

LIFTING HANDBOOK
FOR
MARINE MOVEMENTS

THIRD EDITION

August 2005

(Electronically Revised July 2009)

Gary Horton

John T. Atwood
Daniel J. Nonnemacher

MILITARY SURFACE DEPLOYMENT AND DISTRIBUTION COMMAND
TRANSPORTATION ENGINEERING AGENCY
SCOTT AIR FORCE BASE, ILLINOIS

Director
Military Surface Deployment and Distribution Command
Transportation Engineering Agency
ATTN: SDDCTEA - DPE (G. Horton)
Building 1990, 709 Ward Drive
Scott AFB, IL 62225

Telephone: DSN 770-5765, 618-220-5765, or 1-800-722-0727

FAX: DSN 770-5551 or 618-220-5551

E-mail: gary.horton1@us.army.mil

Make requests for additional copies or latest updated copy of these references can be downloaded from our website: http://www.tea.army.mil/pubs/pubs_order.htm

This book is part of the series started with MTMCTEA PAM 55-19, *Tiedown Handbook for Rail Movements*. The books in the series are:

Handbooks for Military Movements

PAM 55-19, *Tiedown Handbook for Rail Movements*

PAM 55-20, *Tiedown Handbook for Truck Movements*

PAM 55-21, *Lifting and Tiedown Handbook for Helicopter Movements*

PAM 55-22, *Marine Lifting and Lashing Handbook*

PAM 55-23, *Tiedown Handbook for Containerized Movements*

PAM 55-24, *Vehicle and Equipment Preparation Handbook for Fixed Wing Air Movements*

Planning and User's Guide

PAM 70-1 *Transportability for Better Deployability*

PAM 700-2 *Logistics Handbook for Strategic Mobility Planning*

PAM 700-4 *Vessel Characteristics for Shiploading*

PAM 700-5 *Deployment Planning Guide*

PAM 700-6 *Large, Medium Speed, Roll-On/Roll-Off Ships Users' Manual*

PAM 700-7 *Fast Sealift Ship Users' Manual*

Notes

Preface

This is the third edition of the pamphlet. It supersedes the second edition (March 1995) and MTMCTEA PAM 56-1, *Marine Terminal Lifting Guidance*. It contains some changes and improvements over the previous editions.

The shifting emphasis within our National Military Strategy has placed an unprecedented burden on our ability to meet our Crisis Response requirements. The potential for engaging in multiple lesser regional contingencies has become a reality. Never before has so much attention been focused on our strategic lift capability. While airlift is essential for moving people, supplies, and priority items, sealift is the primary means of moving military equipment. Because of the time required to deploy by sea and the relative weight and cube of the equipment involved, strategic sealift becomes the longest leg of the fort-to-foxhole deployment scenario. The purpose of this reference is to shorten this leg by providing standard marine terminal guidance for lifting and lashing military equipment on various strategic ships.

This pamphlet provides users with the proper lifting methods for loading general equipment aboard marine vessels and general procedures for securing military cargo on marine vessels. The pamphlet includes equipment characteristics condensed from TACOM vehicle characteristics sheets, transportability guidance technical manuals (TGTMs), and field experience gained through participating in military exercises. The handbook does not include all military equipment found in the Army inventory. Rather, it covers military equipment commonly encountered during stevedore operations. Helicopters are not covered in this reference. We have published a separate reference, MTMCTEA REF 95-55-21, which specifically addresses helicopters.

Throughout the pamphlet, warnings, cautions, and notes emphasize important or critical guidance.

Table of Contents

Page

Preface..... iv

TIEDOWN GUIDANCE

SECTION

I. Introduction1-1
II. Tips and Common Mistakes2-1
III. Lifting Hardware3-1
IV. Lifting Wheeled Vehicles4-1
V. Lifting Trailers.....5-1
VI. Lifting Tracked Vehicles6-1
VII. Lifting Containers.....7-1

INDEX

Located after Section VII.

Preface

The shifting emphasis within our National Military Strategy has placed an unprecedented burden on our ability to meet our Crisis Response requirements. The potential for engaging in multiple lesser regional contingencies has become a reality. Never before has so much attention been focused on our strategic lift capability. While airlift is essential for moving people, supplies, and priority items, sealift is the primary means of moving military equipment. Because of the time required to deploy by sea and the relative weight and cube of the equipment involved, strategic sealift becomes the longest leg of the fort-to-foxhole deployment scenario. The purpose of this reference is to shorten this leg by providing standard marine terminal guidance for lifting and lashing military equipment on various strategic ships.

This pamphlet provides users with the proper lifting methods for loading general equipment aboard marine vessels and general procedures for securing military cargo on marine vessels. The pamphlet includes equipment characteristics condensed from TACOM vehicle characteristics sheets, transportability guidance technical manuals (TGTMs), and field experience gained through participating in military exercises. The handbook does not include all military equipment found in the Army inventory. Rather, it covers military equipment commonly encountered during stevedore operations. Helicopters are not covered in this reference. We have published a separate reference, MTMCCTEA REF 95-55-21, which specifically addresses helicopters.

Throughout the pamphlet, warnings, cautions, and notes emphasize important or critical guidance.

WARNING

Highlights an operating or maintenance procedure, practice, condition, statement, and so forth, that, if not strictly observed, could result in injury to or death of personnel.

CAUTION

Highlights an operating or maintenance procedure, practice, condition, statement, and so forth, that, if not strictly observed, could result in damage to, or destruction of, equipment or loss of mission effectiveness or long term health hazards to personnel.

NOTE

Highlights an essential operating or maintenance procedure, condition, or statement.

SDDCTEA welcomes comments and recommendations for improving this pamphlet. Readers may send their suggestions by letter or on a marked copy of a page(s) of the pamphlet to Director, Military Surface Deployment and Distribution Command Transportation Engineering Agency, ATTN: SDTE-DPE (G. Horton), Building 1990, 709 Ward Drive, Scott AFB, IL 62225. You may also email gary.horton1@us.army.mil to submit suggestions.

Questions can be answered by contacting us using the information from page ii. Please feel free to make copies of this pamphlet at your own discretion.

Section I. Introduction

Whenever possible, military equipment should be driven on and off ships, for obvious reasons. However, for situations that do not facilitate RORO operations, equipment may be required to be lifted on and off the vessel. In such cases, military shippers assume responsibility for lifting operations at the ports. The following sections provide users with the proper lifting methods for loading general equipment aboard marine vessels. The guidance presented herein should be followed as closely as possible to ensure that safe lifting practices are followed.

Section III describes various lifting hardware, to include spreader bars, sling assemblies, and so forth. The hardware shown is used throughout sections IV through VII, appearing in the diagrams that illustrate lifting procedures for wheeled vehicles, trailers, tracked vehicles, and containers, respectively.

The lifting hardware and procedures described in sections III through VII will ensure equipment can be safely lifted. However, situations typically arise in the field that preclude using standard procedures. Section II, Tips and Common Mistakes, provides useful information for dealing with such situations.

The following symbols are used in the lifting sections of this handbook:

-  spreader bar
-  shackle

Section II. Tips and Common Mistakes

A. Preparing Vehicles Prior to Lifting

1. Make sure all lifting/tiedown shackles are attached to the vehicle.
2. Secure all secondary cargo in the beds of trucks/trailers with banding. Bands should be at least 3/4 by 0.020 inches.
3. Make sure fuel tanks are filled in accordance with the MTMC port call message.
4. Make sure vehicle weights are **accurately** measured and documented. Inaccurate weights could result in unsafe lifts. Also, if vehicles are overloaded, shippers must be aware of the potential handling hazards to prevent safety risks.
5. Fold mirrors to avoid damage to them and other vehicles.
6. Set parking brake just prior to lifting to prevent the vehicle from rolling when it is set down.

CAUTION

If the parking brake is not set and the vehicle tilts forward, landing on its front wheels first, it will roll forward until the rear wheels make contact. Keep personnel clear of the front of vehicles, especially near bulkheads.

B. Lifting Vehicles

1. Visually inspect slings for damage prior to each lift. Also, check to ensure all shackles and bolts are tight.
2. Place hooks, point down through the shackle or lifting provision (see illustration on next page).
3. If shackles are used, make sure screw pins are fully screwed in.

4. Tag lines (guidelines) should be attached to the lowest point on the lifting slings. Do not attach tag lines to the vehicles, this wastes time.

5. Vehicles should be positioned for lifting so that they will not require reorienting before being set down on the ship.

6. Position crane hook over anticipated center of gravity (CG) of vehicle to prevent equipment from swinging when it is lifted (see vehicle transportability data plate). If CG is not known, position hook over center of vehicle to minimize swinging.

7. Place padding between the slings and any edges or points of contact that may cause damage to the equipment or to the slings.

8. Make sure that the slings and spreader bars are of the proper strength and length for the lift.



Proper hook placement for lifting and lashing vehicles.

C. General

1. All personnel should be equipped with gloves and hard hats.
2. There should be only **one** ground guide that signals the crane operator.
3. All personnel should be briefed on safety and be alert to any situations that may arise. Anyone should be able to stop the lift.
4. **Never** wrap tag lines around any part of your body.
5. **Never** walk under a piece of equipment that is being lifted.
6. **Never** stand between a piece of equipment that is being lifted and anything on the ground or on the ship that you could be pinned against.
7. **Never** ride on a piece of equipment that is being lifted.
8. Tiedown devices should not be hung on equipment for lifting onto the ship. Place them inside the cab or the cargo bed for lifting.

Lifting Checklist

- Ensure everyone has had safety briefing.
- Make sure everyone has a hard hat and gloves.
- Make sure everyone knows where the emergency facilities are before starting operations.
- Ensure that all vehicle shackles are in place and secure.
- Make sure the parking brake is set.
- Ensure that the proper sling assembly is being used for each lift.
- Inspect all lifting gear to ensure that it is in good working condition.
- Check all shackles and fittings to ensure that they are secure.
- Ensure tag lines are securely tied to the slings.
- Ensure tag lines are free of kinks, knots, and loops.
- Ensure that crane hook is over center of gravity (CG) or anticipated CG of vehicle.
- Place hook, point down through shackle.
- Ensure that everyone is clear of the vehicle before lifting.
- Ensure that the crane operator has clear unobstructed view of ground guide at all times.
- Do not hang lashings from vehicles to be lifted.

- If a vehicle's front wheels are going to land first, allow space for vehicle to roll forward until the rear wheels come in contact with the deck.
- If anyone observes an unsafe situation they should stop the lift immediately.
- Consult SDDCTEA PAM 55-21 and appropriate technical manuals for lifting helicopters.

Section III. Lifting Hardware

WARNING

Wire rope shall not be used if, in any length equal to eight times the rope diameter, the number of visible broken wires exceeds 10 percent of the total number of wires in the rope or if the rope shows other signs of excessive wear, corrosion, kinking, or defect. (46 Code of Federal Regulations, para 91.37-50(C)). Revised as of 1 October 1991.

Sling assemblies are illustrated and described in this section. Diagrams in sections IV through VII specify the appropriate sling requirements.

Longer lower leg assemblies may be used by stevedore companies as necessary, depending upon the vessel being loaded.

Wire rope diameters are based on the gross vehicle weight (GVW) or the combat weight of the equipment.

MIL-DTL-32108 DETAIL SPECIFICATION**Spreader Bars for Lifting Slings**

This specification is approved for use by the Department of the Army and is available for use by all Departments and Agencies of the Department of Defense.

1. SCOPE

1.1 Scope. This specification covers spreader bars and multiple leg sling sets for lifting older military vehicles and large equipment. Military vehicles designed to current standards should not require spreader-bars.

1.2 Classification. Sling set spreader bars will be of the following sizes, as specified (see 6.2).

1.2.1 Size. Sizes of the spreader bars are as follows:

Size 30/9	9-foot bar, 60,000 pound rated capacity [30-STON (27-MTON)]
Size 40/18	18-foot bar, 80,000 pound rated capacity [40-STON (36-MTON)]

1.3 Part Identifying Number (PIN). The following PIN procedure is for government purposes and does not constitute a requirement for the contractor. The PIN to be used for sling set spreader bars acquired to this specification are created as follows:

MIL-DTL-32108 DETAIL SPECIFICATION

M 32108- 40/18

			----- Size 30/9 - 9-foot bar, 60,000 pound rated capacity
			[30-STON (27-MTON)]
			----- Size 40/18 - 18-foot bar, 80,000 pound rated capacity
			[40-STON (36-MTON)]
			-----Specification number:
			-----M prefix

2. APPLICABLE DOCUMENTS

2.1 General. The documents listed in this section are specified in sections 3, 4, or 5 of this specification. This section does not include documents cited in other sections of this specification or recommended for additional information or as examples. While every effort has been made to ensure the completeness of this list, document users are cautioned that they must meet all specified requirements of documents cited in sections 3, 4, or 5 of this specification, whether or not they are listed.

2.2 Government documents.

2.2.1 Specifications, standards, and handbooks. The following specifications, standards, and handbooks form a part of this document to the extent specified herein. Unless otherwise specified, the issues of these documents are those cited in the solicitation or contract.

Federal Specifications

- FF-T-276 Thimbles, Rope
- RR-C-271 Chain and Attachments, Welded and Weldless
- RR-W-410 Wire Rope and Strand

(Copies of these documents are available online at <http://assist.daps.dla.mil/quicksearch/> or www.dodssp.daps.mil or from the Standardization Document Order Desk, 700 Robbins Avenue, Building 4D, Philadelphia, PA 19111-5094.)

2.3 Non-Government pamphlets. The following documents form a part of this document to the extent specified herein. Unless otherwise specified, the issues of these documents are those cited in the solicitation or contract.

American Society for Testing and Materials (ASTM)

ASTM A36/A36M	Specification for Carbon Structural Steel
ASTM A53/A53M	Specification for Pipe, Steel Black and Hot-Dipped Zinc-Coated, Welded and Seamless
ASTM A123/A123M	Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products

(Copies of these documents are available at <http://www.astm.org>.)

American Welding Society (AWS)

AWS D1.1/D1.1M	Structural Welding Code, Steel
----------------	--------------------------------

(Copies of this document are available at <http://www.aws.org>.)

2.4 Order of Precedence. In the event of a conflict between the text of this document and the references cited herein, the text of this document takes precedent. Nothing in this document, however, supersedes applicable laws and regulations unless a specific exemption has been obtained.

MIL-DTL-32108 DETAIL SPECIFICATION**3. REQUIREMENTS**

3.1 Sling Assembly. The sling assembly, as used in this specification, shall consist of upper, lower, and extension wire rope (cable) legs, thimbles, spreader bar, shackles, master-links, and bolts. Spreader bar shall be constructed as shown in figures 1 and 2 or 3 through 5. Spreader bars shall be primed and painted to commercial standard for marine environment. Recommended color is given in 6.2.

3.2 First Article. When specified (see 6.2), a sample sling assembly shall be subjected to first article inspection in accordance with 4.2.

3.3 Materials. The supplier shall select materials that are capable of meeting all of the operational requirements specified herein. Materials not specified herein shall be of the same quality used for the intended purpose in commercial practice.

3.4 Engineering Sketches. Figures 1 through 5 are engineering design sketches. Preparation of shop drawings is the responsibility of the manufacturer. Where prescribed tolerances could cumulatively result in incorrect fits, the supplier shall adjust his manufacturing tolerances to insure correct fit, assembly and operation of the items. No deviation from the prescribed dimensions is permissible without approval of the contracting officer.

3.5 Design. The sling assembly shall be fabricated and assembled as shown in figures 1 through 5. The sling assemblies and spreader bars shall be designed to a load factor of five-times the breaking strength (rated capacity is 1/5 of breaking strength). The sling assembly shall be able to withstand a pull test of two-times the rated capacity without permanent deformation or failure (see 4.6).

3.5.1 Shackles. Shackles shall conform to RR-C-271, Type IVA, Class 3 (Safety Anchor Shackle {bolt/nut}), Grade-B (high strength alloy). The 1-1/2-inch shackles will be marked 'WLL 25 tons' or greater. [WLL: Working Load Limit – STON] Shackles shall be hot-dip zinc-coated (galvanized). Following commercial manufacturing practice, mechanical properties may exceed RR-C-271 table values.

MIL-DTL-32108 DETAIL SPECIFICATION

3.5.2 Thimbles. Thimbles for wire rope ends shall conform to FF-T-276, Type III. The thimbles shall be heavy-duty hot-dip zinc-coated (galvanized).

3.5.3 Steel Pipe. Steel pipe shall conform to ASTM A53/A53M. Pipe shall be seamless, standard weight (schedule 40).

3.5.4 Steel Plate. Steel plate shall conform to ASTM A36/A36M.

3.5.5 Wire Rope. Wire rope shall be stranded, uncoated, extra-improved plow steel, with regular lay. The wire rope shall be preformed with independent wire rope core (IWRC) and conform to RR-W-410, Type I, Class 2, or Class 3, improved plow steel, wire strand core or IWRC.

3.5.6 Master Link. Master links shall conform to commercial practice. Master link WLL for Size 30/9 shall be 30 STON or greater and Size 40/18, 40 STON or greater.

3.6 Wire Rope Assemblies. All wire rope assemblies shall have the rope ends mechanically spliced or swaged with a seamless carbon steel sleeve over a Flemish-eye splice.

3.7 Galvanizing. All galvanizing shall conform to ASTM A123/A123M.

3.8 Workmanship

3.8.1 Slings Fabrication. The material used in fabricating slings shall be free from kinks, sharp bends, and other conditions or defects that would be deleterious to the finished product. Manufacturing processes shall be done neatly and accurately and not reduce the material strength.

MIL-DTL-32108 DETAIL SPECIFICATION

3.8.2 Welding. Welding procedures shall be in accordance with AWS D1.1/D1.1M. The surface of parts to be welded shall be free from rust, scale, paint, grease, or other foreign matter. Welds shall be of sufficient size and shape to develop the full strength of the parts connected by the welds. Welds shall transmit stress without permanent deformation or failure when the parts connected by the weld are subjected to proof and service loadings.

3.9 Identification Markings

3.9.1 Spreader Bar. Identification marking shall be permanently and legibly marked directly on the spreader bar or on a corrosion-resisting metal plate securely attached to the spreader bar by the manufacturer. Identification marking shall include the size (see 1.2.1), date of manufacture, and the manufacturer's model and serial number (if applicable). An example of spreader bar indelible marking is shown in figure 6.

3.9.2 Sling Assembly. Sling assembly identification markings shall be on a corrosion-resisting metal plate securely attached to the sling set. Identification marking shall include the size (see 1.2), date of manufacture, and the manufacturer's model and serial number (if applicable).

4. VERIFICATION

4.1 Classification of Inspections. The inspection requirements specified herein are classified as follows:

- a. First article inspection (see 4.2).
- b. Quality conformance inspection (see 4.3).

MIL-DTL-32108 DETAIL SPECIFICATION

4.2 First Article Inspection. When required by 3.2 (noted in 6.2) a first article inspection shall include the examination of 4.5 and the tests of 4.6. The first article may be either a first production item or a standard production item from the supplier's current inventory, provided the item meets the requirements of the specification and is representative of the design, construction, and manufacturing technique applicable to the remaining items to be furnished under the contract.

4.3 Quality Conformance Inspection. The quality conformance inspection shall include examination of 4.5 and the proof load test of 4.6.

4.4 Inspections. Unless otherwise specified in the contract, the supplier is responsible for the performance of all required tests and inspections. With Government approval, the contractor may use any facility suitable for performing the tests and inspections. The Government reserves the right to conduct tests and inspections.

4.5 Examination. Each spreader bar/sling assembly shall be examined for compliance with the requirements of section 3 of this document. Any redesign or modification of the supplier's standard product to comply with the specified requirements or modification following failure to meet the specified requirements shall receive particular attention for adequacy and suitability. This element of inspection shall include all visual examinations and dimensional measurements. Noncompliance with any specified requirements or presence of one or more defects preventing or lessening maximum efficiency shall constitute cause for rejection.

4.6 Tests

4.6.1 Proof Testing Sling-Legs. All sling-legs shall be proof load tested to twice rated capacity. Test loads required for proof loading are in table 1. The load given for the sling legs above the spreader bar (upper sling legs) is a resolved load that accounts for sling leg angle. The load shall be held for not less than 5 minutes. Any evidence of permanent deformation other than normal thimble deformation shall be cause for rejection of the sling-leg assembly.

MIL-DTL-32108 DETAIL SPECIFICATION
Table 1. Sling-Leg Proof Loads

Pounds (kN)

Size 30/9	Upper Sling Legs	78,320 (348)
Size 30/9	Lower Sling Legs	60,000 (267)
Size 40/18	Upper Sling Legs	113,140 (503)
Size 40/18	Single Lower Sling Legs	80,000 (356)
Size 40/18	Two Lower Sling Legs	40,000 (178)

4.6.2 Proof Testing Assemblies. When specified (see 6.2), sling assemblies shall be proof load tested to twice rated capacity. Test loads required for proof loading are in table 2. The load shall be held for not less than 5 minutes. Any evidence of permanent deformation other than normal thimble deformation shall be cause for rejection of the sling assembly.

Table 2. Assembly Proof Loads

Pounds (kN)

Size 30/9	120,000 (534)
Size 40/18	160,000 (712)

5. PACKAGING

5.1 Packaging. Preservation, packing and marking shall be as specified in the contract or order (see 6.2).

6. NOTES: This section contains information of a general or explanatory nature that may be helpful, but is not mandatory.

