

TM 55-3805-262-14

TECHNICAL MANUAL

**TRANSPORTABILITY GUIDANCE
SCOOP LOADER, WHEELED, MW24C**

**2-1/2-CUBIC-YARD-CAPACITY
COMMERCIAL CONSTRUCTION EQUIPMENT
(NSN 3805-01-150-4814)**

HEADQUARTERS, DEPARTMENT OF THE ARMY

11 APRIL 1986

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HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, DC, 29 October 1992

**Transportability Guidance
Scoop Loader, Wheeled, MW24C
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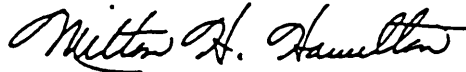
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CHAPTER 1

INTRODUCTION

1-1. Purpose and Scope

a. This manual provides transportability guidance for logistical handling and movement of the MW24C scoop loader.

b. This manual is intended for transportation officers and other personnel responsible for movement or for providing transportation services. Significant technical and physical characteristics, as well as safety considerations required for worldwide movement by the various modes of transportation, are included. When considered appropriate, metric equivalents are given in parentheses following dimensions or other measurements. Conversion tables are contained in appendix A.

1-2. Reporting of Recommendations and Comments

Individual users of this manual are encouraged to recommend changes and submit comments for its improvement. Comments should be prepared on DA Form 2028 (Recommended Changes to DA Publications and Blank Forms) and forwarded to Commander, Military Traffic Management Command

Transportation Engineering Agency, ATTN: MTT-TRC, PO Box 6276, Newport News, VA 23606-0276. Electrically transmitted messages should be addressed to CDR MTMC TEA FT EUSTIS VA/ MTT-TRC//. A reply will be furnished by this command.

1-3. Safety

Appropriate precautionary measures required during movement of the item 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 that, if not followed, could result in injury to or death of personnel.

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

c. *Notes.* A brief statement for use as necessary to emphasize a particular operating procedure, condition, and so forth.

CHAPTER 2 TRANSPORTABILITY DATA

Section I. GENERAL

2-1. Scope

This chapter provides a general description and identification photographs of the MW24C scoop loader, as well as tabulated data that are necessary in movement of the item.

2-2. Description

The loader, which is powered by a diesel engine, has two axles, four-wheel drive, articulated frame steering, and four 20.5 by 25 rubber tires. The loader is equipped with a 2-1/2-cubic-yard multipurpose bucket and rollover protection system/falling objects protection system (ROPS/FOPS) cab. The cab is removable for air transport and for other modes of transportation as required (fig 2-1).

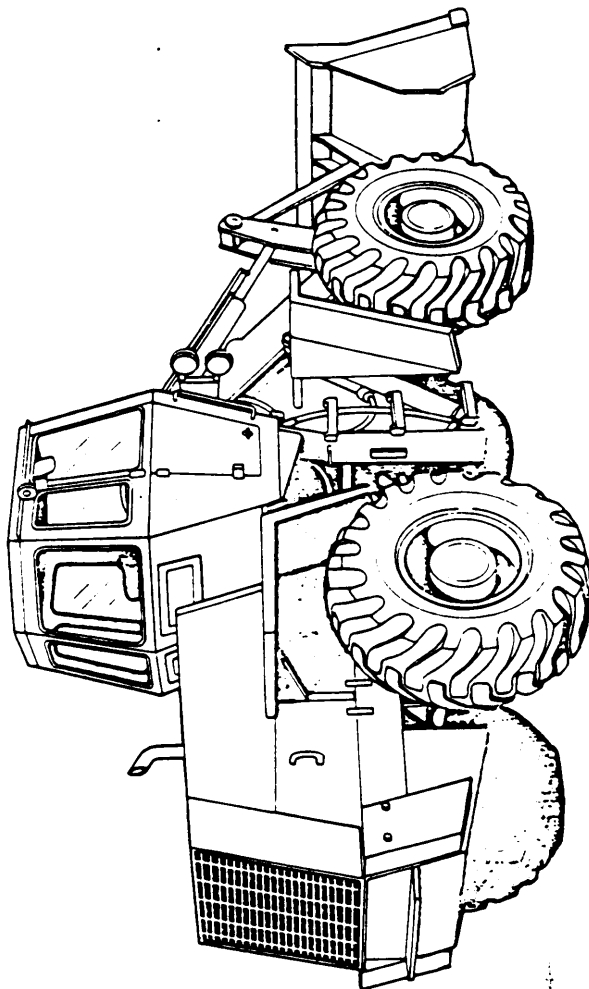


Figure 2-1. MW24C scoop loader.

2-3. Transportability Drawings

Detailed side and end transportability drawings of the MW24C scoop loader, with dimensions, tiedowns, lift provisions, and load-rating capacities, are shown in figures 2-2 through 2-5.

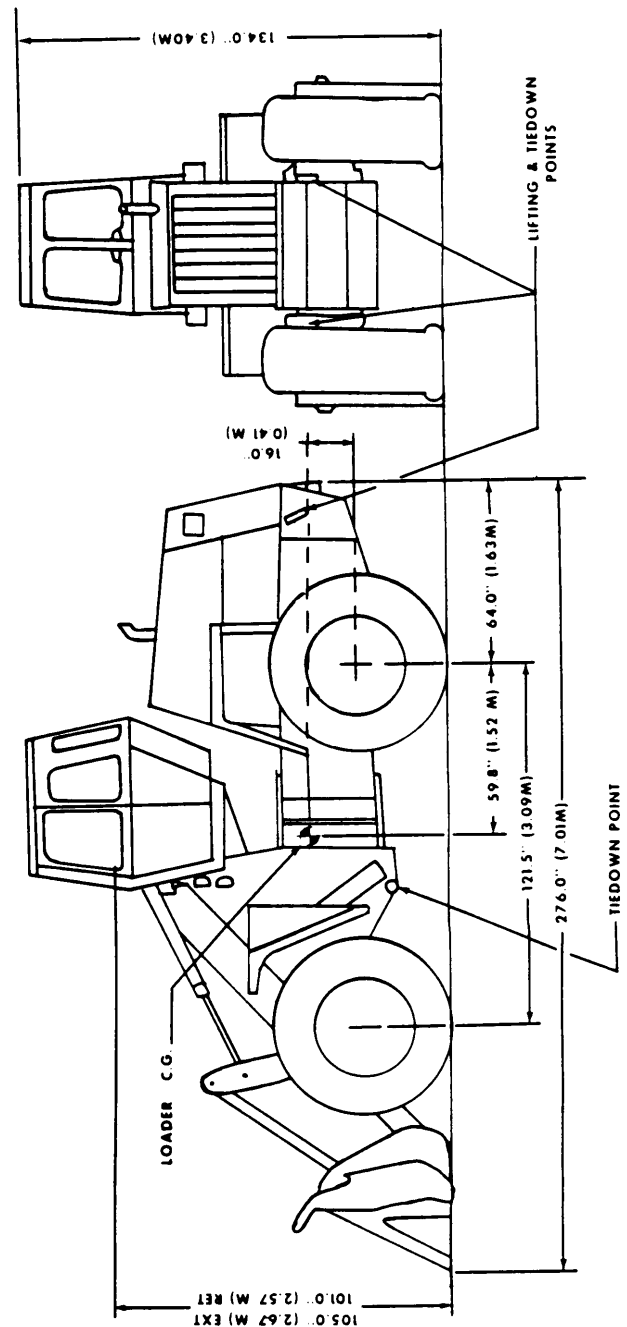


Figure 2-2. Lift points for MW24C scoop loader.

