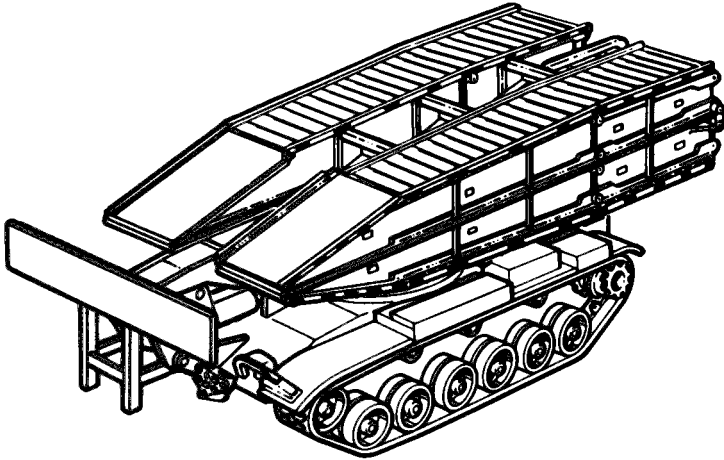


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TM 5-5420-202-10

## OPERATOR'S MANUAL



**LAUNCHER  
AND  
M60A1 TANK CHASSIS,  
TRANSPORTING:  
FOR BRIDGE,  
ARMORED-VEHICLE-LAUNCHED  
SCISSORING TYPE, CLASS 60  
5420-00-889-2020**

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HEADARTERS, DEPARTMENT OF THE ARMY  
30 AUGUST 1985

TA247569



CHANGE  
NO. 8

HEADQUARTERS  
DEPARTMENT OF THE ARMY  
Washington, D.C., *1 May 1996*

OPERATOR'S MANUAL  
LAUNCHER  
AND  
M60A1 TANK CHASSIS,  
TRANSPORTING:  
FOR BRIDGE,  
ARMORED-VEHICLE-LAUNCHED  
SCISSORING TYPE, CLASS 60  
5420-00-889-2020

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2-23 thru 2-96  
2-97 thru 2-100  
3-1 and 3-2  
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i and ii  
2-23 thru 2-96  
2-97 and 2-100  
3-1 and 3-2  
G-1 thru G-8

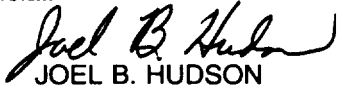
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NO. 7

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OPERATOR'S MANUAL  
LAUNCHER  
AND  
M60A1 TANK CHASSIS,  
TRANSPORTING:  
FOR BRIDGE,  
ARMORED-VEHICLE-LAUNCHED  
SCISSORING TYPE, CLASS 60  
5420-00-889-2020

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OPERATOR'S MANUAL

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AND  
M60A1 TANK CHASSIS,  
TRANSPORTING:  
FOR BRIDGE,  
ARMORED-VEHICLE-LAUNCHED  
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2-46.1 and 2-46.2	2-46.1 and 2-46.2
2-67 and 2-68	2-67 and 2-68
2-73 and 2-74	2-73 and 2-74
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2-125 and 2-126	2-125 and 2-126
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2-187 and 2-188	2-187 and 2-188
2-203 and 2-204	2-203 and 2-204
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2-205 and 2-206	2-205 and 2-206
3-51 and 3-52	3-51 and 3-52
3-63 and 3-64	3-63 and 3-64
3-89 and 3-90	3-89 and 3-90

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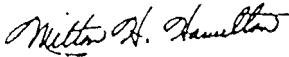
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B-13 thru B-22  
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Change  
No. 5

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OPERATOR'S MANUAL  
LAUNCHER AND M60A1 TANK CHASSIS  
TRANSPORTING  
FOR BRIDGE, ARMORED-VEHICLE-LAUNCHED,  
SCISSORING TYPE, CLASS 60  
5420-00-889-2020

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2-55 and 2-56  
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**TM 5-5420-202-10  
C4**

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NO. 4

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DEPARTMENT OF THE ARMY  
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OPERATOR'S MANUAL

**LAUNCHER  
AND  
M60A1 TANK CHASSIS,  
TRANSPORTING:  
FOR BRIDGE,  
ARMORED-VEHICLE-LAUNCHED  
SCISSORING TYPE, CLASS 60  
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**Operator's Manual**

**LAUNCHER AND M60A1 TANK CHASSIS,**

**TRANSPORTING:**

**FOR BRIDGE, ARMORED-VEHICLE-LAUNCHED,**

**SCISSORING TYPE, CLASS 60**

**5420-00-889-2020**

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**CHANGE  
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OPERATORS MANUAL

LAUNCHER AND M60A1 TANK CHASSIS,  
TRANSPORTING:  
FOR BRIDGE, ARMORED-VEHICLE-LAUNCHED,  
SCISSORING TYPE, CLASS 60  
5420-00-889-2020

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OPERATOR'S MANUAL

LAUNCHER AND M60A1 TANK CHASSIS,  
TRANSPORTING:  
FOR BRIDGE, ARMORED-VEHICLE-LAUNCHED,  
SCISSORING TYPE, CLASS 60  
5420-00-889-2020

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2-45 and 2-46  
None  
2-47 and 2-48  
2-125 and 2-126  
2-133 and 2-134  
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2-135 and 2-136  
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None  
D-3 and D-4  
I-1 thru 14

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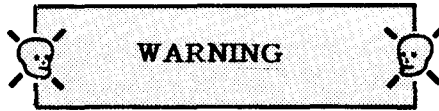
**CARBON MONOXIDE POISONING CAN BE DEADLY.**

Carbon monoxide is a colorless, odorless, deadly poisonous gas, which when breathed, deprives the body of oxygen and causes suffocation. Exposure to air contaminated with carbon monoxide produces symptoms of headache, dizziness, loss of muscular control, apparent drowsiness, and coma. Permanent brain damage or death can result from severe exposure. It occurs in the exhaust fumes of fuel-burning heaters and internal combustion engines and becomes dangerously concentrated under conditions of inadequate ventilation. The following precautions must be observed to insure the safety of personnel whenever the personnel heater, main, or auxiliary engine of any vehicle is operated for maintenance purposes or tactical use.

1. **DO NOT** operate heater or engine of vehicle in an enclosed area unless it is **ADEQUATELY VENTILATED**.
2. **DO NOT** idle engine for long periods without ventilator blower operating. If tactical situation permits, open hatches.
3. **DO NOT** drive any vehicle with inspection plates, cover plates, or engine compartment doors removed unless necessary for maintenance purposes.
4. **BE ALERT** at all times during vehicle operation for exhaust odors and exposure symptoms. If either are present, **IMMEDIATELY VENTILATE** personnel compartments. If symptoms persist, remove affected personnel from vehicle and treat as follows: expose to fresh air; keep warm; **DO NOT PERMIT PHYSICAL EXERCISE**; if necessary, administer artificial respiration.  
For artificial respiration, refer to FM 21-11.
5. Neither the gas-particulate filter unit nor the M25A1 protective mask will protect you against carbon monoxide poisoning.

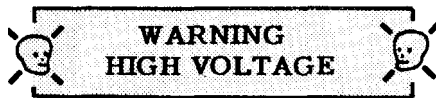
**THE BEST DEFENSE AGAINST CARBON MONOXIDE POISONING IS ADEQUATE VENTILATION.**

TA247572



The following summary list is adapted from the warnings within the manual. However, all warnings should be observed as noted in the text.

1. Make sure all personnel are in a safe position before launching or retrieving bridge.
2. Neither the gas-particulate filter unit nor the M25A1 protective mask will protect you against carbon monoxide poisoning.
3. Make sure fuel tank filler neck and fuel nozzle are touching while refueling.
4. Do not allow flames or sparks within area while refueling. Have a manned fire extinguisher handy.
5. Frostbite to the cheekbone area of the face may be experienced by wearers of the M25A1 protective mask from sub-freezing air delivered by the gas-particulate filter unit. Do not connect the protective mask to the filter unit unless ambient temperature is well above freezing.
6. Do not disconnect/connect any part of the electrical equipment with power on.
7. Operation of this equipment presents a noise hazard to personnel in the area. The noise level exceeds the allowable limits for unprotected personnel. Wear ear muffs or ear plugs.



High voltage is used in the operation of this equipment. Turn on NIGHT VISION power switch only when using IR (infra-red) M24 periscopes. Be sure that IR power cables are connected to prevent accidental shock to personnel.

**WARNING**

1. Follow ammunition handling procedures when handling and loading smoke grenades.
2. Smoke grenades contain RP (red phosphorous). This is a fire hazard and is dangerous to all personnel outside the vehicle.
3. Never place any part of your body in front of discharger when installing and removing canvas cover or loading and unloading grenades.
4. Do not fire smoke grenades while launching bridge. Grenades will strike bridge and launching mechanism.
5. Do not fire smoke grenades in gusty wind conditions (if tactical conditions permit). Particles of a fired grenade may blow back into the vehicle and may cause a fire.
6. When a misfire or dud occurs, all personnel must remain at least 200 meters (219 yards) from vehicle for at least 5 minutes after final attempt to fire. Crew will remain in vehicle with hatches closed.
7. Do not allow flames or sparks within area while stowing ammunition. Have a manned fire extinguisher handy.
8. When destroying smoke grenades by fire, cover must be taken without delay, since an early explosion of explosive ammunition may be caused by the fire.
9. Explosive ammunition or parts containing explosives must be handled carefully at all times. Explosive elements in primers and fuses are particularly sensitive to shock and high temperature. Ammunition and parts should not be dropped, thrown, tumbled, or dragged.
10. Before loading grenade into discharger, be sure each part is free of sand, mud, moisture, frost, snow, ice, grease or other foreign matter.

**WARNING****HAZARDOUS NOISE**

1. Hearing protection (helmet) required.
2. Double hearing protection (helmet and ear plugs) required on road marches at speeds over 15 mph (24.1 kmh).

**WARNING**

Before you work around tracked vehicles, remove rings, bracelets, and wrist-watches. These items may be caught in projections and cause injury or may be shorted across an electrical circuit and cause severe burns and electrical shock.

**WARNING**

Dry Cleaning Solvent P-D-680 is toxic and flammable. To avoid injury, wear protective goggles and gloves and use in a well-ventilated area. Avoid contact with skin, eyes, and clothes, and do not breathe vapors. Do not use near open fire or excessive heat. The flash point for Type I Dry Cleaning Solvent is 100°F (38°C), and for Type II is 140°F (60°C). If you become dizzy while using Dry Cleaning Solvent, get fresh air immediately and get medical aid. If contact with eyes is made, wash your eyes with water and get medical aid immediately.

**WARNING**

FRH hydraulic fluid may contain tricresyl phosphate which, if taken internally, can produce paralysis. Hydraulic fluid may be absorbed through the skin. Wear long sleeves, gloves, goggles, and faceshield. If FRH gets in eyes, wash them immediately and get medical aid immediately. If FRH gets on skin, thoroughly wash with soap and water. Wash hands thoroughly prior to eating or smoking. Application of these measures is considered an effective control of the hazard.

**WARNING**

If NBC exposure is suspected, all air filter media must be handled by personnel wearing protective equipment. Contact your unit NBC Officer or NBC NCO for appropriate handling or disposal.

**WARNING**

Before launching mine clearing line charge (MICLIC) (if equipped), wear hearing protection, close all crew hatches, and turn off vehicle exhaust fans. Failure to do so may result in injury or death to personnel from rocket launching fumes and hazardous noise.

TECHNICAL MANUAL

HEADQUARTERS  
DEPARTMENT OF THE ARMY  
Washington, D.C., 30 August 1985

**OPERATOR'S MANUAL  
LAUNCHER AND M60A1 TANK CHASSIS,  
TRANSPORTING:  
FOR BRIDGE, ARMORED-VEHICLE-LAUNCHED,  
SCISSORING TYPE, CLASS 60  
NSN 5420-00-889-2020**

**REPORTING ERRORS AND RECOMMENDING IMPROVEMENTS**

You can help improve this manual. If you find any mistakes, or if you know of a way to improve the procedures, please let us know. Mail your letter, DA Form 2028 (Recommended Changes to Publications and Blank Forms), or DA form 2028-2 located in the back of this manual directly to: Commander U.S. Army Tank-automotive and Armaments Command, Attn: AMSTA-IM-MCP, Warren, MI 48397-5000. A reply will be furnished to you.

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\*This manual supersedes TM 5-5420-202-10, 15 December 1975.

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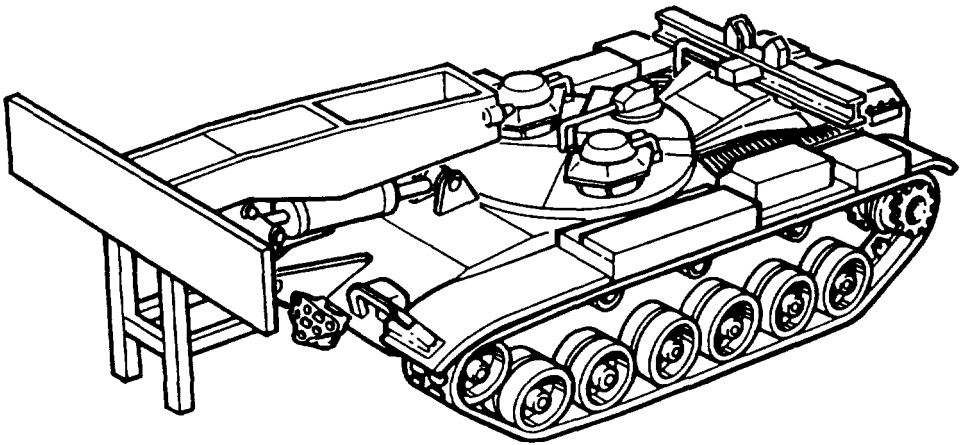
## CHAPTER 1

### INTRODUCTION

#### Section I. GENERAL INFORMATION

##### SCOPE

This manual is for your use in operating and maintaining the M60A1 AVLB. This heavily armored vehicle is used for launching and retrieving a scissoring type, class 60 bridge. The two-man crew consists of an operator and a commander.



##### MAINTENANCE FORMS AND RECORDS

Department of the Army forms and procedures used for equipment maintenance are those prescribed by DA PAM 738-750, The Army Maintenance Management System (TAMMS).

##### REPORTING EQUIPMENT IMPROVEMENT RECOMMENDATIONS (EIR'S)

EIR's must be submitted by anyone who knows of an unsatisfactory condition with equipment design or use. You do not have to show a new design or list a better way to do a procedure, just tell why the design is unfavorable or why a procedure is hard. EIR's may be submitted on SF 368, Quality Deficiency Report.

Mail directly to Commander, U.S. Army Tank-automotive and Armaments Command, AMSTA-TR-T, Warren, MI 48397-5000. A reply will be sent directly to you.

## Section II. EQUIPMENT DESCRIPTION

### EQUIPMENT PURPOSE

- Launch, retrieve, and transport scissoring-type bridge.

### EQUIPMENT CAPABILITIES

- Can be operated in nuclear, biological, or chemical environments.
- Can be operated on rough ground.
- Can be forded in water up to 4 feet deep (1.2 meters) without special equipment.
- Can launch or retrieve bridge on uphill or downhill slope of 15% or side slope of 8%.

### EQUIPMENT FEATURES

- Quick launch (2-5 minutes).
- Only two persons needed for launch/retrieval of bridge.
- Heavy armor protection for personnel.

#### WARNING

Before launching mine clearing line charge (MICLIC) (if equipped), wear hearing protection, close all crew hatches, and turn off vehicle exhaust fans. Failure to do so may result in injury or death to personnel from rocket launching fumes and hazardous noise.

- If vehicle is equipped with mine clearing line charge (MICLIC), refer to TM 9-1375-215-14&P for operating instructions.



**LOCATION AND DESCRIPTION OF MAJOR COMPONENTS**

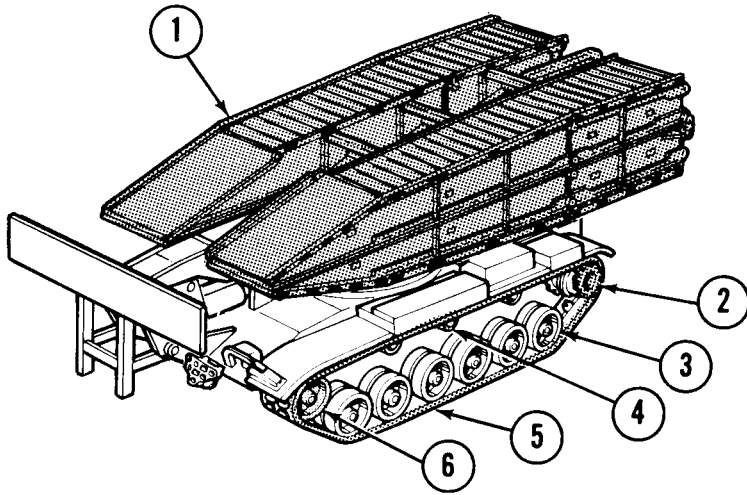
The M60A1 AVLB is divided into two sections - hull and launching mechanism. The hull contains the:

- Crew compartment with all controls for operating the launching mechanism.
- Engine compartment with engine and transmission that supplies power for operating hull and launching mechanism.
- Operator and commander cupolas to enter crew compartment.
- Cupola vision blocks and periscopes for visual operation when openings (hatches) are closed.
- Bridge seat on which bridge rests during transporting.

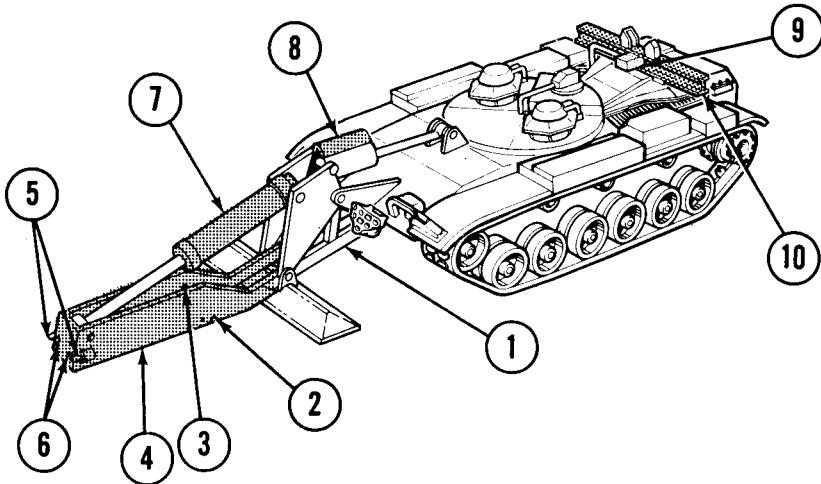
The launcher mechanism contains the:

- Hydraulic system - pump, fluid, cylinders, hoses, and other parts for moving the bridge, outrigger, and tongue during launch and retrieval.
- Outrigger - steadies vehicle during bridge launch and retrieval.
- Tongue - connects vehicle to bridge.

**LOCATION AND DESCRIPTION OF MAJOR COMPONENTS - Continued**

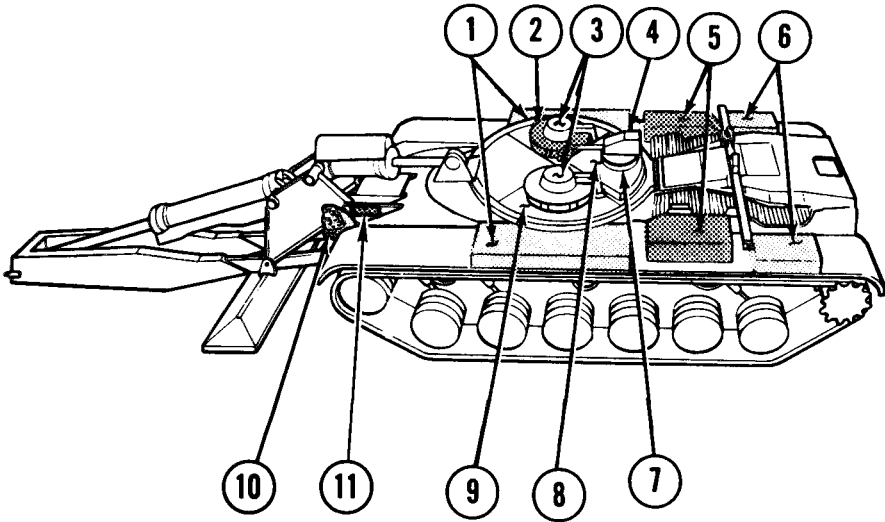


- |                         |                             |
|-------------------------|-----------------------------|
| 1. Bridge               | 4. Support roller           |
| 2. Final drive sprocket | Track                       |
| 3. Roadwheel            | 5. Compensating idler wheel |



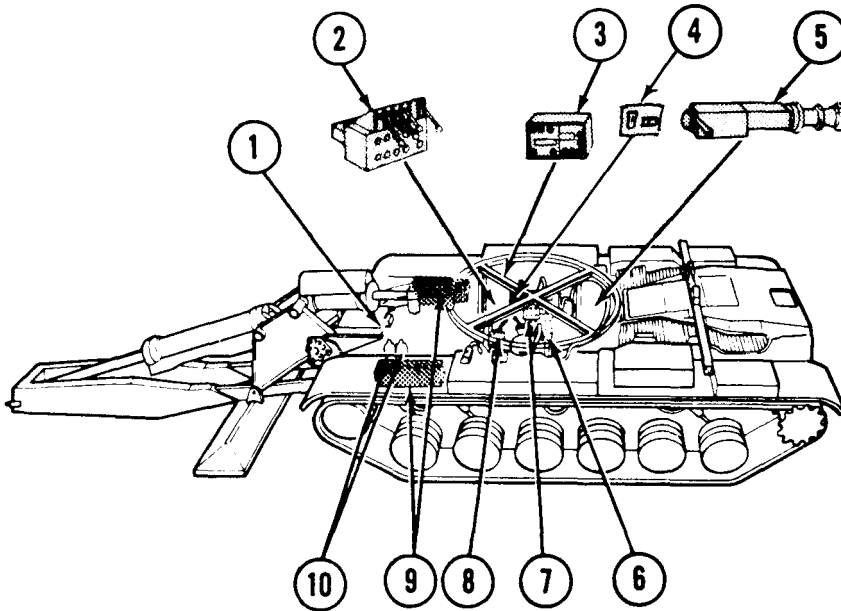
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|-----------------------|-----------------------|
| 1. Boom and outrigger | 6. Ejection cylinders |
| 2. Guide pin          | 7. Tongue cylinder    |
| 3. Locking cylinder   | 8. Overhead cylinder  |
| 4. Tongue             | 9. Holddown cylinder  |
| 5. Pintles            | 10. Bridge seat       |

**LOCATION AND DESCRIPTION OF MAJOR COMPONENTS - Continued**



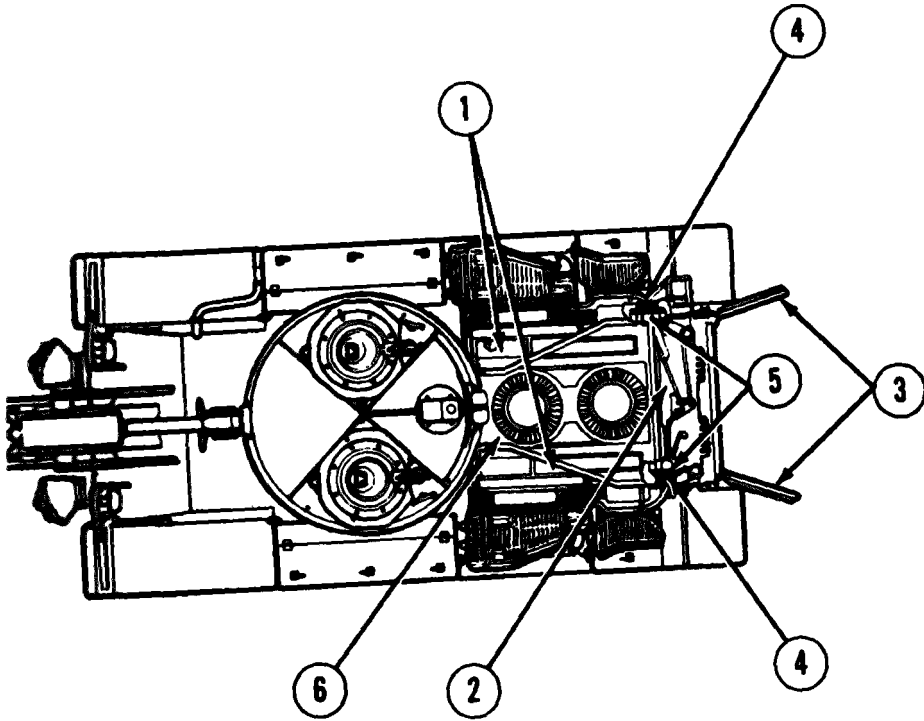
- |                               |  |
|-------------------------------|--|
| 1. Front fender stowage boxes | 7. Ventilating blower cover                      |
| 2. Commander's cupola         | 8. Hydraulic oil reservoir                       |
| 3. Hatches                    | 9* Operator's cupola                             |
| 4. Antenna mount              | 10. Smoke grenade discharger ■<br>(if equipped)  |
| Engine air cleaners           |  |
| 2. Rear fender stowage boxes  | 11. Smoke grenade stowage<br>boxes (if equipped) |

**LOCATION AND DESCRIPTION OF MAJOR COMPONENTS - Continued**



1. Personnel heater
2. Valve bank control
3. Radio
4. Grenade launcher controls  
Power take off (PTO), pump-clutch assembly
5. Operator's master control panel
7. Indicator panel
8. Night Vision Viewer
9. Batteries (6)
10. Fire extinguishers (3)

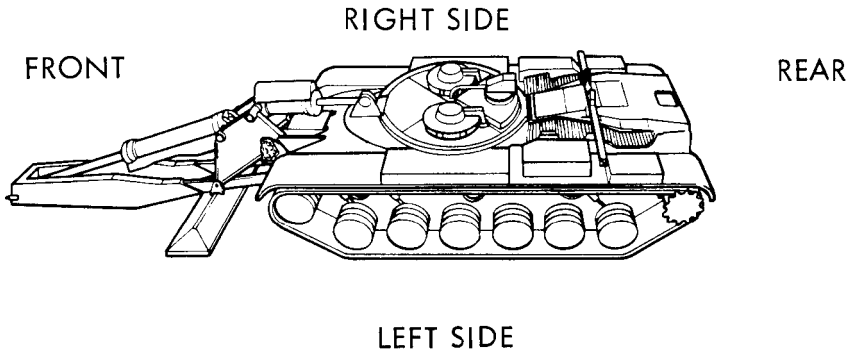
LOCATION AND DESCRIPTION OF MAJOR COMPONENTS - Continued



- |    |              |    |                  |
|----|--------------|----|------------------|
| 1. | Fuel tanks   | 4. | Final drives     |
| 2. | Transmission | 5. | Universal joints |
| 3. | Grille doors | 6. | Engine           |

## **LOCATION AND DESCRIPTION OF MAJOR COMPONENTS - Continued**

### **FRONT, REAR, RIGHT, AND LEFT DESIGNATIONS**



### **DETAILED DESCRIPTION**

If you need a detailed description of any component of the M60A1 bridge launcher, ask your supervisor to let you see a copy of TM 5-5420-202-20 (Hull) or TM 5-5420-228-24 (Launcher). Ask for TM 5-5420-203-14 for details on the bridge.

### **DIFFERENCE BETWEEN MODELS**

There are several M60A1 ALVB equipment variations. This manual covers the following:

- Armored top loading engine air cleaner, or aluminum top loading engine air cleaner.
- Early model operator and commander cupolas, or late model operator and commander cupolas.
- Smoke Generator
- Driver's AN/VVS-2 Night Vision Viewer, or periscope, M24
- Smoke Grenade Launcher
- Vehicle Exhaust Dust Ejector System (VEDES) and Dust Detector System
- Mechanical Track Adjusting Link or Grease Actuated Track Adjusting Link
- AVDS-1790-2D Engine or AVDS-1790-2D A Engine

**EQUIPMENT DATA**

Capacities (fuel and oil):

Fuel tanks (total)	375 gal (1419 litres)
Engine crankcase (refill)	14.5 gal (54.9 litres)
Transmission (refill)	17 gal (64.3 litres)
Final Drives	11 qts (10.4 litres)
Hydraulic system w/bridge	135 gal (511 litres)
w/o bridge	115 gal (435.3 litres)

Controls:

Brakes	hydraulic-mechanical foot pedal
Steering	
Type	hydraulic mechanical
Turning capability	360-degree pivot
Transmission	
Type	CD-850-6A, 2 speed forward, 1 reverse
Operation	mechanical lever, 5 positions (P, N, L, H, R)

Dimensions (travel position):

Length	(w/o bridge)	28.3 ft (8.64 m)
	(w/bridge)	37.0 ft (11.28 m)
Height	(w/o bridge)	10.0 ft (3.0 m)
	(w/bridge)	12.8 ft (3.9 m)
Width	(w/o bridge)	12.0 ft (3.6 m)
	(w/bridge)	13.2 ft (4 m)
Ground clearance		14 in. (35.6 cm)

Engine:

Model	AVDS-1790-2D or -2DA
Type	V-12, turbosupercharged
Governed speed	
full load.	2400 rpm
no load	2650 rpm
idle	700 to 750 rpm
Fuel	diesel oil
20° to 115°F (-7° to 46°C)	40 cetane, regular grade, DF-2
-25° to 20°F (-32° to -7°C)	40 cetane, regular grade, DF-1
-65° to -25° (-55° to -32°C)	40 cetane, regular grade, DF-A
Cooling system (engine and oil)	air-cooled
Fuel consumption	1.13 gpm (gal per mile) (4.3 Lpm)

**EQUIPMENT DATA - Continued**

Electrical System:

Input	24 vdc
Batteries, type	12 vdc, wet-cell
Number	6
Capacity	100 ampere-hours
Charging system type	generator
output	300 amp (max)
Regulator	relay (electro-mechanical)

Land Performance:

Speeds (maximum)	
Low	10 mph (16 kph)
High	30 mph (48 kph)
Reverse	5 mph (8 kph)
Towing speeds (maximum)	
Transmission connected	3 mph (5 kph)
Transmission disconnected	12 mph (20 kph)
Grade (maximum), transporting	
Uphill or downhill	30%
Side slope	1570
Grade (maximum), launching/ retrieving	
Uphill or downhill	15%
Side slope	8%
Obstacle height vehicle will climb (maximum)	
Forward	18 in. (46.2 cm)
Ditch width vehicle will cross	84 in. (214.8 cm)

Weight:

Vehicle (w/o bridge)	92,200 lb (46.1 tons)
	41,859 kg (42 metric tons)
Vehicle (w/bridge)	121,700 lb (61 tons)
	55,252 kg (55.3 metric tons)

Ground Pressure:

Vehicle (w/o bridge)	9.0 psi (lb/sq in.) (62.1 kpa)
Vehicle (w/bridge)	12.2 psi (84.12 kpa)
Bridge (see TM 5-5420-203-14)	Scissoring type, class 60



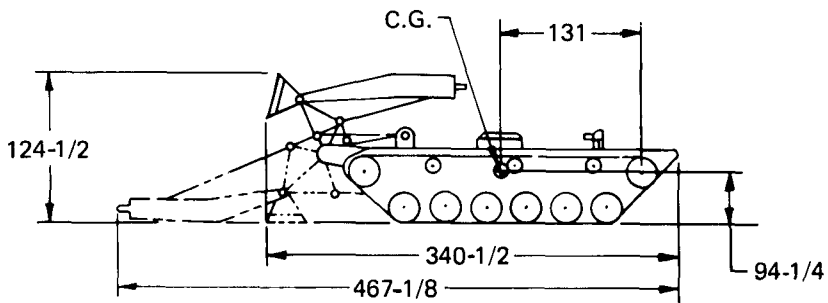
**EQUIPMENT DATA - Continued**

Periscope, M24 (If Equipped)	
Magnification	1X (unity)
Field of view (horizontal)	26.8° (can be pivoted 32° right or left and 15 in elevation)
Operating voltage	16,000 vdc
Night Viewer (If Equipped)	AN/WS-2 Night Vision
Communications System:	
Radio Set	AN/VRC-46, AN/VRC-53, or AN/VRC-64
Intercom set	AN/VIC-1
Gas-Particulate Filter Unit:	
Personnel protection	4 (or less) per unit
Type	M8A3
Protective mask	M25 or M25A1
Smoke Grenade Launcher (If Equipped)	L8 series smoke grenades
Ammunition	UK L8A1 RP (red phosphorous) smoke grenade

**EQUIPMENT DATA - Continued**

**TRANSPORTATION NAMEPLATE**

**TRANSPORTATION DATA FOR  
LAUNCHER TRANSPORTING M60A1 TANK CHASSIS  
FOR BRIDGE, ARMORED VEHICLE  
LAUNCHED, SCISSORING TYPE**



DIMENSIONS ARE IN INCHES.

	UNFOLDED	FOLDED
OVER-ALL LENGTH	467-1/8	340-1/2
OVER-ALL HEIGHT	94-1/4	124-1/2
OVER-ALL WIDTH	144	144
SHIPPING CUBAGE	3740	3560
SHIPPING WEIGHT	46T	46T
SHIPPING TONS	150T	142T
TRACK WIDTH	144	144

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EQUIPMENT DATA - Continued

LAUNCHER NAMEPLATE

<p><b>LAUNCHER TRANSPORTING M60A1 TANK CHASSIS FOR BRIDGE ARMORED VEHICLE LAUNCHED, SCISSORING TYPE NSN 5420-00-889-2020</b></p>	
<b>SERIAL NO.</b>	RIA-56
<b>REGISTRATION NO.</b>	WF005K
<b>MFGR'S NAME &amp; ADDRESS</b>	
<p>ROCK ISLAND ARSENAL ROCK ISLAND, ILLINOIS</p>	
<b>MODE L NO.</b> M-60-A1	
<b>ACCEPTANCE DATE</b>	DEC. 1975
<b>WARRANTY 1 YEAR</b>	
<b>PURCHASE ORDER</b>	DAAK01-72-Z-7324
<b>INSPECTED WEIGHT (TONS)</b>	46.2 TONS
<b>U. S.</b>	



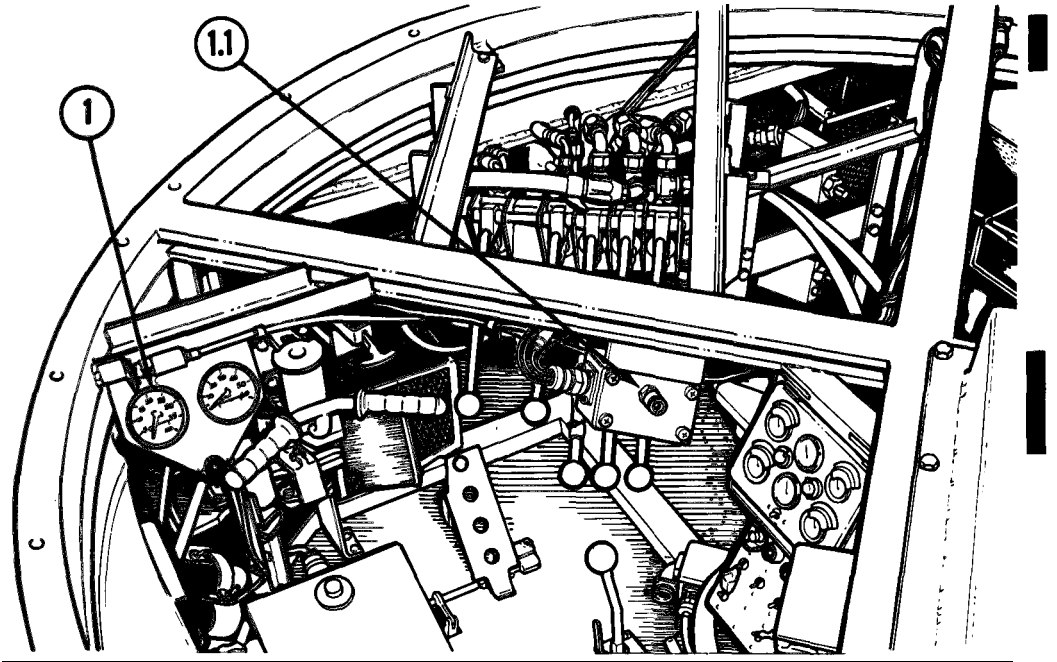
CHAPTER 2

OPERATING INSTRUCTIONS

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

OPERATOR'S CONTROLS AND INDICATORS

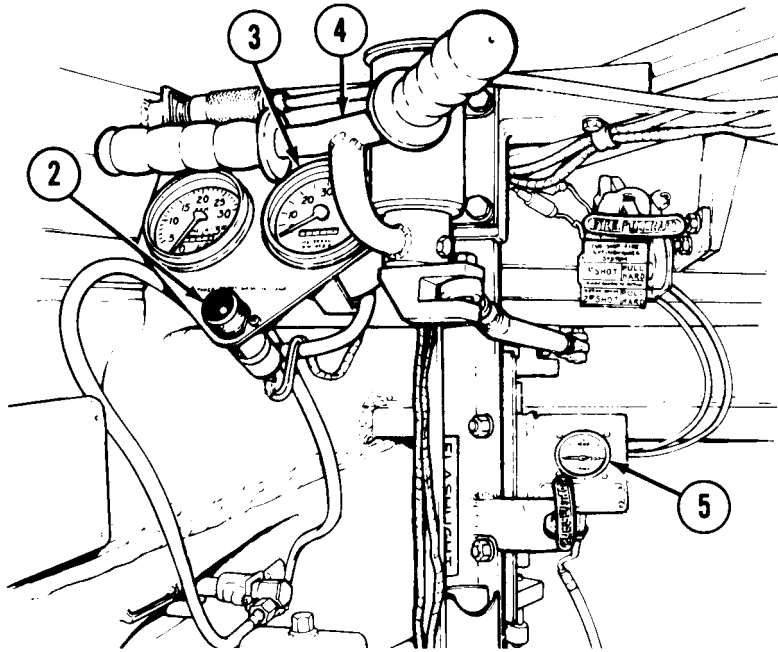
GENERAL



Key	Control or Indicator	Function
1.	Tachometer	Shows engine speed in revolutions per minute (rpm).
	Hour Meter	Registers total equivalent number of hours operated for 1 clock hour at 2,025 rpm.
1.1	DUST DETECTOR WARNING LAMP (If Equipped)	Lights if engine dust detector switch has tripped.

**OPERATOR'S CONTROLS AND INDICATORS - Continued**

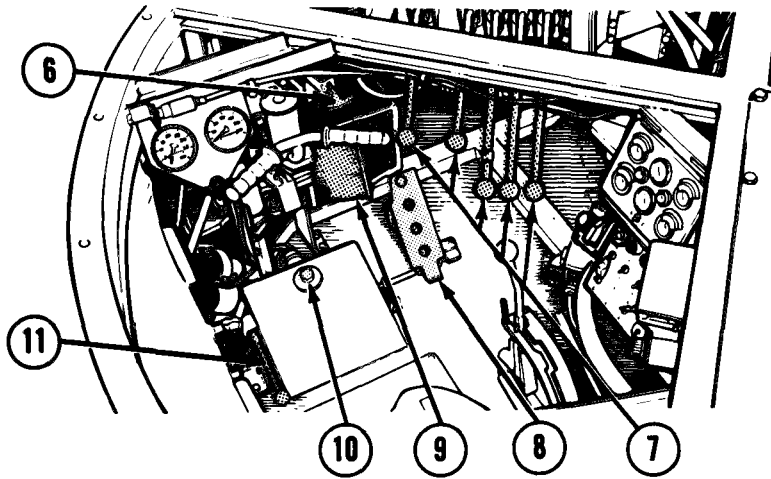
**GENERAL**



Key	Control or Indicator	Function
2.	POWERPLANT WARNING Lamp	Lights if engine oil pressure, engine oil temperature, transmission oil temperature, or transmission oil pressure are not normal or if engine dust detector switch has tripped (if equipped).
3.	Speedometer	Shows speed in miles per hour (mph).
	Odometer	Shows distance traveled in miles and tenths of a mile from 0 to 99,999.9.
4.	Steering Control	Steers vehicle.
5.	Brake Pressure Gage	Shows hydraulic pressure in brake line.

OPERATOR'S CONTROLS AND INDICATORS - Continued

GENERAL

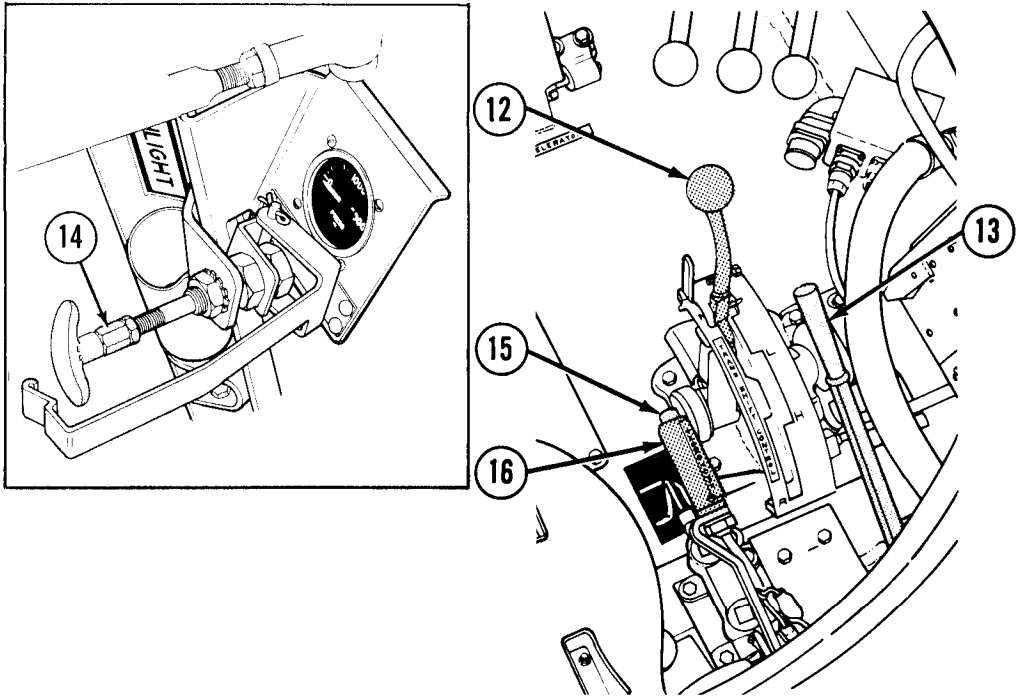


Key	Control or Indicator	Function
6.	Fixed Fire Extinguisher Controls	Discharges fixed fire extinguishers.
<p><b>NOTE</b>                      Fixed fire extinguishers are used to put out fire in the engine compartment.</p>		
7.	Operator's Bridge Launching Controls	See page 2-14.
8.	Accelerator Pedal	Controls engine speed.
9.	Brake Pedal	Applies brakes to control and stop vehicle.
10.	Dimmer Switch	Selects either high or low headlight beam when pressed and released.
11.	Accelerator Locking Lever	Locks accelerator pedal in preset position.

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**OPERATOR'S CONTROLS AND INDICATORS - Continued**

**GENERAL**



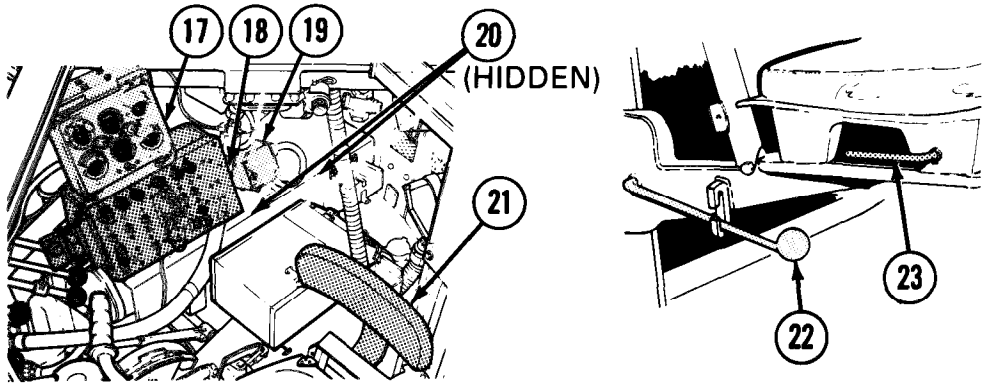
Key	Control or Indicator	Function
12.	Transmission Shift Lever	Controls transmission operating range. Locks brakes when in (P) park position.
13.	Pump-Clutch Lever	Controls hydraulic pump-clutch.
14.	Manual Fuel Shutoff Handle	Controls fuel to engine.
15.	Manifold Heater Switch	Controls fuel and power to manifold heaters.
16.	Purge Pump Control Handle	Forces air from engine fuel system. Pumps fuel to manifold heaters.

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**OPERATOR'S CONTROLS AND INDICATORS - Continued**

**GENERAL**

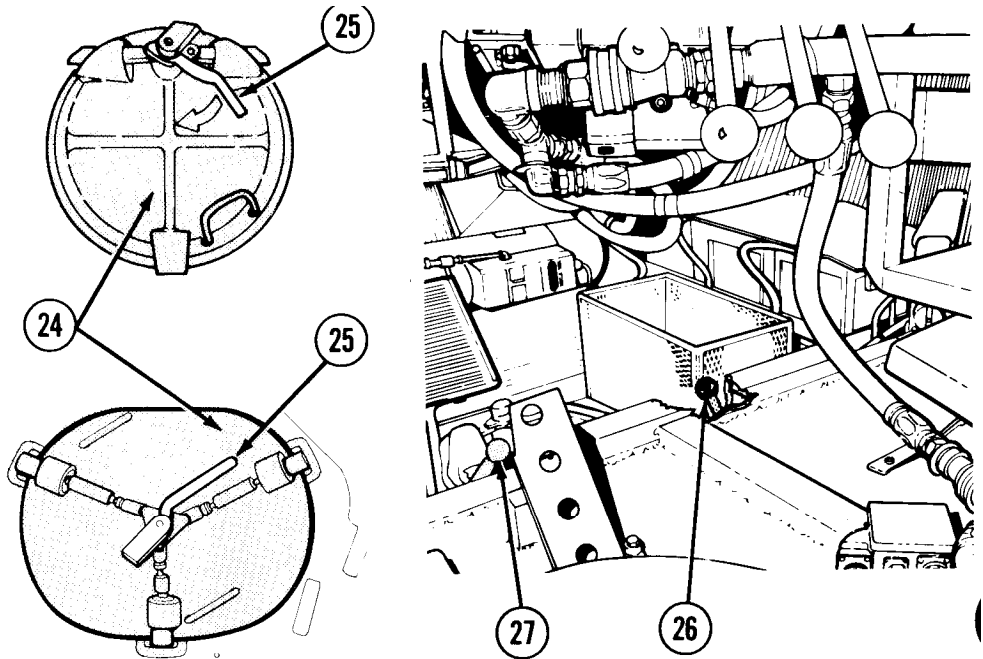


Key	Control or Indicator	Function
17.	Indicator Panel	Provides operator with operating controls and indicators. See page 2-15.
18.	Master Control Panel	Provides operator with operator's controls and indicators. See page 2-17.
19.	Intercom Control Panel	Provides voice communication selection and volume control.
20.	Pump-Clutch Assembly	Provides power to hydraulic pump and pressure for hydraulic system.
21.	Operator's Seat	Controls position of operator.
22.	Height Adjustment Lever	Releases seat for height adjustment. Locks seat at desired height.
23.	Seat Control Handle	Releases seat for forward or rearward adjustment. Locks seat at desired position.

OPERATOR'S CONTROLS AND INDICATORS - Continued

GENERAL

EARLY - TYPE ESCAPE HATCH

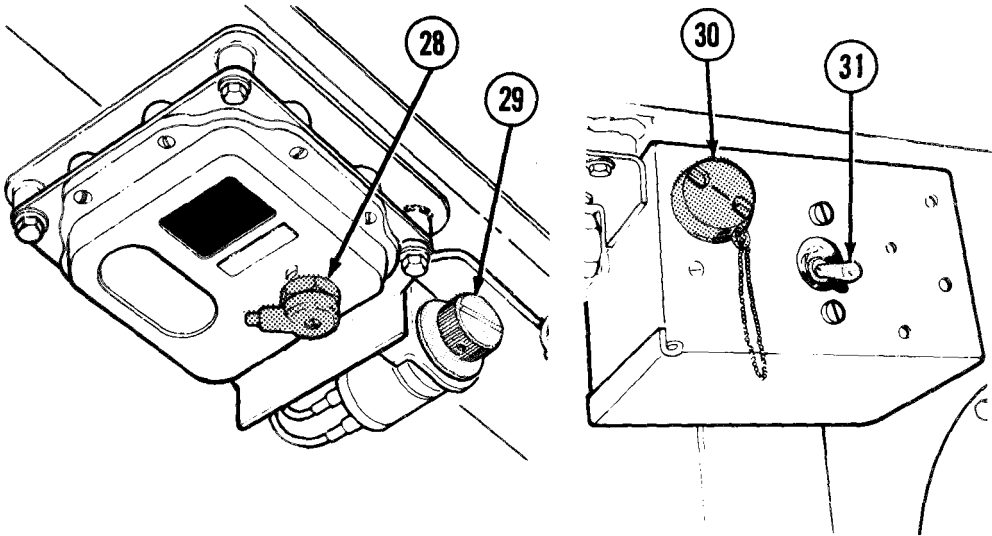


LATE - TYPE ESCAPE HATCH

Key	Control or Indicator	Function
24.	Escape Hatch	Emergency exit from vehicle.
25.	Escape Hatch Lever	Releases escape hatch from hull.
26.	Engine Compartment Drain Valve Lever	Controls engine compartment drain valve.
27.	Crew Compartment Drain Valve Lever	Controls crew compartment drain valve.

**OPERATOR'S CONTROLS AND INDICATORS - Continued**

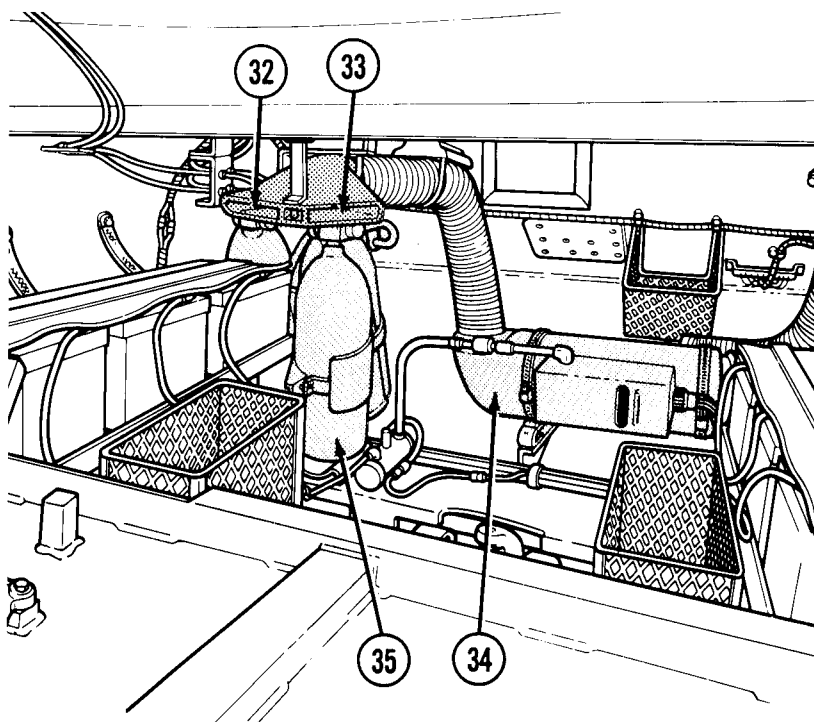
**GENERAL**



Key	Control or Indicator	Function
28.	Domelight Switch	Turns domelight on or off. Selects red or white light.
29.	Rheostat Knob	Controls brightness of domelight.
30.	Utility Outlet	Provides connection for 24 vdc.
31.	Ventilating Blower Switch	Controls ventilating blower.

OPERATOR'S CONTROLS AND INDICATORS - Continued

GENERAL

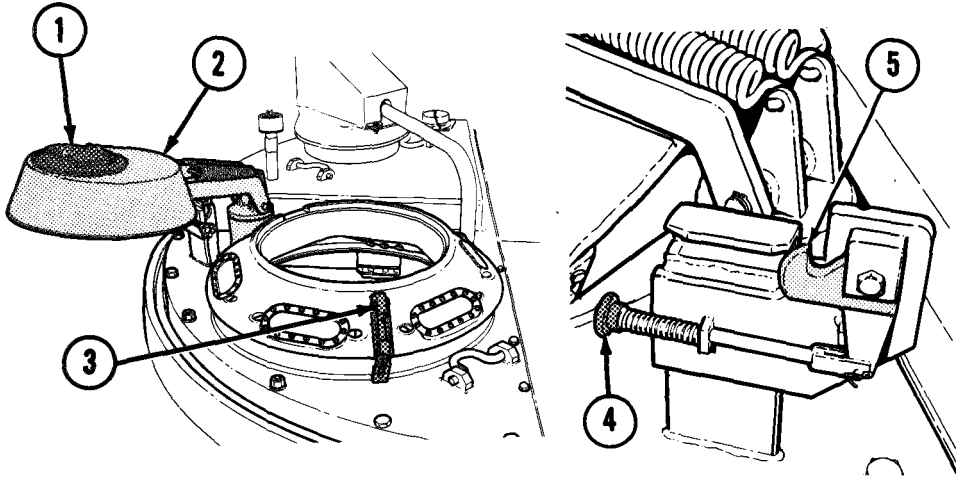


Key	Control or Indicator	Function
32.	Operator's Heater Vent	Directs air from personnel heater toward operator's, are a.
33.	Commander's Heater Vent	Directs air from personnel heater toward commander's are a.
34.	Personnel Heater	Provides heated air for vehicle.
35.	Fire Extinguishers	Contains chemicals (under pressure) for putting out fires in engine compartment.

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**OPERATOR'S CONTROLS AND INDICATORS - Continued**

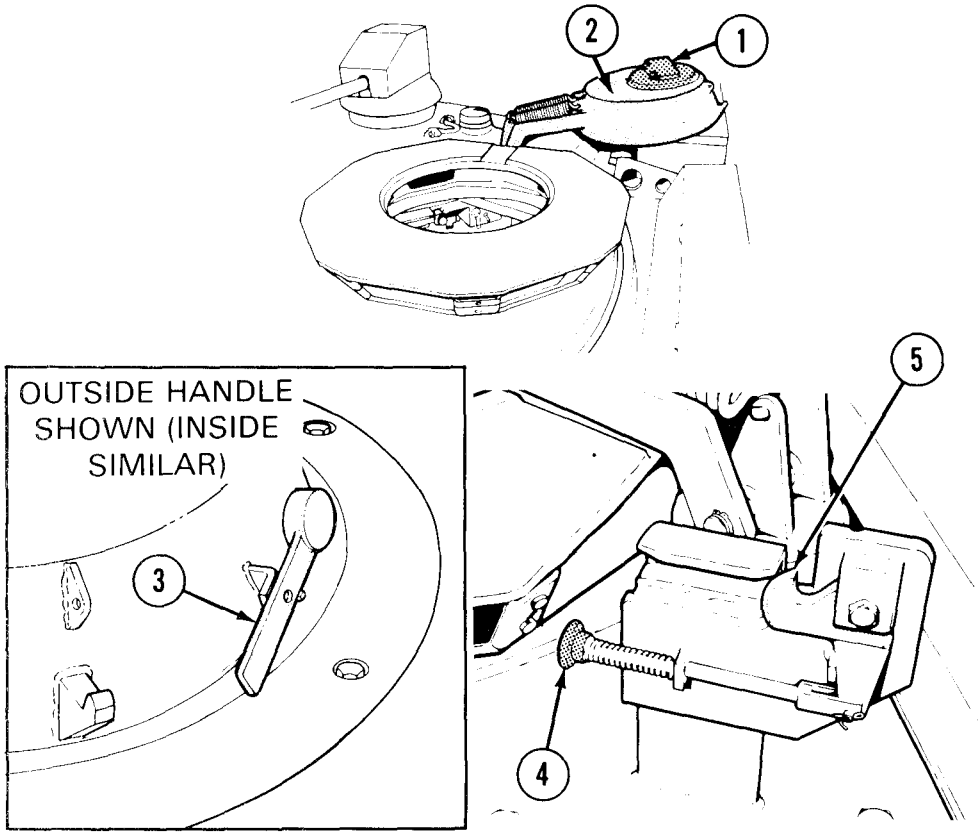
**CUPOLA COVER (Early Model Cupola) (Same for operator and commander)**



Key	Control or Indicator	Function
1.	Periscope Door Assembly or Night Viewer Mount	Supports periscope or night viewer. See page 2-21.
2.	Cupola Cover	Covers hatch opening.
3.	Hasp	Secure cover when closed from outside.
4.	Release Knob	Releases safety latch when pushed.
5.	Safety Latch	Holds cover when open.

**OPERATOR'S CONTROLS AND INDICATORS - Continued**

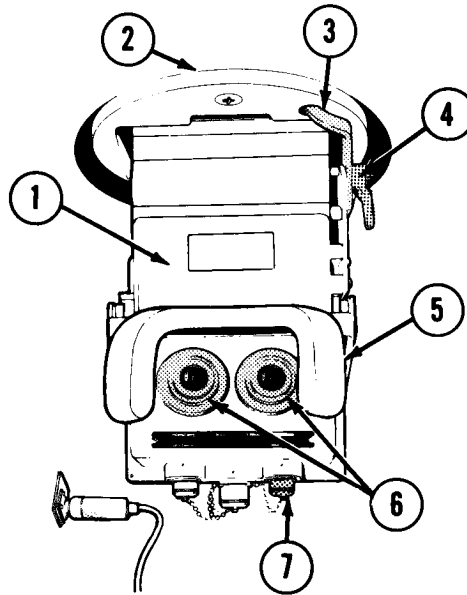
**CUPOLA COVER (Late Model Cuploa (Same for operator and commander))**



Key	Control or Indicator	Function
1.	Persicope Door Assembly or Night Viewer Mount	Supports periscope or night viewer. See page 2-21.
2.	Cupola Cover	Covers hatch opening.
3.	Cover Handles	Secures cover when closed.
4.	Release Knob	Releases safety latch when pushed.
5.	Safety Latch	Holds cover when open.

**OPERATOR'S CONTROLS AND INDICATORS - Continued**

**M24 PERISCOPE (IF EQUIPPED)**

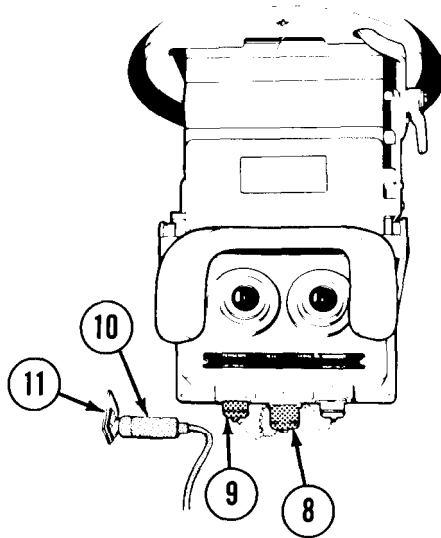


Key	Control or Indicator	Function
1.	M24 Infrared (IR) Periscope	Used when driving at night under IR conditions.
2.	Periscope Mount	Holds periscope in operating position.
3.	Elevation Clamp	Clamps periscope at elevation setting.
4.	Elevation Lever	Adjusts periscope elevation.
5.	Headrest	Adjusts to user's needs.
6.	Eyepieces	Provide vision through periscope.
7.	Right Focus Knob*	Focuses right eyepiece.

\*Dust covers shown in place.

**OPERATOR'S CONTROLS AND INDICATORS - Continued**

**MZ4 PERISCOPE (IF EQUIPPED) - Continued**



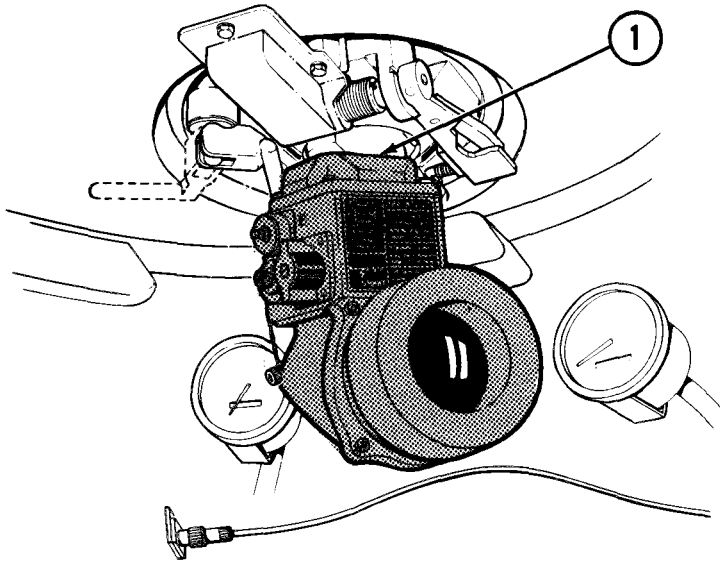
Key	Control or Indicator	Function
8.	Power receptacle*	For connecting high voltage power cable to periscope.
<div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 0 auto;"> <p><b>WARNING</b></p> <p>High voltage is present at periscope power cable and could cause serious injury or death.</p> </div>		
9.	Left Focus Knob*	Focuses left eyepiece.
10.	Power Cable	Provides high voltage to periscope.
11.	Power Cable Stowage Connector	Provides connection for power cable when not connected to periscope.

\*Dust covers shown in place.



OPERATOR'S CONTROLS AND INDICATORS - Continued

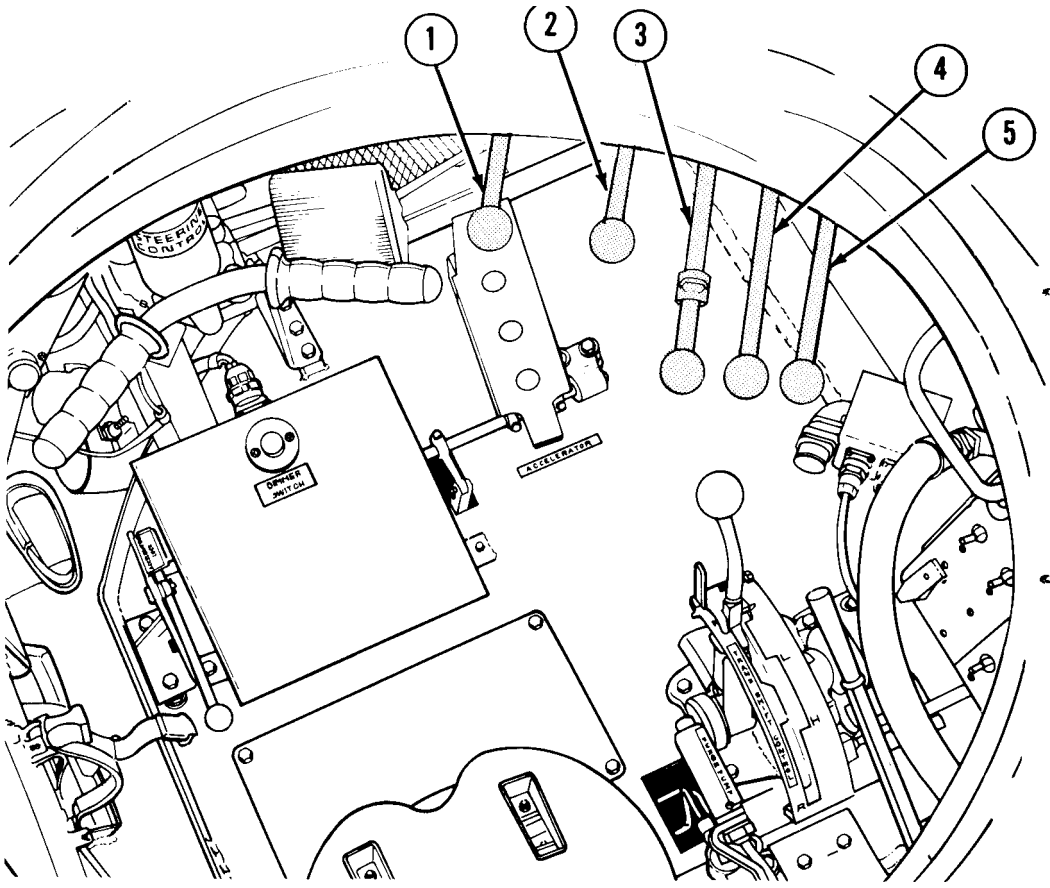
**NIGHT VIEWER (IF EQUIPPED)**



Key	Control or Indicator	Function
1.	AN/WS-2 Night Vision Viewer	Used when driving at night under blackout conditions.

**OPERATOR'S CONTROLS AND INDICATORS - Continued**

**BRIDGE LAUNCHING CONTROLS**

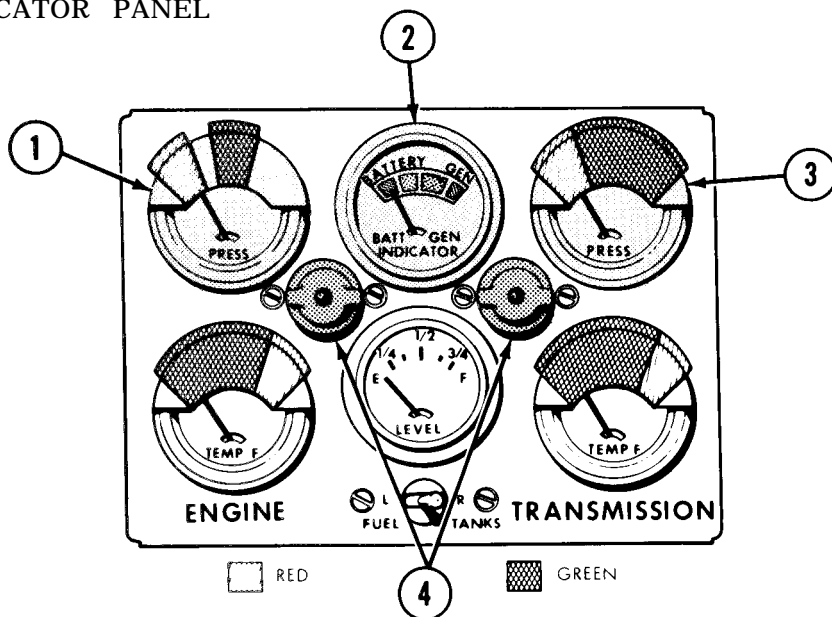


Key	Control or Indicator	Function
1.	EJECT Lever	Controls ejection cylinders.
2.	LOCK Lever	Controls locking cylinder.
3.	SCISSORS Lever	Controls bridge scissors cylinder.
4.	TONGUE Lever	Controls tongue.
5.	OVERHEAD Lever	Controls overhead and hold-down cylinders.

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OPERATOR'S CONTROLS AND INDICATORS - Continued

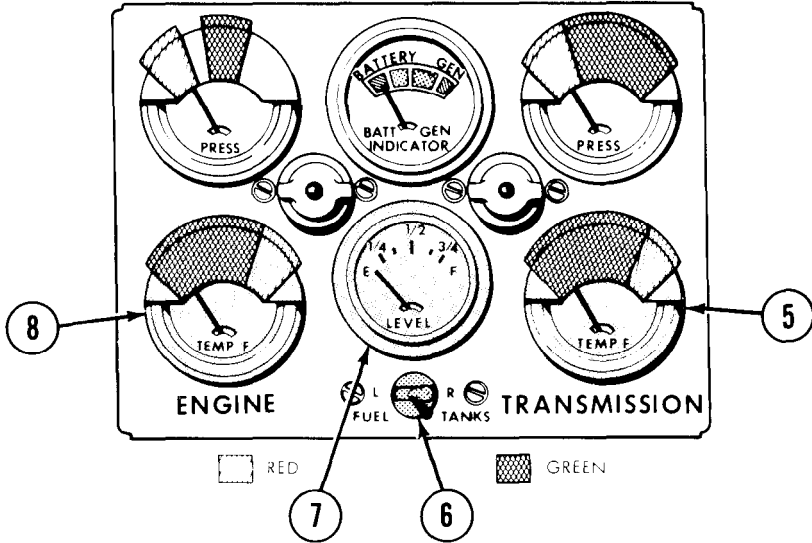
INDICATOR PANEL



Key	Control or Indicator	Function
1.	ENGINE Oil Pressure	Shows operating pressure. Green - normal, red - low.
2.	Battery-Generator	Engine off - shows condition of batteries. Engine running - shows rate of charge.
3.	TRANSMISSION Oil Pressure	Shows operating pressure. Green - normal, red - low.
4.	Panel Lamps	Light panel.

OPERATOR'S CONTROLS AND INDICATORS - Continued

INDICATOR PANEL - Continued

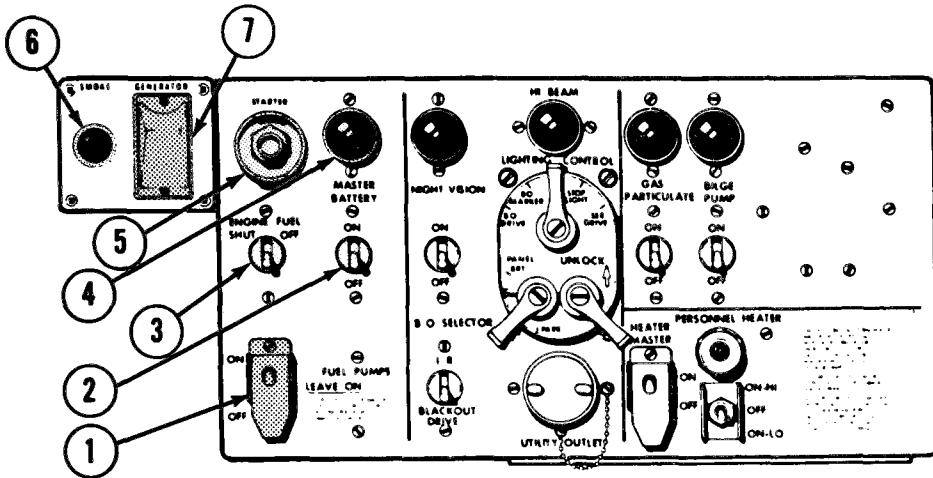


Key	Control or Indicator	Function
5.	TRANSMISSION Oil Temperature	Shows operating temperature. Green - normal, red-high.
6.	FUEL TANKS Selector Switch	Connects fuel level indicator to either fuel tank (L or R).
7.	Fuel LEVEL Gage	Indicates fuel level in tank selected.
8.	ENGINE Oil Temperature	Shows operating temperature. Green - normal, red-high.

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**OPERATOR'S CONTROLS AND INDICATORS - Continued**

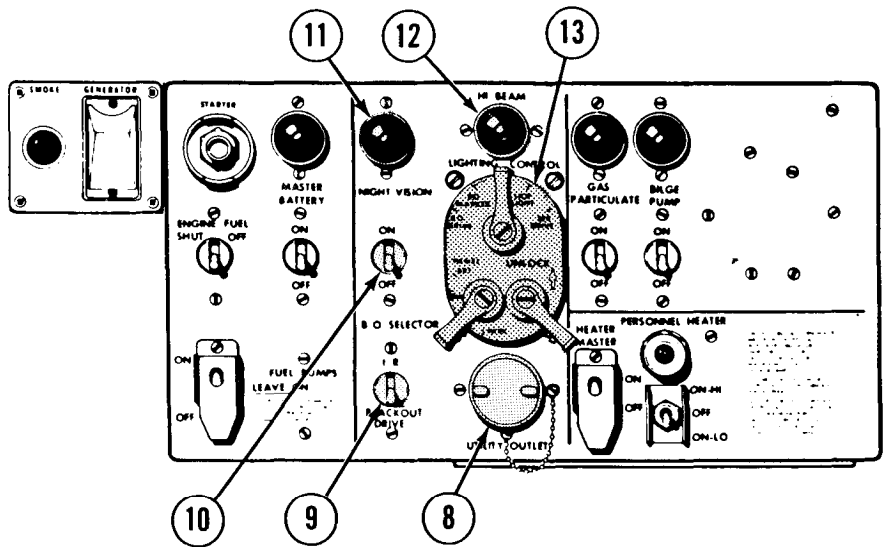
**MASTER CONTROL PANEL**



Key	Control or Indicator	Function
1.	FUEL PUMPS Switch	Controls in-vehicle fuel pumps.
2.	MASTER BATTERY Switch	Controls power to vehicle electrical system.
3.	ENGINE FUEL SHUTOFF Switch	Controls engine fuel.
4.	MASTER BATTERY Indicator	Lights when MASTER BATTERY switch is on.
5.	STARTER Switch	Controls engine starter.
6.	SMOKE GENERATOR Indicator (If Equipped)	Lights when SMOKE GENERATOR is on.
7.	SMOKE GENERATOR Switch (If Equipped)	Controls power to SMOKE GENERATOR system.

**OPERATOR'S CONTROLS AND INDICATORS - Continued**

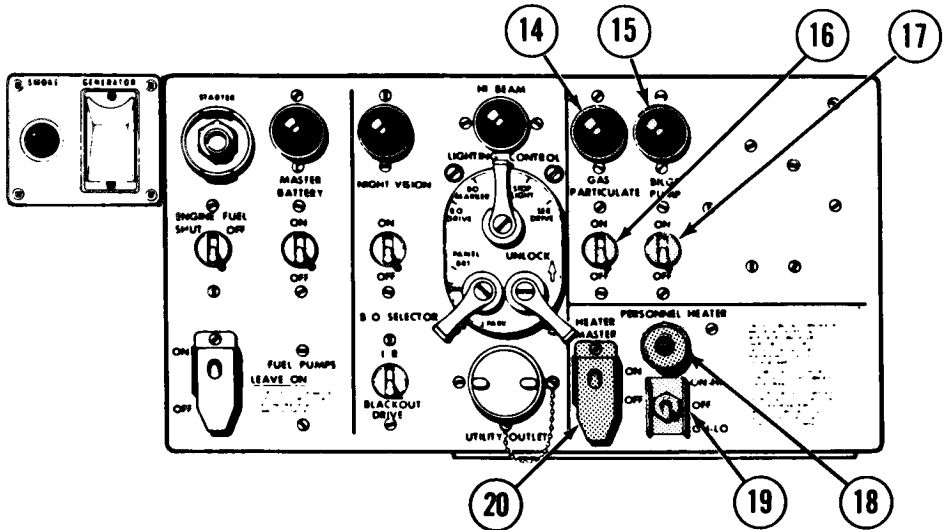
**MASTER CONTROL PANEL - Continued**



Key	Control or Indicator	Function
8.	UTILITY OUTLET	Provides 24 vdc power for accessories.
9.	BO SELECTOR Switch	Selects either infrared (IR) headlights or blackout (BO) drive lights.
10.	NIGHT VISION Switch	Controls infrared periscope power.
11.	NIGHT VISION Indicator	Lights when NIGHT VISION switch is on.
12.	HI BEAM Indicator	Lights when headlights are on high beam.
13.	LIGHTING CONTROL Switch	Controls outside lights and panel lights.

OPERATOR'S CONTROLS AND INDICATORS - Continued

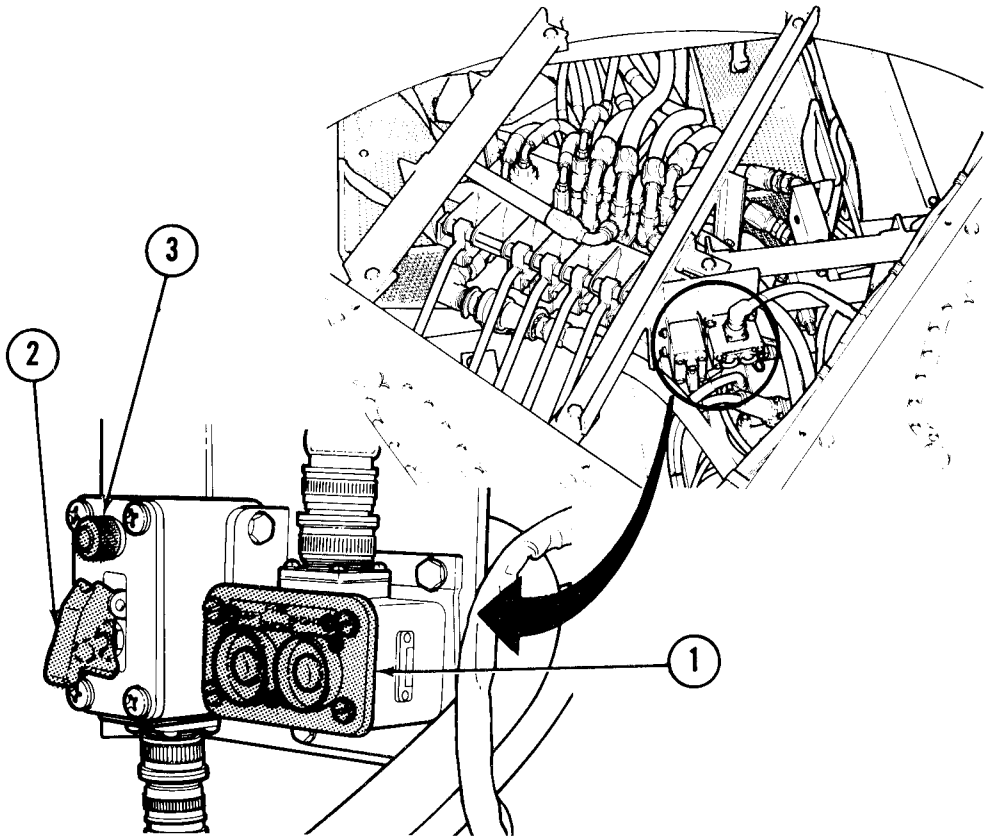
MASTER CONTROL PANEL - Continued



Key	Control or Indicator	Function
14.	GAS-PARTICULATE Indicator	Lights when gas-particulate switch is on.
15.	BILGE PUMP Indicator	Not used.
16.	GAS-PARTICULATE Switch	Controls gas-particulate filter unit power.
17.	BILGE PUMP Switch	Not used.
18.	PERSONNEL HEATER Indicator	Lights when heater is running in ON-HI or ON-LO, or heater is purging in OFF position.
19.	PERSONNEL HEATER Switch	Controls heater power and provides temperature control.
20.	HEATER MASTER Switch	Controls power to PERSONNEL HEATER switch.

**OPERATOR'S CONTROLS AND INDICATORS - Continued**

**SMOKE GRENADE LAUNCHER CONTROLS (IF EQUIPPED)**



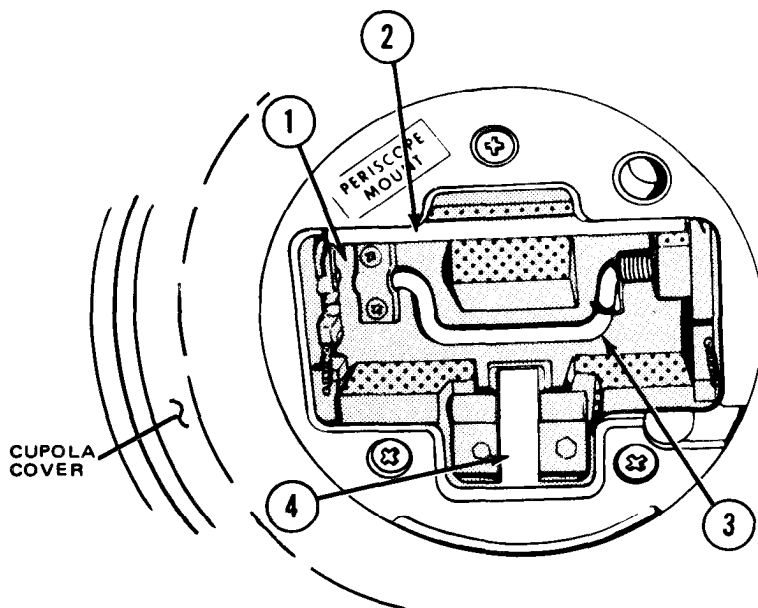
**SMOKE GRENADE LAUNCHER CONTROLS**

Key	Control or Indicator	Function
1.	Pushbutton Unit	Controls firing of left and right dischargers when grenade launcher system power is on.
2.	POWER Switch	Controls power to smoke grenade launcher system.
3.	POWER Lamp	Lights when smoke grenade launcher system power is on.



**OPERATOR'S CONTROLS AND INDICATORS - Continued**

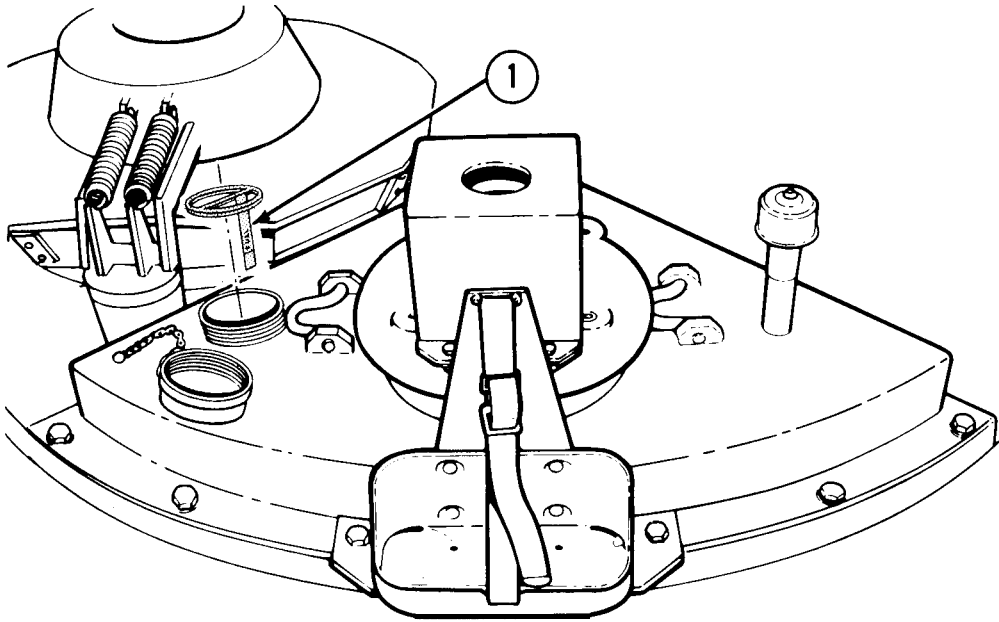
**PERISCOPE DOOR ASSEMBLY (Same for both operator and commander)  
(IF EQUIPPED)**



Key	Control or Indicator	Function
1.	Lid	Covers periscope opening (spring-loaded to open position).
2.	Locking Handle	Locks periscope in place.
3.	Lid Handle	Provides lid grip.
4.	Locking Latch	Locks lid in closed position.

OPERATOR'S CONTROLS AND INDICATORS - Continued

HYDRAULIC RESERVOIR

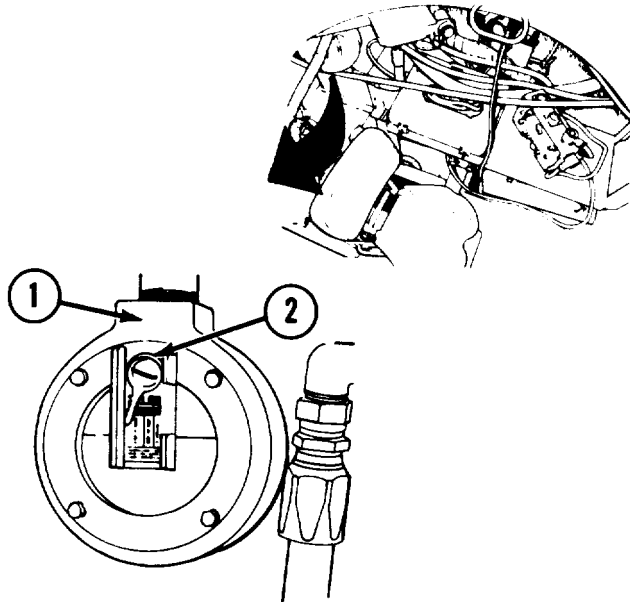


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Key	Control or Indicator	Function
1.	Dipstick	Shows hydraulic fluid level in reservoir.

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OPERATOR'S CONTROLS AND INDICATORS - Continued



Key	Control or Indicator	Function
1.	Reservoir Filter	Filters hydraulic fluid passing from reservoir to hydraulic system.
2.	Filter Indicator	Indicates filter status: FILTER IS CLEAN, NEEDS CLEANING, or BYPASSED.

**SECTION II. PREVENTIVE MAINTENANCE  
CHECKS AND SERVICES (PMCS)**

**GENERAL**

Preventive Maintenance Checks and Services (PMCS) means systematic caring, inspecting, and servicing of equipment to keep it in good condition and to prevent breakdowns.

Be sure to perform your PMCS each time you operate the vehicle. Always do your PMCS in the same order, so it gets to be a habit. Once you have some practice, you will quickly spot anything wrong.

## PREVENTIVE MAINTENANCE CHECKS AND SERVICES - Continued

### PMCS PROCEDURES

#### Explanation of Columns.

**Column 1 - Item No.** Provides the sequence in which the PMCS procedures are to be performed. Use this item number on DA Form 2404 to identify the area where you found something wrong and notify organizational maintenance.

**Column 2 - Interval.** Identifies when the PMCS procedures are to be performed.

Before you begin operating the vehicle, do the Before interval procedures.

While operating the vehicle, do the During interval procedures.

After operating the vehicle, do the After interval procedures.

Once a week do the Weekly interval procedures. If the vehicle has not been operated in the last week, also do the Before interval procedures at the same time.

Once a month do the Monthly interval procedures. If the vehicle has not been operated in the last month, also do the After interval procedures at the same time.

If you are operating the vehicle for the first time, do the Weekly and Monthly interval procedures the first time you do the Before interval procedures.

**Column 3 - Location-Item to Check/Service.** Identifies the vehicle component location where the procedure is to be performed.

**Column 4 - Crewmember/Procedure.** Identifies who will perform the procedure and provides instructions required to determine mission capability of the vehicle.

**Column 5 - Not Fully Mission Capable If:** Identifies vehicle conditions that will prevent the vehicle from performing a mission. Vehicles with any of the conditions identified must be reported as not available and not mission capable.

### SPECIAL INFORMATION

The following paragraphs provide information and general guidelines necessary for the successful completion of PMCS.

#### General

If you find something wrong when performing PMCS, fix it if you can, using Chapter 3 troubleshooting and maintenance procedures.

Pay attention to WARNING and CAUTION statements. A WARNING means someone could be hurt. A CAUTION means equipment could be damaged.

If tools required to perform PMCS are not listed in Appendix B, notify organizational maintenance.

**PREVENTIVE MAINTENANCE CHECKS AND SERVICES - Continued**  
**SPECIAL INFORMATION - Continued**

**Leakage Definitions**

It is necessary to know how fluid leakage affects the status of the vehicle. The following are definitions of the classes of leakage an operator or crewmember needs to know to be able to determine the condition of a leak. Learn, then be familiar with them, and REMEMBER - WHEN IN DOUBT, ASK YOUR SUPERVISOR.

**Leakage Definitions for Crew/Operator PMCS**

<b>CLASS I</b>	Seepage of fluid (as indicated by wetness or discoloration) not great enough to form drops.
<b>CLASS II</b>	Leakage of fluid great enough to form drops but not enough to cause drops to drip from item being checked.
<b>CLASS III</b>	Leakage of fluid great enough to form drops that fall from the item being checked.

**CAUTION**

- . Equipment operation is allowable with minor leakages (Class I or II) except for fuel leaks. Of course, consideration must be given to the fluid capacity of the item or system being checked. When in doubt, ask your supervisor.
- . When operating with Class I or II leaks, continue to check fluid levels as required in your PMCS.
- . Class III leaks should be reported on DA Form 2404 for corrective action by organizational maintenance.

**Inspection**

Look for any sign of a problem or trouble. Senses help here. You can feel, smell, hear, or see many problems. Be alert when on the vehicle.

Inspect to see if items are in good condition and are correctly assembled, stowed, and secured. Inspect to see if items are excessively worn, leaking, corroded, or properly lubricated. Correct any problems found or notify organizational maintenance.

There are some common items to check all over the vehicle. These include the following:

**Bolts, clamps, nuts, and screws:**

Continuously check for looseness. Look for chipped paint, bare metal, rust, or corrosion around bolt and screw heads and nuts. Tighten them when you find them loose. If tools are not available, notify organizational maintenance.

**PREVENTIVE MAINTENANCE CHECKS AND SERVICES - Continued**

**Cleaning and Lubrication**

**WARNING**

Dry Cleaning Solvent P-D-680 is toxic and flammable. To avoid injury, wear protective goggles and gloves and use in a well-ventilated area. Avoid contact with skin, eyes, and clothes, and do not breathe vapors. Do not use near open fire or excessive heat. The flash point for Type I Dry Cleaning Solvent is 100°F (38°C), and for Type II is 140°F (60°C). If you **become** dizzy while using Dry Cleaning Solvent, get fresh air immediately and get medical aid. If contact with eyes is made, wash your eyes with water and get medical aid immediately.

**Use dry cleaning solvent (item 42, appendix D) to clean grease or oil from all metal parts.**

**Do not use material coarser than crocus cloth (item 10, appendix D) to remove rust from metal surfaces.**

**After cleaning, coat unprotected metal surfaces with CLP (item 32, appendix D).**

**Clean all optical lenses with lens cleaning compound (item 11, appendix D).**

**WARNING**

Compressed air used for cleaning purposes will not exceed 30 psi. Use only with effective chip-guarding and personal protective equipment (goggles/faceshield, gloves, etc.).

**The outside of the vehicle may be cleaned using steam, water, or air under pressure if the following precautions are observed:**

- a. **Open drain valve. If drain valve is clogged, notify organizational maintenance.**
- b. **Close all open hatches, grilles, and access doors,**
- c. **Install exhaust and intake plugs on personnel heater to keep water from entering heater, Remove plugs after washing vehicle.**
- d. **Do not direct steam, water, or air under pressure directly into top deck grille and air intake openings, Hydraulic and electrical fitting lines could be damaged.**

**PREVENTIVE MAINTENANCE CHECKS AND SERVICES - Continued****Cleaning and Lubrication - Continued**

- e. Do not direct steam, water, or air under pressure directly at any periscope seal.
- f. Do not direct steam or water under pressure directly into rear grille doors. Water may enter engine exhaust system and could damage engine.
- g. Do not point steam or water under pressure at roadwheel hub caps if within 5 feet (1.5 meters). Water could be forced into the hub and contaminate the oil.

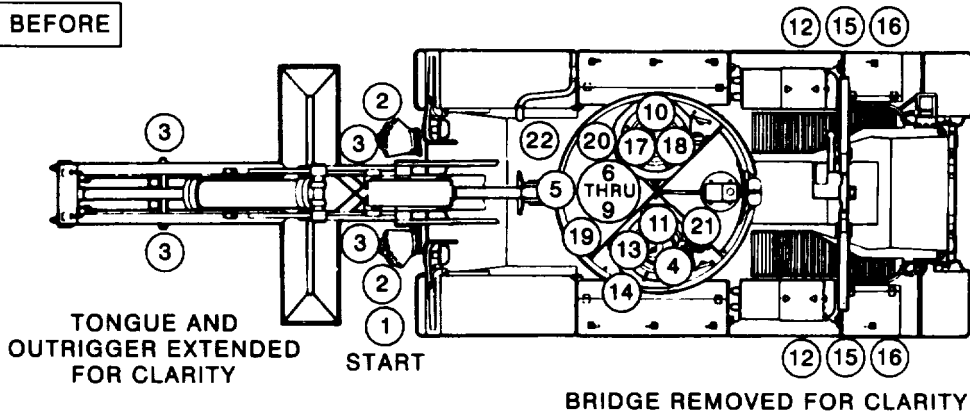
Inspect all external and internal parts and surfaces for corrosion. If corrosion is found, notify organizational maintenance.

LO 5-5420-202-12, M60A1 AVLB lubrication order, has been rescinded. All crew lubrication tasks have been incorporated into Appendix G and PMCS contained in this manual. They are to be performed as required or as a part of crew PMCS. Any reference to LO 5-5420-202-12 must be considered a reference to Appendix G, the crew PMCS or organizational PMCS and must be performed in accordance with instructions provided in the procedures.

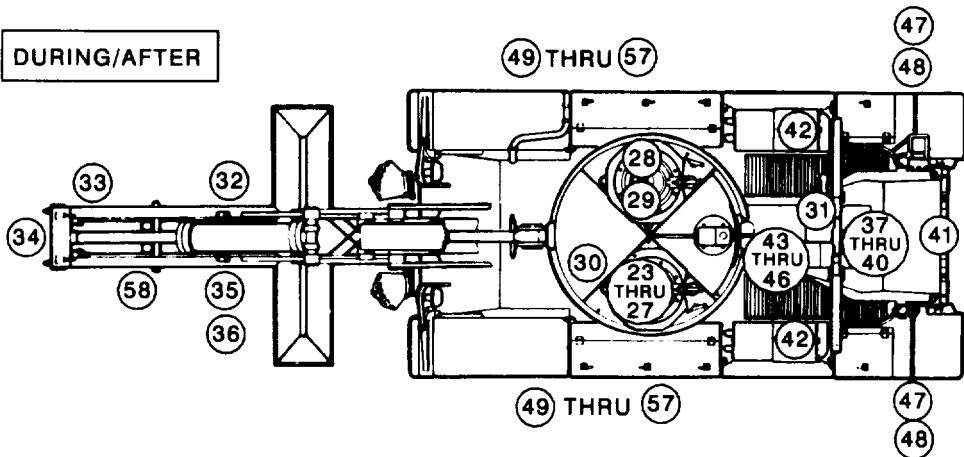
DAILY "WALK-AROUND" PMCS PROCEDURES

These routing diagrams will help you perform your Before, During, and After PMCS. Shown are the locations where you will perform various PMCS items. The locations are identified by the related PMCS item numbers. Before PMCS procedures must include a walk around with checks for fluid leaks, obvious damage, tampering and missing parts.

BEFORE



DURING/AFTER

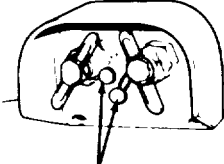




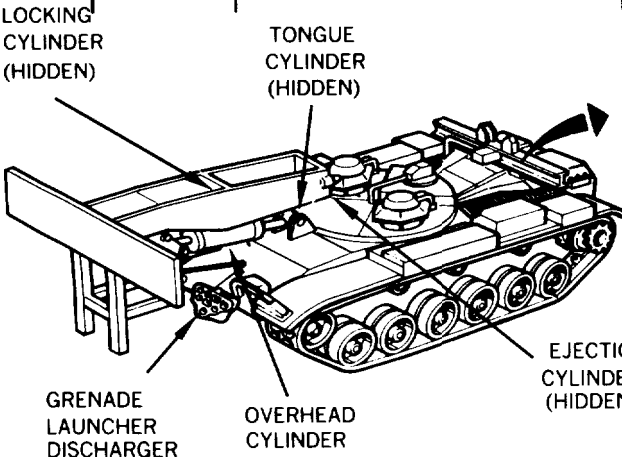
Preventive Maintenance Checks and Services (PMCS) for M60A1 AVLB

Item No.	Interval	Location	<u>Crewmember</u> Procedure	Not Fully Mission Capable if:
		Item to Check/Service		
1	Before	Fire Extinguisher Handles (External)	Driver Make sure safety wire/lead seals on fire extinguisher external release handles are not missing or broken.	Safety wire/lead seal broken or missing.
2	Before	Grenade Launcher Dischargers	If firing is anticipated, wipe all surfaces dry (page G-3).	
3	Before	Hydraulic Fluid Leaks (External)	Visually inspect for evidence of hydraulic fluid leaks in the following areas: overhead cylinder, tongue cylinder, locking cylinder, ejection cylinder, and holddown cylinder cover.	Any Class III leak.

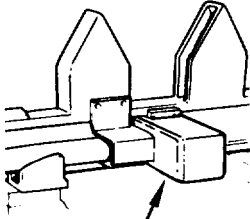
  



SAFETY WIRE/  
LEAD SEAL

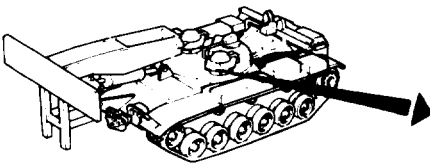
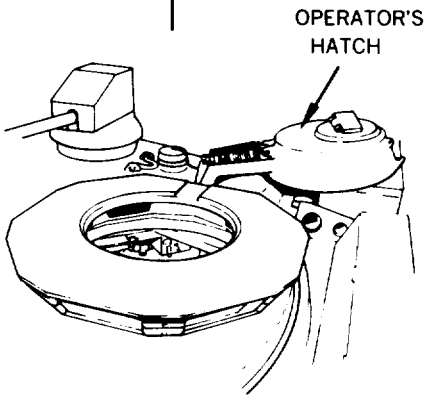


LOCKING CYLINDER (HIDDEN)  
TONGUE CYLINDER (HIDDEN)  
GRENADE LAUNCHER DISCHARGER  
OVERHEAD CYLINDER  
EJECTION CYLINDER (HIDDEN)



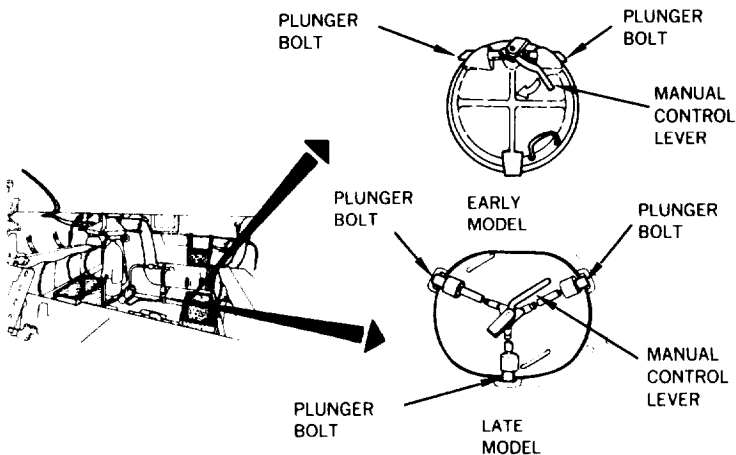
HOLDDOWN CYLINDER COVER

Preventive Maintenance Checks and Services (PMCS) for M60A1 AVLB

Item No.	Interval	Location	Crewmember Procedure	Not Fully Mission Capable if:
		Item to Check/Service		
4	Before	Operator's Hatch	Check that hatch is not missing.	Hatch missing or will not lock in open or closed position.
<p><b><u>WARNING</u></b></p> <p><b>Make sure hatch is locked in open or closed position at all times to prevent injury to personnel.</b></p>				
			<p>Check that hatch locks in open and closed positions.</p> <p>Check that hatch moves smoothly between open and closed positions.</p>	
				
<p>LATE MODEL SHOWN</p>				

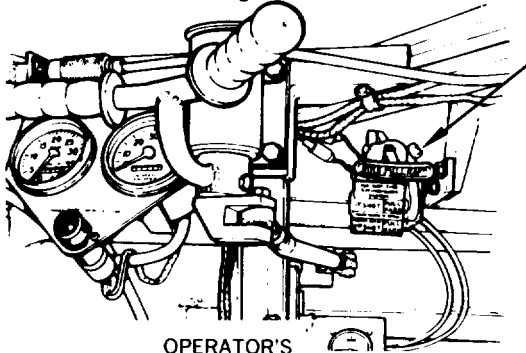
Preventive Maintenance Checks and Services (PMCS) for M60A1 AVLB

Item No.	Interval	Location	<u>Crewmember Procedure</u>	Not Fully Mission Capable if:
		Item to Check/Service		
5	Before	Driver's Escape Hatch (Early or Late Type)	<p>Make sure early-model escape hatch or late-model escape hatch is in place.</p> <p style="text-align: center;"><b><u>WARNING</u></b></p> <p>Do not move control lever clockwise or counterclockwise (open position). Hatch will drop and could cause injury to personnel.</p> <p>Make sure two plunger bolts on early-model escape hatch or three plunger bolts on late-model escape hatch extend over edge of hatch opening.</p> <p>Make sure manual control lever on early-model escape hatch is in full closed (counterclockwise) position, or manual control lever on late-model escape hatch is in full closed (clockwise) position.</p>	<p>Escape hatch cover not installed.</p> <p>Escape hatch lever will not lock.</p>



Preventive Maintenance Checks and Services (PMCS) for M60A1 AVLB

Item No.	Interval	Location	Crewmember Procedure	Not Fully Mission Capable if:
		Item to Check/Service		
6	Before	Fire Extinguisher System	<p>Make sure internal fire extinguisher handle seal is not broken or missing.</p> <p>Make sure three internal fire extinguisher cylinders are installed.</p> <p>Make sure lead seal on each of two internal fire extinguisher cylinder control valves and pins is not broken or missing.</p> <p>Make sure lead seal and shrink tubing on each of three internal fire extinguisher cylinders are not broken or missing.</p>	<p>Seal on handle broken or missing.</p> <p>Cylinder missing.</p> <p>Seals on cylinder control valves broken or missing.</p> <p>Shrink tubing broken or missing.</p>

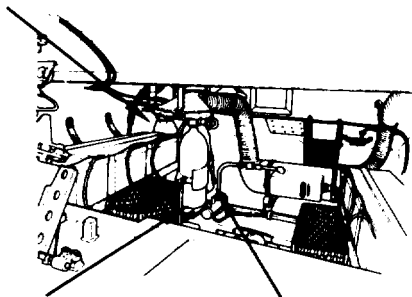


FIRE EXTINGUISHER

OPERATOR'S STATION

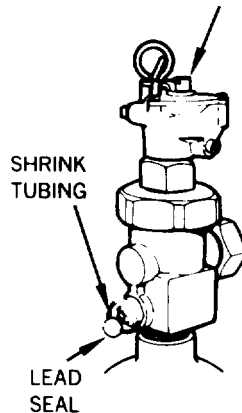
FIRE EXTINGUISHER HANDLE SEAL

CONTROL VALVE LEAD SEAL



FIRE EXTINGUISHER

FIRE EXTINGUISHER



SHRINK TUBING

LEAD SEAL

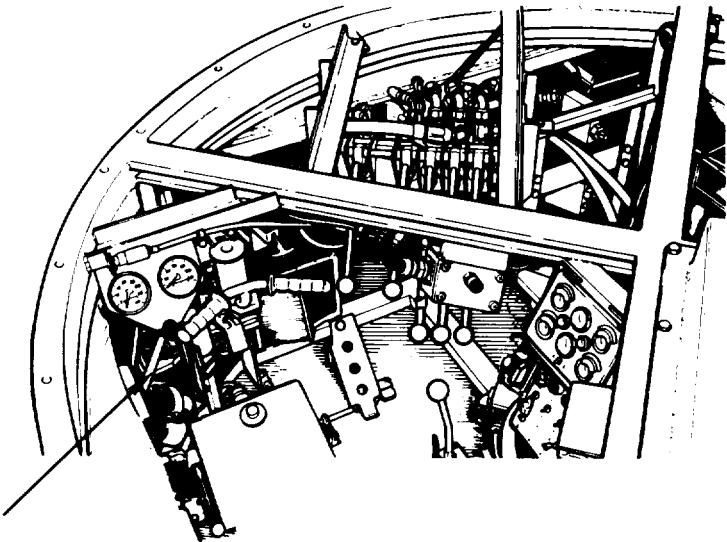
Preventive Maintenance Checks and Services (PMCS) for M60A1 AVLB

Item No.	Interval	Location	Crewmember Procedure	Not Fully Mission Capable if:
		Item to Check/Service		
7	Before	Operator's Seat (Adjustments)	<p>Adjust operator's seat up and down (height adjustment lever), forward and backward (seat control handle).</p> <p>Check that seat moves smoothly and locks in desired position.</p>	<p>Operator's seat is missing or broken (includes seat back).</p> <p>Operator's seat will not adjust.</p>

Preventive Maintenance Checks and Services (PMCS) for M60A1 AVLB

Item No.	Interval	Location	<u>Crewmember</u> Procedure	Not Fully Mission Capable if:
		Item to Check/Service		
8	Before	Hydraulic Brake System	Visually check brake master cylinder and hull area below brake master cylinder assembly and attaching tube assemblies for fluid leaks.	Indication of fluid leak.



