

**TECHNICAL MANUAL**

**TRANSPORTABILITY GUIDANCE**

**(TRUCKS, 5-TON, 6X6, M809-SERIES)**

**TRUCK, CARGO, WWN, M813 (FSN 2320-050-8890),  
WOWN (FSN 2320-050-8902)**

**TRUCK, CARGO, DROPSIDE, WWN, M813A1 (FSN 2320-05-8905),  
WOWN (FSN 232-050-8918)**

**TRUCK, CARGO, WWN, M814 (FSN 2320-050-8987),  
WOWN (FSN 2320-050-8988)**

**TRUCK, LOGGING, BOLSTER, WWN, M815 (FSN 2320-050-8927)**

**TRUCK, WRECKER, MEDIUM, WWN, M816 (FSN 2320-051-0489)**

**TRUCK, DUMP, WWN, M817 (FSN 2320-051-0589),  
WOWN (FSN 2320-050-8970)**

**TRUCK, TRACTOR, WWN, M818 (FSN 2320-050-8978),  
WOWN (FSN 2320-050-8984)**

**TRUCK, TRACTOR, WRECKER, WWN, M819 (FSN 2320-050-9004)**

**TRUCK, VAN, EXPANSIBLE, WOWN, M820 (FSN 2320-050-9006)**

**TRUCK, VAN, EXPANSIBLE, WOWN, M820A2 (FSN 2320-050-9010)**

**TRUCK, STAKE, BRIDGE, TRANSPORTING, WWN, M821 (FSN 2320-050-9015)**

**HEADQUARTERS, DEPARTMENT OF THE ARMY**

**AUGUST 1974**



Change }  
No. 1 }

HEADQUARTERS  
DEPARTMENT OF THE ARMY  
Washington, DC, 17 July 1986

**Transportability Guidance**  
**(TRUCKS, 5-TON , 6x6, M809-SERIES)**  
**TRUCK, CARGO, WVN, M813 (FSN 2320-050-8890),**  
**WOWN (FSN 2320-050-8902)**  
**TRUCK, CARGO, DROPSIDE, WVN, M813A1 (FSN 2320-050-8905),**  
**WOWN (FSN 2320-050-891 3)**  
**TRUCK, CARGO, WVN, M814 (FSN 2320-050-8987),**  
**WOWN (FSN 2320-050-8988)**  
**TRUCK, LOGGING, BOLSTER, WVN, M815 (FSN 2320-050-8927)**  
**TRUCK, WRECKER, MEDIUM, WVN, M816 (FSN 2320-051-0489)**  
**TRUCK, DUMP, WVN, M817 (FSN 2320-051-0589),**  
**WOWN (FSN 2320-050-8970)**  
**TRUCK, TRACTOR, WVN, M818 (FSN 2320-050-8978),**  
**WOWN (FSN 2320-050-8984)**  
**TRUCK, TRACTOR, WRECKER, WVN, M819 (FSN 2320-050-9004)**  
**TRUCK, VAN, EXPANSIBLE, WOWN , M820 (FSN 2320-050-9006)**  
**TRUCK, VAN , EXPANSIBLE, WOWN , M820A2 (FSN 2320-050-9010)**  
**TRUCK, STAKE, BRIDGE, TRANSPORTING, WVN, M821 (FSN 2320-050-9015)**

TM 55-2320-260-15-1,23 August 1974, is changed as follows:

1. New or changed material is indicated by a bar in the margin. Remove old pages and insert new pages as indicated below.

<i>Remove pages</i>	<i>Insert pages</i>
4-3 through 4-12 . . . . .	..4-3 through 4-12
6-1 through 6-8 . . . . .	6-1 through 6-8 (blank)
7-1 through 7-7 . . . . .	..7-1 through 7-6
A-1 through A-2 . . . . .	A-1 through A-2

2. File this change sheet in the front of the publication for reference purposes.

By Order of the Secretary of the Army:

JOHN A. WICKHAM, JR,  
*General, United States Army*  
*Chief of Staff*

Official:  
R. L. DILWORTH  
*Brigadier General, United States Army*  
*The Adjutant General*

Distribution:  
To be distributed in accordance with DA Form 12-38, Organizational, Direct and General Support Maintenance requirements for Truck, Diesel, 5-Ton, 6X6, M809-series.



**TRANSPORTABILITY GUIDANCE  
(TRUCKS, 5-TON, 6x6, M809-SERIES)  
TRUCK, CARGO, WWN, M813 (FSN 2320-050-8890),  
WOWN (FSN 2320-050-8902)  
TRUCK, CARGO, DROPSIDE, WWN, M813A1 (FSN 2320-050-8905),  
WOWN (FSN 2320-050-8913)  
TRUCK, CARGO, WWN, M814 (FSN 2320-050-8987),  
WOWN (FSN 2320-050-8988)  
TRUCK, LOGGING, BOLSTER, WWN, M815 (FSN 2320-050-8927)  
TRUCK, WRECKER, MEDIUM, WWN M816 (FSN 2320-051-0489)  
TRUCK, DUMP, WWN, M817 (FSN 2320-051-0589),  
WOWN (FSN 2320-050-8970)  
TRUCK, TRACTOR, WWN, M818 (FSN 2320-050-8978),  
WOWN, (FSN 2320-050-8984)  
TRUCK, TRACTOR, WRECKER, WWN, M819 (FSN 2320-050-9004)  
TRUCK, VAN, EXPANSIBLE, WOWN, M820 (FSN 2320-050-9006)  
TRUCK, VAN, EXPANSIBLE, WOWN, M820A2 (FSN 2320-050-9010)  
TRUCK, STAKE, BRIDGE, TRANSPORTING, WWN, M821 (FSN 232-050-9015)**

	Paragraph	Page
CHAPTER 1 . INTRODUCTION		
Purpose and scope--	1-1	1-1
Reporting of recommendations and comments	1-2	1-1
Safety-	1-3	1-1
Definitions of warnings, cautions, and notes	1-4	1-1
2. TRANSPORTABILITY DATA		
Section I. GENERAL		
Scope-	2-1	2-1
Description-	2-2	2-1
II. CHARACTERISTICS AND RELATED DATA OF ITEMS		
General -	2-3	2-3
Side- and end-elevation drawings-	2-4	2-3
Reduced configuration	2-5	2-29
CHAPTER 3 . SAFETY		
General	3-1	3-1
Specific safety requirements	3-2	3-1
4. AIR TRANSPORTABILITY GUIDANCE		
Section I. GENERAL		
Scope-	4-1	4-1
Maximum utilization of aircraft	4-2	4-1
Safety-	4-3	4-1
II. TRANSPORT BY US ARMY AIRCRAFT		
Fixed wing aircraft	4-4	4-1
Helicopters	4-5	4-1
III. TRANSPORT BY US AIR FORCE AIRCRAFT		
Aircraft capabilities-	4-6	4-1
Typical loads	4-7	4-2
Responsibility-	4-8	4-2

	Paragraph	Page
CHAPTER 5. OFF-ROAD AND HIGHWAY TRANSPORTABILITY GUIDANCE		
Section I. GENERAL		
Scope-	5-1	5-1
Safety-	5-2	5-1
II. MOVEMENT ON OWN WHEELS		
General-	5-3	5-1
Preparation of trucks	5-4	5-1
III. TRANSPORT BY SEMITRAILER		
General	5-5	5-1
Loading on flatbed semitrailers	5-6	5-1
CHAPTER 6. MARINE AND TERMINAL TRANSPORTABILITY GUIDANCE		
Scope	6-1	6-1
Safety-	6-2	6-1
General-	6-3	6-1
7. RAIL TRANSPORTABILITY GUIDANCE		
Section I. GENERAL		
Scope-	7-1	7-1
Maximum utilization of railcars	7-2	7-1
II. TRANSPORT ON CONUS RAILWAYS		
General-	7-3	7-1
Preparation of vehicles-	7-4	7-1
Loading M809-series trucks on general-purpose flatcars-	7-5	7-1
III. TRANSPORT ON FOREIGN RAILWAYS		
General-	7-6	7-6
Transport on US Army-owned foreign service flatcars	7-7	7-7
APPENDIX. REFERENCES-		A-1

### LIST OF ILLUSTRATIONS

Figure number	Title	Page
2-1	Truck, cargo, 5-ton, 6x6, M813	2-1
2-2	Truck, cargo, dropside, 5-ton, 6x6, M813A1	2-1
2-3	Truck, cargo, 5-ton, 6x6, M814	2-1
2-4	Truck, logging, bolster, 5-ton, 6x6, M815-	2-2
2-5	Truck, wrecker, medium, 5-ton, 6x6, M816	2-2
2-6	Truck, dump, 5-ton, 6x6, M817-	2-2
2-7	Truck, tractor, 5-ton, 6x6, M818-	2-2
2-8	Truck, tractor, wrecker, 5-ton, 6x6, M819	2-2
2-9	Truck, van, expansible, 5-ton, 6x6, M820	2-3
2-10	Truck, van, expansible, 5-ton, 6x6, M820A2-	2-3
2-11	Truck, stake, bridge, transporting, 5-ton, 6x6, M821-	2-3
2-12	Side elevation of truck, cargo, WWN and WOWN, M813-	2-4
2-13	Rear elevation of truck, cargo, WWN and WOWN, M813-	2-5
2-14	Side elevation of truck, dropside, WWN and WOWN, M813A1-	2-6
2-15	Rear elevation of truck, dropside, WWN and WOWN, M813A1-	2-7
2-16	Side elevation of truck, cargo, WWN and WOWN, M814	2-8
2-17	Rear elevation of truck, cargo, WWN and WOWN, M814	2-9
2-18	Side elevation of truck, logging, bolster, WWN, M815-	2-10
2-19	Rear elevation of truck, logging, bolster, WWN, M815-	2-11
2-20	Side elevation of truck, wrecker, medium, WWN, M816	2-12
2-21	Rear elevation of truck, wrecker, medium, WWN, M816-	2-13
2-22	Side elevation of truck, dump, WWN, M817-	2-14
2-23	Side elevation of truck, dump, WOWN, M817-	2-15
2-24	Rear elevation of truck, dump, WWN, M817-	2-16
2-25	Rear elevation of truck, dump, WOWN, M817-	2-17
2-26	Side elevation of truck, tractor, WWN and WOWN, M818	2-18
2-27	Rear elevation of truck, tractor, WWN and WOWN, M818-	2-19
2-28	Side elevation of truck, tractor, wrecker, WWN, M819-	2-20
2-29	Rear elevation of truck, tractor, wrecker, WWN, M819-	2-21
2-30	Side elevation of truck, van, expansible, WOWN, M820-	2-22
2-31	Rear elevation of truck, van, expansible, WOWN, M820-	2-23

Figure number	Title	Page
2-32	Side elevation of truck, van, expansible, WOWN, M820A2- - - - -	2-24
2-33	Rear elevation of truck, van, expansible, WOWN, M820A2- - - - -	2-25
2-34	Side elevation of truck, stake, bridge, WWN, M821- - - - -	2-26
2-35	Rear elevation of truck, stake, bridge, WWN, M821 - - - - -	2-27
4-1	Tiedown diagram for M814 in C-5 aircraft - - - - -	4-3
4-2	Tiedown diagram for M814 in C-130 aircraft - - - - -	4-4
4-3	Tiedown diagram for M814 in C-141 aircraft- - - - -	4-5
4-4	Tiedown diagram for M816 in C-5 aircraft - - - - -	4-6
4-5	Tiedown diagram for M817 in C-5 aircraft - - - - -	4-7
4-6	Tiedown diagram for M817 in C-130 aircraft - - - - -	4-8
4-7	Tiedown diagram for M817 in C-141 aircraft - - - - -	4-9
5-1	Blocking and tiedown of typical M809-series truck on M127-series 12-ton or larger semitrailer - - - - -	5-2
5-2	Rear view of blocking and tiedown of typical M809-series truck on M127-series 12-ton or larger semitrailer- - - - -	5-3
5-3	Blocking and tiedown details- - - - -	5-4
5-4	Tracking diagram for semitrailer, M127A1, and truck, tractor, M818 - - - - -	5-5
5-5	Blocking and tiedown of typical M809-series truck on M270 semitrailer- - - - -	5-6
5-6	Tracking diagram for semitrailer, M270, and truck, tractor, M818- - - - -	5-7
6-1	Lifting diagram for M816 using eight wire slings and two spreader bars- - - - -	6-3
6-2	Lifting diagram for M817 using eight wire slings and two spreader bars- - - - -	6-4
6-3	Lifting diagram for M818 using six wire slings and one spreader bar- - - - -	6-5
6-4	Lifting diagram for M820 using eight wire slings and two spreader bars - - - - -	6-6
6-5	Typical blocking and tiedown of M809-series truck in general cargo vessel - - - - -	6-7
7-1	Blocking and tiedown of typical M809-series truck on CONUS general-purpose flatcar- - - - -	7-2
7-2	Blocking and tiedown detail diagram for typical M809-series truck on CONUS general-purpose flatcar- - - - -	7-3
7-3	Securing M809-series trucks on empty flatcars equipped with center tiedown rails- - - - -	7-4





## CHAPTER I

### INTRODUCTION

---

#### 1-1. Purpose and Scope

This manual provides transportability guidance for logistic handling and movement of the trucks, 5-ton, 6x6, M809-series. It provides transportation officers down to division level and other personnel engaged in or responsible for movement or providing transportation services with information considered appropriate to safe transport. Significant technical and physical characteristics as well as safety considerations required for worldwide movement by the various modes of transportation are included. When considered necessary, metric equivalents are given in parentheses following dimensions or other measurement.

#### 1-2. Reporting of Recommendations and Comments

The reporting of errors, omissions, and recommendations for improving this manual by the individual user is encouraged. Reports should be submitted on DA Form 2028 (Recommended Changes to DA Publications and Blank Forms)

and forwarded direct to Director, Military Traffic Management and Terminal Service Transportation Engineering Agency, AITN: M'IT-GDP, PO Box 6276, Newport News, Virginia 23606.

#### 1-3. Safety

Appropriate precautionary measures required during movement of the items 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.** An operating procedure or practice that, if not correctly followed, could result in personal injury or loss of life.

b. **Caution.** An operating procedure or practice that, if not strictly observed, could result in damage to or destruction of equipment.

c. **Note.** An operating procedure or condition that must be emphasized.



## CHAPTER 2

### TRANSPORTABILITY DATA

#### Section I. GENERAL

##### 2-1. Scope

This chapter provides a general description of the M809-series trucks, identification photographs, and tabulated transportability characteristics and data that are necessary in movement of the vehicles.

##### 2-2. Description

The trucks, 5-ton, 6x6, covered in this manual are all of the M809-series. The model types are of various wheel bases and body styles; all having a tandem rear axle and dual rear tires. All models are powered by a 250-horsepower Cummins (NHL-250) diesel engine. A brief description of the various chassis and body types follows:

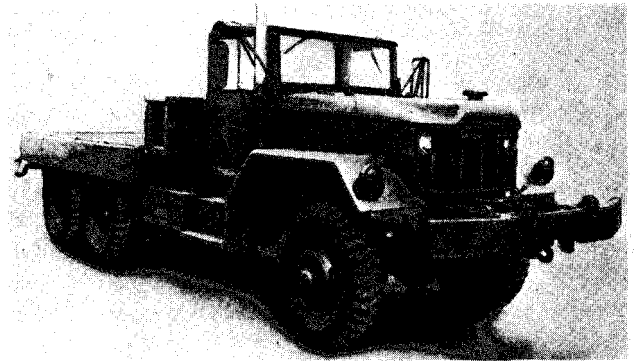
a. *Truck, Cargo, M813 (Fig 2-1).* This truck has a 179-inch wheel base, with a 7- x 14-foot flatbed cargo box (550 cubic feet).

b. *Truck, Cargo, Dropside, M813A1 (Fig 2-2).* This truck has a 179-inch wheel base, with a 7- by 14-foot flatbed cargo box (550 cubic feet). The dropside feature provides a 147 1/2-inch access opening on each side.

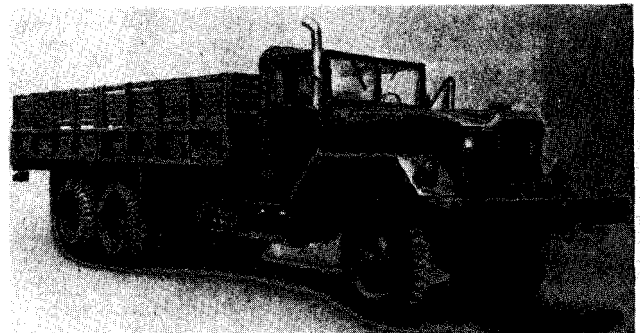
c. *Truck, Cargo, M814 (Fig 2-3).* This truck has a 215-inch wheel base, with a 7- x 20-foot flatbed cargo box (744 cubic feet).



**Figure 2-1.** *Truck, cargo, 5-ton, 6x6, M813.*



**Figure 2-2.** *Truck, cargo, dropside, 5-ton, 6x6, M813A1.*



**Figure 2-3.** *Truck, cargo, 5-ton, 6x6, M814.*

d. *Truck, Logging, Bolster, M815 (Fig 2-4).* This truck has a 179-inch wheel base and is normally used in conjunction with the P14 bolster trailer for transporting utility poles, bridging sections, etc. The cab is standardly equipped with a sheet metal top.

e. *Truck, Wrecker, M816 (Fig 2-5).* This truck has a 179-inch wheel base, with a 20,000-pound-capacity hydraulically operated crane and a 10-foot to 18-foot boom.

f. *Truck, Dump, M817 (Fig 2-6).* This truck has a 167-inch wheel base, with an hydraulically

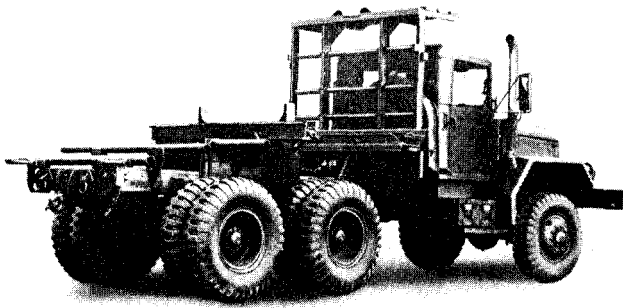


Figure 2-4. Truck, logging, bolster, 5-ton, 6x6, M815.

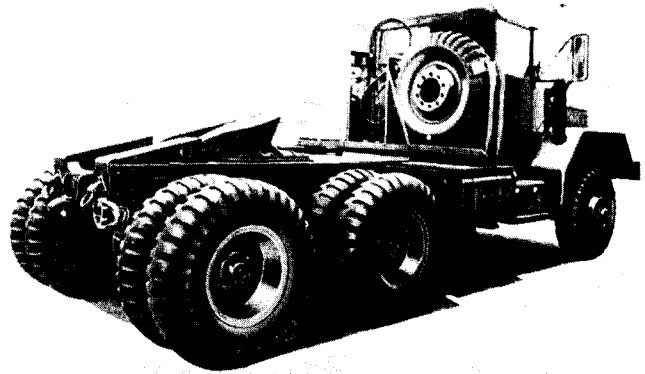


Figure 2-7. Truck, tractor, 5-ton, 6x6, M818.

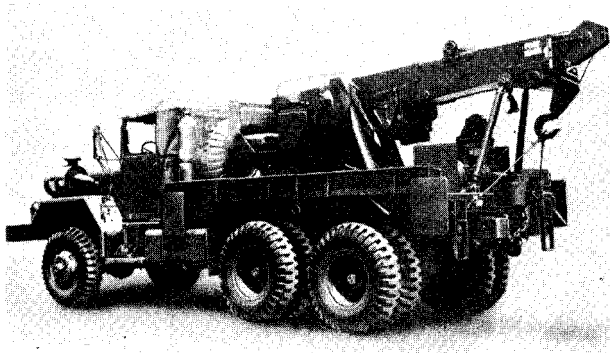


Figure 2-5. Truck, wrecker, medium, 5-ton, 6x6, M816.

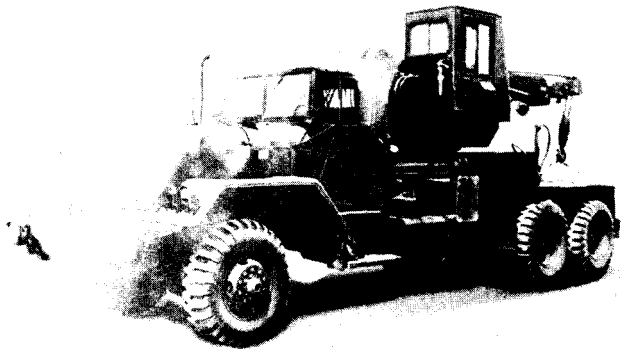


Figure 2-8. Truck, tractor, wrecker, 5-ton, 6x6, M819.

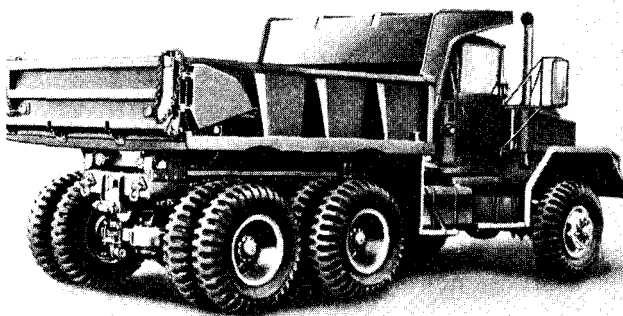


Figure 2-6. Truck, dump, 5-ton, 6x6, M817.

operated 5-cubic yard dump box with twin cylinder hoist assembly.

g. *Truck, Tractor, M818 (Fig 2-7).* This truck has a 167-inch wheel base, with a universal 33-inch fifth wheel and approach and deck

plates. The tractor-to-trailer brake hoses and connections are mounted behind the cab.

h. *Truck, Tractor, Wrecker, M819 (Fig 2-8).* This truck has a 215-inch wheel base, with a 20,000-pound-capacity hydraulically operated crane and a 6-foot 6-inch to 28-foot boom. It has a 33-inch universal fifth wheel and approach and deck plates mounted on the rear of the chassis.

i. *Truck, Van, Expansible, M820 (Fig 2-9).* This truck has a 215-inch wheel base. The van provides a 17-foot body designed for side expansion from the traveling position of 82 inches to 160 inches. The body is equipped with a heating and cooling system, deriving electrical power from an outside source.

j. *Truck, van, Expansible, M820A2 (Fig 2-10).* This truck has a 215-inch wheel base and is basically the same as the M820. It is specifically



Figure 2-9. Truck, van, expandible, 5-ton, 6x6, M820.

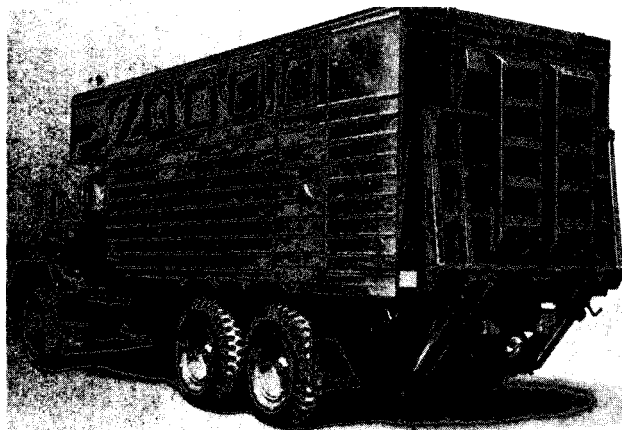


Figure 2-10. Truck, van, expandible, 5-ton 6x6 M820A2.

modified for special application as a tactical image interpretation facility by the Electronics Command. It is further equipped with a 3,000-pound power lift gate.

k. *Truck, Stake, Bridge, Transporting, M821* (Fig 2-11). This truck has a 215-inch wheel base, with a specifically designed stake body for transporting bridge building equipment.

**NOTE**

All trucks have 11:00 x 20 tires except the M819, which has 12:00 x 20 and the M821, which has 14:00 x 20 tires.

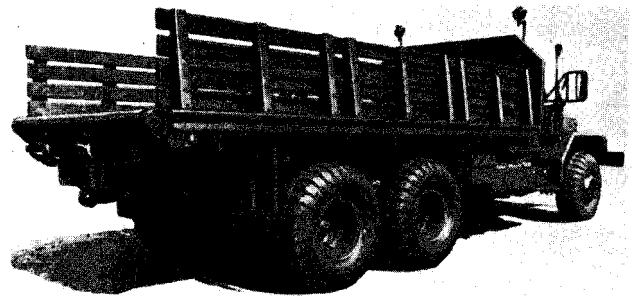


Figure 2-11. Truck, stake, bridge, transporting, 5-ton, 6x6, M821.

**Section II. CHARACTERISTICS AND RELATED DATA OF ITEMS**

**2-3. General**

Truck characteristics contained in table 2-1 are applicable to model number or Federal Stock Number (FSN) shown. Changes in model number or FSN may affect the loadability of the trucks as related to the guidance shown in this manual.

**2-4. Side- and End-Elevation Drawings**

This chapter provides drawings (fig 2-12 through 2-35) that are necessary for determining the loadability of the vehicles for movement by various transportation modes.

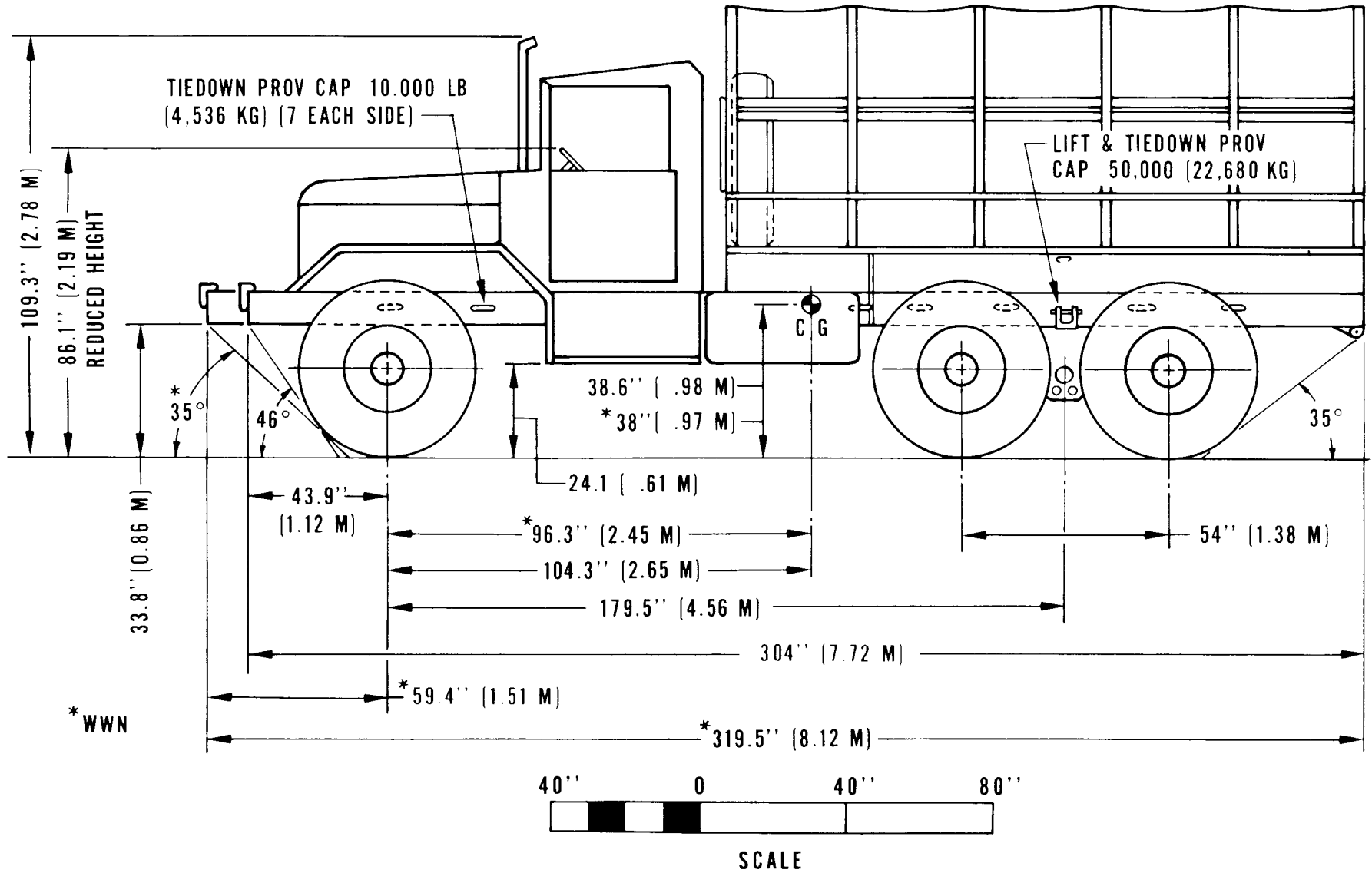


Figure 2-12. Side elevation of truck, cargo, WWN and WOWN, M813.