MIL-DTL-32108 DETAIL SPECIFICATION

6.1 Intended Use. The spreader bar/sling assemblies covered by this specification are intended for use in cargo handling for shipboard and other loading operations in lifting vehicles and large pieces of equipment. The Size 40/18 spreader bar (with 6-foot minimum lower slings) is suitable for top lifting 20-foot ISO containers or flatracks. Size 30/9 spreader bars (with sufficient length lower slings and commercial bottom-lifting-adaptors) are suitable for bottom lifting 20- and 40-foot ISO containers or flatracks.

6.2 Acquisition Requirements. Acquisition documents must specify the following:

- a. Title, number, and date of the specification.
- b. Size of spreader bar assembly required (see 1.2.1). Quantity and length of lower legs for 30/9 or 40/18 (see figure 4). The lower legs for both the 30/9 and the 40/18 should be of equal length between 10 to 12 feet and ending in a thimble eye. Appropriately sized shackles/hooks/ choker-cables will be added in the field as needed.
- c. Suggested color: 30/9 Spreader bar: Yellow.
40/18 Spreader bar: Blue.
Shackles, Bolts and other parts: Galvanized or factory finish.
- d. When required, the quantity and size of Storage Racks (Appendix A and B).
- e. When first article is required for inspection and approval (see 3.2 and 4.2), the contracting officer shall include specific instructions in acquisition documents regarding arrangements for examination, test, and approval of the first article. The contracting officer shall specify proof testing, when deemed necessary, of the sling-legs (see 4.6.1) or the complete assemblies (see 4.6.2).
- f. Packing requirements (see 5.1).

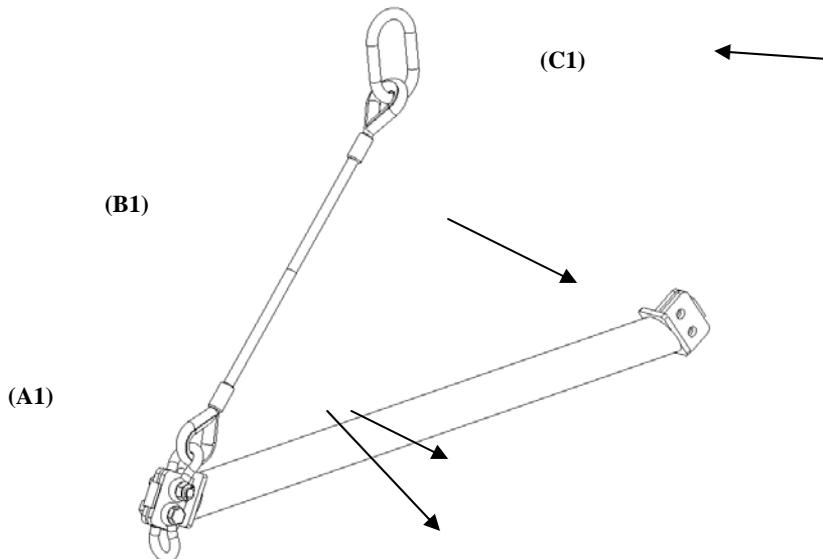
MIL-DTL-32108 DETAIL SPECIFICATION

6.3 Supersession information. This specification replaces Federal Specification FF-S-2874, dated 16 December 1997, which replaced Military Specification MIL-S-22824E, dated 14 September 1993.

6.4 Subject term (key word) list

Shackle
Spreader bar
Wire rope

MIL-DTL-32108 DETAIL SPECIFICATION



(A1) 1-1/2-inch, Grade-B, Safety Anchor Shackles – four required

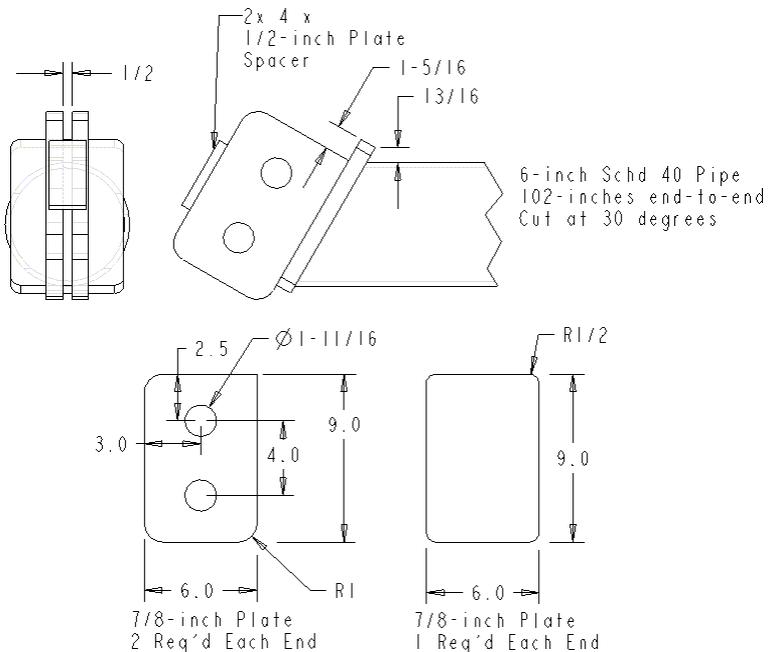
(B1) 1-5/8-inch Wire Rope – upper slings 70 inches (- 0/ +2”) (sling length measured from Thimble contact with shackle to thimble contact with Master-Link) one upper sling shown – two required

(C1) 1-3/4-inch bar Master-Link (WLL \geq 30 STON) – one required

Lower Slings (Not Shown) 1-3/8-inch Wire Rope – two required
Lower sling lengths as specified in 6.2 b

Figure 1. Size 30/9

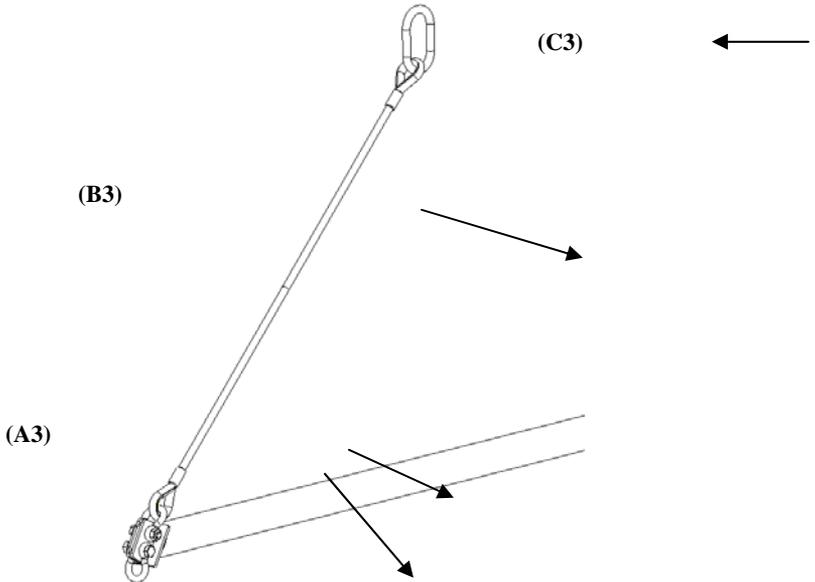
MIL-DTL-32108 DETAIL SPECIFICATION



Construction Details

Figure 2. Size 30/9

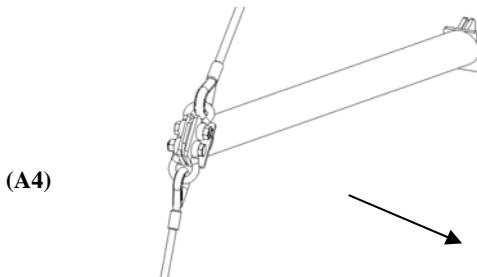
MIL-DTL-32108 DETAIL SPECIFICATION



- (A3) 1-5/8-inch, Grade-B, Safety Anchor Shackles – four required
- (B3) 1-7/8-inch Wire Rope – upper slings 140 inches (- 0/ +3”) (sling length measured from Thimble contact with shackle to thimble contact with Master-Link) one upper sling shown – two required
- (C3) 2-inch bar Master-Link (WLL= \geq 40 STON) – one required

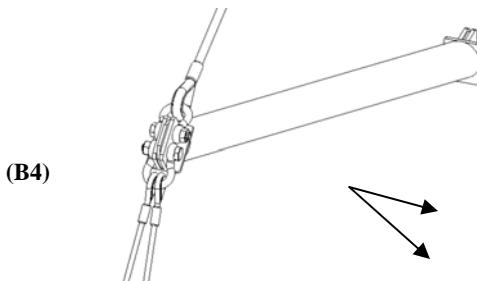
Figure 3. Size 40/18

MIL-DTL-32108 DETAIL SPECIFICATION



[upper slings as shown in Figure 3]

- (A4) Rigged with 1-5/8-inch lower slings – two required
Lower sling lengths as specified in 6.2 b

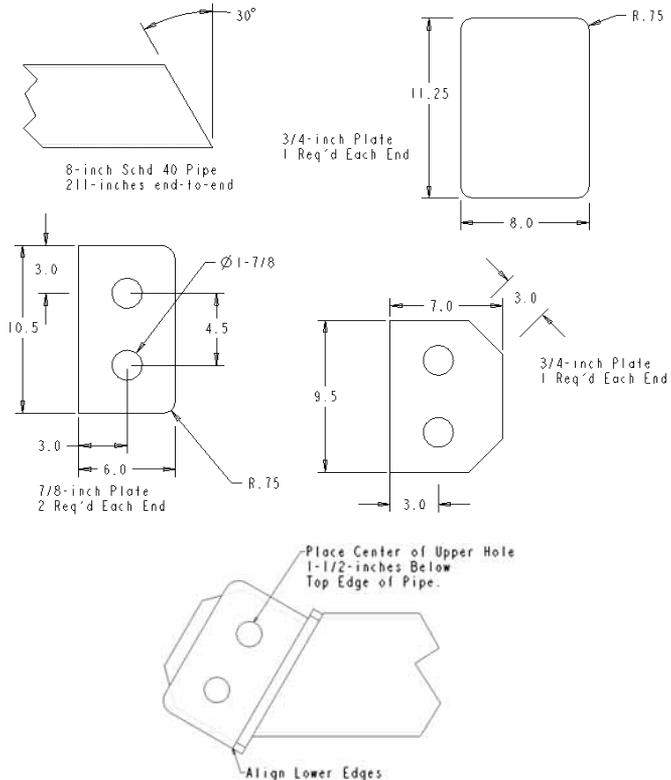


OR

- (B4) 1-1/8-inch Lower Slings – four required
Lower sling lengths as specified in 6.2 b

Figure 4. Size 40/18

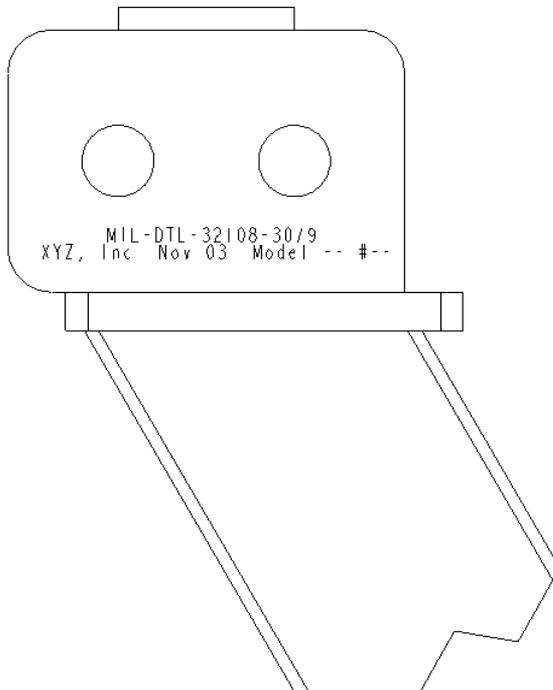
MIL-DTL-32108 DETAIL SPECIFICATION



Construction Details

Figure 5. Size 40/18

MIL-DTL-32108 DETAIL SPECIFICATION



1/2 to 3/8-inch Steel-Stamp Marking

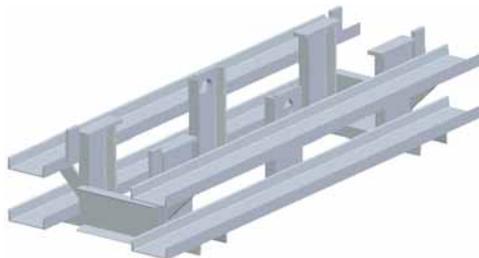
Figure 6. Size Marking

MIL-DTL-32108 DETAIL SPECIFICATION

**Appendix A
30/9 Storage Rack**



**Storage Rack for two 30/9 Spreader-Bars
Loaded Stackable Storage Rack Shown; Empty Trays
for Lower Sling-Legs**



**Storage Rack for two 30/9 Spreader-Bars
Empty Rack Shown ~600 pounds**

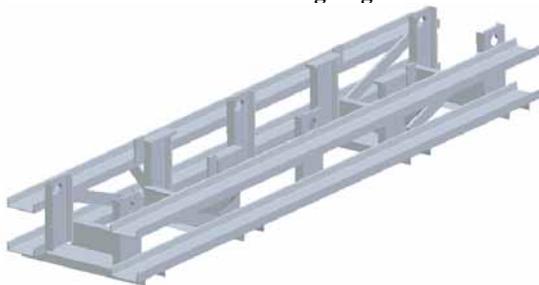
Figure A-1 30/9

MIL-DTL-32108 DETAIL SPECIFICATION

**Appendix B
40/18 Storage Rack**



**Storage Rack for two 40/18 Spreader-Bars
One Stackable Storage Rack Shown; Empty Tray
for Lower Sling-Legs**



**Storage Rack for two 40/18 Spreader-Bars
Empty Stackable Storage Rack Shown ~1,170 pounds**

Figure B-1 40/18

Contact SDDC Transportation Engineering Agency, (email DPEmail@tea.army.mil) for construction details.

WIRE ROPE STRENGTH

Wire rope strength is usually measured in tons of 2,000 pounds and rated to a breaking strength. Breaking strength is the nominal strength for a rope. When wire rope is placed under tension on a test device, new ropes will actually break at a figure equal to, or higher than, the rated breaking strength.

The U.S. Government acceptance strength on wire ropes shall not be less than 97-1/2 percent of the nominal breaking strength. All new or unused rope must meet U.S. Government acceptance strength.

The strength of a wire rope to be used in a specific application is determined by four factors: wire rope diameter, type of construction, grade of wire, and type of core.

Table 3-1 (see next page) lists the nominal strengths for slings constructed of 6 x 19 and 6 x 37, Type I, Class 3 improved and extra improved plow steel IWRC.

Observe the following sling safety considerations:

- Remember that, as the angle of a sling is increased, the ability of the sling to support a load decreases. At 45o, slings will be able to support only 70% of their nominal capacity. Do not lift with angles of less than 45 degrees from horizontal (or more than 45o from the vertical).

- Never overload a sling, and never apply loads suddenly.

- Never be too confident of a new sling. Do not overload it because it is new.

NOTE

Slings constructed of high performance synthetic fibers of adequate strength may be substituted for wire rope slings. Synthetic fiber sling properties will include:

- Limited overall stretch (~1% of length) at rated capacity.
- Chafing/abrasion/UV protective cover that is repairable.
- Inspection features that clearly tell a stevedoring/crane crew, “SLING CAN NOT BE USED”:
- Color coded visual warning of sling chafing/abrasion damage.
- A visual indicator of internal cord overload.
- A continuity gauge to indicate cord fiber damage caused by crushing, cutting, heat, chemicals or other abuse.

A lifting bar of adequate size and strength also may be substituted if the lifting bar does not contact any component of the vehicle beneath the frame, such as the winch, engine, or steering gear.

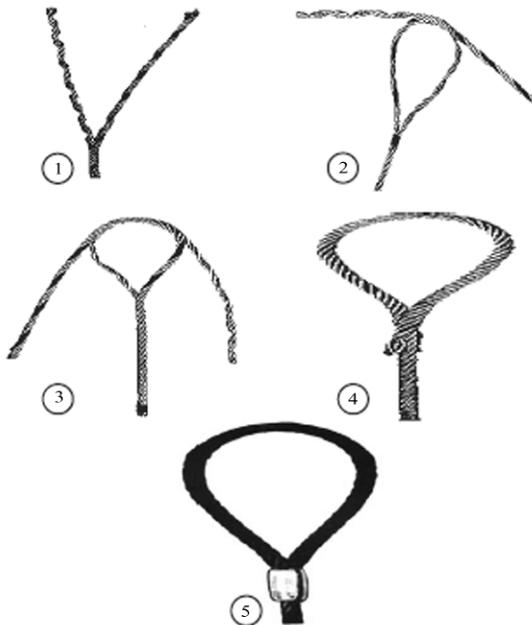
Table 3-1. Nominal Strength of Slings Constructed of 6 x 19 and 6 x 37 Improved Wire Rope Core with Flemish Eye Splice.

Nominal Diameter (inches)	Nominal Strength (tons)	
	Improved Plow Steel	Extra Improved Plow Steel
1/2	10.4	12
5/8	15.9	18.5
3/4	23	26.5
7/8	31.1	35.8
1	40.4	46.5
1-1/4	62.5	71.9
1-1/2	89	103
1-3/4	120	138
2	155	178
2-1/4	193	222
2-1/2	235	271
2-3/4	282	324

NOTE
Nominal strength reflects a 10% reduction
in wire rope strength due to flemish eye splice.

Flemish Eye Splice

Sling eyes are formed using the flemish eye splice as illustrated below. The ends are secured by pressing a metal sleeve over the ends of the strands of the splice. Pull is directly along the centerline of rope and eye. This gives the most efficient use of rope capacity and is economical.



Flemish eye splice.

Section IV. Lifting Wheeled Vehicles

Do not install lifting slings on the front bumper shackles of the M39-, M809-, and M939A1-series 5-ton truck. Use a 4-foot assembly of 3/4-inch diameter, or larger, 6 x 19 IWRC wire rope with a loop in each end. Each loop will have a thimble. The loop with thimble may have a splice or swaged fitting. A zinc-covered fitting with an eye large enough to fit a sling leg or shackle may be used in place of loop with thimble. Use malleable sheet metal or hard-cushioning strips at sharp corners and edges to prevent cutting the wire rope or damaging the vehicle.

Table 4-1. Wheeled Vehicles (Lifting).

Model	Item	Curb Weight (lb)	Gross Weight (lb)	Page
H40XL	Forklift, 4K, Hyster	8,730	N/A	4-9
H60XL	Forklift, 6K, Hyster	10,915	N/A	4-9
LAV-25	Light Armored Vehicle	24,100	28,420	4-10
M10A	Trk, Forklift, 10,000 lb RT	36,315	N/A	4-11
M35A1/2	Trk, Cargo, 2-1/2-ton, WWN	13,720	18,720	4-12
M49A2C	Trk, Tank, Fuel, 2-1/2-ton, WWN	14,860	19,180	4-12
M50A3	Trk, Tank, Water, 2-1/2-ton, WWN	15,150	19,400	4-12
M51A2	Trk, Dump, 5-ton, WWN	22,665	32,663	4-12
M52Trk,	Tractor, 5-ton	17,948	N/A	4-13
M62Trk,	Wrecker, Med, WWN	32,270	N/A	4-12
M63Trk,	Chassis, 5-ton, WWN	18,934	N/A	4-12
M109A3	Trk, Van, Shop 2-1/2-ton, WWN	15,800	20,800	4-12
M246A2	Trk, Wrecker, Med, WWN	32,990	N/A	4-12
M275A2	Trk, Tractor, 2-1/2-ton, WWN	12,645	N/A	4-12
M291A1D	Trk, Van, Exp, 2-1/2-ton	25,572	N/A	4-14
M342A2	Trk, Dump, 2-1/2-ton, WWN	15,775	20,775	4-12
M543A2	Trk, Wrecker, Med, WWN	34,250	N/A	4-13
M813	Trk, Cargo, 5-ton	21,020	31,020	4-12
M813A1	Trk, Cargo, 5-ton, WWN	21,120	31,120	4-12
M814	Trk, Cargo, 5-ton, WWN	23,540	33,540	4-12
M815	Trk, Bolster, Log, 5-ton, WWN	21,040	31,040	4-12
M816	Trk, Wrecker, 5-ton, WWN	35,050	N/A	4-12
M817	Trk, Dump, 5-ton, WWN	23,755	33,755	4-12
M818	Trk, Tractor, 5-ton, WWN	20,165	N/A	4-13
M819	Trk, Wrecker, 5-ton, WWN	35,065	N/A	4-12

Table 4-1. Wheeled Vehicles (Lifting), continued.