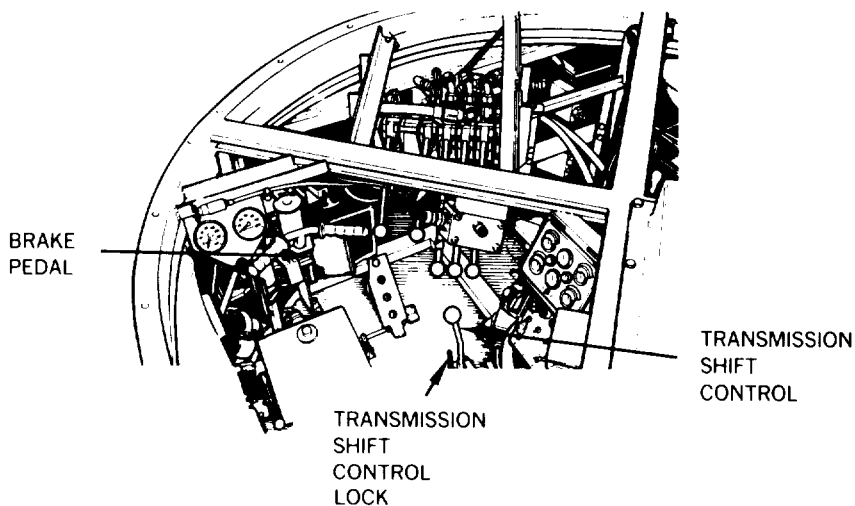
BRAKE  
MASTER  
CYLINDER

Preventive Maintenance Checks and Services (PMCS) for M60A1 AVLB

Item No.	Interval	Location	<u>Crewmember Procedure</u>	Not Fully Mission Capable if:
		Item to Check/Service		
8	Before	Hydraulic Brake System -Continued		
<b>NOTE</b>				
Do not allow brake pedal pressure to go over 900 psi. Brake may become difficult to release.				
			Press brake pedal once until pressure gage indicates 750 to 900 psi. Hold pedal in position for 30 seconds.	750 psi cannot be obtained.
			Check that pedal does not move.	Pressure drop or pedal movement.

Preventive Maintenance Checks and Services (PMCS) for M60A1 AVLB

Item No.	Interval	Location	Crewmember Procedure	Not Fully Mission Capable if:
		Item to Check/Service		
8	Before	Hydraulic Brake System (-Cont)	<p>Place transmission shift control in "P" (park) position and remove foot from brake pedal.</p> <p>Place transmission shift control lock in lock position and ensure that shift control cannot be pulled into "N" (neutral) position.</p> <p>To release brake, press and hold brake pedal. Push transmission shift control lock forward to unlock position. Place transmission shift control in "N" (neutral) position. Release brake pedal.</p>	Transmission shift control can be moved from "P" (park) to "N"(neutral) position with transmission shift control lock in lock position.





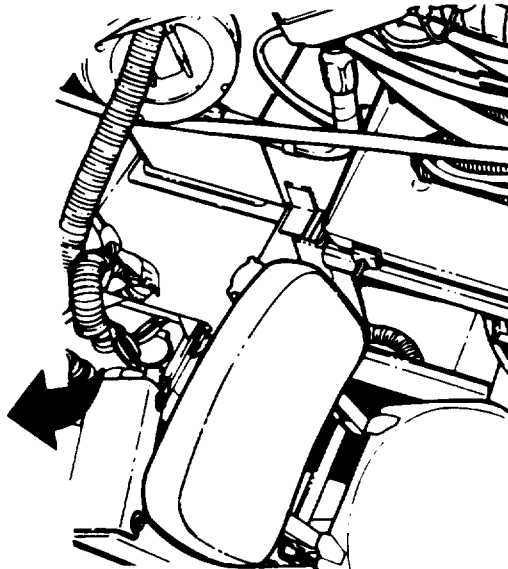
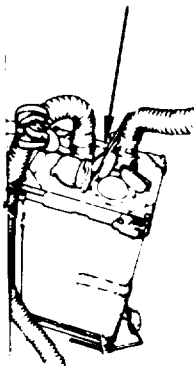
Preventive Maintenance Checks and Services (PMCS) for M60A1 AVLB

Item No.	Interval	Location	Crewmember Procedure	Not Fully Mission Capable if:
		Item to Check/Service		
9	Before	Linkages, Steering, Shifting, and Accelerator	<p>Test steering linkage by moving steering control to left and right positions and releasing.</p> <p>Test transmission shift control linkage by shifting transmission shift control through all positions.</p> <p>Test accelerator linkage by depressing accelerator pedal and allowing pedal to return.</p>	<p>Steering control does not return to center.</p> <p>Transmission shift control binds or will not shift.</p> <p>Accelerator pedal sticks or binds.</p>

Preventive Maintenance Checks and Services (PMCS) for M60A1 AVLB

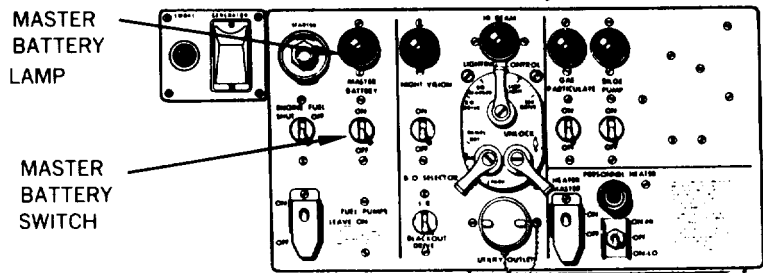
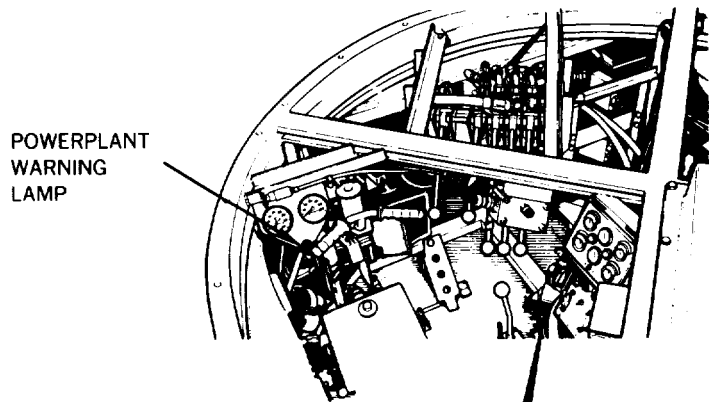
Item No.	Interval	Location	<u>Crewmember Procedure</u>	Not Fully Mission Capable if:
		Item to Check/Service		
10	Before	Gas Particulate System	<p style="text-align: center;"><b><u>WARNING</u></b></p> <p>If NBC exposure is suspected, all air filter media must be handled by personnel wearing protective equipment. Contact your unit NBC officer or NBC NCO for appropriate handling or disposal procedures.</p> <p>At the initiation of combat operations where use of a blood agent (AC or CK) is expected or after a known blood agent attack, notify organizational maintenance that gas particulate filters must be replaced.</p>	

GAS PARTICULATE FILTER UNIT



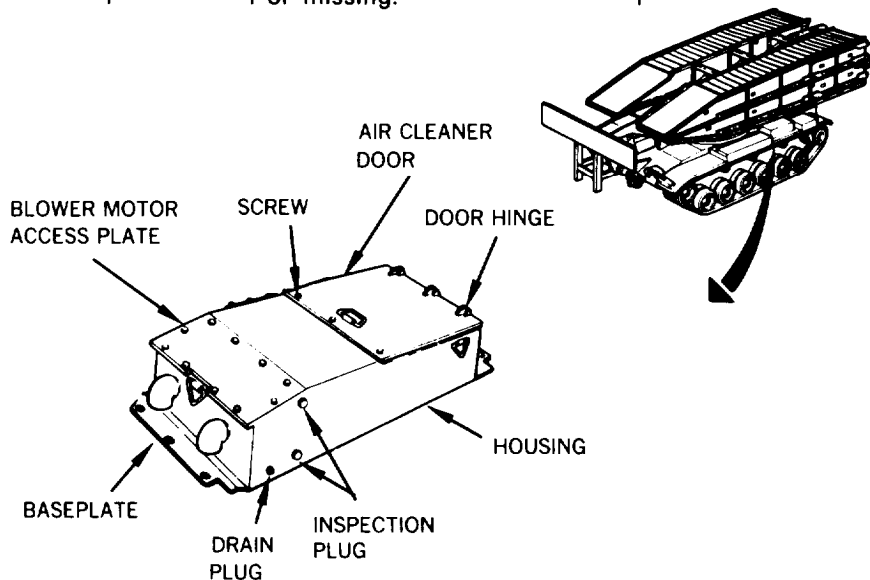
Preventive Maintenance Checks and Services (PMCS) for M60A1 AVLB

Item No.	Interval	Location	Crewmember Procedure	Not Fully Mission Capable if:
		Item to Check/Service		
11	Before	MASTER BATTERY Indicator Lamp and POWER-PLANT WARNING Lamp (Engine Not Running)	Set MASTER BATTERY switch to on.  Check that both MASTER BATTERY lamp and POWER PLANT WARNING lamp light.	MASTER BATTERY lamp or POWER-PLANT WARNING lamp do not light.



Preventive Maintenance Checks and Services (PMCS) for M60A1 AVLB

Item No.	Interval	Location	Crewmember Procedure	Not Fully Mission Capable if:
		Item to Check/Service		
12	Before	Air Cleaner Housings and Doors (Right and Left Sides)	<p>Crew</p> <p>Check that air cleaner door is not cracked, damaged or missing any mounting hardware.</p> <p>Check that door locking screws are not broken or missing.</p> <p>Inspect housing for cracks and dents which would allow dirt to enter.</p> <p>Check baseplate for cracks.</p> <p>Check that door hinges and housing hinges are not bent, broken, cracked or missing.</p> <p>Check blower motor access plate for cracks and loose or missing mounting bolts.</p> <p>Check that drain plug or inspection plugs are not loose or missing.</p>	<p>Any damaged or missing air cleaner door or locking screws or mounting hardware.</p> <p>Cracked or dented housing.</p> <p>Broken or bent door hinges.</p> <p>Blower motor access plate missing.</p> <p>Any missing drain or inspection plugs.</p>

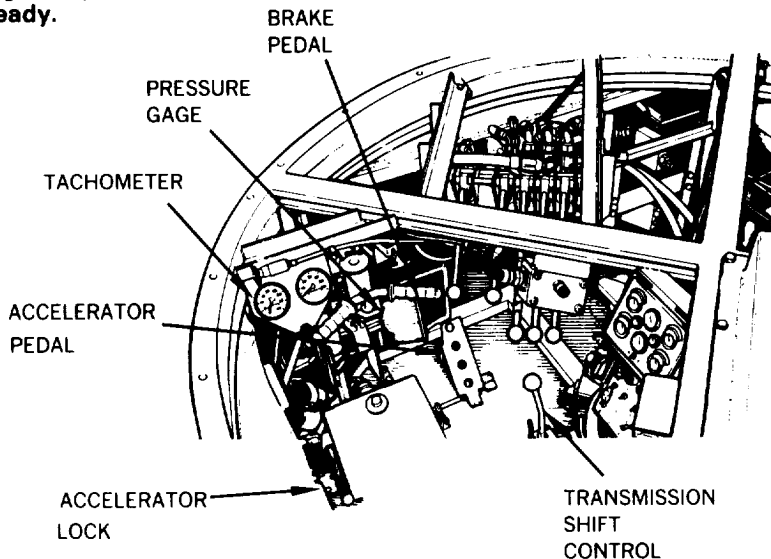


Preventive Maintenance Checks and Services (PMCS) for M60A1 AVLB

Item No.	Interval	Location	Crewmember Procedure	Not Fully Mission Capable if:
		Item to Check/Service		
13	Before	Engine Idle Speed and Accelerator control (Engine Running)	<p>Driver</p> <p>Push down on accelerator lock. Leave transmission shift control in "P" (park) position.</p> <p>Start engine and check idle speed, tachometer must indicate 700 to 750 rpm.</p> <p>Step on brake pedal once until pressure gage reads 750 to 900 psi.</p> <p>Accelerate engine until tachometer reads 1600 rpm. Release accelerator pedal.</p> <p>Check that accelerator pedal returns freely to idle position and tachometer reads from 700 to 750 rpm.</p>	<p>Tachometer is inoperative or missing.</p> <p>750 psi cannot be obtained.</p> <p>Binding prevents pedal from returning to idle position. Engine surges.</p>

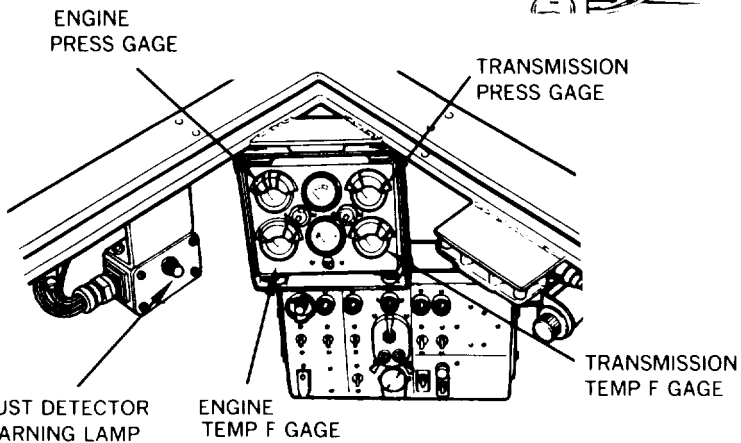
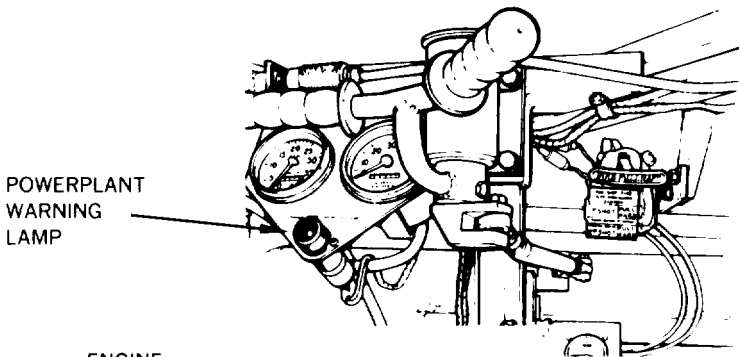
**NOTE**

Engine speed should not surge when accelerator pedal is held steady.



Preventive Maintenance Checks and Services (PMCS) for M60A1 AVLB

Item No.	Interval	Location	Crewmember Procedure	Not Fully Mission Capable if:
		Item to Check/Service		
14	Before	POWER-PLANT WARNING Lamp (Engine Running)	<p>Check lamp frequently to make sure it is not lit. If lamp is lit, immediately check operator's indicator panel ENGINE PRESS, ENGINE TEMP F, TRANSMISSION PRESS, TRANSMISSION TEMP F gages for abnormal readings.</p> <p>Check that DUST DETECTOR WARNING LAMP is out. Press lens cap in to check lamp. If lamp does not light, replace lamp. If lamp lights, go to troubleshooting.</p>	

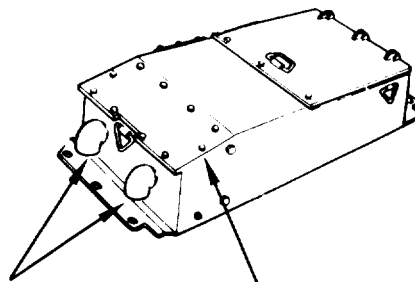


Preventive Maintenance Checks and Services (PMCS) for M60A1 AVLB

Item No.	Interval	Location	Crewmember Procedure	Not Fully Mission Capable if:
		Item to Check/Service		
15	Before	Air Cleaner Blower Motor (Left and Right Sides) (Non-Dust Detector Equipped Vehicles)	<p>Crew</p> <p>Let engine idle, (700 to 750 rpm).</p> <p>Check that flow of air can be felt at all four blower motor elbows.</p>	No air flow at either blower motor elbow on same air cleaner housing.

**CAUTION**

If no air flow is present, shut off engine. Operating engine without airflow will damage the engine.

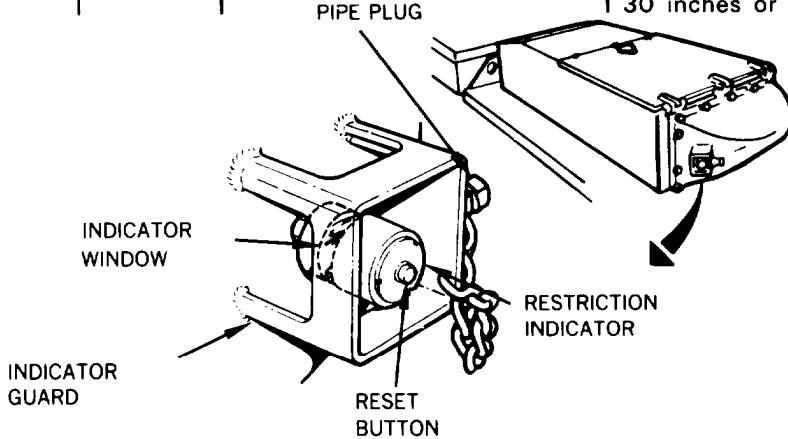


BLOWER MOTOR ELBOW

BOLT

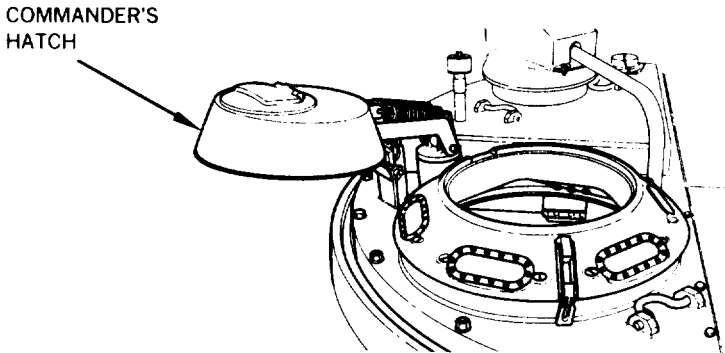
Preventive Maintenance Checks and Services (PMCS) for M60A1 AVLB

Item No.	Interval	Location	Crewmember Procedure	Not Fully Mission Capable if:
		Item to Check/Service		
16	Before	Restriction Indicator (Right and Left Sides)	<p>If tactical situations permit, check the following during stops and halts:</p> <p>Check that restriction indicator, pipe plug, or indicator guard are not damaged or missing.</p> <p>Early Model.</p> <p>Check indicator window.</p> <p>If indicator window shows red, press indicator reset button, accelerate engine to 2400 rpm.</p> <p>Check indicator window.</p> <p>Late Model.</p> <p>Check indicator reading.</p> <p>If indicator registers above 30 inches, press indicator reset button and accelerate engine to 2400 rpm.</p> <p>Check indicator reading.</p>	<p>Both restriction indicator and pipe plug are missing.</p> <p>Restriction indicator remains red after re-set.</p> <p>Indicator reading is 30 inches or more.</p>





Preventive Maintenance Checks and Services (PMCS) for M60A1 AVLB

Item No.	Interval	Location	<u>Crewmember Procedure</u>	Not Fully Mission Capable if:			
		Item to Check/Service					
17	Before	Commander's Hatch	<p>Check that hatch is not missing.</p> <p style="text-align: center;"><b><u>WARNING</u></b></p> <p><b>Make sure hatch is locked in open or closed position at all times to prevent injury to personnel.</b></p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 33%;"></td> <td style="width: 33%;"> <p>Check that hatch locks in open and closed positions.</p> <p>Check that hatch moves smoothly between open and closed positions.</p> </td> <td style="width: 33%;"> <p>Hatch missing or will not lock in open or closed position.</p> </td> </tr> </table>		<p>Check that hatch locks in open and closed positions.</p> <p>Check that hatch moves smoothly between open and closed positions.</p>	<p>Hatch missing or will not lock in open or closed position.</p>	
	<p>Check that hatch locks in open and closed positions.</p> <p>Check that hatch moves smoothly between open and closed positions.</p>	<p>Hatch missing or will not lock in open or closed position.</p>					
 <p>The diagram shows a top-down view of the Commander's Hatch assembly. A circular hatch cover is shown partially open and tilted to the left. An arrow points from the text 'COMMANDER'S HATCH' to the hatch cover. The hatch is mounted on a circular base with various mechanical components, including a handle and locking mechanism.</p>							

Preventive Maintenance Checks and Services (PMCS) for M60A1 AVLB

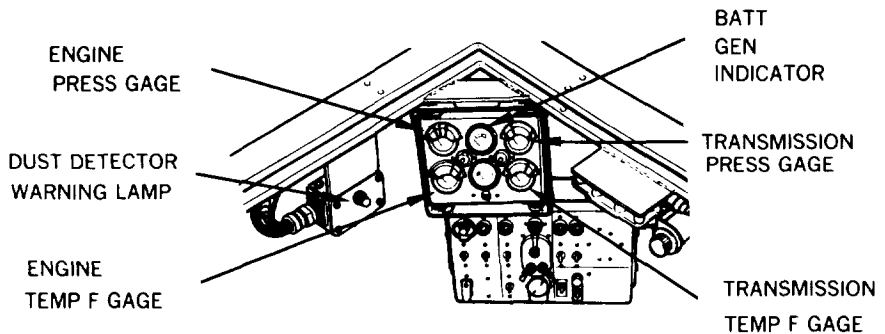
Item No.	Interval	Location	<u>Crewmember</u> Procedure	Not Fully Mission Capable if:
		Item to Check/Service		
18	Before	Commander's Seat Adjustments	<p>Inspect commander's seat for damage.</p> <p>Adjust commander's seat up and down (height adjustment lever), forward and backward (seat control handle). Check that seat moves smoothly and locks in desired position.</p>	<p>Commander's seat is missing or broken (includes seat back).</p> <p>Commander's seat will not adjust.</p>

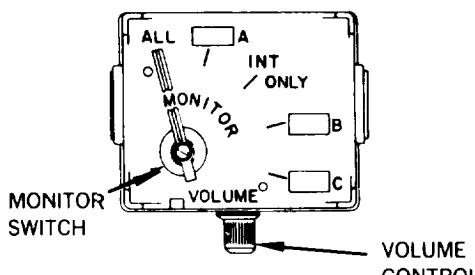
The diagram illustrates the mechanical components for adjusting the commander's seat. A lever on the floor, labeled 'HEIGHT ADJUSTMENT LEVER', is connected to the seat's base. A handle on the seat base, labeled 'SEAT CONTROL HANDLE', is used to move the seat forward and backward. The seat is shown in a side profile, highlighting the adjustment points.

Preventive Maintenance Checks and Services (PMCS) for M60A1 AVLB

Item No.	Interval	Location	Crewmember Procedure	Not Fully Mission Capable if:
		Item to Check/Service		
19	Before	Operator's Indicator Panel (Engine Running)	<p>Check that BATT GEN indicator reads in green band.</p> <p>Check that ENGINE PRESS gage reads in green band, 15 psi at idle (700 to 745 rpm) or 40 to 70 psi when accelerating.</p> <p>Check that ENGINE TEMP F gage reads in green band (between 180 °F and 225 °F when engine is warm).</p> <p>Check that TRANSMISSION PRESS gage reads in green band, 2 psi at idle (700 to 750 rpm) or 8 to 40 psi when accelerating.</p> <p>Check that TRANSMISSION TEMP F reads in green band, between 200 °F 280 °F when engine is warm.</p> <p>Check that DUST DETECTOR WARNING LAMP is out.</p>	<p>BATT GEN indicator reads in red band.</p> <p>ENGINE PRESS gage reads in red band (below 15 psi or above 70 psi).</p> <p>ENG TEMP F gage reads in red band or above 225 °F.</p> <p>TRANSMISSION PRESS gage reads in red band (below 2 psi).</p> <p>TRANSMISSION TEMP F reads in red band or above 280 °F.</p> <p>DUST DETECTOR WARNING LAMP is on, inoperative, or missing.</p> <p>Any gage missing or inoperative.</p>

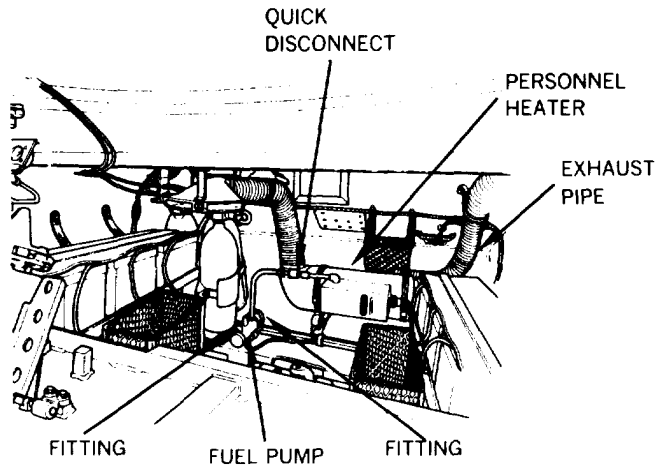


Preventive Maintenance Checks and Services (PMCS) for M60A1 AVLB

Item No.	Interval	Location	<u>Crewmember Procedure</u>	Not Fully Mission Capable if:
		Item to Check/Service		
20	Before	Intercom Set C-2298 (Operator and Commander)	<p>Turn amplifier AM 1780 VRC on.</p> <p>Talk to commander: move MONITOR switch to INT ONLY and adjust VOLUME control to desired level.</p> <p>Check intercom operation.</p> <p>Check radio set operation. For procedures see TM 11-5820-401-10-2 or TM 11-5820-498-12.</p>	<p>Operator cannot talk with commander.</p> <p>Radio will not transmit or receive.</p>
21	Before (Night Operations)	AN/VVS-2 Night Vision Viewer and Hatch	<div style="text-align: center;">  </div> <p style="text-align: center;"><b>CAUTION</b></p> <p><b>Perform AN/VVS-2 night vision check during darkness only. Do not expose objective lens on night vision viewer to direct sunlight or bright light.</b></p>	<p>If operating at night, install and operate night vision viewer (page 2-114).</p> <p>Night vision viewer is inoperative.</p>

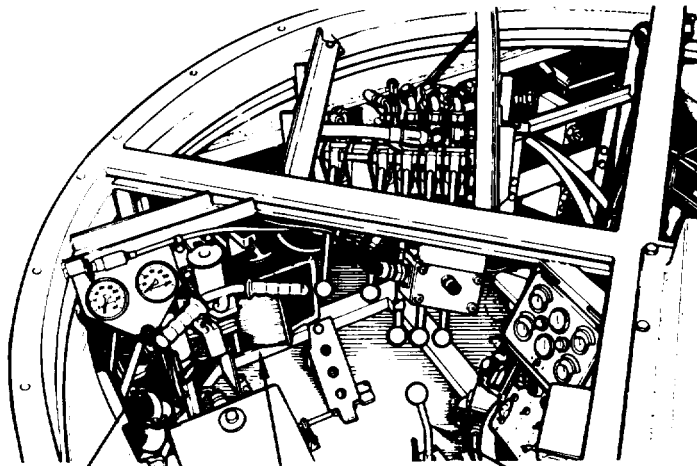
Preventive Maintenance Checks and Services (PMCS) for M60A1 AVLB

Item No.	Interval	Location	Crewmember Procedure	Not Fully Mission Capable if:
		Item to Check/Service		
22	Before	Personnel Heater	<p style="text-align: center;"><b><u>WARNING</u></b></p> <p>If fuel leak or exhaust leak is present, do not use heater until repairs are made. Leaking fuel could cause a fire. Exhaust fumes can cause injury or death.</p> <p>Check for fuel leaks in area of quick disconnect at personnel heater, and fittings and at fuel pump.</p> <p>Check for exhaust fumes in area of personnel heater exhaust pipe at personnel heater hull feed through pipe coupling.</p>	<p>Any fuel leak.</p> <p>Any exhaust leak.</p>



**Preventive Maintenance Checks and Services (PMCS) for M60A1 AVLB**

Item No.	Interval	Location	<u>Crewmember</u> Procedure	Not Fully Mission Capable if:
		Item to Check/Service		
23	During	Steering Control	Check that steering control returns to center position and that vehicle does not wander to right or left.	Vehicle wanders or steering control does not center during operation.
24	During	Transmission Shift Control	When driving vehicle, check for proper response when shifting transmission shift control through entire shift pattern.  Check for binding of transmission shift control or failure of transmission to shift.	Binding of transmission shift control or failure to shift.
25	During	Hydraulic Brake System	Make sure that vehicle stops smoothly and doesn't pull to one side when brake pedal is pressed.	Vehicle does not stop or pulls to one side.



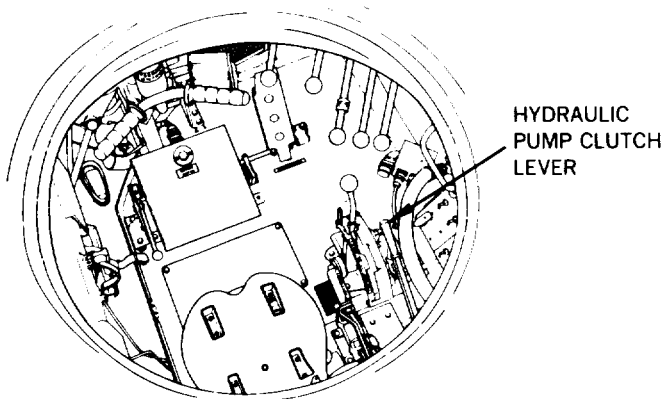
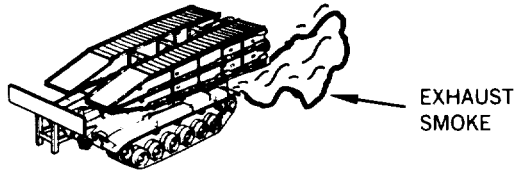
STEERING CONTROL

BRAKE PEDAL

TRANSMISSION SHIFT CONTROL

**Preventive Maintenance Checks and Services (PMCS) for M60A1 AVLB**

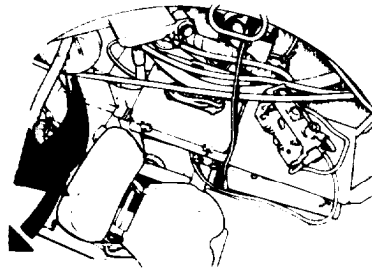
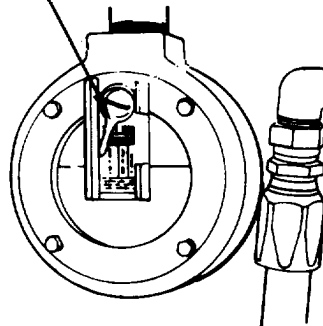
Item No.	Interval	Location	<u>Crewmember Procedure</u>	Not Fully Mission Capable if:
		Item to Check/Service		
26	During	Air Induction System	<p>Check that exhaust smoke is not excessively black.</p> <p>Check for noticeable loss of engine power.</p>	Excessive black smoke or noticeable loss of power.
27	During	Hydraulic Pump Clutch and Universal Joints	<p>Check that hydraulic pump clutch engages.</p> <p>If lever is jammed, remove obstruction.</p> <p>Check clutch for chatter and odor of overheated oil.</p> <p>Check universal joints for any unusual noise or vibration.</p>	Hydraulic pump clutch fails to engage.



Preventive Maintenance Checks and Services (PMCS) for M60A1 AVLB

Item No.	Interval	Location	<u>Crewmember</u> Procedure	Not Fully Mission Capable if:
		Item to Check/Service		
28	During	Reservoir Filter (Clutch Engaged)	<p>Make sure transmission shift control is locked in "P" (park) position and brake is set. Set engine speed (throttle) at 1800 rpm.</p> <p>Visually check that filter indicator indicates FILTER IS CLEAN. If not, notify support maintenance.</p>	Filter indicator does not indicate FILTER IS CLEAN.
29	During	Interior Hydraulic System	Visually check interior of vehicle for hydraulic fluid leaks.	Any Class III fluid leak.

FILTER INDICATOR



COMMANDER'S STATION



Preventive Maintenance Checks and Services (PMCS) for M60A1 AVLB

Item No.	Interval	Location	<u>Crewmember Procedure</u>	Not Fully Mission Capable if:
		Item to Check/Service		
30	During	Launcher Controls and Valve Bank	<p>Check for hydraulic fluid leaks in area of valve bank.</p> <p>Check for proper response of launcher controls during launch or retrieve operations.</p>	<p>Any Class III fluid leak.</p> <p>Fails to complete launch or retrieve operation.</p>

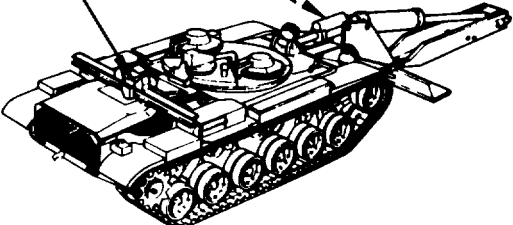
  

VALVE BANK

LAUNCHER CONTROL

OPERATOR'S STATION

**Preventive Maintenance Checks and Services (PMCS) for M60A1 AVLB**

Item No.	Interval	Location	<u>Crewmember Procedure</u>	Not Fully Mission Capable if:
		Item to Check/Service		
<b><u>WARNING</u></b>				
<p>FRH hydraulic fluid may contain tricresyl phosphate which, if taken internally, can produce paralysis. Hydraulic fluid may be absorbed through the skin. Wear long sleeves, gloves, goggles, and face-shield. If FRH gets in eyes, wash them immediately and get medical aid immediately. If FRH gets on skin, thoroughly wash with soap and water. Wash hands thoroughly prior to eating or smoking. Application of these measures is considered an effective control of the hazard.</p>				
31	During	Holddown Cylinder	Immediately after exercising hydraulic system, wipe residue from cylinder seal area using a clean cloth, then check for fluid leaks in these areas.	Any Class III fluid leak.
<b><u>WARNING</u></b>				
<p>FRH hydraulic fluid may contain tricresyl phosphate which, if taken internally, can produce paralysis. Hydraulic fluid may be absorbed through the skin. Wear long sleeves, gloves, goggles, and face-shield. If FRH gets in eyes, wash them immediately and get medical aid immediately. If FRH gets on skin, thoroughly wash with soap and water. Wash hands thoroughly prior to eating or smoking. Application of these measures is considered an effective control of the hazard.</p>				
32	During	Overhead Cylinder	Immediately after exercising hydraulic system, wipe residue from cylinder seal area using a clean cloth, then check for fluid leaks in these areas.	Any Class III fluid leak.
<div style="display: flex; justify-content: space-around; margin-bottom: 10px;"> <span>HOLDDOWN CYLINDER</span> <span>OVERHEAD CYLINDER</span> </div> 				

Preventive Maintenance Checks and Services (PMCS) for M60A1 AVLB

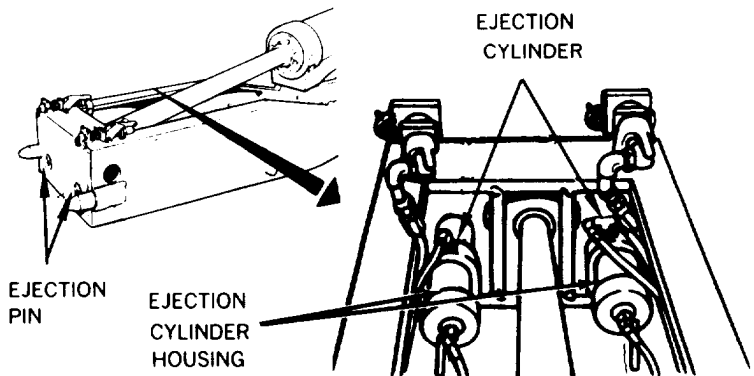
Item No.	Interval	Location	<u>Crewmember Procedure</u>	Not Fully Mission Capable if:
		Item to Check/Service		
33	During	Ejection Cylinder	<p style="text-align: center;"><b><u>WARNING</u></b></p> <ul style="list-style-type: none"> <li>• Ensure bridge is properly positioned before attempting to launch. Actuating ejection cylinders with the bridge improperly positioned could result in injury or death to personnel and/or damage to equipment.</li> <li>• FRH hydraulic fluid may contain tricresyl phosphate which, if taken internally, can produce paralysis. Hydraulic fluid may be absorbed through the skin. Wear long sleeves, gloves, goggles, and faceshield. If FRH gets in eyes, wash them immediately and get medical aid immediately. If FRH gets on skin, thoroughly wash with soap and water. Wash hands thoroughly prior to eating or smoking. Application of these measures is considered an effective control of the hazard.</li> </ul>	

Immediately after exercising hydraulic system, wipe residue from cylinder seal area using a clean cloth, then check for fluid leaks in these areas.

Visually check that ejection pins extend and retract.

Visually check ejection cylinder housing for movement indicating loose housing mount.

Any Class III fluid leak.



**Preventive Maintenance Checks and Services (PMCS) for M60A1 AVLB**

Item No.	Interval	Location	<u>Crewmember Procedure</u>	Not Fully Mission Capable if:
		Item to Check/Service		
34	During	Tongue Quick Disconnect Dust Caps	Visually check for damaged or missing quick-disconnect dust caps.	
35	During	Tongue Cylinder		

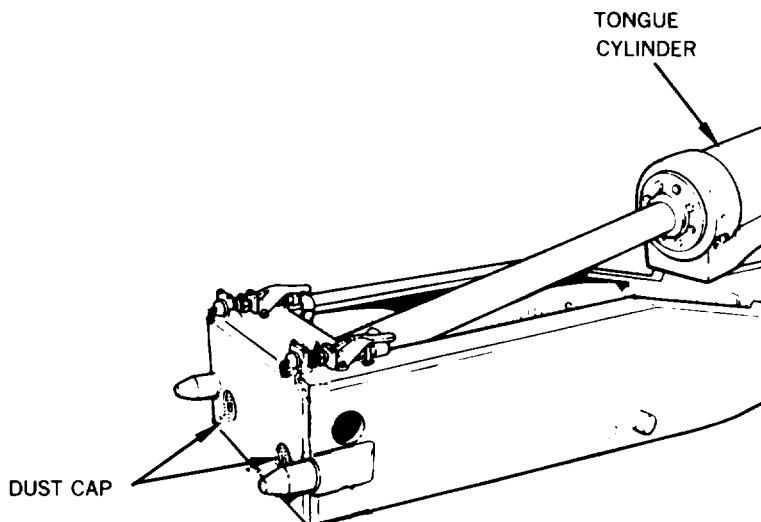
**WARNING**

FRH hydraulic fluid may contain tricresyl phosphate which, if taken internally, can produce paralysis. Hydraulic fluid may be absorbed through the skin. Wear long sleeves, gloves, goggles, and face-shield. If FRH gets in eyes, wash them immediately and get medical aid immediately. If FRH gets on skin, thoroughly wash with soap and water. Wash hands thoroughly prior to eating or smoking. Application of these measures is considered an effective control of the hazard.

Immediately after exercising hydraulic system, wipe residue from cylinder seal area using a clean cloth, then check for fluid leaks in these areas.

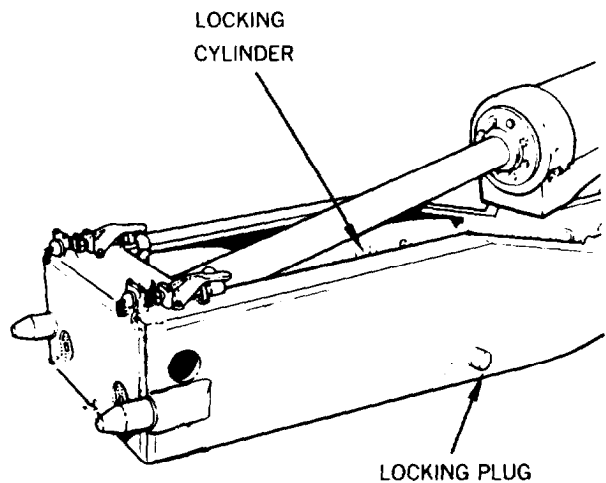
Check for proper operation.

Any Class III fluid leak.



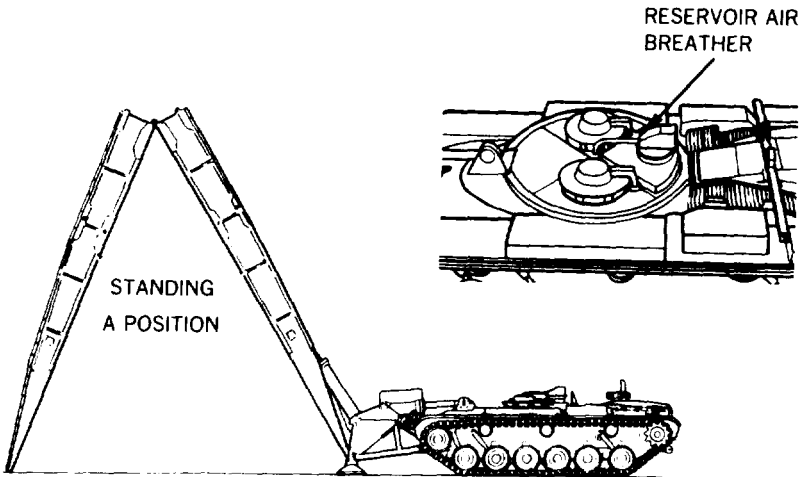
Preventive Maintenance Checks and Services (PMCS) for M60A1 AVLB

Item No.	Interval	Location	<u>Crewmember Procedure</u>	Not Fully Mission Capable if:
		Item to Check/Service		
36	During	Locking Cylinder	<p style="text-align: center;"><b><u>WARNING</u></b></p> <p><b>FRH hydraulic fluid may contain tricresyl phosphate which, if taken internally, can produce paralysis. Hydraulic fluid may be absorbed through the skin. Wear long sleeves, gloves, goggles, and face shield. If FRH gets in eyes, wash them immediately and get medical aid immediately. If FRH gets on skin, thoroughly wash with soap and water. Wash hands thoroughly prior to eating or smoking. Application of these measures is considered an effective control of the hazard.</b></p> <div style="display: flex; justify-content: space-between;"> <div style="border: 1px solid black; padding: 5px; width: 45%;"> <p>Immediately after exercising hydraulic system, wipe residue from cylinder seal area using a clean cloth, then check for fluid leaks in these areas.</p> <p>Visually check that locking plugs extend and retract.</p> </div> <div style="border: 1px solid black; padding: 5px; width: 45%;"> <p>Any Class III fluid leak.</p> <p>Locking plugs will not extend or retract.</p> </div> </div>	



Preventive Maintenance Checks and Services (PMCS) for M60A1 AVLB

Item No.	Interval	Location	<u>Crewmember Procedure</u>	Not Fully Mission Capable if:
		Item to Check/Service		
37	After	Reservoir Air Breather	Launch bridge to standing "A" position (page 2-142).	
<p><b>NOTE</b></p> <p>After operation PMCS tasks are easier to perform with the bridge standing in the "A" position.</p>				
			<p>Check that reservoir air breather is not damaged or missing.</p>	



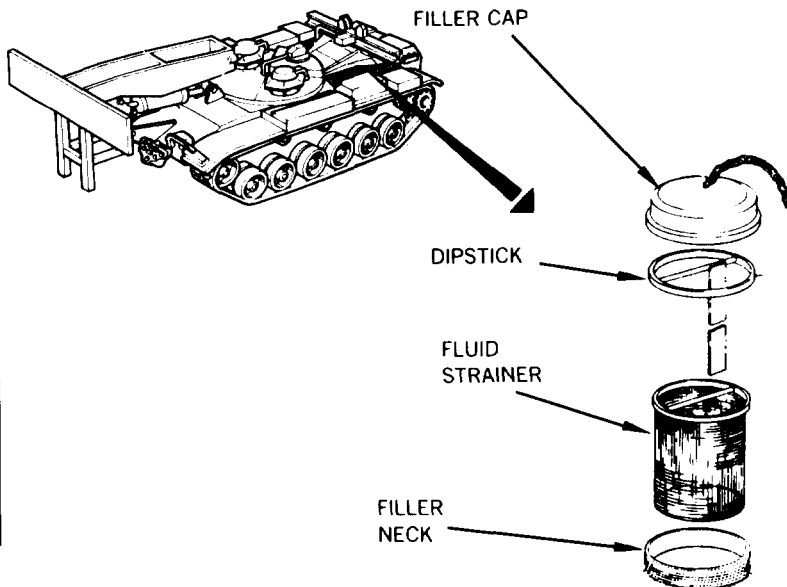
Preventive Maintenance Checks and Services (PMCS) for M60A1 AVLB

Item No.	Interval	Location	Crewmember Procedure	Not Fully Mission Capable if:
		Item to Check/Service		
38	After	Hydraulic Reservoir Fluid and Fluid Strainer		

**WARNING**

FRH hydraulic fluid may contain tricresyl phosphate which, if taken internally, can produce paralysis. Hydraulic fluid may be absorbed through the skin. Wear long sleeves, gloves, goggles, and face-shield. If FRH gets in eyes, wash them immediately and get medical aid immediately. If FRH gets on skin, thoroughly wash with soap and water. Wash hands thoroughly prior to eating or smoking. Application of these measures is considered an effective control of the hazard.

Unscrew reservoir filler cap. Remove dipstick and fluid strainer from reservoir filler neck.



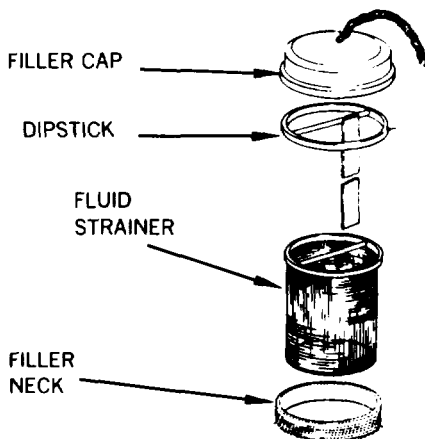
Preventive Maintenance Checks and Services (PMCS) for M60A1 AVLB

Item No.	Interval	Location	Crewmember Procedure	Not Fully Mission Capable if:
		Item to Check/Service		
38	After	Hydraulic Reservoir Fluid and Fluid Strainer (Cont)		

**WARNING**

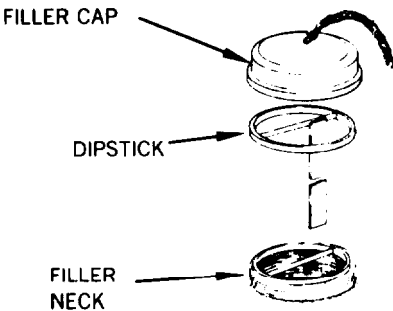
Dry Cleaning Solvent P-D-680 is toxic and flammable. To avoid injury, wear protective goggles and gloves and use in a well-ventilated area. Avoid contact with skin, eyes, and clothes, and do not breathe vapors. Do not use near open fire or excessive heat. The flash point for Type I Dry Cleaning Solvent is 100°F (38°C), and for Type II is 140°F (60°C). If you become dizzy while using Dry Cleaning Solvent, get fresh air immediately and get medical aid. If contact with eyes is made, wash your eyes with water and get medical aid immediately.

Check for and remove any dirt and debris from fluid strainer. If required clean fluid strainer in dry cleaning solvent (item 42, Appendix D), and dry by shaking. Apply FRH oil (item 18, Appendix D) to fluid strainer. Do not use OE/HDO. Install fluid strainer.





Preventive Maintenance Checks and Services (PMCS) for M60A1 AVLB

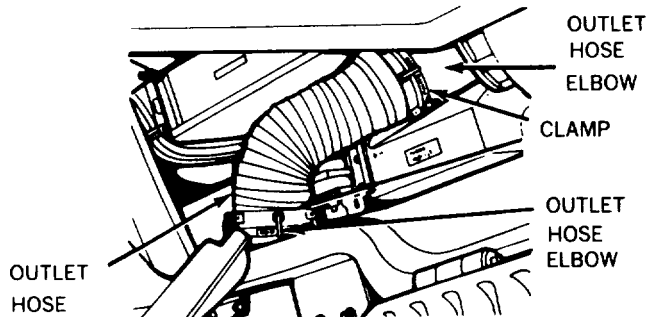
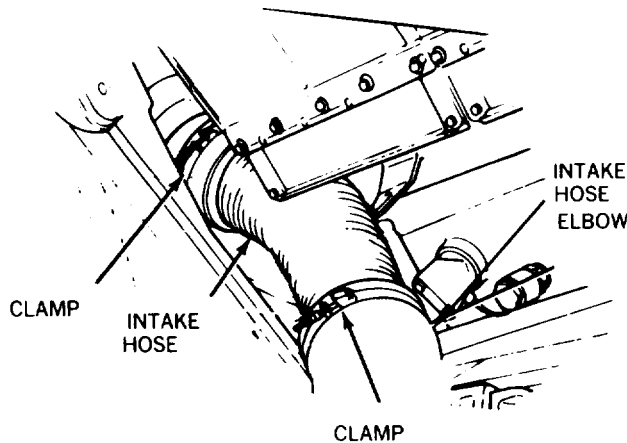
Item No.	Interval	Location	<u>Crewmember Procedure</u>	Not Fully Mission Capable if:
		Item to Check/Service		
38	After	Hydraulic Reservoir Fluid and Fluid Strainer (Cont)	<p style="text-align: center;"><b><u>WARNING</u></b></p> <p>FRH hydraulic fluid may contain tricresyl phosphate which, if taken internally, can produce paralysis. Hydraulic fluid may be absorbed through the skin. Wear long sleeves, gloves, goggles, and face-shield. If FRH gets in eyes, wash them immediately and get medical aid immediately. If FRH gets on skin, thoroughly wash with soap and water. Wash hands thoroughly prior to eating or smoking. Application of these measures is considered an effective control of the hazard.</p> <p>Wipe dipstick, and insert fully into filler neck.</p> <p>Remove dipstick and check that fluid level is at or slightly above FULL mark. If fluid is below FULL mark, add fluid as required (page G-4).</p> 	
39	After	Engine and Transmission Oil Level (Engine Running)	Check engine and transmission oil levels (page G-4).	

Preventive Maintenance Checks and Services (PMCS) for M60A1 AVLB

Item No.	Interval	Location	Crewmember Procedure	Not Fully Mission Capable if:
		Item to Check/Service		
40	After	Top Deck Grille Doors (Left and Right)	<p>Check that all doors are present.</p> <p>Lift open grille doors starting at rear.</p> <p>Look for missing engine heat shroud hardware on grille doors and hinges.</p>	<p>Any top grille door missing.</p> <p>Engine heat shroud missing.</p>
41	After	Mine Clearing Line Charge (MICLIC) Support Bracket (If Equipped)	<p>Check that MICLIC support bracket is not damaged.</p> <p>Check that MICLIC mounting brackets are not damaged and mounting screws and nuts are not loose or missing.</p>	

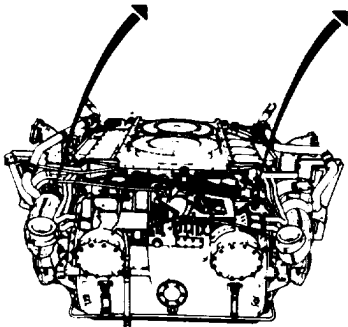
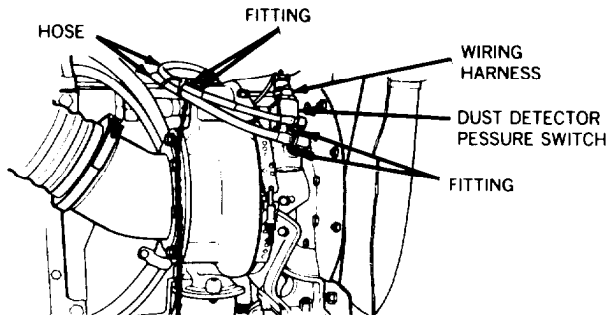
Preventive Maintenance Checks and Services (PMCS) for M60A1 AVLB

Item No.	Interval	Location	Crewmember Procedure	Not Fully Mission Capable if:
		Item to Check/Service		
42	After	Air Cleaner Elbows, Hoses, and Clamps (Right and Left Sides)	<p>Check that air cleaner intake hoses and outlet hoses are not cracked, damaged or missing.</p> <p>Check that intake hose elbows and outlet hose elbows are not loose, damaged, or missing.</p> <p>Check that intake and outlet hose clamps (two on each hose) are not loose, broken, or missing.</p>	<p>Intake or outlet hose damaged or missing.</p> <p>Elbows loose or damaged.</p>

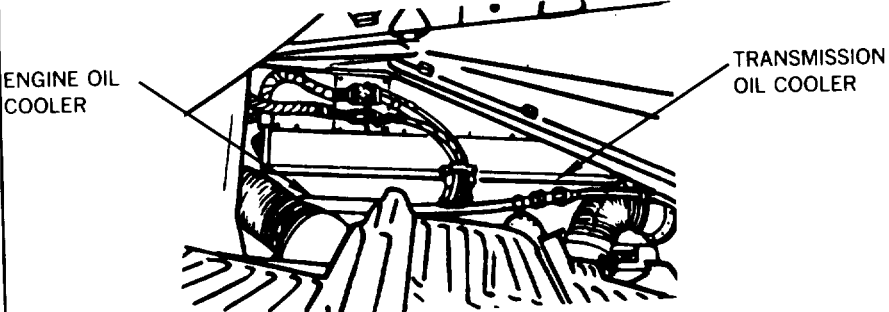
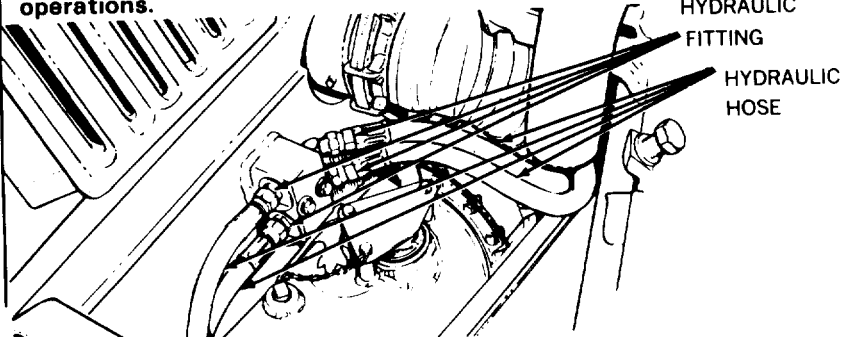


Preventive Maintenance Checks and Services (PMCS) for M60A1 AVLB

Item No.	Interval	Location	<u>Crewmember Procedure</u>	Not Fully Mission Capable if:
		Item to Check/Service		
43	After	Dust Detector Pressure Switch (Right and Left Sides) (If Equipped)	<p>Check dust detector pressure switch for security of mounting.</p> <p>Check dust detector pressure switch to insure that switch has not been tripped (red plunger visible through plastic cover).</p> <p>Check that wiring harness is connected.</p> <p>Check that hoses are not damaged or missing.</p> <p>Check that fittings are secure.</p>	Dust detector switch is tripped.

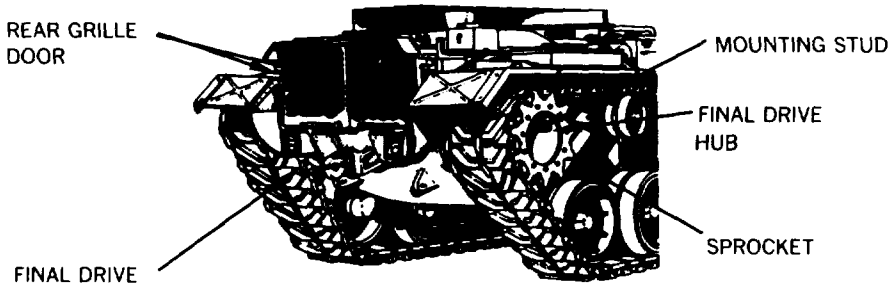


Preventive Maintenance Checks and Services (PMCS) for M60A1 AVLB

Item No.	Interval	Location	Crewmember Procedure	Not Fully Mission Capable if:
		Item to Check/Service		
44	After	Engine Oil and Transmission Oil Coolers, (Right and Left Sides)	<p>Check screens on engine oil and transmission oil coolers for debris.</p> <p>Check coolers for damage and check for leaks.</p>	<p>Damage to oil coolers or oil lines that restricts oil flow. Class III oil leak in oil cooler or lines.</p>
 <p>ENGINE OIL COOLER</p> <p>TRANSMISSION OIL COOLER</p>				
45	After	Hydraulic Hoses and Connections (Engine Compartment)	<p>Check hydraulic hoses and connections in right side of engine compartment for fluid leaks.</p>	<p>Any Class III fluid leak.</p>
<p><b>NOTE</b></p> <p>Check Items 45 to 57 during stops and halts, other than tactical operations.</p>  <p>HYDRAULIC FITTING</p> <p>HYDRAULIC HOSE</p>				

Preventive Maintenance Checks and Services (PMCS) for M60A1 AVLB

Item No.	Interval	Location	<u>Crewmember Procedure</u>	Not Fully Mission Capable if:
		Item to Check/Service		
46	After	Rear Grille Doors	<p>Make sure grille doors are secure.</p> <p>Check for loose or missing hardware.</p> <p>Be sure doors are not damaged or missing.</p>	Rear grille door missing or can not be secured.
47	After	Final Drive	<p>Check for Class III oil leakage between final drive and bottom of sprocket. Report class III fluid leakage to organizational maintenance.</p> <p>Check for sheared mounting studs.</p>	<p>Any Class III fluid leak.</p> <p>More than two final drive hub studs sheared on any one final drive</p>
<p><b><u>WARNING</u></b></p> <p><b>Final drive hubs may be very hot and could cause burns.</b></p>				
48	After	Sprockets	<p>Cautiously check final drive hubs for overheating.</p> <p>Check sprocket for cracks and broken teeth.</p>	<p>Any final drive hub overheated.</p> <p>Sprocket cracked or has broken teeth.</p>



Preventive Maintenance Checks and Services (PMCS) for M60A1 AVLB

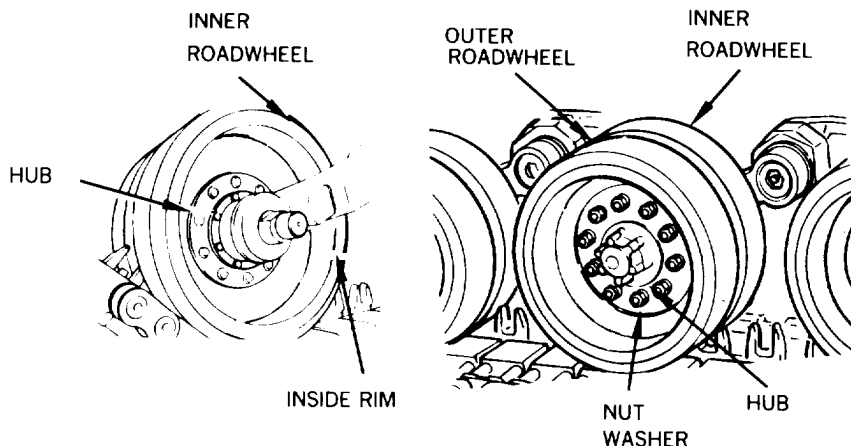
Item No.	Interval	Location	<u>Crewmember</u> Procedure	Not Fully Mission Capable if:
		Item to Check/Service		
49	After	Torsion Bars for Roadwheels No. 1 and 6 (Right and Left Sides)	<p>Look at roadwheels No. 1 and 6 to see if torsion bars are broken or missing.</p> <p>If volute bumper spring bracket is clearly visible above top of roadwheel and extended shock absorber sleeve is clearly visible above top of roadwheel, torsion bar is operational.</p> <p>If volute bumper spring bracket is barely visible above top of roadwheel and compressed shock absorber sleeve is barely visible or not visible above top of roadwheel, torsion bar is broken.</p>	Torsion bars at roadwheels No. 1 and/or 6 broken or missing.

The diagram shows a top-down view of the M60A1 AVLB chassis. It features a long, narrow hull with a turret at the rear. Six roadwheels are visible along the bottom edge of the hull. Two specific roadwheels are labeled: 'ROADWHEEL NO. 6' at the front and 'ROADWHEEL NO. 1' at the rear. Above the hull, two 'SHOCK ABSORBER SLEEVES' are indicated with arrows pointing to the top of the chassis. Below the hull, a 'VOLUTE BUMPER SPRING' is also indicated with an arrow pointing to the front of the chassis.

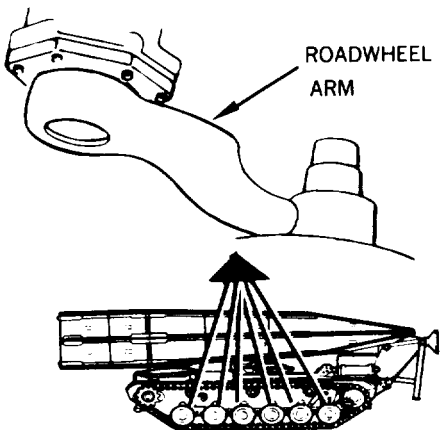
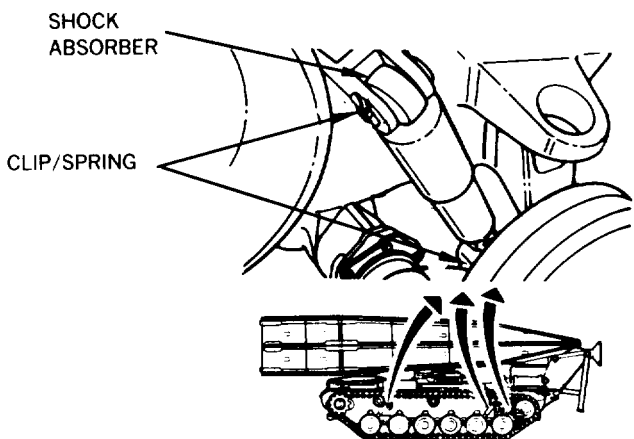
Preventive Maintenance Checks and Services (PMCS) for M60A1 AVLB

Item No.	Interval	Location	Crewmember Procedure	Not Fully Mission Capable if:
		Item to Check/Service		
50	After	Road-wheels and Hubs (Right and Left Sides)	Check inner and outer and roadwheels for chunking or separated rubber that would cause thumping during use.	
			Check for worn mounting holes by looking for a shiny area around mounting nuts and washers.	
<b><u>WARNING</u></b>				
Roadwheel or compensating idler wheel hubs may be extremely hot and could cause burns.				
			<p>Cautiously check hubs for high temperature differences between hubs.</p> <p>Check inside rim for grease spattering. Spattering grease indicates a defective seal.</p> <p>Check for missing roadwheels or compensating idler wheels.</p>	<p>Any hub that is over-heated and cannot be corrected by lubrication.</p> <p>One or more road wheels missing or unserviceable.</p>



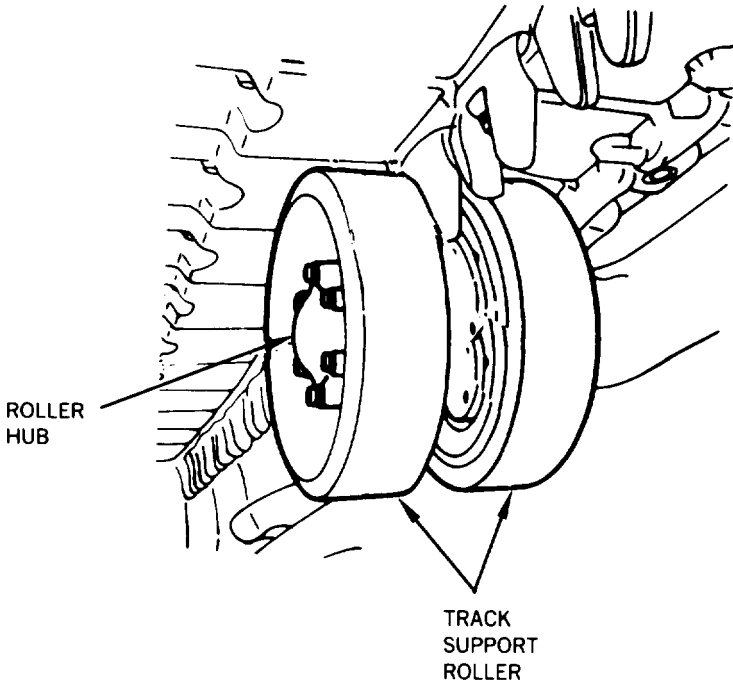


Preventive Maintenance Checks and Services (PMCS) for M60A1 AVLB

Item No.	Interval	Location	<u>Crewmember</u> Procedure	Not Fully Mission Capable if:
		Item to Check/Service		
51	After	Road-wheel Arms (Right and Left Sides)	Be sure that roadwheel arms are not bent, broken, or missing.	
			 <p>The diagram shows a close-up of a roadwheel arm, which is a curved metal component. An arrow points to it with the label 'ROADWHEEL ARM'. Below this, a top-down view of the vehicle's roadwheel assembly is shown with several arrows pointing to the roadwheel arms on both sides.</p>	
52	After	Shock Absorbers (Right and Left Sides)	Check shock absorbers for broken or missing clips/springs and for signs of oil leakage.	Shock absorber at No. 1 or No. 6 road-wheel broken or missing.
			 <p>The diagram shows a close-up of a shock absorber assembly. An arrow points to the main cylindrical component labeled 'SHOCK ABSORBER'. Another arrow points to a smaller component labeled 'CLIP/SPRING'. Below this, a top-down view of the vehicle's roadwheel assembly is shown with arrows pointing to the shock absorbers on both sides.</p>	

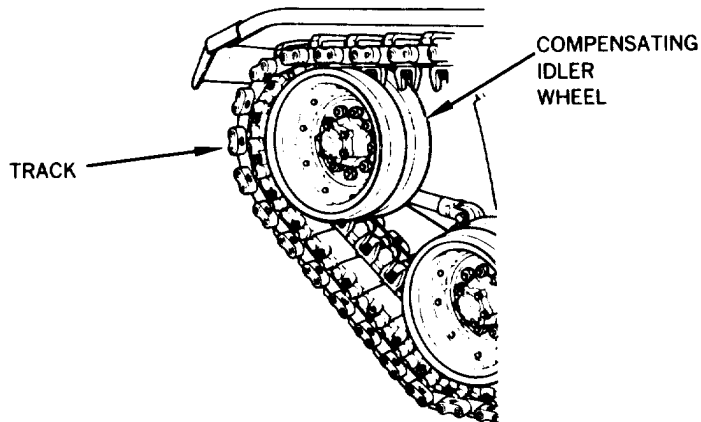
Preventive Maintenance Checks and Services (PMCS) for M60A1 AVLB

Item No.	Interval	Location	Crewmember Procedure	Not Fully Mission Capable if:			
		Item to Check/Service					
53	After	Track Support Rollers and Hubs (Right and Left Sides)	<p>Check for missing or loose track support rollers.</p> <p>Check rollers for separation of rubber from metal and chunking.</p> <p style="text-align: center;">NOTE</p> <p>Notify organizational maintenance if tire separation or chunking is more than 1/2 the width of the tire.</p> <p style="text-align: center;"><b>WARNING</b></p> <p>Track support hubs may be extremely hot and could cause burns.</p> <table border="0" style="width: 100%;"> <tr> <td style="width: 30%;"></td> <td style="width: 30%; border-left: 1px solid black; border-right: 1px solid black;">Cautiously feel support roller hubs for high temperature differences between other hubs.</td> <td style="width: 30%; border-left: 1px solid black;">Any hub that is overheated and cannot be corrected by lubrication.</td> </tr> </table>		Cautiously feel support roller hubs for high temperature differences between other hubs.	Any hub that is overheated and cannot be corrected by lubrication.	One or more track support roller(s) missing or loose.
	Cautiously feel support roller hubs for high temperature differences between other hubs.	Any hub that is overheated and cannot be corrected by lubrication.					



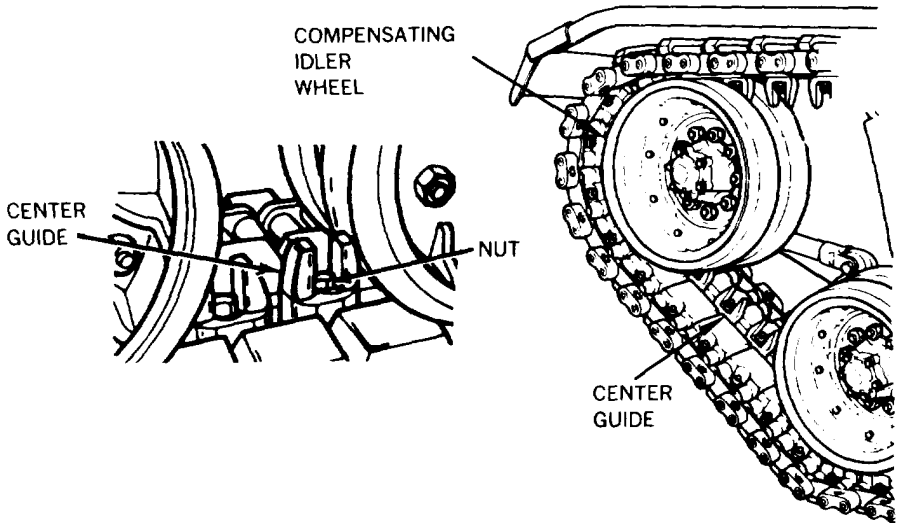
Preventive Maintenance Checks and Services (PMCS) for M60A1 AVLB

Item No.	Interval	Location	<u>Crewmember Procedure</u>	Not Fully Mission Capable if:
		Item to Check/Service		
54	After	Track, End Connectors and Wedges, Center Guides, Track Links, and Track Pads (Left and Right Sides)	<p>Perform track checks as follows:</p> <ol style="list-style-type: none"> <li>1. Park vehicle on hard, level surface. Remove dirt and mud from track.</li> <li>2. Have four crewmen available (two other AVLB crewmen from sister vehicle preferred) to perform track checks.</li> <li>3. Station driver at operator's station and start engine. Station one crewman in front of vehicle to check left track as it passes over compensating idler wheel. Station two crewmen as ground guides.</li> </ol>	



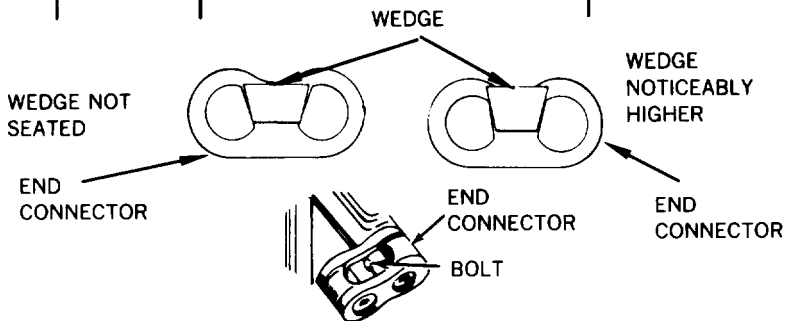
Preventive Maintenance Checks and Services (PMCS) for M60A1 AVLB

Item No.	Interval	Location	Crewmember Procedure	Not Fully Mission Capable if:
		Item to Check/Service		
54	After	Track, End Connectors and Wedges, Center Guides, Track Links, and Track Pads (Left and Right Sides) (Cont)	<p>4. Ground guides direct driver to move vehicle in reverse at creeping speed.</p> <p>5. Front crewmember check track, as it passes over compensating idler wheel. As defects are found, alert front ground guide to signal driver to stop vehicle. Mark out-board end connector where defect is located and corrective action is required. Check track for the following:</p> <p>Missing, bent, cracked, broken, or shiny (loose) center guides.</p> <p>Shiny metal on center guide around mounting bolt (indicates loose center guide).</p>	One or more missing/broken center guides.

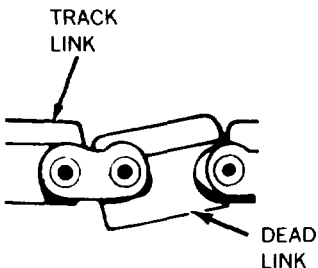


Preventive Maintenance Checks and Services (PMCS) for M60A1 AVLB

Item No.	Interval	Location	Crewmember Procedure	Not Fully Mission Capable if:
		Item to Check/Service		
54	After	Track, End Connectors and Wedges, Center Guides, Track Links, and Track Pads (Left and Right Sides) (Cont)	<p>Missing or loose track pads/links.</p> <p>Excessive wear of track pads/links (indicated by damage to roadway).</p>	
			<div style="text-align: center;"> <p>TRACK PAD</p> <p>REQUIRES REPLACEMENT</p> <p>NORMAL WEAR</p> <p>TRACK PAD</p> </div>	
			<p>Broken, missing, or loose (shiny metal around wedge bolt) end connectors.</p> <p>Missing or improperly seated wedges.</p> <p>Missing or broken wedges and bolts.</p>	<p>One or more broken or missing end connectors.</p> <p>One or more broken/missing wedges.</p>

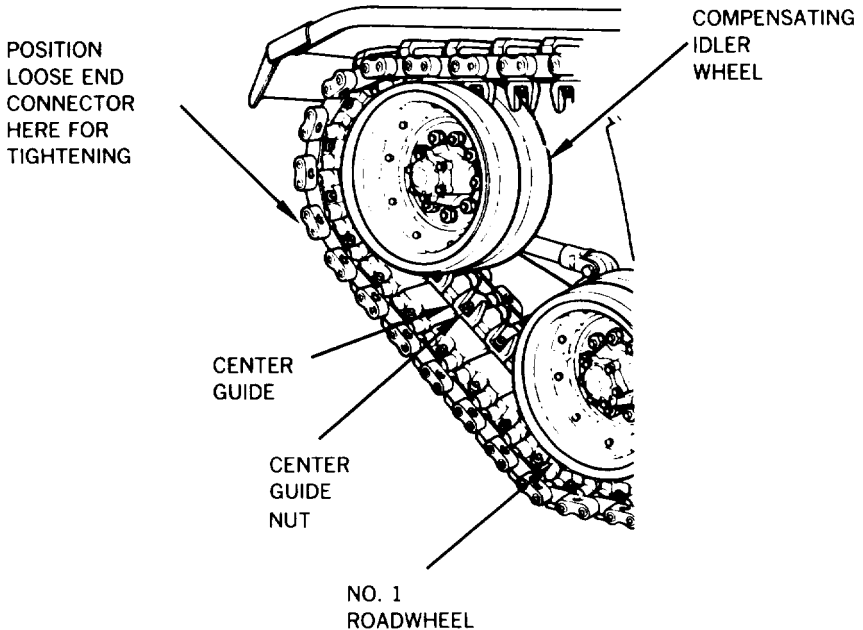


Preventive Maintenance Checks and Services (PMCS) for M60A1 AVLB

Item No.	Interval	Location	Crewmember Procedure	Not Fully Mission Capable if:
		Item to Check/Service		
54	After	Track, End Connectors and Wedges, Center Guides, Track Links, and Track Pads (Left and Right Sides) (Cont)	<p style="text-align: center;"><b>NOTE</b></p> <p><b>When track link appears out of line, it indicates a dead link or damaged track pin bushing.</b></p> <p>6. Look for dead links between track support rollers.</p> <p>7. Check track links for breaks or cracks.</p> <div style="text-align: center;">  </div> <p>8. After left track has been checked and marked, check right track using same procedures. After both tracks are checked and marked, go to applicable corrective procedure.</p>	<p>On one side of vehicle, three or more dead track links or one broken track link.</p>

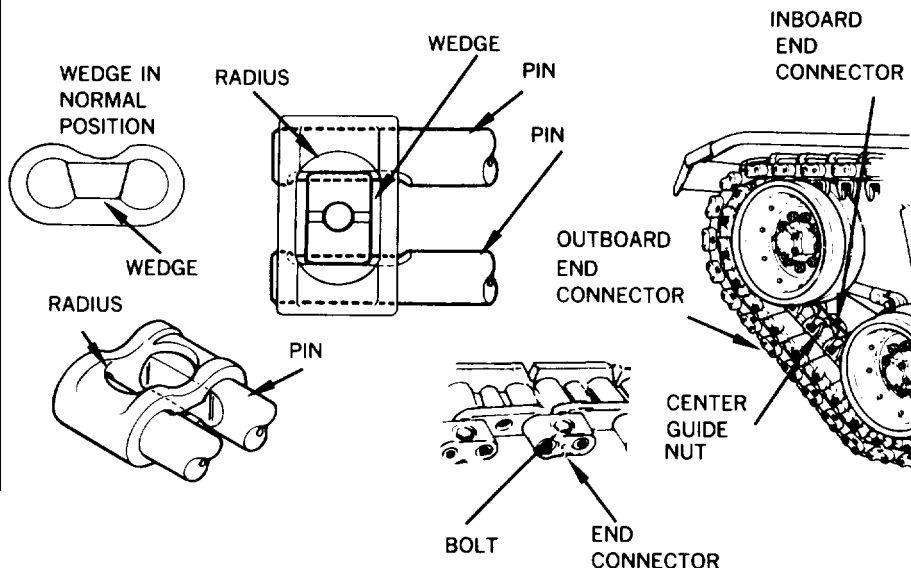
Preventive Maintenance Checks and Services (PMCS) for M60A1 AVLB

Item No.	Interval	Location	<u>Crewmember Procedure</u>	Not Fully Mission Capable if:
		Item to Check/Service		
54	After	Track, End Connectors and Wedges, Center Guides, Track Links, and Track Pads (Left and Right Sides) (Cont)	<p>If end connector is loose or unseated perform the following:</p> <ol style="list-style-type: none"> <li>1. Loosen track tension (page 3-26).</li> <li>2. Loosen center guide nut (left side) on same link that has loose end connector.</li> <li>3. Move vehicle until loose end connector is midway over compensating idler wheel then stop vehicle.</li> </ol>	



Preventive Maintenance Checks and Services (PMCS) for M60A1 AVLB

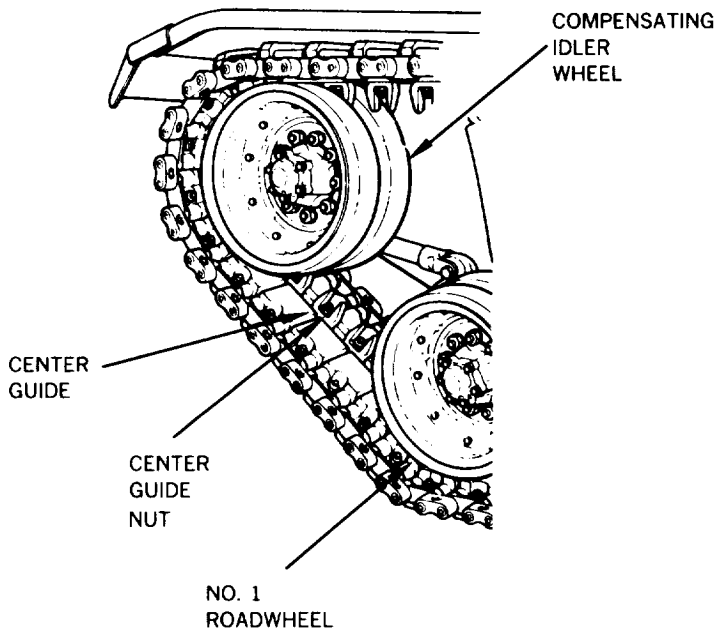
Item No.	Interval	Location	Crewmember Procedure	Not Fully Mission Capable if
		Item to Check/Service		
54	After	Track, End Connectors and Wedges, Center Guides, Track Links, and Track Pads (Left and Right Sides) (Cont)	<p>4. Check that wedge is in normal position and does not touch radius. If wedge touches inner or outer radius, reposition end connector (in or out) on pins to properly seat wedge.</p> <p>5. Tighten both inboard and out board end connector bolts.</p> <p>6. Tighten centerguide nut.</p> <p>If end connector is damaged, replace connector (page 3-30).</p>	



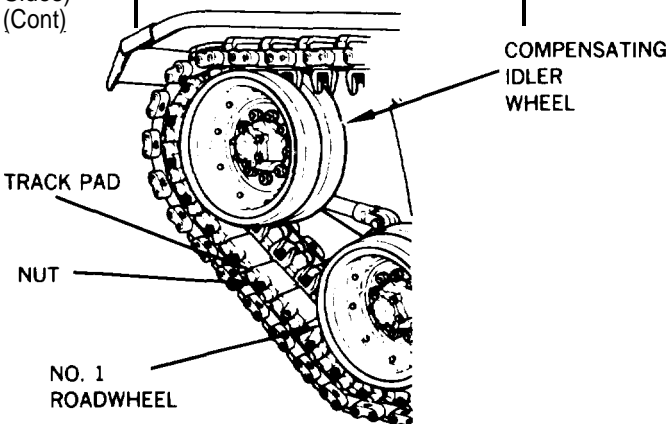


Preventive Maintenance Checks and Services (PMCS) for M60A1 AVLB

Item No.	Interval	Location	Crewmember Procedure	Not Fully Mission Capable if:
		Item to Check/Service		
54	After	Track, End Connectors and Wedges, Center Guides, Track Links, and Track Pads (Left and Right Sides) (Cont)	<p>If center guide is loose, perform the following:</p> <ol style="list-style-type: none"> <li>1. Move vehicle until defective or loose center guide is between compensating idler wheel and No. 1 roadwheel.</li> <li>2. Tighten loose center guide nut. (For reference, proper torque is 360 to 380 lb-ft (488.2 to 515.3 N·m).</li> </ol> <p>If center guide is damaged, replace center guide (page 3-35).</p>	

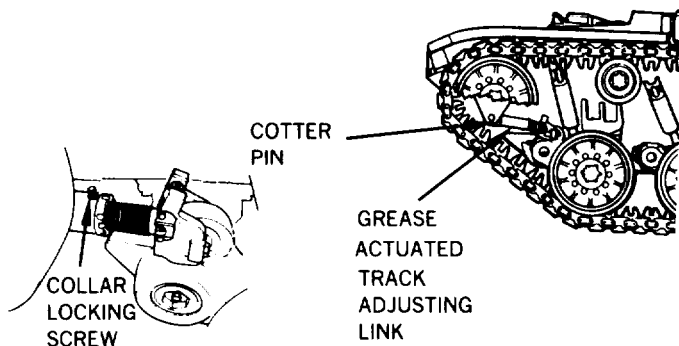
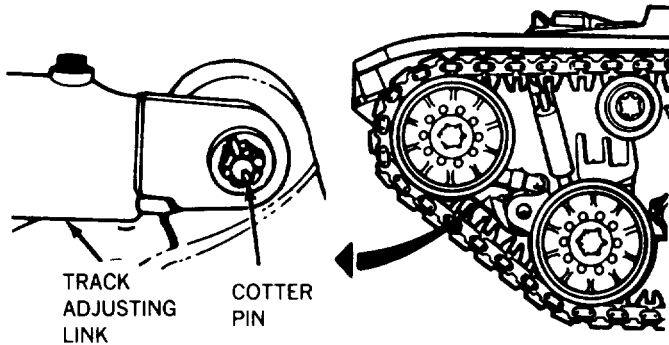


**Preventive Maintenance Checks and Services (PMCS) for M60A1 AVLB**

Item No.	Interval	Location	Crewmember Procedure	Not Fully Mission Capable if:
		Item to Check/Service		
54	After	Track, End Connectors and Wedges, Center Guides, Track Links, and Track Pads (Left and Right Sides) (Cont)	<p>If track pads are loose, perform the following:</p> <ol style="list-style-type: none"> <li>1. Move vehicle until loose track pad is between compensating idler wheel and No. 1 roadwheel.</li> <li>2. Stop vehicle and tighten track pad nut.</li> </ol>	
 <p>The diagram illustrates a section of a vehicle's track system. It shows a compensating idler wheel at the top, a track pad mounted on a track link, a nut used to secure the track pad, and the No. 1 roadwheel at the bottom. Labels with leader lines point to each of these components: COMPENSATING IDLER WHEEL, TRACK PAD, NUT, and NO. 1 ROADWHEEL.</p>				
<p>If track pads are damaged or excessively worn, replace pad (page 3-49).</p> <p>If track links or pins are damaged, replace track link (page 3-39).</p> <p style="text-align: center;">NOTE</p>				
<p>Track tension must be adjusted and is accomplished in Item 57.</p>				

Preventive Maintenance Checks and Services (PMCS) for M60A1 AVLB

Item No.	Interval	Location	Crewmember Procedure	Not Fully Mission Capable if:
		Item to Check/Service		
55	After	Track Adjusting Link (Mechanical) (Left and Right Sides)	<p>Check that link assembly is not missing or broken.</p> <p>Check that cotter pin is not missing or broken.</p>	Track adjusting link broken or missing.
56	After	Track Adjusting Link (Grease Actuated) (Left and Right Sides)	<p>Check for missing, broken, or leaking track adjusting link.</p> <p>Check that cotter pin is not missing.</p> <p>Check that collar locking screw is not loose or missing.</p>	Track adjusting link broken, missing, or leaking.



Preventive Maintenance Checks and Services (PMCS) for M60A1 AVLB

Item No.	Interval	Location	<u>Crewmember Procedure</u>	Not Fully Mission Capable if:
		Item to Check/Service		
56	After	Track Adjusting Link (Grease Actuated) (Left and Right Sides) (Cont)	<p>Check that bearings and pin are not worn.</p> <p>Check that bearing attaching screws are not loose or missing.</p> <p>Check that grease fitting, pressure relief valve and plug are not damaged or missing.</p>	Pressure relief valve or plug damaged or missing.
57	After	Track Tension (Left and Right Sides)	Adjust track tension after all other track inspection and/or faults have been corrected (page 3-51).	
<p><b>CAUTION</b></p> <ul style="list-style-type: none"> <li>Track tension must be checked and adjusted when bridge is placed on vehicle. Proper track tension will prevent track from being thrown.</li> <li>Track tension must be checked and adjusted when bridge is removed and vehicle is to be operated extensively without bridge. Proper track tension will prevent track from being thrown.</li> </ul>				

Preventive Maintenance Checks and Services (PMCS) for M60A1 AVLB

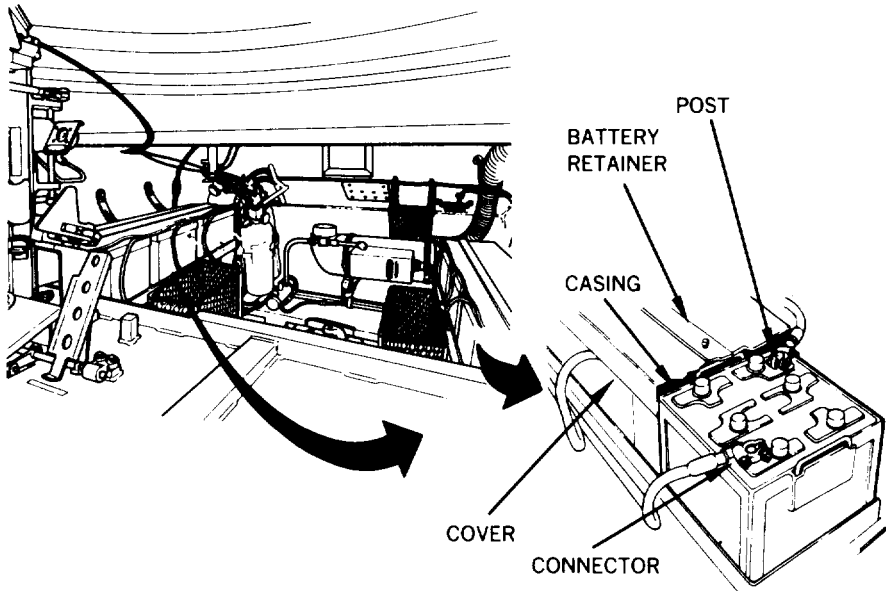
Item No.	Interval	Location	Crewmember Procedure	Not Fully Mission Capable if:
		Item to Check/Service		
58	After	Cylinder, Pins, and Retaining Rings (Left and Right Sides)	Check that pins or retaining rings are not missing on boom, tongue, tongue cylinder and overhead cylinder.	Any pins or retaining rings missing.

The diagram shows a side view of the AVLB's boom and tongue assembly. Labels with arrows point to the following components: OVERHEAD CYLINDER (top), TONGUE CYLINDER (middle), PIN/RETAINING RING (two locations, one on the boom and one on the tongue), TONGUE (bottom left), and BOOM (bottom center).

Preventive Maintenance Checks and Services (PMCS) for M60A1 AVLB

Item No.	Interval	Location	Crewmember Procedure	Not Fully Mission Capable if:
		Item to Check/Service		
59	Weekly	Batteries (Left and Right Sides)	<p>Remove battery retainer (page 3-75). Remove cover.</p> <p>Visually check for broken or loose battery connectors and posts</p> <p>Check for corrosion on battery connectors and posts.</p> <p>Wipe connectors and posts with clean cloth, and apply light coat of GAA grease (item 21, app. D).</p> <p>Check battery casings for cracks.</p>	One or more unserviceable battery.

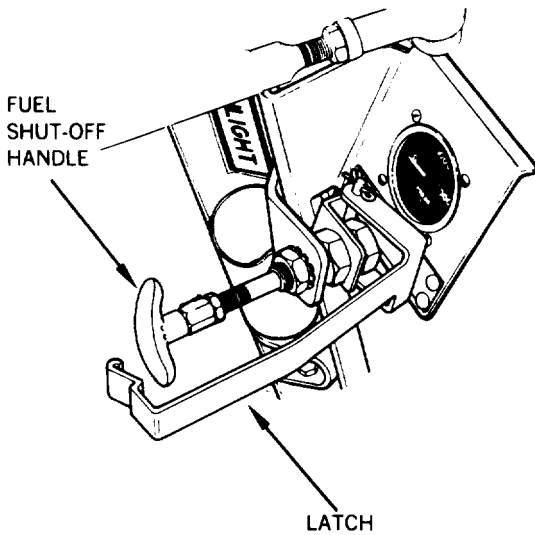


Preventive Maintenance Checks and Services (PMCS) for M60A1 AVLB

Item No.	Interval	Location	<u>Crewmember Procedure</u>	Not Fully Mission Capable if:
		Item to Check/Service		
59	Weekly	Batteries (Left and Right Sides) (Cont)		
<p><b><u>WARNING</u></b></p> <p><b>Electrolyte and battery corrosion can injure you. Wear safety goggles and gloves. If for any reason electrolyte or battery corrosion contacts the eyes, skin, or clothing, immediately flush with large amounts of fresh water. In case of eye or skin contact, see doctor immediately.</b></p> <div style="display: flex; justify-content: space-between; border: 1px solid black; padding: 10px;"> <div style="width: 45%;"></div> <div style="width: 45%; text-align: center;"> <p>Remove battery caps from fill holes. Check that electrolyte covers plates or bottom of split ring (if equipped).</p> <p>If electrolyte level is low, or if you notice any defects, notify organizational maintenance.</p> </div> </div>				

Preventive Maintenance Checks and Services (PMCS) for M60A1 AVLB

Item No.	Interval	Location	<u>Crewmember Procedure</u>	Not Fully Mission Capable if:
		Item to Check/Service		
60	Weekly	Engine Manual Fuel Shut-Off	<p>With engine running, release latch and pull manual FUEL SHUT-OFF handle.</p> <p>Check that engine stops within 30 seconds.</p> <p>Push manual FUEL SHUT-OFF handle in and secure with latch.</p>	Engine does not shut down.





Preventive Maintenance Checks and Services (PMCS) for M60A1 AVLB

Item No.	Interval	Location	<u>Crewmember</u> Procedure	Not Fully Mission Capable if:
		Item to Check/Service		
61	Weekly	Gas Particulate System		

**WARNING**

If NBC exposure is suspected, air filter media must be handled by personnel wearing protective equipment. Contact your unit NBC Officer or NBC NCO for appropriate handling or disposal instructions.

Visually inspect filter unit for damage.

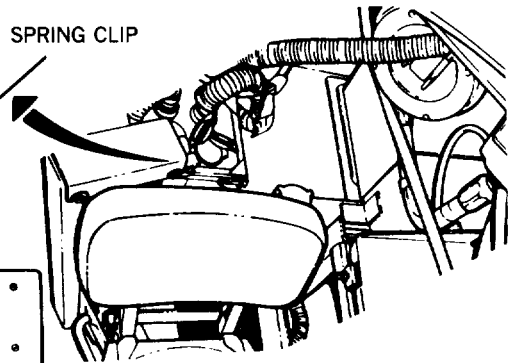
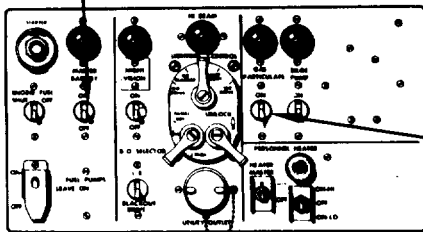
Pull and lift spring clip from air intake openings on filter unit.

Set MASTER BATTERY switch and GAS PARTICULATE switch to ON.

GAS PARTICULATE FILTER UNIT

SPRING CLIP

MASTER BATTERY SWITCH



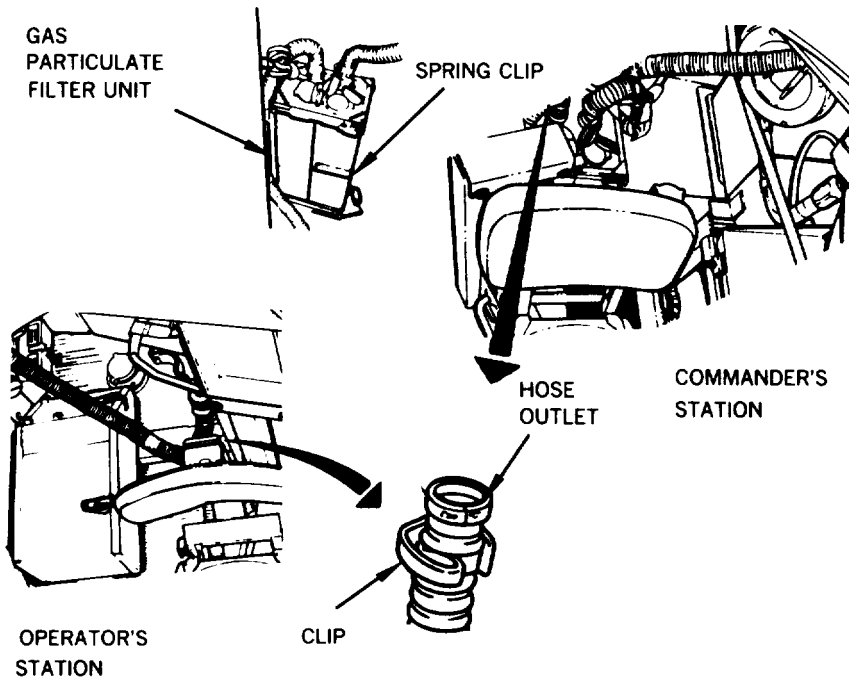
GAS PARTICULATE SWITCH

COMMANDER'S STATION

OPERATOR'S STATION

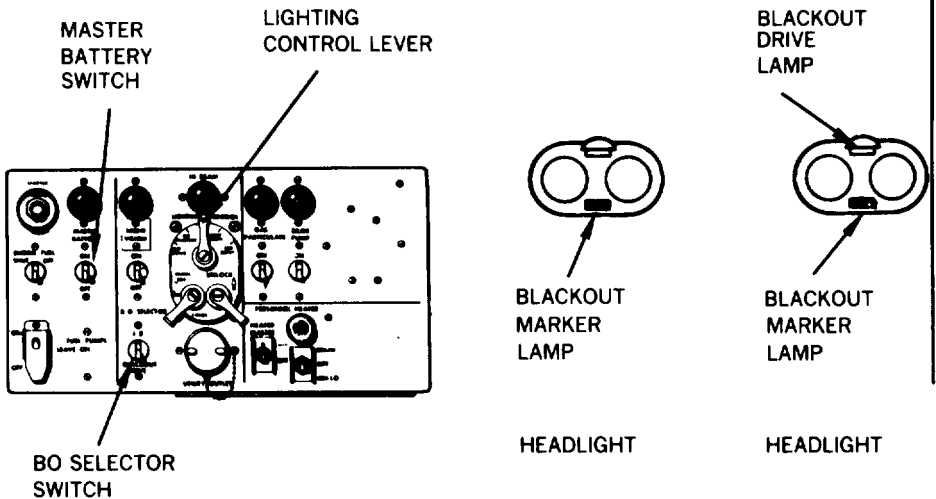
Preventive Maintenance Checks and Services (PMCS) for M60A1 AVLB

Item No.	Interval	Location	<u>Crewmember Procedure</u>	Not Fully Mission Capable if:
		Item to Check/Service		
61	Weekly	Gas Particulate System (Cont)	<p>Pull hose outlet from clip at both crewmember stations.</p> <p>Check for steady flow of air at hose outlet at both crewmember stations.</p> <p>Push hose outlet into clip at both crewmember stations.</p> <p>Set GAS PARTICULATE switch to OFF.</p> <p>Press spring clip on filter unit down to cover air intake opening.</p> <p>Set MASTER BATTERY switch to OFF.</p>	



Preventive Maintenance Checks and Services (PMCS) for MA60A1 AVLB

Item No.	Interval	Location	<u>Crewmember Procedure</u>	Not Fully Mission Capable if:
		Item to Check/Service		
62	Weekly	BO Marker and Service Drive Headlights	<p>Station crewmember in front of vehicle to verify headlight checks.</p> <p>Set MASTER BATTERY switch to ON.</p> <p>Place LIGHTING CONTROL lever to BO MARKER.</p> <p>Check that blackout marker lamps light.</p> <p>Set BO SELECTOR switch to BLACKOUT DRIVE.</p> <p>Check that blackout drive lamp lights.</p>	



Preventive Maintenance Checks and Services (PMCS) for M60A1 AVLB

Item No.	Interval	Location	<u>Crewmember</u> Procedure	Not Fully Mission Capable if:
		Item to Check/Service		
62	Weekly	BO Marker and Service Drive Headlights (Cont)	<p>Place LIGHTING CONTROL lever to SER DRIVE.</p> <p>Check that high and low beams light by pressing and releasing DIMMER SWITCH.</p> <p>Be sure HI BEAM indicator lights when high beam service drive lights are lit.</p>	

SERVICE DRIVE HEADLIGHT



HEADLIGHT

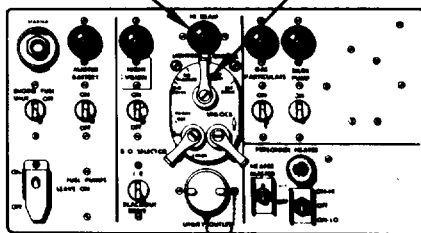
SERVICE DRIVE HEADLIGHT



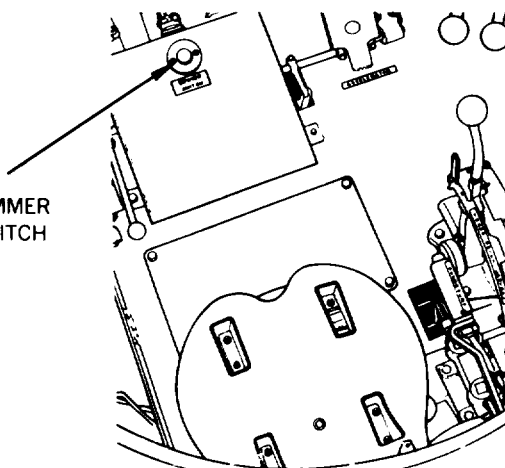
HEADLIGHT

HI BEAM INDICATOR

LIGHTING CONTROL LEVER

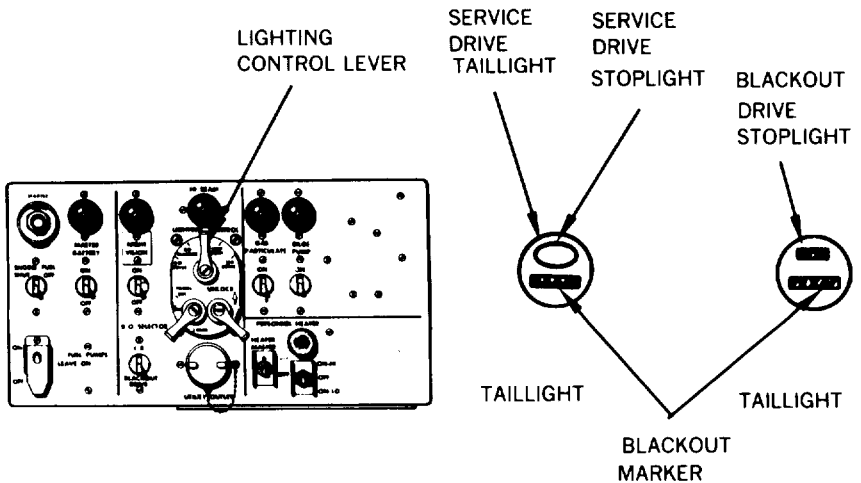


DIMMER SWITCH



Preventive Maintenance Checks and Services (PMCS) for M60A1 AVLB

Item No.	Interval	Location	<u>Crewmember Procedure</u>	Not Fully Mission Capable if:
		Item to Check/Service		
63	Weekly	Taillights	<p>Station crewmember at rear of vehicle to verify taillight and stoplight operation.</p> <p>Check that service drive taillight lights.</p> <p>Press brake pedal. Check that service drive stoplight lights.</p> <p>Turn LIGHTING CONTROL lever to STOPLIGHT.</p> <p>Press brake pedal. Check that service drive stoplight lights.</p> <p>Turn LIGHTING CONTROL lever to BO MARKER.</p> <p>Check that blackout markers light.</p> <p>Press brake pedal. Check that blackout drive stoplight lights.</p>	



Preventive Maintenance Checks and Services (PMCS) for M60A1 AVLB

Item No.	Interval	Location	<u>Crewmember Procedure</u>	Not Fully Mission Capable if:
		Item to Check/Service		
63	Weekly	Taillights (Cont)	<p>Station crewmember at rear of vehicle to verify taillight and stoplight checks.</p> <p>Turn LIGHTING CONTROL lever to BO DRIVE.</p> <p>Check that blackout drive taillights light.</p> <p>Press brake pedal.</p> <p>Check that blackout stoplight lights.</p> <p>Turn LIGHTING CONTROL lever to OFF.</p> <p>Set MASTER BATTERY switch to OFF.</p>	

MASTER BATTERY SWITCH

LIGHTING CONTROL LEVER

BLACKOUT TAILLIGHT

BLACKOUT STOPLIGHT

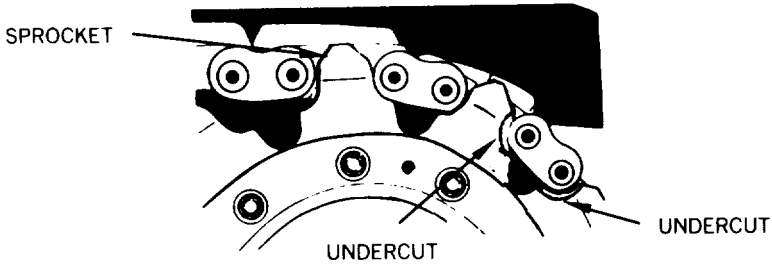
BLACKOUT MARKER

BLACKOUT MARKER

TAILLIGHT

TAILLIGHT

Preventive Maintenance Checks and Services (PMCS) for M60A1 AVLB

Item No.	Interval	Location	<u>Crewmember Procedure</u>	Not Fully Mission Capable if:
		Item to Check/Service		
64	Weekly	Track Drive Sprocket (Right and Left Sides)	Check sprocket for wear by looking at undercut located on two sprocket teeth. Check that undercut area has not been worn away.	Undercut is completely worn away.
				
65	Weekly	AN/VVS-2 Night Vision Viewer and Hatch (Night Check)	<p style="text-align: center;"><b><u>CAUTION</u></b></p> <p>Perform AN/VVS-2 night vision check during darkness only. Do not expose objective lens on night vision viewer to direct sunlight or bright light.</p>	Night vision viewer is inoperative.
			Install and operate night vision viewer (page 2-114).	

