

CHAPTER 2 OPERATING INSTRUCTIONS

Section I. DESCRIPTION AND USE OF OPERATOR'S CONTROLS AND INDICATORS

2-1. KNOW YOUR CONTROLS AND INDICATORS

Before you attempt to operate your equipment, be sure you are familiar with the location and function of all controls and indicators. The location and function of the controls and indicators are described in this section.

WARNING

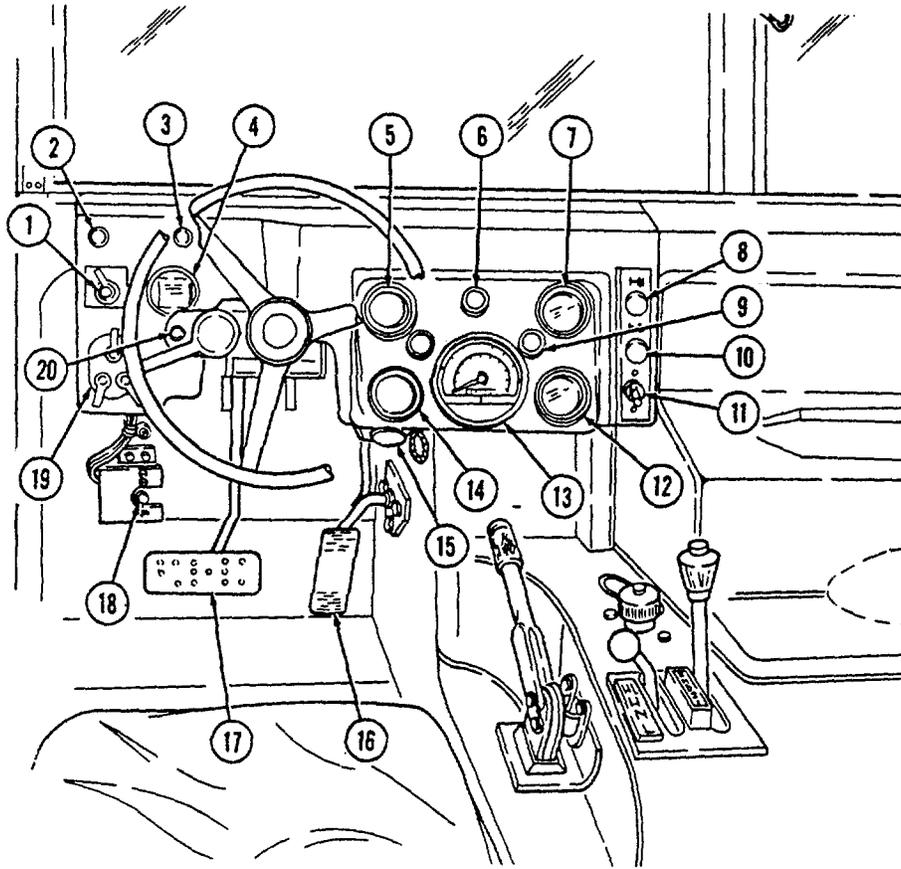
- This vehicle has been designed to operate safely and efficiently within the limits specified in this TM. Operation beyond these limits is prohibited IAW AR 750-1 without written approval from the Commander, U.S. Army Tank-automotive and Armaments Command, ATTN: AMSTA-CM-S, Warren, MI 48397-5000.
- Do not use the hand throttle as an automatic speed or cruise control. The hand throttle does not automatically disengage when brake is applied, resulting in increased stopping distances and possible hazardous and unsafe operation. Injury to personnel or damage to equipment may result.

NOTE

- Except where noted, the controls and indicators in this section are applicable to all vehicles covered in this manual.
- In this manual, the term "left" indicates the driver side of the vehicle. The term "right" indicates the opposite side of the vehicle.

2-2. CONTROLS, INDICATORS, AND EQUIPMENT

a. Driver's Compartment.

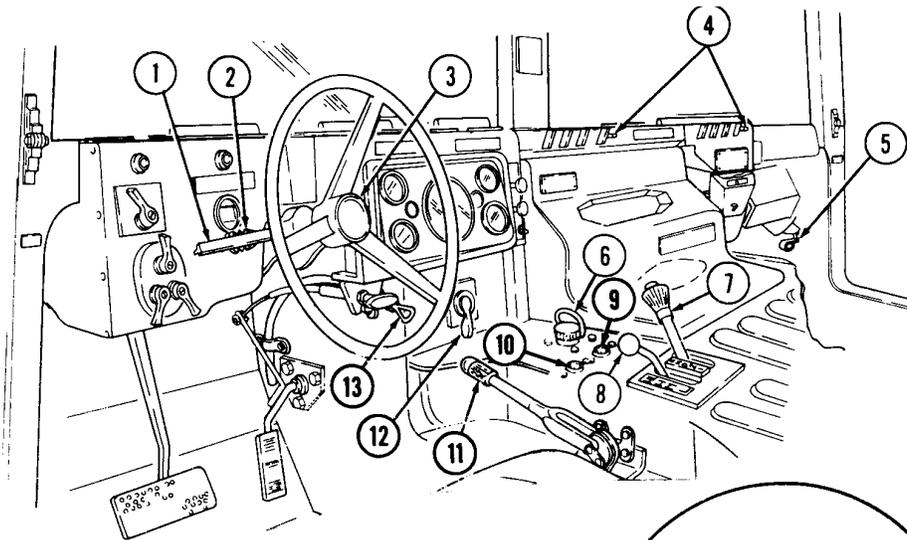


KEY ITEM AND FUNCTION

- 1 *Rotary switch* has "ENG STOP," "RUN," and "START." When positioned to "RUN," glow plugs are activated to heat engine precombustion chambers. When positioned to "START," the starter will engage and crank the engine.
- 2 *Wait-to-start lamp assembly* illuminates when glow plugs are activated, goes out when engine is ready to be started.
- 3 *Brake warning lamp assembly* illuminates if parking brake is applied or if a hydraulic imbalance (leak, etc.) exists between the front and rear brake systems.
- 4 *Air restriction gauge* signals the operator that a restriction exists in the air cleaner.

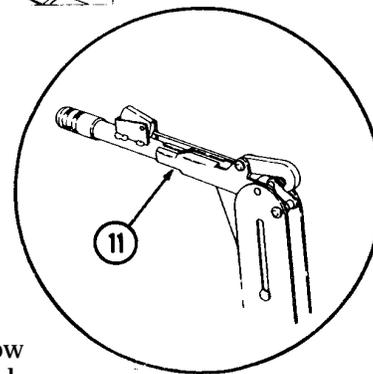
KEY ITEM AND FUNCTION

- 5 *Engine oil pressure gauge* indicates the oil pressure when the engine is running.
- 6 *High beam lamp assembly* illuminates when front headlights are switched to high beam position.
- 7 *Coolant temperature gauge* indicates engine coolant temperature.
- 8 *Defroster control knob* directs heated air to the windshield for defrosting.
- 9 *Instrument panel lights* illuminate instrument panel gauges.
- 10 *Heater control knob* varies temperature of heated air into vehicle.
- 11 *Heater fan switch* controls the blower motor speed. The switch has "HI" (high), "OFF", and "LO" (low) settings to regulate defroster and heater air flow into vehicle.
- 12 *Voltmeter* indicates the charging level and activity of the battery charging system.
- 13 *Speedometer/odometer* indicates vehicle speed and accumulated mileage.
- 14 *Fuel gauge* indicates amount of fuel in fuel tank.
- 15 *Hand throttle* increases engine speed for use during cold weather starting, winch operation, deep water fording, and to obtain maximum alternator output for communications/electrical requirements, and is not to be used as an automatic speed or cruise control.
- 16 *Accelerator pedal* is the operator's foot control for varying engine speed.
- 17 *Service brake pedal* is depressed to slow or stop vehicle.
- 18 *Dimmer switch* permits the operator to select high or low headlight beam.
- 19 *Light switch* controls operation of vehicle service lights and blackout lights.
- 20 *Directional signal /emergency flasher indicator light* illuminates during directional signal or emergency flasher use.



KEY ITEM AND FUNCTION

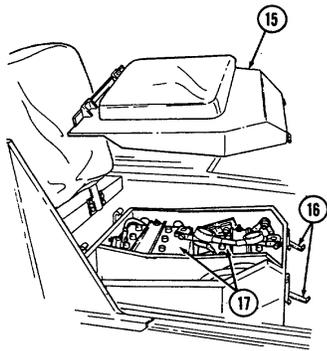
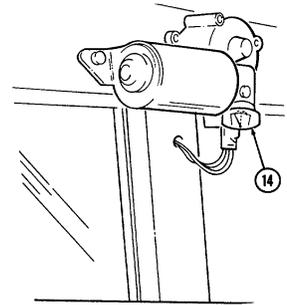
- 1 *Directional signal lever* activates turn signal lights.
- 2 *Warning hazard control* activates the warning flashers.
- 3 *Horn button* activates vehicle horn.
- 4 *Baffle operating rods* slide open to allow heated air into crew compartment.
- 5 *Fresh air intake lever* is pulled back to allow fresh air into crew compartment, or pushed forward to close.
- 6 *Simplified Test Equipment / Internal Combustion Engine-Reprogrammable (STE/ICE-R) diagnostic connector* is attaching point for the vehicle test meter (VTM) to facilitate vehicle electrical and engine systems diagnoses.
- 7 *Transmission shift lever* is used to select vehicle driving range, "R" (reverse), "N" (neutral), "D" (drive), "D" (overdrive) (M1123 and A2 vehicles only), "2" (second), "1" (first), and "P" (park).
- 8 *Transfer case shift lever* is used to select vehicle driving range, "L" (low range), "N" (neutral), "H" (high range), and "H/L" (high lock range).
- 9 *Transmission indicator lamp* comes on when ignition switch is turned on, and goes off when ignition switch is turned off. It is used to flash the diagnostic trouble codes when the transmission control module (TCM) is placed in the diagnostic mode.
- 10 *Transfer case indicator lamp* illuminates when transfer case has completed the low-range shift and high lock range shift.
- 11 *Parking brake lever* is used to apply parking brake. Safety release button must be depressed to release parking brake in new configuration.
- 12 *Fording control switch* (deep water fording kit only) allows operator to select "VENT" during normal operating conditions or "DEEP FORD" for deep water fording.
- 13 *Steering wheel lock cable* permits steering wheel to be locked to prevent unauthorized use of vehicle.



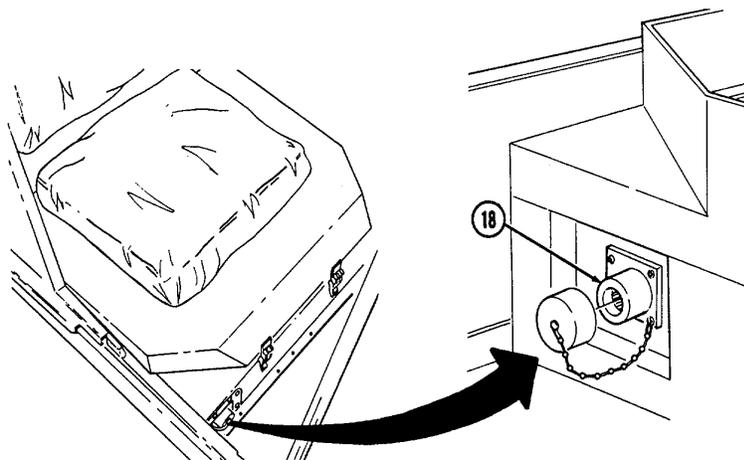
NEW CONFIGURATION

KEY ITEM AND FUNCTION

- 14 *Windshield washer/wiper control knob* operates a two-speed electric wiper motor and when depressed operates windshield washer.



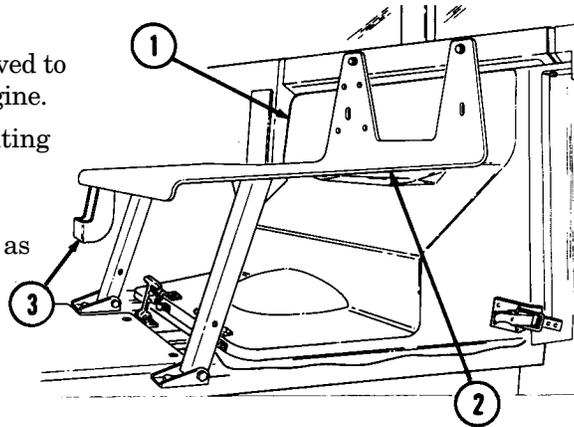
- 15 *Companion seat* is removed to provide access to batteries.
- 16 *Battery box latches* release to permit removal of companion seat for access to batteries.
- 17 *Batteries* provide 24-volt power to vehicle electrical system.
- 18 *Slave receptacle* is located at outside front of battery box. It is the connecting point for the slave cable for slave-starting the vehicle.



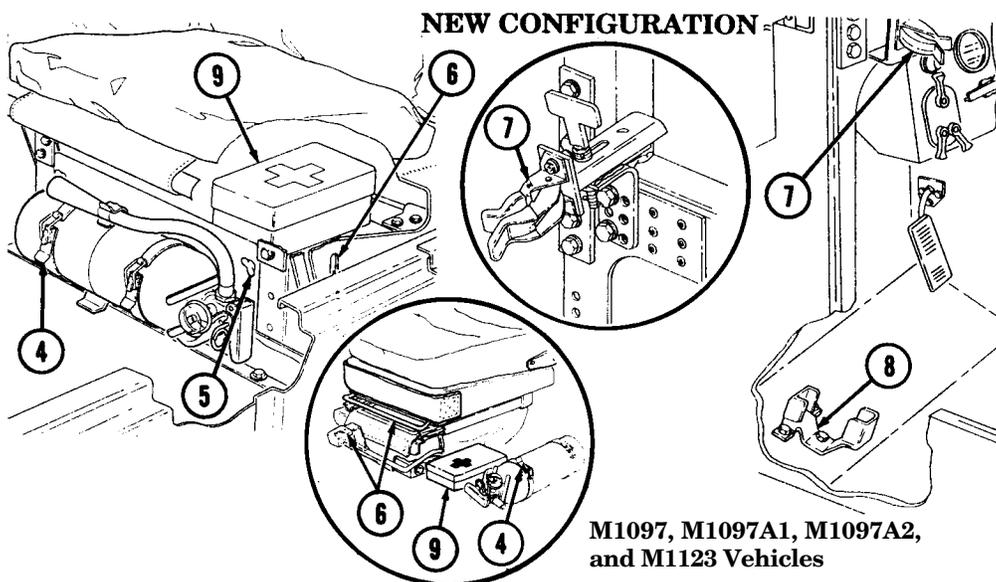
TM 9-2320-280-10

KEY ITEM AND FUNCTION

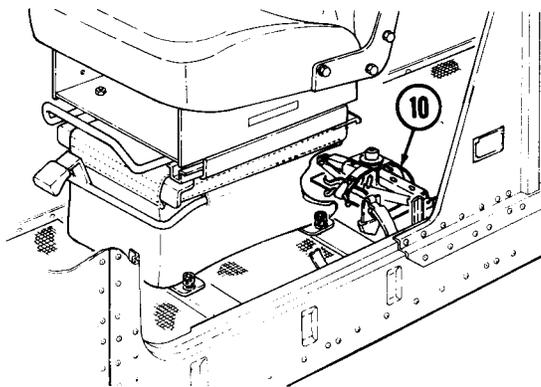
- 1 *Engine access cover* is removed to provide access to rear of engine.
- 2 *Radio rack* serves as mounting point for AN/GRC-160 or AN/VRC-12 radios.
- 3 *Microphone bracket* serves as mounting point for microphone.



- 4 *Fire extinguisher bracket* is located under front of driver's seat and is the stowage location for fire extinguisher. For new configuration vehicles, the bracket is located on the side of the driver's seat.
- 5 *Wing head screws* (two each) secure front access plate for stowage area under driver's seat.
- 6 *Driver's seat adjusting slots* permit driver's seat to be locked in a forward or rearward position. For the new configuration vehicles, the adjusters are located on front of driver's seat.
- 7 *Catch assembly* holds M16A1 rifle safely in place for travel. Adjustable catch assembly configuration holds M16A1 rifle when positioned all the way in or M203 grenade launcher when extended out.
- 8 *Stock brace* holds stock end of M16A1 rifle or M203 grenade launcher in position for travel.
- 9 *First aid kit* is located underneath the driver's seat and is used for crew emergency first aid treatment.



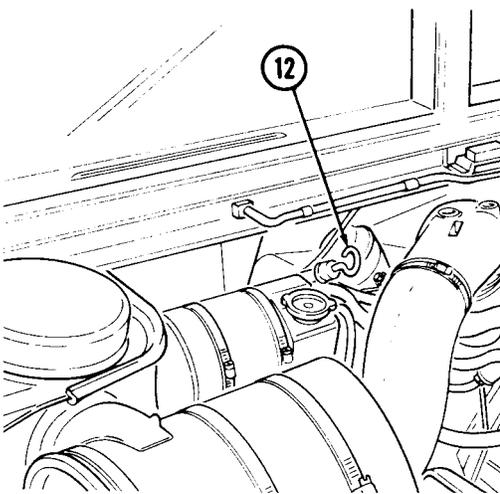
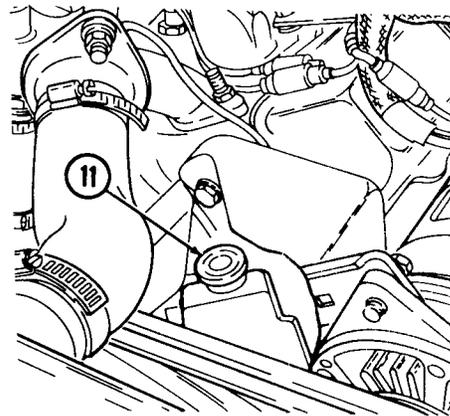
**M1097, M1097A1, M1097A2,
and M1123 Vehicles**



- 10 *Jack retaining strap (M1097 only) is located behind the driver's seat and is used to secure the jack firmly to the vehicle floor.*

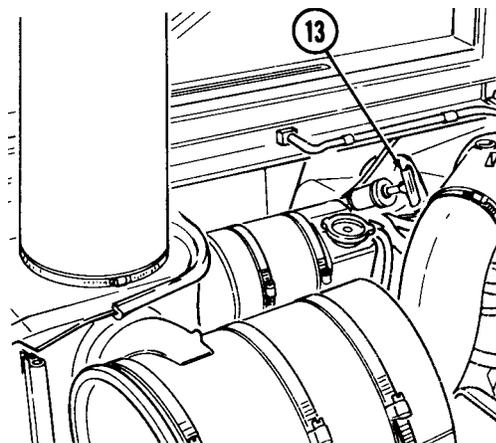
b. Engine Compartment

- 11 *Power steering fluid reservoir cap / dipstick (located left front of engine) is removed to fill and/or check power steering fluid level.*



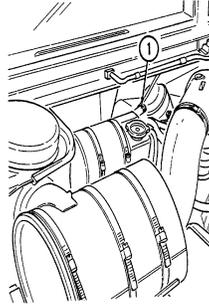
- 12 *Transmission oil dipstick (on vehicles without deep water fording kit) is located right rear of engine and removed to check transmission fluid level.*

- 13 *Transmission oil dipstick (on vehicles with deep water fording kit) is located right rear of engine and removed to check transmission fluid level.*

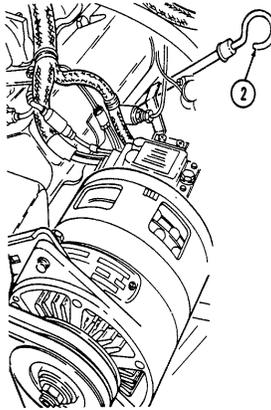


KEY ITEM AND FUNCTION

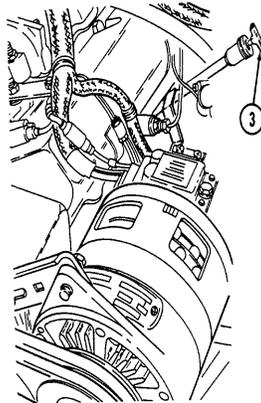
- 1 *Transmission oil dipstick tube* (located right rear of engine) is fill point for transmission fluid.



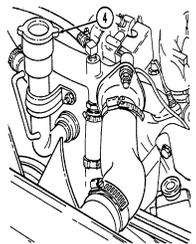
- 2 *Engine oil dipstick* (on vehicles without deep water fording kit) is located behind alternator on left side of engine and removed to check engine oil level.



- 3 *Engine oil dipstick* (on vehicles with deep water fording kit) is located behind alternator on left side of engine and is removed to check engine oil level.

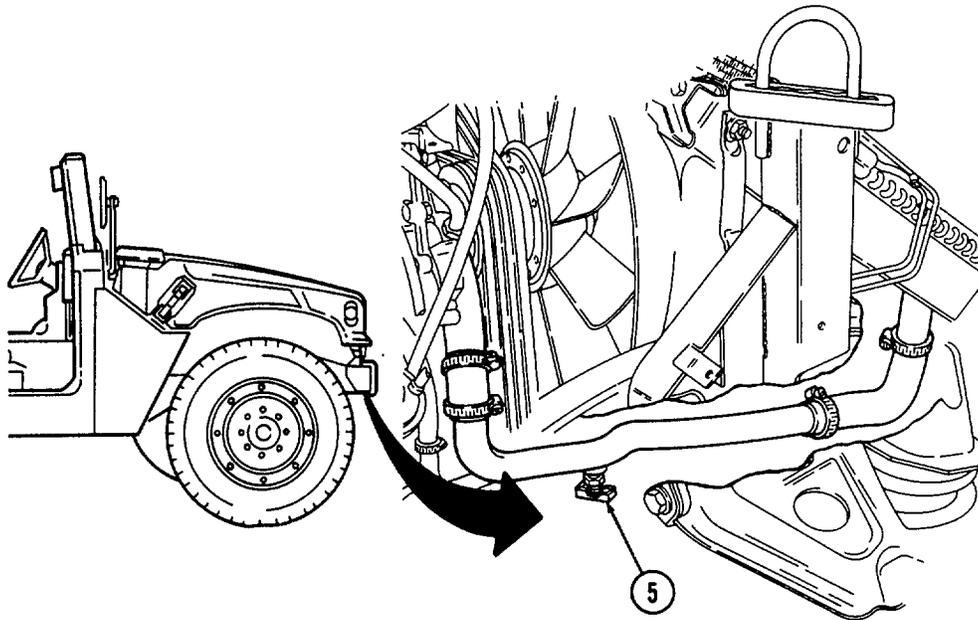


- 4 *Engine oil filler cap* (located front center of engine) is removed from oil filler neck to add oil to engine.

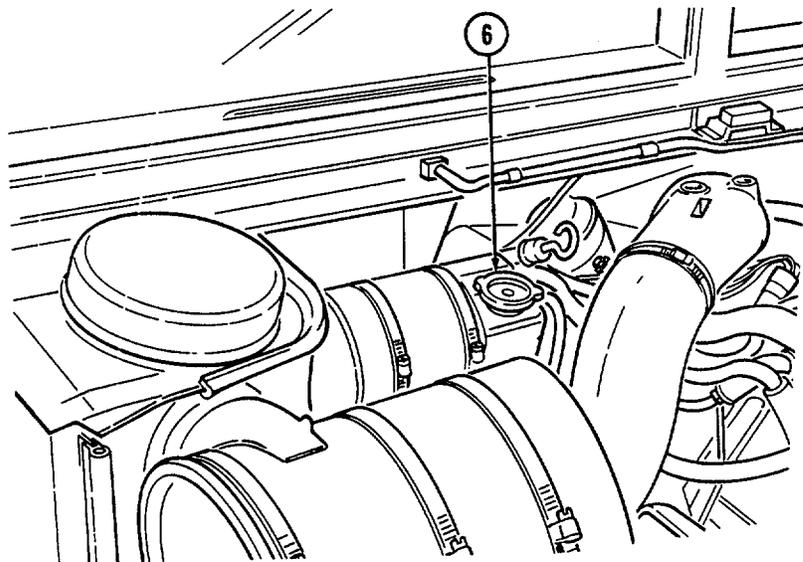


KEY ITEM AND FUNCTION

- 5 *Radiator drainvalve* (located beneath right front of engine on lower radiator crossover pipe) is turned counterclockwise to drain coolant from the radiator.

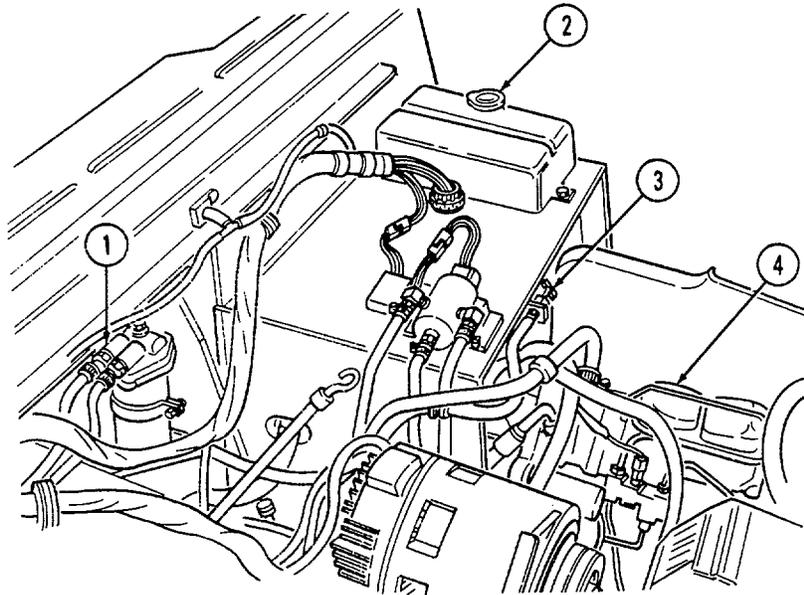


- 6 *Coolant surge tank cap* (located right rear of engine) is removed from surge tank to add coolant to cooling system.

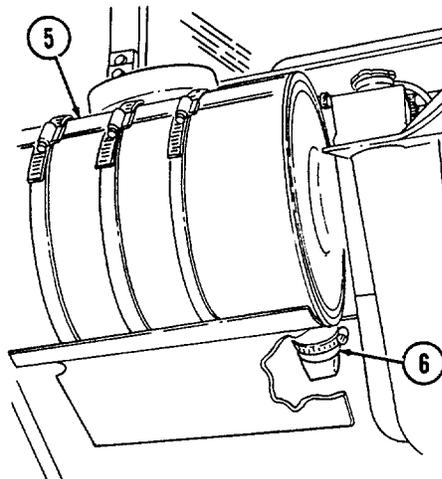


KEY ITEM AND FUNCTION

- 1 *Fuel filter* (located left rear of engine on firewall) filters water from fuel system.
- 2 *Windshield washer reservoir cap* (located left rear of engine) unsnaps to add windshield washer fluid to reservoir.
- 3 *Fuel filter drainvalve* (located left rear of engine compartment on cowl, beneath and in front of windshield washer reservoir) is draining point for water collected in fuel filter.
- 4 *Master cylinder cover* (located left of engine) is removed to fill and/or check brake fluid level.

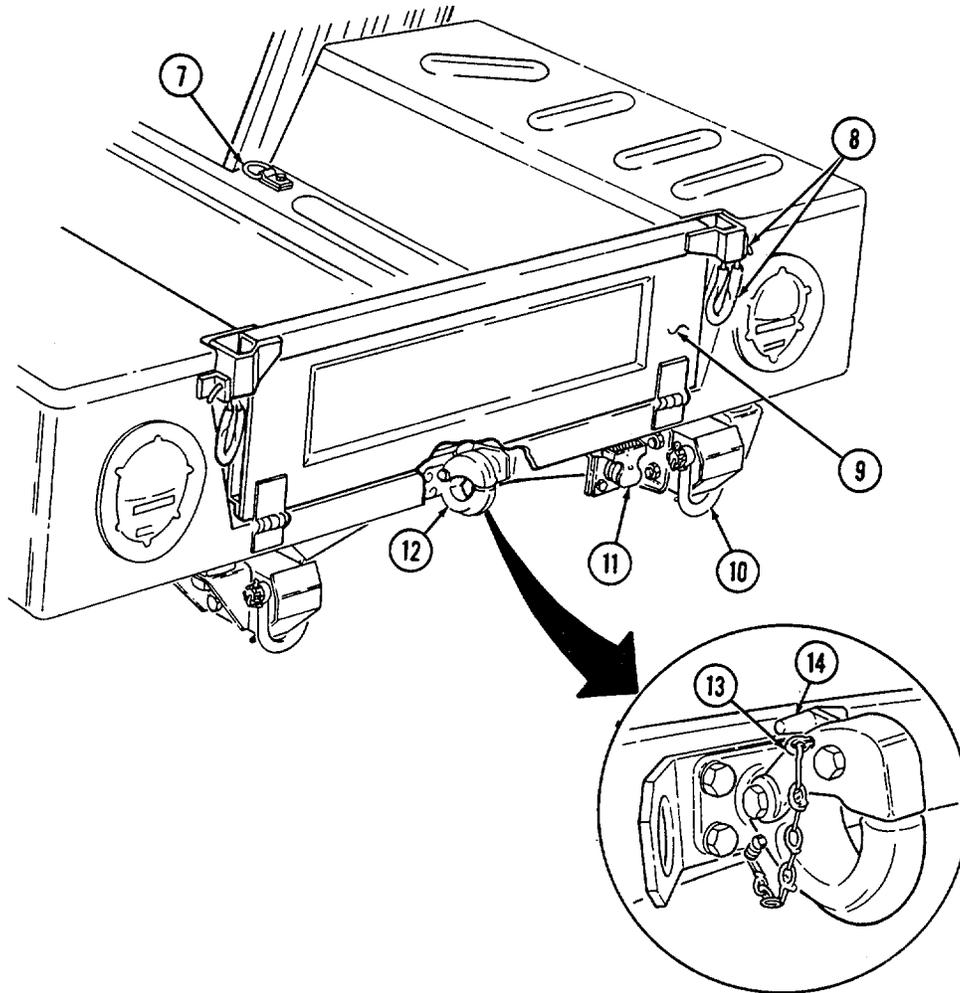


- 5 *Air cleaner assembly* (located right rear of engine) houses air cleaner element which filters dirt and dust from air before it enters combustion chamber.



- 6 *Air cleaner dump valve* when squeezed, releases dirt, mud, or water from air cleaner body assembly.

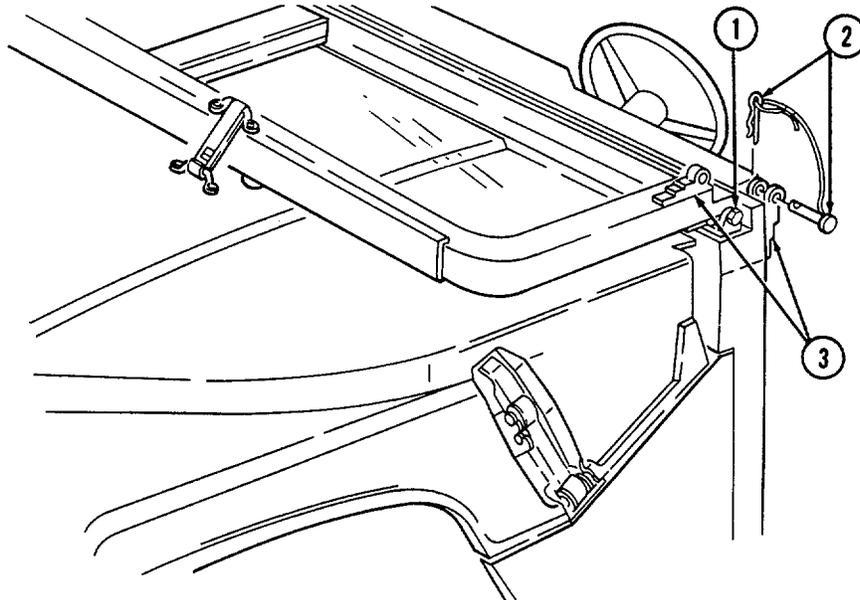
c. **Vehicle Exterior.**



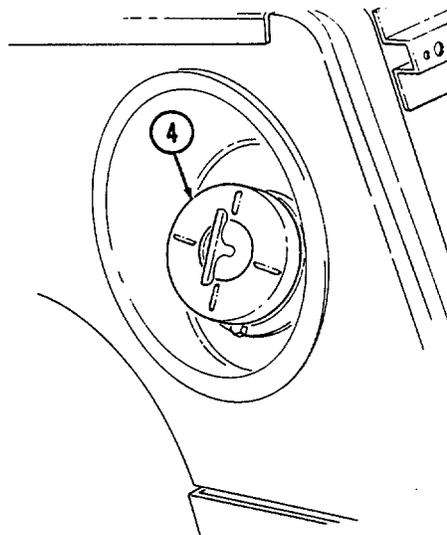
KEY ITEM AND FUNCTION

- 7 *Cargo tiedowns* (eight each) provide tiedown points for use in cargo operations (M998, M998A1, M1038, and M1038A1 only).
- 8 *Tailgate chains and hooks* secure tailgate to rear of vehicle body (all except M996, M996A1, M997, M997A1, and M997A2).
- 9 *Tailgate* opens and closes to allow access to vehicle cargo area (all except M996, M996A1, M997, M997A1, and M997A2).
- 10 *Lifting shackles* (located at front and rear of vehicle) are used to lift or tie down vehicle.
- 11 *Trailer receptacle* provides electrical power for towed equipment.
- 12 *Towing pintle* (rear bumper) provides connection point for towing.
- 13 *Pintle pin* locks pintle latch to towing pintle.
- 14 *Pintle latch* pulls up to open towing pintle and pushes down to lock towing pintle.

KEY ITEM AND FUNCTION



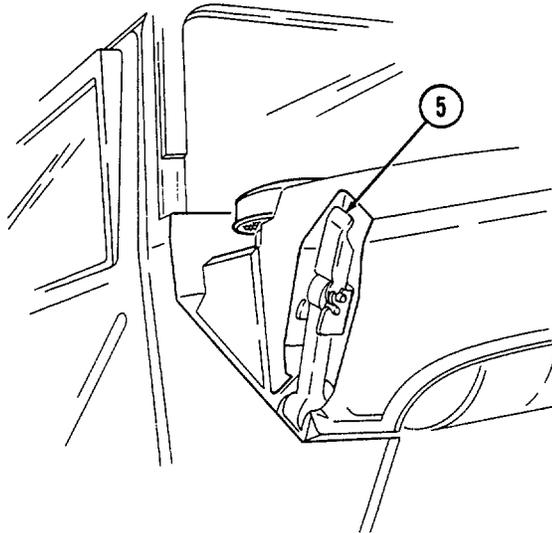
- 1 *Windshield folddown hinges* (soft top models only) are used as a hinge point when lowering windshield. Hinge pins are removed when detaching windshield assembly.
- 2 *Hitch pin and hinge pin* are removed to allow windshield to be lowered or detached.
- 3 *Windshield hinges* (soft top models only) secure windshield in the raised (up) position with hinge pins installed. Hinge pins are removed when lowering or detaching windshield.



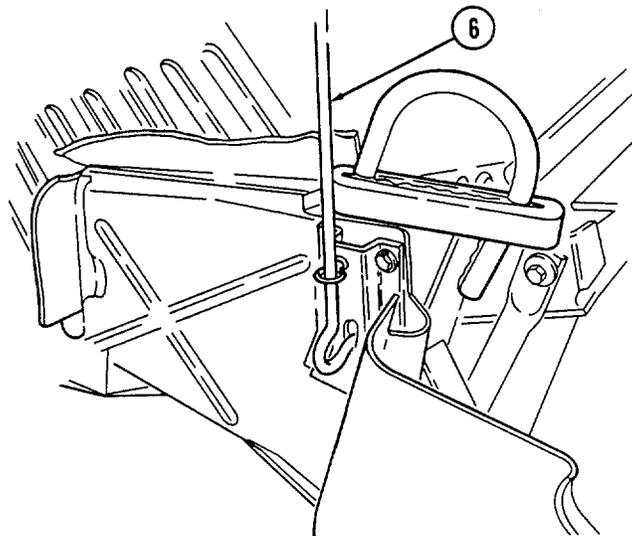
- 4 *Fuel tank filler cap* (located at right rear side of vehicle) is removed to permit fuel servicing.

KEY ITEM AND FUNCTION

- 5 *Hood latches (one on each side of hood) unlatch to release hood.*



- 6 *Hood support rod supports hood in the raised position.*



d. **TOW Carrier (M966, M996A1, M1036, M1045, M1045A1, M1045A2, M1046, and M1046A1) Equipment.**

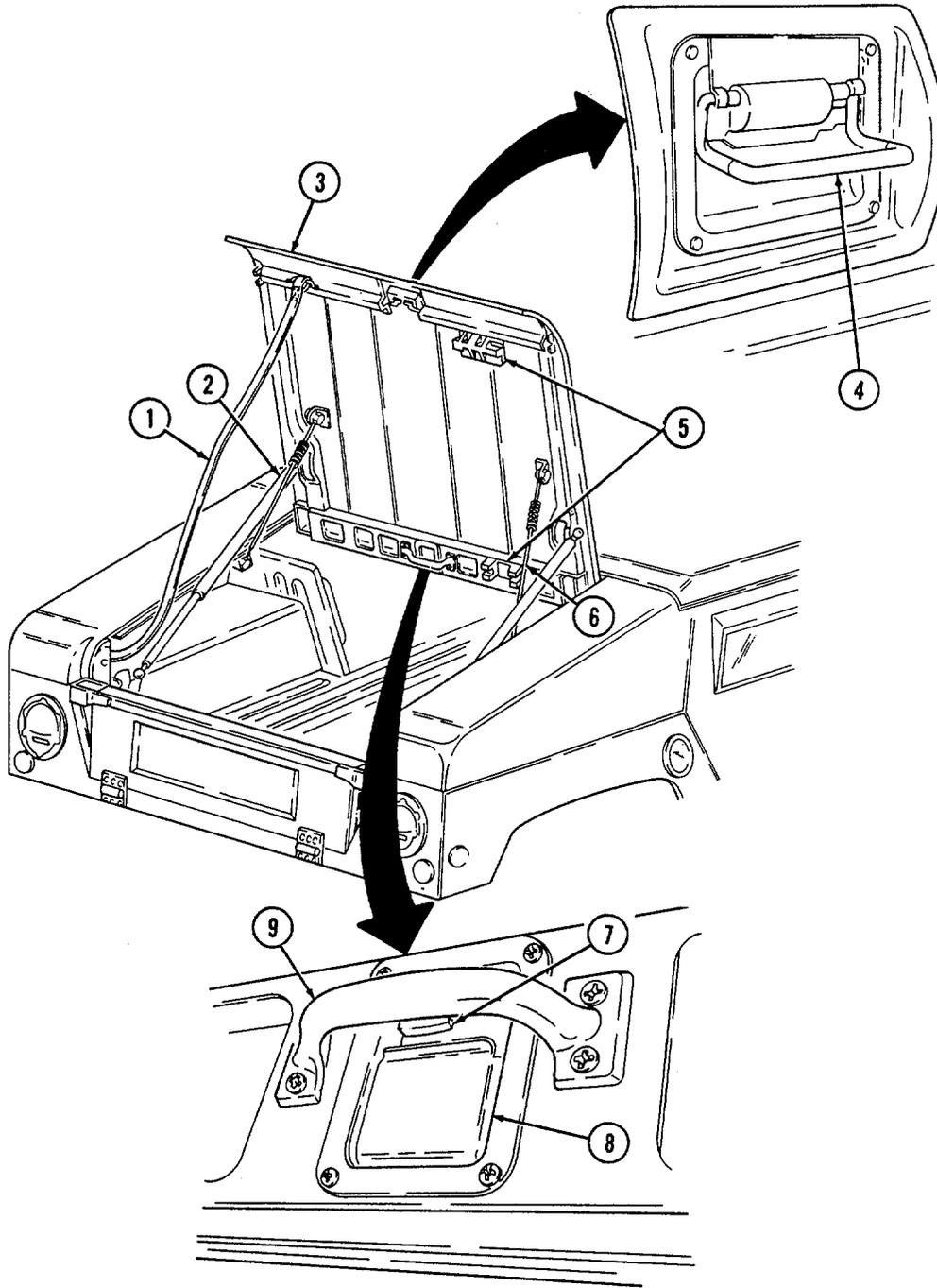
WARNING

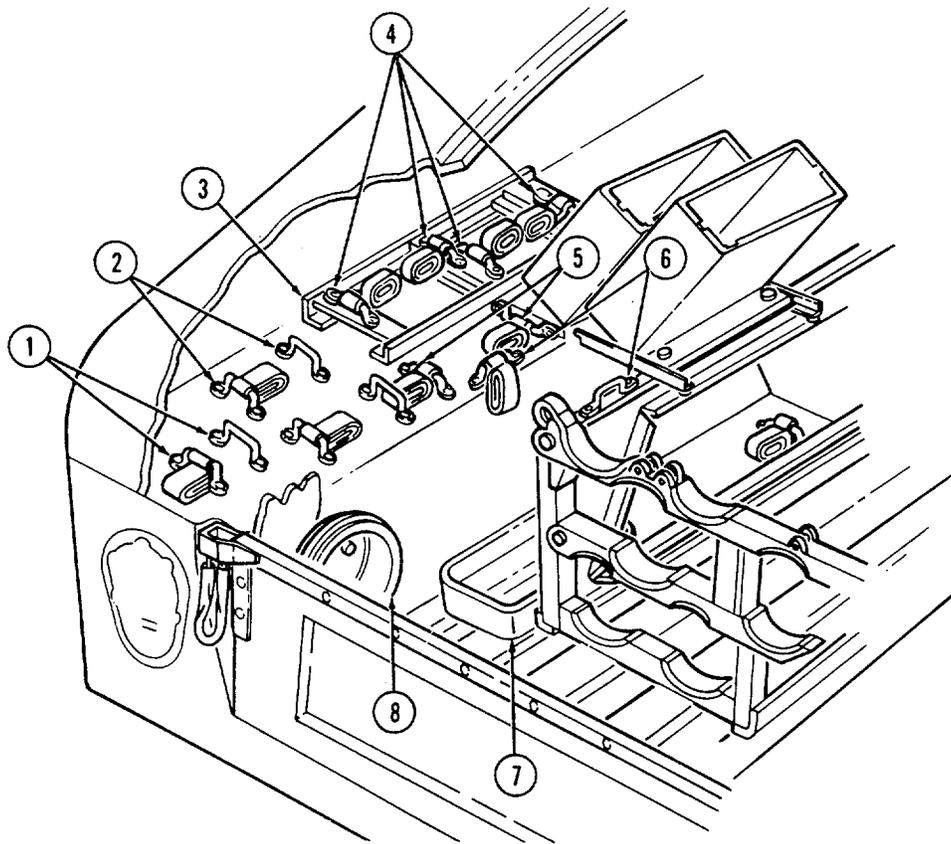
Never open one end of the cargo shell door without first ensuring that the opposite end is securely closed. Not doing so may cause both ends to open at same time causing damage to equipment, mission abort, or injury to personnel.

NOTE

This manual identifies HMMWV equipment which permits the mounting and operation of the TOW launcher system. Specific instructions for employing the TOW and TOW 2 launcher on the HMMWV are covered in TM 9-1425-450-12 and TM 9-1425-472-12.

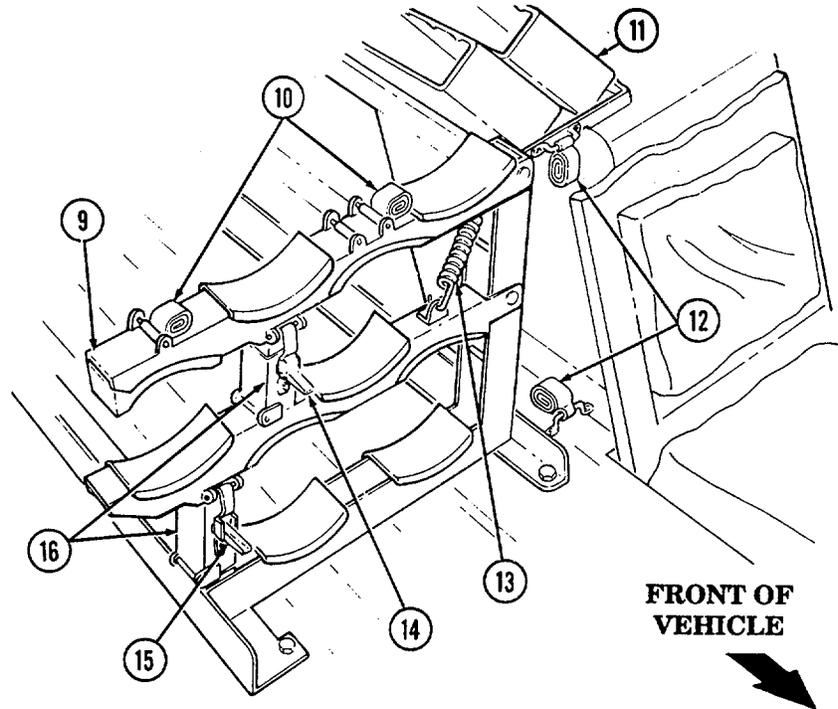
KEY	ITEM AND FUNCTION
1	<i>Cargo shell door strap</i> serves as a grab strap to lower cargo shell door.
2	<i>Cargo shell door assist cylinders</i> provide a lift boost for raising and holding cargo shell door open.
3	<i>Cargo shell door</i> is a double-actuating door which pivots at either end. When door forward latch is released from inside vehicle, door opens rearward and functions as a TOW loader's door to facilitate mounting of TOW launcher and missile loading. When door rear latch is released, door opens forward and permits access to cargo area from rear of vehicle for stowing TOW launcher and equipment or ground mounting TOW launcher.
4	<i>Cargo shell door rear latch</i> is pulled upward to open cargo shell door from rear of vehicle.
5	<i>Launch tube brackets</i> (located on underside of cargo shell door) serve as stowage points for missile launch tube.
6	<i>Cargo shell door retaining cables</i> limit cargo shell door travel when opened from either end.
7	<i>Cargo shell door forward latch locking device</i> prevents accidental opening of cargo shell door from inside vehicle.
8	<i>Cargo shell door forward latch</i> is pulled downward to open door from inside vehicle.
9	<i>Cargo shell door front grab handle</i> serves as a grabbing point for lowering door when inside vehicle.





KEY ITEM AND FUNCTION

- 1 *Telephone set footman loops (two each) and strap secure telephone set beneath rear of left cargo shell.*
- 2 *Cable reel footman loops (two each) and strap secure cable reel forward of telephone set stowage location.*
- 3 *M16 ammo box rack serves as stowage base for two M16 ammo boxes and is located forward of the cable reel stowage location.*
- 4 *M16 ammo box footman loops and straps (four each) secure two M16 ammo boxes to ammo rack.*
- 5 *Combat ration footman loops (four each) and straps (three each) secure one case of combat rations right rear of M16 ammo rack.*
- 6 *Fuel can footman loops (two each) and strap secure fuel can to fuel can stowage bracket.*
- 7 *Fuel can stowage bracket located between the left wheelhouse and missile rack permits vertical stowage of fuel can.*
- 8 *Tripod head mounting bracket secured to left rear wheelhouse permits mounting of traversing unit end of tripod in the stowed position.*



KEY ITEM AND FUNCTION

- 9 *Missile stowage rack* provides stowage for six TOW missile rounds. It consists of a base, a first tier, and a second tier. Tiers pivot upward to facilitate missile stowage and quick access to missiles during reload operations. Missiles are mounted in each rack with warheads facing front of vehicle. Missiles stowed between rack base and second tier are held in without straps. Missiles mounted on top of the second tier are secured with straps located fore and aft of rack.

- 10 *Second tier mounting straps* (four each) located fore and aft of missile rack secure two missile rounds to second tier of rack.

- 11 *Missile guidance set (MGS) battery stowage boxes* provide stowage for two MGS batteries.

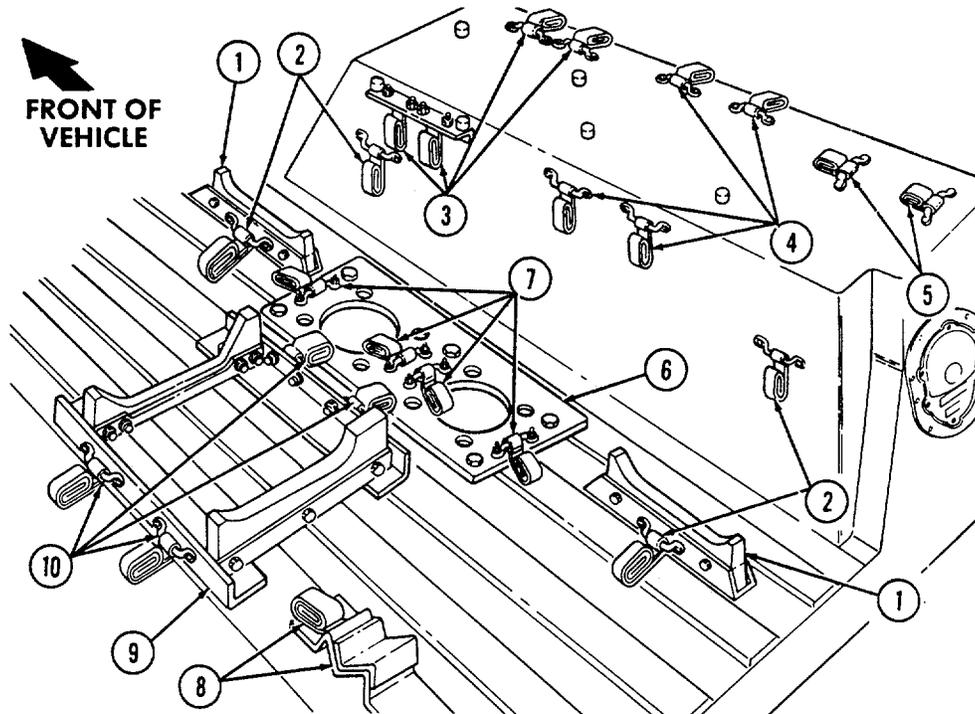
- 12 *Water can footman loops and straps* (two each) secure stowed water can between missile rack and left wheelhouse.

- 13 *Missile rack tier retaining springs* (two each) retain raised first or second tiers of missile rack to permit stowage of missiles or access to missiles for reloading operations.

- 14 *Missile rack second tier locking latches* (two each) located fore and aft of missile rack secure second tier of missile rack to first tier of missile rack.

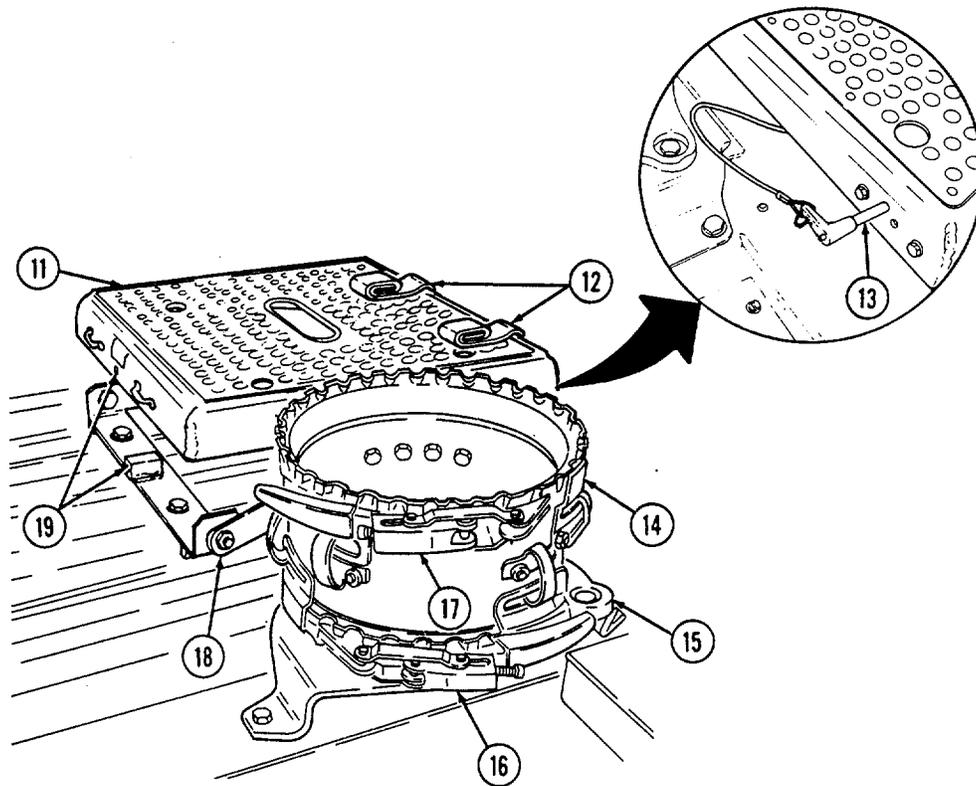
- 15 *Missile rack first tier locking latches* (two each) located right side of missile rack secure first tier of missile rack to rack base.

- 16 *Missile rack support braces* (two each) support first and second missile rack tiers and pivot to outside to allow easy access to missiles for stowage or reloading.



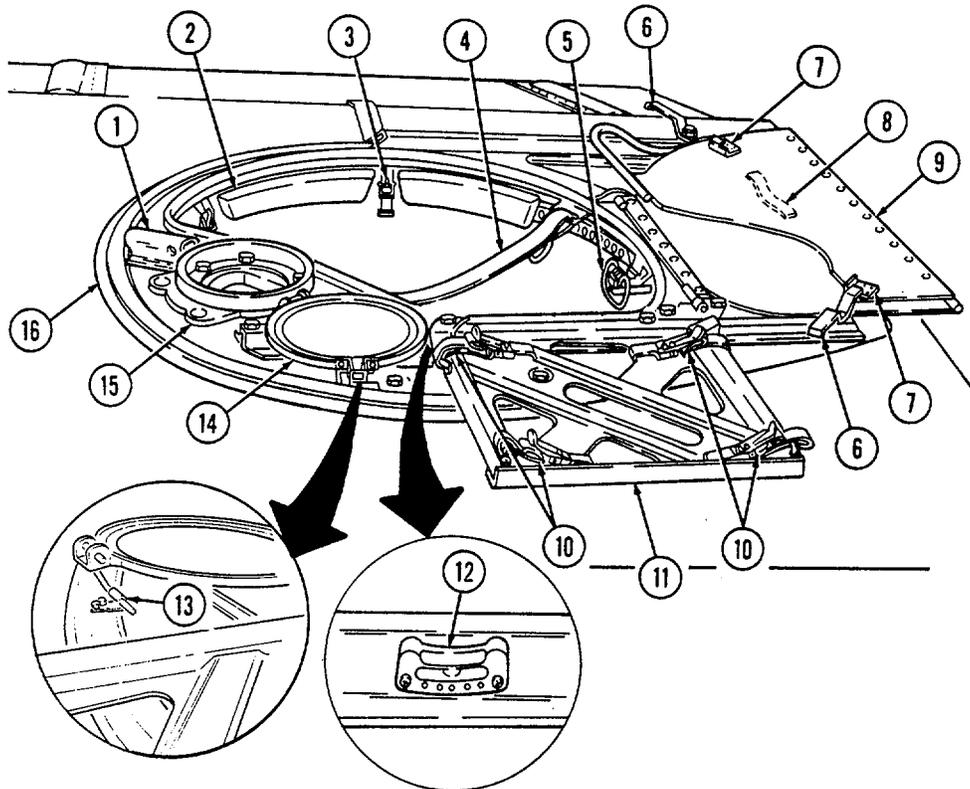
KEY ITEM AND FUNCTION

- 1 *Night sight battery case stowage brackets* (two each) provide mounting locations for night sight battery cases.
- 2 *Night sight battery case footman loops and straps* (four each) secure two night sight battery cases to night sight battery case stowage brackets.
- 3 *Night sight battery case mounting bracket footman loops* (two each) and straps (four each) provide stowage of night sight case to top front of right wheelhouse.
- 4 *Boresight collimator case footman loops and straps* (four each) secure boresight collimator case to top rear of right wheelhouse.
- 5 *Combat ration footman loops and straps* (two each) secure one case of combat rations.
- 6 *Night sight coolant cartridge case stowage bracket* provides mounting location for night sight coolant cartridge cases.
- 7 *Night sight coolant cartridge case footman loops and straps* (four each) secure two night sight coolant cartridge cases to night sight coolant cartridge case stowage bracket.
- 8 *Tripod legs mounting bracket and strap* provide stowage for leg end of tripod.
- 9 *Day sight and carrying bag stowage bracket* provide stowage location for day sight and carrying bag in front of tripod.
- 10 *Day sight and carrying bag footman loops and straps* (four each) secure day sight to day sight stowage bracket.



KEY ITEM AND FUNCTION

- 11 *Gunner's platform* provides an adjustable non-slip platform for TOW gunner. Also serves as mounting base for the MGS in the stowed position.
- 12 *Missile guidance set footman loops and straps* secure MGS to the gunner's platform during extended travel mode.
- 13 *Gunner's platform locking pins* (two each) secure gunner's platform to selected height risers.
- 14 *Traversing unit (TU) mount adapter* adapts TU to the TU stowage pedestal or weapon station pedestal mount.
- 15 *Traversing unit stowage pedestal* provides mounting base for TU mount adapter.
- 16 *Lower traversing unit mount adapter clamp* secures TU mount adapter to the stowage pedestal or weapon station pedestal mount.
- 17 *Upper traversing unit mount adapter clamp* secures TU to TU mount adapter.
- 18 *Gunner's platform risers* provide support and height adjustment for gunner's platform.
- 19 *Gunner's platform locking lugs and holes* (two each) secure gunner's platform to fully lowered position when locking pin is installed.



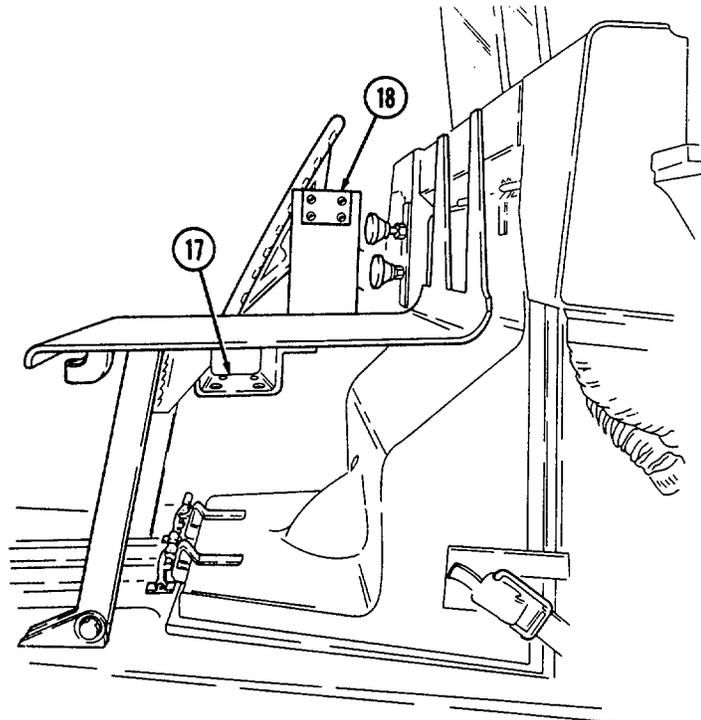
KEY

ITEM AND FUNCTION

- 1 *Turret positioning handle* provides positive right-hand grip to rotate weapon station. Hole in handle serves as securing point for weapon station pedestal mount cover.
- 2 *Gunner's backrest* provides back support for a gunner positioned in weapon station.
- 3 *Hatch cover securing latches* (three each) secure cover to weapon station.
- 4 *Gunner's sling* serves as seat rest or restraint for a gunner positioned in weapon station.
- 5 *Weapon station brake handle* locks the weapon station at the gunner's desired azimuth. Handle is placed in the down position for locking and pulled up when traversing the weapon station.
- 6 *Hatch cover retaining latches* (two each) secure to latch catches for retaining station cover in the open position.
- 7 *Hatch cover retaining catches* (two each) are connection points for retaining latches.
- 8 *Hatch cover handle* is grab handle to assist gunner in opening and closing station cover.
- 9 *Weapon station hatch cover* provides sealed protective covering for roof opening when TOW is not mounted to weapon station.

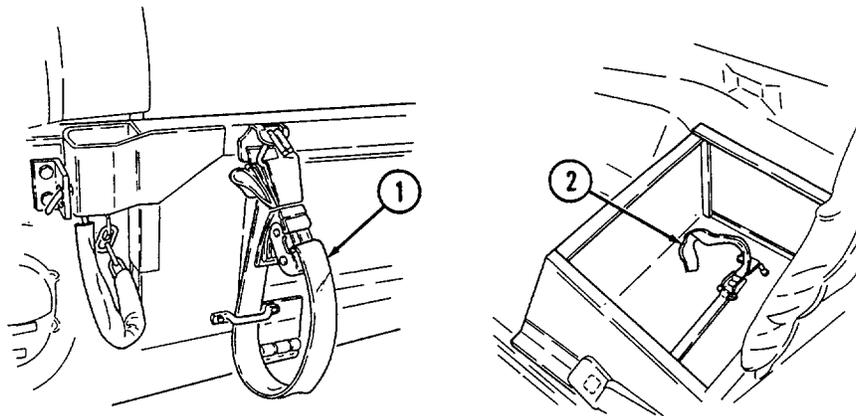
KEY ITEM AND FUNCTION

- 10 *Missile guidance set retaining latches* (four each) secure MGS to MGS weapon station mounting tray.
- 11 *Missile guidance set weapon station mounting tray* is mounting point for the MGS when the TOW launcher is assembled on the weapon station.
- 12 *TOW carrier level gauge (inclinometer)* measures levelness of the vehicle to alert TOW crew when vehicle is beyond recommended side slope operation.
- 13 *Weapon station pedestal mount cover retainer* secures pedestal mount cover in the open position.
- 14 *Weapon station pedestal mount cover* protects pedestal mount opening when TOW launcher is not mounted.
- 15 *Weapon station pedestal mount* is mounting point for TU adapter bracket and TOW launcher.
- 16 *Weapon station* serves as rotating mounting platform for TOW components during the launcher mode of operation. It can be continuously rotated 360° without vehicle power conditioner (VPC) cables connected.
- 17 *Vehicle power conditioner (VPC) mounting plate* provides a mounting point for the VPC. This bracket is mounted to the radio rack.
- 18 *Field glasses bracket* serves as mounting point for field glasses.

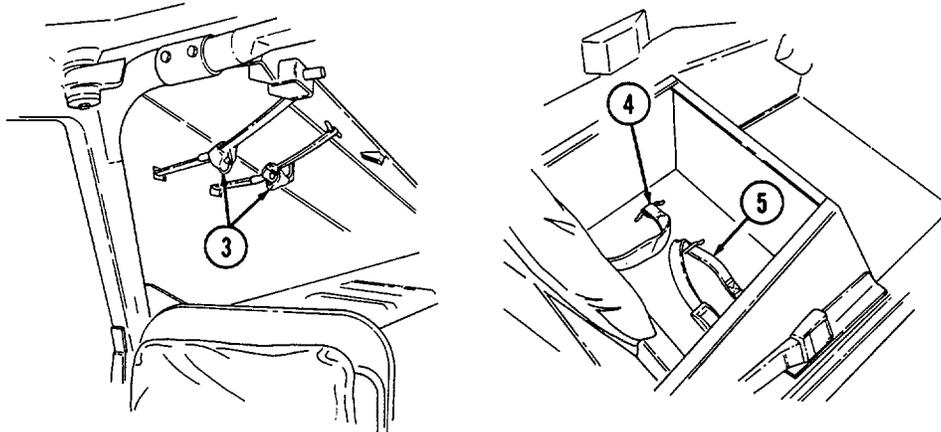


KEY ITEM AND FUNCTION

- 1 *Camouflage screen stowage straps* (four each) secure camouflage screen and support to tailgate.
- 2 *NBC overgarments straps* (two each) secure two sets of NBC overgarments and four sets of gloves to floor (under left rear passenger seat).



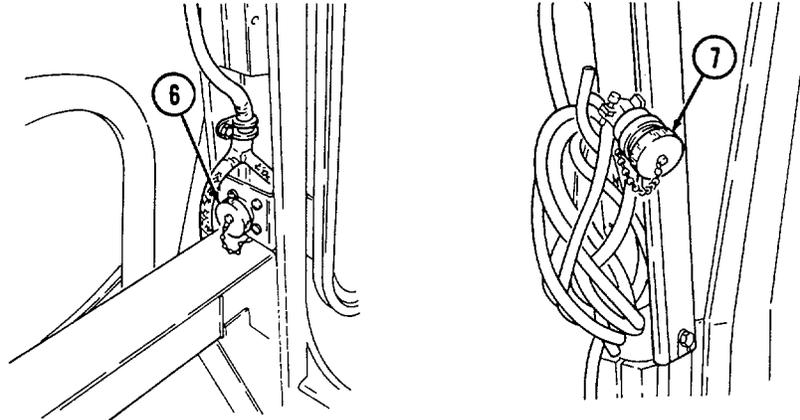
- 3 *NBC overgarments straps* (eight each) secure two sets of overgarments (one set on each side) to cargo shell.
- 4 *Night sight vision goggles stowage straps* secure two sets of night sight vision goggles to floor (under right rear passenger seat).
- 5 *Radiac meter stowage straps* secure radiac meter to floor (under right rear passenger seat).



KEY ITEM AND FUNCTION

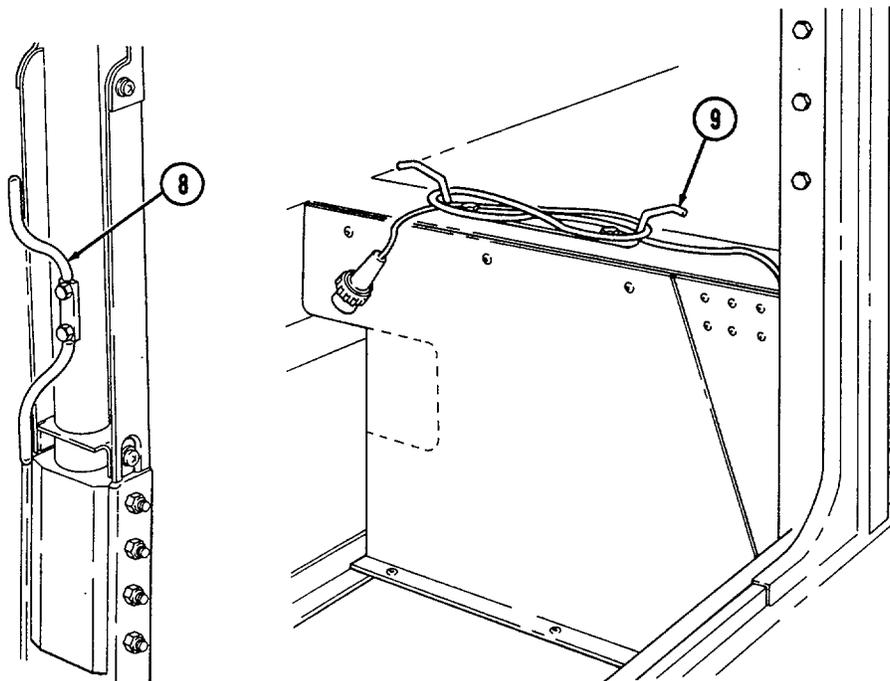
6 *Power connector* is located lower right side of "B" pillar and supplies power for vehicle power conditioner (VPC).

7 *Power conditioner cable* supplies vehicle power to TOW launcher equipment.

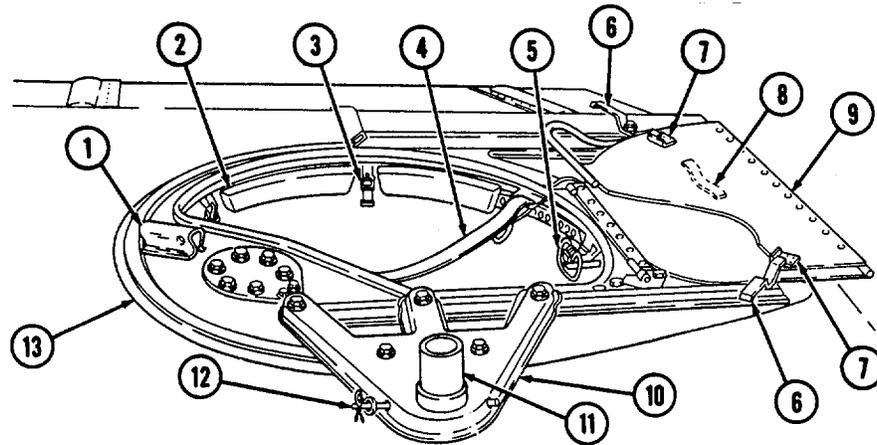


8 *Vehicle power conditioner cable cleat* (for vehicles with serial numbers 99,999 and below) secures the VPC cable to the inner right side of the "B" pillar when the cable is not connected to the power conditioner.

9 *Vehicle power conditioner cable cleat* (for vehicles with serial numbers 100,000 and above) secures the VPC cable behind the passenger seat when the cable is not connected to the power conditioner.



