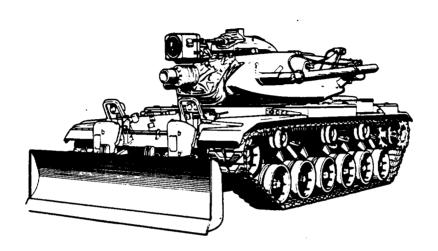
**VOLUME 3 OF 3** 

# OPERATOR'S MANUAL TROUBLESHOOTING AND MAINTENANCE



TROUBLESHOOTING PAGE 3-1

VEHICLE, COMBAT ENGINEER FULL TRACKED: M728 (2350-00-795-1797) MAINTENANCE PROCEDURES PAGE 3-59

This copy is a reprint which includes current pages from Changes 1 through 5.

AMMUNITION PAGE 4-1

SUBJECT INDEX PAGE INDEX 1

HEADQUARTERS, DEPARTMENT OF THE ARMY JANUARY 1981

#### WARNING



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 moving vehicle, elevating gun, or traversing turret.
- 2. Make sure safety is in a safe position on all loaded weapons, until ready to fire.
- 3. When weapons are loaded, keep trained on target and keep all personnel clear of barrels.
- 4. Do not allow flames or sparks within area while refueling or loading ammunition. Have a manned fire extinguisher handy.
- 5. Neither gas-particulate filter unit nor M25A1 tank mask will protect you against carbon monoxide poisoning.
- 6. Do not disconnect/connect any part of electrical equipment with power on.
- 7. Never attempt to operate MASTER BATTERY switch (ON/OFF) from turret compartment. Operation must be performed by crewmember who is situated completely within driver's compartment. Do not under any circumstances use GUNNER'S POWER CONTROL handles for support when reentering turret.
- 8. Never move steering control while engine is running, transmission is in park, and brakes are locked. Moving steering control could result in accidental pivot steering. This could cause injury to personnel or damage to vehicle or property.
- 9. Before you work around tracked vehicle, remove rings, bracelets, and wrist watches. These items may be caught on projections and cause injury or may be shorted across an electrical circuit and cause severe burns and electrical shock.
- 10. Wear safety gloves when handling wire-rope of boom staylines or winch cable.
- 11 Keep all personnel clear of winch and cable during operation. All personnel must be at least the length of cable away from vehicle and load. Serious injury could result if winch fails or cable breaks.
- 12, Main gun must not be elevated above 178 roils (10 degrees) quadrant reading when loading round.

CHANGE

HEADQUARTERS DEPARTMENT OF THE ARMY Washington D.C., 28 September 1994

NO. 6

# OPERATOR'S MANUAL TROUBLESHOOTING AND MAINTENANCE

VEHICLE, COMBAT ENGINEER FULL-TRACKED: M728 (2350-00-795-1797)

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B-7 thru B-12	B-7 thru B-12
B-13 thru B-22 B-22.1/(B-22.2 blank) B-23 and B-24 C-1 and C-2 C-2.1 thru C-2.3/(C-2.4 blank)	B-13 thru B-22 B-22.1/(B-22.2 blank) B-23 and B-24 C-1 and C-2 None

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Index-11 and Index-12	Index-11 and Index-12
Index-15 thru Index-18	Index-15 thru Index-18
Index-19 and Index-20	Index-19 and Index-20
Index-23 thru Index-26	Index-23 thru Index-26

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- 13. Wear goggles and cover relief valve with a rag to prevent grease from getting into eyes. Grease in track adjusting link is under pressure. When relief valve opens it may emit a fine spray of grease. To prevent personnel injury never remove plug to relieve pressure.
- 14. Do not apply turret power or operate turret controls until all personnel are in safe positions and prepared for turret or gun movement,
- 15. Do not operate turret in power or manual mode until all personnel are in proper position, turret ring has been cleared, and shell ejection plate and all platform guards are in place,
- 16. Do not reach into or attempt to enter or exit driver's compartment until turret power switch is off and turret traverse lock is in locked position.
- 17. Crew members out of station are in extreme danger when turret power is on. Commanders must shut down turret power before allowing crew members to leave their stations.





Laser light is dangerous and can cause blindness if viewed without appropriate optical filters. This vehicle is equipped with protective filters for the telescope and gunner's periscope as well as commander's periscope. When operating in an area where lasers are a potential threat, be sure to take protective measures including installation of optical filters.



#### CARBON MONOXIDE POISONING CAN BE DEADLY.

Carbon monoxide is a colorless, odorless, deadly poisonous gas, which when breathed, deprives your body of oxygen and causes suffocation. Exposure to air contaminated with carbon monoxide causes 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. Make sure of safety of personnel whenever personnel heater or engine of vehicle is operated for maintenance purposes or tactical use.

- 1. DO NOT operate heater or vehicle engine 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, administer artificial respiration if necessary.

THE BEST DEFENSE AGAINST CARBON MONOXIDE POISONING IS ADEQUATE VENTILATION.

#### GAS PARTICULATE AND AIR CLEANER FILTERS

Contaminated gas particulate and air cleaner filters must be handled using adequate precautions and must be disposed of by trained personnel in accordance with FM 3-5.

Change No. 5 HEADQUARTERS
DEPARTMENT OF THE ARMY
Washington D. C., 28 February 1992

# OPERATOR'S MANUAL Troubleshooting and Maintenance

# VEHICLE, COMBAT ENGINEER FULL-TRACKED: M728 (2350-00-795-1797)

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3-255 thru 3-260	3-255 thru 3-260
3-301 and 3-302	3-301 and 3-302
A-1 and A-2	A-1 and A-2
B-3 and B-4	B-3 and B-4
B-4.1/B-4.2 (blank)	B-4.1/B-4.2(blank)
B-6.1/B-6.2(blank)	B-6.1/B-6.2(blank)
thru B-12	thru B-12
B-13 and B-14	B-13 and B-14
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C-2.1 and C-2.2	C-2.1 and C-2.2
None	C-2.3/(C-2.4 blank)
C-3 and C-4	C-3 and C-4
Index-13 thru Index-16	Index-13 thru Index -16
Index-I 9 thru Index-29/	Index-19 thru Index-29/
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DEPARTMENT OF THE ARMY

NO. 4

Washington, D. C., 28 January 1987

### **Operator's Manual**

## **Troubleshooting and Maintenance**

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3-107 and 3-108	3-107 and 3-108		
3-121 and 3-122	3-121 and 3-122		
E3 thru E6.1/(E-6.2 blank)	E3 thru E-6.1/(E-6.2 blank)		
E-7 and E-8	E-7 and E-8		

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NO. 3

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### **Operator's Manual**

## **Troubleshooting and Maintenance**

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B-3 and B-4	B-3 and B-4
B-5 and B-6	B-5 and B-6
None	B-6.1/(B-6.2 blank)
B-9 thru B-12	B-9 thru B-12
None	B-12.1/(B-12.2 blank)
B-13 thru B-22	B-13 thru B-22
None	B-22.1/(B-22.2 blank)
B-23 and B-24	B-23 and B-24
C-1 and C-2	C-1 and C-2
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Index 15 and Index 16
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Index 27 and Index 28 Blank DA Forms 2028-2 Blank DA Forms 2028-2

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Remove Pages	Insert Pages
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Index-1 through Index-4 Index-7 through Index-18 None Index-19 through Index-29/(Index-30 blank)	Index-1 through Index-4 Index-7 through Index-18 Index-18.1/(Index-1 8.2 blank) Index-19 through Index-29/(Index-30 blank)

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Technical Manual No. 9-2350-222-10-3

# HEADQUARTERS DEPARTMENT OF THE ARMY Washington, D. C., 12 January 1981

## OPERATOR'S MANUAL TROUBLESHOOTING AND MAINTENANCE VEHICLE, COMBAT ENGINEER FULL TRACKED, M728 (2350-00-795-1797)

#### 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 direct to: Commander, U.S. Army Tank-Automotive Command, Attn: AMSTA-MBC Warren, MI 48397-5000. A reply will be furnished to you.

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	Controls and Indicators
Section II	Preventive Maintenance Checks
	and Services
	VOLUME 2
Section III	operation Under Usual Conditions
Section IV	Operation Under Unusual Conditions

\*This manual, together with TM 9-2350-222-10-1, 12 January 1981, and TM 9-2350-222-10-2, 12 January 1981, supersedes TM 9-2350-222-10, August 1965 and TM 9-2350-222-ESC, 16 October 1972.

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#### 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. See LO 9-2350-222-12 for the proper lubricant and service intervals.

#### 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, 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, the service intervals can be lees often.

#### Section II. TROUBLESHOOTING

### **Troubleshooting Procedure**

- 1. Before attempting to locate the cause of malfunctions, make sure that all steps required for proper operation of equipment have been performed AS THEY ARE LISTED IN THE OPERATING INSTRUCTIONS.
- 2. 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 the listead corrective actions, notify your supervisor.
- 3. Whenever the corrective action indicates "NOTIFY ORGANIZATIONAL MAINTENANCE", or when the malfunction that you observe is not listed in the Symptom Index (page 3-3), list the MALFUNCTION on your DA Form 2404 (Equipment Inspection and Maintenance Worksheet) and give the DA Form 2404 to your supervisor.

TA252933

Change 1 3-1

- 4. Troubleshooting lists the common malfunctions which you may find during the operation or maintenance of the vehicle or its components You should perform the tests/inspections (steps) and corrective actions in the order listed.
- 5. Machine gun interface problems between the gun and vehicle are listed within the troubleshooting procedure. Troubleshoot other machine gun problems from the applicable manual, e.g., TM 9-1005-313-10 for the M240 7.62-mm machine gun, and TM 9-1005-231-10 for the caliber .50 machine gun.

# TROUBLESHOOTING SYMPTOM INDEX

Troubleshooting
Procedure
Page

# **AUXILIARY SYSTEMS AND CONTROLS** Driver cannot see clearly through M24 IR periscope - pink Driver cannot see through M24 IR periscope - no pink light Searchlight (AN/VSS-3A) fails to operate or does not Driver's AN/VVS-2 night vision viewer will not operate or **BOOM** Boom does not move when boom control valve lever is placed 3-56 Boom does not move when winch control lever is placed in 3-58 **BRAKE** 3-19 **ENGINE** Dark or black smoke blowing through rear grill doors (after 3-10 3-8 Engine does not crank when starter switch is pressed . . . . . 3-7 Engine runs rough, or does not idle properly (after warmup) . 3-12 Powerplant warning light comes on while engine is running

above 750-800 rpm.....

TA252934

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# TROUBLESHOOTING SYMPTOM INDEX (Continued)

Troubleshooting
Procedure
Page

# FIRE CONTROL

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	move smoothly in elevation
	Commander's M36 or M36E1 periscope image is not sharp
	or clear
	Commander's M36 periscope daylight or IR body retitles
	are not visible
	Commander's M36E1 periscope daylight or passive body
	recticles are not visible
	Commander's M36 or M36E1 periscope has no night vision
	or night vision is foggy while operating IR body or
	passive elbow on vehicle power
	Commander's M36 or M36E1 periscope has no night vision
	or night vision is foggy through IR body or passive
	elbow when on battery power
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	in elevation
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1 10	BHTS
	51110
	Service drive headlight, IR service drive headlight,
	blackout drive light, or blackout marker light does
	not work
	Service drive taillight, service stoplight, or blackout
	marker light does not work

# TROUBLESHOOTING SYMPTOM INDEX (Continued)

Troubleshooting
Procedure
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Bulldozer moldboard will not lower from lock "travel" position	3-46 3-47 3-49 3-50
	Caliber .50 machine gun ready lamp does not light

TA252936

Change 1 3-5

# TROUBLESHOOTING SYMPTOM INDEX (Continued)

Troubleshooting
Procedure
Page

# **PERSONNEL HEATER** 3-25 **STEERING** 3-24 **TURRET** Hydraulic power pack motor cycles (runs) too often or too long ..... 3-31 Turret does not traverse smoothly in power or does not operate in power ..... 3-27 165-mm gun does not elevate or depress smoothly in power or 3-28 165-mm gun does not elevate or depress smoothly or does not operate manually ..... 3 - 30**VOLTAGE REGULATOR** Battery/generator indicator pointer is in yellow or left red when engine is running ..... 3-20 Battery/generator indicator pointer is in right red when engine is running ..... 3-21 **WINCH** Winch cable does not move when winch control valve lever is 3-52

TA132844

3-54

# MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

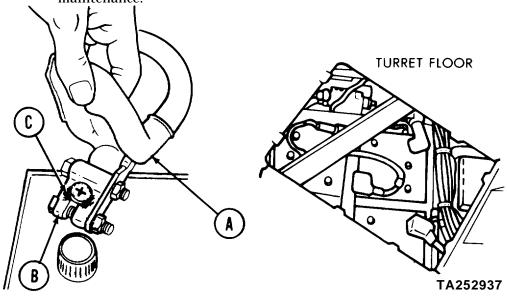
#### **ENGINE**

### 1. ENGINE DOES NOT CRANK WHEN STARTER SWITCH IS PRESSED

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

- Before performing step 2 set MASTER BATTERY switch to OFF (to prevent accidental traversing of turret).
- Remove all rings, jewelry and other metal objects before checking batteries. Conducting electrical charge through metal objects can cause serious inury to personnel.
- Step 2. Lift battery terminal covers (A). Visually check to see if battery terminals (B) and cables are corroded (C) or damaged.
  - a. Clean terminals by wiping with a clean damp cloth.
  - b. Apply a coating of grease (item 24, Appendix D), to terminals to retard corrosion and then tighten terminals.
  - c. If cables or terminals are damaged, notify organizational maintenance.



Change 1 3-7

#### **MALFUNCTION**

# TEST OR INSPECTION CORRECTIVE ACTION

# 1. ENGINE DOES NOT CRANK WHEN STARTER SWITCH IS PRESSED - Continued

Step 3. Check to see if battery water level is above top of plates (page 2-85).

If water level is low, add distilled water (or clear water if distilled unavailable) (page 3-109).

#### NOTE

# Make sure FUEL PUMPS switch is ON.

- Step 4. Slave start vehicle (page 2-609).
  - a. Allow engine to run 15 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

#### **CAUTION**

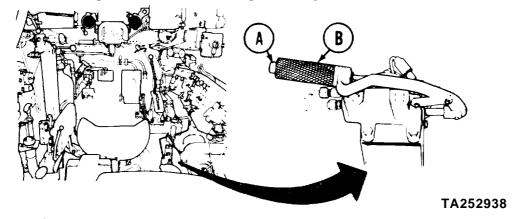
Do not push manifold heater switch (A) while operating purge pump handle (B) in step 1. This will damage the intake manifold.

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

Air will be purged from fuel lines.

Step 2. Start engine (page 2-205).

If engine does not start, go to step 3.



3-8 Change 1

# MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

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

### **CAUTION**

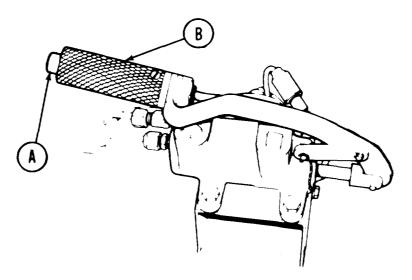
Do not hold manifold heater switch (A) longer than 15 seconds. Holding manifold heater switch more than 15 seconds can damage manifold heaters.

#### **NOTE**

If temperature is less than  $40^{\circ}F$  ( $4^{\circ}$  C), go to Step 3. If temperature is above  $40^{\circ}F$  ( $4^{\circ}$  C), go to Step 4.

Step **3.** While pressing starter switch, press and hold maifold heater switch (A) and pump purge handle (B) for 15 seconds.

If engine does not start, go to step 4.



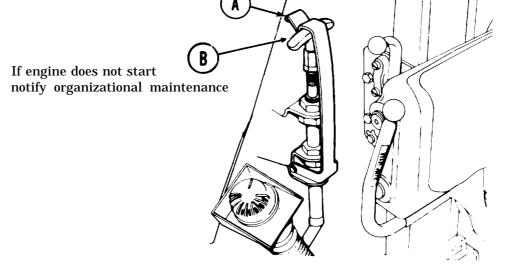
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**Change 1 3-9** 

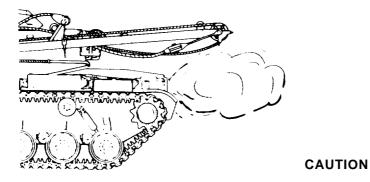
# MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

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

Step 4. Release fuel shutoff handle locking latch (A) if so equipped, Operate fuel shutoff handle (B) three times. Push fuel shutoff handle down and secure locking latch (A) if so equipped. Start engine.



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



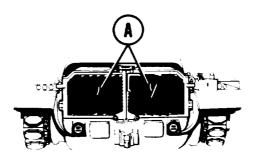
If engine oil pressure indicator shows in red, stop engine. Continued operation may cause engine damage.

# 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 (A) to check for oil.

If oil is present, notify organizational maintenance.



Step 2. Check engine oil level (page 2-74).

- 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).
- c. If smoke appears after performing steps 2,3, and 4 of Malfunction 4, notify organizational maintenance.

# MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

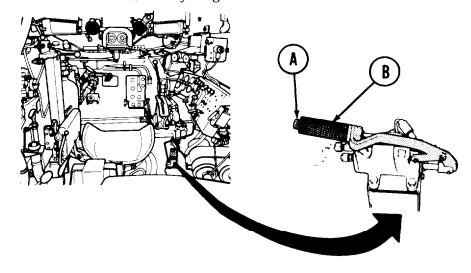
## 4. ENGINE RUNS ROUGH OR DOES NOT IDLE PROPERLY (AFTER WARMUP)

## **CAUTION**

Do not push manifold heater switch (A) while operating purge pump handle (B) in step 1. This will damage the intake manifold.

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

- a. If engine still does not run properly, shut down engine and proceed to step 2 if your tank is equipped with air restriction indicators.
- b. If your tank does not have air restriction indicators, notify organizational maintenance.



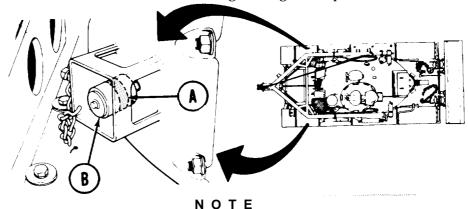
# MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

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

#### NOTE

M728 vehicles may not be equipped with air restriction indicators. If the vehicle does not have air restriction indicators, go to step 4.

- Step 2. Visually check both air restriction indicators (A), if equipped, for condition of air cleaner filters. Attempt to reset restriction indicators by pushing reset button (B).
  - a. If either indicator shows a red band after resetting, notify organizational maintenance.
  - b. If both indicators are showing clear, go to step 4.



Two types of air restriction indicators are presently in use.

 $Early\ model\ -\ Check\ whether\ viewing\ window\ shows\ red.\ If\ red,\ notify\ organizational\ maintenance.$ 

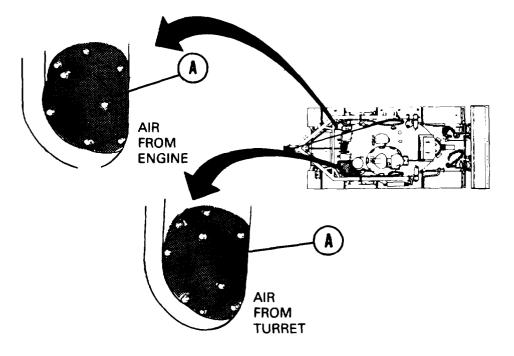
Late model - Check whether gage indicates 30 or more. If so, notify organizational maintenance.

# MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

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

Step 3. Deleted

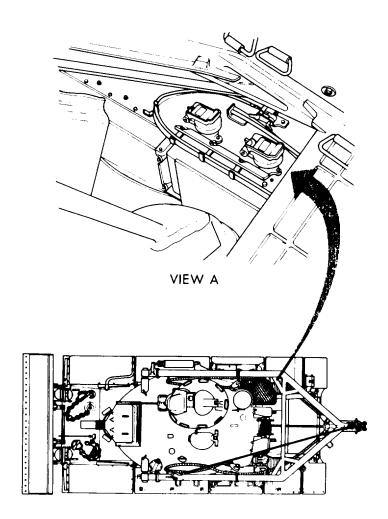
- Step 4. Check engine air intakes (A) inside turret or through top deck grille doors for obstruction.
  - a. Remove any foreign material obstructing intake air.
  - b. If engine does not run properly, notify organizational maintenance.



# MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

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

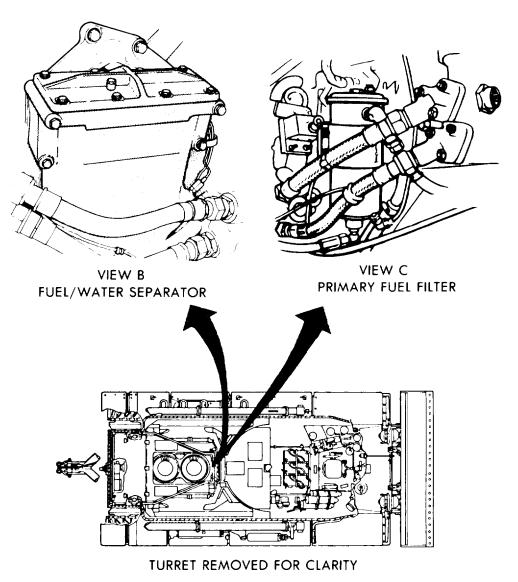
- Step **5.** Inspect both primary and secondary fuel filters to see which group of fuel filters the vehicle is equipped with.
  - a. Open right side top grille doors. If vehicle is equipped as shown in View A, go to step 6.



# MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

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

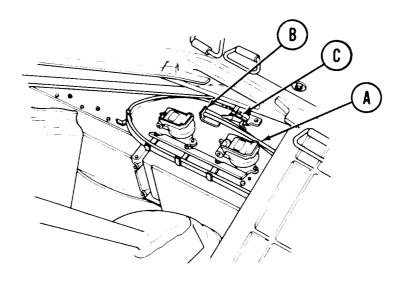
b. If vehicle is equipped as shown in Views B and C, notify organizational maintenance.



# MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

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

Step 6. Shut down engine (page 2-536). Set MASTER BATTERY switch to ON. (Make sure FUEL PUMPS switch is set to ON). Disconnect drain tubes (A) from retaining bracket (B), place tubes into 4 quart container. Open valves (C) (pull valve arms outward). Allow fluid to drain until pure fuel is being discharged (approximately 1 quart per filter or 3 quarts).



### **CAUTION**

Be sure valves are closed after draining condensate. Failure to close valves will cause fuel to be pumped into the hull creating a fire hazard.

If engine does not run properly, notify organizational maintenance.

# 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 TRANS-MISSION oil pressure and oil temperature indicators (gages). Stop engine operation, if ENGINE or TRANSMISSION indicators show in red.

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.

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

#### **CAUTION**

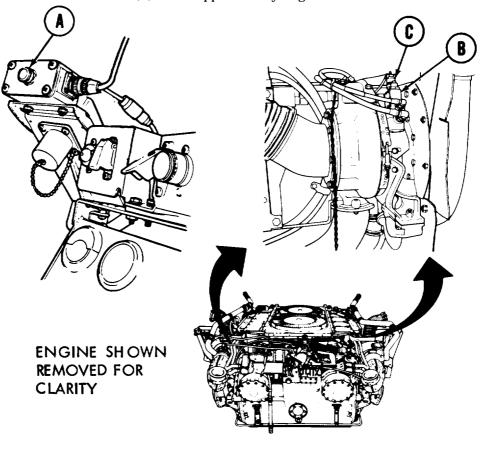
Operate engine only long enough to check engine and transmission oil levels. Continued operation with ENGINE and TRANSMISSION indicators (gages) in red could cause severe damage to the engine or transmission.

- Step 3. Check engine and transmission oil levels (page 2-74).
  - a. If engine or transmission oil is low, add oil (LO 9-2350-222-12).
  - b. If powerplant warning light comes on, notify organizational maintenance.

# 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 light (A) (if equipped).
  - a. If light is on, stop vehicle.
  - b. Open grille doors and check both dust detector pressure switches (B).
  - c. A red plunger (C) visible through plastic cover on switch body, indicates switch (B) has tripped.
  - d. If switch (B) has tripped, notify organizational maintenance.



TA249229

Change 2 3-18.1 /(3-18.2 blank)

# MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

### **BRAKE**

#### 6. PARKING BRAKE DOES NOT RELEASE

Step 1. With transmission shift lever in P (park), depress brake pedal (A) and increase brake pressure above 900 but not more than 1000 psi on brake pressure gage (B), and shift transmission to N (neutral).

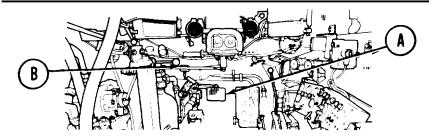
If parking brake does not release, go to step 2.



#### WARNING

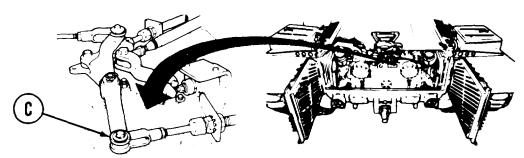
Before going to step 2, block vehicle tracks. Uncontrolled vehicle movement could cause serious injury topersonnei.





Step 2. Remove transmission shroud (page 2-621).

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



- a. If parking brakes release, continue to operate and notify organizational maintenance.
- b. Install transmission shroud (page 2-625).
- c. If brakes do not release, notify organizational maintenance.

# MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

#### **VOLTAGE REGULATOR**

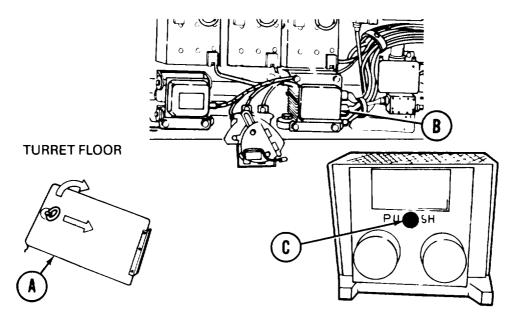
## 7. BATTERY/GENERATOR INDICATOR POINTER IS IN YELLOW OR LEFT RED WHEN ENGINE IS RUNNING

- Step 1. Increase engine speed to 1600 rpm and watch for pointer to move toward green.
  - a. If pointer does not move toward green, go to Step 2.
  - b. If pointer does move to green, notify organizational maintenance.

#### NOTE

Vehicle may be equipped with a voltage control box without an over voltage reset button.

Step 2. Raise turret platform access door (A) and traverse turret to expose voltage regulator (B). Push overvoltage reset button (C) on voltage regulator.



If BATT GEN INDICATOR does not show a charge (green indication), notify organizational maintenance. TA132850

### MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

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



### WARNING

Care should be taken to insure that boiling acid. does not make contact with eyes or skin.



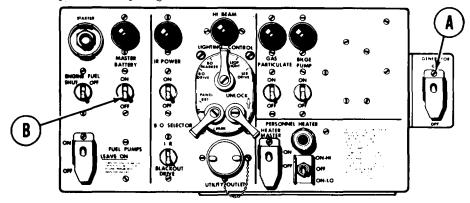
#### **CAUTION**

If BATT GEN INDICATOR is showing in right red, immediately stop engine. Over charging batteries will damage batteries and disable vehicle.

#### **NOTE**

If vehicle is equipped with generator switch (A), do step 1. If not, go to step 2.

- Step 1. Set GENERATOR switch (A) to OFF and raise turret platform access door. Traverse turret to expose vehicle batteries. Check batteries to see if they are boiling, then go to step 3.
- Step 2. Set MASTER BATTERY switch (B) to OFF and raise turret platform access door. Traverse turret to expose vehicle batteries. Check batteries to see if they are boiling.
- Step 3. Notify organizational maintenance.



MASTER CONTROL PANEL SHOWN WITH GENERATOR SWITCH

# MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

#### **LIGHTS**

## 9. SERVICE DRIVE HEADLIGHT, IR SERVICE DRIVE HEADLIGHT, BLACKOUT DRIVE LIGHT OR BLACKOUT MARKER LIGHT DOES NOT WORK

Step 1. Check headlight mounting connector of non-operational headlight assembly to see if mounting nut (A) is secured and seated into headlight mount (B) and make sure that locking clip (C) is secured.

If not, seat properly and secure

Step 2. Operate lights and see if they work.

If lights do not work, go to step 3

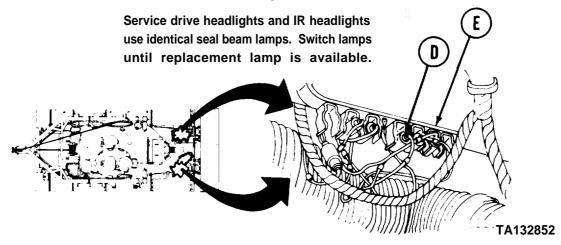
Step 3. Check that all electrical connectors (D) in both right and left headlight harness assemblies (E) are connected.

If not connected, connect.

Step 4. Operate lights and see if they work.

If lights do not work, replace bad lamps with lamps from spare lamp box (page 3-320).

### NOTE



# MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

- 9. SERVICE DRIVE HEADLIGHT, IR SERVICE DRIVE HEADLIGHT 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.

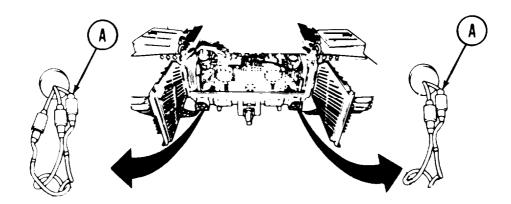
## 10. SERVICE DRIVE TAILLIGHT, SERVICE STOPLIGHT OR BLACKOUT MARKER LIGHT DOES NOT WORK

Step 1. Remove transmission shroud (page 2-622).

### **NOTE**

Right taillight assembly has 2 electrical connectors and left taillight assembly has 3 electrical connectors. Connectors are located behind taillights, under the transmission shroud.

Step 2. Check taillight assembly electrical connector(A) of nonoperational taillight assembly to be sure they are properly connected.



# MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

## 10. SERVICE DRIVE TAILLIGHT, SERVICE STOPLIGHT OR BLACKOUT MARKER LIGHTS DOES NOT WORK - Continued

- a. Secure any loose connectors.
- b. If taillights do not work, go to Step 3.
- c. Install transmission shroud (page 2-625).
- Step 3. Operate lights and see if they work.
  - a. If lights do not work, replace bad lamps with lamp from spare lamp box (page 3-325).
  - b. If tallights 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 3-85).
  - a. If adjustment is not between 3/8 and 9/16 inch, adjust track tension (page 3-85).
  - b. If adjustment is correct, notify organizational maintenance.

# MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

### **PERSONNEL HEATER**

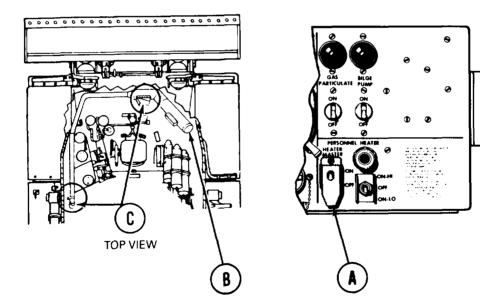
### 12. PERSONNEL HEATER STARTS, RUNS SHORT TIME, STOPS

### NOTE

The HEATER MASTER switch (A) should always be set to ON. If heater was turned OFF with HEATER MASTER switch (A) or operated less than five minutes it may not restart because of flooding.

Step 1. Check blower air inlet (B) and airflow ducts (C) for anything blocking airflow.

Remove anything blocking airflow.

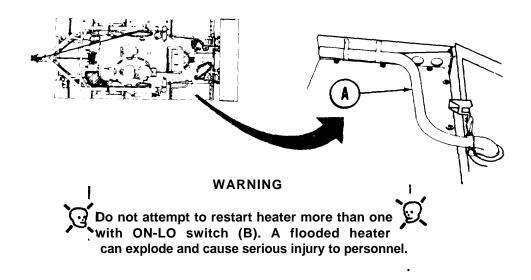


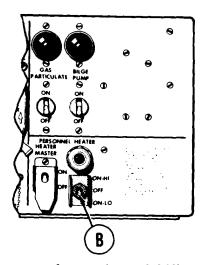
# MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

### 12. PERSONNEL HEATER STARTS, RUNS SHORT TIME, STOPS - Continued

Step 2. Check personnel heater exhaust tube (A) for anything blocking heater exhaust.

Remove anything blocking personnel heater exhaust.





Step 3. Attempt to start heater (page 2-240).

If heater does not run, notify organizational maintenance. TA132856

# MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

#### **TURRET**

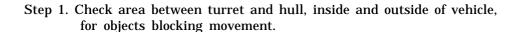
## 13. TURRET DOES NOT TRAVERSE SMOOTHLY IN POWER, OR DOES NOT OPERATE IN POWER

#### WARNING

- Do not apply turret power or operate turret controls until all personnel are in safe positions and prepared for turret or gun movement.
- Do not operate turret in power or manual mode until all personnel are in proper position, turret ring has been cleared, and shell ejection plate and all platform guards are in place.



- Do not reach into or attempt to enter or exit driver's compartment until turret power switch is off and turret traverse lock is in locked position.
- Crew members out of station are in extreme danger when turret power is on. Commanders must shut down turret power before allowing crew members to leave their stations.



If objects are found, remove them.

- Step 2. Check area around gun tube outside of vehicle,
  - a. If gun tube has hit an object, remove objector move vehicle.
  - b. If gun tube has hit part of vehicle hull, elevate the gun.

# MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

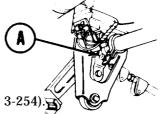
## 13. TURRET DOES NOT TRAVERSE SMOOTHLY IN POWER, OR DOES NOT OPERATE IN POWER - Continued

Step 3. Check deck clearance switch (A) located on turret ceiling.

### **CAUTION**

Do not attempt to adjust deck clearance switch. An improperly adjusted switch can allow the gun to depress too far and may damage the vehicle.

- a. If switch is disconnected, connect.
- b. If connectors are connected, notify organizational maintenance.



Step 4. Check hydraulic fluid level (page 3-254).

If fluid is low, add fluid and turn on ELEV/TRAV POWER switch.

- Step 5. Listen for operation of electric motor below accumulator. If electric motor runs longer than 15 seconds, make sure BATT GEN INDICATOR (driver's master panel ) pointer is in green with engine running.
  - a. If pointer is in yellow or left red, see symptom 7 (page 3-20).
  - b. If pointer is in right red, see symptom 8 (page 3-21).
  - c. If BATT GEN INDICATOR pointer is in green with engine running, notify organizational maintenance of hydraulic power pack problem.

#### **NOTE**

If required, continue to operate with manual traverse after turning off turret power.

3-28 Change 4

# MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

## 14. 165-MM GUN DOES NOT ELEVATE OR DEPRESS SMOOTHLY IN POWER OR DOES NOT OPERATE IN POWER

#### **WARNING**

- Do not reach over or under gun mount unless ELEV/TRAV POWER switch is OFF. Accidental movement of gun may cause injury.
- Do not apply turret power or operate turret controls until all personnel are in safe positions and prepared for turret or gun movement.
- Do not operate turret in power or manual mode until all personnel are in proper position, turret ring has been cleared, and shell ejection plate and all platform guards are in place.
- Do not reach into or attempt to enter or exit driver's compartment until turret power switch is off and turret traverse lock is in locked position.
- Crew members out of station are in extreme danger when turret power is on. Commanders must shut down turret power before allowing crew members to leave their stations.

Step 1. Check area over and under the breech and gun mount for objects blocking gun movement.

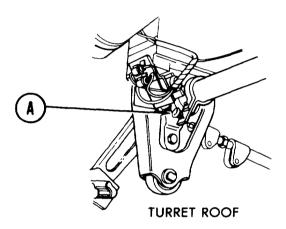
If objects are found, remove them.

# MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

## 14. 165-MM GUN DOES NOT ELEVATE OR DEPRESS SMOOTHLY IN POWER OR DOES NOT OPERATE IN POWER - Continued

Step 2. Visually check deck clearance switch (A) for proper operation.

If switch has been depressed by adjustable stop, the gun cannot be depressed further. Move vehicle and attempt tore-engage target.



### CAUTION

Do not attempt to adjust or disconnect deck clearance switch. This will allow the gun to depress too far and may damage the vehicle.

- Step 3. Check area over and under gun tube outside or vehicle for objects blocking gun movement.
  - a. If gun tube has hit an object, remove object or move vehicle.
  - b. If gun tube has hit part of vehicle, do not attempt to depress gun further. Move vehicle and attempt to re-engage target.

# MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

## 14. 165-MM GUN DOES NOT ELEVATE OR DEPRESS SMOOTHLY IN POWER OR DOES NOT OPERATE IN POWER - Continued

Step 4. Check hydraulic fluid level in accumulator (page 3-254).

If fluid level is low, add fluid and turn on ELEV/TRAV POWER switch.

- Step 5. Listen for operation of electric motor below accumulator. If electric motor runs longer than 15 seconds, make sure BATT GEN INDICATOR (driver's master panel ) pointer is in green with engine running.
  - a. If pointer is in yellow or left red, see symptom 7 (page 3-20).
  - b. If pointer is in right red, see symptom 8 (page 3-21).
  - c. If BATT GEN INDICATOR pointer is in green with engine running, notify organizational maintenance of hydraulic power pack problem.

#### NOTE

If required, continue to operate with manual elevation after turning off turret power.

## 15. 165-MM GUN DOES NOT ELEVATE OR DEPRESS SMOOTHLY OR DOES NOT OPERATE MANUALLY

Step 1. Check if manual elevation control handle can be rotated further in depression after gun is at maximum depression.

If handle can be rotated, continue rotation in depression until it can no longer be rotated.

Step 2. Elevate gun manually.

If gun does not elevate smoothly or does not elevate, check pressure on equilibrator system pressure gage (page 3-260).

# MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

## 16. HYDRAULIC POWER PACK MOTOR CYCLES (RUNS) TOO OFTEN OR TOO LONG

- Step 1. Check hydraulic fluid level (3-254).
  - a. If fluid is low, add fluid and turn on ELEV/TRAV POWER switch.
  - b. If pressure gage reads less than 500 psi before dropping to zero, notify organizational maintenance.
- Step 2. Listen for operation of electric motor below accumulator. If electric motor runs longer than 15 seconds, make sure BATT GEN INDICATOR (driver's master panel) pointer is in green with engine running.
  - a. If pointer is in yellow or left red, see symptom 7 (page 3-20).
  - b. If pointer is in right red, see symptom 8 (page 3-21).
  - c. If BATT GEN INDICATOR pointer is in green with engine running, notify organizational maintenance of hydraulic power pack problem.

#### **MAIN GUN**

#### 17. 165-MM GUN CANNOT BE LOADED - BREECH DOES NOT CLOSE

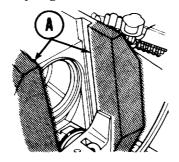
- Step 1. Check if round is completely seated.
  - a. If it is not, seat round correctly.
  - b. If round will not seat, remove round.
- Step 2. Check round for dents, bulges or dirt.
  - a. If round is dirty, clean.
  - b. If round is damaged, return to ammo rack, load another round, and attempt to fire.
- step 3. Check for dirty gun chamber.

If gun chamber is dirty, clean (page 3-190.1)

# MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

#### 17. 165-MM GUN CANNOT BE LOADED - BREECH DOES NOT CLOSE -Continued

- Step 4. Inspect the breech block guide ways (A) for dirt and damage.
  - a. If dirty, clean.
  - b. If damaged, notify organizational maintenance.



Step 5. Check breech spring tension adjustment (page 3-187).

If breech spring tension is not at maximum adjustment, adjust tension (page 3-187).

- Step 6. Remove breech block and inspect operating surfaces (page 3-174).
  - a. If damaged parts are found, notify organizational maintenance.
  - b. Clean, lubricate and install breech block (page 3-184).
- step 7. Load gun.

If breech does not close, notify organizational maintenance.

#### 18. 165-MM GUN DOES NOT RETURN TO BATTERY OR RECOILS SLOWLY

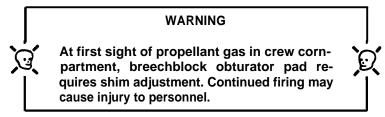
- Step 1. Check replenisher tape for too much hydraulic fluid (page 3-164).
  - a. If there is too much, drain excess fluid into a container (page 3-171).
  - b. If fluid level is not excessive, notify organizational maintenance.

### 19. 165-MM GUN RETURNS TO BATTERY (RECOILS) WITH EXCESSIVE SHOCK

- Step 1. Check replenisher for low hydraulic fluid.
  - a. If low, add hydraulic fluid (page 3-167).
  - b. If fluid level is not low, notify organizational maintenance.

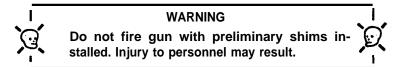
# MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

### 20. EXCESSIVE BURNED POWER GAS COMES OUT OF BREECH AFTER FIRING



Step 1. Check breech block obturator for proper adjustment or damage (page 3-198).

a. If obturator is not seating properly, install preliminary shims as required (page 3-200).



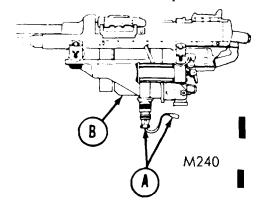
b. If obturator will not seat properly after shimming, notify organizational maintenance.

#### **MACHINE GUNS**

### 21. 7.62-MM MACHINE GUN (COAX) WILL NOT FIRE ELECTRICALLY

Step 1. Check electrical connector(s) (A) at machine gun mount (M240) (B).

If electrical connector is not connected, connect, and attempt to fire.

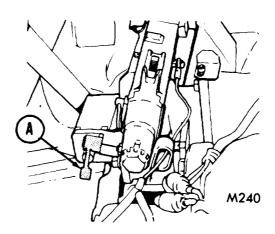


Change 5 3-33

# MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

### 21. 7.62-MM MACHINE GUN (COAX) WILL NOT FIRE ELECTRICALLY - Continued

Step 2. Attempt to fire machine gun manually by pushing manual firing lever (M240) (A).



a. If machine gun fires, notify organizational maintenance.

### **NOTE**

If required, continue to fire manually.

b. If machine gun does not fire manually, troubleshoot M240 using TM  $\,$  9–1005–313–10.

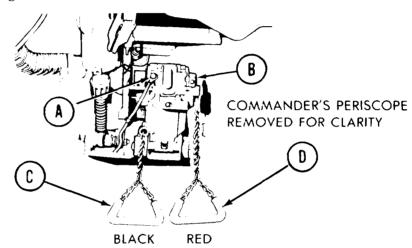
3-34 Change 5

# MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

#### 22. CALIBER .50 MACHINE GUN DOES NOT FIRE ELECTRICALLY

- Step 1. Check electrical connector (A) on machine gun (B).

  If not connected, connect.
- Step 2. Charge weapon by pulling charging (black) handle(C).
  - a. If ammunition belt does not move toward machine gun when charging handle is pulled, make sure belt is not catching on feed chute.
  - b. If fixed feed chute is not alined with machine gun feedway, notify organizational maintenance.



Step 3. Attempt to fire machine gun by pulling manual firing (red) handle (D).

a. If machine gun fires, notify organizational maintenance that machine gun will only fire manually.

### **NOTE**

### If required, continue to fire manually.

b. If machine gun does not fire manually, troubleshoot machine gun using TM 9-1005-231-10.

TA132865

# MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

### 23. CALIBER .50 MACHINE GUN READY LAMP DOES NOT LIGHT

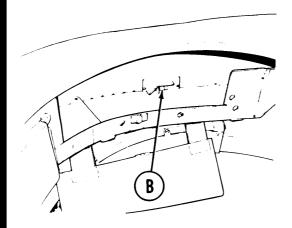


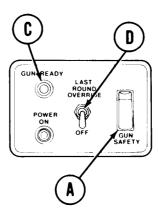
### WARNING



Do not actuate machine gun trigger switch during the following steps.

- Step 1. Set MASTER BATTERY and CUPOLA POWER switches to ON. Set GUN SAFETY switch (A) to FIRE. With ammo loaded or last round stop switch (B) depressed, check if GUN READY indicator (C) lights.
  - a. If yes, proceed with normal operation.
  - b. If no, proceed to step 2.





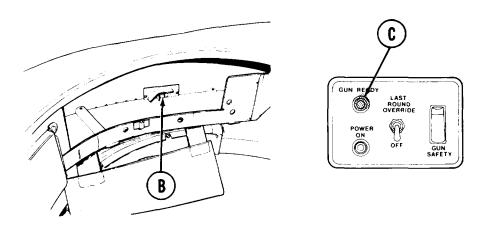
Step 2. Set LAST ROUND OVERRIDE switch (D) to on. Check if GUN READY indicator (C) lights.

- a. If yes, proceed to step 3.
- b. If no. proceed to step 4.

# MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

## 23. CALIBER .50 MACHINE GUN READY LAMP DOES NOT LIGHT - Continued

- step 3. Check if ammo is loaded properly into last round stop switch (B) or that last round stop switch (B) is depressed.
  - a. If ammo is loaded properly or last round stop switch is depressed, notify organizational maintenance.
  - b. If ammo is not loaded properly, reload ammo box (page 2-318).
  - c. If last round stop switch is not depressed, depress as necessary.



Step 4. Replace GUN READY indicator (C) lamp. Recheck operation of GUN READY indicator, step 1 above.

- a. If GUN READY indicator lights, discard defective lamp.
- b. If GUN READY indicator does not light, notify organizational maintenance.

TA252943

Change 1 3-36.1

# MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

#### FIRE CONTROL

## 23.1. GUNNER'S M32CE1 PERISCOPE DOES NOT MOVE SMOOTHLY IN ELEVATION

- Step 1. Check ballistic drive coupling for dirt and for proper connection (page 3-205).
  - a. If coupling is dirty, clean.
  - b. If coupling is not connected properly, connect (page 3-206).
  - c. If periscope does not elevate properly, notify organizational maintenance.

### 24. GUNNER'S M32CE1 PERISCOPE VISION IS NOT SHARP

- Step 1. Check to see if periscope lens is dirty.
  - a. If dirty, clean lens with lens tissue or soft, clean cloth and cleaning solution (item 9, Appendix D).
- Step 2. Check for proper focus.
  - a. If not focused, adjust focus.
  - b. If problem remains, notify organizational maintenance.

### 25. DELETED

# MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

## 25.1. GUNNER'S M32CE1 PERISCOPE HAS WEAK OR NO RETICLE LIGHT

#### NOTE

Close ballistic shield if outside light is too bright to see reticle.

Step 1. Adjust light source control knob for proper lighting of daylight or unity sight retitles.

If reticles do not light or cannot be seen, replace lamp(s) (page 3-228.1).

- Step 2. Adjust RETICLE control for passive elbow light.
  - a. If reticle does not light or cannot be seen, replace lamp (page 3-228.3).
  - If reticle still does not light or cannot be seen, notify organizational maintenance.
- 26. GUNNER'S M32CE1 PERISCOPE HAS NO NIGHT VISION OR NIGHT VISION IS FOGGY WHILE OPERATING PASSIVE ELBOW ON VEHICLE POWER

#### **CAUTION**

Perform night checks under low light conditions, When not in use, a light shutter is provided to protect the elbow against light exposure. Do not operate elbow under daylight conditions unless ballistic shield is closed. These measures are to prevent damage to the equipment.

### **NOTE**

If vehicle power is lost reset M32CE1 periscope passive elbow power switch each time.

# MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

# 26. GUNNER'S M32CE1 PERISCOPE HAS NO NIGHT VISION OR NIGHT VISION IS FOGGY WHILE OPERATING PASSIVE ELBOW ON VEHICLE POWER - Continued

Step 1. Check to see if periscope lens is dirty.

If dirty, clean lens with lens tissue or soft, clean cloth and cleaning solution (item 9, Appendix D).

- Step 2. Check to see if periscope is focused properly.
  - a. If not focused adjust focus.
  - b. If periscope does not focus, notify organizational maintenance.

# 27. GUNNER'S M32CE1 PERISCOPE HAS NO NIGHT VISION OR NIGHT VISION IS FOGGY THROUGH PASSIVE ELBOW WHEN ON BATTERY POWER

#### **CAUTION**

Perform night checks under low light conditions. When not in use, a light shutter is provided to protect the elbow against light exposure, Do not operate elbow under daylight conditions unless ballistic shield is closed. These measures are to prevent damage to the equipment.

Step 1. Check to see if periscope lens is dirty.

If dirty, clean lens with lens tissue or soft, clean cloth and cleaning solution (item 9, Appendix D).

Step 2. Check for proper focus.

If not focused, adjust focus.

- Step 3. Check to see if M30 instrument light for M32CE1 passive elbow is connected properly (page 2-368.3).
  - a. If not, connect light properly.
  - b. If connected properly and passive elbow still does not operate, replace instrument light batteries (page 3-218.1).
  - If periscope still does not operate properly, notify organizational maintenance.

# MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

#### 28. GUNNER'S TELESCOPE IMAGE IS NOT SHARP AND CLEAR

Step 1. Check for proper focus.

If not focused, adjust focus (page 2-380).

- Step 2. Check to see if telescope lens is dirty.
  - a. If dirty; clean lens with lens tissue or soft, clean cloth and cleaning solution (item 9, Appendix D).
  - b. If image is still not clear, notify organizational maintenance.

#### 29. GUNNER'S TELESCOPE HAS WEAK OR NO RETICLE LIGHT

- Step 1. Adjust light source control knob for maximum reticle brightness (page 2-377).
  - a. If reticle does not light or cannot be seen, replace reticle lamp (page 2-234).
  - b. If after replacing lamp, reticle still does not light or cannot be seen, notify organizational maintenance.

## 30. COMMANDER'S M36 OR M36E1 PERISCOPE RETICLE DOES NOT MOVE SMOOTHLY IN ELEVATION

- Step 1. Check to see if quick-disconnect clamp is connected properly to elevation arm assembly.
  - a. If not, clean coupling and connect properly (page 3-205).
  - b. If still not moving properly, or connected properly, notify organizational maintenance.

## 31. COMMANDER'S M36 OR M36E1 PERISCOPE IMAGE IS NOT SHARP ■ OR CLEAR

Step 1. Check to see if periscope lens is dirty.

If dirty, clean lens with lens tissue or soft, clean cloth and cleaning solution (item 9, Appendix D).

- Step 2. Check for proper focus,
  - a. If not focused, adjust focus.
  - b. If problem remains, notify organizational maintenance.

TA252947

Change 1 3-39

# MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

## 32. COMMANDER'S M36 PERISCOPE DAYLIGHT OR IR BODY RETICLES ARE NOT VISIBLE

- Step 1. Adjust light source control knob for maximum brightness.
  - a. Replace any bad lamp (page 3-229 or 3-230).
  - b. If reticle does not light, notify organizational maintenance.

## 32.1 COMMANDER'S M36E1 PERISCOPE DAYLIGHT OR PASSIVE BODY RETICLES ARE NOT VISIBLE

- Step 1. Check to see if passive elbow shutter lever is ON. If OFF, set to ON.
- Step 2. Adjust reticle control for maximum brightness. If there is weak light or no light replace lamp (page 3-228.5).
- Step 3. Adjust daylight body light control for maximum reticle brightness.
  - a. If there is weak light or no light, replace lamp (page 3-228.6).
  - b. If there is still no light, notify organizational maintenance.

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

33. COMMANDER'S M36 OR M36E1 PERISCOPE HAS NO NIGHT VISION, OR NIGHT VISION IS FOGGY WHILE OPERATING IR BODY OR PASSIVE ELBOW ON VEHICLE POWER.

#### **CAUTION**

Always remove battery when it is not being used (M36). Install converter. Battery must be removed and converter installed for vehicle power operation.

Perform IR and night checks under low light conditions. When not is use, a light shutter is provided to protect the elbow against light exposure and an opaque disk is provided to protect the IR body. Do not operate elbow or IR body under daylight conditions unless ballistic shield is closed. These measures are to prevent damage to the equipment.

#### NOTE

If vehicle power is lost, reset M36E1 periscope passive elbow power switch each time.

Step 1. Check for proper focus.

If not focused, adjust focus,

- Step 2. Check if lens is dirty.
  - a. If dirty, clean lens with lens tissue or soft clean cloth and cleaning solution (item 9, appendix D),
  - b. If periscope still does not operate properly, notify organizational maintenance.

TA252949

Change 1 3-40.1/340.2 (blank)

# MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

34. COMMANDER'S M36 OR M36E1 PERISCOPE HAS NO NIGHT VISION OR NIGHT VISION IS FOGGY THROUGH IR BODY OR PASSIVE ELBOW WHEN ON BATTERY POWER.

#### **CAUTION**

Perform IR and night checks under low light conditions. When not in use, a light shutter is provided to protect the elbow against light exposure and an opaque disk is provided to protect the IR body. Do not operate elbow or IR body under daylight conditions unless ballistic shield is closed. These measures are to prevent damage to the equipment.

Step 1. Check for proper focus.

If not focused, adjust focus.

Step 2. Check to see if periscope lens is dirty.

If dirty, clean lens with lens tissue or soft, clean cloth and cleaning solution (item 9, appendix D).

- Step 3. Check to see if M36 IR body has batteries installed properly with the positive (+) end towards periscope. Make sure the cap is on tight.
  - a. If not, install batteries properly and operate periscope (page 2-354).
  - b. If installed properly or periscope still does not operate, replace batteries (page 3-217).
- Step 4. Check to see if M30 instrument light for M36E1 passive elbow is connected properly (page 2-360.4).
  - a. If not, connect light properly.
  - b. If connected properly and passive elbow still does not operate, replace instrument light batteries (page 3-218.2)
  - c. If periscope still does not operate properly, notify organizational maintenance.

TA252950

Change 1 3-41

# MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

#### 35. AZIMUTH INDICATOR SCALES ARE NOT LIGHTED

#### NOTE

The electrical cable is located on the side of the azimuth indicator nearest the turret wall.

Step 1. Check to see if electrical cable is connected properly to the azimuth indicator.

If not, connect properly.

Step 2. Check to see if all four lamps are bad (page 3-245),

If some lamps are on replace bad lamps (page 3-239).

- Step 3. Check M30 auxiliary instrument light. Install or replace batteries as required.
- Step 4. Check to see if M30 instrument light has bad lamp.
  - a. If lamp is bad, replace.
  - b. If electrical connection is proper and instrument lamps, auxiliary instrument light batteries and lamps have been replaced, notify organizational maintenance.

#### **AUXILIARY SYSTEMS AND CONTROLS**

36. 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 IR POWER switch and MASTER BATTERY switch are off before touching power cable. Electrical shock could cause injury.

# MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

36. 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.

#### **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 IR POWER switch and MASTER BATTERY switch to OFF. Wait 2 minutes.
- Step 2. Disconnect power cable and remove periscope from hatch cover (page 2-596).

If exterior lenses are dirty, clean with lens tissue or soft, clean cloth and cleaning solution (item 9, Appendix D).

- Step 3. Remove periscope head from periscope and check interior lenses for dirt and paper (page 3-207).
  - a. If dirty, clean with lens tissue or soft, clean cloth and cleaning solution (item 9, Appendix D). Install periscope head.
  - b. If clean, install periscope into hatch cover (page 3-207).
- Step 4. Connect IR power cable to the periscope and set MASTER BATTERY switch and IR POWER switch to ON.
- Step 5. Check to see if periscope is focused.
  - a. If not focused, adjust focus (page 2-256).
  - If periscope focus will not adjust, notify organizational maintenance.

    TA132873

#### **MALFUNCTION**

## TEST OR INSPECTION CORRECTIVE ACTION

## 37. DRIVER CANNOT SEE THROUGH M24 IR PERISCOPE - NO PINK LIGHT BACKGROUND

#### **WARNING**



The power cable carries 16,000 volts dc. Make sure IR POWER switch and MASTER BATTERY switch are off before touching power cable. Electrical shock could cause injury.



#### **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.



#### 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 IR POWER switch and MASTER BATTERY switch to OFF. Wait 2 minutes.
- Step 2. Grab power cable below connector with one hand. Push cable up, then pull down.
  - a. If cable moves, tighten cable.
  - 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 and connect cable.
  - b. If damaged, notify organizational maintenance.
- Step 4. Set MASTER BATTERY and IR POWER switches to ON.

If there is no pink light background, notify organizational maintenance.

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

37.1 DRIVER'S AN/VVS-2 NIGHT VISION VIEWER WILL NOT OPERATE OR IMAGE (PICTURE) IS NOT CLEAR

### WARNING



Remove battery before operating night vision viewer on vehicle power. The battery will overheat and may explode when vehicle power is connected.

TA252951

Change 1 3-44.1

# MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

# 37.1 DRIVER'S AN/VVS-2 NIGHT VISION VIEWER WILL NOT OPERATE OR IMAGE (PICTURE) IS NOT CLEAR - Continued

- Step 1. Check to see if viewer is connected to vehicle power or internal battery power.
  - a. If connected to vehicle power, remove battery cover and make sure battery has been removed.
  - b. If not connected to vehicle power, remove battery cover and make sure battery is installed with recessed end (+ end) towards viewer. Tighten cap.
- Step 2. Turn OFF BRIGHT rotary switch to maximum brightness.
  - a. If image (picture) is not clear, turn off viewer and remove power cable.
  - b. Remove viewer from hatch cover (page 2-600.1) and clean lenses with lens tissue or soft, clean cloth and cleaning solution (item 9, Appendix D).
  - c. Install viewer and power cable (page 2-196.1).
  - d. If image (picture) does not appear, turn off viewer. If vewier is connected to vehicle power, disconnect cable and install battery.
  - e. If image (picture) does not appear, and viewer has battery installed, turn off viewer and connect to vehicle power.
- Step 3. Turn OFF BRIGHT rotary switch to maximum brightness.
  - a. If image (picture) appears but is not clear, notify organizational maintenance.
  - If image (picture) does not appear, notify organizational maintenance.

# MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

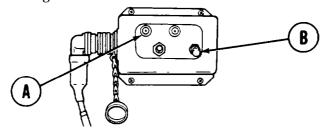
# 37.2. SEARCHLIGHT (AN/VSS-3A) FAILS TO OPERATE OR DOES NOT OPERATE PROPERLY

#### **NOTE**

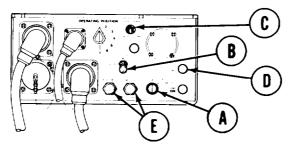
If the control panel you are operating does not look like pictures shown, refer to TM 11-5855-217-12-1 to do steps below.

Step 1. Check if OVER TEMP indicator (A) on searchlight remote control is lit

If indicator is lit, set VISIBLE/INFRA RED/OFF switch (B) to OFF. Allows searchlight to cool for 10 minutes.



Step 2. Set LOCAL/REMOTE switch (A) of bustle controls to LOCAL postion and set VISIBLE/INFRA RED switch (B) and SPREAD BEAM COMPACT BEAM switch (C) to desired position.



- a. If bustle control OVER TEMP light (D) comes on, shut off VISIBLE/INFRA RED switch (B) and notify organizational maintenance,
- b. If searchlight operates and bustle control OVER TEMP light (D) does not come on, continue to operate searchlight with turret bustle controls and notify organizational maintenance that you have a problem with the searchlight remote control.
- Step 3. Unscrew two caps (E) and remove AUXILIARY B+ fuse and MOTOR fuse and check fuses.

# MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

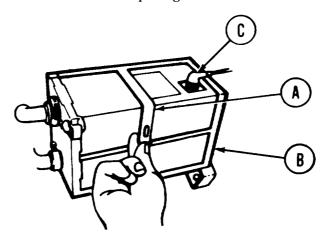
# 37.2 SEARCHLIGHT FAILS TO OPERATE OR DOES NOT OPERATE PROPERLY - Continued

- a. If either fuse is defective (wire broken), replace with good fuse from spare lamp box (motor fuse is 1 amp, 125v, auxiliary B+ fuse is 2 amp, 250v.).
- b. If fuses are not defective, or if spare fuses are not available, notify organizational maintenance.

#### 38. LACK OF AIR, GAS-PARTICULATE FILTER UNIT

Step 1. Make sure spring clip (A) has been lifted from air intake opening on filter unit (B).

If not, lift from air intake opening.



Step 2. Check electrical connector (C) at precleaned 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.

TA252954

Change 1 3-45

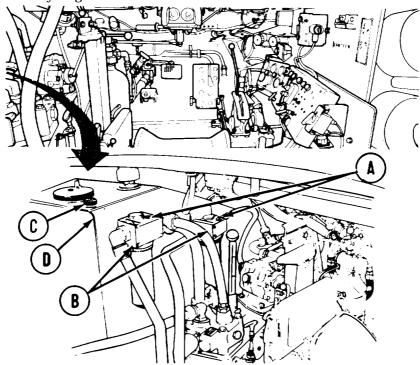
# MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

#### **MOLDBOARD**

# 39. BULLDOZER MOLDBOARD WILL NOT LOWER FROM LOCK "TRAVEL" POSITION

Step 1. Check red buttons(A) on hydraulic oil filters (B).

If red buttons(A) are up, press down. If buttons will not stay down, notify organizational maintenance.



Step 2. Check oil level on dipstick (C) from hydraulic oil reservoir (D).

Add oil if necessary (LO 9-2350-222-12).



#### **WARNING**

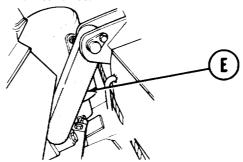
Before leaving vehicle to check moldboard, be sure that engine is off. Accidental vehicle movement may cause injury.



# MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

# 39. BULLDOZER MOLDBOARD WILL NOT LOWER FROM LOCK "TRAVEL" POSITION - Continued

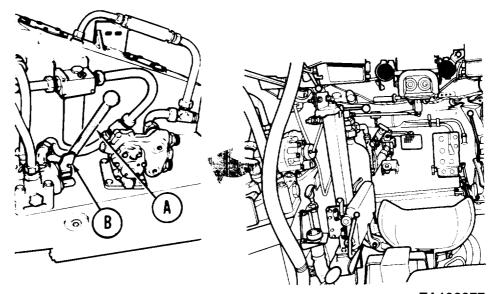
- Step 3. Check linkage (E) at front of vehicle for dirt and stones between parts. Also check for distortion of linkage.
  - a. Remove any obstacle found.
  - b. If linkage(E) is distorted, or problem still exists, notify organizational maintenance.



### 40. BULLDOZER MOLDBOARD DOES NOT LIFT

Step 1. Check to see if selector valve lever(A) is in HULL position.

If not in HULL position (B), place in HULL position.



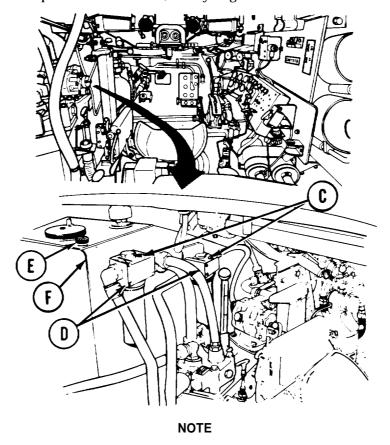
# MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

### 40. BULLDOZER MOLDBOARD DOES NOT LIFT - Continued

Step 2. Check red buttons (C) on hydraulic oil filters (D).

If red buttons (C) are up, press down. If buttons will not stay down, notify organizational maintenance.

- Step 3. Check oil level on dipstick (E) from hydraulic oil reservoir (F).
  - a. Add oil if necessary (LO 9-2350-222-12).
  - b. If problem still exists, notify organizational maintenance.



If required to continue vehicle operation, use Emergency Moldboard Lifting Procedure (page 2-263).

# MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

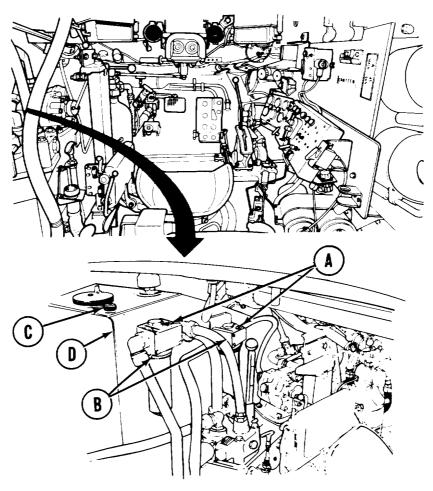
# 41. BULLDOZER BLADE WILL NOT DIG INTO GROUND WITH DIRECTIONAL CONTROL VALVE LEVER IN LOWER POSITION

Step 1. Check red buttons (A) on hydraulic oil filters (B).

If red buttons (A) are up, press down. If buttons will not stay down, notify organizational maintenance.

