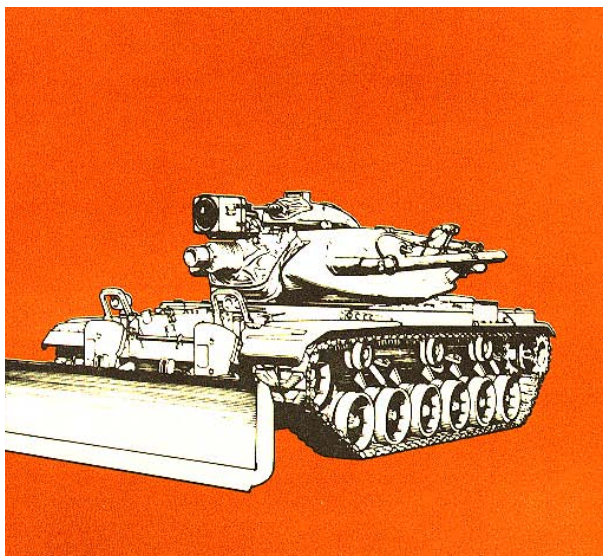


**OPERATOR'S MANUAL  
OPERATION UNDER USUAL  
AND UNUSUAL CONDITIONS**



OPERATION UNDER  
USUAL  
CONDITIONS  
PAGE 2-139

OPERATION UNDER  
USUAL  
CONDITIONS  
PAGE 2-608

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

**This copy is a reprint which includes  
current pages from Changes 1 through 9.**

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**HEADQUARTERS, DEPARTMENT OF THE ARMY**

**JANUARY 1981**

**TA133251**

**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 mils (10 degrees) quadrant reading when loading round.

**WARNINGS**

13. Do not apply turret power or operate turret controls until all personnel are in safe positions and prepared for turret or gun movement.
14. Do not operate turret in power or manual mode until all in personnel are in proper position, turret ring has been cleared, and shell ejection plate and all platform guards are in place.
15. 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.
16. 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 station.
17. If NBC exposure is suspected, all air filter media should be handled by personnel wearing protective equipment. Consult your unit NBC Officer or NBC NCO for appropriate handling or disposal instructions.

**Change 8 b**



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.

Change 1 c

**WARNING****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.

**Change 5 d**

**WARNING**

During hoisting operations, ensure Boom Control Lever is not operated or movement may cause load to fall injuring personnel and or damaging equipment.

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

Driver of towed tank is exposed to carbon monoxide fumes. Frequent driver changes are necessary to prevent over-exposure. Tow tank with tow cables only when disabled tank's universal joints are disconnected. Use another operable tank connected at the rear to avoid loss of steering and braking.

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

**Change 8 e**

CHANGE

NO. 9

HEADQUARTERS  
DEPARTMENT OF THE ARMY  
WASHINGTON, D. C., 10 June 1993OPERATOR'S MANUAL  
OPERATION UNDER USUAL AND UNUSUAL CONDITIONSVEHICLE, COMBAT ENGINEER  
FULL TRACKED: M728  
(2350-00-795-1797)

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2-141 thru 2-144  
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 2-390.1 and 2-390.2  
 2-415 and 2-416  
 2-443 and 2-444  
 2-445 and 2-446  
 2-447 and 2-448  
 2-522.1 and 2-522.2  
 2-527 and 2-528  
 2-543 thru 2-546  
 2-566.1 thru 2-566.3/(2-566.4  
 blank)  
 2-608.1 and 2-608.2  
 2-621 and 2-622  
 (2-664.1 blank)/2-664.2

## Insert Pages

2-141 thru 2-144  
 2-361 thru 2-363/(2-364 blank)  
 None  
 2-388.1 and 2-388.2  
 2-390.1 and 2-390.2  
 2-415 and 2-416  
 None  
 (2-445 blank)/2-446  
 2-447 and 2-448  
 2-522.1 and 2-522.2  
 2-527/(2-528 blank)  
 2-543 thru 2-546  
 2-566.1 thru 2-566.3/(2-566.4  
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Chief of Staff

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No.8

HEADQUARTERS  
DEPARTMENT OF THE ARMY  
Washington D.C., 2 September 1991

**OPERATOR'S MANUAL  
OPERATION UNDER USUAL  
AND UNUSUAL CONDITIONS**

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

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2-243 and 2-244  
2-317 and 2-318  
2-333 and 2-334  
2-339 thru 2-342  
2-377 thru 2-382  
2-399 thru 2-406  
2-425 and 2-426  
2-429 and 2-430  
2-447 and 2-448  
2-453 and 2-454  
2-477 thru 2-496  
2-501 and 2-502  
2-505 and 2-506  
2-522.1 and 2-522.2  
2-523 and 2-524  
2-545 and 2-546  
2-573 and 2-574

Insert Pages

b thru e  
2-139 and 2-140  
2-187 and 2-188  
2-243 and 2-244  
2-317 and 2-318  
2-333/(2-334 blank)  
2-342  
2-382  
2-406  
2-425 and 2-426  
2-429 and 2-430  
2-447 and 2-448  
2-453 and 2-454  
2-477 thru 2-496  
2-501 and 2-502  
2-505 and 2-506  
2-522.1 and 2-522.2  
2-523 and 2-524  
2-545 and 2-546  
2-573 and 2-574

Remove Pages  
2-587 thru 2-590  
2-591 and 2-592  
2-639 and 2-640  
2-668.7 and 2-668.8  
2-668.55 and 2-668.56

Insert Pages  
2-587/(2-588 blank)  
2-591/(2-592 blank)  
2-639 and 2-640  
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2-668.55 and 2-668.56

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OPERATOR'S MANUAL  
Operation Under Usual and Unusual Conditions  
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Operation Under Usual and Unusual Conditions  
VEHICLE, COMBAT ENGINEER  
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## Operator's Manual

Operation Under Usual and Unusual Conditions  
VEHICLE, COMBAT ENGINEER  
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None	2-232.1/(2-232.2 blank)
2-255 thru 2-258	2-255 thru 2-258
2-287 thru 2-290	2-287 thru 2-290
2-523 and 2-524	2-523 and 2-524
2-621 and 2-622	2-621 and 2-622
2-639 thru 2-642	2-639 thru 2-642

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## Operator's Manual

## Operation Under Usual and Unusual Conditions

VEHICLE, COMBAT ENGINEER  
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2-389 and 2-390  
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2-503 and 2-504  
None  
2-541 and 2-542  
None  
2-547 and 2-548  
None  
2-668.37 and 2-668.38

## Insert Pages

b thru d/(e blank)  
(2-389 blank)/2-390  
2-390.1 and 2-390.2  
2-503 and 2-504  
2-504.1 and 2-504.2  
2-541 and 2-542  
2-542.1/(2-542.2 blank)  
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2-668.37 and 2-668.38

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## Operator's Manual

## Operation Under Usual and Unusual Conditions

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2-285 and 2-286  
2-289 and 2-290  
2-388.3/(2-388.4 blank)  
2-435 and 2-436  
2-495 and 2-496  
2-511 thru 2-514

## Insert Pages

2-243 and 2-244  
2-285 and 2-286  
2-289 and 2-290  
2-388.3/(2-388.4 blank)  
2-435 and 2-436  
2-495 and 2-496  
2-511 thru 2-514

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2-211 and 2-212	2-211 and 2-212
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2-213 and 2-214	2-213 and 2-214
2-675 thru 2-678	None
2-679 and 2-680	(2-679 blank)/2-680
None	2-680.1/(2-680.2 blank)
2-681 and 2-682	2-681/(2-682 blank)
2-683 thru 2-687/(2-688 blank)	None
None	DA Forms 2028-2

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NO. 1

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Remove Pages	Insert Pages
b/(c blank) 2-139 through 2-146 2-171 and 2-172 2-177 through 2-180 2-185 and 2-186 2-195 and 2-196 None  2-239 through 2-242 2-269 and through 2-272 2-287 through 2-294 2-301 and 2-302 2-305 and 2-306 2-311 and 2-312 2-317 through 2-320 None 2-323 and 2-324 2-337 and 2-338 2-341 and 2-342 2-347 and 2-348 None 2-349 through 2-354	b and c 2-139 through 2-146 2-171 and 2-172 2-177 through 2-180 2-185 and 2-186 2-195 and 2-196 2-196.1 through 2-196.11/(2-196.12 blank) 2-239 through 2-242 2-269 and through 2-272 2-287 through 2-294 2-301 and 2-302 2-305 and 2-306 2-311 and 2-312 2-317 through 2-320 2-322.1/(2-322.2 blank) 2-323 and 2-324 2-337 and 2-338 2-341 and 2-342 2-347 and 2-348 2-348.1/(2-348.2 blank) 2-349 through 2-354

Remove Pages	Insert Pages
2-357 and 2-358 None 2-361 and 2-362 None 2-369 through 2-372 2-381 and 2-382 2-387 and 2-388 None 2-391 and 2-392 2-399 and 2-400 2-413 and 2-414 2-417 and 2-418 2-421 through 2-424 2-435 and 2-436 2-441 through 2-446 None 2-447 and 2-448 2-453 and 2-454 2-457 through 2-464 2-467 and 2-468 None 2-471 through 2-474 2-495 and 2-496 2-499 and 2-500 2-511 through 2-516 None 2-525 and 2-526 2-537 through 2-550 2-553 and 2-554 None 2-571 and 2-572 2-581 and 2-582 2-585 and 2-586 2-591 and 2-592 None 2-607 through 2-610 2-617 and 2-618 2-661 through 2-664 None 2-665 through 2-668 None 2-667 and 2-668 None	2-357 and 2-358 2-360.1 through 2-360.4 2-361 and 2-362 2-368.1 through 2-368.4 2-369 through 2-372 2-381 and 2-382 2-387 and 2-388 2-388.1 through 2-388.3/(2-388.4 blank) 2-391 and 2-392 2-399 and 2-400 2-413 and 2-414 2-417 and 2-418 2-421 through 2-424 2-435 and 2-436 2-441 through 2-446 2-446.1 and 2-446.2 2-447 and 2-448 2-453 and 2-454 2-457 through 2-464 2-467 and 2-468 2-468.1 through 2-468.3/(2-468.4 blank) 2-471 through 2-474 2-495 and 2-496 2-499 and 2-500 2-511 through 2-516 2-522.1 through 2-522.4 2-525 and 2-526 2-537 through 2-550 2-553 and 2-554 2-566.1 through 2-566.3/(2-566.4 blank) 2-571 and 2-572 2-581 and 2-582 2-585 and 2-586 2-591 and 2-592 2-600.1 through 2-600.4(2-600.6 blank) 2-607 through 2-610 2-617 and 2-618 2-661 through 2-664 2-664.1 (blank)/2-664.2 2-665 and 2-666 2-661.1 through 2-666.6 2-667 and 2-668 2-668.1 through 2-668.56

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OPERATOR'S MANUAL  
OPERATION UNDER USUAL AND UNUSUAL CONDITIONS  
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 202&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.

**TABLE OF CONTENTS**

**VOLUME 1**

		Page
	HOW TO USE THIS MANUAL .....	iii
CHAPTER 1	INTRODUCTION .....	1-1
Section I	General Information .....	1-1
Section II	Equipment Description .....	1-3
CHAPTER 2	OPERATING INSTRUCTIONS .....	2-1
Section I	Description and Use of Operators	
	Controls and Indicators.....	2-1
Section II	Preventive Maintenance Checks	
	and Services .....	2-29

**VOLUME 2**

Section III	Operation Under Usual Conditions .....	2-139
Section IV	Operation Under Unusual Conditions .....	2-608

\*This manual, together with TM 9-2350-222-10-1, 12 January 1981, and TM 9-2350-222-10-3, 12 January 1981, supersedes TM 9-2350-222-10, August 1965 and TM 9-2350-222-ESC, 16 October 1972.

**TA249145**

TABLE OF CONTENTS - Continued

VOLUME 3

		Page
CHAPTER 3	MAINTENANCE INSTRUCTIONS .....	3-1
Section I	Lubrication Instructions .....	3-1
Section II	Troubleshooting .....	3-1
Section III	Maintenance Procedures .....	3-59
CHAPTER 4	AMMUNITION .....	4-1
APPENDIX A.	REFERENCES .....	A-1
APPENDIX B.	COMPONENTS OF END ITEM AND BASIC ISSUE ITEMS LISTS .....	B-1
APPENDIX C.	ADDITIONAL AUTHORIZATION LIST .....	C-1
APPENDIX D.	EXPENDABLE SUPPLIES AND MATERIALS LIST .....	D-1
APPENDIX E.	STOWAGE AND SIGN GUIDE .....	E-1
APPENDIX F.	LIST OF ABBREVIATIONS .....	F-1
	SUBJECT INDEX .....	INDEX 1

TA132277

Section III. OPERATION UNDER USUAL CONDITIONS

OPERATIONAL INDEX

Page

Boresight weapons	
Boresight caliber .50 machine gun .....	2-416
Boresight main gun .....	2-390
Boresight searchlight .....	2-430
Drive the vehicle	
Drive forward .....	2-223
Drive in reverse .....	2-233
Operate brakes .....	2-213
Operate periscopes .....	2-196.1
Operate vehicle lights .....	2-186
Operate transmission .....	2-215
Start engine .....	2-205
Steer the vehicle .....	2-219
Engage target with caliber .50 machine gun	
Fire .....	2-471
Perform failure to fire-immediate action .....	2-476
Track .....	2-469
Engage target with 165-mm main gun	
Auxiliary fire control .....	2-506
Close breech in emergency .....	2-500
Fire .....	2-511
Load .....	2-496
Perform failure to fire-immediate action .....	2-514
Track .....	2-502

OPERATIONAL INDEX

Page

---

Engage target with 7.62-mm machine gun	
Fire .....	2-482
Perform failure to fire-immediate action .....	2-491
Track .....	2478
 Install driver's escape hatch	
Inspect hatch and seal .....	2-532
Inspect hatch for secure placement .....	2-535
Install hatch .....	2-533
Operate boom	
Perform after hoisting operations .....	2-305
Perform hoisting .....	2-294
Prepare for hoisting operations .....	2-287
 Operate communication system	
Operate external handset .....	2-180
Operate intercom .....	2-169
Operate receiver-transmitter .....	2-172
 Operate fire protection system	
Operate fixed external controls .....	2-528
Operate fixed internal controls .....	2-524
Operate portable fire extinguisher .....	2-523
Operate gas particulate system	
Adjust air temperature .....	2-247
Connect mask .....	2-246
Start gas particulate system .....	2-244
Turn off gas particulate system .....	2-248



**OPERATIONAL INDEX**

**Page**

---

Operate hydraulic system	
Start hydraulic system .....	2-249
Turn off hydraulic system.....	2-252
Operate moldboard	
Perform moldboard operations.....	2-256
Prepare for moldboard operations.....	2-253
Stow moldboard.....	2-261
Stow moldboard in emergency.....	2-263
Operate personnel heater	
Set airflow deflector .....	2-242
Turn off heater .....	2-243
Turn on heater .....	2-240
Operate winch	
Perform after winching operations.....	2-284
Perform direct winching .....	2-273
Prepare for winching operations.....	2-269
Perform emergency escape	
Drop driver's escape hatch.....	2-530
Dump driver's seat.....	2-529
Exit from vehicle .....	2-531

OPERATIONAL INDEX

Page

---

Perform post-operating procedures	
Install covers .....	2-571
Lock cupola locks .....	2-569
Lock turret traverse lock .....	2-568
Open loader's hatch from inside.....	2-567
Remove and stow headlight assemblies .....	2-603
Remove antenna .....	2-594
Remove cartridge bag .....	2-591
Remove weapons .....	2-578
Secure and padlock vehicle .....	2-607
Shut down vehicle .....	2-536
Stow sights.....	2-596
Turn off equipment .....	2-539
Unload weapons.....	2-550
Perform smoke screening	
Fire smoke grenade discharger.....	2-522.1
Perform failure to fire-immediate action .....	2-522.3
Turn off smoke generator.....	2-522
Turn on smoke generator.....	2-520
Prepare for firing	
Adjust sights .....	2-349
Install machine guns .....	2-333



OPERATIONAL INDEX

Page

---

Prepare for firing - Continued	
Load machine guns.....	2-373
Load smoke grenade discharges.....	2-388.1
Remove covers .....	2-324
Turn on turret power .....	2-389
Unlock cupola locks .....	2-332
Unlock turret traverse lock .....	2-331
Prepare to operate vehicle	
Install and tie down antenna.....	2-147
Install headlight assemblies .....	2-148
Open hatches .....	2-144
Prepare crew stations .....	2-152
Stow ammunition	
Stow caliber .45 ammunition .....	2-322
Stow caliber .50 machine gun ammunition .....	2-318
Stow hand grenades.....	2-323
Stow smoke grenades.....	2-322.1
Stow 165 mm ammunition.....	2-310
Stow 7.62-mm machine gun ammunition.....	2-320
Zero sights	
Perform initial zero .....	2-434
Perform reference zero .....	2-447
Zero commander's periscope to caliber .50 machine gun .....	2-454
Zero infinity sight to 7.62-mm machine gun .....	2-449



**PREPARE TO OPERATE VEHICLE (OPEN HATCHES)**

**To Open Loader's Hatch:  
Equipment:**

Get key for hatch padlock.

1. Stand on turret over hatch.
2. Using key, unlock hatch padlock.
3. Grasp hatch handle (A).
4. Lift hatch (B) to position (C).

**NOTE**

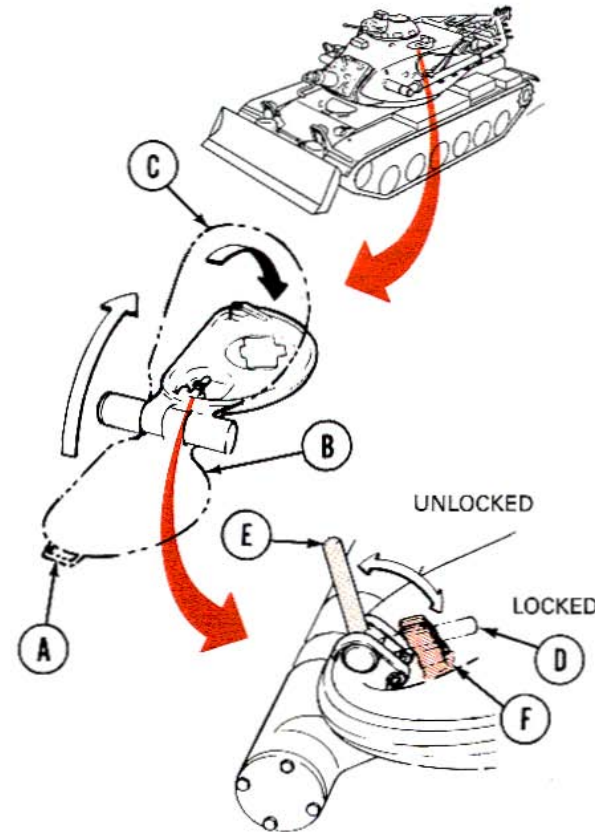
**Spring-loaded lock will lock hatch in position (C).**

5. Pull lock handle (D) to unlocked position (E). Hold.
6. Lower hatch to deck.
7. Release lock handle.

**WARNING**

**Be sure lock handle is secured in spring clip (F) when hatch is open.**

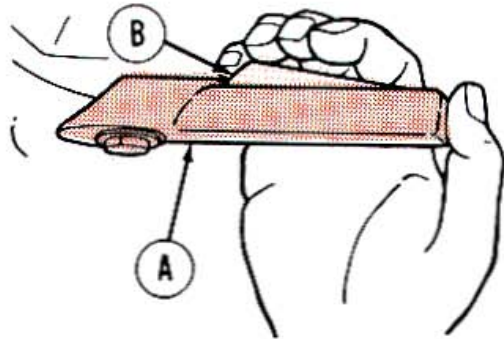
8. Push lock handle (D) into spring clip (F) when hatch is opened.



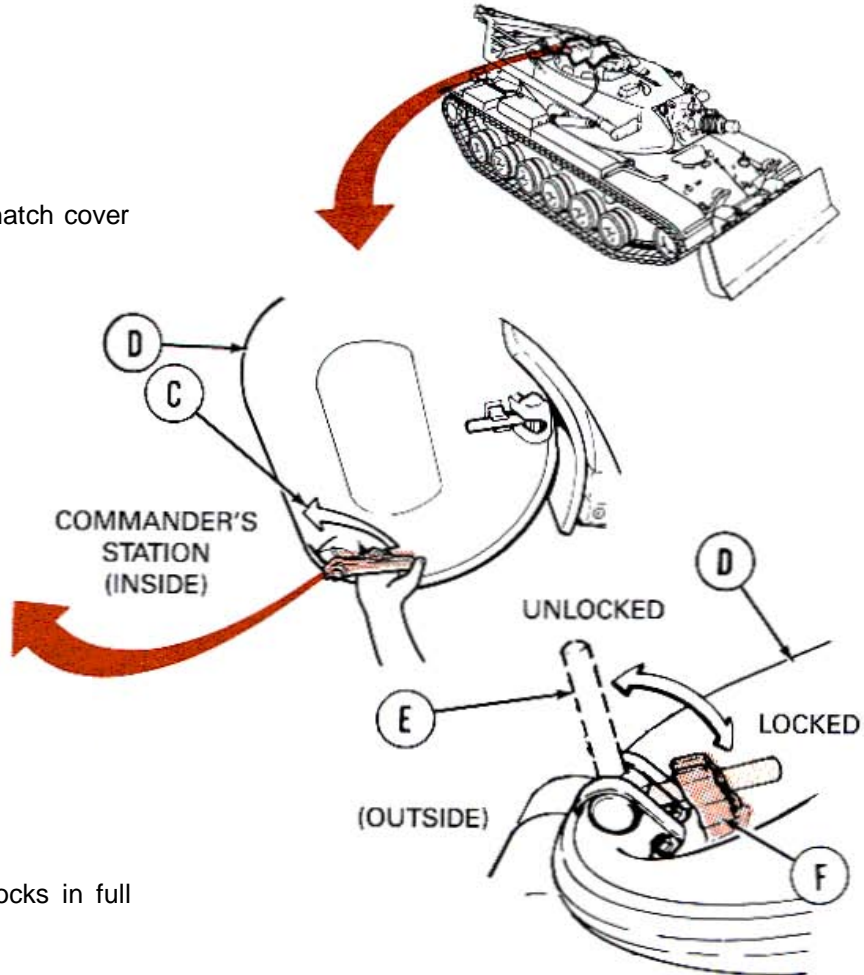
**PREPARE TO OPERATE VEHICLE (OPEN HATCHES) - Continued**

**To Open Cupola Hatch Cover:**

1. Grip hatch release handle (A).
2. Squeeze plate (B) to unlock.
3. Push handle counterclockwise (C) to unlock hatch cover (D). Cover will spring slightly.



**WARNING**  
 Be sure hatch cover is in the locked (fully open) position before releasing cover.



4. Push hatch cover (D) upward until it spring locks in full open position.
5. Push hold-open lock (E) into spring clip (F).

**PREPARE TO OPERATE VEHICLE (OPEN HATCHES) - Continued**  
**To Open Driver's Hatch**

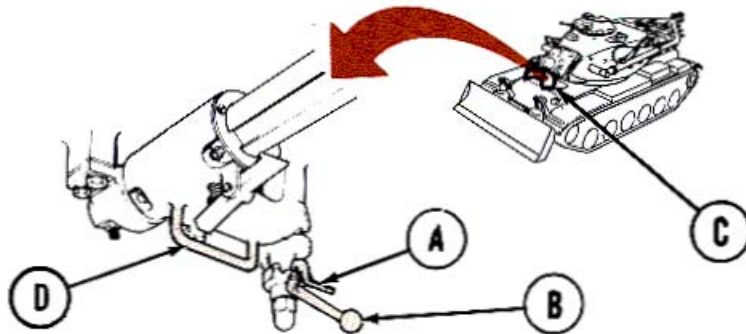
**CAUTION:**

Do not open driver's hatch if driver's IR periscope or night vision viewer is installed. To open driver's hatch could damage periscope or viewer.

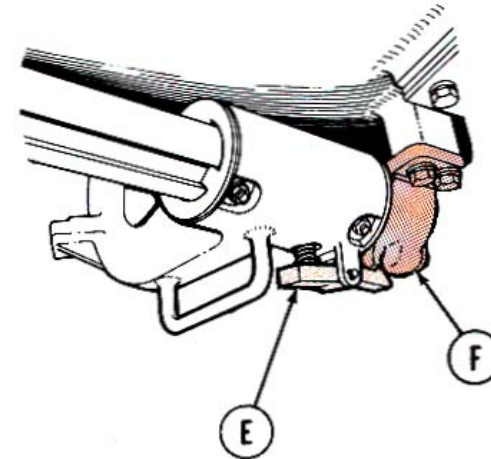
**Make Sure:**

•Driver's IR periscope (page 2-596) or night vision viewer (page 2 600.1) is removed from driver's hatch.

3. Then push handle (B) forward to unlock hatch (C).
4. With both hands, reach upward and behind head. Grasp hatch handle (D).
5. Slide hatch (C) to right in one smooth motion.



1. Sit in driver's seat.
2. With left hand, press latch (A).



6. Be sure that hold-open latch (E) is securely engaged to fixed bracket (F) when hatch is open.

**PREPARE TO OPERATE VEHICLE (INSTALL AND TIE DOWN ANTENNA)**

**Equipment:**

Get from Stowage:

- Antenna bottom section (A).
- Antenna top section (B).
- Antenna tie down cord (C).

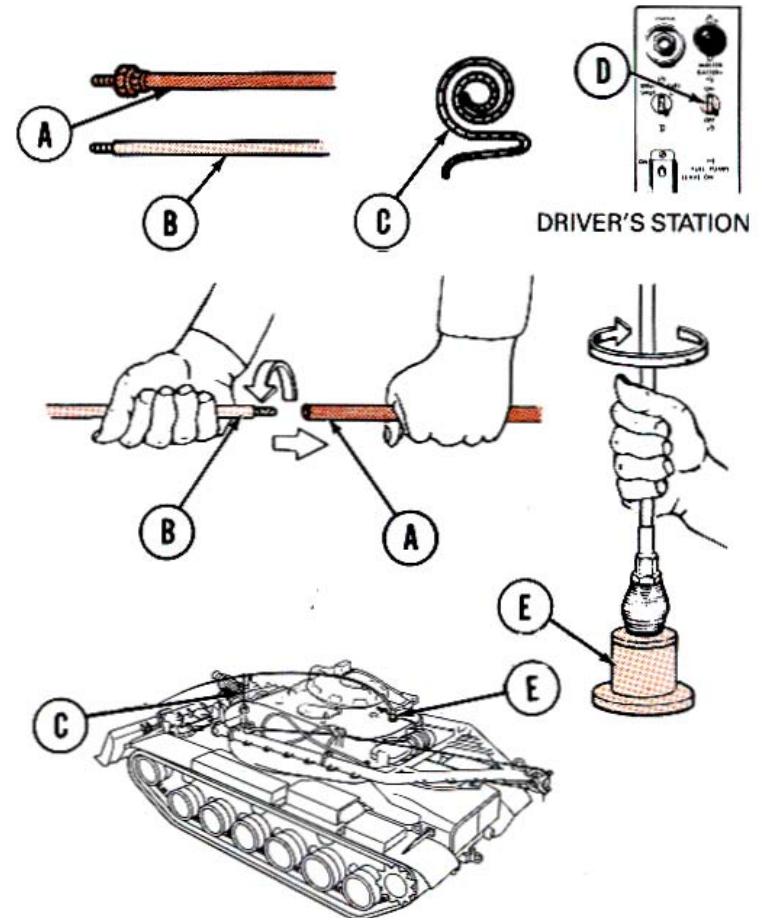
**Make Sure:**

- MASTER BATTERY switch (D) is set to OFF.
1. Join antenna bottom section (A) to antenna top section (B) by inserting section (B) into section (A) and rotating as shown until tight.
  2. Attach antenna to antenna base support (E) by rotating antenna clockwise.

**NOTE**

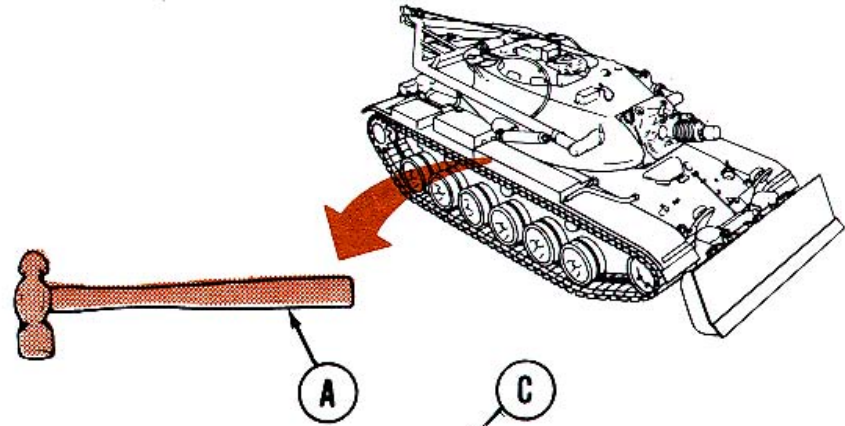
**Antenna is to be tied down when vehicle is moving or when vehicle is operating in areas with high tension power lines. When antenna is tied down, do not operate radio on high power.**

3. Using tie down cord (C), tie antenna to the turret so it does not prevent operation of the turret or cupola.



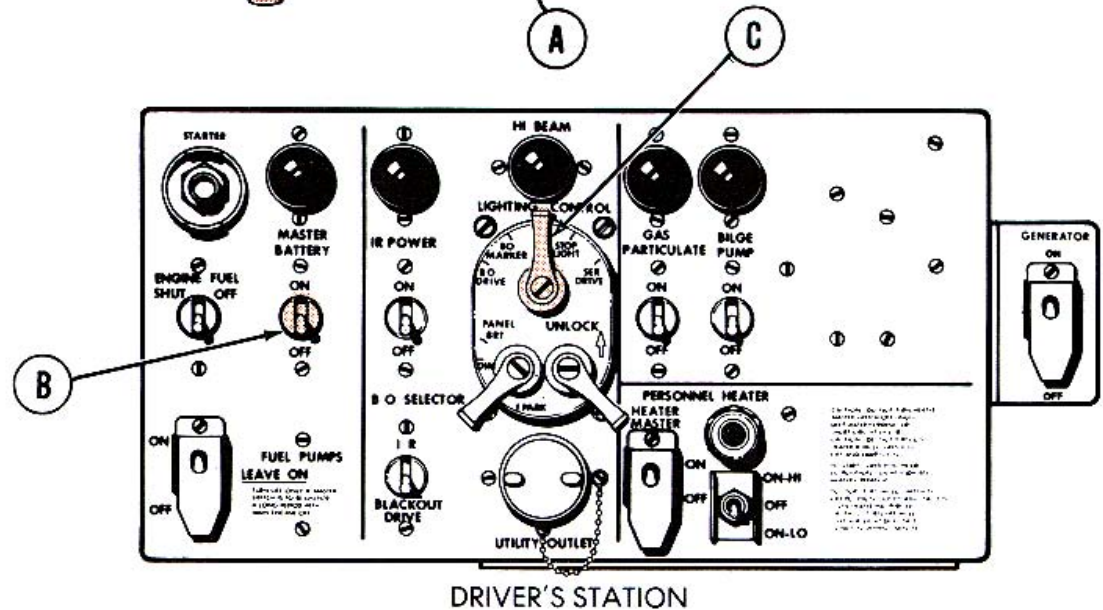
**PREPARE TO OPERATE VEHICLE (INSTALL HEADLIGHT ASSEMBLIES) - Continued**

Tools:  
Get hammer (A) from right front fender box.



**Make Sure:**

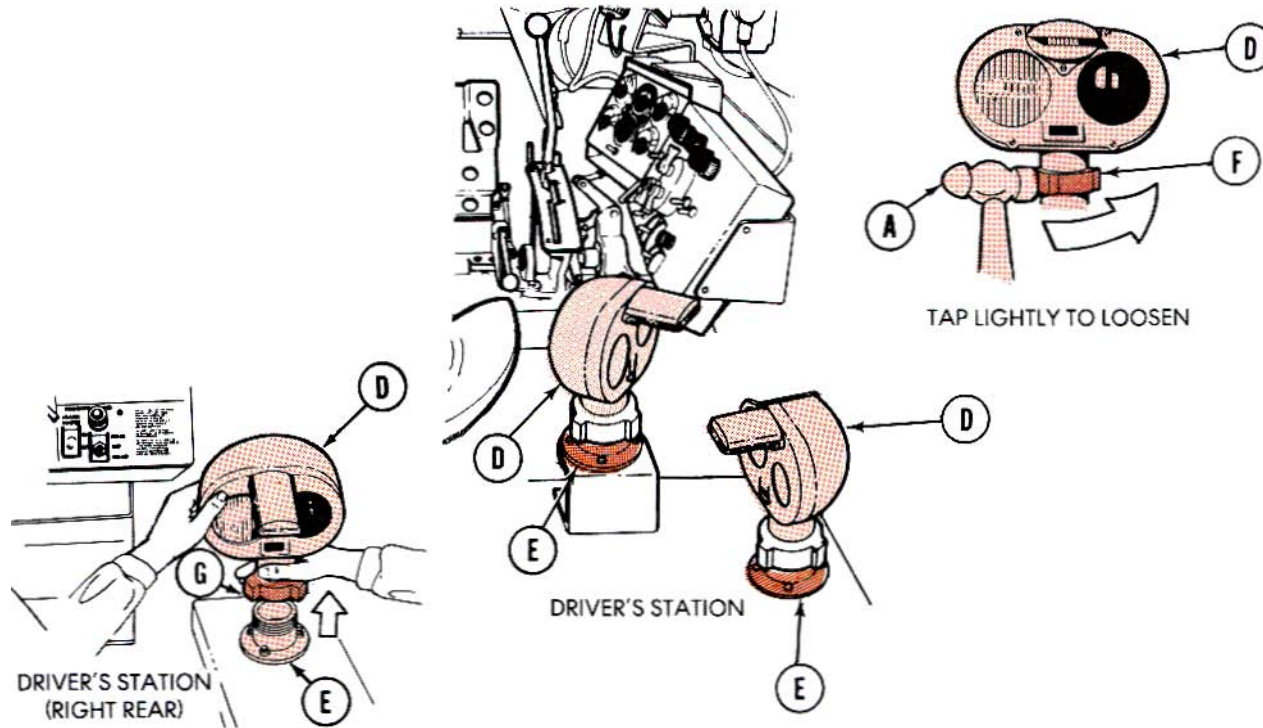
- MASTER BATTERY switch (B) is set to OFF.
- LIGHTING CONTROL lever (C) is set to OFF.





**PREPARE TO OPERATE VEHICLE (INSTALL HEADLIGHT ASSEMBLIES) - Continued**

1. Locate headlight assemblies (D) on two inside stowage mounts (E).

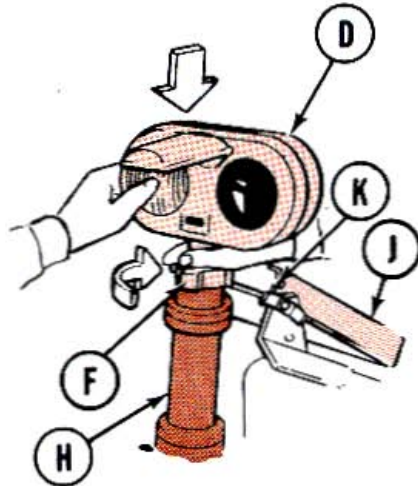
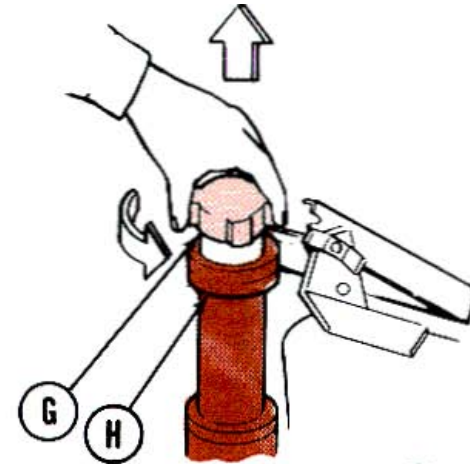
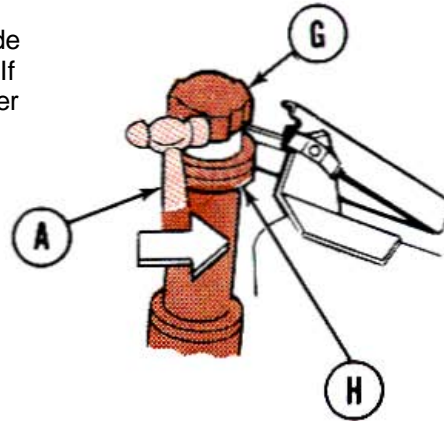


**TA132289**

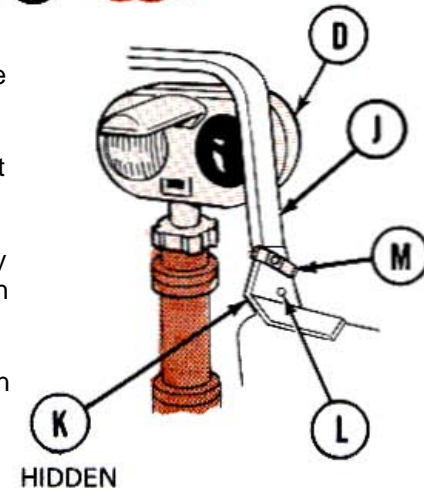
2. Unscrew retainer nut (F) from each mount. If necessary, tap lightly with hammer (A) to loosen.
3. Lift each headlight assembly (D) and remove from mount (E).

PREPARE TO OPERATE VEHICLE (INSTALL HEADLIGHT ASSEMBLIES)- Continued

4. Unscrew caps (G) from outside mounts (H) on front of vehicle. If necessary, tap lightly with hammer (A) to loosen caps (G).

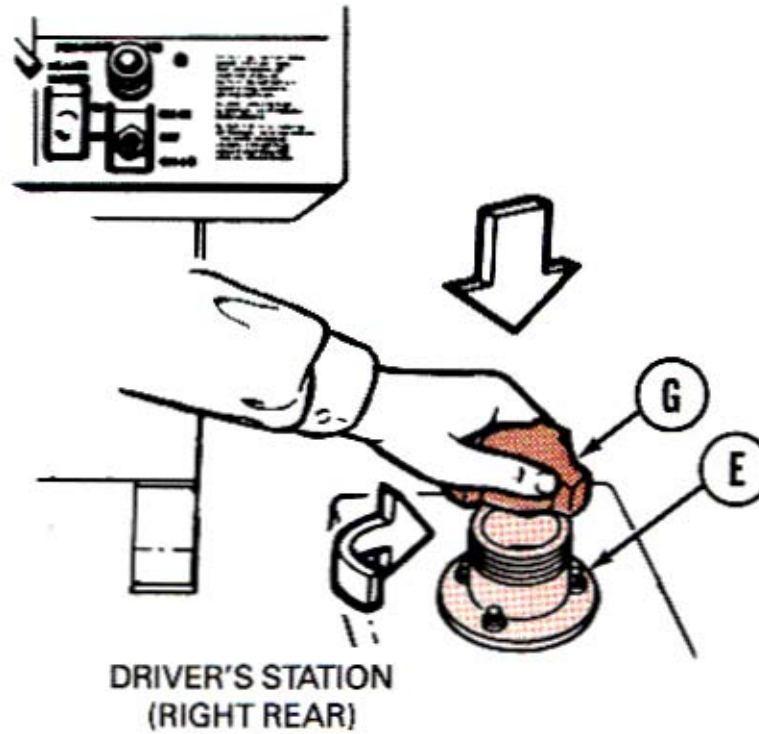


5. Place each headlight assembly (D) on outside mounts (H).
6. Turn retainer nut (F) clockwise to secure headlight assembly (D). Hand tighten only.
7. Raise brush guard (J) over each headlight assembly (D) so notch (K) in bottom of guard aligns with pin (L) on housing.
8. Push guard (J) down until notch (K) mates with pin (L). Tighten wingnut (M).



**PREPARE TO OPERATE VEHICLE (INSTALL HEADLIGHT ASSEMBLIES)- Continued**

9. Screw caps (G), from outside mounts, onto inside mounts (E). Hand tighten only.
10. Return hammer to stowage.



TA132291

**PREPARE TO OPERATE VEHICLE (PREPARE CREW STATIONS)****WARNING**

**Always be sure your caliber .45 submachine gun is cleared before you stow it.**

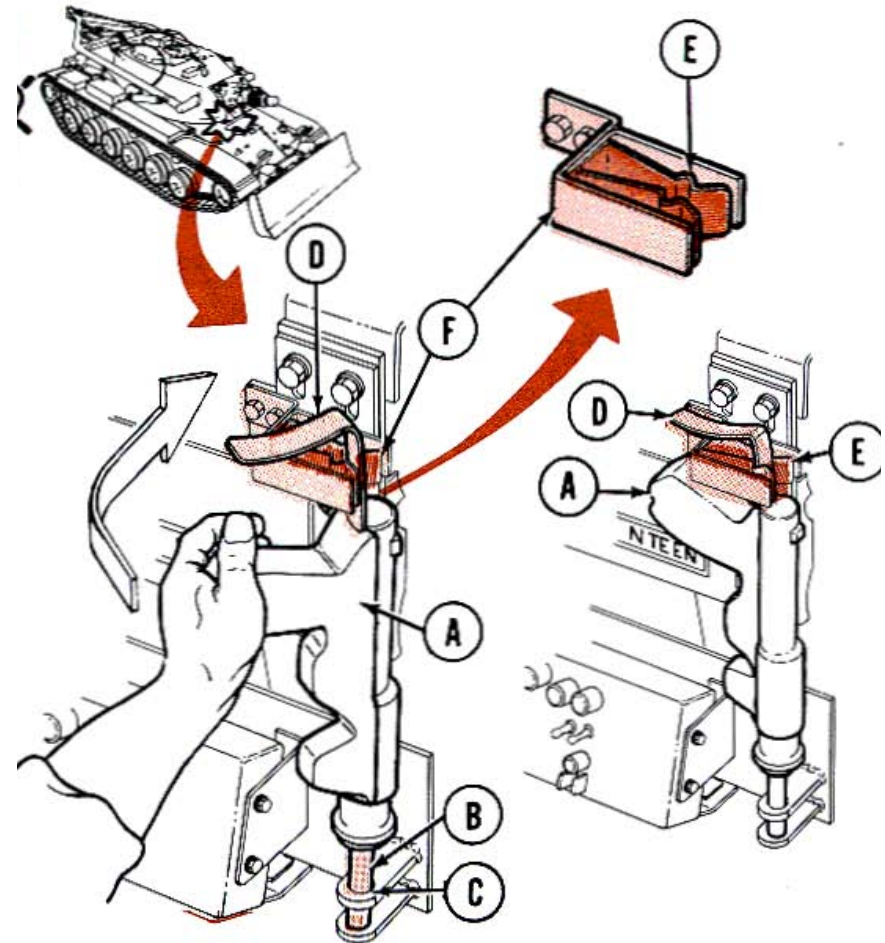
Stow Caliber .45 Submachine Guns:

**NOTE**

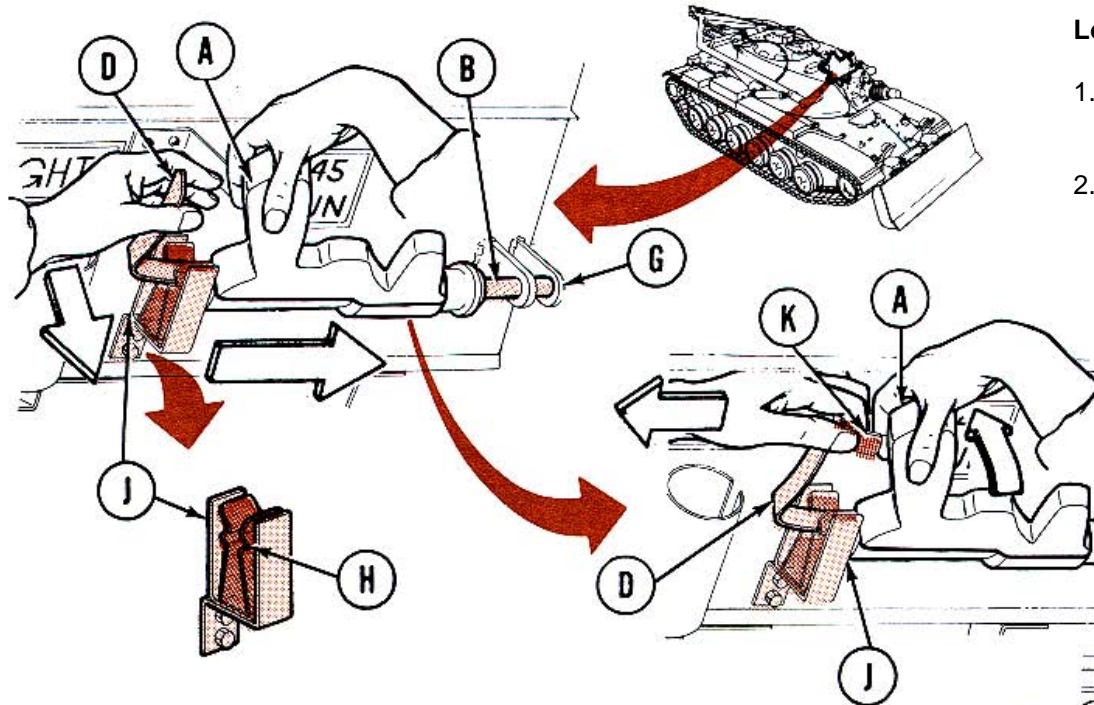
**Collapse your gun before stowing.**

**Driver's Station**

1. Take gun by grip (A). Put barrel (B) through hole (C).
2. Catch gun stock (D) in groove (E) in far side of clip (F).
3. Rotate grip (A) clockwise to wall. Be sure gun stock is held tight in both clip grooves.



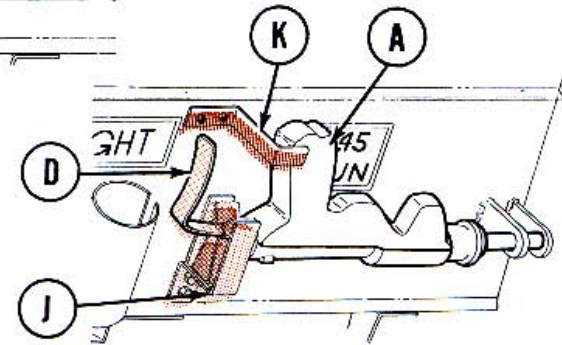
PREPARE TO OPERATE VEHICLE (PREPARE CREW STATIONS) - Continued



Loader's Station

1. Put gun barrel (B) through hole (G).
2. Turn gun grip (A) upward. Catch gun stock (D) in groove (H) in near side of clip (J).

3. Pull spring bracket (K) to left. At same time, push grip (A) upward until gun stock (D) is caught tight in both clip grooves. Release spring bracket (K).

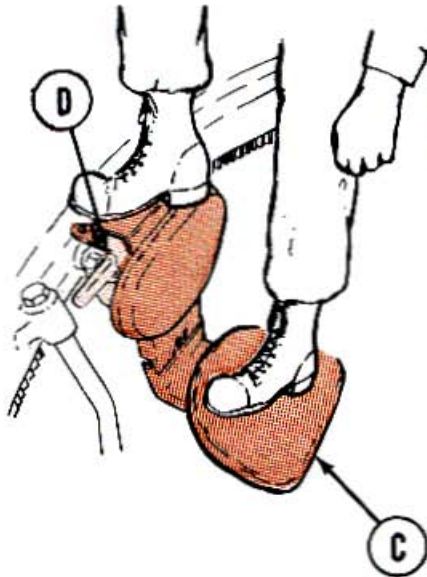


## PREPARE TO OPERATE VEHICLE (PREPARE CREW STATIONS) - Continued

### To Close Loader's Hatch From Inside:

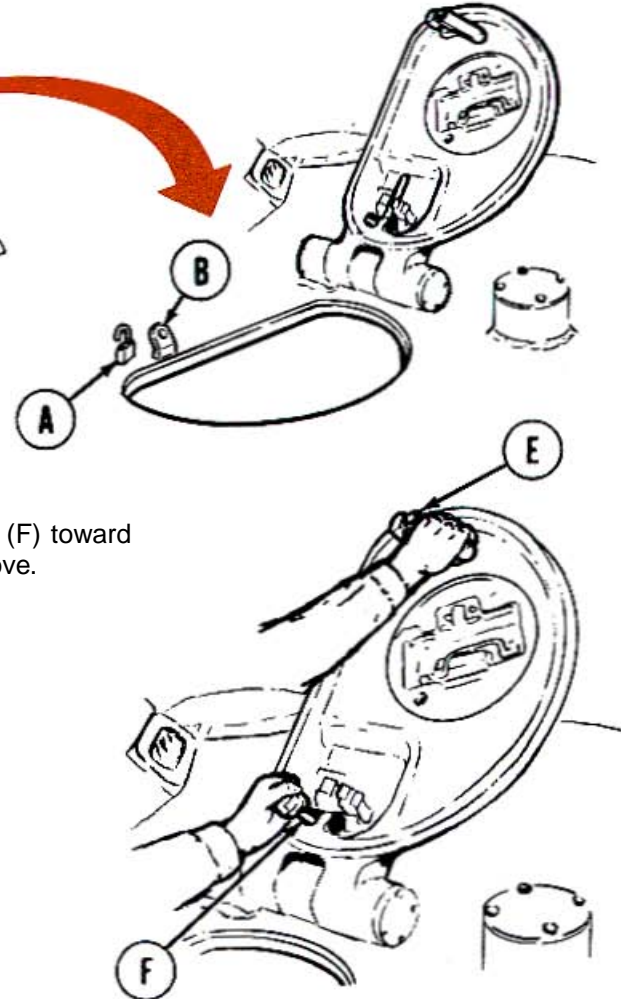
#### Make Sure:

- Hatch padlock (A) is removed from hatch eyelet (B). Do not lose padlock.
1. Stand on loader's seat (C) and turret lock (D).



2. Grasp hatch handle (E).

3. Pull hold-open lock handle (F) toward you until hatch is free to move.

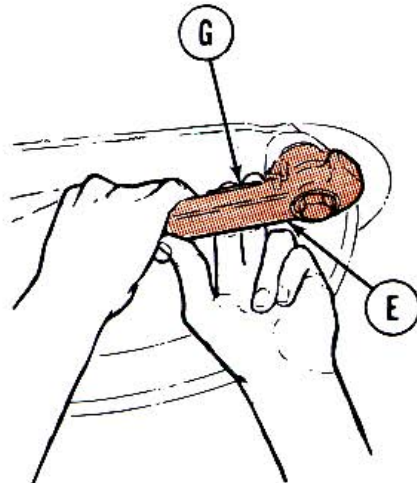


PREPARE TO OPERATE VEHICLE (PREPARE CREW STATIONS) - Continued

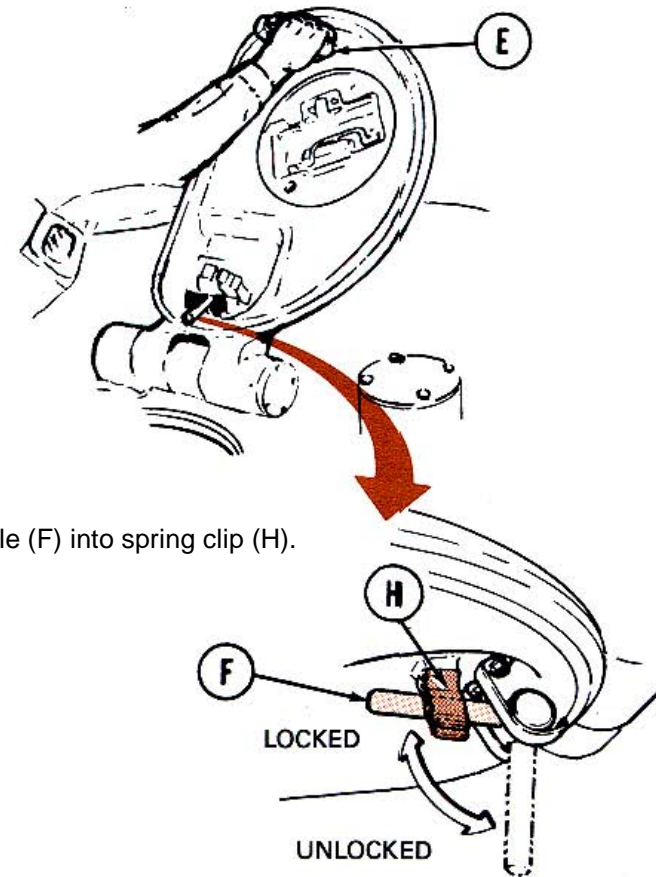
**WARNING**

**Be careful not to close hatch on your fingers**

4. Pull hatch closed with hatch handle (E).
5. Press lever (G) on hatch handle (E).
6. Rotate hatch handle clockwise to lock hatch closed.



7. Push hold-open lock handle (F) into spring clip (H).

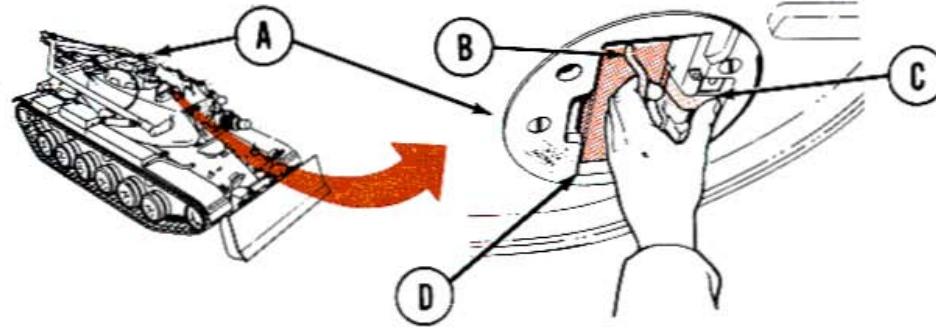


PREPARE TO OPERATE VEHICLE (PREPARE CREW STATIONS) - Continued

To Install Loader's M37 Periscope:

Make Sure:

- Vehicle is stopped.
- Loader's hatch (A) is closed and locked (page 2-154).

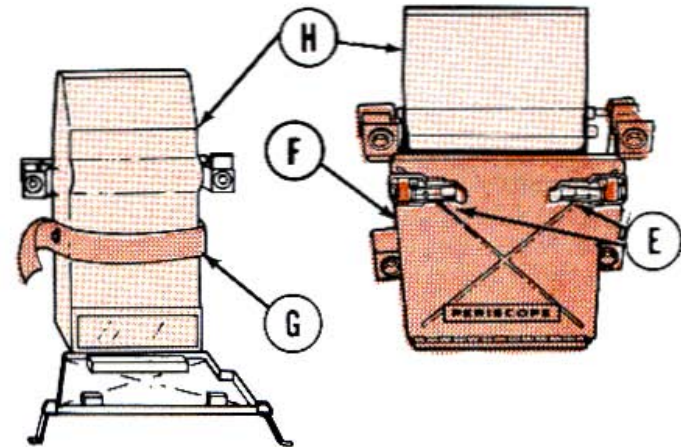
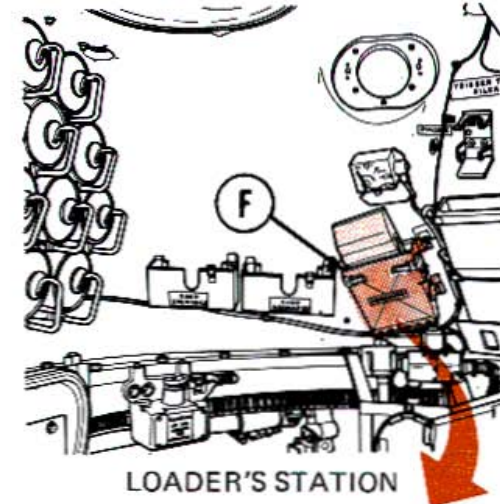


1. Pull periscope lid handle (B) down and hold. Push latch (C) to unlock periscope lid (D). Release periscope lid handle (B).

**WARNING**

**Be sure you have a firm grip on periscope (H) before unlatching cover. Periscope could fall when cover is unlatched and cause injury.**

2. Unlatch latches (E) on periscope stowage box cover (F). Unsnap strap (G) while holding periscope (H) to prevent it from falling.
3. Remove M37 periscope (H) from stowage box.





PREPARE TO OPERATE VEHICLE (PREPARE CREW STATIONS) - Continued

4. Unscrew thumbscrew (J) until threads do not show at point (K). Loosen knob (L).

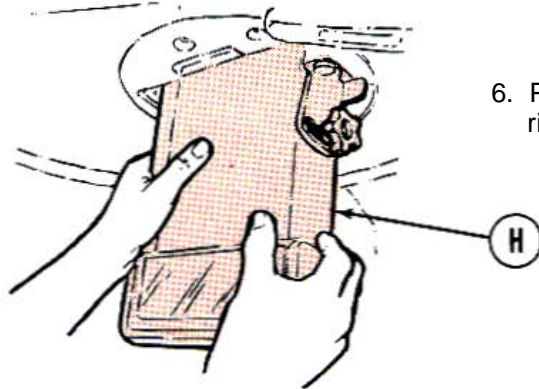
**CAUTION**

**Keep a firm grip on periscope (H) until it is locked securely in mount.**

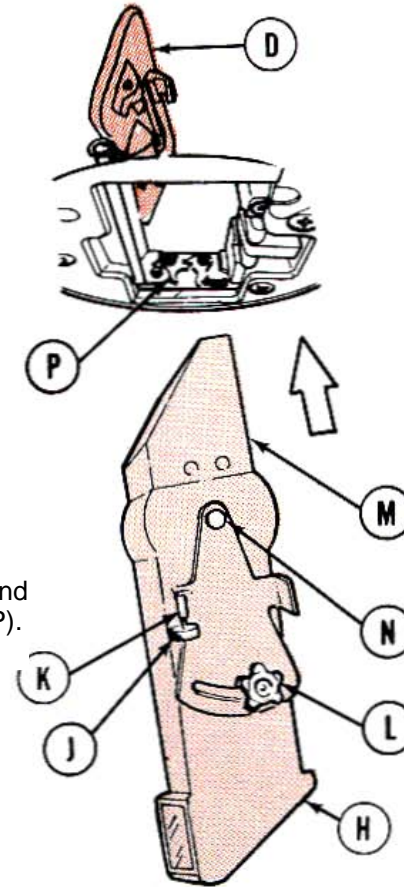
5. Lift periscope (H) carefully into mount opening. Position viewing window (M), on top of periscope, away from periscope lid (D).

**CAUTION**

**Once periscope (H) is installed, do not open loader's hatch until periscope is removed.**

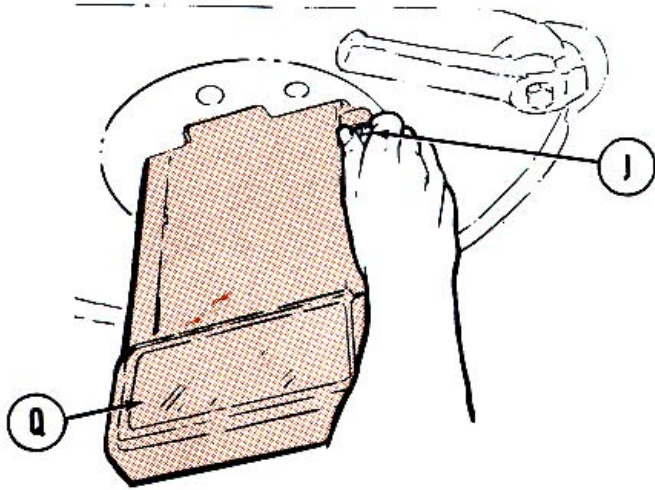


6. Push up on periscope (H) until left and right trunnions (N) are in retainers (P).

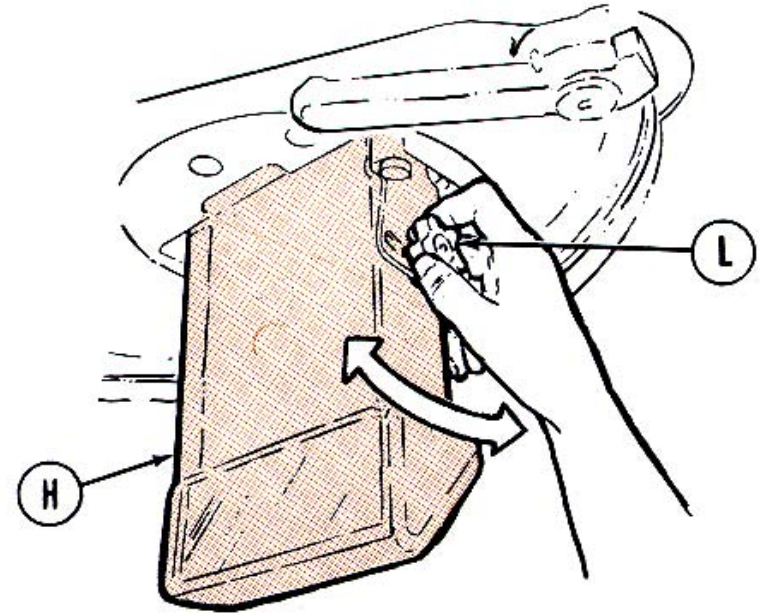


PREPARE TO OPERATE VEHICLE (PREPARE CREW STATIONS) - Continued

7. Tighten thumbscrew (J).
8. Look through periscope window (Q). Move periscope (H) as shown by arrow to get desired field of view.



9. Tighten knob (L).
10. Close and latch periscope stowage box cover.



TA132298

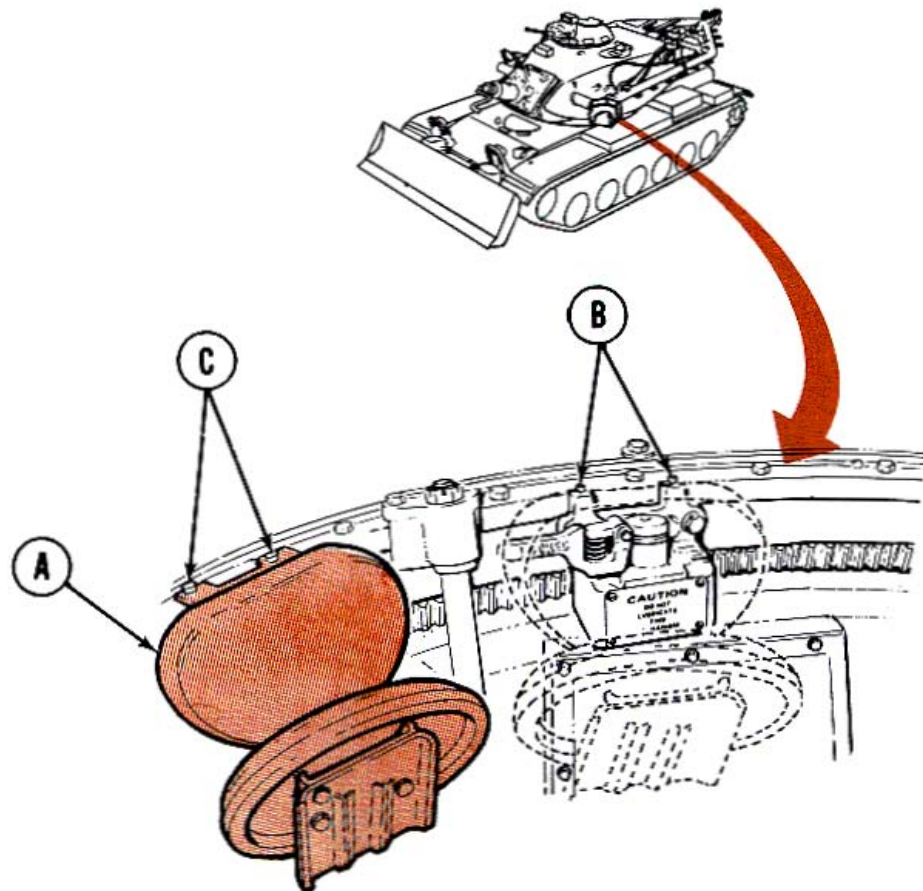
PREPARE TO OPERATE VEHICLE (PREPARE CREW STATIONS) - Continued

To Move Loader's Seat:

NOTE

Seat (A) is spring loaded to raised position and will swing up when not in use. Seat can be stowed on either pins (B) or (C).

1. Lift seat off locating pins (B) or (C).
2. Position seat on locating pins (C) or (B).



TA132299

**PREPARE TO OPERATE VEHICLE (PREPARE CREW STATIONS) - Continued**

**To Adjust Gunner's Seat:**

**Tools:**

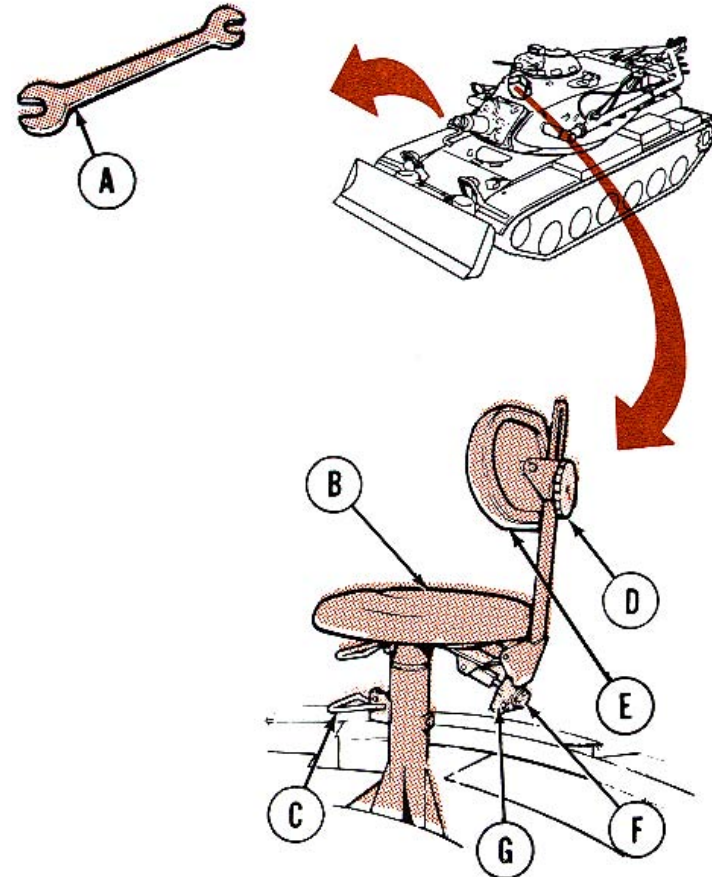
Get 9/16 inch wrench (A) from right front fender box.

1. Sit in gunner's seat (B).

**WARNING**

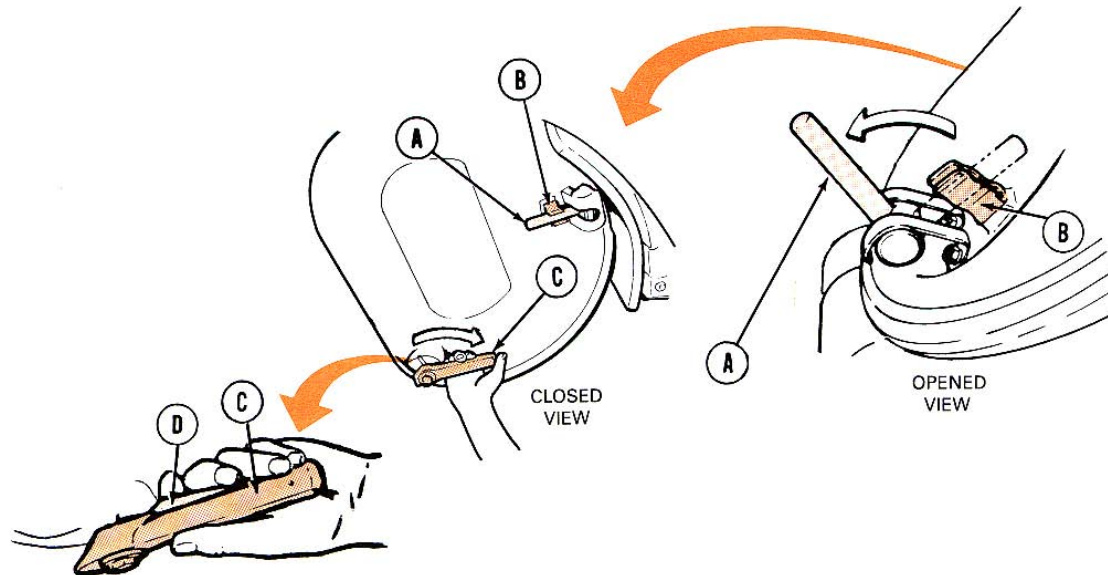
**Support your body weight slightly above seat when lifting height adjusting handle (C).**

2. Lift and hold height-adjusting handle (C) while supporting your body weight.
3. Use body weight to adjust seat height. Release handle (C).
4. Turn knob (D) counterclockwise to loosen. Move backrest (E) up or down.
5. Turn knob (D) clockwise at desired backrest position to tighten.
6. Using wrench, loosen nut (F).
7. Turn knob (G) to adjust tilt.
8. Using wrench (A), tighten nut (F).
9. Return wrench to stowage.



**PREPARE TO OPERATE VEHICLE (PREPARE CREW STATIONS) - Continued****To Close Cupola Hatch From Inside:**

1. Pull hold-open lock handle (A) out of spring clip (B) (opened view).
2. Pull hatch release handle (C) down. Swing hatch closed.



3. Squeeze plate (D) and turn handle (C) clockwise to lock hatch closed.
4. Push hold-open lock handle (A) into spring clip (B) (closed view).

TA132301

## PREPARE TO OPERATE VEHICLE (PREPARE CREW STATIONS) - Continued

**WARNING**

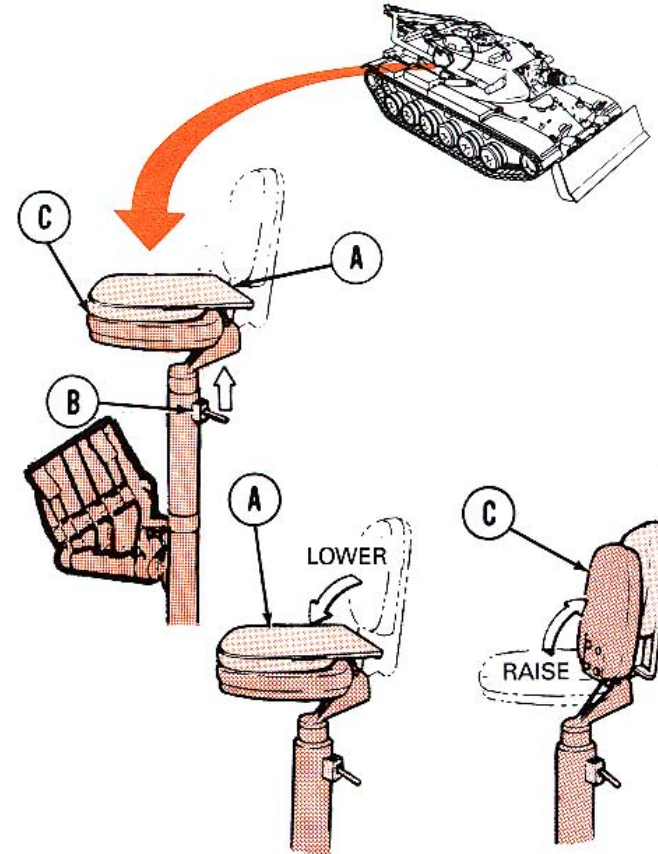
**Do not sit in seat while adjusting.**

**To Position Commander's Seat for Use:**

1. Fold backrest (A) down.
2. Push down on backrest.
3. Lift locking handle (B) with one hand and hold.
4. Raise or lower seat (C) with other hand and arm.
5. Release locking handle (B) when seat is at desired height.
6. Slightly raise or lower seat (C) until locked in position.
7. Raise backrest (A) to upright position.

**To Stow Commander's Seat:**

1. Stow seat (C) in vertical position by lifting seat against backrest (A).
2. Stow in horizontal position by lowering backrest (A) onto seat (C).



TA132302

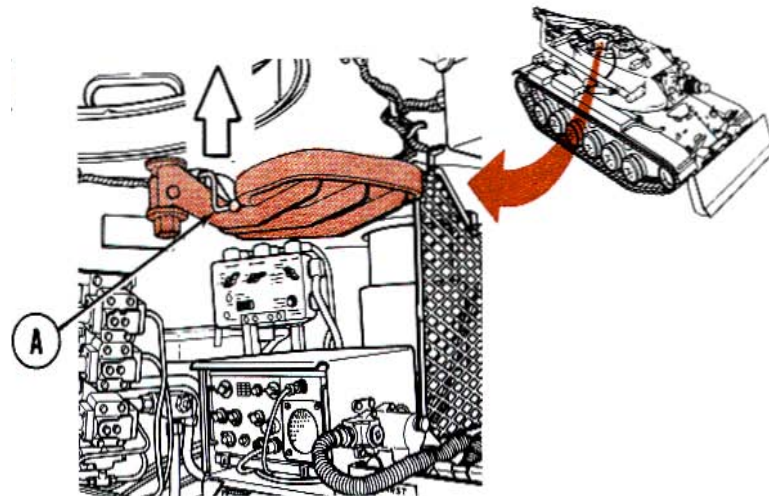
**PREPARE TO OPERATE VEHICLE (PREPARE CREW STATIONS) - Continued**

**WARNING**

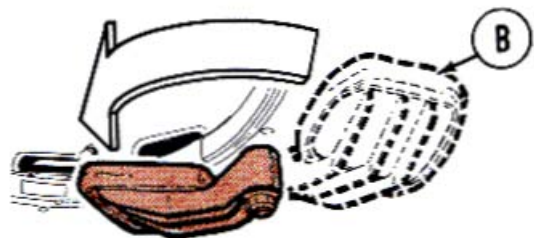
**Do not sit in seat while adjusting**

**To Position Commander's Observation Seat for Use:**

1. Raise and hold locking lever (A).



2. Swing seat (B) out from stowed position to observation position.



3. Release locking lever (A).

**To Stow Commander's Observation Seat:**

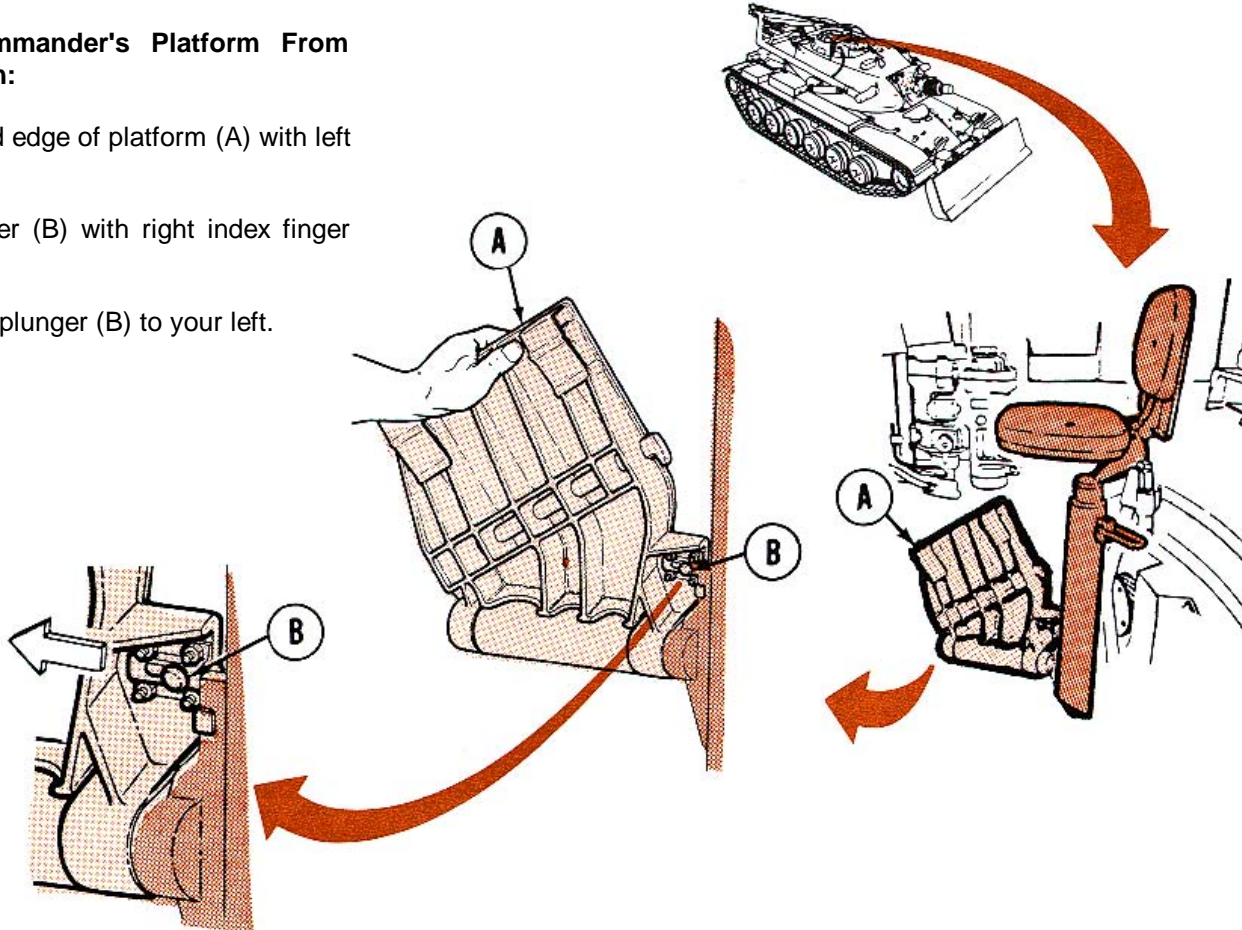
**NOTE**

**Stow seat when not in use.**

1. Raise and hold locking lever (A).
2. Push seat (B) under turret ceiling.
3. Release locking lever (A).

**PREPARE TO OPERATE VEHICLE (PREPARE CREW STATIONS) - Continued****To Lower Commander's Platform From Stowed Position:**

1. Grasp upward edge of platform (A) with left hand.
2. Grasp plunger (B) with right index finger and thumb.
3. Pull and hold plunger (B) to your left.



TA132304



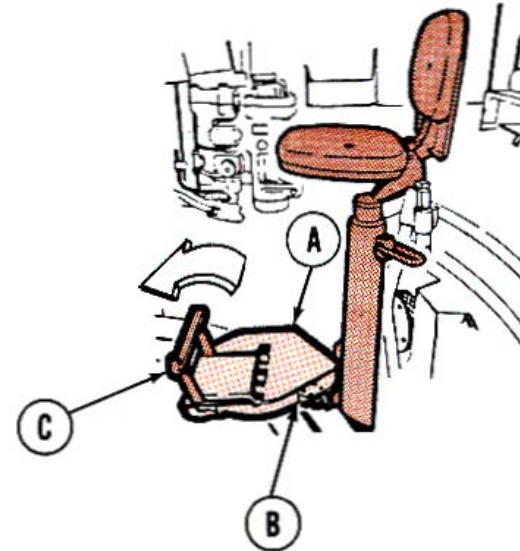
**PREPARE TO OPERATE VEHICLE (PREPARE CREW STATIONS) - Continued**

4. Lower platform (A) to full horizontal position. Release plunger (B).

**NOTE**

**Stow platform (A) in locked, vertical position when not in use. Footrest (C) must be in down position.**

5. Raise foot rest (C) up if desired.

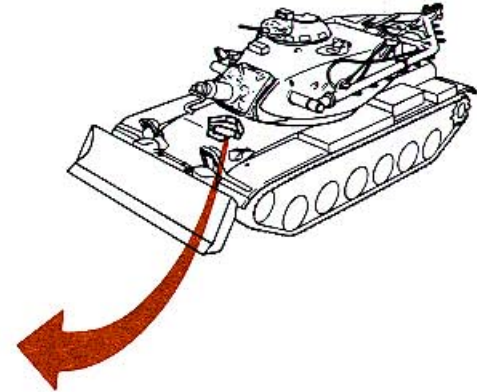
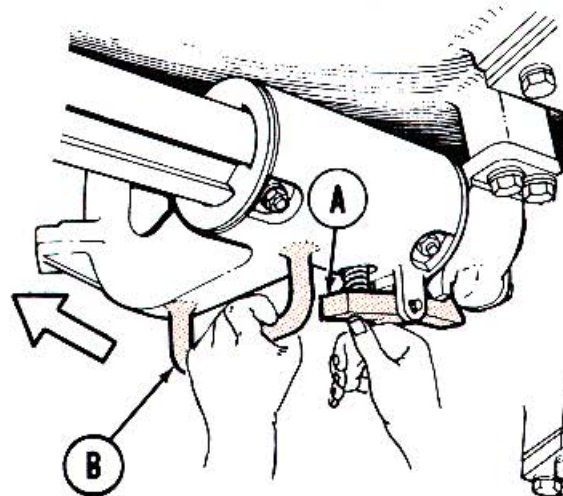
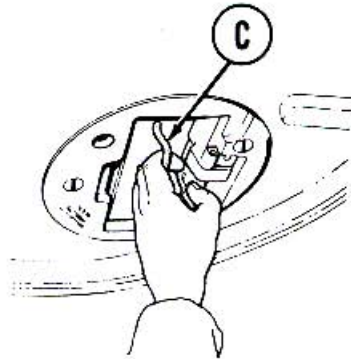
**To Stow Commander's Platform:**

1. Grasp plunger (B) with right index finger and thumb.
2. Pull and hold plunger (B) to your left.
3. Raise platform (A) to stowed position.
4. Release plunger (B).

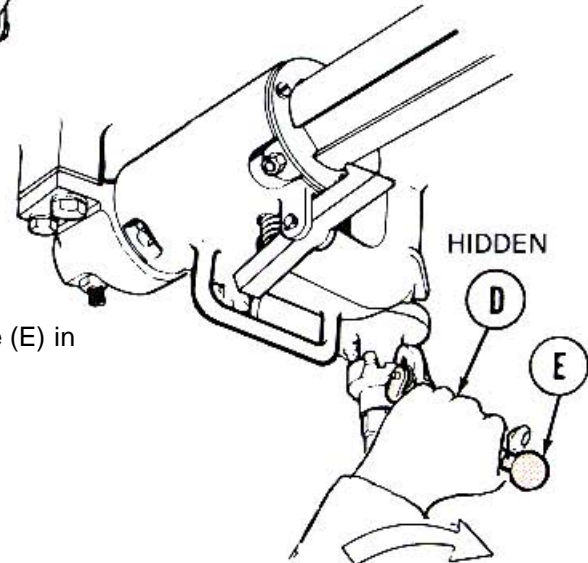
PREPARE TO OPERATE VEHICLE (PREPARE CREW STATIONS) - Continued

To Close Driver's Hatch:

1. Press up on latch (A).
2. While pressing latch, grasp handle (B) and slide hatch all the way to left.
3. Grasp lid handle (C) and pull down.



4. Squeeze latch (D) and push handle (E) in direction of arrow to lock hatch.



## PREPARE TO OPERATE VEHICLE (PREPARE CREW STATIONS) - Continued

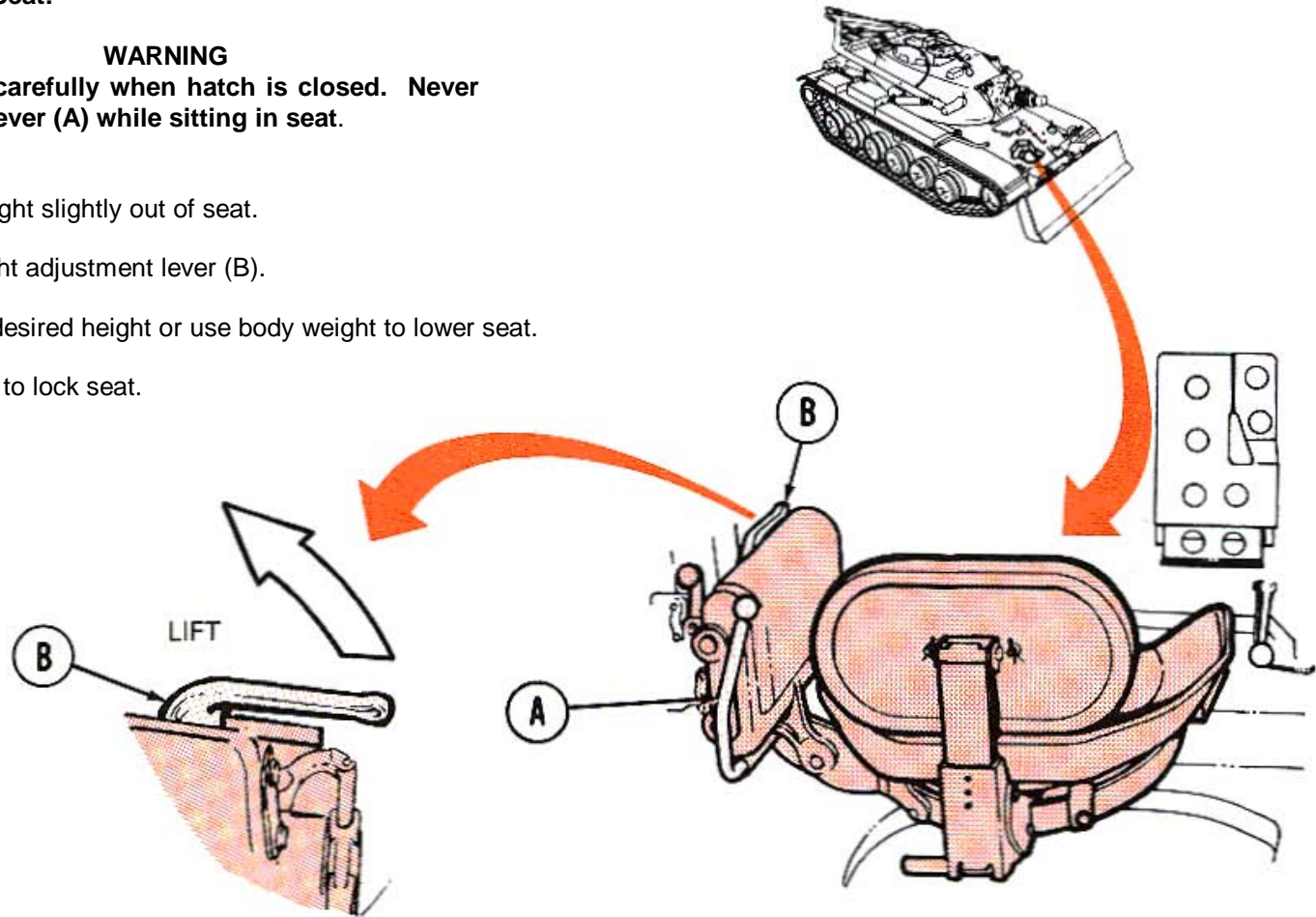
## To Adjust Driver's Seat:

**WARNING**

Raise seat carefully when hatch is closed. Never pull dump lever (A) while sitting in seat.

**Height**

1. Support body weight slightly out of seat.
2. Lift and hold height adjustment lever (B).
3. Let seat raise to desired height or use body weight to lower seat.
4. Release lever (B) to lock seat.



**PREPARE TO OPERATE VEHICLE (PREPARE CREW STATIONS) - Continued****Forward or Backward**

1. Pull handle (C) toward you. Hold.
2. Move seat forward or backward using your body weight.
3. Release handle (C) to lock seat.

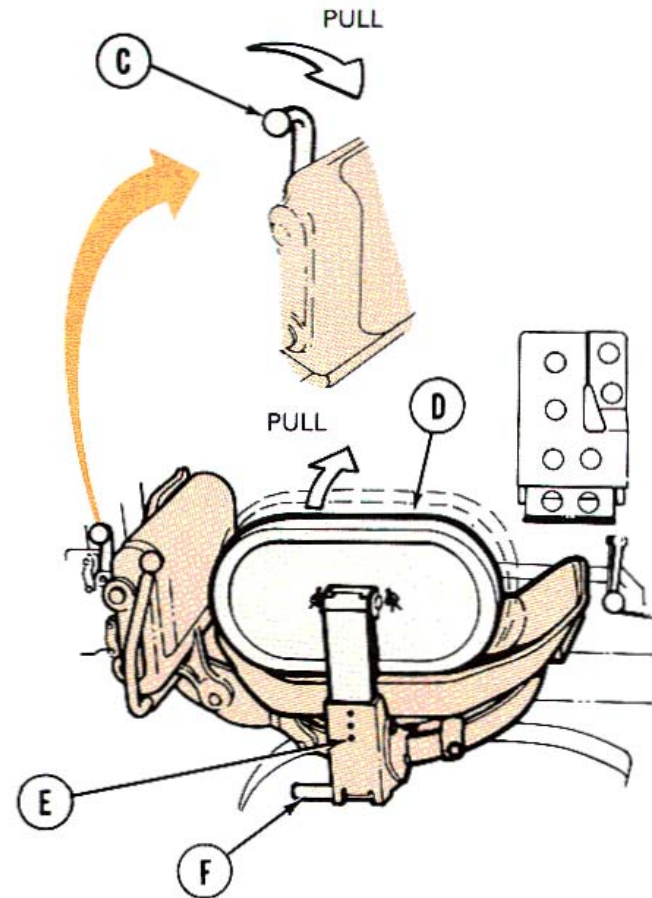
**Backrest**

1. Pull backrest (D) forward until pin is free of hole (E).
2. Move backrest up or down to desired height.

**NOTE**

**Make sure pin inserts into hole (E).**

3. Push and hold backrest tilt-lever (F) down.
4. Tilt backrest (D).
5. Release lever (F).



TA132308

**PREPARE TO OPERATE VEHICLE (PREPARE CREW STATIONS) - Continued**

**Make Sure:**

- MASTER BATTERY switch (A) is set to ON.

**CAUTION**

Never start engine with communication equipment turned on. It is recommended that engine be running to keep batteries charged while communication equipment is turned on.

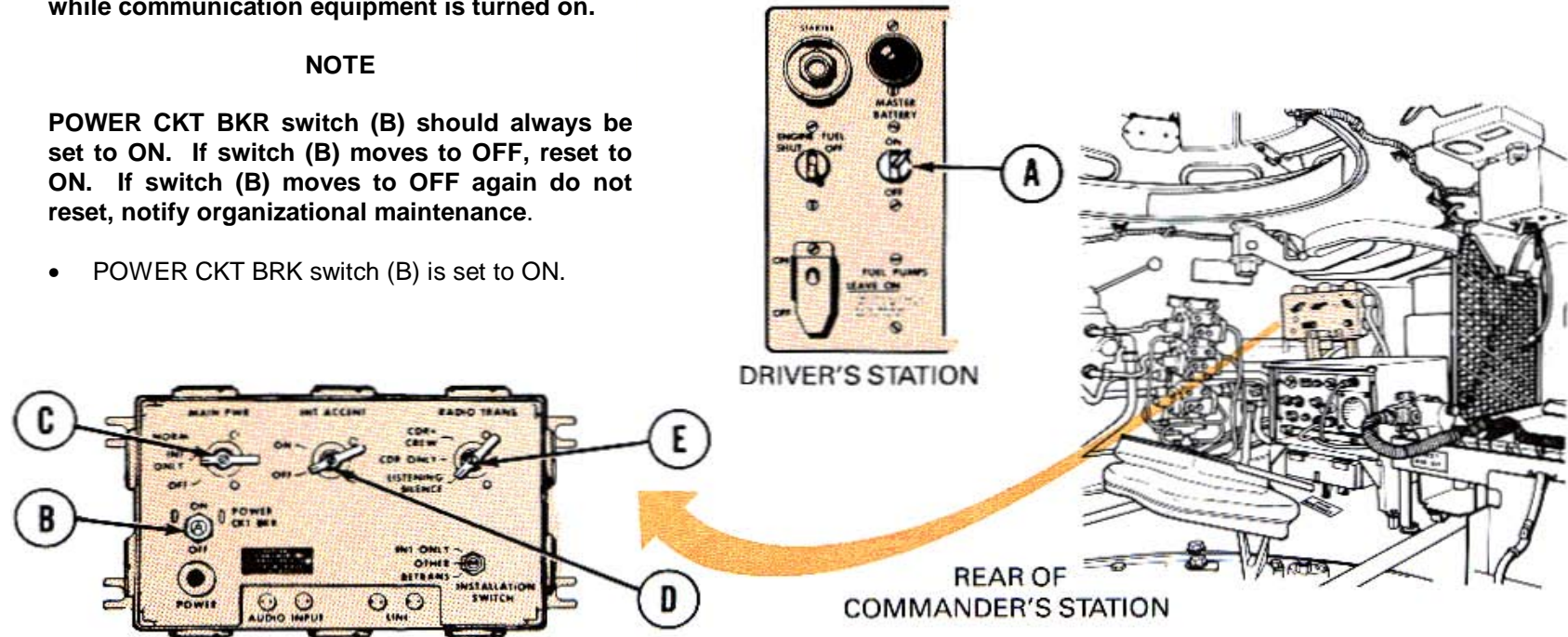
**NOTE**

POWER CKT BKR switch (B) should always be set to ON. If switch (B) moves to OFF, reset to ON. If switch (B) moves to OFF again do not reset, notify organizational maintenance.

- POWER CKT BRK switch (B) is set to ON.

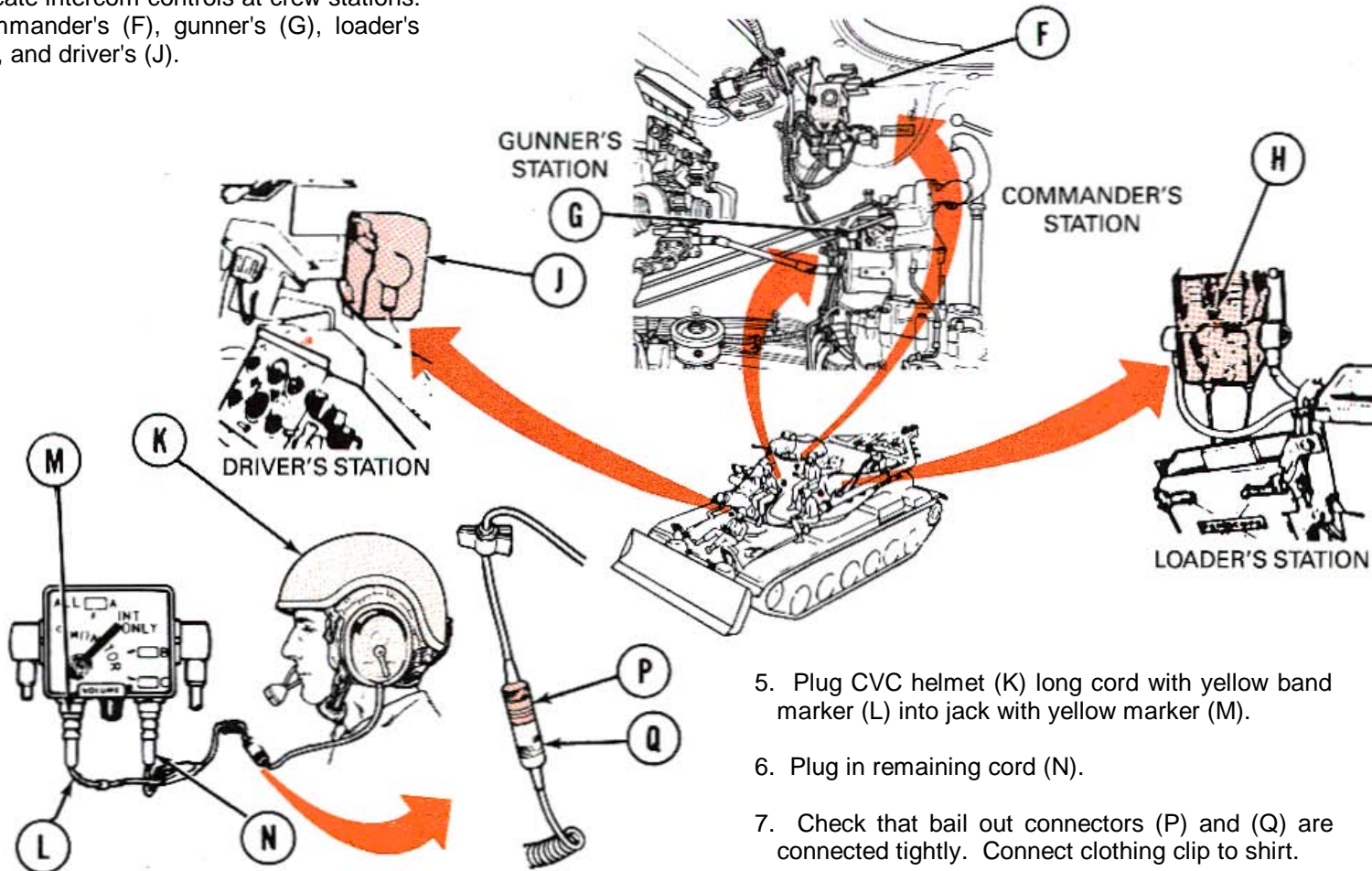
**To Turn Intercom On:**

1. Turn MAIN PWR switch (C) to INT ONLY.
2. Turn INT ACCENT switch (D) to ON or OFF as desired.
3. Turn RADIO TRANS switch (E) to LISTENING SILENCE.



**OPERATE COMMUNICATION SYSTEM (OPERATE INTERCOM) - Continued**

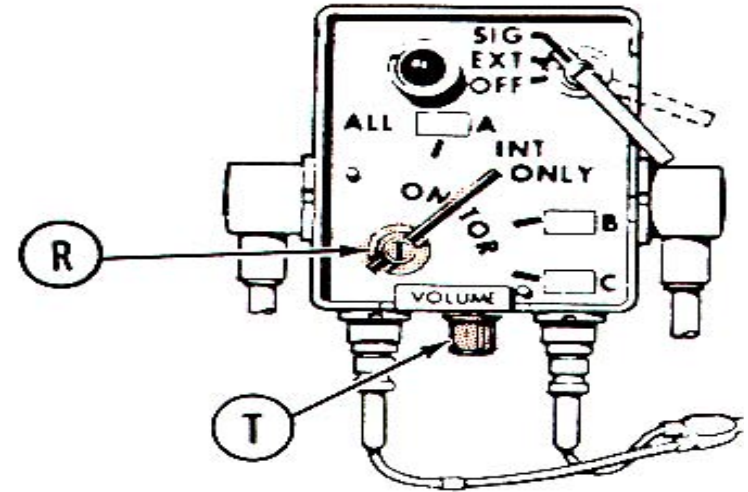
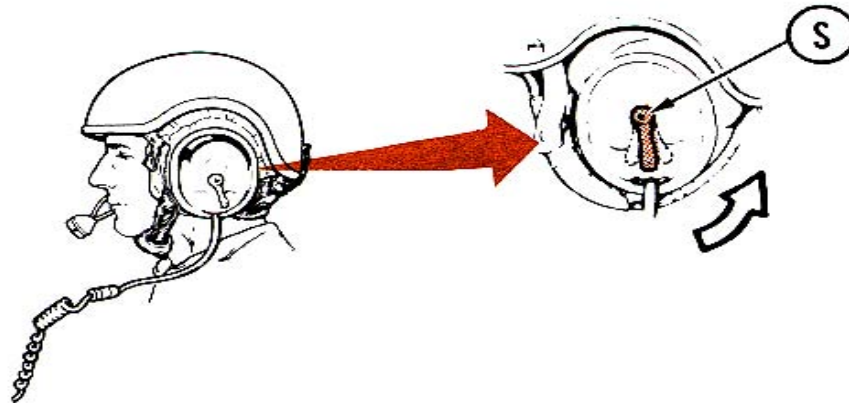
4. Locate intercom controls at crew stations: commander's (F), gunner's (G), loader's (H), and driver's (J).