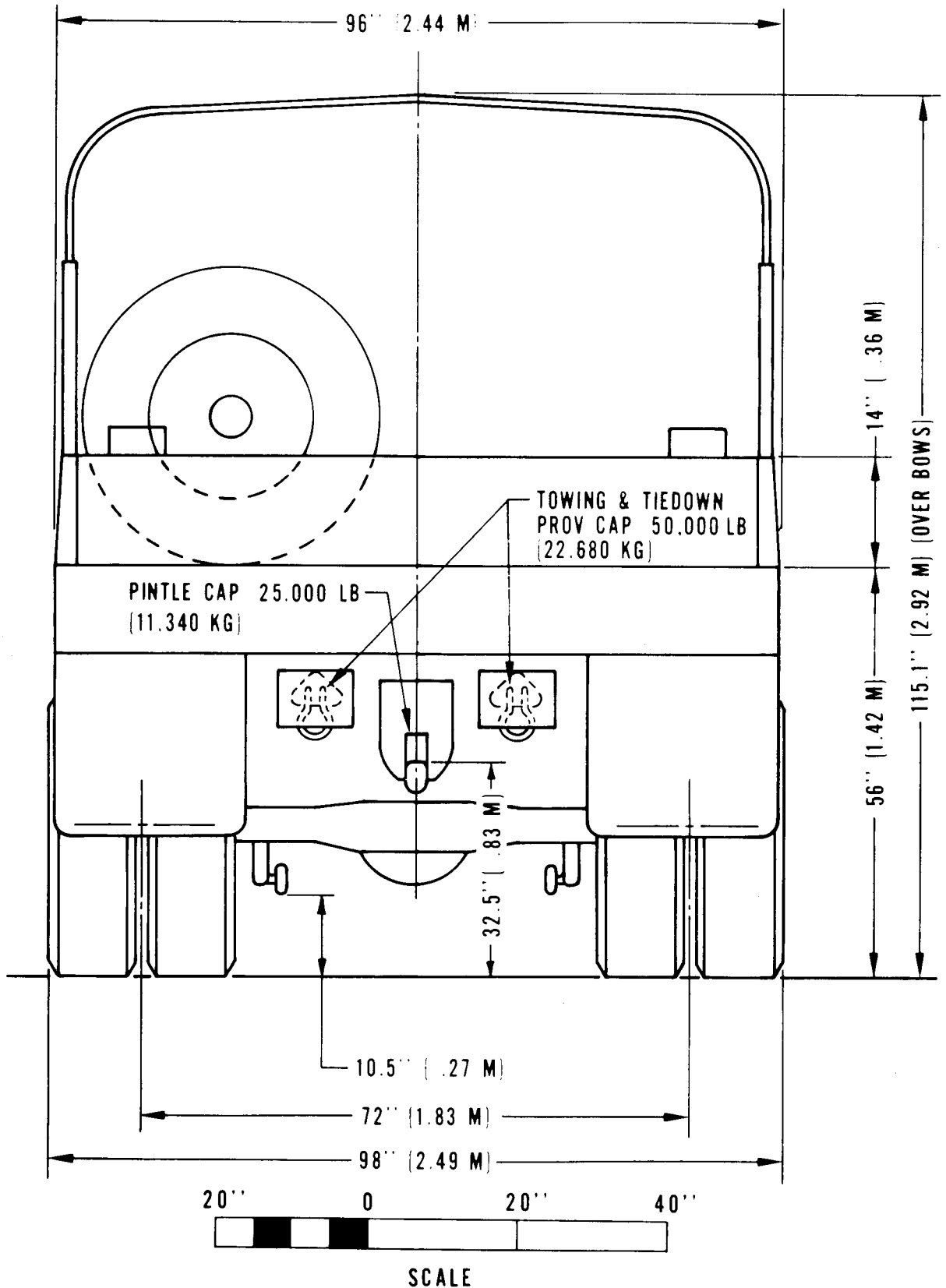


Figure 2-13. Rear elevation of truck, cargo, WVN and WOWN, M818.

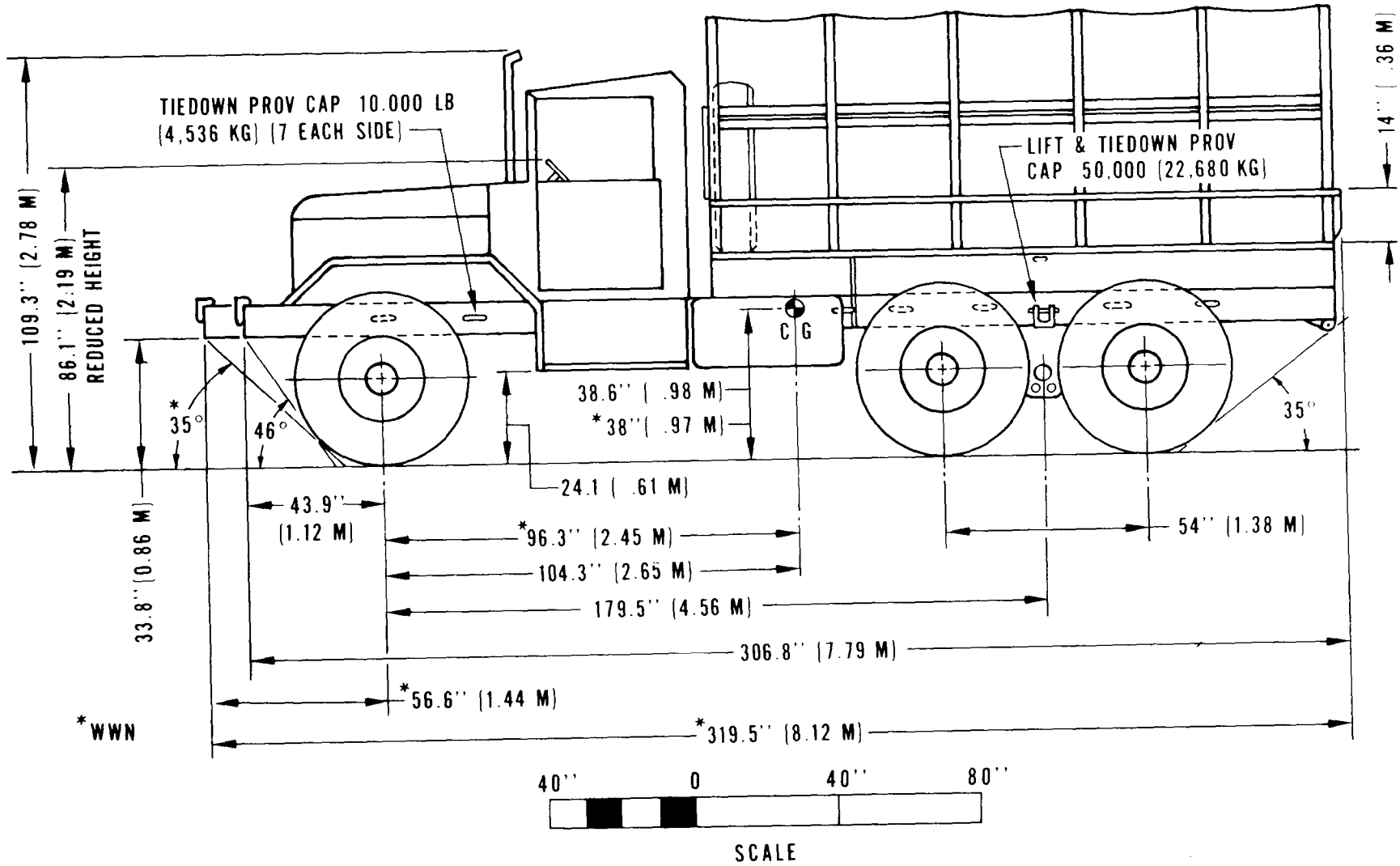


Figure 2-14. Side elevation of truck, dropside, WWN and WOWN, M813A1.



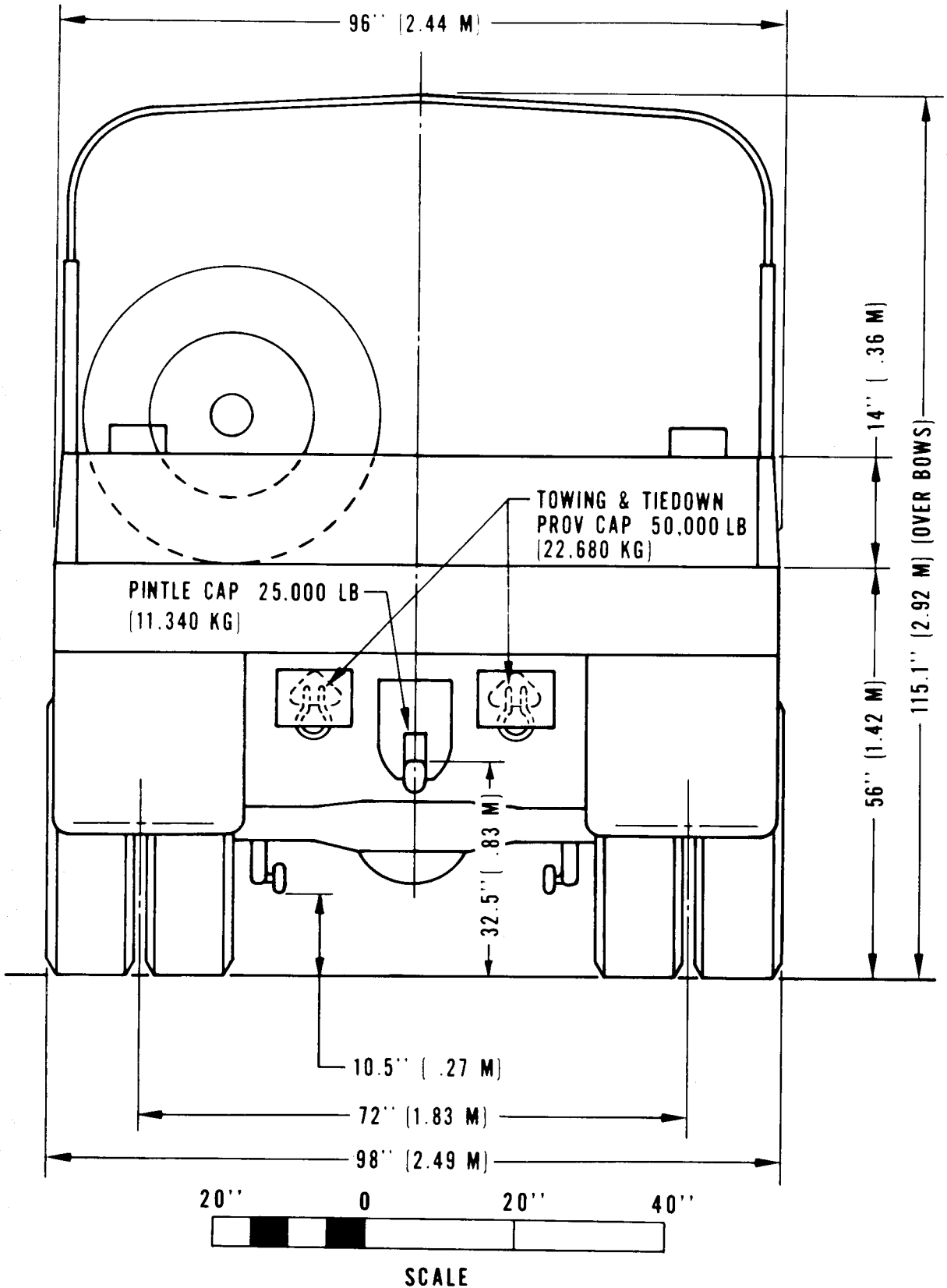


Figure 2-15. Rear elevation of truck, dropside, WWN and WOWN, M813A1.

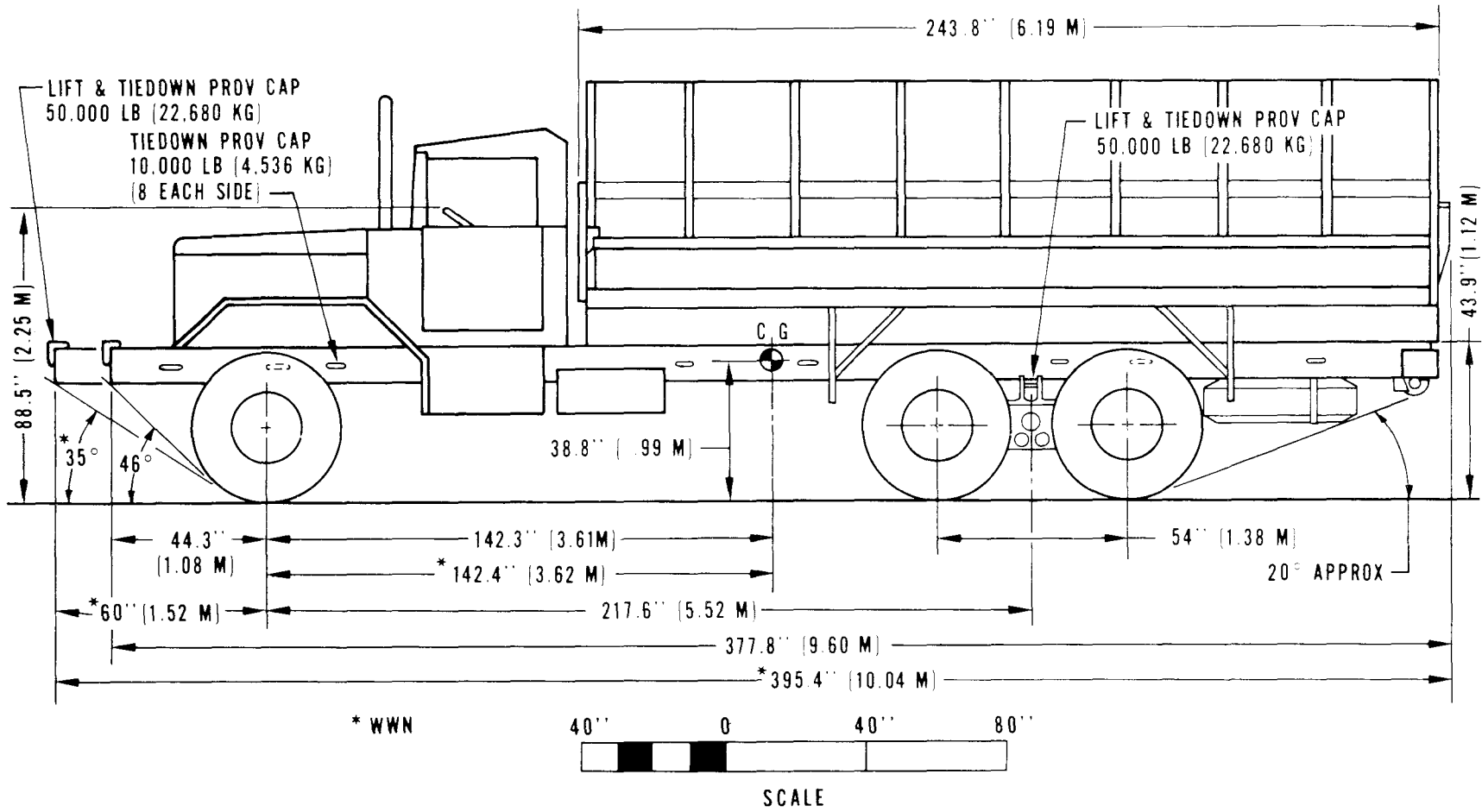


Figure 2-16. Side elevation of truck, cargo, WWN and WOWN, M814.

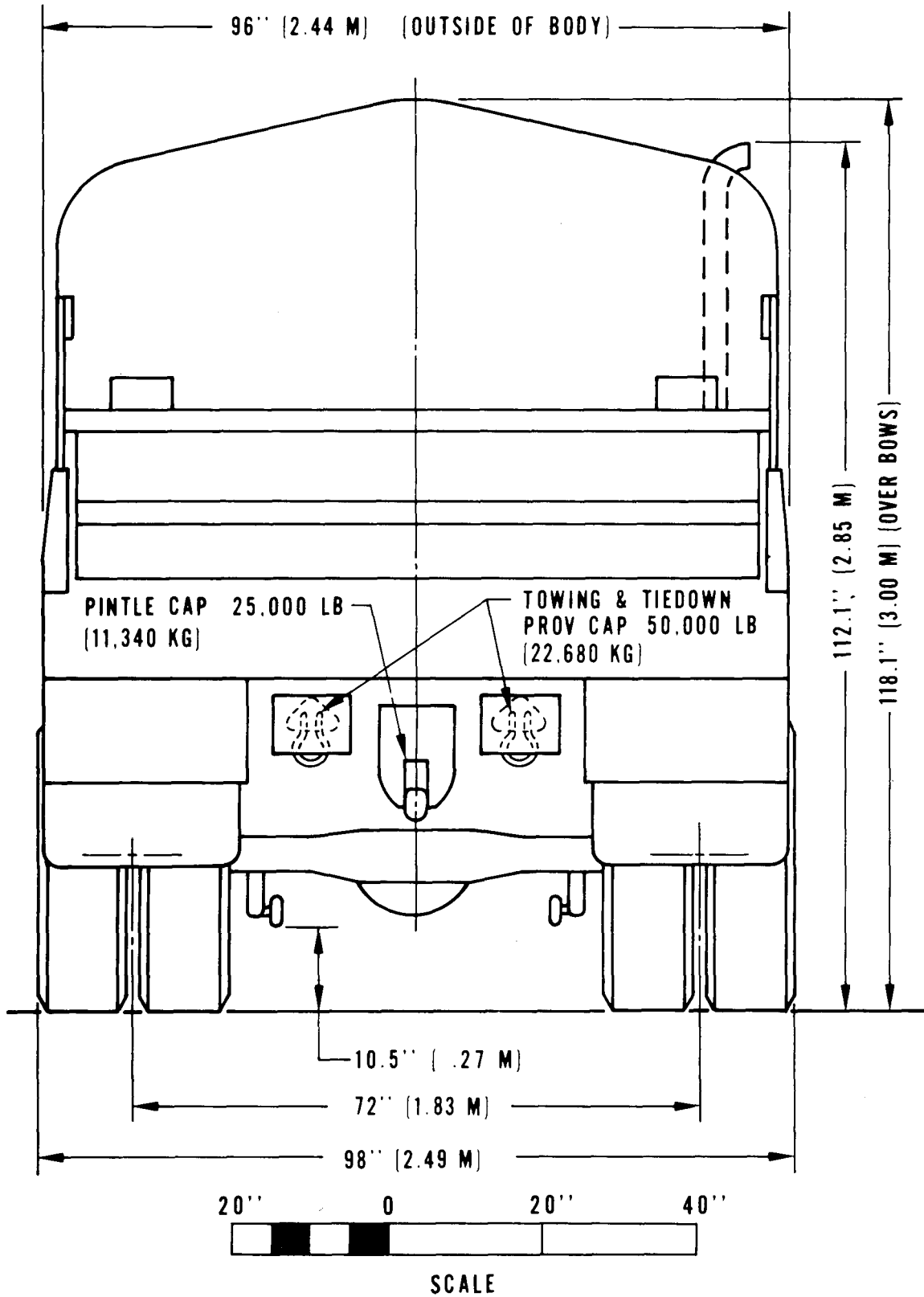


Figure 2-17. Rear elevation of truck, cargo, WVN and WOWN, M814.

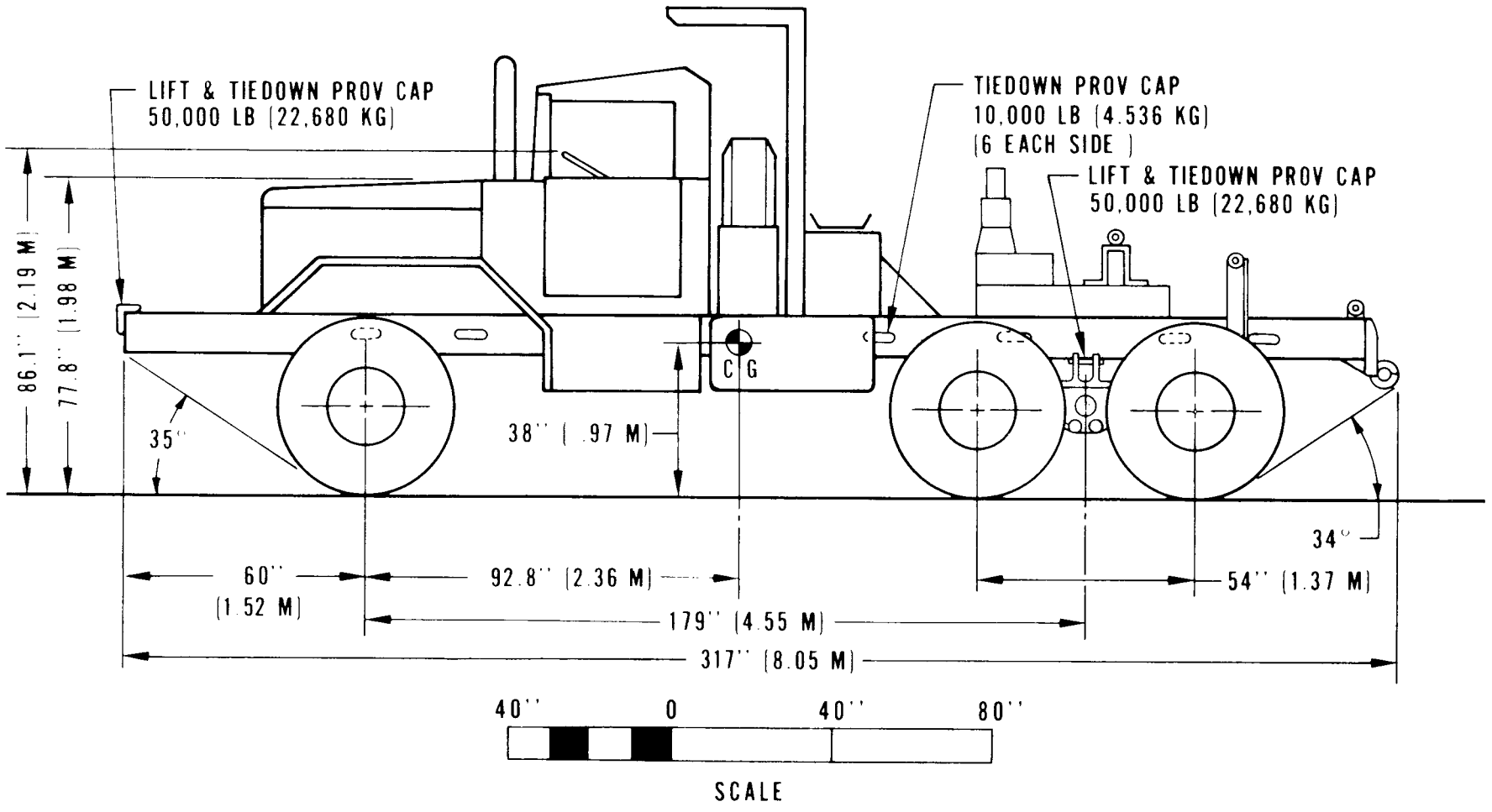


Figure 2-18. Side elevation of truck, logging, bolster, WWN, M815.

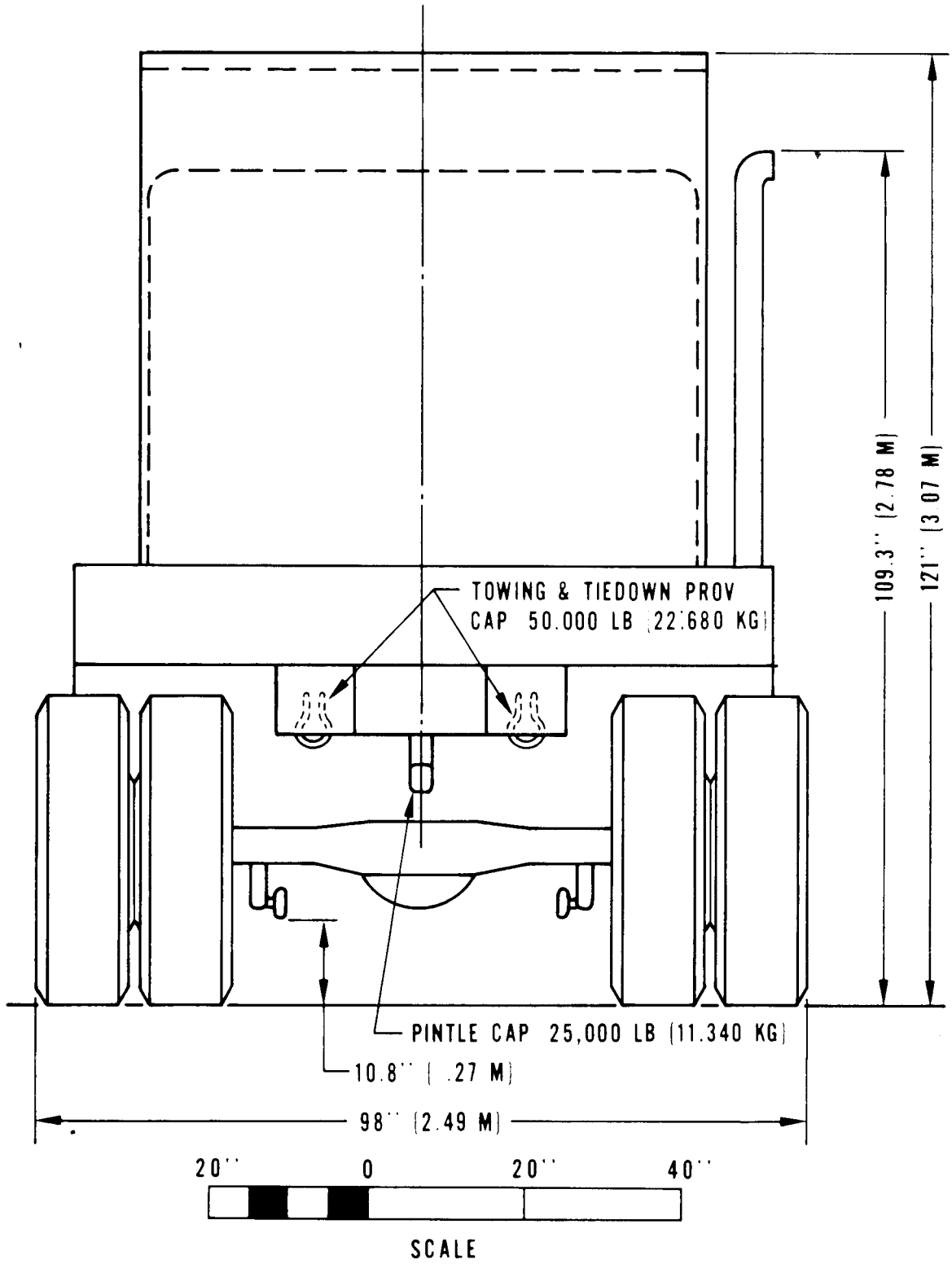


Figure 2-19. Rear elevation of truck, logging, bolster, WVN, M815.

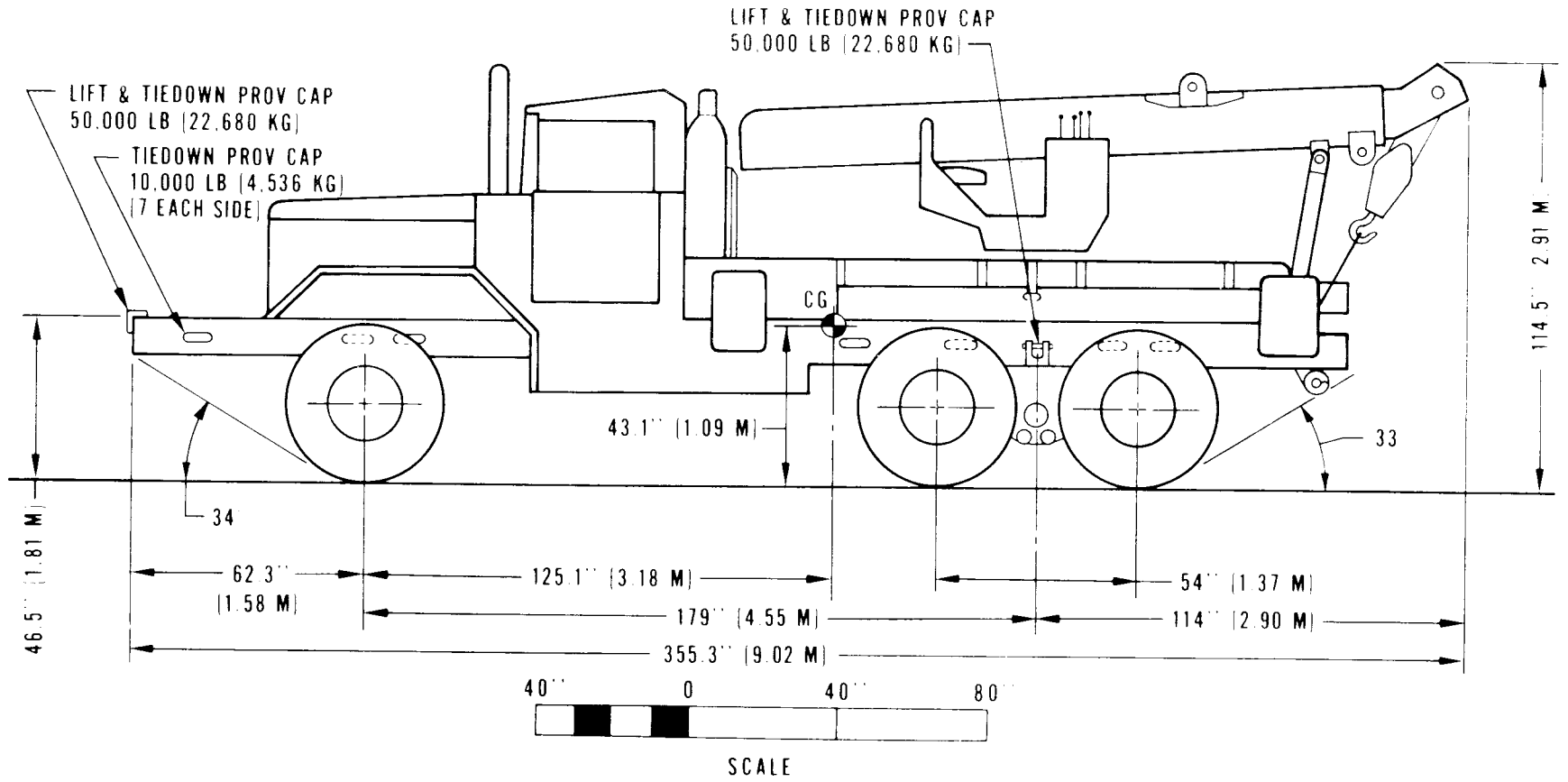


Figure 2-20. Side elevation of truck, wrecker, medium, WWN, M816.

