

# CHAPTER 1 INTRODUCTION

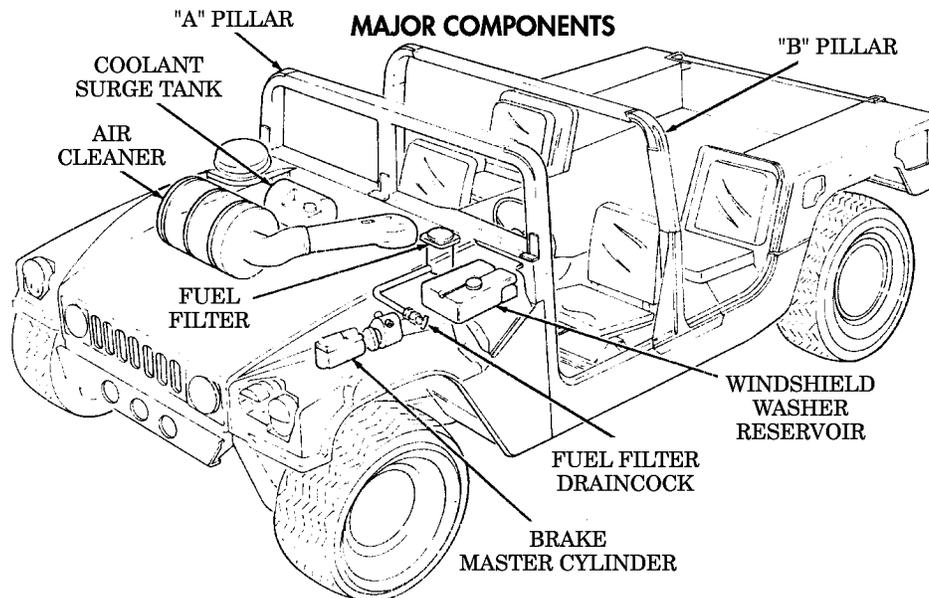
## Section I. GENERAL INFORMATION

### 1-1. SCOPE

a. This manual contains instructions for operating and servicing M998 series vehicles.

These vehicles are:

- (1) M998 and M998A1 Cargo/Troop Carriers
- (2) M1038 and M1038A1 Cargo/Troop Carriers, W/W
- (3) M1097, M1097A1, M1097A, and M1123 Heavy Variants
- (4) M966, M966A1, and M1121 TOW Carriers, Armored
- (5) M1036 TOW Carrier, Armored, W/W
- (6) M1045, M1045A1, and M1045A2 TOW Carriers, W/Supplemental Armor
- (7) M1046 and M1046A1 TOW Carriers, W/Supplemental Armor, W/W
- (8) M1025, M1025A1, and M1025A2 Armament Carriers, Armored
- (9) M1026 and M1026A1 Armament Carriers, Armored, W/W
- (10) M1043, M1043A1, and M1043A2 Armament Carriers, W/Supplemental Armor
- (11) M1044 and M1044A1 Armament Carriers, W/Supplemental Armor, W/W
- (12) M1037 S250 Shelter Carrier
- (13) M1042 S250 Shelter Carrier, W/W
- (14) M996 and M996A1 2-Litter Ambulances, Armored
- (15) M997, M997A1, and M997A2 4-Litter Ambulances, Armored
- (16) M1035, M1035A1, and M1035A2 2-Litter Ambulances, Soft Top



**b.** The material presented here provides operators with information and procedures needed to provide the safest and most efficient operation of these vehicles. This information includes:

- (1) Operator forms and records.
- (2) Descriptions of each vehicle and its operation.
- (3) The purpose of each vehicle.
- (4) Vehicle limitations.
- (5) The function of all controls and indicators.
- (6) Operating instructions for each vehicle.
- (7) Cautions and warnings to operators regarding safety to personnel and equipment.
- (8) How and when to use special purpose kits.
- (9) Operator maintenance checks and service procedures.
- (10) Troubleshooting procedures to be followed by operators if the vehicle malfunctions.

## **1-2. MAINTENANCE FORMS AND RECORDS**

(Army) Department of the Army forms and procedures used for equipment maintenance will be those prescribed by DA Pam 738-750, The Army Maintenance Management System (TAMMS). (Marine Corps) Refer to TM 4700-15/1 series.

## **1-3. HAND RECEIPT MANUAL**

This operator's manual has a companion document with a TM number followed by "-HR" (which stands for Hand Receipt). The TM 9-2320-280-10-HR consists of preprinted hand receipts (DA Form 2062) that list end item related equipment (i.e., COEI, BII, and AAL) you must account for. As an aid to property accountability, additional -HR manuals may be requisitioned from the following source in accordance with procedures in chapter 12, AR 25-30:

Commander  
U.S. Army Publications Distribution Center  
2800 Eastern Blvd.  
Baltimore, MD 21220-2896

## **1-4. REPORTING EQUIPMENT IMPROVEMENT RECOMMENDATIONS (EIR)**

(Army) If your M998 series vehicles need improvement, let us know. Send us an EIR. You, the user, are the only one who can tell us what you don't like about your equipment. Let us know why you don't like the design or performance. Put it on an SF 368 (Product Quality Deficiency Report). Mail it to us at: Commander, U.S. Army Tank-automotive and Armaments Command, ATTN: AMSTA-TR-Q, Warren, Michigan 48397-5000. We'll send you a reply.

### **1-5. EQUIPMENT IMPROVEMENT REPORT AND MAINTENANCE DIGEST (EIR MD)**

The quarterly Equipment Improvement Report and Maintenance Digest, TB 43-0001-39 series, contains valuable field information on the equipment covered in this manual. The information in the TB 43-0001-39 series is compiled from some of the Equipment Improvement Reports that you prepared on the vehicles covered in this manual. Many of these articles result from comments, suggestions, and improvement recommendations that you submitted to the EIR program. The TB 43-0001-39 series contains information on equipment improvements, minor alterations, proposed Modification Work Orders (MWOs), warranties (if applicable), actions taken on some of your DA Form 2028s (Recommended Changes to Publications), and advance information on proposed changes that may affect this manual. The information will help you in doing your job better and will help in keeping you advised of the latest changes to this manual. Also refer to DA Pam 25-30, Consolidated Index of Army Publications and Blank Forms, and appendix A, References, of this manual. (Marine Corps) Submit QDR's in accordance with MCO 4855-10. For those with access to the World Wide Web (WWW), the EIR MD can be viewed through the Army Electronic Product Support. The site is <http://aeps.ria.army.mil>.

### **1-6. BREAK-IN SERVICE**

Upon receipt of vehicle, or after engine replacement, break-in precautions must be observed during the first 500 miles (805 kilometers) of operation. For break-in procedure, refer to paragraph 2-9.

## **Section II. EQUIPMENT DESCRIPTION**

### **1-7. EQUIPMENT CHARACTERISTICS, CAPABILITIES, AND FEATURES**

The 1-1/4 ton, 4x4, M998 series vehicles are tactical vehicles designed for use over all types of roads, as well as cross-country terrain in all weather conditions. The vehicles have four driving wheels powered by a V-8 liquid-cooled diesel engine. Four-wheel hydraulic service brakes and a mechanical parking brake are common to all models in the M998 series. All vehicles are equipped with a pintle hook for towing. Tiedown and lifting eyes are provided for air, rail, or sea shipment.

### **1-8. METRIC SYSTEM**

The equipment/system described herein contains metric components and requires metric, common, and special tools; therefore, metric units in addition to standard units will be used throughout this publication. In addition, a metric conversion table is located on the inside back cover of this publication.

<b>1-9. CARGO/TROOP CARRIERS (M998, M998A1, M1038, AND M1038A1)</b>
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**a. Differences.** The only difference between the M998 and M998A1 cargo/troop carriers and the M1038 and M1038A1 cargo/troop carriers is that the M998 and M998A1 do not have winches and the M1038 and M1038A1 do. This difference affects:

- Vehicle Length
- Vehicle Weight
- Shipping Dimensions
- Approach Angle
- Special Winch-Assisted Operations

It does not affect the basic purpose, performance, or special limitations of the vehicles.