Model	Item	Curb Weight (lb)	Gross Weight (lb)	Page
M820	Trk, Van, Expansible, 5-ton	28,185	33,195	4-14
M820A2	Trk, Van, Expansible, 5-ton	30,195	35,195	4-14
M821	Trk, Stake, 5-ton, WWN	28,880	38,880	4-12
M911	Trk, Tractor, HET, 22-1/2-to	39,952	N/A	4-16
M915	Trk, Tractor Line Haul, 14-ton	18,500	N/A	4-17
M915A1	Trk, Tractor, Line Haul, 25-ton	18,900	N/A	4-17
M915A2	Trk, Tractor, Line Haul, 25-ton	18,680	N/A	4-17
M916	Trk, Tractor, LET	24,000	N/A	4-17
M916A1	Trk, Tractor, LET	27,740	N/A	4-17
M917	Trk, Dump, 20-ton	34,080	74,080	4-18
M918	Trk, Bituminous, 22-1/2-ton	29,839	74,839	4-18
M919	Trk, Concrete, Mixer, 22-1/2-ton	37,540	82,540	4-18
M920	Trk, Tractor, MET 20-ton	26,200	N/A	4-17
M923	Trk, Cargo, 5-ton	21,770	32,070	4-19
M923A1	Trk, Cargo, 5-ton, WWN	23,275	33,275	4-19
M923A2	Trk, Cargo, 5-ton, WWN	20,930	30,930	4-19
M924	Trk, Cargo, 5-ton	21,370	31,370	4-19
M924A1	Trk, Cargo, 5-ton, WWN	23,175	33,175	4-19
M925	Trk, Cargo, 5-ton	22,750	32,750	4-19
M925A1	Trk, Cargo, 5-ton, WWN	23,275	33,275	4-19
M925A2	Trk, Cargo, 5-ton, WWN	22,030	32,030	4-19
M926	Trk, Cargo, 5-ton	22,470	32,470	4-19
M926A1	Trk, Cargo, 5-ton, WWN	23,175	33,175	4-19
M927A1	Trk, Cargo, 5-ton, WWN	26,135	36,135	4-19
M927A2	Trk, Cargo, 5-ton, WWN	23,790	33,790	4-19
M928A1	Trk, Cargo, 5-ton, WWN	26,135	36,135	4-19

Table 4-1. Wheeled Vehicles (Lifting), continued.

Model	Item	Curb Weight (lb)	Gross Weight (lb)	Page
M928A2	Trk, Cargo, 5-ton, WWN	24,890	34,890	4-19
M929	Trk, Dump, 5-ton	23,990	33,990	4-19
M929A1	Trk, Dump, 5-ton, WWN	26,165	36,165	4-19
M930	Trk, Dump, 5-ton	25,090	35,090	4-19
M930A1	Trk, Dump, 5-ton, WWN	26,165	36,165	4-19
M931	Trk, Tractor, 5-ton	20,510	N/A	4-19
M931A1	Trk, Tractor, 5-ton, WWN	22,240	N/A	4-19
M931A2	Trk, Tractor, 5-ton, WWN	19,895	N/A	4-19
M932	Trk, Tractor, 5-ton, WWN	21,150	N/A	4-19
M932A2	Trk, Tractor, 5-ton, WWN	20,995	N/A	4-19
M934	Trk, Van, Expansible, 5-ton	28,440	38,440	4-14
M934A1	Trk, Van, Expansible, 5-ton	29,280	34,280	4-14
M935A1	Trk, Van, Expansible, 5-ton	31,280	36,280	4-14
M936	Trk, Wrecker, 5-ton, WWN	37,600	N/A	4-14
M936A1	Trk, Wrecker, 5-ton, WWN	38,155	N/A	4-14
M950B	Scoop Loader			4-11
M966	Trk, Tow Missile, (HMMWV)	5,269	8,128	4-20
M977	Trk, Cargo, 10-ton	35,500	60,000	4-21
M978	Trk, Tank, Fuel (HEMTT)	34,920	60,000	4-22
M983	Trk, Tractor, 10-ton (HEMTT)	30,760	N/A	4-23
M984	Trk, Wrecker, 10-ton (HEMTT)	42,215	N/A	4-24
M984A1	Trk, Wrecker, 10-ton (HEMTT)	53,000	63,000	4-25
M985	Trk, Cargo, 10-ton (HEMTT)	38,271	60,000	4-21
M996	Trk, Amb, 2-litter (HMMWV)	5,800	8,600	4-26

Table 4-1. Wheeled Vehicles (Lifting), continued.

Model	Item	Curb Weight (lb)	Gross Weight (lb)	Page
M997	Trk, Amb, 1-1/4-ton (HMMWV)	5,800	8,600	4-26
M998	Trk, Utility, 3/4-ton (HMMWV)	7,400	7,700	4-20
M1008	Trk, Cargo, 1-1/4-ton (CUCV)	5,950	9,200	4-27
M1008A1	Trk, Utility, 1-1/4-ton (CUCV)	5,950	9,200	4-27
M1009	Trk, Utility, 1-1/4-ton (CUCV)	5,200	6,700	4-27
M1010	Trk, Amb, 1-1/4-ton (CUCV)	7,475	9,555	4-27
M1025	Trk, Armt, 1-1/4-ton (HMMWV)	6,104	8,200	4-20
M1026	Trk, Utility, 1-1/4-ton (HMMWV)	6,237	8,333	4-20
M1028	Trk, Cargo, 1-1/4-ton (CUCV)	5,750	9,350	4-27
M1028A2	Trk, Utility, 1-1/4-ton (CUCV)	6,120	10,120	4-27
M1035	Trk, Amb, 1-1/4-ton (HMMWV)	5,297	7,900	4-26
M1036	Trk, Amb, 1-1/4-ton (HMMWV)	5,200	8,800	4-26
M1037	Trk, Cargo, 1-1/4-ton (HMMWV)	5,484	8,660	4-26
M1038	Trk, Utility, 1-1/4-ton (HMMWV)	5,591	7,833	4-20
M1042	Trk, Shelter, 1-1/4-ton (HMMWV)	5,617	8,660	4-26

Table 4-1. Wheeled Vehicles (Lifting), continued.

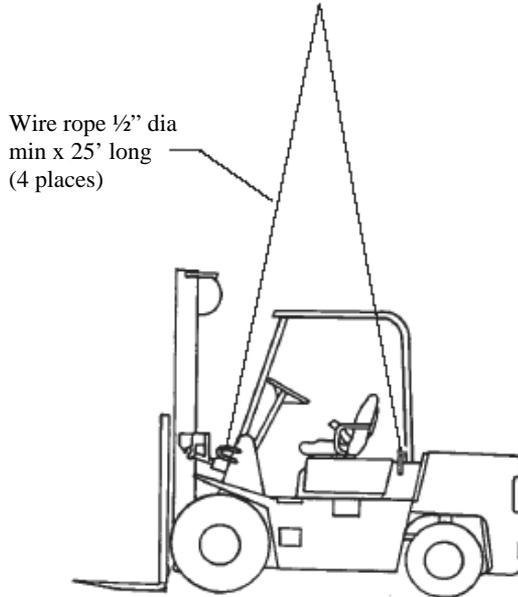
Model	Item	Curb Weight (lb)	Gross Weight (lb)	Page
M1043	Trk, Armt, 1-1/4-ton (HMMWV)	7,673	8,473	4-20
M1044	Trk, Armt, 1-1/4-ton (HMMWV)	7,803	8,600	4-20
M1045	Trk, TOW, 1-1/4-ton (HMMWV)	7,549	8,149	4-20
M1046	Trk, TOW, 1-1/4-ton (HMMWV)	7,679	8,729	4-20
M1070	HET Tractor	40,999	N/A	4-28
M1074	PLS Truck w/flatrack	55,010	88,000	4-29
M1075	PLS Truck w/flatrack	49,520	82,960	4-29
M1076	PLS Trailer w/flatrack	16,530	49,520	4-31
M1077	PLS Flatrack	3,190	36,620	4-32
M1078	LMTV, Cargo	18,137	25,273	4-33
M1079	LMTV, Van	19,879	26,076	4-33
M1081	LMTV, Cargo, A/D	19,379	25,975	4-33
M1083	MTV, Cargo	21,473	33,463	4-33
M1083A1	MTV, Cargo	21,473	33,463	4-33
M1084	MTV, Cargo, W/MHE	24,510	36,152	4-33
M1085	MTV, Long Cargo	22,001	34,738	4-33
M1086	MTV, Long Cargo, W/MHE	26,076	37,422	4-33
M1088	MTV, Tractor	21,184	N/A	4-34
M1089	MTV, Wrecker	36,325	N/A	4-34
M1090	MTV, Dump	23,082	34,986	4-33
M1093	MTV, Cargo, A/D	22,653	34,273	4-33
M1094	MTV, Dump, A/D	24,296	35,503	4-33
M1097	HHV, HMMWV Heavy Variant	5,600	10,001	4-26
M1097A1	HHV, HMMWV Heavy Variant	5,600	10,000	4-26

Table 4-1. Wheeled Vehicles (Lifting), continued.

Model	Item	Curb Weight (lb)	Gross Weight (lb)	Page
M1097A2	HHV, HMMWV Heavy Variant	5,900	10,000	4-26
M1113	HHV, HMMWV Heavy Variant	6,380	11,500	4-26
M1114	HHV, HMMWV Heavy Variant	9,800	12,100	4-26
M1117	Armored Security Vehicle (ASV)	N/A	12,428	4-35
M1120	Trk, Cargo, 10-ton (HEMTT) w/ LHS	35,000		4-36
M1151	Trk, Utility, Expanded Capacity (HMMWV)	7,460	11,500	4-28
M1152	Trk, Utility, Expanded Capacity (HMMWV)	6,400	11,500	4-28
MT250	Crane, Truck-Mounted, 25-ton	65,800	N/A	4-40
M1126	Infantry Carrier Vehicle with Slat Armor	35,574 39,574	40,836 44,836	4-37
M1127	Reconnaissance Vehicle with Slat Armor	36,403 40,403	40,168 44,168	4-37
M1128	Mobile Gun System with Slat Armor	37,311 41,754	43,172 47,172	4-37
M1129	Mortar Carrier with Slat Armor	38,807 42,087	41,923 45,923	4-37
M1130	Commander's Vehicle with Slat Armor	36,614 40,614	39,243 43,243	4-37
M1131	Fire Support Vehicle with Slat Armor	36,364 40,364	38,743 42,743	4-37
M1132	Engineering Squad Vehicle with Slat Armor	36,425 40,425	42,166 46,166	4-37

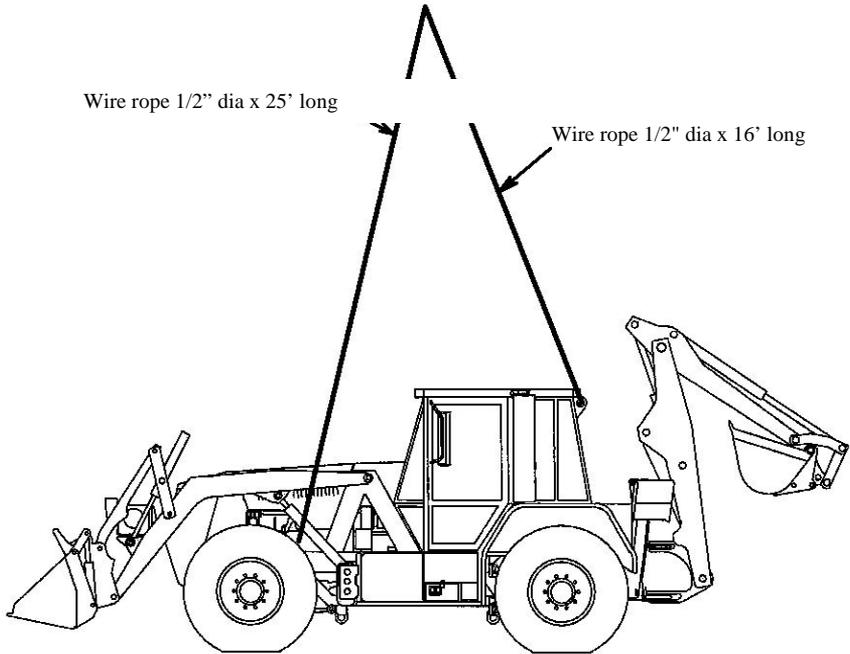
Table 4-1. Wheeled Vehicles (Lifting), continued.

Model	Item	Curb Weight (lb)	Gross Weight (lb)	Page
M1133	Medical Evacuation Vehicle with Slat Armor	37,480 41,480	39,720 43,720	4-37
M1134	Anti-Tank Guided Missile with Slat Armor	38,959 42,959	41,478 45,478	4-37
M1977	Common Bridge Transporter (CBT) System	37,240	55,620	4-38
MK23	Medium Tactical Vehicle Replacement (MTVR)	27,753	42,560	4-39
MK25	Medium Tactical Vehicle Replacement (MTVR)	28,642	43,451	4-39
MK27	Medium Tactical Vehicle Replacement (MTVR)	30,067	44,666	4-39
MK28	Medium Tactical Vehicle Replacement (MTVR)	30,955	45,557	4-39
MT300	Crane, Truck-Mounted, 30-ton	69,910	N/A	4-40
MW24C	Loader, Scoop, Wheel	26,540	N/A	4-11
PATRIOT	Electric Power Plant (EPP) III	N/A	52,910	4-21
RTCH	Rough Terrain Container Handler	118,040	N/A	4-41
SEE	Small Emplacement Excavator	15,000	33,000	4-42
7-1/2-ton	Crane, Rough Terrain	24,230	N/A	4-43

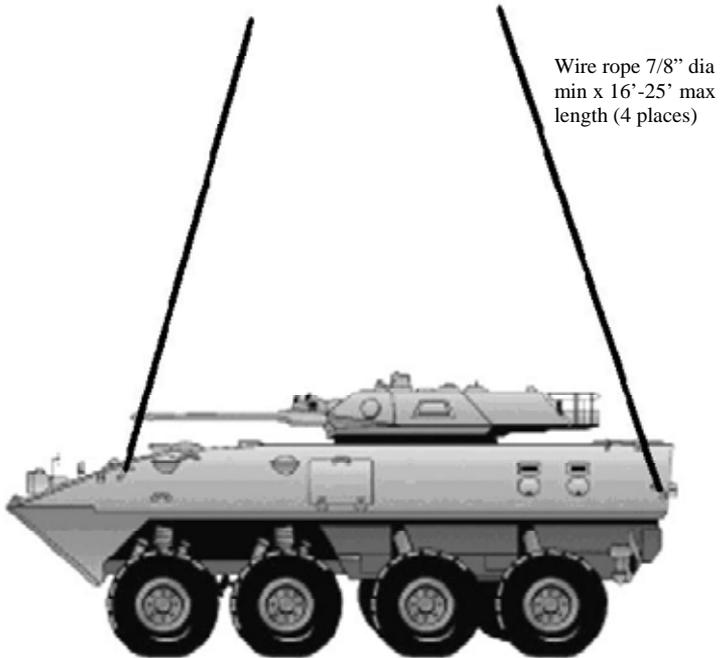


Other similar lifts: Hyster, Model H-40XL

Forklift 6K Hyster, Model H-60XL.



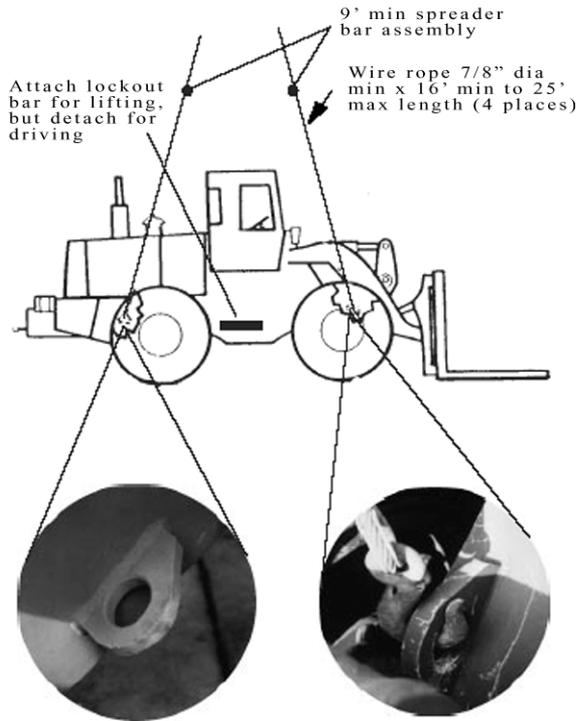
Interim High Mobility Engineer Excavator (IHMEE)



NOTE

**These procedures DO NOT apply to the
Stryker family of vehicles**

Light Armored Vehicle - 25 (LAV-25).



Other similar lifts: MW24C, M950B

M10A, 10,000-pound rough terrain forklift truck.

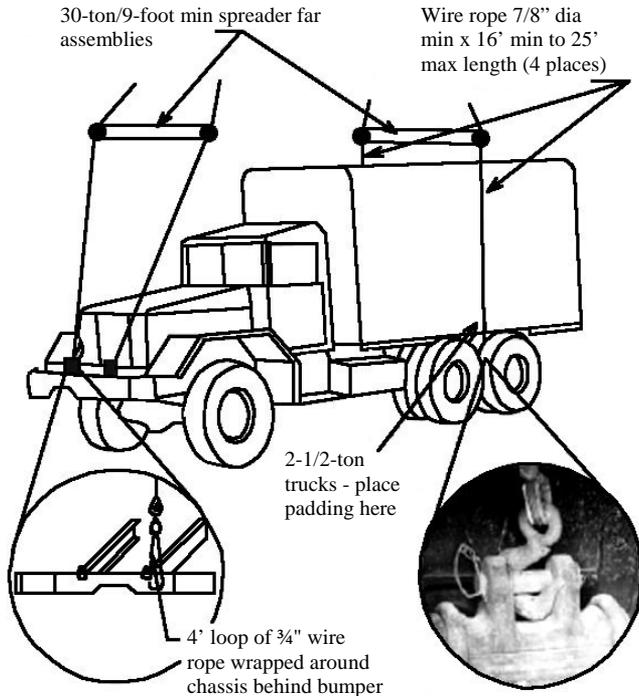
Lifting 5-ton Trucks

Do not install lifting slings on the front bumper shackles of the M39-, M809-, and M939A1-series 5-ton truck. Use a 4-foot assembly of 3/4-inch diameter, or larger, 6x 19 IWRC wire rope with a loop in each end. Each loop will have a thimble. The loop with thimble may have a splice or swaged fitting. A zinc-covered fitting with an eye large enough to fit a sling leg or shackle may be used in place of loop with thimble. Use malleable sheet metal or hard-cushioning strips at sharp corners and edges to prevent cutting the wire rope or damaging the vehicle.

WARNING

Before lifting 5-ton series trucks, check the rear spring pin used for lifting. The proper pin is National Stock Number 5315-01-206-2239, part number 7339966-1.

Some pins already have been replaced by the U.S. Army Tank Automotive Command. These pins have a “B” stamped on the end. If the pin does not meet one of the above requirements, replace the pin before lifting the vehicle.



WARNING

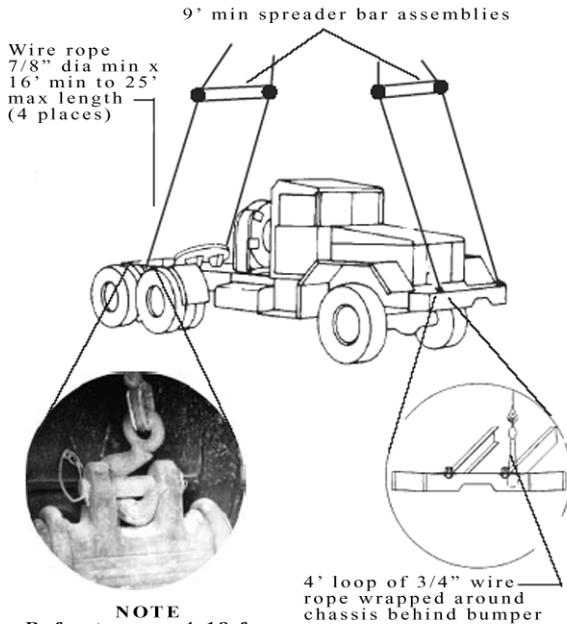
Do not use truck's own shackles for lifting.



NOTE
Refer to page 4-18 for alternate method when lifting pin is missing.

Other similar lifts: M35A1/A2, M49A2C, M50A3, M51A2, M62, M63, M109A3, M246A2, M275A2, M342A2, M813A1, M814, M815, M816, M817, M819, M821

M813, truck, cargo, 5-ton.

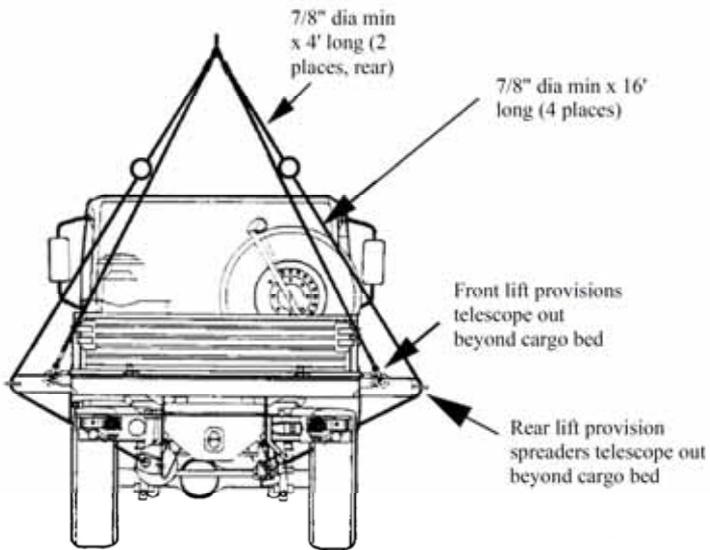


WARNING

Do not use truck's shackles for lifting.

Other similar lifts: M52, M543A2

M818, truck, tractor, 5-ton.

