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TECHNICAL MANUAL

TRANSPORTABILITY GUIDANCE DISPENSER, MINE: GROUND VEHICLE, M128 (NSN 1095-00-397-3456)

HEADQUARTERS, DEPARTMENT OF THE ARMY

AUGUST 1980

TECHNICAL MANUAL
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LIST OF ILLUSTRATIONS

CHAPTER 1

INTRODUCTION

1–1. Purpose and Scope

a. This manual provides transportability guidance for logistical handling and movement of the M128 mine dispenser.

b. This manual provides transportation officers and other personnel who are responsible for movement or for providing transportation services with information considered appropriate for safe transport. Included are significant technical and physical characteristics as well as safety considerations required for worldwide movement by the various modes of transport. Where appropriate, metric equivalents are given in parentheses following dimensions or other measurements. References are contained in the appendix.

1–2. Reporting of Recommendations and Comments

Users of this publication are encouraged to recommend changes and submit comments for its improvement. Comments should be prepared on DA Form 2028 (Recommended Changes to Publications and Blank Forms) and forwarded to DIRECTOR, MILITARY TRAFFIC MANAGEMENT COMMAND TRANSPORTATION ENGINEERING AGENCY, ATTN: MTT-TRC, PO Box 6276, NEWPORT NEWS, VA 23606 (electrically transmitted messages should be addressed to: DIRMTMCTEA FT EUSTIS VA//MTT-TRC//).

1–3. Safety

Appropriate precautionary measures required during movement of the mine dispenser are contained in chapter 3.

1-4. Definitions of Warnings, Cautions, and Notes

Throughout this manual, warnings, cautions, and notes emphasize important or critical guidance. They are used for the following conditions:

a. Warning. Instructions which, if not followed, could result in injury to or death of personnel.

b. Caution. Instructions which, if not strictly observed, could result in damage to, or destruction of, equipment.

c. Note. An operating procedure that must be emphasized.

CHAPTER 2

TRANSPORTABILITY DATA

Section I. GENERAL

2-1. Scope

This chapter provides a general description, identification photographs, tabulated transportability characteristics, and data that are necessary for movement of the mine dispenser.

2-2. Description.

a. General. The mine dispenser is designed to provide a capability for rapid emplacement of minefield.

b. M128 (figs 2-1 and 2–2). The mine dispenser, M128, is mounted on a modified trailer, flatbed, four wheel, M794. The trailer has tandem axles suspended from a center trunnion. The trailer has two towing lunettes. The upper, fixed lunette is for towing by the 5-ton truck prime mover. The lower, reach tube lunette is for towing by M113 or similar tracked vehicles.

Figure 2–1. Mine dispenser, M128, right front view.

Figure 2-2. Mine dispenser, M128, left side view.

Section II. CHARACTERISTICS AND RELATED DATA

2–3. General

Data contained in figures 2-3 and 2-4 and in table 2-1 are applicable to model number or National Stock Number (NSN) shown. Changes in model or NSN may affect transportability as related to guidance contained in this manual.

2-4. Side and Rear Elevation Drawings

Detailed side and rear elevation drawings (figs 2-3 and 2-4) provide necessary data for determining transportability of the mine dispenser by the various modes of transportation.

2–5. Reduced Configuration

Transportation economies can be obtained by reducing the system to its minimum dimensions, without major disassembly, for terminal handling and ocean transport. The reach tube on the tow bar should be fully retracted to achieve minimum length. Detailed procedures for preparation are provided in MIL-V-62038, Military Specification, Preparation for Shipment and Storage of Wheeled Vehicles.

2-6. Unusual Characteristics

The mine dispenser has no unusual characteristics that require special attention be given to temperature, atmospheric pressure, or humidity variations during exposure to normal transportation environments.

2-7. Hazardous and Dangerous Characteristics

Unless the dispenser is shipped with ammunition or explosives, under the provisions of Department of Transportation Special Permit No. 3498 (applicable only to shipments by motor vehicle or rail in periods of actual emergency), or with the hydraulic system pressurized, it will not present any hazardous or dangerous characteristics during exposure to normal transportation environments. Guidance for handling the hydraulic system is provided in chapter 3.

NOTE

Those regulations and/or transportation procedures normally associated with vehicles carrying combustible liquid fuels apply (TM 38-250; *Code of Federal Regulations,* Titles 46 and 49; and the Association of American Railroads *Ru1es Governing the Loading of Commodities on Open-Top Cars and Trailers (app).*

2-8. Fragility

The mine dispenser is so designed that, when restrained in accordance with the guidance provided in this manual, it can withstand the shocks and vibrations associated with current transportation methods.

CAUTION

The leveling jack lock pins may be damaged or broken if the prime mover backs hard into the lunette while coupling or uncoupling. The dispenser must not be moved until the leveling jacks are in the stowed position.

2-9. CONUS Freight Classification

Rail and motor freight classification descriptions and item numbers will be determined in accordance with chapter 211, AR 55-355.

Table 2–1. Characteristics and Related Data

			Weight		Volume, cu ft (cu m)			
Model	TOE LIN	NSN	(lb)	(kg)	operational		reduced	
M128	TBA	1095-00-397-3456	12,500 15,440*	(5,670) (7,004)	1,223	(34.63)	1,111	(31.46)

*With full load of mines.

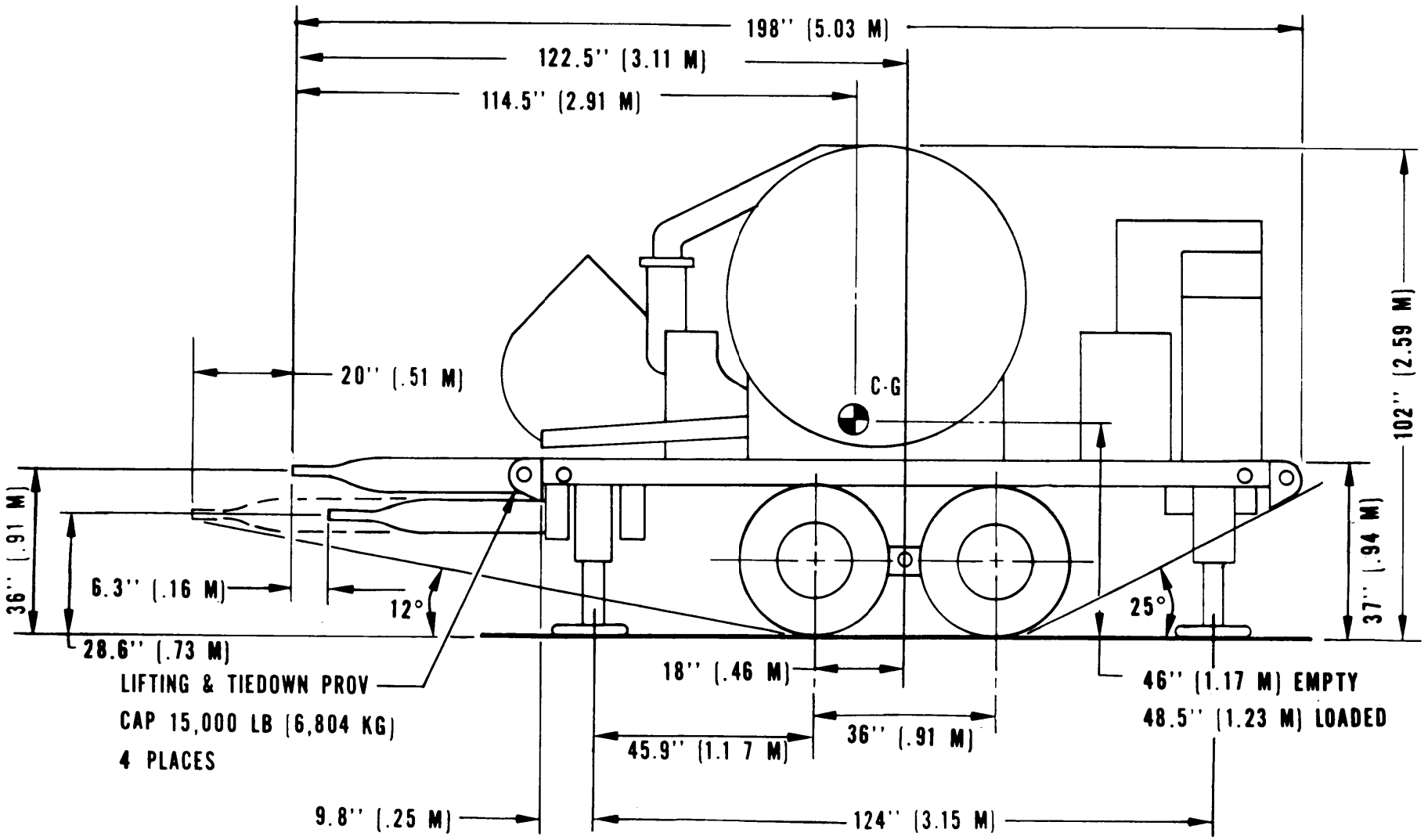


Figure 2–3. Side elevation, mine dispenser, M128.