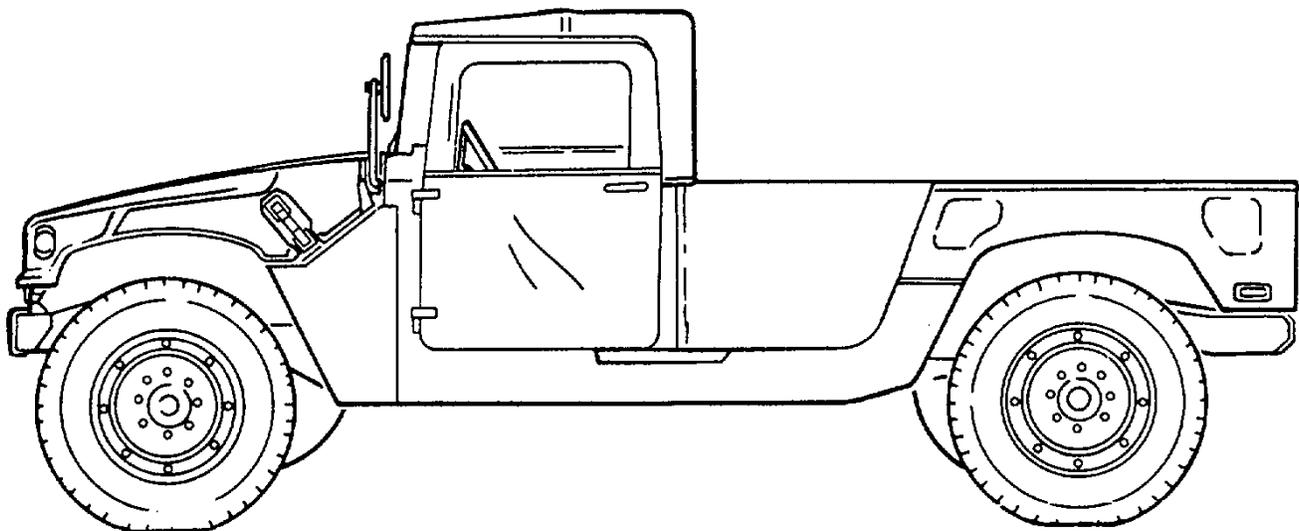
**b. Purpose of the Vehicle.** M998, M998A1, M1038, and M1038A1 cargo/troop carriers are used to transport equipment, materials, and/or personnel. The cargo carrier is capable of transporting a payload (including crew) of 2,500 pounds (1,134 kilograms). The troop carrier is capable of transporting a two-man crew and eight passengers. Both use a troop seat kit for troop transport operations. The cargo/troop carrier also has a four-man crew configuration. The M1038 and M1038A1 are equipped with winches. This feature permits recovery operations of similar vehicles.

**c. Performance.** Fully-loaded M998, M998A1, M1038, and M1038A1 cargo/troop carriers will climb road grades as steep as 60% (31°) and traverse a side slope of up to 40% (22°). The vehicle fords hard bottom water crossing up to 30 inches (76 centimeters) without a deepwater fording kit and 60 inches (152 centimeters) with the kit. Refer to table 1-15 for cruising range.

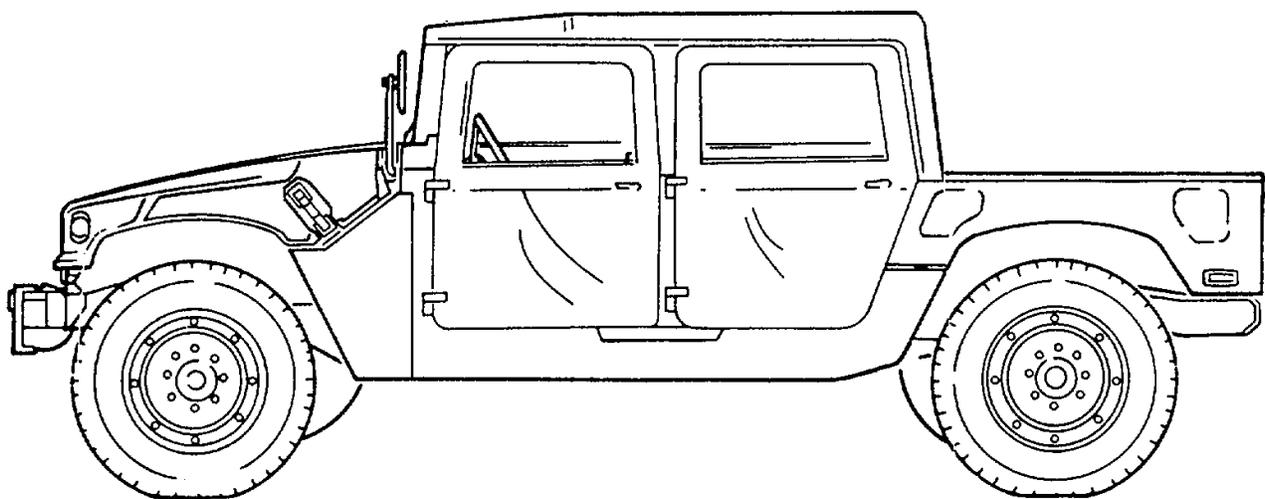
**d. Special Limitations.** None.

**e. Special Instructions in the Manual.**

- (1) Refer to paragraph 2-2, Controls, Indicators, and Equipment.
- (2) Refer to paragraph 2-44, Troop Seat Kit Operation.
- (3) Refer to chapter 2, section V, Cargo/Troop Carrier and S250 Shelter Carrier Operation.



**M998 AND M998A1  
(WITH 2-MAN SOFT TOP INSTALLED)**



**M1038 AND M1038A1 W/WINCH  
(WITH 4-MAN SOFT TOP INSTALLED)**

## 1-10. HEAVY VARIANT CARGO/TROOP CARRIERS (M1097, M1097A1, M1097A2, AND M1123)

**a. Differences.** The difference between the M998 and M998A1 cargo/troop carriers and the M1097, M1097A1, M1097A2, and M1123 heavy variant cargo/troop carriers is that the M1097, M1097A1, M1097A2, and M1123 are specifically designed to accommodate a higher payload capacity. The M1123 and A2 models have new bumpers, which make the vehicles slightly longer. A 9,000 lb winch is also available for the M1123 and A2 models as an option. These differences affect:

- Approach Angle
- Special Winch-Assisted Operations
- Vehicle Length
- Vehicle Weight
- Shipping Dimensions

It does not affect the basic purpose, performance, or special limitations of the vehicles.

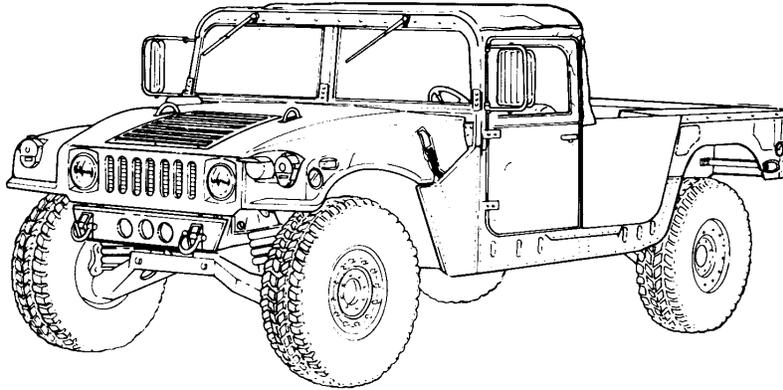
**b. Purpose of the Vehicle.** M1097, M1097A1, M1097A2, and M1123 heavy variant cargo/troop carriers are used to transport equipment, materials, and/or personnel. The heavy variant troop carrier is capable of transporting a two-man crew and eight passengers. The heavy variant cargo carrier is capable of transporting a payload (including crew) of 4,400 pounds (1,998 kilograms). The M1097, M1097A1, M1097A2, and M1123 use a troop seat kit for troop transport operations, a 200 ampere umbilical power cable to power shelter equipment, and stowage racks for ammunition and equipment. For higher payload capacity, the M1097, M1097A1, M1097A2, and M1123 are equipped with a reinforced frame, crossmembers, lifting shackles, heavy-duty rear springs, shock absorbers, reinforced control arms, heavy-duty tires and rims, and a transfer case and differential with a modified gear ratio.

**c. Performance.** Fully-loaded M1097, M1097A1, M1097A2, and M1123 heavy variant cargo/troop carriers will climb road grades as steep as 60% (31°) and traverse a side slope of up to 40% (22°). The vehicle fords hard bottom water crossing up to 30 inches (76 centimeters) without a deep water fording kit and 60 inches (152 centimeters) with the kit. Refer to table 1-15 for cruising range.

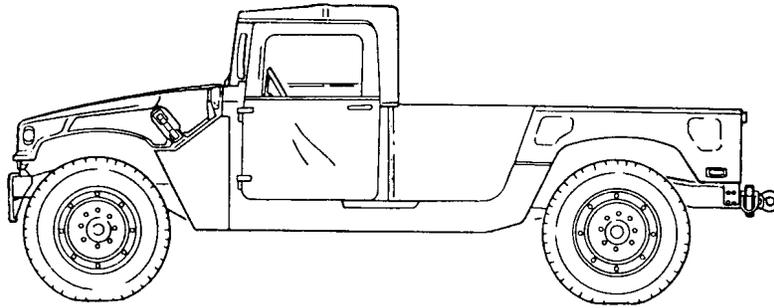
**d. Special Limitations.** None.

**e. Special Instructions in the Manual.**

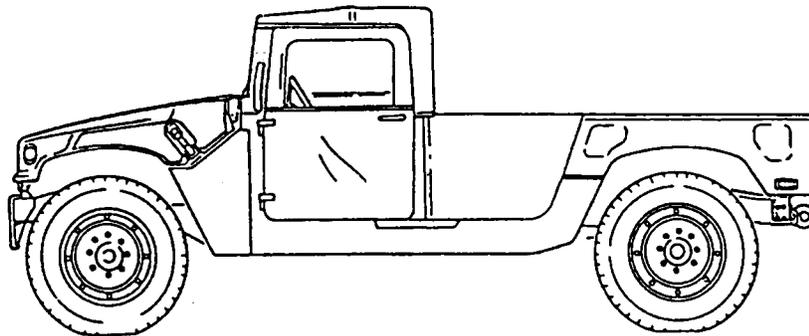
- (1) Refer to paragraph 2-2, Controls, Indicators, and Equipment.
- (2) Refer to paragraph 2-44, Troop Seat Kit Operation.
- (3) Refer to chapter 2, section V, Cargo/Troop Carrier and S250 Shelter Carrier Operation (if equipped).