Preventive Maintenance Checks and Services (PMCS) for M60A1 AVLB

Item No.	Interval	Location	<u>Crewmember Procedure</u>	Not Fully Mission Capable if:
		Item to Check/Service		
66	Weekly	Portable Fire Extinguisher	<p>Check that extinguisher clamp is secure.</p> <p>Check that safety wire/lead seal has not been broken.</p>	
<p>The diagram shows a portable fire extinguisher mounted on a base. Three labels with leader lines point to specific parts: 'PORTABLE FIRE EXTINGUISHER' points to the top handle area, 'CLAMP' points to the metal band around the middle of the cylinder, and 'SAFETY WIRE/LEAD SEAL' points to a wire or seal at the top of the extinguisher.</p>				
67	Monthly	Exercising Hydraulic System		
<p><b><u>WARNING</u></b></p> <p>FRH hydraulic fluid may contain tricresyl phosphate which, if taken internally, can produce paralysis. Hydraulic fluid may be absorbed through the skin. Wear long sleeves, gloves, goggles, and face-shield. If FRH gets in eyes, wash them, and get medical aid immediately. If FRH gets on skin, thoroughly wash with soap and water. Wash hands thoroughly prior to eating or smoking. Application of these measures is considered an effective control of the hazard.</p>				



Preventive Maintenance Checks and Services (PMCS) for M60A1 AVLB

Item No.	Interval	Location	Crewmember Procedure	Not Fully Mission Capable if:
		Item to Check/Service		
67	Monthly	Exercising Hydraulic System (Cont)	<p><b><u>WARNING</u></b></p> <p>Dry Cleaning Solvent P-D-680 is toxic and flammable. To avoid injury, wear protective goggles and gloves and use in a well-ventilated area. Avoid contact with skin, eyes, and clothes, and do not breathe vapors. Do not use near open fire or excessive heat. The flash point for Type I Dry Cleaning Solvent is 100°F (38°C), and for Type II is 140°F (60°C). If you become dizzy while using Dry Cleaning Solvent, get fresh air immediately and get medical aid. If contact with eyes is made, wash your eyes with water and get medical aid immediately.</p>	
		<p>Remove nut, washer, and nameplate securing hydraulic breather filter hood and remove hood. Remove filter element and clean with dry cleaning solvent (item 42, Appendix D). Dip filter element in hydraulic fluid and install on body assembly. Position hood on filter element and secure with nameplate, washer, and nut.</p>		

**Preventive Maintenance Checks and Services (PMCS) for M60A1 AVLB**

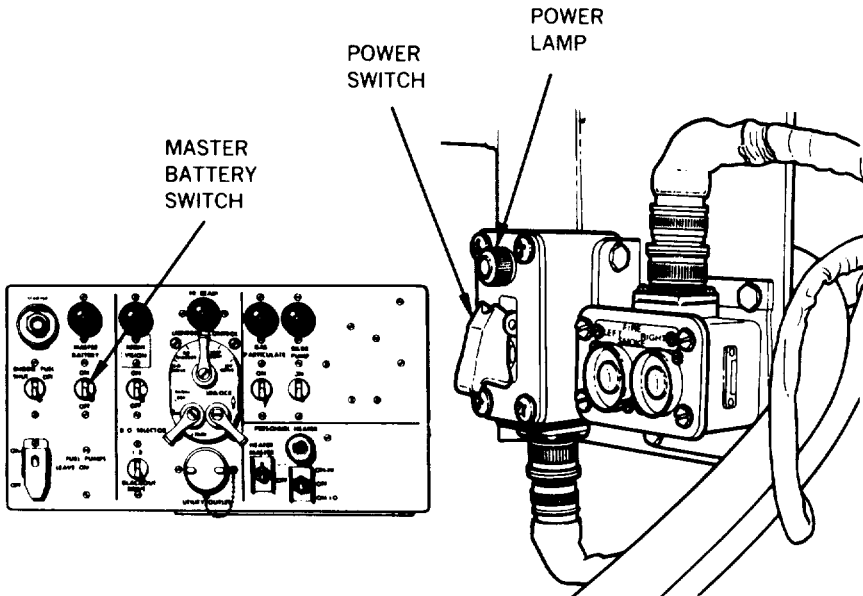
Item No.	Interval	Location	<u>Crewmember</u> Procedure	Not Fully Mission Capable if:
		Item to Check/Service		
67	Monthly	Exercising Hydraulic System (Cont)	Check bridge for serviceability (TM 5-5420-203-14).	Bridge is unserviceable or missing.  Vehicle fails to complete launch or retrieval.
			Perform launch and retrieval procedures (page 2-142 and 2-150 respectively) at least five times.	
<b>NOTE</b>				
<b>One pint of oil loss per operational hour is acceptable</b>				
			Immediately after exercising hydraulic system, wipe residue from all cylinder seal areas using a clean cloth, then check for fluid leaks in these areas.	Any Class III leak.

Preventive Maintenance Checks and Services (PMCS) for M60A1 AVLB

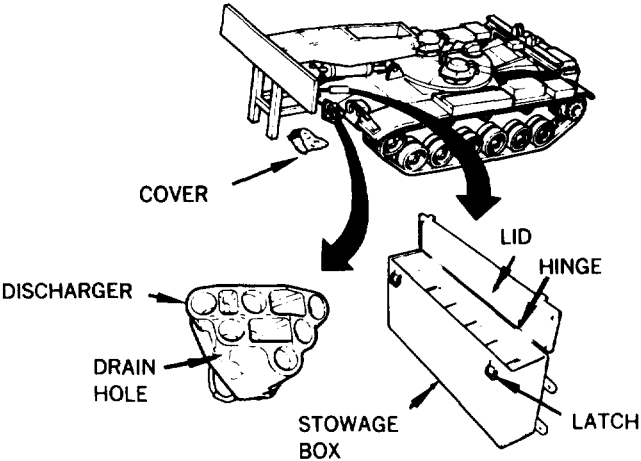
Item No.	Interval	Location	Crewmember Procedure	Not Fully Mission Capable if:
		Item to Check/Service		
68	Monthly	Bridge Seat and Pads	<p>Check for broken welds, loose pad mounting screws, and loose bridge mounting screws.</p> <p>Check for torn or missing pads.</p>	Any broken welds.
69	Monthly	Hydraulic Brake System	Check brake master cylinder fluid level (page G-8).	Brake system leaks.

Preventive Maintenance Checks and Services (PMCS) for M60A1 AVLB

Item No.	Interval	Location	<u>Crewmember</u> Procedure	Not Fully Mission Capable if:
		Item to Check/Service		
70	Monthly	Grenade Launcher Power Box	<p style="text-align: center;"><b><u>WARNING</u></b></p> <p><b>Ensure grenades are not present in grenade dischargers to prevent injury by accidental discharging of grenades.</b></p> <p>Make sure MASTER BATTERY switch is set to ON.</p> <p>Set grenade POWER switch to ON.</p> <p>Check that POWER lamp lights.</p> <p>Set POWER switch to OFF.</p> <p>Set MASTER BATTERY switch to OFF.</p>	



Preventive Maintenance Checks and Services (PMCS) for M60A1 AVLB

Item No.	Interval	Location	Crewmember Procedure	Not Fully Mission Capable if:
		Item to Check/Service		
71	Monthly	Grenade Launcher Discharger, Cover, and Stowage Box (Right and Left Sides)	<p>Make sure MASTER BATTERY switch is set to OFF.</p> <p>Remove cover from discharger and check for tears or damaged canvas.</p> <p>Check discharger for obvious damage and dirty or clogged barrels.</p> <p style="text-align: center;"><b>NOTE</b></p> <p><b>Top center drain hole cannot be checked using stiff wire. If drain hole is clogged, notify organizational maintenance.</b></p> <div style="border: 1px solid black; padding: 5px; margin: 10px auto; width: 80%;"> <p>Check that drain holes are clear by inserting stiff wire in holes.</p> <p>Check stowage box for damaged hinge and for proper operation of lid and latch.</p> <p>Check stowage box for damage and secure mounting.</p> </div> 	

Section III. OPERATION UNDER USUAL CONDITIONS

**NOTE**

If equipment will not work, see troubleshooting procedures (page 3-1).

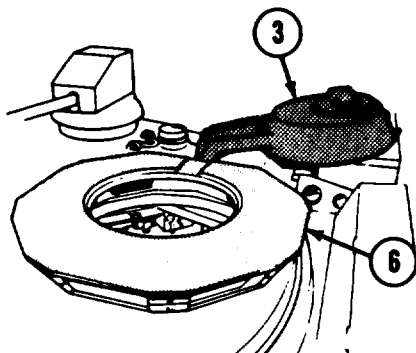
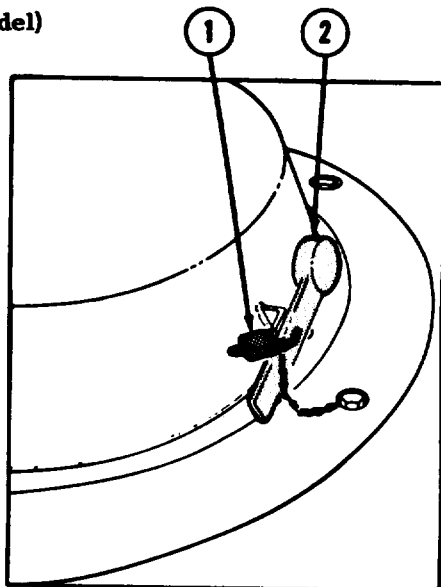
**OPERATE CUPOLA COVER (Late Model)**

**OPEN COVER FROM OUTSIDE**

**NOTE**

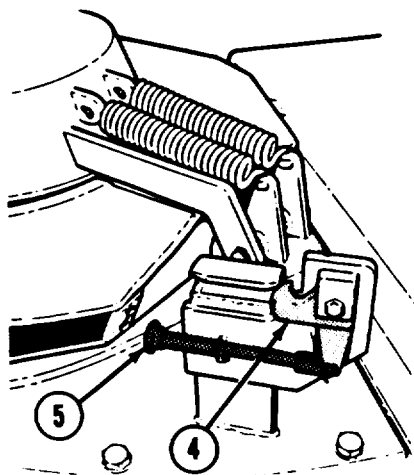
Both covers work the same way.

1. Using key, open padlock (1).
2. Remove padlock (1).
3. Pull up cover handle (2).
4. Swing cover (3) to rear.
5. Lock cover (3) open with safety latch (4).



**CLOSE COVER FROM OUTSIDE**

1. Push in knob (5) to release safety latch (4).
2. Swing cover (3) forward.
3. Push cover down on cupola (6).
4. Push cover handle (2) down to lock position.
5. Lock with padlock (1).



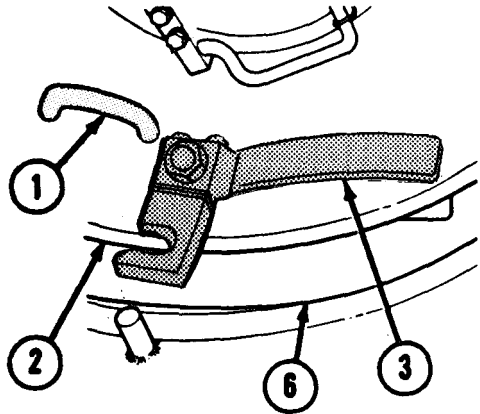
**OPERATE CUPOLA COVER (Late Model - Continued)**

**OPEN COVER FROM INSIDE**

**NOTE**

**Both covers work the same way.**

1. Grasp handle (1) to hold down cover (2).
2. Rotate locking handle (3) counterclockwise.
3. Let cover (2) spring up.
4. Swing cover (2) to rear.
5. Lock cover (2) open with safety latch (4).

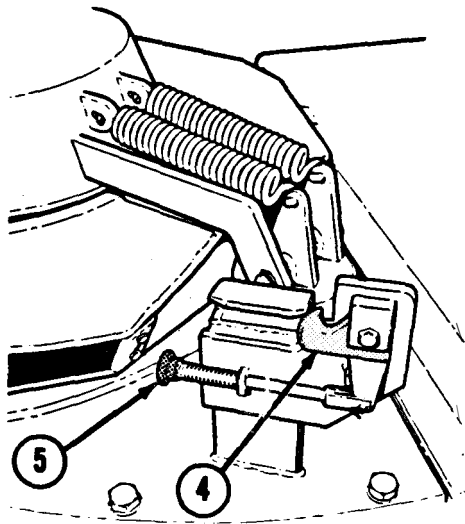
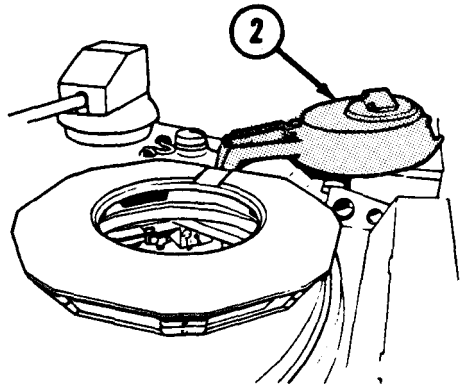


**CLOSE COVER FROM INSIDE**

**WARNING**

Do not release safety latch (4) when vehicle is moving. Cover (2) is heavy and can move, causing injury to personnel, if it is released while vehicle is moving.

1. Push in knob (5) to release safety latch (4).
2. Swing cover (2) forward.
3. Grasp handle (1) inside cover (2).
4. Pull down and hold cover (2) against cupola (6).
5. Rotate locking handle (3) clockwise to lock cover (2) closed.



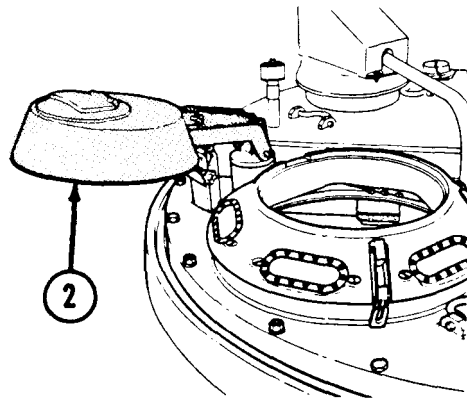
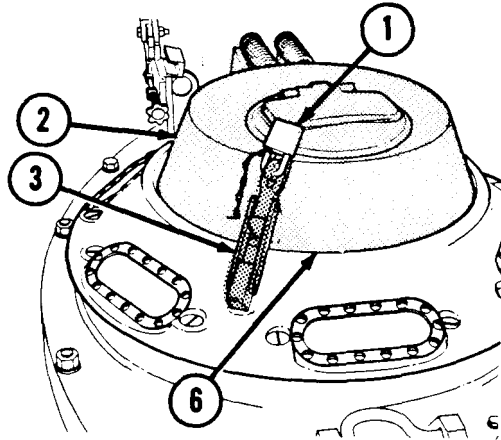
## OPERATE CUPOLA COVER (Early Model)

### OPEN COVER FROM OUTSIDE

#### NOTE

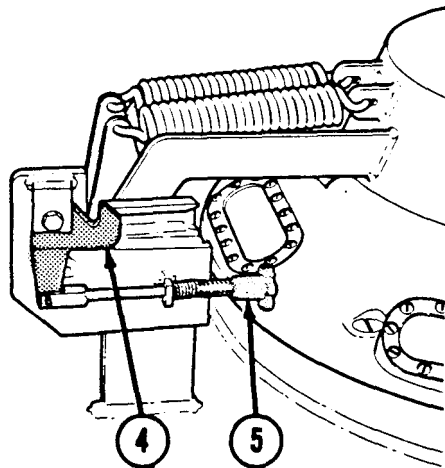
**Both covers work the same way.**

1. Using key, open padlock (1).
2. Remove padlock (1).
3. Hold down cover (2).
4. Fold down hasp (3).
5. Let cover (2) spring up.
6. Swing cover (2) to rear.
7. Lock cover (2) open with safety latch (4).



### CLOSE COVER FROM OUTSIDE

1. Push in knob (5) to release safety latch (4).
2. Swing cover (2) forward.
3. Push and hold cover (2) down on cupola (6).
4. Fold hasp (3) up into place.
5. Lock with padlock (1).





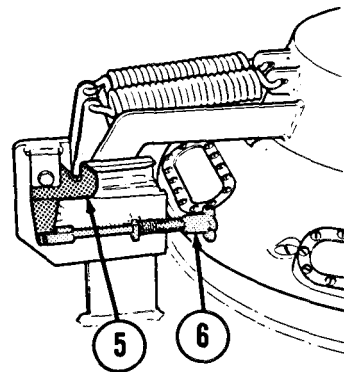
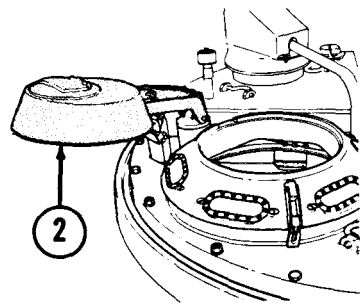
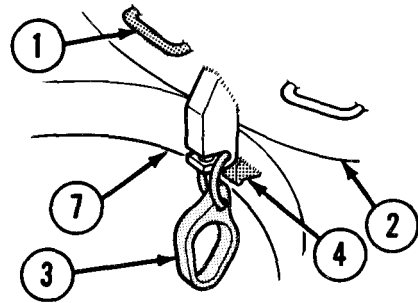
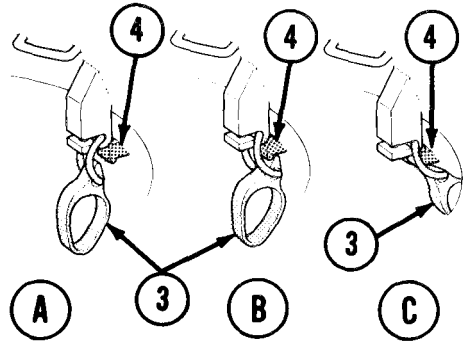
**OPERATE CUPOLA COVER (Early Model) - Continued**

**OPEN COVER FROM INSIDE**

**NOTE**

**Both covers work the same way.**

1. Grasp handle (1) to hold down cover (2).
2. Pull ringed latch (3) back (See Figure B) until free from clasp (4) (See Figure A).
3. Let cover (2) spring up.
4. Swing cover (2) to rear.
5. Lock cover (2) open with safety latch (5).



**CLOSE COVER FROM INSIDE**

**WARNING**



**Do not release safety latch (5) when vehicle is moving. Cover (2) is heavy and can move, causing injury to personnel, if it is released while vehicle is moving.**

1. Push in knob (6) to release safety latch (5).
2. Swing cover (2) forward.
3. Grasp handle (1) inside cover (2).
4. Pull down and hold cover (2) against cupola (7).
5. Grasp ringed latch (3) hanging from cover (2) (See Figure A).
6. Fit tip of ringed latch (3) under clasp (4) attached to cupola (7) (See Figure B).
7. Push ringed latch (3) forward until cover (2) is locked (See Figure C).

## ADJUST SEAT

### UP OR DOWN

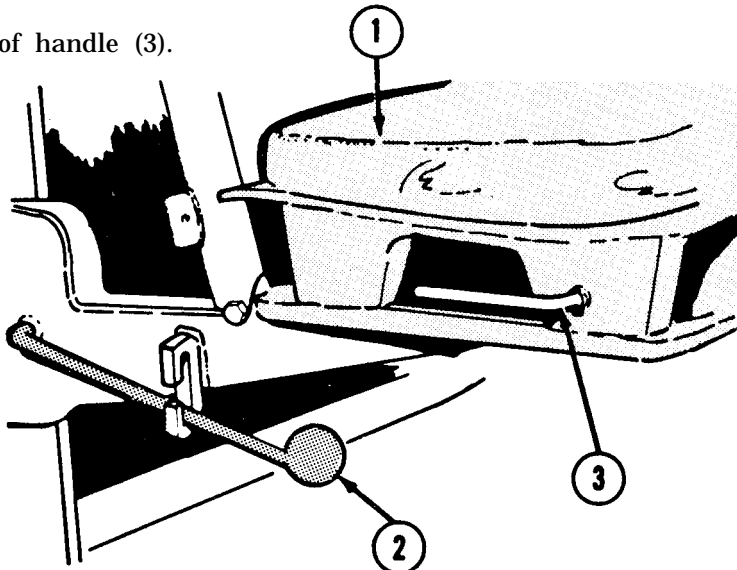
#### WARNING

 **Do not raise or lower seat unless you are sitting in it. To avoid injury, very careful when raising seat with cupola cover closed.** 

1. Sit in seat (1).
2. Lift up and hold height adjustment lever (2).
3. Raise or lower seat to position you want.
4. Let go of lever (2).

### FORWARD OR BACKWARD

1. Sit in seat (1).
2. Pull and hold seat control handle (3) toward seat.
3. Move seat forward or backward to position you want.
4. Let go of handle (3).



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OPERATE FIXED FIRE EXTINGUISHERS

**CAUTION**

After you have used the fixed fire extinguisher, tell organizational maintenance. Don't run the vehicle until you know what started the fire, repairs are made, and empty extinguisher cylinders replaced to prevent recurrence of the fire.

1. Stop vehicle.
2. Quickly pull handle (1) hard and let go.

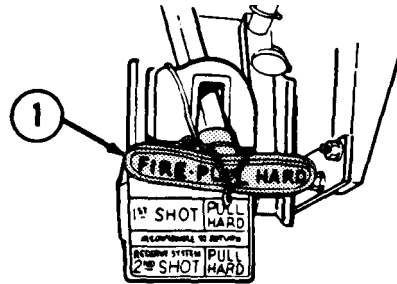
**NOTE**

Pulling handle releases 1st shot and shuts off engine fuel.

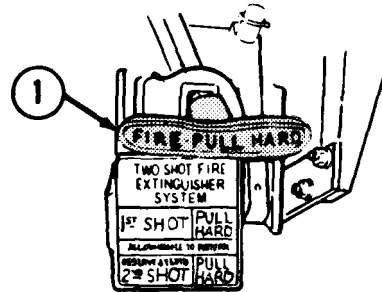
- 2.1. If engine continues to run, pull up on fuel shut off handle (2).
3. If fire is not out in 20 seconds:
  - a. Push handle (1) in.
  - b. Pull hard on handle (1) and let go.

**NOTE**

Pulling handle releases 2nd shot.



READY FOR FIRST SHOT

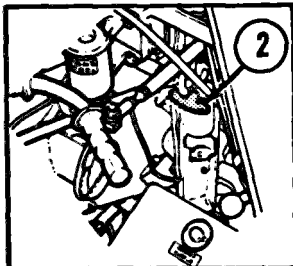
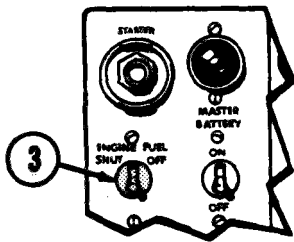


READY FOR SECOND SHOT

4. If both shots are released get out of vehicle and move upwind from vehicle.

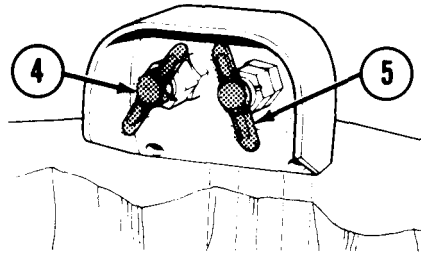
IF 1ST OR 2ND SHOT DID NOT RELEASE:

1. a. Push up and hold ENGINE FUEL SHUT OFF switch (3) for 6 to 10 seconds, or,
  - b. Pull up on fuel shut off handle (2).



**OPERATE FIXED FIRE EXTINGUISHERS - Continued**

2. Get out of vehicle.
3. Go to left front of vehicle.
4. PULL 1ST SHOT handle (4).
5. After about 20 seconds, pull 2ND SHOT handle (5).
6. Move away and upwind of vehicle.
7. Tell organizational maintenance you've had a fire and used the fire extinguishers.



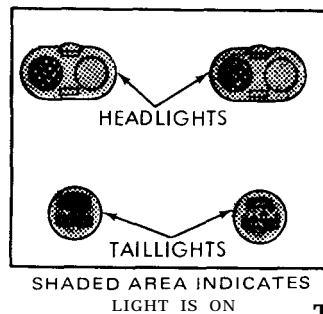
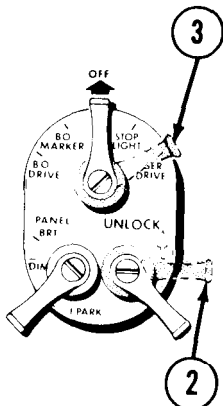
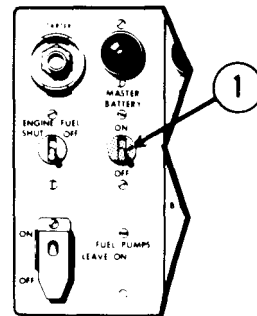
**CAUTION**

**Do not try to start engine until repairs are made and fire extinguishers are replaced to prevent recurrence of fire.**

**OPERATE SERVICE DRIVE LIGHTS**

**ON**

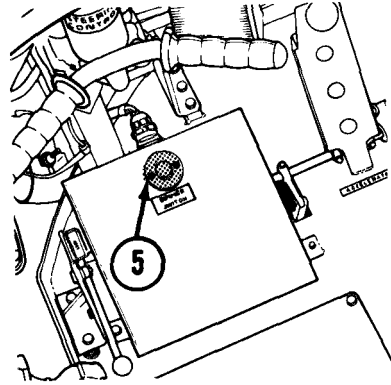
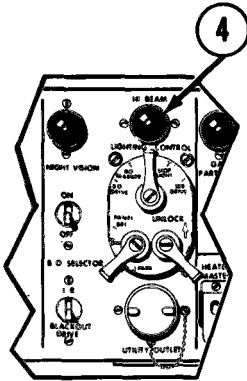
1. MASTER BATTERY switch (1) must be ON.
2. Raise and hold UNLOCK lever (2).
3. Turn lever (3) to SER DRIVE.
4. Release UNLOCK lever (2).



**TA247671**

**HIGH OR LOW HEADLIGHT BEAM**

**NOTE**  
**HI BEAM indicator (4) lights if headlights are on high beam.**



5. Press and release dimmer switch (5) to select high or low beam.

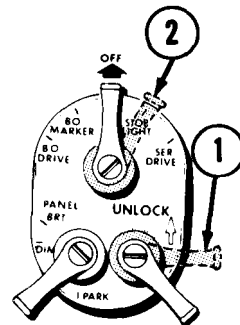
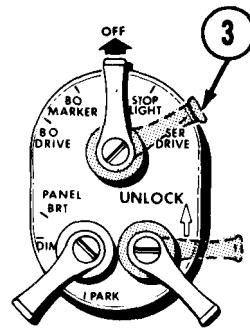
**OFF**

Turn lever (3) to OFF.

**OPERATE SERVICE STOPLIGHT**

**ON**

1. Raise and hold UNLOCK lever (1).
2. Move lever (2) to STOP-LIGHT.
3. Release UNLOCK lever (1).
4. Press brake pedal to operate stoplight.



**OFF**

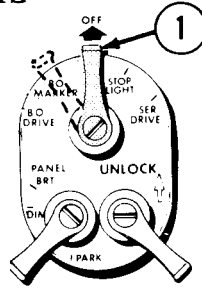
To turn off stoplight, move lever (2) to OFF.



**OPERATE BLACKOUT MARKER LIGHTS**

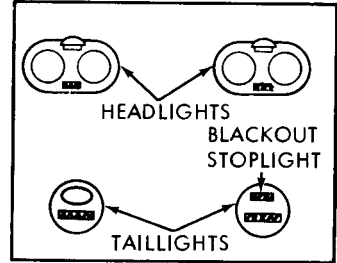
**ON**

1. Move lever (1) to BO MARKER.
2. Press brake pedal to operate blackout stoplight

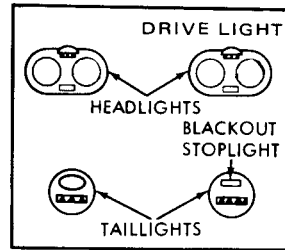
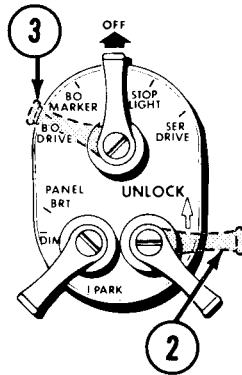
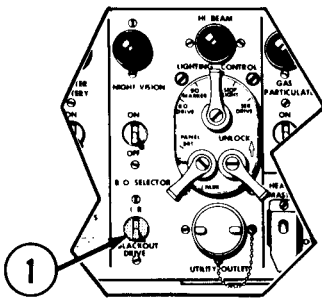


**OFF**

To turn off lights, move lever (1) to OFF.



**OPERATE BLACKOUT DRIVE LIGHTS**



**ON**

1. Set BO SELECTOR switch (1) to BLACKOUT DRIVE.
2. Raise and hold UNLOCK lever (2).
3. Move lever (3) to BO DRIVE.
4. Release UNLOCK lever (2).
5. Press brake pedal to operate blackout stoplight.

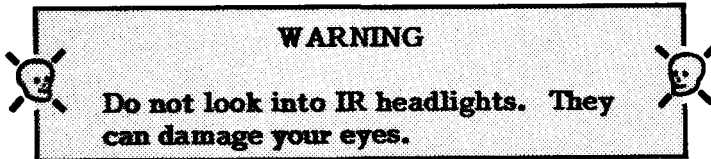
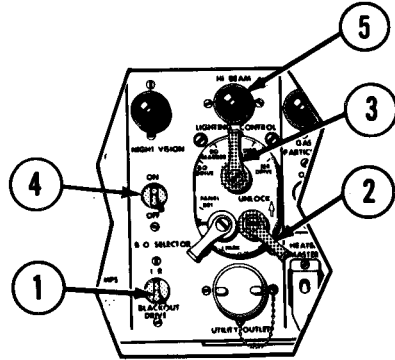
**OFF**

To turn off lights, move lever (3) to OFF.

**OPERATE INFRARED HEADLIGHTS**

**ON**

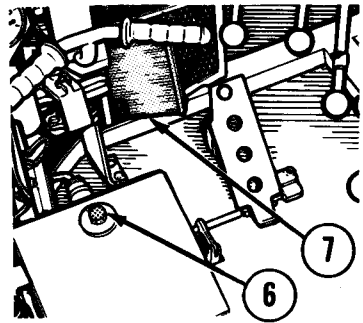
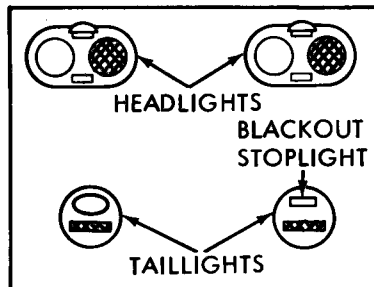
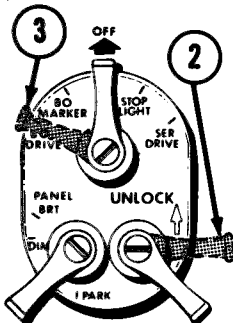
1. Set BO SELECTOR switch (1) to ON.
2. Raise and hold UNLOCK lever (2).
3. Move lever (3) to BO DRIVE.
4. Release UNLOCK lever (2).
5. Set NIGHT VISION switch (4) to ON.



6. Check IR by placing hand on lens. You will feel heat if lights are operating.
7. HI BEAM indicator (5) will light if lights are on high beam.
8. Press and release dimmer switch (6) to select high or low beam.
9. Press brake pedal (7) to operate blackout stoplight.

**OFF**

1. To turn off lights, move lever (3) to OFF.
2. Move NIGHT VISION switch (4) to OFF.
3. Set BO SELECTOR switch (1) to BLACKOUT DRIVE.



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### OPERATE PANEL LIGHTS

#### NOTE

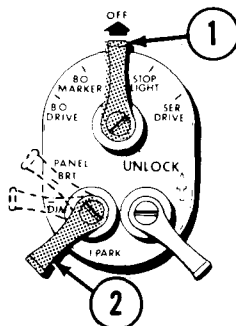
Lever (1) must be in any position except off to move lever (2).

#### ON

Move PANEL lever (2) to BRT or DIM.

#### OFF

To turn off lights, move lever (1) to OFF.



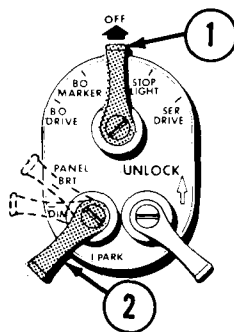
### OPERATE PARKING LIGHTS

#### NOTE

Lever (1) must be in any position except off to move PANEL lever (2).

#### ON

Move PANEL lever (2) to PARK.



#### NOTE

If lever (1) is in SER DRIVE or BO DRIVE, drive lights will come on.

If drive lights were on, they will go off and panel lights will dim.

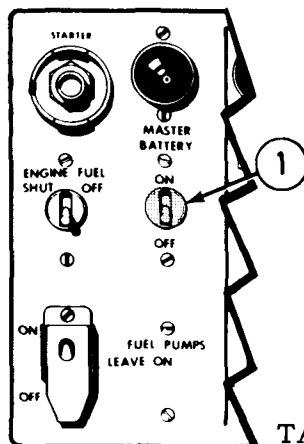
#### OFF

To turn off parking lights, move lever (1) to OFF.

### OPERATE DOMELIGHT

#### ON

1. Set MASTER BATTERY switch (1) to ON.

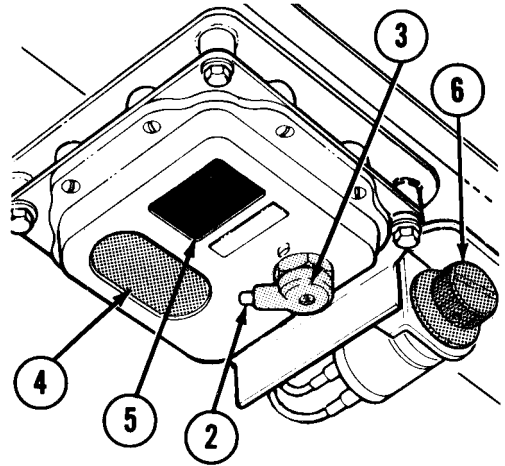


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**OPERATE DOMELIGHT - Continued**

2. Press plunger (2) and move switch (3) to right for white light (4).
3. Move switch (3) to left for black out light (5).
4. Turn knob (6) to change brightness.



**OFF**

1. Press plunger (2) and move switch (3) to center to turn lights off.

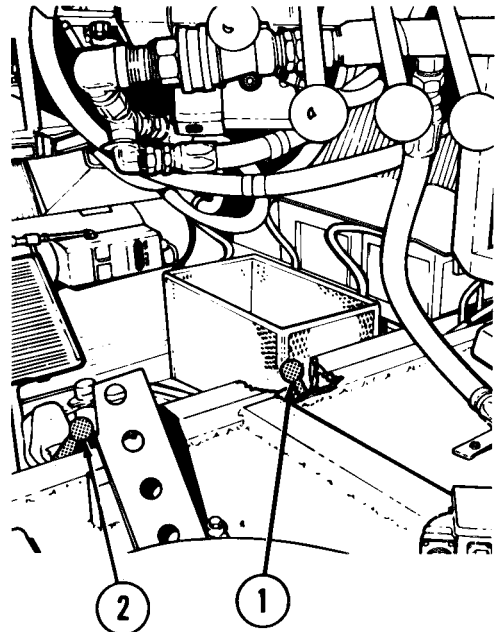
**OPERATING ENGINE COMPARTMENT DRAIN VALVE**

**OPEN**

Push lever (1) down and to the right into detent to lock open.

**CLOSE**

Push lever (1) to left out of detent and pull up.



**OPERATING CREW COMPARTMENT DRAIN VALVE**

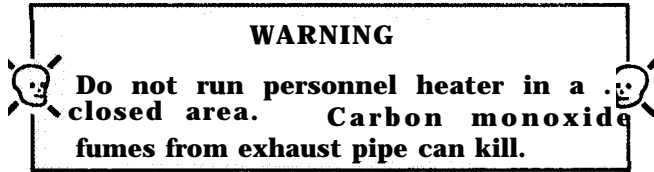
**OPEN**

Push lever (2) to the right and to the rear into detent to lock open.

**CLOSE**

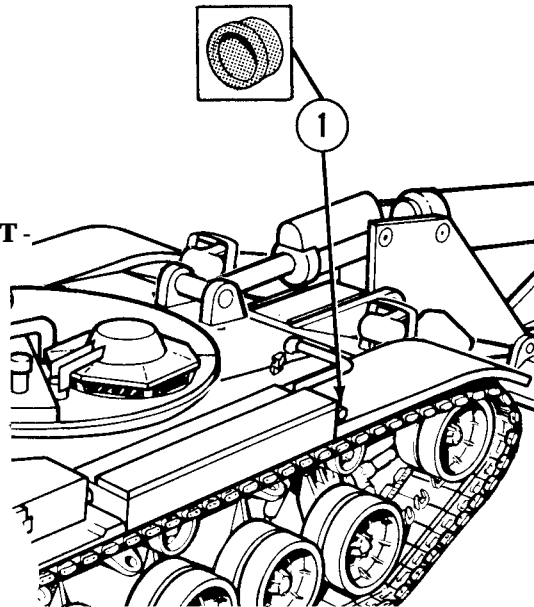
Push lever (2) forward and to the left.

## OPERATE PERSONNEL HEATER



### CAUTION

- Heater could be damaged if run with heater exhaust plug
- Do not turn HEATER MASTER switch (2) OFF except for deep water fording or electrical trouble.

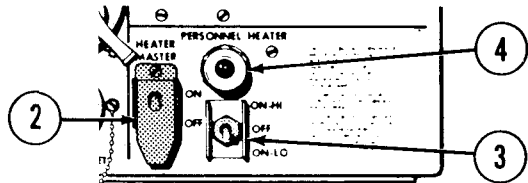


### START HEATER

1. Remove exhaust plug (1).
2. Make sure HEATER MASTER switch (2) is ON.

### NOTE

Notify Organizational Maintenance if ON-HI/OFF/CXG LO switch (3) is OFF and indicator (4) is lit.



3. With switch (3) in OFF position, press indicator (4). It should light, indicating it is all right to start heater. If indicator (4) does not light, notify organizational maintenance.

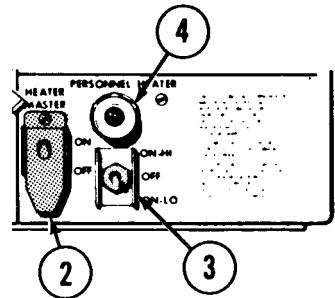
### NOTE

Not more than three attempts should be made to start heater. Indicator (4) will light indicating heater start-up. If the heater does not start in three attempts, notify organizational maintenance.

**OPERATE PERSONNEL HEATER - Continued****CAUTION**

Leave **MASTER BATTERY** switch on until heater has purged. Moving **MASTER BATTERY** switch to **OFF** before heater has purged will damage heater system.

4. Move switch (3) to ON-LO. If heater does not start in 2 minutes, move switch (3) to OFF.
5. After waiting 10 seconds, move switch (3) to ON-LO. If heater does not start in 1 minute, move switch (3) to OFF.
6. After waiting 10 more seconds, move switch (3) to ON-LO. If heater does not start in 1 minute, move switch (3) to OFF and notify organizational maintenance.

**CAUTION**

Do not run heater less than 5 minutes or flooding could occur.

**OPERATION**

7. You can change air temperature (but not amount of air flow) by moving switch (3) from ON-LO to ON-HI, or vice versa. Do not stop in OFF position when adjusting air temperature.

**STOP HEATER****CAUTION**

Do not attempt to shut heater off using the **HEATER MASTER** switch (2). Fuel vapors may be present and heater may be damaged.

8. After heater has run 5 minutes or more, move switch (3) to OFF.

**NOTE**

If indicator (4) does not go out within 5 minutes, notify organizational maintenance.

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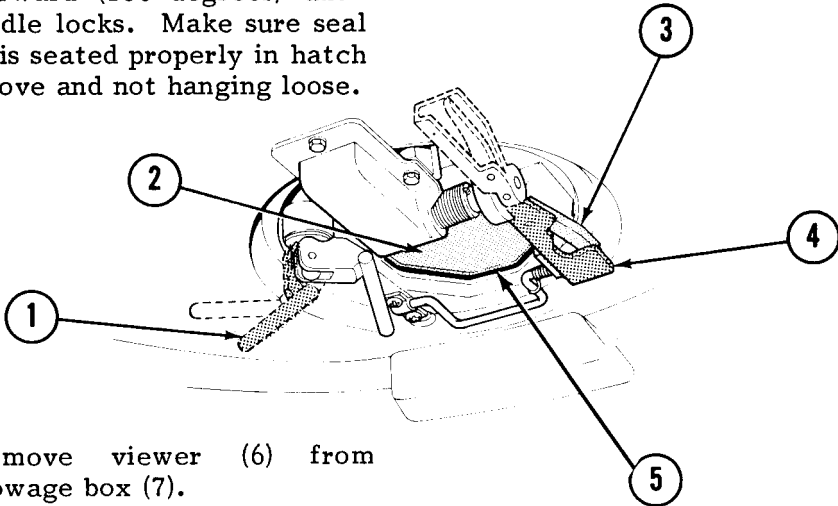
## OPERATING AN/VVS-2 NIGHT VISION VIEWER (IF EQUIPPED)

### INSTALLATION

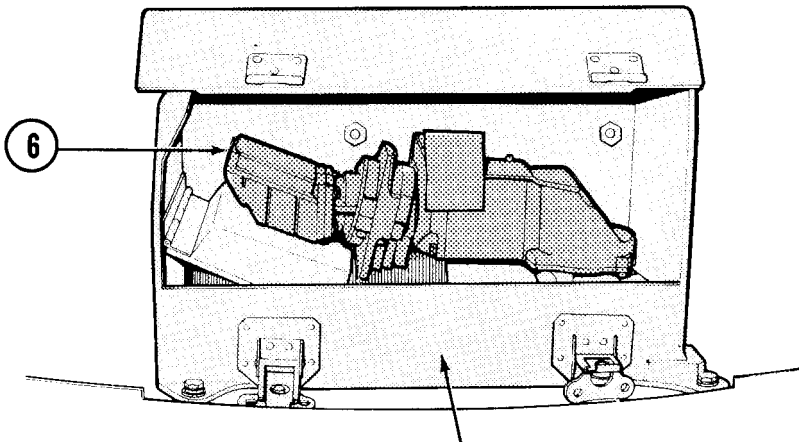
#### NOTE

**Driver's hatch must be closed and locked to install night vision viewer.**

1. Pivot handle (1) fully downward to raise door (2) above hat ch. Then rotate handle (1) rearward until door is fully open. Pivot handle (1) upward. Press lever (3) and pull handle (4) down and rearward (180 degrees) until handle locks. Make sure seal (5) is seated properly in hatch groove and not hanging loose.



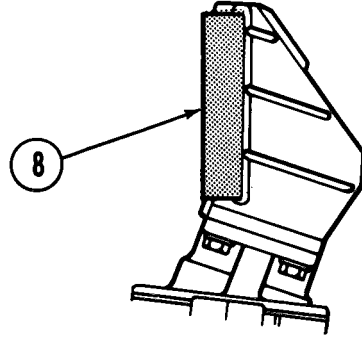
2. Remove viewer (6) from stowage box (7).



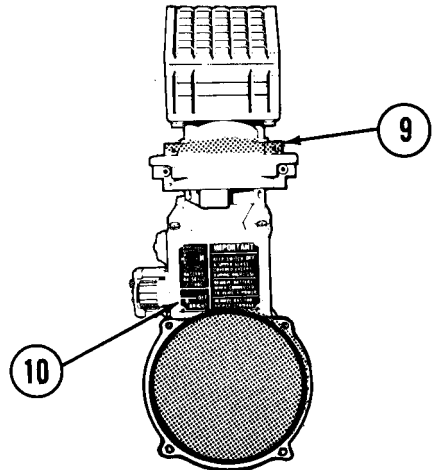
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**OPERATING AN/VVS-2 NIGHT VISION VIEWER (IF EQUIPPED)-  
Continued**

3. Remove snap-on lens cover (8). Stow cover in viewer stowage box.



4. Rotate mounting plate (9) to position in detent. Sides of mounting plate (9) will be in line with sides of viewer (10).

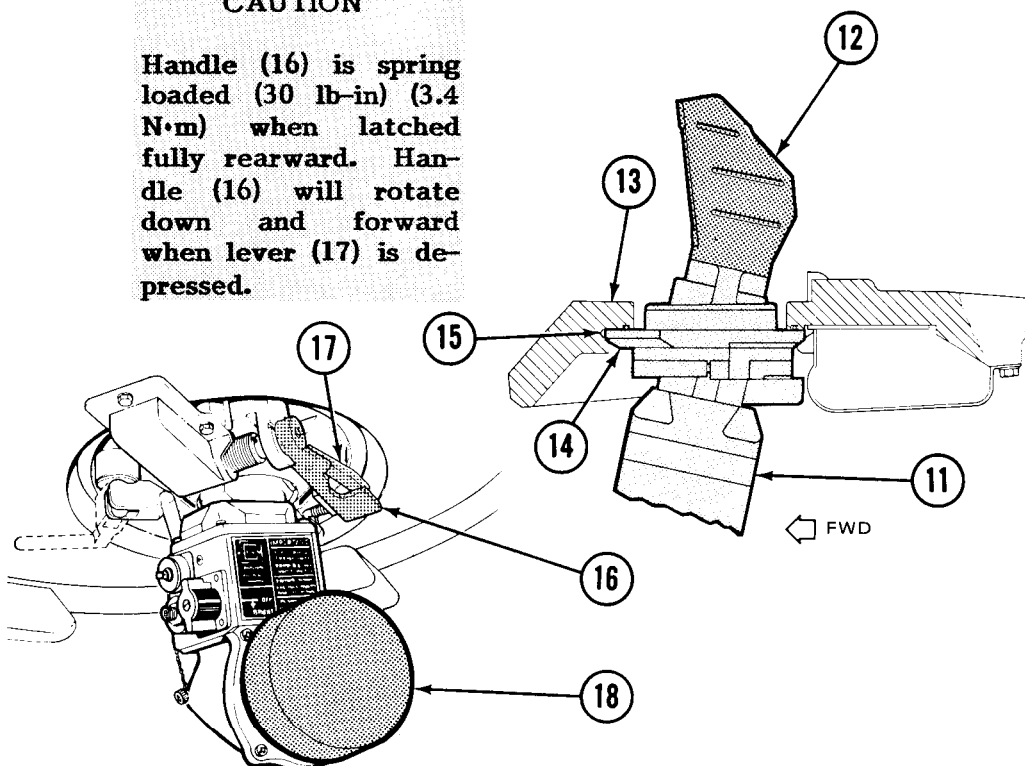


**OPERATING AN/VVS-2 NIGHT VISION VIEWER (IF EQUIPPED)-  
Continued**

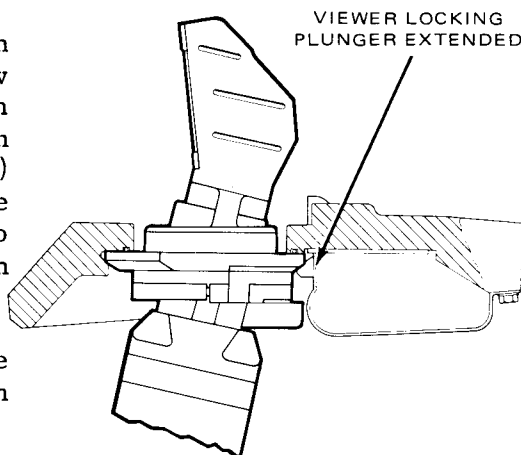
5. Hold viewer (11) in a vertical position and carefully raise viewer head (12) through hatch (13).
6. Engage front edge of mounting plate (14) with slots (15) at front of hatch. Then move rear end of mounting plate upward until viewer is vertical.

**CAUTION**

Handle (16) is spring loaded (30 lb-in) (3.4 N·m) when latched fully rearward. Handle (16) will rotate down and forward when lever (17) is depressed.



7. Hold handle (17) and then press lever (16) and allow handle (17) to rotate down and then forward. Push handle up until lever (16) locks. Before you release viewer, try to shake it to ensure it is seated firmly in place.

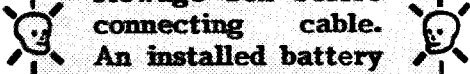


8. Remove snap-on eyepiece cover (18). Stow cover in viewer stowage box.

OPERATING AN/VVS-2 NIGHT VISION VIEWER (IF EQUIPPED)-  
Continued

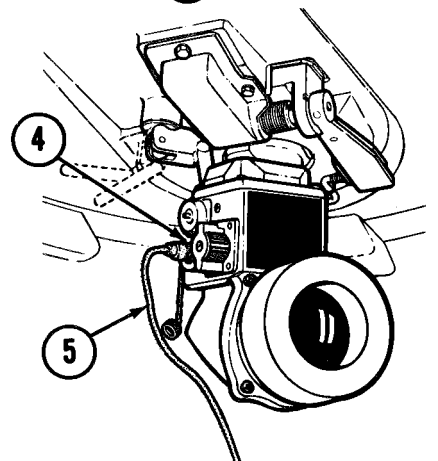
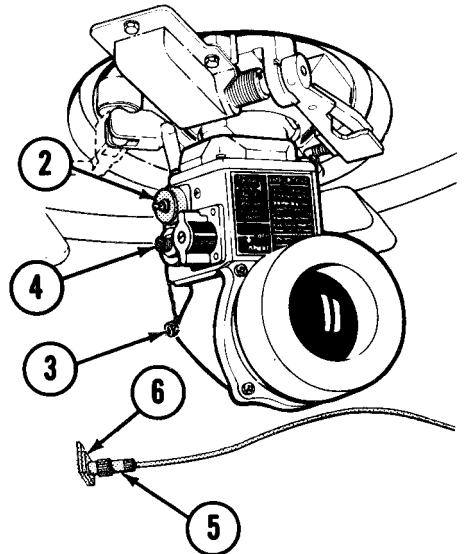
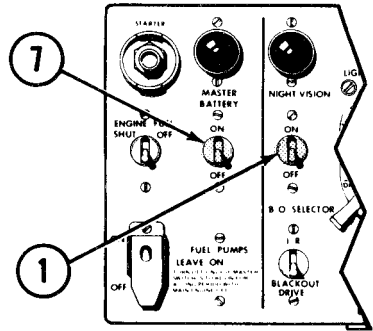
**WARNING**

Remove viewer battery and store in viewer stowage box before connecting cable. An installed battery will overheat and may explode when tank power is used causing injury to you and damage to equipment.



**NOTE**

Viewer may be operated from either vehicle power or battery power. Vehicle power is normally used. When battery power is used, dispose of battery after each night's operation. Normal life of battery in use is 6 to 8 hours.



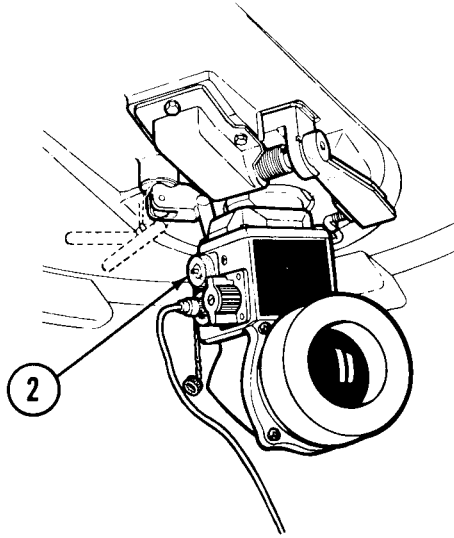
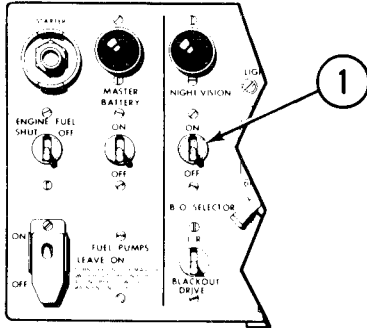
**USING VEHICLE POWER**

1. Set NIGHT VISION switch (1) to OFF.
2. Unscrew battery cap (2) and remove battery, if installed.
3. Reinstall battery cap (2).
4. Remove cover (3) from viewer receptacle (4).
5. Disconnect power cable (5) from dummy receptacle (6).
6. Connect power cable (5) to viewer receptacle (4).
7. Set MASTER BATTERY switch (7) to ON.
8. Set NIGHT VISION switch (1) to ON.

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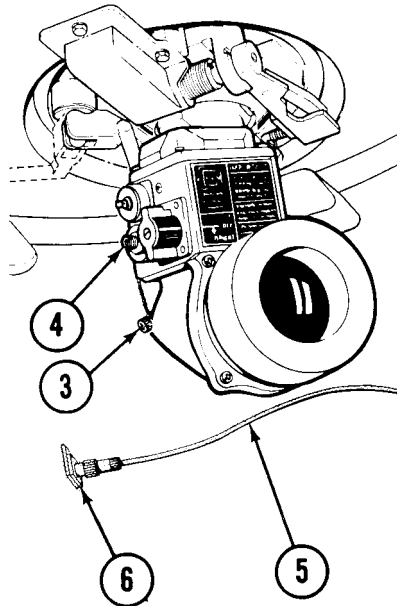
**OPERATING AN/VVS-2 NIGHT VISION VIEWER (IF EQUIPPED)**

**Continued**



**USING BATTERY POWER**

1. If vehicle power cable (5) is connected to viewer, set NIGHT VISION switch (1) to OFF.
2. Disconnect power cable (5) from viewer receptacle (4) and connect to dummy receptacle (6).
3. Install cover (3) on connector (4).
4. Unscrew battery cap (2) and insert battery (item 4, app. D), recessed positive (+) end first (battery is stowed in viewer carrying case with one spare).
5. Reinstall battery cap (2).





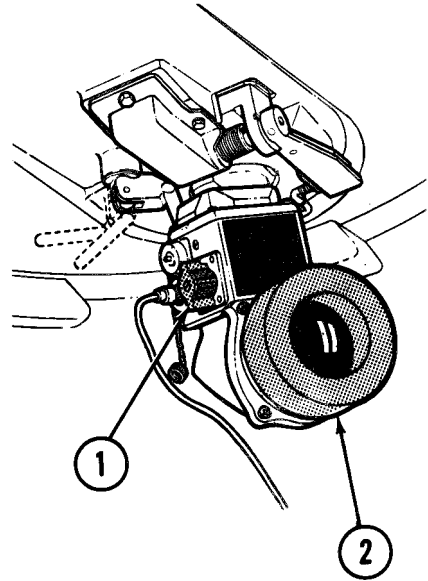
OPERATING AN/VV2 NIGHT VISION VIEWER (IF EQUIPPED)-  
Continued

OPERATING

**NOTE**

**Refer to TM 11-5855-249-10 for additional operating information.**

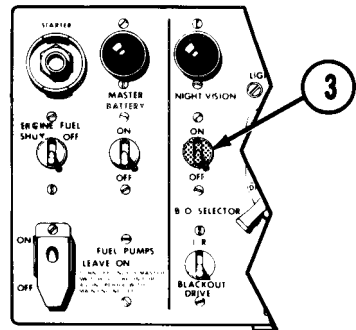
1. Rotate OFF-BRIGHT switch knob (1) to full BRIGHT.
2. If picture on viewer eyepiece is too bright, rotate knob (1) slowly toward OFF until viewing is comfortable to your eyes.
3. For normal driving, set viewer (2) in the straight forward (detent) position. Viewer can be rotated 'right or left to increase terrain coverage.
4. When viewer is installed and not being used, rotate OFF-BRIGHT switch (1) to OFF. Set NIGHT VISION switch (3) to OFF if vehicle power was being used.



**NOTE**

**When viewer is directed toward a bright light source, picture on viewer eyepiece may normally flash or briefly go blank.**

**Viewer range and picture may be improved by turning on the vehicle IR headlights when operating under very low light conditions.**



**OPERATING AN/VVS-2 NIGHT VISION VIEWER (IF EQUIPPED)-  
Continued**

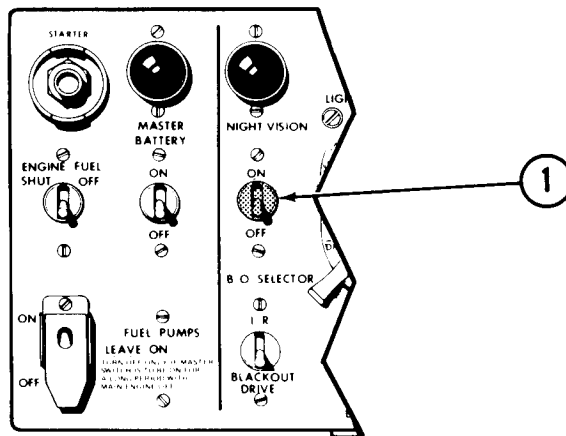
**CLEANING DURING OPERATION**

During bad weather conditions such as blowing dust, rain, or snow, outside lens of viewer may require cleaning to get a clear picture. Clean lens as follows:

1. Loose dust may be removed with the lens dusting brush (item 7, app D).
2. To remove stubborn dirt or smudges, use a white cotton rag (item 39, app D), moistened with lens cleaner compound (item 11, app D). Gently wipe lens using a circular motion starting at the center and working toward the edge. Dry lens with a clean dry tissue, using the same circular motions.

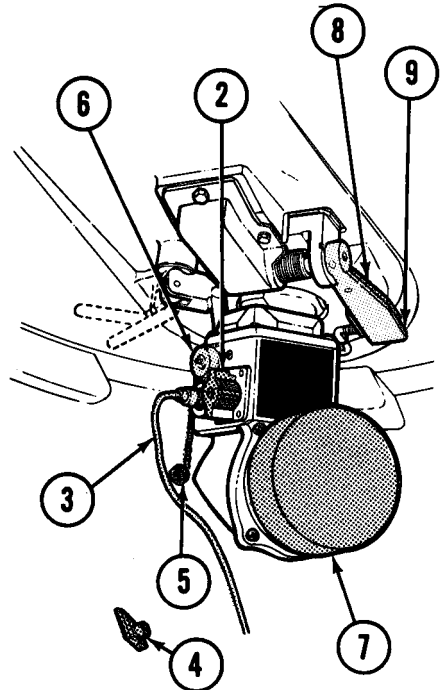
**REMOVAL**

1. If vehicle power was being used, set NIGHT VISION switch (1) to OFF. If battery power was used, remove battery.



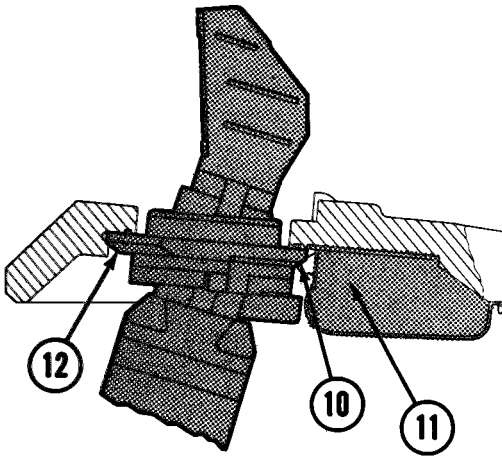
OPERATING AN/VVS-2 NIGHT VISION VIEWER (IF EQUIPPED) - Continued

2. Rotate OFF-BRIGHT switch knob (2) to OFF.
3. Disconnect power cable (3) from viewer and connect to dummy receptacle (4).
4. Install viewer receptacle cap (5).
5. If battery was used, unscrew battery cap (6). Remove and discard battery.
6. Reinstall battery cap (6).
7. Turn viewer to the straight forward (detent) position.
8. Install snap-on eyepiece cover (7).

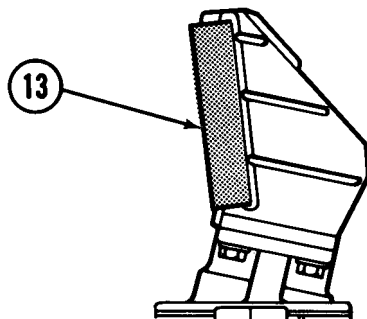


VIEWER SHOWN ROTATED 45° FOR LEFT VIEWING

9. While supporting viewer with your left hand, press lever (8) and pull handle (9) rearward (180 degrees) until it locks. Lower rear end of viewer (10) downward to clear locking plunger (11). Then slide viewer rearward to disengage forward mount (12) and carefully lower from hatch (weight approximately 18 pounds or 8.17 kg).



10. Install snap-on lens cover (13). Snap-on lens cover is stowed in viewer stowage box.

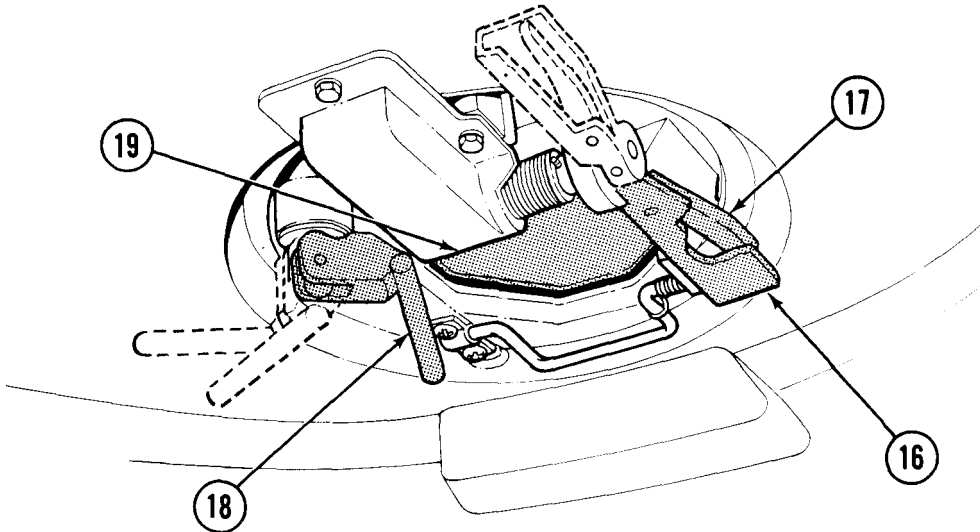
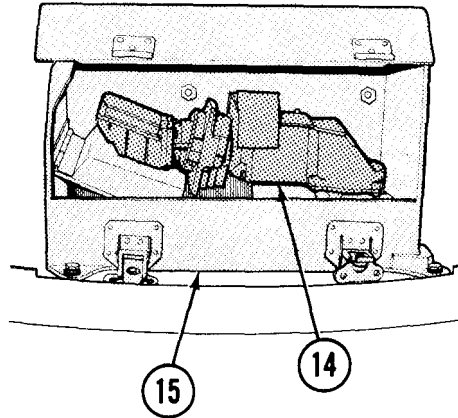


**OPERATING AN/VVS-2 NIGHT VISION VIEWER (IF EQUIPPED) -  
Continued**

11. Stow viewer (14) in stowage box (15).

**CAUTION**

Handle (16) is spring loaded (30 lb-in, 3.4 N.m) when latched fully rearward. Handle (16) will rotate down and forward when lever (17) is depressed.



12. Hold handle (16) and then press lever (17) and allow handle (16) to rotate down and then forward. Push handle (16) up until lever (17) locks in place.

**NOTE**

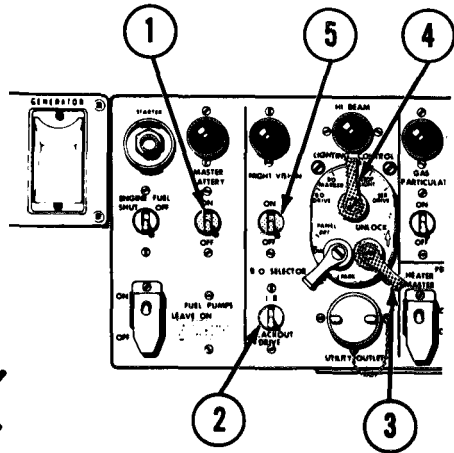
**Make sure viewer door seal area is free of dirt and debris before closing door.**

13. Rotate handle (18) counterclockwise until door (19) is over hatch opening. Pivot handle (18) down to drop door (19) into place. Pivot handle (18) up to lock door closed.

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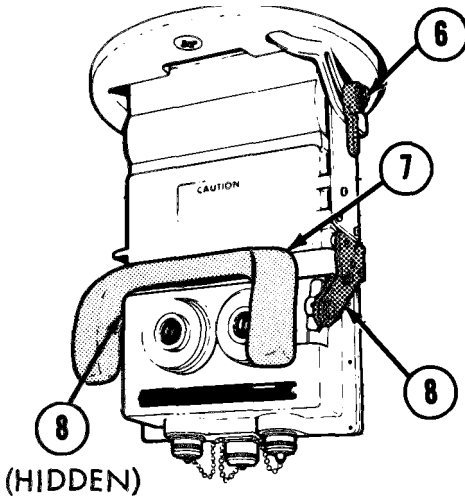
**OPERATING M24 PERISCOPE (IF EQUIPPED)**

1. Install periscope, if required (page 3-8 1).
2. Set MASTER BATTERY switch (1) to ON.
3. Set BO SELECTOR switch (2) to IR.
4. Raise and hold UNLOCK lever (3).



**WARNING**

To prevent eye injury, do not allow anyone to look at IR headlights.



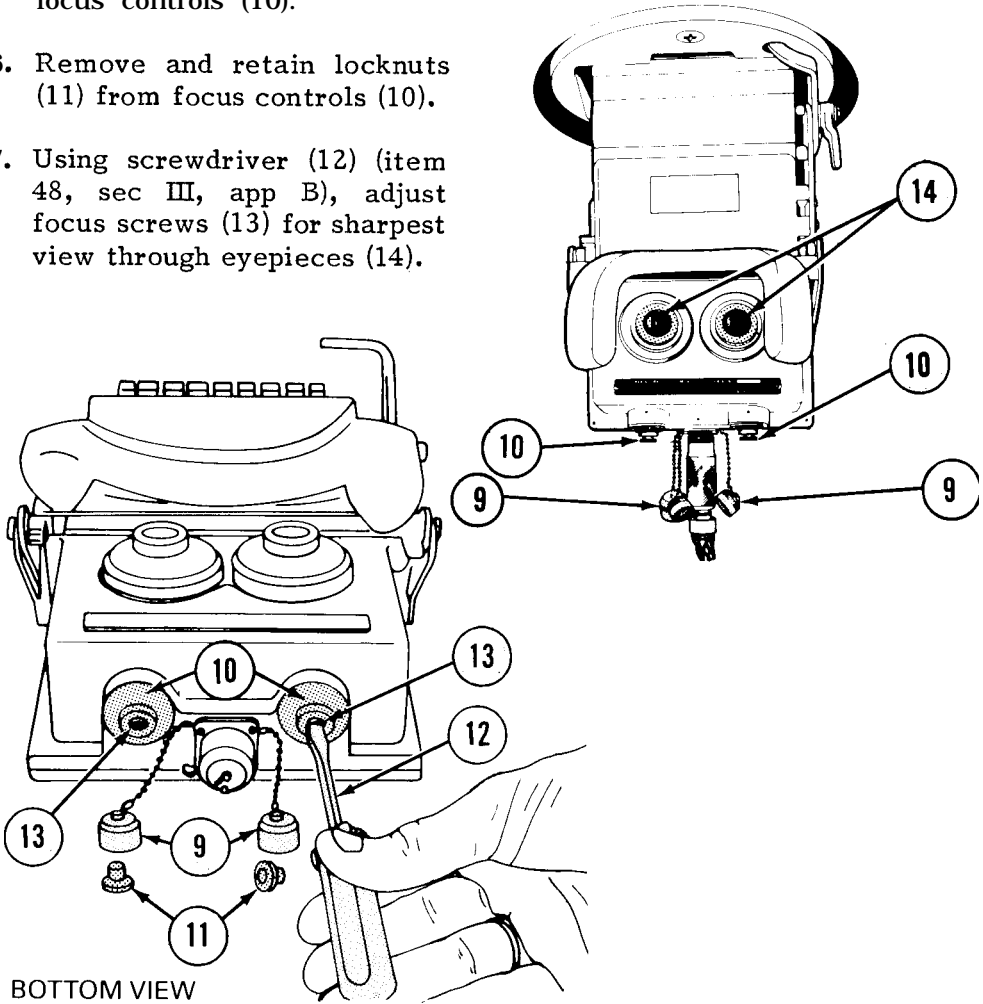
5. Place lever (4) to BO DRIVE.
6. Release UNLOCK lever (3).
7. Set NIGHT VISION switch (5) to ON. NIGHT VISION indicator will light.
8. Release elevation adjustment lever (6).
9. Adjust periscope to elevation angle you desire.
10. Pull lever (6) backward to lock periscope in position.
11. If necessary, adjust headrest (7) by loosening clamp screws (8).
12. Tighten clamp screws (8) after adjustment.
13. Bend headrest (7) to fit contour of head.
14. Allow 5-minute warmup period for periscope before you adjust focus.

**NOTE**

Later model M24 periscopes may not have focus adjustments. If there are no focus adjustments, disregard steps 15 through 19.

**OPERATING M24 PERISCOPE (IF EQUIPPED) - Continued**

15. Remove dust caps (9) from focus controls (10).
16. Remove and retain locknuts (11) from focus controls (10).
17. Using screwdriver (12) (item 48, sec III, app B), adjust focus screws (13) for sharpest view through eyepieces (14).

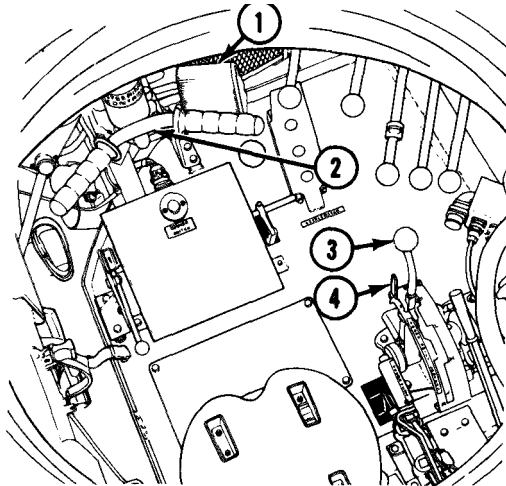


18. Screw locknuts (11) onto focus controls (10) until finger tight.
19. Screw dust caps (9) on focus controls (10) until finger tight.

**APPLYING PARKING BRAKE****CAUTION**

- o **Do not set parking brakes if weather is freezing.**
- o **Do not attempt to set parking brakes before vehicle is stopped, transmission can be damaged.**

1. Make sure tank is stopped.
2. Press brake pedal (1) once until pressure gage (2) indicates 750 to 900 psi. If you go over 900 psi, it may be difficult to release brake.
3. Move shift lever (3) to P (park).
4. Release pedal (1). Parking brake is set.

**RELEASING PARKING BRAKE****NOTE**

**Do not pump pedal. This will increase force necessary to release parking brakes from park position. If pedal has been pumped, release for 1 minute to allow master cylinder to return to unapplied position.**

Press brake pedal (1), push transmission shift lever lock (4) forward, move transmission shift lever (3) to the N (neutral) position, and release brake pedal.

## SHIFTING TRANSMISSION

### NOTE

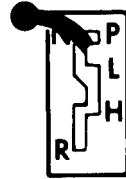
If engine stalls when going over an incline, do not allow vehicle to roll backwards while transmission shift lever is in a drive range. If engine starts to run backwards, stop vehicle and shut off engine. Attempt to rest art. If braking does not stop vehicle, move transmission shift lever to the N position.

### N (NEUTRAL)

M  
A  
S  
P  
X  
I  
E  
M  
E  
D  
U  
D  
M



Use this range when forward or rearward movement is not wanted, when making pivot turn.



### WARNING



Keep brakes applied when you shift , sudden movement of the-vehicle.



### CAUTION

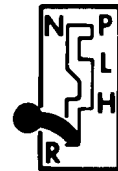
Never go down a slope with shift lever in N. Do not shift from N to L, H, or R unless engine is at idle speed (700 to 750 rpm). Damage to transmission will result.

### R (REVERSE)

M  
A  
S  
P  
X  
I  
E  
M  
E  
D  
U  
D  
M



Use this range for moving vehicle rearward and going up steep grades for maximum engine power.



### CAUTION

Never shift from R to L or H unless vehicle is stopped and engine is at idle speed (700 to 750 rpm). Damage to transmission will result.



**SHIFTING TRANSMISSION - Continued**

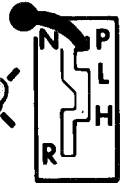
**P (PARK)**

M  
A  
S  
P  
I  
E  
M  
E  
U  
D  
M



**WARNING**

**Keep brakes applied when moving shift lever from P to another range to prevent sudden movement of the vehicle.**



**CAUTION**

**Stop vehicle before you move shift lever to P to prevent damage to transmission.**

**L (LOW)**

M  
A  
S  
P  
I  
E  
M  
E  
U  
D  
M



Move shift lever to P to start engine or lock parking brakes.

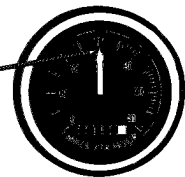
Use this range when you operate on Soft, rough, or steeply inclined terrain or when moving forward from a stop.

**CAUTION**

**When going down steep hills in this range (vehicle moving forward), keep engine speed below 24,00 rpm by applying brakes as required to prevent damage to transmission.**

**H (HIGH)**

M  
A  
S  
P  
I  
E  
M  
E  
U  
D  
M



Use this range when driving on firm, smooth, and level ground.

**CAUTION**

**To prevent transmission damage:**

**Do not start vehicle moving forward from a stop in this range.**

**Do not shift from H to L if speed is more than 9 mph. Do not Shift from 13 to R unless vehicle is stopped and engine is at idle speed (700 to 750 rpm).**

TA247692

## STEERING VEHICLE

### WARNING



Careless tilting can result in loss of steering control, serious injury to personnel and damage to property or to the vehicle.



### CAUTION

- Do not let steering control return to its center position by releasing it. Guide it back to center by hand to avoid damage to steering control or linkage.
- Apply steering gradually. Never jerk vehicle around. You may cause a track to be thrown or damage to transmission.
- Do not oversteer or let vehicle get out of control. Serious injury to personnel and damage to property or vehicle may result.
- Never slow vehicle by steering from side to side. You may damage the tracks.

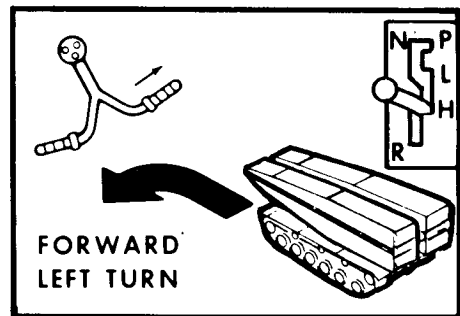
### NOTE

Turning radius is dependent on how far you turn the steering control, transmission range you select, and engine speed.

1. To turn left while vehicle is moving forward with transmission shift lever in L or H, turn steering control to your right.

### NOTE

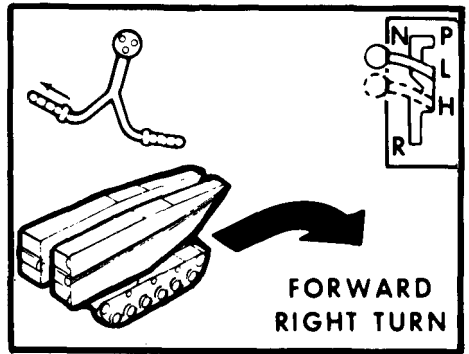
You can make a sharper turn with transmission shift lever in L than you can with it in H.



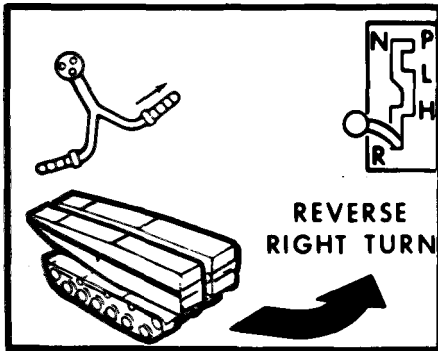
TA247693

**SIZING VEHICLE - Continued**

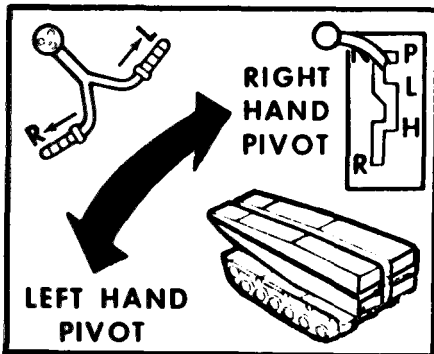
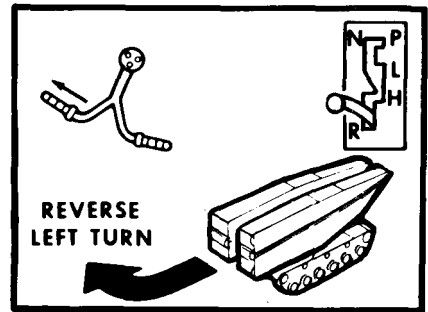
2. To turn right while vehicle is moving forward with transmission shift lever in L or H, turn steering control to your left.



3. To turn right while vehicle is moving rearward with transmission shift lever in R, turn steering control to your right.



4. To turn left while vehicle is moving rearward with transmission shift lever in R, turn steering control to your left.



5. To pivot steer with transmission shift lever in N, turn steering control to your right for left pivot turn and to your left for right pivot turn.

## STARTING ENGINE

### NOTE

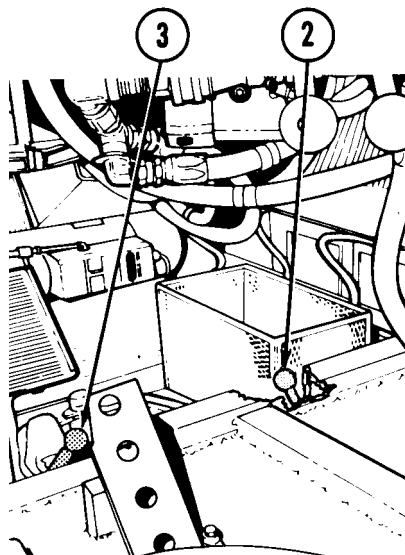
Before starting engine or operating vehicle, perform the operation Checks and services (page 2-24).

**WARNING**

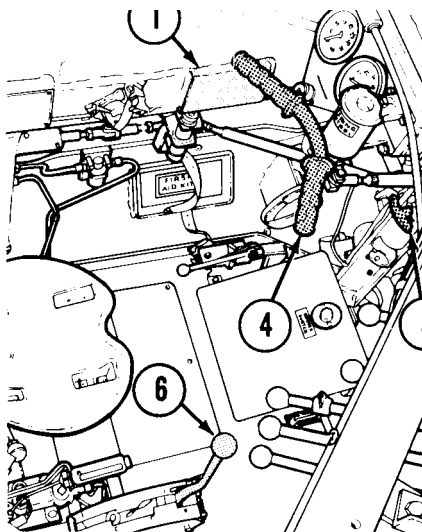
**Hazardous Noise**

To prevent hearing damage:

1. Hearing protection helmet is required.
2. During paved road marches at speed exceeding 15 MPH, double ear protection is required (helmet and ear plugs)



1. Plate (1) is a list of warnings and instructions you must be aware of before you start the engine. Where necessary, more details are provided in the following instructions.
2. Apply parking brake (page 2-125).



3. Close engine compartment drain valve by pushing lever (2) to left out of detent and pull up.
4. Close crew compartment drain valve by moving lever (3) forward and to the left.
5. Center steering control (4).
6. Push manual fuel shutoff handle (5) in.

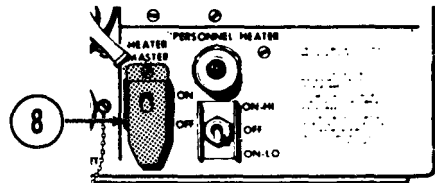
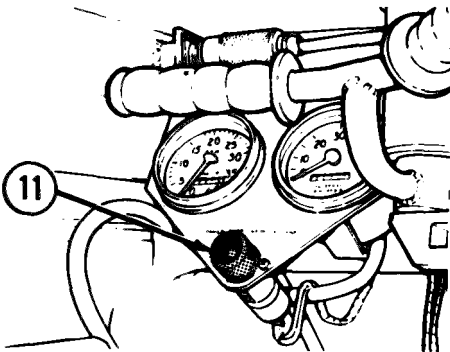
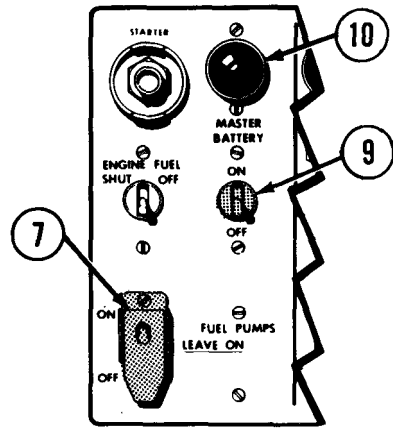
### NOTE

**Check that transmission shift lever (6) is in P position.**

TA247695

**STARTING ENGINE - Continued**

7. Turn off all electrical switches except FUEL PUMPS (7) and personnel heater HEATER MASTER (8).
8. Turn off all communications equipment.
9. Check that FUEL PUMPS switch (9) is ON.
10. Set MASTER BATTERY switch (9) to ON.
11. Check that indicator (10) is on.
12. Check that POWERPLANT WARNING LAMP (11) is on.



**WARNING**

Operation of this equipment presents a noise hazard to personnel in the area. The noise level exceeds the allowable limits for unprotected personnel. Wear ear muffs or ear plugs.

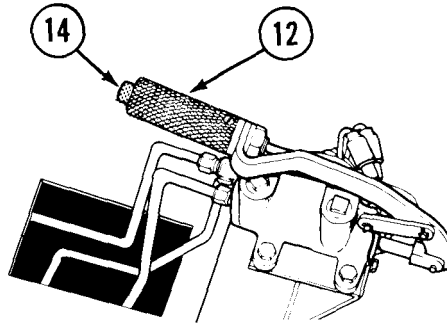
13. If engine has not been operated for a week or more, proceed with step 14. If engine has been operated within a week, skip step 14 and proceed with step 15. For cold weather starting, skip step 15.

**STARTING ENGINE - Continued**

- 14. Purge air from fuel lines by pumping purge pump handle (12) until you feel a back pressure. Three or four strokes should do it.

**CAUTION**

- Do not start vehicle if radio is being used. Radio damage could result.
- Do not press and hold STARTER switch for more than 30 seconds at a time. Damage to starter could result. Allow at least 2 minutes of cool off between attempts to start engine.

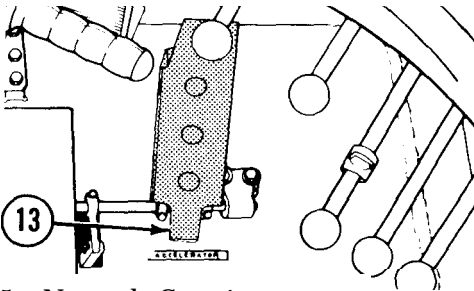


- 16. Cold Weather Starting.

**CAUTION**

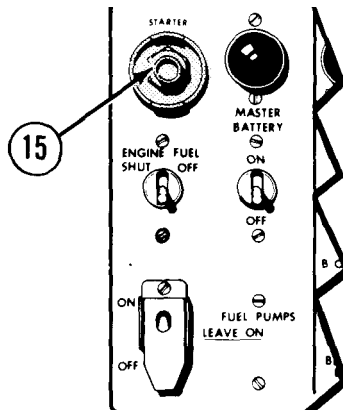
**130 not hold manifold heater switch (14) longer than 15 seconds. Damage to manifold heaters could result.**

Press accelerator pedal (13) about 2/3 to 3/4 of its travel and press and hold STARTER switch (15). While engine is cranking, press manifold heater switch (14) and pump purge pump handle (12). If engine does not start after 30 (maximum) seconds cranking, release STARTER switch and wait at least 2 minutes before you attempt another start. If engine does not start after second try, troubleshoot as specified in troubleshooting table (page 3-2).



- 15. Normal Starting.

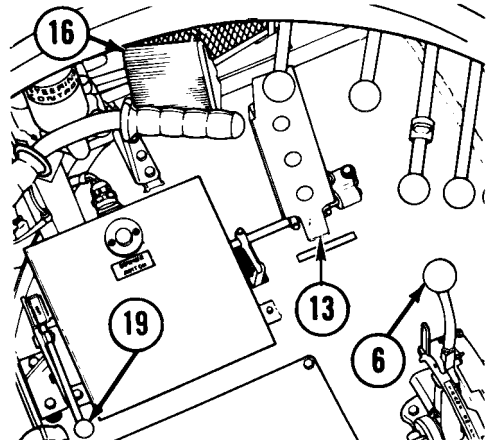
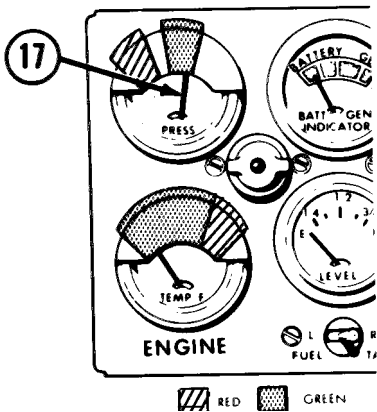
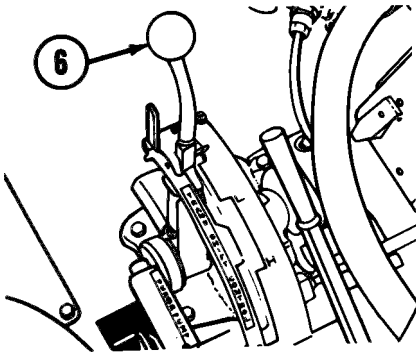
Press accelerator pedal (13) about 2/3 to 3/4 of its travel and press and hold STARTER switch (14). When engine starts, release STARTER switch and proceed to step 17. If engine does not start after a maximum of 30 seconds cranking, release STARTER switch and wait at least 2 minutes before you attempt another start. If engine does not start after second try, troubleshoot as specified in troubleshooting table (page 3-2).



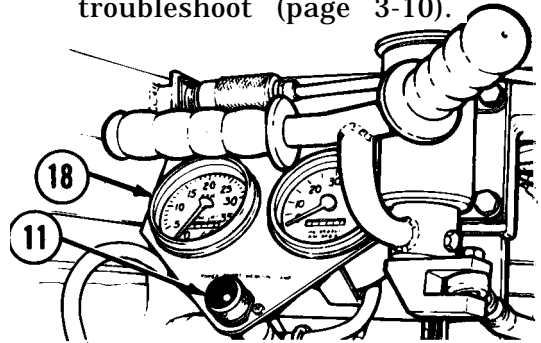
TA247697

**STARTING ENGINE - Continued**

17. If engine starts and runs on only one bank, depress and hold brake (16) and load engine with transmission by shifting lever (6) to H to start the other bank.



18. As soon as engine starts, check that ENGINE OIL PRESSURE indicator needle (17) is in the green area and that POWER-PLANT WARNING LAMP (11) is OFF. If oil pressure does not come up, shut off engine and troubleshoot (page 3-10).



**CAUTION**

Do not accelerate engine beyond warm-up speeds (1,000 to 1,200 rpm). Damage to engine could result.

19. Press accelerator pedal (13) until tachometer (18) indicates 1,000 to 1,200 rpm (1,200 to 1,800 rpm for 3 to 5 minutes in cold weather).
20. Pull up accelerator lock lever (19).
21. Let engine run for 3 to 5 minutes.

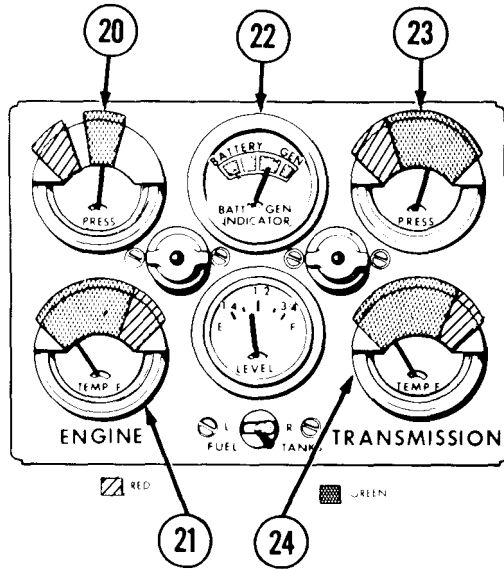
**NOTE**

If engine is to be idled for an extended period, set for 1,000 to 1,200 rpm to prevent smoking.

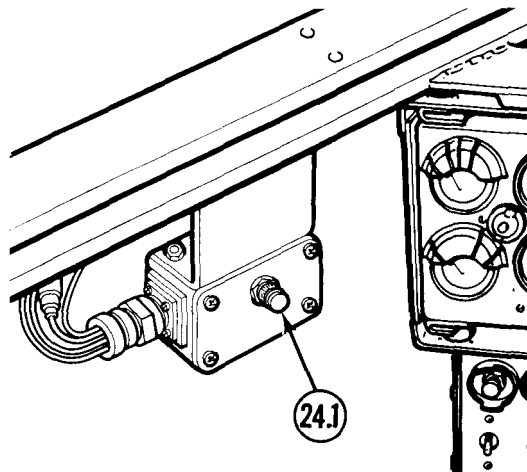
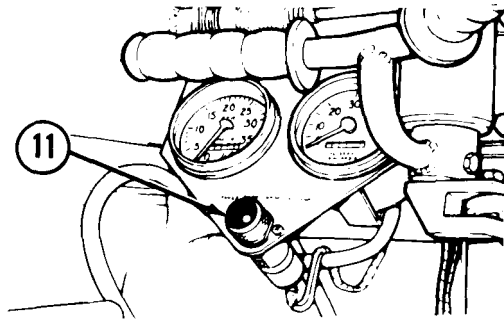
**STARTING ENGINE - Continued**

22. Check that indicators are as follows:

- a. ENGINE OIL indicators (20) and (21): green area.
- b. BATTERY-GENERATOR indicator (22): green area.
- c. TRANSMISSION OIL indicators (23) and (24): green area.
- d. POWERPLANT WARNING LAMP (11): off.
- e. DUST DETECTOR WARNING LAMP (24.1) (If equipped): off.



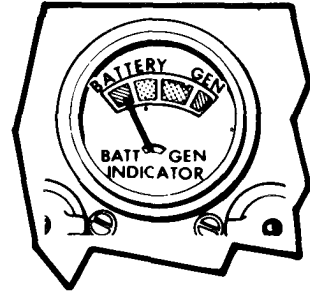
23. If POWERPLANT WARNING LAMP (11) lights during vehicle operation, check engine and transmission indicators (20), (21), (23), (24), and DUST DETECTOR WARNING LAMP (24.1) (if equipped) to determine whether engine, transmission, or air intake system is at fault. stop engine and troubleshoot (page 3-10).





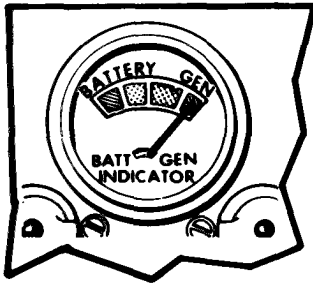
**STARTING ENGINE - Continued**

24. If the BATTERY-GENERATOR indicator needle is in yellow or left red area, alternator is not charging. stop engine and troubleshoot (page 3-12).



**NOT CHARGING**

25. If BATTERY-GENERATOR indicator is in the right red area, alternator is overcharging. Notify organizational maintenance.

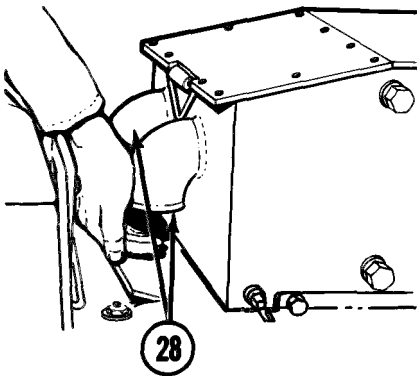
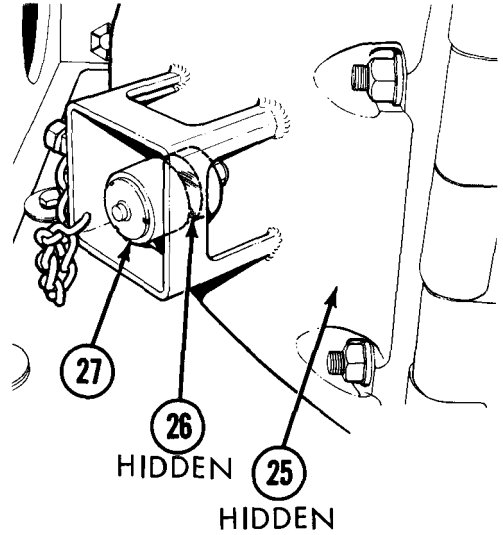


**OVERCHARGING**



**STARTING ENGINE - Continued**

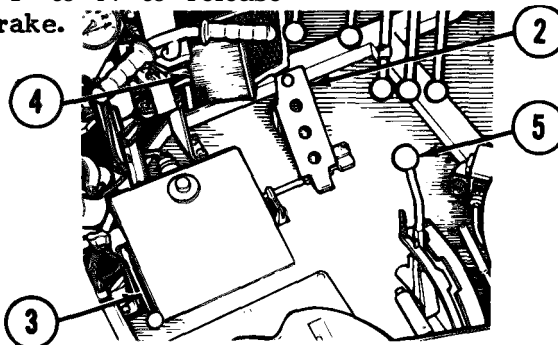
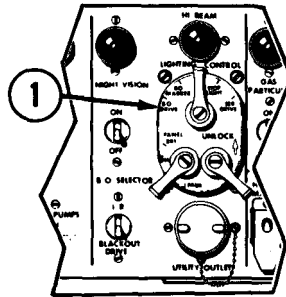
26. Ensure that air doesn't leak at air cleaner elbows (25), air intake flanges, and cover plate gaskets.
27. Check (on early model) that window (26) of indicator "(27) is clear (not red) or (on late model) that window (26) of indicator (27 ) reads less than 30 inches (page 3-86).



28. If vehicle is equipped with air cleaner blower motors, ensure that air exhaust can be felt at all four blower motor exhaust elbows (28) before placing vehicle in motion.

**PLACING VEHICLE IN MOTION**

1. Turn on required lights (1).
2. Press and release accelerator pedal (2) to release accelerator lock (3). Let engine idle (700 to 750 rpm).
3. Press brake pedal (4) and move transmission shift lever [5] from P to N to release parking brake.

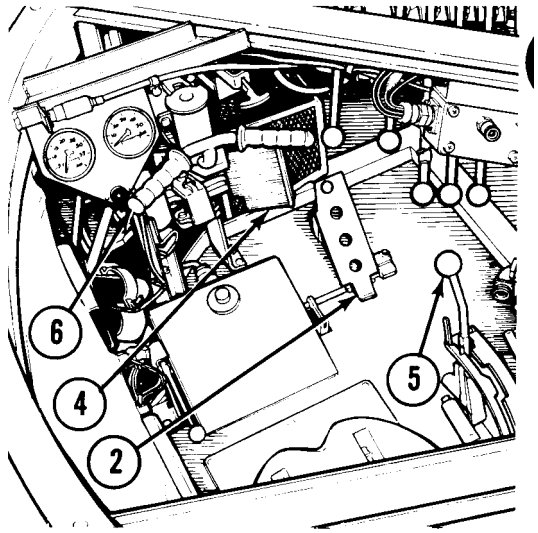


**PLACING VEHICLE IN MOTION - Continued**

**NOTE**

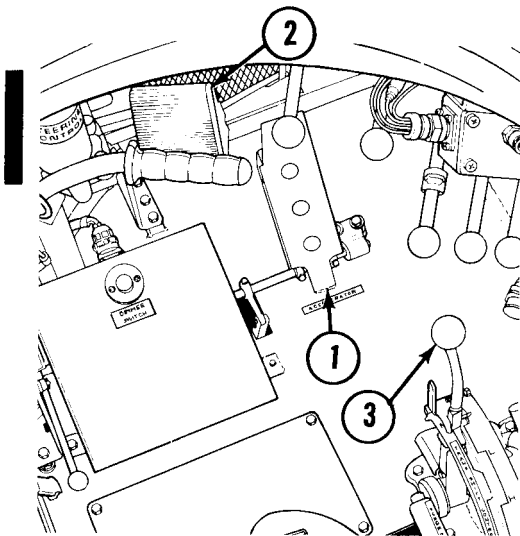
**If you cannot release brake, notify organizational maintenance.**

4. While you maintain pressure on brake pedal (4), move transmission shift lever (5) to desired range (L or R).
5. Release brake pedal (4).
6. slowly press accelerator pedal (2).
7. Steer vehicle with steering control (6).



**STOPPING VEHICLE**

1. Release accelerator pedal (1).
2. Press and hold brake pedal (2) to stop vehicle.
3. Move transmission shift lever (3) to desired range (N, L, or R); or, if you are parking, move transmission shift lever (3) to P and lock parking brake.
4. Release brake pedal (2).

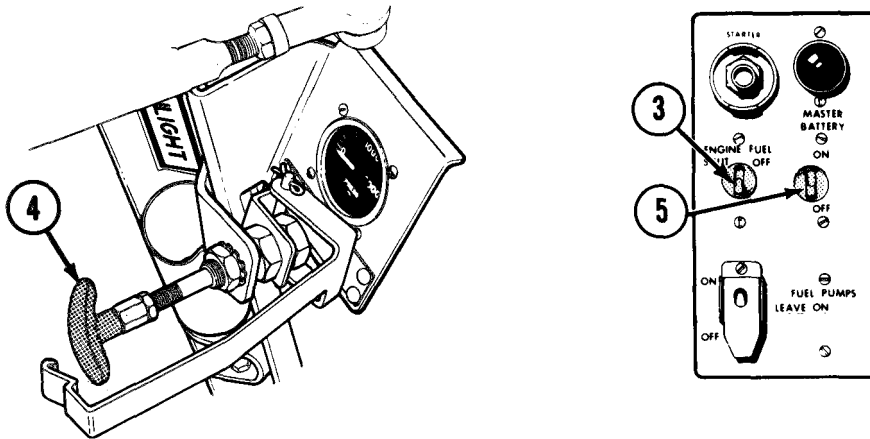


**STOPPING ENGINE**

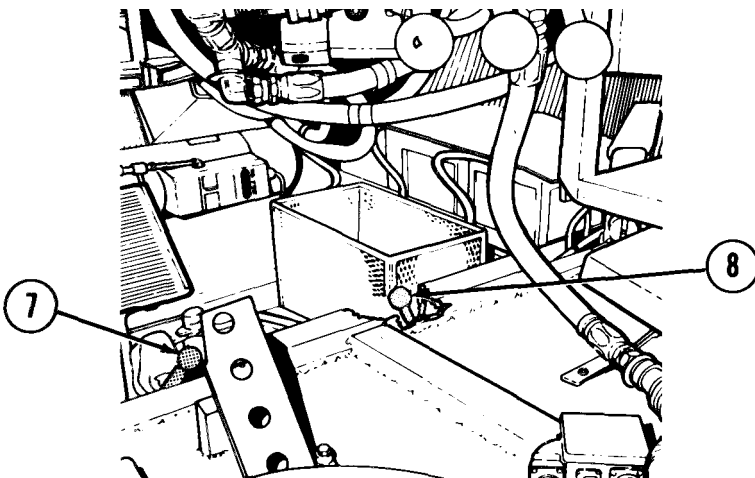
1. After stopping vehicle, run engine at 1,000 to 1,200 rpm for several minutes to cool.
2. After running engine at 1,000 to 1,200 rpm to cool, let it idle (700 to 750 rpm).
3. Turn off all electrical equipment.

**STOPPING ENGINE - Continued**

4. Raise and hold ENGINE FUEL SHUTOFF switch (3) until engine stops.
5. If engine does not stop within 15 seconds, shut off fuel with MANUAL FUEL shutoff handle (4) and increase engine rpm to 1,400. Notify organizational maintenance if it was necessary to shut off engine with MANUAL FUEL shutoff handle.
6. Turn OFF MASTER BATTERY switch (5).



7. If vehicle is to remain parked for a week or more, place MANUAL FUEL shutoff (4) in OFF position.
8. Open crew compartment drain valve (7) and engine compartment drain valve (8) (page 2-1 11).



## **STORAGE OF SCISSORING BRIDGE**

### **CAUTION**

**The scissoring bridge should not be stored in a standing inverted ("A") position.**

### **NOTE**

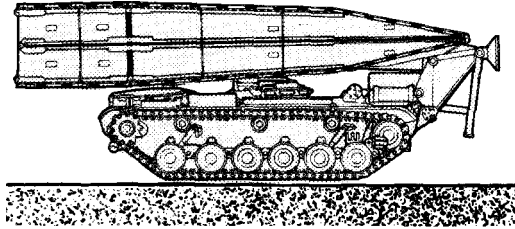
**The removal of the bridge for lesser periods or time of storage should be at the decision of the unit/Bn Cdr.**

When the vehicle is not needed for an extended period (60 days or longer) remove the scissoring bridge and store in an extended position in a suitable flat surfaced area. If storage space is at a premium, bridge may be stored in folded position with cribbing.

Exercising the hydraulic system shall be performed monthly as required by PMCS.

**DRIVING VEHICLE**

**FLAT GROUND**

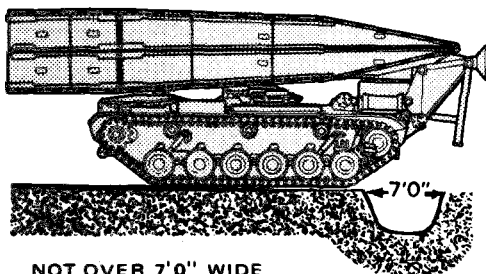


**WARNING**

Careless driving can result in loss of steering control, serious injury to personnel, damage to property, or damage to vehicle. When approaching an obstruction, adjust vehicle speed and direction so that vehicle can meet the obstruction as squarely as possible. Operator should warn the commander to brace himself. Cupola covers should be locked in position.

1. When driving on hard-surfaced roads, avoid oversteering. Make turns gradually.
2. Your speed depends on:
  - a. Surface conditions.
  - b. Weather.
  - c. Visibility.
  - d. Traffic.
  - e. Speed limits (if posted).
  - f. Tactical situation.

**CROSSING DITCH, SHELLHOLE OR TRENCH**



NOT OVER 7'0" WIDE

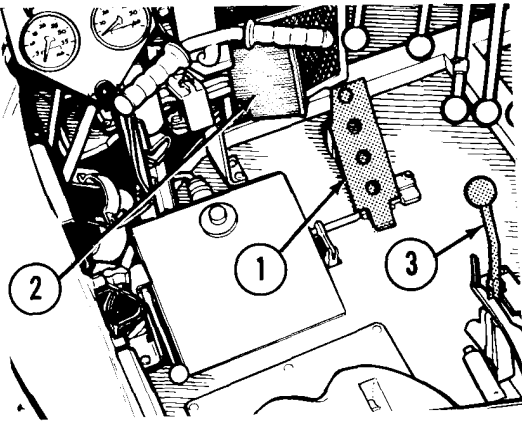
**CAUTION**

Avoid crossing ditches, shell holes, or trenches that would cause rear fenders to strike or dig into the ground. Be careful not to damage rear fenders when climbing out of ditches, shell holes, or trenches. Maximum width of ditch that vehicle can cross is 84 inches (214.6 cm).

TA247704

**DRIVING VEHICLE - Continued**

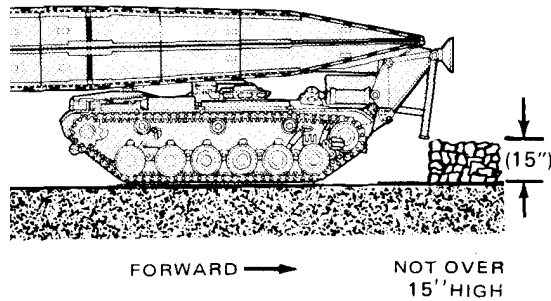
1. Lift foot from accelerator (1) as you approach obstruction.
2. Press brake pedal (2) if necessary.
3. Move transmission shift lever (3) to L.
4. Press accelerator (1) as necessary, especially when climbing out of ditch.



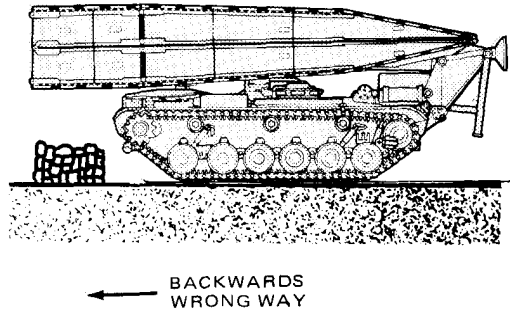
**GOING OVER OBSTRUCTION**

**CAUTION**

Be careful not to damage rear fenders when descending or pulling away from obstruction. Maximum height of obstruction that vehicle will cross is 15 inches (cm) in the forward direction. Do not back vehicle over an obstruction. Going over in reverse direction may result in damage to suspension system.



1. Lift foot from accelerator (1) as you approach obstruction.
2. Press accelerator (1) fully when you start over obstruction.
3. Lift foot from accelerator when you crest (vehicle is centered on obstacle).
4. Let vehicle settle over crest.
5. When front of tracks touch



TA247705



## CROSSING THE CLASS 60 ARMORED VEHICLE LAUNCHED BRIDGE

### **Warning**

**Core must be taken to avoid injury to personnel, and excessive wear and tear to the Class 60 Armored Vehicle Launched Bridge.**

1. Center vehicle on bridge.
2. Do not exceed 8 MPH (13 KPH) crossing speed.
3. Do not stop, accelerate or shift gears while on the bridge.



## DRIVING VEHICLE - Continued GOING UPHILL

### WARNING

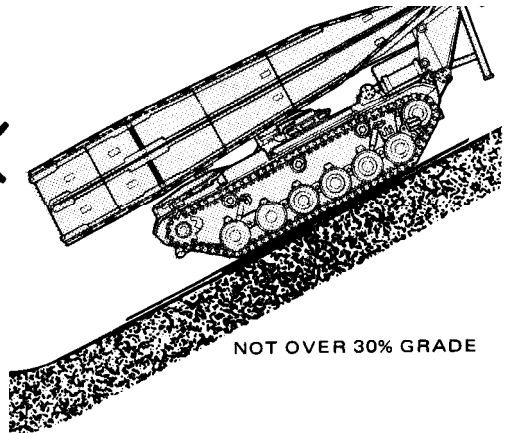


Ensure that all covers are locked in position to avoid possible serious injury to crew.

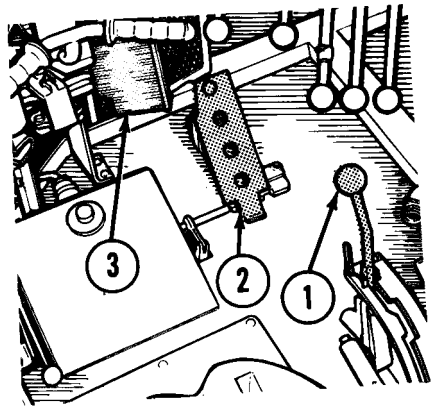


### CAUTION

Do not attempt to hold vehicle stationary on an incline by using accelerator pedal because transmission will overheat. Press brake pedal to hold vehicle and apply parking brakes.



1. Move transmission shift lever (1) to L.
2. Press accelerator pedal (2) as required.
3. If starting from a parked position on a hill, do the following.
  - a. Press and hold brake pedal (3).
  - b. Move transmission shift lever (1) from P to L.
  - c. Press accelerator (2).
  - d. Release brake pedal (3).