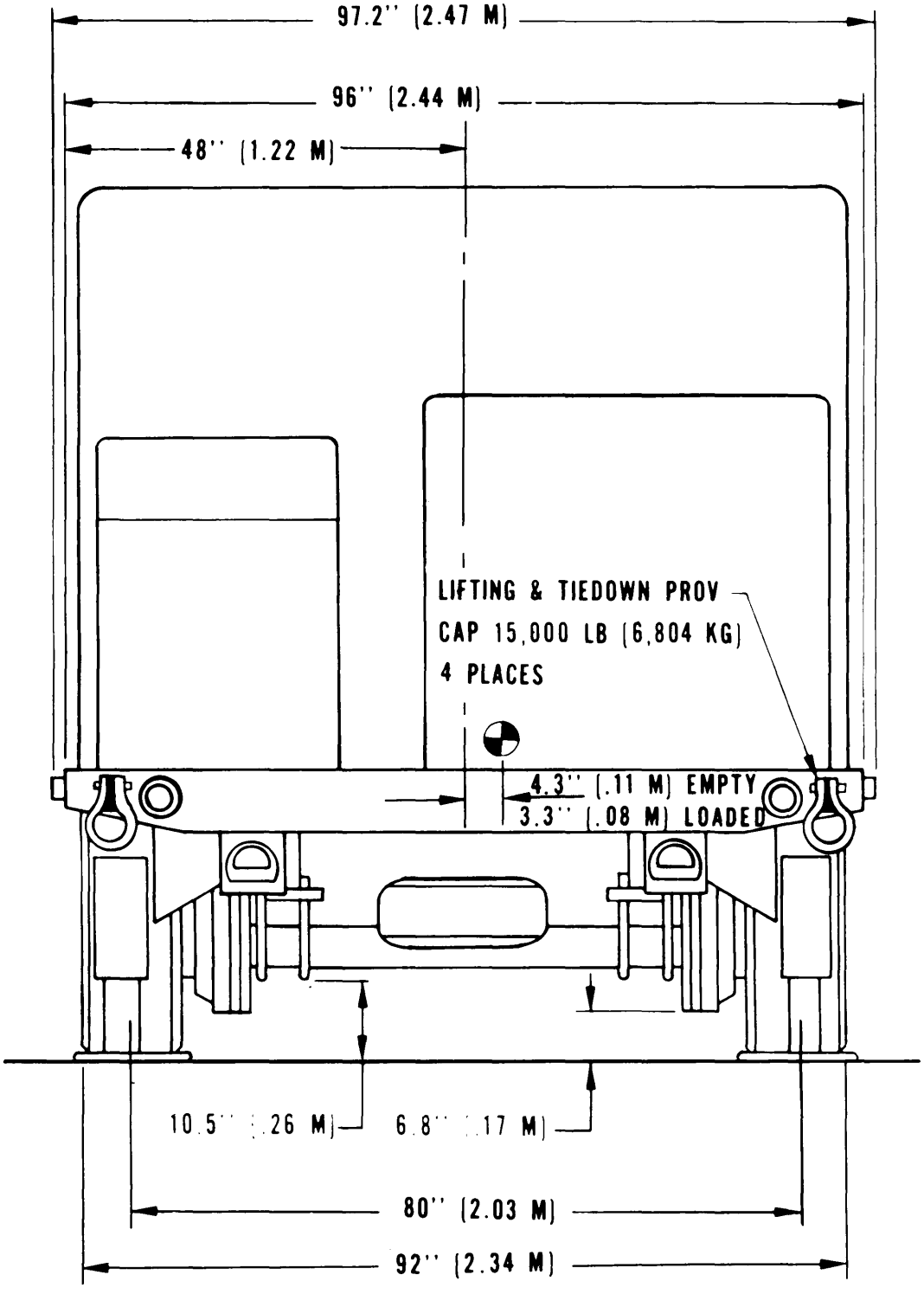


Figure 2–4. Rear elevation, mine dispenser, M128.

CHAPTER 3

SAFETY

3–1. General

General safety considerations and precautions for handling and movement of the mine dispenser are as follows:

a. Check to insure that all loose items are appropriately secured to prevent damage during transport.

b. When backing the dispenser or maneuvering in close areas, insure that a ground guide is provided.

c. Observe operating and handling procedures specified in TM 9-1095-205-10.

d. Have fire extinguishers readily available during all loading and unloading operations.

e. Provide proper ventilation during loading and unloading operations if internal combustion engines are operated. Prolonged inhalation of exhaust fumes will produce adverse effects that could prove fatal.

f. Do not allow the mine dispenser and prime mover to exceed 3 miles per hour (walking speed) on loading ramps, rail cars, or inside aircraft.

3–2. Specific Requirements

Specific safety requirements for each mode of transport are as follows:

a. Air.

(1) Power plant fuel tank must not be less than 1/4 or more than 3/4 full. The provisions of paragraphs 6-27, 6-28, and 8-47 of TM 38-250/ AFR 71-4 must be followed.

(2) The activity offering the mine dispenser for air transport will insure that all ammunition or explosives are removed from the system prior to delivery for loading on the aircraft. It is anticipated that the only exception to the unloaded condition might be if the mine dispenser is to be transported in support of an active combat zone where it would be used immediately to dispense mines upon being unloaded from the aircraft. The provisions of TM 38-250 and local regulations apply for transport of the dispenser with mines.

(3) The pressurized hydraulic system of the mine dispenser must be relieved and vented prior to loading for air transport.

(4) The provisions of chapter 1, TM 38-250/ AFM 71-4 must be complied with when the dispenser is equipped with a winterization kit containing an ether starting-fluid cylinder.

b. Highway.

(1) Do not allow personnel on truck/trailer bed during loading or unloading operations.

(2) CONUS movement is subject to all safety laws, rules, and regulations applicable to commercial carriers. In oversea areas, movements are governed by theater and local regulations.

(3) Do not conduct loading or unloading operations on side or lateral slopes exceeding 10 percent or with a tractor-to-trailer offset angle greater than 5 degrees. Avoid loading on a severe downgrade to prevent the payload from rolling forward on the carrier.

c. Water.

(1) The provisions of *Code of Federal Regulations,* Title 46, Transportation, subpart 146, apply when shipping items equipped with internal combustion engines, flammable liquid fuel, or ether starting-fluid cylinders.

(2) If ammunition or explosives are to be transported with the system, compliance with AR 55-228 and *Water Carrier Tariff No. 32,* or reissues thereof, is mandatory.

(3) Personnel must be cautioned not to walk under items being lifted.

(4) Each lift should have at least two tag lines attached for use in controlling swing of the lift while suspended.

CHAPTER 4

AIR TRANSPORTABILITY GUIDANCE

4-1. Scope

This chapter provides transportability guidance for air movement of the mine dispenser. It covers significant technical and physical characteristics and safety considerations and prescribes the materials required to prepare, load, and unload the mine dispenser as an internal load in the C-5, C-130, and C-141 cargo aircraft.

4-2. Maximum Use of Aircraft Capacity

The load described in this chapter is not a maximum aircraft load. Total cargo loads and operating ranges are subject to variables such as weather, airfield conditions, individual aircraft characteristics, and distance. General guidance on total cargo loads and operating ranges is provided in TM 38-236/AFP 71-8. For specific guidance, contact the nearest Military Airlift Command (MAC) activity.

4-3. Safety

Safety precautions are listed in chapter 3.

4-4. Preparation of System

a. No special handling is required for transport of the mine dispenser in the C-5, C-130, and C-141 aircraft. It may be transported in its operational configuration.

b. Insure that the parking brake is serviceable and that no rocks or stones are embedded in the tire treads.

c. The mine dispenser must be clean and free of dirt, grease, or other debris that could be dislodged during loading, transport, or unloading.

4-5. Transport by US Air Force Aircraft

a. The aircraft commander, or designated representative, is responsible for insuring that the mine dispenser is loaded, properly secured, and unloaded in accordance with section IV of TO 1C-130A–9, or TO 1C-141A–9, as applicable.

b. Restraint factors (g loads) for minimum acceptable conditions specified for crew safety in the event of a controlled emergency landing are specified in TO 1C-5A–9, TO lC-130A-9, and TO 1C-141A–9, as applicable. The tiedown diagram (fig 4-1) and data (table 4-1) are based on acceptable methods. Figure 4-1 shows a representative pattern. The exact placement of the dispenser in the aircraft is dependent primarily upon the aircraft-ready-for-loading weight and upon other cargo to be loaded. Since both factors are subject to wide variances, the exact placement cannot be shown in this manual and must be determined on an individual load basis. Table 4-1 lists the tiedown devices required (provided aboard aircraft) and the tiedown points on the mine dispenser. Insure that tiedown devices are not attached to the reach tube lunette but rather to the fixed lunette above the reach tube.