**M1097 AND M1097A1  
(WITH 2-MAN SOFT TOP INSTALLED)**



**M1097A2**



**M1123**



**1-11. TOW CARRIERS, ARMORED  
(M966, M966A1, M1036, AND M1121)**

**a. Differences.** The only difference between the M966, M966A1, and M1121 TOW carrier armored vehicles and the M1036 TOW carrier armored vehicle is that the M966, M966A1, and M1121 do not have winches and the M1036 does. This difference affects:

- Vehicle Length
- Vehicle Weight
- Shipping Dimensions
- Approach Angle
- Special Winch-Assisted Operations

It does not affect the basic purpose, performance, or special limitations of the vehicles.

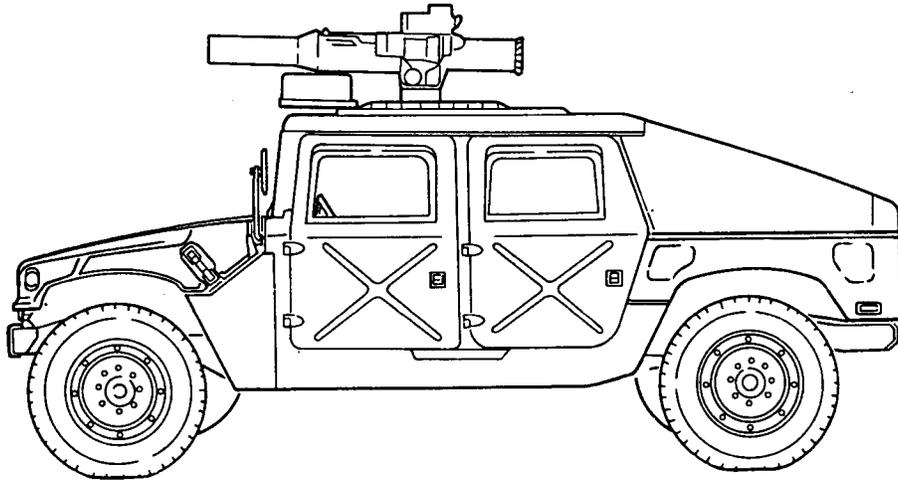
**b. Purpose of the Vehicle.** M966, M966A1, M1036, and M1121 TOW carriers are used to mount and operate the TOW missile launcher system with armor protection for crew, TOW system components, and ammunition. The M1036 is equipped with a winch. This feature permits recovery operations of similar vehicles.

**c. Performance.** Fully-loaded M966, M966A1, M1036, and M1121 TOW carriers will climb road grades as steep as 60% (31°) and traverse a side slope of up to 40% (22°). The vehicles ford hard bottom water crossings up to 30 inches (76 centimeters) without a deep water fording kit and 60 inches (152 centimeters) with the kit. Refer to table 1-15 for cruising range.

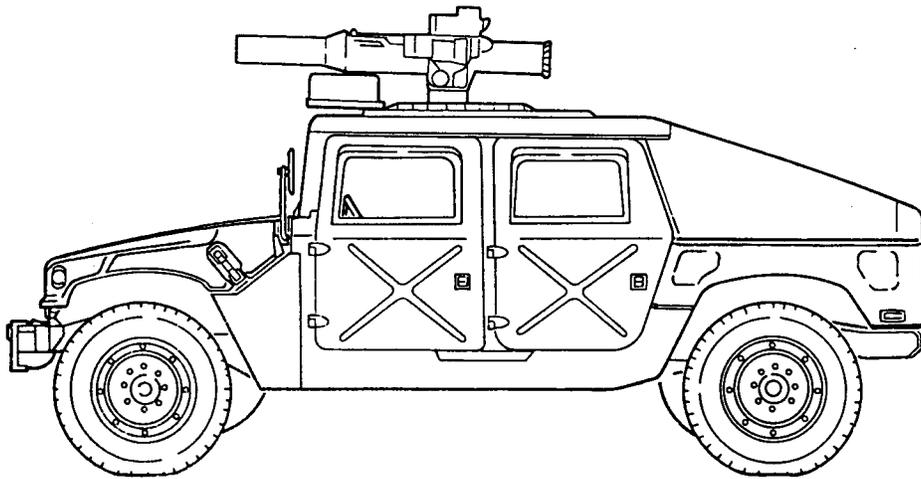
**d. Special Limitations.** Weapon station azimuth is limited to 300° left and right of vehicle centerline when Vehicle Power Conditioner (VPC) cables are connected. With launcher installed, elevation is limited to 20° and depression is limited to 10°.

**e. Special Instructions in the Manual.**

- (1) Refer to paragraph 2-2, Controls, Indicators, and Equipment.
- (2) Refer to chapter 2, section VI, TOW/Armament Carrier Operation.



M966, M966A1, AND M1121



M1036 W/WINCH

**1-12. TOW CARRIERS, W/SUPPLEMENTAL ARMOR (M1045, M1045A1, M1045A2, M1046, AND M1046A1)**

**a. Differences.** The difference between the M1045, M1045A1, and M1045A2 TOW carriers w/supplemental armor and the M1046 and M1046A1 TOW carriers w/supplemental armor is that the M1045, M1045A1, and M1045A2 do not have winches and the M1046 and M1046A1 do. The A2 models have new bumpers, which make the vehicles slightly longer. A 9,000 lb winch is also available for the A2 models as an option. These differences affect:

- Vehicle Length
- Vehicle Weight
- Shipping Dimensions
- Approach Angle
- Special Winch-Assisted Operations

It does not affect the basic purpose, performance, or special limitations of the vehicles.

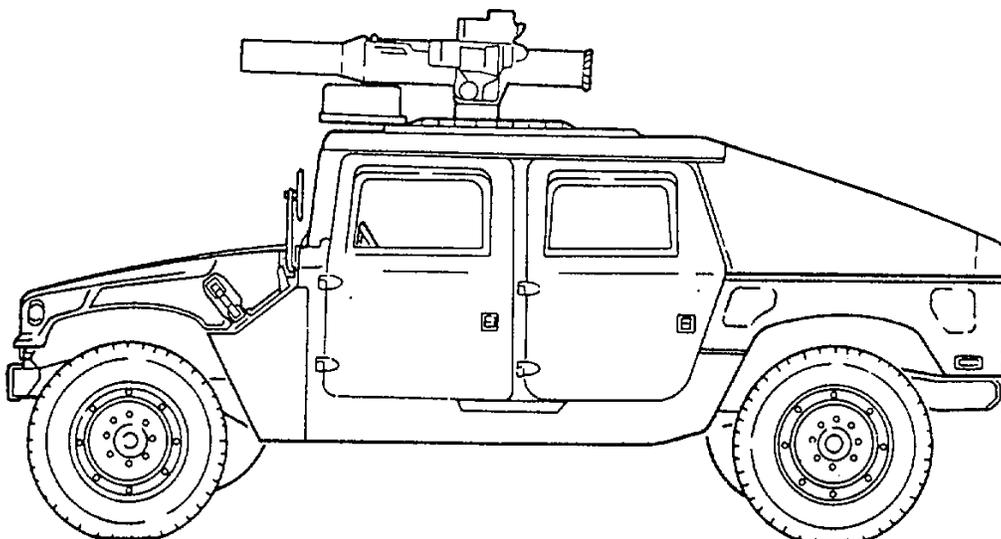
**b. Purpose of the Vehicle.** The M1045, M1045A1, M1045A2, M1046, and M1046A1 provide added ballistic protection for TOW system components, crew, and ammunition. The M1046 and M1046A1 are equipped with winches. This feature permits recovery operations of similar vehicles.

**c. Performance.** Fully-loaded M1045, M1045A1, M1045A2, M1046, and M1046A1 TOW carriers w/supplemental armor will climb road grades as steep as 60% (3-1°) and traverse a side slope of up to 40% (220). The vehicles ford hard bottom water crossings up to 30 inches (76 centimeters) without a deepwater fording kit and 60 inches (152 centimeters) with the kit. Refer to table 1-15 for cruising range.

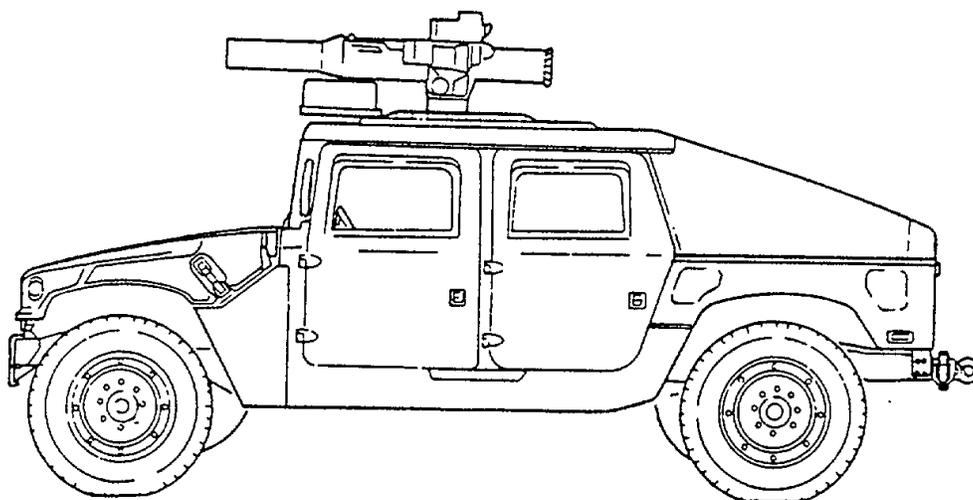
**d. Special Limitations.** Weapon station azimuth is limited to 300° left and right of vehicle centerline when Vehicle Power Conditioner (VPC) cables are connected. With launcher installed, elevation is limited to 20° and depression is limited to 10°.

