TECHNICAL MANUAL

TRANSPORTABILITY GUIDANCE

MIXER, ROTARY TILLER, M076

(NSN 3895-01-141-0882)

H E A D Q U A R T E R S , D E P A R T M E N T O F T H E A R M Y

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TRANSPORTABILITY GUIDANCE MIXER, ROTARY TILLER, M076 (NSN 3895-01-141-0882)

LIST OF ILLUSTRATIONS

LIST OF TABLES

CHAPTER 1

INTRODUCTION

1-1. Purpose and scope

a. This manual provides transportability guidance for logistical handling and movement of the M076, rotary tiller mixer. It contains information considered appropriate for safe transport of the item. Included are significant technical and physical characteristics with safety considerations required for worldwide movement by the various transportation modes. Where needed, metric equivalents are given in parentheses after the US dimensions.

b. This manual is intended for transportation officers and other personnel responsible for movement or transportation services.

1-2. Safety

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

1-3. Definitions of warnings, cautions, and notes

When used in 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. Note. An operating procedure that must be emphasized.

1-4. Reporting of publication improvements

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 Publications and Blank Forms) and sent to Commander, Military Traffic Management Command Transportation Engineering Agency, ATTN: MTT-TRV (F. Mika), PO Box 6276, Newport News, VA 23606-0276. Electrically transmitted comments should be addressed to CDR MTMCTEA FT EUSTISII/MTT-TRV//.

CHAPTER 2

TRANSPORTABILITY DATA

Section I. GENERAL

2-1. Scope
This chapter provides a general description and identification of the M076 rotary tiller mixer (fig 2-1), as well as tabulated transportability characteristics that are necessary in movement of the item.

2-2. Description
a. General. The mixer consists of a diesel-engine-driven rotary soil tiller, a hydraulic traction drive, an additive pump and spray bar, a travel speed indicator, a flow meter, and necessary controls, all mounted on four rubber-tired wheels. The mixer is capable of a 7-foot mixing width and all types of soil stabilization to include bituminious stabilizations with asphalt outbacks and emulsions, cement, lime, and chloride.

2-3. Transportability drawings
Detailed side- and end-view transportability drawings of the mixer, with dimensions and tiedown and lift provision load-rating capacities, are shown in figures 2-2 through 2-4.

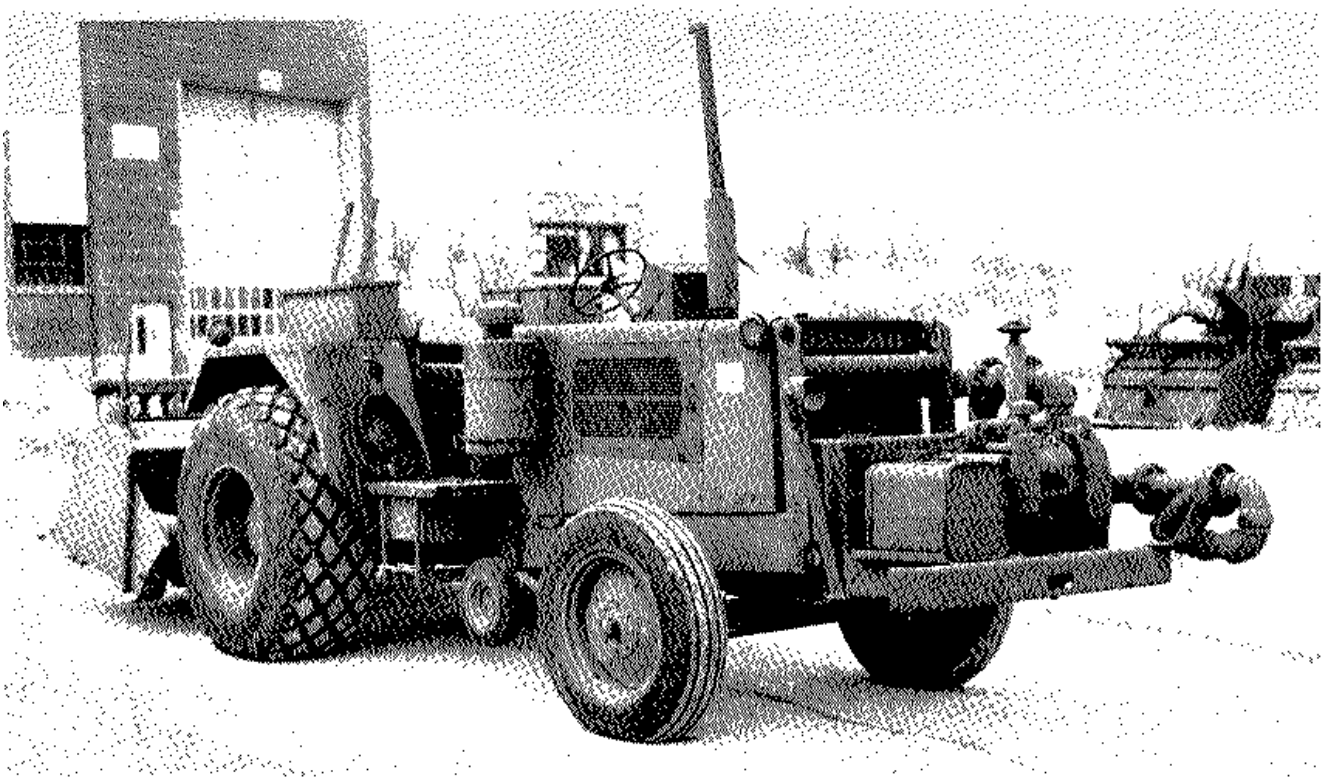


Figure 2-1. M076 rotary tiller mixer.

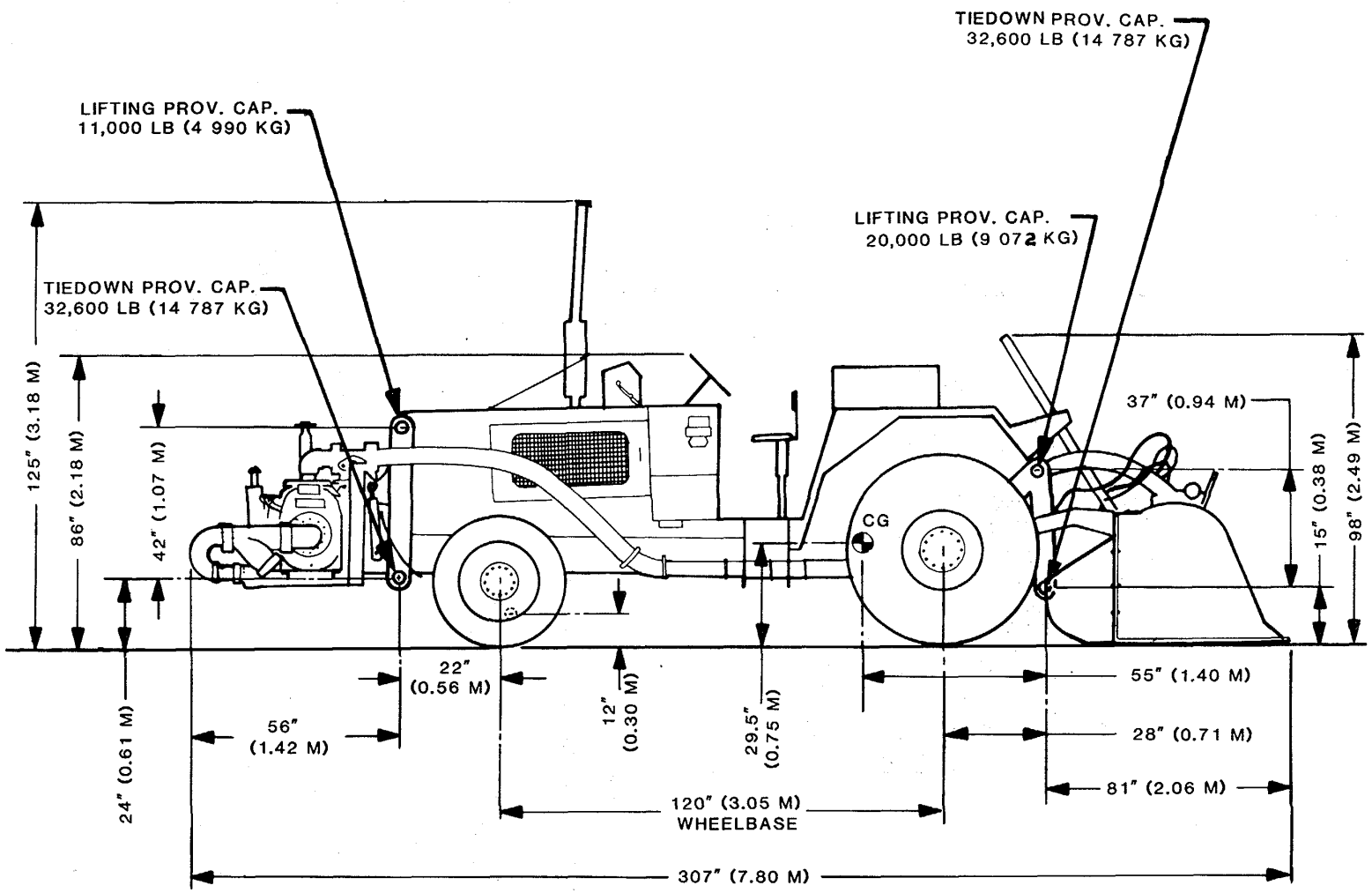


Figure 2-2. Left-side view of the M076 rotary tiller mixer.

