CHAPTER 3
MAINTENANCE INSTRUCTIONS
SECTION I. LUBRICATION

3-1. LUBRICATION INSTRUCTIONS

Lubrication Instructions, Appendix G, designate cleaning and lubricating procedures for M998 series vehicles.

3-2. GENERAL LUBRICATION INSTRUCTIONS

a. Service Intervals. Service intervals on the lubrication instructions are for normal operation in moderate temperatures, humidity, and atmospheric conditions.

b. Application Points. Wipe clean lubricating points and surrounding surfaces before and after applying lubricant.

c. Reports and Records. Report unsatisfactory performance of lubricant or preserving materials on Quality Deficiency Report, SF 368, as stated in paragraph 1-4.

3-3. GENERAL LUBRICATING INSTRUCTIONS UNDER UNUSUAL CONDITIONS

a. Service Intervals. Increase frequency of lubricating service when operating under abnormal conditions such as high or low temperatures, prolonged high-speed driving, or extended cross-country operations. Such operations can destroy lubricant's protective qualities. More frequent lubricating service intervals are necessary to maintain vehicle readiness when operating under abnormal conditions. During inactive periods, with adequate preservation, service intervals can be extended.

b. Changes in Lubricant Grades. Lubricant grades change with weather conditions. Refer to Appendix G for lubricant grade changes.

c. Maintaining Lubricant Levels. Lubricant levels must be checked as specified in Appendix G. Steps must be taken to replenish and maintain lubricant levels.

3-4. LUBRICATION FOR CONTINUED OPERATION BELOW 0°F (-18°C)

Refer to FM 9-207, Operation and Maintenance of Ordnance Materiel in Cold Weather (0°F to -65°F) (-18°C to -54°C), or Appendix G.

SECTION II. TROUBLESHOOTING

3-5. GENERAL

Troubleshooting, table 3-1, contains instructions that will help the operator identify and correct simple vehicle malfunctions. The table also helps the operator identify major mechanical difficulties that must be referred to unit maintenance. The listing of possible malfunctions come under major vehicle headings. They are:

- Engine
- Heating system
- Transmission
- Transfer case
- Brakes
- Wheels and tires
- Steering
- Winch
- Special purpose bodies

3-6. TROUBLESHOOTING PROCEDURES

a. Table 3-1 lists the common malfunctions which you may find during the operation or maintenance of M998 series of vehicles or its components. You should perform the tests/inspections and corrective actions in the order listed.

b. This manual cannot list all malfunctions that may occur, nor all tests or inspections and corrective actions. If a malfunction is not listed or is not corrected by listed actions, notify your supervisor.

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.

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 for further engine tests if you suspect hydrostatic lock.

Table 3-1. Troubleshooting

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

ENGINE

1. ENGINE FAILS TO CRANK

Step 1. Check to see if transmission shift lever is in "N" (neutral) or "P" (park) for M1123 and A2 vehicles.

If not, place lever in "N" (neutral) or "P" (park).

Step 2. Check battery fluid level and check battery connections for looseness, damage, or corrosion.

If any of these conditions exist, notify unit maintenance.

Step 3. Attempt to slave-start vehicle (para. 2-23).

Step 4. Other causes.

Notify unit maintenance.

2. ENGINE CRANKS SLOWLY

Step 1. Check battery fluid level and check battery cable connections for looseness, damage, or corrosion.

If any of these conditions exist, notify unit maintenance.

Step 2. Attempt to slave-start vehicle (para. 2-23).

Step 3. Other causes.

Notify unit maintenance.

3. ENGINE CRANKS BUT DOES NOT START

Step 1. Check to see if fuel gauge indicates "E" (empty).

Fill fuel tank, and start engine.

Step 2. Purge fuel system of air (para. 3-10).

Step 3. Check to see if WAIT-TO-START lamp assembly fails to light or does not go out.

Notify unit maintenance if wait-to-start lamp assembly fails to light or does not go out.

Step 4. Other causes.

Notify unit maintenance.

4. VEHICLE NOT CHARGING ACCORDING TO VOLTMETER

Step 1. Check battery cable connections for looseness, damage, or corrosion.

Notify unit maintenance of any damage to battery cables.

Step 2. Check for broken or missing alternator belts.

Notify unit maintenance if alternator belts are broken or missing.

Step 3. Other causes.

Notify unit maintenance.

Table 3-1. Troubleshooting (Cont'd)

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

5. EXCESSIVE EXHAUST SMOKE AFTER ENGINE REACHES NORMAL OPERATING TEMPERATURE 190°-230°F (88°-110°C)

Step 1. Check oil level for overfilling (Appendix G).
Notify unit maintenance if fluid level is high.

Step 2. Check for restricted air cleaner.
If emergency situation exists, clean air cleaner element (para. 3-15).
If emergency situation does not exist, notify unit maintenance.

Step 3. Other causes.
Notify unit maintenance.

6. ENGINE STARTS BUT MISFIRES, RUNS ROUGH, OR LACKS POWER

Step 1. Check for water in fuel filter by draining.
Drain fuel filter (para. 3-10).

Step 2. Check for restricted air cleaner.
If emergency situation exists, clean air cleaner element (para. 3-15).
If emergency situation does not exist, notify unit maintenance.

Step 3. Other causes.
Notify unit maintenance.

7. ENGINE OVERHEATS ACCORDING TO ENGINE COOLANT TEMPERATURE GAUGE

Step 1. Check to see if fan is running.
If fan is not running, perform emergency fan clutch override procedure (para. 3-23).

Step 2. Allow engine to cool and check for low coolant level.
Add coolant as necessary (para. 3-9).

Step 3. Check for debris blocking radiator fins.
Remove debris.

Step 4. Check for broken or missing fan belts.
Notify unit maintenance if belts are broken or missing.

Step 5. Other causes.
Notify unit maintenance.

8. LOW ENGINE OIL PRESSURE ACCORDING TO OIL PRESSURE GAUGE

Step 1. Check for low oil level (para. 3-17).
Add oil (Appendix G).

Step 2. Other causes.
Notify unit maintenance.

Table 3-1. Troubleshooting (Cont'd)

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

HEATING SYSTEM

9. HOT WATER PERSONNEL HEATER FAILS TO PRODUCE HEAT AFTER ENGINE REACHES OPERATING TEMPERATURE

Step 1. Check operating controls for correct settings.

Step 2. Other causes.

Notify unit maintenance.

TRANSMISSION

10. NO RESPONSE TO SHIFT LEVER MOVEMENT

Step 1. Check to see if transfer case lever is in "N" (neutral) or "P" (Park) for M1123 and A2 vehicles.

Place transmission shift lever in "N" (neutral) or "P" (Park) and select transfer gear range.

Step 2. Other causes.

Notify unit maintenance.

11. ROUGH SHIFTING

All causes.

Notify unit maintenance.

12. FLUID THROWN FROM TRANSMISSION FILL TUBE

Step 1. Check to see if transmission dipstick is loose.

Secure dipstick.

Step 2. Check fluid level for overfilling (para. 3-19).

Notify unit maintenance if fluid level is high.

Step 3. Other causes.

Notify unit maintenance.

13. SLIPPAGE IN ALL RANGES

Step 1. Check for low fluid level (para. 3-19).

Add fluid (Appendix G).

Step 2. Other causes.

Notify unit maintenance.

TRANSFER CASE

14. TRANSFER CASE SHIFT LEVER WILL NOT SHIFT

Step 1. Check for proper shifting sequence. Ensure proper shifting sequence is used (para. 2-11).

Step 2. Other causes.

Notify unit maintenance.

Table 3-1. Troubleshooting (Cont'd)

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

BRAKES

15. POOR SERVICE BRAKING ACTION

All causes.

Notify unit maintenance.

16. SERVICE BRAKES DRAGGING

All causes.

Notify unit maintenance.

17. BRAKE WARNING LAMP ASSEMBLY ON

Step 1. Check to see if parking brake is partially applied.

Disengage parking brake.

Step 2. Check for low brake fluid level (TM 9-2320-280-20).

Add brake fluid (Appendix G).

Step 3. Other causes.

Notify unit maintenance.

18. PARKING BRAKE FAILS TO HOLD VEHICLE

Clean and adjust parking brake (para. 3-13)

If parking brake still fails to hold vehicle, notify unit maintenance.

WHEELS AND TIRES

19. WHEELS WOBBLE OR SHIMMY

Step 1. Check to see if wheel lug nuts are loose.

Tighten loose lug nuts (para. 3-26) and notify unit maintenance to properly torque lug nuts.

Step 2. Inspect for mud or dirt build up inside the rim.

Remove any mud or dirt build up.

Step 3. Other causes.

Notify unit maintenance.

20. EXCESSIVE OR UNEVEN TIRE WEAR

Step 1. Check tire air pressure.

Inflate or deflate tires to correct air pressure.

Step 2. Other causes.

Notify unit maintenance.

21. VEHICLE WANDERS TO ONE SIDE ON LEVEL PAVEMENT

Step 1. Check tire air pressure.

Inflate or deflate tires to correct air pressure.

Step 2. Other causes.

Notify unit maintenance.

Table 3-1.Troubleshooting (Cont'd)

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

STEERING

22. HARD STEERING

Step 1. Check tire air pressure.
Inflate or deflate tires to correct air pressure.

Step 2. Check power steering reservoir for low fluid level (para. 3-20).
Add steering fluid (Appendix G).

Step 3. Check for broken or missing power steering belts.
Notify unit maintenance if belts are broken or missing.

Step 4. Check power steering cooler for bent fins or any other air flow obstructions.
Remove obstructions if fins are not damaged.
Notify unit maintenance if power steering cooler is damaged.

Step 5. Other causes.
Notify unit maintenance.

WINCH

23. WINCH STOPS DURING NORMAL OPERATION

Step 1. Wait 2 minutes and attempt winch operation again.
Refer to para. 2-26 for winch operation.

Step 2. Check to see if clutch lever is engaged (para. 2-26).
If not, engage clutch lever.

Step 3. Check to see if voltmeter is in red or yellow (engine not running).
Start engine and charge batteries.

Step 4. Other causes.
Notify unit maintenance.

SPECIAL PURPOSE BODIES
TOW/ARMAMENT CARRIER

24. WEAPON STATION WILL NOT ROTATE OR LOCK

Step 1. Check to see if brake handle is in proper position (para. 2-54).
Place brake handle in proper position.

Step 2. Check for obstructions that may be restricting weapon station movement.
Remove obstructions.

Step 3. Other causes.
Notify unit maintenance.

25. CARGO SHELL DOOR WILL NOT SEAL PROPERLY

All causes.
Notify unit maintenance.

Table 3-1. Troubleshooting (Cont'd)

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

AMBULANCE

26. ALL CEILING WHITE UGHTS, BLACKOUT UGHTS, AND SPOTLIGHTS FAIL TO ILLUMINATE

Step 1. Check that interior light switch on control box is in proper position.
Place interior light switch in proper position (para. 2-61).

Step 2. If white light illumination is required under blackout conditions, make sure front door, rear doors, and rear steps are closed.

Step 3. For white illumination with front door, rear doors, and rear steps opened, set the vehicle light switch to “service drive" (para. 2-13).

Step 4. Check that left and right lighting fuses are serviceable.
Replace fuses if blown (para. 2-61).

Step 5. Other causes.
Notify unit maintenance.

27. LEFT OR RIGHT CEILING WHITE LIGHTS AND BLACKOUT LIGHT FAIL TO ILLUMINATE

Step 1. Check that left lighting or right lighting fuse is serviceable.
Replace fuse if blown (para. 2-61).

Step 2. Other causes.
Notify unit maintenance.

28. CEIUNG WHITE UGHT OR BLACKOUT UGHT FAILS TO ILLUMINATE

Step 1. Inspect bulb for serviceability.
Replace bulb with known serviceable bulb (para. 3-28).

Step 2. Other causes.
Notify unit maintenance.

29. SPOTUGHT FAILS TO ILLUMINATE

Step 1. Perform malfunction 26, steps 1 through 3.

Step 2. Check if ceiling lights illuminate. If dome lamps illuminate, check to ensure spotlight switch is in proper position.
Place spotlight switch in proper position (para. 2-61).

Step 3. Inspect bulb for serviceability.
Replace bulb with known serviceable bulb (para. 3-28).

Step 4. Other causes.
Notify unit maintenance.