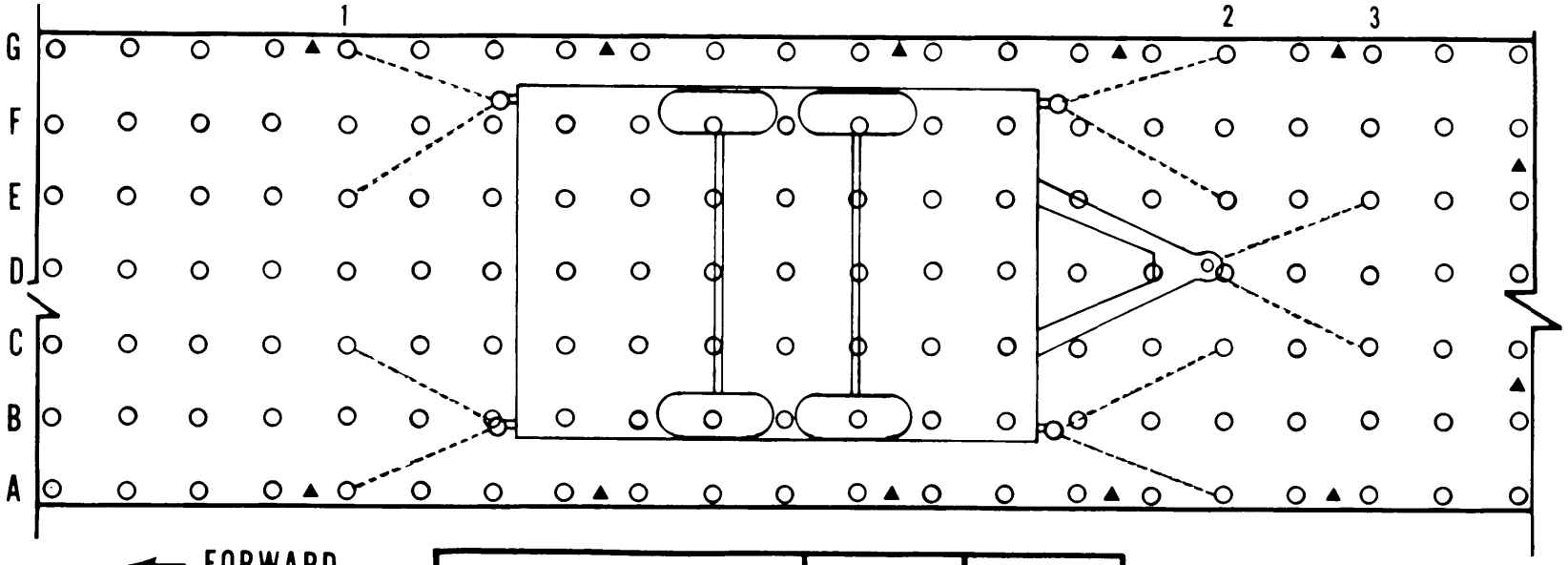
c. The mine dispenser may be loaded aboard aircraft using a prime mover (preferably a truck with a front-mounted pintle). The dispenser should be backed onto the aircraft except when it is loaded over the aft ramp of the C-5; in this latter case, the dispenser may be towed aboard front first. When the dispenser has been positioned, the parking brake must be set. Place one piece of ¾-by 18- by 18-inch plywood shoring on the aircraft floor under each of the four dispenser-leveling jacks. Rotate the leveling jacks to the vertical positions, and then lower the jacks until the jack pad is firmly in place in the center of the plywood shoring. On the C-130 or C-141 aircraft, care must be exercised to insure that the jack pads and shoring are located completely on the treadway areas of the cargo floor. The leveling jacks are to be used only to stablize the dispenser, not to bear the full weight of the dispenser.

WARNING

Consult TM 38-250/AFR 71--4 to insure compatibility of any cargo being considered for loading and transport with the mine dispenser.

4-6. Transport by US Army Aircraft

The mine dispenser exceeds size limitations for internal transport by US Army fixed- or rotary-wing aircraft. The dispenser is within the weight limitations for external lift by the CH-47 and CH–54 helicopters. Rigging instructions for external loads are contained in TM 55-450-19.



SYMBOL	○	▲
STRENGTH OF FITTING	10,000 LB	25,000 LB
BASIC LOAD DIRECTION	ANY	ANY

Figure 4–1. Tiedown diagram for mine dispenser, M128, in C–130 aircraft.

Table 4-1. Tiedown Data for Dispenser, Mine, M128 in C–130 Aircraft

Tiedown Fitting		Tiedown Device*		
Designation	Capacity in 1 ,000 lb	Type	Capacity in 1,000 lb	Attach to Item
A1	10	MB-1	10	Right rear tiedown provision
C1	10	MB-1	10	Right rear tiedown provision
E1	10	MB-1	10	Left rear tiedown provision
G1	10	MB-1	10	Left rear tiedown provision
A2	10	MB-1	10	Right front tiedown provision
C2	10	MB-1	10	Right front tiedown provision
E2	10	MB-1	10	Left front tiedown provision
G2	10	MB-1	10	Left front tiedown provision
C3	10	MB-1	10	Lunette**
E3	10	MB-1	10	Lunette**

*C–2 may be substituted for MB-1.
**Attach tiedown device to upper fixed]unette, not to reach tube Iunette.

CHAPTER 5

HIGHWAY TRANSPORTABILITY GUIDANCE

Section I. GENERAL

5-1. Scope

This chapter provides transportability guidance for highway movement of the mine dispenser. It covers significant technical and physical characteristics and safety considerations and prescribes the materials and guidance required to prepare, load, and tie down the dispenser.

5-2. Safety

Safety precautions are listed in chapter 3.

5-3. General

The mine dispenser is transportable as a towed load using a 5-ton or equal capacity truck as a prime mover. With the two reflectors removed from each side of the trailer bed, the dispenser is within the legal dimensional and weight limitations of CONUS and most oversea areas. Special permits are required in CONUS, and special routing is required overseas for outsize shipments. The prime mover used will determine permit requirements. The procedures for obtaining special permits in CONUS are specified in AR 55-162. Legal limitations in oversea areas are identified in *Limits of Motor Vehicle Sizes and Weights,* International Road Federation, 1023 Washington Building, Washington, DC 20005.

Section II. TRANSPORT BY SEMITRAILER/TRUCK

5-4. Preparation

Secure all loose items to preclude damage en route.

5-5. Transport on Semitrailer/Truck

a. General. The mine dispenser, loaded on flatbed semitrailers or trucks, may be transported over highways. Movement over public highways in CONUS and overseas normally is used when other modes of transport are not available or practical. Highway shipment may be made, using either commercial or military flatbed trailers or trucks of adequate size and capacity (8-ton minimum). Tractors and semitrailers, or trucks, when loaded with the mine dispenser, may exceed height or width limitations. In CONUS the maximum unrestricted height is 162 inches and width is 96 inches. The dispenser is 102 inches high (fig 2-3). Trailers or trucks with a loading surface height of 60 inches or less and a width of 96 inches will provide for unrestricted movement. To illustrate, the dispenser is shown as a typical load on a flatbed (fig 5-1).

b. Material. If semitrailers are equipped with chain-type load binders, they will be used to secure the dispenser to the trailer. If load binders are not available, adequate blocking and tiedown materials are provided by the shipping activity, as specified in table 5-1.

c. Loading. The mine dispenser may be placed in the tiedown position on a flatbed by a crane of 8 tons or more capacity (fig 6-1 provides lifting guidance), or it may be towed onto a flatbed if a suitable ramp and prime mover are available. When the dispenser is in the tiedown position, set the parking brakes.

d. Tiedowns. Figures 5-1 and 5-2 provide a tiedown diagram and the details, compatible with standard loading practices, of how adequately to restrain the load against forces encountered at normal speeds and under normal operating conditions. Table 5-1 provides a bill of materials, and table 5-2 provides guidance for application of the materials for tiedown of the mine dispenser.

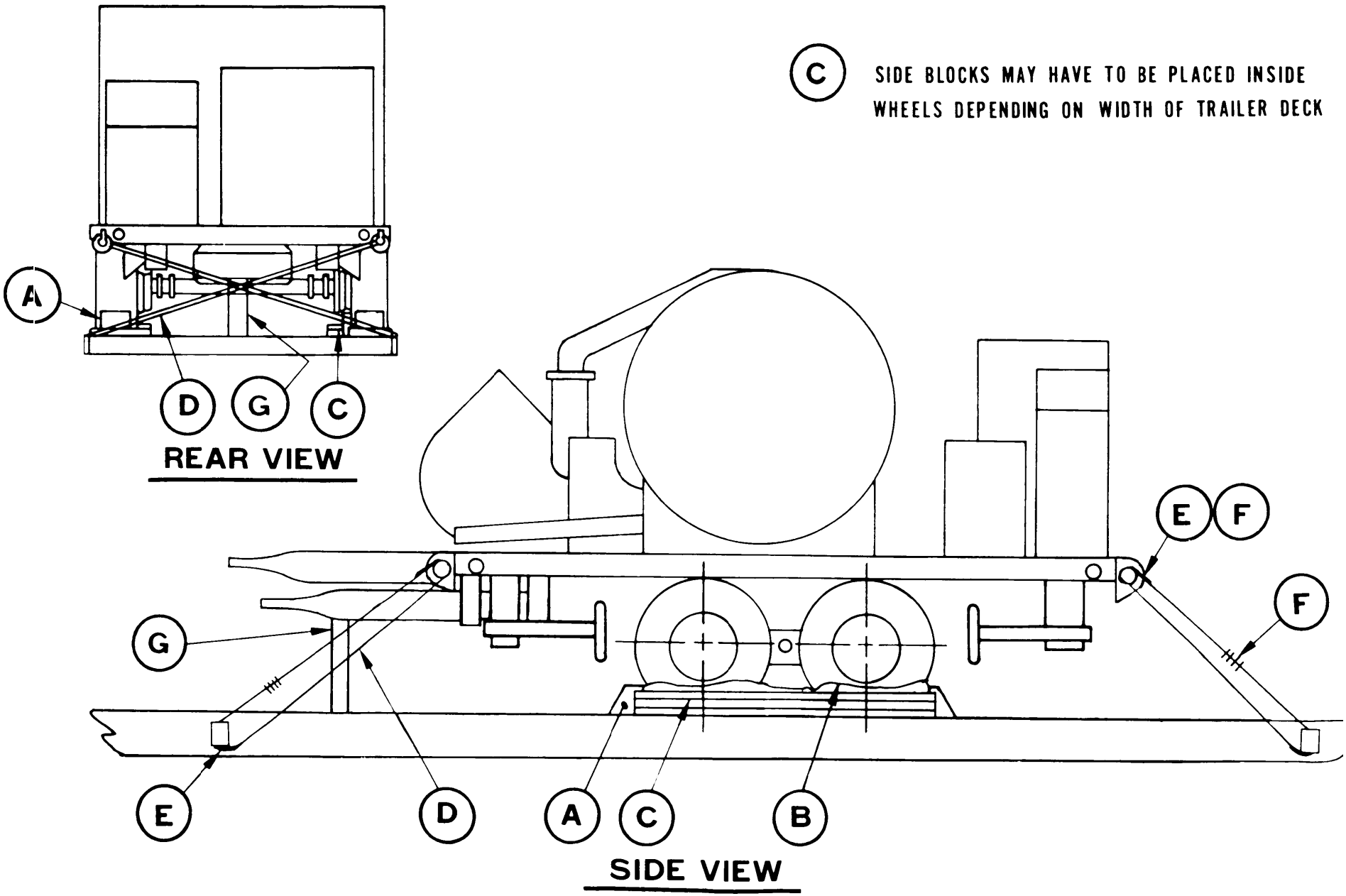
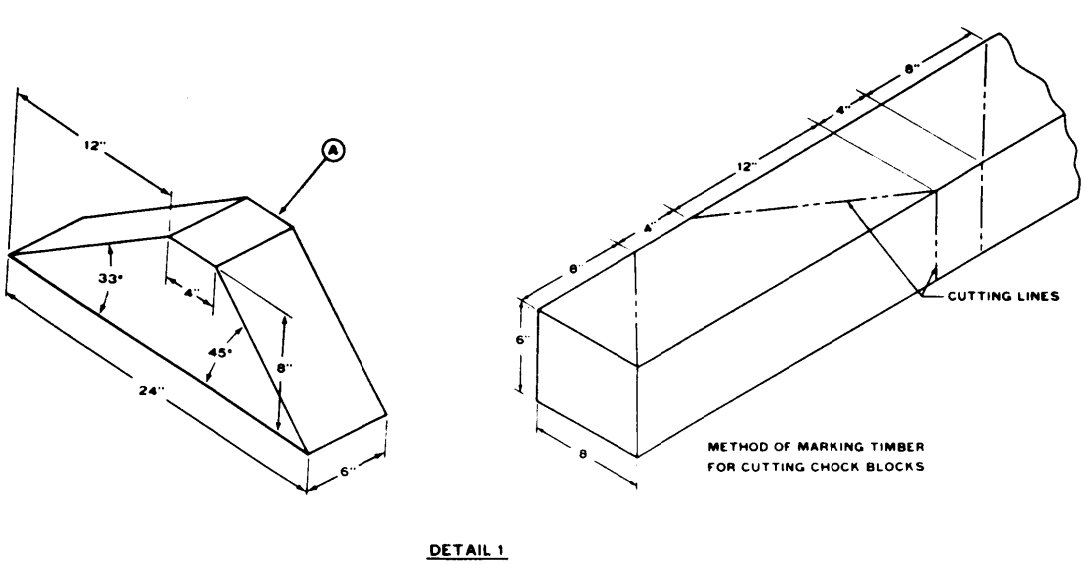
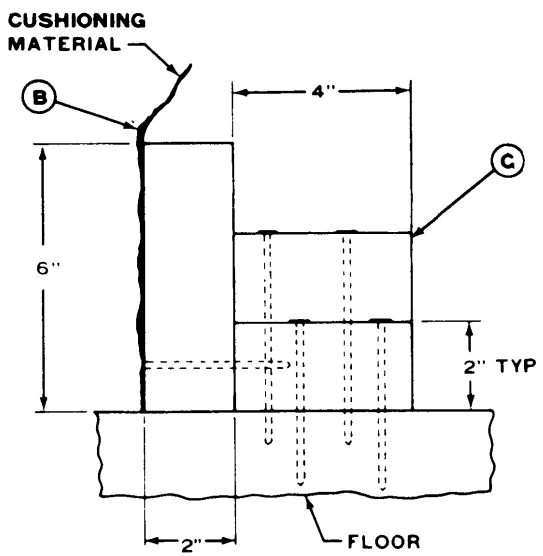