Step 2. Check oil lever on dipstick (C) from hydraulic oil reservoir (D).

Add oil if necessary (LO 9-2350-222-12).



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# MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

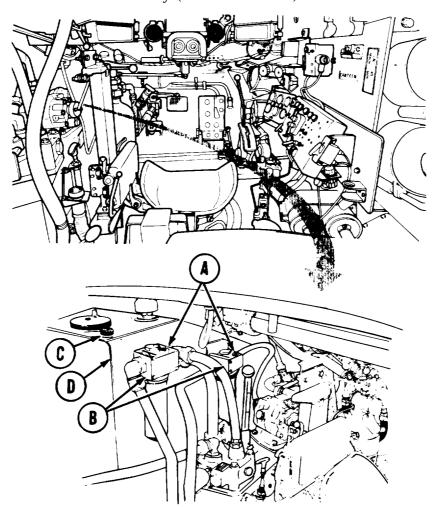
# 42. MOLDBOARD FAILS TO RAISE HIGH ENOUGH TO ENGAGE CARRYING HOOKS

Step 1. Check red buttons (A) on hydraulic oil filters (B).

If red buttons (A) are up, press down. If buttons will not stay down, notify organizational maintenance.

Step 2. Check oil level on dipstick (C) from hydraulic oil reservoir (D).

a. Add oil if necessary (LO 9-2350-222-12).

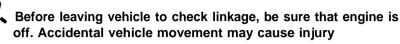


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# MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

# 42. MOLDBOARD FAILS TO RAISE HIGH ENOUGH TO ENGAGE CARRYING HOOKS - Continued

#### **WARNING**





- Step 3. Check linkage (A) at front of vehicle and at base of hydraulic cylinders (B) for dirt, stones and obstructions between parts. Also check for distortion of linkage.
  - a. Remove any obstacle found.
  - b. If linkage is distorted, or problem still exists, notify organizational maintenance.

NOTE

If required to continue operation, use Emergency Moldboard Lifting Procedure (page 2-263).

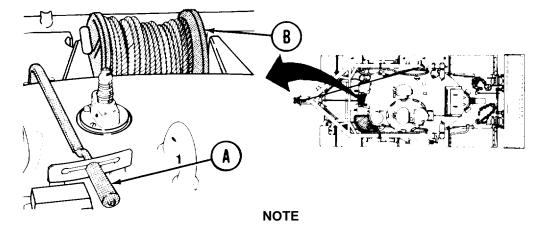
# MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

#### **WINCH**

# 43. WINCH CABLE DOES NOT MOVE WHEN WINCH CONTROL VALVE LEVER IS PLACED IN RAISE OR LOWER POSITION

#### **CAUTION**

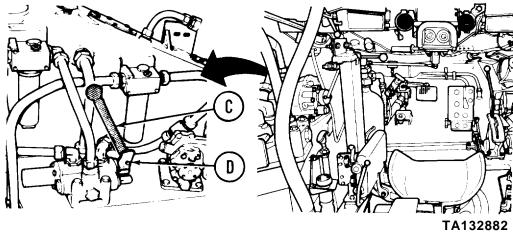
Winch gear shift lever (A) must be in HI or LO position before operating winch (B), or equipment maybe damaged.



Operating the winch is a three crewmen procedure: Commander, Driver, and outside Crewman.

Step 1. Check selector control valve lever(C).

If in NEUTRAL or HULL position, place in TURRET position (D).



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#### MALFUNCTION

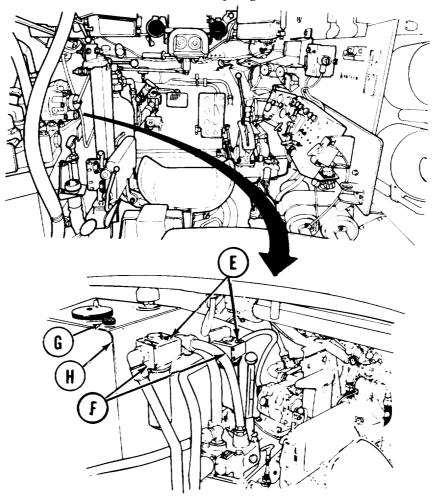
# TEST OR INSPECTION CORRECTIVE ACTION

# 43. WINCH CABLE DOES NOT MOVE WHEN WINCH CONTROL VALVE LEVER IS PLACED IN RAISE OR LOWER POSITION - Continued

Step 2. Check red buttons(E) on hydraulic oil filters (F).

If red buttons (E) are up, press down. If buttons will not stay down, notify organizational maintenance.

- Step 3. Check oil level in dipstick (G) from hydraulic oil reservoir(H),
  - a. Add oil if necessary (LO 9-2350-222-12).
  - b. If oil level is correct, notify organizational maintenance.



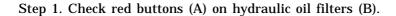
# MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

#### 44. WINCH WILL NOT RAISE LOAD

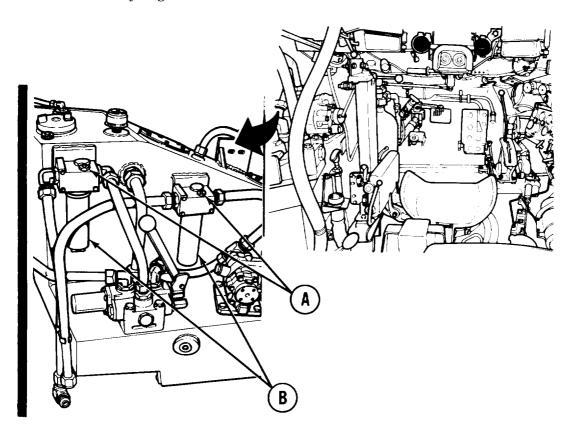
#### WARNING



The lifting capacity with a single line over the boom sheave is 17,500 lbs. The pulling capacity 25,000 lbs. The lifting capacity with a two part line is limited to 35,000 lbs. If capacity is exceeded, equipment may be damaged or personnel may be injured.



If red buttons (A) are up, press down. If buttons will not press down, notify organizational maintenance.

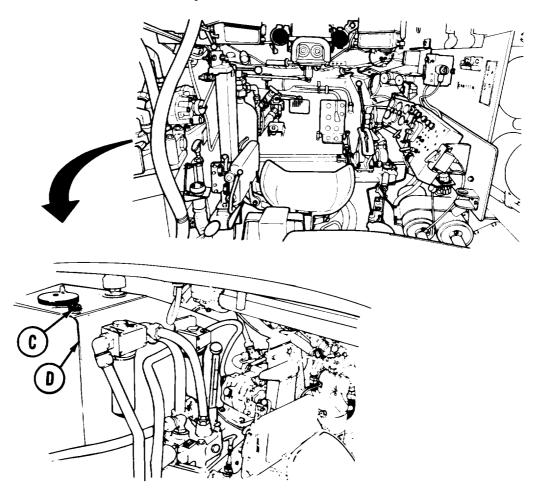


# MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

### 44. WINCH WILL NOT RAISE LOAD - Continued

Step 2. Check oil level on dipstick (C) from hydraulic oil reservoir (D).

Add oil if necessary (LO 9-2350-222-12).



Step 3. Check to see if load is greater than winch's capacity.

- a. If using a single part line, change to a two part line.
- b. If using a two part line, and weight of load is below 35,000 lbs. notify organizational maintenance.

# MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

#### **BOOM**

## 45. BOOM DOES NOT MOVE WHEN BOOM CONTROL VALVE LEVER IS PLACED IN ERECT POSITION

## WARNING

Wear safety gloves when handling wire rope cables. Frayed cables can cause injury to person-

Lifting hook must be in stowed position when operating boom. Free swinging hook can cause injury to personnel.

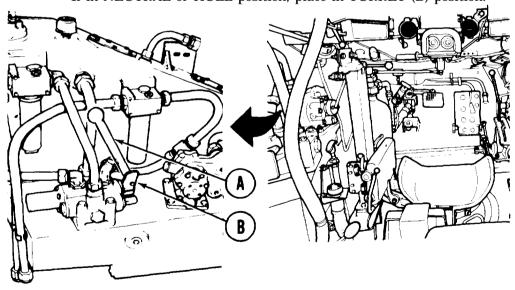
#### NOTE

Boom travel locks must be released.

Operating the boom is a four crewmen procedure: Commander and Driver inside the vehicle. Gunner and Loader outside the vehicle.

Step 1. Check selector control valve lever (A).

If in NEUTRAL or HULL position, place in TURRET (B) position.



3-56 Change 3

# MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

# 45. BOOM DOES NOT MOVE WHEN BOOM CONTROL VALVE LEVER IS PLACED IN ERECT POSITION - Continued

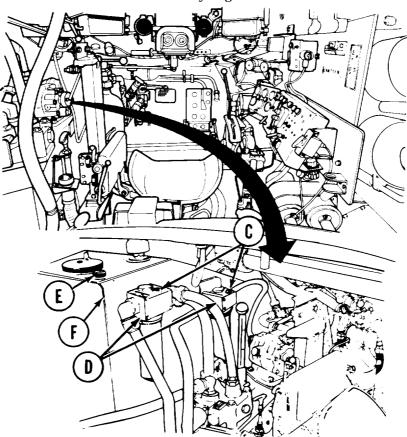
Step 2. Check to see if obstacle restricts movement of boom.

If obstacle restricts movement, remove obstacle, or move vehicle.

Step 3. Check red buttons(C) on hydraulic oil filters (D).

If red buttons (C) are up, press down. If buttons will not stay down, notify organizational maintenance.

- Step 4. Check oil level on dipstick (E) from hydraulic oil reservoir(F).
  - a. Add oil if necessary (LO 9-2350-222-12).
  - b. If oil level is correct, notify organizational maintenance.



#### **TROUBLESHOOTING - continual**

# MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

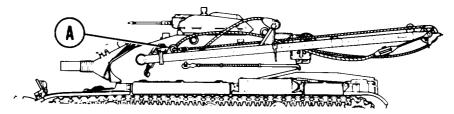
# 46. BOOM DOES NOT MOVE WHEN WINCH CONTROL LEVER IS PLACED IN RAISE POSITION TO STOW THE BOOM

Step 1. Check selector control valve lever.

If in NEUTRAL or HULL position, place in TURRET position.

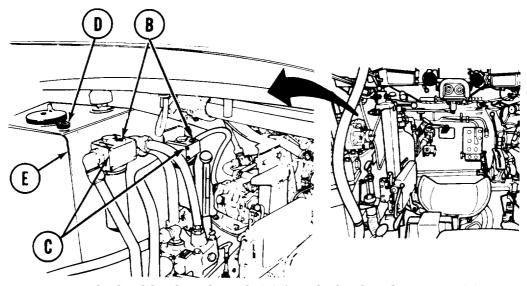
Step 2. Check to see if winch cable hook is attached to hook retaining eye (A) on side of boom.

If it is not, attach to hook retaining eye.



Step 3. Check red buttons (B) on hydraulic oil filters (C).

If red buttons (B) are up, press down. If buttons will not stay down, notify organizational maintenance.



Step 4. Check oil level on dipstick (D) from hydraulic oil reservoir (E).

Add oil if necessary (LO 9-2350-222-12).

## TM 9-2360-222-10-3

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## MAINTAIN TRACK (LOOSEN TRACK TENSION)

Tools:

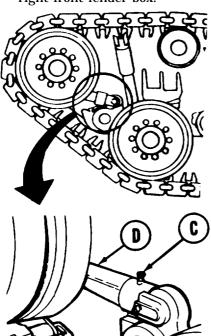
For mechanical link:

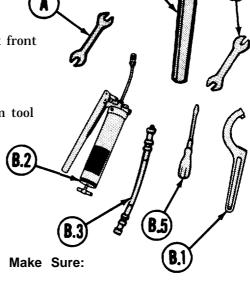
• Get 9/16 inch open end wrench (A) from right front fender box.

Get 3-3/16 inch single open end wrench (B) from right rear fender box.

For grease actuated link:

- Get spanner wrench (B.1) from left front fender box.
- Get grease gun (B.2) from tool bag.
- Get lubrication extension (B.3) from tool bag.
- Get 5/8 inch by 3/4 inch open end wrench (B.4) from tool bag.
- Get flat-tip screwdriver (B.5) from right front fender box.





- Tank is on a hard and level surface.
- Tank is stopped.
- Engine is not running.

#### NOTE

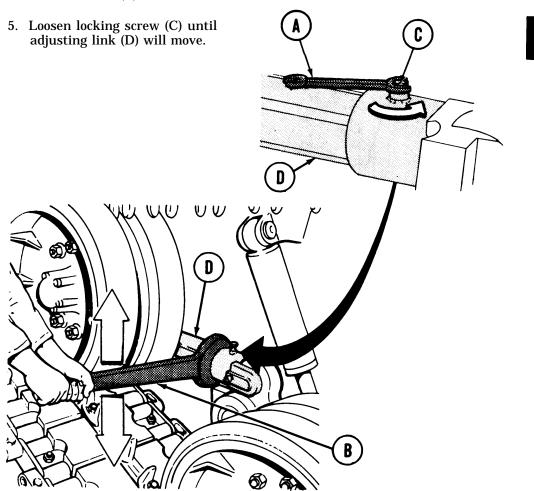
For vehicle with mechanical track adjusting link, go to steps 1 thru 8.

For vehicle with grease actuated track adjusting link, go to steps 9 thru 15.

- 1. Remove dirt and mud from locking screw (C).
- 2. Remove dirt and mud from adjusting link (D).

### MAINTAIN TRACK (LOOSEN TRACK TENSION) - Continued

- 3. Place 9/16 inch open end wrench (A) around locking screw (C).
- 4. Tin-n wrench (A) counterclockwise.



6. Place 3-3/16 inch open end wrench (B) on track adjusting link assembly (D).

## NOTE

On right side of vehicle pull down on wrench (B) to loosen track tension. On left side of vehicle push up on wrench (B) to loosen track tension.

- 7. Push up or pull down on wrench(B) until track sags. Remove wrench.
- 8. If no further maintenance is required, adjust track tension (page 3-85 or page 3-90).

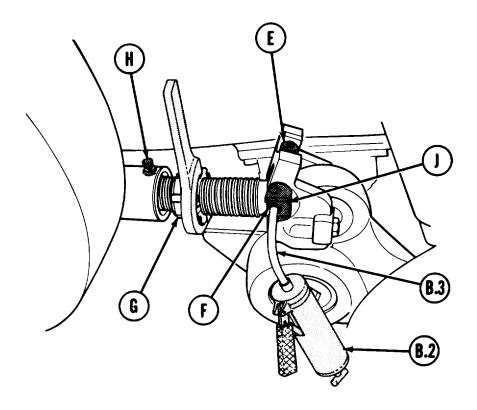
TA249231

Change 2

3-63

## MAINTAIN TRACK (LOOSEN TRACK TENSION) - Continued

9. Remove mud and dirt from pressure relief valve (E), grease fitting (F), threaded locking collar (G), and locking screw (H).



- 10. Insert lubrication extension (B.3) into bracket (J) and couple it with grease fitting (F). Couple grease gun  $(B.\ 2)$  to lubrication extension (B.3).
- 11. Loosen locking screw (H) with 3/4 inch open end wrench.
- 12. Pump grease gun (B.2) a few times to release threaded locking collar (G).

### MAINTAIN TRACK (LOOSEN TRACK TENSION) - Continued

#### NOTE

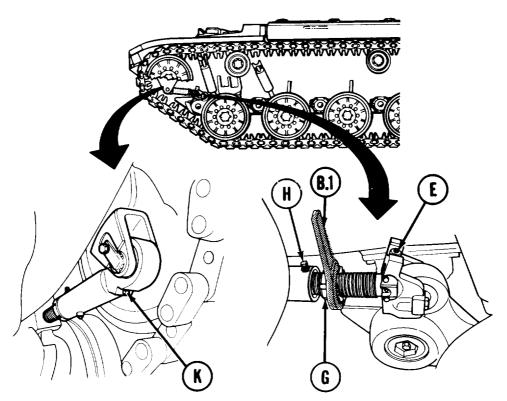
Locking coller (G) may first require tightening to break loose trapped dirt prior to loosening.

13. Back off locking collar (G) using spanner wrench (B.1).

### WARNING

Wear gogles and cover relief valve (E) with a rag to prevent grease from getting into eyes. Grease in track adjusting link is under pressure. When relief valve opens it may emit a fine spray of grease. To prevent personnel injury never remove plug (K) to relieve pressure.

- 14. Relieve link internal pressure by lifting pressure relief valve pin (E) with screwdriver.
- 15. Tighten locking screw (H) with 3/4 inch open end wrench.



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Change 2 3-64.1

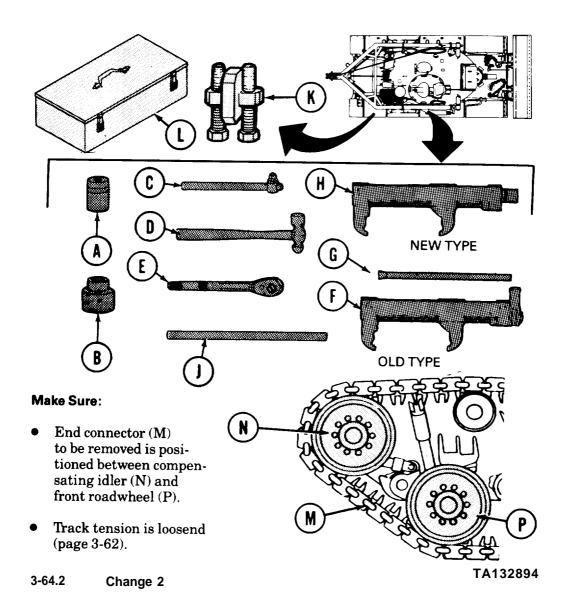
#### MAINTAIN TRACK (REMOVE END CONNECTORS)

#### Tools:

Get from right front fender box:

- 15/16 inch socket with 3/4 inch drive (A).
- 1-1/2 inch socket with 3/4 inch drive (B).
- T-handle socket wrench with 3/4 inch drive (C).
- 2 pound hammer (D).
- Ratchet with 3/4 inch drive (E).
- Two track fixtures (F) with bar (G), if so equipped or two track fixtures (H) used with 3/4 inch drive ratchet (E).
- Extension handle (J).

Get end connector puller (K) from right rear fender box, or hydraulic end connector puller and pump (L).

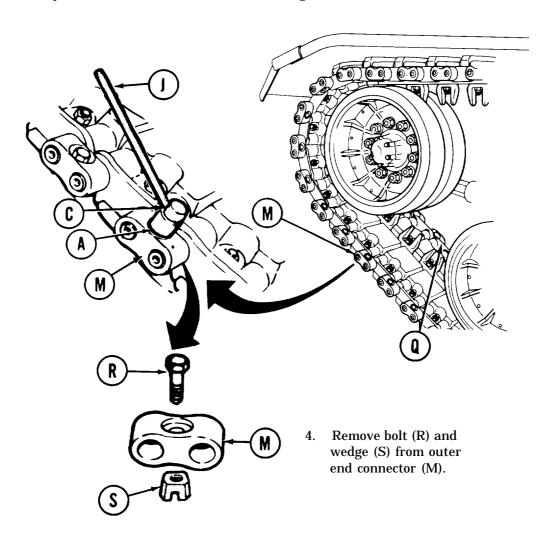


### MAINTAIN TRACK (REMOVE END CONNECTORS) - Continued

### NOTE

Inner end connectors (Q) are removed the same way as outer end connectors (M) as follows below.

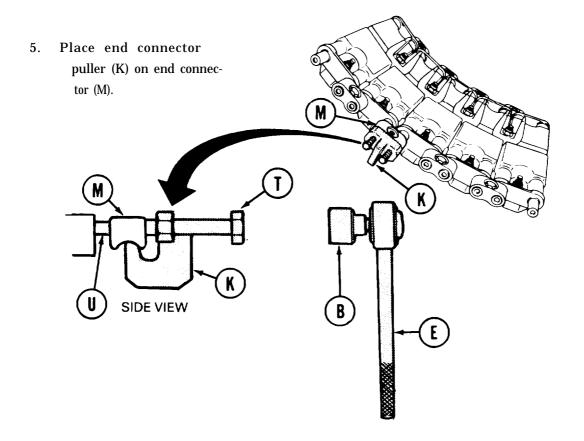
- 1. Place 15/16 inch socket (A), T handle (C), and extension bar (J) on bolt (R).
- 2. Turn counterclockwise to loosen bolt (R). Loosen bolt three turns. Remove socket (A).
- 3. Tap bolt (R), with hammer, to loosen wedge (S).



### MAINTAIN TRACK (REMOVE END CONNECTORS) - Continued

#### NOTE

When using end connector puller (K), do steps 5 and 6 and skip steps 7 thru 10. When using hydraulic end connector puller and pump, skip steps 5 and 6 and do steps 7 thru 10.



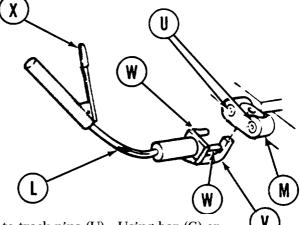
**NOTE** 

It may be necessary to hit seated end connector (M), with hammer, to loosen.

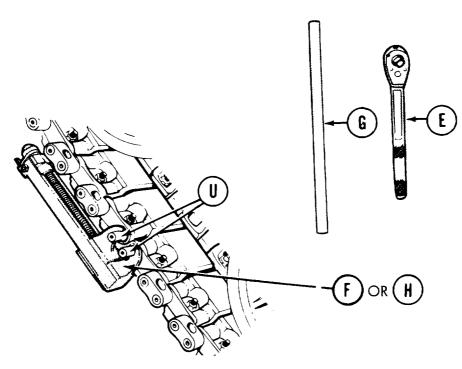
6. Using 1-1/2 inch socket (B) and ratchet (E) with 3/4 inch drive, evenly tighten two puller screws (T). Tighten until about 1 inch of track pins (U) shows behind end connector (M).

## MAINTAIN TRACK (REMOVE END CONNECTOR) - Continued

- 7. Assemble hydraulic end connector puller and pump (L).
- 8. Place hook (V) of hydraulic end connector puller and pump (L) on end connector (M).
- 9. Aline studs (W) with track pins (U).
- 10. Pump handle (X) until about 1 inch of track pins (U) shows behind end connectors (M).

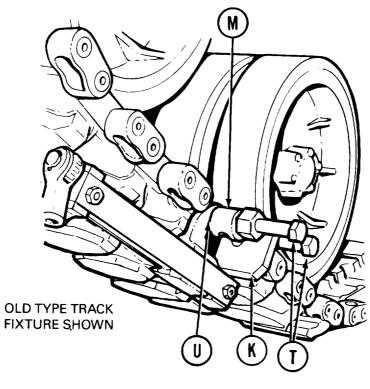


11. Attach track fixture (F) of (H) to track pins (U). Using bar (G) or ratchet (E), turn counterclockwise and tighten.



SHOWN WITH END CONNECTOR REMOVED

## MAINTAIN TRACK (REMOVE END CONNECTORS) - Continued



**NOTE** 

It may be necessary to hit seated end connector (M) with hammer to loosen.

- 12. Tighten puller screws (T) evenly or pump handle on hydraulic end connector pump and puller until end connector (M) pulls free of track pins (U).
- 13. Remove end connector puller (K) or hydraulic end connector pump and puller from end connector (M).

### NOTE

To remove inner end connector, repeat steps 1 thru 13.

- 14. Return end connector puller (K) or hydraulic end connector pump and puller to right rear fender box.
- If no further maintenance is required, install new end connector (page 3-76).

  TA132898

#### **MAINTAIN TRACK (REMOVE CENTERGUIDE)**

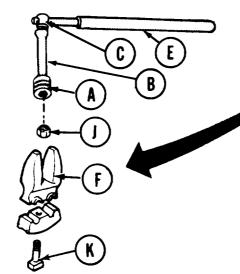
#### Tools:

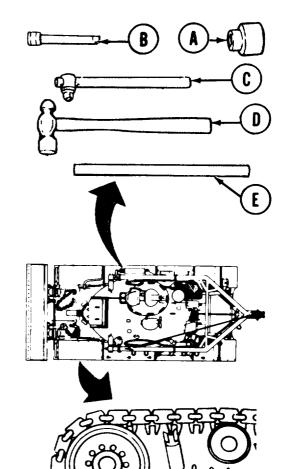
Get tools from right front fender box.

- 1-5/16 inch socket, with 3/4 inch drive (A).
- 4-5/8 inch socket wrench extension with 3/4 inch drive (B).
- T-handle socket wrench with 3/4 inch drive (C).
- 2 pound hammer (D).
- Extension handle (E).

#### Make Sure:

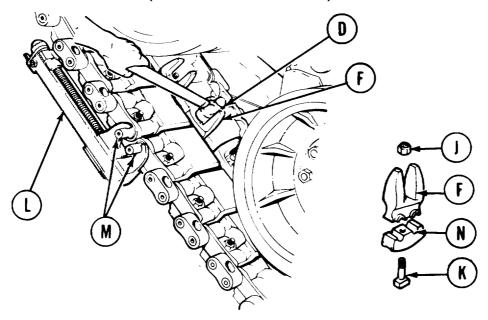
- Vehicle is stopped on hard level surface.
- Centerguide (F) is positioned between compensating idler (G) and number one roadwheel (H).
- Engine is not running,





- 1. Place 1-5/16 inch socket (A), socket wrench 4-5/8 inch extension (B), Thandle socket wrench (C), and extension handle (E) on centerguide nut (J).
- 2. Turn counterclockwise to loosen nut (J) until it is flush with bolt (K).

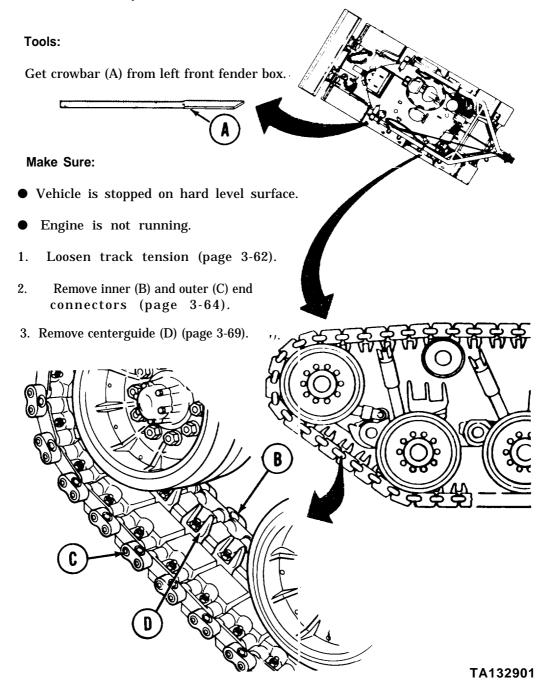
## MAINTAIN TRACK (REMOVE CENTERGUIDE) - Continued



- 3. Loosen track fixture (L) (if installed) until laying loose on pins (M).
- 4. Hit nut (J) and bolt (K) with hammer (D) until cap (N) is loose.
- 5. Remove nut (J).
- 6. Remove centerguide (F), cap (N), and bolt (K).
- 7. If no further maintenance is required, install new centerguide (page 3-78).

## **NOTE**

Two crewmembers are needed to do this procedure.



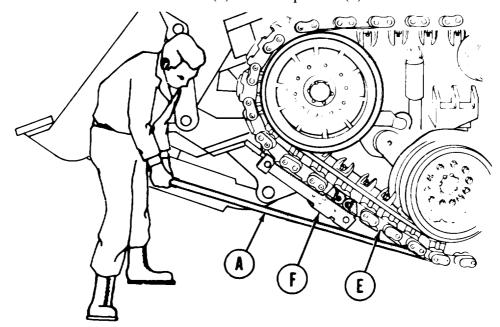
### MAINTAIN TRACK (BREAK TRACK) Continued

### **WARNING**

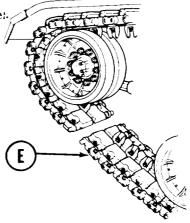


Crewmember holding up track with crowbard must stand to side of track not in front of track. Do not allow personnel in front of track. Injury could result if track suddenly separates.

4. One crewmember use crowbar (A) to hold up track (E).



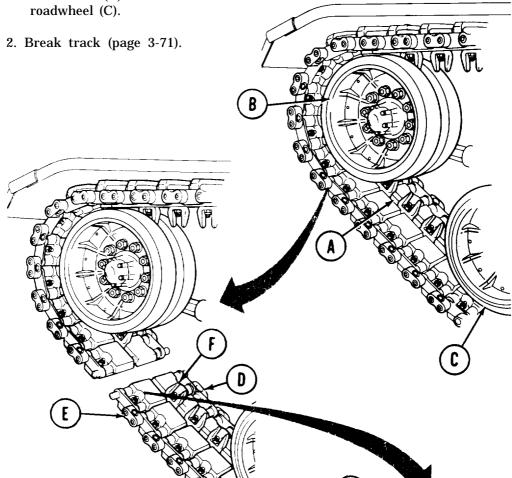
- 5. Turn each fixture (F) clockwise evenly until loose. Remove fixtures from track.
- 6. Remove crowbar (A). Allow track (E) to fall free:
- 7. Return crowbar to stowage.



TA132902

## MAINTAIN TRACK (REMOVE TRACK LINK)

1. Move vehicle until bad link (A) is between compensating idler wheel (B) and front roadwheel (C).



- Remove inner end connector
   (D) and outer end connector
   (E) (pages 3-64 thru 3-68).
   Track fixtures are not needed.
- 4. Remove centerguide (F) (page 3-69).
- 5. Track link (A) will fall free.
- 6. Thrn in bad link.

## MAINTAIN TRACK (INSTALL TRACK LINK)

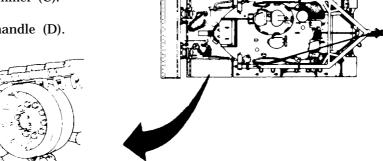
#### **NOTE**

Two crewmembers are needed to do this procedure.

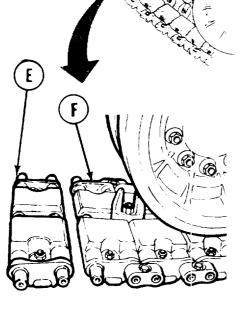
#### Tools:

Get the following tools from right front fender box:

- ullet 15/16 inch socket, with 3/4 inch drive (A).
- T-handle socket wrench, with 3/4 inch drive (B).
- 2 pound hammer (C).
- Extension handle (D).

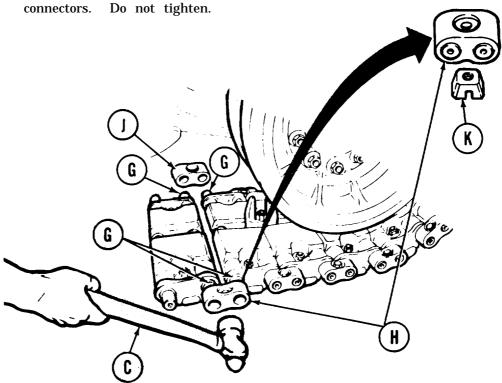


1. Place new track link (E) in front of track (F).

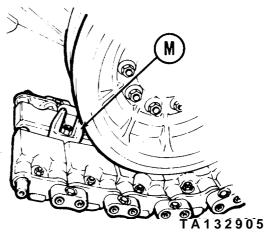


# MAINTAIN TRACK (INSTALL TRACK LINK) - Continued

- 2. One crewmember lineup track link pins (G).
- 3. Other crewmember, using hammer (C), pound end connectors (H ax-m J) onto pins.
- 4. Place wedge (K) and bolt (L) on end connectors. Do not tighten.

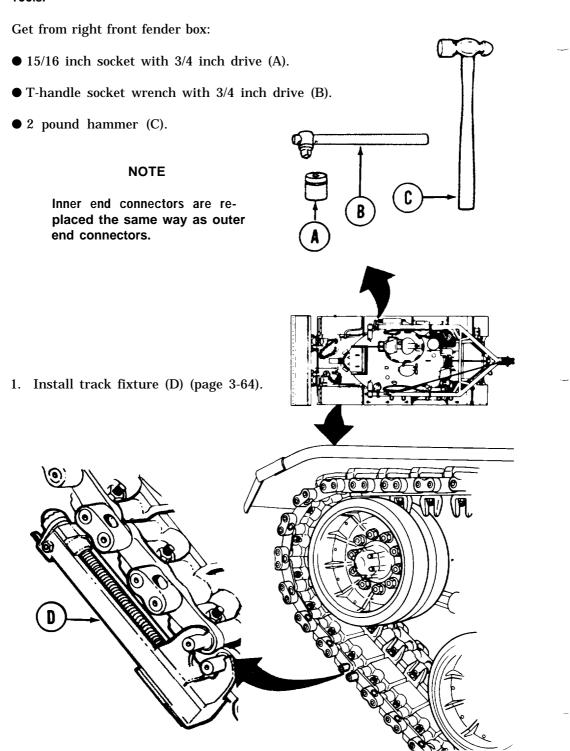


- 5. Check that end connectors (H and J) are tight against track before tightening bolts (L).
- 6. Tighten bolts (L) to snug only.
- 7. Install centerguide (M) (page 3-78).
- 8. Connect track (page 3-79).
- 9. Return tools to stowage.



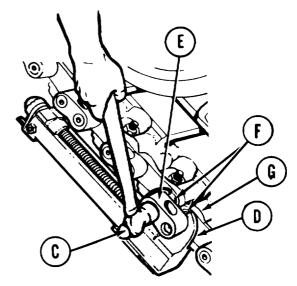
# MAINTAIN TRACK (INSTALL END CONNECTORS)

#### Tools:

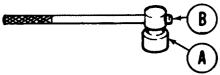


## MAINTAIN TRACK (INSTALL END CONNECTORS) - Continued

2. Using hammer (C), tap end connector (E) onto link pins (F) until it touches track fixture (D).



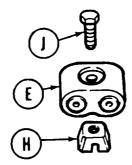
- 3. Turn track fixture (D) clockwise until loose. Remove from track.
- 4. Using hammer (C), pound end connector entirely onto pins until it hits track (G).
- 5. Set wedge (H) in end connector (E).



**NOTE** 

If organizational mechanic is available, have him torque bolt (J). If organizational mechanic is not available, tighten bolt tightly. Have organizational mechanic torque bolt (J) as soon as possible.

- 6. Using T-handle (B) and 15/16 inch socket (A), tighten bolt (J) by turning clockwise.
- 7. Return tools to stowage,



### MAINTAIN TRACK (INSTALL CENTERGUIDE)

#### Tools:

Get from right front fender box:

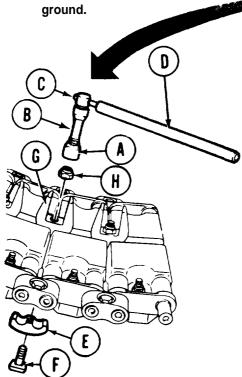
- 1-5/16 inch socket with 3/4 inch drive (A).
- 4-5/8 inch socket wrench extension with 3/4 inch drive (B).
- T-handle socket wrench with 3/4 inch drive (C).
- Extension handle (D).

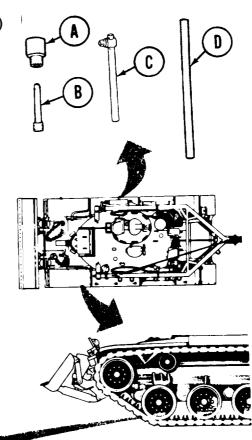
#### Make Sure:

 Centerguide has been removed (page 3-69).

### **NOTE**

If replacing track link on broken track, put crowbar under track pads to lift track off the





- 1. Line up cap (E) and bolt (F) with centerguide (G).
- 2. Screw nut (H) onto bolt (F).
- 3. Place 1-5/16 inch socket (A), 4-5/8 inch extension (B), T-handle wrench (C), and extension handle (D) on centerguide nut (H).
- 4. Turn nut clockwise to tighten.

#### **NOTE**

If organizational mechanic is available, have him torque nut (H). If organizational mechanic is not available, tighten nut (H) tightly and have organizational mechanic torque it as soon as possible.

5. Return tools to stowage.

## MAINTAIN TRACK (CONNECT TRACK)

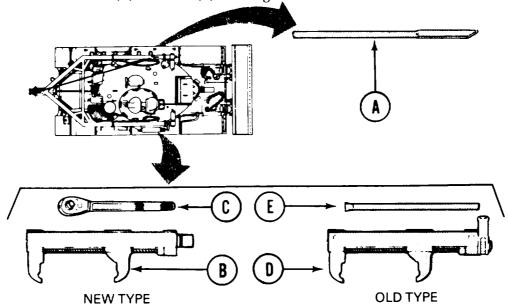
## NOTE

Three crewmembers are needed to do this procedure.

#### Tools:

Get crowbar (A) from left front fender box.

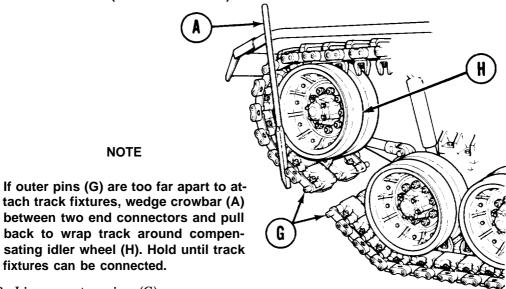
Get two track fixtures (B) used with 3/4 inch drive ratchet (C), if so equipped, or two track fixtures (D) with bar (E) from right front fender box.



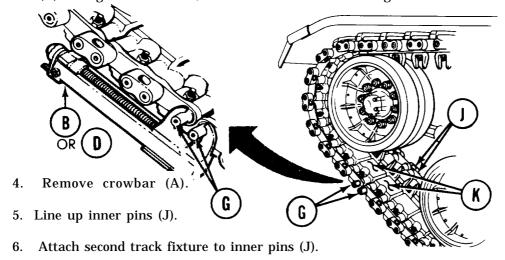
1. One crewmember lift track (F) with crowbar (A).

3-79

#### **MAINTAIN TRACK (CONNECT TRACK) - Continued**



- 2. Lineup outer pins (G).
- 3. Other two crewmembers attach track fixture (B) or (D) to outer track pins (G). Using ratchet or bar, turn counterclockwise and tighten.



7. Tighten both track fixtures (B) or (D) evenly by turning counterclockwise until links (K) 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 3-76).

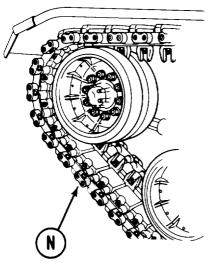
#### **MAINTAIN TRACK (CONNECT TRACK) - Continued**

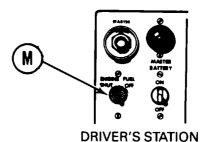
9. Install centerguide (page 3-78).

#### **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 thru 25. Have organizational mechanic torque bolts as soon as possible.

- 10. Loosen centerguide bolt one turn.
- 11. Start engine (page 2-205).
- 12. Move vehicle until end connector is located at point (L). Stop vehicle (page 2-213).
  - 13. Move shift lever to P (park) (Page 2-215).
  - 14. Push ENGINE FUEL SHUTOFF switch (M) up. Hold until engine stops.





15. Set parking brake (page 2-213).

#### NOTE

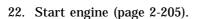
Do not use extension bar to tighten bolts.

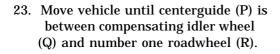
- 16. Tighten inner and outer end connector bolts.
- 17. Start engine (page 2-205).
- 18. Move vehicle until end connector is located at point (N).

#### TM 9-2350-222-10-3

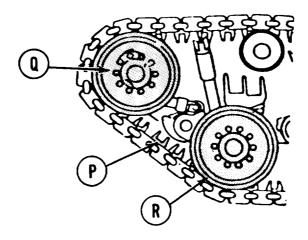
## MAINTAIN TRACK (CONNECT TRACK) - Continued

- 19. Move vehicle until end connector is located at point (L).
- 20. Repeat steps 13 thru 15.
- 21. Tighten inner and outer end connector bolts.





- 24. Repeat steps 13 thru 15.
- 25. Tighten centerguide bolt.



- 26. Adjust track tension (page 3-85 or page 3-90).
  - 27. Return tools to stowage.

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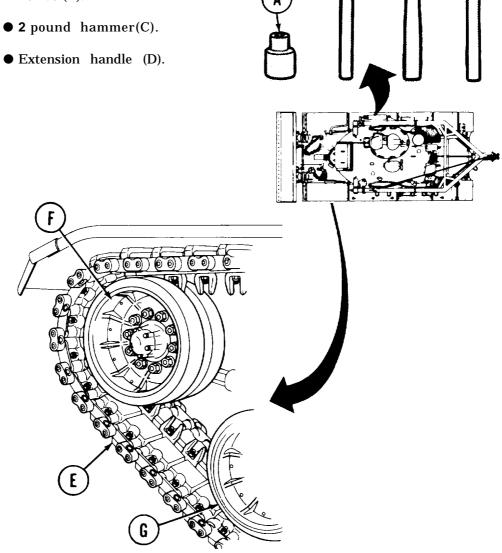
3 - 8 2 Change 2

# MAINTAIN TRACK (REMOVE AND INSTALL T-142 TRACK PAD)

### Tools:

Get from right front fender box:

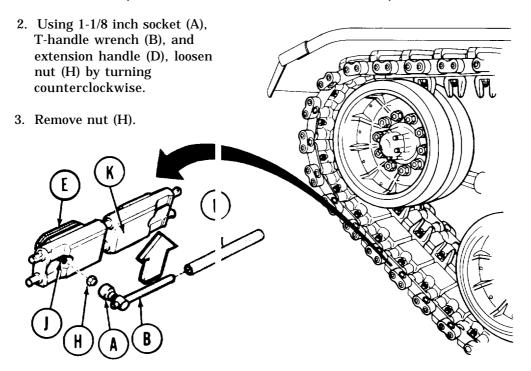
- 1-1/8 inch socket with 3/4 inch drive (A).
- T-handle wrench with 3/4 inch drive (B).



#### To Remove:

1. Move vehicle until bad track pad (E) is between compensating idler wheel (F) and front roadwheel (G). TA132913

## MAINTAIN TRACK (REMOVE AND INSTALL T-142 TRACK PAD) - Continued



4. Hit bolt (J) with hammer to remove pad (E) from link assembly (K).

#### To Install:

- 1. Place new pad (E) on link assembly (K).
- 2. Screw nut (H) on bolt (J).
- 3. Using socket (A), T-handle wrench (B), and extension (D), tighten nut (H).

#### **NOTE**

Have organizational maintenance torque nut as soon as possible.

4. Return tools to stowage.

# MAINTAIN TRACK (ADJUST TRACK TENSION - MECHANICAL)

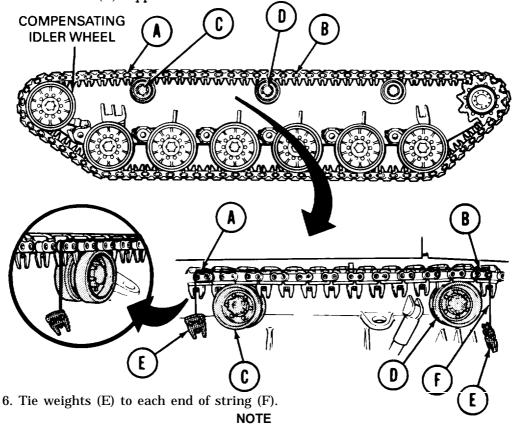
#### **NOTE**

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 2-215).
- 4. Shut off engine.
- 5. Remove dirt and mud from end connectors (A) to (B) near first (C) and second (D) support rollers.

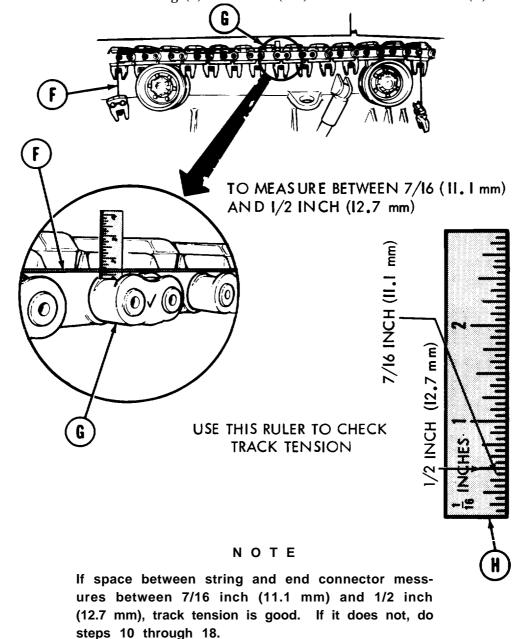


String must be placed over end connectors where it will hang free just beyond support rollers (C) and (D).

7. Place string over center of end connectors (A) and (B).

# MAINTAIN TRACK (ADJUST TRACK TENSION - MECHANICAL) - Continued

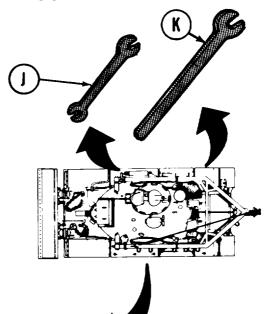
8. Find center of string (F) and mark ( ✓ ) nearest end connector (G).

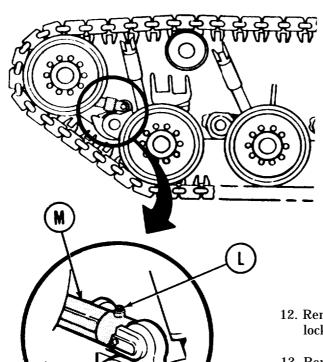


9. Using ruler (H), measure distance between string (F) and marked ( ✓ ) end connector (G).

MAINTAIN TRACK (ADJUST TRACK TENSION - MECHANICAL) - Continued

- 10. Get 9/16 inch open end wrench (J) from right front fender box.
- 11. Get 3-3/16 inch single open end wrench (K) from right rear fender box.





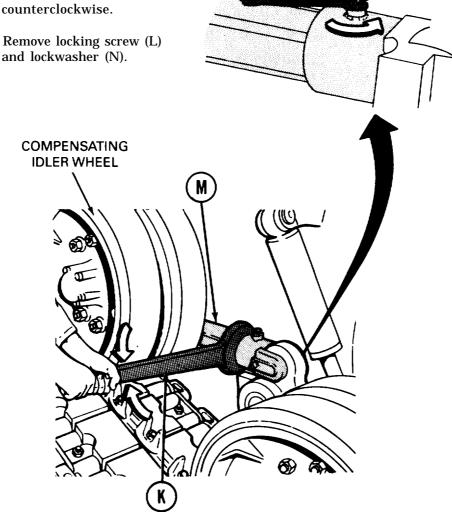
- 12. Remove dirt and mud from locking screw (L).
- 13. Remove dirt and mud from adjusting link (M).

TA249237

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## **MAINTAIN TRACK (ADJUST TRACK TENSION -MECHANICAL) - Continued**

- 14. Place 9/16 inch open end wrench (J) around locking screw (L).
- 15. Turn wrench (J) counterclockwise.
- 16. Remove locking screw (L)



17. Place 3-3/16 inch open end wrench (K) on track adjusting link (M).

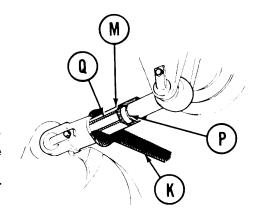
# MAINTAIN TRACK (ADJUST TRACK TENSION - MECHANICAL) - Continued

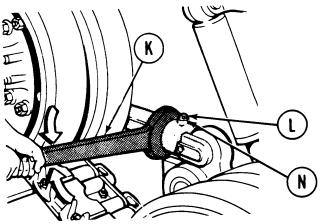
#### NOTE

To adjust track tension on right side of vehicle, pull wrench (K) 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 (M) beyond groove (P). If track tension is still too loose after groove appears, remove track link (page 3-73) 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 (M) with wrench (K).
- 19. Repeat step 9. (Read CAUTION on top of this page.)

#### NOTE

When installing and tightening lockwasher (N) and locking screw (L), make sure high side (Q) of adjusting link is lined up with locking screw (L).

- 20. Install and tighten lockwasher (N) and locking screw (L).
- 21. Lubricate adjusting link (LO 9-2350-222-12).
- 22. Return tools and supplies to stowage.

TA249239

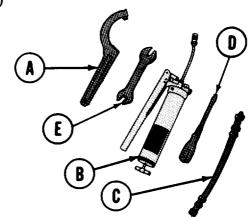
Change 2 3-89

MAINTAIN TRACK (ADJUST TRACK TENSION - GREASE ACTUATED ADJUSTING LINK)

#### Tools:

Get spanner wrench (A) from left front fender box.

Get from tool bag: Grease gun (B) Lubrication extension (C) Flat tip screwdriver (D) 5/8 in x 3/4 in wrench (E)

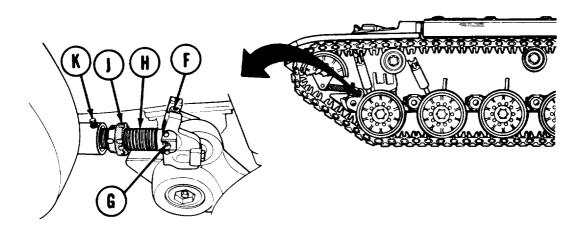


NOTE

Track tension adjustment must be performed after all inspection faults have been corrected.

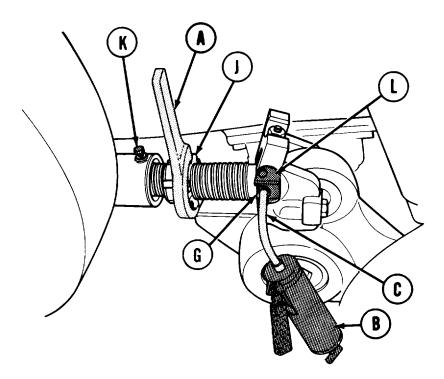
Do not use any other method to check track tension when grease actuated track adjusting link is installed.

- 1. Move tank forward on hard, level surface and coast to a stop without applying brakes.
- 2. Remove/clean grease, mud, and dirt from pressure relief valve (F). grease fitting (G), threaded locking collar (J), and locking screw (K).



# MAINTAIN TRACK (ADJUST TRACK TENSION GREASE ACTUATED ADJUSTING LINK) - Continued

- 3. Attach lubrication extension (C) to grease gun (B). Insert lubrication extension (C) into bracket (L) and couple it with grease fitting (G).
- 4. Loosen and partially unscrew locking screw (K) using wrench.
- 5. Give grease gun (B) a few pumps to release threaded locking collar (J).
- 6. Back off threaded locking collar (J), using spanner wrench (A).



TA249241

Change 2 3-90.1

# MAINTAIN TRACK (ADJUST TRACK TENSION - GREASE ACTUATED ADJUSTING LINK) - Continued

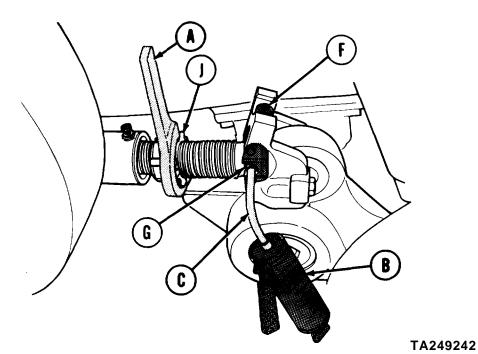
#### NOTE

Threaded locking collar (J) may require tightening to break loose trapped dirt prior to loosening.

- 7. Pump grease into grease actuated adjusting link until grease exits from pressure relief valve (F).
- 8. Tighten threaded locking collar (J), using spanner wrench (A).
- 9. Disconnect lubrication extension (C) from grease fitting (G).
- 10. Remove lubrication extension (C) and grease gun (B).
- 11. Repeat steps 1 through 10 above, for opposite side of tank.
- 12. Repeat steps 1 through 11 two more times (a total of three tension adjustments for each side of tank, made alternately).

#### **NOTE**

Do not make successive tension adjustments on same side of tank. Always alternated sides.



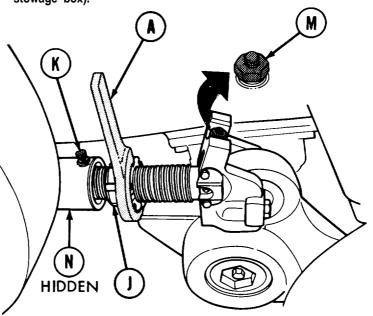
3-90.2 Change 2

# MAINTAIN TRACK (ADJUST TRACK TENSION - GREASE ACTUATED ADJUSTING LINK) - Continued

- 13. Using spanner wrench (A), aline the nearest slot in the threaded locking collar (J) with locking screw (K) and tighten locking screw (both sides of tank).
- 14. Relieve link internal pressure by lifting the pressure relief valve pin (M) with a screwdriver.

#### NOTE

If grease exits from extension limiting valve (N), remove a track link (page 3-73) and readjust track (stow removed track link in fender stowage box).



15. Return tools to stowage.

TA249243

Change 2 3-90.3

#### MAINTAIN TRACK (INSTALL THROWN TRACK)

#### **NOTE**

Four crewmembers are needed to do this procedure.

#### **Tools and Supplies:**

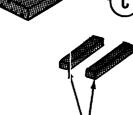
- Get crowbar (A) from left front fender box.
- 30 foot length of 3/4 inch rope (B) (item 57, Appendix D).
- 3 foot by 3 foot metal plate or 3 foot by 3 foot by 3 inch thick wood board (C),
- 2, 1 foot by 3 inch by 2 foot pieces of wood (D) (to block track).

#### Make Sure:

- Hydraulic system is turned off (page 2-252).
- Engine is off.







#### CAUTION

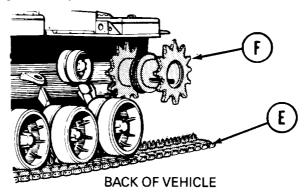
If vehicle cannot be moved under its own power without causing damage to vehicle or track, do not try to remove track. Get help from organizational maintenance.

- 1. Remove rear fender (page 3-96).
- 2. Break track (if not already broken) (page 3-71).

#### CAUTION

Make sure personnel are clear from rear of vehicle. Use ground guide to direct movement of track.

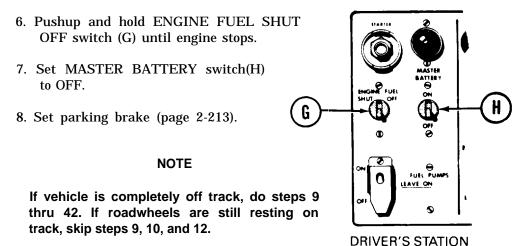
- 3. Start engine, warm up, and let idle (page 2-205).
- 4. Drive vehicle rearward slowly until track (E) is free of drive sprocket (F) (page 2-233).



TA132920

3-90.4

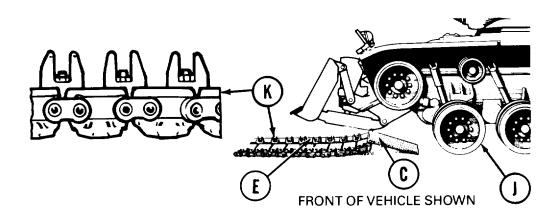
5. Move shift lever to P (park) (page 2-215).



9. Lineup track(E) with roadwheel (J) (front or rear of vehicle).

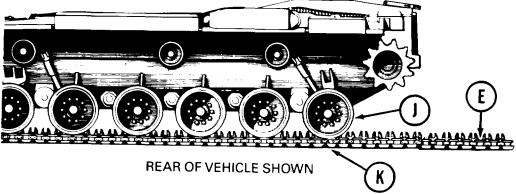
#### **NOTE**

Use heavy metal plate or thick wood board (C) to drive roadwheel (J) onto track (E). If metal plate or board is not available, dig a hole under track so upper part of links (K) are even with ground.



10. Use metal plate or wood board (C)as ramp.

- 11. Start engine, warm up, and let idle (page 2-205).
- 12. Drive vehicle onto track (E) (page 2-223).
- 13. Stop vehicle when number six (last) roadwheel (J) is resting on sixteenth link (K),

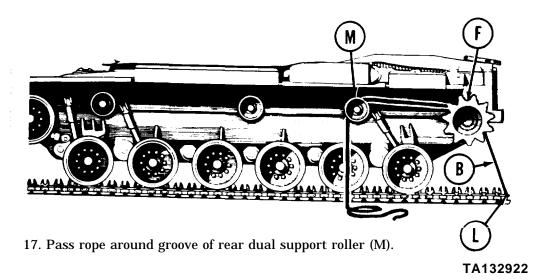


14. Repeat steps 5 thru 8.

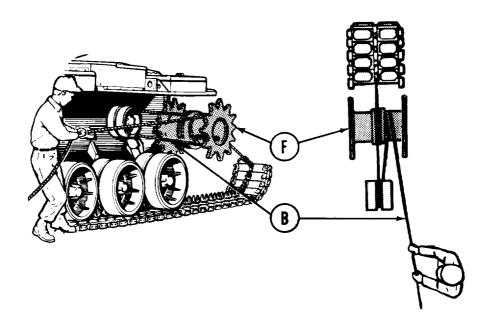
## **NOTE**

Block opposite track front and rear. Use 30-foot piece of rope (B) to move track onto vehicle.

- 15. Tie rope to center of link pin (L).
- 16. Pass rope (B) over centerguide groove of drive sprocket (F).



18. Pass rope (B) under and around outer surface of drive sprocket (F) two times.

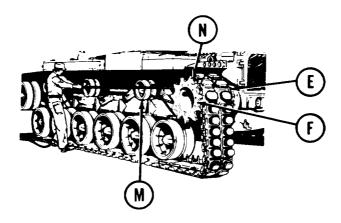


19. Pull free end of rope (B) and hold tightly.

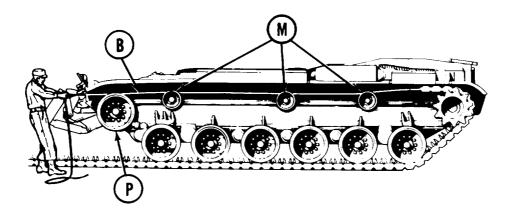
## **NOTE**

### Remove blocks from opposite side.

- 20. Start engine, warm up, and let idle (page 2-205).
- 21. Hold brake. Move shift lever to L (low) (page 2-215).
- 22, Steer slightly away from track (page 2-219).
- 23. Slowly release brake.
- 24. Hold rope (B) at free end while driver accelerates engine until drive sprocket (F) turns slowly.



- 25. Guide free end of track (E) onto drive sprocket (F).
- 26. Stop forward movement of vehicle when three end connectors (N) are on drive sprocket (F).
- 27. Repeat steps 5 thru 8.
  - 28. Remove rope from around sprocket (F) and support roller (M).



- 29. Pass rope (B) over and between three support rollers (M).
- 30. Pass rope (B) over compensating idler wheel (P). Pull and hold rope (B) tight.
- 31. Start engine, warm up, and let idle (page 2-205).

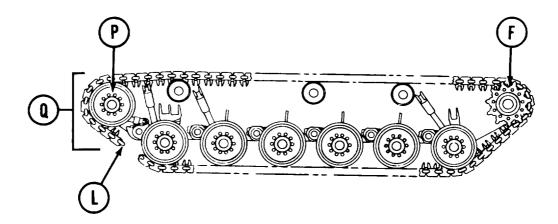
## 3-94 Change 6

- 32. Stepping on brake, move shift lever to L (low) (page 2-215).
- 33. Slowly release brake (page 2-213).

#### **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 (P).

- 34. Accelerate engine enough to slowly turn drive sprocket (F).
- 35. Continue forward until eight track links (Q) pass over compensating idler wheel (P).



- 36. Repeat steps 5 through 8.
- 37. Remove rope from track link pin (L).
- 38. Connect track (page 3-79).
- 39. Adjust track tension (page 3-85).
- 40. Install rear fender (page 3-101).
- 41. Return tools and supplies to stowage.

# **MAINTAIN TRACK (REMOVE REAR FENDER)**

#### **NOTE**

Two crewmembers are needed to do this procedure.

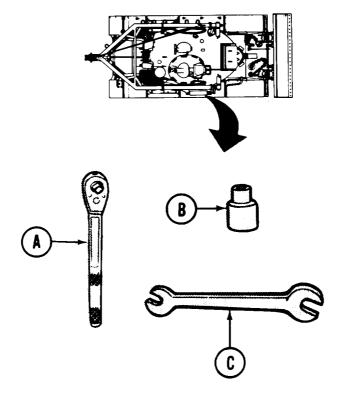
#### Tools:

Get from right front fender box:

- Ratchet with 1/2 inch drive (A).
- 9/16 inch socket with 1/2 inch drive (B).
- 9/16 inch open end wrench (C).

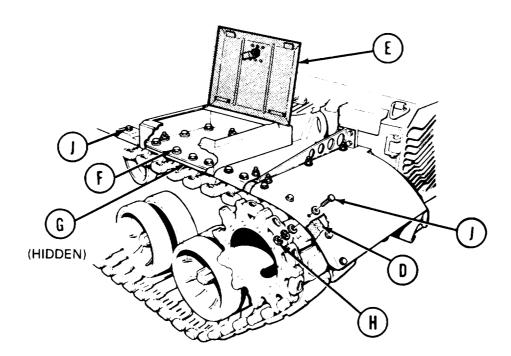
#### Make Sure:

- Vehicle is parked.
- Engine is off.



## To Remove Angle (D):

- 1. Open rear fender box cover (E) to get at screws (F).
- 2. Put open end wrench on nuts (G). Using socket and ratchet on screws (F), loosen screws.
- 3. Remove four nuts (G), four lockwashers, eight flat washers, and four screws (F).
- 4. Put open end wrench on nuts (H). Using socket with ratchet on screws (J), loosen screws.
- 5. Remove eight nuts (H), eight lockwashers, sixteen flat washers, and eight screws (J).
- 6. Remove angle (D).
- 7. Put angle and hardware off to one side.
- 8. Close fender box cover (E).



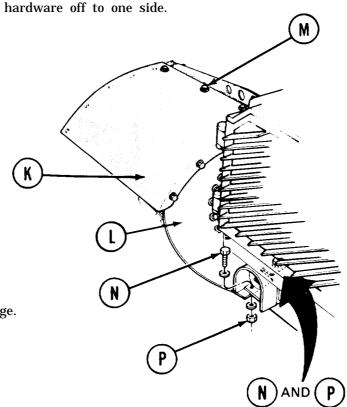
## MAINTAIN TRACK (REMOVE REAR FENDER) - Continued

#### **NOTE**

If right rear fender is to be removed, first remove telephone handset box support (page 3-99). Then do steps on this page.

## To Remove Fender (K) and Shield (L):

- 1. Using socket with ratchet on nuts (M), loosen nuts.
- 2. Remove three nuts (M) and flat washers.
- 3. Put open end wrench on screws (N). Using socket with ratchet on nuts (P), loosen nuts.
- 4. Remove two nuts (P), four flat washers, and two screws (N).
- 5. Remove fender (K) and shield (L).
- 6. Put fender, shield, and hardware off to one side.



7. Return tools to stowage.

TA252958

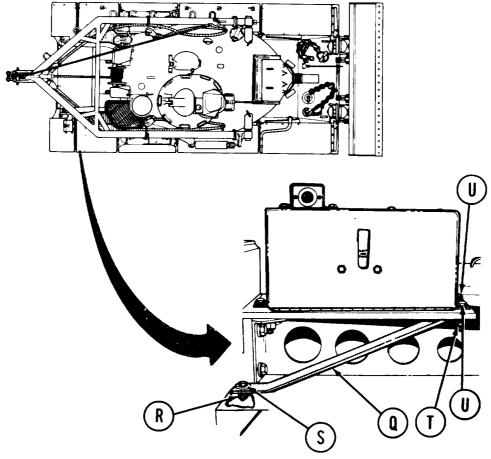
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#### MAINTAIN TRACK (REMOVE REAR FENDER) - Continued

## To Remove Telephone Handset Box Support (Q) From Right Rear Fender:

## (Early type telephone handset box mounting)

- 1. Put open end wrench on nut (R). Using socket with ratchet on screw (S). loosen screw.
- 2. Remove one nut (R), two flat washers, and one screw (S).
- 3. Put open end wrench on nuts (T). Using socket with ratchet on screws (U), loosen nuts.
- 4. Remove two nuts (T), flat washers, and screws (U).
- 5. Remove support (Q).
- 6. Put support and hardware off to one side.



TA252959

Change 1 3-99/(3-100 blank)

# MAINTAIN TRACK (INSTALL REAR FENDER)

#### **NOTE**

Two crewmembers are needed to do this procedure.