5. Plug CVC helmet (K) long cord with yellow band marker (L) into jack with yellow marker (M).
6. Plug in remaining cord (N).
7. Check that bail out connectors (P) and (Q) are connected tightly. Connect clothing clip to shirt.

**OPERATE COMMUNICATION SYSTEM (OPERATE INTERCOM) - Continued**

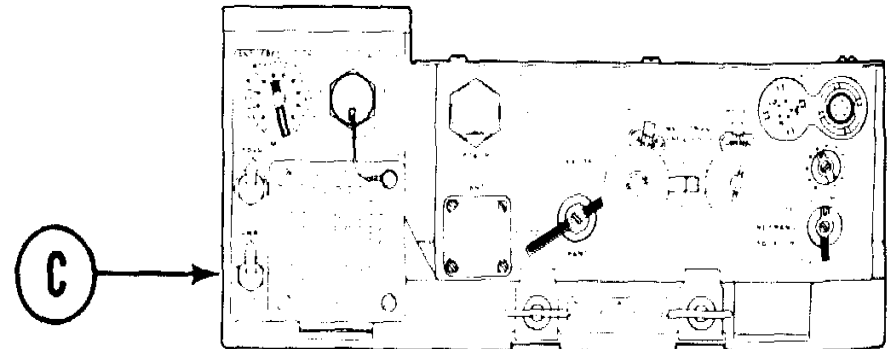
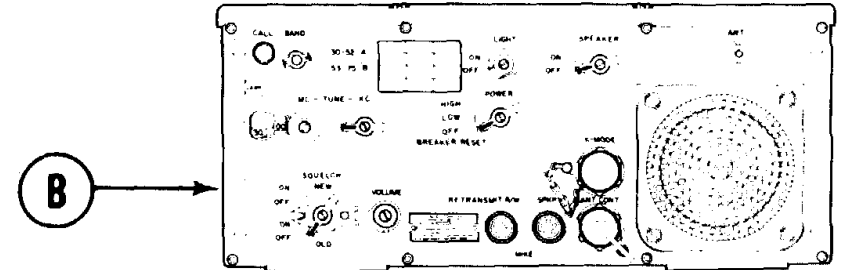
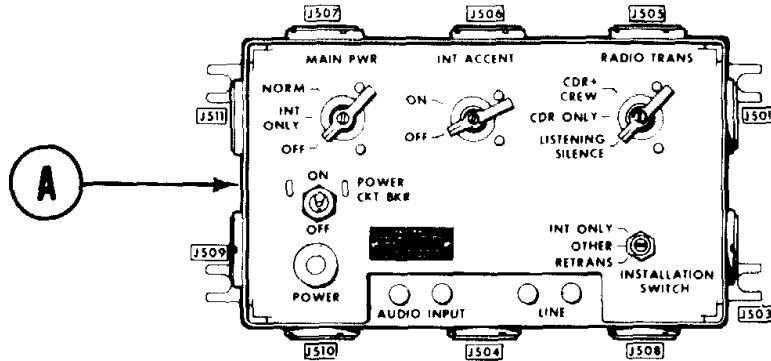
- 8 Turn MONITOR switch (R) INT ONLY.
9. Set CVC helmet switch (S) to rear, to listen and talk.
10. Turn VOLUME knob (T) until satisfied with sound level.



11. Set CVC helmet switch (S) to center if you want to listen only.

**OPERATE COMMUNICATION SYSTEM (OPERATE RECEIVER-TRANSMITTER)**

Vehicle will be equipped with one of the following radio sets. Identify your equipment from following list:



1. AN/VCR-46

- Amplifier AM-1780/VRC (A)
- Receiver Transmitter RT-524/VRC (B)

2. AN/VRC-53 and AN/VRC-64

- Amplifier AM-1780/VRC (A)
- Receiver Transmitter RT-505 (C) for AN/VRC-53 or RT-841 (C) for AN/VRC-64. These sets look and operate the same. Difference is inside.



**OPERATE COMMUNICATION SYSTEM (OPERATE RECEIVER-TRANSMITTER) - Continued**

**To Set Amplifier To Use Receiver Transmitter:  
Make Sure:**

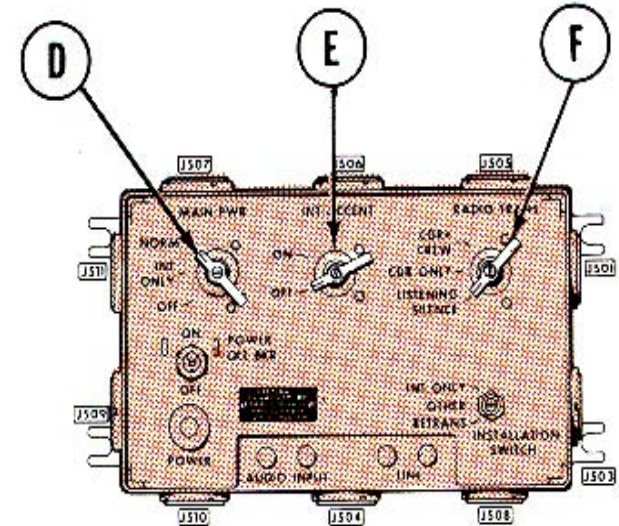
- MASTER BATTERY and POWER CKT BRK switches are set as shown on page 2-169.
  - You read and understand caution and note on page 2-169.
  - CVC helmet is plugged in (page 2-170).
1. Set MAIN PWR switch (D) to NORM.
  2. Set INT ACCENT switch (E) to ON or OFF as desired.

**NOTE**

**When INT ACCENT switch (E) is ON, volume of intercom will be louder than volume of radio.**

**When INT ACCENT switch (E) switch is OFF, volume of intercom will be the same.**

3. Set RADIO TRANS switch (F) to one of the following positions:
  - a. LISTENING SILENCE (Radio transmissions from other sources may be monitored. Radio transmission by commander and crew is impossible.)



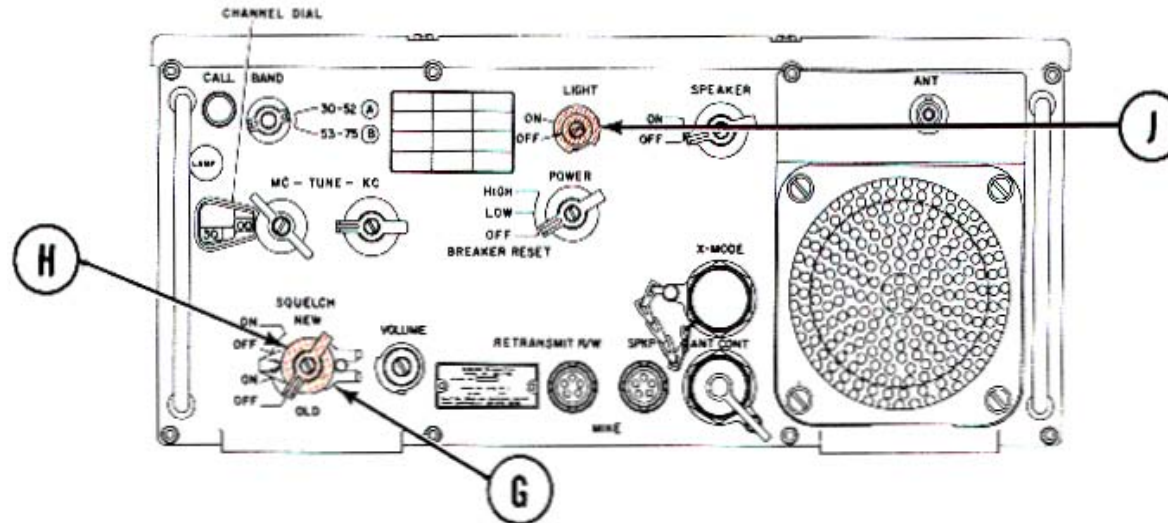
- b. CDR ONLY (Radio transmission from other sources can be monitored. Radio transmission is possible only for commander.)
- c. CDR & CREW (Radio transmission from other sources can be monitored. Radio transmission is possible for commander and any crew member.)

OPERATE COMMUNICATION SYSTEM (OPERATE RECEIVER-TRANSMITTER) - Continued

To Turn ANNRC-46 Receiver Transmitter On:

NOTE

Squelch switch latch (G) is set to keep switch in OLD or NEW setting as Authorized by commander.

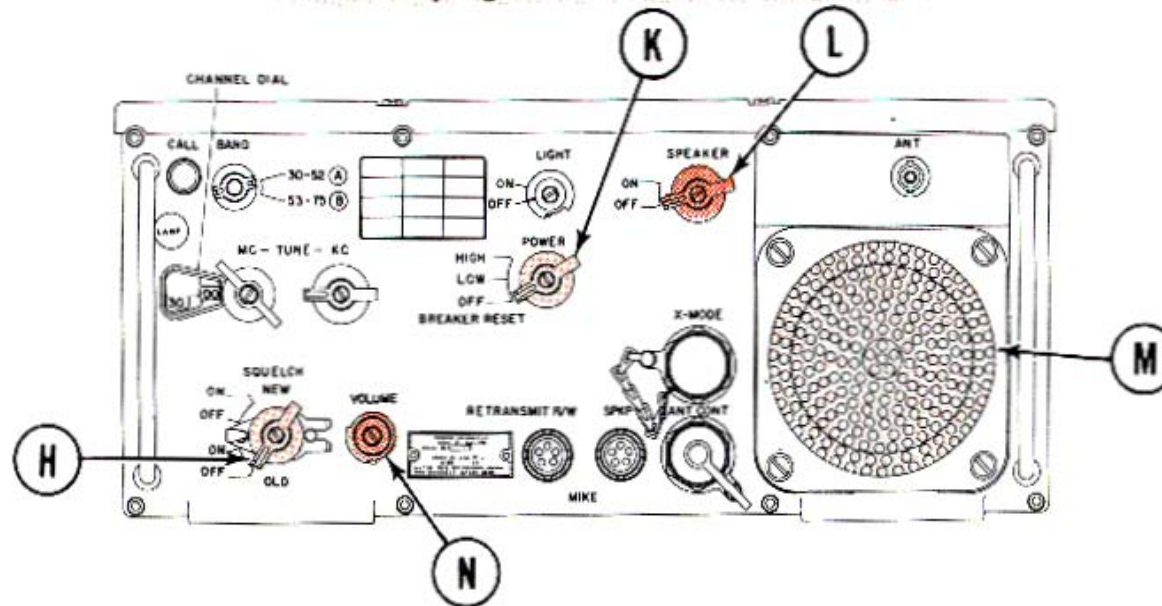


1. Set SQUELCH switch (H) to OFF.
2. Set LIGHT switch:
  - If operating under blackout conditions, set LIGHT switch (J) to OFF.
  - If operating under normal conditions, set LIGHT switch (J) to ON.

## OPERATE COMMUNICATION SYSTEM (OPERATE RECEIVER-TRANSMITTER) - Continued

## CAUTION

If POWER switch moves to OFF BREAKER-RESET, reset switch to LOW. If switch (K) moves to OFF BREAKER-SWITCH again, do not reset. Notify organizational maintenance.

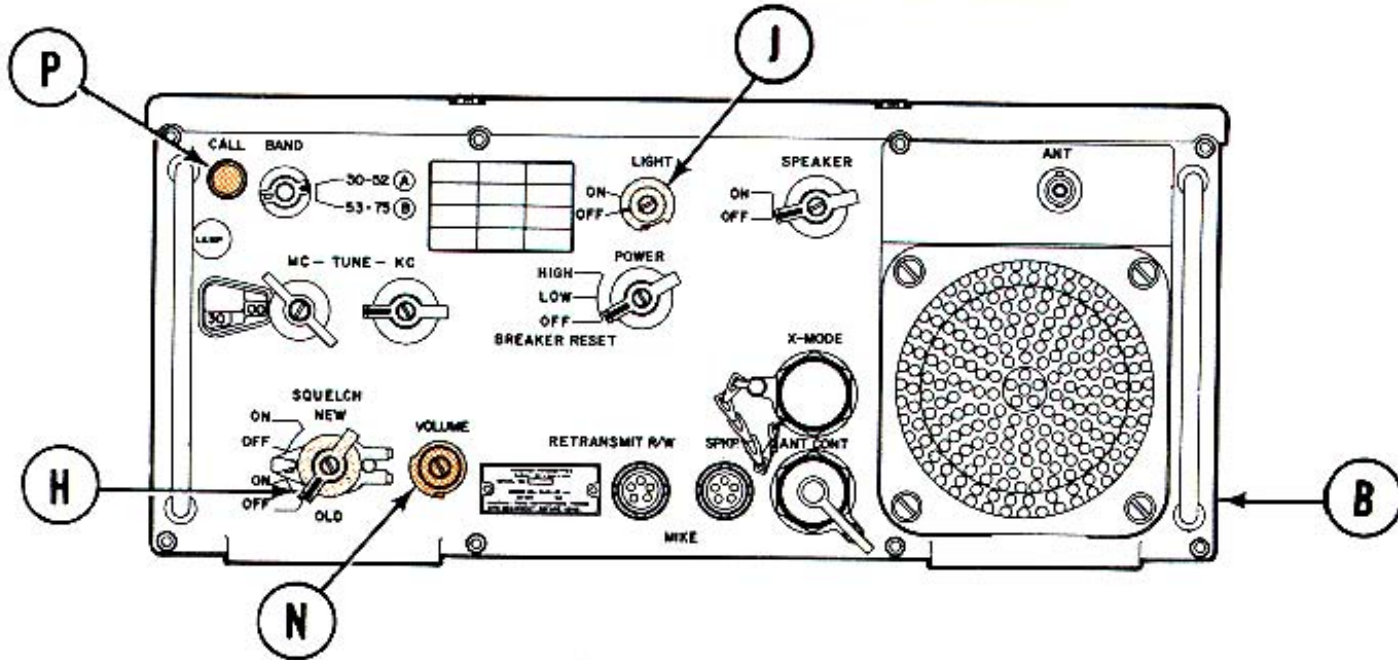


3. Set POWER switch (K) to LOW.
4. If desired, set SPEAKER switch (L) to ON. Signals received will be heard over speaker (M).
5. Adjust VOLUME control (N) until background noise is heard.
6. If squelch is to be used, set SQUELCH switch (H) to ON.
7. Tune to desired frequency using procedure described in TM 11-5820-401-10-2.

**OPERATE COMMUNICATION SYSTEM (OPERATE RECEIVER TRANSMITTER)- Continued**

**NOTE**

**LIGHT switch (J) and SQUELCH switch (H) must both be on for CALL light (P) to operate.**



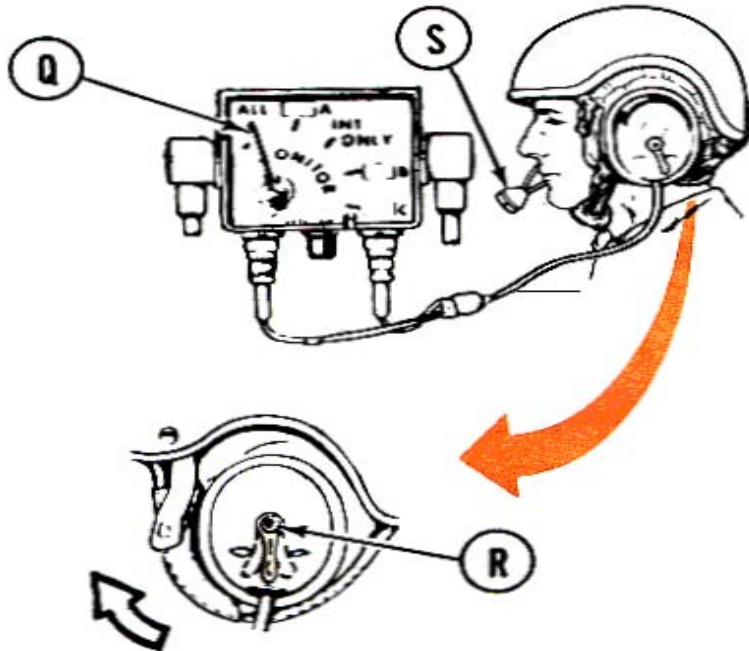
**To Receive Signals:**

1. Watch CALL light (P) and listen for incoming signals.
2. Adjust VOLUME control (N) on receiver transmitter (B) as required.

**OPERATE COMMUNICATION SYSTEM (OPERATE RECEIVER-TRANSMITTER) - Continued**

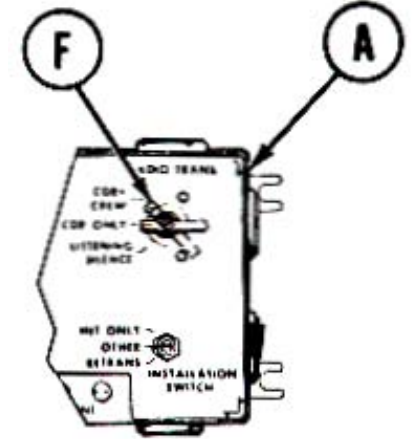
**To Transmit Signal:**

1. Set amplifier (A) RADIO TRANS switch (F) to CDR only or CDR & CREW.
2. Set intercom control switch (Q) to ALL or A.

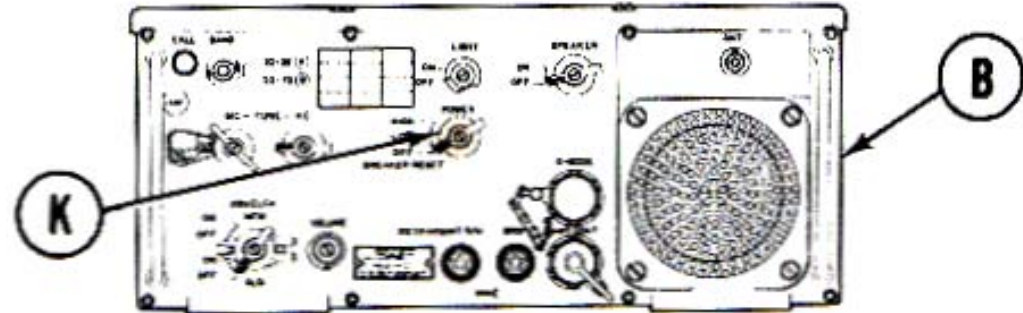


**NOTE**

When a crew member, other than commander, wishes to transmit all other crew members must have their helmet switch in the "listen" (center) position.

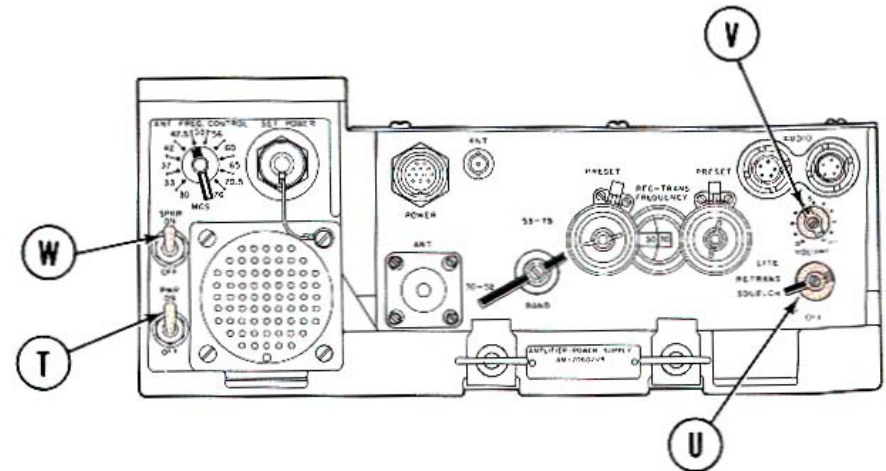


3. Press push-to-talk switch (R) forward.
4. Speak into microphone (S).
5. Release push-to-talk switch (R) to listen.
6. If required, receiver transmitter (B), POWER switch (K) may be set to HIGH. Transmitter will operate at maximum power.



**OPERATE COMMUNICATION SYSTEM (OPERATE RECEIVER-TRANSMITTER) - Continued****To turn On AN/VRC-53 or AN/VRC-64 Receiver Transmitter On:**

1. Set PWR switch (T) to ON.
2. Set function switch (U) to ON.
3. Adjust VOLUME CONTROL (V) until background noise is heard.



4. Tune to desired frequency and set antenna frequency control using procedures described in TM 11-5820-49812.
5. If squelch is to be used, set function switch (U) to SQUELCH.
6. If speaker use is desired, set SPKR switch (W) to ON. Signals received will be heard over speaker.

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**2-178 Change 1**

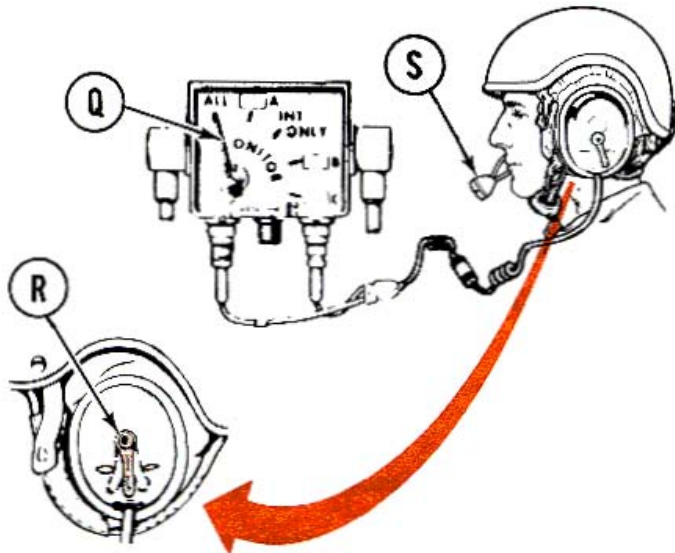
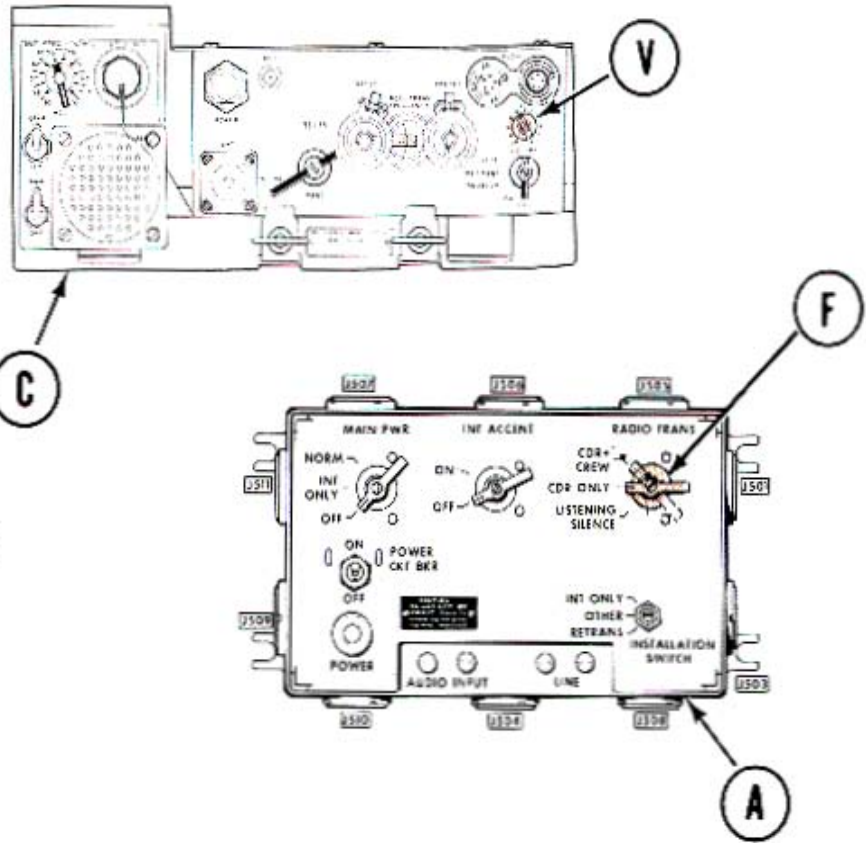
**OPERATE COMMUNICATION SYSTEM (OPERATE RECEIVER-TRANSMITTER) - Continued**

**To Receive Signals:**

1. Listen for incoming signals.
2. Adjust VOLUME control (V) on receiver transmitter (C) as required.

**To Transmit Signals:**

1. Set amplifier (A) RADIO TRANS switch (F) to CDR ONLY or CDR & CREW.



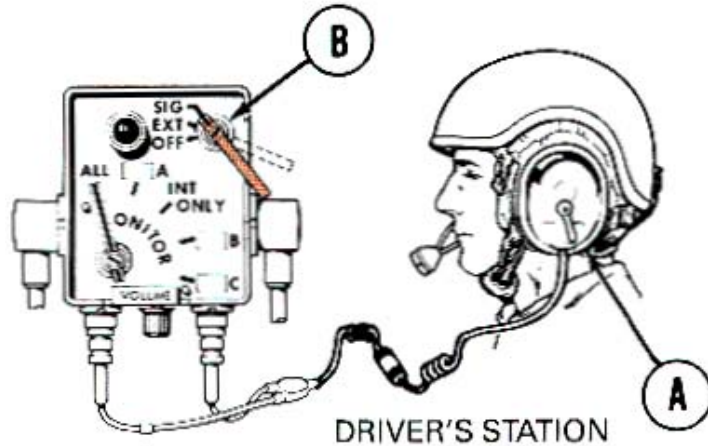
2. Set intercom control switch (Q) to ALL or A.
3. Press push-to-talk switch (R) forward.
4. Speak into microphone (S).
5. Release push-to-talk switch (R) to listen.

**OPERATE COMMUNICATION SYSTEM (OPERATE EXTERNAL HANDSET)**

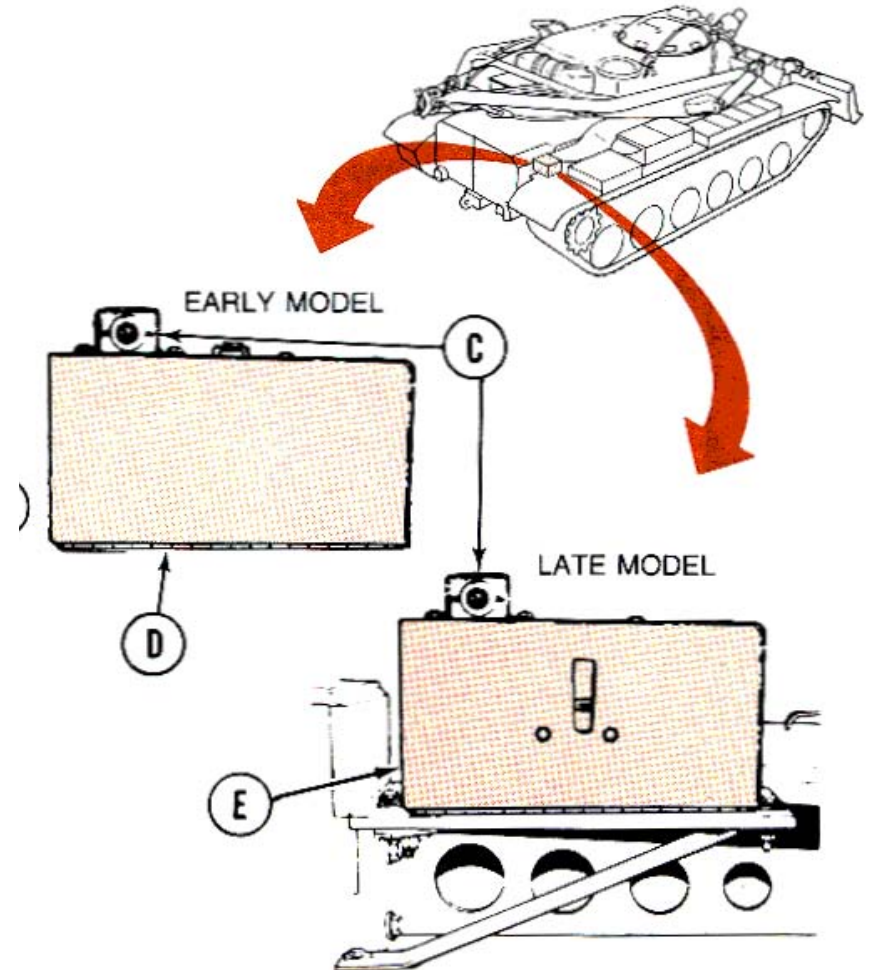
**To Signal Man Outside Vehicle From Driver's Station:**

**Make Sure:**

- Intercom is on (page 2-169).



1. Set CVC helmet switch (A) to rear position.
2. Set switch (B) to SIG and release. LIGHT (C) on external handset box (D or E) will light (blink).
3. Repeat step 2 until answer from outside of vehicle is received.

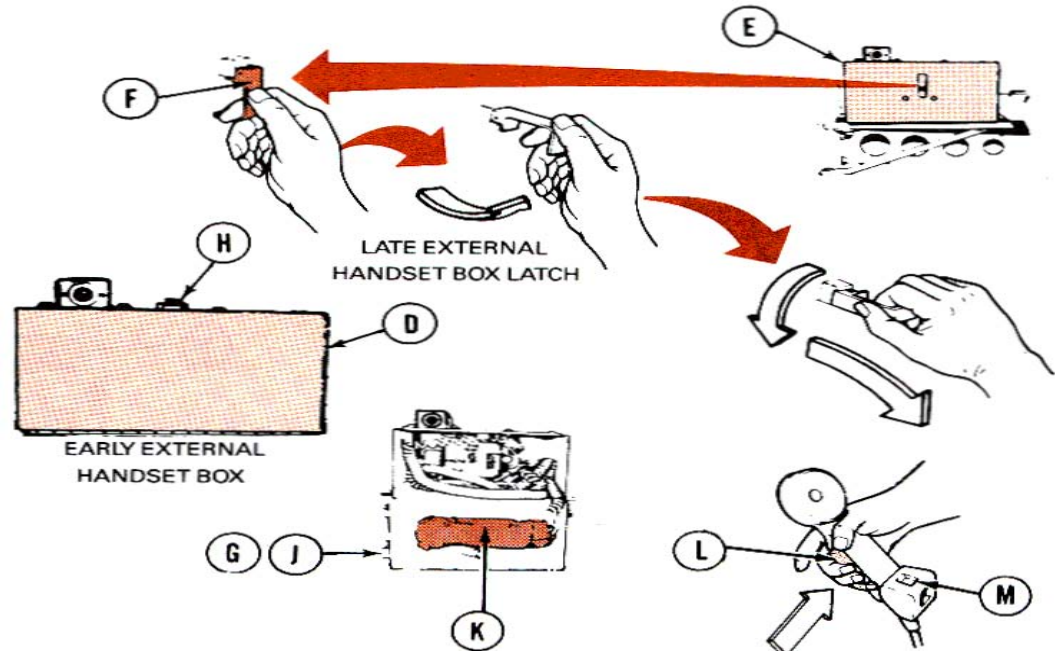




**OPERATE COMMUNICATION SYSTEM (OPERATE EXTERNAL HANDSET) - Continued**

**To Answer Driver From Outside:**

1. Open late model external handset box (E).
  - a. Lift latch (F) and twist.
  - b. Pull door (G) open.
2. Open early model external handset box (D).
  - a. Open latch (H).
  - b. Pull door (J) open.
3. Pull handset (K) from door.
4. Push push-to-talk switch (L) while speaking into mouthpiece (M) of handset.
5. Release push-to-talk switch (L) to listen.

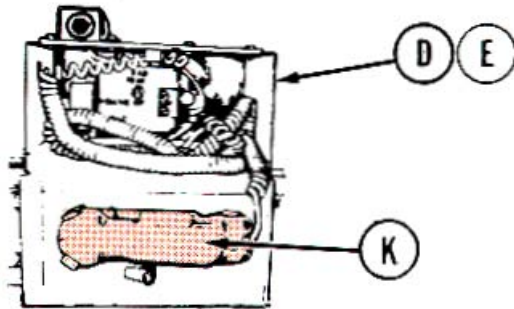


**OPERATE COMMUNICATION SYSTEM (OPERATE EXTERNAL HANDSET) - Continued**

**To Signal Driver From Outside:**

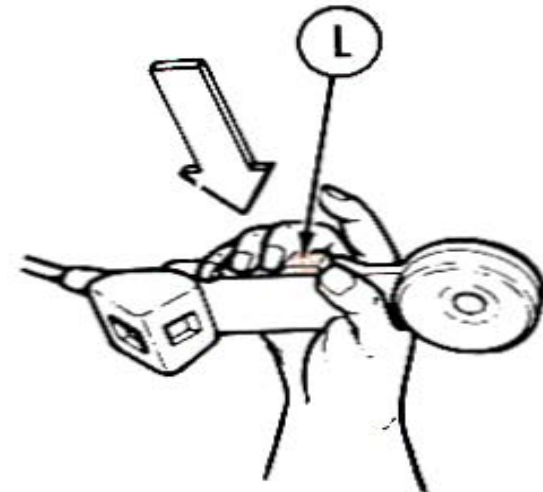
**Make Sure:**

- Intercom is on (page 2-169).



1. Open external handset box (D or E).
2. Remove handset (K) from door

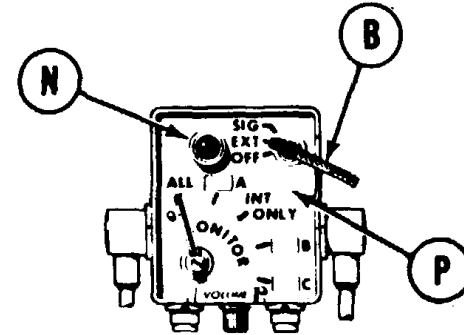
3. Press push-to-talk switch (L) and release. Listen for answer.
4. Press push-to-talk switch (L) to speak. Release switch (L) to listen.



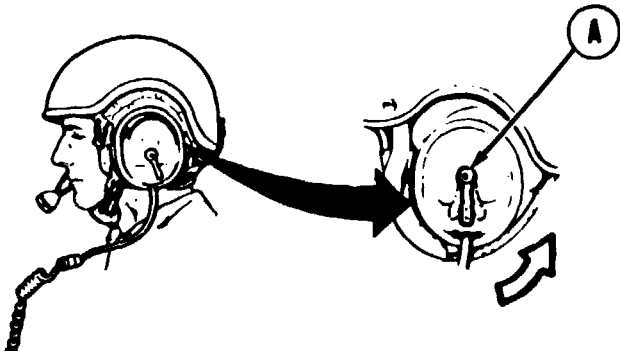
**OPERATE COMMUNICATION SYSTEM (OPERATE EXTERNAL HANDSET) - Continued**

**To Answer Outside Signal, From Inside:**

1. When light (N) on driver's intercom control box (P).lights.
  - a. Set switch (B) to EXT.



- b. Set CVC helmet switch (A) to rear and talk.



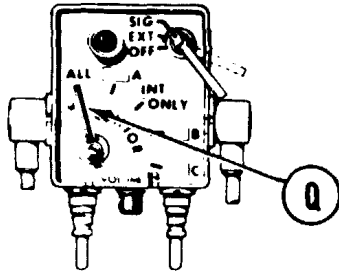
OPERATE COMMUNICATIONS SYSTEM (OPERATE EXTERNAL HANDSET) Continued

To Transmit Over Radio From Outside:

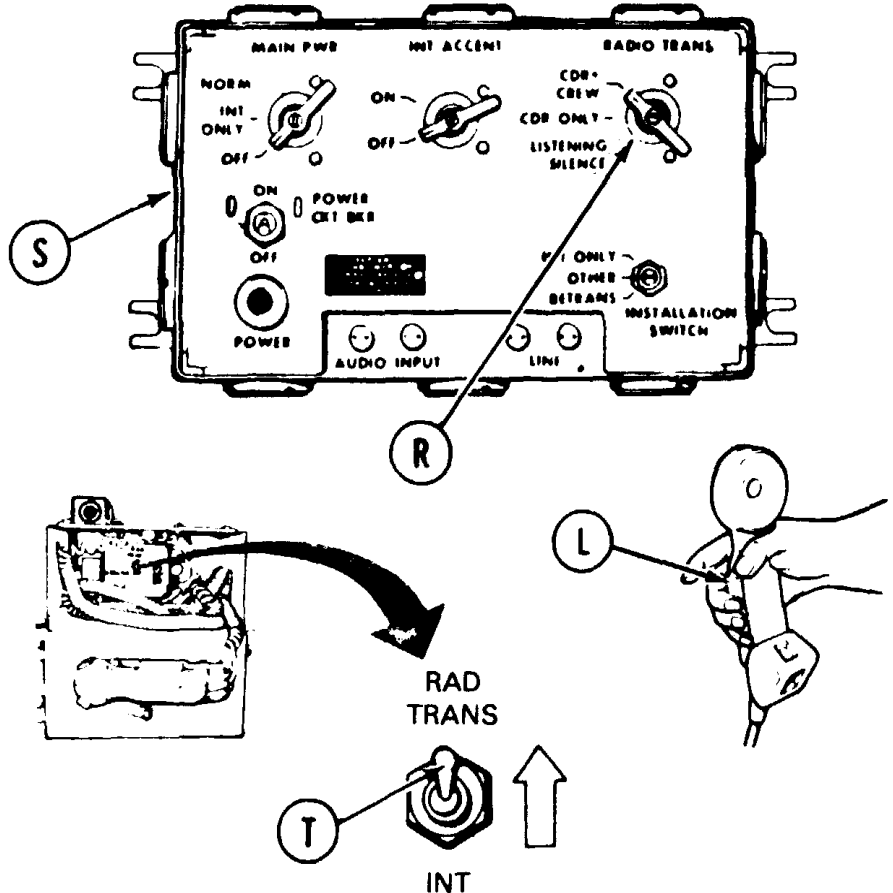
NOTE

All crew members must have their helmet switches in the listen (center) position.

1. Signal driver (page 2-182).
2. Tell driver to set monitor switch (Q) to ALL or A.



3. Make sure radio is turned on:
  - AN/VRC-46 (page 2-174).
  - AN/VRC-53 or 64 (page 2-178).
4. Commander set RADIO TRANS switch (R) on amplifier (S) to CDR & CREW.
5. Push push-to-talk switch (L) and hold. Push switch (T) to RAD TRANS to transmit over radio. Release push-to-talk switch (L) to listen.



**OPERATE COMMUNICATION SYSTEM (OPERATE EXTERNAL HANDSET,) - Continued**

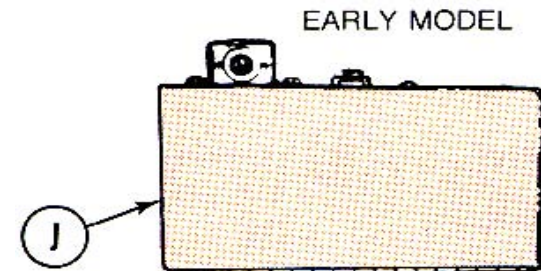
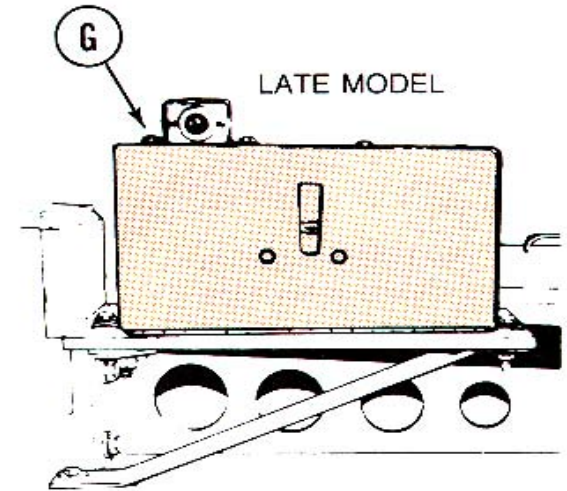
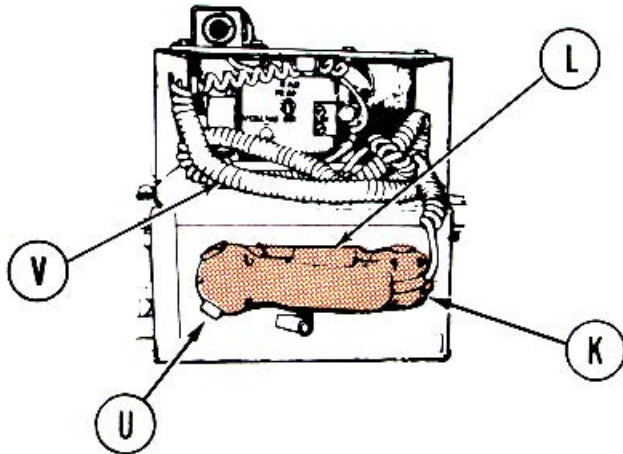
**To Stow External Handset:**

1. Replace handset (K) in clips (U).

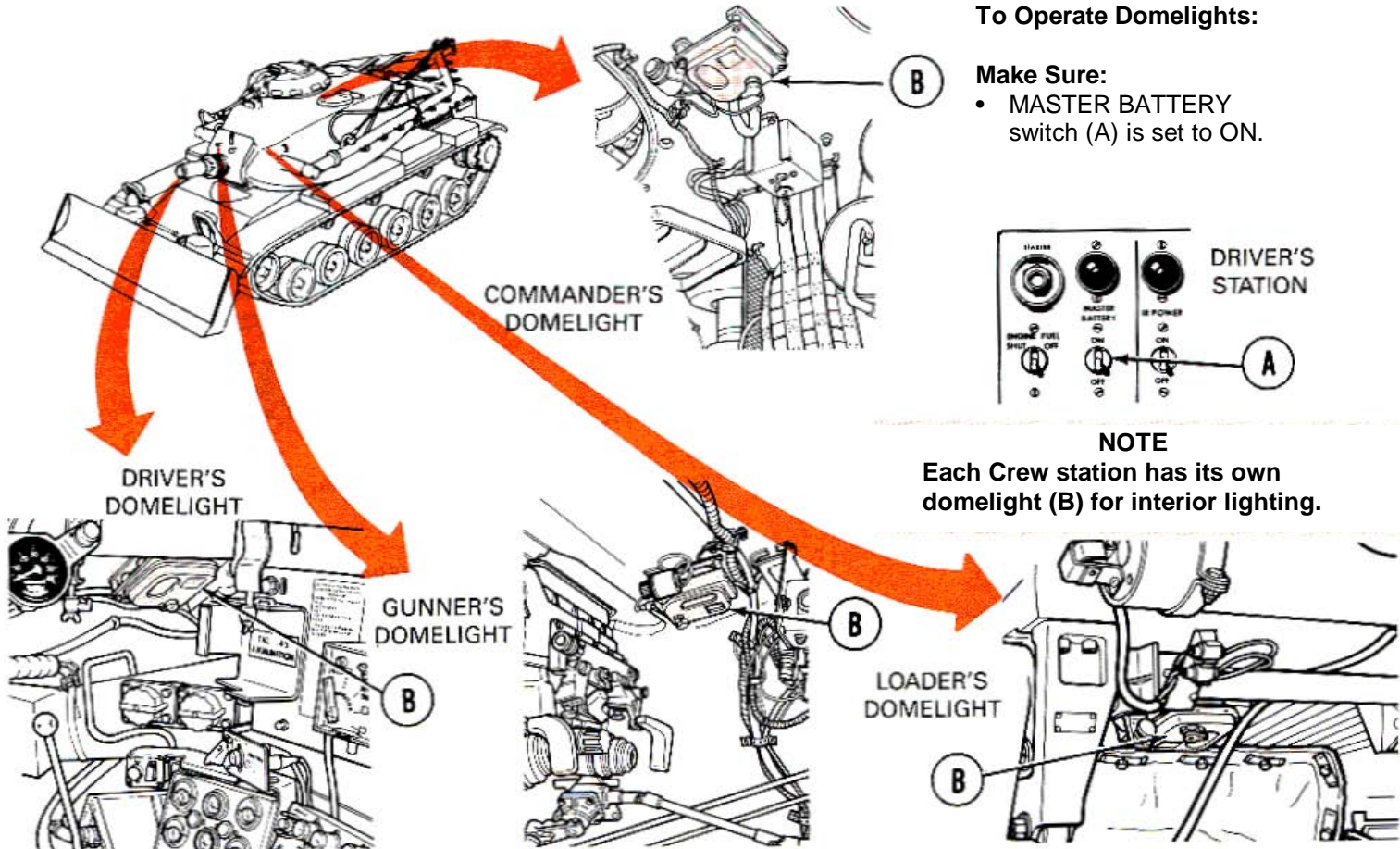
**NOTE**

Stow handset cord (V) so it does not press push-to-talk switch (L) when door (G or J) is closed.

2. Close and latch door (G or J).



DRIVE THE VEHICLE (OPERATE VEHICLE LIGHTS)



To Operate Domelights:

Make Sure:

- MASTER BATTERY switch (A) is set to ON.

**DRIVE THE VEHICLE (OPERATE VEHICLE LIGHTS) - Continued**

**To Turn Blue Domelight On:**

1. Rotate domelight switch knob (C) toward blue lens (D).
2. Rotate rheostat knob (E) to adjust to desired brightness.

**To Turn Blue Domelight Off:**

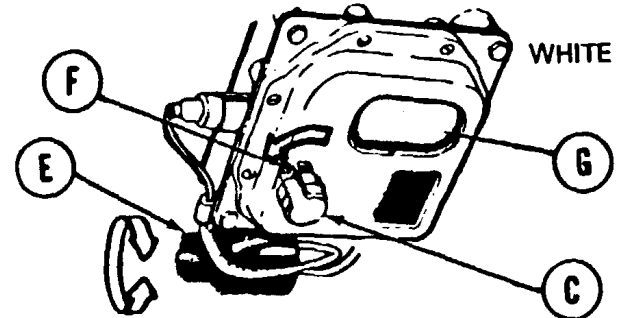
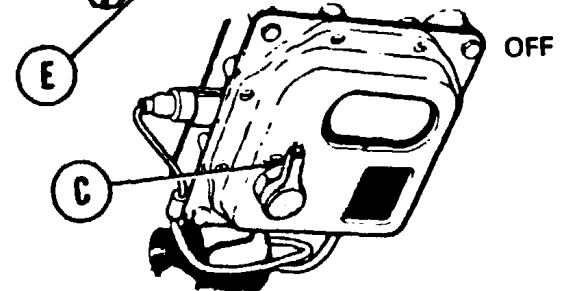
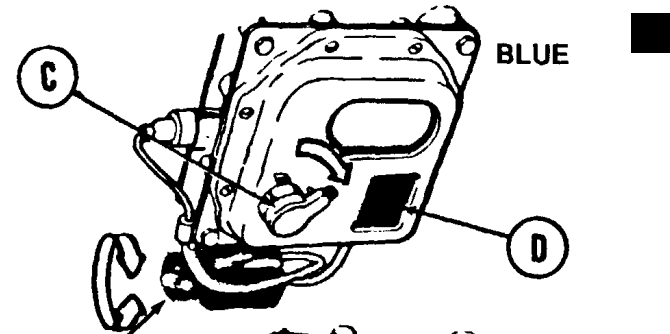
- Rotate knob (C) back to center or stop position.

**To Turn White Domelight On:**

1. Push in and hold plunger (F). Rotate knob (C) away from white lens (G). Release plunger.
2. Rotate rheostat knob (E) to adjust to desired brightness.

**To Turn White Domelight Off:**

- Rotate knob (C) back to center or stop position.



**DRIVE THE VEHICLE (OPERATE VEHICLE LIGHTS) - Continued**

**To Turn Panel Lights On:**

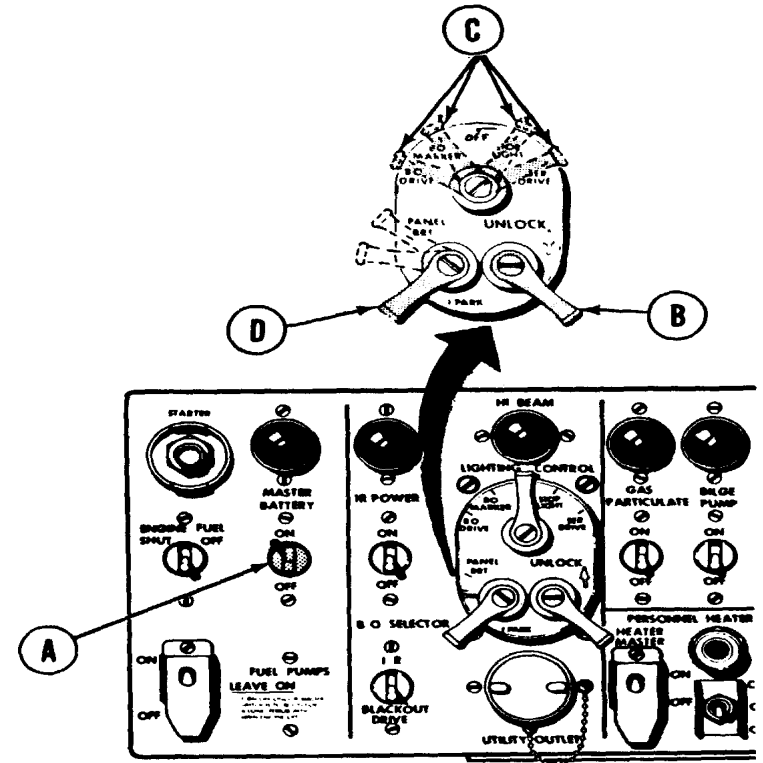
**NOTE**

Panel lights allow easy reading of driver's instruments in darkness without using dome-light MASTER BATTERY switch (A) must be ON.

1. Lift up and hold UNLOCK lever (B).
2. Set LIGHTING CONTROL lever (C) to one of four on positions shown.
3. Release UNLOCK lever (B).
4. Set PANEL switch lever (D) to either DIM or BRT (bright) as required.

**To Turn Panel Lights Off:**

1. If outside lights are still required, set PANEL switch lever (D) to OFF. Only panel lights go off.
2. Set LIGHTING CONTROL lever (C) to OFF. Both panel lights and outside lights go off.



**DRIVER'S STATION**



## DRIVE THE VEHICLE (OPERATE VEHICLE LIGHTS) - Continued

## To Turn Parking Light On:

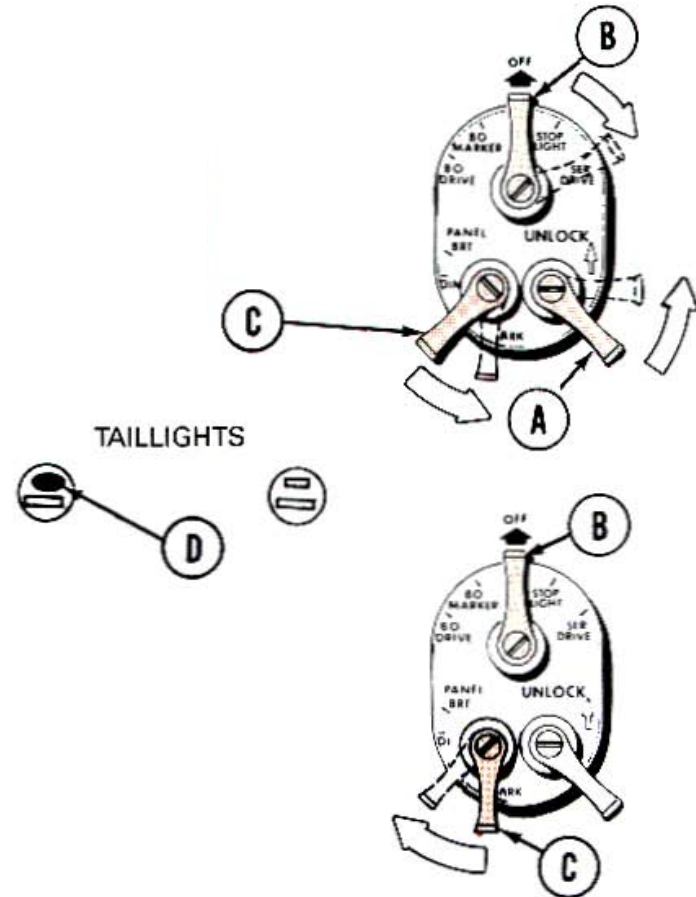
## NOTE

Parking light is used to show position of vehicle when parked. MASTER BATTERY switch must be ON.

1. Lift up and hold UNLOCK lever (A).
2. Set LIGHTING CONTROL lever (B) to SER DRIVE.
3. Set PANEL lever (C) to PARK.
4. Release UNLOCK lever (A). Taillight (D) will light.

## To Turn Parking Light Off:

1. Set PANEL switch lever (C) to OFF.
2. Set LIGHTING CONTROL lever (B) to OFF.



**DRIVE THE VEHICLE (OPERATE VEHICLE LIGHTS) - Continued**

**To Turn Service Drive Lights On:**

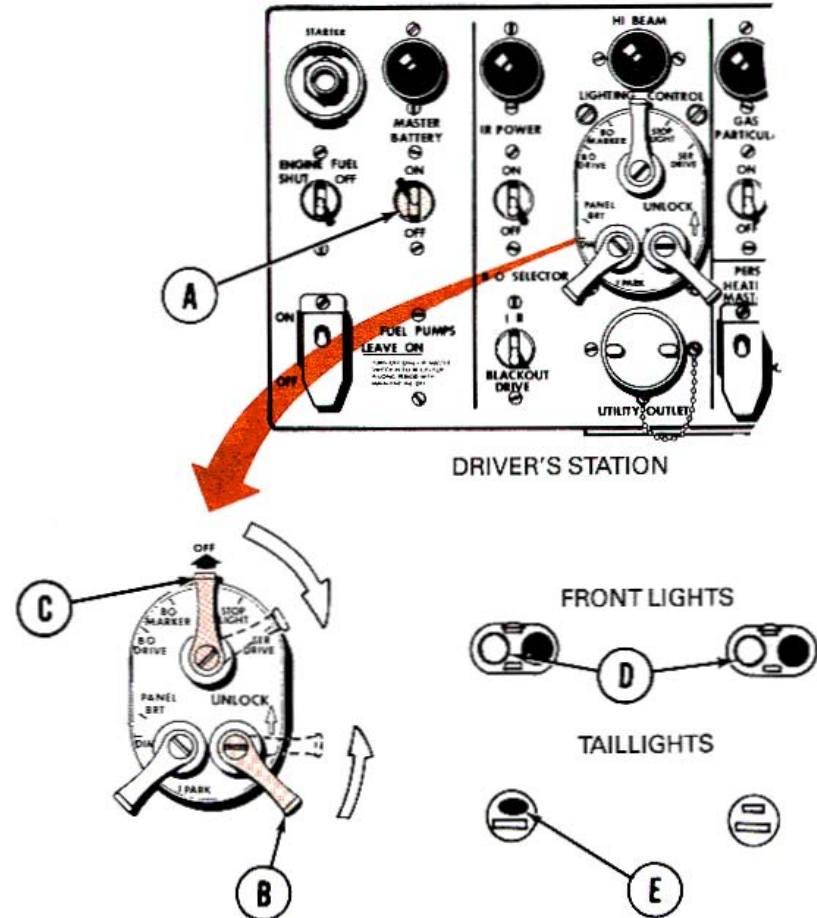
**Make Sure:**

- Vehicle headlights are installed, (page 2-148).
- MASTER BATTERY switch (A) is set to ON.

**NOTE**

**Service drive lights produce visible light and are used for normal night driving in secure areas. Night vision devices are not necessary when using service drive lights.**

1. Lift up and hold UNLOCK lever (B).
2. Set LIGHTING CONTROL lever (C) to SER DRIVE.
3. Release lever (B). Service headlights (D) and taillight (E) will light. Service stoplight (E) will light when brakes are applied.

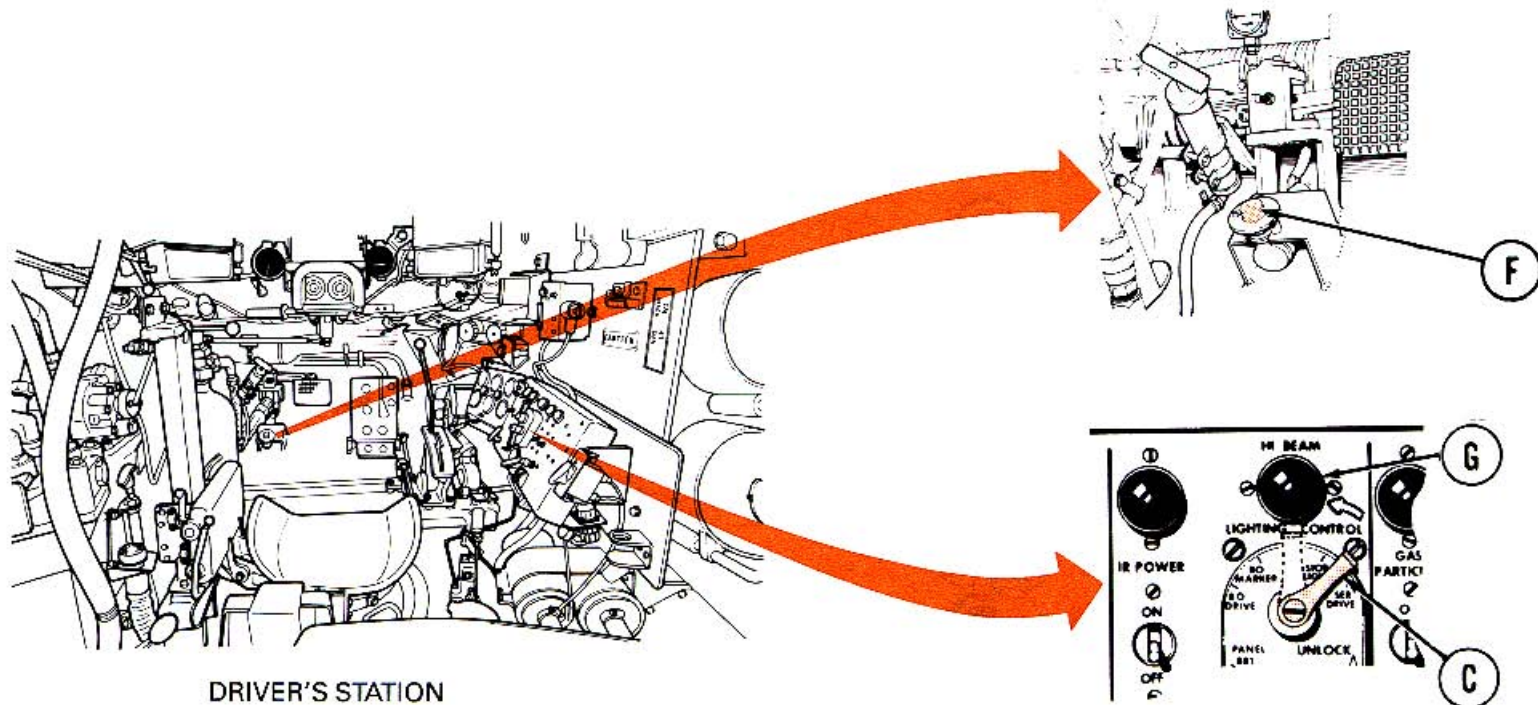


**DRIVE THE VEHICLE (OPERATE VEHICLE LIGHTS) - Continued**

4. Push and release DIMMER SWITCH (F) with foot to choose high or low headlight beam. HI BEAM indicator light (G) will light when high beam is on.

**To Turn Service Drive Lights Off:**

- Set LIGHTING CONTROL lever (C) to OFF.



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**DRIVE THE VEHICLE (OPERATE VEHICLE LIGHTS) - Continued**

**To Turn Service Stoplight On:**

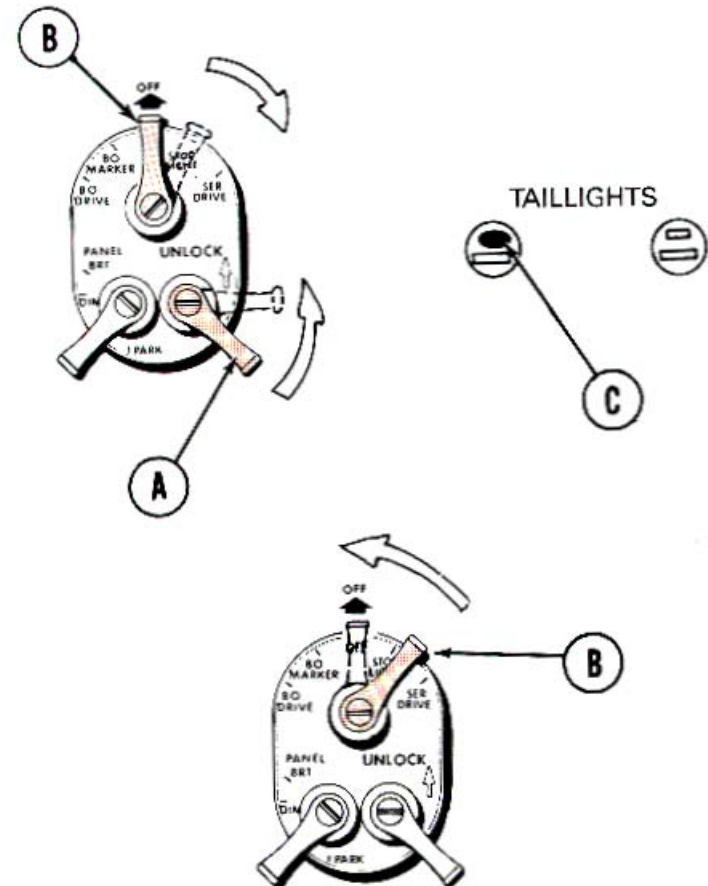
**NOTE**

Service stoplight is for daytime driving. Stoplight will light when brakes are applied to warn driver of following vehicle. MASTER BATTERY switch must be ON.

1. Lift up and hold UNLOCK lever (A).
2. Set LIGHTING CONTROL lever (B) to STOPLIGHT.
3. Release UNLOCK lever (A). Stoplight (C) will light when brake is applied.

**To Turn Service Stoplight Off:**

- Set LIGHTING CONTROL lever (B) to OFF.

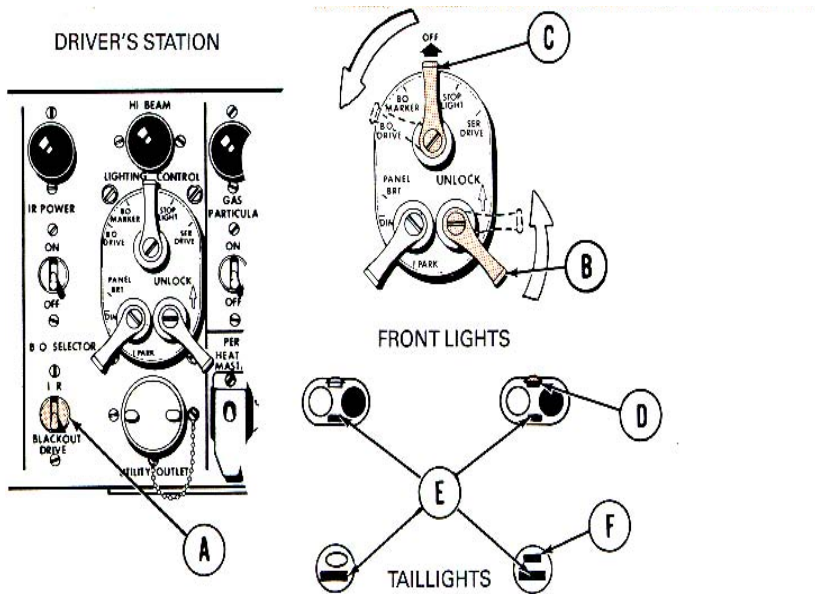


**DRIVE THE VEHICLE (OPERATE VEHICLE LIGHTS) - Continued**

**To Turn Blackout Drive Lights On:**

**NOTE**

**Blackout drive lights are for night driving under blackout conditions. MASTER BATTERY switch must be ON.**



1. Set BO SELECTOR switch (A) to BLACKOUT DRIVE.
2. Lift up and hold UNLOCK lever (B).
3. Set LIGHTING CONTROL lever (C) to BO DRIVE.
4. Release UNLOCK lever (B). Blackout drive light (D) and blackout marker lights (E) will light. Blackout stoplight (F) will light when brake is applied.

**To Turn Blackout Drive Lights Off:**

- Set LIGHTING CONTROL lever (C) to OFF.

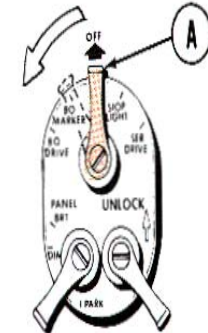
**DRIVE THE VEHICLE (OPERATE VEHICLE LIGHTS) - Continued**

**To Turn Blackout Marker Lights On:**

**NOTE**

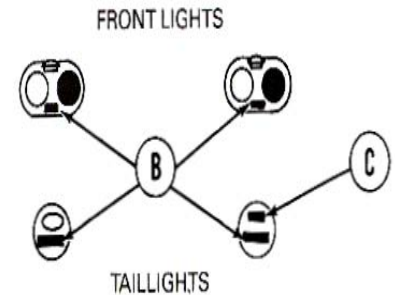
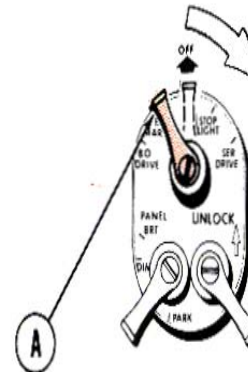
**Blackout marker lights are for night driving under blackout conditions. MASTER BATTERY switch must be ON.**

- Set LIGHTING CONTROL lever (A) to BO MARKER. Blackout marker lights (B) will light. Blackout stoplight (C) will light when brakes are applied.



**To Turn Blackout Marker Lights Off:**

- Set LIGHTING CONTROL lever (A) to OFF.



DRIVE THE VEHICLE (OPERATE VEHICLE LIGHTS) - Continued

To Turn IR (Infrared) Headlights On:

NOTE

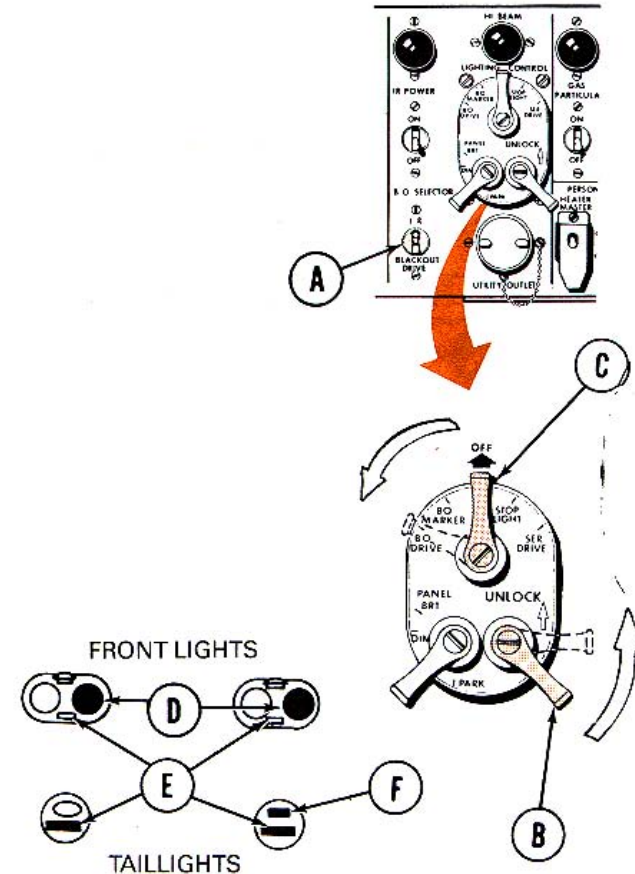
IR headlights are used along with IR periscope or night vision viewer for night driving. IR headlights produce invisible light that can be seen only with an IR night vision device. MASTER BATTERY switch must be ON.

1. Set BO SELECTOR switch (A) to IR position.

WARNING

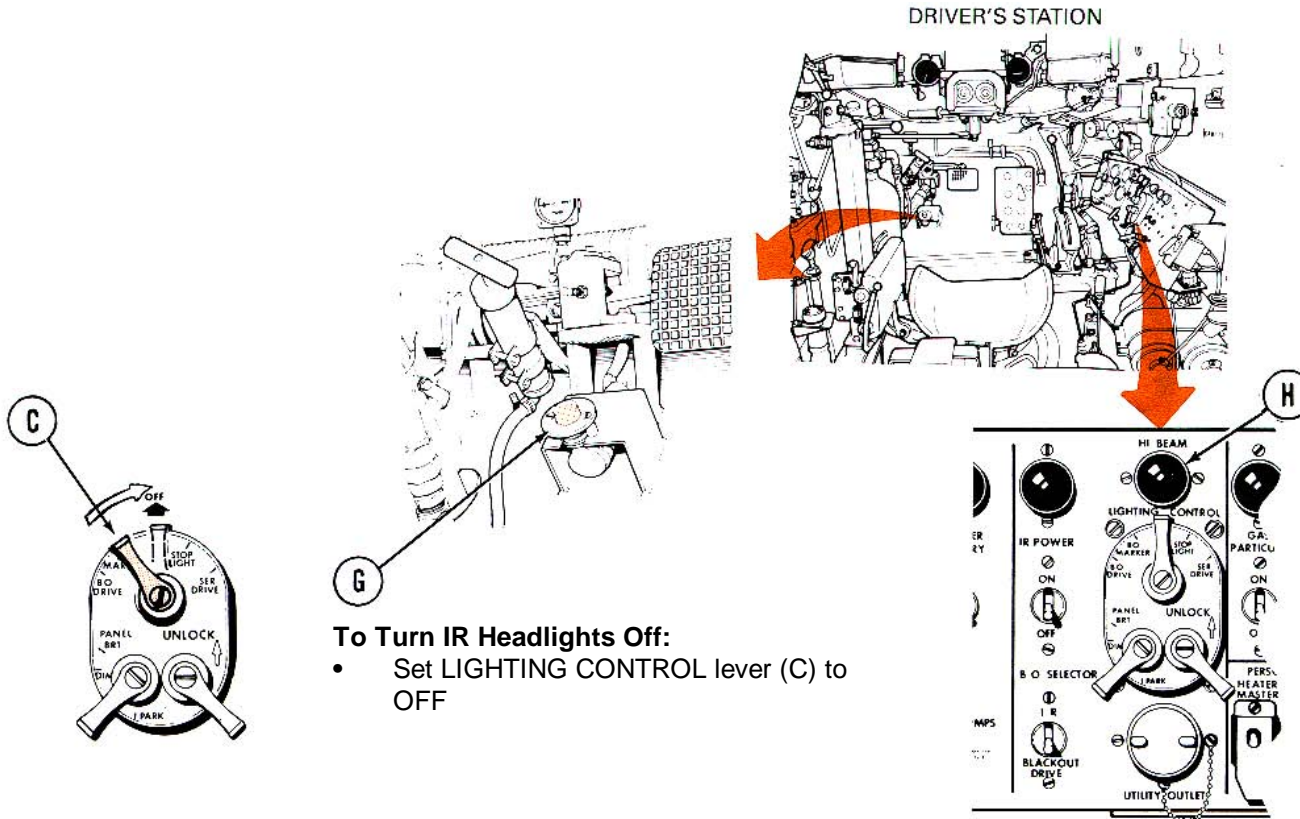
Do not look into IR headlights because of possible eye damage.

2. Lift up and hold UNLOCK lever (B).
3. Move LIGHTING CONTROL lever (C) to BO DRIVE.
4. Release UNLOCK lever (B). IR headlights (D) and blackout marker lights (E) will light. Blackout stoplight (F) will light when brake is applied.



**DRIVE THE VEHICLE (OPERATE VEHICLE LIGHTS) - Continued**

5. Push and release DIMMER SWITCH (G) with foot to choose high or low IR headlight beam. HI BEAM indicator light (H) will light when high beam is on.



**To Turn IR Headlights Off:**

- Set LIGHTING CONTROL lever (C) to OFF

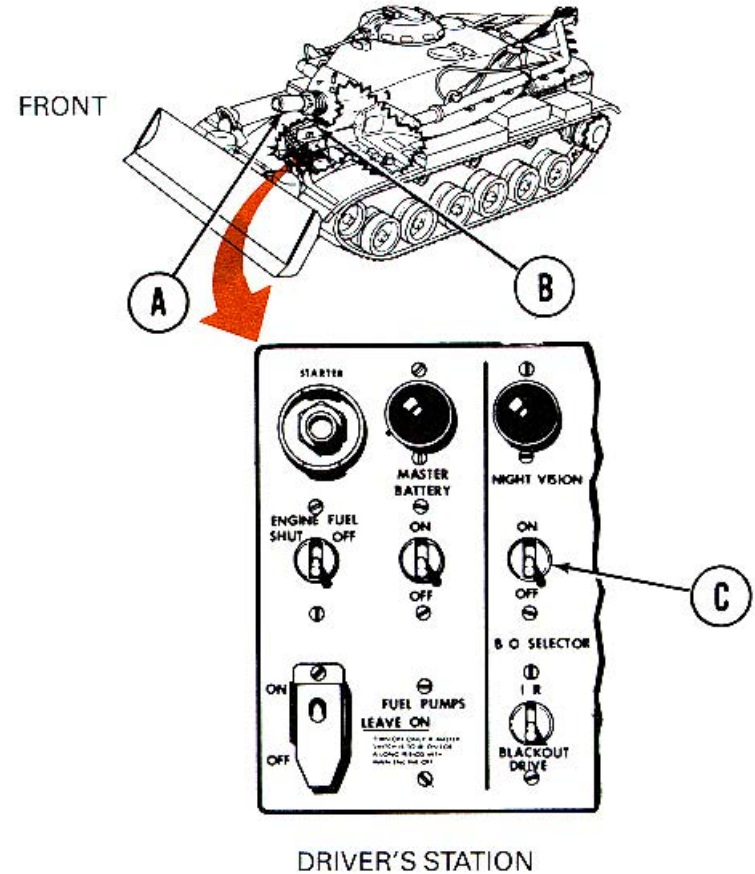


**DRIVE THE VEHICLE (OPERATE PERISCOPES)**

**To Install Driver's Night Vision Viewer AN/VVS-2:**

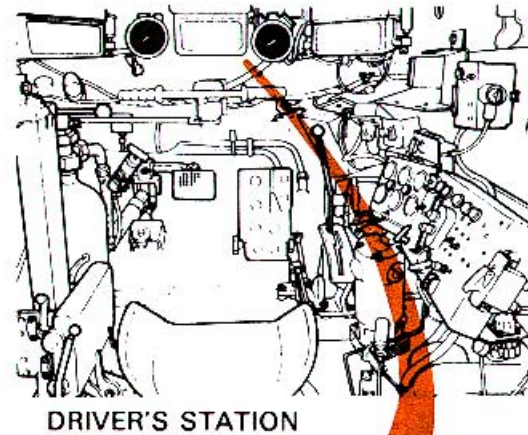
**Make Sure:**

- Vehicle is stopped.
- Main gun (A) is pointed to front.
- Driver's hatch (B) is closed and locked (page 2-166).
- NIGHT VISION switch (C) is set to OFF.

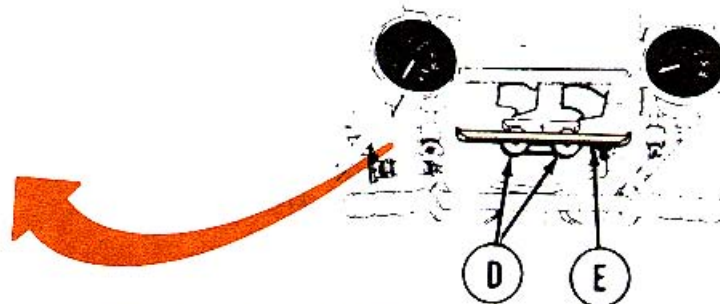
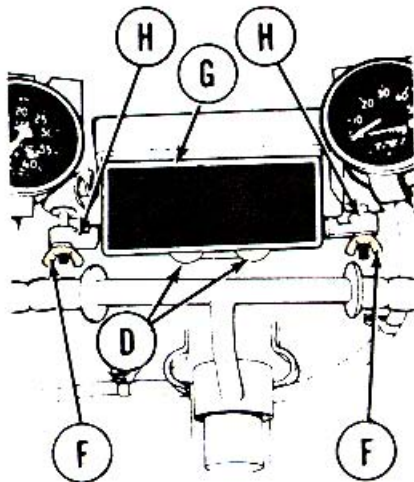


**DRIVE THE VEHICLE (OPERATE PERISCOPES) - Continued**

1. Turn knurled nuts (D) in a clockwise direction to tighten support bracket (E).
2. Loosen two wing nuts (F).
3. Support daylight periscope (G) with hand.
4. Push retainers (H) away from daylight periscope (G).
5. Lower daylight periscope (G) onto support bracket (E).



DRIVER'S STATION

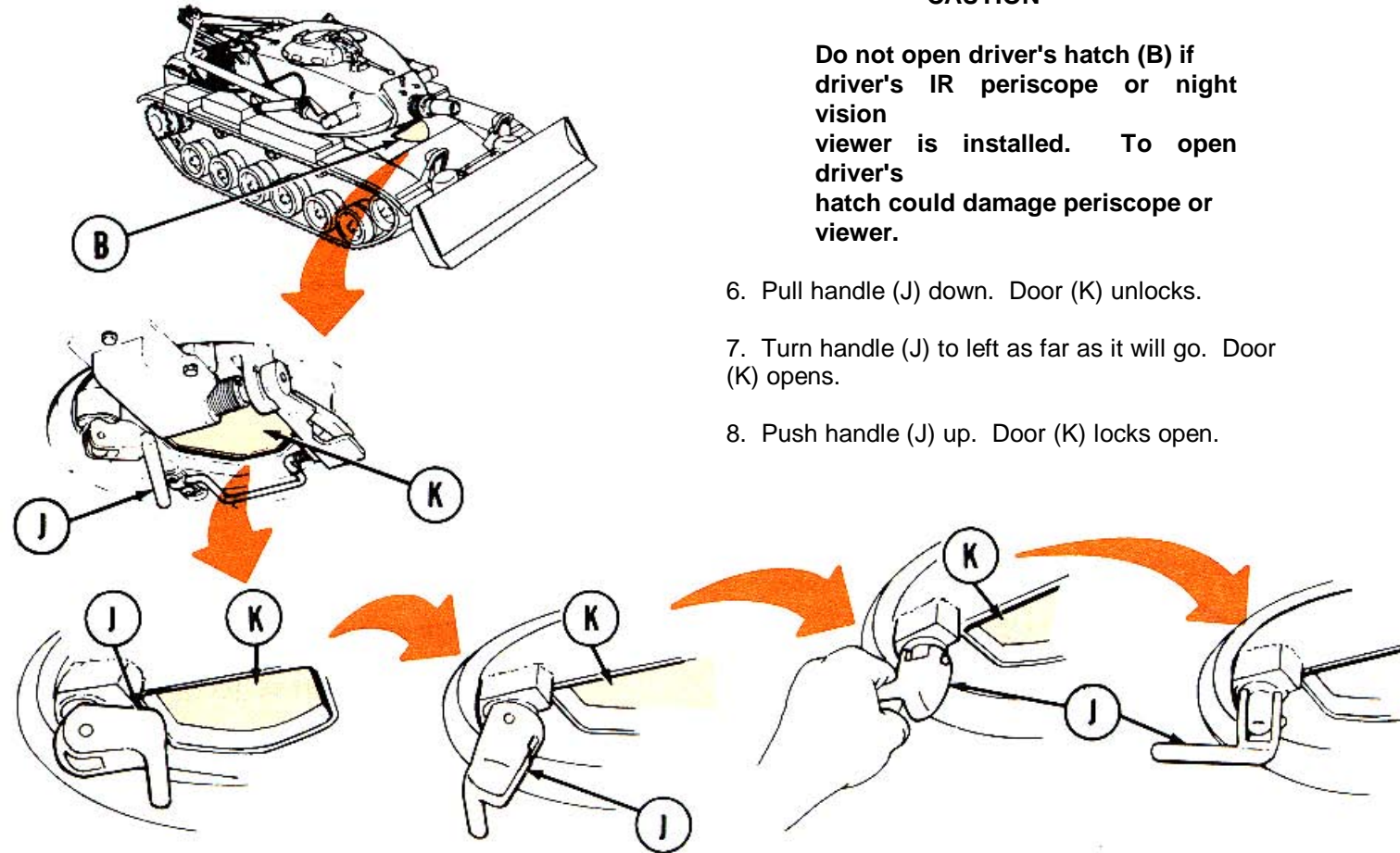


DAYLIGHT PERISCOPE  
REMOVED FOR CLARITY

## DRIVE THE VEHICLE (OPERATE PERISCOPES) - Continued

**CAUTION**

Do not open driver's hatch (B) if driver's IR periscope or night vision viewer is installed. To open driver's hatch could damage periscope or viewer.



6. Pull handle (J) down. Door (K) unlocks.

7. Turn handle (J) to left as far as it will go. Door (K) opens.

8. Push handle (J) up. Door (K) locks open.

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Change 1 2-196.3

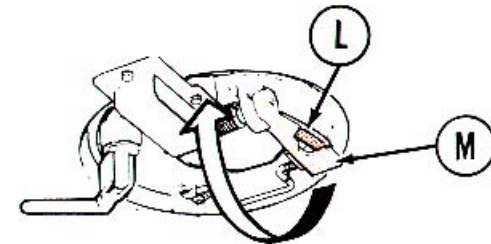
**DRIVE THE VEHICLE (OPERATE PERISCOPES) - Continued**

9. Press lever (L) to unlock handle (M).
10. Turn handle (M) in direction shown.
11. Make sure handle (M) locks in the rear position.
  
12. Make sure rubber seal (N) is seated in groove and not hanging loose.

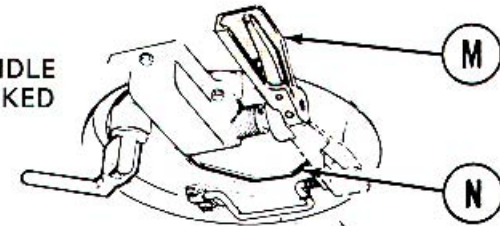
**NOTE**

**When turret is turned with main gun to front, stowage box (P) is behind driver on turret floor (Q).**

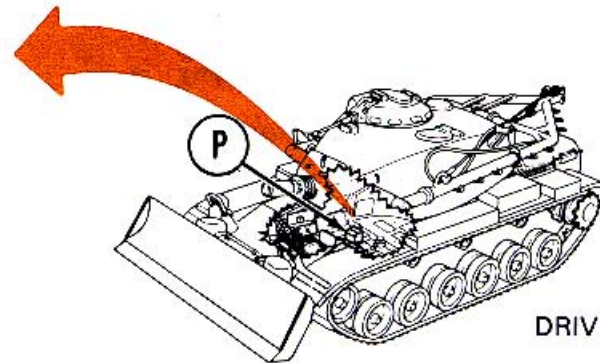
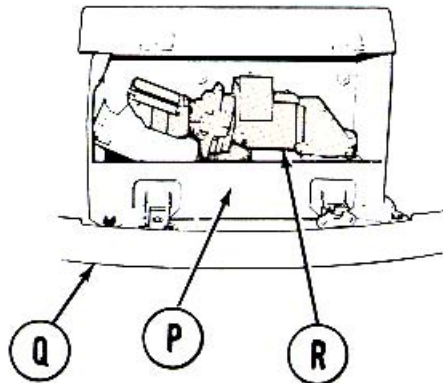
13. Open stowage box (P).
14. Remove night vision viewer (R).



PRESS AND TURN



HANDLE LOCKED



DRIVER'S COMPARTMENT TOP VIEW

## DRIVE THE VEHICLE (OPERATE PERISCOPES) - Continued

**CAUTION**

Keep OFF-BRIGHT switch (S) in OFF and covers on lenses when viewer (R) is not being used. Do not expose viewer (R) to bright light (spotlights, flares, full moon, sun, etc.). Prolonged or excessive light can damage the viewer.

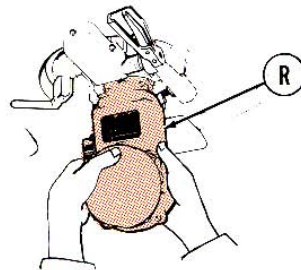
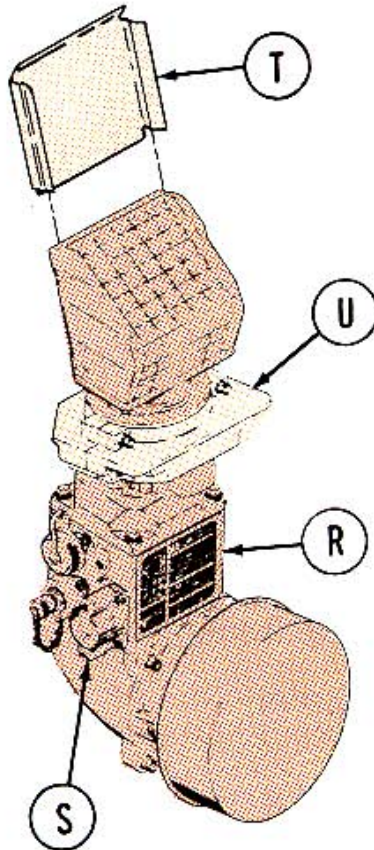
15. Remove lens cover (T). Put lens cover (T) back in stowage box.

16. Rotate mounting plate (U) on viewer (R) until mounting plate (U) is aligned and snaps into position.

**CAUTION**

Do not release viewer until you are sure viewer is locked in place.

17. Carefully raise head of viewer (R) thru door opening.



Change 1 2.196.5

DRIVE THE VEHICLE (OPERATE PERISCOPES) - Continued

18. Put front edge of mounting plate (U) into slot (V) on front of hatch mount (W).

19. Push viewer (R) up until mounting plate (U) is flush against hatch mount (W).

CAUTION

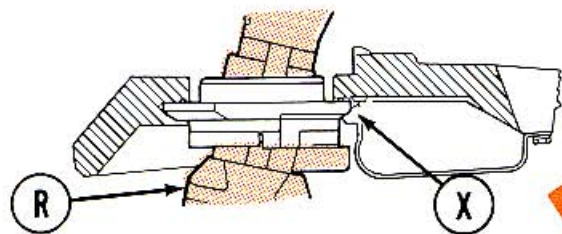
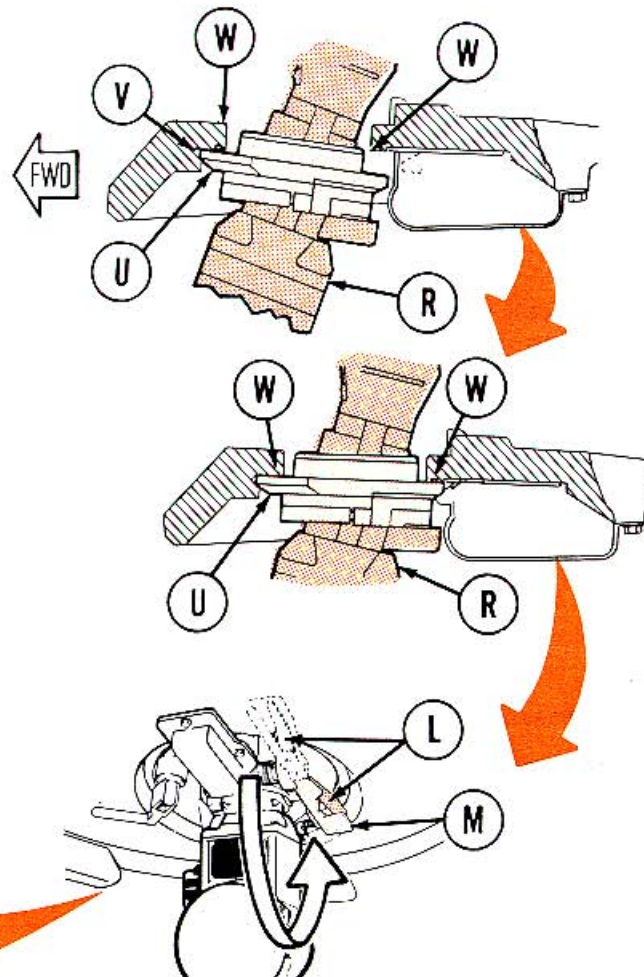
Handle (M) is spring loaded. Use care when unlocking and turning.

20. Press lever (L) to unlock handle (M).

21. Turn handle (M) in direction shown.

22. Release lever (L). Be sure handle (M) locks in place. Locking plunger (X) will lock viewer in place.

23. Check that viewer (R) is firmly in place before releasing.



**DRIVE THE VEHICLE (OPERATE PERISCOPES) - Continued**

24. Remove snap on eyepiece cover (Y). Put cover (Y) in stowage box (P).

**NOTE**

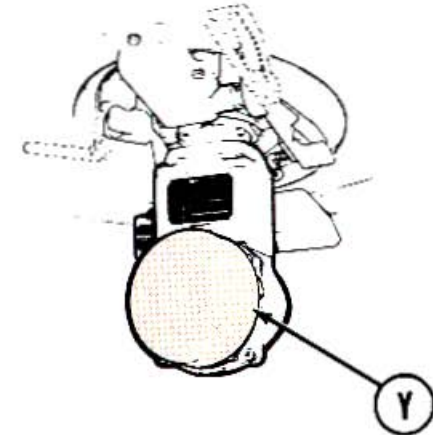
Viewer may be operated from either vehicle power or battery power. Vehicle power is normally used. When battery power is used, dispose of battery after each night's operation. Normal life of battery in use is 6 to 8 hours.

To Connect Vehicle Power to Viewer:

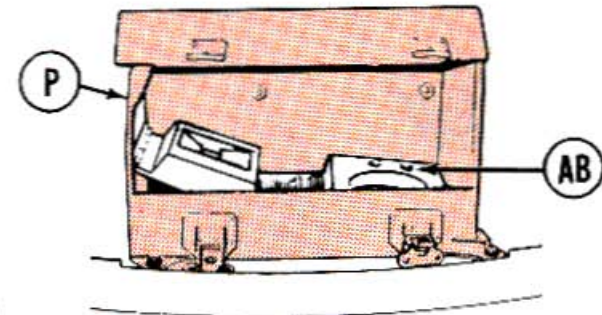
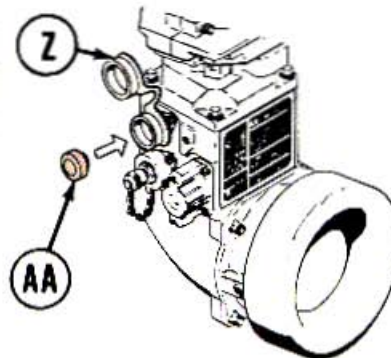
1. Unscrew battery cap (Z).
2. Remove battery (AA) if installed.

**NOTE**

Small round holes (AB) in stowage box (P) cushion are for battery stowage.



**NOTE**  
 Small round holes (AB) in stowage box (P) cushion are for battery stowage.

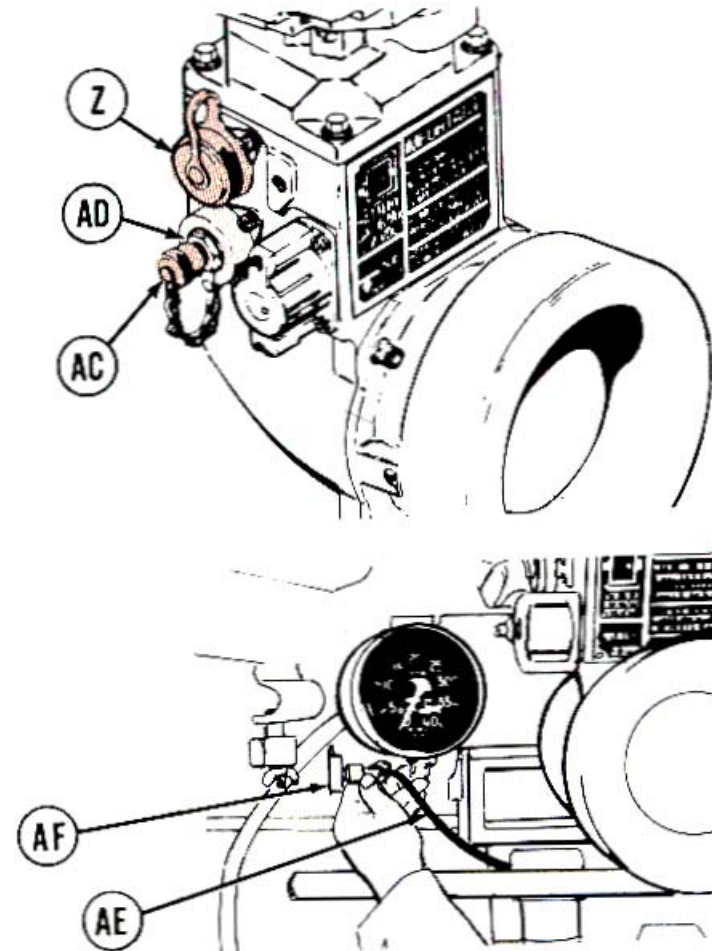


**DRIVE THE VEHICLE (OPERATE PERISCOPES) - Continued**

4. Replace battery cap (Z).
5. Unscrew dust cap (AC) about 1/4 turn. Cap will come loose from receptacle (AD).
6. Unscrew power cable (AE) 1/4 turn. Cable (AE) will come loose from stowage receptacle (AF).
7. Connect power cable (AE) onto viewer power receptacle (AD).

**To Use Battery Power:**

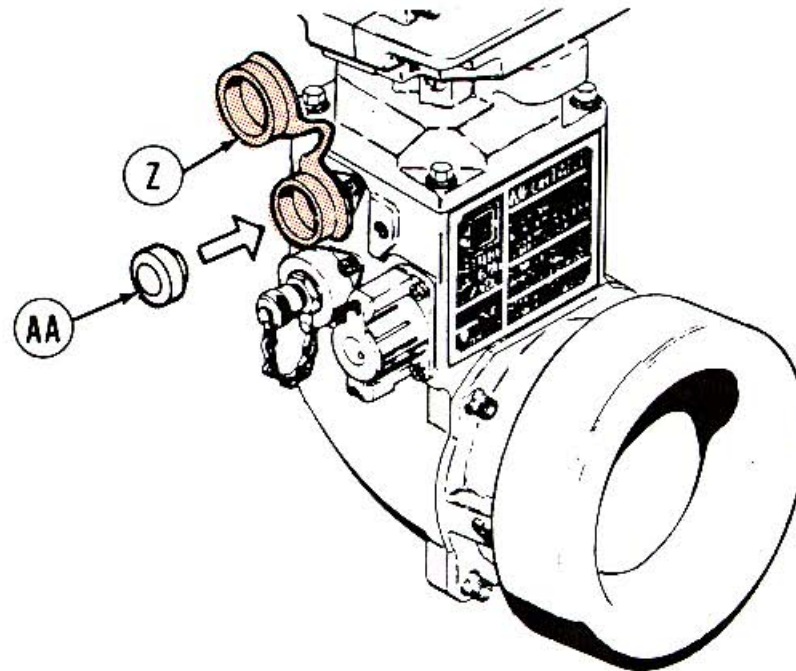
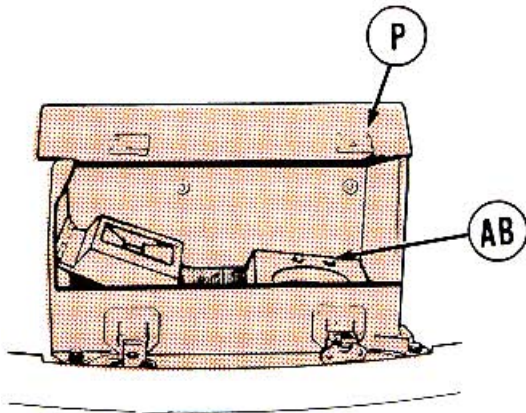
1. Unscrew power cable (AE) from power receptacle (AD).
2. Screw power cable (AE) onto stowage receptacle (AF).
3. Screw dust cap (AC) onto power receptacle (AD).





**DRIVE THE VEHICLE (OPERATE PERISCOPES) - Continued**

4. Unscrew battery cap (Z).
5. Take battery (AA) from cushion hole (AB) in stowage box (P).
6. Install battery (AA) recessed end (+ end) first.
7. Screw battery cap (Z) back onto viewer.



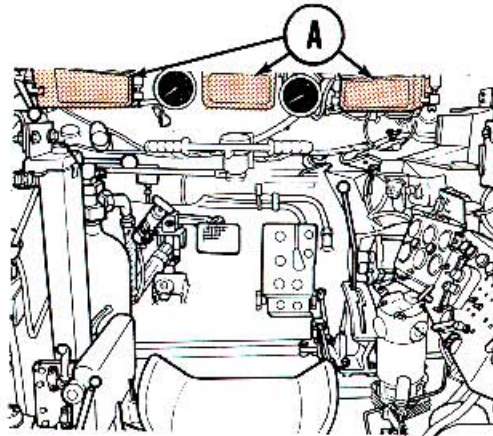
DRIVE THE VEHICLE (OPERATE PERISCOPES) - Continued

**WARNING**

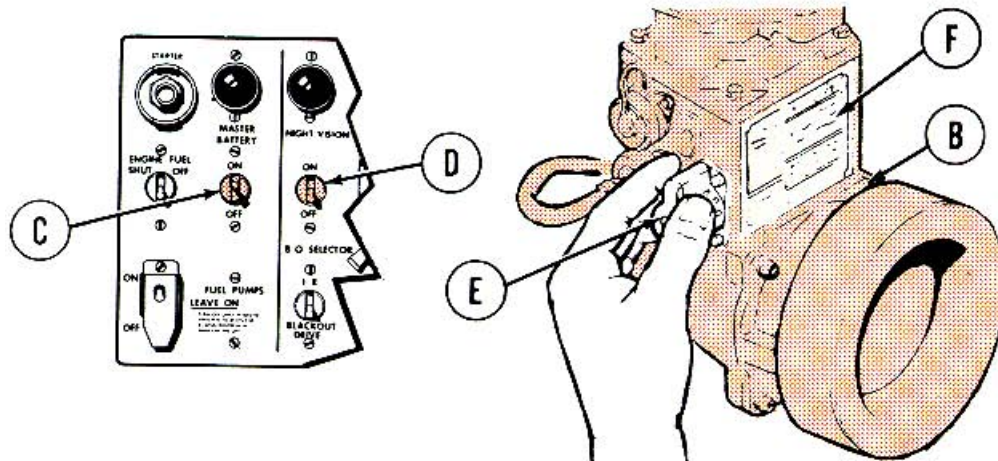
Under blackout conditions, cover daylight periscopes (A). This prevents glow from night vision viewer (B) from being visible outside vehicle. I

**NOTE**

If light conditions are too bright, night vision viewer (B) will not operate.