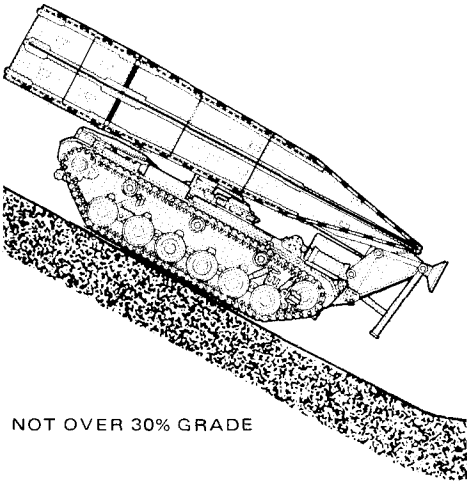


### CAUTION

If engine stalls while going uphill, do not allow vehicle to roll backward while transmission shift lever is in L or H. Serious damage to engine or air cleaner can result and operator's compartment may fill with smoke, because transmission will drive engine backward. If engine starts to run backward, stop vehicle and stop engine. Attempt to restart engine. If braking does not stop vehicle, move transmission shift lever to N (neutral) position to prevent damage to engine from reverse rotations.

TA247706

**DRIVING VEHICLE - Continued  
GOING DOWNHILL**



1. Move transmission shift lever (1) to L.
2. Keep engine speed below 2,400 rpm by apply brakes if necessary.

**NOTE**

**On ordinary grades transmission range of L will normally slow vehicle and brakes may not be necessary.**

3. At bottom of hill, move transmission shift lever (1) to position desired.

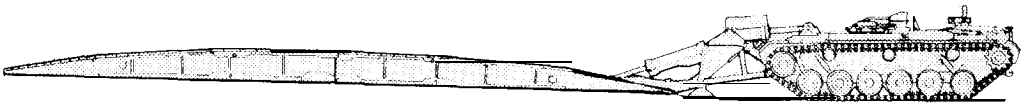
**LAUNCHING BRIDGE**

**CAUTION**

**Do not exceed slope limits shown to prevent damage to the suspension system.**

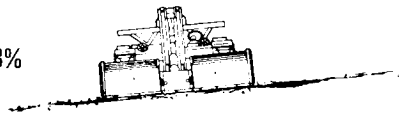


**UPHILL 15%**



**DOWNHILL 15%**

**SIDE SLOPE 8%**



**CAUTION**

**Far-shore area must be in-line with near-shore area and must be 60 feet or less from near-shore. Area where bridge will rest must be free of trees, boulders, and other objects which will not provide good support. Care in selecting launching site will reduce or eliminate damage to bridge or vehicle, possible injury to personnel, and will make it easier to disconnect vehicle from bridge.**

TA247707

**LAUNCHING BRIDGE - Continued**

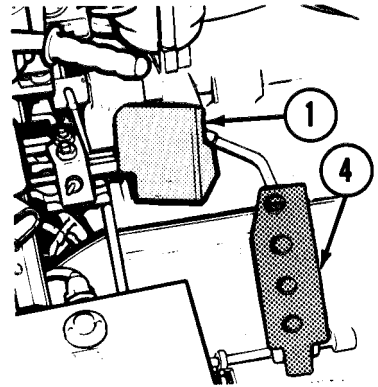
**NOTE**

**In considering launching site, it is important to consider which end of bridge you will be retrieving from. This end of bridge should be provided more ground support if possible.**

1. Start engine (page 2-130).
2. Move vehicle into desired position in-line with selected site.
3. Press and hold brake pedal (1).
4. Move transmission shift lever (2) to N.

**CAUTION**

**Do not pull up clutch lever (3) with engine running over 1,000 rpm, as power take-off components may be damaged.**

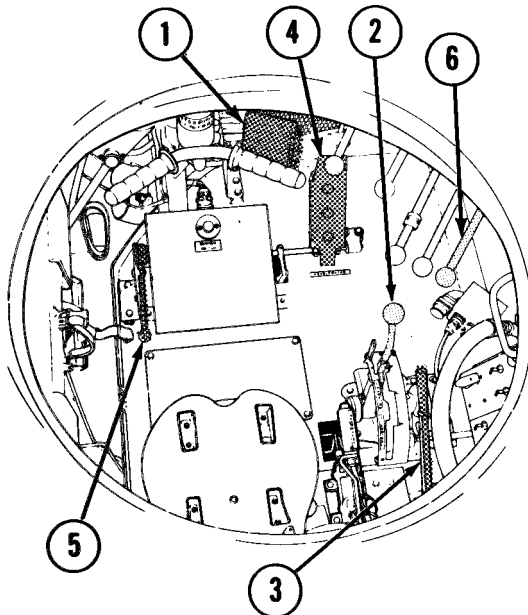


5. Pull up clutch lever (3).

**NOTE**

**A snap can be felt when clutch is properly engaged.**

6. Press accelerator (4) until engine is running at 1,800 rpm.
7. Pull up accelerator lock (5).



**CAUTION**

**When launching bridge, with bridge resting on bridge seat, never push OVERHEAD lever (6) down. This will activate overhead cylinder, pushing bridge down on bridge seat, resulting in breaking bridge seat weld.**

**NOTE**

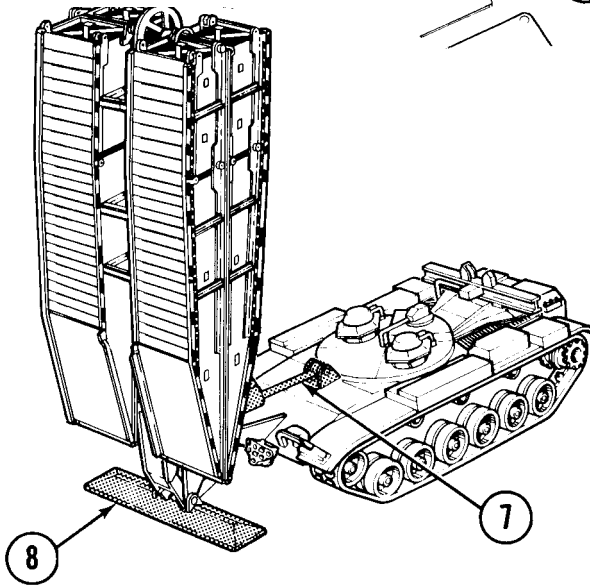
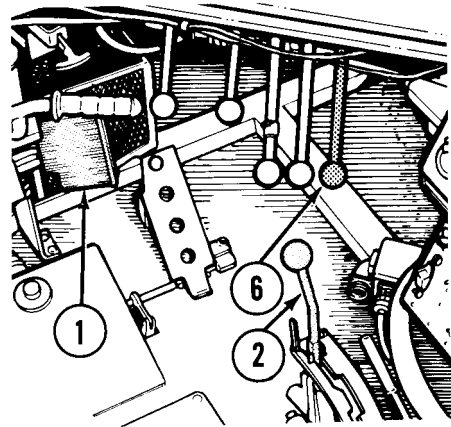
**Holddown chains are automatically released when operator pushes up overhead cylinder control lever.**

**LAUNCHING BRIDGE - Continued**

**NOTE**

**Ease up on brake pedal (1) while extending overhead cylinder (7) to allow vehicle to ride up on outrigger (8).**

8. Pull up OVERHEAD lever (6) until overhead cylinder (7) is all the way out and outrigger (8) is firmly on ground.



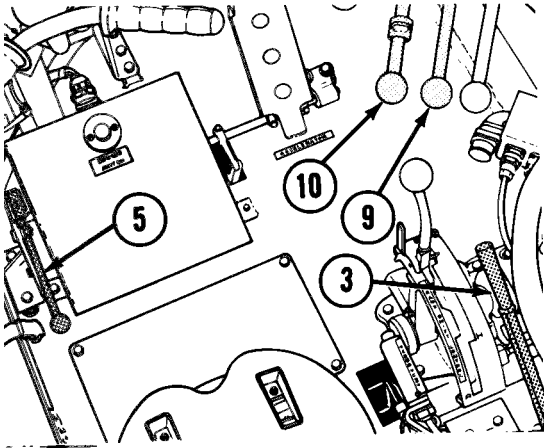
**NOTE**

**Listen for change in sound of hydraulic pump. This indicates that overhead cylinder (7) is all the way out. If it is not, bridge will shift when lowered till overhead cylinder bottoms out.**

9. Make sure overhead cylinder (7) is all the way out.
10. Press brake pedal (1) and move shift lever (2) to P, engaging parking brake.

**LAUNCHING BRIDGE - Continued**

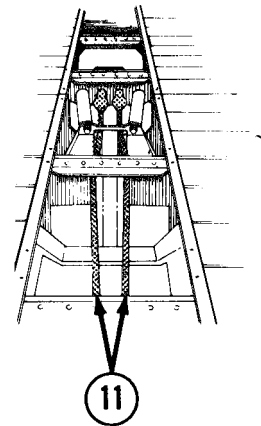
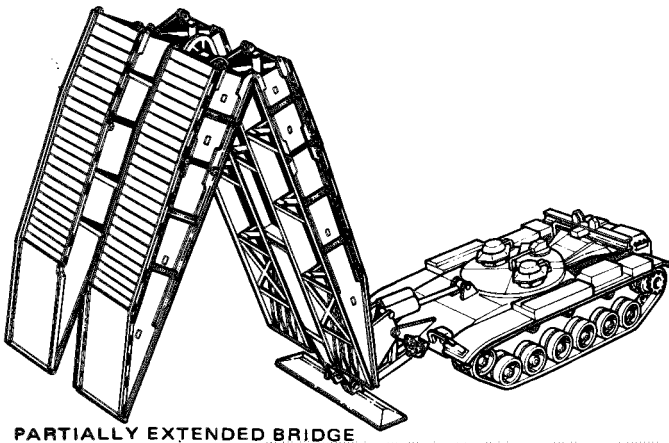
11. Pull up TONGUE lever (9) until bridge just starts to lean over and starts to open, then release the lever.



**NOTE**

Moving both TONGUE lever (9) and SCISSORS lever (10) at the same time will open bridge smoothly.

2. Pull up TONGUE lever (9) and SCISSORS lever (10) to open bridge all the way.



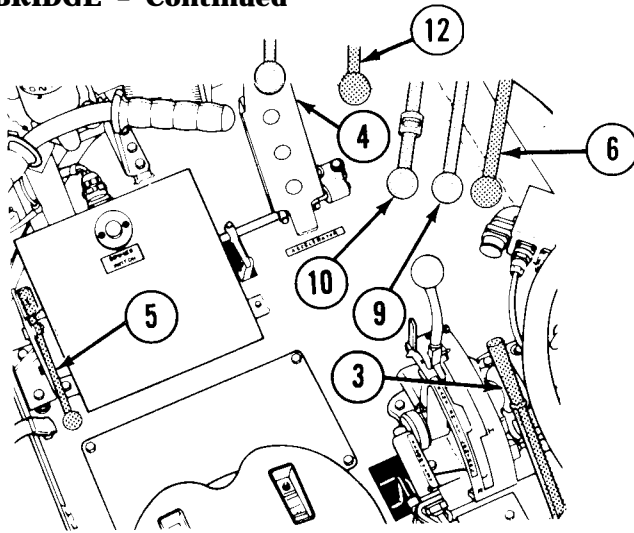
PARTIALLY EXTENDED BRIDGE

**NOTE**

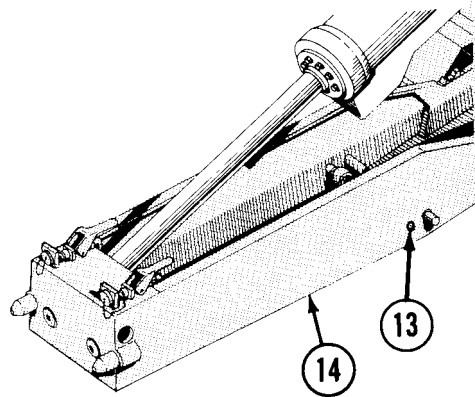
Correct position of bridge is about 2 feet above ground when fully open.

13. Pull up TONGUE lever (9) until bridge settles on ground.
14. Pull SCISSORS lever (10) down until scissoring cables (11) are slack.
15. Push down accelerator lock lever (5).
16. Push down clutch lever (3).

**LAUNCHING BRIDGE - Continued**



17. Pull OVERHEAD lever (6) up and down at least three times to relieve pressure.
18. Pull TONGUE lever (9) up and down at least three times.
19. Raise clutch lever (3).
20. Press accelerator (4) until engine speed is 1,800 rpm.
21. Raise accelerator lock lever (5).
22. Pull up LOCK lever (12) until locking plugs (13) are retracted in tongue (14).
23. Push down accelerator lock lever (5).
24. Push down clutch lever (3).



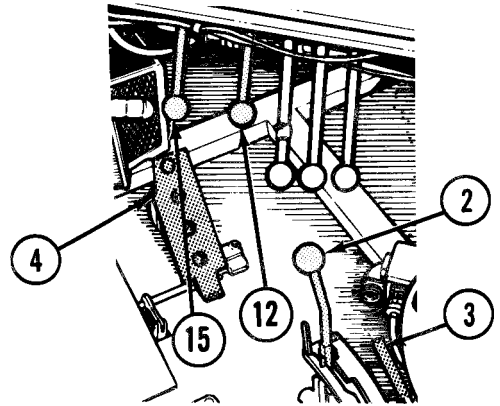


**LAUNCHING BRIDGE - Continued**

**NOTE**

**Use care in backing vehicle to prevent excessive bulldozer action of outrigger.**

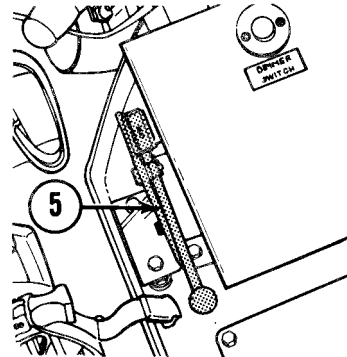
25. Move shift lever (2) to R and back vehicle slowly, while checking for vehicle separation from the bridge.



**NOTE**

**Quick-disconnect fittings between launcher and bridge will disconnect automatically when vehicle is backed away from bridge.**

26. If vehicle does not come free of bridge:
  - a. Move shift lever (2) to N.
  - b. Pull up clutch lever (3).
  - c. Press accelerator (4) until engine is running 1,800 rpm.
  - d. Pull up accelerator lock lever (5).



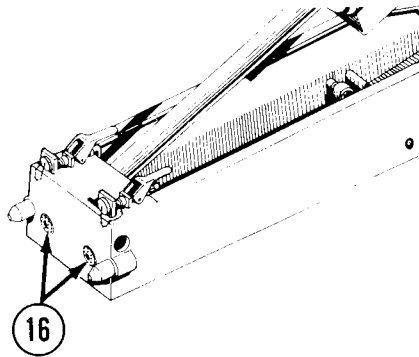
**NOTE**

**As a safety measure, ejection cylinder control is interlocked with locking cylinder rod end line and operates only when locking cylinder control is held in retracting position.**

- e. Pull up LOCK lever (12) and EJECT lever (15) at same time until vehicle is free of bridge.

**LAUNCHING BRIDGE - Continued**

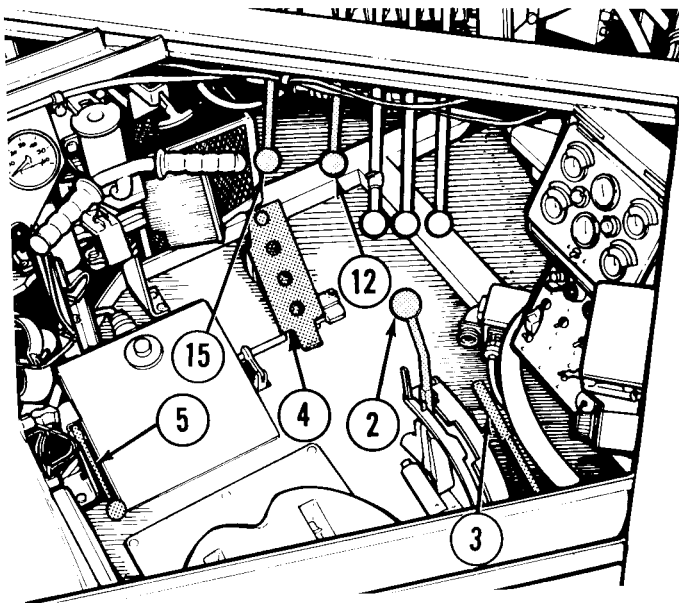
- f. Pull up LOCK lever (12) and push down EJECT lever (15) at same time to retract ejection cylinders (16).
- g. Push down accelerator lock lever (5).
- h. Push down clutch lever (3).



**NOTE**

**Use care in backing vehicle to prevent excessive bulldozer action of outrigger.**

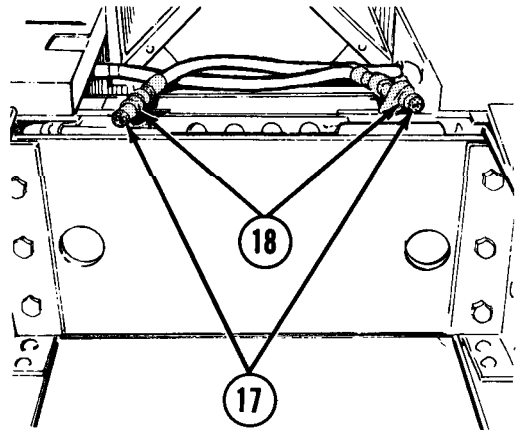
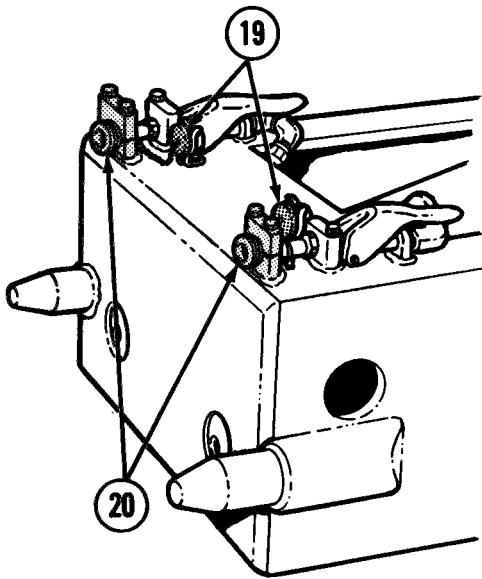
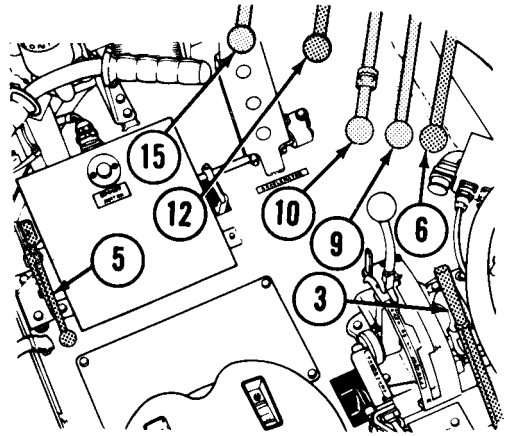
- i. Move shift lever (2) to R and back vehicle slowly, while checking that it is free of bridge.
- 27. Pull up clutch lever (3).
  - 28. Press accelerator (4) until engine is running 1,800 rpm.
  - 29. Pull up accelerator lock lever (5).



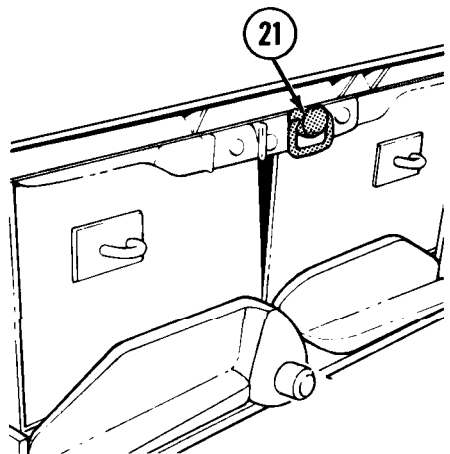
TA247713

**LAUNCHING BRIDGE - Continued**

30. Push down TONGUE lever (9) until tongue is fully retracted.
31. Push down OVERHEAD lever (6) until overhead cylinder is fully retracted.
32. Push down accelerator lock lever (5).
33. Push down clutch lever (3).
34. Push up, then down on all launching control levers (6, 9, 10, 12, 15) at least three times.
35. Move vehicle to desired location.



36. Install dust caps (17) on plugs (18) and dust plugs (19) on sockets (20).
37. Insert locking pins (21) at center of bridge.



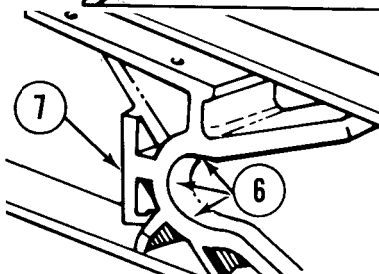
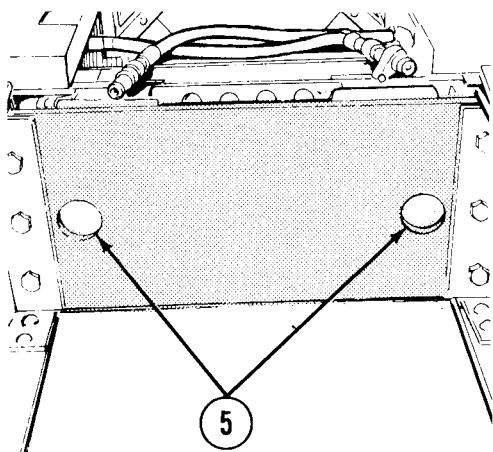
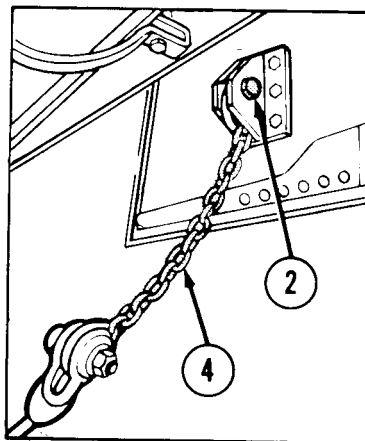
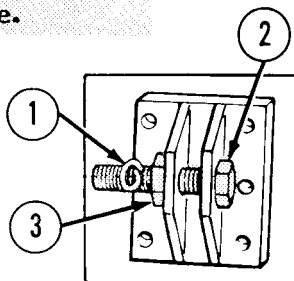
TA247714

**RETRIEVING BRIDGE**

**NOTE**

- Examine lay of bridge with respect to vehicle. Vehicle must be in line with bridge or you cannot pick up bridge. If bridge and vehicle do not line up, raise end of bridge and block up bridge end until they do line up. Be sure that vehicle is far enough away from bridge so that tongue pintles will not strike bridge diaphragm when tongue is lowered.
- A two-man team is required for retrieving bridge. One man is needed at vehicle controls and second man is needed outside to direct movements of vehicle.

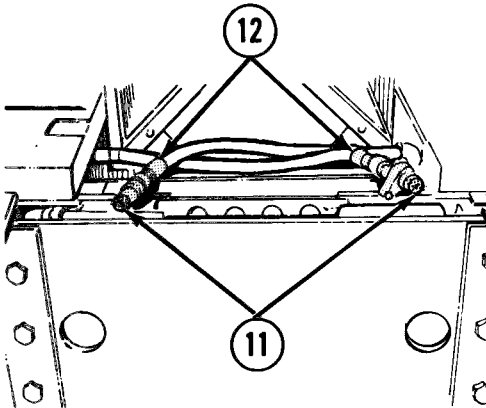
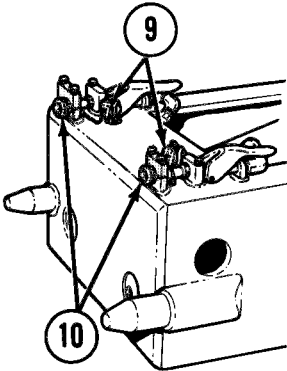
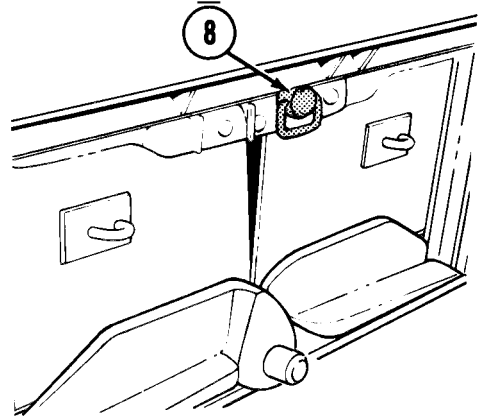
1. Pull locking pin (1) from bolt (2).
2. Remove nut (3) from bolt (2).
3. Remove bolt (2) and hold-down chain (4).
4. Remove any debris from pintle socket (5), crosspin receiver (6), and locking plug plate (7).



TA247715

**RETRIEVING BRIDGE - Continued**

5. Remove bridge locking pins (8).
6. Remove dust plugs (9) from sockets (10) and stow in spring clips. Remove dust caps (11) from plugs (12).

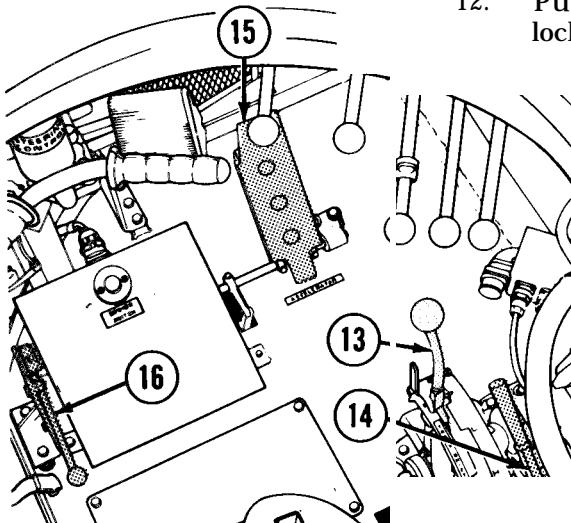


7. Start engine (page 2-130).
8. Move vehicle in-line with bridge.
9. Move shift lever (13) to N.
10. Full up clutch lever (14).

**NOTE**

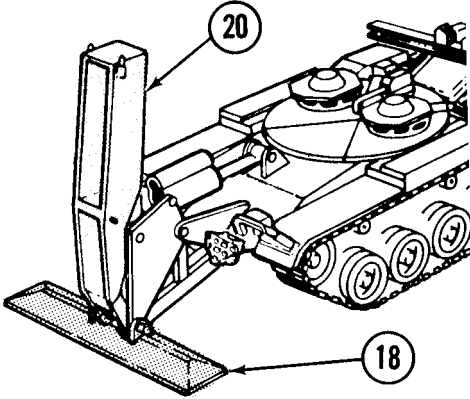
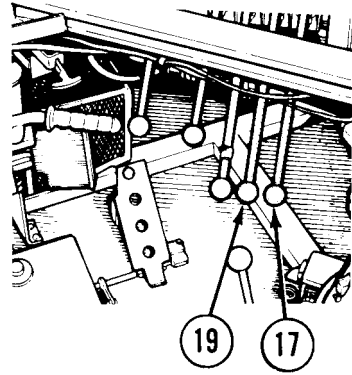
**A snap can be felt when clutch is properly engaged.**

11. Reseal accelerator (15) until engine is running 1,800 rpm.
12. Pull up accelerator lock lever (16).



**RETRIEVING BRIDGE - Continued**

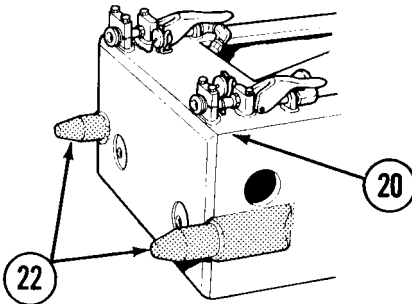
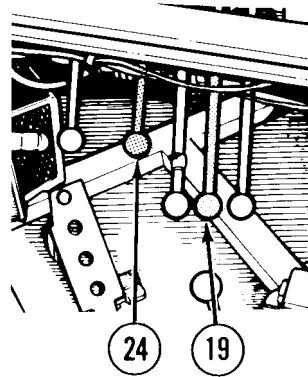
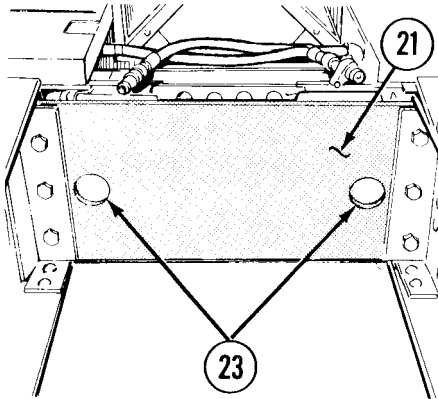
13. Pull up OVERHEAD lever (17) until outrigger (18) is almost touching ground.
14. Pull up TONGUE lever (19) until tongue (20) is aligned with bridge diaphragm (21).



**NOTE**

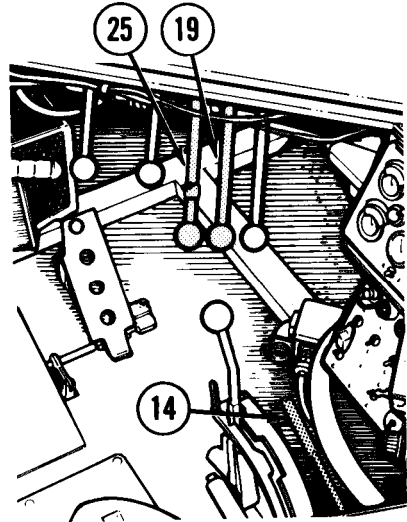
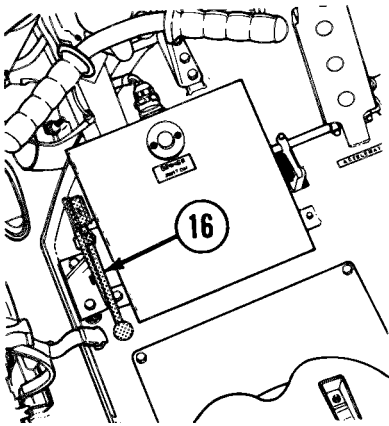
**If pintles do not line up with pintle sockets, reposition vehicle.**

15. Pull up OVERHEAD lever (17) until outrigger (18) is firmly on ground and overhead cylinder is all the way out.
16. Slowly move vehicle forward and align pintles (22) with pintle sockets (23).



17. Pull TONGUE lever up or down until pintles (22) are in pintle sockets (23) and tongue fully contacts diaphragm (21).
18. Push lock lever (24) down to extend locking pins.

**RETRIEVING BRIDGE- Continued**



19. Push down accelerator lock lever (16).

20. Push down clutch lever (14).

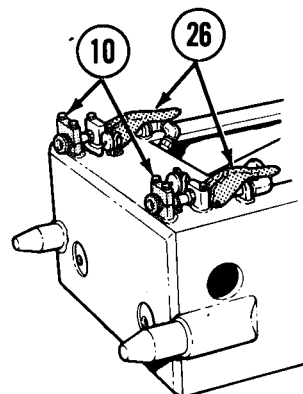
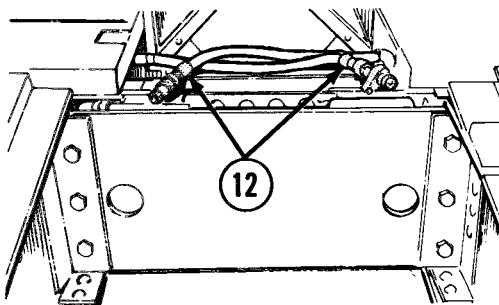
21. Pull SCISSORS lever (25) up then down at least three times.

22. Pull up and hold release handles (26).

23. Push plugs (12) into sockets (10).

24. Release the handles (26) and push plugs (12) into sockets (10) until sockets retract.

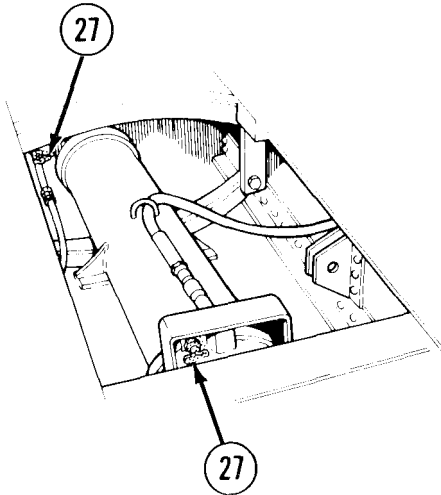
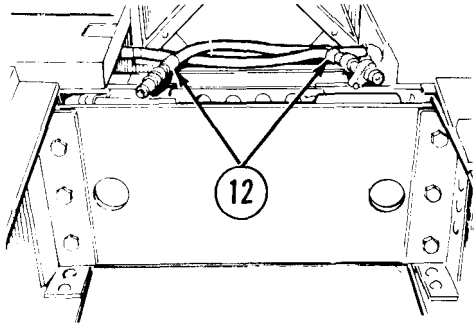
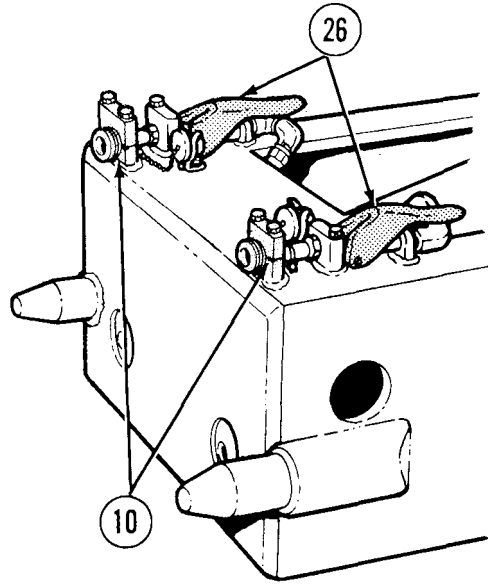
25. Visually check assembly to ensure it is securely connected.



**RETRIEVING BRIDGE - Continued**

26. If couplings will not lock:

- a. Open both valves (27) on scissors cylinder to relieve pressure.
- b. Pull up and hold release handles (26).
- c. Connect socket (10) and plug (12) .
- d. Release the handles (26) and push plugs (12) into sockets (10) until the sockets retract.
- e. Visually check sockets (10) and plugs (12) to make sure they are fully connected.
- f. Close both valves (27) on scissors cylinder.



27. Remove radio antenna.

28. Close and latch operator's cu-  
pola cover (page 2-100).

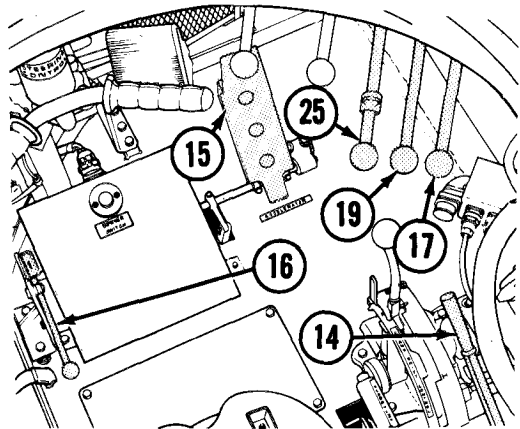


**RETRIEVING BRIDGE - Continued**

**WARNING**

**Operator must be completely inside vehicle with cupola cover closed during remaining procedures to prevent possible injury or death.**

- 29. Pull up clutch lever (14).
- 30. Press accelerator (15) until engine is running 1,800 rpm.
- 31. Pull up accelerator lock lever (16).



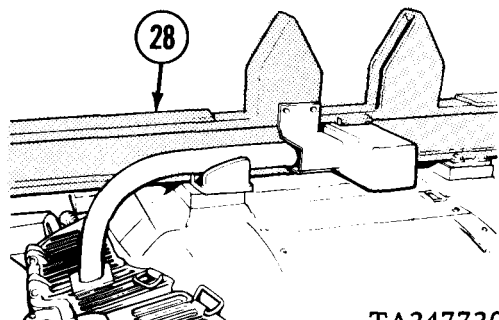
**WARNING**

**Be sure that all personnel are clear of bridge to prevent injury or death.**

**NOTE**

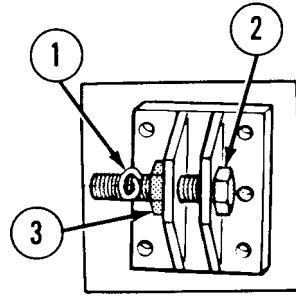
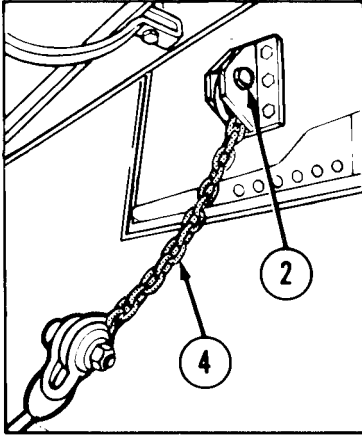
**Free end of bridge should not be more than 2 feet above ground during retrieval.**

- 32. Push up SCISSORS lever (25) until scissors cables are taut. Push down TONGUE lever (19) and SCISSORS lever (25) until tongue and scissors cylinders are fully retracted with bridge folded and in upright position.
- 33. Push down OVERHEAD lever (17) until bridge is just resting on bridge seat (28).



TA247720

**RETRIEVING BRIDGE - Continued**



34. Install holddown chains (4) with bolt (2).

35. Install nut (3) on bolt finger tight.

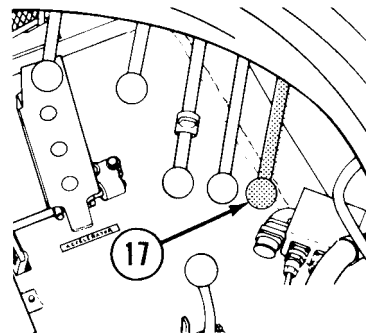
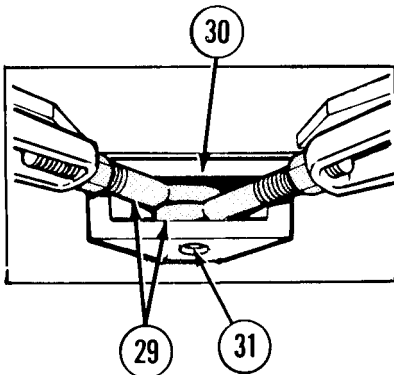
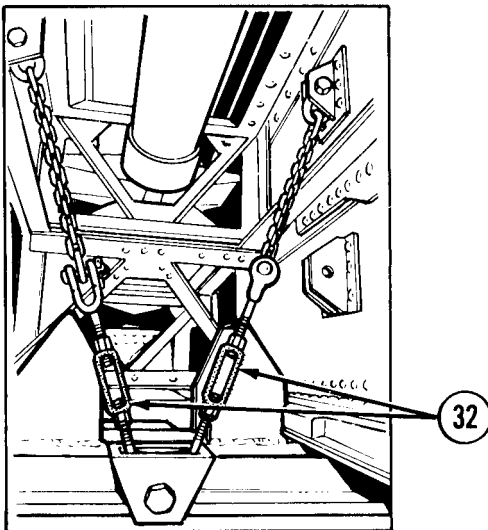
36. Insert locking pin (1) through hole in bolt (2).

37. Install turnbuckle eyes (29) in opening (30).

38. If holddown pin (31) is extended, pull up OVERHEAD lever (17) until holddown pin is retracted.

39. Push down OVERHEAD lever (17) until holddown pin (31) extends through turnbuckle eyes (29) completely.

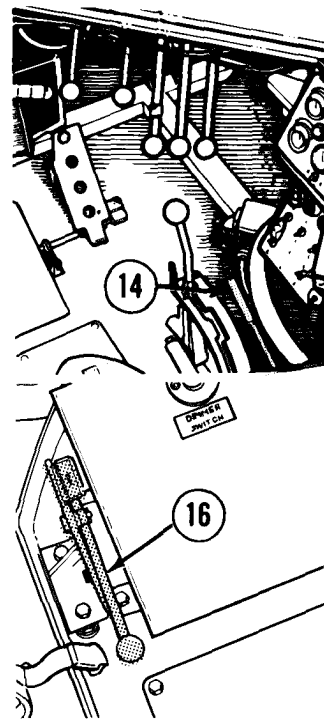
40. Tighten turnbuckles (32) with pinch bar (item 4, section III, app B).



TA24772

**RETRIEVING BRIDGE - Continued**

41. Push down accelerator lock lever (16).
42. Push down clutch lever (14).
43. Pull up then push down on all hydraulic levers at least three times to release pressure in system.
44. Install radio antenna.



**OPERATING AUXILIARY EQUIPMENT**

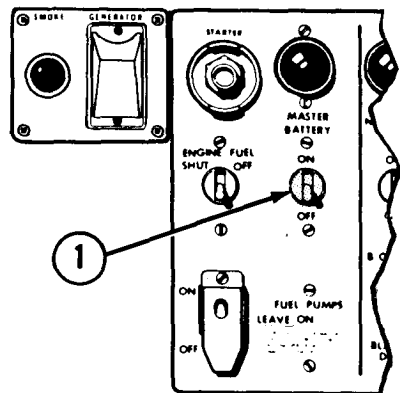
**COMMUNICATION SYSTEM**

**General**

1. Operation of amplifier AM-1780/VRC and operation of intercom sets are contained herein.
2. Refer to TM 11-5820-498-12 for operation of radio sets AN/VRC-53 and -64. Refer to TM 11-5820-401 -10-2 for operation of radio set AN/VRC-46. Refer to TM 11-5915-224-14 for operation of transient suppressor MX-7778A/GRC.
3. Notify organizational maintenance for removal and installation of radio sets.

**OPERATING AMPLIFIER AM-1780/VRC**

1. To turn amplifier on:
  - a. Set MASTER BATTERY switch (1) to ON.

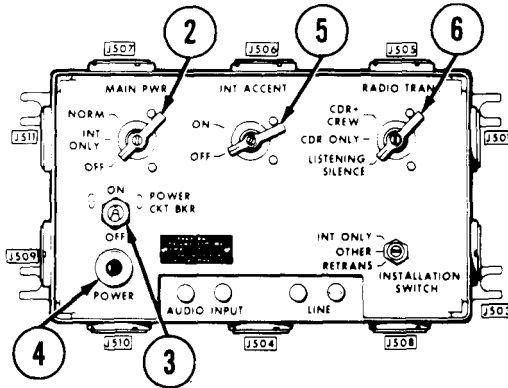


TA247722

**OPERATING AUXILIARY EQUIPMENT- Continued**

**OPERATING AMPLIFIER AM-1780/VRC - Continued**

- b. Move MAIN PWR switch (2) to NORM.
- c. Set POWER CKT BKR (3) to ON. POWER indicator (4) will light.



**CAUTION**

**If POWER CKT BKR (3) trips to OFF after you have reset it, move MAIN PWR switch (2) to OFF to prevent damage to amplifier and notify organizational maintenance.**

- d. If POWER CKT BKR (3) trips to OFF, reset it to ON.
- e. Move INT ACCENT switch (5) to ON or OFF.

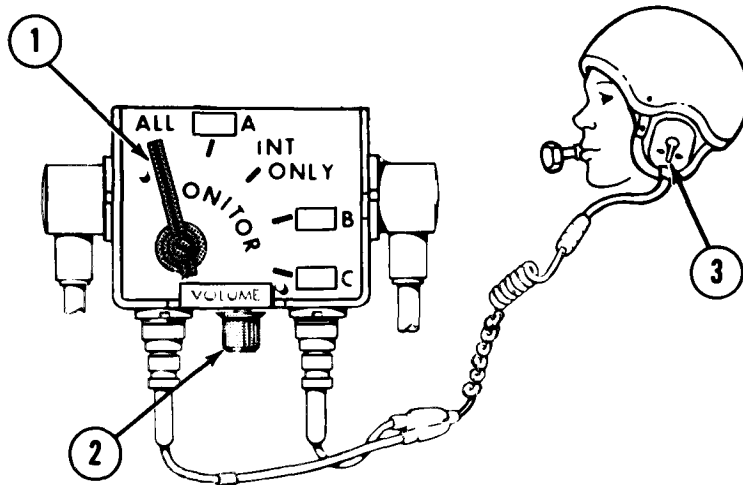
**NOTE**

**INT ACCENT (5) OFF Intercom and radio sound levels are equal.**

**INT ACCENT (5) ON Radio sound level is lower than intercom.**

- f. Move RADIO TRANS switch (6) to CDR + CREW, CDR ONLY, or LISTENING SILENCE.
- 2. To turn amplifier off:
  - a. Move MAIN PWR switch (2) to OFF.
  - b. Set MASTER BATTERY switch (1) to OFF if you do not need it on for other operations.

TA247723

**OPERATING AUXILIARY EQUIPMENT - Continued****INTERCOM SET C-2298/VRC**

1. Turn amplifier AM-1780/VRC on (page 2-157).
2. To transmit on receiver-transmitter:
  - a. Move MONITOR switch (1) to ALL, A, or B.

**NOTE**

**Ensure communication cord with yellow band is connected to the left intercom box connector.**

- b. Connect communication cords to intercom box.
  - c. Adjust VOLUME knob (2) to desired level.
  - d. Hold push-to-talk switch (3) forward to transmit.
3. To talk on intercom:
  - a. Move MONITOR switch (1) to INT ONLY.
  - b. Adjust VOLUME knob (2) to desired level.
  - c\* Set push-to-talk switch (3) rearward to talk.
4. To turn intercom sets off:

Turn amplifier AM-1780/VRC off (page 2-158).

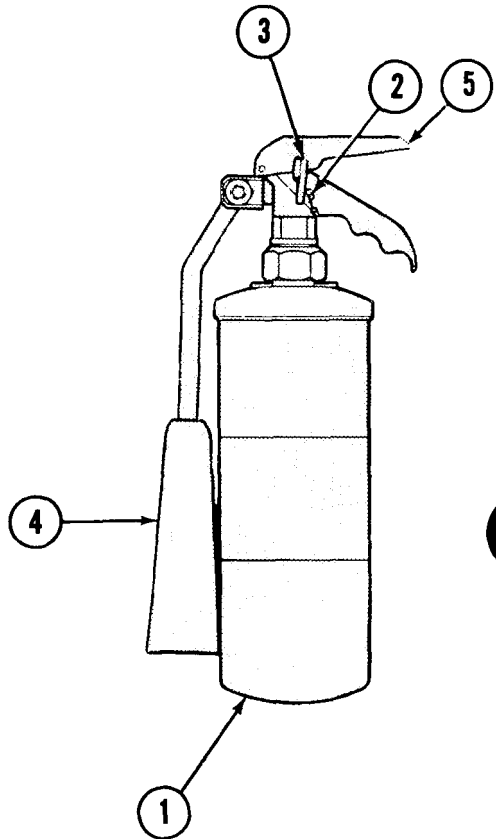
TA247724

**OPERATING AUXILIARY EQUIPMENT - Continued**  
**TYING ANTENNA DOWN**

1. Refer to TB SIG 291 for tiedown information.
2. Refer to TB SIG 291 for safety measures to be observed when using whip-type antennas.

**PORTABLE FIRE EXTINGUISHER**

1. Remove portable fire extinguisher (1) from bracket behind operator's seat.
2. Break wire (2) and pull out pin (3).
3. Pull horn (4) up to level position.
4. Take fire extinguisher (1) as close to fire as possible and point horn (4) directly at base of flames.



**WARNING**

- Fire extinguisher agent will irritate eyes and throat. Avoid contact with fire extinguisher agent.
- If fire is outside tank, approach fire with wind at your back to avoid burns.

**NOTE**

Fire extinguisher does most good when held within five feet of fire.

5. Press down and hold trigger (5) to shoot fire extinguisher at fire.

**NOTE**

**If fire was inside vehicle, open all hatches and let vehicle air out for five minutes before continuing operation.**

6. Put pin (3) back into trigger (5).
7. Turn horn (4) down.
8. Tag fire extinguisher (1) with word empty,
9. Replace empty fire extinguisher (1) as soon as possible.

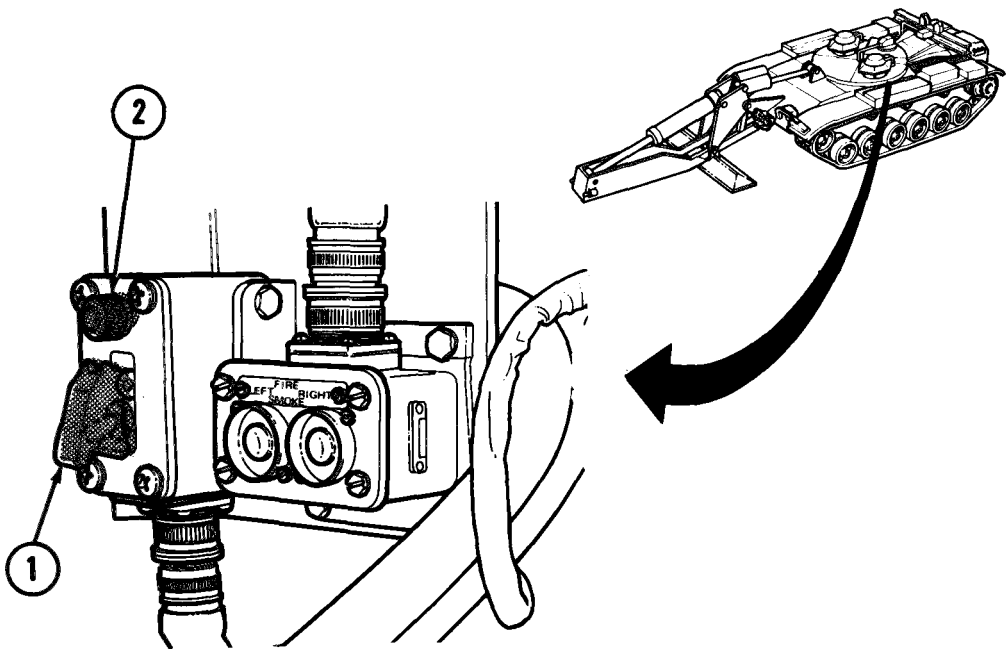
**M239 SMOKE GRENADE LAUNCHER (IF EQUIPPED)****LOADING****WARNING**

Follow standard weapon loading procedures when handling and loading smoke grenades.

Smoke grenades contain RP (red phosphorous). This is a fire hazard and is dangerous to all personnel outside vehicle.

Be sure grenade power switch (1) is OFF (lamp not lit) before loading discharger.

Do not place any part of your body in front of dischargers when loading grenades or when dischargers are loaded.



1. Make sure grenade power switch (1) is OFF (light (2) OFF).
2. Set MASTER BATTERY switch to OFF.

TA247726

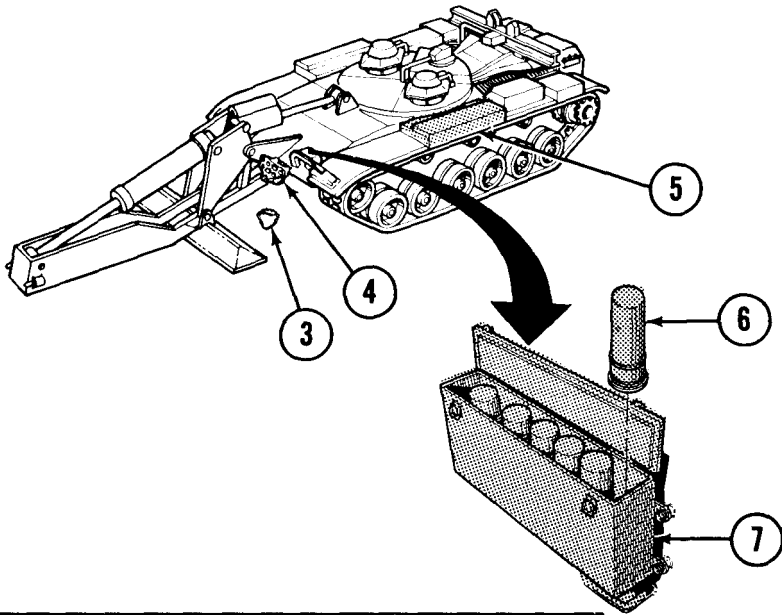
**M239 SMOKE GRENADE LAUNCHER (IF EQUIPPED) - Continued**

**LOADING - Continued**

**WARNING**

Do not place any part of your body in front of dischargers when removing canvas covers from dischargers.

- 3. Remove canvas covers (3) from both discharger (4) and stow in fender stowage box (5).
- 4. Check that all barrels of each discharger are clear and clean.



**WARNING**

If any grenades have external cracks, dents, or other deformities, DO NOT USE. Do not try to disassemble grenades. Place damaged grenades in storage/shipping containers and dispose of in accordance with local regulations.

- 5. Remove grenades (6) from stowage boxes (7).

TA247727



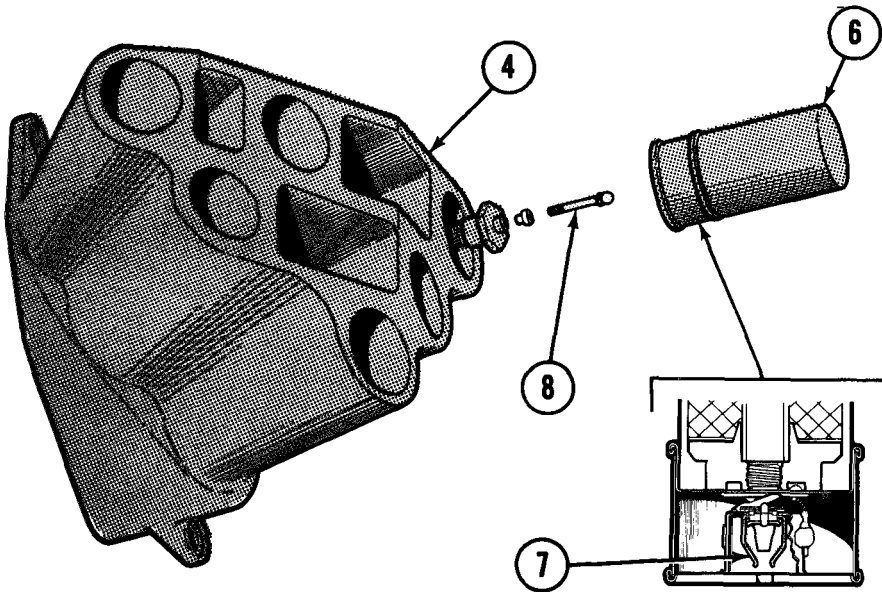
**M239 SMOKE GRENADE LAUNCHER (IF EQUIPPED) - Continued**

**LOADING - Continued**

**WARNING**

Do not place any part of your body in front of discharger when loading smoke grenades.

6. Push six grenades (6), base first, into barrels of each discharger (4). Spring clip (7) on grenade base must engage tip plug (8) at bottom of each barrel.
7. Rotate each grenade (6), 1/4 to 1/2 turn to make sure of electrical contact.



**WARNING**

**DO NOT** set **MASTER BATTERY** switch to **ON** until crewmember is back in vehicle.

**M239 SMOKE GRENADE LAUNCHER (IF EQUIPPED) - Continued**

**FIRING**

**WARNING**

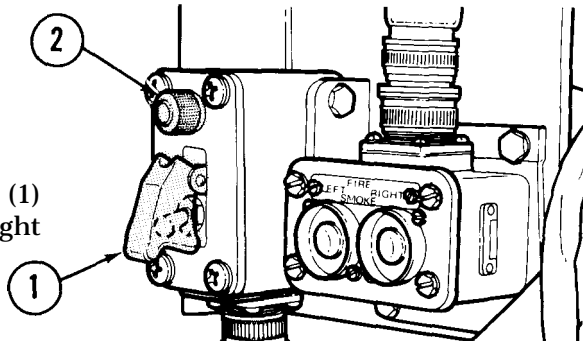
- Do not fire smoke grenades while launching bridge. Grenades will strike bridge and launching mechanism.
- When a misfire or dud occurs, all personnel must remain at least 200 meters (219 yards) from vehicle for at least 5 minutes after final attempt to fire. Crew will remain in vehicle with hatches closed.
- Particles of the L&A1 grenade fire from the M239 system may blow back into the vehicle if fired into gusty winds and may cause a fire.

1. Make sure grenade power switch (1) is OFF (light (2) OFF).
2. Make sure all hatches are locked (page 2-100).

**WARNING**

All outside personnel must remain at least 200 meters (219 yards) from vehicle during firing.

3. Set MASTER BATTERY switch to ON.
4. Set grenade power switch (1) to ON and ensure that light



TA247729

**M239 SMOKE GRENADE LAUNCHER (IF EQUIPPED) - Continued**

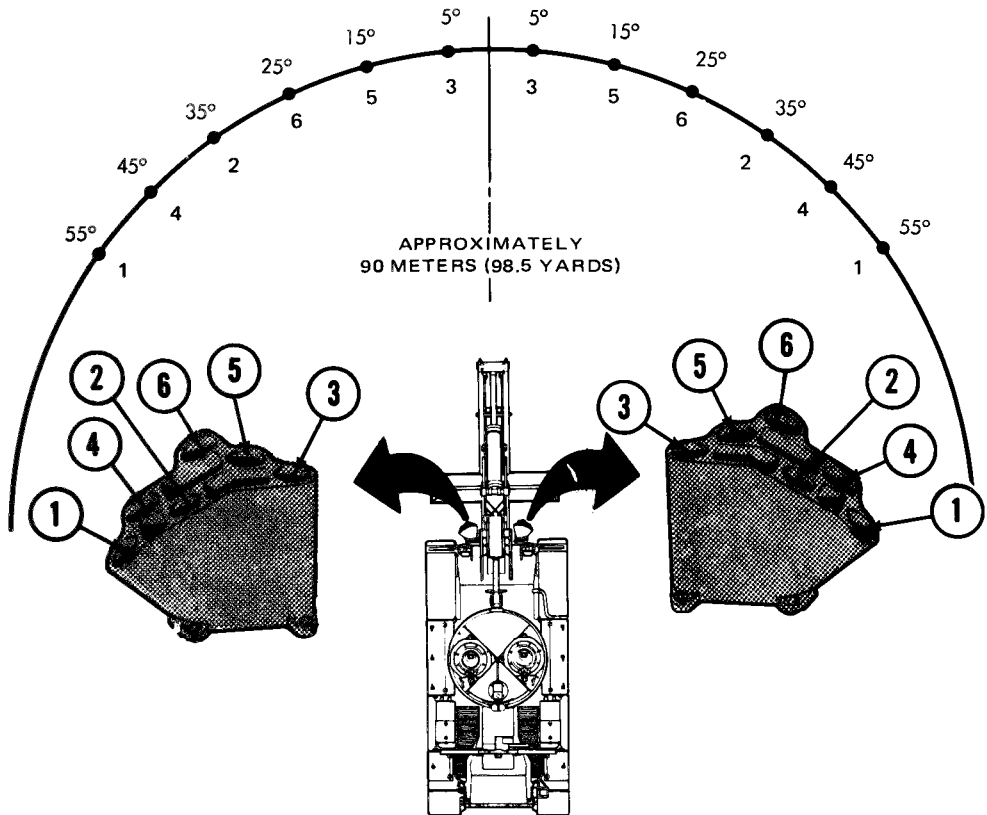
**FIRING - Continued**

Smoke grenades can be fired in the following combinations:

- a. Right pushbutton pat tern
- b. Left pushbutton pattern
- c. Salvo (both pushbuttons)

LEFT PUSHBUTTON PATTERN	
LEFT DISCHARGER	RIGHT DISCHARGER
1-2-5	3-6-4

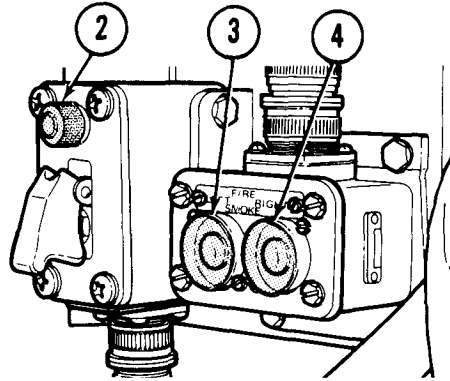
RIGHT PUSHBUTTON PATTERN	
LEFT DISCHARGER	RIGHT DISCHARGER
4-6-3	5-2-1



**M239 SMOKE GRENADE LAUNCHER (IF EQUIPPED) -Continued**

**FIRING - Continued**

5. When grenade power light (2) comes ON, press either FIRE SMOKE LEFT (3), RIGHT (4), or both pushbuttons to fire smoke grenades from dischargers.



**HANGFIRES, MISFIRES, AND DUDS**

**WARNING**

**When misfire occurs, all personnel must remain 200 meters (219 yards) from vehicle and vehicle crew must remain "buttoned up" for at least 5 minutes after final attempt to fire.**

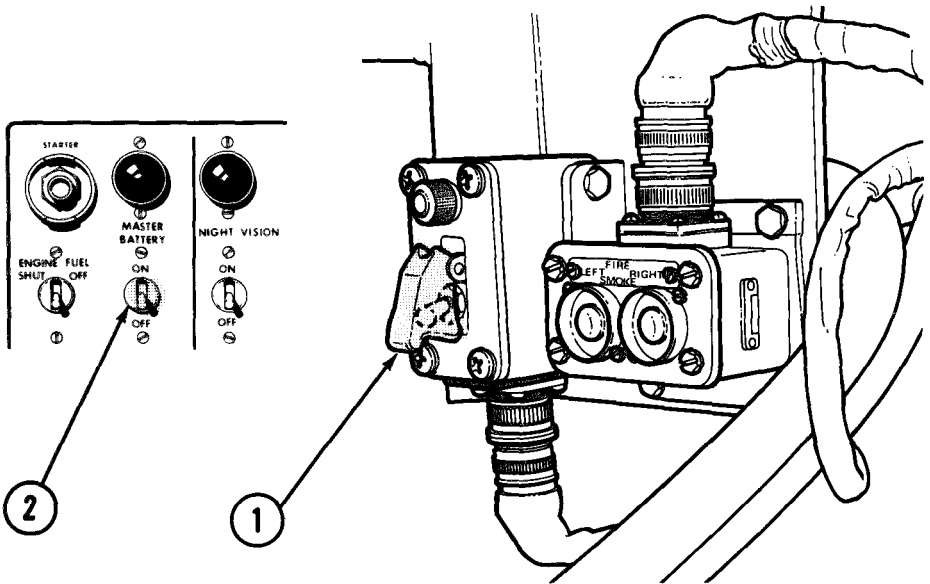
**Do not move dud smoke grenade. Notify EOD (Explosive Ordnance Disposal) personnel and give type, quantity, and precise location of dud grenades.**

1. A HANGFIRE smoke grenade is a temporary failure or delay in action of propellant charge. When hangfire occurs, wait 10 seconds and make two additional attempts to fire with 10-second intervals. If grenade still does not fire, wait 5 minutes and treat it as a misfire.
2. A MISFIRE is the failure of smoke grenade discharger to fire grenades. When misfire occurs, wait 10 seconds and make two additional attempts to fire with 10-second intervals. If grenade still does not fire, wait 5 minutes and remove misfired grenade from discharger and place it 200 meters (219 yards) away from personnel and equipment. Notify EOD personnel and give type, quantity, and precise location of misfired grenades.
3. A DUD is a smoke grenade that has fired from a discharger, but has failed to burst or burn. Wait 15 minutes with hatches closed. Notify EOD personnel and give type and precise location of dud grenade.

**M239 SMOKE GRENADE LAUNCHER (IF QUIPPED) - Continued**

**UNLOADING**

1. Make sure grenade power switch (1) is OFF (light is OFF).
2. set MASTER BATTERY switch (2) to OFF.



**WARNING**

Follow standard ammunition handling procedures when handling and unloading grenades.

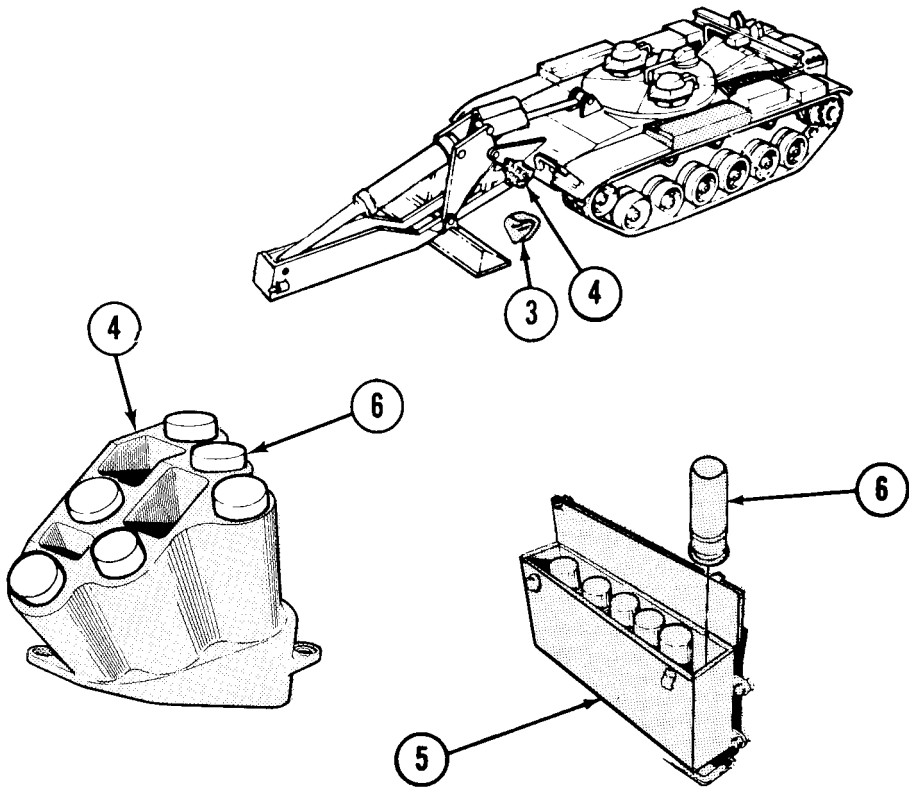
Smoke grenades contain RP (red phosphorous). This is a fire hazard and is dangerous to all personnel outside vehicle.

Never place part of your body in front of the discharger when removing or installing canvas cover.

**M239 SMOKE GRENADE LAUNCHER (IF EQUIPPED) - Continued**

**UNLOADING - Continued**

3. Remove covers (3), if installed, from right and left smoke grenade dischargers (4).
4. Unlatch and open right and left stowage boxes (5).

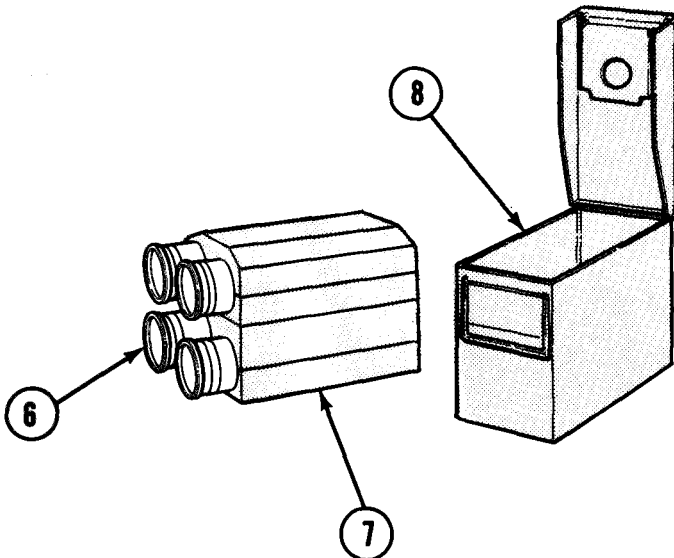
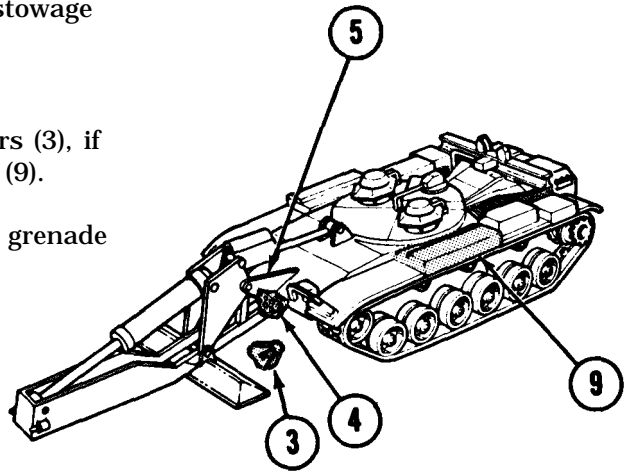


5. Remove all grenades (6) from both grenade dischargers (4) and both stowage boxes (5).

**M239 SMOKE GRENADE LAUNCHER (IF EQUIPPED) - Continued**

**UNLOADING - Continued**

6. Return all grenades (6) to ammunition stowage container (7), and place stowage containers in stowage box (8).
7. Close and latch both stowage boxes (5).
8. Remove discharger covers (3), if stowed, from fender box (9).
9. Install covers (3) on both grenade dischargers (4).



**OPERATING ENGINE SMOKE GENERATOR (IF EQUIPPED)**

**WARNING**

**Do not activate smoke generator in a building or closed area or with personnel near.**

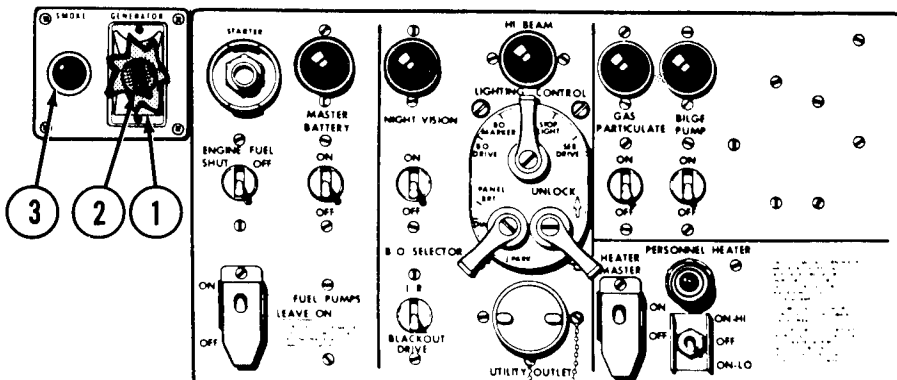
**CAUTION**

**Always be aware of wind direction and speed when using smoke generator.**

**NOTE**

- Do not activate smoke generator when engine is idling. Engine speed should be at least 1,600 rpm.
- Do not operate smoke generator if fuel supply is low.
- Engine should be run a while after smoke system is shut down to clear exhaust.

1. Start engine and bring it up to operating temperature (page 2-130).
2. Lift cover (1) and place SMOKE GENERATOR switch (2) on. Light (3) should come on. (The left and right exhaust pipes should emit white smoke within 10 seconds).



3. Set SMOKE GENERATOR switch (2) to OFF to stop producing smoke.

TA247735



## **Section IV. OPERATION UNDER UNUSUAL CONDITIONS**

### **GENERAL CONDITIONS**

1. In addition to normal preventive maintenance checks and services, you must clean and lubricate your equipment more often to compensate for extremes of temperature, humidity, and terrain conditions that are present or expected. Cleaned and lubricated equipment ensures proper operation and guards against excessive wear and failure.
2. When equipment constantly breaks down due to operating under extreme conditions, report failure(s) using SF Form 368 (Quality Deficiency Report).

### **OPERATING IN EXTREME COLD WEATHER**

#### **GENERAL**

1. You must prepare your equipment when you are scheduled for operation in extreme cold. Generally, extreme cold will cause lubricant to thicken; freeze batteries or prevent them from furnishing enough current for starting the engine; cracked insulation can cause electrical short circuits; prevent fuel from vaporizing to form a combustible mixture for starting; and will cause some materials to become hard, brittle, and easy to damage or break.
2. You should not suddenly move a sighting instrument from cold to warm temperatures, or vice versa. Moisture caused by doing this may cause cloudy optics and rust y internal parts.
3. Always watch for indications of weather effect on equipment.
4. Be cautious when moving vehicle after a shutdown. Thick lubricants may cause failure of parts. After you warm up engine thoroughly, drive vehicle slowly about 100 yards to warm up lubricants to a point where normal operation can be expected.
5. Keep an eye on temperature and pressure indicators. If readings are abnormal, stop vehicle and investigate cause (page 3-10). If you cannot find and correct the problem, notify organizational maintenance.

## **OPERATING IN EXTREME COLD WEATHER - Continued**

### **AT HALT AND PARKING**

1. When you stop for short shutdown periods, park your vehicle in a sheltered spot out of the wind. If you cannot find a sheltered spot, park so that front of vehicle faces into wind. This keeps rain, snow, and sleet from entering engine compartment through rear grille door. When you shut down for a long period, and cannot find dry ground, park vehicle on a footing of planks or brush to prevent tracks from freezing to ground.
2. Additional things you must do when getting ready for shutdown are:
  - a. Place control levers in neutral position to prevent possible freezing in an engaged position.
  - b. Cover all grille doors to retain heat and prevent snow entrance which will melt and freeze in engine compartment.
  - c. Open hull drain valves to drain melted snow while engine heat is present. After draining, close drain valves to prevent their freezing in an open position.
  - d. Clear mud, snow, and ice from vehicle as soon as you can after you stop.
  - e. If you know or suspect that fuel tanks contain excessive water, notify organizational maintenance.
  - f. To prevent linkage freezing, do not apply parking brake.
  - g. Fill your fuel tanks as soon as possible to reduce condensation.
  - h. See TM 9-6140-200-12 for battery care and maintenance.

### **ENGINE AIR CLEANER INTAKES**

#### **GENERAL**

Under normal and especially dusty conditions, operate vehicle with air cleaner intakes set to draw air from crew compartment. When operating in extreme cold, where you want all the heat possible, and if a nuclear, biological, or chemical attack is expected, set intakes to draw air from the engine compartment.

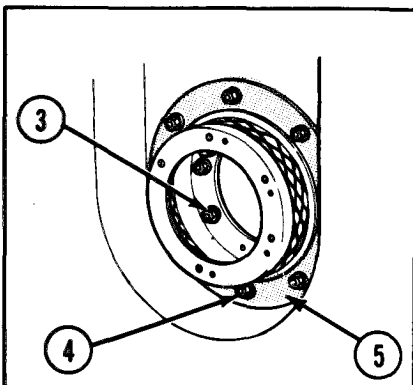
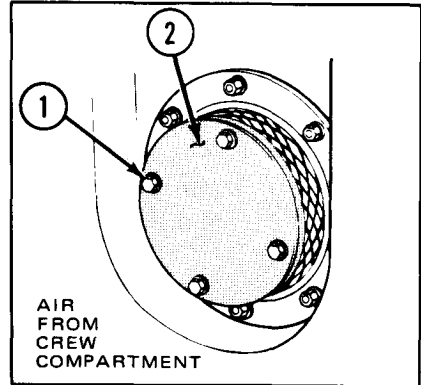
**ENGINE AIR CLEANER INTAKES - Continued**

**REVERSING INTAKES TO DRAW AIR FROM ENGINE COMPARTMENT**

1. Using 1/2 inch socket and ratchet, remove four screws and lockwashers (1) from air intake cover (2).

**NOTE**  
**A gasket is glued to cover**

2. Carefully remove cover (2) and gasket.
3. Using 9/16 inch socket with 5 inch extension and ratchet (item 30, sec III, app B), remove six nuts and lockwashers (3).
4. Using 9/16 inch socket with extension and ratchet, remove eight nuts and lockwashers (4).



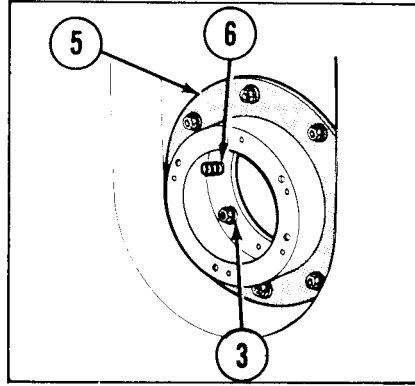
**NOTE**  
**A gasket is glued to bulkhead.**

5. Carefully remove intake (5) from bulkhead.
6. Check to see if gaskets or intakes are damaged. If gaskets and/or intakes are damaged, notify organizational maintenance.

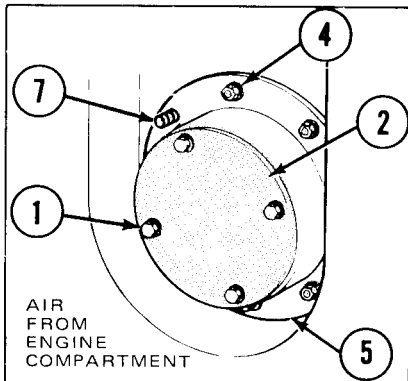
## ENGINE AIR CLEANER INTAKES - Continued

### REVERSING INTAKES TO DRAW AIR FROM ENGINE COMPARTMENT - Continued

7. Position intake (5) on flange studs (6) with screen toward engine compartment.
8. Install six nuts and lockwashers (3) on studs (6).
9. Using 9/16 inch socket with 5 inch extension and rat chet, tighten six nuts (3).



10. Install eight nuts and lockwashers (4) on studs (7).
11. Using 9/16 inch socket extension and ratchet, tighten eight nuts (4).



12. Position cover (2) with gasket on intake (5) and install four screws and lockwashers (1).
13. Using 1/2 inch socket and ratchet, tighten four screws (1).

## OPERATING IN HOT, HUMID, OR SALTY AREAS

1. If you operate your vehicle for long periods at high speeds, on long hard pulls in low or reverse on steep grades, or in soft terrain, you may cause engine to overheat. Avoid using low and reverse for long periods whenever possible. Keep an eye on ENGINE and TRANSMISSION TEMP F indicators. If either indicates in red area, stop vehicle and run engine at 1000 to 1200 rpm until indicator is in green area. Resume operation. If temperature does not return to normal or if overheating recurs, shut down engine and notify organizational maintenance.
2. Frequently check for moisture, corrosion, and fungus growth. Dry all exposed unpainted surfaces and lubricate as prescribed in LO 5-5420-202-12.
3. Shield sighting equipment as much as possible from direct rays of the sun.
4. Weapons require cleaning and lubricating more often when weapons are not in use. Cover exposed metal surfaces with a film of general purpose lubricating oil as prescribed in the LO and keep covers in place.
5. See TM 9-6140-200-12 for battery care and maintenance.

## OPERATING IN DUSTY OR SANDY AREAS

### CAUTION

**Do not operate this vehicle in dusty or sandy areas without the inspection plates or drain plugs. Damage to engine components may result.**

### NOTE

**Air cleaners are to be opened and serviced only by organizational maintenance personnel.**

1. Operation in dusty and sandy areas shortens service life of the air cleaner. Service inspection parts, air cleaner filter element, and air cleaner box assembly more frequently.
2. When at halt for extended periods, cover entire vehicle with canvas. Where entire vehicle cannot be covered, protect periscopes and other optical surfaces against scratches by wind-blown sand. Protect engine compartment against entry of sand or dust.

## **OPERATING IN DUSTY OR SANDY AREAS - Continued**

3. When extended for crossing, frequently check hydraulic seals, hydraulic lines and fittings for leaks. Wipe hydraulic cylinder clean after use and cap all hydraulic fittings.
4. Keep scissoring cables clean of sand buildup.
5. Inspect tracks/sprockets often for signs of track guide and sprocket tooth wear.
6. Avoid sharp high speed turns in loose or fine sand.
7. Track tension is particularly important in loose or fine sand.

### **NOTE**

**Additional information on environmental, equipment can be found in FM 90-3, Desert Operations.**

## **BRAKING VEHICLE WITH ENGINE**

### **CAUTION**

**Use this action only in an emergency when all other actions fail.**

1. The engine will act as a partial brake when moving forward downhill with transmission in reverse or moving rearward downhill with transmission in low or high. Use of engine as a brake should be avoided and should be used only when vehicle brakes will not hold.

### **WARNING**

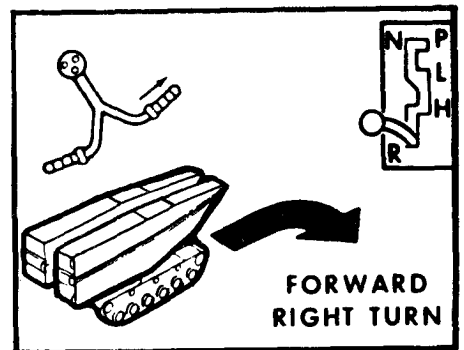
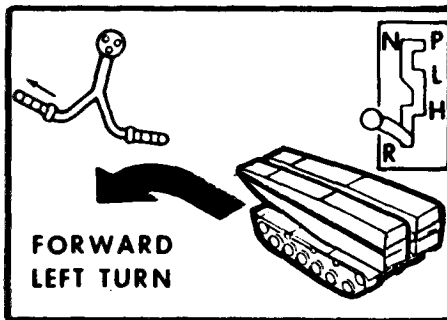
**Steering is reversed when vehicle is moving in a forward direction with transmission in reverse or when vehicle is moving in a rearward direction with transmission in low or high.**

**BRAKING VEHICLE WITH ENGINE - Continued**

**CAUTION**

**When going downhill using engine as a brake, do not allow engine to stall. Use sufficient engine speed to control descent. If engine stalls, do not allow vehicle to roll forward with shift lever in reverse, backward with shift lever in forward gears, because transmission will drive engine backwards and can cause serious damage to engine and air cleaners. If engine starts to run backwards, stop vehicle and shut off engine. Restart engine. If braking does not stop vehicle, shift transmission to neutral to prevent engine damage from reverse rotation.**

2. To turn front of vehicle right while moving forward downhill with transmission in reverse, turn steering control to your right.



3. To turn front of vehicle left while moving forward downhill with transmission in reverse, turn steering control to your left.

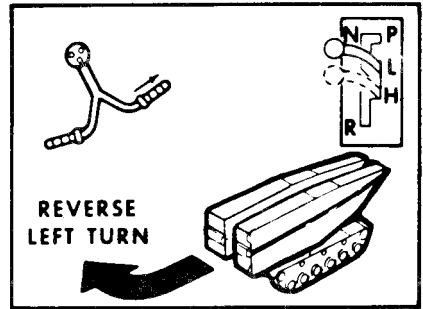
4. To turn rear of vehicle right while moving rearward downhill with transmission in low or high, turn steering control to your left.





**BRAKING VEHICLE WITH ENGINE - Continued**

5. To turn rear of vehicle left while moving rearward downhill with transmission in low or high, turn steering control to your right.



**FORDING**

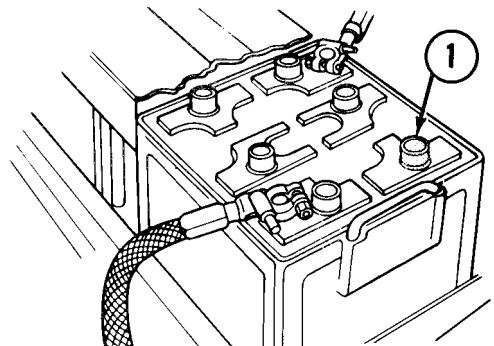
**WARNING**

Do not enter water over 4 feet (1.22 meters) deep. If you accidentally submerge vehicle, get it out of water as soon as possible. Notify organizational maintenance.

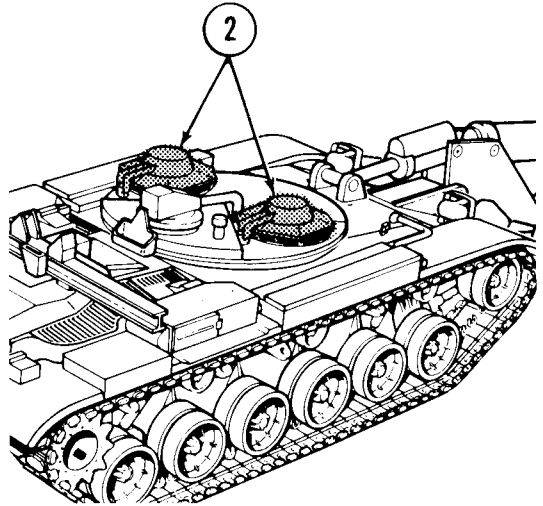
**CAUTION**

Do not operate vehicle after submerging until organizational maintenance has checked it.

1. Before you enter water:
  - a. Check battery filler caps (1) to make sure they are tight.



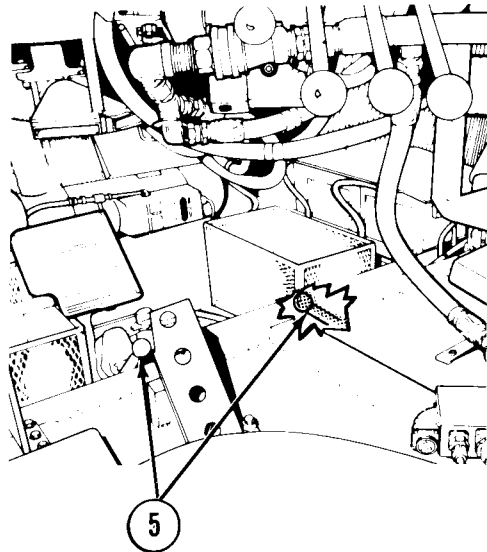
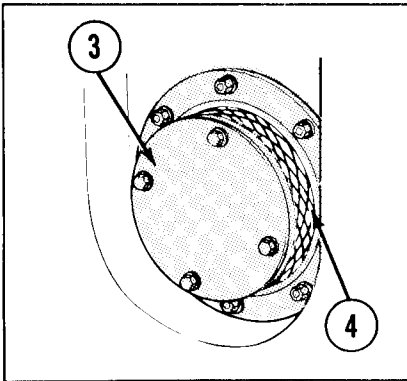
**FORDING - Continued**



b. Close and lock both hatches (2) (page 2-100).

c. Ensure that engine air cleaner intakes (3) are set to draw air from crew compartment (intake screen (4) on crew compartment side of bulkhead). If intakes are set to draw air from engine compartment, see page 2-172 for reversing procedures.

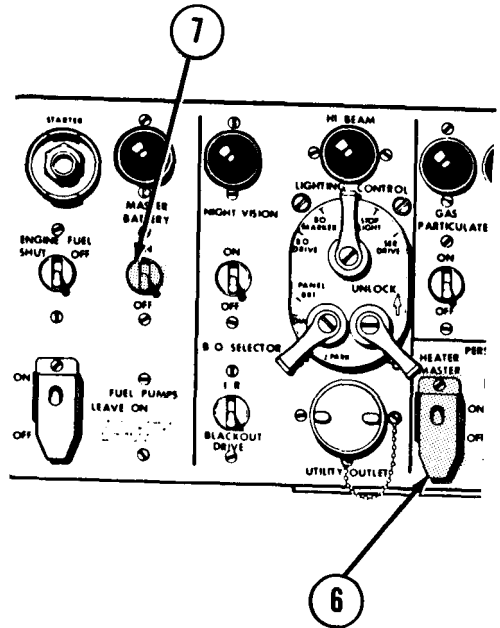
d. Ensure that hull drain valves (5) are closed (page 2-1 11).



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**FORDING - Continued**

- e. Set HEATER MASTER switch (6) to OFF.
- f. Start and warm up engine (page 2-130).
- g. Set MASTER BATTERY switch (7) to OFF.
- h. Drive slowly going into water or you may cause a "bow wave".
- i. Drive at 3 to 4 mph (5 to 6 kph) while fording. Keep engine speed up to at least 1,000 rpm. Slow vehicle with brake, if necessary, while maintaining 1,000 rpm.

**CAUTION**

**If you accidentally drive into water more than 4 feet deep, do not stop engine while it is under water. Exhaust pressure will prevent water from entering engine through the exhaust system. If engine stops while it is under water, do not try to restart. Have vehicle towed from water as soon as possible. If you must stop vehicle while engine is under water, shift transmission to high, apply and hold brakes, and keep engine speed at 1,000 rpm. Do not attempt to operate vehicle after submerging until organizational maintenance has checked it.**

2. After fording, perform after fording maintenance service, page 3-95.

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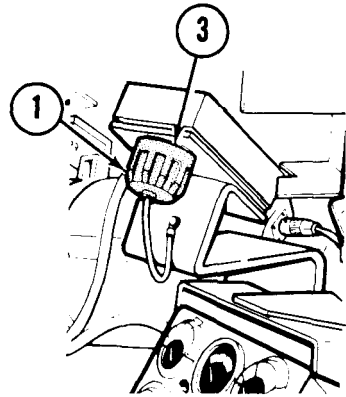
### SLAVE STARTING

#### CAUTION

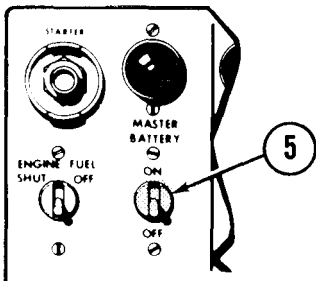
- An organizational mechanic must be present during slave starting procedures, to ensure proper hookup and to preclude damage to equipment.
- Never remove protective caps (1 or 2) from slave receptacles (3 or 4) until MASTER BATTERY switch (5) is set to OFF. You could damage equipment.

#### NOTE

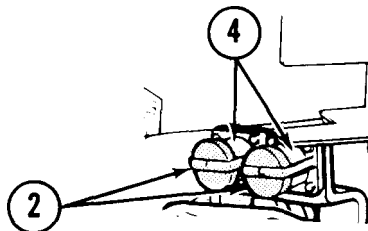
- You will need a "live" (operational) vehicle to start your "dead" vehicle.
- Three persons are required to perform the slave starting procedures. One person stationed in the driver's station of both the live and dead vehicles. The third person, an Organizational Maintenance mechanic, stationed outside the vehicles, directs the operation. The only slave cables and slave cables adapters that may be used are those provided in the organizational maintenance tool sets.



VEHICLE WITH ONE CONTACT (NATO) RECEPTACLE

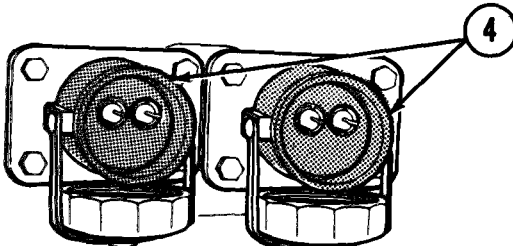


DRIVER'S STATION

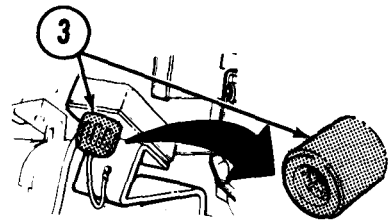


VEHICLE WITH TWO CONTACT RECEPTACLE

**SLAVE STARTING - Continued**



**TWO-CONTACT  
RECEPTACLE**

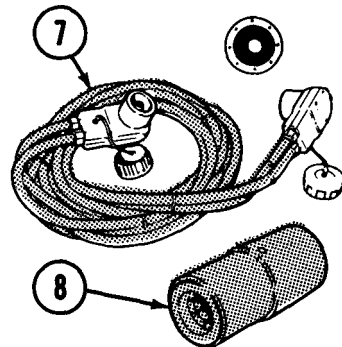
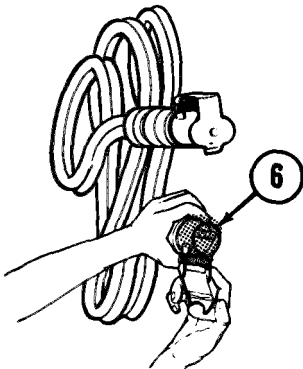


**ONE-CONTACT  
RECEPTACLE (NATO)**

**NOTE**

To get the right slave cable, first check the slave receptacles in both vehicles. Some receptacles (4) have two contacts. Others (3) have one contact.

There are two types of slave cables. The two-prong cable (6) fits only the two-contact receptacle. The one-prong NATO cable (7) fits the one-contact receptacle. It can also fit the two-contact receptacles if you use an adapter (8).



1. Get proper slave cable (6 or 7) and adapter (8) if required.

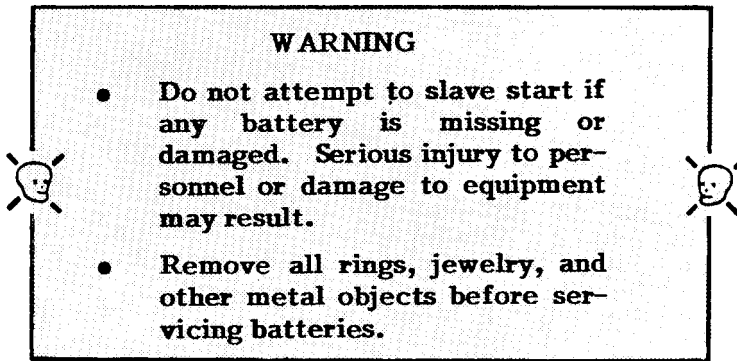
**WARNING**

Do not use defective cables, injury to personnel and/or damage to equipment may result.

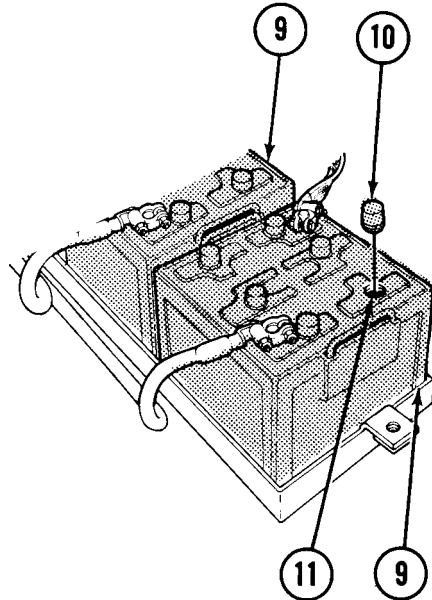
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## SLAVE STARTING - Continued

2. Inspect slave cables for:
  - a. Frayed insulation or exposed wiring.
  - b. Cable connectors and adapter completeness and serviceability.
3. Notify Organizational Maintenance of any defects.

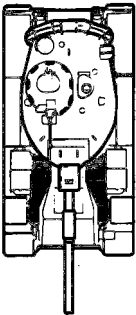
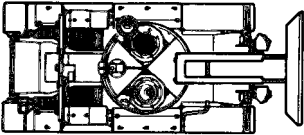
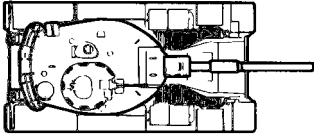
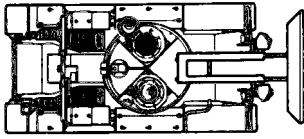


4. Dead vehicle:
  - a. Check that connections on battery cables, leads, and terminals are clean and tight.
  - b. In cold climates: Make sure batteries (9) are not frozen. Take off caps (10). If you see ice or frost inside cell opening (11), batteries are frozen.
  - c. Check for correct electrolyte level in all six batteries (9).
  - d. Notify Organizational Maintenance of any defects.
5. Station one person in driver's station of each vehicle. Organizational mechanic will give directions from the ground.
6. Live vehicle: Start engine (see operator's manual).



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**SLAVE STARTING - Continued**



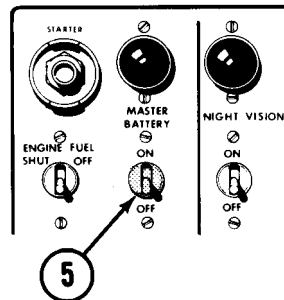
**WARNING**

Do not allow anyone between vehicles. Park vehicles so that one will not damage another if it jumps ahead.

7. Live vehicle: Park beside dead vehicle, facing same way. If that is not possible, traverse main gun to rear, if so equipped. Park live vehicle at right angle to dead vehicle.
8. Both vehicles: Set parking brake.

9. Make sure:
  - Both vehicles:
    - a. Parking brakes are set.
    - b. Hatches are locked open.
    - c. All electrical equipment is off.
  - Dead vehicle: MASTER BATTERY switch (5) is set to OFF.

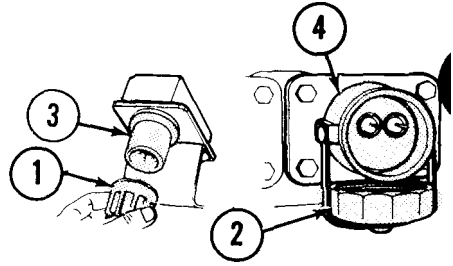
10. Live vehicle: Set MASTER BATTERY switch (5) to OFF. Keep engine running.



**SLAVE STARTING - Continued**

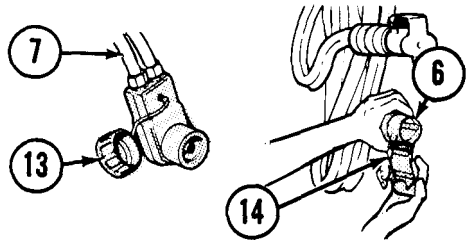
**CAUTION**

Do not remove protective caps (2) or (1) from slave receptacles (4 or 3) until MASTER BATTERY switch is set to OFF.

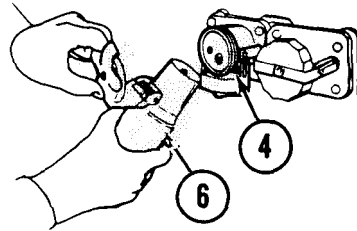


- 11. Both vehicles: Remove protective cap (2 or 1) from slave receptacles (4 or 3).

- 12. Both vehicles: Put one end of cable through driver's hat ch.



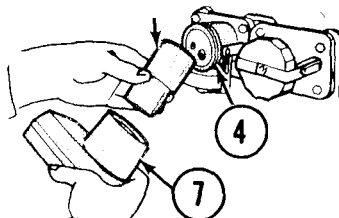
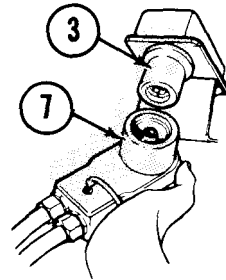
- 13. Both vehicles: Remove protective caps (13 or 14) from cable (7 or 6).



**CAUTION**

**All electrical equipment in both vehicles, must be off before slave starting to prevent damage to equipment.**

- 14. Both vehicles: Connect slave cables (6 or 7) to slave receptacles (4 or 3). Use adapter (8) if connecting cable (7) to two-contact receptacles (4).



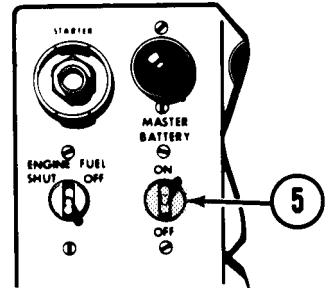


**SLAVE STARTING - Continued****NOTE**

**If tactical situation will not allow you to take the time to charge batteries, go to step 16.**

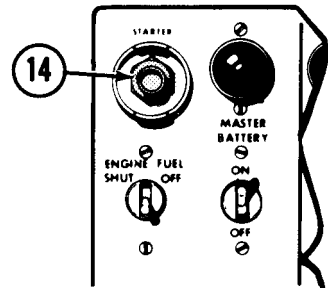
15. Charge dead vehicle's batteries:

- a. Live vehicle: set MASTER BATTERY switch (5) to ON to charge batteries in dead vehicle.
- b. Live vehicle: Set engine to run at 1,000 to 1,200 rpm.
- c. Live vehicle: Let engine run for up to 30 minutes if you have time.



16. Start dead vehicle:

- a. Both vehicles: set MASTER BATTERY switch (5) to ON.
- b. Live vehicle: Set engine to run at 1,000 to 1,200 rpm.

**CAUTION**

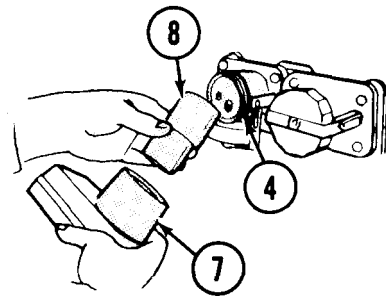
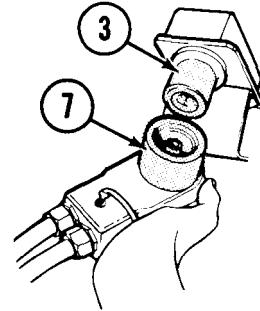
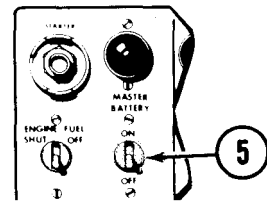
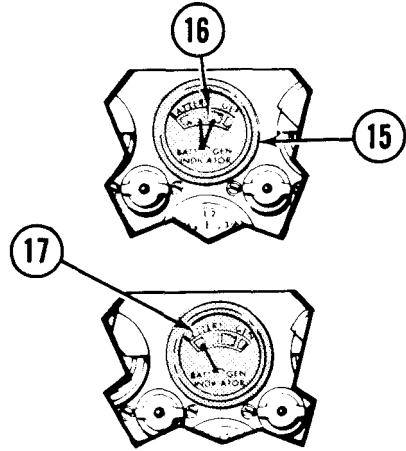
**When you try to start dead vehicle, do not hold STARTER switch (14) longer than 15 seconds. Wait 3 to 5 minutes before making second attempt to start.**

Dead vehicle: Try to start engine once. If engine starts, go to step 17.

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**SLAVE STARTING - Continued**

- d. If engine does not start within 15 seconds, release STARTER switch and read BATT GEN INDICATOR (15).
- e. Indicator needle in yellow or green area (16): Wait 3 to 5 minutes and go back to step 16b.
- f. Indicator needle in left red area (17): Go to step 15. If you do not have time to charge batteries, go to step 16b.
- g. If batteries will not charge or vehicle will not start after two attempts, see troubleshooting (page 3-l).

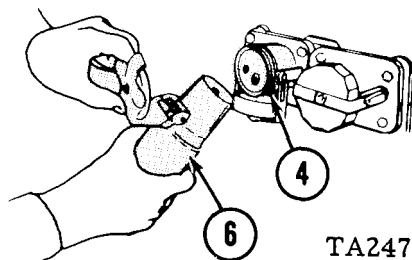


17. Disconnect cables:

- a. Both vehicles: When engine is running smoothly, set MASTER BATTERY switch (5) to OFF.

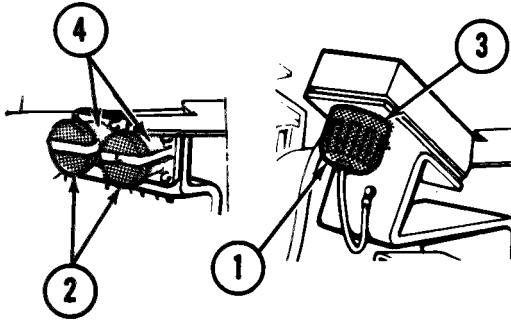
**CAUTION**  
 Do not remove slave cables (6 or 7) from receptacles (4 or 3) until MASTER BATTERY switch (5) is set to OFF in both vehicles.

- b. Both vehicles: Disconnect slave cable (6 or 7) and adapter (8) if used, from receptacles (4 or 3).



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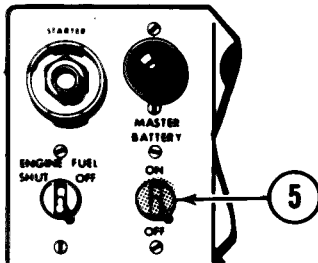
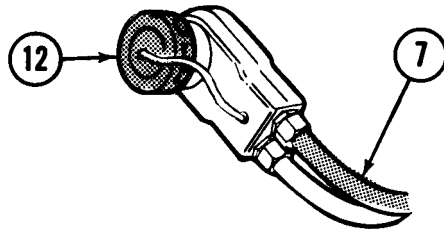
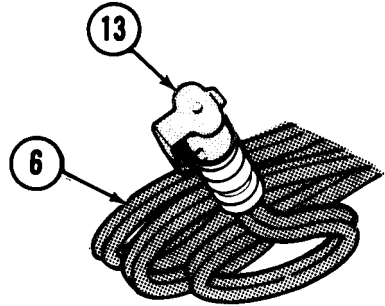
**SLAVE STARTING - Continued**



c. Both vehicles: Install protective caps (2 or 1) on slave receptacles (4 or 3).

d. Both vehicles: Install protective caps (12 or 13) on cable (6 or 7).

e. Both vehicles: Remove cable from driver's hatch opening.



f. Both vehicles: Set MASTER BATTERY switch (5) to ON.

g. Both vehicles: Set engine to run at 1,000 to 1,200 rpm to charge batteries. Run engines for 30 minutes, if you have time.

h. Return adapter, if used, and slave cable to Organizational Maintenance.

**TOW STARTING**

Vehicle cannot be tow-started. Vehicle can only be towed from the rear with a tow bar. Refer to page 2-188 (towing a disabled vehicle).

**TOWING A DISABLED VEHICLE**

**WARNING**

When a tow bar or tow cables are used, a second vehicle is required when describing a grade of 20 degrees or more. A second vehicle is also required when the road or road conditions dictate. Under no circumstances should the vehicle exceed 8 mph.