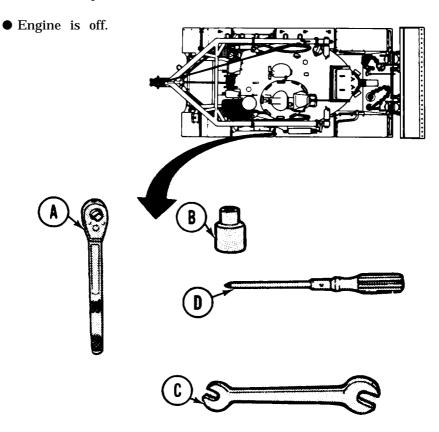
#### Tools:

Get from right front fender box:

- Ratchet with 1/2 inch drive (A),
- 9/16 inch socket with 1/2 inch drive (B).
- 9/16 inch open end wrench (C).
- Cross-tip screwdriver (D).

#### Make Sure:

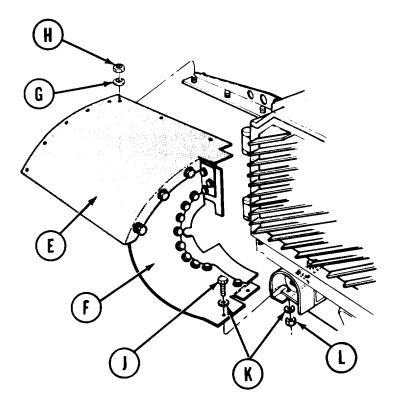
• Vehicle is parked.



# MAINTAIN TRACK (INSTALL REAR FENDER) - Continued

# To Install Fender (E) and Shield (F):

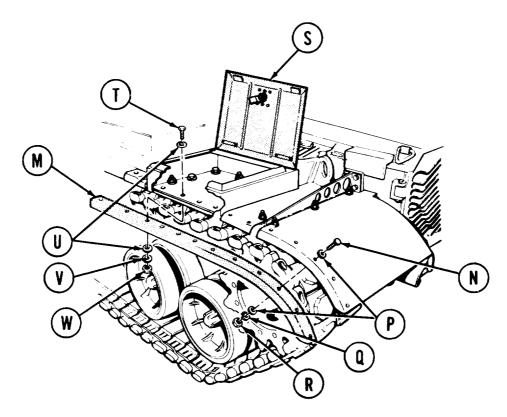
- 1. Put fender (E) and shield (F) in place,
- 2. Using fingers, install three flat washers (G) and nuts (H).
- 3. Using fingers, install two screws (J), four flat washers (K), and two nuts (L). (If necessary, aline holes with screwdriver.)



TA132932

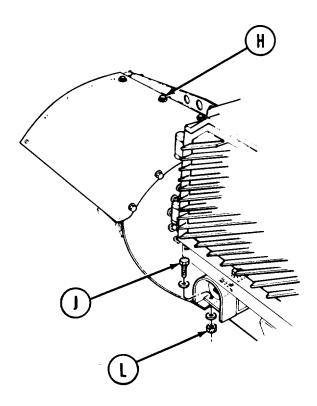
## To Install Angle (M):

- 1. Put angle (M) in place.
- 2. Using fingers, install eight screws (N), sixteen flat washers (P), eight lockwashers (Q), and eight nuts (R). (If necessary, aline holes with screwdriver).
- 3. Open rear fender box cover (S).
- 4. Using fingers, install four screws (T), eight flat washers (U), four lockwashers (V), and four nuts (W).
- 5. Place open end wrench on nuts (R) and (W).
- 6. Using socket with ratchet on screws (N) and (T), tighten screws.
- 7. Close fender box cover (S).



# MAINTAIN TRACK (INSTALL REAR FENDER) - Continued

- 8. Put open end wrench on screw (J).
- 9. Using socket with ratchet on nuts (L) and (H), tighten nuts.



# **NOTE**

Installation of right rear fender requires installation of telephone handset box support (page 3-105).

10. Return tools to stowage.

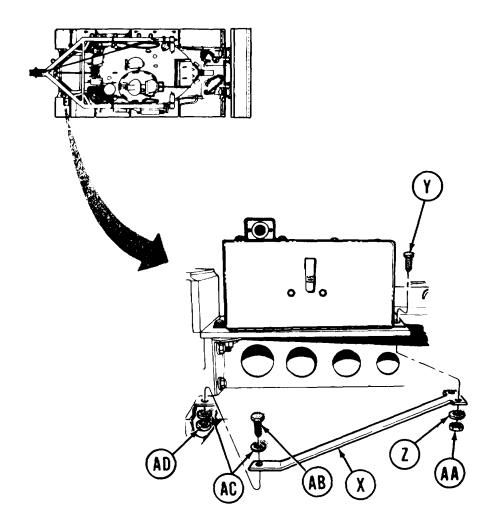
TA252960

3-104 Change 1

## MAINTAIN TRACK (INSTALL REAR FENDER) - Continued

To Install Telephone Handset Box Support (X) On Right Rear Fender Only (Early type telephone handset box mounting)

- 1. Put support (X) in place.
- 2. Using fingers, install two screws (Y), flat washers (Z), and nuts (AA).
- 3. Using fingers, install one screw (AB), two flat washers (AC), and one nut (AD).
- 4. Put open end wrench on nuts (AA) and (AD).
- 5. Using socket with ratchet on screws (Y) and (AB), tighten screws,



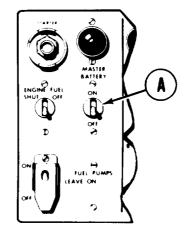
TA252961

Change 1 3-105/(3-106 blank)

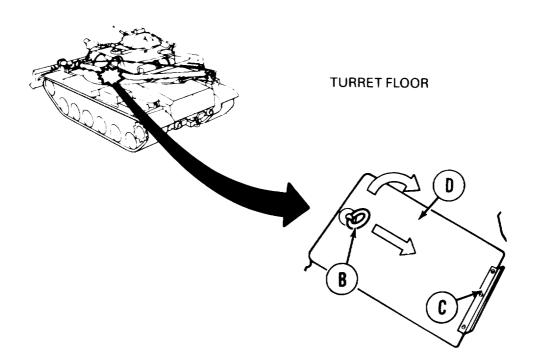
#### MAINTAIN BATTERIES (OPEN BATTERY ACCESS DOOR)

#### Make Sure:

- Engine is off (page 2-536).
- MASTER BATTERY switch (A) is set to OFF.



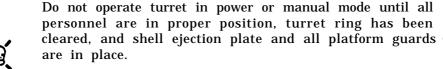
**DRIVER'S STATION** 



- 1. Pull ring (B) back toward hinge (C).
- 2. Raise battery access door (D) on turret platform.

#### WARNING

Do not apply turret power or operate turret controls until all personnel are in safe positions and prepared for turret or gun movement.



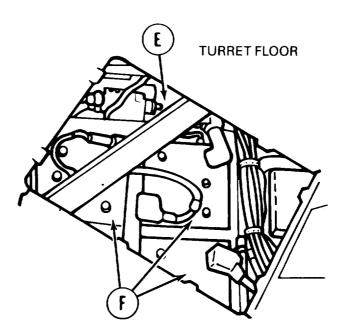
Do not reach into or attempt to enter or exit driver's compartment until turret power switch is off and turret traverse lock is in locked position.

Crew members out of station are in extreme danger when turret power is on. Commanders must shut down turret power before allowing crew members to leave their stations.

#### **NOTE**

It is not possible to gain access through access door opening (E) to, all six batteries (F) at the same time. To make sure all batteries are serviced, work on one battery (F) at a time.

**3.** Traverse turret until each battery (F) is exposed through access door opening (E).





# , C

#### WARNING

Remove all rings, jewelry, and other metal objects before servicing batteries.

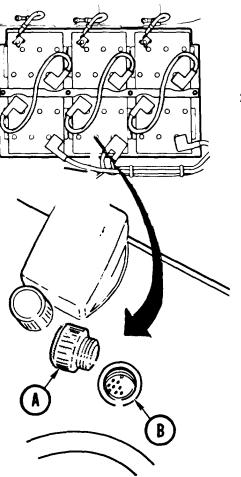


#### **NOTE**

To make sure each battery cell is serviced, remove only one cap (A) at a time.

#### Make Sure:

• Battery access door is open (page 3-107).



- 1. Unscrew battery cap (A).
- 2. Remove battery cap (A) from cell opening (B).

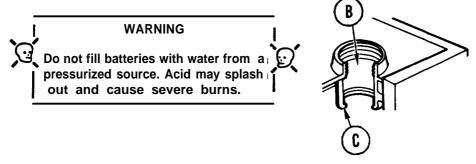
#### **CAUTION**

If battery leakage, corrosion, loose posts, or terminals are detected, notify unit maintenance

Change 5 3-109

#### MAINTAIN BATTERIES (SERVICE BATTERY WATER LEVEL) - Continued

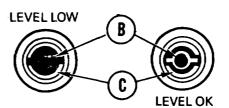
3. Visually check to see if battery water level is up to split ring (C).

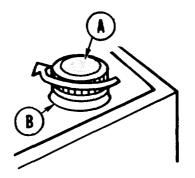


#### **CAUTION**

Do not overfill batteries.

- 4. If level is below split ring (C), add clean water (distilled if available) to bring level to the split ring (C).
- 5. Screw battery cap (A) onto cell opening (B).
- 6. After correcting water level of all batteries, start engine to charge batteries.
- 7. Close battery access door (page 3-115).





#### MAINTAIN BATTERIES (CLEAN BATTERY TERMINALS)



#### **WARNING**

Remove all rings, jewelry, and other metal objects bel fore servicing batteries.

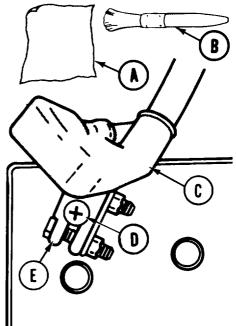
#### **Tools and Supplies:**

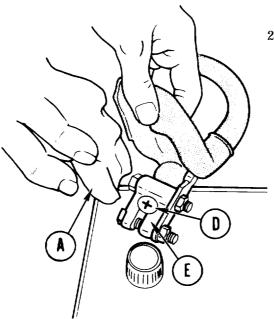
Get clean, dry rags (item 56, Appendix D) (A).

Get brush (item 7, Appendix D) (B). Get grease (item 22, Appendix D).

#### Make Sure:

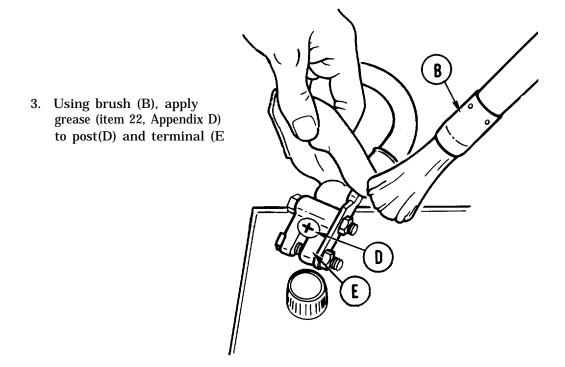
- Battery access door is open (page 3-107).
- 1. Lift battery terminal cover (C) from battery post (D) and terminal (E).

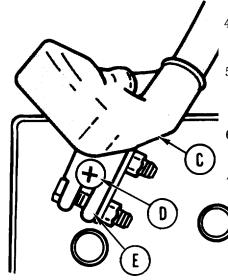




2. Using clean rag (A), wipe battery post (D) and terminal (E) clean.

#### MAINTAIN BATTERIES (CLEAN BATTERY TERMINALS) - Continued



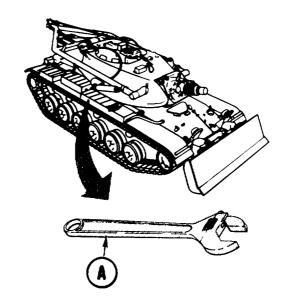


- 4. Push terminal cover (C) over post (D) and terminal (E).
- 5. Repeat steps 1 thru 4 until all posts (D) and terminals (E) are clean.
- 6. Close battery access door (page 3-115).
- 7. Return tools and supplies to stowage.

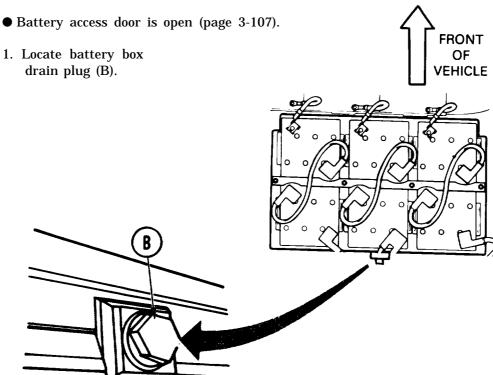
#### MAINTAIN BATTERIES (DRAIN BATTERY BOX IF SO EQUIPPED)

#### Tools:

● Get 12 inch adjustable wrench (A) from right front fender box.

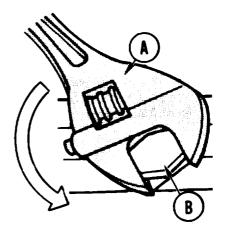


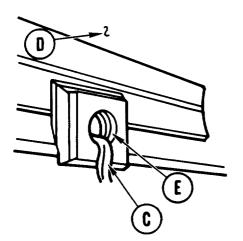
#### Make Sure:



#### MAINTAIN BATTERIES (DRAIN BATTERY BOX- IF SO EQUIPPFD) - Continued

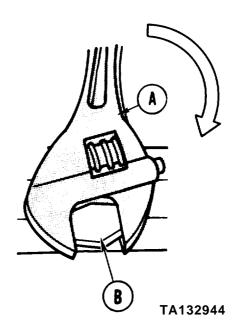
4. Using 12 inch adjustable wrench (A), remove drain plug (B).





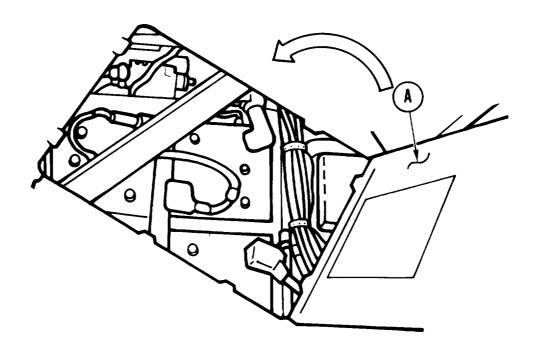
5. Allow liquid (C) to drain from battery box (D) through drain hole (E).

- 6. Using fingers, screw drain plug (B) into battery box.
- 7. Using 12 inch adjustable wrench (A), tighten drain plug (B).
- 8. Close battery access door (page 3-115).
- 9. Return adjustable wrench to stowage.



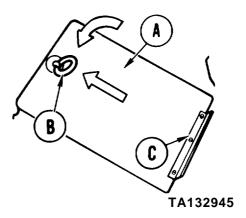
#### MAINTAIN BATTERY (CLOSE BATTERY ACCESS DOOR)

1. Close battery access door (A) on turret platform.



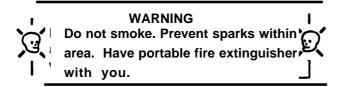
**TURRET FLOOR** 

2. Push ring (B) away from hinge (C) to make sure battery access door (A) is locked.



3-115

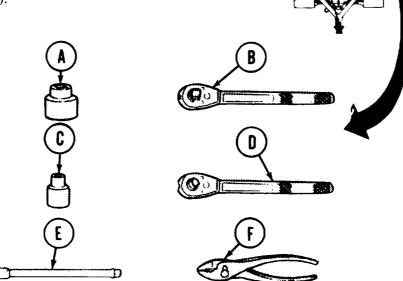
#### PERFORM REFUELING (EMERGENCY)



#### Tools:

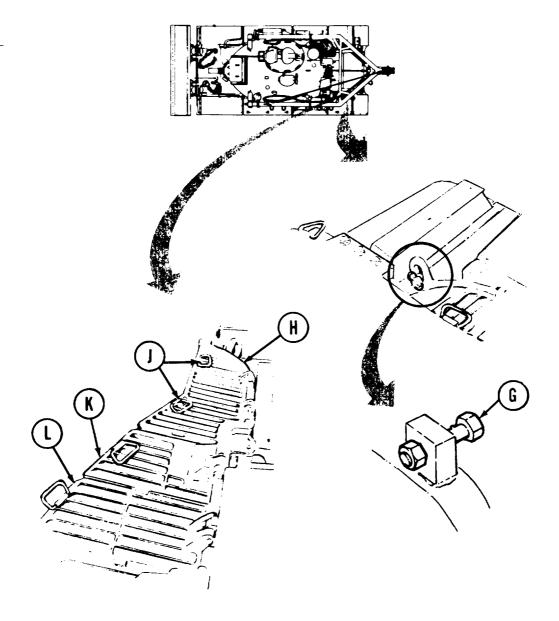
Get from right front fender box:

- 15-16 inch socket with 3/4 inch drive (A).
- Ratchet with 3/4 inch drive (B).
- 7/16 inch socket with 1/2 inch drive (C).
- ullet Ratchet with 1/2 inch drive (D).
- ullet 10 inch extension with 1/2 inch drive (E).
- Pliers (F).



#### Make Sure:

- Vehicle is parked.
- Engine is off.



- 1. Using 15/16 inch socket and 3/4 inch drive ratchet, loosen lock screw (G) on left grille door (H).
- 2. Pull up handles (J) to open grille door (H).
- 3. Open grille door (K), then grille door (L).

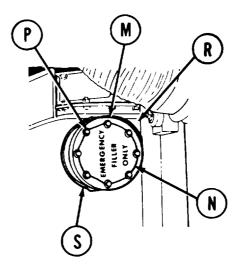
#### PERFORM REFUELING (EMERGENCY) - Continued

- 4. Locate fuel filler cover (M).
- 5. Using pliers, cut and remove lockwire (N).
- 6. Usirw 7/16 inch socket. 10 inch extension, and 1/2 inch drive ratchet, remove eight screws and washers (P).
- 7. Remove cover (M) and gasket (Q) from fuel tank (R).

#### **NOTE**

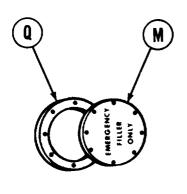
If condtions are sandy or dusty, cover opening around hose.

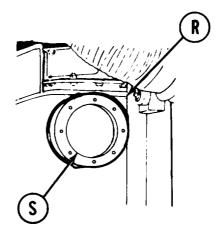
8. Fill fuel tank (R) through opening (S).



#### **NOTE**

Wipe up any spilled fuel immediately.

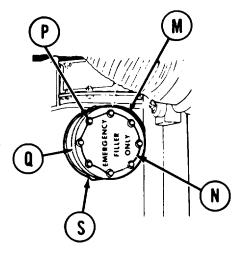


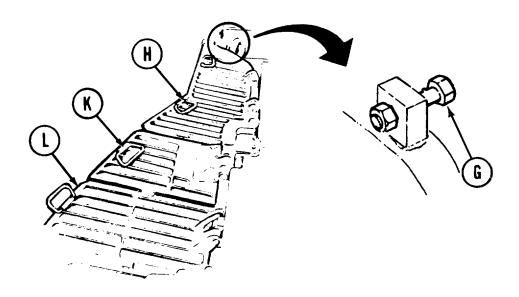


TA132948

#### PERFORM REFUELING (EMERGENCY) - Continued

- 9. Put filler cover (M) and gasket (Q) back opening (S).
- 10. Using 7/16 inch socket, 10 inch extension, and 1/2 inch drive ratchet, install eight screws and washers (P).
- 11. Close top deck grille doors (L), (K), and
- 12. Use 15/16 inch socket and 3/4 inch drive ratchet to secure grille doors with lock screw (G).
- 13. Return tools to stowage.
- 14. Notify organizational maintenance to install lockwire (N) between eight screws (P).





#### PERFORM REFUELING (ISOLATE FUEL TANK)



#### NOTE

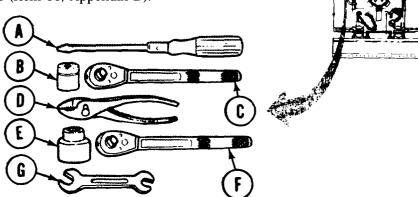
This procedure is to be used to isolate damaged fuel tank.

#### **Tools and Supplies:**

Get from right front fender box:

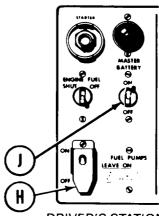
- Flat-tip screwdriver (A).
- 3/4 inch socket with 1/2 inch drive (B),
- Ratchet with 1/2 inch drive (C).
- Pliers (D).
- 1-1/8 inch socket with 3/4 inch drive (E).
- Ratchet with 3/4 inch drive (F).
- 7/16 inch open end wrench (G).

Get rags (item 56, Appendix D).



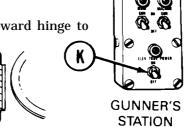
#### Make Sure:

- Vehicle is parked.
- Engine is off.
- FUEL PUMP switch (H) is set to OFF.
- MASTER BATTERY switch (J) is set to ON.
- Turret traverse lock is set to UNLOCKED (page 2-331).



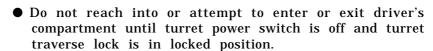
**DRIVER'S STATION** 

- ELEV/TRAV POWER switch (K) is set to ON.
- 1. Pull ring (L) on turret platform door (M) toward hinge to open door.



#### **WARNING**

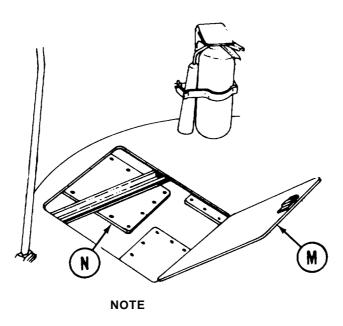
- Do not apply turret power or operate turret controls until all personnel are in safe positions and prepared for turret or gun movement.
- Do not operate turret in power or manual mode until all personnel are in proper position, turret ring has been cleared, and shell ejection plate and all platform guards are in place.



- Crew members out of station are in extreme danger when turret power is on. Commanders must shut down turret power before allowing crew members to leave their stations.
- 2. Traverse turret so main gun is over left front fender (page 2-502).

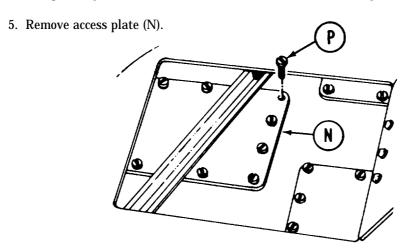


3. Position turret platform door (M) over center access plate (N) in turret floor.

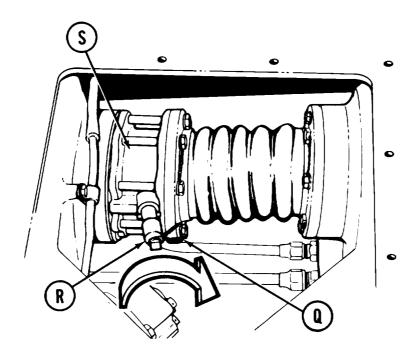


It may be necessary to manually traverse turret to remove all screws from access plate.

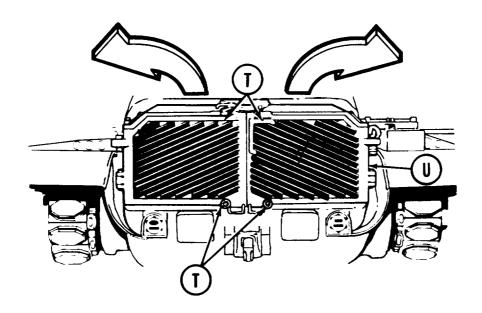
4. Using flat-tip screwdriver, remove 14 screws (P) from access plate (N).



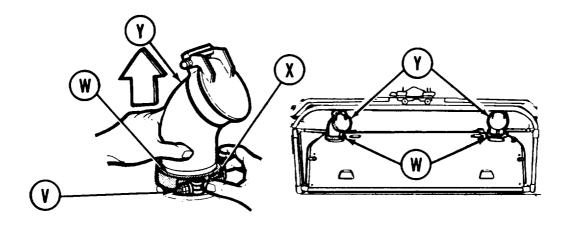
- 6. Using pliers, cut lockwire (Q) on fuel control shaft (R) on isolation valve (S). Remove lockwire.
- 7. Using 7/16 inch open end wrench, rotate control shaft (R) clockwise as far as possible.
- 8. Install access plate.
- 9. Insert 14 screws in access plate and using flat-tip screwdriver, tighten screws.
- 10. Close turret platform door.



- 11. Using 1-1/8 inch socket and 3/4 inch drive ratchet, remove four screws, lockwashers, and flat washers (T) from rear grille doors (U).
- 12. Pull rear grille doors open.



- 13. Using 7/16 inch open end wrench, loosen nuts (V) on exhaust elbow and clamps (W).
- 14. Pull clamp clasp (X) to open, Remove clamps (W) and exhaust elbows (Y).

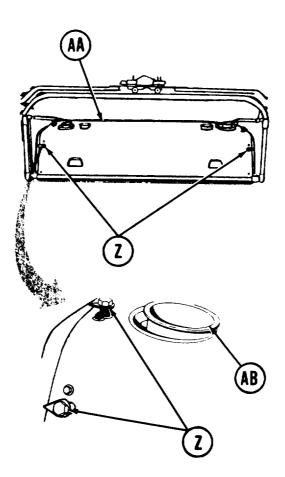


TA132954

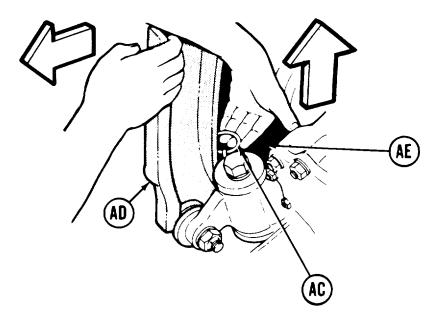
#### **NOTE**

# Removing transmission shroud requires two persons.

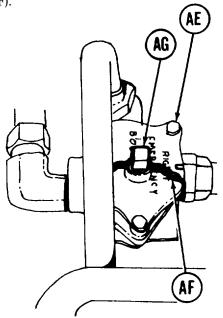
- 15. Using 3/4 inch socket and 1/2 inch drive ratchet, rotate six turnlocks (Z) on transmission shroud (AA) toward center of shroud to loosen.
- 16. Lift transmission shroud and pull toward rear to remove.
- 17. Using rags (item 56, Appendix D), cover exhaust pipe openings (AB).



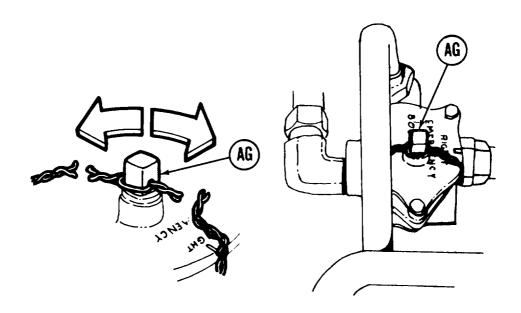
- 18. Pull upon ring (AC) behind left transmission guide (AD).
- 19. Pull transmission guide toward rear to access fuel return selector valve (AE) (hidden).



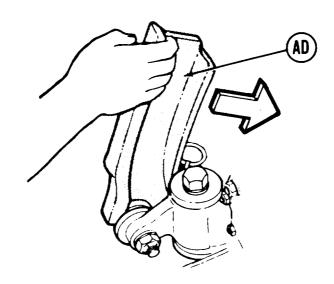
- 20. Using pliers, cut lockwire (AF) on fuel return selector valve handle (AG).
- 21. Remove lockwire (AF).



- 22. Set valve handle (AG) to RIGHT EMERGENCY or LEFT EMERGENCY as required.
- 23. Notify organizational maintenance to install lockwire as soon as possible.



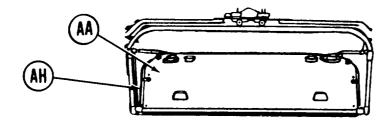
14. Push transmission guide (AD) forward as far as possible.



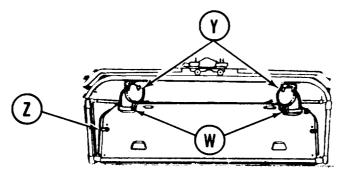
TA132957

3-127

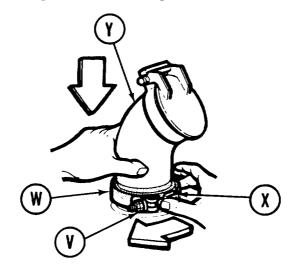
- 25. Remove rag covers from exhaust pipe openings.
- 26. Place transmission shroud (AA) on hull supports (AH).



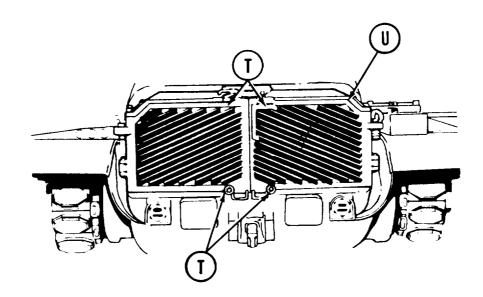
- 27. Using 3/4 inch socket and 1/2 inch drive ratchet, press six turnlocks (Z) down and rotate toward hull to lock.
- 28. Place exhaust elbows (Y) and clamps (W) on exhaust pipes. Elbows should be at 45 degree angle toward center rear of tank.



- 29. Close clamp clasps (X).
- 30. Using 7/16 inch open end wrench, tighten nuts (V) on clamp (W).



- 31. Close rear grille doors (U).
- 32. Insert four screws, lockwashers, and flat washers (T) in grille doors.
- 33. Using 1-1/8 inch socket and 3/4 inch drive ratchet, rotate screws clockwise until tight.



- 34. Return main gun to travel position (page 2-502).
- 35. Set MASTER BATTERY switch to OFF.
- 36. Set ELEV/TRAV POWER switch to OFF.
- 37. Set turret traverse lock to LOCKED (page 2-568)
- 38. Set FUEL PUMP switch to ON.
- 39. Return tools to right front fender box.

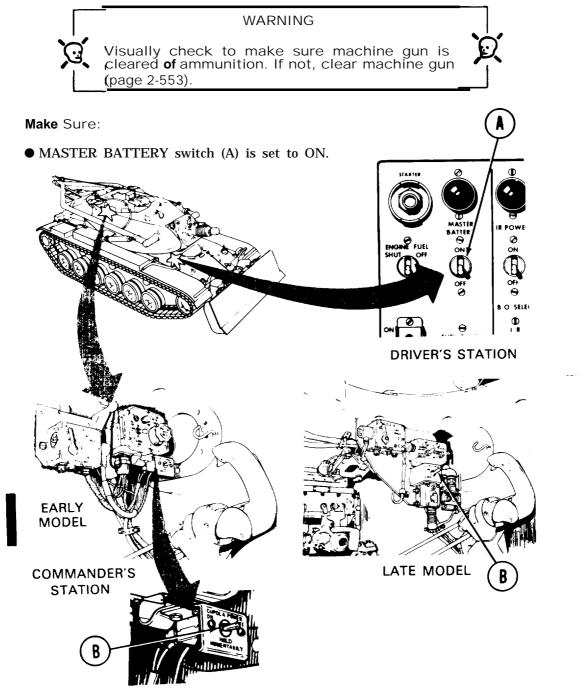
#### **NOTE**

When damaged fuel tank is repaired, return system to normal operation. Make sure lockwire is installed on isolation valve and fuel selector valve by organizational maintenance.

TA132959

3-129

# MAINTAIN CALIBER .50 MACHINE GUN (PERFORM FIRING CIRCUIT TEST - CALIBER .50)



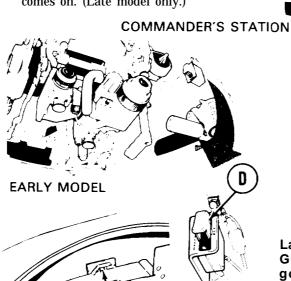
1. Set CUPOLA POWER switch (B) to ON and hold momentarily.

TA252962

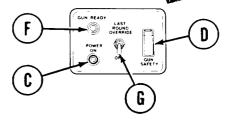
3-130 Change 1

## MAINTAIN CALIBER .50 MACHINE GUN (PERFORM FIRING CIRCUIT TEST - CALIBER .50) Continued

- 1.1 Check that POWER ON indicator (C) comes on. (Late model only.)
- 1.2 Set cupola GUN SAFETY switch (D) to FIRE.
- 1.3 Press last round stop switch (E). (Late model only.)
- 1.4 Check that GUN READY indicator (F) comes on. (Late model only.)



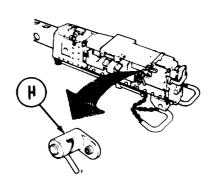




#### **NOTE**

Last round switch will cause GUN READY indicator (F) to go out when there are 20 rounds or less in ammunition box. You can bypass last round switch by setting LAST ROUND OVERRIDE switch (G) to on. GUN READY indicator (F) will then stay on.

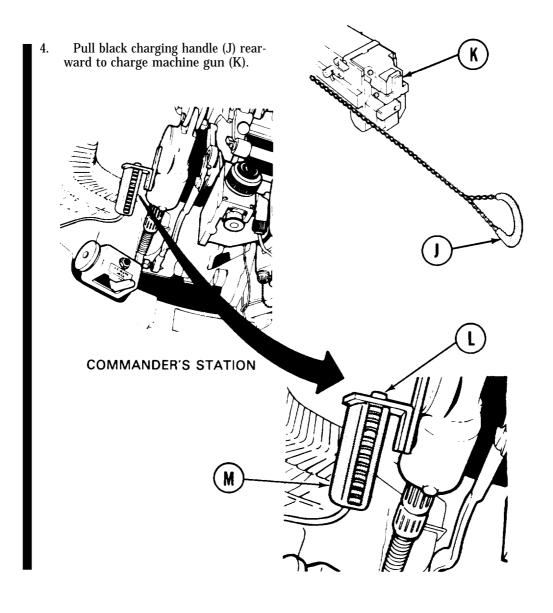
- 1.5 Set LAST ROUND OVERRIDE Switch (G) to off. GUN READY indicator (F) will light, (Late model only.)
- 2. Set MACHINE GUN electrical safety switch (D) to ON. (Early model only.)
- 3. Set machin0egun mechanical safety (H) to F (fire).



TA252963

Change 1 3-131

# MAINTAIN CALIBER .50 MACHINE GUN (PERFORM FIRING CIRCUIT TEST - CALIBER .50) - Continued



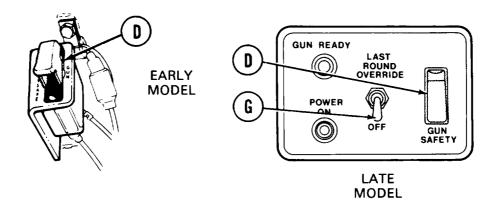
#### **NOTE**

If bolt does not close, notify organizational maintenance.

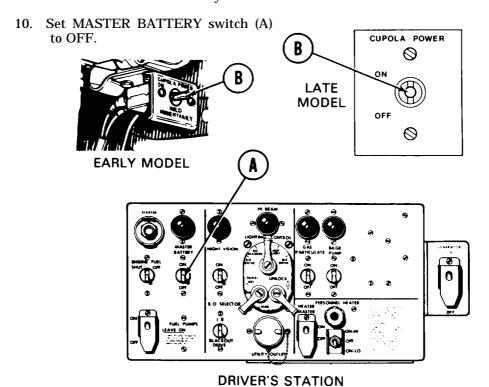
5. While keeping tension on black charging handle (J), press firing button (L) on elevation handle (M) and allow bolt assembly to close slowly.

## MAINTAIN CALIBER .50 MACHINE GUN (PERFORM FIRING CIRCUIT TEST - CALIBER .50) - Continued

- 6. Set MACHINE GUN electrical safety switch (D) to SAFE. (Early model only.)
- 7. Set GUN SAFETY switch (D) to safe. (Late model only.)
- 8. Set LAST ROUND OVERRIDE switch (G) to off. (Late model only.)



9. Set CUPOLA POWER switch (B) to OFF and hold momentarily.



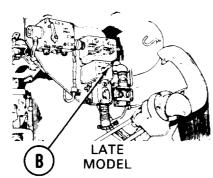
TA252965

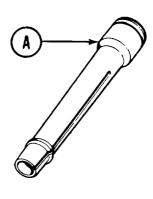
Change 1 3-133

### MAINTAIN CALIBER .50 MACHINE GUN (REMOVE RUPTURED CARTRIDGE CASE)

#### Tools:

Get cartidge extractor (A) from small arms case in oddment tray.



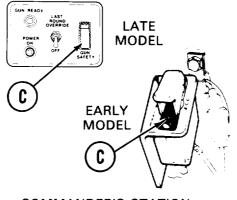


#### Make Sure:

- CUPOLA POWER switch (B) is pushed to OFF and released.
- Machine gun is in level position.



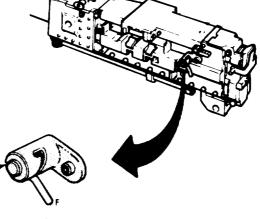
**COMMANDER'S STATION** 



Machine gun electrical safety switch (C) is set to OFF.



● Machine gun mechanical safety (D) is on F (fire).



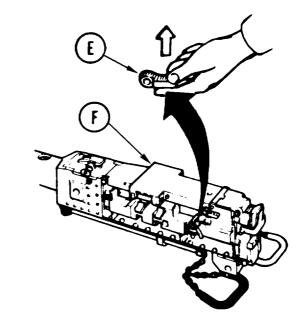
COMMANDER'S STATION

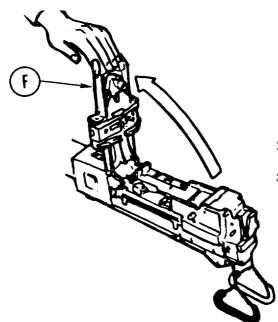
TA252966

3-134 Change 1

# MAINTAIN CALIBER .50 MACHINE GUN (REMOVE RUPTURED CARTRIDGE CASE) - Continued

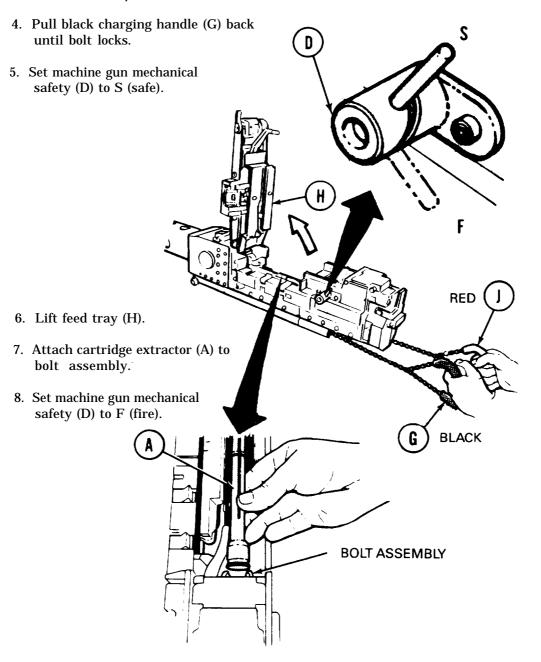
1. Open cradle access door (page 2-345).





- 2. Lift latch (E). Raise cover (F).
- 3. Remove any ammunition.

# MAINTAIN CALIBER .50 MACHINE GUN (REMOVE RUPTURED CARTRIDGE CASE) - Continued

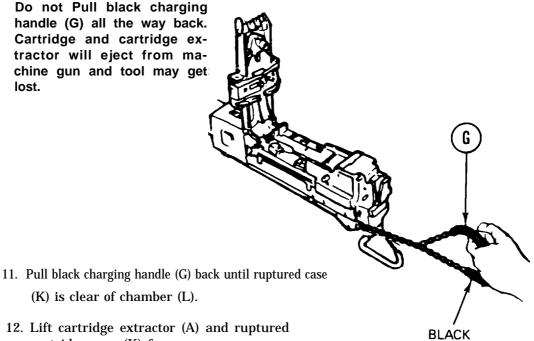


- 9. Pull black charging handle (G) all the way back and hold.
- 10. Pull manual red firing handle (J) back while slowly releasing black charging handle (G).

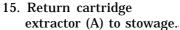
#### **MAINTAIN CALIBER 50 MACHINE GUN (REMOVE RUPTURED CARTRIDGE CASE I - Continued**

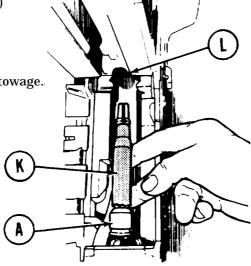
#### **NOTE**

Do not Pull black charging handle (G) all the way back. Cartridge and cartridge extractor will eject from machine gun and tool may get: lost.



- 12. Lift cartridge extractor (A) and ruptured cartridge case (K) from gun.
- 13. Release black charging handle (G).
- 14. Remove ruptured cartridge case (K) from cartridge extractor (A).





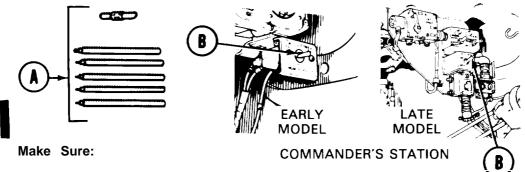
#### MAINTAIN CALIBER .50 MACHINE GUN (REMOVE STUCK ROUND)

#### NOTE

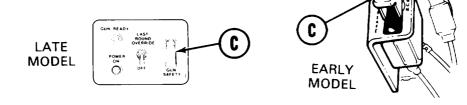
Two crewmembers are needed to do this procedure.

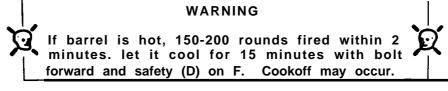
#### Tools:

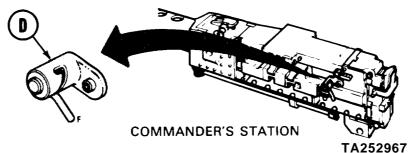
Get cleaning rod sections and handle (A) from small arms case in oddment tray.



- CUPOLA POWER switch (B) is pushed to OFF and released.
- Machine gun electrical safety switch (C) is set to OFF.
- Machine gun mechanical safety (D) is set to S (safe).







3-138 Change 1

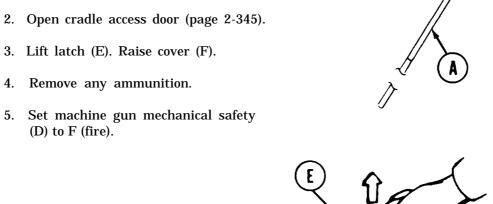
#### MAINTAIN CAL .50 MACHINE GUN (REMOVE STUCK ROUND) - Continued

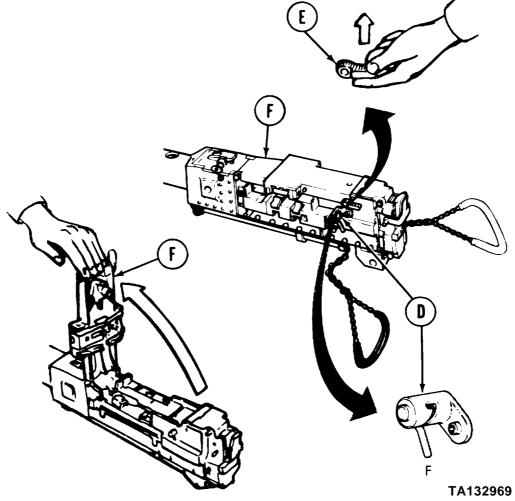
#### **NOTE**

Do not attach swab holder.

- 1. Screw cleaning rod sections and handle (A) together.

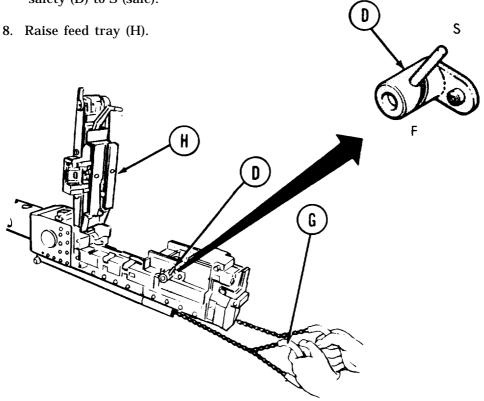
- 5. Set machine gun mechanical safety

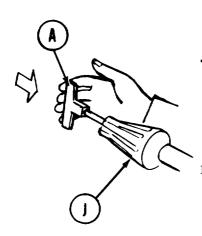




#### MAINTAIN CAL .50 MACHINE GUN (REMOVE STUCK ROUND) - Continued

- 6. Pull black charging handle (G) so bolt is all the way back.
- 7. Set machine gun mechanical safety (D) to S (safe).





#### WARNING

Never stand in front of machine gun barrel.

- 9. Have outside crewman run cleaning rod (A) through front of barrel (J) until stuck round can be felt.
- 10. Tap end of cleaning rod (A) until round backs out of chamber.

#### MAINTAIN CAL 50 MACHINE GUN (REMOVE STUCK ROUND) - Continued

M

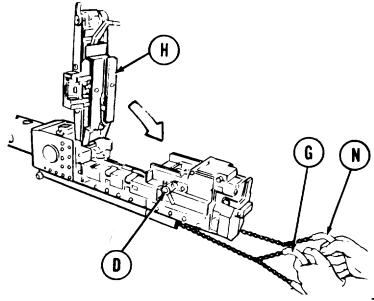
#### WARNING



Base (K) of round must not touch bolt (L). It may explode.

11. Do not allow base (K) of round to touch bolt (L).

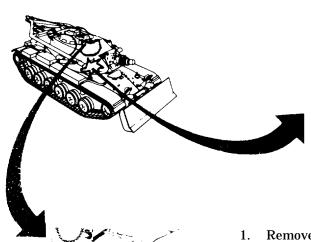
- 12. Have inside crewman remove round (M) from gun. Dispose of round in accordance with existing regulation
- 13. Remove cleaning rod.
- 14. Close feed tray (H).
- 15. Set machine gun mechanical safety to F (fire).
- 16. Pull back black charging handle (G).
- 17. Pull back manual red firing handle (N) while slowly releasing black charging handle (G).
- 18. Load machine gun (page 2-382).
- 19. Close cradle access door (page 2-348).
- 20. Disassemble and return cleaning rod to stowage.

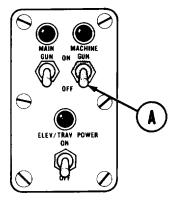


# MAINTAIN 7.62-MM MACHINE GUN (REMOVE RUPTURED CARTRIDGE CASE-M240)

#### Make Sure:

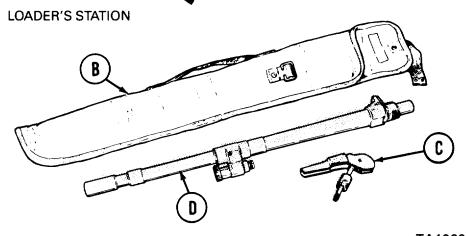
- MACHINE GUN switch (A) is set to OFF.
- Weapon has been unloaded (page 2-559).





**GUNNER'S STATION** 

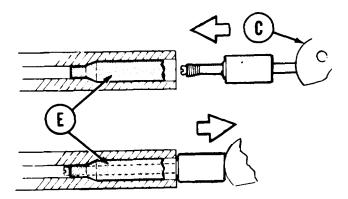
- 1. Remove spare barrel case (B) from stowed position.
- 2. Remove cartridge extractor (C) from spare barrel case.
- 3. Remove barrel (page 3-149).
- 4. Install spare barrel (D) (page 3-151).



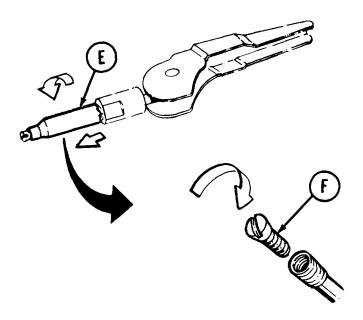
TA132972

# MAINTAIN 7.62-MM MACHINE GUN (REMOVE RUPTURED CARTRIDGE CASE-M240) Continued

5. Open cartridge extractor (C) and push into ruptured cartridge (E).



- 6. Pull back on extractor (C) until ruptured cartridge (E) is free.
- 7. Remove ruptured cartridge case (E) from extractor (C) by turning extractor extension (F) counterclockwise.



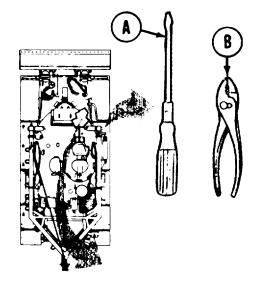
- 8. Replace extractor extension (F) onto extractor (C) by turning extractor extension clockwise.
- 9. Stow extractor (C) and barrel in spare barrel case.
- 10. Put spare barrel case in stowed position.

# MAINTAIN 7.62-MM MACHINE GUN (REMOVE STUCK ROUND-M240)

#### Tools:

Get from right front fender box:

- Flat-tip screwdriver, 6-inch blade (A).
- Combination slip joint pliers (B).

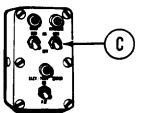


# Make Sure:

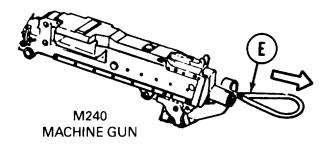
- Machine gun switch (C)is set to OFF.
- Weapon has been unloaded (page 2-559).

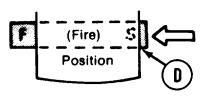
# To Remove Barrel:

- 1. Set safety switch (D) to F (fire).
- 2. Grasp charger handle (E) and pull rearward until bolt locks,



**GUNNER'S STATION** 





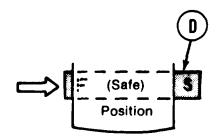
TA132974

# MAINTAIN 7.62-MM MACHINE GUN (REMOVE STUCK ROUND-M240) - Continued

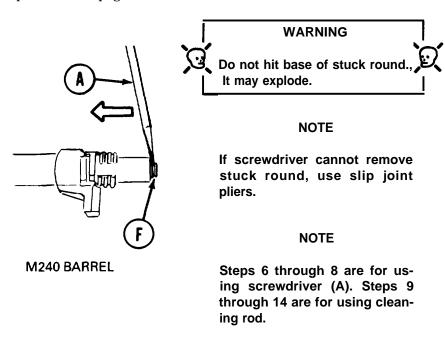
3. Set safety switch (D) to S (safe).

#### **NOTE**

Wait until barrel is cool before removing.



- 4. Remove barrel (page 3-149).
- 5. Install spare barrel (page 3-151).



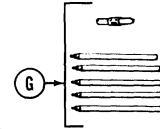
- 6. Position flat portion of screwdriver (A) at slot (F) of stuck round.
- 7. Push top of screwdriver (A) in direction of arrow and remove stuck round.
- 8. Dispose of round in accordance with existing regulations.

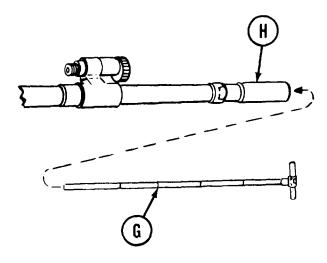
# MAINTAIN 7.62-MM MACHINE GUN (REMOVE STUCK ROUND M240) Continued

#### **NOTE**

#### Do not attach swab holder.

- 9. Get cleaning rod sections and handle (G) from small arms case in oddment tray.
- 10. Screw cleaning rod sections and handle (G) together.
- 11. Insert cleaning rod (G) into M240 barrel (H).





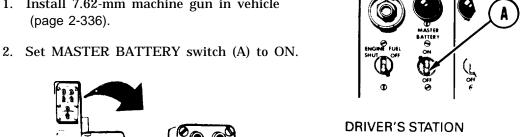
- 12. Gently tap cleaning rod to remove stuck round.
- 13. Disassemble cleaning rod (G) and return to stowage.
- 14. Return tools to stowage.
- 15. Dispose of round in accordance with existing regulations.

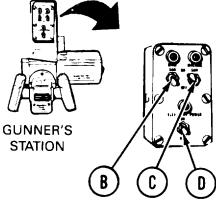
# MAINTAIN 7.62-MM MACHINE GUN (PERFORM FIRING CIRCUIT TEST-M240)



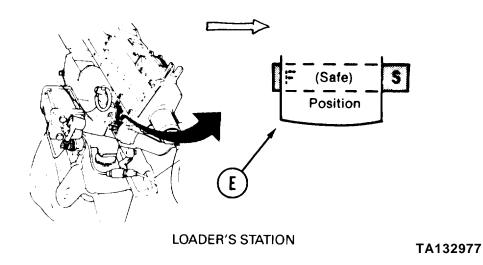
# To prepare For Test:

- 1. Install 7.62-mm machine gun in vehicle (page 2-336).





- 3. Set MAIN GUN switch (B) to OFF.
- 4. Set MACHINE GUN switch (C) to ON.
- Set ELEV/TRAV POWER switch (D) to OFF.
- 6. Set machine gun safety (E) to S (safe).



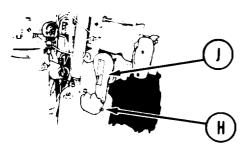
3-147

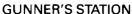
# MAINTAIN 7.62-MM MACHINE GUN (PERFORM FIRING CIRCUIT TEST M240) - Continued

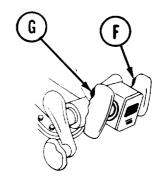
# To Test Firing Circuit:

Listen for a click from machine gun as you perform each of the next four steps. If you do not hear a click, notify organizational maintenance,

- 1. Depress gunner's right trigger (F).
- 2. Depress gunner's left trigger (G).





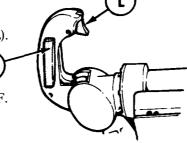


3. Depress switch (H) on manual elevation handle (J).

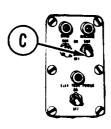
4. Hold down commander's override switch (K) and depress firing trigger (L).

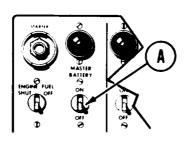
#### **After Test:**

1. Set MACHINE GUN switch (C) to OFF.



COMMANDER'S STATION

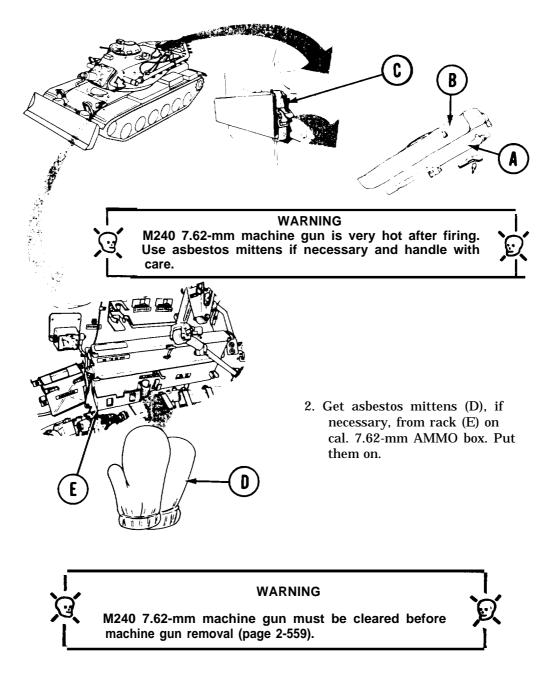




- 2. Set MASTER BATTERY switch (A) to OFF.
- 3. Notify organizational maintenance of any test failures.

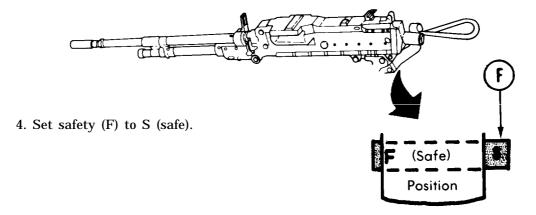
# MAINTAIN 7.62-MM MACHINE GUN (REPLACE BARREL ASSEMBLY-M240)

1. Get spare barrel assembly (A) from spare barrel case (B) in spare barrel box (C).

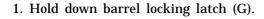


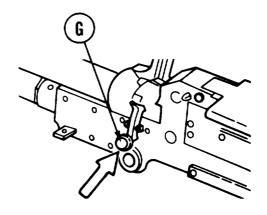
3. Remove M240 7.62-mm machine gun from mounting (page 2-586).

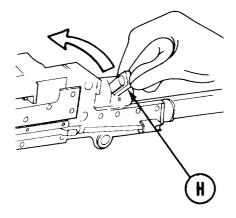
# MAINTAIN 7.62-MM MACHINE GUNE (REPLACE BARREL ASSEMBLY-M240)-Continued



# To Remove Barrel Assembly:



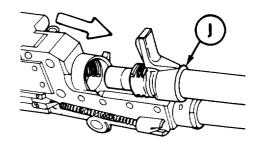




2. Turn up barrel release (H).

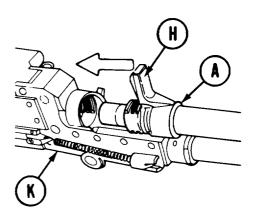
# MAINTAIN 7.62-MM MACHINE GUN (REPLACE BARREL ASSEMBLY-M240) - Continued

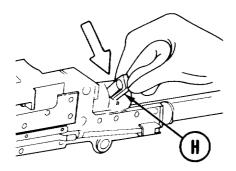
3. Pull barrel assembly (J) straight out.



# To Install Replacement Barrel Assembly:

1. Hold replacement barrel assembly (A) with barrel release (H) up. Aline barrel assembly (A) with receiver assembly (K) and insert.





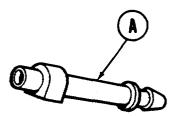
- 2. Rotate barrel release (H) to right and down.
- 3. Install M240 machine gun in mount (page 2-336).
- 4. Return asbestos mittens to stowage. Return barrel assembly (J) to organizational maintenance.

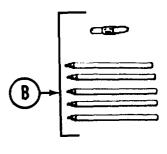
# MAINTAIN 7.62-MM MACHINE GUN (REMOVE RUPTURED CARTRIDGE CASE - M73)

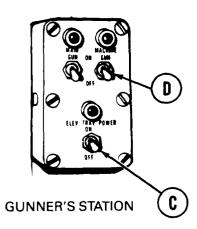
#### Tools:

Get from small arms case in oddment tray:

- Ruptured cartridge case extractor (A).
- Cleaning rod sections and handle (B).







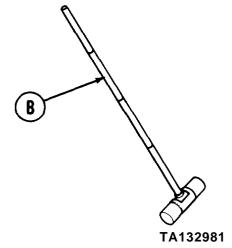
### Make Sure:

- ELEVTTRAV POWER switch (C) is set to OFF.
- MACHINE GUN switch (D) is set to OFF.
- Machine gun is unloaded (page 2-563).

#### **NOTE**

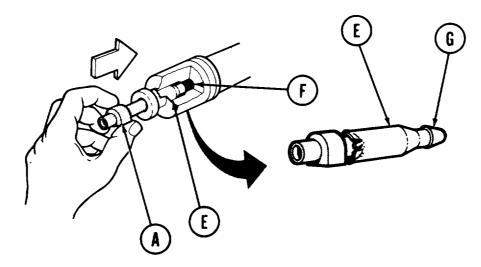
Do not attach swab holder.

- Screw cleaning rod sections and handle (B) together.
- Remove machine gun barrel (page 3-160).

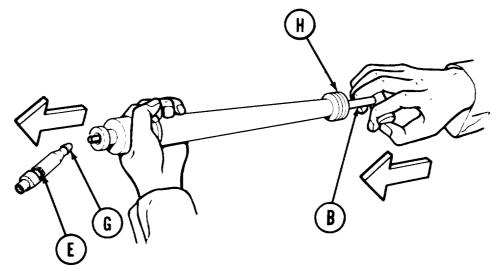


# MAINTAIN 7.62-MM MACHINE GUN (REMOVE RUPTURED CARTRIDGE CASE - M73) - Continued

3. Push extractor (A) through ruptured case (E) into chamber (F) until collet (G) snaps over front end of case.



- 4. Push cleaning rod (B) through muzzle end of barrel (H).
- 5. Push ruptured case (E) and extractor (G) from barrel.



- 6. Look through chamber (F) for damage. Replace barrel if signs of damage or wear (page 3-163).
- 7. Disassemble cleaning rod (B).
- 8. Return tools to stowage.

# MAINTAIN 7.62-MM MACHINE GUN (REMOVE STUCK ROUND - M73)

#### Tools:

Get from small arms case in oddment tray:

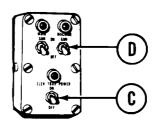
- Combination tool (A).
- Cleaning rod sections and handle (B).



# B - B

#### Make Sure:

- ELEV/TRAV POWER switch (C) is set to OFF.
- MACHINE GUN switch (D) is set to OFF.
- Machine gun is unloaded (page 2-563).

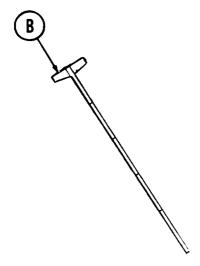


**GUNNER'S STATION** 

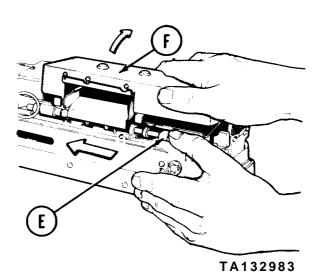
#### **NOTE**

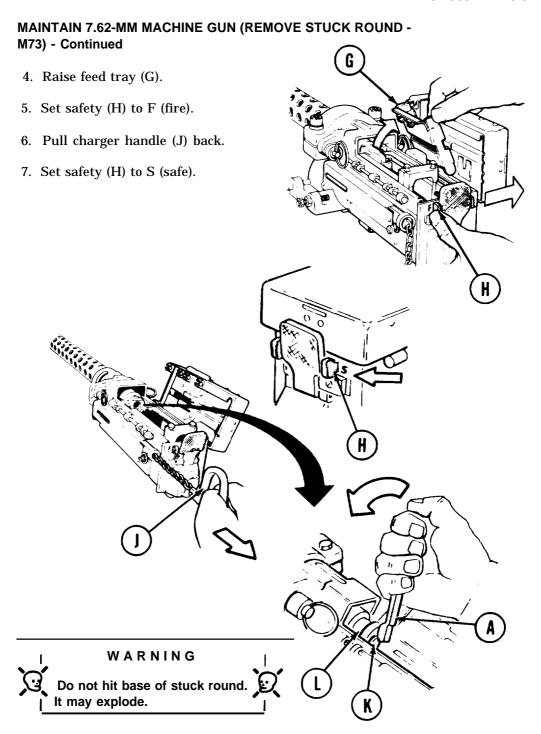
Do not attach swab holder.

1. Screw cleaning rod sections and handle (B) together.



- 2. Push latch rod (E) forward.
- 3. Raise receiver cover (F).

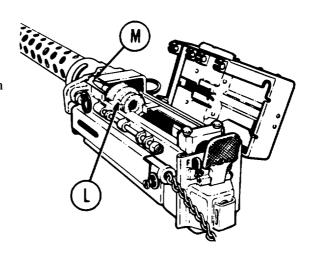


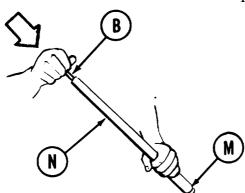


- 8. Place combination tool (A) on lip of case (K).
- 9. Pry forward to remove case (K) from chamber (L).

# MAINTAIN 7.62-MM MACHINE GUN (REMOVE STUCK ROUND - M73) - Continued

- 10. Look into chamber (L). See if projectile (M) has separated from case.
- 11. If projectile has separated from case, do steps 12 thru 14. If not, go to step 15.
- 12. Remove barrel (N) from receiver (page 3-162).

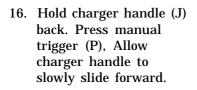




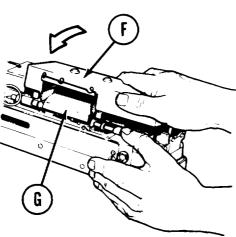
- 13. Place cleaning rod (B) down barrel (N). Tap on rod until projectile comes loose.
- 14. Replace barrel (page 3-163).

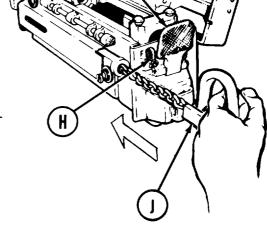
# MAINTAIN 7.62-MM MACHINE GUN (REMOVE STUCK ROUND - M73) - Continued

15. Set safety (H) to F (fire).



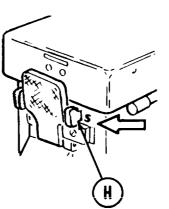
17. Close feed tray (G).