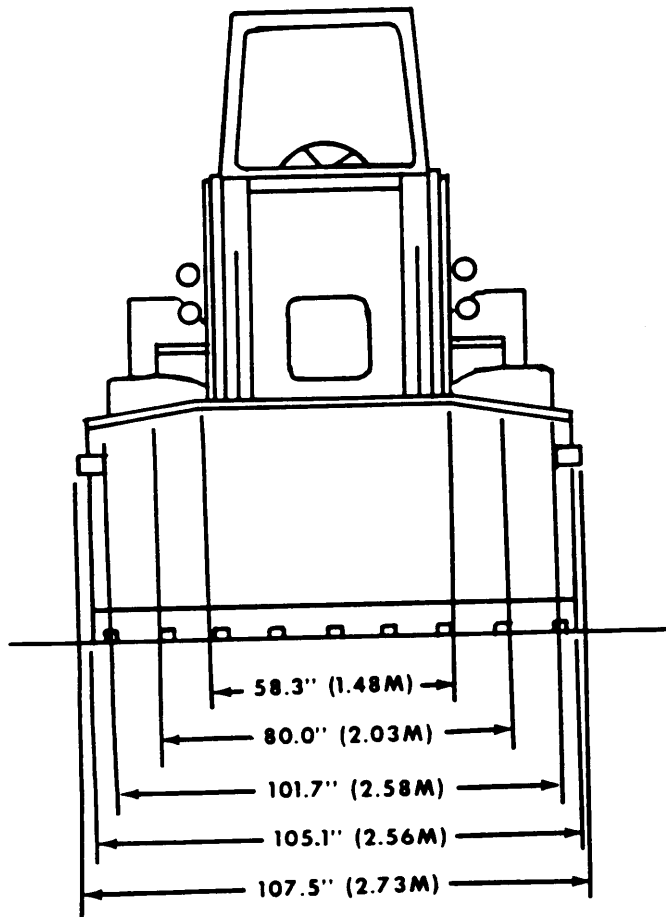


Figure 2-3. Front view of MW24C scoop loader.

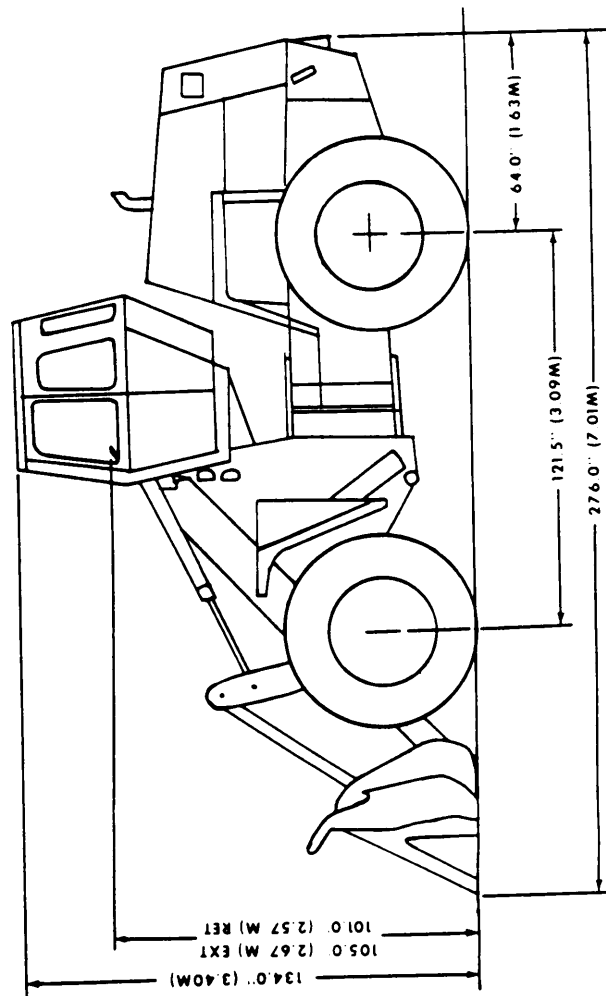


Figure 2-4. Side view of MW24C scoop loader.

Section II. CHARACTERISTICS AND RELATED DATA

2-4. General Transportability Characteristic

National stock number 3805-01-150-4814
 Line item number L76556

Axle loads:

Front

Empty (12,940 lb)
 (5070 kg)
 Loaded (25,105 lb)
 (11 388 kg)

Rear

Empty (13,600 lb)
 (6169 kg)
 Loaded (9,515 lb)
 (4136 kg)

Performance:

Maximum speed 21.2 mph (13 km)
 Fuel tank capacity 58 gal (175 L)
 Turning radius 43 ft(13.11 m)
 Angle of approach 45°
 Angle of departure 40°
 Ground clearance 17.5 in.
 (0.4445 m)

Dimensions and shipping data:

Length, operational 276 in.
 Width, operational 107.5 in. (2.73 m)
 Height, operational 134 in. (3.40 m)
 Height, reduced 105 in. (2.66 m)
 Center of gravity 59.8 in. (1.52 m)
 Tire size 20.5 X 25 12-ply
 Tire pressure 40 psi (front
 and rear)
 Weight 26,540 lb
 (12 039 kg)

2-5. Unusual Characteristics

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

2-6. Hazardous and Dangerous Characteristics

Unless the vehicle is shipped with ammunition, under the provisions of the Department of Transportation Special Permit No. 3498 (applicable to shipments in periods of a national emergency), it will not present any special hazardous or dangerous characteristics during its exposure to normal transportation environments.

NOTE

Those regulations and/or transportation procedures normally associated with shipment of vehicles with diesel fuel will apply.

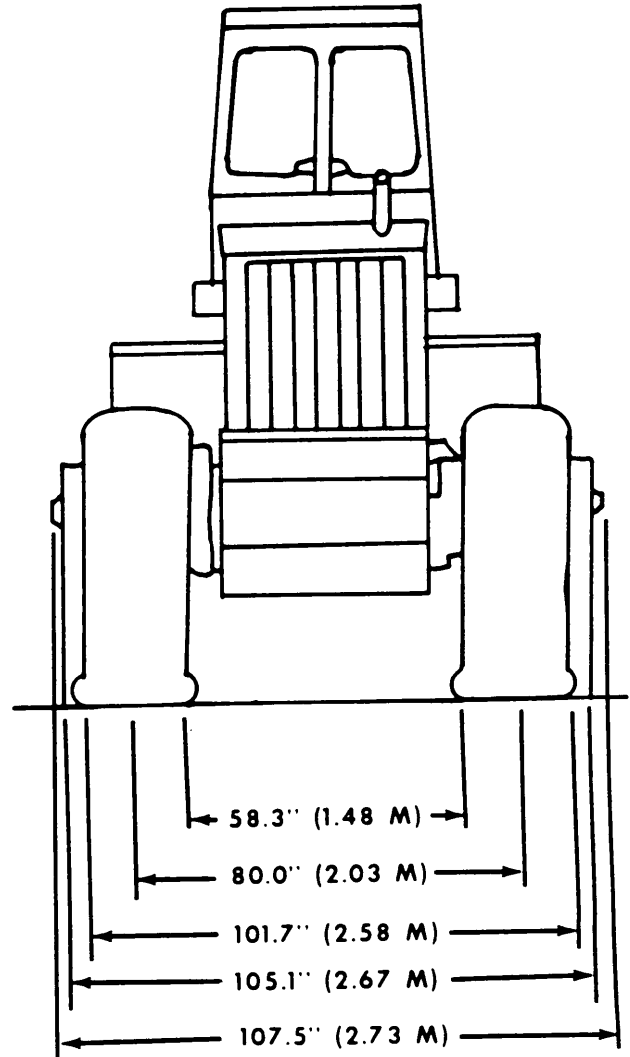


Figure 2-5. Rear view of MW24C scoop loader.

CHAPTER 3

SAFETY

3-1. General

General safety considerations and precautions for movement are as follows:

a. Each vehicle must be checked to ensure that all loose items are appropriately secured, in accordance with applicable regulations.

b. The vehicle must be driven by qualified personnel only.

c. Drivers must not leave their station while the engine is running.

d. When the vehicle is in motion, it must not be mounted or dismounted.

e. Personnel must not ride "on" the vehicle.

f. Personnel must not smoke while operating the vehicle or within 50 feet of a refueling area.

g. The driver must bring the vehicle to a complete stop before driving it into or out of a building.

h. When the vehicle is being operated in reverse or within 20 feet of a building or other vehicles, a ground guide must be used to direct the driver.

i. Personnel must stay clear of the engine exhaust area during and immediately after engine operations. Contact with this area can cause severe burns.

j. The engine must not be operated in an enclosed area without adequate ventilation to provide sufficient air for engine combustion as well as dissipation of exhaust fumes.