Table 3-1. Troubleshooting (Cont'd)

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

30. POOR HEATING, VENTILATING, OR AIR-CONDITIONING PERFORMANCE

Step 1. Ensure that operating controls are properly set.
Set operating controls (para. 2-61).
Step 2. Inspect HVAC filters for excessive dust, dirt, or debris.
Service HVAC filters (para. 3-28).
Step 3. Inspect HVAC fuses for a blown or missing fuse.
Notify unit maintenance.
Replace fuse (para. 2-61).
Step 4. Other causes.
Notify unit maintenance.

Section III. MAINTENANCE PROCEDURES

3-7. GENERAL

The operator/crew is responsible for daily, weekly, and monthly preventive maintenance checks and services listed in table 2-2. Certain other maintenance services, also the responsibility of the operator/crew, are explained in this section.

3-8. RAISING AND SECURING HOOD

a. Raising Hood.

(1) Apply parking brake.

(2) Release left and right hood latches (1).

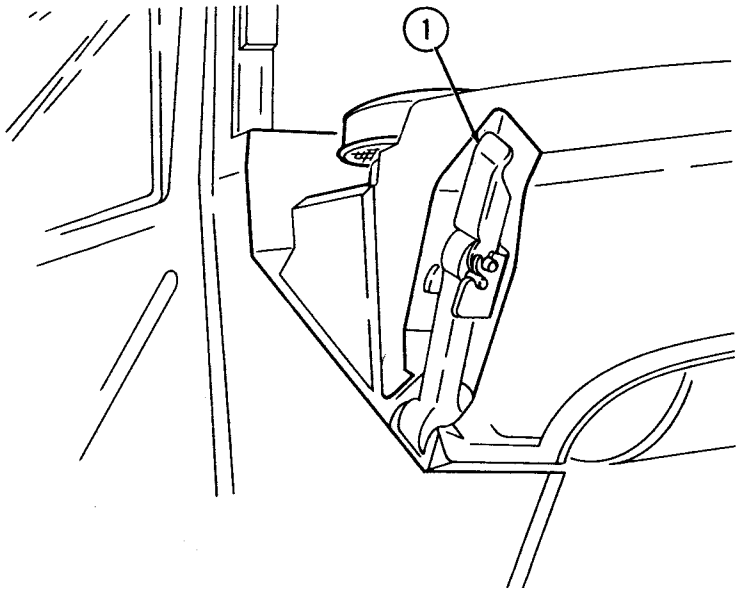
WARNING

To ensure opening of the hood assembly is accomplished safely and effectively, always maintain the proper lifting posture with legs bent and back straight. Failure to do so may cause damage to equipment or injury to personnel.

(3) Facing the driver's side of the hood, position one hand at the rear area of the hood and the other at the rear area of the wheel well.

NOTE

Due to the inherent weight of the assembly, the hood may flex when opening, possibly causing interference between the right side of the hood assembly and the body. This interference can be eliminated by pushing the hood assembly laterally, away from the individual, prior to lifting.



WARNING

When raising and securing hood, ensure the hood prop rod is secured to hood support bracket. Damage to equipment or injury to personnel will occur if hood is not properly secured in raised position.

(4) Push the hood toward the passenger side and lift at the same time, moving your hands toward the front of the hood as it opens. The prop rod (2) should automatically engage the support bracket (3) when hood is raised.

b. Lowering hood.

WARNING

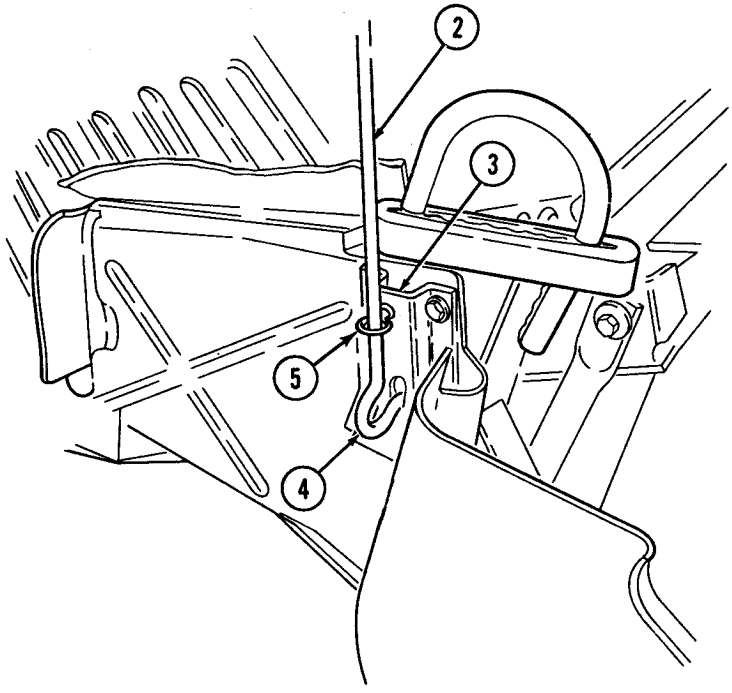
When releasing hood prop rod, do not pull rod at hook end. Injury to fingers will result.

CAUTION

Lower hood slowly. Damage to hood and/or headlights can occur if hood is dropped.

(1) While supporting and slightly raising the hood, grasp prop rod (2) above retaining ring (5), pull out, and release hood prop rod (2).

(2) Once the prop rod hook (4) is clear of the support bracket (3), slowly lower hood and secure left and right hood latches (1).



3-9. SERVICING COOLANT SURGE TANK

WARNING

Extreme care should be taken when removing surge tank filler cap if temperature gauge reads above 165°F (74°C). Do not add coolant to cooling system when engine is hot unless engine is running. Add coolant slowly. Steam or hot coolant under pressure will cause injury.

a. Raise and secure hood (para. 3-8).

b. Visually check coolant level. Surge tank level should be at “COLD FILL LINE" before operation and slightly above "COLD FILL LINE” after operation. If coolant is low, perform steps c through h.

c. Place a thick cloth over surge tank filler cap (1). Carefully turn cap (1) counterclockwise to its first stop to allow cooling system pressure to escape.

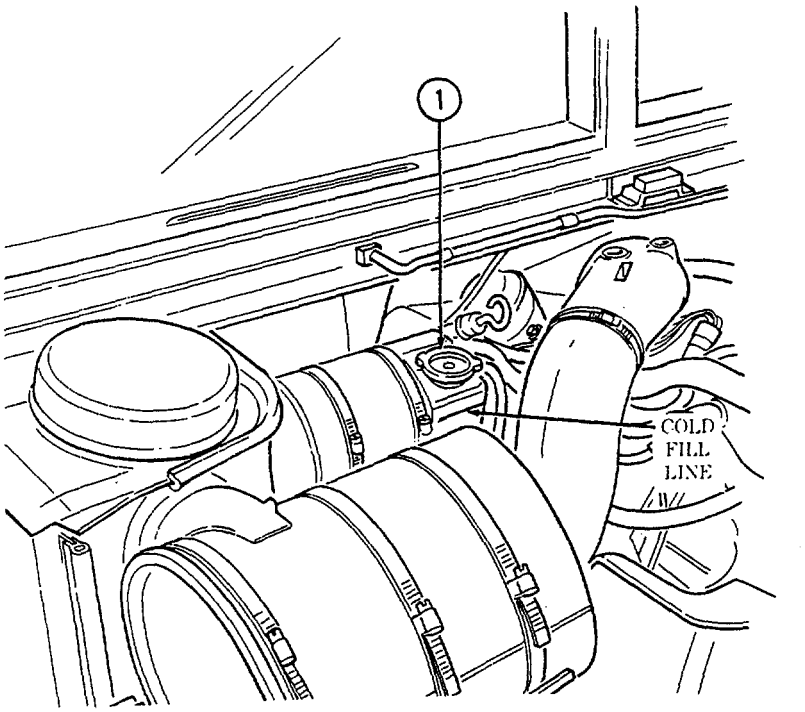
d. After cooling system pressure is vented, push down and turn cap (1) counter-clockwise to remove. Add coolant until surge tank level is at "COLD FILL LINE."

e. Start engine (para. 2-10) and run for one minute.

f. Stop engine (para. 2-12) and recheck coolant level. If coolant level is low, add coolant until surge tank level is at "COLD FILL LINE."

g. Repeat steps e and f until surge tank level remains at “COLD FILL LINE."

h. Install cap (1). Lower and secure hood (para. 3-8).



3-10. FUEL FILTER MAINTENANCE

WARNING

Do not perform fuel system checks, inspection, or maintenance while smoking or near fire, flames, or sparks. Fuel may ignite, causing damage to vehicle and injury or death to personnel.

a. Draining Fuel Filter.

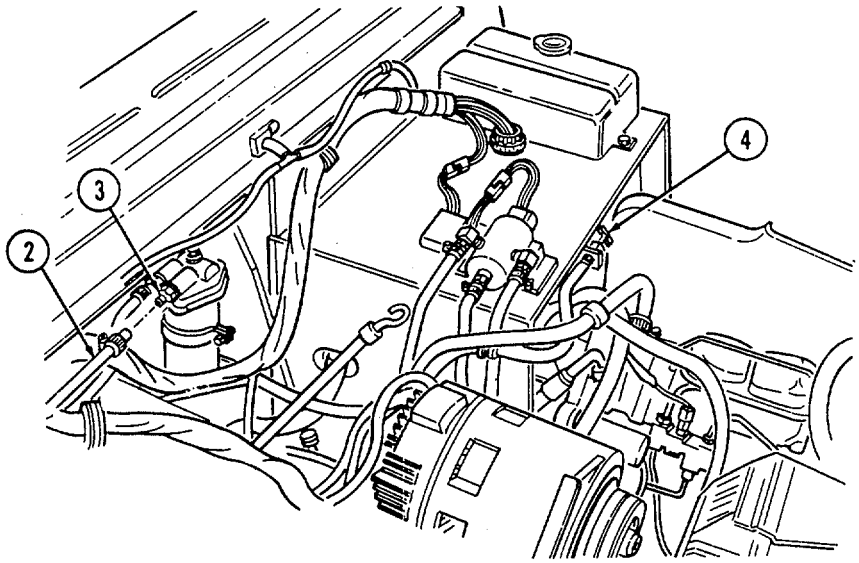
(1) Raise and secure hood (para. 3-8).
(2) Start engine (para. 2-10).
(3) Open fuel draincock (4) and allow approximately 1 pint (0.47 L) of fuel to drain into a suitable container.
(4) Close draincock (4) when draining is complete.
(5) Shut off engine (para. 2-12).
(6) Lower and secure hood (para. 3-8).

b. Purging Fuel System of Air.

NOTE

This procedure is used to purge fuel system of air if vehicle has run out of fuel.

(1) Raise and secure hood (para. 3-8).
(2) Disconnect fuel line (2) from fuel filter outlet (3).
(3) Place a rag over fuel filter outlet (3).
(4) Crank engine until rag is wet with fuel.
(5) Connect fuel line (2) to fuel filter outlet (3).
(6) Start engine (para. 2-10) and ensure fuel system has been purged of air.



3-11. SERVICING BATTERIES

a. Unhook latches (6) securing companion seat (1) to battery box and remove companion seat (1).

WARNING

Do not perform battery system checks or inspections while smoking or near fire, flames, or sparks, especially if the caps are off. Batteries may explode causing damage to vehicle and injury or death to personnel.

b. Check electrolyte level.

(1) Unscrew and remove all battery filler caps (2) and check electrolyte level. If electrolyte level is below the ledge in the battery filler opening, add distilled water (appendix D, item 27).

(2) A battery that is continually in need of electrolyte may indicate an improperly adjusted charging system. Notify unit maintenance if the problem continues.

(3) Inspect the vented battery filler caps (2) to ensure that vents are clear, unobstructed, and permit escape of battery gases. Clean vents if obstructed; replace caps (2) if damaged.

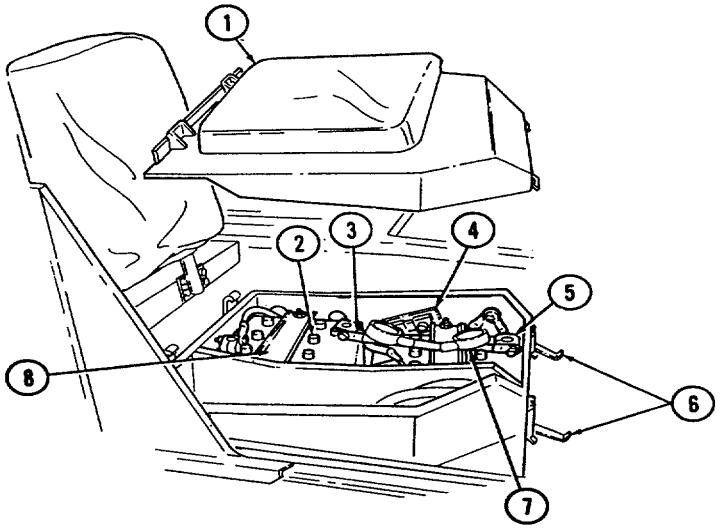
(4) Install filler caps (2).

c. Inspect all battery compartment components, including terminal clamps (5), battery cables (3), battery holddowns (8), and shunt (4) for corrosion, damage, or looseness. Inspect terminal boots (7), if installed. Notify unit maintenance if any of these problems exist.

d. Ensure that battery terminal clamps (5) have a light coat of lubricating oil for corrosion protection. Refer to appendix D, item 19.

e. Install companion seat (1) and secure to battery box with latches (6).

f. Refer to TM 9-6140-200-14 for additional information.