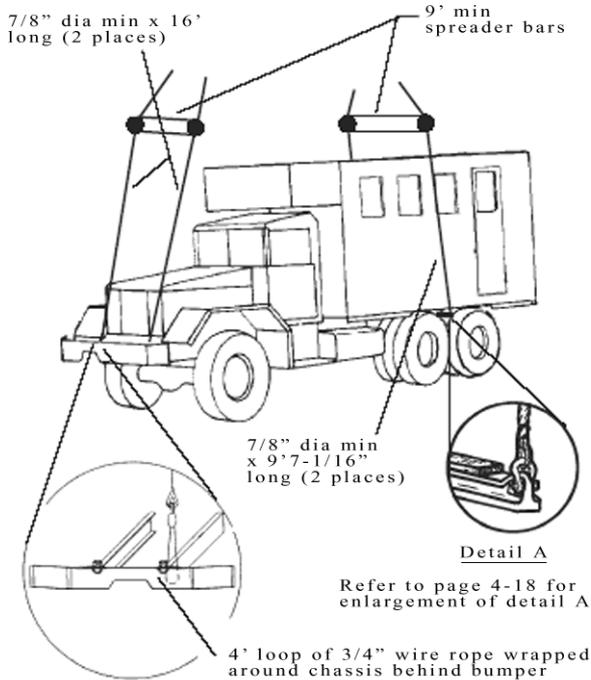
**NOTE**

M1079 van has a top-mounted spreader device for lifting.

HIMARS launcher is not suitable for crane lift.

Other similar lifts: M142, M1078, M1079, M1080, M1081, M1083A1, M1084, M1085, M1086, M1090, M1093, M1094

M 1083, FMTV, 5-ton Standard Cargo.

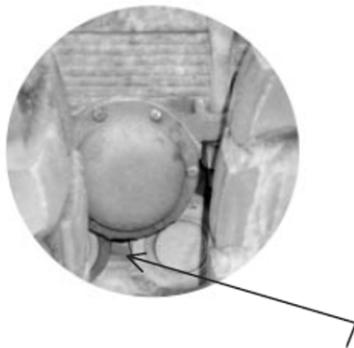
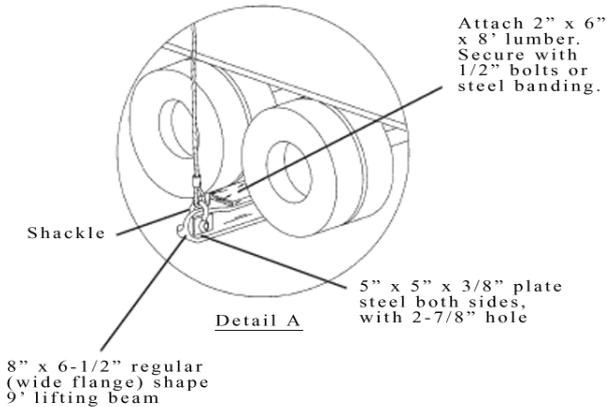


WARNING

Do not use truck's own shackles for lifting.

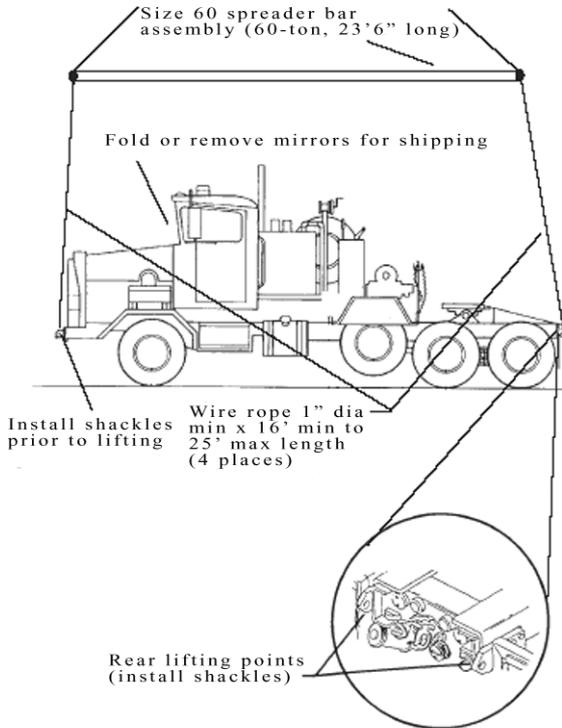
Other similar lifts: M291A1D, M820, M820A2, M934A1, M935A1, M936, M936A1

M934, truck, van, expansible, 5-ton.



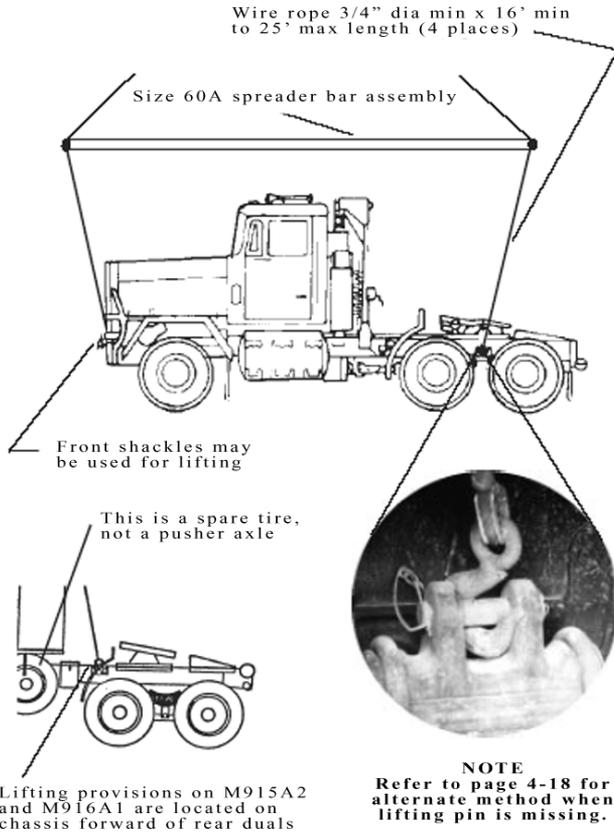
NOTE
If a lifting beam is not available, locate sling as indicated by the arrow (except expansible vans).

Detail A.



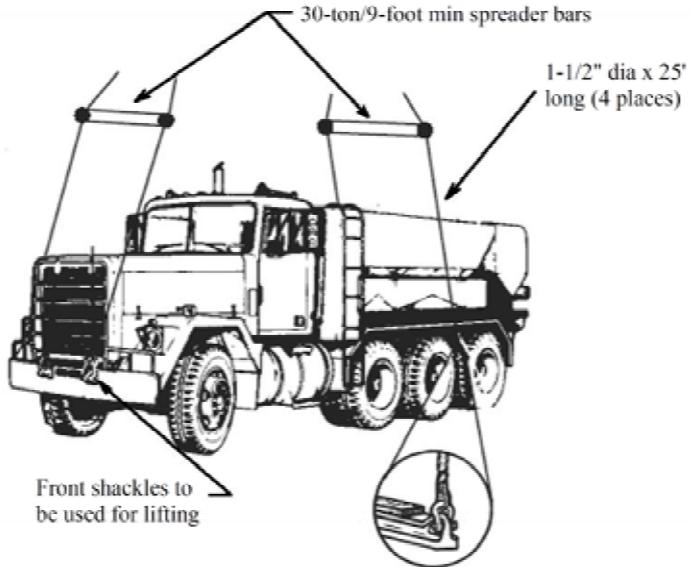
Other similar lifts: None

M911, truck tractor, HET, 22-1/2-ton.



Other similar lifts: M915, M915A2, M916, M916A1, M920

M915A1, truck, tractor, line haul, 14-ton.



30-ton/9-foot min spreader bars

1-1/2" dia x 25' long (4 places)

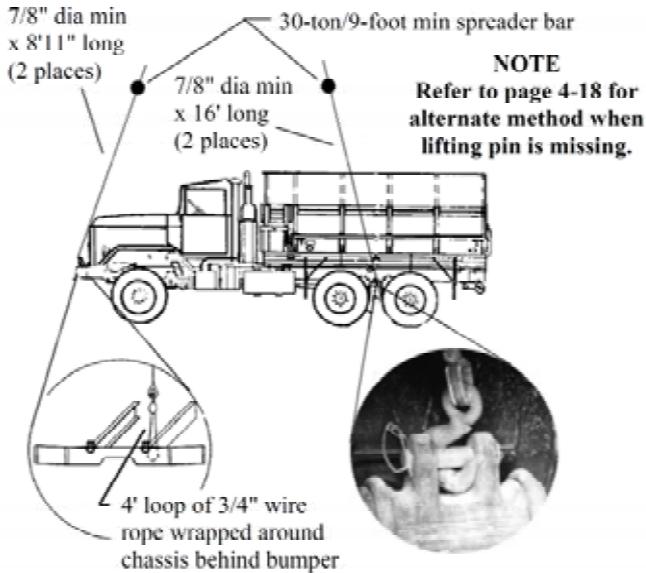
Front shackles to be used for lifting

Detail A

Refer to page 4-18 for Enlargement of detail A

Other similar lifts: M917, M918

M919, truck, concrete, mobile mixer, 22-1/2-ton.



WARNING



Do not use truck's own shackles for lifting (except A2 models).

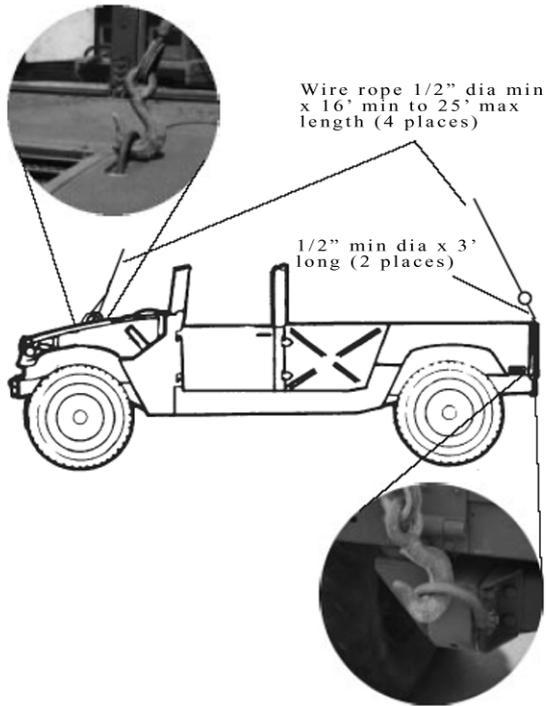
CAUTION



**This method cannot be used for lifting
expandable vans (see page 4-17).**

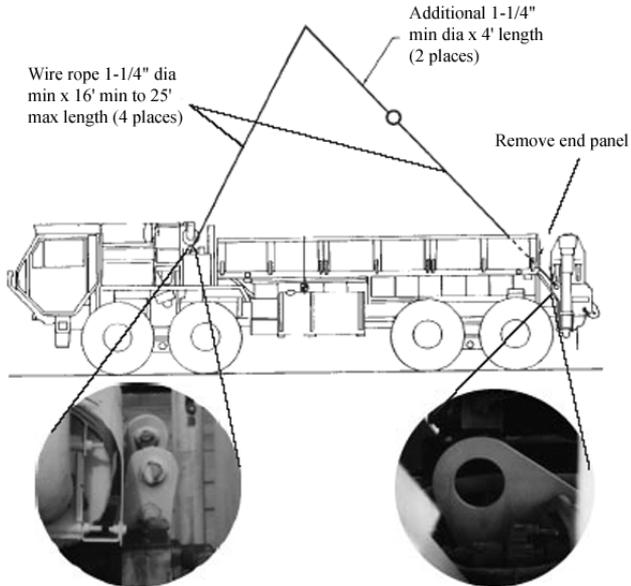
Other similar lifts: M939- and M939A1-series trucks (M923 through M931A2), M932, M932A2, M936, M936A1, M939A2

M924, truck cargo, 5-ton.



Other similar lifts: M966, M1025, M1026, M1038, M1043, M1044, M1045, M1046

M998, truck, utility, 1-1/4-ton (HMMWV).

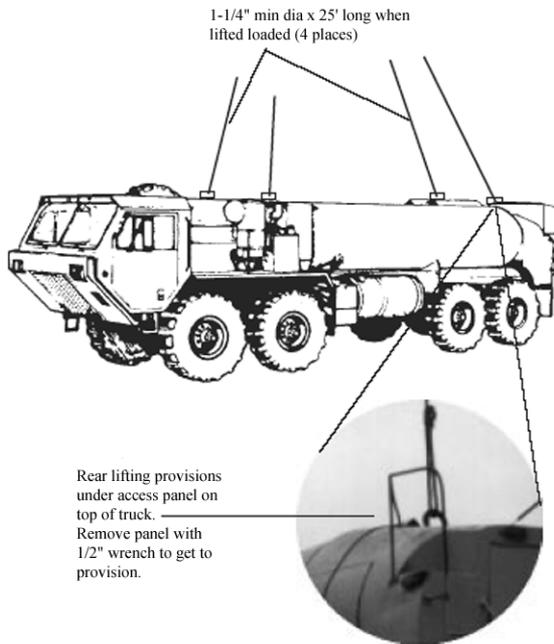


NOTE

Shackle furnished with HEMTT, or shackle, screw pin, pin dia 1-1/2" NSN 4030-00-169-9297 (4 places).

Other similar lifts: M985, PATRIOT Electric Power Plant (EPP) III

M977, truck, cargo, 10-ton, 8 x 8 (HEMTT).

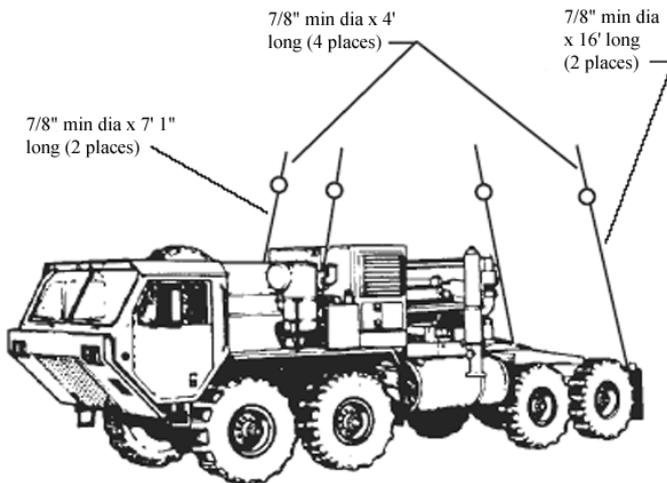


NOTES

30-ton spreader bar assembly may be used with 16-ft or 25-ft long slings.

Shackle furnished with HEMTT, or shackle, screw pin, pin dia 1-1/2" NSN 4030-00-169-9297 (4 places).

M978 truck, fuel-servicing, 10-ton, 8 x 8 (HEMTT).

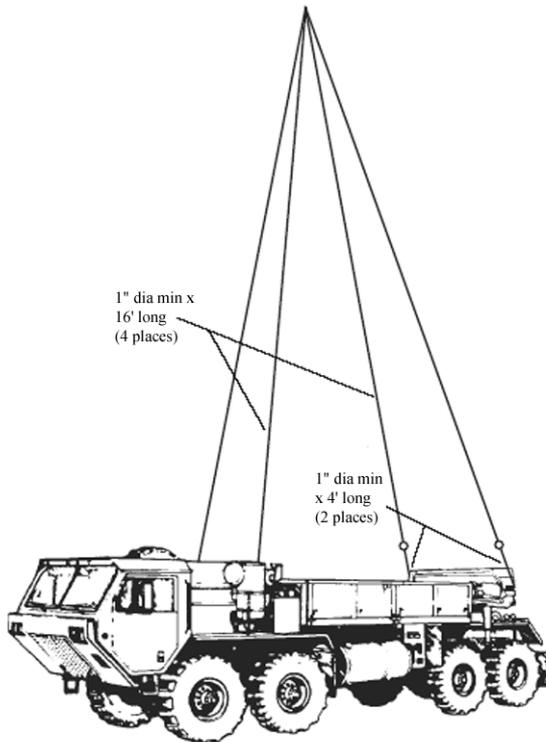


NOTES

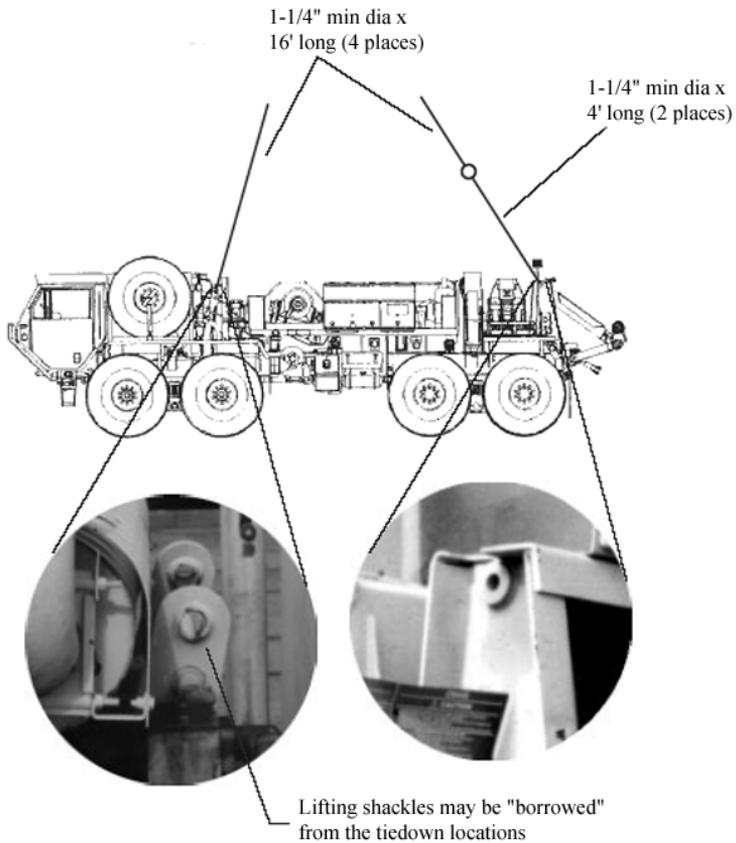
**HEMTT with crane...use
two 25-ft slings on rear.**

**HEMTT without crane...use
two 16-ft slings on front.**

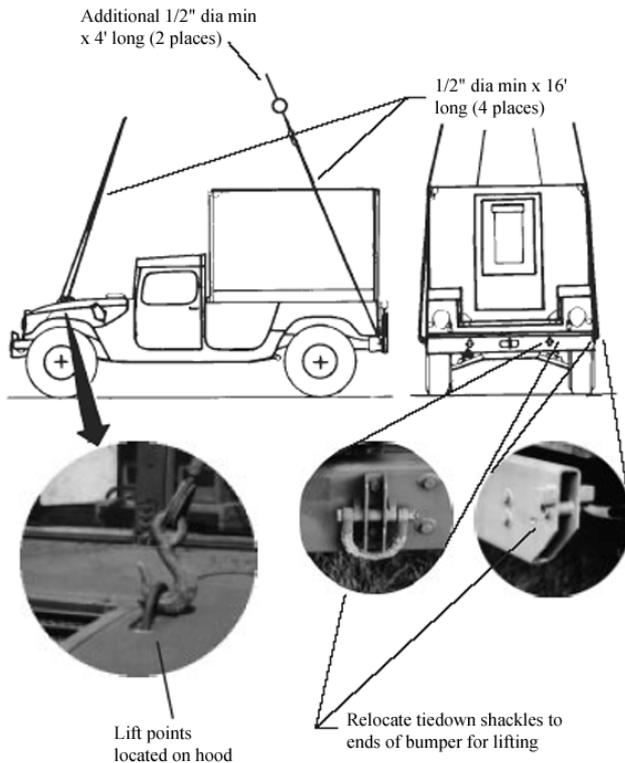
M983 truck, tractor, 10-ton, 8 x 8.



M984 truck, wrecker, 10-ton, 8 x 8.

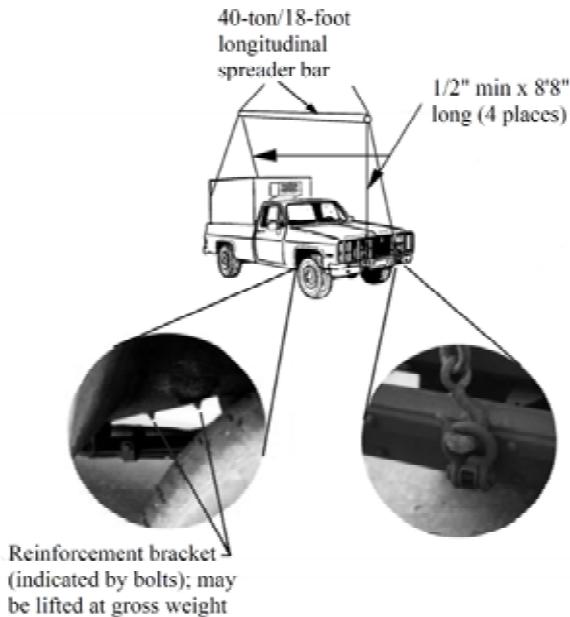


M984A1 truck, wrecker, 10-ton, 8 x 8.



Other similar lifts: M996, M997, M1035, M1036, M1037, M1038, M1042, M1044, M1045, M1046, M1097, M1097A1/A2, M1113, M1114

M1097, truck, shelter carrier, 1-1/4-ton (HHV).