3-2. Specific Safety Requirements

Pertinent safety requirements by individual mode can be found, where applicable, in the appropriate chapters.

CHAPTER 4

AIR TRANSPORTABILITY GUIDANCE

Section I. GENERAL

4-1. Scope

This chapter provides air transportability guidance for movement of the MW24C scoop loader. It contains tiedown diagrams and tiedown data for loading this vehicle in US Air Force C-5, C-130, and C-141 aircraft.

4-2. Maximum Utilization of Aircraft

Additional cargo, including personnel within allowable load limits and restrictions prescribed by pertinent safety regulations, can be transported with the scoop loaders.

4-3. Safety

In addition to the safety precautions contained in chapter 3, the following should be noted:

a. The activity offering the vehicle for transport will notify the aircraft commander or his designated representative if ammunition or explosives are to be transported within the vehicle.

b. The vehicle fuel tank must not be more than three-fourths full.

4-4. Responsibility

The loadmaster is responsible for ensuring that the items described below are properly loaded in or unloaded from the aircraft in accordance with the criteria contained in section IV, TO IC-xxx-9.

Section II. TRANSPORT BY US AIRCRAFT

4-5. Air Capabilities

a. The MW24C scoop loader is transportable in C-5, C-141, and C-130 aircraft.

b. It is transportable in its operational configuration only in the C-5 aircraft.

c. With the ROPS/FOPS removed, the MW24C scoop loader is transportable in C-130, C-141, and C-5 aircraft.

d. For transport in the C-141, the bucket must be lowered to the rest position and placed on floor protection shoring, 1/2- to 3/4-inch plywood or other suitable lumber.

e. Sleeper shoring, in accordance with applicable aircraft loading manuals, is required in four places between the vehicle and the aircraft floor to minimize tire float, which is common during flight gust load conditions.

f. To load the MW24C scoop loader in C-130 aircraft, a special procedure for positioning of the bucket must be followed. The procedure for loading the vehicle in the C-130 is the same as that for the C-141 except the bucket must be positioned for transport. The procedure to position the loader lift arm and bucket for air transport is:

(1) *Start loader engine* Raise lift arm to a bucket height of 12 to 24 inches. Stop the engine, and install the lift arm prop (stored in the cab toolbox) on the right-hand lift cylinder rod. Secure

the prop (fig 4-1) with the 5-inch 3/8 bolt and nut supplied. Lower lift arm (without engine power) to down position.

(2) *Start loader engine* Roll bucket full back in the full down position. Attach a length of type I or larger chain or equivalent (fig 4-2) over bucket spill guard and attach to shank of center bucket tooth. Stop engine, and move bucket control lever to full forward to relieve hydraulic pressure in bucket circuit.

(3) To remove, reverse the process.

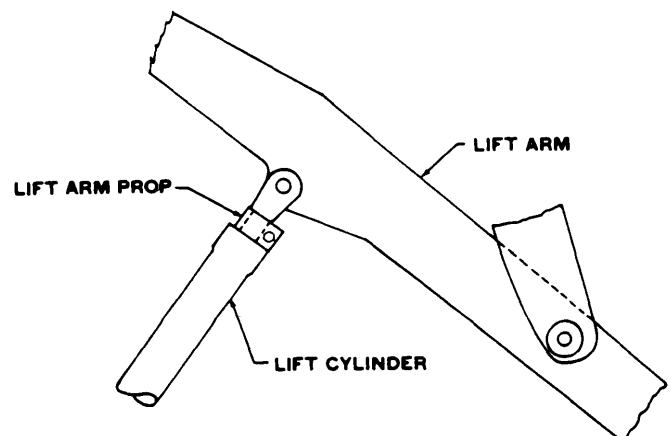


Figure 4-1. Tiedown of bucket in C-130 aircraft.

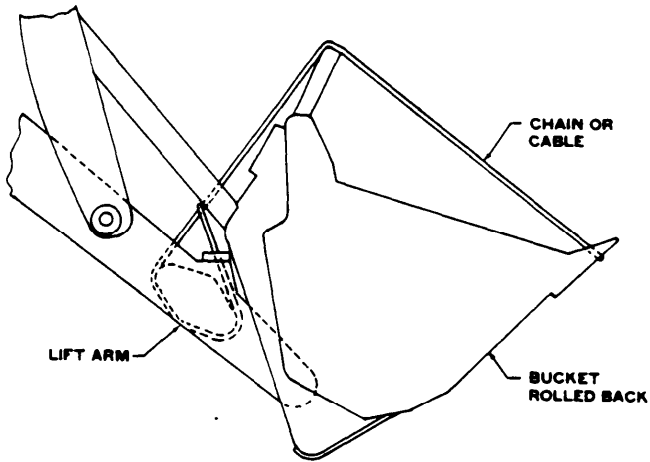


Figure 4-2. Tiedown diagram for bucket in C-130 aircraft.

g. Restraint factors (g loads) for minimum acceptable conditions specified for crew and passenger safety in the event of a controlled emergency landing are specified in applicable aircraft TO. Tiedown diagram figures 4-3 through 4-5 and tiedown tables 4-1 through 4-3 are for general guidance. The figures show representative tiedown patterns, and the tables show the tiedown devices required (provided aboard aircraft), tiedown points on the carrier, and corresponding fitting on the aircraft floor to which the devices are secured. Tiedowns will be applied as directed by the aircraft loadmaster.

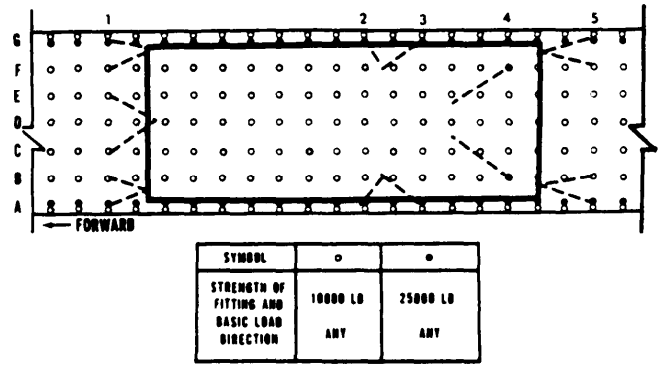


Figure 4-4. Tiedown diagram for MW24C scoop loader in C-141 aircraft.

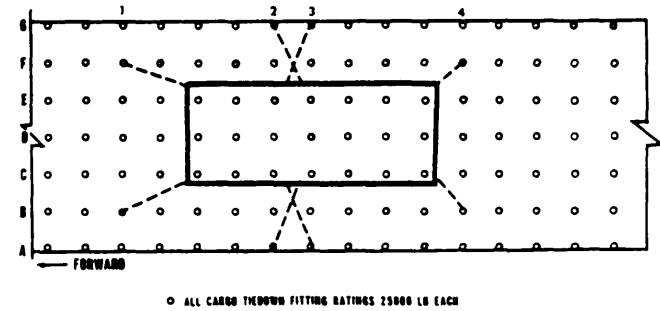


Figure 4-5. Tiedown diagram for MW24C scoop loader in C-5 aircraft.

4-6. Transport by US Army Aircraft

The scoop loader exceeds size and weight limitations for transport by US Army fixed or rotary wing aircraft.

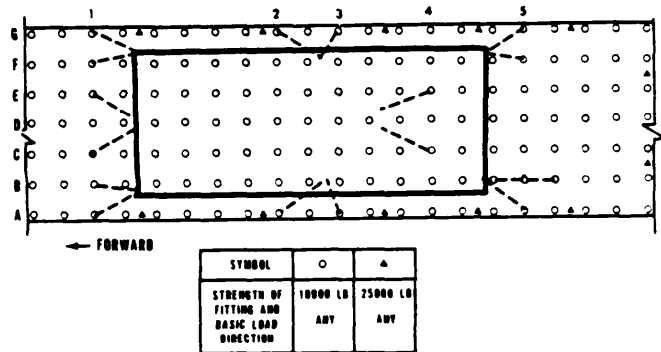


Figure 4-3. Tiedown diagram for MW24C scoop in C-130 aircraft.