- e. **Armament Carrier (M1025, M1025A1, M1025A2, M1026, M1026A1, M1043, M1043A1, M1043A2, M1044, and M1044A1) Equipment.**

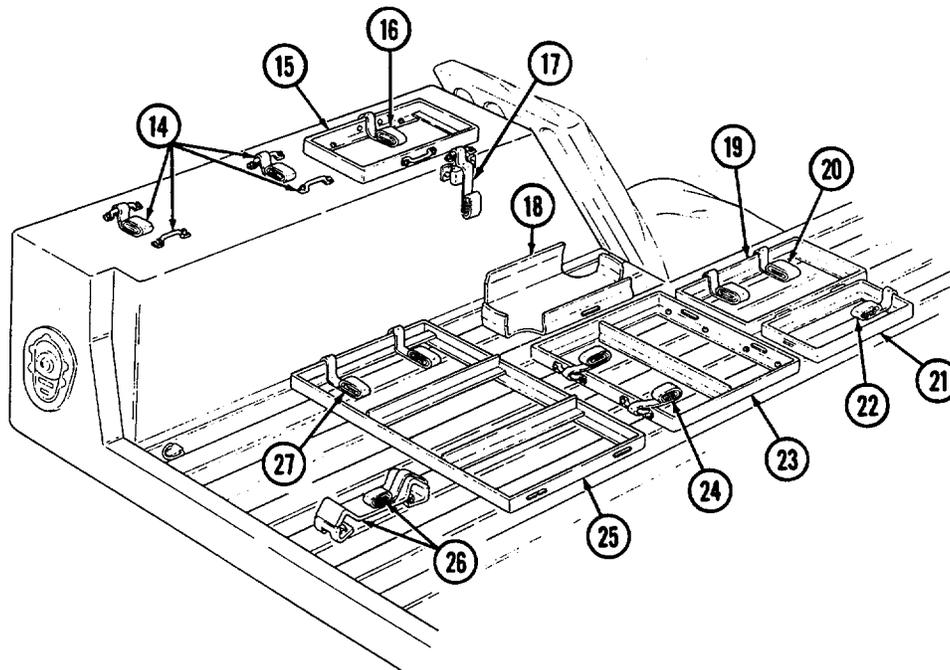


KEY ITEM AND FUNCTION

- 1 *Turret positioning handle* provides positive right-hand grip to rotate weapon station.
- 2 *Gunner's backrest* provides back support for a gunner positioned in weapon station.
- 3 *Hatch cover securing latches* (three each) secure cover to weapon station.
- 4 *Gunner's sling* serves as seat rest or restraint for a gunner positioned in weapon station.
- 5 *Weapon station brake handle* locks the weapon station at the gunner's desired azimuth. Handle is placed in the down position for locking.
- 6 *Hatch cover retaining latches* (two each) secure to latch catches for retaining station cover in the open position.
- 7 *Hatch cover retaining catches* (two each) are connection points for retaining latches.
- 8 *Hatch cover handle* is grab handle to assist gunner in opening and closing station cover.
- 9 *Weapon station hatch cover* provides sealed protective covering for roof opening when weapons are not mounted to weapon station.
- 10 *Armament mount* is mounting bracket for weapon adapter.
- 11 *Universal weapons adapter* provides mounting base for the M60 7.62 mm machine gun, M2 caliber .50 machine gun, and MK19 grenade launcher.
- 12 *Universal weapons adapter pin assembly* secures weapon adapter to the armament mount.
- 13 *Weapon station* serves as rotating mounting platform for weapon components. Can be continuously rotated 360 degrees.

NOTE

Operation and identification of cargo shell door components and gunner's platform can be found in para. 2-2d.

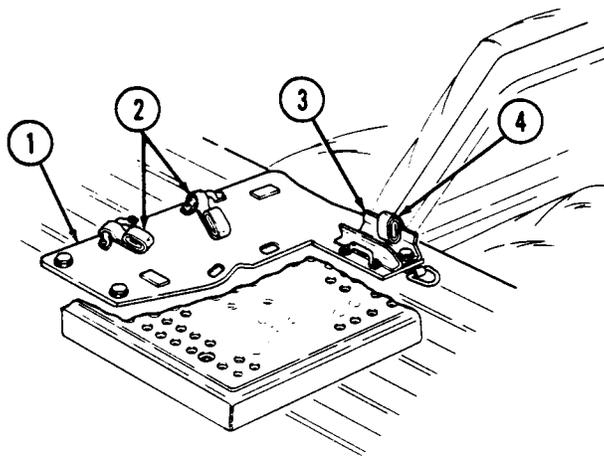


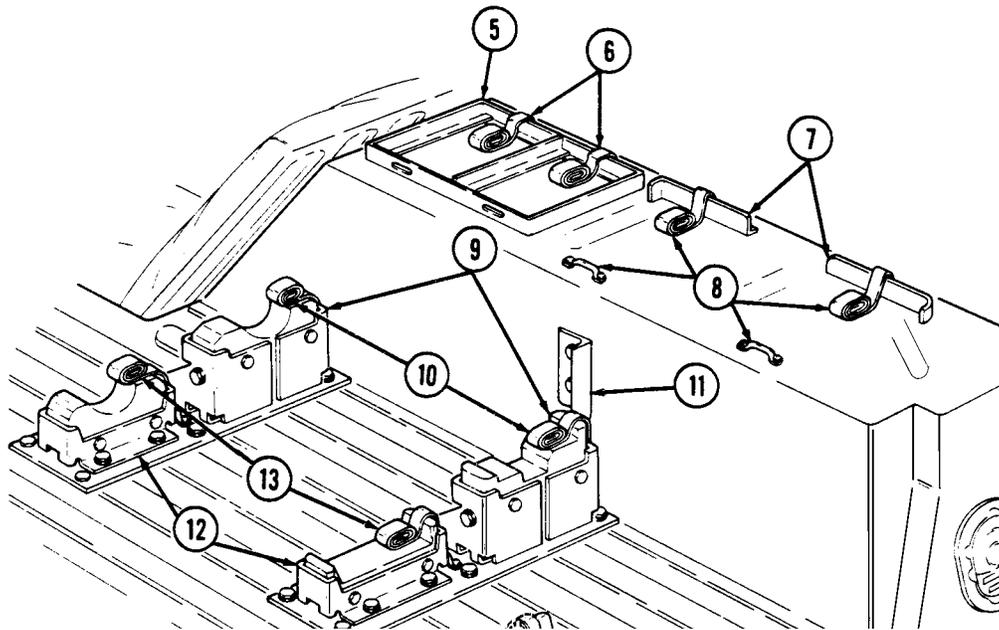
KEY ITEM AND FUNCTION

- 14 *Spare barrel and cleaning kit footman loops and straps (two each) secure spare barrel and cleaning kit for M2 caliber .50 machine gun.*
- 15 *Ammo box rack provides stowage base for caliber .50 ammo box.*
- 16 *Ammo box footman loop and strap secure caliber .50 ammo box to ammo box rack.*
- 17 *Water can footman loop and strap secure 5 gal. water can to water can bracket;*
- 18 *Water can bracket provides stowage base for 5 gal. water can.*
- 19 *Ammo box rack provides stowage base for 40 mm ammo box.*
- 20 *Ammo box footman loops and straps (two each) secure 40 mm ammo box to ammo box rack.*
- 21 *Ammo box rack provides stowage base for caliber .50 ammo box.*
- 22 *Ammo box footman loop and strap secure caliber .50 ammo box to ammo box rack.*
- 23 *Ammo box rack provides stowage base for two 40 mm ammo boxes.*
- 24 *Ammo box footman loops and straps (two each) secure two 40 mm ammo boxes to ammo box rack.*
- 25 *Ammo box rack provides stowage base for three 40 mm ammo boxes.*
- 26 *Tripod mounting bracket and straps (two each) provide stowage for M3 tripod.*
- 27 *Ammo box footman loops and straps (two each) secure three 40 mm ammo boxes to ammo box rack.*

KEY ITEM AND FUNCTION

- 1 *Gun mount adapter plate* provides mounting base for stowage of 40 mm gun mount adapter.
- 2 *Gun mount footman loops and straps* (two each) secure 40 mm gun mount adapter to gun mount adapter plate.
- 3 *Pintle adapter bracket* provides mounting base for stowage of pintle adapter.
- 4 *Pintle adapter footman loop and strap* secure pintle adapter to pintle adapter bracket.
- 5 *Ammo box rack* serves as stowage base for two caliber .50 ammo boxes.
- 6 *Ammo box footman loops and straps* (two each) secure two caliber .50 ammo boxes to ammo box rack.
- 7 *Night sight case stowage brackets* (two each) provide mounting for night sight case.
- 8 *Night sight case footman loops and straps* (two each) secure night sight case to night sight stowage brackets.
- 9 *Grenade launcher stowage brackets* (two each) provide mounting base for stowage of MK19 grenade launcher.
- 10 *Grenade launcher straps and footman loops* (two each) secure MK19 grenade launcher to grenade launcher stowage brackets.
- 11 *Gun stop* restricts movement of stowed MK19/40 mm grenade launcher.
- 12 *Machine gun mounting brackets* (two each) provide mounting base for stowage of M2 caliber .50 machine gun.
- 13 *Machine gun straps and footman loops* (two each) secure M2 caliber .50 machine gun to machine gun mounting brackets.

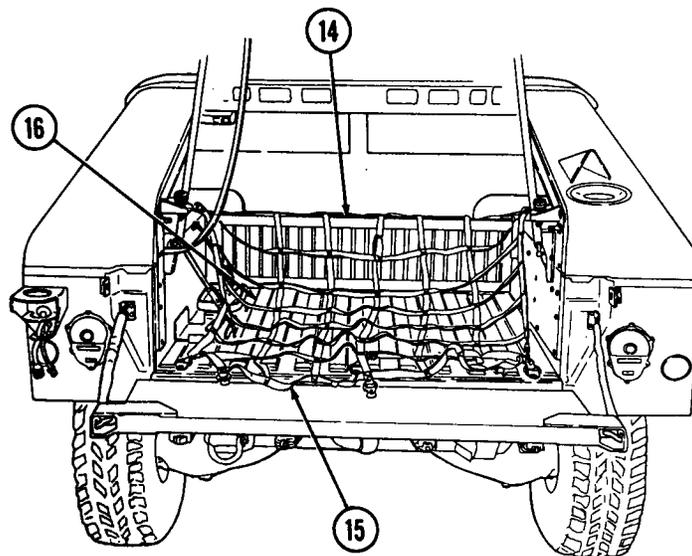




e.1. Armament Carrier (M1025, M1025A1, M1026, M1026A1) Equipment (cargo barrier and net kit)

KEY ITEM AND FUNCTION

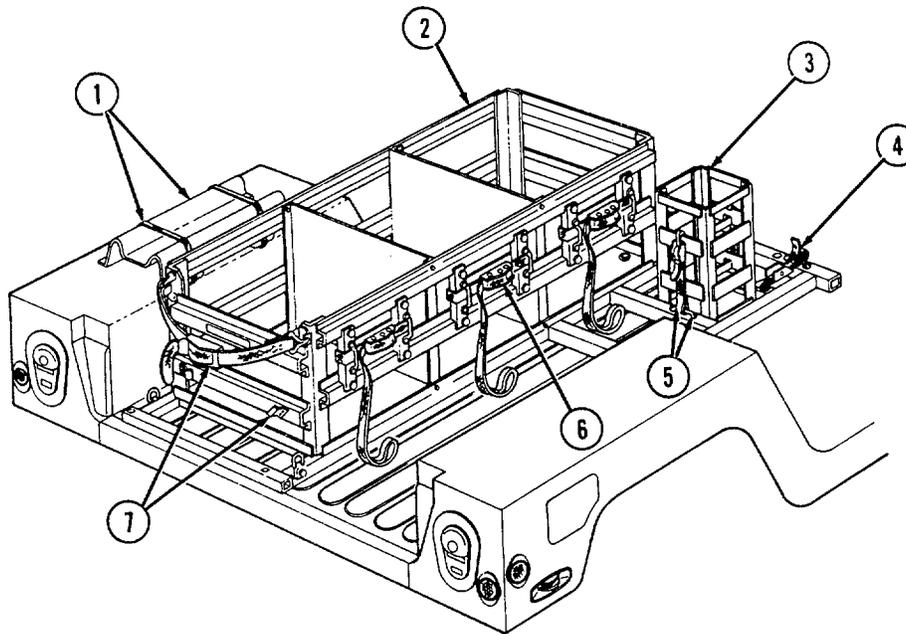
- 14 *Cargo barrier* prevents movement of cargo into the cab area during vehicle operation.
- 15 *Stowage compartment net* secures cargo to the cargo floor and limits movement of cargo during vehicle operation.
- 16 *Antiskid strips* (nine each) prevent cargo from sliding around in the cargo area.



f. **81 MM Mortar Carrier (M998, M998A1, M1038, and M1038A1) Equipment.**

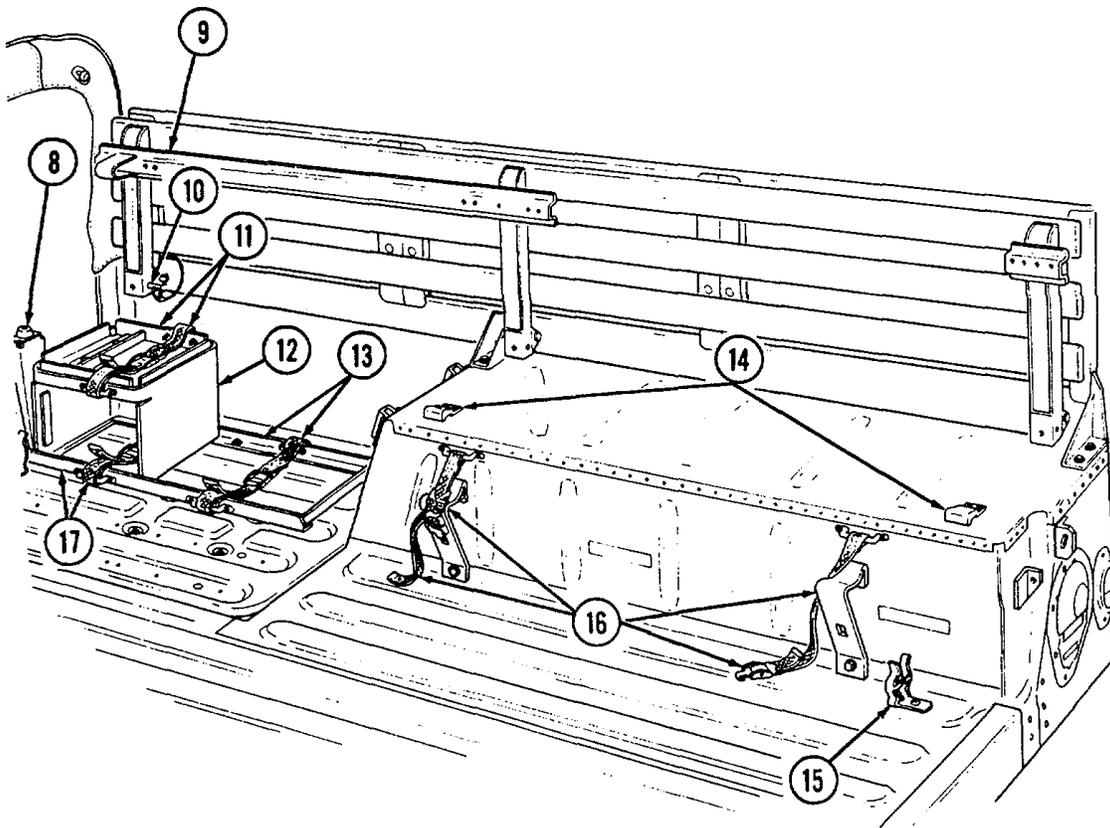
KEY ITEM AND FUNCTION

- 1 *Bipod stowage straps and tray* secure bipod assembly to the wheelhouse.
- 2 *Mortar ammunition container* provides stowage for mortar rounds and equipment.
- 3 *Four-round ready rack* provides stowage for four mortar rounds. Ready rack can be removed from mortar ammunition container and placed near firing position.
- 4 *Aiming post straps* (two each) secure aiming post and stowage bag to mortar ammunition container.
- 5 *Ready rack straps and bracket* secure four-round ready rack to mortar ammunition container.
- 6 *Ammunition straps* (three each) secure mortar ammunition in ammunition container.
- 7 *Mortar base plate stowage strap and brackets* secure mortar base plate to mortar ammunition container.



KEY ITEM AND FUNCTION

- 8 *Troop seat support* provides support for forward end of troop seat when seat is lowered.
- 9 *Troop seat* provides seating for mortar crewman.
- 10 *Lockpins* (two each) secure troop seat in raised position.
- 11 *M14 chest strap and bracket* secure M14 lighting equipment chest to mortar equipment rack.
- 12 *Mortar equipment stowage rack* provides stowage for M14 chest, tool chest, and M166 chest.
- 13 *Tool chest strap and bracket* secure tool chest to mortar equipment rack.
- 14 *Troop seat bumpers* (two each) provide support for troop seat in lowered position.
- 15 *Stowage clips* (two each) secure cleaning staff to vehicle.
- 16 *Cannon stowage straps and brackets* (two each) provide stowage for 81 mm cannon.
- 17 *M166 chest strap and bracket* secures M166 sight unit carrying case to mortar equipment rack.



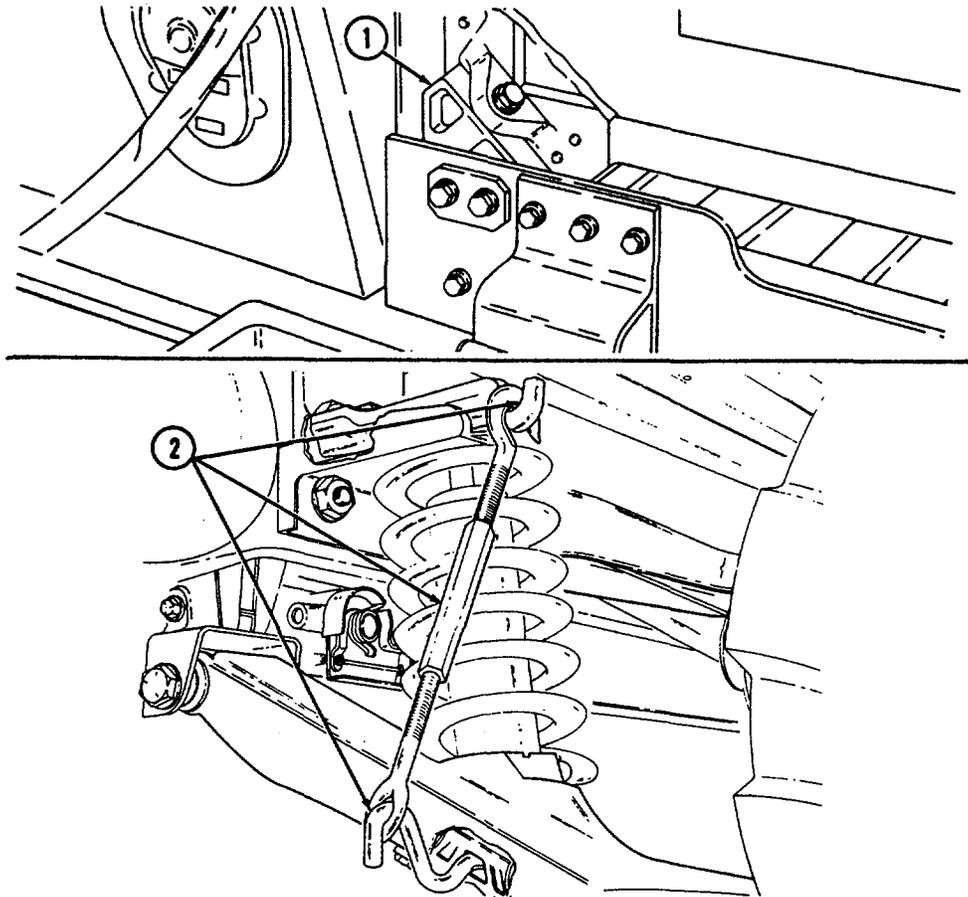
g. S250 Shelter Carrier (M1037 and M1042) Equipment.

KEY ITEM AND FUNCTION

CAUTION

The M1037 and M1042 Shelter Carriers are specifically designed to be operated with the S250 shelter installed. It can be driven safely without the shelter installed, or equivalent payload of 1500 lb (681 kg), for short distances (e.g., to and from maintenance or from the rail head when being delivered), but this should not be done often or for long distances. Driving for long distances without the shelter installed, or equivalent payload of 1500 lb (681 kg) evenly distributed in center of cargo area, will cause damage to equipment.

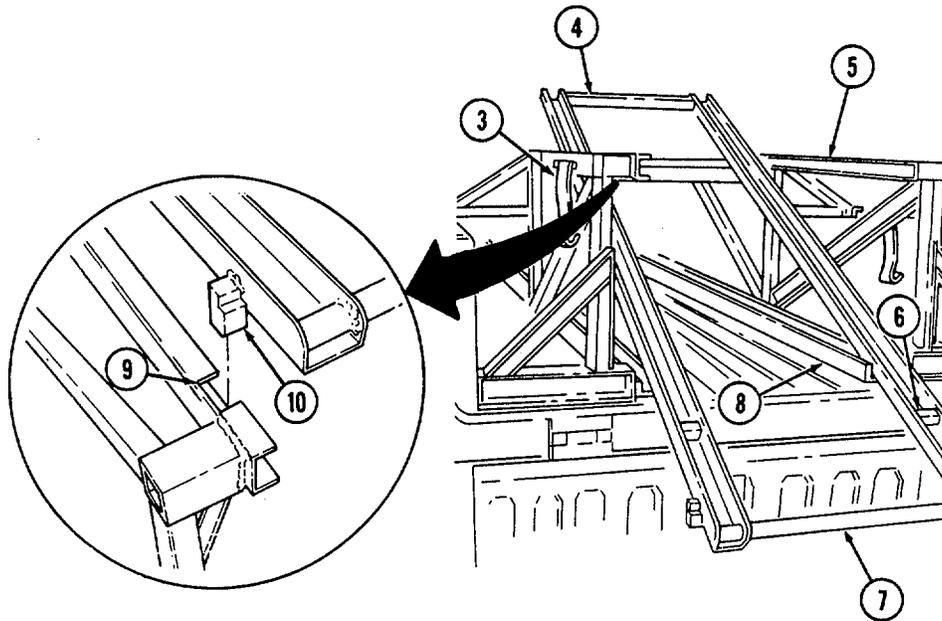
- 1 *Shelter reinforcement brackets* (four each) secure S250 Shelter Carrier to vehicle body.
- 2 *Rear Suspension Tiedown Kit* is used to compress rear suspension to obtain an overall height of 102 in. (259 cm) with S250 shelter.



h. Soft Top Ambulance (M1035, M1035A1, and M1035A2) Equipment.

KEY ITEM AND FUNCTION

- 3 *Litter straps* (eight each) secure litters to litter rack during transportation of litter patients.
- 4 *Upper litter tray* provides a platform for loading litter on upper litter rack.
- 5 *Upper litter rack* provides a platform for securing upper litter tray.
- 6 *Litter stop* secures litter in upper litter tray during loading, unloading, and transportation.
- 7 *Litter tray handle* provides positive grip to slide upper litter tray during loading or unloading.
- 8 *Lower litter rack* provides a platform for securing lower litter.
- 9 *Upper litter rack stop notch* allows upper litter tray stop to be inserted during upper litter tray stowage.
- 10 *Tray stop* secures upper litter tray to upper litter rack during stowage.

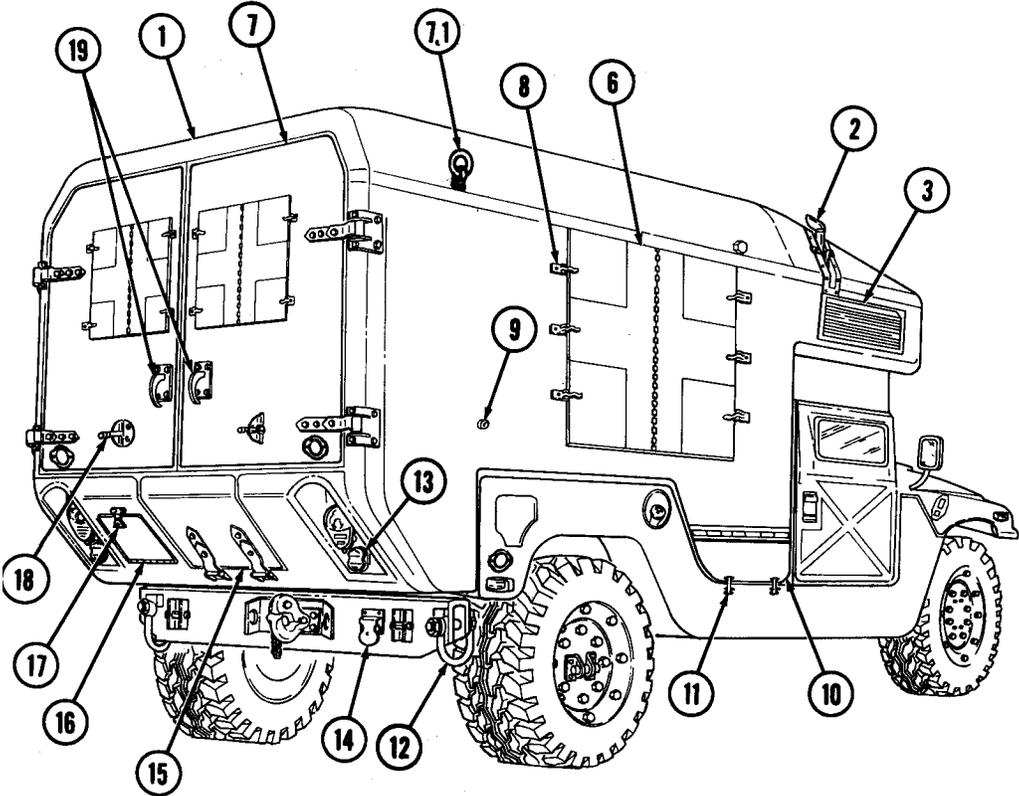
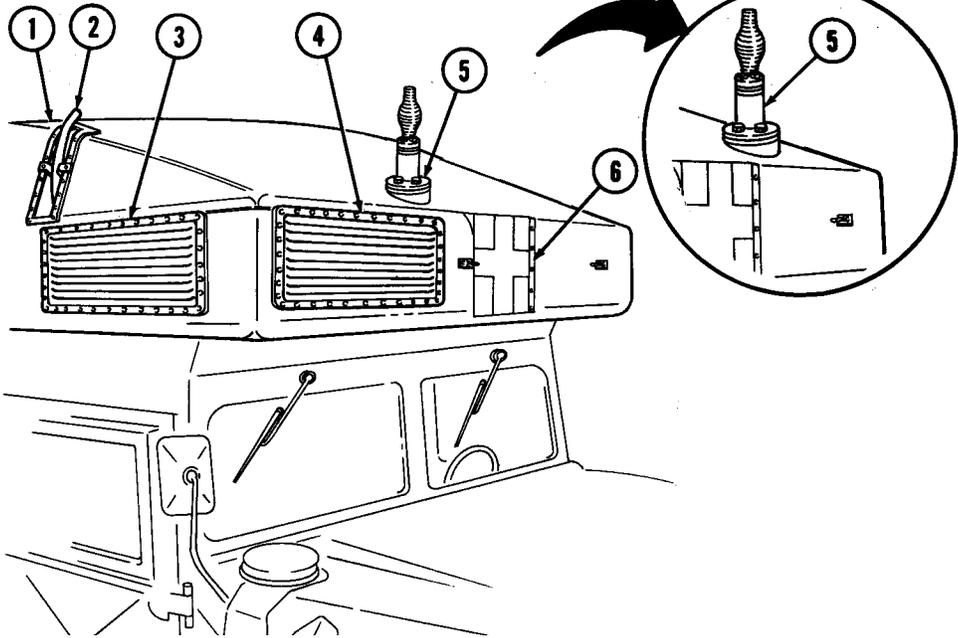


i. **Four-Litter Ambulance (M997, M997A1, and M997A2) Equipment.**

KEY ITEM AND FUNCTION

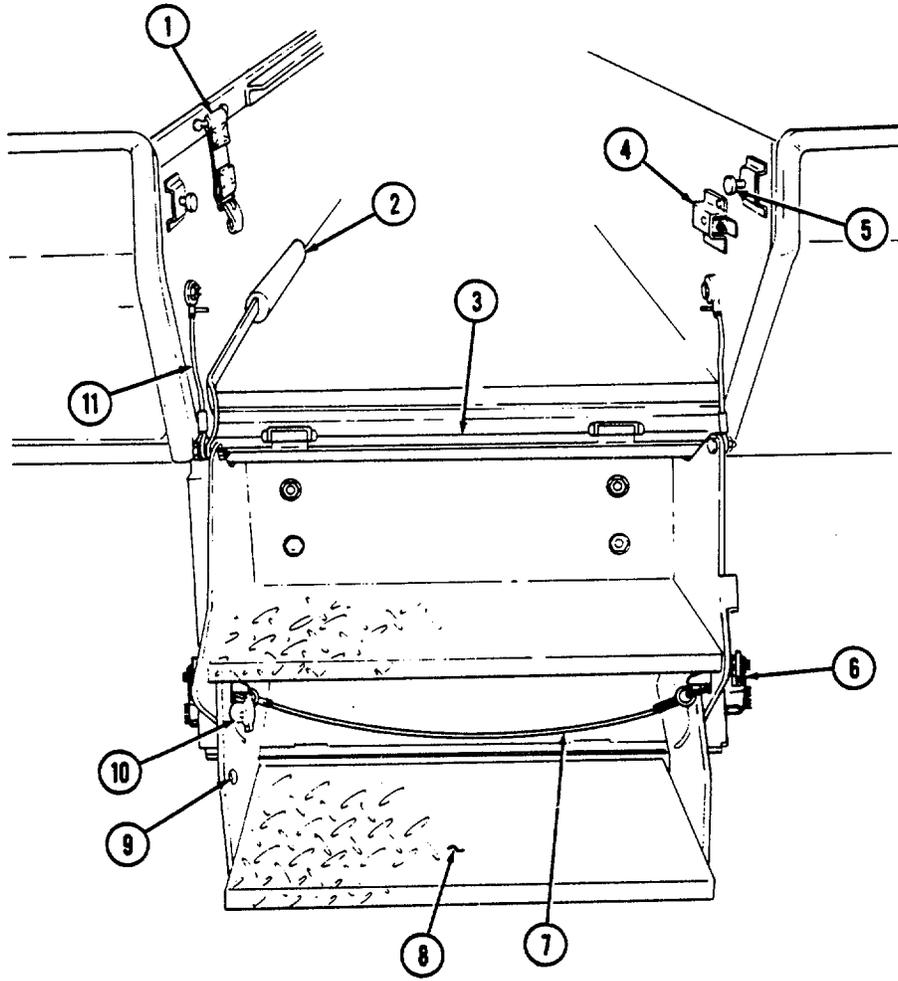
- 1 *Four-litter ambulance* provides transport for up to eight ambulatory patients or four litter patients and two attendants. The ambulance has armor protection, self-contained heating, air-conditioning, and collective NBC protection for crew and patients.
- 2 *Heater exhaust pipe* vents exhaust gases from ambulance heater.
- 3 *Air-conditioner condenser exhaust louver* vents exhaust heat from air-conditioner condenser.
- 4 *Air-conditioner intake louver* provides air intake for air-conditioner.
- 5 *Antenna base mount* provides support for AS-1729/VRC antenna.
- 6 *Red cross placards* are at six locations on the ambulance; one each on the rear doors, sides, front, and top of ambulance body.
- 7 *Rear doors* (two each) provide access into the ambulance for patients and crew. The right rear door must be opened first, and closed last, when entering or leaving the vehicle. Ensure that doors are securely closed and latched before placing the vehicle in motion.
- 7.1 *Spreader Bar Tiedowns* (two each) are used during transport operations.
- 8 *Placard retaining clips* (twelve each) hold the red cross placards in open position, or folded when the vehicle is used for non-ambulance operations.
- 9 *Door holder receptacles* (two each) engage the door holders and secure the rear doors in the fully open position.
- 10 *Side stowage doors* (two each) provide access to stowage areas on the left and right sides of the vehicle.
- 11 *Stowage compartment latches* (four each) secure the side stowage doors in the closed position.
- 12 *Lifting shackles* (located at front and rear of vehicle) are used to tie down the vehicle during transport operations.
- 13 *Backup light assembly* (two each) provides warning to personnel standing at the rear of the vehicle and light for vehicle operator when backing up ambulance.
- 14 *Trailer receptacle* provides electrical power to towed equipment.
- 15 *Rear step assembly* lowers and folds out to provide easy access to ambulance interior. Step assembly must be in stowed position before closing rear doors in preparation for movement.
- 16 *Litter stowage compartment* provides stowage for litters and litter rail extension.
- 17 *Stowage compartment latch* secures litter stowage compartment cover in closed position.
- 18 *Door holders* (two each) engage receptacles on side of ambulance body to secure rear doors in open position.
- 19 *Rear door handles* (two each) are turned to the horizontal position to unlatch rear doors and to the vertical position to latch rear doors. Ensure that doors are closed and handles are securely latched before placing vehicle in motion.

NEW CONFIGURATION

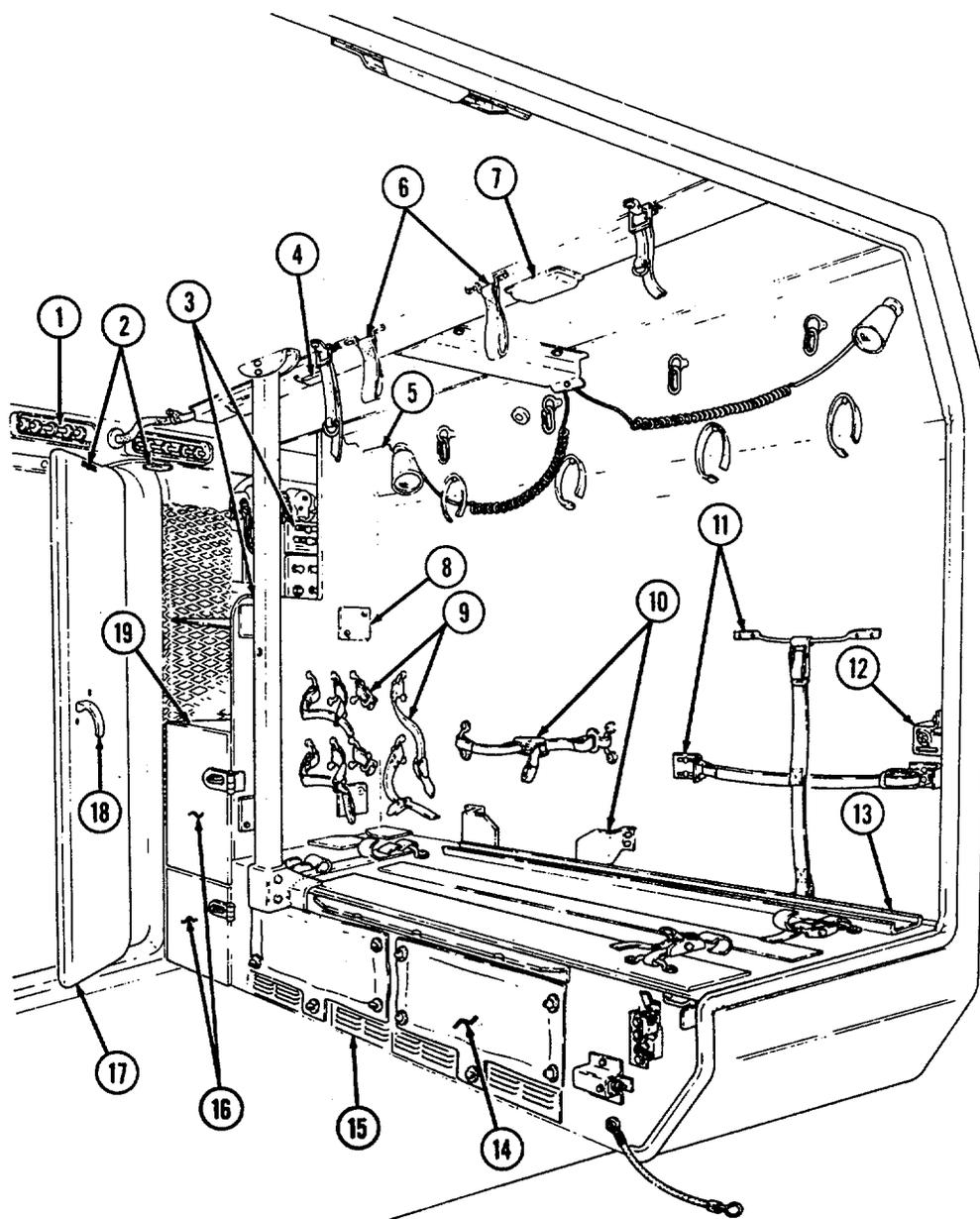


KEY ITEM AND FUNCTION

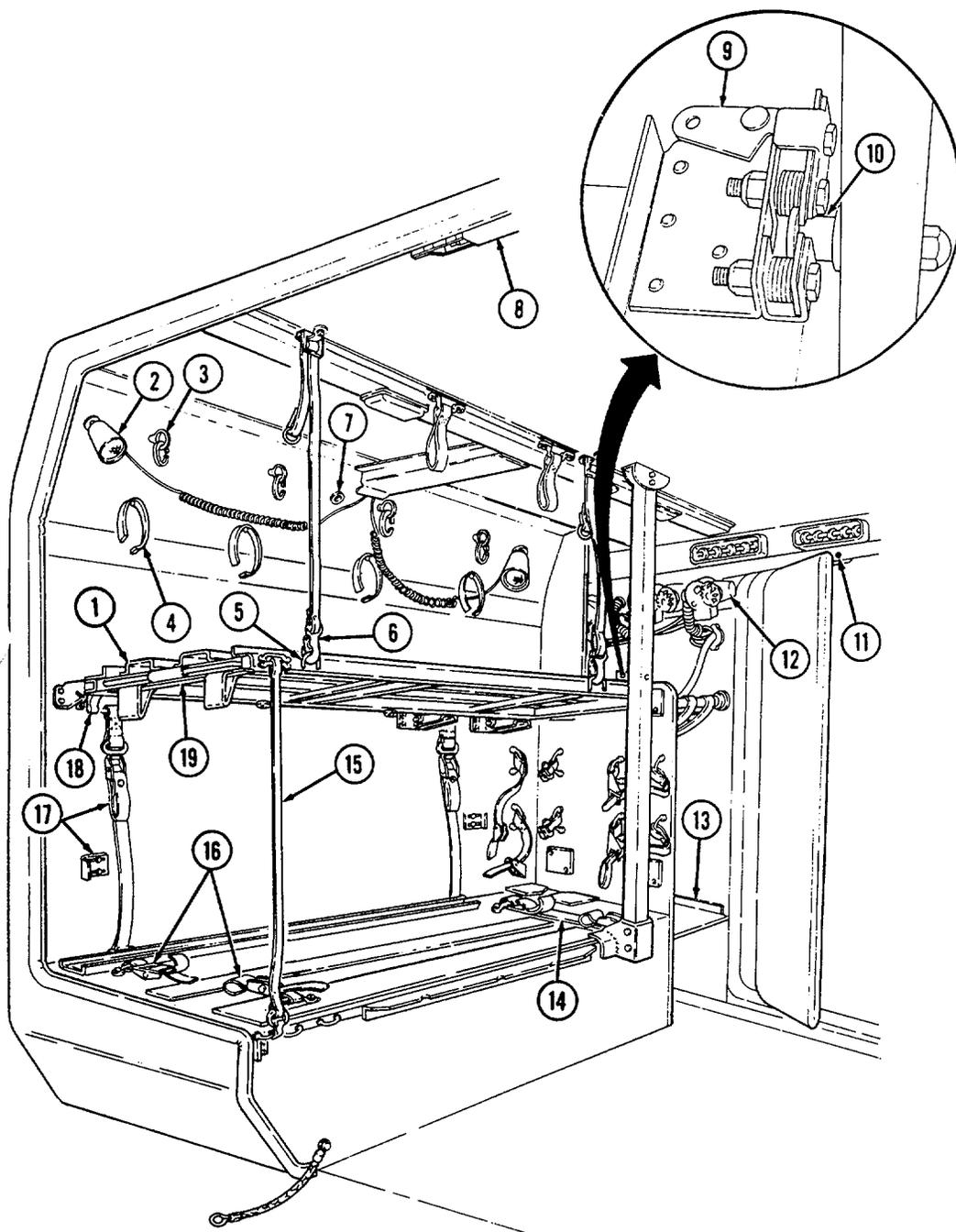
- 1 *Safety strap* secures the rear step assembly in the stowed position.
- 2 *Rear step retractor assembly* provides a lift boost for raising the rear step assembly into stowed position.
- 3 *Rear step assembly* lowers and folds out to provide easy access to ambulance interior. Step assembly is secured in stowed position with safety strap and rear step latch assembly. Step assembly must be in stowed position before closing rear doors in preparation for movement.
- 4 *Blackout switch assembly* activates interior blackout lights and extinguishes white ceiling lights and spotlights when rear step assembly is lowered and interior lights switch is set to either "NORMAL" or "B/O."
- 5 *Rear step strikers* (two each) engage rear step latch assemblies to secure rear step assembly in stowed position.
- 6 *Rear step latch assemblies* (two each) engage rear step strikers to secure rear step assembly in stowed position.
- 7 *Rear step latch cable* is pulled to release rear step strikers so rear step assembly can be lowered.
- 8 *Bottom step* becomes an attendant's seat when rear step assembly is in stowed position.
- 9 *Safety strap attachment hole* is connecting point for safety strap when rear step assembly is in the stowed position.
- 10 *Rear step knob* secures pivoting lower step in fully lowered position or stowed position.
- 11 *Retention cable assemblies* (two each) provide support for rear step assembly in lowered position.

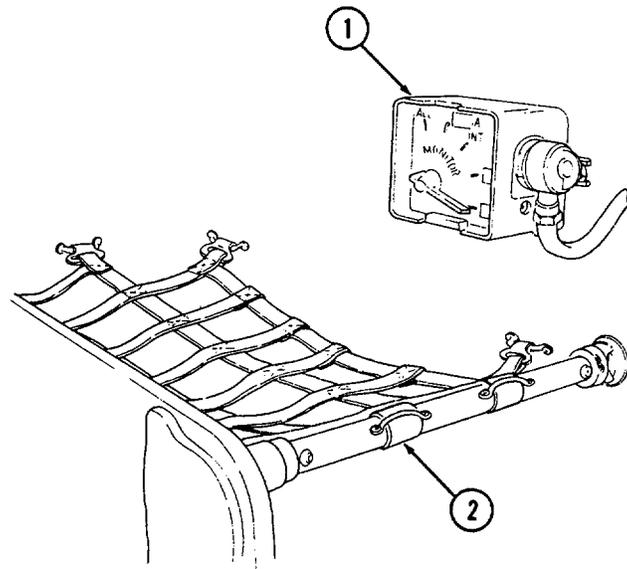


KEY	ITEM AND FUNCTION
1	<i>Air-conditioning louvers</i> (six each) can be adjusted to direct cool air into patient area.
2	<i>Bulkhead door latch assembly</i> secures bulkhead door in open position.
3	<i>Electrical control panels</i> provide centralized control of lighting, heating, and cooling for ambulance interior.
4	<i>Blackout lamp</i> (one per side) provides blue light illumination during blackout conditions.
5	<i>Heater, A/C, and vent operation data plate</i> provide instructions for operating heating, air-conditioning, and ventilation systems within the ambulance interior.
6	<i>Strap assemblies</i> (two per side) provide a handhold to enable patients and attendant to move around when vehicle is in motion.
7	<i>Ceiling lamps</i> (two per side) provide white light illumination for ambulance interior.
8	<i>Litter handle bumpers</i> (eight per side) protect litter handles from damage and restrict litter movement when ambulance is in motion.
9	<i>Oxygen cylinder straps, footman loops, and bumpers</i> provide stowage for two oxygen cylinders on each bulkhead.
10	<i>Attendant seat bracket and strap assembly</i> provide stowage for attendant seat.
11	<i>Spineboard bracket and strap assembly</i> provide stowage for short spineboard.
12	<i>24-volt receptacle</i> (two each) provides a 24-VDC electrical source for ambulance accessories. The other 24-volt receptacle is located on the electrical control panel.
13	<i>Litter skids</i> provide a track to guide litter into position on litter rack.
14	<i>Stowage covers</i> (two each) secure and cover equipment stowed under lower litter rack. Each cover is secured by five turnbuttons.
15	<i>Heater vents</i> (four each) direct heated air into ambulance compartment.
16	<i>Medical cabinet doors and hasps</i> (two each) provide secure stowage areas for medical supplies and equipment.
17	<i>Bulkhead doors</i> (two each) provide walk-through access between vehicle cab and ambulance interior. Left bulkhead door must be closed before right door is closed and latched.
18	<i>Bulkhead door handle</i> latches bulkhead door closed when handle is turned to vertical position.
19	<i>Portable heart monitor stowage</i> provides storage area for portable heart monitor.



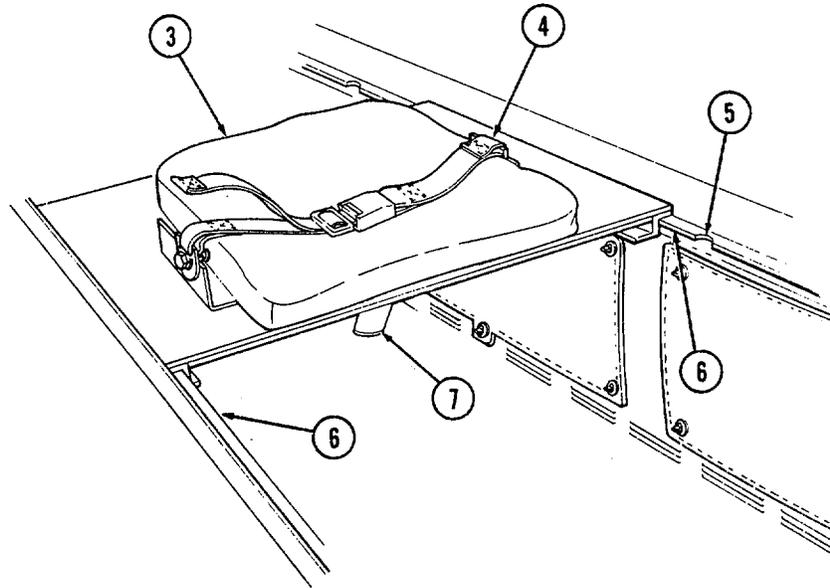
KEY	ITEM AND FUNCTION
1	<i>Upper litter rack</i> (one per side) provides additional litter capacity, and when folded downward, provides backrest for ambulatory patients.
2	<i>Spotlight assembly</i> (two per side) provides a movable source of illumination. Switch on back of spotlight assembly activates light when interior light switch is activated.
3	<i>IV bag hangers</i> (four per side) provide suspension point for patient IV bag.
4	<i>IV bag stowage straps</i> (four per side) secure IV bag in stowed position.
5	<i>Upper litter rack ring</i> (two per side) is the attaching point for litter rack support straps.
6	<i>Litter rack support straps</i> (two per side) support upper litter rack.
7	<i>Spotlight mount</i> (five per side) provides mounting points for movable spotlights. Three wall mounts and two mounts located on the underside of upper litter rack are located on each side of ambulance.
8	<i>Rear door blackout switch</i> activates interior blackout lights and extinguishes all interior white light illumination when rear doors are opened and interior lights switch is set to either "NORMAL" or "B/O."
9	<i>Litter rack front latch</i> , when activated, releases front striker to allow upper litter rack to lower to backrest position.
10	<i>Litter rack front striker</i> engages litter rack front latch assembly to secure upper litter rack in raised position.
11	<i>Bulkhead door blackout light switch</i> activates interior blackout lights and extinguishes all interior white light illumination when bulkhead doors are opened and interior lights switch is set to either "NORMAL" or "B/O."
12	<i>NBC heaters</i> (five in ambulance body, two in cab) provide a flow of heated, filtered air to NBC protective masks worn by crew and patients.
13	<i>Aspirator/resuscitator stowage brackets</i> secure aspirator/resuscitator in stowed position.
14	<i>Front litter rack straps</i> (four per side) secure front litter handles to litter rack.
15	<i>Litter rack tension strap</i> applies tension to upper litter rack to restrict movement of litter rack during vehicle movement.
16	<i>Rear litter rack straps</i> (four per side) secure rear litter handles to litter rack.
17	<i>Spineboard bracket and strap assembly</i> provides stowage for long spineboard.
18	<i>Upper litter rack rear latch assembly</i> (one per side) when unlocked and depressed allows rear of upper litter rack to be lowered to ease loading of patients.
19	<i>Litter rack handle</i> slides out to ease loading of patients into upper litter rack.





KEY ITEM AND FUNCTION

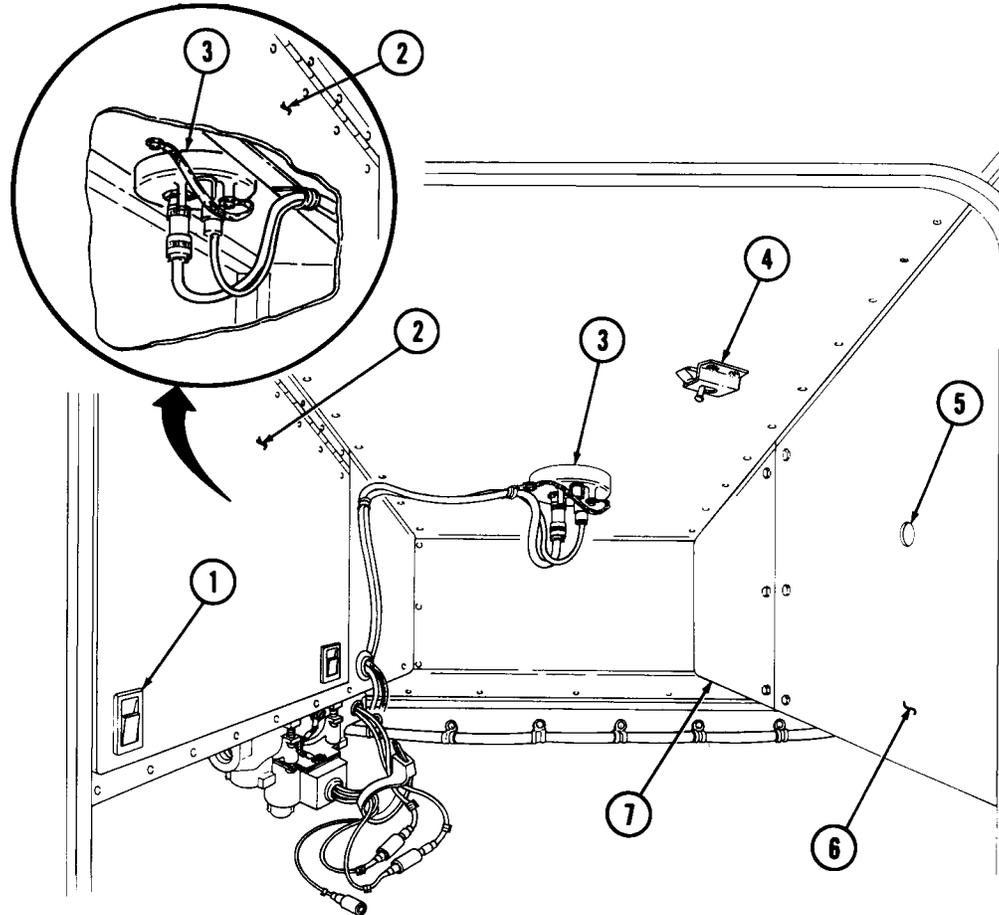
- 1 *Intercom control (C-2298/VRC)* provides communication with the driver and radio control facilities when used with an M24 series protective mask, radio handset, or other audio accessories. A second intercom control is located in the cab on the radio rack.
- 2 *Web shelf net assembly* provides stowage area in front of bulkhead.



KEY ITEM AND FUNCTION

- 3 *Attendant seat* slides along the attendant seat rails providing a sliding and removable seat for the ambulance attendant.
- 4 *Seatbelt assembly* secures the attendant to the attendant seat when ambulance is in motion.
- 5 *Rail notch* secures the attendant seat in one of three locations along the attendant seat rails.
- 6 *Attendant seat rails* (two each) provide a track along which the attendant seat can be positioned.
- 7 *Attendant seat latch* is pushed to the attendant's right to release the locking mechanism holding the attendant seat stationary at rail notch locations.

NEW CONFIGURATION

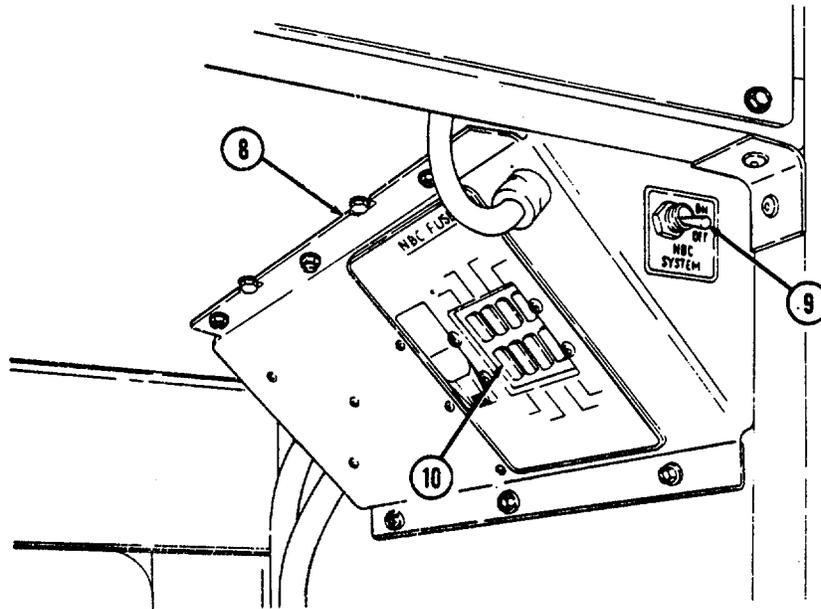


KEY ITEM AND FUNCTION

NOTE

The following items are located in the crew compartment overhead.

- 1 *NBC door paddle handle* permits NBC door to be opened or closed.
- 2 *NBC door* provides access to gas-particulate filter unit and stowage area.
- 3 *Antenna base mount* provides mounting for AS-1729/VRC antenna and cabling.
- 4 *NBC door latch* secures NBC door in open position.
- 5 *Air-conditioner sight glass* allows vehicle operator to visually check status of air-conditioning charging condition.
- 6 *Heating, ventilating, and air-conditioning (HVAC) system compartment door* provides access to HVAC components.
- 7 *Air intake filter door* provides access to air-conditioner air intake filter.



KEY ITEM AND FUNCTION

NOTE

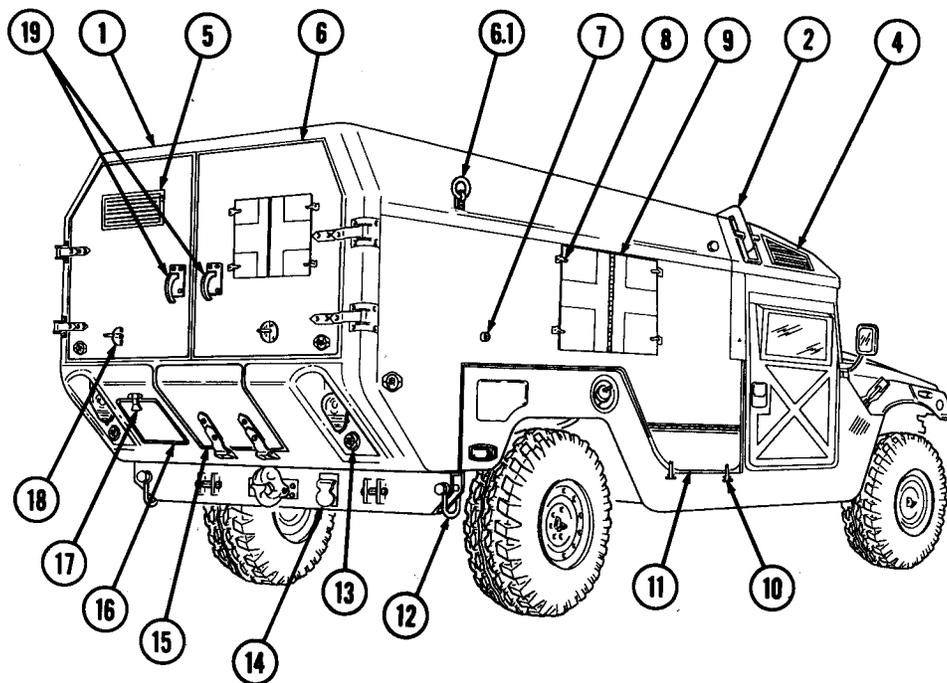
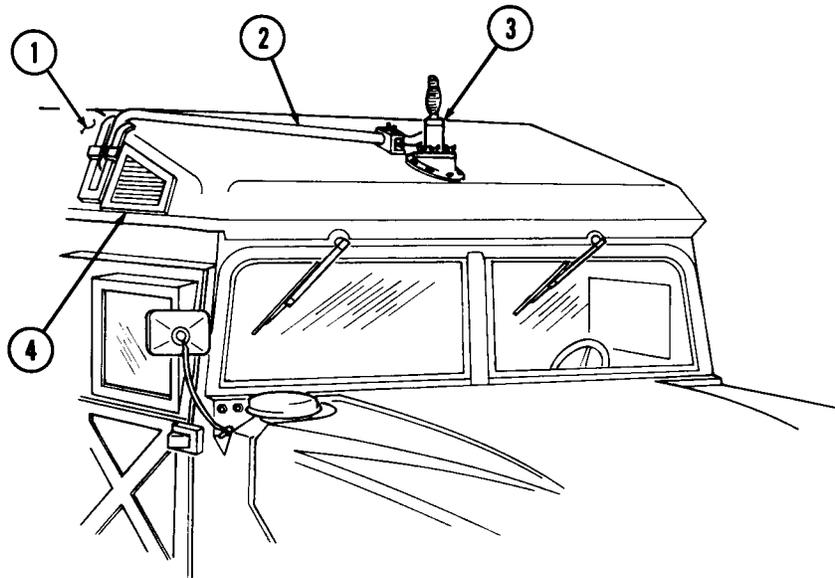
The NBC control box for the M997, M997A1, and M997A2 ambulance has seven heater fuses and one spare fuse.

- 8 *NBC control box* houses circuitry and controls for the collective NBC protection system.
- 9 *NBC system switch* controls operation of the collective NBC protection system.
- 10 20 amp fuses protect NBC heater circuits from overload damage.

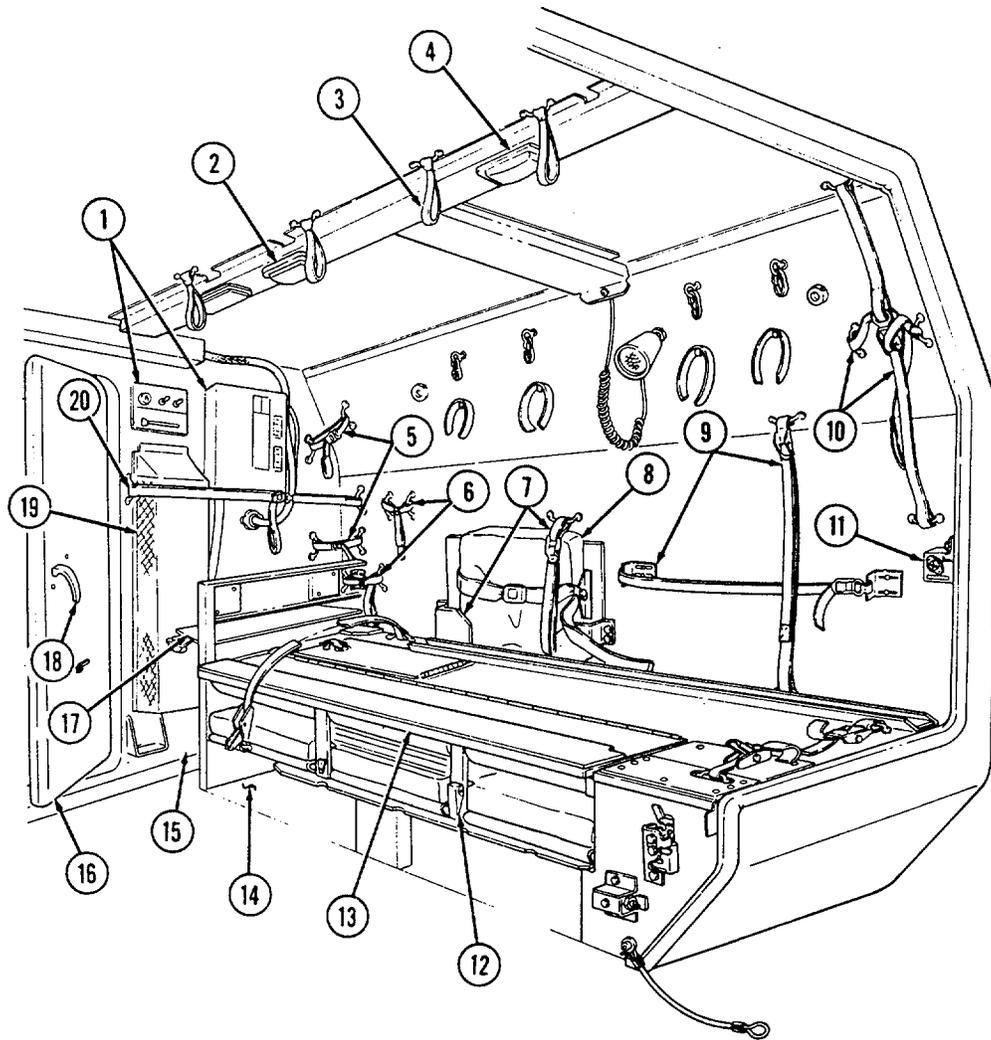
j. Two-Litter Ambulance (M996 and M996A1) Equipment.

KEY ITEM AND FUNCTION

- 1 *Two-litter ambulance* provides transport for up to six ambulatory patients or two litter patients and two attendants. The ambulance has armor protection, self-contained heating and ventilation, and collective NBC protection for crew and patients.
- 2 *Heater exhaust pipe* vents exhaust gases from ambulance heater.
- 3 *Antenna base mount* provides support for AS-1729/VRC antenna.
- 4 *Heater intake louver* provides air intake for heating and ventilating systems.
- 5 *Rear door vent* provides ventilation for patient compartment.
- 6 *Rear doors (two each)* provide access for patients and crew into the ambulance. The right rear door must be opened first, and closed last, when entering or leaving the vehicle. Ensure that the door is securely closed and latched before placing the vehicle in motion.
- 6.1 *Spreader bar tiedowns (two each)* are used during transport operations.
- 7 *Door holder receptacles (two each)* engage the door holders and secure the rear doors in the fully open position.
- 8 *Placard retaining clips (eight each)* hold the red cross placards in open position or folded when the vehicle is used for non-ambulance operations.
- 9 *Red cross placards* are at five locations on the ambulance; one each on the right rear door, sides, front, and top of ambulance body.
- 10 *Stowage compartment latches (four each)* secure the side stowage doors in the closed position.
- 11 *Side stowage doors (two each)* provide exterior stowage areas on the left and right sides of the vehicle.
- 12 *Lifting shackles (located at front and rear of vehicle)* are used to tie down the vehicle during transport operations.
- 13 *Backup light assembly (two each)* provide warning to personnel standing at the rear of the vehicle and light for vehicle operator when backing up ambulance.
- 14 *Trailer receptacle* provides electrical power to towed equipment.
- 15 *Rear step assembly* lowers and folds out to provide easy access to ambulance interior. Step assembly must be in stowed position before closing rear doors in preparation for movement.
- 16 *Litter stowage compartment* provides stowage for litters and litter rail extension.
- 17 *Stowage compartment latch* secures litter stowage compartment cover in closed position.
- 18 *Door holders (two each)* engage receptacles on side of ambulance body to secure rear doors in open position.
- 19 *Rear door handles (two each)* are turned to the horizontal position to unlatch rear doors, and to the vertical position to latch rear doors. Ensure that doors are closed and handles are securely latched before placing vehicle in motion.

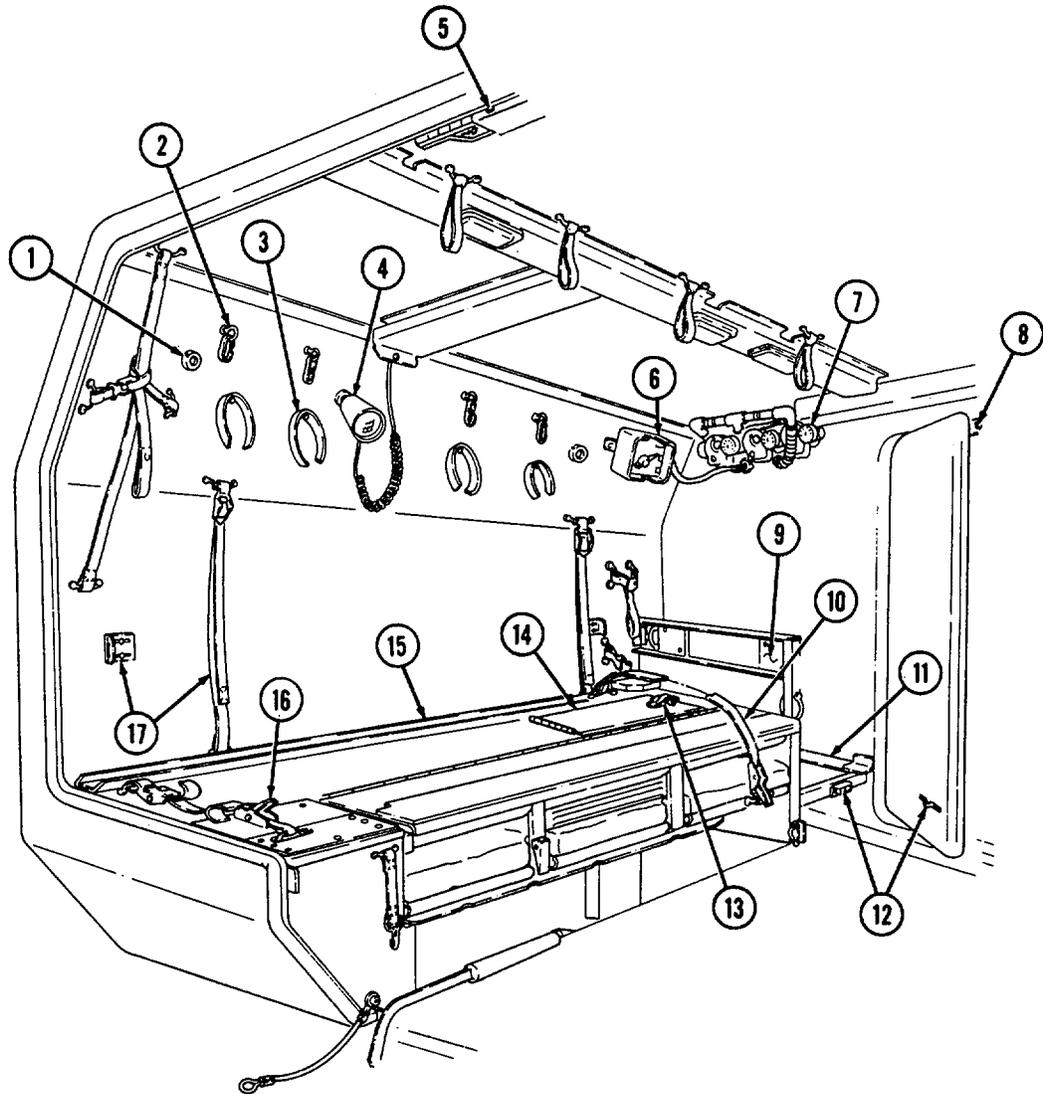


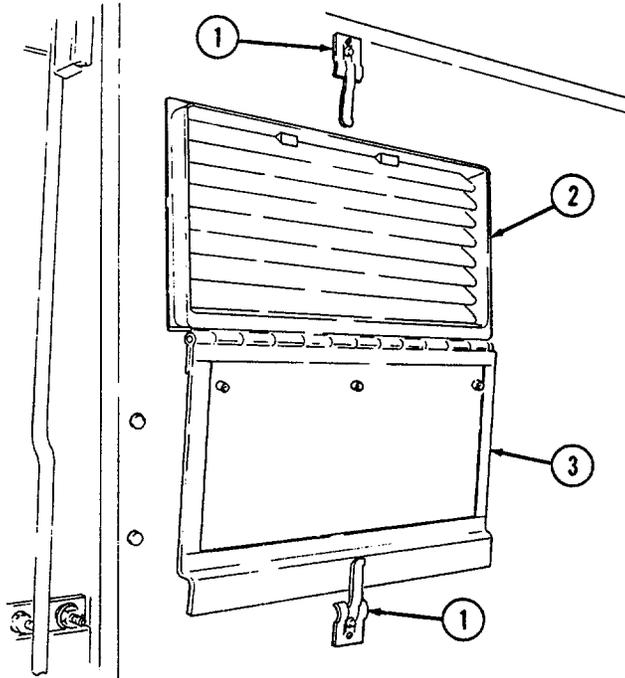
KEY	ITEM AND FUNCTION
1	<i>Electrical control panels</i> provide centralized control of lighting, heating, and ventilation for ambulance interior.
2	<i>Blackout lamp</i> (one per side) provides blue light illumination during blackout conditions.
3	<i>Strap assemblies</i> (four per side) provide an assist to patients and crew when moving about in ambulance interior.
4	<i>Ceiling lamps</i> (two per side) provide white light illumination for ambulance interior.
5	<i>Splint set stowage strap assemblies</i> (two each) secure splint set in stowed position.
6	<i>Oxygen cylinder straps, footman loops, and bumpers</i> provide stowage for oxygen cylinders on each bulkhead.
7	<i>Attendant seat bracket and strap assembly</i> provides stowage for attendant seat.
8	<i>Attendant seat</i> shown in stowed position. When installed on attendant seat rails, provides a movable seat for ambulance attendant.
9	<i>Spineboard bracket and strap assembly</i> provides stowage for short spineboard.
10	<i>Medical instrument and supply set stowage strap assembly</i> (two per side) secures medical instruments and supplies in stowage.
11	<i>24-volt receptacle</i> (two each) provides a 24-VDC electrical source for ambulance accessories. The other 24-volt receptacle is located on the electrical control panel.
12	<i>Ambulatory patient seat latch</i> (one per side) secures folding patient seat back in closed position.
13	<i>Ambulatory patient seat</i> provides seating for three ambulatory patients on each side of ambulance.
14	<i>Stowage area under litter rack</i> provides additional stowage space.
15	<i>Portable heart monitor stowage</i> provides storage area for portable heart monitor.
16	<i>Bulkhead doors</i> (two each) provide walk-through access between vehicle cab and ambulance interior. Left bulkhead door must be closed before right door is closed and latched.
17	<i>Shelf assembly</i> provides area in front of bulkhead for blanket kit and splint kit stowage.
18	<i>Bulkhead door handle</i> latches bulkhead door closed when handle is turned to vertical position.
19	<i>Heater/fresh air vent</i> directs heated air during heater operation or fresh air if ventilation system is activated.
20	<i>Blanket set stowage strap assembly</i> secures medical blanket set in stowed position.