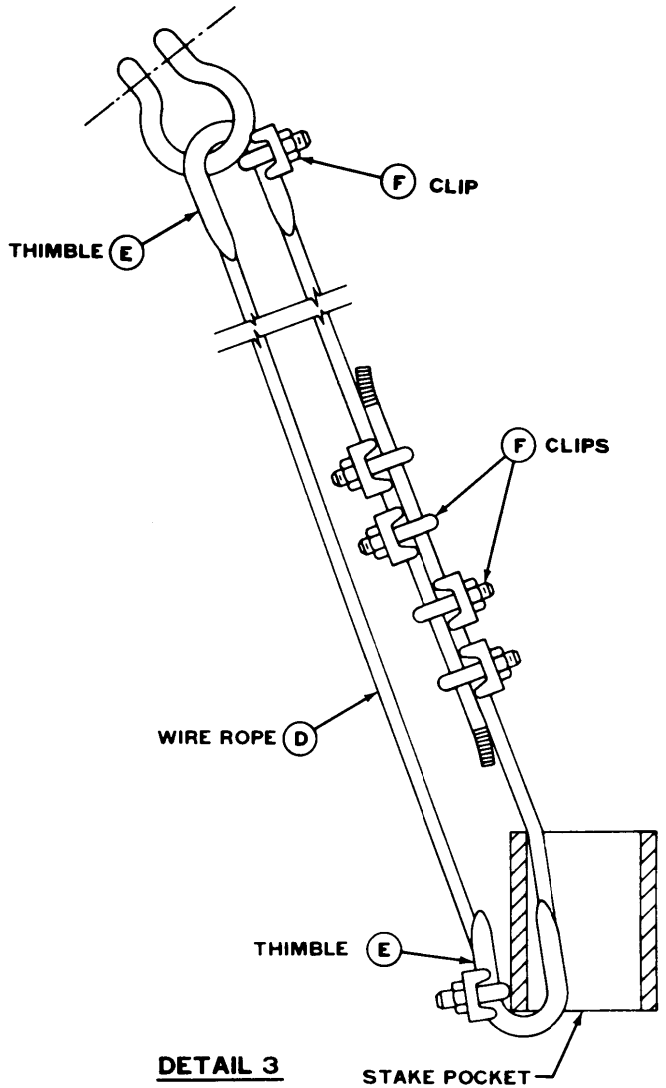
Figure 5–1. Blocking and tiedown of dispenser on a highway carrier.





DETAIL 2

NOT TO SCALE



DETAIL 3

Figure 5–2. Blocking and tiedown details for dispenser on a highway carrier.

Table 5–1. Bill of Materials for Blocking and Tiedown of Dispenser on Highway Carrier (Figs 5–1 and 5–2)

Item	Description	Approximate quantity
Lumber	Douglas-fir, or comparable, straight-grain, free from material defects; Fed Spec MM-L-751H:	
	6- x 8-in.	8 linear ft
	2- x 6-in.	12 linear ft
	2- x 4-in.	24 linear ft
Nails	Common, steel; flathead; bright or cement-coated; Fed Spec FF–N-105B:	
	20d	48
	30d	36
	40d	8
Wire rope	6 x 19 IWRC; improved plow steel; preformed, regular-lay; table X, Fed Spec RR–W-410C: 5/8-inch	80 ft
Clips	Wire rope, U-bolt clips, saddled, single-grip, steel, Crosby heavy-duty, or equal: Fed Spec FF-C-4500: 5/8-inch	24
Thimbles	Standard, open-type; ‘A-inch	8
Cushioning material	Waterproof paper, burlap, or other suitable material	as required

Table 5–2. Application of Materials for Blocking and Tiedownof Dispenser on Highway Carrier (Fig 5-1 and 5-2)

Item	No. required	Application
A	4	Chock Block (detail 1, fig 5–2). Place 45° end against each wheel as shown in figure 5-1. Toenail heel of block (33° end near bottom edge) to trailer/truck floor with one 20d nail in each block. Drive two 40d nails through heel of each block, perpendicular to floor. Toenail each side of each block to floor with two 30d nails.
B	as required	Cushioning material (detail 2, fig 5-2). Locate so that material is under item C and extends 2 inches above item C, between the tire and item C.
C	2	Side blocking (detail 2, fig 5–2). Each to consist of one piece of 2- x 6- x 72-in. lumber and two pieces of 2- x 4- x 72-in. lumber. Nail 2- x 6- x 72-in. piece to edge of lower 2- x 4- x 72-in. piece with ten 20d nails. Place 2- x 6- x 72-in. piece against cushioning material and tire and nail to floor, in a staggered pattern, through 2- x 4- x 72-in. piece with ten 20d nails. Nail upper 2- x 4- x 72-in. piece to lower piece with ten 30d nails.
D	4	Tiedowns, crossed, (detail 3, fig 5-2). Each to consist of one piece 5/8-inch, 6 x 19 IWRC wire rope, length as required (approximately 20 ft). Form a complete loop between tiedown provision and appropriate stake pocket on opposite side of trailer. The angle between the tiedowns and the trailer deck should be as close to 45 degrees as possible. The wire rope ends should overlap at least 18 inches.
E	8	Thimbles. Place one under wire rope on each place where wire rope contacts bottom of stake pocket and tiedown provision. Secure thimble to wire rope with one U-bolt clip (detail 3, fig 5-2).
F	24	Clips. Place four on each item D at overlap area. Space clips 3–¾inches apart with a minimum of 6 inches from ends of wire rope (detail 3, fig 5–2). Place one on each item E as indicated above.
G	1	Brace, Use 6- x 8-inch lumber by length-to-suit (approximately 24 inches). Force fit between truck or trailer bed and reach tube as shown in figure 5-1. Toenail to truck or trailer bed with one 20d nail in each side.

CHAPTER 6

MARINE AND TERMINAL TRANSPORTABILITY GUIDANCE

Section I. GENERAL

6-1. SCOPE

This chapter provides transportability guidance for marine and terminal movement of the mine dispenser. It covers significant technical and physical characteristics and also prescribes the materials and guidance required to prepare, lift, tiedown, and discharge the dispenser.

6-2. Safety

Safety precautions are contained in chapter 3.

6-3. Water Shipment

The mine dispenser can be transported by a variety of inland waterway cargo carriers, by lighters, and by most seagoing cargo vessels.

The methods described in this chapter for lifting and securing are suggested procedures. Other methods of handling and stowage may be used provided they will insure safe delivery without damage.