3-12. FIRST-AID KIT RELOCATION

NOTE

Reports from the field indicate that first-aid kit, stored under the companion seat and in the battery box compartment, can be contaminated by battery acid residues. At the discretion of the unit commander, the first-aid kit can be removed, cleaned, and relocated under the driver's seat.

a. First-aid Kit Removal.

(1) Remove companion seat (para. 2-15).

(2) Remove first-aid kit (9) from bracket and strap assembly (10) located inside battery box compartment (14).

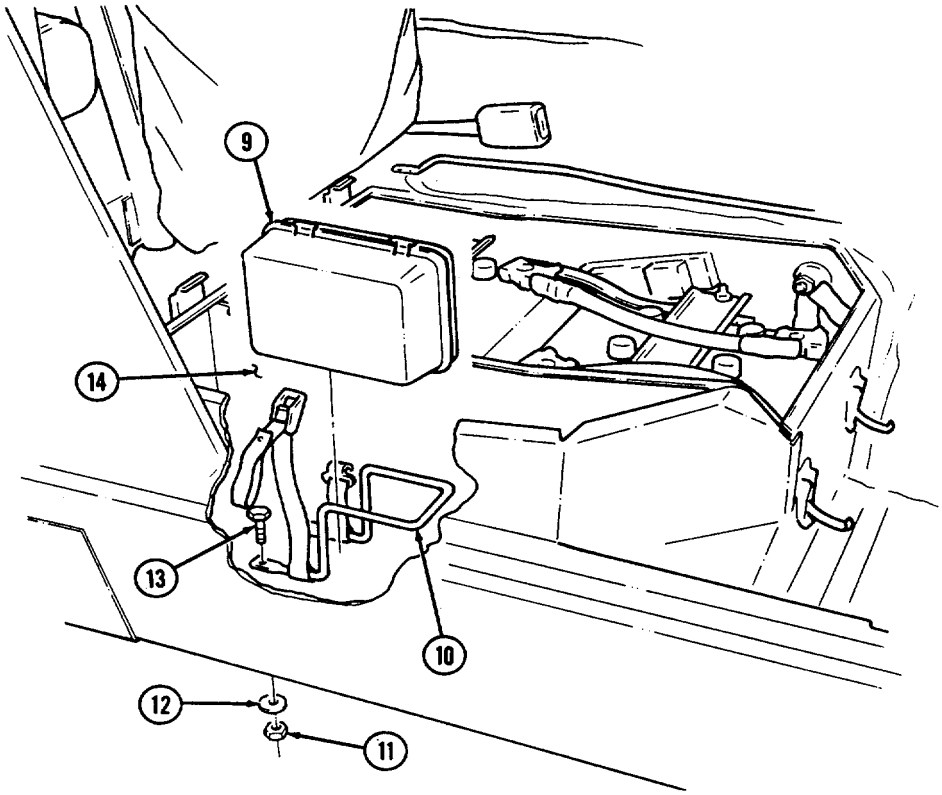
(3) Remove two screws (13), nuts (11), four washers (12), and bracket and strap assembly (10) from battery box compartment (14).

(4) Install companion seat (para. 2-15).

b. First-aid Kit Cleaning.

(1) Using a solution of sodium bicarbonate and water, wash the outside of first-aid kit (9), rinse, and dry completely.

(2) Inspect inside of first-aid kit (9) for evidence of contamination. If contaminated, replace first-aid kit (9).



c. First-aid Kit Installation.

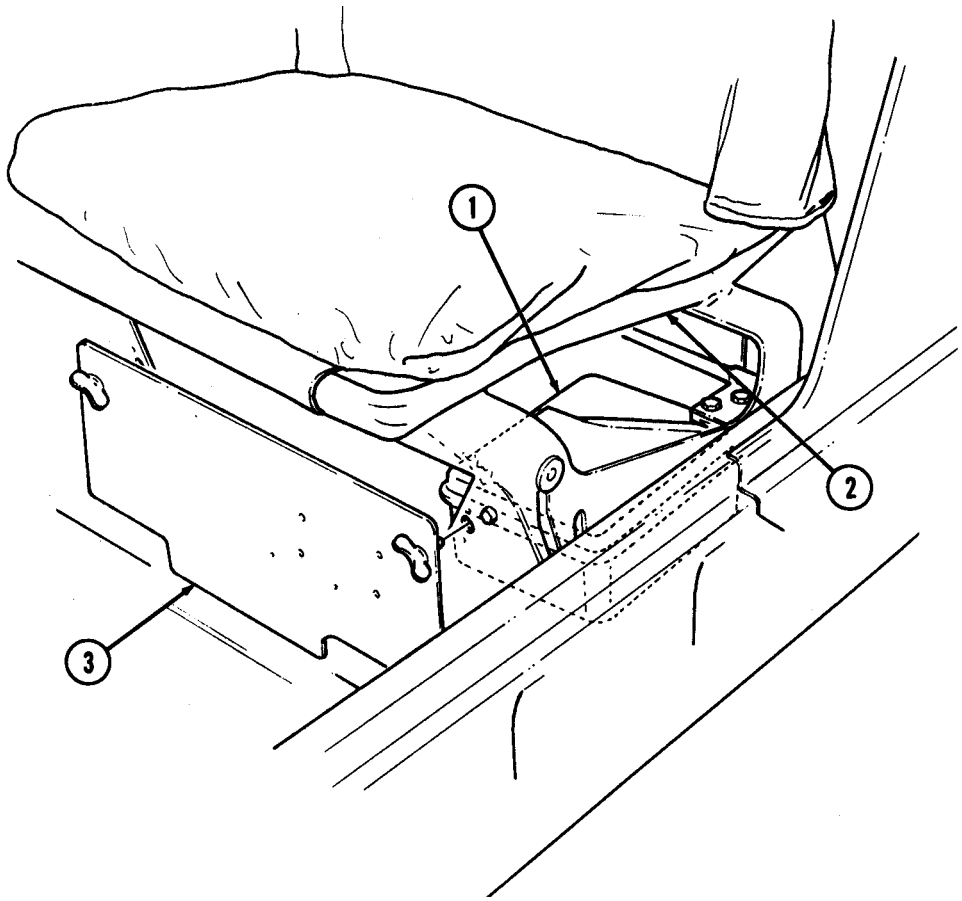
NOTE

An optional cotton duck pamphlet bag (Appendix C, Item 2) can be used to protect first-aid kit.

(1) Remove front access plate (3) from driver's seat (2).

(2) Position first-aid kit (1) under driver's seat (2).

(3) Install front access plate (3) on driver's seat (2).

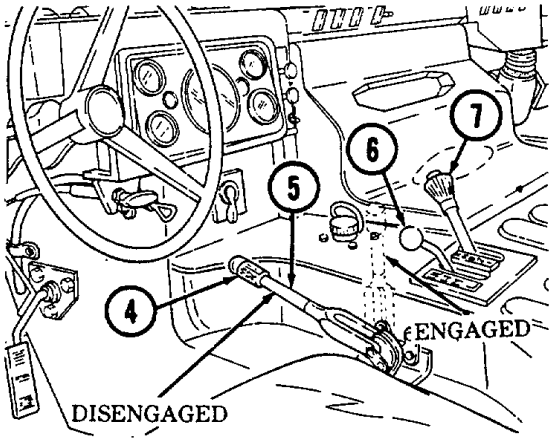


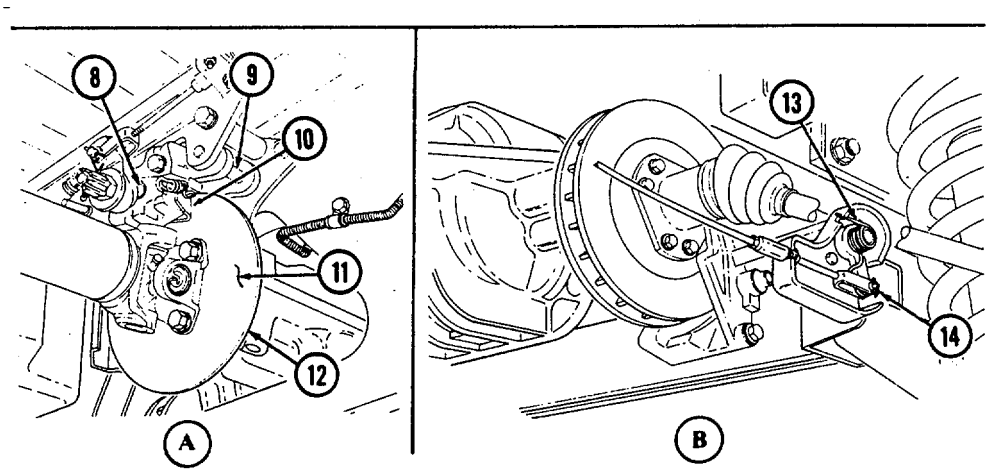
3-13. PARKING BRAKE ADJUSTMENT AND CLEANING

a. Chock wheels and release parking brake handle (5).
b. Turn adjusting knob (4) clockwise as tightly as possible by hand.
c. Apply parking brake handle (5).
d. If parking brake cannot be applied, turn adjusting knob (4) counterclockwise until parking brake can be applied.
e. Test parking brake:
(1) Remove chocks.
(2) Depress service brake pedal and start engine (para. 2-10).
(3) Place transfer case shift lever (6) in "H" (high) and transmission shift lever (7) in "D" (drive).
(4) Slowly let up on service brake pedal. Parking brake should hold vehicle stationary.
f. Vehicles are equipped with one of two types of parking brake assemblies. Check to see if vehicle is equipped with parking brake assembly (A) or parking brake assembly (B). Perform step (1) for parking brake assembly (A) or step (2) for brake assembly (B).

(1) After operating in mud or sand, use a low pressure water source to ensure that the parking brake pads (10), rotor (12), pad-rotor contact areas (11), guide pins (9), and push pins (8) are thoroughly cleaned of mud, sand, or other debris. Lubricate items 8 and 9 in accordance with Appendix G as soon as possible.

(2) After operating in mud or sand, use a low pressure water source to ensure that actuating lever (14) and spring (13) are thoroughly cleaned of mud, sand, or other debris. Lubricate item 14 in accordance with Appendix G as soon as possible.





3-14. SERVICING WINDSHIELD WASHER RESERVOIR

a. Check fluid level in washer reservoir (2). Check frequently under adverse weather conditions.

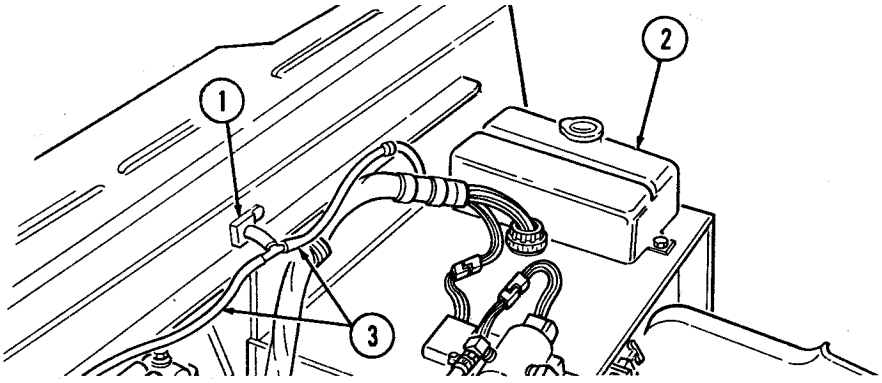
b. If fluid is required, refer to table 3-2.