**e. Special Instructions in the Manual.**

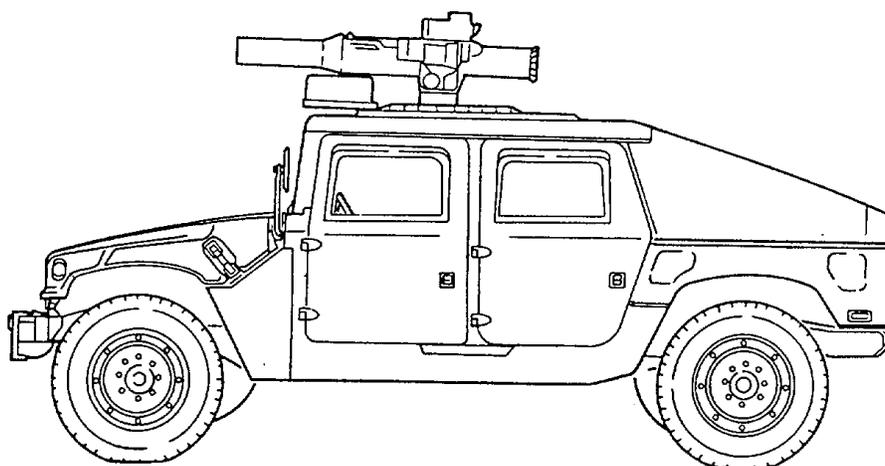
- (1) Refer to paragraph 2-2, Controls, Indicators, and Equipment.
- (2) Refer to chapter 2, section VI, TOW/Armament Carrier Operation.



**M1045 AND M1045A1**



**M1045A2**



**M1046 AND M1046A1 W/WINCH**

**1-13. ARMAMENT CARRIERS, ARMORED (M1025, M1025A1, M1025A2, M1026, AND M1026A1)**

**a. Differences.** The difference between the M1025, M1025A1, and M1025A2 armament carriers and the M1026 and M1026A1 armament carriers is that the M1025 and M1025A1 do not have winches and the M1026 and M1026A1 do. The A2 models have new bumpers, which make the vehicles slightly longer. A 9,000 lb winch is also available for the A2 models as an option. These differences affect:

- Vehicle Length
- Vehicle Weight
- Shipping Dimensions
- Approach Angle
- Special Winch-Assisted Operations

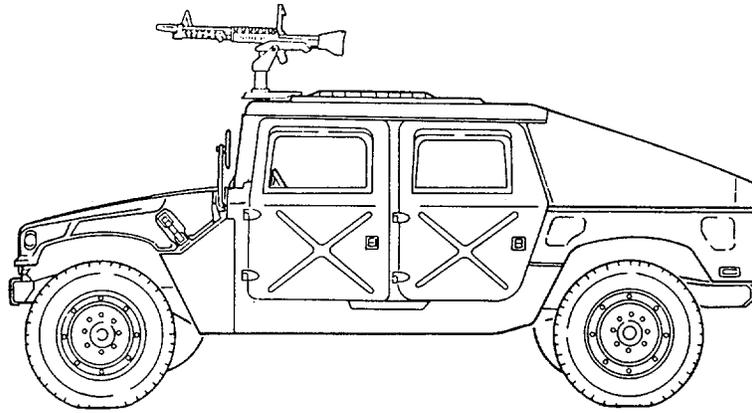
It does not affect the basic purpose, performance, or special limitations of the vehicles.

**b. Purpose of the Vehicle.** The M1025, M1025A1, M1025A2, M1026, and M1026A1 armament carriers provide mounting and firing of the MK19 automatic grenade launcher; M2, caliber .50 machine gun; and M60, 7.62 mm machine gun; ring-mounted with 360° arc of fire, with armor protection for crew, weapon components, and ammunition. The M1026 and M1026A1 are equipped with winches. This feature permits recovery operations of similar vehicles. **c. Performance.** Fully-loaded M1025, M1025A1, M1025A2, M1026, and M1026A1 armament carriers will climb road grades as steep as 60% (31°) and traverse a side slope of up to 40% (22°). The vehicles ford hard bottom water crossings up to 30 inches (76 centimeters) without a deep water fording kit and 60 inches (152 centimeters) with the kit. Refer to table 1-15 for cruising range.

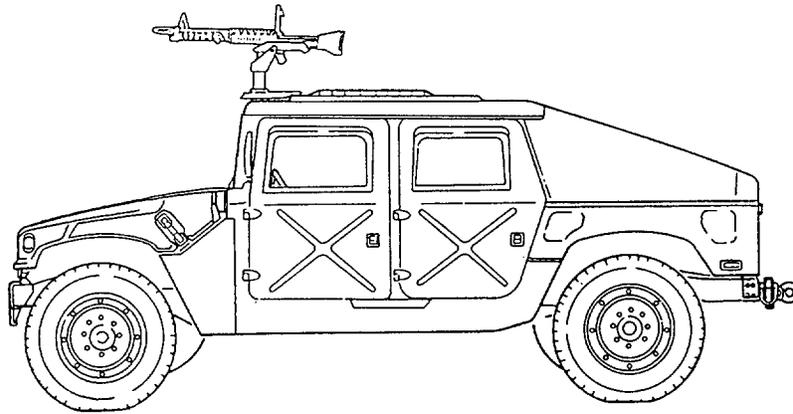
**d. Special Limitations.** None.

**e. Special Instructions in the Manual.**

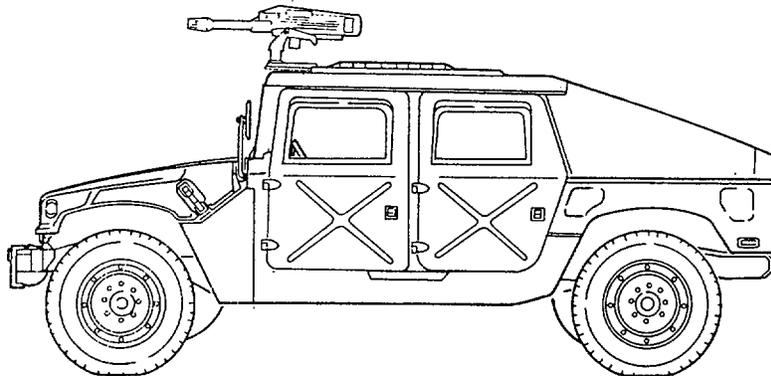
- (1) Refer to paragraph 2-2, Controls, Indicators, and Equipment.
- (2) Refer to chapter 2, section VI, TOW/Armament Carrier Operation.



**M1025 AND M1025A1  
(WITH M60, 7.62 MM MACHINE GUN MOUNTED)**



**M1025A2  
(WITH M60, 7.62 MM MACHINE GUN MOUNTED)**



**M1026 AND M1026A1 W/WINCH  
(WITH MK19 GRENADE LAUNCHER MOUNTED)**

<b>1-14. ARMAMENT CARRIERS, W/SUPPLEMENTAL ARMOR (M1043, M1043A1, M1043A2, M1044, AND M1044A1)</b>
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**a. Differences.** The difference between the M1043, M1043A1, and M1043A2 armament carriers w/supplemental armor and M1044 and M1044A1 armament carriers w/supplemental armor is that the M1043, and M1043A1, do not have winches and the M1044 and M1044A1 do. The A2 models have new bumpers which make the vehicles slightly longer. A 9,000 lb winch is also available for the A2 models as an option. These differences affect:

- Vehicle Length
- Vehicle Weight
- Shipping Dimensions
- Approach Angle
- Special Winch-Assisted Operations

It does not affect the basic purpose, performance, or special limitations of the vehicles.

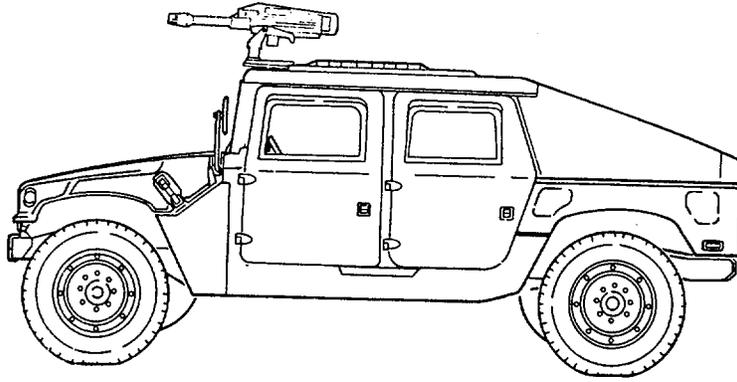
**b. Purpose of the Vehicle.** The M1043, M1043A1, M1043A2, M1044, and M1044A1 armament carriers w/supplemental armor provide added ballistic protection for armament components, crew, and ammunition. The M1044 and M1044A1 are equipped with winches. This feature permits recovery operations of similar vehicles.