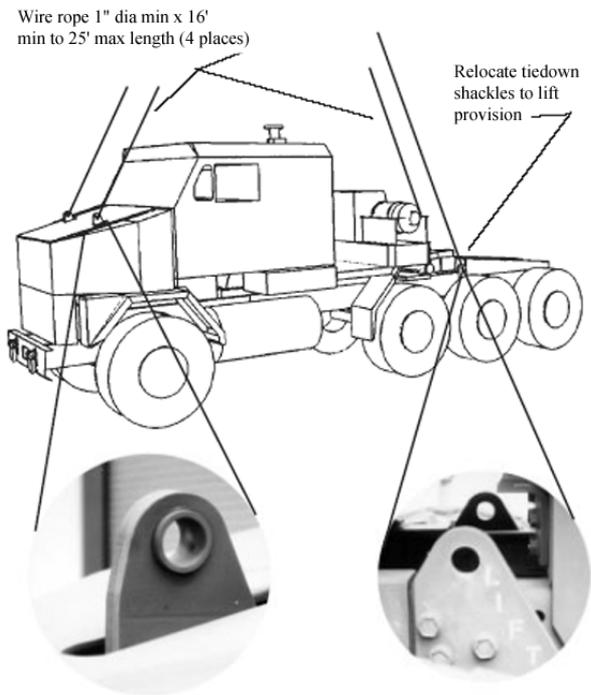
CAUTION



The rear slings for lifting CUCVs with shelters should be routed around the corners of the shelter and secured to prevent the vehicle from flipping over.

Other similar lifts: M1008A1, M1009, M1010, M1028, M1028A1, M1028A2

M1008, truck, cargo, 1-1/4-ton (CUCV).



CAUTION



**Use caution not to damage hood
when installing shackle.**

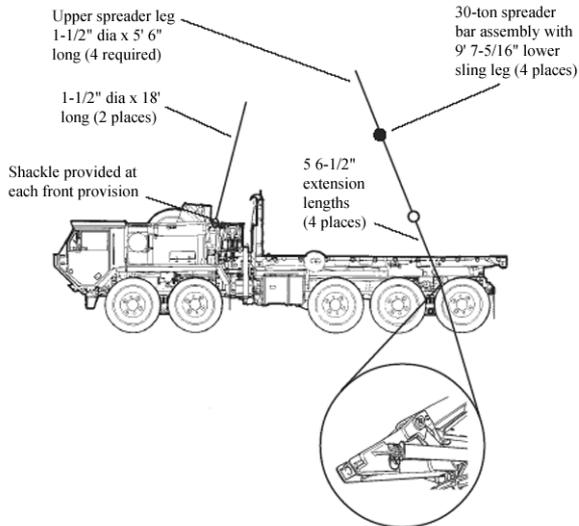
Other similar lifts: None

M1070 truck tractor, heavy-equipment transport (HET).

CAUTION



The vehicle, with flatrack, must be lifted using the exact sling lengths as shown below. Any deviation from this lift procedure could result in damage to the PLS lift provision or to the vehicle structure.



CAUTION



The truck's rear hard lift provisions must be installed prior to lifting with flatrack.

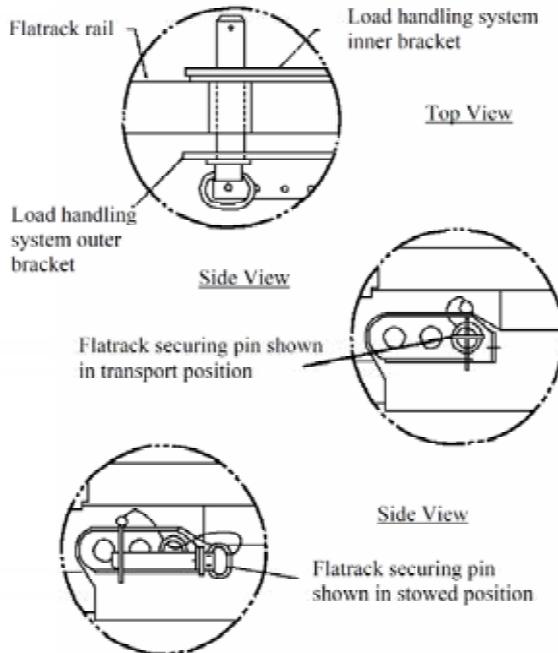
See page 4-33 for additional requirements.

M1074/M1075, PLS truck with M1077 Flatrack.

NOTE

Shippers must ensure that the flatrack is secured to

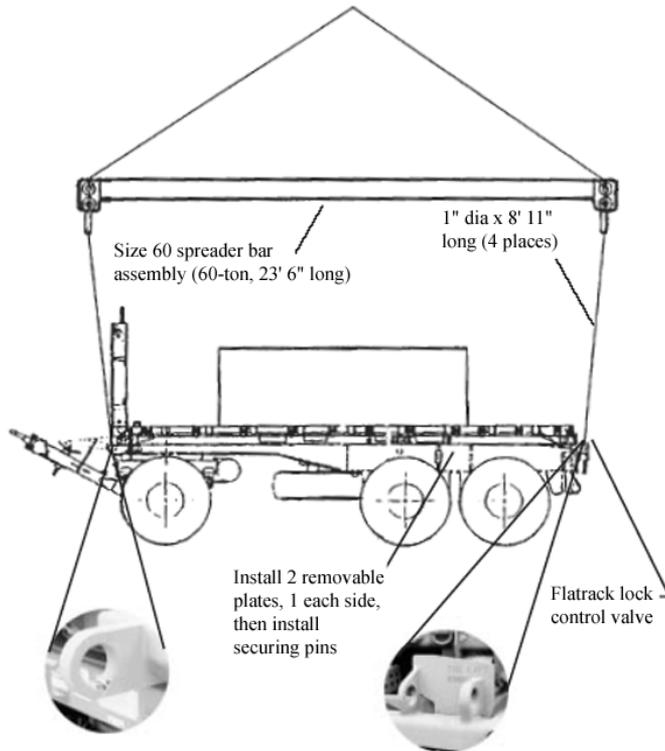
the truck using the two securement pins prior to lifting to prevent the flatrack from shifting.



M1074/M1075, PLS truck with flatrack, continued.

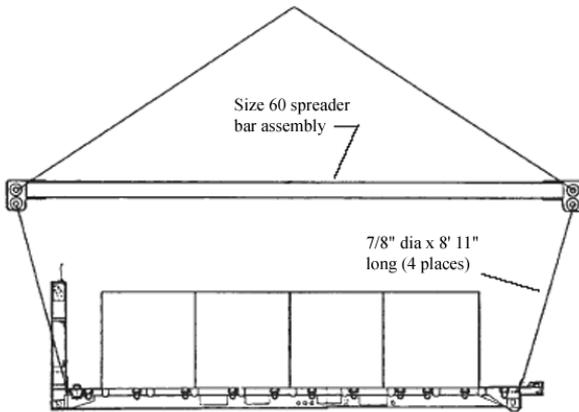
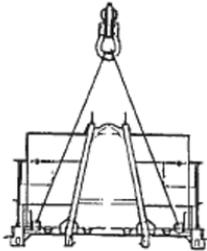
NOTE

See previous page for securing pin figure.



Other similar lifts: M1077 flatrack

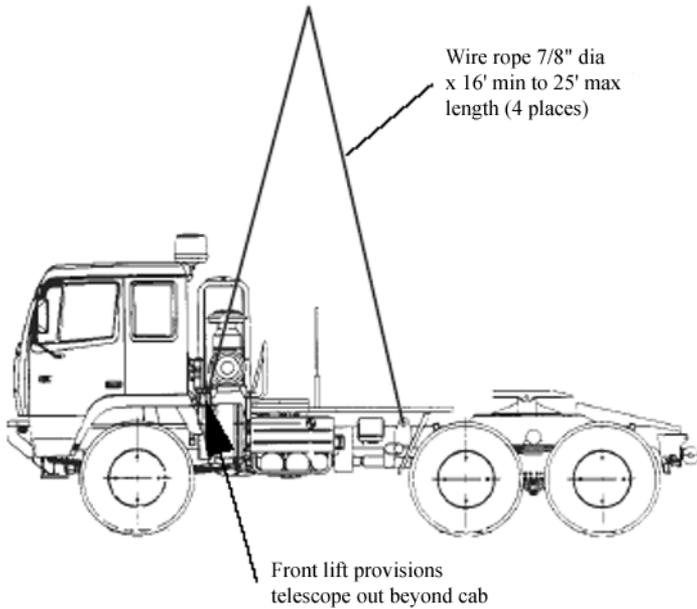
PLS trailer (M1076) with flatrack (M1077).



The M1077 can also be lifted with the lower sling legs attached to the flatrack's bottom ISO corner fittings (see page 7-5).

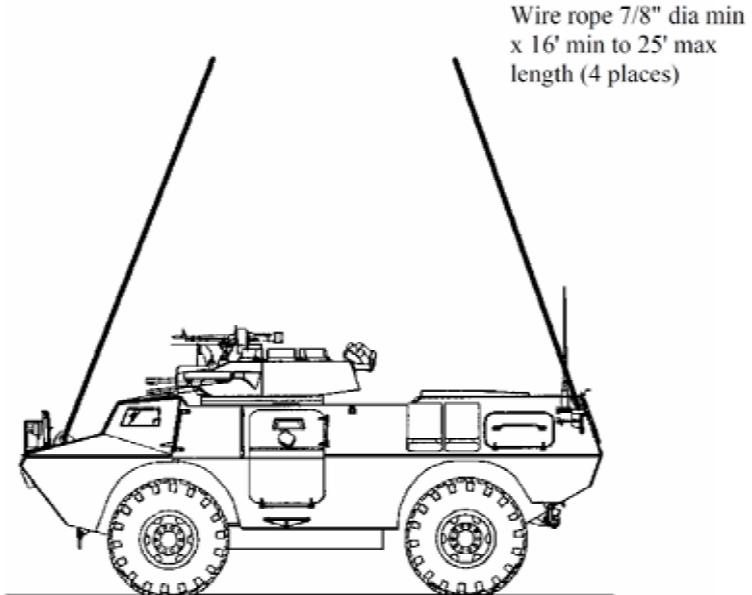
Other similar lifts: M1076 PLS trailer

PLS M1077 flatrack.

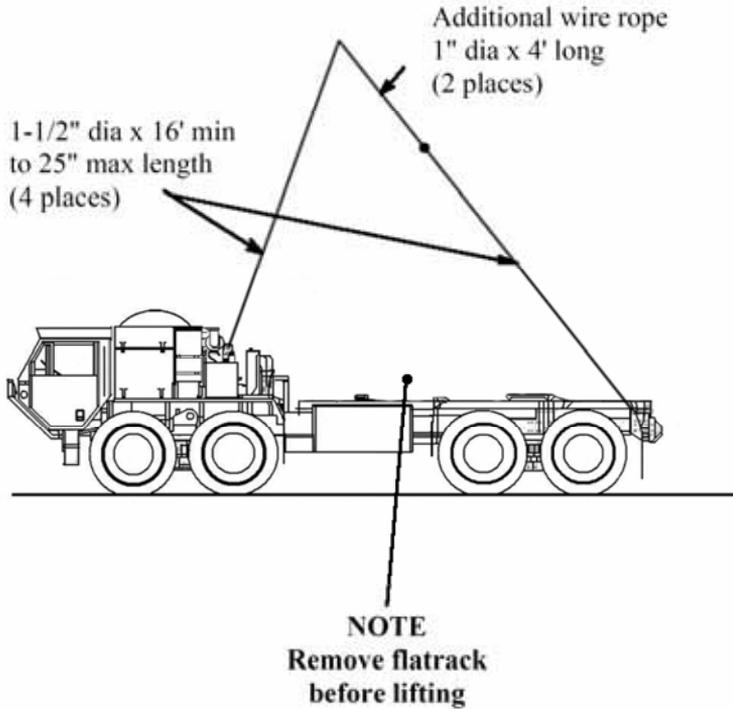


Other similar lifts: M1089 use 25' (4 places) or 16' (4 places) with 4' (2 places, front)

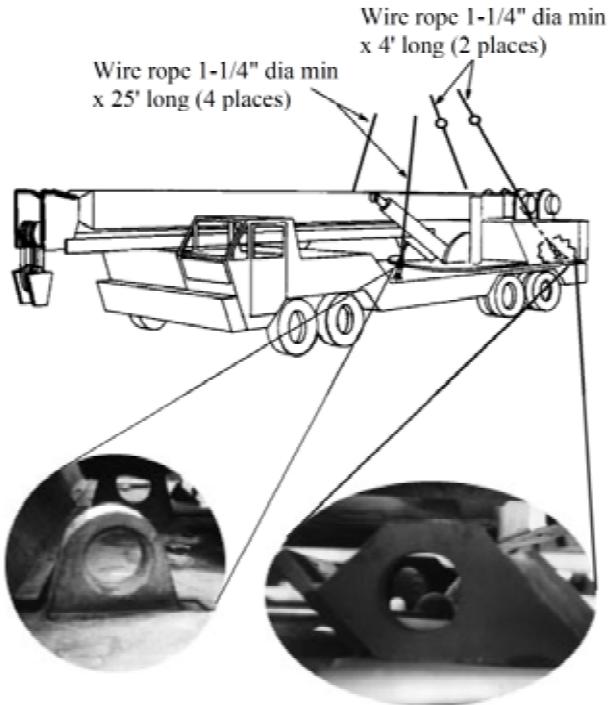
M1088, FMTV, 5-ton tractor



M1117 Armored Security Vehicle (ASV)



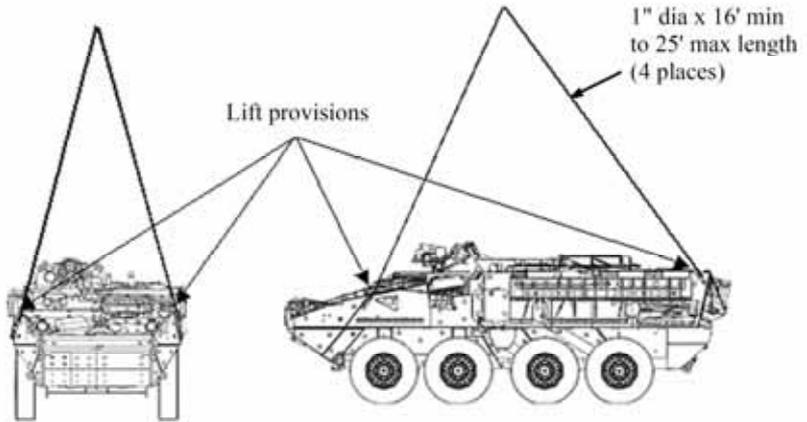
*M1120, Heavy Expanded Mobility Tactical Truck (HEMTT)
with Load Handling System (LHS)*



Rear sling legs pass through the inside of the counterweight.

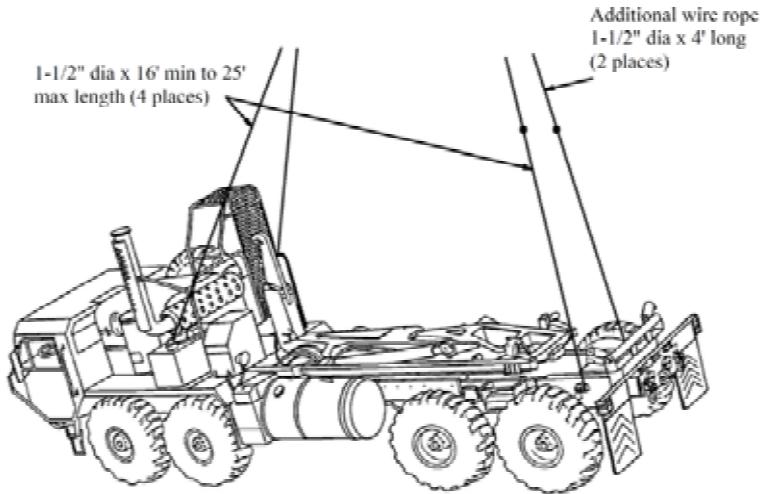
Other similar lifts: MT300

MT250, Crane, Truck-mounted, Hydraulic, 25-ton.



Other similar lifts: M1127, M1128, M1129, M1130, M1131, M1132, M1133, M1134

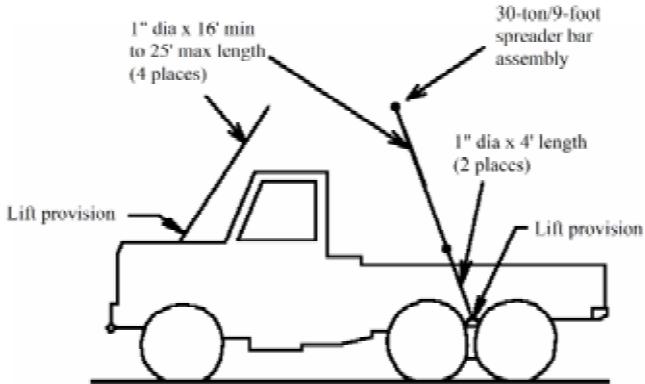
M1126, Infantry Carrier Vehicle.



NOTE

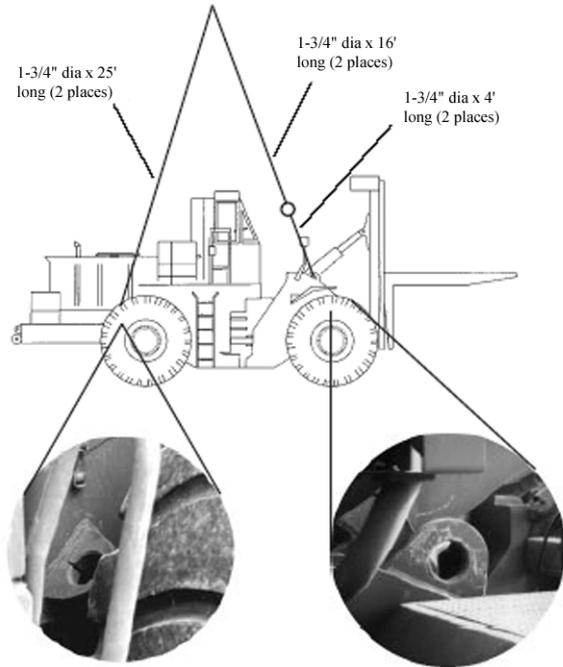
Remove bridge before lifting

M1977 Common Bridge Transporter (CBT) System



Other similar lifts: M25, M27, M28

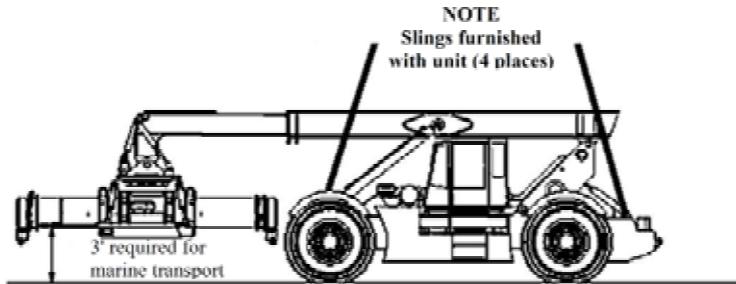
MK23, Medium Tactical Vehicle Replacement (MTVR).



NOTE

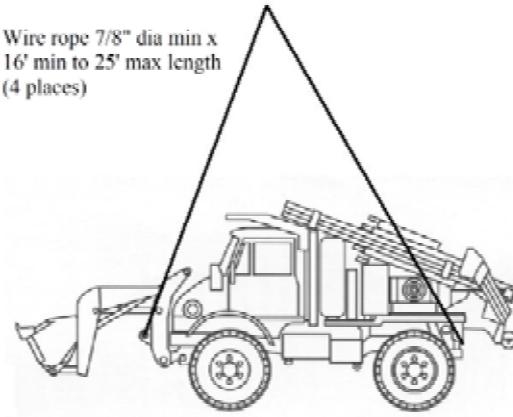
Attach lockout bar for lifting, but detach for driving.

Rough terrain container handler (RTCH), 50,000-pound.

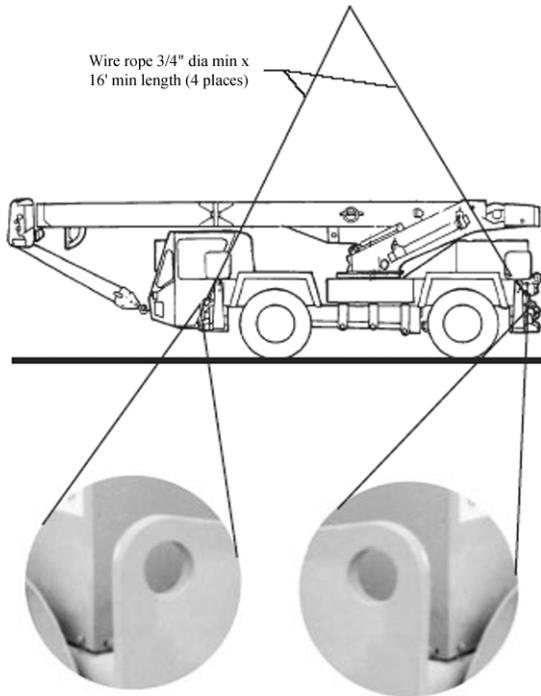


RT240 Rough Terrain Container Handler (RTCH) Kalmar

Wire rope 7/8" dia min x
16' min to 25' max length
(4 places)



Small Emplacement Excavator (SEE)



Other similar lifts: None

Crane, 7-1/2-ton, rough terrain, Koehring.