KEY ITEM AND FUNCTION

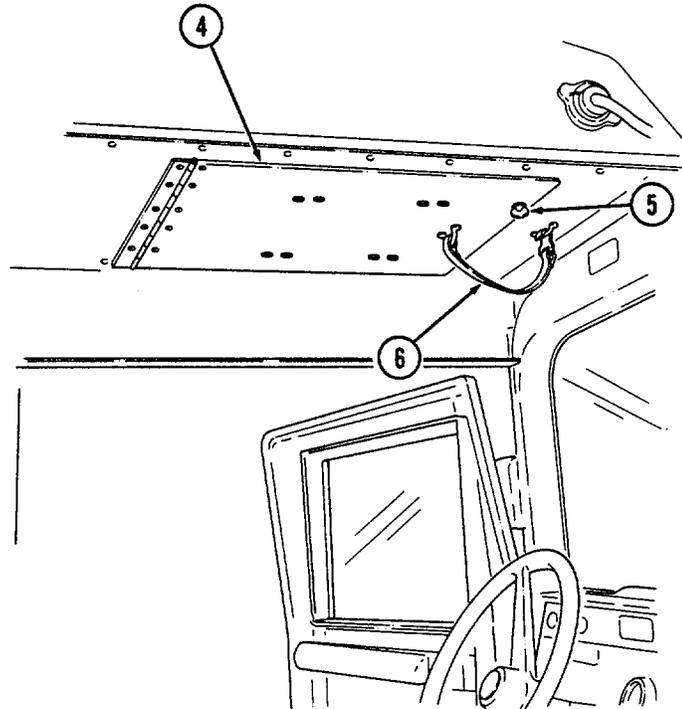
- 1 *Spotlight mount* (three per side) provides mounting points for movable spotlights.
- 2 *IV bag hangers* (four per side) provide suspension points for patient IV bags.
- 3 *IV bag stowage straps* (four per side) secure IV bags in stowed position.
- 4 *Spotlight assembly* (one per side) provides a movable source of illumination. Switch on back of spotlight assembly activates light when interior light switch is activated.
- 5 *Rear door blackout switch* activates interior blackout lights and extinguishes all interior white light illumination when rear doors are opened and interior lights switch is set to either "NORMAL" or "B/O."
- 6 *Intercom control* (C-2298/VRC) provides communication with the driver and radio control facilities when used with an M24 series protective mask, radio handset and speaker, or other audio accessories. A second intercom control is located in the cab.
- 7 *NBC heaters* (three in ambulance body, two in cab) provide a flow of heated, filtered air to NBC protective masks worn by crew and patients.
- 8 *Bulkhead door blackout light switch* activates interior blackout lights and extinguishes all interior white light illumination when bulkhead doors are opened and interior lights switch is set to either "NORMAL" or "B/O".
- 9 *Litter handle bumpers* (four per side) protect litter handles from damage and restrict litter movement when ambulance is in motion.
- 10 *Front litter rack straps* (one per side) secure front litter handles to litter rack.
- 11 *Aspirator/resuscitator stowage brackets* secure aspirator/resuscitator in stowed position.
- 12 *Bulkhead door latch assembly* secures bulkhead door in open position.
- 13 *Medical stowage cover latch* secures stowage cover in closed position.
- 14 *Medical stowage cover* secures medical stowage in compartment beneath litter rack.
- 15 *Litter skids* (two each) provide a track to guide litter into position on litter rack.
- 16 *Rear litter rack straps* (two per side) secure rear litter handles to litter rack.
- 17 *Spineboard bracket and strap assembly* provide stowage for long spineboard.





KEY ITEM AND FUNCTION

- 1 *Vent cover retaining clips* (two each) secure vent cover in either open or closed position.
- 2 *Rear door vent* provides fresh air ventilation for ambulance interior, or can serve as an exhaust vent when used in conjunction with heating/ventilation system.
- 3 *Vent cover* opens to allow fresh air ventilation of ambulance interior.



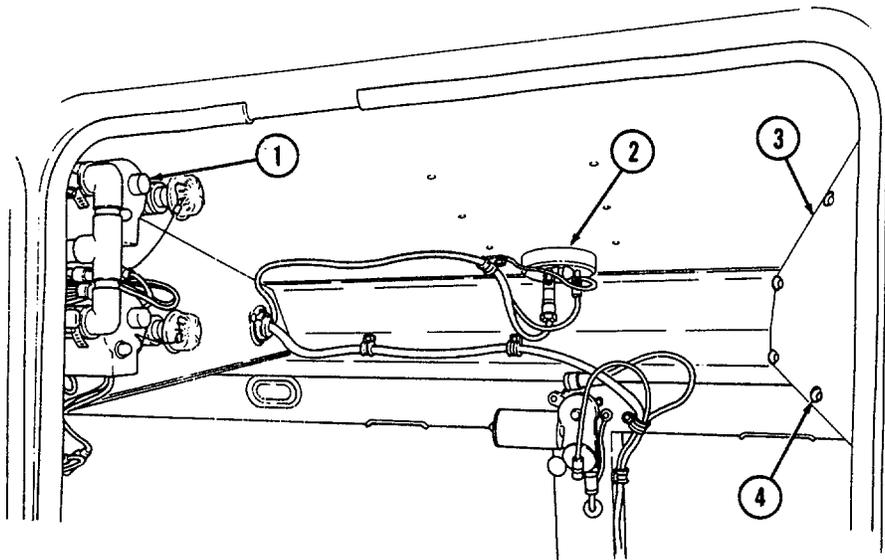
KEY ITEM AND FUNCTION

- 4 *NBC door* provides access to gas-particulate filter unit.
- 5 *Wing head screws* (two each) secure NBC door in closed position.

WARNING

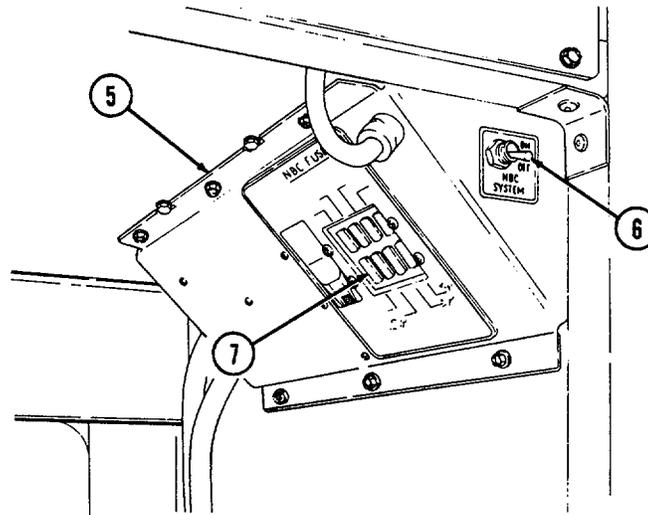
NBC door strap must be in good condition and properly installed to prevent injury to personnel in driver's position or damage to equipment.

- 6 *NBC door strap* acts as a safety strap to prevent NBC door from accidentally opening and injuring driver.



KEY ITEM AND FUNCTION

- 1 *NBC heaters* (three in ambulance body, two in cab) provide a flow of heated, filtered air to NBC protective masks worn by crew and patients.
- 2 *Antenna base mount* provides mounting for AS-1729/VRC antenna and cabling.
- 3 *Heating and ventilating system compartment door* provides access to heating and ventilating system components.
- 4 *Wing head screws* (seven each) secure heating and ventilating system compartment door in closed position.



KEY ITEM AND FUNCTION

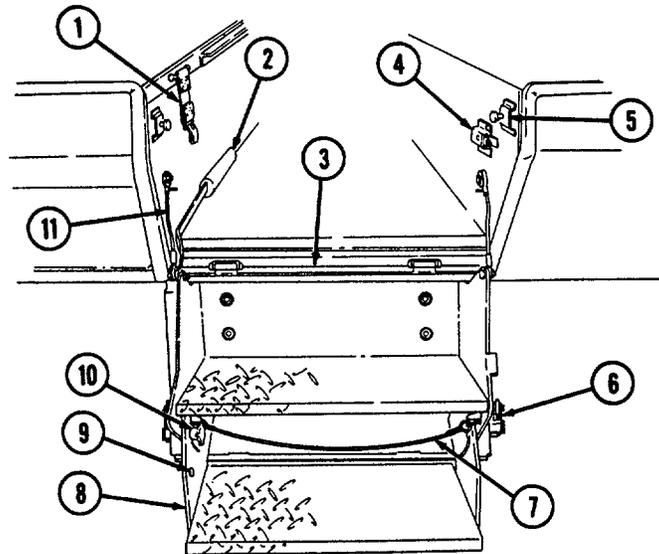
NOTE

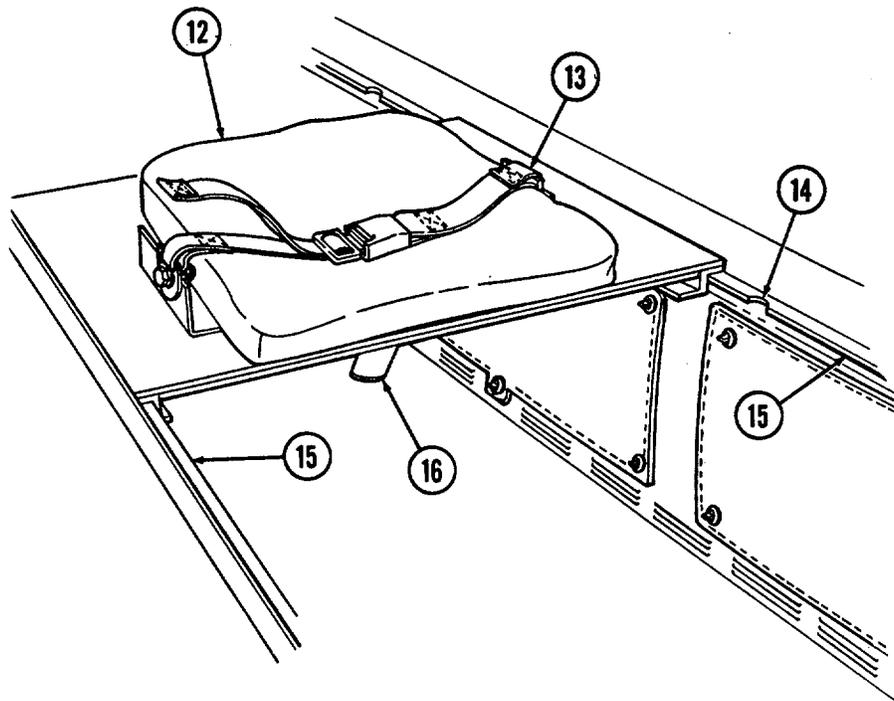
The NBC control box for the M996 and M996A1 ambulance has five heater fuses and one spare fuse.

- 5 *NBC control box* houses circuitry and controls for the collective NBC protection system.
- 6 *NBC system switch* controls operation of the collective NBC protection system.
- 7 *20 amp fuses* protect NBC heater circuits from overload damage.

KEY ITEM AND FUNCTION

- 1 *Safety strap* secures the rear step assembly in the stowed position.
- 2 *Rear step retractor assembly* provides a lift boost for raising the rear step assembly into stowed position.
- 3 *Rear step assembly* lowers and folds out to provide easy access to ambulance interior. Step assembly is secured in stowed position with safety strap and rear step latch assembly. Step assembly must be in stowed position before closing rear doors in preparation for movement.
- 4 *Blackout switch assembly* activates interior blackout lights and extinguishes white ceiling lights and spotlights when rear step assembly is lowered and interior lights switch is set to either "NORMAL" or "B/O."
- 5 *Rear step strikers* (two each) engage rear step latch assemblies to secure rear step assembly in stowed position.
- 6 *Rear step latch assemblies* (two each) engage rear step strikers to secure rear step assembly in stowed position.
- 7 *Rear step latch cable* is pulled to release rear step strikers so rear step assembly can be lowered.
- 8 *Bottom step* becomes an attendant's seat when rear step assembly is in stowed position.
- 9 *Safety strap attachment hole* is connecting point for safety strap when rear step assembly is in the stowed position.
- 10 *Rear step knob* secures pivoting lower step in fully lowered position or stowed position.
- 11 *Retention cable assembly* (two each) provides support for rear step assembly in lowered position.





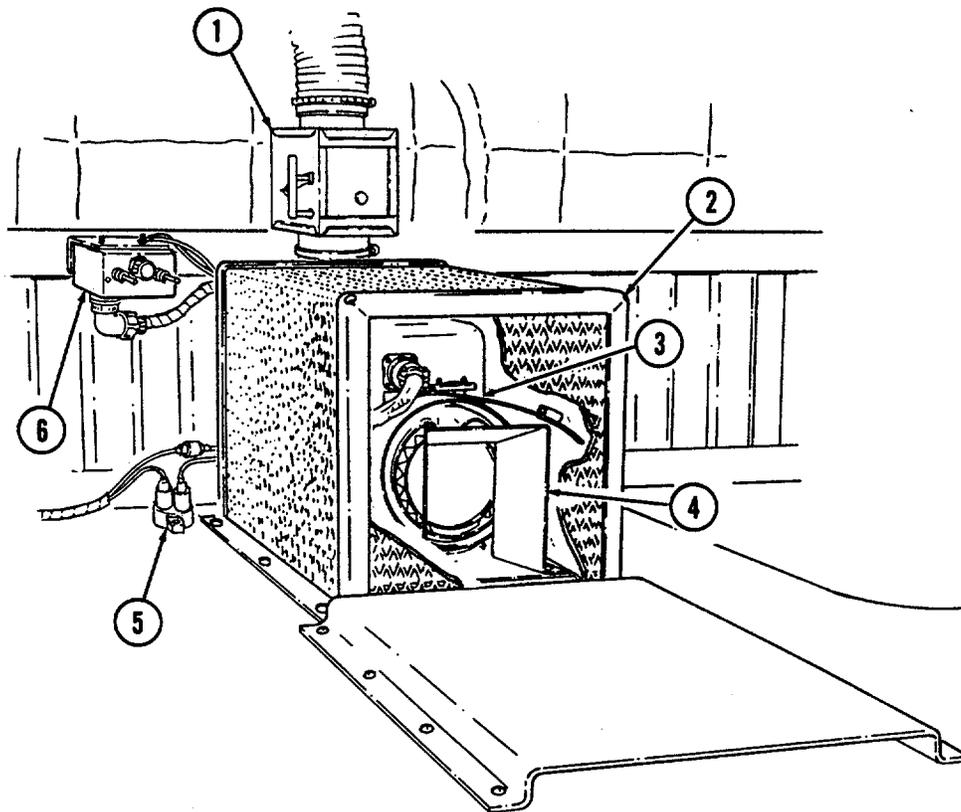
KEY ITEM AND FUNCTION

- 12 *Attendant seat* slides along the attendant seat rails, providing a sliding and removable seat for the ambulance attendant.
- 13 *Seatbelt assembly* secures the attendant to the attendant seat when ambulance is in motion.
- 14 *Rail notch* secures the attendant seat in one of three locations along the attendant seat rails.
- 15 *Attendant seat rails* (two each) provide a track along which the attendant seat can be positioned.
- 16 *Attendant seat latch* is pushed to the attendant's right to release the locking mechanism holding the attendant seat stationary at rail notch locations.

k. Troop/Cargo Winterization Kit Equipment.

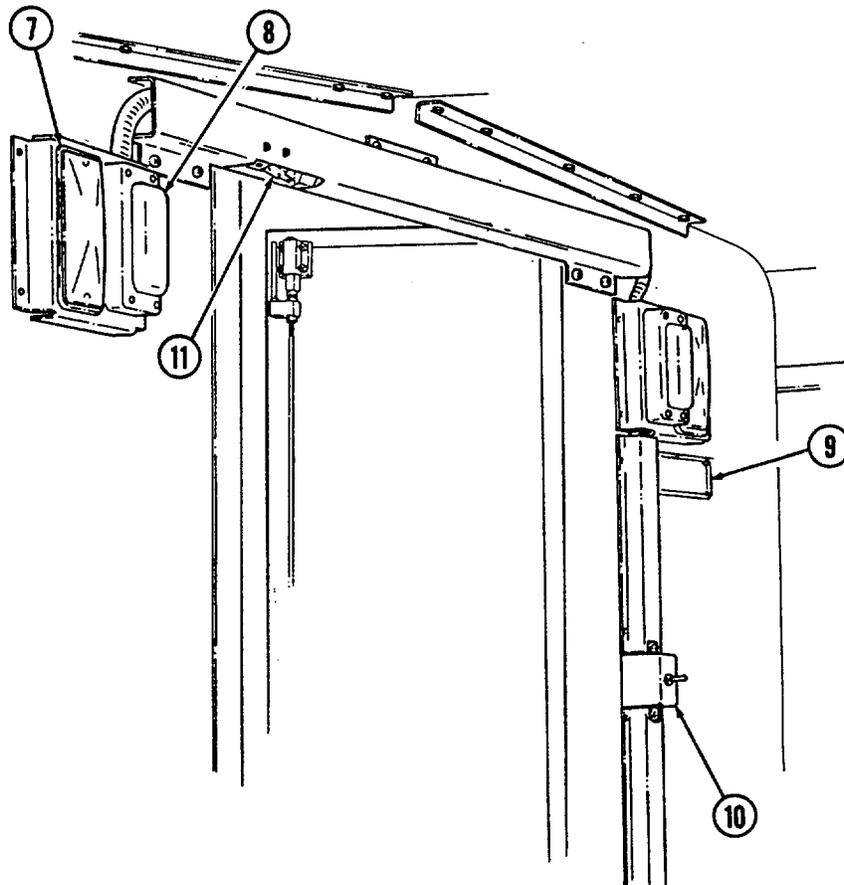
KEY ITEM AND FUNCTION

- 1 *Diverter assembly (damper)* regulates amount of fresh outside air, interior air, or a mixture of both to be circulated through the heater assembly.
- 2 *Heater guard assembly* protects personnel from accidental contact with hot heater components.
- 3 *Heater* provides a flow of heated air to interior of troop/cargo enclosure assembly.
- 4 *Heater deflector* directs heated air from heater to all areas of troop/cargo enclosure assembly.
- 5 *Circuit breaker* protects heater assembly from damage caused by electrical overloading. The circuit breaker is waterproof and automatically resets.
- 6 *Heater control assembly* operates heater and controls blower motor speed.



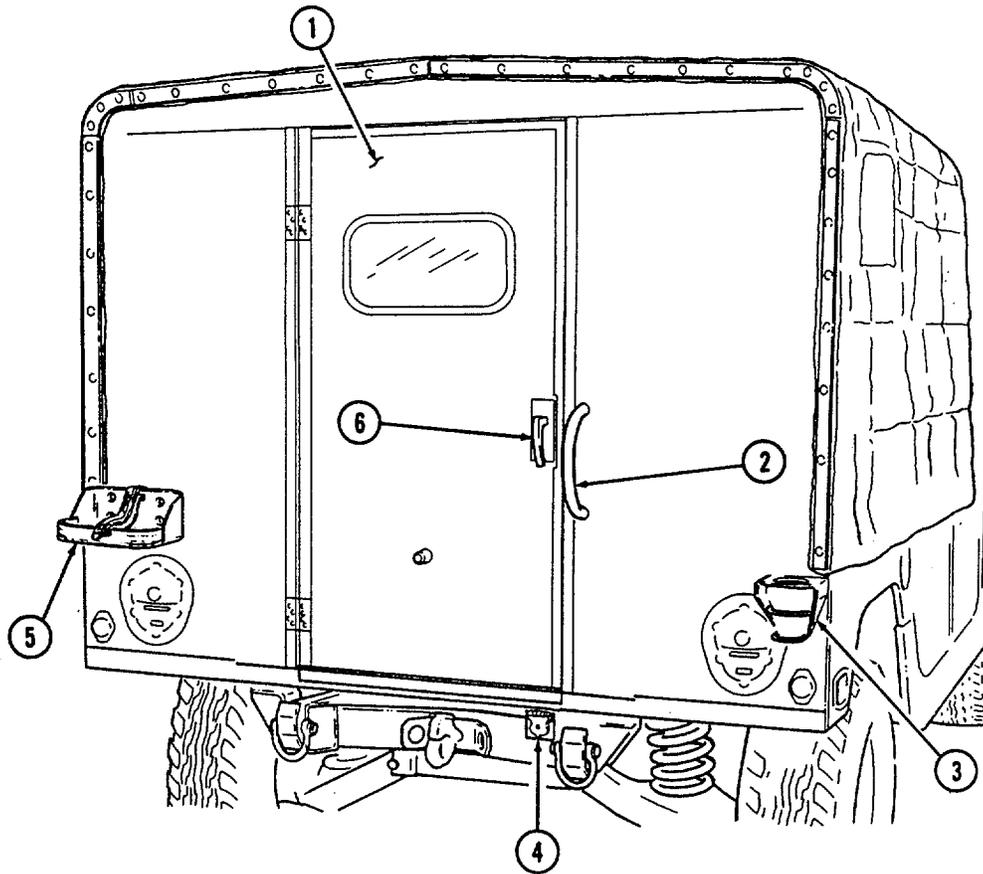
KEY ITEM AND FUNCTION

- 7 *Dome light* provides white light illumination for interior of top enclosure assembly.
- 8 *Blackout light* provides blue light illumination for interior of top enclosure assembly during blackout conditions.
- 9 *Heater data plate* provides heater operating instructions.
- 10 *Blackout/dome light switch* controls operation of blackout lights and dome lights.
- 11 *Door switch assembly* activates blackout light or dome light when door is in closed position.



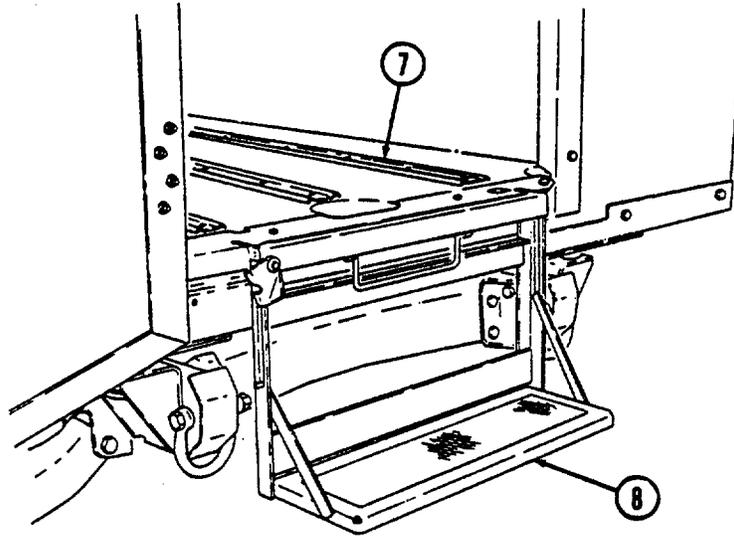
KEY ITEM AND FUNCTION

- 1 *Rear door provides access into enclosure assembly for personnel.*
- 2 *Grab handle serves as a grabbing point to assist personnel when entering into enclosure assembly.*
- 3 *Antenna mounting bracket provides mounting point for AS 1729/VRC antenna and AB-652/GR antenna.*
- 4 *Trailer receptacle provides electrical power to towed equipment.*
- 5 *Fuel can mounting bracket provides easily accessible storage location for fuel can.*
- 6 *Door handle is turned to the horizontal position to unlatch rear door and to the vertical position to latch rear door. Door should be closed and securely latched before placing vehicle in motion.*

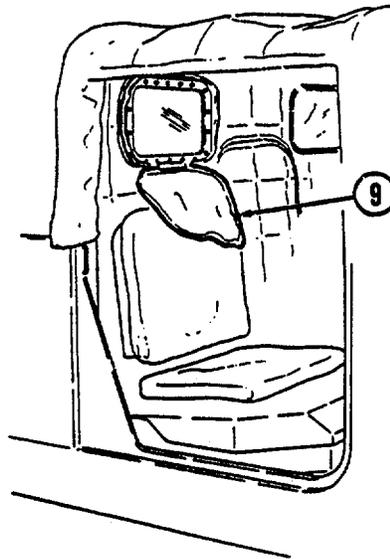


KEY ITEM AND FUNCTION

- 7 *Skid strips* allow cargo to be easily loaded and unloaded from vehicle.
- 8 *Rear step assembly* lowers and folds out to provide easy access to interior of top enclosure assembly. Step assembly must be in stowed position before closing rear door in preparation for vehicle movement.



- 9 *Blackout curtain* blocks light illumination from inside top enclosure assembly.



SECTION II. PREVENTIVE MAINTENANCE CHECKS AND SERVICES

2-3. GENERAL

A permanent record of the services, repairs, and modifications made to these vehicles must be recorded. (Army) See DA Pam 738-750 for a list of the forms and records required and how to complete them. (Marine Corps) Refer to TM 4700-15/1 series.

2-4. CLEANING INSTRUCTIONS

a. Cleaning is an after operation service performed by the operator/crew to keep the vehicle in a state of readiness. Facilities and material available to operators for vehicle cleaning can vary greatly in differing operating conditions. However, vehicles must be maintained in as clean a condition as available cleaning equipment, materials, and tactical situations permit.

WARNING

- Drycleaning solvent is flammable and will not be used near an open flame. A fire extinguisher will be kept nearby when the solvent is used. Use only in well-ventilated places. Failure to do this may result in injury to personnel and/or damage to equipment.
- Protective gloves, clothing, and/or respiratory equipment must be worn whenever caustic, toxic, or flammable cleaning solutions are used. Failure to do this may result in injury to personnel and/or damage to equipment.

CAUTION

- Do not allow cleaning compounds to come into contact with rubber, leather, vinyl, or canvas materials. Damage to equipment will result.
- Do not use compressed air when cleaning vehicle interiors. Damage to equipment will result.
- Do not allow water to enter air cleaner assembly air intake weathercap. Damage to engine will occur.

NOTE

Remember to clean windshield wipers of debris on a regular basis to ensure proper vision.

b. Cleaning Materials. Detailed descriptions of specific cleaning compounds, cleaning solvents, drycleaning solutions, and corrosion-removing compounds are found in TM 9-247.

c. General Guidelines. Table 2-1 provides a general guide of cleaning materials used in removing contaminants from various parts of the vehicle.

Table 2-1. General Cleaning Instructions

Surface	Cleaning Materials Used to Remove		
	Oil/Grease	Salt/Mud/Dust/Debris	Surface Rust/Corrosion
Body	Detergent; water; rags.	Soapy water; soft brush; damp and dry rags.	Corrosion-removing compound; bristle brush; dry rags; and lubricating oil.*
Vehicle Interior (Metals)	Detergent; damp and dry rags.	Damp and dry rags.	Corrosion-removing compound; bristle brush; dry rags; and lubricating oil.*
Glass	Window cleaning compound; dry rags.	Window cleaning compound; dry rags.	Not applicable.
Ballistic Glass	Detergent; soapy water; plastic polish; dry rags.	Detergent; soapy water; plastic polish; dry rags.	Not applicable.
Plastic Windows	Soapy water; cream cleaner; dry rags.**	Soapy water; cream cleaner; dry rags.**	Not applicable.
NOTE			
For removal of fungus and mold on soft top vehicle windows, refer to para. 3-18.			
Vehicle Interior (Seats and Straps)	Water; damp and dry rags.	Soapy water; damp and dry rags.	Not applicable.
Frame	Detergent rinsed with water; dry rags.	Soapy water; damp and dry rags.	Corrosion-removing compound; wire brush; dry rags; and lubricating oil.*
Engine and Transmission	Drycleaning solvent; water; rags.	Soapy water; soft wire brush; damp and dry rags.	Bristle brush; warm water; and dry rags.
Radiator	Not applicable.	Low pressure water or air; soapy water; damp and dry rags.	Not applicable.
Oil Cooler	Not applicable.	Low pressure water or air; soapy water; damp and dry rags.**	Not applicable.
Master Cylinder	Detergent; rinsed with soapy water, dry rags.	Soapy water; damp and dry rags.	Not applicable.
Rubber Insulation	Damp and dry rags.	Damp and dry rags.	Not applicable.
Tires	Soapy water; damp rags.	Soapy water; damp rags.	Not applicable.
Wood	Detergent; water; damp and dry rags.	Low pressure water; soapy water; damp and dry rags.	Not applicable.
<p>* After cleaning, apply light grade of lubricating oil to all unprotected surfaces to prevent continued rust.</p> <p>** Cleaning between oil cooler and radiator. If more space is needed to clean mud and debris between the oil cooler and radiator, refer to unit maintenance. Operator Participation. Operator may perform this cleaning procedure under the supervision of unit level maintenance.</p> <p>***After cleaning window zippers, apply zipper lubricant (appendix D, item 29).</p>			

2-5. PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS)

a. Designated Intervals.

NOTE

Designated intervals are performed under usual operating conditions. PMCS intervals must be performed more frequently when operating under unusual conditions.

(1) BEFORE checks and services of PREVENTIVE MAINTENANCE must be performed prior to placing vehicle or its components in operation.

(2) DURING checks and services of PREVENTIVE MAINTENANCE must be performed while the vehicle and/or its components/systems are in operation.

(3) AFTER checks and services of PREVENTIVE MAINTENANCE are performed upon completion of mission.

(4) WEEKLY checks and services of PREVENTIVE MAINTENANCE are performed once every 7 days.

(5) MONTHLY checks and services of PREVENTIVE MAINTENANCE are performed once every 30 days.

b. Procedures.

(1) For troubleshooting malfunctions, refer to table 3-1 or notify your supervisor.

(2) Use DA Form 2404 or DA Form 5988-E (automated) and report malfunctions to unit maintenance at once.

(3) Tools included with vehicle are to be used when making PREVENTIVE MAINTENANCE checks and services. Wiping cloths are needed to remove dirt or grease.

(4) Refer to appropriate TMs for PMCS requirements on mounted systems (i.e., TOW missiles systems, radios, etc.).

c. Troublespots.

NOTE

Dirt, grease, oil, and debris may cover up a serious problem. Clean as you check. Following precautions printed on container, use drycleaning solvent (SD-3) on all metal surfaces. On rubber or plastic material, use soap and water.

(1) Check all bolts, nuts, and screws. If loose, bent, broken, or missing, either tighten or report conditions to unit maintenance.

(2) Look for loose or chipped paint, and rust or cracks at welds. Remove rust and loose paint, and spot paint as required. If a cracked weld is found, report situation to unit maintenance.

(3) Inspect electrical wires and connectors for cracked or broken insulation. Also look for bare wires, and loose or broken connections. Tighten loose connections. Report other problems to unit maintenance.

(4) Check hoses and fluid lines for wear, damage, and leaks. Ensure clamps and fittings are tight. (Refer to para. 2-6 for information on leaks.)

(5) Check hinges for security and operation.

(6) Check data, caution, and warning plates for security and legibility.

2-5. PREVENTATIVE MAINTENANCE CHECKS AND SERVICES (PMCS) (Cont'd)

- d. **Not Ready/Available.** If a vehicle is not able to perform the mission, equipment will be reported as not ready/available. Refer to DA Pam 738-750.
- e. **Correct Assembly or Stowage.** Check each component for installation as an assembly, in the right place, and with no missing parts.

2-6. FLUID LEAKAGE.

Wetness around seals, gaskets, fittings, or connections indicates leakage. A stain also denotes leakage. If a fitting or connector is loose, tighten it. If broken or defective, report it. Use the following as a guide:

- a. **Class I.** Leakage indicated by wetness or discoloration, but not great enough to form drops.
- b. **Class II.** Leakage great enough to form drops, but not enough to cause drops to drip from item being checked/inspected.
- c. **Class III.** Leakage great enough to form drops that fall from the item being checked/inspected.

CAUTION

Operation is allowable with Class I or II leakage except for brake system. Any brake fluid leakage must be reported. **WHEN IN DOUBT, NOTIFY YOUR SUPERVISOR.** When operating with Class I or II leaks, check fluid levels more frequently. Class III leaks must be reported immediately to your supervisor or to unit maintenance. Failure to do this will result in damage to vehicle and/or components.

2-7. LUBRICATION REQUIREMENTS

For lubrication requirements and procedures, refer to appendix G.

Table 2-2. Preventive Maintenance Checks and Services

Item No.	Interval	Location	<u>Crewmember</u> Procedure	Not Fully Mission Capable if:
		Item to Check/Service		
			<p style="text-align: center;">WARNING</p> <p>Always remember the WARNINGS, CAUTIONS, and NOTES before operating this vehicle and prior to PMCS.</p> <p style="text-align: center;">NOTE</p> <p>Perform your before, after, and weekly checks if:</p> <ul style="list-style-type: none"> a. You are the assigned driver but have not operated the vehicle since the last weekly inspection. b. You are operating the vehicle for the first time. c. See separate manuals for smoke generator, TOW launcher, and radios. 	

Table 2-2. Preventive Maintenance Checks and Services (Cont'd)

Item No.	Interval	Location	Crewmember Procedure	Not Fully Mission Capable if:
		Item to Check/Service		
1	Before	Left Front, Side Exterior	<p>DRIVER</p> <p>CAUTION</p> <p>If leaks are detected in the area of the transfer case oil cooler, do not attempt to tighten retaining nuts; internal damage to the transfer case oil cooler may result. Notify unit maintenance.</p> <p>NOTE</p> <p>If leakage is detected, further investigation is needed to determine the location and cause of the leak.</p> <p>a. Visually check underneath vehicle for any evidence of fluid leakage.</p> <p>b. Visually check front and left side of vehicle for obvious damage that would impair operation.</p>	<p>a. Any brake fluid leak; class III leak of oil, fuel, or coolant.</p> <p>b. Any damage that will prevent operation.</p>

Table 2-2. Preventive Maintenance Checks and Services (Cont'd)

Item No.	Interval	Location	Crewmember Procedure	Not Fully Mission Capable If:
		Item to Check/Service		
2	Before	Left Side Tires	<p><u>DRIVER</u></p> <p><u>WARNING</u> Operating a vehicle with a tire in an underinflated condition or with a questionable defect may lead to premature tire failure and may cause equipment damage and injury or death to personnel.</p> <p>Visually check tires for presence and under inflation.</p>	Tire missing, deflated, or unserviceable.
3	Before	Rear Exterior	<p><u>DRIVER</u></p> <p>NOTE If leakage is detected, further investigation is needed to determine the location and cause of the leak.</p> <p>a. Visually check underneath vehicle for evidence of fluid leakage.</p> <p>b. Visually check rear of vehicle for obvious damage that would impair operation.</p> <p>c. Inspect bumper supports for cracks before towing trailer.</p>	

Table 2-2. Preventive Maintenance Checks and Services (Cont'd)

Item No.	Interval	Location	Crewmember Procedure	Not Fully Mission Capable if:
		Item to Check/Service		
4	Before	Exhaust Louvers	<p><u>DRIVER</u></p> <p>(M996 and M996A1 only) Check air exhaust louvers to ensure they are clear and free of debris that would restrict air flow. Clean any dirt or debris from louvers.</p>	
5	Before	Right Front, Side Exterior	<p><u>DRIVER</u></p> <p>NOTE If leakage is detected, further investigation is needed to determine the location and cause of the leak.</p> <p>a. Visually check underneath vehicle for evidence of fluid leakage.</p> <p>b. Visually check front and right side of vehicle for obvious damage that would impair operation.</p>	<p>a. Any brake fluid leak; class III leak of oil, fuel, or coolant.</p> <p>b. Any damage that would prevent operation.</p>

Table 2-2. Preventive Maintenance Checks and Services (Cont'd)

Item No.	Interval	Location	Crewmember Procedure	Not Fully Mission Capable If:
		Item to Check/Service		
6	Before	Right Side Tires	<p><u>DRIVER</u></p> <p><u>WARNING</u></p> <p>Operating a vehicle with a tire in an underinflated condition or with a questionable defect may lead to premature tire failure and may cause equipment damage and injury or death to personnel.</p> <p>Visually check tires for presence and under inflation.</p>	Tire missing, deflated, or unserviceable.
7	Before	Front	<p><u>DRIVER</u></p> <p><u>NOTE</u></p> <p>If leakage is detected, investigation is needed to determine the location and cause of the leak.</p> <p>a. Visually check front of vehicle for obvious damage that would impair operation.</p> <p>b. Visually check underneath vehicle for evidence of fluid leakage.</p>	<p>a. Any damage that will prevent operation.</p> <p>b. Any brake fluid leak; class III leak of oil, fuel, or coolant.</p>
7.1	Before	Power Steering Reservoir	<p><u>DRIVER</u></p> <p><u>CAUTION</u></p> <ul style="list-style-type: none"> Do not permit dirt, dust, or grit to enter power steering reservoir. Damage to power steering system will result if power steering fluid becomes contaminated. Do not overfill power steering reservoir. Damage to power steering system will result. 	

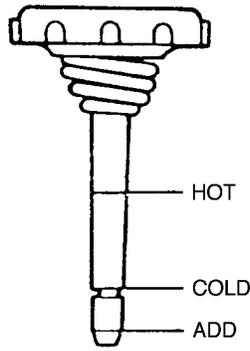


Table 2-2. Preventive Maintenance Checks and Services (Cont'd)

Item No.	Interval	Location	Crewmember Procedure	Not Fully Mission Capable If:
		Item to Check/Service		
7.1	Before	Power Steering Reservoir (Cont'd)	<p>Check fluid in power steering reservoir. Fluid should be between "HOT" and "COLD" marks. Add fluid if level is below "COLD" mark.</p> <p><u>DRIVER</u></p>	
8	Before	Cooling System	<p style="text-align: center;"><u>WARNING</u></p> <p>If engine has been recently operated, do not remove radiator cap to check coolant level. Cooling system is under pressure, and escaping steam or coolant can cause burns.</p> <p style="text-align: center;"><u>CAUTION</u></p> <p>Overheating, caused by lack of coolant, will cause engine damage.</p> <p>Check coolant level in coolant tank. Level should be at or above the "FULL COLD" line. Add coolant if below the "FULL" line.</p> <p><u>DRIVER</u></p>	
9	Before	Seat and Seatbelts	<p style="text-align: center;"><u>NOTE</u></p> <p>Vehicle operation with inoperative seatbelts may violate AR 385-55.</p> <p>a. Check all seatbelts for security, damage, and operation of buckle and clasp ends.</p> <p>b. Check operation of seat adjusting mechanism (driver's seat only).</p>	<p>b. Seat adjustment lock broken or missing.</p>

Table 2-2. Preventive Maintenance Checks and Services (Cont'd)

Item No.	Interval	Location	Crewmember Procedure	Not Fully Mission Capable If:
		Item to Check/Service		
10	Before	Fire Extinguisher	<p><u>DRIVER</u></p> <p>a. Check for missing or damaged fire extinguisher.</p> <p>b. Check gauge for proper pressure of about 150 psi (1034 kPa).</p> <p>c. Check for damaged or missing seal.</p>	<p>a. Fire extinguisher missing or damaged.</p> <p>b. Pressure gauge needle in recharge area.</p> <p>c. Seal broken or missing.</p>
11	Deleted			

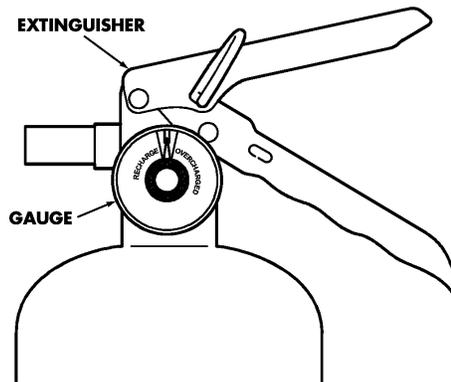


Table 2-2. Preventive Maintenance Checks and Services (Cont'd)

Item No.	Interval	Location	Crewmember Procedure	Not Fully Mission Capable if:
		Item to Check/Service		
12	Before	Instrument Panel	<p><u>DRIVER</u></p> <p><u>WARNING</u> If gauges, instruments, or instrument lights are inoperable or not within ranges described in these checks, immediately shut off engine and notify supervisor or unit maintenance personnel. Continued operation of vehicle may result in injury or damage to equipment.</p> <p>NOTE If engine is warm, wait-to-start light may not come on. During cranking or after starting, light may go on and off a few times.</p> <p>a. Check wait-to-start light and brake warning light. Turn rotary switch to "RUN". Wait-to-start and brake warning light should come on.</p>	<p>a. Wait-to-start light does not come on when engine is cold or wait light stays on continually. Brake warning light does not come on.</p>

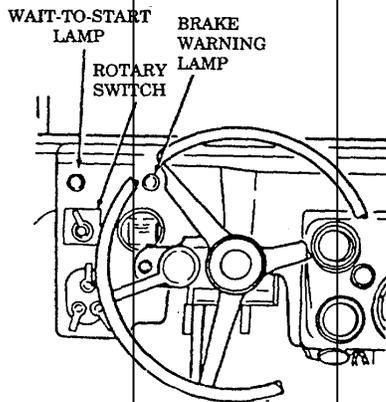


Table 2-2. Preventive Maintenance Checks and Services (Cont'd)

Item No.	Interval	Location	Crewmember Procedure	Not Fully Mission Capable If:
		Item to Check/Service		
12	Before	Instrument Panel (Cont'd)	<p>b. Start engine and check the following:</p> <p>c. Engine oil pressure gauge.</p> <p>d. Voltmeter.</p> <p>e. Air restriction gauge.</p> <p>f. Brake warning light should go off when hand brake is released.</p> <p>g. Check fuel gauge.</p> <p>h. Check coolant temperature gauge.</p>	<p>b. Engine will not start.</p> <p>c. Oil pressure is less than 6 psi (103 kPa) at idle.</p> <p>d. Voltmeter needle stays in yellow or red range.</p> <p>e. Air restriction indicator reaches red zone.</p> <p>f. Brake warning light stays on after hand brake is released or comes on while driving.</p> <p>h. Coolant temperature gauge inoperative or reads greater than 230°F (110°C).</p>
13	Deleted			

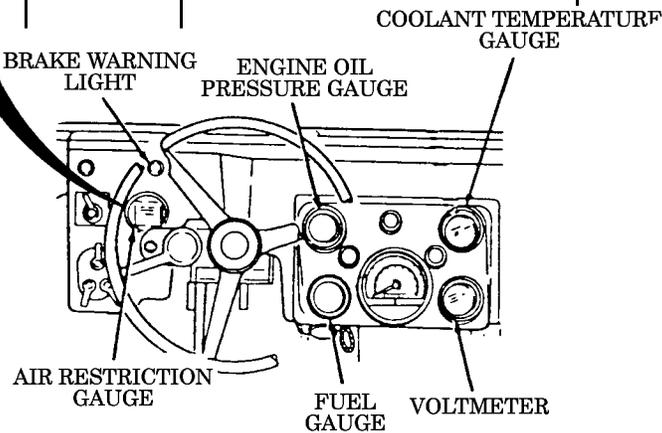
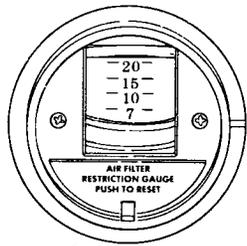


Table 2-2. Preventive Maintenance Checks and Services (Cont'd)

Item No.	Interval	Location	Crewmember Procedure	Not Fully Mission Capable If:
		Item to Check/Service		
14	Before	Brakes	<p><u>DRIVER</u></p> <p>NOTE</p> <p>Engine must be warmed up and idling, transmission in "D" (drive), transfer in "H" (high), and parking brake released to perform the following check.</p> <p>a. Check brake pedal travel. With vehicle at idle, transfer in 2H, and transmission in D, allow vehicle to move forward. As vehicle moves, slowly depress brake pedal. Pedal should travel 1 to 1-1/2 inches before brakes take hold. After brakes take hold, pedal may exceed the 1 to 1-1/2 inch travel. This is normal.</p> <p>b. Check parking brake. With parking brake fully applied, transmission in D or R, and transfer in H, vehicle should not move.</p> <p>c. Check parking brake lever safety mechanism to ensure that it latches when parking brake is applied.</p>	<p>a. Brakes will not stop the vehicle.</p> <p>b. Parking brake inoperable or unable to hold vehicle.</p> <p>c. Parking brake lever safety mechanism is not functioning properly.</p>

Table 2-2. Preventive Maintenance Checks and Services (Cont'd)

Item No.	Interval	Location	Crewmember Procedure	Not Fully Mission Capable If:
		Item to Check/Service		
15	Before	NBC System	<p><u>DRIVER</u> (M996, M996A1, M997, M997A1, and M997A2 only)</p> <p>a. Check NBC system power switch for proper operation and security of mounting. All system fuses, including spares, should be present.</p> <p>b. Check NBC heater for proper operation. When knob is turned clockwise, the light should come on, indicating heater is working.</p> <p>c. Check for steady flow of air at hose outlets. If light does not come on, notify supervisor, and record on DA Form 2404.</p>	
16	Before	Weapon Station	<p><u>DRIVER</u> (TOW and armament carriers, M966, M966A1, M1036, M1045, M1045A1, M1045A2, M1046, M1046A1, M1025, M1025A1, M1025A2, M1026, M1026A1, M1043, M1043A1, M1043A2, M1044, M1044A1, and M1121 only)</p> <p>NOTE Weapon station binding should be checked with weapon system or equivalent weight applied to turret. Refer to appropriate system TM to determine weight of weapon system.</p> <p>a. Check weapon station for binding by rotating 360 degrees in both directions at least five times.</p>	a. Weapon station binds.

Table 2-2. Preventive Maintenance Checks and Services (Cont'd)

Item No.	Interval	Location	Crewmember Procedure	Not Fully Mission Capable If:
		Item to Check/Service		
16	Before	Weapon Station (Cont'd)	<p>b. (Armament carriers only). Check armament mounting plate and bearing sleeve for security of mounting and obvious damage that would impair operation.</p> <p>c. (TOW vehicles only). Check inclinometer for proper operation. Check level vial for breaks and/or bubbles.</p> <p><u>DRIVER</u></p>	<p>b. Armament weapons required for mission: Mounting plate or bearing sleeve missing or any damage that will prevent or impair mounting of armament weapons.</p> <p>c. Level vial is broken or no bubble is present.</p>
17	During	Controls and Indicators	<p>a. Monitor all gauges.</p> <p>b. Check speedometer operation.</p> <p><u>DRIVER</u></p>	<p>a. Engine oil pressure gauge reads less than approximately 40 psi (276 kPa) under normal driving conditions or less than 6 psi (41 kPa) at idle. Coolant temperature gauge reads greater than 230°F (110°C). Air restriction gauge indicates restriction in the air cleaner. Voltmeter indicates a loss of voltage.</p>
18	During	Brakes	<p>Check brakes for pulling or grabbing.</p> <p><u>DRIVER</u></p>	Brakes pull or grab.
19	During	Steering	<p>Be alert for excessive sway, leaning to one side, or unstable handling. Check steering response for unusual free play, binding, or shimmy.</p> <p><u>DRIVER</u></p>	Handling is unstable; turning is difficult or free play, binding, or shimmy detected.
19.1	During	Accelerator Pedal	<p>Check response to accelerator feed. Check for sticking or binding pedal.</p>	Pedal sticking or binding.

Table 2-2. Preventive Maintenance Checks and Services (Cont'd)

Item No.	Interval	Location	Crewmember Procedure	Not Fully Mission Capable If:
		Item to Check/Service		
20	During	Power-train	<p><u>DRIVER</u> Be alert for unusual noises or vibrations from engine, transmission, transfer, differentials, propeller shafts, axle shafts, or wheels.</p>	Unusual noise or vibration detected.
21	During	Transmission	<p><u>DRIVER</u> Check transmission for proper operation.</p>	Transmission slips or will not shift.
22	During	Ambulance Air-conditioner (M997, M997A1, and M997A2 only)	<p><u>DRIVER</u></p> <p>NOTE Perform the following inspection only if the air conditioner is required for climatic conditions. Turn air conditioner on and set blower to maximum cooling speed settings. Wait 5 minutes to allow temperature to stabilize. Check outlet ducts for cool air.</p>	Climatic conditions require air-conditioning and A/C is inoperable, and if outlet duct air is not cooler than ambient temperature.
22.1	After	Gear Shifter Lever	<p><u>DRIVER</u></p> <p>a. Check transmission shift lever operation. Shift transmission through all operating ranges. Lever should move freely through all range positions.</p> <p>b. Check transfer shift lever operation. With transmission in "N," shift transfer lever through all range positions. Lever should move freely through all range positions.</p>	<p>a. Lever inoperable or binds between range detents.</p> <p>b. Lever inoperable or does not engage in all ranges with engine not running.</p>

Table 2-2. Preventive Maintenance Checks and Services (Cont'd)

Item No.	Interval	Location	Crewmember Procedure	Not Fully Mission Capable if:
		Item to Check/Service		
23	After	Transmission fluid	<p><u>DRIVER</u></p> <p><u>CAUTION</u></p> <ul style="list-style-type: none"> Do not permit dirt, dust, or grit to enter transmission oil dipstick tube. Internal transmission damage will result if transmission oil becomes contaminated. Do not overfill transmission. Damage to transmission will result. An over-full transmission can also indicate a transfer case fluid leak. Notify unit maintenance if transmission fluid is above crosshatch mark. <p><u>NOTE</u></p> <ul style="list-style-type: none"> Transmission fluid level should be checked with engine running, parking brake set, transmission shift lever in "N," and vehicle on level ground. Fluid level should be at crosshatch marks on dipstick. Engine operating temperature of 190-230°F (88-110°C) must be reached before performing AFTER checks. <p>Check transmission fluid level. If level is below the crosshatch marks, add sufficient fluid to bring the level to the crosshatch marks.</p>	



Table 2-2. Preventive Maintenance Checks and Services (Cont'd)

Item No.	Interval	Location	Crewmember Procedure	Not Fully Mission Capable If:
		Item to Check/Service		
24	After	Fuel Filter	<p><u>DRIVER</u></p> <p>WARNING</p> <p>Do not perform fuel system checks, inspections, or maintenance while smoking or near fire, flames, or sparks. Fuel may ignite, causing damage to vehicle and injury or death to personnel.</p> <p>NOTE</p> <p>A rubber hose can be attached to drainvalve to catch fuel in container before opening drain valve. If fuel is clear, put fuel back in fuel tank.</p> <p>a. Check fuel for contamination. With engine running, open drainvalve. Allow fuel to drain in suitable container until it runs clear. Close valve.</p> <p>NOTE</p> <p>Fuel retained in the drainvalve may drip when vehicle vibrations occur. This is normal and does not constitute a leak. Wipe drainvalve with rag until excess fuel is removed.</p> <p>b. Check for leaks.</p> <p>c. Stop engine and remove rubber hose from drainvalve, if installed.</p>	<p>a. Fuel is not clear after draining 1 pint (0.47 L).</p> <p>b. Class III leakage evident.</p>

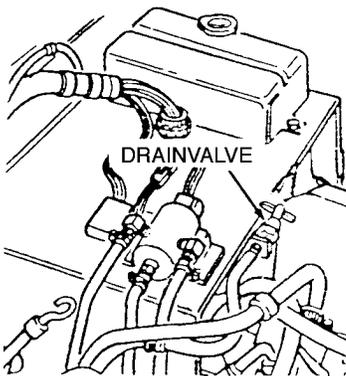


Table 2-2. Preventive Maintenance Checks and Services (Cont'd)

Item No.	Interval	Location	<u>Crewmember Procedure</u>	Not Fully Mission Capable if:
		Item to Check/Service		
25	After	Left Side Tires	<p><u>DRIVER</u></p> <p>WARNING Operating a vehicle with a tire in an underinflated condition or with questionable defect may lead to premature tire failure and may cause equipment damage and injury or death to personnel.</p> <p>Visually check tires for under-inflation, cuts, gouges, cracks, or bulges. Remove all penetrating objects.</p>	Tire deflated or otherwise unserviceable.
26	After	Mirror (Left Side)	<p><u>DRIVER</u></p> <p>NOTE Vehicle operation with damaged or missing outside rearview mirrors may violate AR 385-55. Check mirror for presence, cracks, and serviceability.</p>	
27	After	Left Front, Side Exterior	<p><u>DRIVER</u></p> <p>NOTE If leakage is detected, further investigation is needed to determine the location and cause of the leak.</p> <p>a. Visually check underneath vehicle for evidence of fluid leakage.</p>	a. Any brake fluid leak; Class III leak of oil, fuel, or coolant.

Table 2-2. Preventive Maintenance Checks and Services (Cont'd)

Item No.	Interval	Location	Crewmember Procedure	Not Fully Mission Capable If:
		Item to Check/Service		
27	After	Left Front, Side Exterior (Cont'd)	<p>b. Visually check halfshaft cv boots and ball joint boots for presence, rips, tears, or cuts.</p> <p>c. Inspect frame crossmembers and underbody support for missing hardware, cracks, bends, and breaks. Notify unit maintenance if rust is present, but the base metal is sound.</p> <p>d. Visually check for body damage that would impair operation of vehicle.</p>	<p>c. Crossmembers or underbody support are missing any hardware, broken, cracked, or if a bent or rusted-through condition is present that would affect vehicle operation.</p> <p>d. Any damage that will prevent operation.</p>
28	After	Rear Exterior	<p><u>DRIVER</u></p> <p>NOTE If leakage is detected, further investigation is needed to determine the location and cause of the leak.</p> <p>a. Visually check underneath vehicle for evidence of fluid leakage.</p> <p>b. Visually check halfshaft cv boots and ball joint boots for presence, rips, tears, or cuts.</p> <p>c. Inspect frame crossmembers and underbody support for missing hardware, cracks, bends, and breaks. Notify unit maintenance if rust is present, but the base metal is sound.</p> <p>d. Inspect bumper or cross-member and inner braces in area around towing pintle for cracks or breaks.</p>	<p>a. Any brake fluid leak; class III leak of oil, fuel, or coolant.</p> <p>c. Crossmembers or underbody support are missing any hardware, broken, cracked, or if a bent or rusted-through condition is present that would affect vehicle operation.</p> <p>d. Bumper, cross-member or an inner brace is cracked or broken.</p>

Table 2-2. Preventive Maintenance Checks and Services (Cont'd)

Item No.	Interval	Location	<u>Crewmember</u> Procedure	Not Fully Mission Capable if:
		Item to Check/Service		
29	After	Patient Compartment	<p><u>DRIVER</u></p> <p>(M996, M996A1, M997, M997A1, and M997A2 only)</p> <p>a. Check presence and operation of ceiling white lights, blackout lights, and spotlights.</p> <p>b. Check operation of blackout switches at rear step, rear doors, and bulkhead door.</p> <p>c. Inspect condition and security of litter racks and components.</p> <p>d. Inspect upper litter rack hinges and latches for proper operation, damage, or missing components.</p> <p>e. Inspect tension straps, support straps, litter straps, and footman loops for security of mounting, damage, and missing components.</p> <p>f. Inspect oxygen bottles and mounting components for security of stowage when oxygen bottles are in stowed position.</p> <p>g. Inspect IV straps and hangers for security of mounting, damage, and missing components.</p>	<p>a. One or more lights inoperative or unserviceable.</p> <p>b. Any blackout switch inoperative.</p> <p>d. Hinges or latches inoperative, damaged, or missing.</p>

Table 2-2. Preventive Maintenance Checks and Services (Cont'd)

Item No.	Interval	Location	<u>Crewmember</u> Procedure	Not Fully Mission Capable if:
		Item to Check/Service		
29	After	Patient Compartment (Cont'd)	<p>h. Check operation of rear doors, handles, and latching mechanisms. Check for loose or missing components. Door should not bind and should close securely when latched shut.</p> <p>i. Inspect rear door seals, step seals, bulkhead door and rear door vent seals (M996 and M996A1 only) for proper installation and condition. Door seals must not allow emission of light signature under blackout conditions.</p> <p><u>DRIVER</u></p>	<p>h. Rear door handles and latching mechanisms do not operate properly. Missing or damaged components. Rear doors do not operate properly.</p> <p>i. Door seals allow emission of light signature under blackout conditions (detectable from 50 ft [15 ml of vehicle]).</p>
30	After	Right Side Tires	<p><u>WARNING</u> Operating a vehicle with a tire in an underinflated condition or with questionable defect may lead to premature tire failure and may cause equipment damage and injury or death to personnel.</p> <p>Visually check tires for under-inflation, cuts, gouges, cracks, or bulges. Remove all penetrating objects.</p> <p><u>DRIVER</u></p>	<p>Tire deflated, or otherwise unserviceable.</p>
31	After	Mirror (Right Side)	<p><u>NOTE</u> Vehicle operation with damaged or missing outside rearview mirrors may violate AR 385-55. Check mirror for presence, cracks, and serviceability.</p>	

Table 2-2. Preventive Maintenance Checks and Services (Cont'd)

Item No.	Interval	Location	Crewmember Procedure	Not Fully Mission Capable If:
		Item to Check/Service		
32	After	Right Front, Side Exterior	<p><u>DRIVER</u></p> <p>NOTE If leakage is detected, further investigation is needed to determine the location and cause of the leak.</p> <p>a. Visually check underneath vehicle for evidence of fluid leakage.</p> <p>b. Visually check halfshaft cv boots and ball joint boots for presence of rips, tears, cuts.</p> <p>c. Inspect frame crossmembers and underbody support for missing hardware, cracks, bends, and breaks. Notify unit maintenance if rust is present but the base metal is sound.</p> <p>d. Visually check front and right side of vehicle for obvious damage that would impair operation.</p>	<p>a. Any brake fluid leak; class III leak of oil, fuel, or coolant.</p> <p>c. Crossmembers or underbody support are missing any hardware, broken, cracked, or if a bent or rusted-through condition is present that would affect vehicle operation.</p> <p>d. Any damage that will prevent operation.</p>
33	After	Engine Oil	<p><u>DRIVER</u></p> <p>CAUTION</p> <ul style="list-style-type: none"> Do not permit dirt, dust, or grit to enter engine oil dipstick tube. Internal engine damage will result if engine oil becomes contaminated. Do not overfill engine crankcase. Damage to engine will result. 	

Table 2-2. Preventive Maintenance Checks and Services (Cont'd)

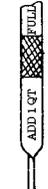
Item No.	Interval	Location	Crewmember Procedure	Not Fully Mission Capable If:
		Item to Check/Service		
33	After 	Engine Oil (Cont'd)	Check engine oil level. Level should be between "ADD" and "FULL." If level is below "ADD," add oil to bring level between the "ADD" and "FULL" marks. <u>DRIVER</u>	Oil appears milky.
34	After	Power Steering Lines and Fittings	<u>WARNING</u> Notify unit maintenance if power steering system has class III leak. Loss of power assist could occur if this condition exists. Check power steering lines and fittings for leaks.	Class III leakage evident.
35	Deleted			

Table 2-2. Preventive Maintenance Checks and Services (Cont'd)

Item No.	Interval	Location	Crewmember Procedure	Not Fully Mission Capable If:
		Item to Check/Service		
36	After	Cooling System	<u>DRIVER</u> Inspect radiator hoses for leakage.	Class III leakage evident.
37	After	Master Cylinder	<u>DRIVER</u> Visually check master cylinder lines for leaks and security of cover.	Any leak or cover missing.
37.1	After	Windshield Washer Jar	<u>DRIVER</u> a. Visually check windshield washer jar for damage. b. Check windshield washer fluid level.	
38	After	Lights	<u>DRIVER</u> CAUTION Never set the rotary switch to "RUN" to check the lights. This drains the batteries and can burn out the glow plugs and control box. NOTE Vehicle operation with damaged or inoperable headlights may violate AR 385-55. a. Check for presence and operation of service drive, turn signal, blackout marker, marker, blackout drive, and side marker lights. b. Check operation of tail/stop-lights. Push down brake pedal approximately 1/4 in. Tail/stop-lights should come on.	

Table 2-2. Preventive Maintenance Checks and Services (Cont'd)

Item No.	Interval	Location	Crewmember Procedure	Not Fully Mission Capable If:
		Item to Check/Service		
39	After	Horn	<p><u>DRIVER</u></p> <p>NOTE Vehicle operation with inoperative horn may violate AR 385-55.</p> <p>Check operation of horn if tactical situation permits.</p>	<p>a. Windshield is cracked, broken, or discolored (cloudy) sufficiently to impair operator's vision.</p>
40	After	Windshield and Wipers	<p><u>DRIVER</u></p> <p>NOTE Vehicle operation with damaged windshield may violate AR 385-55.</p> <p>a. Check windshield for damage that would impair operator's vision.</p> <p>NOTE Vehicle operation with inoperative wipers may violate AR 385-55.</p> <p>b. Check windshield wiper and blade for presence and damage.</p> <p>c. Check windshield wipers and washer for proper operation.</p>	
41	After	Light Switches	<p><u>DRIVER</u></p> <p>NOTE Ensure all switches are in the "OFF" position. Failure to turn switches to the "OFF" position when not in use will drain the batteries.</p> <p>Check and ensure all switches are in the "OFF" position.</p>	

Table 2-2. Preventive Maintenance Checks and Services (Cont'd)

Item No.	Interval	Location	Crewmember Procedure	Not Fully Mission Capable If:
		Item to Check/Service		
41.1	Weekly	Hand Throttle	<p><u>DRIVER</u></p> <p>a. Check hand throttle and mounting bracket for security. Check throttle release button to ensure hand throttle cable operates properly.</p> <p>b. Check hand throttle cable for corrosion, nicks, breaks, or burns.</p>	
42	Weekly	Tires	<p><u>DRIVER</u></p> <p><u>WARNING</u></p> <ul style="list-style-type: none"> Do not exceed 30 psi (207 kPa) cold bias tire inflation pressure. Overinflation of tire may result in premature tire failure, damage to equipment, and injury or death to personnel. Do not exceed 50 psi (345 kPa) cold radial tire inflation pressure. Overinflation of tire may result in damage to equipment and injury or death to personnel. <p>Perform steps a, b, c, and d for bias tires and steps a, b, c, and e for radial tires.</p> <p>NOTE</p> <p>Check tire size designator on sidewall for tire construction identification: 36x12.50-16.5 LT-Bias ply, 37x12.50R 16.5 LT-Radial.</p>	

Table 2-2. Preventive Maintenance Checks and Services (Cont'd)

Item No.	Interval	Location	Crewmember Procedure	Not Fully Mission Capable if:
		Item to Check/Service		
42	Weekly	Tires (Cont'd)	<p>a. Check tire tread depth. Tread should not be worn beyond level of wear bar. Wear bars are molded across the tread pattern in the valley between the center rib and lugs. The tread wear indicator letters (TWI) are molded on the sidewall to aid in locating the wear bar.</p> <p>NOTE The wear bars are not evident on new or very low mileage tires. The wear bars will appear after usual use.</p>	<p>a. Tread is worn even to height of tread wear indicator. Any cut, gouge, or crack that extends to the cord body or any bulges.</p>

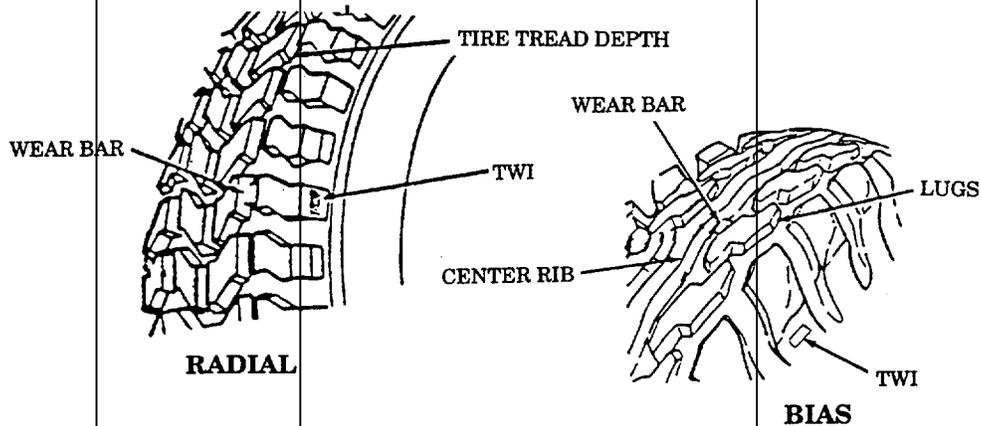


Table 2-2. Preventive Maintenance Checks and Services (Cont'd)

Item No.	Interval	Location	<u>Crewmember</u> Procedure	Not Fully Mission Capable if:
		Item to Check/Service		
42	Weekly	Tires (Cont'd)	<p>b. Measure tread thickness. Tread depth should not be less than 1/16-inch (1.59-mm) thick. (1.59-mm).</p> <p>c. Check for missing or loose wheel stud nuts and lug nuts. Tighten loose lug nuts and have unit maintenance tighten stud nuts and lug nuts to proper torque.</p>	<p>b. Tread depth less than 1/16-inch</p> <p>c. Any wheel stud nut or lug nut is broken or missing.</p>

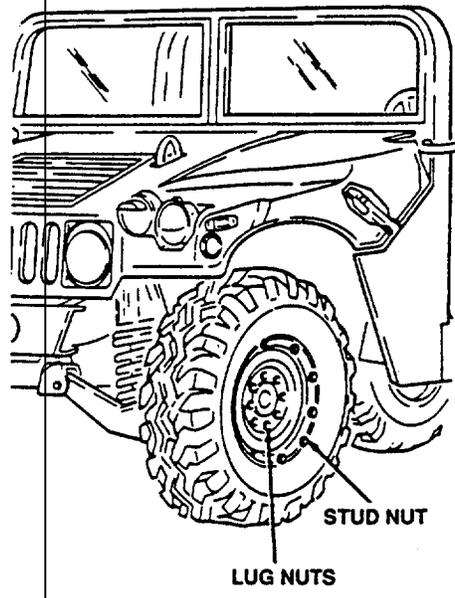


Table 2-2. Preventive Maintenance Checks and Services (Cont'd)

Item No.	Interval	Location	Crewmember Procedure	Not Fully Mission Capable If:		
		Item to Check/Service				
42	Weekly	Tires (Cont'd)	<p>(BIAS TIRES ONLY)</p> <p><u>WARNING</u></p> <p>Do not exceed 30 psi (207 kPa) cold bias tire inflation pressure. Over-inflation of tire may result in premature tire failure, damage to equipment, and injury or death to personnel.</p> <p>Check tire size designator on sidewall for tire construction identification: 36x12.50-16.5 LT-Bias ply.</p> <p>d. Gauge tires for correct air pressure using tire inflation gauge. Adjust as necessary.</p>			
VEHICLE			FRONT		REAR	
			Standard	Metric	Standard	Metric
			(psi)	(kPa)	(psi)	(kPa)
AT GVW						
M966, M998, M1025, M1026, M1035, M1036, M1038, M1043, M1044, M1045, M1046, M1121			20	138	22	152
M996, M997, M1037, M1042			20	138	30	207
UNLOADED* M998, M1038 (only)			16	110	18	124
MUD, SAND, AND SNOW (30 mph [48 kph] max. speed) All models			12	83	16	110
CROSS COUNTRY M998 series (except M1097)			15	103	20	138
*Driver plus one passenger						

Table 2-2. Preventive Maintenance Checks and Services (Cont'd)

Item No.	Interval	Location	Crewmember Procedure	Not Fully Mission Capable If:		
		Item to Check/Service				
42	Weekly	Tires (Cont'd)	<p>(RADIAL TIRES ONLY)</p> <p>WARNING</p> <p>Do not exceed 50 psi (345 kPa) cold radial tire inflation pressure. Over-inflation of tire may result in premature tire failure, damage to equipment, and injury or death to personnel.</p> <p>Check tire size designator on sidewall for tire construction identification: 37x12.50R-16.5 LT-Radial.</p> <p>e. Gauge tires for correct air pressure using tire inflation gauge. Adjust as necessary.</p>			
VEHICLE			FRONT		REAR	
			Standard	Metric	Standard	Metric
			(psi)	(kPa)	(psi)	(kPa)
AT GVW						
M966, M966A1, M998, M998A1, M1025, M1025A1, M1026, M1026A1, M1035, M1035A1, M1036, M1038, M1038A1, M1043, M1043A1, M1043A2, M1044, M1044A1, M1045, M1045A1, M1046, M1046A1, M1121			20	138	25	172
M996, M996A1, M997, M997A1, M997A2, M1037, M1042			20	138	30	207
M1025A2, M1035A2, M1045A2,			25	172	40	276
M997A2, M1043A2, M1097A1, M1097A2, M1123			35	241	40	276
M1097			36	248	42	290
UNLOADED* All models			15	103	18	124
MUD, SAND, AND SNOW (15 mph [48 kph] max. speed) All models			12	83	20	138
*Driver plus one passenger						

Table 2-2. Preventive Maintenance Checks and Services (Cont'd)

Item No.	Interval	Location	Crewmember Procedure		Not Fully Mission Capable If:	
		Item to Check/Service				
42	Weekly	Tires (Contd)				
VEHICLE			FRONT		REAR	
			Standard	Metric	Standard	Metric
AT GVW			(psi)	(kPa)	(psi)	(kPa)
CROSS COUNTRY M998 and M998A1 series (except M1097 and M1097A1)			15	103	20	138
M998A2 series, M1097, and M1097A1			20	138	30	207
43	Weekly	Exhaust System	<u>DRIVER</u> Check exhaust system for security of all mounts, tightness of clamps and bolts, rusted conditions, damaged pipes, and any indication of an exhaust leak.		Any mounts are broken, pipes are rusted through or broken, and any indication of an exhaust leak.	
44	Weekly	Shock Absorbers	<u>DRIVER</u> Visually inspect shock absorbers for leaks, damage, and security of mounting.		Class III leakage or damage is evident; mounting damaged or loose.	
45	Weekly	Doors and Windows	<u>DRIVER</u> Check operation of doors and windows.			
46	Weekly	Tailgate	<u>DRIVER</u> Check operation of tailgate. Check that tailgate latches securely and operates properly.			