**c. Performance.** Fully-loaded M1043, M1043A1, M1043A2, M1044, and M1044A1 armament carriers w/supplemental armor will climb road grades as steep as 60% (31°) and traverse a side slope of up to 40% (220). The vehicles ford hard bottom water crossings up to 30 inches (76 centimeters) without a deep-water fording kit and 60 inches (152 centimeters) with the kit. Refer to table 1-15 for cruising range.

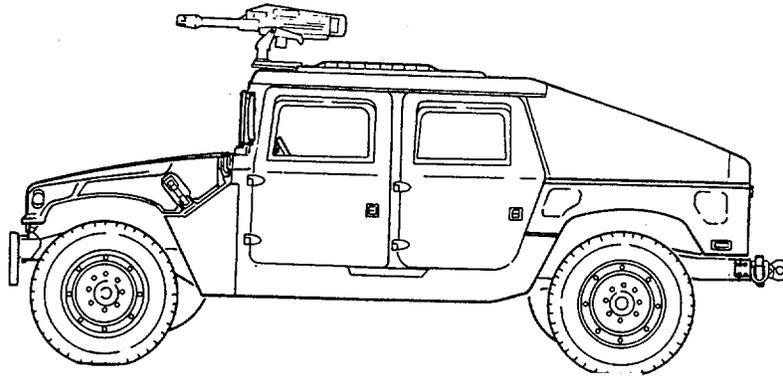
**d. Special Limitations.** None.

**e. Special Instructions in the Manual.**

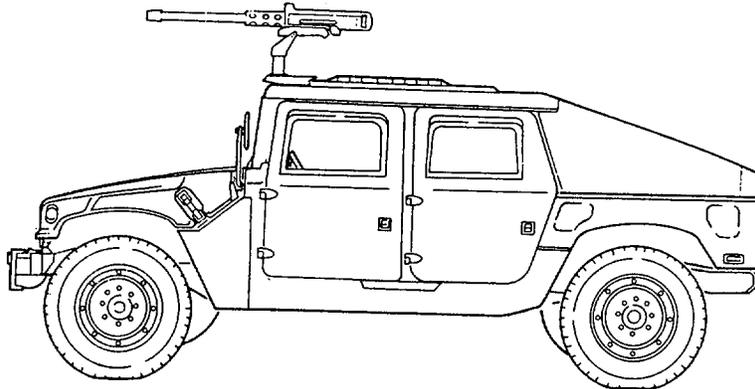
- (1) Refer to paragraph 2-2, Controls, Indicators, and Equipment.
- (2) Refer to chapter 2, section VI, TOW/Armament Carrier Operation.



**M1043 AND M1043A1  
(WITH MK19 GRENADE LAUNCHER MOUNTED)**



**M1043A2  
(WITH MK19 GRENADE LAUNCHER MOUNTED)**



**M1044 AND M1044AI W/WINCH  
(WITH M2, CAUBER .50 MACHINE GUN MOUNTED)**

**1-15. S250 SHELTER CARRIERS (M1037 AND M1042)**

**a. Differences.** The only difference between the M1037 shelter carrier and the M1042 shelter carrier is that the M1037 does not have a winch and the M1042 does. This difference affects:

- Vehicle Length
- Vehicle Weight
- Shipping Dimensions
- Approach Angle
- Special Winch-Assisted Operations

It does not affect the basic purpose, performance, or special limitations of the vehicles.

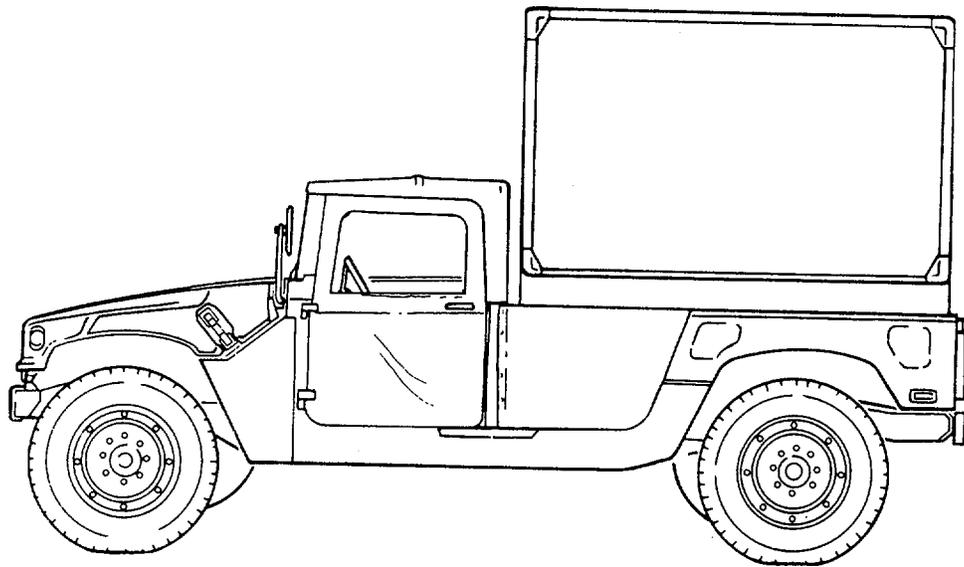
**b. Purpose of the Vehicle.** The M1037 and M1042 shelter carriers provide the capability to secure and transport the S250 electrical equipment shelter with a total payload (including crew) of 3,600 pounds (1,634 kilograms). The M1042 is equipped with a winch. This feature permits recovery operations of similar vehicles.

**c. Performance.** Fully-loaded M1037 and M1042 shelter carriers will climb road grades as steep as 60% (31°) and traverse a side slope of up to 40% (22°). The vehicles ford hard bottom water crossings up to 30 inches (76 centimeters) without a deepwater fording kit and 60 inches (152 centimeters) with the kit. Refer to table 1-15 for cruising range.

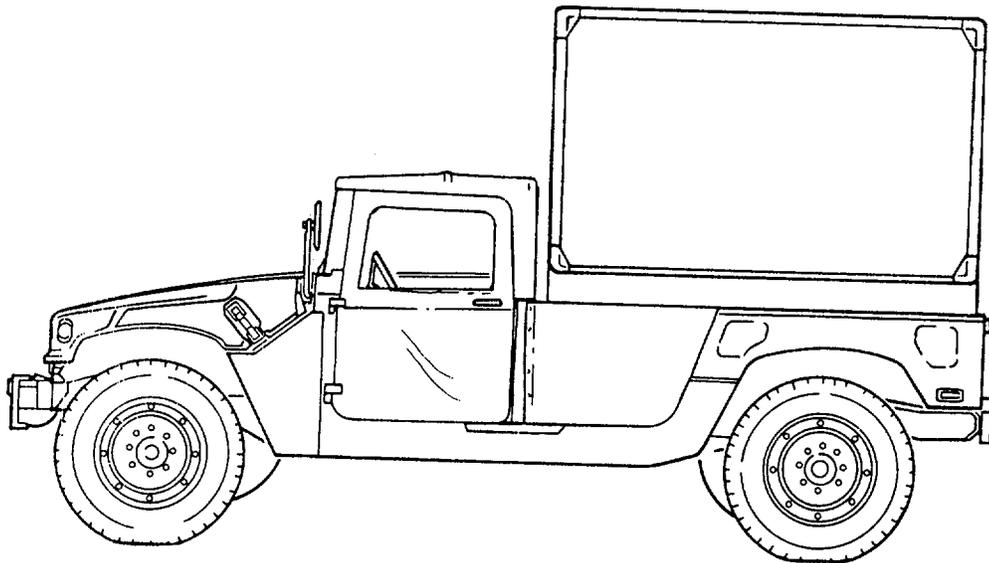
**d. Special Limitations.** None.

**e. Special Instructions in the Manual.**

- (1) Refer to paragraph 2-2, Controls, Indicators, and Equipment.
- (2) Refer to chapter 2, section V, Cargo/Troop Carrier and S250 Shelter Carrier Operation.



M1037



M1042 W/WINCH

**1-16. 2-LITTER AMBULANCES, ARMORED (M996 AND M996A1); 4-LITTER AMBULANCES, ARMORED (M997, M997A1, AND M997A2)**

**a. Differences.** The M996 and M996A1 are armored 2-litter ambulances. The M997, M997A1, and M997A2 are 4-litter ambulances with armor protection and air conditioning for crew and patients. The A2 models have new bumpers, which make the vehicles slightly longer. A 9,000 lb winch is also available for the A2 models as an option. These differences affect:

- Approach Angle
- Special Winch-Assisted Operations
- Vehicle Length
- Vehicle Weight
- Shipping Dimensions

**b. Purpose of the Vehicle.**

**(1) M996 and M996A1 Armored 2-Litter Ambulances.** The M996 and M996A1 ambulances are capable of transporting up to two litter patients, six ambulatory patients, or a combination of litter and ambulatory patients. Additionally, medical personnel, equipment, and a driver can be accommodated in the vehicle. The patient compartment is heated with a vehicle-mounted fuel burning heater. For operation in an NBC environment, the M996 and M996A1 are equipped with a Gas-Particulate Filter Unit (GPFU) with heaters capable of supporting up to five personnel equipped with either M25 series protective masks or M13 series patient protective masks. The GPFU forces temperature-controlled, filtered air to the mask facepieces, which increases protection, eases breathing, and reduces stress and heat fatigue during extended periods of NBC operation.