1. If operating night vision viewer (B) on vehicle power:
  - a. Set MASTER BATTERY switch (C) to ON.
  - b. Set NIGHT VISION switch (D) to ON.
2. Turn OFF-BRIGHT rotary switch (E) in direction of arrow shown on plate (F).



**NOTE**

Switch (E) is normally set to full BRIGHT. If image is too bright at this setting, turn switch (E) toward OFF to adjust contrast.

During very low light conditions, turn on vehicle IR headlights (page 2-195) for better image.

**DRIVE THE VEHICLE (OPERATE PERISCOPES) - Continued**

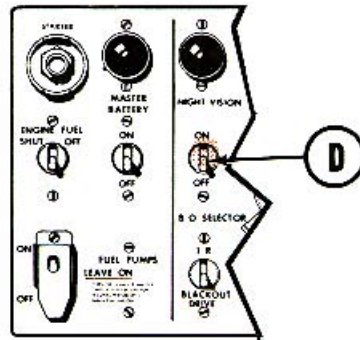
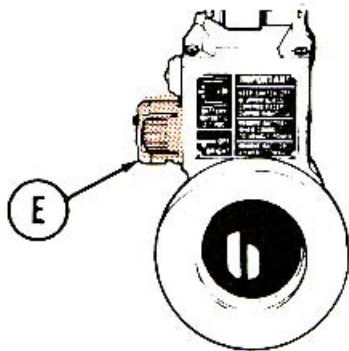
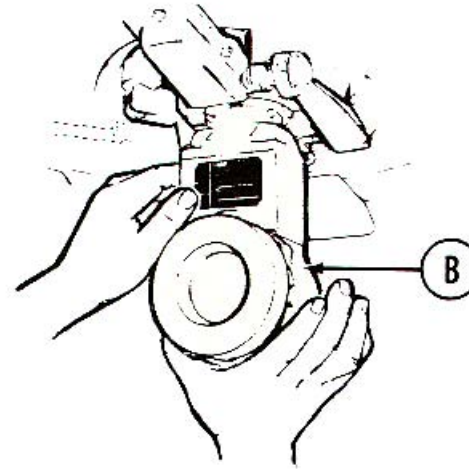
- Hand rotate viewer (B) as required to view right or left. For normal viewing, set viewer (B) straight ahead.

**NOTE**

Flashes of light from guns or other sources will make image flash or go momentarily blank.

Image may be distorted by operation of turret blower and hydraulic powerpack.

If you normally wear reading glasses, wear them while using viewer.



**When Viewer is Not in Use:**

- Set OFF-BRIGHT switch (E) to OFF.
- Set NIGHT VISION switch (D) to OFF.

**DRIVE THE VEHICLE (OPERATE PERISCOPES) - Continued**

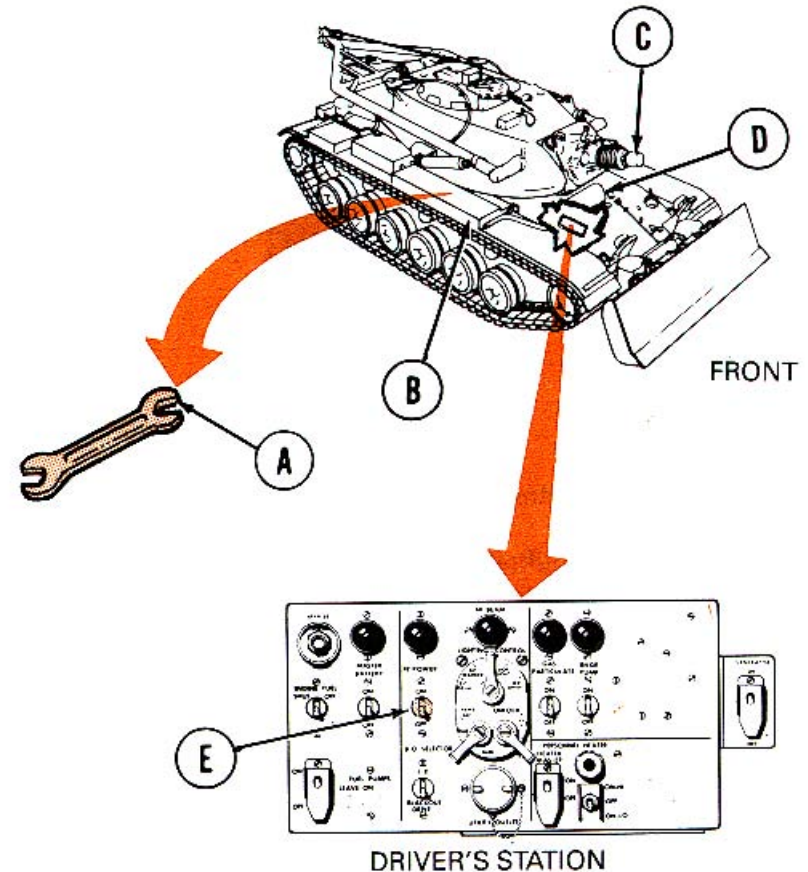
**To Install Driver's M24 IR Periscope:**

**Tools:**

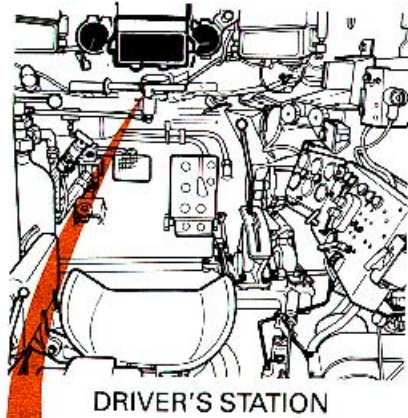
Get 1/2 inch open end wrench (A) from right front fender box (B).

**Make Sure:**

- Vehicle is stopped.
- Main gun (C) is pointed to front.
- Driver's hatch (D) is closed and locked (page 2-166).
- IR POWER switch (E) is set to OFF.
- Turret traverse lock is set to LOCKED (page 2-568).

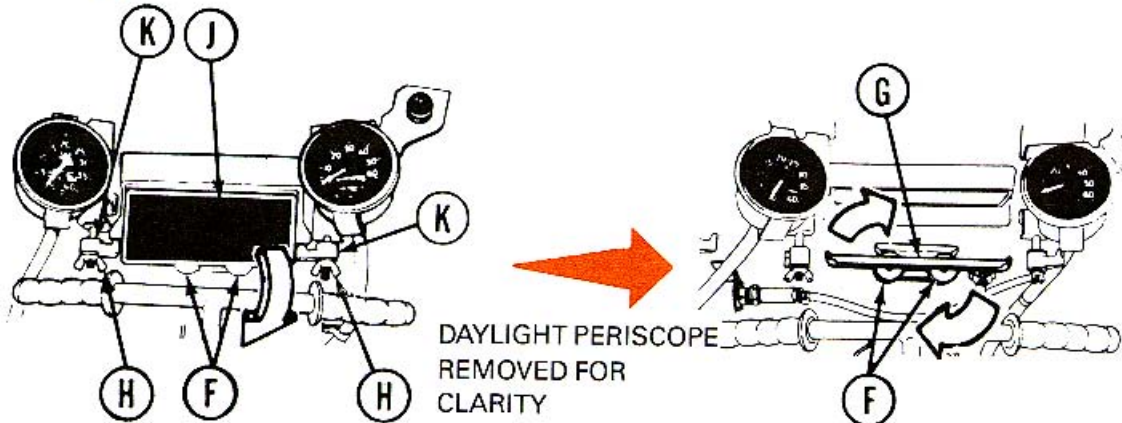


DRIVE THE VEHICLE (OPERATE PERISCOPES) - Continued



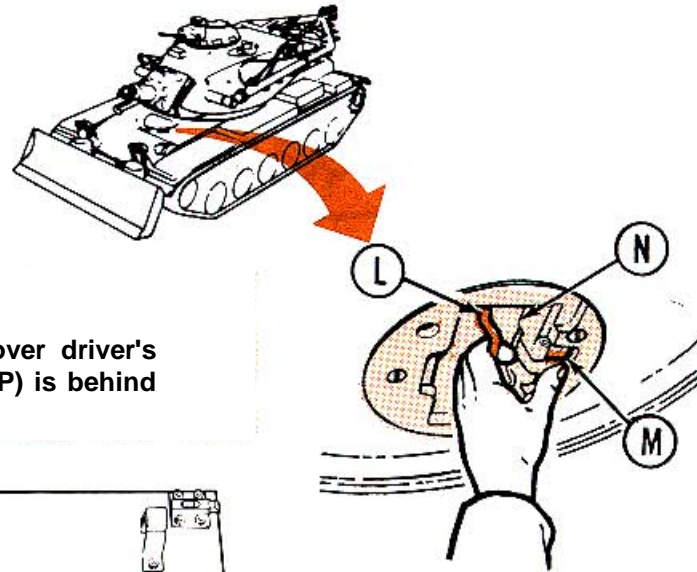
To Lower M27 Periscope:

1. Turn knurled nuts (F) in direction shown to tighten support bracket (G).
2. Loosen wing nuts (H).
3. Support daylight periscope (J) with hand.
4. Push retainers (K) away from daylight periscope (J).
5. Lower daylight periscope (J) onto support bracket (G)



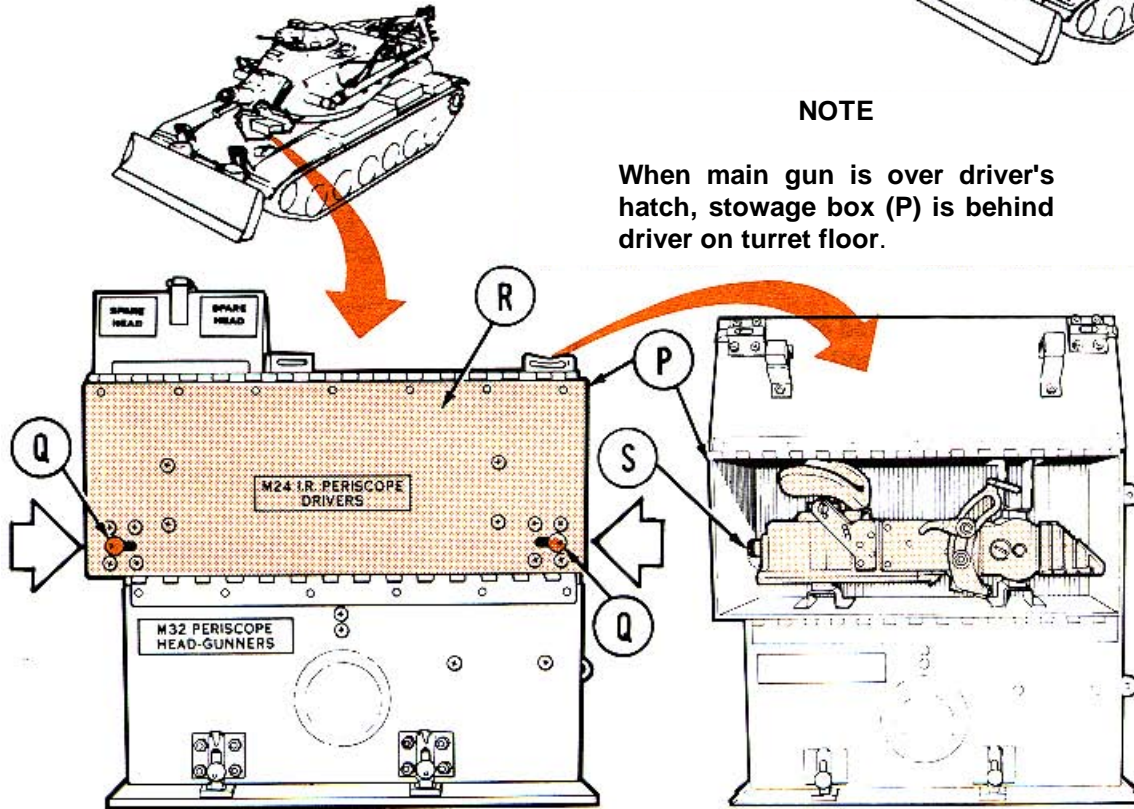
**DRIVE THE VEHICLE (OPERATE PERISCOPES) - Continued**

6. Pull down on periscope lid handle (L). Push up on latch (M) to unlock lid (N).
7. Push open lid (N).



**NOTE**

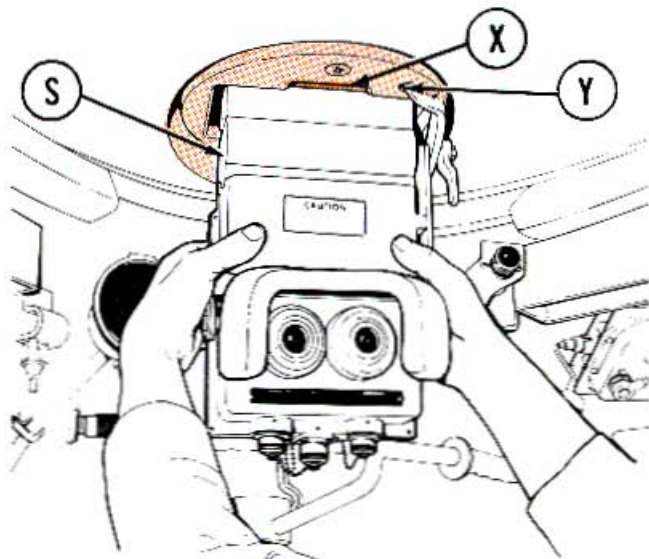
When main gun is over driver's hatch, storage box (P) is behind driver on turret floor.



8. Push latches (Q) on IR periscope storage box (P) to open door (R).
9. Remove IR periscope (S) from storage box (P). Close and lock box.

**DRIVE THE VEHICLE (OPERATE PERISCOPES) - Continued**

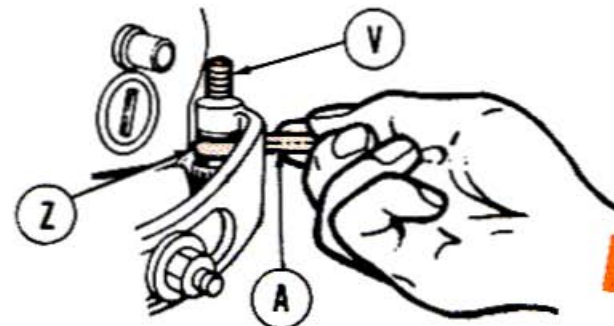
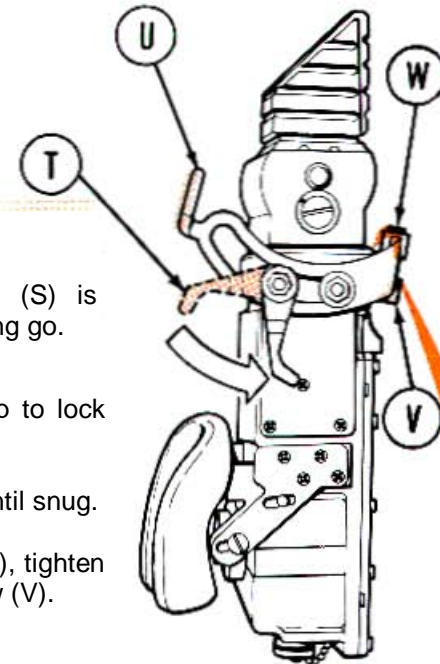
10. Turn lever (T) in direction shown. Elevation clamp (U) will be free to pivot.
11. Unscrew thumbscrew (V). Allow about one thread to show at point (W).
12. Position IR periscope (S) in periscope mount (X).
13. Make sure elevation clamp (U) is in detent (Y).



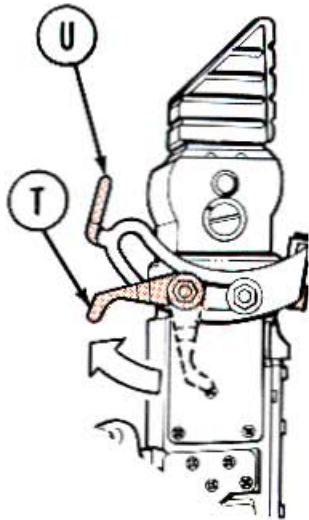
**CAUTION**

Make sure IR periscope (S) is locked in place before letting go.

14. Push IR periscope (S) up to lock into periscope mount (X).
15. Tighten thumbscrew (V) until snug.
16. Using open end wrench (A), tighten jamnut (Z) on thumbscrew (V).



**DRIVE THE VEHICLE (OPERATE PERISCOPES) - Continued**



17. Turn lever (T) in direction shown until tight. Elevation clamp (U) will be locked.
18. Unscrew power receptacle dust cap (AA).

**WARNING**

**IR POWER switch must be set to OFF. High voltage is present in power cable and can cause serious injury to personnel.**

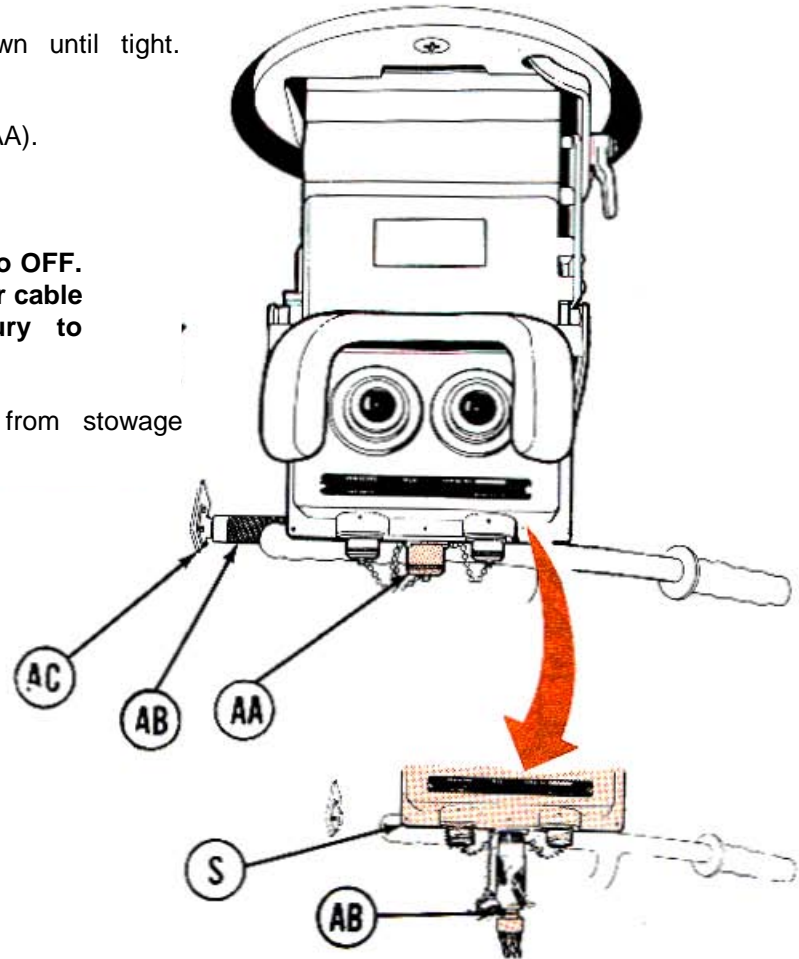
19. Unscrew IR power cable (AB) from stowage receptacle (AC).

20. Connect IR power cable (AB) to IR periscope (S).

**CAUTION**

**Driver's hatch must stay closed and locked when IR periscope is installed.**

21. Return open end wrench to stowage.





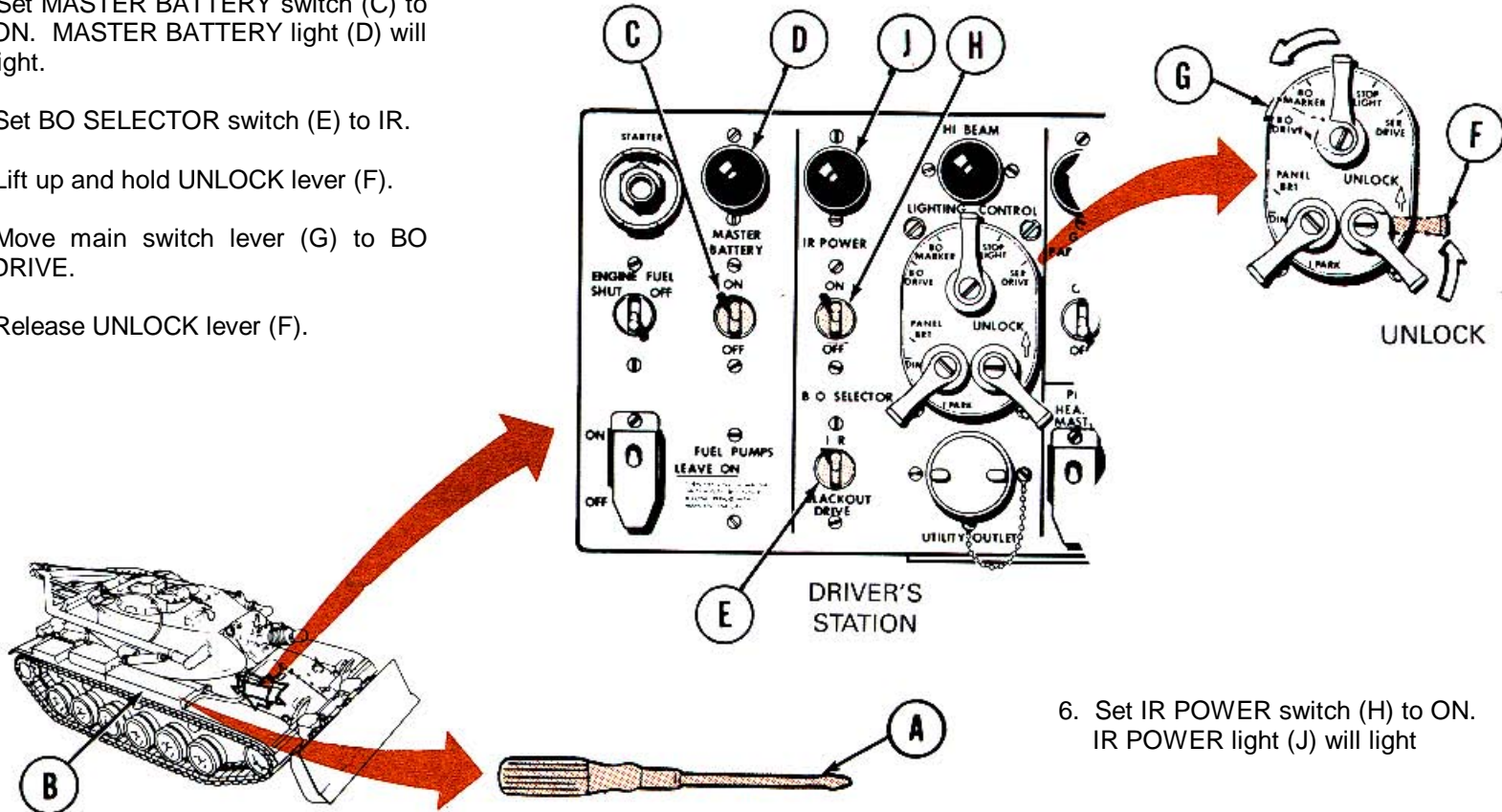
**DRIVE THE VEHICLE (OPERATE PERISCOPES) - Continued**

**To Operate Driver's M24 IR Periscope:**

Tools:

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

1. Set MASTER BATTERY switch (C) to ON. MASTER BATTERY light (D) will light.
2. Set BO SELECTOR switch (E) to IR.
3. Lift up and hold UNLOCK lever (F).
4. Move main switch lever (G) to BO DRIVE.
5. Release UNLOCK lever (F).



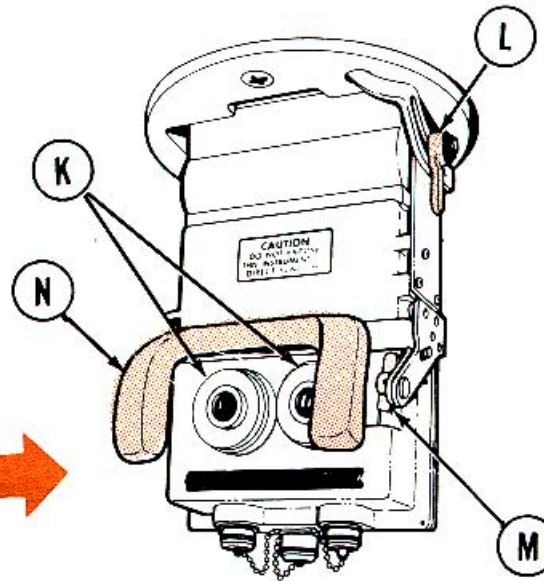
6. Set IR POWER switch (H) to ON. IR POWER light (J) will light

## DRIVE THE VEHICLE (OPERATE PERISCOPES) - Continued

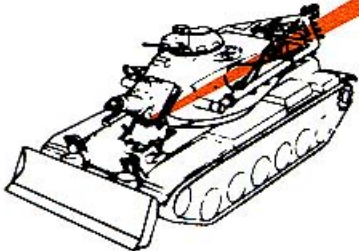
## NOTE

Allow five minutes for periscope to warm up before you adjust IR periscope for viewing or focus through eyepiece (K).

7. Adjust for viewing as follows:
  - a. Push lever (L) away from you.
  - b. Position IR periscope.
  - c. Pull lever (L) toward you to lock IR periscope

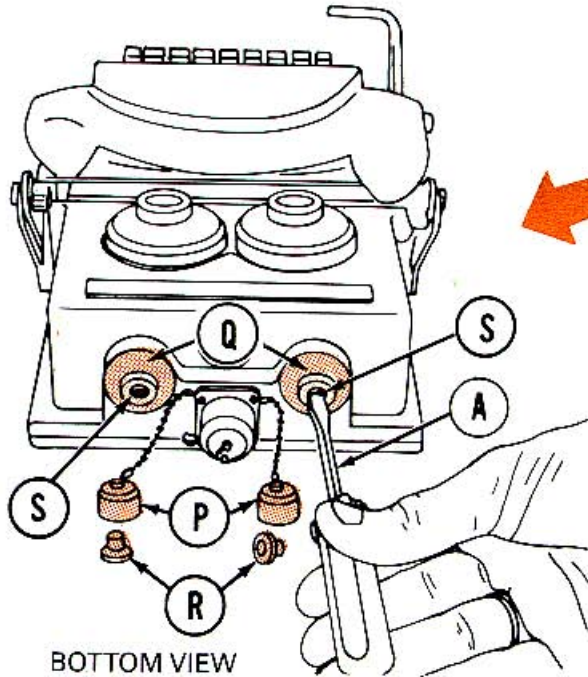
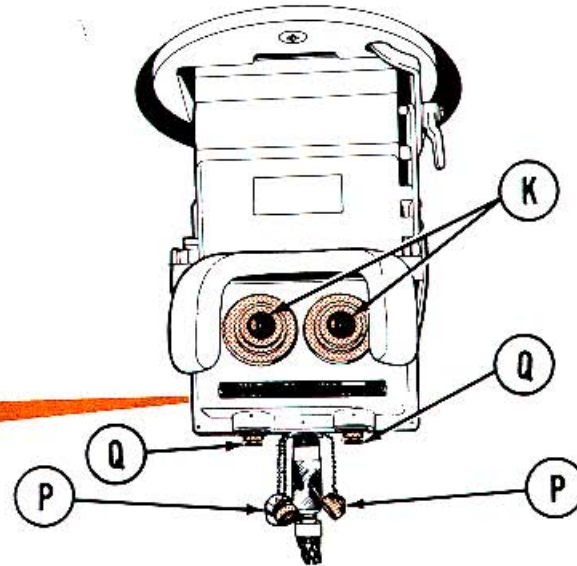


8. Adjust headrest as follows:
  - a. Loosen wingnut (M).
  - b. Adjust headrest (N) for comfort.
  - c. Tighten wingnut (M).



**DRIVE THE VEHICLE (OPERATE PERISCOPES) - Continued**

9. Remove dust caps (P) from focus controls (Q).
10. Remove and retain locknuts (R) from focus controls (Q).
11. After 5-minute warmup period, sight through eyepiece (K).
12. Using screwdriver (A), adjust focus screws (S).



13. Screw locknuts (R) onto focus controls (Q) until finger tight.
14. Screw dust caps (P) on focus controls (Q) until finger tight.
15. Return screwdriver (A) to stowage

**DRIVE THE VEHICLE (START ENGINE)**

1. Read instruction plate (A) completely.

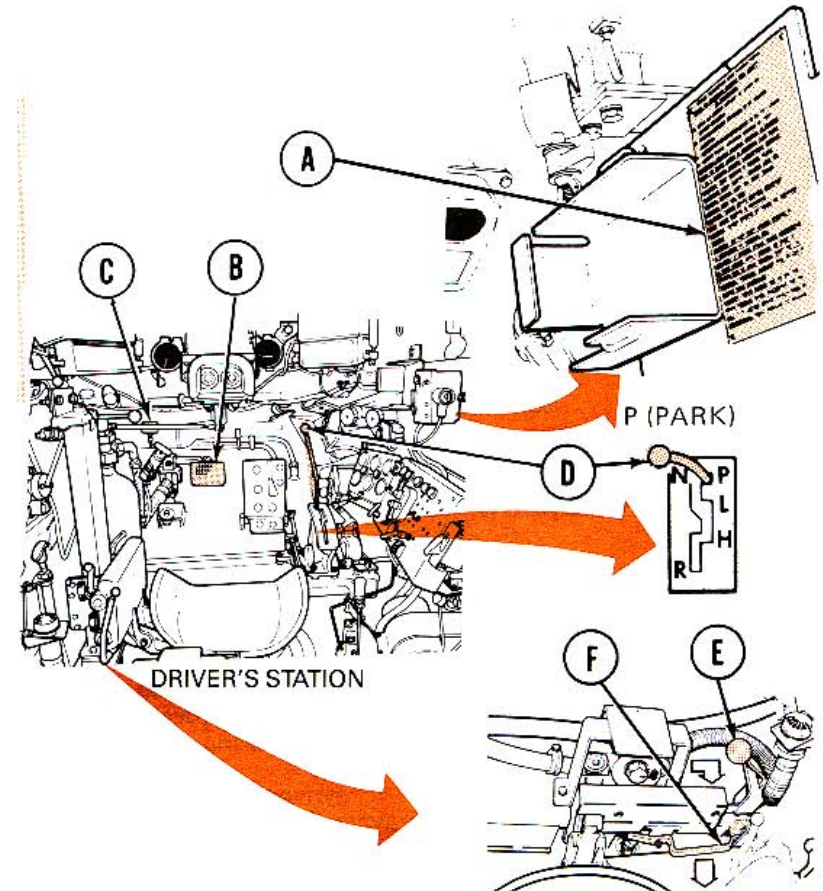
**CAUTION**

**Do not set parking brake if weather is freezing.**

**NOTE**

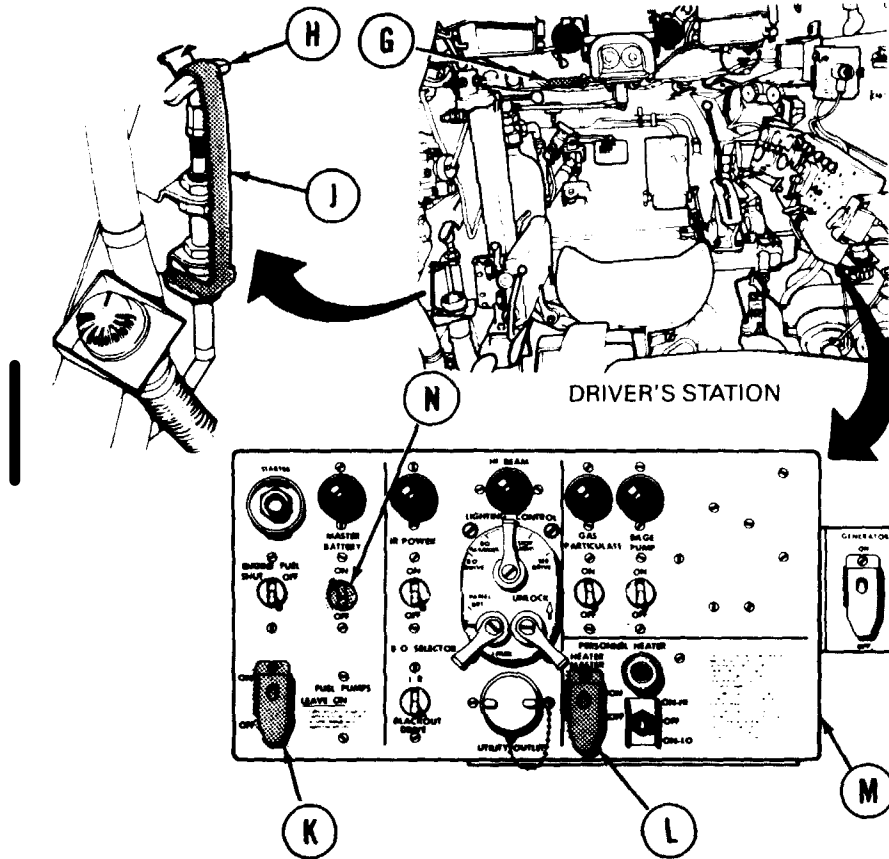
**When pushing brake pedal (B), do not go over 900 psi on pressure gage (C). If more than 900 psi is applied, brake will be very hard to release.**

2. Set parking brake:
  - a. Check that transmission shift lever (D) is in P (park) position.
  - b. Push brake pedal (B) until pressure gage (C) shows between 750 and 900 psi.
  - c. Release brake pedal (B). Parking brake will be set.
3. Close crew compartment and engine compartment drain valves:
  - a. Push lever (E) toward left side of vehicle and pull forward to close REAR DRAIN VALVE.
  - b. Push lever (F) down to close FRONT DRAIN VALVE.

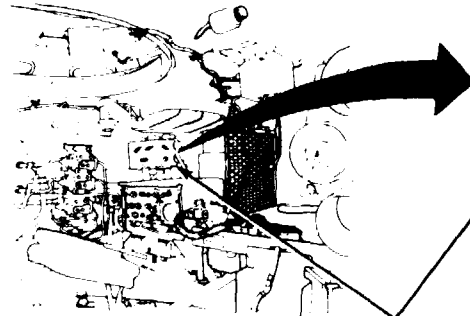
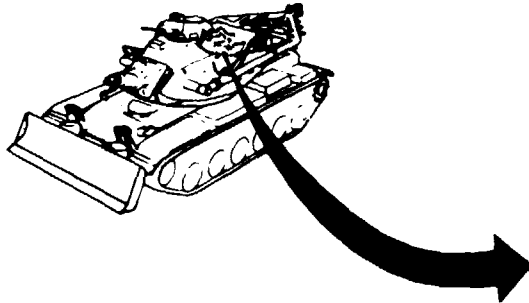


DRIVE THE VEHICLE (START ENGINE) - Continued

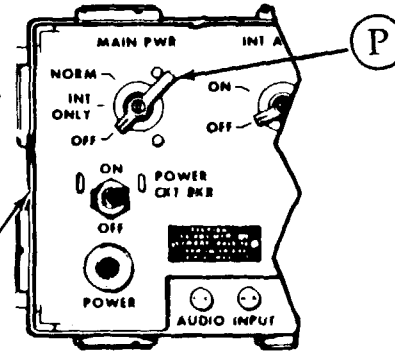
4. Check that steering control (G) is in center position. If not, center control (G).
5. Check that manual fuel shut-off valve handle (H) is pushed down and locked. If not, push down on valve handle (H). Snap spring clip (1) over valve handle (H) if spring clip is installed.
6. Check that FUEL PUMPS switch (K) and HEATER MASTER switch (L) are set to ON. If not, set both switches to ON.
7. Check that all other control panel (M) switches, except (K) and (L), are set to OFF.
8. Make sure MAIN PWR switch (P) on amplifier (Q) is set to OFF. If not, set to OFF or have another crewmember set to OFF.



DRIVE THE VEHICLE (START ENGINE) - Continued



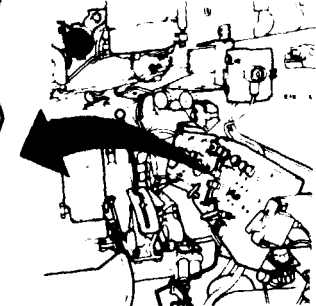
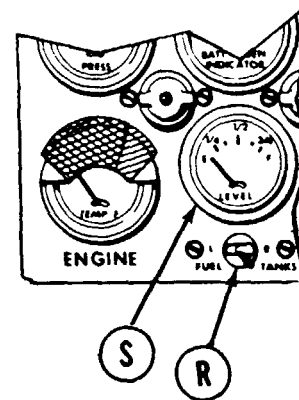
COMMANDER'S STATION



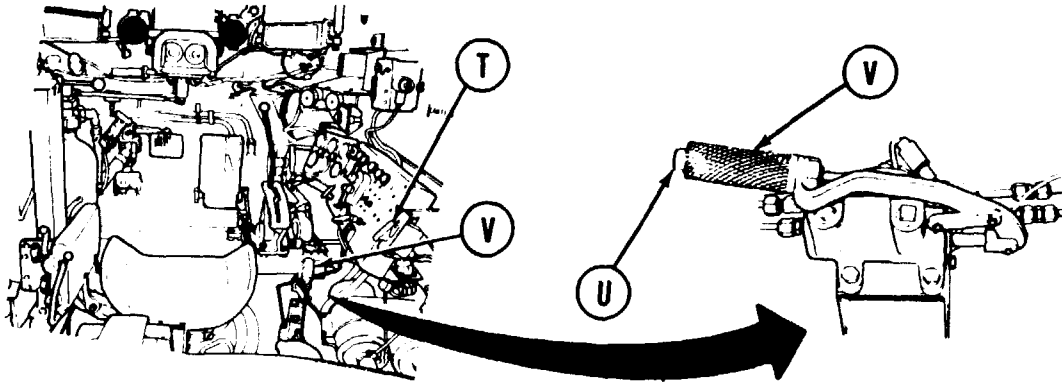
9. Set MASTER BATTERY switch (N) to ON.

10. Check fuel level in both tanks:

- a. Set FUEL TANKS switch (R) to position L (left fuel tank). Check LEVEL gage (S).
- b. Set FUEL TANKS switch (R) to position R (right fuel tank). Check LEVEL gage (S).
- c. Notify vehicle commander if either or both tanks are less than full.



DRIVER'S STATION

**DRIVE THE VEHICLE (START ENGINE) - Continued**

11. Check that GENERATOR switch (T) is set to ON. If not, set it to ON.

**NOTE**

**If engine has not been started within a week or more, do step 12. If engine has been started within a week, go to step 13. Do not push manifold heater switch (U) while pumping purge pump handle (V) in step 12.**

12. Pump purge pump handle (V) until you feel back pressure (three or four strokes). Air will be purged from fuel lines.

**DRIVE THE VEHICLE (START ENGINE) - Continued**

13. Follow moderate weather steps if air temperature is above + 40°F ( + 40C). Follow cold weather steps if air temperature is between - 10°F (- 23°C) and + 40°F (+ 40C). Cold Weather

**CAUTION**

**Do not allow engine to race when first started. Let up on accelerator pedal (W) if engine races.**

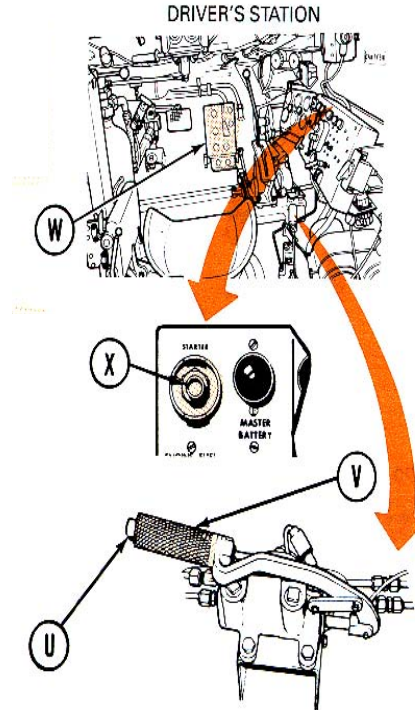
**Moderate Weather**

**NOTE.**

**The following steps must be done all at the same time. Read first, then do.**

- a. Push and hold accelerator pedal (W) down 2/3 to 3/4 of its travel.
- b. Press and hold STARTER switch (X) for no longer than 15 seconds

**Cold Weather**



**NOTE**

**Steps a, b, and c must be done all at the same time. Read first, then do.**

- a. Push and hold accelerator pedal (W) down 2/3 to 3/4
- b. Press and hold STARTER switch (X) for no longer than 15 seconds
- c. Pump purge pump handle(V) for 15 seconds.

**CAUTION**

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

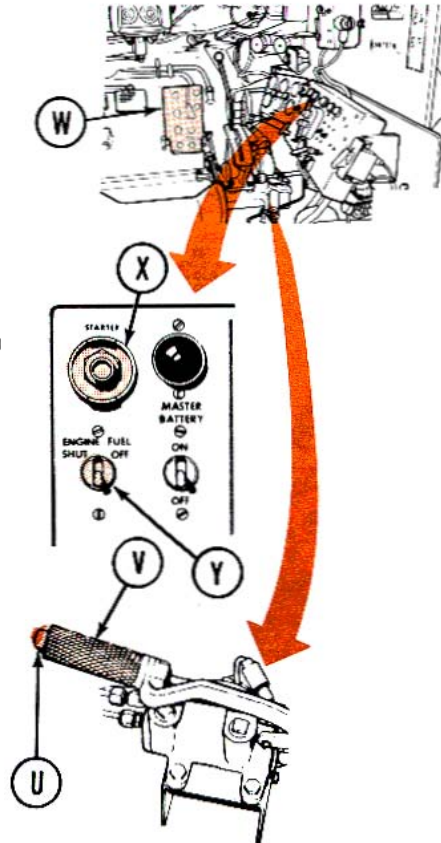
- d. Press and hold manifold heater switch (U).



**DRIVE THE VEHICLE (START ENGINE) - Continued**

**Moderate Weather**

- c. If engine starts before 15 seconds:
  - Release STARTER switch (X).
  - Go to step 14.
- d. If engine does not start after 15 seconds:
  - Release STARTER switch (X).
  - Release accelerator pedal (W).
  - Wait 3 to 5 minutes.
  - Repeat from step a.
  - If engine does not start after second try, go to troubleshooting (page 3-8).
- e. If engine starts but runs poorly (won't idle):
  - Push up and hold ENGINE FUEL SHUT OFF switch (Y) until engine stops.
  - Go to troubleshooting (page 3-12).

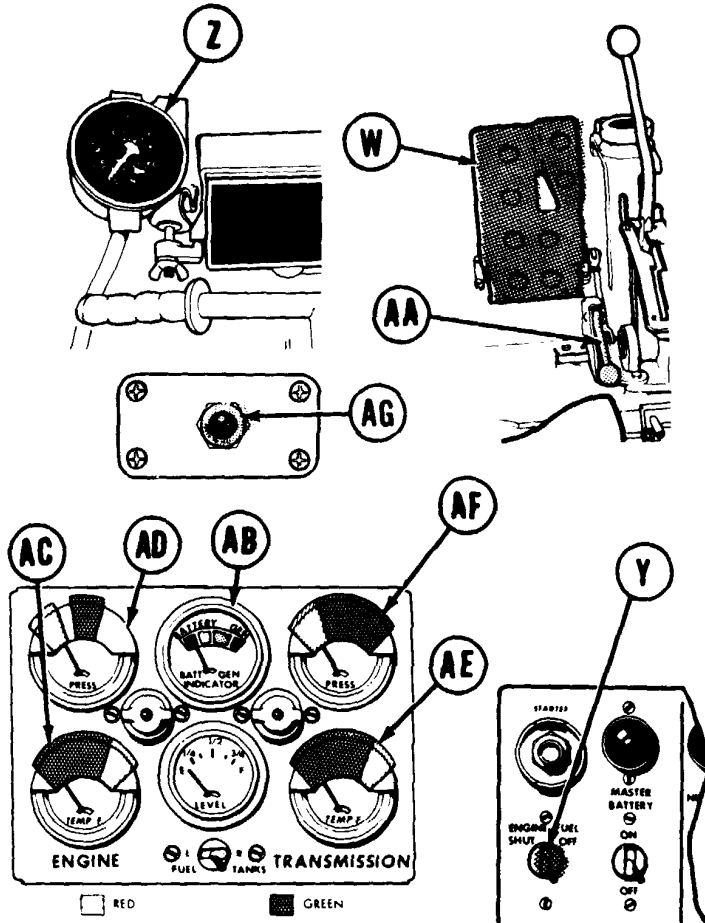


**Cold Weather**

- e. If engine starts before 15 seconds:
  - Release STARTER switch (X).
  - Release purge pump handle (V).
  - Release manifold heater switch (U).
  - Go to step 14.
- f. If engine does not start after 15 seconds:
  - Release all controls (except brakes).
  - Wait 3 to 5 minutes.
  - Repeat from step a
  - If engine does not start after second try, go to troubleshooting (page 3-12). (page 3-8).
- g. If engine starts but runs poorly (won't idle):
  - Push up and hold ENGINE FUEL SHUT OFF switch (Y) until engine stops.
  - Go to troubleshooting (page 3-12)

DRIVE THE VEHICLE (START ENGINE) - Continued

14. Operate accelerator pedal (W) until tachometer (Z) indicates 1000 to 1200 rpm. Pull up on accelerator lock handle (AA) to lock accelerator pedal.
15. Allow engine to warm up at 1000 to 1200 rpm for at least three minutes. While engine is warming up, continue with step 16.



**CAUTION**

If following indicators show other than conditions listed in step 16, damage to engine may occur. Push up and hold ENGINE FUEL SHUTOFF switch (Y) until engine stops and notify organizational maintenance.

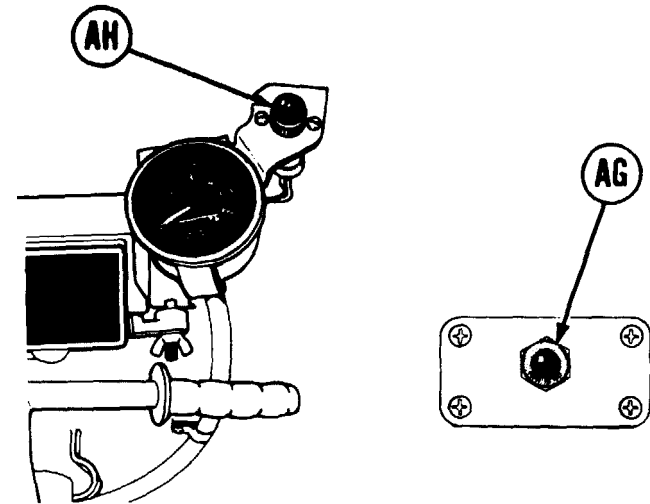
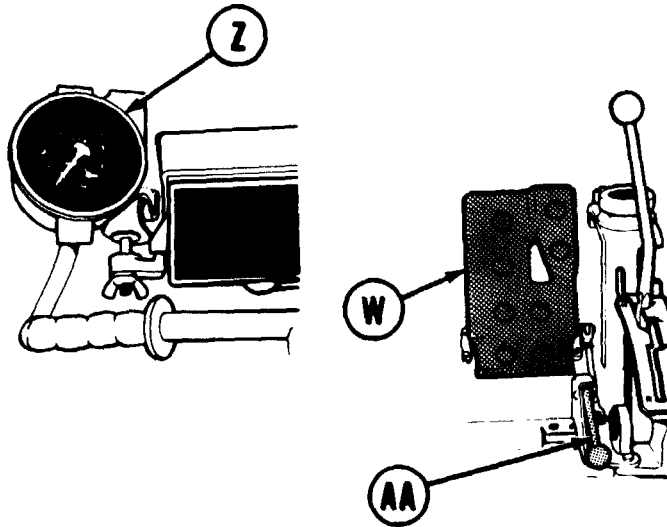
**NOTE**

For BATT GEN INDICATOR problems, see troubleshooting (page 3-20).

16. Check that indicators are as follows:
  - a. BATT GEN INDICATOR (AB) needle is in green area.
  - b. ENGINE oil TEMP (AC) needle is in green area (between 1200 and 2250).
  - c. ENGINE oil PRESS (AD) needle is in green area (between 40 psi and 70 psi).
  - d. TRANSMISSION oil TEMP (AE) needle is in green area (between 1600 and 2800).
  - e. TRANSMISSION oil PRESS (AF) needle is in green area (between 8 psi and 40 psi).
  - f. DUST DETECTOR WARNING LIGHT (AG) (if equipped) OFF.

**DRIVE THE VEHICLE (START ENGINE) - Continued**

17. Check POWERPLANT WARNING LAMP (AH).
  - a. If not lit, continue to operate.
  - b. If lit, check DUST DETECTOR WARNING LIGHT (AG) (if equipped). If DUST DETECTOR WARNING LIGHT is lit, stop engine and troubleshoot (page 3-18.1 ). If DUST DETECTOR WARNING LIGHT is not lit, do not shut down engine, go to troubleshooting (page 3-18).



**NOTE**

Do step 1`8 only if you followed Cold Weather steps for starting engine and only after a full three minute warmup at 1000 to 1200 rpm.

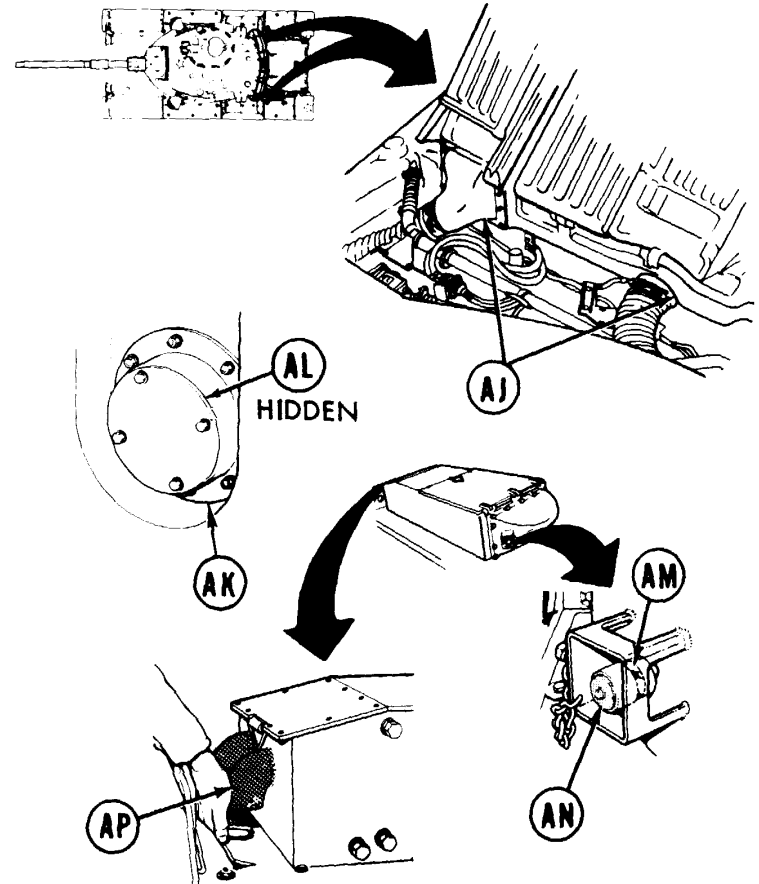
18. Operate accelerator pedal (W) until tachometer (Z) indicates 1200 to 1800 rpm. Pull up on accelerator lock handle (AA) to lock accelerator pedal. Allow engine to warm up at this rpm for another three minutes.

**DRIVE THE VEHICLE (START ENGINE) - Continued**

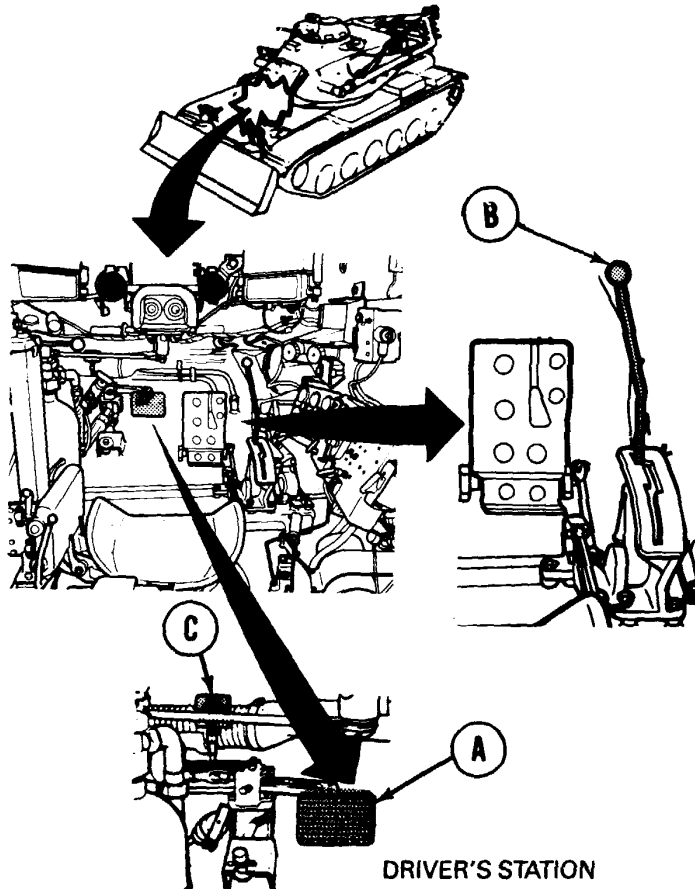
19. Open top deck grille doors. Make sure that air does not leak at air cleaner elbows (AJ), air intake flanges (AK), and cover plate gaskets (AL). Check that window (AM) of indicator (AN) (if equipped) is clear (not red) (early model) or indicates a reading of less than 30 (late model)

VIEW INSIDE  
CREW COMPARTMENT

20. Make sure that air exhaust can be felt at all four, blower motor exhaust elbows (AP) (if equipped) before placing tank in motion.



## DRIVE THE VEHICLE (OPERATE BRAKES)



DRIVER'S STATION

## To Stop Vehicle:

**NOTE**

**Push hard to stop quick.**

1. Push brake pedal (A) with right foot. Push until vehicle stops.
2. To release brakes, take foot off pedal (A).

## To Set Parking Brake:

**CAUTION**

**Do not set parking brakes if weather is freezing. If vehicle is not stopped, transmission can be damaged.**

1. Make sure vehicle is stopped.
2. Push pedal (A) until pressure gage (C) reads between 750 and 900 psi.

**NOTE**

**When pushing pedal (A), do not go over 900 psi on pressure gage (C). If more than 900 psi is applied, brake will be hard to release.**

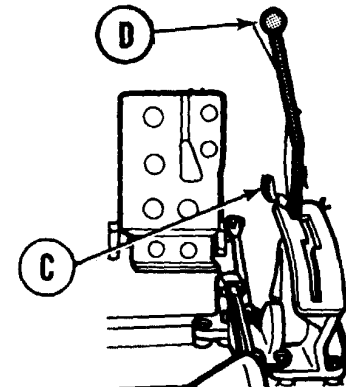
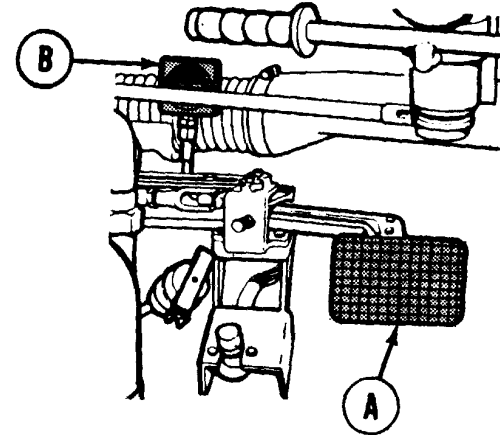
**When pushing p 1i C:A-do**

3. Move transmission shift lever (B) to P (park).
4. Release pedal (A). Parking brake is set.

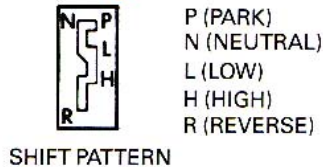
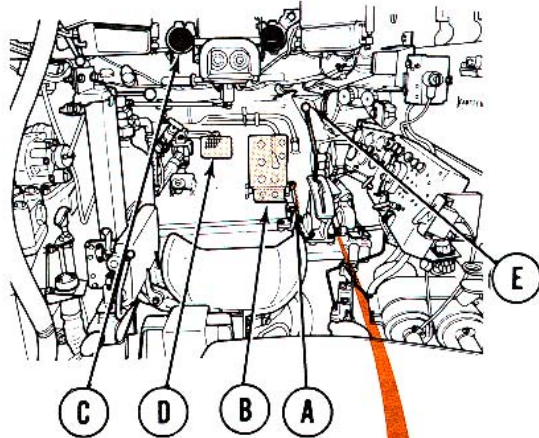
**DRIVE THE VEHICLE (OPERATE BRAKES) - Continued****To Release Parking Brake:****NOTE**

**If parking brake has been set at 900 psi, then more than 900 psi will be required to release it.**

1. Push brake pedal (A) until pressure gage (B) reads about 900 psi. Do not pump pedal (A).
2. Push transmission shift lever lock (C) forward (if installed).
3. Move transmission shift lever (D) from P (park) to N (neutral). Do not force shift lever (D). If necessary, push harder on pedal (A) until lever (D) can be moved to N (neutral).
4. Release pedal (A).



**DRIVE THE VEHICLE (OPERATE TRANSMISSION)**



**Before Shifting Transmission Make Sure:**

- Engine temperature indicator needle is in green zone.
- Accelerator lock (A) is unlocked. To unlock, push accelerator pedal (B) down a little and release.
- Tachometer (C) shows engine idle speed at 700 to 750 rpm.

**CAUTION**

**If engine stalls when driving uphill, depress brake (D) to stop vehicle's backward movement. Do not let vehicle roll backward while transmission shift lever (E) is in L (low) or H (high).**

**If braking does not stop vehicle from going backward, move lever (E) to N (neutral).**

**If engine starts to run backwards, stop vehicle (do not shut off engine while vehicle is moving). Shut off engine. Try to restart.**

**DRIVE THE VEHICLE (OPERATE TRANSMISSION) - Continued**  
**Transmission Range:**

**P (PARK)**



**WARNING**

Push and hold brake pedal (D) when moving lever (E) from P to another range, or vehicle will move.

**CAUTION**

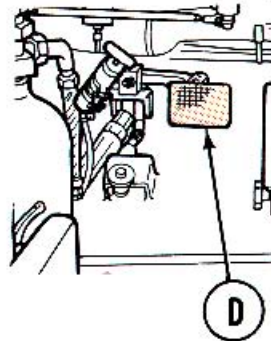
Vehicle must be at full stop before you move lever (E) to P to prevent damage to transmission.

**WARNING**

Push and hold brake pedal (D) when moving lever (E) from N to another range or vehicle will move.

**CAUTION**

Never go down a hill with lever (E) in N. Do not shift from N to L or R unless engine idle speed is at 700 to 750 rpm.



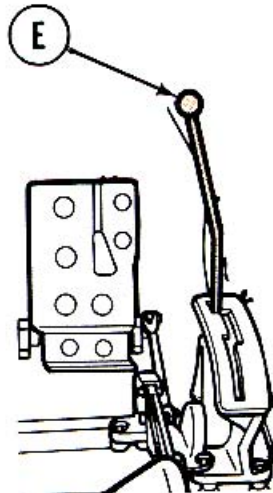
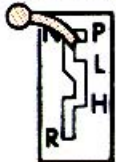
**Use P (Park) When:**

- Parking vehicle.
- Starting engine.
- Setting parking brakes.
- Operating winch and boom.

**Use N (Neutral) When**

- Forward or reverse movement is not wanted.
- Making a pivot turn.

**N (NEUTRAL)**





DRIVE THE VEHICLE (OPERATE TRANSMISSION) - Continued

Transmission Range:

L (LOW)



**CAUTION**

When going down steep hills in L, keep engine rpm on tachometer (C) below 2400 rpm. Push brake pedal (D) to slow vehicle as required

Maximum speed in L : 10 mph. Exceeding this speed in L could damage vehicle

**CAUTION**

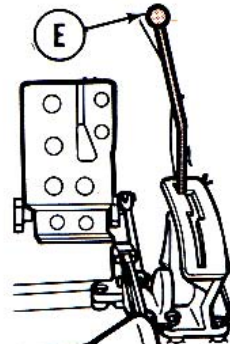
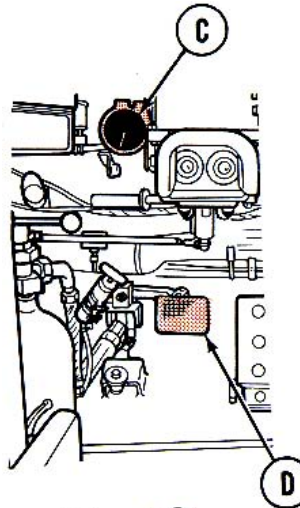
Do not move lever (E) from H to L if speed is more than 9 mph. Donot move lever (E) from H to R unless:

- Vehicle is stopped and
- Engine idle speed is 700 to 750 rpm

Minimum speed in H: 10 mph. Constant slower speeds in H could damage vehicle engine

Maximum speed in H : 30 mph. Exceeding this could damage vehicle engine

H (HIGH)



**Use L (Low) When:**

- Driving on soft, rough, or steep ground.
- Moving forward from a stop.
- Bulldozing.

**Use H (High) When:**

- Driving on firm, smooth, and level ground.
- Driving on roads.

**DRIVE THE VEHICLE (OPERATE TRANSMISSION) - Continued**

**Transmission Range:**

**R (REVERSE)**



**WARNING**

When shift lever (E) is in R position, steering is reversed. Moving steering control right causes vehicle to go left.

**WARNING**

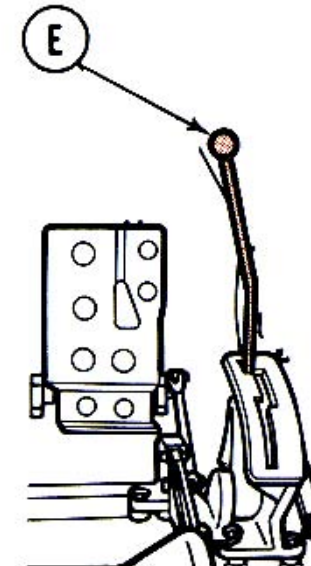
Never move lever (E) out of R unless vehicle is stopped and engine idle speed is at 700 to 750 rpm. Injury to personnel or damage may occur.

**CAUTION**

Maximum speed in R: 5mph. Exceeding this speed could damage vehicle engine.

**Use R (Reverse) When:**

- Moving vehicle backwards.
- Going up steep hills for maximum engine power



**DRIVE THE VEHICLE (STEER THE VEHICLE)****WARNING**

Careless driving can cause loss of steering control. This can result in injury to personnel and damage to property or vehicle.

**Make Sure:**

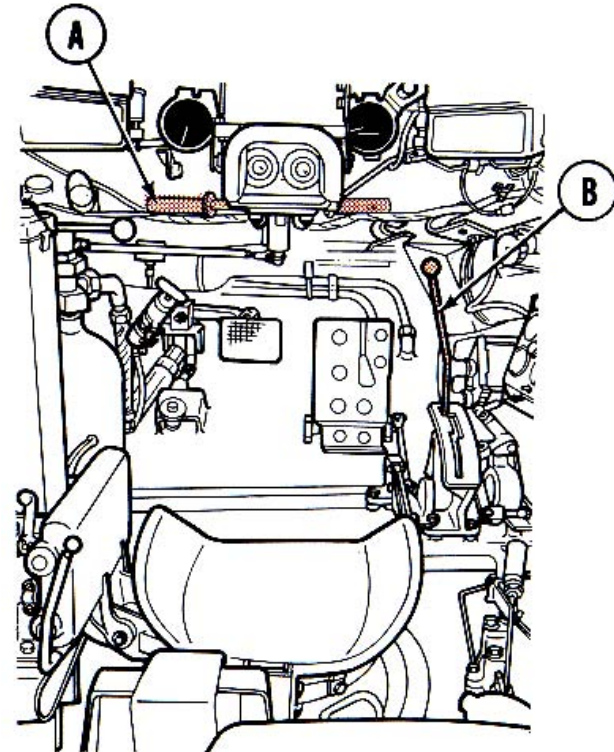
- You understand the use of transmission shift lever (page 2-215).

**CAUTION**

Do not let steering control (A) return to center position by releasing it. Guide it back to center by hand to avoid damage to steering linkage. Always turn steering control smoothly. Never jerk it around. You may cause a thrown track or damage a transmission. Never slow vehicle by steering from side to side. Damage to track may result.

**NOTE**

Steering response depends on three things: How far you turn steering control (A). Transmission range. Speed of engine. You can make a sharper turn with transmission shift lever (B) in L rather than in H.

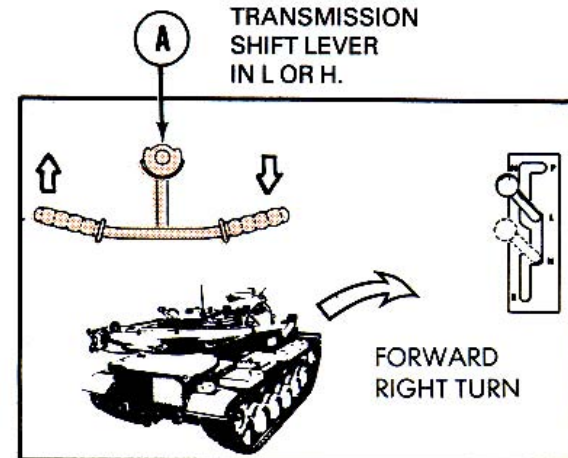
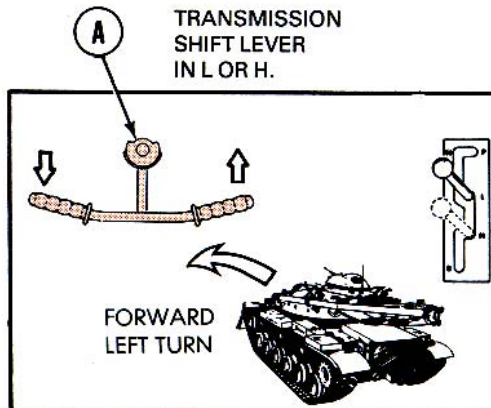


DRIVER'S STATION

**DRIVE THE VEHICLE (STEER THE VEHICLE) - Continued**

**Forward Right Turn**

1. Turn steering control (A) smoothly to left as required.
2. Increase engine speed slightly.
3. As turn is completed, ease steering control (A) back to center.

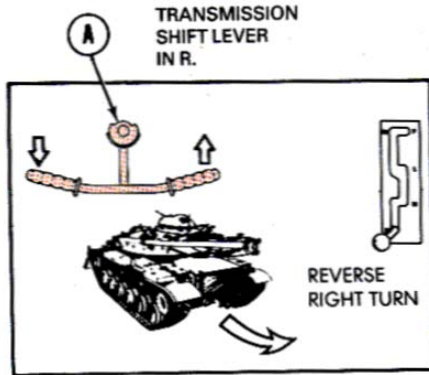


**Forward Left Turn**

1. Turn steering control (A) smoothly to right as required.
2. Increase engine speed slightly.
3. As turn is completed, ease steering control (A) back to center.

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## DRIVE THE VEHICLE (STEER THE VEHICLE) - Continued

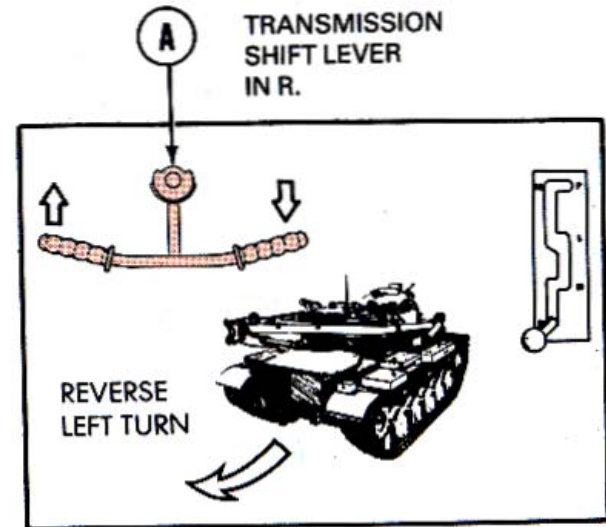


### Reverse Left Turn

1. Turn steering control (A) smoothly to left as required.
2. Increase engine speed slightly.
3. As turn is completed, ease steering control (A) back to center.

### Reverse Right Turn

1. Turn steering control (A) smoothly to right as required.
2. Increase engine speed slightly.
3. As turn is completed, ease steering control (A) back to center.



TA132363

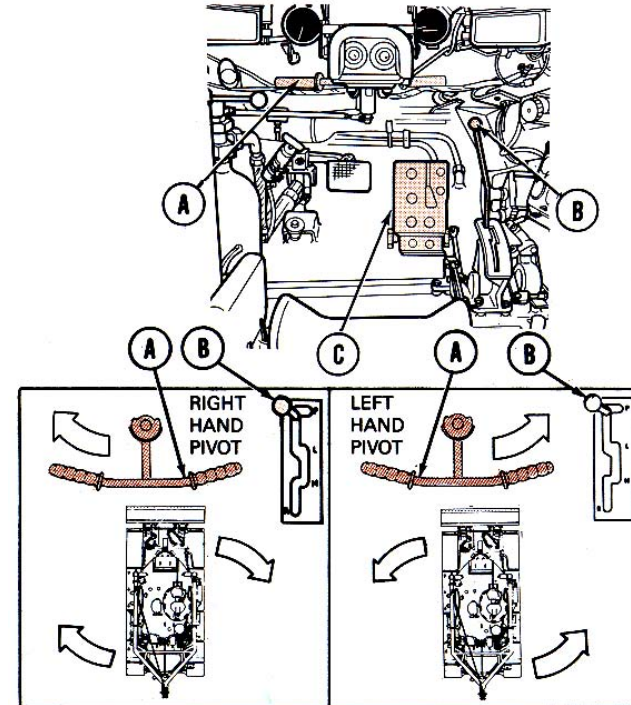
**DRIVE THE VEHICLE (STEER THE VEHICLE) - Continued**

**Pivot Turn (Right and Left)**

**WARNING**

**Do not try to pivot turn while vehicle is moving. Injury to personnel and damage to vehicle can result.**

1. Bring vehicle to complete stop.
2. Shift transmission lever (B) to N.
3. To pivot turn right, turn steering control (A) left.  
To pivot turn left, turn steering control (A) right.
4. Slowly push accelerator pedal (C) to increase engine speed and turn vehicle.
5. As turn is completed:
  - a. Move steering control (A) back to center.
  - b. Release accelerator pedal (C).



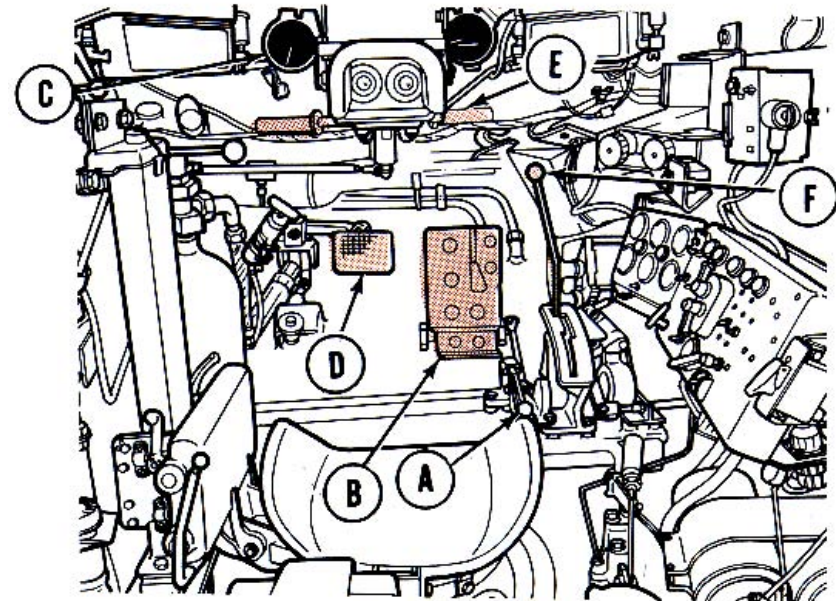
TA132361

**DRIVE THE VEHICLE (DRIVE FORWARD)****NOTE**

The following procedures do not include operating moldboard. For moldboard operations, see page 2-256.

**Make Sure:**

- Moldboard is in stowed position (page 2-261).
- Boom is in stowed position (page 2-305).
- Engine is running (page 2-205).
- Accelerator lock (A) is unlocked.  
If not, push accelerator pedal (B) down slightly and release.
- Parking brake is released (page 2-214).
- Tachometer (C) shows engine idle speed is 700 to 750 rpm.
- Required lights are turned on (page 2-186).
- Required driver's periscopes are installed and operating (page 2-197).



DRIVER'S STATION

- You understand operation of following items:  
Brake pedal (D) (page 2-213).  
Steering control (E) (page 2-219).  
Transmission shift lever (F) (page 2-215).

**DRIVE THE VEHICLE (DRIVE FORWARD) - Continued**

**To Drive Over Soft Ground Or Rough Ground Using Low Range And Speed Of 10 MPH.**

1. Press and hold brake pedal (D).
2. Move transmission shift lever (F) to L.
3. Release brake pedal (D).

**WARNING**

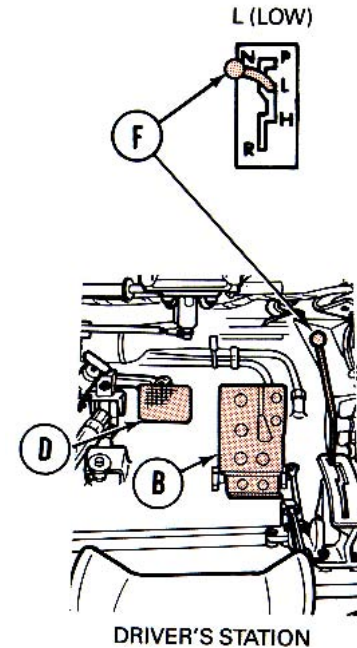
**Never push accelerator pedal (B) rapidly. Injury to personnel or damage to vehicle could result.**

4. Push down slowly on accelerator pedal (B).

**CAUTION**

**Maximum speed in L is 10 mph. Higher speed could damage vehicle.**

5. Accelerate, brake, and steer as required.





**DRIVE THE VEHICLE (DRIVE FORWARD) - Continued**

To Drive Over Firm, Smooth, Level Ground Using High Range and Speed Under 30 MPH:

**NOTE**

There is little gain in acceleration by starting in L on firm, smooth, level ground. The vehicle will accelerate from a start in H.

1. Push and hold brake pedal (D).
2. Move transmission shift lever (F) to H.
3. Release brake pedal (D).

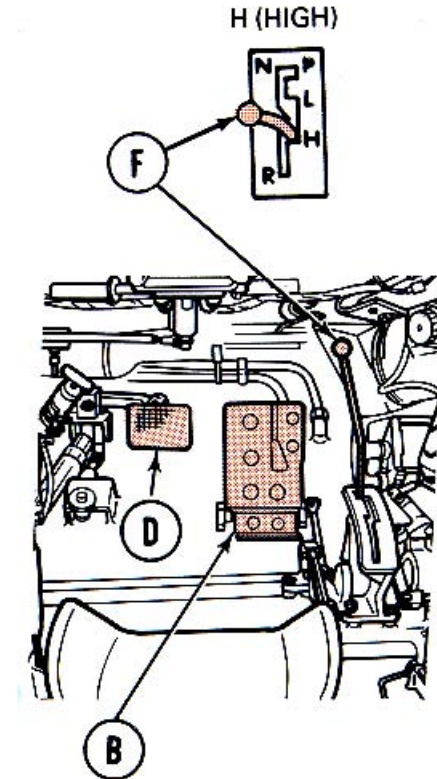
**WARNING**

Never push accelerator pedal (B) rapidly. Injury to personnel or damage to vehicle could result.

**CAUTION**

Minimum constant speed in H is 10 mph. Constant slower speeds in H could damage vehicle engine. Maximum speed in H is 30 mph. Exceeding this speed could damage vehicle engine.

4. Push down slowly on accelerator pedal (B). Accelerate to speed over 10 mph.
5. Accelerate, brake, and steer as required.



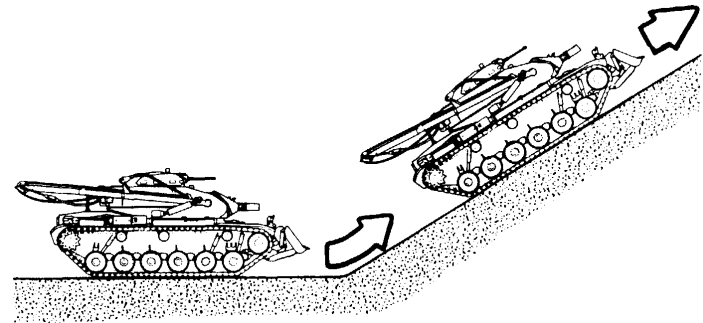
**DRIVE THE VEHICLE (DRIVE FORWARD) - Continued****To Go Up Steep Grade:****Make Sure:**

- You read and understand the cautions involved while going up steep grade (page 2-215).

**CAUTION**

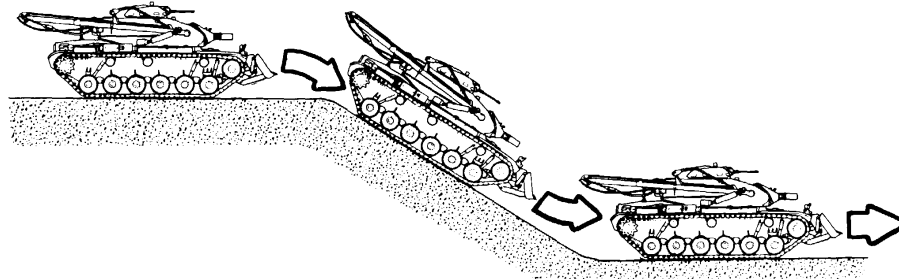
**Maximum grade vehicle will climb is 60 percent.**

1. Warn crew to brace themselves.
2. Approach grade as squarely as possible.
3. Move transmission shift lever to L.

**NOTE**

Try not to stop when ice/is going up a steep grade. It may be hard to get vehicle started forward again. Make a minimum number of steering corrections. Steering corrections use power and will slow forward movement of vehicle. Vehicle has more climbing power in R than in L. If vehicle will not go up grade in L (low), shift transmission shift lever to R (reverse) and ease vehicle slowly backward to bottom of grade (page 2-215). Turn vehicle around Try going up in reverse (page 2-235).

4. Push accelerator down as required to climb grade.

**DRIVE THE VEHICLE (DRIVE FORWARD) - Continued****To Go Down Steep Grade:**

1. Warn crew to brace themselves.
2. Approach grade as squarely as possible.

**WARNING**

**Never go down a grade with transmission shift lever in N.**

3. Stop vehicle at top of grade.
4. Move transmission shift lever to L.
5. Using accelerator, slowly move vehicle forward in L until front tips down grade.
6. Release accelerator. Apply brakes.
7. Use brakes to keep speed below 10 mph and engine speed below 2400 rpm.
8. Steer and brake as required while vehicle rolls down grade.

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**DRIVE THE VEHICLE (DRIVE FORWARD) - Continued**

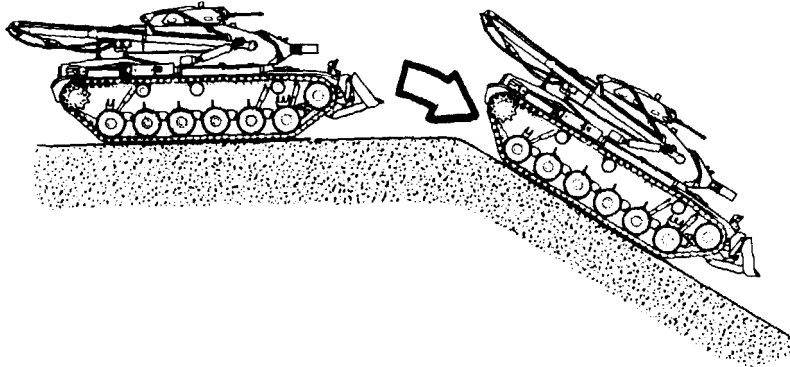
**To Go Down Steep Grade Using Engine as Brake:**

1. Warn crew to brace themselves.
2. Move vehicle over edge of grade in L.

**WARNING**

**Steering is reversed when vehicle is moving forward with transmission shift lever in R.**

3. Push and hold brake pedal to stop vehicle.



**CAUTION**

**If engine stalls while vehicle is moving forward in R, transmission will drive engine backward.**

**Keep engine speed (rpm) high enough to prevent engine from stalling.**

**If Engine Should Stall:**

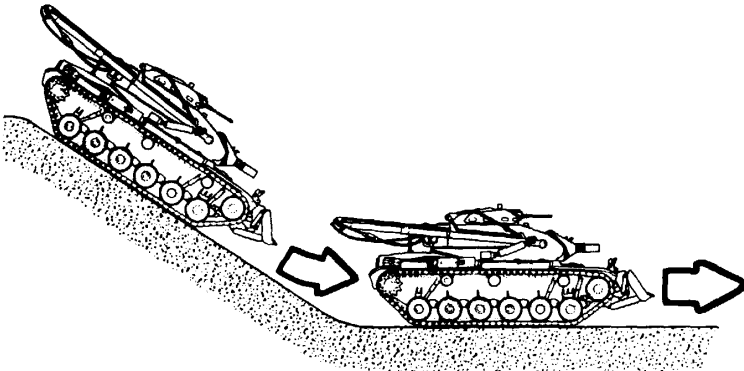
- Stop vehicle. Do not allow vehicle to roll forward in R.
- Move transmission shift lever to N.
- Restart engine.

**If Engine Stalls and Starts to Run Backwards:**

- Stop vehicle. Hold brake pedal.
- Push up and hold ENGINE FUEL SHUT OFF switch until engine stops.
- Move transmission shift lever to N.
- Restart engine.

**DRIVE THE VEHICLE (DRIVE FORWARD) - Continued**

4. Move transmission shift lever to R.
5. Release brakes. Push down on accelerator pedal. Engine will act as brake as vehicle rolls down grade. High engine speed produces more braking action.
6. Steer as required.
7. When bottom grade is reached:
  - a. Release accelerator.
  - b. Stop vehicle.
  - c. Move transmission shift lever to L or H as required.



TA132369

**DRIVE THE VEHICLE (DRIVE FORWARD) - Continued**

**To Drive on Side Slope:**

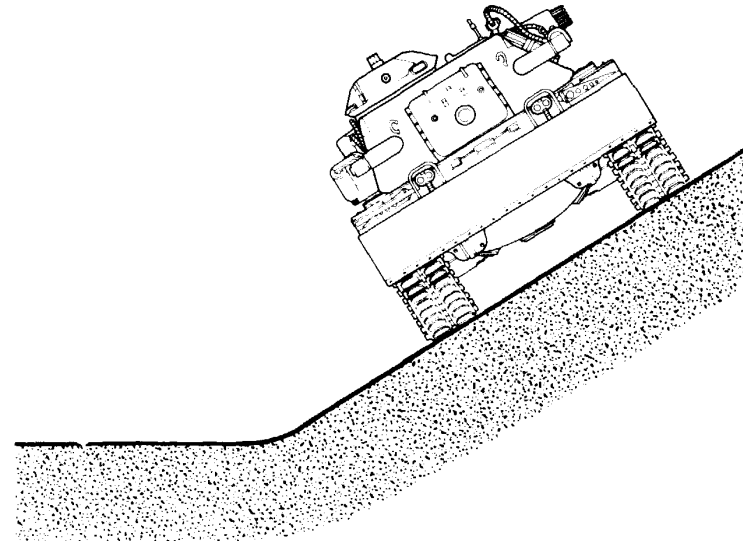
**WARNING**

Maximum grade for side-slope operation is 30 percent.

**CAUTION**

Do not turn quickly when driving on side slopes. Turning quickly could cause vehicle to overturn or throw track.

- \* When driving on side slope, vehicle will tend to drift downhill.
- \* Prevent drifting downhill by making steering corrections smoothly.



TA132370

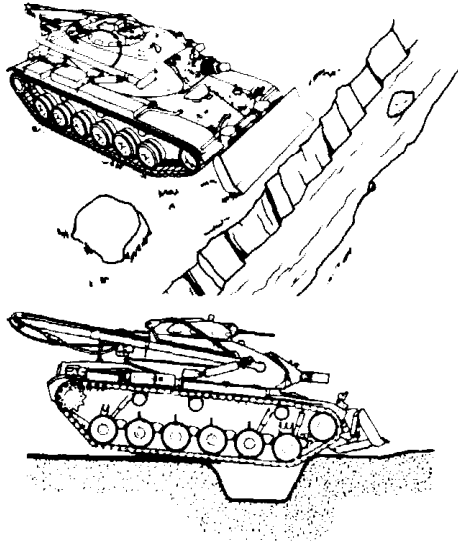
**DRIVE THE VEHICLE (DRIVE FORWARD) - Continued**

**To Cross Ditch:**

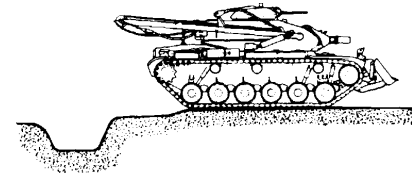
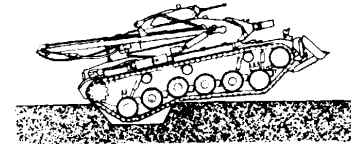
**CAUTION**

**Maximum width of ditch vehicle can cross is 99 inches. Maximum depth is 26 inches**

1. Approach ditch as squarely as possible.
2. Warn crew to brace themselves.
3. Make sure transmission shift lever is in L.



4. Using accelerator and brakes, ease vehicle into ditch a little at a time. Do this until front of vehicle tips over edge.
5. Release accelerator and apply brakes.
6. Using brakes, ease vehicle forward until track rests on bottom or opposite side of ditch.

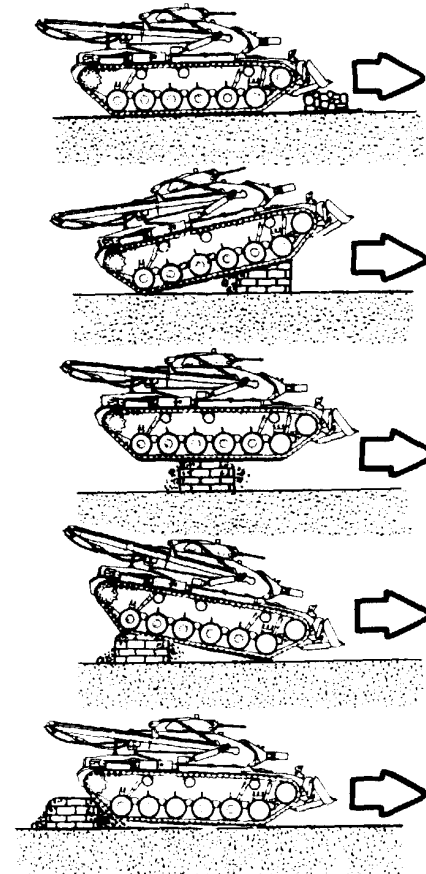


7. Release brakes.
8. Accelerate slowly but smoothly across ditch.
9. Let up slightly on accelerator as front of vehicle begins to level from climb.

**DRIVE THE VEHICLE (DRIVE FORWARD) - Continued****To Go Over Obstacle:****CAUTION**

**Maximum height of obstacle vehicle can go over is 30 inches**

1. Warn crew to brace themselves.
2. Make sure transmission shift lever is in L.
3. Approach obstacle as slowly and as squarely as possible.
4. As track touches obstacle, push down slowly on accelerator pedal until vehicle climbs obstacle. Hold accelerator pedal to climb obstacle until vehicle begins to level.
5. As vehicle begins to level:
  - a. Release accelerator.
  - b. Push and hold brake pedal.
6. Allow front of vehicle to settle on opposite side of obstacle.
7. Using brakes, allow vehicle to roll very slowly off obstacle.





**CROSSING THE CLASS 60 ARMORED VEHICLE LAUNCHED BRIDGE**

**WARNING**

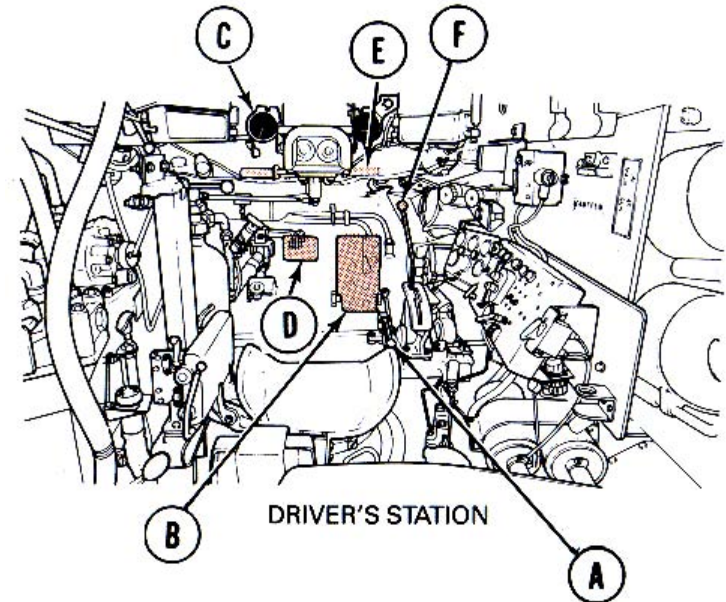
**Care must be taken to avoid injury to personnel and to avoid excessive wear and tear to the class 60 Armored Vehicle Launched Bridge.**

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

**Change 5 2-232.1/(2-232.2 blank)**

**DRIVE THE VEHICLE (DRIVE IN REVERSE)****Make Sure:**

- Moldboard is in stowed position (page 2-261).
- Boom is in stowed position (page 2-305).
- Engine is running (page 2-205).
- Accelerator lock (A) is unlocked. If not, push accelerator pedal (B) down slightly and release.
- Parking brake is released (page 2-214).
- Tachometer (C) shows engine idle speed is 700 to 750 rpm.
- Required lights are turned on (page 2-186).
- Required driver's periscopes are installed and operating (page 2-197).
- You understand operation of following items:  
 Brake pedal (D) (page 2-213).  
 Steering control (E) (page 2-219).  
 Transmission shift lever (F) (page 2-215).



TA132373

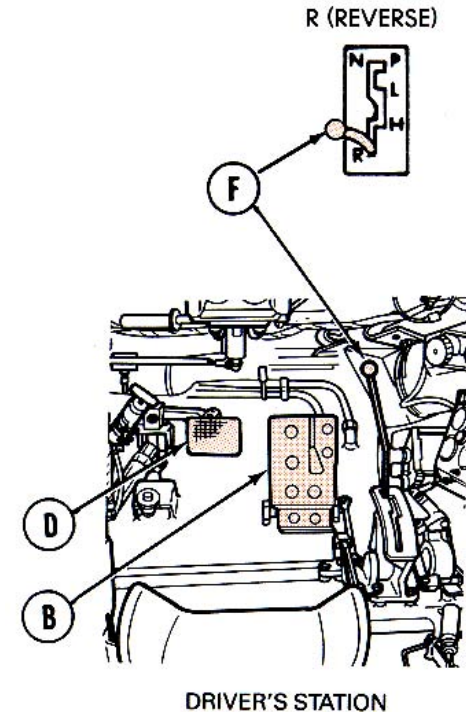
**DRIVE THE VEHICLE (DRIVE REVERSE) - Continued****To Drive Vehicle in Reverse:****WARNING**

Driver has no vision to the rear. A guide is required when driving vehicle in reverse. Either a vehicle mounted guide in communication with the driver, or a visible dismounted guide can be used.

**CAUTION**

Operation of steering control is reversed when operating vehicle in reverse. See page 2-221 for instructions on how to make right or left turn when operating in reverse. Before moving lever (F) to R, make sure vehicle is completely stopped.

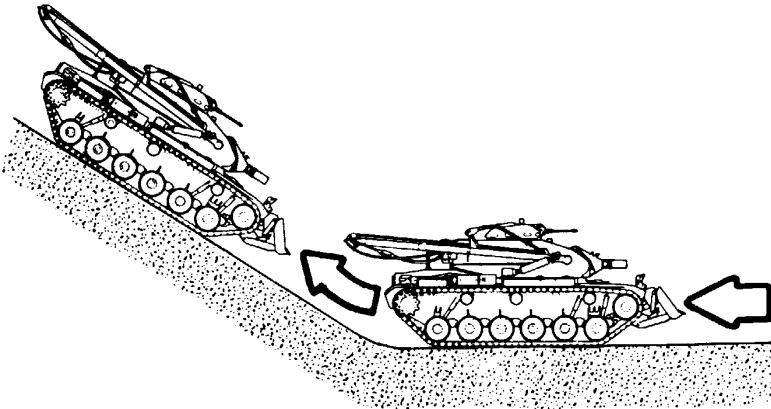
1. Push and hold brake pedal (D).
2. Move lever (F) to R.
3. Release brake pedal (D).
4. Push slowly on accelerator pedal (B).
5. Follow direction from mounted guide or signals from dismounted guide.
6. Accelerate, brake, and steer as required.



**DRIVE THE VEHICLE (DRIVE IN REVERSE) - Continued****To Drive Up Steep Grade in Reverse:****WARNING**

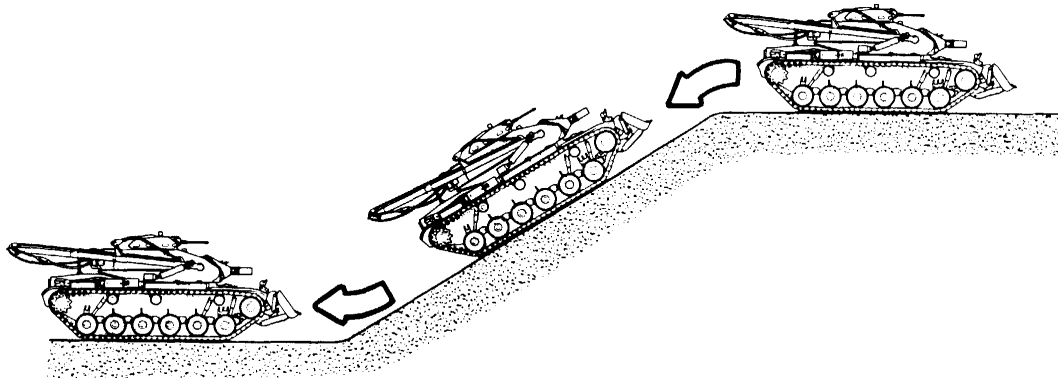
Driver has no vision to the rear. A guide is required when driving vehicle in reverse. A vehicle mounted guide (commander or loader) must direct driver using intercom (page 2-169).

1. Warn crew to brace themselves.
2. Follow steering directions from guide.
3. Approach grade as squarely as possible.
4. Push accelerator down as required to climb grade.



**DRIVE THE VEHICLE (DRIVE IN REVERSE) - Continued****To Drive Down Steep Grades**

- 1 Warn crew to brace themselves.
- 2 Follow steering directions from guide.
- 3 Back up to grade as squarely as possible.
- 4 Using accelerator, move vehicle slowly with transmission in R until rear of vehicle tips down grade.
- 5 Release accelerator. Apply brakes.
- 6 Use brake to keep speed below 5 mph and engine speed below 2400 rpm.
- 7 Steer and brake as required while vehicle rolls backward down grade.



**DRIVE THE VEHICLE (DRIVE IN REVERSE) - Continued**

**To Drive on Slide Slope**

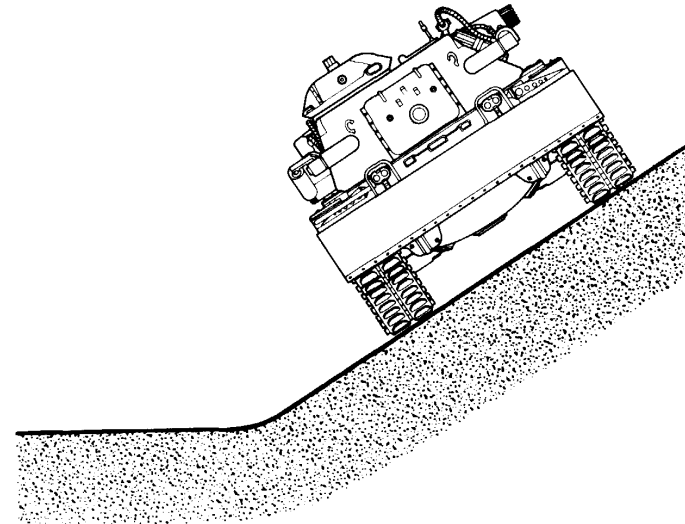
**WARNING**

Maximum grade for side -slope operation is 30 percent.

**CAUTION**

Do not turn quickly when driving on side slope. Turning quickly could cause vehicle to overturn or throw track.

- When driving on side slope, vehicle will tend to drift downhill
- Prevent drifting downhill BY making steering corrections smoothly



TA132377

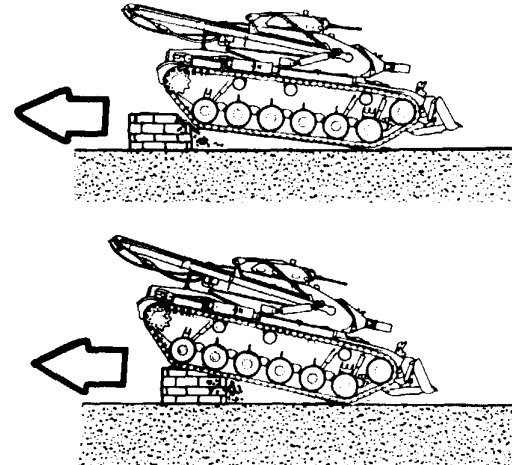
**DRIVE THE VEHICLE (DRIVE IN REVERSE) - Continued****To Drive Over Obstacle:****WARNING**

Driver has no vision to the rear. A guide is required when driving vehicle in reverse. A vehicle mounted guide (commander or loader) must direct driver using intercom (page 2-169).

**CAUTION**

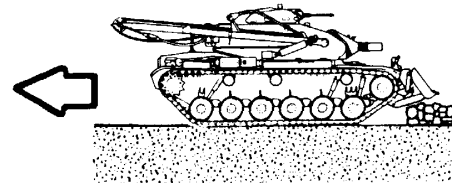
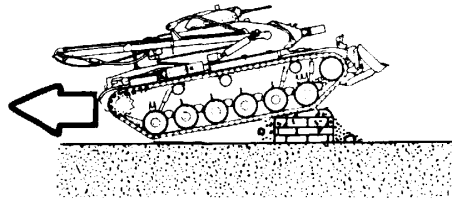
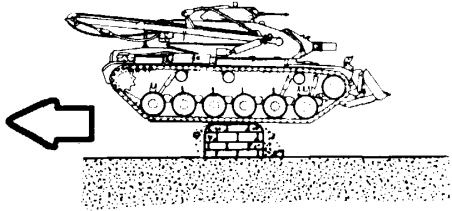
Steering is reverse when driving backward & Maximum height of obstacle vehicle can go over backwards is 24 inches

1. Warn crew to brace themselves.
2. Follow instructions from guide.
3. Approach obstacle as slowly and as squarely as possible with transmission in R.
4. As track touches obstacle, push down slowly on accelerator pedal until vehicle starts to climb obstacle. Hold accelerator pedal until vehicle begins to level.