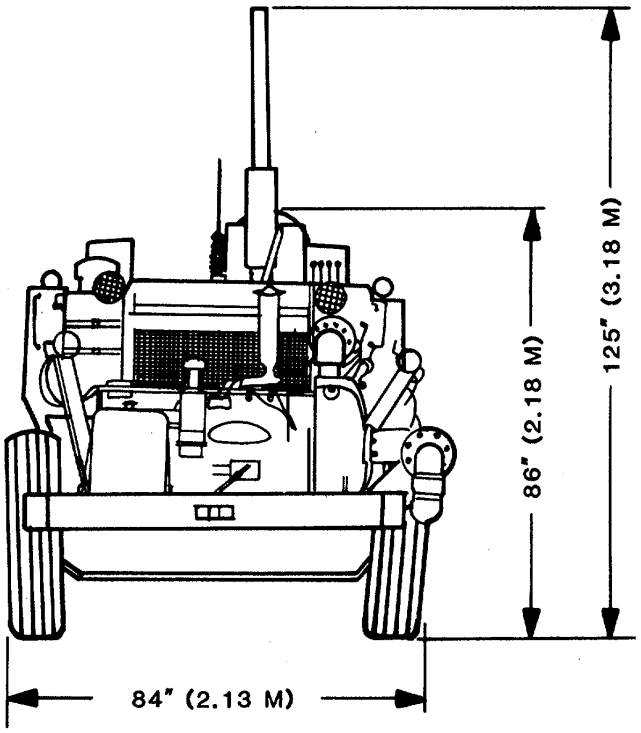


Figure 2-3. Front view of the M076 rotary tiller mixer.

Section II. CHARACTERISTICS AND RELATED DATA

2-4. General transportability characteristics

Data contained herein are applicable to the model number or national stock number shown.

National stock number 3895-01-141-0882
Line item number..... M55384
Ground pressure:
  Front ..... 21.5 psi (148.2 kPa)
  Rear ..... 20.8 psi (143.4 kPa)
Ground contact area:
  Front (per tire) .....175 in.^{2} (0.113m^2)
  Rear (per tire).....600 in.^{2} (0.387 m^2)
Tire type:
  Front ..... 9 x 24
  Rear ..... 23.1 x 26
Inflation pressure:
  Front ..... 28 psi (193.1 kPa)
  Rear ..... 16 psi (110.3 kPa)
Axle load:
  Front axle ..... 3,760 lb (1706 kg)
  Rear axle.....12,500 lb (5670 kg)
Performance:
  Maximum speed.....20 mph (32 km/hr)
  Maximum grade ..... 20 pct
  Range ..... 233 mi (375 km)
  Fuel tank capacity ..... 80 US gal (303 L)
Turning radius..... 20 ft (6.10 m)
Angle of approach..... 25°
Angle of departure..... 14°
Ground clearance (with tiller.....12 in. (0.30 m)
raised and skis removed) .....
Dimensions and shipping data:
  Length:
    Operational .....307 in. (7.80)
    Reduced .....295 in. (7.49 m)
  Width:
    Operational .....103.75 in. (2.64 m)
    Reduced .....96.00 in. (2.44 m)
  Height:
    Operational .....125 in. (3.18 m)
    Reduced (stacks) .....98 in. (2.49 m)
    Reduced (stacks and bars).....86 in. (2.18 m)
  Area:
    Operational ..... 221.19 ft^2 (20.55 m^2)
    Reduced (skis removed) ..... 196.67 ft^2 (18.27 m^2)
  Cube:
    Operational ..... 2,304.05 ft^3 (65.20 m^3)
    Reduced (stacks and bars)... 1,409.44 ft^3 (39.89 m^3)
Center of gravity:
  Above ground .....29.50 in. (0.75 m)
  From rear lift eye. .....55.00 in. (1.40 m)
Weights:
  Operational ..... 16,260 lb (7376 kg)
  *Reduced (components removed) 13,630 lb (6182 kg)

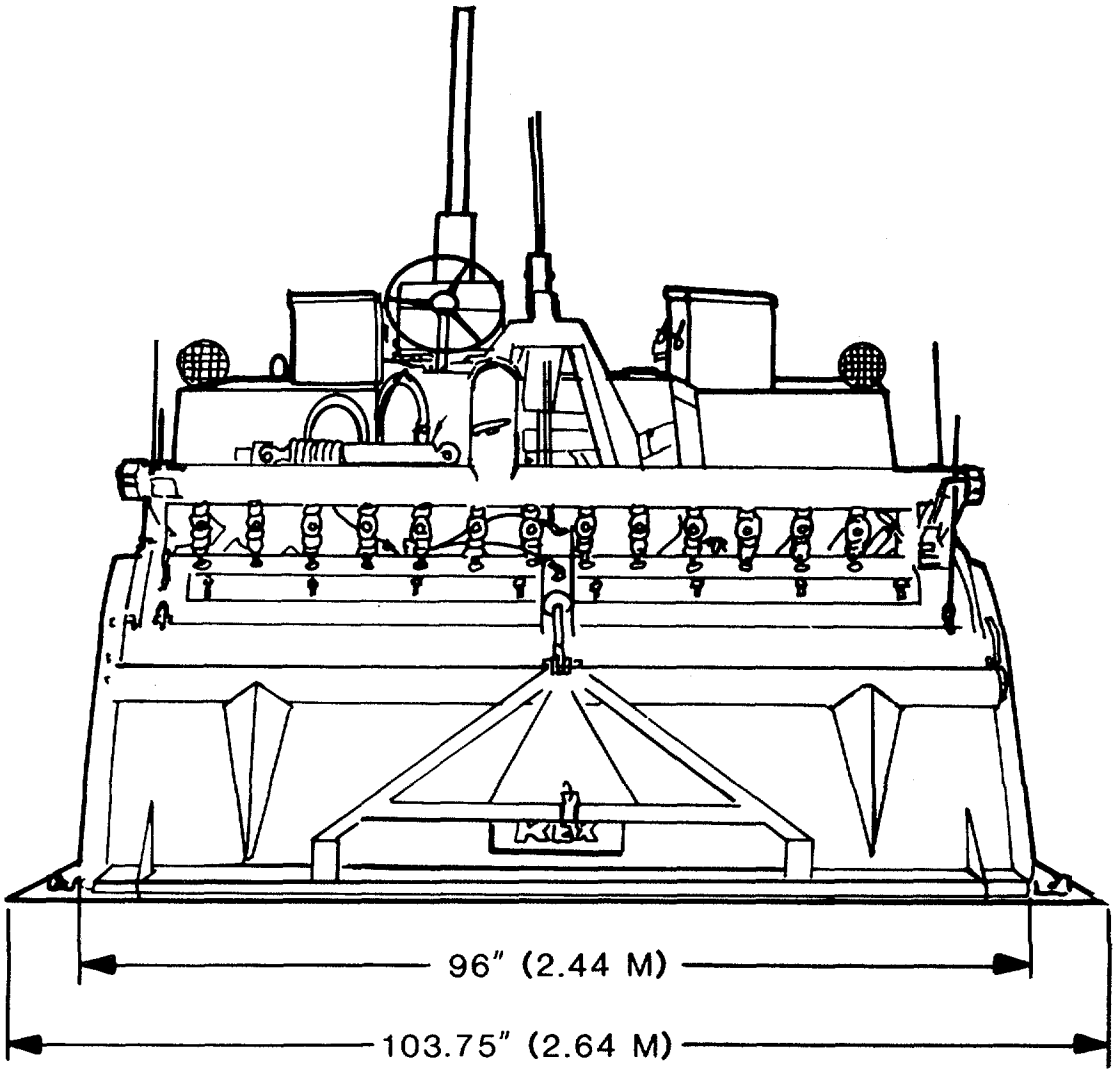


Figure 2-4. Rear view of the M076 rotary tiller mixer.