Table 3-2. Cleaning Compound-to-Water Ratio

Temperature Range	Cleaning Compound	to	Water
+15°F (-9°C)	1	to	2
+40° to -15°F (+4° to -26°C)	1	to	1
+40° to -65°F (+4° to -54°C)	2	to	1

c. If washer system does not work, check washer nozzles (1) to see if they are blocked with dirt and/or debris. Remove dirt and/or debris with fine wire.

d. Check hoses (3) for leaks or poor conditions.



3-15. AIR CLEANER SERVICING (EMERGENCY PROCEDURE)

a. General. Air cleaner service is required when the yellow air restriction indicator (6) reaches the red zone (5) of the gauge (4).

CAUTION

Do not operate engine without air cleaner element. Damage to engine will result.

b. Filter Element Removal.

(1) Raise and secure hood (para. 3-8).

NOTE

Perform step 3 for vehicles with new over-center clamp configuration only.

(2) Loosen clamp bolt (13) and remove clamp (7) and cover (8) from air cleaner assembly (11).

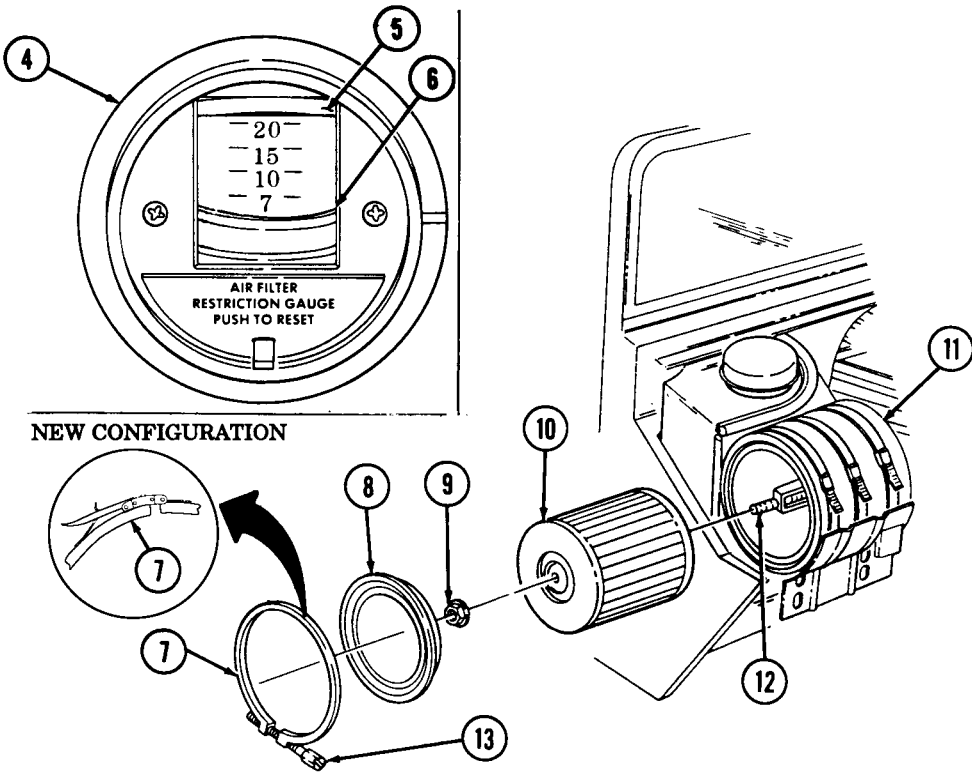
(3) Release over center-clamp (7) and remove clamp (7) and cover (8) from air cleaner assembly (11).

WARNING

- NBC contaminated filters must be handled using adequate precautions (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 Standard Operating Procedures (SOP).
- Failure to observe above warnings may result in injury or death.

(3) Remove nut and washer assembly (9) securing filter element (10) to stud (12) and pull filter element (10) from air cleaner assembly (11).

(4) Place cover (8) and clamp (7) back on air cleaner assembly (11) to prevent dirt and dust from entering air induction system while cleaning filter element (10).



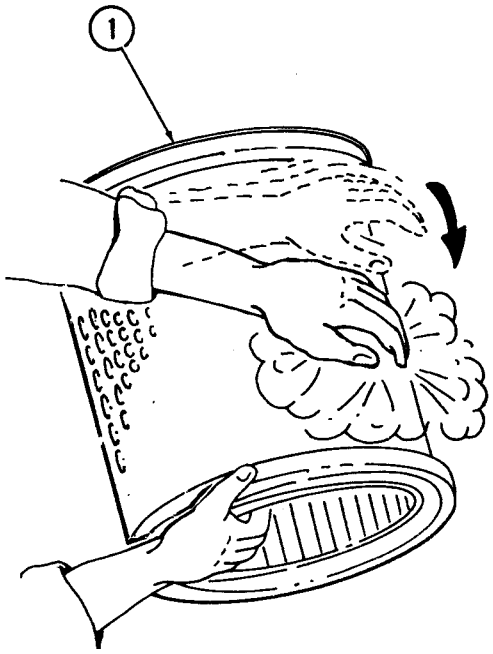
c. Air Filter Element Cleaning.

CAUTION

Do not strike ends of filter element on hard surface, or damage to filter element may result.

(1) Hold filter element (1) so open end faces ground.

(2) Gently tap completely around filter element (1) with hand to free trapped dirt.



d. Filter Element Installation.

(1) Remove clamp (2) and cover (3) from air cleaner assembly (5).

(2) Position filter element (1) into air cleaner assembly (5) and secure element (1) to stud (6) with nut and washer assembly (4).

CAUTION

When clamp is secured to end of air cleaner ensure the clamp bolt is between the three and six o'clock positions to prevent damaging hood when hood is closed.

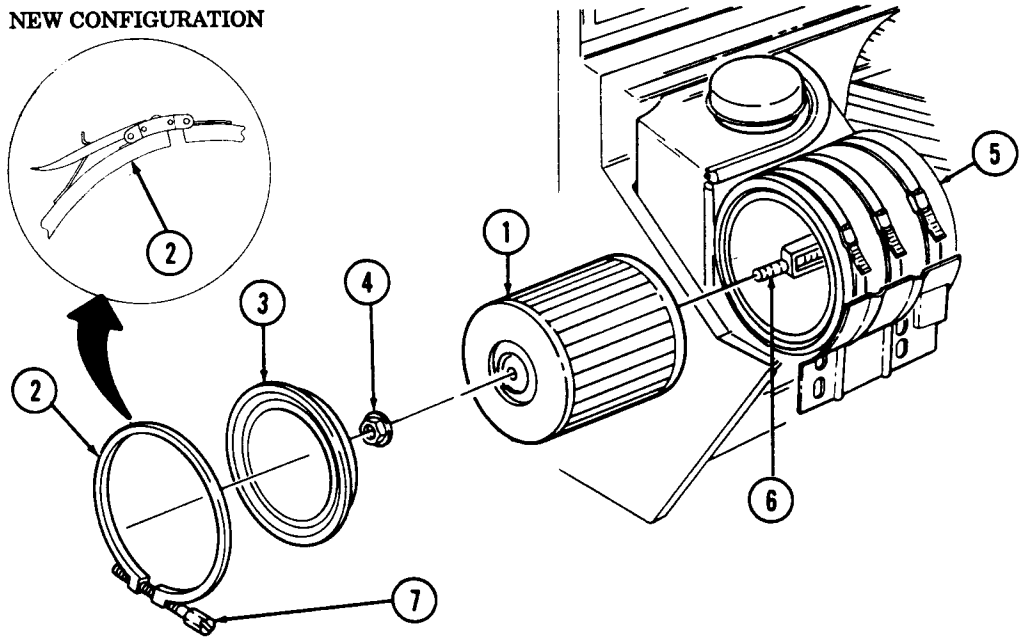
NOTE

Perform step 4 for vehicles with new over-center clamp configuration only.

(3) Install cover (3) on end of air cleaner assembly (5) and position clamp (2) as shown. Tighten clamp bolt (7).

(4) Install cover (3) on air cleaner assembly (5) and secure with over-center clamp (2).

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



3-16. AIR CLEANER DUMP VALVE SERVICING

NOTE

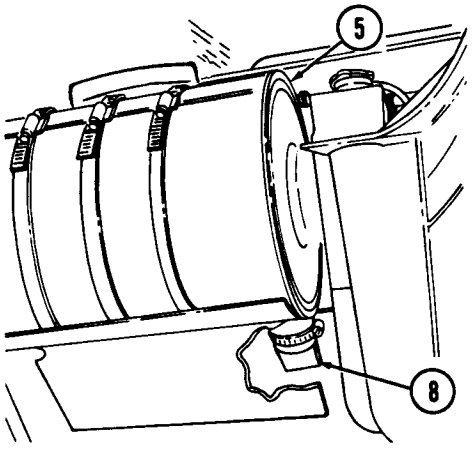
Air cleaner dump valve should be serviced after any operation through sand, mud, or water.

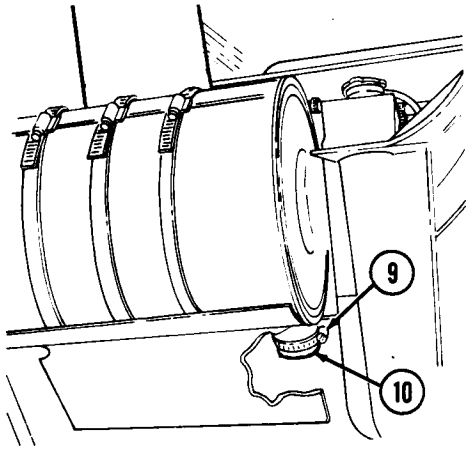
a. Raise and secure hood (para. 3-8).

b. Squeeze dump valve (8) to clear any sand, mud, or water from air cleaner assembly (5).

c. For vehicles equipped with a deep water fording kit, loosen clamp (9) and remove cap (10). Clean and install cap (10) and secure with clamp (9).

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





3-17. ENGINE OIL SERVICING

a. Raise and secure hood (para. 3-8).

CAUTION

Do not permit dirt, dust, or grit to enter engine oil dipstick tube. Internal engine damage will result if engine oil becomes contaminated.

NOTE

- Engine oil level is checked with engine off.
- If oil level checks above 'FULL," it may be due to oil cooler drain back. Operate the engine for one minute, shut down, wait one minute, and recheck oil level.
- Vehicles equipped with deep fording kit will have a sealed dipstick.

b. Pull out dipstick (1) and check for proper oil level. Level should be at crosshatch marks (2) between “FULL" and “ADD 1 QT.”

CAUTION

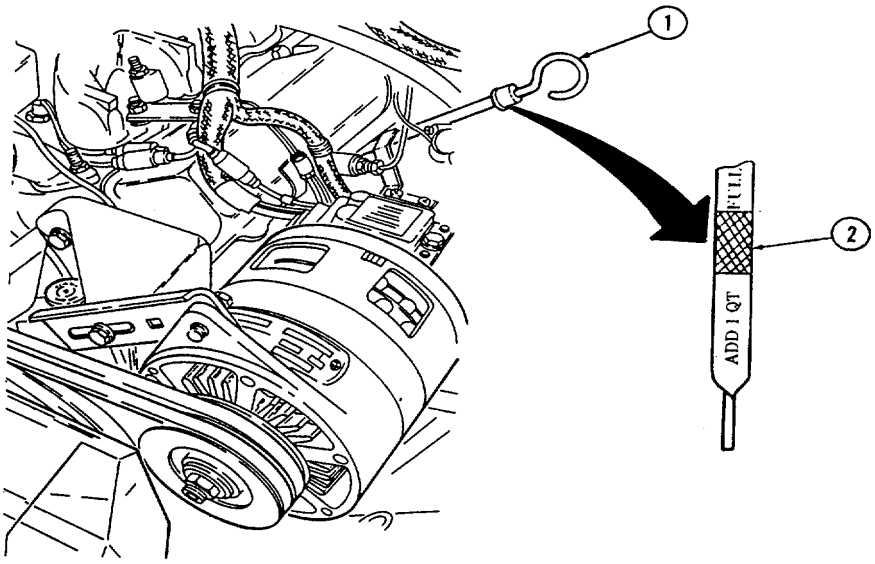
Do not overfill engine crankcase. Damage to engine will result.

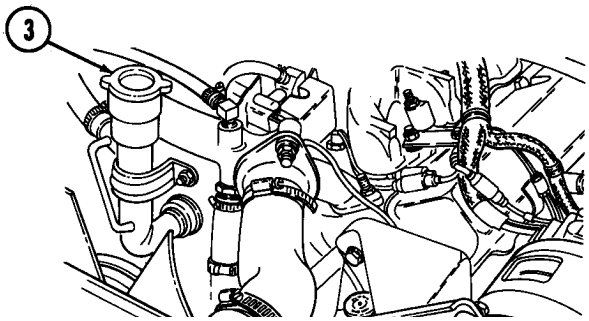
c. If engine oil is low, remove oil filler cap (3) and add engine oil (Appendix G).