Table 2-2. Preventive Maintenance Checks and Services (Cont'd)

Item No.	Interval	Location	Crewmember Procedure	Not Fully Mission Capable If:
		Item to Check/Service		
47	Weekly	Armament Carriers	<p><u>DRIVER</u></p> <p>(TOW and armament carriers M966, M966A1, M1036, M1045, M1045A1, M1045A2, M1046, M1046A1, M1025, M1025A1, M1025A2, M1026, M1026A1, M1043, M1043A1, M1043A2, M1044, M1044A1, and M1121 only)</p> <p>a. Inspect cargo shell door for bends, warping, binding, and ease of operation. Inspect latching mechanisms for proper operation. Inspect lift cylinders for bends and security of mounting.</p> <p>b. Inspect strap assembly for frays and security of mounting.</p> <p>c. Check cargo shell door for alignment as follows:</p> <p>(1) Insert a piece of paper between the door seal and door opening.</p> <p>(2) With door closed, seal should offer resistance to pulling out paper. If door seal does not offer resistance, adjustment is required.</p>	<p>a. Lift cylinders or latches bent, warped, binding, or inoperative.</p>

Table 2-2. Preventive Maintenance Checks and Services (Cont'd)

Item No.	Interval	Location	Crewmember Procedure	Not Fully Mission Capable If:
		Item to Check/Service		
48	Weekly	Patient Compartment	<p><u>DRIVER</u> (M996, M996A1, M997, M997A1, and M997A2 only)</p> <p><u>WARNING</u></p> <p>Be sure cables are securely connected to the steps before using. Failure to do so may cause injury to personnel.</p> <ul style="list-style-type: none"> a. Inspect step assembly. b. Check operation of step latch. Latch should securely engage step striker to secure step assembly in the stowed position. c. Check operation of attendant seat and rail. Inspect seat and rail for damage, missing components, and binding during operation. Ensure proper adjustment and operation of seatbelt. d. Check operation of ambulatory patient seat (M996 and M996A1 only). Check for damage or missing components. e. Inspect handhold straps and footman loops for security, damage, or missing components (M996 and M996A1 only). 	<ul style="list-style-type: none"> c. Seatbelt, attendant seat, or rail is broken or missing.

Table 2-2. Preventive Maintenance Checks and Services (Cont'd)

Item No.	Interval	Location	Crewmember Procedure	Not Fully Mission Capable If:
		Item to Check/Service		
49	Weekly	Front Arctic Heater and/or Rear Troop/Cargo Heater	<p><u>DRIVER</u> (Vehicle w/Arctic Winterization Kit and/or Troop/Cargo Winterization Kit)</p> <p>a. Check heater and heater controls for proper operation.</p> <p>b. Check fuel lines and fittings for leaks, cracks, or breaks.</p> <p>c. Check electrical cables and connections for security, or frayed or broken wires.</p> <p>d. Check heater exhaust pipe for damage, security of mounting, and missing components.</p> <p>e. Check fuel filter for leaks or damage.</p>	<p>a. Heater inoperable and mission requires heater.</p> <p>b. Class III fuel leakage is evident and mission requires heater.</p> <p>c. Frayed or broken wires.</p> <p>d. Heater exhaust damaged or components missing.</p> <p>e. Class III leak evident.</p>
50	Weekly	Crew Door	<p><u>DRIVER</u> (M966, M966A1, M996, M996A1, M997, M997A1, M997A2, M1025, M1025A1, M1025A2, M1026, M1026A1, M1036, and M1121 only)</p> <p>a. Check crew door assembly for visible cracks that would make door unserviceable or unable to secure properly.</p> <p>b. Check crew door assembly latch, hinges, and door handle for damage, looseness, or missing parts.</p>	<p>a. Visible cracks, or door does not secure properly.</p> <p>b. Loose, missing, or unserviceable parts.</p>

Table 2-2. Preventive Maintenance Checks and Services (Cont'd)

Item No.	Interval	Location	Crewmember Procedure	Not Fully Mission Capable If:
		Item to Check/Service		
51	Weekly	Air Cleaner	<p><u>DRIVER</u></p> <p><u>WARNING</u></p> <p>If NBC exposure is suspected, all air filter media should be handled by personnel wearing protective equipment. Consult your unit NBC Officer or NBC NCO for appropriate handling or disposal instructions.</p> <p>Check air cleaner weathercap, air cleaner assembly, air intake hose, and air horn for security of mounting and damage.</p>	Evidence of damage to air cleaner weathercap, body, air intake hose, or mounting that will allow unfiltered air to enter the engine.
52	Weekly	Alternator Brackets	<p><u>DRIVER</u></p> <p>Visually check power steering and alternator brackets for cracks, damage, or loose bolts.</p>	Damaged or cracked bracket, or loose bolts.
53	Weekly	Cooling System	<p><u>DRIVER</u></p> <p>a. Check fan and fan pulley for damage.</p> <p>b. Check radiator for leaks, clogged or damaged fins, and loose or damaged hoses to and from the engine.</p>	<p>a. Fan blade or pulley is bent, broken, cracked, or loose.</p> <p>b. Class III leakage evident.</p>

Table 2-2. Preventive Maintenance Checks and Services (Cont'd)

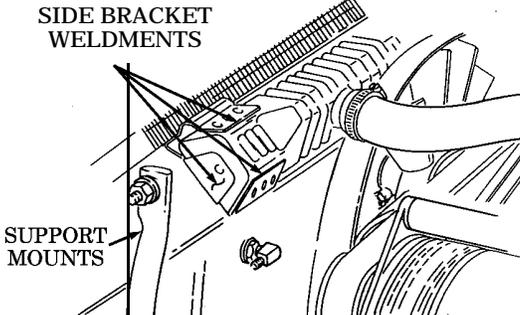
Item No.	Interval	Location	Crewmember Procedure	Not Fully Mission Capable If:
		Item to Check/Service		
53	Weekly	Cooling System (Cont'd)	<p>c. Check support mounts, side brackets, and side bracket weldments on radiator for missing hardware, damage, or broken welds.</p>  <p>NOTE Belt flutter at idle is normal in the HMMWV belt drive system. It does not necessarily indicate that the belts are loose. Belt flutter should disappear as the engine is accelerated.</p> <p>d. Check for loose, missing, broken, cracked, or frayed drivebelts (all models except "A2" and M1123 vehicles). Notify supervisor if loose drivebelts are suspected.</p> <p>e. For A2 and M1123 models, check for looseness, misalignment, breaks, splits, or frayed serpentine belt.</p> <p>f. Check fan shroud for damage.</p> <p>g. Check engine oil cooler and hoses for damage and leaks.</p>	<p>c. Support mounts broken, damaged, or missing hardware. Side brackets damaged or weldments broken.</p> <p>d. Any drivebelt is missing, broken, frayed or dry rotted. Belt fiber has more than one crack 1/8-in. (3.18 mm) in depth or 50% or frays more than 2 in. (5.1 cm) long.</p> <p>e. Serpentine drivebelt is loose, misaligned (off one or more grooves on any pulley), breaks or splits in outer surface, frays on either edge if cord is broken.</p> <p>f. Fan shroud broken, cracked, or loose.</p> <p>g. Class III leak evident.</p>

Table 2-2. Preventive Maintenance Checks and Services (Cont'd)

Item No.	Interval	Location	Crewmember Procedure	Not Fully Mission Capable If:
		Item to Check/Service		
54	Weekly	Batteries	<p><u>DRIVER</u></p> <p><u>WARNING</u></p> <ul style="list-style-type: none"> • Don't smoke, have open flames, or make sparks around batteries, especially if the caps are off. Batteries can explode and cause injury or death. • Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry contacts battery terminal, a direct short will result, causing instant heating of tools, severe injury to personnel, or damage to equipment. <p>a. Remove companion seat and check batteries for damaged casing, terminal posts, and security of mounting. Notify unit maintenance if any defects are found.</p> <p>b. Electrolyte should be filled to the level/split ring in the battery filler opening (vent). If fluid is low, fill with distilled water to split ring (refer to appendix D, item 27). If fluid is gassing (boiling), notify unit maintenance.</p> <p>NOTE</p> <p>Water in battery box can be caused by debris plugging battery box drain holes. If water is present, clean debris from battery box drain holes.</p> <p>c. Check battery box for corrosion or water on bottom of battery tray.</p>	<p>a. One or more batteries missing, un-serviceable, leaking, terminal or cables are loose, corroded, or holddowns are not secure.</p>

Table 2-2. Preventive Maintenance Checks and Services (Cont'd)

Item No.	Interval	Location	Crewmember Procedure	Not Fully Mission Capable If:
		Item to Check/Service		
55	Weekly	Weapon Station	<p><u>DRIVER</u> (M966, M966A1, M1036, M1045, M1045A1, M1045A2, M1046, M1046A1, M1025, M1025A1, M1025A2, M1026, M1026A1, M1043, M1043A1, M1043A2, M1044, M1044A1, and M1121 only)</p> <p>a. Inspect weapon station hatch and hinge for bends, cracks, warped, or damaged areas.</p> <p>b. Inspect brake handle for ease of operation.</p> <p>c. Inspect gunner's sling for tears or frays.</p>	
56	Weekly	TOW Missile Rack	<p><u>DRIVER</u> (M966, M966A1, M1036, M1045, M1045A1, M1045A2, M1046, M1046A1, and M1121 only)</p> <p>a. Inspect TOW missile rack latch assembly and support braces for presence and ease of operation.</p> <p>b. Inspect straps for tears and frays.</p> <p>c. Check for presence of TOW adapter.</p>	<p>a. Rack will not support or stow six TOW missiles.</p> <p>c. TOW adapter missing or damaged.</p>
57	Weekly	Gunner's Platform	<p><u>DRIVER</u> Inspect gunner's platform risers for binding, ease of operation, or missing lock-pins.</p>	<p>Gunner's platform cannot be adjusted.</p>

Table 2-2. Preventive Maintenance Checks and Services (Cont'd)

Item No.	Interval	Location	Crewmember Procedure	Not Fully Mission Capable If:
		Item to Check/Service		
58	Weekly	Tiedowns	<p><u>DRIVER</u></p> <p>a. Inspect stored equipment footman loops for presence and security of mounting. Inspect straps for tears or frays.</p> <p>b. Inspect stowage brackets, footman loops, and tiedowns for security of mounting, damage, and missing components.</p> <p>c. Inspect all tiedown strap assemblies for proper operation, frays, damage, cleanliness, and security of mounting.</p>	
59	Weekly	Bulkhead Doors	<p><u>DRIVER</u></p> <p>(M996, M996A1, M997, M997A1, and M997A2 only)</p> <p>Check operation of bulkhead doors. Doors should securely latch when closed or fully opened. Inspect all door components for damage, adjustment, or missing components.</p>	

Table 2-2. Preventive Maintenance Checks and Services (Cont'd)

Item No.	Interval	Location	Crewmember Procedure	Not Fully Mission Capable If:
		Item to Check/Service		
60	Weekly	Environment Control System	<p><u>DRIVER</u></p> <p>a. Check security of A/C heater control box mounting.</p> <p>b. Check Heating, Ventilation and Air Conditioning (HVAC) filter (para. 3-27) for dirt or debris. Clean filters of dirt and debris that would restrict air flow.</p> <p>NOTE</p> <p>Insufficient cooling could be a result of loss of R12. This is a gas, therefore leaks cannot be detected. If lines or fittings are suspect, the vehicle is to be considered non-mission capable and sent to Direct Support for further inspection(s).</p> <p>c. Inspect exposed HVAC system ducts, hoses, fitting lines, vents, and mounting hardware for damage, leaks, missing components, and security of mounting.</p> <p>d. Inspect exposed wiring harnesses for breaks, frayed insulation, loose or damaged connectors, and loose, damaged, or missing mounting hardware.</p>	<p>d. Wiring harness broken, frayed, or damaged. Mounting hardware missing.</p>

Table 2-2. Preventive Maintenance Checks and Services (Cont'd)

Item No.	Interval	Location	Crewmember Procedure	Not Fully Mission Capable If:
		Item to Check/Service		
61	Weekly	NBC System	<p><u>DRIVER</u> (M996, M996A1, M997, M997A1, and M997A2 only)</p> <p>a. Inspect exposed NBC equipment for security of mounting, damage, and missing components.</p> <p>b. Inspect NBC stowage compartment door seals, hinges, latches, and straps for proper operation, damage, and missing components.</p> <p>c. Inspect M13 patient protective mask, hoses, and end connectors for damage, leaks, or missing components. Inspect adapter for stripped threads or other damage.</p>	

Table 2-2. Preventive Maintenance Checks and Services (Cont'd)

Item No.	Interval	Location	Crewmember Procedure	Not Fully Mission Capable If:
		Item to Check/Service		
62	Weekly	Canvas and Bows	<p><u>DRIVER</u> (M998, M998A1, M1038, and M1038A1 w/Soft Top Enclosure)</p> <p>a. Inspect cargo cover for tears, punctures, and ripped seams.</p> <p>b. Inspect windows for cracks and scratches.</p> <p>c. Inspect bows and mounting brackets for damage and security of mounting.</p> <p>d. Inspect footman loops and straps for tears, frays, and security of mounting.</p>	Actuating lever or spring is missing or broken.
63	Weekly	Tow Pintle	<p><u>DRIVER</u> Check pintle hook for looseness, damaged locking mechanism, and presence of cotter pin.</p>	
64	Weekly	Tow Hooks	<p><u>DRIVER</u> Check presence and condition of tow hooks (front and rear).</p>	
65	Weekly	Trailer Electrical Connector	<p><u>DRIVER</u> Check trailer electrical connector for damage.</p>	
66	Weekly	Parking Brake	<p><u>DRIVER</u> Check combination service/parking brake assemblies; inspect parking brake for obstruction of the actuating lever or broken or missing spring.</p>	
67	Deleted			

Table 2-2. Preventive Maintenance Checks and Services (Cont'd)

Item No.	Interval	Location	Crewmember Procedure	Not Fully Mission Capable If:
		Item to Check/Service		
68	Monthly	Corrosion	<p><u>DRIVER</u></p> <p>Visually inspect vehicle for indication of corrosion or cracks and/or breaks.</p>	Any corroded-through condition or cracks or breaks that would affect vehicle operation.
69	Monthly	Tailgate	<p><u>DRIVER</u></p> <p>Check tailgate for corroded-through condition and/or damage. If tailgate does not latch securely or is damaged, notify unit maintenance.</p>	Any corroded-through condition or damage that would affect vehicle operation.
70	Monthly	Red Cross Plate	<p><u>DRIVER</u></p> <p>(M996, M996A1, M997, M997A1, and M997A2 only)</p> <p>a. Check cross marking latches and hinges for proper operation, security of mounting, damage, or missing components.</p> <p>b. Inspect stowage component door hinge, seal, and latch for proper operation, damage, or missing components.</p>	
71	Monthly	Shelter Mount Kit	<p><u>DRIVER</u></p> <p>(M1037, M1042, M1097, M1097A1, M1097A2, and M1123 only)</p> <p>Inspect shelter mounting bracket for security of mounting and loose or missing bolts.</p>	Any mounting bolt missing.

Table 2-2. Preventive Maintenance Checks and Services (Cont'd)

Item No.	Interval	Location	Crewmember Procedure	Not Fully Mission Capable If:
		Item to Check/Service		
72	Monthly	Winch	<p><u>DRIVER</u> (Vehicles with winch)</p> <ul style="list-style-type: none"> a. Check winch controls for proper operation. b. Check winch cable for kinks, frays, or breaks. 	<ul style="list-style-type: none"> b. Mission requires troop seats and troop seats are inoperative or damaged.
73	Monthly	Troop Seats	<p><u>DRIVER</u> (M998, M998A1, M1038, and M1038A1 w/Troop Seats Kit)</p> <ul style="list-style-type: none"> a. Inspect troop seats for missing or damaged lockpins. b. Inspect troop seats and backrest for security of mounting. 	

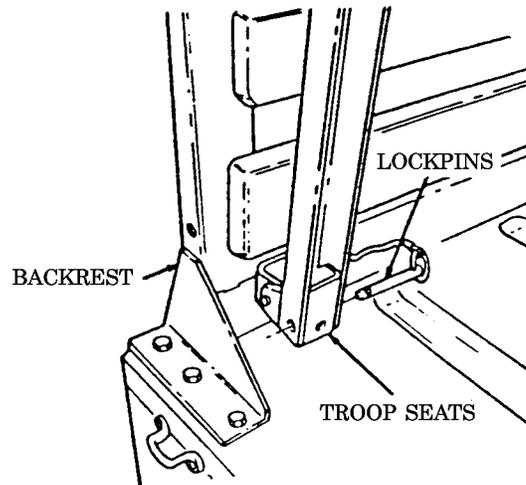


Table 2-2. Preventive Maintenance Checks and Services (Cont'd)

Item No.	Interval	Location	Crewmember Procedure	Not Fully Mission Capable If:
		Item to Check/Service		
74	Monthly	TOW Power Cable	<p><u>DRIVER</u></p> <p>(M966, M1036, M1045, M1046 - serial numbers 1 through 19,410)</p> <p>Inspect TOW power cable at the point where it exits the battery box. Chafing of the nylon braid that covers the cable is acceptable. If there is evidence that the wire inside is exposed, notify unit maintenance. the cable is acceptable. If there is evidence that the wire inside is exposed, notify unit maintenance.</p>	

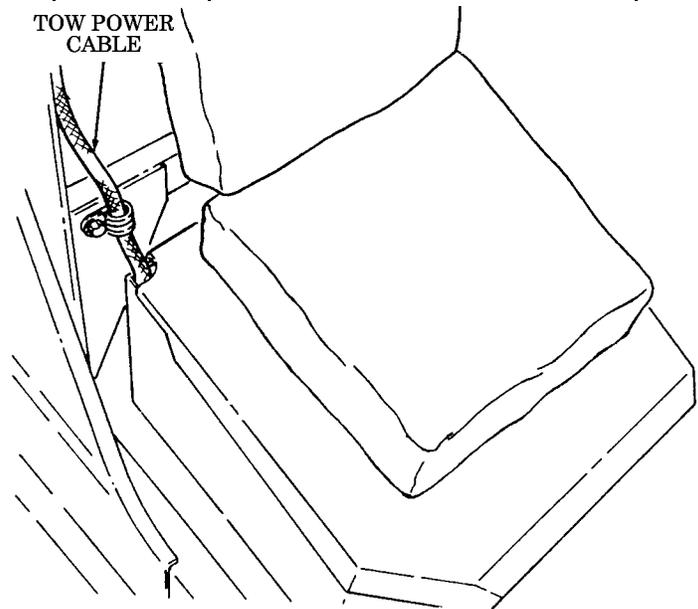
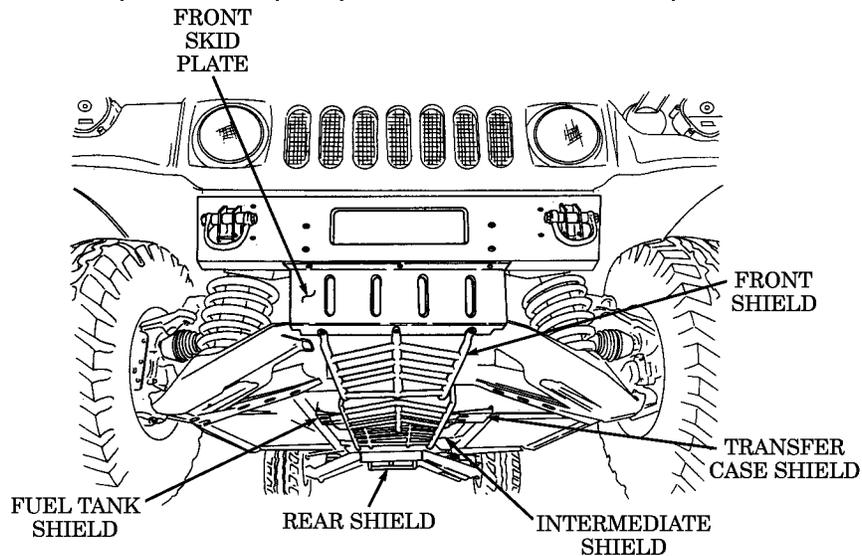


Table 2-2. Preventive Maintenance Checks and Services (Cont'd)

Item No.	Interval	Location	Crewmember Procedure	Not Fully Mission Capable If:
		Item to Check/Service		
75	Monthly	Zippers	<p>DRIVER</p> <p>a. Check canvas top and door zippers for corrosion and/or damage.</p> <p>b. Apply interlock lubricant (zipperease) (refer to appendix D, item 29) to canvas top and door zippers.</p> <p>(Vehicles equipped with skid plate)</p> <p>a. Inspect skid plate and shield for bends, breaks, or cracks.</p> <p>b. Inspect shields for loose fasteners, or damaged or missing components. Tighten loose fasteners, or replace damaged or missing components.</p>	
76	Monthly	Skid Plates		



Section III. OPERATION UNDER USUAL CONDITIONS

2-8. GENERAL

This section provides instructions for vehicle operations under moderate temperature, humidity, and terrain conditions. For vehicle operation under unusual conditions, refer to section IV of this chapter.

NOTE

Before you operate your vehicle, be sure to perform the preventive maintenance checks and services shown in table 2-2.

2-9. BREAK-IN SERVICE

- a. Perform all before operation checks and services as indicated in table 2-2.
- b. Upon receipt of vehicle, or after engine replacement, the following break-in speeds and precautions should be observed during the first 500 miles (805 km) of operation:
 - Do not exceed a speed of 55 miles per hour (89 kilometers per hour).
 - Do not drive for long periods of time at constant speed.
 - Avoid rapid acceleration or deceleration.
 - Drive at a moderate speed until the engine is fully warmed up.
 - No trailer towing.

2-10. STARTING THE ENGINE

WARNING

- The automatic transmissions on M998 and “A1” vehicles do not have a “PARK” position. Whenever the vehicle is parked, or the transmission is in “NEUTRAL”, the parking brake **MUST BE APPLIED**. Damage to equipment and injury to personnel may occur if these instructions are not followed.
- The automatic transmissions on the M1123 and “A2” vehicles have a “PARK” position. Never use the transmission shift lever in place of the parking brake. Set the parking brake. Make sure the transmission shift lever is in the “P” (park) position and transfer case shift lever is **NOT** in the “N” (neutral) position. Damage to equipment and injury to personnel may occur if these instructions are not followed.
- Chock blocks will be used when parking a vehicle with inoperative parking brakes, when operating in extreme cold conditions, when parking on inclines, or whenever and wherever maintenance is being performed. Failure to do so may result in injury to personnel or damage to equipment.
- For M1097, M1123, and all A1 and A2 model vehicles only, hearing protection is required for driver and passengers when engine is running. Noise levels produced by these vehicles exceed 85 dBA, which may cause injury to personnel.

NOTE

To apply parking brake, grasp handle firmly and pull upward until handle is locked in a straight-up position.

- a. Ensure parking brake is applied.
- b. Adjust driver's seat (para. 2-14).

WARNING

Visibility may be restricted with right rearview mirror.

- c. Adjust left and right rearview mirrors. Ensure both mirrors provide a clear view (para. 3-24 or 3-25).
- d. Ensure all windows are clean. If not, clean windows before attempting to move vehicle (refer to table 2-1).

WARNING

Ensure all slack from two-point seatbelt adjusting strap or three-point seatbelt is removed. Two-point seatbelt retracts but does not lock in any position. Three-point seatbelt retracts and will lock only during sudden stops or impact. Injury to personnel will result if an accident occurs and seatbelt is not used or adjusted properly.

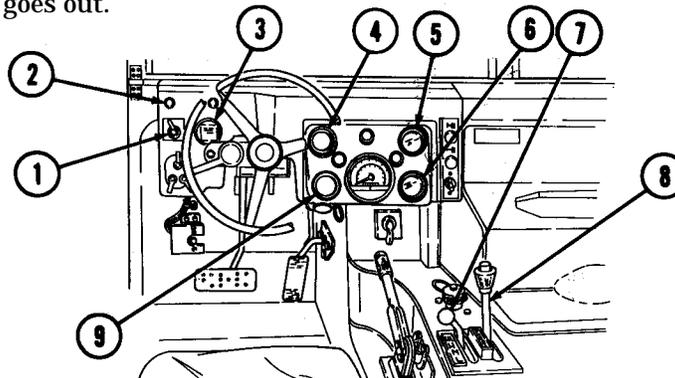
NOTE

Fasten unused seatbelts to protect the belt ends from damage or dirt contamination.

- e. Fasten and adjust seatbelt (para. 2-16).
- f. Place transmission shift lever (8) in "N" (neutral) and transfer case shift lever (7) in desired range. See table 1-9 for transfer case range selection.

CAUTION

- Do not leave rotary switch in "RUN" position for extended periods of time. Glow plugs will continue to cycle and batteries will discharge leading to a no-start condition.
 - Glare from the sun may make it difficult to tell if the wait-to-start lamp assembly is illuminated. If this occurs, shade the light with your hands to ensure that the wait-to-start lamp assembly goes out before attempting to start the vehicle.
 - Starting the engine before the wait-to-start lamp goes out can result in starting problems.
- g. Place rotary switch (1) to "RUN" and wait until WAIT-TO-START lamp assembly (2) goes out.



CAUTION

- If ambient temperature is above 0°F (-18°C), do not operate starter continuously for more than 20 seconds; wait 10 to 15 seconds between periods of starter operation. Failure to do this will result in damage to the starter.
 - If any instrument reading is not normal, stop engine. Failure to do this will result in damage to the engine. Refer to troubleshooting, table 3-1.
 - If engine does not start, leave rotary switch in "RUN" position and wait 10 to 15 seconds before trying to restart. Failure to do this will result in damage to glow plugs or starter.
 - If you accidentally turn the rotary switch to "ENG STOP" position after an unsuccessful attempt to start, wait 90 seconds before trying to restart. Failure to do this will result in damage to glow plugs.
- h. Place rotary switch (1) to 'START.'" Release lever after engine starts. Lever will return automatically to "RUN".

NOTE

Before the engine reaches operating temperature, the WAIT-TO-START lamp may flicker and a clicking noise may be heard. This is due to glow plug relay cycling and is a normal condition.

- i. Allow engine to warm up for approximately one minute and ensure instruments indicate the following:
- (1) Oil pressure gauge (4) should register above approximately 6 psi (41 kPa) with engine at idle.
 - (2) Voltmeter (6) should register in green area.
 - (3) Fuel gauge (9) should indicate fuel level in fuel tank.
 - (4) Air restriction gauge (3) should not register within the red zone.
- j. Stop engine if any of the following conditions occur:
- (1) Excessive engine vibration.
 - (2) Oil pressure does not register or suddenly drops to or less than approximately 6 psi (41 kPa) with engine at idle.
 - (3) Air restriction gauge (3) is within the red zone.
- k. If engine overheating occurs:
- (1) Park vehicle, allow engine to idle.
 - (2) Observe coolant temperature gauge (5) for steady cooling.

CAUTION

Stop engine if coolant temperature gauge suddenly increases beyond approximately 230°F (110°C), or damage to engine will result.

- (3) If engine coolant temperature continues to increase, or does not decrease, as indicated by engine temperature gauge (5), stop engine. Perform troubleshooting procedures in table 3-1.

2-11. PLACING VEHICLE IN MOTION

WARNING

- This vehicle has been designed to operate safely and efficiently within the limits specified in this TM. Operation beyond these limits are prohibited IAW AR 750-1 without written approval from the Commander, U.S. Army Tank-automotive and Armaments Command, ATTN: AMSTA-CM-S, Warren, MI 48397-5000.
- Communications shelters AN/GRC-122 and AN/GRC-142 RATT may overload truck by up to 500 lbs (227 kg). Use caution when driving to avoid damage to equipment or injury to personnel.

NOTE

The following procedures apply to a vehicle being driven in good weather on high traction surfaces where little or no wheel slippage is evident. For operating the vehicle under unusual conditions; i.e., unusual terrain, cold weather, ice, snow, dusty or sandy areas, mud or rain, refer to section IV.

- a. Be sure all auxiliary equipment and tools are stored for travel.

CAUTION

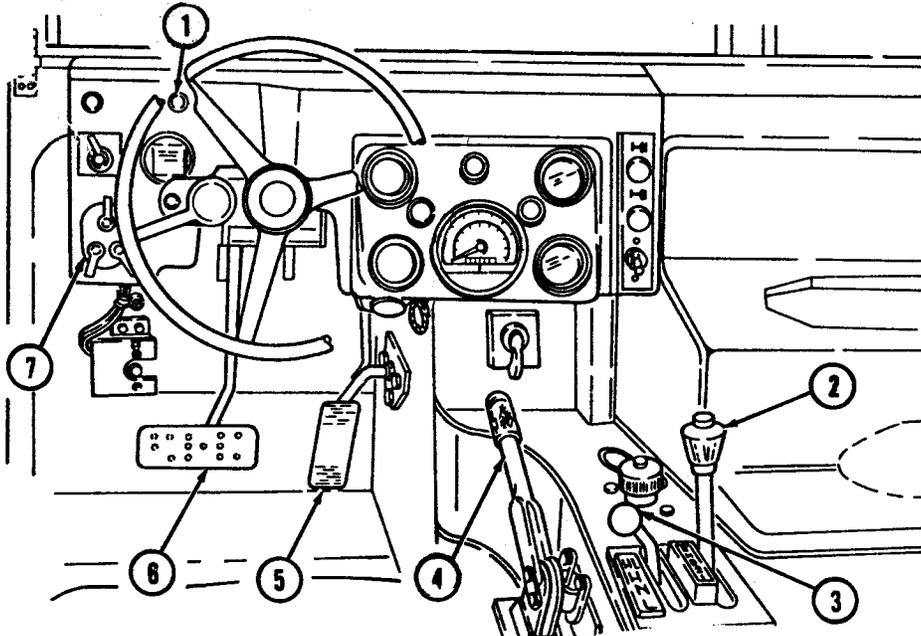
- Vehicle must be stopped, engine off, and transmission shift lever placed in “N” (Neutral), before transfer case can be shifted. Failure to do this will result in damage to drivetrain.
 - Do not place transfer case shift lever in “H/L” (high lock range) or “L” (low range) on high traction surfaces where little or no wheel slippage is evident, particularly when encountering sharp, continuous turns. Failure to operate the vehicle with transfer case in “H” (high range) on high traction surfaces, particularly when encountering sharp, continuous turns, can damage drivetrain.
- b. With transmission shift lever (2) in “N” (neutral), select “H” (high range) transfer case driving gear range using transfer case shift lever (3). This range is for normal driving in good weather, or on high traction surfaces.
 - c. Start engine (para. 2-10).
 - d. Set vehicle light switch (7) (para. 2-13).

CAUTION

Ensure parking brake is released completely before operating the vehicle. Failure to do so may cause damage to equipment.

NOTE

- To release parking brake, grasp handle firmly and push forward until handle is seated in its most forward position.
 - Starting with A1 vehicles, parking brake handles have a safety release button which must be depressed to release the parking brake.
 - If covering warning lamp with tape, put a pinhole in the tape in order to recognize when the light is on.
- e. Depress service brake pedal (6). Depress parking brake release button and release parking brake lever (4). The brake warning lamp assembly (1) should go out.



- f. Place transmission shift lever (2) in “D” (drive) or “(D)” (overdrive) for M1123 and “A2” series vehicles), for normal driving.
- g. Release service brake pedal (6), and depress accelerator pedal (5). Accelerate at a safe, steady speed.
- h. Upshift or downshift transmission shift lever (2) when road and/or traffic conditions change.

WARNING

Extreme caution shall be taken when transporting personnel. Rollover protection and seatbelts are available for the crew area only and are not provided in the troop/cargo area. Failure to use basic safe driving skills may result in injury or death to personnel and damage to equipment.

NOTE

To help judge clearance more accurately, guide rods can be used at the discretion of the unit commander.

- i. Exercise extreme caution when transporting personnel. Rollover protection is available for the crew area only and is not provided in the troop/cargo area. Although certain design characteristics of the vehicle, such as vehicle width, ground clearance, independent suspension, etc., provide improved capabilities, accidents can still happen.

WARNING

Vehicle speed must be reduced consistent with weather and road/terrain conditions. Obstacles such as stumps and boulders must be avoided. Failure to use basic safe driving techniques/skills may result in injury or death to personnel and damage to equipment.

- j. Operators are reminded to observe basic safe driving techniques/skills when operating the vehicle, especially when transporting personnel.

2-12. STOPPING THE VEHICLE AND ENGINE

- a. Release accelerator pedal (5).
- b. Depress service brake pedal (6) to bring vehicle to a gradual stop.

NOTE

The automatic transmission of the M1123 and "A2" series vehicles has a "PARK" position. Proceed to steps f and g for the M1123 and "A2" series vehicles.

- c. Move transmission shift lever (3) to "N" (neutral).
- d. If vehicle must be backed into parking position, have another person act as a ground guide to direct reverse operation.

WARNING

- The automatic transmission of the M998 series vehicle does not have a "PARK" position. Whenever the vehicle is parked, or the transmission is in "NEUTRAL," the parking brake **MUST BE APPLIED**. Damage to equipment and injury to personnel may occur if these instructions are not followed.
- Chock blocks shall be used when parking a vehicle with inoperative parking brakes, when operating in extreme cold conditions, when parking on inclines, or whenever and wherever maintenance is being performed. Failure to do this may result in injury to personnel or damage to equipment.

NOTE

To apply parking brake, grasp handle firmly, and pull upward until handle is locked in a straight-up position.

- e. Once vehicle is completely stopped, apply parking brake lever (4).

WARNING

- The automatic transmission of the M1123 and "A2" vehicles have a "PARK" position. Never use the transmission shift lever in place of the parking brake. Set the parking brake. Make sure the transmission shift lever is in the "P" (park) position and transfer case shift lever is **NOT** in the "N" (neutral) position. Damage to equipment and injury to personnel may occur if these instructions are not followed.

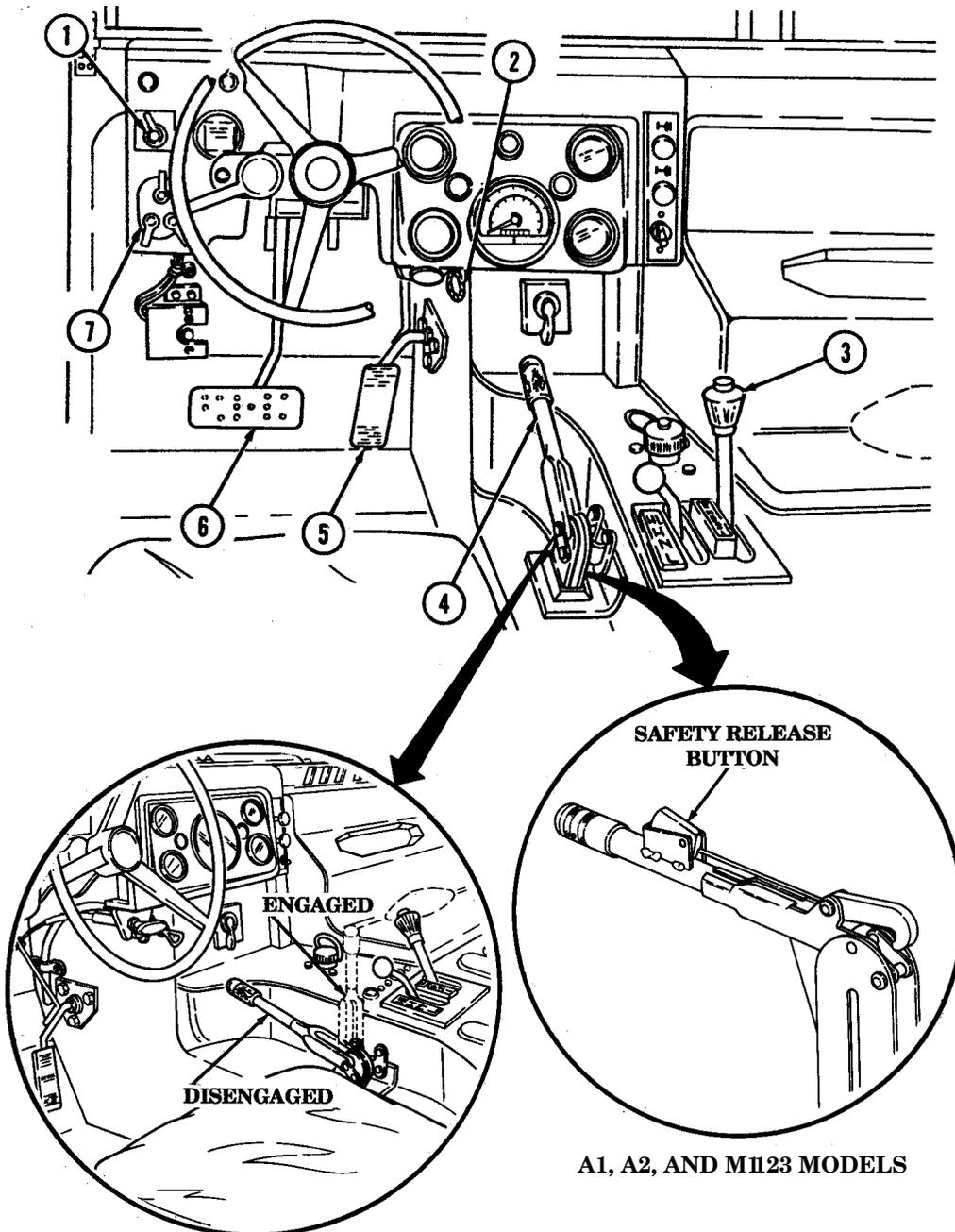
NOTE

- Some vehicles have parking brake levers that do not lock. If equipped with a chain lock, secure parking brake lever with the chain lock to prevent accidental release of the parking brake. If not equipped, refer to unit maintenance for installation procedures.
 - Steps f and g apply to the M1123 and "A2" series vehicles only.
- f. Once vehicle is completely stopped, apply parking brake lever (4).
 - g. Move transmission shift lever (3) to "P" (park).
 - h. Turn light switch (7) to "OFF."
 - i. Place rotary switch (1) to "ENG STOP."

NOTE

If there is engine run-on, pinch the fuel return line with your fingers or a pair of pliers to stop the engine. Notify unit maintenance.

- j. Lock steering wheel with cable (2) and chock wheels if tactical situation permits.



A1, A2, AND M1123 MODELS

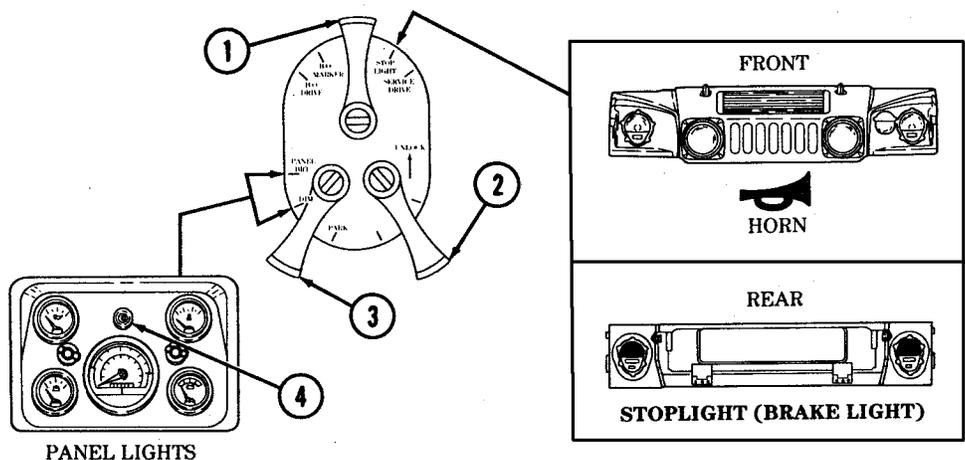
A1, A2, AND M1123 MODELS

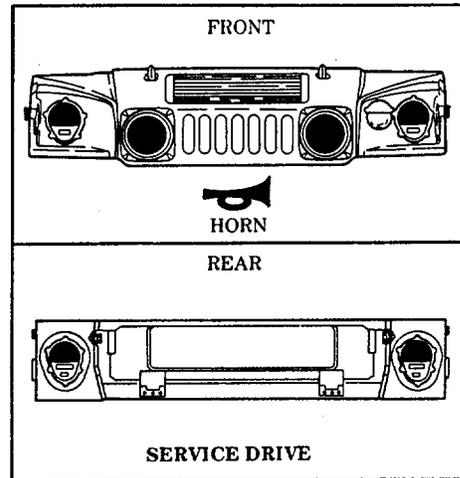
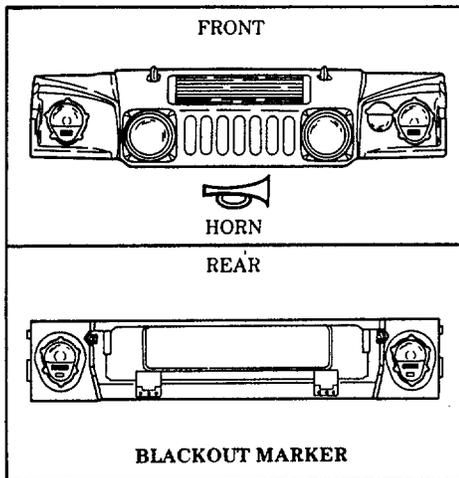
2-13. OPERATION OF VEHICLE LIGHT SWITCH

- a. To illuminate instrument panel:
 - (1) Lift unlock lever (2) to "UNLOCK" and hold in position.
 - (2) Turn selector switch lever (1) to any "ON" position except "B.O. MARKER."
 - (3) Turn auxiliary lever (3) to "DIM" or "PANEL BRT" (bright).
- b. For normal daylight driving, turn selector lever (1) to "STOPLIGHT."
- c. For night driving, turn selector lever (1) to "SERVICE DRIVE." The headlight dimmer foot switch is depressed to provide high beam service light operation. The indicator light (4) on the instrument panel should illuminate when high beams are operating.
- d. In blackout operations:
 - (1) When driving vehicle, turn selector lever (1) to "B.O. DRIVE."
 - (2) When vehicle is parked, turn selector lever (1) to "B.O. MARKER."
- e. To illuminate parked vehicle at night (if tactical situation permits):
 - (1) Keep selector lever (1) in "SERVICE DRIVE."
 - (2) Turn auxiliary lever (3) to "PARK."
- f. Move turn signal lever up for right turns, down for left turns.
- g. For hazard warning lights (blinking lights):

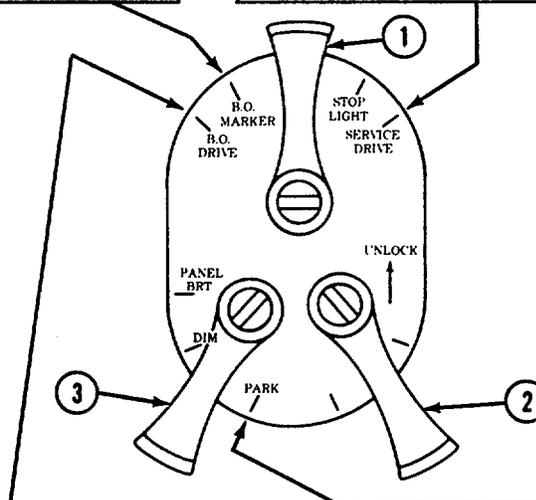
NOTE

- For vehicles built prior to 1990, the warning flashers override operation of the brake lights. For vehicles built in 1990 and after, a brake light override feature is installed.
 - The headlights cannot be turned on when auxiliary lever (3) is in the "PARK" position.
- (1) Turn selector lever (1) to "SERVICE DRIVE" or "STOPLIGHT."
 - (2) Pull warning hazard tab out and move turn signal lever up to lock lever in place.
 - (3) To deactivate, move turn signal lever back to neutral.
- h. For horn operation, turn selector lever (1) to either "STOPLIGHT" or "SERVICE DRIVE."

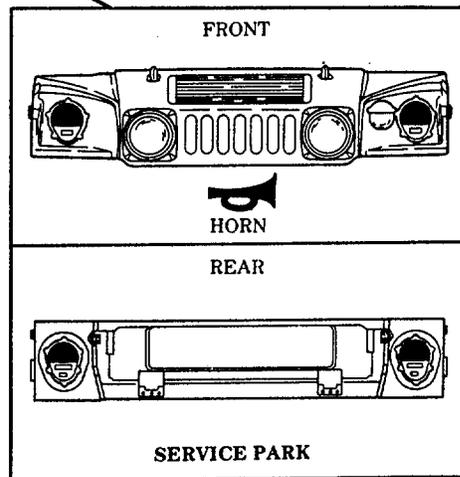
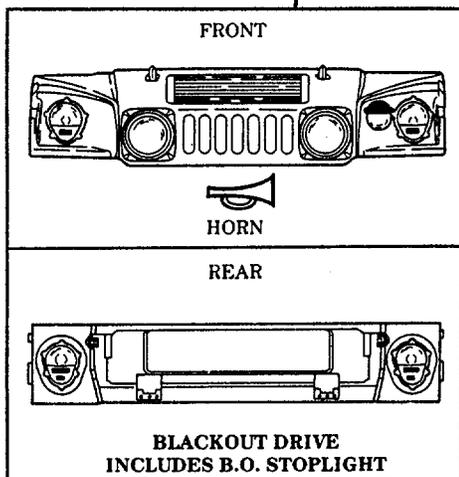




NOTE:
TO MOVE SELECTOR SWITCH LEVER FROM "OFF" TO ANY ON POSITION EXCEPT "B.O. MARKER," "UNLOCK" SWITCH LEVER MUST BE LIFTED TO "UNLOCK".



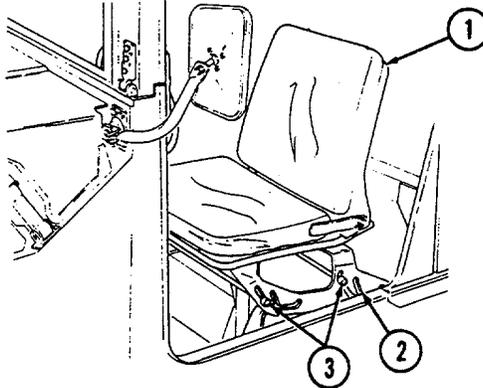
NOTE
RETURN ALL LIGHT SWITCH LEVERS TO THE "OFF" POSITION AFTER EACH PERIOD OF OPERATION.



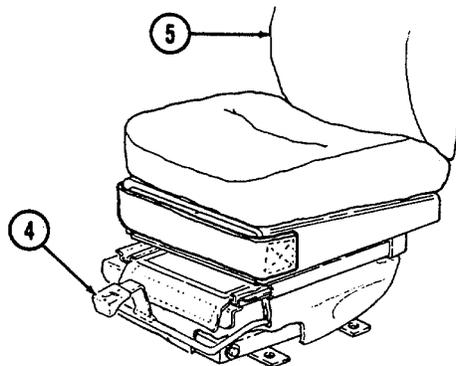
2-14. ADJUSTING DRIVER'S SEAT**NOTE**

- Perform steps a and b for vehicles with old configuration driver's seat.
- Perform steps c and d for vehicles with new configuration driver's seat.

- To adjust seat (1), exit vehicle and lift seat (1) up and slide seat (1) forward or rearward so that seat mount pins (3) are positioned in desired slots (2).
- Adjust seat (1) for most comfortable and effective position.



- To adjust horizontal position of seat:
 - Pull seat adjustment lever (4) upward and slide seat (5) to desired position.
 - Release seat adjustment lever (4) to lock seat (5) into position.
- To adjust vertical position of seat:
 - Pull seat adjustment lever (4) upward and allow body weight to lower seat (5).
 - To raise seat (5), pull seat adjustment lever (4) upward and remove body weight from seat (5).
 - Release seat adjustment lever (4) to lock seat (5) in desired position.



2-15. COMPANION SEAT ASSEMBLY AND BATTERY BOX COVER REPLACEMENT

a. Removal of companion seat assembly and battery box cover.

(1) Pull seat adjustment lever (10) upward and slide companion seat assembly (6) forward.

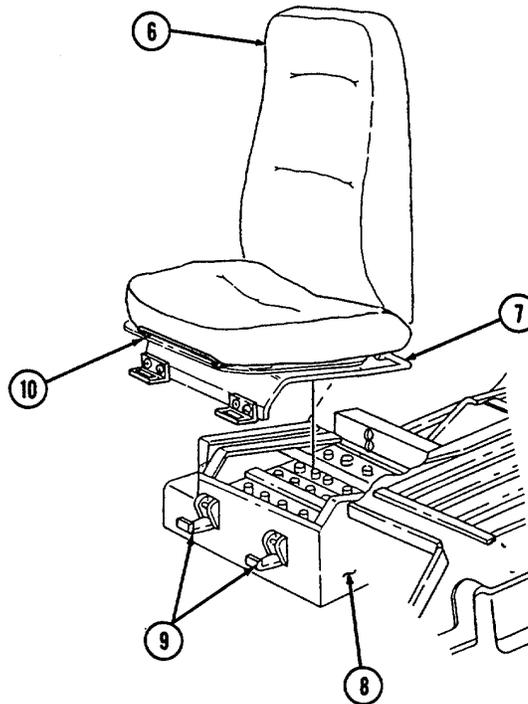
(2) Release two latches (9) securing companion seat assembly (6) and battery box lever (7) to battery box (8)

(3) Lift and pull companion seat assembly (6) and battery box cover (7) forward and remove from battery box (8).

b. Installation of companion seat assembly and battery box cover.

(1) Install companion seat assembly (6) and battery box cover (7) on battery box (8) and secure with two latches (9).

(2) Pull seat adjustment lever (10) upward and slide companion seat assembly (6) to desired position.



2-16. SEATBELT OPERATION

a. Two-Point Seatbelt.

WARNING

Ensure all slack from two-point seatbelt adjusting strap is removed. Two-point seatbelt retracts but does not lock in any position. Injury to personnel will result if an accident occurs and two-point seatbelt is not in use or adjusted properly.

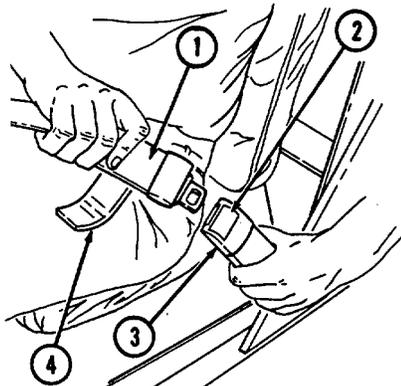
- (1) **Seatbelt Fastening.** Pull seatbelt (1) across body and fasten strap in belt buckle (3).
- (2) **Seatbelt Adjustment.** Pull adjustable strap (4) to remove slack from seatbelt (1). Seatbelt (1) must fit snugly across operator's hips.
- (3) **Seatbelt Unfastening.** Push release button (2) on belt buckle (3) to release seatbelt (1).

b. Three-Point Seatbelt.

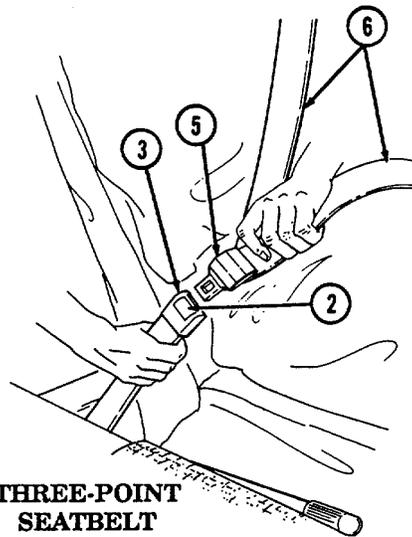
WARNING

Ensure all slack from three-point seatbelt is removed. Three-point seatbelt retracts and will lock only during sudden stops or impact. Injury to personnel will result if an accident occurs and three-point seatbelt is not in use or adjusted properly.

- (1) **Seatbelt Fastening.** Pull shoulder harness and seatbelt (6) across body and fasten latch plate (5) to belt buckle (3).
- (2) **Seatbelt Adjustment.** Pull shoulder harness strap (6) through latch plate (5) and remove slack from seatbelt (6). Seatbelt (6) must fit snugly across operator's hips, shoulder, and chest.
- (3) **Seatbelt Unfastening.** Push release button (2) on belt buckle (3) to release seatbelt (6).



**TWO-POINT
SEATBELT**



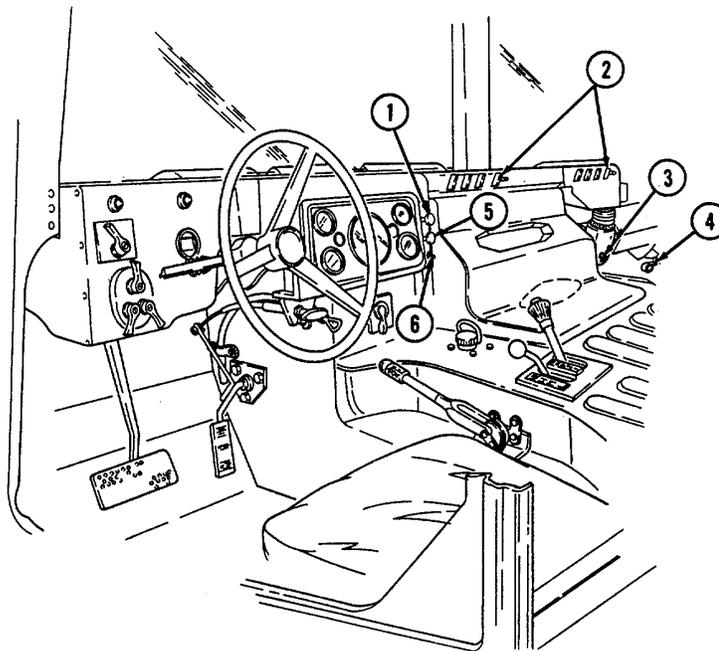
**THREE-POINT
SEATBELT**

2-17. DEFROSTER OPERATION (ALL EXCEPT A2 VEHICLES)**a. To defrost windshield:**

- (1) Start engine (para. 2-10).
- (2) Push fresh air intake lever (4) forward to close grille.
- (3) Slide baffles (2) to the right to close air vents.
- (4) Loosen thumbscrew (3) and position deflector to close air flow to the floor of vehicle. Tighten thumbscrew (3).
- (5) Turn heater fan switch (6) "ON" to desired setting, "HIGH" OR "LOW."
- (6) Position heater control knob (5) to desired setting.

NOTE

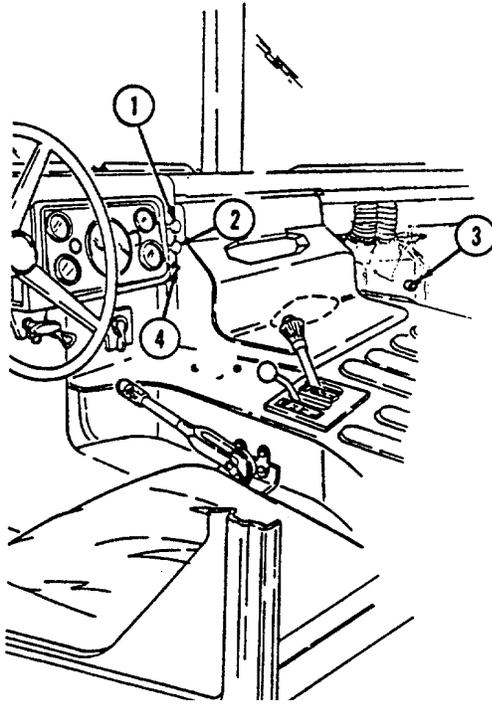
- To obtain maximum air flow to driver's side windshield only, pull defroster control knob halfway out.
 - To obtain even air flow to both sides of the windshield, pull defroster control knob all the way out.
 - To allow warm air into crew area while defrosting windshield, slide baffles to open air vents.
- (7) Position defroster control knob (1) to desired setting.



2-18. DEFROSTER OPERATION (A2 VEHICLES)

To defrost windshield:

- (1) Start engine (para. 2-10).
- (2) Push fresh air intake lever (3) forward to close grille.
- (3) Turn heater fan switch (4) "ON" to desired setting, "HIGH" or "LOW."
- (4) Position heater control knob (2) to desired setting.
- (5) Push defroster control knob (1) in.



2-19. HEATER OPERATION (ALL EXCEPT A2 VEHICLES)

To operate heater:

- (1) Start engine (para. 2-10).
- (2) Push fresh air intake lever (4) forward to close grille.

NOTE

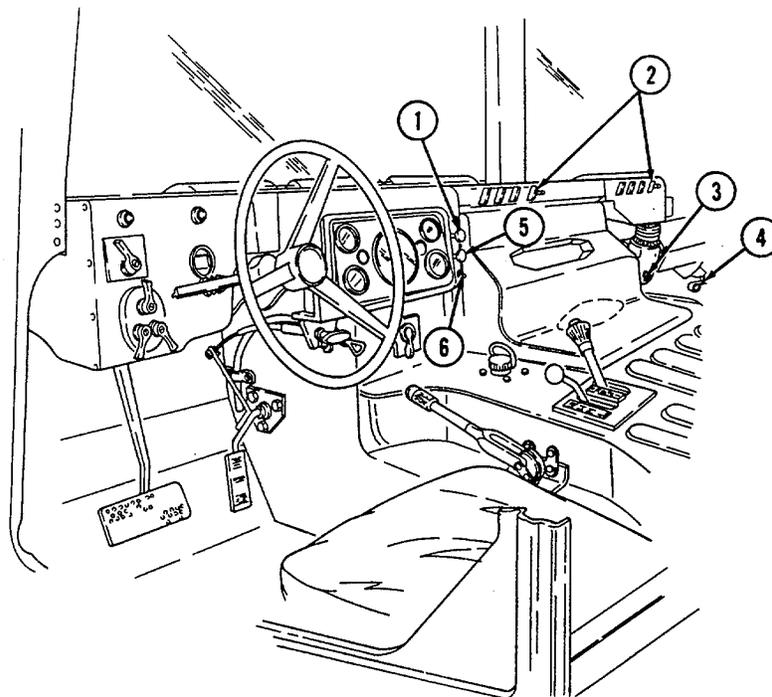
Perform step 3 if air flow to floor of vehicle is closed.

- (3) Loosen thumbscrew (3) and position deflector to allow air flow to floor of vehicle. Tighten thumbscrew (3).
- (4) Slide baffles (2) to the left to open air vents.
- (5) Turn heater fan switch (6) "ON" to desired setting, "HIGH" OR "LOW."

NOTE

For maximum heat, pull heater control knob all the way out.

- (6) Position heater control knob (5) to desired setting.
- (7) Push defroster control knob (1) in.



2-20. HEATER OPERATION (A2 VEHICLES)

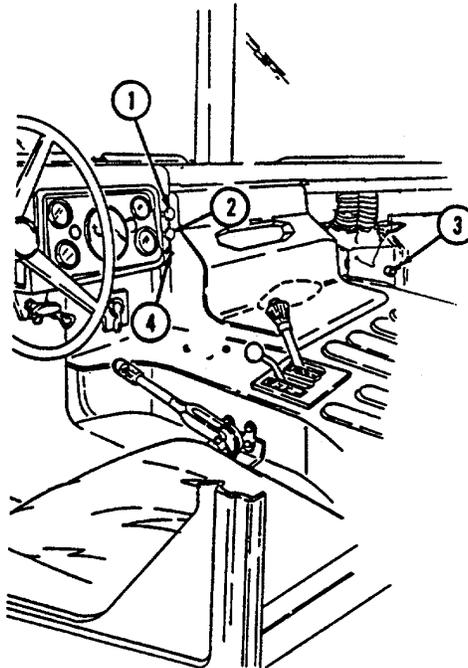
To operate heater.

- (1) Start engine (para. 2-10).
- (2) Push fresh air intake lever (3) forward to close grille.
- (3) Turn heater fan switch (4) "ON" to desired setting, "HIGH" or "LOW."

NOTE

For maximum heat, pull heater control knob all the way out.

- (4) Position heater control knob (2) to desired setting.
- (5) Push defroster control knob (1) out.



2-21. TAILGATE OPERATION

a. Lowering Tailgate.

WARNING

Do not use tow pintle as a step when entering or exiting vehicle cargo area. Failure to do so may result in injury to personnel or damage to equipment.

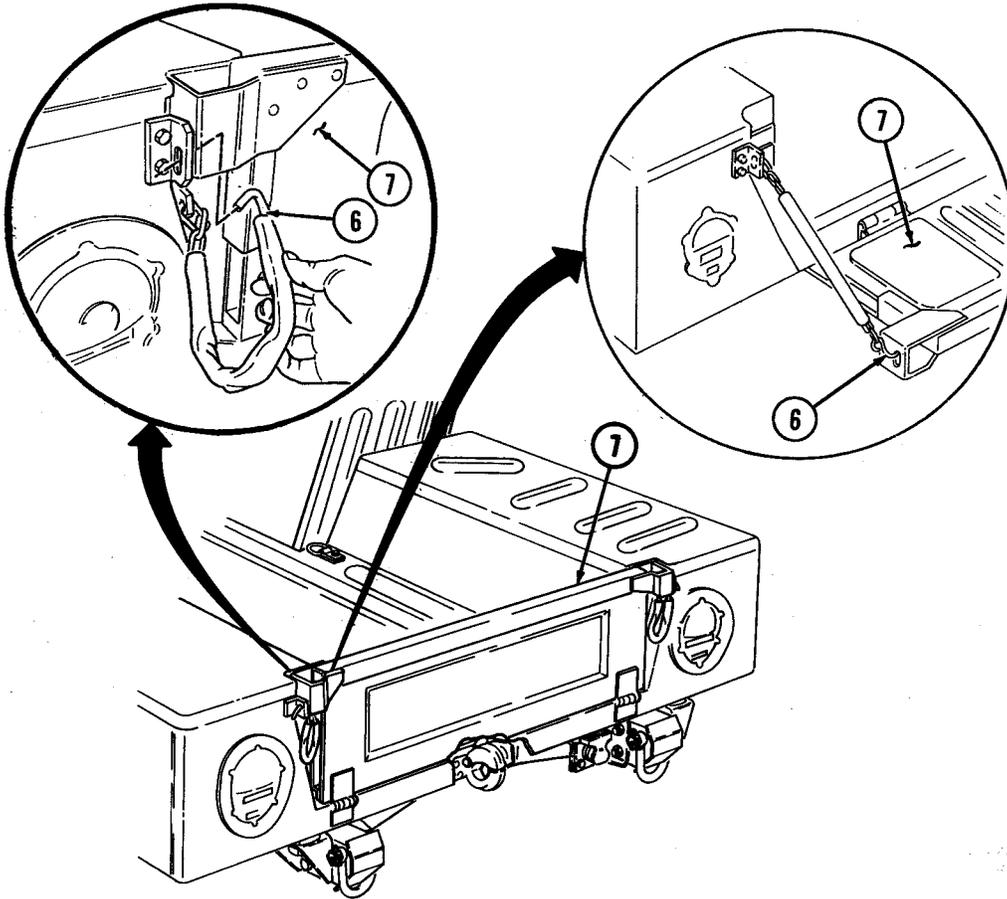
CAUTION

The tailgate should not be lowered further than the length of tailgate chains. Tailgate chains should always be used to support tailgate when open. Do not allow tailgate to slam against lifting shackles. Damage to equipment may occur.

- (1) Remove two tailgate chain hooks (6) securing tailgate (7) to rear of vehicle body.
- (2) Lower tailgate (7) and secure with two tailgate chain hooks (6).

b. Raising Tailgate.

- (1) Raise tailgate (7).
- (2) Secure tailgate (7) to rear of vehicle body with two tailgate chain hooks (6).



2-22. PIONEER TOOL STOWAGE RACK OPERATION

a. Tool Stowage Rack Removal.

- (1) Release two tension latches (3) from latch strikes (2) and lower tool rack (4)
- (2) Lift tool rack (4) out of support bracket (1) to remove tool rack (4).

b. Tool Removal.

NOTE

Note location of straps for installation.

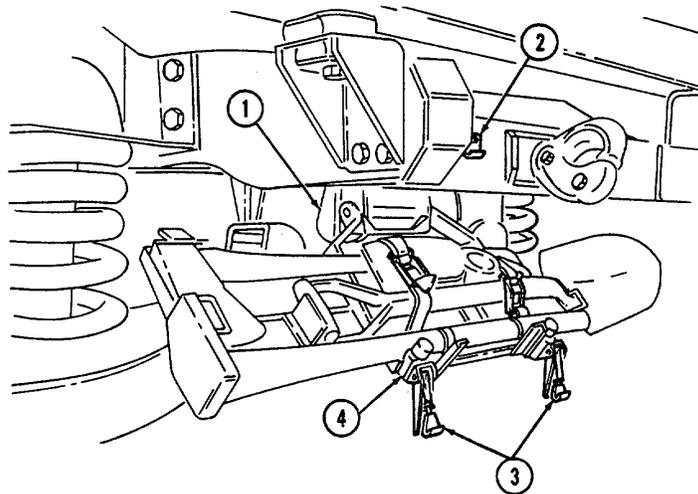
- (1) Loosen and disconnect two strap assemblies (8) securing tools.
- (2) Remove mattock head (6) from tool rack (4).
- (3) Remove shovel (7) from retainer (12) by turning 90° from stowage position and sliding through tool rod support (9).
- (4) Remove mattock handle (5) from tool rack (4).
- (5) Unlatch ax head retainer (11) and slide head out of ax head support (1) and remove ax (13).

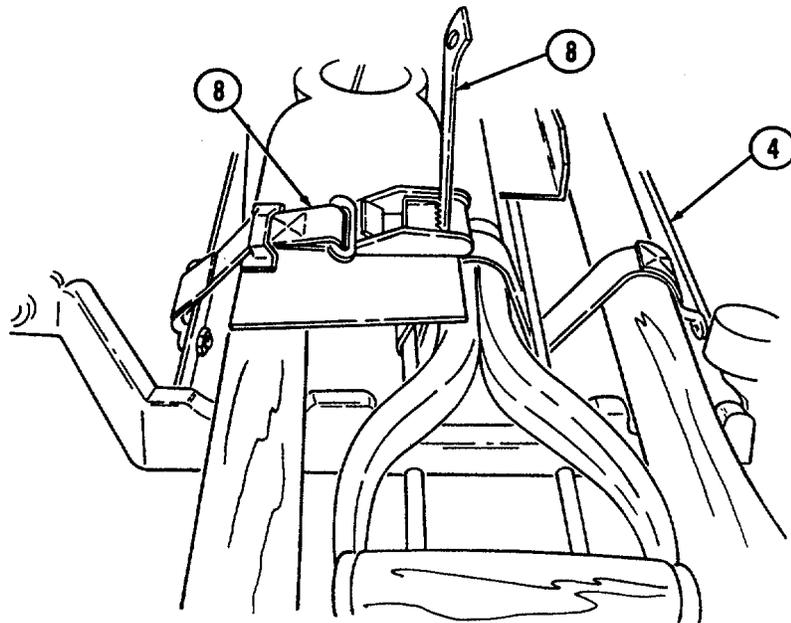
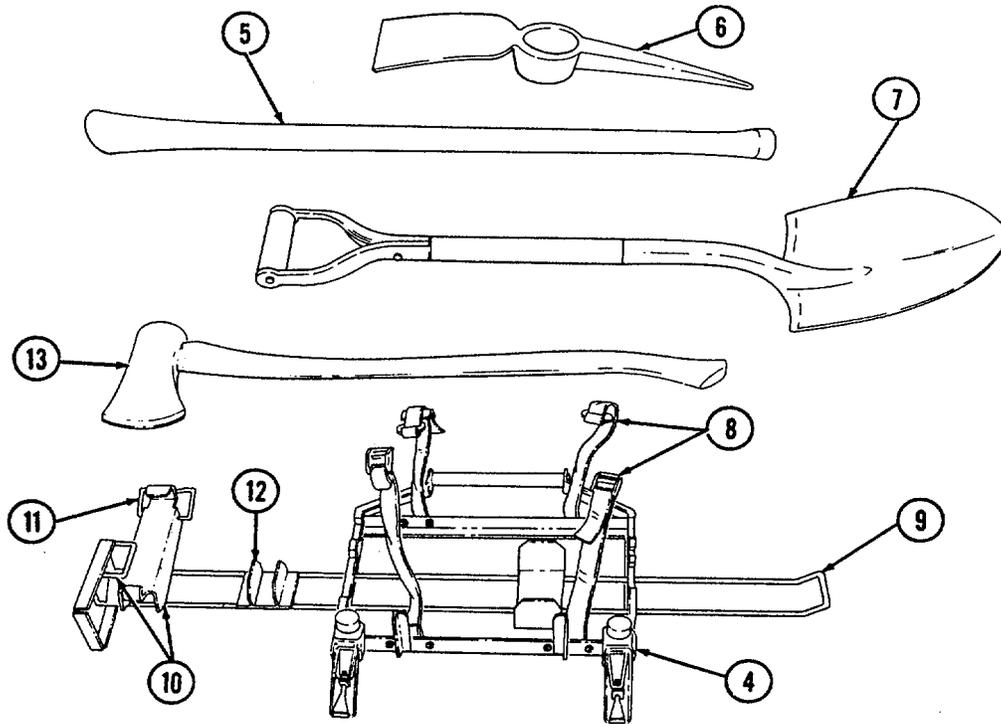
NOTE

For improved pioneer tool accessibility, tools can be stored inside the vehicle cargo area at the discretion of the unit commander. Tools must be secured in place.

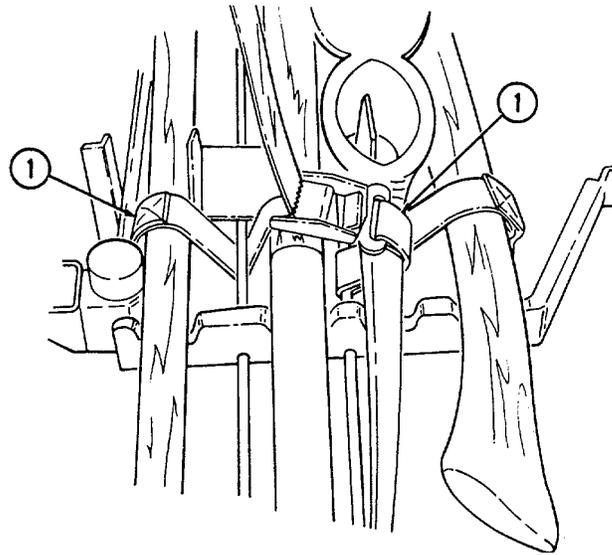
c. Tool Installation.