Table 4-1. Tiedown Data for MW24C Scoop Loader in C-190 Aircraft

<u>Tiedown Fitting</u>		<u>Tiedown Device</u>		
Designation	Capacity in 1,000 lb	Type	in 1,000 lb	Attach to item
G1	10	MB1	10	Rear lifting point, left.
F1	10	MB1	10	Rear lifting point, left.
E1	10	MB1	10	Tow pintle, left.
C1	10	MB1	10	Tow pintle, left.
B1	10	MB1	10	Rear lifting point, right.
A1	10	MB1	10	Rear lifting point, right.
G2	10	MB1	10	Center tiedown device, left.
A2	10	MB1	10	Center tiedown device, left.
G3	10	MB1	10	Center tiedown device, right.
A3	10	MB1	10	Center tiedown device, right.
E4	10	MB1	10	Around front axle, left.
C4	10	MB1	10	Around front axle, right.
G5	10	MB1	10	Front lifting point, left.
F5	10	MB1	10	Front lifting point, left.
B5	10	MB1	10	Front lifting point, right.
A5	10	MB1	10	Front lifting point, right.

Table 4-2. Tiedown Data for MW24C Scoop Loader in C-141 Aircraft

<u>Tiedown Fitting</u>		<u>Tiedown Device</u>		
Designation	Capacity in 1,000 lb	Type	in 1,000 lb	Attach to item
G1	25	MB2	25	Rear lifting point, left.
F1	10	MB1	10	Rear lifting point, left.
E1	10	MB1	10	Tow pintle, left.
C1	10	MB1	10	Tow pintle, left.
B1	10	MB1	10	Rear lifting point, right.
A1	25	MB2	25	Rear lifting point, right.
G2	25	MB2	25	Center tiedown device, left.
A2	25	MB2	25	Center tiedown device, left.
G3	25	MB2	25	Center tiedown device, right.
A3	25	MB2	25	Center tiedown device, right.
E4	10	MB1	10	Around front axle, left.
C4	10	MB1	10	Around front axle, right.
G5	25	MB2	25	Front lifting point, left.
F5	10	MB1	10	Front lifting point, left.
B5	10	MB1	10	Front lifting point, right.
A5	25	MB2	25	Front lifting point, right.

Table 4-3. Tiedown Data for MW24C Scoop Loader in C-5 Aircraft

<u>Tiedown Fitting</u>		<u>Tiedown Device</u>		
Designation	Capacity in 1,000 lb	Type	in 1,000 lb	Attach to item
F1	25	MB2	25	Rear lifting point, left.
B1	25	MB2	25	Rear lifting point, right.
G2	25	MB2	25	Center tiedown point, left.
A2	25	MB2	25	Center tiedown point, right.
A3	25	MB2	25	Center tiedown point, left.
G3	25	MB2	25	Center tiedown point, right.
F4	25	MB2	25	Front lifting point, left.
B4	25	MB2	25	Front lifting point, right.

CHAPTER 5

HIGHWAY TRANSPORTABILITY GUIDANCE

Section I. GENERAL

5-1. Scope

This chapter provides highway transportability guidance for movement of the MW24C scoop loader. It covers technical data and safety considerations and prescribes the materials and guidance required to prepare, load, tie down, and unload the vehicle.

5-2. Safety

In addition to the safety precautions contained in chapter 3, movement is subject to all safety laws, rules, and regulations applicable to commercial carriers. Overseas, such movements are governed by theater regulations.

CAUTION

Vehicles must not exceed 3 miles per hour during loading and unloading.

5-3. General

The vehicle is considered self-deliverable, except on roads where the minimum speed is higher than the loader's maximum speed.

5-4. Transport on Semitrailer

The MW24C scoop loader, loaded on a semitrailer, may be transported over highways. Movement over public highways in CONUS and overseas should be made only when other modes of transport are not available or practical. Highway shipments may be made using either military or

commercial semitrailers of adequate capacity. Since tractors and semitrailers normally exceed dimensional and/or weight limitations in CONUS and overseas, special permits are required in CONUS (AR 55-162), and special routing may be required for overseas movement.

5-5. Transport on M870 Semitrailer

a. *General.* The MW24C scoop loader/M870 combination load in its operational configuration exceeds height and width limitations. The width, 107.5 inches (2.73 meters), is not a serious problem, since permits may be applied for without the loader being certified as essential to national defense. Since the ROP/FOPS can be removed to reduce the height, the loader can be transported without certification.

b. *Materials.* Adequate bracing and tiedown materials are provided by the shipping activity. Figure 5-1 shows tiedown of the vehicle. Figure 5-2 shows bracing material detail, and figure 5-3 is an end view of the vehicle on the semitrailer. Tables 5-1 and 5-2 show the materials needed for tiedown of this vehicle.

c. *Loading.* The loader may be placed in the tiedown position on a semitrailer by a crane of adequate capacity, or it may be driven onto the semitrailer, provided ramps are available. When the loader is in the tiedown position, the transmission shift lever should be placed in the neutral position and wire-tied. Also, the brakes should be set and air tanks drained.

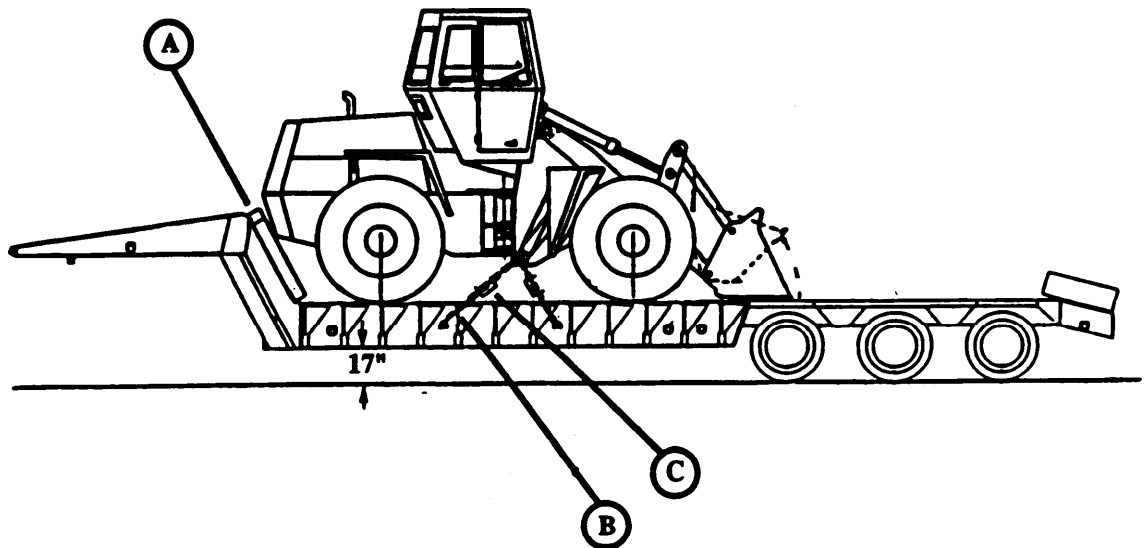


Figure 5-1. Tiedown of MW24C scoop loader on M870 semitrailer.