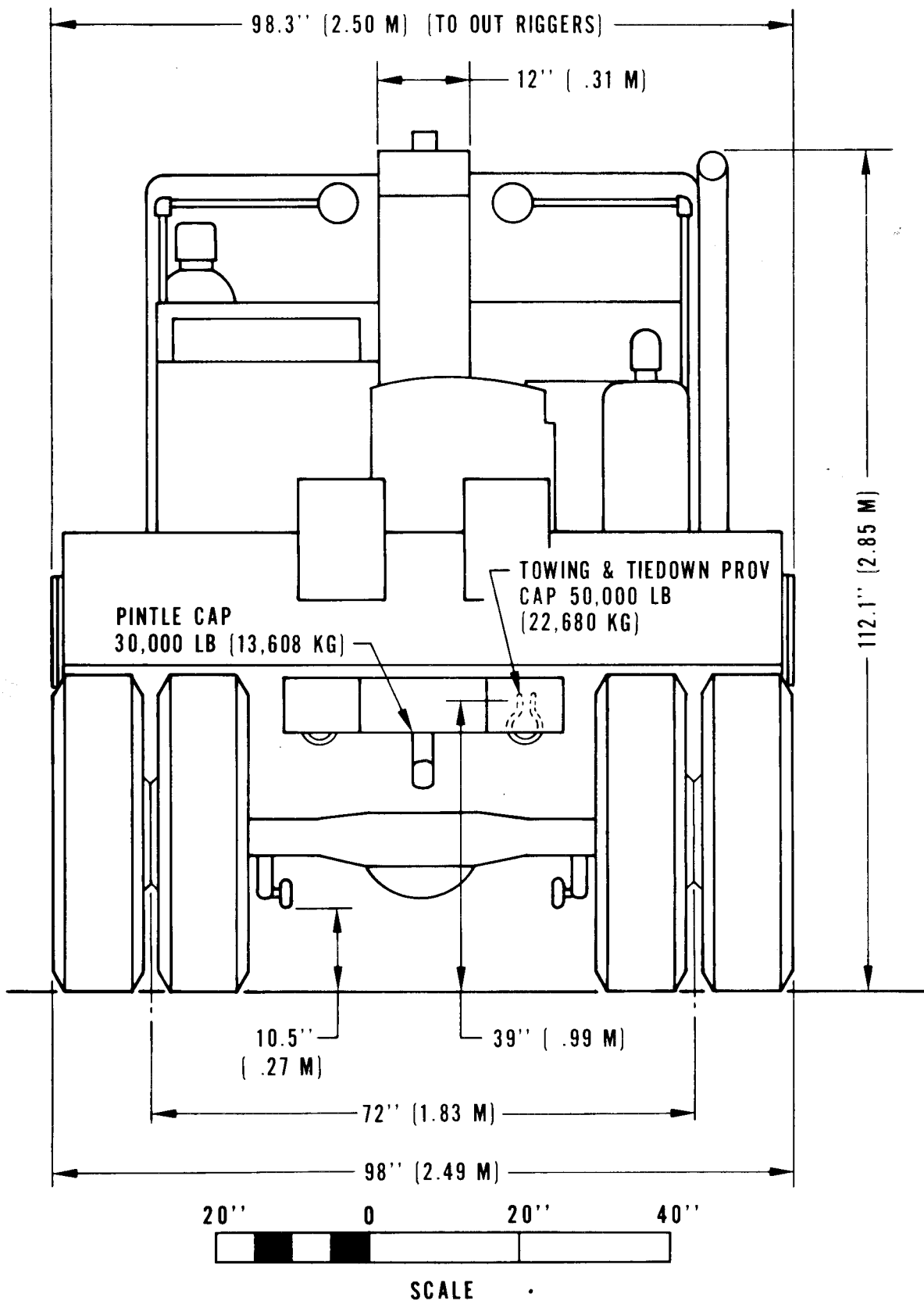


Figure 2-21. Rear elevation of truck, wrecker, medium, WVN, M816.

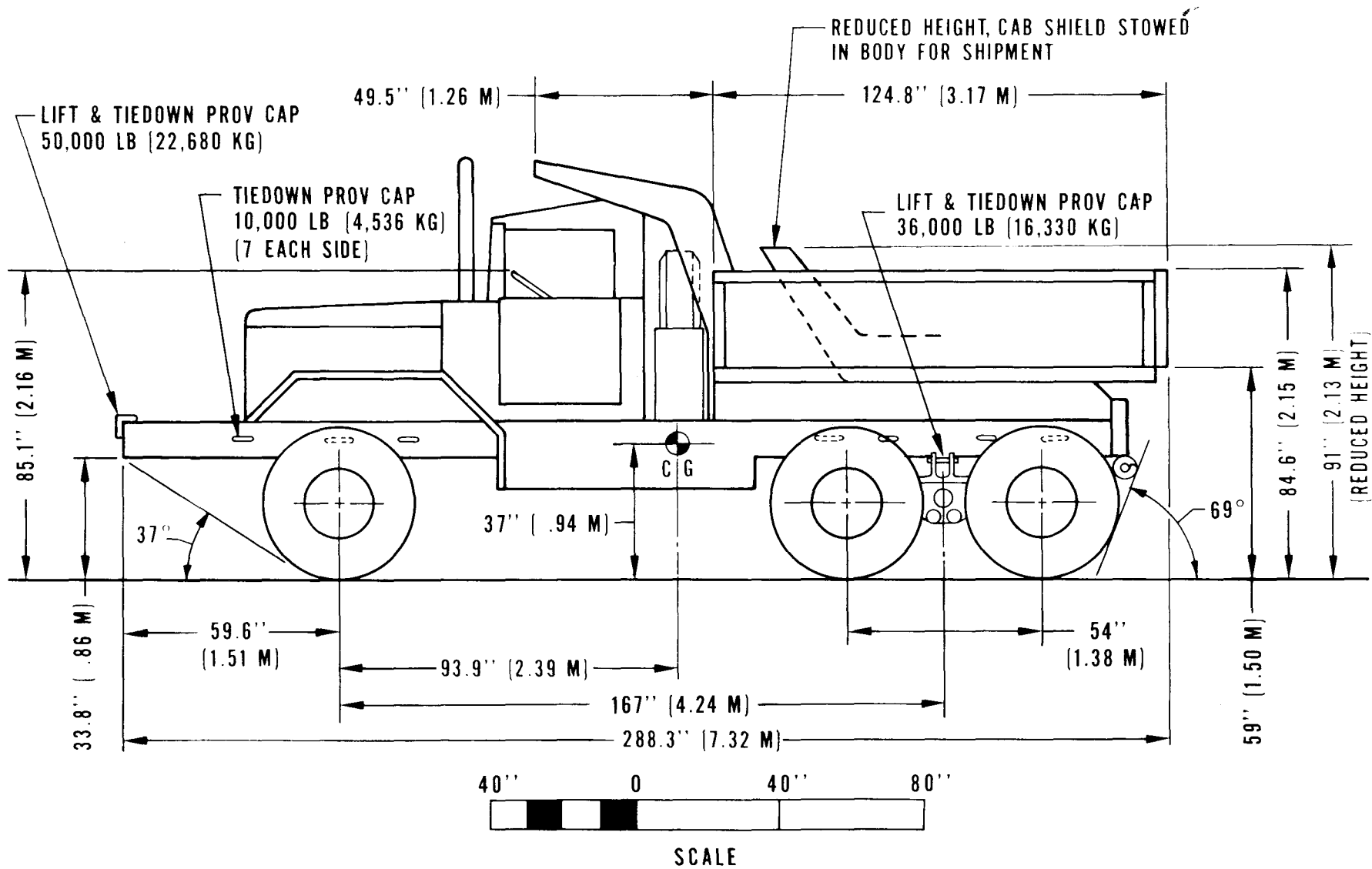


Figure 2-22. Side elevation of truck, dump, WWN, M817.



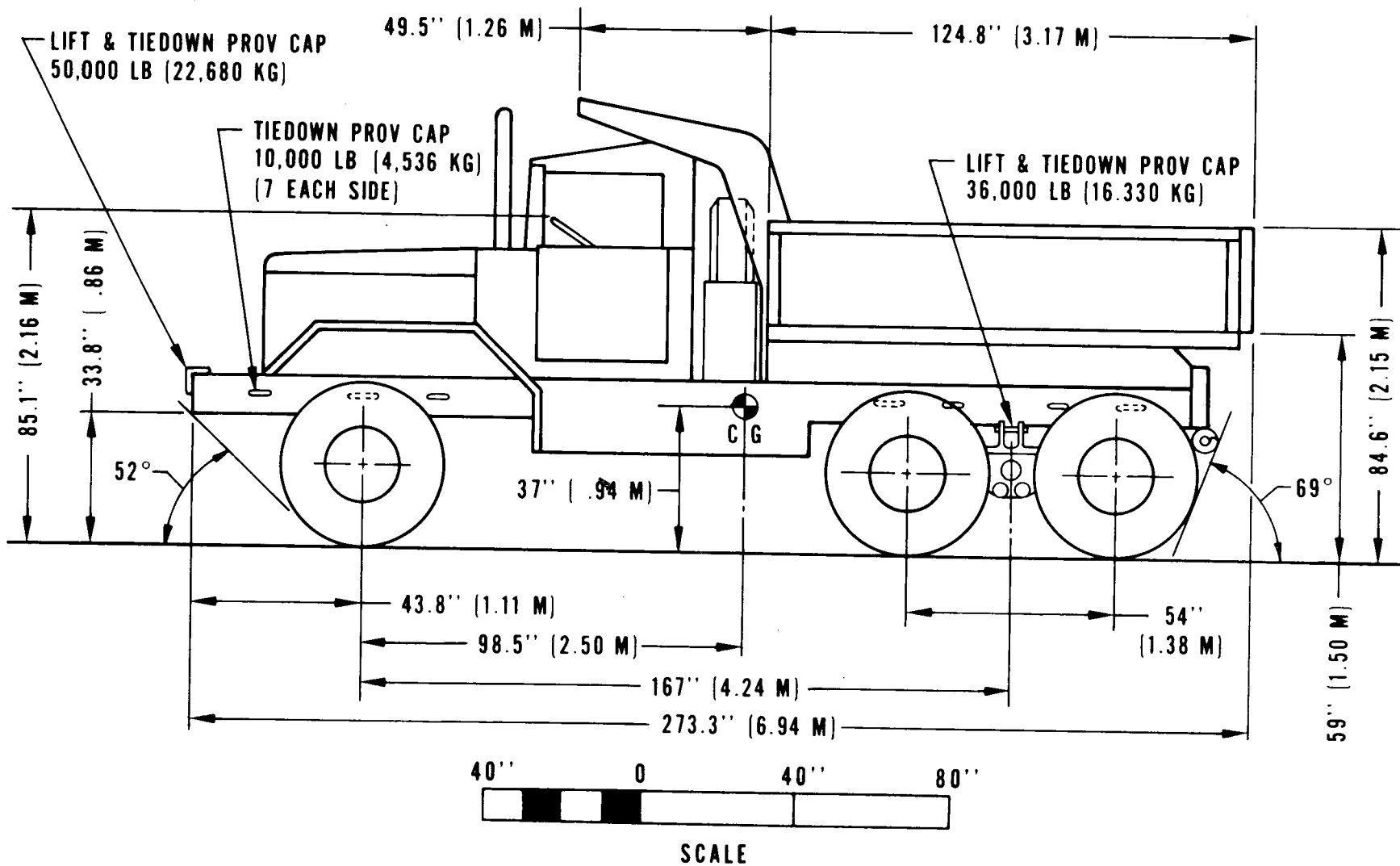


Figure 2-23. Side elevation of truck, dump, WOWN, M817.

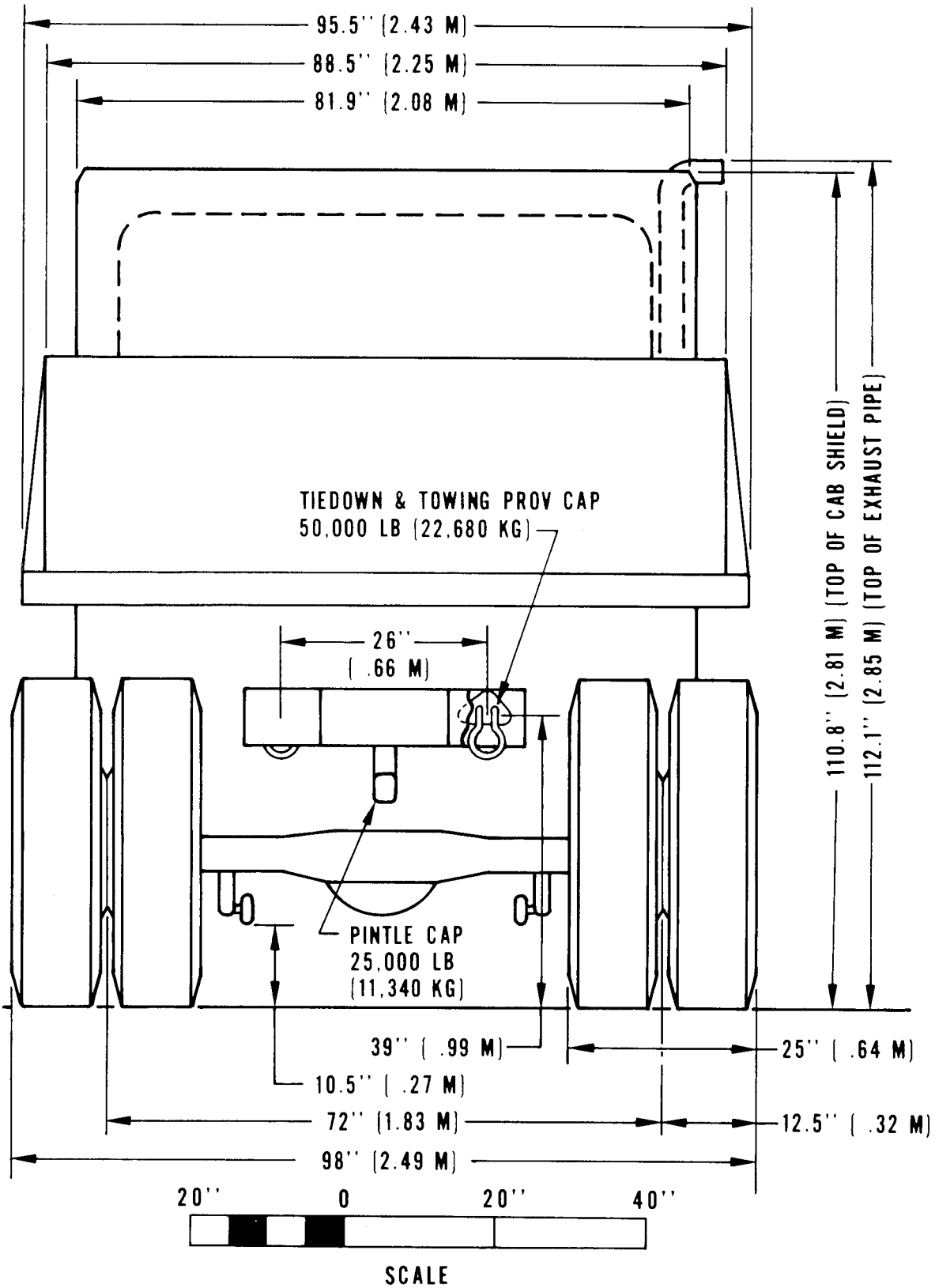


Figure 2-24. Rear elevation of truck, dump, WWN, M817.

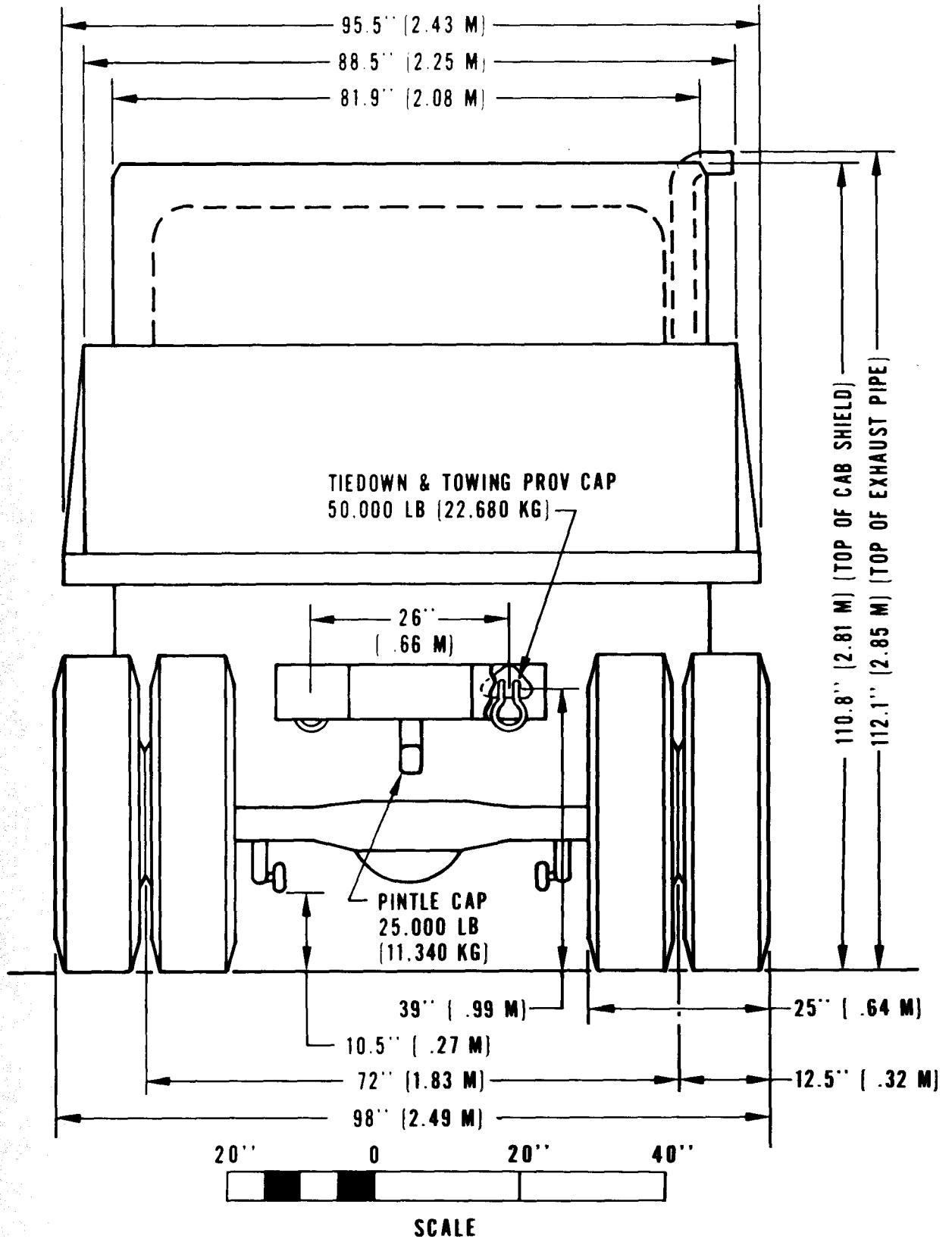


Figure 2-25. Rear elevation of truck, dump, WOWN, M817.

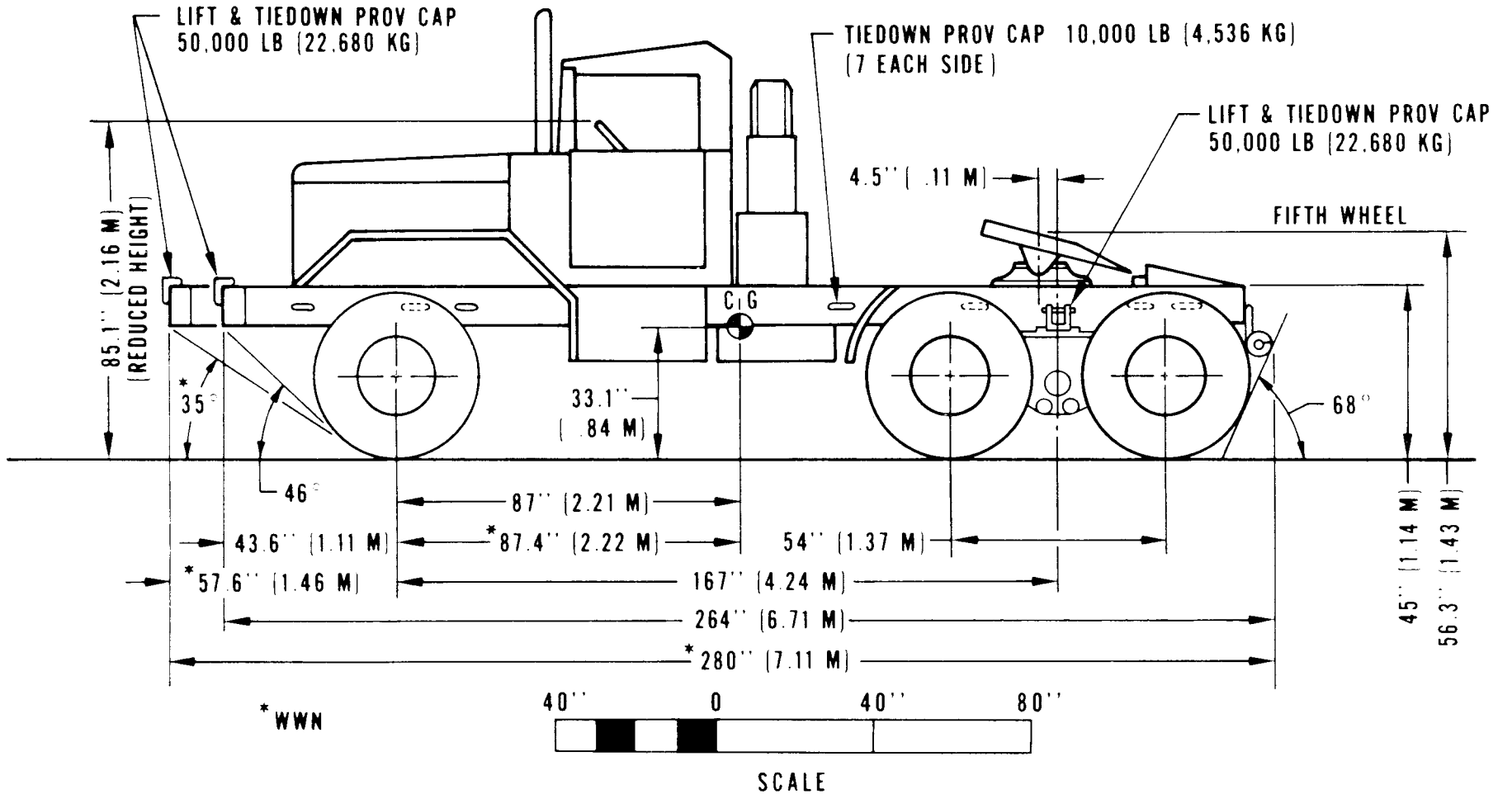


Figure 2-26. Side elevation of truck, tractor, WWN and WOWN, M818.

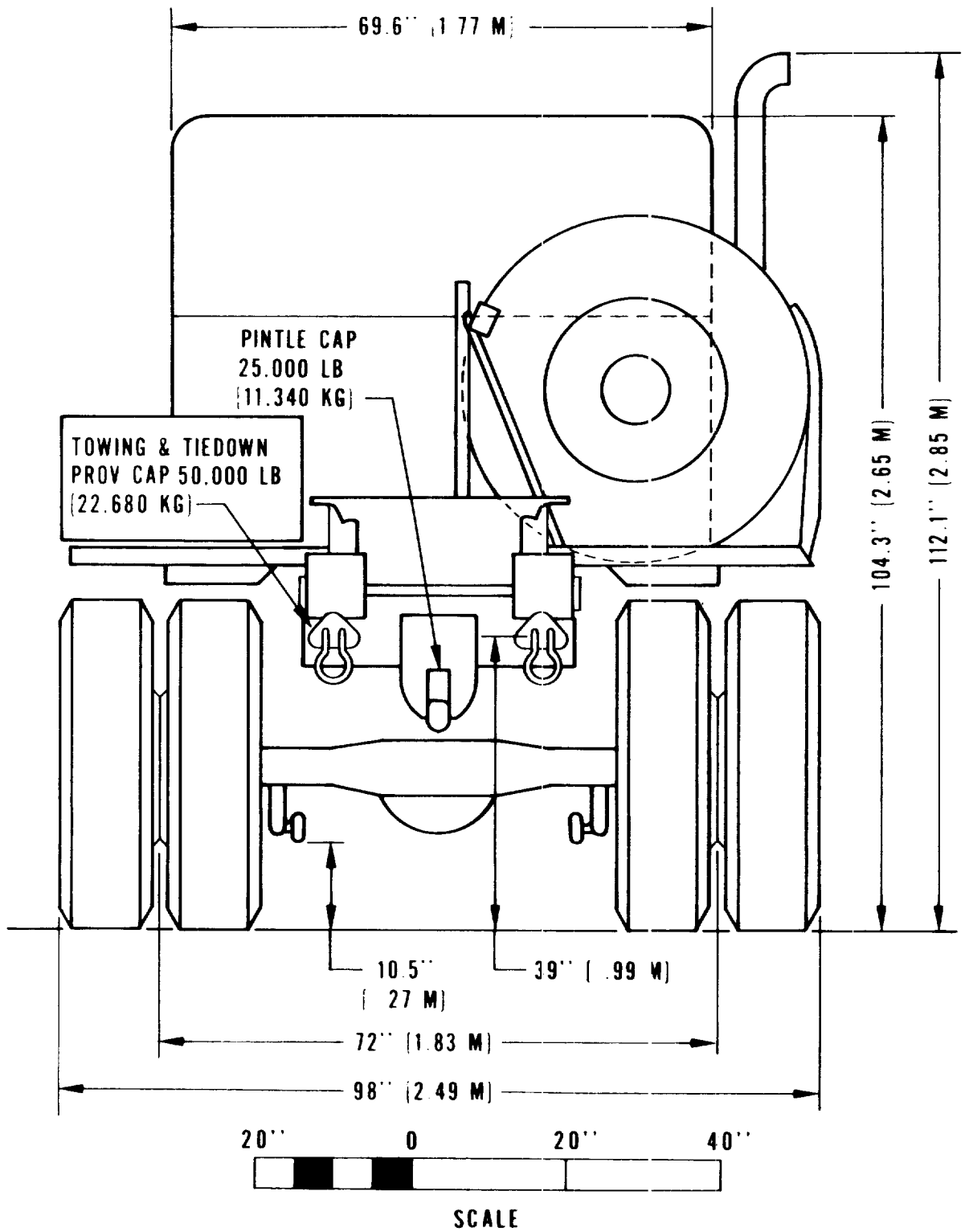


Figure 2-27. Rear elevation of truck, tractor, WWN and WOWN, M818.