CAUTION

Install a non-vented filler cap only. An incorrect filler cap will not seal properly, causing water to enter and damage engine.

d. Replace oil filler cap (3), tighten securely, and wipe away any spilled oil.
e. Lower and secure hood (para. 3-8).





3-18. PLASTIC WINDOW CLEANING

CAUTION

Never clean plastic windows with abrasives. Repeated use of abrasives or failure to follow the instructions below will eventually cause damage to windows.

NOTE

This paragraph provides instructions for cleaning soft top plastic windows and ballistic windshield and windows. This procedure is to be used on the inner plastic laminate surfaces of ballistic glass. Clean the outer surface of ballistic glass as you would plain glass.

a. Plastic Window Cleaning.

(1) Wash windows using soap and water and a soft, clean cloth.

(2) Rinse with clean water.

(3) Apply cream cleaner (appendix D, item 26) to plastic windows.

(4) Wipe cream cleaner off with dry cloth. Cream cleaner improves visual clarity after cleaning with soap and water.

a.1. Plastic Window Cleaning - Fungus and Mold.

(1) Wash windows using soap and water and a soft clean cloth.

(2) Rinse with clean water.

(3) Using a soft, clean cloth and isopropyl alcohol (Appendix D, Item 1.01), clean off fungus and mold.

(4) Wipe area with soft, clean cloth.

b. Ballistic Glass Cleaning.

CAUTION

Remove rings or other hard objects from hands before cleaning or polishing plastic surfaces. Do not use hard, dirty, or gritty cloths on plastic surfaces. Do not apply water, solvent, or polish unless the plastic is cool and is protected from the heating effects of sunlight. Failure to follow these instructions will cause damage to ballistic glass.

(1) Add detergent (appendix D, item 5) to a gallon of water.

(2) Saturate a soft cloth with cleaning solution and lightly rub plastic surface.

(3) Flush off cleaning solution with water and dry with a soft cloth.

(4) Apply polish (appendix D, item 24) to plastic surface. Let dry, then wipe clean. Light scratches can be removed by vigorous rubbing, but care should be taken not to rub too long in one place.

3-19. TRANSMISSION FLUID SERVICING

a. Raise and secure hood (para. 3-8).
b. Start engine (para. 2-10).
c. While depressing service brake pedal, move transmission shift lever through all operating ranges and "R" (reverse) before checking fluid level in "N" (neutral) with parking brake applied.

CAUTION

Do not permit dirt, dust, or grit to enter transmission oil dipstick tube. Internal transmission damage will result if transmission fluid becomes contaminated.

NOTE

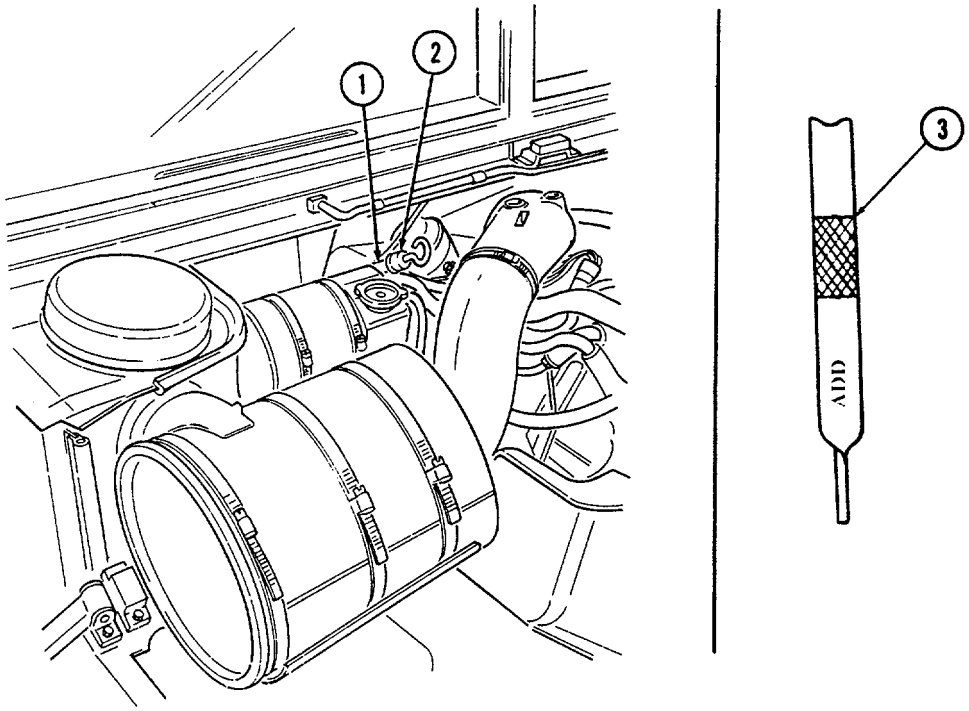
Vehicles equipped with deepwater fording kit will have a sealed dipstick.

d. Pull out dipstick (2) and check for proper transmission fluid level. At normal operating temperature, fluid level should be at crosshatch marks (3).

CAUTION

Do not overfill transmission. Damage to transmission will result.

e. If transmission fluid level is low, add fluid (appendix G) through fill pipe (1), insert dipstick (2), and wipe away any spilled fluid.
f. Shut off engine (para. 2-12).
g. Lower and secure hood (para. 3-8).



3-20. POWER STEERING FLUID SERVICING

a. Raise and secure hood (para. 3-8).

CAUTION

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.

b. Pull out cap/dipstick (5) and check steering fluid level. If engine is warm, level should be between "HOT" and “COLD” marks. If engine is cool, level should be between “ADD" and “COLD" marks. In either condition, fluid must be added if level reads below "ADD” mark.

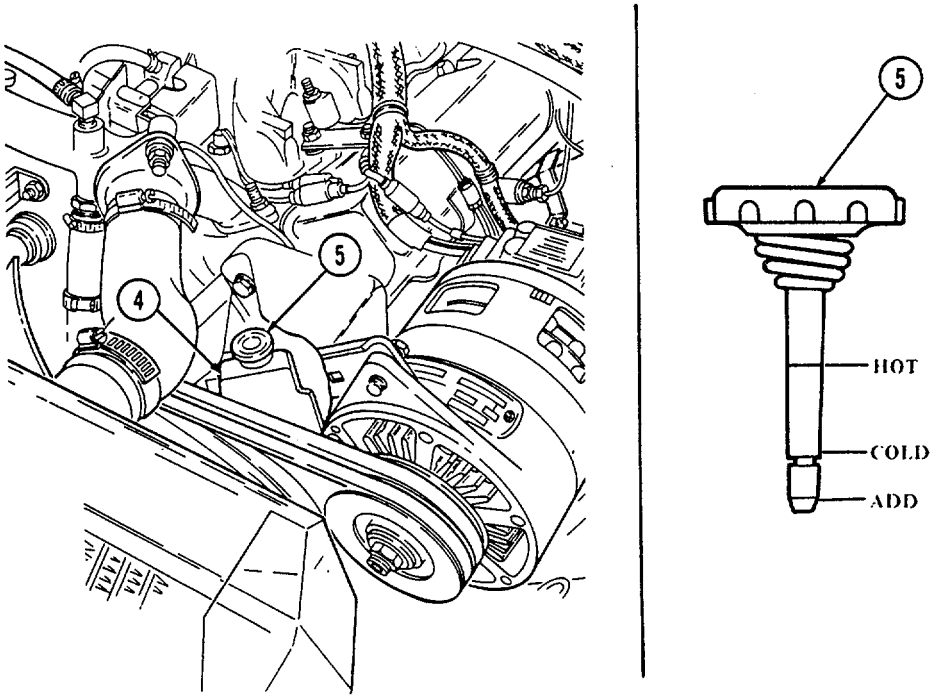
CAUTION

Do not overfill power steering reservoir. Damage to power steering system will result.

c. If fluid level is low, add fluid (appendix G) to power steering reservoir (4) and wipe away any fluid spilled.

d. Install cap/dipstick (5).

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



3-21. FUEL TANK SERVICING

a. Shut off engine (para. 2-12).

WARNING

Do not perform fuel system checks, inspection, or maintenance while smoking or near fire, flames, or sparks. Fuel may ignite, causing damage to vehicle, and injury or death to personnel.

CAUTION

Do not turn fuel cap handle more than necessary to remove or seal fuel cap. Fuel cap chain links may separate or become damaged.

b. Turn fuel cap handle (1) on fuel cap (2) counterclockwise and remove fuel cap (2).

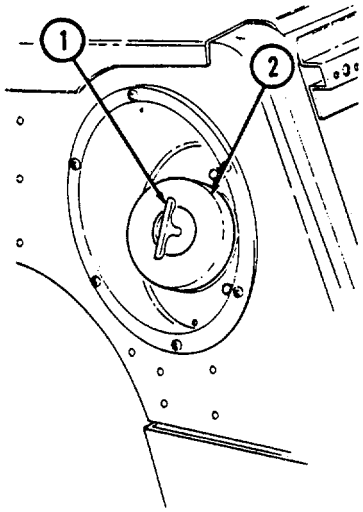
NOTE

To help prevent spills and overflows, pay close attention to the dispensing nozzle while refueling. Do not exceed a safe refueling rate. If fuel backup and spillage is being experienced, reduce flow rate. Also, when topping off the tank, a reduced flow rate should be used.

CAUTION

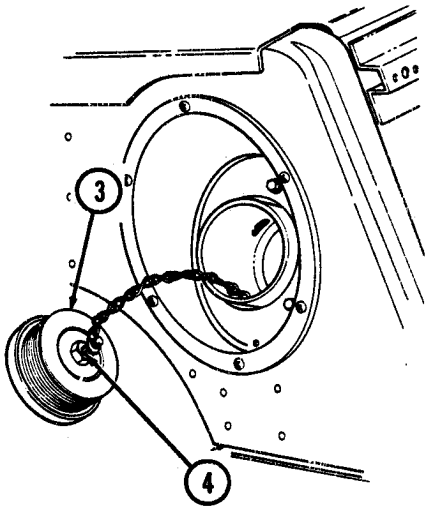
When refueling the vehicle, be careful that the nozzle does not slam into the filler pipe. Damage to the strainer may occur, allowing dirty fuel to clog up the filters.

c. Insert the fuel filler nozzle into the filler neck rubber cone, using caution not to puncture the fuel filler neck strainer. Dispense fuel into fuel tank.



d. If the fuel cap handle (1) is turned more than necessary to remove the fuel cap (2), the fuel cap backing plate (3) may become jammed on the staked threads (4). Correct the problem by holding the backing plate (3) and turning the fuel cap handle (1) clockwise until the backing plate (3) turns freely.

e. When fueling operation is complete, install fuel cap (2) and turn fuel cap handle (1) clockwise to seal fuel cap (2).



3-22. TIRE CHAIN INSTALLATION AND REMOVAL

CAUTION

Tire chains are only used when extra traction is required and must be used as an axle set. Any other combination may cause damage to the drivetrain.

a. Radial Tire Chain Installation.

(1) Spread out tire chain assembly (1) and line up with tire.

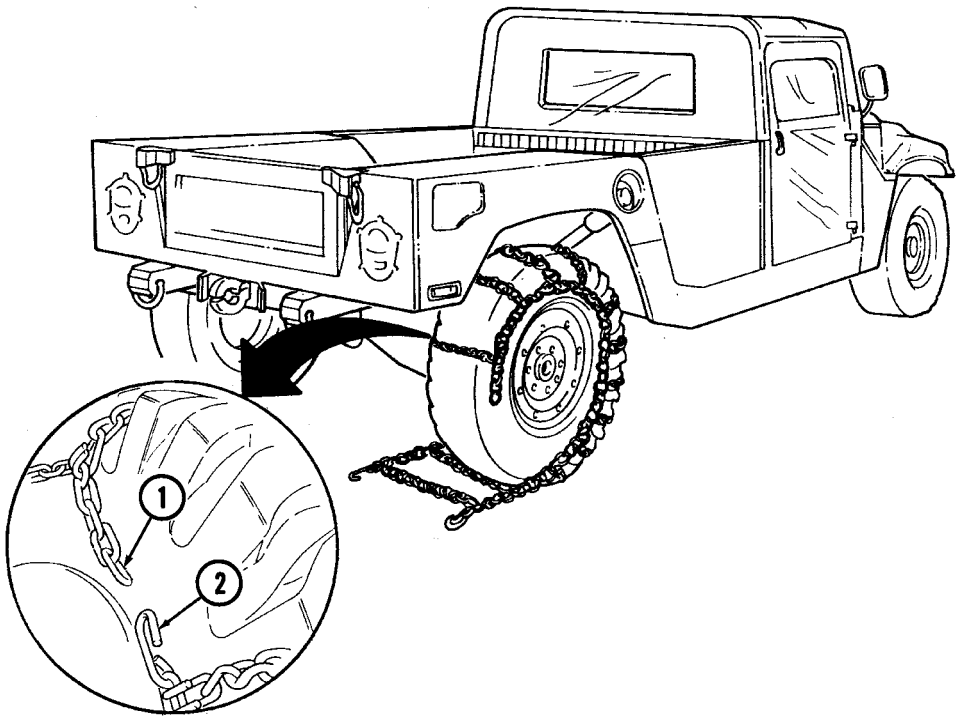
(2) Cautiously move or drive vehicle over tire chain assembly (1) until wheel is positioned at either end of chain assembly (1), allowing tire chain assembly (1) to be draped up and over tire.