TA132378

**DRIVE THE VEHICLE (DRIVE IN REVERSE) - Continued**



5. As vehicle levels on top of obstacle:
  - a. Release accelerator.
  - b. Push and hold brake pedal.
6. Allow rear of vehicle to settle gently on opposite side of obstacle.
7. Using brakes, allow vehicle to roll very slowly off obstacle.

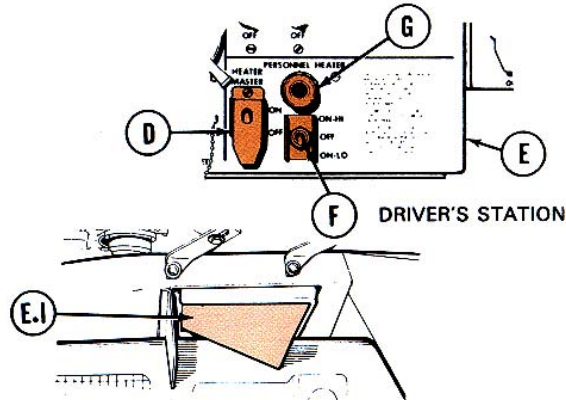
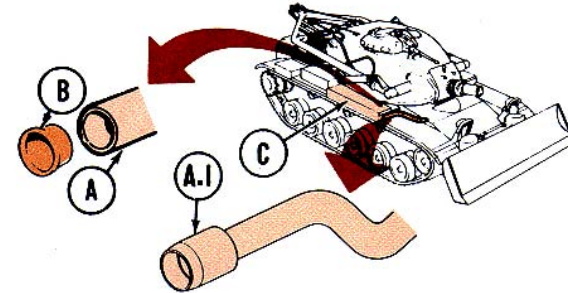


**OPERATE PERSONNEL HEATER (TURN ON HEATER)**

**NOTE**

- If your vehicle is equipped with the early exhaust tube (A), perform steps 1 and 2.
- If your vehicle is equipped with the late exhaust tube (A.1), skip steps 1 and 2.

1. Pull out heater exhaust plug (B) (if installed) from heater exhaust pipe (A).
2. Stow heater exhaust plug (B) in right front fender box (C).



**Make Sure:**

- HEATER MASTER switch (D) on panel (E) is set to ON.
- Heater duct deflector (E.1) is present.
- Engine air intakes are set to draw air from engine compartment (page 2-659) or hatches are open.

**CAUTION**

Never set HEATER MASTER switch (D) to OFF unless fording water or if electrical short occurs.

Do not start heater if switch (F) is set to OFF and light (G) is on. Notify organizational maintenance.

Do not operate heater if tank is in an enclosed area, unless heater is vented outside.

**OPERATE PERSONNEL HEATER (TURN ON HEATER) - Continued**

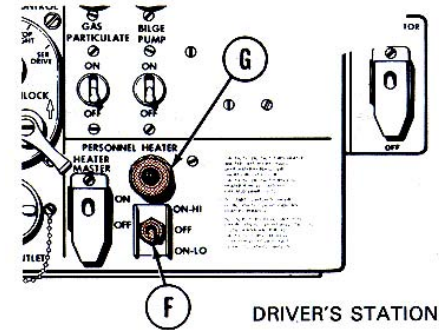
3. Set switch (F) to ON-HI or ON-LO as desired.

**NOTE**

Switch (F) may be switched from ON-LO to ON-HI or ON-HI to ON-LO. Do not stop switch (F) in OFF (center position) or heater will shut off.

4. Wait for 4 minutes.

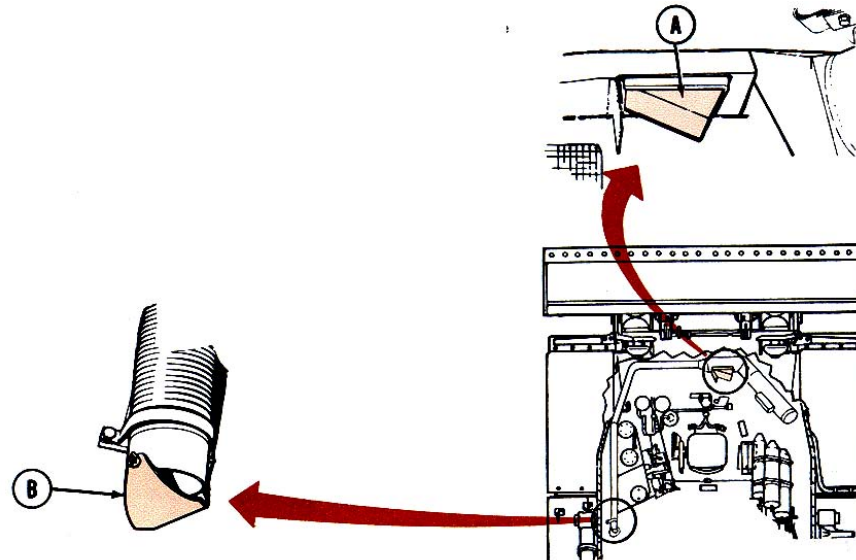
- a. If light (G) lights, go to step 1 (page 2-242).
- b. If light (G) fails to light, set switch (F) to OFF, wait 10 seconds and depress light (G).
  - (1) If light fails to light, notify organizational maintenance.
  - (2) If light lights, set switch (F) to ON-LO or ON-HI and wait for 2 minutes.
  - (3) If light (G) lights, go to step 1 (page 2-242).
  - (4) If light (G) fails to light, set switch (F) to OFF. Wait 10 seconds.
  - (5) Set switch (F) to ON-LO or ON-HI and wait for 2 minutes. If light (G) fails to light, set switch (F) to OFF and notify organizational maintenance.



TA252746

**OPERATE PERSONNEL HEATER (SET AIRFLOW DEFLECTOR)**

1. Push or pull heater door (A) toward the front or rear of the vehicle to control air flow in driver's station.
2. Other crew member, pull up or push down vent (B) to control flow of warm air into turret.

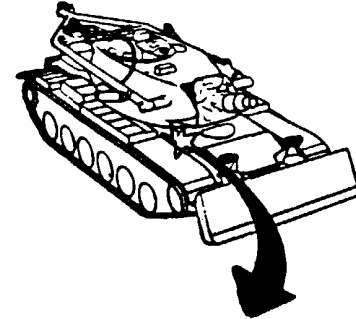


TA252747

**OPERATE PERSONNEL HEATER (TURN OFF HEATER)**

**CAUTION**

- Do not set HEATER MASTER switch (A) OFF unless fording.
- Leave MASTER BATTERY switch ON until heater fuel line is empty and light (B) is off.



**NOTE**

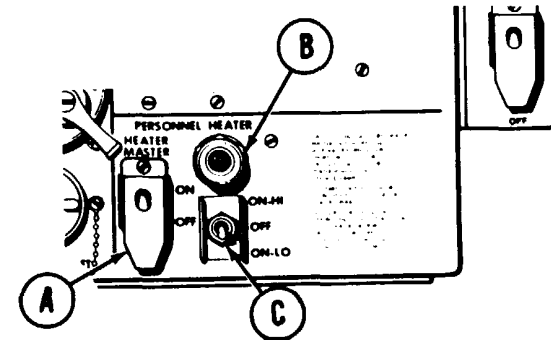
Heater must be on for at least 5 minutes before turning off.

1. Set PERSONNEL HEATER switch (C) to OFF.

**NOTE**

Heater will continue to operate until fuel line is empty.

2. Check that light (B) goes off within 5 minutes.
3. If light does not go off after 5 minutes, notify organizational maintenance.



**OPERATE GAS PARTICULATE SYSTEM (START GAS PARTICULATE SYSTEM)**

**WARNING**

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

If under CBR attack, put mask on as quickly as possible.

It alone will filter toxic agents while gas particulate unit is put into operation.

If NBC exposure is suspected, all air filter media should be handled by personnel wearing protective equipment.

Consult your unit NBC Officer or NBC NCO for appropriate handling or disposal instructions.

**NOTE**

A decal has been developed that warns of NBC exposure. It is to be positioned in a noticeable place on or near the air filter housing. You may order the decal using part number 12296626, CAGEC 19207; reference TB 43-0219 for more information.

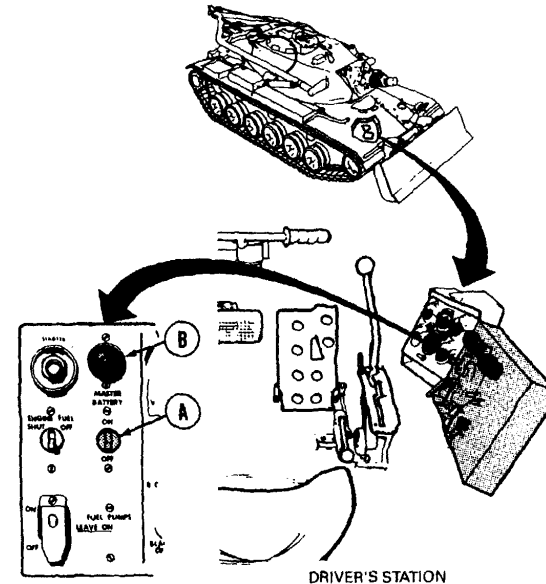


IF NBC EXPOSURE IS SUSPECTED ALL AIR FILTER MEDIA WILL BE HANDLED BY PERSONNEL WEARING FULL NBC PROTECTIVE EQUIPMENT. SEE OPERATOR/MAINTENANCE MANUAL.

7690-01 -1 14-3702

**NBC Warning Decal**

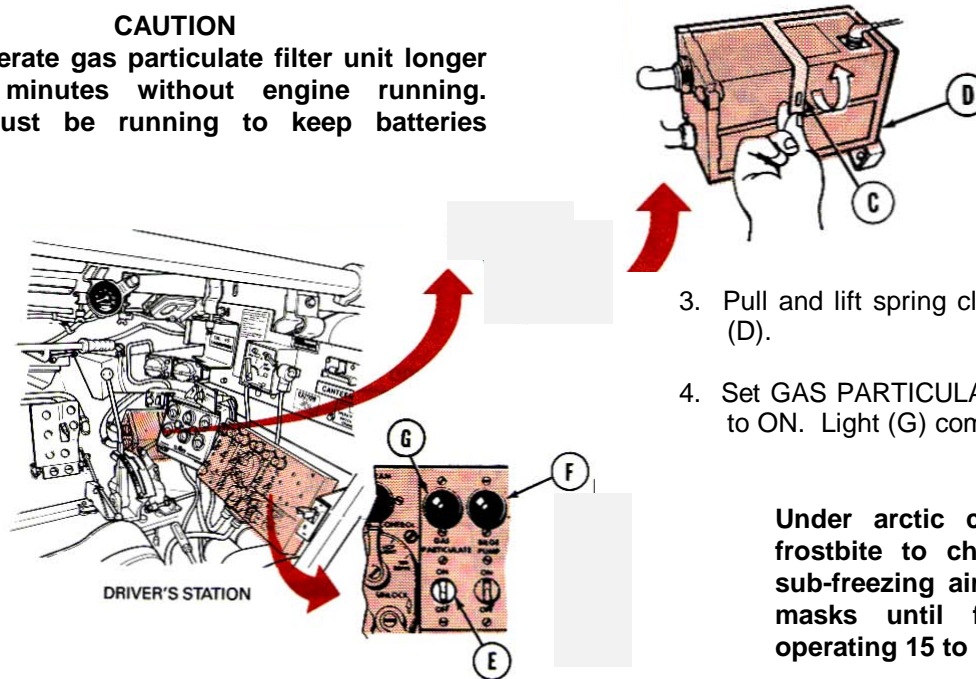
1. Put on and adjust mask (not part of filter unit).
2. Set MASTER BATTERY switch (A) to ON. Light (B) will light.



**OPERATE GAS PARTICULATE SYSTEM (START GAS PARTICULATE SYSTEM) - Continued**

**CAUTION**

Do not operate gas particulate filter unit longer than 10 minutes without engine running. Engine must be running to keep batteries charged.



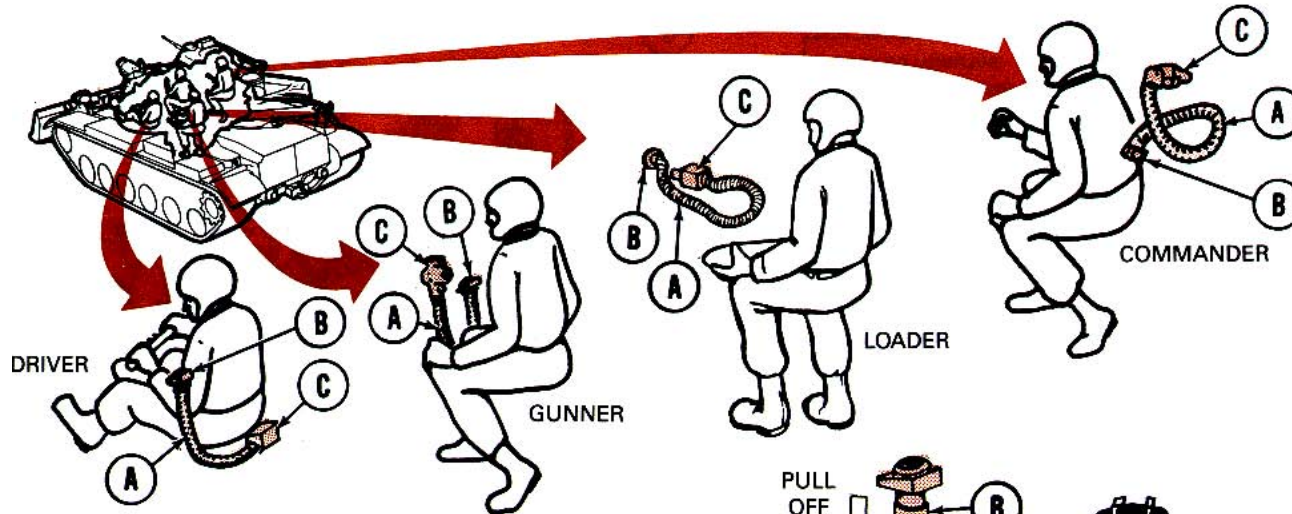
3. Pull and lift spring clip (C) from air intake opening on filter unit (D).
4. Set GAS PARTICULATE switch (E) on driver's control panel (F) to ON. Light (G) comes on.

**WARNING**

Under arctic conditions, there is danger of frostbite to cheekbone area, when breathing sub-freezing air. Do not connect air hoses to masks until filtered air heater has been operating 15 to 20 minutes.

TA132385

**OPERATE GAS PARTICULATE SYSTEM (CONNECT MASK)**

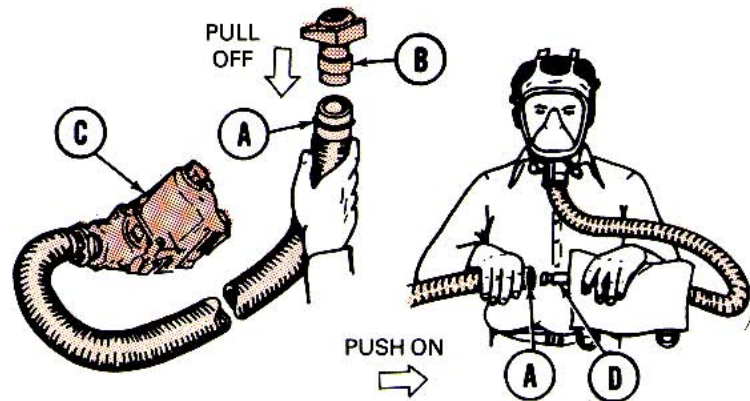


1. Pull hose (A) off connector (B).

**NOTE**

Other end of hose (A) is attached to M3 heater unit (C).

2. Push hose (A) over open end of M25A1 tank mask cannister (D). If air is too cold, adjust temperature (page 2-247).



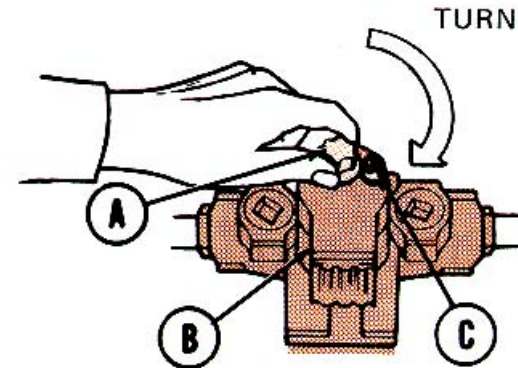
**OPERATE GAS PARTICULATE SYSTEM (ADJUST AIR TEMPERATURE)****CAUTION**

Be sure that gas particulate switch is on before turning on heater switch or damage to heater element may occur.

1. Turn knob (A) on M3 heater (B) clockwise from OFF until light (C) comes on.

**NOTE**

Indicator light will normally go off and on during heater operation.

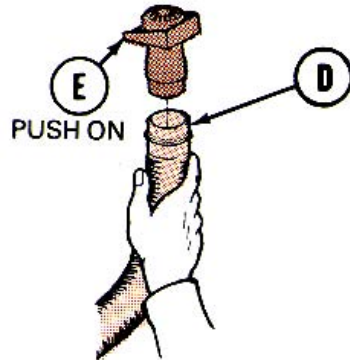
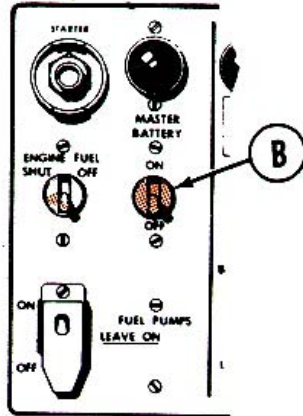


TA132387

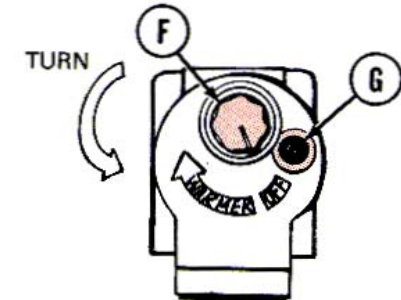
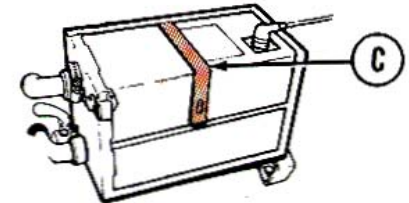
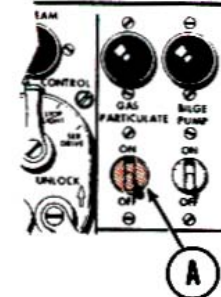
2. Turn knob (A) clockwise to increase air temperature or counterclockwise to decrease air temperature.



**OPERATE GAS PARTICULATE SYSTEM (TURN OFF GAS PARTICULATE SYSTEM)**



1. Turn air heater knob (F) counterclockwise to OFF position, if heater was in use. Light (G) will go off.
2. Set GAS PARTICULATE switch (A) to OFF.
3. Set MASTER BATTERY switch (B) to OFF if not required for other operation.
4. Remove mask.
5. Press spring clip (C) down to close air intake openings.
6. Disconnect hose (D) from mask cannister. Connect to connector (E).



TA132388

**OPERATE HYDRAULIC SYSTEM (START HYDRAULIC SYSTEM)**

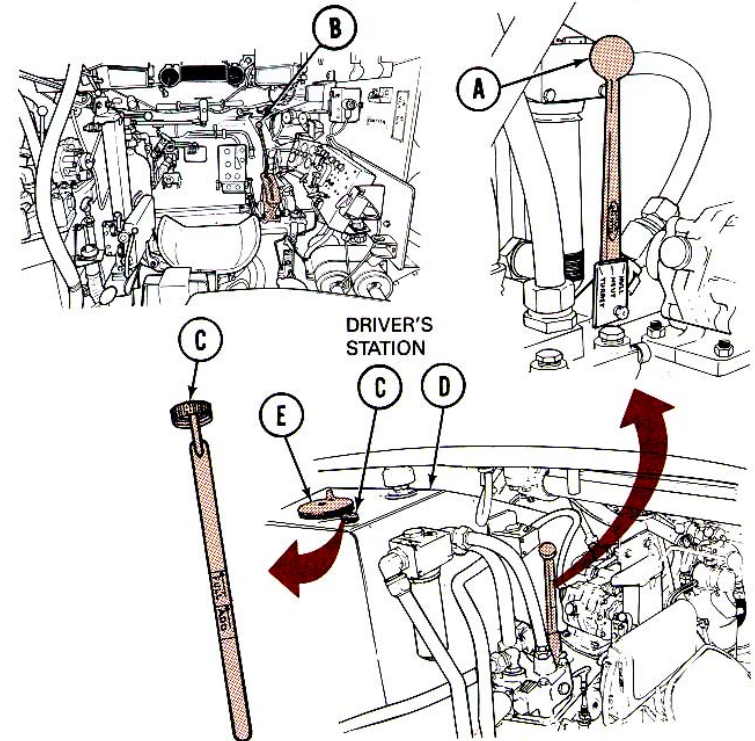
**Supplies:**

- Clean rags (item 56, App. D)

**Make Sure:**

- Moldboard is stowed (page 2-261).
- Boom is stowed (page 2-305).
- Winch cable is stowed (page 2-284).
- SELECTOR VALVE lever (A) is in NEUT position.
- Transmission shift lever (B) is set to P (park).

1. Unscrew and remove dipstick (C) from hydraulic oil reservoir (D).
2. Wipe oil from dipstick (C) with clean rag.
3. Push dipstick (C) all the way into oil reservoir (D) and remove again.
4. Check oil level on dipstick (C).
  - a. If oil level is between FULL and ADD lines, oil level is ok.
  - b. If oil level is below ADD line, unscrew and remove filler cap (E) and add oil (see LO 9-2350-222-12).



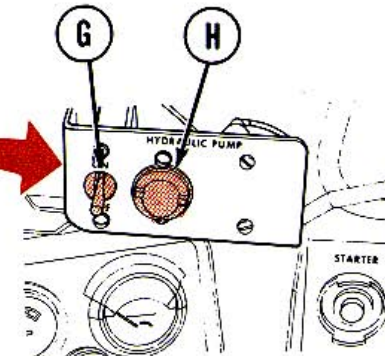
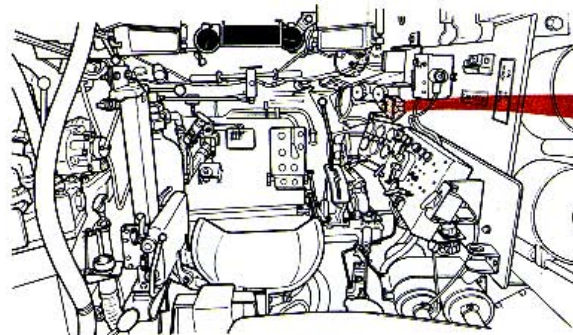
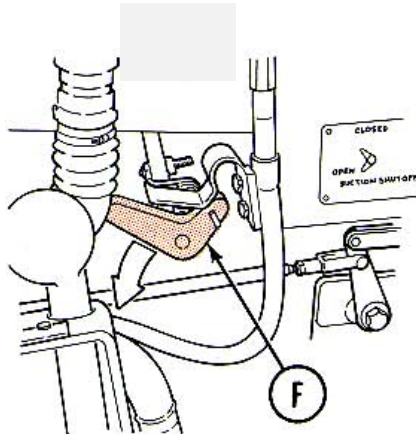
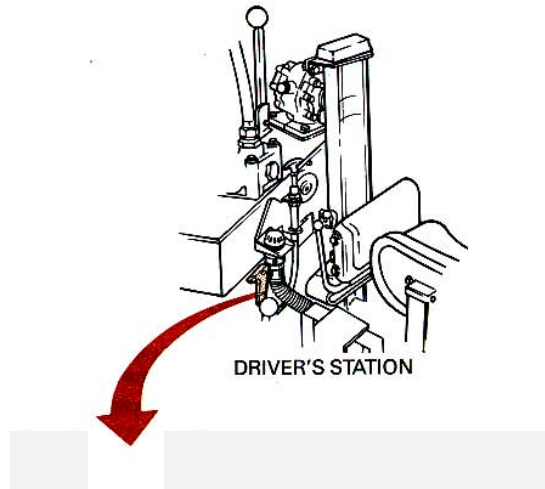
TA132389

OPERATE HYDRAULIC SYSTEM (START HYDRAULIC SYSTEM) - Continued

**WARNING**

**SUCTION SHUTOFF VALVE lever (F) is spring loaded. Use care when operating lever to avoid pinched fingers.**

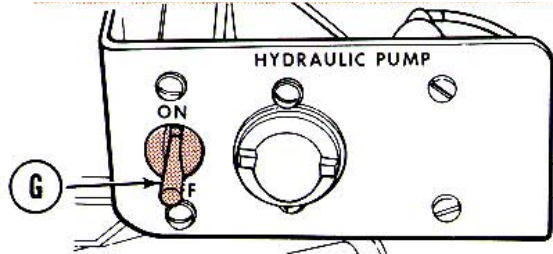
6. Push SUCTION SHUTOFF VALVE lever (F) down to OPEN position.
7. Start engine (page 2-205), if not already running.
8. Set HYDRAULIC PUMP switch (G) to ON. Light (H) will light. Wait two minutes for engine and hydraulic pump to warm up.



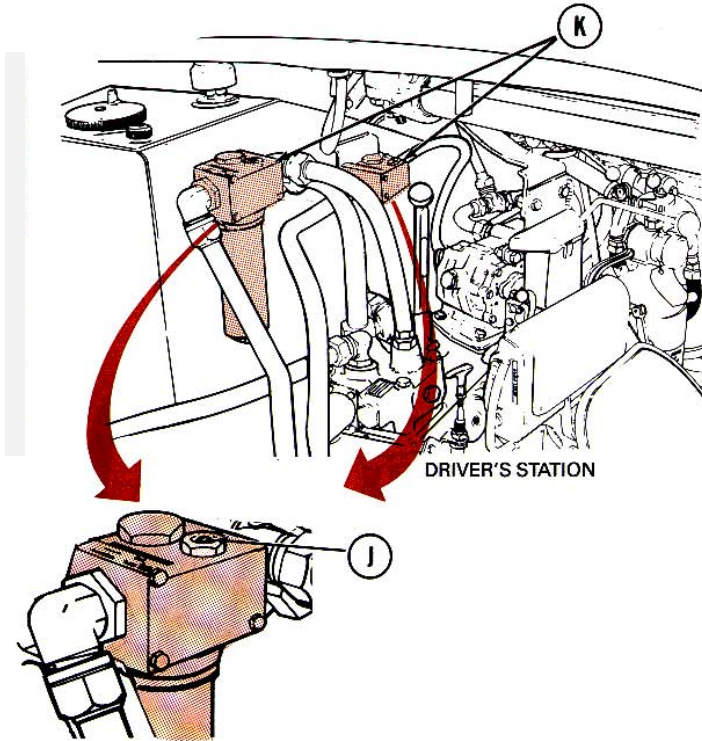
**OPERATE HYDRAULIC SYSTEM (START HYDRAULIC SYSTEM) - Continued**

**CAUTION**

If red indicators (J) on two hydraulic oil filters (K) will not press down, set HYDRAUUC PUMP switch (G) to OFF. Do not continue to operate hydraulic system. Notify organizational maintenance.



9. Check red indicators (J) on two hydraulic filters (K). If red indicator (J) sticks up, press it back down.



TA132391

**OPERATE HYDRAULIC SYSTEM (TURN OFF HYDRAULIC SYSTEM)**

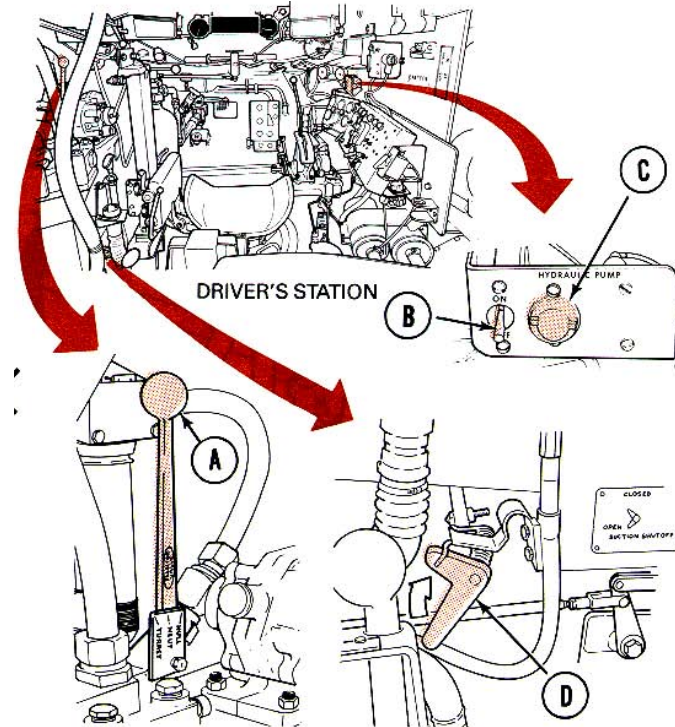
**Make Sure:**

- Moldboard is stowed (page 2-261).
  - Boom is stowed (page 2-305).
  - Winch cable is stowed (page 2-284).
1. Set SELECTOR VALVE lever (A) to NEUT.
  2. Set HYDRAULIC PUMP switch (B) to OFF. Light (C) will go out.

**WARNING**

**SUCTION SHUTOFF VALVE lever (D) is spring loaded. Keep hands clear of valve movement. Lever will spring into position quickly.**

3. Lift SUCTION SHUTOFF VALVE lever (D) to CLOSED position.



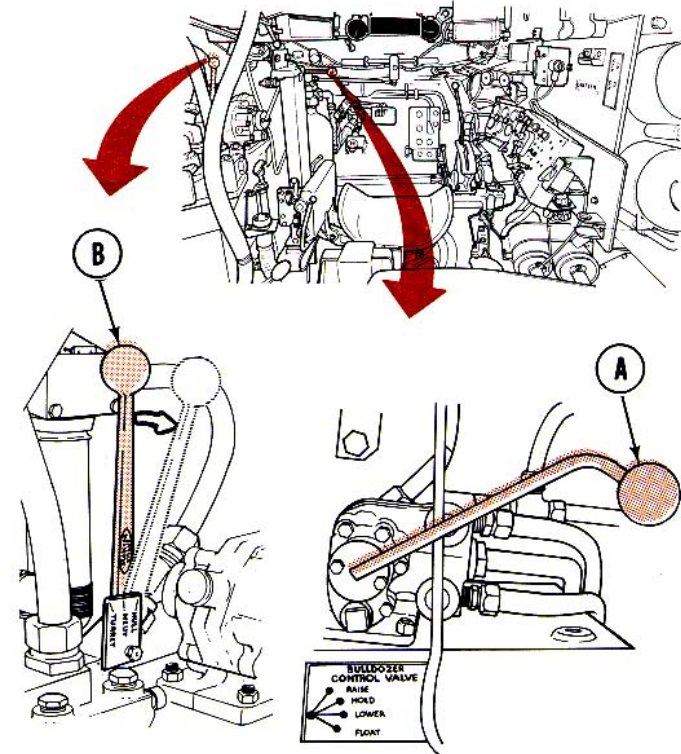
TA132392

## OPERATE MOLDBOARD (PREPARE FOR MOLDBOARD OPERATIONS)

### Make Sure:

- Hydraulic system has been started (page 2-248).
- Driver's hatch is locked open (page 2-146).
- Driver's seat is raised (page 2-167) so you can see moldboard.
- BULLDOZER CONTROL VALVE lever (A) is set in HOLD position.

1. Set SELECTOR VALVE lever (B) to HULL.



TA132393

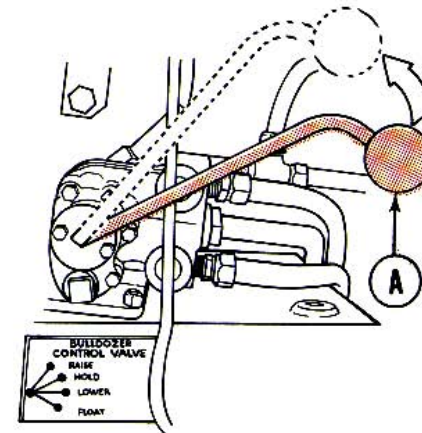
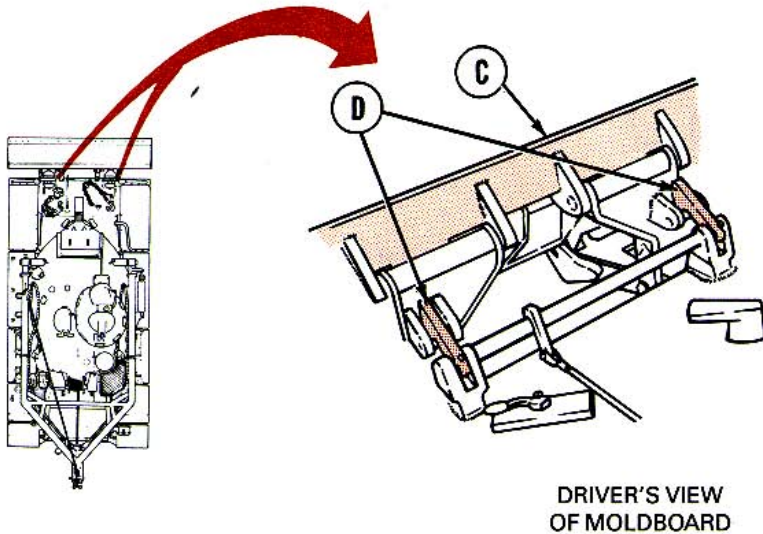
**OPERATE MOLDBOARD (PREPARE FOR MOLDBOARD OPERATIONS) - Continued**

**NOTE**

**BULLDOZER CONTROL VALVE lever (A) is spring loaded. It will spring back to HOLD position when released from RAISE or LOWER position.**

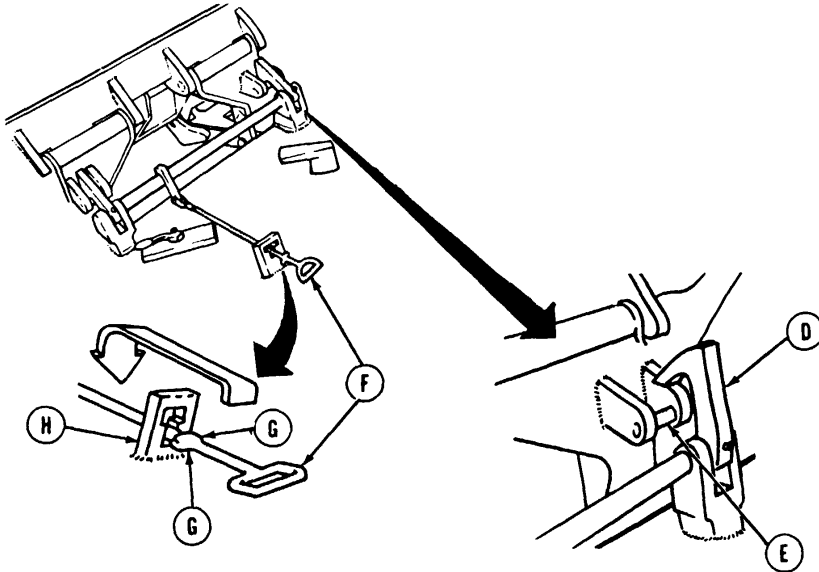
2. Move and hold BULLDOZER CONTROL VALVE lever (A) to RAISE position to lift weight of moldboard (C) from carrying hooks (D).

3. Release BULLDOZER CONTROL VALVE lever (A) when moldboard (C) reaches it highest position and stops. BULLDOZER CONTROL VALVE lever (A) will return to HOLD position.



TA132394

**OPERATE MOLDBOARD (PREPARE FOR MOLDBOARD OPERATIONS) - Continued**



4. Lift and push locking hook handle (F) forward until tabs (G) pass thru slot in top of block (H). Locking hooks (D) will raise up away from pins (E).
5. With tabs (G) in front of block (H), set locking hook handle (F) back into narrow part of slot in block (H).

TA132395



**OPERATE MOLDBOARD (PERFORM MOLDBOARD OPERATIONS)****WARNING**

You may need ground guides to direct when bulldozing. Make sure all ground personnel are clear of moldboard travel path when in operation. Failure to do this could cause injury or death to ground personnel.

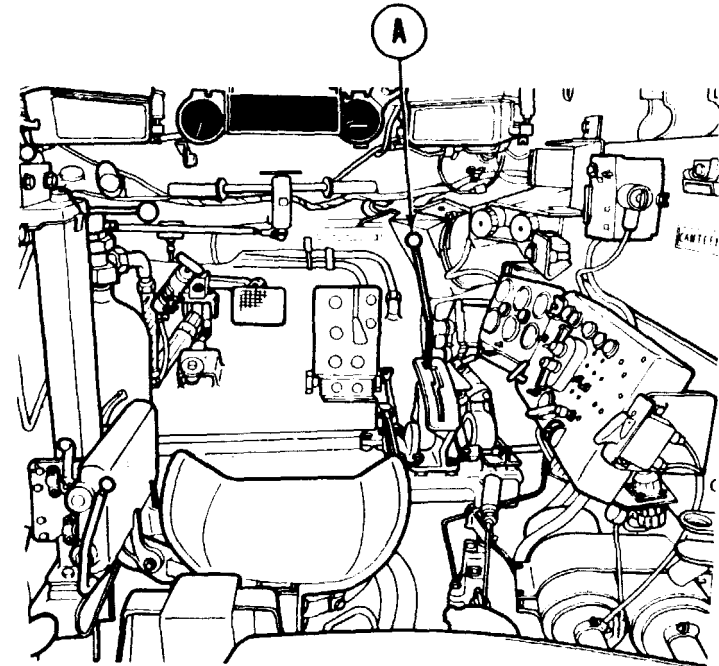
**CAUTION**

Always operate vehicle with transmission shift lever (A) in L (low) or R (reverse), never in H (high), when bulldozing.

Always maintain a steady speed when bulldozing.

Always bulldoze an amount of material that can be moved without causing vehicle to stall. Recommend no more than 1 inch depth for initial cut.

Never move an amount of material that will cause slippage of track. Loss of steering control could result.



DRIVER'S STATION

**OPERATE MOLDBOARD (PERFORM MOLDBOARD OPERATIONS) - Continued**

**To Lower Moldboard:**

**Make Sure:**

- You have read WARNING and CAUTION (page 2-256).
- Hydraulic system has been started (page 2-249).
- Moldboard is prepared for operations (page 2-253).

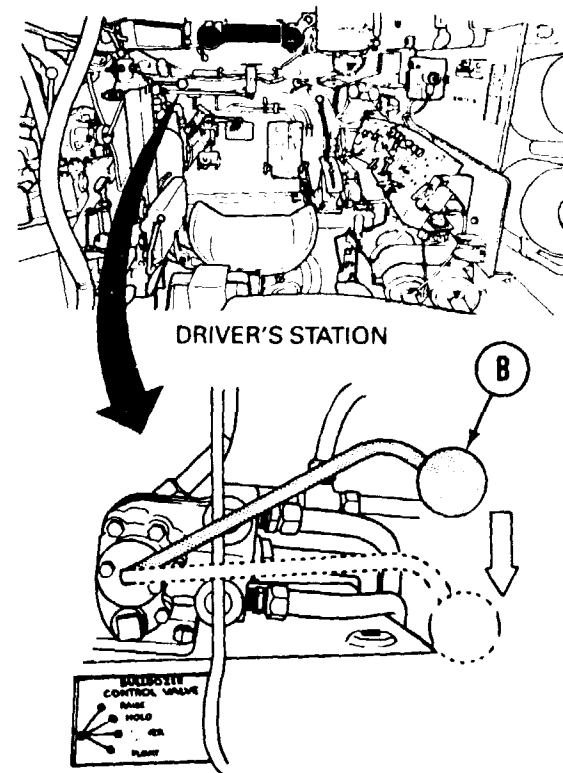
**CAUTION**

After the moldboard has been set to the proper depth, ensure that the control handle returns to HOLD position and shut OFF Hydraulic pump switch to avoid damage to system while in use. For further adjustments to moldboard turn ON and OFF Hydraulic pump as needed.

**NOTE**

When you hold BULLDOZER CONTROL VALVE LEVER (B) in LOWER position, moldboard will continue to lower until it reaches its lowest point This may raise front of vehicle.

1. Move and hold BULLDOZER CONTROL VALVE lever (B) down to LOWER position. Release BULLDOZER CONTROL VALVE lever (B) when moldboard is at desired height. BULLDOZER CONTROL VALVE lever (B) will return to HOLD position.



TA132397

**OPERATE MOLDBOARD (PERFORM MOLDBOARD OPERATIONS) - Continued**

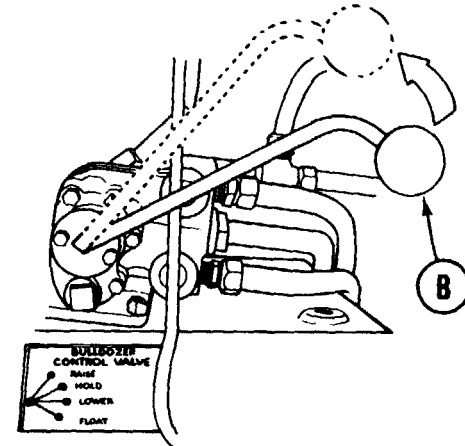
**To Raise Moldboard:**

**Make Sure:**

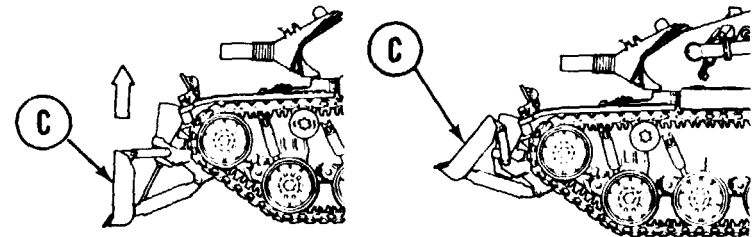
- You have read WARNING and CAUTION (page 2-256).
- Hydraulic system has been started (page 2-249).
- Moldboard is prepared for operations (page 2-253).

**NOTE**

**When you hold BULLDOZER CONTROL VALVE lever (B) up to RAISE position, moldboard will continue to rise until it reaches its highest point.**



1. Move and hold BULLDOZER CONTROL VALVE lever (B) up to RAISE position. Release BULLDOZER CONTROL VALVE lever (B) when moldboard (C) is at desired height. BULLDOZER CONTROL VALVE lever (B) will return to HOLD position.



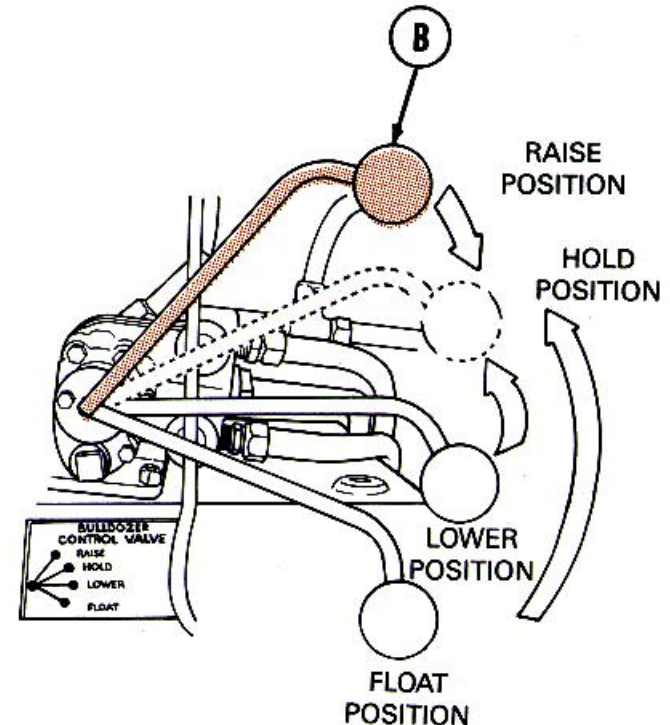
**OPERATE MOLDBOARD (PERFORM MOLDBOARD OPERATIONS) - Continued****To Hold Moldboard:****Make Sure:**

- You have read WARNING and CAUTION (page 2-256).
- Hydraulic system has been started (page 2-249).
- Moldboard is prepared for operations (page 2-253).

**NOTE**

When **BULLDOZER CONTROL VALVE lever (B)** is in **HOLD** position, moldboard is held rigidly in place. **BULLDOZER CONTROL VALVE lever (B)** is spring loaded to return to **HOLD** position when released from either **RAISE** or **LOWER** position. **BULLDOZER CONTROL VALVE lever** must be moved manually from **FLOAT** position to **HOLD** position.

1. To go to **HOLD** position from **RAISE** or **LOWER**, release **BULLDOZER CONTROL VALVE lever (B)**. Lever will move to **HOLD** position.
2. To go to **HOLD** position from **FLOAT**, move **BULLDOZER CONTROL VALVE lever (B)** to **HOLD** position and release.



TA132399

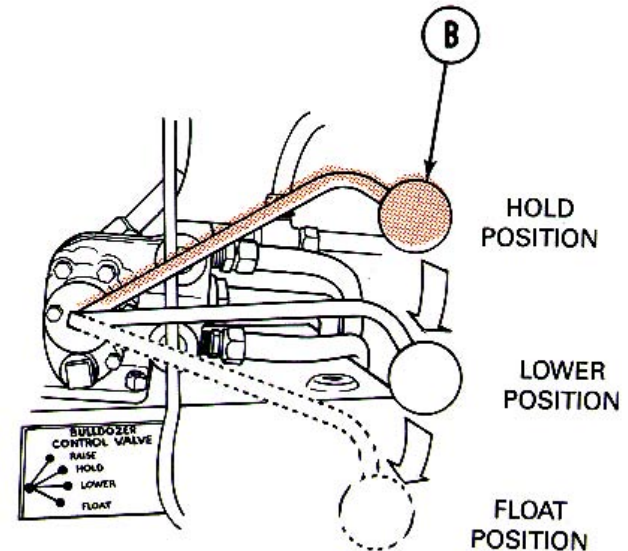
**OPERATE MOLDBOARD (PERFORM MOLDBOARD OPERATIONS) - Continued****To Float Moldboard:****Make Sure:**

- You have read WARNING and CAUTION (page 2-256).
- Hydraulic system has been started (page 2-249).
- Moldboard is prepared for operations (page 2-253).

**NOTE**

When **BULLDOZER CONTROL VALVE** lever (B) is in **FLOAT** position, moldboard rides on ground with its own weight for downward pressure. **FLOAT** position is useful for moving loose material on hard surfaces. Do not use **FLOAT** on very soft or loose ground. The moldboard will dig in and collect more material than vehicle can push without stalling. When **BULLDOZER CONTROL VALVE** lever (B) is set to **FLOAT**, it will stay in **FLOAT** until moved.

1. Move and hold **BULLDOZER CONTROL VALVE** lever (B) to **LOWER** position. When moldboard touches ground, move **BULLDOZER CONTROL VALVE LEVER** (B) to **FLOAT** position and release.

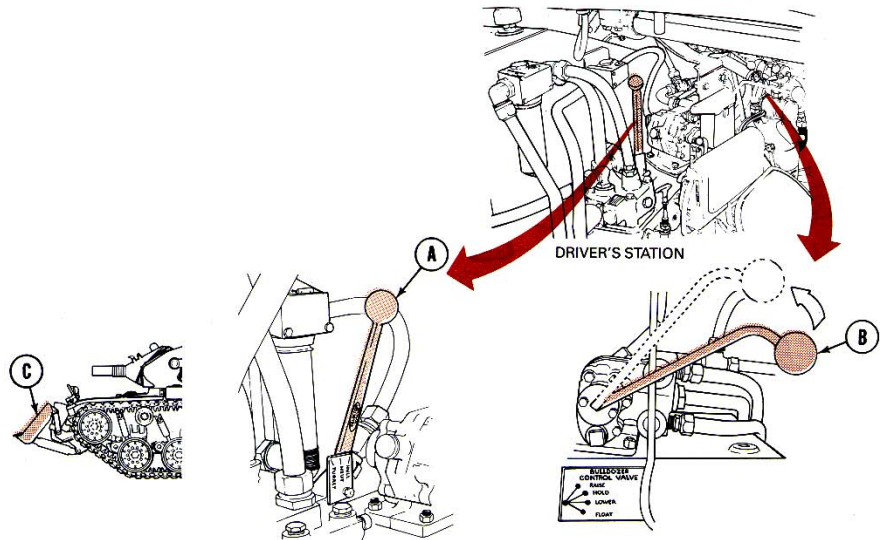


TA132400

## OPERATE MOLDBOARD (STOW MOLDBOARD)

### Make Sure:

- Parking brake is set (page 2-213).
  - Hydraulic system has been started (page 2-249).
  - SELECTOR VALVE lever (A) is set to HULL.
1. Move and hold BULLDOZER CONTROL VALVE lever (B) to RAISE position. Moldboard (C) will move to its highest point of travel and stop.
  2. Release BULLDOZER CONTROL VALVE lever (B). Moldboard (C) will stay in position.

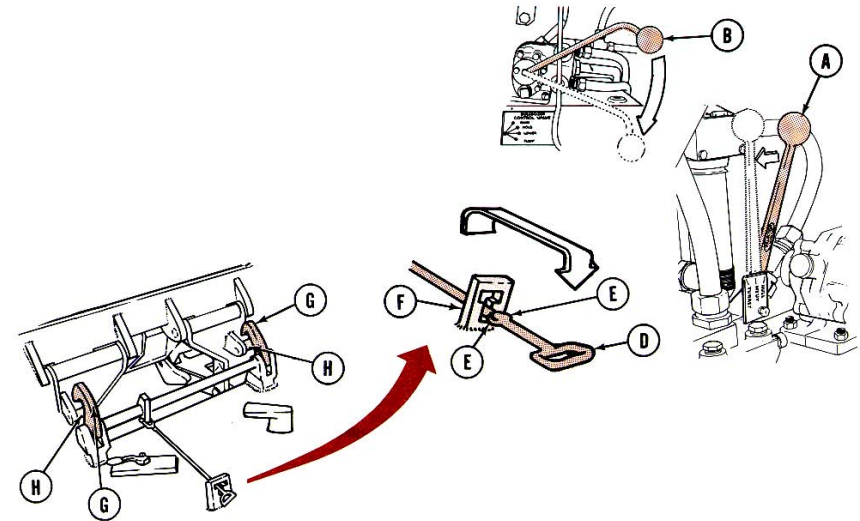


2-261

TA132401

**OPERATE MOLDBOARD (STOW MOLDBOARD) - Continued**

3. Push locking hook handle (D) forward as far as it will go.
4. Lift and pull back locking hook handle (D) until tabs (E) pass thru slot in top of block (F).
5. With tabs (E) to rear of block (F), set locking hook handle (D) back into narrow part of slot in block (F).
6. Move BULLDOZER CONTROL VALVE lever (B) to FLOAT position. Locking hooks (G) will rest on pins (H).



**TA132402**

7. Set SELECTOR VALVE lever (A) to NEUT.
8. Move BULLDOZER CONTROL VALVE lever (B) to HOLD position.
9. Turn off hydraulic system (page 2-252), if not required for other operations.

**OPERATE MOLDBOARD (STOW MOLDBOARD IN EMERGENCY)****NOTE**

If vehicle hydraulic system fails and moldboard is not stowed, use the following procedure to stow moldboard. This procedure requires at least one crewmember stationed on the ground. Crewmember will both assist and ground guide the driver.

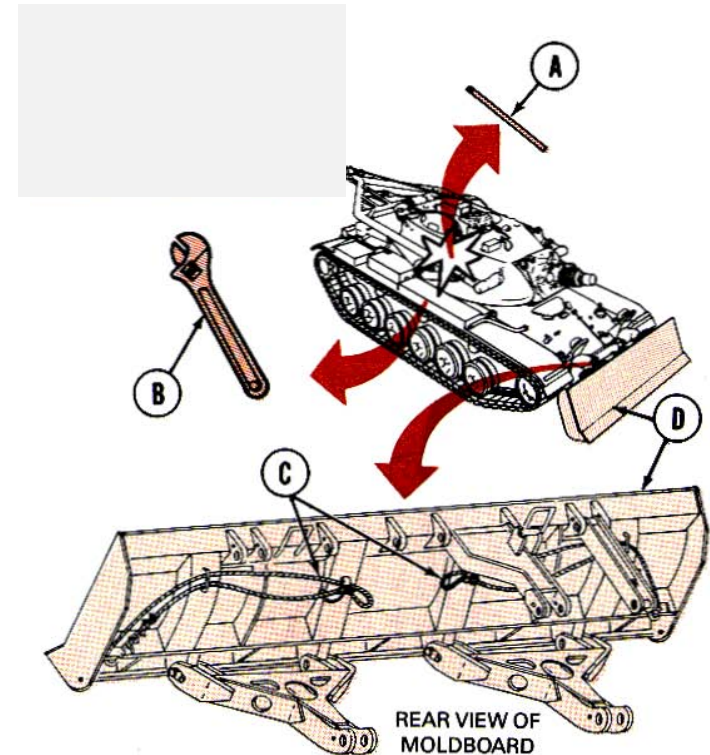
**Tools:**

Get pinch bar (A) from commanders station

Get 8 inch adjustable wrench (B) from right front fender box.

**Make Sure:**

- Parking brakes are set (page 2-213).
1. Locate emergency lift cables (C) stowed behind moldboard (D).



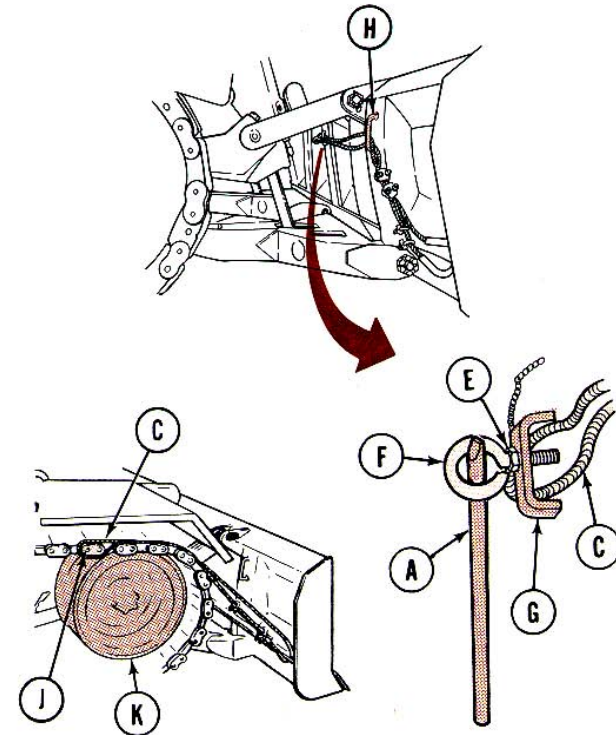
TA132403



**OPERATE MOLDBOARD (STOW MOLDBOARD IN EMERGENCY) - Continued****NOTE**

**Always wear gloves when handling steel cables.**

2. Using adjustable wrench (B), loosen nut (E) on eyebolt (F).
3. Unscrew eyebolt (F). If necessary, insert pinch bar (A) thru eyebolt (F). Use pinch bar (A) to turn eyebolt.
4. Remove eyebolt (F) and clamp (G). Emergency lift cable (C) will drop free. Put eyebolt (F) and clamp (G) in right front fender box to prevent loss.
5. Pull emergency lift cable (C) from retaining bracket (H).
6. Pull emergency lift cable (C) on top of track.
7. Loop emergency lift cable (C) around track end connector (J) that is located above compensating idler wheel (K).
8. Repeat steps 2 thru 7 on opposite side, then continue with step 9.
9. Start engine (page 2-205).



TA132404

**OPERATE MOLDBOARD (STOW MOLDBOARD IN EMERGENCY) - Continued**

**CAUTION**

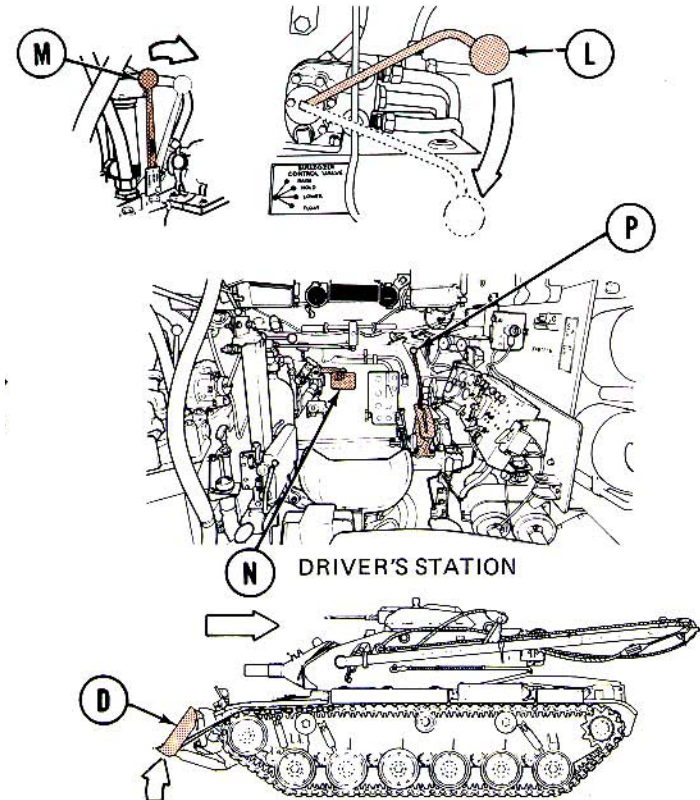
When lifting moldboard with emergency lift cables, always place **BULLDOZER CONTROL VALVE** lever (L) in **FLOAT** position or damage to equipment will occur.

10. Set **SELECTOR VALVE** lever (M) to Hull.
11. Move **BULLDOZER CONTROL VALVE** lever (L) to **FLOAT** position.

**WARNING**

Always use a ground guide when driving vehicle in reverse. Crewmember on ground will ground guide driver. Failure to use a ground guide could result in injury or death to ground personnel. Keep ground crew at least 15 feet away from vehicle until moldboard (D) is locked in stowed position and tension is removed from lift cables. Cable could break and injure ground crew.

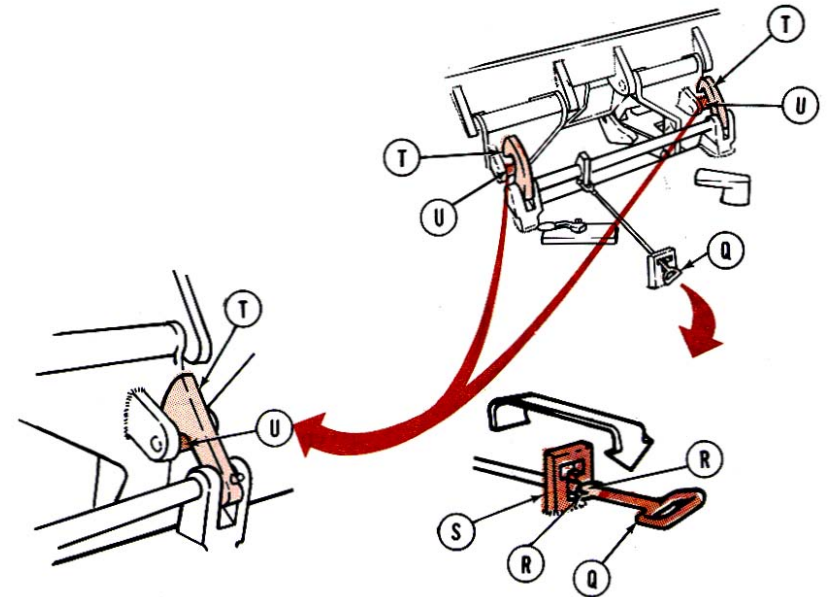
12. Release parking brake (page 2-214).
13. Press and hold brake pedal (N).
14. Shift transmission shift lever (P) to R (reverse).
15. Drive vehicle slowly in reverse until moldboard (D) is raised to its maximum height.
16. When moldboard (D) reaches its maximum height, press and hold brake pedal (N).
17. Set parking brake (page 2-213).



TA132405

**OPERATE MOLDBOARD (STOW MOLDBOARD IN EMERGENCY) - Continued**

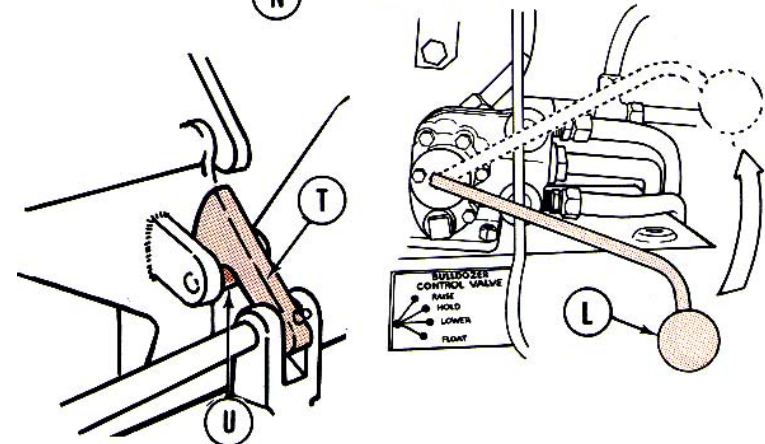
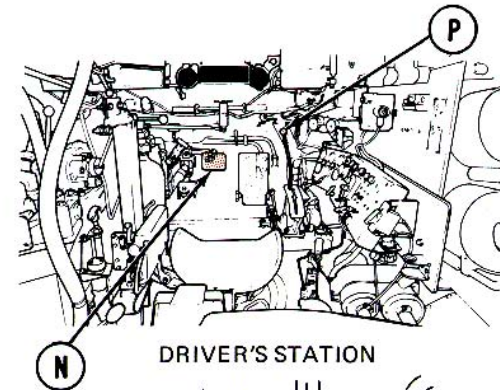
18. Push locking hook handle (Q) forward as far as it will go.
19. Lift and pull back locking hook handle (Q) until tabs (R) pass thru slot in top of block (S). Locking hooks (T) will rest on pins (U).
20. With tabs (R) to rear of block (S), set locking hook handle (Q) back into narrow part of slot in block (S).



TA132406

**OPERATE MOLDBOARD (STOW MOLDBOARD IN EMERGENCY) - Continued**

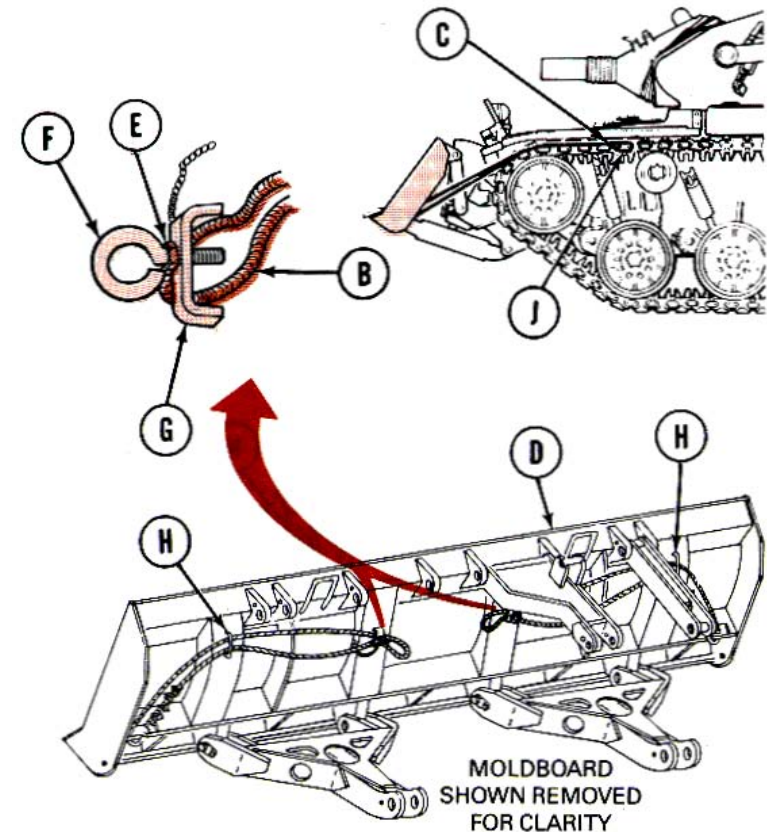
21. Release parking brake (page 2-214).
22. Push and hold brake pedal (N).
23. Shift transmission shift lever (P) to L (low).
24. Slowly release brake pedal (N). Allow vehicle to move forward only slightly.
25. When locking hooks (T) rest firmly on pins (U), stop vehicle.
26. Set BULLDOZER CONTROL VALVE lever (L) to HOLD.
27. Drive vehicle forward about one foot to release tension on emergency lift cables.
28. Shift transmission shift lever (P) to P (park).
29. Set parking brake (page 2-213).



TA132407

**OPERATE MOLDBOARD (STOW MOLDBOARD IN EMERGENCY) - Continued**

30. Remove emergency lift cable (C) from track end connector (J).
31. Feed free end of emergency lift cable (C) thru bracket (H) on moldboard (D).
32. Pull emergency lift cable thru bracket (H) to clamp (G).
33. Place free end of emergency lift cable (C) under clamp (G) as shown.
34. Screw eyebolt (F) into moldboard (D) until clamp (G) is snug against moldboard.
35. Using adjustable wrench (B), tighten nut (E).
36. Repeat steps 28 thru 33 on opposite side.
37. Return adjustable wrench and pinch bar to stowage.
38. Set SELECTOR VALVE lever (M) to NEUT.
39. Lift SUCTION SHUTOFF VALVE lever (V) to CLOSED position.



TA132408

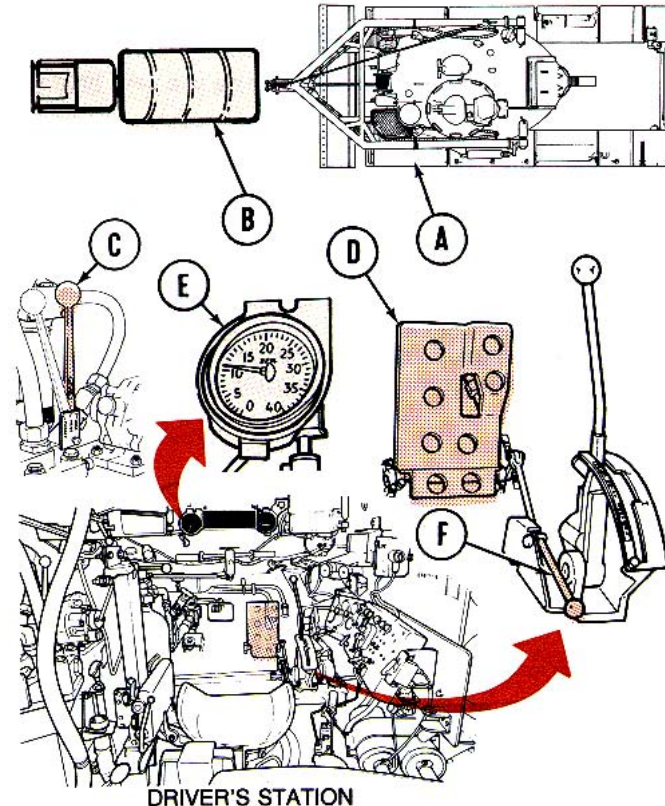
**OPERATE WINCH (PREPARE FOR WINCHING OPERATIONS)**

**NOTE**

Operating the winch requires three crewmembers: Commander, Driver, and outside Crewmember.

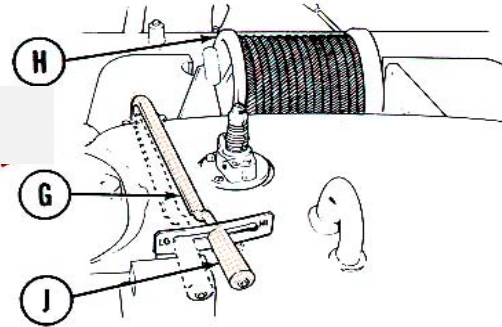
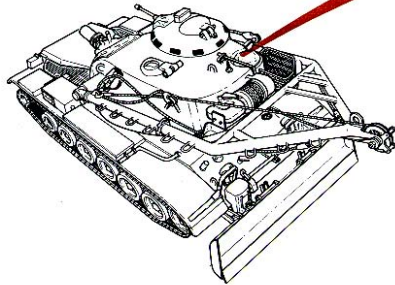
**Make Sure:**

- Turret is traversed (page 2-502) so boom is over driver's compartment.
1. Position vehicle (A) as squarely as possible to load (B).
  2. Start hydraulic system (page 2-249).
  3. Prepare moldboard for operations (page 2-253).
  4. Lower moldboard to ground (page 2-257) to stabilize vehicle during winching operations.
  5. Set SELECTOR VALVE lever (C) to TURRET.
  6. Depress accelerator pedal (D) until tachometer (E) shows 1100 rpm.
  7. Pull up and hold accelerator locking lever (F) to maintain engine speed at 1100 rpm.
  8. Release accelerator pedal (D).
  9. Release accelerator locking lever (F).



TA252748

OPERATE WINCH (PREPARE FOR WINCHING OPERATIONS) - Continued



TA252749

**CAUTION**

Winch gear shift lever (G) must be locked in LO position before operating winch (H). Failure to lock lever could cause winch to slip and damage equipment.

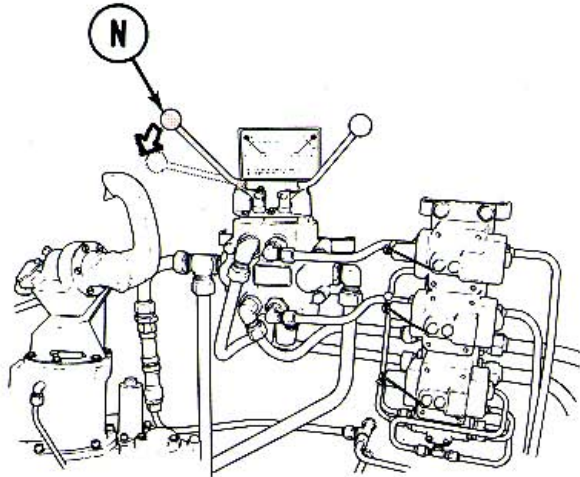
**NOTE**

If shifting is difficult, do not force lever (G). Slightly turn winch (H) until gear shift lever (G) moves into position.

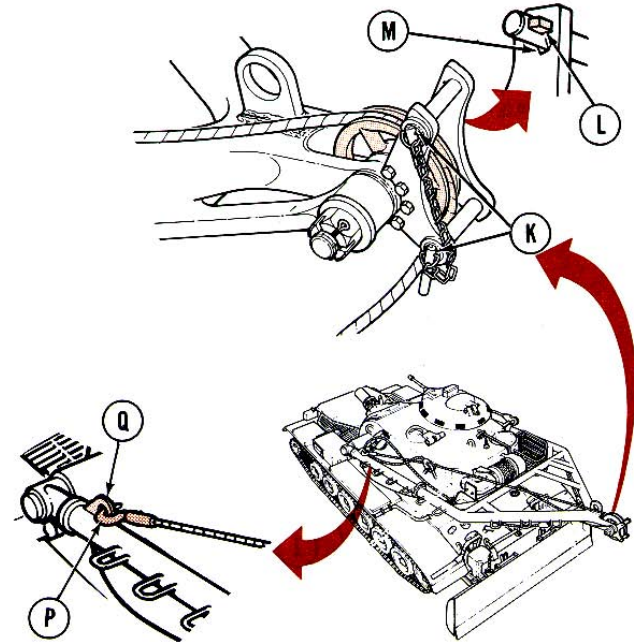
10. Pull back and hold shift lever locking handle (J).
11. Move shift lever (G) to LO.
12. Release shift lever handle (J).

**OPERATE WINCH (PREPARE FOR WINCHING OPERATIONS) - Continued**

13. Turn two cable guide pins (K) until tabs (L) align with slots (M). Pull out guide pins (K) from supports.
14. Move WINCH CONTROL lever (N) down to pay out cable.
15. Release WINCH CONTROL lever (N) when cable lifting hook (P) is loose on retaining eye (Q).



COMMANDER'S STATION



TA132411

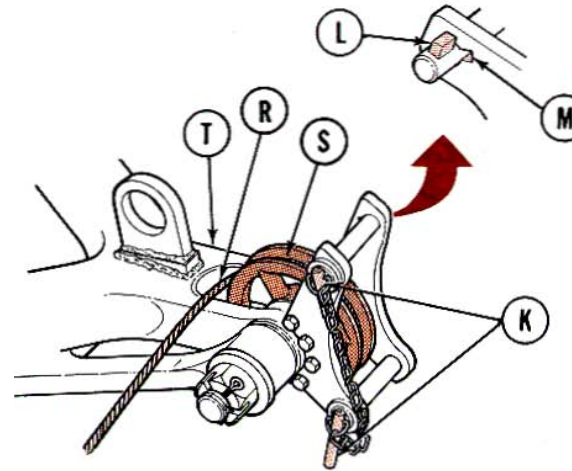
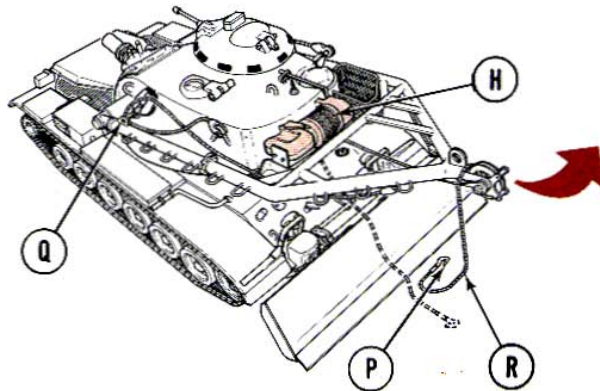


**OPERATE WINCH (PREPARE FOR WINCHING OPERATIONS) - Continued**

**WARNING**

**Wear safety gloves when handling wire-rope stay lines and winch cable.**

16. Remove cable lifting hook (P) from retaining eye (Q). Place cable lifting hook (P) on ground.
17. Aline two cable guide pins (K) and tabs (L) with slots (M). Push guide pins (K) in place and turn to lock.



- TA252750**
18. Lift winch cable (R) out of pulley groove (S) and off end of boom (T). Lower cable (R) to ground.
  19. Position cable (R) in front of vehicle in line with winch (H).

**OPERATE WINCH (PERFORM DIRECT WINCHING)**

**To Perform Single Line Direct Pull Winching:**

**WARNING**

Driver's hatch must be kept closed during winching operations. If cable should break with hatch open, driver could be injured or killed.

**NOTE**

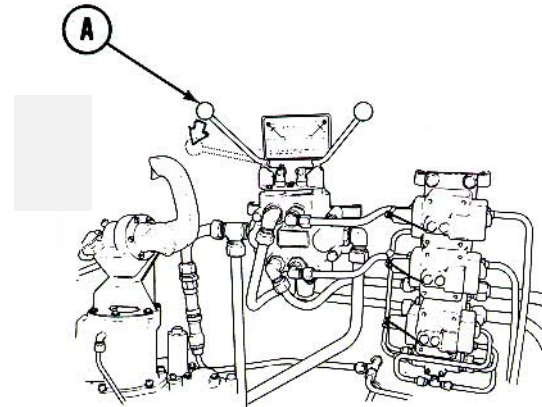
Operating the winch requires three crewmembers: Commander, Driver, and outside Crewmember.

**Make Sure:**

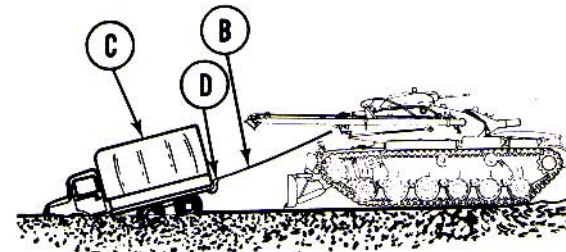
- Vehicle is prepared for winching (page 2-269).
  - Driver's hatch is closed (page 2-166).
1. Move WINCH CONTROL lever (A) down to pay out enough cable (B) to reach load (C).
  2. Connect lifting hook (D) to load (C).

**CAUTION**

Pulling capacity with a single line is 25,000 pounds on the bare winch cable drum.

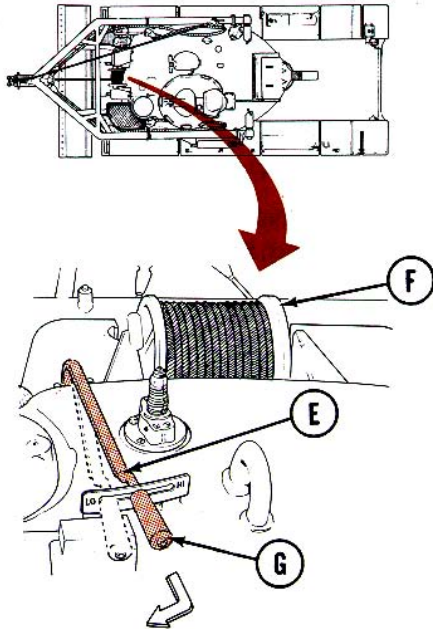


COMMANDER'S STATION



TA132413

**OPERATE WINCH (PERFORM DIRECT WINCHING) - Continued**



**CAUTION**

Winch gear shift lever (E) must be locked in LO position before operating winch (F).

**NOTE**

If shifting is difficult, do not force lever (E). Slightly turn winch (F) until gear shift lever (E) moves into position.

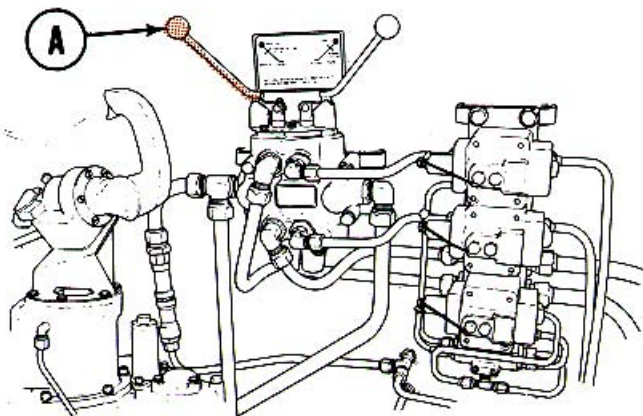
3. Pull back and hold shift lever handle (G).
4. Move shift lever (E) to LO.
5. Release shift lever handle (G).

**WARNING**

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 malfunctions or cable breaks.

TA132414

**OPERATE WINCH (PERFORM DIRECT WINCHING) - Continued**



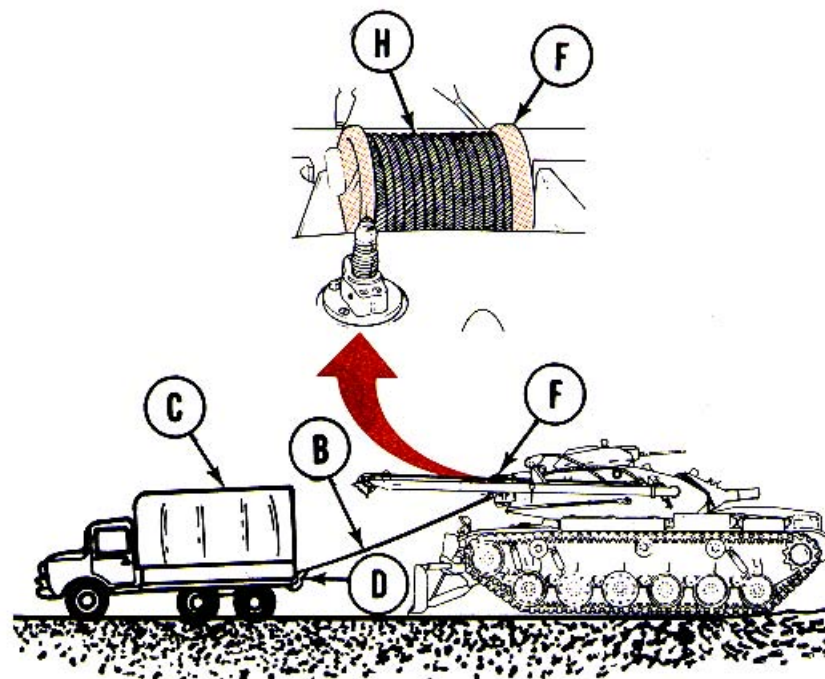
**COMMANDER'S STATION**

7. Traverse turret (page 2-502) back and forth to keep winch (F) in line with cable (B). Maintain tight and even coils (H).
8. Move WINCH CONTROL lever (A) down to release tension on cable (B).
9. Remove lifting hook (D) from load (C).
10. Perform after winching operations (page 2-284).

**CAUTION**

**Cable (B) must be kept tight and coils (H) dose together when rewinding cable on winch (F).**

6. Move WINCH CONTROL lever (A) up to reel in cable (B) and load (C).



**OPERATE WINCH (PERFORM DIRECT WINCHING) - Continued**

**To Perform Two-Part Line Direct Pull Winching:**

**NOTE**

Operating the winch requires three crewmembers:  
Commander, Driver and outside Crewmember.

**Tools and Supplies:**

Get from right front fender box:

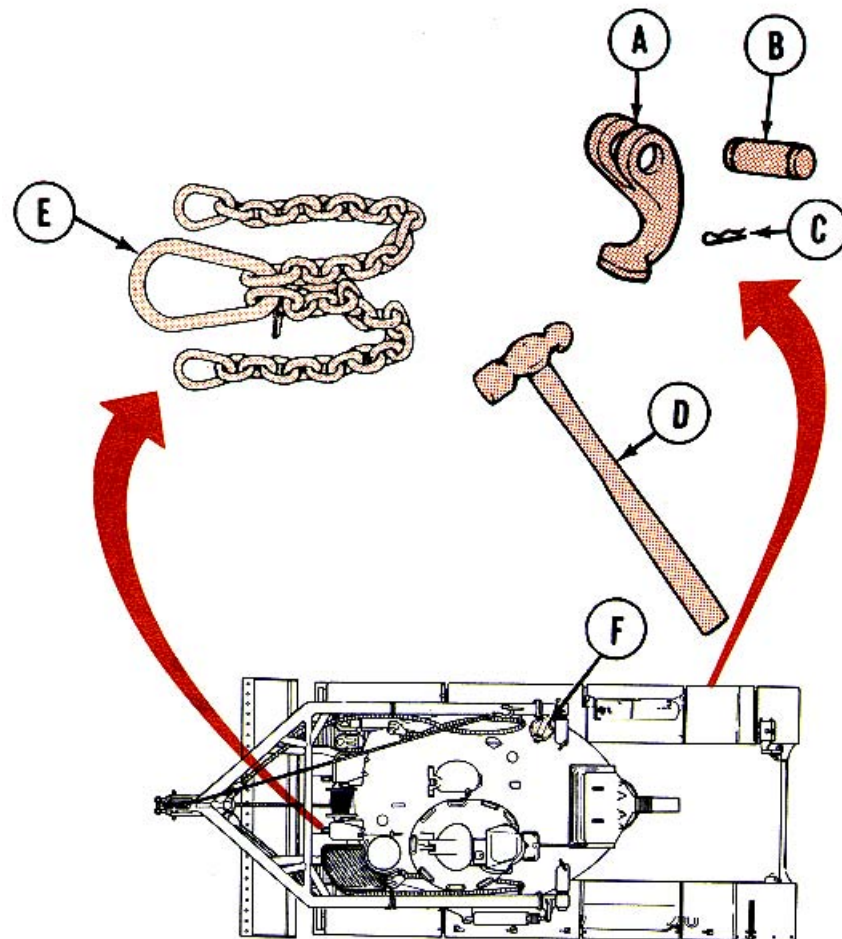
- Two tow hooks (A)
- Two tow pins (B)
- Four locking pins (C)
- Two pound hammer (D)

- Get chain assembly (E) from front slope of hull.

**Make Sure:**

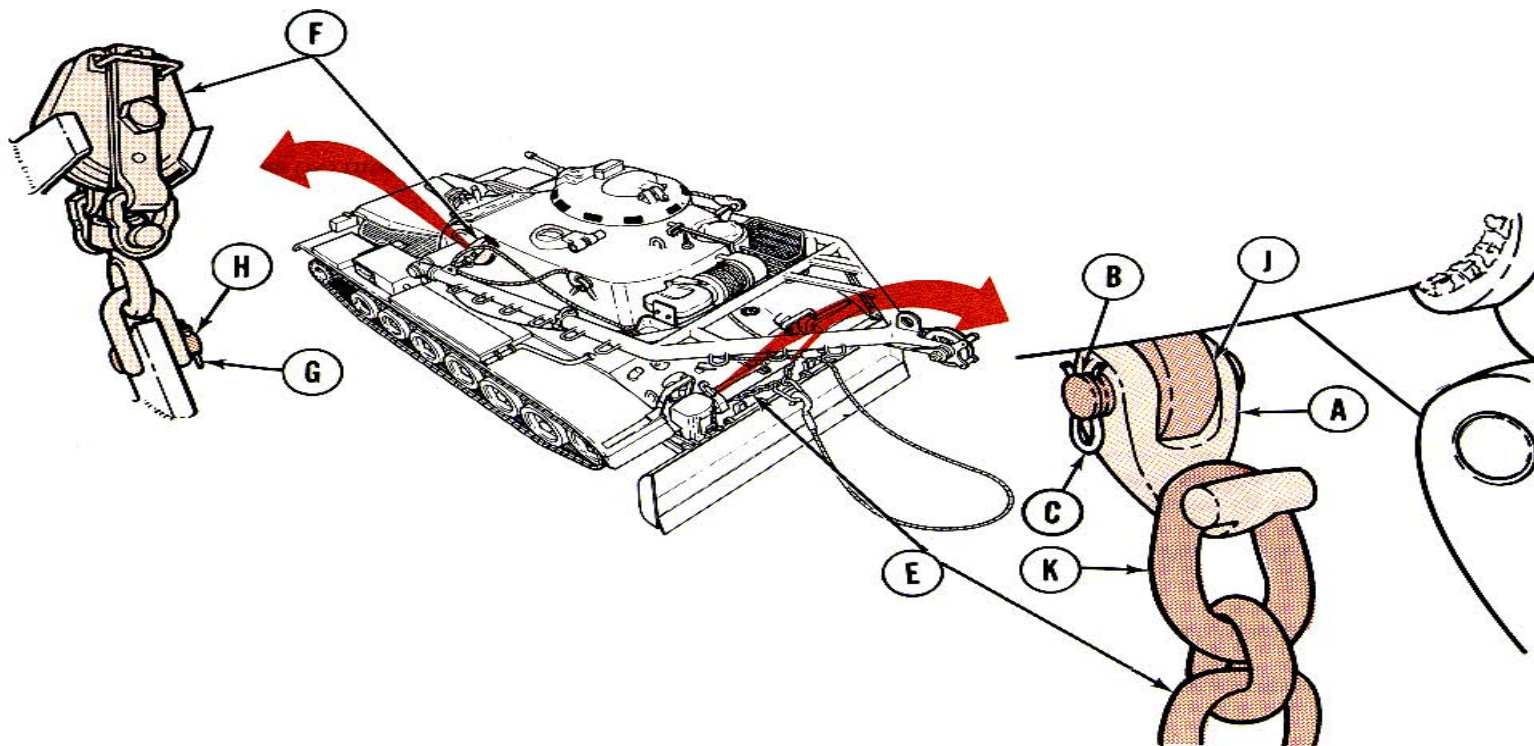
- Vehicle is prepared for winching (page 2-269).
- Driver's hatch is closed (page 2-166).

1. Locate snatch block (F) on left front side of turret.



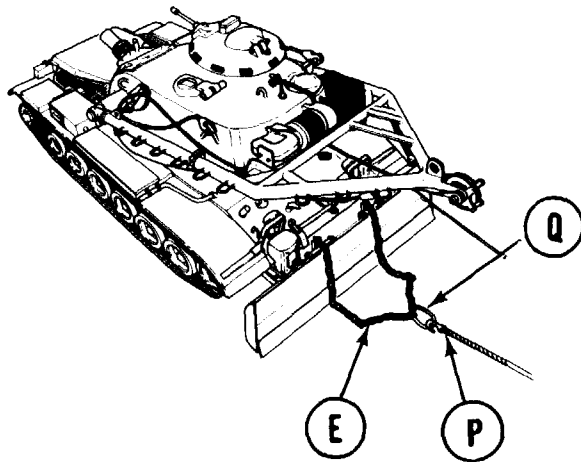
OPERATE WINCH (PERFORM DIRECT WINCHING) - Continued

2. Remove spring clip (G). Pull out retaining pin (H) securing snatch block (F).
3. Remove snatch block (F) from turret.
4. Install retaining pin (H) in snatch block (F). Secure pin with spring clip (G).



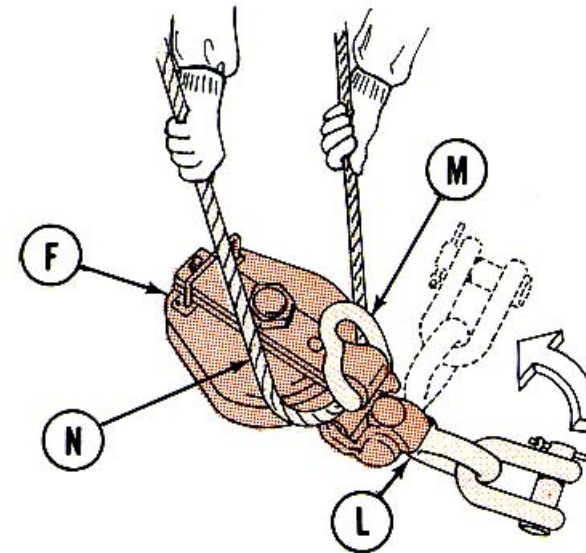
5. Install two tow hooks (A) over two tow eyes (J) on front of vehicle.
  - a. Insert tow pins (B) thru tow hooks (A) and tow eyes (J).
  - b. Use hammer to install two locking pins (C), one on each end of tow pin (B).
6. Over each tow hook (A) hook one end of chain assembly (E). Turn end chain link (K) so small end is around two hook (A) as shown.

**OPERATE WINCH (PERFORM DIRECT WINCHING) - Continued**



7. Turn swivel (L) to unlock ring (N) on snatch block (F).
8. Lift ring (M) to open snatch block (F).

**WARNING**  
 Wear safety gloves when handling wire-rope stay lines and winch cable.



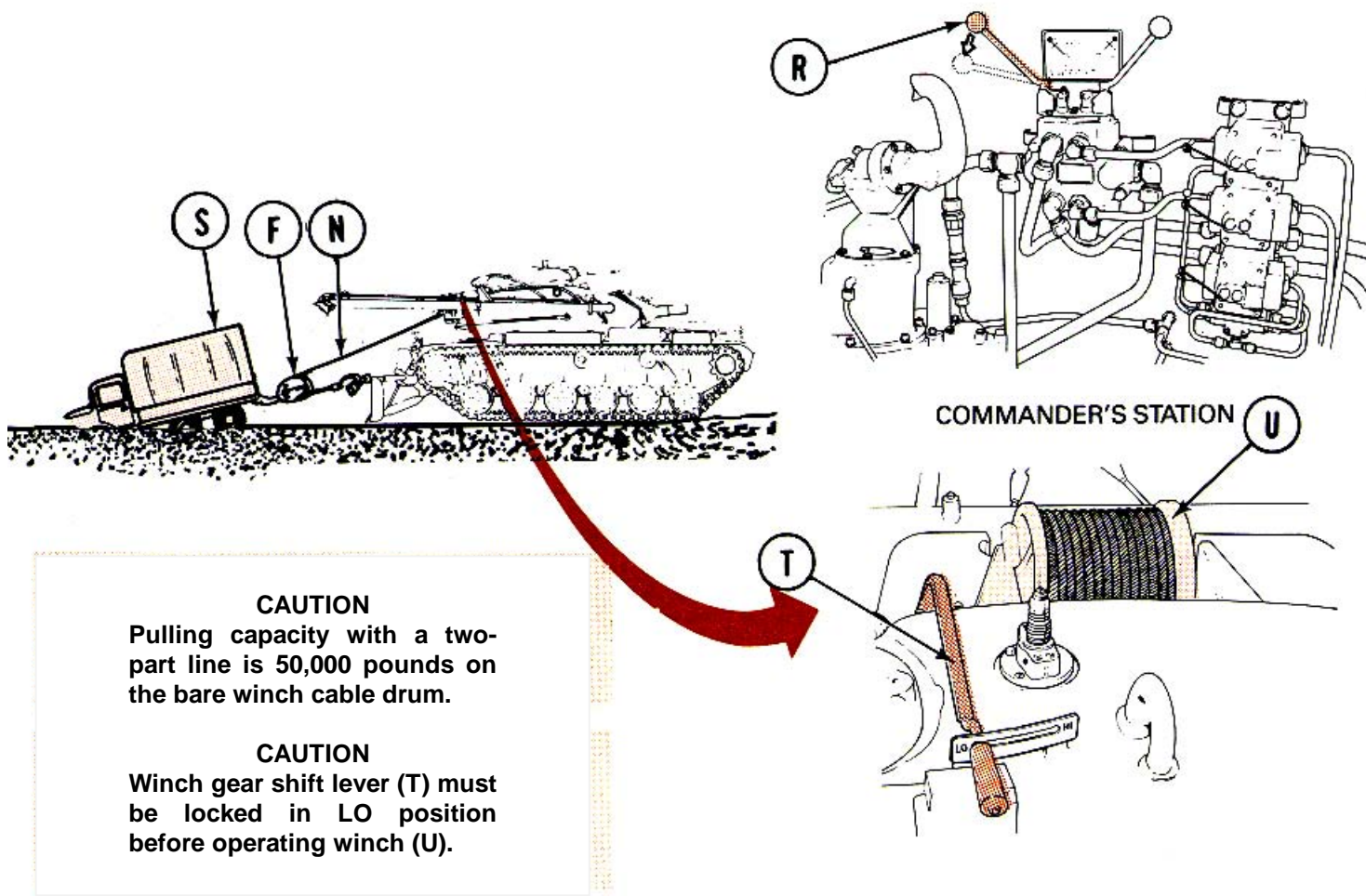
9. Insert winch cable (N) into snatch block (F).
10. Push ring (M) back over swivel (L).
11. Turn swivel (L) to lock ring (M).
12. Place cable lifting hook (P) in large link (Q) of chain assembly (E).

TA132418

**OPERATE WINCH (PERFORM DIRECT WINCHING) - Continued**

13. Move WINCH CONTROL lever (R) down to pay out enough cable (N) to reach load (S).

14. Connect snatch block (F) to load (S).



**CAUTION**  
 Pulling capacity with a two-part line is 50,000 pounds on the bare winch cable drum.

**CAUTION**  
 Winch gear shift lever (T) must be locked in LO position before operating winch (U).



**OPERATE WINCH (PERFORM DIRECT WINCHING) - Continued**

**NOTE**

If shifting is difficult, do not force lever (T). Slightly turn winch (U) until gear shift lever (T) moves into position.

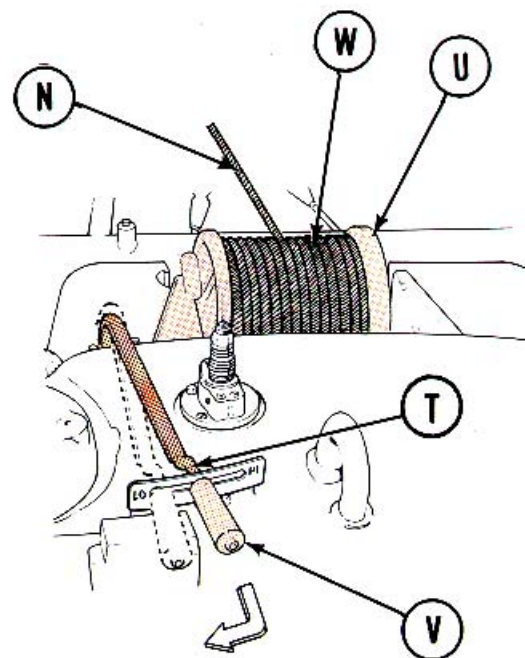
15. Pull back and hold shift lever handle (V).
16. Move shift lever (T) to LO.
17. Release shift lever handle (V).

**WARNING**

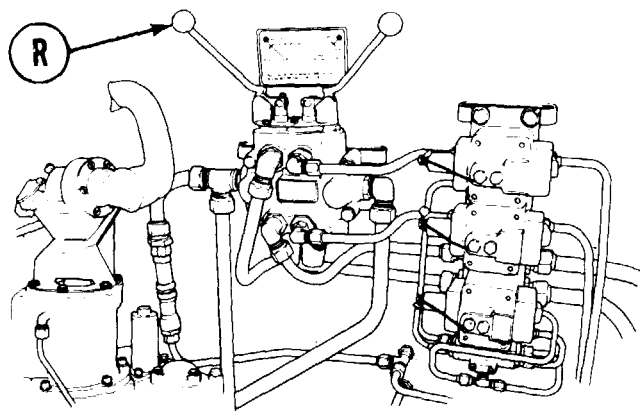
Keep Deep all personnel clear of winch and cable during operation. All personnel must be at least the length of cable away from vehicle and load. Serious injury could result if winch malfunctions or cable breaks.

**CAUTION**

Cable (N) must be kept tight and coils (W) dose together when rewinding cable on winch (U).



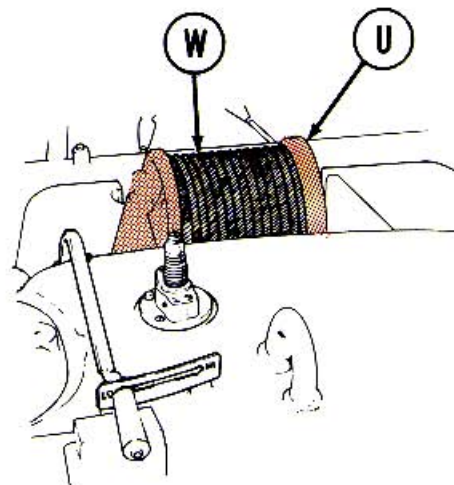
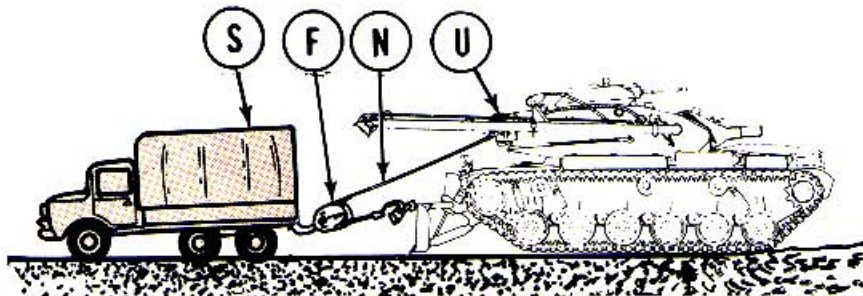
OPERATE WINCH (PERFORM DIRECT WINCHING) - Continued



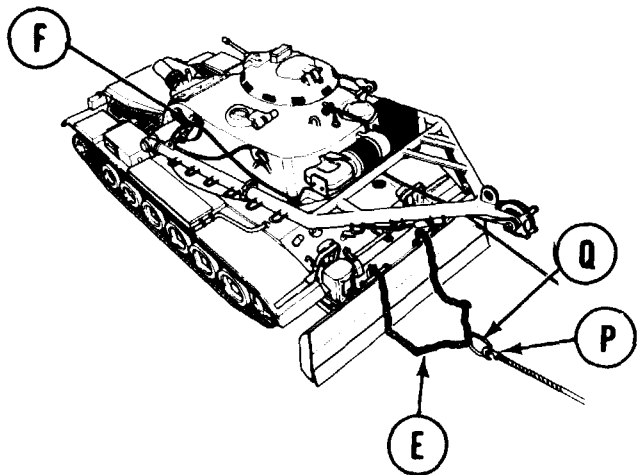
**NOTE**  
Winching speed with two lines will be half the speed of single line operation.