**CAUTION**

If engine or transmission of disabled vehicle is damaged, or vehicle will be towed more than 1 mile, disconnect universal joints from final drives. Vehicle will not have brakes when you disconnect universal joints.

**NOTE**

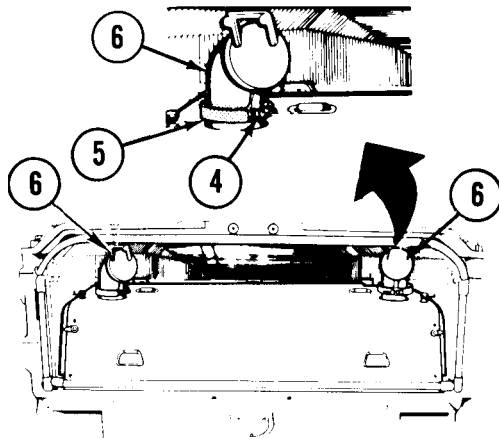
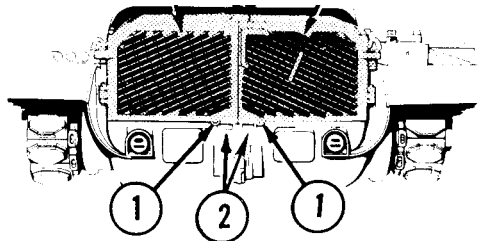
Tow only with a V-type tow bar, from the rear. Obtain tow bar from organizational maintenance. Towing vehicle will control direction of towed vehicle.

1. Remove bridge from vehicle (TM 5-5420-203-14).
2. Disconnect universal joints from final drive as follows:
  - a. Chock roadwheels.

**NOTE**

If roadwheels cannot be chocked, connect tow bar (page 2-191), before disconnecting final drive.

- b. Release parking brake.
- c. Using 1-1/8 inch socket and ratchet, remove four screws (1).
- d. Pull handles (2) and open door (3).
- e. Using 7/16 inch open end wrench, loosen clamp nuts (4).
- f. Remove clamps (5).
- g. Remove elbows (6).



**TOWING A DISABLED VEHICLE- Continued**

- h. Using 3/4 inch combination wrench, rotate six cam screws (7) toward center of vehicle.

**NOTE**  
**Two persons are required to lift shroud (8).**

- i. Lift and remove shroud (8).

**NOTE**  
**You may have to rotate quick-disconnect ring (9) to gain access to screw (10) and lockwire (11).**

- j. Using pliers, remove lockwire (11) at final drive, both sides of transmission.

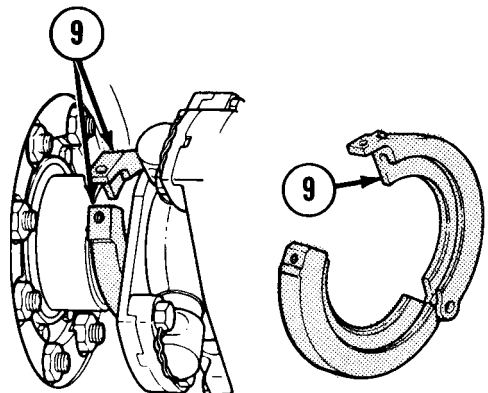
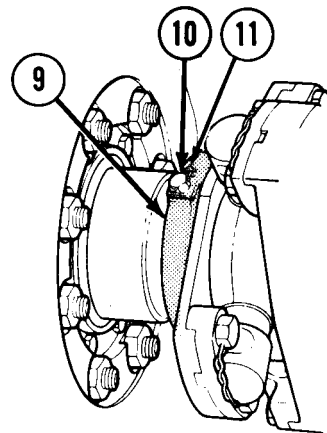
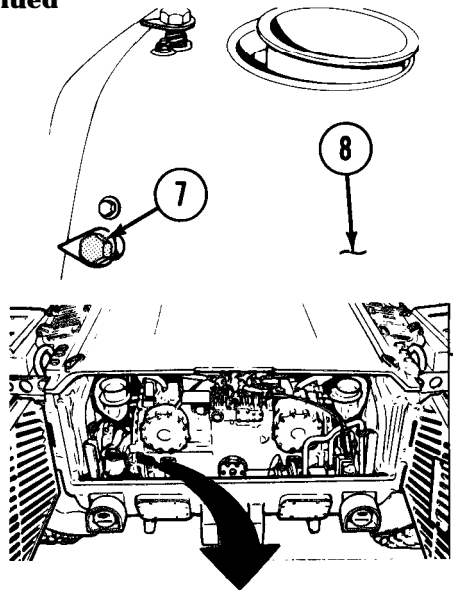
**NOTE**  
**When removing screw (10), hold on to quick-disconnect ring (9), or it will snap open and fall down into engine compartment.**

- k. Using 3/4 inch combination wrench, remove screw (10).

**NOTE**  
**Using hammer, you may have to hit quick-disconnect ring (9) to remove.**

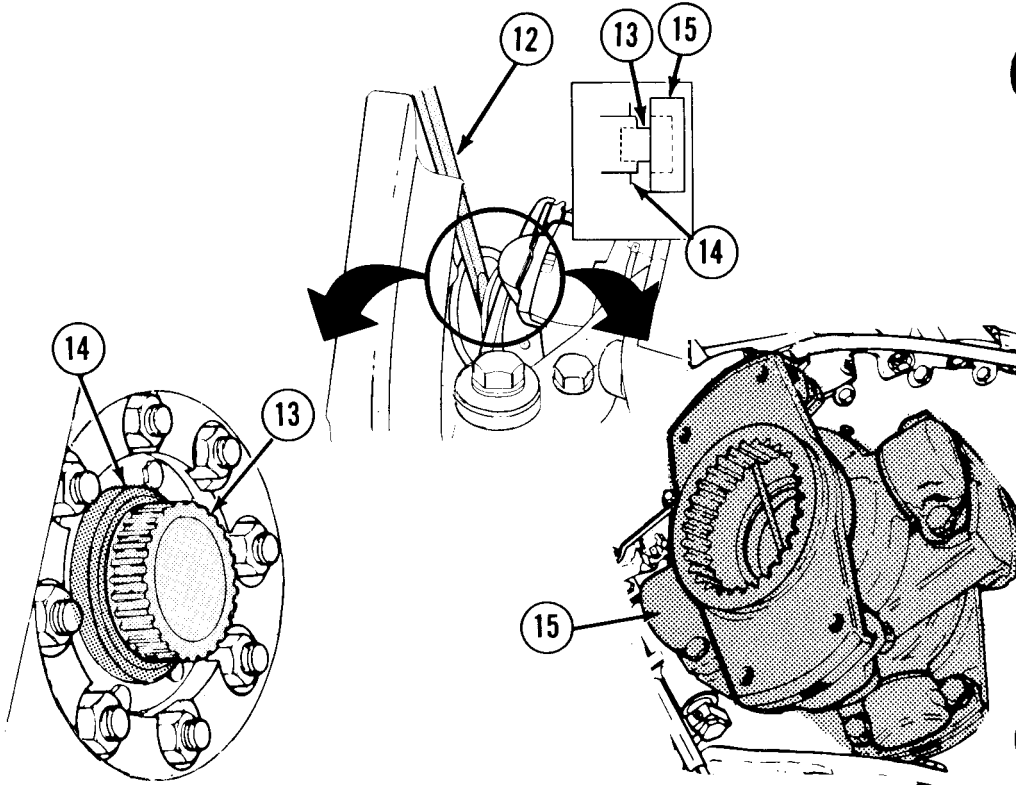
- l. Separate quick-disconnect ring (9).

- m. Remove quick-disconnect ring (9) from both sides of transmission.

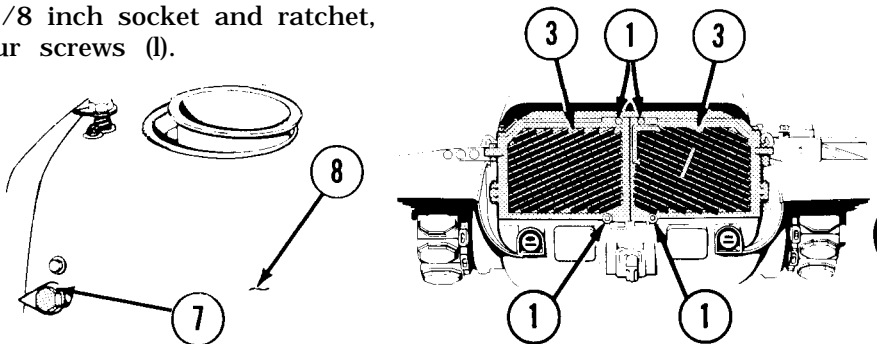


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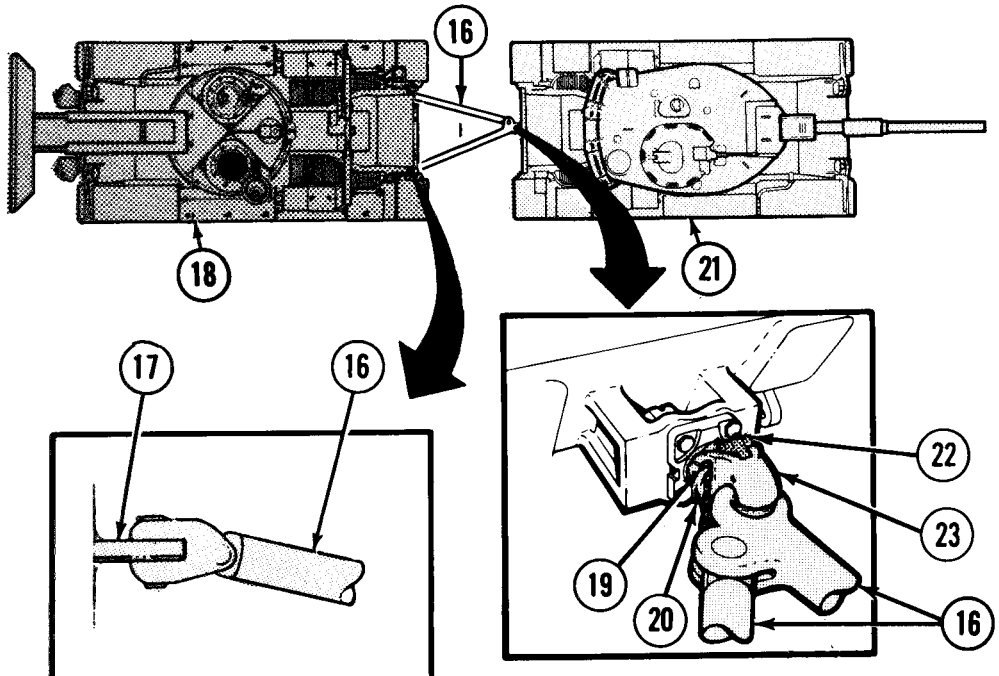
**TOWING A DISABLED VEHICLE - Continued**



- n. Insert pinch bar (12) (item 4, sec III, app B) and, using hammer (item 25, sec III, app B), pry final drive adapter (13) toward final drive (14) far enough to free final drive adapter from universal joint (15) on both sides of transmission.
- o. Reposition shroud (8). Using 3/4 inch combination wrench, rotate six cam screws (7) to secure shroud.
- p. Stow remaining parts in fender box.
- q. Close rear doors (3).
- r. Using 1-1/8 inch socket and ratchet, install four screws (1).



**TOWING A DISABLED VEHICLE - Continued**



3. Connect towing vehicle to disabled vehicle as follows:

- a. Connect tow bar (16) to towing eyes (17) of disabled vehicle (18).
- b. Remove cotter pin (19) from, pintle (20) of towing vehicle (21).
- c. Raise latch (22) and lift lock (23).
- d. Aline pintle (20) with tow bar (16) lower tow bar into Pintle, lower lock (23).
- e. Install cotter pin (19).

4. Remove chocks.

**CAUTION**

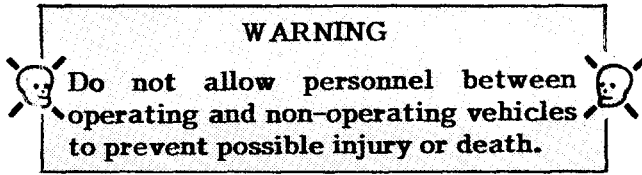
**Do not tow vehicle over 3 mph with universal joints connected or with tracks removed. Do not exceed 8 mph under any conditions.**

- 5. Tow vehicle in a straight line and, when necessary, make wide turns.
- 6. Upon completion of towing operation, chock roadwheels of disabled vehicle.
- 7. Disconnect tow bar.
- 8. Notify organizational maintenance.

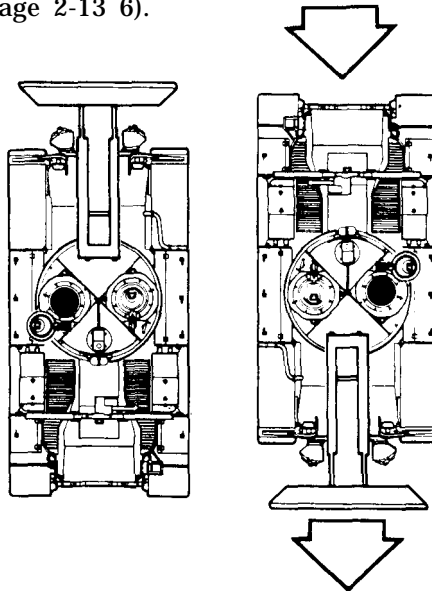
TA247756

## SLAVING HYDRAULIC SYSTEM

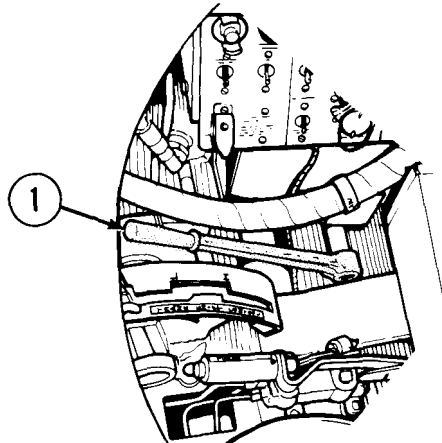
1. On operating vehicle:
  - a. Start engine (page 2-130).



- b. Move operating vehicle next to non-operating vehicle. Preferred position is, facing in opposite directions with commander's cupolas side-by-side.
  - c. Stop engine (page 2-13 6).



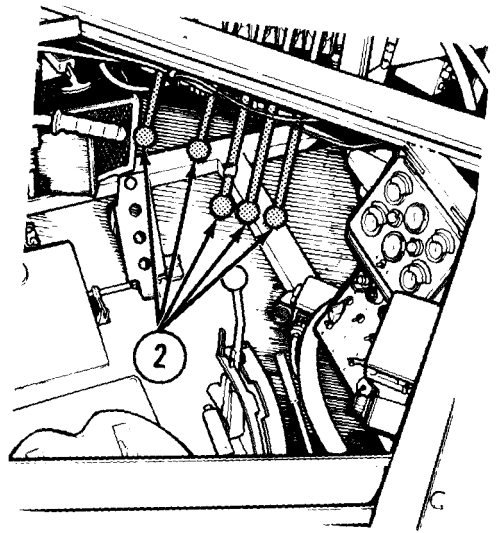
2. On both vehicles:
  - a. Set parking brakes (page 2-125).
  - b. Push down clutch lever (1).



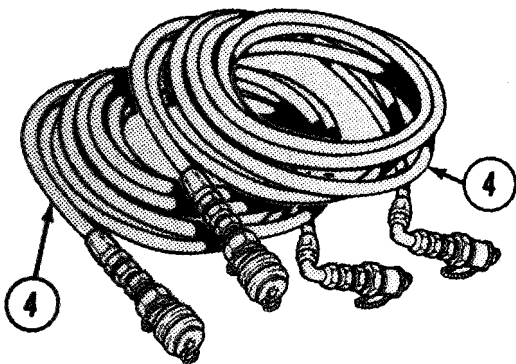
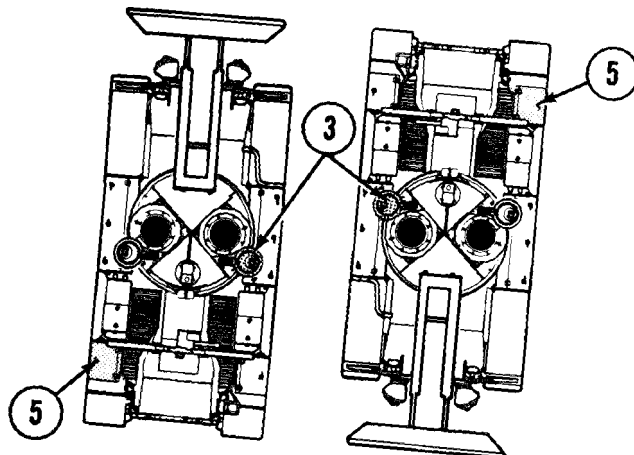
TA247757



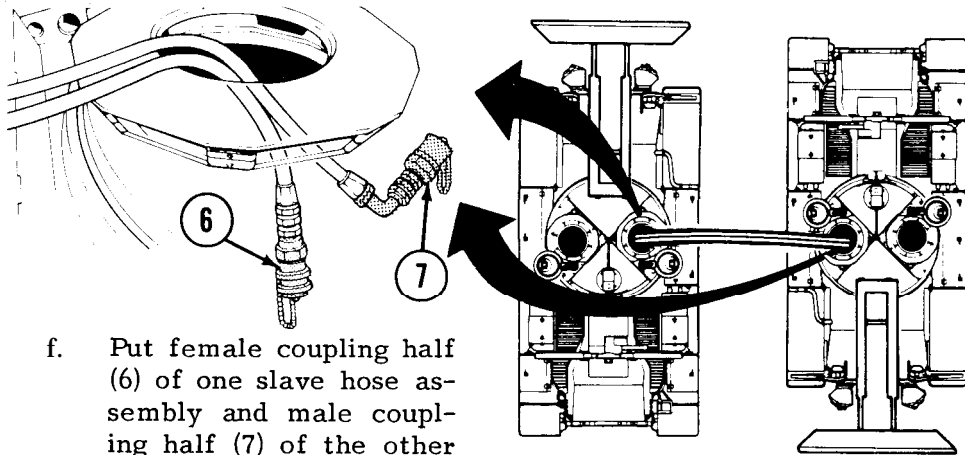
- c. Pull all hydraulic control levers (2) up and down, three times to relieve pressure in system.



- d. Open commander's hatches (3).
- e. Remove slave hose assemblies (4) (item 32, sec III, app B) from left rear fender stowage boxes (5).



**SLAVING HYDRAULIC SYSTEM - Continued**



- f. Put female coupling half (6) of one slave hose assembly and male coupling half (7) of the other slave hose assembly through commander's hatch of each vehicle.

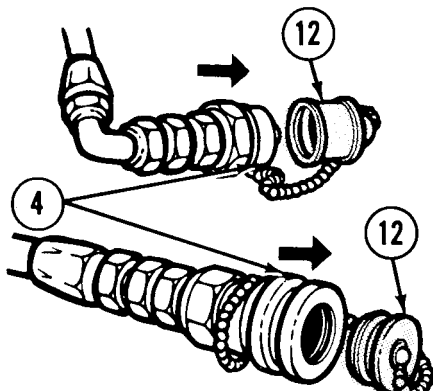
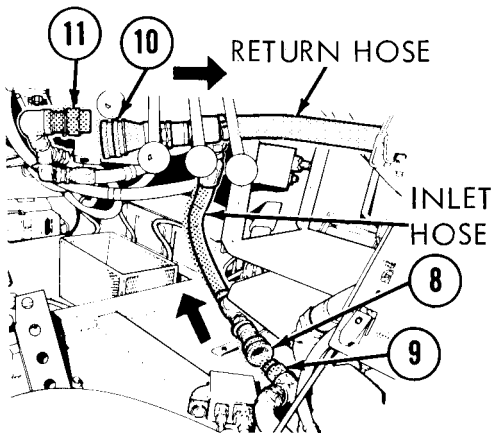
**WARNING**

When connecting or disconnecting the quick-disconnect couplings, cover them with a rag (item 39, app D) to control spray and prevent injury to crewmen.

3. On non-operating vehicle:

- a. Disconnect inlet hose coupling half (8) from pump output coupling half (9). Put rag on coupling half (9).

- b. Disconnect return hose coupling half (10) from valve outlet coupling half (11). Put rag on coupling half (10).



- c. Remove dust caps (12) from slave hoses (4).

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**SLAVING HYDRAULIC SYSTEM - Continued**

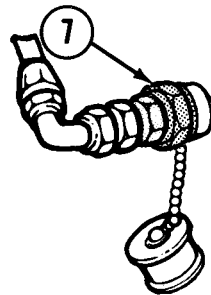
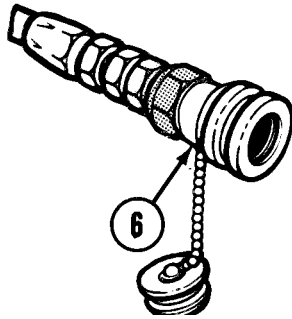
**WARNING**

**Make sure coupling half (6) is pointing away from personnel when relieving pressure. Hydraulic fluid spray could cause serious injury.**

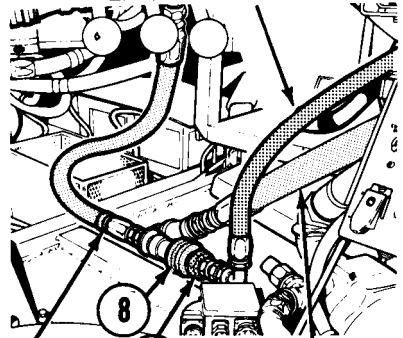
**NOTE**

**If pressure in slave hoses prevents locking quick-disconnects, relieve pressure by performing steps d and e. If quick-disconnects lock properly, omit steps d and e.**

- d. Insert socket extension (item 14, sec. III, app B) into female coupling half (6).
- e. Push back plunger inside female coupling half (6) to bleed excess hydraulic pressure.

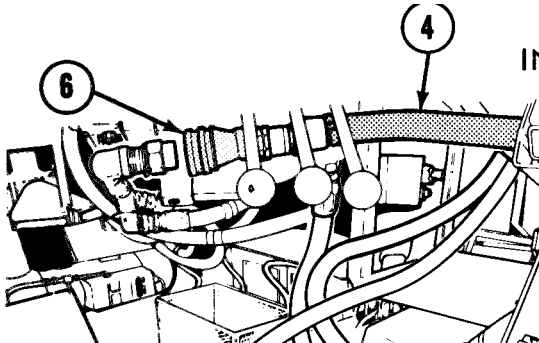


**SLAVE HOSE ASSEMBLY**



**INLET HOSE (7) RETURN HOSE**

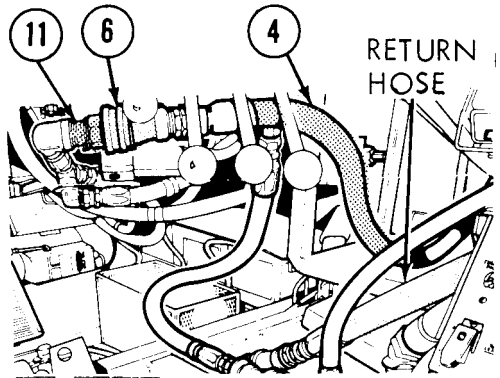
- f. Push male coupling half (7) of slave hose into inlet hose coupling half (8).
- g. Pull on inlet hose and slave hose to make sure connection is locked.



- h. On slave hose (4), pull back and hold female coupling half (6).

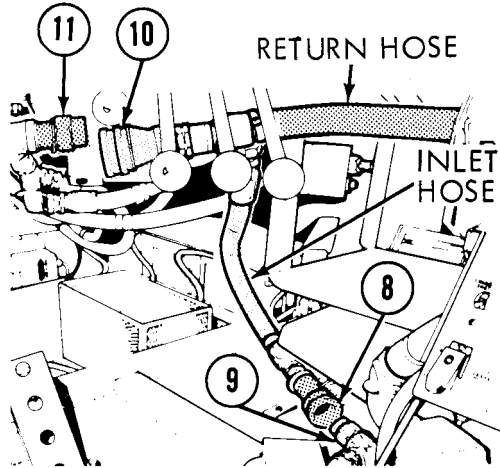
**SLAVING HYDRAULIC SYSTEM - Continued**

- i. Push female coupling half (6) onto valve outlet coupling half (11).
- j. Pull on slave hose (4) to make sure connection is locked.

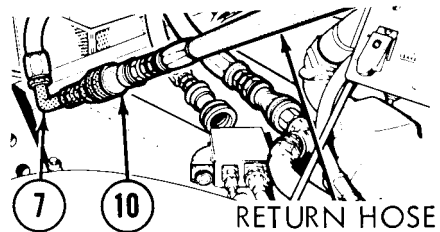
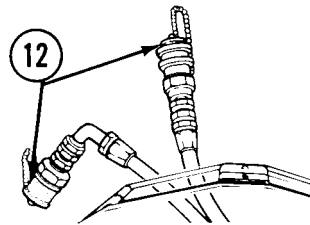


4. On operating vehicle:

- a. Disconnect inlet hose coupling half (8) from pump output coupling half (9). Put protective covering on coupling half (8).
- b. Disconnect return hose coupling half (10) from valve outlet coupling half (11). Put protective covering on coupling half (11).



- c. Remove dust caps (12) from slave hoses.
- d. Push male coupling half (7) of slave hose into female coupling half (10) of return hose.
- e. Pull on both hoses to make sure connection is locked.

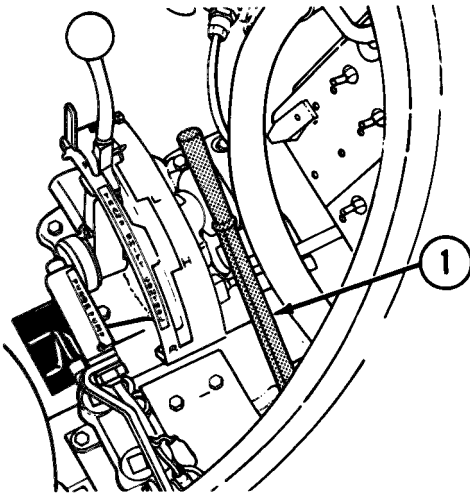
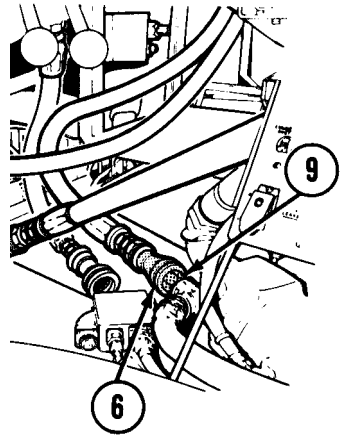


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**SLAVING HYDRAULIC SYSTEM - Continued**

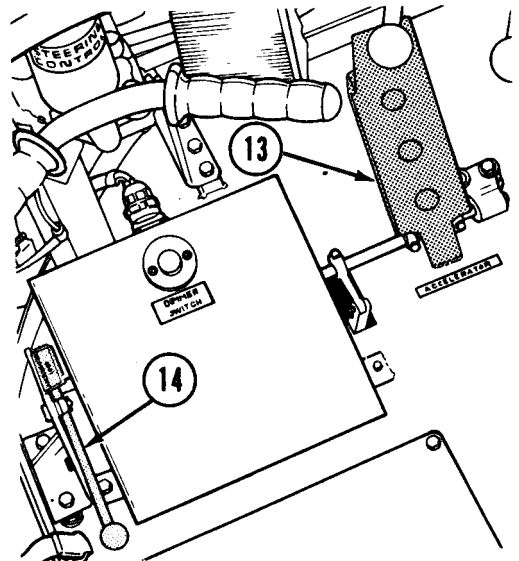
Push female coupling half (6) of slave hose on male coupling half (9) of pump outlet.

Pull on slave hose to make sure connection is locked.



- h. Start engine (page 2-1 30).
- i. Pull up clutch lever (1).

- j. Depress accelerator (13) until engine is running 1,800 rpm.
- k. Raise accelerator lock lever (14).



TA247762

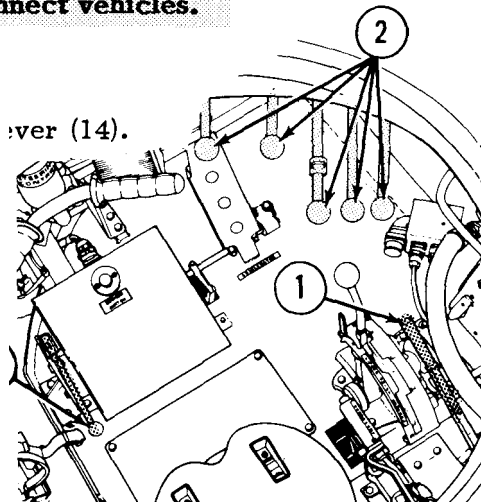
**SLAVING HYDRAULIC SYSTEM - Continued**

5. Using hydraulic controls in non-operating vehicle, launch bridge (page 2-142) or retrieve (page 2-150).

**NOTE**

**Upon completion of launch or retrieve procedure, perform the following steps to disconnect vehicles.**

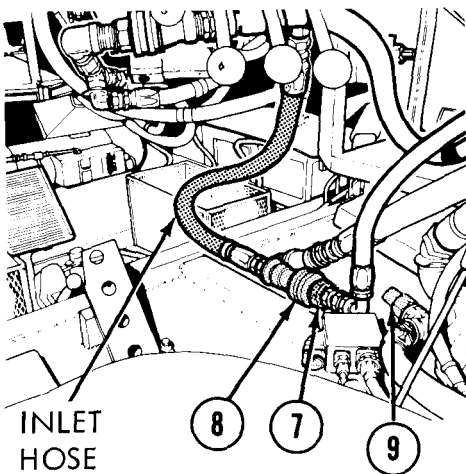
6. On operating vehicle:
  - a. Push down accelerator lock lever (14).
  - b. Push down clutch lever (1)
  - c. Stop engine (page 2-136).
7. On non-operating vehicle:
  - a. Push all hydraulic control levers (2) up and down three times to relieve pressure in system.



**WARNING**

When connecting or disconnecting the quick-disconnect couplings, cover them with a rag (item 39, app D) to control spray and prevent injury to crewmen.

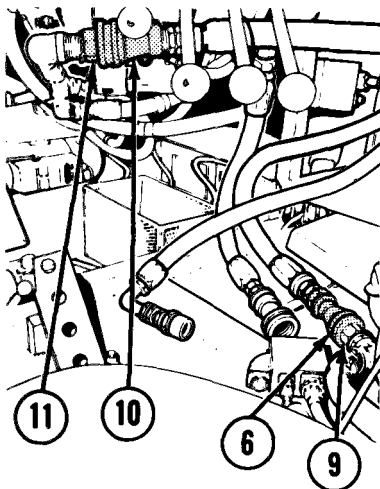
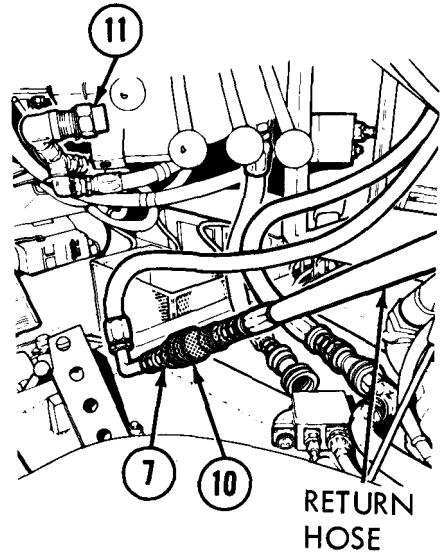
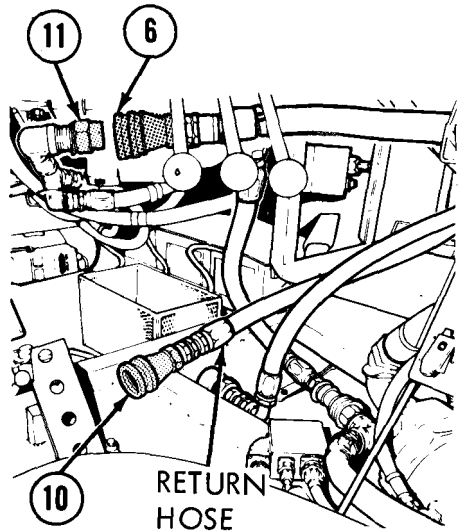
- b. Disconnect slave hose male coupling half (7) from inlet hose coupling half (8).
- c. Remove protective covering and connect inlet hose coupling half (8) to pump outlet coupling half (9).
- d. Pull on inlet hose to make sure connection is locked.



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**SLAVING HYDRAULIC SYSTEM - Continued**

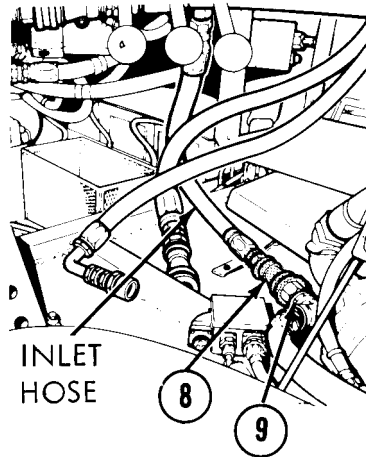
- e. Disconnect slave hose female coupling half (6) from valve outlet coupling half (11).
  - f. Remove protective covering and connect return hose coupling half (10) to valve outlet coupling half (11).
  - g. Pull on return hose to make sure connection is locked.
  - h. Wipe up any spilled hydraulic fluid.
8. On operating vehicle:
- a. Disconnect slave hose male coupling half (7) from return hose coupling half (10).
  - b. Remove protective covering and connect return hose coupling half (10) to valve outlet coupling half (11).
  - c. Pull on return hose to make sure connection is locked.



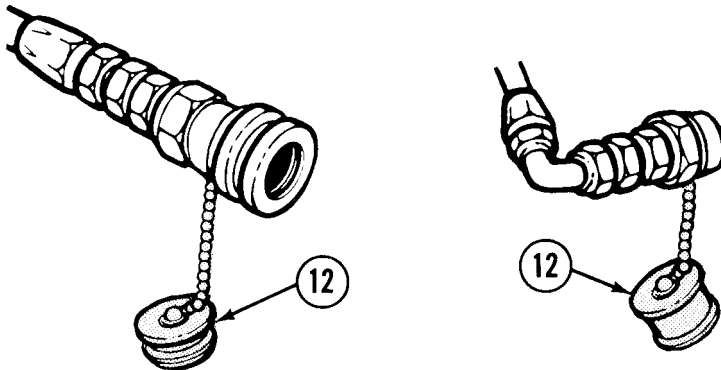
- d. Disconnect slave hose female coupling half (6) from pump outlet male coupling half (9).

**SLAVING HYDRAULIC SYSTEM - Continued**

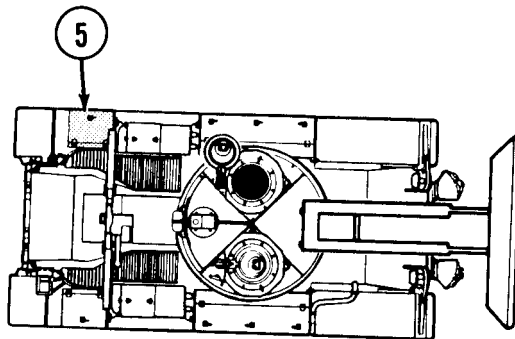
- e. Remove protective covering and connect inlet hose coupling half (8) to pump output coupling half (9).
- f. Pull on inlet hose to make sure connection is locked.
- g. Wipe up any spilled hydraulic fluid.



- 9. Clean both slave hoses using solvent (item 42, app D).
- 10. Dry hoses thoroughly.
- 11. Install dust caps (12) on slave hoses.



- 12. Stow a slave hose in the left rear fender stowage box (5) of each vehicle.



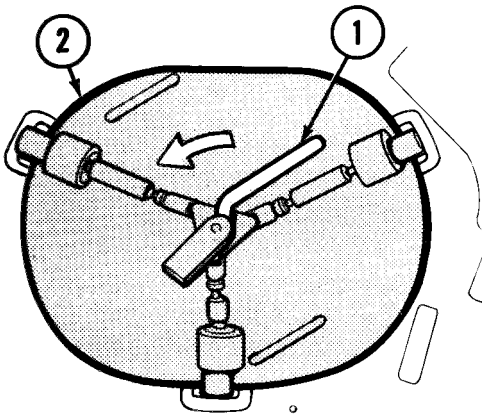
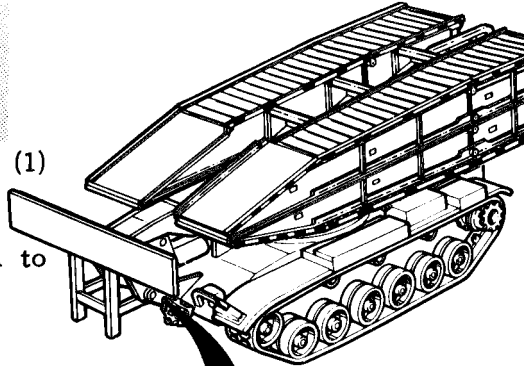


**REMOVING/INSTALLING ESCAPE HATCH  
REMOVAL**

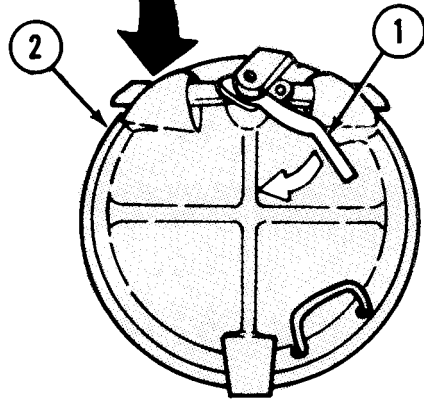
**CAUTION**

Escape hatch should be operated only for emergency exit from vehicle. Hatch weighs about 125 pounds (56.8 kg) and will fall to ground when released.

1. Move escape hatch lever (1) in direction shown.
2. Escape hatch (2) will fall to ground.



LATE-TYPE  
ESCAPE HATCH



EARLY-TYPE ESCAPE HATCH

**INSTALLATION**

**NOTE**

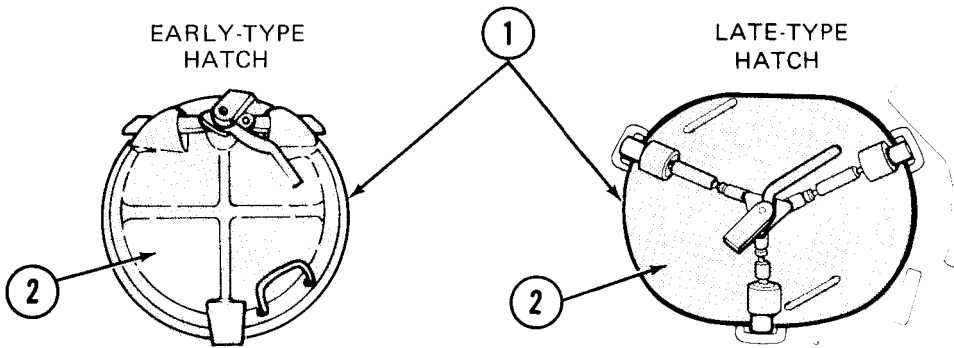
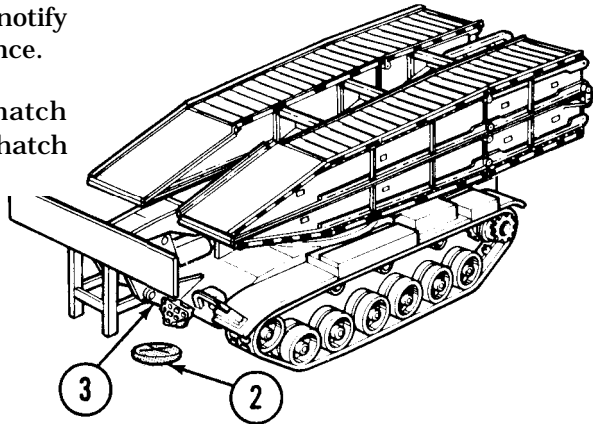
- Normally, this task is organizational maintenance responsibility. In an emergency, crew can replace as follows.
- Use hydraulic floor jack if available. If not, use three persons. Two will raise cover outside vehicle and one inside to latch cover.

TA247766

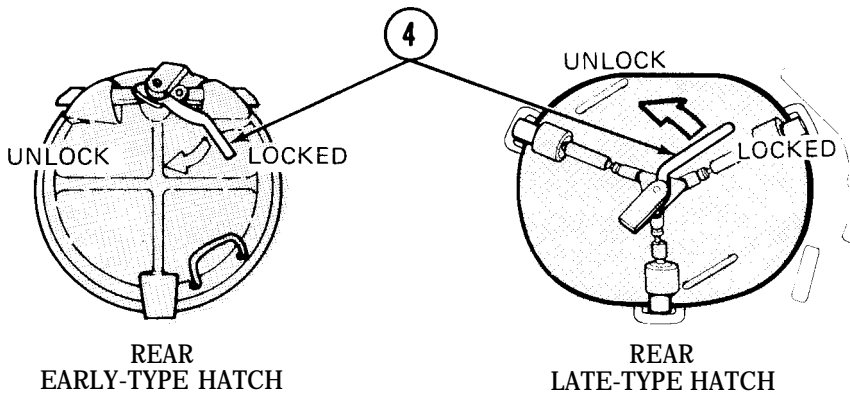
**REMOVING/INSTALLING ESCAPE HATCH - Continued**

**INSTALLATION - Continued**

1. Inspect hatch seal (1) for cracks and tears.
2. If seal (1) is defective, notify organizational maintenance.
3. Clean edge of escape hatch (2) and edge of escape hatch opening (3).



4. Lubricate seal (1) with silicone compound (item 16, app D).

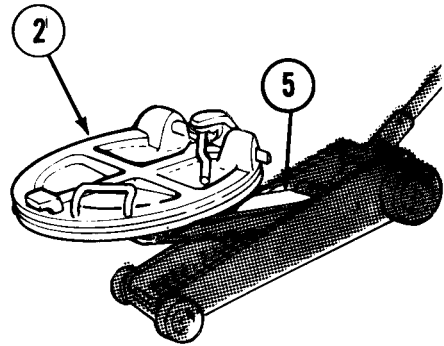


5. Push latch lever (4) all the way left to unlock.

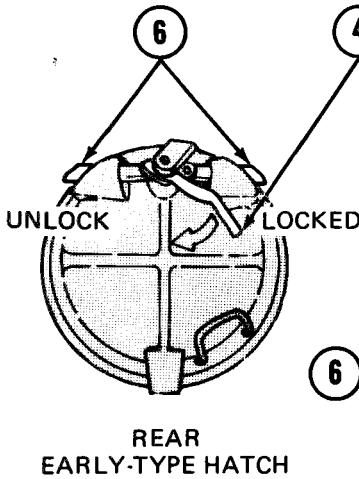
**REMOVING/INSTALLING ESCAPE HATCH - Continued**

**INSTALLATION - Continued**

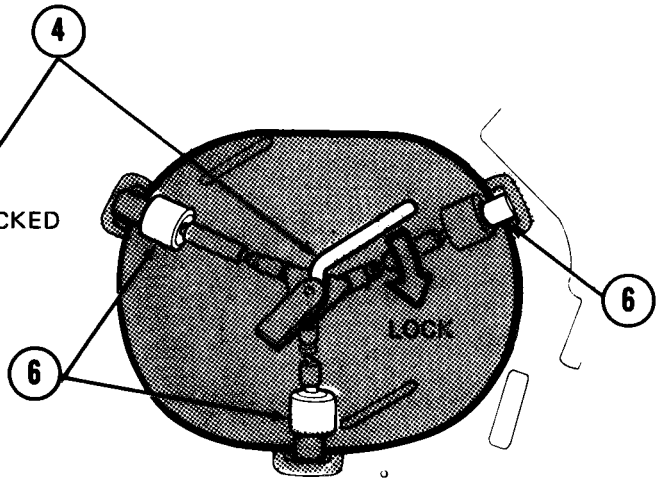
6. Position hatch (2) on jack (5) (if available).
7. Position hatch (2) and jack (5) under hull opening.
8. Raise jack (5) until hatch (2) is in opening.
9. Aline hatch (2) with hull opening.



EARLY TYPE SHOWN



REAR EARLY-TYPE HATCH



REAR LATE-TYPE HATCH

10. Push latch lever (4) all the way right to lock hatch in place.
11. Lower jack and remove.

**INSTALL DRIVER'S ESCAPE HATCH (INSPECT HATCH FOR SECURE REPLACEMENT)**

1. See that latch lever (4) is seated.
2. See that locking bolts (6) are fully seated.
3. If latch lever (4) and locking bolts (6) are not seated, notify organizational maintenance.

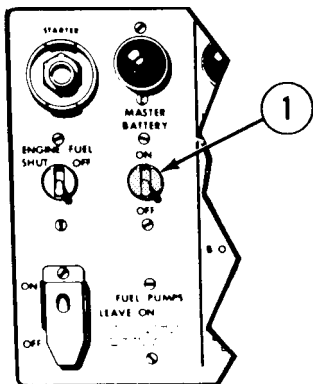
## OPERATING GAS PARTICULATE FILTER UNIT

### WARNING

Neither the filter unit nor the M25A1 tank mask will protect you against carbon monoxide poisoning.

If under CBR attack, put mask on as quickly as possible. It alone will filter toxic agents while gas particulate unit is put into operation.

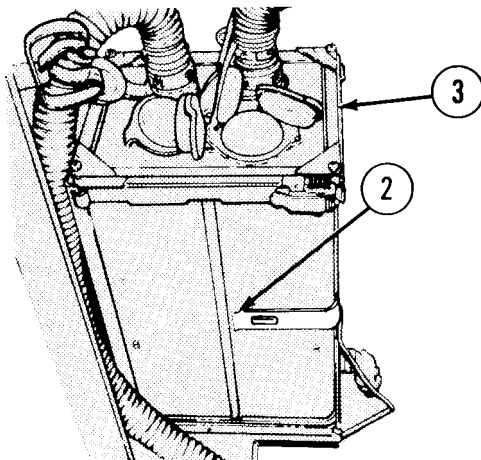
If NBC exposure is suspected, all air filter media should be handled by personnel wearing protective equipment. Consult your unit NBC Officer or NBC NCO for appropriate handling or disposal instructions.



1. Set MASTER BATTERY switch (1) to ON.

2. Put on and adjust M25A1 protective mask (not part of filter unit). See TM 3-4240-280-10.

3. Slide spring clip (2) from air intake openings on precleaned and particulate filter unit assembly (3).



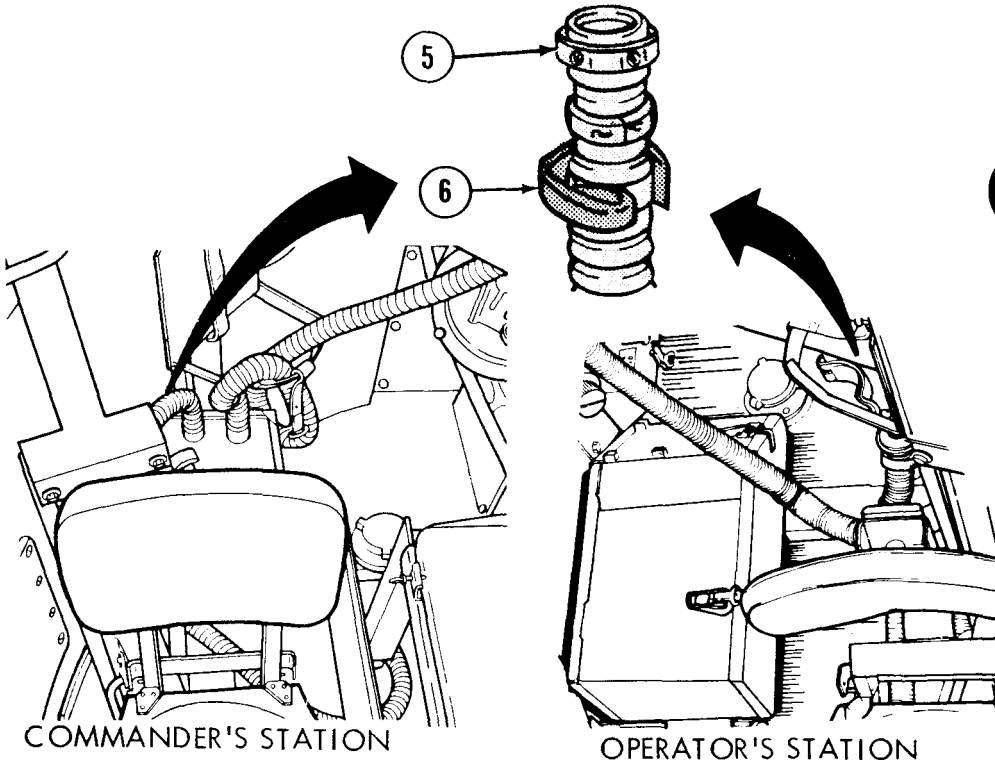
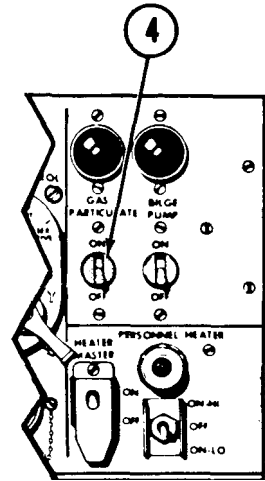


**OPERATING GAS-PARTICULATE FILTER UNIT - Continued**

4. Set GAS PARTICULATE switch (4) to ON.

**WARNING**

Frostbite to the cheekbone area of the face may be experienced by wearers of the M25A1 protective mask from subfreezing air delivered by the gas-particulate filter unit. Do not connect the protective mask to the filter unit hose unless existing air temperature is well above freezing.

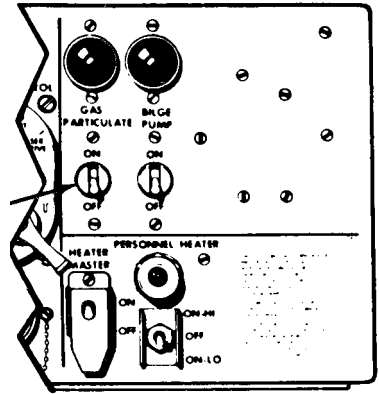


5. Disconnect hose (5) from clip (6).
6. Connect hose (5) to M25A1 protective mask canister.

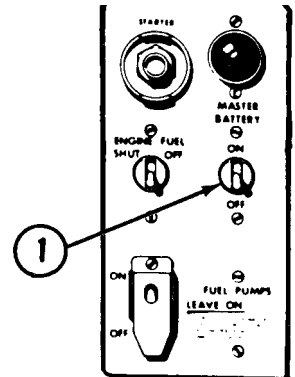
**OPERATING GAS PARTICULATE FILTER UNIT - Continued**

To stop filtered air:

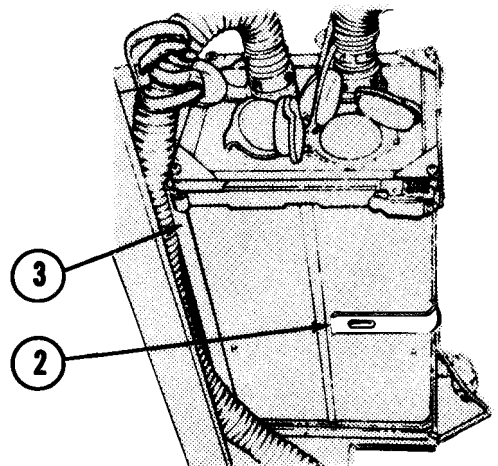
1. Set GAS-PARTICULATE switch (4) to OFF.



2. Set MASTER BATTERY switch (1) to OFF if not required for other operation.



3. Remove M25A1 protective mask, disconnect from protective mask canister and connect hose (5) to appropriate clip (6).
4. Press spring clip (2) on particulate filter unit assembly (3) to close air intake openings.



## GAS AND PARTICULATE FILTER CHANGE CRITERIA

### WARNING



If NBC exposure is suspected, all air filter media must be handled by personnel wearing protective equipment. Contact your unit NBC Officer or NBC NCO for appropriate handling or disposal instructions.



For your maximum safety, it is vital that the gas and particulate filters of the filter unit M8A3 be fully serviceable. You are responsible for notifying organizational maintenance when one or more of the following conditions exist. They are responsible for changing filters when notified.

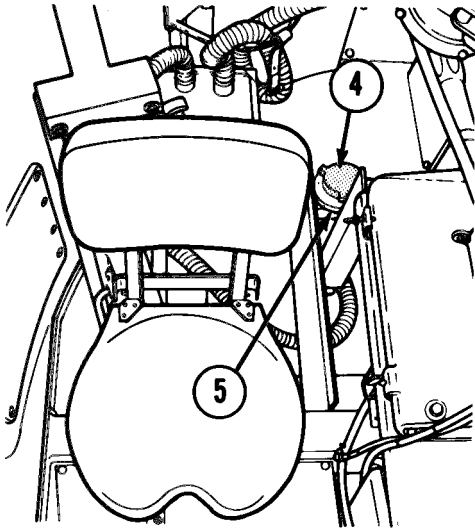
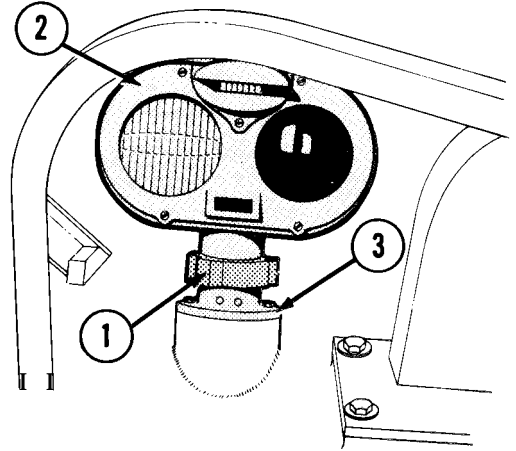
1. Conditions for M12A1 gas filter replacement:
  - a. Physical damage or water immersion.
  - b. Low air flow to the masks, determined not to be caused by incorrect hose connections or low electrical power.
  - c. At beginning of combat conditions when the use of CK (Cyanogen Chloride) or AC (Hydrogen Cyanide) is expected.
  - d. As soon as possible after each AC or CK attack.
  - e. 5,000 mile vehicle overhaul (peacetime).
  - f. 1,500 hours of vehicle operation (approximately 5 months, wartime).
2. Conditions for M13 particulate filter replacement:
  - a. Physical damage.
  - b. The M 12A1 gas filter is changed.
  - c. The particulate filter becomes clogged, resulting in insufficient air flow.



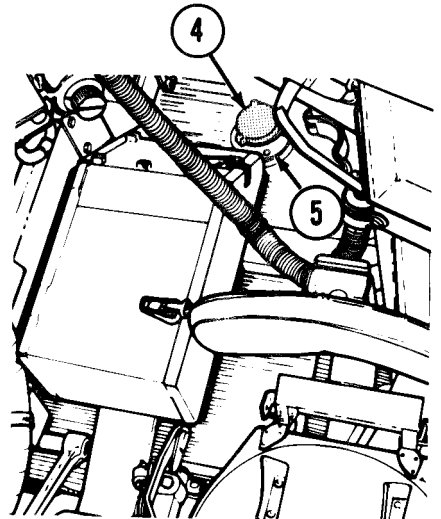
**REMOVING/STOWING/INSTALLING HEADLIGHT**

**REMOVAL AND STOWAGE**

1. Unscrew nut (1).
2. Pull headlight (2) upward to remove from outside mount (3).

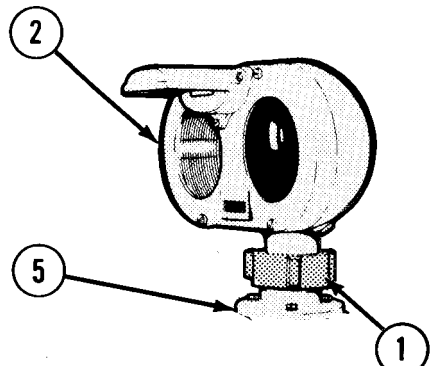


BEHIND COMMANDER'S SEAT



BEHIND OPERATOR'S SEAT

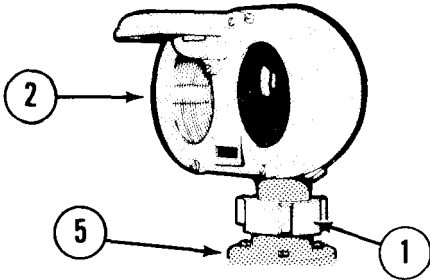
3. Unscrew caps (4) from inside stowage mounts (5).
4. Position headlight (2) on inside stowage mount (5) and secure with nut (1).
5. Install caps (4) on outside mounts (3).



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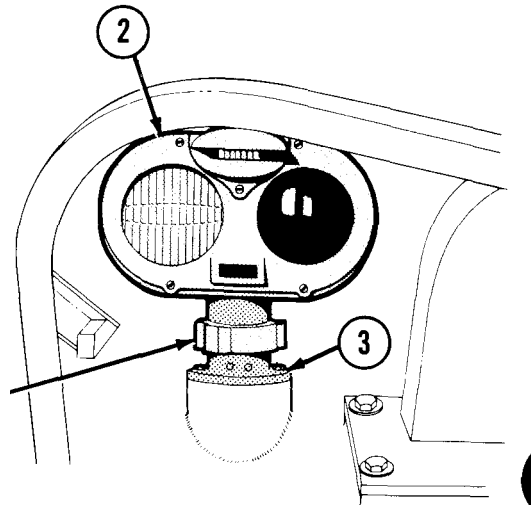
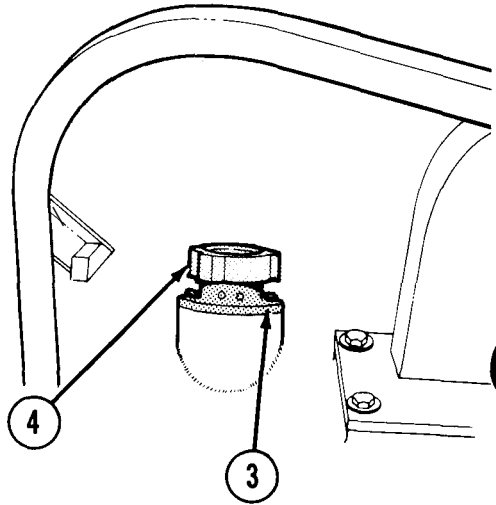
**REMOVING/STOWING/INSTALLING HEADLIGHT - Continued**

**INSTALLATION**



1. Remove headlights (2) from inside stowage mounts (5) by unscrewing headlight nut (1).

2. Remove caps (4) from outside mounts (3).
3. Install caps (4) on inside stowage mounts (5).
4. Install headlights (2) by pushing headlight downward into connector on mount (3).
5. Thread nut (1) onto mount (3) and tighten nut until secure.



TA247773

**CHAPTER 3****MAINTENANCE INSTRUCTIONS****Section I. LUBRICATION INSTRUCTIONS****SERVICE INTERVALS-NORMAL CONDITIONS**

For safer, more trouble-free operation, see to it that your vehicle is serviced when it needs it. LO 5-5420-202-12, M60A1 AVLB lubrication order, has been rescinded. All crew lubrication tasks have been incorporated into Appendix G and into the PMCS contained in this manual. They are to be performed as required or as a part of crew PMCS. Any reference to LO 5-5420-202-12 must be considered a reference to Appendix G, crew PMCS, or organizational PMCS and must be performed in accordance with instructions provided in the applicable procedures. All lubrication instructions are mandatory.

**SERVICE INTERVALS-UNUSUAL CONDITIONS**

Your vehicle will require extra service and care when you operate under unusual conditions. High or low temperatures, long periods of hard use, or continued use in sand, water, mud, or snow will break down the lubricant. Then you have to add or change lubricant more often. But during long periods when the vehicle isn't used, service intervals can be stretched.

**Section II. TROUBLESHOOTING**

The way you operate and maintain your vehicle will determine how often you'll have to use the troubleshooting section.

Pages 3-2 through 3-25 list common malfunctions which you may find during operation or maintenance of your vehicle or its components. You should perform test/inspections and corrective actions in the order listed.

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 corrective actions, notify your supervisor.

If the corrective action requires lubrication or oil, refer to Appendix G or notify organizational maintenance.

TROUBLESHOOTING - Continued

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**MALFUNCTION**  
**TEST OR INSPECTION**  
**CORRECTIVE ACTION**

---

**ENGINE**

**1. ENGINE DOES NOT CRANK WHEN STARTER SWITCH IS DEPRESSED**

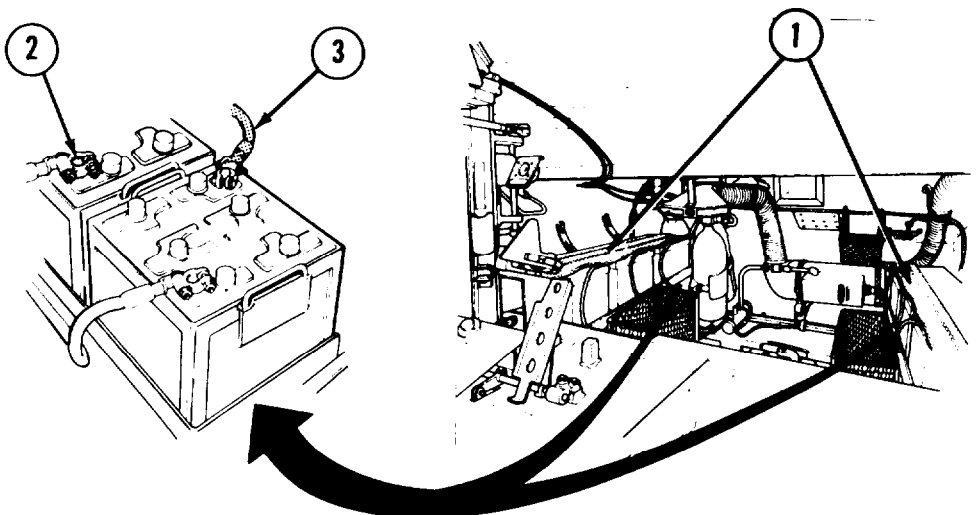
Step 1. Move shifting control lever from park to reverse and back to park. Attempt to start vehicle. If vehicle does not start, go to step 2.

**WARNING**

**Remove all rings, jewelry or other metal objects before checking batteries. Conducting electrical charge through metal objects can cause serious injury to personnel.**

Step 2. Remove battery cover assemblies (1) (page 3-75). Visually check to see if battery terminals (2) and cables (3) are corroded or damaged.

If cables are corroded or damaged, notify organizational maintenance.



**TROUBLESHOOTING - Continued**


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**MALFUNCTION**  
**TEST OR INSPECTION**  
**CORRECTIVE ACTION**


---

**1. ENGINE DOES NOT CRANK WHEN STARTER SWITCH IS DEPRESSED - Continued**

Step 3. Visually check for broken or loose battery connections and posts.

If connections are loose, notify organizational maintenance.

Step 4. Check to see if electrolyte level is above top of plates (page 3-75).

If electrolyte level is low, notify organizational maintenance.

Step 5. Slave start vehicle (page 2-180).

a. Allow engine to run 30 minutes to charge batteries.

b. If engine does not start or batteries do not charge, notify organizational maintenance.

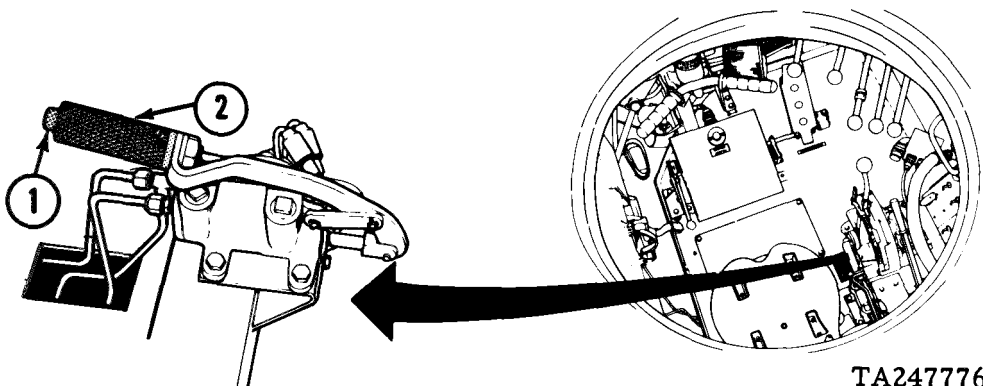
**2. ENGINE CRANKS BUT DOES NOT START**

Step 1. Pump purge handle (2) until you feel back pressure.

Air will be purged from fuel lines.

Step 2. Start engine (page 2-130).

If engine does not start, go to step 3.



TA247776

**TROUBLESHOOTING - Continued**

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**MALFUNCTION**

**TEST OR INSPECTION**

**CORRECTIVE ACTION**

---

**2. ENGINE CRANKS BUT DOES NOT START - Continued**

**CAUTION**

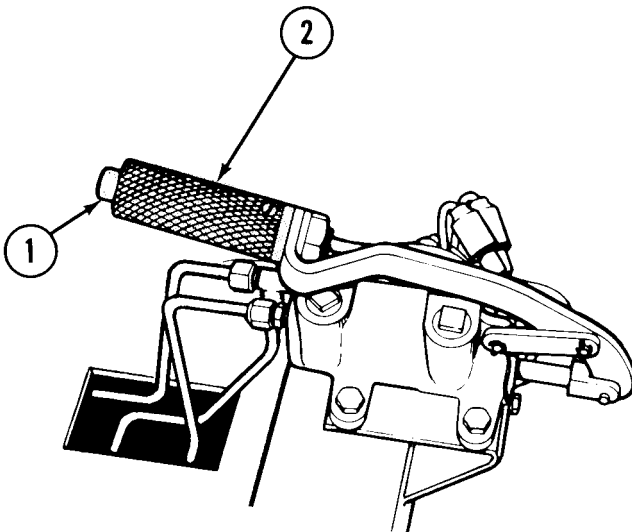
**Do not hold manifold heater switch (1) longer than 15 seconds. Holding manifold heater switch more than 15 seconds can damage manifold heaters.**

**NOTE**

**If temperature is less than 40°F, go to step 3. If temperature is above 40°F, go to step 4.**

Step 3. While depressing starter switch, press and hold manifold heater switch (1) and pump purge handle (2) for 15 seconds.

If engine does not start, go to step 4.



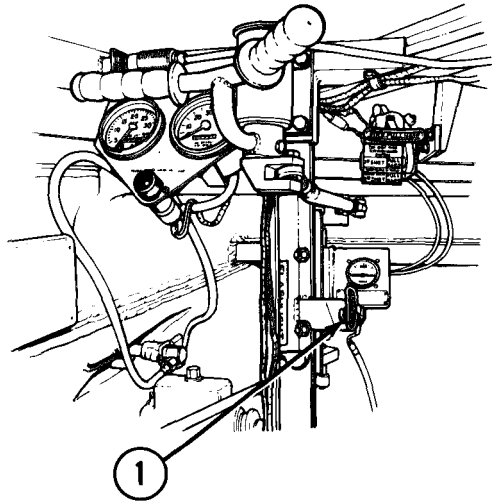
TA247777

**TROUBLESHOOTING - Continued**

<b>MALFUNCTION</b>	<b>TEST OR INSPECTION</b>	<b>CORRECTIVE ACTION</b>
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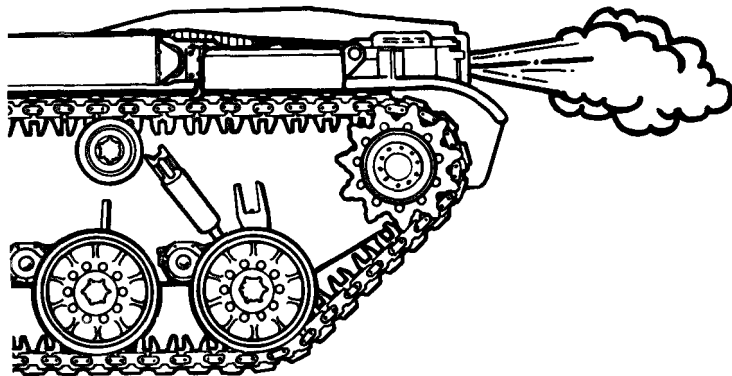
**2. ENGINE CRANKS BUT DOES NOT START- Continued**

Step 4. Operate fuel shutoff handle (1) three times. Push fuel shutoff handle in and start engine.



If engine does not start, notify organizational maintenance.

**3. DARK OR BLACK SMOKE BLOWING THROUGH REAR GRILLE DOORS (AFTER WARMUP)**



**CAUTION**

If engine oil pressure indicator shows in red, stop engine (Page 2-136). Continued operation may cause engine damage.

TA247778

**TROUBLESHOOTING - Continued**

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**MALFUNCTION**

**TEST OR INSPECTION**

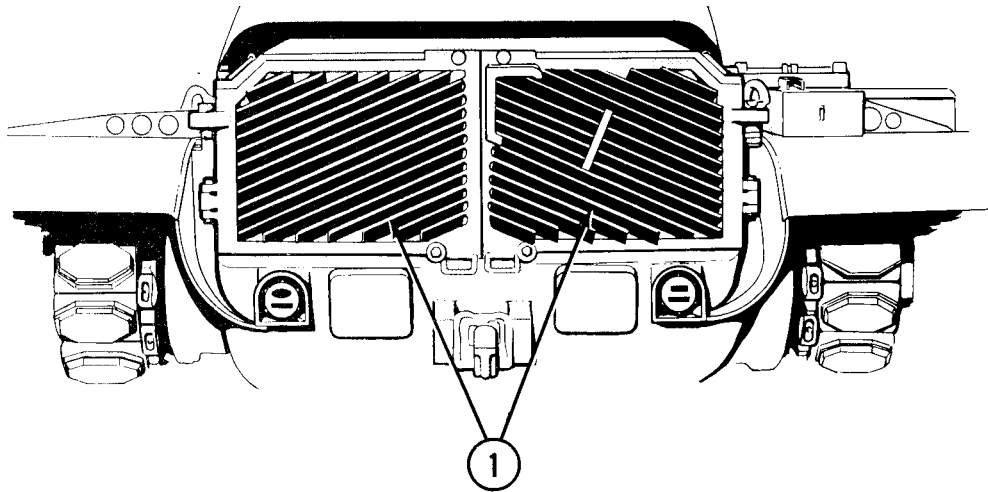
**CORRECTIVE ACTION**

---

**3. DARK OR BLACK SMOKE BLOWING THROUGH REAR GRILLE DOORS (AFTER WARMUP) - Continued**

Step 1. Feel rear grille doors (1) to check for oil.

If oil is present, notify organizational maintenance.



Step 2. Check engine oil level (page 2-57).

- a. If engine oil level is too high (overfull), notify organizational maintenance.
- b. If engine oil level is correct, perform steps 2, 3, and 4 of Malfunction 4, Engine Runs Rough or Does Not Idle Properly After Warmup.



**TROUBLESHOOTING - Continued**


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**MALFUNCTION**  
**TEST OR INSPECTION**  
**CORRECTWE ACTION**

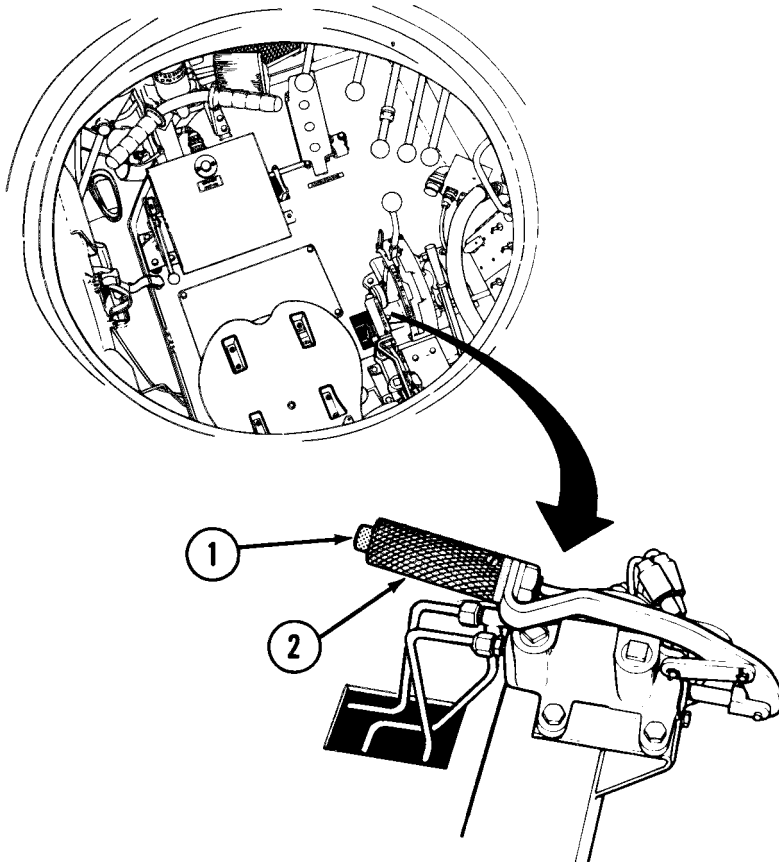

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**4. ENGINE RUNS ROUGH OR DOES NOT IDLE PROPERLY (AFTER WARMUP)****CAUTION**

**Do not push manifold heater switch (1) while operating purge pump handle (2) in step 1. This may damage the intake manifold.**

Step 1. Pump purge pump handle (2) until back pressure is felt.

If engine still does not run properly, shut down engine (page 2-136).



TA247780

**TROUBLESHOOTING - Continued**

**MALFUNCTION**

**TEST OR INSPECTION**

**CORRECTIVE ACTION**

**4. ENGINE RUNS ROUGH OR DOES NOT IDLE PROPERLY (AFTER WARM PUP) - Continued**

**NOTE**

**AVLB vehicles may not be equipped with air restriction indicators. If the vehicle does not have air restriction indicators, go to step 3.**

Step 2. Visually check both air restriction indicators (1) if equipped, for condition of air cleaner filters. The air restriction indicators will be either the Early Model or the Late Model.

a. If the vehicle is equipped with Early Model indicators attempt to reset the restriction indicators by pushing reset button (2).

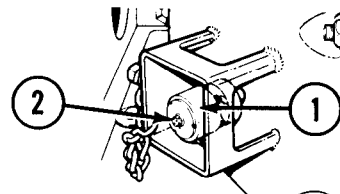
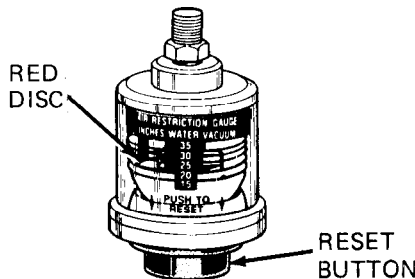
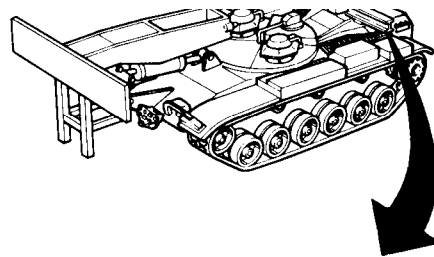
(1) If either indicator shows a red band after resetting, notify organizational maintenance for service.

(2) If both indicators are showing clear, go to step 4.

b. If the vehicle is equipped with the Late Model indicators and they have a reading of 30 inches or more, as shown by the red disc, the filter elements need to be cleaned, notify organizational maintenance.

**NOTE**

**Late model indicators are not to be reset until filter element has been cleaned or replaced.**



EARLY MODEL

TA247781

**TROUBLESHOOTING - Continued**


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**MALFUNCTION**  
**TEST OR INSPECTION**  
**CORRECTIVE ACTION**

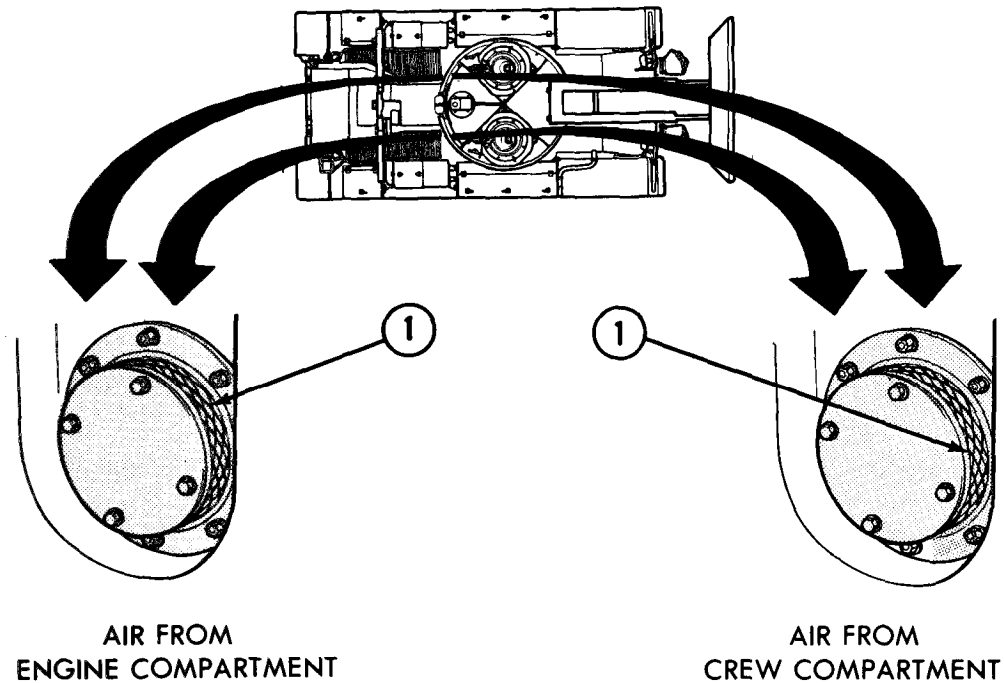

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**4. ENGINE RUNS ROUGH OR DOES NOT IDLE PROPERLY (AFTER WARMUP) - Continued**

Step 3. Check engine air intakes (1) inside crew compartment or through top deck grille doors for obstruction.

- a. Remove any foreign material obstructing intake air and start engine (page 2-1 30).
- b. If engine does not run properly, notify organizational maintenance.

Step 4. For vehicles without air restriction indicators, notify organizational maintenance.



TA247782

**TROUBLESHOOTING - Continued**

**MALFUNCTION**

**TEST OR INSPECTION**

**CORRECTIVE ACTION**

- 5. POWERPLANT WARNING LIGHT COMES ON WHILE ENGINE IS RUNNING ABOVE 750-800 RPM**

**CAUTION**

**IF POWERPLANT WARNING LIGHT is on, check ENGINE and TRANSMISSION oil pressure and temperature indicators (gages). stop engine if ENGINE or TRANSMISSION indicators show in red (page 2-136).**

- Step 1. Check right and left top deck grille doors to see if anything is blocking airflow.

If grille doors are obstructed, remove obstruction.

- Step 2. Check engine and transmission oil cooler screens for obstruction by dirt, leaves or other foreign material (page 2-60).

If obstruction is found, remove. If unable to remove obstruction, notify organizational maintenance.

**CAUTION**

**operate engine only long enough to check engine and transmission oil levels. Continued operation with powerplant warning light on could cause severe damage to the engine or transmission.**

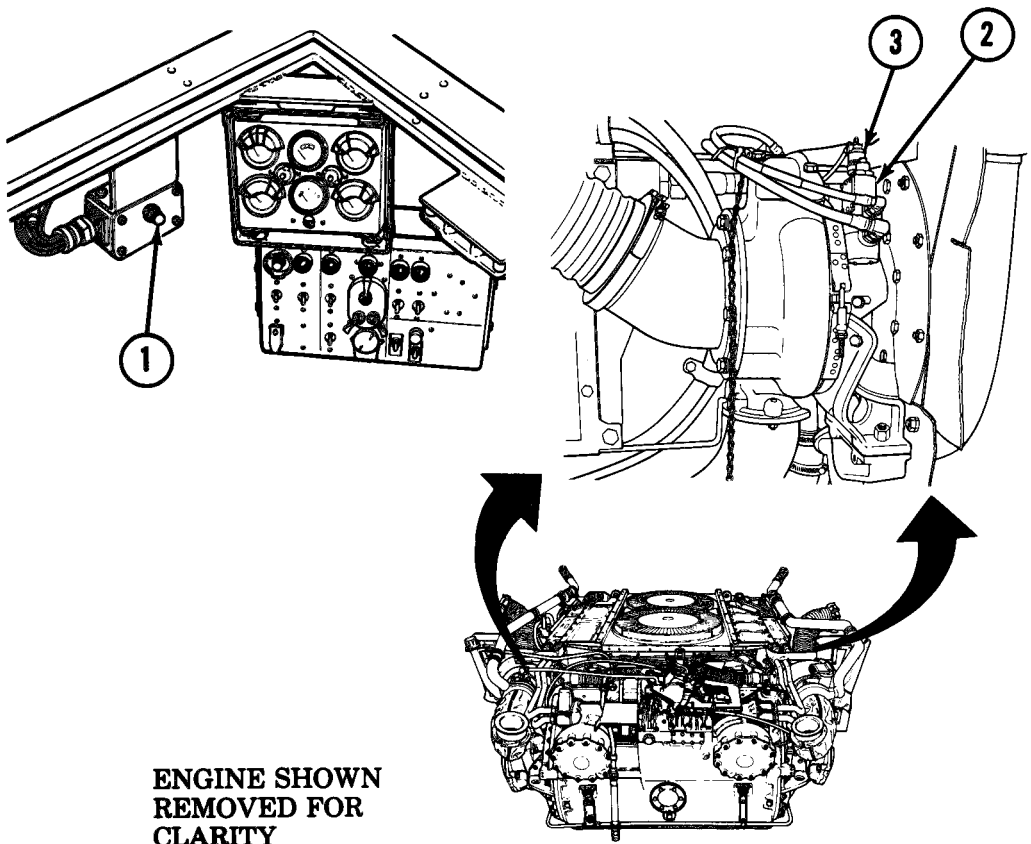
- Step 3. **Check engine and transmission oil levels (LO 5-5420-202-12).**

- a. If engine or transmission oil is low, add oil (LO 5-5420-202-12).
- b. If powerplant warning light comes on, notify organizational maintenance.

**TROUBLESHOOTING - Continued****MALFUNCTION****TEST OR INSPECTION****CORRECTIVE ACTION**

5\* POWERPLANT WARNING LIGHT COMES ON WHILE ENGINE IS RUNNING ABOVE 750-800 RPM - Continued

- Step 4. Check DUST DETECTOR WARNING LAMP (1) (if equipped),
- a. If lamp is on, stop vehicle.
  - b. Open grille doors and check both dust detector pressure switches (2).
  - c. A red plunger (3), visible through plastic cover on switch body, indicates switch (2) has tripped.
  - d. If switch (2) has tripped, notify organizational maintenance.





**TROUBLESHOOTING - Continued**


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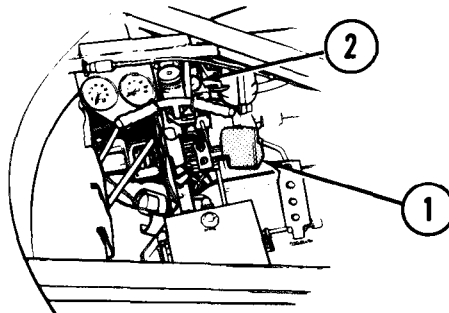
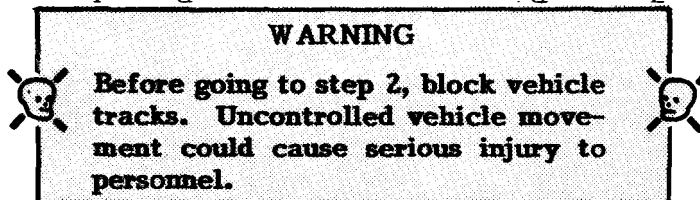
**MALFUNCTION**  
**TEST OR INSPECTION**  
**CORRECTIVE ACTION**


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**BRAKES****6. PARKING BRAKE DOES NOT RELEASE**

Step 1. With transmission shift lever in P (park), depress brake pedal (1) and increase brake pressure to 1000 psi on brake pressure gage (2), and shift transmission to N (neutral).

If parking brake does not release, go to step 2.



Step 2. Remove transmission shroud (page 2-188, steps c thru i).

Step 3. With transmission shift lever in (neutral), manually pry bellcrank (3) (without forcing) and listen for brakes to

- a. If parking brakes release, continue to operate and notify organizational maintenance.
- b. If brakes do not release, notify organizational maintenance.

TA247784

**TROUBLESHOOTING - Continued**

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**MALFUNCTION  
TEST OR INSPECTION  
CORRECTIVE ACTION**

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**VOLTAGE REGULATOR**

**7. BATTERY/GENERATOR INDICATOR POINTER IS IN YELLOW OR LEFT RED WHEN ENGINE IS RUNNING**

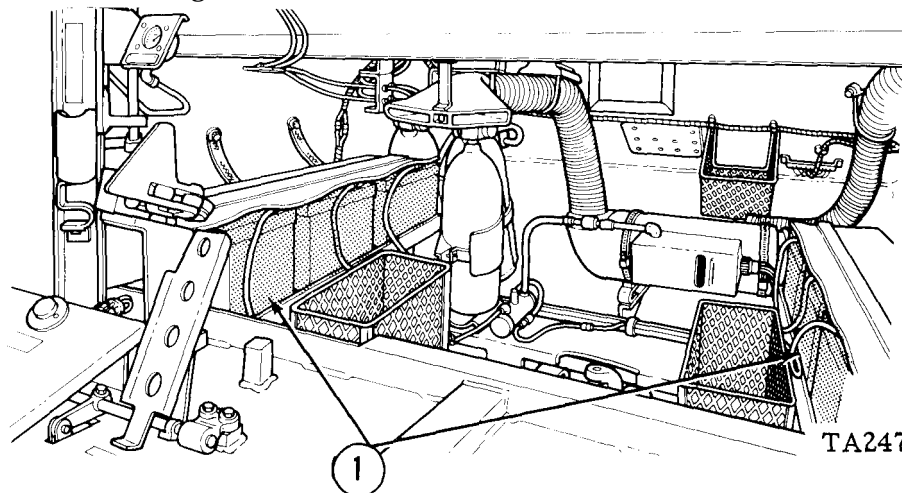
- Step 1. Increase engine speed to 1600 rpm and watch for pointer to move toward green.
- a. If pointer moves to green, continue operation and notify organizational maintenance.
  - b. If pointer does not move to green, stop engine (page 2-13 6) and notify organizational maintenance.

**8. BATTERY/GENERATOR INDICATOR POINTER IS IN RIGHT RED WHEN ENGINE IS RUNNING**

**WARNING**

If **BATTERY/GENERATOR** indicator is showing in right red, immediately stop engine (page 2-136). Overcharged batteries could explode and cause serious injury or death to personnel.

- Step 1. Check batteries (1) by touching battery case to see if they are hot or boiling.
- Step 2. If batteries are hot, stop engine (page 2-136) and notify organizational maintenance.



TA247785



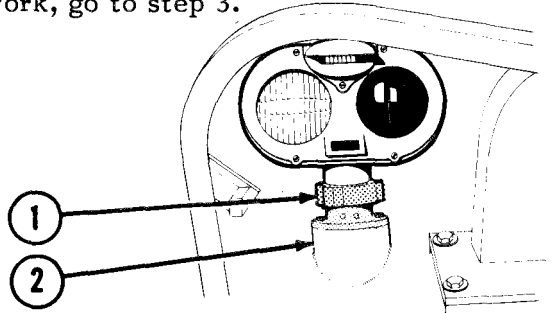
**TROUBLESHOOTING - Continued****MALFUNCTION****TEST OR INSPECTION****CORRECTIVE ACTION****LIGHTS****9. SERVICE DRIVE HEADLIGHT, IR BLACKOUT DRIVE LIGHT OR BLACKOUT MARKER LIGHT DOES NOT WORK**

Step 1. Check headlight mounting connectors of non-operational headlight assembly to see if mounting nut (1) is secured and seated into headlight mount (2).

If not, secure and seat properly.

Step 2. Operate lights and see if they work (page 2-106).

If lights do not work, go to step 3.



Step 3. Check that all electrical connectors (3) in both right and left headlight harness assemblies (4) are connected.

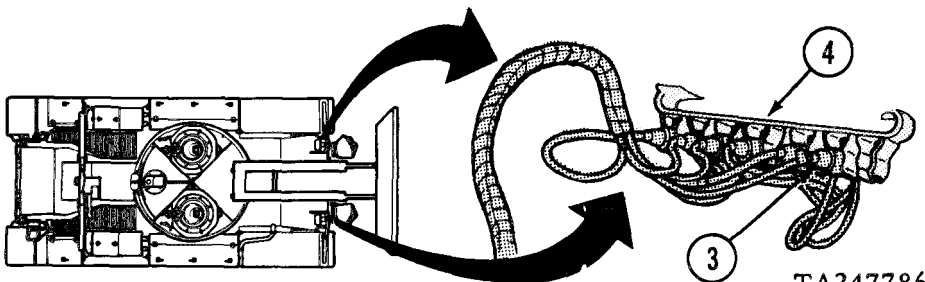
If not connected, connect.

Step 4. Operate lights and see if they work (page 2-106).

If lights do not work, replace bad lamps (page 3-76).

**NOTE**

**Service drive headlights and IR headlights use identical seal beam lamps. Switch lamps until replacement lamp is available.**



TA247786

**TROUBLESHOOTING - Continued**

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**MALFUNCTION**

**TEST OR INSPECTION**

**CORRECTIVE ACTION**

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**9. SERVICE DRIVE HEADLIGHT, IR BLACKOUT DRIVE LIGHT OR BLACKOUT MARKER LIGHT DOES NOT WORK - Continued**

Step 5. Operate service drive headlights, IR headlights, blackout drive light or blackout marker light.

If lights do not work, notify organizational maintenance.

**10. SERVICE DRIVE TAILLIGHT, SERVICE STOPLIGHT OR BLACK-OUT MARKER LIGHT DOES NOT WORK**

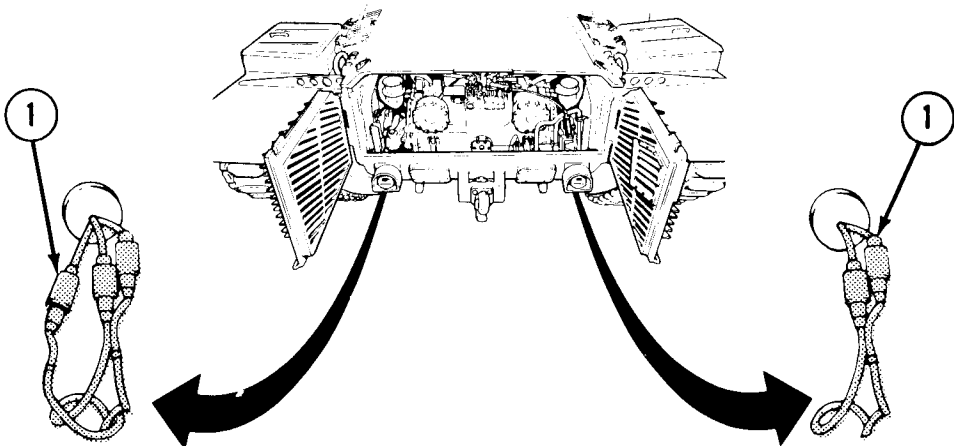
Step 1. Remove transmission shroud (page 2-188, steps c thru i).

**NOTE**

**Right taillight assembly has two electrical connectors and left taillight assembly has three electrical connectors. Connectors are located behind taillights, under the transmission shroud.**

Step 2. Check non-operational taillight assembly electrical connectors (1) to be sure they are properly connected.

Secure any loose connectors.



TA247787

**TROUBLESHOOTING - Continued**

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**MALFUNCTION****TEST OR INSPECTION****CORRECTIVE ACTION**

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**10. SERVICE DRIVE TAILLIGHT, SERVICE STOPLIGHT OR BLACKOUT MARKER LIGHT DOES NOT WORK - Continued**

- Step 3. Operate lights and see if they work (page 2-106).
- a. If lights do not work, replace bad lamps (page 3-76).
  - b. If taillights still do not work, notify organizational maintenance.

**STEERING****11. VEHICLE LEADS TO RIGHT OR LEFT ON FLAT ROAD**

- Step 1. Check track tension adjustment (page 3-51).
- a. If adjustment is not as specified, adjust track tension (page 3-51).
  - b. If adjustment is correct, notify organizational maintenance.

**TROUBLESHOOTING - Continued**

**MALFUNCTION**

**TEST OR INSPECTION**

**CORRECTIVE ACTION**

**PERSONNEL HEATER**

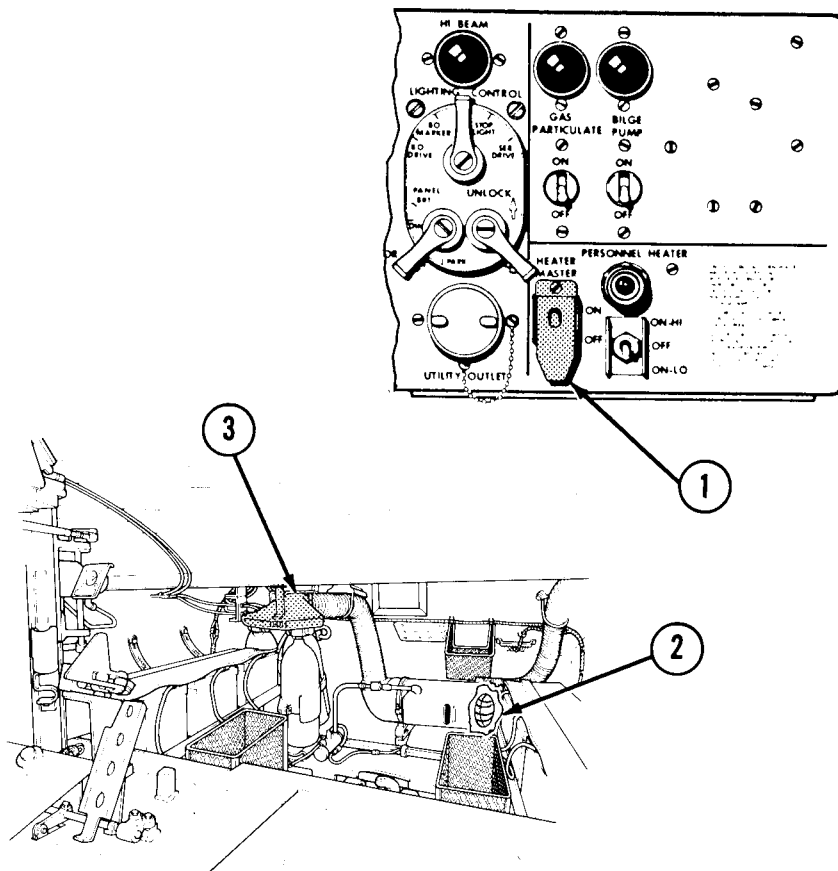
**12. PERSONNEL HEATER STARTS, RUNS SHORT TIME, STOPS**

**NOTE**

The **HEATER MASTER** switch (1) should always be set to **ON**. If heater was turned **OFF** with **HEATER MASTER** switch (1) or operated less than 5 minutes it may not restart because of flooding.

Step 1. Check blower air inlet (2) and airflow ducts (3) for anything blocking airflow.

Remove anything blocking airflow.



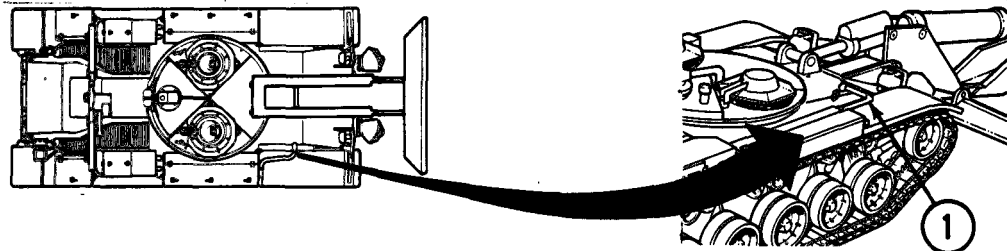
TROUBLESHOOTING - Continued

**MALFUNCTION**  
**TEST OR INSPECTION**  
**CORRECTIVE ACTION**

**12. PERSONNEL HEATER STARTS, RUNS SHORT TIME, STOPS - Continued**

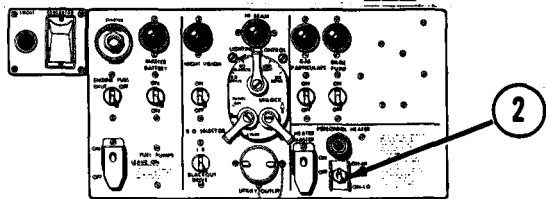
Step 2. Check personnel heater exhaust tube (1) for anything blocking heater exhaust.

Remove anything blocking personnel heater exhaust.



**WARNING**

Do not attempt to restart heater more than one time with ON-LO switch (2). A flooded heater can explode and cause serious injury to personnel.



Step 3. Attempt to start heater (page 2-112).

If heater does not run, notify organizational maintenance.

AUXILIARY SYSTEMS AND CONTROLS

**13. DRIVER CANNOT SEE CLEARLY THROUGH M24 IR PERISCOPE - PINK LIGHT BACKGROUND - NO CLEAR IMAGE (PICTURE)**

**WARNING**

The power cable carries 16,000 volts dc. Make sure NIGHT VISION switch and MASTER BATTERY switch are off before touching power cable. Electrical shock could cause serious injury or death.

## TROUBLESHOOTING - Continued

### MALFUNCTION

#### TEST OR INSPECTION

#### CORRECTIVE ACTION

- 13. DRIVER CANNOT SEE CLEARLY THROUGH M24 IR PERISCOPE-  
PINK LIGHT BACKGROUND - NO CLEAR IMAGE (PICTURE)-  
Continued**

#### WARNING



Wait at least 2 minutes after IR POWER switch is turned off before touching periscope power cable. High voltage is present for several seconds after IR POWER switch is turned off and could cause serious injury or death.



#### CAUTION

Perform M24 IR periscope checks during darkness. Do not expose IR periscope to direct sunlight. Bright light will damage the periscope.

- Step 1. Set NIGHT VISION switch and MASTER BATTERY switch to OFF. Wait 2 minutes.
- Step 2. Disconnect power cable and remove periscope from hatch cover (page 3-83).
- Step 3. Check exterior lenses if dirty:
  - a. Clean with soft, clean rag (item 39, app D) and lens cleaning compound (item 11, app D). Go to step 4.
  - b. If clean, go to step 4.
- Step 4. Remove periscope head from periscope (page 3-85) and check interior lenses for dirt and the presence of lens protective masking paper.
  - a. If dirty, clean with soft, clean rag (item 39, app D) and lens cleaning compound (item 11, app D). Go to step 5.
  - b. If lens protective masking paper is present, remove. Go to step 5.
  - c. If clean, go to step 5.
- Step 5. Install periscope head in periscope (page 3-85), then install periscope in hatch cover (page 3-81).
- Step 6. Connect IR power cable (page 3-81) to the periscope and set MASTER BATTERY switch and NIGHT VISION switch to ON.
- Step 7. Check to see if periscope is focused.

#### NOTE

Later model M24 periscopes may not have focus adjustments. If there are no focus adjustments and M24 periscope is faulty, notify organizational maintenance.

TA247791

**TROUBLESHOOTING - Continued****MALFUNCTION****TEST OR INSPECTION****CORRECTIVE ACTION****13. DRIVER CANNOT SEE CLEARLY THROUGH M24 IR PERISCOPE - PINK LIGHT BACKGROUND - NO CLEAR IMAGE (PICTURE) - Continued**

- a. If not focused, adjust fucus (page 2-12).
- b. If periscope focus will not adjust, notify organizational maintenance.

**14. DRIVER CANNOT SEE THROUGH M24 IR PERISCOPE -NO PINK LIGHT BACKGROUND****WARNING**

The power cable carries 16,000 volts dc. Make sure NIGHT VISION switch and MASTER BATTERY switch are off before touching power cable. Electrical shock could cause serious injury or death.

Wait at least 2 minutes after NIGHT VISION switch is turned OFF before touching periscope power cable. High voltage is present for several seconds after NIGHT VISION switch is turned OFF and could cause serious injury or death.

**CAUTION**

Perform M24 IR periscope checks during darkness. Do not expose IR periscope to direct sunlight. Bright light will damage the periscope.

- Step 1. Set NIGHT VISION switch and MASTER BATTERY switch to OFF. Wait 2 minutes.
- Step 2. Grasp power cable below connector with one hand. Push cable up, then pull down.
  - a. If cable moves, tighten cable. Go to step 4.
  - b. If cable does not tighten, go to step 3.
- Step 3. Remove cable and check for dirt or damaged connector on periscope or cable.
  - a. If dirty, clean with a brush (item 6, app D) and connect cable. Go to step 4.
  - b. If damaged, notify organizational maintenance.

TA247792

**TROUBLESHOOTING - Continued**

**MALFUNCTION**

**TEST OR INSPECTION**

**CORRECTIVE ACTION**

**14. DRIVER CANNOT SEE THROUGH M24 IR PERISCOPE - NO PINK LIGHT BACKGROUND - Continued.**

Step 4. Set MASTER BATTERY and NIGHT VISION switches to ON.

If there is no pink light background, notify organizational maintenance.

**15. DRIVER'S MGHT VISION VIEWER DOES NOT OPERATE ON BATTERY POWER (VIEWER OPERATES ON VEHICLE POWER).**

**WARNING**

Remove viewer battery from viewer (page 2-117) and store in viewer stowage box before connecting cable. An installed battery will overheat and may explode when tank power is used, causing injury to you and damage to equipment.



Step 1. Check if vehicle power cable is attached to night vision viewer (page 2-117).

If attached, place NIGHT VISION power switch in OFF position, wait 2 minutes and disconnect vehicle cable.

Step 2. Place night vision viewer OFF/BRIGHT rotary switch in OFF position. Check if battery is installed and is installed with positive (+) end first in night vision viewer.

Step 3. Night vision viewer battery may be discharged. Replace battery for test (page 2-117).

Step 4. Check for corrosion or dirt on battery contacts, contact in night vision viewer, or contact in battery compartment cap.

If dirty, clean contacts.

**16. DRIVER'S MGHT VISION VIEWER DOES NOT OPERATE ON VEHICLE POWER (VIEWER OPERATES ON BATTERY POWER).**

**CAUTION**

Remove battery (page 2-117) before connecting vehicle power cable to night vision viewer.

TA247793



**TROUBLESHOOTING - Continued**

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**MALFUNCTION****TEST OR INSPECTION****CORRECTIVE ACTION**

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**16. DRIVER'S NIGHT VISION VIEWER DOES NOT OPERATE ON VEHICLE POWER (VIEWER OPERATES ON BATTERY POWER) - Continued.**

Step 1. Check if MASTER BATTERY and NIGHT VISION power switches are ON.

If not, place both switches ON.

Step 2. Check if vehicle power cable is loose or not connected to night vision viewer (page 2-11 7).

If not connected, place NIGHT VISION power switch OFF, and connect vehicle power cable to night vision viewer.

Step 3. Place NIGHT VISION power switch OFF, and disconnect vehicle power cable from night vision viewer. Check for corrosion or dirt on cable or viewer contacts.

If dirty, clean contacts.

**17. DRIVER'S NIGHT VISION VIEWER DOES NOT OPERATE ON VEHICLE POWER OR BATTERY POWER.**

Step 1. Check if outside lens cover is installed. If installed, remove (page 2-114).

Step 2. Check if outside conditions are too bright. If terrain or sky is too bright, driver's night vision viewer will automatically shut off. Point viewer at dark scene.

Step 3. Check if OFF/BRIGHT rotary switch is set to OFF. If off, rotate switch to maximum BRIGHT position.

## TROUBLESHOOTING - Continued

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### MALFUNCTION

#### TEST OR INSPECTION

#### CORRECTIVE ACTION

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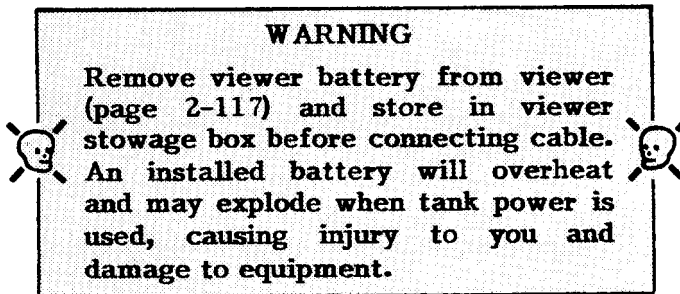
### 18. DRIVER'S NIGHT VISION VIEWER PICTURE QUALITY IS POOR.

Step 1. Check if OFF/BRIGHT rotary switch is adjusted properly.

If not, rotate to maximum BRIGHT position and reduce brightness for best image.

Step 2. Check if lenses are dirty or fogged.

If yes, clean outside lens and eyepiece lens (page 2-120).



Step 3. Check if picture quality is better using vehicle power than when using battery power.

If yes, replace battery (page 2-117).