(3) Maneuver tire chain assembly (1) until cross-link sections are evenly spaced around tire. Secure one side of tire chain assembly (1) to tire by hooking inside fastener (2) to chain assembly (1). Tighten chain assembly (1) as much as possible.

(4) Repeat steps 1 through 3 above until all tire chain assemblies have been properly installed.

(5) Hook end fastener (3) to chain assembly (1) and secure with locking retainer (4) to tighten chain assembly (1). Ensure as many chain links as possible lay between the sidewall head lugs (5) on both sides of tires.

(6) Move vehicle forward a few feet and retighten chain assembly (1) to remove any slack from where tire was resting on chain assembly (1). Secure loose chain linkage to chain assembly (1) with wire or other field expedient method.



(7) After vehicle is driven one or two miles, stop and retighten tire chains. Ensure as many chain links as possible lie between the sidewall head lugs (5) on both sides of the tires.

(8) After final tightening, secure loose chain linkage to chain assembly (1) with wire or other field expedient method.

(9) Occasionally check tire chains (1) during operations to ensure tire chains (1) have not slipped.

b. Radial Tire Chain Removal.

CAUTION

Remove tire chains from tires as soon as possible after leaving area requiring their use. Prolonged use of tire chains may damage drivetrain.

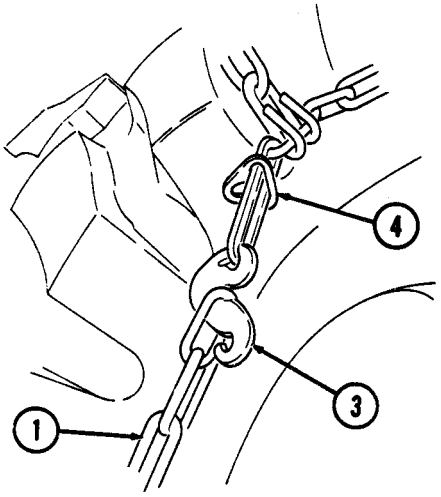
(1) Detach locking retainer (4) from end fastener (3) and unhook end fastener (3) from chain assembly (1).

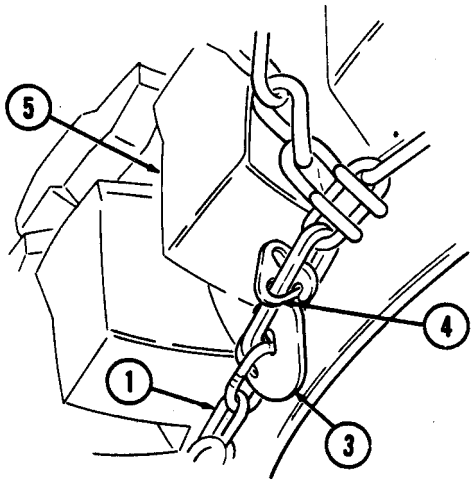
(2) Unhook inside fastener (2) from chain assembly (1) and remove chain assembly (1) from tire.

(3) Drive vehicle off chain assembly (1).

(4) Repeat operations listed in steps 1 through 3 above until all tire chain assemblies (1) have been removed from tires.

(5) Stow tire chain assemblies (1) under driver's seat.





c. Bias Ply Tire Chain Installation.

CAUTION

Tire chains are only used when extra traction is required and must be used as an axle set. Any other combination may cause damage to the drivetrain.

(1) Install quick link (1) through cross-link connector (4) located on each side of tire chain assembly (5) between the third and fourth cross chains (3). Tighten nut (2).

(2) Spread out tire chain assembly (5) and line up with tire.

(3) Cautiously move or drive vehicle over tire chain assembly (5) until wheel is positioned at either end of chain assembly (5), allowing tire chain assembly (5) to be draped up and over tire.

(4) Maneuver tire chain assembly (5) until cross-link sections are evenly spaced around tire. Secure one side of tire chain assembly (5) to tire by hooking inside fastener (6) to chain assembly (5). Tighten chain assembly (5) as much as possible.

(5) Repeat steps 2 through 4 above until all tire chain assemblies have been properly installed.

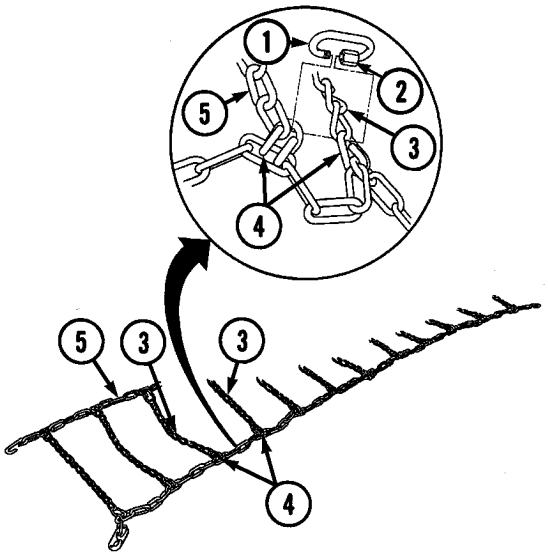
(6) Hook end fastener (7) to chain assembly (5) and secure with locking retainer (8) to tighten chain assembly (5). Ensure as many chain links as possible lay between the sidewall head lugs (9) on both sides of tires.

(7) Move vehicle forward a few feet and retighten chain assembly (5) to remove any slack from where tire was resting on chain assembly (5). Secure loose chain linkage to chain assembly (5) with wire or other field-expedient method.

(8) After vehicle is driven one or two miles, stop and retighten tire chains. Ensure as many chain links as possible lay between the sidewall head lugs (9) on both sides of the tires.

(9) After final tightening, secure loose chain linkage to chain assembly (5) with wire or other field-expedient method.

(10) Occasionally check tire chains (5) during operations to ensure tire chains (5) have not slipped.



d. Bias Ply Tire Chain Removal.

CAUTION

Remove tire chains from tires as soon as possible after leaving area requiring their use. Prolonged use of tire chains may damage drivetrain.

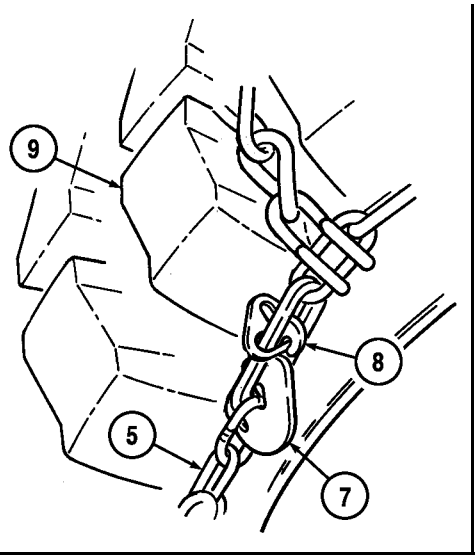
(1) Detach locking retainer (8) from end fastener (7) and unhook end fastener (7) from chain assembly (5).

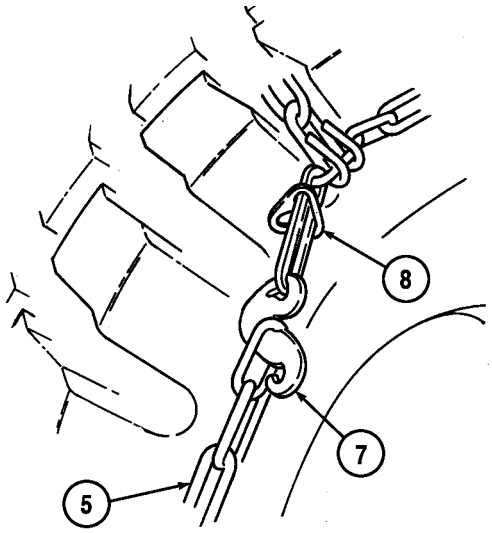
(2) Unhook inside fastener (6) from chain assembly (5) and remove chain assembly (5) from tire.

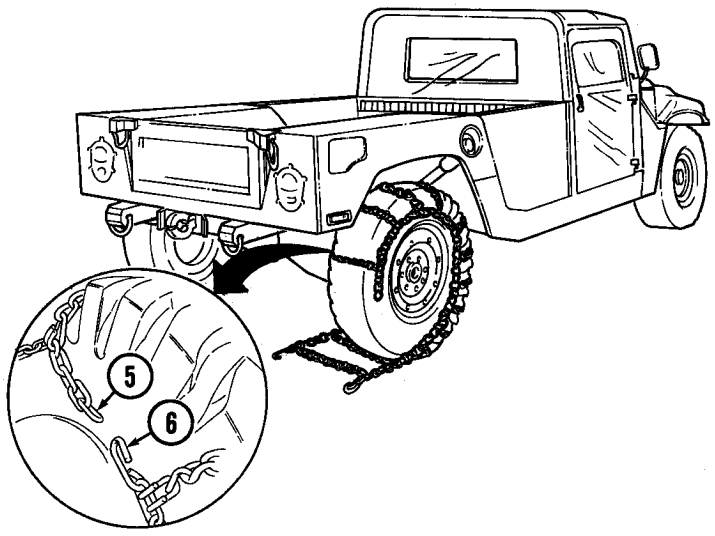
(3) Drive vehicle off chain assembly (5).

(4) Repeat steps 1 through 3 until all tire chain assemblies (5) have been removed from tires.

(5) Stow tire chain assemblies (5) under driver's seat.







3-23. EMERGENCY FAN CLUTCH OVERRIDE

a. The radiator fan in M998 series vehicles normally activates when engine temperature exceeds 220°F (104°C) and deactivates when engine temperature drops to 190°F (88°C). If overheating occurs in an emergency situation, this procedure will ensure continuous fan operation.

b. Raise and secure hood (para. 3-8).

NOTE

Stop engine (para. 2-12) prior to disconnecting time delay module.

c. Disconnect time delay module connector (1) from control valve connector (2).

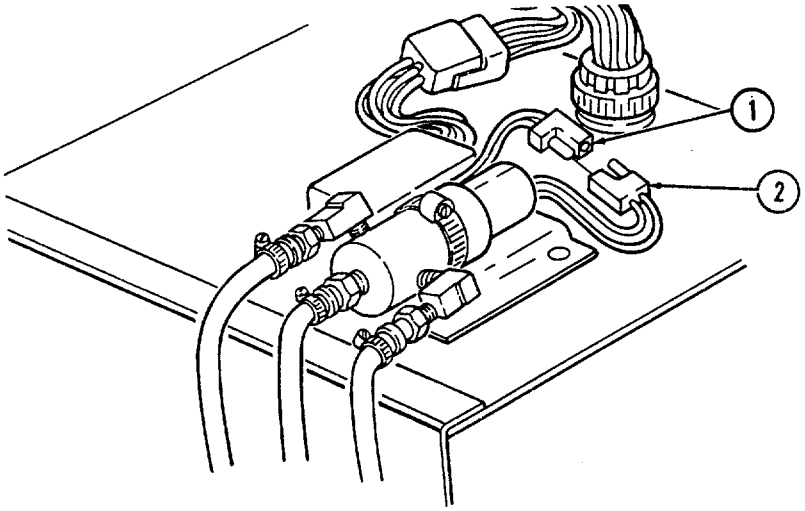
d. Start engine (para. 2-10).

e. Check fan for continuous operation. If fan is not operating continuously, stop engine and notify unit maintenance.

f. Lower and secure hood (para. 3-10).

g. Allow engine to cool at idle until engine temperature lowers to normal operating temperature of 190°-230°F (88°-110°C).

h. Proceed to unit maintenance with vehicle. Make certain unit maintenance is notified of emergency service performed on vehicle.