18. Move WINCH CONTROL lever (R) up to reel in cable (N) and load (S).
19. Traverse turret (page 2-502) back and forth to keep winch (U) in line with cable (N). Maintain tight and even coils (W).

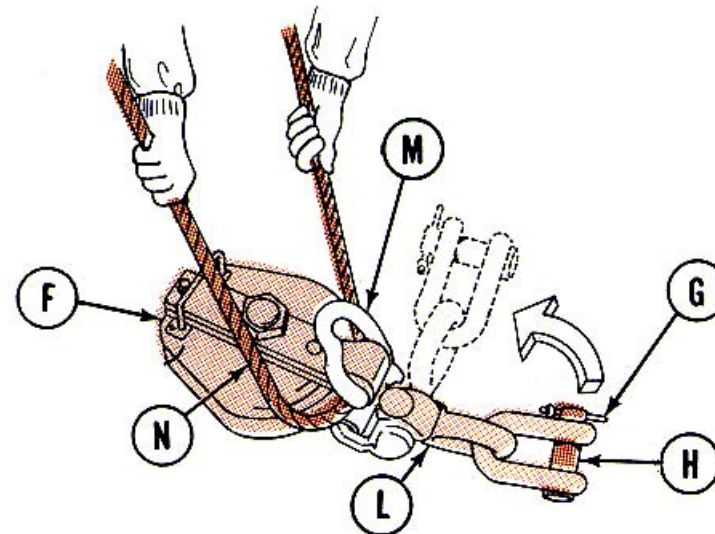
20. Move WINCH CONTROL lever (R) down to release tension on cable (N).
21. Remove snatch block (F) from load (S).



OPERATE WINCH (PERFORM DIRECT WINCHING) - Continued



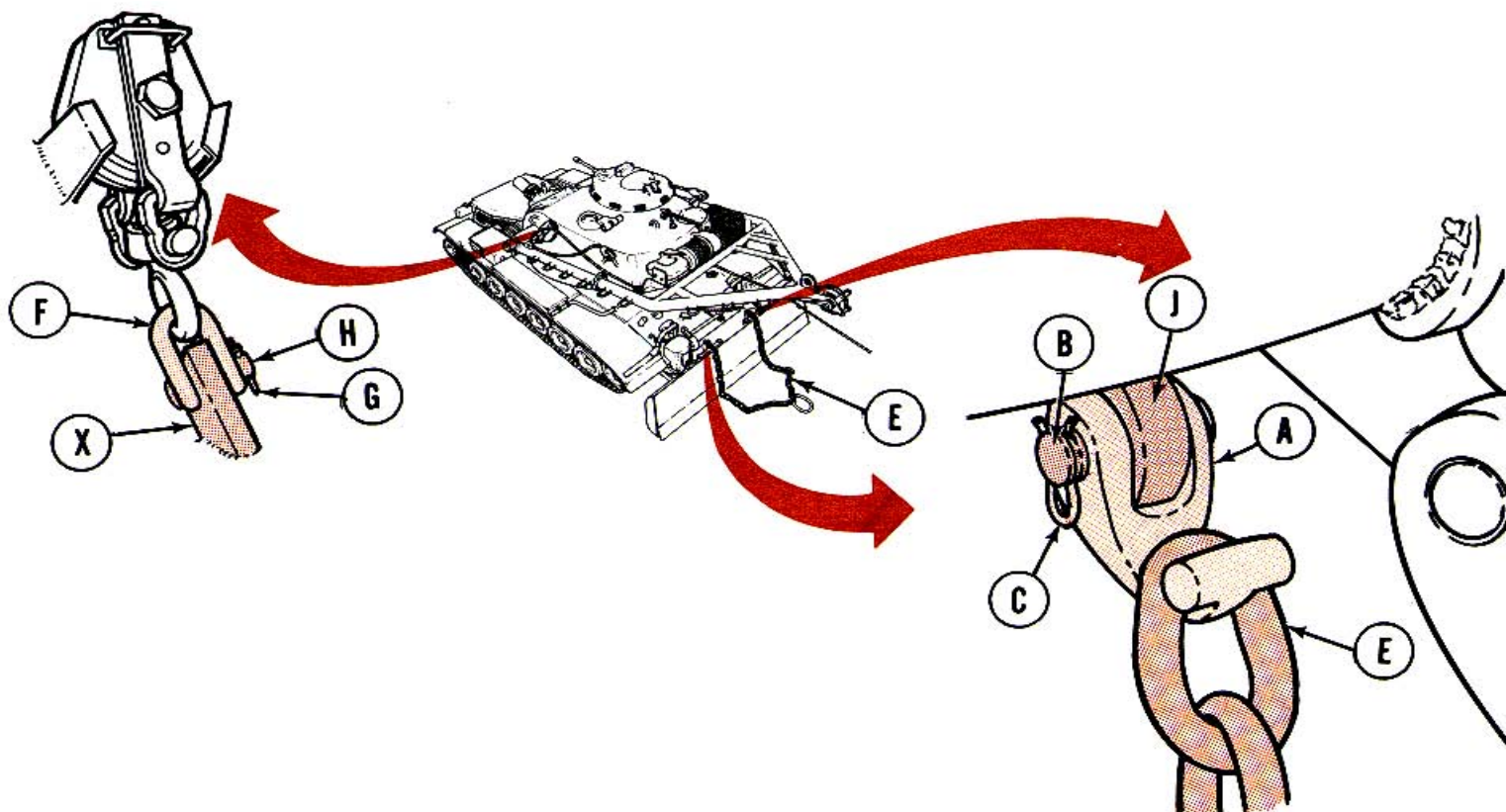
22. Turn swivel (L) to unlock ring (M) on snatch block (F).
23. Lift ring (M) to open snatch block (F).
24. Remove winch cable (N) from snatch block (F).



25. Push ring (M) back over swivel (L).
26. Turn swivel (L) to lock ring (M).
27. Remove cable lifting hook (P) from large link (Q) of chain assembly (E).
28. Remove spring clip (G). Pull out retaining pin (H).
29. Return snatch block (F) to stowed position.

OPERATE WINCH (PERFORM DIRECT WINCHING) - Continued

30. Install retaining pin (H) thru snatch block (F) and mount (X). Secure pin with spring clip (G).
31. Remove chain assembly (E) from two tow hooks (A).
32. Remove locking pins (C) from two tow pins (B).



33. Remove two tow hooks (A) from two tow eyes (J).
34. Return tow hooks (A) tow pins (B) and locking pins (C) to stowage.
35. Return chain assembly (E) to front slope of hull.
36. Perform after winching operation (page 2-284).

**OPERATE WINCH (PERFORM AFTER WINCHING OPERATIONS)**

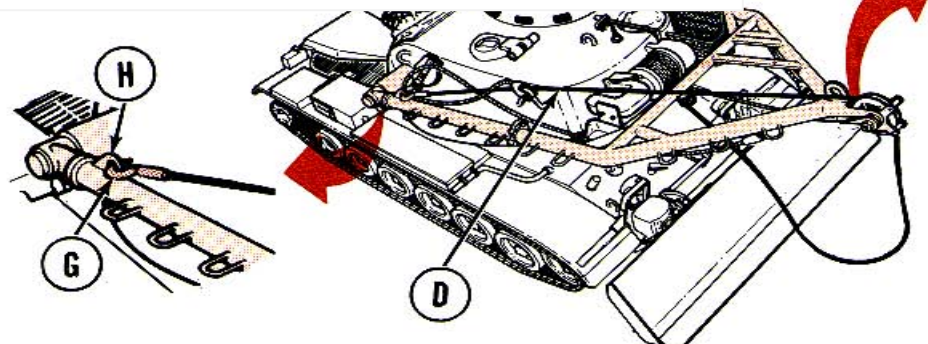
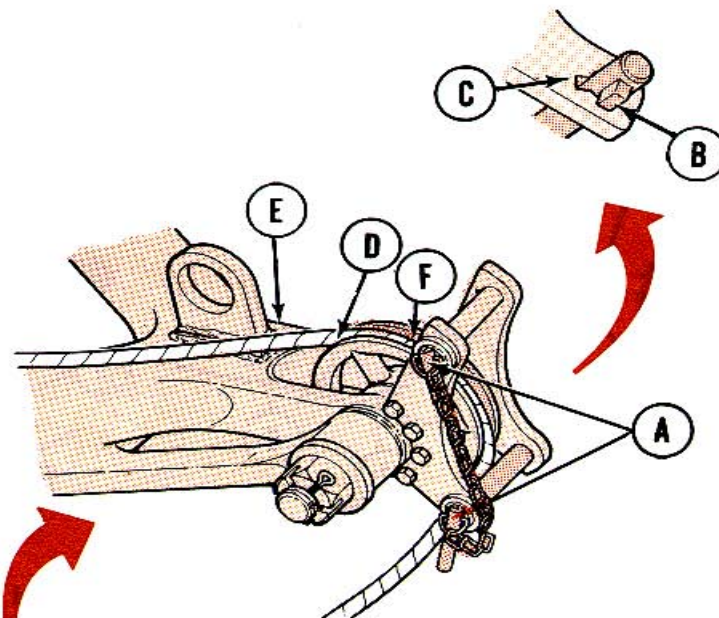
**NOTE**

Operating the winch requires three crewmembers: Commander, Driver, and outside Crewmember.

1. Turn two cable guide pins (A) until tabs (B) align with slots (C). Pull out guide pins (A) from supports

**WARNING**

Wear safety gloves when handling wire-rope stay lines and winch cable.

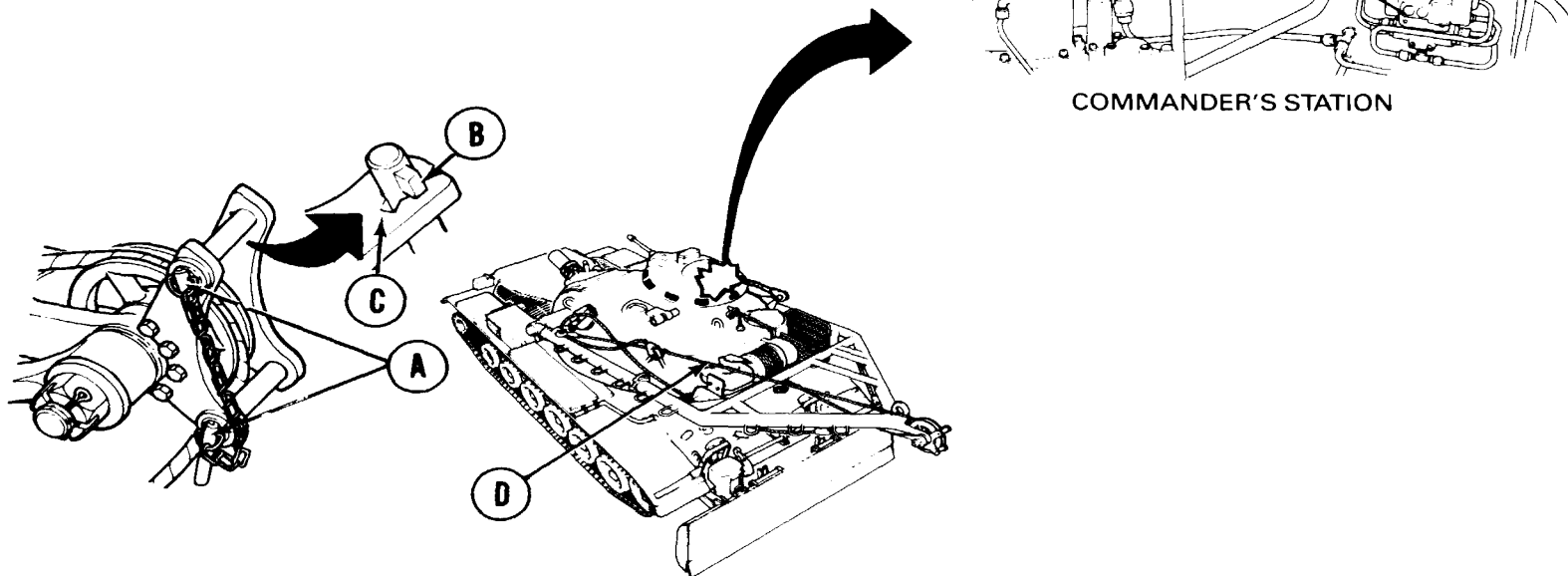


2. Place cable (D) over end of boom (E).
3. Place cable (D) in pulley groove (F).
4. Pull cable (D) over boom (E). Position lifting hook (G) in retaining eye (H).

TA132424

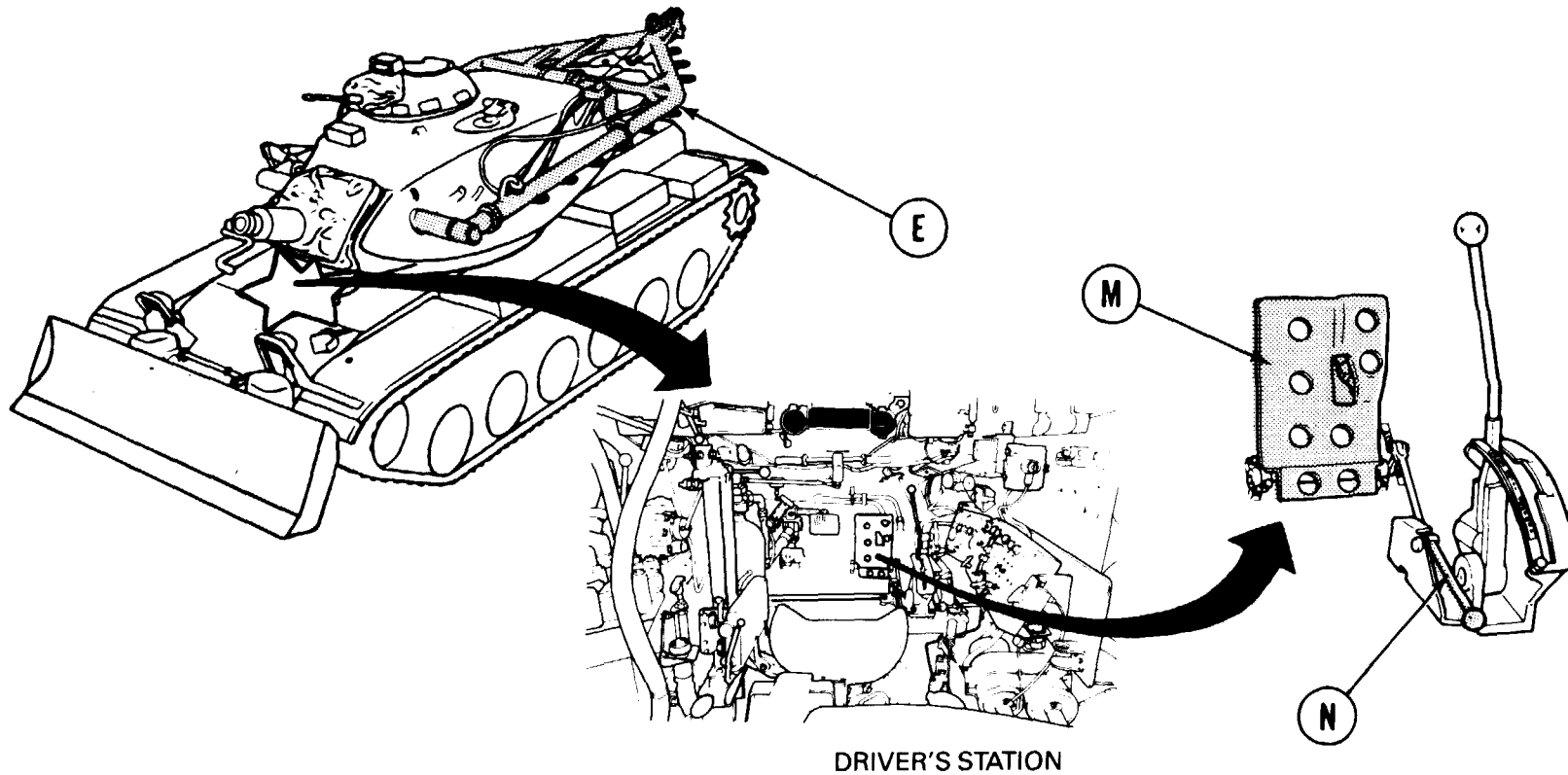
**OPERATE WINCH (PERFORM AFTER WINCHING OPERATIONS) - Continued**

5. Move WINCH CONTROL lever (J) up to reel in cable slack. Release WINCH CONTROL lever (J) when cable (D) is snug.
6. Deleted.
7. Deleted.
8. Deleted.
9. Aline two cable guide pins (A) and tabs (B) with slots (C). Push guide pins (A) in place and turn to lock.



OPERATE WINCH (PERFORM AFTER WINCHING OPERATIONS) - Continued

10. Traverse turret (page 2-502) so boom (E) is over engine.
11. Stow moldboard (page 2-261).



12. Press down and release accelerator pedal (M) to unlock lever (N).
13. Turn off hydraulic system (page 2-252), if not required for other operations.

**OPERATE BOOM (PREPARE FOR HOISTING OPERATIONS)****WARNING**

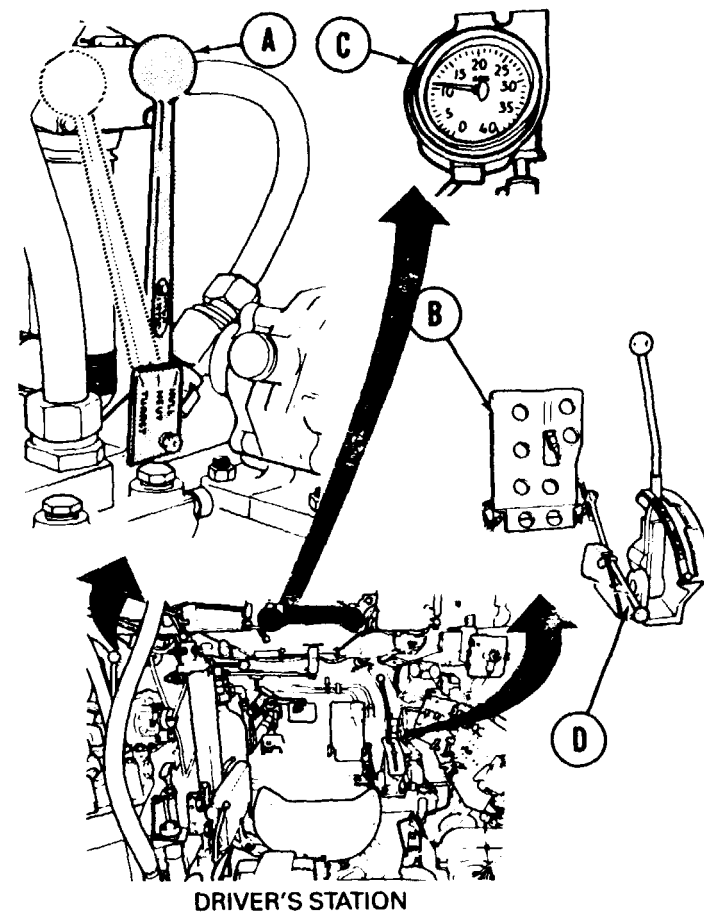
During hoisting operations, ensure the BOOM control lever is not operated.

**NOTE**

Operating the boom requires all four crewmembers. Station Commander and Driver inside vehicle. Station Loader and Gunner outside vehicle.

**Make Sure:**

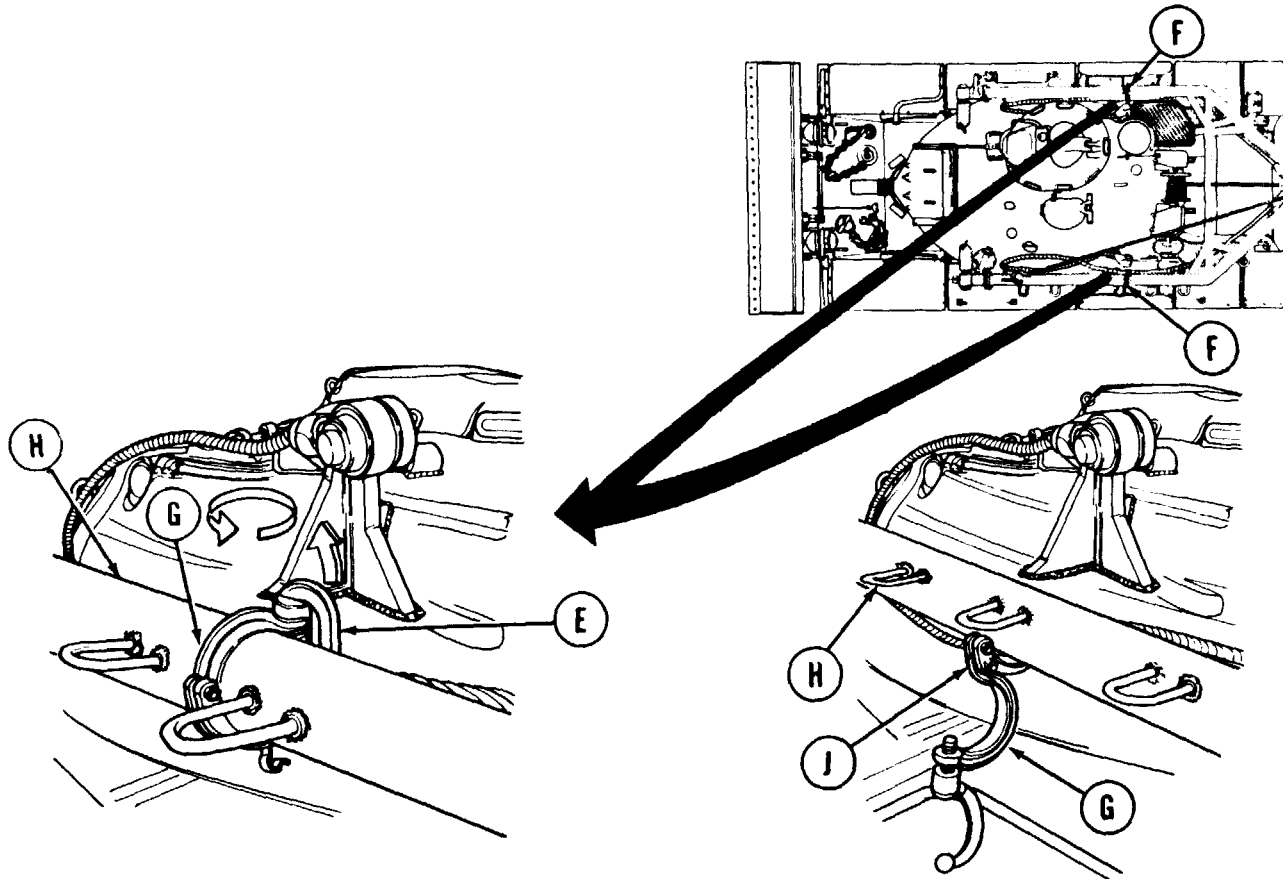
- Radio antenna is properly tied down.
  - Azimuth interlock is locked (page 2-570)
  - Turret is traversed (page 2-502) so main gun is over driver's hatch.
  - Winch gear shift lever is in low position (steps 15, 16, and 17, page 2-280).
  - Turret lock is locked (page 2-568).
1. Start hydraulic system (page 2-249).
  2. Set SELECTOR VALVE lever (A) to TURRET.
  3. Operate accelerator pedal (B) until tachometer (C) indicates engine speed of 1100 rpm.
  4. Pull up and hold accelerator locking lever (D) to maintain engine speed of 1100 rpm.
  5. Release accelerator pedal (B).
  6. Release accelerator locking lever (D).





**OPERATE BOOM (PREPARE FOR HOISTING OPERATIONS) - Continued**

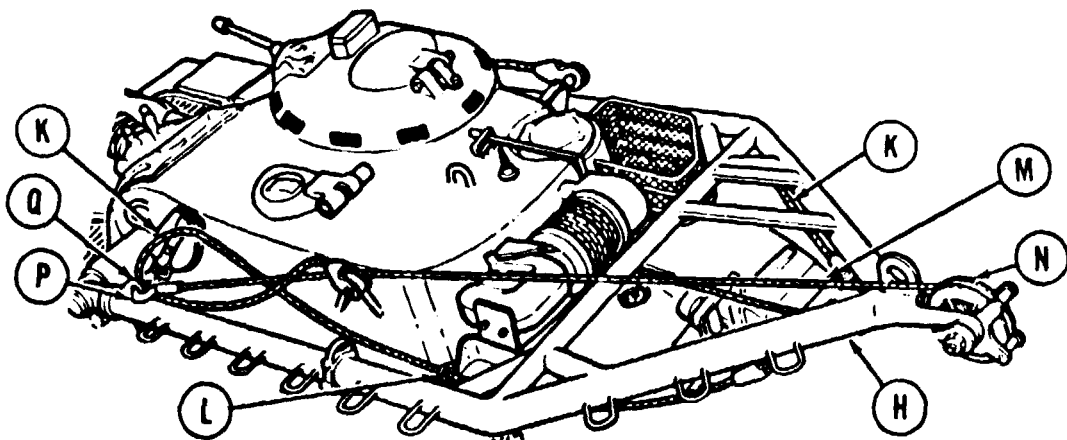
7. Raise locking handle (E) on two boom travel locks (F).
8. Turn locking handle (E) counterclockwise until retainer (G) is released.
9. Lift retainer (G) from boom (H). Let retainer hang from hinge (J) as shown.



**OPERATE WINCH (PERFORM AFTER WINCHING OPERATIONS) - Continued****WARNING**

**Wear gloves when handling steel cables to prevent possible injury to your hands**

10. Unhook left and right staylines (K) from two J-shaped hooks (L), one hook on right side, one hook on left side.
11. Check that staylines (K) are not tangled or snagged. Position them so as boom raises, they will not snag on turret equipment.
12. Check that winch cable (M) is around pulley (N) on tip of boom (H). If not, position winch cable (M) around pulley (N).
13. Check that winch cable lifting hook (P) is hooked in retaining eye (Q). If not, hook lifting hook (P) in retaining eye (Q).



TA252752

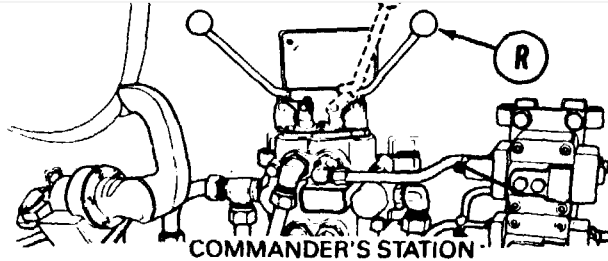
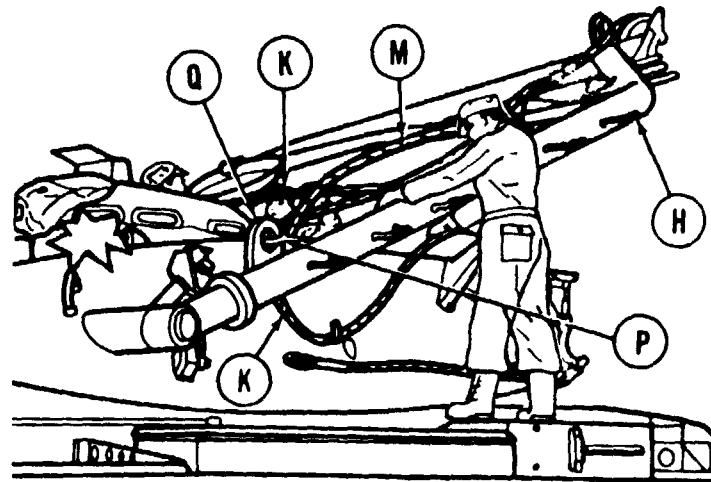
**WARNING**

Never position any part of your body under boom during erecting procedure. Sudden loss of hydraulic power could cause boom to fall causing serious injury or death. Commander should keep upper part of body to left side of cupola to avoid possible injury from staylines.

**NOTE**

If staylines (K) or winch cable (M) tangle or snag, tell Commander to stop operation of boom immediately. Untangle staylines (K) or winch cable (M). Continue with procedure

14. Position crewmember on each side of boom (H) to guide staylines and prevent snagging.
15. Crewmember on left side of vehicle, watch lifting hook (P) so it does not slip from retaining eye (Q).



COMMANDER'S STATION

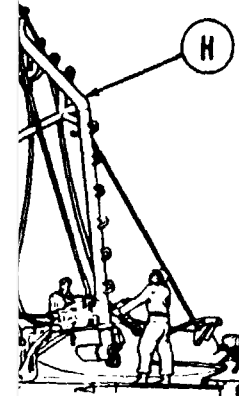
**WARNING**

During hoisting operations, ensure BOOM control lever (R) is not operated or movement may cause load to fall injuring personnel and/or damaging equipment.

**CAUTION**

Do not operate winch control lever and boom control lever at the same time.

16. Move BOOM CONTROL lever (R) up to slowly raise boom (H).

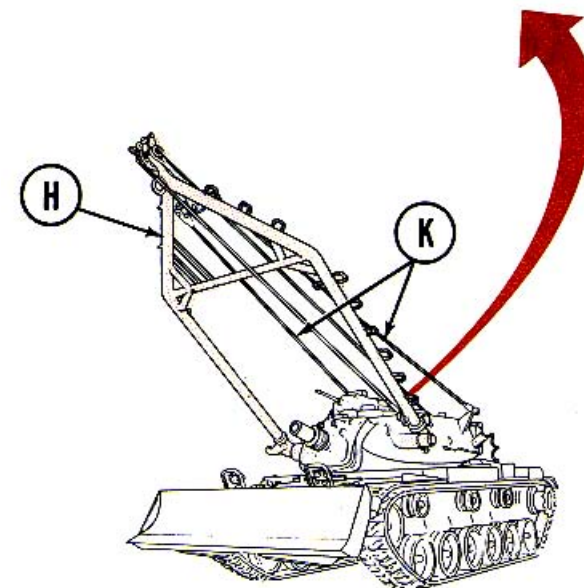
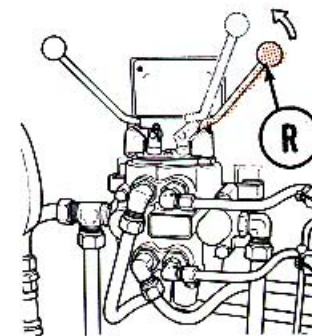


**OPERATE BOOM (PREPARE FOR HOISTING OPERATIONS) - Continued**

**WARNING**

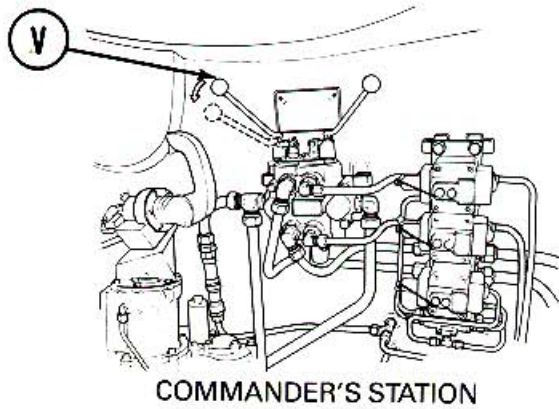
**Do not raise boom past vertical position until winch gear shift lever is locked in LO position.**

17. Release BOOM CONTROL lever (R) just before boom (H) reaches vertical position.
18. Position right stayline (K) on top of cupola.
19. Move boom control lever (R) up slowly until boom (H) is in operating position and both staylines (K) are tight.
20. Deleted
21. Deleted



TA252754

**OPERATE BOOM (PREPARE FOR HOISTING OPERATIONS) -  
Continued**



**WARNING**

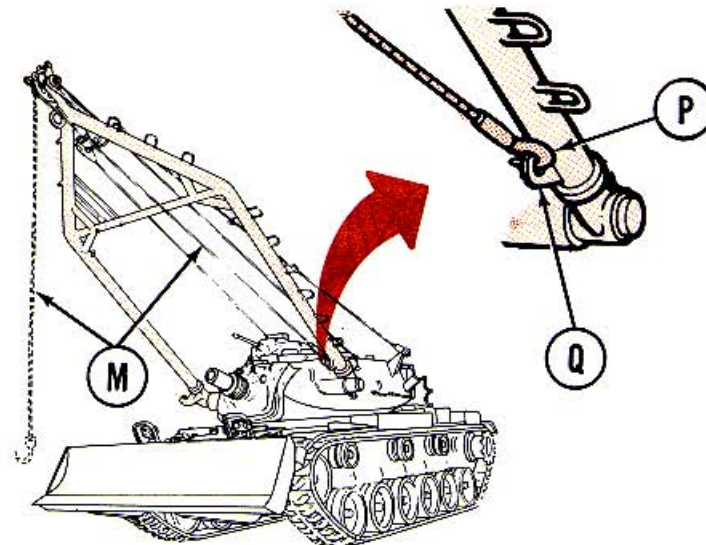
Be sure all personnel are clear o cable swing area before releasing lifting (P). Serious injury could result if personnel are hit.

24. Remove lifting hook (P) from retaining eye (Q). Carefully position hook in front of vehicle.
25. Check that cable (M) is not tangled or snagged. If it is, untangle it.

**CAUTION**

Winch gear shift lever must be in LO position before operating winch. Gear damage can occur if shift lever is moved while under power.

22. Move WINCH CONTROL LEVER (V) down to pay out winch cable (M).
23. Release WINCH CONTROL LEVER (V) when cable lifting hook (P) is loose on retaining eye (Q).



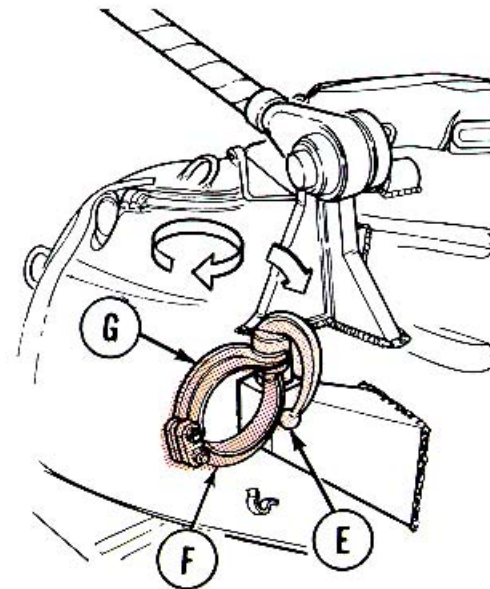
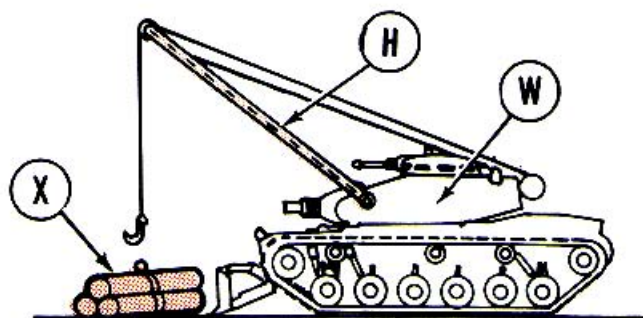
**OPERATE BOOM (PREPARE FOR HOISTING OPERATIONS) - Continued**

- 26. Close retainer (G) on both boom travel locks (F).
- 27. Turn locking handle (E) clockwise until retainer (G) is tight.
- 28. Push locking handle (E) down.
- 29. Untie antenna.
- 30. Set turret lock to UNLOCKED (page 2-331).

**CAUTION**

If hoisting operation is performed on a hill, do not lift over the downhill side of vehicle. Position vehicle so load is on uphill side of vehicle.

- 31. Position vehicle (W):
  - a. On as level ground as possible.
  - b. So end of boom (H) is over load (X).



**NOTE**

Lowered moldboard will act as a stabilizer during hoisting. If movement of vehicle is not required, perform steps 32 and 33. If movement of vehicle is required, skip steps 32 and 33.

- 32. Prepare moldboard for operations (page 2-253).
- 31. Lower moldboard to ground (page 2-257).

**OPERATE BOOM (PERFORM HOISTING)**

**To Perform Single Line Hoisting:**

**NOTE**

Operating the boom requires all four crewmembers. Station Commander and Driver inside vehicle. Station Gunner and Loader outside vehicle.

**Supplies:**

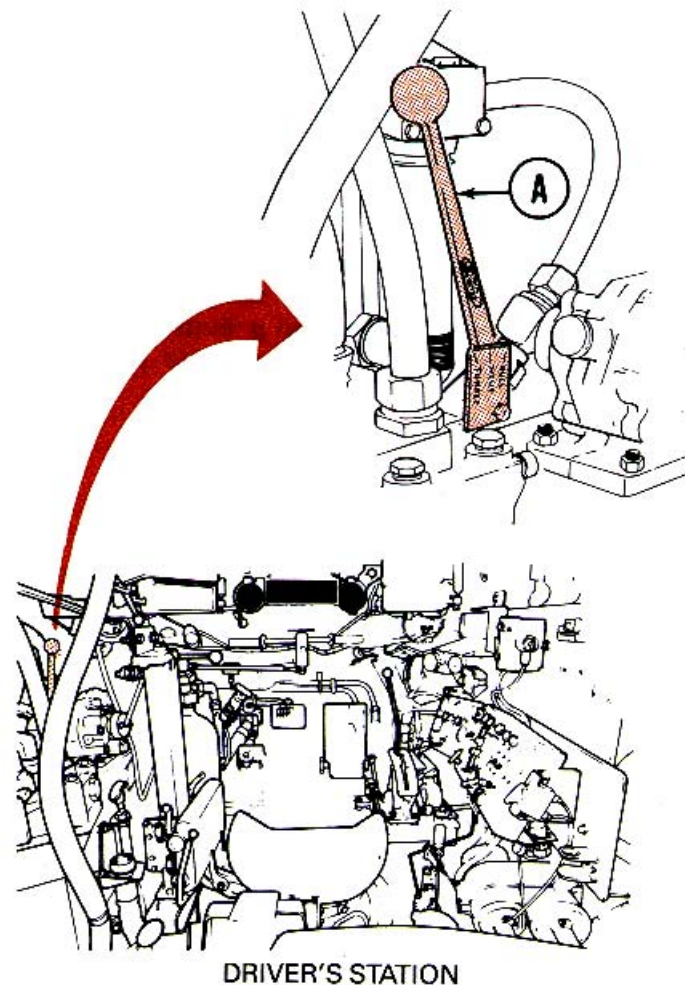
Get 50 foot length of rope to use as guideline.

**Make Sure:**

- Vehicle is prepared for hoisting (page 2-287).
- Driver's hatch is closed (page 2-166).
- SELECTOR VALVE lever (A) is set to TURRET.
- Turret is prepared for power operation (page 2-389).

**NOTE**

Position crewmember away from vehicle where he can watch boom operation and communicate with Commander by using hand signals.

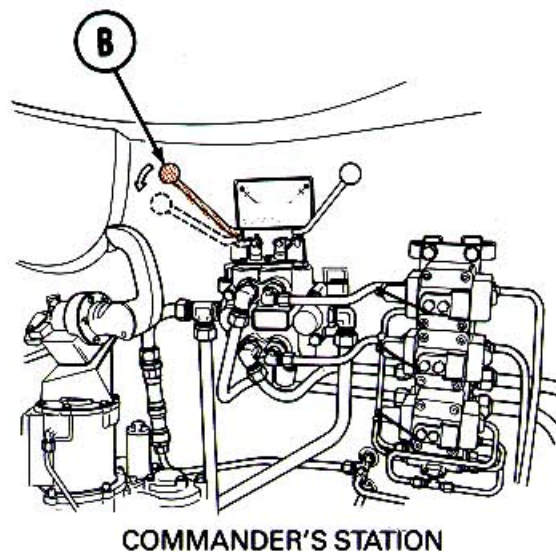


**OPERATE BOOM (PERFORM HOISTING) - Continued**

1. Move WINCH CONTROL lever (B) down to pay out enough cable (C) to reach load (D).
2. Connect lifting hook (E) to load (D).
3. Connect rope (F) to load (D).
4. Hold rope (F) to prevent load (D) from turning.

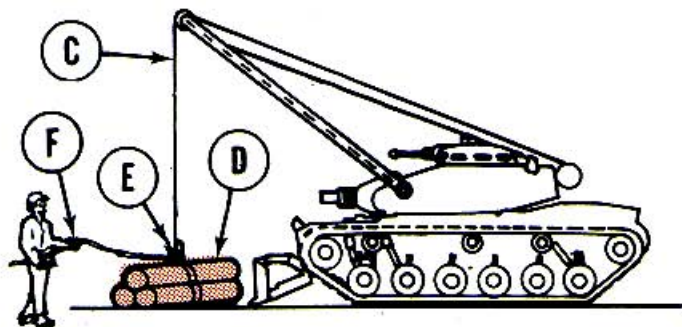
**WARNING**

Keep all personnel clear of winch cable during hoisting operation. All personnel must be at least the length of cable away from vehicle and load. Serious injury could result if winch malfunctions or cable breaks.



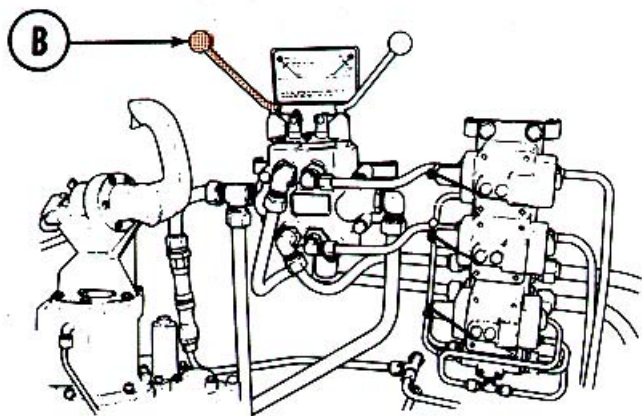
COMMANDER'S STATION

**CAUTION**  
Lifting capacity with a single line is 17,500 pounds.





OPERATE BOOM (PERFORM HOISTING) - Continued



COMMANDER'S STATION

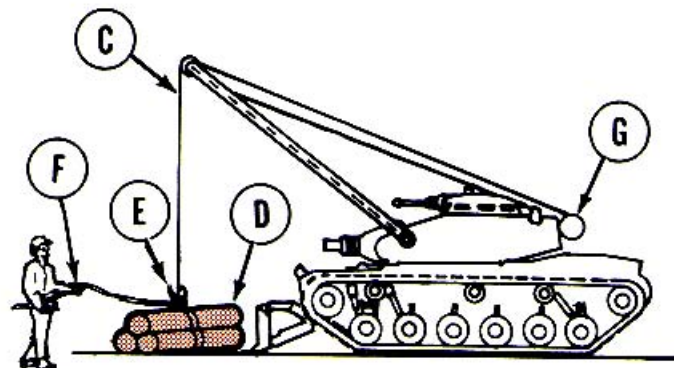
**CAUTION**  
 Cable (C) must be kept tight and coils close together when rewinding cable on winch (G).

5. Move WINCH CONTROL lever (B) up to reel in cable (C) and lift load (D). Release lever when load is at desired height.

**NOTE**  
 If necessary, traverse turret (page 2-505) or move vehicle to place load (D) in desired position.

6. Move WINCH CONTROL lever (B) down to pay out cable (C) and lower load (D). Release lever when load is placed in desired position.

7. Remove lifting hook (E) from load (D).
8. Remove rope (F) from load (D).
9. Return rope (F).
10. after hoisting operations (page 2-305).



**OPERATE BOOM (PERFORM HOISTING) - Continued**

**To Perform Two-Part Line Hoisting:**

**NOTE**

Operating the boom requires all four crewmembers. Station Commander and Driver inside vehicle. Station Gunner and Loader outside vehicle.

**Supplies:**

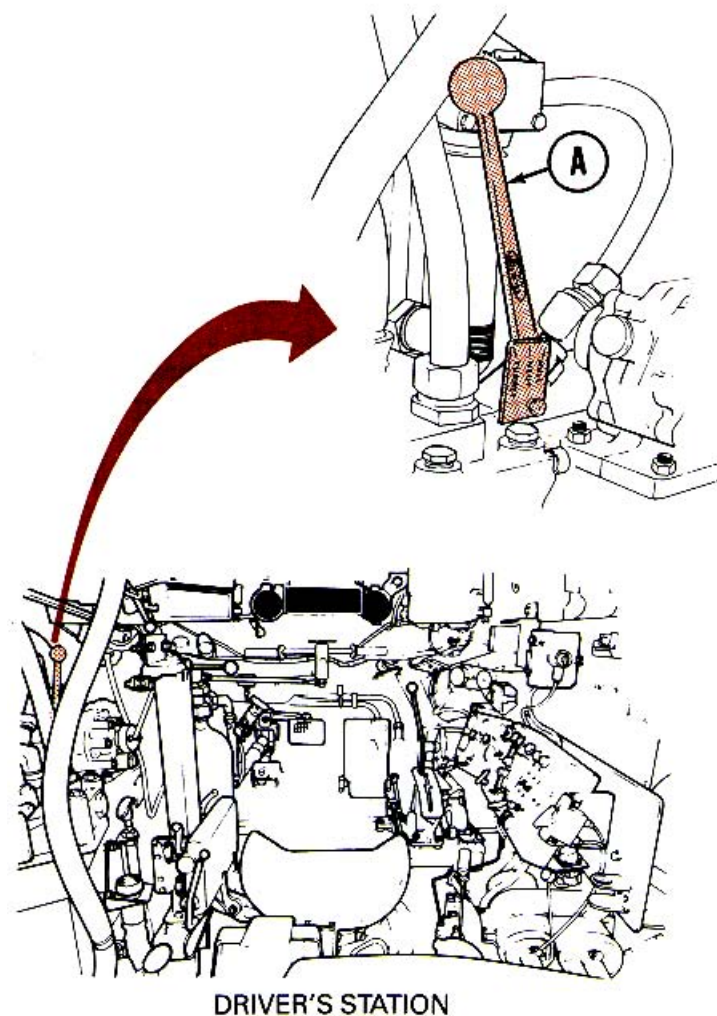
Get 50 foot length of rope to use as guideline.

**Make Sure:**

- Vehicle is prepared for hoisting (page 2-287).
- Driver's hatch is closed (page 2-166).
- SELECTOR VALVE lever (A) is set to TURRET.
- Turret is prepared for power operation (page 2-389).

**NOTE**

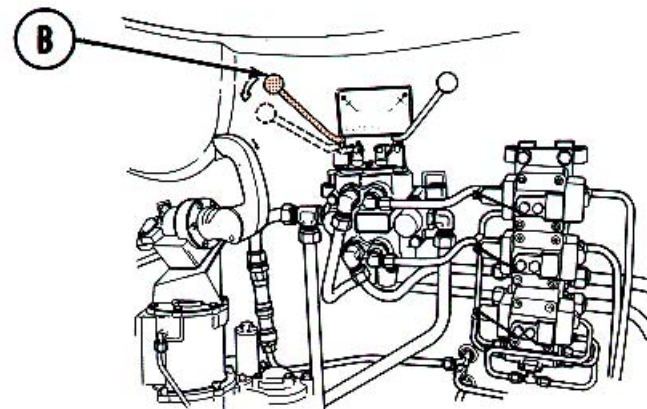
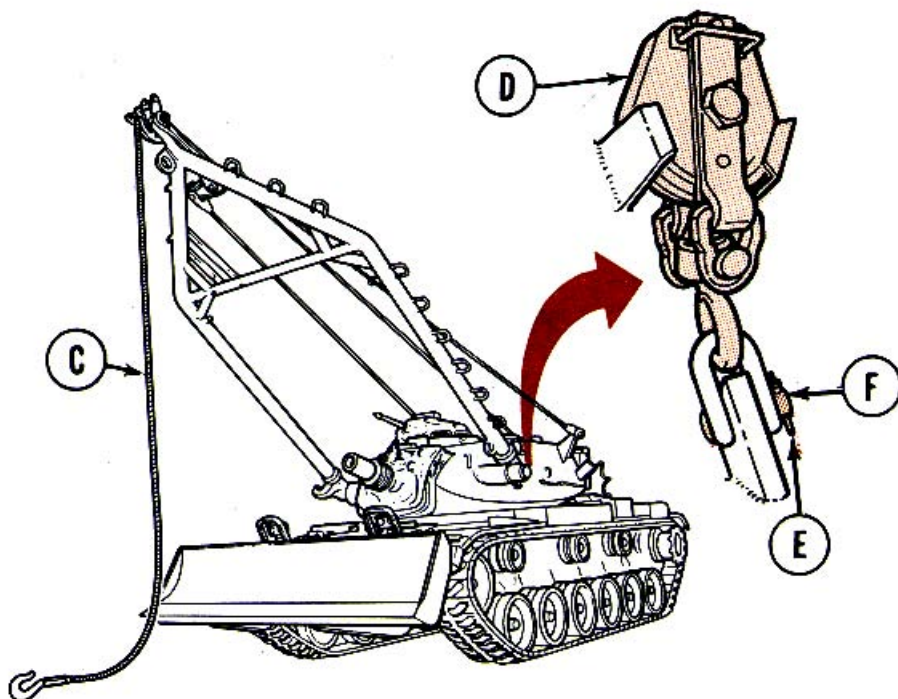
Position crewmember away from vehicle where he can watch boom operation and communicate with Commander by using hand signals.



DRIVER'S STATION

**OPERATE BOOM (PERFORM HOISTING) - Continued**

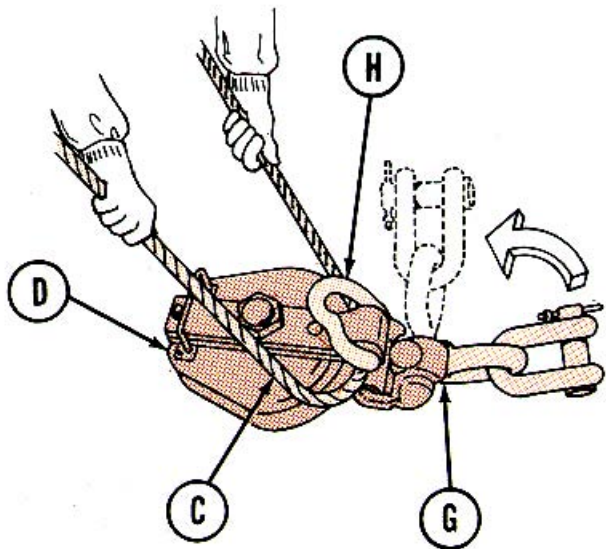
1. Move WINCH CONTROL lever (B) down to pay out enough cable (C) to reach the ground.
2. Locate snatch block (D) on left front side of turret.
3. Remove spring clip (E). Pull out retaining pin (F) securing snatch block (D).



**COMMANDER'S STATION**

4. Remove snatch block (D) from turret.
5. Install retaining pin (F) in snatch block (D). Secure pin with spring clip (E).

**OPERATE BOOM (PERFORM HOISTING) - Continued**

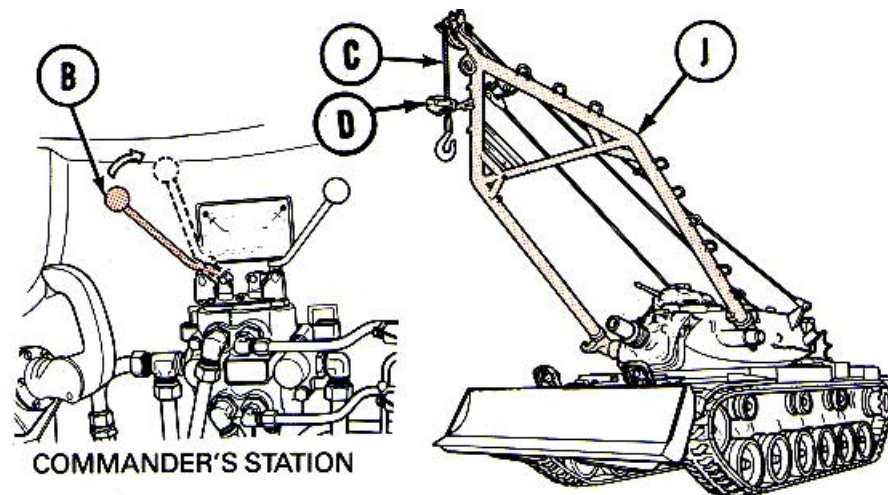


11. Move WINCH CONTROL lever (B) up to reel in cable (C) and snatch block (D). Release lever (B) when snatch block (D) is about one foot from end of boom (J).

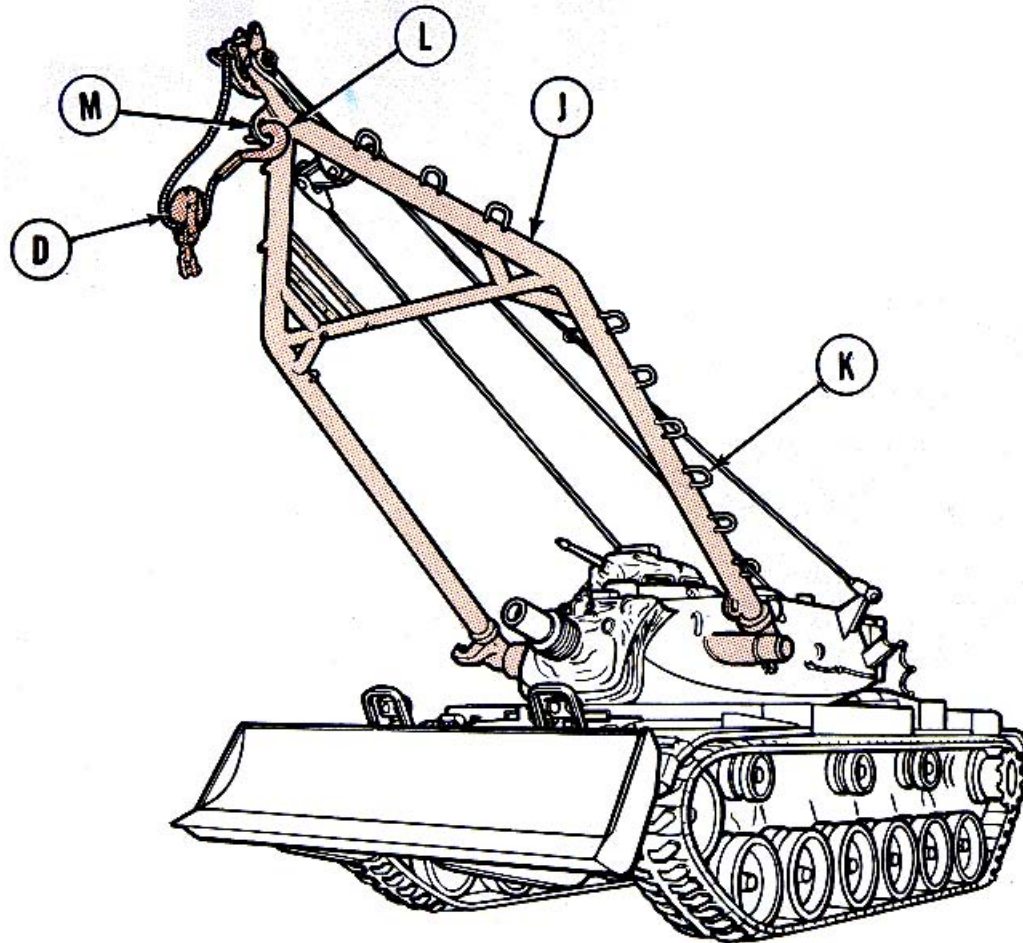
6. Turn swivel (G) to unlock ring (H) on snatch block (D).
7. Lift ring (H) to open snatch block (D).

**WARNING**  
Wear safety gloves when handling winch cable.

8. Insert winch cable (C) into snatch block (D).
9. Push ring (H) back over swivel (G).
10. Turn swivel (G) to lock ring (H).



OPERATE BOOM (PERFORM HOISTING) - Continued



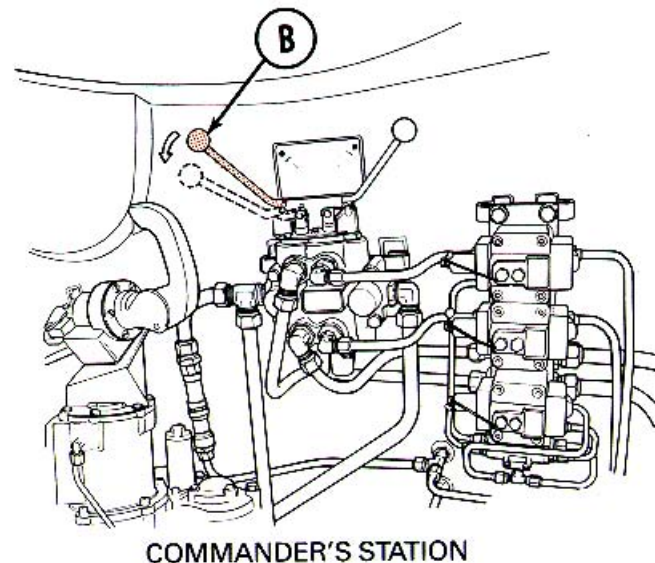
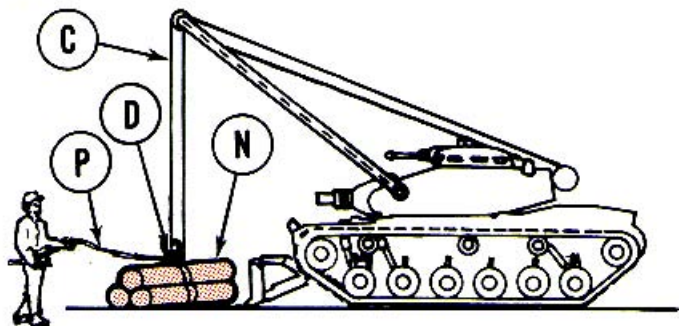
12. Using rungs (K) as ladder, carefully climb up left side of boom (J).
13. Lean over end of boom (J).
14. Grasp cable lifting hook (L) and place in retaining eye (M). Let snatch block (D) hang from cable.
15. Carefully climb down boom (J).

**OPERATE BOOM (PERFORM HOISTING) - Continued**

16. Move WINCH CONTROL lever (B) down to pay out enough cable (C) to reach load (N).
17. Connect snatch block (D) to load (N).
18. Connect rope (P) to load (N).
19. Hold rope (P) to prevent load (N) from turning.

**WARNING**

Keep all personnel clear of winch cable during hoisting operation. All personnel must be at least the length of cable away from vehicle and load. Serious injury could result if winch malfunctions or cable breaks.

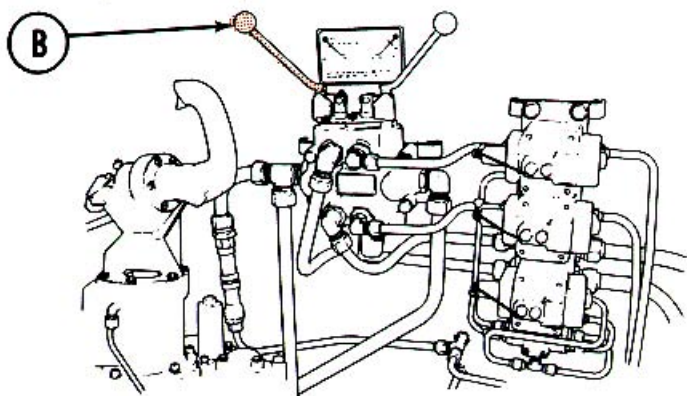


**CAUTION**  
Lifting capacity with two-part line is 35,000 pounds.

**NOTE**  
Hoisting speed with two-part line will be half the speed of single line operation.

TA252757

**OPERATE BOOM (PERFORM HOISTING) - Continued**



**COMMANDER'S STATION**

21. Move WINCH CONTROL lever (B) down to pay out cable (C) and lower load (N). Release lever when load is placed in desired position.
22. Remove snatch block (D) from load (N).
23. Remove rope (P) from load (N).
24. Move WINCH CONTROL lever (B) down to pay out cable (C) and lower snatch block (D). Release lever when snatch block rests on the ground.

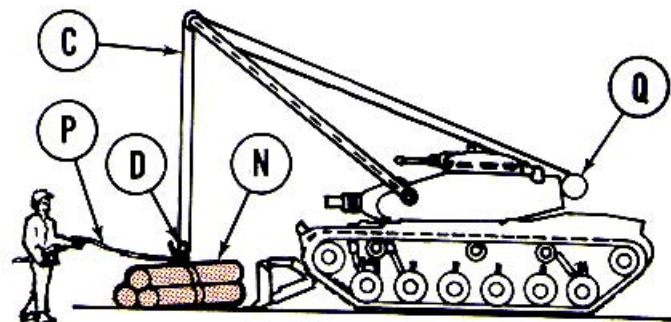
**CAUTION**

Cable (C) must be kept tight and coils close together when rewinding cable on winch (Q).

20. Move WINCH CONTROL lever (B) up to reel in cable (C) and lift load (N). Release lever when load is at desired height.

**NOTE**

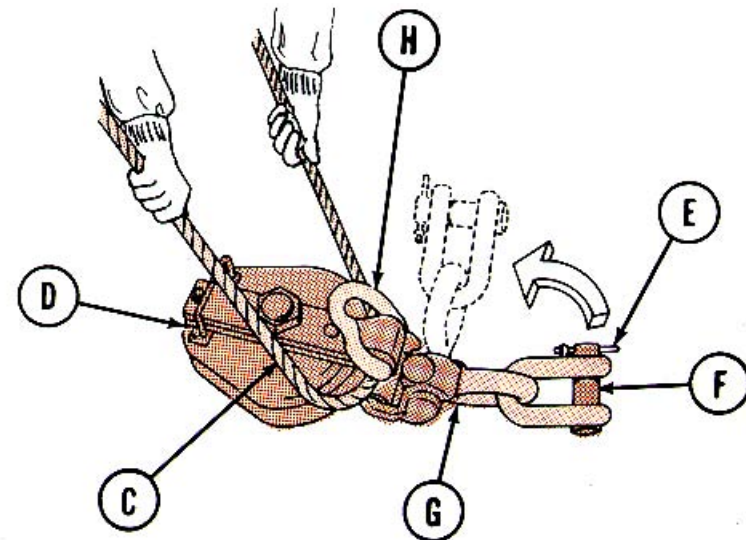
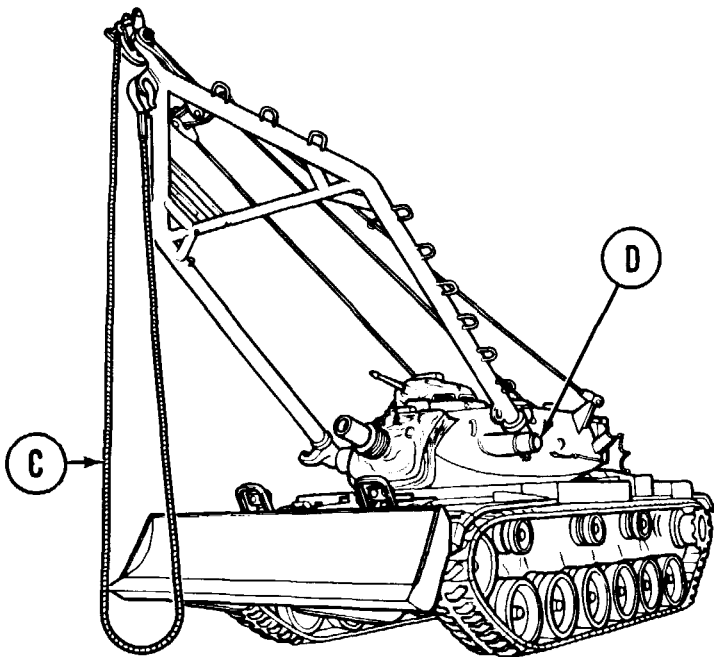
If necessary, traverse turret (page 2-505) or move vehicle to place load (N) in desired position.



TA252758

**OPERATE BOOM (PERFORM HOISTING) - Continued**

25. Turn swivel (G) to unlock ring (H) on snatch block (D).
26. Lift ring (H) to open snatch block (D).
27. Remove winch cable (C) from snatch block (D).
28. Push ring (H) back over swivel (G).

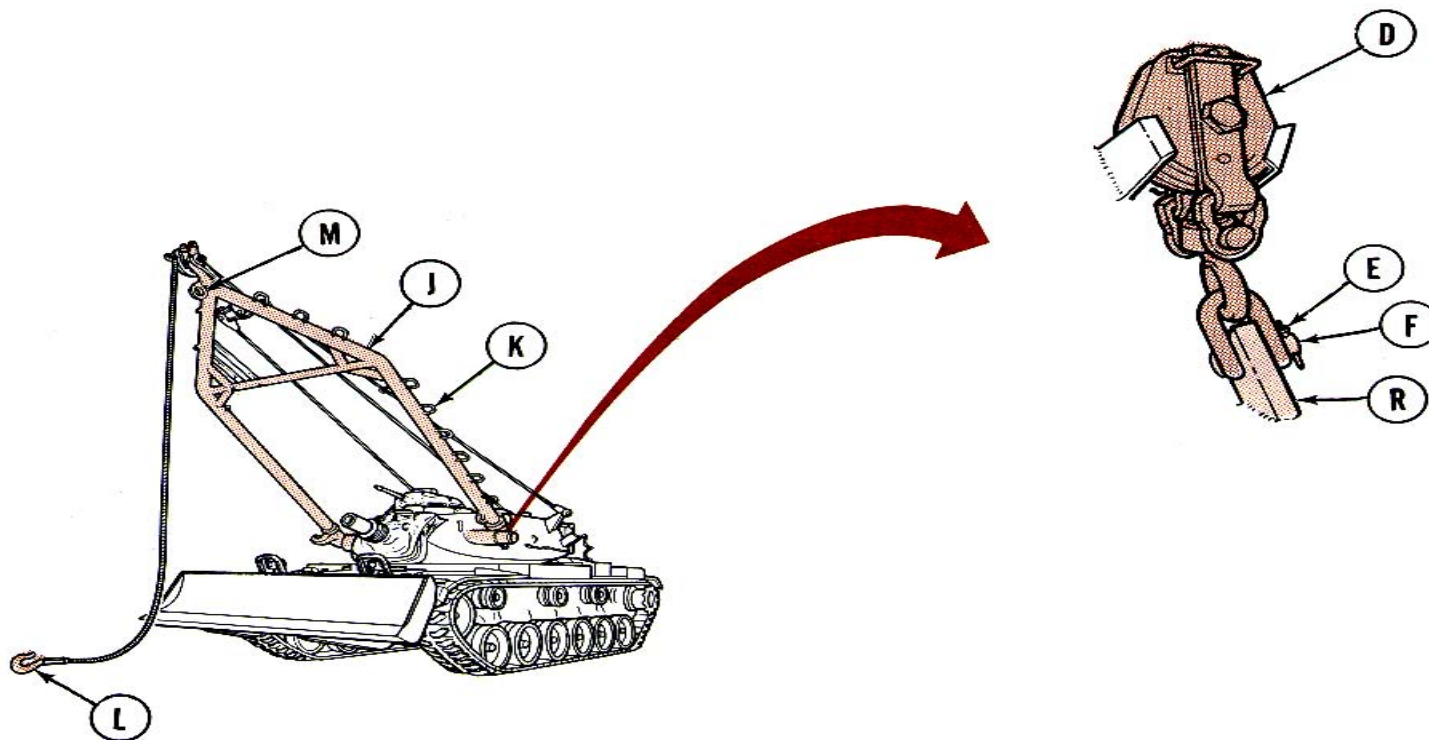


29. Turn swivel (G) to lock ring (H).
30. Remove spring clip (E). Pull out retaining pin (F).
31. Return snatch block (D) to stowage position on left front of turret.



**OPERATE BOOM (PERFORM HOISTING) - Continued**

- 32. Install retaining pin (F) thru snatch block (D) and mount (R). Secure pin with spring clip (E).
- 33. Using rungs (K) as ladder, carefully climb up left side of boom (J).
- 34. Remove cable lifting hook (L) from retaining eye (M).



- 35. Carefully lower hook (L) to ground.
- 36. Carefully climb down boom (J).
- 37. Return rope.
- 38. Perform after hoisting operations (page 2-305).

TA132444

**OPERATE BOOM (PERFORM AFTER HOISTING OPERATIONS)**

**NOTE**

Operating the boom requires all four crew members.  
 Station commander and Driver inside vehicle.  
 Station Loader and Gunner outside vehicle.

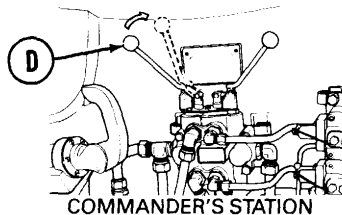
**Make Sure:**

- Radio antenna is properly tied down.
1. Position lifting hook (A) in retaining eye (B).

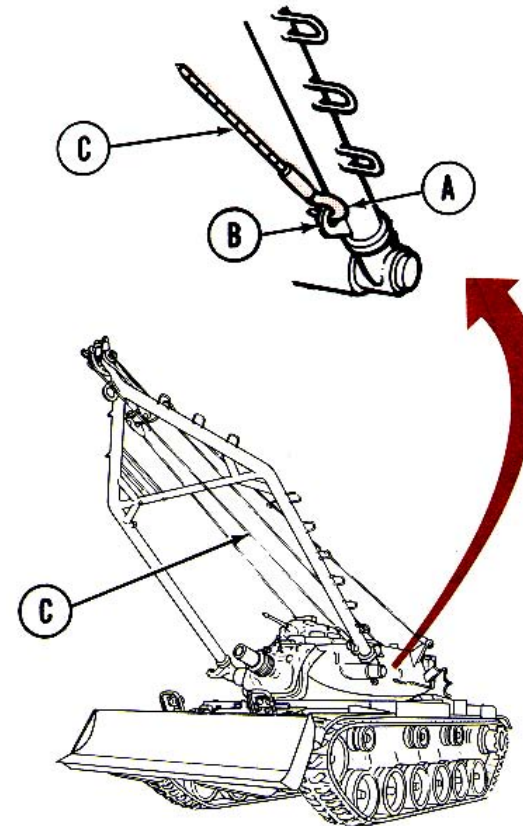
**CAUTION**

**Cable (C) must be kept tight and coils close together when rewinding cable on winch.**

2. Move WINCH CONTROL lever (D) up to reel in cable slack. Release lever when cable (C) is snug.
3. Check that winch cable (C) is not tangled or snagged. If it is, untangle it.

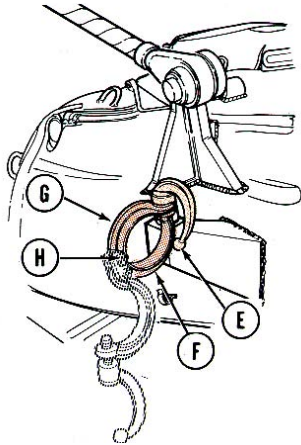


COMMANDER'S STATION



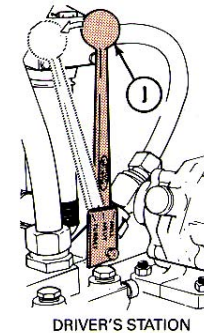
TA252759

**OPERATE BOOM (PERFORM AFTER HOISTING OPERATIONS) - Continued**



8. Turn locking handle (E) counterclockwise until retainer (G) is released.
9. Lift retainer (G). Let retainer hang from hinge (H).
10. Set SELECTOR VALVE lever (J) to TURRET.

4. Stow moldboard (page 2-261) if used.
5. Traverse turret (page 2-505) so main gun is over driver's hatch.
6. Set turret traverse lock to LOCKED (page 2-568).
7. Raise locking handle (E) on both boom travel locks (F).

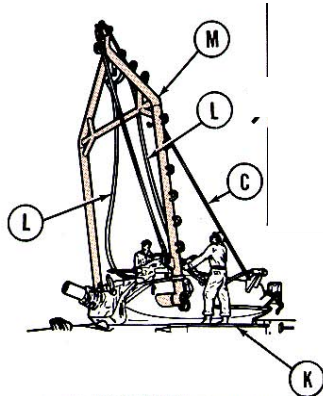


**OPERATE BOOM (PERFORM AFTER HOISTING OPERATIONS) - Continued**

**WARNING**

Never position any part of your body under boom during stow procedure. Sudden loss of hydraulic power can cause boom to fall causing serious injury or death. Commander should keep upper part of body to left side of cupola to avoid injury from staylines.

Wear safety gloves when handling wire-rope staylines and winch cable.

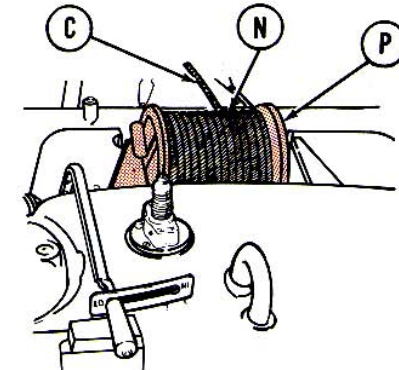
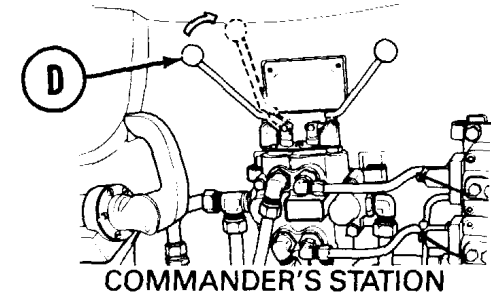


- Stand on front fender box (K). Guide staylines (L) into position so they do not tangle or snag as boom (M) is lowered.

**CAUTION**

Cable (C) must be kept tight and coils (N) close together when rewinding cable on winch (p).

- Move WINCH CONTROL lever (D) up slowly to reel in cable (C) and pull boom (M) up. Release lever when boom is just past vertical position.



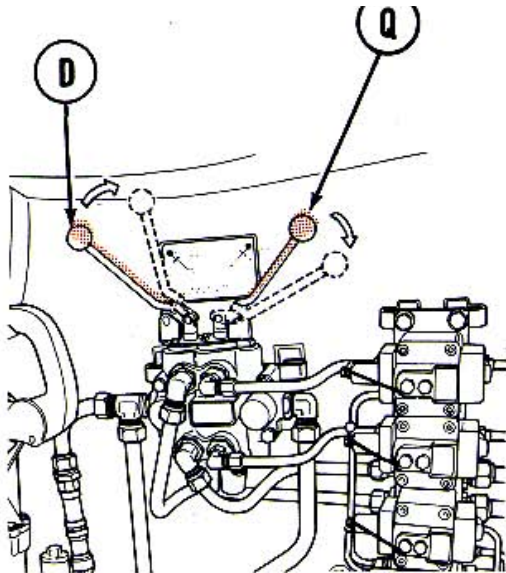
TA132447

**OPERATE BOOM (PERFORM AFTER HOISTING OPERATIONS) - Continued'**

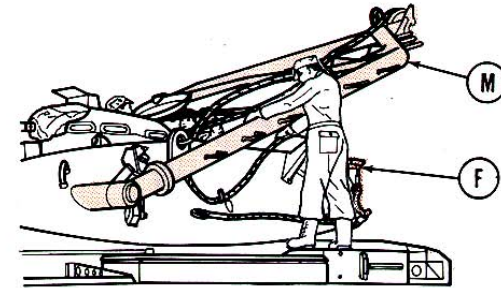
**CAUTION**

**Do not operate BOOM CONTROL lever (Q) and WINCH CONTROL lever (D) at the same time or damage may occur to boom linear actuating cylinder.**

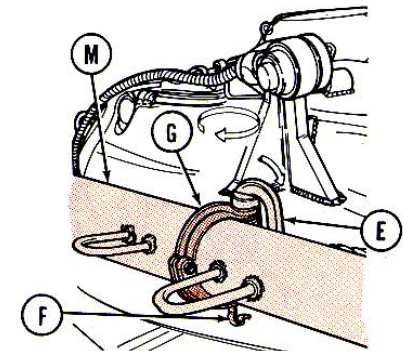
13. Move BOOM CONTROL lever (Q) down to bring boom down, stopping every one to two feet to use WINCH CONTROL lever (D) to take up slack in winch cable, until boom is about one foot from each travel lock (F).



**COMMANDER'S STATION**

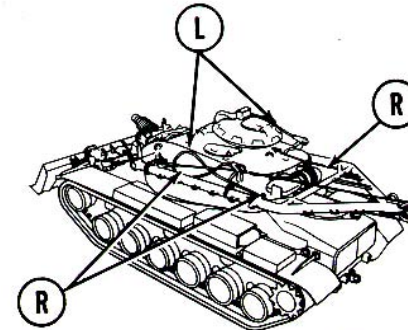


14. Move BOOM CONTROL lever (Q) down to FINAL STOW position. Release lever when boom (M) rests in both travel locks (F).
15. Close retainer (G) on both boom travel locks (F).
16. Turn locking handle (E) clockwise until retainer (G) is tight.
17. Push locking handle (E) down.
18. Move WINCH CONTROL lever (D) up to reel in cable slack. Release lever when cable is snug.

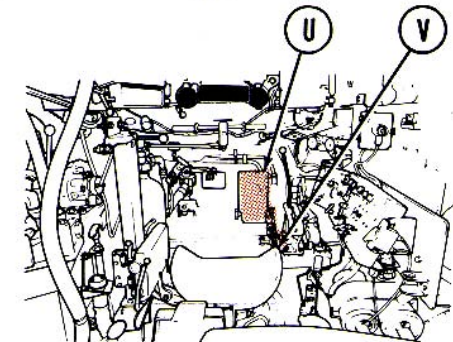
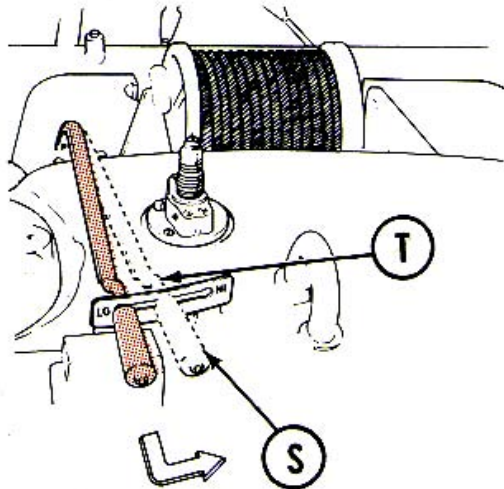


**OPERATE BOOM (PERFORM AFTER HOISTING OPERATIONS) - Continued**

19. Hook left and right staylines (L) on three J-shaped hooks (R), one hook on right side, two hooks on left side.
20. Pull back and hold shift lever handle (S).
21. Move shift lever (T) to center (neutral) position.
22. Release shift lever handle (S).



23. Press down and release accelerator pedal (U) to unlock lever (V).
24. Turn off hydraulic system (page 2-252), if not required for other operations.



DRIVER'S STATION

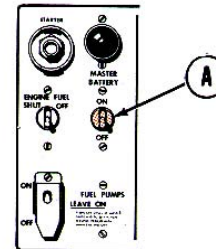
**STOW AMMUNITION (STOW 165-MM AMMUNITION)**

**WARNING**

**Do not allow flames or sparks within area while stowing ammunition. Have a manned fire extinguisher handy. Always be sure that MASTER BATTERY and ELEV/TRAV POWER switches are set to OFF.**

**Make Sure:**

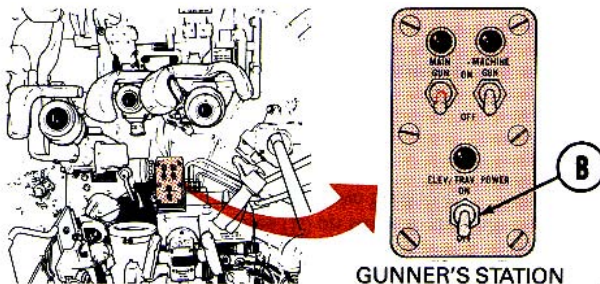
- Turret is traversed so main gun is over engine compartment (page 2-502).
- MASTER BATTERY switch (A) is set to OFF.
- ELEV/TRAV POWER switch (B) is set to OFF.
- Turret traverse lock is LOCKED (page 2-568).



DRIVER'S STATION

Loader's seat is located on pins to left of turret traverse lock (page 2-159).

Chapter on AMMUNITION (page 4-1) has been read and is understood.



GUNNER'S STATION

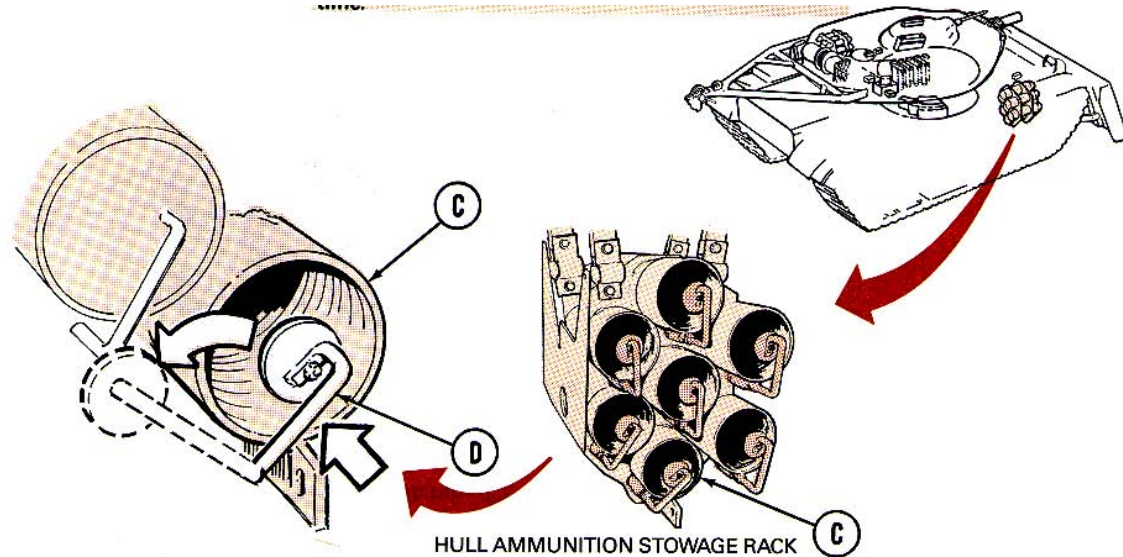
**STOW AMMUNITION (STOW 165-MM AMMUNITION) - Continued**

**To Stow Ammunition In Hull Ammunition Stowage Rack:**

**NOTE**

When stowing ammunition in hull stowage rack, always stow ammunition in horizontal layers from bottom to top. Open, load, and close one tube (C) at a time.

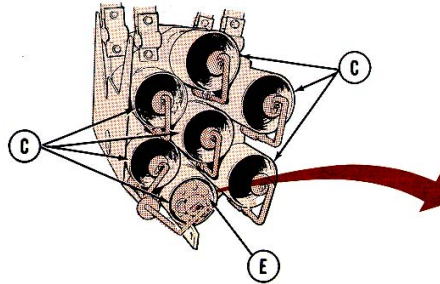
1. Push in and rotate handle (D) counterclockwise to open tube (C).



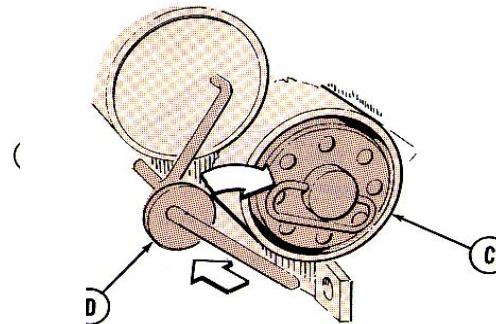


**STOW AMMUNITION (STOW 165-MM AMMUNITION) - Continued**

2. Stow ammunition round (E), nose end first, in tube (C).



3. Push in and rotate handle (D) clockwise to close tube (C).



HULL AMMUNITION STOWAGE BOX

4. Repeat steps 1 thru 3 until all seven tubes (C) in hull storage rack have been filled.

TA252761

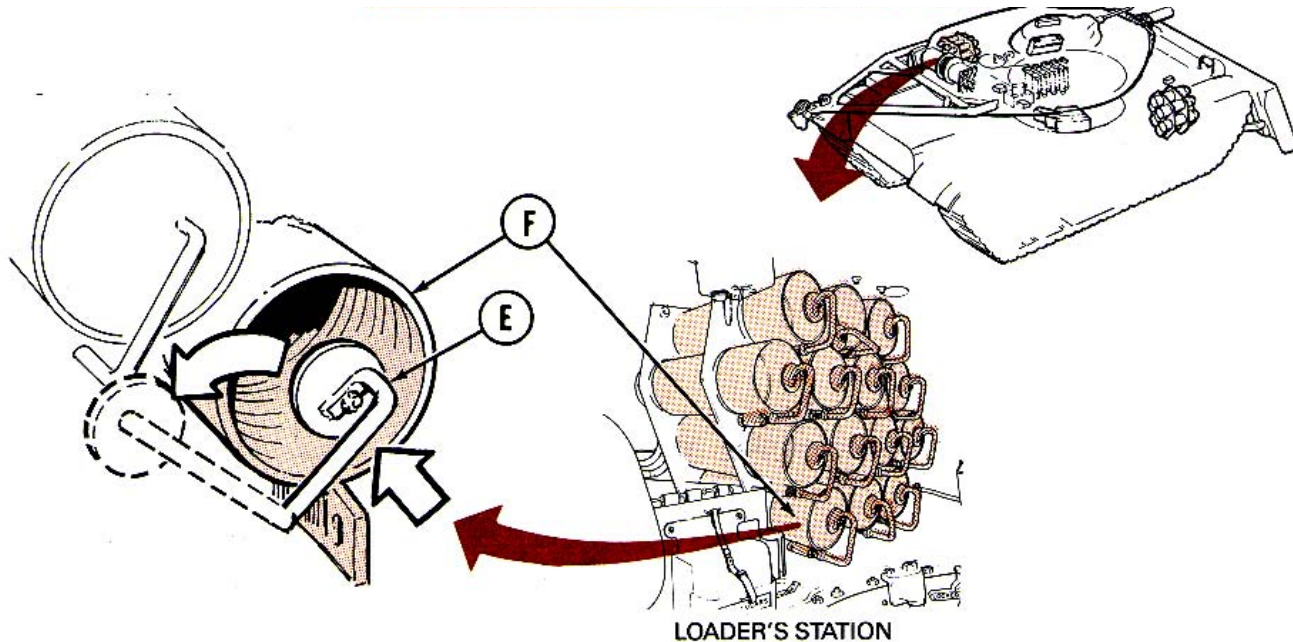
**STOW AMMUNITION (STOW 165-MM AMMUNITION) - Continued**

**To Stow Ammunition In Turret Bustle Ammunition Stowage Rack:**

**NOTE**

**When stowing ammunition in turret bustle stowage rack, always stow ammunition in horizontal layers from bottom to top Open, load, and close one tube (F) at a time**

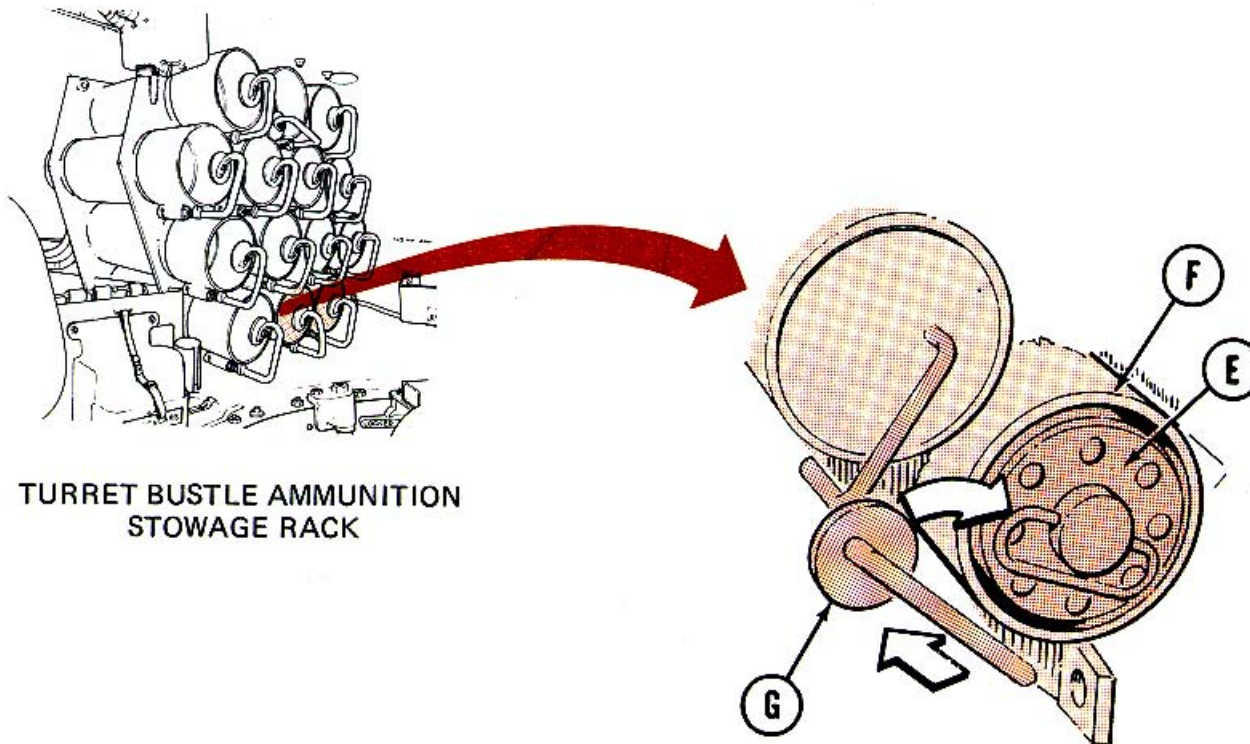
1. Push in and rotate handle (E) counterclockwise to open tube (F).



**STOW AMMUNITION (STOW 165-MM AMMUNITION) - Continued**

2. Stow ammunition round (E), nose end first, in tube (F).

3. Push in and rotate handle (G) clockwise to close tube (F).



**TURRET BUSTLE AMMUNITION  
STOWAGE RACK**

4. Repeat steps 1 thru 3 until all 14 tubes (F) in turret bustle storage rack have been filled.

To Stow Ammunition In Turret Ammunition Ready Rack:

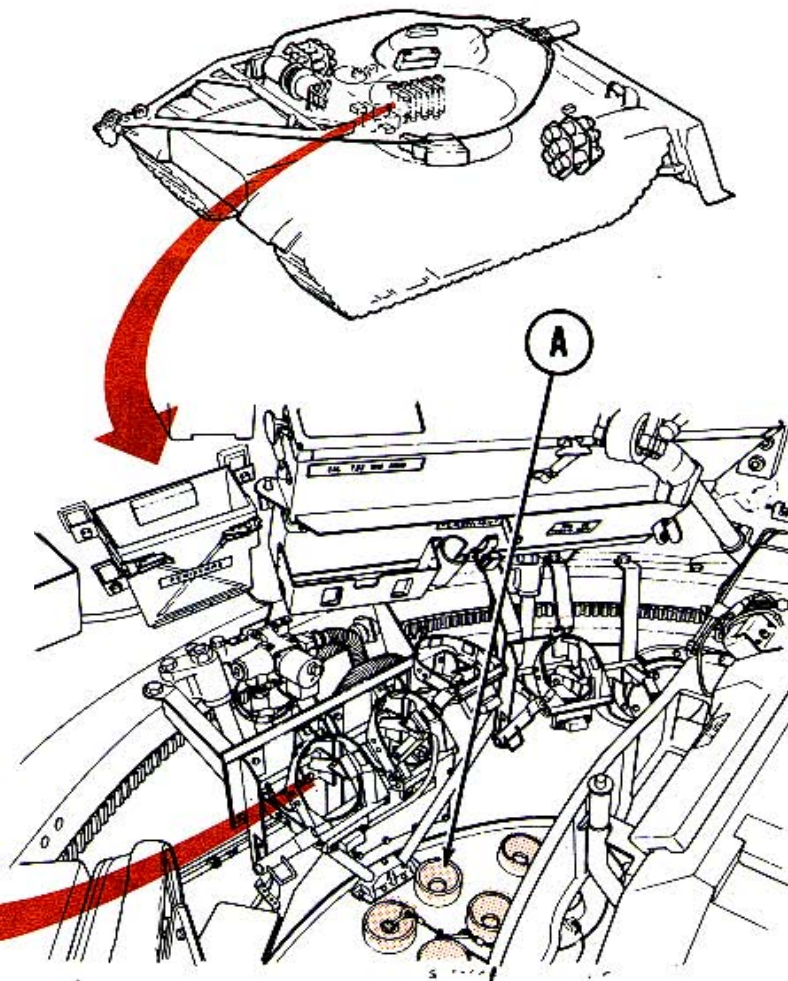
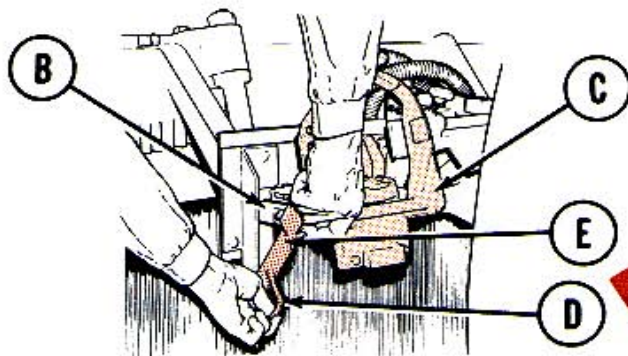
**WARNING**

Do not stow ammunition round at any location where rubber pad (A) is missing.

**NOTE**

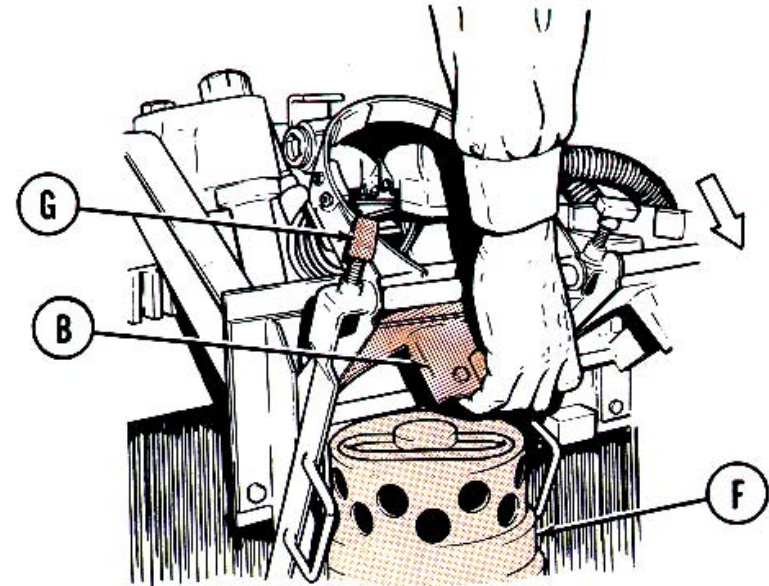
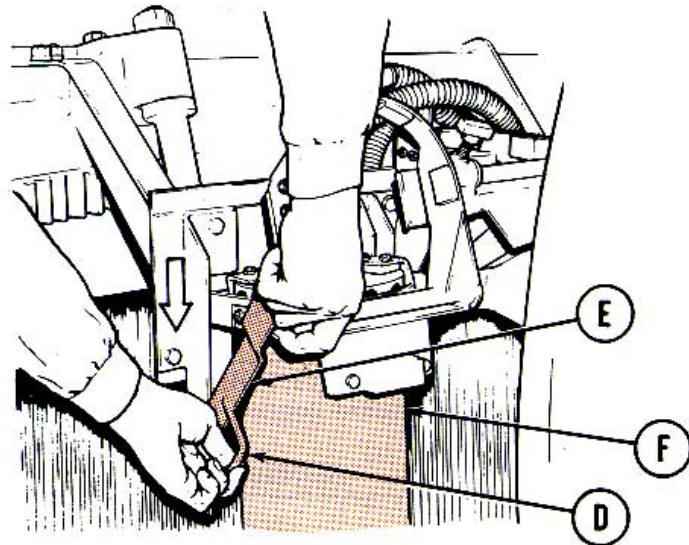
When stowing ammunition, start at front of turret and fill four inner brackets (B) first. After inner brackets (B) have been filled, start at front of turret and fill five outer brackets (C).

1. Pull up on handle (D) on support arm (E) to unlock inner bracket (B).
2. Pull up on inner bracket (B).



**STOW AMMUNITION (STOW 165-MM AMMUNITION) - Continued**

3. Place ammunition round (F), nose down, on cushioning pad under forward inner bracket (B).
4. Pull up on bracket (B) to unlock handle (D).
5. Push down on handle (D) until bracket (B) seats over round (F).

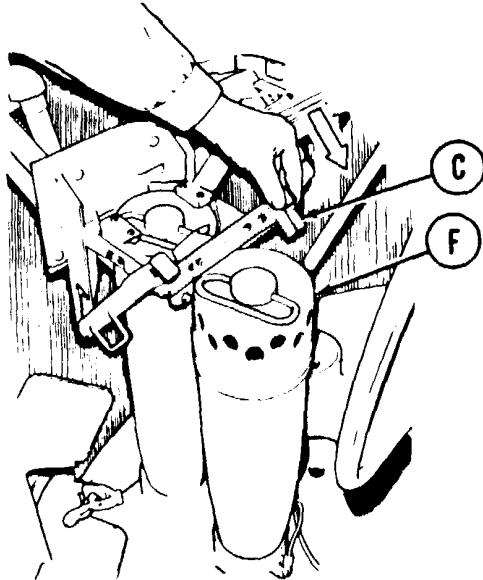


6. Turn knob (G) clockwise until inner bracket (B) and support arm (E) are locked in position.
7. Repeat steps 1 thru 6 until all four inner brackets are filled.

**TA132456**

**STOW AMMUNITION (STOW 165-MM AMMUNITION) - Continued**

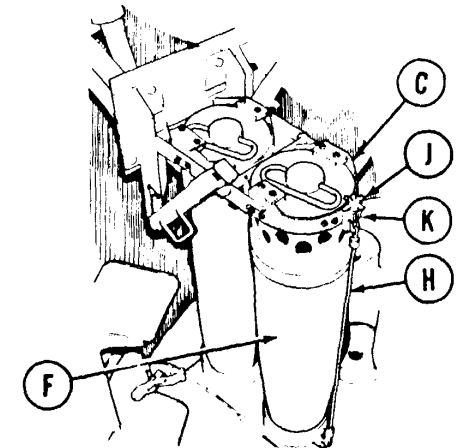
8. Pull up on outer bracket (C).