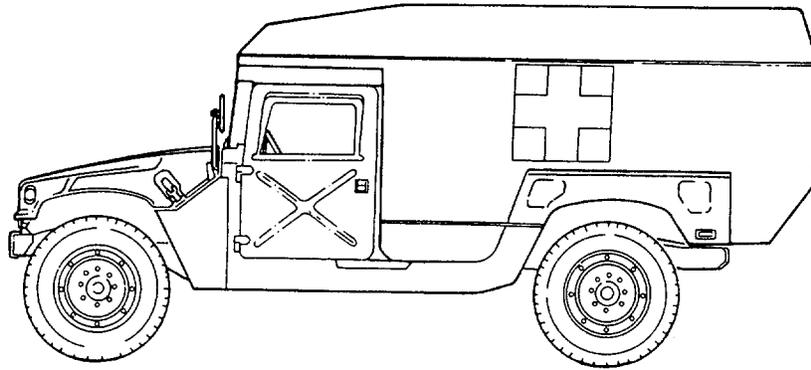
**(2) M997, M997A1, and M997A2 Armored 4-Litter Ambulances.** The M997, M997A1, and M997A2 ambulances are capable of transporting up to four litter patients, eight ambulatory patients, or a combination of litter and ambulatory patients. Additionally, medical personnel, equipment, and a driver can be accommodated in the vehicle. The ambulance can be heated, ventilated, or air conditioned, depending on environmental conditions. For operation in an NBC environment, the M997, M997A1, and M997A2 are equipped with a Gas-Particulate Filter Unit (GPFU) with heaters capable of supporting up to seven personnel equipped with either M25 series protective masks or M13 series patient protective masks. The GPFU forces temperature-controlled, filtered air to the mask facepieces, which increases protection, eases breathing, and reduces stress and heat fatigue during extended periods of NBC operation.

**c. Performance.** Fully-loaded M996, M996A1, M997, M997A1, and M997A2 ambulances will climb road grades as steep as 60% (31°) and traverse a side slope of up to 40% (220). The vehicles ford hard bottom water crossings up to 30 inches (76 centimeters) without a deep water fording kit and 60 inches (152 centimeters) with the kit. Refer to table 1-15 for cruising range.

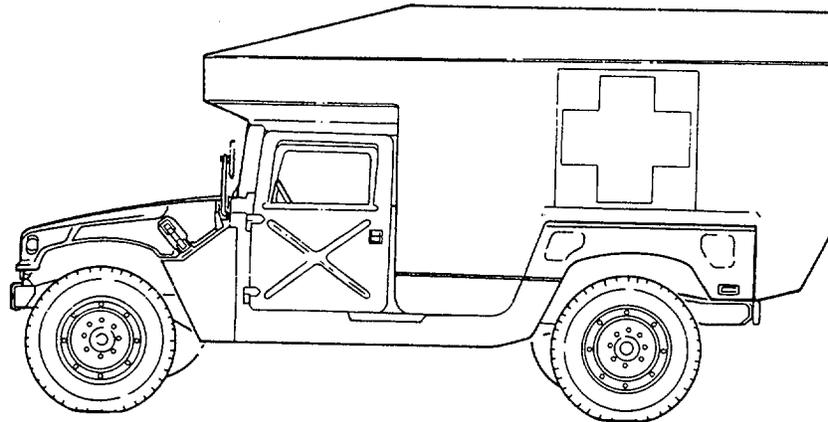
**d. Special Limitations.** None.

**e. Special Instructions in the Manual.**

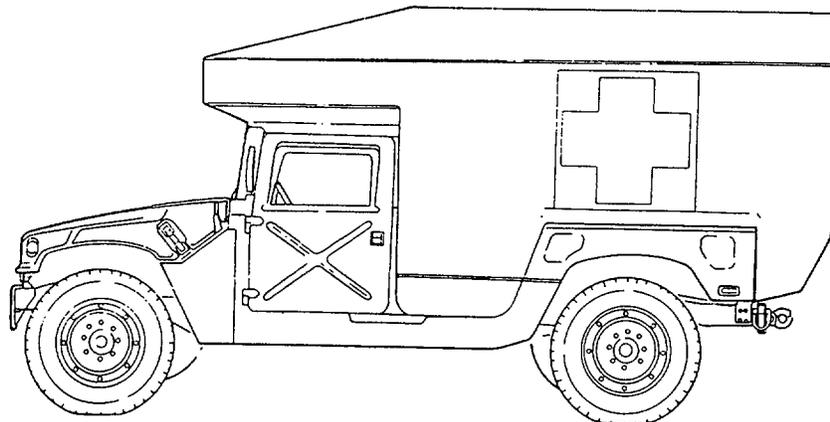
- (1) Refer to paragraph 2-2, Controls, Indicators, and Equipment.
- (2) Refer to chapter 2, section VII, Ambulance Operation.



M996 AND M996A1



M997 AND M997A1



M997A2

<b>1-17. 2-LITTER AMBULANCES, SOFT TOP (M1035, M1035A1, AND M1035A2)</b>
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**a. Differences.** The difference between the M1035, M1035A1, and M1035A2 2-litter soft top ambulances is that the M1035A2 is longer, due to new bumpers, and can be equipped with an optional 9,000 lb winch. These differences affect:

- Approach Angle
- Special Winch-Assisted Operations
- Vehicle Length
- Vehicle Weight
- Shipping Dimensions

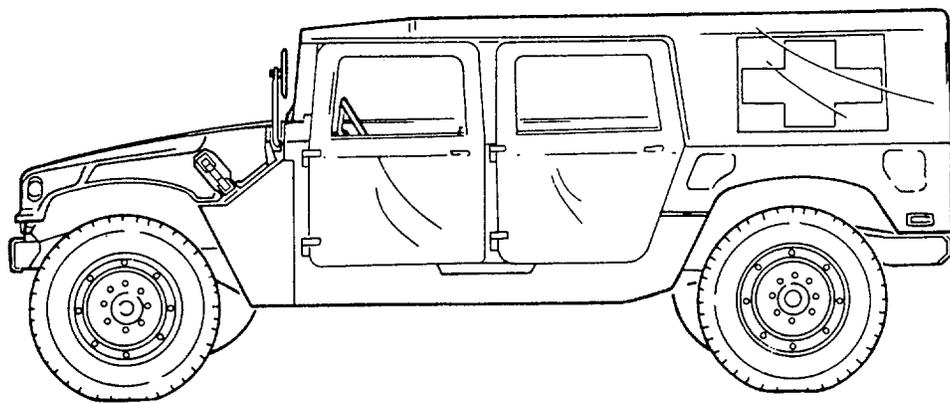
**b. Purpose of the Vehicle.** The M1035, M1035A1, and M1035A2 ambulances are 2-litter soft tops which have no armor protection for crew and patients.

**c. Performance.** Fully-loaded M1035, M1035A1, and M1035A2 ambulances will climb road grades as steep as 60% (31°) and traverse a side slope of up to 40% (22°). The vehicles ford hard bottom water crossings up to 30 inches (76 centimeters) without a deep water fording kit and 60 inches (152 centimeters) with the kit. Refer to table 1-15 for cruising range.

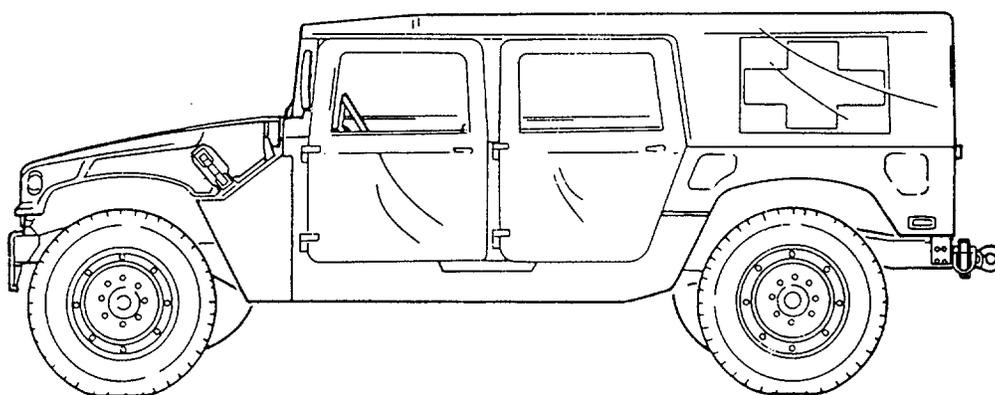
**d. Special Limitations.** None.

**e. Special Instructions in the Manual.**

- (1) Refer to paragraph 2-2, Controls, Indicators, and Equipment.
- (2) Refer to chapter 2, section VII, Ambulance Operation.



M1035 AND M1035A1



M1035A2

**1-18. TABULATED DATA**

This paragraph organizes vehicle specifications, special equipment, and model differences in table form for easy reference by operators.

*Table 1-1. Differences Between Models*

Equipment/Function	M966, M966A1, M1121	M996, M996A1	M997, M997A1, M997A2	M998, M998A1	M1025, M1025A1, M1025A2	M1026, M1026A1	M1035, M1035A1, M1035A2	M1036	M1037	M1038, M1038A1	M1042	M1043, M1043A1, M1043A2	M1044, M1044A1	M1045, M1045A1, M1045A2	M1046, M1046A1	M1097, M1097A1, M1097A2, M1123
Personnel/Cargo Operations				x						x						x
TOW Launcher Mounting	x							x						x	x	
Armament Mounting					x	x						x	x			
S250 Shelter Configuration									x		x					x
Ambulance:																
Two Litter Patients		x					x									
Four Litter Patients			x													
Eight Ambulatory Patients			x													
Six Ambulatory Patients		x														
Two Litter and Four Ambulatory Patients			x													
One Litter and Three Ambulatory Patients		x														
Vehicle Winch			*		*	x	*	x		x	x	*	x	*	x	*
Communications:																
AN/GRC-160	x	x	x	x	x	x		x		x		x	x	x	x	
AN/VRC-12 Series				x						x						
Collective NBC Protection		x	x													
Basic Armor	x	x	x		x	x		x								
Supplemental Armor												x	x	x	x	
Howitzer Prime Mover																x

\* Identifies an optional winch available for A2 models.