Section II. LOADING AND SECURING

6-4. General Rules

a. Stowage. Whenever possible, belowdeck stowage should be provided. In general, good stowage means placing the items as close together as practical, with minimum space between outer item and sweatboards (approximately 4 to 6 inches). Breakable parts should be protected, spare parts stowed in or near parent item, and brakes set with brake lever wire tied. Secure the dispenser by blocking wheels front, rear, and on both sides; lash with wire rope or chains to bulkhead, stanchions, or padeyes.

b. Lifting. The mine dispenser has four lifting eyes. Two are located at the front corners and two are located at the rear corners of the trailer bed. Two spreader bars must be used with the sling legs attached to the front and rear lifting eyes to preclude damage to the powerpack and controls (fig 6-1).

c. Loading. Mine dispensers will be loaded on cargo vessels in their minimum configuration as described in paragraph 2-5. They may be loaded in operational configuration aboard landing craft, beach discharge lighters, amphibious lighters, and landing ships by towing with a suitable prime mover or by lifting with cranes of at least 8-ton capacity. They can be loaded onto the decks of barges from a pier when tidal conditions are suitable and when ramps are available. They can be loaded onto seagoing vessels by shoreside or floating cranes of adequate capacity or by heavy-lift ship's gear.

6-5. General-Cargo and Barge-Type (LASH and SEABEE) Ships

NOTE

Dispenser fuel tanks must be drained and battery terminals must be disconnected and taped.

a. Lighterage. When transporting the mine dispenser by lighterage to or from vessels, blocking will be required. When transporting long distances or through rough water, tiedowns must also be used.

b. Securing. Requirements for securing the mine dispensers aboard general-cargo and barge-type vessels are essentially the same. Secure the dispensers by blocking the wheels front, rear, and on both sides; lash with wire rope or chains to bulkheads, stanchions, or padeyes. Figure 6-2 shows suggested blocking and tiedown details. Materials for blocking and tiedown are listed in table 6-1. Application of materials is shown in table 6-2.

c. *Stowage in barges.* Barge stability is noticeably affected by the loading of heavy items. The

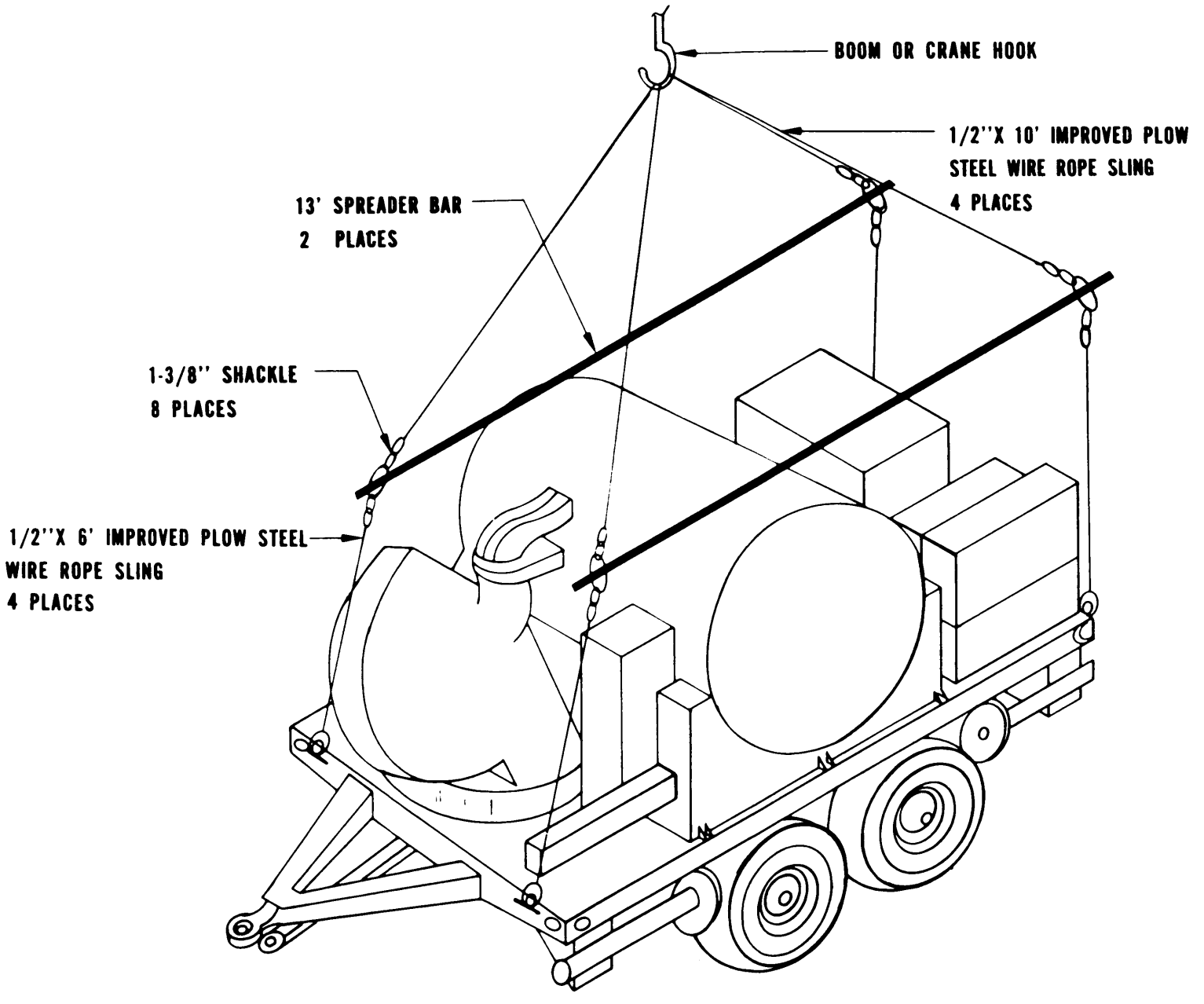


Figure 6–1. Lifting of dispenser using eight-legged bridle sling and two spreader bars.

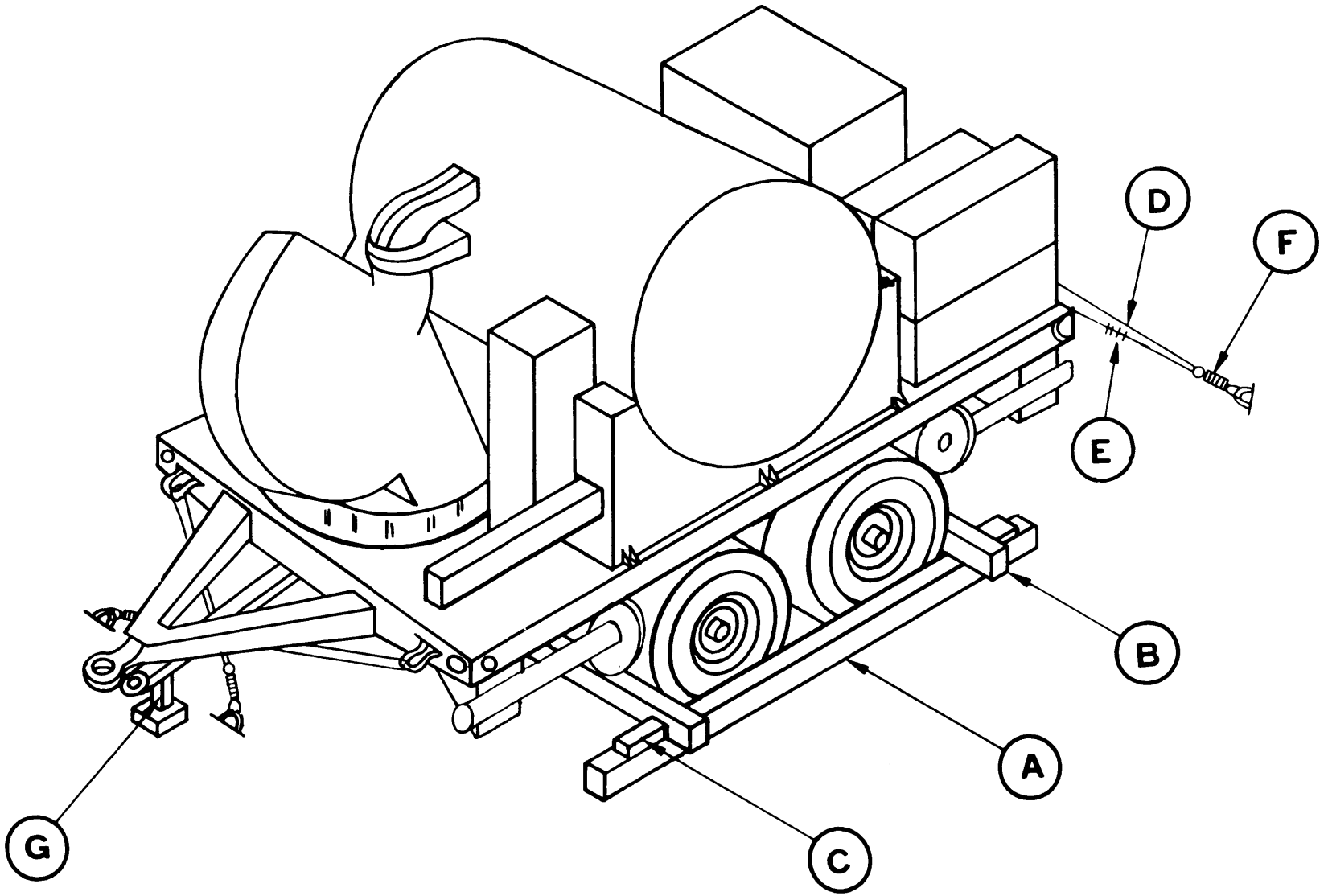


Figure 6–2. Blocking and tiedown of dispenser in general-cargo vessel.