9. Place ammunition round (F), nose down, on cushioning pad under forward outer bracket (C).

10. Pull outer bracket (C) down over end of ammunition round (F).

11. Raise end of cable assembly (H) until cable end of knob (J) will fit into clevis (k) on outer bracket.



12. Turn knob (J) clockwise until cable is tight.

13. Repeat steps 8 thru 11 until all five outer brackets (C) are filled.

TA132457

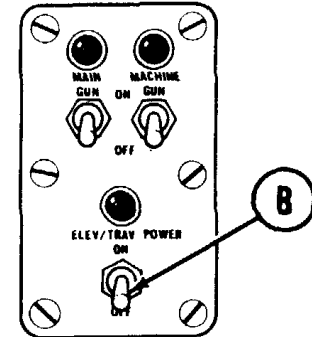
**STOW AMMUNITION (STOW CALIBER .50 MACHINE GUN AMMUNITION)**

**WARNING**

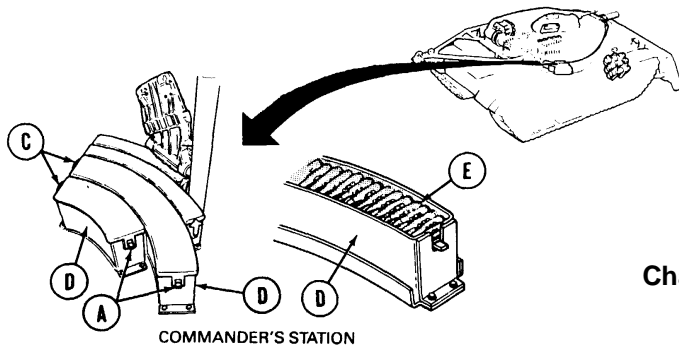
**Do not allow flames or sparks within area while stowing ammunition. Have a manned fire extinguisher handy.**

**Make Sure:**

- Ammunition to be stowed is M15A2 linked caliber .50 ammunition (page 4-).
- Main gun is depressed (page 2-502) so that you can open box covers (A).
- ELEV/TRAV POWER switch (B) is set to OFF.
- Commander's platform is stowed (page 2-165).



**GUNNER'S STATION**

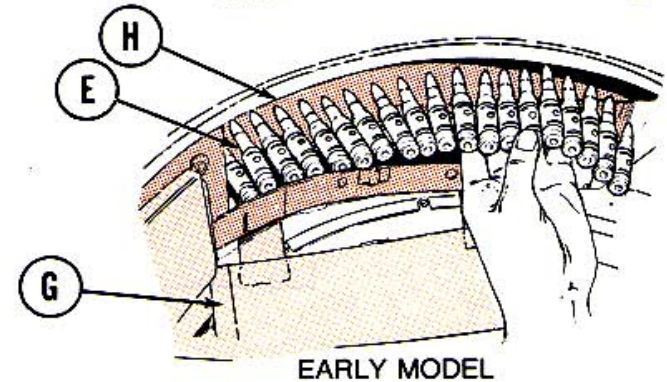
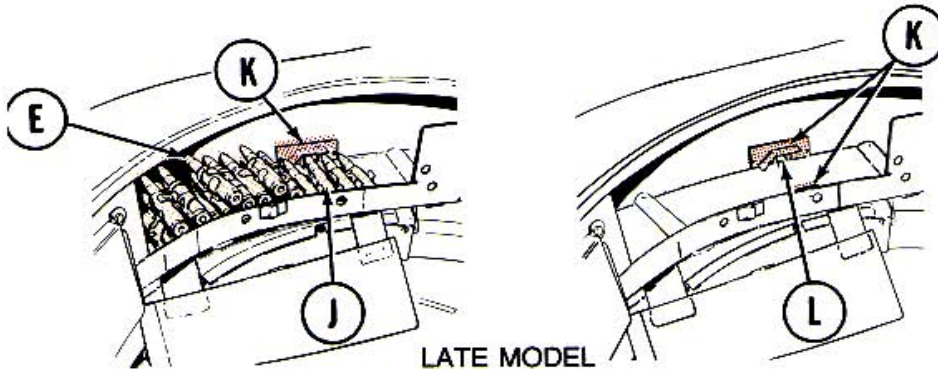
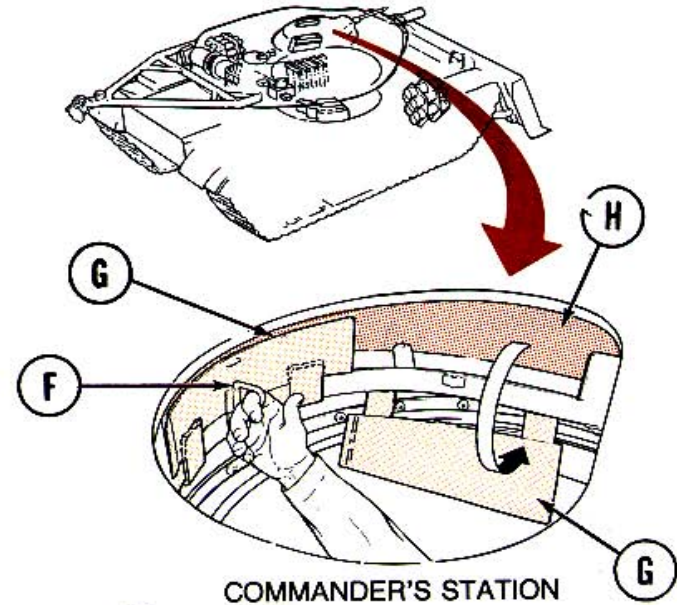


**Change 8 2-318**

1. Pull up on latches (C) on two boxes (D). Release latches from covers (A).
2. Remove covers (A).
3. Fill boxes (D) with linked caliber .50 ammunition (E) in layers.
4. Install covers (A) by positioning slots over hooks on forward end of boxes. Lower covers. Pull up on latches (C). Hook latches to cover.

**STOW AMMUNITION (STOW CALIBER .50 MACHINE GUN AMMUNITION) - Continued**

5. Rotate two index-finger grips (F) out from two covers (G) of cupola caliber .50 ammunition box (H). Pull up on finger grips (F). Open box covers (G).
6. Fill box (H) with layers of linked caliber .50 ammunition belts (E).
  - Early model, begin in the lower left of box. Put first layer of ammunition flat in box with pointed end away from you and closed side of links up. Connect belts of ammunition together as you fill ammunition box (H).
  - Late model, put first layer of ammunition flat in box with pointed ends away from you and open side of links up. Push third round (J) under guards (K). Pointed end of round (J) must depress last round stop switch (L). Fourth round must be outside guard (K). Connect belts of ammunition together as you fill box (H).
7. Close covers (G). Push down on index-finger grips (F) to lock covers (G). Rotate index-finger grips flush with covers (G).





**STOW AMMUNITION (STOW 7.62-MM MACHINE GUN AMMUNITION)****Make Sure:**

Main gun is elevated (page 2-502) so that you can reach all latches (A) on 7.62-mm ready ammunition box (B).

ELEV/TRAV POWER switch (C) is set to OFF.

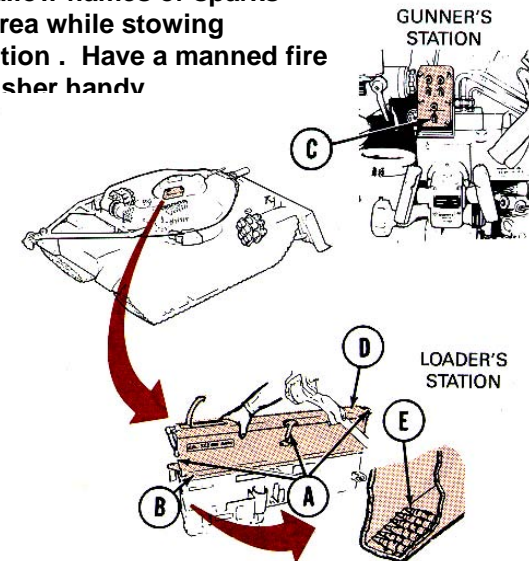
Turret traverse lock is LOCKED (page 2-568).

Commander's platform is stowed (page 2-165).

Commander's seat is in raised position (page 2-162).

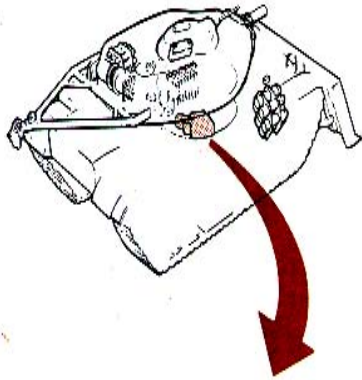
1. Pull up on three latches (A) on 7.62-mm ammunition ready box (B). Swing away from cover (D). Release latches.
2. Remove cover (D).
3. Fill box with layers of linked 7.62-mm ammunition belts (E). Begin in lower left corner. Put first layer of ammunition flat in box with pointed end away from you and with closed side of links up. Connect belts of ammunition together as you fill ready box.
4. Install cover (D). Pull up on latches (A) and hook to cover. Release latches.

**WARNING**  
Do not allow flames or sparks within area while stowing ammunition. Have a manned fire extinguisher handy.

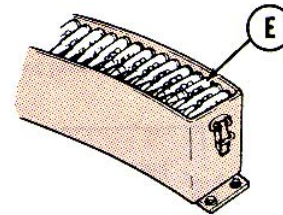
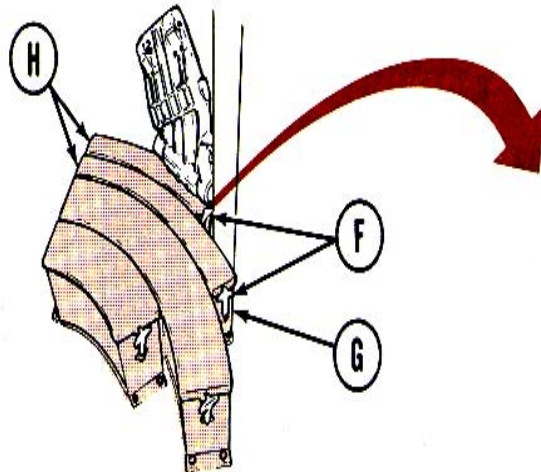


TA132460

STOW AMMUNITION (STOW 7.62-MM MACHINE GUN AMMUNITION) - Continued



5. Pull up on latches (F) on two 7.62-mm ammunition boxes (G) on turret floor. Swing latches away from cover (H). Release latches.
6. Remove covers (H).
7. Fill boxes with layers of linked 7.62-mm ammunition belts (E). Pointed ends should point toward you.
8. Install covers (H) by positioning slots over hooks on forward end of boxes and lower covers. Pull up on latches (F). Hook latches to covers. Release latches.



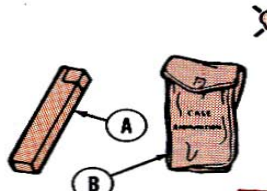
COMMANDER'S STATION

TA132461

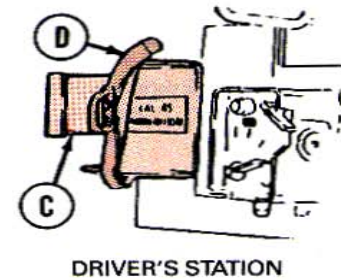
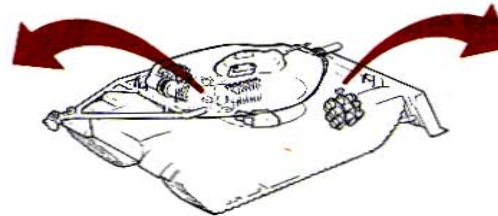
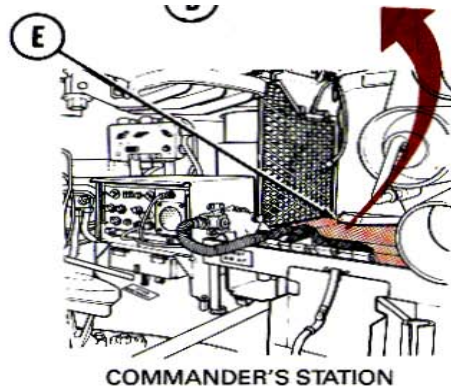
**STOW AMMUNITION (STOW CALIBER .45 AMMUNITION)**

**WARNING**

**Do not allow flames or sparks within area while stowing ammunition. Have a manned fire extinguisher handy.**



1. Inspect loaded clips (A) for cleanliness.
2. Fill two ammunition pockets (B) with six clips each.
3. Stow one pocket in holder (C). Buckle strap (D).
4. Stow one pocket in oddment tray (E).



**STOW AMMUNITION (STOW SMOKE GRENADES)****WARNING**

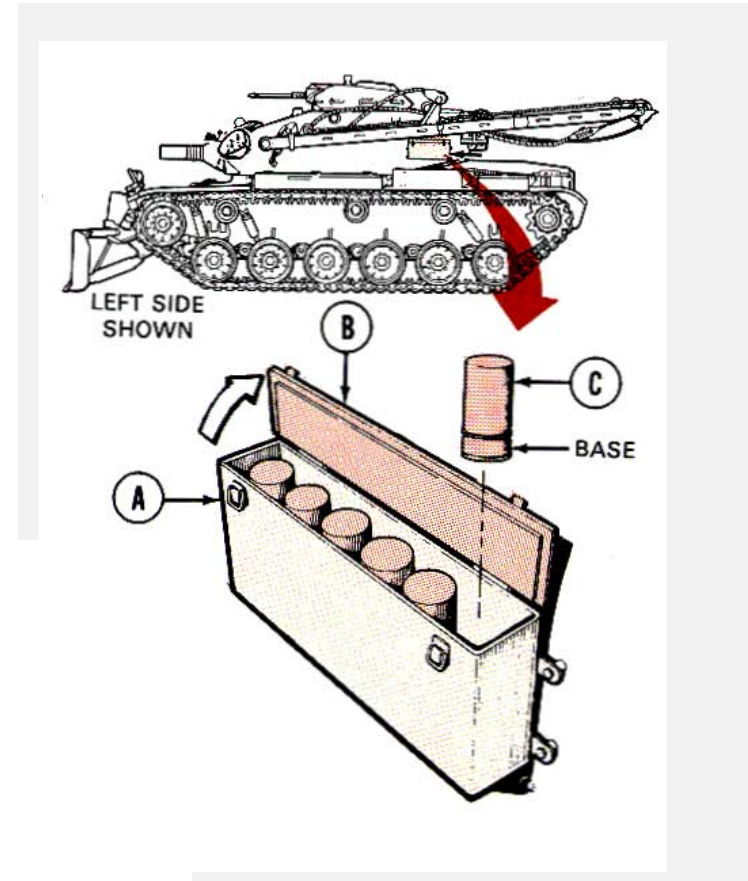
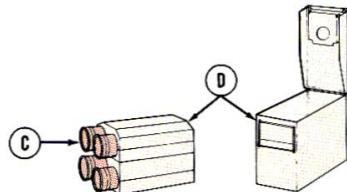
Smoke grenades contain red phosphorous (RP) This is a fire hazard. All personnel should be extremely careful when handling smoke grenades.

Do not allow flames or sparks within area while stowing ammunition. Have a manned fire extinguisher handy.

**NOTE**

There is one stowage bin (A) located on each side of the turret.

1. Open stowage bin lid (B).
2. Remove smoke grenades (C) from ammunition storage box (D).
3. Put six smoke grenades (C), base first, into each stowage bin (A).
4. Close and latch lid (B).



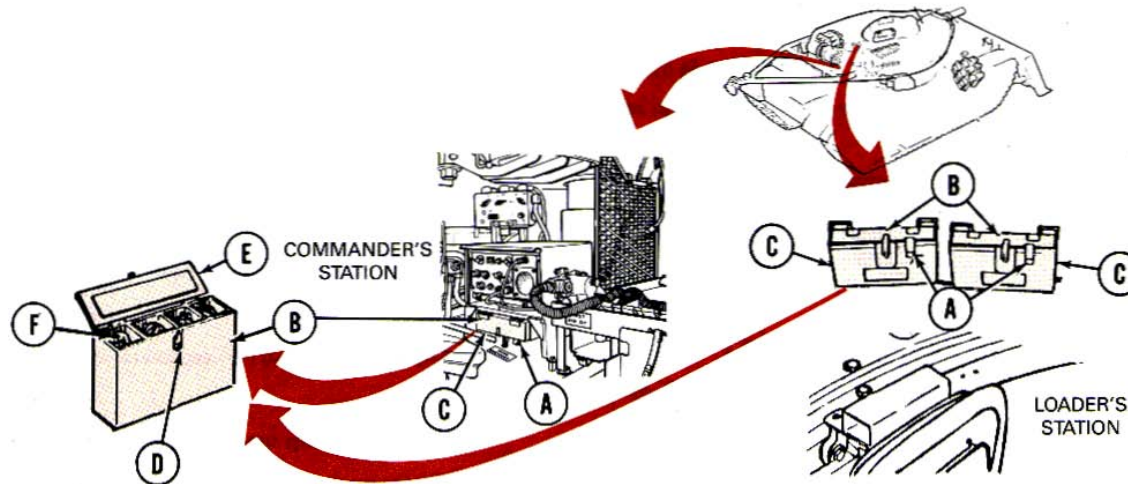
Change 1 2-322.1/(2-322.2 blank)

TA252764

**STOW AMMUNITION (STOW HAND GRENADES)****WARNING**

Do not allow flames or sparks within area while stowing ammunition. Have a manned L fire extinguisher handy.

1. Press spring clips (A). Pull out three grenade boxes (B) from stowage brackets (C). Release spring clips (A).
2. Lift latches (D) on grenade boxes (B). Raise covers (E).
3. Put four hand grenades (F) into each grenade box (B).
4. Close covers (E) on grenade boxes (B). Close latches (D).
5. Push grenade boxes (B) into stowage brackets (C) until spring clips (A) lock grenade boxes in place.



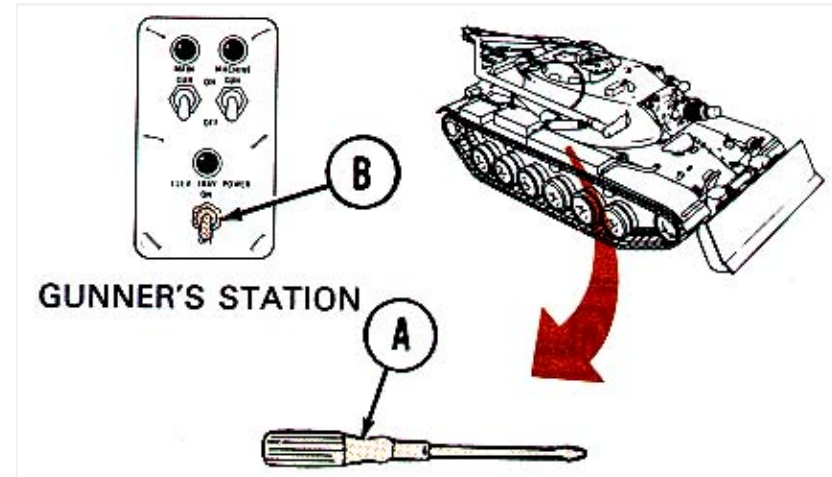
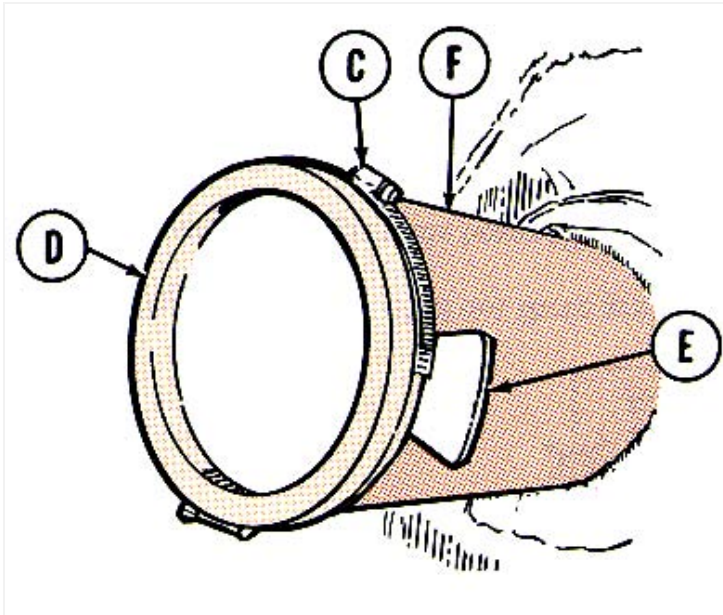
TA252765

**PREPARE FOR FIRING (REMOVE COVERS)****To Remove and Stow Main Gun Muzzle Cap:****Tools:**

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

**Make Sure:**

- Main gun is unloaded (page 2-550).
- Turret traverse lock is LOCKED (page 2-568).
- ELEV/TRAV POWER switch (B) is set to OFF.



1. Using screwdriver (A), loosen screw on clamp (C).
  2. Grasp muzzle cap (D) by tabs (E).
  3. Pull muzzle cap (D) and clamp (C) from end of main gun (F).
- WARNING**  
Inspect gun tube for any obstruction. Firing the gun with obstruction may cause damage to gun tube and possible injury to personnel.
4. Stow muzzle cap (D) and clamp (C) in right front fender box.
  5. Return screwdriver (A) to stowage.

TA132465

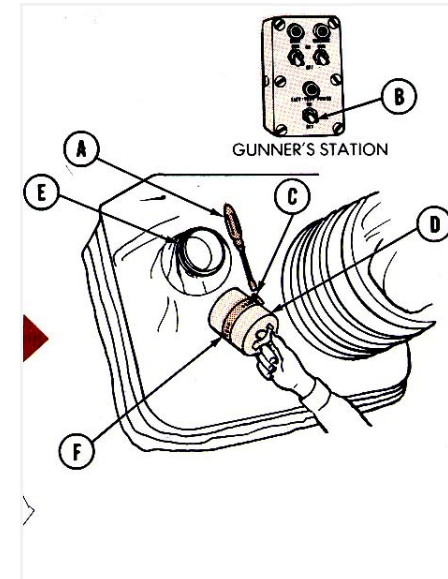
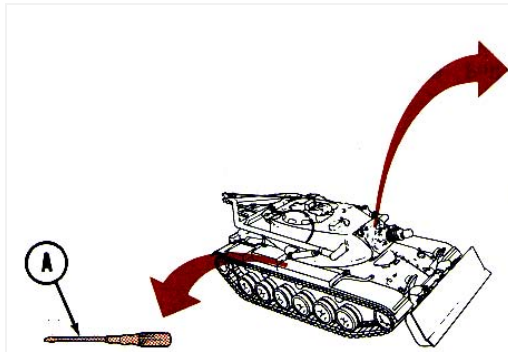
**PREPARE FOR FIRING (REMOVE COVERS) - Continued****To Remove and Stow Telescope Cover:****Tools:**

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

**Make Sure:**

- Turret traversing lock is LOCKED (page 2-568).
- ELEV/TRAV POWER switch (B) is set to OFF.

1. Using screwdriver (A), loosen screw (C).
2. Pull cover (D) from housing (E).
3. Remove clamp (F) from cover (D).



4. Replace clamp on housing (E).
5. Using screwdriver (A), tighten screw (C).
6. Place cover (D) in right front fender box.
7. Return screwdriver (A) to stowage.

PREPARE FOR FIRING (REMOVE COVERS) Continued

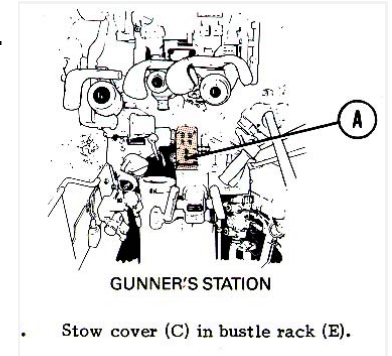
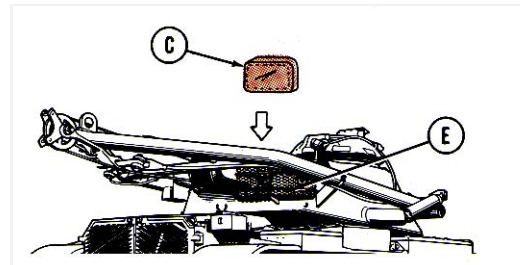
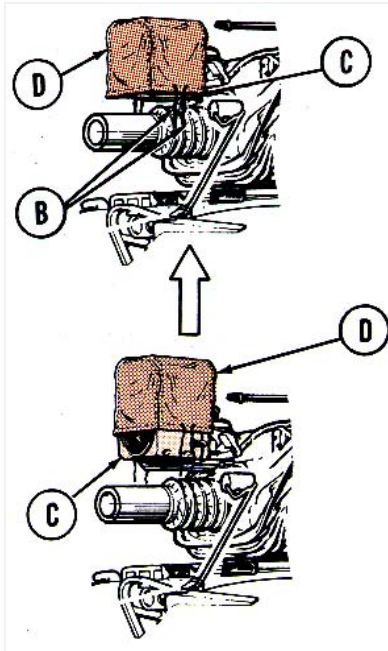
**NOTE**

For ANNSS-3A searchlight, do steps 1 thru 4.  
 For AN/VSS-2 searchlight, do steps 1 thru 3 on page 2-327.

To Remove Cover from ANNSS-3A Searchlight (If So Equipped):

**Make Sure:**

- ELEV/TRAV POWER switch (A) is set to OFF.
1. Untie cover drawstrings (B) underneath searchlight (C).
  2. Pull cover (D) carefully up from searchlight (C).
  3. Fold cover (D).
  4. Stow cover (D) in bustle rack (E).



TA132466

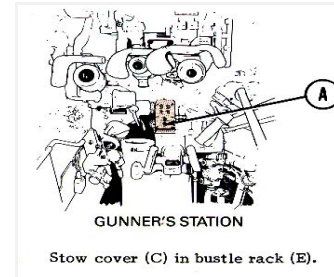
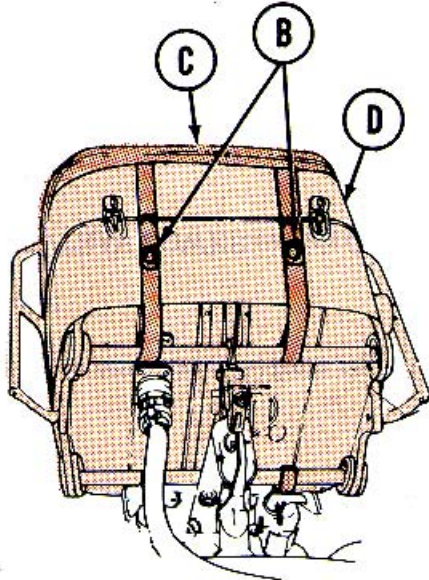


**PREPARE FOR FIRING (REMOVE COVERS) - Continued**

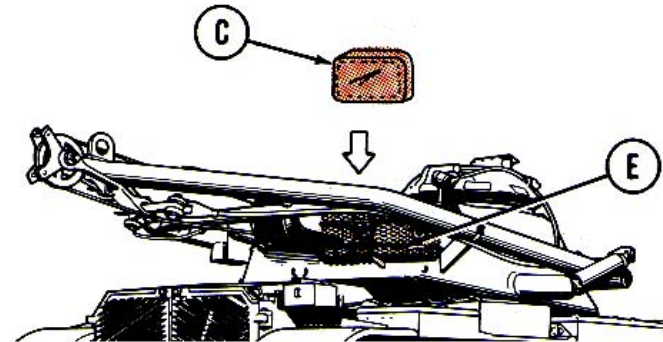
**To Remove Cover From ANIVSS-2 Searchlight (If So Equipped):**

**Make Sure:**

- ELEV/TRAV POWER switch (A) is set to OFF.
1. Unbuckle four cover strap buckles (B), two top, two bottom. (Top buckles (B) shown.)
  2. Pull cover (C) from front of searchlight (D).



3. Stow cover (C) in bustle rack (E).



**PREPARE FOR FIRING (REMOVE COVERS) - Continued**

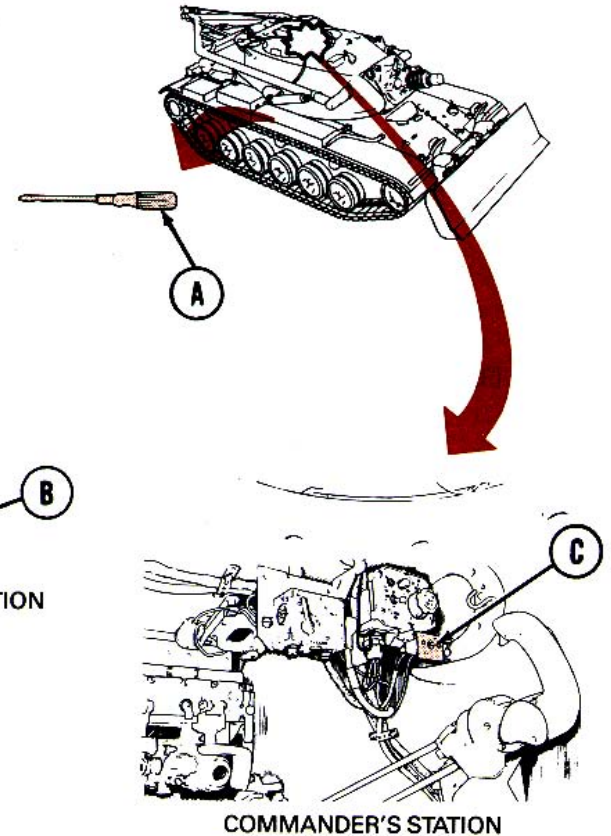
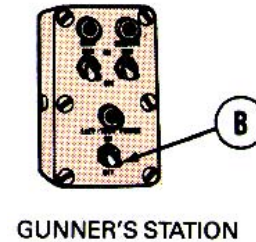
**To Remove and Stow Caliber .50 Machine Gun Cover:**

**Tools:**

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

**Make Sure:**

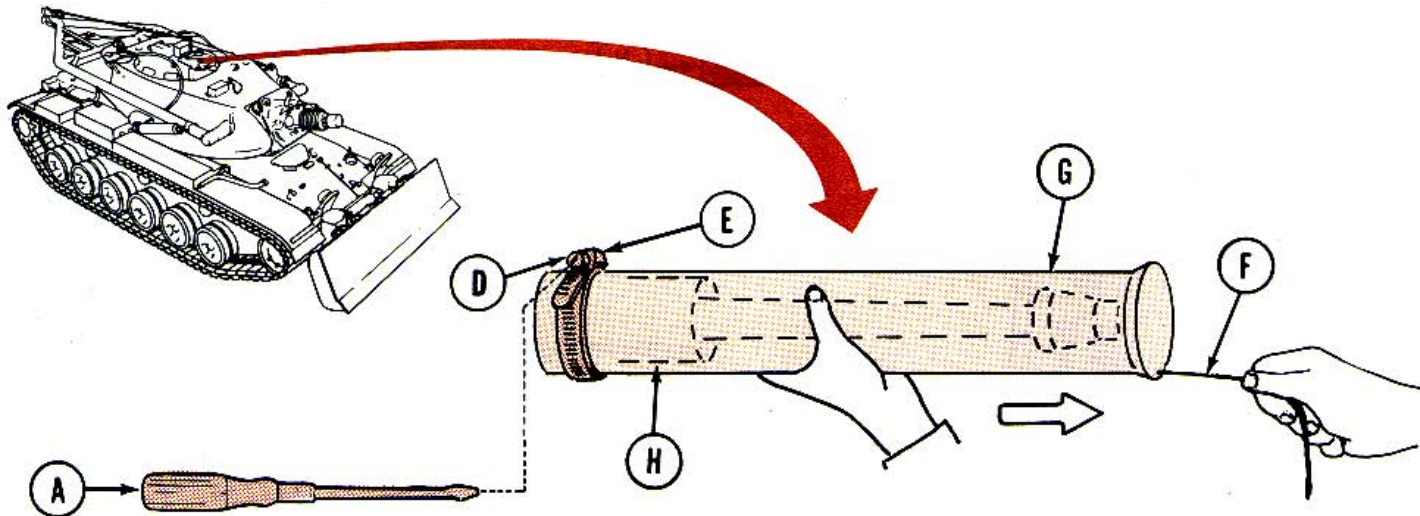
- ELEV/TRAV POWER switch (B) is set to OFF.



- Cupola AZIMUTH LOCK is locked (page 2-569).
- CUPOLA POWER switch (C) is set to OFF.

**PREPARE FOR FIRING (REMOVE COVERS) - Continued**

1. Using screwdriver (A), loosen screw (D) on clamp (E).
2. Pull strap (F). Remove cover (G).
3. Remove clamp (E) from cover (G).
4. Put clamp (E) on housing (H).
5. Using screwdriver (A), tighten screw (D).
6. Place cover (G) in right front fender box.
7. Return screwdriver (A) to stowage.



**PREPARE FOR FIRING (REMOVE COVERS) - Continued****To Remove and Stow 7.62-MM Machine Gun Cover:**

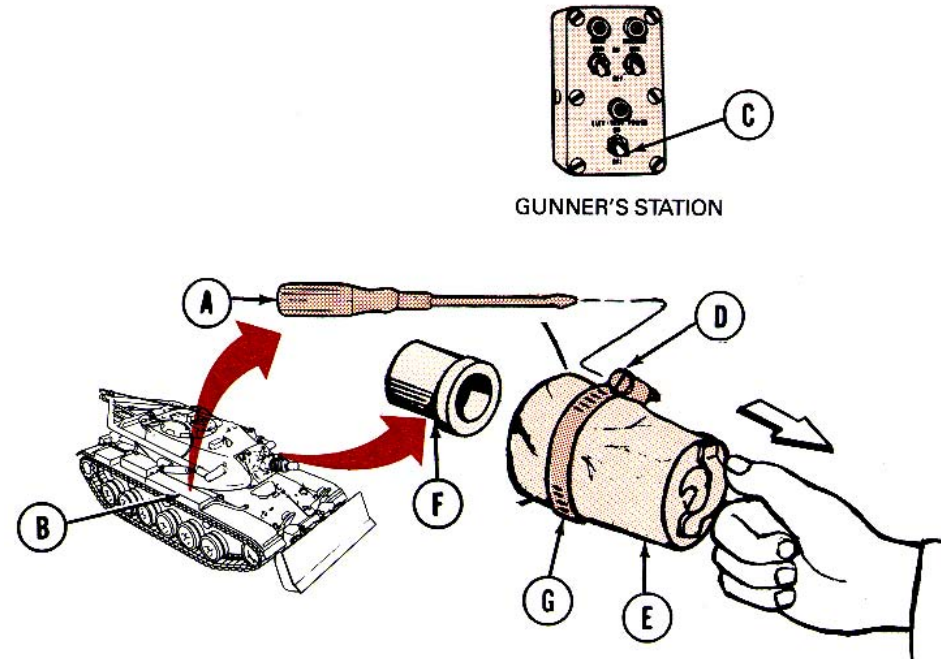
Tools:

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

**Make Sure:**

- Turret traversing lock is LOCKED (page 2-568).
- ELEV/TRAV POWER switch (C) is set to OFF.

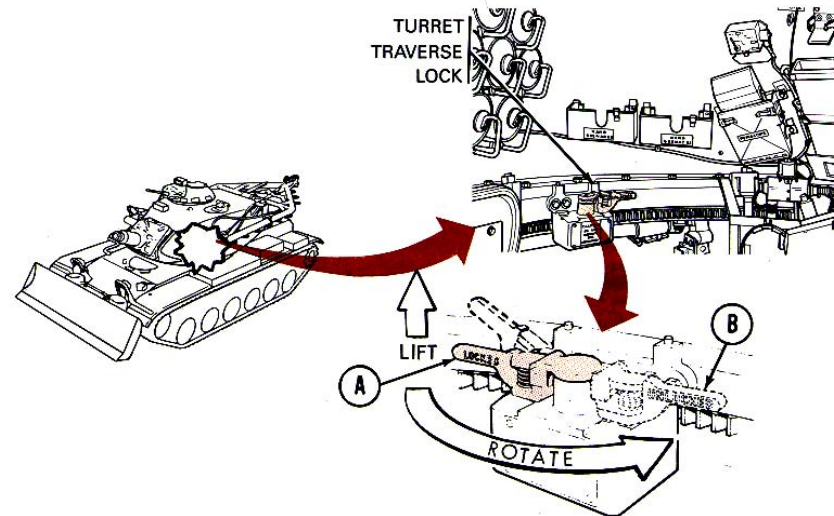
1. Using screwdriver (A), loosen screw (D).
2. Pull cover (E) from housing (F).
3. Remove clamp (G) from cover (E).
4. Replace clamp (G) on housing (F).
5. Using screwdriver (A), tighten screw (D).
6. Place cover (E) in right front fender box (B).
7. Return screwdriver (A) to stowage.



**PREPARE FOR FIRING (UNLOCK TURRET TRAVERSE LOCK)****Make Sure:**

- Loader's seat is located on pins to left of turret traverse lock (page 2-159).

1. Lift lever (A).
2. Rotate lever (A) all the way to UNLOCKED position (B).
3. Lower lever (A).

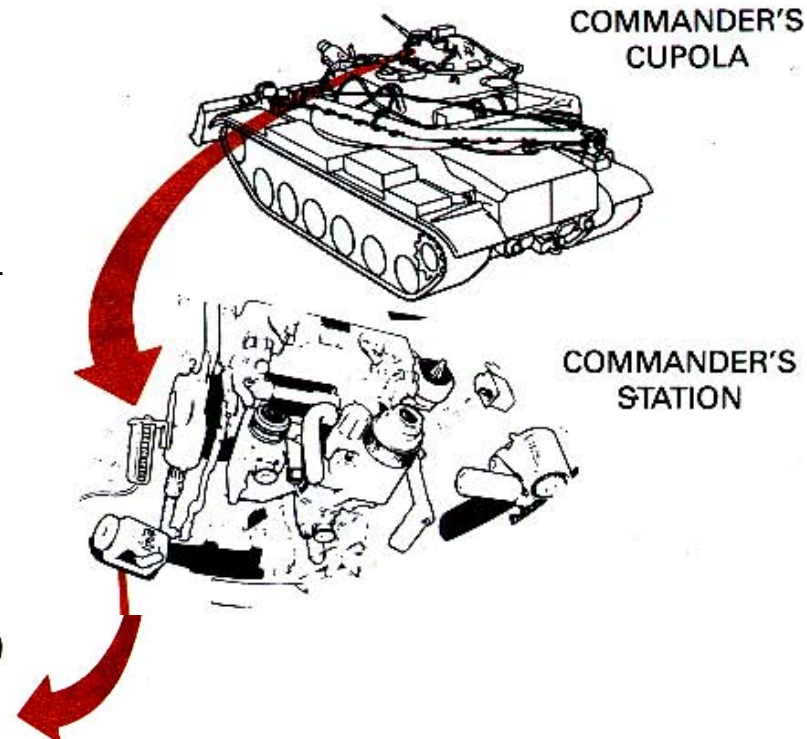
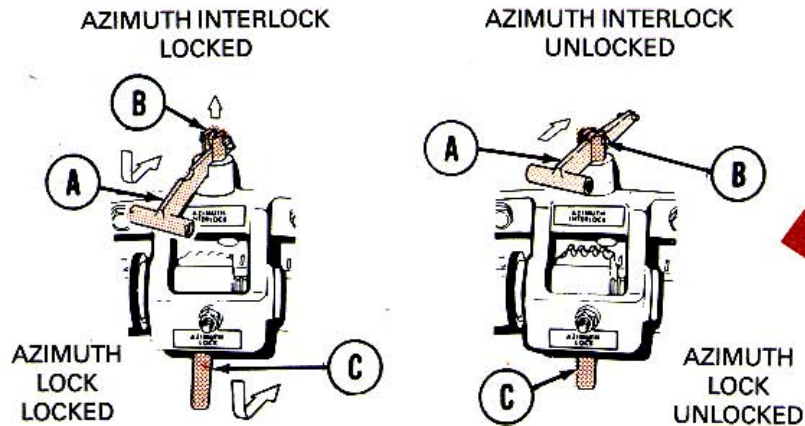


**PREPARE FOR FIRING (UNLOCK CUPOLA LOCKS)**

**NOTE**

If **AZIMUTH INTERLOCK** is unlocked, only step 3 below is required.

1. Pull down on **AZIMUTH INTERLOCK** handle (A) to lift pin (B).
2. Push **AZIMUTH INTERLOCK** handle (A) into slot in pin (B).
3. Push down on **AZIMUTH LOCK** handle (C).

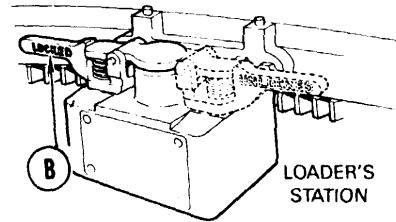


### PREPARE FOR FIRING (INSTALL MACHINE GUNS)

#### To Install 7.62-MM Machine Gun Cartridge Bag:

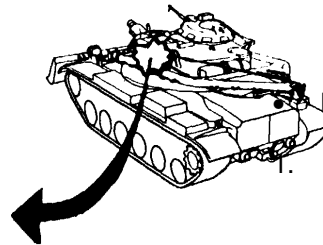
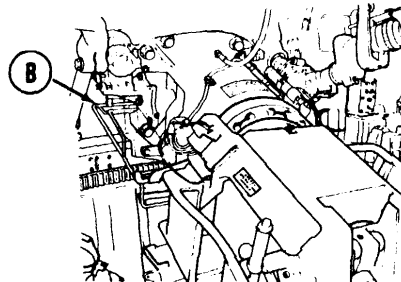
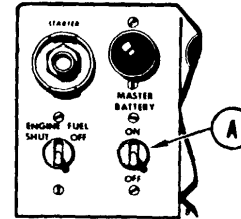
##### Make Sure:

- Machine gun not installed.



- Turret traverse lock (B) is set to LOCKED (page 2-568).

DRIVER'S STATION



Machine gun not installed.

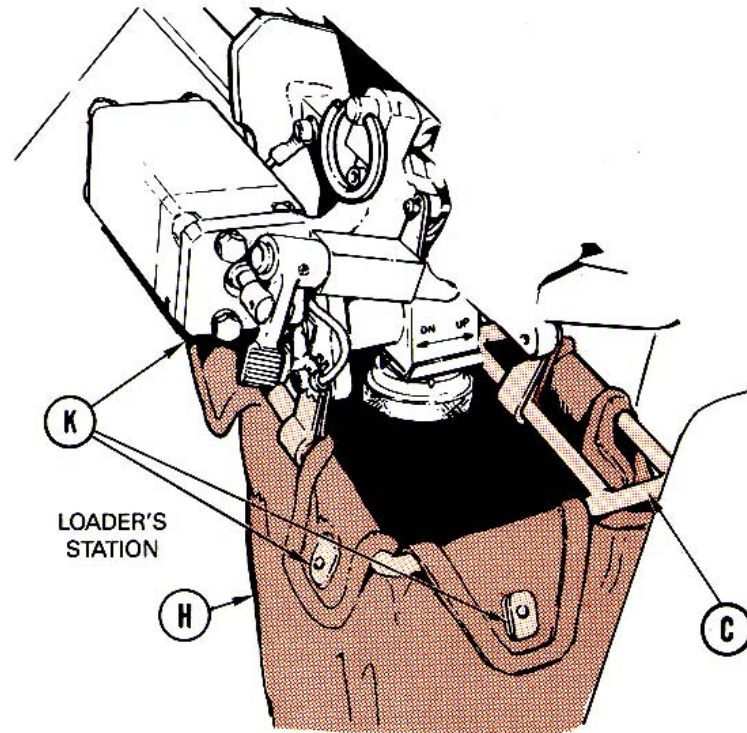
1. Locate bag support (C).

LOADER'S STATION

**PREPARE FOR FIRING (INSTALL MACHINE GUNS) -  
Continued**

**For M240 Machine Gun:**

1. Place cartridge bag (H) onto bag support (C).
2. Press snap fasteners (K) closed.



TA132475

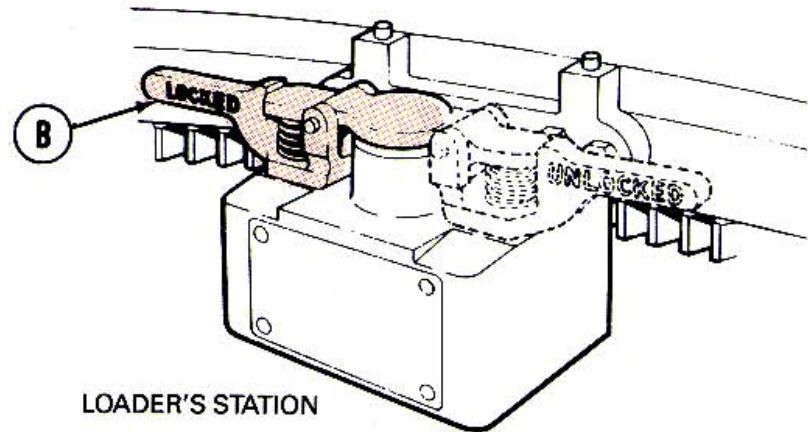
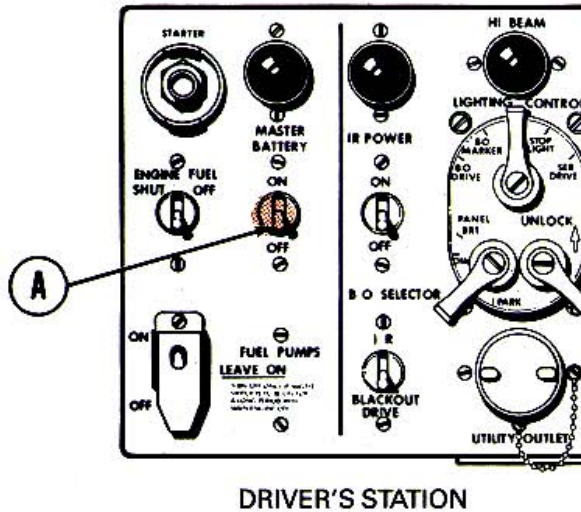


**PREPARE FOR FIRING (INSTALL MACHINE GUNS) - Continued**

**To Install M240 7.62-MM Machine Gun:**

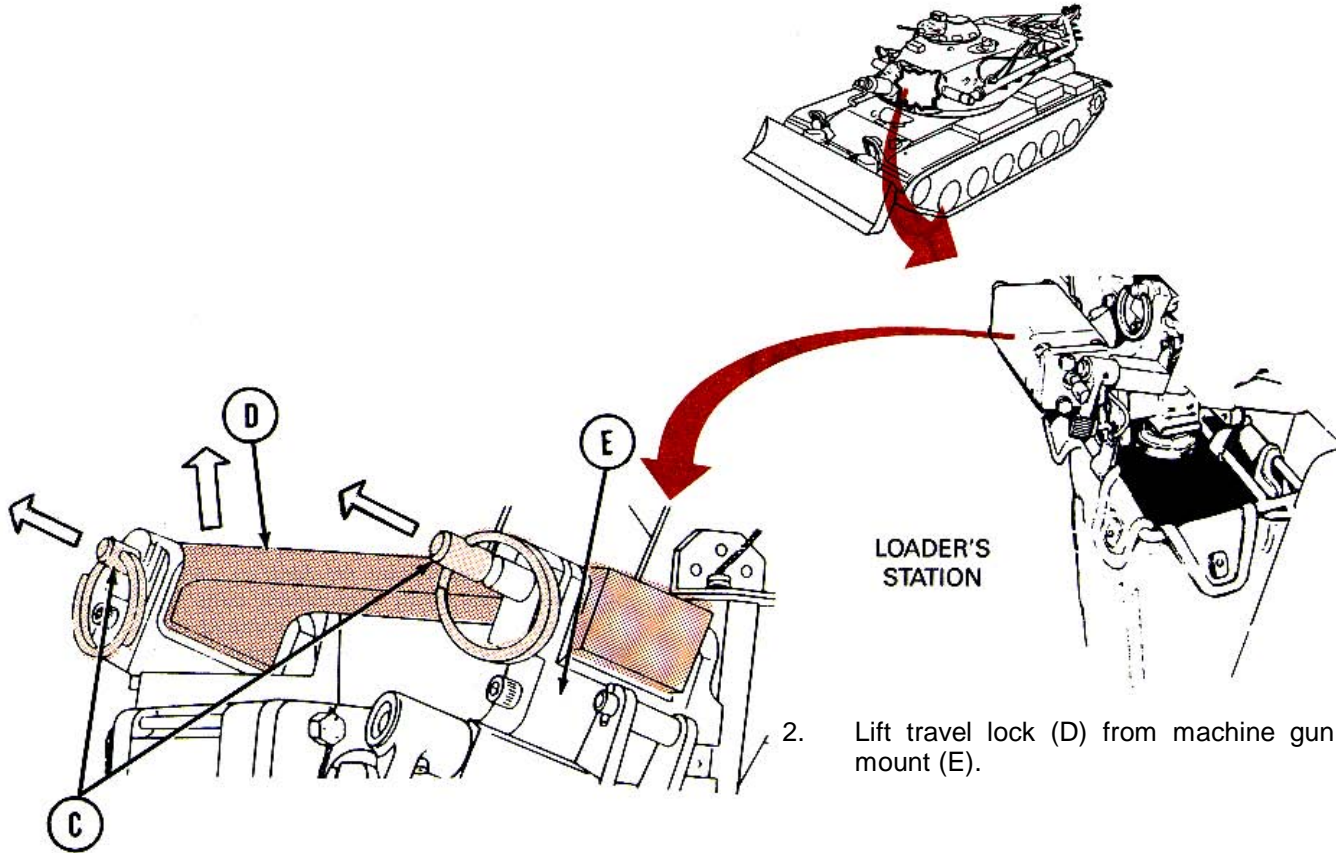
**Make Sure:**

- MASTER BATTERY switch (A) is set to OFF.
- Turret traverse lock (B) is set to LOCKED (page 2-568).
- Machine gun is not loaded (page 2-559).



**PREPARE FOR FIRING (INSTALL MACHINE GUNS) - Continued**

1. Pull pins (C) out until they stop.



LOADER'S  
STATION

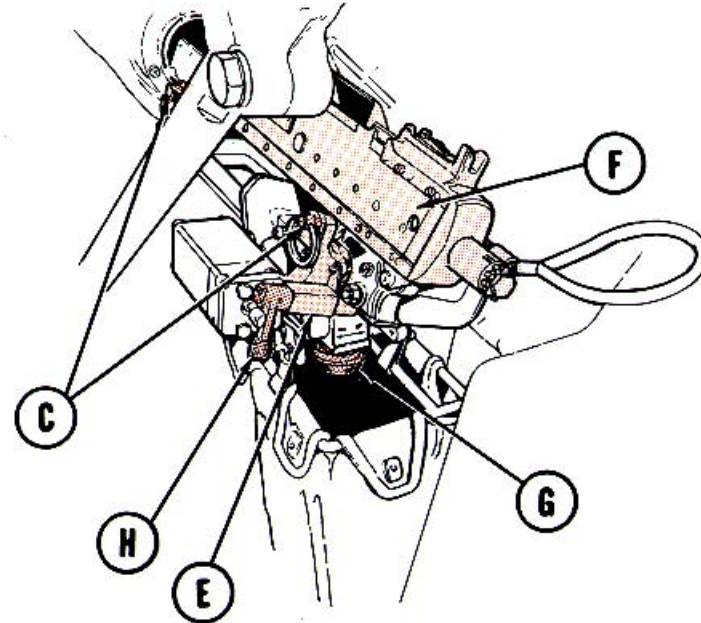
2. Lift travel lock (D) from machine gun mount (E).

## PREPARE FOR FIRING (INSTALL MACHINE GUNS) - Continued

**NOTE**

Preset mount (E) by turning elevation knob (G) clockwise until rear mounting bracket bottoms onto flange of elevation shaft. Turn elevation knob counterclockwise for 23 clicks. Turn traversing knob (H) clockwise until the traversing and elevation bracket backs up to its bottom of travel. Then turn traversing knob counterclockwise 31 clicks. It may be necessary to depress or elevate main gun (page 2-502) slightly to slide machinegun (F) into machinegun mount (E).

3. Slide machine gun (F) into machine gun mount (E).
4. Aline holes on machine gun (F) with holes on machine gun mount (E).
5. Push pins (C) in until they snap into place to secure machine gun (F).



LOADER'S  
STATION

TA252766

**PREPARE FOR FIRING (INSTALL MACHINE GUNS) - Continued**

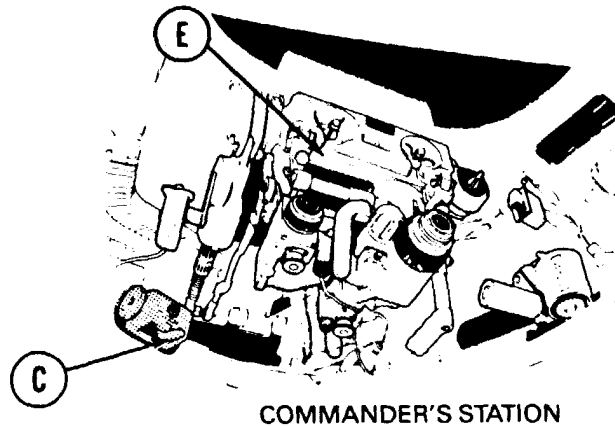
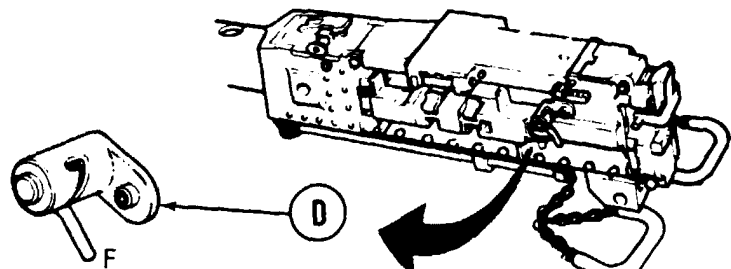
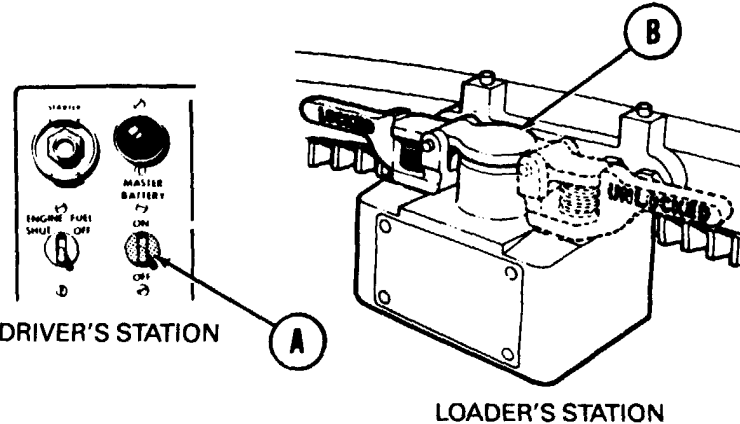
**To Install M85 Caliber .50 Machine Gun:**

**NOTE**

Two crewmembers are needed to do this procedure.

**Make Sure:**

- MASTER BATTERY switch (A) is set to OFF.
- Turret traverse lock (B) is set to LOCKED (page 2-568).
- Cupola AZIMUTH LOCK (C) is lifted into locked position (page 2-569).
- Machine gun is not loaded (page 2-553).
- Machine gun mechanical safety (D) is set to F (fire).
- Bolt assembly is in forward position.



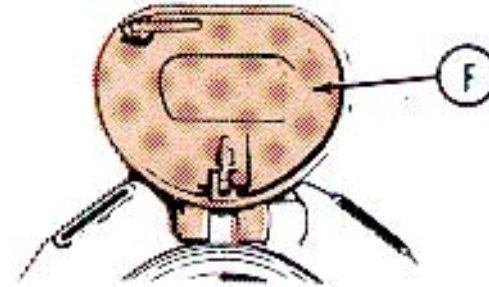
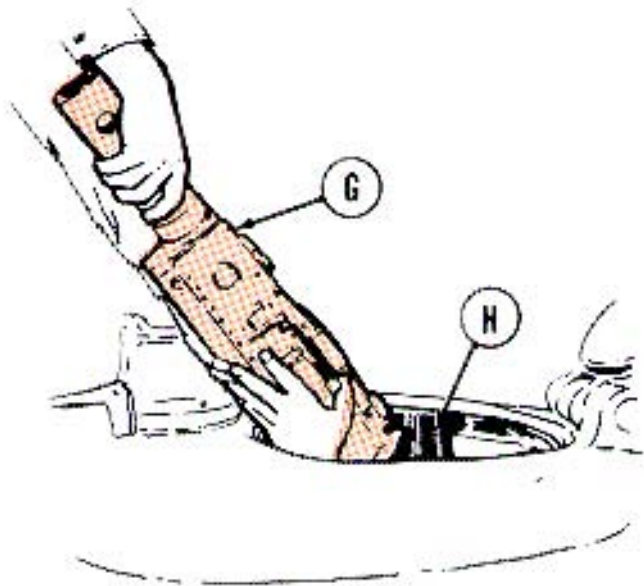
1. Remove commander's periscope IR and daylight body (E) (page 3-212) or passive and daylight body (page 3-210.3).

Change 8 2-342

All data on pages 2-339 thru 2-342 deleted.

**PREPARE FOR FIRING (INSTALL MACHINE GUNS) - Continued**

2. Open cupola hatch door (F) and lock (page 2-145).
3. Elevate cupola cradle to maximum elevation (page 2-470).

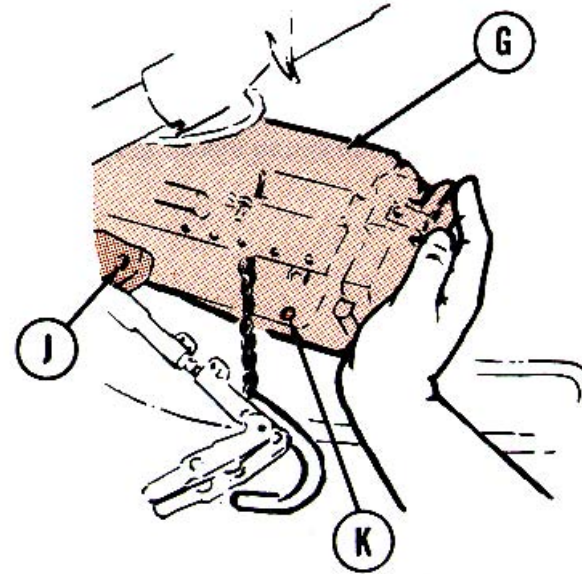
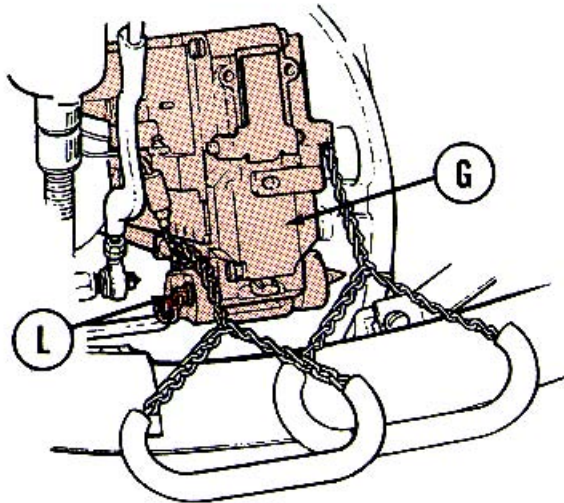


4. Man outside of cupola hands machine gun (G) through cupola hatch opening (H) to man inside cupola.

TA132483

**PREPARE FOR FIRING (INSTALL MACHINE GUNS) - Continued**

- Slide machine gun (G) forward into cradle until hole on mount (J) and hole on gun (K) line up.

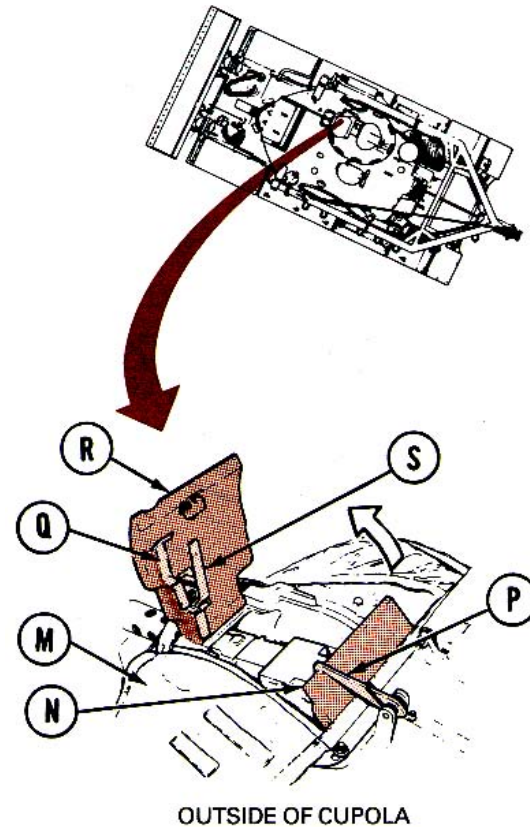


- Slide rear mounting pin (L) into hole to secure machine gun (G). Lower gun if necessary.

TA132484

**PREPARE FOR FIRING (INSTALL MACHINE GUNS) - Continued**

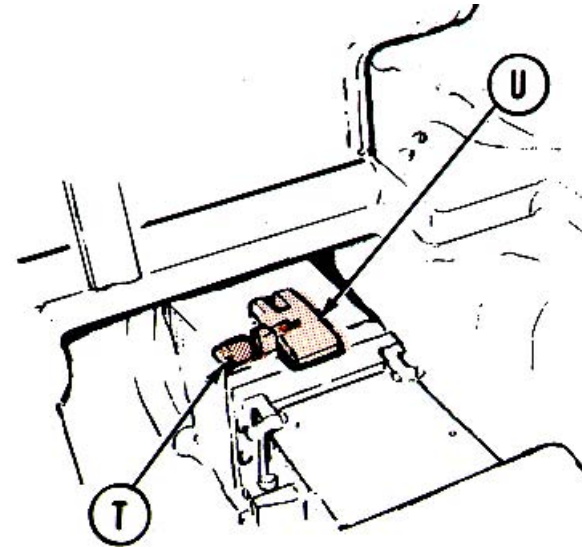
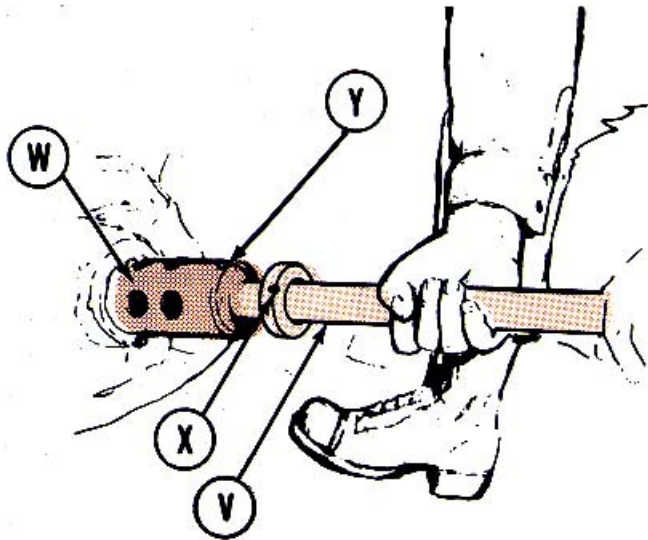
7. Lower machine gun to minimum elevation (page 2-470).
8. Open press-on type fastener and fold back cupola machine gun cradle cover (M).
9. Push up from inside and lift top access door (N).
10. Lock top access door (N) in place with hold-open latch (P).
11. Pull latch (Q) and lift cradle access door (R).
12. Spring loaded cradle access latch (S) will lock access door (R) open.
13. Elevate machine gun to a level position (page 2-470).



TA132485

**PREPARE FOR FIRING (INSTALL MACHINE GUNS) - Continued**

14. Standing outside cupola, push in pin (T), push down lever (U) and hold.
15. Push barrel (V) into receiver (W) with notch (X) turned to side as shown.



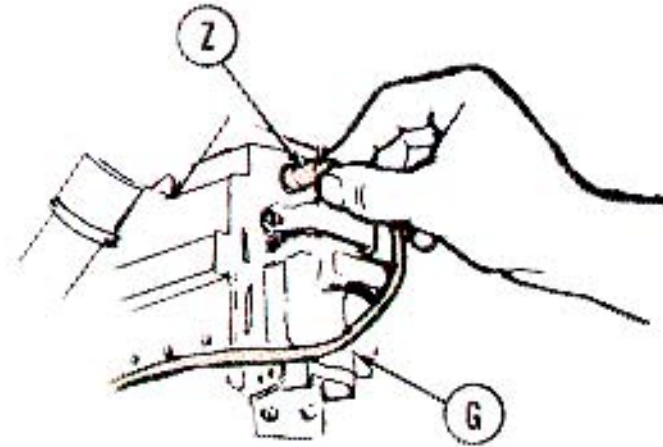
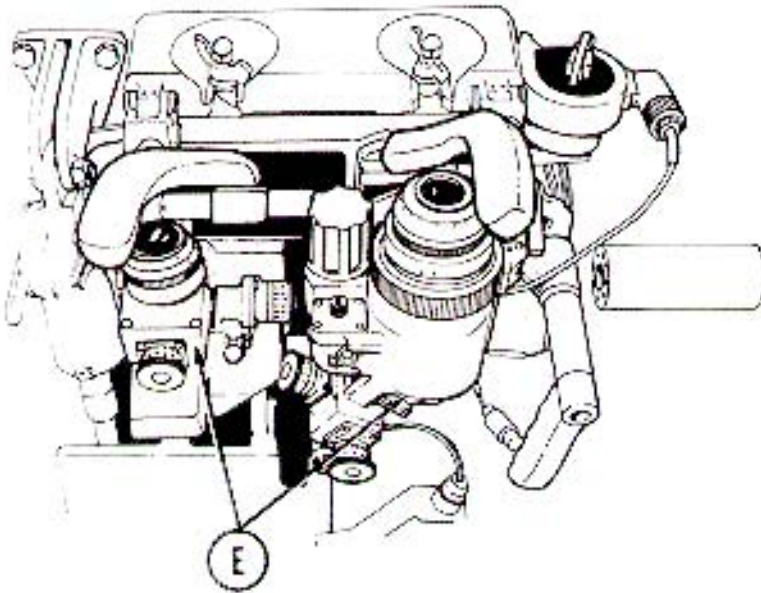
16. Release pin (T) and lever (U).
17. Rotate barrel (V) clockwise 1/4 turn until notch (X) on barrel lines up with notch (Y) on receiver (W). Listen for click as barrel is locked in gun.

TA132486



**PREPARE FOR FIRING (INSTALL MACHINE GUNS) - Continued**

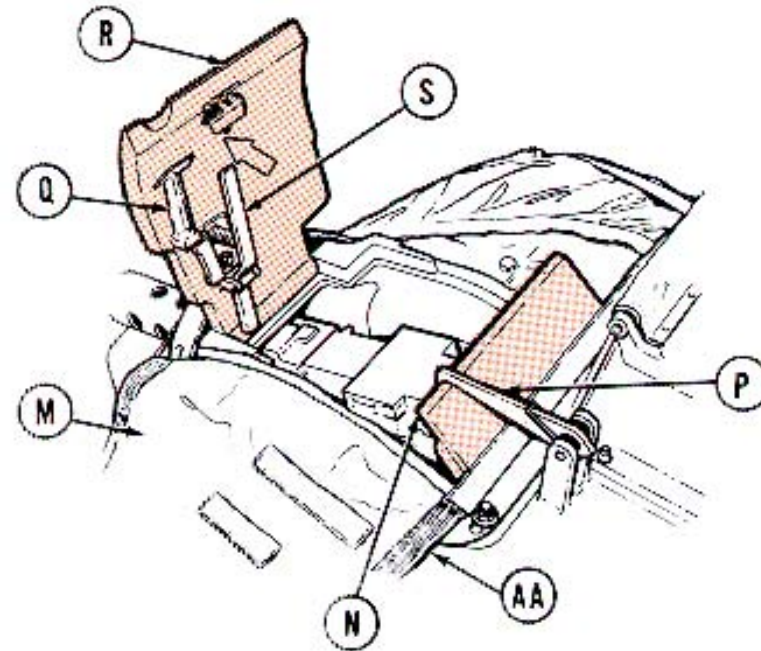
18. Inside cupola, connect solenoid lead connector (Z) (Number P2) to machine gun (G).
19. Install commander's periscope IR and daylight body (E) (page 3-222) or passive and daylight body (page 3-220.4).



TA252768

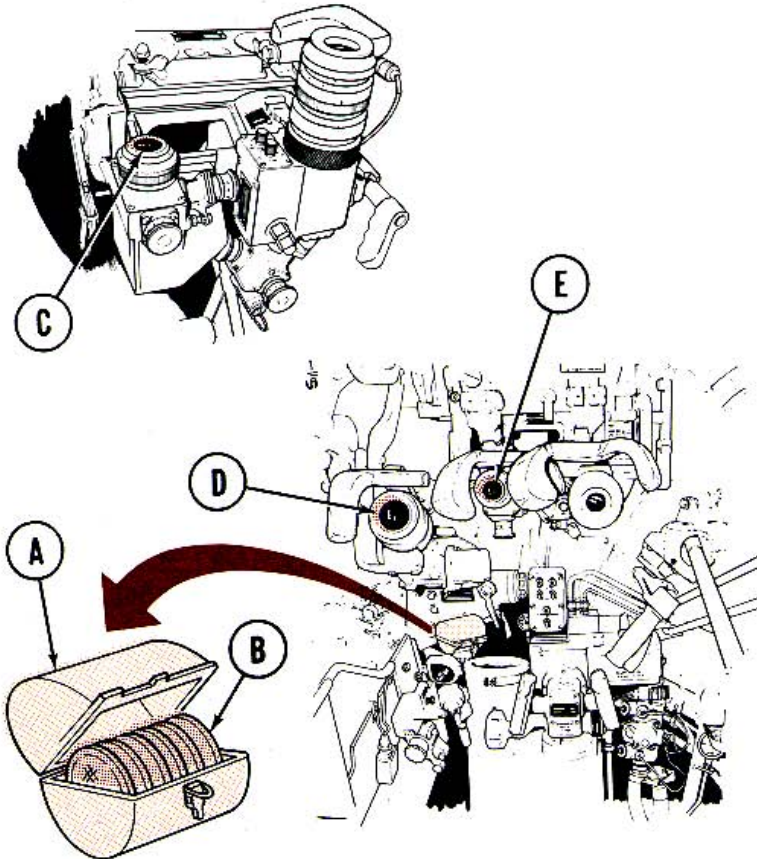
**PREPARE FOR FIRING (INSTALL MACHINE GUNS) - Continued**

20. Lower machine gun to minimum elevation (page 2-470).
21. Push down on latch (S) and lower cradle access door (R).
22. Lift hold-open latch (P) and close top access door (N).
23. Pull latch (Q) to fully close cradle access door (R).
24. Fold back cupola machine gun cradle cover (M) until it covers the access doors.
25. Secure press-on-type fastener (AA) on cradle cover.
26. Elevate machine gun to a level position (page 2-470).



TA132488

## PREPARE FOR FIRING (ADJUST SIGHTS)



### WARNING

Green laser filters must be installed on eyepieces of the telescope and both periscopes when operating in an area where lasers are in use. Filters will prevent eye damage from laser light entering turret through periscopes or telescope.

### NOTE

Only late model vehicles are equipped with green laser filters.

### Install Laser Filters:

1. Open filter box (A).
2. Remove three green laser filters (B). Close box.
3. Push one filter (B) on each eyepiece (C), (D), and (E).

**PREPARE FOR FIRING (ADJUST SIGHTS) - Continued**

**To Sight Commander's M36 or M36E1 Periscope Daylight Body:**

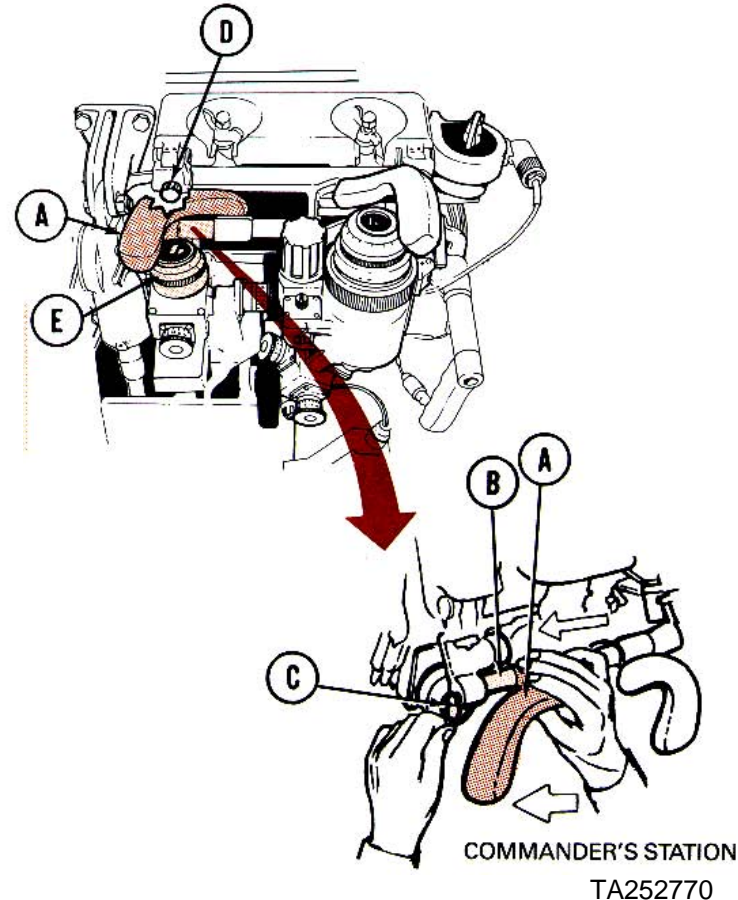
**Make Sure:**

- Laser filters are installed (page 2-348.1) if required.
1. If headrest (A) and bar (B) are raised, pull them all the way down.

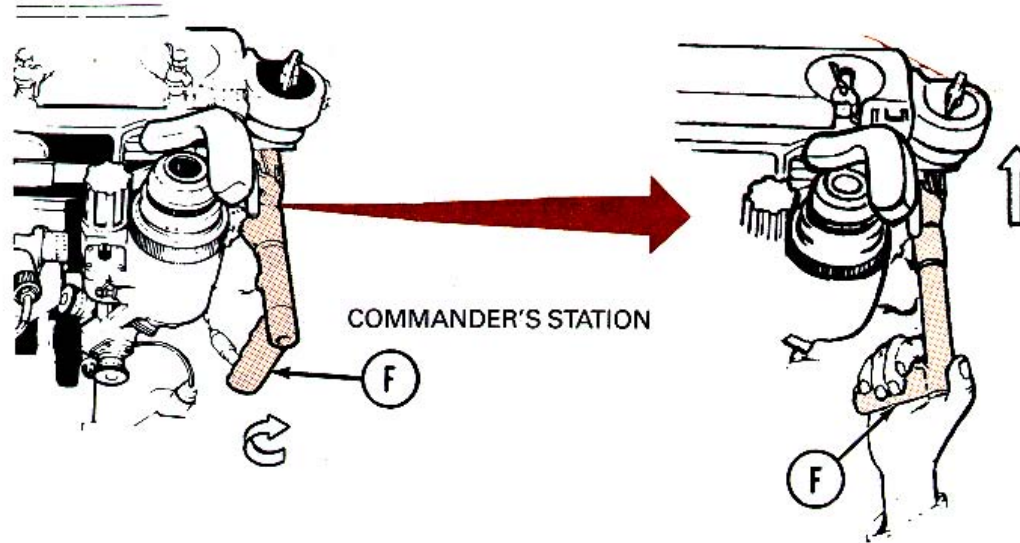
**NOTE**

**Determine direction of rotation of lever (C) at time of headrest adjustment. Direction can vary from vehicle to vehicle.**

2. Rotate lever (C) to loosen headrest (A).
3. Slide headrest (A) to left end of bar (B).
4. Rotate headrest on bar to desired position.
5. Rotate lever (C) to tighten headrest (A) on bar (B).
6. Adjust stop screw (D) to move headrest (A) desired distance from daylight body eyepiece (E).
7. Adjust headrest (A) to desired shape.

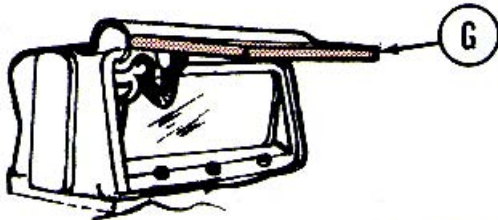


PREPARE FOR FIRING (ADJUST SIGHTS) - Continued



8. Rotate handle (F) toward you and hold.
9. Push handle (F) all the way up to open ballistic shield (G).
10. Release handle (F) to lock ballistic shield open.

11. To operate on vehicle power, go to page 2-351.  
To operate without vehicle power, go to page 2-353.



OUTSIDE CUPOLA

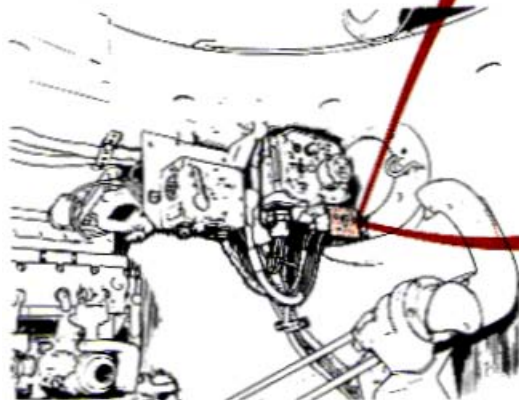
PREPARE FOR FIRING (ADJUST SIGHTS) - Continued

To Sight Commander's M36 Periscope Daylight Body If Vehicle Power is Available:

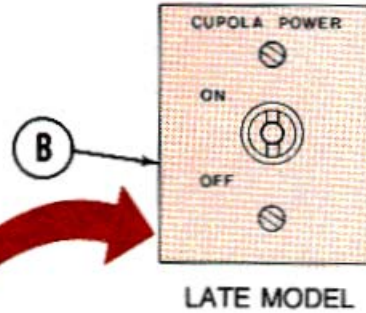
NOTE

If periscope is being adjusted under daylight conditions, do steps 4 and 6, skip steps 1, 2, 3 and 5. If periscope is being adjusted under night or low light

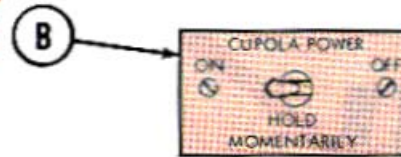
under and 6, scope is r low



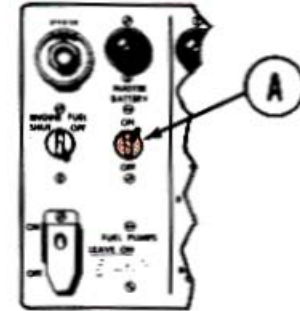
COMMANDER'S STATION



LATE MODEL



EARLY MODEL

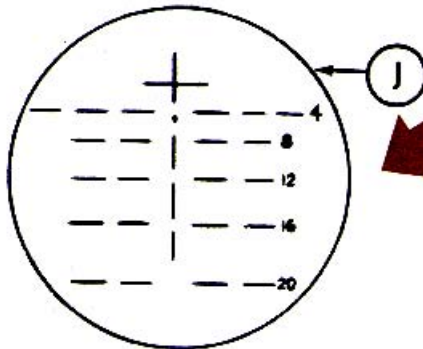
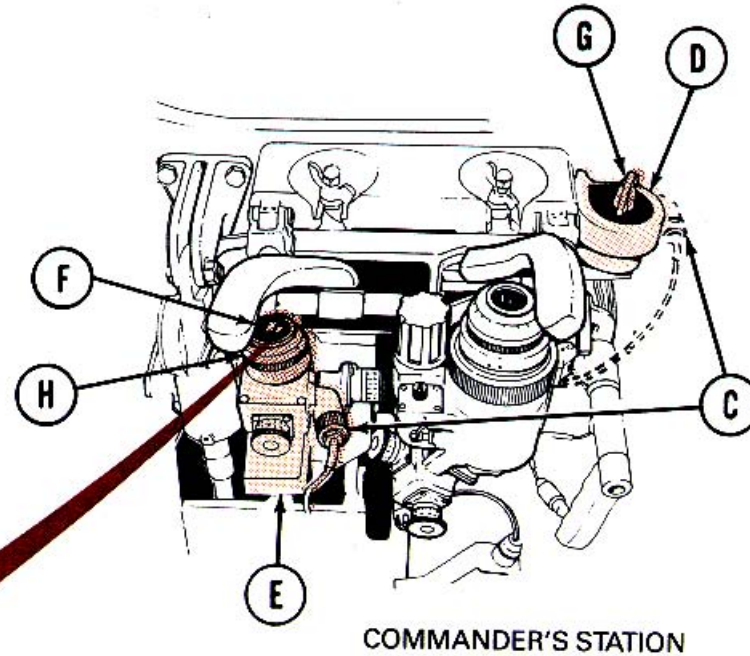


DRIVER'S STATION

1. Set MASTER BATTERY switch (A) to ON.
2. Set CUPOLA POWER switch (B) to ON. Hold momentarily and release.

**PREPARE FOR FIRING (ADJUST SIGHTS) - Continued**

3. Remove lamp housing (C) from light source control (D) and install it on daylight body (E).
4. Look into daylight body eyepiece (F).
5. Rotate light source control knob (G) to desired reticle brightness.
6. Rotate diopter ring (H) to focus reticle (J).



**PREPARE FOR FIRING (ADJUST SIGHTS) - Continued**

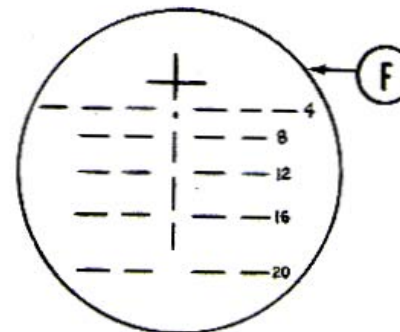
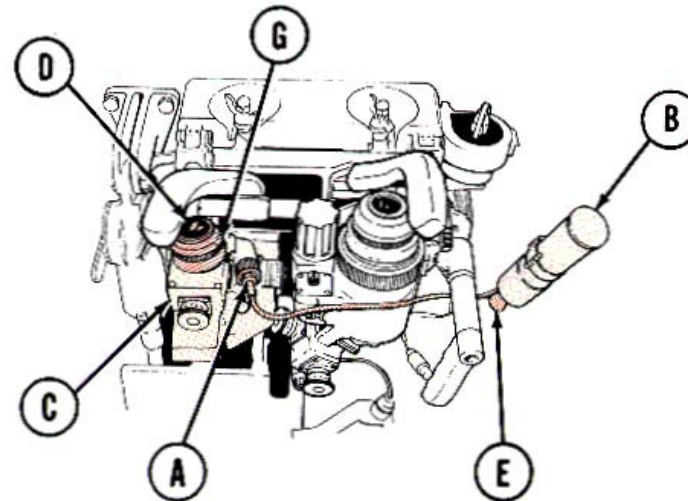
To Sight Commander's M36 or M36E1 Periscope Daylight Body If Vehicle Power Is Not Available:

**NOTE**

- If periscope is being adjusted under daylight conditions, do steps 3 and 5, skip steps 1, 2, and 4. If periscope is being adjusted under night or low light conditions, go to step 1.

- Two types of instrument lights (M30 and M50) are stowed on vehicle. If M50 is not stowed in commander's cupola, it is stowed on main gun mount. See page 2-370 for location of M50 on main gun mount.

1. Remove lamp housing (A) from M50 instrument light (B).
2. Install lamp housing (A) on daylight body (C).
3. Look into daylight body eyepiece (D).
4. Rotate instrument light control knob (E) until satisfied with reticle (F) brightness.
5. Rotate diopter ring (G) to focus reticle (F).



TA252772



**PREPARE FOR FIRING (ADJUST SIGHTS) - Continued****To Sight Commander's M36 Periscope IR Body:****CAUTION**

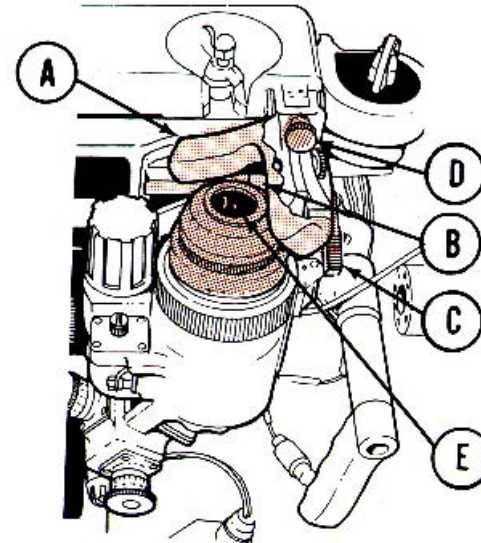
Perform IR checks under low light conditions. An opaque disk is provided to protect the IR body against exposure to light when not in use. Do not remove opaque disk or operate IR body under daylight conditions unless ballistic shield is closed. Do not open ballistic shield under daylight conditions with opaque disk removed.

1. If headrest (A) and bar (B) are raised, pull all the way down.

**NOTE**

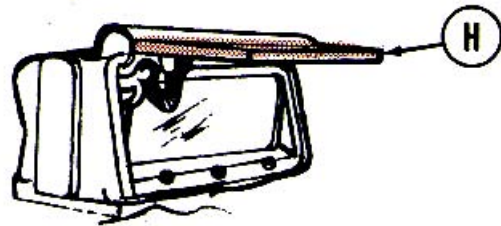
**Determine direction of rotation of lever (C) at time of headrest adjustment. Direction can vary from vehicle to vehicle.**

2. Rotate lever (C) to loosen headrest (A).
3. Slide headrest (A) to right end of bar (B).
4. Rotate headrest on bar to desired position.
5. Rotate lever (C) to tighten headrest (A) on bar (B).
6. Adjust stop screw (D) to move headrest (A) desired distance from IR body eyepiece (E).

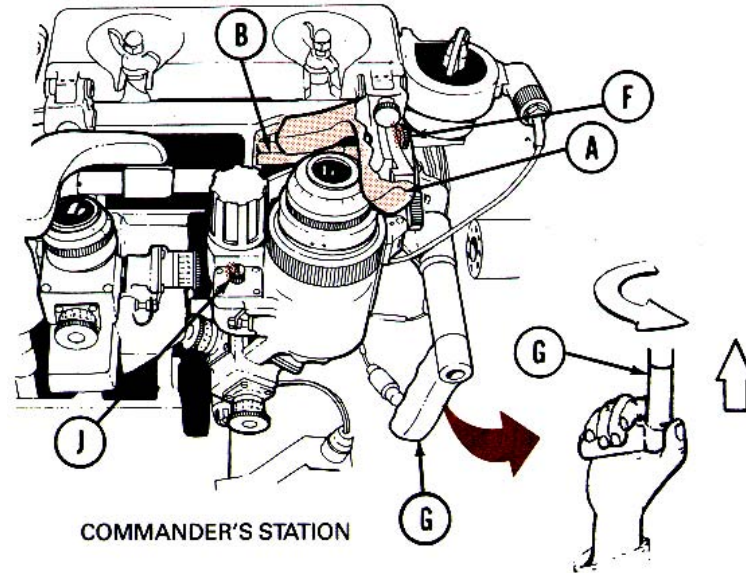
**COMMANDER'S STATION**

**PREPARE FOR FIRING (ADJUST SIGHTS) - Continued**

7. Loosen finger adjust screw (F).
8. Slide headrest (A) and bar (B) up or down, as required.
9. Tighten finger adjust screw (F).
10. Adjust headrest (A) to desired shape.
11. Rotate handle (G) toward you and hold.
12. Push handle (G) all the way up to open ballistic shield (H).



OUTSIDE CUPOLA

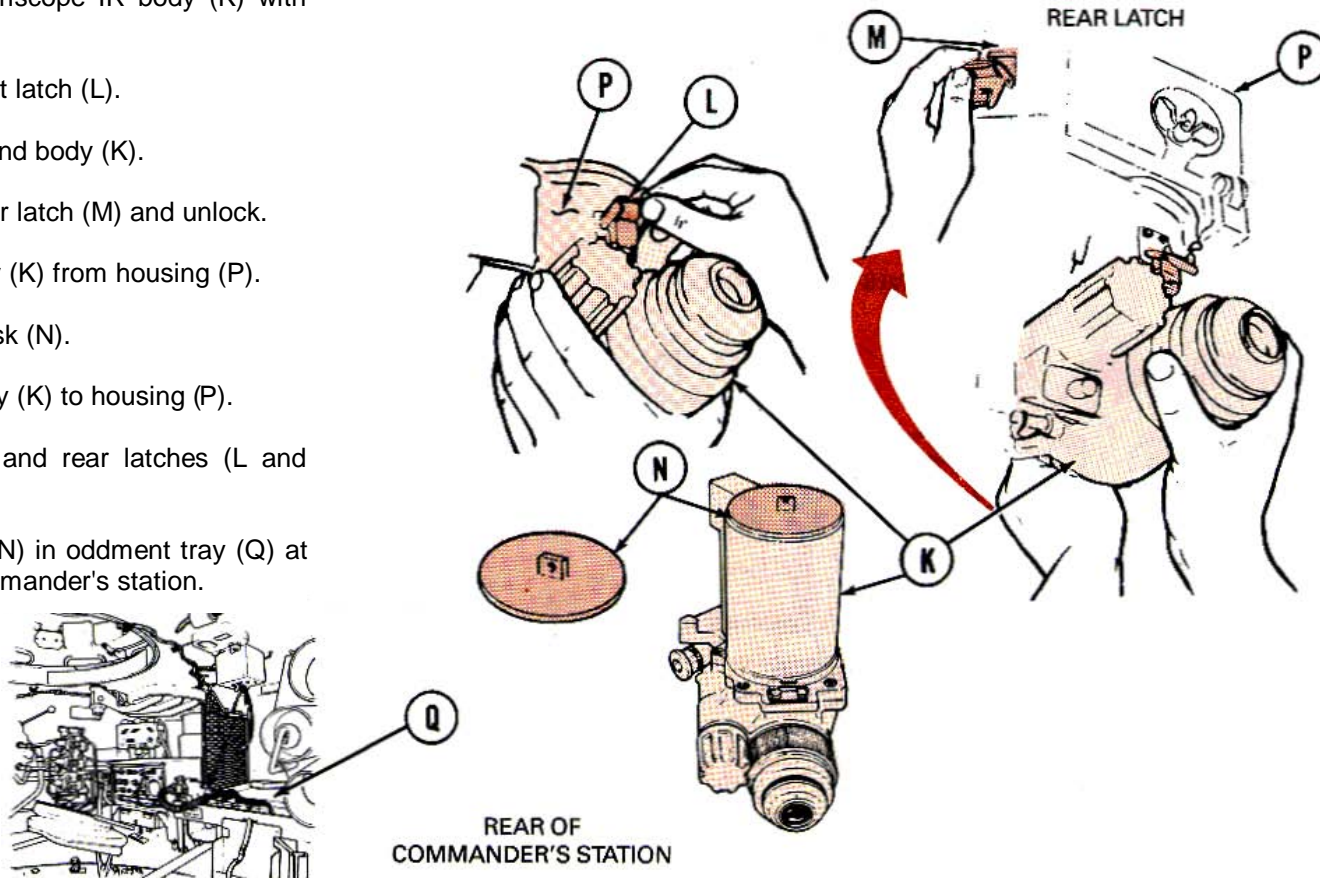


TA132495

13. Release handle (G) to lock ballistic shield open.
14. Trim IR power knob (J) to OFF (if ON).

**PREPARE FOR FIRING (ADJUST SIGHTS) - Continued**

15. Support periscope IR body (K) with left hand.
16. Unlock front latch (L).
17. Reach behind body (K).
18. Feel for rear latch (M) and unlock.
19. Lower body (K) from housing (P).
20. Remove disk (N).
21. Return body (K) to housing (P).
22. Lock front and rear latches (L and M).
23. Stow disk (N) in oddment tray (Q) at rear of commander's station.



REAR OF  
COMMANDER'S STATION

2-356

PREPARE FOR FIRING (ADJUST SIGHTS) - Continued

**NOTE**

Converter (R) provides voltage for background lighting. If converter (R) is missing or broken, a BA42 battery may be used.

**NOTE**

If converter is being used, go to step 25. If BA42 battery is being used, go to steps 24, 25 and 26, skip step 27.

24. Install BA42 battery, if needed.

a. Unscrew cap (S) from body (K).

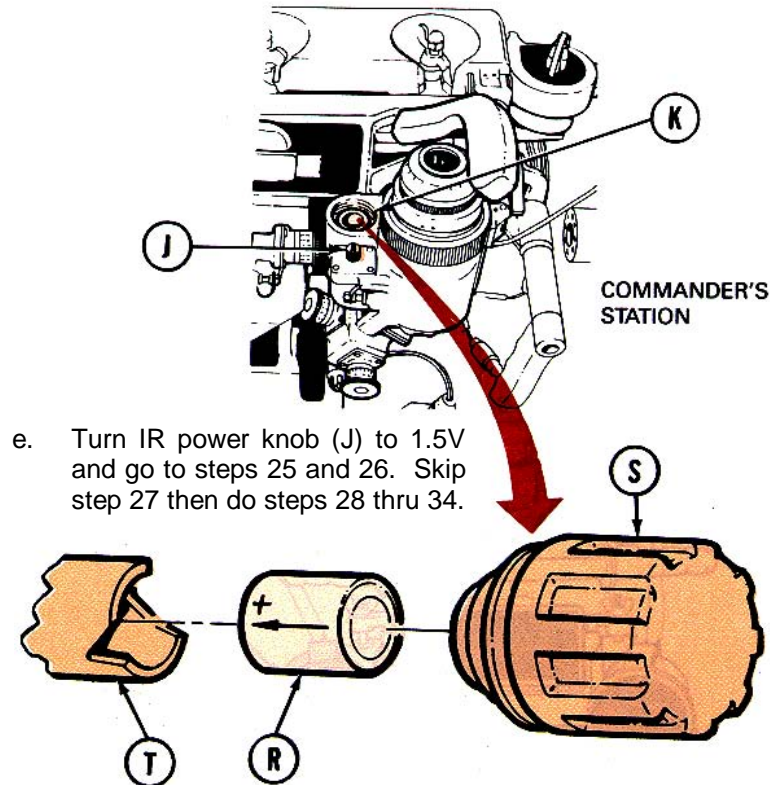
**CAUTION**

When removing converter (R) and installing battery, do not allow sleeve (T) to turn.

b. Remove converter (R) and stow.

c. Place battery positive end (+) into sleeve (T).

d. Screw cap (S) on body (K).

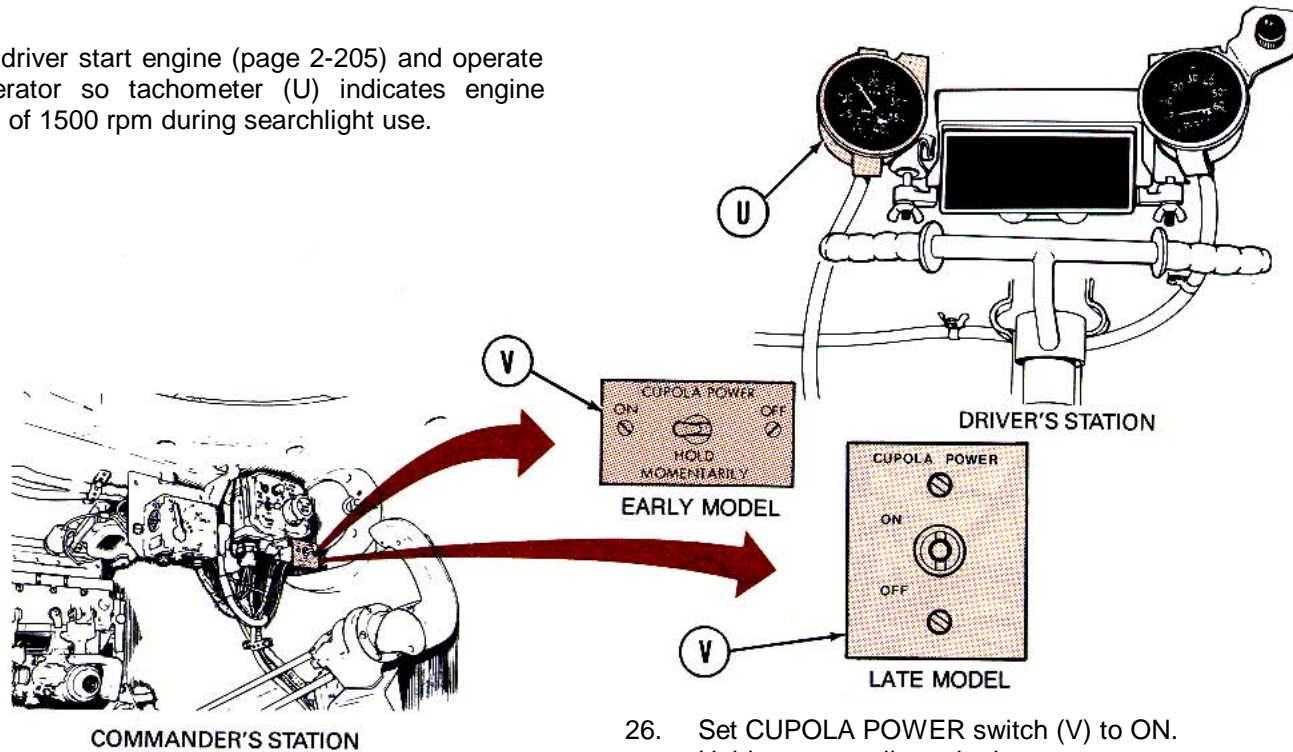


e. Turn IR power knob (J) to 1.5V and go to steps 25 and 26. Skip step 27 then do steps 28 thru 34.

TA132497

**PREPARE FOR FIRING (ADJUST SIGHTS) - Continued**

25. Have driver start engine (page 2-205) and operate accelerator so tachometer (U) indicates engine speed of 1500 rpm during searchlight use.



26. Set CUPOLA POWER switch (V) to ON. Hold momentarily and release.

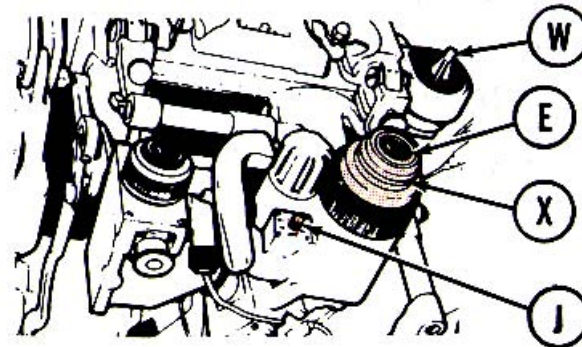
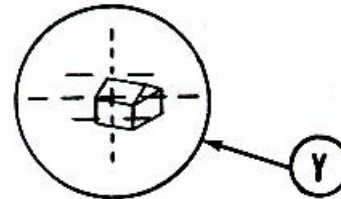
TA252773

**PREPARE FOR FIRING (ADJUST SIGHTS) - Continued**

**WARNING**

Do not turn IR power switch (J) to 24V if BA42 battery is being used.