Table 1-2. Capacities

Vehicle	Description	Capacity	
		Standard	Metric
All	Cooling system	26 qt	24.6 L
All	Engine (crankcase only)	7 qt	6.6 L
All	Engine (crankcase with new filter)	8 qt	7.6 L
All	Differential (each)	2 qt	1.9 L
All (Except M1123 and A2)	Transmission (3L80) (drain and refill)	6 qt	5.7 L
M1123 and A2 Series Vehicles	Transmission (4L80-E) (drain and refill)	7.7 qt	7.3 L
All (Except M1097, A1, A2, and M1123 Series Vehicles)	Transfer case (218)	3.5 qt	3.3 L
M1097, A1, A2, and M1123 Series Vehicles	Transfer case (242)	3.35 qt	3.17 L
All	Fuel tank	25 gal.	94.6 L
All	Steering system	1 qt	0.95 L
All	Steering system (with steering cooler)	1.25 qt	1.18 L
All (Except M1097, A1, A2, and M1123 Series Vehicles)	Brake master cylinder	0.69 pt	0.33 L
M1097, A1, A2, and M1123 Series Vehicles	Brake master cylinder	1.12 pt	0.53 L
All (Except M1097, A1, A2, and M1123 Series Vehicles)	Total brake system	1.2 pt	0.57 L
M1097, A1, A2, and M1123 Series Vehicles	Total brake system	1.63 pt	0.77 L
All	Windshield washer	1 qt	0.95 L
All	Geared hub	1 pt	0.47 L

Table 1-3. General Service Data

Vehicle	Description	Expected Temperatures		
		Above +15° (above -9°C)	+40° to -15°F (+4° to -26°C)	+40° to -65°F (+4° to -54°C)
All	Cooling system	1/4 ethylene glycol, 3/4 water	2/5 ethylene glycol, 3/5 water	3/5 ethylene glycol, 2/5 water
All	Engine	OE/HDO 30	OE/HDO 10	OEA
All	Fuel tank	DF1, DF2	DF1	DF1, DFA*
		All Temp. Alternate JP-8		
All	Differentials	GO 80/90	GO 80/90	GO 75
All	Geared hubs	GO 80/90	GO 80/90	GO 75
All	Transmission (3L80)	Dexron® II or Dexron® III	Dexron® II or Dexron® III	Dexron® II or Dexron® III
	Transmission (4L80-E)	Dexron® III	Dexron® III	Dexron® III
All	Transfer case	Dexron® II or Dexron® III	Dexron® II or Dexron® III	Dexron® II or Dexron® III
All	Steering system	Dexron® II or Dexron® III	Dexron® II or Dexron® III	Dexron® II or Dexron® III
All	Brake system	Brake Fluid Silicone (BFS)	Brake Fluid Silicone (BFS)	Brake Fluid Silicone (BFS)
All	Windshield washer reservoir	1/3 cleaning compound, 2/3 water	1/2 cleaning compound, 1/2 water	2/3 cleaning compound, 1/3 water

\* Use below -20°F (-29°C)

Table 1-4. Engine Data (6.2 L)

Type .....	6.2 liter diesel, naturally-aspirated, liquid-cooled
Cylinders .....	8(V)
Brake horsepower.....	150 horsepower @ 3600 rpm
Idle speed (engine rpm) .....	650 ± 25 rpm
Operating speed (engine rpm) .....	1500-2300 rpm
Oil pressure at idle.....	15 psi (103 kPa)
Normal operating oil pressure .....	40-50 psi (276-345 kPa)

Table 1-5. Engine Data (6.5 L)

Type .....	6.5 liter diesel, naturally-aspirated, liquid-cooled
Cylinders .....	8(V)
Brake horsepower.....	160 horsepower @ 3400 rpm
Idle speed (engine rpm) .....	725 ± 25 rpm
Operating speed (engine rpm) .....	1500-2300 rpm
Oil pressure at idle.....	10 psi (69 kPa)
Normal operating oil pressure .....	40-50 psi (276-345 kPa)

Table 1-6. Cooling System Data

Surge tank cap pressure .....	15 psi (103 kPa)
Thermostat:	
Starts to open .....	190°F (88°C)
Fully open.....	212°F (100°C)
Radiator.....	Downflow type
Fan.....	10 blade, 19 inch (48 cm)
Normal operating coolant temperature.....	190°-230°F (88°-110°C)

Table 1-7. Transmission Data (3L80)

General Information	
Model .....	Turbo Hydra-Matic 3L80
Type .....	Three-speed automatic
Oil type.....	Dexron® II
Transmission Range Selection	
Recommended Shift Lever Position	Operating Condition
"R" (reverse)	Clear of traffic and obstructions, using ground guide.
"N" (neutral)	Vehicle stopped with parking brake applied.
"D" (drive)	Normal driving and fording.
"2" (second)	Hill climbing and "engine braking" to slow vehicle when descending steep hills.
"1" (first)	Maximum "engine braking" when descending very steep hills, climbing steep hills, or driving through deep mud, sand, or snow.

Table 1-8. Transmission Data (4L80-E)

General Information	
Model .....	Turbo Hydra-Matic 4L80-E
Type .....	Four-speed automatic
Oil type.....	Dexron® III
Transmission Range Selection	
Recommended Shift Lever Position	Operating Condition
"P" (park)	Vehicle stopped with parking brake applied.
"R" (reverse)	Clear of traffic and obstructions, using ground guide.
"N" (neutral)	Vehicle stopped with parking brake applied.
" $\text{\textcircled{D}}$ " (overdrive)	Normal driving and fording.
"D" (drive)	Hilly terrain and towing a trailer.
"2" (second)	Hill climbing and "engine braking" to slow vehicle when descending steep hills.
"1" (first)	Maximum "engine braking" when descending very steep hills, climbing steep hills, or driving through deep mud, sand, or snow.

Table 1-9. Transfer Case Data (218)

<b>General Information</b>	
Model .....	New Process Gear 218 (MOD)
Type .....	Two-speed, locking, chain driven
Oil type.....	Dexron® II
<b>CAUTION</b>	
Damage to drivetrain will occur if transfer case ranges are not selected properly. Refer to paragraph 2-11, Placing Vehicle in Motion, and paragraph 2-29, Operating on Unusual Terrain, for specific instructions.	
<b>Transfer Case Range Selection</b>	
Recommended Shift Lever Position	Operating Condition
"H" (high range)	This drive range shall be selected whenever possible. High range should be used when operating on all primary, secondary, and off-road surfaces, where little or no wheel slippage exists. This range is also to be used when encountering sharp, continuous turns on high traction surfaces.
"H/L" (high lock range)	This drive range shall be selected only when continuous wheel slippage is evident; i.e., when operating in mud, snow, loose sand, or on ice, and increased control or additional traction is required.
"L" (low range)	This drive range shall be selected only when high ranges do not provide sufficient power to negotiate steep hills or downgrades. This range shall also be used when the vehicle is mired and cannot be extracted using the high lock range.
"N" (neutral)	Vehicle is disabled and must be towed.

Table 1-10. Transfer Case Data (242)

<b>General Information</b>	
Model .....	New Process Gear 242 (MOD)
Type .....	Two-speed, locking, chain driven
Oil type.....	Dexron® II
<b>CAUTION</b>	
<p><b>Damage to drivetrain will occur if transfer case ranges are not selected properly. Refer to paragraph 2-11 for specific instructions on Placing Vehicle in Motion, and paragraph 2-29, Operating on Unusual Terrain.</b></p>	
<b>Transfer Case Range Selection</b>	
<b>Recommended Shift Lever Position</b>	<b>Operating Condition</b>
"H" (high range)	This drive range shall be selected whenever possible. High range should be used when operating on all primary, secondary, and off-road surfaces, where little or no wheel slippage exists. This range is also to be used when encountering sharp, continuous turns on high traction surfaces.
"H/L" (high lock range)	This drive range shall be selected for off- highway hilly terrain or when continuous wheel slippage is evident; i.e., when operating in mud, snow, loose sand, or on ice, and increased control or additional traction is required.
"L" (low range)	This drive range shall be selected only when high ranges do not provide sufficient power to negotiate steep hills or downgrades. This range shall also be used when the vehicle is mired and cannot be extracted using the high lock range.
"N" (neutral)	Vehicle is disabled and must be towed.