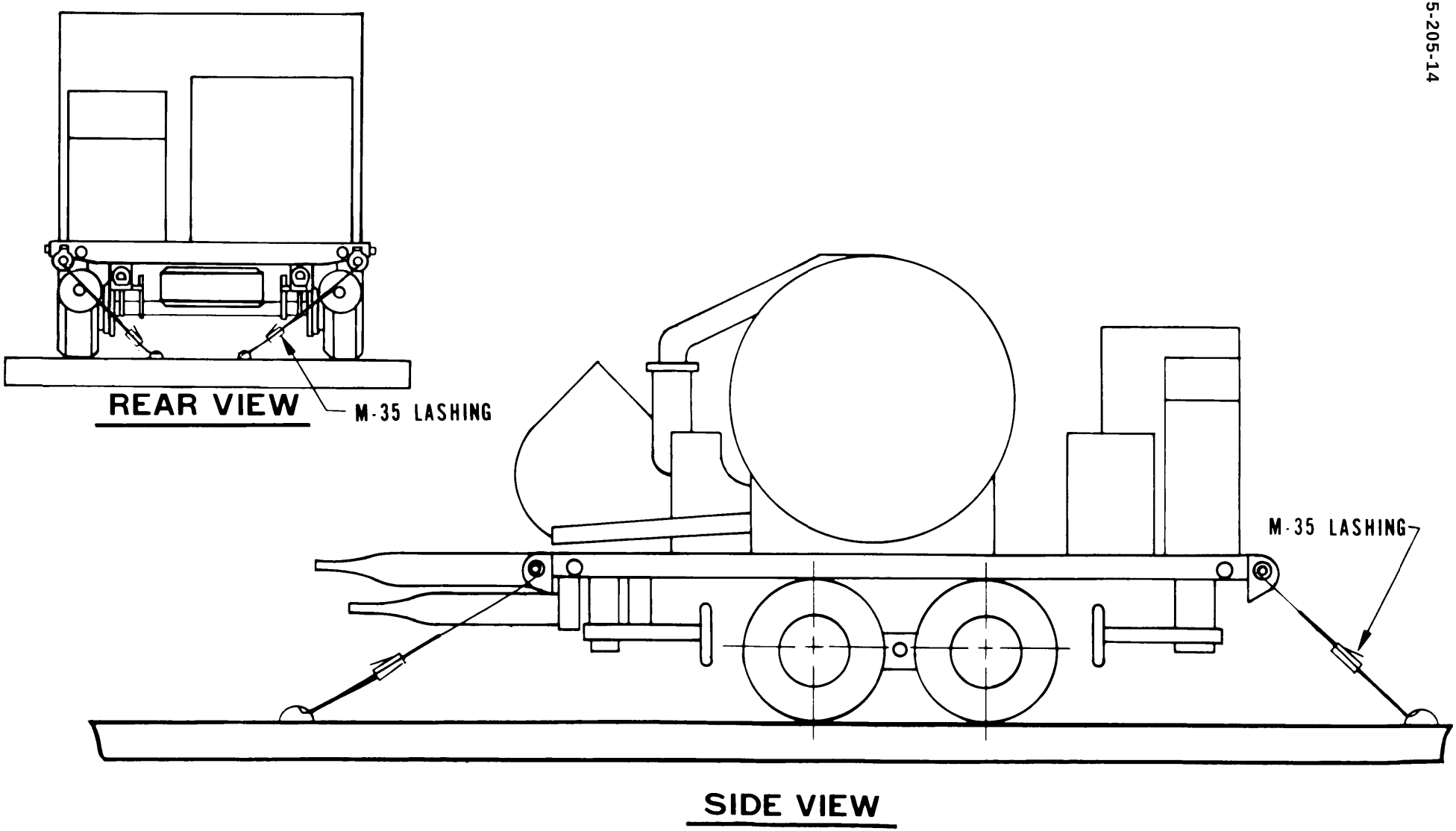


Figure 6–3. Tiedown of dispenser on RORO vessel.

Table 6–1. Bill of Materials Blocking and Tiedown of Mine Dispenser in General-Cargo Vessel (Fig 6–2)

Item	Description	Approximate quantity
Lumber	Douglas-fir, or comparable, straight-grain, free from material defects; Fed Spec MM-L–751 H:	
	2- x 4-in.	4 linear ft
	4- x 4-in	38 linear ft
	2- x 12-in.	1 linear ft
Nails	Common, steel; flathead, bright or cement coated; Fed Spec FF-N–105B:	
	20d	20
	50d	16
Wire rope	6 x 19, IWRC; improved plow steel; preformed, regular-lay; Fed Spec RR–W-410C: 5/8-in.	80 ft
Clips	Wire rope, U-bolt clips, saddled, single grip, steel, Crosby heavy-duty or equal: MIL–STD 16842: 5/8-in.	16
Turnbuckle	Eye-and-jaw type, l-in. dia x 12-in. takeup; Fed Spec FF–T–791b or equal	4

mine dispensers should be loaded symmetrically in sequence about the centerline of the barge in a manner to counterbalance variations in centers of gravity, that is, alternate head to tail.

6-6. Roll-on/Roll-off (RORO), Seatrain, Landing, and Attack Cargo Ships

NOTE

When mine dispensers are loaded on vessels that are adequately ventilated by power blowers, such as RORO vessels, the fuel need not be drained and batteries need not be disconnected.

a. Loading. Mine dispensers, in operational configuration, can be towed by their prime movers aboard vessels having roll-on capability.

b. Securing. RORO, Seatrain, landing, and attack cargo ships are equipped with patented lashing gear and pre-positioned fittings in the deck. The use of such equipment is adequate, and blocking and bracing are not required. Figure 6-3 shows suggested tiedown details for a mine dispenser aboard a RORO vessel, using four 35,000-pound-capacity (M–35) lashings.

6-7. Landing Craft and Amphibians

When transporting the mine dispensers for extended distances or through rough waters, blocking and tiedowns must be used. In most cases, landing craft and amphibians are equipped with lashings and deck fittings. When lashing are not provided, a suitable substitute may be used.

Table 6–2. Application of" Materials for Blocking and Tiedown of Mine Dispenser *in General-Cargo Vessel (Fig* 6-2)

Item	*No. required*	*Application*
A	2	Side blocks. Each to consist of 4- x 4- x 108-in. lumber. Locate one piece centered against outside of each pair of wheels.
B	2	End blocks. Each to consist of 4- x 4- x 108-in. lumber. Locate on top of item A and against wheels as shown in figure 6–2. Toenail to item A with four 50d nails at each end of each item B.
c	4	Backup cleats. Each to consist of one piece of 2- x 4- x 12-in. lumber. Locate on top of item A against the joint of each item B. Nail to item A with four 20d nails each.
D	4	Wire rope. Form a complete loop through each mine dispenser tiedown provision and the eye of a turn buckle. Overlap wire rope ends at least 18 inches.
E	16	Clips. Place four on each wire rope at the overlap area, and space 3¾ inches apart, a minimum of 6 inches from ends of wire rope. Details for placement of clips may be found in figure 5-2. Tighten so that wire rope cannot slip.
F	4	Turnbuckles. Attach jaw end to padeye built into vessel deck. Tighten as required.
G	1	Brace. Consists of one piece of 2- x 12- x 12-in. lumber and one piece of 4- x 4-in. lumber, length cut-to-fit. Place 2- x 12- x 12-in. piece on vessel deck, under reach tube, aft of the lunette. Force fit the 4- x 4-in. cut-to-fit piece between the 2- x 12- x 12-in. piece and the bottom of the reach tube aft of the lunette. Toenail with four 20d nails.

CHAPTER 7

RAIL TRANSPORTABILITY GUIDANCE

Section I. GENERAL

7-1. Scope

This chapter provides transportability guidance for rail movement of the mine dispenser. It covers significant technical and physical characteristics and safety considerations and also prescribes the materials and guidance required to prepare, load, and tiedown the dispenser on open top flatcars.

7-2. Maximum Use of Railcar Capacity

Additional cargo, as approved by the activity offering the dispenser for transport, may be transported on a railcar with the dispenser, provided the railcar weight and dimensional limitations are not exceeded.

Section II. TRANSPORT ON CONUS RAILWAYS

7-3. General

The transportability guidance contained in this section is applicable when the dispenser is transported on CONUS railways. Consideration is given to movements on railcars normally used for this type of equipment. When at a maximum width at the top of 96 inches and a height of 102 inches, the dispenser can be transported without restriction and without sectionalization or major disassembly.

7-4. Preparation

As a minimum, insure that all loose items are removed or secured to prevent loss or damage in transit.

7-5. Loading on General-Purpose Flatcars

a. The mine dispenser can be placed in the tiedown position on a railcar by a crane of adequate capacity (8-ton minimum). Refer to chapter 6 for lifting guidance. The dispenser may be towed onto a railcar if suitable ramp or bridge is available.

b. The load illustrated in figure 7–1 is based on a flatcar width of 10 feet 6 inches. Figure 7–2 gives detailed instructions for blocking and tiedown. Tables 7–1 and 7–2 provide a bill of materials and instructions for their application to secure the dispenser on general-purpose flatcars.

NOTE

A staggered nailing pattern should be used when lumber or laminated lumber is nailed to the floor of a railcar. The nailing pattern for an upper piece of lumber should be adjusted as required so that a nail for that piece will not be driven into or against a nail in the lower piece of lumber.

7-6. Loading on Special-Purpose Flatcars

a. The mine dispenser can be placed in the tiedown position on a special-purpose flatcar by a crane of adequate capacity (8-ton minimum), or it may be towed onto the flatcar provided a suitable ramp or bridge is available.

b. Figure 7-3 shows the dispenser loaded on a center-tiedown-rail-equipped flatcar. Table 7–3 provides guidance for the application of chain tiedowns (provided with flatcar) for securing the dispenser on center-tiedown-rail-equipped flatcars.