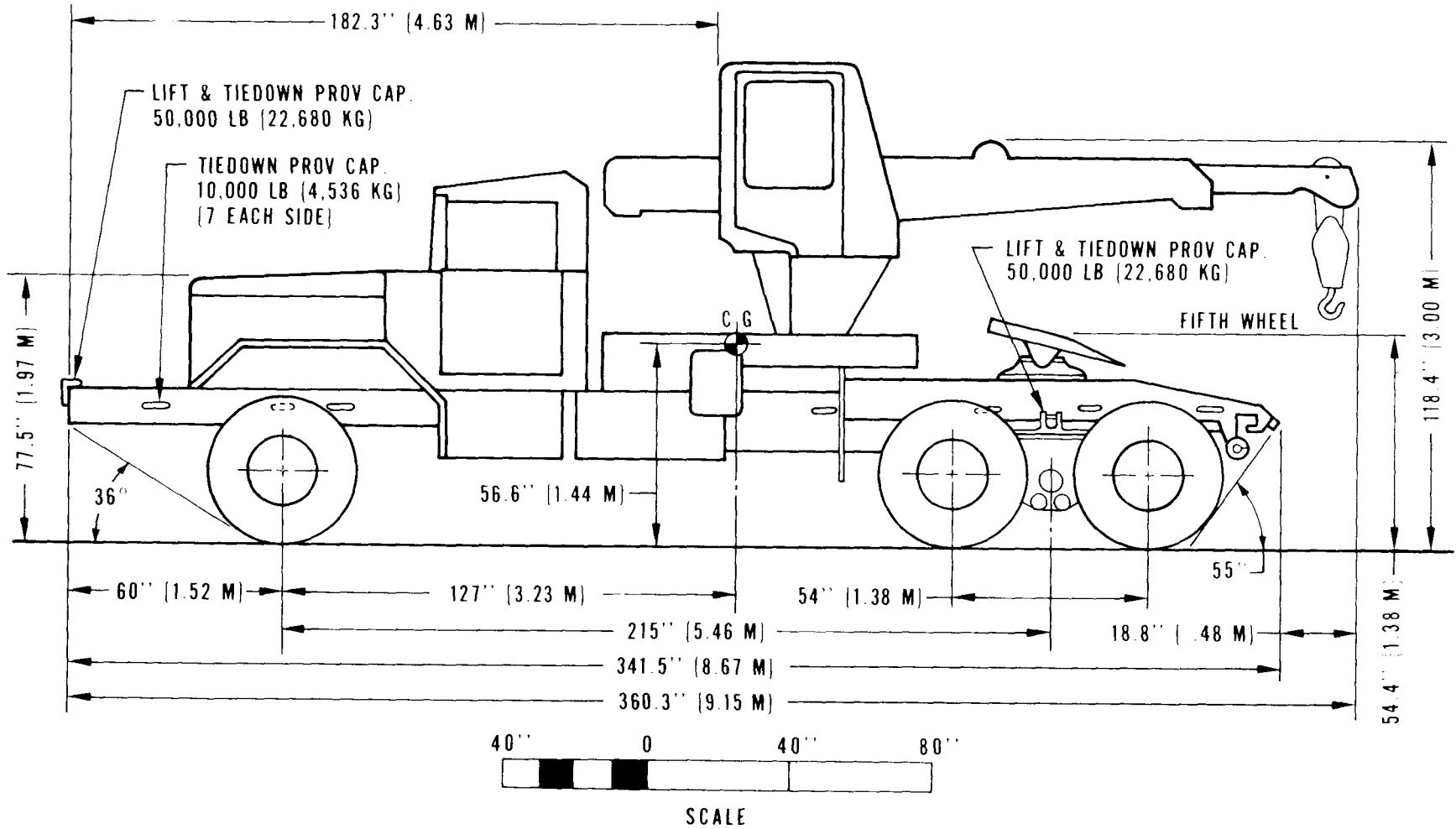


Figure 2-28. Side elevation of truck, tractor, wrecker, WWN, M819.

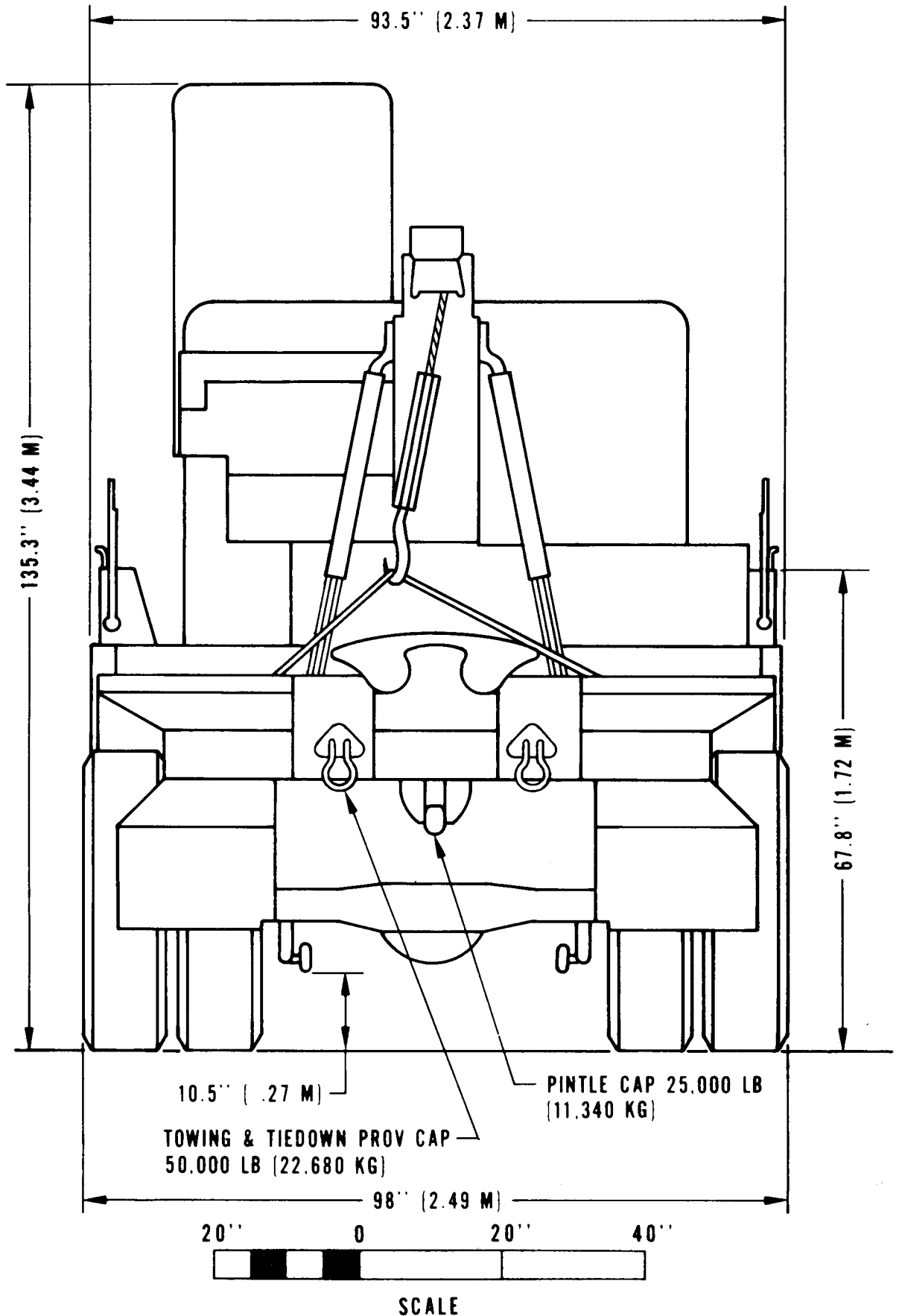


Figure 2-29. Rear elevation of truck, tractor, wrecker, WWN, M819.

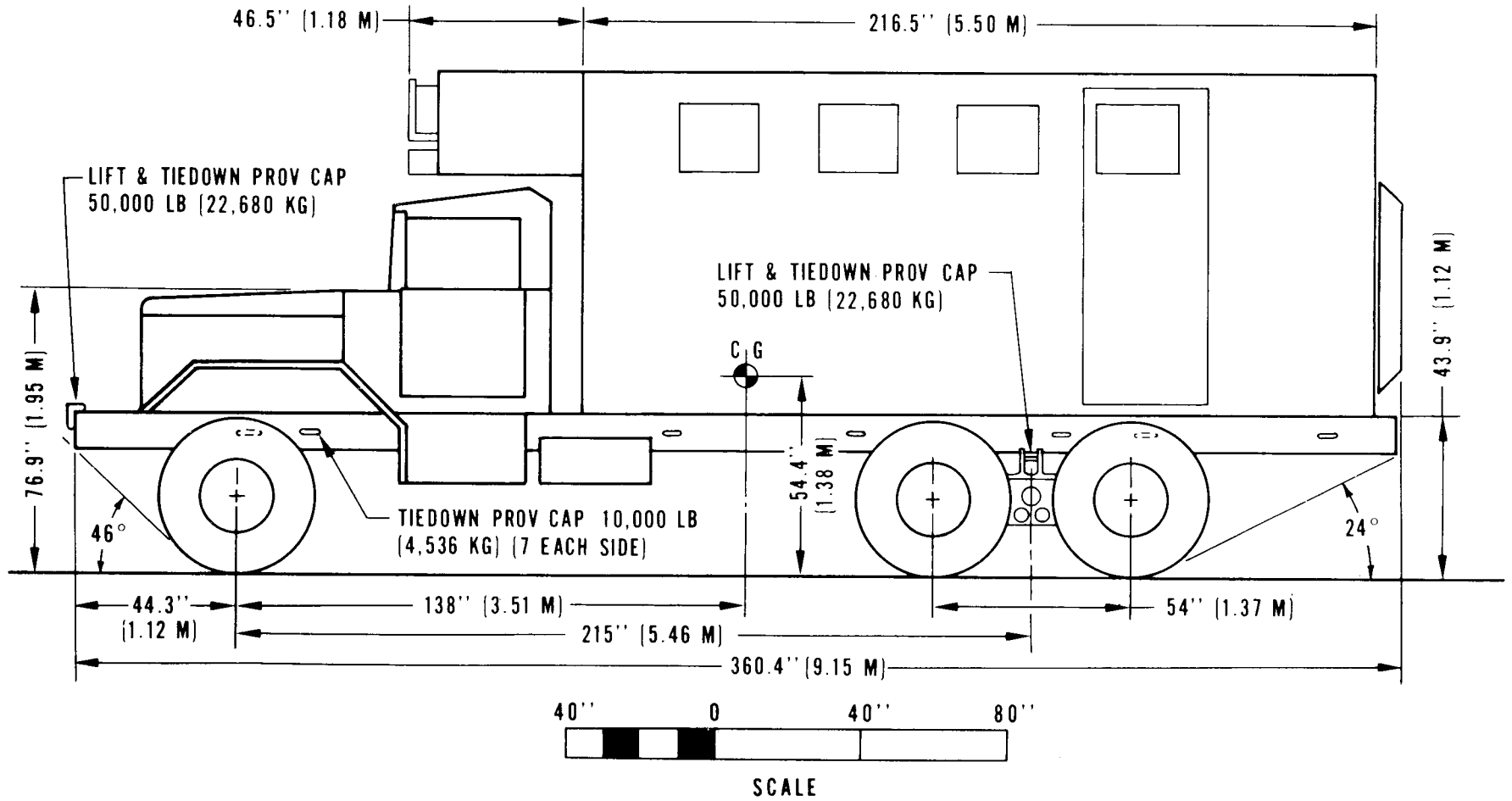


Figure 2-30. Side elevation of truck, van, expansible, WOWN, M820.



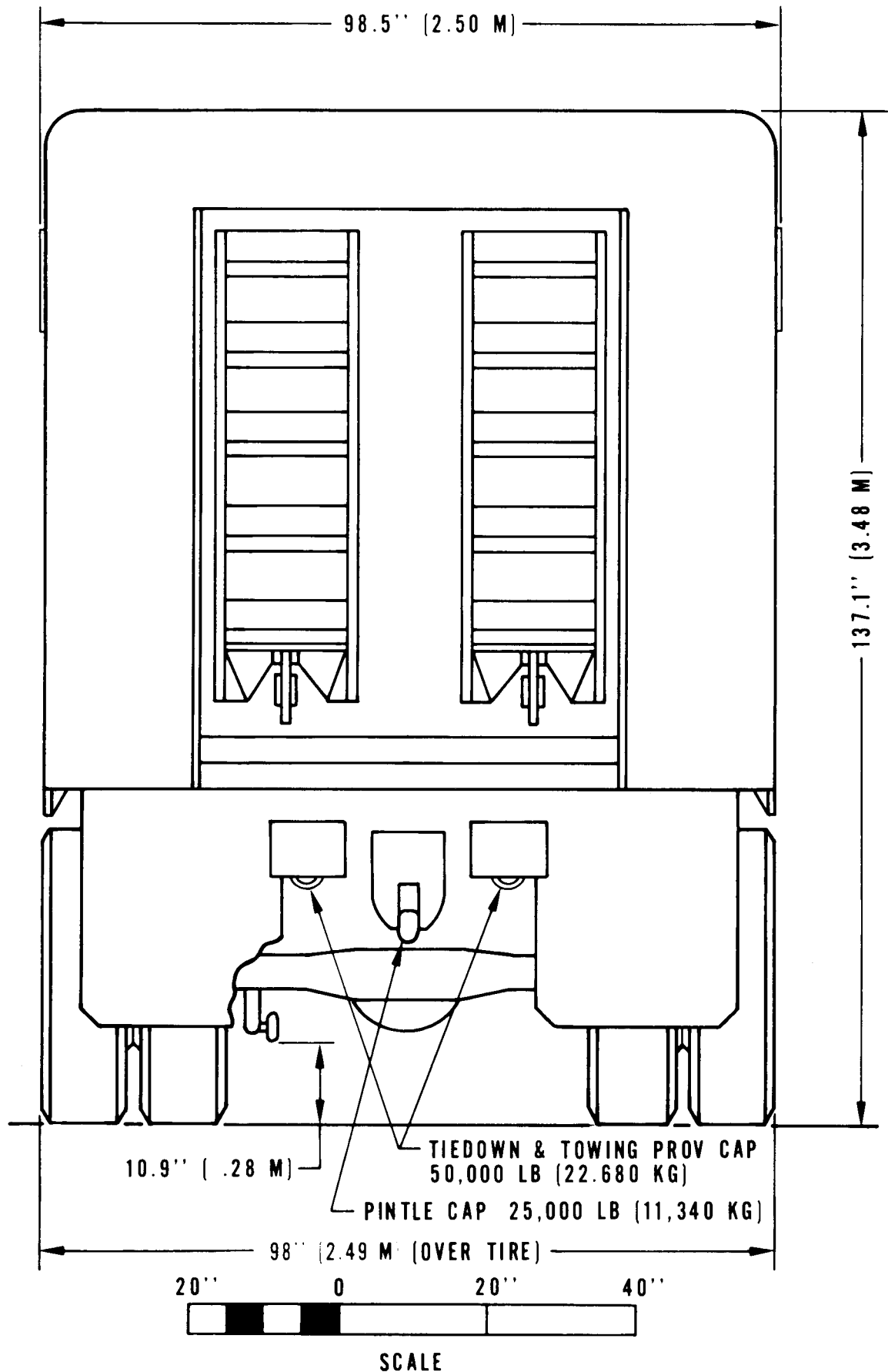


Figure 2-31. Rear elevation of truck, van, expensible, WOWN, M820.

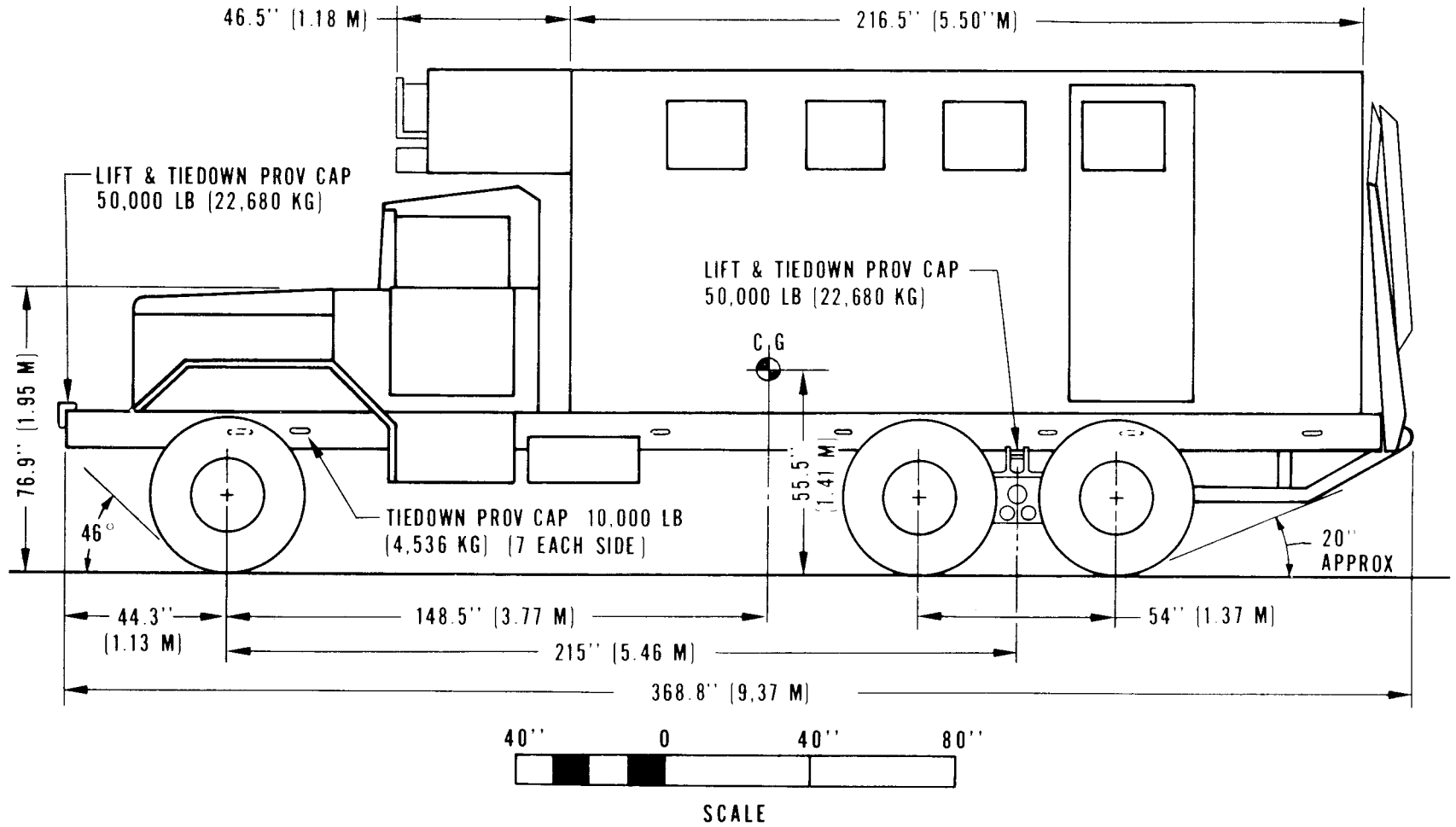


Figure 2-32. Side elevation of truck, van, expansible, WOWN, M820A2.

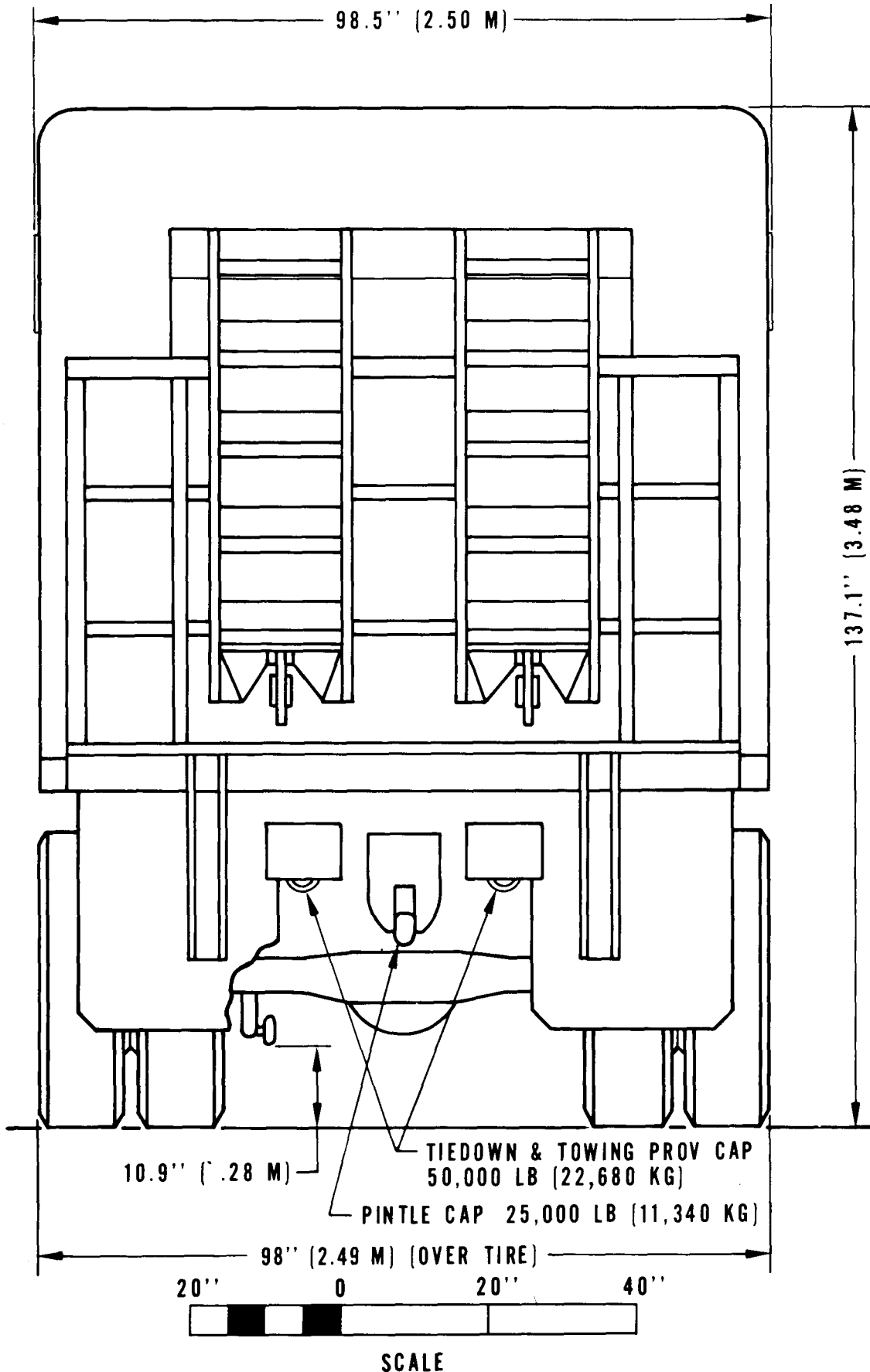


Figure 2-33. Rear elevation of truck, van, expansible, WOWN, M820A2.

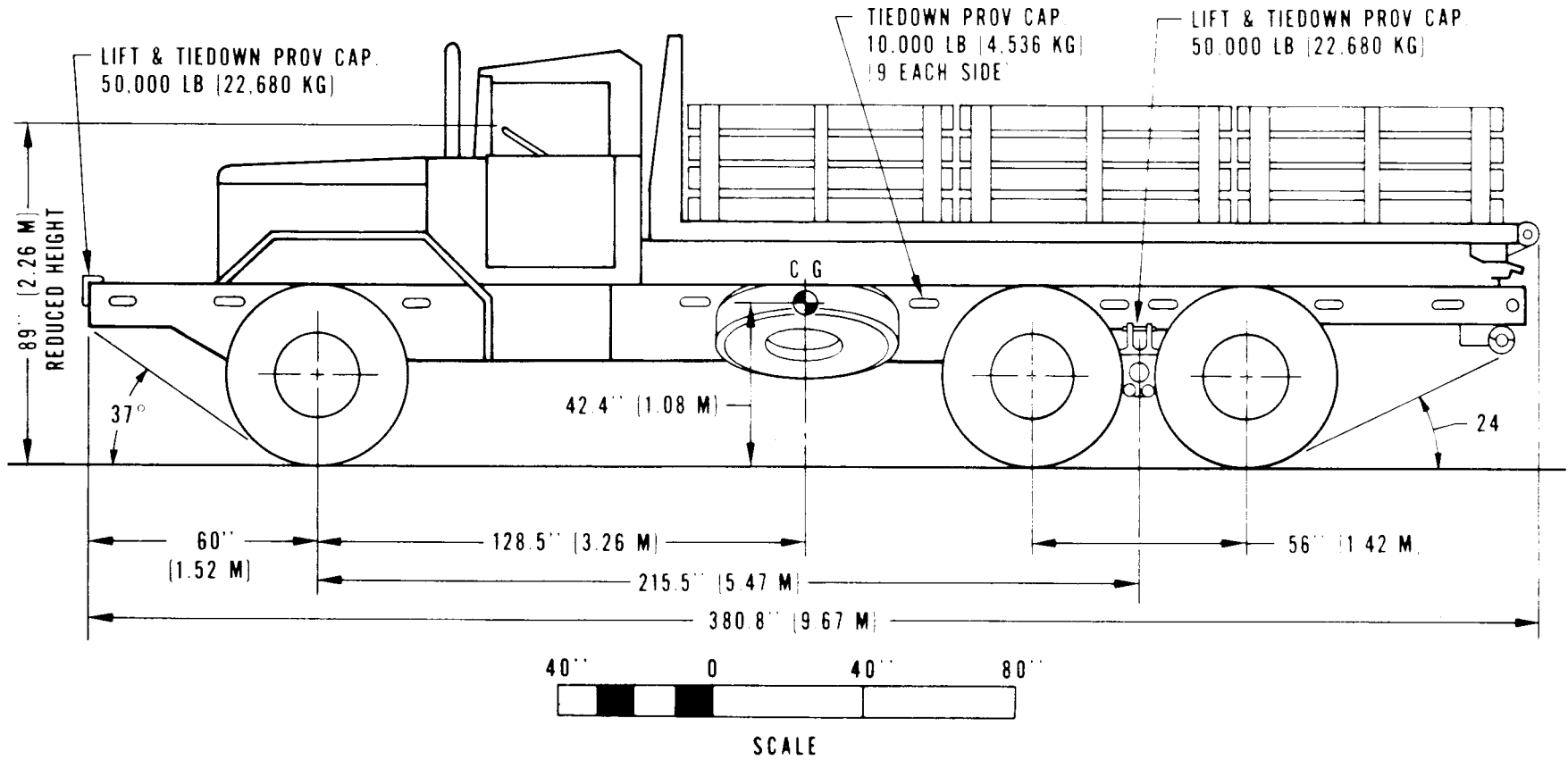


Figure 2-34. Side elevation of truck, stake, bridge, WWN, M821.

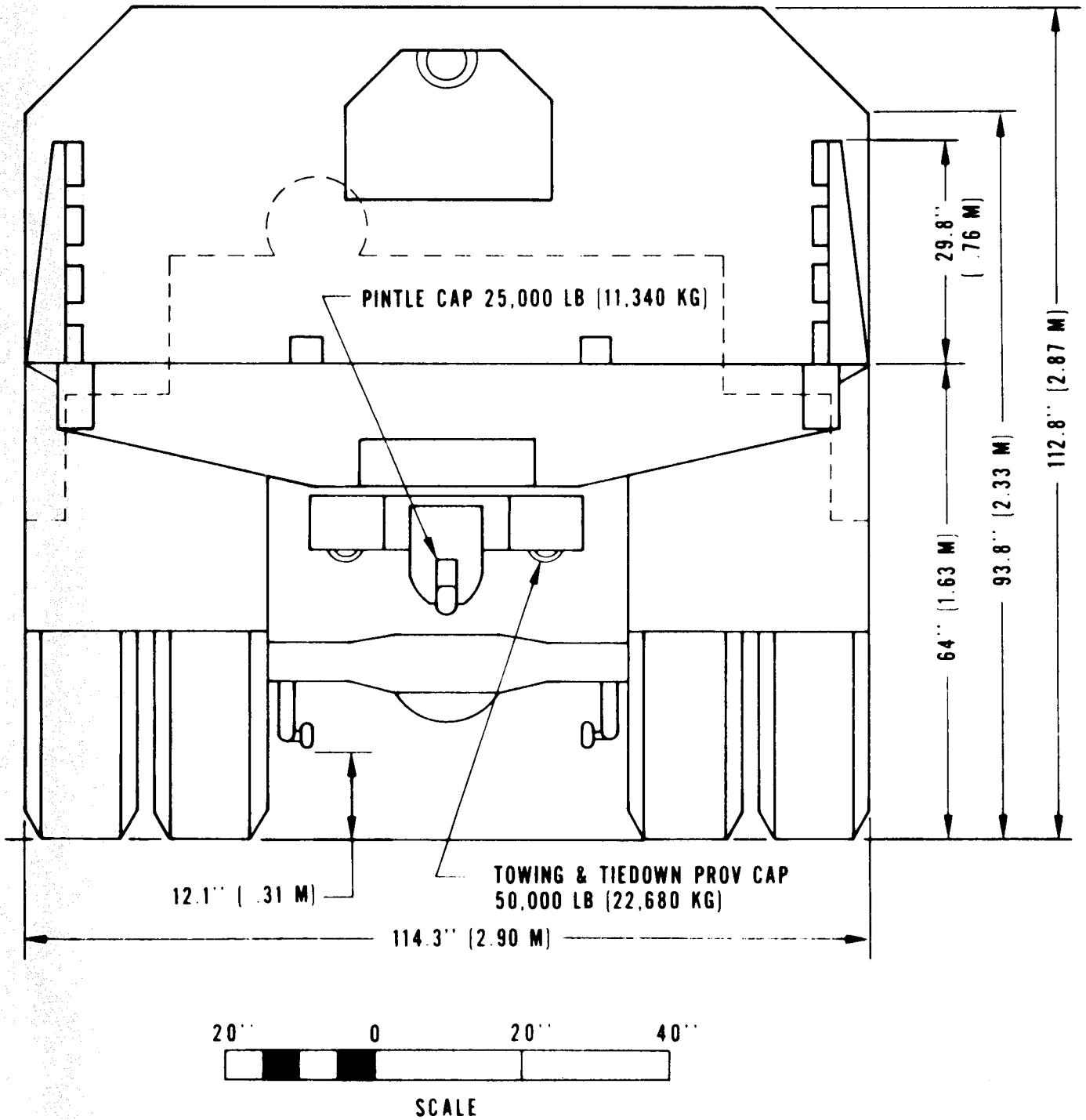


Figure 2-35. Rear elevation of truck, stake, bridge, WWN, M821.