Section V. Lifting Trailers

If possible, trailers should be towed aboard ship by, and stowed with, their prime movers.

Fifth-wheel semitrailers should always be coupled to their prime mover when stowed.

When it is necessary to lift trailers, they should be lifted separately from their prime movers, and then recoupled before lashing.

Table 5-1 summarizes trailers addressed in this handbook.

Table 5-1. Trailers (lifting).

Model	Item	Curb Weight (lb)	Gross Weight (lb)*	Page
M101A2	Trlr, Cargo, 3/4-ton	1,280	2,780	5-4
M105A2 /A3	Trlr, Cargo 1-1/2-ton	2,750	5,750	5-4
M107A1 /A2	Trlr, Tank, Water, 1-1/2-ton	2,280	5,280	5-5
M116A2	Trlr, Cargo, 3/4-ton	740	2,780	5-4
M116A3	Trlr, Cargo, 3/4-ton	795	3,160	5-4
M118A1	Semitrlr, Stake, 6-ton	8,060	20,090	5-6
M119A1	Semitrlr, Van, Cargo, 6-ton	8,140	20,470	5-6
M127A1C	Semitrlr, Stake, 12-ton	13,840	36,840	5-6
M128A1C	Semitrlr, Van, Cargo, 12-ton	15,220	39,220	5-6
M129A2C	Semitrlr, Van, Supply, 12-ton	15,400	39,400	5-6
M131A4	Semitrlr, Fuel, 5000 Gal.	12,900	36,165	5-7
M146	Semitrlr, Van, Shop, 6-ton	7,330	19,330	5-6
M149A2	Trlr, Tank, Water, 1-1/2-ton	2,730	6,062	5-5
M172A1	Semitrlr, Lowbed, 15-25-ton	16,600	16,600	5-8

*Gross weight is the maximum permissible lifting weight.

Table 5-1. Trailers (lifting), continued.

Model	Item	Curb Weight (lb)	Gross Weight (lb)*	Page
M270A1	Semitrailer, Lowbed	17,500	17,500	5-9
M310	Trailer, Cable, Reel, 3-1/2-ton	2,950	9,950	5-5
M313	Semitrailer, Van Expand, 6-ton	15,350	27,350	5-6
M332	Trailer, Ammo/Gen Cargo, 1-1/2-ton	2,875	5,875	5-5
M349A1	Semitrailer, Van, Refr, 7-1/2-ton	8,750	23,750	5-6
M373A2	Semitrailer, Van, Electronic, 6-ton	9,430	21,430	5-6
M416A1	Trailer, Cargo, 1/4-ton	670	1,170	5-10
M447	Semitrailer, Van, Shop, 6-ton	13,080	25,080	5-6
M747	Semitrailer, Lowbed, HET, 60-ton	31,000	71,000	5-11
M782	Semitrailer, Flatbed, 22-1/2-ton	17,400	84,600	5-12
M870A1	Trailer, Lowbed, 40-ton	16,500	96,500	5-13
M871	Semitrailer, Flatbed, 22-1/2-ton	15,900	60,900	5-12
M871A1	Semitrailer, Flatbed, 22-1/2-ton	15,630	61,630	5-12
M872A1	Semitrailer, Flatbed, 34-ton	19,240	86,440	5-12
M902	Trailer, PATRIOT Launcher	N/A	55,800	5-14
M967A1	Semitrailer, fuel, 5000 Gal.	13,020	48,020	5-7
M969A1	Semitrailer, fuel, 5000 Gal.	15,140	50,140	5-7
M969A2	Semitrailer, fuel, 5000 Gal.	16,810	51,810	5-15
M970A1	Semitrailer, fuel, 5000 Gal.	16,810	51,810	5-7
M989A1	Trailer, (HEMAT)	10,650	32,650	5-16
M1000	Semitrailer, HET	50,400	100,400	5-17
M1048	Trailer, MTSS, 6-1/2-ton	7,940	19,940	5-18
M1061	Trailer, Flatbed, 5-ton	5,800	15,000	5-18
M1061A1	Trailer, Gen. Purp, 5-ton	5,850	15,000	5-18
M1073	Trailer, Flatbed, 7-1/2-ton	6,640	20,255	5-18

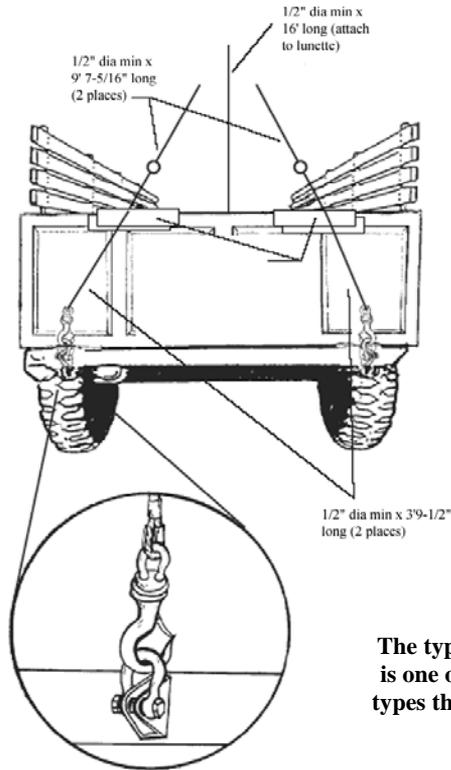
*Gross weight is the maximum permissible lifting weight.

Table 5-1. Trailers (lifting), continued.

Model	Item	Curb Weight	Gross Weight	Page
-------	------	-------------	--------------	------

		(lb)	(lb)*	
M1082	Trlr, FMTV, 2-1/2-ton	6,860	11,500	5-19
M1095	Trlr, FMTV, 5-ton	9,202	20,000	5-20
M1098	Semitrlr, Water, 5000 Gal.	16,810	55,810	5-7
M1112	Trlr, Water, 400 Gal.	3,945	11,200	5-21
HP15T	Trlr, Flatbed, Tilt Deck, 15-ton	8,000	38,000	5-18
PU-732/M	Trlr, Power Unit	N/A	6,080	5-22

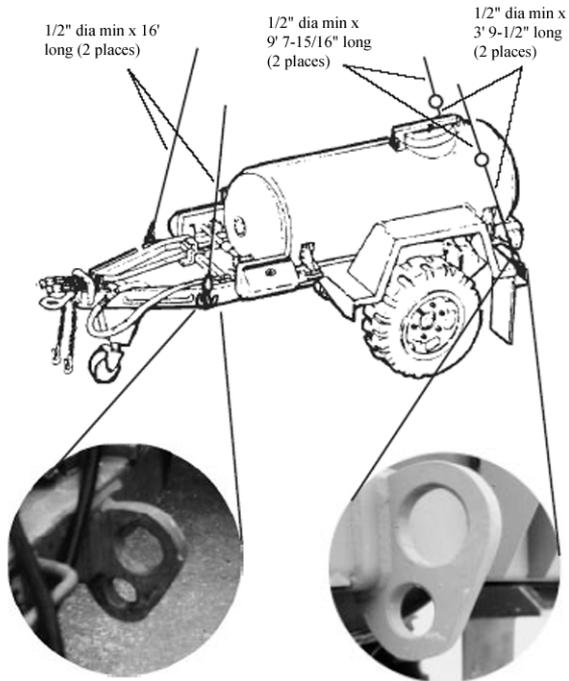
*Gross weight is the maximum permissible lifting weight.



NOTE
 The type provision shown is one of several different types that may be present.

Other similar lifts: M101A2, M116A2, M116A3

M105A2/A3, trailer, cargo, 1-1/2-ton.

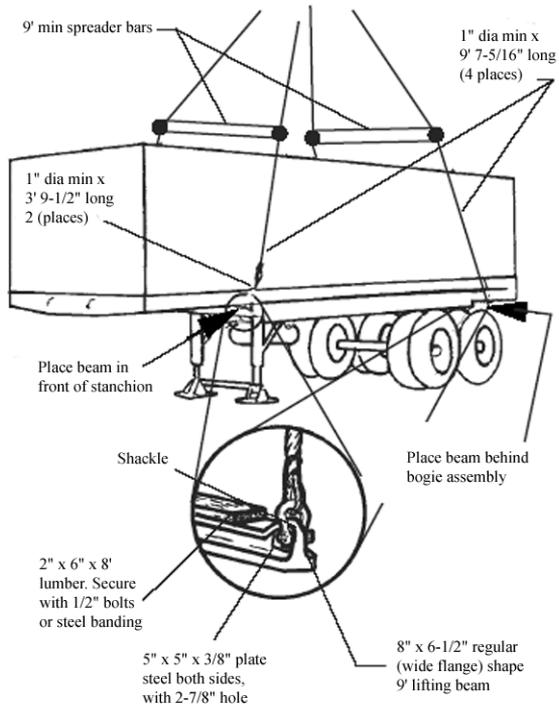


NOTE

Trailers may have various types of provisions.

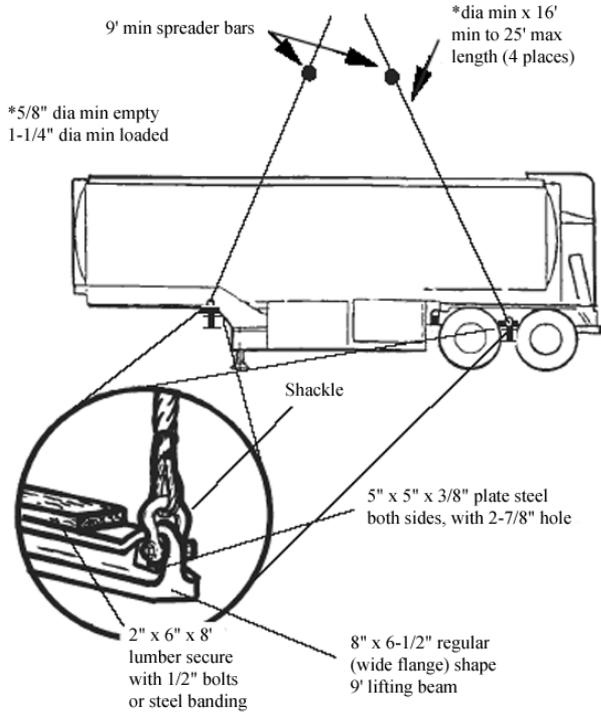
Other similar lifts: M107A1/A2, M310, M332

M149A2, trailer, tank, water, 1-1/2-ton.



Other similar lifts: M118A1, M119A1, M127A1C, M129A2C, M146, M313, M349A1, M373A2, M447

M128A1C, semitrailer, van, cargo, 12-ton.



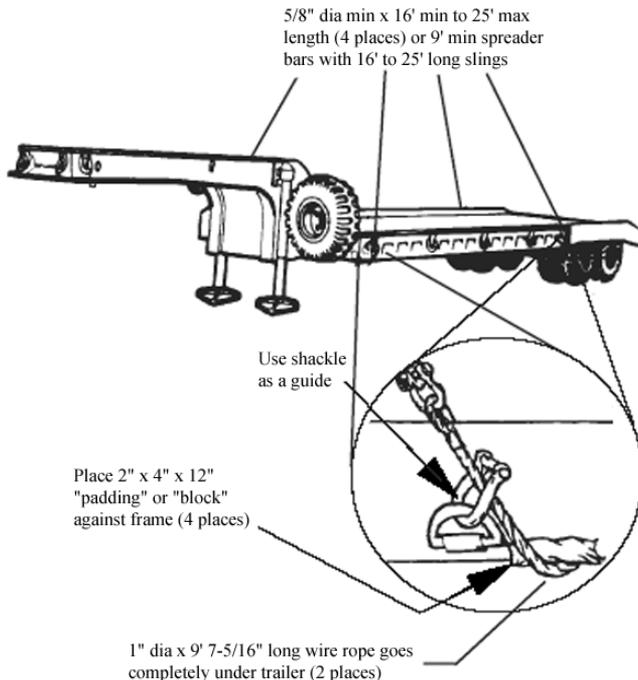
Other similar lifts: M967A1, M969A1, M970A1, M1098

M131A4 semitrailer, fuel.

WARNING



Do not lift M172 trailer loaded with cargo.

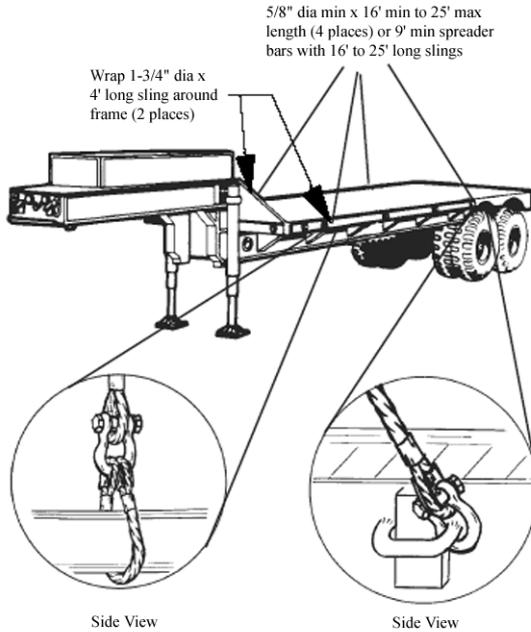


M172A1, semitrailer, lowbed, 15- to 25-ton.

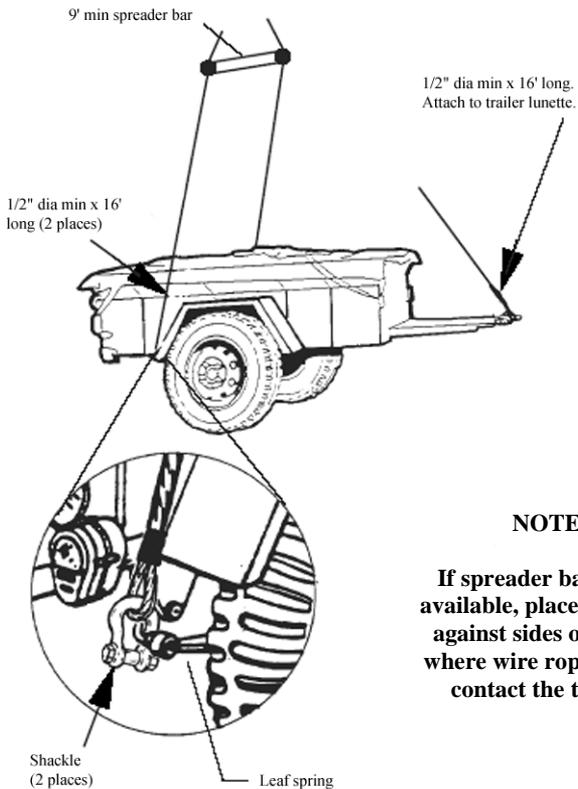
WARNING



Do not lift M270A1 trailer loaded with cargo.



M270A1, semitrailer, lowbed, wrecker, 12-ton.

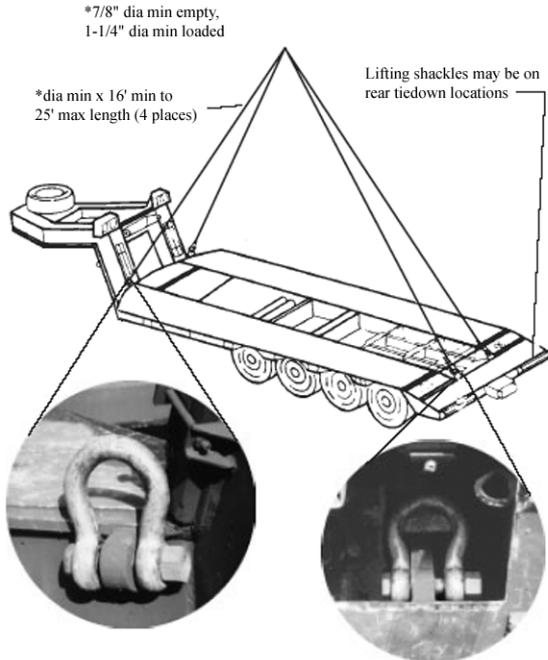


M416A1, trailer, cargo, 1/4-ton.

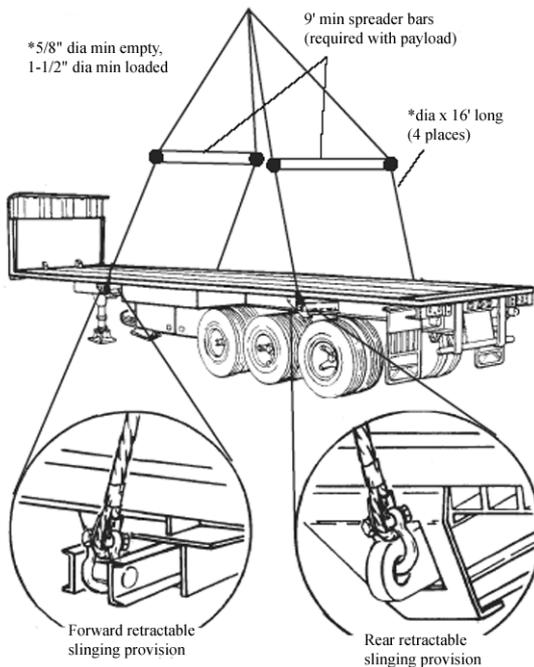
WARNING



Maximum cargo load is 20 tons. When lifting loaded semi-trailer, use size 60 sling assembly with short legs forward.



M747, semitrailer, lowbed, HET, 60-ton.



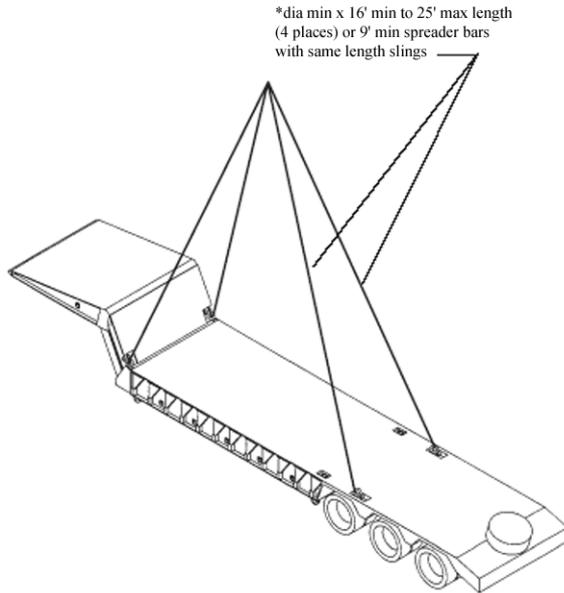
NOTE

All cargo must be evenly distributed and secured on the trailer.

Other similar lifts: M782, M871, M871A1, M872A3, M970A1, M970A2

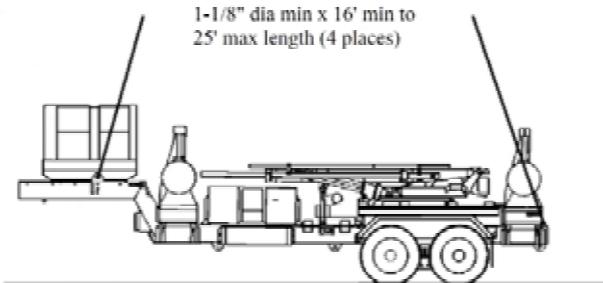
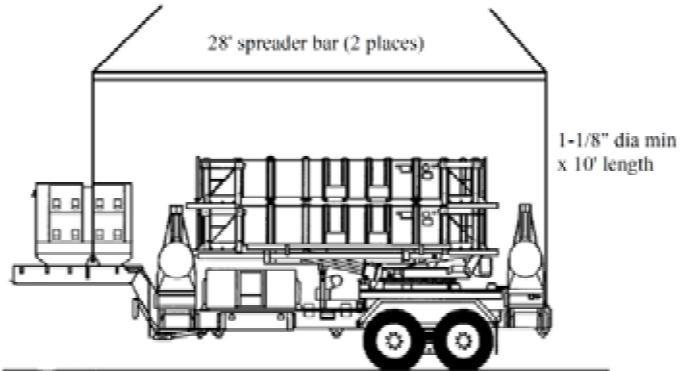
M872A1, semitrailer, flatbed, 34-ton.

5/8" dia min empty, 1-1/2" dia min loaded

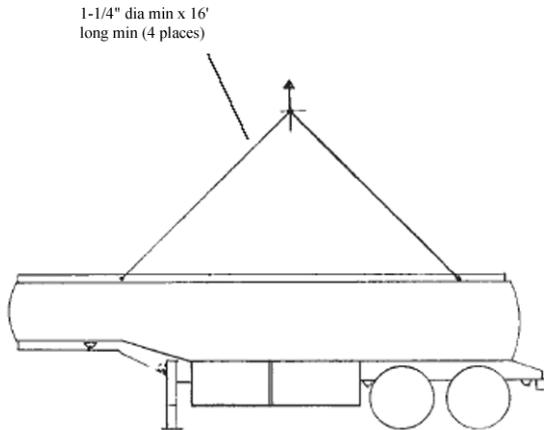


Other similar lifts: M870A3

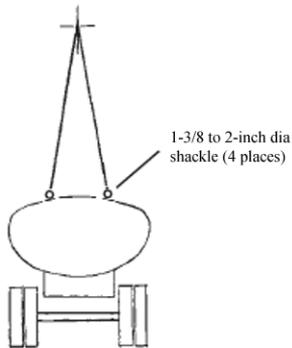
M870A1, semitrailer, lowbed, 40-ton.