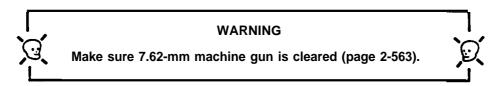


- 18. Close machine gun cover (F).
- 19. Slide safety (H) to S (safe).
- 20. Disassemble cleaning rod.
- 21. Return tools to stowage.
- 22. Deliver old barrel to organizational maintenance for disposition.

  Dispose of round in accordance with existing regulations.

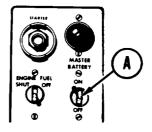


# MAINTAIN 7.62-MM MACHINE GUN (PERFORM FIRING CIRCUIT TEST - M73)

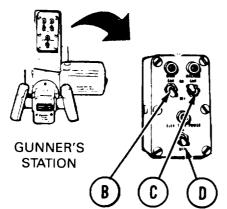


# To Prepare For Test:

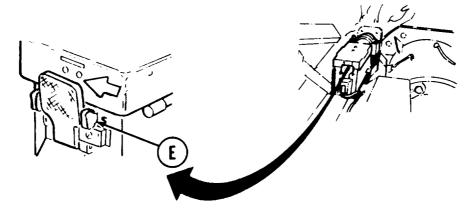
- 1. Install 7.62-mm machine gun in vehicle (page 2-339).
- 2. Set MASTER BATTERY switch (A) to ON.



**DRIVER'S STATION** 



- 3. Set MAIN GUN switch (B) to OFF
- 4. Set MACHINE GUN switch (C) to ON.
- 5. Set ELEV/TRAV POWER switch (D) to OFF.
- 6. Set machine gun safety (E) to S (safe).



TA132988

# MAINTAIN 7.62-MM MACHINE GUN (PERFORM FIRING CIRCUIT TEST - M73) Continued

#### To Test Firing Circuit:

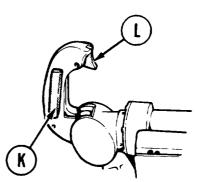
Listen for a click from machine gun as you perform each of the next four steps. If you do not hear a click, notify organizational maintenance.

- 1. Depress gunner's right trigger (F).
- 2. Depress gunner's left trigger (G).



**GUNNER'S STATION** 

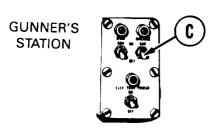
- **GUNNER'S STATION**
- 3. Depress switch (H) on MANUAL ELEVATION CONTROL handle (J).
- 4. Hold down commander's override switch (K) and depress firing trigger (L).

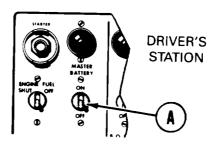


COMMANDER'S STATION

#### After Test:

1. Set MACHINE GUN switch (C) to OFF.



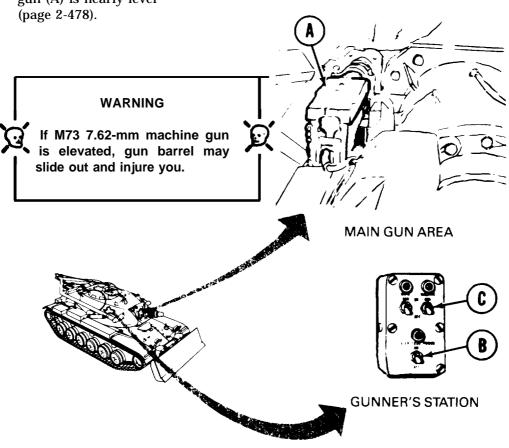


- Set MASTER BATTERY switch (A) 2. to OFF.
- 3. Notify organizational maintenance of any test failures.

# MAINTAIN 7.62-MM MACHINE GUN (REPLACE BARREL ASSEMBLY - M73)

#### Make Sure:

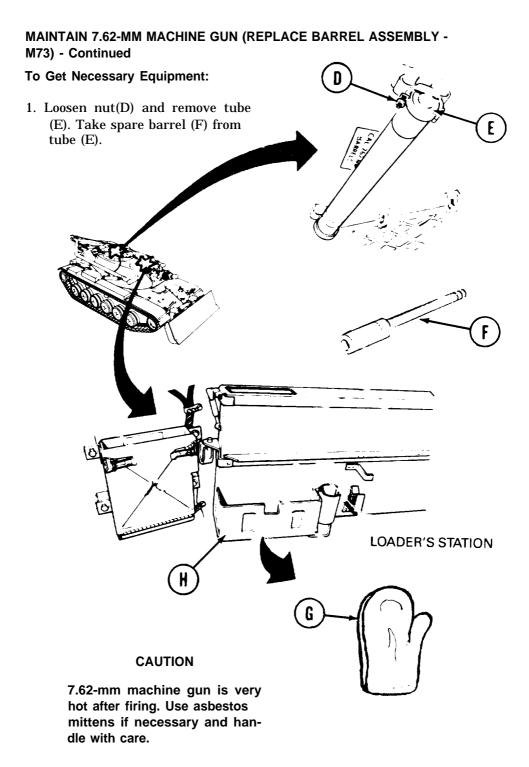
• M73 7.62-mm machine gun (A) is nearly level (page 2-478)



- ELEV/TRAV POWER switch (B) is set to OFF.
- MACHINE GUN switch (C)is set to OFF.
- M73 7.62-mm machine gun is clear (page 2-563).

# **NOTE**

After unloading, safety is set to S (safe) and barrel extension assembly is forward.



2. If M73 7.62-mm machine gun is hot from firing, get asbestos mittens (G) from rack (H) on caliber 7.62-mm ammunition box.

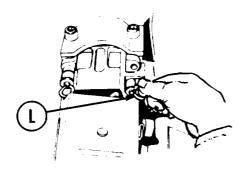
MAINTAIN 7.62-MM MACHINE GUN (REPLACE BARREL ASSEMBLY - M73) - Continued

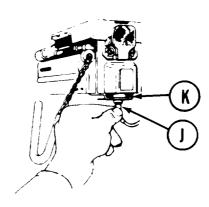
#### To Remove Barrel:

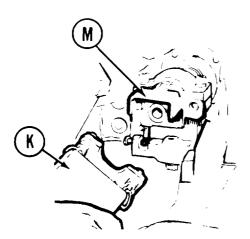
#### **CAUTION**

7.62-mm machine gun is very hot after firing. Use asbestos mittens if necessary and handle with care.

1. Disconnect electrical lead (J) from receiver (K).

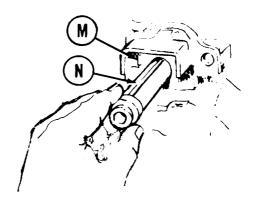






- 2. Pull back right disconnector ring (L). At the same time, swing right side of receiver (K) down.
- 3. Pull receiver (K) off barrel jacket (M).

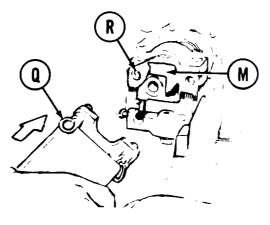
4. Pull barrel (N) from barrel jacket (M).

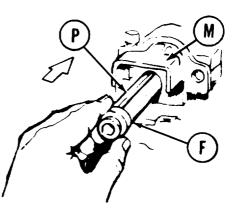


# MAINTAIN 7.62-MM MACHINE GUN (REPLACE BARREL ASSEMBLY - M73) - Continued

#### To Install New Barrel:

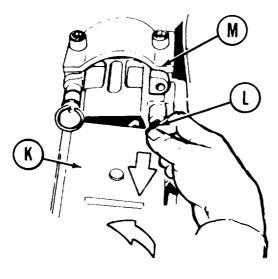
1. Hold new barrel (F) so slot (P) is up. Slide barrel (F) all the way into jacket (M).



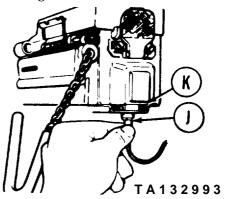


- 2. Place left disconnector (Q) through hole (R) in left side of barrel jacket (M).
- 3. Pull right disconnector ring (L) back. At the same time, swing receiver (K) up. Release ring (L) so that disconnector goes into hole on barrel jacket (M).





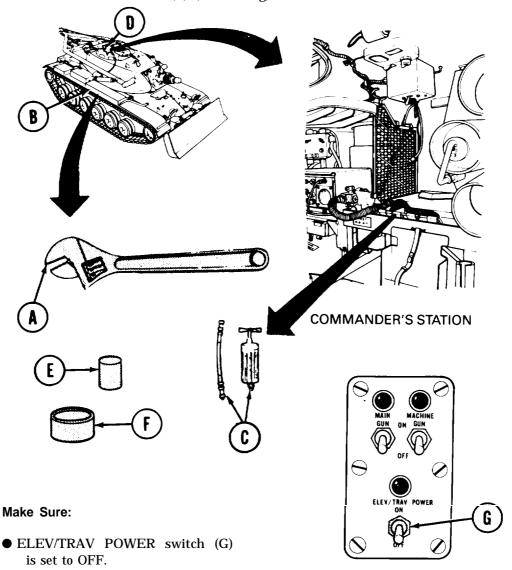
- 4. Connect electrical lead (J) to receiver (K).
- 5. Return asbestos mittens to Stowage.
- 6. Return old gun barrel to organizational maintenance.



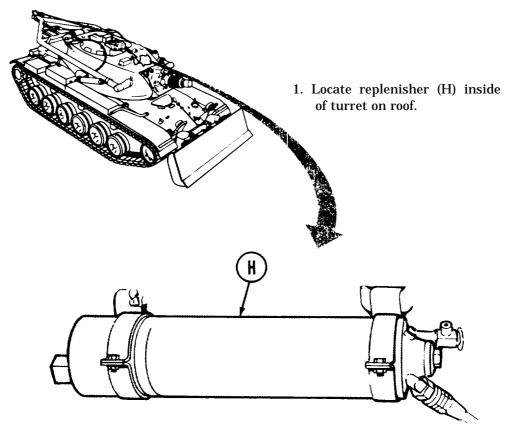
# MAINTAIN MAIN GUN (REPLENISH OIL IN REPLENISHER)

# **Tools and Supplies:**

- Get 8 inch adjustable wrench (A) from right front fender box (B) (if filling).
- Get fluid gun assembly (C) from inside tool equipment roll in oddment tray inside turret (D) (if filling).
- Get FRH hydraulic fluid (E) (item 28, Appendix D) (if filling).
- Get 8 ounce container (F) (if draining).



**GUNNER'S STATION** 

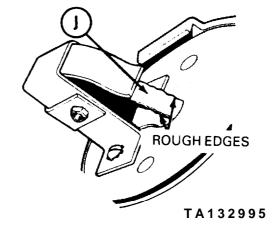


2. Read Replenisher Indicator Tape:

# **NOTE**

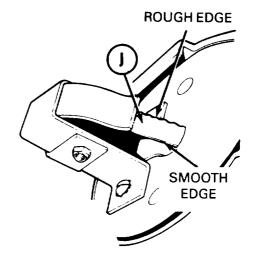
Recoil system oil will expand during firing and will assume original volume when cool (before firing).

 If indicator tape (J) is rough on both edges, then fluid is low and replenisher must be filled.

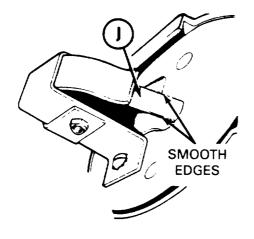


3-165

• If indicator tape (J) shows one rough edge and one smooth edge, the fluid level is normal.

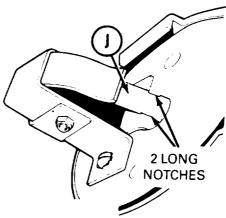


• If, before firing, indicator tape (J) has two smooth edges, then there is too much fluid and replenisher must be drained.



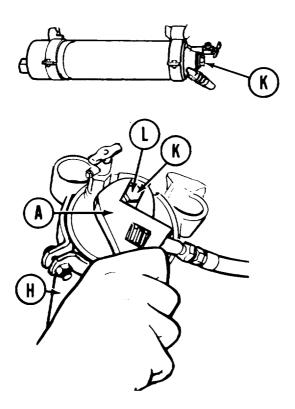
• If, during firing, indicator tape (J) has two smooth edges, then fluid level is normal.

 If, before or during firing, indicator tape (J) shows two long notches, then there is too much fluid and replenisher must be drained until two smooth edges show on tape.

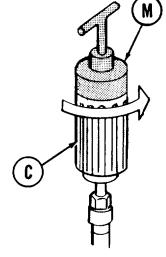


# To Fill Replenisher:

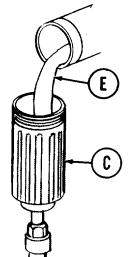
1. Using 8-inch adjustable wrench (A), remove plug (K) and washer (L) from end of replenisher (H).



- 2. Unscrew fluid gun cap (M).
- 3. Remove fluid gun cap (M) from fluid gun assembly (C).



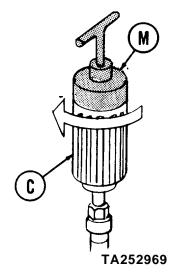




When filling fluid gun assembly (C), place finger on end of hose to prevent leaking of hydraulic fluid.

4. Fill fluid gun assembly (C) with FRH hydraulic fluid (E) (item 28, Appendix D).

- 5. Place fluid gun cap (M) onto fluid gun assembly (C).
- 6. Screw fluid gun cap (M) on.

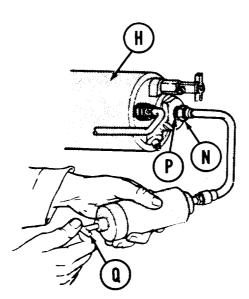


3-168 Change 1

# **NOTE**

# Air must not be injected into recoil system.

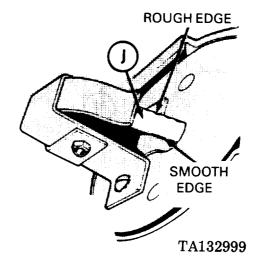
7. Loosely connect fluid gun hose fitting (N) to filling valve (P) on replenisher (H).



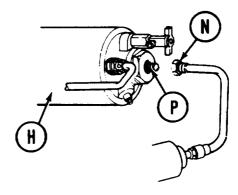
8. Rotate fluid gun handle (Q) clockwise until a small amount of fluid leaks from around filling valve (P).

9. Using 8 inch adjustable wrench, tighten fitting (N) to valve (P).

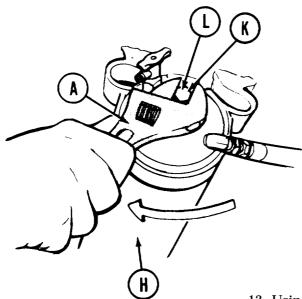
10. Rotate and push handle (Q) inward until indicator tape (J) is rough on one edge only.



11. Using 8 inch adjustable wrench, disconnect fluid gun hose fitting (N) from filling valve (P) on replenisher (H).



12. Using fingers, install washer (L) and plug (K) into valve (P).



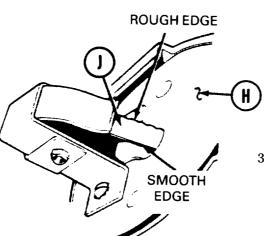
- 13. Using 8 inch adjustable wrench (A), tighten washer (L) and plug (K).
- 14. Return tools and supplies to stowage.

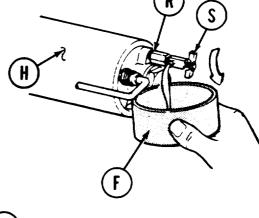
#### To Bleed Replenisher:

#### **NOTE**

A container should be used to catch hydraulic fluid as it drains.

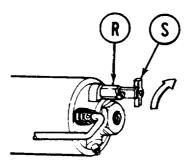
- 1. Hold container (F) under petcock (R) on replenisher (H).
- 2. Turn petcock knob (S) counterclockwise to allow fluid to drain.





3. Drain hydraulic fluid from replenisher (H) until indicator tape (J) has one rough edge and one smooth edge.

- 4. Turn petcock knob (S) clockwise until fluid stops draining from petcock (R).
- 5. Dispose of old hydraulic fluid in accordance with local regulations.



# MAINTAIN MAIN GUN (MAINTAIN BREECHBLOCK ASSEMBLY)

# **Tools and Equipment:**

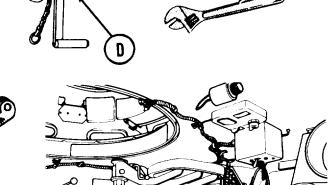
Get from right front fender box:

- 6 inch flat-tip screwdriver (A)
- 1/4 inch socket head screw hex key (B)
- 12 inch adjustable wrench (C)
- Chain hoist (D)

Get from oddment tray:

- Eyebolt (E)
- Spanner wrench (F')

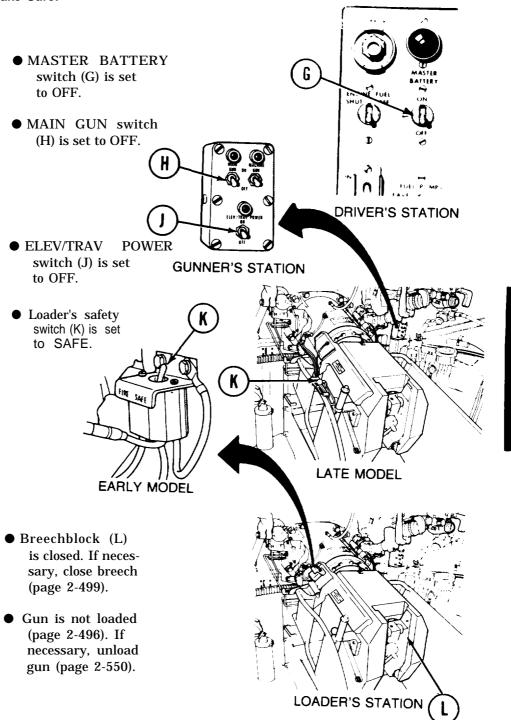




 Get five or six clean rags (item 56, Appendix D).



#### Make Sure:



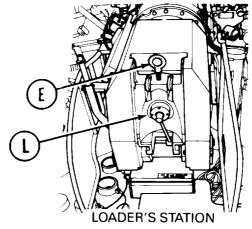
TA252970

Change 1 3-173

# MAINTAIN MAIN GUN (MAINTAIN BREECHBLOCK ASSEMBLY) - Continued

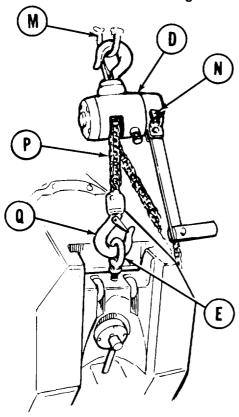
## To Remove Breechblock Assembly:

- 1. Raise or lower main gun until it looks about level (page 2-502).
- 2. Screw eyebolt (E) hand tight into top of breechblock (L).



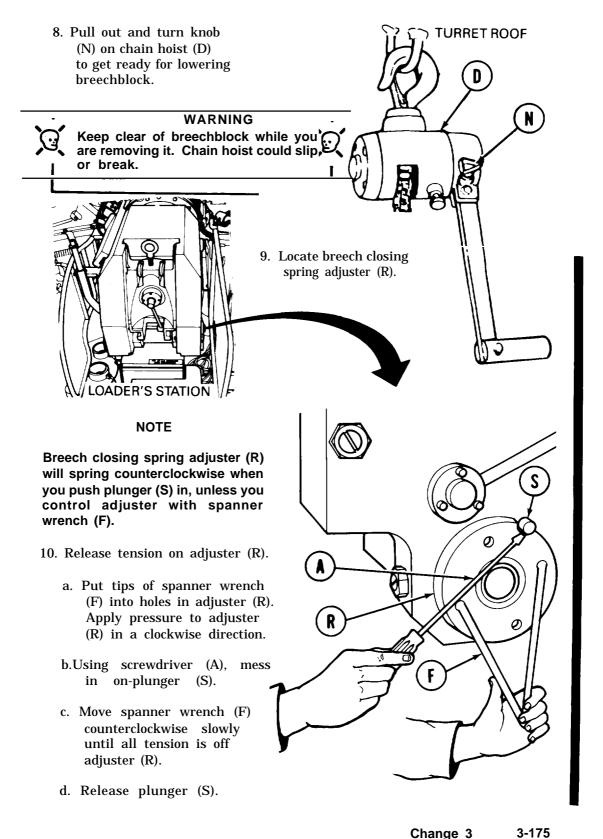
#### **CAUTION**

Handle breechblock (L) with care so that you do not damage it.

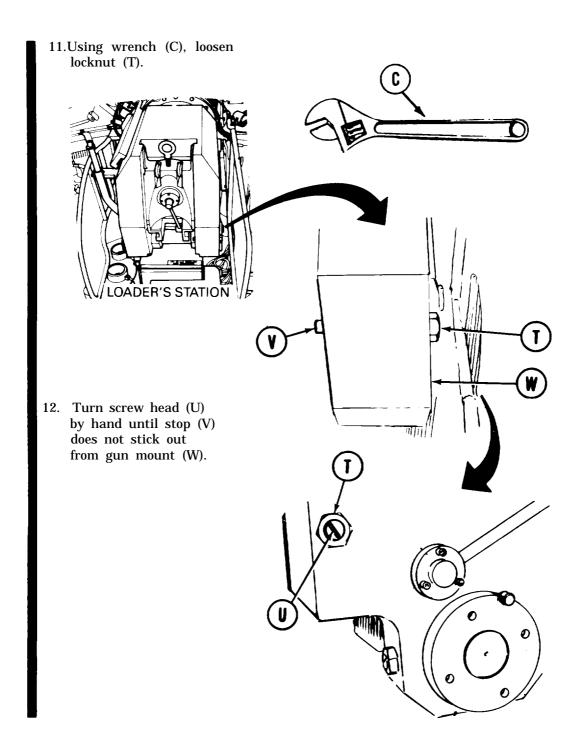


LOADER'S STATION

- 3. Hang chain hoist (D) over main gun from hook (M) in turret ceiling.
- 4. Pull out and hold knob (N) on chain hoist (D).
- 5. Pull chain (P) on either side until you can put chain hoist hook (Q) into eyebolt (E).
- 6. Put chain hoist hook
  (Q) into eyebolt (E)
  and pull chain (P) tight.
- 7. Release knob (N).



Change 3

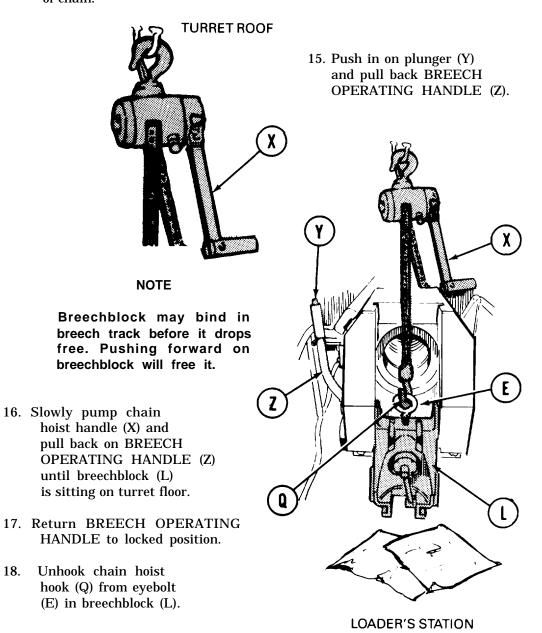


13. Spread clean rags on turret floor under breechblock.

3-176 Change 3

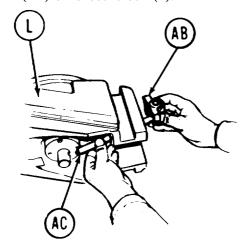
# MAINTAIN MAIN GUN (MAINTAIN BREECHBLOCK ASSEMBLY) - Continued

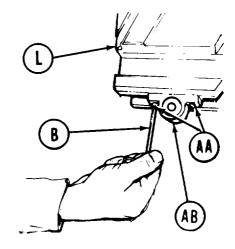
14. Pump chain hoist handle (X) to let out two inches of chain.



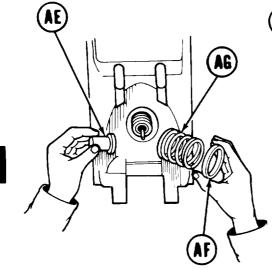
# To Disassemble Breech block Assembly:

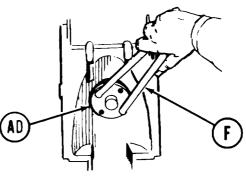
1. Using 1/4 inch socket head screw key (B), remove two screws (AA) from housing and contact assembly (AB) on breechblock (L).



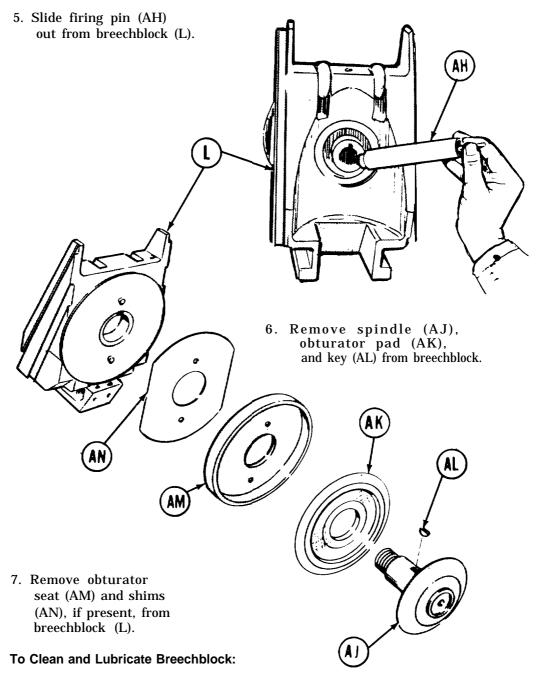


- 2. Remove housing and contact assembly (AB) and connector rod (AC) from breechblock (L).
- 3. Using spanner wrench (F), turn spindle nut (AD) counterclockwise and remove from breechblock.





4. Remove cap (AE), washer (AF), and spring (AG) from breechblock.



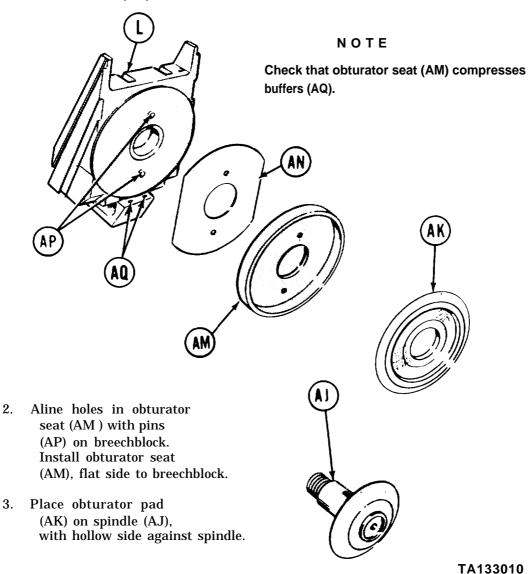
● See LO 9-2350-222-12.

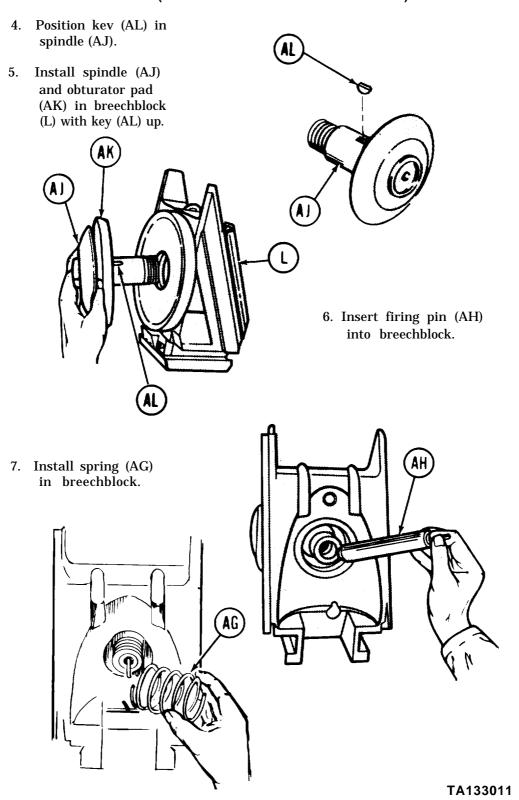
#### To Assemble Breechblock Assembly:

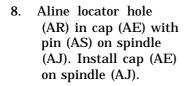
#### **NOTE**

If you are replacing obturator pad with a new pad, see page 3-197 for procedure to decide if shims are necessary. If you are not replacing obturator pad, be sure to install any shims that you removed.

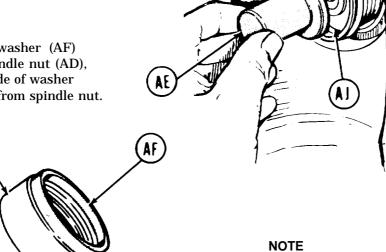
 If shimming is necessary, aline holes on shim
 (AN) with pins (AP)
 on breechblock (L).
 Install shim (AN) on breechblock.



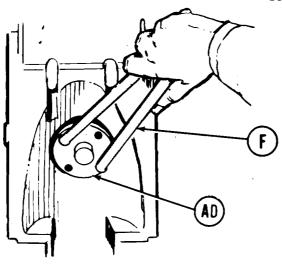




9. Place washer (AF) on spindle nut (AD), flat side of washer away from spindle nut.

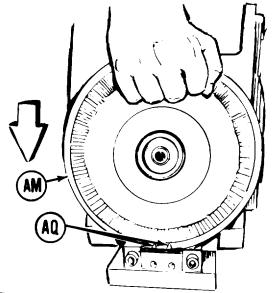


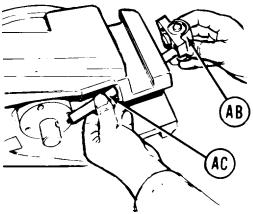
When installing spindle nut (AD), be careful not to move cap (AE) off pin (AS).



10. Install spindle nut (AD) on breechblock. Tighten spindle nut with spanner wrench (F).

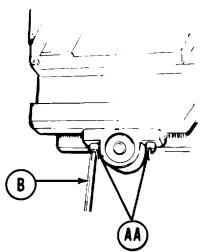
11. Check that obturator seat (AM) rests on buffers (AQ) and that buffers go down when you press obturator seat. If not, disassemble breechblock (page 3-178), and reassemble (page 3-180). Be sure to follow instructions carefully.





12. Position connector rod (AC) and housing and contact assembly (AB) on breechblock.

13. Install two screws
(AA) to attach housing and contact assembly
(AB) to breechblock.
Using hex key (B), tighten screws until snug.



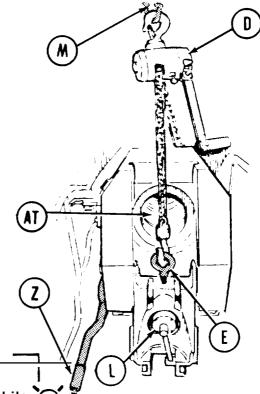
#### To Install Breechblock:

#### Make Sure:

- Eyebolt (E) is installed in breechblock.
- BREECH OPERATING HANDLE (Z) is down and as far forward as it will go.
- Position breechblock

   (L) under breech opening
   (AT) of main gun.
- Connect chain hoist

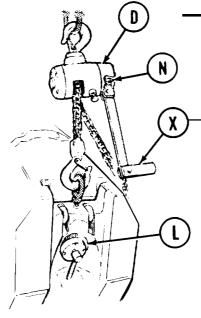
   (D) to hook (M) in turret
   ceiling and eyebolt
   (E) on breechblock
   (page 3-174).



**WARNING** 

Keep lear of breechblock while are installing it. Chain hoist could or break.

LOADER'S STATION

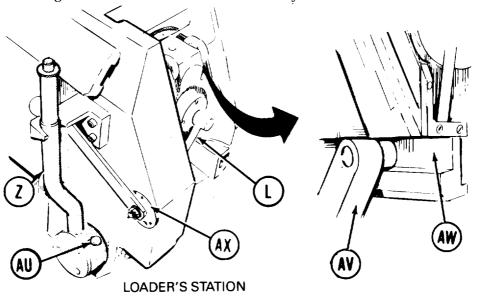


#### **WARNING**

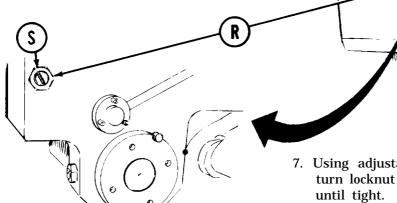
If breachblock sticks, do not try to force it with chain hoist. 4, Breechblock could fall and b jure personnel.

3. Pull out and turn knob
(N) on chain hoist (D).
Pump chain hoist handle
(X) slowly to raise
breechblock (L). At
the same time, guide
breechblock into place
in breech opening.

4. Push in on clutch (AU). At the same time, move BREECH OPERATING HANDLE (Z) up and forward while second crewman pumps chain hoist handle until crank pins (AV) go into grooves (AW) on bottom of breechblock and BREECH OPERATING HANDLE latches. Shake breechblock if it sticks and continue raising breechblock until it will not rise anymore.

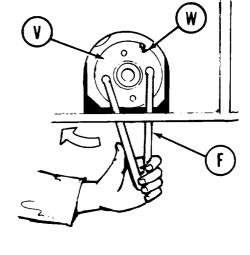


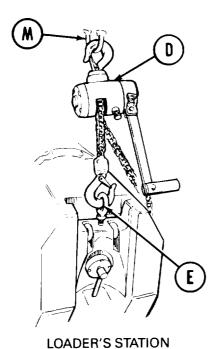
- 5. Pull upon breechblock release lever (AX) and pump chain hoist handle until breechblock (L) is fully seated.
- 6. Turn screw head (S) by hand clockwise as far as possible.



7. Using adjustable wrench, turn locknut (R) clockwise

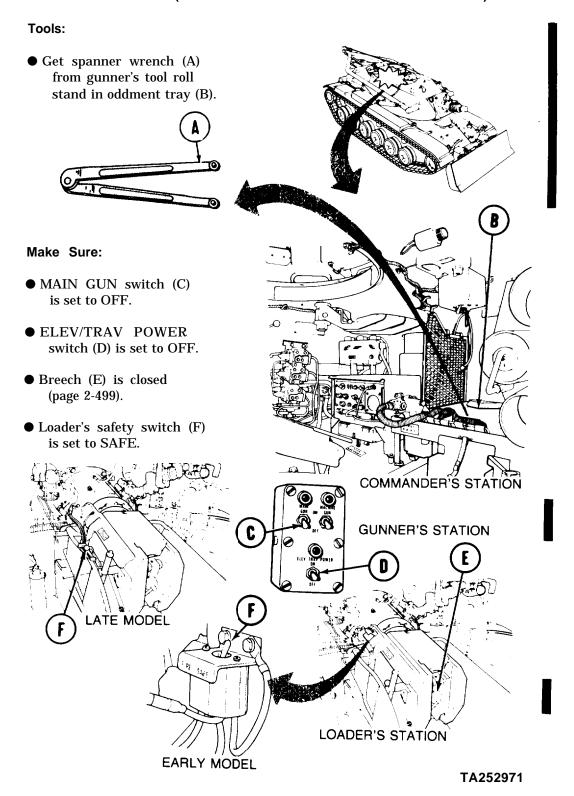
- 8. Insert tips of spanner wrench (F) into holes on adjuster (V).
- Using spanner wrench
   (F), rotate adjuster
   (V) clockwise until
   plunger (W) clicks
   into first notch.





- 10. Remove chain hoist
  (D) from eyebolt (E)
  and hook (M) in turret
  ceiling.
- 11. Unscrew eyebolt (E) from breechblock.
- 12. Return screwdriver, hex key, adjustable wrench, and chain hoist to right front fender box.
- 13. Return eyebolt and spanner wrench to oddment tray.
- 14. Dispose of rags.
- 15. Open and close breech to check for proper functioning.

# MAINTAIN MAIN GUN (ADJUST BREECH CLOSING SPRING TENSION)



Change 1 3-187

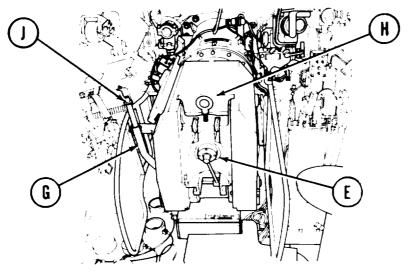
# MAINTAIN MAIN GUN (ADJUST BREECH CLOSING SPRING TENSION) - Continued

## **WARNING**



Keep your hand clear of breech (E) to prevent injury. Do not release BREECH OPERATING HANDLE (G) while you are checking that gun tube (H) is clear. Handle can snap back and injure you.

- 1. Check that gun (H) is clear:
  - a. Grip BREECH OPERATING handle (G). Press in plunger (J). Pull BREECH OPERATING HANDLE (G) back about one foot. Breech will open slightly.
  - b. Check that ammunition has been removed from gun tube (H).
  - c. Move BREECH OPERATING HANDLE (G) up and forward until it latches.



LOADER'S STATION

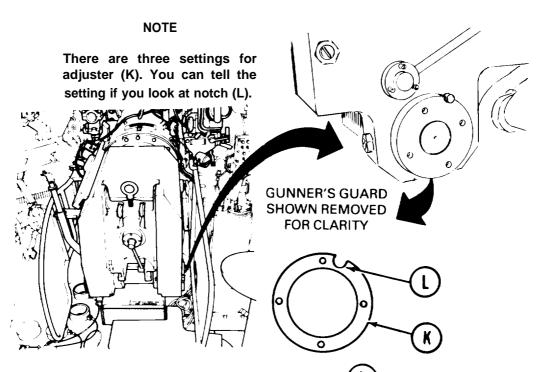


#### WARNING

Be sure BREECH OPERATING HANDLE (G) is latched. An unlatched handle can injure you and damage equipment.

- d. Unload gun if necessary (page 2-550).
- 2. Lower gun as low as possible (page 2-502).

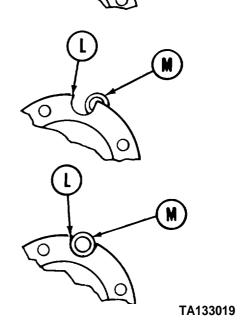
# MAINTAIN MAIN GUN (ADJUST BREECH CLOSING SPRING TENSION) - Continued



- 3. Check the present setting at the adjuster (K):
  - Notch 1: Plunger (M) is to right of notch (L).
  - Notch 2: Plunger (M) is half in notch (L).
  - Notch 3: Plunger (M) is all in the notch (L).

#### **NOTE**

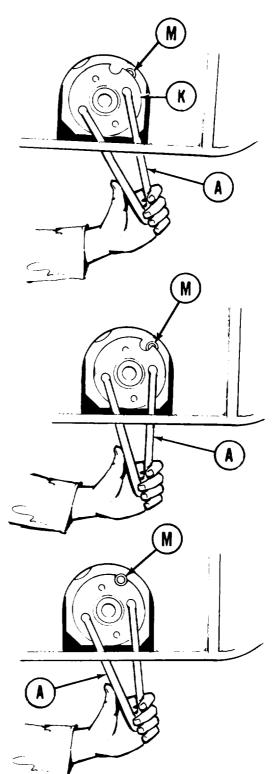
If you have to use notch 3, notify organizational maintenance. Your closing spring is getting too weak.



3-189

# MAINTAIN MAIN GUN (ADJUST BREECH CLOSING SPRING TENSION) - Continued

- 4. Set tension of breech closing spring:
- To make breech close:
  - a. Place tips of spanner wrench (A) into holes of adjuster (K).
  - b. Pull spanner wrench
    (A) straight back
    until plunger (M)
    clicks into notch 1.
- If breech does not lock closed:
  - a. Place tips of spanner wrench (A) into holes of adjuster(K).
  - b. Pull spanner wrench
    (A) straight back
    until plunger (M)
    clicks into notch 2.
  - If breech still does not close:
  - a. Place tips of spanner wrench (A) into holes of adjuster (K).
  - b. Pull spanner wrench (A) straight back until plunger (M) clicks into notch 3. If breech must be adjusted to notch 3, notify organizational maintenance.
- 5. Open and close breech to check that it is operating smoothly (page 2-496 and page 2-499). If necessary, go to step 4 and adjust spring again.
- 6. Return wrench to stowage.



3-190 Change 3

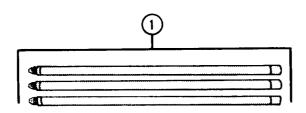
#### MAINTAIN MAIN GUN (CLEAN AND PRESERVE TUBE)

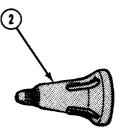
- 1. Quarterly or as required:
  - a. Open breech and place flashlight or extension light into breech facing muzzle end of gun tube.
  - b. Inspect gun tube bore for pitting, flaws, cracking, and deformation. Notify organizational maintenance of any defects.

#### **NOTE**

A clean bore is not necessarily a shiny bore and may have a dull gray appearance.

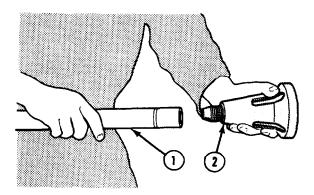
- c. Inspect gun tube for powder fouling or rust. If powder fouling or rust is present, clean gun tube (step 3).
- 2. Before firing
  - a. Wipe all surfaces dry.
  - b. Wipe gun tube bore dry as follows:
    - (1) Remove three cleaning staff sections (1) and cleaning and unloading rammer (2) from fender stowage boxes.



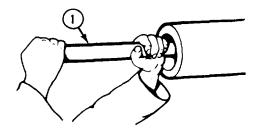


#### MAINTAIN MAIN GUN (CLEAN AND PRESERVE TUBE) - Continued

- (2) Assemble three cleaning staff sections (1) and cleaning and unloading rammer (2).
- (3) Wrap a new cleaning sleeve cloth (Item 17.1, Appendix D) securely on cleaning and unloading rammer (2).



- (4) Station one crew member in turret at the breech opening.
- (5) Insert cleaning staff sections (1) and cleaning and unloading rammer (2) into gun tube.



- (6) Push cleaning staff sections (1) with cleaning and unloading rammer (2) straight through gun tube bore from muzzle to breech.
- (7) Remove cleaning sleeve cloth at breech. Remove cleaning staff sections (1) and cleaning and unloading rammer (2) from gun tube bore.
- (8) Repeat steps 3 through 7 until all surfaces of gun tube bore appear clean and dry.

#### MAINTAIN MAIN GUN (CLEAN AND PRESERVE TUBE) - Continued

#### 3. After firing

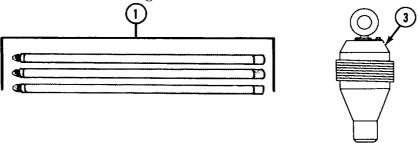
#### CAUTION

- Do not use abrasives to clean the gun tube bore. Use of abrasives can cause damage to the gun tube bore.
- Do not confuse powder fouling with coppering. Do not remove copper from gun tube bore. Damage to gun tube will result.

#### **NOTE**

Allow sufficient time after firing for gun tube to cool enough to be touched by bare hands without discomfort. This will prevent loss of volatile agents in cleaner, lubricant, preservative (CLP) (Item 13.1, Appendix D).

a. Remove three cleaning staff sections (1) and bore brush assembly (3) from fender stowage boxes.

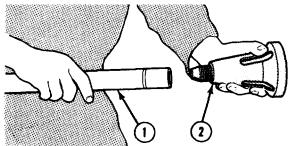


- b. Assemble three cleaning staff sections (1) and bore brush assembly (3). Apply CLP (Item 13.1, Appendix D) to bore brush assembly (3).
- c. Insert cleaning staff sections (1) and bore brush assembly (3) into gun tube. Push cleaning staff sections (1) with bore brush assembly (3) the entire length of the gun tube once forward and back.
- d. Apply CLP (Item 13.1, Appendix D) to bore brush assembly (3). Insert cleaning staff sections (1) and bore brush assembly (3) into gun tube. Use a push-pull action to loosen and remove powder fouling from entire length of gun tube bore.

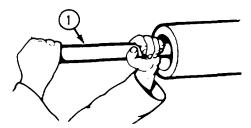
Change 6 3-190.3

#### MAINTAIN MAIN GUN (CLEAN AND PRESERVE TUBE) - Continued

- e. Apply CLP (Item 13.1, Appendix D) to bore brush assembly (3). Insert cleaning staff sections (1) and bore brush assembly (3) into gun tube. Push cleaning staff sections (1) with bore brush assembly (3) the entire length of the gun tube once forward and back.
- f. Remove bore brush assembly (3) and cleaning staff sections (1) from gun tube.
- g. Remove bore brush assembly (3) from cleaning staff sections (l).
- h. Install cleaning and unloading rammer (2) into cleaning staff sections (l).



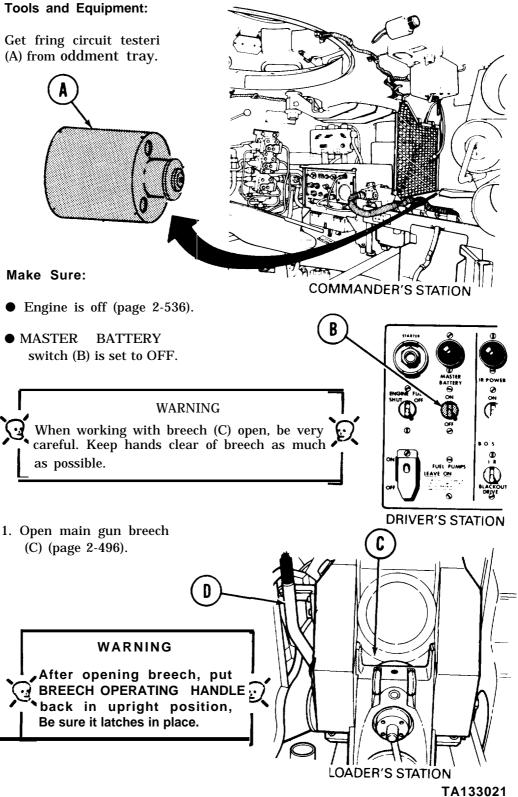
- i. Install new cleaning sleeve cloth (Item 17.1, Appendix D) and securely wrap on cleaning and unloading rammer (2).
- j. Insert cleaning staff sections (1) and cleaning unloading rammer (2) into gun tube.



- k. Push cleaning staff sections (1) with cleaning and unloading rammer (2) the entire length of the gun tube once forward and back.
- l. Remove cleaning staff sections (1) and cleaning and unloading rammer (2) from gun tube bore. Remove and dispose of cleaning sleeve cloth.
- m. Apply CLP (Item 13.1, Appendix D) to new cleaning sleeve cloth (Item 17,1, Appendix D) and wrap cleaning sleeve cloth securely on cleaning and unloading rammer (2). Repeat steps k and 1.
- n. Inspect gun tube bore for cleanliness. Do not wipe gun tube bore dry.
- o. Repeat steps a thru n for two consecutive days after firing.
- p. On third day, repeat steps a thru n. Insure all surfaces of gun tube bore have a thin coat of CLP (Item 13.1, Appendix D) applied.

#### 3-190.4 Change 6

#### MAINTAIN MAIN GUN (CHECK FIRING CIRCUIT WITH TESTER)

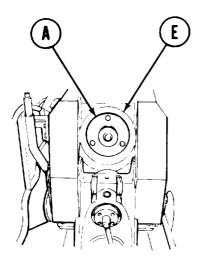


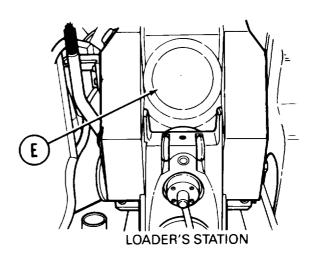
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3-191

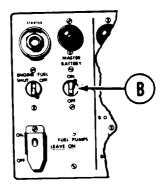
# MAINTAIN MAIN GUN (CHECK FIRING CIRCUIT WITH TESTER) - Continued

2. Look into gun tube
(E) to make sure gun
is not loaded. Unload
gun if necessary (page 2-550).



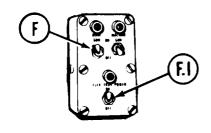


- 2.1 Lower main gun until level or below level (page 2-502).
- 3. Place firing circuit tester (A) into gun tube (E), flat end first.



**DRIVER'S STATION** 

- 4. Close breech (page 2-499).
- 5. Set MASTER BATTERY switch (B) to ON.

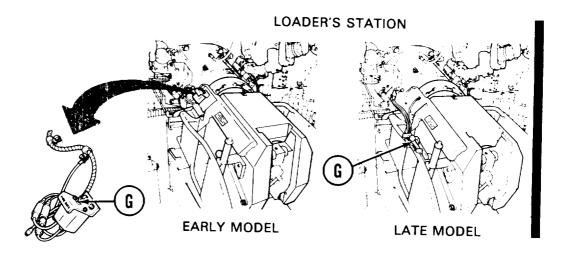


**GUNNER'S STATION** 

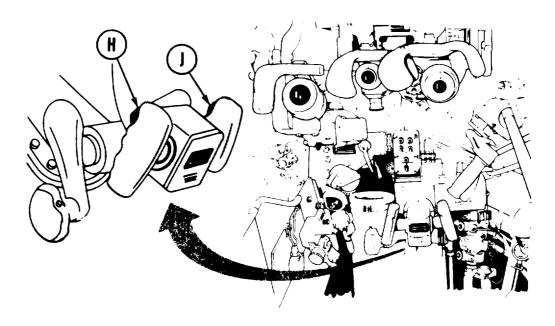
- 5.1 Set ELEV/TRAV POWER switch (F.1) to ON.
- 6. Set MAIN GUN switch (F) to ON.

3-192 Change 3

7. Set loader's safety switch (G) to FIRE.



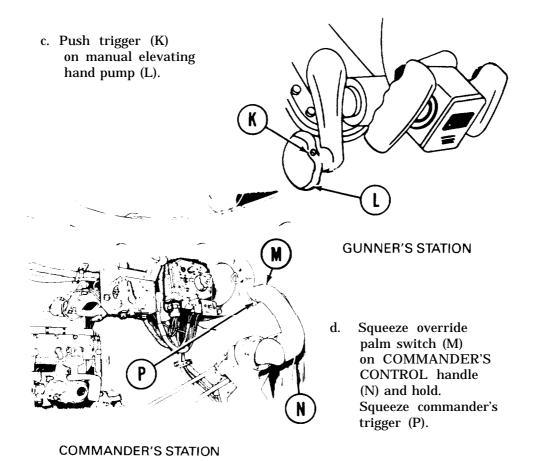
- 8. Listen for a buzzing from firing circuit tester as you do tests a, b, c and d.
  - a. Squeeze left gunner's trigger (H).
  - b. Squeeze right gunner's trigger (J).



TA254450

Change 1 3-193

# MAINTAIN MAIN GUN (CHECK FIRING CIRCUIT WITH TESTER) - Continued

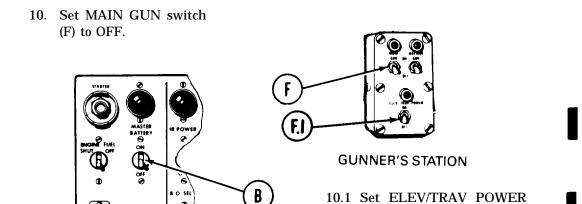


9. If buzzing sound was not heard during any of the tests, notify organizational maintenance.

switch (F.1) to OFF.

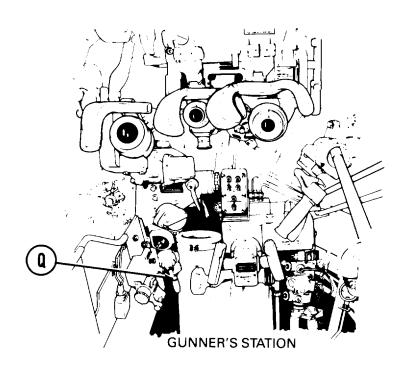
11. Set MASTER BATTERY switch (B) to OFF.

# MAINTAIN MAIN GUN (CHECK FIRING CIRCUIT WITH TESTER) - Continued



- 12. Listen for a buzzing from firing circuit tester as you do the following test.
  - Twist MANUAL FIRING device handle (Q) sharply clockwise.

DRIVER'S STATION

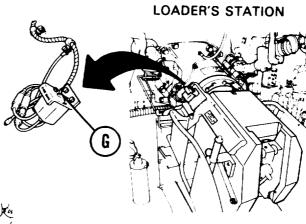


Change 3 3-195

#### TM 9-2350-222-10-3

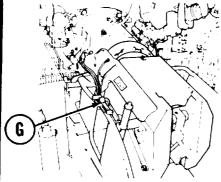
#### MAINTAIN MAIN GUN (CHECK FIRING CIRCUIT WITH TESTER) - Continued

- 13. Set loader's safety switch (G) to SAFE.
- 14. Open breech (page 2-496).
- 15. Remove firing circuit tester (A) from main gun.



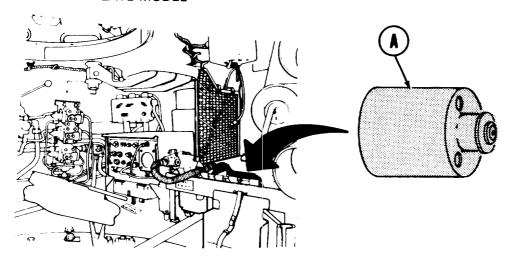
**EARLY MODEL** 

LOADER'S STATION



LATE MODEL

- 16. Close breech (2-499).
- 17. Return firing circuit tester to stowage.



COMMANDER'S STATION

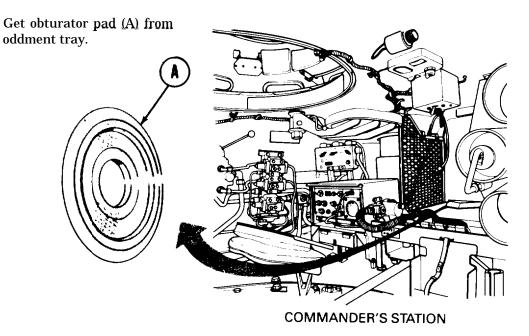
18. If buzzing sound was not heard during any of the tests, notify organizational maintenance.

TA252972

3-196 Change 1

#### MAINTAIN MAIN GUN (REPLACE OBTURATOR PAD)

#### **Equipment:**



- 1. Remove breechblock assembly (page 3-174).
- 2. Disassemble breechblock assembly (page 3-178).
- 3. Assemble breechblock assembly (page 3-180) using new obturator pad in place of old one, Leave out shim or shims if present.
- 4. Install breechblock assembly (page 3-184).
- 5. Check and shim obturator pad (page 3-198).
- 6. Take old obturator pad to organizational maintenance and exchange for new one.
- 7. Stow new obturator pad in oddment tray.

# MAINTAIN MAIN GUN (CHECK AND SHIM OBTURATOR PAD) Tools and Equipment: Get from right front fender box: Obturator shim set (A). Hand pump oiler (B). Preliminary shim set (C).

To Check If Obturator Needs Shims:

Clean rags (item 56, Appendix D).

#### **NOTE**

The purpose of shims is to add thickness to obturator assembly so breech is completely sealed when closed.

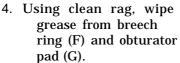
**COMMANDER'S STATION** 

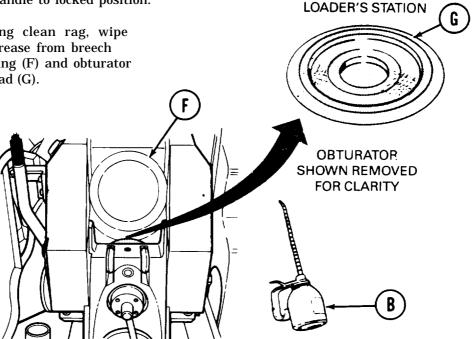
Supplies:

#### MAINTAIN MAIN GUN (CHECK AND SHIM OBTURATOR PAD) - Continued

D

- 1. Open breech (page 2-496) and close breech (page 2-499) four times.
- 2. With breech mechanism clean and lubricated. set the adjuster at the minimum preload required to fully close the breech (page 3-187).
- 3. Push in on plunger (D) and pull BREECH OPERATING HANDLE (E) back until breech is locked open. Return handle to locked position.





LOADER'S STATION

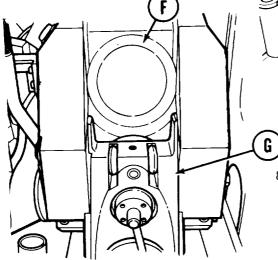
5. Using hand pump oiler (B) and fingers, coat surface of breech ring (F) with a thin film of oil.

TA133029

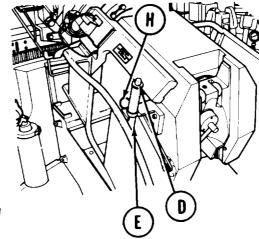
3-199

#### MAINTAIN MAIN GUN (CHECK AND SHIM OBTURAOTR PAD) - Continued

- 6. Pull up on breechblock release lever (H), breech will close.
- 7. Press in on plunger
  (D) and pull BREECH
  OPERATING HANDLE (E)
  back until breech is open.



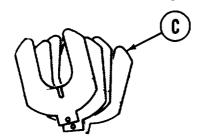
LOADER'S STATION



LOADER'S STATION

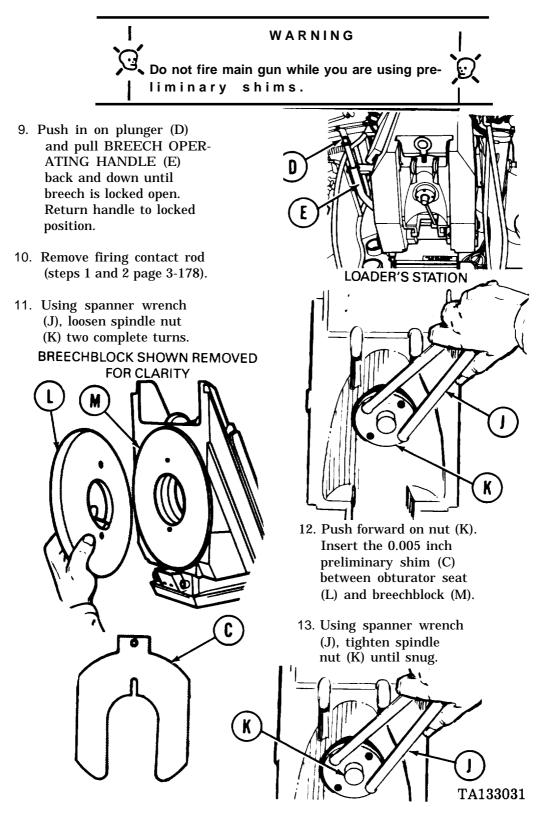
- 8. Check impression obturator makes in oil on breech ring (F).
  - If obturator makes a clear impression completely around breech ring (F), close breech and go to step 24.
  - If impression of obturator does not show completely around breech ring (F), continue with step 9.

To Decide How Much Shimming Is Necessary:

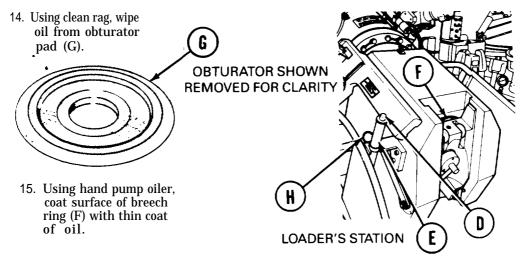


#### **NOTE**

Use preliminary shims (C) to find out how thick the permanent shim must be. There are five preliminary shims. The thinnest is 0.005 inch thick. Next are 0.01, 0.02, 0.03 and 0.04 inch thick.



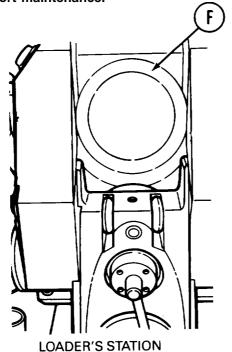
#### MAINTAIN MAIN GUN (CHECK AND SHIM OBTURATOR PAD) -Continued



- 16. Pull upon breechblock release handle (H), breech will close.
- 17. Press plunger (D) and move BREECH OPERATING HANDLE (E) back and down until breech is locked open.

#### **NOTE**

If obturator does not seat after using shims up to 0.02 inch thickness, notify support maintenance.



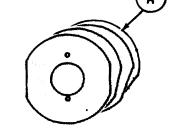
- 18. Check impression obturator makes in oil on breech ring (F).
  - If obturator makes a clear impression completely around breech ring (F), breechblock seals when closed.
     Continue with step 19.
  - If impression of obturator does not show completely around breech ring, breechblock is not sealed.
     Repeat steps 9 thru 17 using combination of preliminary shims to add 0.005 inch at a time, to preliminary shims already used.

MAINTAIN MAIN GUN (CHECK AND SHIM OBTURATOR PAD) - Continued

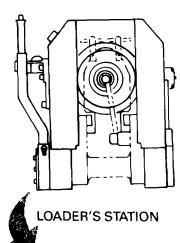
To Install Permanent Shims:

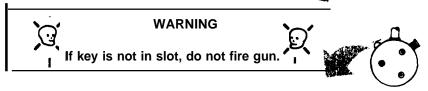
#### NOTE

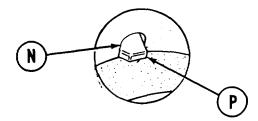
You have six permanent shims (A). The sizes are 0.004, 0.006, 0.008, 0.010, 0.015 and 0.020 inches. You may have to use a combination of these shims to obtain the correct thickness.



- 19. Repeat step 11. Remove preliminary shim or shims used and record their thickness.
- 20. Remove breechblock (page 3-174).
- 21. Disassemble breechblock (page 3-178).
- 22. Using correct thickness of permanent shim or shims, assemble breechblock (page 3-180).
- 23. Install breechblock (page 3-184).
- 24. Look to see if key (N) fits into slot (P) as shown.
  - If key is in slot, continue starting with step 25.
  - If key is not in slot. notify organizational maintenance.





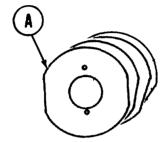


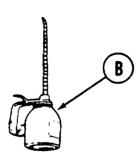
TA133033

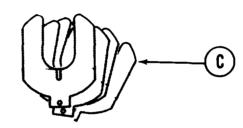
3-203

# MAINTAIN MAIN GUN (CHECK AND SHIM OBTURATOR PAD) -Continued

- 25. Perform firing circuit test (page 3-191).
  - If gun fails test, notify organizational maintenance.
- 26. Return hand pump oiler (B) and remaining permanent shims (A) to right front fender box.







- 27. Return preliminary shims to oddment tray.
- 28. Adjust breech closing spring tension (page 3-187).

**DRIVER'S STATION** 

COMMANDER'S
\_\_\_STATION

## MAINTAIN M239 SMOKE GRENADE LAUNCHER (CLEAN DISCHARGERS)

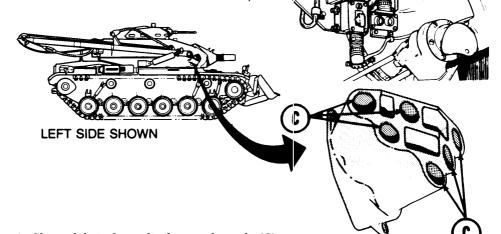
#### Supplies:

Get the following Supplies:

- Rifle bore cleaner (item 10, Appendix D)
- Lubricating oil (item 48, Appendix D)
- Clean, dry rags (item 56, Appendix D)
- Steel Wire (item 66, Appendix D)

#### Make Sure:

- MASTER BATTERY switch (A) is set to OFF.
- Turret lock is LOCKED (page 2-566).
- Smoke grenade launcher power switch (B) is set to OFF.
- Covers are removed (page 2-566.2).
- Smoke grenade dischargers are unloaded (page 2-566.1).



1. Clean debris from discharger barrels (C).

Change 1 3-204.1

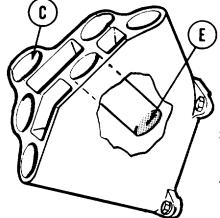
# MAINTAIN M239 SMOKE GRENADE LAUNCHER (CLEAN DISCHARGERS)

#### - Continued

#### NOTE

Top center barrel drain hole cannot b. cleaned using steel wire. If drain hole is clogged, notify organizational maintenance to clean drain hole using compressed air.