TA247795

**TROUBLESHOOTING - Continued**

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**MALFUNCTION**

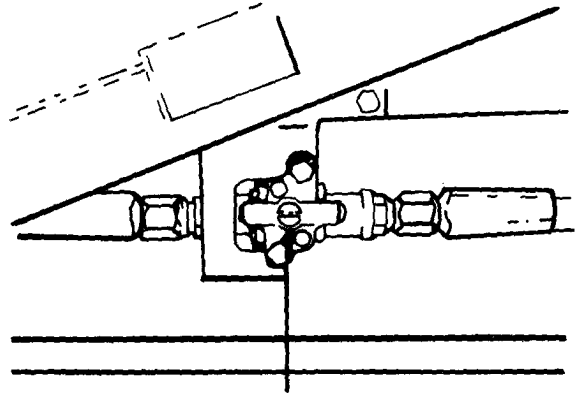
**TEST OR INSPECTION**

**CORRECTIVE ACTION**

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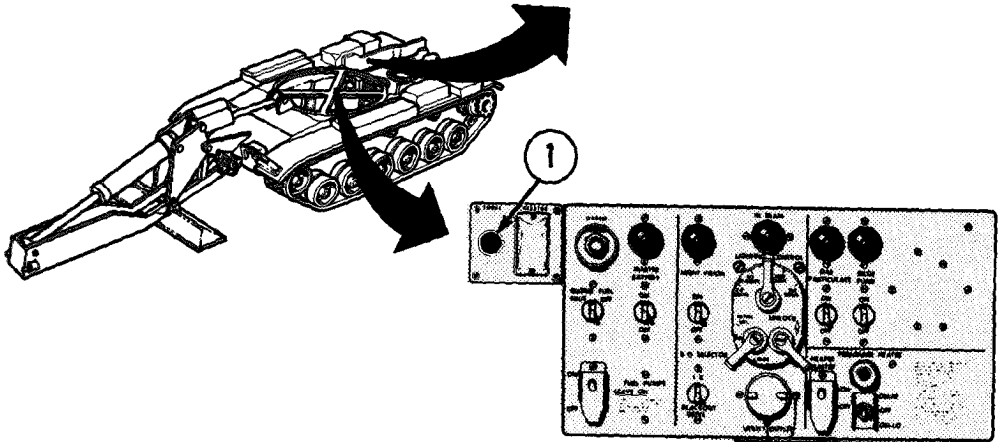
**19. SMOKE GENERATOR WILL NOT WORK (NO SMOKE OR QUANTITY OF SMOKE IS NOT NORMAL)**

- Step 1. Check that smoke generator manual fuel shutoff valve is open. (Top of engine - right side).
- Step 2. If smoke generator lamp (1) does not come on, notify organizational maintenance.



QUADRANT AND TOP DECK  
REMOVED FOR CLARITY

SMOKE GENERATOR MANUAL  
FUEL SHUT-OFF VALVE



OPERATOR'S STATION

TA247796

**TROUBLESHOOTING - Continued**

**MALFUNCTION**

**TEST OR INSPECTION**

**CORRECTIVE ACTION**

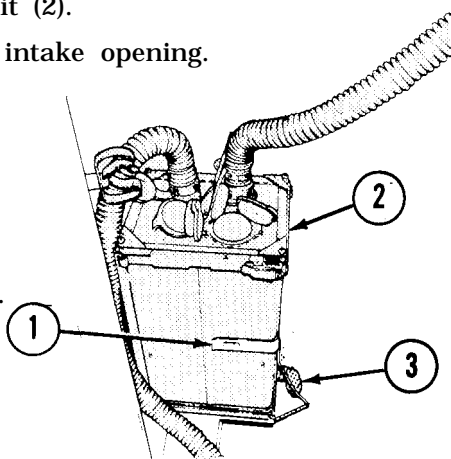
**20. LACK OF AIR, GAS-PARTICULATE FILTER UNIT**

Step 1. Make sure spring clip (1) has been lifted from air intake opening on filter unit (2).

If not, lift from air intake opening.

Step 2. Check electrical connect or (3) at precleaner and filter unit.

If connector is loose, tighten.



Step 3. Check if precleaned and filter unit motor is operating by listening for motor noise.

If motor is not running, notify organizational maintenance.

**21. BRIDGE FAILS TO LIFT OFF BRIDGE SEAT OR FAILS TO LIFT WHEN RETRIEVING BRIDGE.**

Step 1. Check clutch and make sure it is fully engaged.

Step 2. Check for low level in hydraulic reservoir (page 2-31).

a. If hydraulic fluid is low, refill (refer to LO 5-5420-202-1 2) and repeat launching or retrieving procedures (page 2-142 and 2-150, respectively).

b. If hydraulic fluid level is correct and bridge will not raise, notify organizational maintenance.

**22. BRIDGE FAILS TO OPEN DURING LAUNCHING OR FAILS TO CLOSE WHEN RETRIEVING.**

Step 1. Check for low level in hydraulic reservoir (page 2-31).

If hydraulic fluid is low, refill (refer to LO 5-5420-202-12) and repeat launching or retrieving procedures (pages 2-142 and 2-150, respectively).

TA247797

**TROUBLESHOOTING - Continued**

**MALFUNCTION**

**TEST OR INSPECTION**

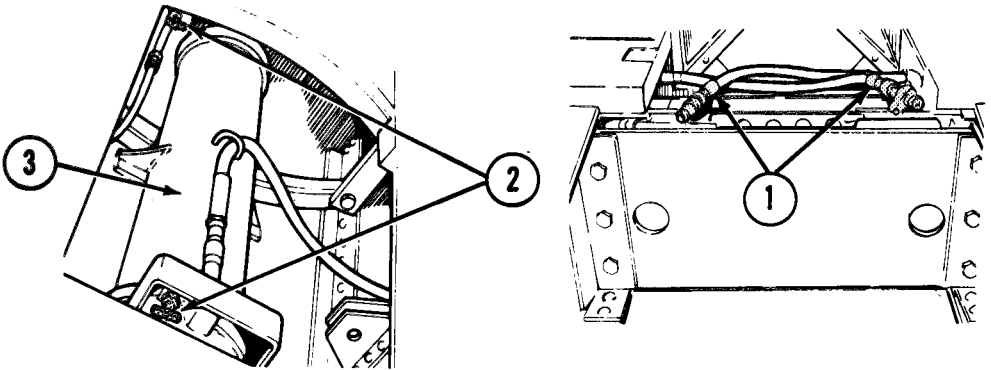
**CORRECTIVE ACTION**

**22. BRIDGE FAILS TO OPEN DURING LAUNCHING OR FAILS CLOSE WHEN RETRIEVING - Continued**

Step 2. Check that quick disconnect couplings (1) are properly connected (page 2-154).

Step 3. Check for open valves (2) on bridge scissors cylinder (3).

If valves are open, close. If bridge still fails to open or close, notify organizational maintenance.



**23. LAUNCHER DOES NOT ENGAGE BRIDGE DURING RETRIEVING**

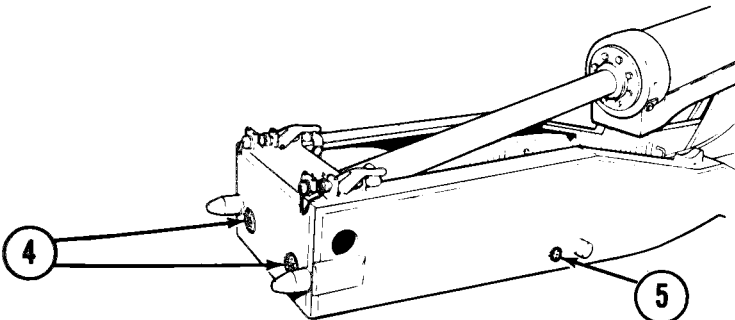
Check if ejection cylinder plugs (4) retract.

If ejection cylinder plugs did not retract, notify organizational maintenance.

**24. LAUNCHER DOES NOT RELEASE BRIDGE**

Check that locking cylinder plugs (5) did retract.

If locking cylinder plugs did not retract, notify organizational maintenance.



### Section III. MAINTENANCE PROCEDURES

#### MAINTAIN TRACK (LOOSEN TRACK TENSION) CONVENTIONAL TRACK ADJUSTING LINK

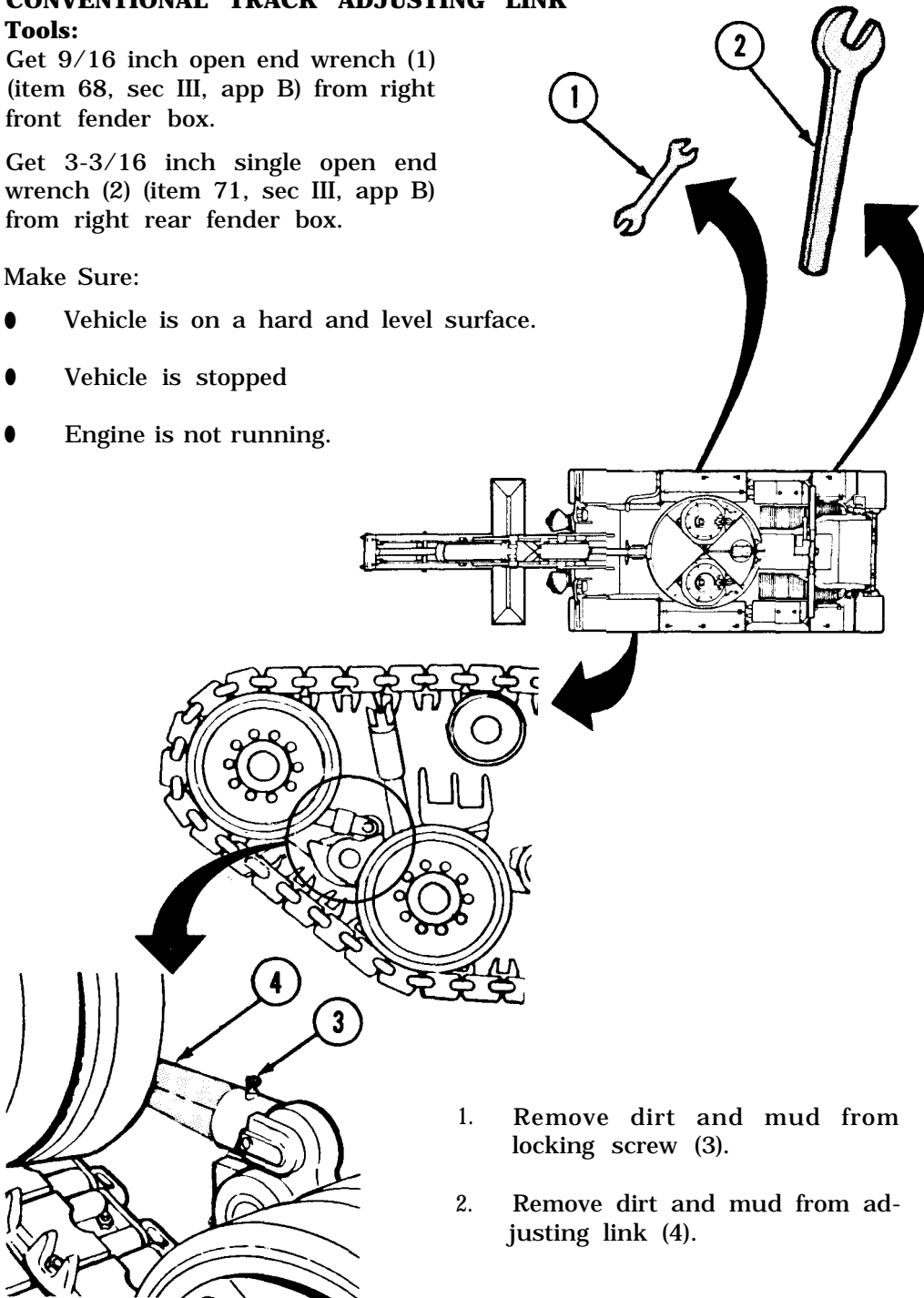
**Tools:**

Get 9/16 inch open end wrench (1) (item 68, sec III, app B) from right front fender box.

Get 3-3/16 inch single open end wrench (2) (item 71, sec III, app B) from right rear fender box.

**Make Sure:**

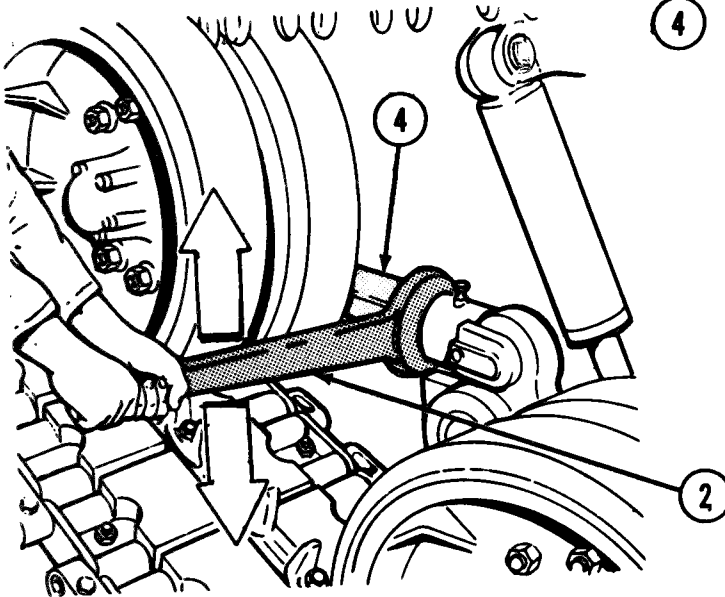
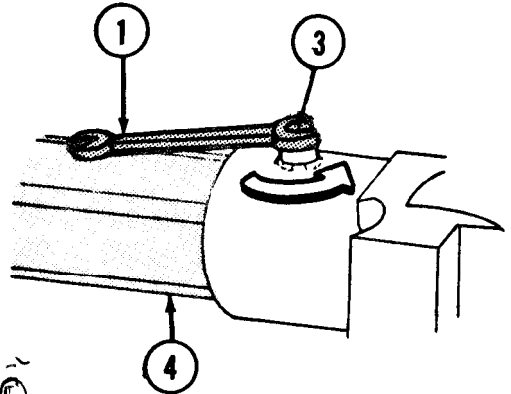
- Vehicle is on a hard and level surface.
- Vehicle is stopped
- Engine is not running.



TA247799

**MAINTAIN TRACK (LOOSEN TRACK TENSION) - Continued**  
**CONVENTIONAL TRACK ADJUSTING LINK - Continued**

3. Place 9/16 inch open end wrench (1) on locking screw (3).
4. Turn wrench (1) counter-clockwise.
5. Loosen locking screw (3) until adjusting arm (4) will move.



6. Place 3-3/16 inch open end wrench (2) on track adjusting link assembly (4).

**NOTE**

**On right side of vehicle pull down on wrench (2) to loosen track tension.  
 On left side of vehicle push up on wrench (2) to loosen track tension.**

7. Push up or pull down on wrench (2) until track sags. Remove wrench.
8. If no further maintenance is required, adjust track tension (page 3-51).

TA247800

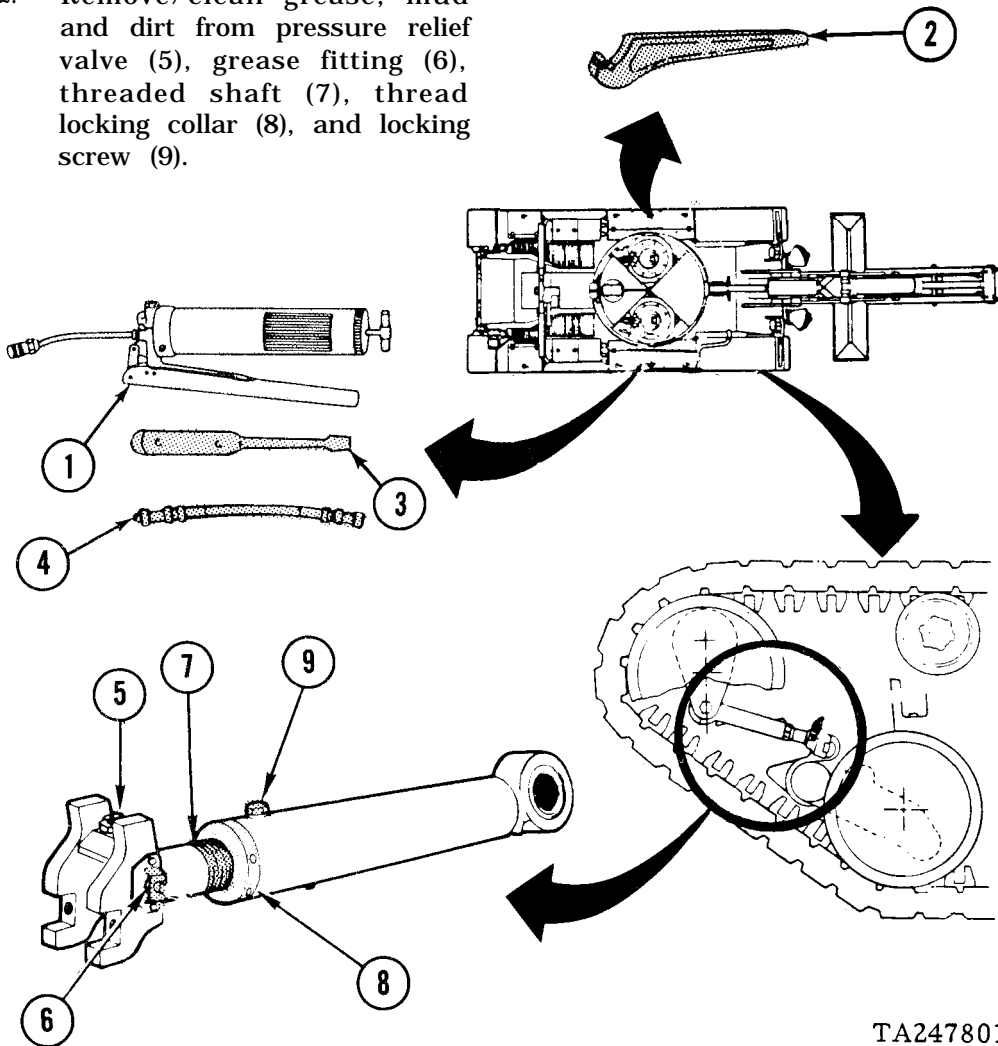
## MAINTAIN TRACK (LOOSEN TRACK TENSION)

### GREASE ACTUATED ADJUSTING LINK (IF EQUIPPED)

#### Tools:

- Get grease gun (1) from right front fender box.
- Get spanner wrench (2) from left front fender box.
- Get extra heavy duty flat-tipped screwdriver (3) from right front fender box.
- Get grease gun extension (4) from right front fender box.

1. Move vehicle forward on hard level surfaces and coast to a stop without applying brakes.
2. Remove/clean grease, mud and dirt from pressure relief valve (5), grease fitting (6), threaded shaft (7), thread locking collar (8), and locking screw (9).



TA247801



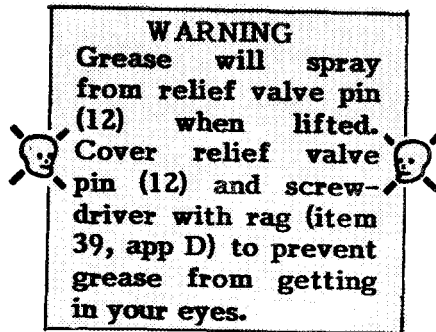
**MAINTAIN TRACK (LOOSEN TRACK TENSION) - Continued**

**GREASE ACTUATED ADJUSTING LINK**

3. Loosen locking screw (9).
4. Insert lube gun extension (4) into bracket (10) and couple it with grease fitting (6), couple grease gun (1) to lube gun extension (4).
5. Pump grease gun (1) a few times to release threaded locking, collar (8).
6. Back off locking collar (8) using spanner wrench (2).

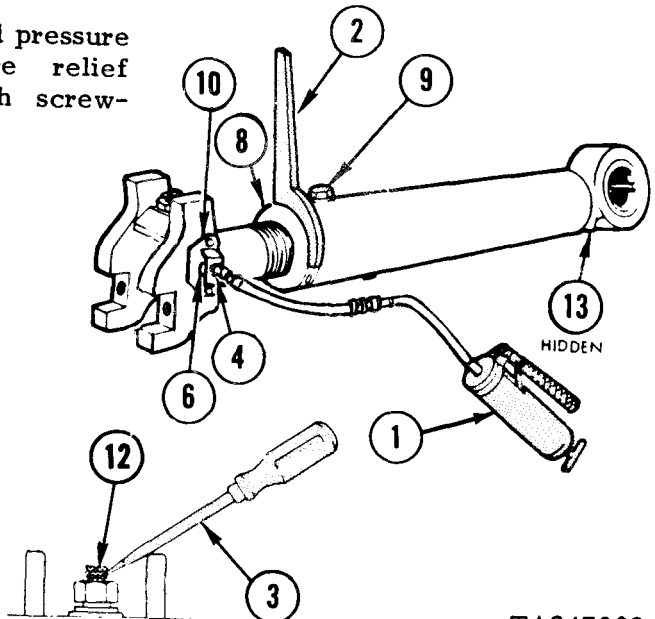
**NOTE**

**Locking collar may first require tightening to break loose trapped dirt prior to loosening.**



7. Relieve link internal pressure by lifting pressure relief valve pin (12) with screwdriver (3).

**NOTE**  
 Never remove plug (13) to relieve pressure when track is connected. After track is broken, plug (13) may be removed for easy hand collapsing of grease actuated adjusting link.



TA247802

**MAINTAIN TRACK (REMOVE END CONNECTORS)**

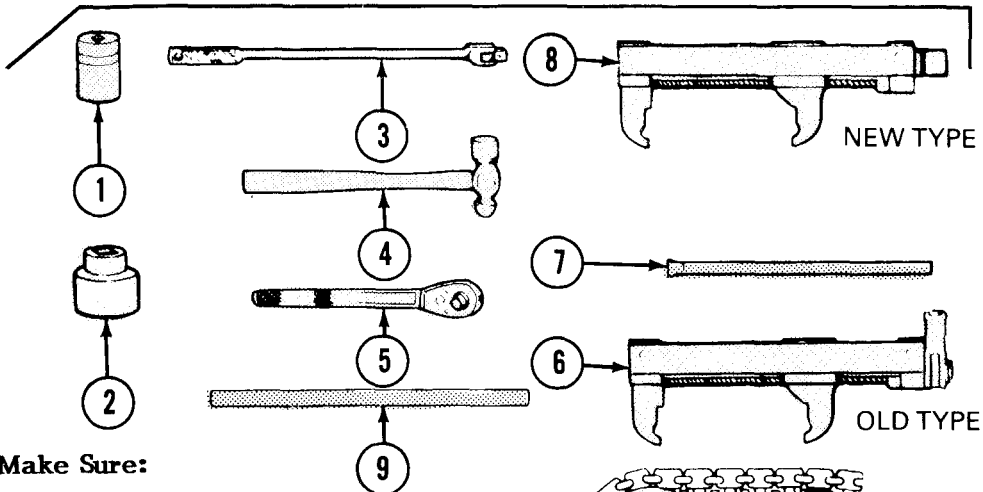
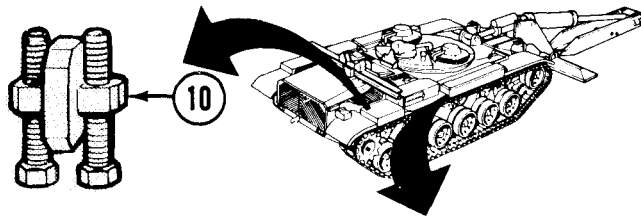
**Tools:**

Get from right front fender box:

- 15/16 inch socket with 3/4 inch drive (1) (item 60, sec III, app B).
- 1-1/2 inch socket with 3/4 inch drive (2) (item 62, sec III, app B).
- Hinged handle socket wrench with 3/4 inch drive (3) (item 29, sec 111, app B).
- 2 pound hammer (4) (item 25, sec III, app B).
- Ratchet with 3/4 inch drive (5) (item 31, sec III, app B).
- Two track fixtures (6) with bar (7), if so equipped or two track fixtures (8) (item 20, sec III, app B) used with 3/4 inch drive ratchet (5).
- Extension handle (9) (item 26, sec III, app B).

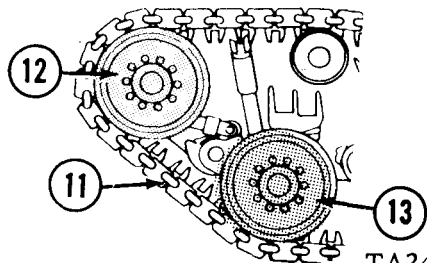
Get from right rear fender box:

- End connector puller (10) (item 44, sec III, app B).



**Make Sure:**

- End connector (11) to be removed is positioned between compensating idler (12) and front roadwheel (13).
- Track tension is loosened (page 3-26).

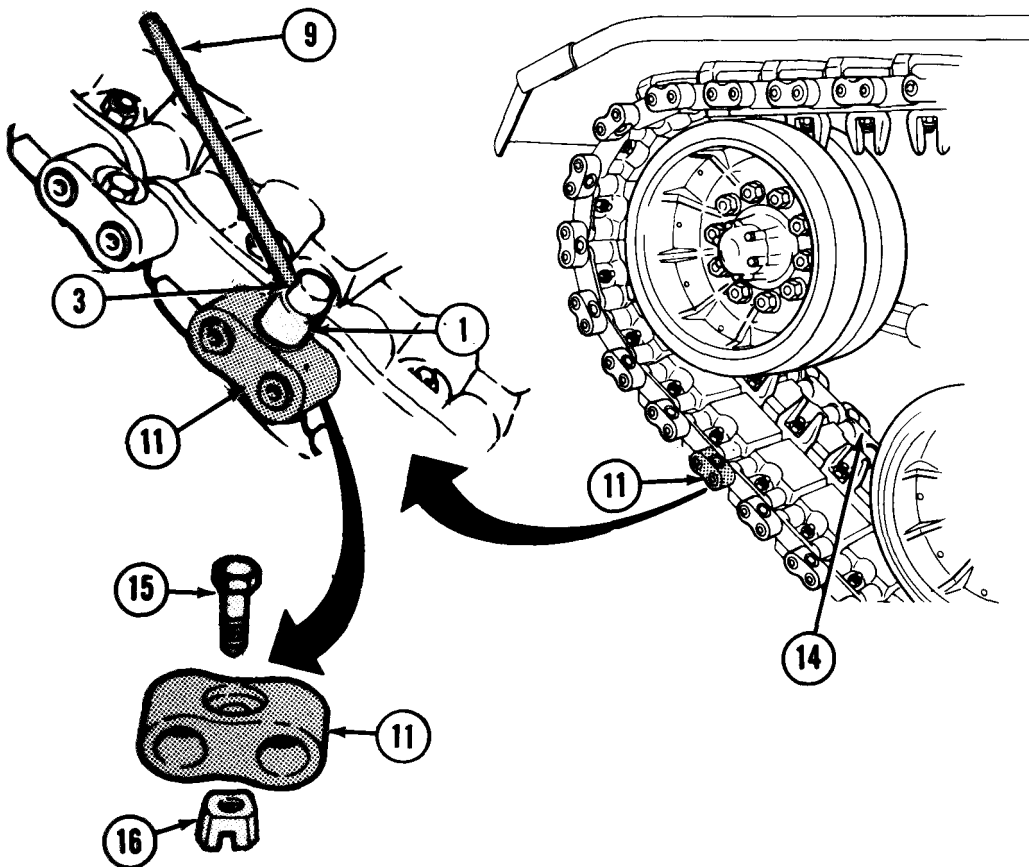


TA247803

**MAINTAIN TRACK (REMOVE END CONNECTORS) - Continued****NOTE**

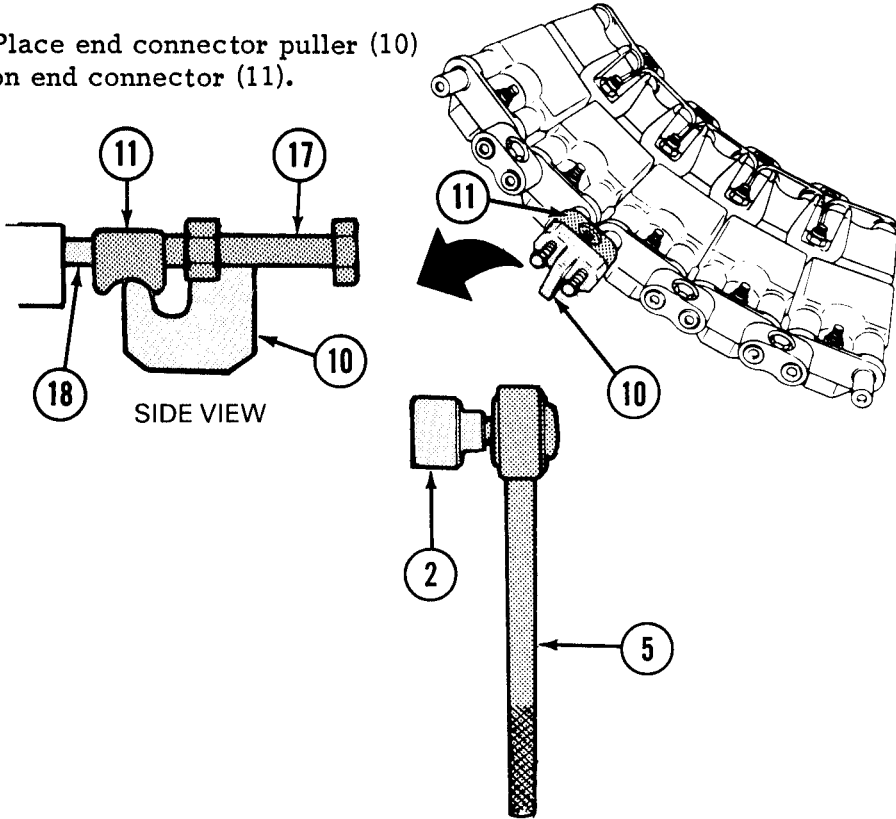
**Inner end connectors (14) are removed the same way as outer end connectors (11) as follows below.**

1. Place 15/16 inch socket (1), handle (3), and extension handle (9) on bolt (15).
2. Turn counterclockwise to loosen bolt (15). Loosen bolt three turns. Remove socket (1).
3. Tap bolt (15), with hammer, to loosen wedge (16).
4. Remove bolt (15) and wedge (16) from outer end connector (11).



**MAINTAIN TRACK (REMOVE END CONNECTORS) - Continued**

5. Place end connector puller (10) on end connector (11).



**NOTE**

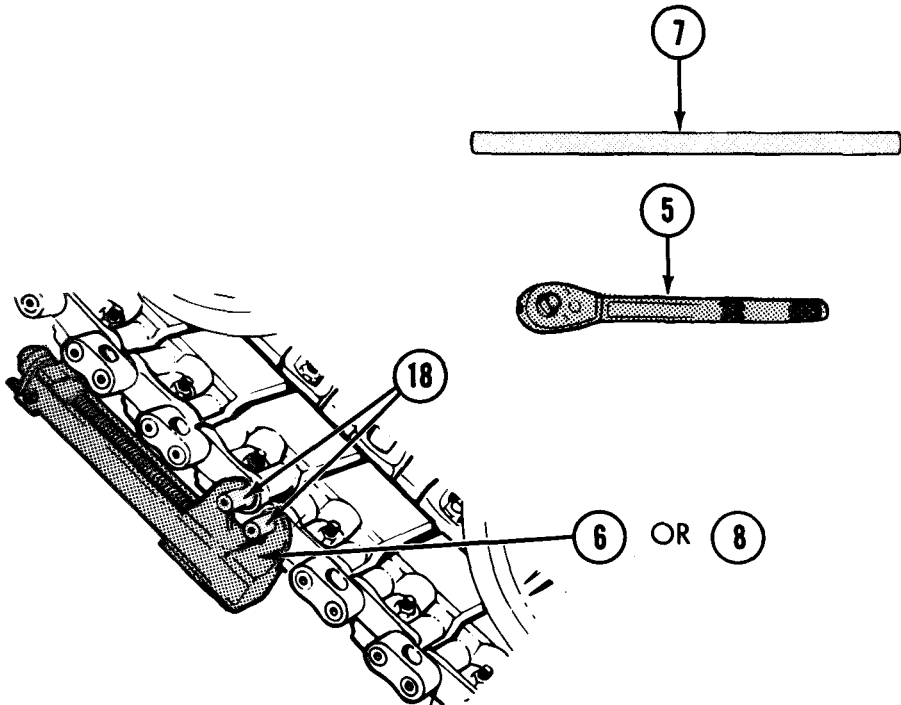
**It may be necessary to hit seated end connector (11), with hammer, to loosen.**

6. Using 1-1/2 inch socket (2) and ratchet (5) with 3/4 inch drive, evenly tighten two puller screws (17). Tighten until about 1 inch of track pins (18) shows behind end connector (11).

TA247805

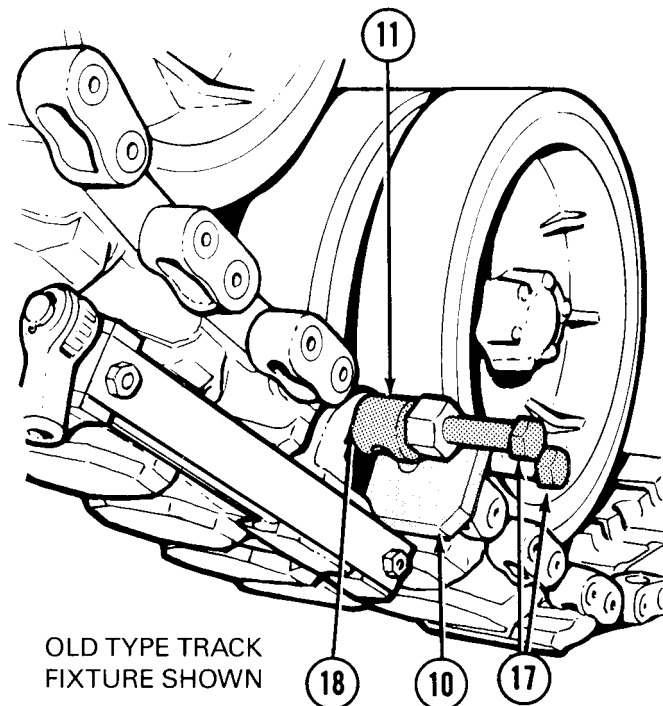
**MAINTAIN TRACK (REMOVE END CONNECTORS) - Continued**

7. Attach track fixture (6) or (8) to track pins (18). Using bar (7) or ratchet (5), turn counterclockwise and tighten.



SHOWN WITH END CONNECTOR REMOVED

**MAINTAIN TRACK (REMOVE END CONNECTORS) - Continued**



**NOTE**

**It maybe necessary to hit seated end connector (11) with hammer to loosen.**

- 8. Tighten puller screws (17) evenly until end connector (11) pulls free of track pins (18).**
- 9. Remove end connector puller (10) from end connector (11).**

**NOTE**

**To remove inner end connector, repeat steps 1 through 9.**

- 10. Return end connector puller (10) to right. rear fender box.**
- 11. If no further maintenance is required, install new end connector (page 3-42).**

**MAINTAIN TRACK (REMOVE CENTERGUIDE)**

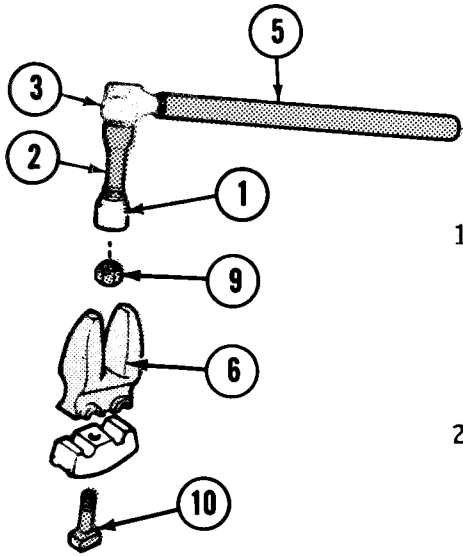
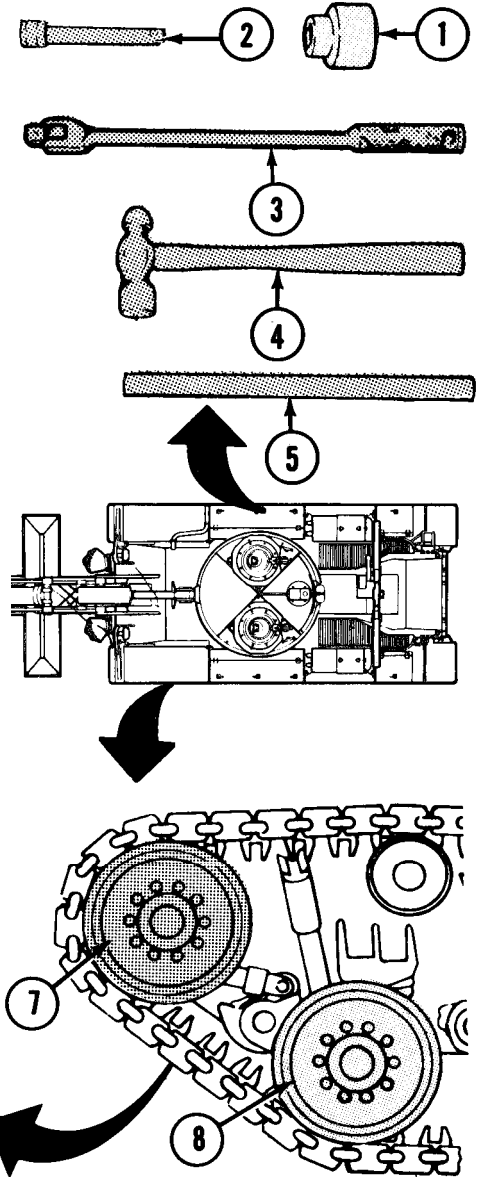
**Tools:**

Get tools from right front fender box.

- 1-5/16 inch socket, with 3/4 inch drive (1) (item 53, sec III, app B).
- 4-5/8 inch socket wrench extension with 3/4 inch drive (2) (item 16, sec III, app B).
- Hinged handle socket wrench with 3/4 inch drive (3) (item 29, sec III, app B).
- 2 pound hammer (4) (item 25, sec III, app B).
- Extension handle (5) (item 26, sec III, app B).

**Make Sure:**

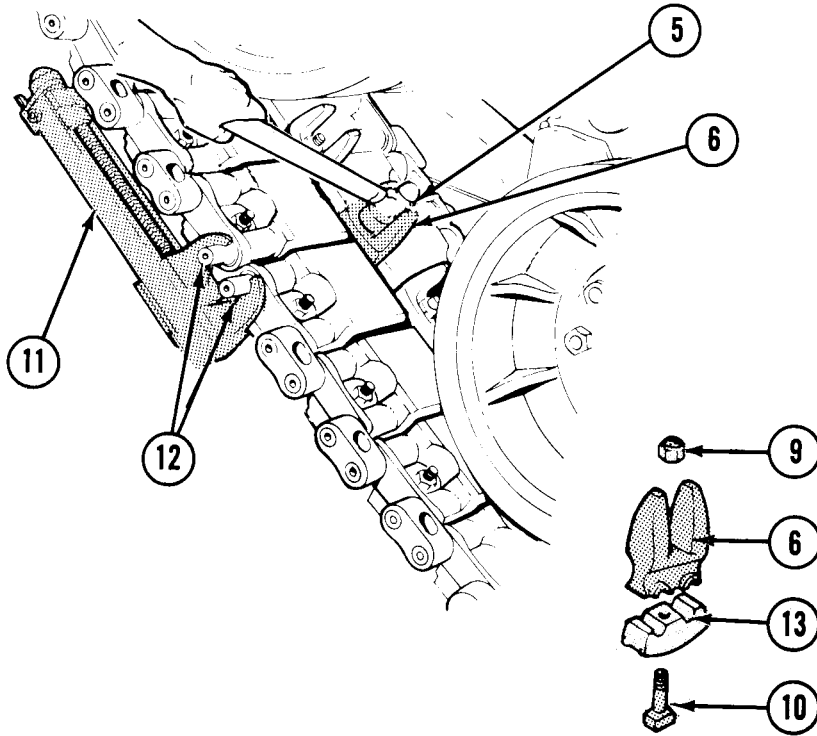
- Vehicle is stopped on level surface.
- Centerguide (6) is positioned between compensating idler (7) and number one roadwheel (8).
- Engine is not running.



1. Place 1-5/16 inch socket (1), socket wrench 4-5/8 inch extension (2), hinged handle socket wrench (3), and extension handle (5) on centerguide nut (9).
2. Turn counterclockwise to loosen nut (9) until it is flush with bolt (10).

TA247808

**MAINTAIN TRACK (REMOVE CENTERGUIDE) - Continued**



3. Loosen track fixture (11) (if installed) until laying loose on pins (12).
4. Hit nut (9) and bolt (10) with hammer (5) until cap (13) is loose.
5. Remove nut (9).
6. Remove centerguide (6), cap (13), and bolt (10).
7. If no further maintenance is required, install new centerguide (page 3-44).



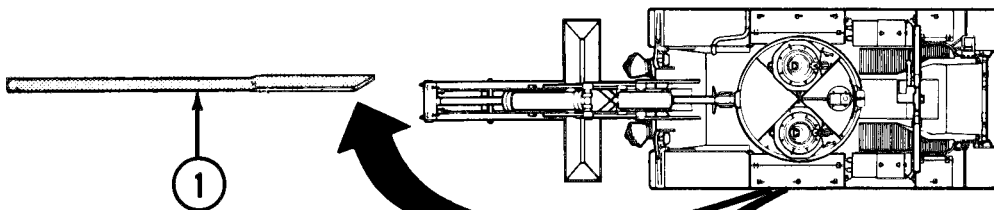
**MAINTAIN TRACK (BREAK TRACK)**

**NOTE**

**Two crewmembers are needed to do this procedure.**

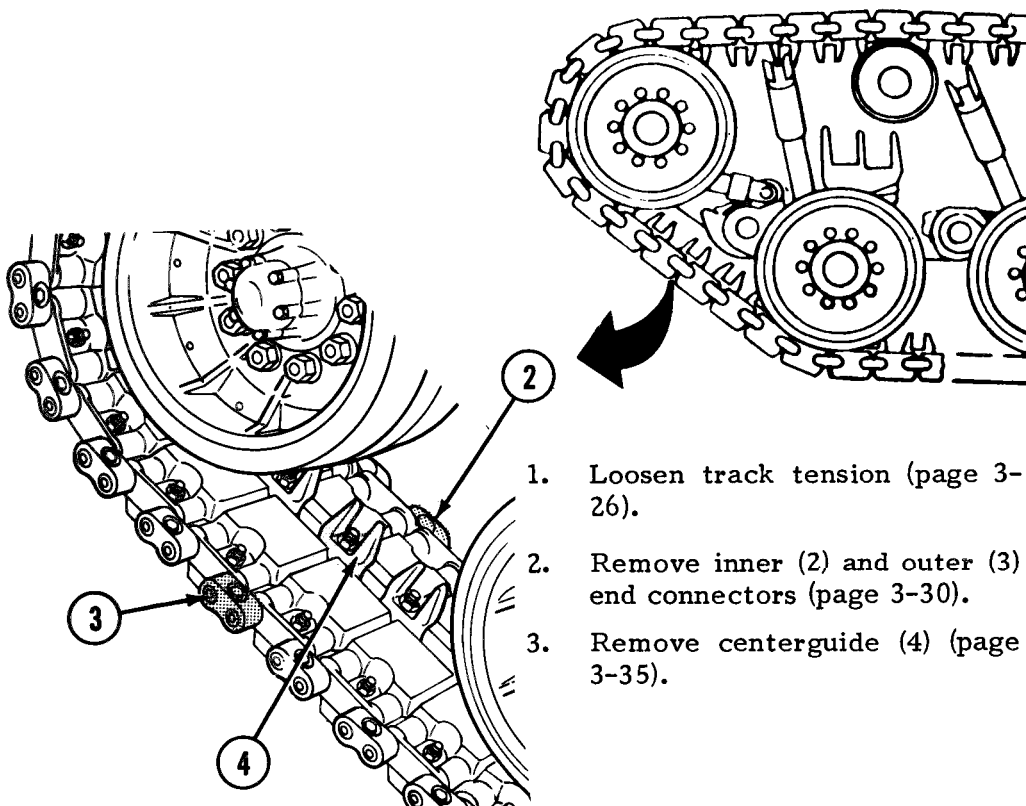
**Tool:**

Get crowbar (1) (item 10, sec III, app B) from left front fender box.



**Make Sure:**

- Vehicle is stopped on hard level surface.
- Engine is not running.



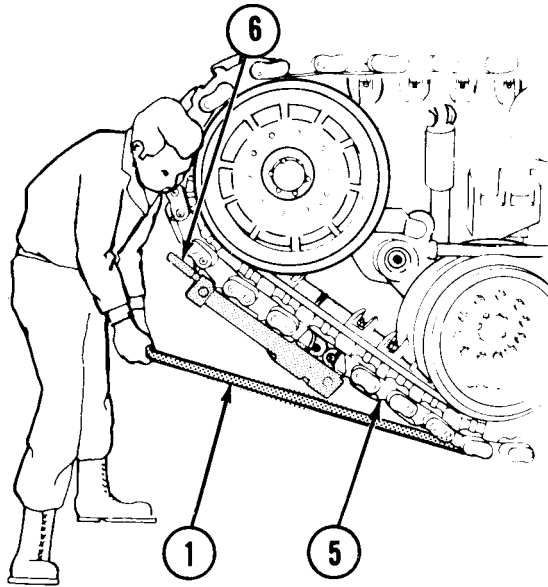
1. Loosen track tension (page 3-26).
2. Remove inner (2) and outer (3) end connectors (page 3-30).
3. Remove centerguide (4) (page 3-35).

**MAINTAIN TRACK (BREAK TRACK) - Continued**

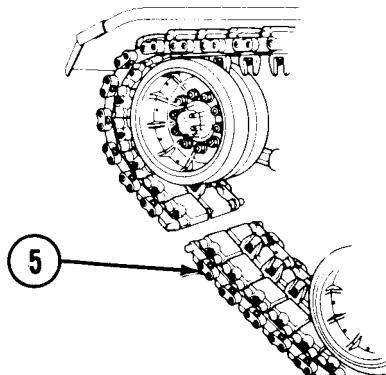
**WARNING**

Crewmember holding up track with crowbar must stand to side of track, not in front of track. Do not allow personnel in front of track. Injury or death could result if track suddenly separates.

- 4. One crewmember use crowbar (1) to hold up track (5).



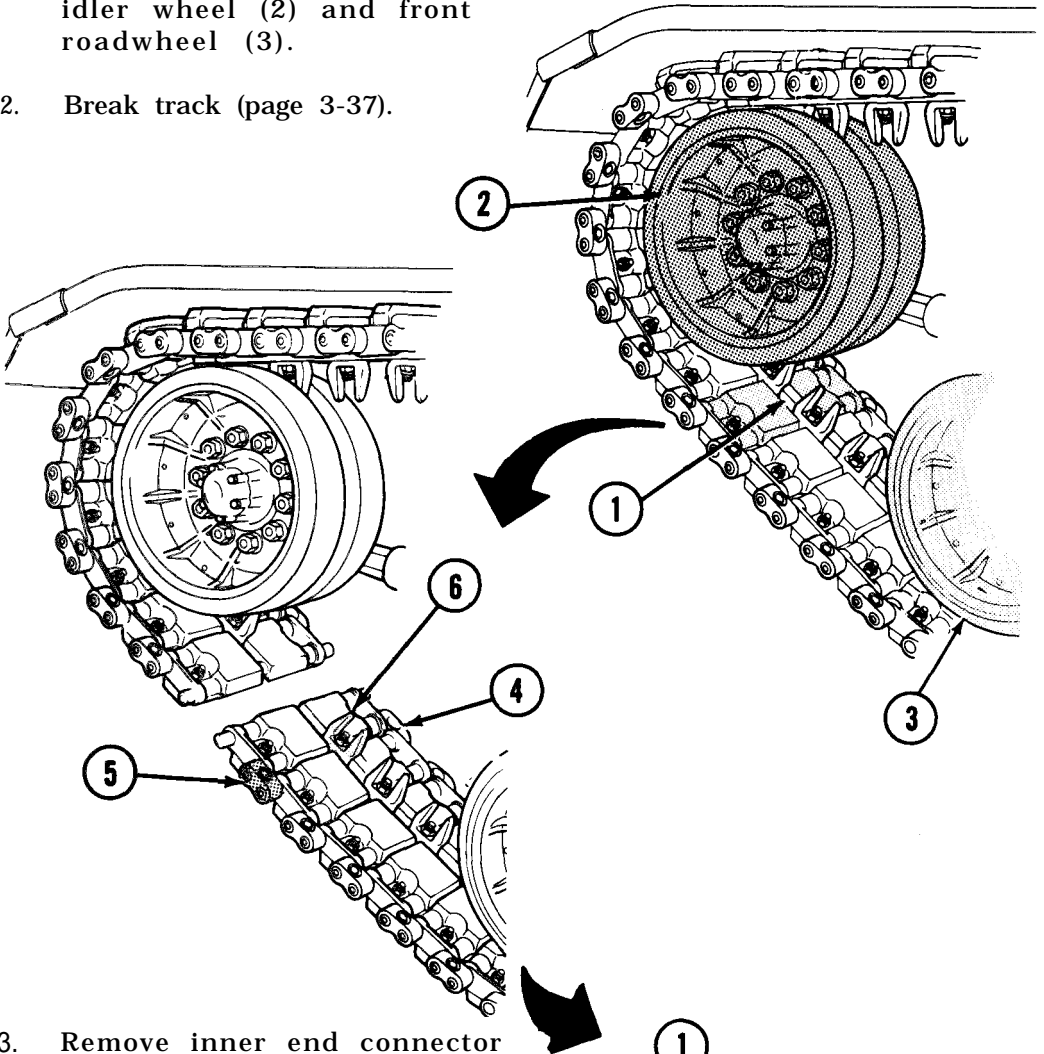
- 5. Turn fixture (6) clockwise evenly until loose. Remove fixture from track.
- 6. Remove crowbar (1). Allow track (5) to fall free.
- 7. Return crowbar to stowage.



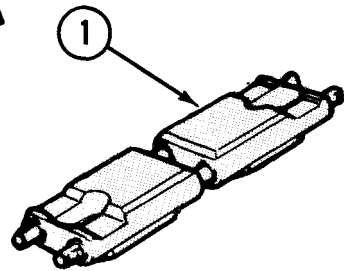
TA247811

**MAINTAIN TRACK (REMOVE TRACK LINK)**

1. Move vehicle until bad link (1) is between compensating idler wheel (2) and front roadwheel (3).
2. Break track (page 3-37).



3. Remove inner end connector (4) and outer end connector (5) (pages 3-30 through 3-34). Track fixtures are not needed.
4. Remove centerguide (6) (page 3-35).
5. Track link (1) will fall free.
6. Turn in bad link.



MAINTAIN TRACK (INSTALL TRACK LINK)

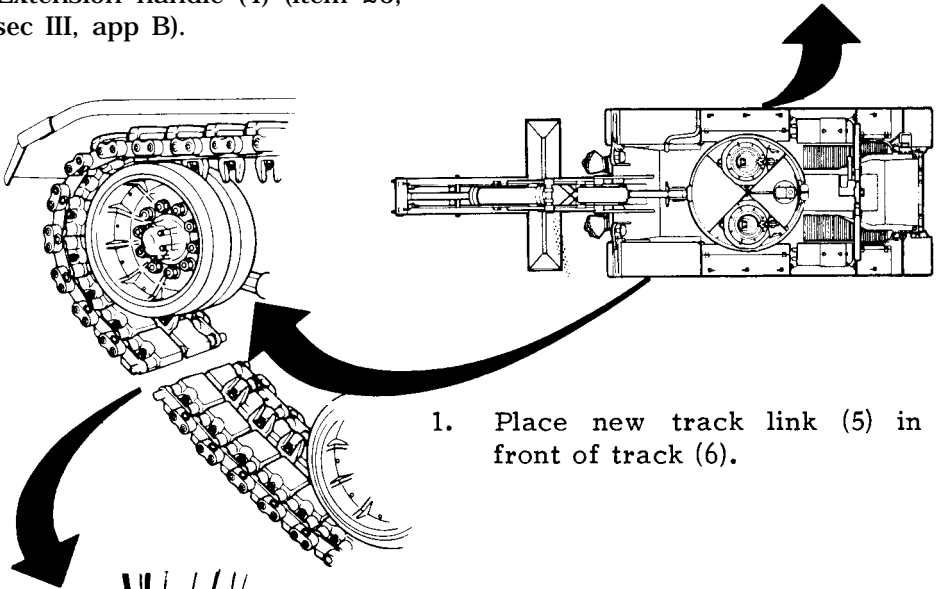
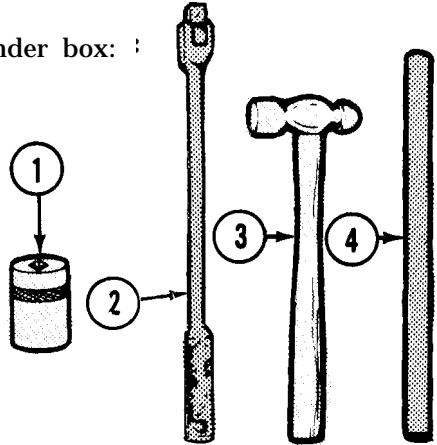
NOTE

Two crewmembers are needed to do this procedure.

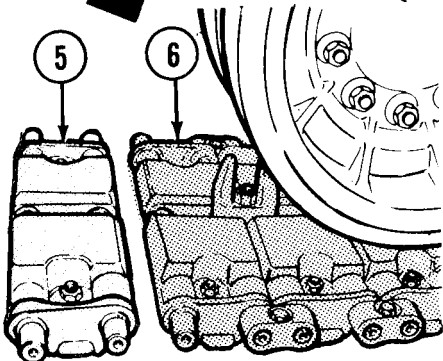
Tools:

Get the following tools from right front fender box :

- 15/16 inch socket, with 3/4 inch drive (1) (item 60, sec III, app B).
- Hinged handle socket wrench with 3/4 inch drive (3) (item 29, sec III, app B).
- 2 pound hammer (3) (item 25, sec II, app B).
- Extension handle (4) (item 26, sec III, app B).

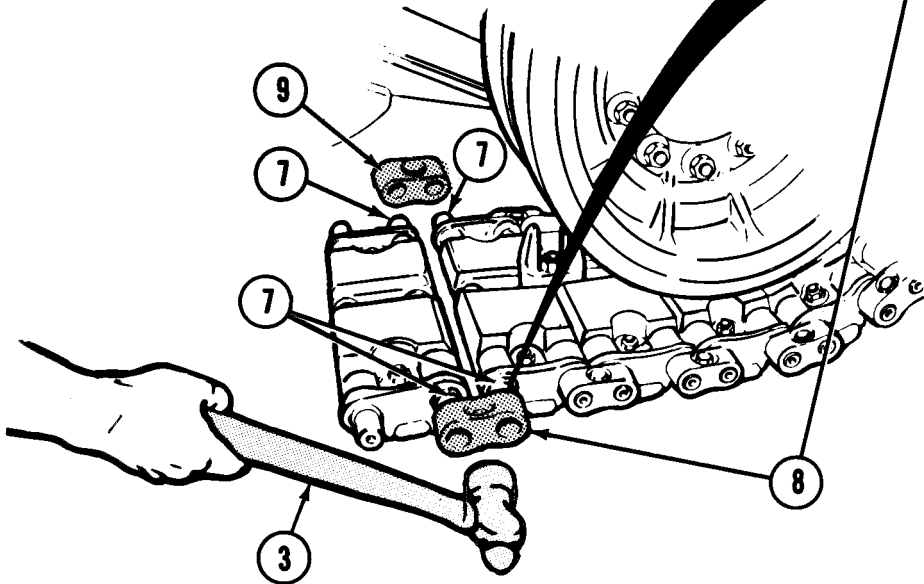
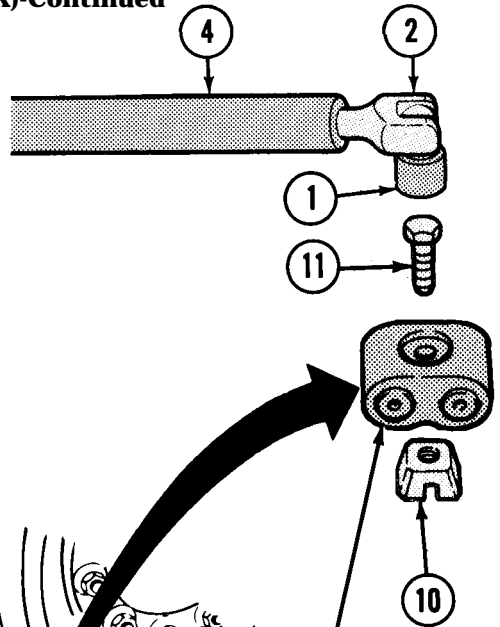


1. Place new track link (5) in front of track (6).

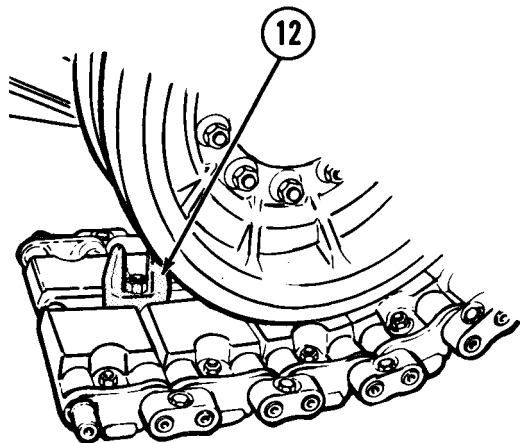


**MAINTAIN TRACK (INSTALL TRACK LINK)-Continued**

2. One crewmember line up track link pins (7).
3. Other crewmember, using hammer (3), pound end connectors (8 and 9) onto pins.
4. Place wedge (10) and bolt (11) on end connectors. Do not tighten.



5. Check that end connectors (8 and 9) are tighten against track before tightening bolts (11).
6. Using extension handle (4) on hinged handle socket wrench (2) with 15/16 inch socket (1), tighten bolts (11) to snug only.
7. Install centerguide (12) (page 3-44).
8. Connect track (page 3-45).
9. Return tools to stowage.



TA247814

**MAINTAIN TRACK (INSTALL END CONNECTORS)**

**Tools:**

Get from right front fender box:

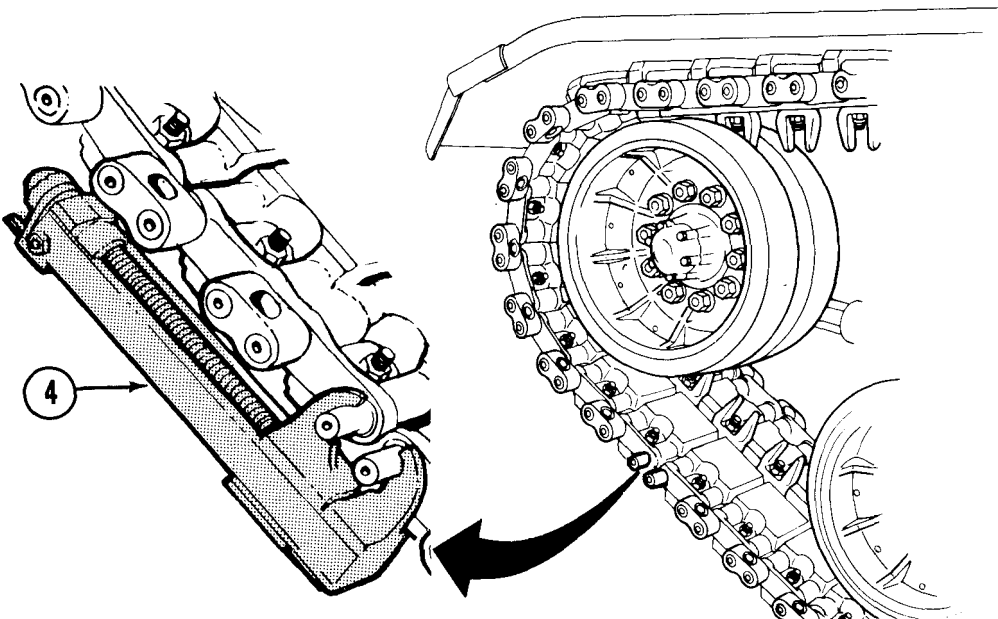
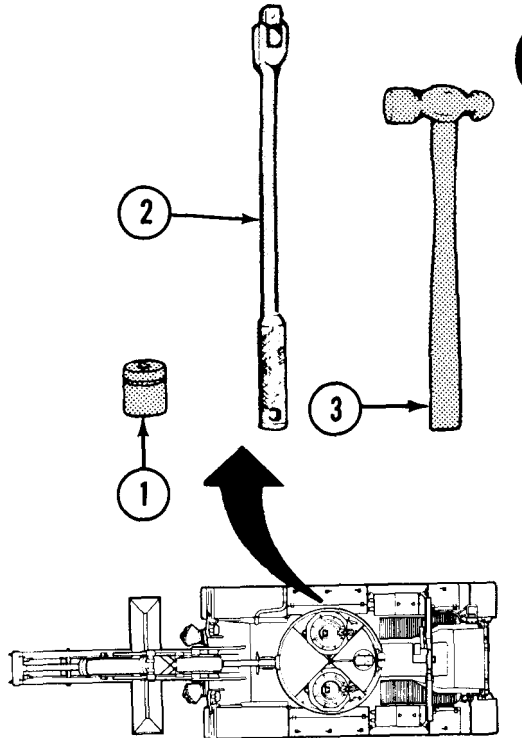
15/16 inch socket with 3/4 inch drive (1) (item 60, sec III, app B).

- Hinged handle socket wrench with 3/4 inch drive (2) (item 29, sec III, app B).
- 2 pound hammer (3) (item 25, sec III, app B).

**NOTE**

**Inner end correctors are replaced the same way as outer end connectors.**

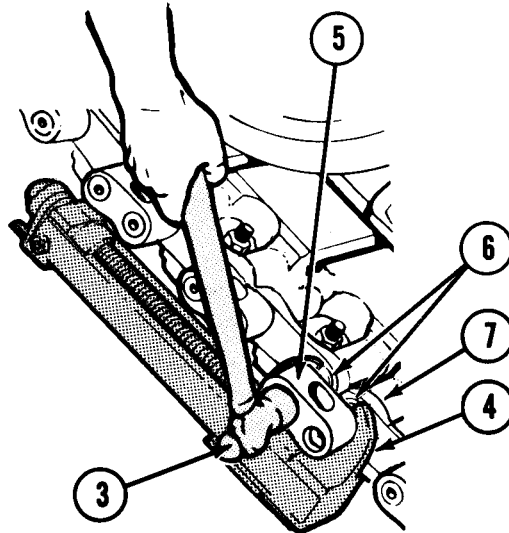
- Install track fixture (4).



TA247815

**MAINTAIN TRACK (INSTALL END CONNECTORS) - Continued**

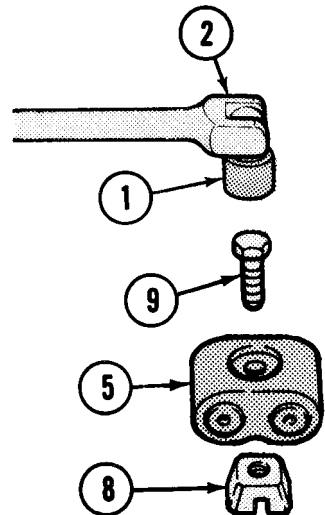
2. Using hammer (3), tap end connector (5) onto link pins (6) until it touches track fixture (4).



3. Turn track fixture (4) clockwise until loose. Remove from track.
4. Using hammer (3), pound end connector entirely onto pins until it hits track (7).
5. Set wedge (8) in end connector (5).

**NOTE**

**If organizational mechanic is available, have him torque bolt (9). If organizational mechanic is not available, position track as shown on page 3-47, step 12, and tighten bolt tightly. Have organizational mechanic torque bolt (9) as soon as possible.**



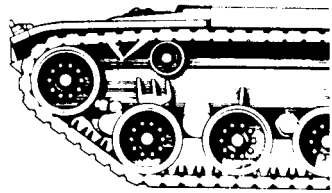
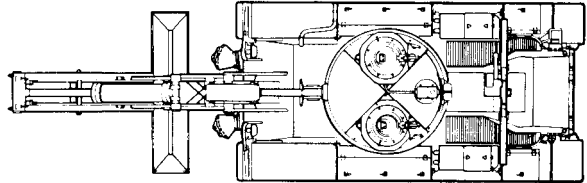
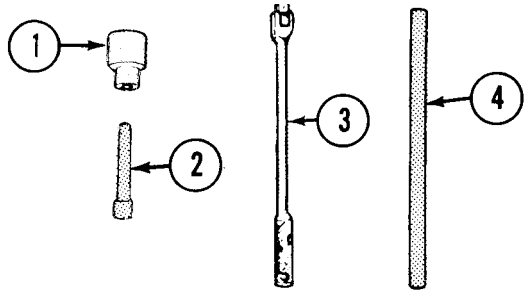
6. Using hinged handle (2) and 15/16 inch socket (1), tighten bolt (9) by turning clockwise.
7. Return tools to stowage.

**MAINTAIN TRACK (INSTALL CENTERGUIDE)**

**Tools:**

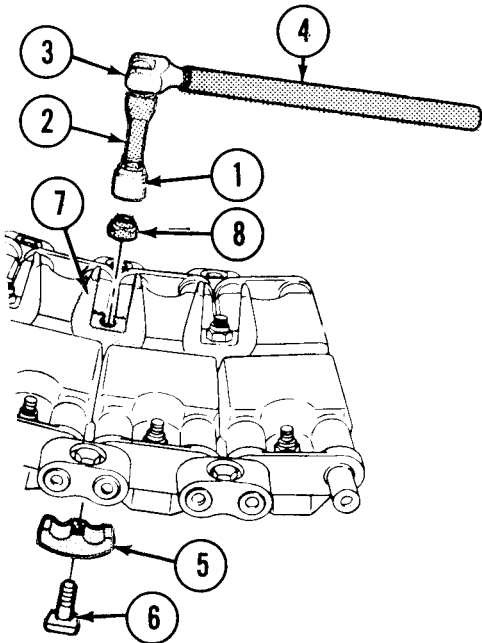
Get from right front fender box:

- 1-5/16 inch socket with 3/4 inch drive (1) (item 53, sec III, app B).
- 4-5/8 inch socket wrench extension with 3/4 inch drive (2) (item 16, sec III, app B).
- Hinged handle socket wrench with 3/4 inch drive (2) (item 29, sec III, app B).
- Extension handle (4) (ite sec III, app B).



**NOTE**

**If replacing track link on broken track, put tanker's bar under track pads to lift track off the ground.**



1. Line up cap (5) and bolt (6) with centerguide (7).
2. Screw nut (8) onto bolt (6).
3. Place 1-5/16 inch socket (1), 4-5/8 inch extension (2), hinged handle wrench (3), and extension handle (4) on centerguide nut (8).
4. Turn nut clockwise to tighten.

**NOTE**

**If organizational mechanic is available, have him torque nut (8). If organizational mechanic is not available, tighten nut (8) tighten and have organizational mechanic torque it as soon as possible.**

5. Return tools to stowage.

TA247817



**MAINTAIN TRACK (CONNECT TRACK)**

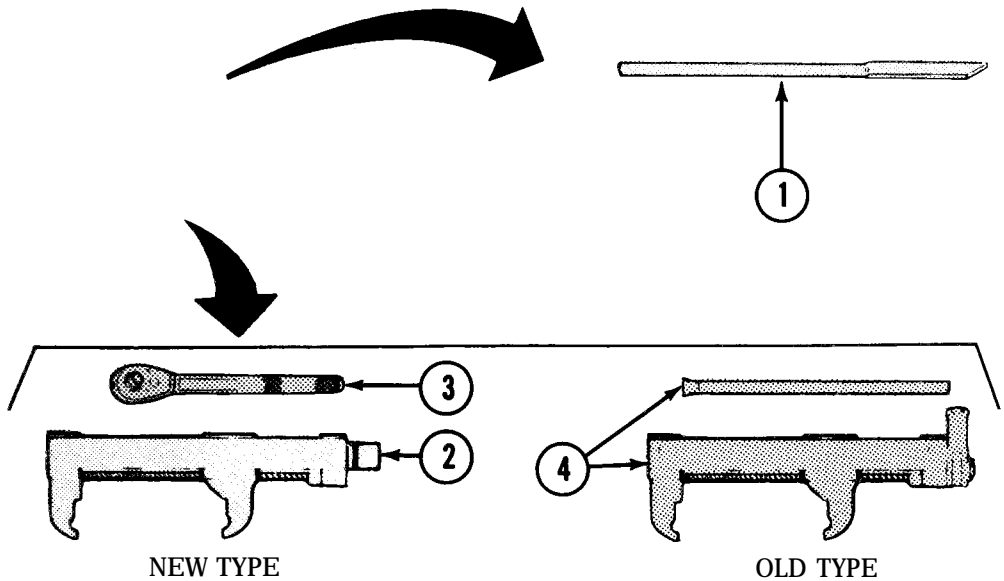
**NOTE**

**Three crewmembers are needed to do this procedure.**

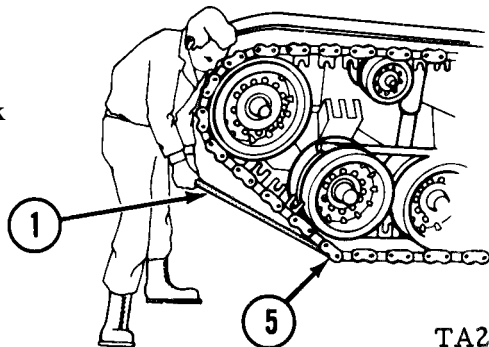
**Tools:**

Get crowbar (1) (item 10, sec III app D), from left front fender box.

Get two track fixtures (2) (item 20, sec III, app B) used with 3/4 inch drive ratchet (3) (item 31, sec III app B), if so equipped, or two track fixtures with bar (4) (item 20, sec III app B) from right front fender box.



1. One crewmember lift track (5) with crowbar (1).

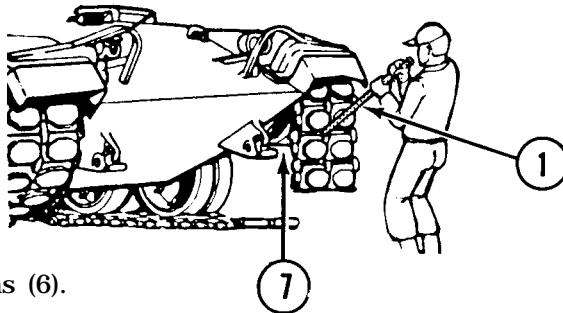


TA247818

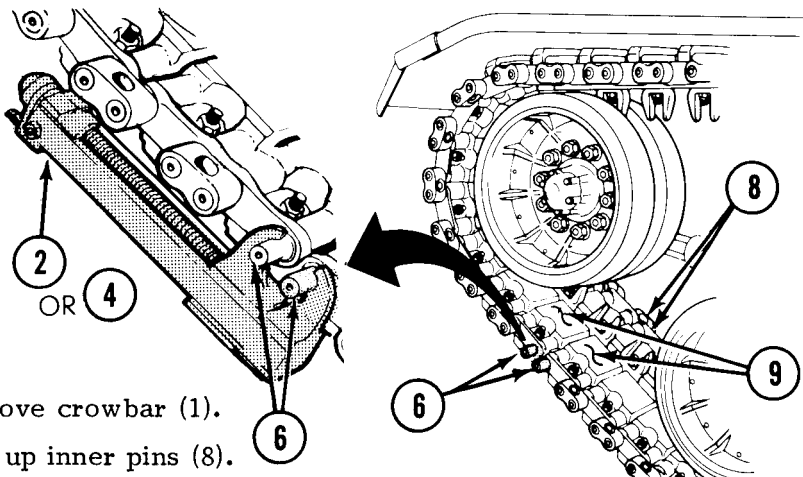
**MAINTAIN TRACK (CONNECT TRACK) - Continued**

**NOTE**

**If outer pins (6) are too far apart to attach track fixtures, wedge crowbar (1) between two centerguides and groove of compensating idler wheel (7). Pull down 011 crowbar until track fixtures can be attached.**



2. Line up outer pins (6).
3. Other two crewmembers attach track fixture (2) or (4) to outer track pins (6). Using ratchet or bar, turn counterclockwise and tighten.



4. Remove crowbar (1).
5. Line up inner pins (8).
6. Attach second track fixture inner pins (8).
7. Tighten both track fixtures (2) or (4) evenly by turning counterclockwise until links (9) are almost touching.

**NOTE**

**Use new centerguide bolt and nut if available. If not, replace as soon as possible.**

8. Install both outer and inner connectors (page 3-42).

TA247819

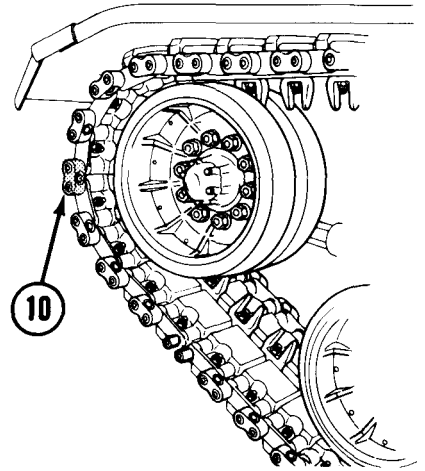
**MAINTAIN TRACK (CONNECT TRACK) - Continued**

9. Install centerguide (page 3-44).

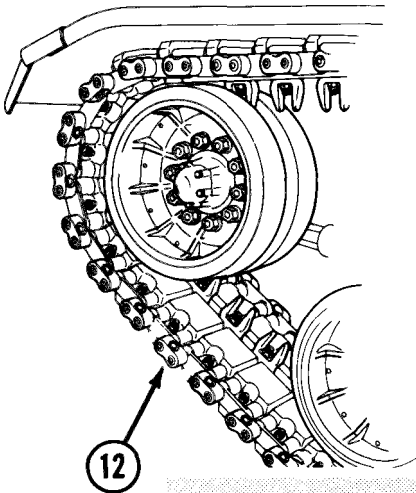
**NOTE**

If organizational mechanic is available, torque end connector and centerguide bolts. Then go to step 26.

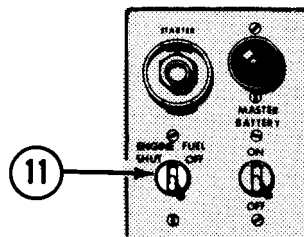
If organizational mechanic is not available, do steps 10 through 25. Have organizational mechanic torque as soon as possible.



10. Loosen centerguide bolt one turn.
11. Start engine (page 2-130).
12. Move vehicle until end connector is located at point (10). Stop vehicle (page 2-136 ).
13. Move shift lever to P (park) (page 2-126).



14. Push ENGINE FUEL SHUTOFF switch (11) up. Hold until engine stops.
15. Set parking brake (page 2-125).



**DRIVER'S STATION**

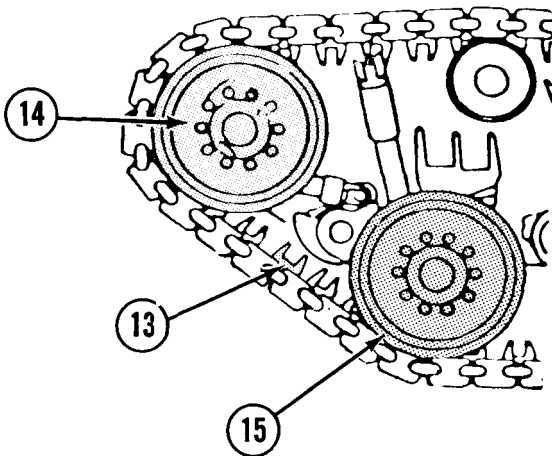
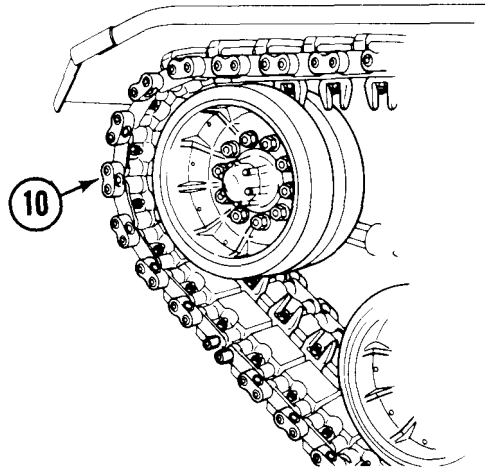
**NOTE**

**Do not use extension bar to tighten bolts.**

16. Tighten inner and outer end connector bolts.
17. Start engine (page 2-1 30).
18. Move vehicle until end connector is located at point (12).

**MAINTAIN TRACK (CONNECT TRACK) - Continued**

19. Move vehicle until end connector is located at point (10).
20. Repeat steps 13 through 15.
21. Tighten inner and outer end connector bolts.
22. Start engine (page 2-130).
23. Move vehicle until centerguide (13) is between compensating idler wheel (14) and number one roadwheel (1 5).
24. Repeat steps 13 through 15.
25. Tighten centerguide bolt.



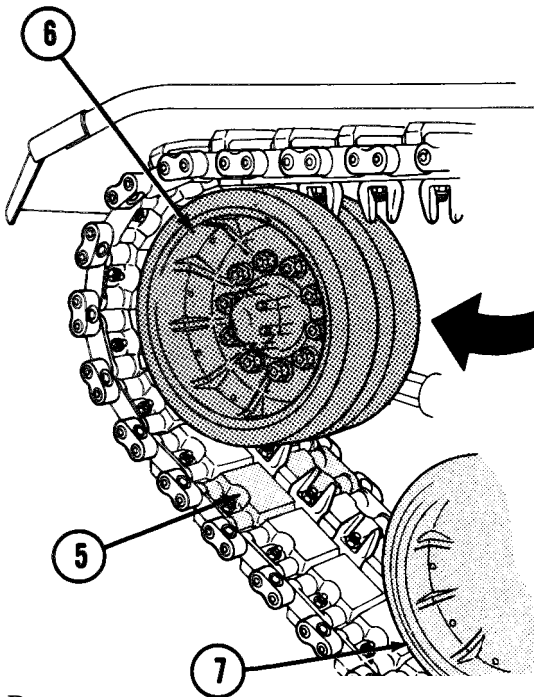
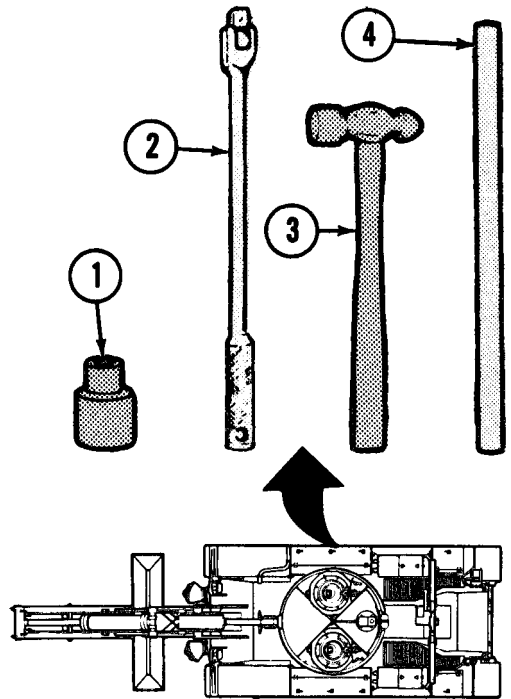
26. Adjust track tension (page 3-51).
27. Return tools to stowage.

**MAINTAIN TRACK (REMOVE AND INSTALL T-142 TRACK PAD)**

**Tools:**

Get from right front fender box:

- 1-1/8 inch socket with 3/4 inch drive (1) (item 52 sec III, app B).
- Hinged handle socket wrench, with 3/4 inch drive (2) (item 29, sec III, app B).
- 2 pound hammer (3) (item 25, sec III, app B).
- Extension handle (4) (item 26, sec III, app B).



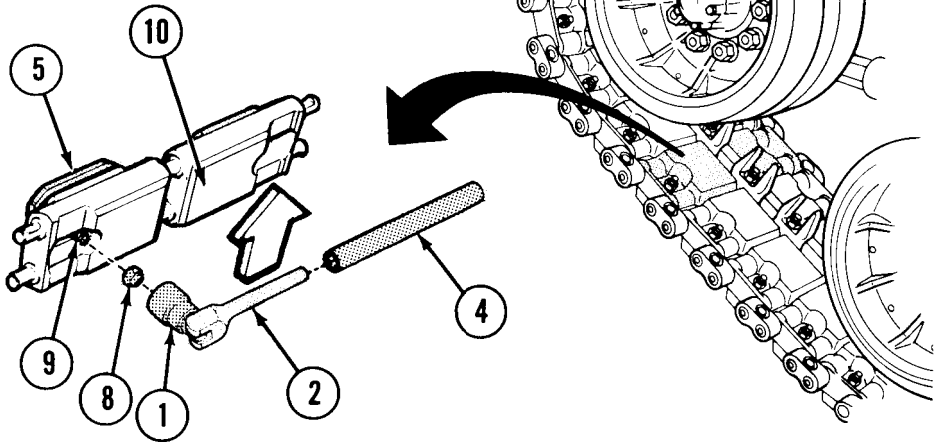
To Remove:

1. Move vehicle until bad track pad (5) is between compensating idler wheel (6) and front roadwheel (7).

TA247822

**MAINTAIN TRACK (REMOVE AND INSTALL T-142 TRACK PAD)**  
**(Continued)**

2. Using 1-1/8 inch socket (1), hinged handle wrench (2), and extension handle (4), loosen nut (8) by turning counterclockwise.
3. Remove nut (8).



4. Hit bolt (9) with hammer to remove pad (5) from link assembly (10).

**To Install:**

1. Place new pad (5) on link assembly (10).
2. Screw nut (8) on bolt (9).
3. Using socket (1), hinged handle wrench (2), and extension (4), tighten nut (8).

**NOTE**

**Have organizational maintenance torque nut as soon as possible.**

4. Return tools to stowage.

TA247823

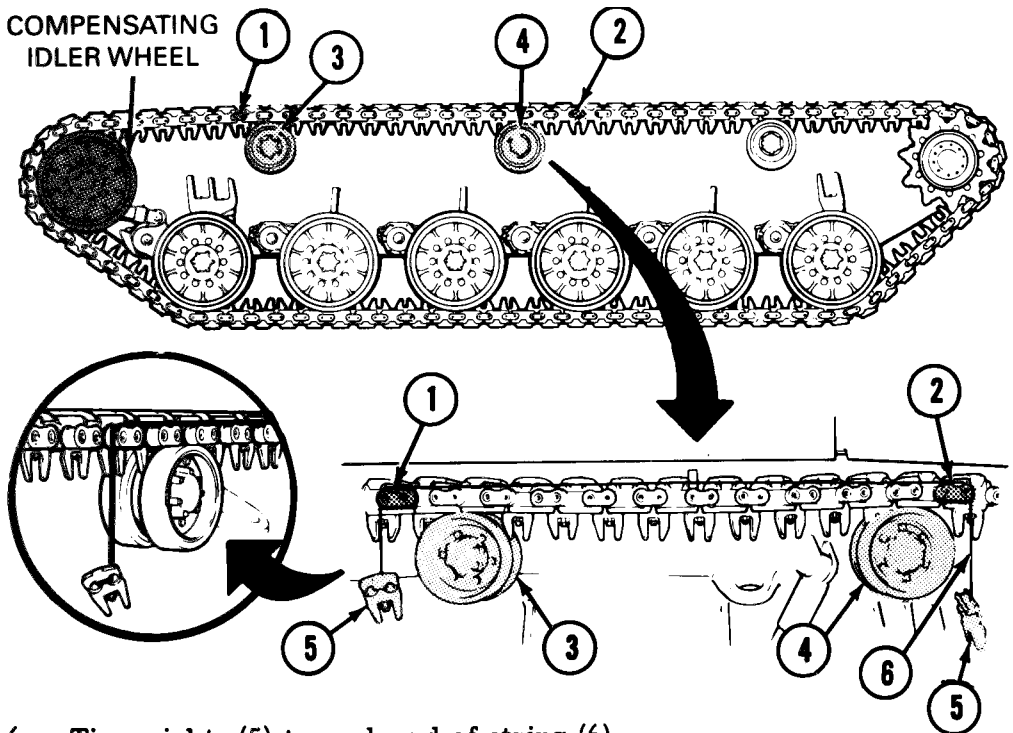
**MAINTAIN TRACK (ADJUST TRACK TENSION)****NOTE**

**Track tension adjustments must be made with vehicle on smooth, level ground.**

**Supplies:**

Get a 10-foot-long string strong enough to hold weights such as two end connectors or two centerguides.

1. Move vehicle backward at least two vehicle lengths.
2. Move vehicle forward and allow vehicle to coast to stop without applying brakes.
3. Set shift lever to P (park) (page 2-126).
4. Shut off engine.
5. Remove dirt and mud from end connectors (1) and (2) near first (3) and second (4) support rollers.



6. Tie weights (5) to each end of string (6).

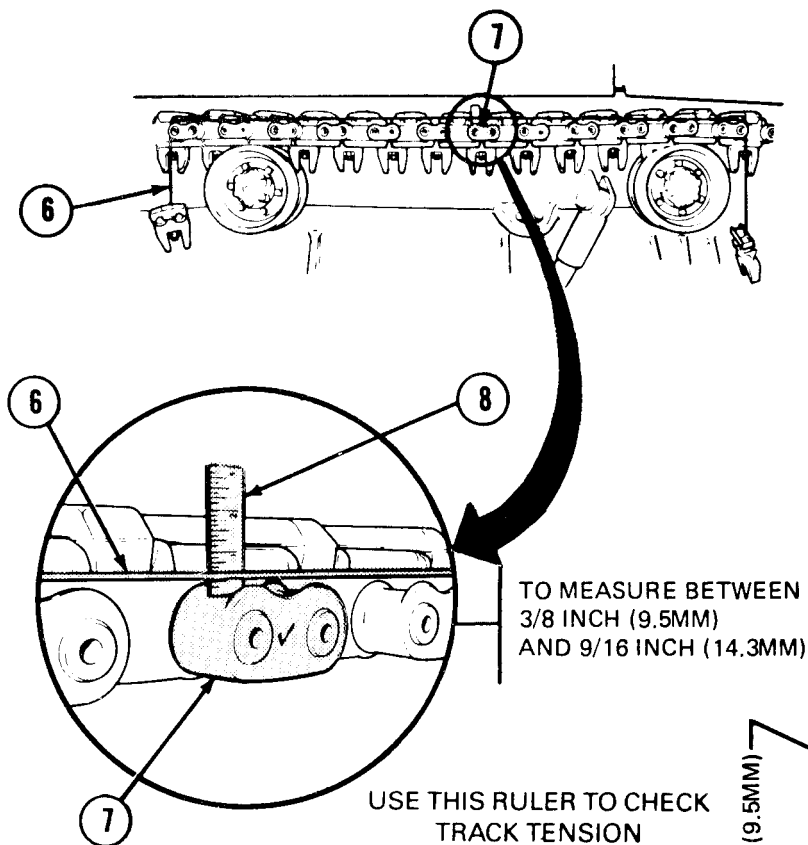
**NOTE**

**String must be placed over end connectors where it will hang free just beyond support rollers (2) and (3).**

7. Place string over center of end connectors (1) and (2).

**MAINTAIN TRACK (ADJUST TRACK TENSION) -Continued**

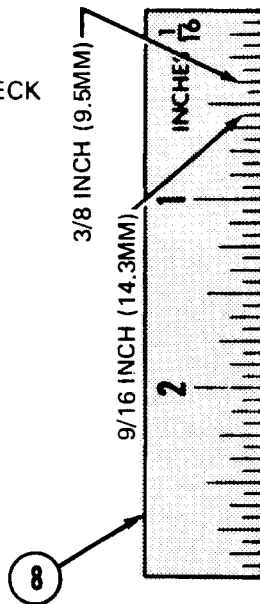
8. Find center of string (6) and mark (✓) nearest end connector (7).



9. Using ruler (8), measure distance between string (6) and marked (✓) end connector (7) measure to bottom of string.

**NOTE**

If space between string and end connector measures between 3/8 inch (9.5 mm) and 9/16 inch (14.3 mm), track tension is good. If it does not, do steps 10 through 22 for conventional track adjusting link or go to page 3-56 for grease actuated adjusting link.

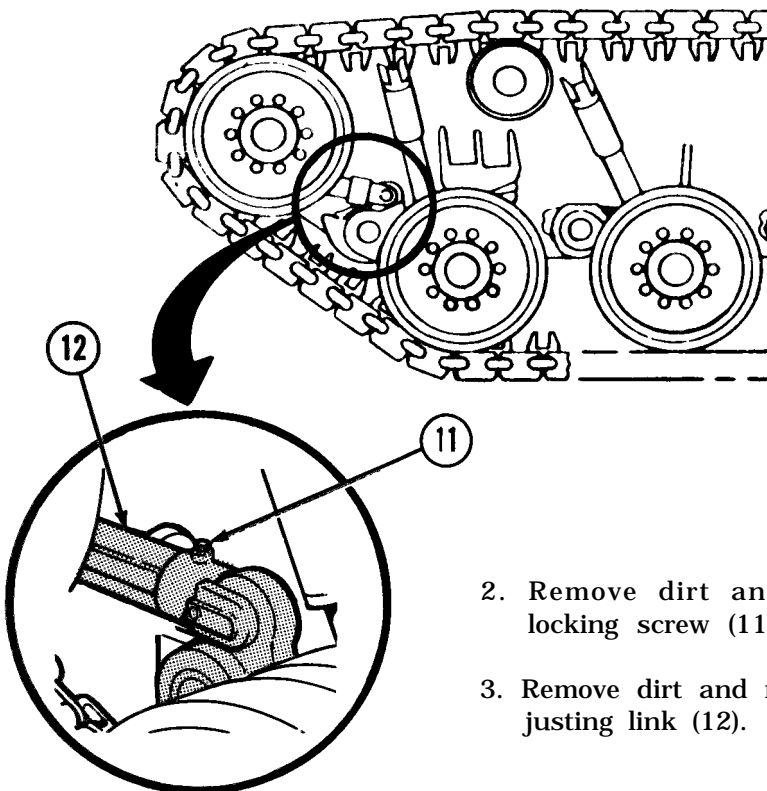
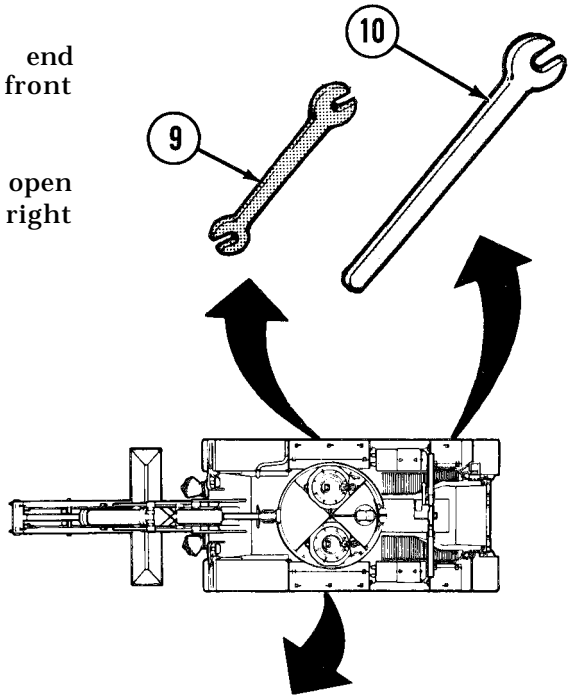




MAINTAIN TRACK (ADJUST TRACK TENSION) - Continued

10. Get  $9/16$  inch open end wrench (9) from right front fender box.

11. Get  $3-3/16$  inch single open end wrench (10) from right rear fender box.

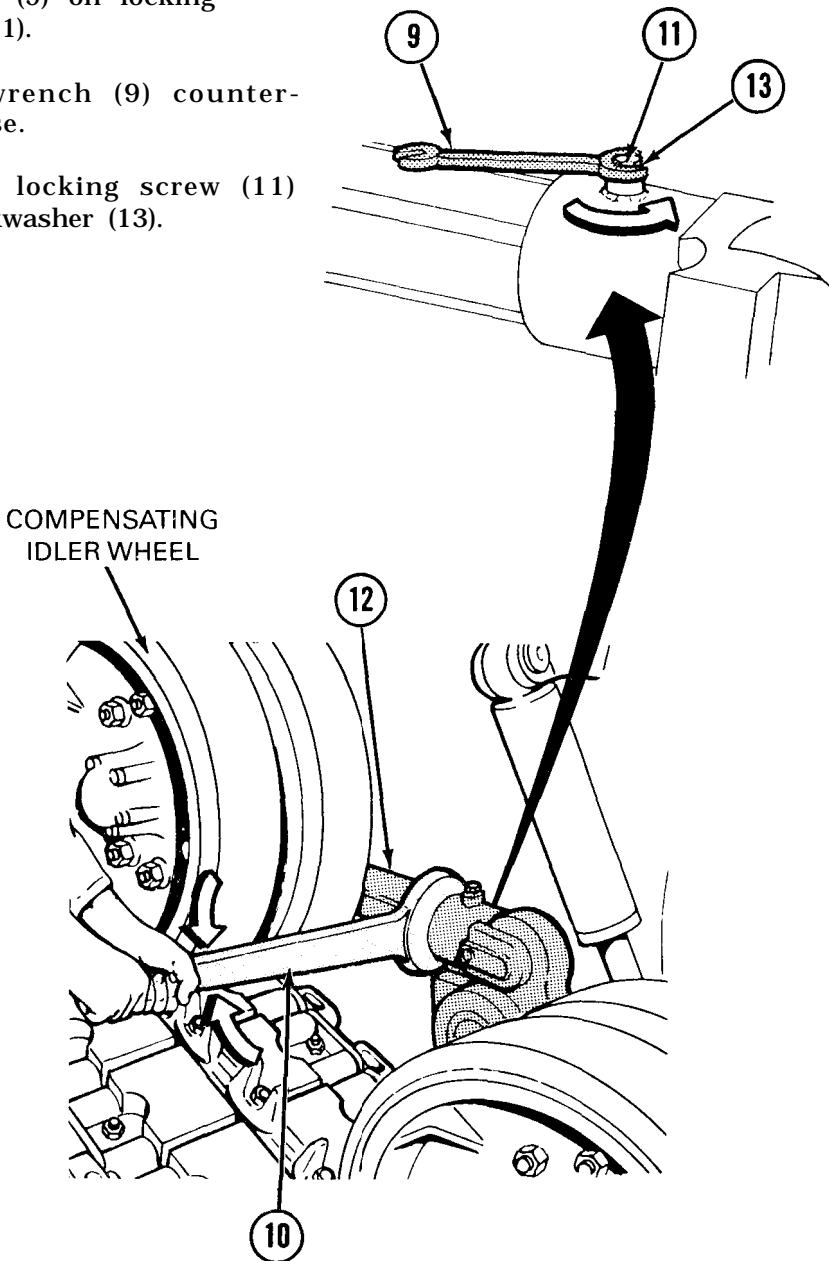


2. Remove dirt and mud from locking screw (11).

3. Remove dirt and mud from adjusting link (12).

**MAINTAIN TRACK (ADJUST TRACK TENSION) - Continued**

- 14. Place 9/16 inch open end wrench (9) on locking screw (11).
- 15. Turn wrench (9) counter-clockwise.
- 16. Remove locking screw (11) and lockwasher (13).



- 17. Place 3-3/16 inch open end wrench (10) on track adjusting link (12).

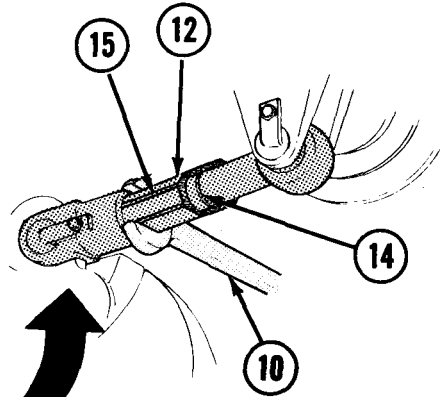
## MAINTAIN TRACK (ADJUST TRACK TENSION) - Continued

### NOTE

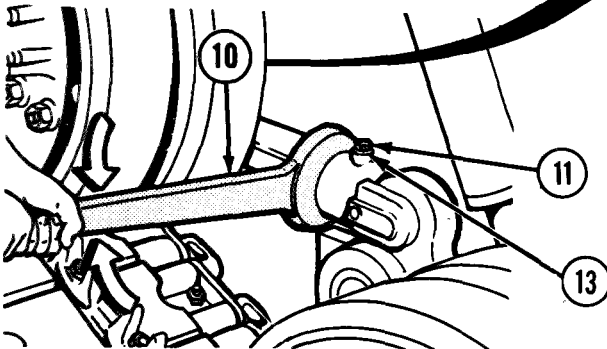
To adjust track tension on right sides of vehicle, pull wrench (10) up to increase tension and push down to decrease tension. On left side of track use opposite directions.

### CAUTION

If tightening tension, do not move adjusting link (12) beyond groove (14). If track tension is still too loose after groove appears, remove track link (page 3-39) and readjust track tension (stow removed track link in fender stowage box). If a track link must be removed when adjusting one side, the other side does not have to be shortened.



REAR VIEW OF  
ADJUSTING LINK



18. Loosen or tighten track tension as required by turning adjusting link (12) with wrench (10).
19. Repeat step 9. (Read CAUTION on top of this page).

### NOTE

When installing and tightening lockwasher (13) and locking screw (11), make sure high side (15) of adjusting link is lined up with screw.

20. Install and tighten lockwasher (13) and locking screw (11).
21. Lubricate adjusting link (LO 9-2350-202-12).
22. Return tools and supplies to stowage.

TA247828

**MAINTAIN TRACK (ADJUST TRACK TENSION) - Continued**

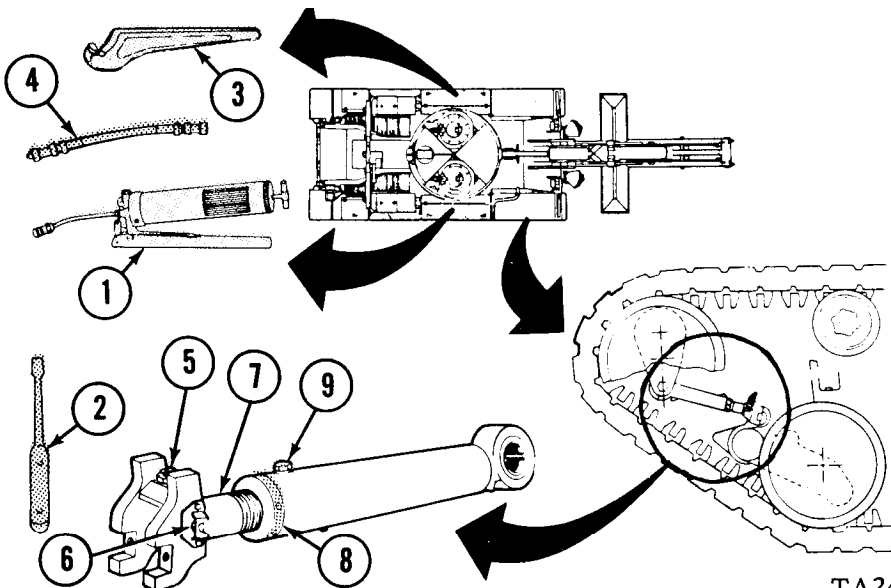
**GREASE ACTUATED ADJUSTING LINK (IF EQUIPPED)**

**NOTE**

**Track tension adjustment must be performed after all inspection faults have been corrected.**

**Do not use any other method to check track tension when grease actuated track adjusting link is installed.**

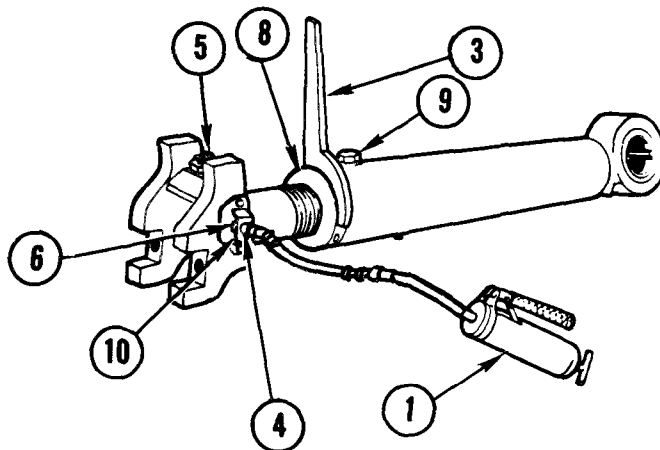
1. Get grease gun (1) from right front fender box.
2. Get screwdriver (2) from right front fender box.
3. Get spanner wrench (3) from left front fender box.
4. Get grease gun extension (4) from right front fender box.
5. Move vehicle forward on hard level surface and coast to a stop without applying brakes.
6. Remove/clean grease, mud, and dirt from pressure relief-valve (5), grease fitting (6), threaded shaft (7), threaded locking collar (8), and locking screw (9).



TA247829

**MAINTAIN TRACK (ADJUST TRACK TENSION) - Continued**  
**GREASE ACTUATED ADJUSTING LINK ( IF EQUIPPED)**

7. Loosen and partially unscrew locking screw (9).
8. Attach lube gun extension (4) to grease gun (1). Insert lube gun extension into bracket (10) and couple it with grease fitting (6).
9. Give grease gun a few pumps to release threaded locking collar (23).
10. Back off threaded locking collar (8), using spanner wrench (3).



**NOTE**

**Threaded locking collar (8) may require tightening to break loose trapped dirt prior to loosening.**

11. Pump grease into grease actuated adjusting link until grease exits from pressure relief valve (5).
12. Tighten threaded locking collar (8), using spanner wrench (3).
13. Disconnect lube gun extension (4) from grease fitting (6).
14. Remove lube gun extension (4) and grease gun (1).

TA247830

**MAINTAIN TRACK (ADJUST TRACK TENSION) - Continued**  
**GREASE ACTUATED ADJUSTING LINK (IF EQUIPPED)**

15. Repeat steps 5 through 14, for opposite side of vehicle.
16. Repeat steps 5 through 15, two more times (a total of three tension adjustments for each side of vehicle, made alternately).

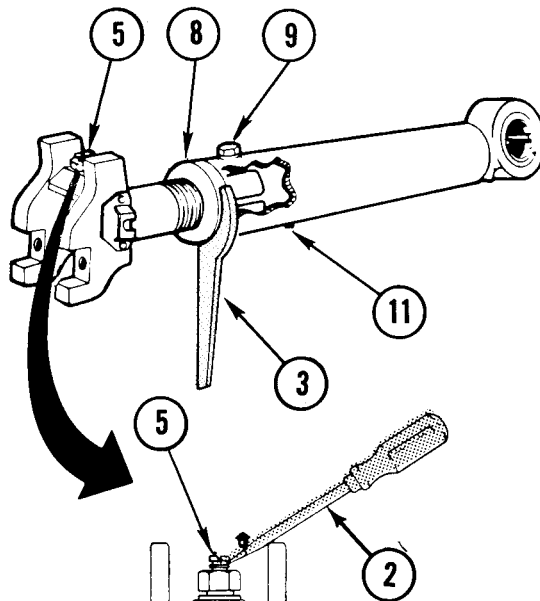
**NOTE**

**Do not make successive tension adjustments on same side of vehicle. Always alternate sides.**

17. Using spanner wrench (3), align tie nearest slot in the threaded locking collar (8) with locking screw (9) and tighten locking screw (both sides of vehicle).
18. Relieve link internal pressure by lifting the pressure relief valve pin (5) with screwdriver (2).

**NOTE**

**If grease exits from extension limiting valve (11), remove a track link (page 3-37) and readjust track (stow removed track link in fender stowage box).**



TA247831

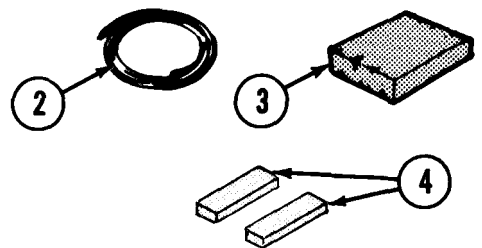
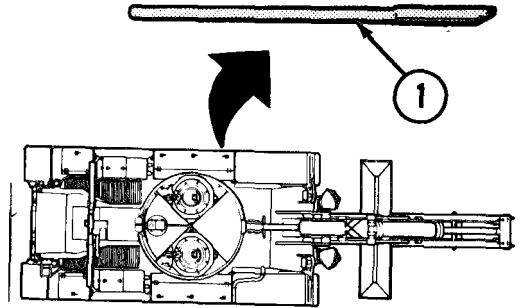
**MAINTAIN TRACK (INSTALL THROWN TRACK)**

**NOTE**

**Four crewmembers are needed to do this procedure.**

**Tools and Supplies:**

- Get crowbar (1) (item 10, sec III, app B) from left front fender box.
- 30 foot length of 3-inch rope (2) (item 40, app D).
- 3 foot by 3 foot metal plate or 3 foot by 3 foot by 3 inch thick wood board (3).
- 2, 1 foot by 3 inch by 2 foot pieces of wood (4) (to block track).