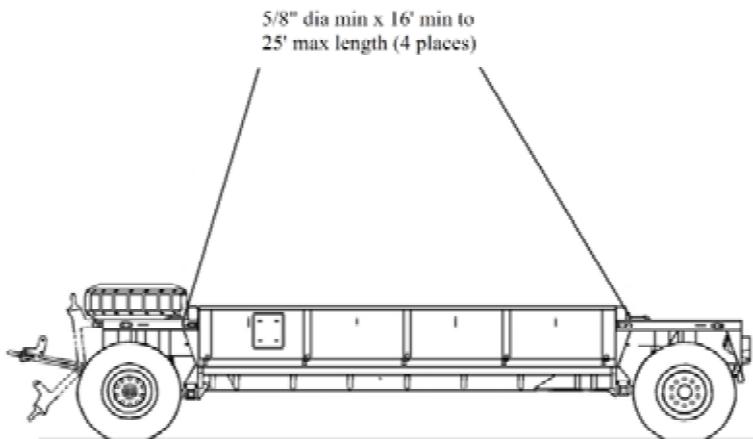
M902, PATRIOT launcher trailer



NOTE
This is the only fuel semitrailer approved for lifting using the lift provisions. The provisions are suitable to lift a loaded tanker.



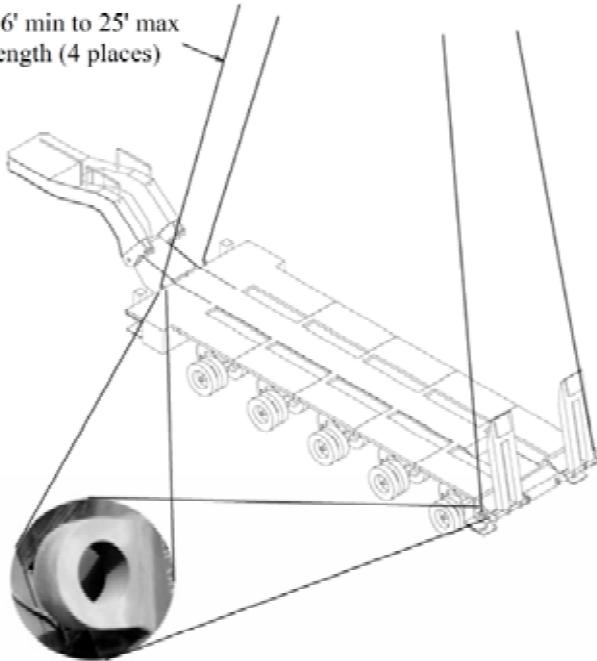
M969A2 semitrailer, fuel.



M989A1, HEMAT

1" dia min empty, 1-1/2" dia min with 50,500-pound payload

16' min to 25' max
length (4 places)

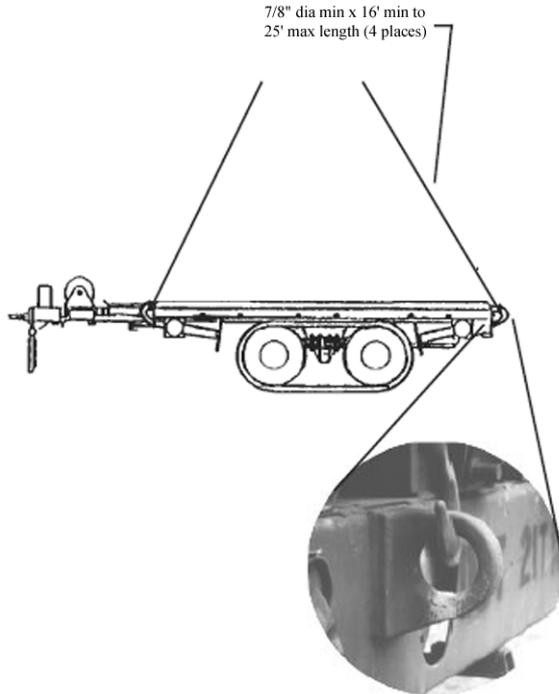


CAUTION



Lifting is restricted to a 50,500-pound payload. Also, ensure that the hydraulic gooseneck is in the locked position.

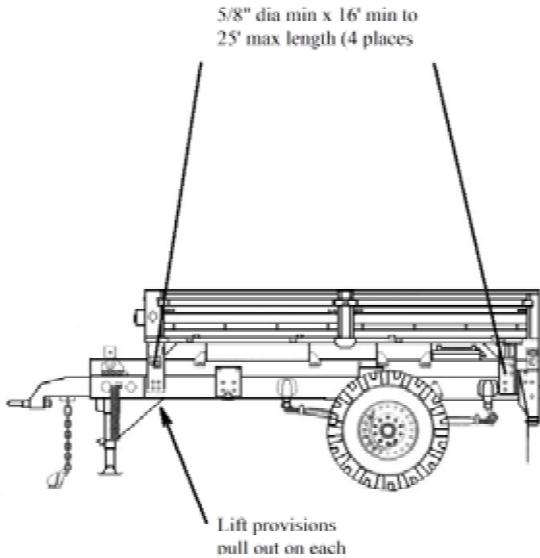
M1000 semitrailer, HET.

**NOTE**

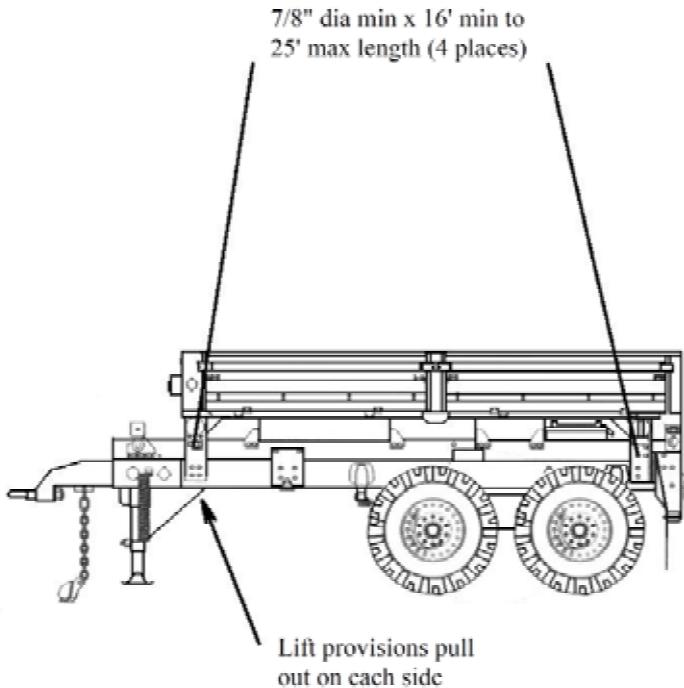
When trailer is loaded, a spreader bar is required for lifting. Use the M1076 (page 4-33) configuration with a 40-ton/18-foot spreader bar.

Other similar lifts: M1061, M1061A1, M1073, HP15T

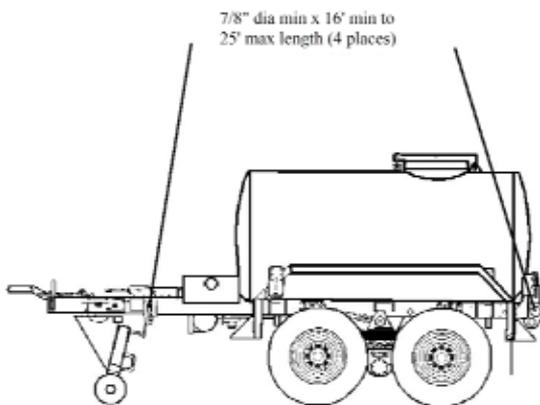
M1048, Trailer.



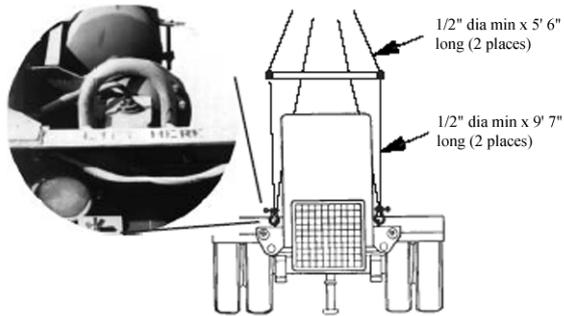
M1082 FMTV 2-1/2-ton trailer.



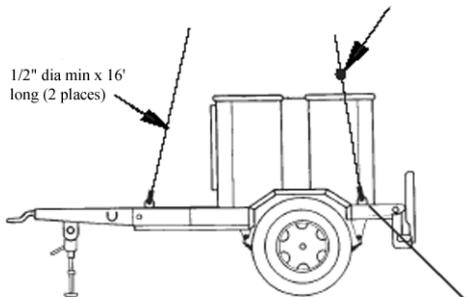
M1095 FMTV 5-ton trailer



M1112 400 Gallon water



4' spreader bar. If not available, use 4' min spreader bar

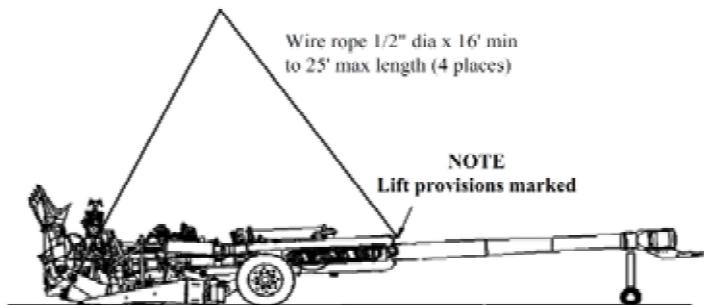


This provision is not accessible on all trailers. If not, both tiedown provisions should be used instead

NOTE
Spreader bar provided with trailer.

Other similar lifts: PU-405 A/M, PU-406 B/M, PU-495 B/G, PU-650 B/G, and so forth.

PU-732/M power unit.



M777, Lightweight 155mm Howitzer

Section VI. Lifting Tracked Vehicles

This section provides guidance for safe lifting of tracked vehicles. If it is necessary to drive the vehicles to their stow positions, track pads must be installed or the vehicles must be driven over lumber so no metal-to-metal contact is made.

Table 6-1 summarizes tracked vehicles included in this handbook.

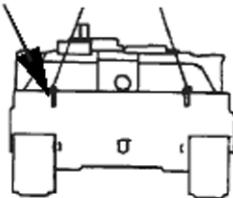
Table 6-1. Tracked vehicles (lifting).

Model	Item	Curb Weight (lb)	Gross Weight (lb)	Page
M1	Tank, Combat	N/A	123,000	6-3
M1A1	Tank, Combat	125,000	135,200	6-3
M1A2	Tank, Combat	128,600	137,360	6-3
M2	Vehicle, Infantry Fighting	N/A	47,000	6-5
M2A1	Vehicle, Infantry Fighting	43,132	50,617	6-5
M2A2	Vehicle, Infantry Fighting	53,247	67,282	6-5
M3	Vehicle, Cavalry Fighting	N/A	48,450	6-5
M3A1	Vehicle, Cavalry Fighting	42,502	50,190	6-5
M3A2	Vehicle, Cavalry Fighting	53,157	67,213	6-5
M3A3	Vehicle, Cavalry Fighting		73,272	6-5
M6	Vehicle, Cavalry Fighting		65,692	6-5
M7	Vehicle, Cavalry Fighting		59,285	6-5
M9	Earthmover, Armored Combat	36,000	N/A	6-6
M88	Vehicle, Recovery	107,600	109,600	6-3
M88A1E1	Vehicle, Recovery, Imp	129,000	139,600	6-3
M106A2	Carrier, Mortar, 107-mm	25,044	26,876	6-7
M109A6	Howitzer, 155-mm, Med, SP	56,000	64,200	6-8
M110A2	Howitzer, 8-in., Hvy, SP	55,800	62,500	6-4
M113A2	Carrier Personnel	21,887	25,007	6-7
M125A2	Carrier, Mortar, 81-mm	23,424	25,256	6-7

Table 6-1. Tracked vehicles (lifting), continued.

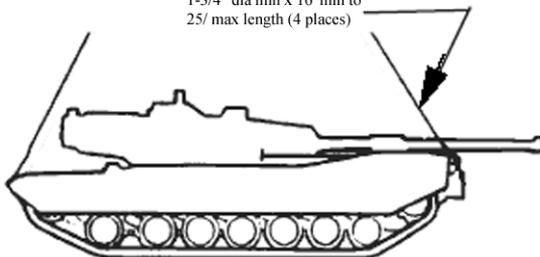
Model	Item	Curb Weight (lb)	Gross Weight (lb)	Page
M270/A1	Multiple Launch Rocket System (MLRS)	46,000	56,200	6-9
M577A2	Carrier, Command Post	24,142	25,813	6-7
M728	Vehicle, Cbt Engr, Full Track	N/A	117,400	6-4
M901A1	Vehicle, Cbt, Improved TOW	N/A	26,000	6-7
M992	Vehicle, Field Arty Ammo Spt	46,500	58,500	6-8
M992A1	Carrier, Ammo	46,800	57,000	6-8
M992A2	Carrier, Ammo	42,600	63,600	6-8
M1059	Carrier, Smoke Gen.	23,700	24,400	6-7
D7	Caterpillar Tractor, with blade and ripper	38,196	52,450	6-10

Place 2-1/2" dia shackles
(4 places). See page 3-3
for shackle details



Rear Elevation

1-3/4" dia min x 16' min to
25' max length (4 places)



CAUTION

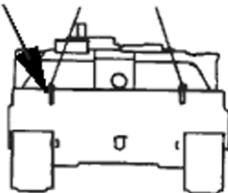


To avoid interference, the turret must be rotated 180° as shown before lifting. If bustle racks are installed, use page 6-4.

Other similar lifts: M88, M88A1E1

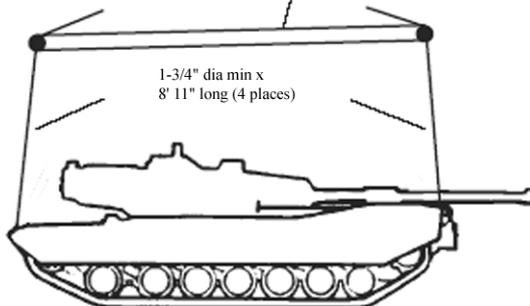
M1-series tank without bustle racks.

Place 2-1/2" dia shackles
(4 places). See page 3-3
for shackle details.



Size 60A sling
assembly

Two spreader
bars are required
for vehicles over
120,000 pounds



1-3/4" dia min x
8' 11" long (4 places)

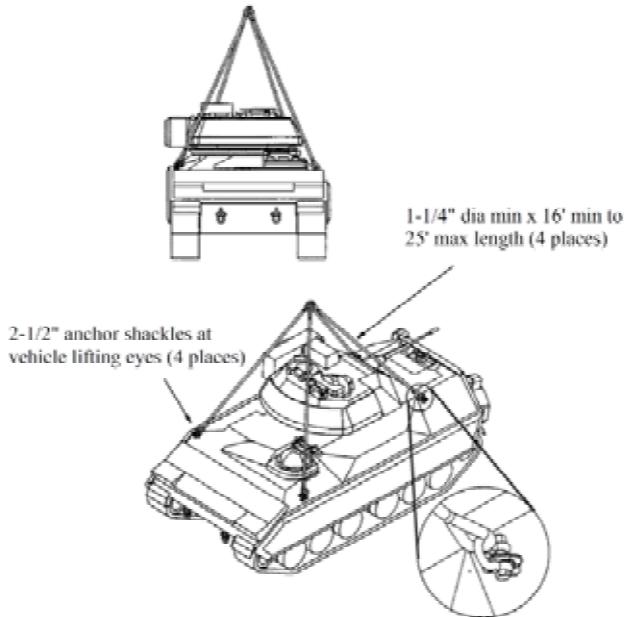
CAUTION



The turret must be rotated 180 degrees as shown before lifting.

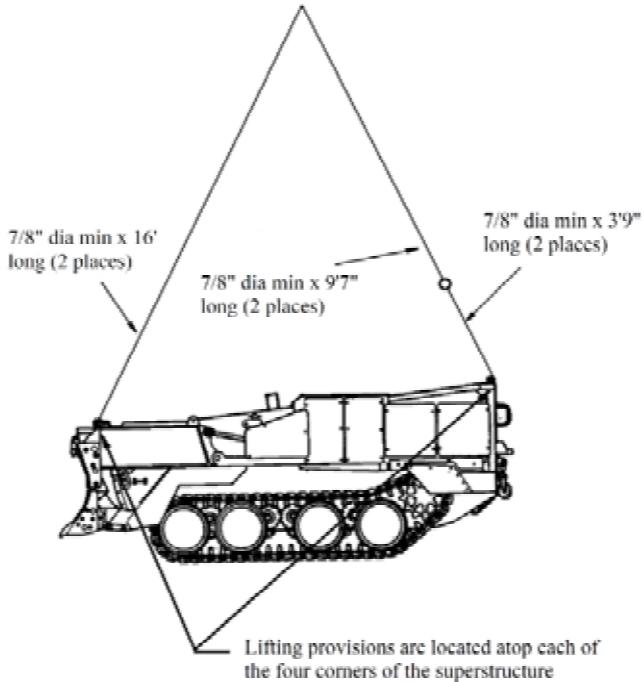
Other similar lifts: M88, M88A1E1, M110A2, M728

M1-series tank using spreader bar.

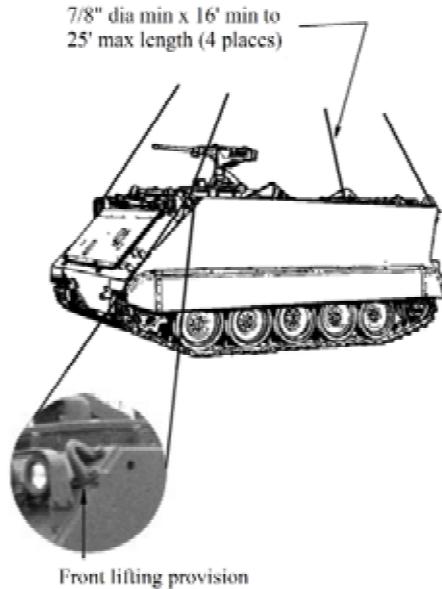


Other similar lifts: M2A1/A2, M3A1/A2/A3, M6, M7

M2/M3, fighting vehicles.



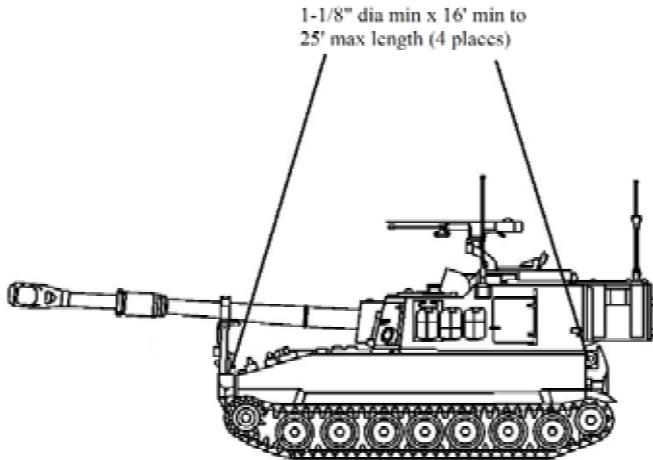
M9, armored combat earthmover (ACE).

**NOTE**

Use 1-1/2" shackle (4 places).

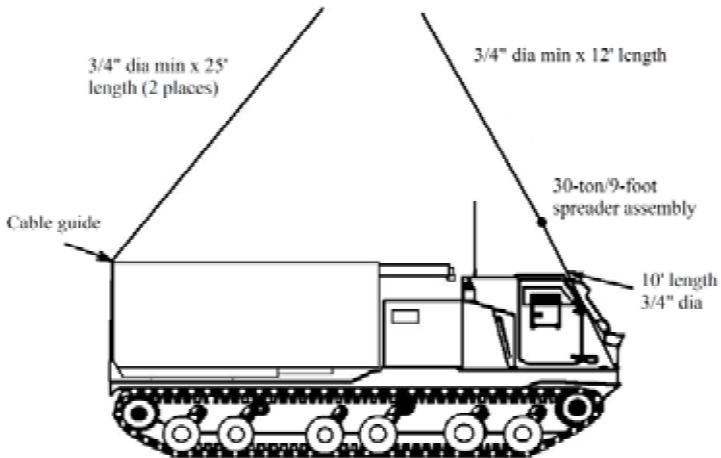
Other similar lifts: M106A2, M113A3, M125A2, M577A2, M667, M741A1, M901A1, M981, M1059, M1064, M1068

M113A2, carrier, personnel



Other similar lifts: M992, M992A1, M992A2, M109A2-A5

M109A6, howitzer, 155 mm, medium, full-tracked.