Table 1-11. Maximum Vehicle Operating Speeds (3L80 Transmission)

Transmission Range Selection	Transfer Case Range Selection		
	"L" Low Range	"H" High Range	"H/L" High Lock Range
"R" (reverse)	11 mph (18 kph)	29 mph (47 kph)	11 mph (18 kph)
"D" (drive)	27 mph (43 kph)	55 mph (88 kph)	55 mph (88 kph)
"2" (second)	19 mph (31 kph)	48 mph (77 kph)	48 mph (77 kph)
"1" (first)	11 mph (18 kph)	29 mph (47 kph)	29 mp (47 kph)

Table 1-12. Maximum Vehicle Operating Speeds (4L80-E Transmission)

Transmission Range Selection	Transfer Case Range Selection		
	"L" Low Range	"H" High Range	"H/L" High Lock Range
"R" (reverse)	11 mph (18 kph)	29 mph (47 kph)	11 mph (18 kph)
"D" (overdrive)	27 mph (43 kph)	55 mph (88 kph)	55 mph (88 kph)
"D" (drive)	27 mph (43 kph)	55 mph (88 kph)	55 mph (88 kph)
"2" (second)	19 mph (31 kph)	48 mph (77 kph)	48 mph (77 kph)
"1" (first)	11 mph (18 kph)	29 mph (47 kph)	29 mph (47 kph)

Table 1-13. Vehicle Dimensions (All except M1123 and A2 Vehicles)

Vehicle	Length Overall		Height Overall*		Height Minimum Reducible	
	Inches	Centimeters	Inches	Centimeters	Inches	Centimeters
M966/M966A1	180	457	73 69**	185 175	71	180
M996/M996A1	202	513	86	218	77	196
M997/M997A1	202	513	102	259	102	259
M998/M998A1	180	457	69	175	55	140
M1025/M1025A1	180	457	73 69**	185 175	71	180
M1026/M1026A1	185	470	73 69**	185 175	71	180
M1035/M1035A1	180	457	69	175	55	140
M1036	185	470	73 69**	185 175	71	180
M1037	189	480	69	175	55	140
M1038/M1038A1	185	470	69	175	55	140
M1042	185	470	69	175	55	140
M1043/M1043A1	180	457	73 69**	185 175	71	180
M1044/M1044A1	185	470	73 69**	185 175	71	180
M1045/M1045A1	180	457	73 69**	185 175	71	180
M1046/M1046A1	185	470	73	185	71	180
M1097/M1097A1	180	457	69**	175	55	140
M1121	180	457	73	185	71	180
	Width Overall		Ground Clearance			
Vehicle	Inches	Centimeters	Under Axle		Under Chassis	
			Inches	Centimeters	Inches	Centimeters
All	85	216	16	41	24	61

\* Height covers basic vehicle only.

\*\* Height when weapon station is removed.

Table 1-14. Vehicle Dimensions (M1123 and A2 Vehicles)

Vehicle	Length Overall		Height Overall*		Height Minimum Reducible	
	Inches	Centimeters	Inches	Centimeters	Inches	Centimeters
M997A2	204.5	519.5	102	259	102	259
M1025A2	190.5	483.9	73	185	71	180
			69**	175		
M1035A2	190.5	483.9	69	175	55	140
M1043A2	190.5	483.9	73	185	71	180
			69**	175		
M1045A2	190.5	483.9	73	185	71	180
			69**	175		
M1097A2	190.5	483.9	69	175	55	140
M1123	182.5	463.6	69	175	55	140
	Width Overall		Ground Clearance			
	Inches	Centimeters	Under Axle		Under Chassis	
			Inches	Centimeters	Inches	Centimeters
All	85	216	16	41	24	61

\* Height covers basic vehicle only.

\*\* Height when weapon station is removed.

Table 1-15. Vehicle Cruising Range

<b>NOTE</b>		
When vehicle is driven on hard surface and hilly terrain at a speed of 30-40 mph (48-64 kph), the ranges shown in this table can be expected when using bias ply tires. Cruising range may increase by approximately 30 miles (48 km) when using radial tires.		
Vehicles	Gross Vehicle Weight (GVW)	Cruising Range
M998, M1035, M1038	7,700 lb (3,496 kg)	337 mi (542 km)
M966, M1025, M1026, M1036, M1121	8,200 lb (3,723 kg)	320 mi (515 km)
M1043, M1044, M1045, M1046	8,400 lb (3,814 kg)	312 mi (502 km)
M996, M1037, M1042	8,660 lb (3,932 kg)	300 mi (483 km)
M997	9,100 lb (4,131 kg)	275 mi (442 km)
M1097	10,000 lb (4,540 kg)	275 mi (442 km)
M998A1, M1035A1, M1038A1	7,880 lb (3,578 kg)	337 mi (542 km)
M966A1, M1025A1, M1026A1	8,380 lb (3,805 kg)	320 mi (515 km)
M1043A1, M1044A1, M1045A1, M1046A1	8,580 lb (3,895 kg)	312 mi (502 km)
M996A1	8,840 lb (4,013 kg)	300 mi (483 km)
M997A1	9,280 lb (4,213 kg)	275 mi (442 km)
M1097A1	10,000 lb (4,540 kg)	275 mi (442 km)
M1035A2	10,300 lb (4,676 kg)	337 mi (542 km)
M1025A2	10,300 lb (4,676 kg)	320 mi (515 km)
M1043A2, M1045A2	10,300 lb (4,676 kg)	312 mi (502 km)
M997A2	9,280 lb (4,213 kg)	275 mi (442 km)
M1097A2, M1123	10,300 lb (4,676 kg)	275 mi (442 km)

Table 1-16 6,000 lb Winch Data

Vehicle	Description	Capacities	
		Standard	Metric
M1026, M1036, M1038, M1042, M1044, M0146, M1026A1, M1038A1, M1044A1, M1046A1	Max. Load (Fifth Layer)	3,360 lb	1,525 kg
	Max. Load (Fourth Layer)	3,780 lb	1,716 kg
	Max. Load (Third Layer)	4,310 lb	1,957 kg
	Max. Load (Second Layer)	5,020 lb	2,279 kg
	Max. Load (First Layer)	6,000 lb	2,724 kg

Table 1-17. 9,000 lb Winch Data (Optional)

Vehicle	Description	Capacities	
		Standard	Metric
M1097A2, M1025A2, M1043A2, M1123, M1045A2, M997A2, M1035A2	Max. Load (Fifth Layer)	6,200 lb	2,815 kg
	Max. Load (Fourth Layer)	7,000 lb	3,178 kg
	Max. Load (Third Layer)	8,000 lb	3,632 kg
	Max. Load (Second Layer)	8,500 lb	3,859 kg
	Max. Load (First Layer)	9,000 lb	4,086 kg

Table 1-17.1. 10,500 lb Winch Data (Optional)

Vehicle	Description	Capacities	
		Standard	Metric
All vehicles except M1097A2, M1025A2, M1043A2, M1123, M1045A2, M997A2, M1035A2	Max. Load (Fifth Layer)	9,620 lb	4,367 kg
	Max. Load (Fourth Layer)	8,700 lb	3,950 kg
	Max. Load (Third Layer)	6,800 lb	3,087 kg
	Max. Load (Second Layer)	5,600 lb	2,542 kg
	Max. Load (First Layer)	4,700 lb	2,134 kg

Table 1-18. Curb Weight

Vehicle	Curb Weight	Vehicle	Curb Weight
M998	5,200 lb (2,361 kg)	M997	7,180 lb (3,260 kg)
M1038	5,327 lb (2,418 kg)	M1045	6,438 lb (2,923 kg)
M966	6,051 lb (2,747 kg)	M1046	6,565 lb (2,981 kg)
M1025	5,960 lb (2,706 kg)	M1043	6,411 lb (2,911 kg)
M1026	6,087 lb (2,763 kg)	M1044	6,538 lb (2,968 kg)
M1037	5,425 lb (2,463 kg)	M1035	5,297 lb (2,405 kg)
M996	6,748 lb (3,064 kg)	M1042	5,551 lb (2,520 kg)
M1036	6,178 lb (2,805 kg)	M1097	5,600 lb (2,542 kg)
M998A1	5,380 lb (2,443 kg)	M997A1	7,360 lb (3,341 kg)
M1038A1	5,507 lb (2,500 kg)	M1045A1	6,618 lb (3,005 kg)
M966A1	6,231 lb (2,829 kg)	M1046A1	6,745 lb (3,062 kg)
M1025A1	6,140 lb (2,788 kg)	M1043A1	6,591 lb (2,992 kg)
M1026A1	6,267 lb (2,845 kg)	M1044A1	6,718 lb (3,050 kg)
M996A1	6,928 lb (3,145 kg)	M1035A1	5,477 lb (2,487 kg)
M1097A1	5,600 lb (2,542 kg)	M1025A2	6,780 lb (3,078 kg)
M1045A2	7,258 lb (3,295 kg)	M1043A2	7,230 lb (3,282 kg)
M1097A2	5,900 lb (2,679 kg)	M1035A2	6,100 lb (2,769 kg)
M997A2	7,660 lb (3,478 kg)	M1121	6,051 lb (2,747 kg)
M1123	5,900 lb (2,679 kg)		

**NOTE**

Refer to FM 5-36 for information on trailer weights.

Table 1-19. Vehicle Bridge Classification

Model	Empty	Loaded	
		Cross-Country	Highway
M966, M966A1, M996, M996A1, M997, M997A1, M997A2, M998, M998A1, M1025, M1025A1, M1025A2, M1026, M1026A1, M1036, M1044, M1044A1, M1045, M1045A1, M1045A2, M1046, M1046A1, M1121	3	4	4
M1035, M1035A1, M1035A2	2	3	3
M1037, M1038, M1038A1, M1042, M1043, M1043A1, M1043A2, M1097, M1097A1, M1097A2, M1123	2	4	4