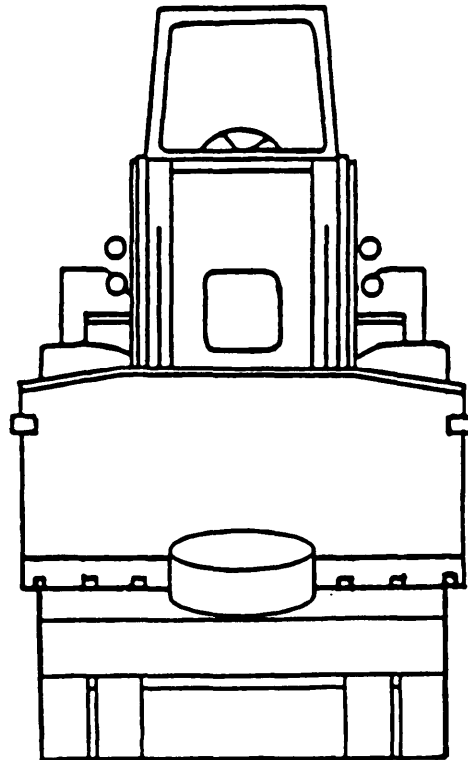
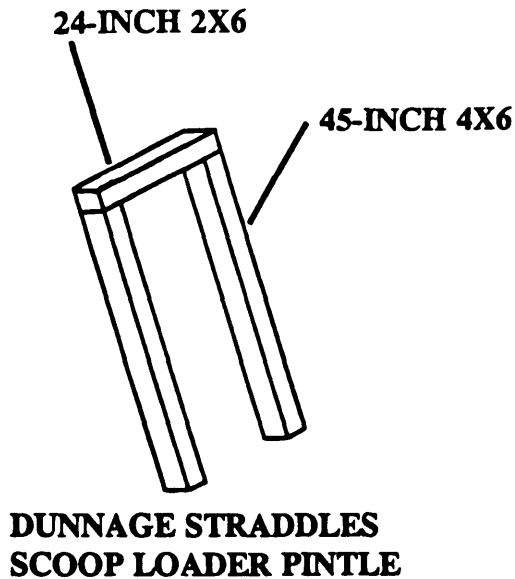


Figure 5-2. Detail of dunnage for the MW24C scoop loader on M870 semitrailer.

Figure 5-3. End view of MW24C scoop loader on M870 semitrailer.

Table 5-1. Bill of Material for Tiedown of MW24C Scoop Loader on M870 Semitrailer (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: 4- x 6-inch 2- x 6-inch	8 linear feet 2 linear feet
Nails	Common, steel; flathead; bright; table XI-b, Fed Spec FF-N-105B: 16d	4 ea
Chain Assemblies*	5/8-inch x 14-feet, NSN 4010-00-443-4845	4 ea
Load Binder*	For 5/8- to 3/4-inch chain, type 4, NSN 3990-01-213-1746, with compression unit	4 ea

*Items normally carried in M870 semitrailer as basic issue items.

Table 5-2. Application of Materials for Blocking and Tiedown of MW24C Scoop Loader on M870 Semitrailer (Figs 5-1 and 5-2)

Item	No. Required	Application
A	1	Dunnage. Secure the 2- x 6-inch board to the two 4- x 6-inch boards with four 16d nails as shown in figure 5-2. Place the dunnage against the semitrailer gooseneck. Move the scoop loader forward on the semitrailer until the engine cowling touches the dunnage.
B	4	Chain. Attach two chains to left underside MW24C tiedown ring. Run one chain forward to left side trailer tiedown provision. Run the other chain back to left side trailer tiedown provision. Repeat on opposite side.
C	4	Load binder. Attach one to each item B and tighten.

Table 5-2. Application of Materials for Blocking and Tiedown of MW24C Scoop Loader on M870 Semitrailer (Figs 5-1 and 5-2)

Item	No. Required	Application
A	8	Chock block (block detail, fig 52). Locate the 2- x 4-inch portion against wheels. Place two blocks in front of each wheel and two blocks in rear of each wheel. Nail each block to semitrailer with one 20d two 60d, and three 40d nails in heel and one 40d nail in each side of block. ZL
B	4	Shackle. Attach one shackle to each front tiedown and lifting provision.
C	8	Chain. Attach one chain to shackle on left front tiedown provision and to right front trailer tiedown ring. Attach one chain to shackle on right front tiedown provision and to left front trailer tiedown ring. Attach one chain to shackle on left front lifting provision and to left trailer gooseneck tiedown ring. Repeat on right front side. Attach one chain to left rear tiedown provision and to right rear trailer tiedown ring. Attach one chain to right rear tiedown provision and to left rear trailer tiedown ring. Attach one chain to left rear tiedown provision and to left side trailer tiedown ring. Repeat on right rear side.
D	8	Load binder. Attach one to each item C and tighten.

CHAPTER 6

MARINE AND TERMINAL TRANSPORTABILITY GUIDANCE

Section I. GENERAL

6-1. Scope

This chapter provides marine and terminal transportability guidance for movement of the MW24C scoop loader. It covers significant technical and physical characteristics, as well as safety considerations, and prescribes the materials and guidance required to prepare, lift, tie down, and discharge the scoop loader.

6-2. Safety

In addition to the safety precautions contained in chapter 3, the following should be noted as applicable:

- a. The activity offering the vehicle for transport will notify the carrier if ammunition or explosives are to be transported with the item.
- b. Fire extinguishers must be available during all loading and discharge operations.
- c. Slings and other items used in loading and discharge operation should be inspected for condition and adequate capacity.
- d. Personnel should be cautioned not to walk under vehicle being lifted.

e. All lifts should have sufficient guide lines attached to control the swing of the vehicle while suspended.

f. Vehicle fuel tank must not be more than one-fourth full, and battery terminals must be disconnected and taped.

g. Vehicle transmission must be placed in the neutral position with control lever wire-tied.

h. Parking brakes must be firmly set and air tanks drained.

6-3. Water Shipment

The MW24C scoop loader can be transported by a variety of barges and lighters and by most seagoing cargo vessels.

NOTE

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 ensure safe delivery without damage.

Section II. LOADING AND SECURING

6-4. General Rules

a. *Stowage.* Below-deck stowage should be provided whenever possible. In general, good stowage means placing the scoop loaders as close together as possible with minimum space between outer item and sweatboards. Breakable parts should be protected, and spare parts should be stowed in or near parent item.

b. *Lifting.* Correct lifting points are the lifting eyes located at the upper front and rear sides of the scoop loader. A typical lifting diagram is shown in figure 6-1.

c. *Loading.* The MW24C scoop loader will be loaded on seagoing cargo vessels in its minimum configuration. It may be loaded aboard landing craft, beach discharge lighters, heavy and medium amphibious lighters, and landing ships under its own power or by cranes of adequate capacity. It can also be driven or towed aboard roll-n/roll-off vessels, or onto decks of barges from a pier when tidal conditions are suitable and ramps are available.

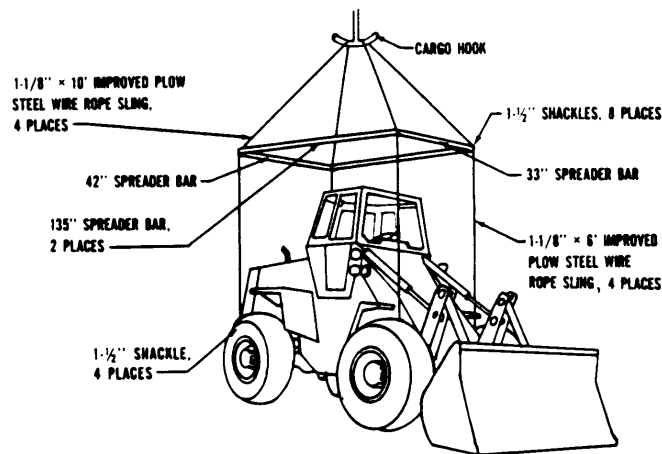


Figure 6-1. Lifting diagram for MW24C scoop loader (an eight-wire sling and four spreader bars are used).

6-5. Barges and Lighters

When the scoop loader is in its operational height, it can be transported only under pontoons in the C-8 and C-9 lash lighters. At its reduced height, it can be transported in the forward and aft bulkhead of the C-8 and C-9 lash lighters. For transport in SEABEE barges, no restrictions exist for the scoop loader in either the operational or reduced configuration. When the scoop loader is to be moved an extended distance or through rough waters, tiedowns must be used. Shown in figure 6-2 are typical blocking and tiedown details.

6-6. Special Design

Seatrain/trailer vessels, RORO ships, landing ships, and general cargo ships are equipped with patented lashing gear and pre-positioned fittings in the decks. The use of such equipment is adequate without additional blocking and bracing. The bill of materials and their application are listed in tables 6-1 and 6-2.