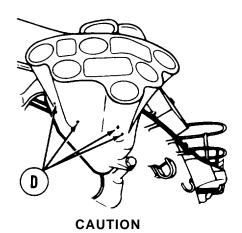
2. Using steel wire, make sure drain holes (D) in barrel are clear.



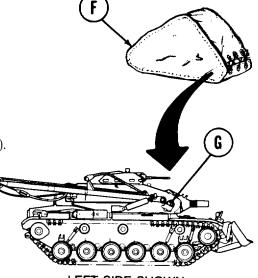
**CAUTION** 

Tip plugs must be clean and dry. Do not oil tip plugs.

- 5. Install discharger covers (F) grenade dischargers (G) (page 2-566.3).
- 6. Return supplies to stowage.



- Do not step on dischargers.
- Do not use wire brush or steal wool to clean barrels.
- 3. Using rags and rifle bore cleaner or soap and water, clean barrels (C).
- 4. Using clean, dry rags, remove all cleaning solution from barrels. Make sure no residue remains around tip plugs (E).



LEFT SIDE SHOWN

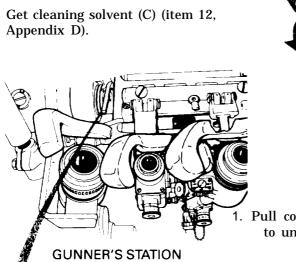
# **MAINTAIN BALLISTIC DRIVE (CLEAN COUPLING)**

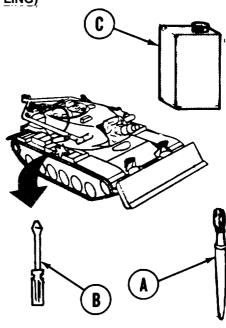
# **Tools and Supplies:**

D

Get from right front fender box:l

- Sash brush (A) (item 7, Appendix D).
- Flat-tip screwdriver (B).



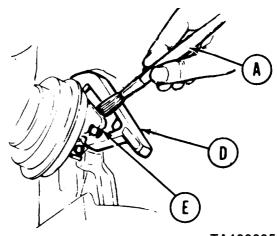


1. Pull coupling lever (D) on ballistic drive to unlock.

#### **NOTE**

Allow all parts to air dry after cleaning.

Dampen lever (D) and coupling wedge
 (E) with cleaning solvent using
 brush (A).

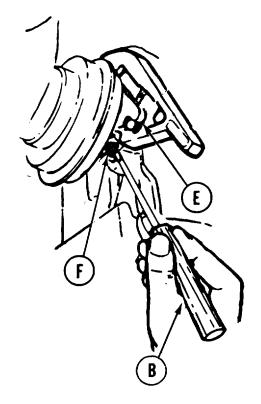


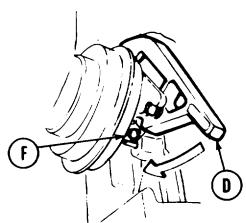
TA133035

3-205

# MAINTAIN BALLISTIC DRIVE (CLEAN COUPLING) - Continued

- 3. Using end of screwdriver (B), check if retaining ball (F) is dirty by pressing ball on coupling wedge (E).
- 4. If ball is dirty, clean with cleaning solvent using brush.



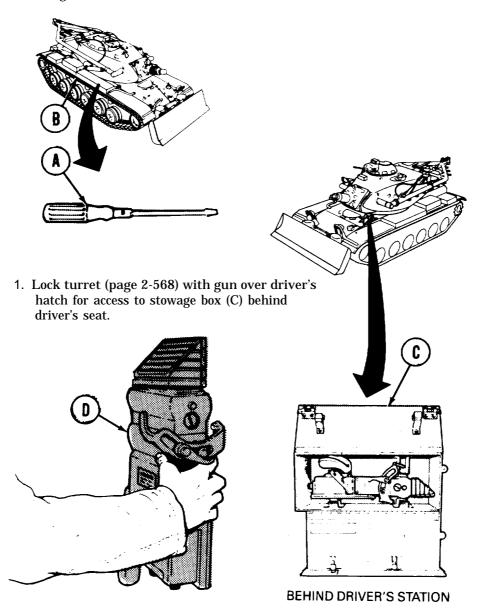


- 5. Push coupling lever (D) until lever locks over retaining ball (F).
- 6. Return tools and supplies to stowage.

#### MAINTAIN PERISCOPES (REPLACE M24 PERISCOPE HEAD ASSEMBLY)

#### Tools:

Get flat-tip screwdriver (A) from right front fender box (B).



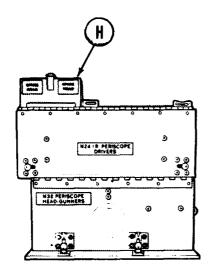
2. Remove M24 periscope (D) from stowage box (C).

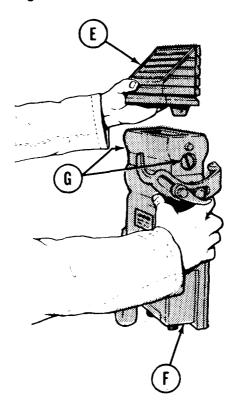
# MAINTAIN PERISCOPES (REPLACE M24 PERISCOPE HEAD ASSEMBLY) - Continued

#### **NOTE**

# Do not expose periscope head assembly (E) to sunlight.

- 3. While holding body (F), turn two body latch eccentrics (G) one-half turn counterclockwise.
- 4. Lift head assembly (E) from body assembly (F).
- 5. Get spare head assembly (E) from turret stowage box (H). underneath 165-mm main gun.
- 6. Put damaged head assembly (E) in periscope stowage box (H). Turn in to organizational maintenance for a replacement as soon as possible.
- 7. Place new head assembly (E) on body assembly (F).





- 8. Turn body latch eccentrics (G) fully clockwise to secure head assembly (E) to body assembly (F).
- 9. Return screwdriver to stowage.
- All data on pages 3-209 and 3-210 deleted. 3-208 Change 6

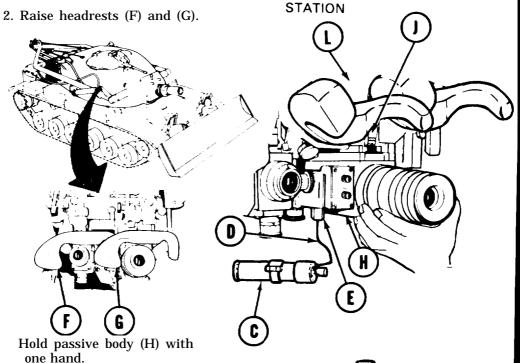
**GUNNER'S** STATION

#### MAINTAIN PERISCOPES (REMOVE PERISCOPE BODY)

#### To Remove M32CE1 Passive Body:

#### Make Sure:

- MASTER BATTERY switch (A) is set to OFF.
- ELEV/TRAV POWER switch (B) is set to OFF.
- 1. Disconnect light source (C) (if connected):
  - a. Remove cable (D) from connector (E).
  - b. Connect cable (D) to light source (C).



DRIVER'S

- 3. one hand.
- 4. Release front latch (J).
- 5. Release rear latch (K) behind periscope.
- Lower passive body (H) until it 6. clears the head assembly (L).

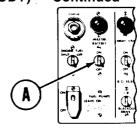
TA252975

Change 1 3-210.1

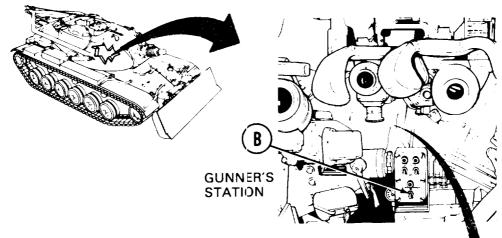
#### To Remove M32CE1 Daylight Body:

#### Make Sure:

- MASTER BATTERY switch (A) is set to OFF.
- ELEV/TRAV POWER switch (B) is set to OFF.



**DRIVER'S STATION** 



#### **CAUTION**

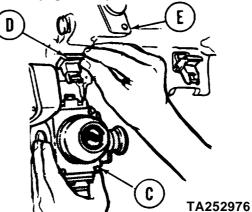
Optical equipment is very fragile and should be handled with care. When removing, make sure you always have a firm hold to prevent dropping. Take care not to touch lenses with your fingers.

1. Hold daylight body (C) firmly with left hand.

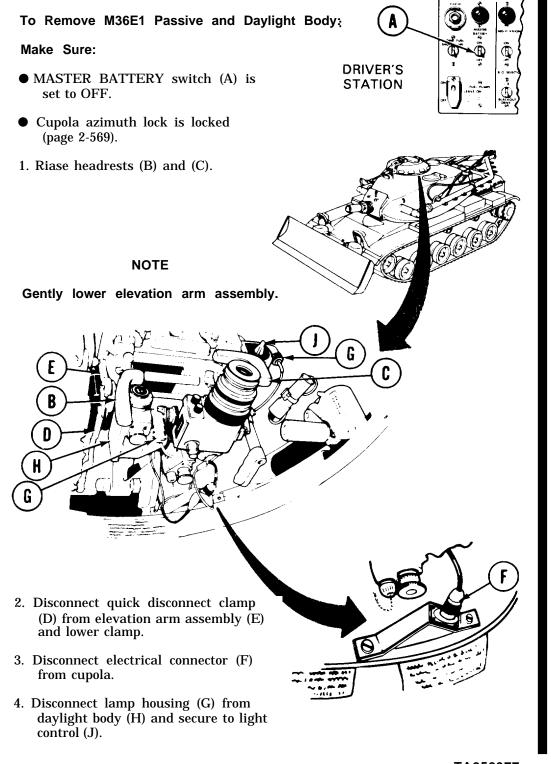
#### **NOTE**

Rear latch is behind daylight body.

- 2. Release two latches (D) (one front, one rear).
- 3. Lower daylight body (C) carefully down from periscope head (E).

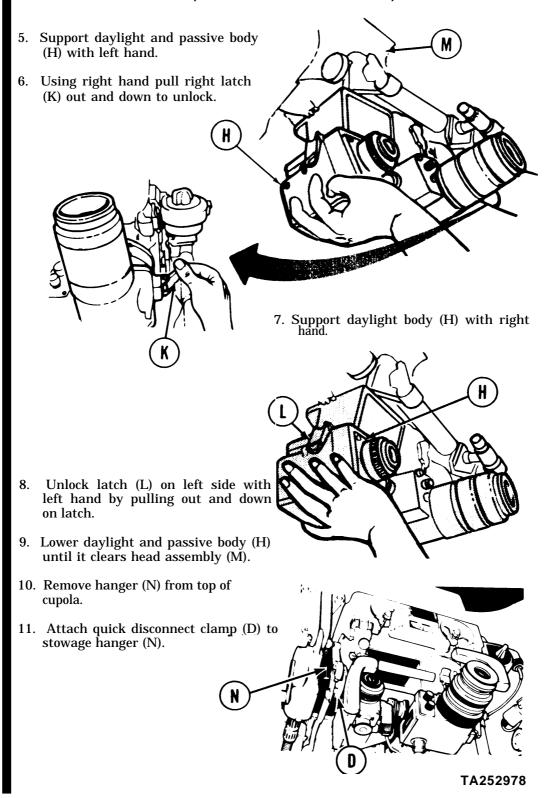


3-210.2 Change 1



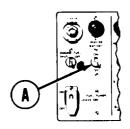
TA252977

Change 1 3-210.3



### To Remove M36E1 Passive Body: Make Sure:

- MASTER BATTERY switch (A) is set to OFF.
- Cupola azimuth lock is locked (page 2-569).



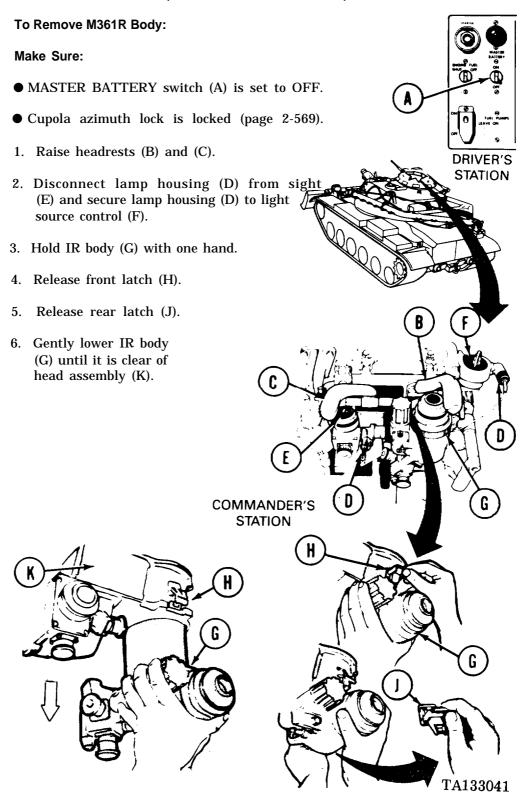
DRIVER'S STATION

- 1. Raise headrests (B) and (C).

  2. Disconnect lamp housing (D) from sight (E).

  3. Secure lamp housing (D) to light source control (F).
- 4. Hold base of body (G) with one hand.
- 5. Release front latch (H).
- 6. Release rear latch (J).
- 7. Lower passive body (G) from head assembly (K).

Change 6 3-210.5/(3-210.6 blank)



#### To Remove M36IR and Daylight Body:

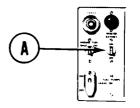
#### Make Sure:

- MASTER BATTERY switch (A) is set to OFF.
- Cupola azimuth lock is locked (page 2-569).
- 1. Raise headrests (B) and (C).

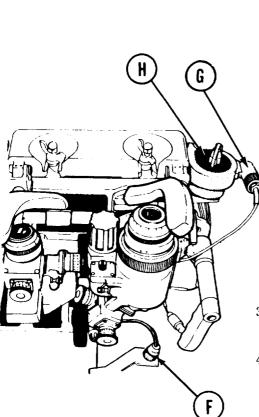
#### **NOTE**

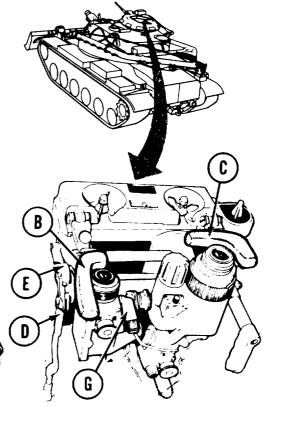
Lower elevation arm assembly gently.

2. Disconnect quick-disconnect clamp (D) from elevation arm assembly (E).



DRIVER'S STATION

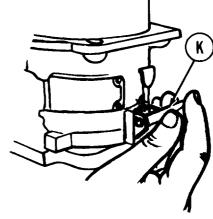




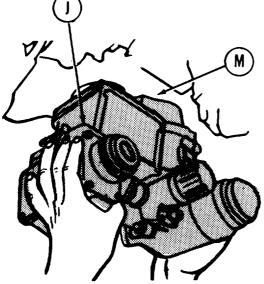
**COMMANDER'S STATION** 

- Disconnect electrical connector (F) from cupola.
- 4. Disconnect lamp housing (G) and secure to light control (H).

- 5. Support IR and daylight body (J) with left hand.
- 6. Using right hand, pull right latch (K) out and down to unlock.
- 7. Support body (J) with right hand.

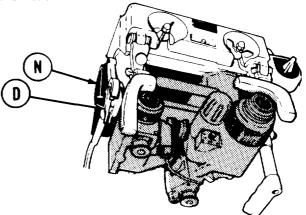


8. Unlock left latch (L) by pulling out and down.





9. Lower body (J) until it clears head assembly (M).



- 10. Remove stowage hanger from top of cupola.
- 11. Attach quick-disconnect (D) to hanger (N).

All data on pages 3-214 thru 3-216 deleted. ■ Change 6 3-213/(3-2 14 blank)

### MAINTAIN PERISCOPES (REPLACE PERISCOPE BATTERY/CONVERTER) - Continued

To Replace Converter with Battery on M36IR Body:

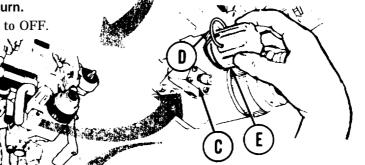
#### Tools:

Get wire cutter (A) from right front fender box.

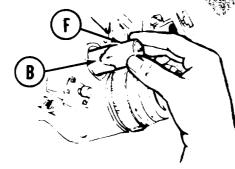
#### **CAUTION**

When removing or installing converter or battery, prevent loose connections. Do not allow sleeve (B) to turn.

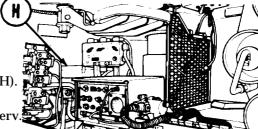
1. Set IR switch (C) to OFF.



COMMANDER'S STATION

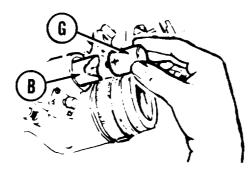


- 2. Using wire cutter (A), cut lockwire (D).
- 3. Unscrew cap (E).
- 4. Pull converter (F) out from periscope sleeve (B).



5. Get BA42 battery (G) (item 5, Appendix D) from spare lamp box (H).

6. Stow converter (F) in place of battery



COMMANDER'S STATION

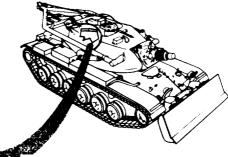
- 7. Insert battery (G) into periscope sleeve (B), positive (+) end first.
- 8. Replace cap (E).
- 9. Return wire cutter to stowage.

#### MAINTAIN PERISCOPES (REPLACE PERISCOPE BATTERY/CONVERTER) -Continued

To Replace Battery with Converter on M36IR Body:

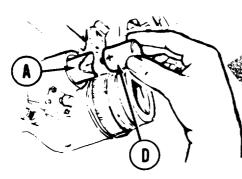
#### **CAUTION**

When removing or installing converter or battery, prevent loose connections. Do not allow sleeve (A) to turn.

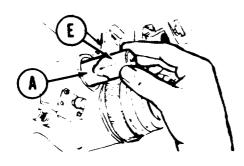


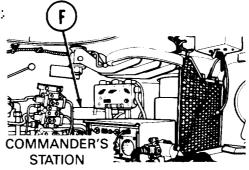
Set IR switch (B) to OFF.





- 2. Unscrew cap (C).
- 3. Pull battery (D) out from periscope sleeve (A).
- 4. Get converter (E) from spare lamp box (F).
- 5. Stow battery (D) in place of converter:
- 6. Insert converter (E) as indicated by arrow on converter into periscope sleeve (A).



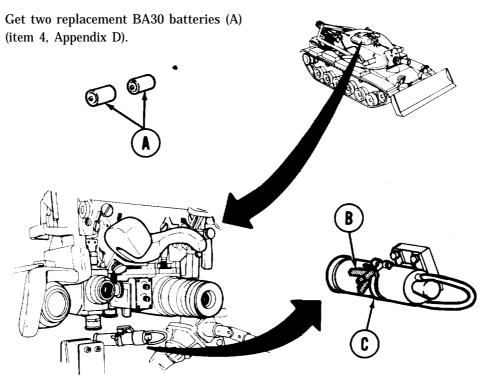


- 7. Replace cap (C).
- 8. Have organizational mechanic install lockwire on cap (C).

#### MAINTAIN PERISCOPES (REPLACE PERISCOPE BATTERIES)

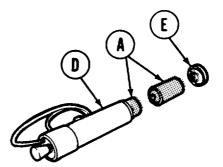
### To Replace Batteries in M30 Instrument Light for M32CE1 Periscope:

#### Supplies:



**GUNNER'S STATION** 

- 1. Loosen wing nut (B) on bracket (C).
- 2. Remove instrument light (D).
- 3. Remove cap (E) from instrument light.
- 4. Remove two used batteries (A) from instrument light (D).
- 5. Install two new BA30 batteries (A) positive (+) end first.
- 6. Replace cap (E).
- 7. Replace instrument light (D) into bracket (C).
- 8. Tighten wing nut (B).



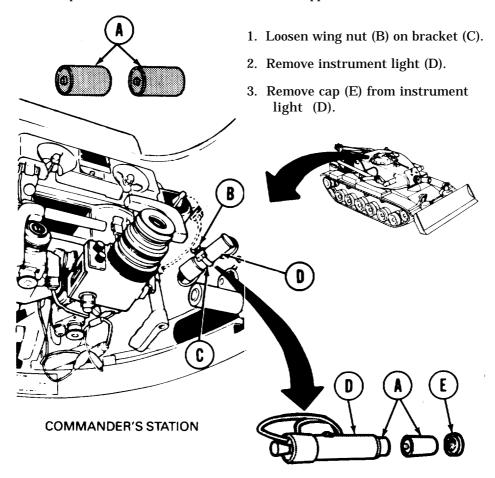
TA252980

Change 1 3-218.1

#### MAINTAIN PERISCOPES (REPLACE PERISCOPE BATTERIES) - Continued

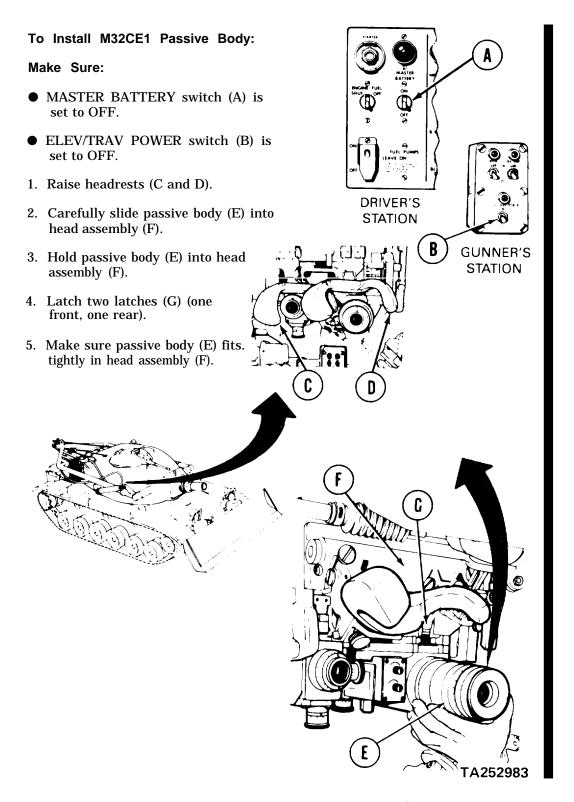
## To Replace Batteries in M30 Instrument Light for M36E1 Periscope: Supplies:

Get two replacement BA30 batteries (A) (item 4, Appendix D).



- 4. Remove two used batteries (A) from instrument light (D).
- 5. Install two new BA30 batteries (A) positive (+) end first.
- 6. Replace cap (E).
- 7. Replace instrument light (D) in bracket (C).
- 8. Tighten wing nut (B).

All data on pages 3-219 and 3-220 deleted. 3-218.2 Change 6

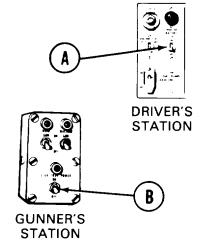


Change 1 3-220.1

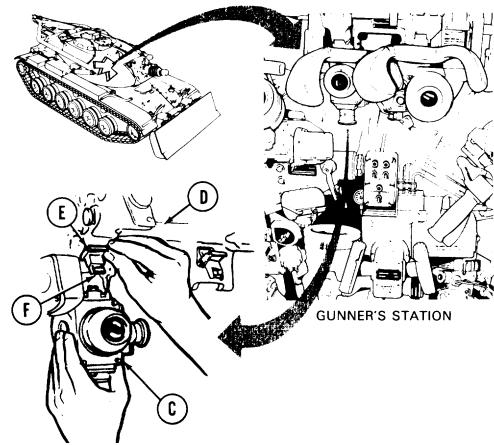
#### To Install M32CE1 Daylight Body:

#### Make Sure:

- MASTER BATTERY switch (A) is set to OFF.
- ELEV/TRAV POWER switch (B) is set to OFF.
- 1. Slide daylight body (C) carefully up into periscope head (D).
- 2. Support daylight body (C) with left hand.
- **3.** Latch two latches (E) (one front, one rear).



4. Make sure daylight body (C) and periscope head (D) fit tightly at point (F).

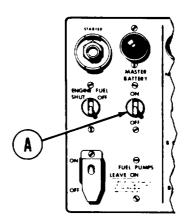


3-220.2 Change 1

#### To Install M36E1 Passive Body:

Make Sure:

- MASTER BATTERY switch (A) is set to OFF.
- Cupola azimuth lock is locked (page 2-569).
- 1. Raise headrest (B) and (C).
- 2. Slide passive body (D) into head assembly (E).
- 3. Hold base of body (D) with one hand.
- 4. Engage latches (F) (one front, one rear).
- 5. Engage front latch (G).

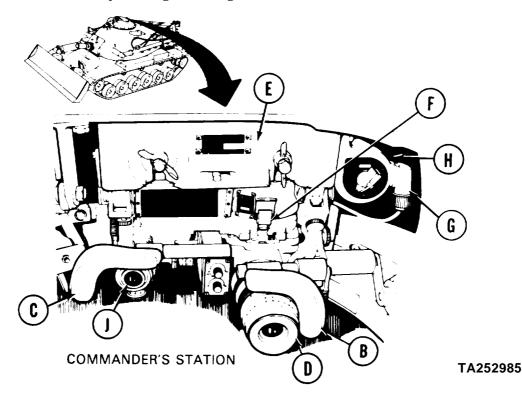


**DRIVER'S STATION** 

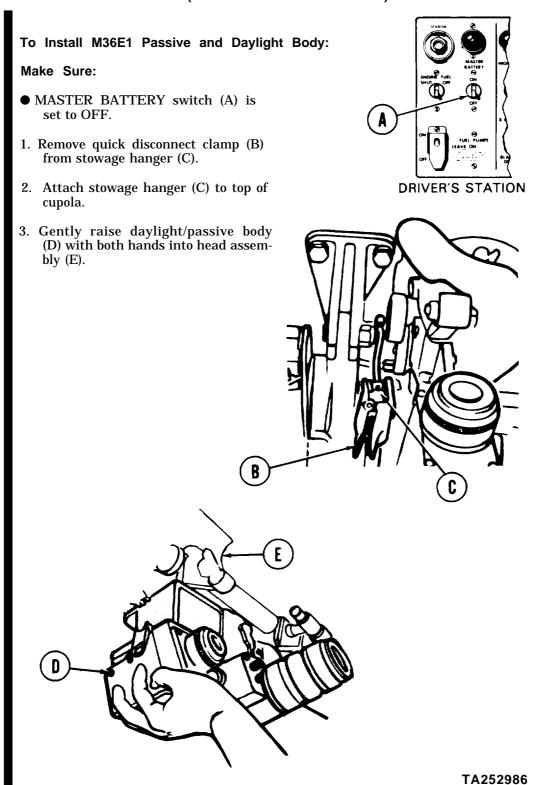
#### **NOTE**

Make sure passive body (D) is secure before removing hand.

- 6. Remove lamp housing (G) from light source control (H).
- 7. Connect lamp housing (G) to sight (J).

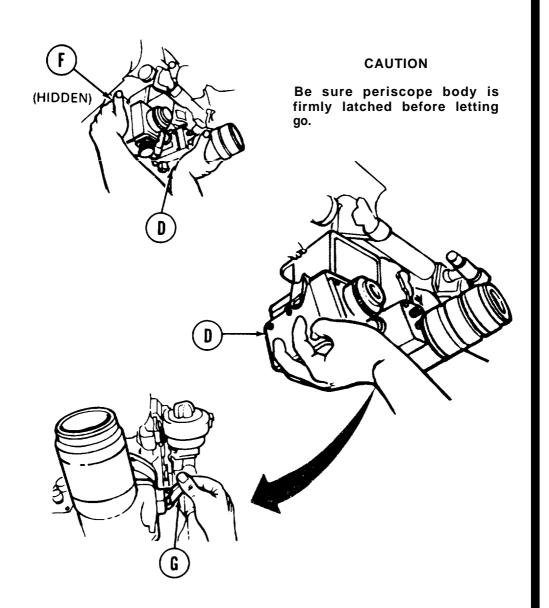


Change 1 3-220.3



3-220.4 Change 1

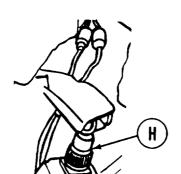
4. Hold body (D) with right hand and hook left latch (F) by pushing out and up.



5. Hold daylight and passive body (D) with left hand and lock latch (G) on right by pushing out and up.

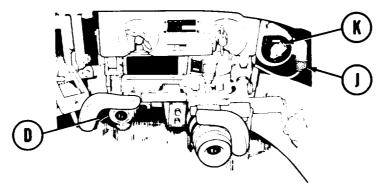
TA252987

Change 1 3-220.5

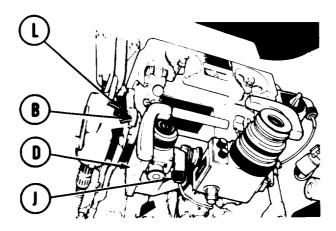


6. Connect electrical connector (H) to cupola.

7. Disconnect lamp housing (J) from light control (K) and secure to body (D).



8. Connect quick disconnect clamp (B) to elevation arm assembly (L).



#### To Install M36IR Body:

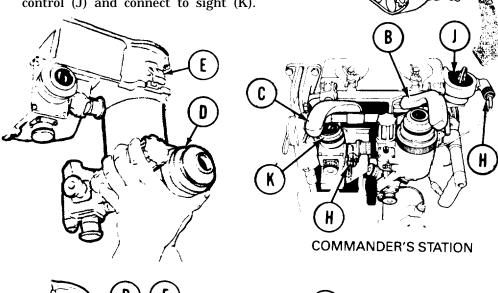
#### Make Sure:

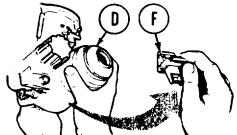
- MASTER BATTERY switch (A) is set to OFF.
- Cupola azimuth lock is locked (page 2-569).
- 1. Raise headrest (B) and (C).
- 2. Raise IR body (D) into head assembly (E).
- 3. Hold IR body (D) with one hand.

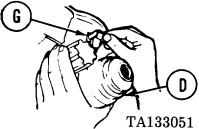
DRIVER'S STATION

A

- 4. Hook rear latch (F) by pulling down on latch.
- 5. Hook front latch (G) by pushing up on latch.
- 6. Make sure IR body (D) is secure before removing hand from body.
- 7. Remove lamp housing (H) from light source control (J) and connect to sight (K).

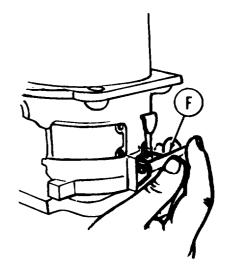


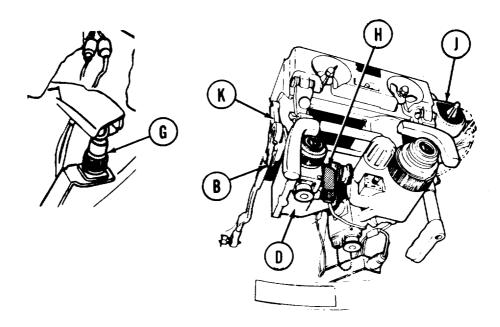




# To Install M36IR and Daylight Body: Make Sure: • MASTER BATTERY switch (A) is set to OFF. • Cupola azimuth lock is locked (page 2-569). 1. Remove quick-disconnect clamp (B) from hanger (C). 2. Attach stowage hanger (C) to top of cupola. **COMMANDER'S STATION** 3. Gently raise periscope body (D) into head assembly (E). 4. Hold body (D) in one hand and lock latch (F) by pushing out and up. 5. Hold body (D) with one hand.

- 6. Push latch (F) out and up to lock.
- 7. Connect electrical connector (G) to cupola.
- 8. Disconnect lamp housing (H) from light control (J) and secure to body (D).
- 9. Connect quick-disconnect clamp (B) to elevation arm assembly (K).

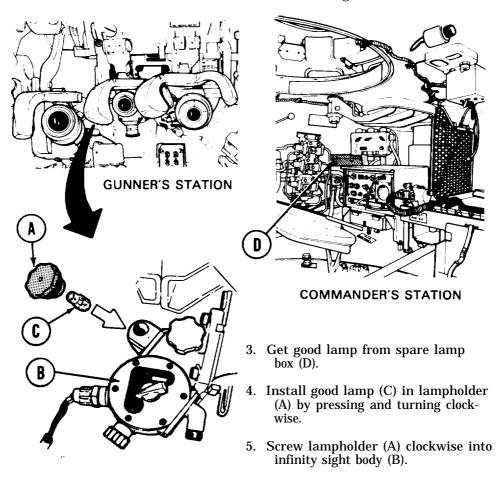




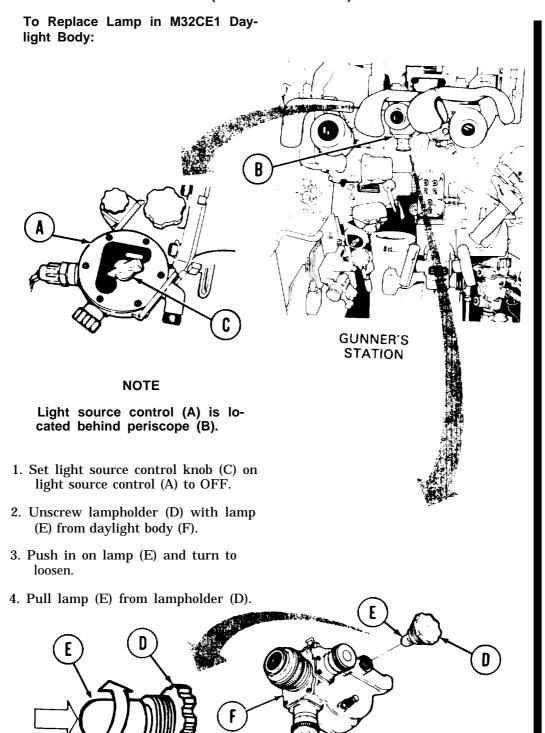
#### MAINTAIN PERISCOPES (REPLACE LAMPS) - Continued

#### To Replace Infinity Sight Lamp For M32CE1 Periscope:

- 1. Unscrew lampholder (A) counterclockwise and remove from infinity sight body (B) (located to left behind M32CE1 periscope).
- 2. Remove bad lamp (C) by pressing and turning counterclockwise.



- 6. Put infinity sight into operation (page 2-450) to check lamp. If reticle lights, dispose of bad lamp. If reticle does not light, notify organizational maintenance.
- All data on pages 3-224 thru 3-227 deleted. 3-228 Change 6

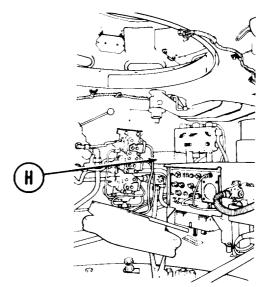


Change 1 3-228.1

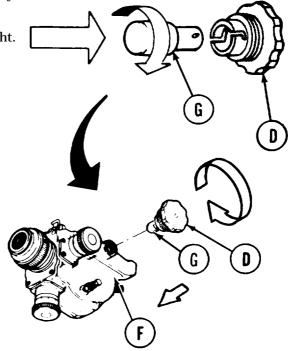
TA252990

DAYLIGHT BODY SHOWN REMOVED FOR CLARITY

#### MAINTAIN PERISCOPES (REPLACE LAMPS) - Continued



- COMMANDER'S STATION
- 5. Remove spare lamp (G) from spare lamp box (H).
- 6. Install spare lamp (G) into lampholder (D).
- 7. Screw lampholder (D) back into daylight body (F).
- 8. Tighten lampholder (D) finger tight.



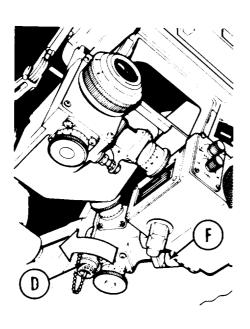
#### MAINTAIN PERISCOPES (REPLACE LAMPS) - Continued

#### To Replace Lamp in M32CE1 Passive Body:

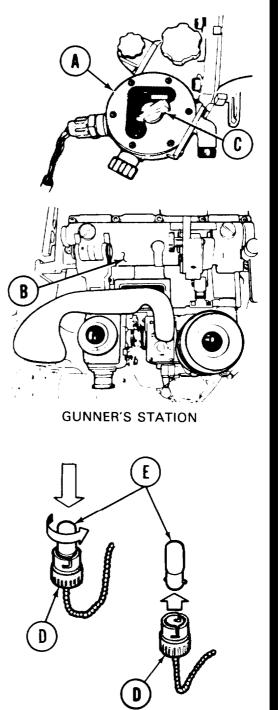
#### NOTE

Light source control (A) is located behind M32CE1 periscope (B).

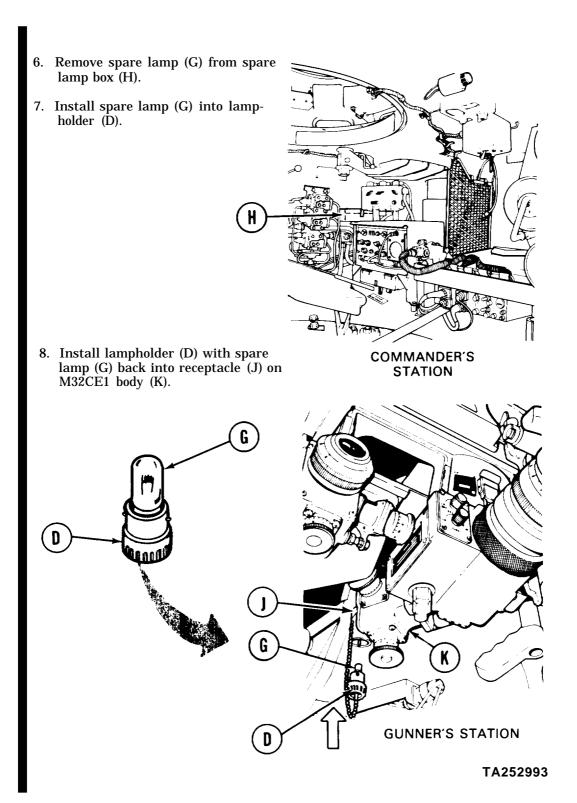
1. Set light source control knob (C) on light source control (A) to OFF.



- 2. Turn lampholder (D) approximately 1/4 turn.
- 3. Pull lampholder (D) with burned out lamp (E) from passive body (F).
- 4. Push in on lamp (E) and turn to loosen.
- 5. Pull lamp (E) from lampholder (D).



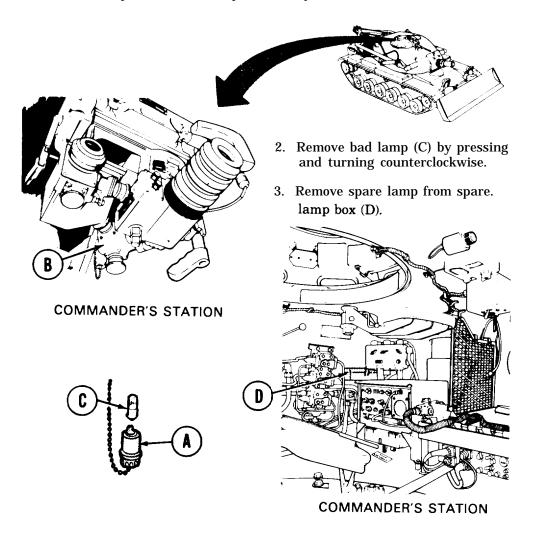
Change 1 3-228.3



3-228.4 Change 1

#### To Replace Lamp in M36E1 Passive Body:

1. Unscrew lampholder (A) from passive body (B).

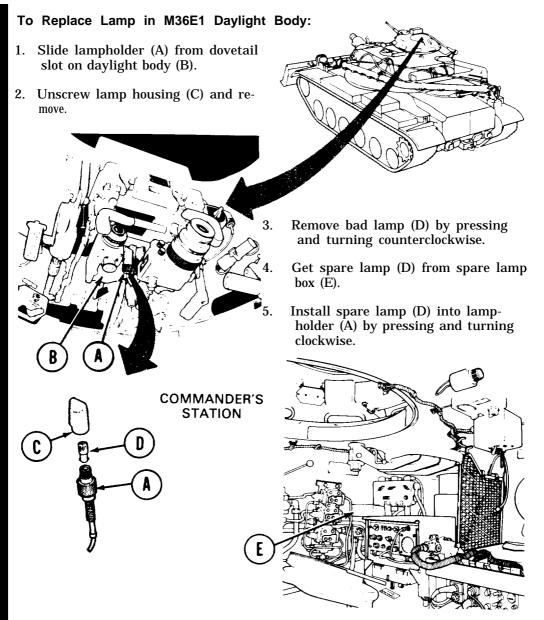


- 4. Install spare lamp (C) into lampholder (A) by pressing and turning clockwise.
- 5. Screw lampholder (A) into body (B).
- 6. Put passive body into operation (page 2-360.1) to check lamp. If reticle lights, dispose of bad lamp. If reticle does not light, notify organizational maintenance.

TA252994

Change 1 3-228.5

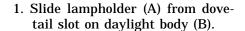
#### MAINTAIN PERISCOPES (REPLACE LAMPS) Continued



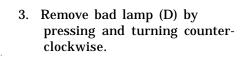
- 6. Screw lamp housing (C) on lampholder (A).
- 7. Replace lampholder (A) on dovetail slot on daylight body (B).
- 8. Put daylight body into operation (page 2-349) to check lamp. If reticle lights, dispose of bad lamp. If reticle does not light, notify organizational maintenance.

#### **MAINTAIN PERISCOPES (REPLACE LAMPS) - Continued**

#### To Replace Lamp in M36 Daylight Body:

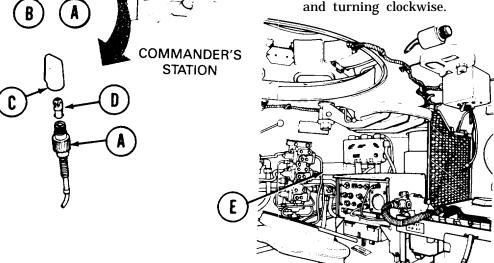


2. Unscrew lamp housing (C) and remove.



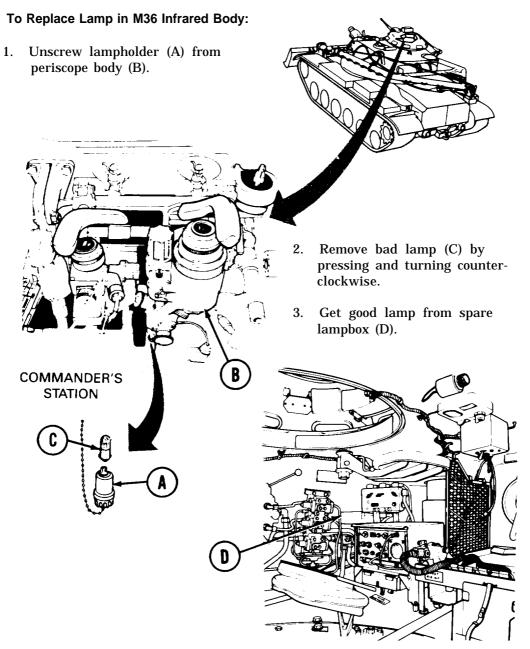
4. Get good lamp (D) from spare lampbox (E).

5. Install good lamp (D) into lampholder (A) by pressing and turning clockwise.



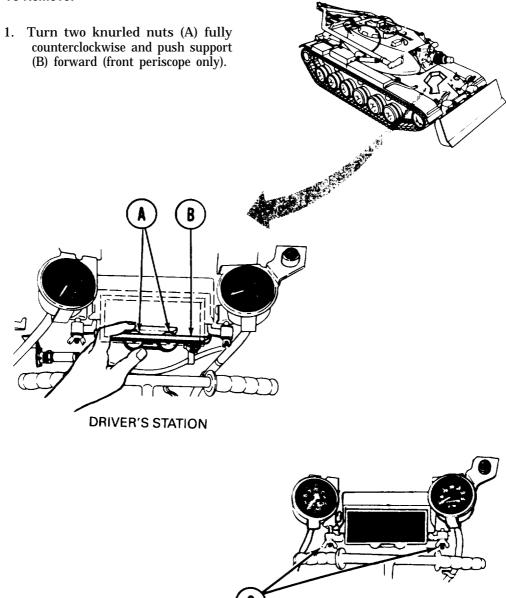
- 6. Screw lamp housing (C) on lampholder (A).
- 7. Replace lampholder (A) on dovetail slot on daylight body (D).
- 8. Put daylight body into operation (page 2-349) to check lamp. If reticle lights, dispose of bad lamp. If reticle does not light, notify organizational maintenance.

#### MAINTAIN PERISCOPES (REPLACE LAMPS) - Continued



- 4. Install good lamp (C) into lampholder (A) by pressing and turning clockwise.
- 5. Screw lampholder (A) into body (B).
- 6. Put infrared body into operation (page 2-354) to check lamp. If reticle lights, dispose of bad lamp. If reticle does not light, notify organizational maintenance.

#### To Remove:



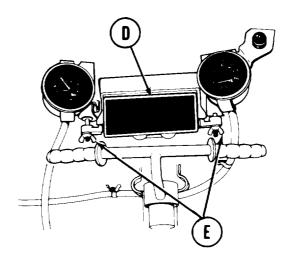
2. Loosen wing nuts (C) on each side of periscope.

TA133061

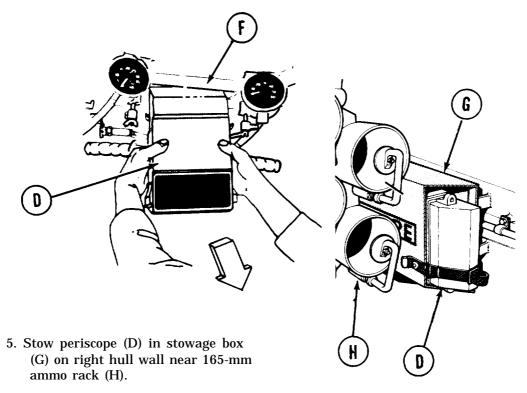
**DRIVER'S STATION** 

#### MAINTAIN PERISCOPES (REPLACE M27 PERISCOPE) - Continued

3. Holdup periscope (D) and rotate retainers (E) on both sides until clear of periscope (D).

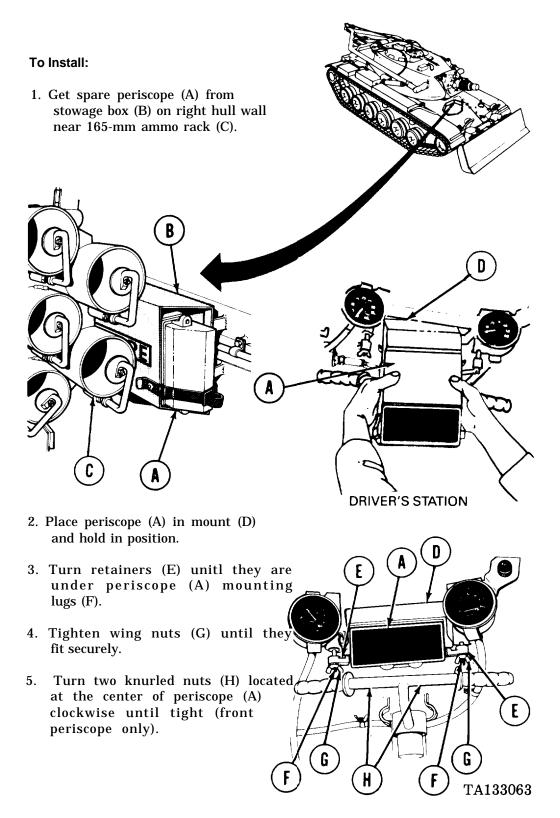


4. Lower periscope (D) from mount (F).



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#### MAINTAIN PERISCOPES (REPLACE M27 PERISCOPE) - Continued



MAINTAIN TELESCOPE (REPLACE TELESCOPE M50 INSTRUMENT LIGHT BATTERIES AND LAMP)

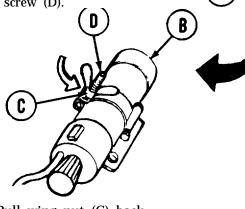
Supplies:

Get two replacement BA 30 batteries (A) (item 4, Appendix D).

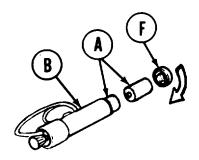
#### To Replace Batteries:

1. Locate battery container (B).

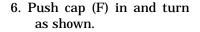
2. Turn wing nut (C) counterclockwise until nut is halfway up screw (D).



- 3. Pull wing nut (C) back.
- 4. Pull clamp (E) back.
- 5. Remove battery container (B) from clamp (E).

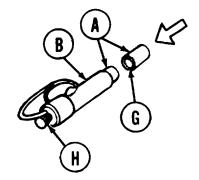


- 9. Insert two new batteries (A) into battery container (B).
- 10. Make sure positive ends (G) of both batteries (A) are towards knob (H).



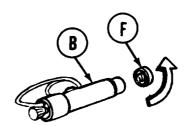
- 7. Remove cap (F).
- 8. Remove two old batteries (A).

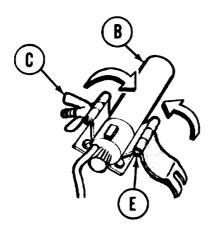
'S STATION



# MAINTAIN TELESCOPE (REPLACE TELESCOPE M50 INSTRUMENT LIGHT BATTERIES AND LAMP) - Continued

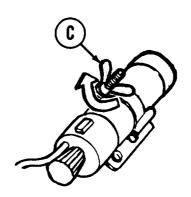
11. Depress cap (F) and turn as shown until secure.





- 12. Place battery container (B) into clamp (E).
- 13. Pull clamp (E) over battery container (B).
- 14. Pull wing nut (C) over clamp (E).

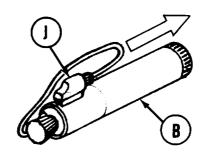
15. Turn wing nut (C) clockwise to tighten.

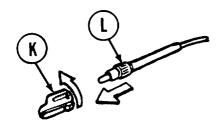


# MAINTAIN TELESCOPE (REPLACE TELESCOPE M50 INSTRUMENT LIGHT BATTERIES AND LAMP) - Continued

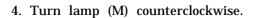
## To Replace Lamp:

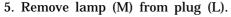
1. Slide lamp housing (J) from battery container (B).

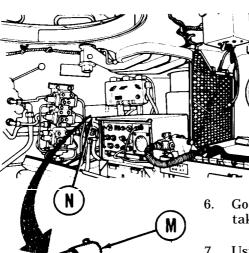




- 2. Turn lamp cap (K) counter-clockwise.
- 3. Separate lamp cap (K) from plug (L).



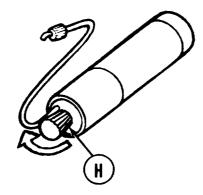




- 6. Go to spare lamp box (N), taking bad lamp with you.
- 7. Using bad lamp as a guide, get replacement lamp (M) from box (N).

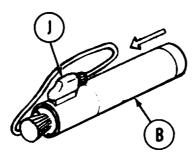
# MAINTAIN TELESCOPE (REPLACE TELESCOPE M50 INSTRUMENT LIGHT BATTERIES AND LAMP) - Continued

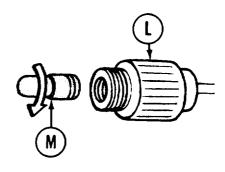
- 8. Aline new lamp with plug (L).
- 9. Turn lamp (M) clockwise into plug (L) to tighten.



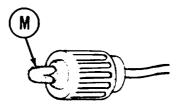
- 11. Look at lamp (M) to check if lamp lights.
- 12. If lamp does not light, go to step 4 of lamp replacement.

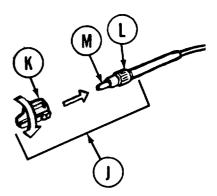
  If lamp still does not light, notify organizational maintenance.
- 13. If batteries are bad, go to step 2 of battery replacement.
- 14. Place lamp cap (K) over plug (L).
- 15. Turn lamp cap (K) clockwise to tighten.





10. Turn rheostat knob (H) clockwise to ON position.



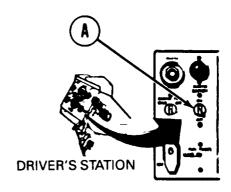


16. Slide lamp housing (J) onto battery container (B).

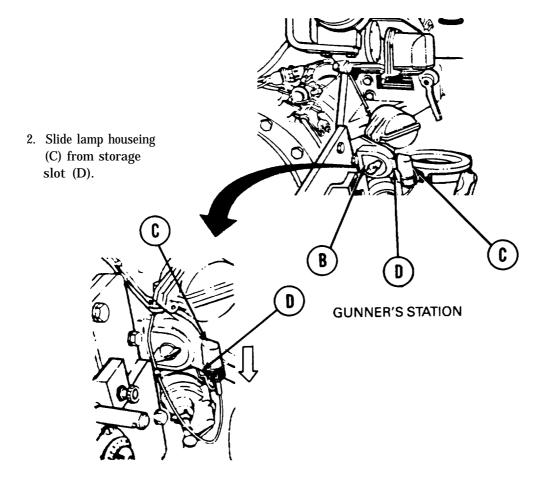
# MAINTAIN TELESCOPE (REPLACE LIGHT SOURCE LAMP)

## Make Sure:

• MASTER BATTERY switch (A) is set to OFF.

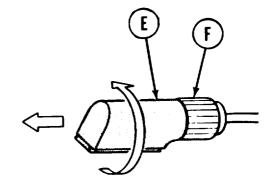


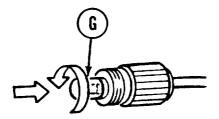
1. Locate light source control (B).



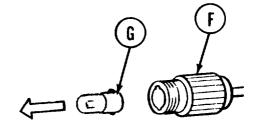
# MAINTAIN TELESCOPE (REPLACE LIGHT SOURCE LAMP) - Continued

- 3. Turn cap (E) counterclockwise while holding plug (F).
- 4. Remove cap (E) from plug (F).

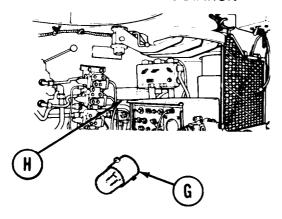




- 5. Push in lamp (G) and turn counterclockwise.
- 6. Remove lamp (G) from plug (F).



## **COMMANDER'S STATION**

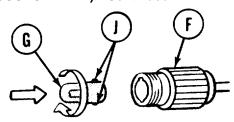


- 7. Go to spare lamp box (H), taking bad lamp with you.
- 8. Using bad lamp as a guide, get replacement lamp (G) from box (H).

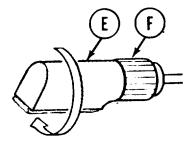
TA133069

3-239

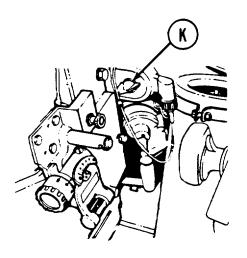
# MAINTAIN TELESPCOE (REPLACE LIGHT SOURCE LAMP) - Continued

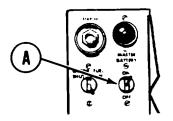


- 9. Aline new lamp pins (J) with plug (F).
- 10. Push lamp (G) into plug (F) and turn clockwise to tighten.
- 11. Place lamp cap (E) over plug (F).
- 12. Turn lamp cap (E) clockwise to tighten.



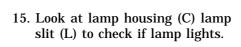
13. Set MASTER BATTERY switch (A) to ON.

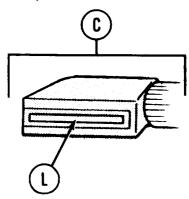




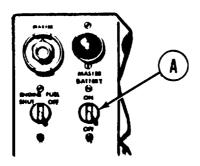
14. Turn light source control knob (K) clockwise.

# MAINTAIN TELESCOPE (REPLACE LIGHT SOURCE LAMP) - Continued



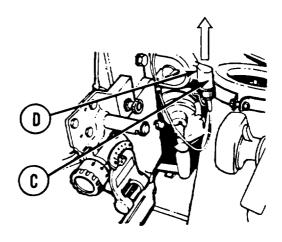


16. If lamp does not light, notify organizational maintenance.



17. Set MASTER BATTERY switch (A) to OFF.

18. Slide lamp housing (C) onto storage slot (D).



TA133071

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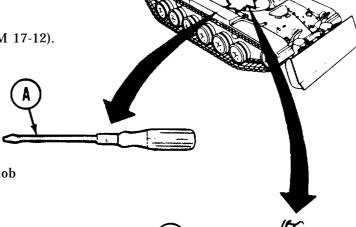
#### MAINTAIN ELEVATION QUADRANT (ALINE ELEVATION SCALE)

#### Tools:

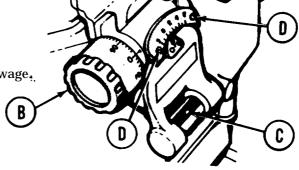
● Get flat-tip screwdriver (A) from right front fender box.

#### Make Sure:

• Gun tube is level (FM 17-12).



- Turn micrometer knob
   (B) until bubble (C)
   in level is centered.
- 2. Using screwdriver (A), loosen two screws (D) on elevation scale (E).
- 3. Slide elevation scale (E) either left or right until zero alines with arrow.
- 4. Make sure bubble (C) remains centered.
- 5. Using screwdriver (A), tighten two screws (D).
- 6. Return screwdriver (A) to stowage.



**GUNNER'S STATION** 

#### MAINTAIN ELEVATION QUADRANT (ALINE MICROMETER)

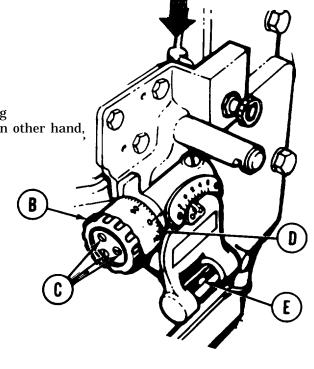
#### Tools:

● Get flat-tip screwdriver (A) from right front fender box.



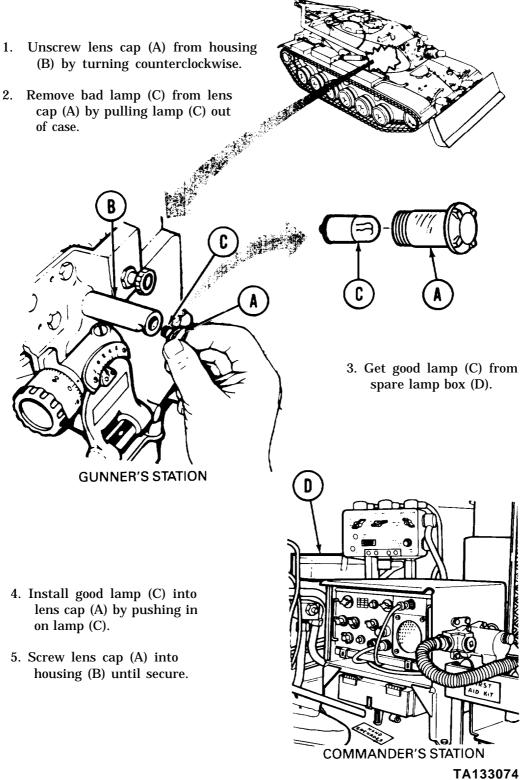
- Gun tube is level (FM 17-12).
- Hold micrometer knob

   (B) with one hand. Using flat-tip screwdriver (A) in other hand, loosen three screws (C).
- 2. Slide micrometer scale (D) in either direction to zero.
- 3. Make sure bubble (E) remains centered.
- Using screwdriver (A), tighten three screws
   (C) on micrometer knob (B).
- 5. Return screwdriver (A) to stowage.



**GUNNER'S STATION** 

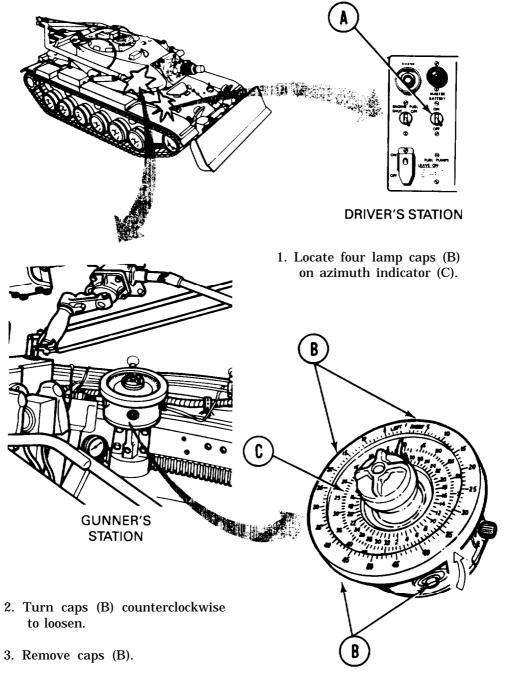
## MAINTAIN ELEVATION QUADRANT (REPLACE LAMP)



# **MAINTAIN AZIMUTH INDICATOR (REPLACE LAMPS)**

## Make Sure:

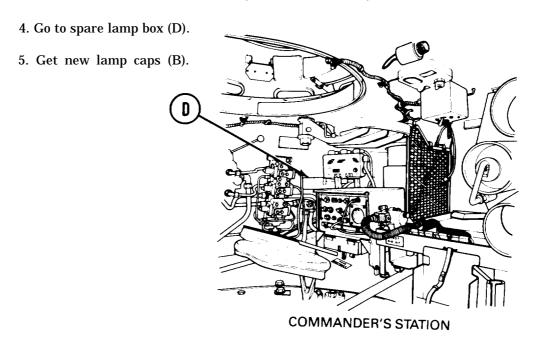
• MASTER BATTERY switch (A) is set to OFF.

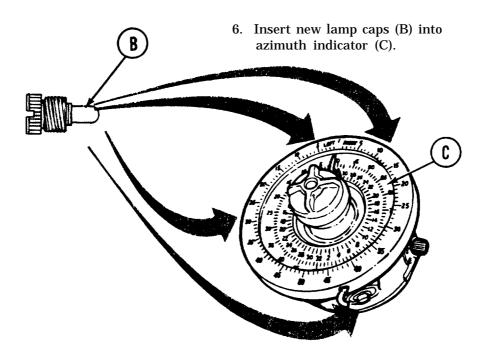


TA133075

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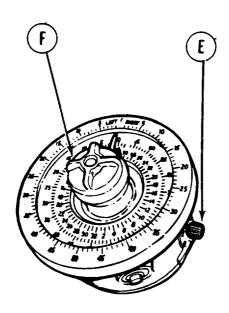
# MAINTAIN AZIMUTH INDICATOR (REPLACE LAMPS) - Continued

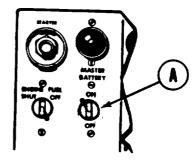




7. Turn caps (B) clockwise until tight.

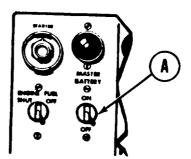
8. Set MASTER BATTERY switch (A) to ON.





9. Turn azimuth indicator rheostat knob (E) clockwise to ON.

- 10. Look at azimuth indicator dial (F) to check if lamps work.
- 11. If lamps do not work, go to troubleshooting (page 3-42).
- 12. Set MASTER BATTERY switch (A) to OFF.



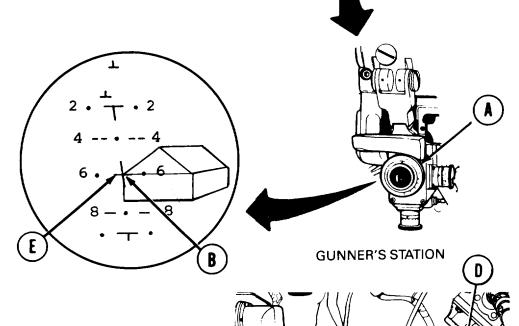
# MAINTAIN AZIMUTH INDICATOR (ACCURACY AND SLIPPAGE CHECK)

## Make Sure:

• Turret lock is unlocked (page 2-331).

## **Accuracy Test:**

- 1. Look through eyepiece (A) on gunner's daylight periscope.
- 2. Select aiming point (B) with clearly defined right angle.