Military load classification (MLC):
M818/M871/Mixer..... MLC 21
M920/M870/Mixer..... MLC 24
*With components in crate 88" x 38" x 52"; 101 cu ft; 2830 lbs gross weight.

2-5. Unusual characteristics
This vehicle has no unusual characteristics that would require that special attention be given to temperature, atmospheric pressure, or humidity variations during its exposure to normal transportation environments.

2-6. Hazardous and dangerous characteristics.
The vehicle has no special hazardous or dangerous characteristics during its exposure to normal transportation environments.

NOTE

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

CHAPTER 3

SAFETY

3-1. General

General safety considerations and precautions for movement are as follows:

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

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

c. Drivers must not leave the operator's position 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. The seat belt will be fastened during vehicle operation.

g. Personnel must not smoke when operating or refueling the vehicle.

h. The driver must bring the vehicle to a complete stop before driving in or out of a building.

i. Whenever the vehicle is operated in reverse, a ground guide must be used to direct the driver.

j. Personnel must stay clear of the engine exhaust area during and immediately after engine operation. Contact with these areas can cause severe burns.

k. 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 gases.

3-2. Specific safety requirements

Pertinent safety requirements by individual mode are given, where applicable, in the appropriate chapters.

CHAPTER 4

AIR TRANSPORTABILITY GUIDANCE

4-1. Scope

This chapter provides air transportability guidance for the movement of the M076 rotary tiller mixer. It covers technical and physical characteristics, as well as safety considerations, and prescribes the manpower, material, and time required to prepare, load, and tie down the vehicle on, or unload the vehicle from, US Air Force aircraft.

4-2. Maximum utilization of aircraft

The loads described in this section are not maximum loads. General guidance on total cargo loads and on operating ranges is provided in TM 38-236/AFP 71-8. Additional cargo and/or personnel within allowable load limits and restrictions prescribed by pertinent safety regulations can be transported.

4-3. Applicability

a. US Air Force Aircraft. The M076 rotary tiller mixer is transportable in C-130, C-141, and C-5 aircraft. Procedures in this manual and those prescribed in TO 1C-130A-9, TO 1C-141B-9, and TO 1C-5A-9 are applicable.

b. Tiedown. This vehicle is tied down in accordance with the applicable TO 1C-XXX-9, section IV. Figures 4-1 through 4-3 show suggested tiedown patterns for the vehicle in the C-130, C-141, and C-5, respectively. Tables 4-1 through 4-3 list the tiedown devices required, the location of tiedown points, the corresponding fittings to which the devices are secured, and the number and capacity of devices.

c. Loadmaster Responsibilities. The loadmaster will ensure that the vehicle is loaded and secured in accordance with the applicable TO 1C-XXX-9.

4-4. Safety

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

a. Vehicle fuel tanks must be at least one-fourth full but not more than three-fourths full.

b. Each vehicle must be checked carefully to ensure that all loose items are properly secured in accordance with restraint criteria.

WARNING

Proper ventilation must be provided during loading and unloading. Prolonged inhalation of carbon monoxide fumes may be fatal.

WARNING

Fire extinguishers must be readily available during all loading and unloading operations.

CAUTION

Vehicles must not exceed 3 miles per hour (walking speed) on loading ramps or inside aircraft.

4-5. Preparation of vehicle

The following steps pertain to the preparation of the M076 rotary tiller mixer for transport in C-130, C-141, and C-5 aircraft.

a. Remove exhaust stack and muffler (for C-130 and C-141).

b. Remove skis from tiller assembly.

NOTE

Stow the exhaust stack, muffler, and skis in the driver's compartment. Secure with tiedown devices as required.

c. Pin the rotor bar at the highest possible setting.

d. Minimal approach shoring may be required for on/offloading the C-141 if ramp angle is more than 14 degrees.

WARNING

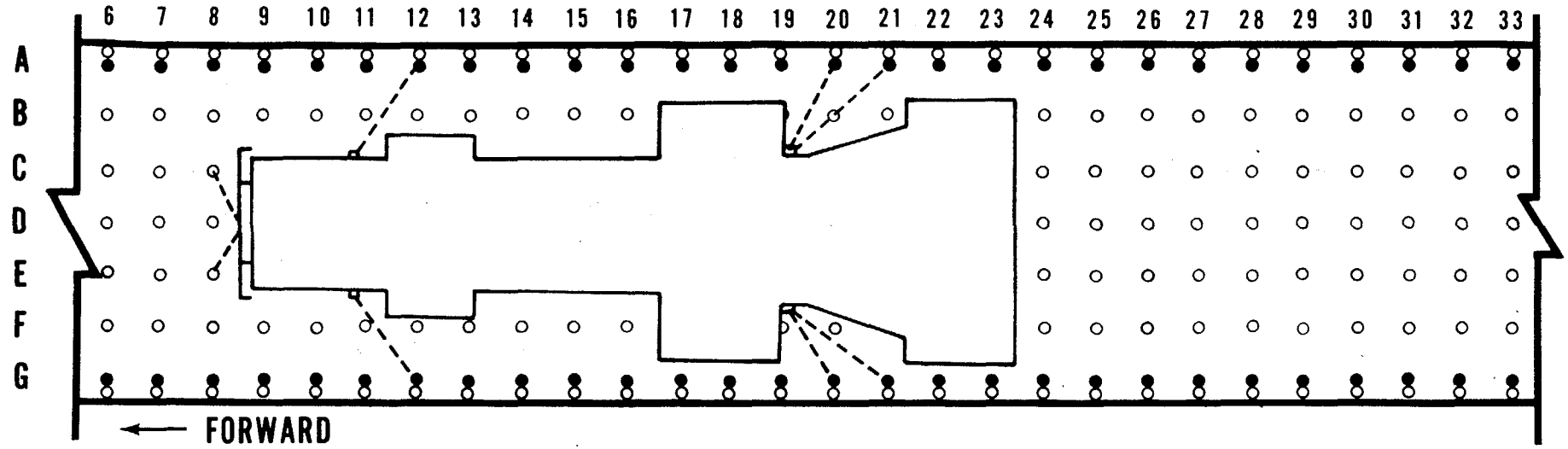
Because of floor load considerations, the mixer's rear tire pressure must be exactly 16 psi per tire and the front tire pressure must be 32 to 35 psi per tire.

4-6. Internal transport by US Army aircraft

The M076 rotary tiller mixer exceeds the size and/or weight limitations for internal transport by US Army fixed-wing aircraft or helicopters.

4-7. External transport by US Army helicopters

Helicopter transport of the M076 rotary tiller mixer is not required. However, the vehicles gross weight does permit external air transport (EAT) by the CH-47 under limited mission flight profiles. To be externally