- (1) Install ax (13) by sliding ax head into ax head support (10); secure with retainer (11).
- (2) Install mattock handle (5) in tool rack (4).
- (3) Position shovel (7) through tool rod support (9) and secure handle of shovel into retainer (12).
- (4) Install mattock head (6) in tool rack (4).
- (5) Connect and tighten two strap assemblies (8) to secure tools to tool rack (4).



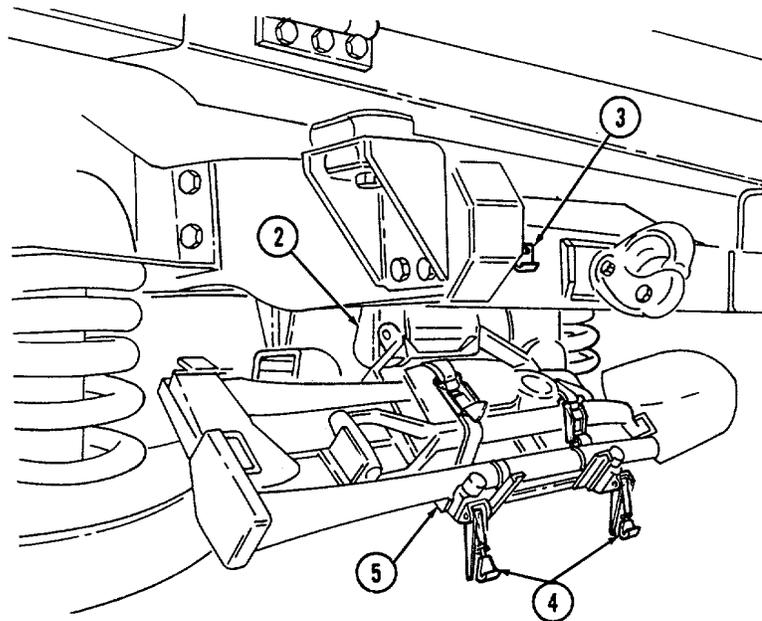


(6) Connect and tighten strap assembly (1) and secure tools.



d. Tool Storage Rack Installation.

- (1) Place tool rack (5) in support bracket (2).
- (2) Raise tool rack (5) and secure tension latches (4) to latch strikes (3).



2-22.1. MAX TOOL KIT STOWAGE OPERATION

NOTE

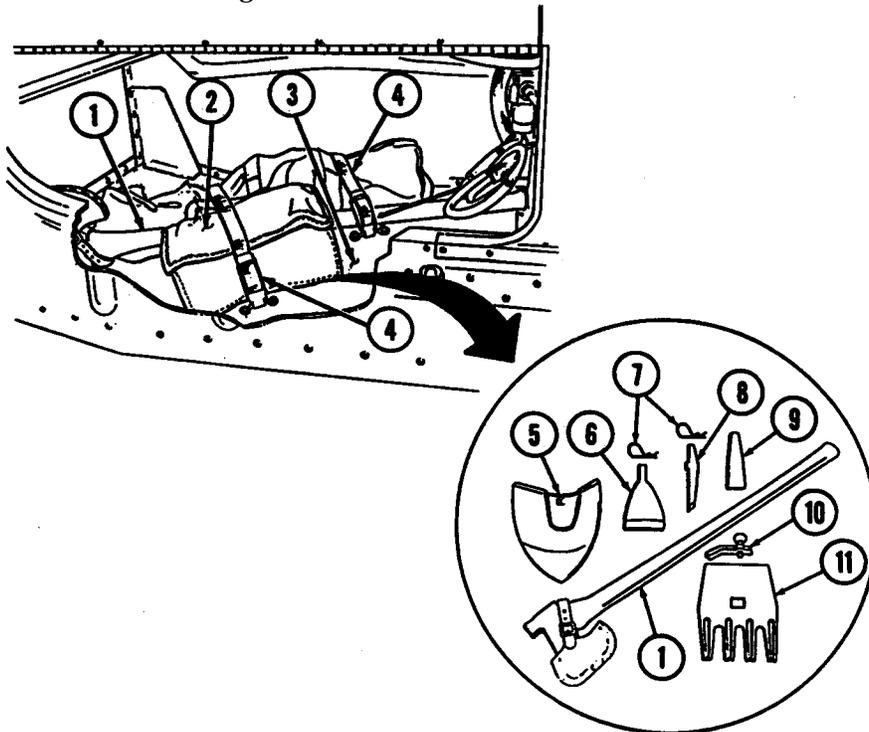
Stowage location on M1025A2, M1043A2, and M1045A2 vehicles is behind left rear seat. Stowage location on M1035A2, M1097A2, and M1123 vehicles is on tunnel. The following procedure is for M997A2 vehicles.

a. Tool Removal.

- (1) Disconnect two strap assemblies (4) in right footwell (3) and remove ax (1) and max tool kit case (2).
- (2) Remove the following attachments from max tool kit case (2):
 - Reversible rake/hoe attachment (11)
 - Rake/hoe thumbscrew attachment (10)
 - Shovel attachment (5)
 - Six safety locking pins (7)
 - Broad pick attachment (9)
 - Pick attachment (8)
 - Mattock attachment (6)

NOTE

- Using the ax and attachments, the max tool kit can be incorporated into seven basic hand tools.
- Ax blade must be covered with sheath before using kit.
- Read all safety and assembly instructions enclosed with max tool kit before using kit.



b. Reversible Rake/Hoe Attachment.

(1) Connect rake/hoe attachment (2) (with either rake or hoe in the working position) into socket (4) on end of ax (1).

NOTE

Thumbscrew must be seated tightly in rake/hoe attachment and socket of ax. Check thumbscrew often to be sure it does not work loose.

(2) Install thumbscrew (3) on rake/hoe attachment (2) and in socket (4) of ax (1). Tighten thumbscrew (3).

(3) To remove rake/hoe attachment (2), remove thumbscrew (3) from rake/hoe attachment (2) and ax (1).

c. Shovel Attachment.

NOTE

Shovel attachment is shown. Broad pick, pick, and mattock attachments are attached basically the same.

(1) Connect shovel attachment (5) into socket (4) on end of ax (1).

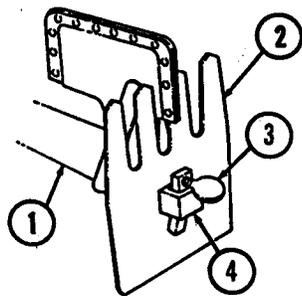
(2) Insert safety locking pin (6) into hole in end of taper on shovel attachment (5).

(3) To remove shovel attachment (5), remove safety locking pin (8) from shovel attachment (5) and ax (1).

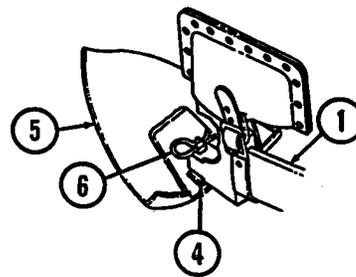
d. Tool Installation.

(1) Replace attachments in the max tool kit case (7).

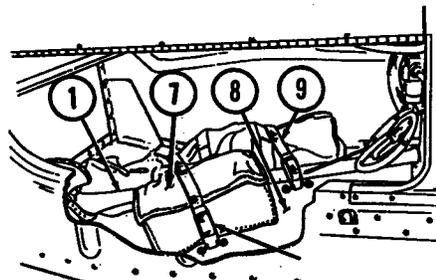
(2) Install max tool kit case (7) and ax (1) with two strap assemblies (9) in right footwell (8) of vehicle.



REVERSIBLE RAKE/HOE ATTACHMENT



SHOVEL ATTACHMENT



2-23. SLAVE STARTING OPERATION

- a. Position slaving vehicle and disabled vehicle close enough for cable hookup.
- b. Stop slaving vehicle engine.

NOTE

Vehicles with kits 5705623 and 5705624 and serial numbers 100,000 and above are equipped with screw-on covers.

- c. Remove cover from slave receptacle of disabled vehicle and slaving vehicle.

WARNING

Ensure all battery cables in disabled vehicle are properly connected before connecting slave cable. Damage to batteries, cables, or serious injury to personnel may result from improperly connected batteries.

CAUTION

Use a twisting motion when installing slave cable to the receptacle. Forcefully pushing the cable onto the receptacle may cause damage to the receptacle mount.

NOTE

Ensure all electrical switches in both vehicles are turned off.

- d. Connect slave cable to the slave receptacle of both vehicles.
- e. Start slaving vehicle engine.
- f. Start disabled vehicle engine.

CAUTION

Use a twisting motion when disconnecting slave cable from the receptacle. Forcefully pulling the cable from the receptacle may cause damage to the receptacle mount.

- g. After engine starts, disconnect slave cable from both vehicles.

NOTE

- Screw-on type covers must be fully tightened to ensure a proper seal.
- For ease of removal, apply hand cleaner (Appendix D, Item 11) on the inside of the cover before installing receptacle covers. ■

- h. Install receptacle covers on both vehicles.
- i. Clean and stow slave cable.

2-24. TOWING OPERATION

CAUTION

- Do not exceed a towing speed of 30 mph (48 kph) or a towing distance of 30 mi (48 km) without first removing the front propeller shaft and/or rear propeller shaft with the parking brake rotor as specified in table 2-3. Failure to remove the necessary propeller shafts may result in damage to the transmission and/or transfer case.
- Before initiating vehicle recovery, operator should be familiar with basic vehicle recovery techniques and precautions. Refer to FM 20-22, Vehicle Recovery Operations.

NOTE

- If propeller shafts are to be removed, notify unit maintenance personnel.
- Towing pintle (front bumper) provides improved driver control when moving trailers in hard-to-maneuver areas and during aircraft loading operations.

Table 2-3. Towing Operations

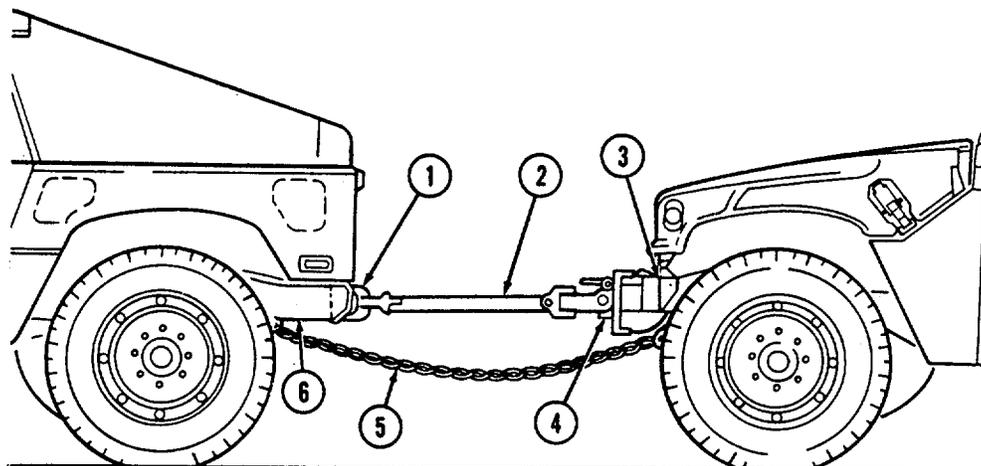
Vehicle Towing Mode	Prop Shafts
Rear wheels up Front wheels up Four wheels on ground	Front off Rear off (Parking brake rotor removed) Front and rear off (Parking brake rotor removed)

a. Towing Vehicle from Front (Four Wheels on Ground).

CAUTION

Always use a tow bar when towing vehicle. Failure to do so may cause damage to equipment.

- (1) Attach towbar (2) to the towing shackle brackets (4) of the vehicle to be towed and to the pintle hook (1) of the towing vehicle.
- (2) Attach safety chain (5) to vehicle frames directly behind bumper (3) or bumperette (6). Let safety chain (5) dip to about 1 ft (30.5 cm) from the ground.
- (3) If towing operation is over a distance of 30 mi (48 km), or towing speed is expected to be over 30 mph (48 kph), remove propeller shafts specified in table 2-3.
- (4) Place transmission and transfer case shift levers in “N” (neutral).
- (5) Depress parking brake release button and release parking brake lever.
- (6) Proceed with towing operation. The vehicle is capable of towing a vehicle of similar weight, fully loaded, for a distance of 50 mi (80 km).



b. Towing Vehicle from Front (Front Wheels Up).**NOTE**

Ensure that towbar is connected to towing brackets as shown in illustration.

- (1) Attach towbar (5) to brackets (1) and to wrecker towing pintle.

CAUTION

Ensure that wrecker hoisting boom and hook are centered over the lifting shackles. Failure to do this may result in difficult turning during towing operations.

- (2) Install chain assembly (3) through lifting shackles (2) and attach chain assembly (3) to the wrecker's hoisting hook (4).

- (3) Secure safety chain (6) to towed vehicle's frame and to wrecker directly behind the bumpers and let safety chain (6) dip to about 1 ft (30.5 cm) from the ground.

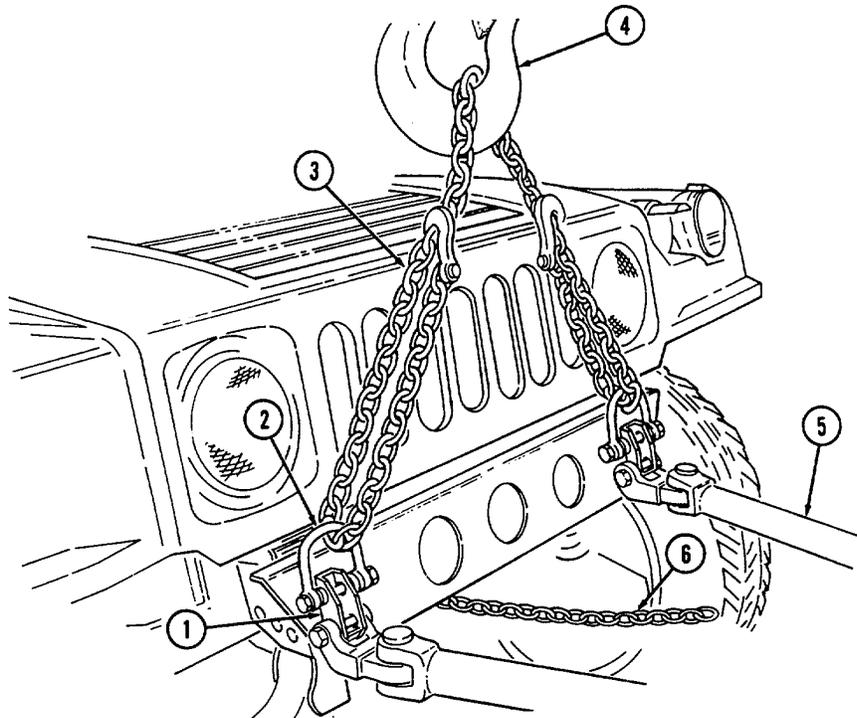
- (4) Hoist vehicle to be towed.

- (5) If towing operation is more than a distance of 30 mi (48 km), or towing speed is expected to be over 30 mph (48 kph), remove rear propeller shaft and rotor.

- (6) Place transmission and transfer case shift levers in "N" (neutral).

- (7) Depress parking brake release button and release parking brake lever.

- (8) Proceed with towing operation.



c. Towing Vehicle from Rear (Rear Wheels Up).

NOTE

It will be necessary to remove the wrecker lifting eyes (shackle) prior to attaching the towbar arms.

- (1) Attach the eye of the towbar (5) to the pintle (7) of the vehicle requiring towing and the towbar arms to the wrecker rear lifting eye attaching bracket.

CAUTION

Ensure that wrecker hoisting boom and hook are centered over the lifting shackles. Failure to do this may result in difficult turning during towing operations.

- (2) Install chain assembly (3) through the rear lifting shackles (8) and attach the chain assembly (3) to the wrecker's hoisting hook (4).

- (3) Secure safety chain (6) to towed vehicle's frame and to wrecker directly behind bumper or bumperette and let safety chain (6) dip to about 1 ft (30.5 cm) from the ground.

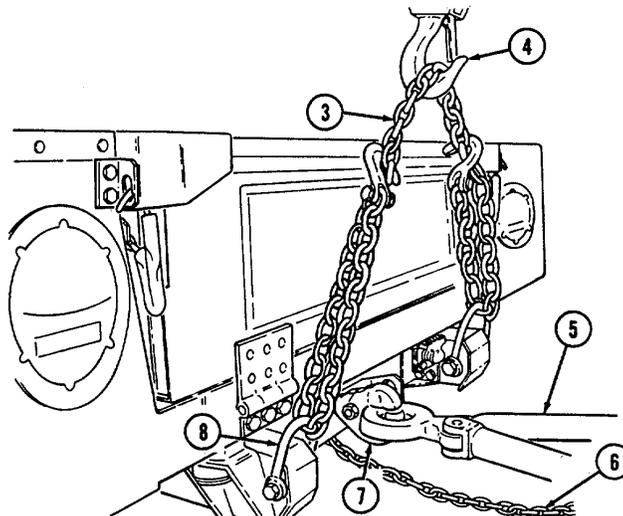
WARNING

Prior to towing vehicle with rear wheels up, secure steering wheel to prevent front wheels from turning. Failure to do this may cause damage to vehicle and injury or death to personnel.

- (4) Secure steering wheel.

- (5) If towing operation is more than a distance of 30 mi (48 km), or towing speed is expected to be over 30 mph (48 kph), remove front propeller shaft.

- (6) Place transmission and transfer case shift levers in "N" (neutral).
- (7) Depress parking brake release button and release parking brake lever.
- (8) Lift rear wheels from ground.
- (9) Proceed with towing operations.



d. Towing S250 Shelter Vehicle from Rear (Rear Wheels Up).**NOTE**

It will be necessary to remove the wrecker lifting eyes (shackle) prior to attaching the towbar arms.

(1) Attach the eye of the towbar (3) to the pintle (4) of the vehicle requiring towing and the towbar arms to the wrecker rear lifting eye attaching bracket.

CAUTION

Ensure that wrecker hoisting boom and hook are centered over the lifting shackles. Failure to do this may result in difficult turning during towing operations.

NOTE

If necessary, relocate the rear lifting shackles from the ends of the bumper to the location indicated.

(2) Install the two hooks of chain assembly (1) through the rear lifting shackles (6) and attach the chain assembly (1) to the wrecker's hoisting hook (2).

(3) Secure safety chain (5) to towed vehicle's frame and to wrecker directly behind bumpers and let safety chain (5) dip to about 1 ft (30.5 cm) from the ground.

WARNING

Prior to towing vehicle with rear wheels up, secure steering wheel to prevent front wheels from turning. Failure to do this may cause damage to vehicle and injury or death to personnel.

(4) Secure steering wheel.

(5) If towing operation is over a distance of 30 mi (48 km), remove front propeller shaft.

(6) Place transmission and transfer case shift levers in "N" (neutral).

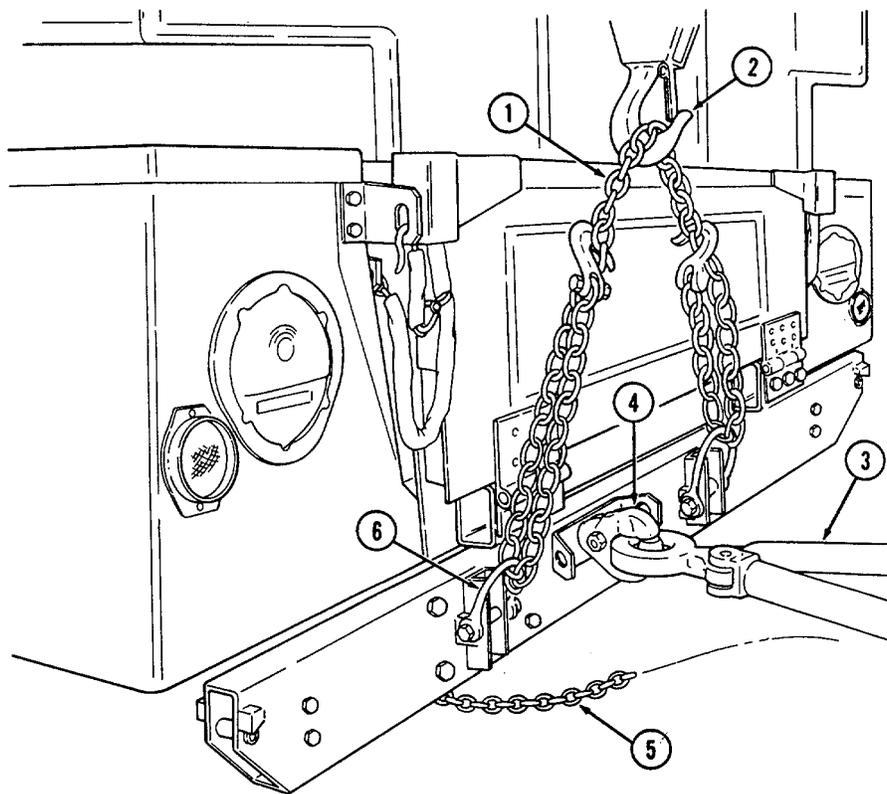
(7) Depress parking brake release button and release parking brake lever

(8) Lift rear wheels from ground.

CAUTION

Do not exceed 15 mph (24 kph) towing speed. Avoid sharp turns and U-turns when towing. Failure to comply may cause damage to equipment.

(9) Proceed with towing operations.



e. Towing M996, M996A1, M997, M997A1, and M997A2 Ambulance Vehicles from Rear (Rear Wheels Up).

- (1) Install eye (12) of towbar (9) in pintle hook (11) of towing vehicle and secure pintle hook (11) with cotter pin (10).
- (2) Remove two safety pins (16) and connector pins (3) securing two clamps (2) to towbar extension legs (7) and remove clamps (2).
- (3) Install two clamps (2) on rear bumper (1) of disabled vehicle with adjusting nuts (17) facing downward and clamp chains (18) over top of bumper (1).
- (4) Remove two safety pins (14) and extension pins (13) securing extension legs (7) to towbar (9), and adjust extension legs (7) length to attach to two clamps (3). Secure extension legs (7) to two clamps (2) with two connector pins (3) and safety pins (16).
- (5) Secure extension legs (7) to towbar (9) with two extension pins (13) and safety pins (14).
- (6) Tighten two adjusting nuts (17) on clamps (2) to secure clamp chains (18) to bumper (1).

CAUTION

Wrecker hoisting boom should be positioned so that chain from wrecker boom hook to towing pintle makes minimal contact with rear of ambulance body. It may be necessary to extend towbar legs to provide sufficient hoisting chain clearance to prevent damage to rear of ambulance body.

- (7) Attach hoisting chain (5) to wrecker boom hook (6) and towing pintle (4) of towed vehicle, ensuring towing pintle latch (15) is facing downward.
- (8) Attach and secure safety chain (8) to frame of disabled vehicle and to wrecker, directly behind bumper (1). Allow chain (8) to dip to approximately 1 ft (30.5 cm) above ground.

WARNING

Prior to towing vehicle with rear wheels up, secure steering wheel to prevent front wheels from turning. Failure to do this may cause damage to vehicle, injury, or death.

- (9) Secure steering wheel.
- (10) If towing distance is more than 30 mi (48 km), remove front propeller shaft.
- (11) Place transmission and transfer case shift levers in "N" (neutral) position.
- (12) Lift rear end of disabled vehicle off ground.

CAUTION

Do not exceed 15 mph (24 kph) towing speed. Avoid sharp turns and U-turns when towing. Failure to comply may cause damage to equipment.

- (13) Proceed with towing operations.

The ambulances are authorized to tow trailers only during administrative or tactical moves, when not transporting patients.

Trailer payloads should be evenly distributed to prevent excessive tongue loads.

Table 2-3.1. Vehicle Trailer Towing Requirements

HMMWV Model Number	Description	MWO Requirements				Remarks
		M1101	M1102	<3400 lb (1544 kg)	<4200 lb (1905 kg)	
M998/M998A1	Cargo/Troop	A		A		
M1038/M1038A1	Cargo/Troop	A		A		
M1097/M1097A1/M1097A2	Heavy Variant	B	B	B	B	
M1123	Heavy Variant	C	C	C	C	
M966/M966A1	Tow Carrier	A		A		
M1121	Tow Carrier	A		A		
M1036	Tow Carrier	A		A		
M1045/M1045A1	Tow Carrier	A		A		
M1045A2	Tow Carrier	C	C	C	C	
M1046/M1046A1	Tow Carrier	A		A		
M1025/M1025A1	Armament Carrier	A		A		
M1025A2	Armament Carrier	B	B	B	B	
M1026/M1026A1	Armament Carrier	A		A		
M1043/1043A1	Armament Carrier	A		A		
M1043A2	Armament Carrier	C	C	C	C	
M1044/M1044A1	Armament Carrier	A		A		
M1037	Shelter Carrier	B1		B1		See Note
M1042	Shelter Carrier	B1		B1		
M996/M996A1	Ambulance	B1		B1		
M997/M997A1	Ambulance	B1		B1		
M997A2	Ambulance	B	B	B	B	
M1035/M1035A1	Ambulance	A			A	
M1035A2	Ambulance	B	B	B	B	

Key:

A = MWO 9-2320-280-20-7

B = MWO 9-2320-280-20-6

B1 = Need MWO 9-2320-280-20-6 but must change stencil to read 3400 lb (1544 kg) instead of 4200 lb (1907 kg).

C = Comes equipped. No MWO required.

<3400 lb (1544 kg) = Any system mounted on HMT Chassis with GVW of 3400 lb (1544 kg) or less.

<4200 lb (1907 kg) = Any system mounted on HMT Chassis with GVW of 4200 lb (1907 kg) or less.

Note: Pintle extensions are required on vehicles with Shelter Standardized Integrated Command Post System (SICPS) type II. If vehicle is equipped with SICPS (M788) mounted, MWO 9-2320-280-20-6 is not required.

2-26. ELECTRIC WINCH OPERATION

a. **General.** The vehicle electrical system is used to power the winch. It is recommended to have engine running while operating the winch so the alternator recharges the battery. Increased engine rpms can be maintained by use of the hand throttle. When engaging or disengaging the clutch, it may be necessary to rotate the drum by hand to align gears.

b. **Preparation for Use.**

NOTE

The eye of the winch cable needs a thimble to keep wires from shearing or breaking. Refer to unit maintenance for installation.

(1) Park vehicle directly facing object to be winched. Place transmission shift lever in "N" (neutral), or "P" (Park) for M1123 and A2 vehicles.

(2) Apply parking brake.

(3) Start engine (para. 2-10).

(4) Chock wheels.

c. **Unwinding Winch Cable.**

CAUTION

Do not power out winch cable for more than 10 ft (3 m). Use free spool for paying out long lengths of winch cable. Failure to free spool long lengths of winch cable will cause damage to winch.

(1) Turn clutch lever (1) counterclockwise to "FREE SPOOL."

WARNING

- Wear leather gloves when handling winch cable. Do not handle cable with bare hands.
- When fully extending winch cable, ensure that four wraps of winch cable remain on drum at all times. Failure to do this may cause injury or death to personnel.

NOTE

Allow 1 ft (30.5 cm) of slack in winch cable prior to start of winching operations. This allows time for winch motor start-up for maximum pulling power.

(2) Pull out cable (5) by hand to desired length. Connect to load leaving 1 ft (30.5 cm) of slack in cable (5).

d. **Pulling Load.**

NOTE

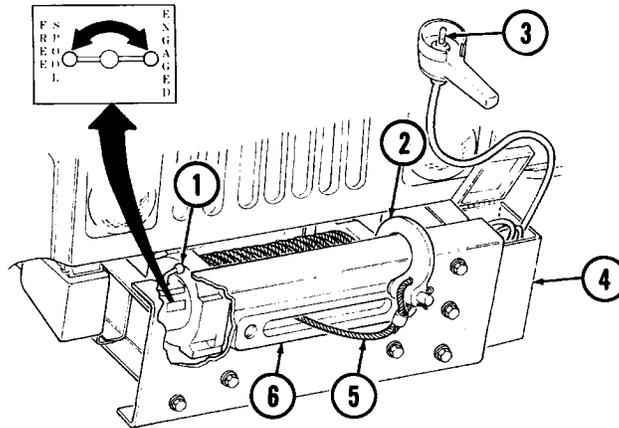
Refer to table 1-16 (6,000 lb), or table 1-17 (Optional 9,000 lb), Winch Data, for pulling load capacity.

(1) Remove remote control switch (3) from stowage box (4).

(2) Turn clutch lever (1) clockwise to "ENGAGED."

WARNING

Direct all personnel to stand clear of winch cable during winch operation. A snapped winch cable will cause injury or death.



NOTE

- The electric winch is equipped with an electronic current limiter switch to prevent winch overload. If winch stops repeatedly during operation and restarts in approximately five seconds, the electronic current limiter is being activated, indicating an overload condition.
- The electric winch is equipped with a thermal cutoff switch to prevent winch from overheating. If winch stops during operation, and does not restart within five seconds, wait approximately two minutes to let winch cool off and allow thermal switch to reset. If after five minutes winch is still inoperative, notify unit maintenance.

CAUTION

Do not fully apply hand throttle during engine “NO LOAD” condition. Damage to engine may result.

- (3) Pull out hand throttle until desired engine speed is obtained.
- (4) Operate remote control switch (3) to “IN” or “OUT” until load has been retrieved.

e. Securing Winch After Operation.

CAUTION

Winch cable must be wound onto the drum under a load of at least 500 lbs (227 kg) or outer wraps will draw into the inner wraps and damage winch cable.

- (1) Wind winch cable (5) until hook (2) is 4 ft (1.2 m) from cable guide (6).
- (2) Turn clutch lever (1) counterclockwise to “FREE SPOOL” and rotate drum by hand to retrieve the remaining cable.
- (3) Place remote control switch (3) in stowage box (4).
- (4) Turn clutch lever (1) clockwise to “ENGAGED.”
- (5) Release hand throttle.

2-26.1. HYDRAULIC WINCH OPERATION

a. General. The vehicle power steering pump is used to power the winch. The engine must be running while operating the winch. However if the engine will not run, the winch cable may be payed out by moving the levers to FREE SPOOL wheel position, then paying out cable down to the fifth layer. Then move levers to LOCK position, keeping no less than five full wraps of cable on the winch drum. When engaging or disengaging HIGH and LOW range, it will be necessary to rotate the drum by hand to align gears. This may also be done by powering the winch in and out with no load on cable 1/2 second at a time until full engagement is achieved.

b. Preparation for Use.

NOTE

The eye of the winch cable needs a thimble to keep wires from shearing or breaking. Refer to unit maintenance for installation.

(1) Park vehicle directly facing object to be winched. Place transmission shift lever in "N" (neutral), or "P" (Park) for M1123 and A2 vehicles.

(2) Apply parking brake.

(3) Chock wheels.

(4) Start engine (para. 2-10).

c. Unwinding Winch Cable.

CAUTION

Do not power out winch cable for more than 10 ft (3 m). Use free spool for paying out long lengths of winch cable. Failure to free spool long lengths of winch cable will cause damage to winch.

(1) Move clutch levers (1) and (2) to "FREE."

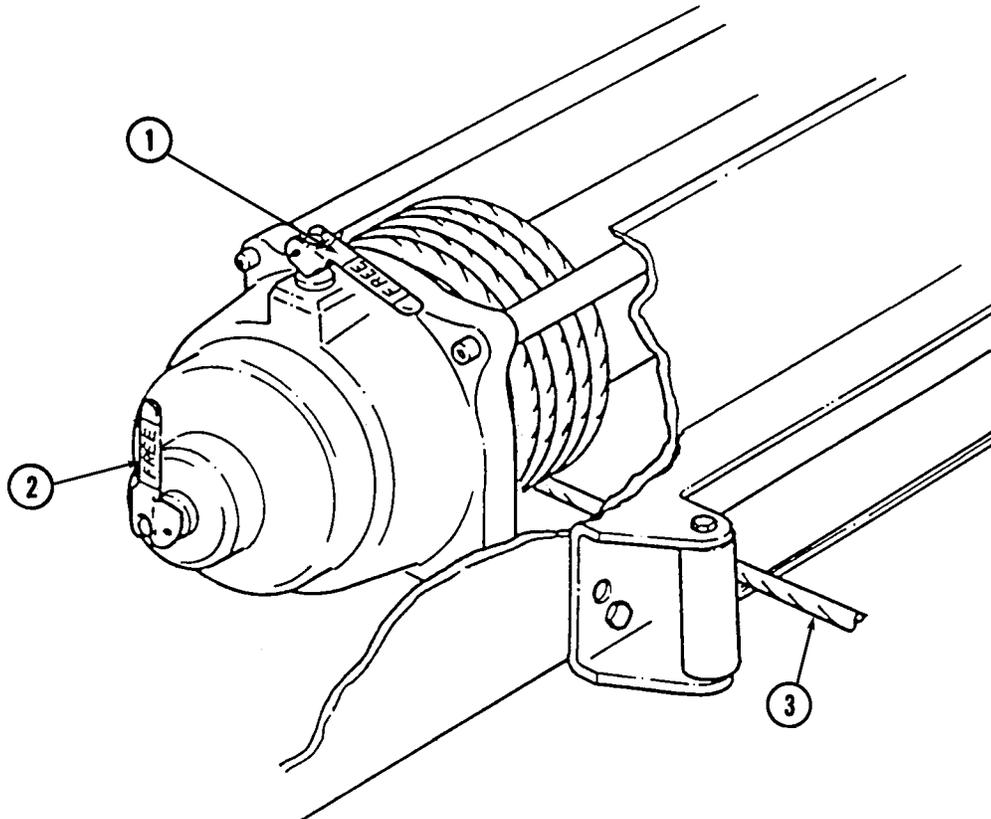
WARNING

- Wear leather gloves when handling winch cable. Do not handle cable with bare hands.
- When fully extending winch cable, ensure that five wraps of winch cable remain on drum at all times. Failure to do this may cause injury or death to personnel.

NOTE

Allow 1 ft (30.5 cm) of slack in winch cable prior to start of winching operations. This allows time for winch motor start up for maximum pulling power.

(2) Pull cable (3) by hand to desired length. Connect to load, leaving 1 ft (30.5 cm) of slack in cable (3).



d. Pulling Load.

NOTE

Refer to table 1-17.1. (Optional 10,500 lb), Winch Data, for pulling capacity.

(1) Remove remote control switch (5) from stowage box (6) and cap (9) from controller plug (7) and connect hand controller connector (8) to controller plug (7).

(2) Move clutch lever 1 (1) to "LOW" position and leave clutch lever 2 (4) at "FREE" position to place winch (2) in "LOW" range.

WARNING

Direct all personnel to stand clear of winch cable during winch operation. A snapped winch cable may cause injury or death.

CAUTION

Do not move winch levers with load on winch or when powering winch in or out.

(3) Press "OUT" remote control button (10) or "IN" remote control button (11) until load has been retrieved.

e. Securing Winch After Operation.

CAUTION

Winch cable must be wound onto the drum under a load of at least 500 lbs (227 kg), or outer wraps will draw into the inner wraps and damage winch cable.

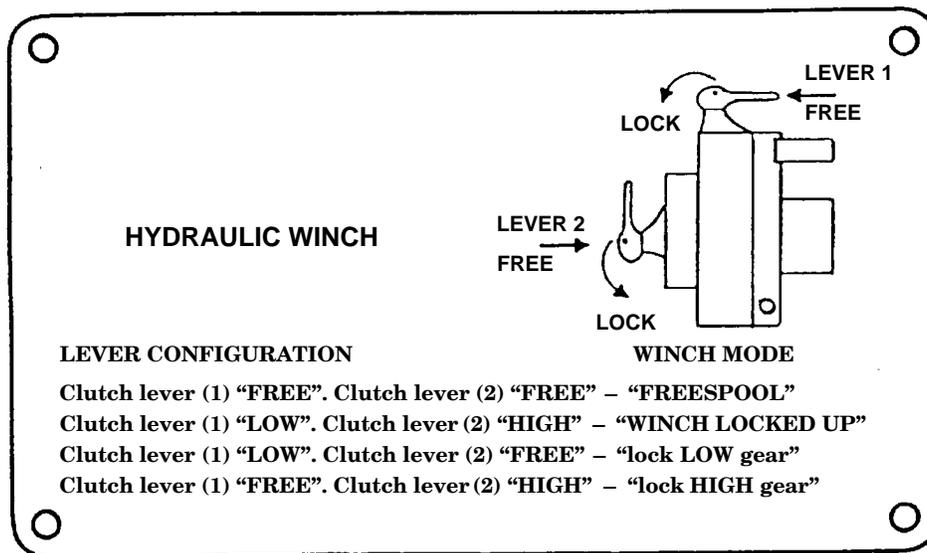
(1) Wind winch cable (2) until hook is 4 ft (1.2 m) from cable guide (12).

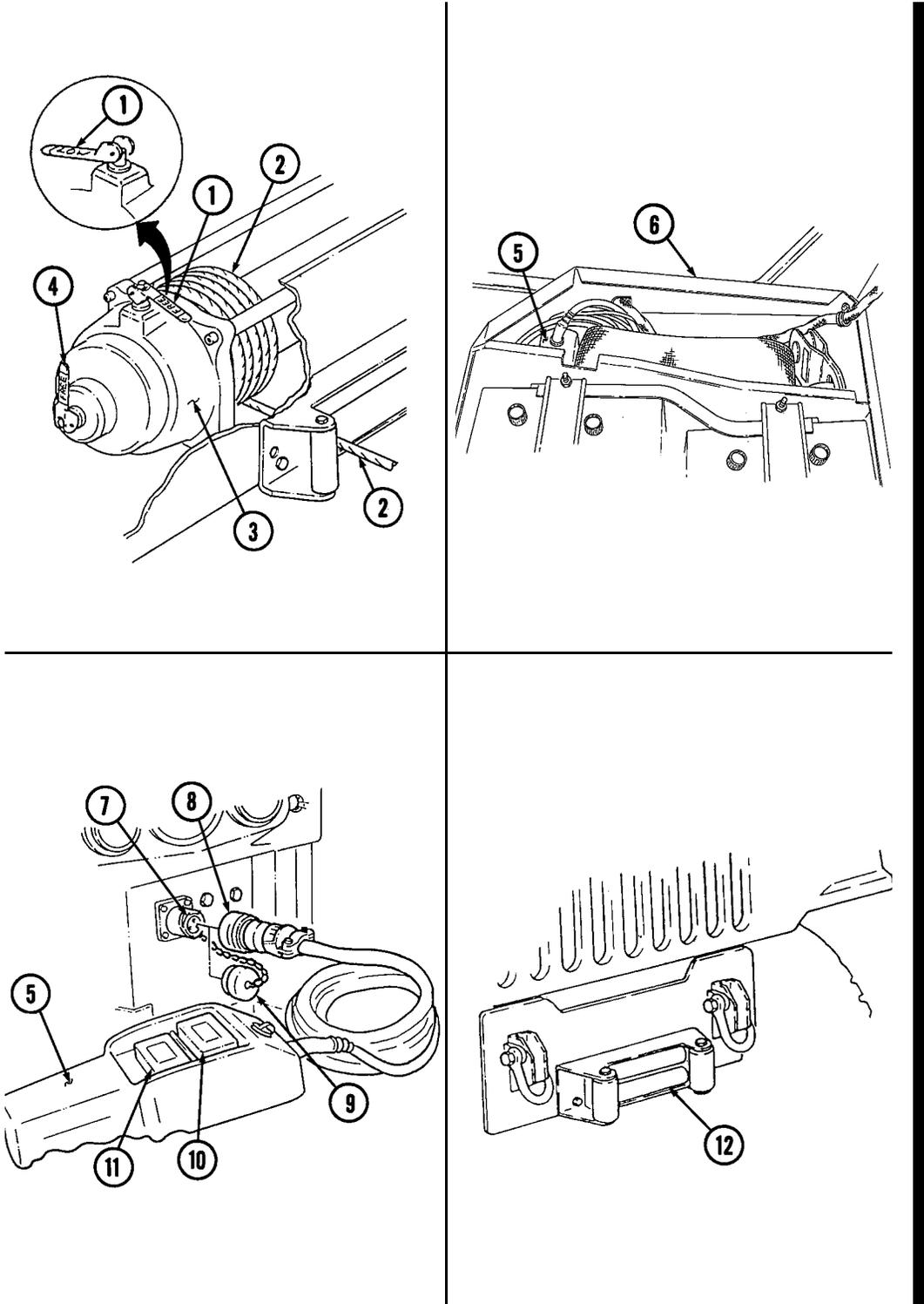
(2) Move clutch levers 1 (1) and 2 (4) to "FREE" positions and rotate drum by hand to retrieve the remaining cable.

(3) Remove hand controller connector (8) from controller plug (7) and place remote control switch (5) in stowage box (6).

(4) Move clutch lever 1 (1) to "LOW" position and clutch lever 2 (4) to "HIGH" position to lockup winch (3).

(5) Install cap (9) on controller plug (7).





2-27. MALFUNCTION

a. Before Operation.

- (1) Ensure operator PMCS have been accomplished and needle of indicator gauge (1) is in the green zone. Refer to table 2-2.
- (2) Refer to para. 2-2 for fire extinguisher stowage location.

WARNING

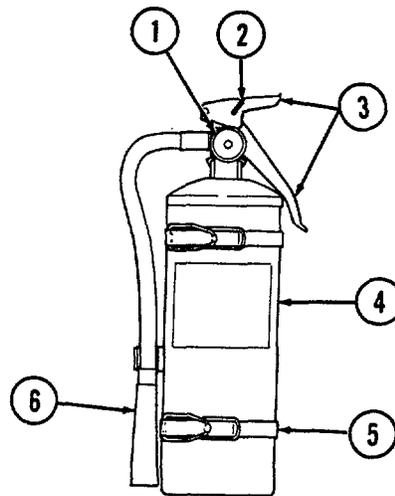
- Avoid using fire extinguisher in unventilated areas. Prolonged inhalation exposure to extinguishing agent or fumes from burning materials may cause injury to personnel.
- Using fire extinguisher in windy areas will cause rapid dispersal of extinguishing agent and reduce effectiveness in fire control.

b. During Operation.

- (1) To operate fire extinguisher (4), remove from stowage bracket (5). Remove locking pin (2) and direct nozzle (6) to source of flames.
- (2) Squeeze handles (3) together and direct extinguishing agent to base of flames. To extinguish burning liquid in a container, direct extinguishing agent against inside of container, just above burning liquid.

c. After Operation.

- (1) Stow fire extinguisher (4) in stowage bracket (5).
- (2) Notify unit maintenance to replace or recharge fire extinguisher (4) after use.



Section IV. OPERATION UNDER UNUSUAL CONDITIONS

2-28. SPECIAL INSTRUCTIONS

a. General. Special instructions for operating and maintaining vehicles under unusual conditions are included in this section. Unusual conditions are extreme temperatures, humidity, and/or terrain. Special care in cleaning and lubrication must be taken in order to keep vehicles operational when operating under unusual conditions.

WARNING

This vehicle has been designed to operate safely and efficiently within the limits specified in this TM. Operation beyond these limits is prohibited IAW AR 750-1 without written approval from the Commander, U.S. Army Tank-automotive and Armaments Command, ATTN: AMSTA-CM-S, Warren, MI 48397-5000.

NOTE

Except where noted, all normal operating procedures will apply in addition to special instructions for unusual operating conditions.

b. Cleaning. Refer to para. 2-4 for cleaning instructions and precautions.

c. Lubrication. Refer to appendix G for proper lubricating instructions.

d. Driving Instructions.

(1) FM 21-305, Manual for the Wheeled Vehicle Driver, contains special driving instructions for operating wheeled vehicles.

(2) FM 55-30, Army Motor Transport Unit Operations, contains instructions on driver selection, training, and supervision.

(3) FM 9-207, Operation and Maintenance of Ordnance Materiel in Cold Weather, contains instructions on vehicle operation in extreme cold of 0°F to -65°F (-18°C to -54°C).

(4) Other documents with information on vehicle operation under unusual conditions are:

- | | |
|--|---------------------------------|
| (a) FM 31-70 Basic Cold Weather Manual | (d) FM 90-5 Jungle Operations |
| (b) FM 31-71 Northern Operations | (e) FM 90-6 Mountain Operations |
| (c) FM 90-3 Desert Operations | |

e. Special Purpose Kits. Paragraphs describing special purpose kits for operation under unusual conditions are:

- (1) Deep water fording operation, para. 2-37.
- (2) Arctic operation, para. 2-39 or 2-40.

f. Transmission Range Selection. For proper transmission range selection, refer to table 1-7 or table 1-8. If transmission range selection is peculiar to an unusual operating condition, it will be specified in the applicable paragraph.

g. Transfer Case Range Selection.

CAUTION

- Vehicle must be stopped, engine off, and transmission shift lever in "N" (neutral) before transfer case can be shifted. Failure to do this will result in damage to drivetrain.
- Damage to drivetrain will result if transfer case is operated in "L" (low range) or "H/L" (high lock range) on high traction surfaces with no wheel slippage.

CAUTION

- When necessary to temporarily operate transfer case in "H/L" (high lock range) or "L" (low range) when additional traction is needed to prevent wheel slippage, avoid sharp continuous turns. Failure to avoid sharp continuous turns while operating transfer case in locked ranges may cause damage to drivetrain.
- Immediately after operation in "H/L" (high lock range) or "L" (low range), ensure transfer case is shifted to "H" (high range) to avoid damage to drivetrain. If any noises from drivetrain components are heard, ensure that transfer case range is properly selected.

For proper transfer case range selection, refer to table 1-9. If transfer case range selection is peculiar to an unusual operating condition, it will be specified in the applicable paragraph.

2-29. OPERATING ON UNUSUAL TERRAIN

a. General Rules. Driving off-road over rough or unusual terrain basically requires using good driving sense. Experience is the best teacher, but there are a few good rules to keep in mind when you are in that kind of driving situation.

WARNING

- Use extreme caution when transporting personnel. Rollover protection is available for the crew area only and is not provided in the troop/cargo area. Although certain design characteristics of the vehicle, such as vehicle width, ground clearance, independent suspension, etc., provide improved capabilities, accidents can still happen.
- Operators are reminded to observe basic safe driving techniques/skills when operating the vehicle, especially when transporting personnel. Vehicle speed must be reduced consistent with weather and road/terrain conditions. Obstacles such as stumps and boulders must be avoided. Failure to use basic safe driving techniques/skills may result in injury or death to personnel and damage to equipment.

(1) Use "H/L" (high lock range) or "L" (low range) only when absolutely required by the conditions identified in table 1-9. After operations on unusual terrain, be sure to shift the transfer case from "H/L" (high lock range) or "L" (low range) to "H" (high range) to avoid damaging drivetrain components.

(2) Select proper transmission and transfer case driving ranges. Refer to table 1-7 or table 1-8 for transmission range selections. For transfer case range selections, refer to table 1-9.

(3) Keep engine at a moderate speed. The engine works at its best pace in the mid-range revolutions per minute (rpms). You can slow down or speed up quickly without changing gears if you get into a tight spot. Use the transmission shift lever and transfer case shift lever to control the engine speed.

(4) Attempt to keep wheels from spinning. If the wheels start to spin, ease off the accelerator pedal until the wheels regain traction.

(5) The instructions for placing vehicle in motion (para. 2-11) also apply to operating on unusual terrain.

b. Unusual Terrain Driving Techniques**CAUTION**

- Do not shift into any lower gear than is necessary to maintain headway. Attempt to maintain a constant engine speed. Over-revving engine will cause the wheels to slip, and traction will be lost.
- Before ascending or descending steep hills, stop vehicle, place transmission to “N” (neutral), and shift transfer case to “L” (low range). Failure to shift transfer case to “L” (low range) before ascending or descending steep hills may result in damage to drivetrain.

(1) Before climbing a steep hill, shift the transfer case into “L” (low range) and the automatic transmission into “1” (first). If wheels start to slip, “walk” the vehicle the last few remaining feet of a hill by swinging the front wheels sharply left and right if situation permits. This action will provide fresh “bite” into the surface and will usually result in enough traction to complete the climb.

CAUTION

When “L” (low range) is used for “engine braking” while descending steep grades, avoid sharp continuous turns. Failure to avoid sharp continuous turns while operating transfer case in range may cause damage to drivetrain.

(2) You can proceed safely down a steep grade by shifting the transfer case into “L” (low range) and the transmission into “2” (second) or “1” (first). Let the vehicle go slowly down the hill with all four wheels turning against engine compression.

WARNING

Do not travel diagonally across a hill unless it is absolutely necessary, or injury to personnel or damage to equipment may result.

(3) When moving across a slope, choose the least angle possible, keep moving, and avoid turning quickly.

(4) If it is difficult to shift out of a locked range, drivetrain torque buildup may have occurred. If necessary to relieve drivetrain torque buildup when leaving a low traction surface for a high traction surface, the vehicle should be backed up for a distance of approximately 5 ft (1.5 m) before proceeding.

2-30. COLD WEATHER STARTING BELOW +32°F (0°C)**WARNING**

Starting aids will not be used on the engine. Use of starting aids will cause damage to vehicle, injury, or death.

(1) Start engine (para. 2-10).

WARNING

- Do not use the hand throttle as an automatic speed or cruise control. The hand throttle does not automatically disengage when brake is applied, resulting in increased stopping distances and possible hazardous and unsafe operation.
- Do not fully apply hand throttle when engine is not under load.

NOTE

If engine cranks slowly and voltmeter indicates low battery charge level, attempt to slave start vehicle (para. 2-23). If vehicle still will not start, perform troubleshooting procedures in table 3-1.

(2) After engine starts, pull out hand throttle until desired engine speed is obtained. Twist handle to lock hand throttle.

(3) Allow engine to warm up at an increased speed for approximately three minutes.

(4) After warm-up period, unlock hand throttle and push hand throttle in and allow engine speed to decrease.

2-31. OPERATING IN EXTREME COLD, ON ICE, OR SNOW

a. Before Operation.

(1) Operate arctic winterization equipment (para. 2-39 or 2-40).

(2) Scrape off any ice accumulated on vehicle.

(3) Remove ice and snow from area around air cleaner intake cap.

(4) Refer to para. 2-30 for cold weather starting instructions.

(5) Refer to para. 2-29 for techniques that can be used when operating on unusual terrain.

(6) Refer to para. 3-22 for tire chain installation and operation.

(7) Operate troop/cargo winterization heater, if applicable (para. 2-41).

b. During Operation.

WARNING

- Vehicle operation in snow is a hazardous condition. Operator must travel at reduced speeds and be prepared to meet sudden changes in road conditions. Failure to maintain safe stopping distances will cause damage to vehicle and injury or death to personnel.
- Pump brakes gradually when stopping vehicle on ice or snow. Sudden braking will cause wheels to lock and vehicle to slide out of control, causing damage to vehicle and injury or death to personnel.
- Chock blocks shall be used when parking a vehicle in extreme cold conditions. Failure to do so may result in injury to personnel or damage to equipment.

NOTE

Keep area around air cleaner intake cap clear of snow and ice. Snow and ice may melt, refreeze, and cause restriction in air intake system. If necessary, remove intake cap and clear ice and snow without damaging intake cap screen. Hold the cap near the vehicle exhaust to quickly melt ice without damaging screen.

(1) Place transmission shift lever in "D" (drive) (or "Ⓓ" overdrive for M1123 and A2 vehicles), and transfer case shift lever in "H/L" (high lock range). Place vehicle in motion slowly to prevent wheels from spinning.

NOTE

If additional power is needed to extract vehicle when mired in snow, place transmission in "1" (first) and transfer case in "L" (low range). After vehicle is extracted from mired condition, immediately return transfer case to "H/L" (high lock range) position.

(2) If rear skidding occurs:

(a) Let up on accelerator pedal.

(b) Turn steering wheel in direction of skid until control has been regained.

(c) Apply brake pedal in a gradual pumping manner.

c. After Operation.

(1) Remove all ice and snow from underside of vehicle and fuel tank filler cap.

(2) Drain fuel filter (para. 3-10).

2-32. OPERATING IN DUSTY, SANDY AREAS

a. General. Vehicles operating in dusty or sandy areas require frequent servicing of the air filter and cooling system.

NOTE

For dusty conditions, a precleaner, NSN 2940-01-302-8028, can be inserted in the air intake shield assembly, at the discretion of the unit commander.

b. Before Operation.

(1) Reduce tire inflation to 12 psi (83 kPa) front and 16 psi (110 kPa) rear to increase traction when operating in sand.

(2) When operating in loose sand or soft ground, place transfer case shift lever in "H/L" (high lock range) position and transmission shift lever in "D" (drive) (or "Ⓓ" (overdrive) for M1123 and A2 vehicles).

(3) Refer to paragraph 2-29 for techniques that can be used when operating on unusual terrain.

c. During Operation.

NOTE

If additional power is needed to extract vehicle when mired in sand, place transmission in "1" (first) and transfer case in "L" (low range). After vehicle is extracted from mired condition, immediately return transfer case to "H/L" (high lock range) position.

(1) Frequently check air restriction gauge. If indicator shows red, park vehicle, stop engine, and refer to para. 3-15 for emergency air cleaner servicing.

(2) If engine overheating occurs:

(a) Park vehicle, allow engine to idle.

(b) Observe coolant temperature gauge for steady cooling.

CAUTION

Stop engine if coolant temperature gauge suddenly increases beyond approximately 230°F (110°C). Failure to comply will result in damage to engine.

(c) If coolant temperature continues to increase or does not lower, stop engine. Perform applicable troubleshooting procedures in table 3-1.

(3) Accelerate slowly so wheels will not spin and dig into sand.

CAUTION

Use a wrecker or second vehicle equipped with winch to recover vehicles mired in deep sand. Do not attempt to "rock" vehicles out of deep sand with quick transmission shift changes. Damage to transmission will occur.

d. After Operation.

(1) At end of daily operation, remove all sand from accelerator linkage and brake components.

(2) Park vehicle in shade whenever possible to protect tires, soft tops, paint, wood, and seals from sun, dust, and sand.

(3) If shade is not available, cover vehicle with tarpaulin. When entire vehicle cannot be covered, protect windows and hood with tarpaulin to prevent entry of sand or dust.

(4) Vehicles completing operation in dusty, sandy areas must be lubricated and serviced by unit maintenance as soon as possible.

2-33. OPERATING IN MUD

a. Before Operation.

(1) Before operating in mud, place transfer case shift lever in "H/L" (high lock range) and transmission shift lever in "D" (drive) (or "D" (overdrive) for M1123 and A2 vehicles).

(2) Refer to paragraph 2-29 for techniques that can be used when operating on unusual terrain.

b. During Operation.

CAUTION

- Do not repeatedly shift transmission or overspeed the engine during operation in deep mud. Damage to drivetrain may result.
- Use wrecker or a second vehicle equipped with winch to recover vehicles mired in deep mud. Do not attempt to "rock" vehicles out of deep mud with quick transmission shift changes. Damage to transmission will occur.

NOTE

If additional power is needed to extract vehicle when mired in mud, place transmission in "1" (first) and transfer case in "L" (low range). After vehicle is extracted from mired condition, immediately return transfer case to "H/L" (high lock range) position.

Skidding and sudden loss of steering control are operating problems in mud. When rear end skidding occurs, immediately turn wheel in direction of skid.

c. After Operation.

(1) Wash the following as soon as possible with low pressure water:

CAUTION

Do not allow water to enter air intake cap or air cleaner assembly. Damage to engine will occur.

- (a) Radiator and oil cooler
- (b) Propeller shaft U-joint and halfshafts
- (c) Steering linkage and ball joints

WARNING

Do not rely on service brakes until they dry out. Keep applying brakes until uneven braking ceases. Failure to do this may cause damage to vehicle and injury or death to personnel.

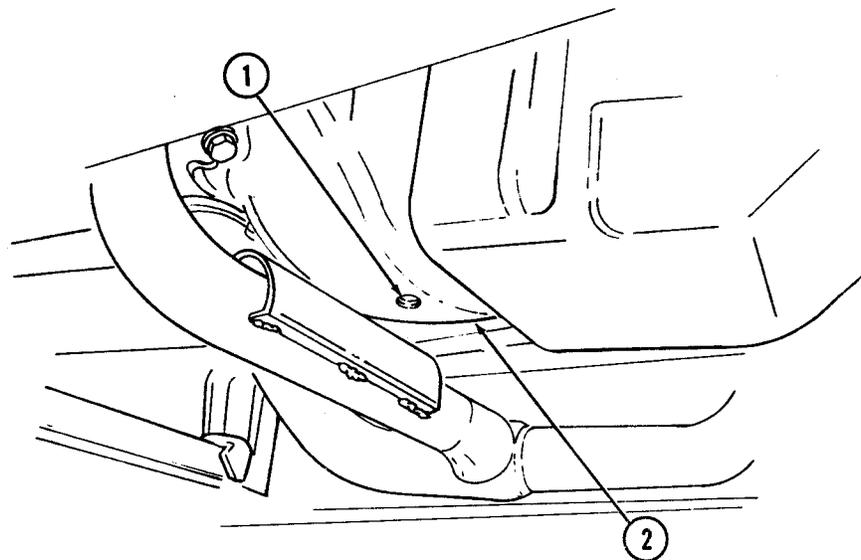
- (d) Brake rotors and pads (service)
- (e) Brake rotors and pads (park)
- (f) Parking brake linkage
- (g) Service lights
- (h) Transmission control linkage
- (i) Accelerator control linkage
- (j) Sway bar bushings
- (k) Towing pintle
- (l) Fuel filler cap
- (m) Vehicle exterior
- (n) Geared hubs
- (o) Advance solenoid rocker arm and fuel injection pump

- (2) Remove mud from air cleaner dump valve (para. 3-16).
- (3) Remove mud from drain hole (1) on converter housing cover (2).
- (4) Remove mud from battery box drain holes.

NOTE

To prevent parking brake linkage from binding, lithium grease should be used after operating in mud. Clean mud, grit, and debris from linkage. Apply lithium grease (Appendix D, Item 10.1) and move linkage back and forth to work into joints.

- (5) Vehicles completing operation in deep mud must be lubricated and serviced by unit maintenance as soon as possible.



2-34. OPERATING IN EXTREME HEAT

a. General. Extreme heat exists when ambient temperatures reach 95°F (35°C) or more. The effect of extreme heat on vehicle engine is a decrease in engine efficiency.

b. Before Operation.

- (1) Perform before operation checks and services in table 2-2.
- (2) Check for foreign objects in front of radiator and clean as required.
- (3) Check batteries more frequently. If electrolyte is low, add distilled water, refer to Appendix D, Item 27.

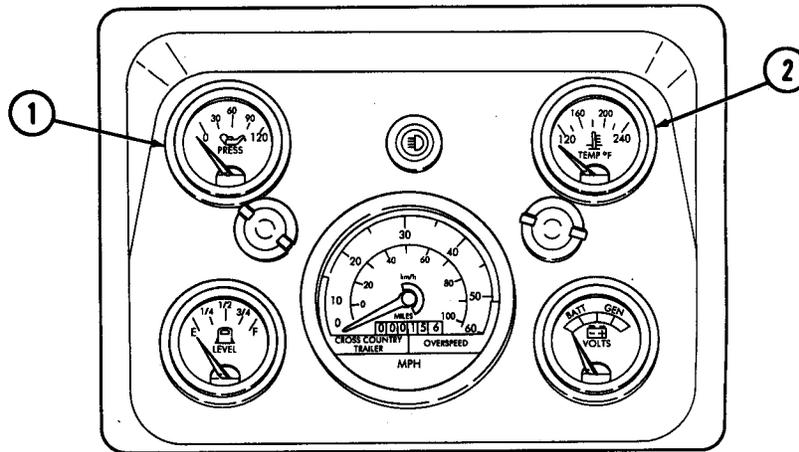
c. During Operation.

CAUTION

Avoid continuous vehicle operation at high speeds. Avoid long hard pulls on steep grades with transfer case shift lever in "L" (low range) position. Damage to transfer case will result.

(1) Frequently check coolant temperature gauge (2) and oil pressure gauge (1). Engine is overheating if one or more of the following conditions exist:

- (a) Engine coolant temperature is more than approximately 230°F (110°C) as indicated by temperature gauge (2).
- (b) Engine oil pressure drops below approximately 15 psi (103 kPa) with engine under a load.
- (c) Engine oil pressure drops below approximately 6 psi (41 kPa) with engine at idle.



(2) If engine overheating occurs:

- (a) Park vehicle, allowing engine to idle.
- (b) Observe coolant temperature gauge (2) for steady cooling.

CAUTION

- Stop engine if coolant temperature gauge suddenly increases beyond approximately 230°F (110°C). Failure to comply will result in damage to engine.
- Notify unit maintenance to check differential, T-case, and transmission fluids for "oil breakdown" caused by overheating.

(c) If engine coolant temperature continues to increase or does not lower, stop engine. Perform troubleshooting procedures in table 3-1.

2-35. OPERATING IN RAINY OR HUMID CONDITIONS

a. **General.** Material inactive for long periods during rainy or humid conditions can rust rapidly. Fungus may develop in the fuel tanks as well as on soft tops, seats, and other components. Frequent inspections, cleaning, and lubrication are necessary to maintain the operational readiness of vehicles.

b. Before Operation. Fuel filter must be drained frequently because of high condensation in fuel system. To drain fuel filter, refer to paragraph 3-10.

c. During Operation.

- (1) If necessary, place transfer case shift lever in "H/L" (high lock range) to obtain a start without spinning wheels.
- (2) Do not spin wheels when placing vehicle in motion in heavy rain conditions.
- (3) Refer to para. 2-29 for techniques that can be used when operating on unusual terrain.

2-36. SHALLOW WATER FORDING OPERATION

a. General. M998 series vehicles have a 30 in. (76 cm) shallow water fording capability without the use of a deep water fording kit.

CAUTION

Never attempt shallow water fording unless water depth is known to be 30 in. (76 cm) or less, and bottom is known to be hard. Do not exceed 5 mph (8 kph) during fording operation. Damage to vehicle will result.

b. Before Operation.

- (1) Make sure oil dipstick, transmission dipstick, oil filler cap, and fuel tank cap are secure.
- (2) Secure all loose objects on vehicle.
- (3) Make sure battery caps are all present and tight.

WARNING

Do not allow tools to come in contact with vehicle when disconnecting or connecting slave receptacle cable. Tool contact with vehicle will result in a direct short, causing instant heating of tool, tool damage, and injury to personnel.

NOTE

Perform steps 4 through 6 only if fording in salt water.

- (4) Disconnect battery ground cable (1).

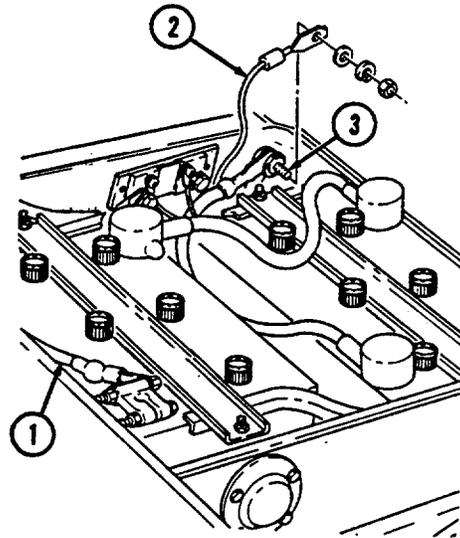
NOTE

Battery positive cable must remain on power stud.

- (5) Disconnect slave receptacle positive lead 49A (2) at power stud (3).

- (6) Connect battery ground cable (1).

- (7) Place transfer case shift lever in "H" (high range).



c. **During Operation.**

CAUTION

Entering water too fast will cause water to splash up over hood and into air intake. The engine may stop abruptly and will not crank. Do not continue starting efforts; damage to engine will result.

- (1) Enter water slowly and maintain even vehicle speed while fording.
- (2) Exit water in area with gentle slope.

NOTE

- Hydrostatic lock is caused by the entry of substantial amounts of water into the engine through the air intake system and subsequent contamination of the fuel system. Hydrostatic lock most frequently occurs during or just after fording. Water is forced into the air intake system, is drawn into the engine, and effectively “locks-up” the engine.
- Notify unit maintenance if you suspect hydrostatic lock and they will further test the engine.

d. **After Operation.**

WARNING

Do not rely on service brakes after fording until the brakes dry out. Keep applying brakes until uneven braking ceases. Failure to do this may cause damage to vehicle or injury or death to personnel.

NOTE

If accumulated water drains slowly through floor drain holes, refer to unit maintenance for drilling and improving drain holes

- (1) If fording operation was through salt water, wash and wipe off all salt deposits as soon as possible.

NOTE

To prevent parking brake linkage from binding, lithium grease should be used after operating in mud. Clean mud, grit, and debris from linkage. Apply lithium grease (Appendix D, Item 10.1) and move linkage back and forth to work into joints.

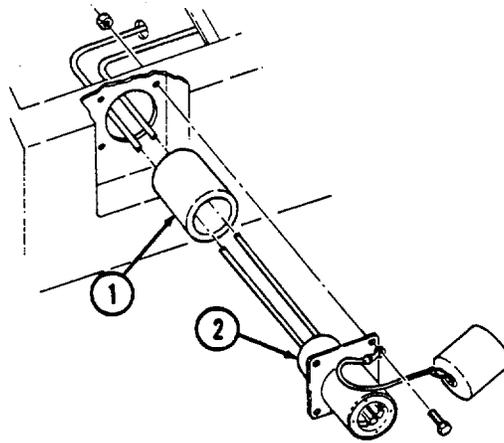
- (2) Vehicles completing shallow water fording operation must be lubricated and serviced by unit maintenance as soon as possible.

NOTE

Perform steps 3 through 7 only if fording was in salt water.

- (3) Slide rubber boot (1) back and inspect slave receptacle (2) for evidence of corrosion, RTV wash out, or salt water penetration of RTV sealant. If any evidence of these conditions is found, report vehicle to unit maintenance for corrective action. Do not connect slave receptacle positive lead (4).

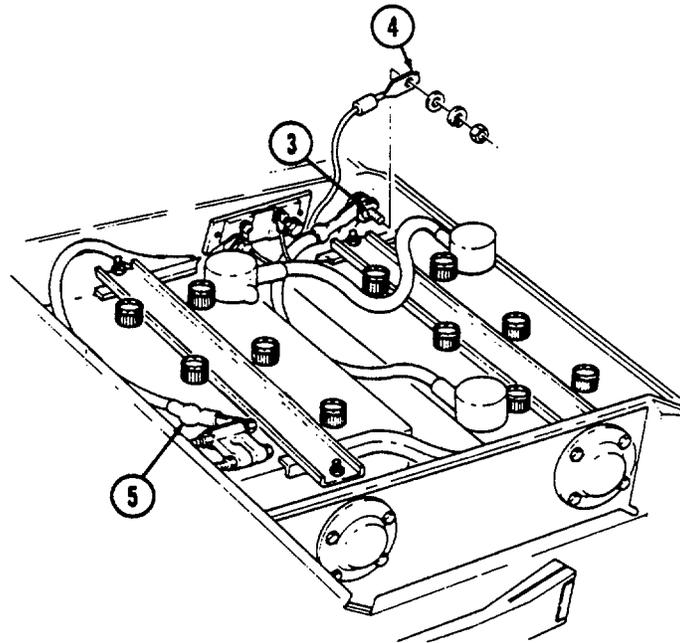
- (4) If no evidence of corrosion, RTV wash out, or salt water penetration of the RTV sealant is found, slide rubber boot (1) on slave receptacle (2).



WARNING

Do not allow tools to come in contact with vehicle when disconnecting or connecting slave receptacle cable. Tool contact with vehicle will result in a direct short, causing instant heating of tool, tool damage, and injury to personnel.

- (5) Disconnect battery ground cable (5).
- (6) Connect slave receptacle positive lead 49A (4) at power stud (3).
- (7) Connect battery ground cable (5).



2-37. DEEP WATER FORDING OPERATION

a. General. The deep water fording kit allows M998 series vehicles to ford water up to 60 in. (152 cm) deep.