Table 2-1. Characteristics and Related Data

Nomenclature (5-ton, 6x6)	TOE LIN		FSN	Weight, Lb (kg)	Volume, cu ft (cu m)	
			(2320)		Operational	Reduced
Truck, Cargo M813	WWN	X40968	050-8890	21,771 (9,875)	2,495.7 (70.63)	1,560.7 (44.17)
	WOWN	X40831	050-8902	20,910 (9,485)	2,314.4 (65.50)	1,484.7 (42.02)
Truck, Cargo, Dropside M813A1	WWN	X40931	050-8905	22,144 (10,045)	2,495.7 (70.63)	1,560.7 (44.20)
	WOWN	X40794	050-8913	20,982 (9,517)	2,331.7 (65.99)	1,498.7 (42.41)
Truck, Cargo M814	WWN	X41242	050-8987	25,607 (11,615)	3,102.3 (87.80)	1,984.6 (56.16)
	WOWN	X41105	050-8988	24,037 (10,903)	2,964.2 (83.89)	1,896.2 (53.66)
Truck, Bolster M815	WWN	X39187	050-8927	21,420 (9,716)	2,175.9 (61.58)	Not reducible
Truck, Wrecker M816	WWN	X63299	051-0489	34,820 (15,794)	2,702.1 (76.47)	2,307.2 (58.34)
Truck, Dump M817	WWN	X43845	051-0589	23,847 (10,817)	2,147.1 (60.76)	1,487.9 (42.11)
	WOWN	X43708	050-8970	22,615 (10,258)	2,035.4 (57.60)	1,410.5 (39.92)
Truck, Tractor M818	WWN	X59463	050-8978	20,107 (9,121)	2,085.3 (59.01)	1,351.4 (38.24)
	WOWN	X59326	050-8984	19,387 (8,794)	1,966.1 (55.64)	1,274.1 (36.06)
Truck, Tractor, Wrecker M819	WWN	X60696	050-9004	33,874 (15,365)	3,247.1 (91.89)	2,419.3 (68.47)
Truck, Van, Exp M820	WOWN	X62237	050-9006	27,577 (12,509)	3,262.6 (92.33)	2,816.5 (79.71)
	WOWN	X62271	050-9010	29,495 (13,363)	3,331.4 (94.28)	2,875.9 (81.39)
Truck, Stake M821	WWN	X56586	050-9015	27,888 (12,650)	2,920.8 (82.60)	2,822.6 (79.88)

**2-5. Reduced Configuration**

Transportation economies can be obtained by reducing each vehicle to its minimum dimensions for transport by ship. Removable items such as bows, tarpaulins, exhaust pipe extensions, etc., should be stowed within the confines

of the vehicle cargo compartment. Cargo transported in the vehicle should not exceed the minimum dimensions or weight limitation of the vehicle. Examples of dimensional reductions for the M809-series trucks are found in table 2-2, height reduction of M809-series trucks.

*Table 2-2. Height Reduction of M809-Series Trucks*

	M813	M813A1	M814	M816	M817	M818	M819
<b>Reduced Height</b>	86.1 (2.19)	86.1 (2.19)	88.5 (2.25)	112.3 (2.85)	91.0 (2.31)	85.1 (2.16)	118.4 (3.00)
<b>Cab tarpaulin</b>	X	X	X	X	X	X	X
<b>Pillar post assy</b>	X	X	X	X	X	X	X
<b>Tail pipe extension</b>	X	X	X	X	X	X	X
<b>Mirrors and arms</b>	X	X	X	X	X	X	X
<b>Cargo tarpaulin</b>	X	X	X				
<b>Bows</b>	X	X	X				
<b>Spare tire</b>	X	X			X	X	X
<b>Lower windshield</b>	X	X	X		X	X	
<b>Gravel shield</b>					X		
<b>Shipper braces</b>				X		X	
<b>Boom roller</b>				X			X
<b>Operator's cab</b>							X





## CHAPTER 3

### SAFETY

---

#### 3-1. General

General safety considerations and precautions for movement are as follows:

- a. Check each vehicle to insure that all loose items are appropriately secured.
- b. When backing a vehicle insure that no personnel or obstructions are behind it.

#### **WARNING**

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

#### **WARNING**

Proper ventilation must be provided when loading and unloading if vehicle engine is used. Prolonged exposure to carbon monoxide fumes will produce adverse effects that may prove fatal.

#### 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 M809-series trucks. It presents examples of tiedown diagrams and tiedown data tables for loading these vehicles in US Air Force C-5, C-130, and C-141 airplanes.

##### 4-2. Maximum Utilization of Aircraft

Additional cargo including nuclear weapons and/or personnel within allowable load limits and restrictions prescribed by pertinent safety regulations (app) can be transported with the M809-series trucks in US Air Force aircraft.

##### 4-3. Safety

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

*a.* The activity offering the vehicles or items for air transport will notify the aircraft commander or his designated representative in the event ammunition or explosives are to be transported within a vehicle.

*b.* The vehicles' fuel tanks must not be more than three-fourths full.

*c.* The required number of tiedowns plus their capacity must be checked and the criteria for gravity forces adhered to.

#### NOTE

General cargo loads depicted in this manual for US Air Force C-130 and C-141 airplanes are restrained to the minimum of 8g's forward restraint that is required when passengers or nuclear weapons cargo are carried forward of the general cargo. The 8g's forward restraint may be reduced to a minimum of 3g's forward restraint for general cargo when passengers or nuclear weapons are *not* carried forward of the general cargo.

When passengers or nuclear weapons cargo are carried forward of general cargo, the HBU-8/A (VAN ZELM) barrier net or equivalent net on aircraft so equipped shall be positioned in front of the general cargo to achieve a minimum of 8g's forward restraint.

#### NOTE

In air loading the center of gravity of each vehicle must be determined and where weight and/or measurement is critical each vehicle should be weighed and/or measured.

#### Section II. TRANSPORT BY US ARMY AIRCRAFT

##### 4-4. Fixed Wing Aircraft

All trucks of the M809-series are too large and too heavy for transport by the US Army fixed wing aircraft.

##### 4-5. Rotary Wing Aircraft

The truck, tractor, M818, is the only M809-series

vehicle that can be transported by a US Army helicopter. The M818, without winch, can be externally transported by the CH-47 and CH-54 helicopters under optimum conditions; however, the truck has not been test-lifted. When tests have been accomplished, the procedures will be published in a revision to this manual.

#### Section III. TRANSPORT BY US AIR FORCE AIRCRAFT

##### 4-6. Aircraft Capabilities

All of the M809-series trucks can be loaded into the US Air Force C-5 aircraft. The M813, M813A, M814, M815, M817, and M818 trucks can be

loaded into the US Air Force C-130 and C-141 aircraft. Test loading of these vehicles has not been accomplished. When test loading and procedures are obtained, they will be published in a

revision to this manual. Because of their height, the M816, M819, M820, M820A2, and M821 cannot be loaded into the US Air Force C-130 and C-141 aircraft.

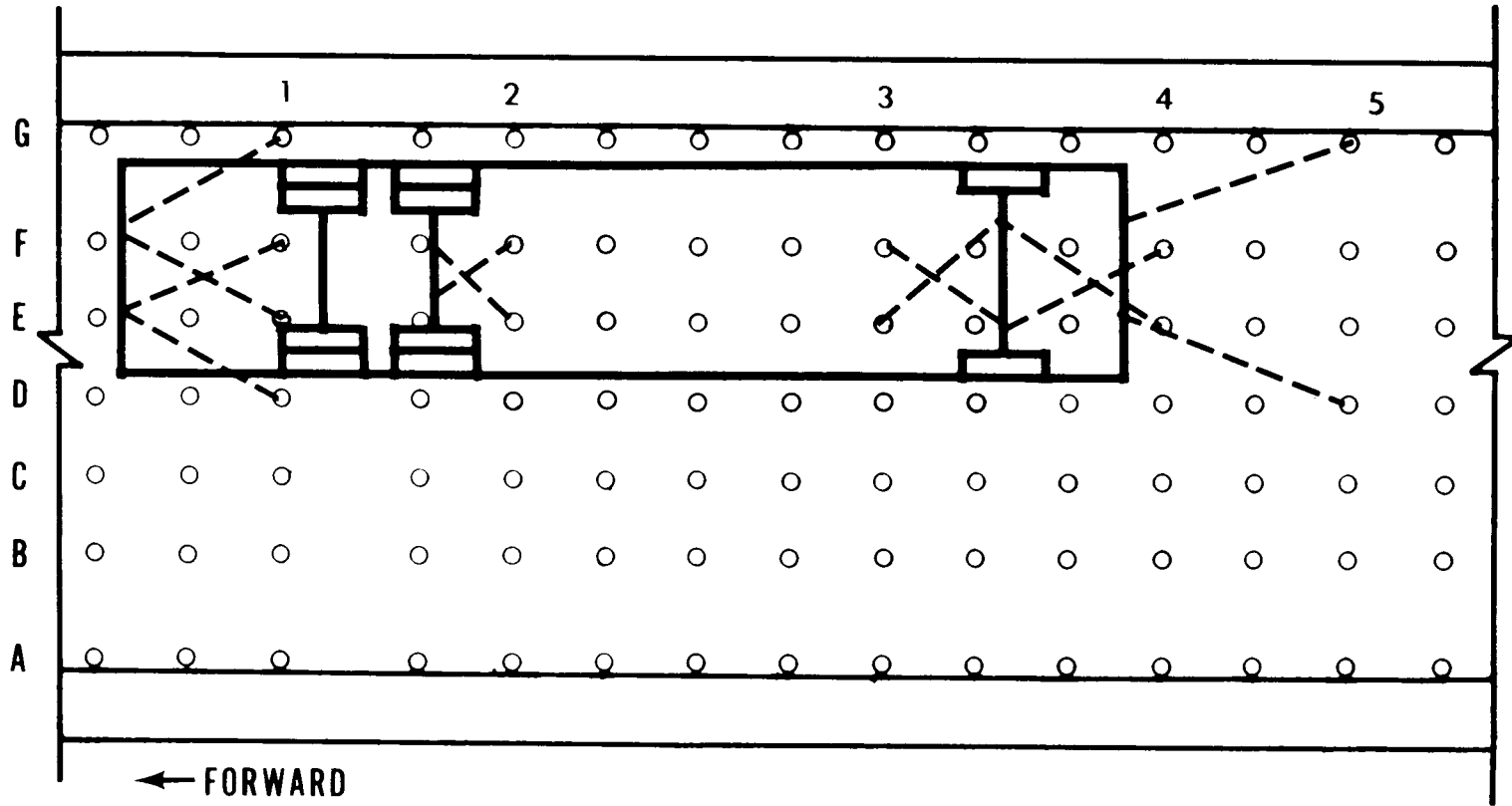
#### **4-7. Typical loads**

The following tiedown diagrams (fig 4-1 through 4-7) and data (tables 4-1 through 4-7) are based on acceptable methods for vehicles similar to the M809-series trucks and can be used as a guide for loading the M809-series trucks. Loads are based on the vehicles in reduced configurations without major sectionalization. Figures

show the tiedown pattern; the tables list the type and capacity of the tiedown devices required, the location points on the trucks, and the corresponding row of fittings to which the devices are secured. Refer to AR 70-39 for specified minimum restraint factors (g load) required.

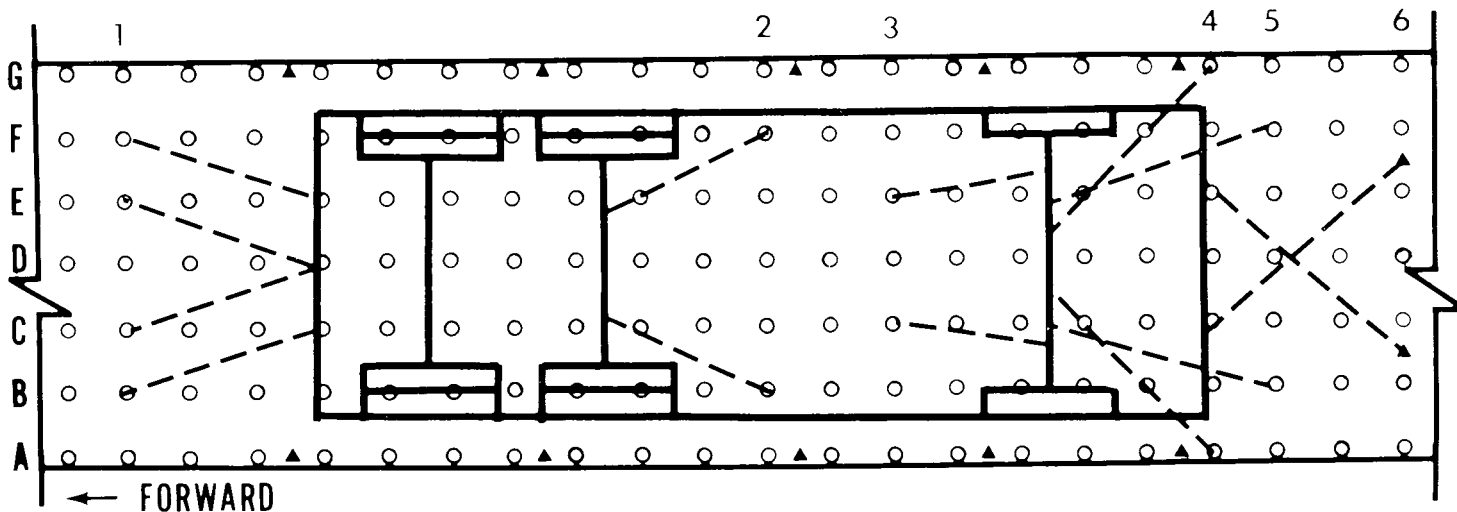
#### **4-8. Responsibility**

The aircraft commander or his representative is responsible for insuring that the load is secured in accordance with restraint criteria outlined in applicable aircraft T.O. 1C-XXXX-9.



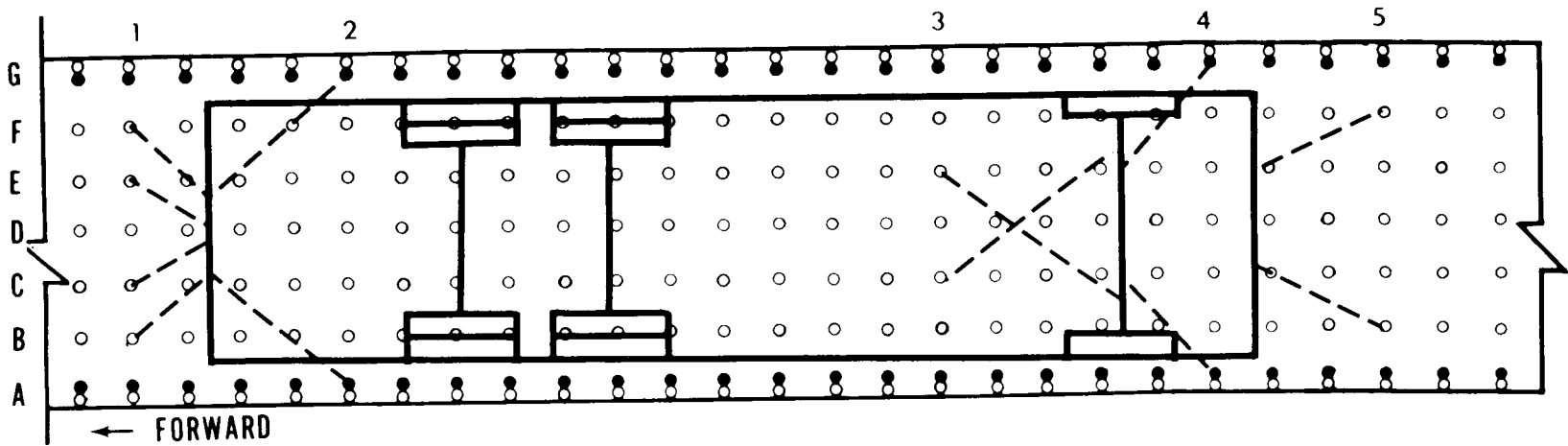
○ ALL CARGO TIEDOWN FITTING RATINGS 25000 LB EACH

Figure 4-1. Tiedown diagram for M814 in C-5 aircraft.



SYMBOL	○	▲
STRENGTH OF FITTING AND BASIC LOAD DIRECTION	10000 LB ANY	25000 LB ANY

Figure 4-2. Tiedown diagram for M814 in C-130 aircraft.



SYMBOL	○	●
STRENGTH OF FITTING AND BASIC LOAD DIRECTION	10000 LB ANY	25000 LB ANY

Figure 4-3. Tiedown of M814 in C-141 aircraft.

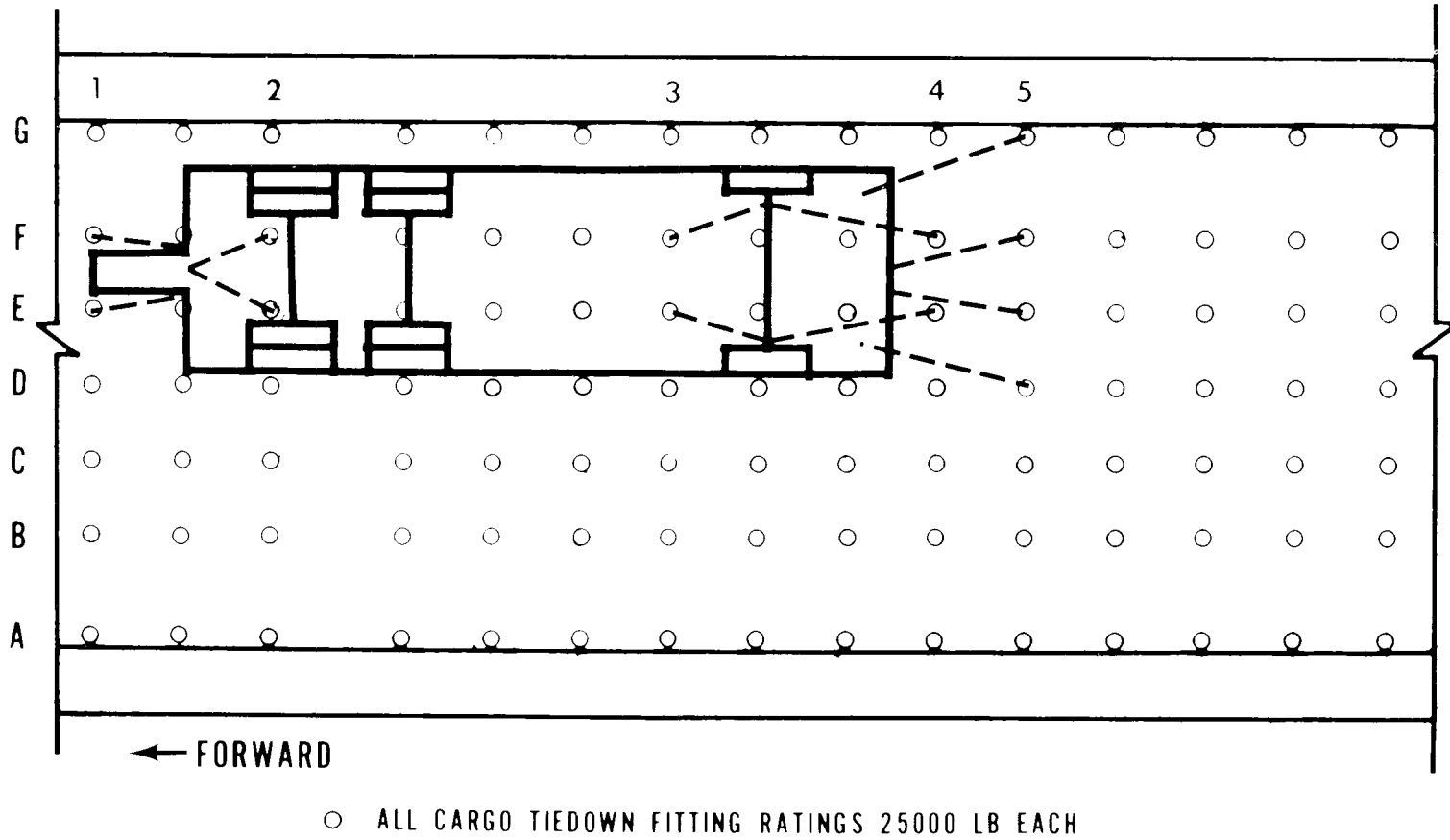
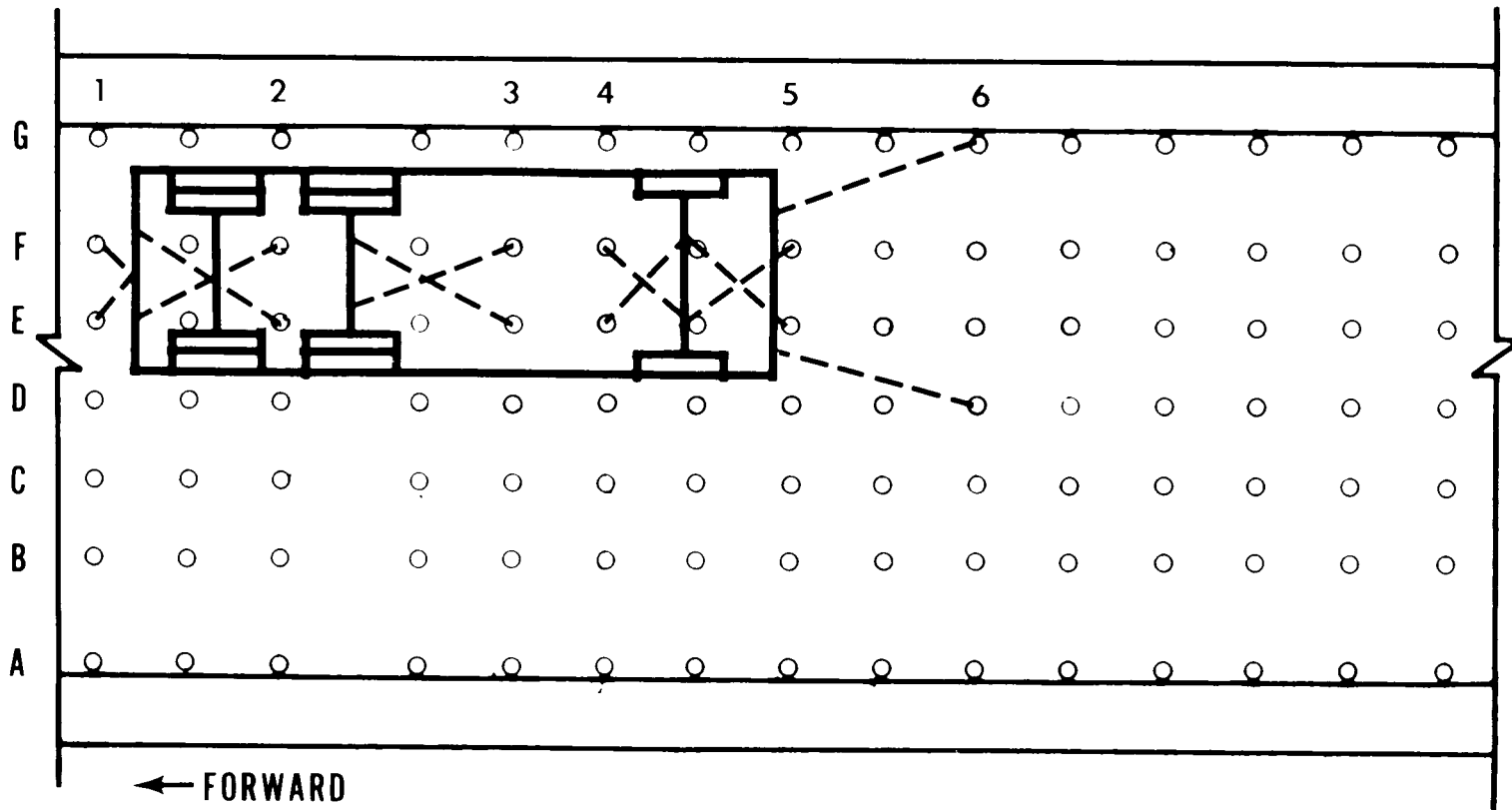


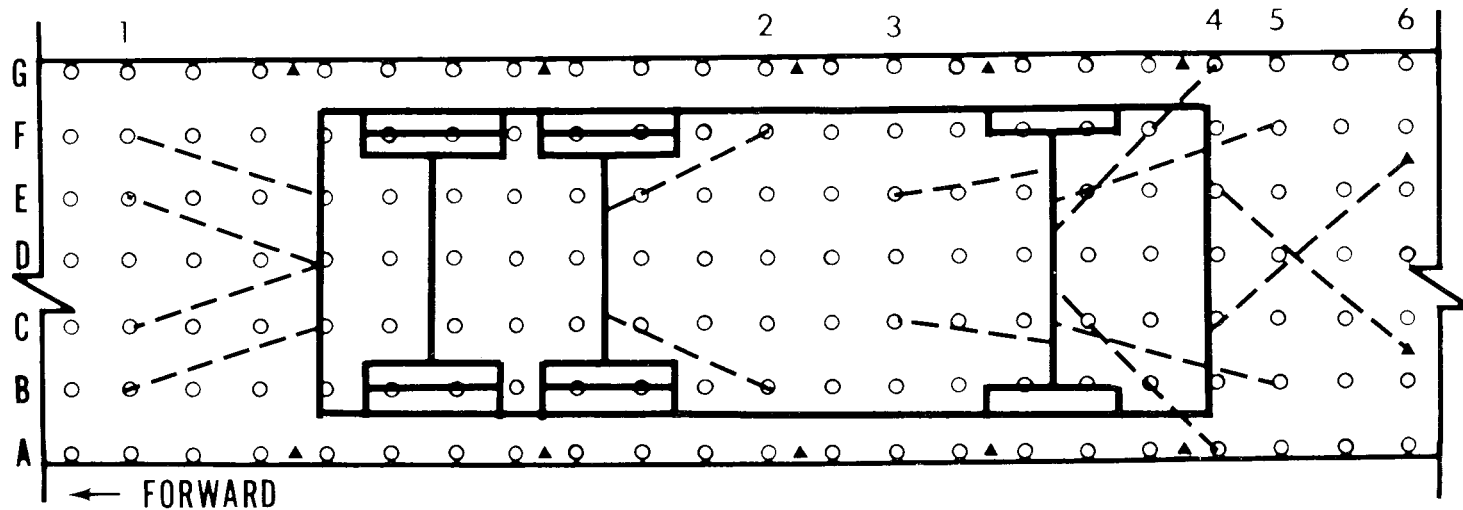
Figure 4-4. Tiedown diagram for M816 in C-5 aircraft.