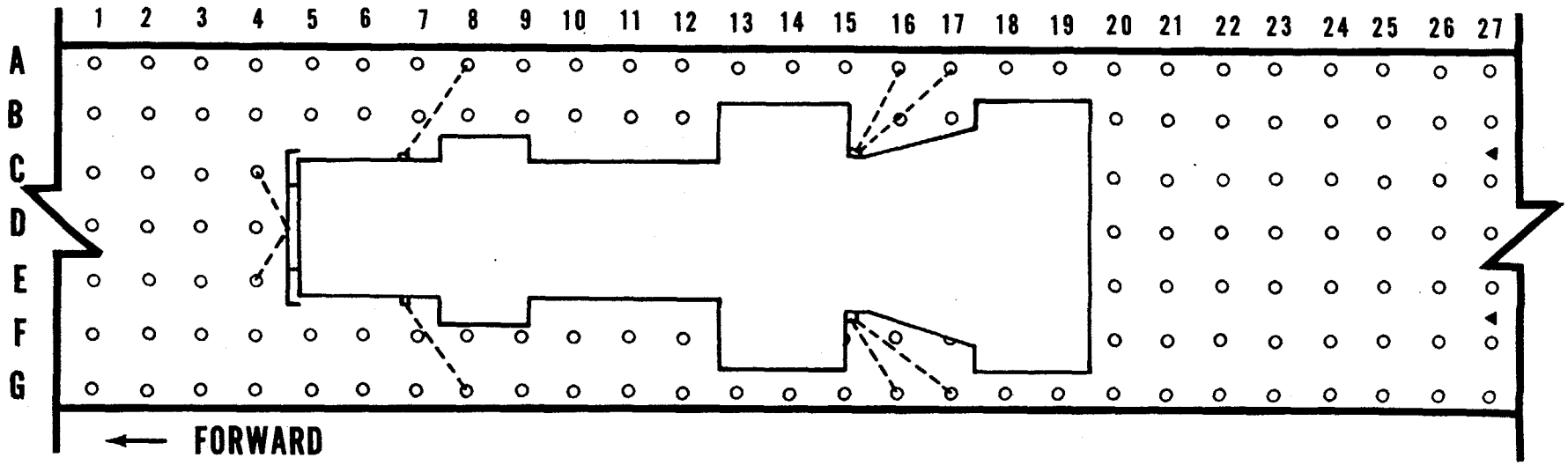


LEGEND: C-141 AIRCRAFT

- ○ 10,000 POUND CAPACITY TIEDOWN FITTING
- ● 25,000 POUND CAPACITY TIEDOWN FITTING

NOTE: TIEDOWN FITTINGS ARE LOCATED IN ROWS A THROUGH G AND AND COLUMNS 1 THROUGH 42. THIS IS A TYPICAL TIEDOWN PROCEDURE AND ONLY COLUMNS 6 THROUGH 33 ARE SHOWN. ITEM BEING SHIPPED CAN BE TIED DOWN AT ANY LOCATION (1-42) APPROVED BY LOADMASTER.

Figure 4-1. Tiedown diagram for the M076 rotary tiller mixer in C-130 aircraft.

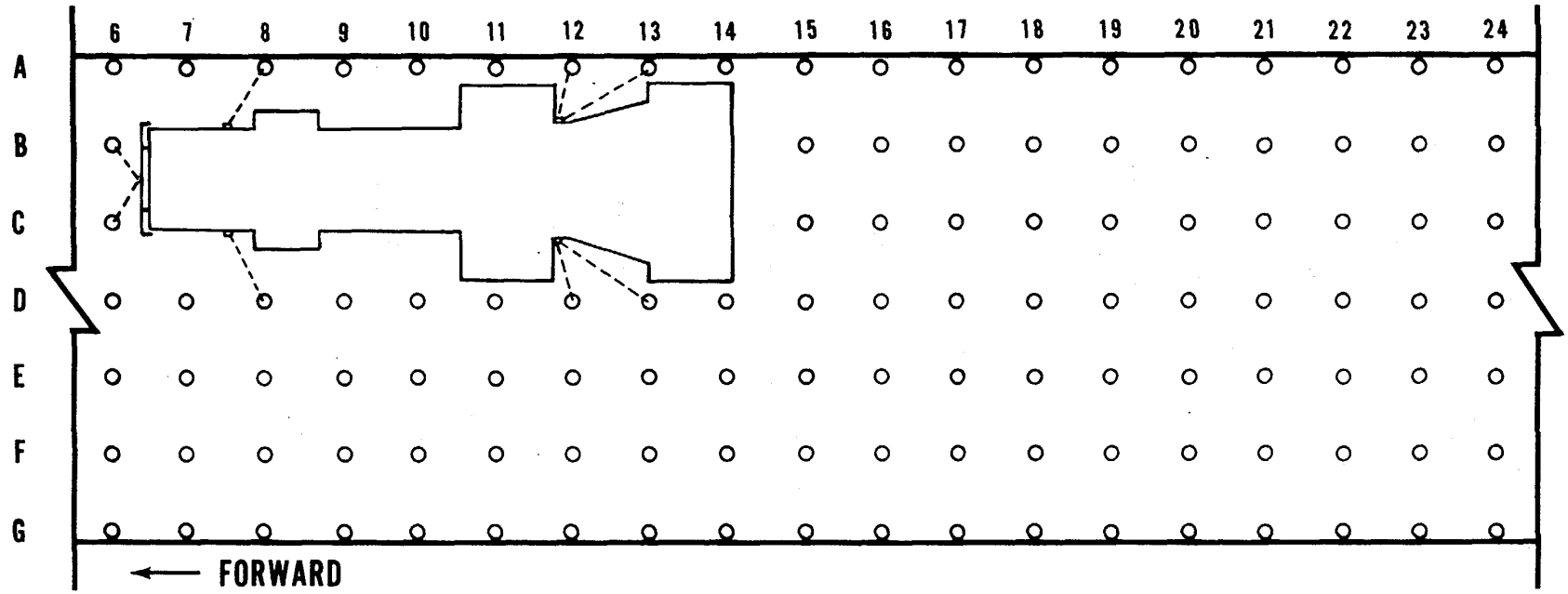


LEGEND: C-130 AIRCRAFT

- ○ 10,000 POUND CAPACITY TIEDOWN FITTING
- ▲ 25,000 POUND CAPACITY TIEDOWN FITTING

NOTE: TIEDOWN FITTINGS ARE LOCATED IN ROWS A THROUGH G AND COLUMNS 1 THROUGH 30. FIVE OF THESE AS ARE LOCATED ON THE RAMP. THIS IS A TYPICAL TIEDOWN PROCEDURE AND ONLY COLUMNS 1 THROUGH 27 ARE SHOWN. ITEM BEING SHIPPED CAN BE TIED DOWN AT ANY LOCATION (1-30) APPROVED BY THE LOADMASTER.

Figure 4-2. Tiedown diagram for the M076 rotary tiller mixer in C-141 aircraft.



LEGEND: C-5 AIRCRAFT

o ALL CARGO TIEDOWN FITTING RATINGS 25000 LB EACH

NOTE: TIEDOWN FITTINGS ARE LOCATED IN ROWS A THROUGH G AND COLUMNS 1 THROUGH 48. TEN OF THESE ARE LOCATED ON THE RAMPS : FIVE ON THE FORWARD RAMP AND FIVE ON THE AFT RAMP. THIS IS A TYPICAL TIEDOWN PROCEDURE AND ONLY COLUMNS 6 THROUGH 24 ARE SHOWN. ITEM BEING SHIPPED CAN BE TIED DOWN AT ANY LOCATION (1-42) APPROVED BY THE LOADMASTER.

Figure 4-3. Tiedown diagram for the M076 rotary tiller mixer in C-5 aircraft.

transportable, the vehicle must receive EAT certification from the US Army Natick Research, Development and Engineering Center (USANRDEC).

Table 4-1. Tiedown Data for M076 Rotary Tiller Mixer in C-130 Aircraft

Tiedown fitting		Tiedown device		
Desig-nation	Capacity in 1,000 lb	Type	Capacity in 1,000 lb	Attach to item
C4	10	MB-1	10	Center front tiedown provision.
E4	10	MB-1	10	Center front tiedown provision.
A8	10	MB-1	10	Right front tiedown provision.
G8	10	MB-1	10	Left front tiedown provision.
A16	10	MB-1	10	Right rear lift provision.
G16	10	MB-1	10	Left rear lift provision.
A17	10	MB-1	10	Right rear tiedown provision.
G17	10	MB-1	10	Left rear tiedown provision.

Table 4-2. Tiedown Data for M076 Rotary Tiller Mixer in C-141 Aircraft

Tiedown fitting		Tiedown device		
Desig-nation	Capacity in 1,000 lb	Type	Capacity in 1,000 lb	Attach to item
C8	10	MB-1	10	Center front tiedown provision.
E8	10	MB-1	10	Center front tiedown provision.
A12	25	MB-1	10	Right front tiedown provision.
G12	25	MB-1	10	Left front tiedown provision.
A20	25	MB-1	10	Right rear lift provision.
G20	25	MB-1	10	Left rear lift provision.
A21	25	MB-1	10	Right rear tiedown provision.
G21	25	MB-1	10	Left rear tiedown provision.

Table 4-3. Tiedown Data for M076 Rotary Tiller Mixer in C-5 Aircraft

Tiedown fitting		Tiedown device		
Desig-nation	Capacity in 1,000 lb	Type	Capacity in 1,000 lb	Attach to item
B6	25	MB-1	10	Center front tiedown provision.
C6	25	MB-1	10	Center front tiedown provision.
A8	25	MB-1	10	Right front tiedown provision.
D8	25	MB-1	10	Left front tiedown provision.
A12	25	MB-1	10	Right rear lift provision.
D12	25	MB-1	10	Left rear lift provision.
A13	25	MB-1	10	Right rear tiedown provision.
D13	25	MB-1	10	Left rear tiedown provision.