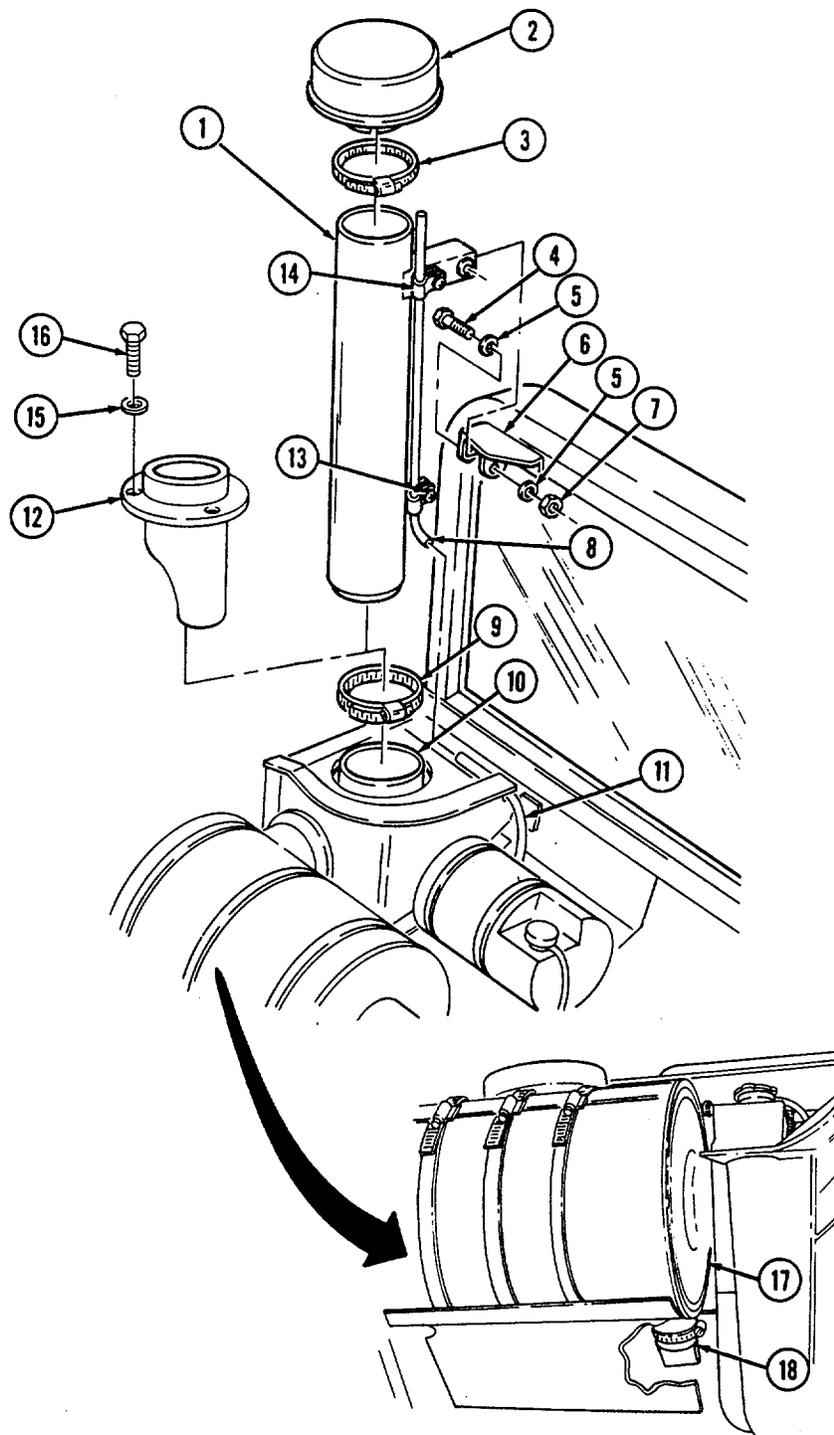
CAUTION

Never attempt deep water fording unless water depth is known to be 60 in. (152 cm) or less, and bottom is known to be hard. Do not exceed 5 mph (8 kph) during fording operation. Damage to vehicle will result.

b. Before Operation.**NOTE**

Retain all parts removed for reuse.

- (1) Raise and secure hood (para. 3-8).
- (2) Loosen clamp (3) and remove weathercap (2) and clamp (3) from shield (12).
- (3) Remove three capscrews (16), washers (15), and shield (12) from cowling (10). Stow shield (12).
- (4) Install intake assembly vent tube (8) on air intake assembly (1) with two clips (14) and screws (13).
- (5) Install air intake assembly (1) and clamp (9) into cowling (10) and tighten clamp (9).
- (6) Connect fuel tank vent line (11) to intake assembly vent tube (8).
- (7) Install air intake assembly (1) on windshield mounting bracket (6) with washer (5), capscrew (4), washer (5), and nut (7).
- (8) Install clamp (3) and weathercap (2) on air intake assembly (1) and tighten clamp (3).
- (9) Ensure that rubber cap (18) on the bottom of air cleaner body (17) is secure.



WARNING

Exhaust system components are hot after prolonged vehicle use. Ensure exhaust system components are cool before removing/ installing exhaust assembly. Failure to do this will result in injury to personnel.

NOTE

Any items removed for fording must be stowed for reuse.

(10) Remove three locknuts (17), washers (9), capscrews (10), and washers (9) securing tailpipe (11) to muffler (16).

(11) Remove two nuts (15), lockwashers (14), and U-bolt (12) securing tail-pipe (11) to clamp (13).

(12) Remove tailpipe (11) and gasket (8) from muffler (16).

(13) Install two rubber isolators (5) into wheelhouse (6). To ease installation, wet rubber isolators (5) with water.

(14) If isolators (5) cannot be installed easily, check alignment of holes in wheelhouse (6) and reinforcement bracket (3). To align holes, loosen capscrews (4) securing reinforcement bracket (3) to wheelhouse (6). Align holes in wheel-house (6) and reinforcement bracket (3) and tighten capscrews (4). Install isolators (5).

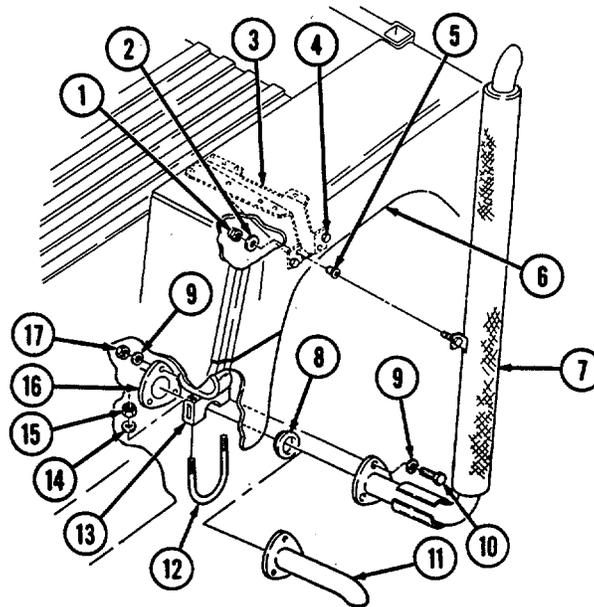
(15) Install exhaust assembly (7) and gasket (8) on muffler (16) with three washers (9), capscrews (10), washers (9), and locknuts (17).

(16) Install exhaust assembly (7) on wheelhouse (6) with two washers (2) and locknuts (1).

(17) Ensure oil dipstick, transmission dipstick, oil filler cap, and fuel tank cap are secure.

(18) Secure all loose objects on vehicle.

(19) Ensure battery caps are all present and tight.



WARNING

Do not allow tools to come in contact with vehicle when disconnecting or connecting slave receptacle cable. Tool contact with vehicle will result in a direct short, causing instant heating of tool, tool damage, and injury to personnel.

NOTE

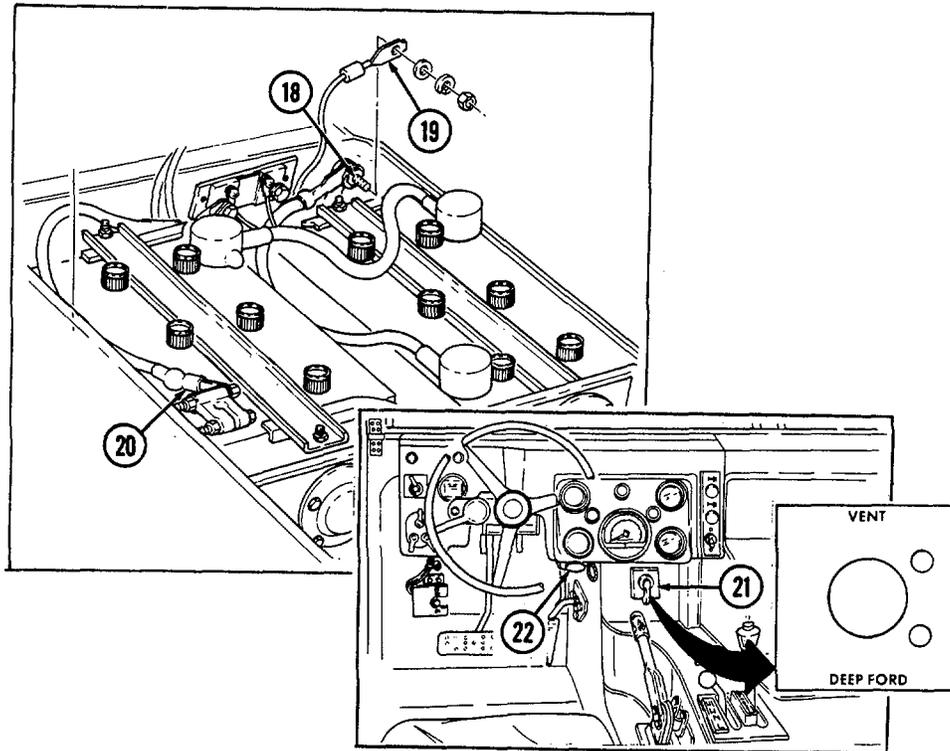
Perform steps 20 through 22 only if fording in salt water.

- (20) Disconnect battery ground cable (20).

NOTE

Battery positive cable must remain on power stud.

- (21) Disconnect slave receptacle positive lead 49A (19) at power stud (18).
- (22) Connect battery ground cable (20).
- (23) Place transfer case shift lever in appropriate range (table 1-9).
- (24) Turn off all non-essential electrical loads (lights, fan, heater/defroster).
- (25) Place fording selector switch (21) in "DEEP FORD" position prior to entering water.
- (26) Pull out hand throttle (22) until desired engine speed is obtained. Twist hand throttle (22) to lock in position.
- (27) Open driver and passenger windows.



c. During Operation.

WARNING

Entering water too fast will cause water to splash up over hood and into air intake. The engine may stop abruptly and will not crank. Do not continue starting efforts; damage to engine will result.

NOTE

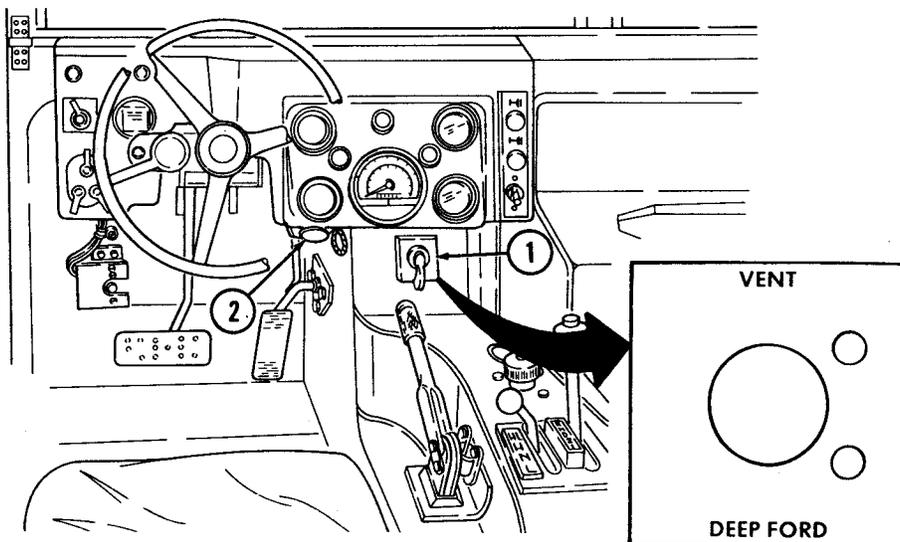
Perform step 1 for M996, M996A1, M997, M997A1, and M997A2 vehicles.

- (1) Enter water until water level has reached the bottom of the driver and passenger windows, stop for a two minute waiting period to allow the ambulance body to fill with water, then proceed with operations.
- (2) Enter water slowly and maintain even vehicle speed, 5 mph (8 kph) maximum.
- (3) Exit water in area with gentle slope.
- (4) Place fording selector switch (1) in "VENT" position upon leaving water.

WARNING

After fording do not use the hand throttle as an automatic speed or cruise control. The hand throttle does not automatically disengage when brake is applied, resulting in increased stopping distances and possible hazardous and unsafe operation. Injury to personnel or damage to equipment may result.

- (5) Unlock and push in hand throttle (2).



WARNING

Do not rely on service brakes after fording until the brakes dry out. Keep applying brakes until uneven braking ceases. Failure to do this may cause damage to vehicle, and injury or death to personnel.

- (6) Place transfer case shift lever in desired range.

NOTE

- Hydrostatic lock is caused by the entry of substantial amounts of water into the engine through the air intake system and subsequent contamination of the fuel system. Hydrostatic lock most frequently occurs during or just after fording. Water is forced into the air intake system, drawn into the engine, and effectively "locks-up" the engine.
- Notify unit maintenance if you suspect hydrostatic lock, and they will further test the engine.

d. After Operation.

WARNING

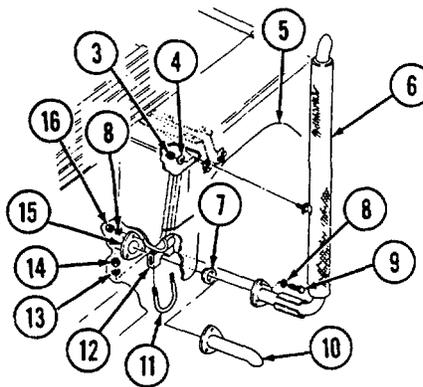
Exhaust system components are hot after prolonged vehicle use. Ensure exhaust system components are cool before removing/ installing exhaust assembly. Failure to do this will result in injury to personnel.

- (1) Stop engine.

NOTE

- Steps 2 through 13 are performed only if required.
- If accumulated water drains slowly through the holes, refer to unit maintenance for drilling and improving drain holes.

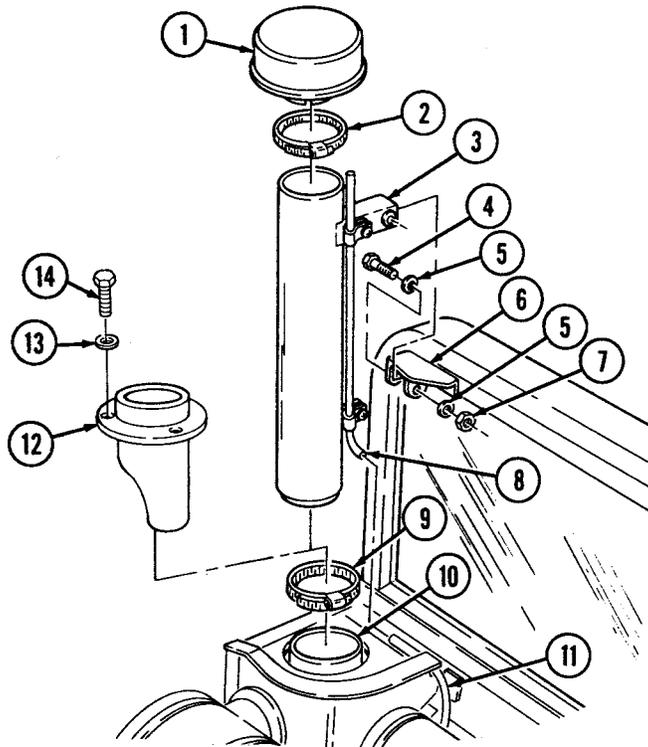
- (2) Remove three locknuts (16), washers (8), capscrews (9), washers (8), gasket (7), and exhaust assembly (6) from muffler (15).
- (3) Remove two locknuts (3), washers (4), and exhaust assembly (6) from wheelhouse (5).
- (4) Install gasket (7) and tailpipe (10) on muffler (15) with three washers (8), capscrews (9), washers (8), and locknuts (16).
- (5) Install clamp (12) on tailpipe (10) with U-bolt (11), two lockwashers (13), and nuts (14).



(6) Loosen clamp (2) securing weathercap (1) to air intake assembly (3) and remove weathercap (1).

(7) Remove nut (7), washer (5), capscrew (4), washer (5), and air intake assembly (3) from windshield mounting bracket (6).

(8) Disconnect fuel tank vent line (11) from intake assembly vent tube (8).



(9) Loosen clamp (9) securing air intake assembly (3) to cowling (10) and remove air intake assembly (3) and clamp (9).

(10) Install shield (12) in cowling (10) with three washers (13) and capscrews (14).

(11) Install weathercap (1) and clamp (2) on shield (12) and tighten clamp (2).

(12) Lower and secure hood (para. 3-8).

(13) Clean and stow intake and exhaust assembly components.

(14) If fording operation was through salt water, wash and wipe off all salt deposits as soon as possible.

NOTE

To prevent parking brake linkage from binding, lithium grease should be used after operating in mud. Clean mud, grit, and debris from linkage. Apply lithium grease (Appendix D, Item 10.1) and move linkage back and forth to work into joints.

(15) Vehicles completing deep water fording operation must be lubricated and serviced by unit maintenance as soon as possible.

NOTE

Perform steps 16 through 20 only if fording was in salt water.

(16) Slide rubber boot (15) back and inspect slave receptacle (16) for evidence of corrosion, RTV wash out, or salt water penetration of RTV sealant. If any evidence of these conditions is found, report vehicle to unit maintenance for corrective action. Do not connect slave receptacle positive lead (17).

(17) If no evidence of corrosion, RTV wash out, or salt water penetration of the RTV sealant is found, slide rubber boot (15) on slave receptacle (16).

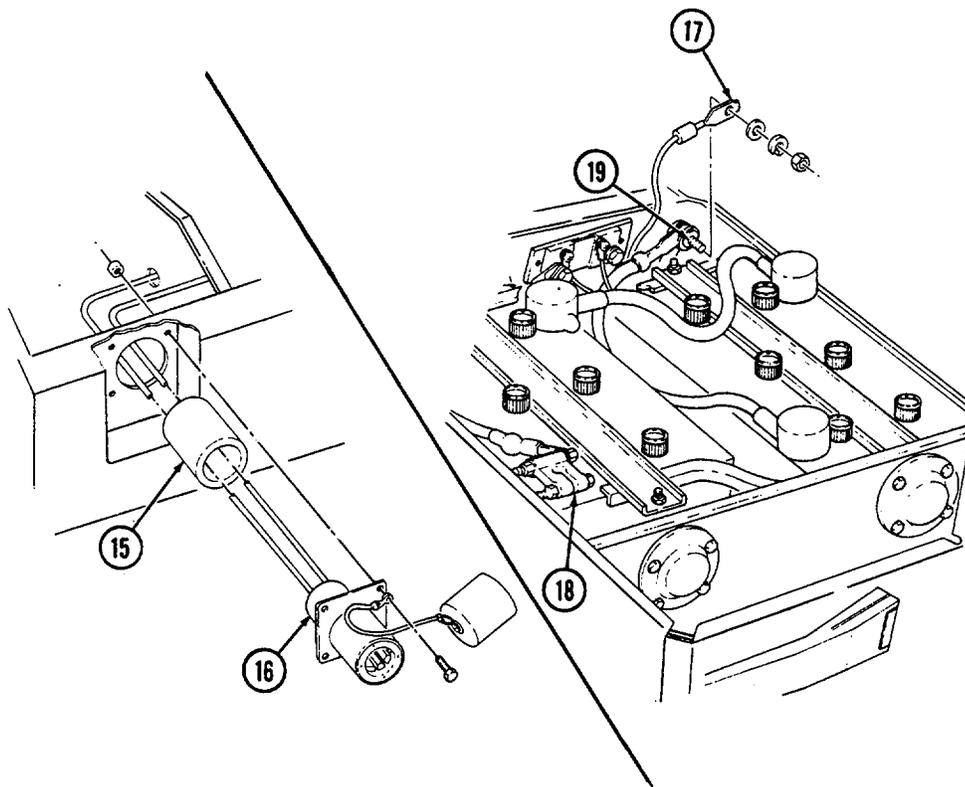
WARNING

Do not allow tools to come in contact with vehicle when disconnecting or connecting slave receptacle cable. Tool contact with vehicle will result in a direct short, causing instant heating of tool, tool damage, and injury to personnel.

(18) Disconnect battery ground cable (18).

(19) Connect slave receptacle positive lead 49A (17) at power stud (19).

(20) Connect battery ground cable (18).



2-38. RUNFLAT OPERATIONS

M998 series vehicles are equipped with runflat devices, allowing the vehicle to be driven with one or more tires flat. For runflat operations, refer to table 2-4.

WARNING

- Do not exceed 30 mph (48 kph) during any runflat operation. Do not exceed 20 mph (32 kph) with both rear tires flat. Loss of vehicle control will occur, causing damage to equipment, injury or death to personnel.
- Speeds indicated in table 2-4 are maximum and must be reduced when traveling on secondary roads, cross-country, or with traffic present. Failure to reduce speeds could cause loss of control of vehicle, resulting in damage to equipment and injury or death to personnel.
- When driving your vehicle, the existing conditions are constantly changing. Never drive at a speed greater than is reasonable and prudent for these conditions. Loss of vehicle control will occur causing damage to equipment and injury or death to personnel.

CAUTION

- A wheel that has been run flat must be replaced and inspected by unit maintenance as soon as possible before reuse, or damage to equipment may result.
- Runflat operation may cause the tread to separate from the tire and/or wheel. If abnormal handling is experienced, or noise such as flapping or pounding around the wheel well occurs, the tread needs to be cut away from the wheel before continuing operation. Failure to do so could result in damage to the vehicle.

Table 2-4. Runflat Operation

NOTE		
Runflat travel distance will improve with radial tire and rubber runflat. If additional travel is required, tire tread may be cut away from tire.		
Combination of Flat Tires	Recommended Vehicle Speed	Distance
Two tires flat – rear	20 mph maximum (32 kph)	30 mi (48 km)
One tire flat – any location	30 mph (48 kph)	30 mi (48 km)
Two tires flat – same side	30 mph (48 kph)	30 mi (48 km)
Two tires flat – front only	30 mph (48 kph)	30 mi (48 km)

2-39. ARCTIC OPERATION (ALL EXCEPT M1123 AND A2 VEHICLES)

a. General. Arctic winterization kits are for use during extremely cold temperatures from 0°F (-18°C) to -50°F (-46°C).

CAUTION

- Do not operate arctic heater in ambient temperatures above 0°F (-18°C) or with temperature switch in “HI” position when temperature is above -25°F (-32°C). Damage to equipment may result.
- Close battery box door after 30 minutes of arctic heater operation or when engine is running. Failure to do so may result in damage to batteries.

b. Starting Arctic Heater.

- (1) Set temperature switch (4) on heater control box (1) to "LO" position.
- (2) Move start switch (3) on heater control box (1) to "START" position and hold for approximately 2 minutes or until heater starts and yellow indicator lamp (2) comes on.

NOTE

If the start switch is moved from the "START" to "ON" position too quickly, the heater flame will be extinguished and the heater will need restarting.

- (3) When heater starts, move start switch (3) on heater control box (1) to "ON" position. If heater does not start, move start switch (3) to "OFF" position for 10 seconds and then back to "START" for 60 seconds. Repeat procedure if heater doesn't start.

c. Starting Engine With Arctic Heater Assistance.

- (1) Push defroster control knob (9) all the way in to ensure hot air is not directed on windshield.
- (2) Pull exhaust diverter cable knob (6) out to allow heater exhaust to heat the engine oil pan.
- (3) Open battery box door (8), by sliding away from plenum (7), to heat batteries.
- (4) Move regulator control lever (5) to "ARCTIC HEATER" position.

CAUTION

Do not operate arctic heater in ambient temperatures above 0°F (-18°C) or with temperature switch in "HI" position, when temperature is above -25°F (-32°C). Damage to equipment will result.

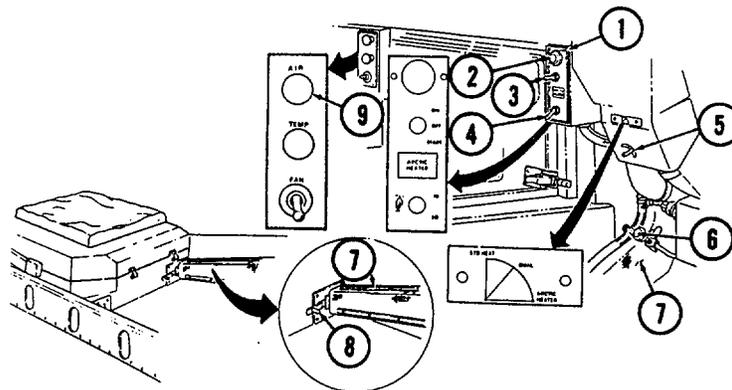
- (5) Start arctic heater and set temperature switch (4) on heater control box (1) to "LO" position for temperatures from 0°F (-18°C) to -25°F (-32°C), or to "HI" position for temperatures from -25°F (-32°C) to -50°F (-46°C).

- (6) Operate heater for 30 minutes maximum at -50°F (-46°C); less time may be required for higher ambient temperatures.

CAUTION

Close battery box door after 30 minutes of arctic heater operation or when engine is running. Failure to do so may result in damage to batteries.

- (7) Close battery box door (8) by sliding toward plenum (7).



- (8) Push exhaust diverter cable knob (5) in to shut off heat to engine oil pan.
- (9) Start engine (para. 2-30).
- (10) If engine fails to start, notify unit maintenance.

d. Stopping Arctic Heater.

Set start switch (2) on heater control box (1) to "OFF" position.

NOTE

The yellow indicator lamp will remain lit and the fan will continue to run until the heater has purged itself of fuel.

e. Defrosting Windshield in Ambient Temperatures Above -25°F (-32°C).

CAUTION

- Cab must be heated prior to defrosting, or damage to windshield will occur.
- Use of the arctic heater to defrost in temperatures above -25°F (-32°C) will damage the windshield.
- Do not operate arctic heater with regulator control lever in "STANDARD HEAT" position and battery box door closed, or damage to equipment will occur.

- (1) Start engine with arctic heater assistance.
- (2) Shut off arctic heater.
- (3) Pull defrost control knob (8) all the way out to direct air on windshield.
- (4) Pull temperature control knob (7) all the way out for maximum heat.
- (5) Set regulator control lever (4) to "STANDARD HEAT" position.
- (6) Set standard heater fan switch (6) to "HI" position until windshield is defrosted.

f. Defrosting Windshield in Ambient Temperatures from -25°F (-32°C) to 50°F (-46°C).

- (1) Start engine with arctic heater assistance.
- (2) Set temperature switch (3) on heater control box (1) to "LO" position.
- (3) Set regulator control lever (4) to "DUAL" position.
- (4) Pull defrost control knob (8) all the way out to direct air on windshield.
- (5) Pull temperature control knob (7) all the way out for maximum heat.
- (6) Set standard heater fan switch (6) to "LO" position until windshield is defrosted.

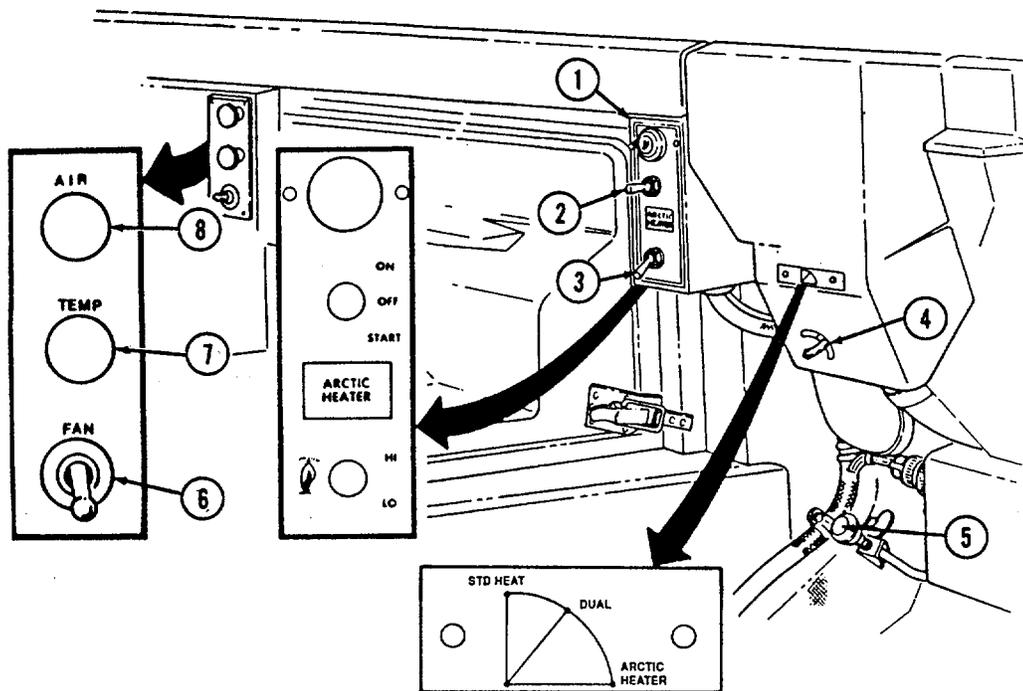
g. Heating Cab with Arctic Heater.

- (1) Start engine (para. 2-30).

CAUTION

Do not operate arctic heater in ambient temperatures above 0°F (-18°C), or with temperature switch in "HI" position, when temperature is above -25°F (-32°C). Damage to equipment will result.

- (2) Start arctic heater and set temperature switch (3) on heater control box (1) to "LO" position for temperatures from 0°F (-18°C) to -25°F (-32°C), or "HI" position for temperatures from -25°F (-32°C) to -50°F (-46°C).
- (3) Set regulator control lever (4) to "DUAL" or "ARCTIC HEATER" position to achieve desired mix of air.
- (4) Push defrost control knob (8) all the way in to direct airflow to heat ducts.
- (5) Pull temperature control knob (7) all the way out for maximum heat.
- (6) Set standard heater fan switch (6) to desired position to mix air.



2-40. ARCTIC OPERATION (A2 VEHICLES)

a. General. Arctic winterization kits are for use during extremely cold temperatures from 0°F (-18°C) to -50°F (-46°C).

CAUTION

- Do not operate arctic heater in ambient temperatures above 0°F (-18°C), or with temperature switch in "HI" position, when temperature is above -25°F (-32°C). Damage to equipment may result.
- Close battery box door after 30 minutes of arctic heater operation or when engine is running. Failure to do so may result in damage to batteries.

b. Starting Arctic Heater.

(1) Set temperature switch (4) on heater control box (1) to "LO" position.

(2) Move start switch (3) on heater control box (1) to "START" position and hold for approximately 2 minutes or until heater starts and yellow indicator lamp (2) comes on.

NOTE

If the start switch is moved from the "START" to "ON" position too quickly, the heater flame will be extinguished and the heater will need restarting.

(3) When heater starts, move start switch (3) on heater control box (1) to "ON" position. If heater does not start, move start switch (3) to "OFF" position for 10 seconds and then back to "START" for 60 seconds. Repeat procedure if heater doesn't start.

c. Starting Engine With Arctic Heater Assistance.

- (1) Pull defroster control knob (9) all the way out to ensure hot air is not directed on windshield.
- (2) Pull exhaust diverter cable knob (6) out to allow heater exhaust to heat the engine oil pan.
- (3) Open battery box door (8), by sliding away from plenum (7), to heat batteries.
- (4) Move regulator control lever (5) up to "STANDARD HEAT" position.

CAUTION

Do not operate arctic heater in ambient temperatures above 0°F (-18°C), or with temperature switch in "HI" position, when temperature is above -25°F (-32°C). Damage to equipment will result.

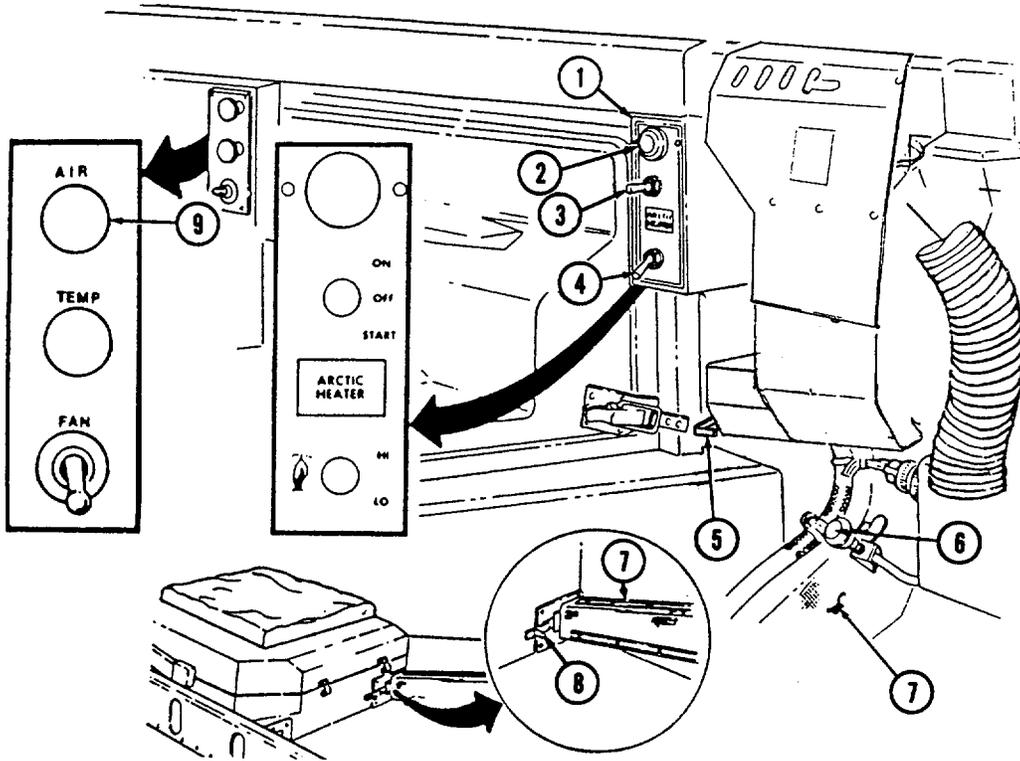
(5) Start arctic heater and set temperature switch (4) on heater control box (1) to "LO" position for temperatures from 0°F (-18°C) to -25°F (-32°C), or "HI" position for temperatures from -25°F (-32°C) to -50°F (-46°C).

(6) Operate heater for 30 minutes maximum at -50°F (-46°C); less time may be required for higher ambient temperatures.

CAUTION

Close battery box door after 30 minutes of arctic heater operation or when engine is running. Failure to do so may result in damage to batteries.

(7) Close battery box door (8) by sliding toward plenum (7).



- (8) Push exhaust diverter cable knob (5) in to shut off heat to engine oil pan.
- (9) Start engine (para. 2-30).
- (10) If engine fails to start, notify unit maintenance.

d. Stopping Arctic Heater.

Set start switch (2) on heater control box (1) to "OFF" position.

NOTE

The yellow indicator lamp will remain lit and the fan will continue to run until the heater has purged itself of fuel.

e. Defrosting Windshield in Ambient Temperatures Above -25°F (-32°C).

CAUTION

- Cab must be heated prior to defrosting, or damage to windshield will occur.
- Use of the arctic heater to defrost in temperatures above -25°F (-32°C) will damage the windshield.
- Do not operate arctic heater with regulator control lever in "STANDARD HEAT" position and battery box door closed, or damage will occur.

- (1) Start engine with arctic heater assistance.
- (2) Shut off arctic heater.
- (3) Push defroster control knob (8) all the way in to direct air on windshield.
- (4) Pull temperature control knob (7) all the way out for maximum heat.
- (5) Set regulator control lever (4) up to "STANDARD HEAT" position.
- (6) Set standard heater fan switch (6) to "HI" position until windshield is defrosted.

f. Defrosting Windshield in Ambient Temperatures from -25°F (-32°C) to -50°F (-46°C).

- (1) Start engine with arctic heater assistance.
- (2) Set temperature switch (3) on heater control box (1) to "LO" position.
- (3) Set regulator control lever (4) down to "ARCTIC HEAT" position.
- (4) Push defroster control knob (8) all the way in to direct air on windshield.
- (5) Pull temperature control knob (7) all the way out for maximum heat.
- (6) Set standard heater fan switch (6) to "LO" position until windshield is defrosted.

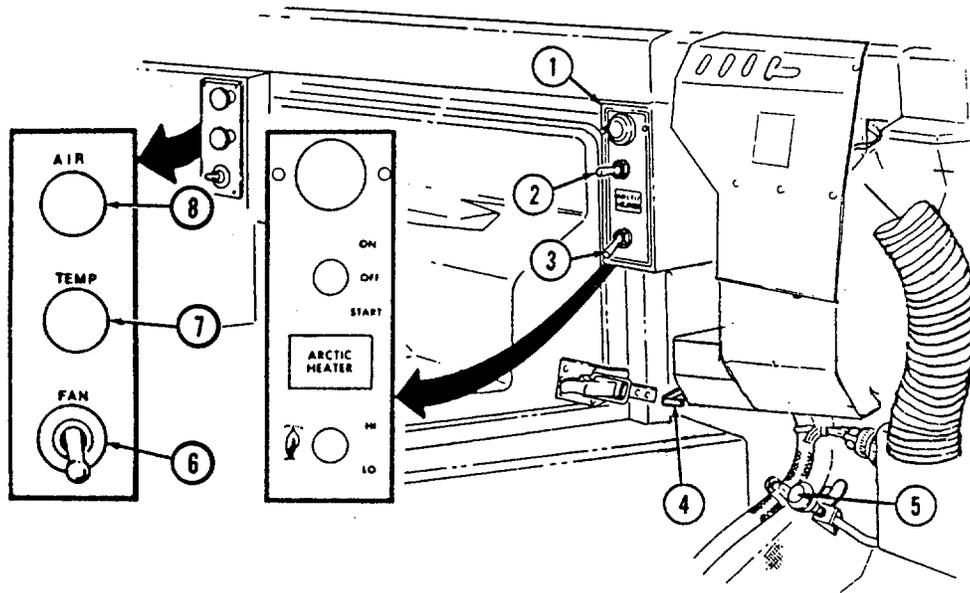
g. Heating Cab with Arctic Heater.

- (1) Start engine (para. 2-30).

CAUTION

Do not operate arctic heater in ambient temperatures above 0°F (-18°C), or with temperature switch in "HI" position, when temperature is above -25°F (-32°C), or without standard heater fan on. Damage to equipment will result.

- (2) Start arctic heater and set temperature switch (3) on heater control box (1) to "LO" position for temperatures from 0°F (-18°C) to -25°F (-32°C), or "HI" position for temperatures from -25°F (-32°C) to -50°F (-46°C).
- (3) Set regulator control lever (4) to "ARCTIC HEAT" position.
- (4) Pull defrost control knob (8) all the way out to direct airflow to heat ducts.
- (5) Pull temperature control knob (7) all the way out for maximum heat.
- (6) Set standard heater fan switch (6) to desired position to mix air.



2-41. TROOP/CARGO WINTERIZATION HEATER OPERATING INSTRUCTIONS
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a. General.

Troop/cargo winterization heater is for use during extremely cold temperatures from 0°F (-18°C) to -50°F (-46°C).

CAUTION

Do not operate troop/cargo heater in ambient temperatures above 0°F (-18°C), or with fan switch in "HI" position, when temperature is above -25°F (-32°C). Damage to equipment will result.

NOTE

Heater may be operated with engine running or engine off.

b. Starting Heater.

(1) Set heater fan switch (4) to "LO" position.

(2) Move heater control switch (2) to "START" position and hold for approximately two minutes or until heater starts and heater indicator light (1) comes on.

(3) When heater starts, move heater control switch (2) to "RUN" position.

The heater indicator light (1) will remain illuminated.

(4) Set heater fan switch (4) to desired position ("HI" or "LO").

NOTE

To defrost the interior of the troop/cargo enclosure, the diverter assembly door should be shut or in the closed position.

(5) Adjust diverter assembly (3) to regulate amount of outside and inside air to be circulated through the heater assembly and into the troop/cargo area.

c. If Heater Fails to Start:**NOTE**

If the start switch is moved from the "START" to "RUN" position too quickly, the heater flame will be extinguished and the heater will need restarting.

(1) Move heater control switch (2) to "OFF" position for 10 seconds, and then back to "START" for 60 seconds. Repeat procedure if heater doesn't start.

(2) Press heater indicator light (1) to test electrical circuit.

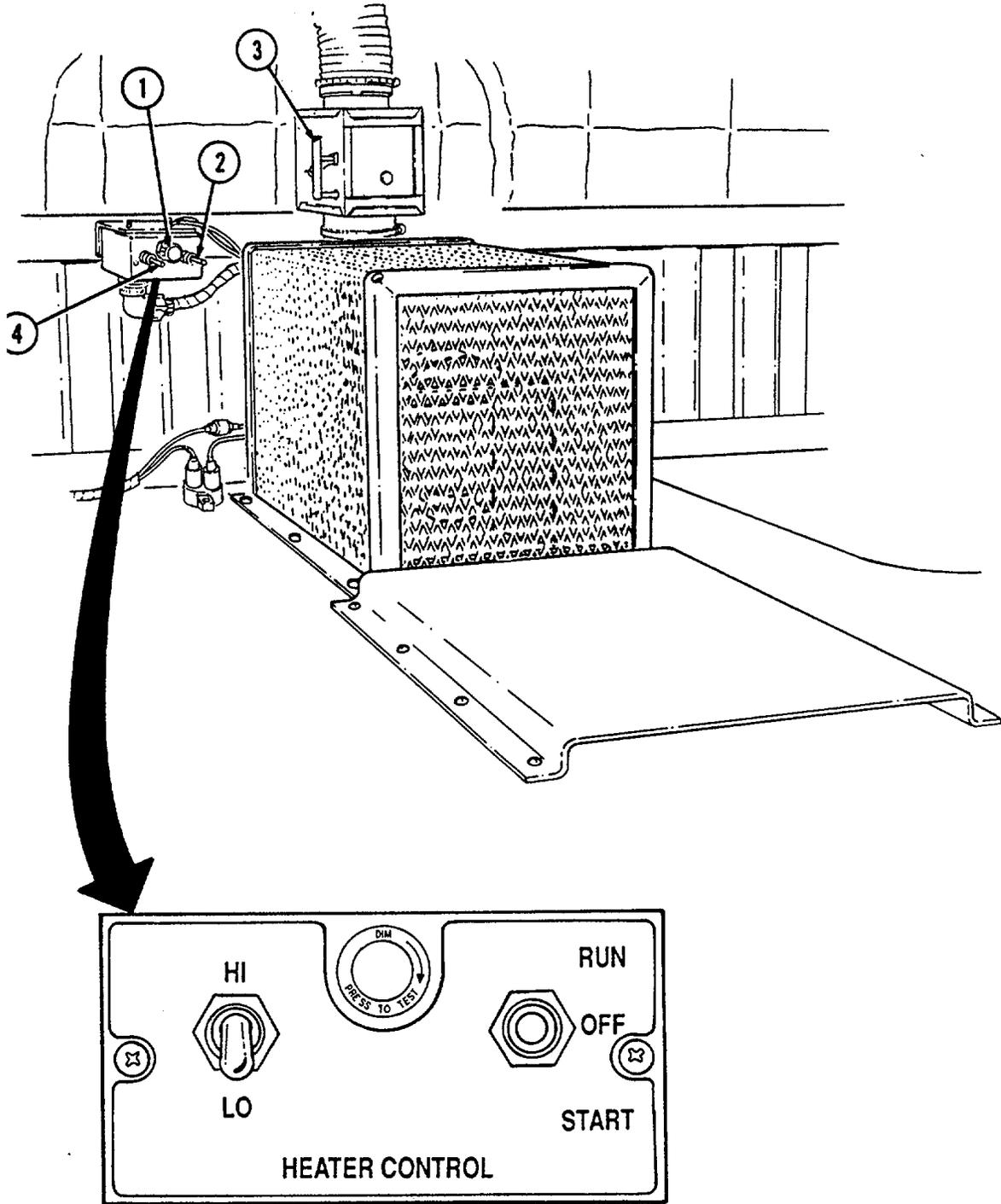
(3) If heater indicator light (1) works and heater still fails to start in approximately three minutes, service is required.

d. Shutting Heater Off.

Move heater control switch (2) to "OFF."

NOTE

The heater indicator light will remain on and the fan will continue to run until the heater has purged itself of fuel.



Section V. CARGO/TROOP CARRIER AND S250 SHELTER CARRIER OPERATION

2-42. GENERAL

a. This section provides operating instructions for components found on M998, M998A1, M1038, and M1038A1 cargo/troop carriers and M1037 and M1042 S250 shelter carriers.

b. Refer to para. 2-2a for stowage location of fire extinguisher on cargo/troop carriers and S250 shelter carriers. Refer to para. 2-27 for operation of fire extinguisher.

2-43. WINDSHIELD ASSEMBLY OPERATION

WARNING

Do not operate the vehicle without the windshield assembly positioned upright and the "B" pillar securely attached. Operation of the vehicle without these structures in place may result in injury to personnel and damage to equipment.

NOTE

Before lowering windshield on vehicles equipped with retention bracket, the windshield retention bracket must be removed. Refer to unit maintenance.

a. Lowering Windshield Assembly.

(1) Remove two hitch pins (3) from inside hinge pins (4) and remove hinge pins (4).

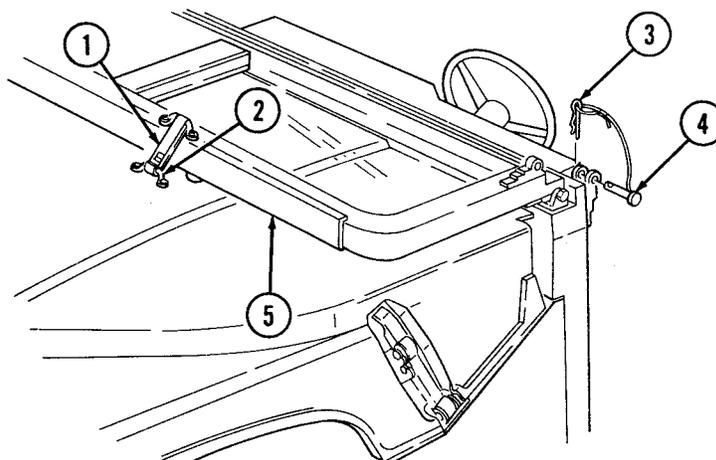
(2) Lower windshield assembly (5) to hood and secure to four footman loops (2) with two straps (1).

b. Raising Windshield Assembly.

(1) Remove straps (1) from footman loops (2) securing windshield assembly (5) to hood.

(2) Raise windshield assembly (5).

(3) Secure windshield assembly (5) with two inside hinge pins (4) and hitch pins (3).



2-44. TROOP SEAT KIT OPERATION

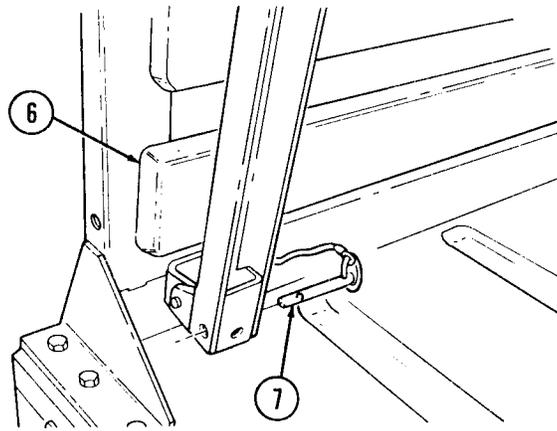
a. General. The troop seat kit is used to convert M998, M998A1, M1097, M1097A1, M1097A2, and M1123 cargo vehicles into troop carriers.

b. Lowering Troop Seat.

- (1) Remove two lockpins (7) from troop seat (6).
- (2) Lower troop seat (6).
- (3) Install two lockpins (7) to secure troop seat (6).

c. Raising Troop Seat.

- (1) Remove two lockpins (7) from troop seat (6).
- (2) Raise troop seat (6) and secure with two lockpins (7).

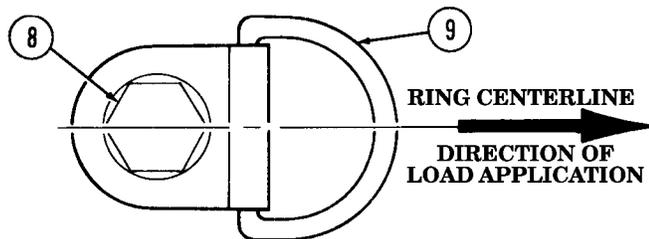


2-45. CARGO TIEDOWN OPERATION

CAUTION

The static rated working load of the tiedown ring assembly is 500 lb (227 kg) applied along the centerline of the assembly. Side-loading the tiedown ring assembly will cause damage to the tiedown and/or cause the tiedown bolt to become loose. Either of these conditions will result in an unrestrained load causing damage to vehicle and/or equipment.

The load must be applied as shown below. If tiedown rings (9) loosen, position tiedown ring (9) in direction of load and tighten bolt (8). Notify unit maintenance to tighten bolt (8) to 65 lb-ft (88 N·m) when practical.



**2-46. REMOVAL AND INSTALLATION OF TWO-MAN CREW AREA
SOFT TOP ENCLOSURE**

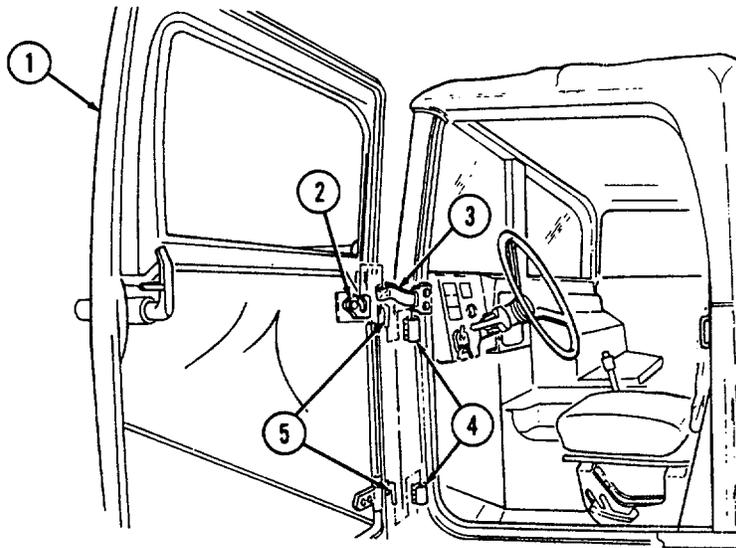
NOTE

- Ensure P/N 12340736-7 is used for replacement of soft top on vehicles equipped with three-point seatbelt.
- For ease of installation, soft top components should be installed when temperatures are above 72°F (22°C).
- To keep hinge screws tight, lockwasher NSN 5310-00-527-3634 and locknut NSN 5310-00-241-6658 can be used for installation of soft top doors.
- To prevent seams from leaking, coat with adhesive as needed (refer to appendix D, item 1).

a. General. The two-man soft top enclosure consists of two soft doors, rear curtain, cab roof cover, two rails and bow assembly.

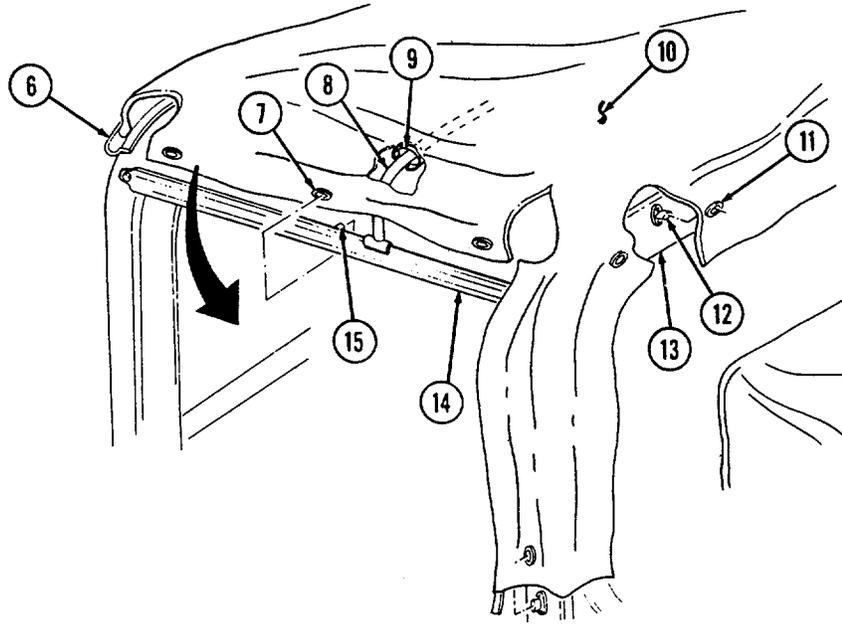
b. Removal of Soft Top Doors.

- (1) Open door (1) and detach door holding check strap (3) from mounting plate (2).
- (2) Raise door (1) to remove hinge pins (5) from hinge brackets (4).
- (3) Remove door (1).

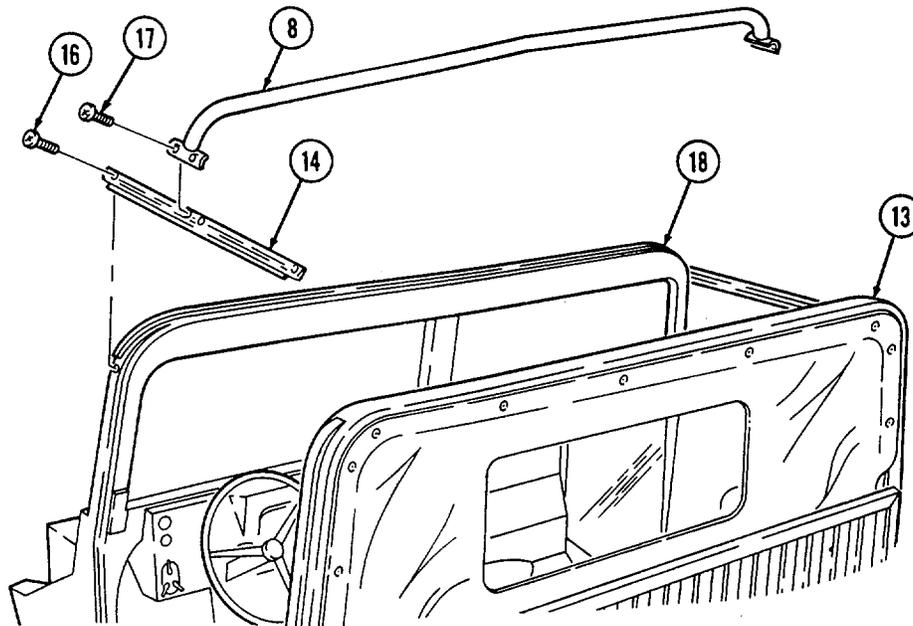


c. Removal of Cab Roof Cover, Rails, and Bow Assembly.

- (1) Unfasten eyelets (7) from turnbuttons (15) on horizontal rails (14), and unfasten hook and loop attachments (9) securing cab roof cover (10) to bow assembly (8).
- (2) Remove cab roof cover (10) from horizontal rails (14).
- (3) Unfasten eyelets (11) from turnbuttons (12) on "B" pillar (13) and "A" pillar (18).



- (4) Roll cab roof cover (10) over windshield and slide cab roof cover (10) from channel (6).
- (5) Remove four screws (17) and bow assembly (8) from horizontal rails (14).
- (6) Remove four screws (16) securing two horizontal rails (14) to "A" pillar (18) and "B" pillar (13). Remove horizontal rails (14).



d. Removal of Rear Curtain.

- (1) Detach curtain straps (5) from footman loops (7) behind seats by depressing locking taps (6).

NOTE

Perform step 2 if vehicle is equipped with two-man arctic cab.

- (2) Peel curtain (4) back from fastener tape (8).
- (3) Unfasten eyelets (3) from turnbuttons (2) on "B" pillar (1).
- (4) Remove rear curtain (4).

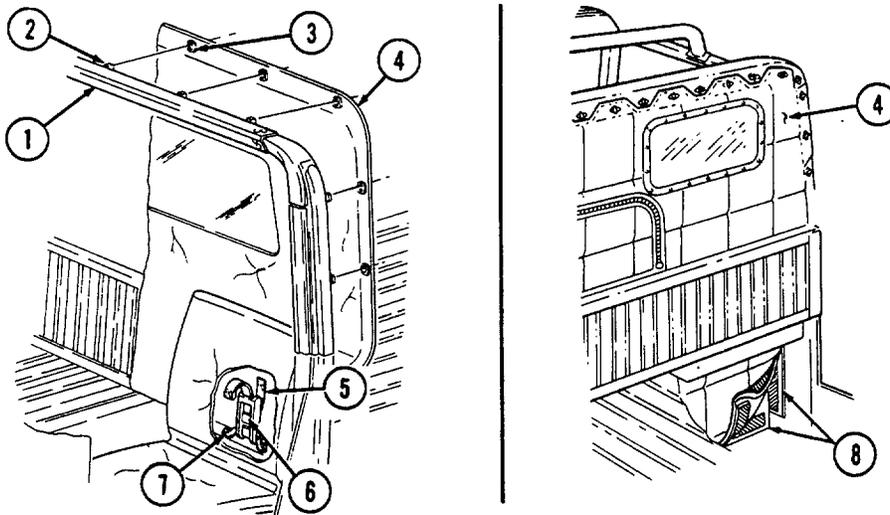
e. Installation of Rear Curtain.

- (1) Install rear curtain (4) to "B" pillar (1) by fastening eyelets (3) to turn buttons (2).

NOTE

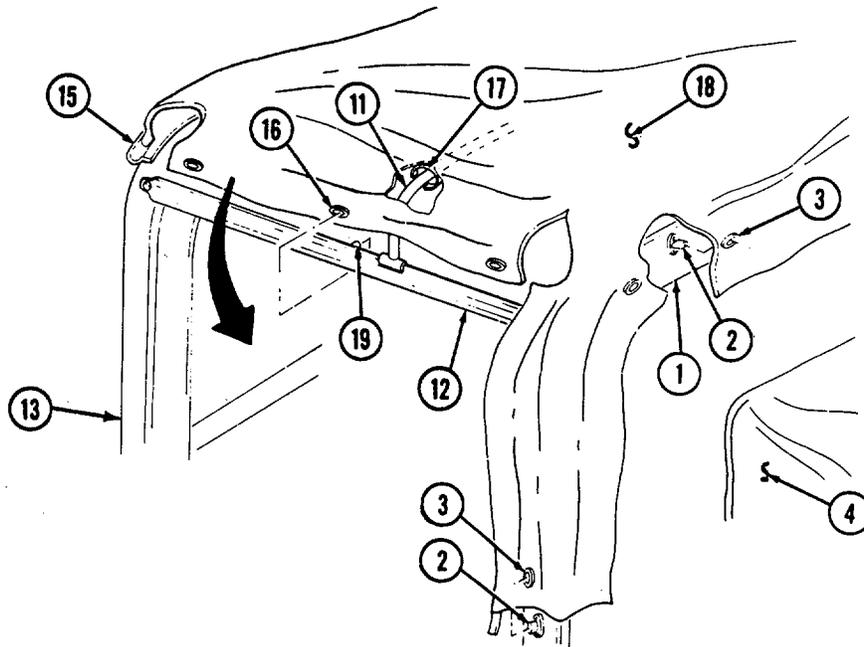
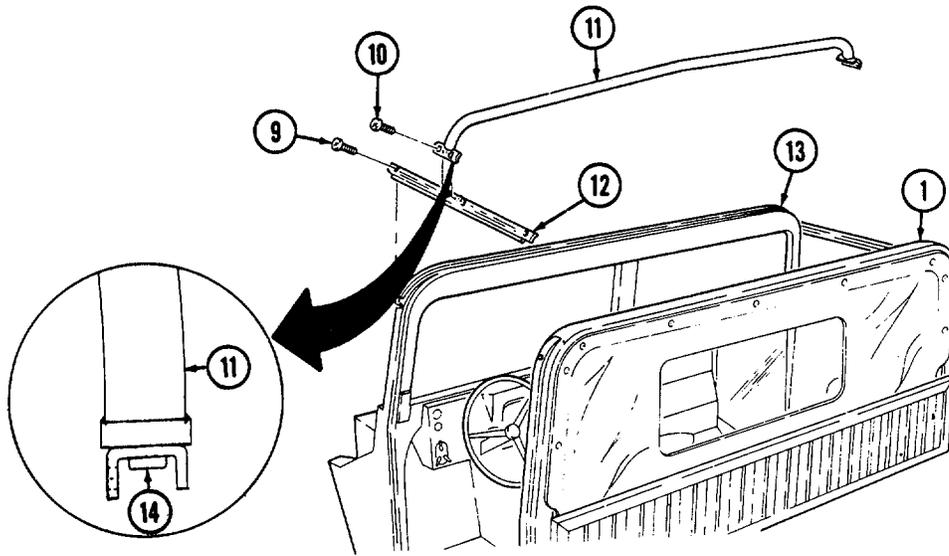
Perform step 2 if vehicle is equipped with two-man arctic cab.

- (2) Attach curtain (4) to fastener tape (8).
- (3) Attach curtain straps (5) to footman loops (7) located behind seats. Tighten straps (5) equally, but do not overtighten.



f. Installation of Cab Roof Cover, Rails, and Bow Assembly.

- (1) Install two horizontal rails (12) on "A" pillar (13) and "B" pillar (1), and secure with four screws (9). The short end of horizontal rails (12) go toward front of vehicle.
- (2) Loosen end bracket screws (14) and install bow assembly (11) on horizontal rails (12) and secure with four screws (10). Retighten bracket screws (14).
- (3) Slide cab roof cover (18) into channel (15) on "A" pillar (13) and roll cab roof cover (18) over cab.
- (4) Install cab roof cover (18) over rear curtain (4) at "B" pillar (1) and fasten eyelets (3) to turnbuttons (2) on "B" pillar (1) and "A" pillar (13).
- (5) Position cab roof cover (18) around horizontal rails (12) and fasten eyelets (16) to turnbuttons (19). Secure cab roof cover (18) to bow assembly (11) with hook and loop attachments (17).



g. Installation of Soft Top Doors.

(1) Apply a small amount of seasonal grade OE oil to hinge pins (6), and install door (1) by inserting hinge pins (6) into hinge brackets (5).

(2) Install door holding check strap (3) on mounting plate (2).

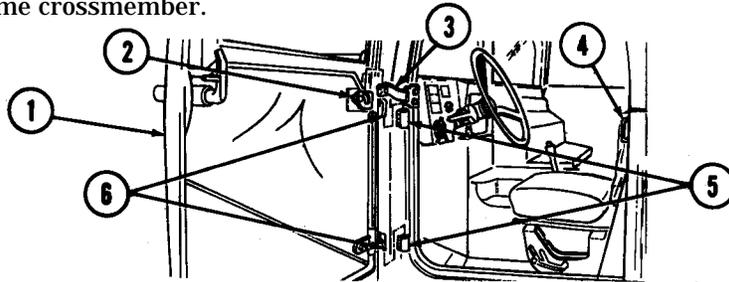
CAUTION

If door is jammed, do not force open. Excessive force may damage door.

(3) Close door (1). It may be necessary to adjust door hinges (5) or door latch striker (4) to achieve a tight seal. If adjustment is necessary, notify unit maintenance.

NOTE

When lowering the soft top door window, always fold the window to the inside of the vehicle and secure between the door and the door frame crossmember.



2-47. REMOVAL AND INSTALLATION OF TROOP AREA SOFT TOP ENCLOSURES

CAUTION

Remove any accumulation of rain, snow, and ice from the cargo cover as soon as possible. Failure to do so could result in damage to the cargo cover assembly. If the vehicle is to be parked for a long period of time, the cargo cover can be removed. The decision whether or not to remove the cover should be based on the length of time the vehicle is to be parked and the expected weather conditions.

NOTE

- For ease of installation, soft top components should be installed when temperatures are above 72°F (22°C).
- To prevent seams from leaking, coat with adhesive as needed (refer to appendix D, item 1)

a. Removal of Troop Area Enclosure.

(1) Unfasten eyelets (9) from turnbuttons (8) on “B” pillar (16), front bow (10), and rear bow (13).

(2) Press locking tab (20) and unhook straps (14) from footman loops (19).

(3) Detach hook and loop attachment securing front flap (7) of troop area soft top (12) from two-man crew area soft top (17). Remove grommets (18) from footman loops (19).

(4) Remove troop area cover (12).

b. Removal of Bows. Remove bows (10), (11), and (13) from bow retainer (15).

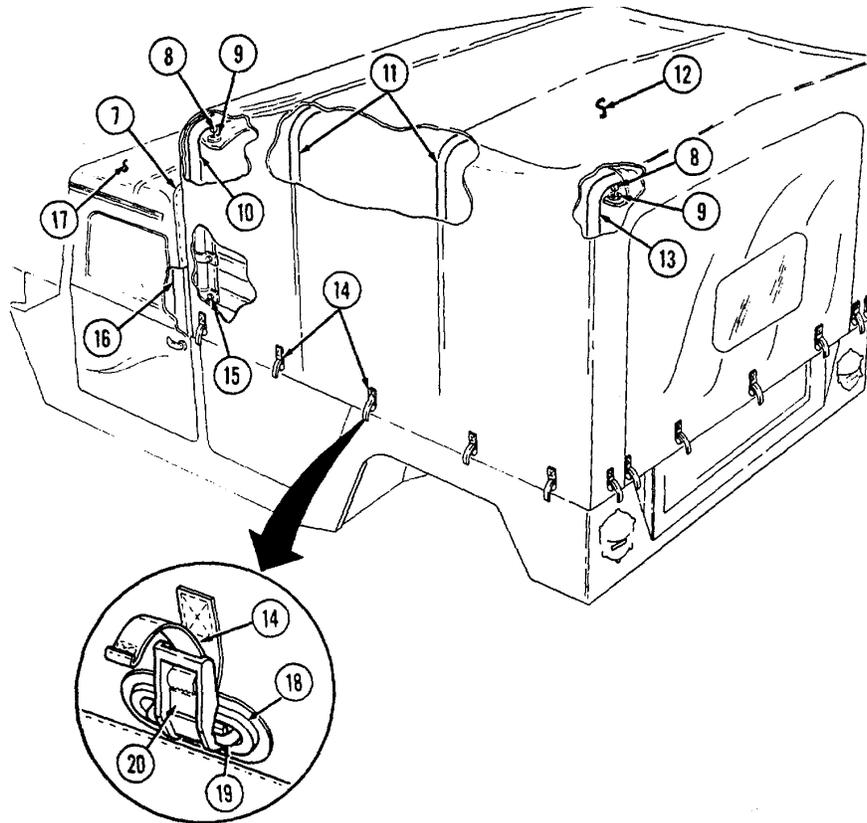
c. Installation of Bows. The front bow assembly (10) and rear bow assembly (13) contain turnbuttons (8); the front bow assembly (10) has shorter legs. Install bows (10), (11), and (13) into bow retainers (15).

d. Installation of Troop Area Enclosure.

NOTE

- Troop seats and two-man crew area soft top must be installed prior to installation of bows and troop area enclosure.
- To prevent canvas noise and damage, tiedowns can be added to the canvas at the commander's discretion, refer to unit maintenance.

- (1) Install troop area cover (12) over "B" pillar (16), front bow (10), intermediate bows (11), and rear bow (13).
- (2) Fasten eyelets (9) to turnbuttons (8) on "B" pillar (16), front bow (10), and rear bow (13).
- (3) Fit troop area cover (12) evenly to ensure tight fit and secure by installing grommets (18) over footman loops (19). Attach straps (14) to footman loops (19) and pull straps (14) tight.
- (4) Secure front flap (7) of troop area cover (12) to two-man crew area soft top (17).



**2-48. REMOVAL AND INSTALLATION OF FOUR-MAN CREW AREA
SOFT TOP AND ARCTIC SOFT TOP ENCLOSURES**

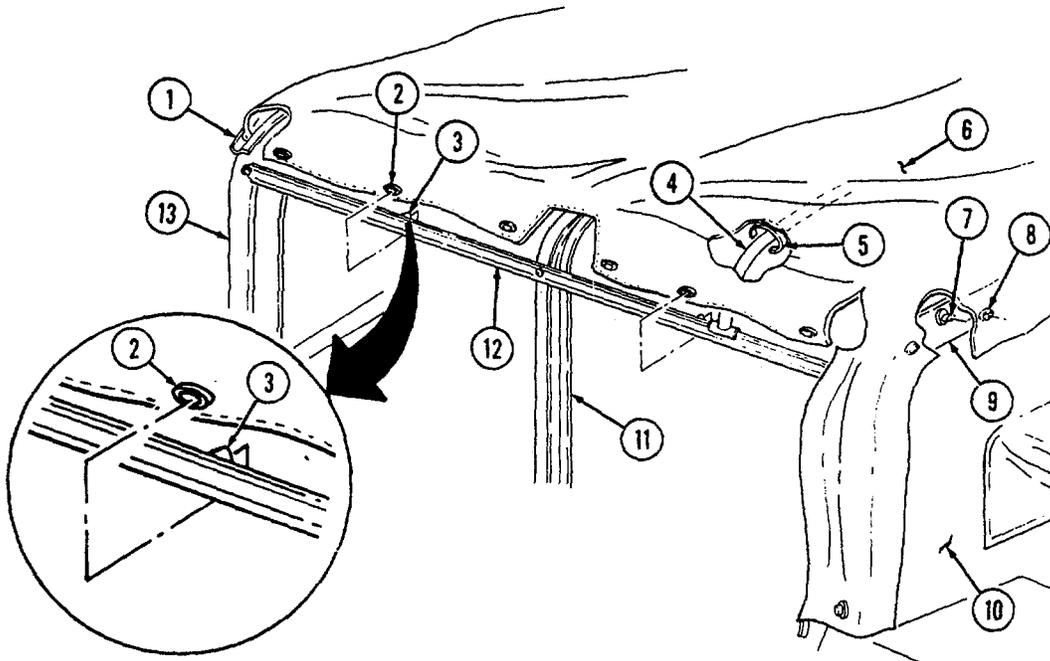
NOTE

- For ease of installation, soft top components should be installed when temperatures are above 72°F (22°C).
- To prevent seams from leaking, coat with adhesive as needed (refer to appendix D, item 1).

a. General. The four-man soft top and arctic soft top enclosures consist of four soft doors, rear curtain, cab roof cover, and bow assemblies. For removal and installation of doors, refer to para. 2-46. Para. 2-48 covers removal and installation of four-man cab roof cover, rails, bow assemblies, and rear curtain.

b. Removal of Cab Roof Cover, Rails, and Bow Assemblies.

- (1) Unfasten eyelets (2) from turnbuttons (3) on horizontal rails (12) and "A" pillar (13). Unfasten hook and loop attachments (5) securing cab roof cover (6) to bow assemblies (4) and "B" pillar (11).
- (2) Remove cab roof cover (6) from horizontal rails (12).
- (3) Unfasten eyelets (8) from turnbuttons (7) on "C" pillar (9).
- (4) Roll cab roof cover (6) over windshield and slide cab roof cover (6) from channel (1).
- (5) Remove eight screws (14) and two bow assemblies (4) from horizontal rails (12).
- (6) Remove six screws (15) and two horizontal rails (12) from "A" pillar (13), "B" pillar (11), and "C" pillar (9).