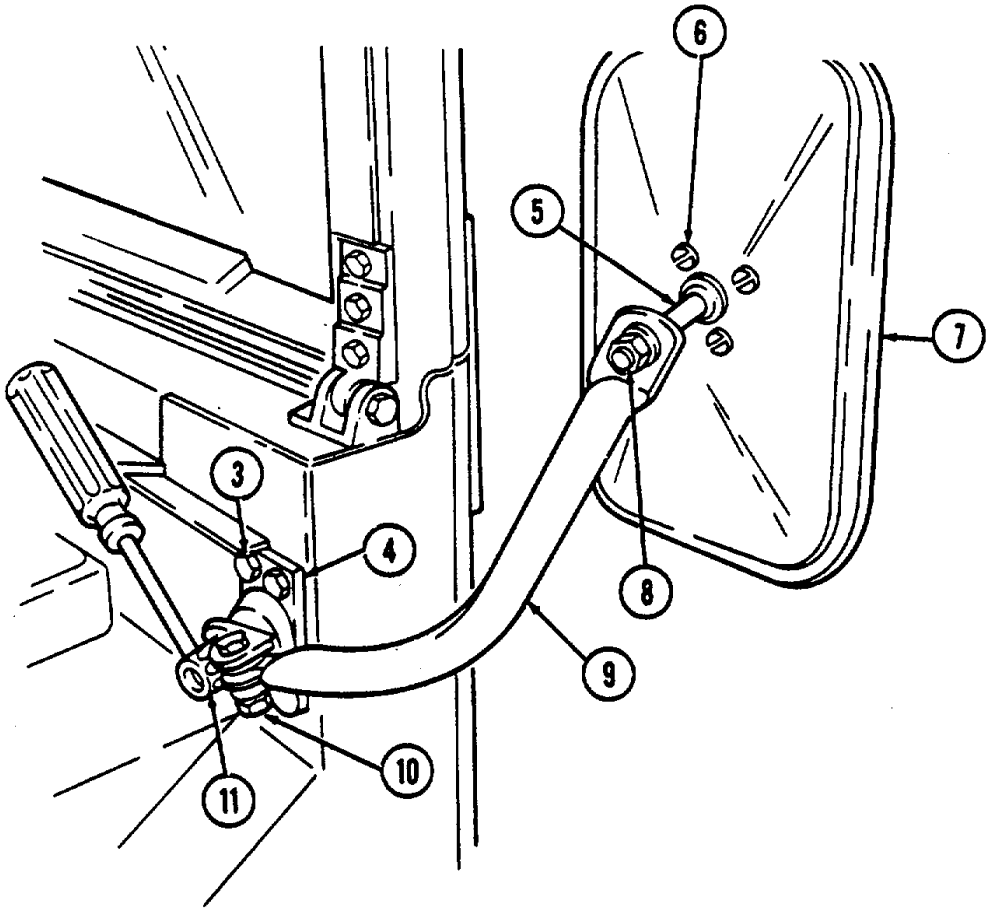
3-24. REARVIEW MIRROR ADJUSTMENT (FOR VEHICLE SERIAL NUMBER 99,999 AND BELOW)

a. Raise and secure hood (para. 3-8).
b. Using screwdriver, loosen special nut (11) securing arm assembly (9) to rearview mirror bracket (4).

NOTE

Right mirror must be adjusted for viewing through the windshield.

c. Adjust mirror head (7) and arm assembly (9) to proper position.
d. Tighten special nut (11) securing arm assembly (9) to rearview mirror bracket (4). Ensure rearview mirror bracket mounting capscrews (3) are secure.
e. If mirror head (7) will not hold adjustment, tighten screws (6).
f. If arm assembly (9) will not hold adjustment, tighten nut (10).
g. If mirror head shaft (5) will not hold adjustment, tighten nut (8).
h. Lower and secure hood (para. 3-8).



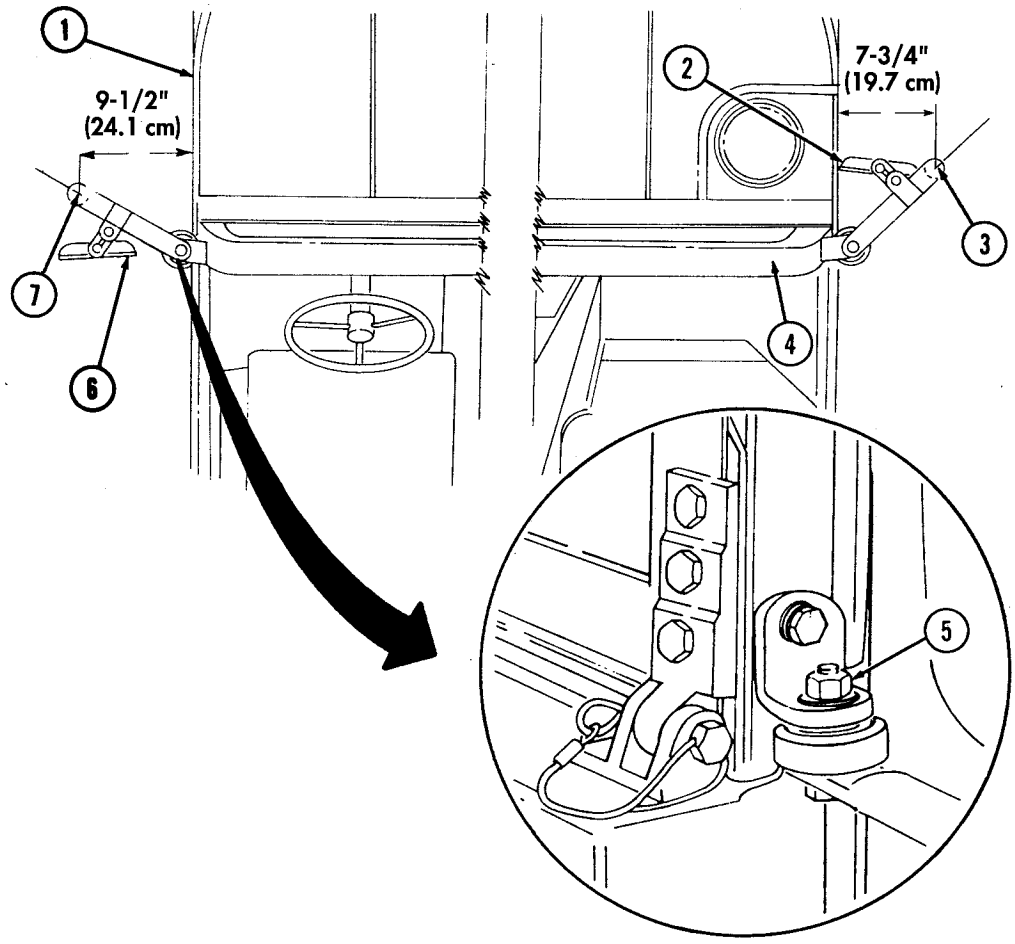
3-25. REARVIEW MIRROR ADJUSTMENT (FOR VEHICLE SERIAL NUMBER 100,000 AND ABOVE)

NOTE

- Prior to mirror adjustment, move mirror arm assembly until assembly locks in place.
- Illustration shows left side adjustment assembly; right side is basically the same.
- The left mirror has been lowered 5 in. (12.7 cm) on M996A2, M997A2, M1025A2, M1035A2, M1043A2, M1045A2, M1097A2, and M1123 vehicles to improve visibility.

a. Left Mirror (Driver's Side). Loosen top nut (5) and position mirror arm (7) forward of windshield frame (4) so that center line of mirror arm (7) is approximately 9-1/2 in. (24.1 cm) from vehicle (1). Tighten top nut (5). Adjust mirror head (6) for maximum visibility.

b. Right Mirror (Passenger's Side). Loosen top nut (5) and position mirror arm (3) forward of windshield frame (4) so that center line of mirror arm (3) is approximately 7-3/4 in. (19.7 cm) from vehicle (1). Tighten top nut (5). Adjust mirror head (2) for maximum visibility.



3-26. WHEEL ASSEMBLY REPLACEMENT

WARNING

- Always apply parking brake and block opposite wheel before removing wheel assembly. Avoid removing wheel assembly when vehicle is on sloping terrain. Injury to personnel, or damage to equipment may result.
- Remove only the inner group of nuts when removing a wheel from the vehicle. Removing the outer nuts which hold the rim together while the wheel assembly is inflated could result in serious injury or death.
- Ensure scissors jack is positioned directly under the lower control arm, next to the wheel being replaced. Do not place at any other location such as frame rails. Injury to personnel, or damage to equipment may result.
- Radial and bias ply tires should not be mixed on the same vehicle. Injury to personnel or damage to equipment may result.
- Do not use bias ply tires on the M1097, M1123, or any A1 and A2 models, under any condition. Due to tire load ratings and vehicle load carrying capabilities, only the load range "D" radial tire can be used on the M1097, M1123, and all A1 and A2 models.

NOTE

Check tire size designator on sidewall for tire construction identification: 36 x 12.50-16.5LT-Bias ply, 37 x 12.50R16.5LT-Radial.

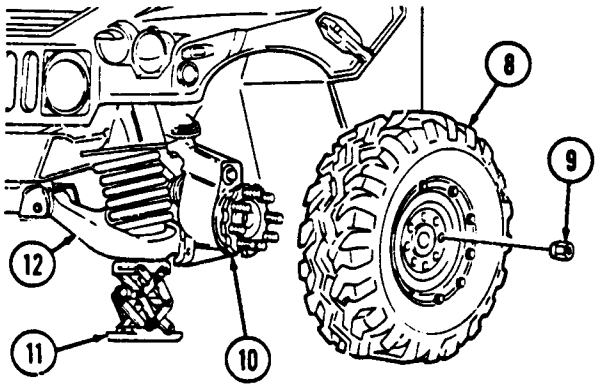
a. Wheel Assembly Removal.

(1) Place jack (11) under lower control arm (12) next to wheel being replaced. Center jack (11) squarely under point of contact.

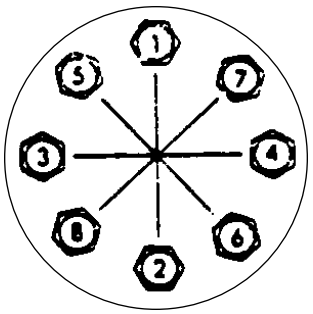
(2) Loosen eight lug nuts (9), but do not remove.

(3) Raise vehicle high enough to allow removal of wheel assembly (8).

(4) Remove eight lug nuts (9) securing wheel assembly (8) to geared hub (10) and remove wheel assembly (8).



TIGHTENING SEQUENCE



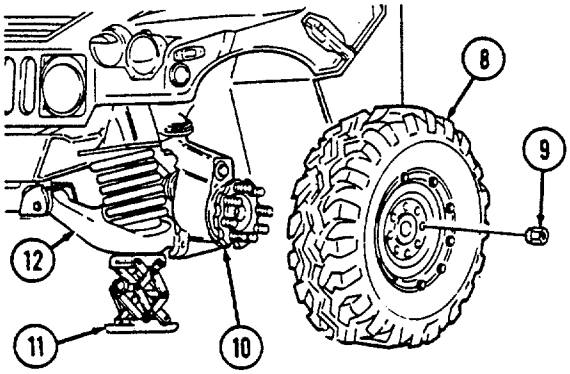
b. Wheel Assembly Installation.

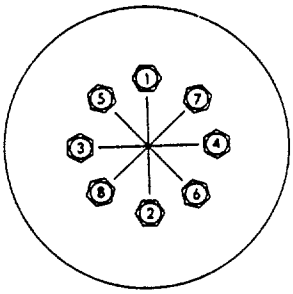
(1) Install wheel assembly (8) to geared hub (10) and secure with eight lug nuts (9). Tighten lug nuts (9) to full engagement of wheel assembly (8) to geared hub (10).

(2) Slowly lower vehicle and remove jack (11).

(3) Tighten eight lug nuts (9) in the sequence indicated.

(4) Notify unit maintenance to tighten lug nuts (9) to proper torque as soon as possible.





3-27. HEATING, VENTILATION, AND AIR-CONDITIONING AIR INTAKE FILTER SERVICE

WARNING

- 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 Standard Operating Procedure (SOP).
- Failure to observe above warnings may result in injury or death.

a. M996 and M996A1 Filter Removal.