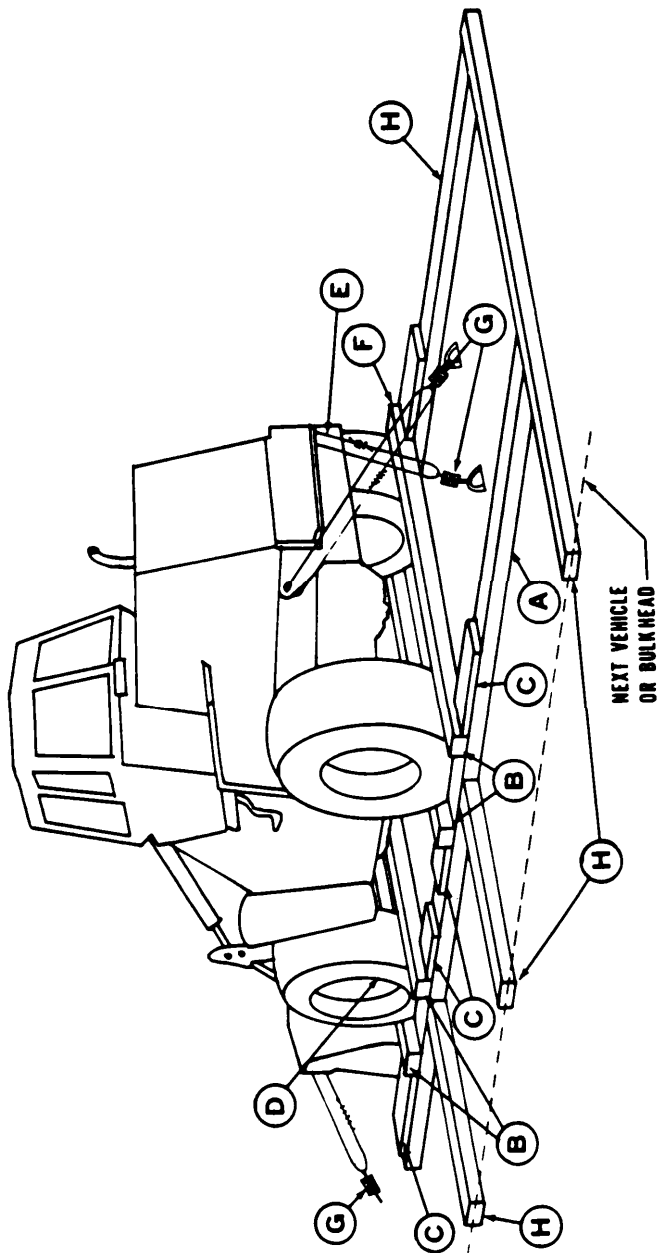


Figure 6-2. Typical blocking and tiedown of MW24C in general cargo and barge-type vessels.

Table 6-1. Bill of Materials for Blocking and Tiedown of MW24C Scoop Loader in General-Cargo and Barge-Type Vessels.

Item	Description	Approximate Quantity
Turnbuckles	Eye- and jaw-type, 1-inch diameter x 18-inch takeup, NSN 5340-00-188-0341, or equal.	4
Lumber	Douglas-fir, or comparable; straight-grain, free from material defects; Fed Spec MM-L-751H: 4- x 6-inch 6- x 8-inch	8 linear ft 70 linear ft
Nails	Common, steel; flathead; bright or cement-coated; table XI-b, Fed Spec FF-N-105B: 40d	80
Wire rope	6 x 19, IWRC; improved plow steel; preformed, regular-lay; table X, Fed Spec RR-W-410C: 5/8-inch	60 ft
Clips	Wire rope, U-bolt clips saddled, single-grip; steel; Crosby heavy-duty, or equal; MIL-STD 16842: 5/8-inch	16

Table 6-2. Application of Materials for Blocking and Tiedown of MW24C Scoop Loader in General Cargo Vessel.

Item	No. Required	Application
A	2	<i>Side blocking.</i> Each consists of 6- x 8- x 192-inch* lumber. Locate one piece on each side of scoop loader against outside of tires.
B	4	<i>End blocking.</i> Each consists of 6- x 8- x 110-inch* lumber. Locate on top of item A and against front of front wheels and rear of rear wheels. Toenail to item A with four 40d nails at each end of each piece.
C	8	<i>Backup cleats.</i> Each consists of 4- x 6- x 12-inch lumber. Locate one on top of each item A and against item B. Nail to item A with four 40d nails.
D	2	<i>Shackles.</i> Secure one shackle to each front tiedown provision.
E	4	<i>Wire rope.</i> Form a complete loop through each scoop loader tiedown provision and the eye of a turnbuckle. On the scoop loader, the front loop will be through item D. Overlap wire rope ends at least 24 inches.
F	16	<i>Clamps.</i> Place four on each wire rope at the overlap area, and space 3-3/4 inches apart, with a minimum of 6 inches from ends of wire rope. Torque nuts of clamps to 65 foot-pounds.
G	4	<i>Turnbuckles.</i> Attach jaw end to padeye built into vessel deck. Tighten so that wire rope cannot slip.
H	as required	<i>Bracing.</i> Consists of 6- x 8-inch lumber, length cut-to-fit. Brace as required against adjacent vehicle, cargo, or vessel bulkhead. Toenail each end of each piece to adjacent blocking with four 40d nails. Lumber and nails for this requirement are not included in table 6-1.

* Approximate lengths. May be cut length-to-suit.

CHAPTER 7

RAIL TRANSPORTABILITY GUIDANCE

Section I. GENERAL

7-1. Scope

This chapter provides rail transportability guidance for movement of the MW24C scoop loader. It covers significant technical data and physical characteristics, as well as safety considerations, and prescribes the materials and guidance required to prepare, load, and tie down the scoop loader on open-top flatcars.

7-2 .Maximum Utilization of Railcars

Additional cargo, as approved by the activity offering the vehicle for transport, may be transported with the vehicle.

Section II. TRANSPORT ON CONUS RAILWAYS

7-3. General

The transportability guidance contained in this section is applicable when the scoop loader is transported on CONUS railways. Consideration is given to single and multiple movements on the type of railcars normally used for the transport of this type of equipment.

7-4. Loading on General Purpose Flatcar

The scoop loader may be placed in the tiedown position on the railcar by a crane of adequate capacity, or it may be driven or towed onto the railcar provided a suitable ramp or bridge is available.

CAUTION

Do not allow the scoop loader to exceed 3 mph during loading and unloading operations.

b. The loads shown in figures 7-1 and 7-2 are based on a flatcar with a minimum width of 9 feet 6 inches, which will provide sufficient space for blocking materials. Figure 7-3 is a detailed diagram of the blocking and tiedown for these loads. The bill of materials for blocking and tiedown of the vehicle shown is in table 7-1, and the application of these materials is shown in table 7-2.