CHAPTER 5

HIGHWAY TRANSPORTABILITY GUIDANCE

Section I. GENERAL

5-1. Scope
This chapter provides highway transportability guidance for movement of the M076 rotary tiller mixer. It covers technical and physical characteristics as well as safety considerations, and prescribes the material and guidance required to prepare, load, and tie down the vehicle.

5-2. Safety
In addition to the safety precautions contained in chapter 3, movement within CONUS is subject to all safety laws, rules, and regulations applicable to commercial carriers. Overseas, such movements are governed by the theater and local regulations.

CAUTION

Vehicle must not exceed 3 mph during loading or unloading.

5-3. General
The M076 rotary tiller mixer is not self-deliverable.

5-4. Transport of the M076 Rotary Tiller Mixer by Semitrailer
When loaded on semitrailers, the rotary tiller mixer may be transported over highways. Highway shipments may be made using either commercial or military semitrailers of adequate capacity and size. The designated military tractor/ semitrailer combinations are either the M920/ M870 or the M818/M871. The M8181M871 is capable of unrestricted highway transport throughout CONUS and in most of the countries listed in the International Road Federation. Since the M920/M870 combination has many more restrictions, the M8181M871 should be used as the primary highway carrier for the rotary tiller mixer.

5-5. Transport of the M076 Rotary Tiller Mixer on the M871 Semitrailer Towed by the M818 Truck Tractor
a. Preparation. The vehicle's lift bars should be replaced by shorter bar stock. The exhaust stack and air cleaner stack should also be removed to lower the overall height. The skis should be removed from the tiller assembly for better access to the rear tiedown fittings. All removed equipment should be stowed in the driver's compartment.

b. MTMC Assistance. Assistance in obtaining approval for highway movement of the loaded transport system can be obtained from the Commander, Military Traffic Management Command, ATTN: MT-SA, Washington, DC 20315.

c. Loading. The vehicle may be driven onto the semitrailer if a ramp is available. If no ramp is available, the vehicle may be lifted onto the semitrailer by a crane of sufficient capacity. Lifting procedures and precautions are provided in paragraph 6-4*b.*

d. Bill of Materials and Application. Table 5-1 is the bill of materials for blocking and tiedown of the vehicle on the semitrailer. Table 5-2 shows the application of these materials. Figure 5-1 depicts a top and side view of the rotary tiller mixer restrained on the semitrailer. Figure 5-2 shows blocking details.

Table 5-1. Bill of Materials for Blocking and Tiedown of the M076 Rotary Tiller Mixer on the M871 Semitrailer

Item	Description	Approximate Quantity
Lumber	Douglas-fir, or comparable, straight-grain, free from material defects; Fed Spec MM-L-751H:	
	6x 6-inch	2 linear feet
	6x 8-inch	8 linear feet

Table 5-1. Bill of Materials for Blocking and Tiedown of the M076 Rotary Tiller Mixer on the M871 Semitrailer-Continued

Item	Description	Approximate Quantity
Wire rope*	6x19, IWRC; improved plow steel; pre-formed, regular-lay; table X, Fed Spec RR-W-410:	
	3/8-inch	40 feet
Clamps*	Wire rope, U-bolt clips, saddled, single-grip, steel, Crosby heavy-duty, or equal; MIL-STD-16842:	
	3/8-inch	12
Thimbles	Standard, open-type: 3/8-inch	8
Nails	Common, steel; flathead; bright or cement-coated; para 3.6.11.2, Fed Spec FF-N-105B:	
	(43/4-inch)	30
Protective material	Waterproof paper, burlap or other suitable material	as required

*Suitable capacity chains and loadbinders may be substituted for 3/8-inch wire rope and clamps.

Table 5-2. Application of Material for Tiedown of the M076 Rotary Tiller Mixer on the M871 Semitrailer (Fig 5-1)

Item	No. Required	Application
A	4	Chock block (fig 5-2, detail 1). Each to consist of a piece of 6-x 8-inch lumber cut to dimensions shown. Place blocks against front and back of each rear wheel. Secure each to trailer floor with three nails through heel of block. Toenail each block with two additional nails through each side.
B	2	Side block (fig 5-2, detail 2). Each to consist of a piece of 6x 6-inch lumber cut to dimensions shown. Cover the flat end of each block with a piece of protective material (item C), and place one block against the inside of each rear wheel. Secure to trailer floor with three nails through heel of block. Toenail each block with two additional nails through each side.
C, D, E, F	8	Thimble, open-type, 3/8-inch. Place one on each M076 rotary tiller mixer tiedown (front and back) and on each semitrailer stake pocket to be used.
C, D, E, F	4	Wire rope, 3/8-inch. Attach in a complete loop through the thimbles on the vehicle tiedown and through the thimble on the semitrailer stake pocket on the same side.
	20	Clamp, 3/8-inch. Secure the ends of the wire rope with three clamps each. Space the clamps 3 3/4 inches on the rope. Secure each thimble with one clamp.

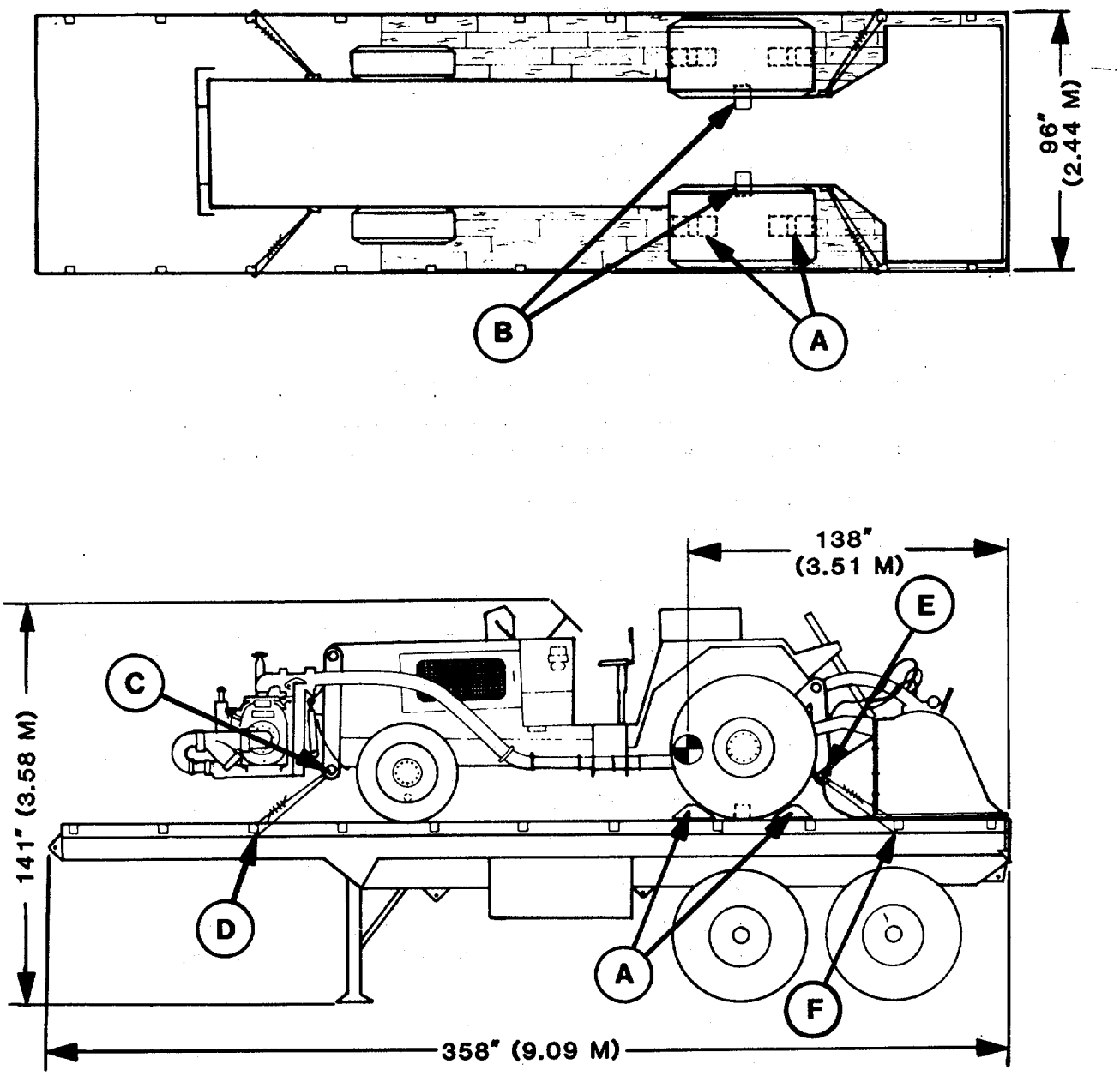
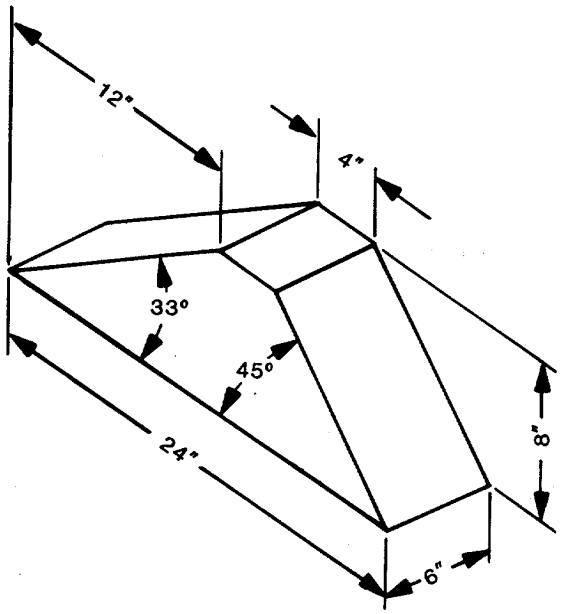
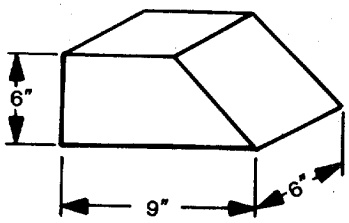