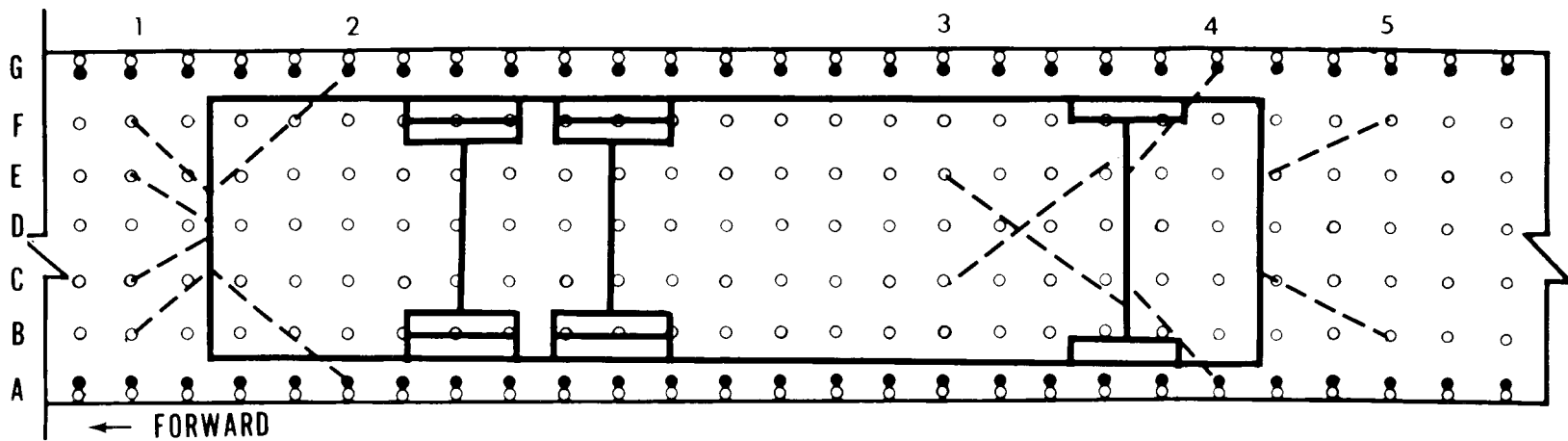
○ ALL CARGO TIEDOWN FITTING RATINGS 25000 LB EACH

Figure 4-5. Tiedown diagram for M817 in C-5 aircraft.



SYMBOL	○	▲
STRENGTH OF FITTING AND BASIC LOAD DIRECTION	10000 LB ANY	25000 LB ANY

Figure 4-6. Tiedown of M817 in C-130 aircraft.



SYMBOL	○	●
STRENGTH OF FITTING AND BASIC LOAD DIRECTION	10000 LB ANY	25000 LB ANY

Figure 4-7. Tiedown diagram for M817 in C-141 aircraft.

Table 4-1. Tiedown Data for M814 in C-5 Aircraft

Tiedown fitting		Tiedown device*		
design- nation	capacity in 1,000 lb	type	capacity in 1,000 lb	Attach to item
D1	25	MB-2	25	Right rear tiedown shackle
G1	25	MB-2	25	Left rear tiedown shackle
E1	25	MB-2	25	Left rear tiedown shackle
F1	25	MB-2	25	Right rear tiedown shackle
E2	25	MB-2	25	Intermediate axle, around left side
F2	25	MB-2	25	Intermediate axle, around right side
E3	25	MB-2	25	Front axle, around left side
F3	25	MB-2	25	Front axle, around right side
F4	25	MB-2	25	Front axle, around left side
F4	25	MB-2	25	Front axle, around right side
D5	25	MB-2	25	Right front tiedown shackle
G5	25	MB-2	25	Left front tiedown shackle

\*D-1 may be substituted for MB-2.

Table 4-2. Tiedown Data for M814 in C-130 Aircraft

Tiedown fitting		Tiedown device		
design- nation	capacity in 1,000 lb	type	capacity in 1,000 lb	Attach to item
B1	10	MB-1	10	Lifting shackle, right side
F1	10	MB-1	10	Lifting shackle, left side
C1	10	MB-1	10	Pintle
E1	10	MB-1	10	Pintle
B2	10	MB-1	10	Center axle, around right side
F2	10	MB-1	10	Center axle, around left side
C3	10	MB-1	10	Front axle, around right side
E3	10	MB-1	10	Front axle, around left side
A4	10	MB-1	10	Frame, around right side
G4	10	MB-1	10	Frame, around left side
B5	10	MB-1	10	Front axle, around right side
F5	10	MB-1	10	Front axle, around left side
C6	25	MB-2	25	Lifting shackle, left side
E6	25	MB-2	25	Lifting shackle, right side

Table 4-3. Tiedown Data for M814 in C-141 Aircraft

Tiedown fitting		Tiedown device		
design- nation	capacity in 1,000 lb	type	capacity in 1,000 lb	Attach to item
B1	10	MB-1	10	Right rear shackle
F1	10	MB-1	10	Left rear shackle
C1	10	MB-1	10	Pintle
E1	10	MB-1	10	Pintle
A2	25	MB-2	25	Bumperette right side
G2	25	MB-2	25	Bumperette left side
C3	10	MB-1	10	Front axle, around right side
E3	10	MB-1	10	Front axle, around left side
A4	25	MB-2	25	Front axle, around right side
G4	25	MB-2	25	Front axle, around left side
B5	10	MB-1	10	Lifting shackle, right side
F5	10	MB-1	10	Lifting shackle, left side

Table 4-4. Tiedown Data for M816 in C-5 Aircraft

Tiedown fitting		Tiedown device*		
design- nation	capacity in 1,000 lb	type	capacity in 1,000 lb	Attach to item
E1	25	MB-2	25	Right side rear shackle
F1	25	MB-2	25	Left side rear shackle
E2	25	MB-2	25	Pintle
F2	25	MB-2	25	Pintle
E3	25	MB-2	25	Right side front axle
F3	25	MB-2	25	Left side front axle
E4	25	MB-2	25	Right side front axle
F4	25	MB-2	25	Left side front axle
D5	25	MB-2	25	Frame and bumper, around right side
G5	25	MB-2	25	Frame and bumper, around left side
E5	25	MB-2	25	Right side front shackle
F5	25	MB-2	25	Left side front shackle

\*D-1 may be substituted for MB-2.

Table 4-5. Tiedown Data for M-817 in C-5 Aircraft

Tiedown fitting		Tiedown device*		
design- nation	capacity in 1,000 lb	type	capacity in 1,000 lb	Attach to item
E1	25	MB-2	25	Pintle
F1	25	MB-2	25	Pintle
E2	25	MB-2	25	Left rear shackle
F2	25	MB-2	25	Right rear shackle
E3	25	MB-2	25	Left side intermediate axle
F3	25	MB-2	25	Right side intermediate axle
E4	25	MB-2	25	Left side front axle
F4	25	MB-2	25	Right side front axle
E5	25	MB-2	25	Left side front axle
F5	25	MB-2	25	Right side front axle
D6	25	MB-2	25	Right front shackle
G6	25	MB-2	25	Left front shackle

\*D-1 may be substituted for MB-2.

Table 4-6. Tiedown Data for M8-17 in C-130 Aircraft

Tiedown fitting		Tiedown device		
design- nation	capacity in 1,000 lb	type	capacity in 1,000 lb	Attach to item
B1	10	MB-1	10	Lifting shackle, right side
F1	10	MB-1	10	Lifting shackle, left side
C1	10	MB-1	10	Pintle
E1	10	MB-1	10	Pintle
B2	10	MB-1	10	Center axle, around right side
F2	10	MB-1	10	Center axle, around left side
C3	10	MB-1	10	Front axle, around right side
E3	10	MB-1	10	Front axle, around left side
A4	10	MB-1	10	Front axle, around right side
G4	10	MB-1	10	Front axle, around left side
B5	10	MB-1	10	Front axle, around right side
F5	10	MB-1	10	Front axle, around left side
C6	25	MB-2	25	Lifting shackle, left side
E6	25	MB-2	25	Lifting shackle, right side

Table 4-7. Tiedown Data for M817 in C-141 Aircraft

Tiedown fitting		Tiedown device		
design- nation	capacity in 1,000 lb	type	capacity in 1,000 lb	Attach to item
B1	10	MB-1	10	Right rear shackle
F1	10	MB-1	10	Left rear shackle
C1	10	MB-1	10	Pintle
E1	10	MB-1	10	Pintle
A2	25	MB-2	25	Bumperette right side
G2	25	MB-2	25	Bumperette left side
C3	10	MB-1	10	Front axle, around right side
E3	10	MB-1	10	Front axle, around left side
A4	25	MB-2	25	Front axle, around right side
G4	25	MB-2	25	Front axle, around left side
B5	10	MB-1	10	Lifting shackle, right side
F5	10	MB-1	10	Lifting shackle, left side

## CHAPTER 5

### OFF-ROAD AND HIGHWAY TRANSPORTABILITY GUIDANCE

---

#### Section I. GENERAL

##### 5-1. Scope

This chapter provides highway and off-road transportability guidance for movement of the M809-series trucks. It covers significant technical and physical characteristics and safety considerations; prescribes the materials; and provides guidance required to prepare, load, tie down, and unload the vehicles.

##### 5-2. Safety

In addition to the safety precautions contained in chapter 3, the vehicles are subject to all the safety laws, rules, and regulations applicable to commercial carriers when moving over public highways in CONUS.

#### Section II. MOVEMENT ON OWN WHEELS

##### 5-3. General

The M809-series trucks can be moved under their own power either empty or carrying and/or towing a semitrailer as applicable to the vehicle considered. The vehicles exceed CONUS legal width limitations and highway permits are required. These restrictions also apply to highway movement overseas. The procedures for obtaining special permits in CONUS are outlined in AR 55-162. Legal limitations of oversea areas are identified in "Limits of Motor Vehicle Sizes

and Weights," International Road Federation, Geneva, Switzerland.

##### 5-4. Preparations of Trucks

No special preparation is required for trucks being moved under their own power other than organizational maintenance. Special preparation for transport by semitrailer of 809-series trucks may consist of reducing vehicles' heights to their lowest shipping configuration as indicated in table 2-2. Height of vehicle on M127A1 semitrailer normally cannot exceed 13 feet.

#### Section III. TRANSPORT BY SEMITRAILER

##### 5-5. General

The M809-series trucks can be transported over highway by semitrailers of adequate capacity and size. Both in CONUS and overseas, permits will be required because width of the transported item will exceed highway limitations. In addition, depending upon the tractor-trailer combination used for transport, overall length and/or height limitations may be exceeded.

##### 5-6. Loading on Flatbed Semitrailers

The trucks may be placed in the tiedown position on the semitrailers by a crane or from a

loading ramp. After placement at the tiedown position, the items will be secured in accordance with figures 5-1, 5-2, and 5-3. Figure 5-4 shows the tracking diagram of the M127A1 semitrailer pulled by M818 truck tractor. Figure 5-5 gives typical M809-series trucks blocking and tiedown details. Figure 5-6 is the tracking diagram for the M270 semitrailer pulled by M818 truck tractor. Tables 5-1 and 5-2, bill of and application of materials for blocking and tiedown, are used in conjunction with figure 5-1, 5-2, and 5-3. Tables 5-3 and 5-4, the bill of and application of materials for blocking and tiedown, are used in conjunction with figures 5-3 and 5-5.

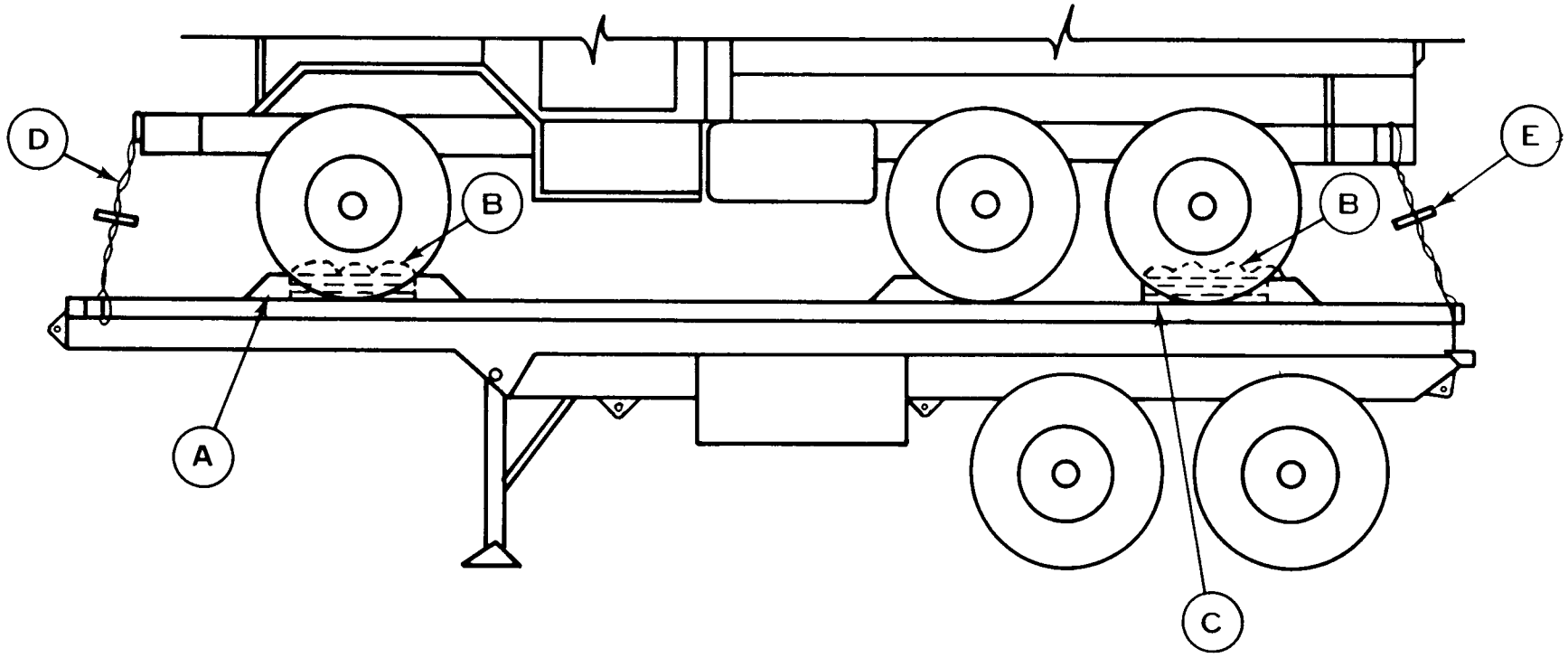
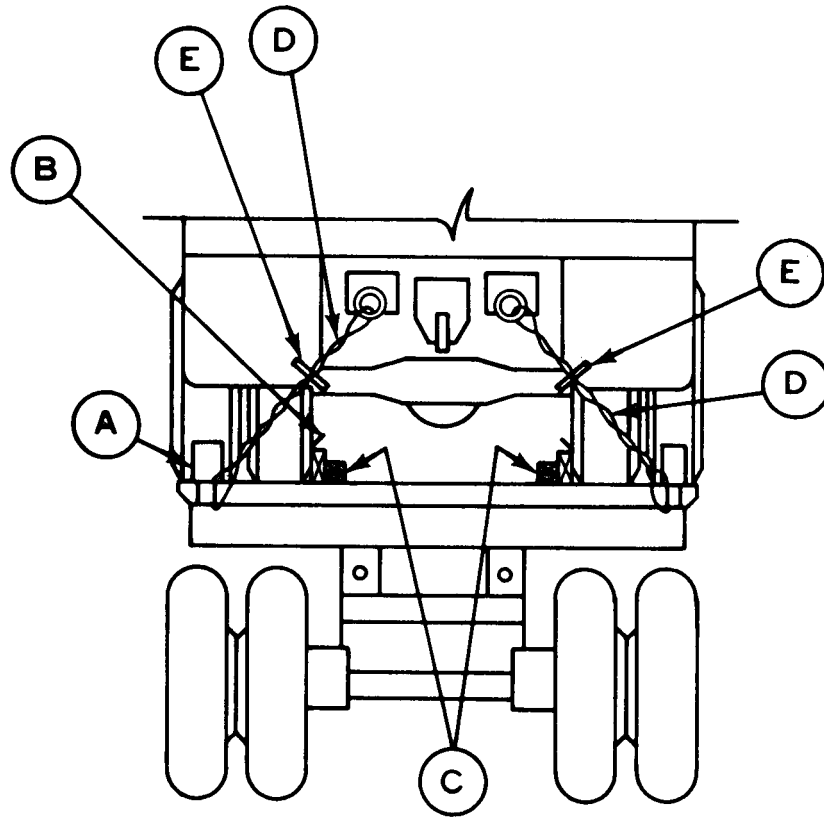
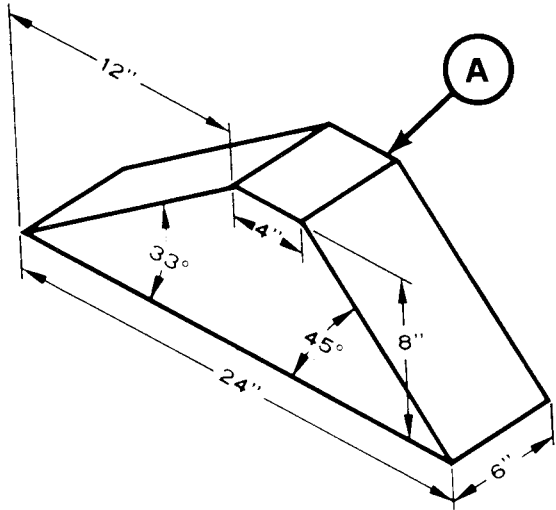


Figure 5-1. Blocking and tiedown of typical M809-series truck on M127-series 12-ton or larger semitrailer.

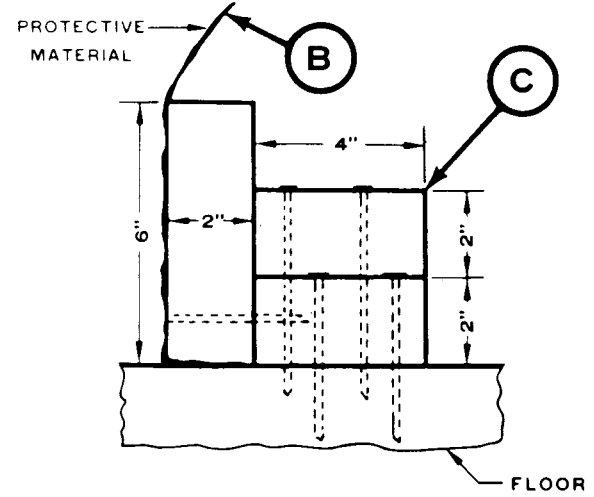




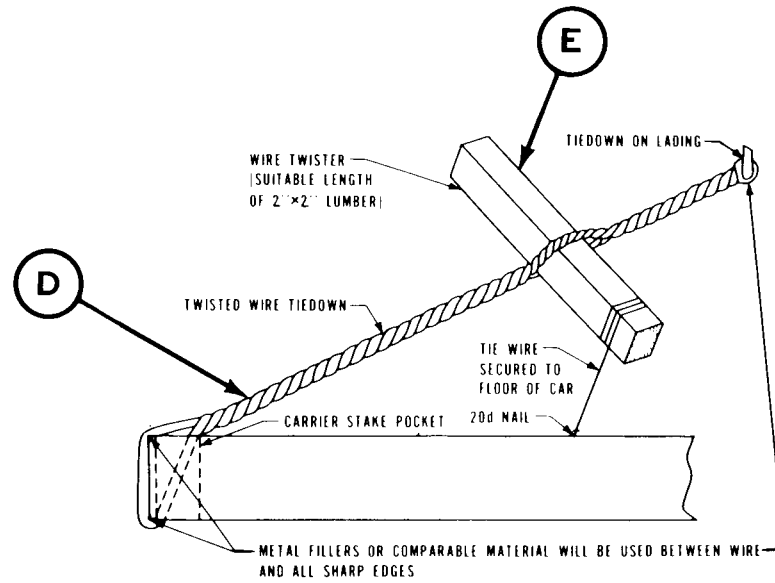
*Figure 5-2. Rear view of blocking and tiedown of typical M809-series truck on M127-series 12-ton or larger semitrailer.*



**DETAIL 1**



**DETAIL 2**



**SKETCH 1**

**NOT TO SCALE**

*Figure 5-3. Blocking and tiedown details.*

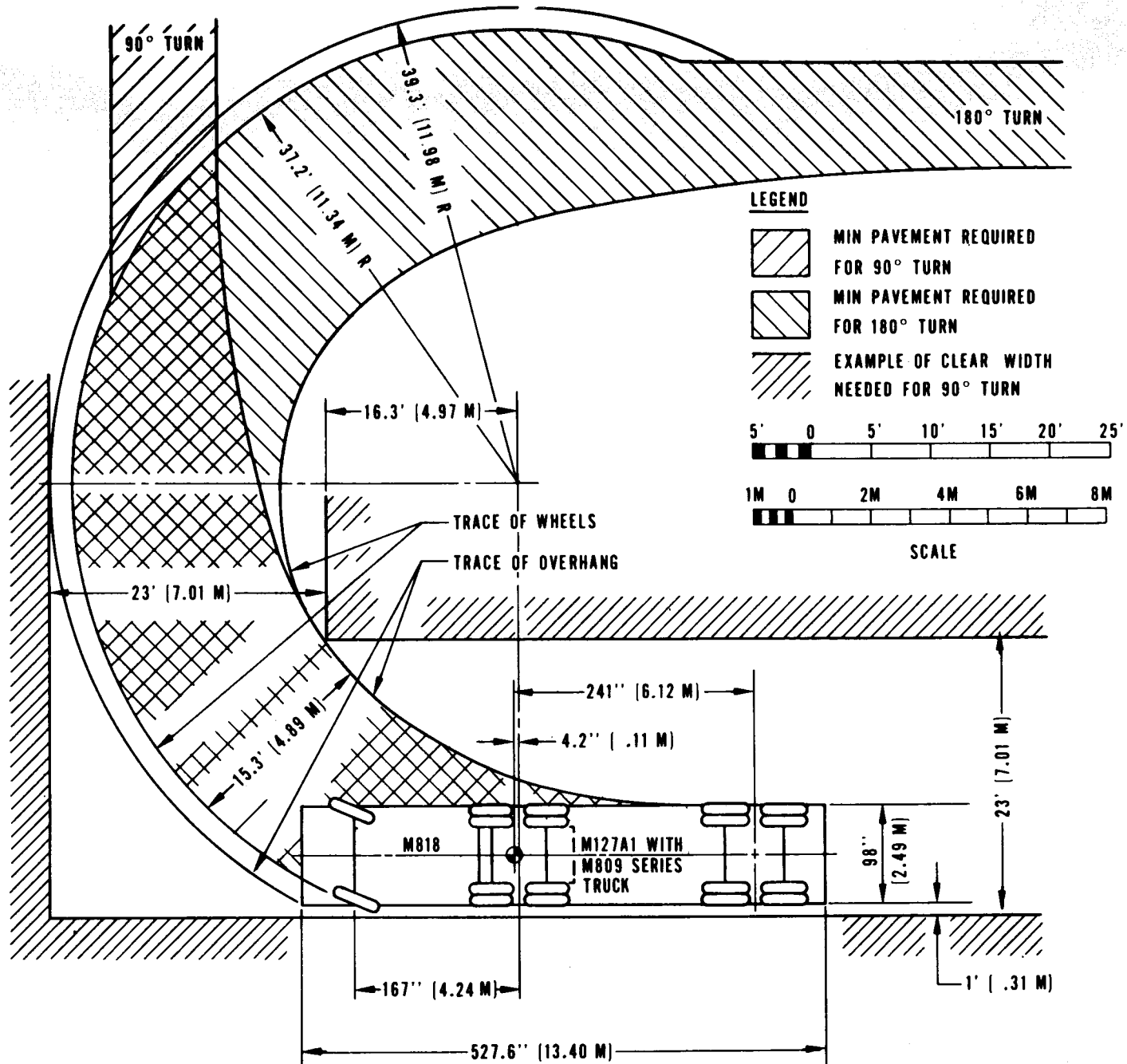


Figure 5-4. Tracking diagram for semitrailer, M127A1, and truck, tractor, M818.

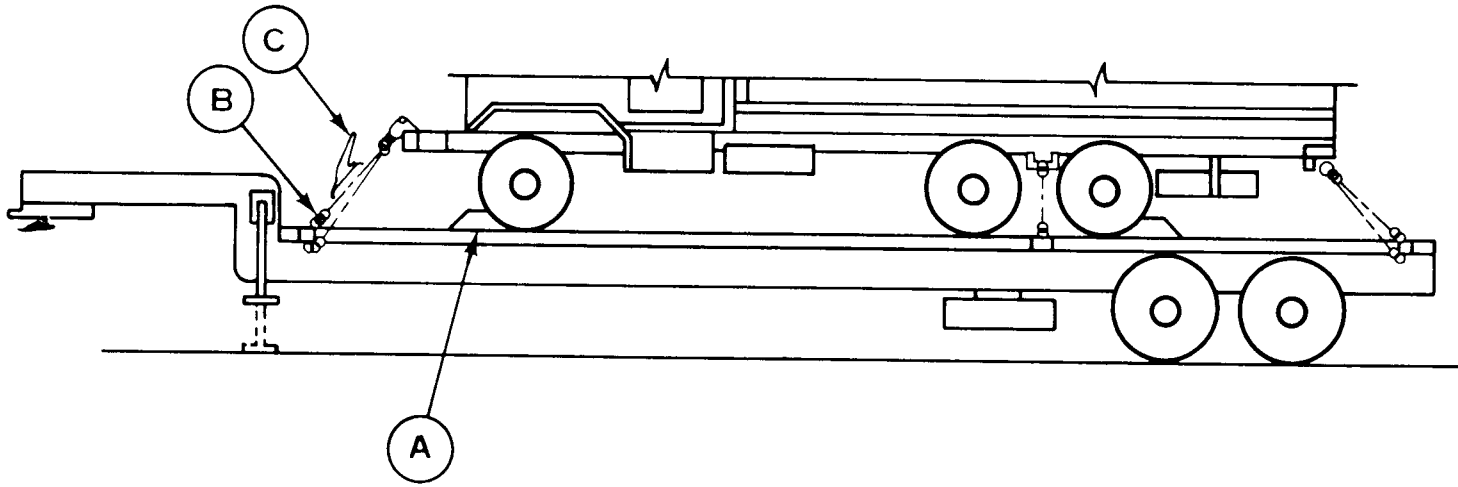


Figure 5-5. Blocking and tiedown of typical M809-series truck on M270 semitrailer.

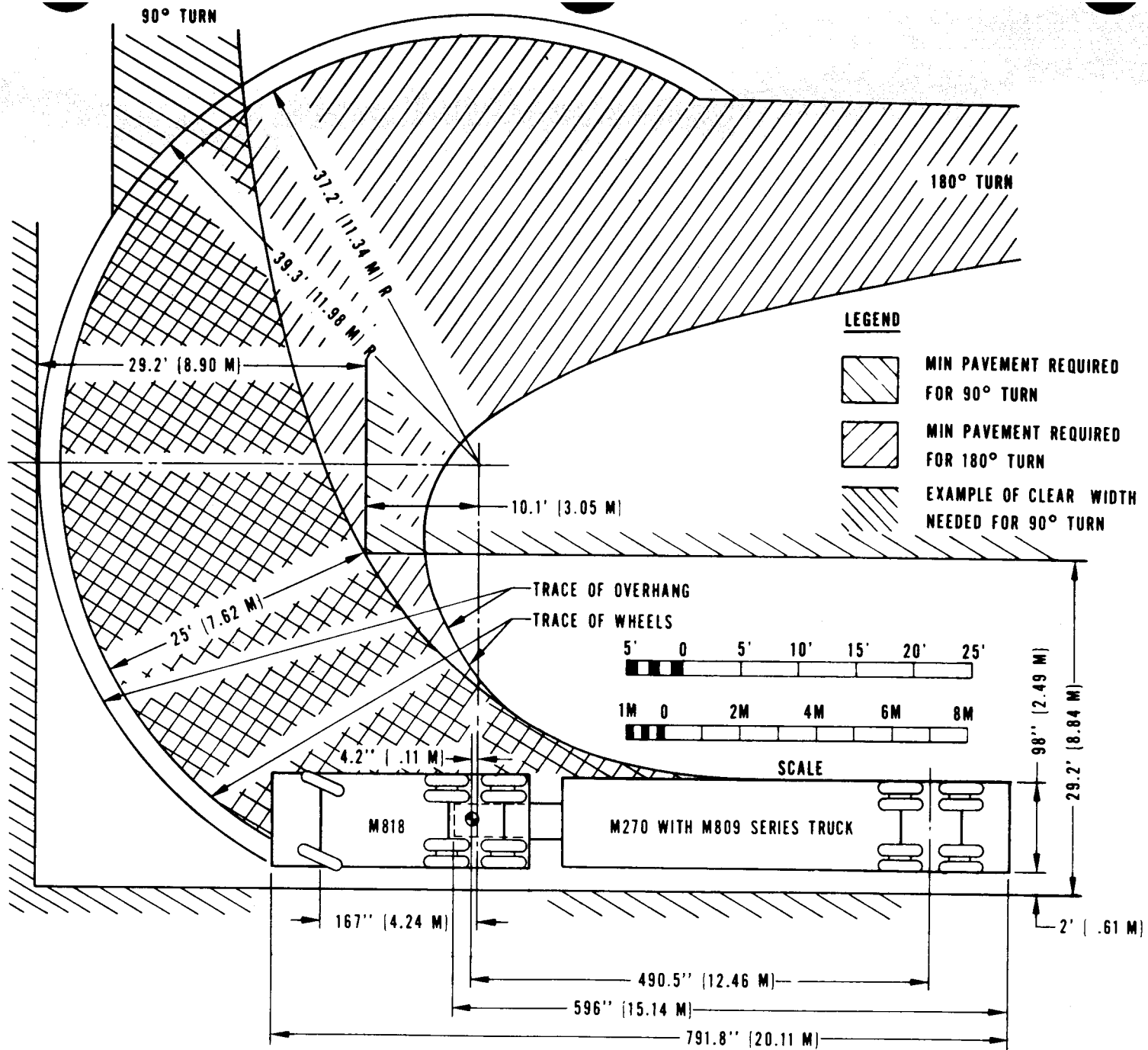


Figure 5-6. Tracking diagram for semitrailer, M270, and truck, tractor, M818.