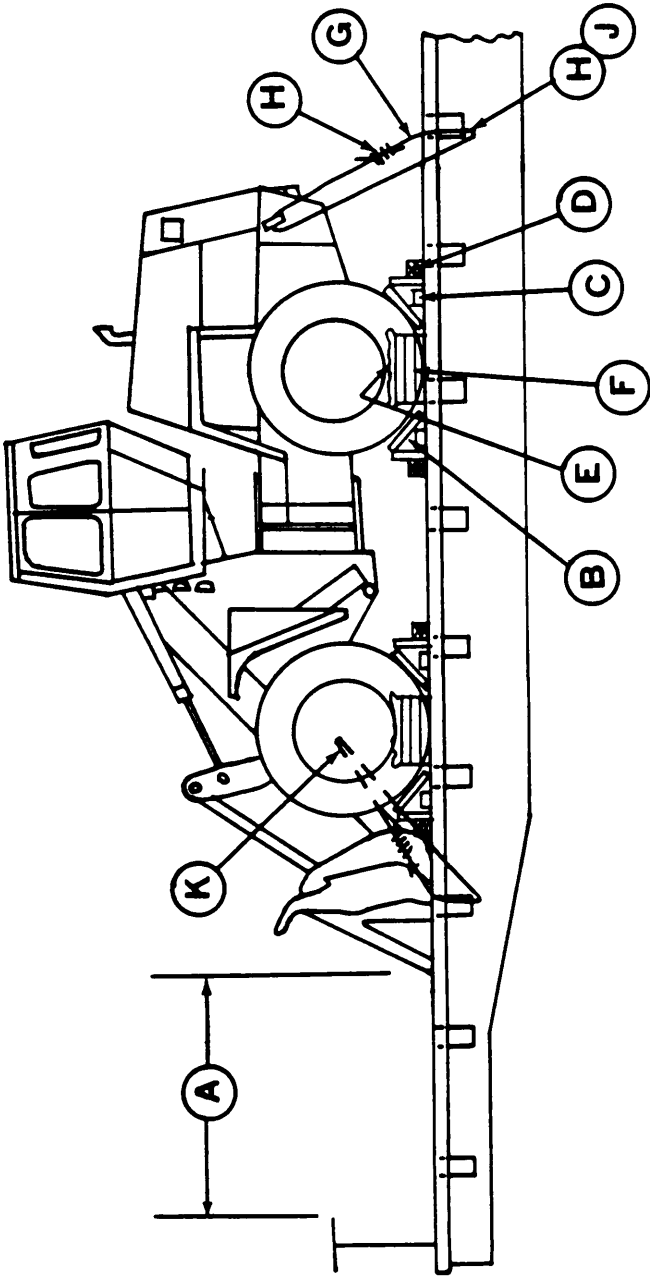


Figure 7-1. Blocking and tiedown diagram MW24C scoop loader on CONUS general-purpose flatcar (side view).

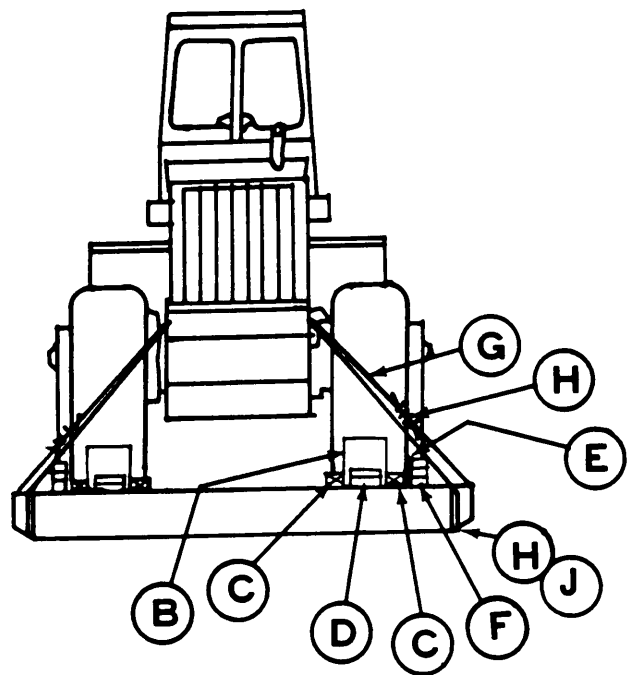


Figure 7-2. Blocking and tiedown diagram for MW24C scoop loader on CONUS general-purpose flatcar (rear view).

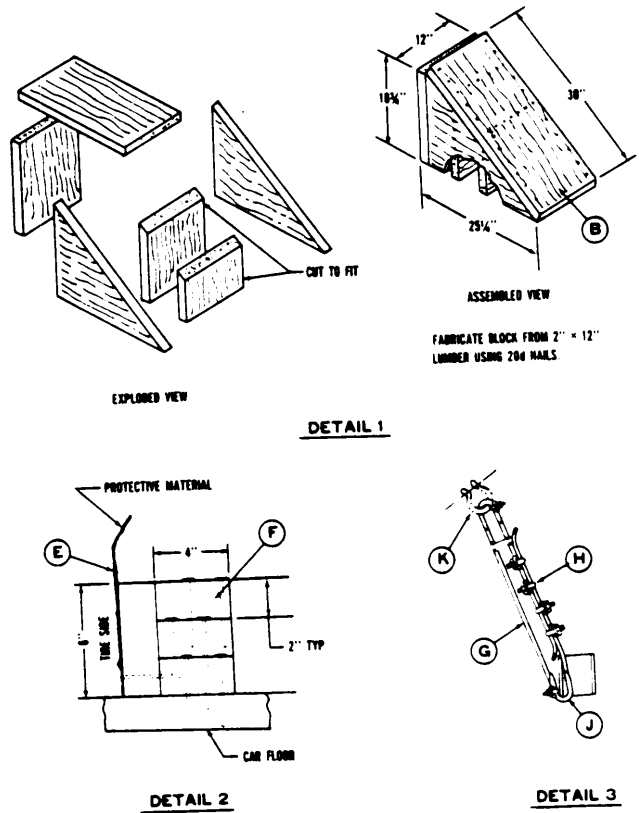


Figure 7-3. Blocking and tiedown details.

Table 7-1. Bill of Materials Blocking and Tiedown of MW24C on CONUS General-Purpose Flatcar (Figs 7-1 Through 7-3).

Item	Description	Approximate Quantity
Lumber	Douglas-fir, or comparable: straight-grain, free from material defects; Fed Spec MM-L751H: 2-x 4-inch 2-x 6-inch 2-x 12-inch	80 linear ft 12 linear ft 100 linear ft
Nails	Common, steel: flathead: bright or cement-coated; table XI-b, Fed Spec FF-N-105B: 12d 20d 30d	25 560 170
Thimbles	Standard, open-type: 5/8-inch	6
Clamps	Wire rope, U-bolt clips, saddled, single-grip; steel; Crosby heavy-duty, or equal; MIL-STD 16842: 5/8-inch	20
Cushioning material	Waterproof paper, burlap, or other suitable material	as required
Shackles	Anchor, screw pin, 1-inch pin size; NSN 4030-00-542-3182	2
Wire rope	6 x 19, IWRC; improved plow steel; preformed, regular-lay; table X, Fed Spec RR-W-410C: 5/8-inch	60 ft

Table 7-2. Application of Materials for Blocking and Tiedown of MW24C loader on CONUS General-Purpose Flatcar (Figs 7-1 Through 7-3).

Item	No. Required	Application
A		<i>Brake wheel clearance.</i> Minimum clearance required is 6 inches above, in back of, and on both sides of, and 4 inches underneath wheel.
B	8	<i>Blocks (detail 1, fig 7-3).</i> Locate one against the front and rear of each wheel.
C	16	<i>Side cleat.</i> Each consist of one piece of 2- x 4- x 20-inch lumber. Locate one piece on each side of each item B. Secure to car floor with six 30d nails.
D	8	<i>End cleat</i> Each to consist of two pieces of 2- x4-x 12-inch lumber. Locate one against end of each item B. Secure lower piece to car floor with four 30d nails and top piece to lower piece with four 30d nails.
E	1 each item F	<i>Cushioning material.</i> Locate bottom portion under item F: the top portion should extend 2 inch above item F (detail 2, fig 7-3).
F	4	<i>Side block.</i> Each to consist of one piece of 2- x 6- x 36-inch lumber and three pieces of 2- x 4- x 36-inch lumber (detail 2, fig 7-3). Nail one edge of 2- x6- x 36-inch piece to bottom 2-x 4- x 36-inch piece with five 12d nails. Then place against tire and nail to car floor through 2- x 4- x 36-inch piece with four 20d nails. Nail the other two 2- x 4- x 36-inch pieces to one below in the same manner.
G	4	<i>Wire rope.</i> Each to consist of one piece of 5/8-inch wire rope. length as required (about 15 feet). Form a complete loop between tiedown shackle or provision and appropriate stake pocket (detail 3, fig 7-3). Wire-rope ends should overlap a minimum of 24 inches.
H	20	<i>Clamps.</i> Place four on each wire rope at the overlap area and space 3-3/4 inches apart with a minimum of 6 inches from ends of cable. Place one clamp under each stake pocket and shackle, to secure wire rope and thimble together (detail 3, fig 7-3).
J	6	<i>Thimbles.</i> Place one at bottom of each stake pocket (four) and each front shackle, item K, where used.
K	2	<i>Shuckles.</i> Attach one to each front tiedown provision of the MW24C scoop loader.