**Make Sure:**

- Engine is off.

**CAUTION**

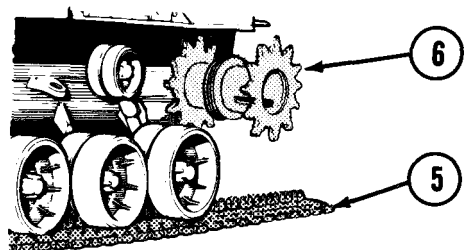
**If vehicle cannot be moved under its own power without causing damage to vehicle or track, do not try to remove track. Get help from organizational maintenance.**

1. Remove rear fender (page 3-65).
2. Break track (if not already broken) (page 3-37)

**CAUTION**

**Make sure personnel are clear from rear of vehicle. Use ground guide to direct movement of track.**

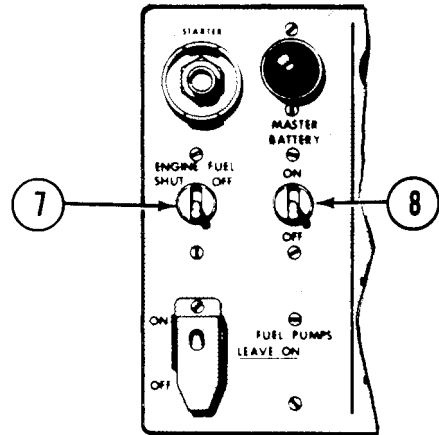
3. Start engine, warm up, and let idle (page 2-130).
4. Drive vehicle rearward slowly until track (5) is free of drive sprocket (6) (page 2-135).



BACK OF VEHICLE TA247982

**MAINTAIN TRACK (INSTALL THROWN TRACK) - Continued**

5. Move shift lever to 1? (park) (page 2-126).
6. Push Up and hold ENGINE FUEL SHUT OFF switch (7) until engine stops.
7. Set MASTER BATTERY switch (8) to OFF.
8. Set parking brake (page 2-125).



DRIVER'S STATION

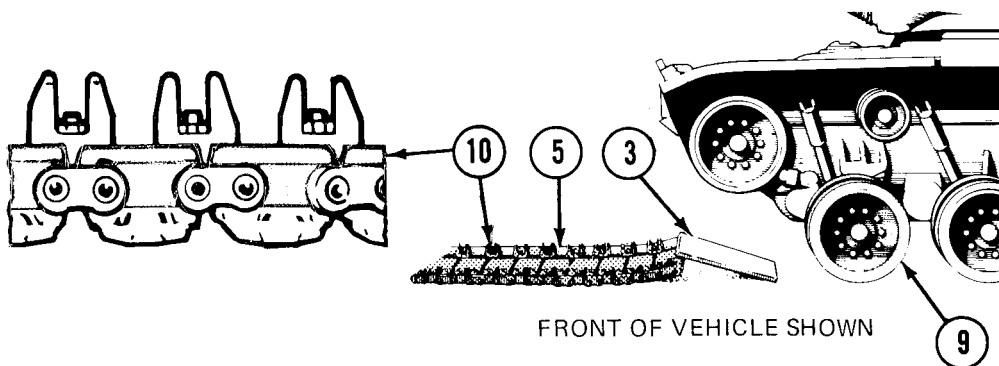
**NOTE**

**If vehicle is completely off track, do steps 9 through 42. If roadwheels are still resting on track, skip steps 9, 10, and 12.**

9. Line Up track (5) with roadwheel (9) (front or rear of vehicle)"

**NOTE**

**Use heavy metal plate or thick wood board (3) to drive roadwheel (9) onto track (5). If metal plate or board is not available, dig a hole under track so upper part of links (10) is even with ground.**



FRONT OF VEHICLE SHOWN

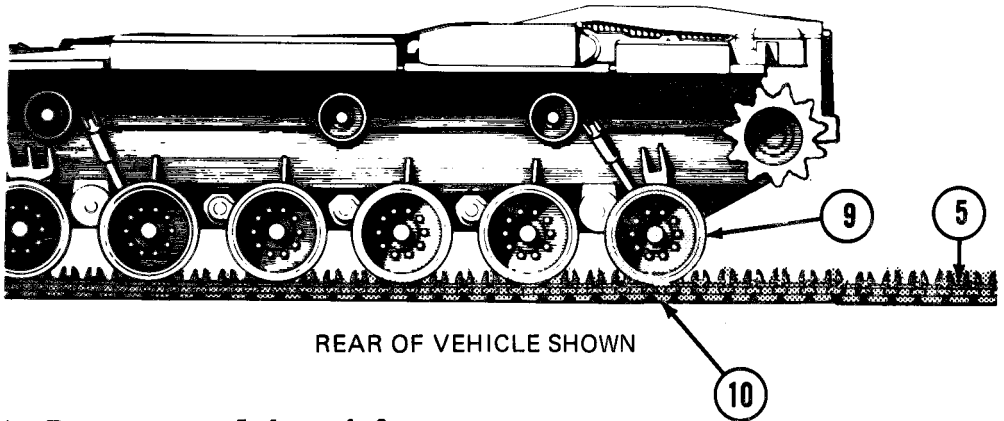
10. Use metal plate or wood board (3) as ramp.

TA247833



**MAINTAIN TRACK (INSTALL THROWN TRACK) - Continued**

11. Start engine, warm up, and let idle (page 2-1 30).
12. Drive vehicle onto track (5) (page 2-13 5).
13. Stop vehicle when number six (last) roadwheel (9) is resting on sixteenth link (10).

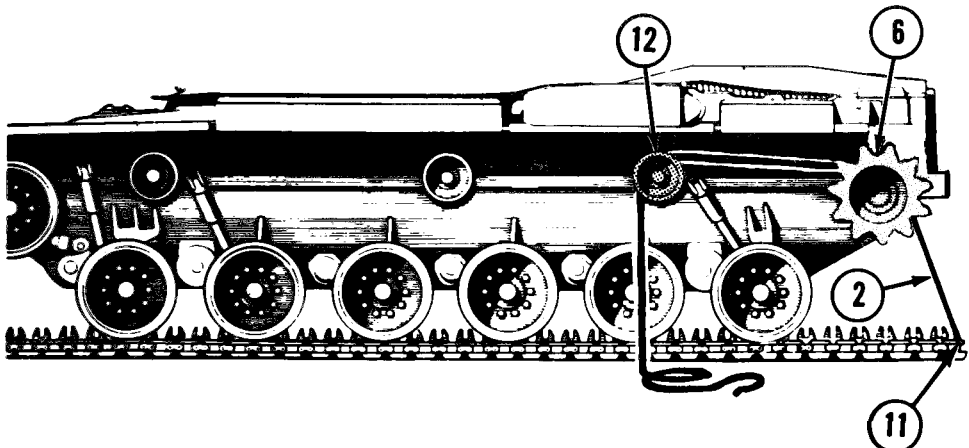


14. Repeat steps 5 through 8.

**NOTE**

**Block opposite track front and rear. Use 30-foot piece of rope (2) to move track onto vehicle.**

15. Tie rope to center of link pin (11).
16. Pass rope (2) over centerguide groove of drive sprocket (6).

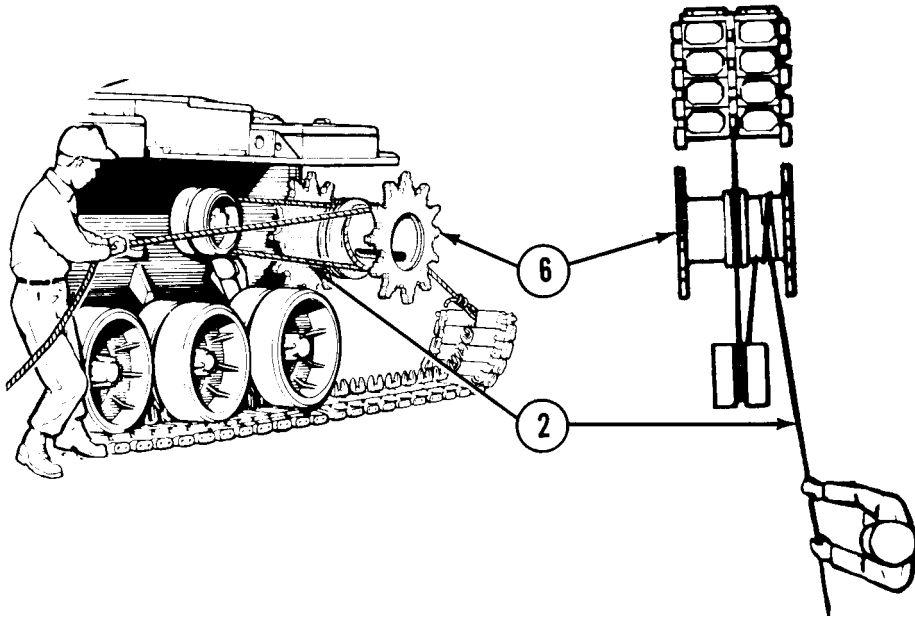


17. Pass rope around groove of rear dual support roller (12).

TA247834

**MAINTAIN TRACK (INSTALL THROWN TRACK) - Continued**

18. Pass rope (2) under and around outer surface of drive sprocket (6) two times.

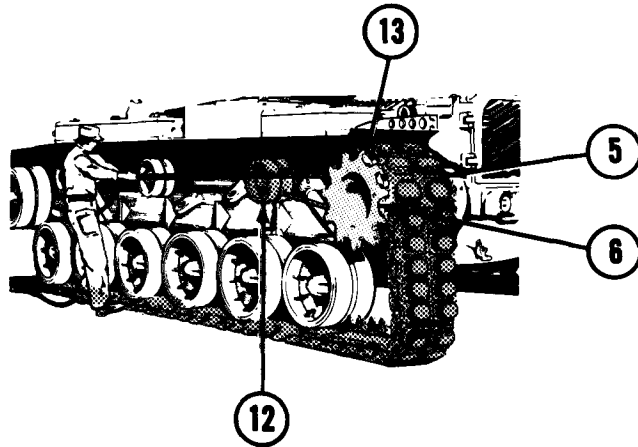


19. Pull free end of rope (2) and hold tightly.

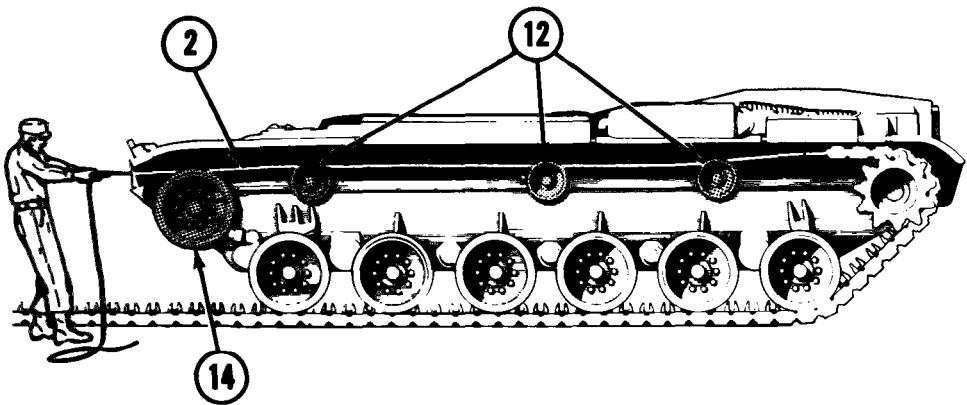
**NOTE**

**Remove blocks from opposite side.**

20. Start engine, warm up, and let idle ( page 2-130).
21. Hold brake. Move shift lever to L (low) (page 2-126).
22. Steer slightly away from track (page 2-128).
23. Slowly release brake.
24. Hold rope (2) at free end while driver accelerates engine until drive sprocket (6) turns slowly.

**MAINTAIN TRACK (INSTALL THROWN TRACK) - Continued**

25. Guide free end of track (5) onto drive sprocket (6).
26. Stop forward movement of vehicle when three end connectors (13) are on drive sprocket (6).
27. Repeat steps 5 thru 8.
28. Remove rope from around sprocket (6) and support roller (12).



29. Pass rope (2) over and between three support rollers (12).
30. Pass rope (2) over compensating idler wheel (14). Pull and hold rope (2) tight.
31. Start engine, warm up, and let idle (page 2-130).

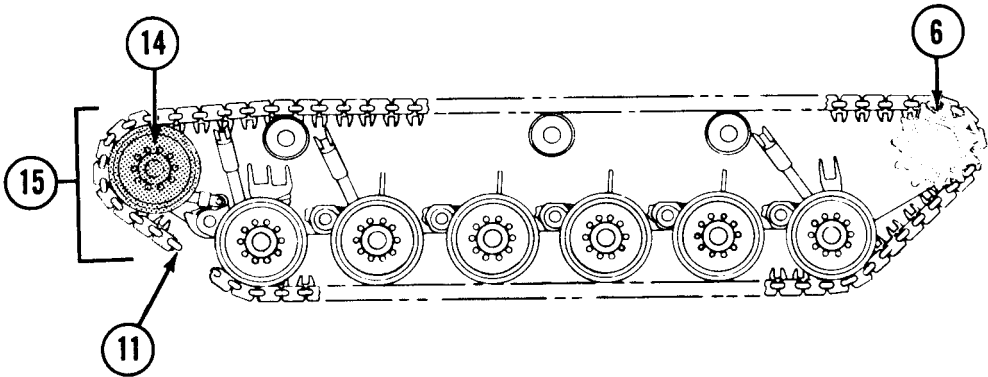
**MAINTAIN TRACK ( INSTALL THROWN TRACK )-Continued**

- 32. Stepping on brake, move shift lever to L (low) (page 2-1 26).
- 33. Slowly release brake (page 2-135).

**NOTE**

**Free end of track will sometimes drive down toward ground over forward side of drive sprockets. If this happens, place crowbar under track links with end of crowbar against side of vehicle to keep track moving over support rollers and forward compensating idler wheel (14).**

- 34. Accelerate engine enough to slowly turn drive sprocket (6).
- 35. Continue forward until eight track links (15) pass over compensating idler wheel (14).



- 36. Repeat steps 5 through 8.
- 37. Remove rope from track link pin (1 1).
- 38. Connect track (page 3-45).
- 39. Adjust track tension (page 3-51).
- 40. Install rear fender (page 3-67).
- 41. Return tools and supplies to stowage.

TA247837

**MAINTAIN TRACK (REMOVE REAR FENDER)**

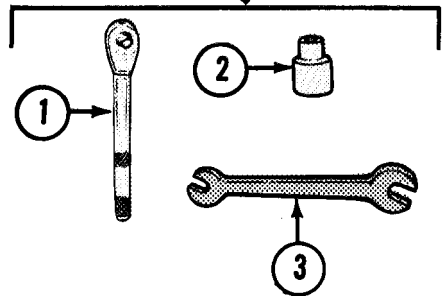
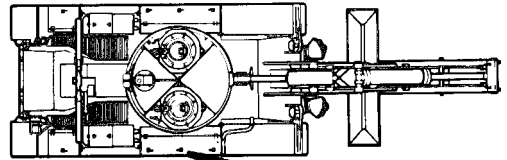
**NOTE**

**Two crewmembers are needed to do this procedure.**

**Tools:**

Get from right front fender box:

- Ratchet with 1/2 inch drive (1) (item 30, sec III, app B).
- 9/16 inch socket with 1/2 inch drive (2) (item 57, sec III, app B).
- 9/16 inch open end wrench (3) (item 68, sec III, app B).

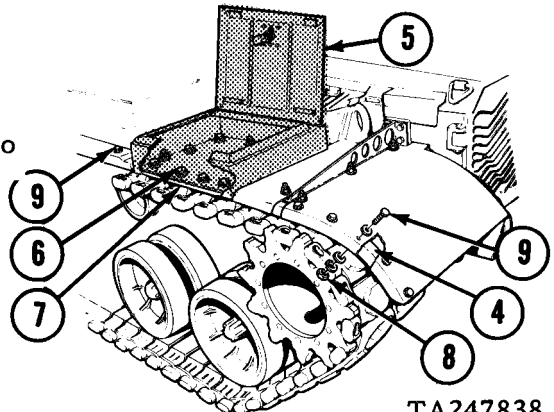


**Make Sure:**

- 1 Vehicle is parked.
- 1 Engine is off.

**To Remove Angle (4):**

1. Open rear fender box cover (5) to get at screws (6).
2. Put open end wrench on nuts (7). Using socket and ratchet, on screws (6), loosen screws.
3. Remove four nuts (7), four lockwashers, eight flat washers, and four screws (6).
4. Put open end wrench on nuts (8). Using socket with ratchet, on screws (9), loosen screws.
5. Remove eight nuts (8), eight lockwashers, sixteen flat washers, and eight screws (9).
6. Remove angle (4).
7. Put angle and hard ware off to one side.
8. Close fender box covers (5).

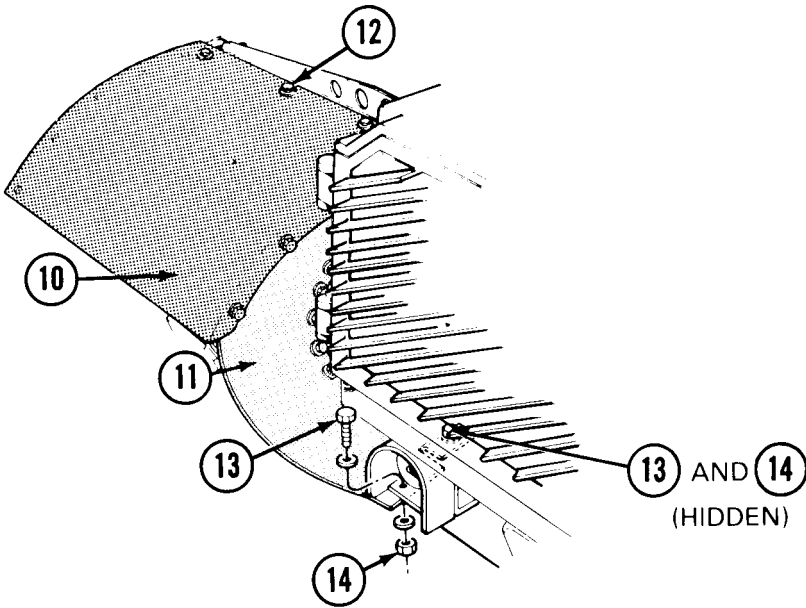


TA247838

**MAINTAIN TRACK (REMOVE REAR FENDER) - Continued**

**To Remove Fender (10) and Shield(11):**

1. Using socket with ratchet on nuts (12), loosen nuts.
2. Remove three nuts (12) and flat washers.
3. Put open end wrench on screws (13). Using socket with ratchet on nuts (14), loosen nuts.
4. Remove two nuts (14), four flat washers, and two screws (13).
5. Remove fender (10) and shield (11).
6. Put fender, shield, and hardware off to one side.
7. Return tools to stowage.



**MAINTAIN (INSTALL REAR FENDER)**

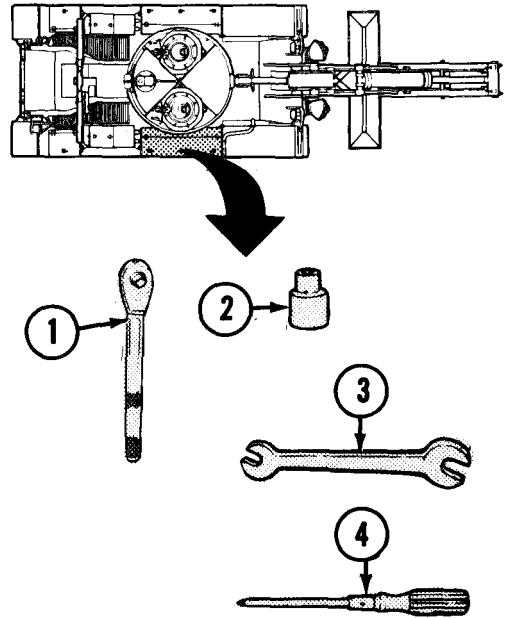
**NOTE**

**Two crewmembers are needed to do this procedure.**

Tools:

Get from right front fender box:

- Ratchet with 1/2 inch drive (1) (item 30, sec III, app B).
- 9/16 inch socket with 1/2 inch drive (2) (item 63, sec III, app B).
- 9/16 inch open end wrench (3) (item 68, sec III, app B).
- Cross-tip screwdriver (4) (item 46 or 47, sec III, app B).

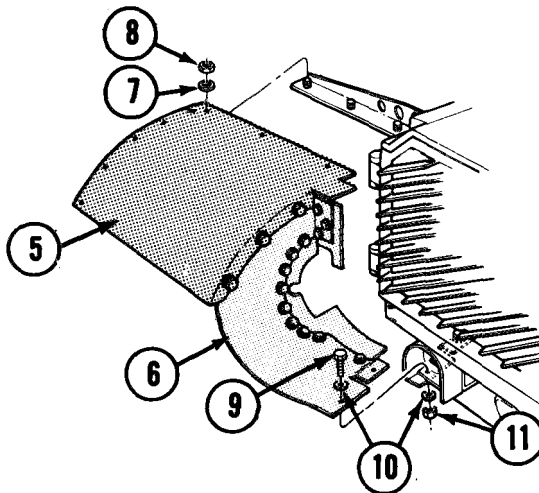


Make Sure:

- Vehicle is parked.
- Engine is off.

To Install Fender (5) and Shield (6):

1. Put fender (5) and shield (6) in place.
2. Using fingers, install three flat washers (7) and nuts (8).
3. Using fingers, install two screws (9), four flat washers (10), and two nuts (11). (If necessary, aline holes with screwdriver.)

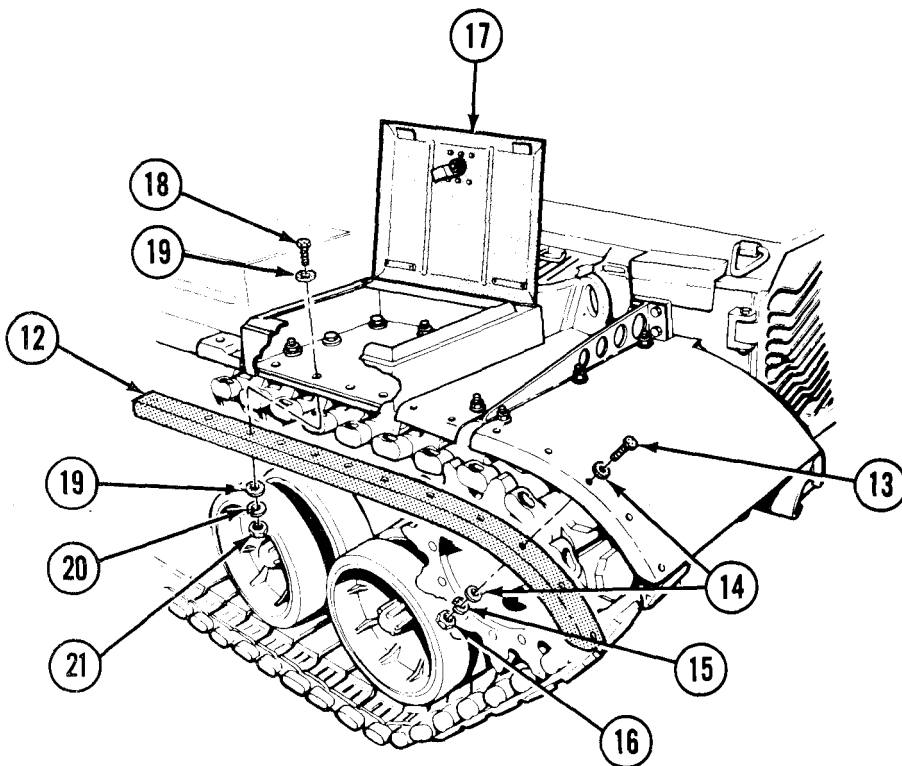


TA247840

**MAINTAIN TRACK (INSTALL REAR FENDER) - Continued**

**To Install Angle (12):**

1. Put angle (12) in place.
2. Using fingers, install eight screws (13), sixteen flat washers (14), eight lockwashers (15), and eight nuts (16). (If necessary, aline holes with screwdriver).
3. Open rear fender box cover (17).
4. Using fingers, install four screws (18), eight flat washers (19), four lockwashers (20), and four nuts (21).
5. Place open end wrench on nuts (16) and (21).
6. Using socket with ratchet on screws (13) and (18), tighten screws.
7. Close fender box cover (17).

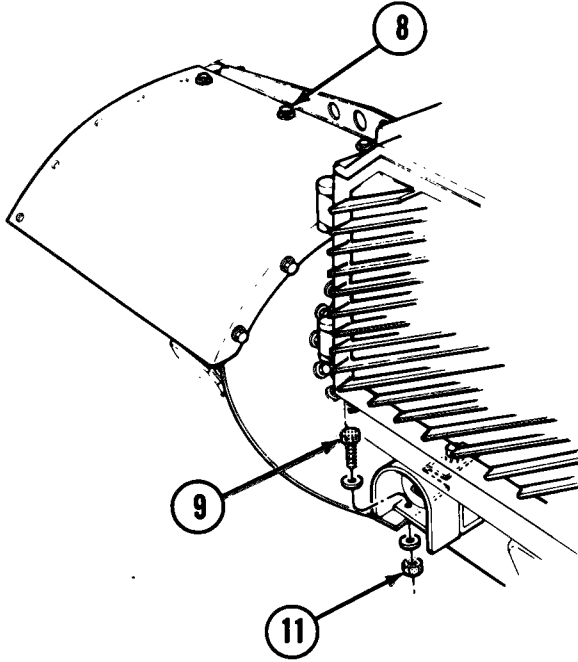


TA247841



**MAINTAIN TRACK (INSTALL REAR FENDER) - Continued**

8. Put open end wrench on screw (9).
9. Using socket with ratchet on nuts (11) and (8), tighten nuts.



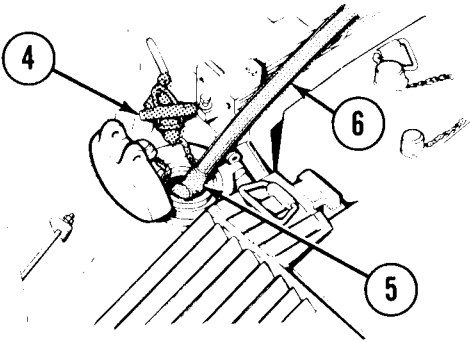
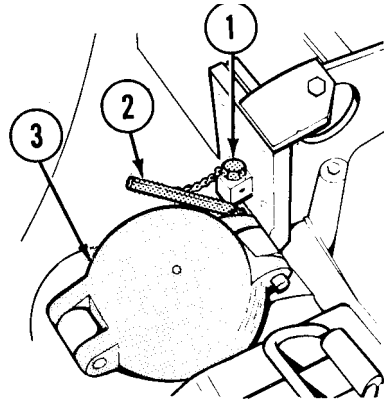
10. Return tools to stowage.

**REFUELING FROM PRESSURIZED SOURCE**

**WARNING**

Do not smoke or allow flames or sparks within area while filling fuel tanks. Have a manned fire extinguisher present.

1. Using 15/16 inch wrench, loosen lock screw (1).
2. Remove lock pin (2) and lift cover (3). Turn filler cap (4) 1/4-turn counterclockwise and remove.



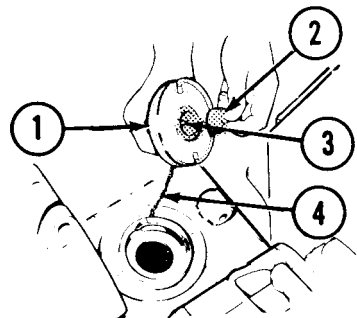
**NOTE**

During sandy, dusty, or other adverse conditions, prevent foreign matter from entering fuel tanks by covering fuel filler opening (5) around hose (6).

3. Insert hose into opening. Allow for fuel expansion by filling to about 6 inches below opening (approximately 385 gallons for complete refill). Remove any spilled fuel immediately.
4. Remove hose. Replace filler cap (4) and turn 1/4-turn clockwise to tighten.
5. Position and lower cover (3). Secure with lock pin (2). Using 15/16 inch wrench, secure lock pin with lock screw (1).

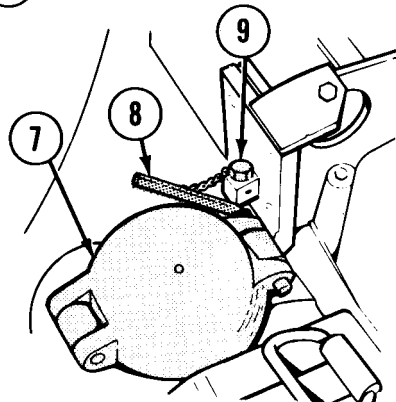
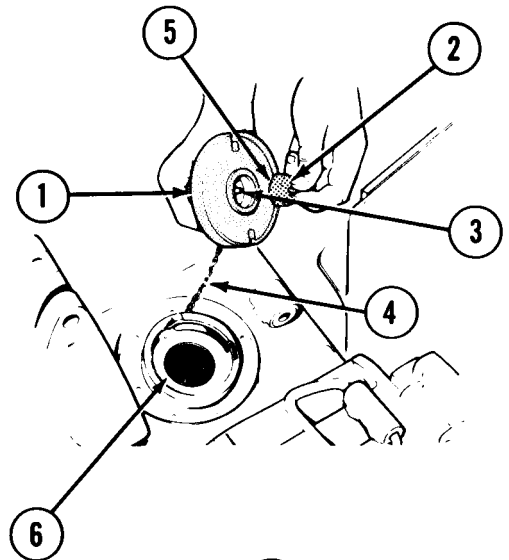
**SERVICING FUEL FILLER CAP**

1. Remove fuel filler cap (1) according to steps 1 and 2 in above instruction.
2. Using pliers (item 49, sec III, app B), remove vent cap (2) from filler cap (1) exposing relief vent (3).
3. Remove chain (4) from base of fuel filler cap (1).



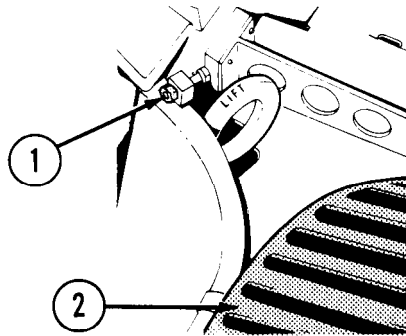
**SERVICING FUEL FILLER CAP - Continued**

4. Inspect vent cap and screen. (5) inside of vent cap (2) for foreign particles.
5. Clean in solvent (item 42, app D), if necessary.
6. With vent cap (2) removed, inspect fuel filler cap (1) float and ball operation as follows:
  - a. With fuel filler cap (1) right-side up, float point should not appear in relief vent (3).
  - b. With fuel filler cap (1) upside-down, float point should be visible in relief vent (3).
  - c. If float is not visible, notify organizational maintenance.
7. Manually press vent cap (2) into filler cap (1).
8. Reconnect chain (4) to base of filler cap (1).
9. Position cap (1) on filler neck (6) and turn 1/4-turn clockwise.
10. Close cover (7) and insert lock pin (8).
11. Using 15/16 inch wrench, tighten lock screw (9).



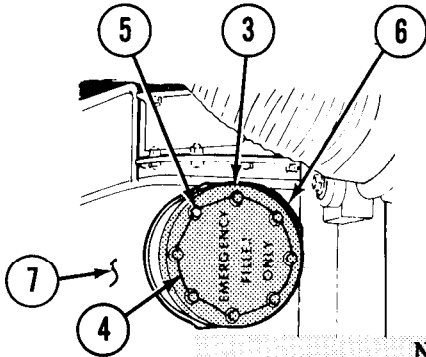
**EMERGENCY REFUELING**

- Using 15/16 inch wrench, loosen lockscrew (1) and open left top deck grille doors (2) for access to left fuel tank emergency fuel filler cover (3).



**WARNING**

Do not smoke or allow sparks within area while filling fuel tank. Have a manned fire extinguisher ready for use, if needed.



- Using pliers (item 43, sec III, app B), remove lockwire (4).
- Using 7/16 inch socket and ratchet (item 30, sec III, app B), remove eight screws and washers (5).
- Remove filler cover (3) and gasket (6) from left fuel tank (7).

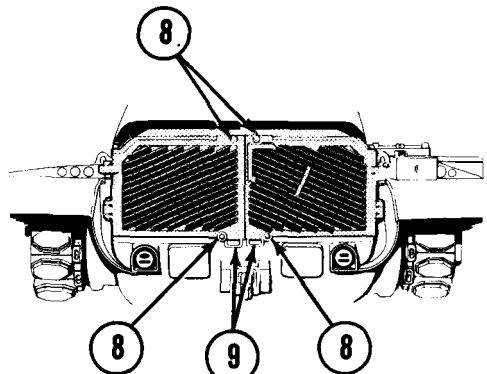
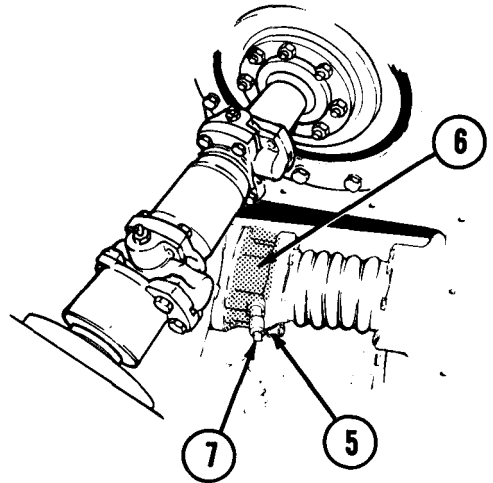
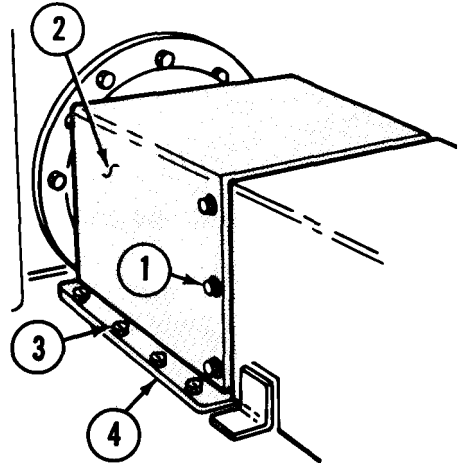
**NOTE**

During sandy, dusty, or other adverse conditions, prevent foreign matter from entering fuel tanks by covering opening around hose.

- Insert fuel hose into filter opening and refuel. Remove any spilled fuel immediately.
- Remove fuel hose. Manually secure filler cover (3) and gasket (6) with eight screws and washers (5).
- Using 7/16 inch socket, tighten eight screws (5).
- Have organizational maintenance install lockwire (4) as soon as possible.
- Close top deck grille doors (2).
- Using 15/16 inch wrench, tighten lockscrew (1).

**ISOLATING FUEL TANKS**

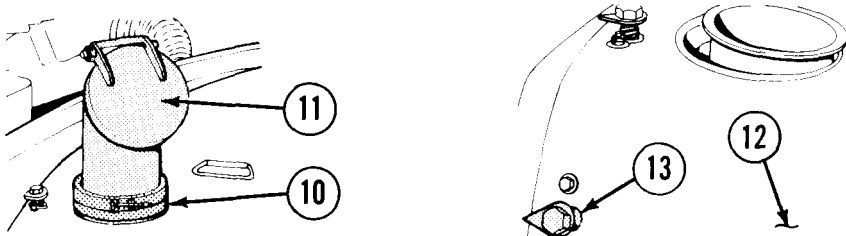
1. Using 9/16 inch socket and ratchet (item 30, sec III, app B), remove six screws and washers (1) from cover (2).
2. Manually remove cover (2).
3. Using flat-tip screwdriver (item 51, sec III, app B), remove 12 screws (3) from access cover (4).
4. Using pliers (item 43, sec III, app B), remove lockwire (5) from fuel tank crossover butterfly valve (6) and collar (7).
5. Rotate collar clockwise as far as possible. Have organizational maintenance install lockwire (5) as soon as possible.
6. Replace access cover plate (4), and manually install 12 screws (3).
7. Using flat-tip screwdriver, tighten 12 screws (3).
8. Position cover (2) and manually install six screws and washers (1).
9. Using 9/16 inch socket, tighten six screws and washers (1).
10. Using 1-1/8 inch wrench, remove four screw assemblies (8) securing rear grille doors (9). Open doors.



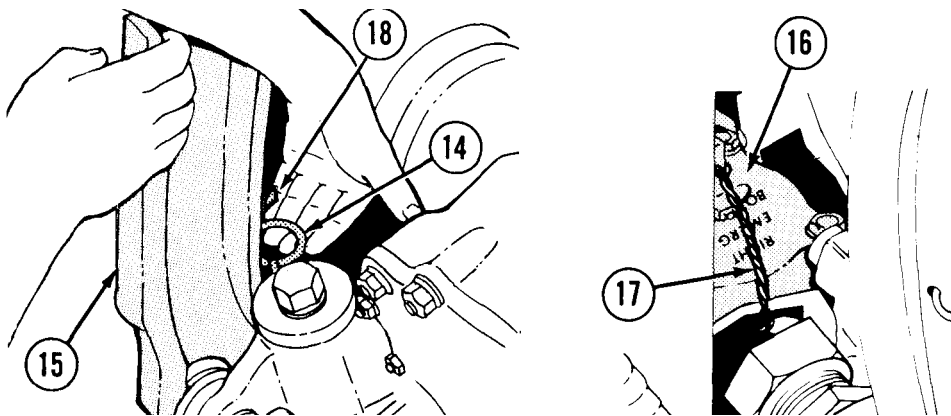
TA247846

**ISOLATING FUEL TANKS - Continued**

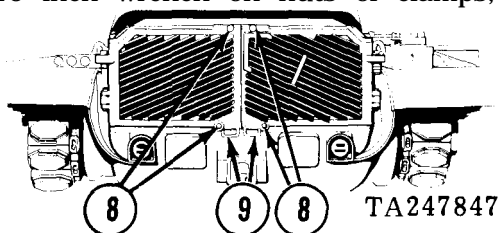
11. Using 7/16 inch wrench on nuts of clamps, remove clamps (10) and exhaust elbows (11) from exhaust pipes on each side of transmission shroud (12).
12. Using 3/4 inch wrench, unlock six turn lock assemblies (13) and remove transmission shroud (12). Cover exhaust pipe openings to prevent foreign matter from entering engine.



13. Pull up on ring (14) and move left side transmission guide (15) rearward for access to fuel selector valve (16).
14. Using pliers, remove lockwire (17). Turn fuel selector valve (16) to either left or right emergency, as required. Have organizational maintenance install lockwire (17) as soon as possible.
15. Raise lock latch (18) and move left side transmission guide (15) forward until it snaps in place.



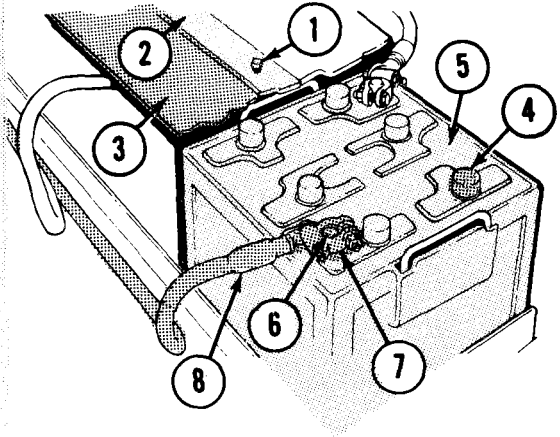
16. Remove covers from exhaust pipe openings. Place transmission shroud (12) on support and, using 3/4 inch wrench, lock six turnlock assemblies (13).
17. Set exhaust elbows (11) on exhaust pipes at 45-degree angle toward center of vehicle and using 7/16 inch wrench on nuts of clamps, install clamps (10).
18. Close rear grille doors (9) and, using 1-1/8 inch wrench, install screw assemblies (8).



## BATTERY CARE AND MAINTENANCE

### CAUTION

To reduce battery damage, batteries will not be removed from equipment battery box container for cleaning purposes at times other than a scheduled equipment service or battery replacement requirement. Equipment operator may assist in cleaning operations, but actual removal and replacement must be accomplished by organizational maintenance.



### NOTE

Two racks of three batteries each are located forward of the crew compartment. If you notice any battery leakage, notify organizational maintenance.

1. Using 9/16 inch wrench, remove four screws, lockwashers, and washers (1).
2. Remove retainer (2).
3. Remove cover (3).
4. Remove six caps (4) on each battery (5).
5. Check electrolyte level. Electrolyte level must be filled to ledge in battery filler opening. Do not over fill. If low or is boiling, notify organizational maintenance.
6. Install six caps (4) on each battery (5).
7. If water was added, start engine. Run engine for 15 minutes to mix electrolyte with water and charge batteries.
8. Inspect terminals (posts) (6), clamps (7), cables (8), batteries (5), and retainer (2) for corrosion. If corroded, have organizational maintenance clean and coat them with metal surface protection.

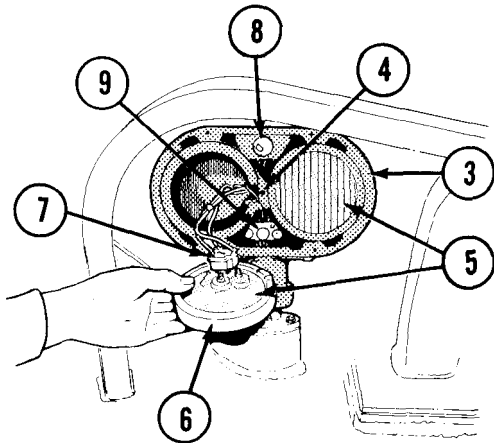
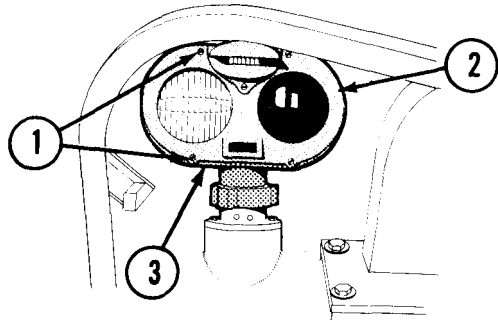
### NOTE

For further maintenance, refer to TM 9-6140-200-12.

9. Install cover (3).
10. Install retainer (2).
11. Using 9/16 inch wrench, secure retainer and cover with four screws, lockwashers, and washers (1).

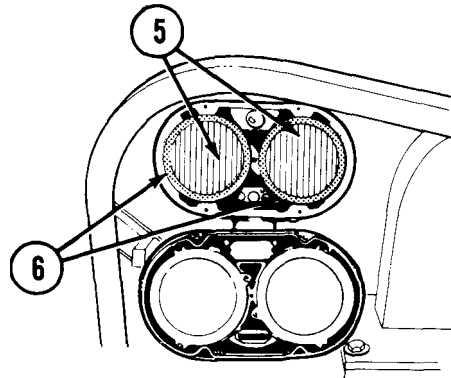
**REPLACING HEADLIGHT, BLACKOUT DRIVE, AND BLACKOUT MARKER LAMPS**

1. Cover removal:
  - a. Set MASTER BATTERY switch to OFF.
  - b. Using flat-tip screw-driver (item 45, sec III, app B), unscrew four captive screws (1).
  - c. Remove cover (2) by pulling straight out from body (3) to avoid damaging guide pin (4).



2. Headlight sealed-beam removal:
  - a. Remove seal-beam(s) (5) with seal (6) from body (3).
  - b. Disconnect connector (7).
  - c. Remove seal (6) from sealed-beam.

3. Remove blackout drive lamp (8) (item 26, app D) or blackout marker lamp (9) (item 29, app D) by pressing in and turning counterclockwise. Replace by alining lamp pins with socket, press into socket, turn clockwise to lock in place.



**NOTE**

**Make sure sealed-beam is positioned with the word FOG at the bottom.**

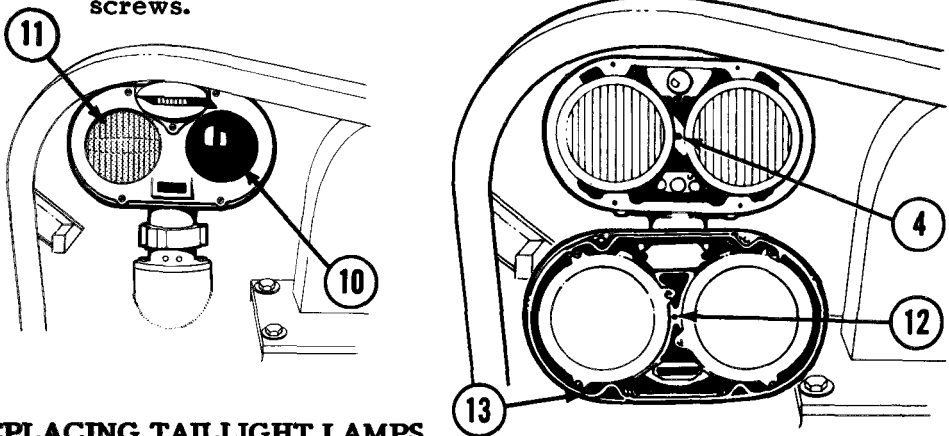
4. Headlight sealed-beam installation:
  - a. Install seal (6) on sealed-beam (5).
  - b. Connect connector (7).
  - c. Position sealed-beam in headlight body.



**REPLACING HEADLIGHT, BLACKOUT DRIVE, AND BLACKOUT MARKER LAMPS - Continued**

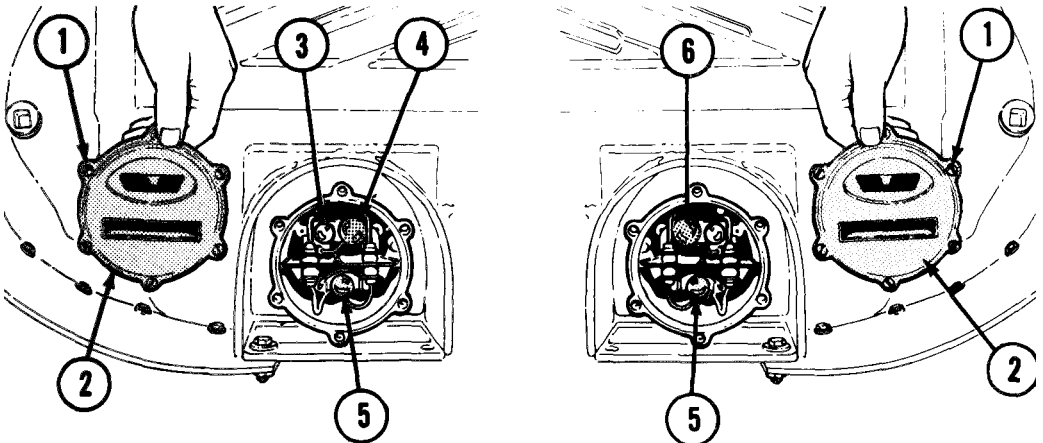
5. Headlight cover installation:

- a. Wipe IR lens (10), clear lens (11), and blackout lenses with a clean cloth.
- b. Aline guide pin (4) with guide pin hole (12) and push cover in until seal (13) is firmly seated.
- c. Using screwdriver, secure cover to body with four captive screws.



**REPLACING TAILLIGHT LAMPS**

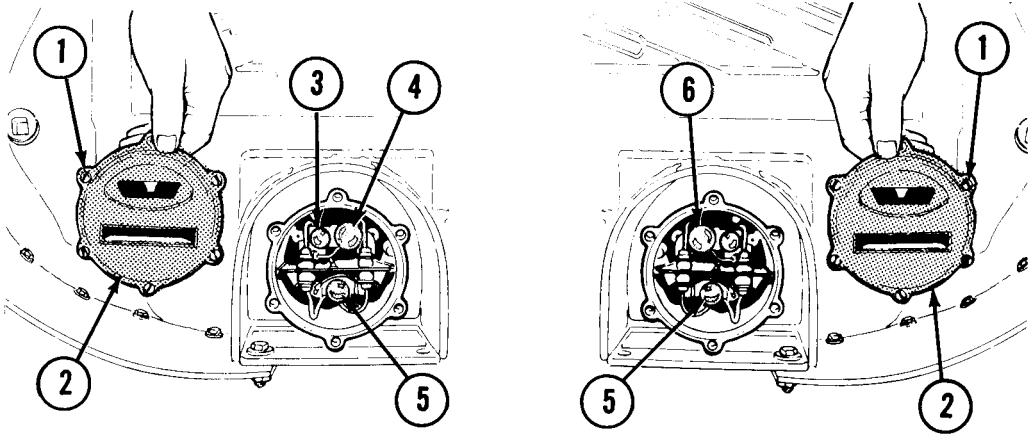
- L Set MASTER BATTERY switch to OFF.
- 2. Using flat-tip screwdriver (item 45, sec III, app B), unscrew six captive screws (1) and open door (2).
- 3. Press in defective lamp for service drive (3), service stoplight (4), blackout marker (5), or blackout stoplight (6), turn counterclockwise, and remove.



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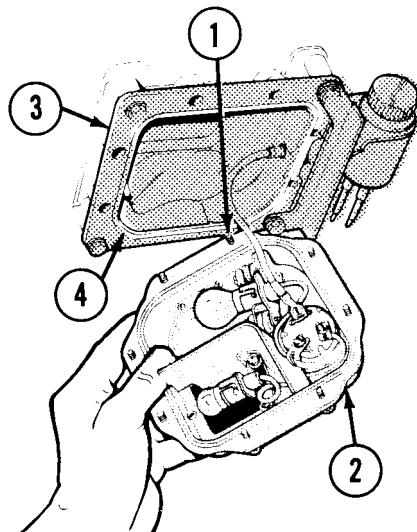
**REPLACING TAILLIGHT LAMPS - Continued**

4. Aline replacement lamp (service drive (3), item 29, app D; service stoplight (4), item 26, app D; blackout marker (5), item 29, app D; and/or blackout stoplight (6), item 29 app D) pins with socket, press lamp in, and turn clockwise to lock.
5. Wipe lenses and door (2) with a clean cloth.
6. Install door (2) and using screwdriver, secure with six captive screws (1). Make sure seal-is seated properly.



**REPLACING DOMELIGHT LAMPS**

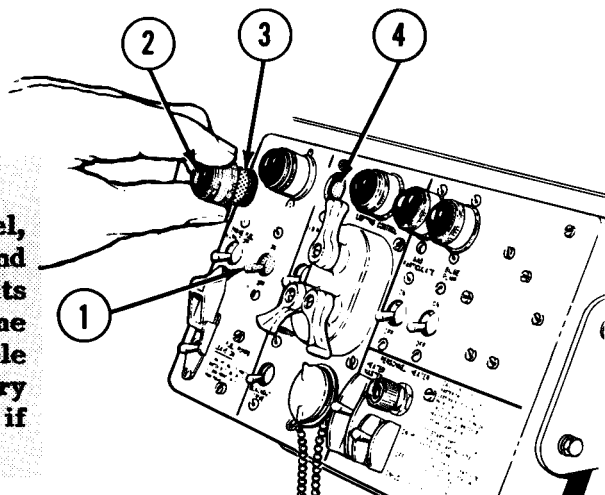
1. Set MASTER BATTERY switch to OFF.
2. Using flat-tip screwdriver (item 45, sec III, app B), unscrew eight captive screws (1) and remove door (2) from body (3).
3. Press defective lamp in and turn counterclockwise to remove.
4. Aline new large lamp (item 27, app D) and/or small lamp (item 25, app D) pins with socket, press lamp in, and turn clockwise.
5. Wipe lenses and door (2) with a clean cloth.
6. Install door (2) on body (3) and using screwdriver, secure with eight captive screws (1). Make sure seal (4) is seated properly.



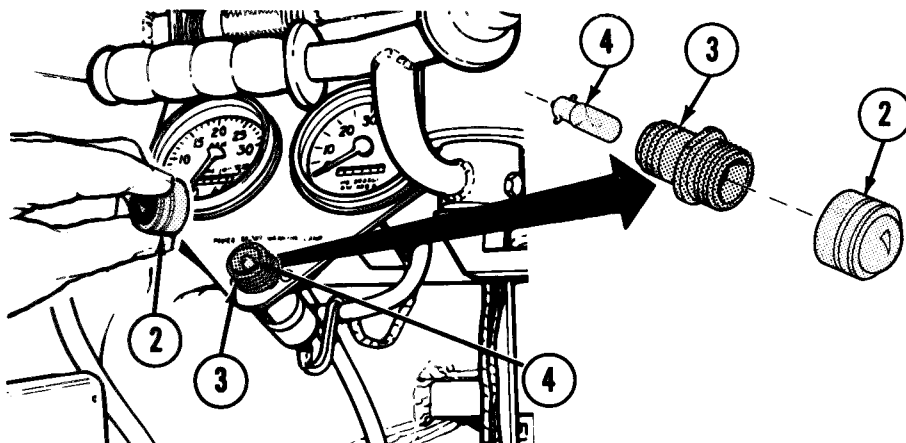
TA247851

## REPLACING LAMP - MASTER CONTROL PANEL, SMOKE GENERATOR, AND POWERPLANT WARNING LIGHTS

**NOTE**  
Master control panel, smoke generator, and power plant warning lights are replaced in the same manner. An adjustable wrench may be necessary to loosen the adapters if they are tight.



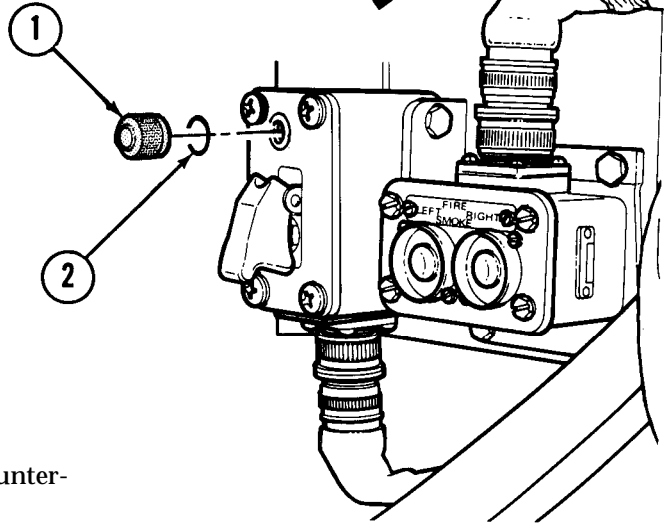
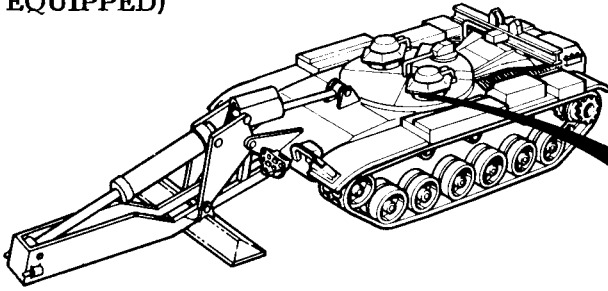
1. Set MASTER BATTERY switch (1) to OFF.
2. Remove lens cap (2) from defective master control panel light, SMOKE GENERATOR, or POWERPLANT WARNING light as applicable.
3. Unscrew adapter (3) with gasket and press defective lamp (4) in. Turn counterclockwise and remove.



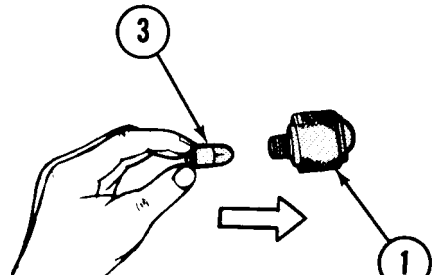
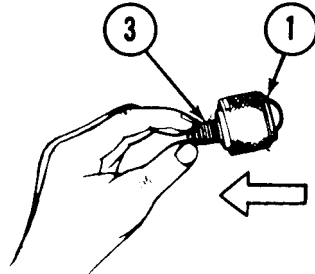
4. Align master control panel, SMOKE GENERATOR, and/or POWERPLANT WARNING light new lamp (item 28, app D) and/or personnel heater new lamp (item 25, app D) pins with socket) press lamp in, and turn clockwise.
5. Manually install adapter (3) with gasket.
6. Install lens cap (2) on adapter (3).

TA247852

**REPLACING LAMP-SMOKE GRENADE LAUNCHER POWER BOX (IF EQUIPPED)**



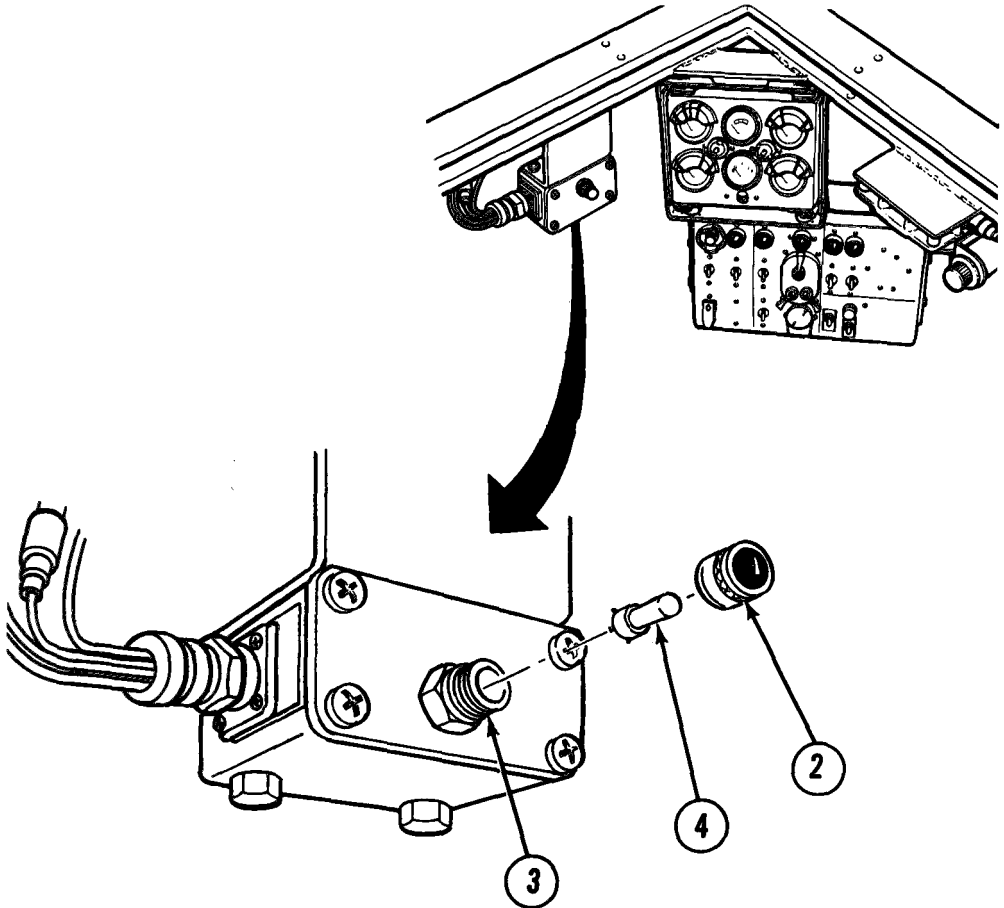
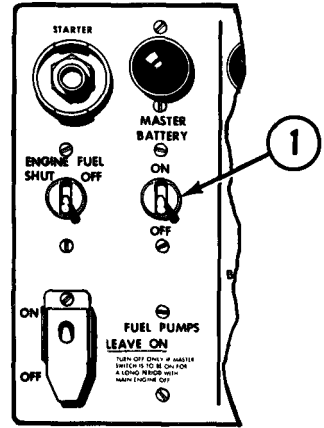
1. Set MASTER switch to OFF.
2. Rotate lens cap (1) counter-clockwise.
3. Remove lens cap (1) and seal (2) from socket.
4. Pull lamp (3) from lens cap (1).
5. Get matching replacement lamp (3), (item 30, app D).
6. Push new lamp (3) into lens cap (A).
7. Place seal 92) and lens cap (1) in socket.
8. Rotate lens cap (1) clockwise until tight.



TA247853

**REPLACING LAMP - DUST DETECTOR WARNING LAMP (IF EQUIPPED)**

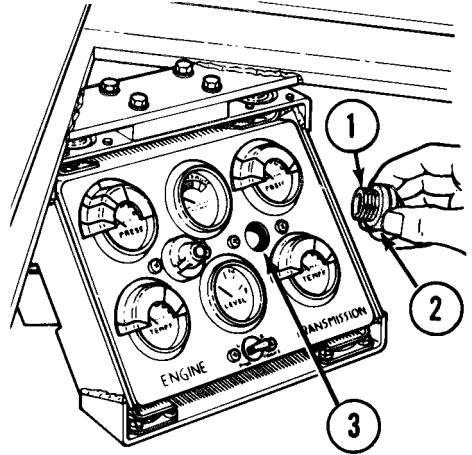
1. Set MASTER BATTERY switch (1) to OFF.
2. Unscrew lens cap (2) from indicator lamp socket (3).
3. Remove defective lamp (4) from socket (3).
4. list all replacement lamp (item 23, Appendix D) in socket (3).
5. Install lens cap (2).





**REPLACING LAMP - INSTRUMENT PANEL CLUSTER ASSEMBLY**

1. Set MASTER BATTERY switch to OFF.
2. Remove lens (1) with gasket (2).
3. Press in defective lamp (3) and turn counterclockwise to remove.
4. Aline new lamp (3) (item 28, app D) pins with socket, press lamp in and turn clockwise.
5. Install lens (1) with gasket (2).



**INSTALLING M24 INFRARED PERISCOPE**

**WARNING**

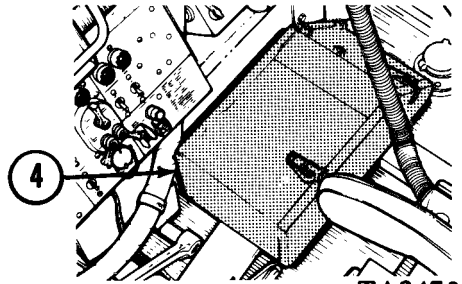
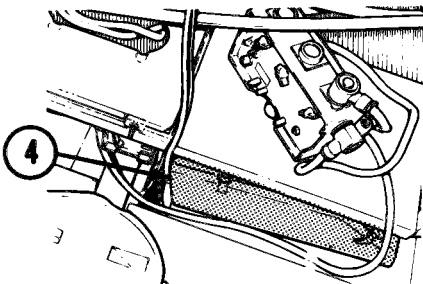
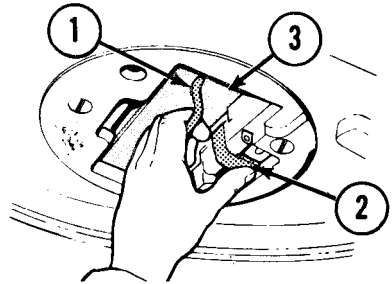
**NIGHT VISION switch must be set to OFF. High voltage is present in power cable and can cause serious injury to personnel.**

1. Insure that MASTER BATTERY and NIGHT VISION switch are OFF.
2. Close hatch.
3. Pull periscope holder lid handle (1) down, depress lid latch (2) push lid (3) open.

**CAUTION**

**Periscope could be damaged if exposed to direct sunlight.**

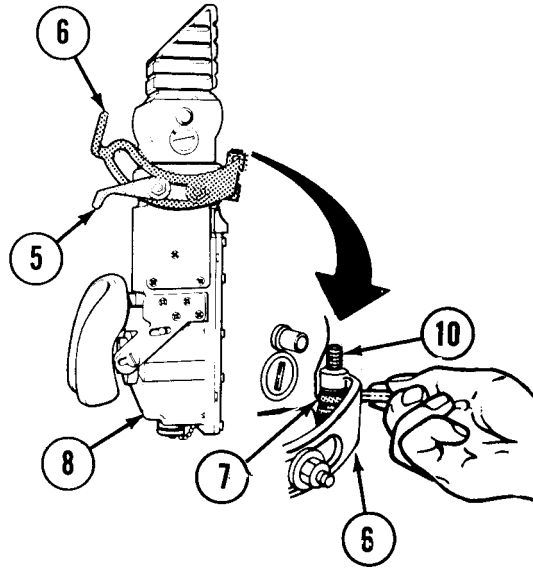
4. Remove periscope from stowage box (4).



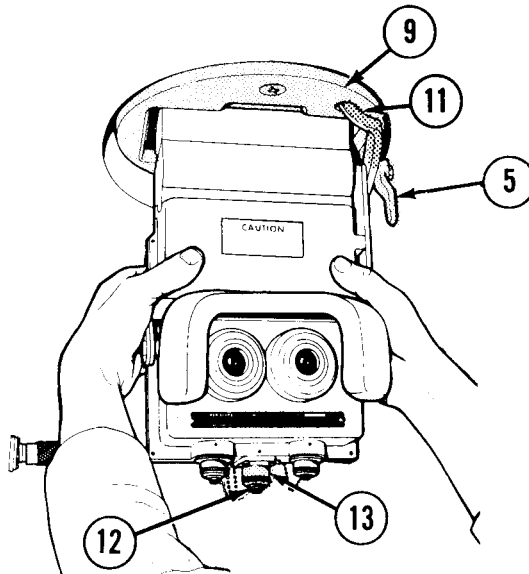
TA247854

**INSTALLING M24 INFRARED PERISCOPE-Continued**

5. Release elevation adjustment lever (5) allowing elevation clamp (6) to pivot.
6. Using 1/2 inch wrench, loosen jamnut (7) on elevation clamp (6).
7. Position periscope (8) in periscope mount (9) and push up to lock in place. Insure periscope is locked in place before you release it.



8. Manually tighten adjustment screw (10) on elevation clamp (6) until clamp is seated firmly in detent (11). Using 1/2 inch wrench, tighten jamnut (7).
9. Rotate elevation adjustment lever (5) to lock periscope.

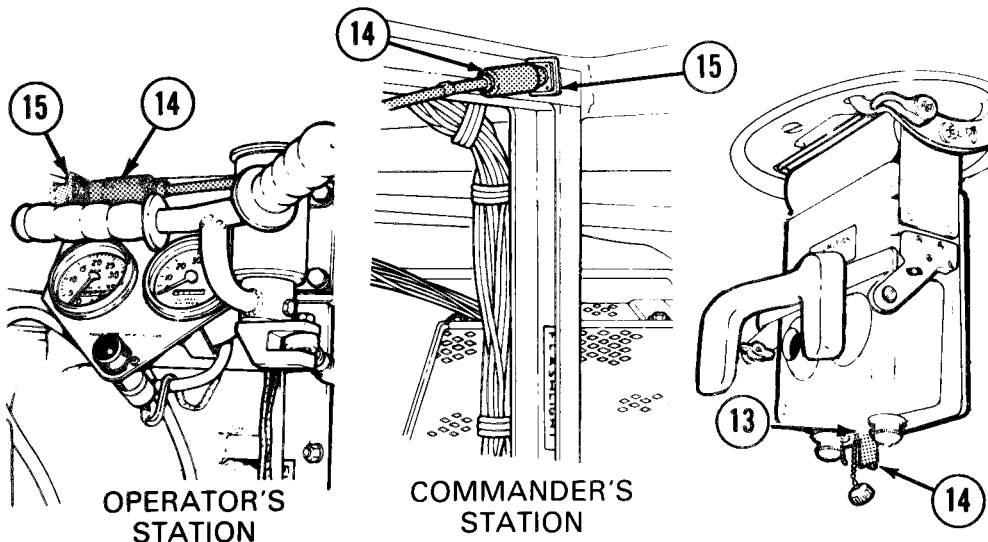


10. Unscrew dust cap (12) from periscope receptacle (13).



**INSTALLING M24 INFRARED PERISCOPE - Continued**

- Remove power cable (14) from stowage receptacle (15).



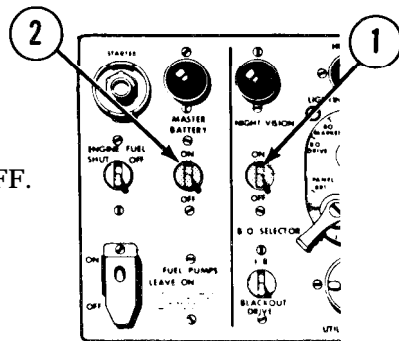
- Connect power cable (14) to periscope receptacle (13). Insure that power cable is properly connected to periscope receptacle.

**REMOVING M24 INFRARED PERISCOPE**

**WARNING**

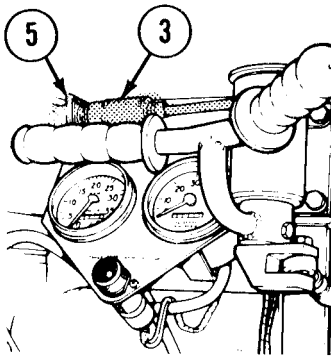
**High voltage is present at periscope power cable for several minutes after NIGHT VISION switch is turned off. Wait at least 2 minutes after NIGHT VISION switch is turned off before disconnecting cable from periscope to prevent serious injury or death.**

- Set NIGHT VISION switch (1) to OFF.
- Set MASTER BATTERY switch (2) to OFF.

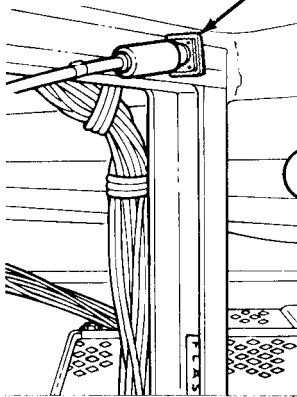


**REMOVING M24 INFRARED PERISCOPE**

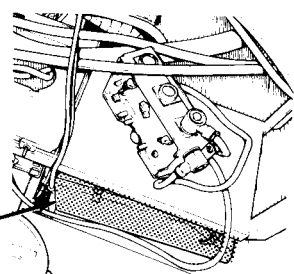
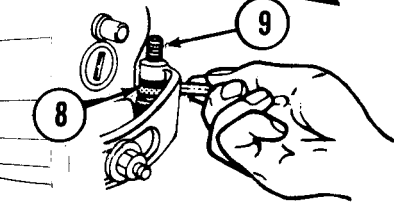
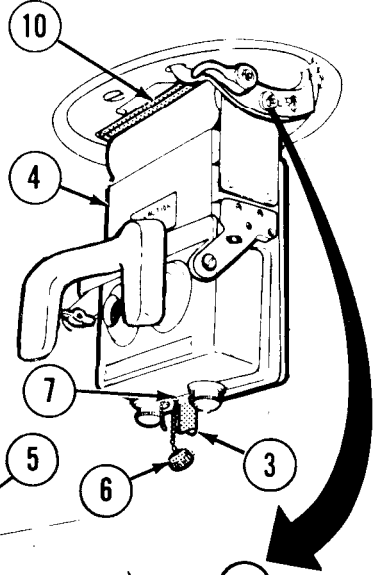
3. Disconnect power cable (3) from periscope (4).
4. Connect power cable (3) to stowage receptacle (5).
5. Install dust cap (6) on periscope power receptacle (7).
6. Using 1/2 inch wrench, loosen jamnut (8).
7. Manually loosen adjustment screw (9).



OPERATOR'S STATION

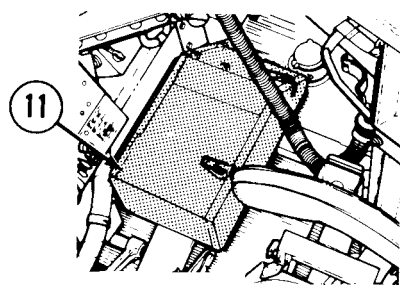


COMMANDER'S STATION

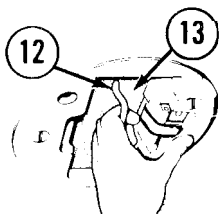


COMMANDER'S STOWAGE BOX

8. Support periscope (4) with one hand at bottom.
9. Push up on release bar (10) to release periscope.
10. Stow periscope (4) in stowage box (11).
11. Pull down periscope lid handle (12) until lid (13) is latched.

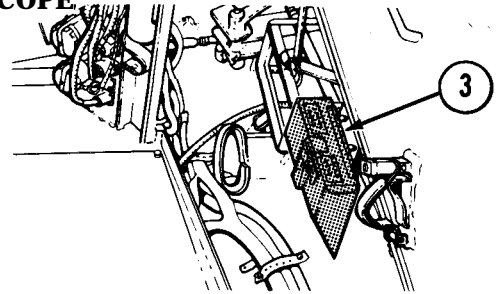
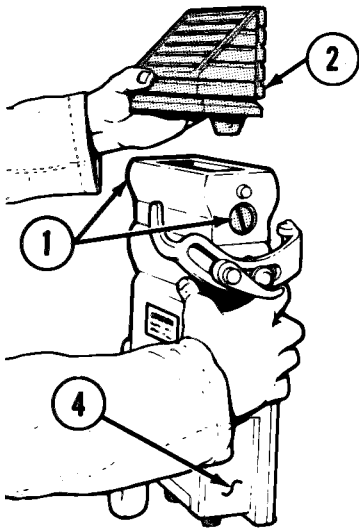


OPERATOR'S STOWAGE BOX

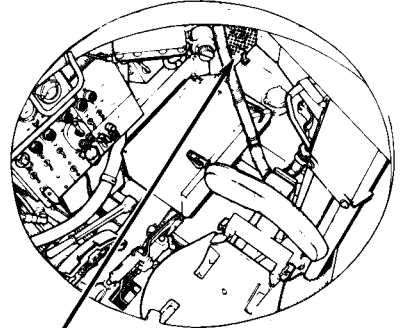


TA247857

**REPLACING M24 INFRARED PERISCOPE**



COMMANDER'S STOWAGE BOX



OPERATOR'S STOWAGE BOX

**CAUTION**

**Periscope could be damaged if exposed to direct sunlight.**

1. Remove periscope from holder.
2. Stand periscope on padded surface and hold with one hand.
3. Using flat-tip screwdriver, turn eccentric latches (1) 1/2-turn counterclockwise.
4. Remove head (2).
5. Remove spare head from stowage box (3).
6. Install spare head on body (4).
7. Using screwdriver, secure by turning eccentric latches (1) 1/2-turn clockwise.
8. Install periscope (page 3-81).
9. Place removed head (2) in stowage box (3).
10. When appropriate, turn in removed head to organizational maintenance.

**SERVICING ENGINE ATR CLEANERS**

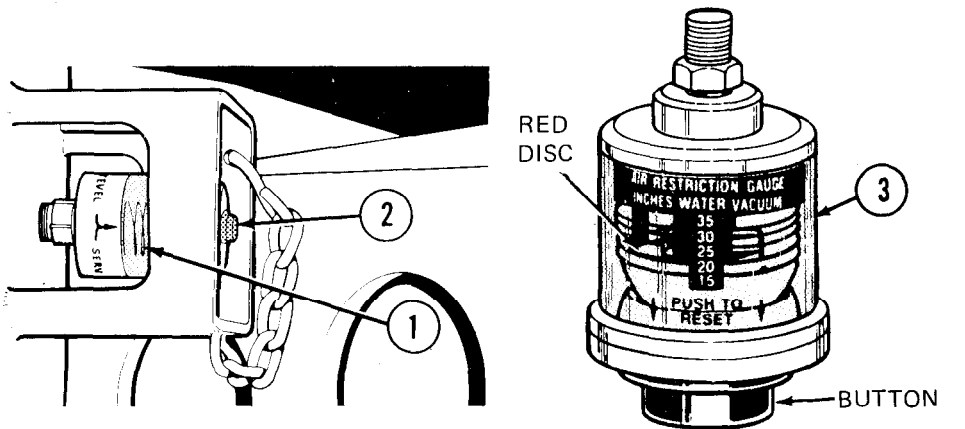
**NOTE**

**Use the following procedure for either top loading armored air cleaners, or top loading aluminum air cleaners.**

**NOTE**

**Air cleaner restriction indicators are checked with engine running.**

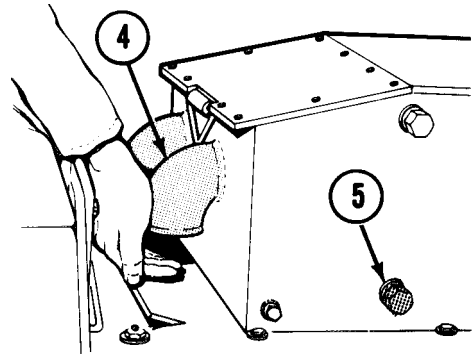
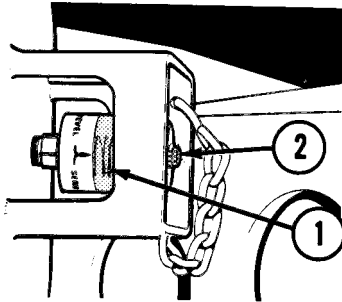
1. Air cleaners are normally serviced after every 750 miles of vehicle operation or quarterly, whichever occurs first, by organizational maintenance. Under severe dust conditions, power loss or excessive black smoke may indicate need for more frequent cleaning.
  - a. If air cleaner is equipped with early model restriction indicator, before you stop engine check to see if restriction indicator window (1) is clear or red. A clear window indicates a normal condition. If indicator window shows red, press indicator reset button (2), and rev engine to 2,400 rpm maximum, then recheck indicator window. If window still shows red the second time, stop engine and notify organizational maintenance.
  - b. If air cleaner is equipped with late model restriction indicator (3), measure the amount of restriction created by the filter element. The late model indicator measures the amount of restriction being created by the filter element in 5 inch increments and only to be reset when the filter element is cleaned or replaced. A reading of 30 inches or more indicates that the filter elements need to be cleaned, stop engine and notify organizational maintenance.



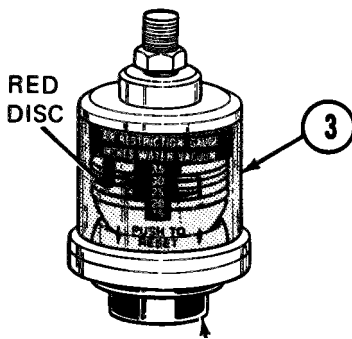
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**SERVICING ENGINE AIR CLEANERS - Continued**

2. Check to see that air exhaust can be felt at all four blower motor elbows (4). If air exhaust cannot be felt, notify organizational maintenance.



3. If indicator window is red, early model (1), or has a reading of 30 inches or more, late model (3), but engine power loss is not indicated and air can be felt at all four blower motor elbows, continue operations until first opportunity for servicing at next maintenance level.



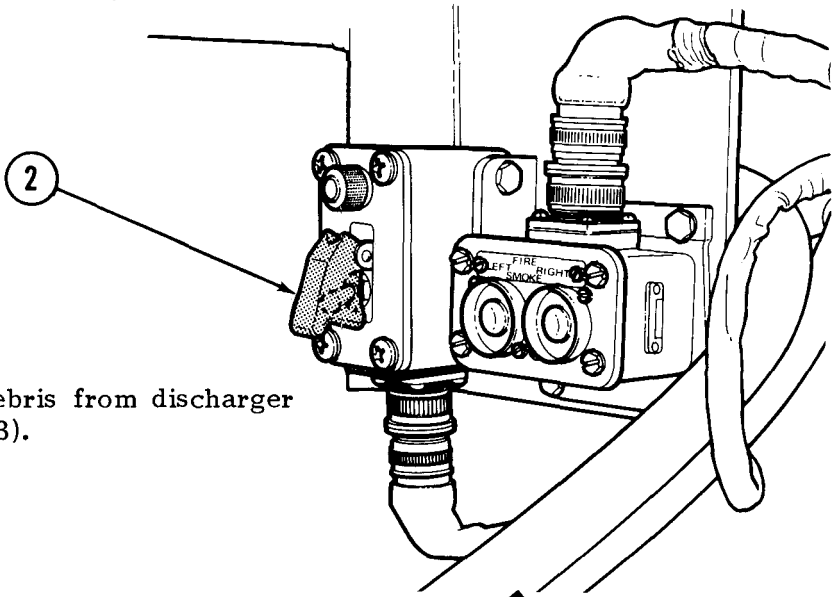
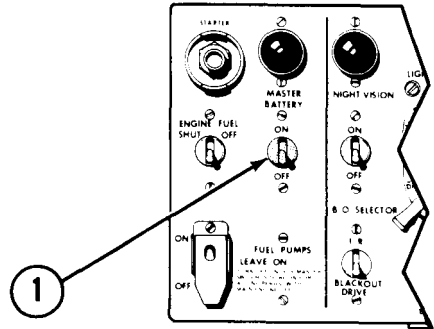
BUTTON

4. If window (1) is red, early model (1), or has a reading of 30 inches or more, late model (3), power loss is indicated and air can be felt at all four blower motor elbows, notify organizational maintenance.
5. If indicator window is clear, proceed to step 6.
6. Lift grille doors on right and left sides of vehicle and check for loose or missing air cleaner input and output hose clamps. If loose, tighten clamp. If missing, notify organizational maintenance and do not start vehicle until clamp is replaced.
7. Remove lower inspection plug (5) and shine a light into hole. If you find dust accumulated above bottom row of tubes, replace plug and notify organizational maintenance.

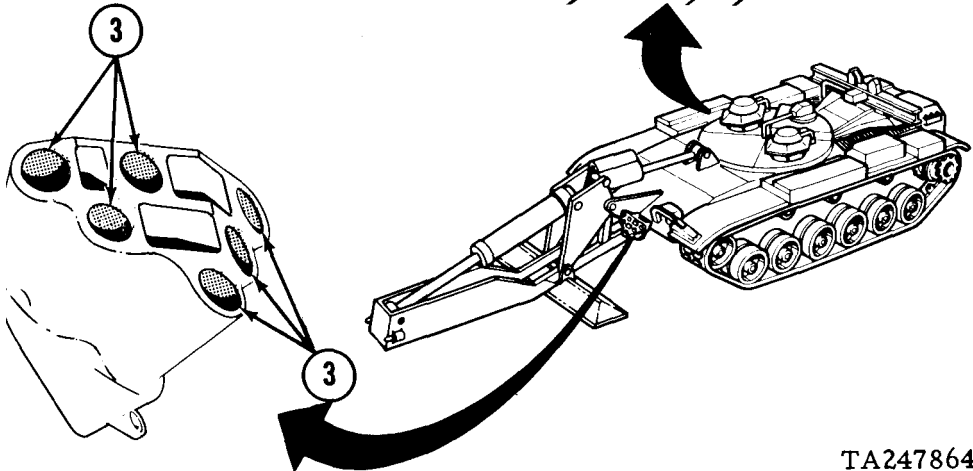
### M239 SMOKE GRENADE LAUNCHER (IF EQUIPPED) CLEANING DISCHARGERS

#### Make Sure:

- MASTER BATTERY switch (1) is set to OFF.
- Smoke grenade launcher power switch (2) is set to OFF.
- Covers are removed (page 2-161).
- Smoke grenade dischargers are unloaded (page 2-167).



1. Clean debris from discharger barrels (3).



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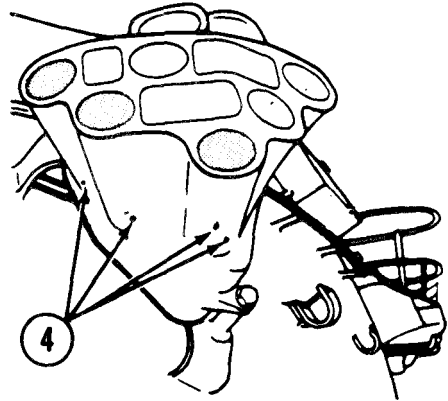
**M239 SMOKE GRENADE LAUNCHER (IF EQUIPPED) - Continued**

**CLEANING DISCHARGERS - Continued**

**NOTE**

Top center barrel drain hole cannot be cleaned using steel wire. If drain hole is clogged, notify organizational maintenance to clean drain hole using compressed air.

- Using steel wire, make sure drain holes (4) in barrel are clear.

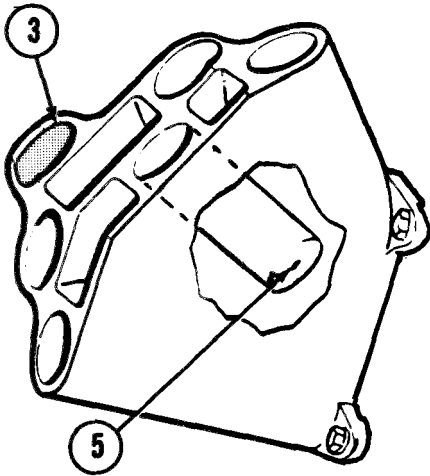


**CAUTION**

Do not step on dischargers.

**WARNING**

Do not use wire brush or steel wool to clean barrels.

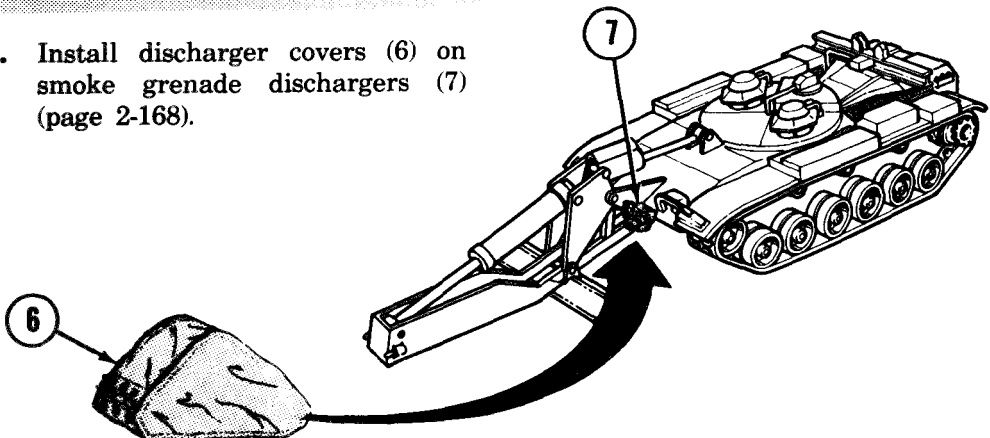


**CAUTION**

Tip plugs must be clean and dry. Do not oil tip plugs.

- Using rags and rifle bore cleaner or soap and water, clean barrels (3).
- Using clean, dry rags, remove all cleaning solution from barrels. Make sure no residue remains around tip plugs (5).

- Install discharger covers (6) on smoke grenade dischargers (7) (page 2-168).



### M239 SMOKE GRENADE LAUNCHER (IF EQUIPPED) STOWING SMOKE GRENADES

#### WARNING

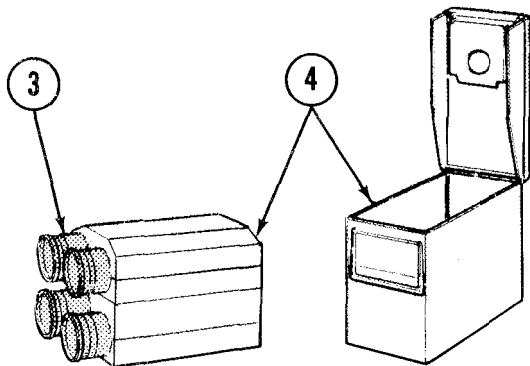
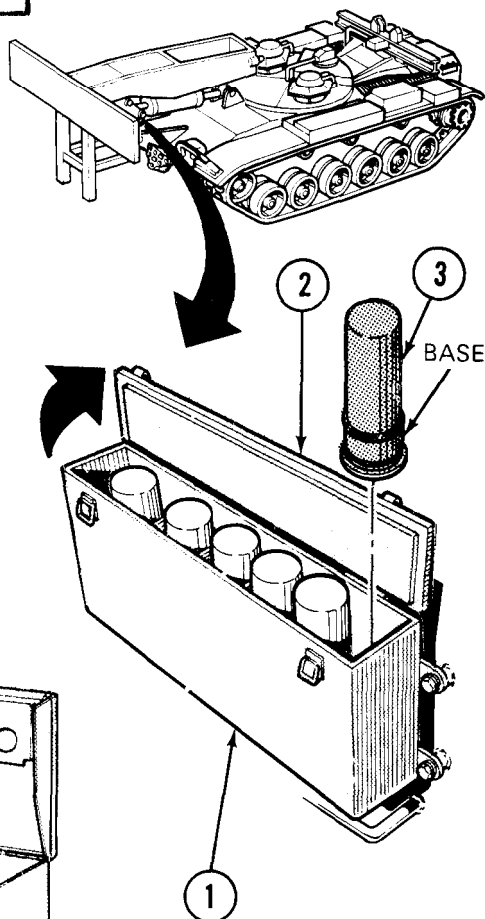
Smoke grenades contain red phosphorous (RP). This is a fire hazard. All personnel should be extremely careful when handling smoke grenades.

Do not allow flames or sparks within area while stowing ammunition. Have a manned fire extinguisher handy.

#### NOTE

There is one storage box (1) located on each side of the overhead cylinder.

1. Open storage box lid (2).
2. Remove smoke grenades (3) from ammunition storage box (4).
3. Put six smoke grenades (3) base first, into each storage box (1).
4. Close and latch lid (2).



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**TOP DECK GRILLE DOORS OPERATION**

**OPEN DOORS**

1. Using 15/16 inch wrench, loosen four screws (1)

**CAUTION**

**Keep feet clear of grille doors to prevent injury.**

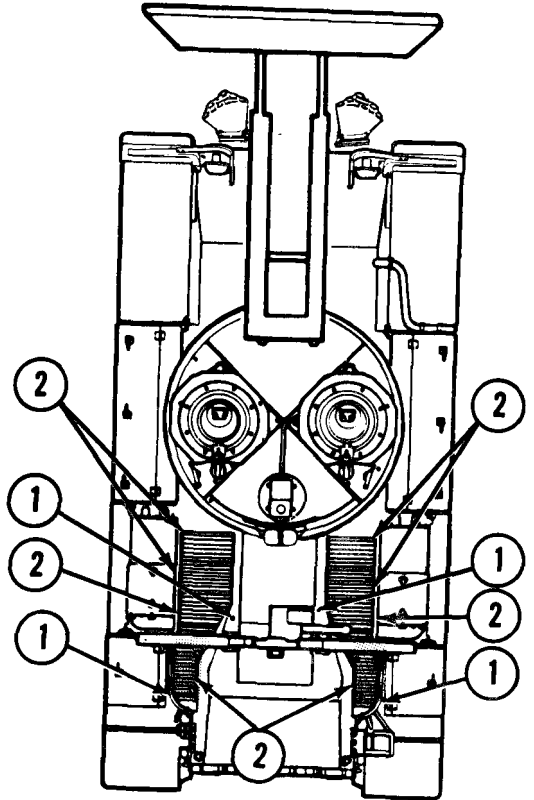
2. Pull on handles and open eight grille doors (2).

**CLOSE DOORS**

**CAUTION**

**Keep feet clear of grille doors to prevent injury.**

1. Close grille doors (2).
2. Using 15/16 inch wrench, tighten four screws (1).



## **MAINTENANCE UNDER ADVERSE CONDITIONS**

### **GENERAL**

In addition to normal preventive maintenance services, special care in cleaning and lubrication of the vehicle must be observed where extremes of temperature, humidity, and terrain conditions are present or anticipated. You must properly clean and lubricate the vehicle to insure proper operation, functioning and guarding against excessive wear of working parts and deterioration of material. You must also follow proper procedures for stowage and handling of lubricants and fuels.

### **EXTREME COLD WEATHER**

1. Typical problems in extreme cold weather: Maintenance of mechanical equipment in extreme cold conditions is exceptionally difficult in the field. Even shop maintenance cannot be completed with normal speed because you must allow equipment to warm up before you can make satisfactory repairs. In the field, you must perform maintenance under most difficult conditions. Your bare hands will stick to cold metal. Engine oils, except subzero grades, are unpourable at temperatures below -40°F. Ordinary greases become hard at extremely cold temperatures. These difficulties increase the time required for you to perform maintenance. At temperatures below -40°F, you may require up to five times the normal amount of time. The time you require to warm a vehicle so it will start and be operable at temperatures as low as -50°F may approach 2 hours. Complete winterization, diligent maintenance, and well-trained crews are the key to efficient operation of vehicles in extreme cold weather.
2. Batteries: Extreme cold causes batteries to freeze and prevents them from furnishing sufficient current. See FM 9-207 for methods of protecting batteries from cold and maintenance of batteries in cold weather.
3. Tracks and suspension: If possible, clean mud, snow, and ice from tracks and suspension after stopping. See FM 9-207 for more detailed information about maintenance of and effects of cold weather on tracks and suspension.
4. Canvas covers: Canvas covers present difficulties in conforming to their intended use due to apparent shrinkage. Shrinkage is usually a result of wrinkles that are extremely difficult to smooth out at subzero temperatures. Whenever possible, you should warm and unfold canvas in heated enclosures. Clean all snow, mud, and ice

**MAINTENANCE UNDER ADVERSE CONDITIONS - Continued****EXTREME COLD WEATHER - Continued**

from vehicle before covering. Keep ends of canvas off ground to prevent canvas from freezing to ground. Always cover rear deck to prevent entrance of snow into engine compartment. Snow will melt and later freeze, which may prevent you from operating linkages.

5. Metal parts: Metal parts become brittle at subzero temperatures and cannot withstand shock loads as well as at normal temperatures. You must make frequent inspections of metal parts and components for cracks and breakage.
6. Plastic and rubber parts: You must handle any parts made of plastic or rubber carefully. Plastic and rubber parts become brittle in cold weather and may break due to vibration of handling. To prevent insulation from cracking and causing short circuits, you must warm rubber or plastic insulated cables before bending, and make sure that all cables are properly installed.
7. Fuel and Lubricants: See FM 9-207 for instructions on storage, handling, and use of fuels and lubricants in cold weather.

**EXTREME HOT WEATHER**

1. Typical problems in extreme hot weather: Extreme heat causes water, lubricants, and fuels to expand and possibly overflow their containers. Perspiration from your hands contains acids and salts which cause corrosion of unprotected metal parts when handled. Engines and transmissions have a greater tendency to overheat. Metal parts can become too hot for you to handle, and paint can blister. Extreme heat and overexposure in the sun can cause rubber and plastic parts to age and crack.
2. Batteries: Batteries will self-discharge at a greater rate if left standing for long periods of time in high temperatures. You must consider this condition when operating in hot zones. You should run vehicle engine, periodically, to keep batteries charged.
3. Metal parts: Remove paint blisters with abrasive paper and spot paint as required.
4. Plastic and rubber parts: Check plastic and rubber insulated cables for cracks which can result in short circuits. Check all plastic and rubber parts for cracks and aging.
5. Optical equipment: Do not expose sighting/optical equipment optical parts to direct rays of sun.

## **MAINTENANCE UNDER ADVERSE CONDITIONS-Continued**

### **HIGHLY HUMID OR SALTY ATMOSPHERE**

1. Typical problems in very humid or salty atmosphere. Corrosive action will occur on all parts that are not properly protected. You will see evidence of corrosive action in the form of rust and paint blisters on metal parts, and mildew, mold, or fungus growth on wood, fabrics, or leather. Humid and salty atmospheres have a tendency to deteriorate oil and grease and destroy their rust-preventive qualities.
2. Metal surfaces: Remove corrosion from exterior metal surfaces with abrasive paper and apply a protective coating of paint, oil, or suitable rust preventive as required.
3. Canvas covers: You must clean and dry canvas often to prevent mildew.
4. Magnesium and aluminum parts: Clean all magnesium and aluminum parts and wipe dry to prevent corrosion.

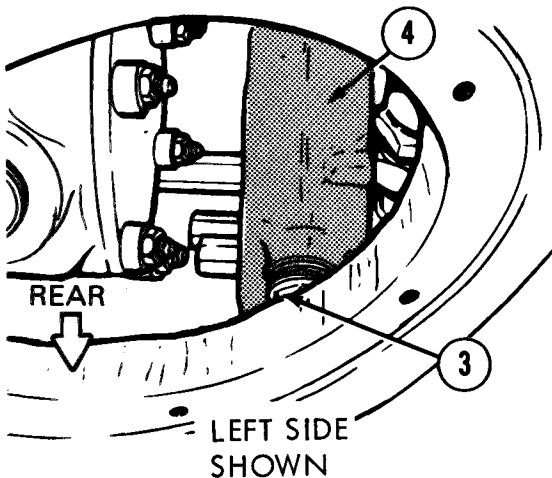
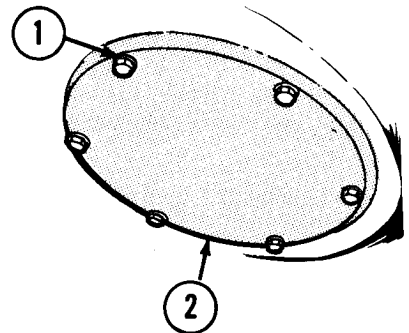
### **SAND, DUST, OR MUD**

1. Typical problem in sand, dust, or mud: Painted surfaces and sighting optical parts, if not covered, become etched by sand. Lubricants and fuels become contaminated. Service life of air cleaners and filters is shortened.
2. Sighting equipment: Keep exposed optical surfaces protected as much of the time as you can to prevent etching by sand or dust.
3. Engine and engine compartment: You must clean engine compartment and engine as often as required to prevent accumulation of sand, dust, or mud. Cover engine compartment grilles when halted.

**MAINTENANCE UNDER ADVERSE CONDITIONS - Continued**

**AFTER FORDING**

1. General: The following services should be performed on vehicle after fording, especially in salt water. Perform these services, as soon as tactical situation permits, to halt deterioration and avoid damage before the vehicle is driven extensively in regular service. Heat generated by moving parts during operation of vehicle will evaporate or force out most of the water which may have entered at various points. Also, any small amount of water which has entered engine crankcase through leakage or due to condensation will usually be evaporated and passed by ventilating system.
2. Hull:
  - a. Open drain valves and allow all water to drain (page 2-111).
  - b. If fording was in salt water, wash all traces of salt water and salt deposits from vehicle.
  - c. Clean, dry, and lubricate all exposed surfaces that will affect operation or deterioration due to exposure to water.
3. Engine, transmission, and final drive: Inspect engine, transmission, and final drive oil for contamination. If you find evidence of contamination, notify organizational maintenance.
4. Brake controls:
  - a. Using 9/16 inch socket, remove six screws and lockwashers (1) securing each of two rear access covers (2) to underside of hull. Remove covers and gaskets.

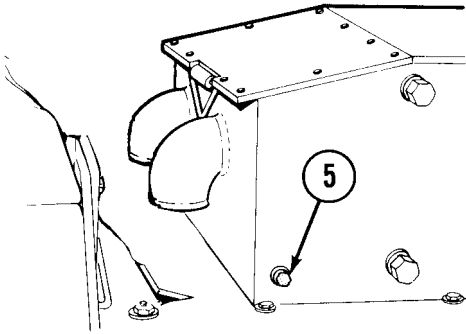


- b. Using adjustable wrench, remove drain plug (3) from left and right brake control housings (4). Allow all water to drain.
- c. Using adjustable wrench, install drain plug (3).

**MAINTENANCE UNDER ADVERSE CONDITIONS -Continued**

**AFTER FORDING - Continued**

- d. Place access covers and gaskets in position and secure with crews and lockwashers.
- 5. Suspension sytem: Lubricate all lubrication fittings (LO 5-5420-202-12).



- 6. Air cleaner: Remove air cleaner drain plug (5). If you find evidence of water leakage into air cleaner, notify organizational maintenance. If no water is present, reinstall drain plug.

- 7. Batteries: If an excessive amount of water entered hull (capable of splashing over batteries), check electrolyte level to be sure no water entered batteries through vent caps (page 3-75). If you find high fluid levels, notify organizational maintenance.

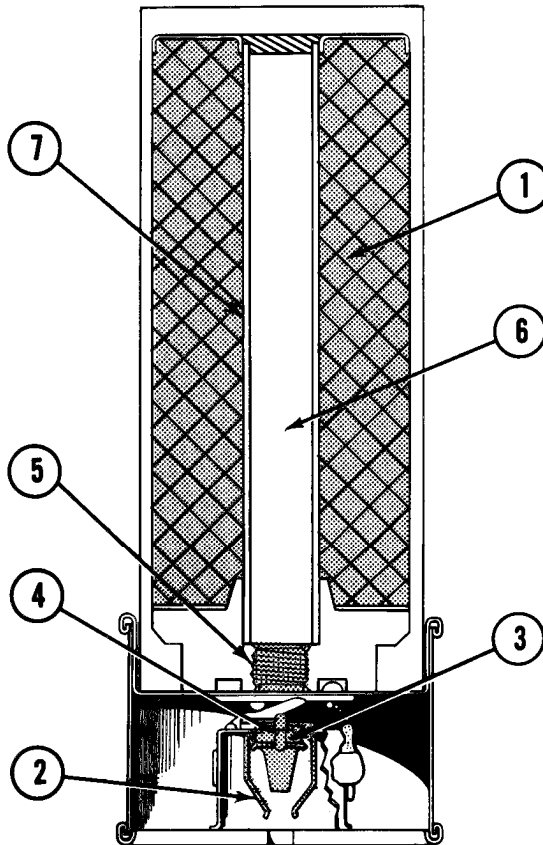
## CHAPTER 4 AMMUNITION

### SMOKE GRENADE

#### GENERAL

UK (United Kingdom) L8A1 RP (Red Phosphorous) screening smoke grenades are used with the M239 grenade launcher. They are filled with a red phosphorous and butyl rubber mix (1). Each grenade is approximately 2.61 inches (66.3 mm in diameter, 7.28 inches (185 mm) long, and weighs approximately 1.5 pounds (.68 kg).

A grenade is propelled from the discharger when electrical current at the firing contact (2) ignites the fuze (3). The fuze ignites the propellant charge (4) and a delay composition within the delay holder (5) and, in turn, the gunpowder bursting charge (6). This bursts the rubber case (7) and ignites the red phosphorous/butyl rubber composition (1) to produce an immediate smoke cloud.

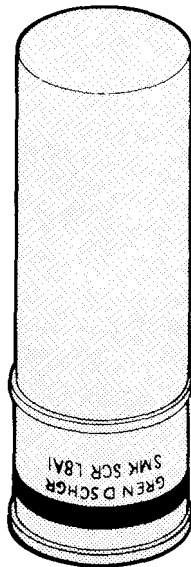


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## **SMOKE GRENADE-Continued**

### **IDENTIFICATION**

The ammunition is completely identified by the markings at the base of the casing.



### **DESTRUCTION OF UK L8A1 RP AMMUNITION TO PREVENT ENEMY USAGE**

Destroy grenades by burning as follows:

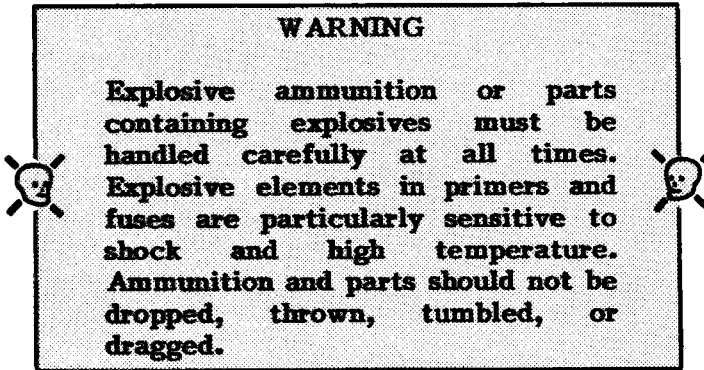
1. The ammunition should be stacked up in a pile.
2. Place flammable materials such as rags, scrap wood, or brush on and about the pile.

**WARNING**

Cover must be taken without delay, since an early explosion of explosive ammunition may be caused by the fire.

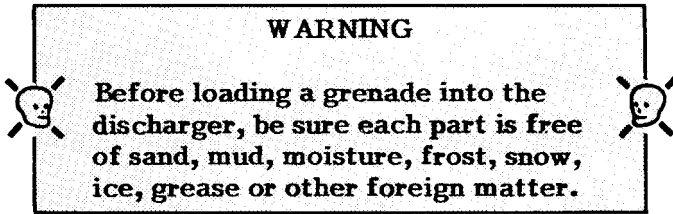
3. Ignite by means of an incendiary grenade fired from a safe distance, a combustible train of suitable length, or other appropriate means. Take cover immediately. The danger area for piles being burned in the open is 600 meters (657 yards).



**SMOKE GRENADE-Continued****CARE HANDLING, AND PRESERVATION**

1. Ammunition is packed to withstand conditions ordinarily met in the field. Take care to keep packing boxes from becoming broken or damaged. All broken packing boxes must be repaired immediately. Carefully transfer all markings to new packing boxes.
2. When necessary to leave ammunition in open, raise it on platform at least 3 inches (7.6 cm) from ground. Cover with a double thickness of paulin. Leave 18 inches (46 cm) space for air circulation. Trenches should be dug to prevent water from running under the pile. Ammunition is damaged by moisture and high temperature and should be protected as follows:
  - a. Do not break moisture-resistant seal on container until ammunition is to be used.
  - b. Protect ammunition, particularly fuzes, from high temperature and direct rays of sun. More uniform firing is obtained if rounds are at the same temperature.
  - c. Do not disassemble grenade or any of its parts.
  - d. When loading grenades into stowage box, grasp grenade case with hand over primer (P), and nose of projectile with other hand.