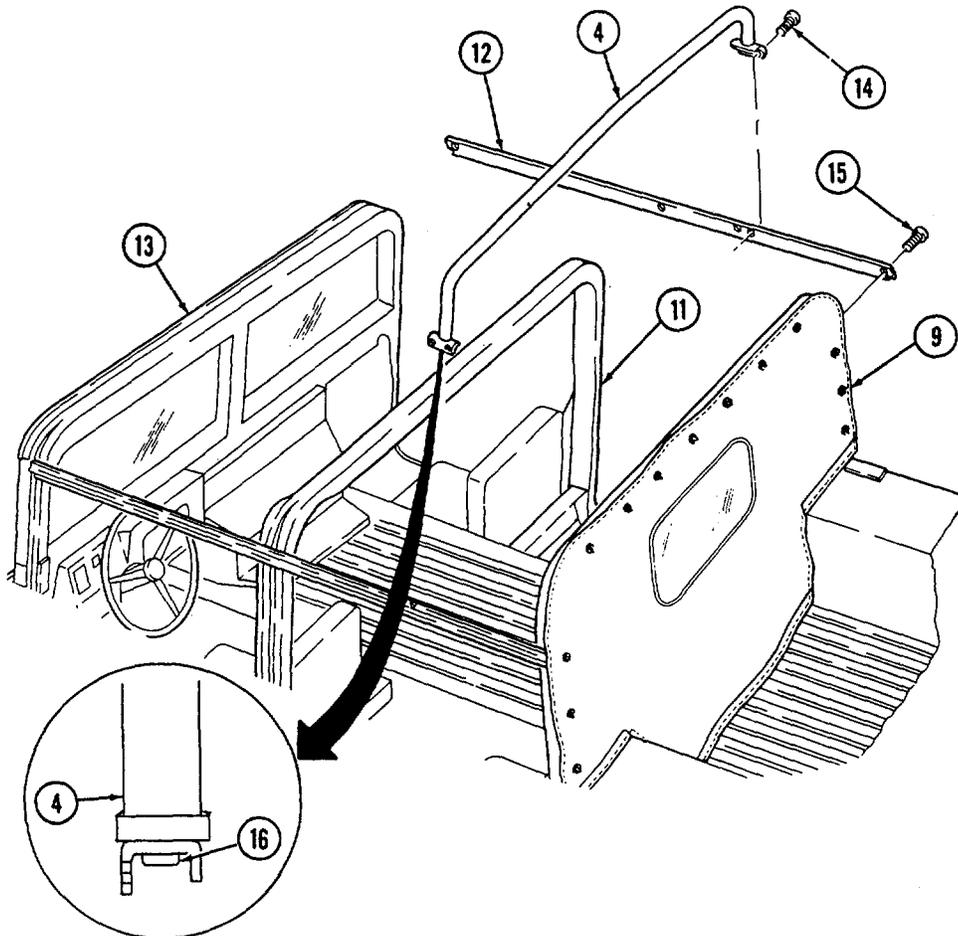


c. Installation of Rails, Bow Assemblies, and Cab Roof Cover.

NOTE

Align horizontal rail holes with holes in "A," "B," and "C" pillars.

- (1) Install two horizontal rails (12) on "A" pillar (13), "B" pillar (11), and "C" pillar (9) and secure with six screws (15).
- (2) Loosen end bracket screws (16), and install two bow assemblies (4) on horizontal rails (12) with eight screws (14). Tighten bracket screws (16).
- (3) Slide cab roof cover (6) into channel (1) on "A" pillar (13), roll cab roof cover (6) over cab, and fasten eyelets (2) to turnbuttons (3) on "A" pillar (13).



- (4) Install cab roof cover (6) over rear curtain (10) at "C" pillar (9) and fasten eyelets (8) to turnbuttons (7) on "C" pillar (9).
- (5) Position cab roof cover (6) around horizontal rails (12) and fasten eyelets (2) to turnbuttons (3). Attach cab roof cover (6) to bow assemblies (4) with hook and loop attachments (5).

d. Removal of Rear Curtain.

(1) Detach four curtain straps (11) from footman loops (13) on wheelhousings (15) and cargo floor (14) by depressing locking tabs (12).

NOTE

Perform step 2 if vehicle is equipped with four-man arctic cab.

- (2) Peel curtain (2) back from fastener tape (3).
- (3) Unfasten eyelets (10) from turnbuttons (16) on "C" pillar (1).

NOTE

Perform step 4 for vehicles equipped with three-point seatbelts.

- (4) Unfasten eyelets (7) from turnbuttons (8) on rear seatbelt bracket (9).
- (5) Remove curtain (4).

e. Installation of Rear Curtain.

(1) Install curtain (4) on "C" pillar (1) by fastening eyelets (10) to turnbuttons (16).

NOTE

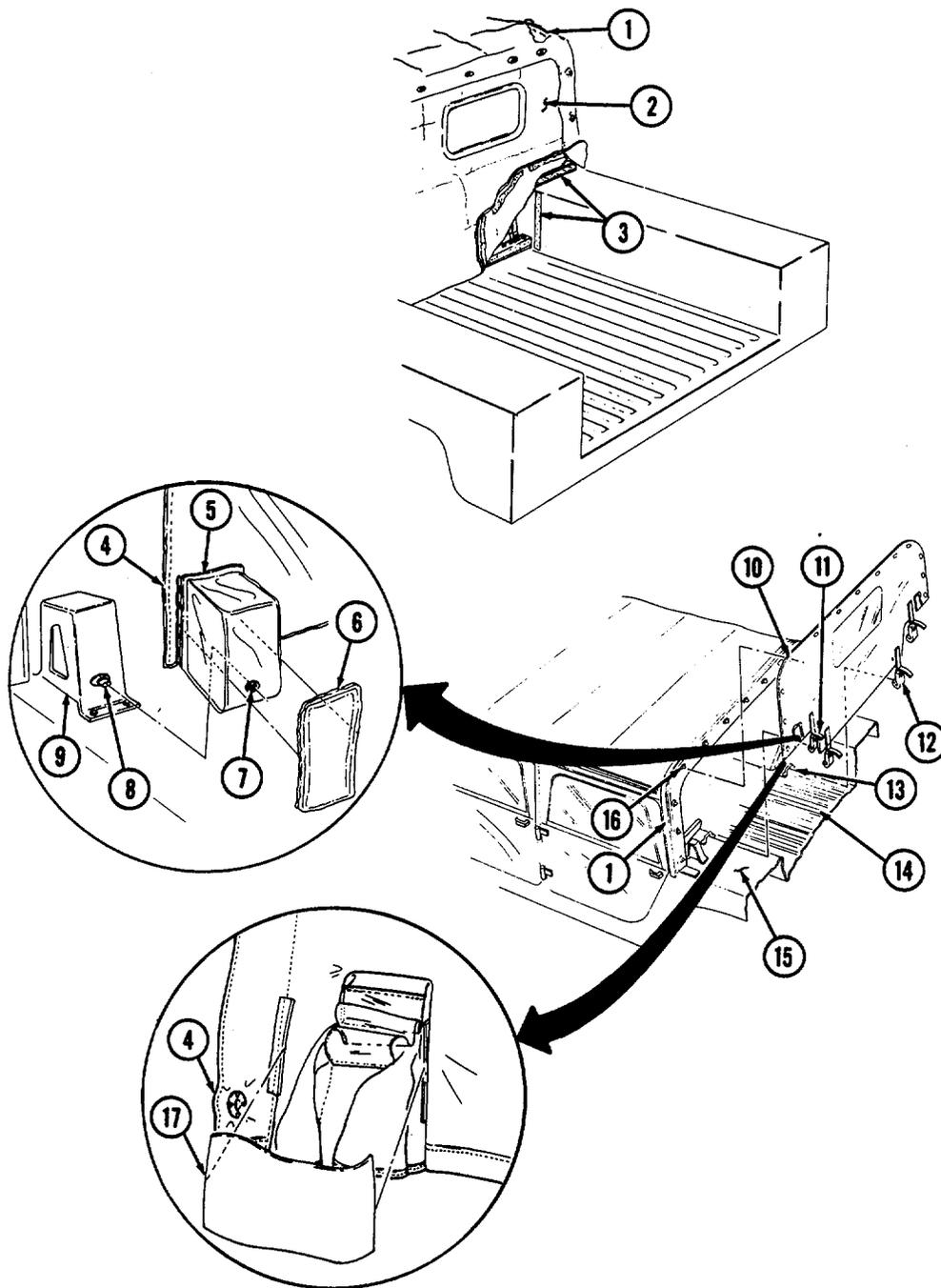
- Perform steps 2 and 3 when installing new curtain on vehicles with three-point seatbelts.
- Ensure P/N 12342475 is used for replacement of rear curtain on vehicles equipped with three-point seatbelt.

- (2) Cut away inside curtain panel (17) and remove curtain panel (17) from curtain (4).
- (3) Cut away outside curtain panel (6) and remove curtain panel (6) from curtain (4).
- (4) Extend rear seatbelt bracket boot (5) and install over rear seatbelt bracket (9).
- (5) Fasten eyelets (7) to turnbuttons (8) on rear seatbelt bracket (9).

NOTE

Perform step 6 if vehicle is equipped with four-man arctic cab.

- (6) Attach curtain (2) to fastener tape (3).
- (7) Attach four curtain straps (11) to footman loops (13) on wheelhousings (15) and cargo floor (14). Tighten straps (11) equally, but do not overtighten.



**2-49. REMOVAL AND INSTALLATION OF FOUR-MAN CARGO AREA
SOFT TOP ENCLOSURE**

NOTE

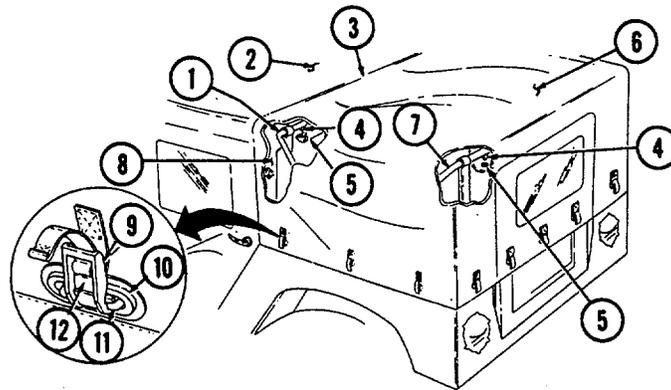
- For ease of installation, soft top components should be installed when temperatures are above 72°F (22°C).
- To prevent seams from leaking, coat with adhesive as needed (refer to appendix D, item 1).

CAUTION

Remove any accumulation of rain, snow, and ice from the cargo cover as soon as possible. Failure to do so could result in damage to the cargo cover assembly. If the vehicle is to be parked for a long period of time, the cargo cover can be removed. The decision whether or not to remove the cover should be based on the length of time the vehicle is to be parked and the expected weather conditions.

a. Removal of Cargo Enclosure.

- (1) Unfasten hook and loop attachment (3) securing cargo cover (6) to cab roof (2) at "C" pillar (8).
- (2) Unfasten eyelets (5) from turnbuttons (4) on "C" pillar (8), front bow (1), and rear bow (7).
- (3) Detach straps (9) from footman loops (11) by depressing locking tabs (12) and loosening straps (9).
- (4) Remove grommets (10) from footman loops (11).
- (5) Remove cargo cover (6).

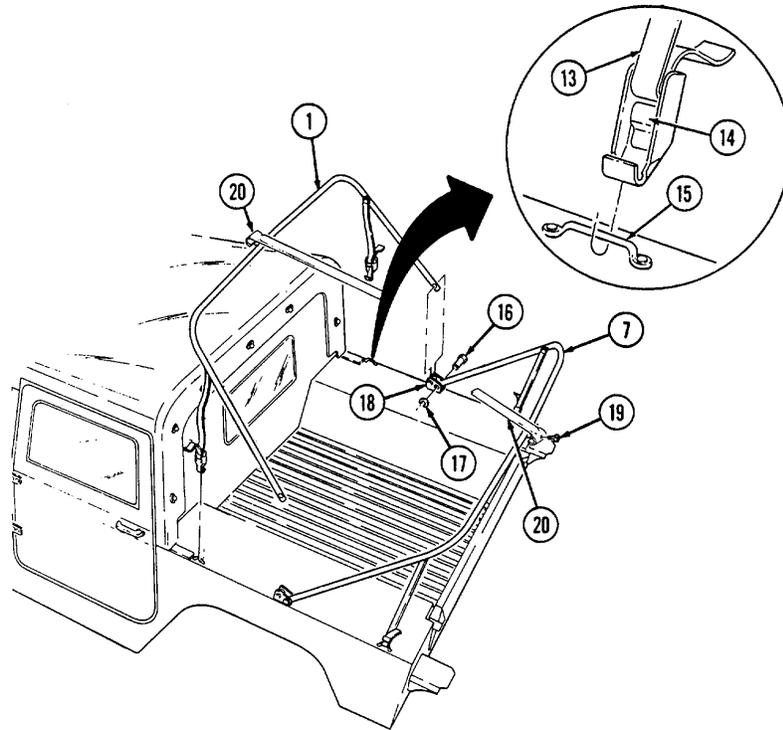


b. Removal of Bows.

NOTE

If bows are broken or bent, reinforce 3/64 in. (1.2 mm) thick bow walls with steel rod NSN 9510-00-596-2063. Reinforce 3/32 in. (2.4 mm) bows with steel rod NSN 9510-00-596-2066.

- (1) Depress locking tabs (14) and unhook straps (13) from footman loops (15)
- (2) Remove capscrews (19) securing longitudinal bow (20) to front bow (1) and rear bow (7). Remove longitudinal bow (20).
- (3) Remove four snaprings (17) and pivot pins (16) securing front bow (1) and rear bow (7) to pivot brackets (18). Remove bows (1) and (7).



c. Installation of Bows .

NOTE

Four-man crew area soft top must be installed before installation of bows and cargo enclosure.

- (1) Install bows (1) and (7) on pivot brackets (18) and secure with four pivot pins (16) and snaprings (17).
- (2) Install longitudinal bow (20) on front bow (1) and rear bow (7) and secure with two capscrews (19).
- (3) Install straps (13) on footman loops (15) and pull straps (13) tight.

d. Installation of Cargo Enclosure.

- (1) Install cargo cover (6) over "C" pillar (8), front bow (1), and rear bow (7).
- (2) Fasten eyelets (5) to turnbuttons (4) on "C" pillar (8), front bow (1), and rear bow (7).
- (3) Secure cargo (6) to cab roof (2) at "C" pillar (8) with hook and loop attachment (3).
- (4) Install grommets (10) on footman loops (11) and attach straps (9) to footman loops (11). Tighten straps (9) equally, but do not overtighten.

**2-50. REMOVAL AND INSTALLATION OF S250 SHELTER CARRIER
REAR SUSPENSION TIEDOWN KIT**

CAUTION

The M1037 and M1042 shelter carriers are specifically designed to be operated with the S250 shelter installed. The vehicles can be driven safely without the shelter installed, or equivalent payload of 1,500 lb (681 kg), for short distances (e.g., to and from maintenance or from the rail head when being delivered), but this should not be done often or for long distances. Driving for long distances without the shelter installed, or equivalent payload of 1500 lb (681 kg) evenly distributed in center of cargo area, will cause damage to equipment.

NOTE

- Rear suspension tiedown kit is to be used only for shipment and should be removed promptly after shipment.
- The following applies to M1037 and M1042 vehicles only.

a. Removal of S250 Rear Suspension Tiedown Kit.

(1) Using wrench provided, turn out turnbuckle assembly (1) and unhook from suspension tiedown bracket (2) and suspension tiedown bar (7).

(2) Remove suspension tiedown bracket (2) from upper spring mount bracket (4).

(3) Remove suspension tiedown bar (7) from lower control arm (5).

b. Installation of S250 Rear Suspension Tiedown Kit.

CAUTION

Ensure suspension tiedown bracket is fully seated to upper spring mount bracket and nut. Suspension tiedown bracket could spring free under tension, causing damage to vehicle.

(1) Install suspension tiedown bracket (2) to upper spring mount bracket (4) with cupped end seated against upper spring mount bracket nut (3).

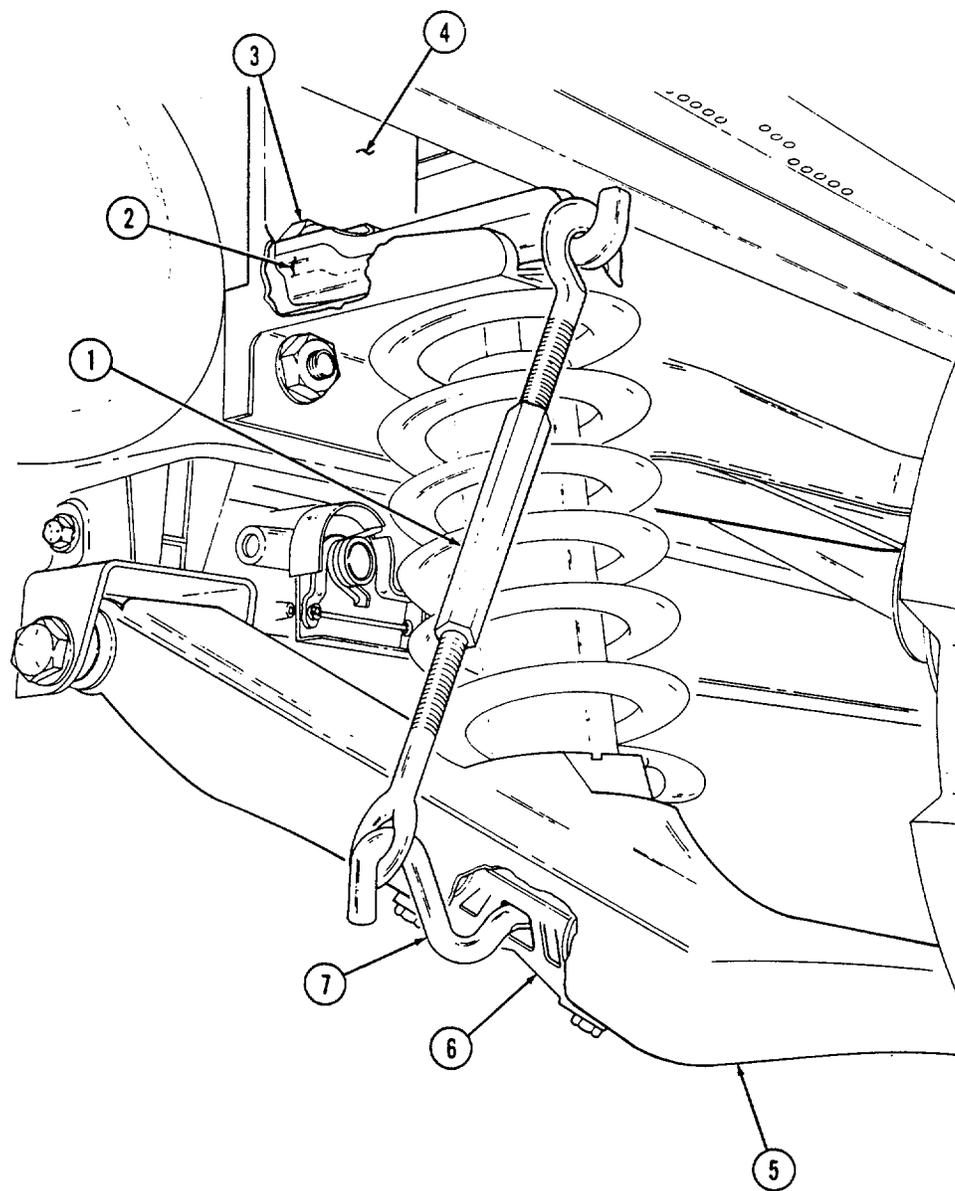
(2) Install suspension tiedown bar (7) into lower control arm (5) and shock mount bracket (6).

NOTE

Ensure turnbuckle assembly eye and hook have an equal amount of threads inside the turnbuckle.

(3) Grease threads on turnbuckle assembly (1) and hook turnbuckle assembly (1) to suspension tiedown bar (7) and suspension tiedown bracket (2).

(4) With wrench provided, tighten until turnbuckle assembly (1) is completely turned in.



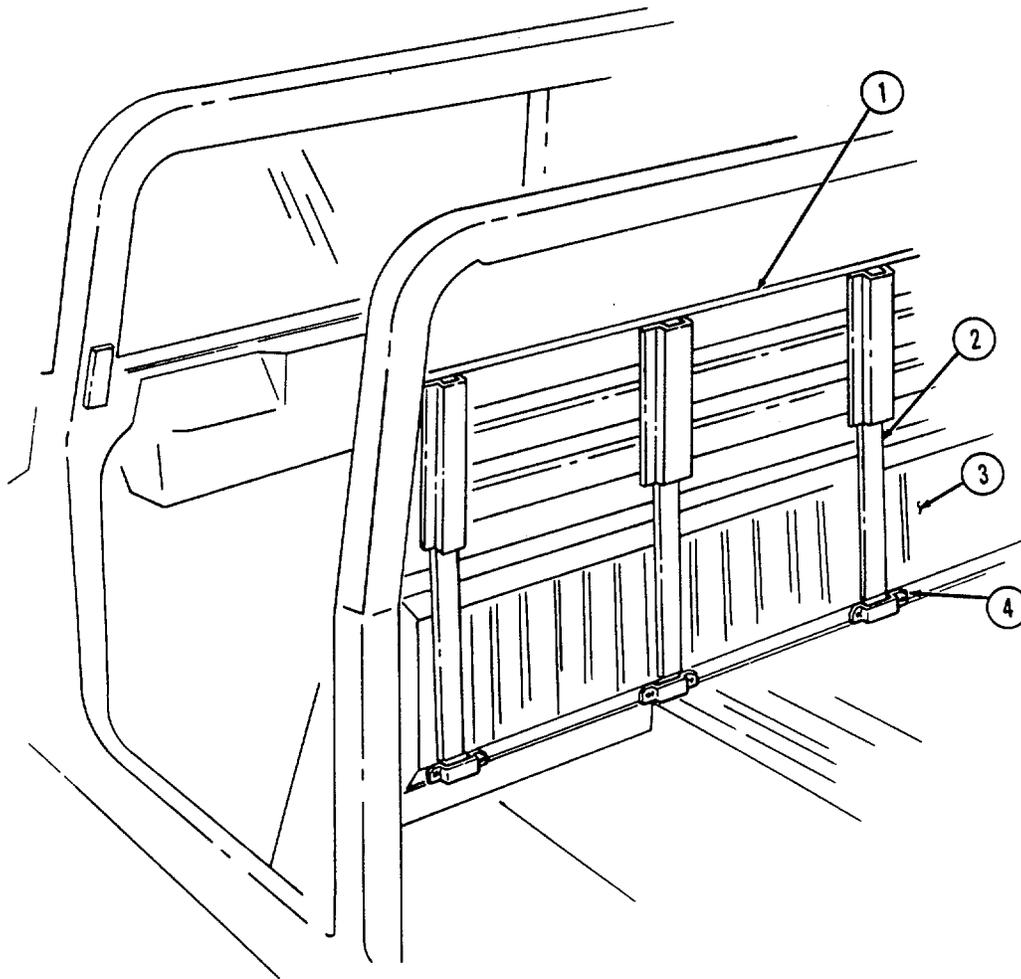
2-51. REMOVAL AND INSTALLATION OF CARGO BARRIER EXTENSION**a. Removal of Cargo Barrier Extension.**

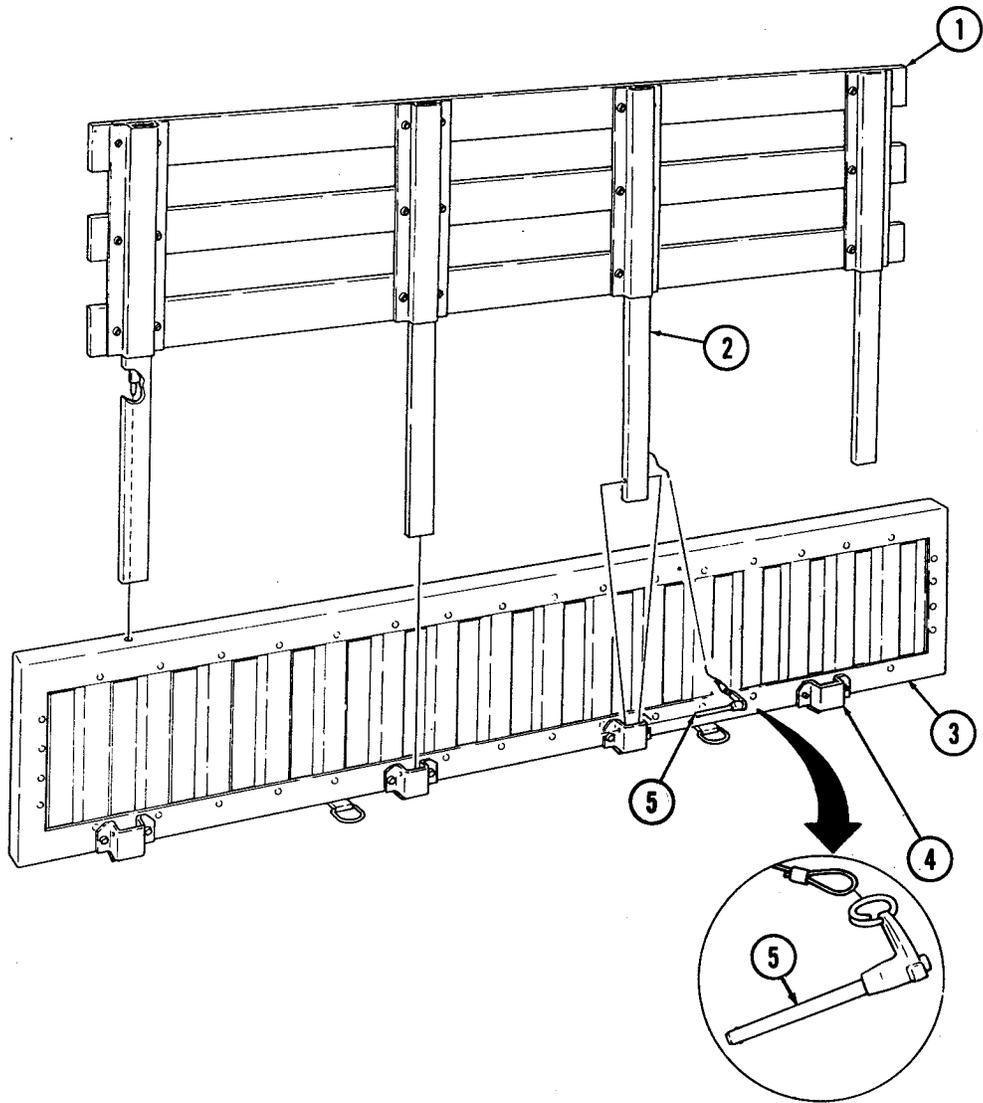
Remove quick release pin (5) from post assembly (2) and remove cargo barrier extension (1) from cargo bulkhead (3).

b. Installation of Cargo Barrier Extension.**NOTE**

When installing cargo barrier extension, ensure side rack pins on post assemblies slide into holes of cargo bulkhead.

Install cargo barrier extension (1) into four mounting brackets (4) on cargo bulkhead (3) and secure with quick release pin (5).





2-51.1. REMOVAL AND INSTALLATION OF CARGO BARRIER AND NET

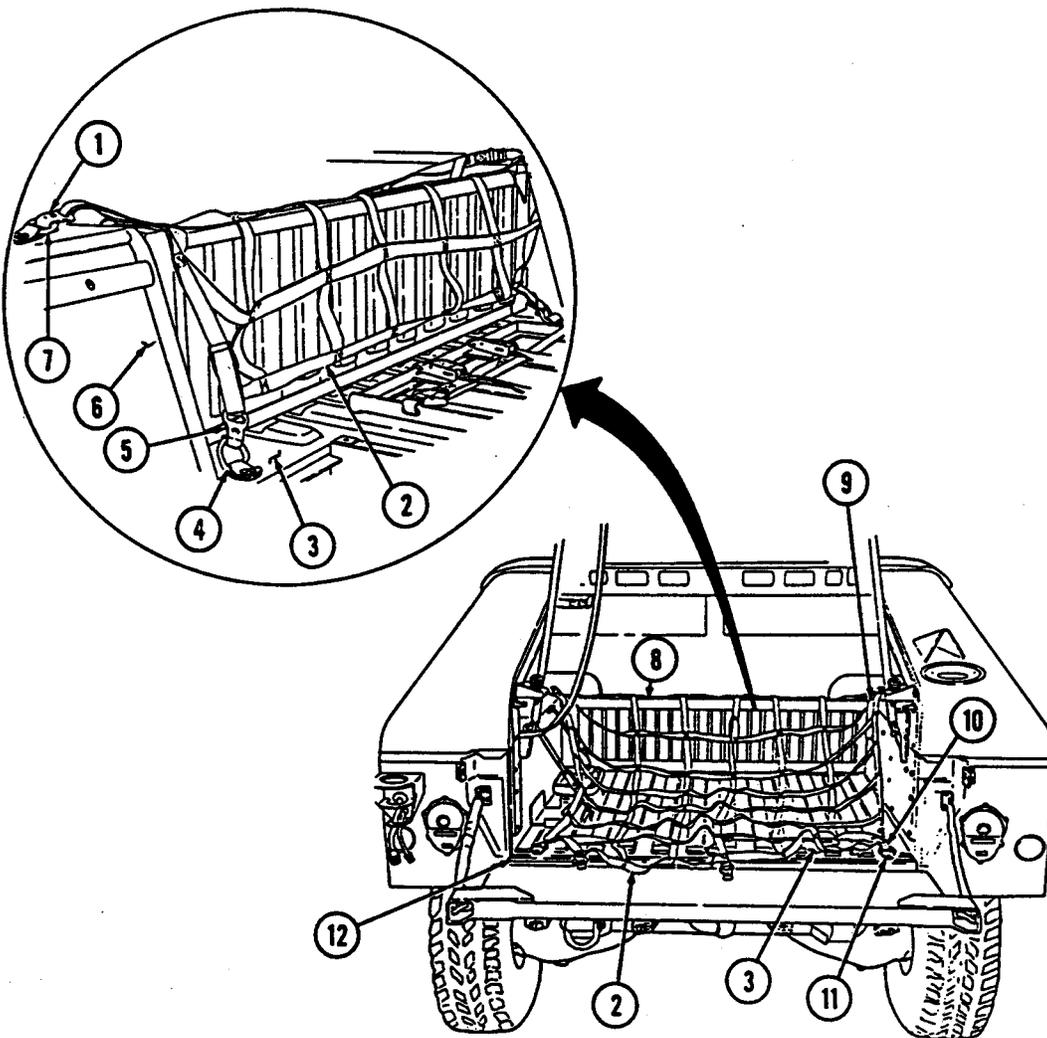
NOTE

Removal and installation instructions for the cargo barrier and storage compartment net are applicable only for M1025, M1025A1, M1026, and M1026A1 vehicles equipped with the cargo barrier and net kit.

a. Removal of Cargo Barrier and Net.

(1) Remove net (2) by unhooking two J-hooks (5) from D-rings (4) on cargo floor (3), two J-hooks (1) from D-rings (7) on left and right wheelhouses (6), and three J-hooks (10) from D-rings (11) at D-beam (12) on cargo floor (3).

(2) Slide cargo barrier (8) out of left and right channels (9).



b. Installation of Cargo Barrier and Net.

(1) Position cargo barrier (8) into left and right channels (9) and slide cargo barrier (8) down to cargo floor (3).

CAUTION

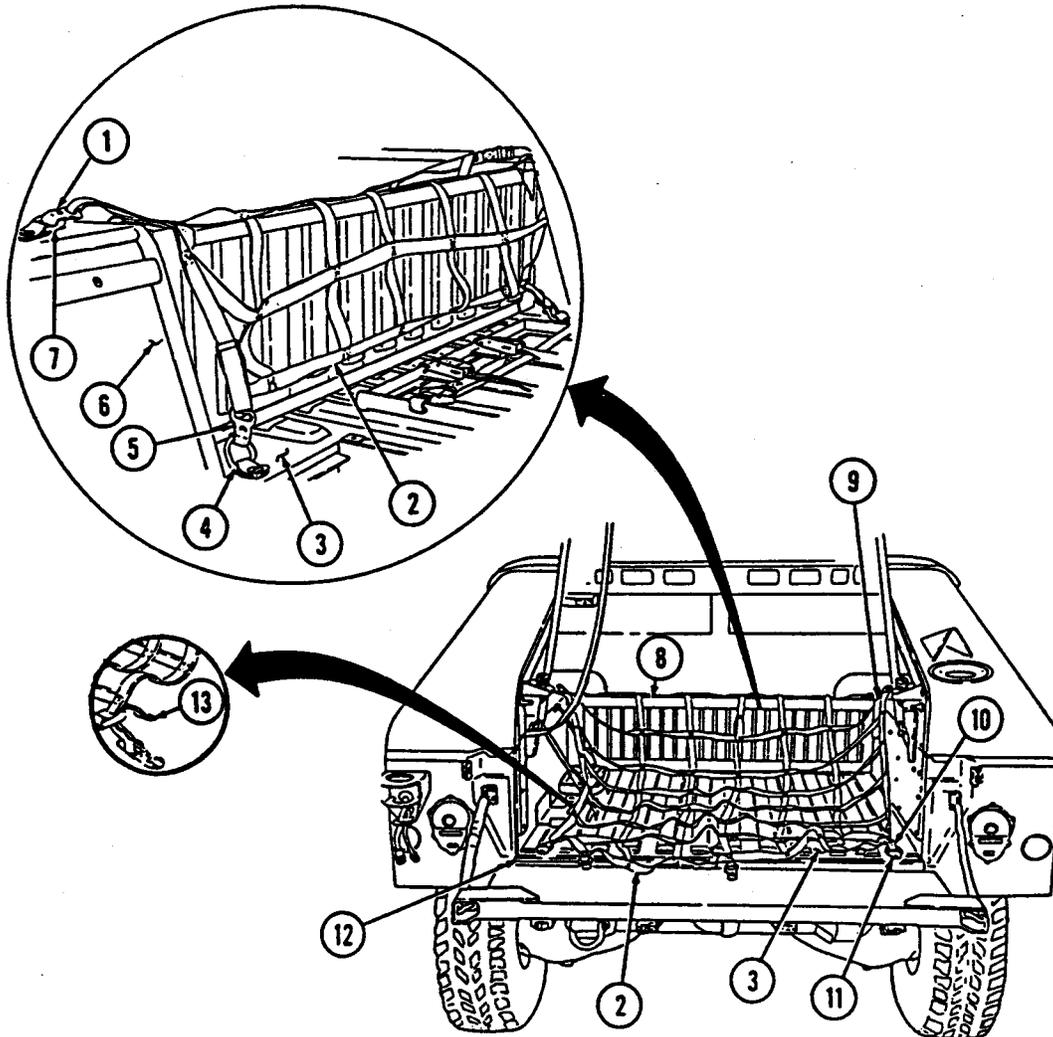
If slack exists in stowage compartment net, attach two J-hooks to each D-ring at D-beam on cargo floor to ensure J-hooks are not damaged when closing tailgate.

NOTE

Prior to installing net, ensure four J-hooks are toward front of vehicle and six J-hooks are toward rear of vehicle.

(2) Position net (2) on cargo floor (3) and install two J-hooks (5) to D-rings (4) on cargo floor (3), two J-hooks (1) to D-rings (7) on left and right wheelhouse (6), and three J-hooks (10) to D-rings (11) on D-beam (12) on cargo floor (3).

(3) Pull adjustable strap (13) to remove slack from net (2).



Section VI. TOW/ARMAMENT CARRIER OPERATION

2-52. GENERAL

a. This section provides operating instructions for components found on M966, M966A1, M1036, M1045, M1045A1, M1045A2, M1046, M1046A1, and M1121 TOW carriers and on M1025, M1025A1, M1025A2, M1026, M1026A1, M1043, M1043A1, M1043A2, M1044, and M1044A1 armament carriers.

b. Refer to para. 2-2a for stowage location of fire extinguisher on TOW and armament carriers. Refer to para. 2-27 for operation of fire extinguisher.

2-53. CARGO SHELL DOOR OPERATION

WARNING

Never open one end of the cargo shell door without first ensuring that the opposite end is securely closed. Not doing so may cause both ends to open at the same time, causing damage to equipment, mission abort, or injury to personnel.

a. **General.** The cargo shell door is a double-actuating door that pivots at either end. When door forward latch is released from inside vehicle, door opens rearward and functions as a TOW loader's door to facilitate mounting of TOW launcher, missile loading, and missile reloading. When door rear latch is released, door opens forward and permits access to cargo area from rear of vehicle for stowing the TOW launcher and equipment or ground mounting TOW launcher.

NOTE

For ease of operation, a grab-hold loop can be attached to the cargo door strap at the discretion of unit commander. Notify unit maintenance for installation of grab-hold loop.

b. Raising and Lowering Rear End of Cargo Shell Door.

(1) Turn locking device (6) to the lock position to ensure that forward end of cargo shell door (2) is locked. Pull door handle (1) upward and release. Push door (2) open, until door (2) will open automatically to FULL OPEN position.

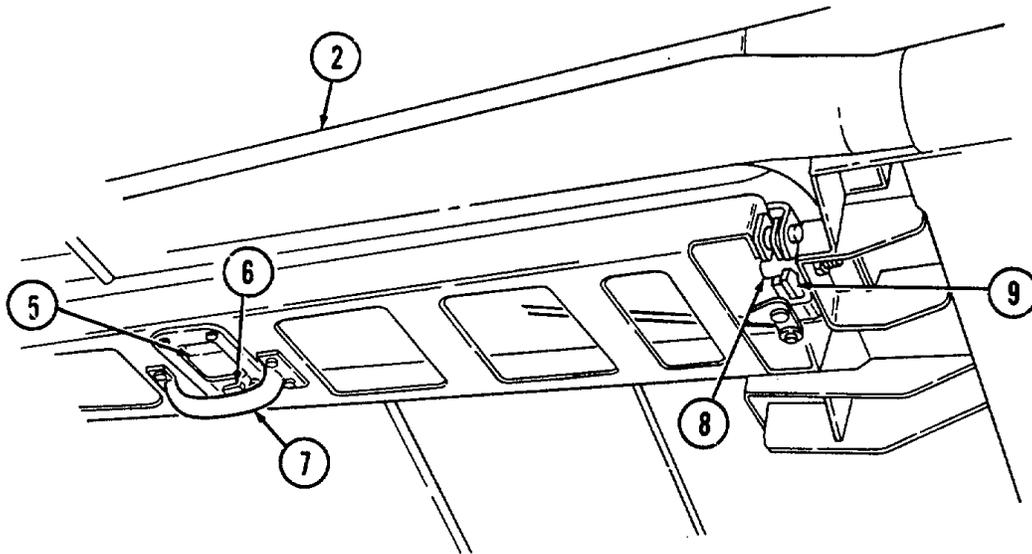
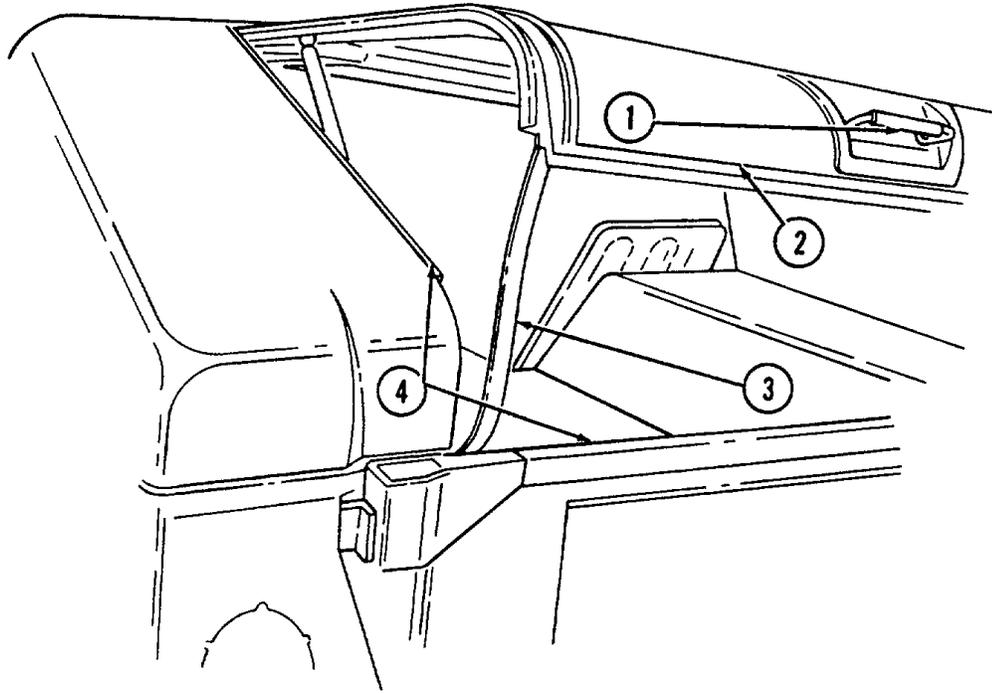
(2) Pull on strap (3) to lower door (2) then slam shut. Ensure door (2) is locked by observing alignment of door surface with cargo shell surface side and bottom edges (4).

c. Raising and Lowering Forward End of Cargo Shell Door.

(1) Turn locking device (6) to unlock position and pull door forward latch (5) downward and release. Push door (2) open with grab handle (7) until door (2) will open automatically to full open position.

(2) Pull down on grab handle (7) to lower door (2), then pull shut. Ensure door (2) is locked by observing position of striker pins (8) and latch (9) engagement while pushing and pulling on grab handle (7).

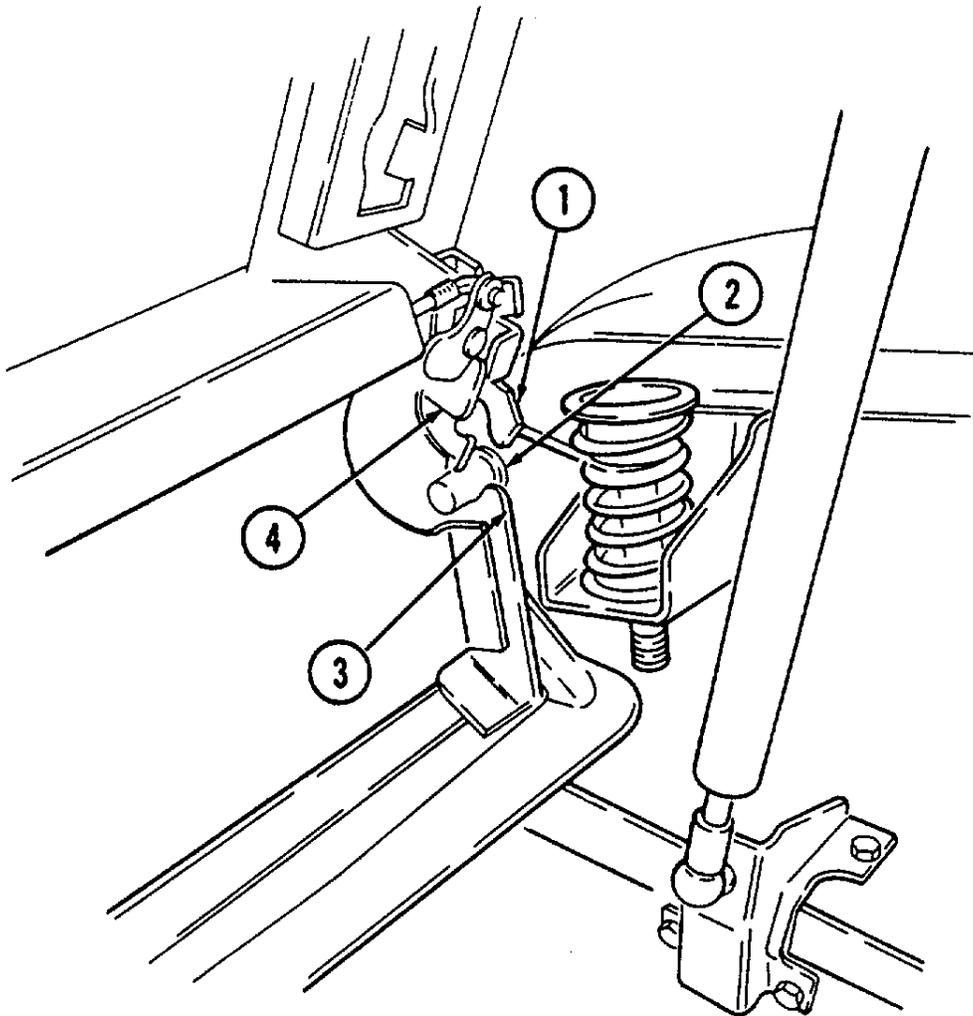
(3) Turn locking device (6) to lock forward end of cargo shell door (2).

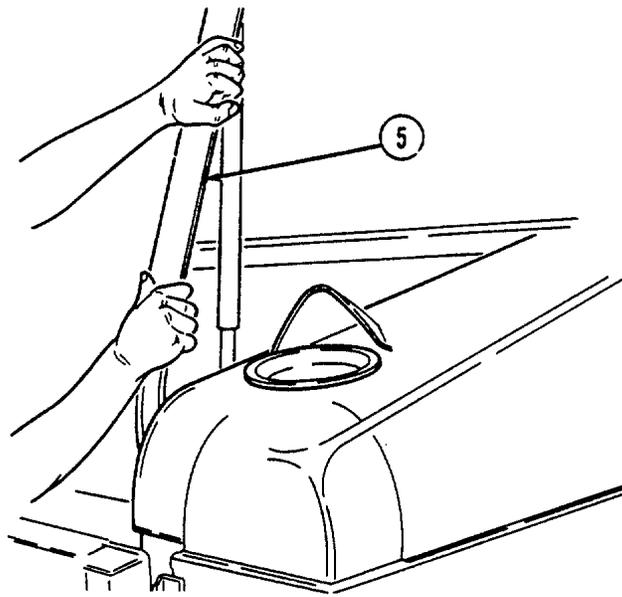


d. Cargo Shell Door Emergency Service.**NOTE**

Should both ends of the cargo shell door open at the same time, a safety catch built into the rear latch mechanism will normally engage the rear strikers and prevent the door from slinging forward. Should this occur, procedures to reinstall the door are provided in steps 1 through 8. If door has separated from all four strikers, notify unit maintenance.

- (1) Inspect the rear latch mechanism and ensure the rear strikers (2) have engaged the safety catch (3).
- (2) Turn locking device (9), pull the cargo shell door forward latch (6) from inside the vehicle, and completely raise door (5).
- (3) Release rear door latch locks (1), if locked.
- (4) Grasp raised door (5) from rear of vehicle with both hands and pull right side of door (5) straight down. A distinctive latching sound should be heard.

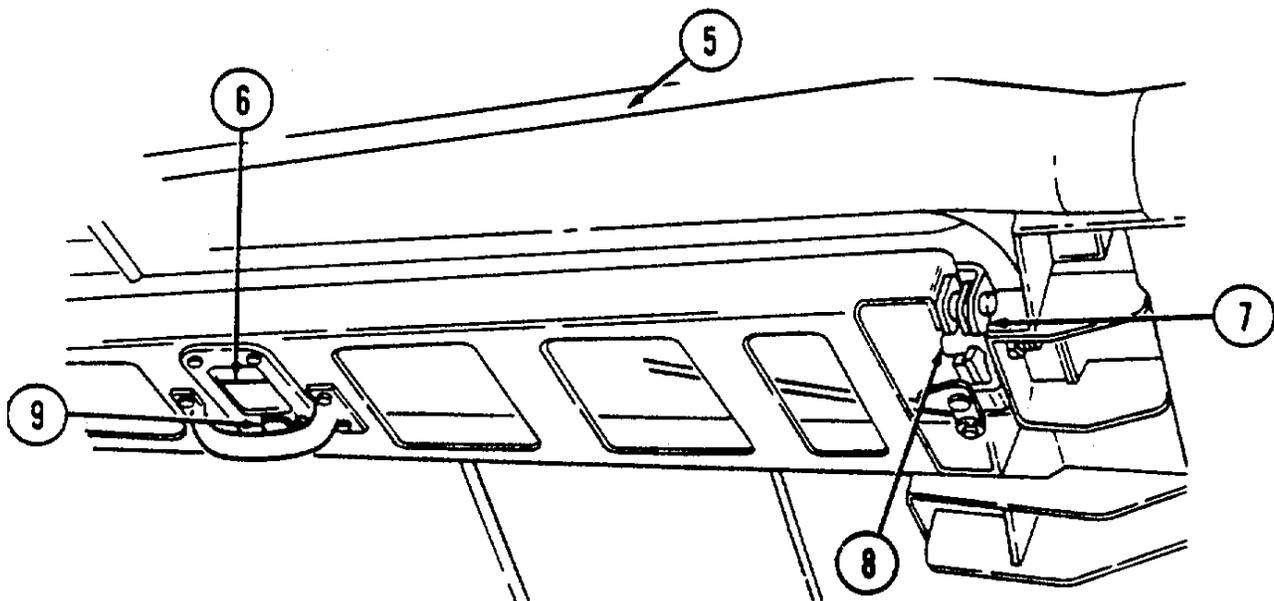




- (5) Inspect right rear latch mechanism again to ensure striker (2) engagement with latch (4).
- (6) Perform steps 3, 4, and 5 for left side of door.

(7) Enter vehicle, pull forward end of door (5) shut, and turn locking device (9). Inspect forward door latches (7) to ensure proper striker (8) engagement.

(8) Exit vehicle and raise door (5) from the rear. Operation of door (5) should be smooth. If operation is not smooth, or door components appear damaged, notify unit maintenance.



2-54. TOW WEAPON STATION OPERATION

a. Before Operation.

- (1) Release three weapon station cover securing latches (2) and push weapon station cover (7) open using weapon station cover handle (8).
- (2) Secure weapon station cover (7) in the open position with two retaining latches (5) and catches (6).
- (3) Raise weapon station brake handle (4) to unlock weapon station (9).
- (4) Use weapon station brake handle (4) and turret positioning handle (1) to rotate weapon station (9) to the desired azimuth.
- (5) Lock weapon station (9) with brake handle (4).

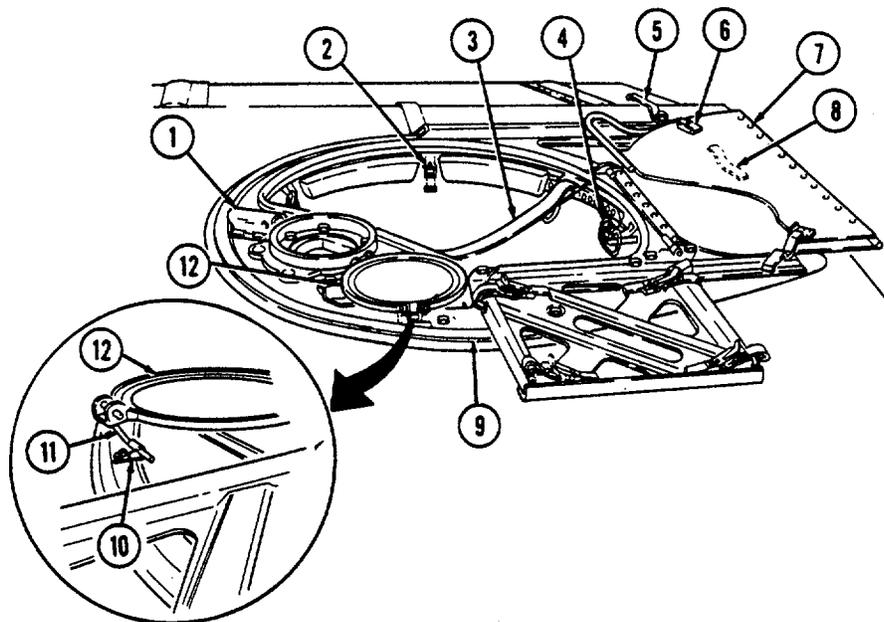
CAUTION

Do not sit, stand, or place heavy objects on weapon station, tray, or cover. Components may bend, and damage to equipment will occur.

- (6) Use gunner's sling (3) as seat rest or restraint if gunner is positioned in the weapon station during travel or weapon operation.
- (7) Detach retaining pin (11) on weapon station pedestal mount cover (12) from hole in turret positioning handle (1) and open pedestal mount cover (12).
- (8) Secure pedestal mount cover (12) to pedestal mount cover retainer (10).

b. After Operation.

- (1) Detach pedestal mount cover (12) from pedestal mount cover retainer (10).
- (2) Close pedestal mount cover (12) and secure retaining pin (11) to turret positioning handle (1).
- (3) Remove two retaining latches (5) from catches (6).
- (4) Close weapon station cover (7) and secure with three weapon station securing latches (2).



2-55. ARMAMENT WEAPON STATION OPERATION

a. Before Operation.

- (1) Release three weapon station cover securing latches (2) and push weapon station cover (7) open using weapon station cover handle (8).
- (2) Secure weapon station cover (7) in the open position with two retaining latches (5) and catches (6).
- (3) Raise weapon station brake handle (4) to unlock weapon station (9).
- (4) Use weapon station brake handle (4) and turret positioning handle (1) to rotate weapon station (9) to the desired azimuth.
- (5) Lock weapon station (9) with brake handle (4).

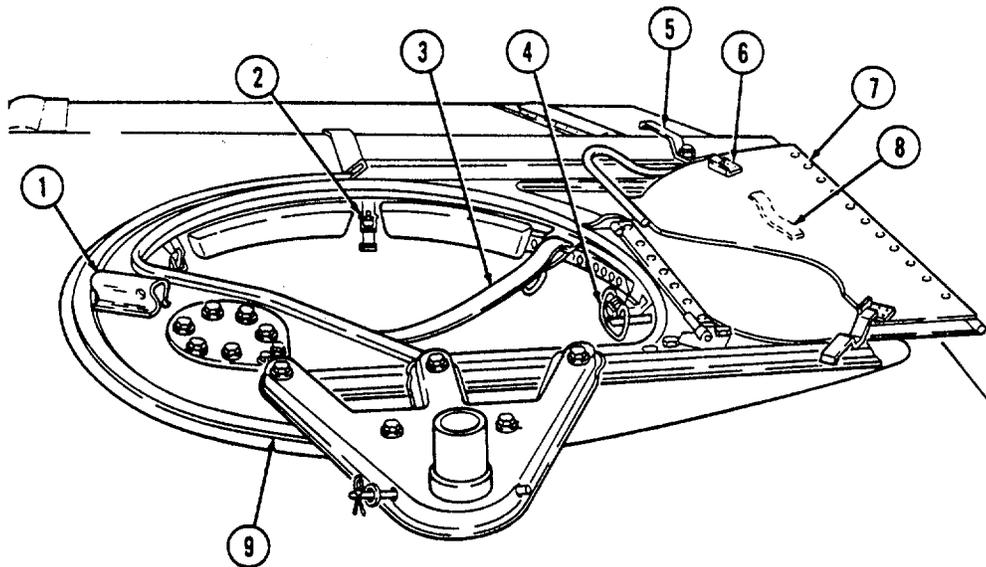
CAUTION

Do not sit, stand, or place heavy objects on weapon station, tray, or cover. Components may bend and damage to equipment will occur.

- (6) Use gunner's sling (3) as seat rest or restraint if gunner is positioned in the weapon station during travel or weapon operation.

b. After Operation.

- (1) Remove two retaining latches (5) from catches (6).
- (2) Close weapon station cover (7) and secure with three weapon station securing latches (2).



2-56. GUNNER'S PLATFORM OPERATION

a. Before Operation.

(1) Depress two lock buttons (6) on locking pins (5) and remove locking pins (5) from locking lugs (9) and holes (10) securing platform (1) in stowed position (14).

(2) Grasp hand hold (2) on platform (1) to lift platform (1) to either half-height position (13) or full-height position (12).

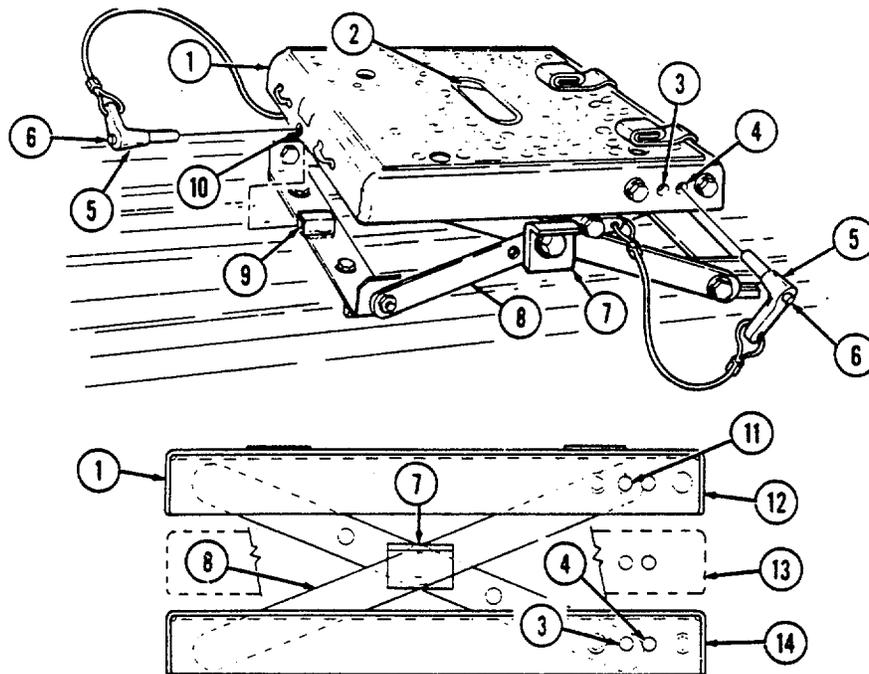
(a) If half-height position (13) is required, lift platform (1) all the way up, and turn two latches (7) so that ledges of latches (7) are facing up and parallel to bottom edge of platform (1). Lower platform (1) and allow to rest on ledges of latch (7) at half-height position (13). Insert locking pins (5) through forward locking holes (4) in platform (1) and holes (11) in platform risers (8).

(b) If full-height position (12) is required, lift platform (1) to the full-height position (12), and ensure that rear locking holes (3) in left and right sides of platform (1) are aligned with locking holes (11) in platform risers (8). Insert locking pins (5) through rear locking holes (3) in platform (1) and holes (11) in platform risers (8).

b. After Operation.

(1) Remove locking pins (5) securing platform (1) in either half-height position (13) or full-height position (12) by pressing lock buttons (6) and removing locking pins (5). Lift up on platform (1) and turn two latches (7) so that ledges of latch (7) are facing downward, parallel to floor.

(2) Lower platform to stowed position (14), and align locking holes (10) with locking lugs (9). Insert locking pins (5) through locking holes (10) and lugs (9).



SECTION VII. AMBULANCE OPERATION

2-57. GENERAL

a. This section provides operating instructions for components found on M996, M996A1, M997, M997A1, M997A2, M1035, M1035A1, and M1035A2 ambulances.

b. Refer to para. 2-2a for stowage location of fire extinguisher on ambulance vehicles. Refer to para. 2-27 for operation of fire extinguisher.

WARNING

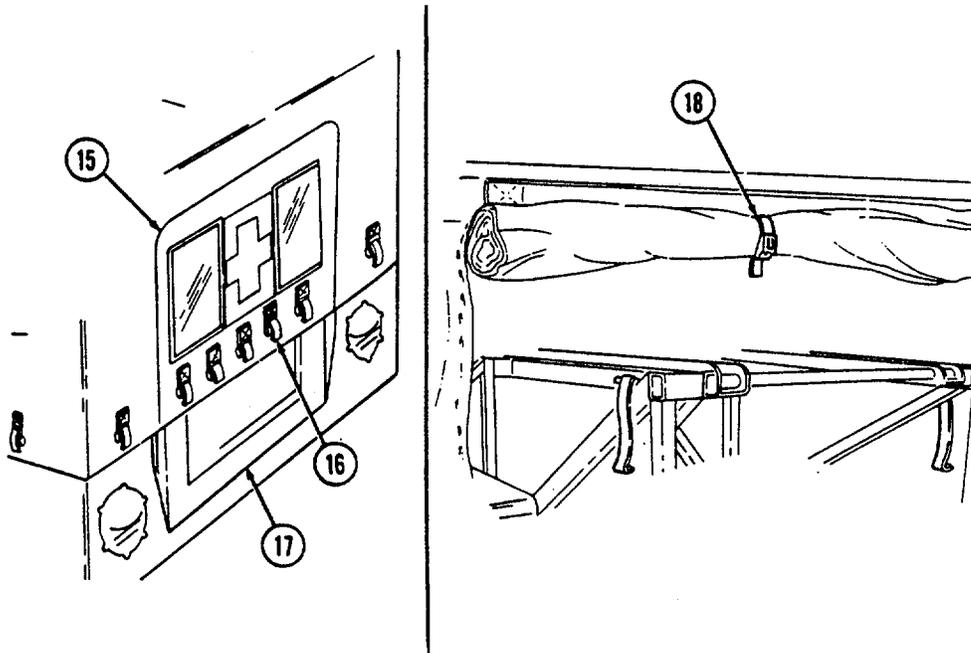
To prevent possible injury, insulation may be added to the exposed refrigerant lines of the air conditioner behind the companion seat, at the discretion of unit commander. Notify unit maintenance for installation of insulation.

2-58. SOFT TOP AMBULANCE (M1035, M1035A1, AND M1035A2) LITER RACK OPERATION**WARNING**

When transporting more than one litter patient, first litter patient must be loaded on upper litter rack. Injury may result if litter patient is loaded in lower litter rack first.

a. Unloading Litters from Litter Rack.

- (1) Release five straps (16) securing enclosure rear curtain (15) to tailgate (17).
- (2) Roll up enclosure rear curtain (15) and secure with two straps (18).
- (3) Lower tailgate (17) (para. 2-21).



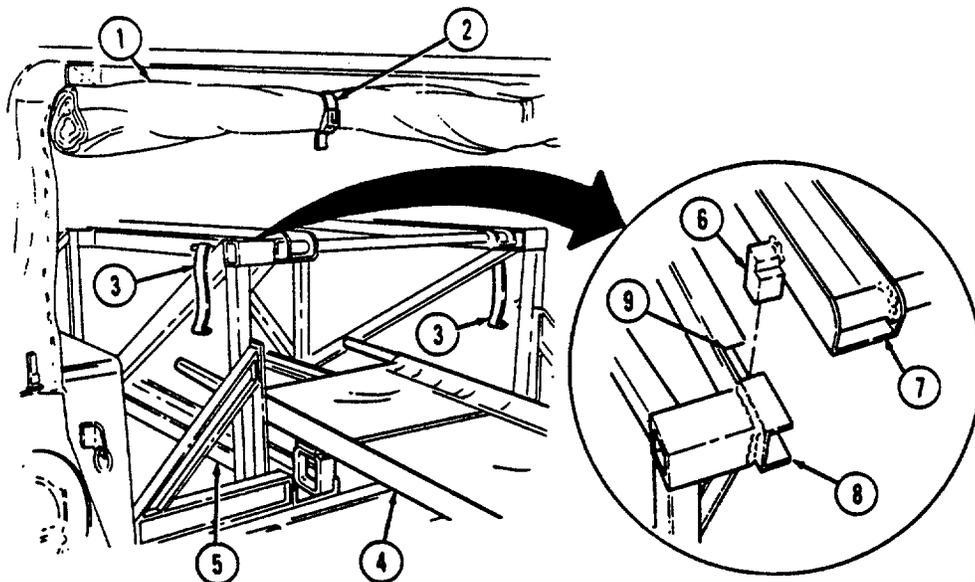
- (4) Release four straps (3) securing litter (4) to lower litter rack (5).
- (5) Pull out and remove litter (4) from lower litter rack (5).
- (6) Release four straps (3) securing litter (10) to upper litter rack (8).
- (7) Upper litter tray (7) must be pushed forward and raised slightly to allow stops (6) to clear notches (9) in upper litter rack (8).
- (8) Pull upper litter tray (7) out from upper litter rack (8). Lower and rest upper litter tray (7) in lower litter rack (5).
- (9) Remove litter (10) from upper litter tray (7).

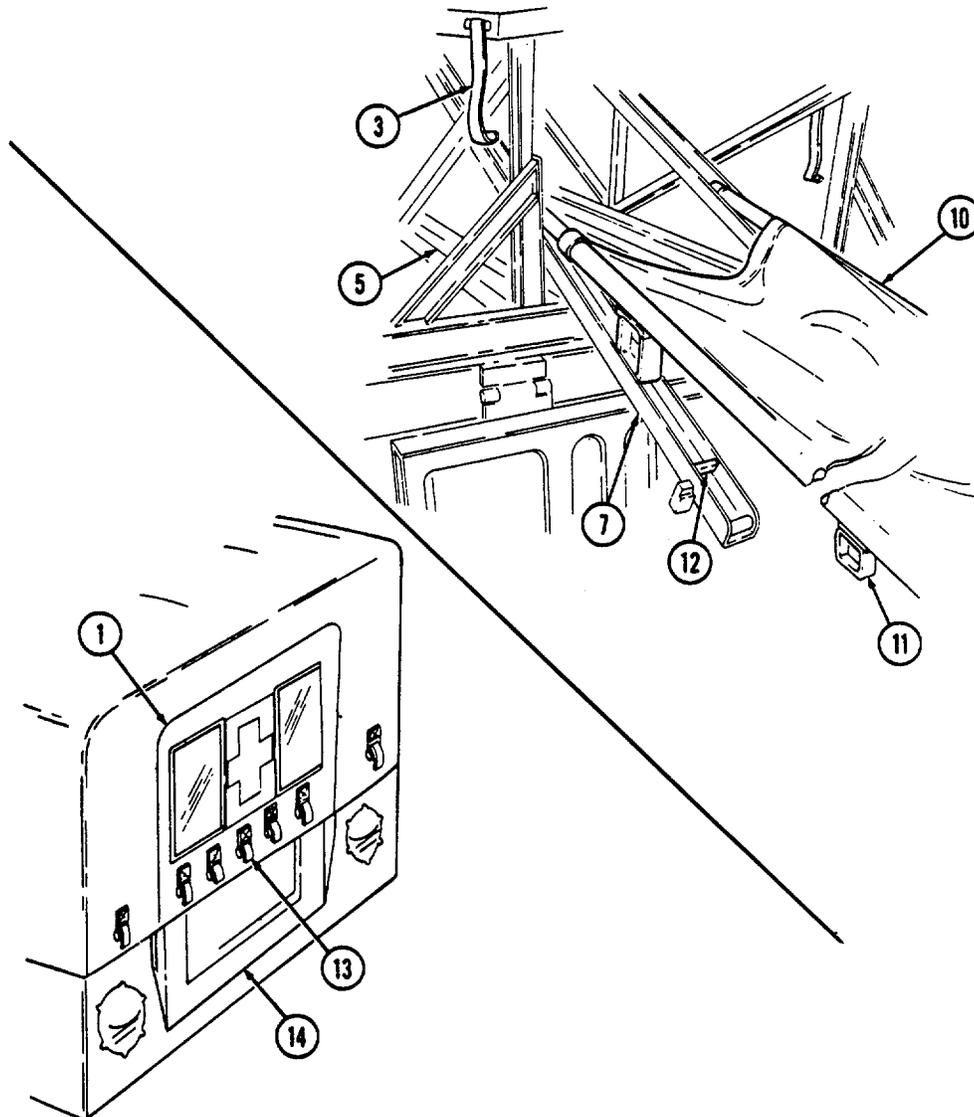
b. Loading Litters on Litter Racks

NOTE

Ensure litter support legs are positioned behind stops on upper litter tray.

- (1) Place litter (10) on upper litter tray (7).
- (2) Slide litter (10) up until rear support legs (11) are positioned behind stops (12) on upper litter tray (7).
- (3) Pull litter tray (7) up and push forward to lock litter tray (7) to upper litter rack (8).
- (4) Secure litter (10) to upper litter rack (8) with four straps (3).
- (5) Place litter (4) on lower litter rack (5) and slide forward.
- (6) Secure litter (4) to lower litter rack (5) with four straps (3).
- (7) Raise tailgate (14) (para. 2-21).
- (8) Release two straps (2) and unroll enclosure rear curtain (1).
- (9) Secure enclosure rear curtain (1) to tailgate (14) with five straps (13).





**2-59. REMOVAL AND INSTALLATION OF SOFT TOP AMBULANCE
(M 1035, M1035A1, AND M1035A2) ENCLOSURE**

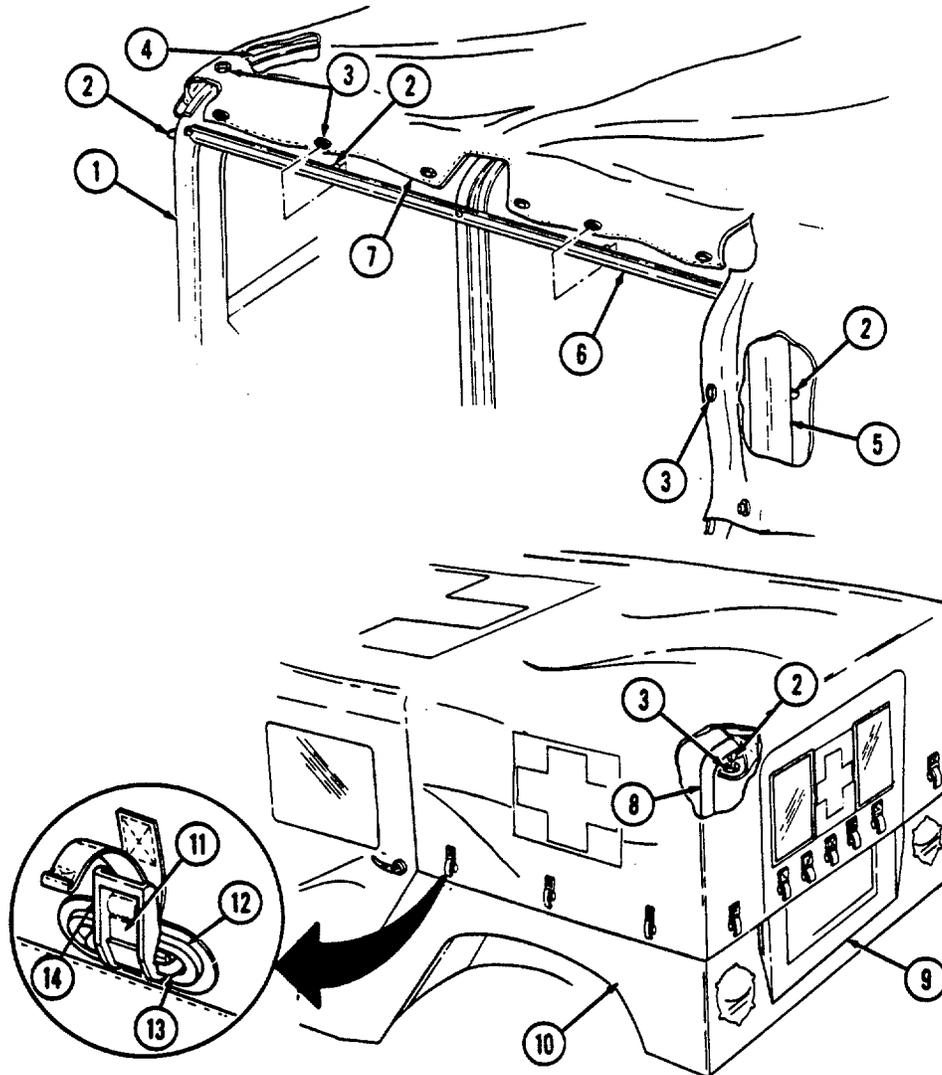
NOTE

For ease of installation, soft top components should be installed when temperatures are above 72°F (22°C).

a. General. The 2-litter ambulance soft top enclosure consists of four soft doors, roof cover, and bow assemblies. For removal of doors, refer to para. 2-46. Para. 2-59 covers removal and installation of roof cover, rails, bow assemblies, and rear bow.

b. Removal of Roof Cover, Rails, and Bow Assemblies.