GENERAL INSTRUCTIONS

1. Handbrakes are to be set and air tanks must be drained.
2. Gearshift levers must be placed in the neutral position and wire-tied.
3. See General Rules 1, 2, 3, 4, 5, 9, 14, 15, 19A, 19B, and 19C, section 1 of the *Rules Governing the Loading of Commodities on Open-Top Cars and Trailers*, published by the Association of American Railroads, for further details.
4. Tensioning of wire rope can be accomplished with an applicable size come-along mechanical hoist or equal tensioning device.

7-5. Loading the MW24C Scoop Loader on Special Purpose Flatcars

a. The scoop loader may be placed in the tiedown position on the flatcar by a crane, or it may be driven or towed onto the flatcar provided a suitable ramp or bridge is available.

b. Figure 7-4 shows the scoop loader on a center tiedown rail-equipped flatcar. Table 7-3 presents the application of chain tiedowns for securing the vehicle on a center tiedown flatcar.

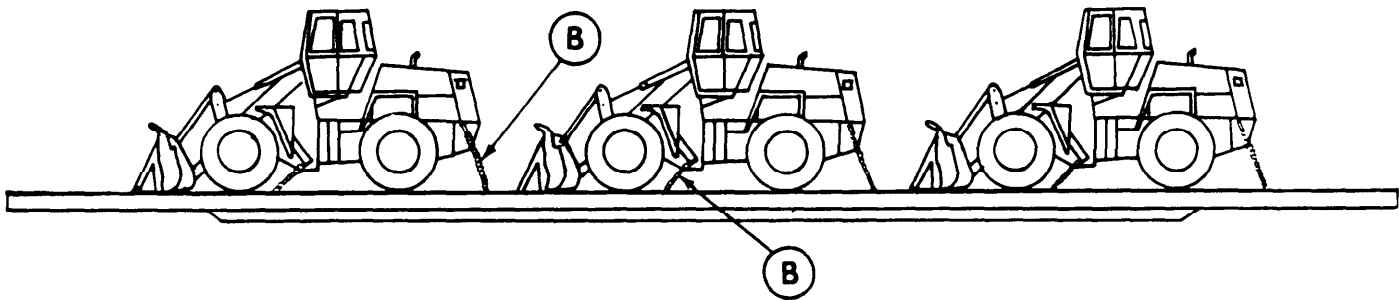


Figure 7-4. Tiedown of MW24C scoop on flatcars with center tiedown rails.

Table 7-2. Application of Materials for Blocking and Tiedown of MW24C loader on CONUS General-Purpose Flatcar

Item	No. Required	Application
A		<i>Brakewheel clearance.</i> Minimum clearance required is 6 inches above, in back of, and on both sides of and 4 inches underneath wheel.
B	4 ea unit	1/2-inch diameter alloy steel chain proof-tested to minimum of 22,500 pounds for vehicles weighing from 16,000 to 25,000 pounds inclusive. 1/2-inch diameter alloy steel chain, extra strength, proof-tested to minimum of 27,500 pounds for vehicles weighing from 25,000 to 40,000 pounds inclusive.

GENERAL INSTRUCTIONS

1. When ordering specialized railway equipment, shippers should specify cars equipped with tiedown devices in the quantity shown in item B. 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 to secure vehicles. Load binders are not to be used in place of turnbuckles to tension tiedown chains.
2. Vehicles must be faced in the same direction and uniformly spaced along the length of the car to allow sufficient space at each end of the car and between the vehicles for securement. Tiedowns should be applied parallel to each other at the same end of the vehicle and from the vehicle tiedown point to the car tiedown facility. The angle of the tiedown should be as close as possible to 45°. When the length of vehicles loaded on an 89-foot car precludes facing all cars in the same direction, one vehicle may be reversed to ensure application of tiedown at a floor angle of 45°.
3. Air tanks must be drained.
4. Gearshift levers on vehicles equipped with automatic or standard transmissions must be wire-tied in neutral position.
5. Open hooks must be secured with wire over the opening to prevent the hook from being disengaged from chain link to which it is secured.
6. Turnbuckles used to tighten chains must be wired or locked to prevent them from turning during transit unless turnbuckles are equipped with self-locking devices.
7. When vehicles are shipped in a loaded configuration, the gross weight of the vehicle and cargo combined must be determined to assure that the proper size and/or number of tiedowns are used to secure the vehicles to the railcar.

Section III. TRANSPORT ON FOREIGN RAILWAYS

7-6. General

The transportability guidance contained in this section is applicable when the scoop loader is transported on foreign railways. Consideration is given to single and multiple movements on types of railcars normally used for the transport of the equipment. When loaded on a suitable flatcar, the scoop loader can be transported within European countries in its reduced configuration and complies with the passe partout international (PPI) gauge railways: this also applies to most of the countries in the Middle East and South America. Clearances vary by country, and each country will require a separate check. Because of various designation systems and clear-

ances used by different countries, evaluation of transport capability must be made on an individual basis.

7-7. Transport on Foreign-Service Flatcars

a. General. The vehicles can be transported on a number of foreign service flatcars.

b. Materials. The materials required for blocking and tiedown of vehicles on foreign-service flatcars are essentially the same as those used with CON US. For general guidance, refer to figures 7-1 and 7-2. Detailed guidance is contained in 4th Transportation Command Pamphlet 55-2, *Tiedown Guide for Rail Movements*.

APPENDIX A CONVERSION TABLES

1. Common Metric Abbreviations.

m= meter
dm = decimeter
cm = centimeter
mm = millimeter

kg = kilogram
km = kilometer
MT = metric ton

2. Linear Measure.

1 mi= 1,609.35 m
1 yd= 0.9144 m
1 ft = 0.3048 m
1 in. = 0.0254 m
1 m= 10 dm = 100 cm = 1,000 mm

1 km= 0.6214 mi
1 m = 1.0936 yd
1 m = 3.2808 ft
1 m = 39.3700 in.

3. Surface Measure.

1 sq yd = 0.8361 sq m
1 sq ft = 0.0929 sq m
1 sq in. = 0.00064 sq m

1 sqm= 1.196 sq yd
1 sqm= 10.764 sq ft
1 sqm= 1,550 sq in.

4. Cubic Measure.

1 cu yd= 0.76455 cu m
1 cu ft = 0.02831 cu m
1 cu in. = 0.000016 cu m

1 cu m= 1.31 CU yd
1 cu m = 35.30 cu ft
1 cu m = 61,023 cu in.

5. Weight.

1 STON = 907.185 kg
1 lb = 0.45359 kg

1 kg = 2.2046 lb
1 MT = 1,000 kg
1 MT = 2,204.62 lb

6. The following simplified conversion factors are accurate to within 2 percent for quick computations:

a. *Inches to centimeters.* Multiply in. by 10 and divide by 4.

b. *Yards to meters.* Multiply yd by 9 and divide by 10.

c. *Miles to kilometers.* Multiply mi by 8 and divide by 5.

d. *Pounds to kilograms.* Multiply lb by 5 and divide by 11.

Paragraph 7-37, FM 55-15 and paragraph 2-15, TM 55-450-15 contain additional detailed conversion factors.

7. The following conversions are provided for guidance when lumber, wire rope, or wire are procured in areas that use the metric system. Lumber sizes are rounded to the nearest 1/2 cm.

a. *Lumber.*

2-in. x 4-in. x desired length = 5-cm x 10-cm x desired length.

1-in. x 6-in. x desired length = 2.5-cm x 15-cm x desired length.

6-in. x 8-in. x desired length = 15-cm x 20-cm x desired length.

1-in. x 12-in. x desired length = 2.5-cm x 30-cm x desired length (length normally expressed in ft or m).

b. *Wire rope.*

3/8-in. dia = 9.5-mm dia

1/2-in. dia = 12.7-mm dia

5/8-in. dia = 15.8-mm dia

3/4-in. dia = 19.0-mm dia

7/8-in. dia = 22.2-mm dia

1-in. dia = 25.4-mm dia

1 1/4-in. dia = 31.7-mm dia

1 1/2-in dia = 38.1-mm dia

Round to the next higher whole mm of available wire rope sizes.

c. *Wire.* No. 8 gauge annealed (11/64-in dia) = 4.37-mm dia. Round as in b above.

By Order of the Secretary of the Army:

JOHN A. WICKHAM, JR.
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Chief of Staff

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