(1) Loosen seven captive wing head screws (2) securing panel (1) to body (3) and remove panel (1).

(2) Slide filter (4) out of mounting bracket (5) and remove filter (4).

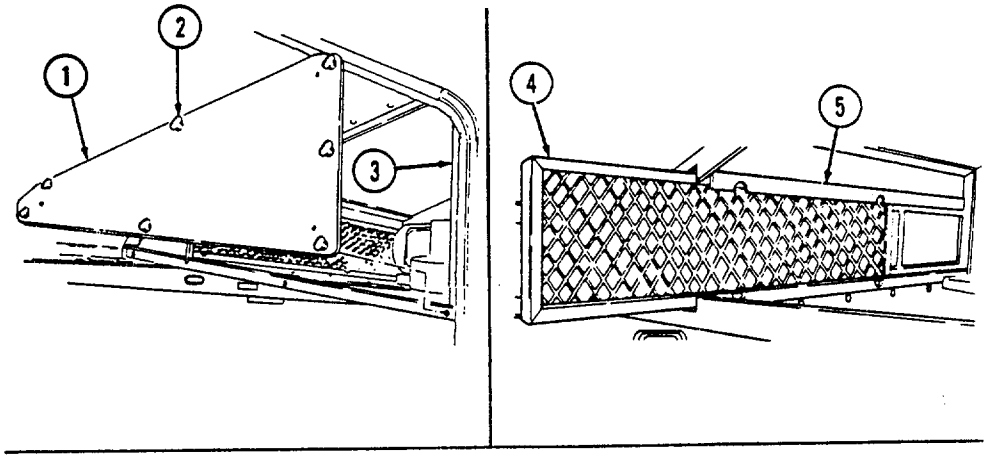
b. M997, M997A1, and M997A2 Filter Removal.

(1) Remove two capscrews (6), lockwashers (14), and washers (13) securing front cover panel (12) to panel (8).

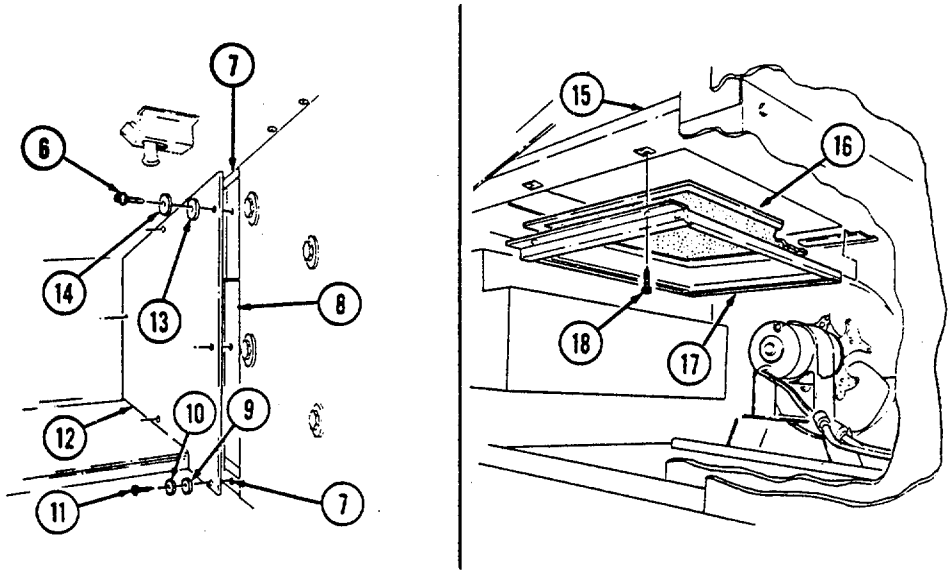
(2) Remove four screws (11), lockwashers (10), and washers (9) securing front cover panel (12) to body (7) and remove panel (12).

(3) Remove two screws (18) securing frame (17) and filter (16) to air intake assembly (15) and remove frame (17) and filter (16).

M996 AND M996A1 ONLY



M997,M997A1, AND M997A2 ONLY



c. Inspection. Inspect filters for tears, rips, contaminants, or other damage. Inspect filter frames for cracks, bends, or other damage. If filters or frames are damaged, notify unit maintenance.

d. M996 and M996A1 Filter Installation.

(1) Slide filter (4) into mounting bracket (5).

(2) Install cover panel (1) on body (3) with seven captive wing head screws (2).

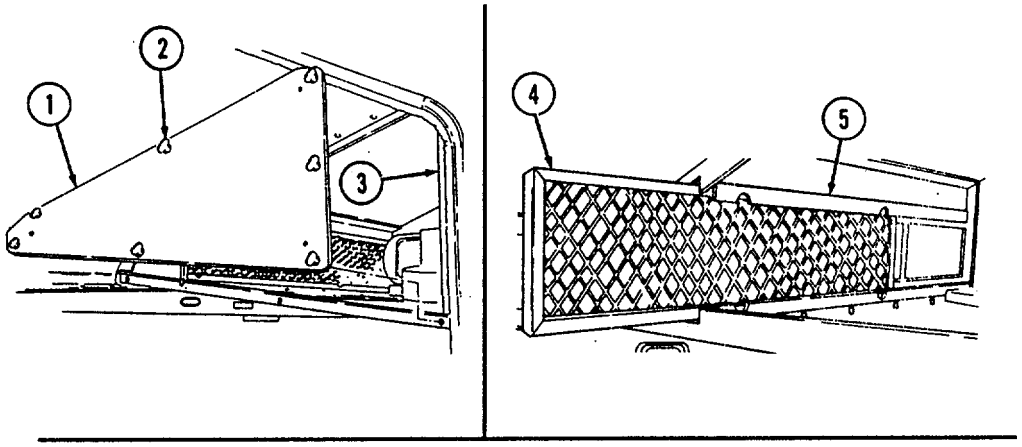
e. M997, M997A1, and M997A2 Filter Installation.

(1) Install filter (16) and frame (17) on air intake assembly (15) with two screws (18).

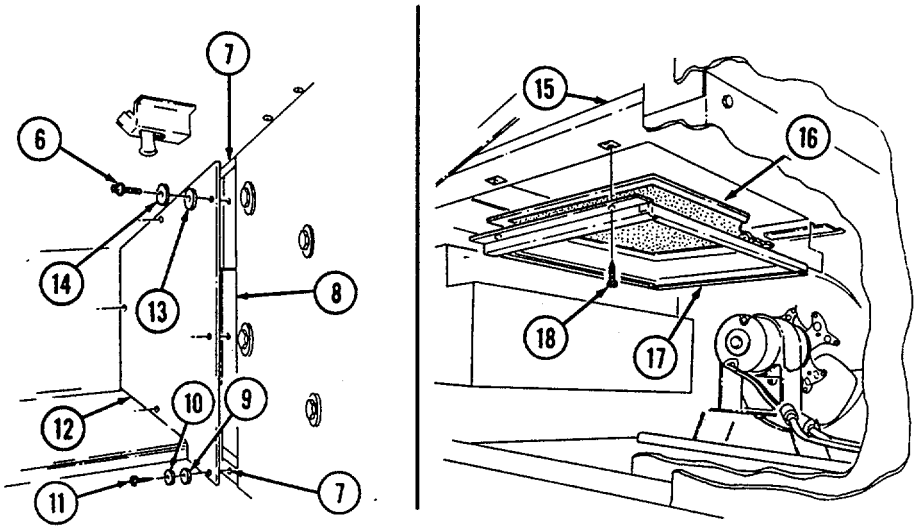
(2) Install front cover panel (12) to body (7) and secure with four washers (9), lockwashers (10), and screws (11).

(3) Secure front cover panel (12) to panel (8) with two washers (13), lockwashers (14), and capscrews (6).

M996 AND M996A1 ONLY



M997, M997A1, AND M997A2 ONLY



3-28. AMBULANCE INTERIOR LIGHT BULB REPLACEMENT

a. General. Replacement bulbs are located in the storage compartment of the vehicle.

WARNING

When changing light bulbs, ensure the system in which the bulb is being replaced is turned off. Failure to do so may cause injury.

NOTE

Ceiling white light and blackout light assemblies are removed and installed basically the same. This procedure covers the ceiling white light assemblies.

b. Ceiling Light Bulb Removal.

(1) Remove two screws (3) securing lens (4) to light assembly (2). Remove lens (4).
(2) Press light bulb (5) into socket (1), twist counterclockwise, and remove light bulb (5).

c. Ceiling Light Bulb Installation.

(1) Install light bulb (5) into socket (1), press in, and twist clockwise to secure.
(2) Install lens (4) to light assembly (2) and secure with two screws (3).

d. Spotlight Bulb Removal.

NOTE

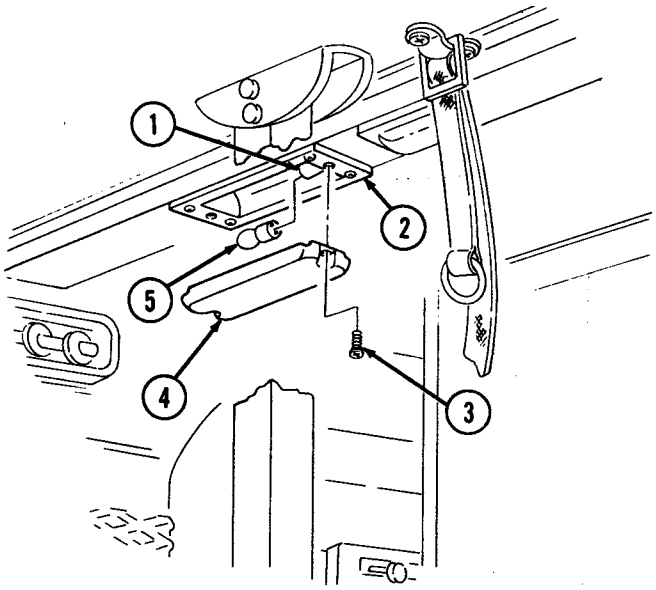
M996, M996A1, M997, M997A1, and M997A2 vehicles spotlight bulb replacement is basically the same. This procedure covers M996 and M996A1 spotlight bulb replacement for M996 and M996A1 vehicles.

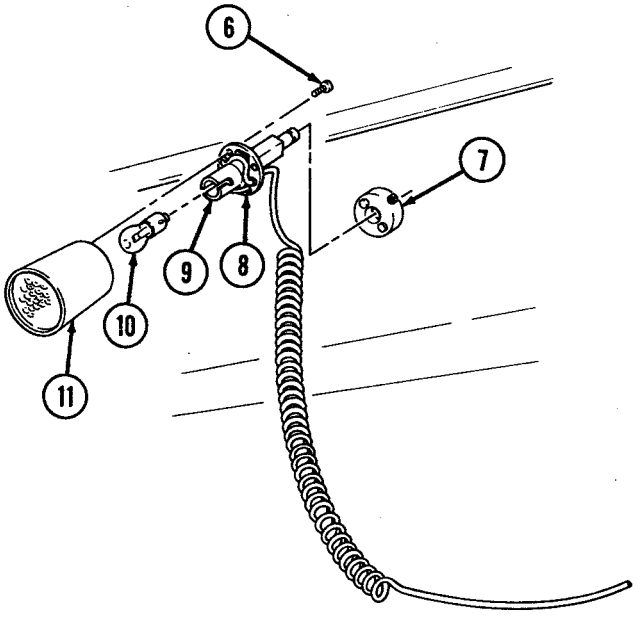
(1) Remove base (8) from wall socket (7).
(2) Remove four screws (6) securing lens assembly (11) to base (8) and remove lens assembly (11).
(3) Press light bulb (10) into socket (9), twist counterclockwise, and remove light bulb (10).

e. Spotlight Bulb Installation.

(1) Install light bulb (10) into socket (9), press in, and twist clockwise to secure.
(2) Install base (8) on lens assembly (11) and secure with four screws (6).
(3) Install base (8) into wall socket (7).

f. Test Interior Lights Operation. Refer to para. 2-61.


1
2
5
4
3


6
7
9
8
10
11

3-29. RESTRAINING NET INSTALLATION

Restraining Net Installation.

(Models M966, M966A1, M1025, M1025A1, M1026, M1026A1, M1036, M1043, M1043A1, M1044, M1044A1, M1045, M1045A1, M1046, M1046A1, and M1121).

(1) Position restraining net (2) behind rear seats (1) and loop three straps (3) through roof brackets (4). Do not tighten straps (3).

(2) Route three straps (5) on restraining net (2) through tiedowns (6) on cargo floor (7). Tighten straps (3) and (5).