Table 5-1. Bill of Materials for Blocking and Tiedown of Typical M809-Series Truck on M127-Series 12-ton or Larger Semitrailer (Fig 5-1,5-2, and 5-3)

Item	Description	Approximate quantity
Lumber	Douglas-fir, or comparable, straight-grain, free from material defects; Fed Spec: MM-L-751c: 2- x 4-in _____	24 linear ft
	2- x 6-in -----	12 linear ft
	6- x 8-in _____	16 linear ft
Nails	Common, steel; flathead; bright or cement-coated; table XI-b, Fed Spec FF-N-105a: 20d _____	48
	30d _____	52
	40d -----	16
Wire	No. 8 gage, black annealed; Fed Spec QQ-W-461f -----	200 ft
Cushioning Material	Waterproof paper, or suitable material _____	as required

Table 5-2. Application of Materials for Blocking and Tiedown of Typical M809-Series Truck on M127-Series 12-Ton or Larger Semitrailer (Fig 5-1, 5-2, and 5-3)

Item	No. required	Application
A	8	Chock block (detail 1, item A, fig 5-3). Locate 33° portion against front of front and intermediate wheels and against rear of front and rear wheels. Toenail heel of block (near bottom edge) to semitrailer floor with one 20d nail. Additionally, drive two 4d nails into heel of block, perpendicular to semitrailer floor. Toenail each side of block to semitrailer floor with two 30d nails on each side.
B	as required	Protective material (detail 2, item B, fig 5-3) such as waterproof paper or burlap, should be located under bottom edge of 2- x 4- x 36-in piece and between tire and 2- x 6- 36-in piece to extend 2 in above blocking.
c	4	Side blocking (detail 2, item C, fig 5-3). Each to consist of one piece of 2- x 6- x 36-in lumber and two pieces of 2- x 4- x 36-in lumber. Nail 2- x 6- x 36-in piece to edge of lower 2- x 4- x 36-in piece with five 20d nails. Place 2- x 6- x 36-in piece against tire and nail to semitrailer floor through 2- x 4- x 36-in piece with five 20d nails in staggered pattern. Nail other 2- x 4- x 36-in piece to one below in like manner with five 30d nails.
D	4	Eight strands of No. 8 gage black annealed wire. Attach to front and rear tiedown provisions on vehicles and semitrailer as indicated (fig 5-1 and 5-2). Substitute, if desired, 1/2- or 5/8-in IWRC wire rope in a complete loop, and secure with four cable clips spaced approximately in apart.
E	4	Wire twisters (sketch 1, fig 5-3). Use 2- x 2-in lumber by length-to-suit (metal rod or bolt may be used in lieu of lumber). After twisting wire taut, rod, bolt, or lumber should be left in place and secured to prevent unwinding.

Table 5-3. Bill of Materials for Blocking and Tiedown of Typical M809-Series Truck on M270 Semitrailer (Fig 5-5)

Item	Description	Approximate quantity
Lumber	Douglas-fir, or comparable, straight-grain, free from material defects; Fed Spec: MM-L-751c: 6- x 8-in	6 linear ft
Chain	General service, S-leg, alloy steel, 1/4- to 1/2-in size, 10-ft length, with two grabhooks.	6
Load binder	Lever operated, 4-in take-up, with two grabhooks designed for 1/4- to 1/2-in chain. 18 1/2-in lever, large, 4-ton capacity, OD finish; MIL-B-1816 (FSN 3990-274-6746).	6

Table 5-4. Application of Materials for Blocking and Tiedown of Typical M809-Series Truck on Semitrailer (Fig 5-3 and 5-5)

Item	No. required	Application
A	6	Chock block (detail 1, item A, fig 5-3). Locate 33° portion against front of front wheels and against rear of rear outside wheels. Drive block securely under wheels with sledge hammer.
B	4	Chain, general service, S-leg, alloy steel, 1/4- to 1/2-in size, 10 ft length, with two grabhooks. Pass one end of chain through tiedown shackles at each end of vehicle and engage grabhook on convenient chain link. Pass other end of chains through stake pockets on same side of semitrailer forming a 45° angle.
	2	Pass one end of chain around lifting pin located between intermediate and rear wheels and through nearest stake pocket.
C	6	Load binder, lever operated, 4-in take-up, with two grabhook designed for 1/4- or 1/2-in chain. Engage one grabhook into link of chain coming from vehicle securement points. Pull chain through stake pocket and engage other grabhook into a convenient link. Pull lever down, and lock into secured position. A piece of pipe may be required to depress lever in locking position to insure sufficient depression on vehicle tires.





## CHAPTER 6

## MARINE AND TERMINAL TRANSPORTABILITY GUIDANCE

## 6-1. Scope

This chapter provides marine and terminal transportability guidance for movement of the M809-series trucks. It covers significant technical and physical characteristics and safety considerations; prescribes blocking materials; and provides guidance required to prepare, lift, tie down, and discharge the trucks.

## 6-2. Safety

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

a. All vessel's equipment and gear should be inspected before use.

b. All stevedore slings and other items used in loading and discharge operations should be inspected for their condition and adequate capacity.

c. All personnel should be cautioned not to walk under vehicles being lifted.

d. Lifting rings and shackles on each truck should be inspected to insure that they are complete and not damaged.

e. All lifts should have at least two tag lines attached to control the swing of the truck while suspended.

## 6-3. General

Whenever possible, trucks should receive the protection of below-deck stowage. In general, good stowage of vehicles means having the vehicles placed fore and aft as close together as practical, with minimum spacing between outer vehicles and sweatboards (about 4 to 6 inches); breakable parts protected; spare parts stowed in or near the parent vehicle; brakes on, with brake lever wire-tied; transmission in neutral, with control level wire-tied; battery terminals disconnected and taped; and fuel drained. To secure vehicles, the wheels should be blocked in front, in rear, and on both sides; also, the vehicles should be lashed with wire rope or chains to bulkhead, stanchions, or padeyes.

**NOTES**

1. When trucks are loaded on vessels that are adequately ventilated by power blowers, such as roll-on/roll-off vessels, gasoline need not be drained.

2. The methods described in this chapter for lifting and securing the trucks are suggested procedures. Other methods of handling and

stowage may be used provided they will insure safe delivery without damage.

*A. Lifting.*

(1) Installed lifting shackles should not be used on the front bumpers of 2-1/2-ton 6x6 trucks. Instead, a 6-foot length assembly of 3/4-inch diameter or larger, 6x19, IWRC wire rope with a loop in each end should be used. Each loop will have a thimble. The loop with thimble may be made with a splice or a swage fitting or may be replaced with zinc poured fittings with an eye large enough to fit the sling leg hook or shackle. One loop should be placed in the sling hook or shackle. The wire rope should be passed down the front side of and under the bumper, up and over the frame, and under and up the front side of the bumper. The other loop should be placed in the sling hook or shackle with the first loop. The existing lifting shackle may be used as a cable guide only with the pin removed and the wires should be placed in the shackle and the pin reinstalled, as shown in figures 6-1 through 6-4. These procedures should be repeated for the opposite front-lifting attachment. Malleable sheet metal or hard cushioning strips should be used at sharp corners and edges to prevent the wire rope from being cut or frame edges bent.

**NOTE**

Other methods such as chains of adequate size and strength may be substituted provided they will not damage truck components and can be readily adapted to sling leg. A lifting bar of adequate size and strength also may be substituted provided it does not contact any component of the truck beneath the frame, such as the winch, engine, steering gear, or so forth.

**NOTE**

Nylon slings of adequate capacity may be substituted for the wire rope looped around the frame and front bumper. A rubber hose, such as a piece of used fire hose, should be used as cushioning material between the nylon sling and the truck frame.

**CAUTION**

The two front shackles on top of the front bumper must not be used for lifting.

(2) The rear lifting points are located on the spring saddle and pin assembly located on top of the rear springs. Bodies are reinforced near the spring and pin assembly. The sling leg is passed through the cable

guide attached to the bottom outside edge of the cargo body to insure that lifting slings do not shift during lifting operations. Rear sling leg eyes are attached directly to the pin in the spring saddle with a shackle. Typical lifting diagrams are shown in figures 6-1 through 6-4.

b. *Loading.* Vehicles are always loaded on vessels in their minimum configuration; that is, reduced height, with or without cargo, and side view mirrors folded back or removed to reduce the width of the vehicles. They can be loaded onto landing craft, beach discharge and amphibious lighters, and landing ship tanks under

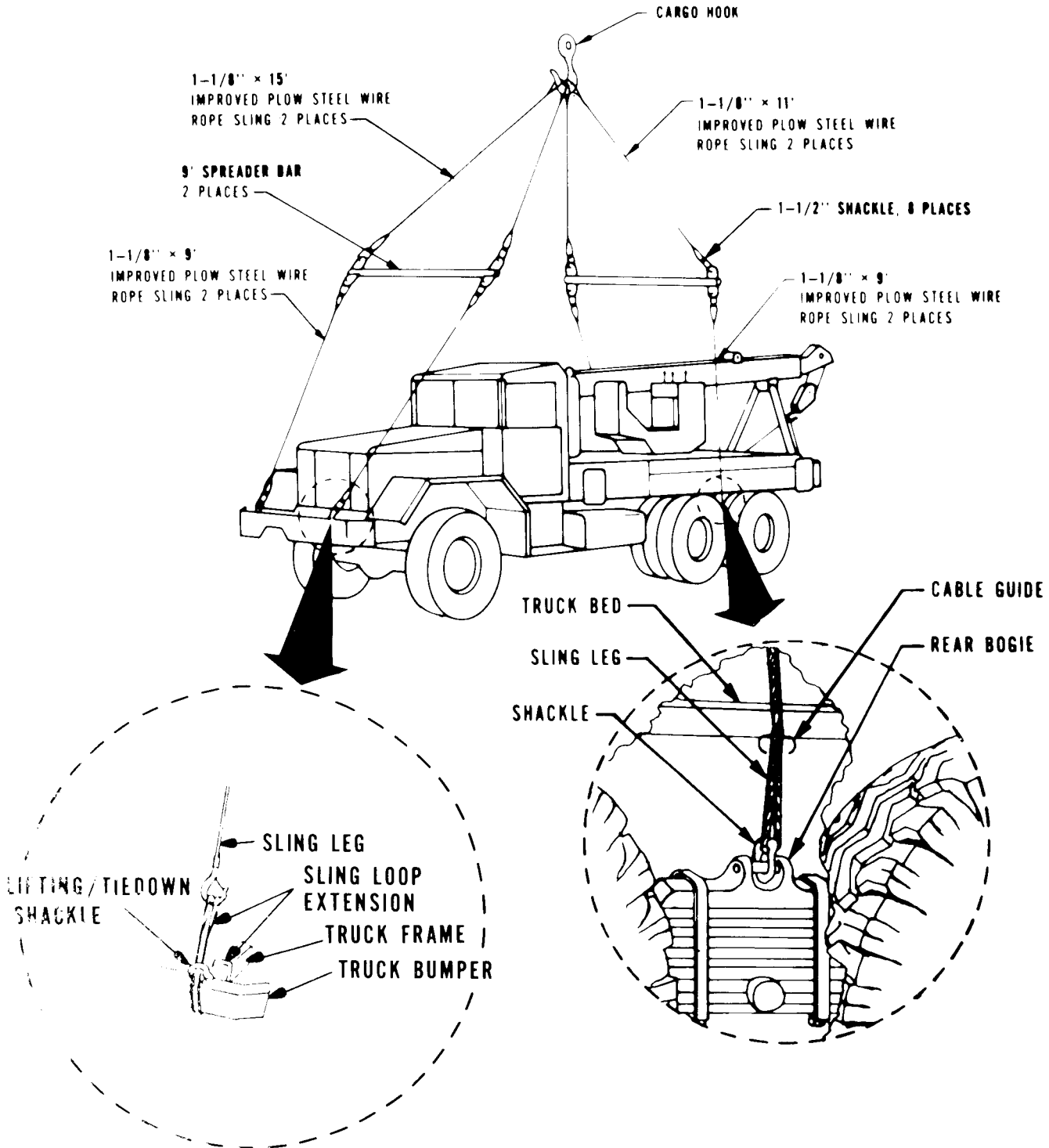


Figure 6-1. Lifting diagram for M816 with eight-wire sling and two spreader bars.

their own power or by crane of adequate capacity. The vehicles can also be loaded under their own power onto the decks of barges from pier when tidal conditions are suitable and ramps are available. They can also be loaded onto seagoing vessels by shoreside or floating cranes of adequate capacity. Jumbo booms and heavy-

lift ship's gear may be used in loading vehicles on vessels. The vehicles can, under their own power or towed, be loaded on roll-on/roll-off vessels. Typical blocking and tiedown details are shown in figure 6-5. A list of materials and their application are shown in tables 6-1 and 6-2.

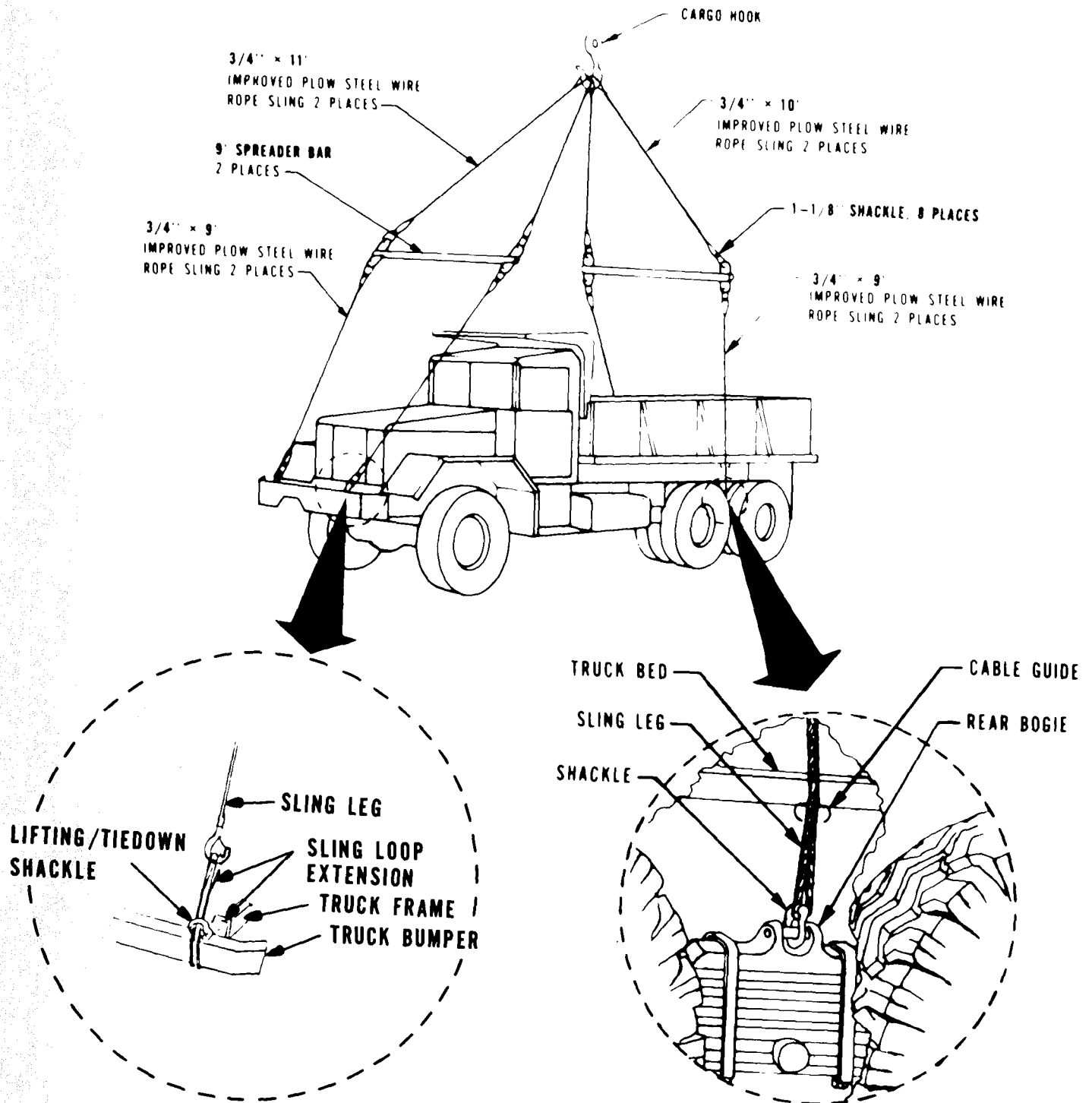


Figure 6-2. Lifting diagram for M817 with eight-wire sling and two spreader bars.

c. *Special Design and Miscellaneous Vehicles.* Rail-car/trailer vessels, roll-on/roll-off ships, landing ships, and attack-cargo vessels are equipped with patented lashing gear and prepositioned fittings in the deck. The use of such equipment is adequate, and the vehicles will not require blocking and bracing. For move-

ment by barge or similar lighterage, the vehicles must be blocked and braced. When vehicles loaded aboard landing craft and amphibious lighters are to be transported extended distances or in rough water, the vehicles should be lashed, blocked, and braced.

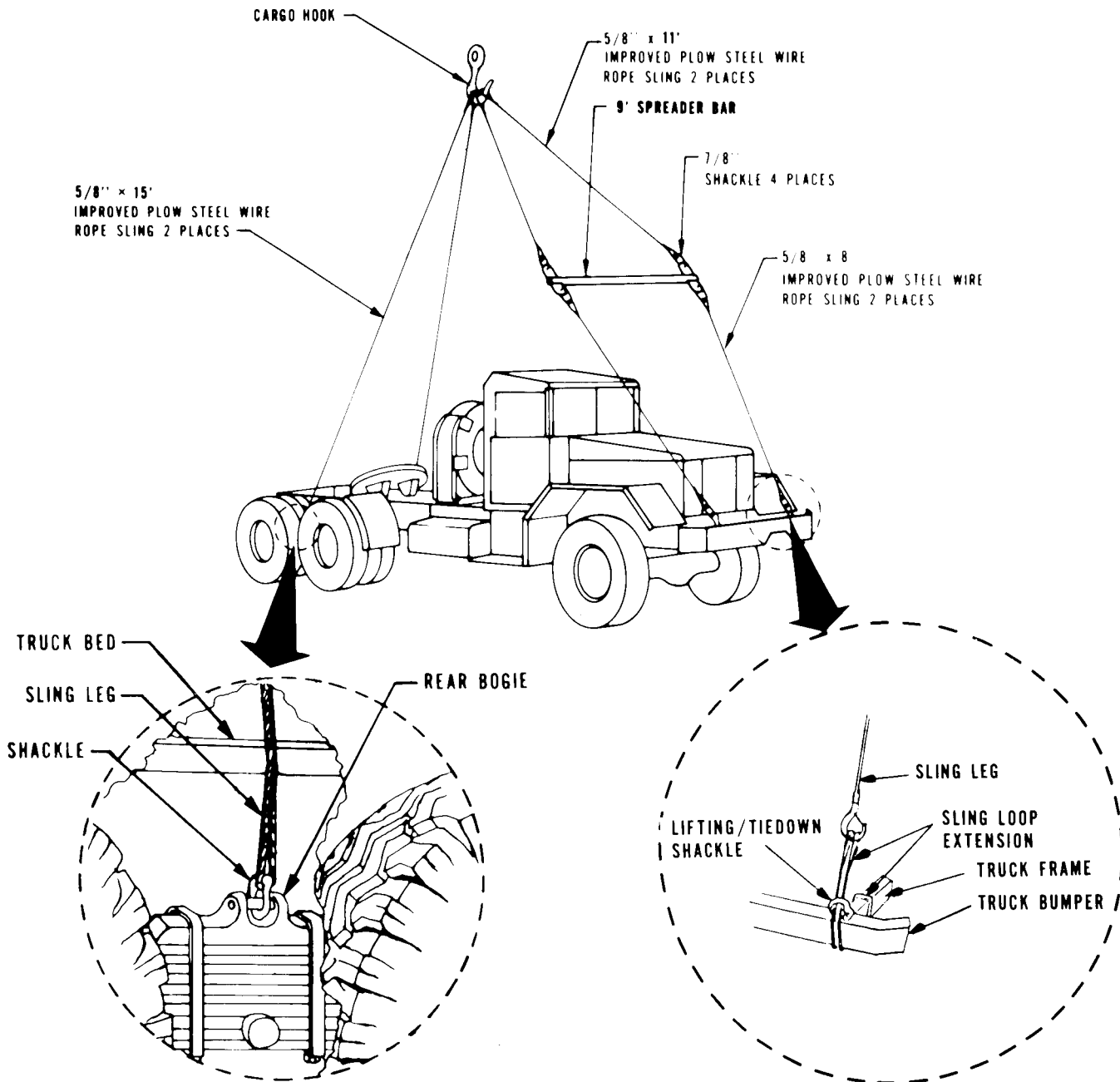


Figure 6-3. Lifting diagram for M52 with six-wire sling and one spreader bar.

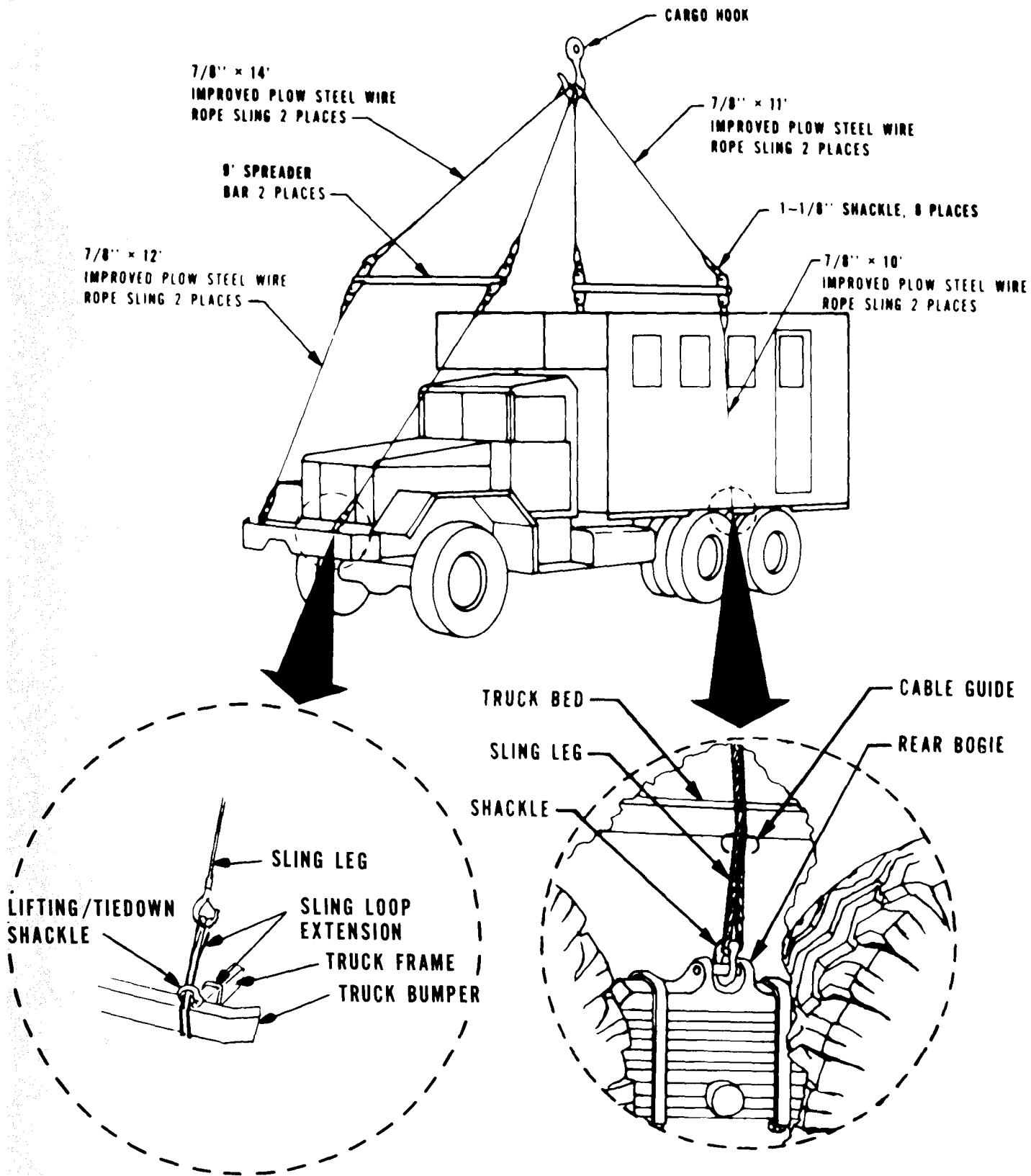


Figure 6-4. Lifting diagram for M820 with eight wire sling and two spreader bars.

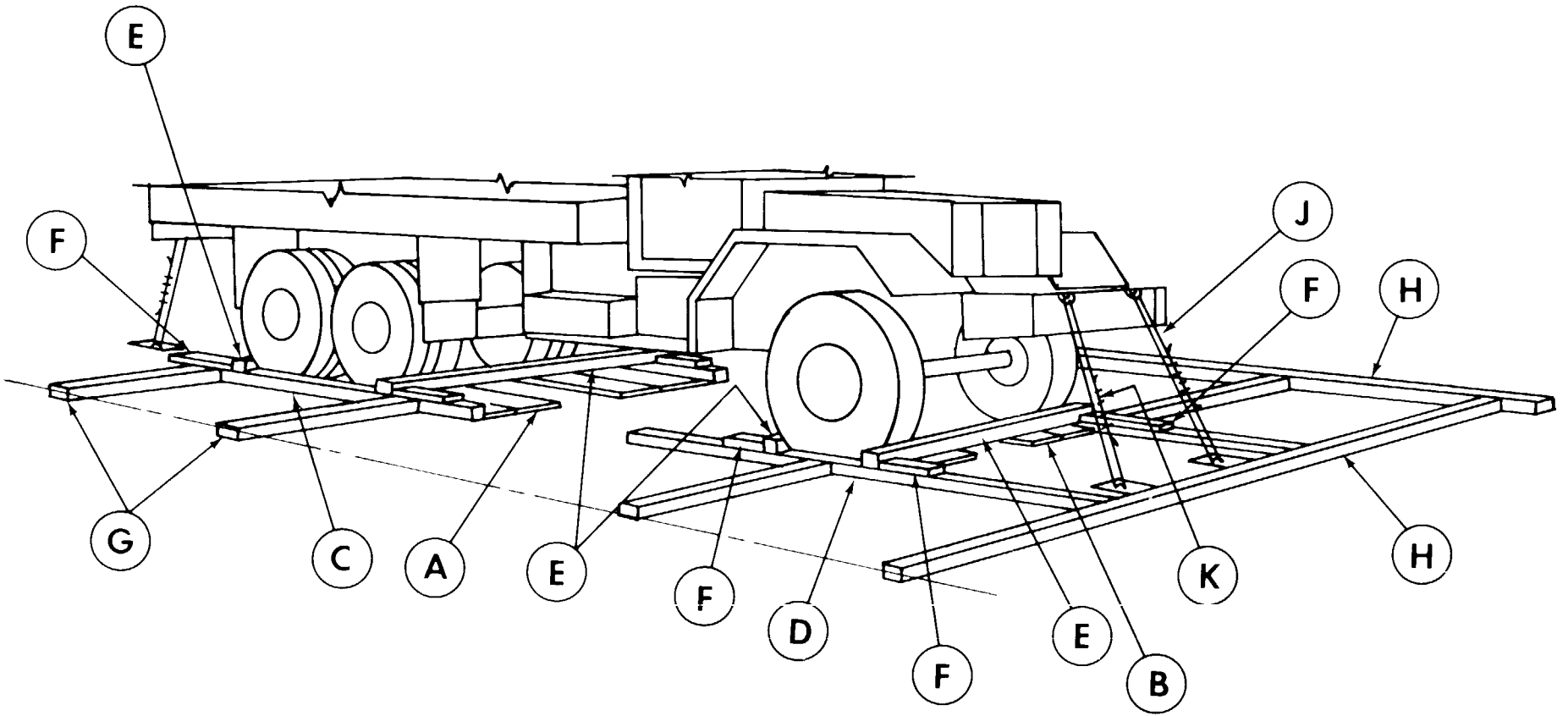


Figure 6-5. Typical blocking and tiedown of 5-ton truck in general cargo vessel.