3. Using MANUAL ELEVATION CONTROL handle (C) and MANUAL TRAVERSE handle (D), aline cross (E) on aiming point (B).

 $\mathcal{C}$ 

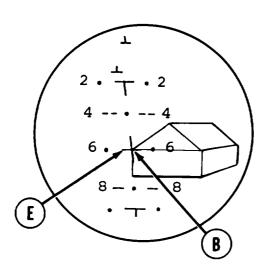
## MAINTAIN AZIMUTH INDICATOR (ACCURACY AND SLIPPAGE CHECK) - Continued

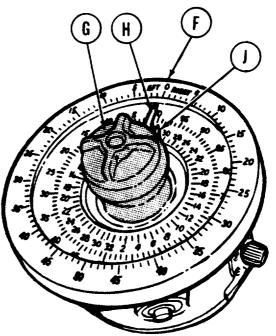
- 4. Set azimuth indicator (F) to zero:
  - a. Press down and hold resetter knob (G).
  - b. Turn resetter knob (G) to aline middle scale pointer (H) with inner scale pointer (J),
  - c. Depress resetter knob (G) fully and hold.
  - d. Turn resetter knob (G) moving both pointers (H) and (J) to zero.

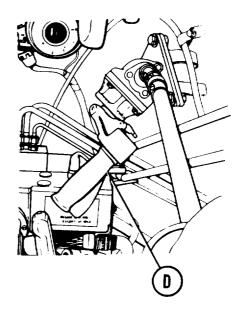
## **NOTE**

Make sure you do not traverse past original aiming point during following steps.

5. Using MANUAL TRAVERSE handle (D), traverse turret through a complete circle. Bring aiming cross (E) back on same aiming point (B).





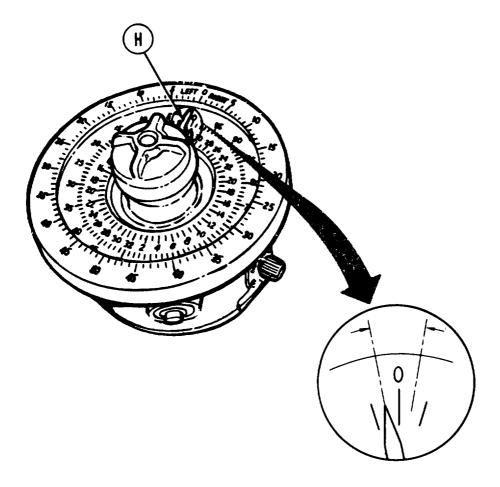


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# MAINTAIN AZIMUTH INDICATOR (ACCURACY AND SLIPPAGE CHECK) - Continued

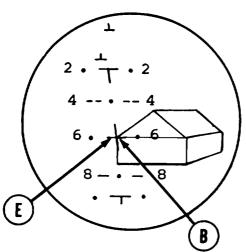
- 6. Check azimuth indicator.
  - a. If pointer (H) is within area shown, azimuth indicator is accurate.
  - b. If pointer (H) is out of area shown, notify organizational maintenance personnel.

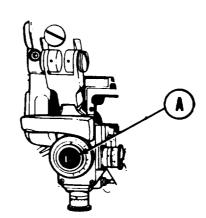


# MAINTAIN AZIMUTH INDICATOR (ACCURACY AND SLIPPAGE CHECK) - Continued

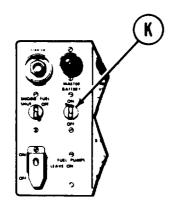
# Slippage Teat:

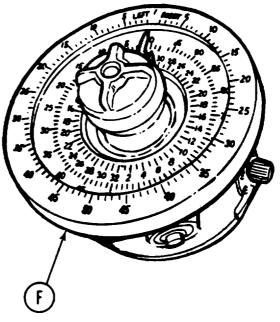
- 1. Look through eyepiece (A) on gunner's daylight periscope.
- 2. Realine aiming cross (E) on aiming point (B) if necessary.





- 3. Reset azimuth indicator (F) to zero if necessary.
- 4. Set MASTER BATTERY switch (K) to ON.



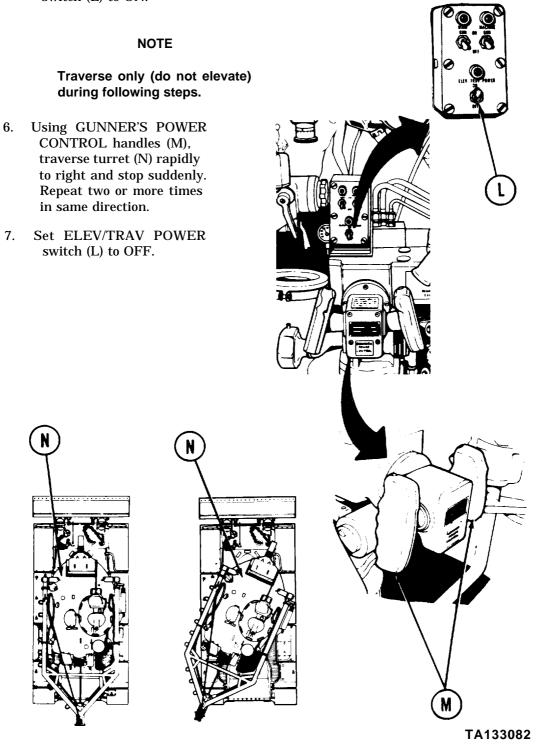


TA133081

3-251

## MAINTAIN AZIMUTH INDICATOR (ACCURARY AND SLIPPAGE CHECK) - Continued

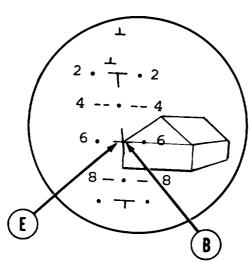
5. Set ELEV/TRAV POWER switch (L) to ON.



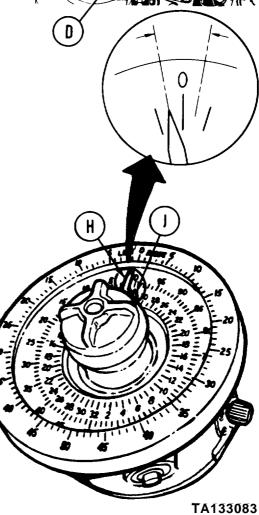
## **NOTE**

Do not traverse past original aiming point during next step.

- 8. Using MANUAL TRAVERSE handle (D), traverse turret left until cross (E) is alined with aiming point (B).
- 9. Check azimuth indicator:
  - a. If pointer (H) is within area shown, azimuth indicator has not slipped.



- b. If either pointer (H) or (J) is out of area shown, notify organizational maintenance personnel.
- 10. Repeat steps 1 thru 9 in opposite direction.



# MAINTAIN TURRET (SERVICE TURRET HYDRAULICS)

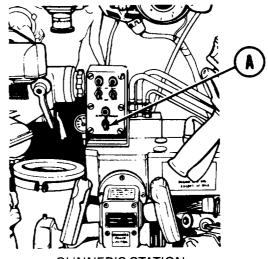
# To Check Hydraulic Fluid Level:

# Supplies:

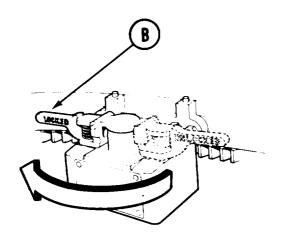
Get FRH hydraulic fluid (item 28, Appendix D).

## Make Sure:

- ELEV/TRAV POWER switch (A) is set to OFF.
- Turret traverse lock (B) is set to LOCKED (page 2-568).

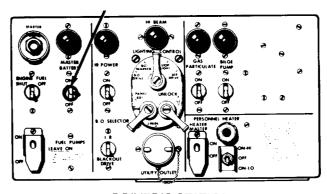


**GUNNER'S STATION** 



• MASTER BATTERY switch (C) is set to ON.



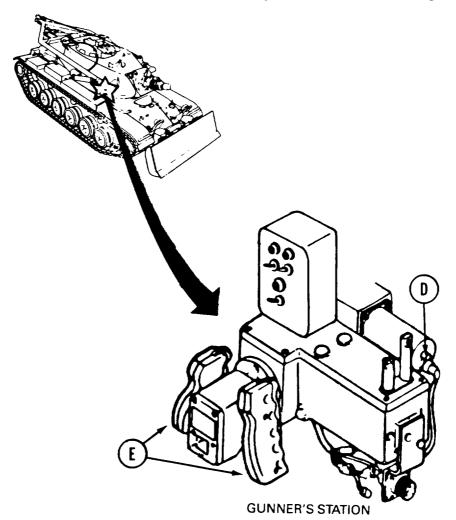


**DRIVER'S STATION** 

# NOTE

Read steps 1 thru 5 and then perform.

- 1. Press in and hold power solenoid plunger (D).
- 2. Slowly turn handle (E) left or right.

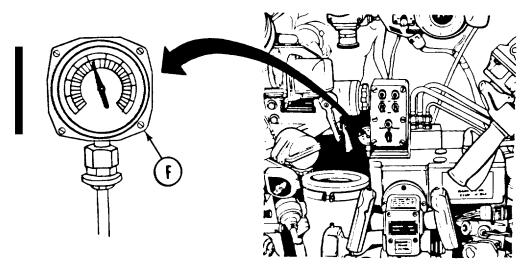


TA133085

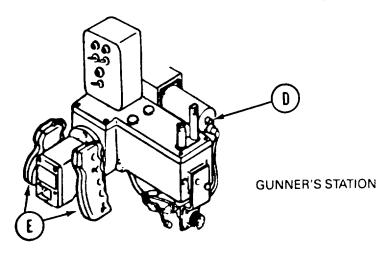
3-255

## NOTE

If pressure gage (F) reads less than 500 psi before dropping to zero, the nitrogen precharge is low. Notify organizational maintenance.



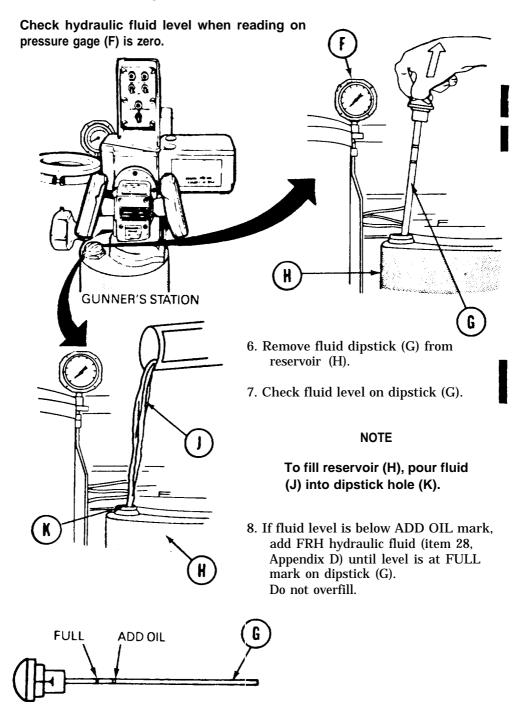
**GUNNER'S STATION** 



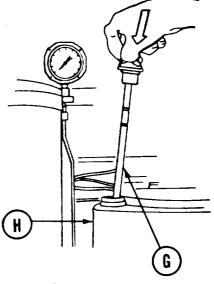
- 3. Observe pressure gage (F). Needle will drop slowly to  $525~\pm25$  psi nitrogen precharge, then it will quickly drop to zero.
- 4. Return handle (E) to neutral (center).
- 5. Release power solenoid plunger (D).

## 3-256 Change 5

#### **NOTE**

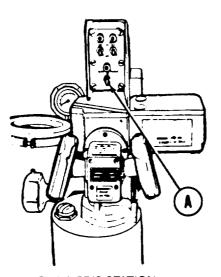


- 9. Replace fluid dipstick (G) into reservoir (H).
- 10. If nitrogen precharge (525 ±25 psi ) was indicated, set ELEV/TRAV POWER switch (A) to ON to recharge hydraulic system.



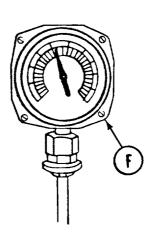
**CAUTION** 

If gage pressure exceeds 1500 psi, if motor operates continuously, or if motor is very noisy, set ELEV/TRAV POWER switch (A) to OFF and notify organizational maintenance.



**GUNNER'S STATION** 

- Il. Watch pressure gage (F) for needle to rise to approximately 1225-1275 psi.
- 1.2. Turn turret to right or left and then back to center. Watch for smooth movement (page 2-503).
- 13. Raise and lower gun. Watch for smooth movement (page 2-502).
- 14. Set ELEV/TRAV POWER switch (A) to OFF.
- 15. Set MASTER BATTERY switch to OFF.



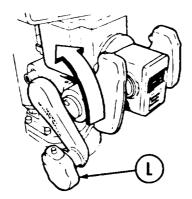
## 3-258 Change 5

## To Pump Pressure Up in Manual Elevating Accumulator:

#### Make Sure:

• ELEV/TRAV POWER switch (A) is set to OFF.

 Rotate MANUAL ELEVATION CONTROL handle (L) counterclockwise to depress gun to its lowest limit.



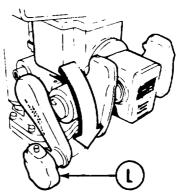
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**GUNNER'S STATION** 

**GUNNER'S STATION** 

2. Continue rotating MANUAL ELEVATION CONTROL handle (L) counterclockwise until back pressure will not allow any more rotation. If no back pressure is felt after approximately 50 rotations, notify organizational maintenance.

3. Rotate MANUAL ELEVATION CONTROL handle (L) clockwise until gun is in desired position.

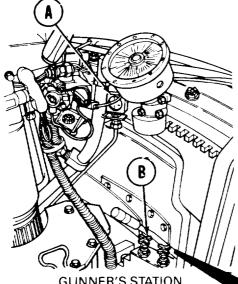


**GUNNER'S STATION** 

Change 5 3-259

#### MAINTAIN TURRET (BALANCE AND ADJUST EQUILIBRATOR **ACCUMULATOR PRESSURE)**

1. Check pressure on equilibrator system pressure gage (A).



#### **NOTE**

If pressure gage (A) reads 1500-1600 psi, equilibrator system is correct. Skip steps 2 through 6 and go to step 7.

If pressure gage (A) reads below 1500 psi, equilibrator system pressure is low. Continue with step 2 and skip step 6.

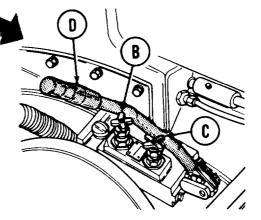
If pressure gage (A) reads above 1800 psi, equilibrator system pressure is high. Skip steps 2 through 5 and continue with step 6.

**GUNNER'S STATION** 

2. Perform zero pressure check of equilibrator system as follows:

#### NOTE

If pressure gage (A) reads less than 1375 psi before quickly dropping to zero the nitrogen precharge is low. Notify organizational maintenance.



- a. Turn handle (B) one turn counterclockwise to open drain valve.
- b. Observe pressure gage (A). Needle will drop slowly to less than 1375 psi nitrogen prechange, then it will quickly drop to zero.
- c. Turn handle (B) one turn clockwise to close valve.
- Turn handle (C) one turn counterclockwise to open charging valve.
- 4. With main gun fully elevated, watch pressure gage (A) and pump hand pump handle (D) up and down. Stop when gage reads between 1700 and 1800 psi.

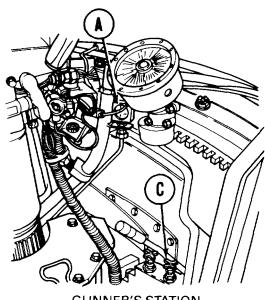
## MAINTAIN TURRET (BALANCE AND ADJUST EQUILIBRATOR **ACCUMULATOR PRESSURE) - Continued**

5. Turn handle (C) one turn clockwise to close charging valve.

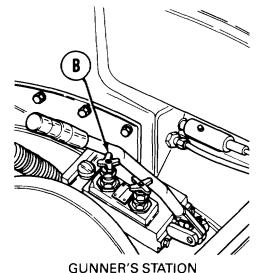
#### NOTE

If pressure gage (A) reads above 1800 psi, equilibrator system is high. Continue with step 6. If gage reads below 1800 psi; go to step 7.

6. With main gun fully elevated watch pressure gage (A), Turning handle (B) one turn counterclockwise, open drain valve. When pressure gage (A) reads 1700-1800 psi, turn handle (B) clockwise, closing drain valve.







#### **NOTE**

After equilibrator accumulator has been balanced and adjusted pressure gage (A) should hold above 1500 psi. If pressure gage (A) drops below 1500 psi, add hydraulic fluid to hydraulic reservoir (pages 3-262). Notify organizational maintenance you had to add hydraulic fluid as soon as possible.

7. Elevate and depress main gun (page 2-502) several times to make sure main gun operates smoothly. If main gun does not operate smoothly, notify organizational maintenance.

## MAINTAIN TURRET (SERVICE EQUILIBRATOR HYDRAULIC RESERVOIR)

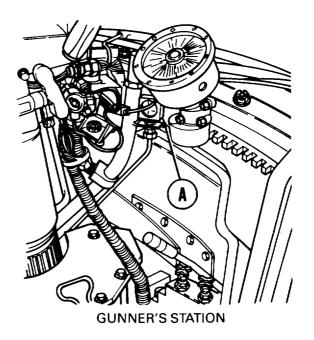
## Supplies:

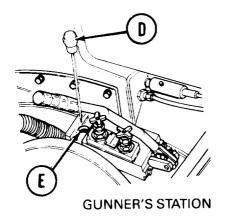
Get FRH hydraulic fluid (item 27, Appendix D).

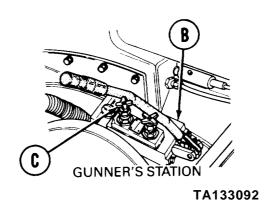
#### NOTE

During steps 1 thru 3 if pressure gage (A) reads less than 1375 psi before quickly dropping to zero the nitrogen precharge is low. Notify organizational maintenance.

- 1. Locate hand pump (B).
- 2. Turning handle (C) one turn counterclockwise, open drain valve.
- 3. Watch pressure gage (A) until pressure drops to zero.
- 4 . Remove dipstick (D) from hydraulic reservoir (E) and wipe dry.







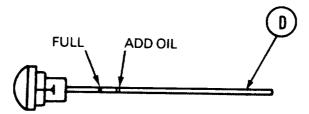
# MAINTAIN TURRET (SERVICE EQUILIBRATOR HYDRAULIC RESERVOIR) - Continued

5. Reinsert dipstick (D) and check fluid level.

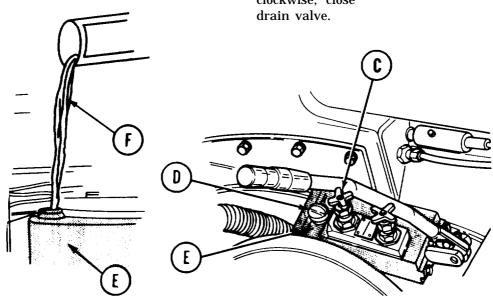
#### **NOTE**

To add hydraulic fluid (F) to hydraulic reservoir (E), pour fluid (F) into dipstick hole.

6. If fluid level is below ADD OIL mark on dipstick (D), add FRH hydraulic fluid until level is at FULL mark on dipstick, Do not overfill.

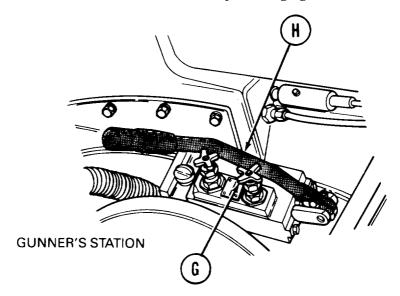


- 7. Replace dipstick (D) into hydraulic reservoir (E).
- 8. Turning handle (C) clockwise, close drain valve.

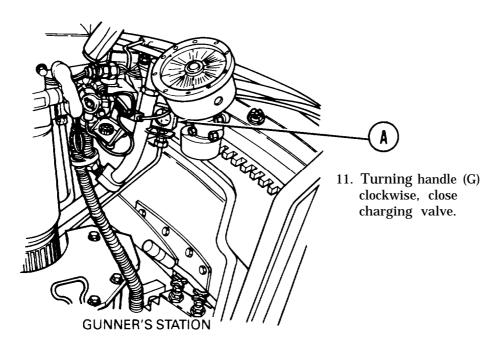


# MAINTAIN TURRET (SERVICE EQUILIBRATOR HYDRAULIC RESERVOIR) - Continued

9. Turning handle (G) one turn counterclockwise, open charging valve.



10. Watching pressure gage (A), pump handle (H) up and down until gage reads 1500-1800 psi with main gun fully elevated.



12. Elevate and depress main gun (page 2-502) several times to make sure pressure stays at 1500-1800 psi. If pressure continues to drop below 1500 psi, notify organizational maintenance.

#### MAINTAIN SEARCHLIGHT (INSTALL SEAHCLIGHT)

#### WARNING

The xenon searchlight lamp is filled with gas under high pressure. Be very careful in handling searchlight. Installation is a three-person operation. Dropping or jarring could cause lamp to explode. This could result in serious injury or DEATH to personnel.

## AN/VSS-2 Searchlight:

#### **Tools and Equipment:**

Get from right front fender box:

- 2 pound hammer (A)
- Pliers (B)

Get from left front fender box:

• Searchlight cable (C)

#### Make Sure:

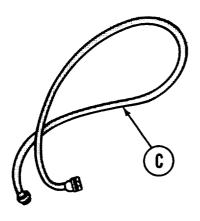
• Engine is off (page 2-536).

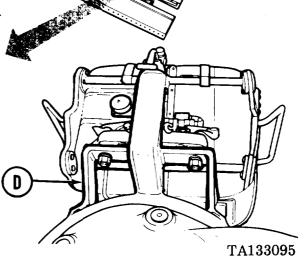
• Searchlight cover is removed (page 2-327)

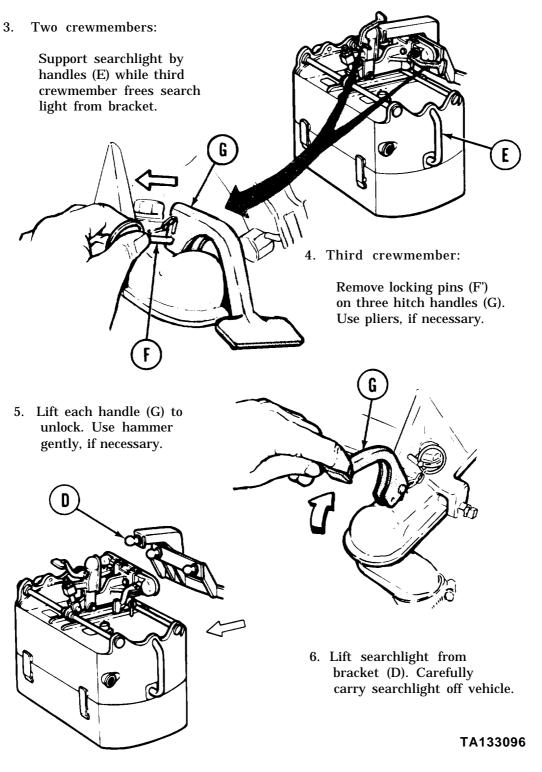
To Take Searchlight From Stowage Bracket:

1. Traverse turret until searchlight stowage bracket (D) is over engine (page 2-503).

2. Lock turret lock (page 2-568).



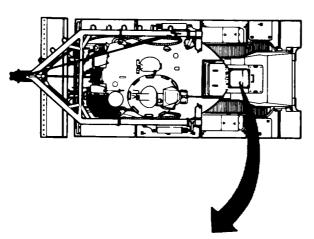


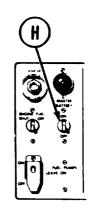


# To Install Searchlight:

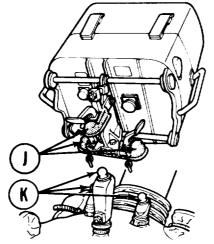
#### Make Sure:

- Hitch handles are raised from all three ball sockets (page 3-266).
- Main gun is level (page 2-502).
- 1. Unlock turret lock (page 2-331).
- 2. Traverse turret to rear (page 2-503).
- 3. Lock turret lock (page 2-568).
- 4. Set MASTER BATT'ERY switch (H) to OFF.

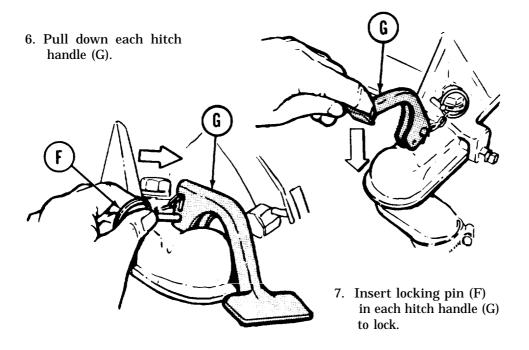




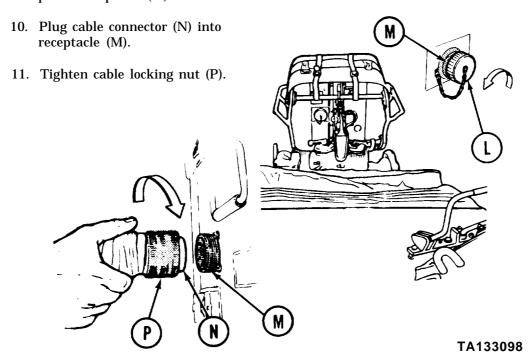
**DRIVER'S STATION** 



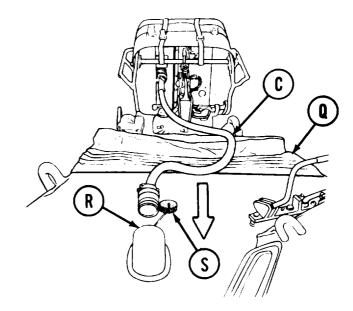
 Place searchlight ball sockets (J) over ball studs (K) on mounting bracket.



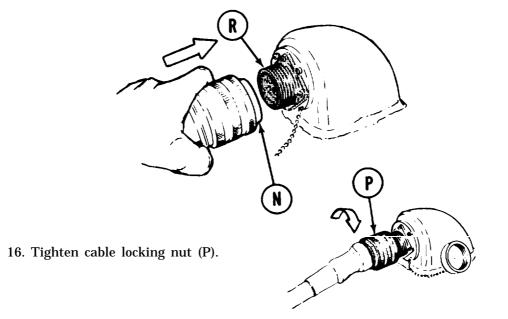
- 8. Unscrew protective cap (L) from searchlight power receptacle (M).
- 9. Aline cable connector (N) with power receptacle (M).



- 12. Lay electrical cable (C) from rear of searchlight across gun shield (Q) to turret electrical outlet (R).
- 13. Unscrew turret electrical outlet cap (S).

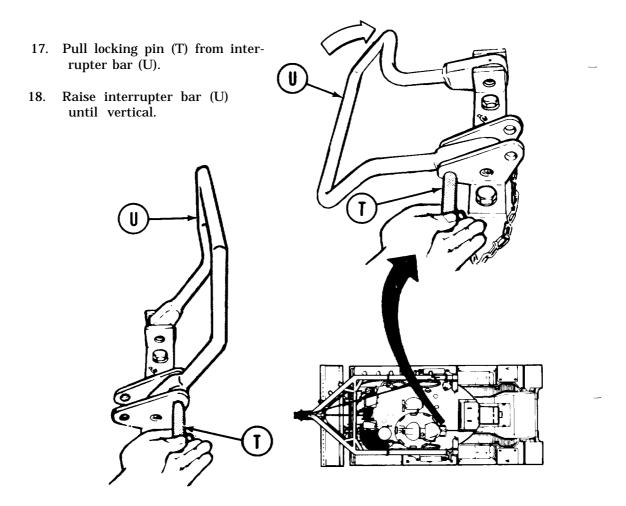


- 14. Aline cable connector (N) with turret outlet (R).
- 15. Plug cable connector (N) into turret outlet.



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- 19. Insert locking pin (T) through interrupter bar (U).
- 20. Return hammer and pliers to stowage.



#### **WARNING**

The xenon searchlight lamp is filled with gas under high pressure. Be very careful in handling searchlight. Installation is a three-person operation. Dropping jarring could cause lamp to explode. This could result in serious injury or DEATH to personnel.



# AN/VSS-3A Searchlight:

### **Tools and Equipment:**

Get from right front fender box:

- 2 pound hammer (A)
- Pliers (B)

Get from left front fender box:

• Searchlight cable (C)

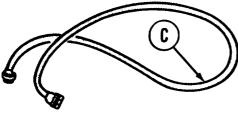
#### Make Sure:

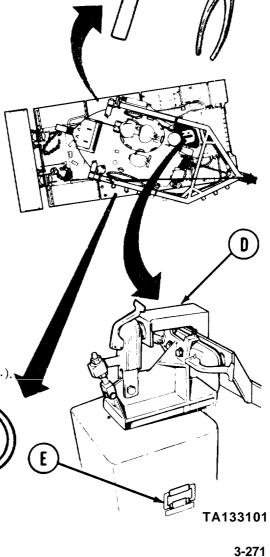
- Engine is off (page 2-536).
- Searchlight cover is removed (page 2-326).

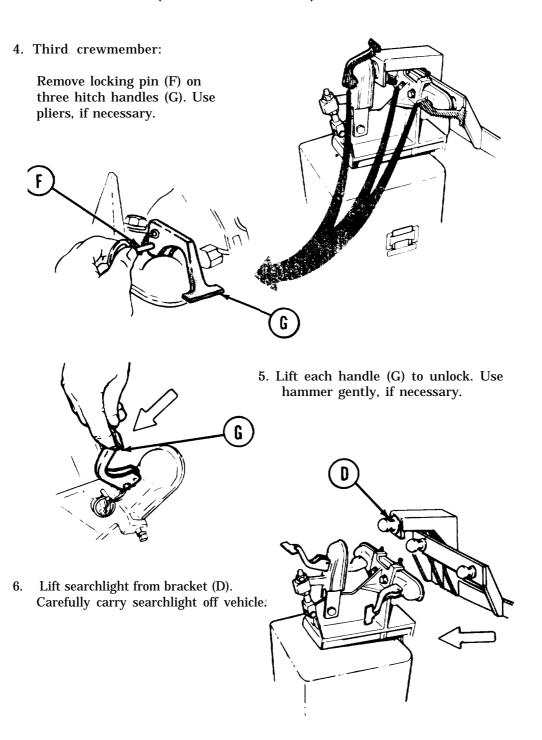
# To Take Searchlight From Stowage Bracket:

- 1. Traverse turret until searchlight stowage bracket (D) is over engine (page 2-503).
- 2. Lock turret lock (page 2-568).
- 3. Two crewmembers:

Support searchlight by handles (E).).





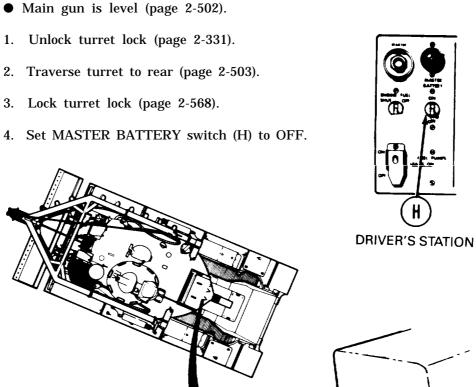


TA133102

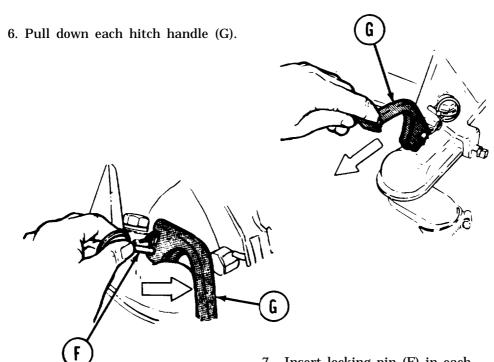
# To Install Searchlight:

### Make Sure:

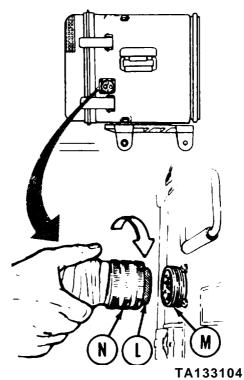
- Hitch handles are raised from all three ball sockets (page 3-272).



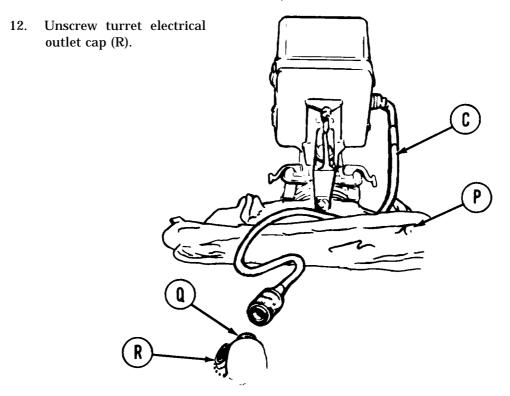
5. Place searchlight ball sockets (J) over ball studs (K) on mounting bracket.



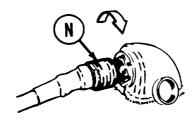
- 7. Insert locking pin (F) in each hitch handle (G) to lock.
- 8. Aline cable connector (L) with searchlight receptacle (M).
- 9. Plug cable connector (L) into searchlight receptacle (M).
- 10. Rotate cable locking nut (N) clockwise until tight.

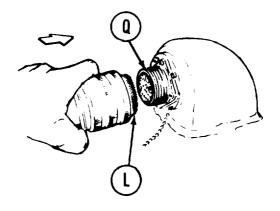


11. Lay electrical cable (C) from right side of searchlight across gun shield (P) to turret electrical outlet (Q).



- 13. Aline cable connector (L) with turret outlet (Q).
- $\begin{array}{ll} \hbox{14.} & \hbox{Hug cable connector (L)} \\ & \hbox{into turret outlet(Q)}. \end{array}$

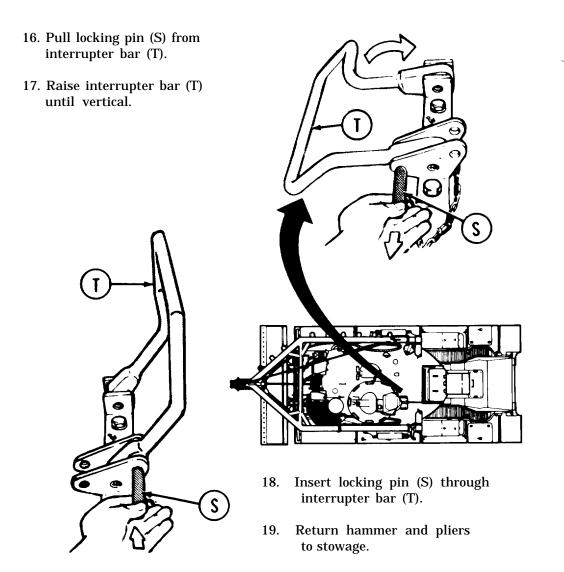




15. Tighten cable locking nut (N).

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### MAINTAIN SEARCHLIGHT (REMOVE SEARCHLIGHT)



WARNING
The xenon searchlight lamp is filled with gas under high pressure. Be very careful in handling searchlight. Removal is a three-person operation, Dropping or jarring could cause lamp to explode. This could result in serious injury or DEATH to personnel.



### AV/VSS-2 Searchlight:

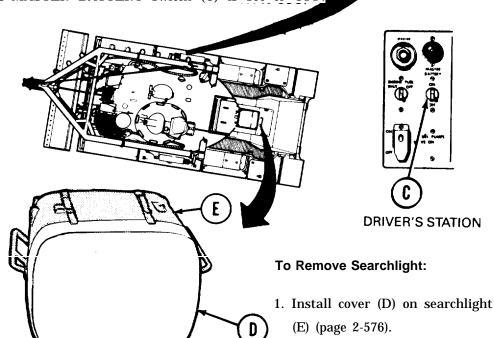
#### **Tools and Equipment:**

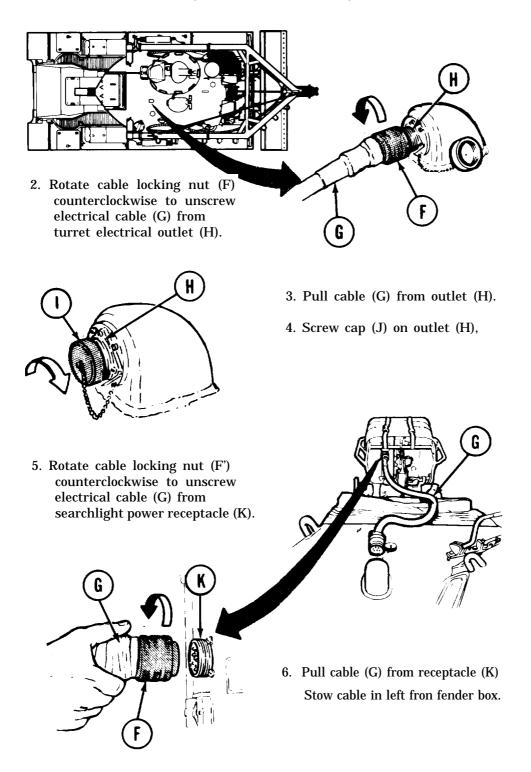
Get from right front fender box:

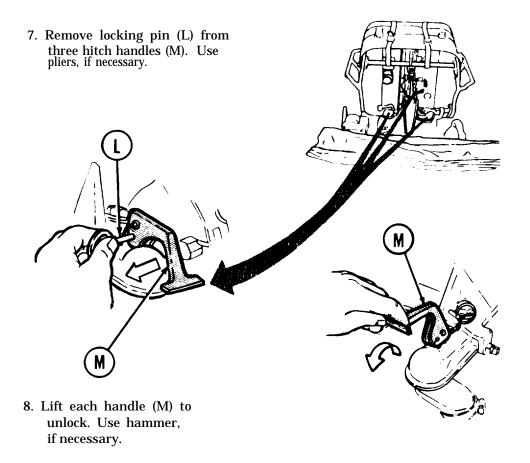
- 2 pound hammer (A)
- Pliers (B)

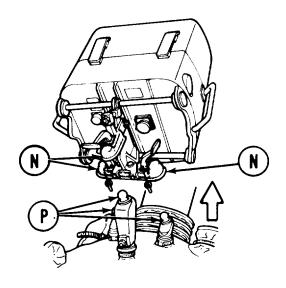
#### Make Sure:

- Searchlight is off and cool (page 2-445).
- Main gun is level and to the rear of vehicle (page 2-502).
- Turret lock is locked (page 2-568).
- Engine is off (page 2-536).
- MASTER BATTERY switch (C) is set to OFF.

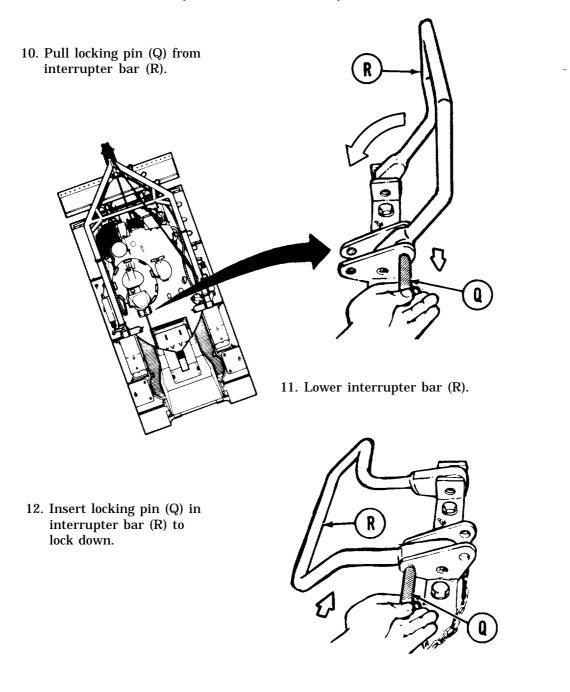


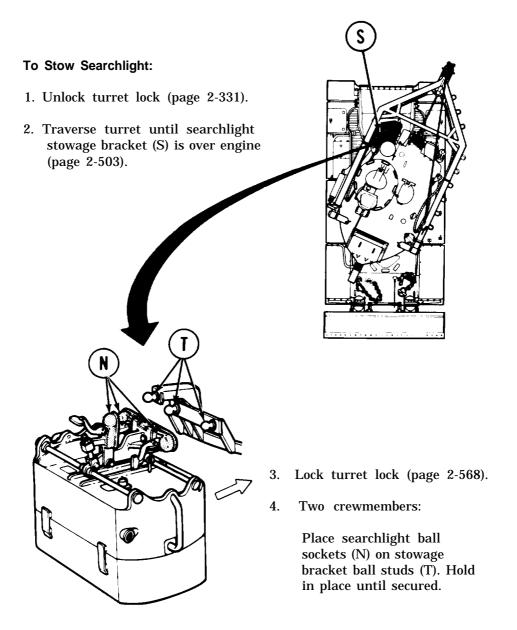






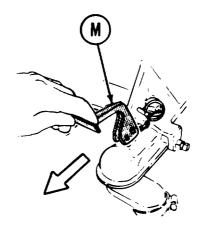
 Lift searchlight ball sockets (N) from ball studs (P). Carefully carry searchlight off vehicle.

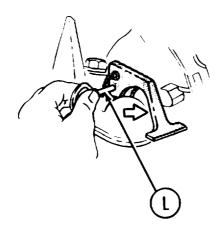




5. Third crewmember:

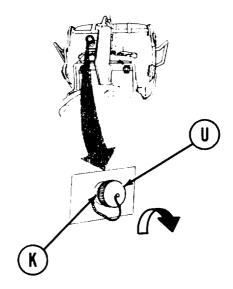
Pull down three hitch handles (M) on searchlight ball sockets.





6. Insert locking pin (L) in three hitch handles.

- 7. Screw protective cap (U) into searchlight cable receptacle (K).
- 8. Return hammer and pliers to stowage.



# **WARNING**



The xenon searchlight lamp is filled with gas under high pressure. Be very careful in handling searchlight. Removal is a three-person operation. Dropping or jarring could cause lamp to explode. This could result in serious injury or DEATH to personnel.

### AN/VSS-3A Searchlight:

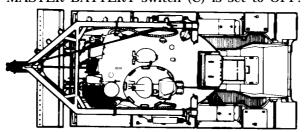
# **Tools and Equipment:**

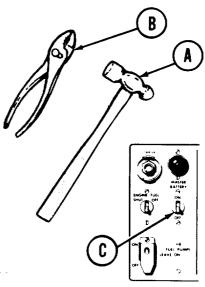
Get from right front fender box:

- 2 pound hammer (A)
- Pliers (B)

#### Make Sure:

- Searchlight is off and cool (page 2-445).
- Main gun is level and to the rear of vehicle (page 2-502).
- Turret lock is locked (page 2-568).
- Engine is off (page 2-536).
- MASTER BATTERY switch (C) is set to OFF.





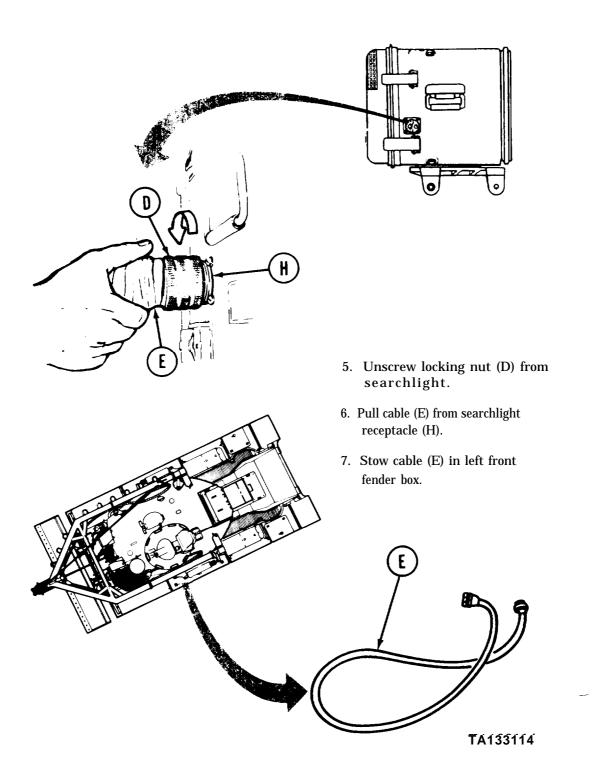
DRIVER'S STATION

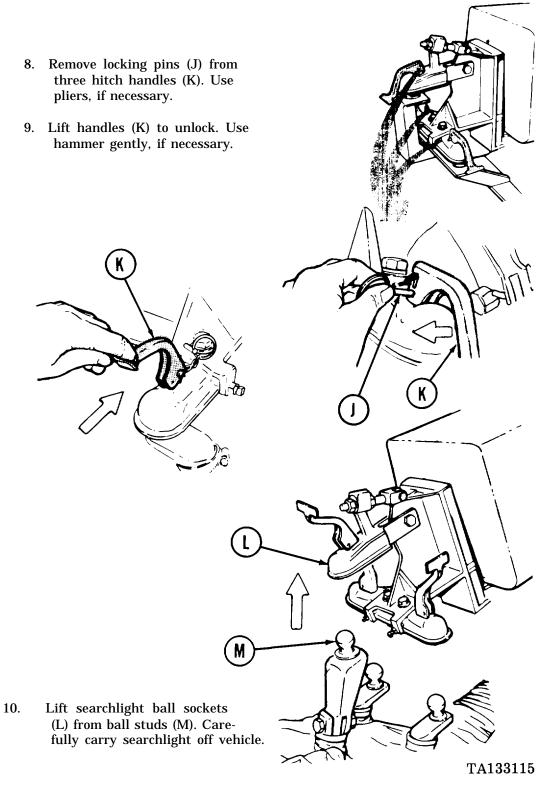


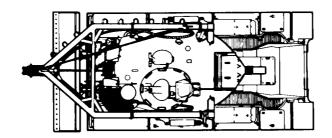


### To Remove Searchlight:

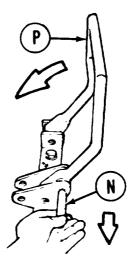
- 1. Install cover on searchlight (page 2-575).
- 2. Rotate cable locking nut (D) counterclockwise to unscrew electrical cable (E) from turret electrical outlet (F).
- 3. Pull cable (E) from outlet (F).
- 4. Screw cap (G) on outlet (F).

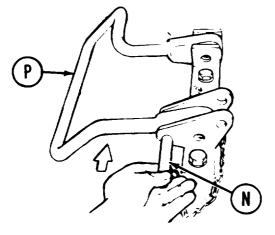






11. Pull locking pin (N) from interrupter bar (P).





- 12. Lower interrupter bar (P).
- 13. Insert locking pin (N) in interrupter bar (P) to lock down.

# To Stow Searchlight:

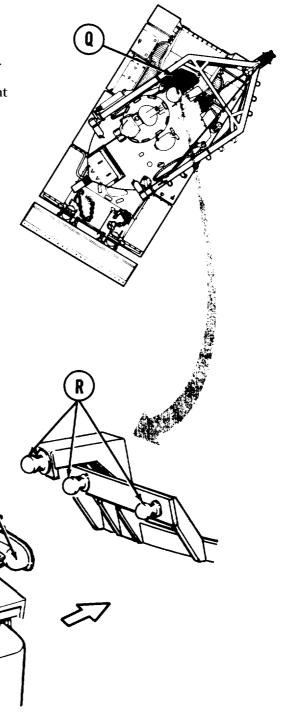
1. Unlock turret lock (page 2-331).

2. Traverse turret until searchlight stowage bracket (Q) is over engine (page 2-503).

3. Lock turret lock (page 2-568).

4. Two crewmembers:

5. Place searchlight ball sockets (L) on stowage bracket ball studs (R). Hold in place until secured.

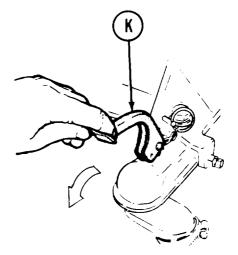


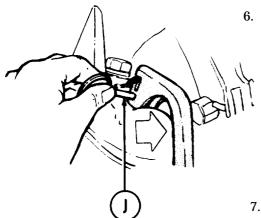
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# 5. Third crewmember:

Pull down three hitch handles (K) on searchlight ball sockets.





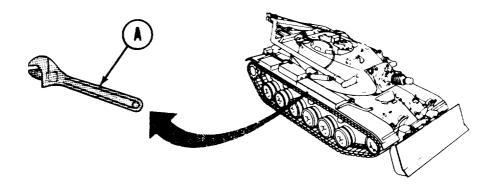
6. Insert locking pin (J) in three hitch handles.

7. Return hammer and pliers to stowage.

# REPLACE INTERIOR LAMPS (REPLACE POWERPLANT WARNING LAMP)

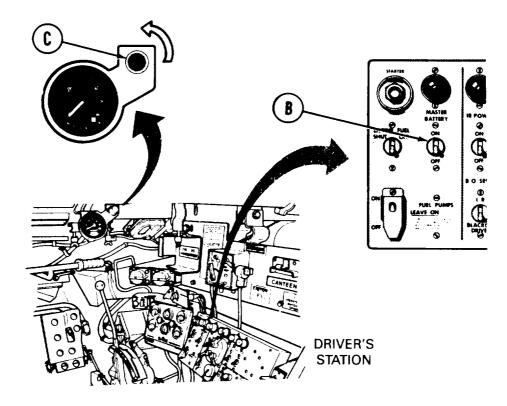
# Tools:

• Get 12 inch adjustable wrench (A) from right front fender box.



# Make Sure:

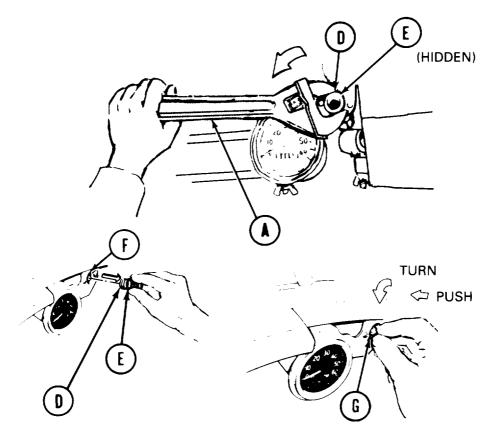
• MASTER BATTERY switch (B) is set to OFF.



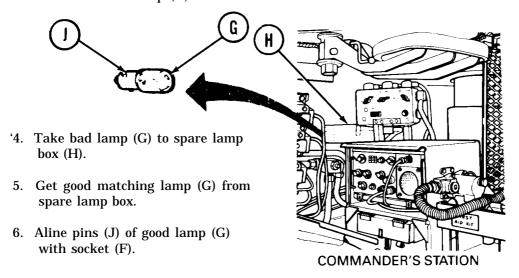
1. Unscrew POWERPLANT WARNING LAMP lens cap (C).

# REPLACE INTERIOR LAMPS (REPLACE POWERPLANT WARNING LAMP) - Continued

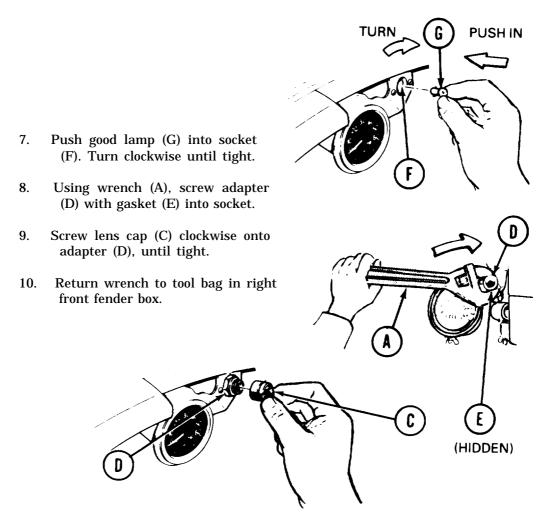
2. Using wrench (A), unscrew adapter (D) with gasket (E) from socket (F).



3. Push in on bad lamp (G). Turn counterclockwise to remove.

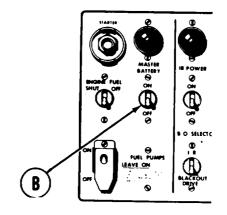


### REPLACE INTERIOR LAMPS (REPLACE POWERPLANT WARNING LAMP) - Continued



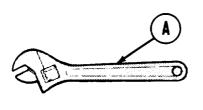
### To Test POWERPLANT WARNING LAMP After Lamp Replacement:

- 1. Set MASTER BATTERY switch
  (B) to ON. POWERPLANT
  WARNING LAMP (G) should light.
- 2. Set MASTER BATTERY switch (B) to OFF.
- 3. If lamp failed to light, notify organizational maintenance.



TA133121

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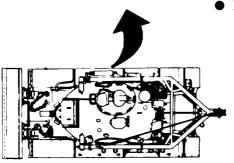


# Tools:

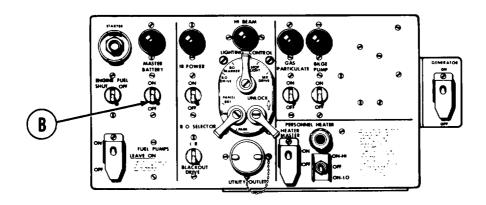
● Get 12 inch adjustable wrench (A) from right front fender box.

# Make Sure:

• MASTER BATTERY switch (B) is set to ON.

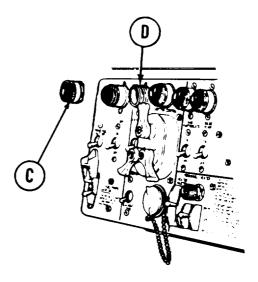


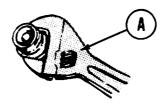
- 1. Locate bad panel lamp.
- 2. Set MASTER BATTERY switch (B) to OFF.



To Replace MASTER BATTERY, IR POWER/NIGHT VISION, HI BEAM, GAS PARTICULATE OR BILGE PUMP Indicator Lamp:

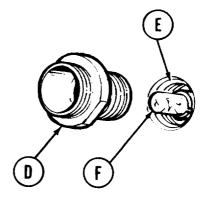
1. Unscrew lens cap (C) to remove from adapter (D).





2. Using adjustable wrench (A), turn adapter (D) counterclockwise to remove from socket (E).

3. Push in lamp (F) and rotate counterclockwise to remove.

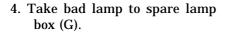


TA252996

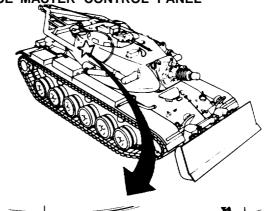
Change 1 3-293

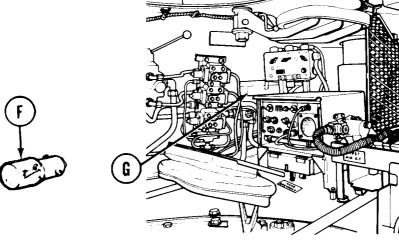
REPLACE INTERIOR LAMPS (REPLACE MASTER CONTROL PANEL

LAMPS) - Continued



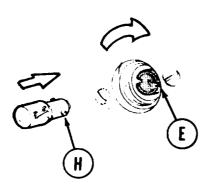
5. Get matching replacement lamp (F) from lamp box.



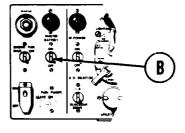


COMMANDER'S STATION

- 6. Aline new lamp pins (H) with socket (E).
- 7. Push lamp into socket (E) and rotate clockwise to tighten.



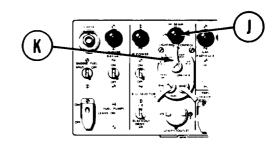
8. Set MASTER BATTERY switch (B) to ON.

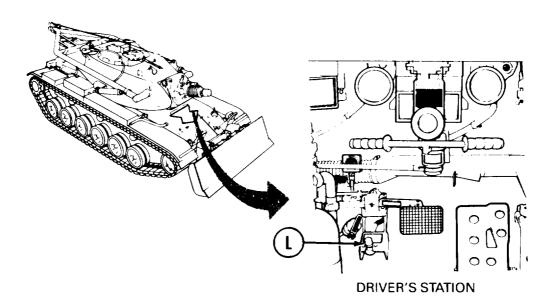


**DRIVER'S STATION** 

### To Test HI BEAM Indicator Lamp (J):

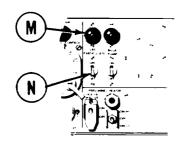
- 1. Set LIGHTING CONTROL lever (K) to SER DRIVE
- 2. Press dimmer switch (L) two times while observing lamp (J).





- 3. If lamp does not light, set LIGHTING CONTROL lever to OFF.
- 4. Notify organizational maintenance.

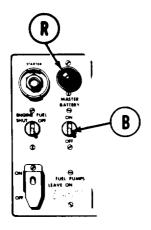
# To Test GAS-PARTICULATE Indicator Lamp (M):

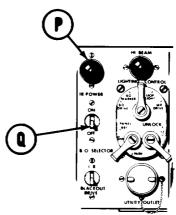


- 1. Set GAS PARTICULATE switch (N) to ON.
- 2. If lamp (M) fails to light, set switch (N) to OFF.
- 3. Notify organizational maintenance.

# To test IR POWER/NIGHT VISION Indicator Lamp (P):

- 1. Set IR POWER/NIGHT VISION switch (Q) to ON.
- 2. If lamp (P) fails to light, set switch (Q) to OFF.
- 3. Notify organizational maintenance.



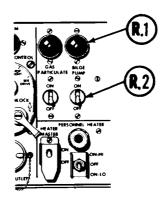


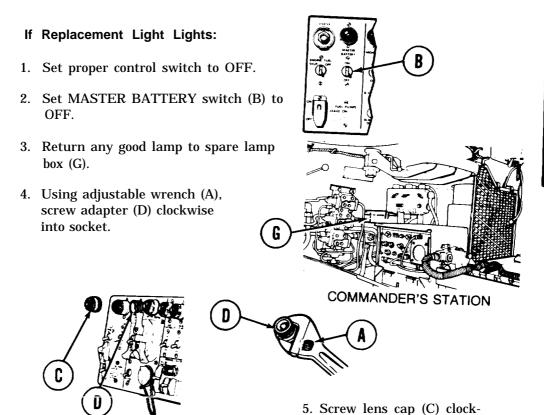
# To Test MASTER BATTERY Indicator Lamp (R):

- 1. Set MASTER BATTERY switch (B) to ON.
- 2. If lamp fails to light, notify organizational maintenance.

# To Test BILGE PUMP Indicator Lamp (R.1):

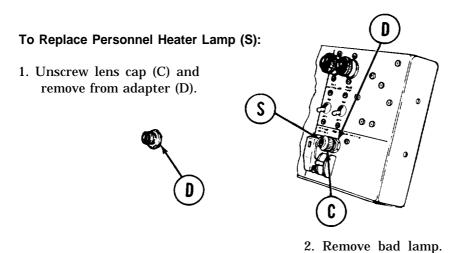
- 1. Set BILGE PUMP switch (R.2) to ON.
- 2. If lamp (R.1) fails to light, set switch (R.2) to OFF.
- 3. Notify organizational maintenance.





6. Return wrench to stowage.

wise onto adapter (D).

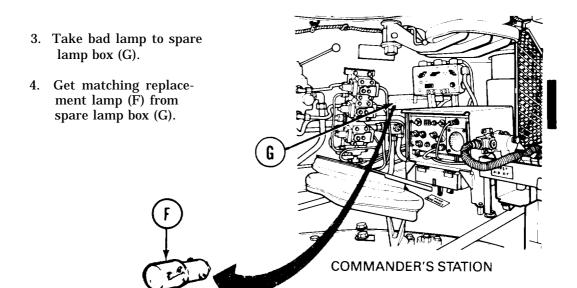


TA252998

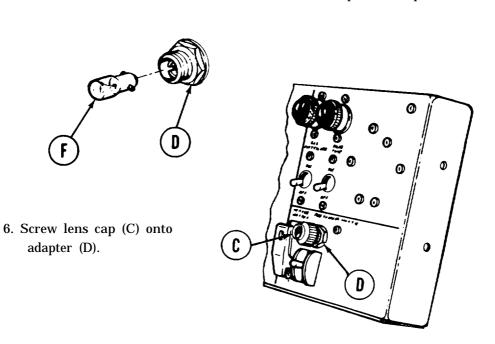
Change 1 3-297

# TM 9-2350-222-10-3

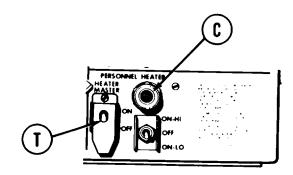
# REPLACE INTERIOR LAMPS (REPLACE MASTER CONTROL PANEL LAMPS) Continued



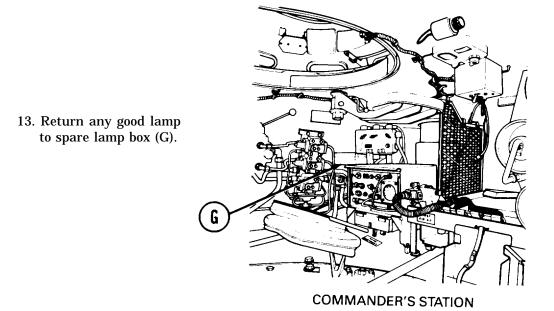
5. Push lamp into adapter (D).



- 8. Set HEATER MASTER switch (T) to ON.
- 9. Press lens cap (C) to test lamp.
- 10 Release lens cap (C).



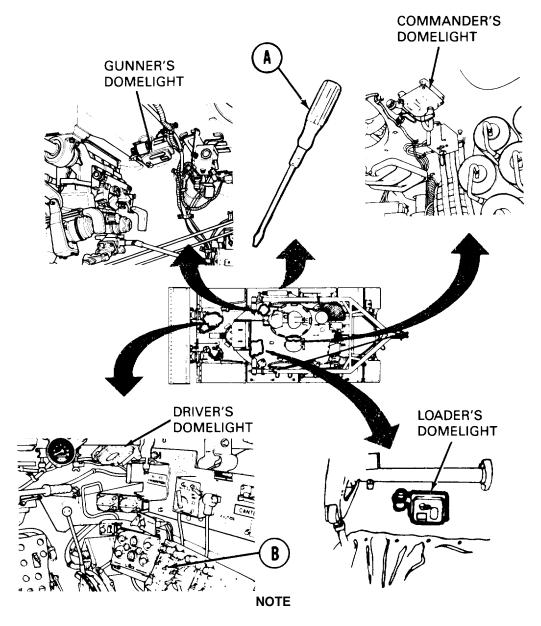
- 11. If lamp fails to light, set HEATER MASTER switch (T) to OFF and notify organizational maintenance.
- 12. If lamp lights, set HEATER MASTER switch (T) to OFF.



# **REPLACE INTERIOR LAMPS (REPLACE DOMELIGHT LAMPS)**

### Tools:

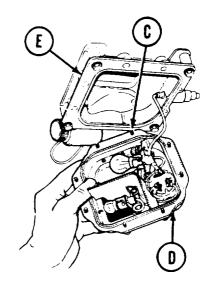
- Get flat-tip screwdriver (A) from right front fender box.
- 1. Set MASTER BATTERY switch (B) to OFF.

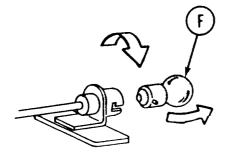


You may have to lower rear end of main gun to work on loader's domelight (page 2-502).

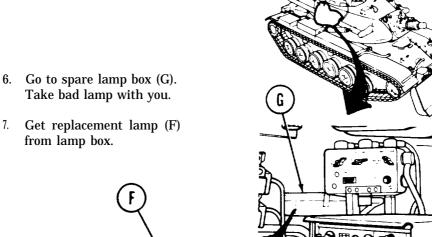
# REPLACE INTERIOR LAMPS (REPLACE DOMELIGHT LAMPS) - Continued

- 2. Using flat-tip screwdriver, loosen eight captive screws (C) from domelight door (D).
- 3. Remove door (D) from body (E).





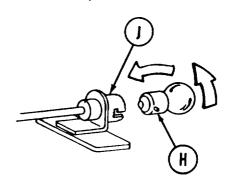
- 4. Using fingers, push bad lamp (F) in while rotating.
- 5. Remove lamp.

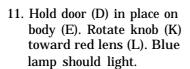


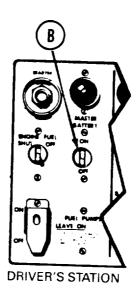
COMMANDER'S STATION TA133131

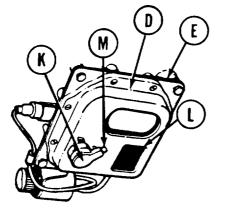
# REPLACE INTERIOR LAMPS (REPLACE DOMELIGHT LAMPS) - Continued

- 8. Aline new lamp pins (H) with socket (J).
- 9. Push lamp into socket and rotate.
- 10 Set MASTER BATTERY switch (B) to ON.