27. Turn IR power knob (J) to 24V.
28. Look into eyepiece (E).
29. Turn control knob (W) until satisfied with light.
30. Turn diopter ring (X) until background grain (Y) is clear.



**COMMANDER'S STATION**

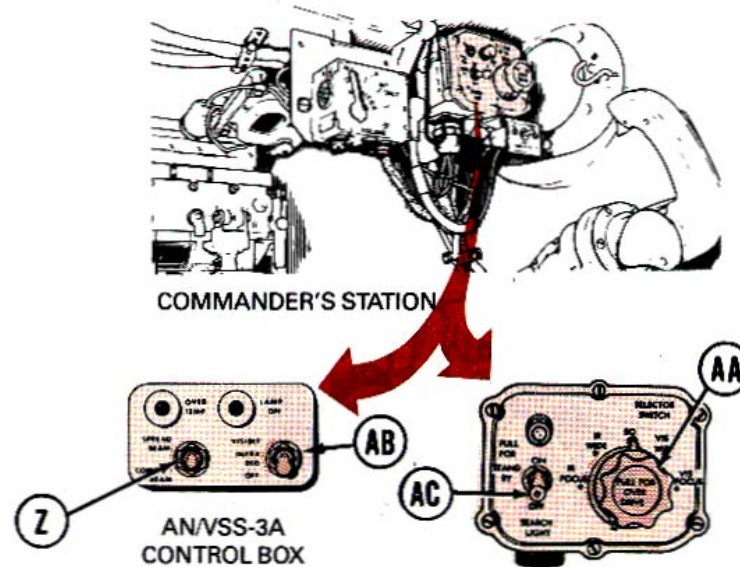
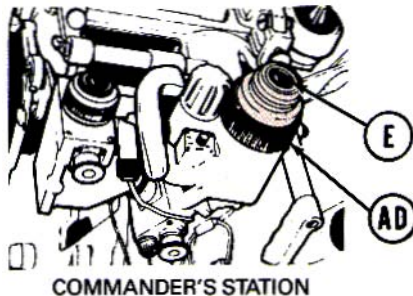
TA132499

**PREPARE FOR FIRING (ADJUST SIGHTS) - Continued**

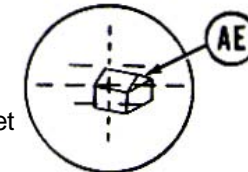
**NOTE**

**If tactical situation permits, do steps 31 through 34.**

31. Set xenon searchlight master control to remote (TM 11-5855-217-12-1) (AN/VSS-3A only).
32. Select searchlight beam:
  - If equipped with AN/SS-3A, set switch (Z) to COMPACT BEAM.
  - If equipped with AN/VSS-2, turn SELECTOR SWITCH (AA) to IR FOCUS.
33. Turn on searchlight:
  - If equipped with AN/VSS-3A, set switch (AB) to INFRARED.
  - If equipped with AN/VSS-2, pull out and set SEARCHLIGHT switch (AC) to ON.



34. Look into eyepiece (E). Rotate focus ring (AD) until target (AE) is clear.
35. Turn searchlight off:
  - If equipped with AN/VSS-3A, set switch (AB) to OFF.
  - If equipped with AN/VSS-2, pull out and set SEARCHLIGHT switch (AC) to OFF.
36. Shut down vehicle (page 2-536).



**PREPARE FOR FIRING (ADJUST SIGHTS)- Continued**

**To Sight Commander's M36E1 Periscope Passive Body:**

**CAUTION**

Perform night checks under low light conditions. A light shutter is provided to protect passive body against light exposure when not in use. Do not operate body under daylight conditions unless RETICLE knob is turned OFF and ballistic shield is closed. Do not open ballistic shield under daylight conditions unless passive body is turned off.

**Make Sure:**

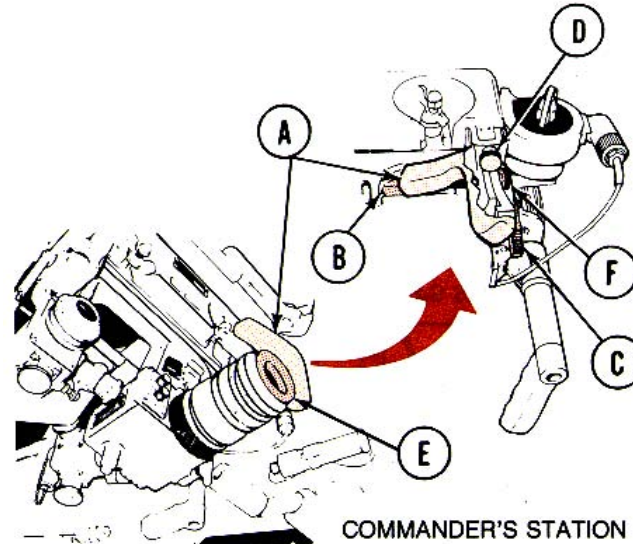
- Ballistic shield is opened (page 2-350).
- 1. If headrest (A) and bar (B) are raised, pull them all the way down.

**NOTE**

Determine direction of rotation of lever (C) at time of headrest adjustment. Direction can vary from vehicle to vehicle.

2. Rotate lever (C) to loosen headrest (A).
3. Slide headrest (A) to right end of bar (B). Rotate headrest on bar to desired position.
4. Rotate lever (C) to tighten headrest (A) on bar (B).
5. Adjust stop screw (D) to move headrest (A) desired distance from passive body eyepiece (E).

6. Loosen finger adjustment screw (F).
7. Slide headrest (A) and bar (B) up or down, to desired position.
8. Tighten finger adjust screw (F).



9. Adjust headrest (A) to desired shape.
10. To operate on vehicle power, go to (page 2-360.2). To operate without vehicle power, go to (page 2-360.4).

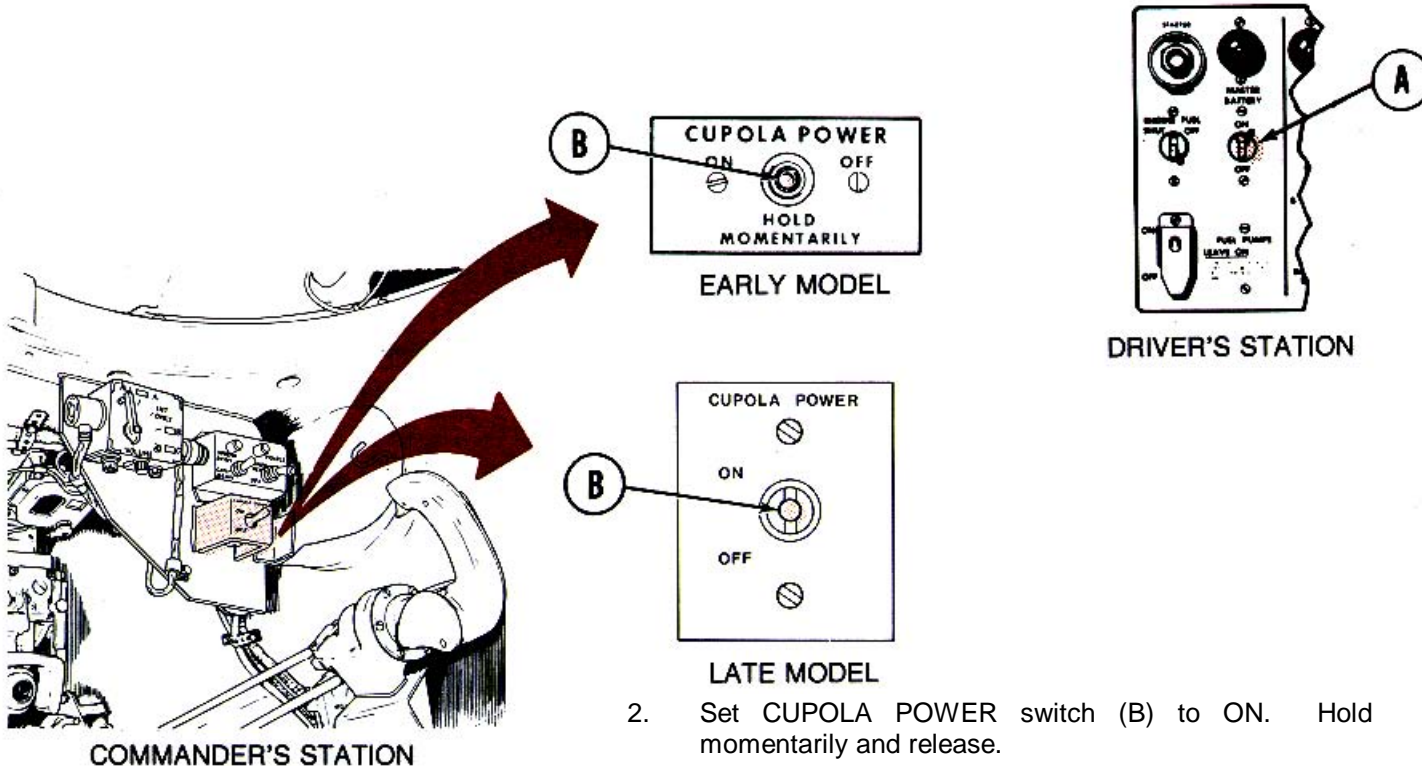
TA252774



**PREPARE FOR FIRING (ADJUST SIGHTS) - Continued**

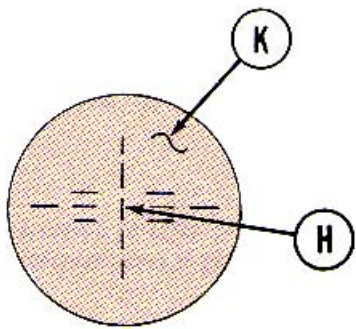
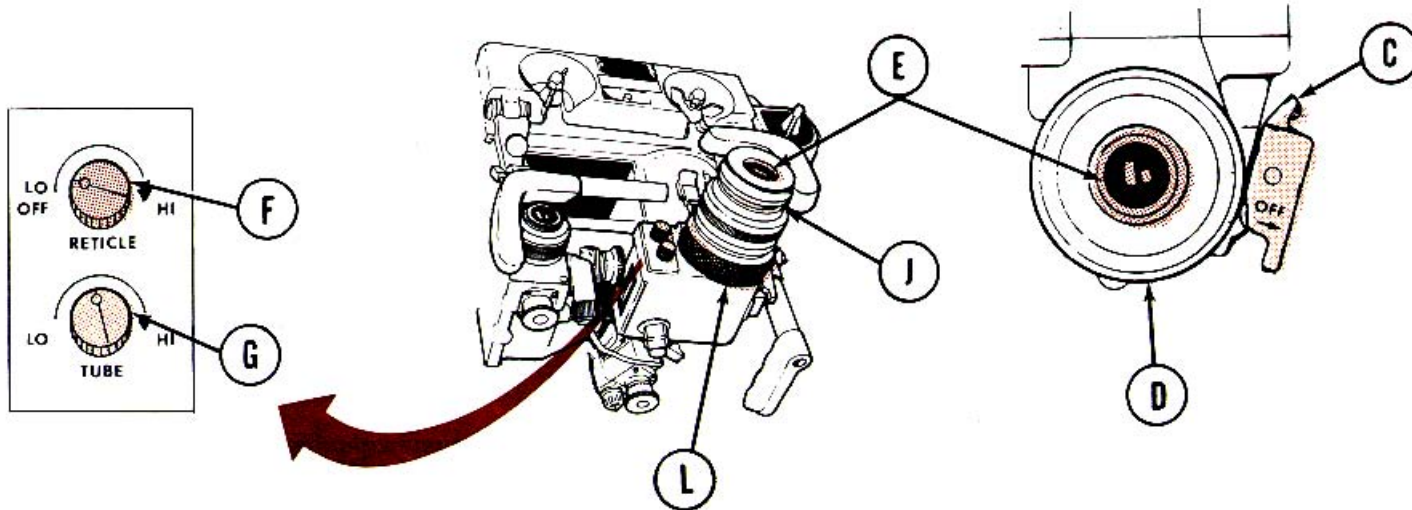
**To Sight Commander's M36E1 Periscope Passive Body Using Vehicle Power:**

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



2. Set CUPOLA POWER switch (B) to ON. Hold momentarily and release.

PREPARE FOR FIRING (ADJUST SIGHTS) - Continued



3. Push light shutter lever (C) left to activate power on passive body.
4. Look into passive body eyepiece (E), rotate reticle knob (F) until satisfied with reticle brightness.
5. Rotate TUBE control (G) until reticle (H) is clear.
6. Rotate diopter right (J) until background grain (K) is clear.
7. Rotate focus ring (L) for best focus.

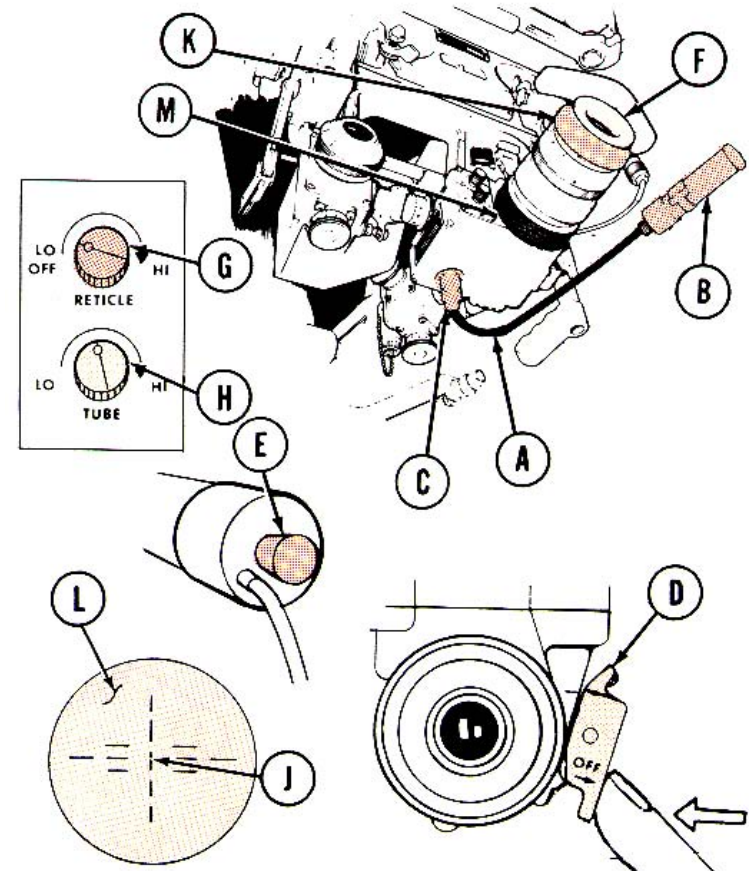
## PREPARE FOR FIRING (ADJUST SIGHTS) - Continued

To Sight Commander's M36E1 Periscope Passive Body If Vehicle Power Is Not Available:

### NOTE

Two types of instrument lights (M30 and M50) are stowed on vehicle. If M30 is not stowed in commander's cupola, it is stowed at gunner's station. See page 2-368.3 for location of M30 at gunner's station.

1. Remove cable (A) from M30 instrument light (B).
2. Connect cable (A) to connector (C).
3. Push light shutter lever (D) to left to open light shutter.
4. Rotate switch (E) to ON.
5. Look into passive body eyepiece (F), rotate reticle knob (G) until satisfied with reticle brightness.
6. Rotate TUBE control (H) until reticle (J) is clear.
7. Rotate diopter ring (K) until background grain (L) is clear.
8. Rotate focus ring (M) for best focus.



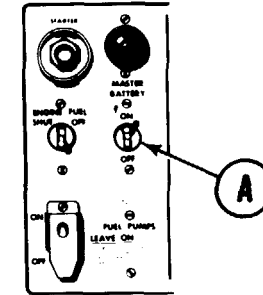
TA252777

**PREPARE FOR FIRING (ADJUST SIGHTS) - Continued**

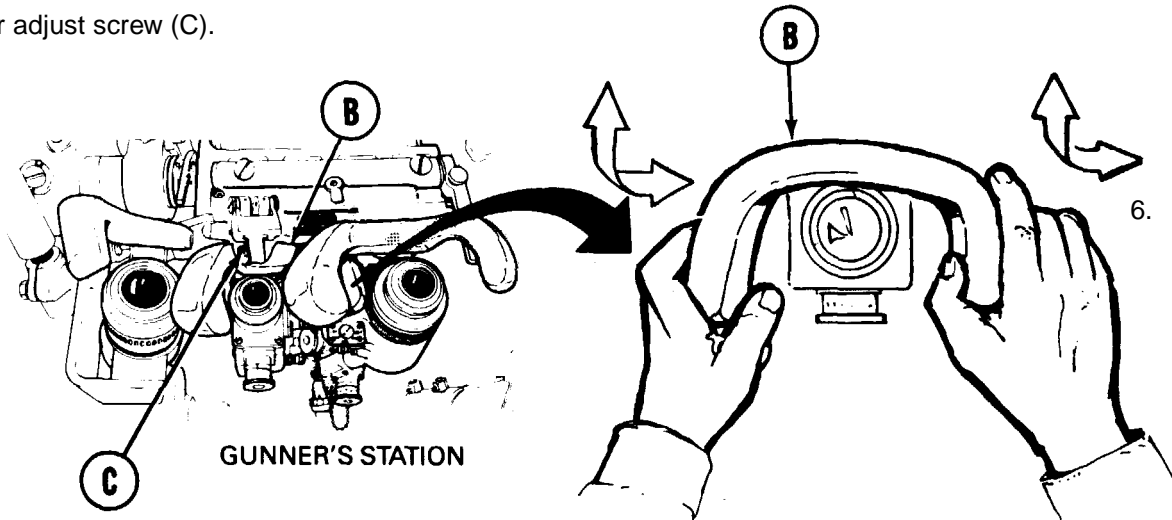
**To Sight Gunner's M32CE1 Periscope Daylight Body:**

**Make Sure:**

- Laser filter is installed (page 2-348.1) if required.
1. Set MASTER BATTERY switch (A) to ON.
  2. If headrest (B) is raised, pull it all the way down.
  3. Loosen finger adjust screw (C).
  4. Slide headrest (B) to desired viewing position.
  5. Tighten finger adjust screw (C).

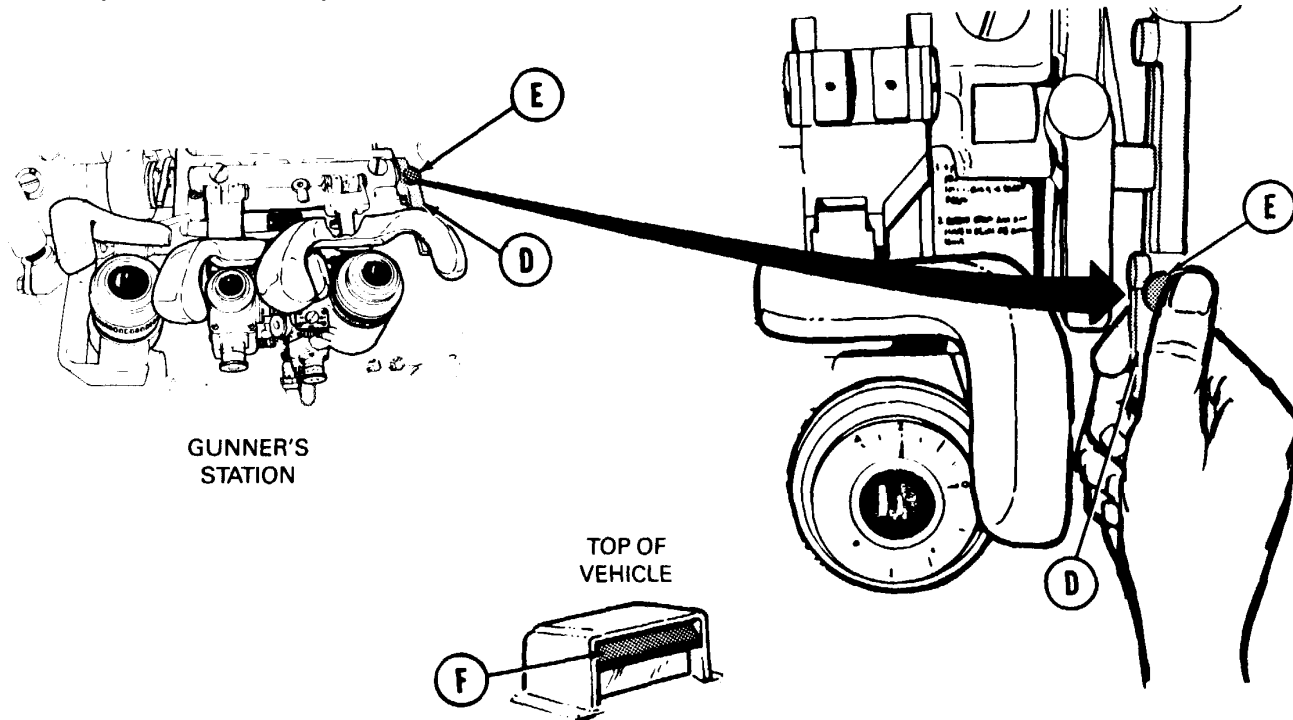


DRIVER'S STATION



6. Adjust headrest (B) to desired shape.

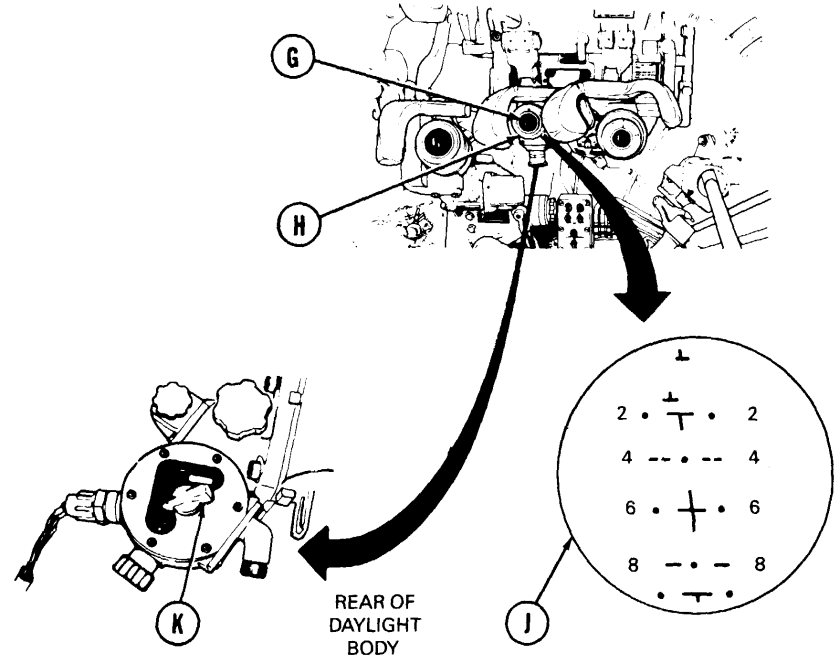
PREPARE FOR FIRING (ADJUST SIGHTS) - Continued



7. Grasp handle (D).
8. Depress button (E) with thumb.
9. Push handle (D) upward to raise ballistic shield (F).

**PREPARE FOR FIRING (ADJUST SIGHTS) - Continued**

10. Look into daylight body eyepiece (G).
11. Rotate diopter ring (H) to focus reticle (J).
12. If periscope is being adjusted under night or low light conditions, rotate light source control knob (K) to desired reticle brightness.



All data on pages 2-364 thru 2-368 deleted. |

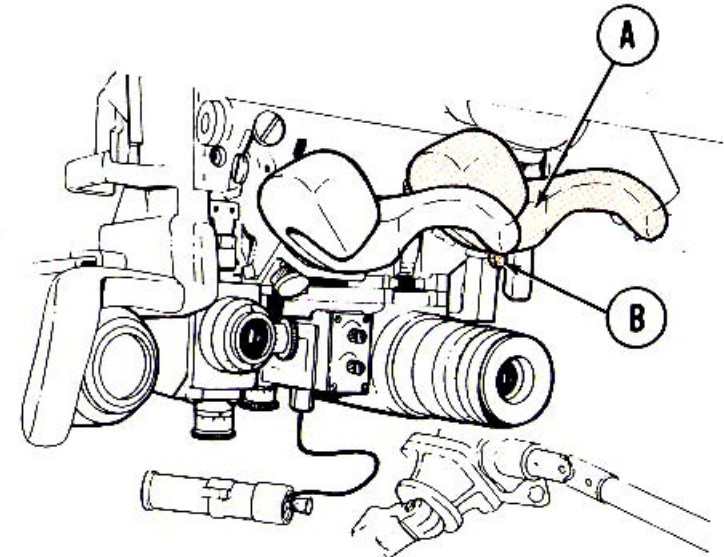
Change 9 2-363/(2-364 blank)

**PREPARE FOR FIRING (ADJUST SIGHTS)- Continued****To Sight Gunner's M32CE1 Periscope Passive Body:****CAUTION**

Perform night checks under low light conditions. A light shutter is provided to protect passive elbow against light exposure when not in use. Do not operate elbow under day-light conditions unless RETICLE knob is turned to OFF and ballistic shield is closed. Do not open ballistic shield under daylight conditions unless passive elbow is turned off.

**Make Sure:**

- Ballistic shield is open (page 2-362).
1. If headrest (A) is raised, pull it all the way down.
  2. Loosen finger adjust screw (B).
  3. Slide headrest (A) to desired viewing position.
  4. Tighten finger adjust screw (B).
  5. Adjust headrest (A) to desired shape.

**GUNNER'S STATION****NOTE**

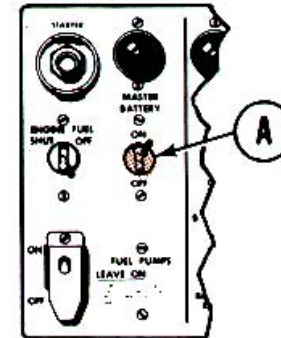
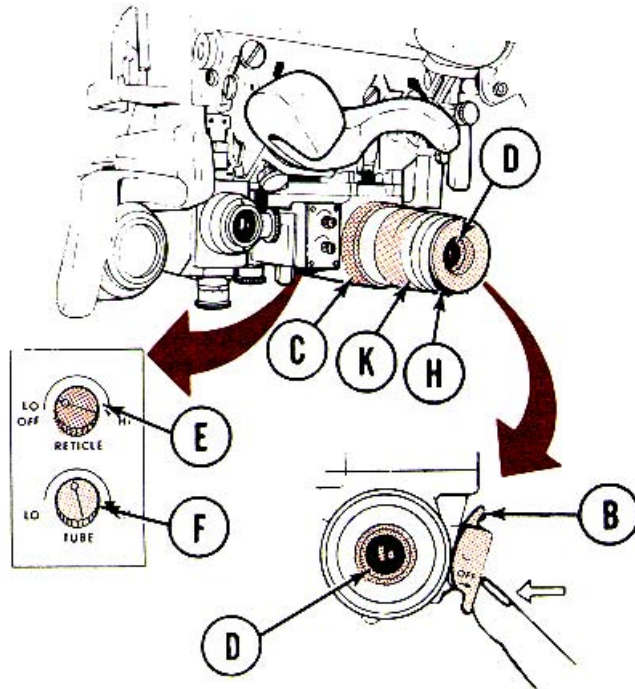
If vehicle power is to be used, go to page 2-368.2.

If vehicle power is not available, go on page 2-368.3.

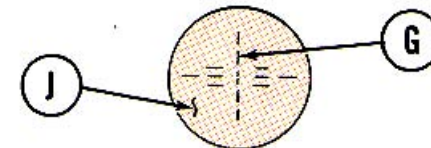
TA252779

PREPARE FOR FIRING (ADJUST SIGHTS) - Continued

To Sight Gunner's M32CE1 Periscope Passive Body Using Vehicle Power



1. Set MASTER BATTERY switch (A) to ON.
2. Push light shutter lever (B) left to turn on power to passive elbow (C) and to open light shutter.
3. Look into passive body eyepiece (D), rotate reticle knob (E) until satisfied with reticle brightness.
4. Rotate TUBE control (F) until reticle (G) is clear.
5. Rotate diopter ring (H) until background grain (J) is clear.
6. Rotate focus ring (K) for best focus of reticle (G).





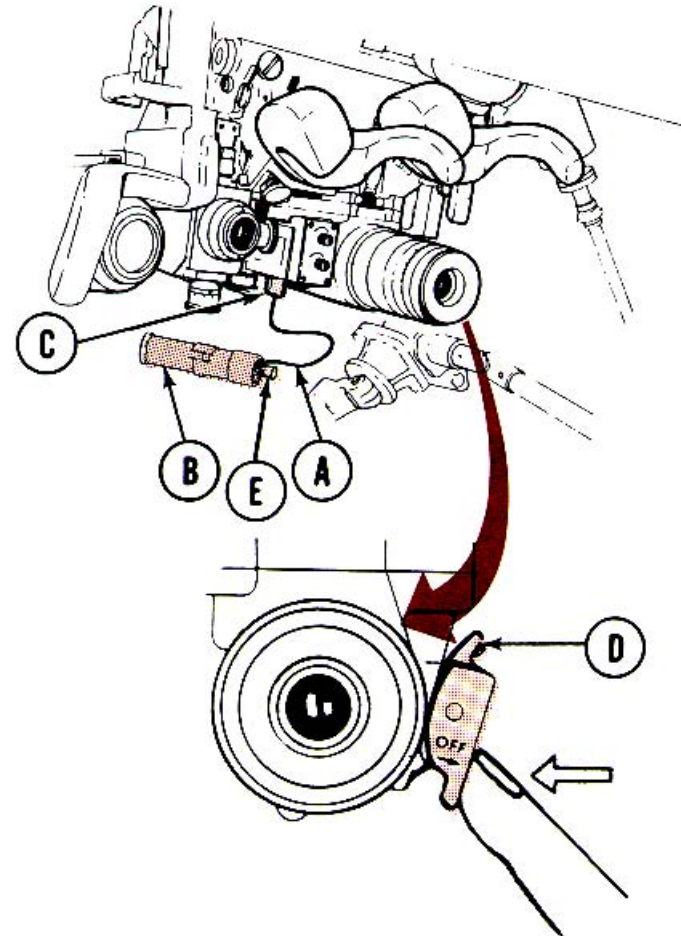
**PREPARE FOR FIRING (ADJUST SIGHTS) - Continued**

To Sight Gunner's M32CE1 Periscope Passive Body If Vehicle Power Is Not Available:

**NOTE**

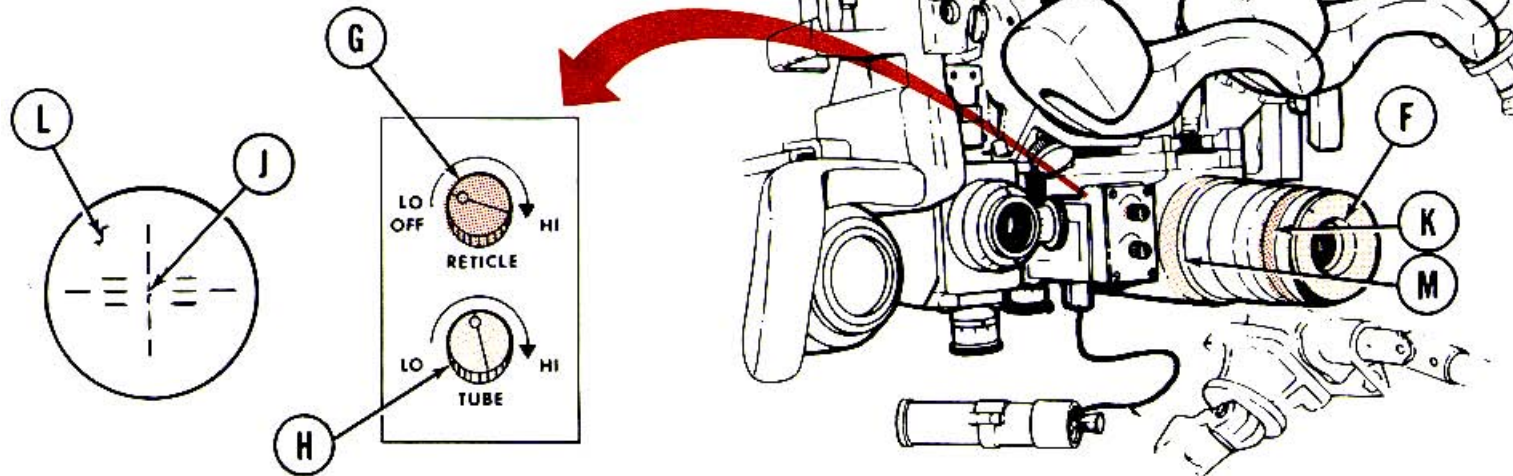
Two types of instrument lights (M30 and M50) are stowed on vehicle. If M30 is not stowed at gunner's station, it is stowed in commander's cupola. See page 2-360.4 for location of M30 in commander's cupola.

1. Remove cable (A) from M30 instrument light (B).
2. Connect cable (A) to connector (C).
3. Push light shutter lever (D) left to open shutter.
4. Turn switch (E) all way clockwise (ON).



**PREPARE FOR FIRING (ADJUST SIGHTS) - Continued**

5. Look into passive body eyepiece (F), rotate reticle knob (G) until satisfied with reticle brightness.
6. Rotate TUBE control (H) until reticle (J) is clear.
7. Rotate diopter ring (K) until background grain (L) is clear.
8. Rotate focus ring (M) for best focus of reticle (J).



Change 1 2-368.4

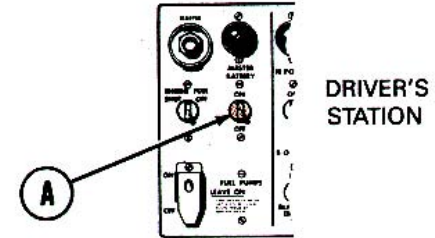
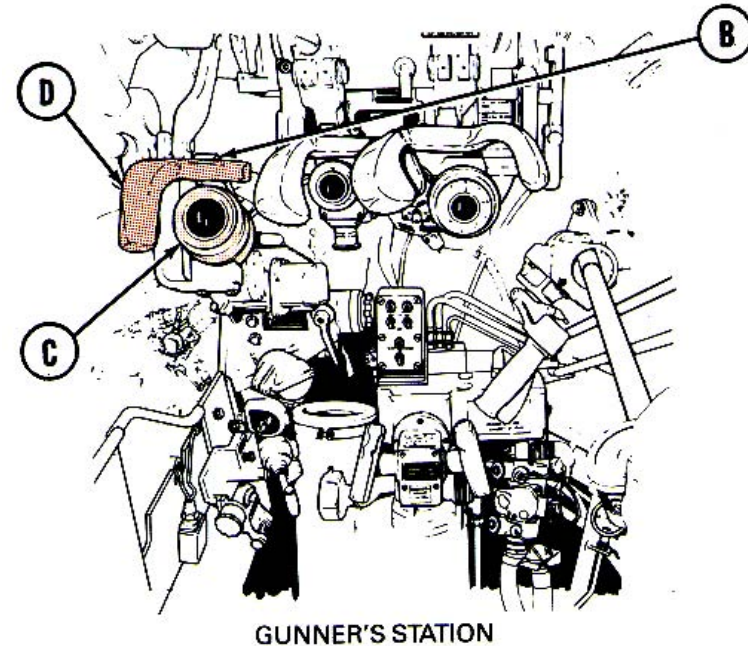
TA252782

**PREPARE FOR FIRING (ADJUST SIGHTS) - Continued**

**To Sight M105F Telescope:**

**Make Sure:**

- MASTER BATTERY switch (A) is set to ON.
- Laser filter is installed (page 2-348.1) if required.



1. Loosen finger adjust screw (B) on telescope (C).
2. Adjust headrest (D) to desired viewing position.
3. Tighten finger adjust screw (B).

**NOTE**

If sight is being adjusted under daylight conditions, go to step 8.

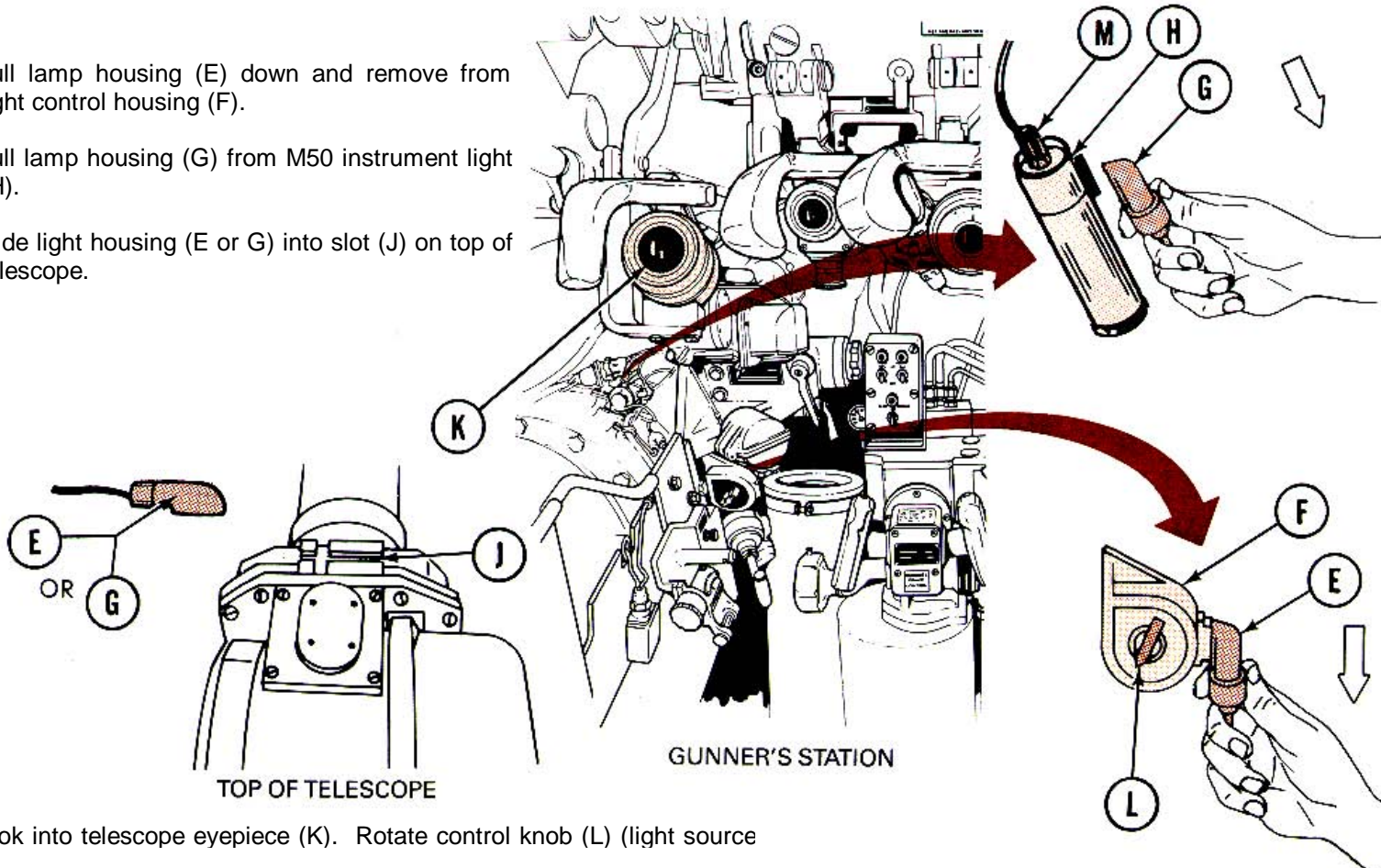
If sight is being adjusted under night or low light conditions, go to step 4 or 5.

If vehicle power is being used, go to step 4. Skip step 5.

If vehicle power is not available, and M50 instrument light is being used, skip step 4 and go to step 5.

**PREPARE FOR FIRING (ADJUST SIGHTS) - Continued**

4. Pull lamp housing (E) down and remove from light control housing (F).
5. Pull lamp housing (G) from M50 instrument light (H).
6. Slide light housing (E or G) into slot (J) on top of telescope.



7. Look into telescope eyepiece (K). Rotate control knob (L) (light source)

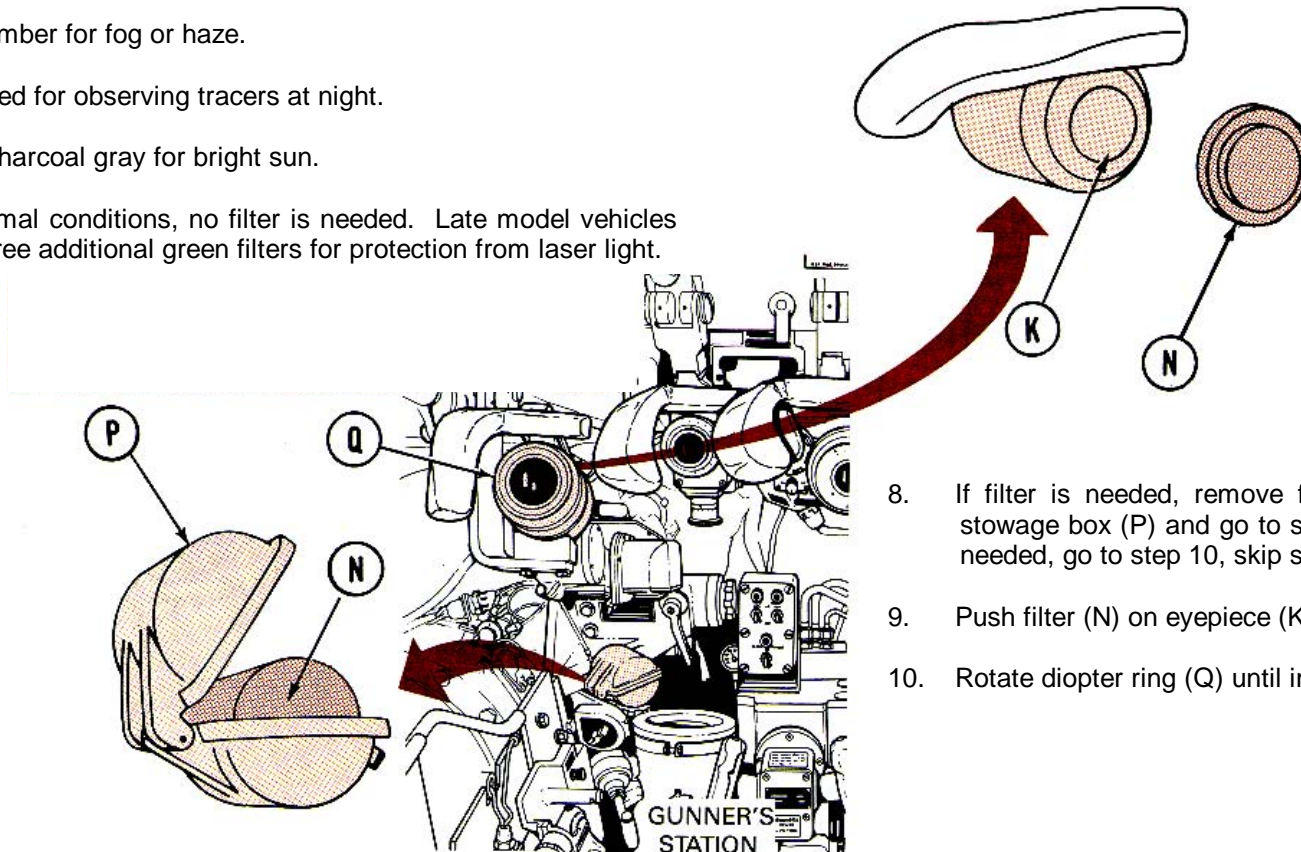
**PREPARE FOR FIRING (ADJUST SIGHTS) - Continued**

**NOTE**

Three filters (N) are stowed in filter stowage box (P).

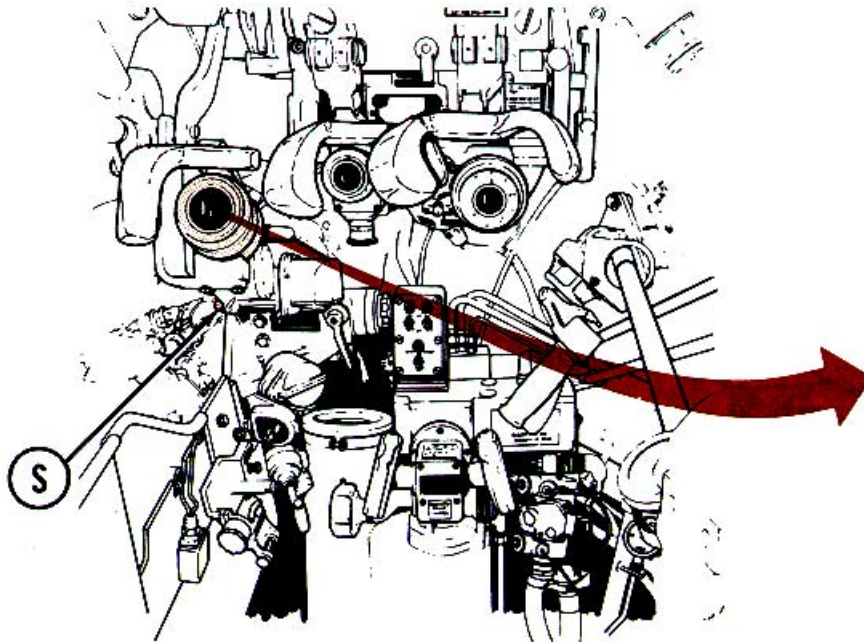
- a. Amber for fog or haze.
- b. Red for observing tracers at night.
- c. Charcoal gray for bright sun.

For normal conditions, no filter is needed. Late model vehicles have three additional green filters for protection from laser light.



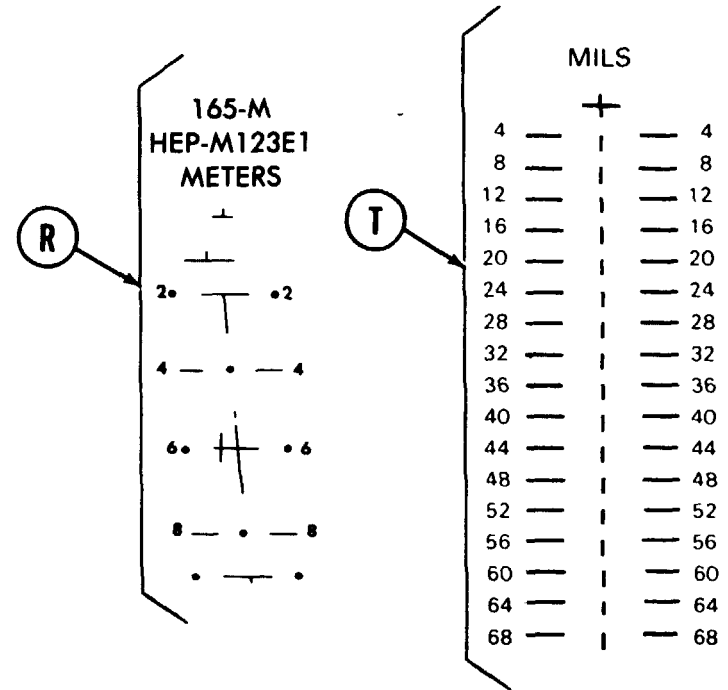
8. If filter is needed, remove filter (N) from filter stowage box (P) and go to step 9. If filter is not needed, go to step 10, skip step 9.
9. Push filter (N) on eyepiece (K).
10. Rotate diopter ring (Q) until image is clear.

PREPARE FOR FIRING (ADJUST SIGHTS) - Continued



**GUNNER'S STATION**

11. To select reticle (R), push lever (S) left.  
To select reticle (T), push lever (S) right.



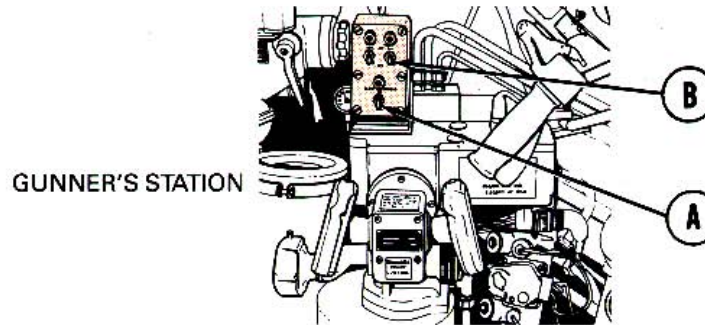
TA132512

**PREPARE FOR FIRING (LOAD MACHINE GUNS)**

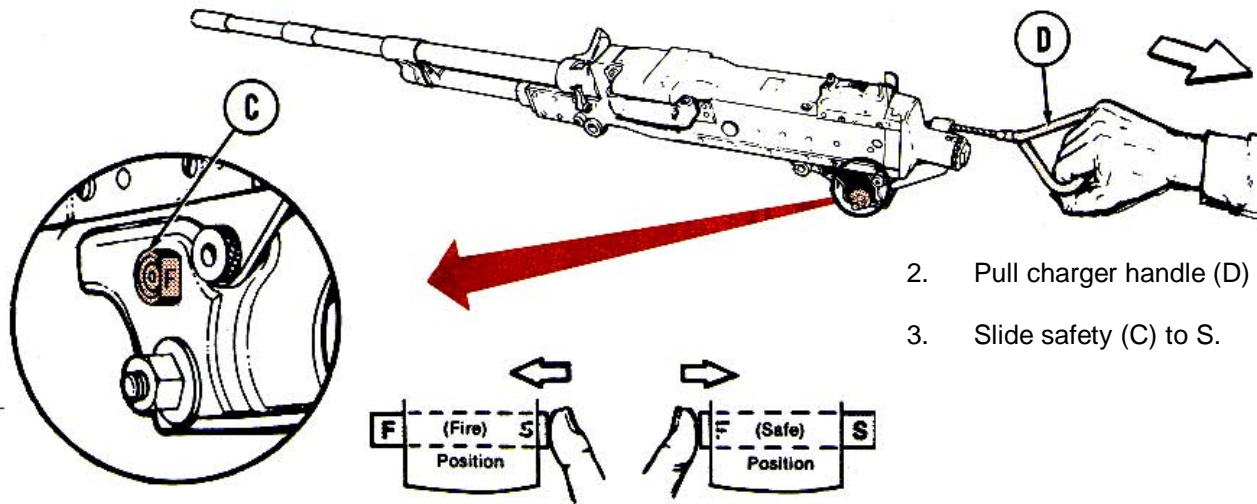
**To Load M240 7.62-mm Machine Gun:**

**Make Sure:**

- Turret traversing lock is LOCKED (page 2-568).
- ELEV/TRAV POWER switch (A) is OFF.
- Machine gun switch (B) is OFF.



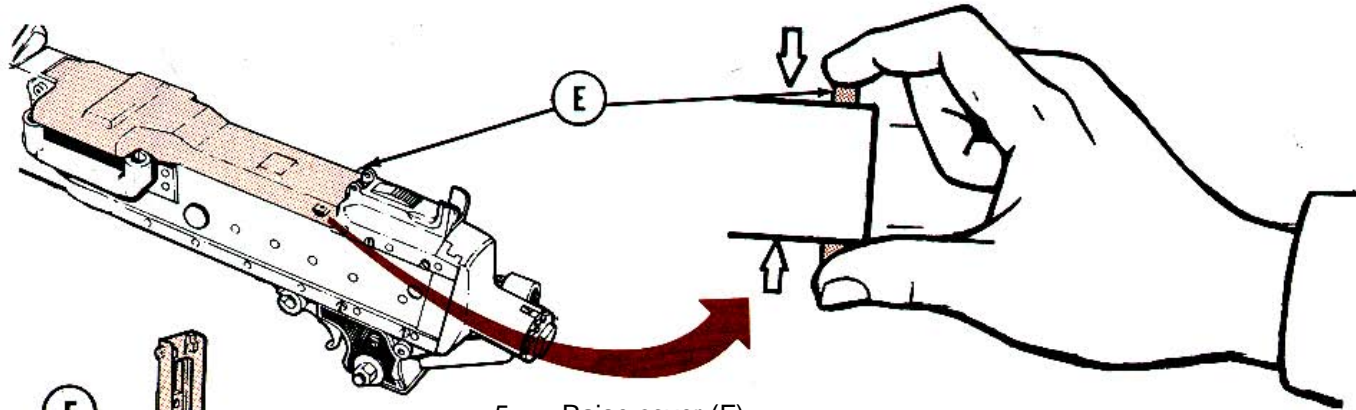
1. Slide safety (C) to F.



2. Pull charger handle (D) back all the way.
3. Slide safety (C) to S.

**PREPARE FOR FIRING (LOAD MACHINE GUNS) - Continued**

4. Push in and hold cover latches (E).

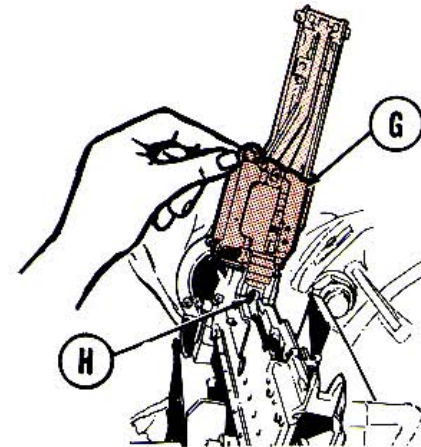
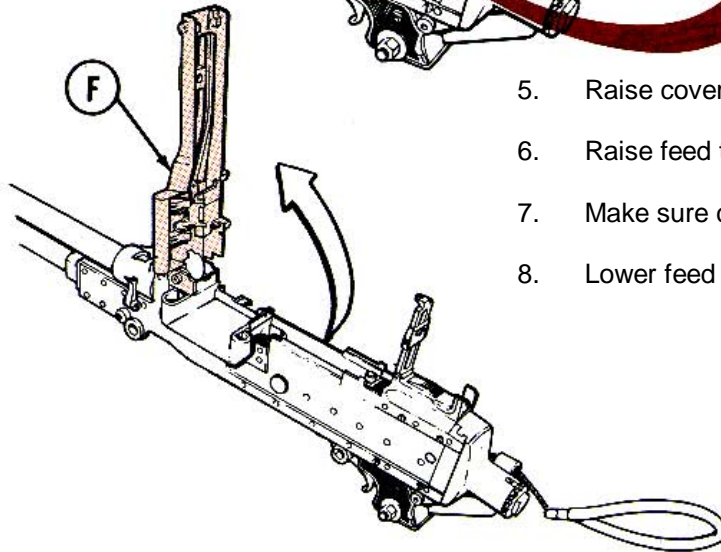


5. Raise cover (F).

6. Raise feed tray (G).

7. Make sure chamber (H) is clear.

8. Lower feed tray (G).



2-374

TA132514

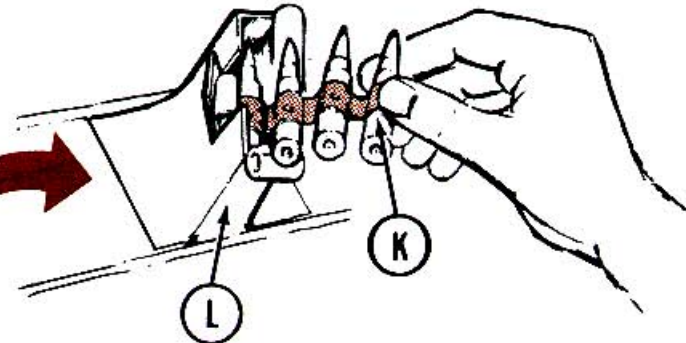
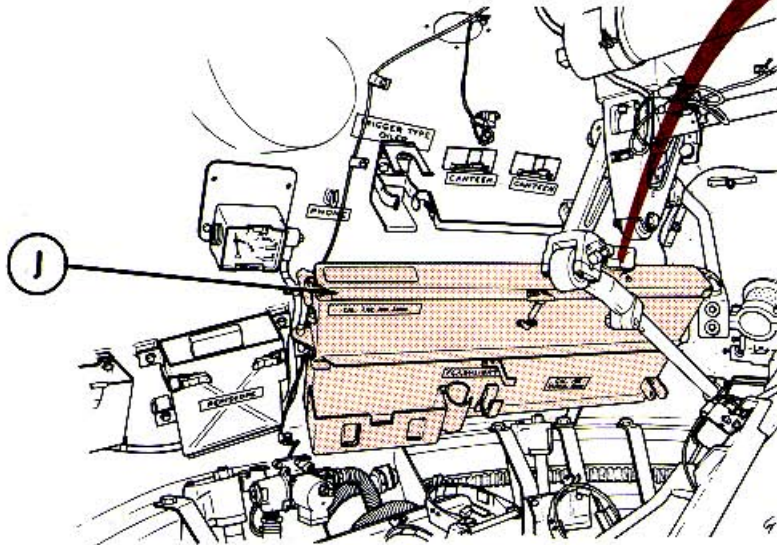


PREPARE FOR FIRING (LOAD MACHINE GUNS) - Continued

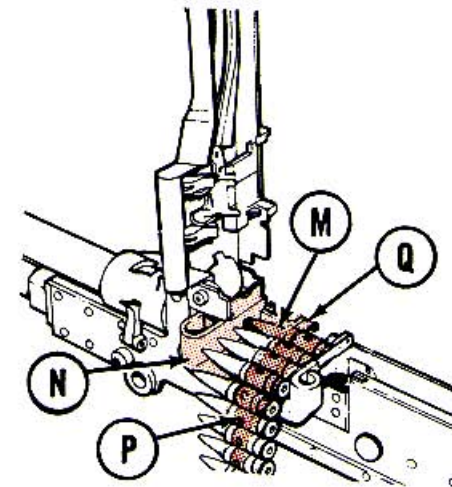
**WARNING**

Make sure safety is at S until machine gun is to be fired.

9. Find ready ammunition box (J) in turret.



10. Grasp ammunition belt (K). Pull through chute (L).
11. Place first round (M) in feed tray (N) with open side of links (P) down, and push against cartridge stop (Q).



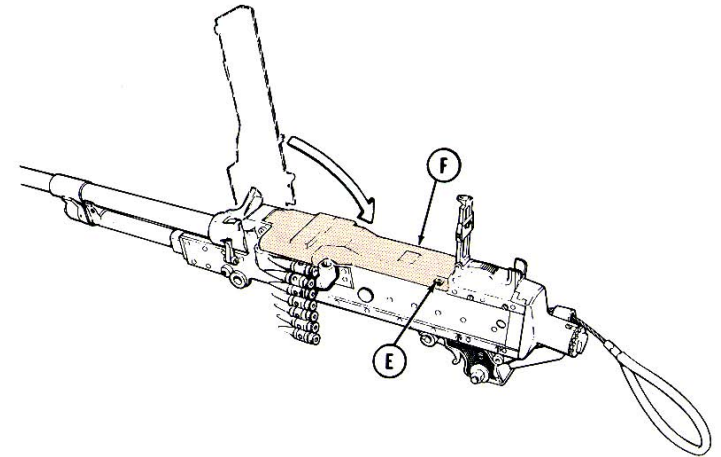
**PREPARE FOR FIRING (LOAD MACHINE GUNS) - Continued****NOTE**

When closing cover hold up ammunition belt with left hand to make sure round does not slip from feed tray.

12. Close cover (F).
13. Check that cover latches (E) are locked.

**WARNING**

**Make sure safety is at S until machine gun is to be fired.**



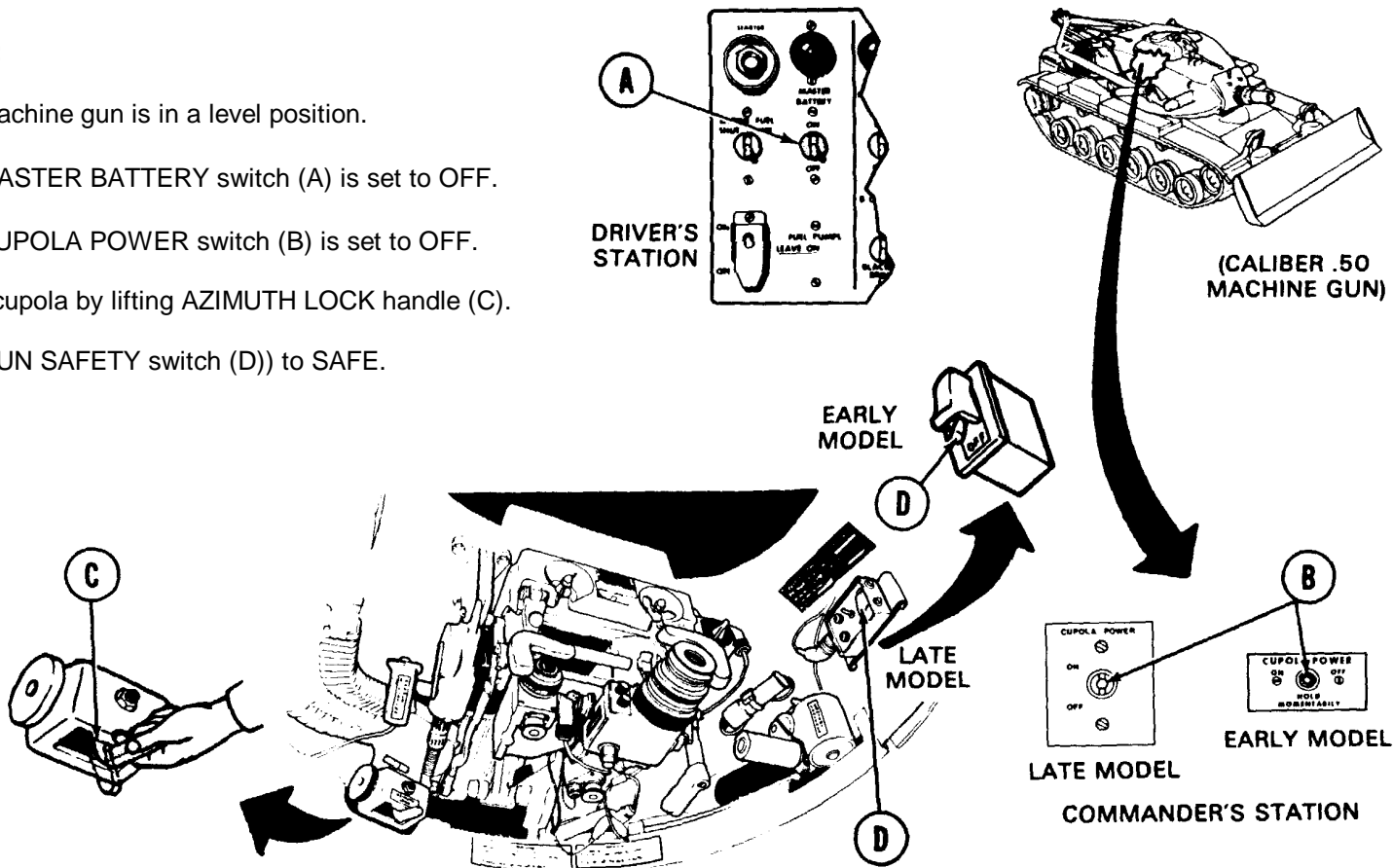
TA132516

**PREPARE FOR FIRING (LOAD MACHINE GUNS)- Continued**

**To Load Caliber .50 Machine Gun:**

**Make Sure:**

- Machine gun is in a level position.
  - MASTER BATTERY switch (A) is set to OFF.
  - CUPOLA POWER switch (B) is set to OFF.
1. Lock cupola by lifting AZIMUTH LOCK handle (C).
  2. Set GUN SAFETY switch (D) to SAFE.

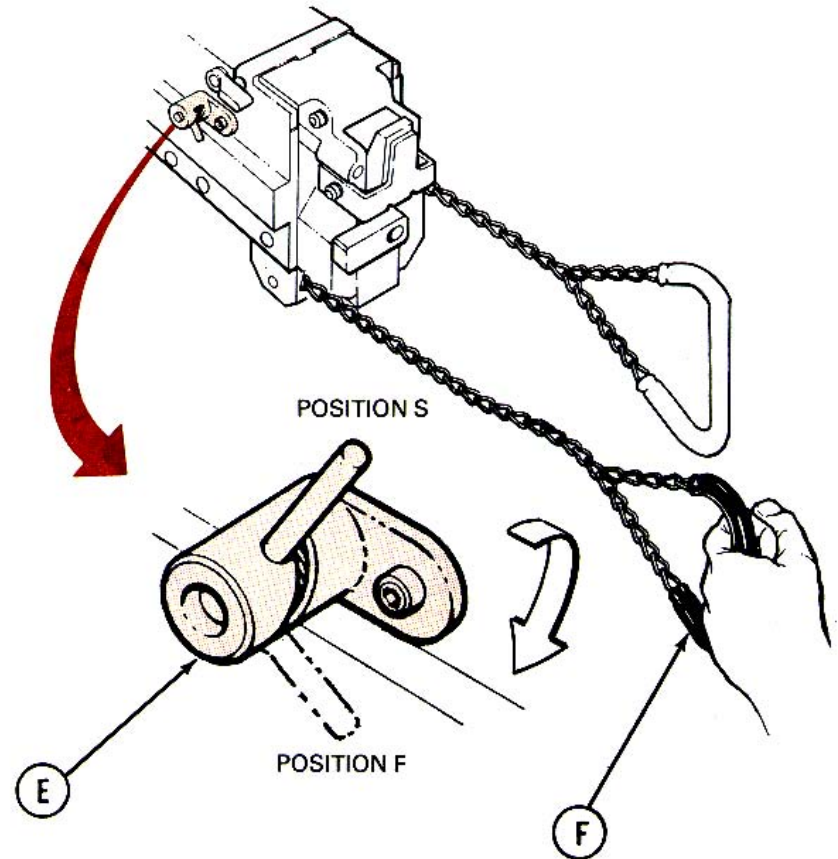


All data on pages 2-377 thru 2-381 deleted.

Change 8 2-382

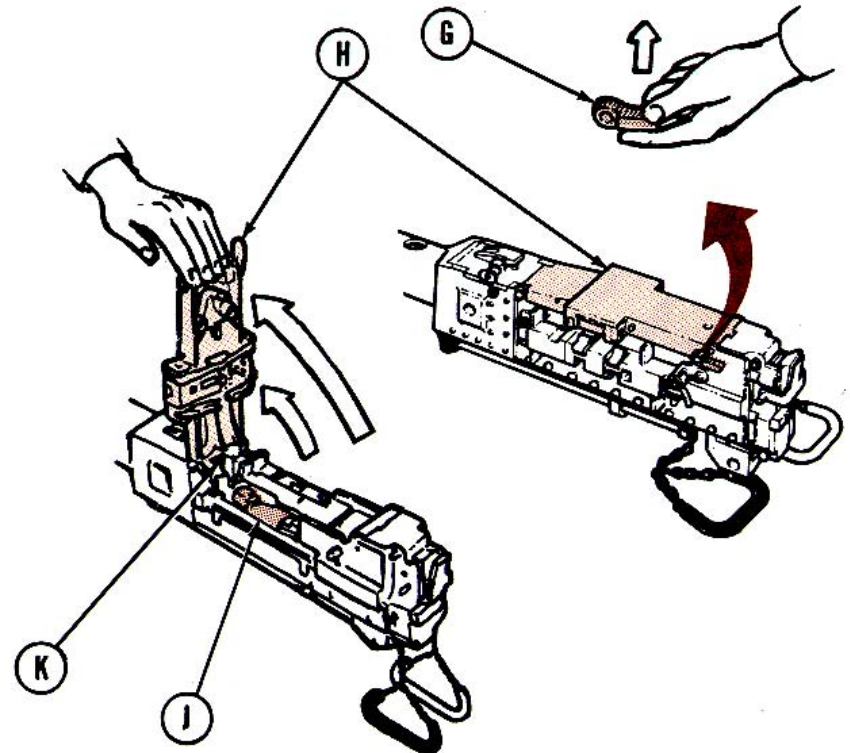
**PREPARE FOR FIRING (LOAD MACHINE GUNS) - Continued**

3. Set mechanical safety (E) to position F.
4. Pull black charging handle (F) back until gun is cocked, then release.
5. Set mechanical safety (E) to position S.



**PREPARE FOR FIRING (LOAD MACHINE GUNS) - Continued**

6. Lift latch (G). Raise cover (H).
7. Raise feed tray (J).
8. Make sure chamber (K) is clear.
9. Lower feed tray (J).



2-384

TA132524

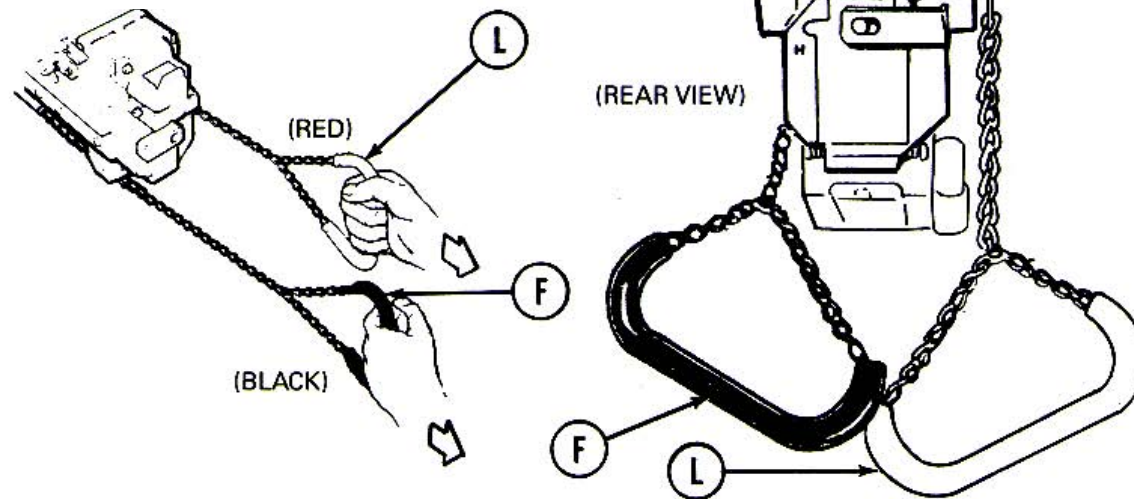
**PREPARE FOR FIRING (LOAD MACHINE GUNS) - Continued**

10. Set mechanical safety (E) to position F.
11. Pull black charging handle (F) completely back and hold.

**NOTE**

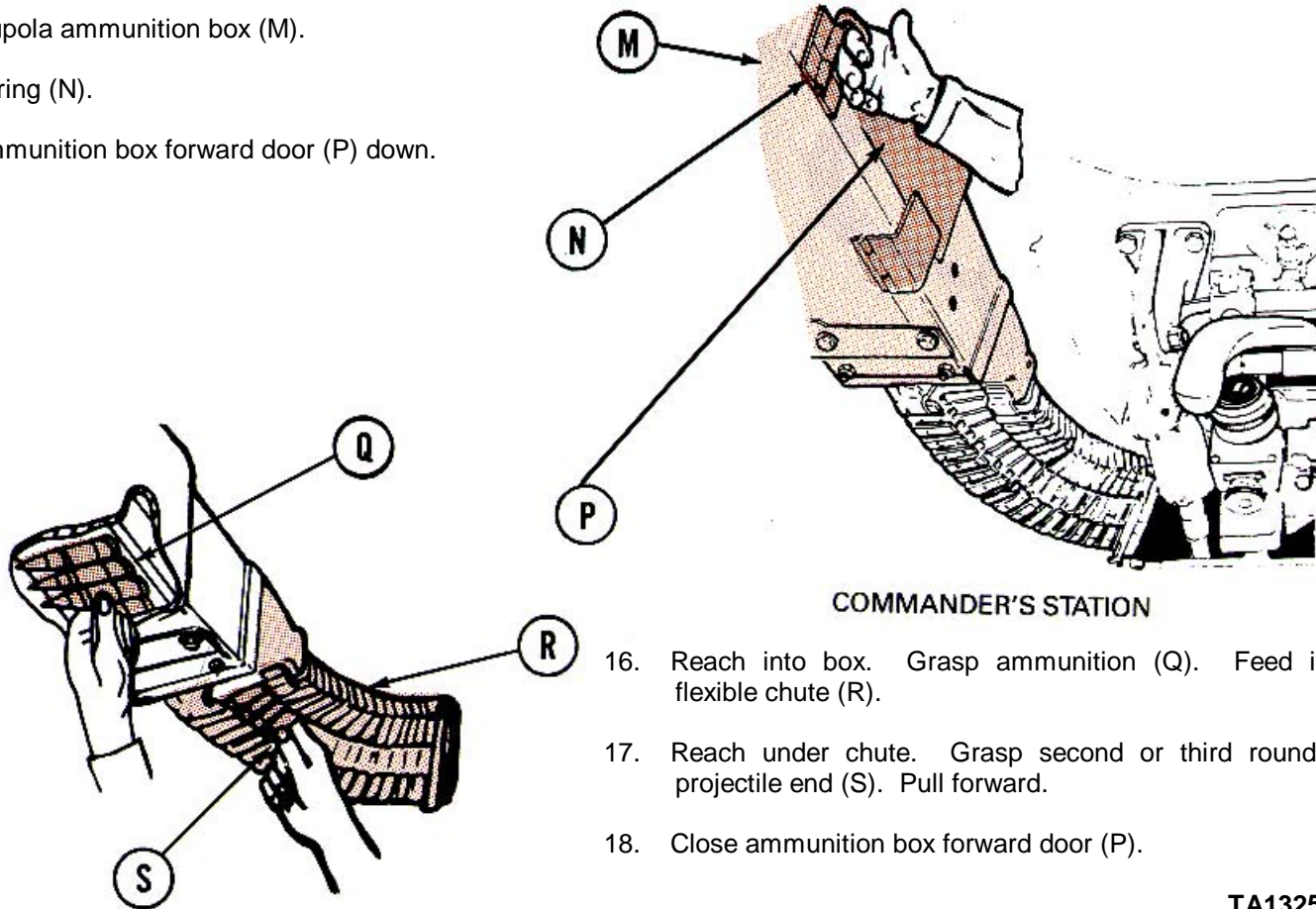
**Black charging handle must be held back when manual red firing handle is pulled. Slowly relax tension on black charging handle allowing bolt to move forward slowly.**

12. Pull manual red firing handle (L) back while slowly relaxing tension on black charging handle (F).



**PREPARE FOR FIRING (LOAD MACHINE GUNS) - Continued**

13. Locate cupola ammunition box (M).
14. Lift latch ring (N).
15. Swing ammunition box forward door (P) down.

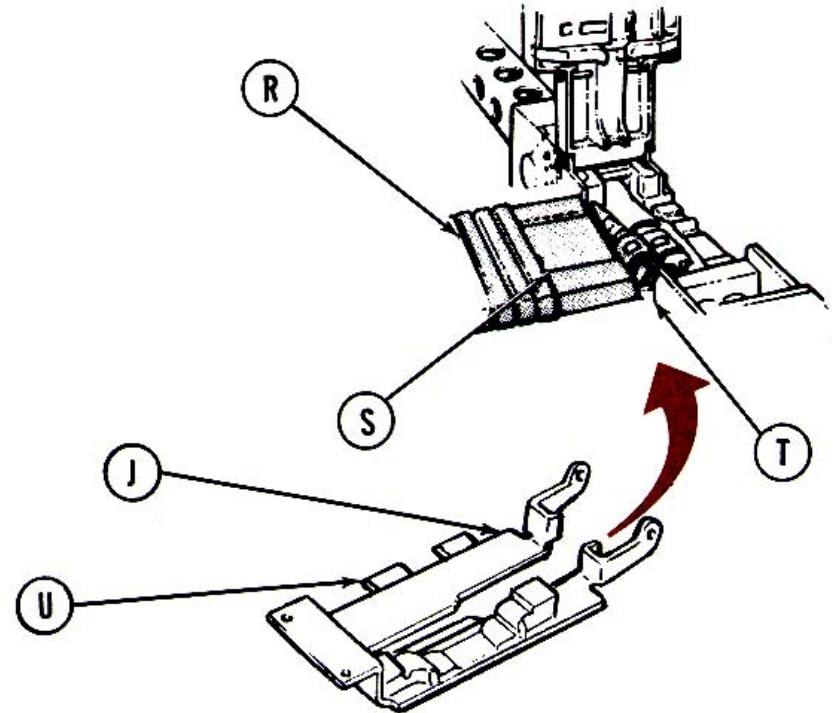


16. Reach into box. Grasp ammunition (Q). Feed into flexible chute (R).
17. Reach under chute. Grasp second or third round at projectile end (S). Pull forward.
18. Close ammunition box forward door (P).

TA132526

**PREPARE FOR FIRING (LOAD MACHINE GUNS) - Continued**

19. Pull rounds from flexible chute (R) into feed tray (J).
20. Make sure open side of links (S) is down.
21. Make sure first round (T) is over belt retaining pawls (U).



TA132527



**PREPARE FOR FIRING (LOAD MACHINE GUNS)- Continued**

- 22. Close cover (H). Secure to receiver assembly (V).
- 23. Make sure mechanical safety (E) is set to F.

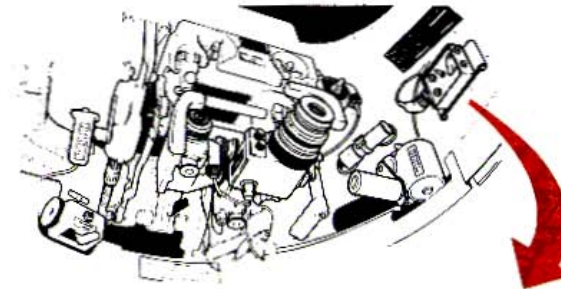
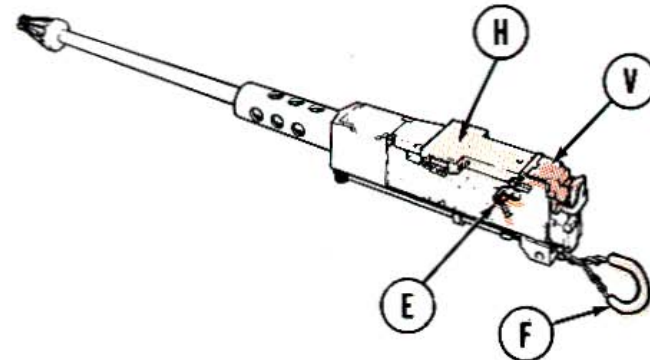
**WARNING**

**Machine gun must be charged before safety is set to position S. If safety is set to S while bolt, is forward and an attempt is made to charge gun, gun may accidentally fire.**

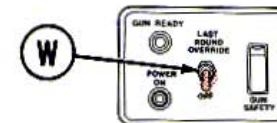
**NOTE**

If first round jams or is cocked in chute, pull ammunition belt back into box one inch and push belt through again. If ammunition still fails to feed into machine gun, check flex feed chute attached to cradle. If feed chute does not align with machine gun, notify organizational maintenance.

- 24. Charge machine gun by pulling black charging handle (F) fully back.
- 25. Set safety (E) to position S.
- 26. Set LAST ROUND OVERRIDE switch (W) to OFF. (Late models only).



**COMMANDER'S STATION**

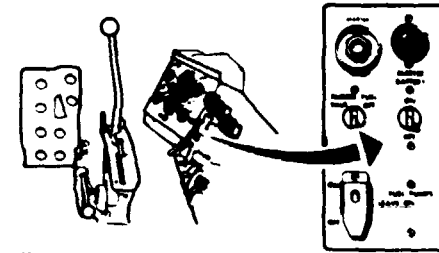
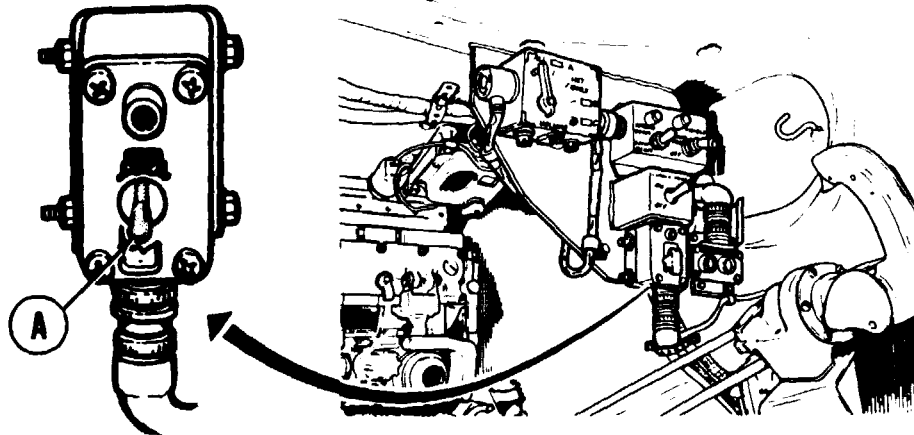


**PREPARE FOR FIRING (LOAD SMOKE GRENADE DISCHARGERS)**

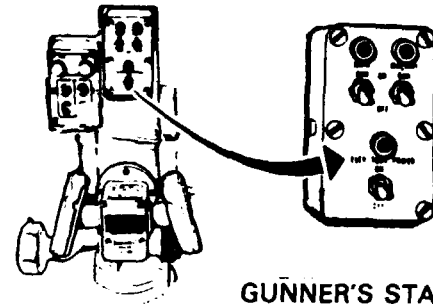
**Make Sure:**

- MASTER BATTERY switch is set to OFF.
- ELEV/TRAV POWER switch is set to OFF.
- Turret traverse lock is LOCKED (page 2-568).

1. Set smoke grenade discharger POWER SWITCH (A) to OFF.



**DRIVER'S STATION**



**GUNNER'S STATION**

**PREPARE FOR FIRING (LOAD SMOKE GRENADE DISCHARGERS) - Continued****WARNING**

Follow ammunition handling procedures when handling and loading grenades.

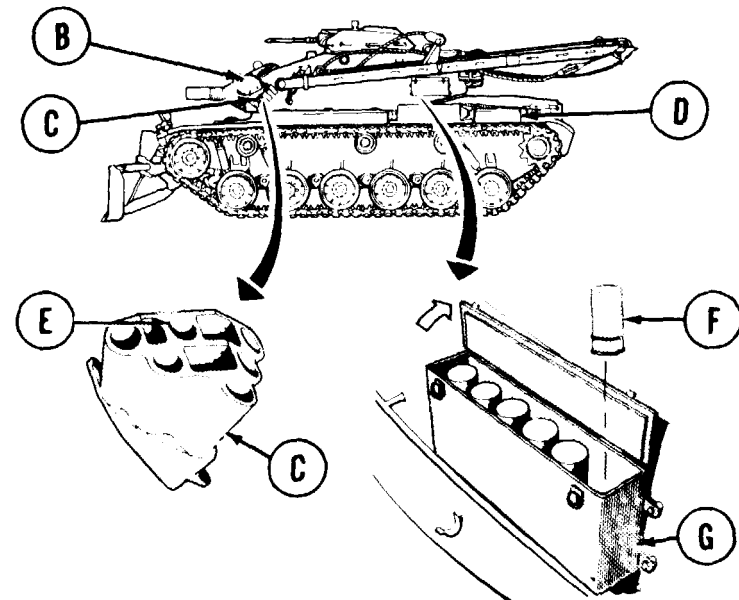
Smoke grenades contain RP (red phosphorus). This is a fire hazard and is dangerous to all personnel outside tank.

Never place part of your body in front of the dischargers when removing or installing discharge covers.

2. Remove covers (B) from left and right grenade dischargers (C).
3. Stow covers (B) in fender box (D).
4. Check that all barrels (E) of each discharger (C) are clear.
5. Remove grenades (F) from stowage boxes (G).

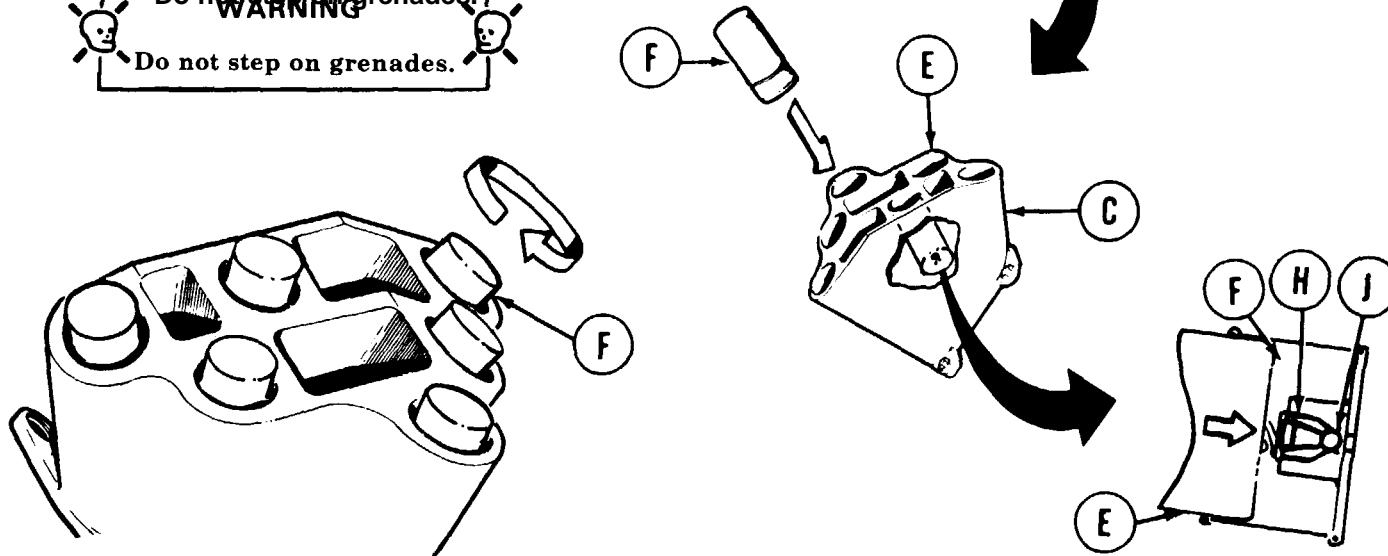
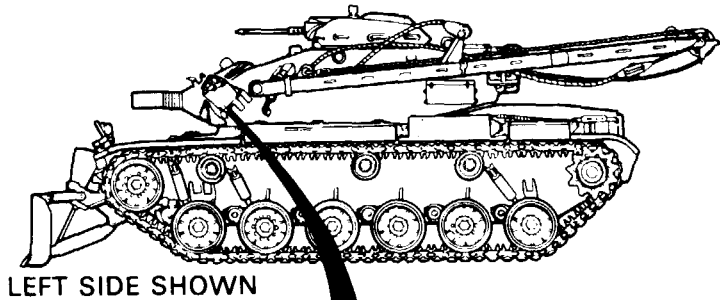
**WARNING**

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



6. Push one grenade (F), base first, into each of the six discharger tubes (E) in each discharger (C).
7. Make sure spring clip (H) on grenade (F) clips over tip plug (J) in barrel (E).
8. Turn each grenade (F) in direction shown 1/4 to 1/2 turn to make good electrical contact.

**WARNING**



**PREPARE FOR FIRING (TURN ON TURRET POWER)****To Prepare Turret for Power Operation:****Make Sure:**

- MASTER BATTERY switch (A) is set to ON.
- Hydraulic powerpack is serviced (page 3-255).
- Turret traverse lock is UNLOCKED (page 2-331).

**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.

**PREPARE FOR FIRING (TURN ON TURRET POWER) - Continued**

**Warning**

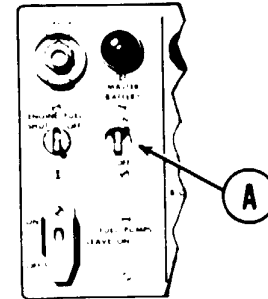
Clear turret firing area of all personnel and equipment before setting ELEV/TRAV POWER switch (B) to ON.

1. Set ELEV/TRAV POWER switch (B) to ON. Light (C) will light.

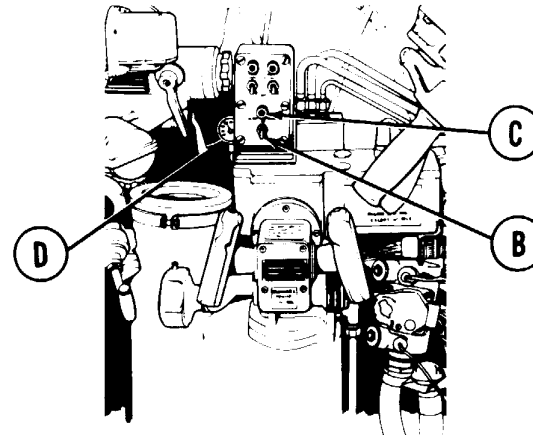
**CAUTION**

Pressure gage (D) should read between 1225 and 1275 psi. If not, notify organizational maintenance. If gage reads higher than 1500 psi, if motor keeps running, or if motor is very noisy, turn off turret power immediately.

2. Check pressure gage (D).



DRIVER'S STATION



GUNNER'S STATION

**BORESIGHT WEAPONS (BORESIGHT MAIN GUN)**

**Tools and Supplies:**

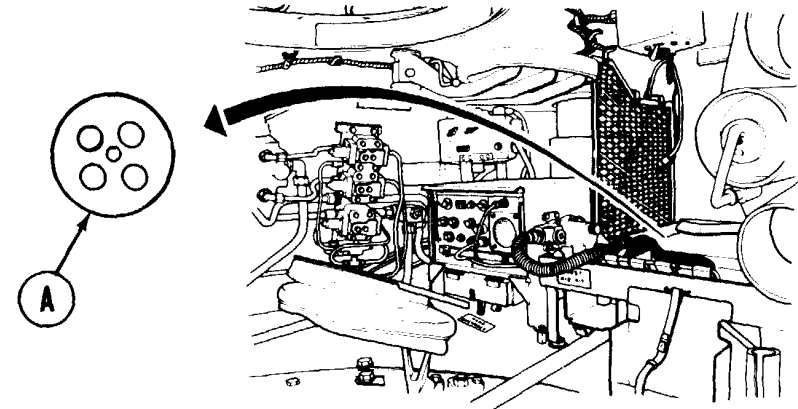
Get breech boresight (A) from oddment tray.

Get black string and tape.

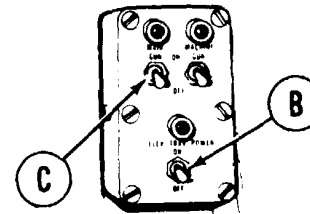
Get M22 binoculars from binocular box in commander's station.

**Make Sure:**

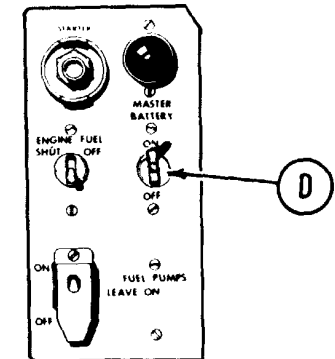
- Synchronization check has been done by organizational maintenance within the last 90 days (quarterly).
- Vehicle is parked on as firm and level ground as possible.
- Parking brake is set (page 2-213).
- Pages 2-324 thru 2-372 of prepare for firing have been performed.
- ELEVI/TRAV POWER switch (B) is set to OFF.
- MAIN GUN switch (C) is set to OFF.
- MASTER BATTERY switch (D) is set to ON.
- All sights are prepared for operation.
- Turret traverse lock is UNLOCKED (page 2-331).



COMMANDER'S STATION



GUNNER'S STATION

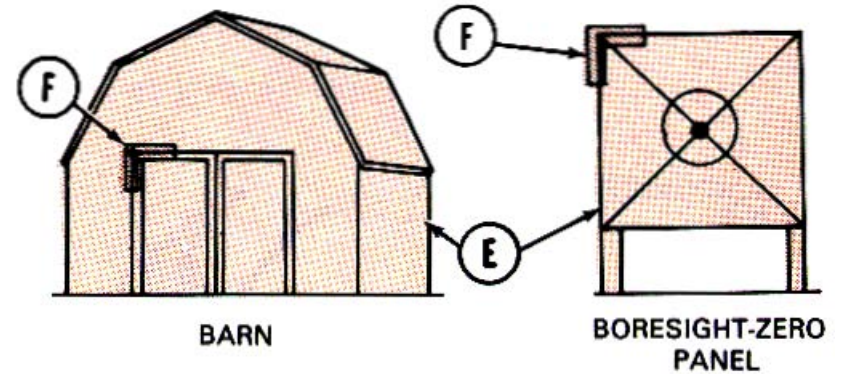


DRIVER'S STATION

**BORESIGHT WEAPONS (BORESIGHT MAIN GUN) - Continued**

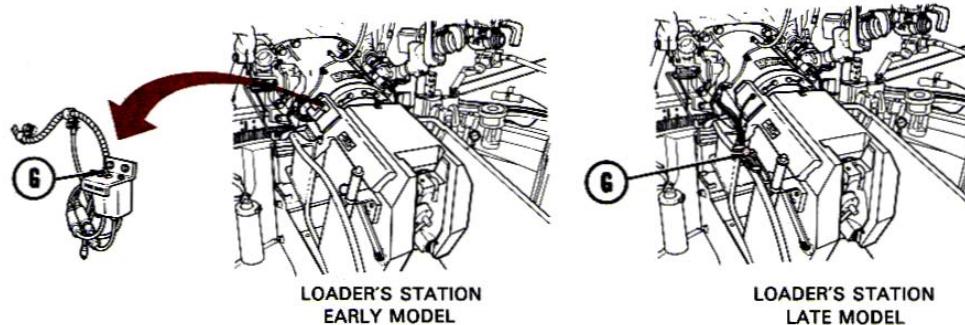
**Commander:**

1. Select target according to following requirements:
  - a. Target (E) should be at known range as close to 600 meters as possible.
  - b. Target (E) should have a clearly defined right angle (F) to align weapons and sights.
2. Identify target (E) to loader and gunner.



**Loader:**

3. Set safety switch (G) to SAFE.





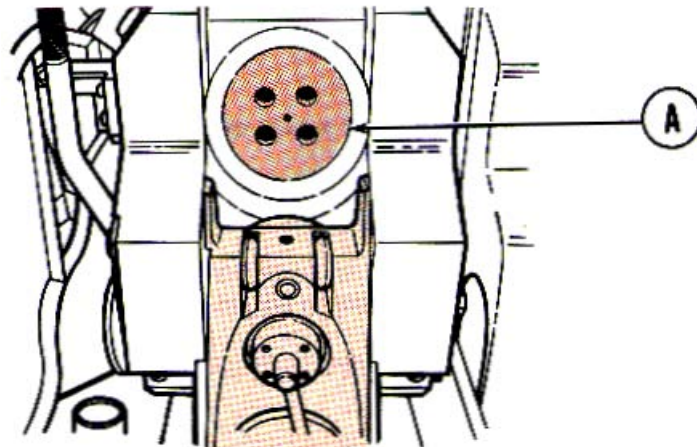
**BORESIGHT WEAPONS (BORESIGHT MAIN GUN) - Continued**

4. Grip BREECH OPERATING HANDLE (H), press in plunger (J), and pull back until breechblock (K) locks open.

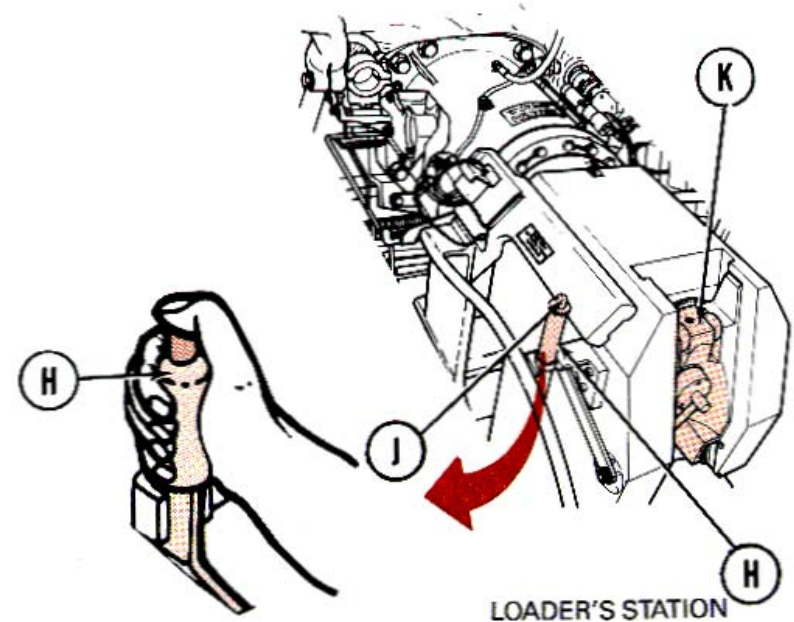
**WARNING**

Be sure BREECH OPERATING HANDLE (H) is atcd. An unlatched BREECH OPERATING HANDLE can injure you and damage equipment.

5. Move BREECH OPERATING HANDLE (H) up and forward until it latches.



LOADER'S STATION



6. Look to see that breech is clear.
7. Unload main gun (page 2-551) if loaded.
8. Place breech boresight (A) in open breech of main gun.

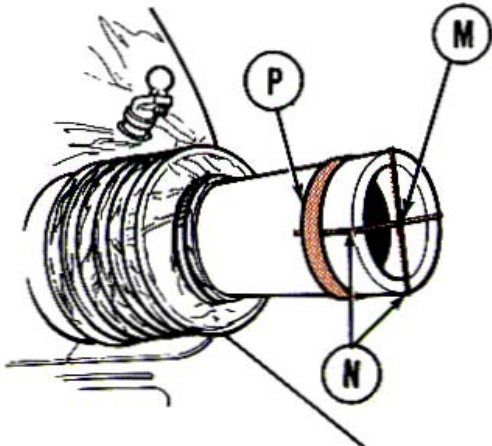
TA252792

Change 1 2-392

**BORESIGHT WEAPONS (BORESIGHT MAIN GUN) - Continued**

**Gunner:**

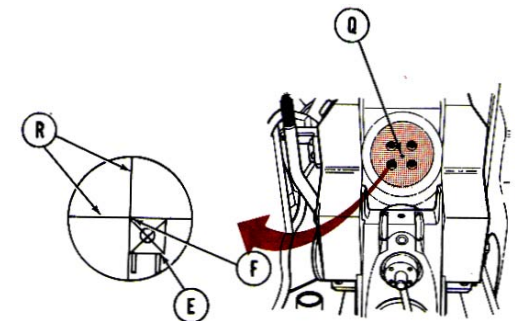
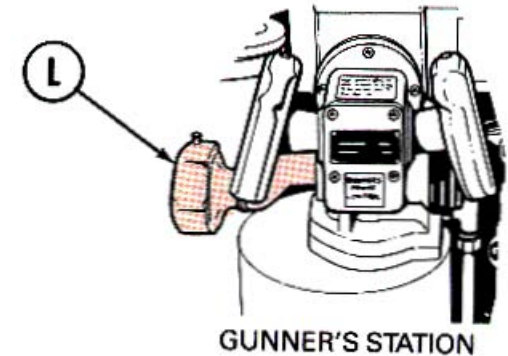
- Using MANUAL ELEVATING CONTROL handle (L) move main gun to maximum elevation.