Figure 5-1. Top and side view of the M076 rotary tiller mixer blocked and restrained on the M871 semitrailer.



DETAIL 1



DETAIL 2

Figure 5-2. Blocking detail diagram.

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 M076 rotary tiller mixer. It covers technical and physical characteristics, as well as safety considerations, and prescribes the materials and guidance required to prepare, load, tie down, and unload the vehicle.

6-2. Safety
In addition to the safety precautions contained in chapter 3, the following areas apply:

a. All vessel equipment and gear should be inspected before use.
b. All stevedore slings and other items used in loading and unloading operations should be checked for their condition and capacity.
c. All other precautionary measures and safety regulations peculiar to the loading/unloading site or terminal will be adhered to.
d. Vehicle fuel tanks must be drained and battery terminals disconnected.
e. Vehicle transmission must be placed in the neutral position and handbrake set.

NOTE

When the M076 rotary tiller mixer is loaded on vessels that are adequately ventilated by power blowers, such as those commonly found on the roll-on/roll-off (RORO) ships, fuel tanks need not be drained.

6-3. Water Shipment

The M076 rotary tiller mixer can be transported by a great variety of inland waterway cargo carriers, lighters, and barges and by most seagoing cargo vessels.

NOTE

The methods described in this chapter for lifting and securing the M076 rotary tiller mixer are suggested procedures. Other methods of handling and stowage may be used to accomplish safe delivery without damage.

Section II. LOADING AND SECURING

6-4. General Rules for Stowing

a. General. Whenever possible, vehicles should receive the protection of below-deck stowage. In general, good stowage of vehicles means having them placed fore and aft as close together as practical, with minimum spacing (about 4 to 6 inches) between outer vehicles and the sweat-boards. Breakable parts or auxiliary equipment of the vehicles should be adequately protected and secured for shipment. If not shipped on the vehicle, spare parts and on-equipment material should be properly identified as to location or disposition during shipment. Vehicles in the ship's hold should be blocked in front, in rear, and on both sides of the wheels so that the vehicles cannot move. Individual vehicle blocks should be braced to bulkheads, stanchions, and other vehicle blocks. In addition, all vehicles should be lashed with wire rope or chains to nearby padeyes, bulkheads, or stanchions.
b. Lifting. Correct lifting points on the vehicle are the lifting eye provisions located as shown in figure 6-1.
c. Loading. Vehicles are always loaded on vessels in their minimum configuration-that is, reduced height and/or reduced width. The preparation procedures outlined in paragraph 5-5.a should be followed. The rotary tiller mixer can be driven or lifted by crane of adequate capacity onto landing craft, beach discharge and amphibious lighters, landing ship tanks (LST), and landing ship docks (LSD). The vehicles can also be driven onto the decks of barges from pierside when tidal conditions are suitable and ramps are available. They can be loaded onto seagoing vessels by shoreside or floating cranes of adequate capacity. Also, jumbo booms and heavy-lift ship's gear may be used in loading vehicles onto vessels. The vehicles can be driven or towed onto roll-on/roll-o*ff vessels.*
d. Materials

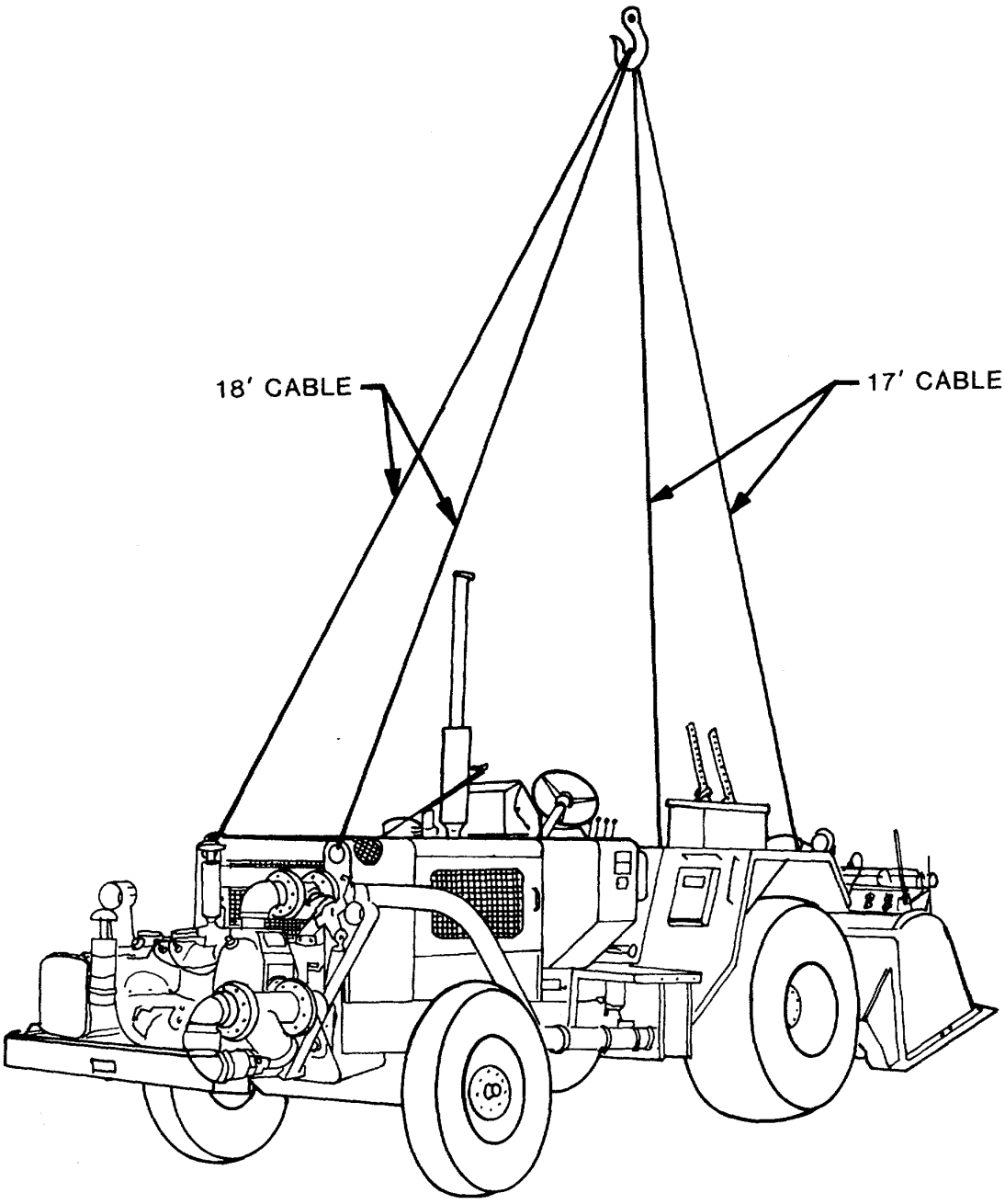


Figure 6-1. Lifting diagram for M076 rotary tiller mixer.