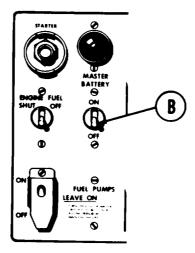




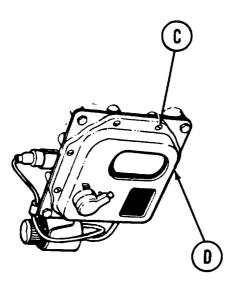
12. Press plunger (M). Rotate knob (K) two clicks away from red lens (L). Blue lamp should light.

# REPLACE INTERIOR LAMPS (REPLACE DOME LIGHT LAMPS) - Continued

13. If either lamp does not light, repeat steps 5 through 13 for that lamp one more time. If lamp still does not light, notify organizational maintenance.



**DRIVER'S STATION** 

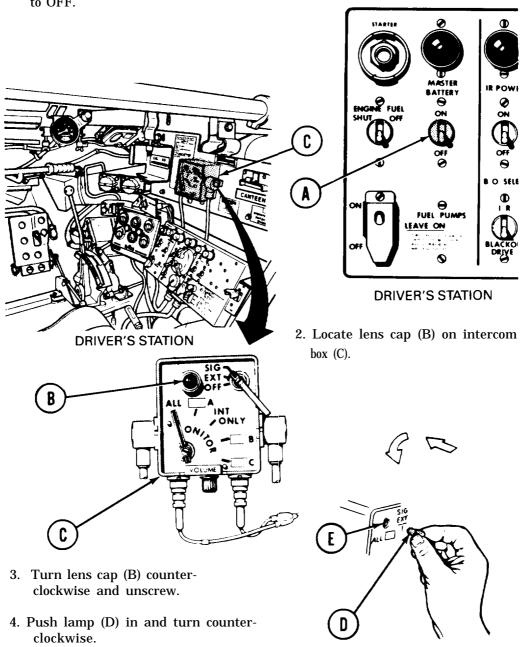


- 14. Set MASTER BATTERY switch (B) to OFF.
- 15. Using flat-tip screwdriver, install eight captive screws (C) in domelight door (D).
- 16. Return screwdriver to stowage.

# REPLACE INTERIOR LAMPS (REPLACE COMMUNICATION EQUIPMENT LAMPS)

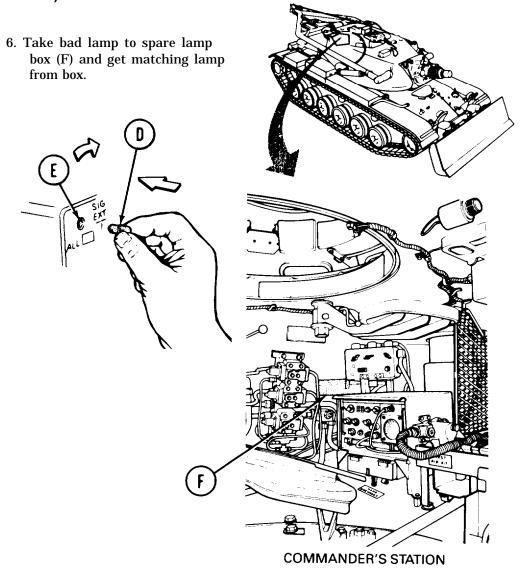
# To Replace Lamp in Driver's Intercom Box:

1. Set MASTER BATTERY switch (A) to OFF.



5. Pull lamp out of socket (E).

# REPLACE INTERIOR LAMPS (REPLACE COMMUNICATION EQUIPMENT LAMPS) - Continued



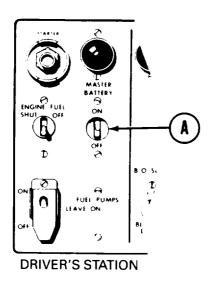
- 7. Put good lamp into lamp socket (E).
- 8. Push in on lamp (D) and turn clockwise.

# REPLACE INTERIOR LAMPS (REPLACE COMMUNICATION EQUIPMENT LAMPS)

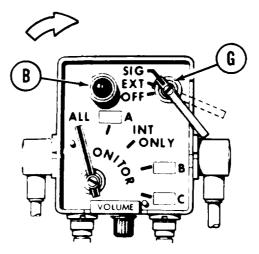
- Continued

# To Check Lamp:

9. Set MASTER BATTERY switch (A) to ON.



10. Turn SIG-EXT-OFF switch (G) to SIG. Lamp will light.

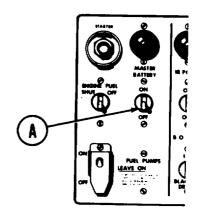


- 11. If lamp lights, set MASTER BATTERY switch (A) to OFF.
- 12. Screw on lens cap (B).
- 13. If lamp does not light, repeat steps 1 through 10. If lamp still does not light, set MASTER BATTERY switch (A) to OFF. Notify organizational maintenance.

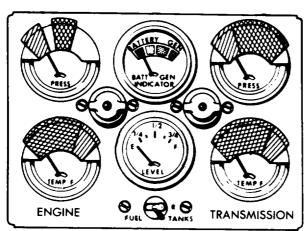
### REPLACE INTERIOR LAMPS (REPLACE GAGE INSTRUCTMENT PANEL LAMPS)

### Make Sure:

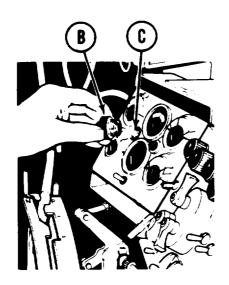
• MASTER BATTERY switch (A) is set to OFF.



**DRIVER'S STATION** 



**DRIVER'S STATION** 



- 1. Unscrew lens cap (B) to remove.
- 2. Push in lamp (C) and rotate counterclockwise.

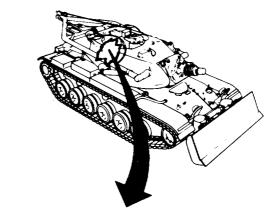
TA133137

3-307

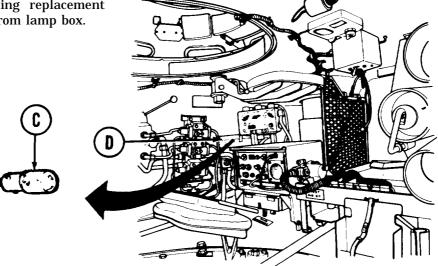
### REPLACE INTERIOR LAMPS (REPLACE GAGE INSTRUMENT PANEL

LAMPS) - Continued

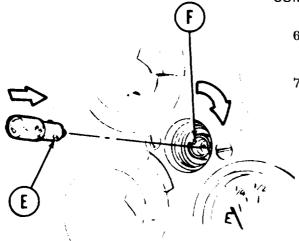
- 3. Remove lamp.
- 4. Take bad lamp (C) to spare lamp box (D).



5. Get matching replacement lamp (C) from lamp box.



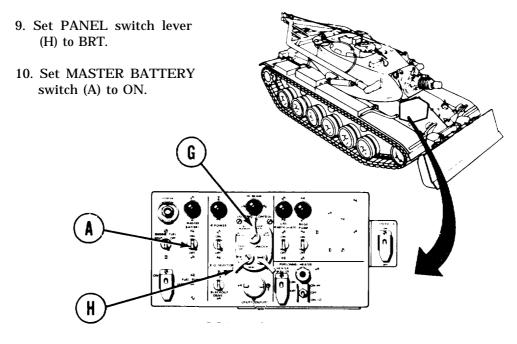
### COMMANDER'S STATION



- 6. Aline locking pins (E) of new lamp with socket (F).
- 7. Push lamp into socket and rotate clockwise to tighten.

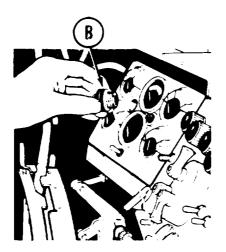
# REPLACE INTERIOR LAMPS (REPLACE GAGE INSTRUMENT PANEL LAMPS) - Continued

8. Set LIGHTING CONTROL lever (G) to SER DRIVE.



**NOTE** 

If lamps do not light, set MASTER BATTERY switch (A) to OFF. Notify organizational maintenance.

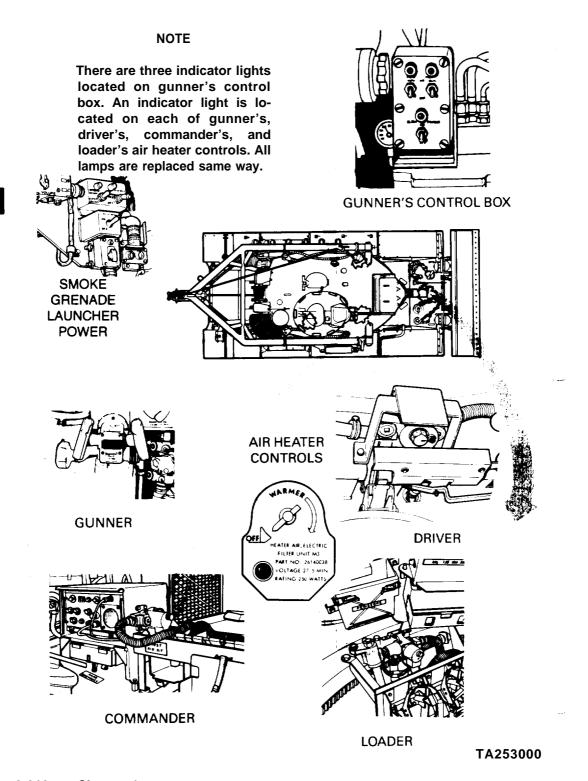


- 11. Set PANEL switch lever (H) to OFF.
- 12. Set LIGHTING CONTROL lever (G) to OFF.
- 13. Place lens cap (B) in socket and tighten.
- 14. Set MASTER BATTERY switch (A) to OFF.

TA133139

3-309

# REPLACE INTERIOR LAMPS (GUNNER'S CONTROL BOX, SMOKE GRENADE LAUNCHER POWER, AND M3 AIR HEATERS)



3-310 Change 1

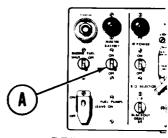
# REPLACE INTERIOR LAMPS (GUNNER'S CONTROL BOX, SMOKE GRENADE LAUNCHER POWER AND M3 AIR HEATERS) - Continued

1. Set MASTER BATTERY switch (A) to OFF.

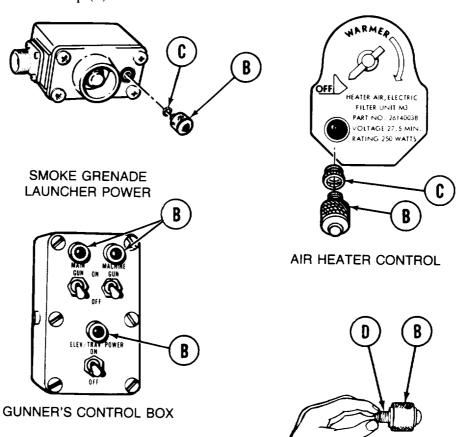
### **NOTE**

Some vehicles might have a different air heater control than shown.

- 2. Locate bad lamp.
- 3. Rotate lens cap (B) counterclockwise.



**DRIVER'S STATION** 



4. Remove lens cap (B) and seal (C) from socket.

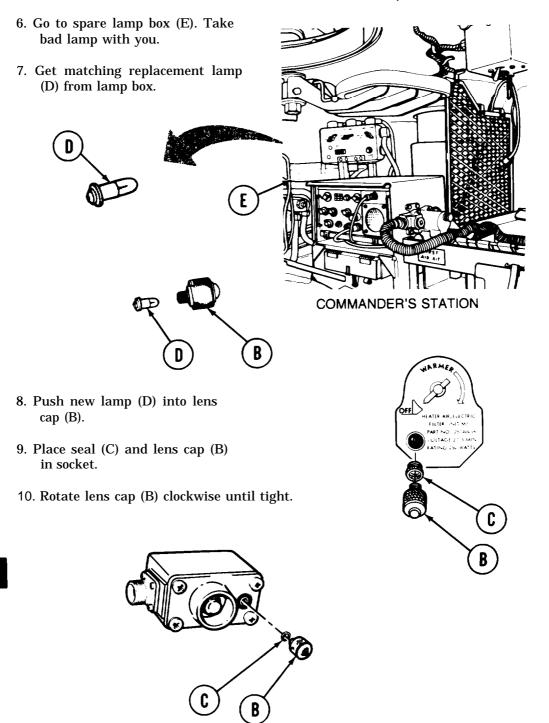
5. Pull lamp (D) from lens cap (B).

TA253001

Change 1 3-311

### TM 9-2350-222-10-3

# REPLACE INTERIOR LAMPS (GUNNER'S CONTROL BOX, SMOKE GRENADE LAUNCHER POWER AND M3 AIR HEATERS) - Continued



CUPOLA POWER

ON

OFF

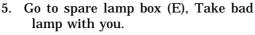
0

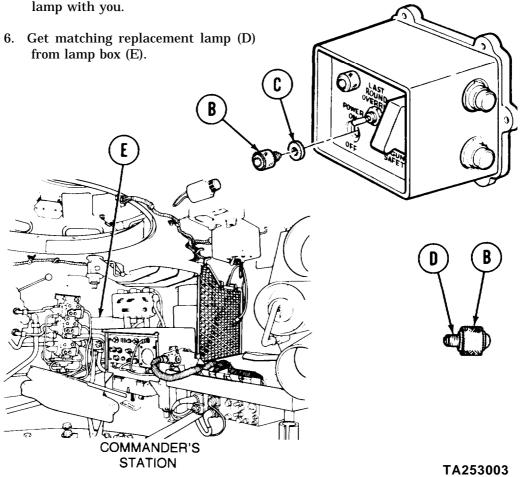
0

### REPLACE INTERIOR LAMPS (REPLACE COMMANDER'S PANEL LAMPS)

### Make Sure:

- Caliber .50 machine gun is clear of ammunition (page 2-553).
- CUPOLA POWER switch (A) is set to OFF.
- 1. Locate bad lamp.
- 2. Rotate lens cap (B) counterclockwise.
- 3. Remove lens cap (B) and seal (C) from socket.
- 4. Pull lamp (D) from lens cap (B).

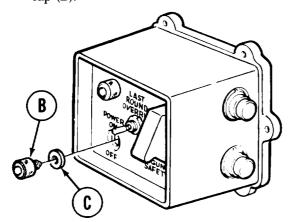


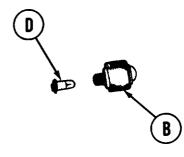


Change 1 3-312.1

# REPLACE INTERIOR LAMPS (REPLACE COMMANDER'S PANEL LAMPS) Continued

7. Push new lamp (D) into lens cap (B).





- 8. Place seal (C) and lens cap (B) in socket.
- Rotate lens cap (B) clockwise until tight.

### To Test Commander's Panel Lamps After Lamp Replacement:

- 1. Set CUPOLA POWER switch (A) to ON. POWER ON indicator (B) should light.
- 2. Set LAST ROUND OVERRIDE switch (C) to ON.

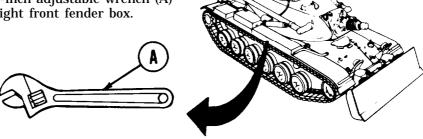
B

- 5. Set LAST ROUND OVERRIDE switch (C) to OFF.
- 6. Set CUPOLA POWER SWITCH (A) to OFF.
- 7. If either lamp failed to light, notify organizational maintenance.

### REPLACE INTERIOR LAMPS (REPLACE SMOKE GENERATOR LAMP, IF EQUIPPED ON VEHICLES)

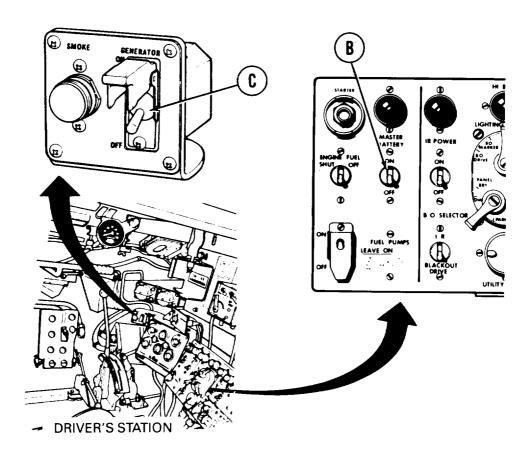
### Tools:

• Get 12-inch adjustable wrench (A) from right front fender box.



### Make Sure:

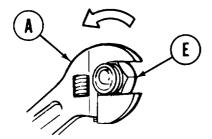
- MASTER BATTERY switch (B) is set to OFF.
- SMOKE GENERATOR switch (C) is set to OFF.

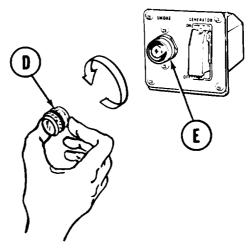


Change 3 3-313

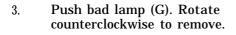
# REPLACE INTERIOR LAMPS (REPLACE SMOKE GENERATOR LAMP, IF EQUIPPED ON VEHICLES) - Continued

1. Unscrew lens cap (D) counter-clockwise from adapter (E).

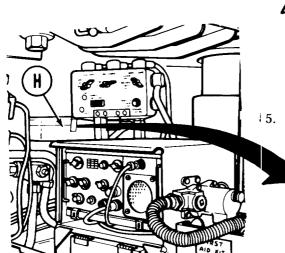




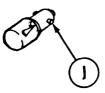
2. Using adjustable wrench (A), unscrew adapter (E) counterclockwise from socket (F).



4. Take bad lamp (G) to spare lamp box (H).



5. Get matching replacement lamp (J) from spare lamp box (H).

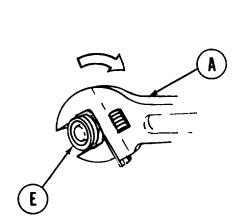


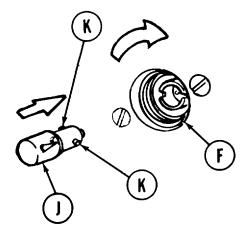
COMMANDER'S STATION

3-314 Change 3

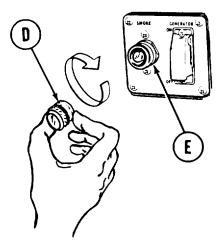
# REPLACE INTERIOR LAMPS (REPLACE SMOKE GENERATOR LAMP, IF EQUIPPED ON VEHICLES) - Continued

- 6. Aline pins (K) of good lamp (J) with socket (F).
- 7. Push good lamp (J) into socket (F). Rotate clockwise to tighten.





- 8. Using wrench (A), screw adapter (E) clockwise into socket (F).
- 9. Screw lens cap (D) clockwise into adapter (E).
- 10. Return wrench to stowage.
- 11. Test lamp (page 3-316).



Change 3 3-315

### REPLACE INTERIOR LAMPS (REPLACE SMOKE GENERATOR LAMP, IF EQUIPPED ON VEHICLES) - Continued

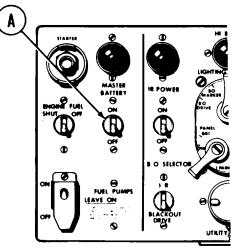
To Test Smoke Generator Indicator Lamp After Lamp Replacement:

#### WARNING

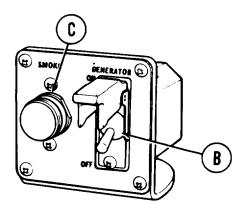
Use following procedure to test smoke generator indicator lamp with engine not running. If test is to be done with engine running, refer to operation of smoke generator (page 2-520).

#### Make Sure:

- Engine is not running.
- 1. Set MASTER BATTERY switch (A) to ON.
- 2. Set SMOKE GENERATOR switch (B) to ON. Indicator lamp (C) should light.



**DRIVER'S STATION** 

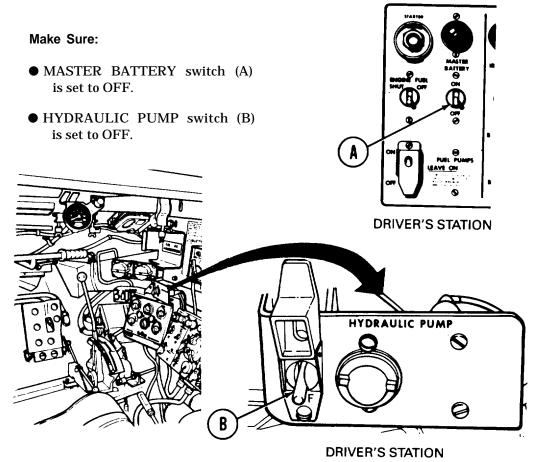


- 3. Set SMOKE GENERATOR switch (B) to OFF.
- 4. Set MASTER BATTERY switch (A) to OFF.

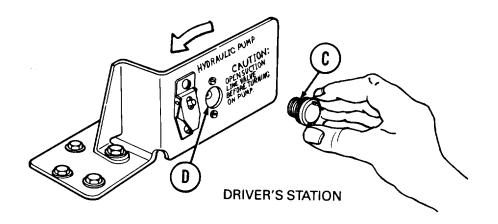
5. If SMOKE GENERATOR indicator lamp (C) failed to light, notify organizational maintenance.

### 3-316 Change 3

### REPLACE INTERIOR LAMPS (REPLACE HYDRAULIC PANEL LAMP)



1. Turn lens cap (C) counterclockwise to remove from socket (D).

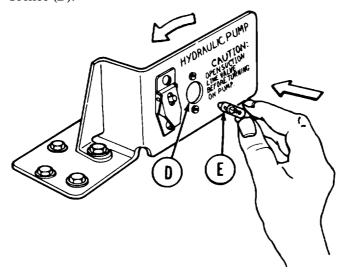


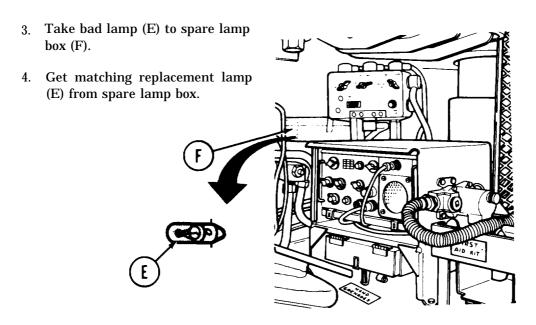
TA133147

3-317

### REPLACE INTERIOR LAMPS (REPLACE HYDRAULIC PANEL LAMP) - Continued

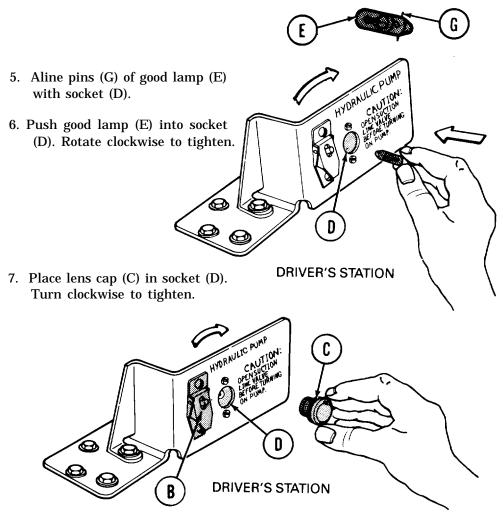
2. Push in bad lamp (E). Rotate counterclockwise to remove from socket (D).



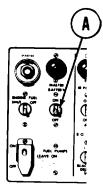


**COMMANDER'S STATION** 

### REPLACE INTERIOR LAMPS (REPLACE HYDRAULIC PANEL LAMP) - Continued



To Test HYDRAULIC PUMP Indicator After Lamp Replacement: .



**DRIVER'S STATION** 

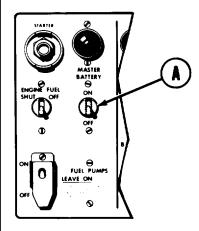
- 1. Set MASTER BATTERY switch (A) to ON.
- 2. Set HYDRAULIC PUMP switch (B) to ON. Indicator should light.
- 3. Set HYDRAULIC PUMP switch (B) to OFF.
- 4. Set MASTER BATTERY switch (A) to OFF.
- 5. If indicator failed to light, notify organizational maintenance.

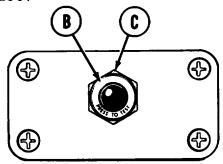
TA133149

3-319

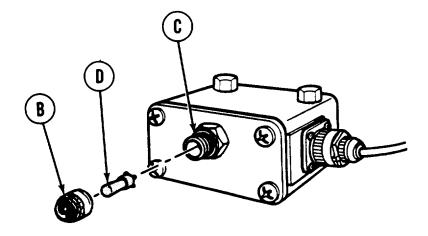
# REPLACE INTERIOR LAMPS (REPLACE DUST DETECTOR WARNING LIGHT)

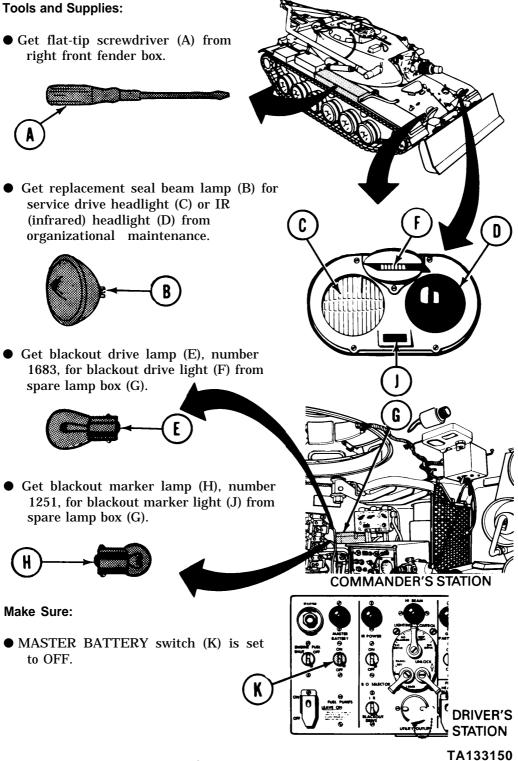
1. Set MASTER BATTERY switch (A) to  ${\sf OFF}.$ 





- 2. Unscrew lens cap(B) from indicator lamp socket (C).
- 3. Remove defective lamp (D) from socket (C).
- 4. Install replacement lamp (item 32, Appendix D) in socket (C).
- 5. Install lens cap (B).



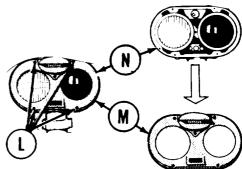


(3-320.1 blank)/3-320.2

Change 2

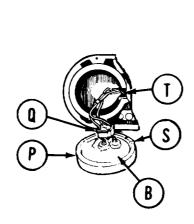
### To Remove Cover from Headlight Assembly:

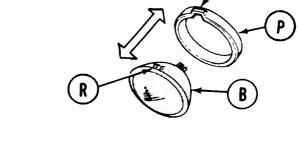
- 1. Using screwdriver, loosen four captive screws (L) on cover (M).
- 2. Holding cover (M) with one hand, unscrew captive screws (L) all the way.
- 3. Pull cover (M) out from headlight assembly (N).



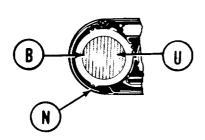
### To Replace Lamps for Service Drive or IR Headlights:

- 1. Pull seal beam lamp (B) and rubber seal (P) out.
- 2. Unplug connector (Q) from seal beam lamp (B).
- 3. Carefully take rubber seal (P) off seal beam lamp (B).



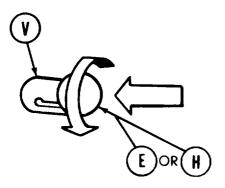


- 4. Put seal (P) on replacement seal beam lamp (B) so bumps (R) fit into groove (S).
- 5. Plug connector (Q) into seal beam lamp (B).
- 6. Put seal beam lamp (B) in place on headlight assembly (N) so groove (S) fits in opening (T). Make sure lines (U) on seal beam lamp (B) are vertical.
- 7. Test lamp (page 3-322).



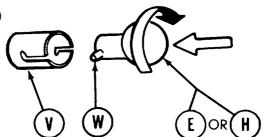
### To Replace Lamps for Blackout Drive or Blackout Marker Lights:

1. Pushing in on blackout drive lamp (E) or blackout marker lamp (H), turn counterclockwise.



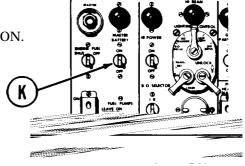
2. Pull bad lamp (E or H) from socket (V).

- 3. Aline pins (W) of good lamp (E or H) with L-shaped grooves (X) of socket (V).
- 4. Pushing good lamp (E or H) into socket (V), turn clockwise.
- 5. Test lamp (page 3-323).

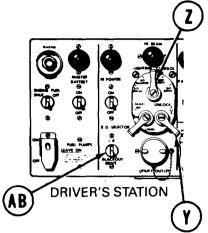


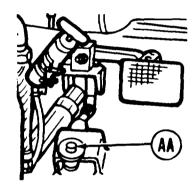
### To Test Light After Lamp Replacement:

- 1. Set MASTER BATTERY switch (K) to ON.
- 2. Turn on new lamp.
  If any new lamp
  fails to light, notify
  organizational maintenance.



- Service Drive Headlight Lamp:
- a. Lift and hold UNLOCK lever (Y).
- Set LIGHTING CONTROL lever (Z) to SER DRIVE. Release UNLOCK lever (Y). Service drive headlight lamp should light.
- Press DIMMER switch (AA) once. Other beam of service drive headlight lamp should light.

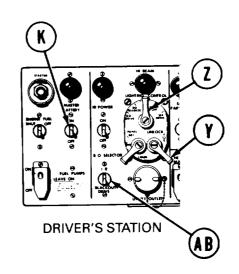




**DRIVER'S STATION** 

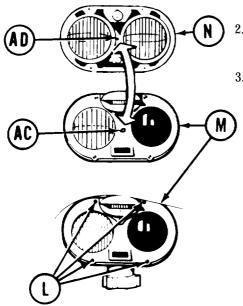
- Infrared Headlight Lamp:
  - a. Set BO SELECTOR switch (AB) to IR.
  - b. Lift and hold UNLOCK lever (Y).
  - c. Set LIGHTING CONTROL lever (Z) to BO DRIVE. Release UNLOCK lever (Y). IR headlight lamp should light.
  - d. Press DIMMER switch (AA) once. Other beam of IR headlight lamp should light.
- Blackout Drive Light Lamp:
- a. Set BO SELECTOR switch (AB) to BO.
- b. Lift and hold UNLOCK lever (Y).
- c. Set LIGHTING CONTROL lever (Z) to BO DRIVE, Release UNLOCK lever (Y). Black-out drive lamp should light,

- Blackout Marker Light Lamp:
  - a. Set BO SELECTOR switch (AB) to BO.
  - b. Lift and hold UNLOCK lever (Y).
  - c. Set LIGHTING CONTROL lever (Z) to BO MARKER. Release UNLOCK lever (Y). Blackout marker lamp should light.
- 3. Set LIGHTING CONTROL lever (Z) to OFF.
- 4. Set MASTER BATTERY switch (K) to OFF.



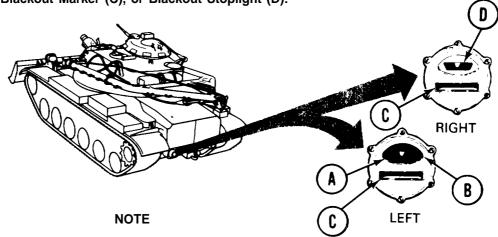
## To Install Cover on Headlight Assembly:

- 1. Alining hole (AC) with pin (AD), place cover (M) on headlight assembly (N).
- 2. Using flat-tip screwdriver, tighten 4 captive screws (L).
- 3. Return screwdriver to stowage.



### REPLACE EXTERNAL LAMPS (REPLACE TAILLIGHT ASSEMBLY LAMPS)

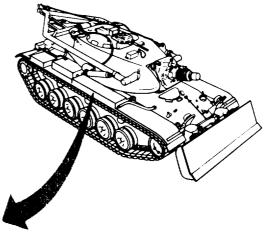
To Replace Lamps for Service Drive Taillight (A), Service Stoplight (B), Blackout Marker (C), or Blackout Stoplight (D):

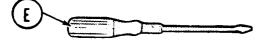


Two crewmembers are needed to do this procedure.



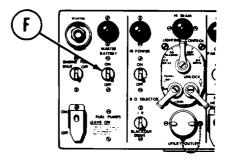
● Get flat-tip screwdriver (E) from right front fender box.





### Make Sure:

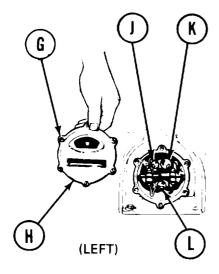
 MASTER BATTERY switch (F) is set to OFF.



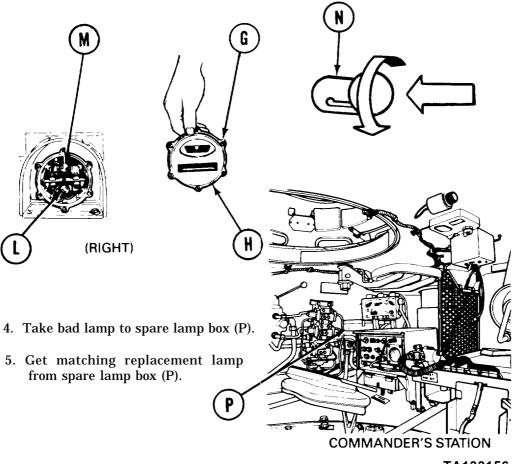
**DRIVER'S STATION** 

TA133155

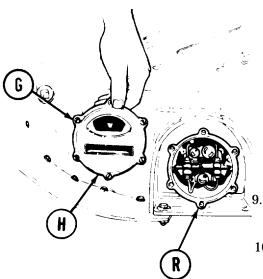
3-325



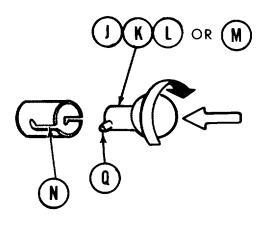
- 1. Using flat-tip screwdriver, loosen 6 captive screws (G) on door (H).
- 2. Remove door (H).
- 3. Pushing in on service drive (J), service stoplight (K), blackout marker (L), or blackout stoplight (M) lamp, rotate lamp counterclockwise. Remove bad lamp (J, K, L, or M) from socket (N).



- 6. Aline pins (Q) of good lamp (J, K, L, or M) with socket (N).
- 7. Pushing good lamp (J, K, L, or M) into socket (N), rotate lamp clockwise to tighten.
- 8. Test light (page 3-328).



11. Return screwdriver to stowage.



### NOTE

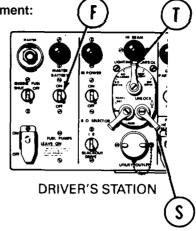
Clean taillight lenses (both sides) before installing door (H).

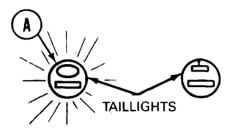
Aline captive screws (G) in door (H) with screw holes (R).

10. Using flat-tip screwdriver, tighten captive screws (G), making sure that seal on door seats properly.

### To Test Service Drive Taillight After Lamp Replacement:

- 1. Set MASTER BATTERY switch (F) to ON.
- 2. Lift up and hold UNLOCK lever (S).
- 3. Set LIGHTING CONTROL LEVER (T) to SER DRIVE. Release UNLOCK lever (S). Service drive taillight (A) lamp should light.



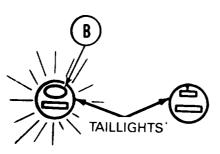


- 4. Set LIGHTING CONTROL lever (T) to OFF.
- 5. Set MASTER BATTERY switch (F) to OFF.
- 6. If service drive taillight failed to light, notify organizational maintenance.

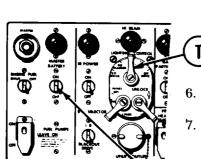
### To Test Service Stoplight After Lamp Replacement:

- 1. Set MASTER BATTERY switch (F) to ON.
- 2. Lift up and hold UNLOCK lever (S).
- 3. Set LIGHTING CONTROL lever (T) to STOP LIGHT. Release UNLOCK lever (S).

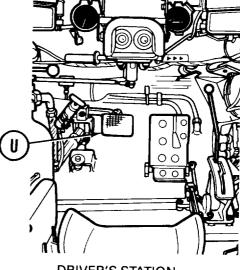
4. Press brake pedal (U). Service stoplight (B) lamp should light.



5. Release brake pedal (U).



**DRIVER'S STATION** 



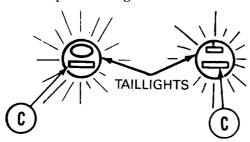
**DRIVER'S STATION** 

- 6. Set LIGHTING CONTROL lever (T) to OFF.
- 7. Set MASTER BATTERY switch (F) to OFF.

8. If service stoplight failed to light, notify organizational maintenance.

### To Test Blackout Marker After Lamp Replacement:

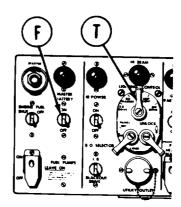
- 1. Set MASTER BATTERY switch (F) to ON.
- 2. Set LIGHTING CONTROL lever (T) to BO MARKER. Blackout marker (C) lamp should light.



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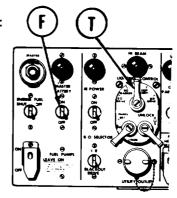
3-329

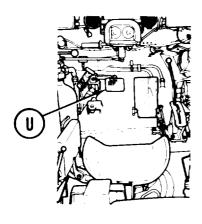
- 3. Set LIGHTING CONTROL lever (T) to OFF.
- 4. Set MASTER BATTERY switch (F) to OFF.
- 5. If blackout marker failed to light, notify organizational maintenance.



### To Test Blackout Stoplight After Lamp Replacement:

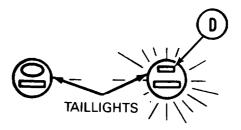
- 1. Set MASTER BATTERY switch (F) to ON.
- 2. Set LIGHTING CONTROL lever (T) to ON.





**DRIVER'S STATION** 

3. Press brake pedal (U). Blackout stoplight (D) lamp should light.



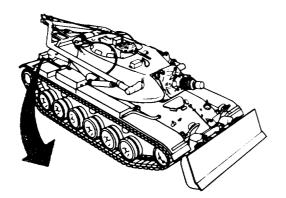
4. Release brake pedal (U).

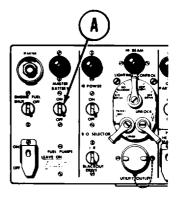
- 5. Set LIGHTING CONTROL lever (T) to OFF.
- 6. Set MASTER BATTERY switch (F) to OFF.
- 7. If blackout stoplight failed to light, notify organizational maintenance.

### REPLACE EXTERNAL LAMPS (REPLACE EXTERNAL HANDSET BOX LAMP)

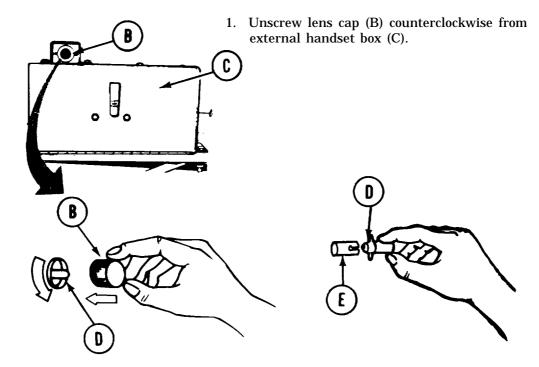
### Make Sure:

• MASTER BATTERY switch (A) is set to OFF.





**DRIVER'S STATION** 



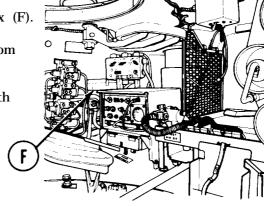
- 2. Pushing bad lamp (D) in, turn counterclockwise.
- 3. Remove bad lamp (D) from socket (E).

## REPLACE EXTERNAL LAMPS (REPLACE EXTERNAL HANDSET BOX LAMP) - Continued

4. Take bad lamp to spare lamp box (F).

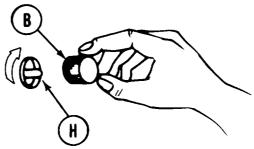
5. Get matching replacement lamp from spare lamp box (F).

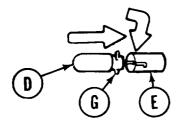
6. Aline pins (G) on good lamp (D) with socket (E).



**COMMANDER'S STATION** 

7. Pushing in on good lamp (D), rotate clockwise to tighten.

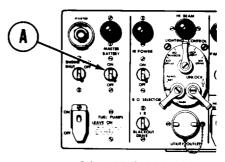




8. Screw lens cap (B) clockwise into adapter (H).

### To Test External Handset Box Indicator After Lamp Replacement:

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

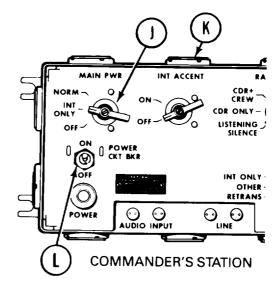


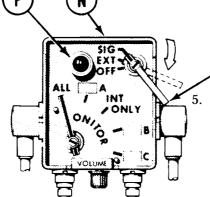
DRIVER'S STATION

# REPLACE EXTERNAL LAMPS (REPLACE EXTERNAL HANDSET BOX LAMP) - Continued

M

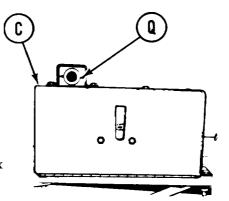
- 2. Rotate MAIN PWR switch (J) to INT ONLY on radio amplifier (K).
- 3. Set POWER CKT BKR switch (L) to ON.
- 4. Notify driver "power circuit is on".





**DRIVER'S STATION** 

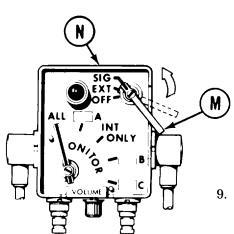
Rotate handle (M) on driver's intercom box (N) to SIG.  $\label{eq:sigma} % \begin{array}{c} P(x) = P(x) \\ P(x)$ 

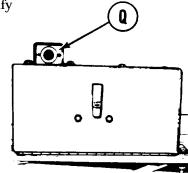


- 6. Indicator (Q) on external handset box (C) should light.
- 7. If indicator (Q) does not light, check driver's intercom box indicator (P). If indicator (P) does not light, replace indicator (P) lamp (page 3-304).

### REPLACE EXTERNAL LAMPS (REPLACE EXTERNAL HANDSET BOX LAMP) - Continued

8. If indicator (Q) still does not light, notify organizational maintenance.

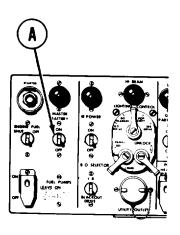


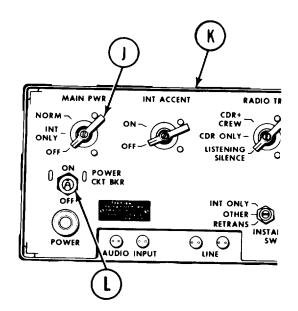


9. Rotate handle (M) on driver's intercom box (N) to OFF.

**DRIVER'S STATION** 

- 10. Rotate MAIN PWR switch (J) on radio amplifier (K) to OFF.
- 11. Set POWER CKT BKR (L) to OFF.





12. Set MASTER BATTERY switch (A) to OFF.

#### CHAPTER 4

### AMMUNITION

#### 165-MM AMMUNITION

#### General

Ammunition for 165-mm gun M135 is issued in fixed complete rounds. A complete round (A) consists of all ammunition parts needed to fire weapon once, It consists of an electric primer (B) and propelling charge (C) contained in a cartridge case (D) and a fused projectile (E). The cartridge case is threaded onto the base of the projectile. The term "fixed" used with ammunition means that propelling charge cannot be changed. Round is loaded into gun as a unit.

### **CAUTION**

Use only ammunition authorized for 165-mm gun M135.

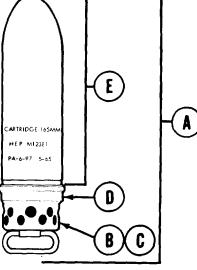
### Firing Table

Use firing table FT 165-A-2 with 165-mm gun M135.

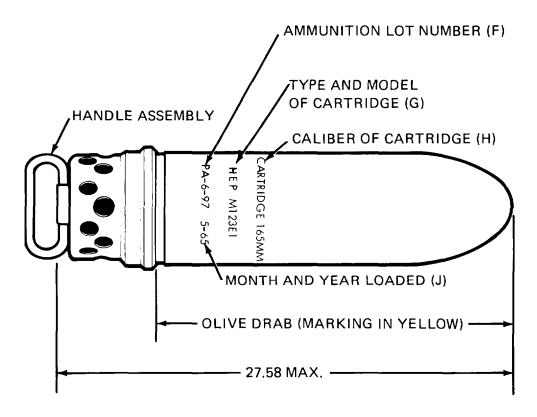
#### Identification

- 1. General. Ammunition and ammunition parts are identified by painting and marking (including an ammunition lot number) on ammunition items and on all original packing containers.
- 2. Ammunition Lot Number. The lot number is needed for records, including reports on conditions, functioning, or accidents in which ammunition maybe involved.

Complete rounds of fixed ammunition of any one lot are similarly manufactured. To obtain greatest accuracy when firing, successive rounds should be from same lot number whenever possible.



3. Painting. Projectiles are painted to prevent rust and provide easy identification. Dull paint is used to meet requirements for camouflage. Color scheme is as follows:



- 4. Marking (Stenciled). These markings are stenciled on the projectile:
  - a. Ammunition lot number (F); e.g., PA-6-97.
  - b. Type and model of cartridge (G); e.g., HEP M123E1.
  - c. Caliber of cartridge (H); e.g., 165-mm.
  - d. Month and year loaded (J); e.g., 5-65.

Care, Handling, and Preservation

### **WARNING**



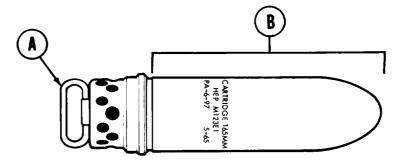
Explosive ammunition or parts containing explosives must be handled carefully at all times. Explosive elements in primers and fuses are particularly sensitive to shock and high temperature. Ammunition and parts should not be dropped, thrown, tumbled, or dragged.



- 1. Ammuniton 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 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 complete round or any of its parts,



Make sure turret lock is in locked position when loading ammunition into vehicle.



d. When loading 165-mm ammunition into vehicle, station one crewmember on ground, one crewmember on fender near loader's hatch, one crewmember on top of turret (who hands round to crewmember inside turret) and one crewmember inside turret. Grasp round by handle (A) with one hand, and nose of projectile (B) with other hand. Pass round from person to person. Always lower round through loader's hatch, projectile (B) first.



e. 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.

### **Authorized Rounds**

	Complete Round		Projectile	1	
Standard Nomenclature	Weight (approx)		weight as fired (approx)	Primer	Fuze
HIGH-EXPLOSIVE:  CARTRIDGE, 165-MM: HEP, M123E1, W/FUZE, BD, M62A1E1	65.6 lb (29.6 kg)	27.62 in. 70.15 cm)	62.5 lb (28.3kg)	Electric M73	BD M62A1E1

#### 165-MM Ammunition - Continued

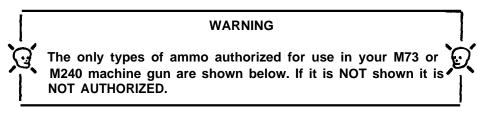
#### Preparation for Firing

After removal from packing materials ammunition for 165-mm gun M135 is ready for loading. Once loaded into gun the handle assembly must be removed before closing breech and firing round. Rounds loaded but not fired must have handle assembly installed before being stowed on vehicle or in stowage area. Use these rounds first in later firings so stocks of opened packings are kept to a minimum.

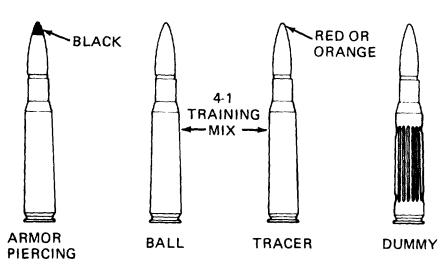
#### Precautions in Firing

- 1. Before 165-mm M135 main gun is fired, assure all hatches are closed and all personnel outside the vehicle are under available cover at least 600 meters from target and should exercise caution to 1000 meters.
- 2. After firing, visually inspect chamber for debris which may be left after round is fired.
- 3. Insure handle assembly is attached to round at all times when round is not in gun tube.
- 4. If firing is halted and a round is in chamber of hot weapon, attach handle assembly and remove round immediately to prevent a cook off.

#### 7.62-MM AMMUNITION



#### NATO 7.62-MM AMMO

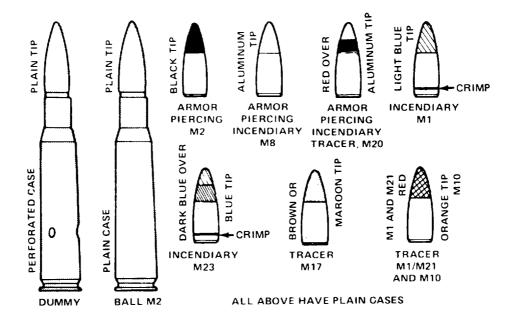


Change 3

#### **CALIBER .50 AMMUNITION**

# WARNING Ammo which fails to fire in your weapon will be separated from other ammo and reported to E.0.D

- 1. Use in M85 machine gun with M15A2 link.
- 2. Normal training mix consists of four ball M2 with one tracer M17.
- 3. Normal combat mix consists of four API-M8 with one APIT-M20.



#### **APPENDIX A**

#### **REFERENCES**

# Scope

This appendix lists all forms, field manuals, and technical manuals referenced in this manual.

Forms Recommended Changes to Publications . DA Form 2028 Recommended Changes to Equipment Technical Manuals . DA Form 2028-2 Equipment, Inspection, and Maintenance Worksheet . DA Form 2404 Maintenance Requests . DA Form 2407
Field Manuals  NBC Decontamination
Firing Table Cannon, 165-MM Gun, M35 On Combat Engineer Vehicle, Full-Tracked, M728
Lubrication Order         Lubrication Order for Vehicle Combat Engineer,         Full-Tracked, M728       LO 9-2350-222-12
Technical Manuals Operator's Manual, Mask, Chemical-Biological:    Aircraft ABC-M24 and Accessories and    Mask, Chemical-Biological Tank M25/M25A1    and Accessories
Tools List): Sub-Machine Gun Caliber .45         M3 W/E and M3A1 W/E       TM 9-1005-229-12         Operator's Manual: M85 Machine Gun       TM 9-1005-231-10
operator 5 marian. Moo machine dui

#### **REFERENCES - Continued**

Technical Manuals - Continued
Operator's Manual: For Machine Gun, 7.62-MM, M240 TM 9-1005-313-10
Ammunition, General
Small Arms Ammunition
Operator's and Organizational Maintenance Manual:
Grenades Hand and Directional: M18 TM 9-1330-200-12
Organizational Maintenance Manual For Combat
Engineer Vehicle, Full-Tracked, M728 (Hull) TM 9-2350222-201
Organizational Maintenance Manual For Combat
Engineer Vehicle, Full-Tracked, M728 (Turret) TM 9-2350-222-20-2
Operator's, Organizational, Direct Support and General
Support Maintenance Manual for Lead-Acid Storage
Batteries
Operator Manual: Radio Sets AN/VRC-12, AN/VRC-43
AN/VRC-44, AN/VRC-45, AN/VRC46, AN/VRC-47
AN/VRC-48, and AN/VRC-49 TM 11-5820-401-10-2
Operator's and Organizational Maintenance Manual
(Including Repair Parts and Special Tools list): Radio
Set AN/VRC-12, AN/VRC-43, AN/VRC-44, AN/VRC-
45, AN/VRC46, AN/VRC-47, AN/VRC-48, AN/VRC-49,
AN/VRC-54, and AN/VRC-55 MOUNTING MT-1029/
VRC and MT-1898/VRC; ANTENNA AT-912/VRC;
Control Frequency Selector C-2742/VRC and Control
Radio Set C-2299/VRC TM 11-5820-401-12
Operator's and Organizational Maintenance Manual
Radio Sets AN/VRC-53, AN/VRC-64, AN/GRC-125 and
AN/GRC-160 and Amplifier Power Supply Groups OA-
3633/GRC and OA-3633A/GRC
Operator's and Organizational Maintenance Manual
(Including Repair Parts and Special Tools List):
Searchlight Set, Infrared AN/VSS-3A
The Army Maintenance Management System (TAMMS) DA PAM 738-750

#### **APPENDIX B**

#### COMPONENTS OF END ITEM AND BASIC ISSUE ITEMS LISTS.

#### Section I. INTRODUCTION

#### Scope

This appendix lists components of end item and basic issue items for the M728 CEV (Combat Engineer Vehicle) to help you inventory items required for safe and efficient operation.

#### General

The Components of End Item and Basic Issue Items Lists are divided into the following sections:

- a. Section II. Integral Components of End Item. This listing is for informational purposes only, and is not authority to requisition replacements. 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 these items.
- b. Section III. Basic Issue Items. These are the minimum essential items required to place the M728 CEV in operation, to operate it, and to perform emergency repairs. Although shipped separately packaged BII must be with the vehicle 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 TOE/MTOE authorization of the end item.

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#### COMPONENTS OF END ITEM AND BASIC ISSURE ITEMS LISTS - Continued

#### **Explanation of Columns**

The following provides an explanation of columns found in the tabular listings:

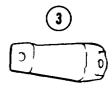
- Column (1) Illustration Number (Illus Number). This column indicates the number of the illustration in which the item is shown.
- Column (2) National Stock Number. Indicates the National stock number assigned to the item and will be used for requisitioning purposes.
- Column (3) Description. Indicates the national item name and, if required, a minimum description to identify and locate the item. The last line for each item indicates the FSCM (in parentheses) followed by the part number.
- Column (4) Unit of Measure (U/M). Indicates the measure used in performing the actual operation/maintenance function. This measure is expressed by a two-character alphabetical abbreviation (e.g. ea, in, pr).
- Column (5) Quantity required (Qty Rqr). Indicates the quantity of the item authorized to be used with/on the equipment.

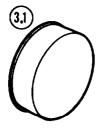
Section II. INTEGRAL COMPONENTS OF END ITEM

(1) Illus Number	(2) National Stock Number	(3) Description FSCM & Part Number	(4) U/M	(5) Oty Rqr
1	2590-00-906-4741	BOX ASSY., SPARE BULB (mounted on radio rack) (19207) 10870949	EA	1
2	2540-00-996-0714	BOX ASSY., GRENADES (1 under radio rack and 2 on left turret wall) (19207) 10905855	EA	3
3	5340-00-078-8995	BRACKET, ANGLE (searchlight mounting, on gunshield) (19207) 10934087	EA	1
3.1	5855-01-027-3625	CAP, PROTECTIVE, EYEPIECE (with AN/VVS-2 night vision viewer) (80063) SMC771382 (LATE MODEL)	EA	1
4	1240-00-980-9292	CONTROL LIGHT SOURCE (mounted next to M38 or M36E1 periscope) (19200) 8619159	EA	1
5	1240-00-970-8656	CONTROL LIGHT SOURCE (mounted on main gun mount for telescope) (19200) 8619165-1	EA	1







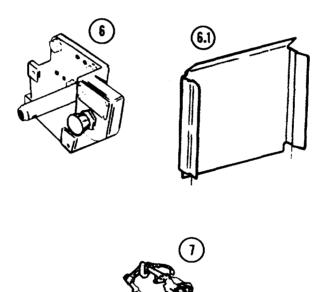




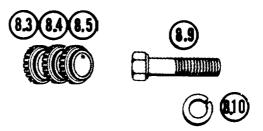


TM 9-2350-222-10-3
INTEGRAL COMPONENTS OF END ITEM - Continued

(1) !Nus Number	(2) National Stock Number	(3) Description FSCM & Part Number	(4) U/M	(5) Oty Rer
6	1290-00-086-4272	CONTROL LIGHT SOURCE (mounted on main gun with M13A3 quadrant) (19200) 8620880	EA	1
6.1	5855-01-027-1553	COVER, PROTECTIVE, WINDOW DRIVER'S VIEWER (with AN/VVS-2 night vision viewer, in box under gun mount) (80083) SMC771384 (LATE MODEL)	EA	1
7	1220-00-071-5330	DRIVE, BALLISTICS XM15 (mounted in turret) (19200) 10516375	EA	1

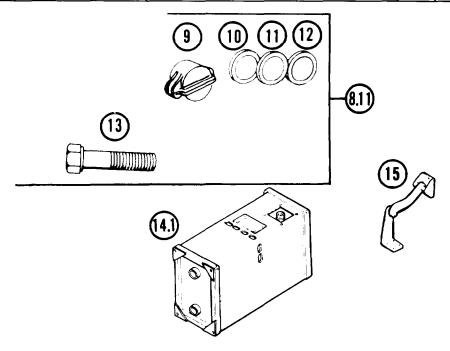


(1) Illus Number	(2) National Stock Number	(3) Description FSCM & Part Number	(4) U/M	(5) Oty Rer
8		Deleted		
8.1		Deleted		
8.2		Deleted	EA	1
8.3	1240-00-871-2884	FILTER (RED) (19200) 8574728	EA	1
8.4	1240-00-871-2883	FILTER (AMBER) (19200) 8574729	EA	1
8.5	1240-00-871-2882	FILTER (NEUTRAL) (19200) 8574730	EA	1
8.6		Deleted		
8.7		Deleted		
8.8		Deleted		
8.9	5305-00-702-4523	SCREW (96906) MS35307-8	EA	3
8.10	5310-00-933-8121	WASHER (96906) MS35338-139	EA	3



Change 6 B-4.1/(B-4.2 blank)

(1) Illus Number	(2) National Stock Number	(3) Description FSCM & Part Number	(4) U/M	(5) Qty Rqr
8.11	1240-00-970-8657	FILTER BOX ASSY. (mounted on telescope mount) (19200) 8620450 (EARLY MODEL)	EA	1
9	1240-00-970-8658	- CONSISTING OF - BOX ASSY. (19200) 8620670	EA	1
10	1240-00-871-2884	FILTER (RED) (19200) 8574728	EA	1
11	1240-00-871-2883	FILTER (AMBER) (19200) 8574729	EA	1
12	1240-00-871-2882	FILTER (NEUTRAL) (19200) 8574730	EA	1
13	5305-00-207-8253	SCREW (96906) MS35307-8	EA	2
14		Deleted		
14.1	4240-00-964-9061	FILTER UNIT, GAS PARTICULATE (mounted in driver's station) (81361) DL5-19-3051	EA	1
15	1240-00-979-3595	HANGER ASSY., TELESCOPE (mounted on turret roof) (19200) 10516077	EA	1



Change 6 B-5

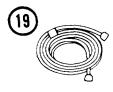
#### TM 9-2350-222-10-3

#### INTEGRAL COMPONENTS OF END ITEM - Continued

(1) Ilius Number	(2) National Stock Number	(3) Description FSCM & Part Number	(4) U/M	(5) Oty Rgr
16		Deleted		
17	2540-00-706-8219	HOOK, TOW CABLE (in right front fender box) (19207) 7068219	EA	4
18	1290-00-790-1926	Deleted		
18	1290-00-370-3467	INDICATOR, AZIMUTH, M28E2 (mounted in gunner's station) (19207) 10933520-1 (LATE MODEL)	EA	1
19	5820-00-494-6630	INSTALLATION HARNESS (AN/VRC-46, AN/VRC-53 OR AN/VRC-64) (80063) PPL4401	EA	1





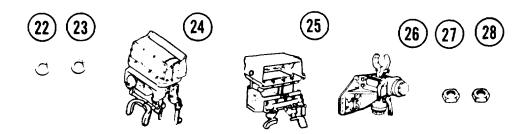


(1) Illus Number	(2) National Stock Number	(3) Description FSCM & Part Number	(4) U/M	(5) Oty Rar
			1	
·				
-				
<del></del>				
·				
20	1290-00-658-4307	LIGHT, INSTRUMENT M30 (mounted in gunner's or commander's station) (19200) 6584307 (LATE MODEL)	EA	1
20.1	1290-00-535-7630	LIGHT, INSTRUMENT M50 (mounted on hand firing mechanism bracket) (19200) 7651744	EA	1
21	1240-00-980-9293	LINK ASSY., M36 OR M36E1 PERISCOPE (mounted in cupola) (19200) 10516123	EA	1



Change 5 B-6.1/B-6.2(blank)

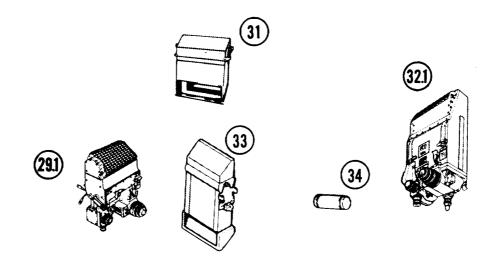
(1) Illus Number	(2) National Stock Number	(3) Description FSCM & Part Number	(4) U/M	(5) Oty Rar
22	5310-00-584-7888	LOCKWASHER (searchlight mounting, on gun shield) (98908) MS35338-51	EA	3
23	5310-00-011-8124	LOCKWASHER (BRACKET TO CLEVIS) (searchlight mounting, on gun shield) (96906) MS35338-70	EA	1
24		Deleted		
24	1240-00-348-8446	MOUNT, PERISCOPE, M118E1 (mounted in turret roof opening) (19200) 11727490 (LATE MODEL)	EA	1
25	1240-00-394-3149	MOUNT, PERISCOPE, M119E1 (mounted in cupola) (19200) 11727489	EA	1
26	1240-00-676-2176	MOUNT, TELESCOPE, M114 (mounted in gunner's station) (19200) 11727489	EA	1
27	5310-00-763-8901	NUT (searchlight mounting, on gun shield) (96906) MS51968-23	EA	3
28	5310-00-763-8894	NUT (BRACKET TO CLEVIS) (searchlight mounting, on gun shield) (96906) MS51968-24	EA	1
29		Deleted		



Change 6 B-7

TM 9-2350-22-10-3
INTEGRAL COMPONENTS OF END ITEM - Continued

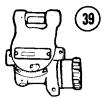
(1) Illus Number	(2) National Stock Number	(3) Description FSCM & Part Number	(4) U/M	(5) Oty Rar
29.1	1240-00-348-8441	PERISCOPE, COMMANDER'S, M38E1 (in periscope mount M119) (19200) 11727480 (LATE MODEL)	EA	1
30		Deleted		
31	1240-00-344-4643	PERISCOPE, DRIVER'S, M27 (3 mounted forward of driver's hatch, 1 stowed in box on right hull wall) (19200) 7633132	EA	4
32		Deleted		
32.1	1240-01-092-7910	PERISCOPE, GUNNER'S, M32CE1 (in periscope mount M118E1) (19200) 11747440 (LATE MODEL)	EA	1
33	6650-00-856-9455	PERISCOPE, LOADER'S, M37 (mounted in loader's hatch or stowed in box on left turret wall) (19200) 8635100	EA	1
34	5315-00-706-9195	PIN, GROOVED HEADLESS (for tow hook mounting, stowed in right front fender box) (19207) 7069195	EA	4



B-8 Change 6

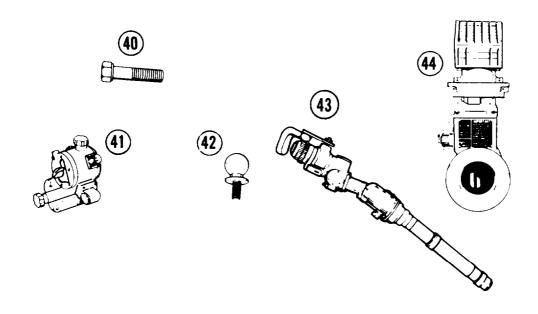
(1) Illus Number	(2) National Stock Number	(3) Description FSCM & Part Number	(4) U/M	(5) Qty Rgr
35	5315-00-350-4326	PIN, LOCK (for tow hook mounting, stowed in right front fender box) (19207) 5213744	EA	8
36		Deleted		
37		Deleted		
38		Deleted		
39	1290-00-856-9451	QUADRANT, FIRE CONTROL, M13A3 (mounted on main gun mount) (19200) 7695046	EA	1