- (1) Unfasten eyelets (3) from turnbuttons (2) on two horizontal rails (6) and "A" pillar (1).
- (2) Remove roof cover (7) from horizontal rails (6).
- (3) Unfasten eyelets (3) from turnbuttons (2) on "C" pillar (5) and rear bow (8).
- (4) Depress locking tabs (11) and unhook straps (14) from footman loops (13) on wheelhouse (10) and tailgate (9). Remove grommets (12) from foot-man loops (13).
- (5) Roll roof cover (7) over rear bow (8) and lower rear bow (8).
- (6) Roll roof cover (7) over "C" pillar (5) and "A" pillar (1).
- (7) Slide roof cover (7) from channel (4).



(8) Remove eight screws (17) securing two bow assemblies (15) to horizontal rails (6). Remove bow assemblies (15).

(9) Remove six screws (17) securing two horizontal rails (6) to "A" pillar (1), "B" pillar (16) and "C" pillar (5). Remove horizontal rails (6).

c. Removal of Rear Bow.

(1) Depress locking tabs (11) and unhook straps (14) from footman loops (13).

(2) Remove two snaprings (20) and pivot pins (18) securing rear bow (8) to pivot brackets (19). Remove rear bow (8).

d. Installation of Rear Bow.

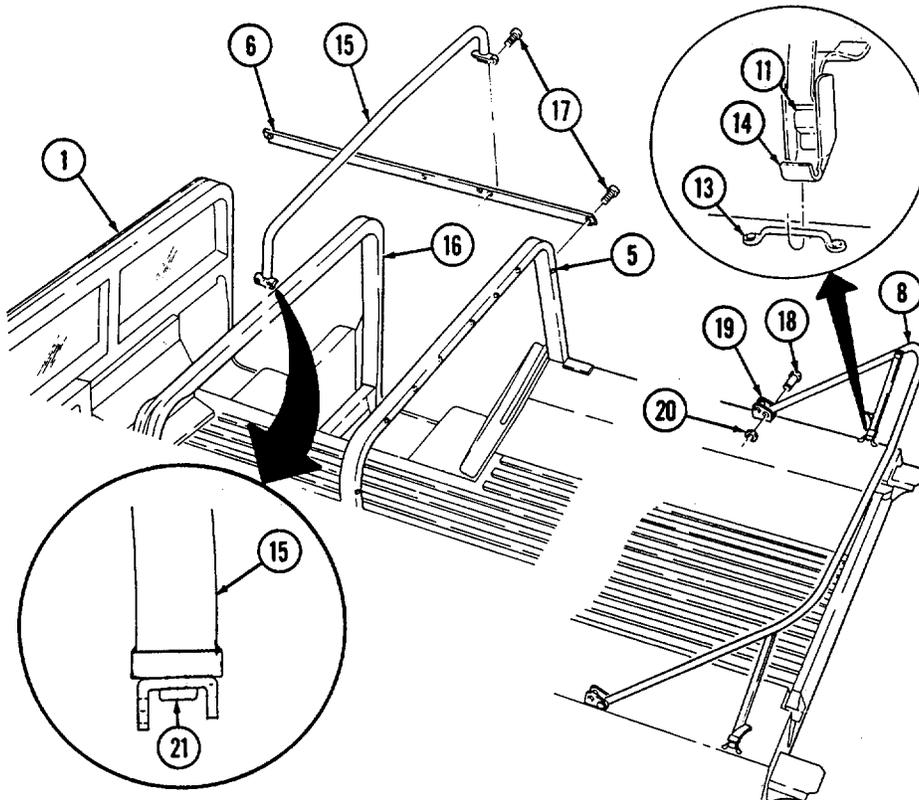
(1) Install rear bow (8) to two pivot brackets (19) with two pivot pins (18) and snaprings (20).

(2) Install straps (14) to footman loop (13).

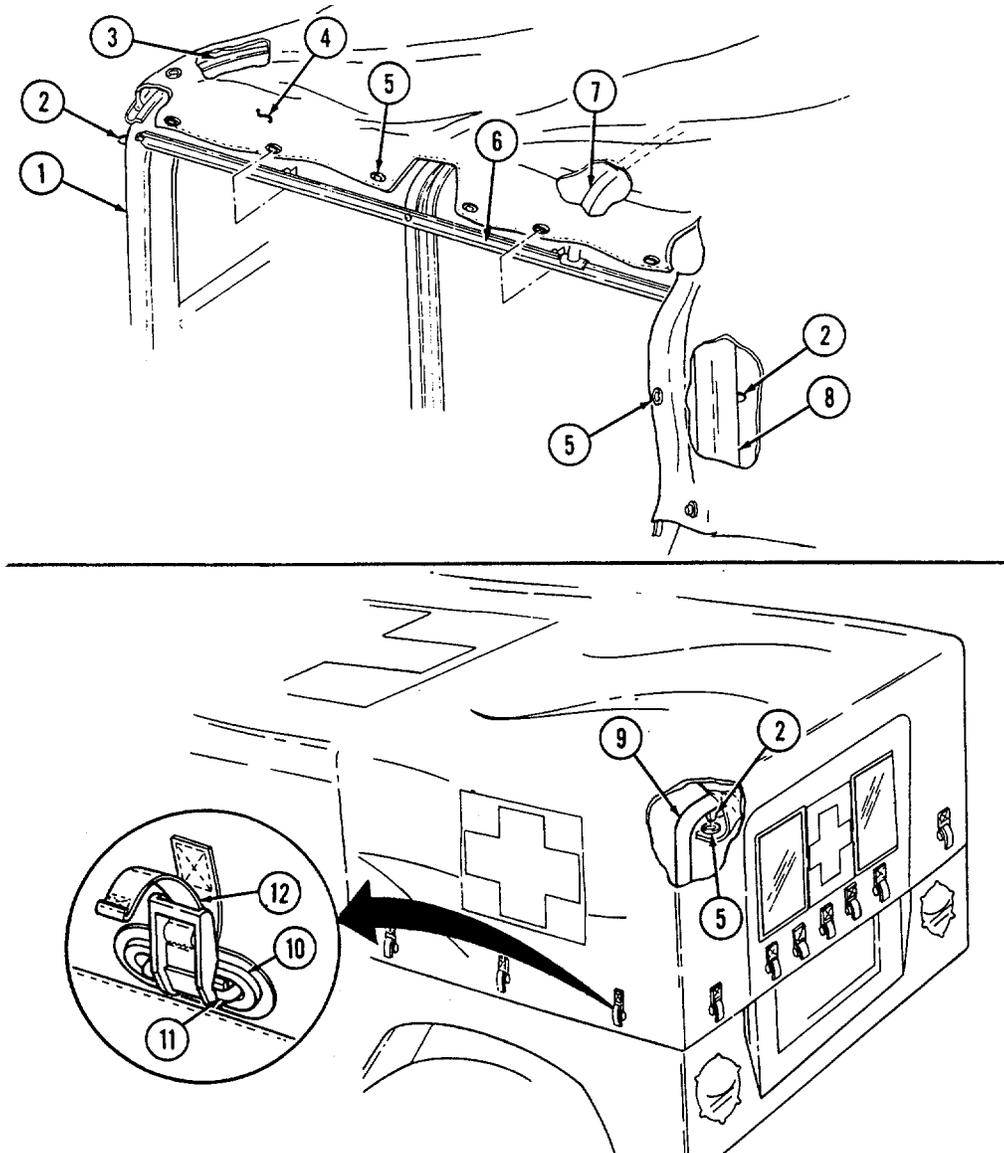
e. Installation of Rails, Bow Assemblies, and Roof Cover.

(1) Install two horizontal rails (6) to "A" pillar (1), "B" pillar (16), and "C" pillar (5) with six screws (17).

(2) Loosen end bracket screws (21) and install two bow assemblies (15) on horizontal rails (6) with eight screws (17). Tighten bracket screws (21).



- (3) Slide roof cover (4) into channel (3) and roll roof cover (4) over bow assemblies (7) and rear bow (9).
- (4) Raise rear bow (9) and roll roof cover (4) over rear bow (9).
- (5) Fasten eyelets (5) to turnbuttons (2) on rear bow (9).
- (6) Install roof cover (4) around horizontal rails (6) and "C" pillar (8) and fasten eyelets (5) to turnbuttons (2).
- (7) Fasten eyelets (5) to turnbuttons (2) on "A" pillar (1).
- (8) Install grommets (10) over footman loops (11), attach straps (12) to footman loops (11), and pull straps (12) tight.



2-60. AMBULANCE REAR STEP ASSEMBLY OPERATION

a. Lowering Rear Steps.

- (1) Open and secure rear doors.
- (2) Ensure that the rear step safety strap (13) is connected to the rear step assembly (20).
- (3) Pull rear step latch cable (16) to release rear step latches (15).

WARNING

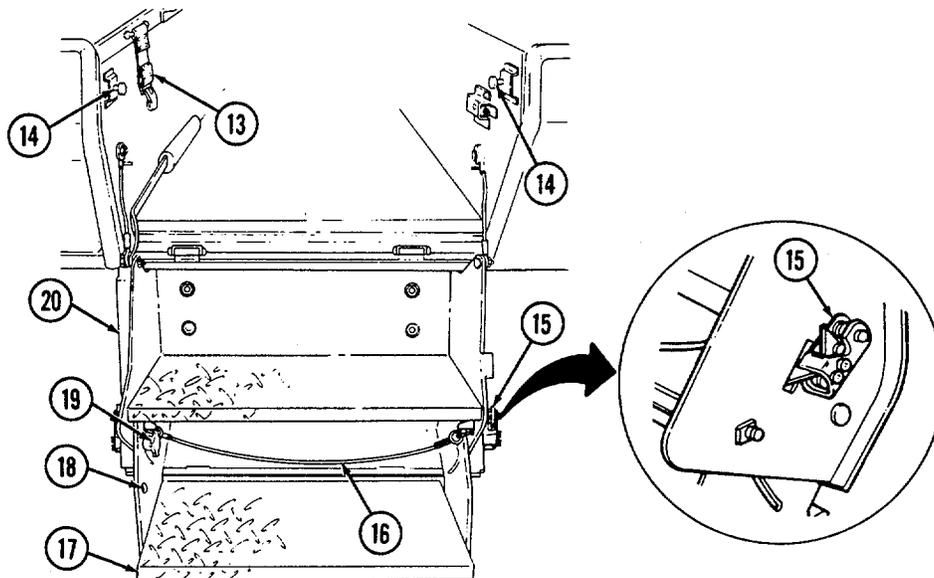
Personnel inside vehicle should not lean on rear step assembly while unlatching and disconnecting rear safety strap. Injury to personnel may result from rapidly falling steps.

(4) While grasping bottom step (17) with one hand, disconnect safety strap (13) from hole (18) on rear step assembly (20).

- (5) Lower rear step assembly (20) by releasing bottom step (17).
- (6) Turn knob (19) clockwise to secure bottom step (17).

b. Raising Rear Steps.

- (1) Turn knob (19) counterclockwise and raise bottom step (17).
- (2) Lift rear step assembly (20) until rear step latches (15) engage with rear step strikers (14).
- (3) Connect step safety strap (13) to hole (18) on rear step assembly (20).
- (4) Close and secure rear doors.



2-61. AMBULANCE INTERIOR ELECTRICAL CONTROLS

a. General. The vehicle electrical system is used to power the NBC air filtration system, interior lights, heater, air-conditioner, and ventilation system. It is recommended to have engine running while operating the heater, vent, and NBC air filtration system so the alternator maintains battery charge. The engine must be running to operate the air-conditioner compressor.

NOTE

- Electrical control panels on M996, M996A1, M997, M997A1, and M997A2 ambulances are basically the same (M997 is shown).
- To facilitate blackout operations, M996, M996A1, M997, M997A1, and M997A2 ambulance interior lighting systems have been designed so that all white light illumination in the patient compartment will be extinguished when bulkhead doors, rear doors, or rear steps are opened unless the vehicle main light switch is in "SERVICE DRIVE" position.

b. White Light Operation.

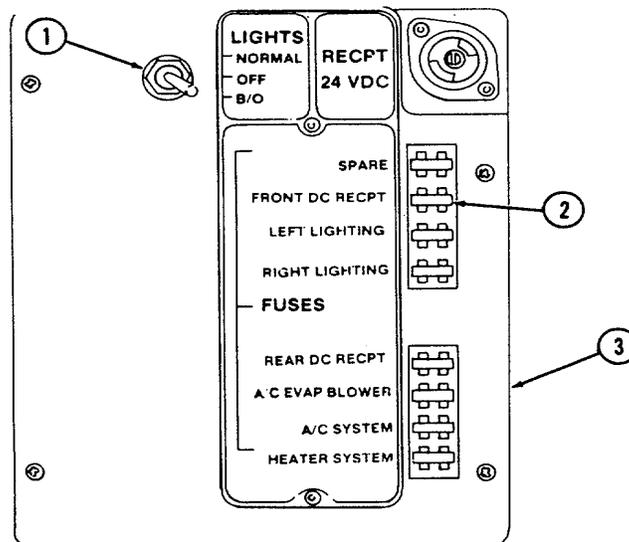
(1) Place interior light switch (1) on electrical control panel (3) in "NORMAL" position. The blackout lights will illuminate.

(2) Close bulkhead doors, rear doors, and steps. Ceiling white lights will illuminate and blackout lights will extinguish.

(3) To activate spotlights, engage switch on back of spotlight assembly.

(4) If bulkhead doors, rear doors, or rear steps are opened, all white light illumination will be extinguished and blackout lights will be illuminated.

(5) Turn vehicle main light switch to "SERVICE DRIVE" to operate interior white lights when bulkhead doors, rear doors, or rear steps are open and blackout operation is not required.



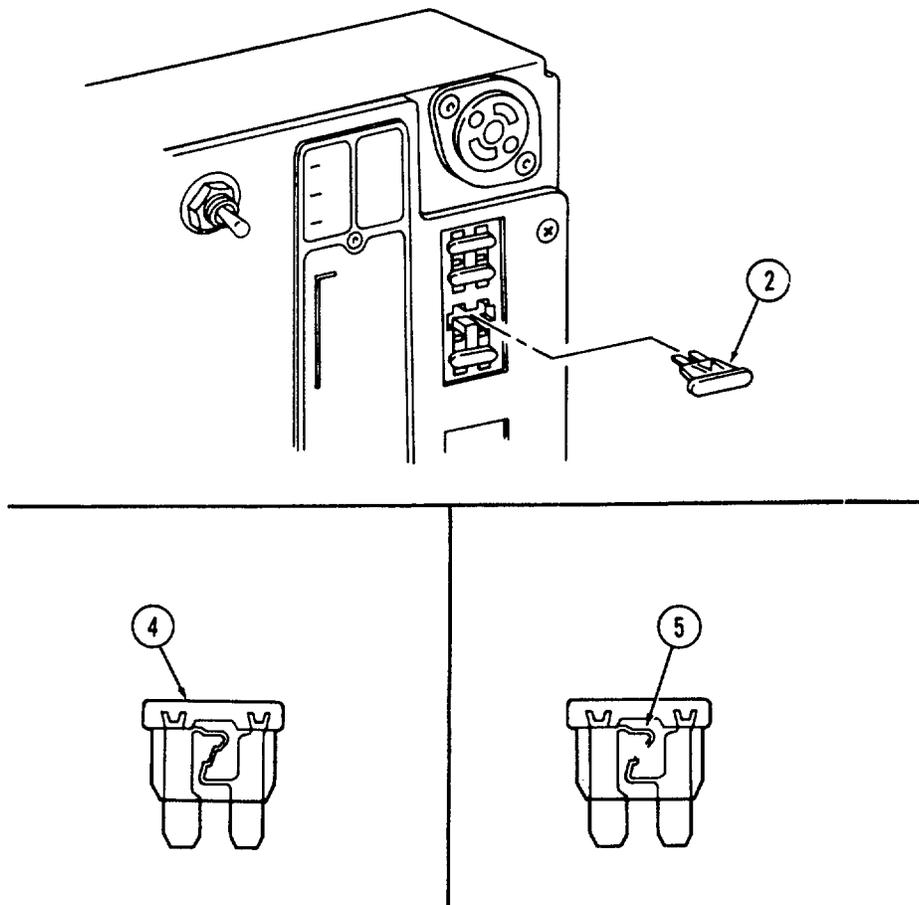
c. **Blackout Light Operation.** Place interior light switch (1) in "B/O" position. Blackout lights will illuminate.

NOTE

Blackout position on the electrical control panel overrides the automatic blackout switches in the event of automatic blackout switch failure in blackout conditions.

d. **Interior Light Operation.** Place interior light switch (1) in "OFF" position to extinguish all interior lights.

e. **Fuse Replacement.** To replace a defective fuse (2) in the electrical control panel (3), pull fuse (2) straight out of panel (3). Inspect fuse (2) for an open fuse element (5). Replace with known good fuse (4). All fuses in the control box are 20 amp.



NOTE

- Prior to starting ambulance heater, ensure that vehicle fuel gauge registers above 1/4 full. If heater is operated with fuel level below 1/4, the heater may shut off and not restart. This feature is to ensure that vehicle remains operational. If heater will not restart, notify unit maintenance to refill tank and bleed heater fuel system.
- Normal start-up time for M996, M996A1, M997, M997A1, and M997A2 ambulance heaters is approximately 2-1/2 minutes. Time may vary depending on amount of use.

f. M996 and M996A1 Heater Operation.

WARNING

Do not operate heater when ventilation system is on. Damage to heater, or injury to personnel will result.

(1) To operate heater, ensure fuel cutoff valve (14) is open and place vent off-on-max lever (5) to "OFF." Hold heater run-start switch (2) to "START" until heater light (1) illuminates to show that heater burner is operating.

(2) When heater light (1) illuminates, position heater run-start switch (2) to "RUN."

(3) Outlet air temperature can be adjusted by positioning fuel selection switch (3) to either "HIGH" or "LOW."

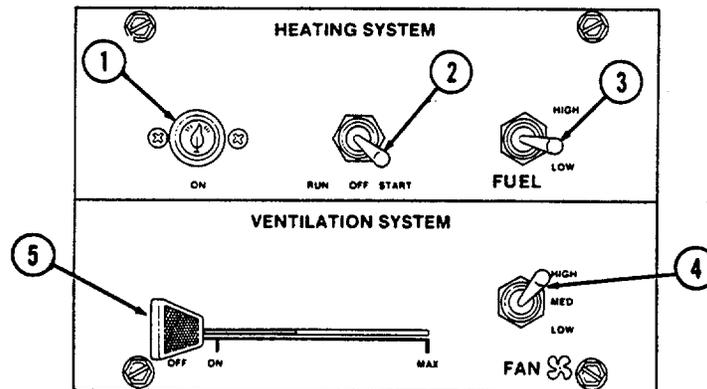
(4) To turn heater off, position heater run-start switch (2) to "OFF." It will take several minutes for heater to purge itself of fuel.

g. M996 and M996A1 Vent Operation.

(1) To operate ventilation system, position on-off-max lever (5) to "ON." The proportion of fresh air entering patient compartment can be adjusted by the following:

- Position fan control switch (4) to "HIGH", "MED", or "LOW."
- Adjust off-on-max lever (5) to the right to increase proportion of fresh air entering the system.
- Open rear door vent to enable it to function as an exhaust vent.

(2) To turn ventilation system off, place on-off-max lever (5) to "OFF."



h. M997, M997A1, and M997A2 Heater Operation.

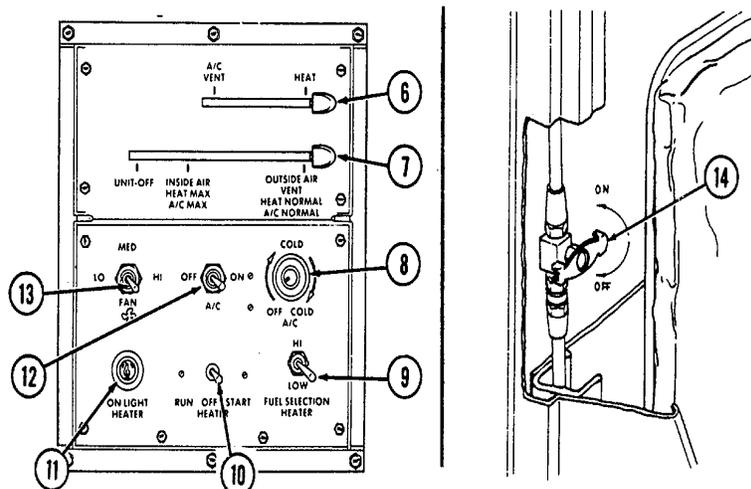
- (1) To operate the heater, ensure fuel cutoff valve (14) is open and place A/C vent-heat lever (6) in "HEAT" position.
- (2) Adjust the inside-outside air lever (7) to "HEAT MAX" or "HEAT NORMAL."
- (3) Position fuel selection switch (9) to "LOW."
- (4) Hold heater run-start switch (10) to "START" position until heater light (11) illuminates to show that heater burner is operating. When heater light (11) illuminates, position the heater run-start switch (10) to "RUN."
- (5) Outlet air temperature can be adjusted by positioning the fuel selection switch (9) to either "HI" or "LOW," the fan switch (13) to "LO," "MED," or "HI," and the inside-outside air lever (7) to either "HEAT MAX" or "HEAT NORMAL."
- (6) To turn the heater off, position the heater run-start switch (10) to "OFF." It will take several minutes for the heater to purge itself of fuel. After heater light (11) goes off, move inside-outside air lever (7) to "UNIT-OFF."

i. M997, M997A1, and M997A2 Air-Conditioner Operation.

- (1) Start engine (para. 2-10).
- (2) To operate the air-conditioner, position the A/C vent-heat lever (6) to "A/C."
- (3) Adjust the inside-outside air lever (7) to "A/C MAX" or "A/C NORMAL."
- (4) Set A/C off-on switch (12) to "ON."
- (5) Adjust A/C cold control (8) clockwise to "COLD."
- (6) Outlet air temperature can be adjusted with A/C cold control (8) by rotating the control (8) between "OFF" and "COLD," the fan switch (13) to "LO," "MED," or "HI," and the inside-outside air lever (7) to "A/C MAX" or "A/C NORMAL."
- (7) To turn air-conditioner off, position the A/C switch (12) to "OFF" and move inside-outside air lever (7) to "UNIT-OFF."

j. M997, M997A1, and M997A2 Vent Operation.

- (1) To operate ventilation system without heating or cooling incoming air, place A/C vent-heat lever (6) and inside-outside air lever (7) in "VENT" position.
- (2) Activate fan switch (13) to "LO," "MED," or "HI."
- (3) To turn ventilation system off, place inside-outside air lever (7) in "UNIT-OFF" position.



2-62. AMBULANCE LITTER RACK OPERATION

a. Assembling Litter Rail Extension.

- (1) Turn latch (1) counterclockwise and open stowage compartment door (2).
- (2) Loosen and disconnect securing strap (7) and remove folded litter rail extension (6) from stowage compartment (5).

NOTE

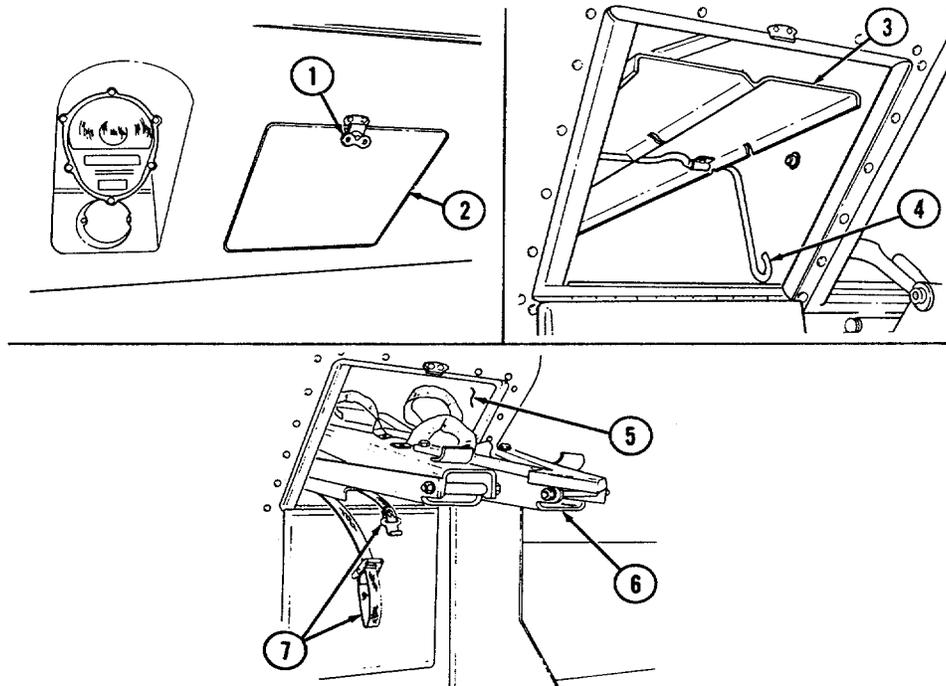
Perform step 3 for M997, M997A1, and M997A2 vehicles. M996 and M996A1 litters are stowed behind right ambulatory patient seat.

- (3) Lift tray (3) slightly and push in tray supports (4) to lower tray (3) for access to stowed litters.
- (4) Pull left and right rails (8) apart and let legs (13) drop down. Ensure feet (14) are flat on ground.
- (5) Lock support braces (15), and adjust straps (16) as necessary.

b. Unloading Litters from Lower Litter Rack.

WARNING

- When unloading more than two litter patients, lower litter rack patients must be unloaded first. Injury may result if upper litter rack patients are unloaded first.
- Make sure straps and equipment do not inhibit unloading operations. Unload litters carefully to prevent patient injury.



- (1) Release front and rear litter handle straps (10) securing litter (9) to lower litter rack (11).
- (2) Secure both rails (8) of litter rail extension (6) into slots (12) on lower litter rack (11).
- (3) Slide litter (9) from lower litter rack (11) onto litter rail extension (6). Lift up and remove litter (9) from lower litter rack extension (6).

c. Loading Litters on Lower Litter Rack.

WARNING

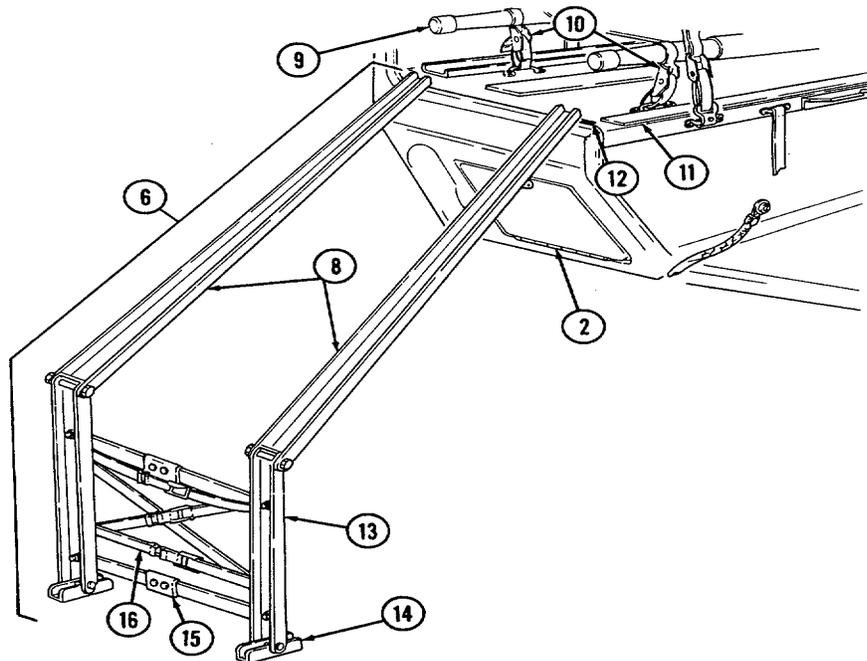
When loading more than two litter patients, upper litter rack patients must be loaded first. Injury may result if litter patients are loaded in lower litter rack first.

- (1) Place litter (9) on litter rail extension (6).

WARNING

Ensure straps and equipment do not inhibit litter loading operations. Load litters carefully to prevent patient injury.

- (2) Slide litter (9) onto lower litter rack (11).
- (3) Secure litter (9) to lower litter rack (11) with front and rear litter handle straps (10).



d. **Unloading Litters from Upper Litter Racks.**

WARNING

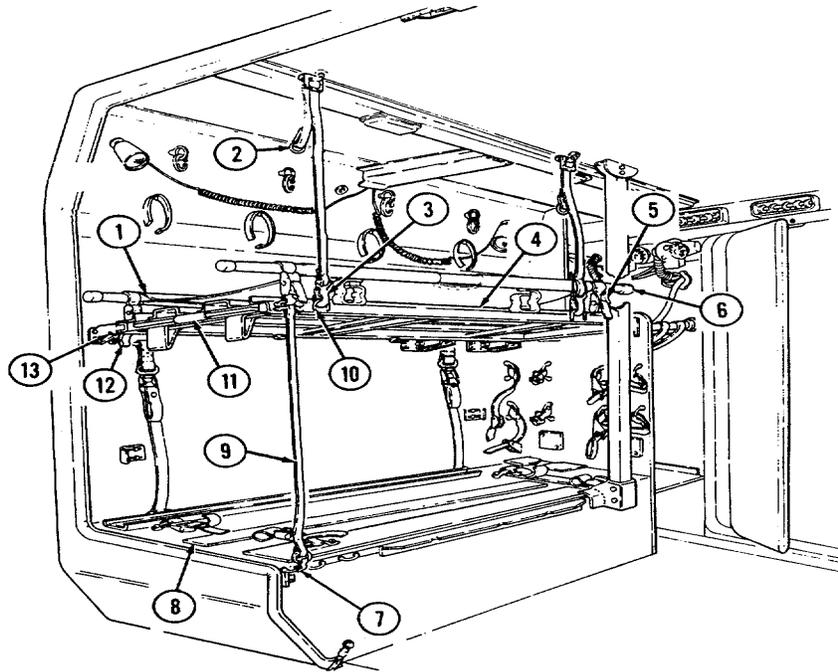
When unloading more than two litter patients, lower litter rack patients must be unloaded first. Injury may result if upper litter rack patients are unloaded first.

- (1) Release front litter handle straps (5) from litter handles (6).
- (2) Unhook tension strap (9) from footman loop (7) on lower litter rack (8).
- (3) Pull out upper litter rack handle (11) and support weight of upper litter rack (4).

WARNING

Rear end of upper litter must be supported before releasing suspension strap hook. Injury to personnel may result if rear end of upper litter is not supported.

- (4) Unhook rear suspension strap hook (3) from loop (10) on upper litter rack (4). Clip suspension strap hook (3) to eye (2).
- (5) Release litter support latch stop (13), push latch (12) in, and lower upper litter rack (4) onto lower litter rack (8).



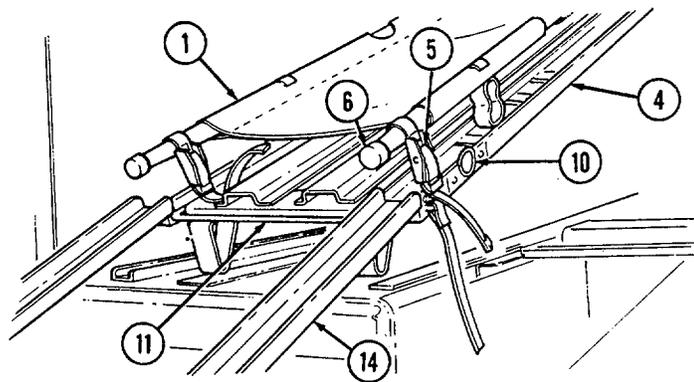
- (6) Slide litter rack handle (11) into upper litter rack (4).
- (7) Secure rails of litter rail extension (14) into slots in upper litter rack (4).
- (8) Release rear litter handle straps (5) from litter handles (6).
- (9) Slide litter (1) down rails (14) until litter (1) is clear of upper litter rack (4).
- (10) Lift and remove litter (1) from litter rail extension (14).
- (11) Remove litter rail extension (14) from upper litter rack (4).

e. Loading Litters on Upper Litter Racks.

WARNING

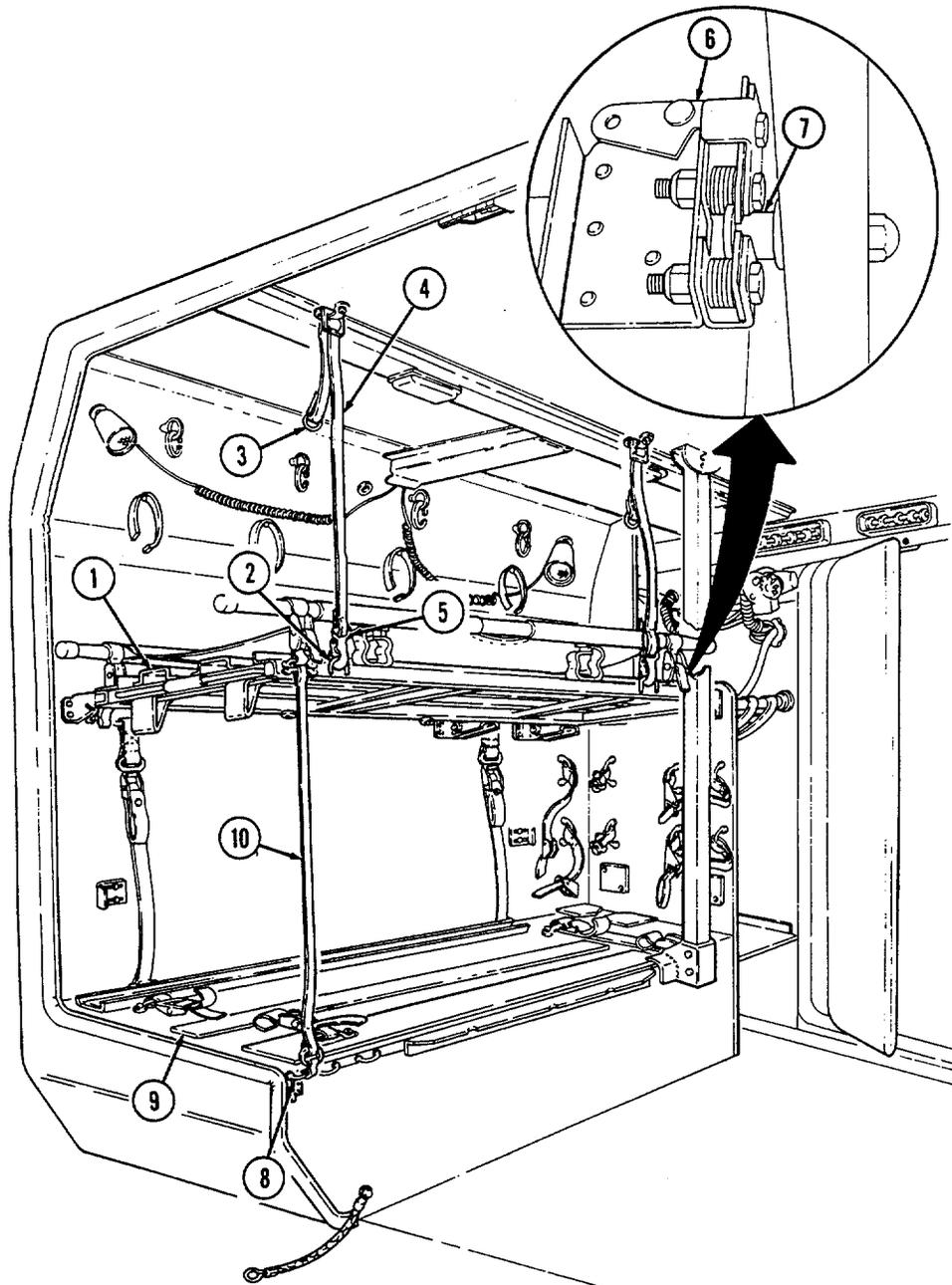
When loading more than two litter patients, upper litter rack patients must be loaded first. Injury may result if litter patients are loaded in lower litter rack first.

- (1) Secure both rails of litter rail extension (14) into slots in upper litter rack (4).
- (2) Place litter (1) on litter rail extension (14).
- (3) Slide litter (1) up rails (14) until litter (1) is clear of litter rail extension (14).
- (4) Secure rear litter handles (6) to upper litter rack (4) with rear litter handle straps (5).
- (5) Remove litter rail extension (14) from upper litter rack (4).
- (6) Unhook suspension strap hook (3) from eye (2).
- (7) Pull out upper litter rack handle (11).
- (8) Raise upper litter rack (4), push into litter support latch (12), and secure with latch stop (13).
- (9) Attach suspension strap hook (3) to loop (10) on upper litter rack (4).
- (10) Secure front litter handles (6) to litter rack (4) with front litter handle straps (5).
- (11) Hook tension strap (9) to footman loop (7) on lower litter rack (8).
- (12) Slide litter rack handle (11) into upper litter rack (4).

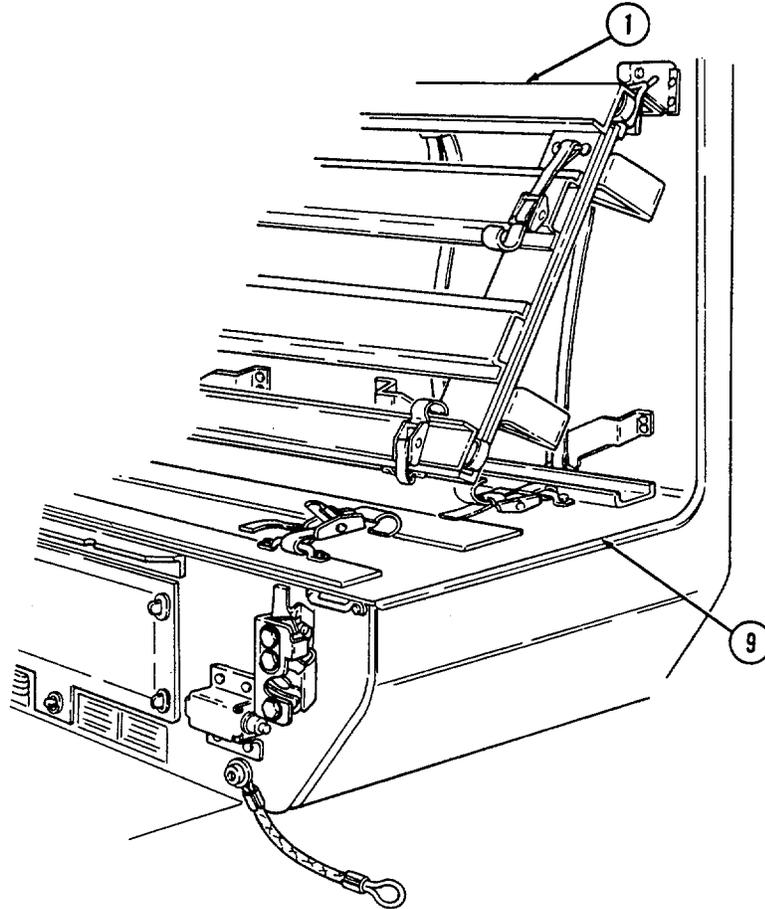


f. Folding Upper Litter Rack to the Backrest Position.

- (1) Unhook litter rack tension strap (10) from lower litter rack footman loop (8).
- (2) Unhook two upper litter rack suspension straps (4) from loops (2) on upper litter rack (1) and hook strap ends (5) to eyes (3).



- (3) Release upper litter rack latch (6) and disengage rack striker (7) from latch (6).
- (4) Lower upper litter rack (1) onto the lower litter rack (9) forming a backrest.
- (5) To convert backrest to upper litter rack (1), raise upper litter rack (1) and engage rack striker (7) into upper litter rack latch (6). Ensure striker (7) is locked in latch (6).
- (6) Unhook two upper litter rack suspension strap hooks (5) from eyes (3) and hook to loops (2) on upper litter rack (1).
- (7) Hook upper litter rack tension strap (10) to footman loop (8) on lower litter rack (9).
- (8) Adjust straps (10) and (4) for proper tension.



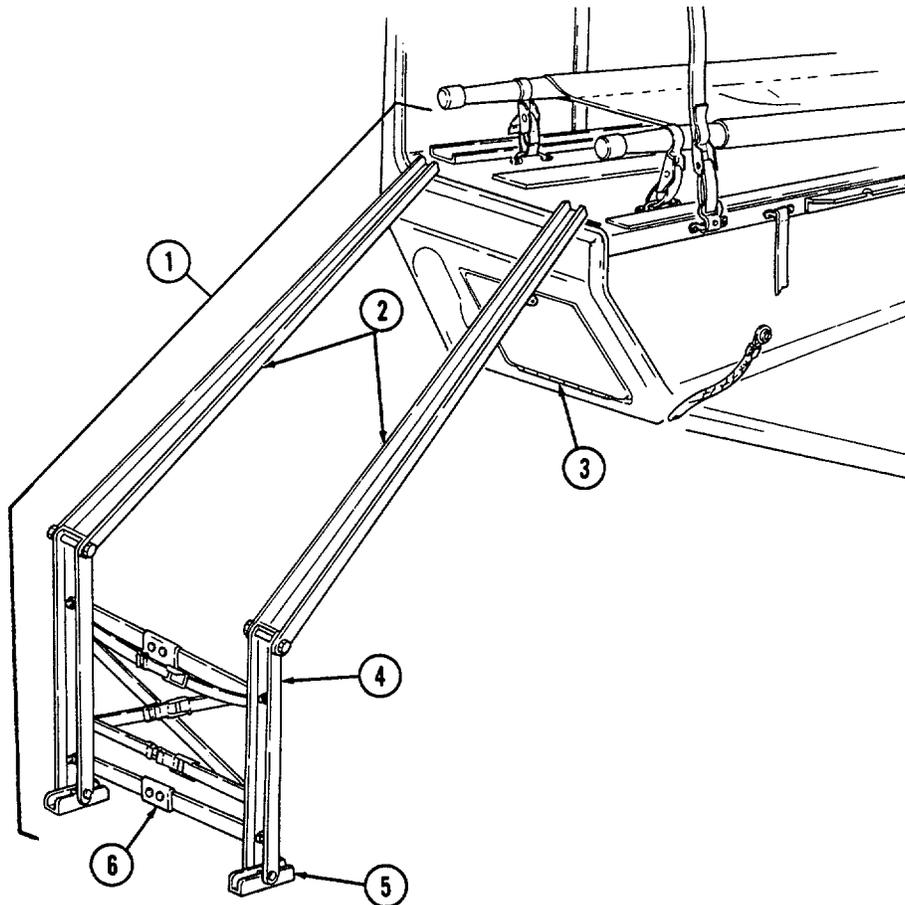
g. Fold and Stow Litter Rail Extension.

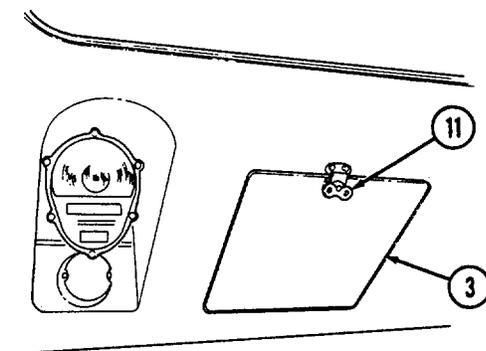
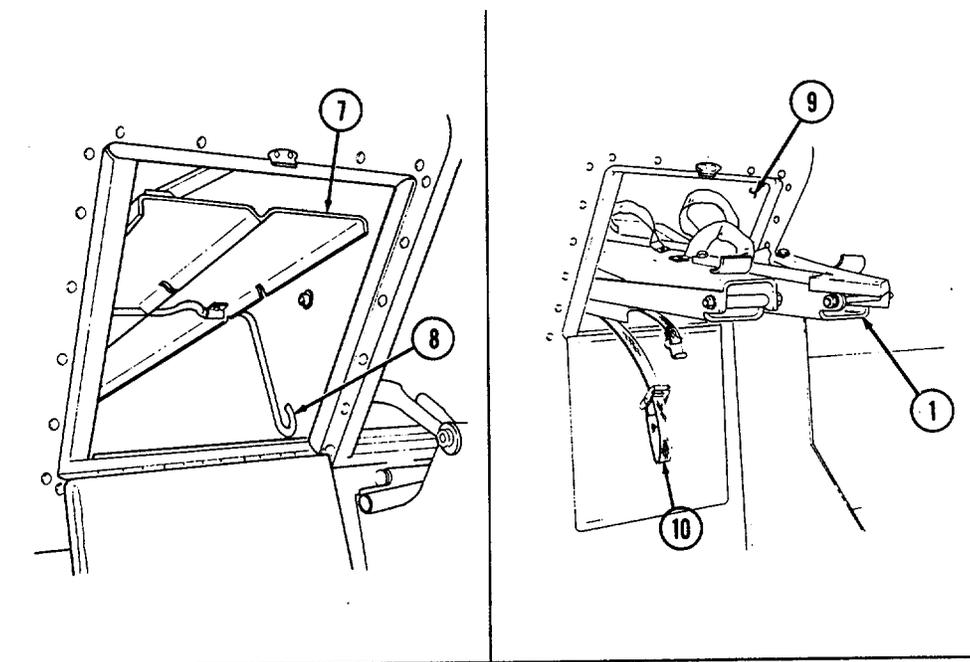
- (1) Unlock support braces (6).
- (2) Fold left and right rails (2) together.
- (3) Fold left and right litter rail legs (4) and feet (5) against rail (2).
- (4) Lift tray (7), push tray supports (8) in, and lower tray (7).

NOTE

Perform step 5 for M997, M997A1, and M997A2 vehicles only. M996 and M996A1 litters are stowed behind right ambulatory patient seat.

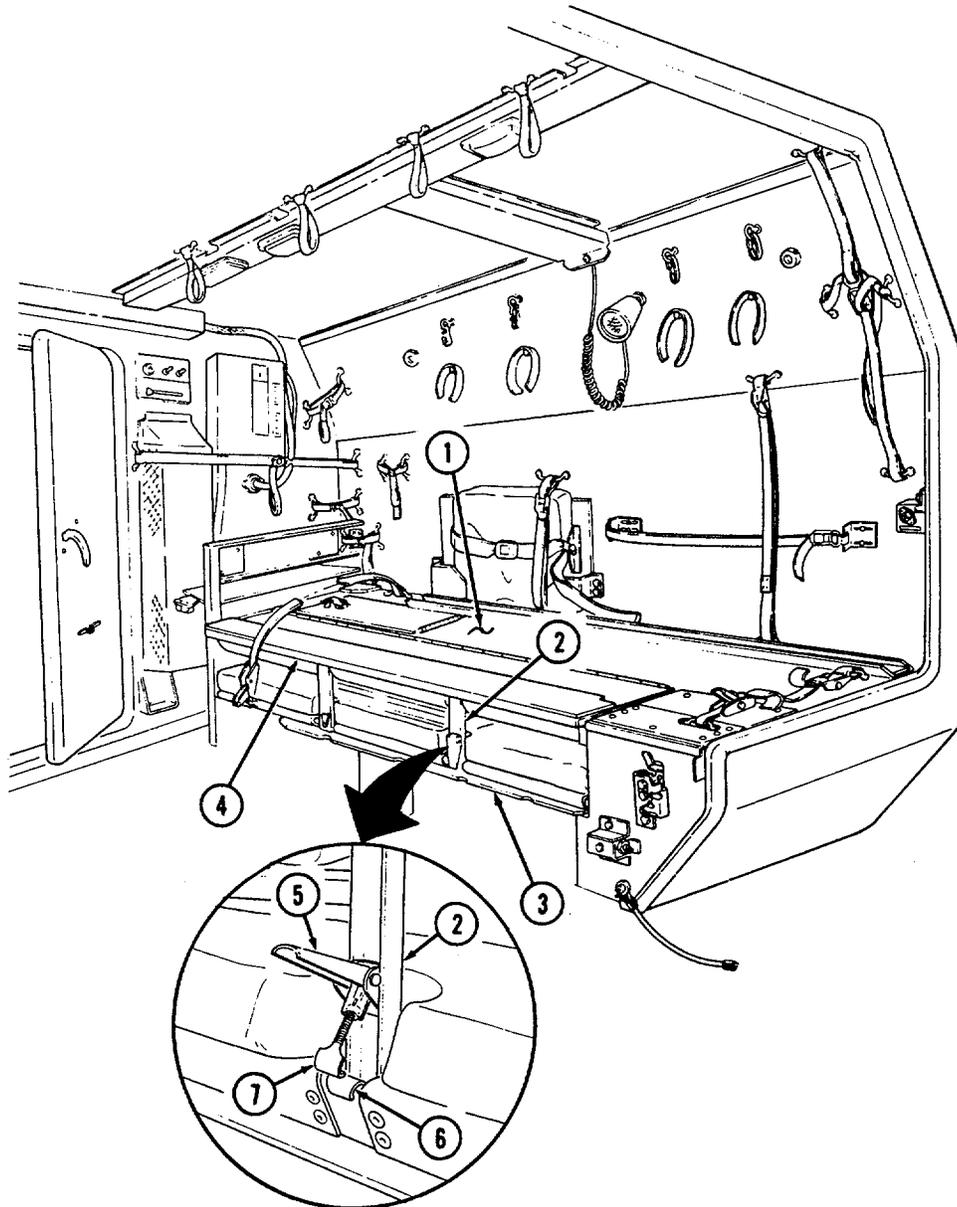
- (5) Slide litters into stowage compartment (9) on top of lift tray (7). Pull out supports (8) to place lift tray (7) in raised position.
- (6) Place folded litter rail extension (1) into stowage compartment (9) and secure with strap (10).
- (7) Close door (3) and turn latch (11) clockwise to secure door (3).





h. Opening Patient Seat to Accommodate Ambulatory Patients.

- (1) Ensure litters (1) are in stowed position.
- (2) Pull out and up on seat latch handle (5) and remove latch (7) from catch (6).
- (3) Lift seatback (4) to open position and fold seatback support (2) into recesses between seat cushions (9).
- (4) Ensure that seat braces (8) are fully extended and locked in position.

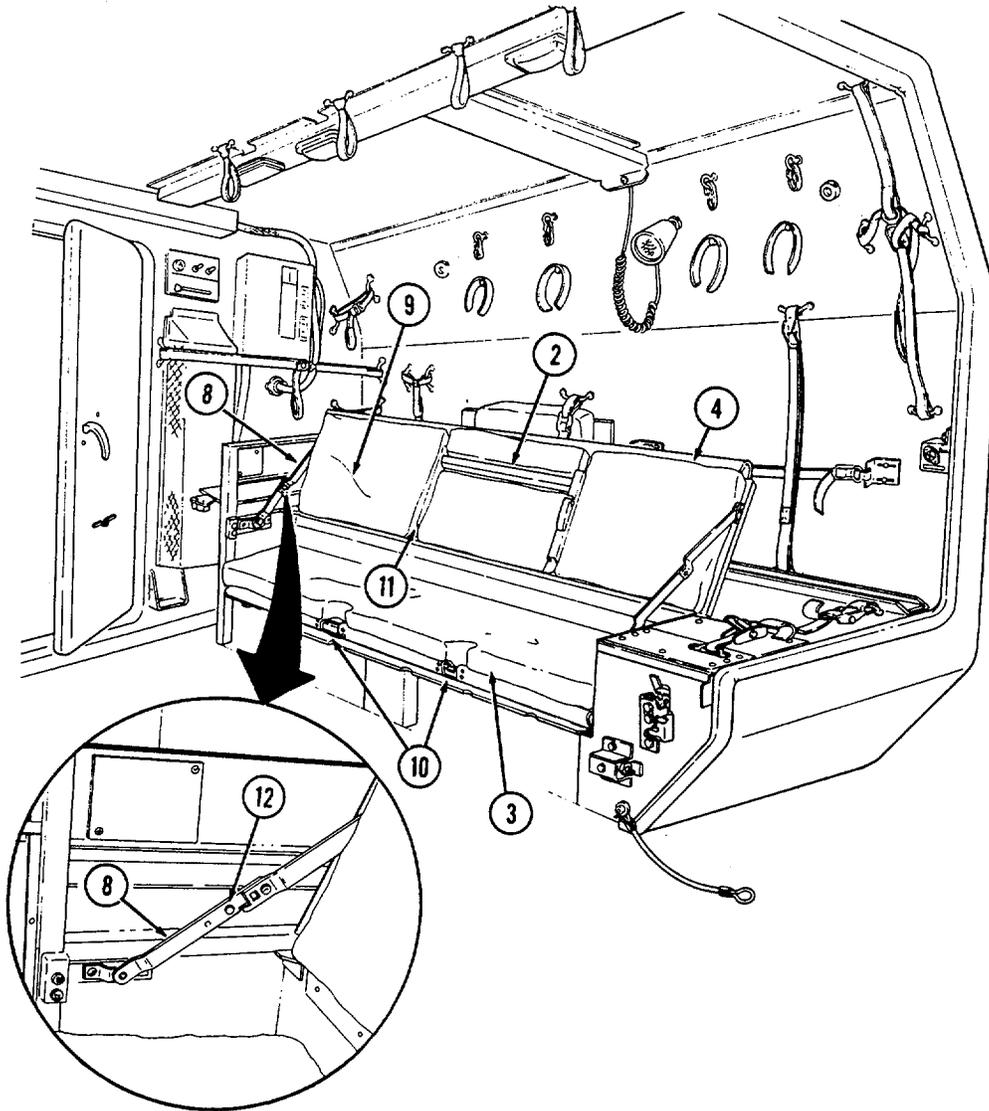


i. Closing Patient Seat to Accommodate Litter Patients.

(1) Press lock buttons (12) on seat braces (8) and fold braces (8) toward seatback (4).

(2) Fold seatback support (2) outward and fold seatback (4) into closed position. Ensure that guide pins (11) on seatback support (2) engage holes (10) in seat base (3).

(3) Install seatback (4) to seat base (3) with seat latch (7) and catch (6). If necessary to ensure security of seatback (4), adjust seat latch (7) to proper length by turning clockwise or counterclockwise.



2-63. AMBULANCE NBC SYSTEM OPERATION

WARNING

- NBC filters do not protect against carbon monoxide poisoning.
- NBC filters do not decontaminate or neutralize contamination, they only collect and contain it.
- NBC contaminated filters must be handled using adequate precaution (FM 3-5) and must be disposed of by trained personnel.
- After Nuclear, Biological, or Chemical (NBC) exposure of this vehicle, all air filters shall be handled with extreme caution. Unprotected personnel may experience injury or death if residual toxic agents or radioactive material are present. Servicing personnel will wear protective overgarments, mask, hood, and chemical protective gloves and boots. All contaminated air filters will be placed into double-lined plastic bags and moved immediately to a temporary segregation area away from the work site. If contaminated by radioactive dust, the Company NBC team will measure the radiation before removal. The NBC team will determine the extent of safety procedures required. The temporary segregation area will be marked with the appropriate NBC signs. Final disposal of contaminated air filters will be in accordance with local SOP.
- Failure to observe above warnings may result in injury or death.

a. General

(1) For operation in an NBC environment, M996, M996A1, M997, M997A1, and M997A2 ambulances are equipped with a collective NBC protection system known as a Gas-Particulate Filter Unit (GPFU). The GPFU forces filtered, temperature-controlled air to the facepiece of the M25 series protective mask or the M13 series patient protective mask, increasing NBC protection, easing breathing effort, and reducing stress and heat fatigue during extended periods of NBC operation.

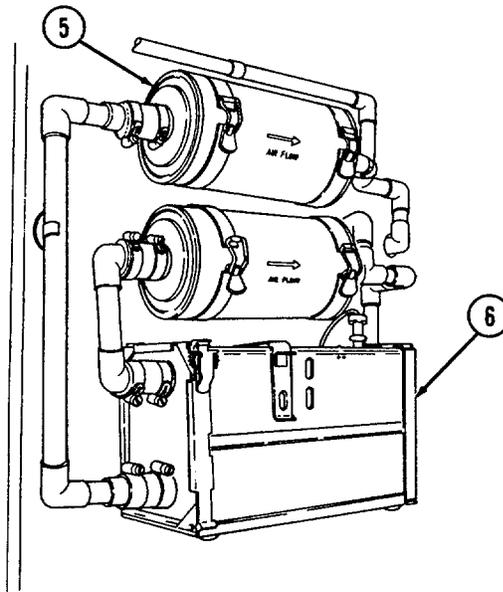
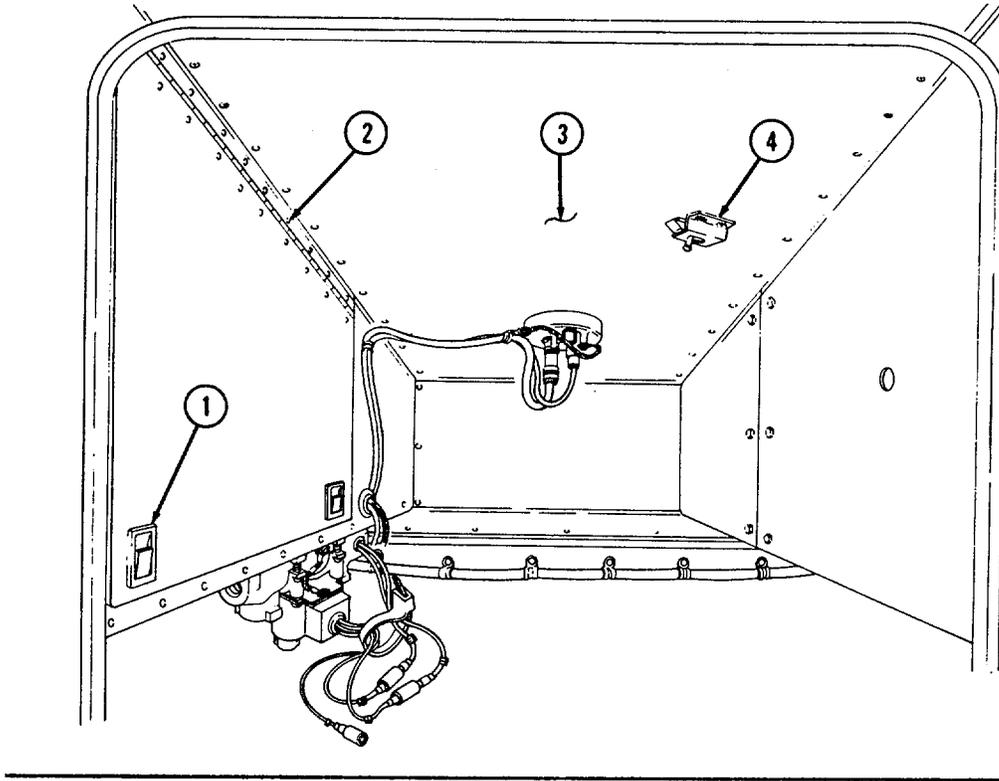
(2) The GPFU system mounted in M996 and M996A1, M997, M997A1, and M997A2 ambulances include the following components:

- M1A1-19 precleaner (blower)/particulate filter unit
- M18 gas filters (two per vehicle)
- NBC control panel and wiring harness
- Five or seven individual NBC heaters
- PVC or flex tubing to connect filter precleaner/particulate filter and heaters.

b. Component Location and Identification.

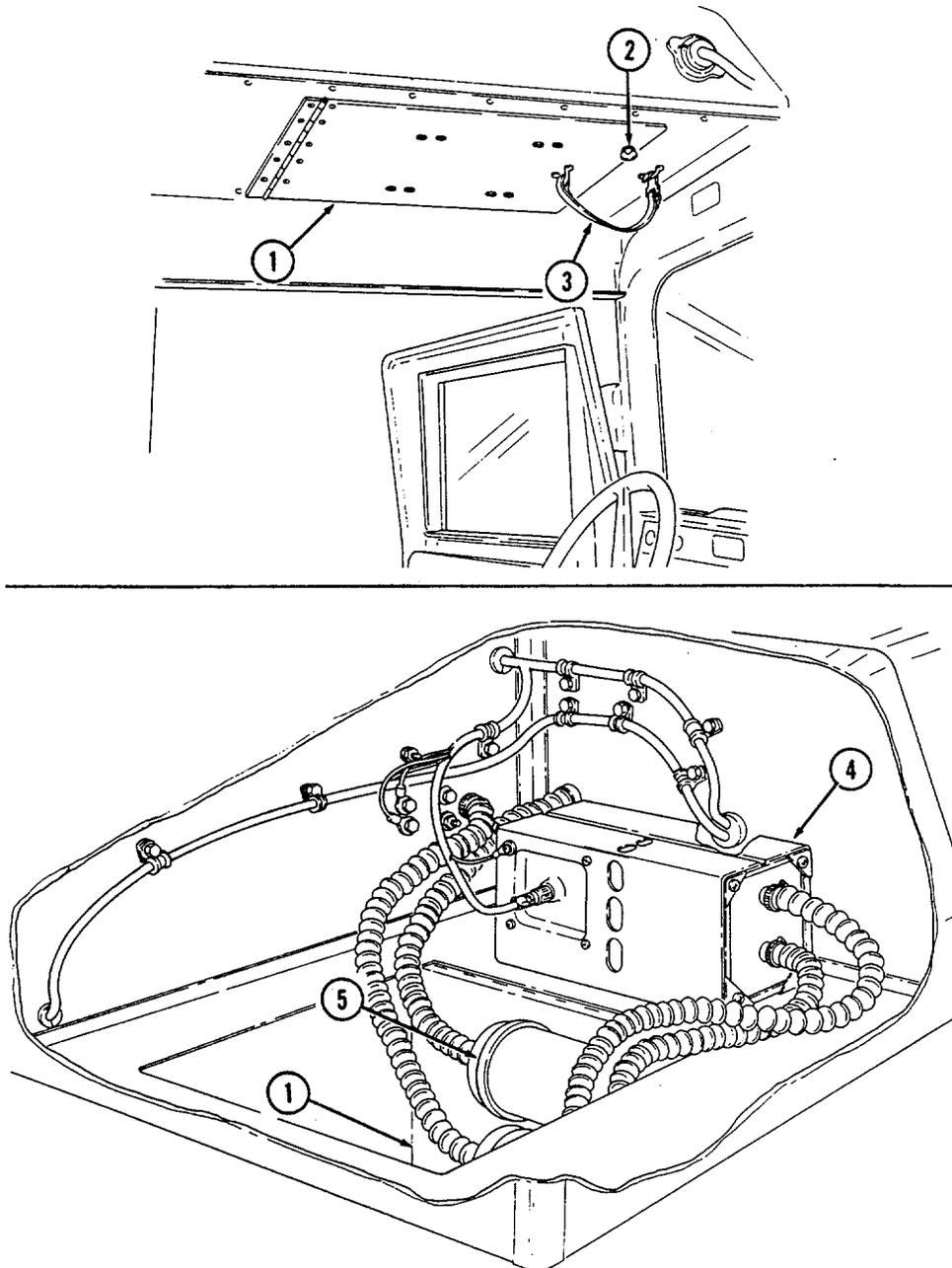
(1) The precleaner/particulate filter unit (6) and the two gas filters (5) are located in the NBC stowage compartment above the driver's position. In the M997, M997A1, and M997A2 ambulances, entry to this compartment is gained by unlatching the two paddle locks (1) and securing the NBC access door (2) to the ceiling (3) with the door catch (4).

M997, M997A1, AND M997A2

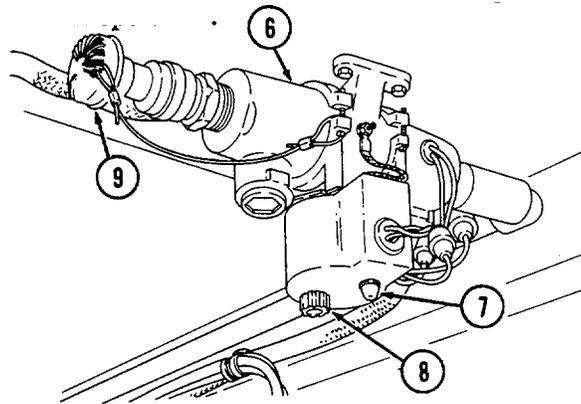


(2) In the M996 and M996A1 ambulances, the precleaner/particulate filter unit (4) and two gas filters (5) are mounted in a similar configuration to the M997, M997A1, and M997A2. Entry into the NBC compartment is gained through the NBC access door (1) located directly over the driver's head by removing the safety strap (3) and loosening two captive wing head screws (2) and carefully lowering the NBC access door (1). M18 gas filters in both vehicles are replaced in a similar manner. Contaminated M18 gas filters and the precleaner/particulate filter units should only be replaced by specially-trained NBC personnel.

M996 AND M996A1

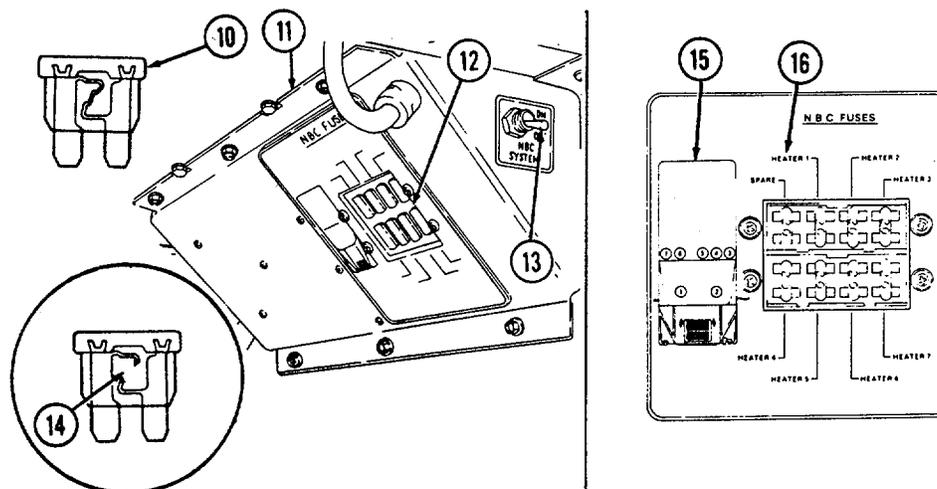


(3) The NBC heaters (6) supply heated air to protective mask facepieces connected to the GPFU system. Five heaters are installed in the M996 and M996A1 ambulances; three in the patient compartment and two in the cab. Seven heaters are installed in the M997, M997A1, and M997A2 ambulances; five in the patient compartment and two in the cab. When the heater (6) is not in use, the protective cap (9) should be installed in the heater (6) outlet. The cap (9) is a one-way check valve allowing air to flow in only one direction, outward from the heater (6). This reduces the potential risk of NBC contamination to the vehicle's NBC system. The heater (6) is activated by turning the temperature control knob (8) clockwise and adjusting to the desired heat level. The indicator light (7) will illuminate when the heater (6) is in operation.



(4) The NBC control box (11) is mounted in the cab above and behind the passenger position. It houses the control switch (13) for the system and a fuse panel (12). A diagram (15) on the control box (11) shows heater location and identifies the fuse responsible for each heater circuit (16). Spare fuses are also present.

(5) To replace a NBC fuse (10), simply pull it straight out of the fuse panel (12). Check fuse (10) for an open fuse element or a melted fuse link (14). If the fuse (10) is damaged, replace with a new fuse (10). All fuses in the NBC control box are 20 amp.



c. NBC System Operation.

(1) Activate the collective NBC protection system by positioning the NBC control switch (2) on the NBC control box (1) to the "ON" position. The M1A1-19 precleaner/particulate unit blower should engage.

(2) M25 series protective mask (10): remove protective cap (3) from heater outlet (4) and connect either the six or nine foot air hose (8) to canister coupling (9). Connect hose coupling (7) to the heater outlet (4).

(3) M13 series patient protective mask (11): mask the patient with the M13 series mask (11). Connect either the six or nine foot air hose (8) to adapter (13) and connect adapter (13) to protective mask facepiece (12). Remove protective cap (14) from the heater outlet (15) and connect hose coupling (7) to heater outlet (15).

(4) Turn heater control (6) to "WARMER" and adjust to desired heat level. Indicator light (5) should illuminate when heater is on.

(5) To shut down the NBC system, use the following procedure:

- (a) Unmask crew and patients when all clear is sounded.
- (b) Remove mask air lines from heater outlets.
- (c) Install protective caps on heater outlets.
- (d) Position switch on NBC control box to "OFF" position.
- (e) Clean/decontaminate and stow NBC gear.