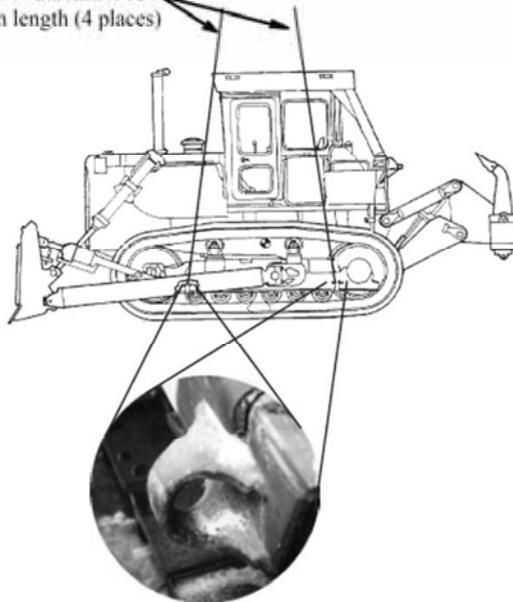
M270 and M270A1 Multiple Launch Rocket System (MLRS)

CAUTION



The ripper shanks should be turned upward for marine transport.

1-1/4" dia min x 16'
min length (4 places)



Other similar lifts: None

D7 Caterpillar tractor with blade and ripper.

Section VII. Lifting Containers

Table 7-1 summarizes the container lifting procedures in this handbook.

Table 7-1. Containers (Lifting).

Configuration	Page
Twist locks	7-3
Rectangular spreader	7-4
“H” spreader w/shackles	7-5
Bottom corner fittings	7-6
Container/chassis combination	7-7

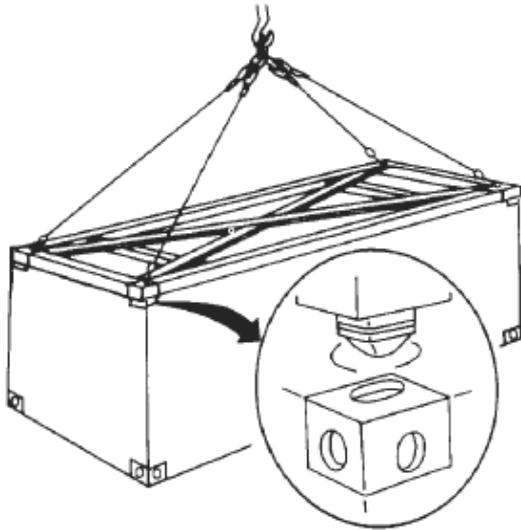
Equipment Size/Weight Limits for Container Transport
Maximum Item Dimensions

External Container Dimensions (ft)	Width	Height	Length	Gross Weight
8 by 8 by 20	85 in. 2 159 mm	80 2 032	219 5 563	52,900 pounds 24 metric tons
8 by 8.5 by 20	85 2 159	85 2 159	219 5 563	52,900 24
8 by 8 by 40	85 2 159	80 2 032	460 11 684	67,200 30.5
8 by 8.5 by 40	85 2 159	85 2 159	460 11 684	67,200 30.5
8 by 9.5 by 40	85 2 159	102 2 591	460 11 684	67,200 30.5
*Cargo weight plus container weight				

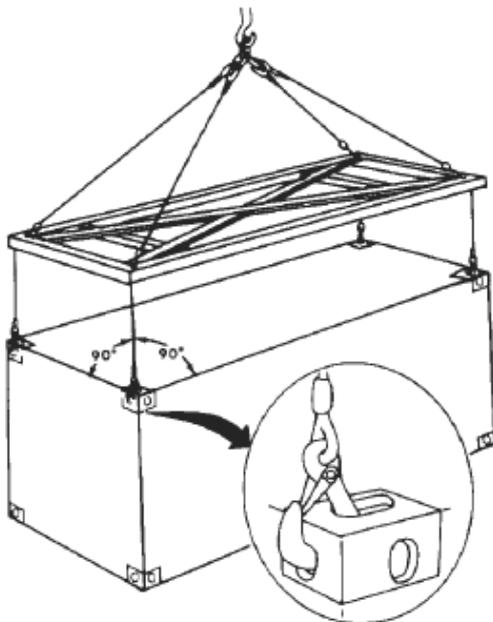
Average Container Tare Weights (weight varies by manufacturer)

8 by 8 by 20	4,806 pounds 2 180 kg
8 by 8.5 by 20	4,911 2 228

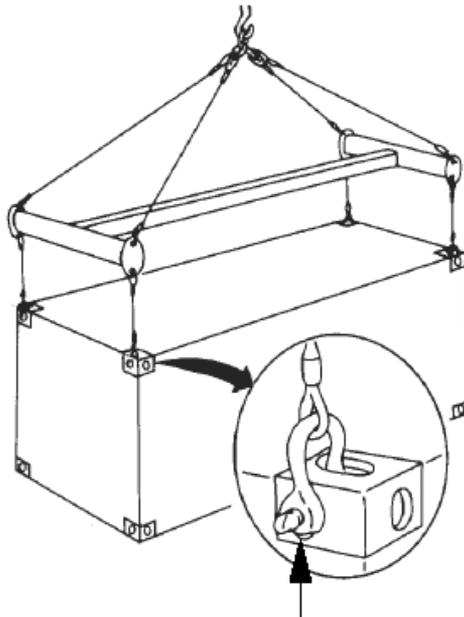
8 by 8.5 by 40	8,265 3 749
8 by 9.5 by 40	8,775 3 980



Twist locks

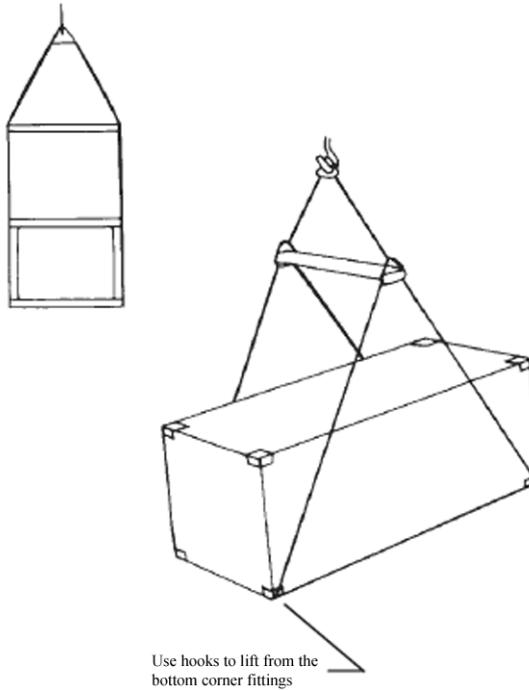


Rectangular spreader

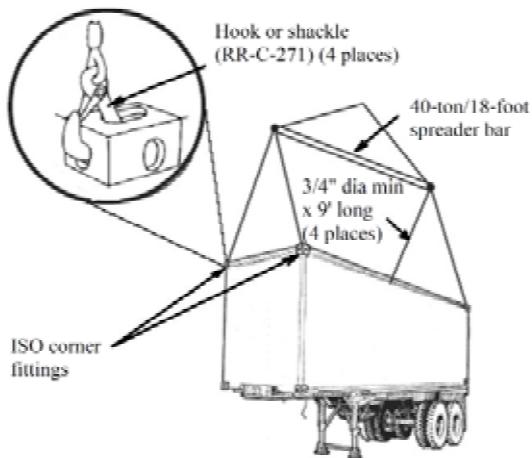


Use 1-1/2" shackle
(RR-C-271) (4 places)

"H" type fixed spreader bar with shackles.



Other similar lifts: M1077 flatrack, M1 enhanced flatrack



CAUTION



Do not exceed the gross combination weight.

NOTE

Telescopic spreader or nonpowered spreaders may also be used for lifting.

ISO 20-foot container/chassis combination.

Lifting Index

Model	Item	Lifting Section Page
D7G	Caterpillar Tractor, w/ blade and ripper	6-10
HP15T	Trlr, Flatbed, Tilt Deck, 15-ton	5-18
H40XL	Forklift, 4K, Hyster	4-9
H60XL	Forklift, 6K, Hyster	4-9
LAV-25	Light Armored Vehicle	4-10
MT250	Crane, Truck-Mounted, 25-ton	4-27
MT300	Crane, Truck-Mounted, 30-ton	4-27
MW24C	Loader, Scoop, Wheel	4-8
M1	Tank, Combat	6-3
M1A1	Tank, Combat	6-3
M1A2	Tank, Combat	6-3
M2	Vehicle, Infantry Fighting	6-5
M2A1	Vehicle, Infantry Fighting	6-5
M2A2	Vehicle, Infantry Fighting	6-5
M3	Vehicle, Cavalry Fighting	6-5
M3A1	Vehicle, Cavalry Fighting	6-5
M3A2	Vehicle, Cavalry Fighting	6-5
M6	Vehicle, Cavalry Fighting	6-5
M7	Vehicle, Cavalry Fighting	6-5
M9	Earthmover, Armored Combat	6-6
M10A	Trk, Forklift, 10,000 lb, RT	4-11
M35A1/2	Trk, Cargo, 2-1/2-ton, WWN	4-12
M49A2C	Trk, Tank, Fuel, 2-1/2-ton, WWN	4-12
M50A3	Trk, Tank, Water, 2-1/2-ton, WWN	4-12
M51A2	Trk, Dump, 5-ton, WWN	4-12
M52	Trk, Tractor, 5-ton	4-13
M62	Trk, Wrecker, Mec, WWN	4-12
M63	Trk, Chassis, 5-ton, WWN	4-12
M88	Vehicle, Recovery	6-3
M88A1E1	Vehicle, Recovery	6-3
M101A2	Trlr, Cargo, 3/4-ton	5-4

Model	Item	Lifting Section Page
M105A2/A3	Trlr, Cargo 1-1/2-ton	5-4
M106A2	Carrier, Mortar, 107-mm	6-7
M107A1/A2	Trlr, Tank, Water, 1-1/2-ton	5-5
M109A3	Trk, Van, Shop 2-1/2-ton, WWN	4-12
M109A6	Howitzer, 155-mm, Med, SP	6-8
M110A2	Howitzer, 8-in., Hvy, SP	6-4
M113A2	Carrier, Personnel	6-7
M116A2	Trlr, Cargo, 3/4-ton, 2 wheel	5-4
M116A3	Trlr, Cargo, 3/4-ton, 2 wheel	5-4
M118A1	Semitrlr, Stake, 6-ton	5-6
M119A1	Semitrlr, Van, Cargo, 6-ton	5-6
M125A2	Carrier, Mortar, 81-mm	6-7
M127A1C	Semitrlr, Stake, 12-ton	5-6
M128A1C	Semitrlr, Van, Cargo, 12-ton	5-6
M129A2C	Semitrlr, Van, Supply, 12-ton	5-6
M131A4	Semitrlr, Fuel, 5000 Gal.	5-7
M146	Semitrlr, Van, Shop, 6-ton	5-6
M149A2	Trlr, Tank, Water, 1-1/2-ton	5-5
M172A1	Semitrlr, Lowbed, 15-25-ton	5-8
M246A2	Trk, Wrecker, Med, WWN	4-12
M270A1	Semitrlr, Lowbed	5-9
M275A2	Trk, Tractor, 2-1/2-ton, WWN	4-12
M291A1D	Trk, Van, Exp, 2-1/2-ton	4-14
M310	Trlr, Cable, Reel, 3-1/2-ton	5-5
M313	Semitrlr, Van Expand, 6-ton	5-6
M332	Trlr, Ammo/Gen Cargo, 1-1/2-T	5-5
M342A2	Trk, Dump, 2-1/2-ton, WWN	4-12
M349A1	Semitrlr, Van, Refr, 7-1/2-ton	5-6
M373A2	Semitrlr, Van, Electronic, 6-ton	5-6
M416A1	Trlr, Cargo, 1/4-ton	5-10
M447	Semitrlr, Van, Shop, 6-ton	5-6
M543A2	Trk, Wrecker, Med, WWN	4-13
M548A1/E1	Carrier, Cargo, 6-ton	6-9

Model	Item	Lifting Section Page
M577A2	Carrier, Command Post	6-7
M728	Vehicle, Cbt Engr, Full Track	6-4
M747	Semitrler, Lowbed, HET, 60-ton	5-11
M782	Semitrler, Flatbed, 22-1/2-ton	5-12
M813	Trk, Cargo, 5-ton	4-12
M813A1	Trk, Cargo, 5-ton, WWN	4-12
M814	Trk, Cargo, 5-ton, WWN	4-12
M815	Trk, Bolster, Log, 5-ton, WWN	4-12
M816	Trk, Wrecker, 5-ton WWN	4-12
M817	Trk, Dump, 5-ton, WWN	4-12
M818	Trk, Tractor, 5-ton WWN	4-13
M819	Trk, Wrecker, 5-ton WWN	4-12
M820	Trk, Van, Expansible, 5-ton	4-14
M820A2	Trk, Van, Expansible, 5-ton	4-14
M821	Trk, Stake, 5-ton, WWN	4-12
M870A1	Trlr, Lowbed, 40-ton	5-13
M871	Semitrler, Flatbed, 22-1/2-ton	5-12
M871A1	Semitrler, Flatbed, 22-1/2-ton	5-12
M872	Semitrler, Flatbed, 34-ton	5-12
M872A1	Semitrler, Flatbed, 34-ton	5-12
M901A1	Vehicle, Cbt, Improved TOW	6-7
M902	Trlr, PATRIOT Launcher	5-14
M911	Trk, Tractor, HET, 22-1/2-ton	4-16
M915	Trk, Tractor Line Haul, 14-ton	4-17
M915A1	Trk, Tractor Line Haul, 25-ton	4-17
M915A2	Trk, Tractor Line Haul, 25-ton	4-17
M916	Trk, Tractor, LET	4-17
M916A1	Trk, Tractor, LET	4-17
M917	Trk, Dump, 20-ton	4-18
M918	Trk, Bituminous, 22-1/2-ton	4-18
M919	Trk, Concrete, Mixer, 22-1/2-ton	4-18
M920	Trk, Tractor, MET, 20-ton	4-17
M923	Trk, Cargo, 5-ton	4-19

Model	Item	Lifting Section Page
M923A1	Trk, Cargo, 5-ton, WWN	4-19
M923A2	Trk, Cargo, 5-ton, WWN	4-19
M924	Trk, Cargo, 5-ton	4-19
M924A1	Trk, Cargo, 5-ton, WWN	4-19
M925	Trk, Cargo, 5-ton	4-19
M925A1	Trk, Cargo, 5-ton, WWN	4-19
M925A2	Trk, Cargo, 5-ton, WWN	4-19
M926	Trk, Cargo, 5-ton	4-19
M926A1	Trk, Cargo, 5-ton, WWN	4-19
M927A1	Trk, Cargo, 5-ton, WWN	4-19
M927A2	Trk, Cargo, 5-ton, WWN	4-19
M928A1	Trk, Cargo, 5-ton, WWN	4-19
M928A2	Trk, Cargo, 5-ton, WWN	4-19
M929	Trk, Dump, 5-ton	4-19
M929A1	Trk, Dump, 5-ton, WWN	4-19
M930	Trk, Dump, 5-ton	4-19
M930A1	Trk, Dump, 5-ton, WWN	4-19
M931	Trk, Tractor, 5-ton	4-19
M931A1	Trk, Tractor, 5-ton, WWN	4-19
M931A2	Trk, Tractor, 5-ton, WWN	4-19
M932	Trk, Tractor, 5-ton, WWN	4-19
M932A2	Trk, Tractor, 5-ton, WWN	4-19
M934	Trk, Van, Expansible, 5-ton	4-14
M934A1	Trk, Van, Expansible, 5-ton	4-14
M935A1	Trk, Van, Expansible, 5-ton	4-14
M936	Trk, Wrecker, 5-ton, WWN	4-14
M936A1	Trk, Wrecker, 5-ton, WWN	4-14
M950B	Scoop Loader	4-11
M966	Trk, Tow Missile, (HMMWV)	4-20
M967A1	Semitr, fuel, 5000 Gal.	5-7
M969A1	Semitr, fuel, 5000 Gal.	5-7
M969A2	Semitr, fuel, 5000 Gal.	5-15
M970A1	Semitr, fuel, 5000 Gal.	5-7

Model	Item	Lifting Section Page
M977	Trk, Cargo, 10-ton (HEMTT)	4-21
M978	Trk, Tank, Fuel (HEMTT)	4-22
M983	Trk, Tractor, 10-ton (HEMTT)	4-23
M984	Trk, Wrecker, 10-ton (HEMTT)	4-24
M984A1	Trk, Wrecker, 10-ton (HEMTT)	4-25
M985	Trk, Cargo, 10-ton (HEMTT)	4-21
M989A1	Trlr, (HEMAT)	5-16
M992	Vehicle, Field Arty Ammo Spt	6-8
M992A1	Carrier, Ammo	6-8
M992A2	Carrier, Ammo	6-8
M996	Trk, Amb, 2-litter (HMMWV)	4-26
M997	Trk, Amb, 1-1/4-ton (HMMWV)	4-26
M998	Trk, Utility, 3/4-ton (HMMWV)	4-20
M1000	Semitr, HET	5-17
M1008	Trk, Cargo, 1-1/4-ton (CUCV)	4-27
M1008A1	Trk, Utility, 1-1/4-ton (CUCV)	4-27
M1009	Trk, Utility, 1-1/4-ton (CUCV)	4-27
M1010	Trk, Amb, 1-1/4-ton (CUCV)	4-27
M1015A1	Carrier, Full Track	6-9
M1025	Trk, Armt, 1-1/4-ton (HMMWV)	4-20
M1026	Trk, Utility, 1-1/4-ton (HMMWV)	4-20
M1028	Trk, Cargo, 1-1/4-ton (CUCV)	4-27
M1028A2	Trk, Utility, 1-1/4-ton (CUCV)	4-27
M1035	Trk, Amb, 1-1/4-ton (HMMWV)	4-26
M1036	Trk, Amb, 1-1/4-ton (HMMWV)	4-26
M1037	Trk, Cargo, 1-1/4-ton (HMMWV)	4-26
M1038	Trk, Utility, 1-1/4-ton (HMMWV)	4-20
M1042	Trk, Shelter, 1-1/4-ton (HMMWV)	4-26
M1043	Trk, Armt, 1-1/4-ton (HMMWV)	4-20
M1044	Trk, Armt, 1-1/4-ton (HMMWV)	4-20
M1045	Trk, TOW, 1-1/4-ton (HMMWV)	4-20
M1046	Trk, TOW, 1-1/4-ton (HMMWV)	4-20
M1048	Trlr, MTSS, 6-1/2-ton	5-18

Model	Item	Lifting Section Page
M1059	Carrier, Smoke Gen	6-7
M1061	Trlr, Flatbed, 5-ton	5-18
M1061A1	Trlr, Gen. Purp, 5-ton	5-18
M1070	HET Tractor	4-28
M1073	Trlr, Flatbed, 7-1/2-ton	5-18
M1074	PLS Truck w/flatrack	4-29
M1075	PLS Truck w/flatrack	4-29
M1076	PLS Trailer w/flatrack	4-31
M1077	PLS Flatrack	4-32
M1078	LMTV, Cargo	4-33
M1079	LMTV, Van	4-33
M1081	LMTV, Cargo, A/D	4-33
M1082	Trlr, FMTV, 2-1/2-ton	5-19
M1083	MTV, Cargo	4-33
M1083A1	MTV, Cargo	4-33
M1084	MTV, Cargo, W/MHE	4-33
M1085	MTV, Long Cargo	4-33
M1086	MTV, Long Cargo, W/MHE	4-33
M1088	MTV, Tractor	4-34
M1089	MTV, Wrecker	4-34
M1090	MTV, Dump	4-33
M1093	MTV, Cargo, A/D	4-33
M1094	MTV, Dump, A/D	4-33
M1095	Trlr, FMTV, 5-ton	5-20
M1097	HHV, HMMWV Heavy Variant	4-26
M1097A1	HHV, HMMWV Heavy Variant	4-26
M1097A2	HHV, HMMWV Heavy Variant	4-26
M1098	Semitrlr, Water, 5000 Gal.	5-7
M1112	Trlr, Water, 400 Gal.	5-21
M1113	HHV, HMMWV Heavy Variant	4-26
M1114	HHV, HMMWV Heavy Variant	4-26
M1117	Armored Security Vehicle	4-35
M1120	Trk, Cargo, 10-ton (HEMTT) w/ LHS	4-36

Model	Item	Lifting Section Page
M1126	Infantry Carrier Vehicle with Slat Armor	4-37
M1127	Reconnaissance Vehicle with Slat Armor	4-37
M1128	Mobile Gun System with Slat Armor	4-37
M1129	Mortar Carrier with Slat Armor	4-37
M1130	Commander's Vehicle with Slat Armor	4-37
M1131	Fire Support Vehicle	4-37
M1132	Engineering Squad Vehicle with Slat Armor	4-37
M1133	Medical Evacuation Vehicle with Slat Armor	4-37
M1134	Anti-Tank Guided Missile with Slat Armor	4-37
M1977	Common Bridge Transporter System	4-38
MK23	Medium Tactical Vehicle Replacement	4-39
MK25	Medium Tactical Vehicle Replacement	4-39
MK27	Medium Tactical Vehicle Replacement	4-39
MK28	Medium Tactical Vehicle Replacement	4-39
MT250	Crane, Truck-Mounted, 25-ton	4-40
MT300	Crane, Truck-Mounted, 30-ton	4-40
MW24C	Loader, Scoop, Wheel	4-11
PATRIOT	Electric Power Plant III	4-21
PU-732/M	Trlr, Power Unit	5-22
RTCH	Rough Terrain Container Handler	4-41
SEE	Small Emplacement Excavator	4-42
7-1/2-ton	Crane, Rough-Terrain	5-14