TM 9-2350-222-10-3

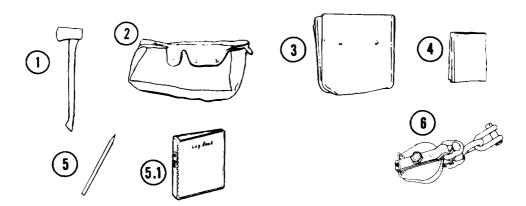
(1) Illus Number	(2) National Stock Number	(3) Description FSCM & Part Number	(4) U/M	(5) Oty Rgr
40	5305-00-082-6977	SCREW (BRACKET TO CLEVIS) (searchlight mounting, on gun shield) (96906) MS90727-192	EA	1
41	1240-00-056-4584	SIGHT, INFINITY (mounted in gunner's station) (19200) 8835466	EA	1
42	5307-00-845-5729	STUD, SEARCHLIGHT, MOUNTING BALL (mounted on gun shield) (19207) 8762826	EA	3
43	1240-00-764-1668	TELESCOPE, M105F (in telescope mount M114) (19200) 8574700-2	EA	1
44	5855-01-096-0871	VIEWER ASSY., DRIVER'S AN/VVS-2 (Mounted in driver's hatch or stowed in box under main gun mount) (80063) SMD771480-1 (LATE MODEL)	EA	1



B-10 Change 6

#### Section III. BASIC ISSUE ITEMS

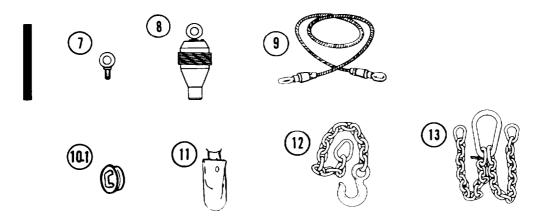
(1) Illus Number	(2) National Stock Number	(3) Description FSCM & Part Number	(4) U/M	(5) Qty Rar
1	5110-00-293-2336	AX, SINGLE BIT, 4 LB HEAD, 34 IN. LG. HANDLE (in left front fender box) (19207) 6150925	EA	1
2	1015-00-799-7410	BAG ASSY., EMPTY CARTRIDGE 7.62-MM (attached to gun mount support) (19207) 7997410	EA	1
3	2540-00-670-2459	BAG ASSY., PAMPHLET (hung on screen by radio rack) (19207) 11676920	EA	1
4	5140-00-473-6256	BAG, TOOL, SATCHEL (in right front fender box) (19207) 11655979	EA	1
5	5120-00-526-6044	BAR, PINCH, 1/2 IN. WIDE BLADE X 16 IN. LG. (on right turret wall beside commander) (19204) 5266044	EA	1
5.1	7510-00-889-3494	BINDER, EQUIPMENT LOG BOOK (in pamphlet bag) (19207) 1167003	EA	2
5.2		Deleted		
6	3940-00-630-9932	BLOCK, SNATCH, 3/4 IN. WIRE ROPE (on left, outside of turret) (19207) 8337021	EA	1



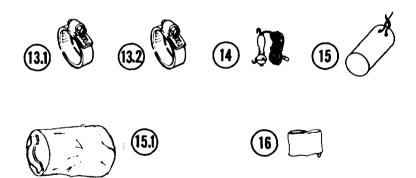
Change 6 B-11

# TM 9-2350-222-10-3

(1) Illus Number	(2) National Stock Number	(3) Description FSCM & Part Number	(4) U/M	(5) Oty Rgr
7	5306-00-017-6143	BOLT, EYE (in roll, gun tools and equipment) (96906) MS51937-7	EA	1
8	1025-01-331-8858	BRUSH ASSY., BORE - 165MM GUN (in right front fender box) (65983) 165-110	EA	1
9	4010-00-202-2425	CABLE, TOWING (stowed on outside turret wall) (19207) 7360553	EA	2
10		Deleted		
10.1	1015-01-014-4703	CAP, TELESCOPE (on M105D telescope) (19207) 11655683	EA	1
11	5140-00-261-4994	CARRIER, WIRE CUTTER (in tool bag) (19207) 11655787	EA	1
12	4010-00-133-8137	CHAIN ASSY., SINGLE LEG WITH HOOK AND RING (on front glacis of hull) (19207) 12253104-8	EA	2
13	4010-00-133-6517	CHAIN ASSY., V-TYPE, LIFTING (on front glacis of hull) (19207) 10929894	EA	1

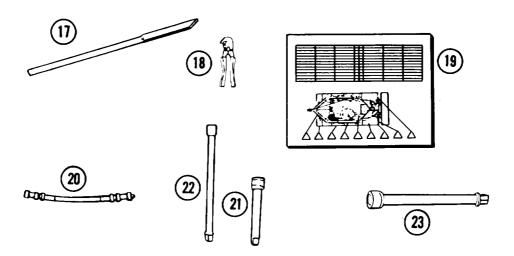


(1) Illus Number	(2) National Stock Number	(3) Description FSCM & Part Number	(4) U/M	(5) Qty Rqr
13.1	4730-00-908-6293	CLAMP HOSE (on M240 machine gun cover) (96906) MS35842-15	EA	1
13.2	4730-00-908-6294	CLAMP HOSE (on telescope cap) (96906) MS35842-16	EA	1
14	6230-00-378-2053	CORD, LIGHT, ELECTRICAL (in right front fender box) (19207) 17C35079-33	EA	1
15	1025-00-557-6513	COVER, BORE BRUSH (on bore brush) (19206) 5576513	EA	1
15.1	1015-01-014-4704	COVER, FITTED, M240 MACHINE GUN (on M240 machine gun) (19207) 11655682	EA	1
16	1005-00-779-6026	COVER ASSY., M85 MACHINE GUN (on M85 machine gun) (19207) 10870713	EA	1



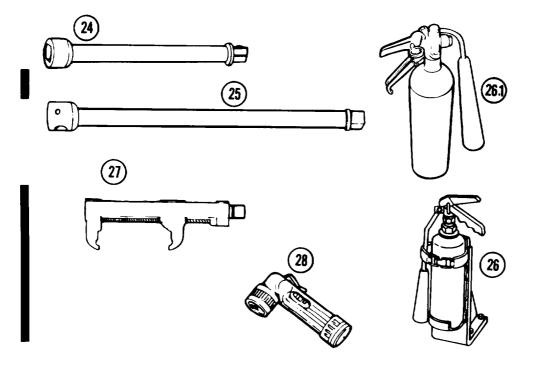
Change 3 B-12.1/B-12.2(blank)

(1) Illus Number	(2) National Stock Number	(3) Description FSCM & Part Number	(4) U/M	(5) Qty Rqr
17	5120-00-224-1390	CROWBAR, PINCH POINT, 60 IN. LG. x 1-1/4 IN. POINT (in left front fender box) (19207) 11677049-1	EA	1
18	5110-00-595-8229	CUTTER, BARBED WIRE, INSULATED HANDLES (in carrier, in tool bag) (19207) 11655981	EA	1
19	7610-00-918-0577	DIAGRAM, STRAP LOCATION (in pamphlet bag) (19207) 10940574	EA	1
20	4930-00-288-1511	EXTENSION, GREASE GUN (in tool bag) (19207) 6300333	EA	1
21	5120-00-243-7326	EXTENSION, SOCKET WRENCH 1/2 IN. DR. x 5 IN. LG. (in tool bag) (95683) 418306	EA	1
22	5120-00-227-8074	EXTENSION, SOCKET WRENCH 1/2 IN. DR. x 10 IN. LG. (in tool bag) (19207) 11655788-1	EA	1
23	5120-00-273-9208	EXTENSION, SOCKET WRENCH 3/4 IN. DR. x 4-5/8 IN. LG. (in tool bag) (55719) L32	EA	1



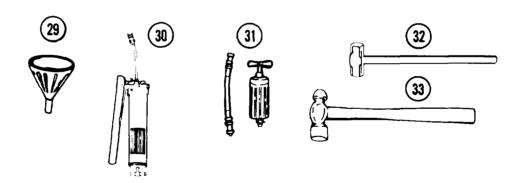
Change 6 B-13

(1) Illus Number	(2) National Stock Number	(3) Description FSCM & Part Number	(4) U/M	(5) Oty Rar
24	5120-00-243-7328	EXTENSION, SOCKET WRENCH 3/4 IN. DR. x 8 IN. LG. (in tool bag) (19204) 41B309-20	EA	1
25	5120-00-227-8079	EXTENSION, SOCKET WRENCH 3/4 IN. DR. x 16 IN. LG. (in tool bag) (55719) L122	EA	1
26	4210-00-555-8837	EXTINGUISHER, FIRE, HALON PORTABLE, 2-3/4 LB., CT, BR W/BRACKET (on coax machinegun ammunition box) (19207) 10916537	EA	1
26.1	4210-00-708-0031	EXTINGUISHER, FIRE, HALON PORTABLE, W/O BRACKET MIL E 52031	EA	1
27	5120-01-016-2149	FIXTURE, TRACK CONNECTING, POWER (in right front fender box) (19207) 12252120	EA	2
28	6230-00 264-8261	FLASHLIGHT (1-in. bracket at left of oddment tray, 1-in. bracket on hull roof by driver, 1-in. bracket on 7.62mm ready ammo box) (21108) MX991/U	EA	3



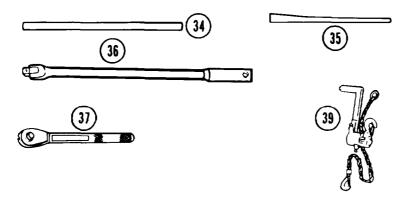
B-14 Change 6

(1) Illus Number	(2) National Stock Number	(3) Description FSCM & Part Number	(4) U/M	(5) Oty Rqr
29	7240-00-527-9868	FUNNEL, METAL, WITH STRAINER 1 QT. CAPACITY (in right rear fender box) (81348) RRF800T1CBS2	EA	1
30	4930-01-133-7143	GREASE GUN, HAND LEVER OPERATED 21 OZ. CAPACITY (in tool bag) (36251) 1035	EA	1
31	4930-00-695-0370	GUN ASSY., LUBE OIL, 8 OZ. CAPACITY (in roll, gun tools and equipment) (19207) 8689550	EA	1
32	5120-00-900-6097	HAMMER, ENGINEER, FIBERGLASS HANDLE, 10 LB. (in left front fender box) (81348) GGGH86T10C1SB OR	EA	1
32	5120-00-243-2957	HAMMER, ENGINEER, HICKORY HANDLE 10 LB. (in left front fender box) (79416) 75 H	EA	1
33	5120-00-061-8546	HAMMER, MACHINIST, FIBERGLASS HANDLE 2 LB. (in tool bag) (19207) 11677028-3	EA	1



# TM 9-2350-222-10-3 BASIC ISSUE ITEMS - Continued

(1) Illus Number	(2) National Stock Number	(3) Description FSCM & Part Number	(4) U/M	(5) Oty Rar
34	5120-00-473-6320	HANDLE, EXTENSION, WRENCH - 1 1/8 IN. I.D. x 36 IN. LG. (in right front fender box) (80064) 1756412	EA	1
35	5120-00-228-6574	HANDLE, MATTOCK-PICK-36 IN. LG. (in left front fender box) (19207) 11677021	EA	1
36	5120-00-236-7590	HANDLE, SOCKET, WRENCH, HINGED - 1/2 IN. DR. x 14 IN. LG. (in tool bag) (19207) 11655786-1	EA	1
36	5120-00-221-7959	HANDLE, SOCKET WRENCH, HINGED - 3/4 IN. DR. x 23 IN. LG. (in tool bag) (45225) H377	EA	1
37	5120-00-230-6385	HANDLE, SOCKET WRENCH, RATCHET - 1/2 IN. DR. x 9 IN. LG. (in tool bag) (99993) H41H1505-9	EA	1
37	5120-00-249-1076	HANDLE, SOCKET WRENCH, RATCHET - 3/4 IN. DR. x 17 IN. LG. (in tool bag) (55719) L72SH	EA	1
38		Deleted		
39	3950-00-092-9064	HOIST, CHAIN - 1/2 TON, 4 FT. LIFT - LEVER OPERATED (in right front fender box) (18740) MP10	EA	1



B-16 Change 6

(1) Illus Number	(2) National Stock Number	(3) Description FSCM & Part Number	(4) U/M	(5) Qty Rgr
40	5120-00-240-5292	KEY, SOCKET HEAD SCREW, L-TYPE, SHORT - 1/8 IN. (in tool bag) (55719) AW4	EA	1
40	5120-00-889-2163	KEY, SOCKET HEAD SCREW, L-TYPE SHORT - 9/64 IN. (in tool bag) (55719) 4-1-2	EA	1
40	5120-00-198-5392	KEY, SOCKET HEAD SCREW, L-TYPE SHORT - 5/32 IN. (in tool bag) (80064) 1940717	EA	1
40	5120-00-240-5300	KEY, SOCKET HEAD SCREW, L-TYPE, SHORT - 3/16 IN. (in tool bag) (56232) 191315	EA	1
40	5120-00-242-7411	KEY, SOCKET HEAD SCREW, L-TYPE SHORT - 7/32 IN. (in tool bag) (80064) 1940719	EA	1
40	5120-00-224-4659	KEY, SOCKET HEAD SCREW, L-TYPE, SHORT - 1/4 IN. (in tool bag) (80064) 1940720	EA	1
40	5120-00-240-5274	KEY, SOCKET HEAD SCREW, L-TYPE, SHORT - 5/16 IN. (in tool bag) (80064) 1940721	EA	1
40	5120-00-198-5390	KEY, SOCKET HEAD SCREW, L-TYPE SHORT - 3/8 IN. (in tool bag) (80064) 1940722	EA	1
40	5120-00-244-2510	KEY, SOCKET HEAD SCREW, L-TYPE SHORT - 5/8 IN. (in tool bag) (80064) 1940710	EA	1
41	6545-00-922-1200	KIT, FIRST AID (1 in rack behind commander, 1 in right rear fender box) (89875) 11677011	EA	2
41.1	5310-00-159-6209	LOCKWASHER (for M85 deflection plate mounting) (96906) MS122032	EA	2

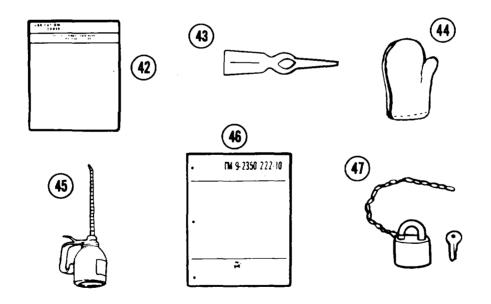






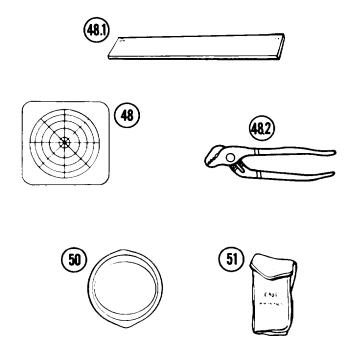
Change 3 B-17

(1) Illus Number	(2) National Stock Number	(3) Description FSCM & Part Number	(4) U/M	(5) Qty Rgr
42		LUBRICATION ORDER LO 9-2350-222-12 (in pamphlet bag)	EA	1
43	5120-00-243-2395	MATTOCK PICK-5 LB. HEAD, W/O HANDLE (in left front fender box) (19207) 11877022	EA	1
44	8415-01-092-0039	MITTENS, HEAT PROTECTIVE (in rack on 7.62 mm ready ammo box) (81349) MIL-M-11199	EA	2
45	4930-00-262-8868	OILER, HAND PUMP, FLEXIBLE SPOUT (in bracket on left turret wall) (72798) 328	EA	1
46		OPERATOR MANUAL TM 9-2350-222-10 (3 VOLUMES) (in pamphlet bag)	EA	1
47	5340-00-158-3805	PADLOCK, INDIVIDUAL (1 on loader's hatch, 4 on fender boxes) (81349) MILP17802TAC1	EA	5
47	5340-00-158-3807	- OR - PADLOCK, INDIVIDUAL W/CLEVIS (1 on loader's hatch, 4 on fender boxes) (81349) MILP17802TAC1	EA	5



B-18 Change 6

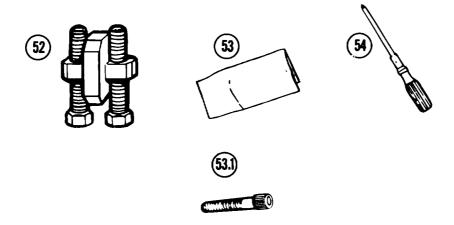
(1) Illus Number	(2) National Stock Number	(3) Description FSCM & Part Number	(4) U/M	(5) Qty Rgr
48	9905-00-624-3415	PLATE, INSTRUCTION (RANGE CARD) (in pamphlet bag) (19200) 8724207		1
48.1	1005-00-863-7797	PLATE, DEFLECTION, M85 MACHINE GUN (on M85 machine gun) (19207) 10905244	EA	1
48.2	5120-00-278-0350	PLIERS, SLIP JOINT, ANGLE NOSE, MULTI-TONGUE AND GROOVE, 5 IN. LG. (in tool bag) (80244) GGGP471T2C1SA	EA	1
48.2	5120-00-278-0352	PLIERS, SLIP JOINT, ANGLE NOSE MULTI-TONGUE AND GROOVE, 10 IN.LG. (in tool bag) (71612) 420	EA	1
49		Deleted		
50	1025-00-299-0785	PLUG, MUZZLE - 165MM GUN (on main gun barrel muzzle) (19206) 8769215	EA	1
51	8465-00-705-2438	POCKET, AMMUNITION MAGAZINE (FOR M3A1 SUBMACHINE GUN) (1-right front of driver, 1-in bustle oddment tray) (81349) MILP43312	EA	2



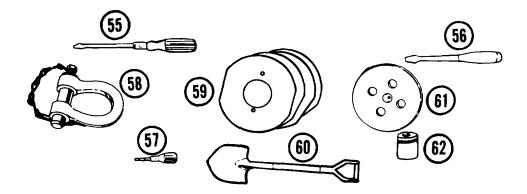
Change 6 B-19

TM 9-2350-222-10-3

(1) Illus Number	(2) National Stock Number	(3) Description FSCM & Part Number	(4) U/M	(5) Oty Rgr
52	5120-01-040-9318	PULLER, MECHANICAL, TRACK END CONNECTOR (in right rear fender box) (19207) 12252143	EA	1
53	4933-00-796-4537	ROLL ASSY., GUN TOOLS AND EQUIPMENT (stowed in oddment tray) (19207) 7964537	EA	1
53.1	5305-00-983-6664	SCREW, CAP, 3/16 IN. SOCKET HEAD (for M85 deflection plate mounting) (96906) MS16998-47	EA	2
54	5120-00-234-8913	SCREWDRIVER, CROSS TIP, PHILLIPS NO. 2, 4 IN. BLADE (in tool bag) (55719) RGP42	EA	1
54	5120-00-224-7375	SCREWDRIVER, CROSS TIP, PHILLIPS NO. 4, 8 IN. BLADE (in tool bag) (55719) RGP84	EA	1



(1) Illus Number	(2) National Stock Number	(3) Description FSCM & Part Number	(4) U/M	(5) Oty Rar
55	5120-00-234-6664	SCREWDRIVER, FLAT TIP, GENERAL PURPOSE 6 IN. BLADE (in tool bag) (72368) 2143-6	EA	1
56	5120-00-227-7338	SCREWDRIVER, FLAT TIP, EXTRA HEAVY DUTY 5 IN. BLADE (in tool bag) (77948) D339	EA	1
57	5120-00-598-8502	SCREWDRIVER, FLAT TIP, CLOSE QUARTER, 1-1/2 IN. BLADE (in tool bag) (55719) SSD1	EA	1
58	2540-00-318-0326	SHACKLE, ANCHOR, 1/8 IN. D (in right front fender box) (19207) 7357967	EA	2
59	1025-00-127-2976	SHIM SET, OBTURATOR (in right front fender box) (19206) 11578242	SET	1
59.1		Deleted		
60	5120-00-293-3336	SHOVEL, ROUND POINT, D-HANDLE SHORT (in left front fender box) (19207) 11855784	EA	1
61	4933-00-299-0787	SIGHT, BREECH BORE (in oddment tray) (19206) 8769218	EA	1
62	5120-00-237-0982	SOCKET, SOCKET WRENCH, 12 PT. 1/2 IN. DR. x 3/8 IN. (in tool bag) (55719) SW120	EA	1



Change 6 B-21

TM 9-2350-222-10-3
BASIC ISSUE ITEMS - Continued

(1) Illus Number	(2) National Stock Number	(3) Description FSCM & Part Number	(4) U/M	(5) Oty Rar
63	5120-00-189-7924	SOCKET, SOCKET WRENCH, 12 PT. 1/2 IN. DR. x 7/16 IN. (in tool bag) (65814) ST1214	EA	1
63	5120-00-237-0984	SOCKET, SOCKET WRENCH, 12 PT. 1/2 IN. DR. x 1/2 IN. (in tool bag) (55719) SW161	EA	1
63	5120-00-189-7932	SOCKET, SOCKET WRENCH, 12 PT. 1/2 IN. DR. x 9/16 IN. (in tool bag) (19207) 11677025-1	EA	1
63	5120-00-189-7946	SOCKET, SOCKET WRENCH, 12 PT. 1/2 IN. DR. x 5/8 IN. (in tool bag) (19207) 11677025-2	EA	1
63	5120-00-235-5870	SOCKET, SOCKET WRENCH, 12 PT. 1/2 IN. DR. x 11/16 IN. (in tool bag) (19207) 11677025-3	EA	1
63	5120-00-189-7985	SOCKET, SOCKET WRENCH, 12 PT. 1/2 IN. DR. x 3/4 IN. (in tool bag) (19207) 11677025-4	EA	1
63	5120-00-189-7933	SOCKET, SOCKET WRENCH, 12 PT. 1/2 IN. DR. x 13/16 IN. (in tool bag) (65814) ST1226	EA	1
63	5120-00-189-7934	SOCKET, SOCKET WRENCH, 12 PT. 1/2 IN. DR. x 7/8 IN. (in tool bag) (19207) 11677025-5	EA	1

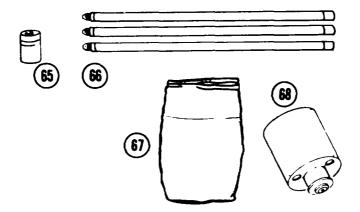


(1) Illus Number	(2) National Stock Number	(3) Description FSCM & Part Number	(4) U/M	(5) Oty Rar
64		Deleted		
64	5120-00-239-0021	SOCKET, SOCKET WRENCH, 12 PT. 3/4-IN. DR. x 1-1/8 IN. (in tool bag) (47805) 5536	EA	1
64	5120-00-235-5871	SOCKET, SOCKET WRENCH, 12 PT. 3/4-IN. DR. x 1-1/4 IN. (in tool bag) (47805) 5540	EA	1
64		Deleted		
64	5120-00-293-0094	SOCKET, SOCKET WRENCH, 12 PT. 3/4-IN. DR. x 1-1/2 IN. (in tool bag) (47805) 5548	EA	1



Change 6 B-22.1/(B-22.2 blank)

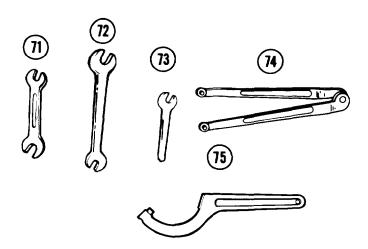
(1) Illus Number	(2) National Stock Number	(3) Description FSCM & Part Number	(4) U/M	(5) Qty Rgr
65	5120-01-135-0994	SOCKET, IMPACT WRENCH 3/4 IN. DR. x 15/16 IN. (in tool bag) (65719) 11669752		
65	5130-00-227-6681	Deleted	EA	1
65	5130-01-084-6025	SOCKET, IMPACT WRENCH, POWER DR. 3/4 IN. DR. x 1-5/16 IN. (in tool bag) (19207) 10894847-1	EA	1
66	1025-00-563-7232	STAFF SECTION, CLEANING (in left front fender box) (19206) 7309228	EA	3
67	8340-00-841-6456	TARPAULIN, COTTON DUCK, WITH GROMMETS, 12 x 17 FT. (strapped to bustle cargo rack) (81348) KP146T2C1	EA	1
68	1025-00-907-6957	TESTER, FIRING CIRCUIT (in oddment tray) (19206) 11576610	EA	1
69		Deleted		
70		Deleted		!



Change 6 B-23

TM 9-2350-222-10-3
BASIC ISSUE ITEMS - Continued

(1) Illus Number	(2) National Stock Number	(3) Description FSCM & Part Number	(4) U/M	(5) Qty Rgr
71	5120-00-277-2307	WRENCH, DOUBLE HEAD, OPEN END, 5/16 IN. x 3/8 IN. (in tool bag) (55719) \$1012		1
71	5120-00-187-7123	WRENCH, DOUBLE HEAD, OPEN END, 7/16 IN. x 1/2 IN. (in tool bag) (55719) \$1416	EA	1
72	5120-00-293-2134	WRENCH, DOUBLE HEAD, OPEN END, 9/16 IN. x 11/16 IN. (in tool bag) (19207) 5323330	EA	1
72	5120-00-224-3102	WRENCH, DOUBLE HEAD, OPEN END, 5/8 IN. x 3/4 IN. (in tool bag) (65814) 729	EA	1
73	5120-00-563-7342	WRENCH, SINGLE HEAD, OPEN END, 3-3/16 IN. x 26 IN. LG. (in right rear fender box) (19207) 8708683	EA	1
74	5120-00-264-3777	WRENCH, SPANNER, ADJUSTABLE 4 IN. CAPACITY x 10-3/8 IN. (in roll, gun tools and equipment) (96906) MS16146-3	EA	1
75	5120-01-100-0391	WRENCH, SPANNER, TRACK ADJUSTING LINK (in left front fender box) (19207) 12301553	EA	1



B-24 Change 6

# APPENDIX C ADDITIONAL AUTHORIZATION LIST

## Section I. INTRODUCTION

#### **SCOPE**

This appendix lists additional items you are authorized for the support of the M728 Combat Engineer Vehicle  $\,$  (CEV).

#### **GENERAL**

This list identifies items that do not have to accompany the M728 (CEV) and that do not have to be turned in with it. These items are all authorized to you by CTA, MTOE, TDA, or JTA.

#### **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)	(2)	(3)	(4)
NATIONAL STOCK NUMBER	DESCRIPTION FSCM & PART NUMBER		QTY AUTH
	MTOE AUTHORIZED ITEMS		
5820-00-494-6649	Accessory kit, MK-1274/V (80063) PPL4402	EA	1
1240-01-207-5787	Binocular, M22 (19200) 9394727		1
1240-01-252-8075	Cup, eye (19200) 9360507		2
1240-01-252-8073	Cover, eye lens (19200) 9360505		1
1240-01-252-8072	Strap, carrying (19200) 9360504		1
1240-01-252-8074	Cover, objective (19200) 9360506	EA	2

# ADDITIONAL AUTHORIZATION LIST - Continued

(1)	(2)	(3)	(4)
NATIONAL STOCK NUMBER	DESCRIPTION FSCM & PART NUMBER	U/M	QTY AUTH
6650-00-863-5657	Binocular, I. R. M18 w/equip. (19200) 8270115	EA	1
	CONSISTING OF		
6650-00-877-0091	Binocular, M18 (19200) 10514360	EA	1
1240-00-077-1688	Power supply (19200) 10516158	EA	1
6650-00-850-3312	Carrying case (19200) 10514520	EA	1
7240-00-089-3827	Can, water, military, plastic, 5 gal. (81349) MILC43613		2
	OR OPTIONAL		
7240-00-242-6153	Can, water, military, steel, 5 gal. (81349) MILC13984T1	EA	2
8345-00-375-0223	Flag set, M238		1
	CONSISTING OF		
8345-00-178-8437	Case, carrying 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
8345-00-227-1406	Flag, MC-275 (Green) Component E	EA	1
8345-00-242-3650	Staff, flag, MC-270 Component B	EA	3

# ADDITIONAL AUTHORIZATION LIST - Continued

(1)	(2)	(3)	(4)
NATIONAL STOCK NUMBER	DESCRIPTION FSCM & PART NUMBER	U/M	QTY AUTH
5855-00-114-4953	Installation kit, searchlight (80063) SCD647180	EA	1
1040-01-015-0874	Launcher, smoke grenade, M239 (mounted on turret) (81361) B13-12-32		1
	CONSISTING OF		
1040-01-041-9830	Bin, smoke grenades (K6897) FV576789	EA	2
1040-01-042-3861	Cover, discharger, left (K6897) FV578937		1
1040-01-043-7896	Cover, discharger, right (K6897) FV578934	EA	1
1040-01-041-9829	Discharger, left (K6897) FV855991	EA	1
1040-01-041-9828	Discharger, right (K6897) FV855990	EA	1
5975-01-047-8359	Pushbutton, firing (K6897) FV861135	EA	1
1005-00-690-2790	Machine gun, cal. 50,, M85 (19204) 12002938	EA	1
1005-01-025-8095	Machine gun, 7.62-MM, M240 (19200) 11826290	EA	1
8345-00-174-6865	Panel, marker, aerial liason, VS-17/GVX (81349) MILP40061	EA	2

## TM 9-2350-222-10-3

# ADDITIONAL AUTHORIZATION LIST - Continued

(1)	(2)	(3)	(4)
NATIONAL STOCK NUMBER	DESCRIPTION FSCM & PART NUMBER	U/M	QTY AUTH
1290-00-891-9999	Quadrant, gunners, M1A2 w/case (19200) 7197156	EA	1
	CONSISTING OF		
4931-00-910-3678	Quadrant, M1A1 (19200) 8228867	EA	1
1290-00-769-2958	Case, carrying, M82 (19200) 7692958	EA	1
5820-00-223-7433	Radio set, AN/VRC-46 (80063) PPL4319	EA	1
	OR OPTIONAL	r.	
5820-00-223-7467	Radio set, AN/VRC-53 (80063) PPL4323	EA	1
	OR OPTIONAL		
5820-00-223-7475	Radio set, AN/VRC-64 (80063) PPL4324	EA	1
7240-00-177-6154	Spout, flexible, 5 gal. can (09647) 838A7511	EA	2
7310-00-285-6155	Stove, cooking, gasoline, w/case (81349) MILS10736-1	EA	1
1005-00-672-1771	Submachine gun, cal. 45 M3A1 (19205) 6721771	EA	2
4930-00-735-7745	Dispensing pump, hand, rotary (10 GPM) (60145) 414902-1	EA	1
4730-00-690-1162	Adapter, straight, pipe (19207) 10870333	EA	1

#### APPENDIX D

#### **EXPENDABLE SUPPLIES AND MATERIALS LIST**

#### **Section 1. INTRODUCTION**

#### Scope

This appendix lists expendable supplies and materials you will need to operate and maintain the M728 (Combat Engineer Vehicle). These items are authorized to you by CTA 50-970, Expendable Items (Except Medical, Class V, Repair Parts, and Heraldic Items).

#### **Explanation of Columns**

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, Appendix D").

Column 2- Level. This column identifies the lowest level of maintenance that requires the listed item.

#### C - Operator/Crew

Column 3- National Stock Number. This is the National stock number assigned to the item; use it to request or requisition the item.

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.

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.

TM 9-2350-222-10-3
Section II. EXPENDABLE SUPPLIES AND MATERIALS LIST

(1) Item Number	(2)	(3) National Stock Number	(4) Description FSCM & Part Number	(5) U/M
1	C	8040-00-282-9025	ADHESIVE, GENERAL PURPOSE, NATURAL RUBBER (81348) MMMA1617T1	OZ
2	С	8040-00-262-9028	ADHESIVE, GENERAL PURPOSE, NATURAL Rubber (81348) MMMA1817T1	PT
3	С	8040-00-664-4318	ADHESIVE, GENERAL PURPOSE, SYNTHETIC RUBBER (81348) MMM11817T2	PT
4	С	8135-00-120-1020	BATTERY, BA30 (81349) MILB18/9	EA
5	С	6135-00-120-1010	BATTERY, BA42 (81349) MILB18/20	EA
5.1	С	6135-00-485-7402	BATTERY, BA1567/U (81349) MILB18	EA
8	С	8020-00-244-0153	BRUSH, ARTIST, METAL FERRULE FLAT POINT 7/16 IN. WIDE (81348) HB241	
7	c	8020-00-224-8024	BRUSH, ARTIST, METAL FERRULE ROUND TAPERED (81348) HB118T1C1SA	
8	С	1015-00-815-7208	BRUSH, SECTION, CLEANING (19207) 8157208	
9	С	6850-00-227-1887	COMPOUND, CLEANING, LENS (81349) MILC43454	EA
10	С	6850-00-224-6656	COMPOUND, CLEANING, RIFLE BORE (81349) MILC372	OZ
11	С	8850-00-224-6657	COMPOUND, CLEANING, RIFLE BORE (81349) MILC372	0Z
12	С	6850-00-597-9765	COMPOUND, CLEANING, SOLVENT (81349) MILC18718	
13	С	5810-00-141-7838	COMPOUND, NONSLIP, O.D. (81349) MILW5044T2	
13.1	С	9150-01-079-6124	CLEANER, LUBRICANT, PRESERVATIVE (CLP), 4 OZ. BOTTLE (81349) MILL63460	
14	С	5350-00-192-5047	CLOTH, ABRASIVE, ALOXIDE-80 GRIT (81348) PC451T1C1	

# **EXPENDABLE SUPPLIES AND MATERIALS LIST - Continued**

(1) Item	(2)	(3) National Stock	(4) Description	(5)
Number	Level	Number	FSCM & Part Number	U/M
15	С	5350-00-192-5049	CLOTH, ABRASIVE, ALOXIDE - 120 GRIT (81348) PC451T1C1	SH
16	С	5350-00-192-5051	CLOTH, ABRASIVE, ALOXIDE - 180 GRIT (81348) PC451T1C1	SH
17	С	5350-00-221-0872	CLOTH, ABRASIVE, CROCUS (CA) (81348) PC458C1	SH
17.1	С	1025-01-311-3770	CLOTH, CLEANING SLEEVE, (27412) 155/203-140	вх
18	С	4730-00-050-4208	FITTING, LUBRICATION (96906) MS15003-1	EA
19	С	4730-00-289-8261	FITTING, LUBRICATION (96906) MS35670-3	EA
20	С	8415-00-926-1674	GLOVES, BARBED, WIRE HANDLERS (81349) MILG43411	PR
21	С	9150-00-273-8633	GREASE, AIRCRAFT (GPS) (81349) MILL4343	OZ
22	С	9150-00-935-1017	GREASE, AUTO ARTILLERY (GAA) (81349) MILG10924	OZ
23	C	9150-00-190-0904	GREASE, AUTO ARTILLERY (GAA) (81349) MILG10924	LB
24	С	9150-00-190-0905	GREASE, AUTO ARTILLERY (GAA) (81349) MILG10924	LB
25	С	9150-00-257-5370	GREASE, GRAPHITE (GG-1) (81348) VVG671	LB
26	С	9150-00-985-7244	GREASE, INSTRUMENT (GAI) (81349) MILG23827	OZ
27	С	9150-00-754-2595	GREASE, MOLYBDENUM DISULFIDE (GMD) (81349) MILG21164	LB
28	С	9150-00-111-6256	HYDRAULIC FLUID (FRH) (81349) MILH46170	ΩТ
29	С	1240-01-016-2271	LAMP, 2.5V. #43 (96906) 11747186	EA
30	С	6240-00-500-1762	LAMP, 2.5V. #329 (81348) WL111	EA

Change 6 D-3

TM 9-2350-222-10-3
EXPENDABLE SUPPLIES AND MATERIALS LIST - Continued

(1)	(2)	(3)	(4)	(5)
ltem Number	Level	National Stock Number	Description FSCM & Part Number	U/M
31	С	6240-00-155-8714	LAMP, 28V. #313 (96906) MS25231-313	EA
32	С	6240-00-155-7836	LAMP, 28V. #327 (96906) MS25237-327	EA
33	С	6240-00-019-3093	LAMP, 28V. #623 (96906) MS15570-623	EA
34	С	6240-00-019-0877	LAMP, 28V. #1251 (96906) MS15570-1251	EA
35	С	6240-00-044-6914	LAMP, 28V. #1683 (96906) MS25232-1683	EA
36	С	6240-00-295-2668	LAMP, 28V. #1691 (96906) MS25232-1691	EA
37	С	6240-00-266-9940	LAMP, 28V. #1829 (96906) MS25231-1829	EA
38	С	6240-00-051-4843	LAMP, 28V. #8623 (96906) MS25326-8623	EA
39	С	9150-00-889-3522	LUBRICANT, SEMI FLUID (LSA) (81349) MILL46000	OZ
40	С	9150-00-402-4478	LUBRICATING OIL ENGINE (OEA) (81349) MILL46167	ΩТ
41	С	9150-00-265-9425	LUBRICATING OIL ENGINE (OE10) (81349) MILL2104G10	ΩТ
42	С	9150-00-186-6681	LUBRICATING OIL ENGINE (OE30) (81349) MILL2104G30	QT
43	С	9150-00-265-9435	LUBRICATING OIL ENGINE (OE30) (81349) MILL2104G30	GL
44	С	9150-00-261-7904	LUBRICATING OIL GEAR SUB (GOS) (81349) MILL 10324	QΤ
45	С	9150-00-905-9100	LUBRICATION OIL GRADE 80 (GO) (81349) MILL2105	QT
46	С	9150-00-664-6518	LUBRICATING OIL, INSTRUMENT (81349) MILL6085	OZ

## **EXPENDABLE SUPPLIES AND MATERIALS LIST - Continued**

(1) Item	(2)	(3) National Stock	(4) Description	(5)
Number	Level	Number	FSCM & Part Number	U/M
47	С	9150-00-273-2389	LUBRICATING OIL, PRESERVATIVE, GENERAL PURPOSE (PL) (81348) WL800	OZ
48	С	9150-00-231-6689	LUBRICATING OIL, PRESERVATIVE, GENERAL PURPOSE (PL) (81348) WL800	ΩΤ
49	С	9150-00-271-8427	LUBRICATING OIL, PRESERVATIVE, MEDIUM (PL) (81349) MILL3150	OZ
50	С	9150-00-231-2361	LUBRICATING OIL PRESERVATIVE, MEDIUM (PL) (81349) MILL3150	ΩТ
51	С	9150-00-292-9698	LUBRICATING OIL, WEAPONS LOW TEMPERATURE (64807) WESCODYNE	ΩΤ
52	С	9150-00-664-0038	LUBRICATING OIL, WEAPONS LOW TEMPERATURE (81349) MILL 14107	OZ
53	С	1025-00-127-2976	OBTURATOR PAD AND SHIM SET, 165-MM GUN (19206) 11578242	EA
54	С	4730-00-703-7928	PLUG, MACHINE THREAD (19207) 7037928	EA
55	С	4730-00-045-9833	PLUG, PIPE MAGNETIC (96906) MS49006-12	EA
56	С	7920-00-205-1711	RAG, WIPING COTTON, WHITE (81348) DDDR30GB	LB
57	С	4020-00-689-5688	ROPE, MANILLA, 3°4 IN. (81348) TR605	FT
58	С	8030-00-965-2438	SEALING COMPOUND, 1-1 2 IN. 1EXTRUDED (81349) MILS 11030	FT
59	С	6850-00-880-7616	SILICONE COMPOUND (81349) MILS8660	oz
60	С	6850-00-664-5685	SOLVENT, DRY CLEANING (SD) (81348) PPD680	ΩТ
61	С	6850-00-281-1985	SOLVENT, DRY CLEANING (SD) (81348) PPD680	GL

TM 9-2350-222-10-3

## **EXPENDABLE SUPPLIES AND MATERIALS LIST - Continued**

(1) Item Number	(2) Level	(3) National Stock Number	(4) Description FSCM & Part Number	(5) U/M
62	С	1005-00-288-3565	SWAB, SMALL ARMS (19204) 5019316	PK
63	С	7510-00-551-1245	TAPE, SEALING, O.D. 4 IN. (81348) PPPT60	YD
64	С	8010-00-242-2089	THINNER, PAINT (TDN) (81348) TTT291T1GA	GL
65	С	5365-00-516-8098	WASHER RECOIL CYLINDER FILLING PLUG (19207) 5168098	EA
66	С	9505-00-604-5815	WIRE, STEEL, CARBON (MS - 20 995-F41)	LB

#### **APPENDIX E**

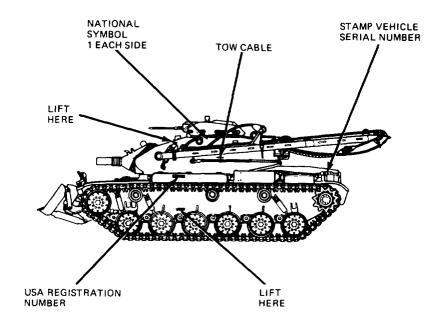
#### STOWAGE AND SIGN GUIDE

#### Scope

This appendix shows locations for stowage of equipment and material carried on M728 CEV (Combat Engineer Vehicle).

#### General

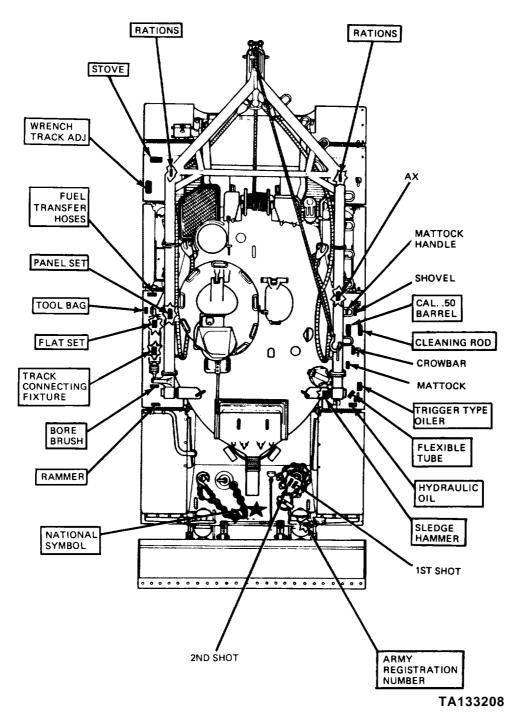
The figures below and on next pages show location of decals, stencils, and metal signs used on the vehicle. Most of these signs mark places where equipment should be stowed. Some are cautions or information you need to operate vehicle safely.



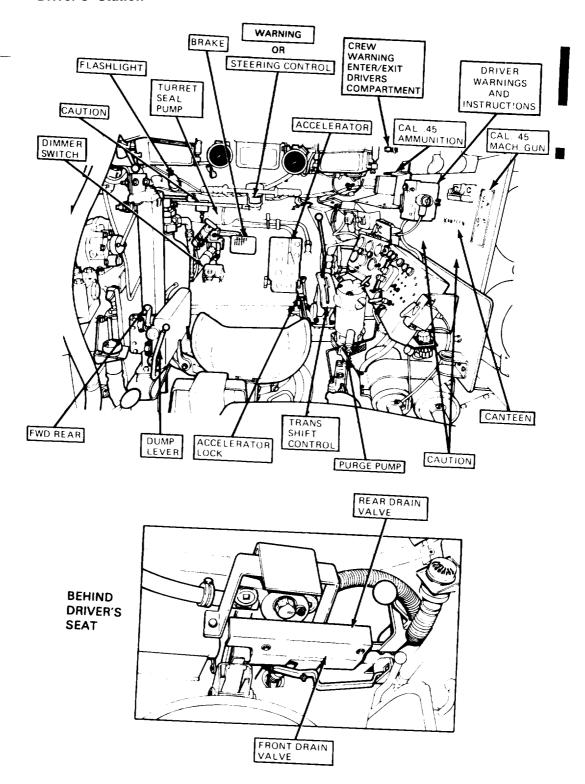
#### **NOTE**

Signs outlined with boxes are decals, applied in locations shown to read from angle shown. Signs not outlined with boxes are stencils.

#### **Vehicle Exterior**

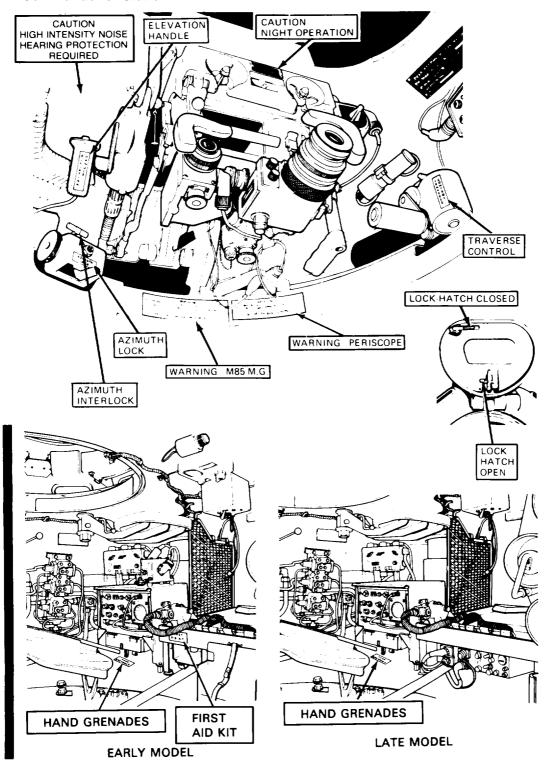


## **Driver's Station**



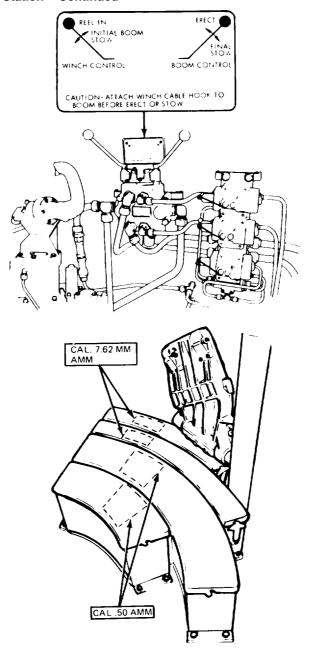
Change 4 E-3

## Commander's Station



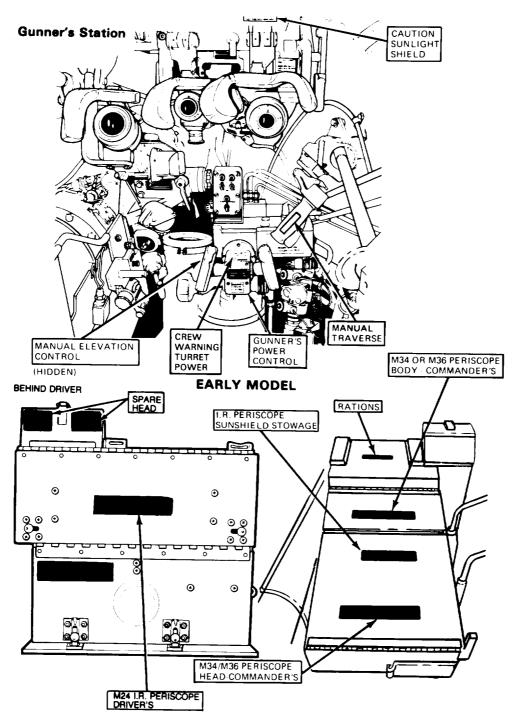
E-4 Change 1

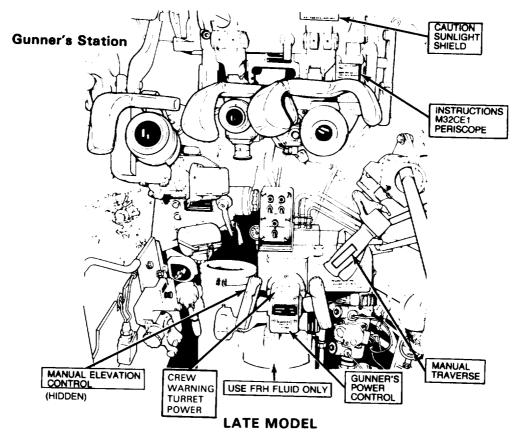
## Commander's Station - Continued

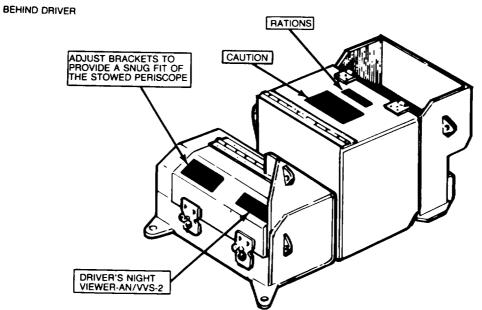


(TURRET PLATFORM FLOOR)

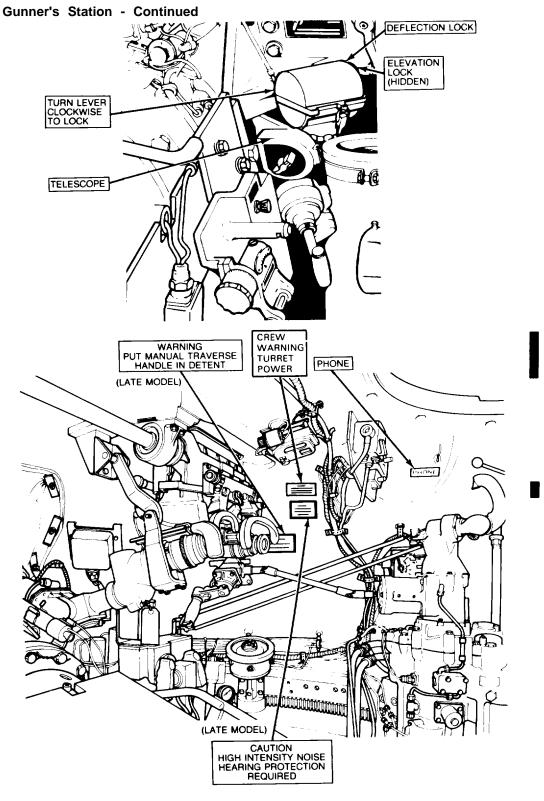
TM 9-2350-222-10-3 STOWAGE AND SIGN GUIDE - Continued



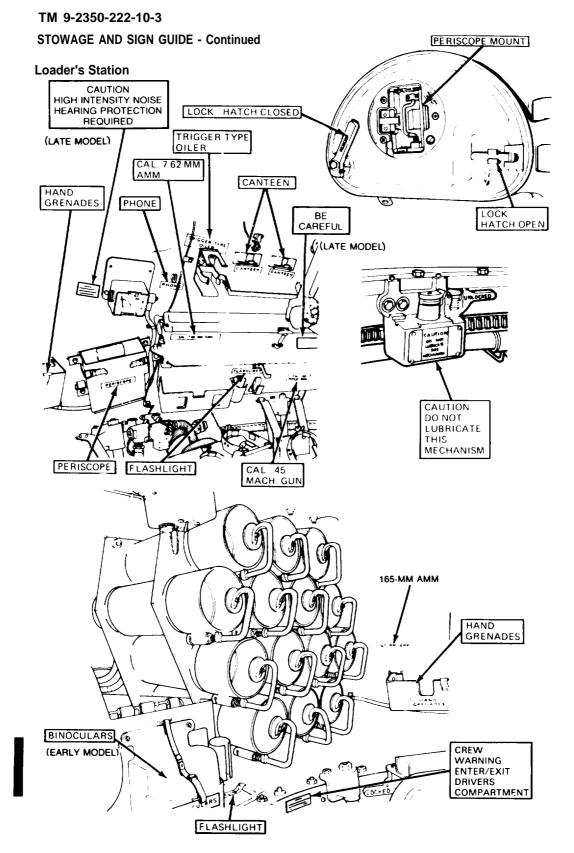




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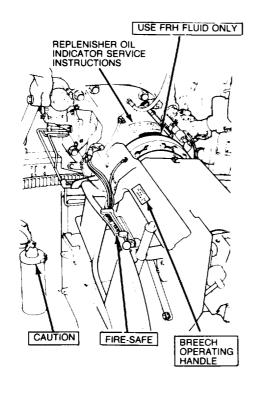


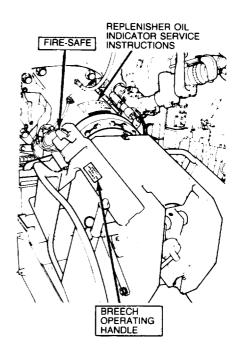
Change 4 E-7



E-8 Change 4

## Loader's Station - Continued



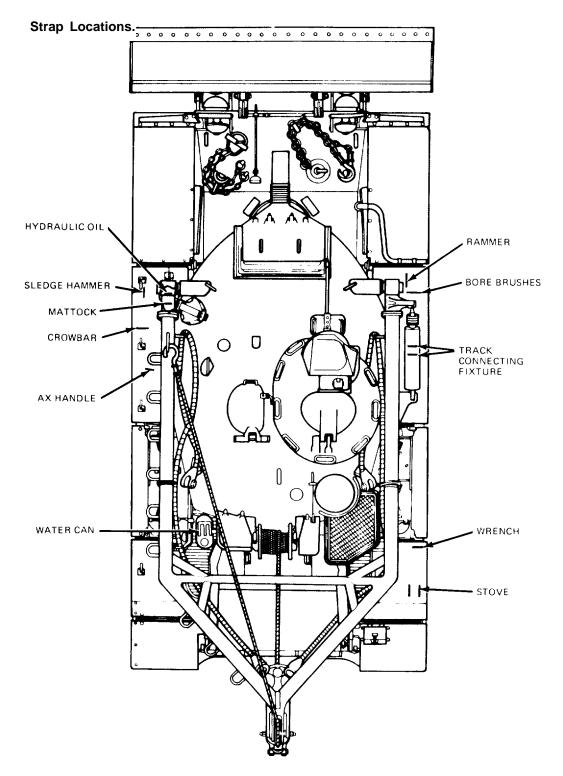


LATE MODEL

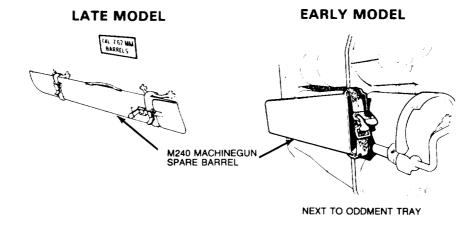
EARLY MODEL

TA253025

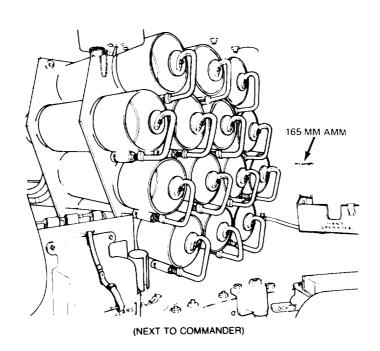
Change 1 E-8.1/(E-8.2 blank)



Strap Locations - Continued



(IF VEHICLE IS EQUIPPED FOR M240 MACHINE GUN)



# APPENDIX F

## LIST OF ABREVIATIONS

## List of Abbreviations

1100 1 01 00 100
AAL additional authorization list
ADJadjustable
ADJadjustment
AMM ammunition
AMMO ammunition
AMP ampere
ASSYassembly
AUXauxiliary
BATT battery
BD base detonating
BF before firing
BII basic issue item
BKR breaker
BO blackout
BRKT bracket
BRT bright
C celsius
CAL caliber
CBR
CDR commander
CKTcircuit
CM centimeters
CYC
CVCcombat vehicle crewmember
DA Department of the Army
dc direct current
deg degree
DF during firing
DIA diameter
DR drive
EA each
EFC effective full charge
EIRequipment improvement recommendation
ELEV elevate
EOD Explosive Ordnance Disposal
EQPT equipment
EXT external
F Fahrenheit
F fast
F fire
FM field manual
FT foot, feet
FWDforward

# TM 9-2350-222-10-3

## List of Abbreviations - Continued

GAA grease, auto artillery	
GL, gl gallon	
GEN generator	
gpm gallons per minute	
Hhigh	
HEP high explosive plastic	
HIhigh	
HOR horizontal	
ICOEI integral components of the end item	
ininch	
INSTL installation	
INTintercom	
IRinfrared	
JTAjoint table of allowance	
kg kilogram	
kg kilogram km kilometer	
kpa kilopasals	
kph kilometers per hour	
L left	
L low	
lbpound	
LDRSloaders	
LG long	
LO low	
LOlubrication order	
LTlight	
MACH machine	
MAG magazine	
MGmachine gun	
mm millimeter	
mph mile per hour	
MT mechanical time	
MT mount	
MTG mounting	
MTOE modified table of organization and equipment	
N neutral	
NATO North Atlantic Treaty Organization	
NORMnormal	
OPNGopening	
OPToptional	
ORD ordnance	
OZ ounce	
P park	
pet percent  PL PD point initiating base detenating	
PI, BD point initiating, base detonating	
PMCS	
PMCS preventive maintenance checks and services	
PRESS pressure	TA133218

## **List of Abbreviations - Continued**

psi pounds per square inch
PTpint
PTpoint
PWRpower
QTquart
QTYquantity
Rreverse
Rright
RADradio
RCV'D received
RDround
REQ'D required
RO roll
rpmrevolution per minute
ssafe
SERservice
SHsheet
SIGsignal
SLsliding
SPCL special
SPKR speaker
SQ square
T tee
TAMMS the Army maintenance management system
TARP tarpaulin
TDA table of distribution and allowance
TEMP temperature
TM technical manual
TOE table of organization and equipment
TP-T target practice with tracer
TRANS transmission
TRAV traverse
V volt
v volt
vdc volt direct current
VERT vertical
W-BF weekly - before firing
W/ with
W/O without
WD
WP white phosphorous
WP white phosphorous WTweight
WP white phosphorous  WT weight  YD yard

TA133219

F-3/(F-4 blank)

SUBJECT Page

Abbreviations, list of F-1
Accelerator
Lock
Lock accelerator lock
Unlock accelerator lock
Pedal
Operate during driving
Operate during utving
Access door, battery
Close
Open
Additional authorization list
Adjust airflow deflectors, personnel heater
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Perform deep water fording  Before entering water  Before installing water fording lip test  Driving during fording  Emergency exit during fording  Jettison operations  Tactical emergency operations  To install deep water fording kit  To stop tank during fording  Perform direct pull winching  Perform emergency escape  Drop driver's escape hatch  Dump driver's seat  Exit from tank  Perform failure to fire-imm  Caliber .50 machine gun  M240 7.62-mm machine gun  165-mm main gun  Perform hoisting	kitt	2-668.43

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E. C. MEYER General, United States Army Chief of Staff

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J. C. PENNINGTON Major General, United States Army The Adjutant General

To be distributed in accordance with DA Form 12-37, Operators Maintenance requirements for M728 Combat Engineer Vehicle.

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SEPT

1980 OPERATOR'S MANUAL

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BE EXACT PIN-POINT WHERE IT IS PAGE PARA: FIGURE TABLE				IN THIS SPACE TELL WHAT IS WRONG AND WHAT SHOULD BE DONE ABOUT IT:
3	GRAPH	Z	NO NO	Item 10. Change illustration. Reason: Tube end shown assembled on wrong side of lever cam.
109		51		Item 3. The NSN and P/N are not listed on the AMDF nor the MCRL. Request correct NSN and P/N be furnished.
2-8			2-1	Preventive Maintenance Checks and Services.  Item 7 under "Items to be inspected" should be changed to read as follows: Firing linkage and firing mechanism pawl.
12	1-6a			Since there are both 20-and 30-round magazines forthis rifle, data on both should be listed.
				SAMPLE
				HONE NUMBER SIGN HERE 999-9999 John Joe.
517 .	John	Doe	(777)	999-9999 John Doc

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#### 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

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

TO CHANGE

#### 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

#### CURIC MEASURE

1 Cu. Centimeter = 1000 Cu. Millimeters = 0.06 Cu. Inches 1 Cu. Meter = 1,000,000 Cu. Centimeters = 35.31 Cu. Feet

%(°F − 32) = °C 212° Fahrenheit is equivalent to 100° Celsius 90° Fahrenheit is equivalent to 32.2° Celsius 32° Fahrenheit is equivalent to 0° Celsius

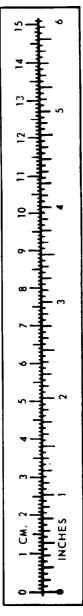
MULTIPLY BY

% °C + 32 = °F

### **APPROXIMATE CONVERSION FACTORS**

TO

	1 <sup>-</sup> .	
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
		0.473
Pints	Liters	0.946
Quarts	Liters	
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 MULT	iply by
Centimeters	Inches	0.394
Meters	Feet	3.280
Meters	Yards	1.094
Kilometers	Miles	0.621
Square Centimeters	Square Inches	
		0.155
	Square Feet	
Square Meters	Square Feet	10.764
Square Meters	Square Yards	10.764 1.196
Square MetersSquare MetersSquare Kilometers	Square YardsSquare Miles	10.764 1.196 0.386
Square Meters	Square Yards	10.764 1.196 0.386 2.471
Square Meters	Square Yards	10.764 1.196 0.386 2.471 35.315
Square Meters	Square Yards	10.764 1.196 0.386 2.471 35.316 1.308
Square Meters	Square Yards Square Miles Acres Cubic Feet Cubic Yards Fluid Ounces	10.764 1.196 0.386 2.471 35.315 1.306 0.034
Square Meters	Square Yards Square Miles Acres Cubic Feet Cubic Yards Fluid Ounces Pints	10.764 1.196 0.386 2.471 35.315 1.306 0.034 2.113
Square Meters Square Meters Square Kilometers Square Hectometers Cubic Meters Milliliters Liters	Square Yards Square Miles Acres Cubic Feet Cubic Yards Fluid Ounces Pints Quarts	10.764 1.196 0.386 2.471 35.316 1.306 0.034 2.113 1.057
Square Meters Square Meters Square Kilometers Square Hectometers Cubic Meters Cubic Meters Milliliters Liters Liters Liters	Square Yards Square Miles Acres Cubic Feet Cubic Yards Fluid Ounces Pints Ouarts Gallons	10.764 1.196 0.386 2.471 35.316 1.306 0.034 2.113 1.057 0.264
Square Meters Square Meters Square Kilometers Square Hectometers Cubic Meters Cubic Meters Milliliters Liters Liters Liters	Square Yards Square Miles Acres Cubic Feet Cubic Yards Fluid Ounces Pints Quarts	10.764 1.196 0.386 2.471 35.318 1.306 0.034 2.113 1.057 0.264 0.038
Square Meters Square Meters Square Kilometers Square Hectometers Cubic Meters Cubic Meters Liters Liters Liters Grams	Square Yards Square Miles Acres Cubic Feet Cubic Yards Fluid Ounces Pints Ouarts Gallons	10.764 1.196 0.386 2.471 35.316 1.306 0.034 2.113 1.057 0.264 0.035 2.205
Square Meters Square Meters Square Kilometers Square Hectometers Cubic Meters Cubic Meters Milliliters Liters Liters Grams Kilograms	Square Yards Square Miles Acres Cubic Feet Cubic Yards Fluid Ounces Pints Ouarts Gallons Ounces	10.764 1.196 0.386 2.471 35.316 1.306 0.034 2.113 1.057 0.264 0.035 2.205
Square Meters Square Meters Square Kilometers Square Hectometers Cubic Meters Milliliters Liters Liters Grams Kilograms Metric Tons	Square Yards Square Miles Acres Cubic Feet Cubic Yards Fluid Ounces Pints Quarts Gallons Ounces Pounds	0.155 10.764 1.196 0.386 2.471 35.315 1.306 0.034 2.113 1.053 0.264 0.035 2.205 1.102 0.736
Square Meters Square Meters Square Kilometers Square Hectometers Cubic Meters Cubic Meters Milliliters Liters Liters Grams Kilograms Metric Tons Newton-Meters	Square Yards Square Miles Acres Cubic Feet Cubic Yards Fluid Ounces Pints Quarts Gallons Ounces Pounds Short Tons Pound-Feet	10.764 1.196 0.386 2.471 35.315 1.306 0.034 2.111 1.057 0.264 0.035 2.200 1.102
Square Meters Square Meters Square Kilometers Square Hectometers Cubic Meters Cubic Meters Liters Liters Liters Grams Metric Tons Newton-Meters Kilopascals Kilometers per Liter	Square Yards Square Miles Acres Cubic Feet Cubic Yards Fluid Ounces Pints Quarts Gallons Ounces Pounds Short Tons Pound-Feet Pounds per Square Inch	10.764 1.196 0.386 2.471 35.316 1.306 0.034 2.113 1.053 0.264 0.035 2.200 1.102 0.736



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