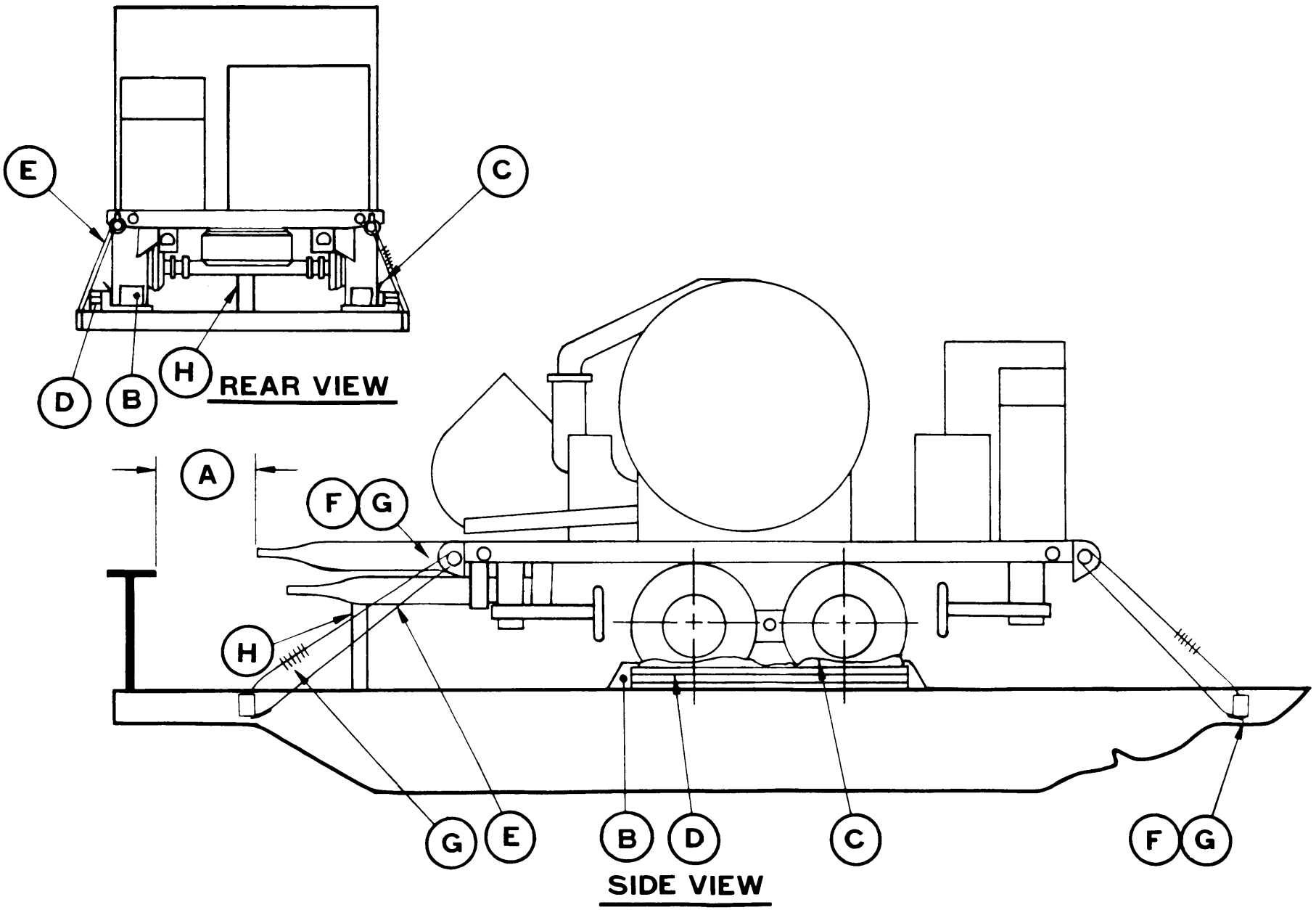


Figure 7–1. Blocking and tiedown of dispenser on general-purpose flatcar.

Figure 7–2. Blocking and tiedown details for dispenser on general-purpose flatcar.

Table 7–1. Bill of Materials for Blocking and Tiedown of Dispenser on General-Purpose Flatcar (Figs 7–1 and 7–2)

Item	Description	Approximate quantity
Lumber	Douglas-fir, or comparable, straight-grain, free from material defects; Fed Spec MM-L-751 H:	
	6- x 8-in.	8 linear ft
	2- x 6-in.	12 linear ft
	2- x 4-in.	36 linear ft
Nails	Common, steel; flathead, bright or cement-coated; Fed Spec FF-N-105B:	
	20d	44
	30d	56
	40d	12
Thimbles	Standard, open-type: 5/8-in.	8
Clips	Wire rope, U-bolt clips, saddled, single-grip, steel, Crosby heavy-duty, or equal: Fed Spec FF-C-450D 5/8-in.	32
Wire rope	6 x 19, IWRC; improved plow steel; preformed, regular-lay; table X, Fed Spec RR–W-410C: 5/8-in.	60 ft
Cushioning material	Waterproof paper, burlap, or other suitable material	as required

Table 7–2. Application of Material for blocking and Tiedown of Dispenser on General-Flatcar(Figs 7-1 and 7-2)

Item	No. required	Application
A		Brake wheel clearance. Minimum clearance required is 6 in. above, in back of, and on both sides of, and 4 in. underneath wheel, 12-in. minimum clearance from end of car to load extending from center of brake wheel to side of car, and 6 ft above car floor (fig 7–1).
B	4	Chock block (detail 1, fig 7-2). Place 45° end against each wheel as shown in figure 7-1. Toenail heel of block (33° end near bottom edge) to car floor with one 20d nail in each block. Drive two 40d nails through heel of each block, perpendicular to car floor. Toenail each side of each block to floor with two 30d nails.
C	as required	Cushioning material (detail 2, fig 7-2). Locate so that material is under item D and extends 2 in. above item D between tires and item L).
D	2	Side blocking (detail 2, fig 7-2). Each to consist of one piece of 2- x 6- x 72-in. lumber and three pieces of 2- x 4- x 72-in. lumber. Nail 2- x 4- x 72-in. piece to edge of lower 2- x 4- x 72-in. piece with ten 20d nails. Place 2- x 6- x 72-in. piece against cushioning material and tire and nail to car floor through 2- x 4- x 72-in. piece in a staggered pattern with ten 20d nails. Nail two upper 2- x 4- x 72-in. pieces to lower piece with ten 30d nails each,
E	4	Tiedowns (detail 3, fig 7–2). Each to consist of one piece 5/8-in. 6 x 19, IWRC wire rope, length as required (approximately 15 ft). Form a complete loop between tiedown shackle and appropriate stake pocket at a maximum angle of 45 degrees. Wire rope ends should overlap approximately 25 in.
F	8	Thimbles. Place one under wire rope at each place where rope passes over bottom edge of stake pocket and tiedown shackle. Secure each thimble to wire rope with one 5/8-in. clip (detail 3, fig 7-2).
G	24	Clips. Place six on each item E at overlap area. Space clips 3¾-in. apart a minimum of 6 in. from ends of wire rope (detail 3, fig 7–2). Place one on each item F as indicated above.
H	1	Brace. Consists of one piece of 6- x 8-in. lumber by length-to-suit (approximately 24 in.). Force fit between rail car floor and bottom of reach tube aft of lunette. Toenail to car floor with one 40d nail through each side.

GENERAL INSTRUCTIONS

1. Set handbrake and block and wire lever in place.

2. General Rules, 1,2,3,4,5, 14, 15, 19A, and 19B, Section I of the *Rule Governing the Loading of Commodities on Open-Top Cars and Trailers*, published by the Association of American Railroads, apply.