**SMOKE GRENADE-Continued**



- e. Grenades dent easily and should be protected from hard knocks and blows. Dented grenades may result in incomplete seating, jamming in chamber, and difficulty in removal. Do not load or fire dented rounds.
- f. Do not handle duds. Duds are extremely dangerous. Their fuzes may be armed. They should be left in place for disposal by authorized personnel in accordance with TM 9-1300-206.
- g. Do not remove protective or safety devices from fuzes until just before loading.

## **APPENDIX A REFERENCES**

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### A-1. SCOPE

This appendix lists all forms, field manuals, and technical manuals referenced in this manual.

### A-2. FORMS

Recommended Changes to DA Publications	DA Form 2028
Quality Deficiency Report	SF 368

### A-3. FIELD MANUALS

Operation and Maintenance of Ordnance Materiel in Cold Weather	FM 9-207
Chemical, Biological, Radiological and Nuclear Defense	FM 21-40
Basic Cold Weather Manual	FM 31-70
Northern Operations	FM 31-71

### A-4. TECHNICAL MANUALS

Radio Interference Suppression	TM 11-483
Operator's Manual, Radio Sets	TM 11-5820-401 -10-2
Operator and Organizational Maintenance Manual, Radio Sets	TM 11-5820-498-12
Operator's Manual for Viewer, Driver's Night Vision AN/VVS-2	TM 11-5855-249-10
Operator's Organizational, Direct Support and General Support Maintenance Manual Including Repair Parts and Special Tools List: Suppressor, Electrical Transient MX-7778A/GRC	TM 11-5915-224-14
Intercommunication Station AN/VIA-4	TM 11-706

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**REFERENCES-Continued**

**A-4. TECHNICAL MANUALS-Continued**

Driver's Selection, Training, and Supervision, Tracked Vehicles	TM 21-301
Manual for the Tracked Combat Vehicle Driver	TM 21-306
Operator's Manual, Mask, Chemical-Biological: Aircraft ABC-M 24 and Accessories and Mask Chemical-Biological: Tank M25/M25A1 and Accessories	TM 3-4240-280-10
The Army Maintenance Management System (TAMMS)	DA PAM 738-750
Painting Instructions for Field Use	TM 43-0139
Operator's, Organizational, Direct Support and General Support Maintenance Manual; Bridge, Armored-Vehicle-Launched; Scissoring Type; Aluminum; 60-ft Span	TM 5-5420-203-14
Repairs and Utilities; Fire Protection Equipment and Appliances; Inspection Operations, and Preventative Maintenance	TM 5-687
Administrative Storage of Equipment	TM 740-90-1
Procedures for Destruction of Equipment to Prevent Enemy Use	TM 750-244-3
Operator and Organizational Maintenance Manual for Lead Acid Type Batteries	TM 9-6140-200-12

**MISCELLANEOUS PUBLICATIONS**

**REFERENCES-Continued**

<p>Identification List for Fuels, Lubricants, Oils and Waxes</p>	<p>C9100-IL</p>
<p>Lubrication Order; Launcher M60A1 Tank Chassis, Transporting: for Bridge, Armored- Vehicle-Launched, Scissoring Type, Class 60</p>	<p>LO 5-5420-202-12</p>
<p>Safety Measures to be Observed When Installing and Using Whip Antennas, Field- Type Masts, Towers and Antennas and Metal Poles That Are Used With Communications, Radar and Direction Finder Equipment (TO 31P5-1-1)</p>	<p>TB SIG 291</p>
<p>Hand Portable Fire Extinguishers Approved for Army Users</p>	<p>TB 5-4200-200-10</p>
<p>Operator, Unit, Direct Support &amp; General Support Maintenance Manual Including Repair Parts and Special Tools List for Demolition Kit, Mine Clearing Line Charge (MICLIC)</p>	<p>TM 9-1375-215-14&amp;P</p>



**APPENDIX B****COMPONENTS OF END ITEM AND BASIC ISSUE ITEMS LIST****Section I INTRODUCTION****B-1. SCOPE**

This appendix lists components of end item and basic issue items for the M60A1 AVLB to help you inventory items required for safe and efficient operation.

**B-2 GENERAL**

The Components of End Item and Basic Issue Items Lists are divided into the following sections:

a. Section II. Components of End Item. This listing is for informational purposes only, and is not authority to requisition replacement items. These items are part of the end item, but are removed and separately packaged for transportation or shipment. As part of the end item, these items must be with the end item whenever it is issued or transferred between property accounts. Illustrations are furnished to assist you in identifying the items.

b. Section III. Basic Issue Items. These are the minimum essential items required to place the M60A1 AVLB in operation, to operate it, and to perform emergency repairs. Although shipped separately packaged, BII must be with the M60A1 AVLB during operation and whenever it is transferred between property accounts. The illustrations will assist you with hard-to-identify items. This manual is your authority to request/requisition replacement BII, based on TO E/M TOE authorization of the end item.

**B-3. EXPLANATION OF COLUMNS**

The following provides an explanation of columns found in the tabular listings:

a. Column (1) - Illustration Number (Illus Number). This column indicates the number of the illustration in which the item is shown.

b. Column (2) - National Stock Number. Indicates the National stock number assigned to the item and will be used for requisitioning purposes.

**Section I. INTRODUCTION-Continued**

**B-3. EXPLANATION OF COLUMNS-Continued**

c. Column (3) - Description. Indicates the National item name and a minimum description to identify and locate the item. The last line for each item indicates the Federal Supply Code for Manufacturer (FSCM) (in parentheses) followed by the part number.

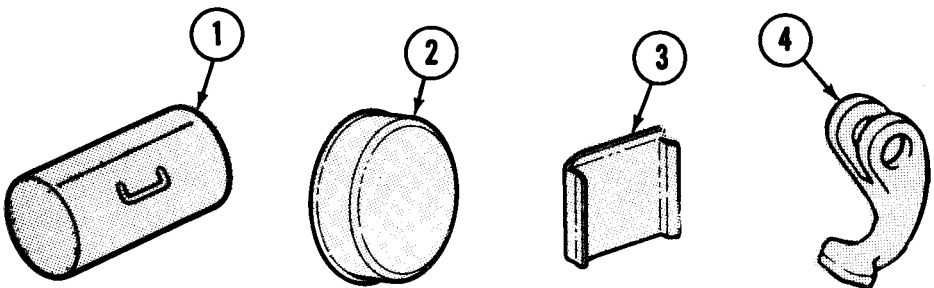
d. Column (4) - Unit of Measure (U/M). Indicates the measure used in performing the actual operational/maintenance function. This measure is expressed by a two-character alphabetical abbreviation (e.g., ea, in, pr).

e. Column (5) - Quantity required (Qty rqr). Indicates the quantity of the item authorized to be used with/on the equipment.



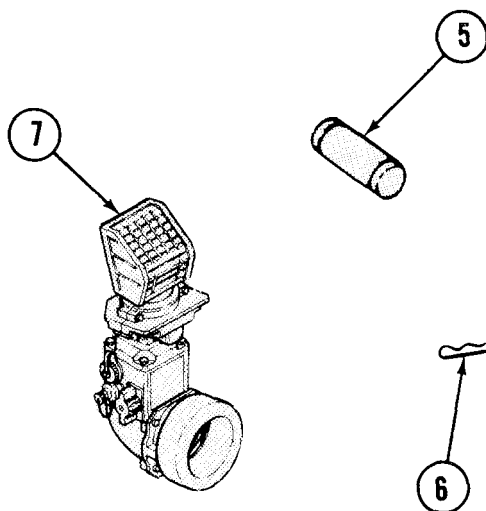
**Section II. COMPONENTS OF END ITEM**

(1) Illus. number	(2) National Stock number	(3) Description FSCM and Part number	(4) U/M	(5) Qty rqr
1		CASE, CARRYING: AN/ VVS-2, NIGHT VIEWER (1-RIGHT REAR OF DRIVER ON FLOOR, 2- LEFT FRONT OF COM- MANDER UNDER RADIO RACK) (19207) 11669784	EA	2
2	5855-01-027-3625	COVER PROTECTIVE: EYEPIECE DRIVERS VIEWER (ON VIEWER OR STOWED IN CARRYING CASE) (80063) SM- C771382	EA	2
3	5855-01-027-1553	COVER, PROTECTIVE: WINDOW, DRIVERS VIEWER (ON VIEWER) OR STOWED IN CARRYING CASE) (80063) SM-C771364	EA	2
4	2540-00-706-8219	HOOK, TOW, CABLE: (IN RIGHT FRONT FENDER STOWAGE BOX) (19207) 7068219	EA	4



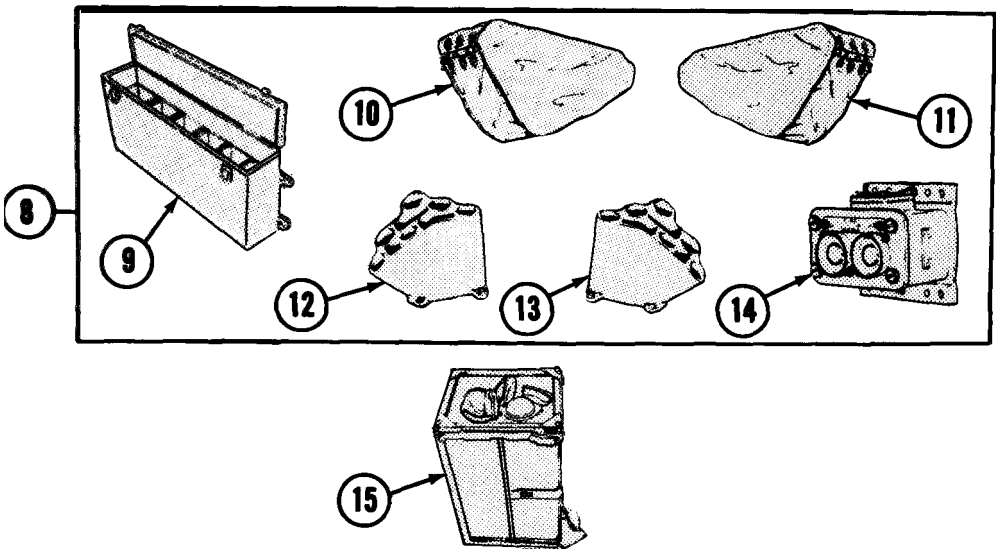
**Section II. COMPONENTS OF END ITEM-Continued**

(1) Illus number	(2) National Stock number	Description FSCM and Part number	(4) U/M	(5) Qty rqr
5	3315-00-706-9195	PIN, GROOVED, HEADLESS: (IN RIGHT FRONT FENDER STOWAGE BOX) (19207) 7069195	EA	4
6	3315-00-350-4326	PIN LOCKING: (IN RIGHT FRONT FENDER STOWAGE BOX) (19207) 5213744	EA	8
7	5855-01-096-0871	VIEWER, NIGHT, AN/VVS-2: (MOUNTED IN HATCH OR STOWED IN CARRYING CASE) (80063) SM-D-771480-1	EA	2



**Section II. COMPONENTS OF END ITEM - Continued**

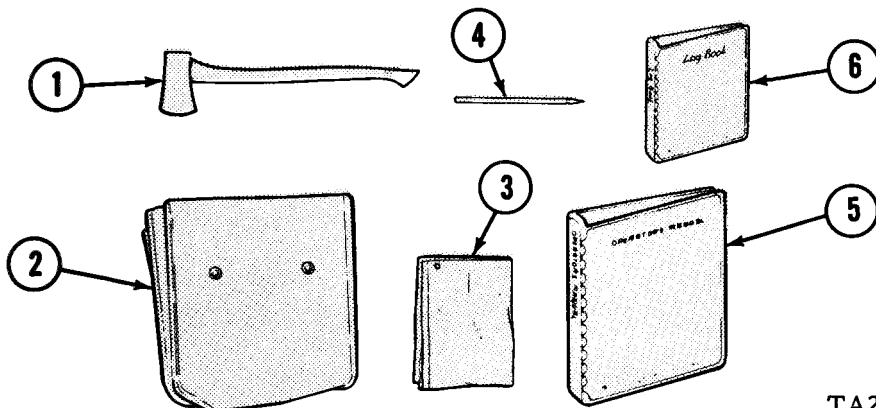
(1) Illus. number	(2) National Stock number	(3) Description FSCM and Part number	(4) U/M	(5) Qty rqr
8	1040-01-015-0874	LAUNCHER, SMOKE GRENADE, M239 (MOUNTED ON CHASSIS) (81361) B13-12-32	EA	1
9	1040-01-041-9830	- CONSISTING OF - BOX, STOWAGE (K6897) FV576789	EA	2
10	1040-01-042-3861	COVER, DISCHARGER, RIGHT (K6897) FV578937	EA	1
11	1040-01-043-7896	COVER, DISCHARGER, LEFT (K6897) FV578934	EA	1
12	1040-01-041-9829	DISCHARGER, RIGHT (K6897) FV855991	EA	1
13	1040-01-041-9828	DISCHARGER, LEFT	EA	1
14	5975-01-047-8359	PUSHBUTTON, FIRING (K6897) FV861135	EA	1
15	4240-00-853-3701	FILTER UNIT, GAS PARTICULATE (81361) DL5-19-1779	EA	1





Section III. BASIC ISSUE ITEMS

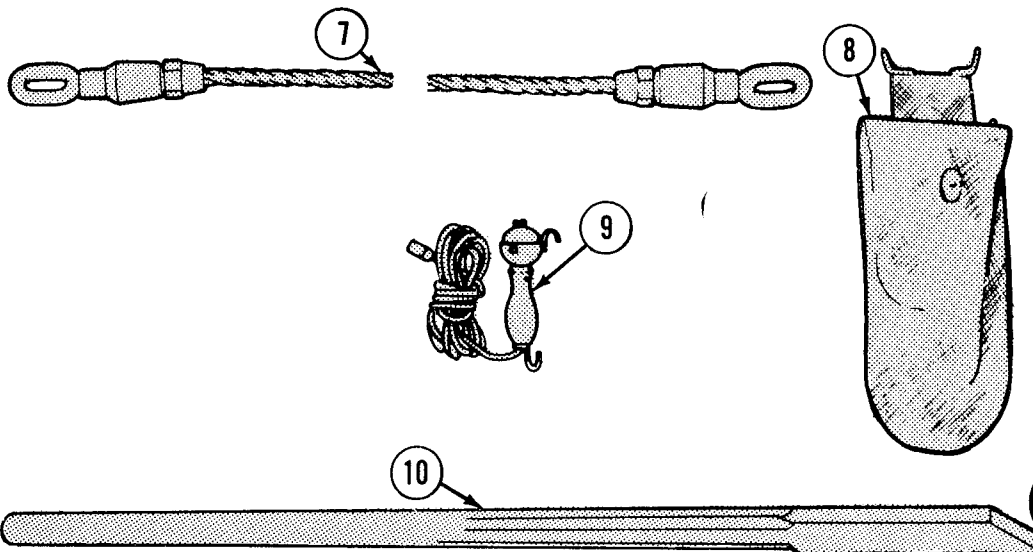
(1) Illus. number	(2) National Stock number	(3) Description FSCM and Part number	(4) U/M	(5) Qty rqr
1	5110-00-293-2336	AXE: SINGLE BIT, 4 LB HEAD, 34 IN. LG HANDLE (IN LEFT FRONT FENDER STOWAGE BOX) (19207) 6150925	EA	1
2	2540-00-670-2459	BAG ASSY: PAMPHLET (IN CREW COMPARTMENT) (19207) 11676920	EA	1
3	5140-00-473-6256	BAG TOOL: SATCHEL (IN RIGHT FRONT FENDER STOWAGE BOX) (19207) 11655979	EA	1
4	5120-00-526-6044	BAR, PINCH: 1/2 IN. WIDE 16 IN. LG (IN TOOL BAG IN RIGHT FRONT FENDER STOWAGE BOX) (19204) 5266044	EA	1
5	7510-00-738-6164	BINDER, LOOSELEAF: TECHNICAL MANUALS (IN PAMPHLET BAG) (19207) 10952007	EA	1
6	7510-00-889-3494	BINDER, LOOSELEAF: EQUIPMENT LOG BOOK (IN PAMPHLET BAG) (19207) 11677003	EA	1



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**Section III. BASIC ISSUE ITEMS - Continued**

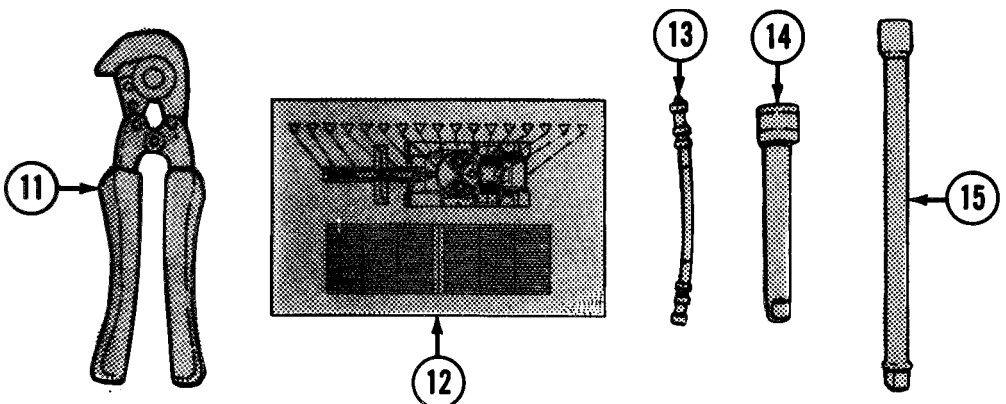
(1) Illus. number	(2) National Stock number	Description FSCM and Part number	(4) U/M	(5) Qty rqr
7	4010-00-202-2425	CABLE TOWING: 1-1/8 IN. DIA, 10 FT LG (IN BRACKETS ON LEFT SIDE OF HULL) (19207) 7360553	EA	2
8	5140-00-261-4994	CARRIER, WIRE CUTTER: (IN TOOL BAG IN RIGHT FRONT FENDER STOWAGE BOX) (19207) 11655787	EA	1
9	6230-00-378-2053	CORD, LIGHT, ELECTRIC AL: 15 FT. LG (IN RIGHT FRONT FENDER STOWAGE BOX) (19207) 17-C-35079-33	EA	1
10	5120-00-224-1390	CROWBAR: PINCH POINT, 60 IN. LG, 1-1/4 IN. POINT (IN LEFT FRONT FENDER STOWAGE BOX) (19207) 11677049-1	EA	1



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**Section III. BASIC ISSUE ITEMS - Continued**

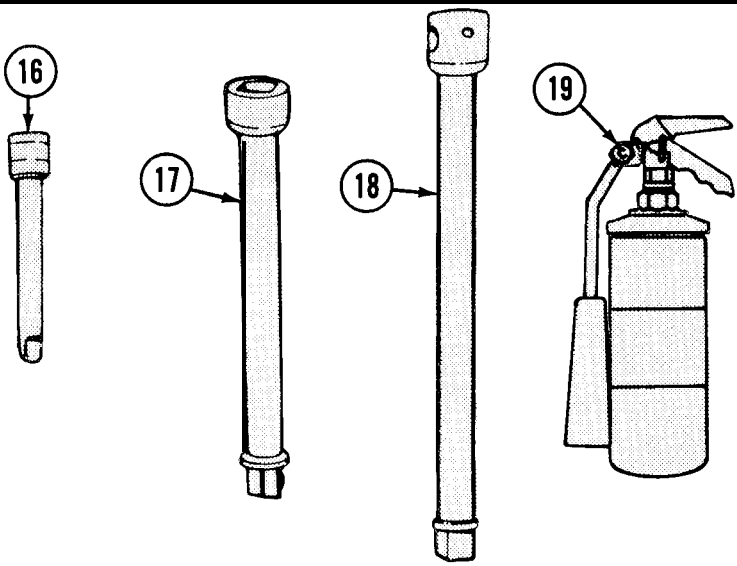
(1) Illus. m	(2) National Stock number	Description FSCM and Part number	(4) U/M	Q
11	5110-00-595-8229	CUTTER, BARBED WIRE, INSULATED HANDLES: (IN CARRIER, ITEM 8, 5140-00-261-4994) (19207) 11655981	EA	
12	2590-00-740-3968	DIAGRAM, STRAP LOCATION (IN PAMPHLET BAG, ITEM 2, 2540-00-670-2459) (19207) 10934431	EA	
13	4930-00-288-1511	EXTENSION, GREASE GUN: 12 IN. LG, FLEXIBLE (IN TOOL BAG IN RIGHT FRONT FENDER STOWAGE BOX (19207) 6300333	EA	
14	5120-00-243-7326	EXTENSION, SOCKET WRENCH: 1/2 IN. DR, 5 IN. LG (IN TOOL BAG IN RIGHT FRONT FENDER STOWAGE BOX) (95683) 41B306	EA	
15	5120-00-227-8074	EXTENSION, SOCKET WRENCH: 1/2 IN. DR, 10 IN. LG (IN TOOL BAG IN RIGHT FRONT FENDER STOWAGE BOX) (19207) 11655788-1	EA	



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**Section III. BASIC ISSUE ITEMS - Continued**

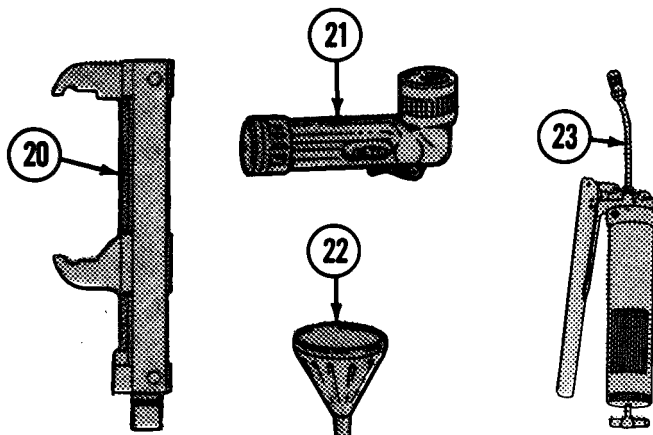
(1) Illus. number	(2) National Stock number	Description FSCM and Part number	(4) U/M	(5) Qty rqr
16	5120-00-273-9208	EXTENSION, SOCKET WRENCH: 3/4 IN. DR, 4-5/8 IN. LG (IN TOOL BAG IN RIGHT FRONT FENDER STOWAGE BOX) (55719) L32	EA	1
17	5120-00-243-7328	EXTENSION, SOCKET WRENCH: 3/4 IN. DR, 8 IN. LG (IN TOOL BAG IN RIGHT FRONT FENDER STOWAGE BOX) (19204) 41 B309-20	EA	1
18	5120-00-227-8079	EXTENSION, SOCKET WRENCH: 3/4 IN. DR, 16 IN. LG (IN TOOL BAG IN RIGHT FRONT FENDER STOWAGE BOX) (55719) L122	EA	1
19	4210-00-555-8837	EXTINGUISHER, FIRE: CF, BR <sub>3</sub> , 2-3/4 LB. WITH BRACKET (ON RACK BEHIND OPERATOR'S SEAT) (19207) 10916537	EA	1





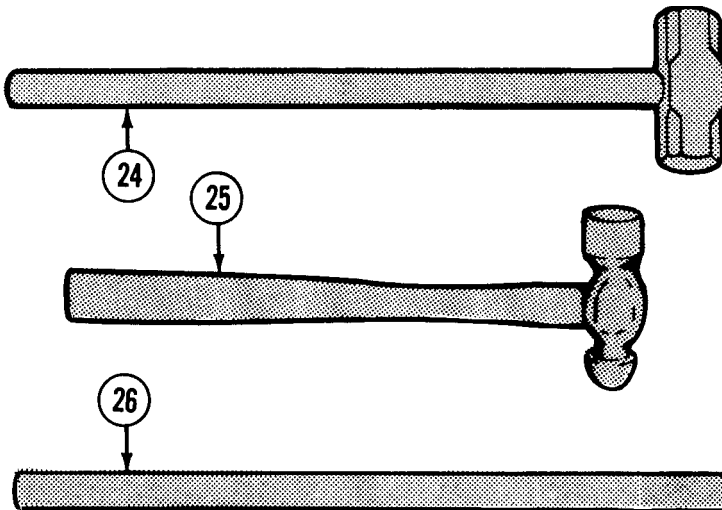
Section III. BASIC ISSUE ITEMS - **Continued**

(1) Illus. number	(2) National Stock number	(3) Description FSCM and Part number	(4) U/M	(5) Qty rqr
20	5120-01-016-2149	FIXTURE, TRACK CONNECTING (POWER OPERATION): (IN RIGHT FRONT FENDER STOWAGE BOX) (19207) 12252120	EA	2
21	6230-00-264-8261	FLASHLIGHT: (IN CREW COMPARTMENT FLASHLIGHT BRACKETS) (21108) MX991-U	EA	2
22	7240-00-527-9868	FUNNEL: METAL WITH STRAINER, 1 QT CAPACITY (IN RIGHT REAR FENDER STOWAGE BOX) (81348) RRF800T1CBS2	EA	1
23	4930-01-133-7143	GUN, LUBRICATING: HIGH PRESSURE, 21 OZ CAPACITY (IN TOOL BAG IN RIGHT FRONT FENDER STOWAGE BOX) (19207) 12312118	EA	1



**Section III. BASIC ISSUE ITEMS - Continued**

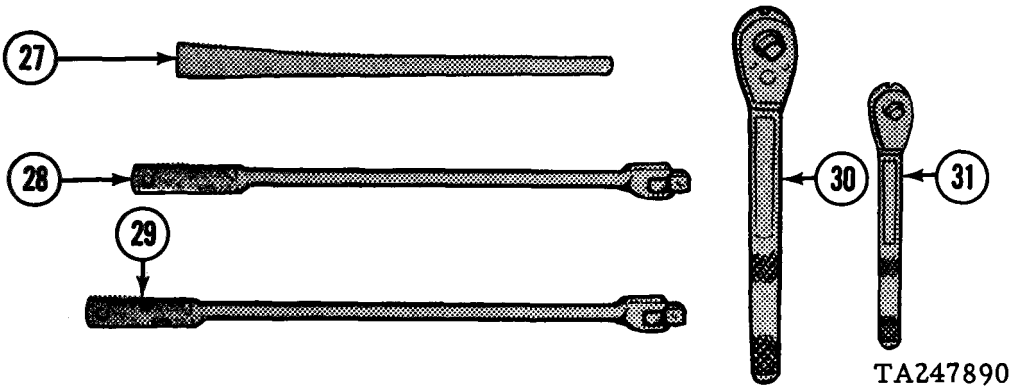
(1) Illus. number	National Stock number	(3) Description FSCM and Part number	(4) U/M	(5) Qty rqr
24	5120-00-243-2957	HAMMER, ENGINEER: 10 10 LB SLEDGE, HICKORY WOOD HANDLE (IN LEFT FRONT FENDER STOWAGE BOX) (79416) 75H  or optional	EA	1
24	5120-00-900-6097	HAMMER, ENGINEER: 10 LB SLEDGE, FIBER- GLASS HANDLE (IN LEFT FRONT FENDER STOWAGE BOX) (81348) GGGH86T10C1SB	ALT	1
25	5120-00-061-8546	HAMMER, MACHINIST: 2 LB FIBERGLASS HANDLE (IN TOOL BAG IN RIGHT FRONT FENDER STOWAGE BOX) (19207) 11677028-3	EA	1
26	5120-00-473-6320	HANDLE, EXTENSION, WRENCH: 1-1/8 IN. DIA, 36 IN. LG (IN RIGHT FRONT FENDER STOWAGE BOX) (80064) 1756412	EA	1



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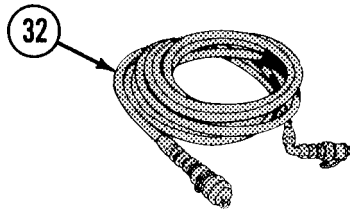
Section III. BASIC ISSUE ITEMS - Continued

(1) Illus. number	National Stock number	Description FSCM and Part number	(4) U/M	(5) Qty rqr
27	5120-00-288-6574	HANDLE, MATTOCK, PICK 36 IN. LG (IN LEFT FRONT FENDER STOWAGE BOX) (19207) 11677021	EA	1
28	5120-00-236-7590	HANDLE, SOCKET WRENCH, HINGED: 1/2 IN. DR, 14 IN. LG (IN TOOL BAG IN RIGHT FRONT FENDER STOWAGE BOX) (19207) 11655786-1	EA	1
29	5120-00-221-7959	HANDLE, SOCKET WRENCH, HINGED: 3/4 IN. DR, 23 IN. LG (IN TOOL BAG IN RIGHT FRONT FENDER STOWAGE BOX) (45225) H377	EA	1
30	5120-00-230-6385	HANDLE, SOCKET WRENCH, RATCHET: 1/2 IN. DR, 9 IN. LG (IN TOOL BAG IN RIGHT FRONT FENDER STOWAGE BOX) (99993) H41H1505-9	EA	1
31	5120-00-249-1076	HANDLE, SOCKET WRENCH, RATCHET; 3/4 IN. DR, 17 IN. LG (IN TOOL BAG IN RIGHT FRONT FENDER STOWAGE BOX) (55719) L72SH	EA	1



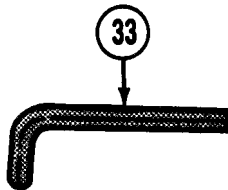
**Section III. BASIC ISSUE ITEMS - Continued**

Illus. number	National Stock number	Description FSCM and Part number	(4) U/M	(5) Qty rqr
32	4720-00-498-6291	HOSE ASSEMBLY, HYDRAULIC SLAVE: (IN LEFT REAR FENDER STOWAGE BOX) (97403) 13215E6140	EA	1



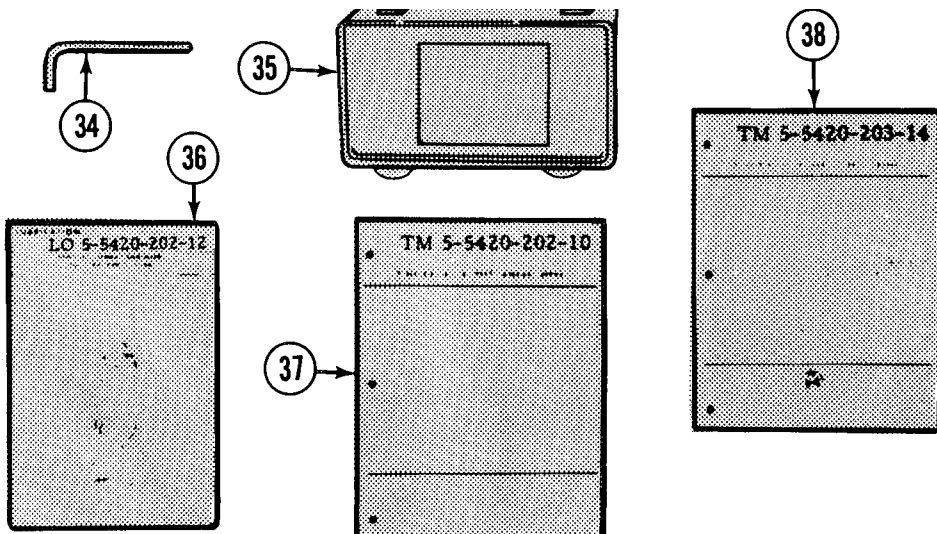
Section III. BASIC ISSUE ITEMS - Continued

(1) Illus. number	National Stock number	Description FSCM and Part number	U/M	Qty rqr
33	5120-00-198-5390	KEY, SOCKET HEAD SCREW L-TYPE, SHORT: 3/8 IN. (IN TOOL BAG IN RIGHT FRONT FENDER STOWAGE BOX) (80064) 1940722	EA	1



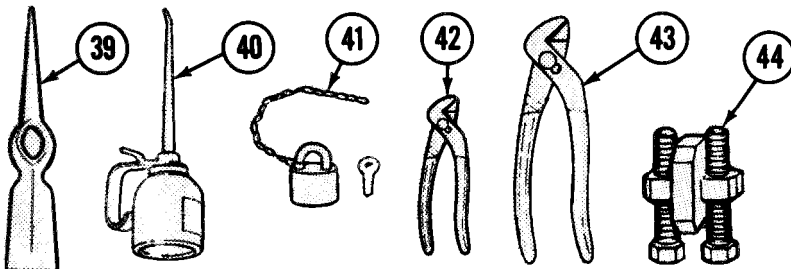
**Section III. BASIC ISSUE ITEMS-Continued**

(1) Illus. number	(2) National Stock number	Description FSCM and Part number	(4) U/M	(5) Qty rqr
34	5120-00-224-2510	KEY SOCKET HEAD SCREW, L-TYPE, SHORT: 5/8 IN. (IN TOOL BAG IN RIGHT FRONT FENDER STOWAGE BOX) (80064) 1940710	EA	1
35	6545-00-922-1200	KIT, FIRST AID: (ONE IN CREW COMPARTMENT, ONE IN RIGHT REAR FENDE STOWAGE BOX) (89875) 11677011	EA	2
36		LUBRICATION ORDER: (IN PAMPHLET BAG) LO 5-5420 -202-12	EA	1
37		MANUAL, OPERATOR'S: (IN PAMPHLET BAG) TM 5-5420-202-10	EA	1
38		MANUAL, OPERATOR'S (BRIDGE): (IN PAMPHLET BAG) TM 5-5420-203-14	EA	1



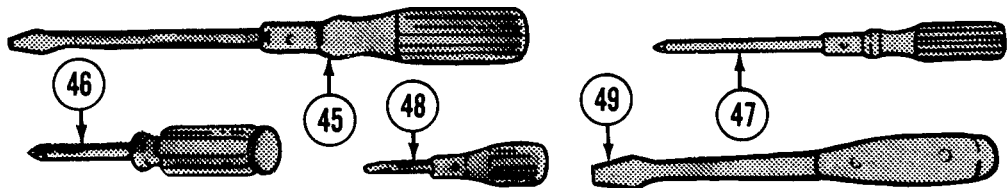
**Section III. BASIC ISSUE ITEMS - Continued**

(1) Illus. number	(2) National Stock number	(3) Description FSC M and Part number	(4) U/M	(5) Qty rgr
39	5120-00-243-2395	MATTOCK, PICK: 5 LB W/O HANDLE (IN LEFT FRONT FENDER STOWAGE BOX) (19207) 11677022	EA	1
40	4930-00-262-8868	OILER, HAND: WITH LEVER PUMP, FLEXIBLE SPOUT (IN LEFT FRONT FENDER STOWAGE BOX) (72798) 328	EA	1
41	5340-00-158-3805	PADLOCK, INDIVIDUAL 2 ON CUPOLA HATCHES 4 ON FENDER BOXES MILP17802 TAC1 (81349)	EA	6
42	5120-00-278-0350	OR PADLOCK, INDIVIDUAL, W/CLEVIS (81349) MILP17802 TAC1	EA	1
43	5120-00-278-0352	PLIERS, SLIP- JOINT: ANGLE NOSE, MULTI- TONGUE AND GROOVE, 5 IN. LG (IN TOOL BAG IN RIGHT FRONT FENDER STOWAGE BOX) (80244) GGGP471T2C1SA	EA	1
44	5120-01-040-9318	PLIERS, SLIP-JOINT: ANGLE NOSE, MULTI- TONGUE AND GROOVE, 10 IN. LG (IN TOOL BAG IN RIGHT FRONT FENDER STOWAGE BOX) (71612) 420	EA	1
		PULLER, MECHANIC AL, TRACK END CONNECTOR: (IN RIGHT REAR FENDER STOWAGE BOX) (19207) 12252143	EA	1



**Section III. BASIC ISSUE ITEMS - Continued**

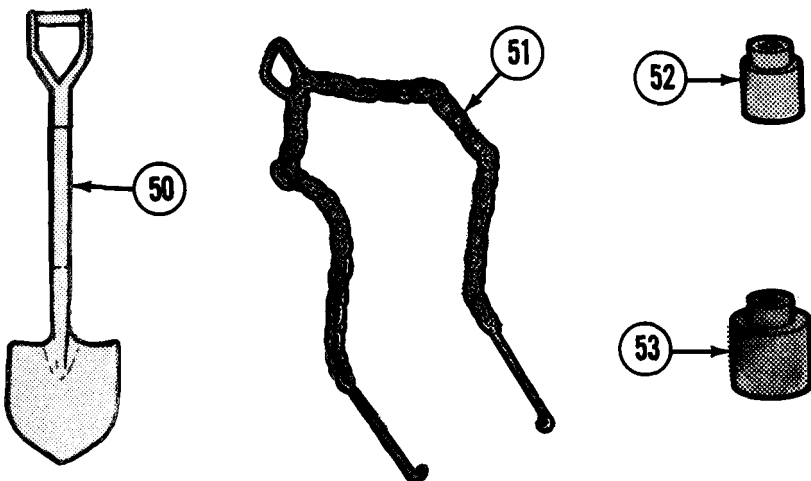
(1) Illus. number	(2) National Stock number	Description FSCM and Part number	(4) U/M	(5) Qty rqr
45	5120-00-234-8910	SCREWDRIVER, FLAT-TIPPED, GENERAL PURPOSE: 6 IN. BLADE (IN TOOL BAG IN RIGHT FRONT FENDER STOWAGE BOX) (72368) 2143-6	EA	1
46	5120-00-234-8913	SCREWDRIVER, CROSS-TIPPED, PHILLIPS NO. 2: 4 IN. BLADE (IN TOOL BAG IN RIGHT FRONT FENDER STOWAGE BOX) (55719) RGP42	EA	1
47	5120-00-224-7375	SCREWDRIVER, CROSS-TIPPED, PHILLIPS NO. 4: 8 IN. BLADE (IN TOOL BAG IN RIGHT FRONT FENDER STOWAGE BOX) (55719) RGP84	EA	1
48	5120-00-596-8502	SCREWDRIVER, FLAT-TIPPED, CLOSE QUARTER: 1-1/2 IN. BLADE (IN TOOL BAG IN RIGHT FRONT FENDER STOWAGE BOX) (55719) SSD1	EA	1
49	5120-00-227-7338	SCREWDRIVER, FLAT-TIPPED, EXTRA HEAVY DUTY: 5 IN. BLADE (IN TOOL BAG IN RIGHT FRONT FENDER STOWAGE BOX) (77948) D339	EA	1





**Section III. BASIC ISSUE ITEMS - Continued**

(1) Illus. number	(2) National Stock number	Description FSCM and Part number	(4) U/M	(5) Qty rgr
50	5120-00-293-3336	SHOVEL, HAND: ROUND POINT, D-HANDLE, SHORT (IN LEFT FRONT FENDER STOWAGE BOX) (19207) 11655784	EA	1
51	3940-01-110-4432	SLING, MULTIPLE LEG: 2 LEG, 5/8 IN. X 6 FT CHAIN (IN LEFT FRONT FENDER BOX) (97403) 13212 E7099	EA	2
52	5120-01-135-0994	SOCKET, IMPACT WRENCH, 3/4 IN. DR, 15/16 (IN TOOL BAG IN RIGHT FRONT FENDER STOWAGE BOX) (55719) 11669752	EA	1
53	5130-00-227-6684	SOCKET, IMPACT WRENCH 6 PT, 3/4 IN. DR. 1-5/16 IN. (IN TOOL BAG IN RIGHT FRONT FEND R STOWAGE BOX) (11976) C67455	EA	1



**Section III. BASIC ISSUE ITEMS - Continued**

(1) Illus. number	(2) National Stock number	Description FSCM and Part number	(4) U/M	(5) Qty rqr
54	5120-00-237-0982	SOCKET, SOCKET WRENCH: 12 PT, 1/2 IN. DR, 3/8 IN. (IN TOOL BAG IN RIGHT FRONT FENDER STOWAGE BOX) (55719) SW120	EA	1
55	5120-00-189-7924	SOCKET, SOCKET WRENCH: 12 PT, 1/2 IN. DR, 7/16 IN. (IN TOOL BAG IN RIGHT FRONT FENDER STOWAGE BOX) (65814) ST1214	EA	1
56	5120-00-222-2021	SOCKET, SOCKET WRENCH: 12 PT, 1/2 IN. DR, 1/2 IN. (IN TOOL BAG IN RIGHT FRONT FENDER STOWAGE BOX) (55719) W-925-2493	EA	1
57	5120-00-189-7932	SOCKET, SOCKET WRENCH: 12 PT, 1/2 IN. DR, 9/16 IN. (IN TOOL BAG IN RIGHT FRONT FENDER STOWAGE BOX) (19207) 11677025-1	EA	1



54



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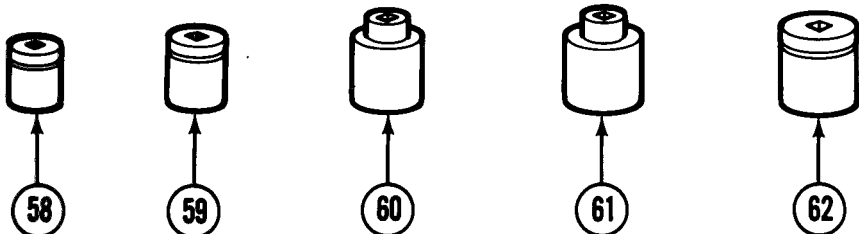
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**Section III. BASIC ISSUE ITEMS - Continued**

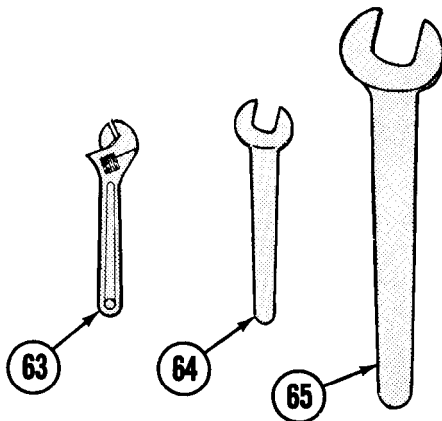
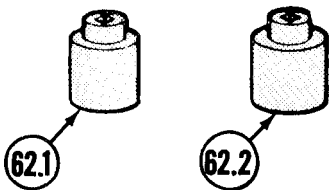
(1) Illus. number	National Stock number	Description FSCM and Part number	(4) U/M	(5) Qty rqr
58	5120-00-189-7985	SOCKET, SOCKET WRENCH: 12 PT, 1/2 IN. DR, 3/4 IN. (IN TOOL BAG IN RIGHT FRONT FENDER STOWAGE BOX) (19207) 11677025-4	EA	1
59	5120-00-189-7934	SOCKET, SOCKET WRENCH: 12 PT, 1/2 IN. DR, 7/8 IN. (IN TOOL BAG IN RIGHT FRONT FENDER STOWAGE BOX) (19207) 11677025-5	EA	1
60	5120-00-181-6813	SOCKET, SOCKET WRENCH: 12 PT, 3/4 IN. DR, 15/16 IN. IN TOOL BAG IN RIGHT FRONT FENDER STOWAGE BOX (24789) 1230	EA	1
61	5120-00-235-5871	SOCKET, SOCKET WRENCH: 12 PT, 3/4 IN. DR, 1-1/4 IN. (IN TOOL BAG IN RIGHT FRONT FENDER STOWAGE BOX) (47805) 5540	EA	1
62	5120-00-293-0094	SOCKET, SOCKET WRENCH: 12 PT, 3/4 IN. DR, 1-1/2 IN. (IN TOOL BAG IN RIGHT FRONT FENDER STOWAGE BOX) (47805) 5548	EA	1



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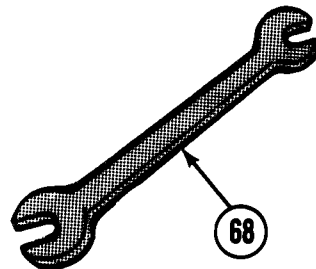
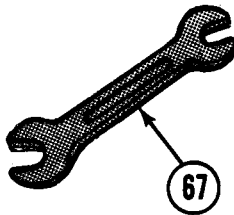
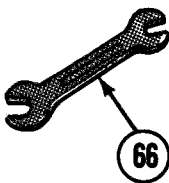
**Section III. BASIC ISSUE ITEMS - Continued**

(1) Illus. number	(2) National Stock number	Description FSCM and Part number	(4) U/M	(5) Qty req
62.1	120-00-239-0021	SOCKET, SOCKET WRENCH: 12 PT, 3/4 IN. DR. X 1 1/8 IN (IN TOOL BAG IN RIGHT FRONT FENDER STOWAGE BOX (47805) 5536		
62.2	130-01-084-6025	SOCKET, SOCKET WRENCH, POWER DR. 3/4 IN. DR, 1 5/16 IN. (IN TOOL BAG IN RIGHT FRONT FENDER STOWAGE BOX) (19207) 10894847-1		
63	120-00-473-6476	WRENCH, ADJUSTABLE, AUTOMOTIVE: 11 1/2 IN. HANDLE (IN TOOL BAG IN RIGHT FRONT FENDER STOWAGE BOX) (80212) P489	EA	2
64	120-00-277-1246	WRENCH, CYLINDER ROD FLATS: 1 1/2 INCH (IN RIGHT FRONT FENDER STOWAGE BOX) (07971) 1709	EA	1
65	120-00-050-8745	WRENCH, CYLINDER ROD FLATS: 4-9/ 16 INCH (IN RIGHT FRONT FENDER STOWAGE BOX) (97403) 13211 E3202	EA	1



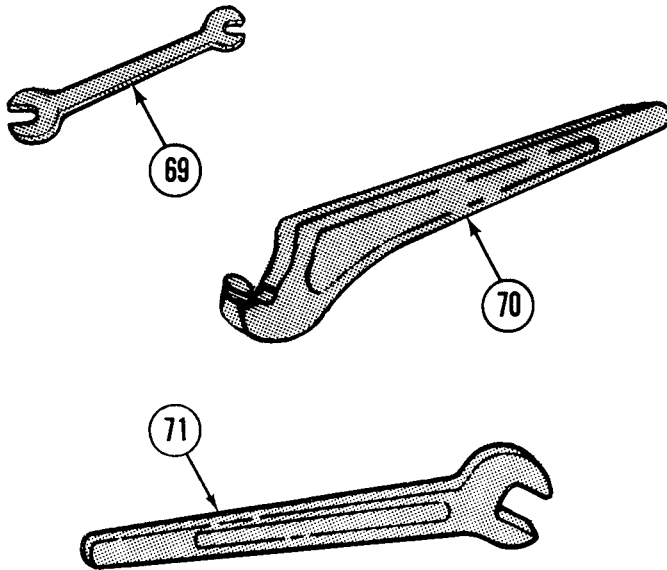
**Section III. BASIC ISSUE ITEMS - Continued**

(1) Illus. number	(2) National Stock number	Description FSCM and Part number	(4) U/M	(5) Qty rqr
66	5120-00-277-2307	WRENCH, DOUBLE HEAD, OPEN END: 5/16 IN. AND 3/8 IN. (IN TOOL BAG IN RIGHT FRONT STOWAGE BOX) (55719) S1012	EA	1
67	5120-00-187-7123	WRENCH, DOUBLE HEAD, OPEN END: 7/16 IN. AND 1/2 IN. (IN TOOL BAG IN RIGHT FRONT FENDER STOWAGE BOX) (55719) S1416	EA	1
68	5120-00-293-2134	WRENCH, DOUBLE HEAD, OPEN END: 9/16 IN. AND 11/16 IN. (IN TOOL BAG IN RIGHT REAR FENDER BOX) (19207) 5323330	EA	1



**Section III. BASIC ISSUE ITEMS - Continued**

(1) Illus. number	(2) National Stock number	Description FSCM and Part number	(4) U/M	(5) Qty rgr
69	5120-00-224-3102	WRENCH, DOUBLE HEAD, OPEN END: 5/8 IN. AND 3/4 IN. (IN TOOL BAG IN RIGHT FRONT FENDER BOX) (65814) 729	EA	1
70	5120-01-100-0391	WRENCH, SPANNER: TRACK ADJUSTING LINK (IN LEFT FRONT FENDER STOWAGE BOX) (19207) 12301553	EA	1
71	5120-00-563-7342	WRENCH, SINGLE HEAD, OPEN END: 3-5/32 IN., 26 IN. LG (IN RIGHT REAR FENDER STOWAGE BOX) (19207) 8708683	EA	1



**APPENDIX C****ADDITIONAL AUTHORIZATION LIST**

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**Section I. INTRODUCTION****1. SCOPE**

This appendix lists additional items you are authorized for the support of the M60A1 AVLB.

**2. GENERAL**

This list identifies items that do not have to accompany the M60A1 AVLB and that do not have to be turned in with it. These items are all authorized to you by Combined Table of Allowances (C TA), Modified Table of Organization and Equipment (M TOE), Table of Distribution and Allowances (TDA), or Joint Table of Allowances (JTA).

**3. EXPLANATION OF LISTING**

National stock numbers, descriptions, and quantities are provided to help you identify and request the additional items you require to support this equipment. The items are listed in alphabetical sequence by item name under the type document (i.e., CTA, MTOE, TDA, or JTA) which authorizes the item (s) to you.

**SECTION II. ADDITIONAL AUTHORIZATION LIST**

(1) NATIONAL STOCK NUMBER	(2) DESCRIPTION  FSCM & PART NUMBER	(3) J/M	(4) QTY AUTH
<u>MTOE AUTHORIZED ITEMS</u>			
5820-00- 223-7433	RADIO SET, AN/VRC-46: (IN RADIO MOUNT) (80063) PPL4319	EA	1
OR			
5820-00- 233-7475	RADIO SET, AN/VRC-64: (IN RADIO MOUNT) (80063) PPL4324	EA	1
<u>CTA AUTHORIZED ITEMS</u>			
5820-00- 938-0214	ACCESSORY KIT, MK-1297-G (USED WITH RADI SET AN/VRC-46 OR AN/VRC-64): (INSTALLED WITH RADIO SET) (80063) PPL4425	EA	1
7240-00- 089-3827	CAN, WATER, MILITARY, PLASTIC, 5 GL: (IN WATER CAN STOWAGE BRACKET) (81349) MIL-C-43613	EA	1
OR			
7240-00 242-6153	CAN, WATER, MILITARY, STEEL, 5GL: (IN WATER CAN STOWAGE BRACKET) (81349) MIL-C-13984T1		
8345-00 375-0223	FLAG SET, M238: (IN RIGHT FRONT FENDER STOWAGE BOX) (81349) MIL-F-40045 -CONSISTING OF-	EA	1
8345-00- 178-8437	CASE, CARRYING, CS-90: COMPONENT A	EA	1
8345-00- 227-1511	FLAG, MC-273 (RED): COMPONENT C	EA	1
8345-00- 227-1405	FLAG, MC-274 (YELLOW); COMPONENT D	EA	1



## Section II. ADDITIONAL AUTHORIZATION LIST(Continued)

(1) NATIONAL STOCK NUMBER	(2) DESCRIPTION U/M FSCM & PART NUMBER	(3) J/M	(4) QTY AUTH
<u>CTA AUTHORIZED ITEMS</u> - Continued			
8345-00- 227-1406	FLAG, MC-275 (GREEN): COMPONENT E	EA	1
8345-00- 242-3650	STAFF, FLAG, MC-270: COMPONENT B	EA	3
8345-00- 174-6865	PANEL, MARKER, AERIAL LIAISON, VS-17/ GVX: (IN RIGHT FRONT FENDER STOWAGE BOX (81349) MIL-P-40061	EA	2
4930-00- 294-5110	PUMP, DISPENSING, HAND, ROTARY,10 GPM: (IN RIGHT FRONT FENDER STOWAGE BOX) (81348) XXD385T1	EA	1
7240-00- 177-6154	SPOUT, FLEXIBLE, 5 GL CAN: (IN RIGHT FRONT FENDER STOWAGE BOX) (09647) 838 A7511 MIL-S-1285	EA	2
7310-00- 285-6155	STOVE, COOKING, GASOLINE, WITH CASE: (IN RIGHT REAR FENDER STOWAGE BOX) (81349) MILS10736-1	EA	1



**APPENDIX D****EXPENDABLE SUPPLIES AND MATERIALS LIST****Section I. INTRODUCTION****1. SCOPE**

This appendix lists expendable supplies and materials you will need to operate and maintain the M60A1 AVLB. These items are authorized to you by CTA 50-970, Expendable Items (except Medical, Class V, Repair Parts, and Heraldic Items).

**2. EXPLANATION OF COLUMNS**

a. Column 1- Item number. This number is assigned to the entry in the listing and is referenced in the narrative instructions to identify the material (e.g., "Use cleaning compound, item 12, app D").

b. Column 2- Level. This column identifies the lowest level of maintenance that requires the listed item.

C - Operator/Crew  
O- organizational Maintenance  
F - Direct Support Maintenance  
H - General Support Maintenance

c. Column 3- National Stock Number. This is the National stock number assigned to the item; use it to request or requisition the item.

d. Column 4- Description. Indicates the Federal item name and, if required, a description to identify the item. The last line for each item indicates the Federal Supply Code for Manufacturer (FSCM) in parentheses followed by the part number.

e. Column 5 - Unit of Measure (U/M). Indicates the measure used in performing the actual maintenance function. This measure is expressed by a two-character alphabetical abbreviation (e.g., ea, in, pr). If the unit of measure differs from the unit of issue, requisition the lowest unit of issue that will satisfy your requirements.

**SECTION II. EXPENDABLE SUPPLIES AND MATERIALS LIST**

(1) ITEM NUMBER	(2) LEVEL	(3) NATIONAL STOCK NUMBER	(4) DESCRIPTION	(5) U/M
1	C	8040-00 262-9028	ADHESIVE , GENERAL PURPOSE NATURAL RUBBER: 1 PT CAN (81348) 829899	PT
2	C	8040-00 664-4318	ADHESIVE, GENERAL PURPOSE, SYNTHETIC RUBBER TYPE II: 1 PT CAN (76381) EC870	PT
3	C	8040-00 865-8991	ADHESIVE, GENERAL PURPOSE, RTV SILICONE (80244) MILA46106 TYPE I	EA
4	C	6135-00- 120-1020	BATTERY: FLASHLIGHTS AND INSTRUMENTS: 10 EA (83642) BA30	EA
5	C	6135-00- 485-7402	BATTERY: DRIVER'S PASSIVE NIGHT VIEWER: 3 EA (80058) BA1567/U	EA
6	C	8020-00 244-0153	BRUSH, ARTIST, METAL FERRULE, FLATPOINT, 7/16 IN WIDE (81348) HB241	EA
7	C	8020-00 224-8024	BRUSH, ARTIST, METAL FERRULE, ROUND TAPERED: (81348) HB118T1C1SA	EA
8	C	1015-00- 615-7208	BRUSH, SECTION, CLEANING: (19207) 6157208	EA
9	C	7920-00- 291-5815	BRUSH, WIRE, SCRATCH (81348) HB178	EA
10	C	5350-00 221-0872	CLOTH, ABRASIVE, CROCUS (CA) 50 SHEETS (81348) PC458C1	SH
11	C	6850-00 227-1887	COMPOUND, CLEANING, LENS: 1 QT CAN (81349) MILC43454	QT

**Section II. EXPENDABLE SUPPLIES AND MATERIALS LIST (Continued)**

(1) ITEM NUMBER	(2) LEVEL	(3) NATIONAL STOCK NUMBER	(4) DESCRIPTION	(5) J/M
12	C	6850-00- 628-7249	COMPOUND, CLEANING, ALUMINUM SURFACE: 1 QT (81349) MILC5410	QT
13	C	5610-00- 141-7838	COMPOUND, WALK WAY OD: 1 GL CAN (81349) MILW5044T2	GL
14	C	8030-00- 903-0931	COMPOUND, CORROSION PREVENTIVE GRADE 1: 1 PT. (02847) NOX-RUST 110	PT
15	C	8030-00- 174-9672	COMPOUND, CORROSION REMOVING AND CONDITIONING TYPE 1: 5 GAL (81349) MILC10578	GL

**Section II. EXPENDABLE SUPPLIES AND MATERIALS LIST (Continued)**

(1) ITEM NUMBER	(2) LEVEL	(3) NATIONAL STOCK NUMBER	(4) DESCRIPTION	(5) J/M
16	C	6850-00- 880-7616	COMPOUND, SILICONE: 8 OZ (19203) 801362	OZ
17	C	9150-01- 102-9455	FLUID, BRAKE, SILICONE, AUTOMOTIVE (BFS) (81349) MILB46176	GL
18	C	9150-00- 111-6256	FLUID, HYDRAULIC (FRH): 1 QT CAN (81349) MILH46170	QT
19	C	8415-00- 266-8680	GLOVES, RUBBER, INDUSTRIAL TYPE III: 1 PR (81348) ZZG381T3	PR
20	C	4240-00- 017-9768	GOGGLES, INDUSTRIAL: 1 PR (18876) 11040123-1	PR
21	C	9150-00- 935-1017	GREASE, AUTOMOTIVE AND ARTILLERY (GAA): 14 OZ (81349) MILG10924	OZ
22	C	9150-00- 190-0905	GREASE, AUTOMOTIVE AND ARTILLERY (GAA): 5 LB (81349) MILG10924	LB
23	C	6240-00- 155-7836	LAMP, 28V, #327: HI BEAM INDICATOR, DUST DETECTOR WARNING (96906) MS25237-327	EA
24	C	6240-00- 155-8714	LAMP, 28V, #313: PERSONNEL HEATER (96906) MS25231-313	EA
25	C	6240-00- 019-3093	LAMP 28V, #623: DOMELIGHT (96906) MS15570-623	EA

**Section II. EXPENDABLE SUPPLIES AND MATERIALS LIST (Continued)**

(1) ITEM NUMBER	(2) LEVEL	(3) NATIONAL STOCK NUMBER	(4) DESCRIPTION	(5) J/M
26	C	6240-00 044-6914	LAMP, 28V, #1683: BO DRIVE (96906), MS35478-1683	EA
27	C	6240-00- 295-2668	LAMP, 28V, #1691: DOMELIGHTS (96906) MS35478-1691	EA
28	C	6240-00 266-9940	LAMP, 28V, #1829: MASTER CONTROL PANEL, INSTRUMENT PANEL, POWER PLANT WARNING (96906) MS25231-1829	EA
29	C	6240-00- 019-0877	LAMP, 28V, #1251: BO MARKER HEAD AND TAILLIGHT AND MASTER BATTERY INDICATOR, (96906) MS15570-1251	EA
30	C	1240-01- 016-2271	LAMP 25V, #43: PASSIVE ELBOW (19200) 11747186	EA
31	C	6240-00- 368-4972	LAMP, INCANDESCENT, 28V #4811: DUAL HEADLAMPS (96906) MS18003-4811	EA
32	C	9150-01- 054-6453	LUBRICANT, CLEANER AND PRESERVATIVE (CLP) (81349) MILL63460	PT
33	C	9150-01- 152-4117	LUBRICATING OIL, ENGINE AND TRANSMISSION (OE/HDO-15 W -40) 1 QT CAN (81349) MILL2104	QT
34	DELETED	ED		

**Section II. EXPENDABLE SUPPLIES AND MATERIALS LIST (Continued)**

(1) ITEM NUMBER	(2) LEVEL	(3) NATIONAL STOCK NUMBER	(4) DESCRIPTION	(5) U/M
■ 35	DELETED			
36	C	9150-00 402-4478	OIL, LUBRICATING, ENGINE (OEA) (ARCTIC (81349) MILL46167	QT
37	C	9150-00- 261-7899	PENETRATING OIL: 1 PT 81348) VVP216	PT



**Section II. EXPENDABLE SUPPLIES AND MATERIALS LIST (Continued)**

(1) ITEM NUMBER	(2) LEVEL	(3) NATIONAL STOCK NUMBER	(4) DESCRIPTION	(5) U/M
38	C	4730-01-038-5290	PLUG, PIPE, MAGNETIC: (FINAL DRIVE FILLER) (19207) 11668933	EA
39	C	7920-00-205-1711	RAG, WIPING, COTTON, WHITE: 50 LB (81348) DDDR30GB	LB
40	C	4020-00-231-9014	ROPE, FIBROUS, 3 STRAND, INDIA: (3-INCH DIAMETER 2250 LB SAFE CAPACITY) 1200 FT. (81340) CGS21R4TMC2	FT
41	C	8950-00-292-9611	SODA, BAKING: (BATTERY TERMINALS) 1 LB (81348) EE-B-86	LB
42	C	6850-00-664-5685	SOLVENT, DRY CLEANING (SD): 1 QT CAN (81348) PPD680 THH	QT
43	C	1005-00-288-3565	SWAB, SMALL ARMS: (1 9204) 5019316	PK
44	C	7510-00-551-1245	TAPE, ADHESIVE, SEALING PACKAGING, OPAQUE: (4 INCH WIDE) 60 YDS (81348) PPPT60T3C1	RL
45	C	5970-00-198-8621	TAPE, INSULATION, ELECTRICIANS: (TYPE EF9) 80 FT (81348) HH1510	RL
46	C	7510-00-473-9513	TAPE, MASKING: (2 INCH WIDE) 1 ROLL (81349) MILT23397	RL
47	C	5970-01-052-4941	TAPE, TEFLON TYPE E: 1 ROLL (88301) 7503-36	RL

**Section II. EXPENDABLE SUPPLIES AND MATERIALS LIST (Continued)**

(1) ITEM NUMBER	(2) LEVEL	(3) NATIONAL STOCK NUMBER	(4) DESCRIPTION	(5) U/M
48	C	8010-00- 242-2089	THINNER, PAINT (TDN): 1 GL CAN (18876) 814368	GL

**APPENDIX E****STOWAGE AND SIGN GUIDE**

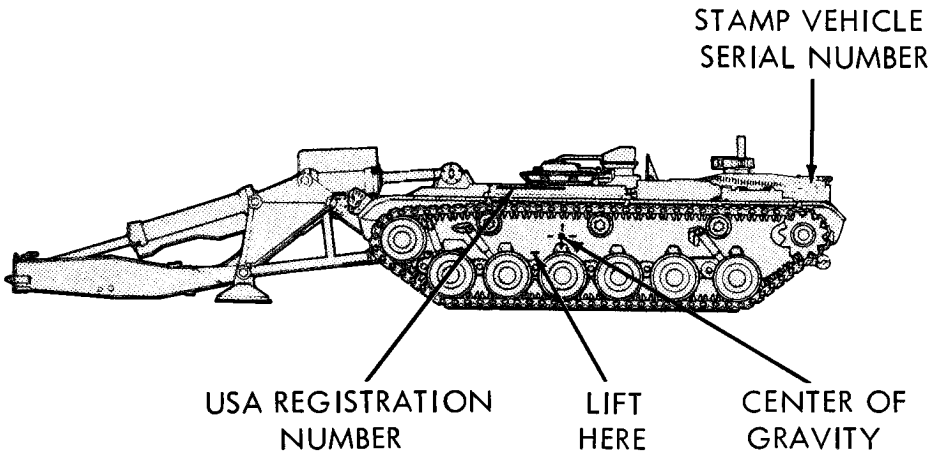
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**1. SCOPE**

This appendix shows the locations for stowage of equipment and materiel required to be carried on the M 60A1 AVLB.

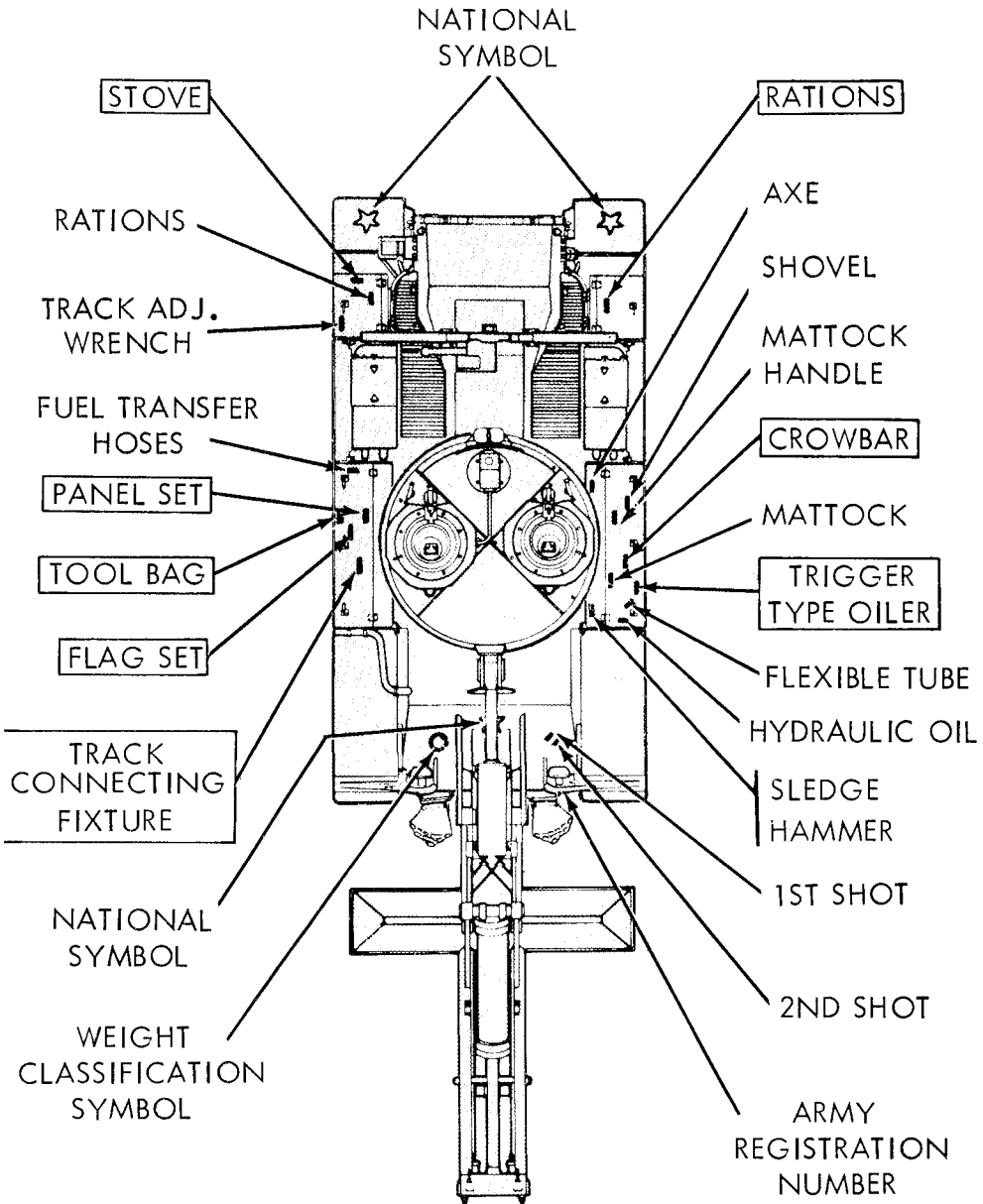
**2. GENERAL**

The figures below and on the next pages show the location of decals, stencils, and metal signs used on the vehicle. Most of these signs mark the places where equipment should be stowed. Some are cautions or information you need to operate the vehicle safely.

**NOTE**

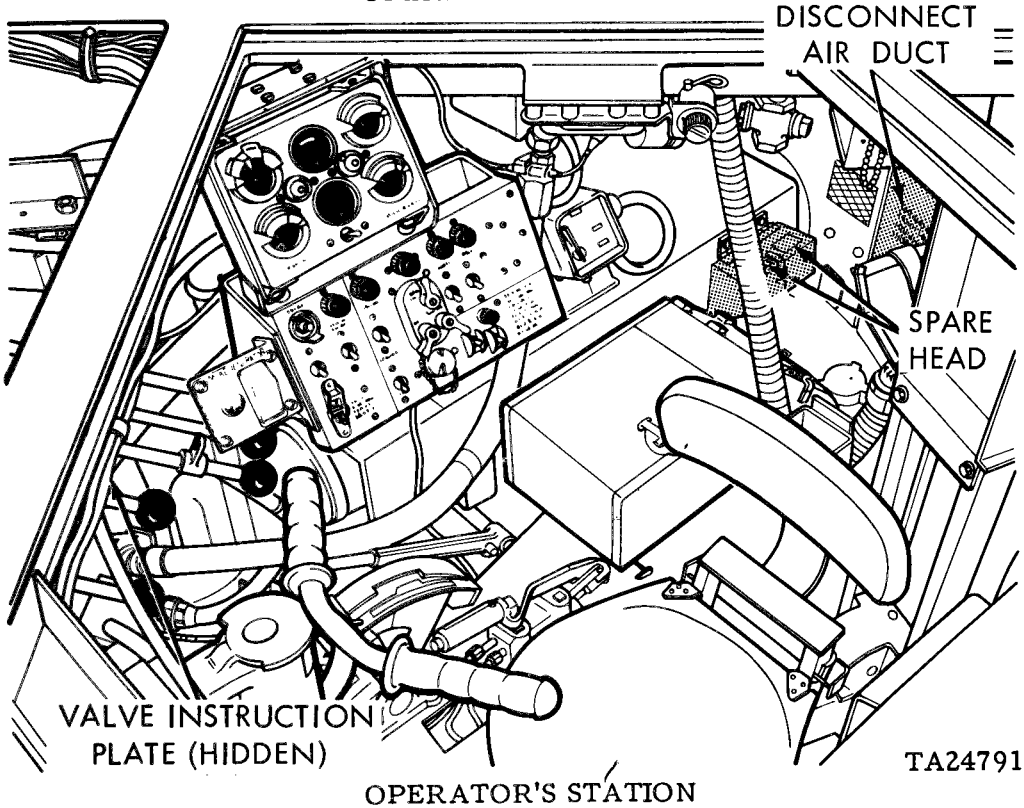
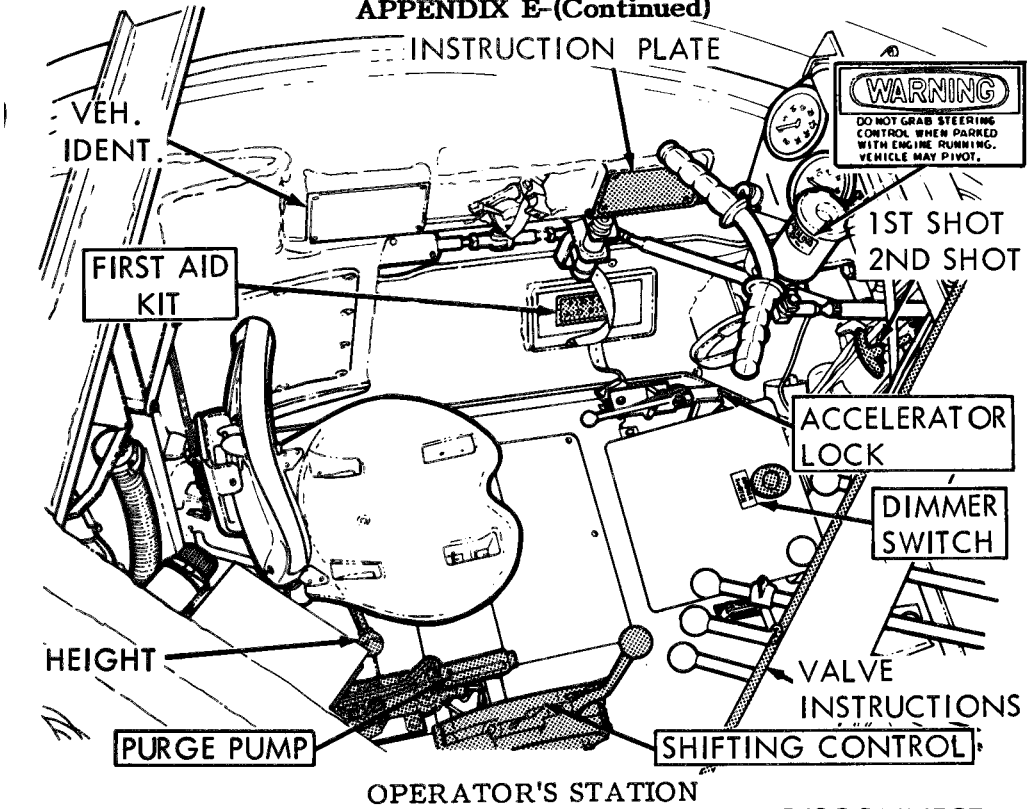
**Signs outlined with boxes are decals, applied in locations shown to read from angle shown. Signs not outlined with boxes are stencils.**

APPENDIX E-(Continued)



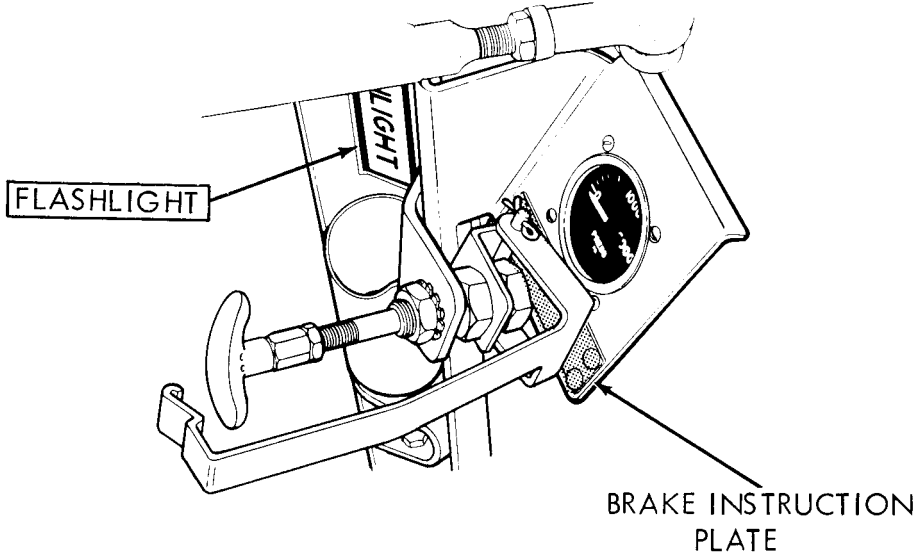
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APPENDIX E-(Continued)



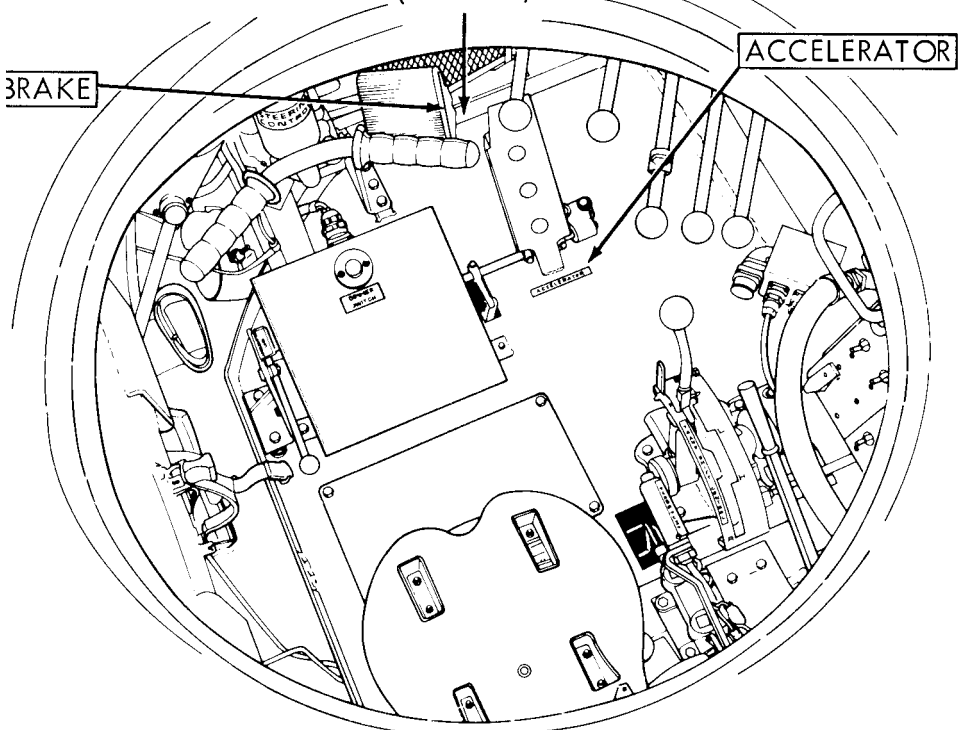
TA24791

APPENDIX E-(Continued)



OPERATOR'S STATION

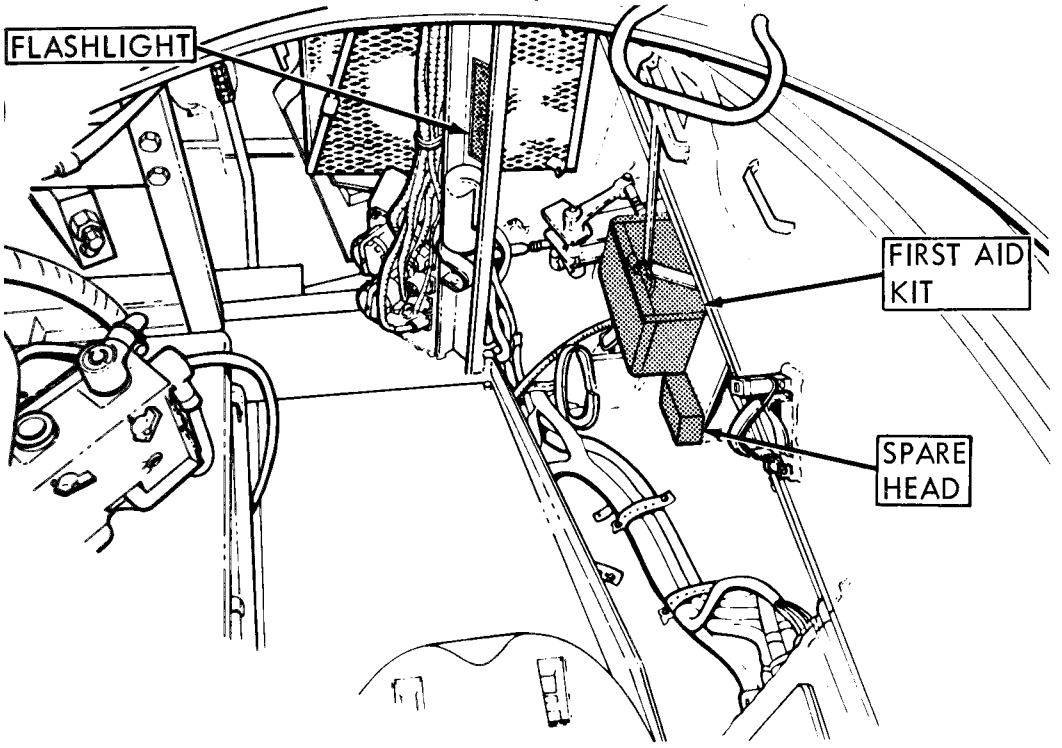
DRAIN VALVE LEVERS  
(HIDDEN)



OPERATOR'S STATION

TA247916

APPENDIX E-(Continued)

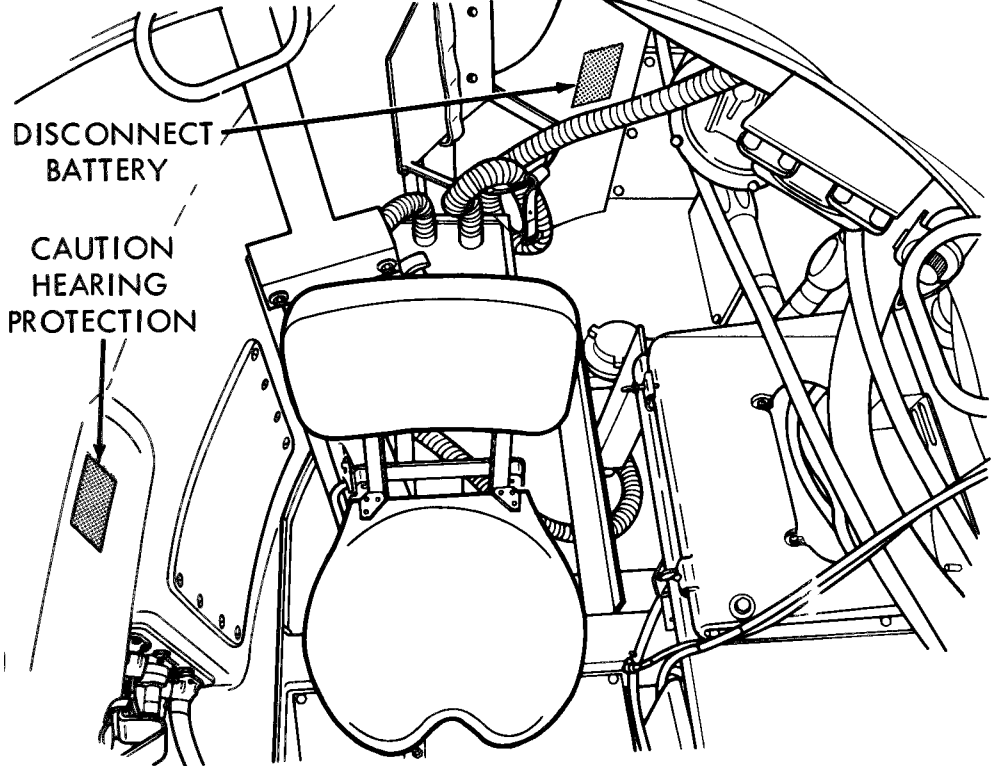


FLASHLIGHT

FIRST AID KIT

SPARE HEAD

COMMANDER'S STATION



DISCONNECT BATTERY

CAUTION HEARING PROTECTION

COMMANDER'S STATION

TA247917





## APPENDIX F

## ABBREVIATIONS

AMP	ampere
BII	basic issue item
BO	blackout
BX	box
C	celsius
cm	centimeters
CTA	common table of allowance
CU FT	cubic feet
DA	Department of the Army
DIA	diameter
DR	drive
EA	each
EIR	equipment improvement recommendation
F	Fahrenheit
FM	field manual
FT	foot, feet
GAA	grease, auto artillery
GL, gl, gal	gallon
gpm	gallons per mile
H	high
in	inch
IR	infrared
JTA	joint table of allowance
KPa	kilopascals
Kg	kilogram
Kph	kilometers per hour
L	left
L	low
lb	pound
LG	long
LO	low
LO	lubrication order
Lpm	letters per mile
m	meter
mm	millimeter
mph	mile per hour
MTOE	modified table of organization and equipment
N	neutral
Oz	ounce
P	park

APPENDIX F-(Continued)

ABBREVIATIONS

PMCS	preventive maintenance checks and services
PR	pair
psi	pounds per square inch
PT	pint
PTO	power take off
QT	quart
QTY	quantity
R	reverse
R	right
RL	roll
RP	red phosphorous
rpm	revolution per minute
SIG	signal
T	ton
TAMMS	The Army Maintenance Management System
TB	technical bulletin
TD A	table of distribution and allowance
TOE	table of organization and equipment
vdc	volt direct current

## APPENDIX G

### LUBRICATION INSTRUCTIONS

#### G-1. SCOPE

This appendix provides crew lubrication instructions. Lubrication intervals (on-condition or hard time) are based on normal operation. Lubricate more often during constant use or in severe conditions.

#### G-2. GENERAL

All lubrication instructions are mandatory.

Use only authorized lubricants.

Interval symbols used are: B - Before Operation, A - After Operation, M - Monthly, and AR - As Required.

For multiple lubrication points, capacity is for each point.

For equipment under manufacturer's warranty, hard time service intervals shall be followed. Intervals shall be shortened if lubricants are known to be contaminated or equipment is operated under adverse conditions.

Engine, transmission, and hydraulic system fluid levels are checked according to this appendix, but drain and refill are subject to Army Oil Analysis Program (AOAP). If AOAP is not available, hard time intervals apply.

Hard (fixed) time intervals and the related man-hour times are based on normal operation. The man-hours time specified is the time you need to do all the services prescribed for a particular interval. Change the interval if your lubricants are contaminated or if you are operating the equipment under adverse conditions, including longer-than-usual operating hours. The interval may be extended during periods of low activity. If extended, adequate preservation precautions must be taken.

When checking fluid levels, vehicle must be on level surface.

Oil filters must be serviced/changed when they are known to be contaminated or clogged, service is recommended by AOAP, or hard time service is required.

Dispose of used lubricants in accordance with local Standing Operating Procedures (SOP).

If operating in 0° F to -65 °F (-18 °C to -54 °C) temperatures without Army Oil Analysis, quarterly/750 mile transmission and engine oil changes are required.

For arctic operation, see FM 9-207.

For desert operation, see FM 90-3.

Clean all grease fittings before attaching grease gun. Operate grease gun until grease appears at seal or relief valve. Check escaping grease for contamination. Notify organizational maintenance if contaminated.

If no other treatment is directed, paint or clean and coat unprotected metal surfaces with cleaner/lubricant/preservative (CLP) (item 32, appendix D).

Clean around filler necks/drain plugs/openings before servicing to keep dirt from entering system.

**WARNING**

**Dry Cleaning Solvent P-D-680 is toxic and flammable. To avoid injury, wear protective goggles and gloves and use in a well-ventilated area. Avoid contact with skin, eyes, and clothes, and do not breathe vapors. Do not use near open fire or excessive heat. The flash point for Type I Dry Cleaning Solvent is 100 °F (38 °C), and for Type II is 140 °F (60 °C). If you become dizzy while using Dry Cleaning Solvent, get fresh air immediately and get medical aid. If contact with eyes is made, wash your eyes with water and get medical aid immediately.**

Use clean rag (item 39, appendix D) and dry cleaning solvent (item 42, appendix D) to clean grease or oil from all metal surfaces except those exposed to powder fouling. For powder-fouled surfaces, use CLP (item 32, appendix D).

**G-3. OIL CAN POINTS**

Lubricate oil can points as they become accessible while performing PMCS procedures. Use the applicable lubricant identified and lubricate the following item<sup>s</sup> as a part of PMCS:

- |   |   |
|---|---|
| Headlight removal nuts<br>Fender stowage box latches<br>and hinges<br>Towing hooks (hinge pin)<br>Brake linkage<br>Transmission support guide<br>rails and rollers<br>Driver's escape hatch late<br>model (clean and coat pins,<br>plungers, and all unpainted<br>surfaces) | Grille door hinges<br>Control rod clevises<br>Universal joints<br>Ammunition box latches<br>Driver's and commander's<br>seats moving parts<br>Hatch locks and hinges<br>Driver's night viewer hatch<br>door pivot pin and latch |
|---|---|

**Oil Can Points Lubricants**

<b>Temperature Range</b>	<b>Lubricant Mil. Symbol (NATO Code) Specification</b>	<b>Capacity</b>	<b>Interval</b>	<b>Man-hour</b>
Oil Can Points + 5°F to + 125°F (-15°C to + 52°C)	OE/HDO-15/40 (O-1236) MIL-L-2104	AR	AR	0.4
+ 5°F to -70°F (-15°C to -57°C)	OEA (O-183) MIL-L-46167			

For arctic operation, see FM 9-207

Do not lubricate the following items:

Starter solenoid  
 Air cleaner blower motor  
 Hydraulic powerpack electric motor  
 Heater motor

Gas particulate fan motor  
 Tracks  
 Tachometer drive adapter  
 Ventilator blower motor  
 Any item not pointed out.

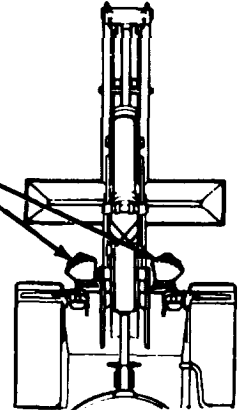
**G-4. SMOKE GRENADE LAUNCHERS**

**SMOKE GRENADE LAUNCHERS**  
 (See Note)

**LUBRICANT ● INTERVAL**

**CLP**

**B/A**



**Smoke Grenade Launchers Lubricant**

Temperature Range	Lubricant Mil. Symbol (NATO Code) Specification	Capacity	Interval	Man-hour
Smoke Grenade Launchers All Temperatures	CLP (S-758) MIL-L-63460	AR	B/A	0.2

For arctic operation, see FM 9-207

**G-5. SMOKE GRENADE LAUNCHERS NOTE**

SMOKE GRENADE LAUNCHERS

- a. Before Firing: Wipe all surfaces dry.
- b. After Firing: Immediately clean with CLP (item 32, appendix D) and wipe dry. Apply a light coat of CLP to all surfaces. Make sure all surfaces are coated. Do not wipe dry. After firing, repeat process for 2 days.
- c. Inactivity: If not to be fired for an extended period, quarterly, clean with CLP (item 32, appendix D), wipe dry and apply CLP to all surfaces.

G-6. LAUNCHER, ENGINE, AND TRANSMISSION CHECKS.

LUBRICANT ● INTERVAL

**LAUNCHER HYDRAULIC  
LEVEL AND FILL**  
(See Note 1)

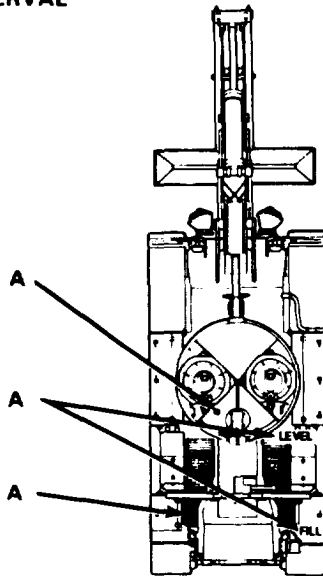
FRH

**ENGINE OIL LEVEL  
AND FILL**  
(See Note 2)

OE/HDO  
OEA

**TRANSMISSION OIL  
LEVEL AND FILL**  
(See Note 3)

OE/HDO  
OEA



Launcher, Engine, and Transmission Lubricants

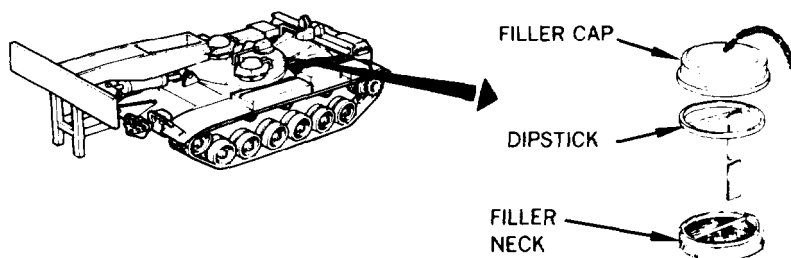
Temperature Range	Lubricant Mil. Symbol (NATO Code) Specification	Capacity	Interval	Man-hour
Launcher All Temperatures	FRH (H-544) MIL-H-46170	AR	A	0.2
Engine Transmission + 5°F to + 125°F (-15°C to + 52°C)	OE/HDO-15/40 (O-1236) MIL-L-2104	AR AR	A A	0.1 0.1
+ 5°F to -70°F (-15°C to -57°C)	OEA (O-183) MIL-L-46167			

For arctic operation, see FM 9-207

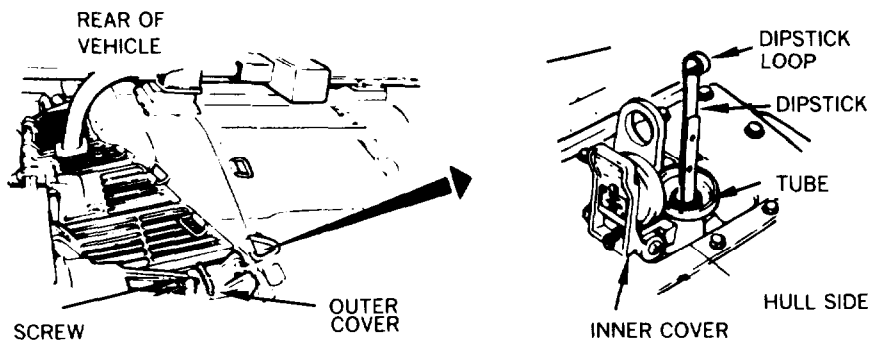
**G-7. LAUNCHER, ENGINE, AND TRANSMISSION NOTES.****WARNING**

FRH hydraulic fluid may contain tricresyl phosphate which, if taken internally, can produce paralysis. Hydraulic fluid may be absorbed through the skin. Wear long sleeves, gloves, goggles, and faceshield. If FRH gets in eyes, wash them immediately and get medical aid immediately. If FRH gets on skin, thoroughly wash with soap and water. Wash hands thoroughly prior to eating or smoking. Application of these measures is considered an effective control of the hazard.

1. LAUNCHER HYDRAULIC LEVEL AND FILL. Unscrew reservoir filler cap. Remove dipstick from filler neck. Wipe dipstick and insert fully into filler neck. Remove dipstick and check that fluid level is at or slightly above FULL mark. If fluid is below FULL mark, add fluid as required.



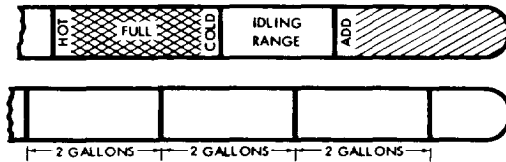
2. ENGINE OIL LEVEL AND FILL. Engine oil level must be checked with engine running (700 to 750 rpm) and with vehicle parked on level ground. Engine oil must be at operating temperature (gage panel indicator in green band area). Operate engine at idle (700 to 1200 rpm) for 5 to 10 minutes, if engine has not been operated. Loosen screw securing outer cover and lift outer cover. Open inner cover and remove dipstick from tube. Wipe dipstick and insert in tube with dipstick loop facing hull. If engine has been operating for an extended period of time, perform hot oil level check. If engine has been operating at 700 to 1200 rpm for only 5 to 10 minutes, perform cold oil level check.



G-7. LAUNCHER, ENGINE, AND TRANSMISSION NOTES - Continued

NOTE

Reverse side of dipstick has four hash marks. Distance between each mark is 2 gallons (7.6 l). When dipstick indicates low oil level, use hash marks to determine amount of oil to add. Added oil will not be indicated on dipstick until after engine has been running for several minutes.



Hot Oil Level Check (Engine has been operating for an extended period of time.)

If tactical situation permits, allow engine to idle at 700 to 750 rpm for 5 to 10 minutes, then remove engine dipstick and note oil level. If oil level is above "ADD" mark, engine is safe to operate. However, if current mission is expected to be of a long duration, add oil, as required, to bring oil level to "HOT FULL" mark. If oil level is below "ADD" mark, add oil as required to bring oil level to "HOT FULL" mark.

If tactical situation does not permit running of engine for 5 to 10 minutes, allow engine to idle at 700 to 750 rpm and remove engine dipstick and note oil level. If oil level is 2 to 3 inches (5.08 to 7.62 cm) above "HOT FULL" mark, engine is safe to operate. Indication of overfilled condition is normal. This condition is due to oil expansion and aeration. If oil level is below "ADD" mark, add oil as required to bring oil level to "HOT FULL" mark.

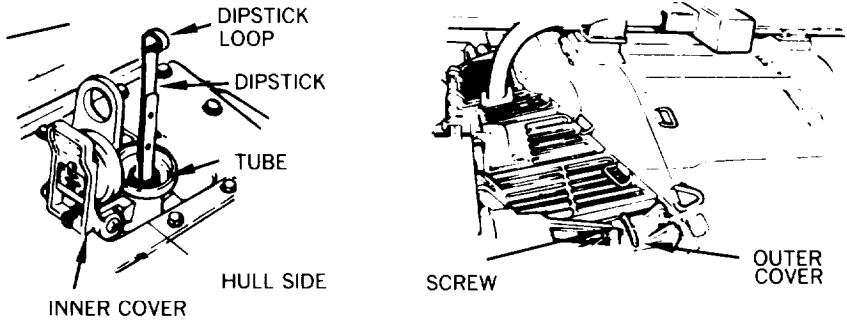
Cold Oil Level Check (Engine has been operating at 700 to 1200 rpm for 5 to 10 minutes.)

Remove engine dipstick with engine idling at 700 to 750 rpm. If oil level on dipstick is in "IDLING RANGE" (between "ADD" and "HOT FULL" marks), engine is safe to operate. If oil level is below "ADD" mark, add oil as required to bring level to "COLD FULL" mark.

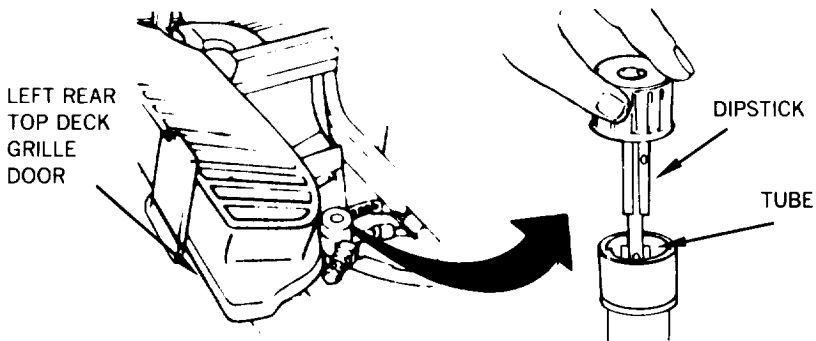


**G-7. LAUNCHER, ENGINE, AND TRANSMISSION NOTES-Continued**

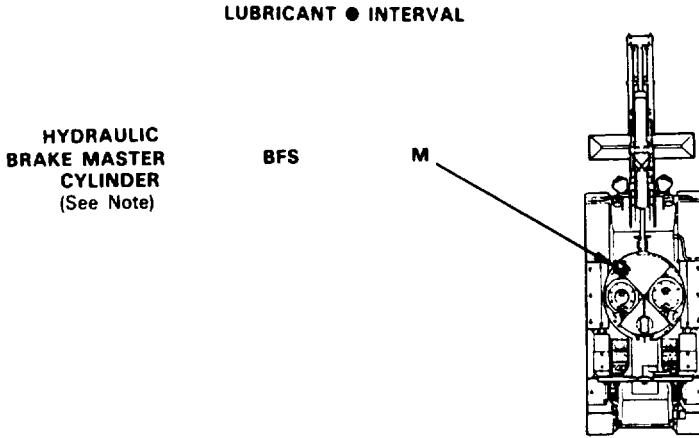
Install dipstick in tube with dipstick loop facing hull. Close inner cover. Close outer cover and secure with screw.



**3. TRANSMISSION OIL LEVEL AND FILL.** Transmission must be at operating temperature (gauge panel indicator in green area) to obtain an accurate oil level indication. If indicator is not in green band and tactical situation permits, run engine at 1000 to 1200 rpm with parking brakes set and shift lever in PARK until operating temperature is indicated. With engine at idle (700 to 750 rpm), open left rear top deck grille door and remove transmission oil dipstick from tube. Wipe dipstick and insert fully in tube. Remove dipstick from tube and note oil level on dipstick. If oil level is below "FULL" mark on dipstick, add oil as required to bring oil level to "FULL" mark. Approximately 3 gallons (11.4 l) of oil will raise transmission oil level from "ADD" mark to "FULL" mark. If oil level is at or above "ADD" mark on dipstick, transmission is safe to operate. Install dipstick in tube and close top deck grille door.



**G-8. HYDRAULIC BRAKE MASTER CYLINDER CHECK.**



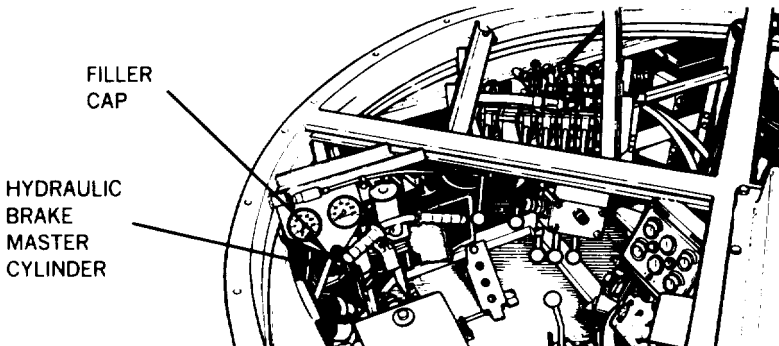
Hydraulic Brake Master Cylinder Lubricant

Temperature Range	Lubricant Mil. Symbol (NATO Code) Specification	Capacity	Interval	Man-hour
Hydraulic Brake Master Cylinder All Temperatures	BFS (H-547) MIL-B-46176	AR	M	0.3

For arctic operation, see FM 9-207

**G-9. HYDRAULIC BRAKE MASTER CYLINDER NOTE**

Remove filler cap. Check that fluid level is 1/4 inch (0.64 cm) from top of opening. If fluid level is low, add fluid as required to attain proper level. Install filler cap.



## SUBJECT INDEX


SUBJECT	A	PAGE
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Additional Authorization List		C-1
Air Cleaner		
Intakes Reversing (See Operation, Cold Weather)		
Servicing		3-86
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By Order of the Secretary of the Army:

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Operator's Manual

BE EXACT PIN-POINT WHERE IT IS

PAGE NO	PARA-GRAPH	FIGURE NO	TABLE NO
2-27			
2-104			
2-166			

IN THIS SPACE TELL WHAT IS WRONG AND WHAT SHOULD BE DONE ABOUT IT:

Upper right item number should be 86

Adjustment lever callout in step 2 should be (2) to match rest of text and illustration.

In the Warning, 200 meters should convert to 219 yards.

SAMPLE

PRINTED NAME GRADE OR TITLE AND TELEPHONE NUMBER

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TEAR ALONG PERFORATED LINE

# THE METRIC SYSTEM AND EQUIVALENTS

## LINEAR MEASURE

1 Centimeter = 10 Millimeters = 0.01 Meters = 0.3937 Inches  
 1 Meter = 100 Centimeters = 1000 Millimeters = 39.37 Inches  
 1 Kilometer = 1000 Meters = 0.621 Miles

## WEIGHTS

1 Gram = 0.001 Kilograms = 1000 Milligrams = 0.035 Ounces  
 1 Kilogram = 1000 Grams = 2.2 Lb.  
 1 Metric Ton = 1000 Kilograms = 1 Megagram = 1.1 Short Tons

## LIQUID MEASURE

1 Milliliter = 0.001 Liters = 0.0338 Fluid Ounces  
 1 Liter = 1000 Milliliters = 33.82 Fluid Ounces

## SQUARE MEASURE

1 Sq. Centimeter = 100 Sq. Millimeters = 0.155 Sq. Inches  
 1 Sq. Meter = 10,000 Sq. Centimeters = 10.76 Sq. Feet  
 1 Sq. Kilometer = 1,000,000 Sq. Meters = 0.386 Sq. Miles

## CUBIC MEASURE

1 Cu. Centimeter = 1000 Cu. Millimeters = 0.06 Cu. Inches  
 1 Cu. Meter = 1,000,000 Cu. Centimeters = 35.31 Cu. Feet

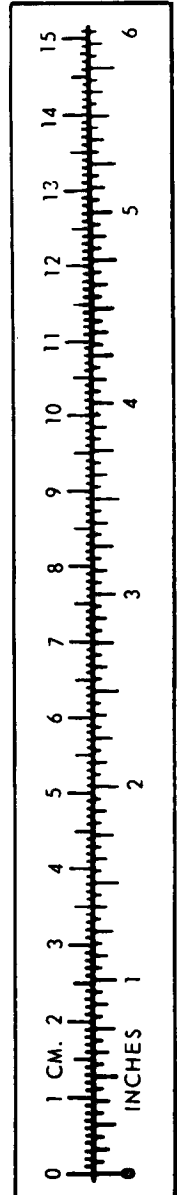
## TEMPERATURE

$\frac{5}{9}(\text{°F} - 32) = \text{°C}$   
 212° Fahrenheit is equivalent to 100° Celsius  
 90° Fahrenheit is equivalent to 32.2° Celsius  
 32° Fahrenheit is equivalent to 0° Celsius  
 $\frac{5}{9}(\text{°C} + 32) = \text{°F}$

## APPROXIMATE CONVERSION FACTORS

TO CHANGE	TO	MULTIPLY BY
Inches	Centimeters	2.540
Feet	Meters	0.305
Yards	Meters	0.914
Miles	Kilometers	1.609
Square Inches	Square Centimeters	6.451
Square Feet	Square Meters	0.093
Square Yards	Square Meters	0.836
Square Miles	Square Kilometers	2.590
Acres	Square Hectometers	0.405
Cubic Feet	Cubic Meters	0.028
Cubic Yards	Cubic Meters	0.765
Fluid Ounces	Milliliters	29.573
Pints	Liters	0.473
Quarts	Liters	0.946
Gallons	Liters	3.785
Ounces	Grams	28.349
Pounds	Kilograms	0.454
Short Tons	Metric Tons	0.907
Pound-Feet	Newton-Meters	1.356
Pounds per Square Inch	Kilopascals	6.895
Miles per Gallon	Kilometers per Liter	0.425
Miles per Hour	Kilometers per Hour	1.609

TO CHANGE	TO	MULTIPLY BY
Centimeters	Inches	0.394
Meters	Feet	3.280
Meters	Yards	1.094
Kilometers	Miles	0.621
Square Centimeters	Square Inches	0.155
Square Meters	Square Feet	10.764
Square Meters	Square Yards	1.196
Square Kilometers	Square Miles	0.386
Square Hectometers	Acres	2.471
Cubic Meters	Cubic Feet	35.315
Cubic Meters	Cubic Yards	1.308
Milliliters	Fluid Ounces	0.034
Liters	Pints	2.113
Liters	Quarts	1.057
Liters	Gallons	0.264
Grams	Ounces	0.035
Kilograms	Pounds	2.205
Metric Tons	Short Tons	1.102
Newton-Meters	Pound-Feet	0.738
Kilopascals	Pounds per Square Inch	0.145
Kilometers per Liter	Miles per Gallon	2.354
Kilometers per Hour	Miles per Hour	0.621



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