraft.

c. C-5 Aircraft. Place a 22-foot cargo extraction parachute and a 5 1/2-inch, two-point

link assembly on the load for installation in the aircraft. See FM 10-500-2/TO 13C7-1-5 for extraction line requirements.

NOTE: A sling/extraction line bag must be used.

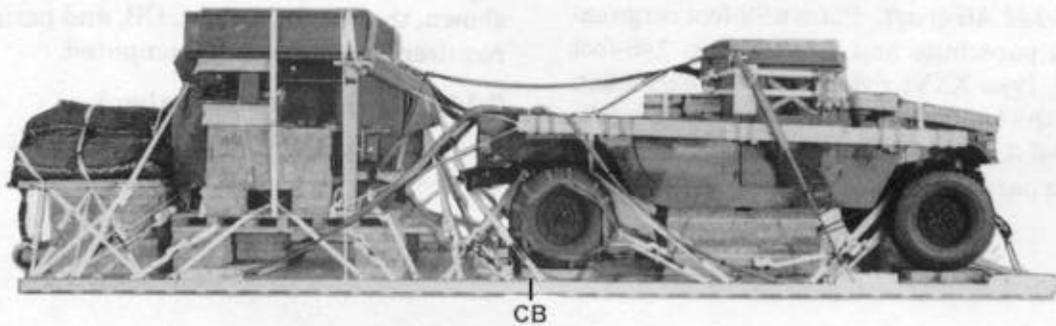
7-18. Marking Rigged Load

Mark the rigged load according to FM 10-500-2/TO 13C7-1-5 and as shown in Figure 7-31. If the load varies from the one shown, the weight, height, CB, and parachute requirements must be recomputed.

7-19. Equipment Required

Use the equipment listed in Table 7-1 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	14,140 pounds
Maximum allowed	14,900 pounds
Height	95 inches
Width	108 inches
Length	354 inches
Overhang: Front	0 inches
Rear	18 inches
CB (from front edge of platform)	170 inches
Extraction system	EFTC

Figure 7-31. Avenger air defense system rigged for low-velocity airdrop on a type V platform

Table 7-1. Equipment required for rigging Avenger air defense weapon system for low-velocity airdrop on a type V platform

NATIONAL STOCK NUMBER	ITEM	QUANTITY
1670-00-162-4981	Adapter, coupling, EFTC	2
5365-00-405-9293	Spacer	2
8040-00-273-8713	Adhesive, paste, 1-gal	As required
	Clevis, suspension:	
4030-00-678-8562	3/4-in (medium)	4
4030-00-090-5354	1-in (large)	9
8305-00-242-3593	Cloth, cotton duck, 60-in	As required
4020-00-240-2146	Cord, nylon, type III, 550-lb	As required
1670-00-157-6527	Coupling, airdrop, extraction force transfer w 28-ft cable	1
1670-00-360-0329	Cover, link assembly (type IV)	6
8135-00-664-6958	Cushioning material, packaging, cellulose wadding	As required
8305-00-958-3685	Felt, 1/2-in thick	As required
1670-01-183-2678	Leaf, extraction line	2
	Line, extraction:	
1670-01-062-6313	60-ft (3-loop), type XXVI nylon webbing	1
1670-01-107-7651	140-ft (3-loop), type XXVI nylon webbing	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
1670-00-003-1953	Plate, side, 3 3/4-in	2
1670-00-003-1954	Plate, side, 5 1/2-in	2
5365-00-007-3414	Spacer, large	2
1670-00-783-5988	Type IV	3
	Lumber:	
5510-00-220-6146	2- by 4-in	As required
5510-00-220-6148	2- by 6-in	As required
5510-00-220-6246	2- by 8-in	As required
5510-00-220-6250	2- by 12-in	As required
5510-00-220-6274	4- by 4-in	As required
	Nail, steel wired, common:	
5315-00-010-4657	6d	As required
5315-00-010-4661	10d	As required

Table 7-1. Equipment required for rigging Avenger air defense weapon system for low-velocity airdrop on a type V platform (continued)

NATIONAL STOCK NUMBER	ITEM	QUANTITY
1670-00-753-3928	Pad, energy-dissipating, honeycomb, 3- by 36- by 96-in	28 sheets
1670-01-016-7841	Parachute: Cargo, G-11B	3
1670-01-063-3716	Cargo, extraction, 22-ft Platform, AD, type V, 28-ft:	1
	Bracket:	
1670-01-162-2375	Inside EFTA	(1)
1670-01-162-2374	Outside EFTA	(1)
1670-01-162-2372	Clevis assembly	(46)
1670-01-162-2376	Extraction bracket assembly	(1)
1670-01-247-2389	Suspension link	(4)
1670-01-162-2381	Tandem link	(2)
	Plywood:	
5530-00-129-7721	1/4-in	1 sheet
5530-00-129-7777	1/2-in	1 sheet
5530-00-128-4981	3/4-in	7 sheets
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 riser extensions:	
1670-01-062-6302	20-ft (2-loop), type XXVI nylon webbing	6
	For Lifting:	
1670-01-062-6304	9-ft (2-loop), type XXVI nylon webbing	4
1670-01-063-7760	11-ft (2-loop), type XXVI nylon webbing	2
1670-01-062-6303	12-ft (2-loop), type XXVI nylon webbing	2
	For suspension slings:	
1670-01-062-6304	9-ft (2-loop), type XXVI nylon webbing	2
1670-01-063-7760	11-ft (2-loop), type XXVI nylon webbing	2
1670-01-063-7761	16-ft (2-loop), type XXVI nylon webbing	4
1670-00-998-0116	Strap, parachute release, w fastener and guillotine knife	2
8305-00-074-5124	Tape, adhesive, 2-in	As required
1670-00-937-0271	Tie-down assembly, 15-ft	61
1670-00-431-8486	Vehicle drive-off aid	1

Table 7-1. Equipment required for rigging Avenger air defense weapon system for low-velocity airdrop on a type V platform (continued)

NATIONAL STOCK NUMBER	ITEM	QUANTITY
8305-00-268-2411	Webbing: Cotton, 1/4-in, type I	As required
8305-00-082-5752	Nylon, Tubular: 1/2-in or	As required
8305-00-268-2453	1/2-in	As required
8305-00-264-6151	1-in	As required
8305-00-263-3591	Type V Type VIII	As required As required

GLOSSARY

ACB attitude control bar	in inch
AFB Air Force base	LAPE low-altitude parachute extraction
AFJMAN Air Force joint manual	LAPES low-altitude parachute extraction system
AFR Air Force regulation	lb pound
AFTO Air Force technical order	LRF laser range finder
attn attention	lv low-velocity
CB center of balance	no number
d penny	NSN national stock number
DA Department of the Army	PEFTC extractor force transfer coupling (platform)
DD Department of Defense	SL/CS static line/connector strap
diam diameter	TM technical manual
ECU environmental control unit	TO technical order
EFTA extraction force transfer actuator	TRADOC United States Army Training and Doctrine Command
EFTC extraction force transfer coupling	US United States
FM field manual	w with
ft foot/feet	yd yard
gal gallon	
HMMWV high-mobility, multipurpose wheeled vehicle	
HQ headquarters	

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