3. Tension wire rope with an applicable sized come-along mechanical hoist or equal tensioning device.

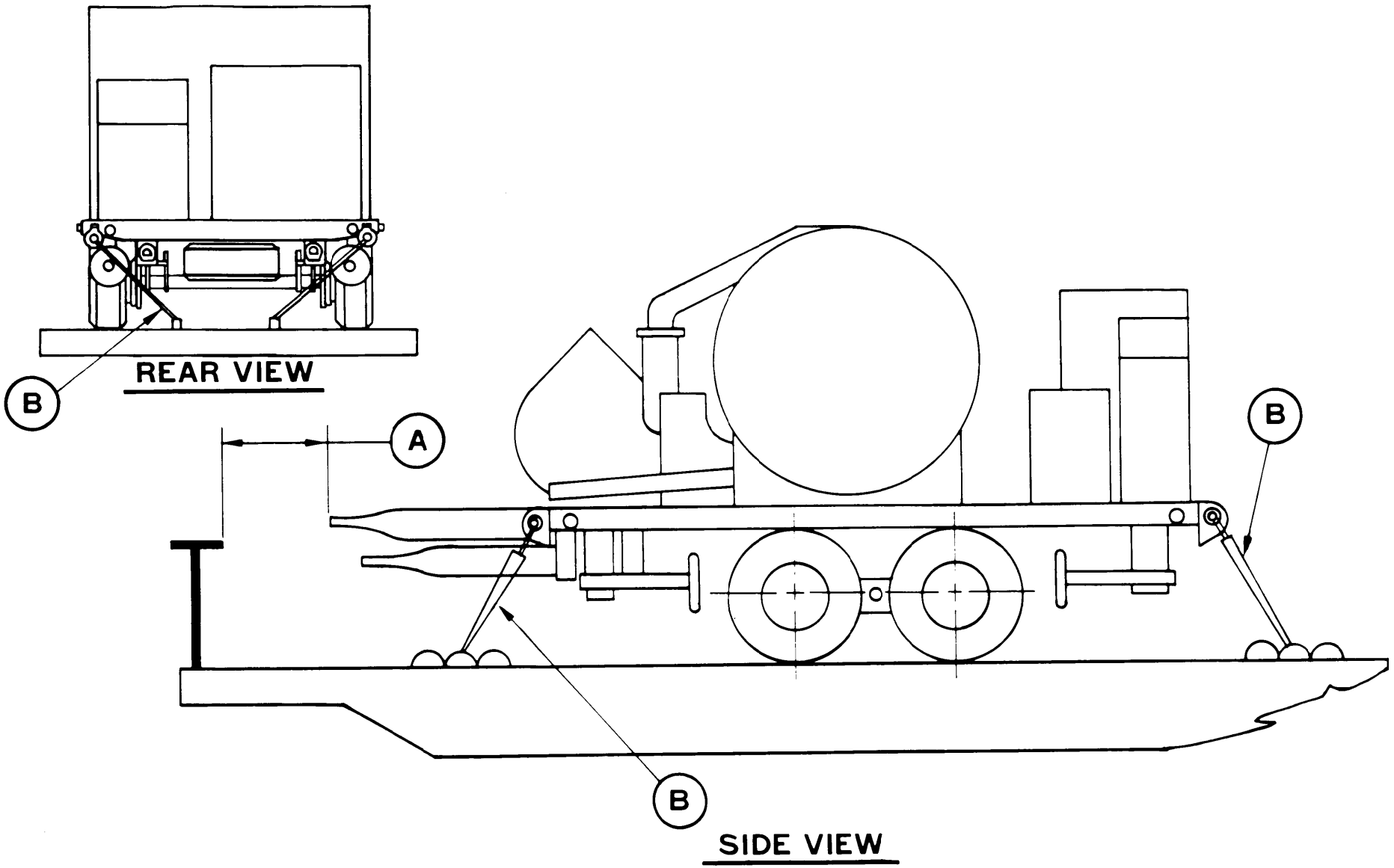


Figure 7–3. Tiedown of dispenser on center-tiedown-rail-equipped flatcar.

Section III. TRANSPORT ON FOREIGN RAILWAYS

7-7. General

The transportability guidance contained in this section is applicable when the mine dispenser is transported on foreign railways. Consideration is given to movement on the types of railcars normally used for the transport of this type of equipment. The dispenser can be transported in its operational configuration (figs 2-3 and 2-4) *with restrictions* within European countries complying with the International Loading Gauge. This also applies to the majority of the countries of the Middle East, South America, and to Australia, India, and Pakistan. Because of the height and width at the top of the dispenser, special clearance and routing will be required for each country. In Australia, India, and Pakistan, wide- or broad-gauge railways provide greater clearances and less restrictions. Because of the various designation systems used by different countries, foreign railcars are difficult to classify. In addition, clearances vary between countries and within a country. Consequently, evaluation of transport capability must be made on an individual basis.

7–8. Transport on Foreign Service Flatcars

a. General. The mine dispenser can be transported on a number of foreign service flatcars. Table 7-4 lists some of the flatcars available in Europe that are suitable for transporting the mine dispenser.

b. Materials. The materials required for blocking and tiedown of the mine dispenser on foreign service flatcars are essentially the same as those used within CONUS. Detailed guidance is contained in the 4th Transportation Brigade Pamphlet 55-2, *Tiedown Guide for Rail Movements.*

Table 7-3. Application of Chain Tiedown for Securing Dispenser on Center- Tiedown-Rail-Equipped Flatcar (Fig 7-3)

item	No. required	Application
A	—	Brake wheel clearance. Minimum clearance required is 6 in. above, in back of, and on both sides of wheel, and 4 in. underneath wheel. Also required is a 12-in. minimum clearance from end of car to load, extending from center of brake wheel to side of car, and 6 ft above car floor (fig *7–3).*
B	4 ea unit	Chain tiedown. ½-in. -diameter alloy-steel chain, proof-tested to a minimum of 22,500 lb. Apply one chain to each of the four tiedown provisions and to an appropriate tiedown on the center rail of the flatcar.

Table 7-3. Application of Chain Tiedowns for Securing Dispenser on Center- Tiedown-Rail-Equipped Flatcar (Fig 7-3)—Continued

GENERAL INSTRUCTIONS

1. Shippers should specify cars equipped with tiedown devices in the quantity shown in item B above when ordering specialized railway equipment. When carriers furnish cars that do not have built-in chains and tensioning devices, chains and turnbuckles of appropriate size and strength will be used in lieu thereof for securement of the dispenser. Load binders are not to be used in lieu of turnbuckles to tension tiedown chains.
2. For multiple shipments, the dispensers must face in the same direction and be uniformly spaced along the length of the car to allow sufficient space for securement at each end of the car and between the dispensers. Apply tiedowns at the same end of the dispenser and from the dispenser tiedown point to the car tiedown facility. The angle of the tiedown in relation to the car floor should be as close to 45 degrees as possible.
3. Parking brake must be set.
4. Open hooks must be secured with wire over the opening to prevent the hook from becoming disengaged from the chain link to which it is secured.
5. Turnbuckles used to tighten chains must be wired or locked to prevent them from turning during transit, unless the turnbuckles used have self-locking devices.

Table 7–4. Charactcristics of European Flatcars

Flatcar designation	Capacity	Length	Width	Plateform height
SSY	52-ton (47.17 MT)	31-ft 2-in. (5.50 m)	10-ft 4-in. (3.15 m)	4-ft 2¾-in. (1.29 m)
SSYS	66-ton (59.88 MT)	31-ft 2-in. (9.50 m)	10-ft 4-in. (3.15 m)	4-ft 2¾-in. (1.29 m)

* Above top of rail.

APPENDIX

REFERENCES

1. Army Regulations (AR)

55-162 Permits for Oversize, Overweight, or Other Special Military Movements on Public Highways in the Contiguous States and District of Columbia
55-228 Transportation by Water of Explosives and Hazardous Cargo
55-355 Military Traffic Management Regulation
70-47 Engineering for Transportability
746-1 Color, Marking, and Preparation of Equipment for Shipment

2. Army Field Manuals (FM)

1–100 Army Aviation Utilization
55-13 Air Transport of Supplies and Equipment: Standard Loads in Air Force G5 Aircraft
55-15 Transportation Reference Data
55-17 Terminal Operations Coordinator's Handbook

3. Army Supply Bulletin (SB)

700-20 Army Adopted/Other Items Selected for Authorization/List of Reportable Items

4. Army Technical Bulletin (TB)

55-46-1 Standard Characteristics (Dimensions, Weight, and Cube) for Transportation of Military Vehicles and Other Outsize/Overweight Equipment

5. Army Technical Manuals (TM)

5-725 Rigging
9–1095–205–10 Operators Manual, Mine Dispenser, Ground Vehicle M128
38-236 (AFP 71-8) Preparation of Freight for Air Shipment
38-250 (AFR 71-4) Preparation of Hazardous Materials for Military Air Shipment
55-450-10/1 Air Transport of Supplies and Equipment: Standard Loads in US Air Force C-130E Aircraft
55-450-10/2 Air Transport of Supplies and Equipment: Standard Loads in US Air Force C-141 Aircraft
55-450-11 Air Transport of Supplies and Equipment: Helicopter External Loads Rigged with Air Delivery Equipment
55450-15 Air Movement of Troops and Equipment (Nontactical)
55-450-19 Army Helicopter External Load Operations
55-500 Marine Equipment Characteristics and Data

6. Air Force Manuals (AFM)

TO 1–1B-40 Handbook of Weight and Balance Data
TO lC-5A-9 Loading Instructions, USAF Series C-5 Aircraft
TO 1C-130-9 Loading Instructions, USAF Series C-130 Aircraft
TO 1C-141A–9 Loading Instructions, USAF Series C-141 Aircraft

NOTE
Air Force Technical Orders that have not been integrated into the Department of the Army publications system may be requisitioned through the Adjutant General Office in accordance with AR 310-71.

7. Other Publications and Sources of Procurement

a. Rail and Highway Shipment

(1) *Code of Federal Regulations*
Title 49-Transportation, Parts 170-179
Available from: Superintendent of Documents
US Government Printing Office
Washington, DC 20402

(2) Association of American Railroads *Rules Governing the Loading of Commodities on Open-Top Cars and Trailers*
Section No. l-General Rules
Section No. 6-Rules Governing the Loading of Department of Defense Materiel on Open-Top Cars

Available from: Association of American Railroads
59 E. Van Buren Street
Chicago, IL 60605

(3) R. M. Graziano's Tariff No. 32 (or reissues thereof) *Hazardous Materials Regulation of the Department of Transportation, Including Specifications for Shipping Containers*

Available from: R. M. Graziano, Agent
1920 L Street NW
Washington, DC 20036

(4) American Trucking Association, Inc., Agent Publication ICC ATA III-A/FMC F–15-1 (or reissues thereof). *Department of Transportation Regulations Governing Transportation of Hazardous Materials by Motor, Rail and Water, Including Specifications for Shipping Containers*

Available from: James C. Harkins, Issuing Officer
1616 P Street NW
Washington, DC 20036

(5) 4th Transportation Brigade Pamphlet No. 55-2

Tiedown Guide for Rail Movement

Available from: Headquarters
4th Transportation Brigade
APO New York 09451

(6) International Road Federation

Limits of Motor Vehicle Sizes and Weights

Available from: International Road Federation
1023 Washington Building
Washington, DC 20005

b. Water Shipment

(1) *Code of Federal Regulations*

Title 46-Shipping, Part 146

Available from: Superintendent of Documents
US Government Printing Office
Washington, DC 20402

(2) Agent R. M. Graziano's *Water Carrier Tariff No. 32* (or reissues thereof) *Regulations Governing the Transportation or Storage of Explosives or Other Dangerous Articles or Substances, and Combustible Liquids on Board Vessels*

Available from: R. M. Graziano, Agent
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