Table 6-1. Bill of Materials for Blocking and Tiedown of Typical 5-Ton,6x6 Truck in Hold of General Cargo Vessel (Fig 6-5)

Item	Description	Approximate quantity
Lumber	Douglas-fir, or comparable lumber, straight-grain, free from material defects; Fed Spec	
	MM-L-751H: 2-x4-in. ....	16 linear ft
	2- x 12-in. ....	72 linear ft
	4- x 6-in. ....	90 linear ft
	Common, steel; flathead, bright or cement-coated; para 3.6.11.2, Fed Spec	
	FF-N-105B: 12d . . . . .	40
	God . . . . .	50
	God . . . . .	16
Wire rope	Type I, general purpose; class 2, 6x 19 improved plow steel, wire strand core or IWRC; Fed Spec	
	RR-W-401C: 5/8-in. ....	00 ft
Clamps	Wire rope, U-bolt clips, saddled, single grip, forged steel, Crosby heavy -duty, or equal; Fed Spec	
	FF-C-450D: 5/8-in. ....	16

Table 6-2. Application of Materials for Blocking and Tiedown of Typical 5. Ton, 6x6 Truck in Hold of General Cargo Vessel (Fig 6-5)

Item	No. Required	Application
A	6	Flooring, 2- x 12- x 96-in lumber. Locate under rear wheels.
B	4	Flooring, 2- x 12- x 72-in lumber, Locate under front wheels.
C	2	Side blocking for rear wheels, 4- x 6- x 108-in lumber. Locate at side of rear wheels.
D	2	Side blocking for front wheels, 4- x 6- x 54-in lumber. Locate at side of front wheels.
E	4	Blocks, 4- x 6- x 108-in lumber. Locate one in front of front and intermediate wheels and in back of front and rear wheels. Toenail each end to side blocking with two 60d nails.
F	8	Cleats, 2- x 4- x 24-in lumber. Locate against blocks (item E) as indicated in figure 6-5, and secure each to side blocking (item D) with five 12d nails.
G	as required	Bracing, 4- x 6-in x random-length lumber, cut-to-fit. Place ends against side blocking and blocking of other cargo, side of ship, or other ship's structure, and secure each end with four 30d nails.
H	as required	Blocking, 4- x 6-in x random-length lumber. Place around truck and against other blocking, side of vessel, or other ship's structure to assist in holding bracing in place.
J	4	Wire rope, 5/8-in. Each cable will form a complete loop between vehicle tiedown shackle and deck padeye.
K	16	Clamps, 5/8-in. Place four clamps over each cable loop at the overlap area and space 3-1/2 in apart, with a minimum of 6 in from ends of cable. See sketch 1, figure 7-2.





CHAPTER 7

RAIL TRANSPORTABILITY GUIDANCE

Section I. GENERAL

7-1. Scope

This chapter provides rail transportability guidance for movement of the M809-series trucks. It covers significant technical and physical characteristics and safety considerations; prescribes the materials; and provides guidance required to prepare, load, tie down,

and unload the vehicles.

7-2. Maximum Utilization of Railcars

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

Section II. TRANSPORT ON CONUS RAILWAYS

7-3. General

The transportability guidance contained in this section is applicable when the trucks are transported on CONUS railways. Consideration is given to single and multiple movements on the types of railcars normally used for the movement of these vehicles. The trucks, when loaded on suitable railcars, can be transported without sectionalization or major disassembly, except for the M820, which has a nonreducible height of 135.1 inches. The M820 must receive special routing and/or restricted movement. The other trucks, when at their respective reduced heights, are transportable within the Association of American Railroads' Outline Diagram for Single Loads, Without End Overhang, on Open Top Cars as shown in both the *Railway Line Clearance Publication* and the *Official Railway Equipment Register*.

7-4. Preparation of Vehicles

The degree of preparation for the vehicles before being transported by railcar is dependent upon the operational commitment.

7-5. Loading M809-Series Trucks on General-Purpose Flatcars

a. The trucks may be placed in the tiedown position on the railcar by a crane, or they may be driven or towed provided a suitable ramp or bridge is available.

b. The loads shown in figures 7-1 and 7-3 are based on flatcar minimum width of 9 feet 6 inches, except for the M821, which requires a car width of 10 feet 6 inches. Figure 7-2 is a blocking and tiedown detail diagram for figure 7-1. Table 7-1 is the bill of material for blocking and tiedown of the vehicles, Tables 7-2

Table 7-1. Bill of Materials for Blocking and Tiedown of Typical M809-Series Truck on CONUS General-Purpose Flatcars (Figs 7-1 and 7-2)

Item	Description	Approximate quantity
Lumber	Douglas-fir, or comparable lumber, straight-grain, free from material defects; Fed Spec MM-L-751 c: 2-x 4 -in . . . . .	54 ft
	2-x 6-in . . . . .	18 ft
	6-x 8 -in . . . . .	18 ft
Nails	Common, steel; flathead; bright or cement-coated; table X1 -b, Fed Spec FF-N-105a: 12d . . . . .	30
	20d . . . . .	72
	40d . . . . .	60
Wire rope	6x19, IWRC; improved plow steel; preformed, regular-lay; table X, Fed Spec RR-W-410c: 1/2-in dia . . . . .	100 ft
Clamps	Wire-rope U-bolt clips, saddled, single-grip, steel, Crosby heavy-duty, or equal; Fed Spec FF-C-450d: 1/2 in . . . . .	40
Thimbles	Standard, open-type: 1/2 in . . . . .	4
Cushioning material	Waterproof paper, or suitable material . . . . .	is required
Blocks	See detail 1, figure 7-2 . . . . .	12

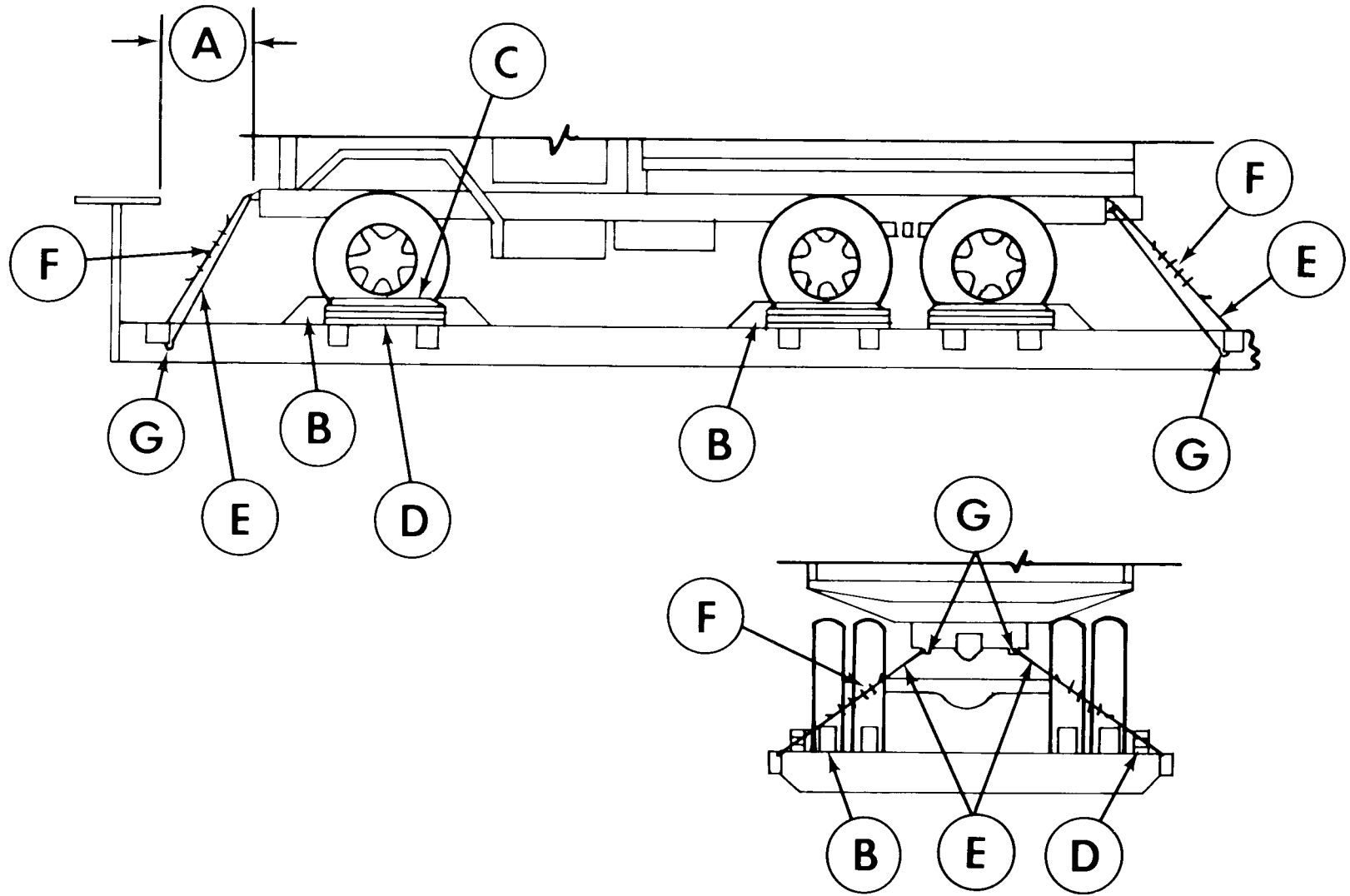
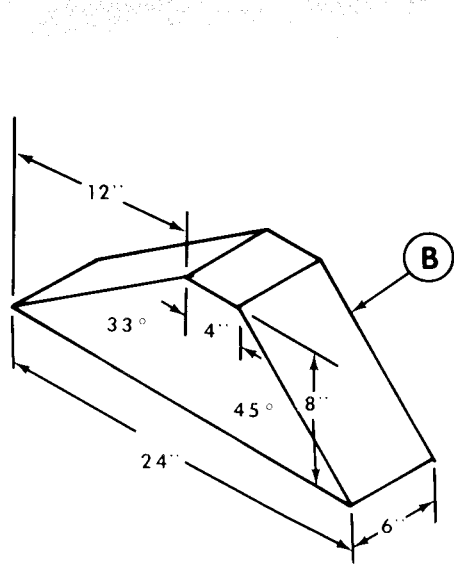
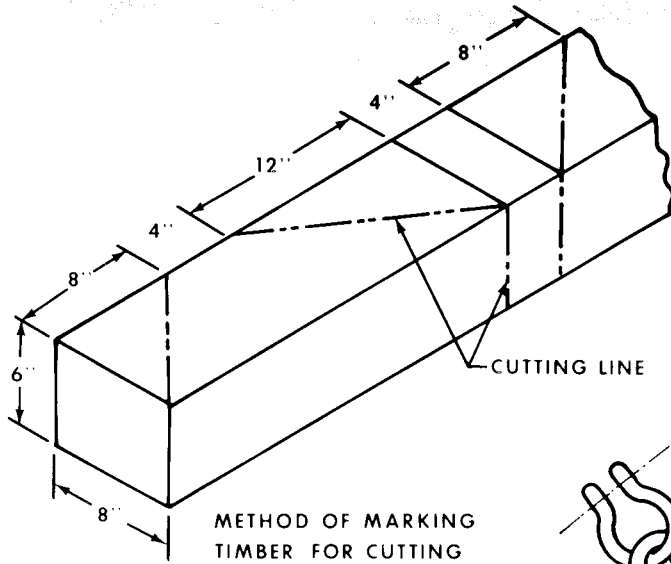


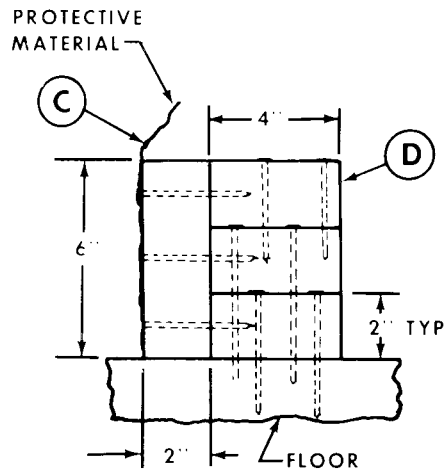
Figure 7-1. Blocking and tiedown of typical M809-series truck on CONUS general-purpose flatcar.



**DETAIL 1**

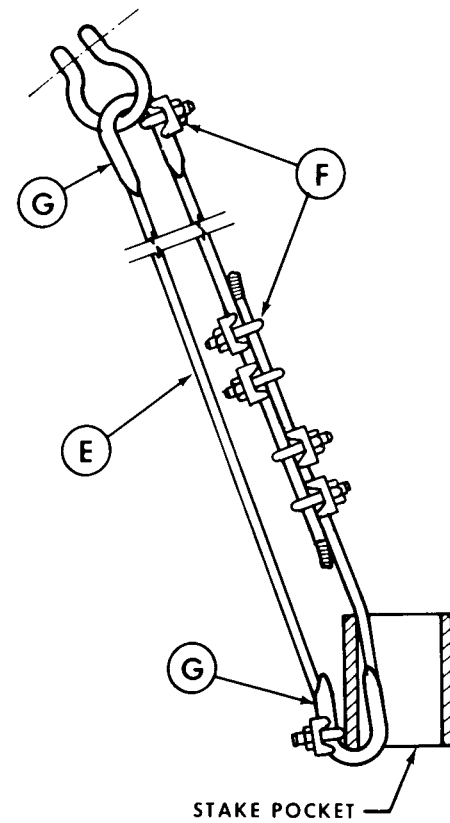


METHOD OF MARKING  
TIMBER FOR CUTTING  
CHOCKING BLOCKS



**DETAIL 2**

NOT TO SCALE



**DETAIL 3**

Figure 7-2. Blocking and tiedown detail diagram for M809-series truck on CONUS general-purpose flatcar.

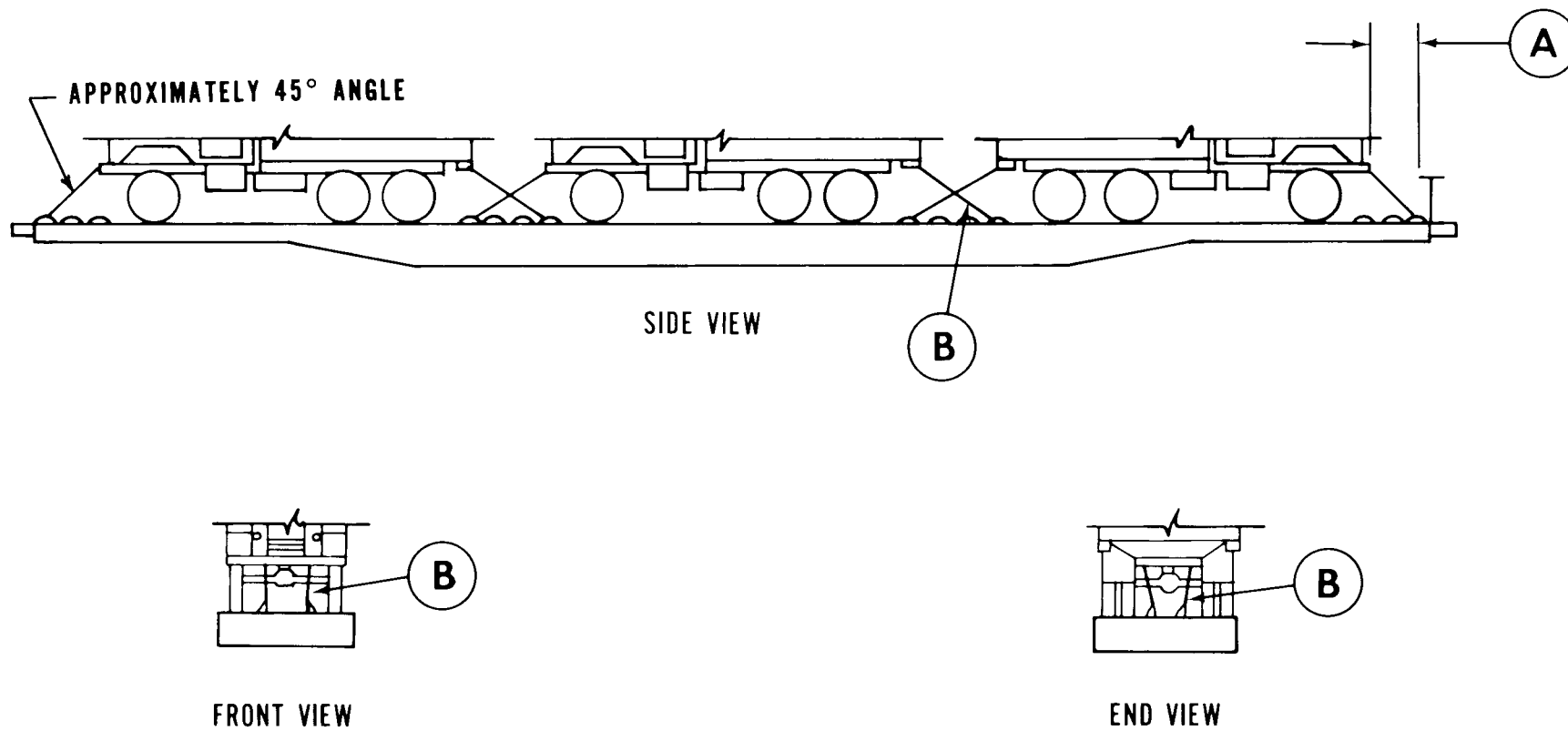


Figure 7-3. Securing M809-series trucks on empty flatcars equipped with center tiedown rails.

and 7-3 present application of materials for loading and securing the vehicles on general-purpose flatcars.

**NOTE**

A staggered nailing pattern will be used when lumber or laminated lumber is nailed to the floor of the railcar. Additionally, the nail-

ing pattern for an upper piece of laminated lumber will be adjusted as required so that a nail for that piece will not be driven through, onto, or right beside a nail in the lower piece of lumber.

Table 7-2. Application of Materials for Blocking and Tiedown of Typical M809-Series Truck on CONUS General-Purpose Flatcars (Figs 7-17-2)

Item	No. Required	Application
A	—	Brake-wheel clearance. Minimum clearance required is 6 in above, in back of, and on both sides of and 4 in underneath wheel (fig 7-1).
B	12	Chock block (detail 1, item B, fig 7-2), 6- x 8- x 24-in lumber. Locate 45° portion of block against front and rear of front wheels, in front of inside and outside intermediate wheels, and in back of inside and outside rear wheels. Nail heel of block to car floor with three 40d nails, and toenail that portion of block under tire to car floor with two 40d nails before items C and D are applied.
c	1 ea item D	Suitable material, such as waterproof paper or burlap, Locate bottom portion under item D, the top portion to extend 2 in above item D (detail 2, item C, fig 7-2).
D	6	Blocks, each to consist of one piece of 2- x 6- x 36-in lumber and three pieces of 2- x 4- x 36-in lumber (detail 2, item D, fig 7-2). Nail one edge of 2- x 6- x 36-in piece to bottom 2- x 4- x 36-in piece with five 12d nails. Then place against tire and nail to car floor through 2- x 4- x 36-in piece with four 20d nails. Nail other two 2- x 4- x 36-in pieces to one below in same manner.
E	4	Wire rope, 1/2-in, 6x19, IWRC. Each cable will form a complete loop between the tiedown shackle and stake pockets (sketch 1, item E, fig 7-2).
F	24	Cable clips, 1/2-in four each, Place on each cable loop at the overlap area, and space 3-1/2 in apart with a minimum of 6 in from ends of cable. One additional clip shall be placed under each stake pocket and shackle to secure cable and thimble together (sketch 1, items F and G, fig 7-2).
G	8	Thimble, open-type, 1/2-in Place one at bottom of each stake pocket and shackle (sketch 1, item G. fig 7-2).

GENERAL INSTRUCTIONS

1. All handbrakes are to be set with the hand levers wired or blocked, Gearshift levers for automatic or conventional transmissions must be placed and wire-tied in neutral position.
2. Tires are to be inflated to 10 psi above highway operating pressures.
3. General Rules 4, 5, 9, 10, 14, 15, 19A, and 19B in section I of the Rules *Governing the Loading of Commodities on Open-Type Cars*, published by the Association of American Railroads, provide further details.

Table 7-3. Application of Chain Tiedown for Securing M809-Series Trucks on Flatcars Equipped With Center Tiedown Rails (Fig 7-3)

Item	No. Required	Application
A	—	Brake-wheel clearance, Minimum clearance required is 6 in above, in back of, and on both sides of and 4 in underneath wheel.
B	4 ea. unit	Chain. 1/2-in-dia alloy steel, or proof-tested to minimum of 22,500 lb for vehicles over 16,000 lb to 25,000 lb, inclusive. Chain. 1/2-in-dia alloy steel, extra strength, proof-tested to minimum of 27,500 lb for vehicles over 25,000 lb to 40,000 lb, inclusive.

GENERAL INSTRUCTIONS

1. Shippers should specify cars equipped with tiedown devices in the quantity shown in Item B when ordering specialized railway equipment. When carriers furnish cars that do not have built-in chains and tensioning devices, chains and turnbuckles of appropriate size and strength will be used for securement of vehicles. Load binders are not to be used in lieu of turnbuckles to tension tiedown chains.
2. Vehicles must face in the same direction and be uniformly spaced along the length of the car to allow sufficient space at each end of the car and between the vehicles for securement. Apply tiedowns 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 must be as close to 45° as possible. When length of vehicles loaded on a 75-ft car precludes facing all vehicles in the same direction, one vehicle may be reversed to insure application of tiedown at a floor angle of 45°.
3. Handbrakes must be set.
4. Gearshift levers on vehicles equipped with automatic or standard transmissions must have the gear shift lever wire-tied in neutral position.
5. Open hooks must be secured with wire over the opening to prevent hook from becoming disengaged from chain link to which hook is secured.
6. Turnbuckles used to tighten chains must be wired or locked to prevent them from turning during transit unless the 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 in order to assure that the proper size and/or number of tiedowns are used to secure the vehicles to the railcar. The "approximate

weight" column of table 7-4 may be used to determine the new restraint requirements imposed by the additional weight of the cargo. 8. Method of loading, as shown, is applicable to vehicles weighing up to 40,000 lb each. The vehicles in the quantity shown in table 7-4 can be loaded on 60-ft, 75-ft, 85-ft, and 89-ft cars.

Table 7-4. Quantity of M809-Series Truck That can be Loaded on Railroad Cars With Center Tiedown Rails

Model	Description (2-1/2-Ton, 6x6)	Quantity per car				Approximate weight (lb)*
		60-ft	75-ft	85-ft	89-ft	
M818	Tractor, WOWN	2	3	3	3	19,387
M818	Tractor, WWN	2	3	3	3	20,107
M813	Cargo, WOWN	2	2	3	3	20,909
M813A1	Cargo, Dropside, WOWN	2	2	3	3	30,982
M815	Bolster, Logging, WWN	2	2	3	3	21,420
M813	Cargo, WWN	2	2	3	3	22,126
M813A1	Cargo, Dropside, WWN	2	2	3	3	22,144
M817	Dump, WOWN	2	2	3	3	22,781
M817	Dump, WWN	2	2	3	3	23,847
M814	Cargo, WOWN	1	2	2	2	24,037
M814	Cargo, WWN	1	2	2	2	25,609
M820	Van, Expansible, WOWN	1	2	2	2	27,577
M821	Stake, Bridge, Transporting, WWN	1	2	2	2	27,888
M820A2	Van, Expansible, WOWN	1	2	2	2	29,495
M819	Tractor, Wrecker, WWN	1	2	2	2	33,874
M816	Wrecker, Medium, WWN	1	2	2	2	34,820

Section III. TRANSPORT ON FOREIGN RAILWAYS

7-6. General

The transportability guidance contained in this section is applicable when the M809-series trucks are transported on foreign railways. Consideration is given to single and multiple vehicle movements on the type of railcars normally used for the movement of these types of vehicles. The vehicles, when loaded on suitable railcars, can be transported in their reduced height configuration with restrictions within European countries complying with the International Loading Gauge (formerly Berne International); most of the countries in the Middle East; and South America, Australia, India, and Pakistan. In the Middle East and South America, the clearances vary by country, and each country will require a separate check. In Australia, India, and Pakistan, wide- or broad-gauge railways provide greater clearances and less restrictions.

Because of the various designation systems used by different countries, foreign railcars are not easily classified. In addition, clearances vary, in many cases, from one country to the next and within one country; consequently, evaluation of transportability capability must be made on an individual basis.

7-7. Transport on US Army 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 the vehicle 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.

really used for the movement of these types of vehicles. The vehicles, when loaded on a suitable railcar, can be transported in their reduced height configuration with restrictions within European countries complying with the International Loading Gauge (formerly Berne International); the majority of the countries in the Middle East; and South America, Australia, India, and Pakistan. In the Middle East and South America, the clearances vary by country, and each country will require a separate check. In Australia, India, and Pakistan, wide- or broad-gauge railways provide greater clearances and less restrictions. Because of the various designation systems used by different countries, foreign railcars are not easily classified.

In addition, clearances vary, in many cases, from one country to the next and within one country; consequently, evaluation of transportability capability must be made on an individual basis.

**7-7. Transport on US Army Foreign Service Flatcars**

*a. General.* The vehicles can be transported on a bumper of US Army-owned foreign service flatcars. These flatcars are exclusively for the transport of US military materiel. Table 7-5 represents a few of the flatcars available in Europe that are suitable for transporting the vehicles.

*Table 7-5. Characteristics of US Army-Owned European Flatcars Available for Transporting Vehicles*

Flatcar designation	Capacity	Length	Width	Platform height*
<b>SSY**</b>	52-ton (47.17 MTON)	31-ft.2-in (9.50 m)	10-ft 4-in (3.15 m)	4-ft 2¾-in (1.29 m)
<b>SSYS</b>	66-ton (59.88 MTON)	31-ft 2-in (9.50)	10-ft 4-in (3.15 m)	4-ft 2¾-in (1.29)
<b>FFLM</b>	90-ton (81.65 MTON)	46-ft 8-in (14.42 m)	10-ft 3-in (3.12 m)	4-ft 2¾-in (1.29 m)

\*Above top of rail.

\*\*German-owned SSY cars are designated RLMMP.

*b. Materials.* The materials required for blocking and tiedown of the vehicles on US Army-owned foreign flatcars are essentially the

same as those used for transporting the vehicles within CONUS. For general guidance, refer to figure 7-1.





## APPENDIX

### REFERENCES

#### A-1 Army Regulations (AR)

55-29	Military Convoy Operations in CONUS
55-162	Permits for Oversize, Overweight, or Other Special Military Movements on Public Highways in the United States
55-355	Military Traffic Management Regulation
70-39	Criteria for Air Transport and Airdrop Material
95-16	Weight and Balance-Army Aircraft
385-40	Accident Reporting and Records

#### A-2. Field Manuals (FM)

1-100	Army Aviation Utilization
5-36	Route Reconnaissance and Classification
55-9	Unit Air Movement Plan
55-15	Transportation Reference Data

#### A-3. Supply Bulletins (SB)

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

#### A-4. Technical Manuals (TM)

5-330	Planning and Design of Roads, Airbases and Heliports in Theater of Operations
5-725	Rigging
9-2320-260-10	Operation-Truck, 5-Ton, 6x6, M809 Series
55-405-9	Army Aviation Maintenance Engineering Manual: Weight and Balance
55-450-10/1	Air Transport of Supplies and Equipment Standard Loads in US Air Force C-130E Aircraft
55-450-10/2	Air Transport of Supplies and Equipment Standard Loads in Air Force C-141 Aircraft
55-450-10/3	Air Transport of Supplies and Equipment Standard Loads in Air Force C-5 Aircraft
55-500	Marine Equipment Characteristics and Data
55-513	Military Stevedoring

#### A-5. Technical Orders (TO) (Air Force)

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

#### NOTE

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

#### A-6. Other Publications and Source of Procurement

Association of American Railroads, *Rules Governing the Loading Commodities on Open-Top Cars*  
 Section No. 1-General Rules  
 Section No. 6-Rules Governing the Loading of Department of Defense Material  
 Secretary  
 Mechanical Division  
 Association of American Railroads  
 ATTN: J. H. Bean  
 59 E. Van Buren St.

Chicago, Illinois 60605

Water Carriers' Tariff No. 26 or reissues thereof—Regulations *Governing the Transportation or Storage of Explosives or Other Dangerous Articles or Substances, and Combustible Liquids on Board Vessels.*

R. M. Graziano, Agent

American Railroad Building

1920 L St. N.W.

Washington, D.C. 20036

Motor Carriers' Explosives and Dangerous Articles Tariff No. 15 or reissues thereof—Department of Transportation Regulations *Governing Transportation of Hazardous Materials by Motor, Rail and Water Including Specifications for Shipping Containers.*

Richard H. Hinchcliff, Issuing Officer

1616 P Street, N.W.

Washington, D.C. 20036

By Order of the Secretary of the Army:

Official:

VERNE L. BOWERS  
*Major General, United States Army*  
*The Adjutant General*

CREIGHTON W. ABRAMS  
*General, United States Army*  
*Chief of Staff*

Distribution:

To be distributed in accordance with DA Form 12-34 (qty rqr block no. 165) requirements for Wheel Vehicles.