(1) Table 6-1 is the approximate bill of materials for blocking and tiedown of a rotary tiller mixer in the hold of a general cargo vessel. Required amounts will vary as to type of vessel configuration and location aboard the vessel.

(2) See figure 6-2 for typical blocking and tiedown details of a rotary tiller mixer in the hold of a general cargo vessel.

(3) Table 6-2 provides data concerning the application of materials required to restrain the vehicle.

3. *Special Design*. Seatrain trailer vessels, RORO ships, landing ships, and attack cargo vessels are equipped with patented lashing gear

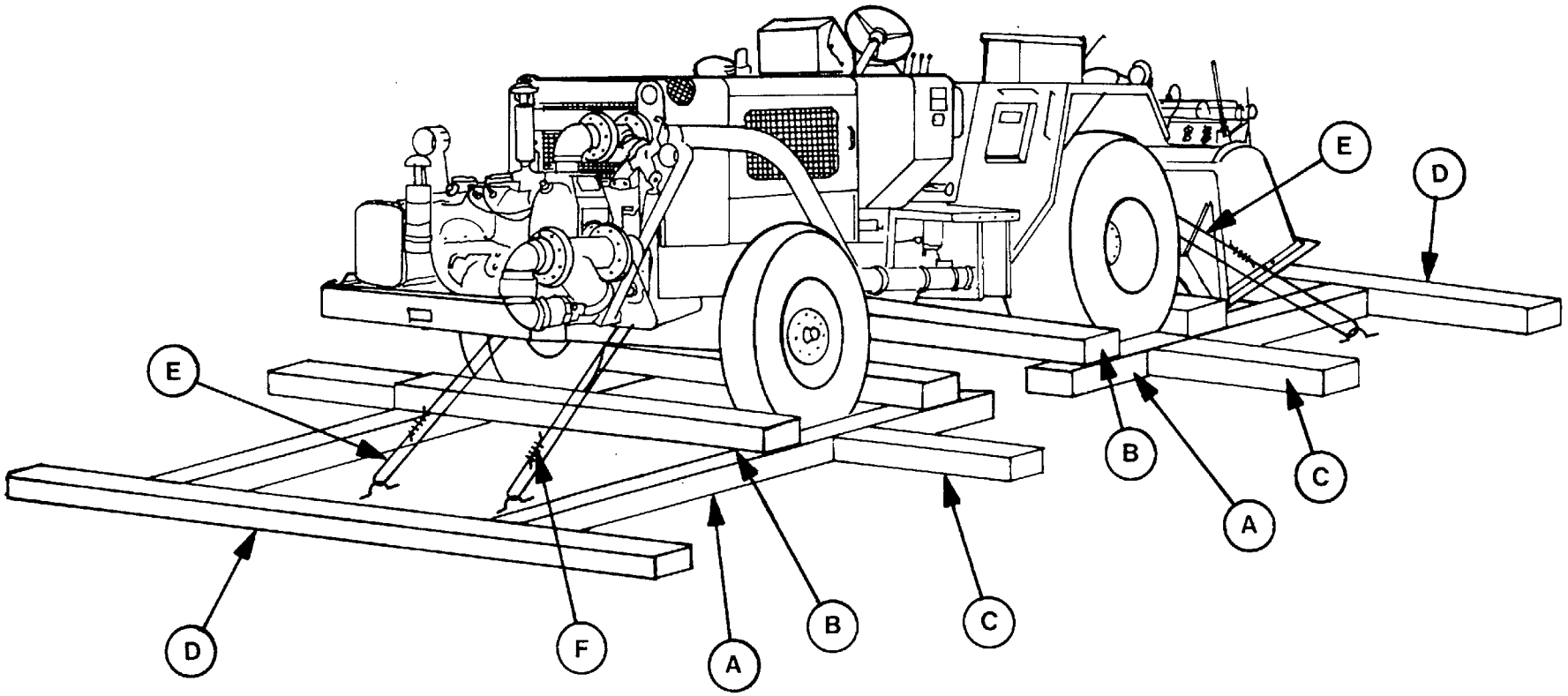


Figure 6-2. Typical blocking and tiedown of a M076 rotary tiller mixer in a general cargo vessel.

and pre-positioned fittings in the deck. When transporting the rotary tiller mixer aboard such vessels, use of the onboard restraint equipment is considered adequate, and the vehicle will require no further blocking or bracing.

6-5. Barges and Lighters

When the rotary tiller mixer is to be moved by barge or similar lighterage to or from vessels secured to piers or at a sheltered anchorage, blocking and chocking materials are required. When the vehicle is to be moved extended distances or through rough waters, tiedown restraints also must be used.

6-6. Landing Ships, Landing Craft, and Amphibious Vessels

When the vehicle is to be moved extended distances or through rough waters, blocking and tiedowns must be used. Usually the vessels are equipped with a turnbuckle with a sheep's foot on one end that fits into a deck cloverleaf, where not provided, a suitable substitute may be used.

Table 6-1. Bill of Materials for Blocking and Tiedown of the Rotary Tiller Mixer in Hold of General Cargo Vessel (Fig 6-2)

Item	Description	Approximate Quantity
Lumber	Douglas-fir, or comparable, straight-grain, free from material defects; Fed Spec MM-L-751H:	
	4x 4-inch	100 linear feet
Nails	Common, steel; flathead; bright or cement-coated; para 3.6.11.2,Fed Spec FF-N-105B:	
	20d	40
	50d	40
Wire rope	6x19, IWRC; improved plow steel; preformed, regular-lay; table X, Fed Spec RR-W-410:	
	5/8-inch	50 feet
Clamps	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 Tie-down of the Rotary Tiller Mixer in Hold of General Cargo Vessel (Fig 6-2)

Item	No. Required	Application
A	4	Side blocking. Consists of 4x4-inch lumber. Front pair is approximately 90 inches long; rear pair is approximately 144 inches long. Place on each side of vehicle against tires.
B	4	End blocking. Consists of 4x 4-inch lumber. Front pair is approximately 92 inches long; rear is pair .approximately 110 inches long. Place on top of item A against vehicle treads. Toenail to item A.
C	4	Bracing, 4x 4-inch lumber, cut to fit. Place ends against side blocking on both sides of vehicle and against blocking of other cargo, side of vessel, or other ship's structure, and secure with four nails.
D	2	Blocking, 4x 4-inch lumber, cut to fit. Place in front and back of vehicle and against other blocking to hold the blocking in place. Toenail to items A and B.
E	4	Wire rope, 5/s-inch. Run each cable in a complete loop through vehicle tiedown and deck padeye. Ensure sufficient overlap for clamps.
F	16	Clamps, 5/8-inch. Place four clamps over each cable loop overlap area and space 31/2 inches apart, with a minimum of 6 inches from ends of cable.

CHAPTER 7
RAIL TRANSPORTABILITY GUIDANCE

Section I. GENERAL

7-1. Scope
This chapter provides rail transportability guidance for movement of the M076 rotary tiller mixer. It covers significant characteristics, both technical and physical, and safety concerns and prescribes the materials and guidance required to prepare, load, tie down, and unload the vehicle.

7-2. Maximum Utilization of Railcars
Additional cargo, as approved by the activity offering the items 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 vehicle is transported on CONUS railways. Consideration is given to single and multiple movements on this vehicle by the type of flatcars normally used. The vehicle, when loaded on a suitable flatcar, can be transported without sectionalization or major disassembly.

7-4. Preparation for Loading
The exhaust stack and tiller skis must be removed to lower the height and to give access to the rear tiedown points.

7-5. Loading of the M076 Rotary Tiller Mixer on General Purpose Flatcars
a. The vehicle may be placed in the tiedown position on the railcar, approximately centered, by a crane, or it may be driven or towed abroad, provided a suitable ramp or bridge is available. When the vehicle is loaded by crane, the procedures and precautions outlined in paragraph 6-4b will be adhered to.

b. Typical loading diagram of the M076 rotary tiller mixer on a general purpose flatcar is shown in figure 7-1. The type of blocking and tiedown depicted is compatible with standard loading practices and provides adequate restraint against forces encountered during movements at normal speed.

c. Table 7-1 in the bill of materials for blocking and tiedown of an M076 rotary tiller mixer. Table 7-2 provides data for the application of materials required to restrain the vehicle.

Item	Description	Approximate Quantity
Lumber	Douglas-fir, or comparable, straight-grain, free from materials defects; Fed Spec MM-L-751H:	
	2x 4-inch	25 linear feet
	4x 8-inch	35 linear feet
Nails	Common, steel; flathead; bright or cement coated; para 3.6.11.2,Fed Spec FF-N-105B:	
	20d	25
	40d	120
	60d	50
Wire rope	6x19, IWRC; improved plow steel; preformed, regular-lay; Fed Spec RR-W-410:	
	3/8-inch	50 feet
Thimbles	Standard, open-type: 3/8-inch	8

Table 7-1. Bill of Materials for Blocking and Tiedown of an M076 Rotary Tiller Mixer on a General Purpose Flatcar-Continued

Item	Description	Approximate Quantity
Clamps	Wire rope; U-bolt clips, saddled, single-grip, steel, Crosby heavy-duty, or equal; MIL-STD-16842:	
	3/8-inch	12

Table 7-2. Application of Materials for Blocking and Tiedown of an M076 Rotary Tiller Mixer on a General Purpose Flatcar

Item	No. Required	Application
A		Brake-wheel clearance. Minimum clearance required is 6 inches above, in back of, and on both sides of and 4 inches underneath wheel.
B	16	Chock blocks cut to pattern "B." Locate two against front and back of each front wheel and two against the front and back of each rear wheel. Nail each to floor with two 60d, three 40d, and one 20d nail in heel and one 40d nail in each side of block.
C	4	Side blocks cut to pattern "C." Locate one against the outside of each front wheel and one against the inside of each rear wheel. Nail each to floor with two 60d, three 40d, and one 20d nail in heel and one 40d in each side of block.
D	4	Wire rope, 3/8-inch. In a complete loop, apply from tiedowns to side stake pockets as indicated in figure 7-1. Place thimbles at the bottom of each stake pocket and through each tiedown. Overlap wire rope at least 12 inches.
	12	Clamps, 3/8-inch. Fasten each wire rope with three clamps spaced 2 1/4 inches apart.

Section III. TRANSPORT ON FOREIGN RAILWAYS

7-6. General

The transportability guidance contained in this section is applicable when the M076 rotary tiller mixer is transported on foreign railways. Consideration is given to single and multiple vehicle movements for the types of flatcars normally used in the movement of this type of vehicle. When loaded onto a suitable flatcar, the vehicle, in reduced configuration (para 7-4), can be transported for generally unrestricted rail movement throughout Europe and also in countries worldwide that use standard or wide-gauge track. The vehicle is within limits of the width and height of Gabarit International de Chargement (GIC) gauge railways.

7-7. Transport on Foreign-Service Flatcars

a. General. The vehicle can be transported on most foreign-service flatcars, both light and heavy duty.

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

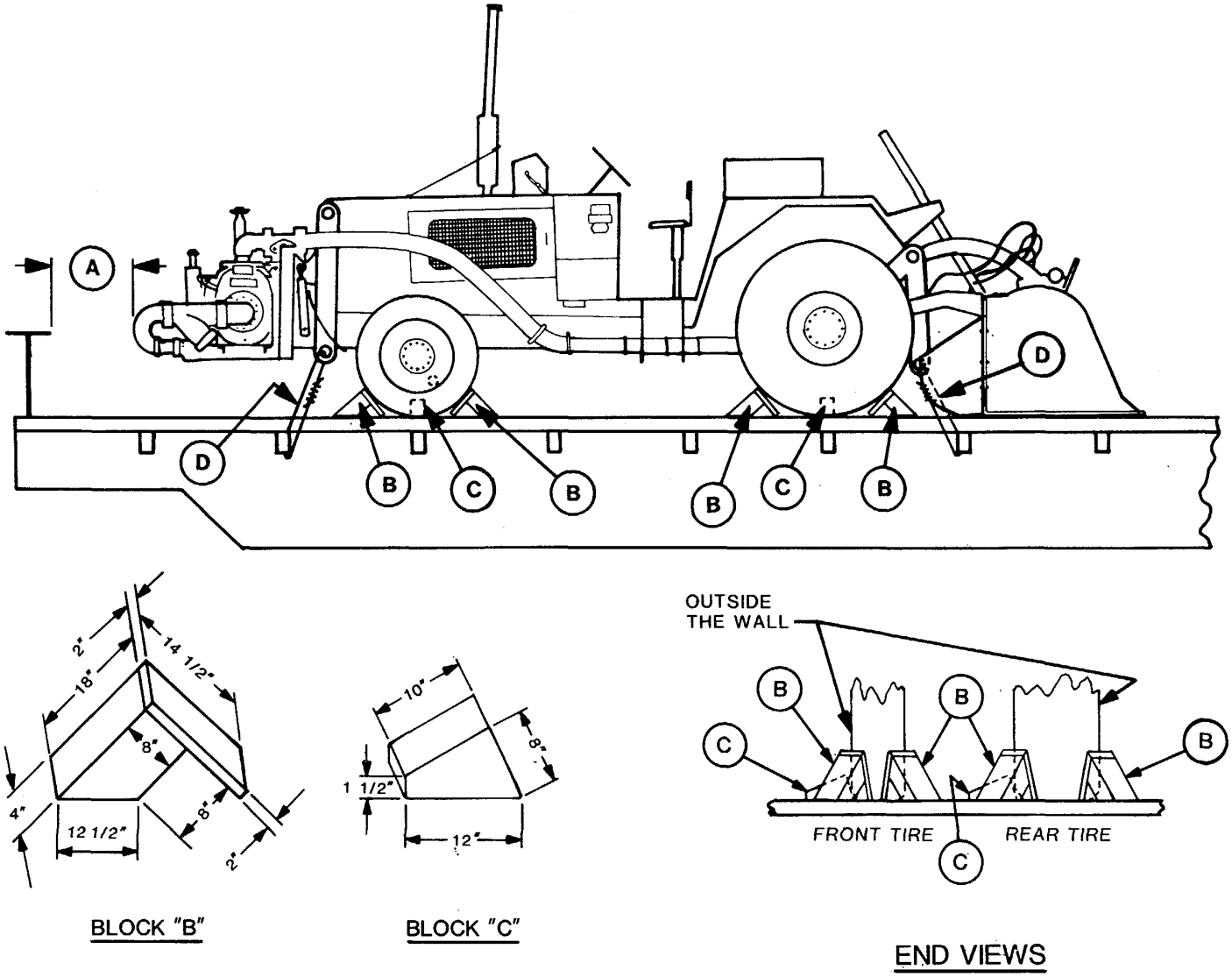


Figure 7-1. M076 rotary tiller mixer loaded and restrained on general purpose flatcar.

APPENDIX
REFERENCES

A-1. Army Regulations (AR)

55-29	Military Convoy Operations in CONUS
55-80	Highways for National Defense
55-162	Permits for Oversize, Overweight, or Other Special Military Movements on Public Highways in the United States
55-228	Transportation by Water of Explosives and Hazardous Cargo
55-355	Military Traffic Management Regulation
70-44DOD	Engineering for Transportability
385-40	Accident Reports and Records
746-1	Packaging of Army Materiel for Shipment and Storage

A-2. Field Manuals (FM)

5-34	Engineer Field Data
5-36	Route Reconnaissance and Classification
55-9	Unit Air Movement
55-13	Transportation Reference Data
55-17	Terminal Operations Coordinator's Handbook

A-3. Supply Bulletin (SB)

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

A-4. Technical Bulletin (TB)

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

A-5. Technical Manuals (TM)

5-3895-359-1 & P	Operator's Manual, Mixer, Rotary Tiller, MO76
38-250 (AFR 71-4)	Packaging and Materials Handling: Preparation of Dangerous Materials for Transportation by Military Air Shipment
55-500	Marine Equipment Characteristics and Data
55-2200-001-12	Transportability Guidance for Application of Blocking, Bracing, and Tiedown Materials for Rail Transport

A-6. Technical Orders (TO) (Air Force)

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

A-7. Other Publications and Source of Procurement

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

b. Association of American Railroads *Rules Governing the Loading of Commodities on Open-Top Cars and Trailers*
Section No. 1-General Rules
Section No. 2-Rules Governing the Loading of Department of Defense Material on Open-Top Cars
Available from: Association of American Railroads
American Railroads Building
50F Street, NW
Washington, DC 20001

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