**Loader:**

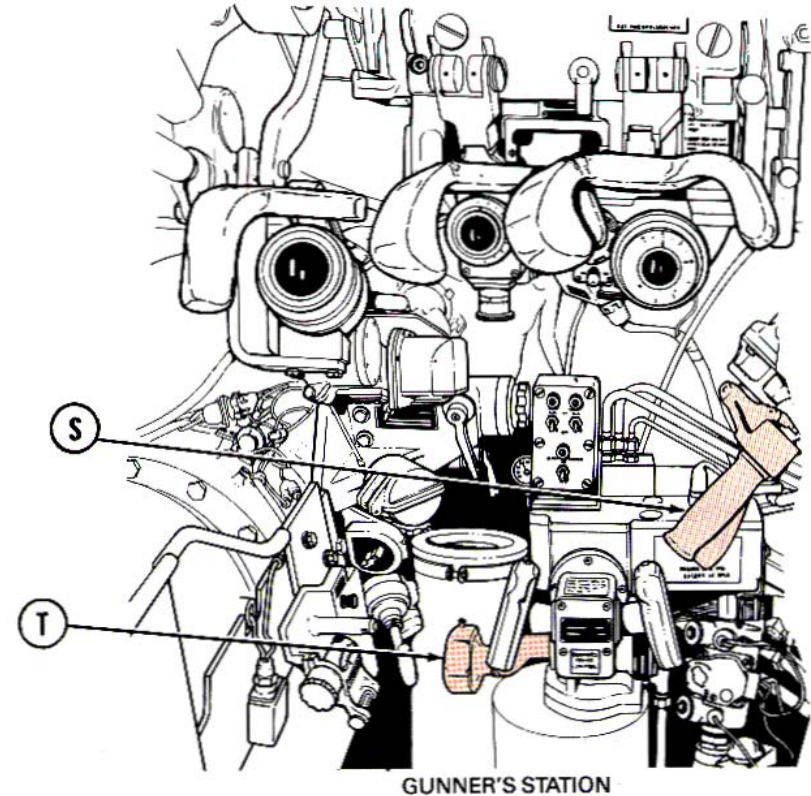
- Place black string (M) across marks (N) on muzzle of gun.
- Use tape (P) to attach black string (M) to muzzle.

- Look thru center hole (Q) of breech boresight (A) to sight target (E) and cross threads (R).
- Direct gunner to move turret and main gun manually until cross threads (R) are alined on target right angle (F) as shown.



**BORESIGHT WEAPONS (BORESIGHT MAIN GUN) - Continued****Gunner:**

14. Manually position main gun as directed by loader as follows:
  - a. Using MANUAL TRAVERSE handle (S), move main gun to left or right.
  - b. Using MANUAL ELEVATION CONTROL handle (T), raise or lower main gun.



TA132534

**BORESIGHT WEAPONS (BORESIGHT MAIN GUN) - Continued**

**To Aline Gunner's Periscope Daylight Body On Target:**

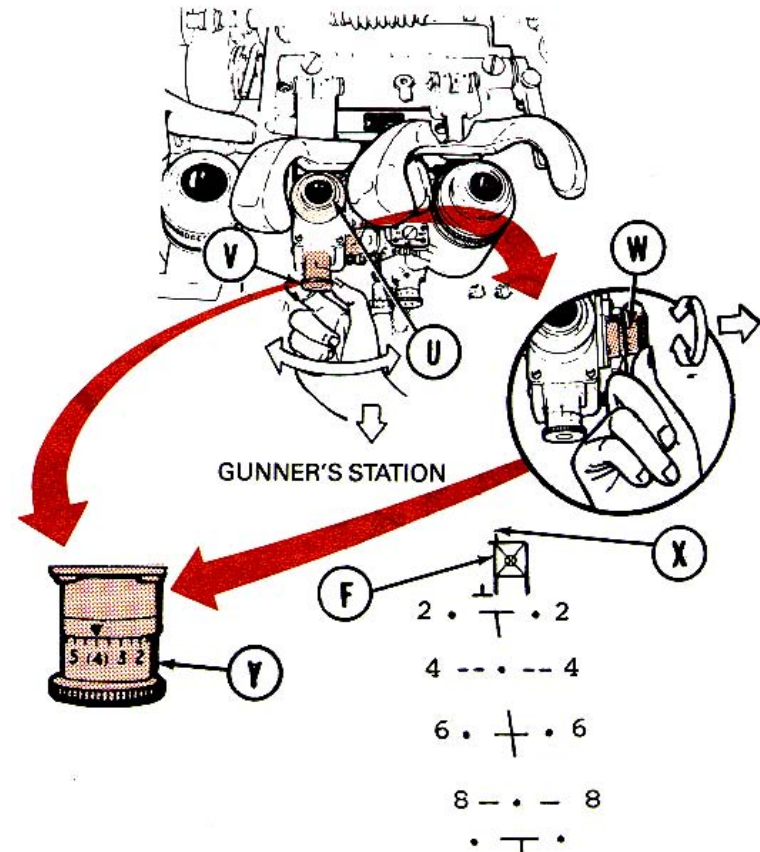
**Gunner:**

15. Look through daylight body eyepiece (U).
16. Pull out and turn elevation knob (V) and deflection knob (W) to adjust reticle boresight cross (X) on target right angle (F).

**NOTE**

**Do not pull out on elevation or deflection knobs while doing step 17.**

17. Rotate slip scale (Y) on elevation knob (V) and deflection knob (W) so they each read 4.

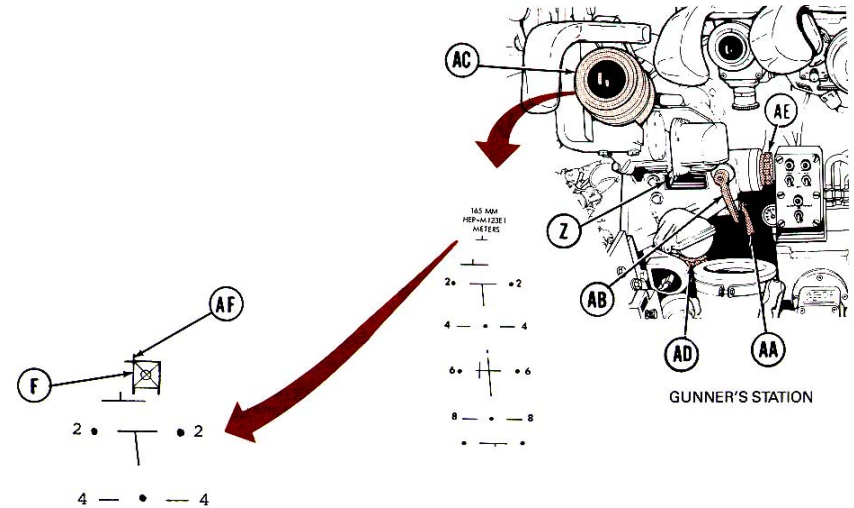


**BORESIGHT WEAPONS (BORESIGHT MAIN GUN) - Continued**

**To Aline Telescope On Target:**

**Gunner:**

18. Push reticle selector lever (Z) to right.
19. Unlock ELEVATION LOCK (AA) by pushing and DEFLECTION LOCK (AB) by turning counterclockwise.
20. Look through telescope eyepiece (AC). Turn elevation knob (AD) and deflection knob (AE) to aline reticle boresight cross (AF) on target right angle (F).



**BORESIGHT WEAPONS (BORESIGHT MAIN GUN) - Continued**

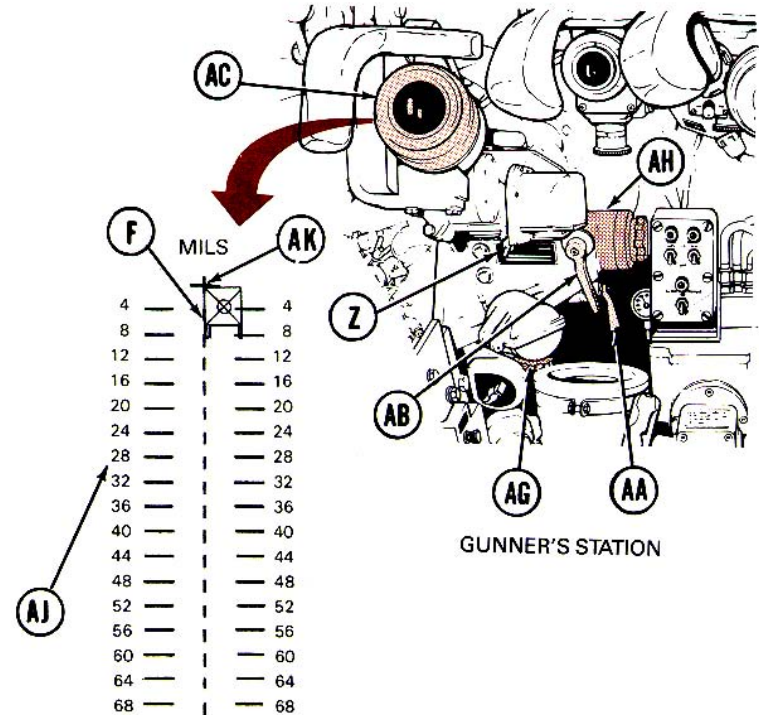
**Gunner:**

21. Lock ELEVATION LOCK (AA) by pulling toward you and DEFLECTION LOCK (AB) by turning clockwise.

**NOTE**

**Do not pull out on elevation or deflection knobs while doing step 22.**

22. Rotate elevation slip scale (AG) and deflection slip scale (AH) until each one reads 3.
23. Push reticle selector lever (Z) left. Reticle (AJ) will show in eyepiece (AC).
24. Check that boresight cross (AK) of reticle (AJ) is alined on target right angle (F). If not, notify organizational maintenance.



TA132537

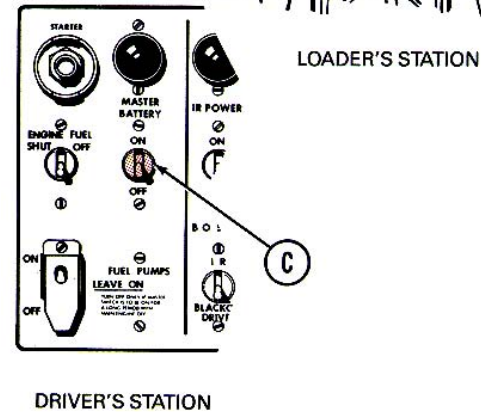
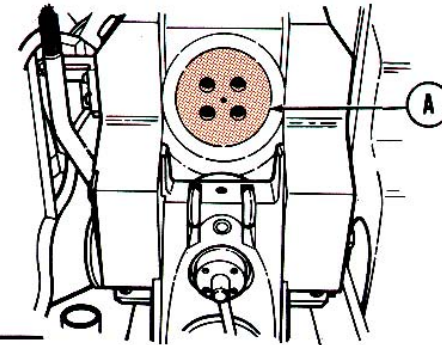
**BORESIGHT WEAPONS (BORESIGHT MAIN GUN) - Continued**

**Loader:**

25. Remove breech boresight (A) from open breech of main gun.
26. Stow breech boresight (A) in oddment tray.
27. Close breech on main gun (page 2-552).

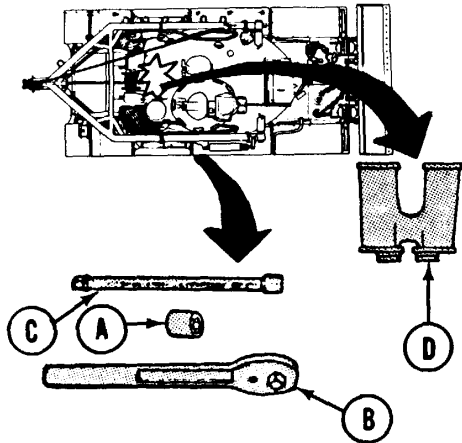
**Driver:**

28. Set MASTER BATTERY switch (C) to OFF if not required to operate other equipment.



**BORESIGHT WEAPONS (BORESIGHT 7.62-MM MACHINE GUN) - Continued**

**Boresight M240 Machine Gun:**



**Tools and Equipment:**

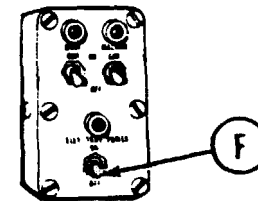
Get from right front fender box:

- 1-1/8 inch socket with 3/4 inch drive (A).
- Ratchet with 3/4 inch drive (B).
- 16 inch extension with 3/4 inch drive (C).

Get M22 binoculars (D) from binocular box in commander's station. ■

**Make Sure:**

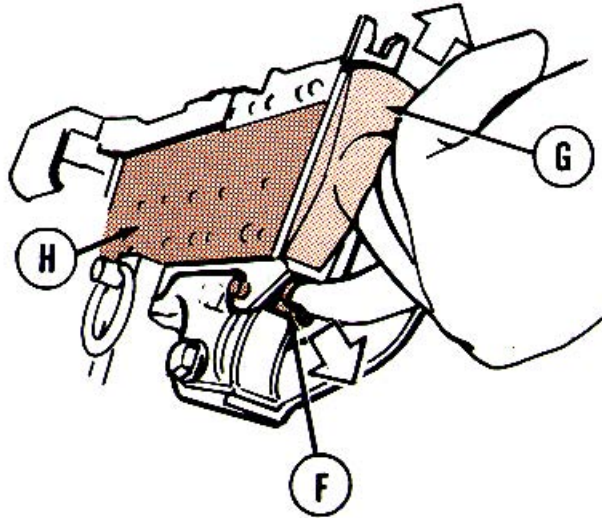
- ELEV/TRAV POWER switch (E) is set to OFF.
- Machine gun is unloaded and bolt is forward (page 2-559).
- 165-mm main gun is boresighted (page 2-390).



**GUNNER'S STATION**

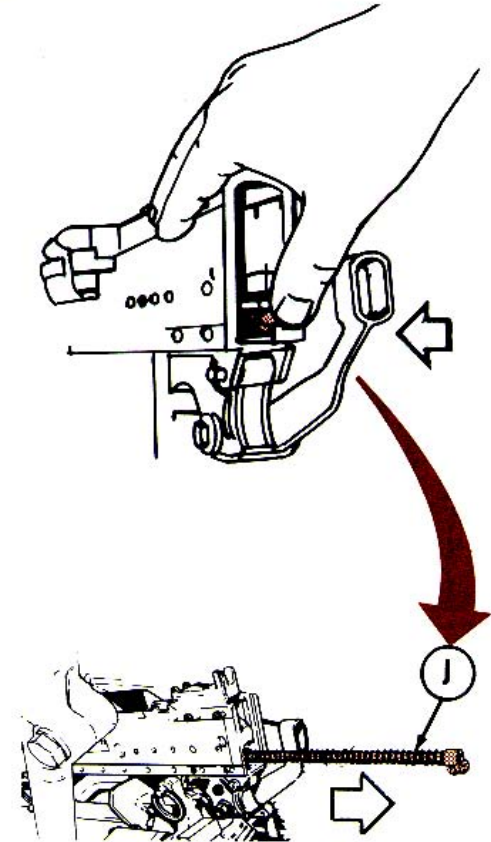


**BORESIGHT WEAPONS (BORESIGHT 7.62-MM MACHINE GUN) - Continued**



**LOADER'S STATION**

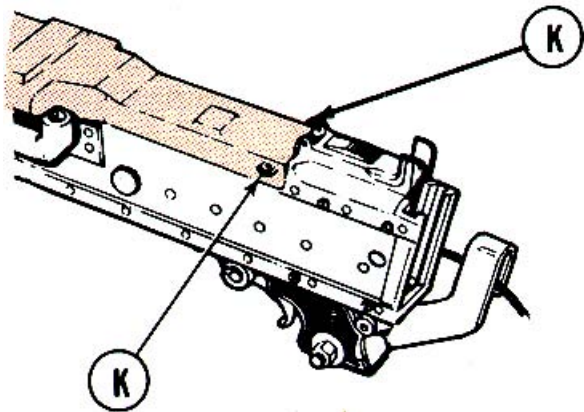
1. Pull back latch (F). Lift buffer (G) and remove from receiver (H).
2. Push in and lift driver spring (J). Pull back and remove from receiver.



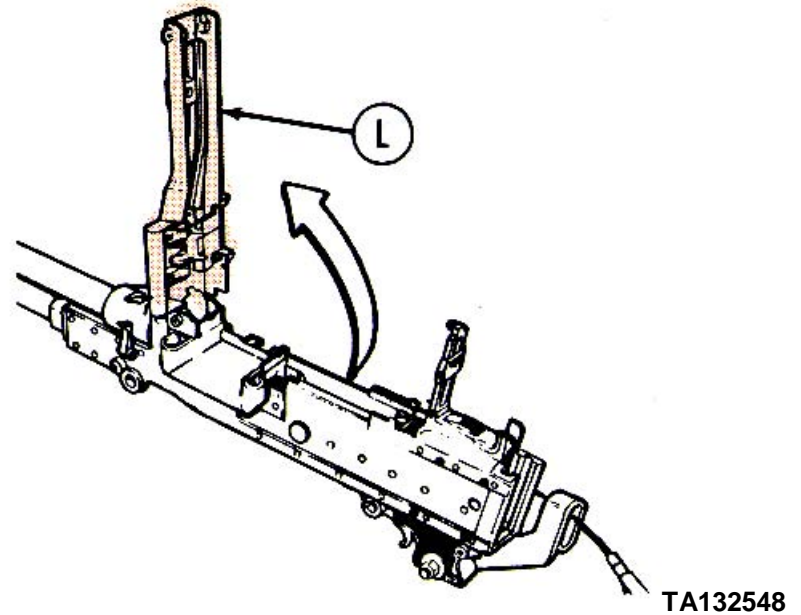
TA132547

**BORESIGHT WEAPONS (BORESIGHT 7.62-MM MACHINE GUN) - Continued**

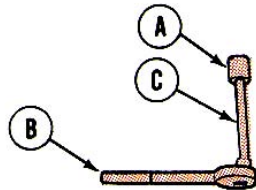
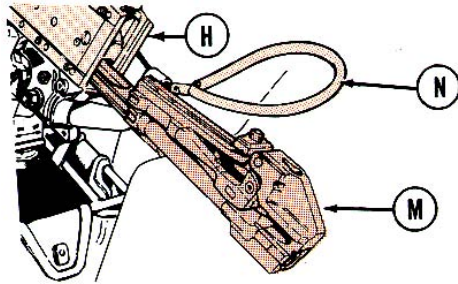
3. Push in and hold cover latches (K).



4. Raise cover (L).



**BORESIGHT WEAPONS (BORESIGHT 7.62-MM MACHINE GUN) - Continued**

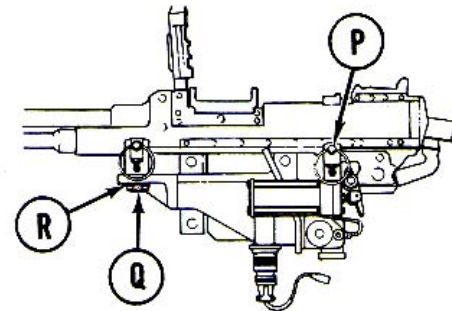


10. Using socket (A) and ratchet (B) with extension (C), loosen nut (Q).
11. Tighten nut (Q) until it touches washer (R), then tighten an additional 1/3 turn.

**NOTE**

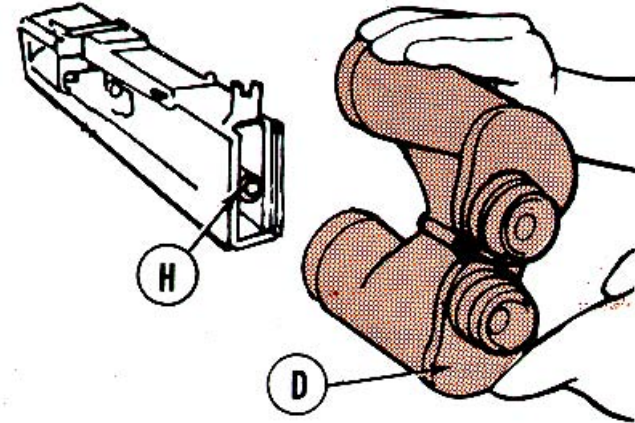
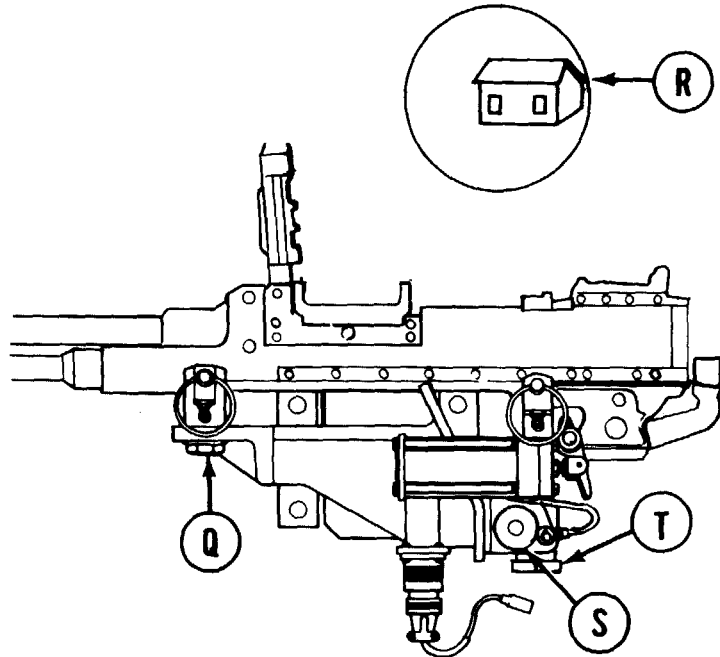
Put left hand against rear of receiver (H) to keep rod and bolt assembly (M) from falling from weapon.

5. Pull back charger handle (N).
6. Release charger handle (N).
7. Pull out on mounting pin (P) and lift up on rear machine gun.
8. Slide rod and bolt assembly (M) from receiver (H) and remove.
9. Place machine gun back in mount and engage rear mounting pin (P).



**BORESIGHT WEAPONS (BORESIGHT 7.62-MM MACHINE GUN) - Continued**

12. Using binoculars (D), look straight into rear of receiver (H) and through bore to sight the target (R).

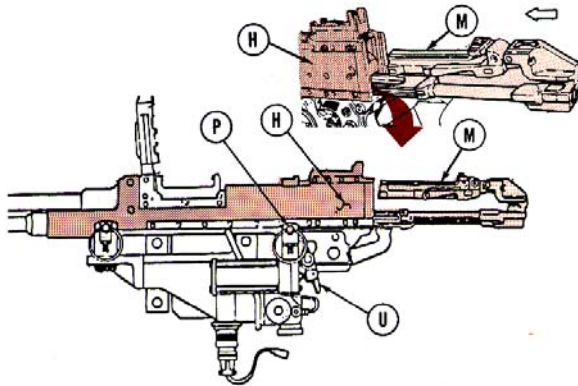


13. Rotate knob (S) to move bore either left or right and aline on target (R).
14. Rotate knob (T) to move bore either up or down and aline on target (R).
15. Tighten nut (Q). Bore should be alined on target (R), if not, repeat steps 8 through 14.

TA132550

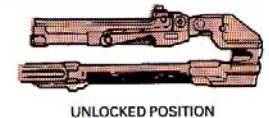
2-410

**BORESIGHT WEAPONS (BORESIGHT 7.62-MM MACHINE GUN) - Continued**



19. Push bolt of rod and bolt assembly (M) completely into receiver (H) while in unlocked position.
20. Lower machine gun into mount and engage rear mounting pin (P).

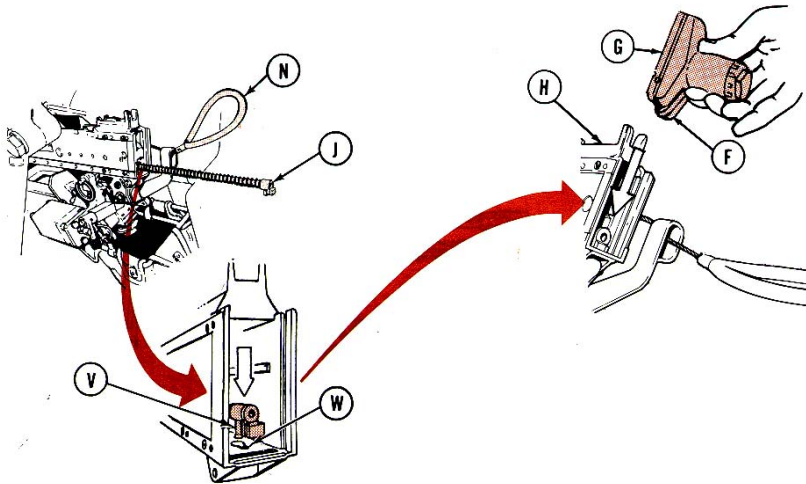
16. Remove rear mounting pin (P) and lift up on rear of machine gun.
17. Aline rod and bolt assembly (M) with receiver (H).
18. Push and hold trigger release (U).



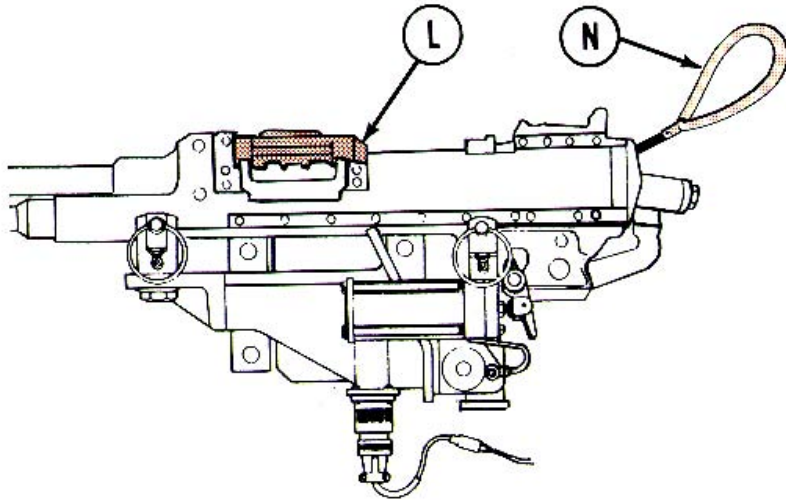
**BORESIGHT WEAPONS (BORESIGHT 7.62-MM MACHINE GUN) - Continued**

21. Aline drive spring (J) with hole in operating rod.
22. Push forward and down until pin (V) catches in keyhole (W) in bottom receiver (H).

23. Aline buffer (G) with receiver (H).
24. Push buffer (G) down until latch (F) locks.
25. Pull back charger handle (N) to lock bolt to rear
26. Release charger handle (N).



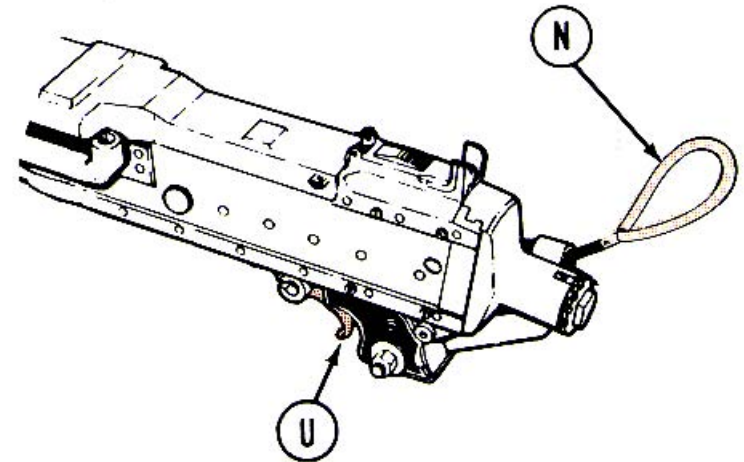
**BORESIGHT WEAPONS (BORESIGHT 7.62-MM MACHINE GUN) - Continued**



27. Close cover (L) and lock.

28. Pull charger handle (N) all way back and hold tightly.

29. Pull trigger release (U) and let charger handle (N) go forward slowly.

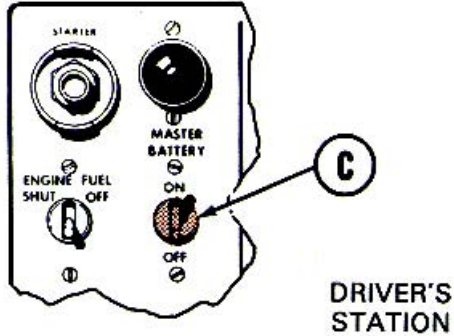


TA132553

30. Return tools and equipment to stowage.

**BORESIGHT WEAPONS (BORESIGHT 7.62-mm MACHINE GUN) - Continued**

To Aline Infinity Sight on Target:

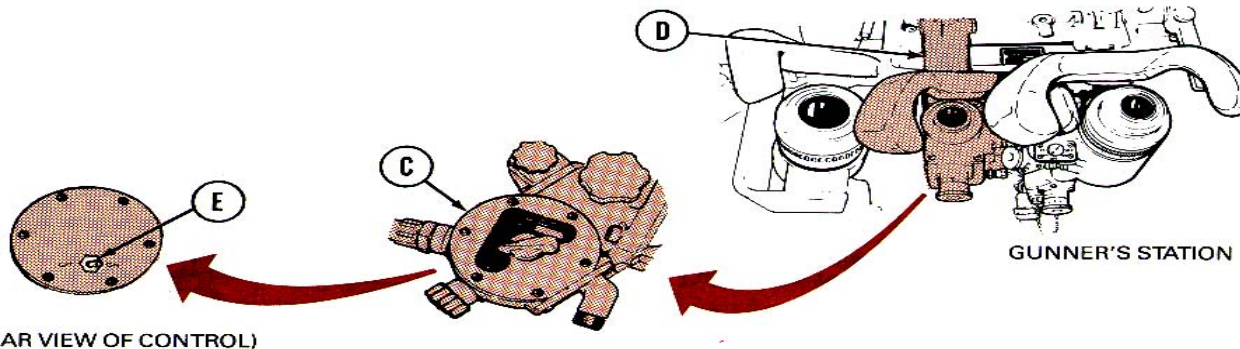


**Make Sure:**

- 7.62-mm machine gun has been boresighted (page 2-399 for M73 or page 2-406 for M240).

1. Set MASTER BATTERY switch (A) to ON, indicator (B) will light.

2. Locate infinity control (C) behind M32C or M32CE1 periscope (D).

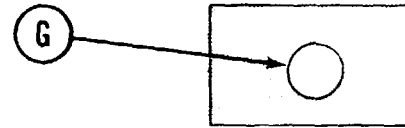
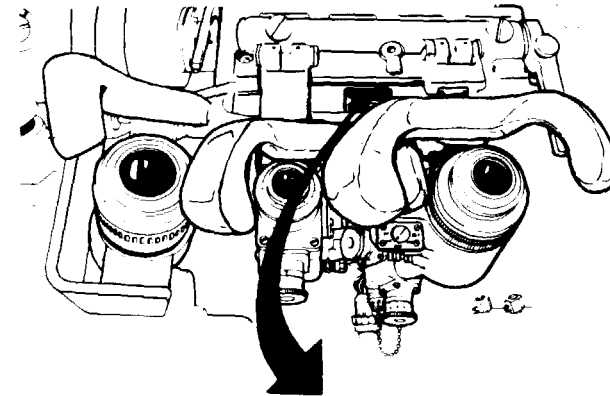
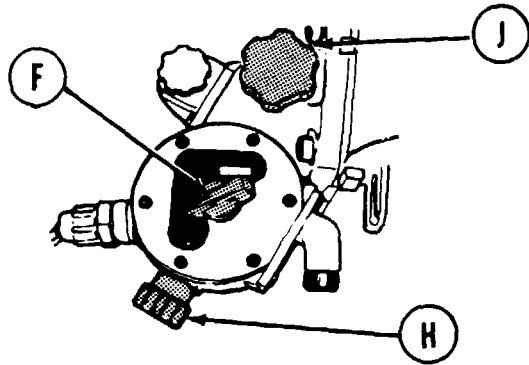


3. Reach behind infinity control (C), set toggle switch (E) to ON by pushing toward front of turret.

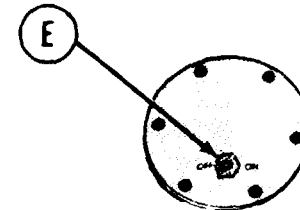


**BORESIGHT WEAPONS (BORESIGHT 7.62-MM MACHINE GUN) - Continued**

4. Looking thru unity window turn control knob (F) clockwise until infinity reticle (G) is clear and bright.
5. Rotate knob (H) to align reticle up or down on target.



6. Rotate knob (J) to align reticle left or right on target.
7. Push switch (E) toward back of turret to shut off infinity reticle..



(BACK OF INFINITY CONTROL)

**BORESIGHT WEAPONS (BORESIGHT CALIBER .50 MACHINE GUN)**

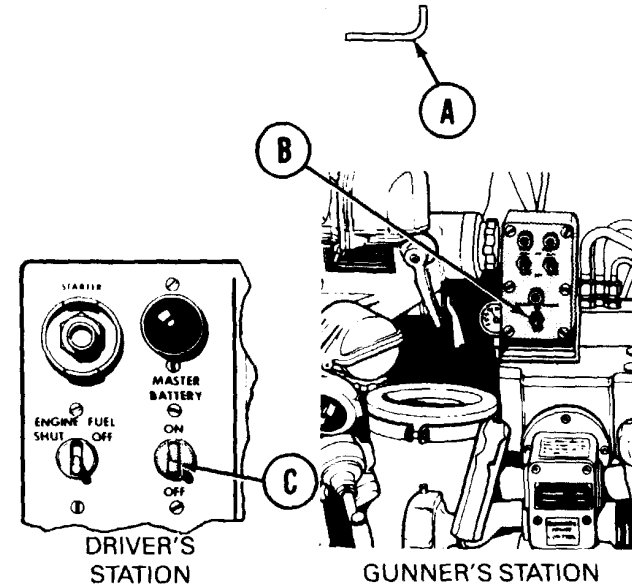
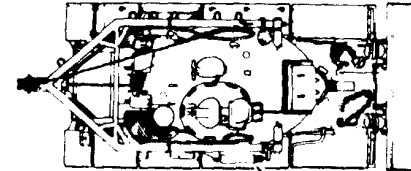
**Tools and Equipment:**

Get socket head screw key wrench (A) from right front fender box.

- Get M22 binoculars from binocular box in commander's station.

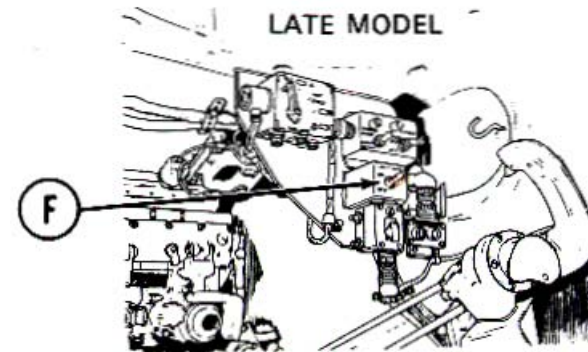
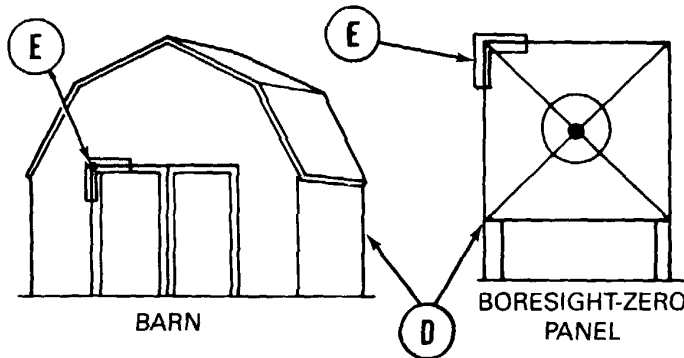
**Make Sure:**

- Synchronization check has been done by organizational maintenance within the last 90 days (quarterly).
- Vehicle is parked on as firm and level ground as possible.
- Parking brake is set (page 2-214).
- Pages 2-324 thru 2-372 of prepare for firing have been performed.
- Machine gun is unloaded and bolt is forward (page 2-553).
- ELEV/TRAV POWER switch (B) is set to OFF.
- MASTER BATTERY switch (C) is set to ON.

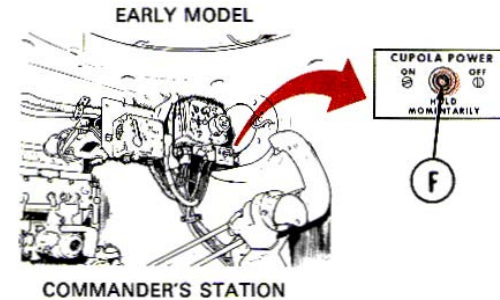


**BORESIGHT WEAPONS (BORESIGHT CALIBER .50 MACHINE GUN) - Continued**

1. Select target according to following requirements:
  - a. Target (D) should be at known range as close to 500 meters as possible.
  - b. Target (D) should have a clearly defined right angle (E) to aline weapons and sights.



2. Push CUPOLA POWER switch (F) to OFF, hold momentarily, then release.



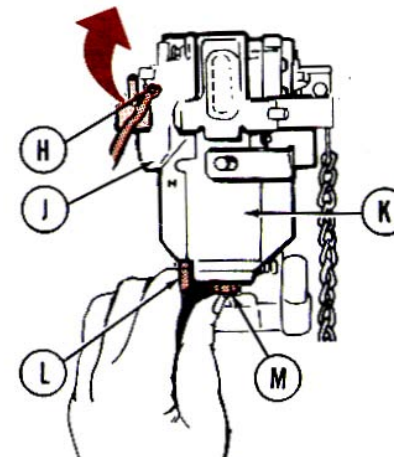
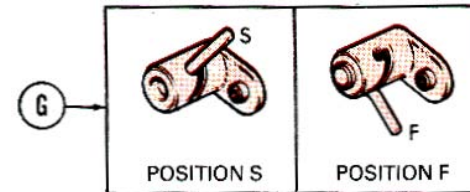
3. Remove M36 periscope IR and daylight body (page 3-211) or M36E1 periscope passive and daylight body (page 3-210.3).

**BORESIGHT WEAPONS (BORESIGHT CALIBER .50 MACHINE GUN) - Continued**

**WARNING**

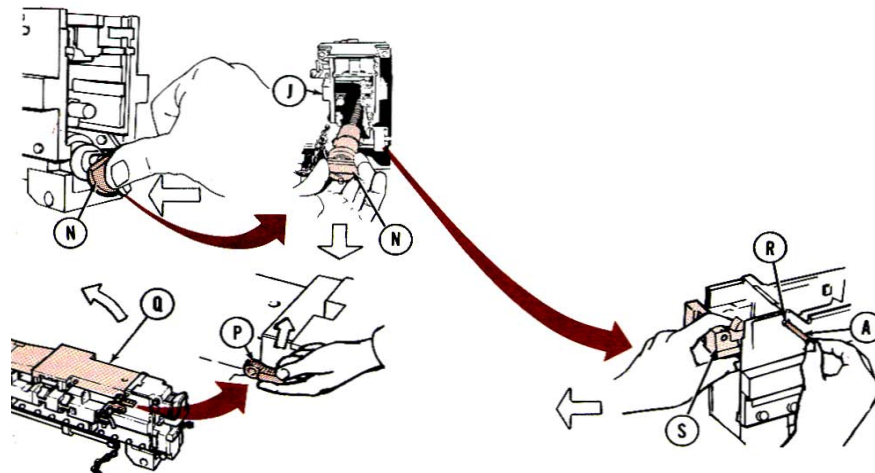
**Bolt must be forward before removing back plate**

4. Set machine gun safety (G) to F. Allow bolt to move slowly forward using the charging handle and manual firing trigger.
5. Pull electrical solenoid lead (H) from receiver (J).
6. Elevate machine gun (page 2-470) to allow removal of back-plate (K).
7. Use left hand to push in lock (L). Raise latch (M) and lift back-plate (K) from receiver.



COMMANDER'S STATION

**BORESIGHT WEAPONS (BORESIGHT CALIBER .50 MACHINE GUN) - Continued**



9. Push in and turn guide rod (N). Guide rod will spring out.
10. Pull back guide rod (N) and springs and remove from receiver (J)
11. Lift latch (P). Raise and hold cover (Q) as high as possible to allow removal of following parts:
  - a. Use a socket head screw key wrench (A) or similiar tool to fit hole (R). Push tool into hole. Slide sear (S) back and remove from receiver

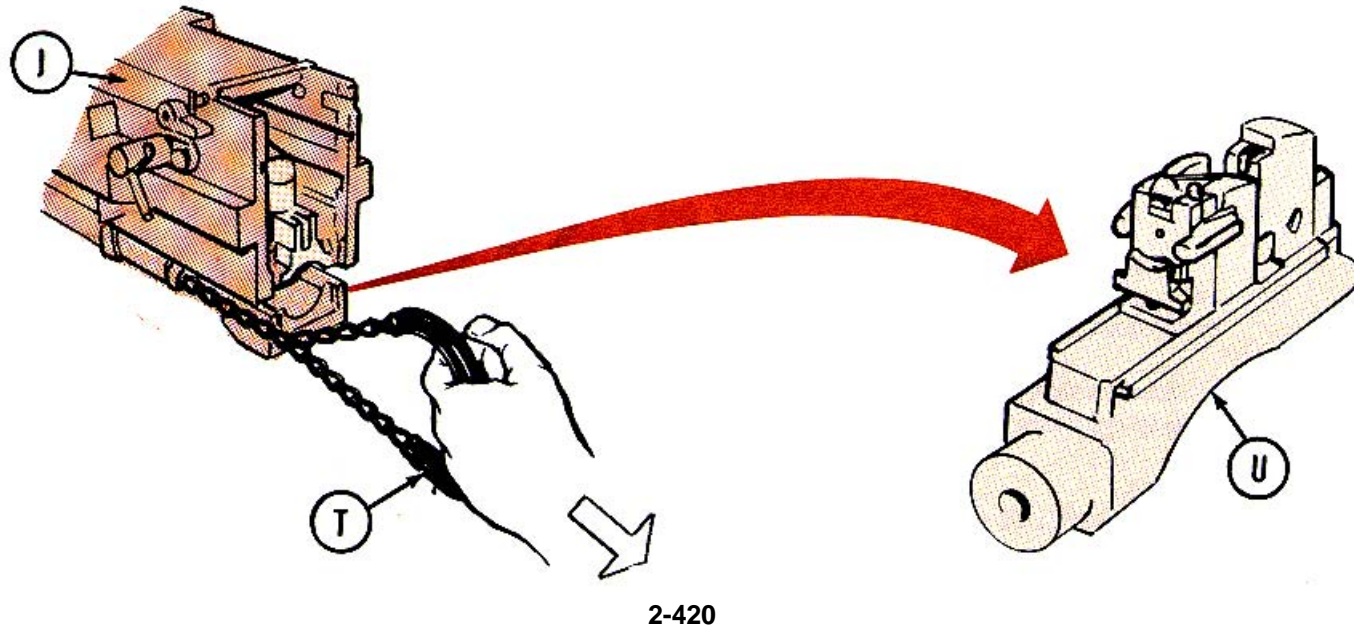
TA132559

2-419

**BORESIGHT WEAPONS (BORESIGHT CALIBER .50 MACHINE GUN) - Continued**

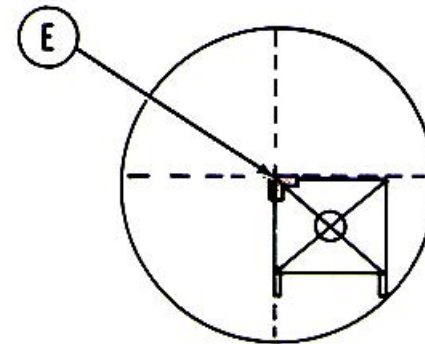
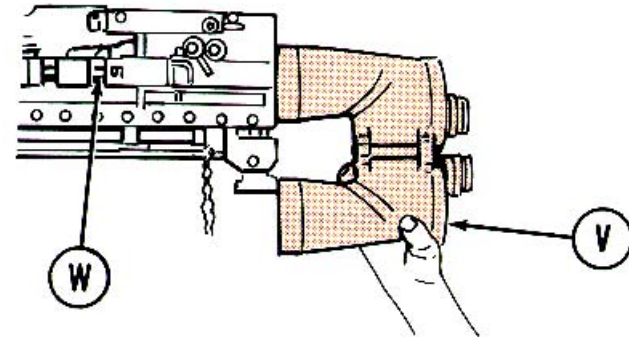
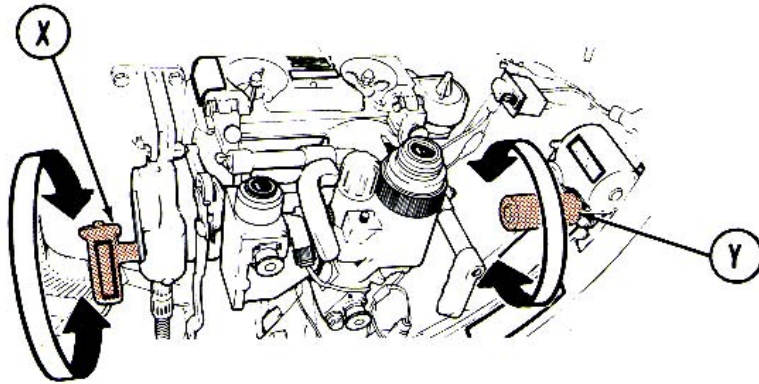
b. Pull black charging handle (T) back. Remove bolt (U) from receiver (J).

12. Unlock cupola (page 2-332).



**BORESIGHT WEAPONS (BORESIGHT CALIBER .50 MACHINE GUN) - Continued**

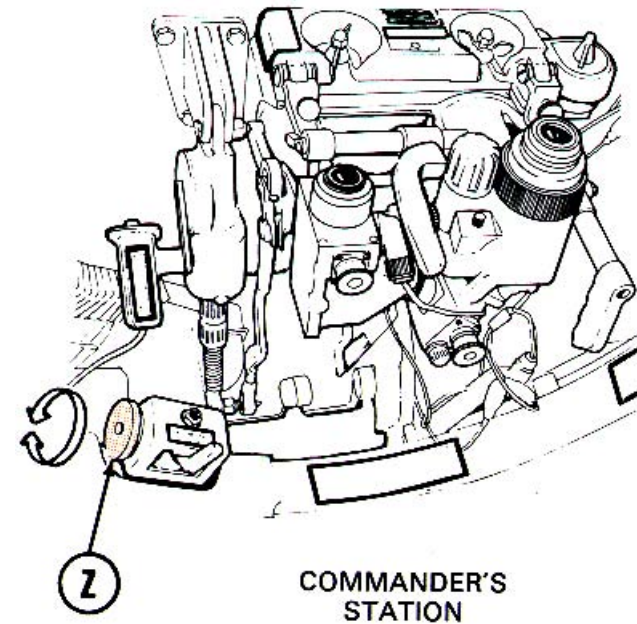
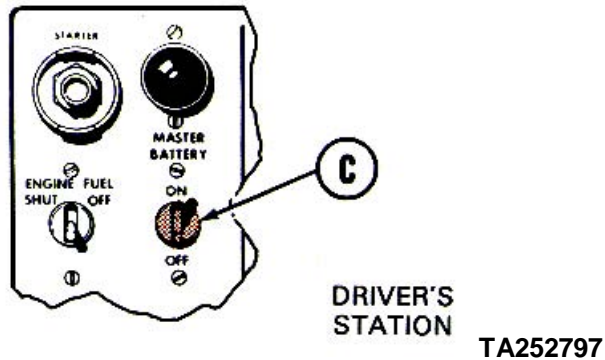
13. While holding binoculars (V) against rear of machine gun (W), sight down barrel.
14. While sighting down barrel, turn cupola elevation handle (X) and traversing handle (Y) until target right angle (E) is in center of barrel as shown.



TA132561

**BORESIGHT WEAPONS (BORESIGHT CALIBER .50 MACHINE GUN) - Continued**

15. Lock cupola (page 2-569).
16. Turn AZIMUTH adjustment knob (Z) if further alinement is needed.
17. Install M36 periscope IR and daylight body (page 3-221) or M36E1 periscope passive and daylight body (page 3-220.4).



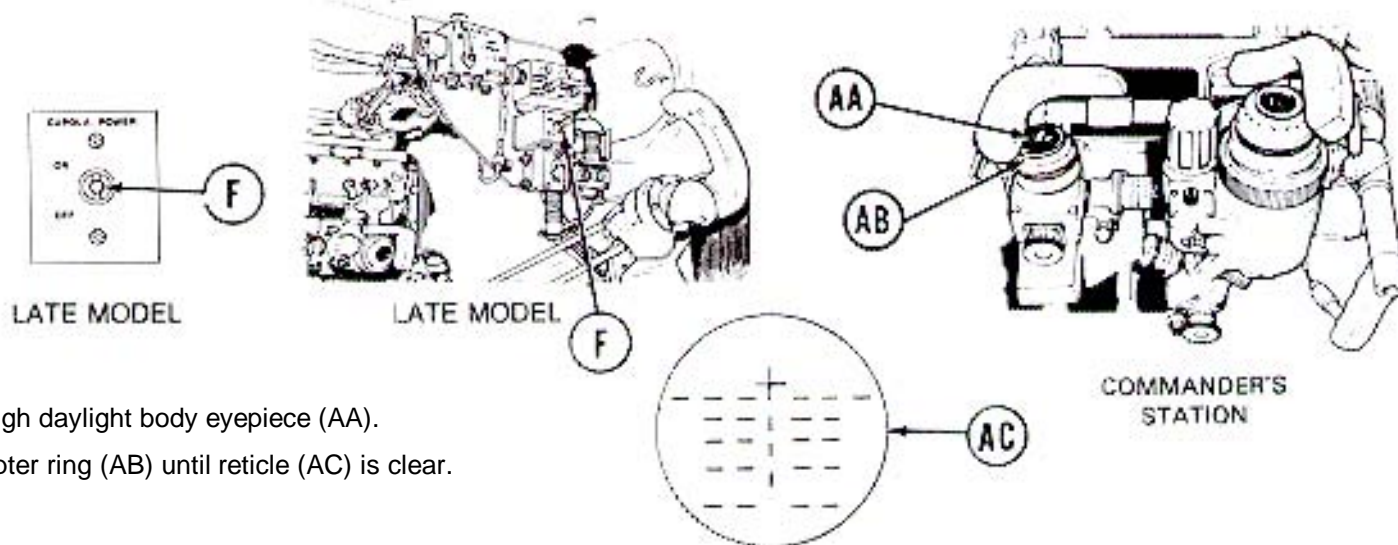
**To Aline Daylight Body of M36 or M36E1 Periscope On Target:**

18. Set MASTER BATTERY switch (C) to ON.



**BORESIGHT WEAPONS (BORESIGHT CALIBER .50 MACHINE GUN) - Continued**

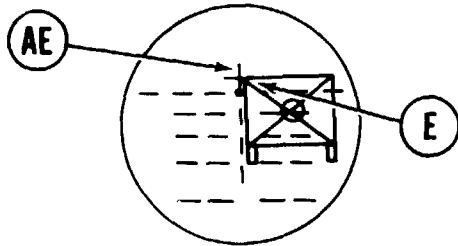
19. Push CUPOLA POWER switch (F) to ON, hold momentarily, then release.



20. Sight through daylight body eyepiece (AA).
21. Rotate diopter ring (AB) until reticle (AC) is clear.

**BORESIGHT WEAPONS (BORESIGHT CALIBER .50 MACHINE GUN) - Continued**

22. Pull down and turn elevation knob (AD) to raise or lower reticle. Aline boresight cross (AE) on target right angle (E).

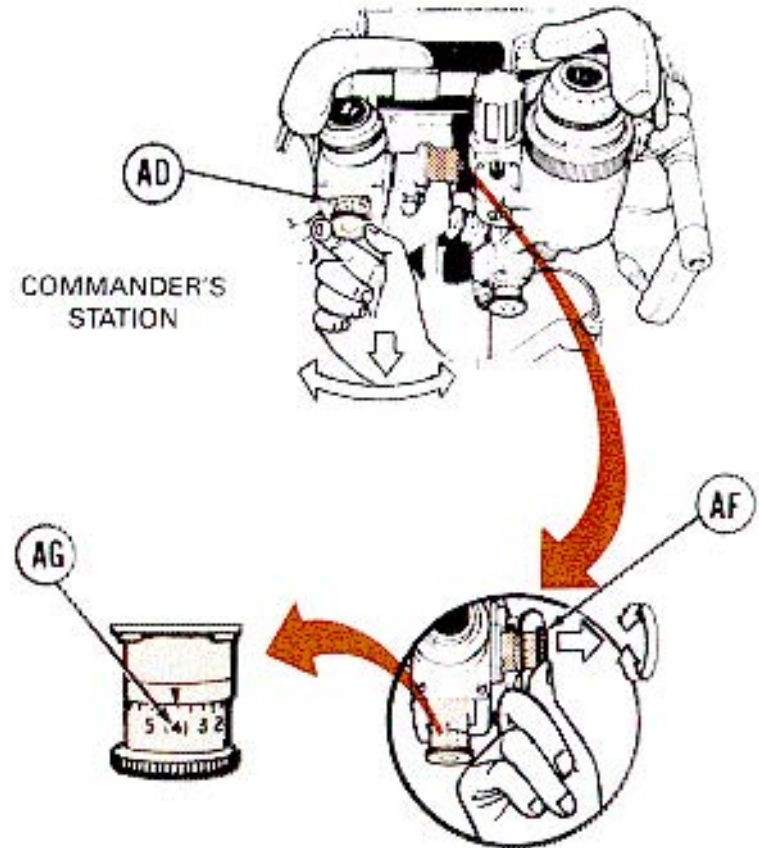


23. Pull out and turn deflection knob (AF) to move reticle left or right. Aline boresight cross (AE) on target right angle (E).

**NOTE**

**Do not allow elevation knob (AD) and deflection knob (AF) to move when setting slip scales (AG) to 4.**

24. Rotate slip scales (AG) on elevation knob (AD) and deflection knob (AF) so each reads 4.



**BORESIGHT WEAPONS (BORESIGHT CALIBER .50 MACHINE GUN) - Continued**

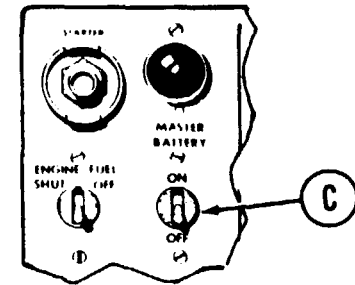
**To Restore Equipment To Operating Condition:**

25. Set MASTER BATTERY switch (C) to OFF.

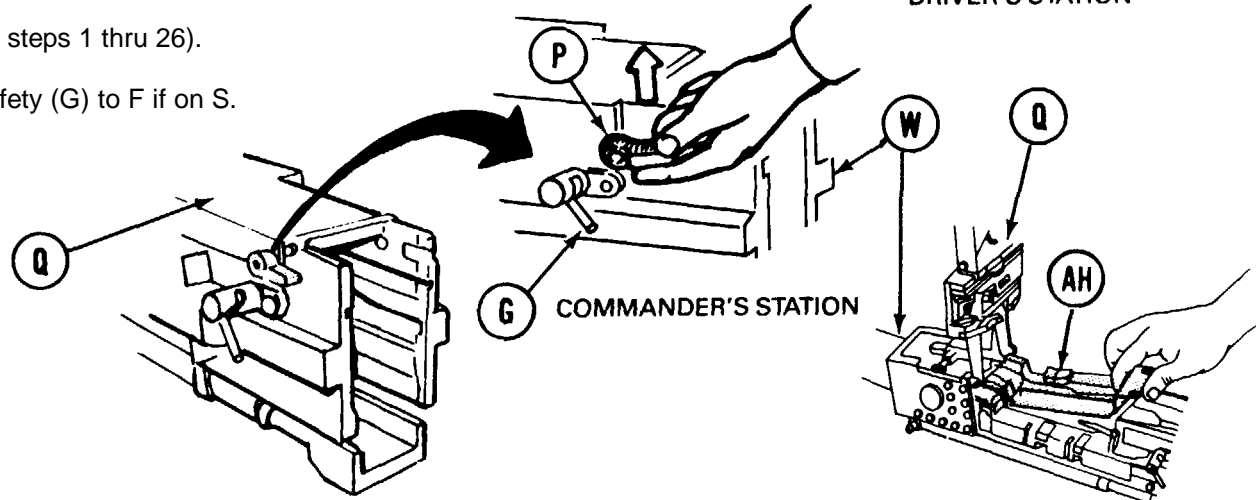
**NOTE**

**Be careful that elevation and deflection knobs are not turned when removing periscope or replacing periscope.**

26. Elevate machine gun (W) to maximum elevation (page 2-578, steps 1 thru 26).
27. Remove periscope (page 2-578, steps 1 thru 26).
28. Set machine gun mechanical safety (G) to F if on S.
29. Lift latch (P). Raise cover (Q).
30. Raise feed tray (AH).

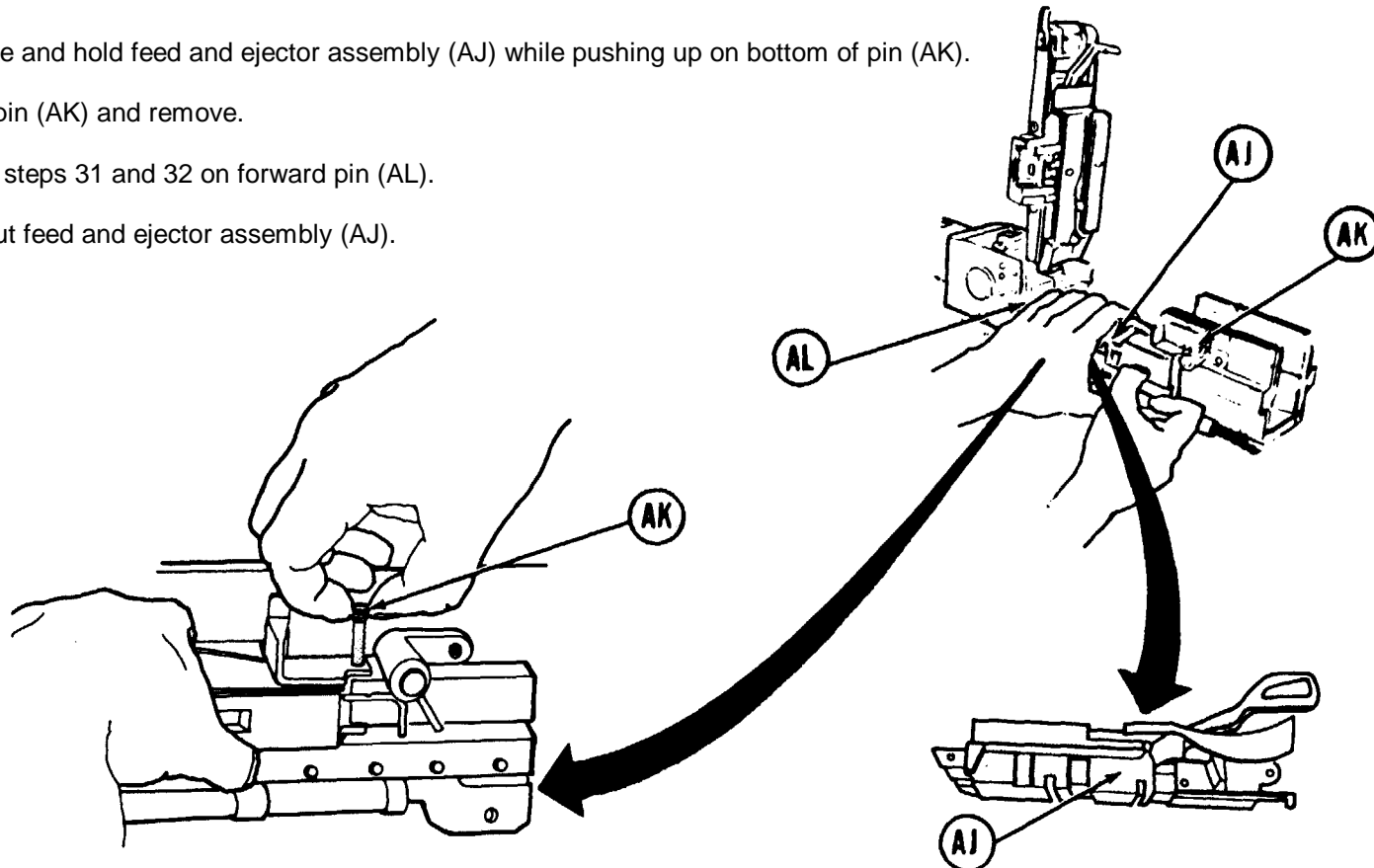


**DRIVER'S STATION**



**BORESIGHT WEAPONS (BORESIGHT CALIBER .50 MACHINE GUN} - Continued**

31. Squeeze and hold feed and ejector assembly (AJ) while pushing up on bottom of pin (AK).
32. Grasp pin (AK) and remove.
33. Repeat steps 31 and 32 on forward pin (AL).
34. Slide out feed and ejector assembly (AJ).

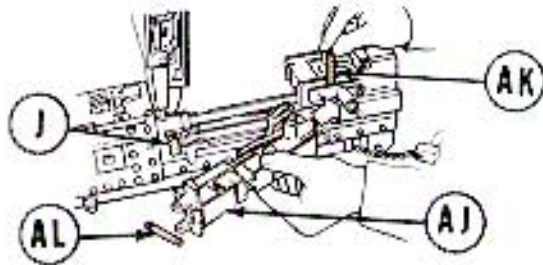
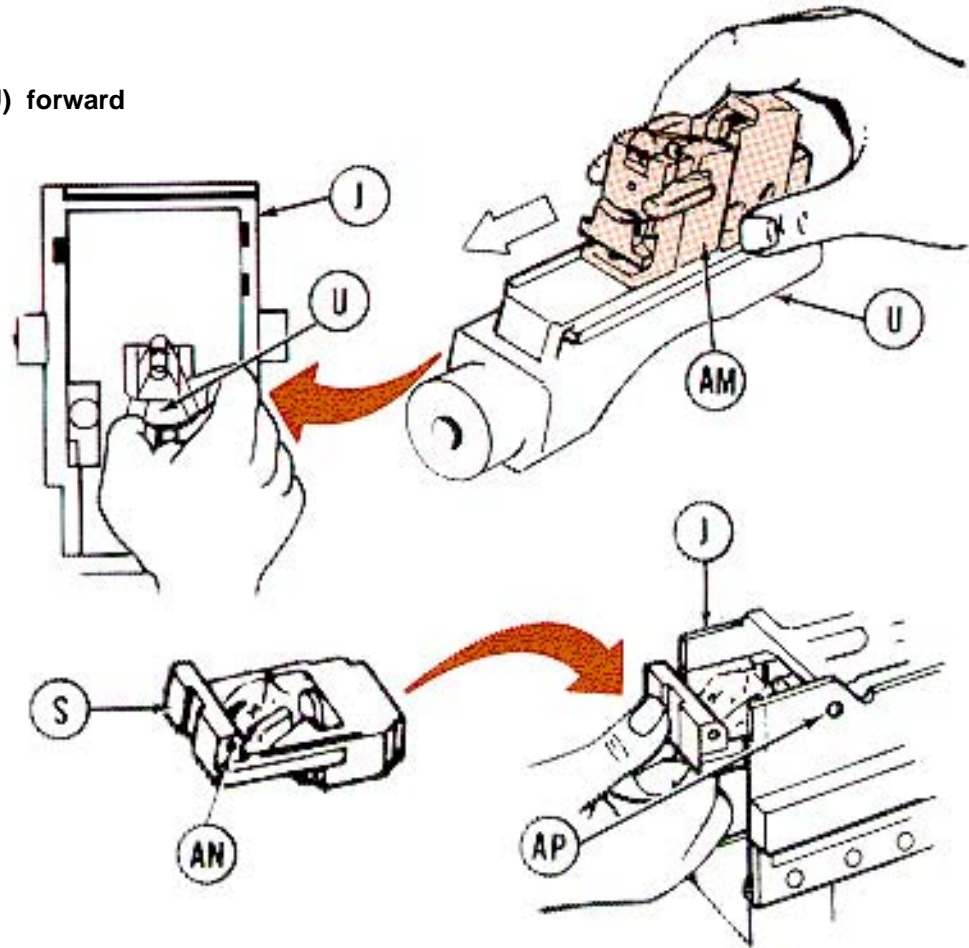


**BORESIGHT WEAPONS (BORESIGHT CALIBER .50 MACHINE GUN) - Continued**

**NOTE**

**Keep hinged portion (AM) of bolt assembly (U) forward until bolt assembly is fully forward.**

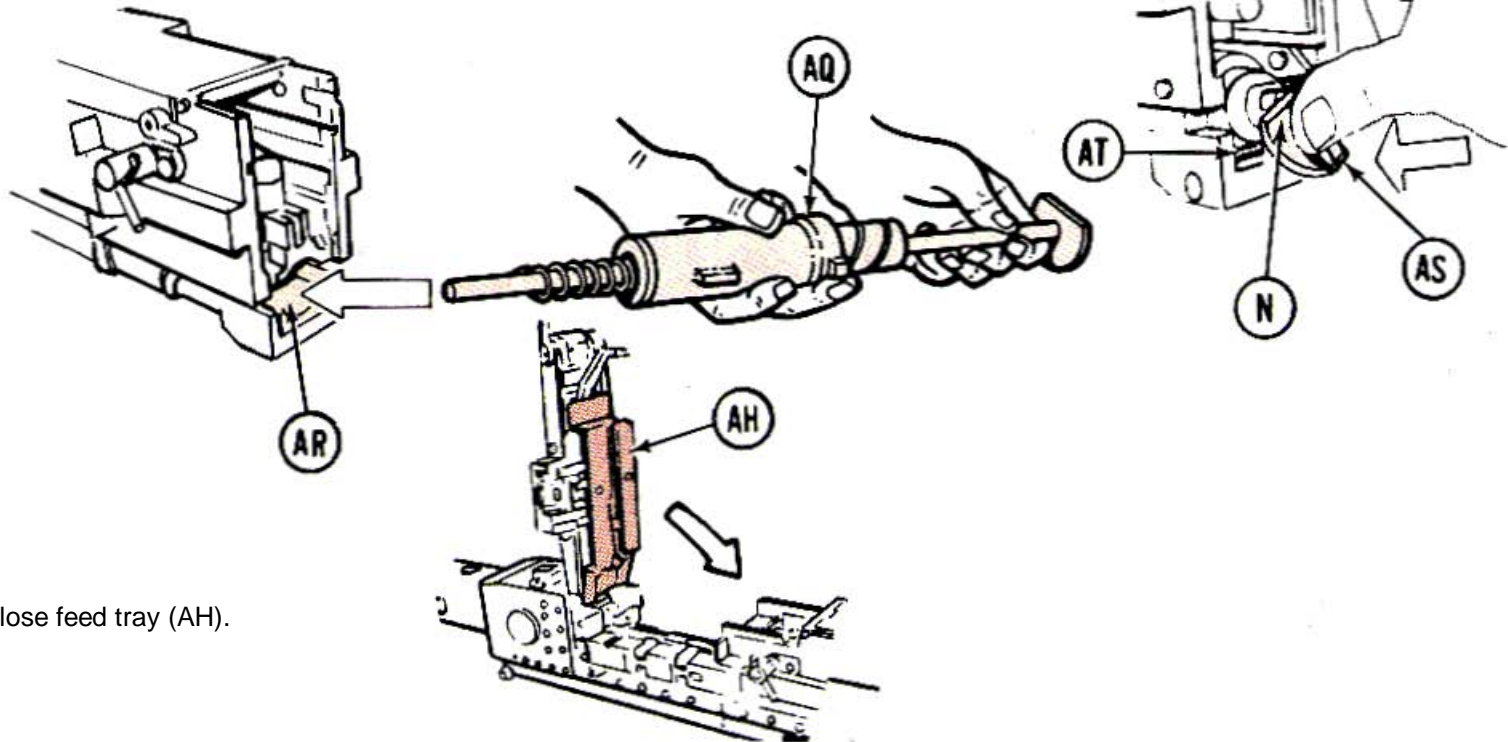
- 35. Push and slide portion (AM) of bolt assembly (U) forward and hold.
- 36. Slide bolt assembly (U) with portion (AM) forward into receiver (J) as far as it will go and release.
- 37. Install feed and ejector assembly (AJ).
- 38. Install pins (AK) and (AL), push down until heads are flush with receiver (J).



- 39. Aline sear assembly (S) with receiver (J). Push sear (S) forward until pin (AN) snaps into hole (AP).

**BORESIGHT WEAPONS (BORESIGHT CALIBER .50 MACHINE GUN) - Continued**

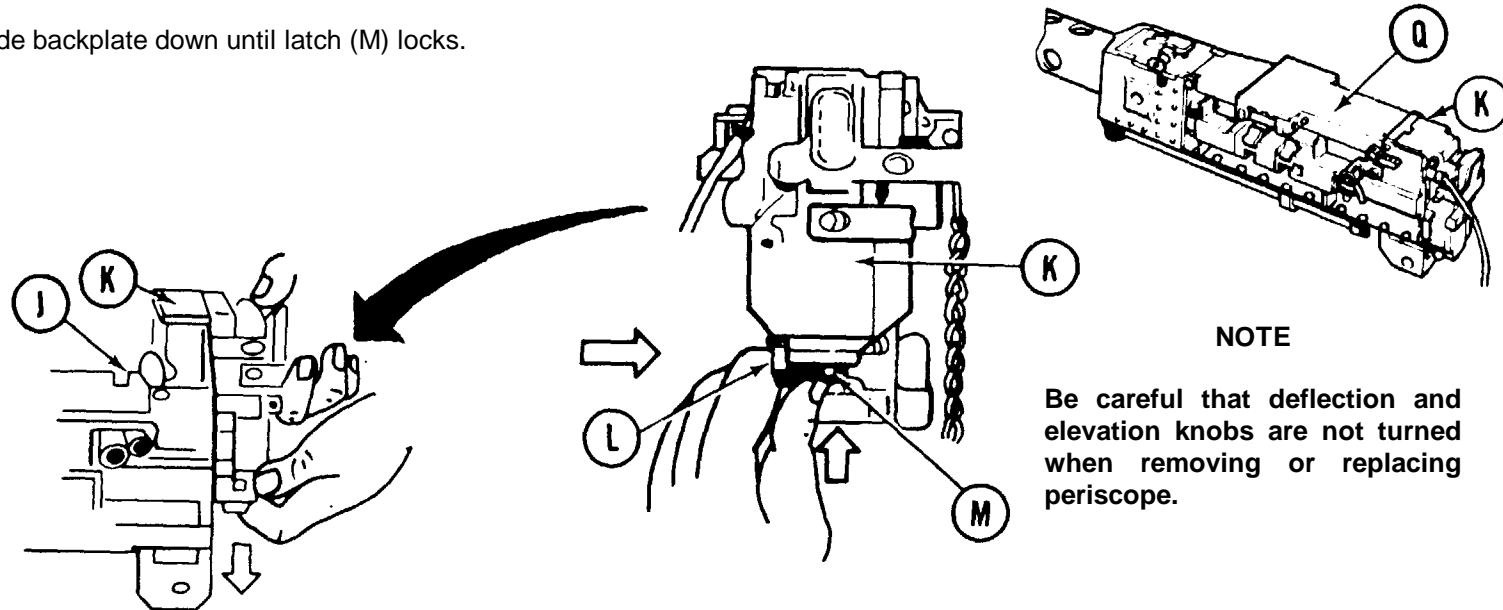
- 40. Aline buffer group (AQ) with recess (AR). Push buffer (AQ) forward until latch (AS) is alined with slot (AT).
- 41. Turn guide rod (N) to lock latch (AS) into slot (AT).



- 42. Close feed tray (AH).

**BORESIGHT WEAPONS (BORESIGHT CALIBER .50 MACHINE GUN) - Continued**

43. Close machine gun cover (Q).
44. Grasp backplate (K), hold in lock (L), and latch (M).
45. Aline backplate (K) with receiver (J).
46. Slide backplate down until latch (M) locks.



47. Install machine gun and periscope (page 2-344, steps 5 thru 26).
48. Return tools and equipment to stowage.

**BORESIGHT WEAPONS (BORESIGHT SEARCHLIGHT)****NOTE**

Perform searchlight boresighting at dusk.

**Tools:**

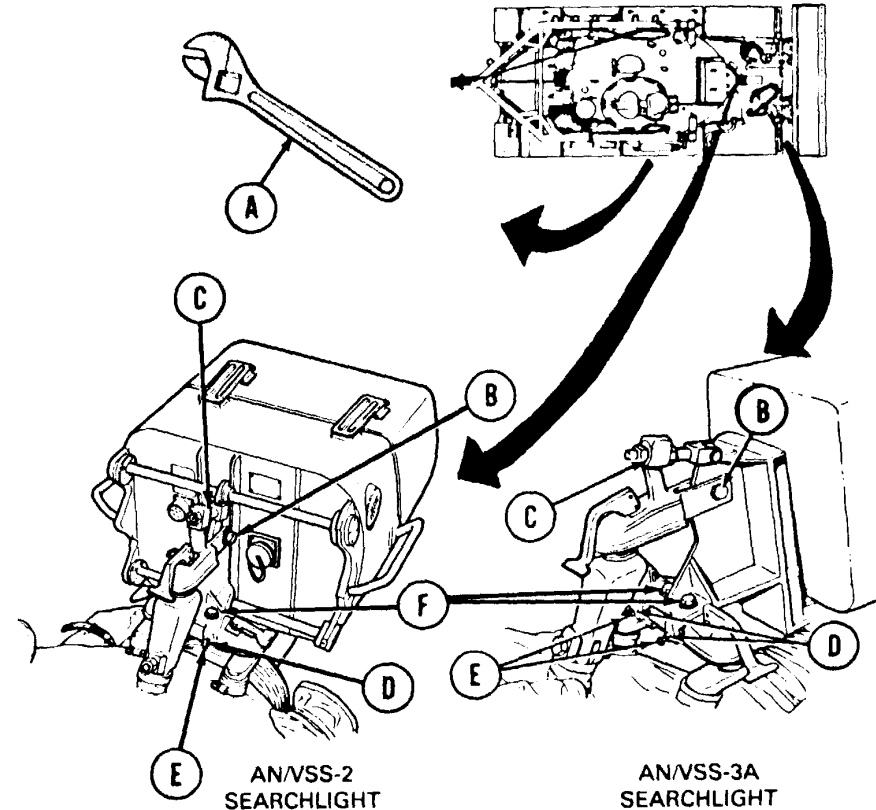
Get 12 inch adjustable wrench (A) from right front fender box.

**Make Sure:**

- Searchlight is installed AN/VSS-3A (page 3-271) or AN/VSS-2 (page 3-265).
- Engine is running at 1500 rpm (page 2-205).
- 7.62-mm machine gun is boresighted or M240 (page 2-406).
- Infinity sight is alined on target (page 2-449).

**Loader:**

1. Using 12 inch adjustable wrench (A):
  - a. Loosen nut (B).
  - b. Loosen elevation adjusting nut (C).
  - c. Loosen jamnuts (D) on horizontal adjusting screws (E).
  - d. Loosen clamp screws (F).

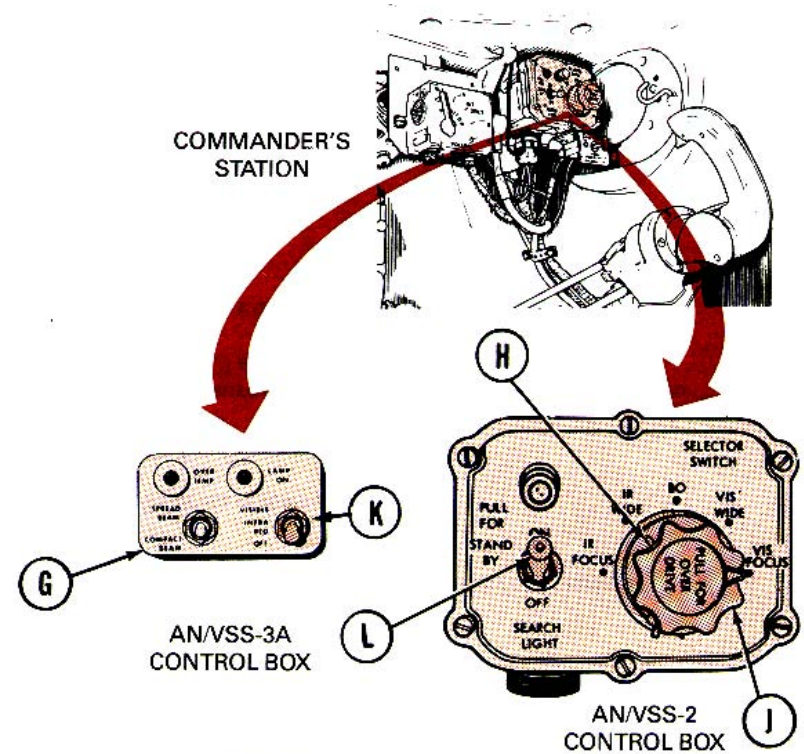
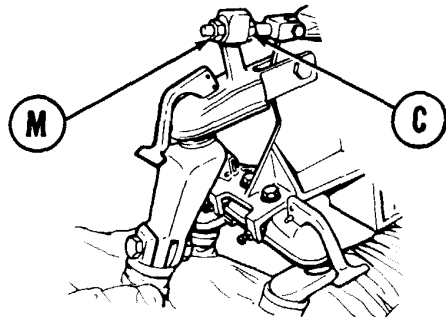




**BORESIGHT WEAPONS (BORESIGHT SEARCHLIGHT) - Continued**

**Commander:**

2. Set xenon searchlight master control to remote (TM 11-5855-217-12-1) (AN/VSS-3A only).
3. Select searchlight beam:
  - If equipped with AN/VSS-3A, set switch (G) to COMPACT BEAM.
  - If equipped with AN/VSS-2, press pin (H) and turn SELECTOR SWITCH (J) to VIS FOCUS.
4. Turn on searchlight:
  - If equipped with AN/VSS-3A, set switch (K) to VISIBLE.
  - If equipped with AN/VSS-2, pull out and set SEARCHLIGHT switch (L) to ON.



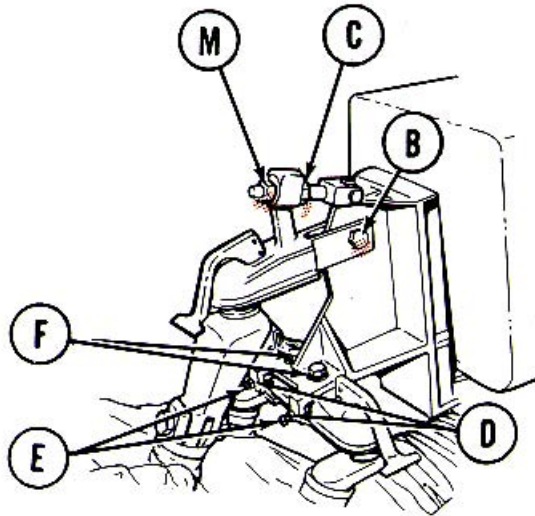
**Loader:**

5. Turn nut (M) to move light up or nut (C) to move light down on target.

**BORESIGHT WEAPONS (BORESIGHT SEARCHLIGHT) - Continued**

**Loader:**

6. Aline light left or right on target by turning screws (E).



7. Aline searchlight to target by turning jamnut (M) or screws (E).
8. Tighten screws (F).
9. Tighten jamnuts (D).
10. Make sure searchlight is still alined, then tighten nuts (C) and (M).
11. Tighten nut (B).

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**BORESIGHT WEAPONS (BORESIGHT SEARCHLIGHT) - Continued**

**Commander:**

12. Turn off searchlight:
  - If equipped with AN/VSS-3A, set switch (K) to OFF.
  - If equipped with AN/VSS-2, turn SELECTOR SWITCH (J) to BO. Set SEARCHLIGHT switch (L) to OFF.

**CAUTION**

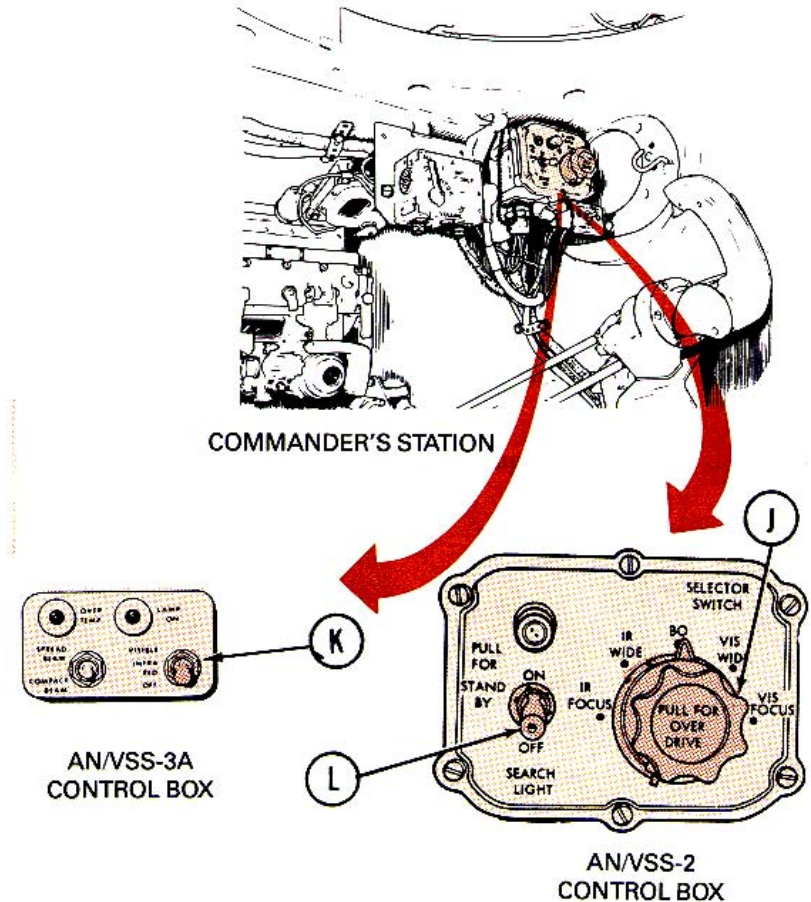
**Wait until blower motor stops running before turning off MASTER BATTERY switch to prevent damage to searchlight.**

**Driver:**

13. Set MASTER BATTERY switch to OFF.

**Loader:**

14. Return wrench to stowage.



**ZERO SIGHTS (PERFORM INITIAL ZERO)****NOTE**

**This procedure is for establishing initial zero. Once an accurate zero has been established and recorded for each sight, it is unnecessary to repeat initial zeroing unless:**

- **Gun tube is changed.**
- **Gun sight linkage is moved.**
- **All sights are removed at once.**

To zero sight that has been removed or replaced, go to page 2-447. Zeroing requires all four crewmembers at their stations.

Title of crewmember before steps (example, Commander:) will be crewmember that does steps underneath.

For more information on zeroing, see chapter 4 of FM 17-12.

**ZERO SIGHTS (PERFORM INITIAL ZERO) - Continued**

**Make Sure:**

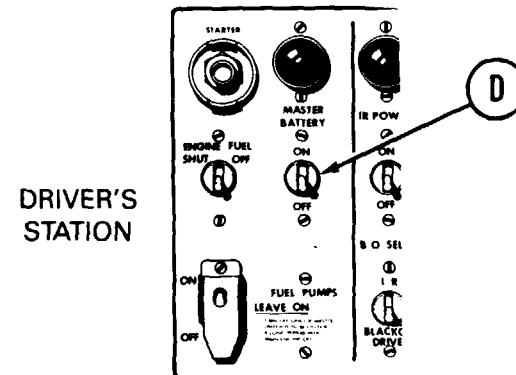
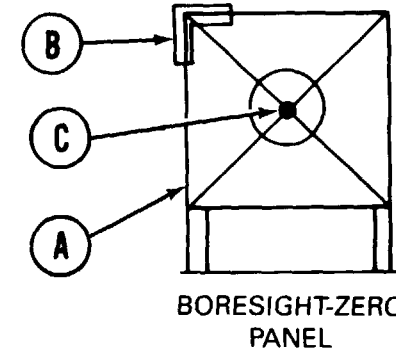
- Vehicle is parked on as firm and level ground as possible.
- Weapons and sights are boresighted and synchronized (page 2-390).
- Vehicle is prepared for firing (page 2-324 thru 2-372).
- Intercom is turned on (page 2-169).
- All hatches are closed, commander's (page 2-161), loader's (page 2-154), driver's (page 2-166).
- Indicator tape on replenisher shows one smooth edge and one rough edge (2-108).

**Commander:**

1. Select target according to following requirements:
  - a. Target (A) should be at known range as close to 600 meters as possible.
  - b. Target (A) should have a clearly defined right angle (B) for referring sights.
  - c. Target should have aiming point (C) surrounded by solid mass to see where rounds hit.
2. Identify selected target (A) to gunner.

**Driver:**

3. Set MASTER BATTERY switch (D) to ON.



**ZERO SIGHTS (PERFORM INITIAL ZERO) - Continued**

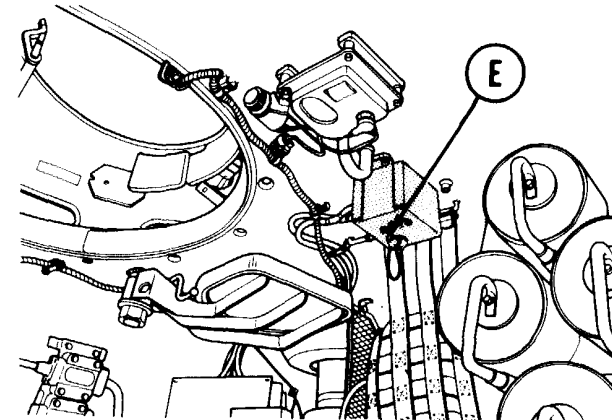
**Loader:**

4. Set turret ventilating BLOWER switch (E) to ON.

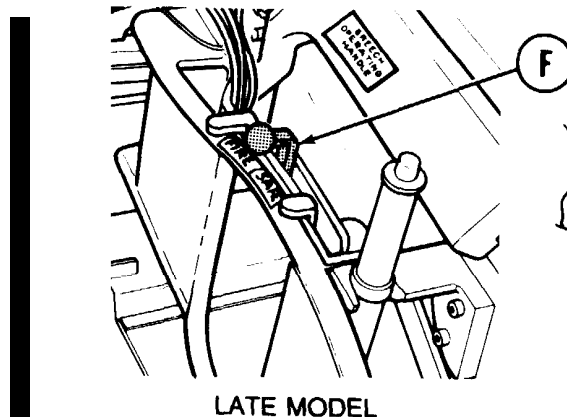
**NOTE**

**Steps 5 thru 8 will be repeated three times to get a three round shot group.**

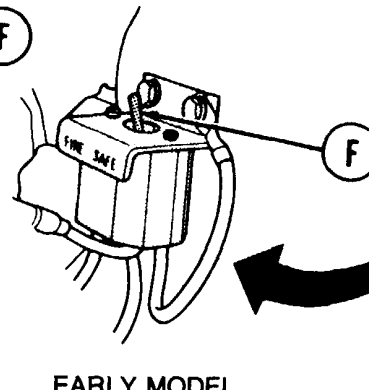
5. Load 165-mm main gun with HEP ammunition (page 2-496). If possible use ammunition of same lot number for all rounds fired during zeroing. Be sure to set main gun safety switch (F) to FIRE.



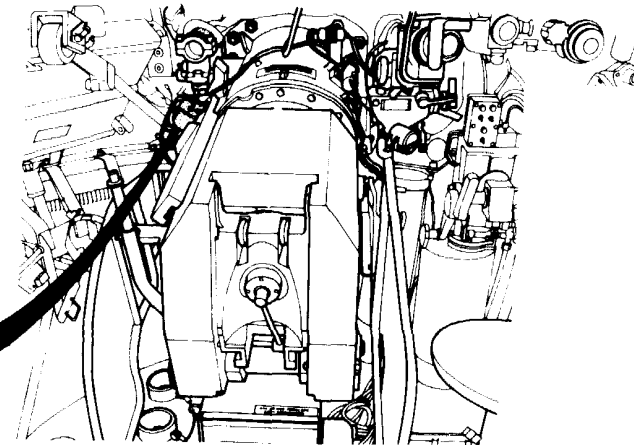
**TURRET ROOF**



**LATE MODEL**



**EARLY MODEL**



**LOADER'S STATION**

**ZERO SIGHTS (PERFORM INITIAL ZERO) - Continued**

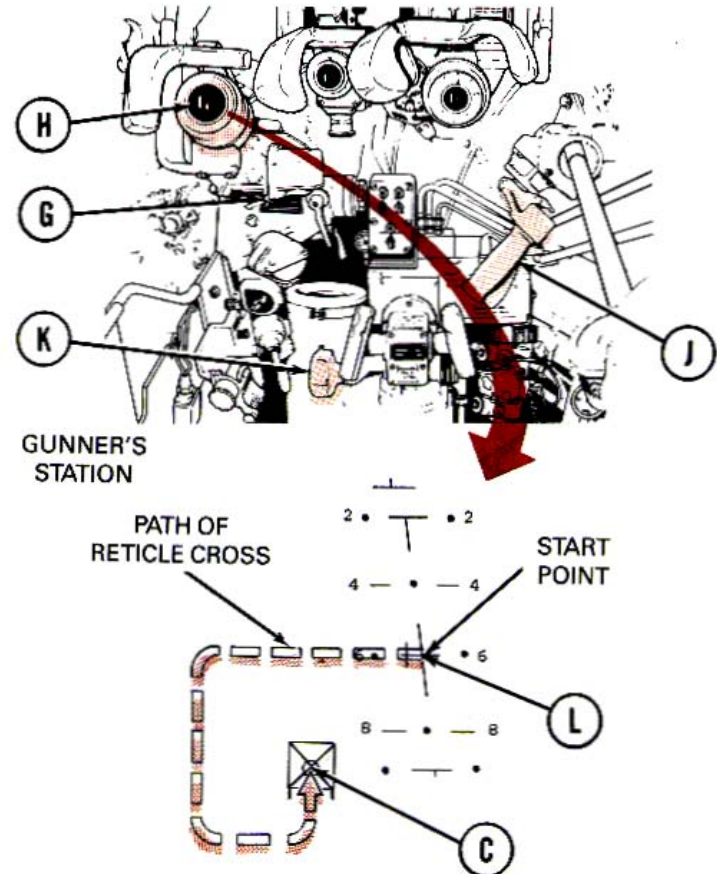
**Gunner:**

6. Set telescope reticle selector (G) to right.
7. Look through telescope eyepiece (H) while doing step 8. Use MANUAL TRAVERSE handle (J) and MANUAL ELEVATION CONTROL handle (K) to move reticle 600 meter aiming cross (L).

**NOTE**

The following method for aligning reticle 600 meter aiming cross (L) on target aiming point (C) will be referred to as the G-box method. Note the path of the aiming cross (L) outlined below in brown roughly forms the letter G and boxes in the aiming point. This method eliminates backlash error from manual control mechanisms

8. Move reticle 600 meter aiming cross (L) on a path, like one shown in brown below, around and onto aiming point (C) as follows:
  - a. Bring 600 meter aiming cross to start point above and right of aiming point.
  - b. Bring 600 meter aiming cross above and left of aiming point.
  - c. Then down below aiming point.
  - d. Then right to directly under aiming point.
  - e. Then up and exactly on aiming point being careful not to overtravel it. If you overtravel it, repeat 8a through 8e.



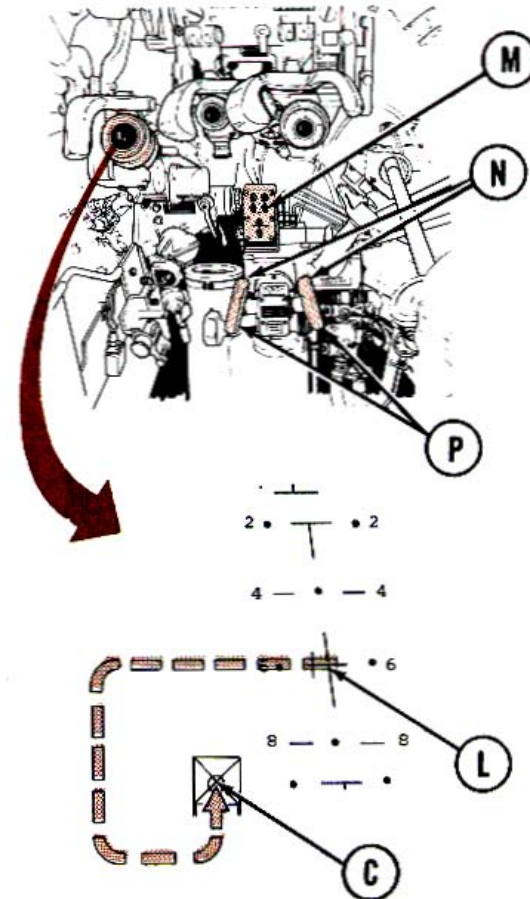
**ZERO SIGHTS (PERFORM INITIAL ZERO) - Continued**

**WARNING**

**When firing main gun, all hatches must be closed to protect crew from burst of rounds.**

**Gunner:**

9. Wait for commander's order to fire. Upon order to fire:
  - a. Set MAIN GUN switch (M) to ON.
  - b. Press either firing trigger (N) on GUNNER'S POWER CONTROL handles (P). Main gun will fire.
  - c. Set MAIN GUN switch (M) to OFF.
10. Repeat steps 5 through 9 two more times to get a three-round shot group. After third round is fired, use G-box method to align reticle 600 meter aiming cross (L) on target aiming point (C). Continue with step 11.

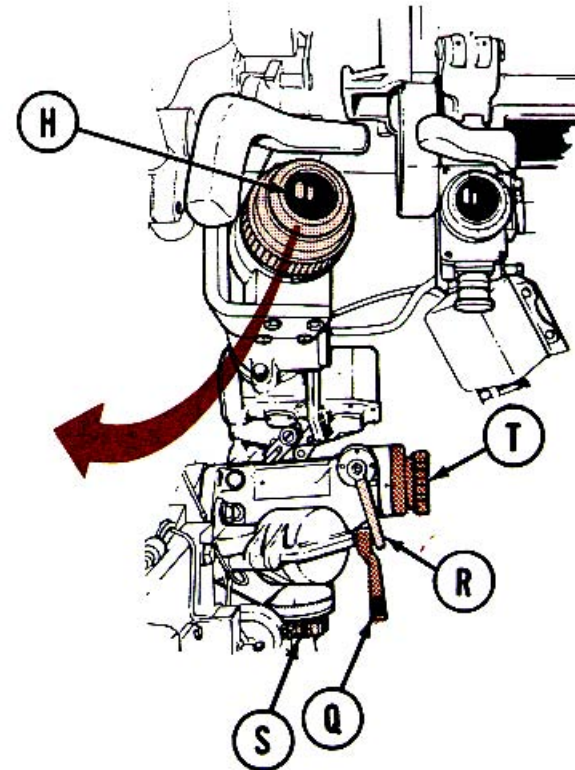
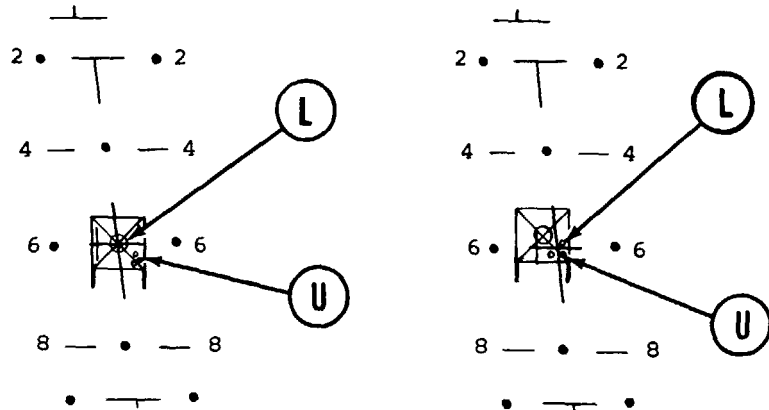




**ZERO SIGHTS (PERFORM INITIAL ZERO) - Continued**

**Gunner:**

11. Unlock telescope elevation lock (Q) and deflection lock (R).
12. Look through telescope eyepiece (H).
13. Turn telescope elevation knob (S) and deflection knob (T) to align 600 meter aiming cross (L) to center of three-round shot group (U).
14. Lock elevation lock (Q) and deflection lock (R).



**GUNNER'S STATION**

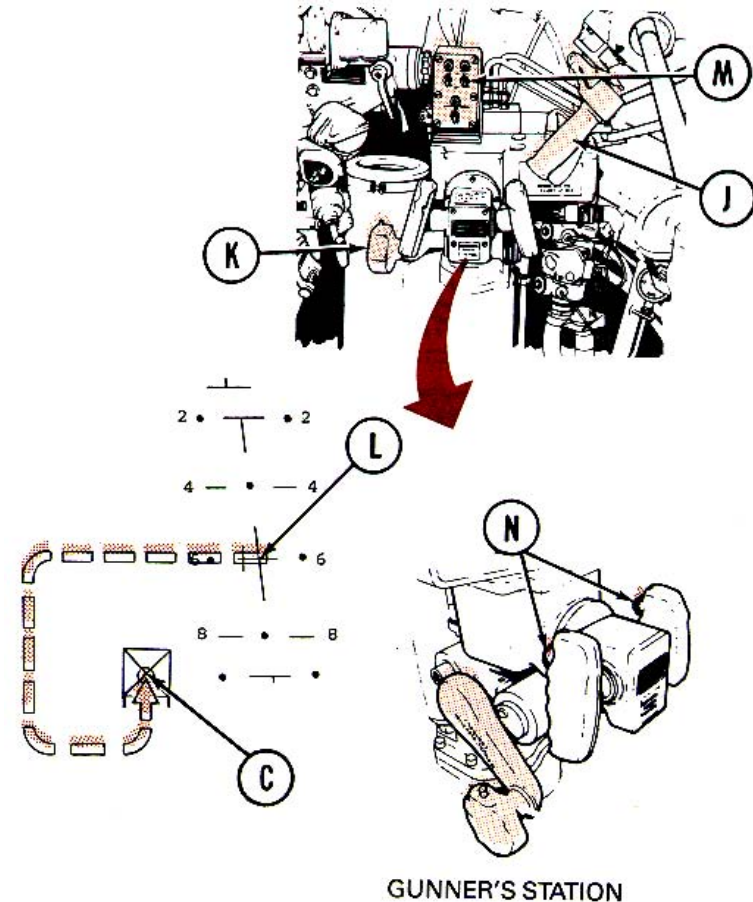
**ZERO SIGHTS (PERFORM INITIAL ZERO) - Continued**

**Loader:**

15. Load 165-mm gun with HEP ammunition (page 2-496). If possible, use ammunition of same lot number for all rounds fired during zeroing.

**Gunner:**

16. Using MANUAL TRAVERSE handle (J) and MANUAL ELEVATION CONTROL handle (K), aline reticle 600 meter aiming cross (L) on target aiming point (C) using G-box method.
17. Wait for commander's order to fire. Upon order to fire:
  - a. Set MAIN GUN switch (M) to ON.
  - b. Press either firing trigger (N).
  - c. Set MAIN GUN switch (M) to OFF.
18. After firing, use MANUAL TRAVERSE handle (J) and MANUAL ELEVATION CONTROL handle (K) to aline reticle 600 meter aiming cross (L) on target aiming point (C) using G-box method.

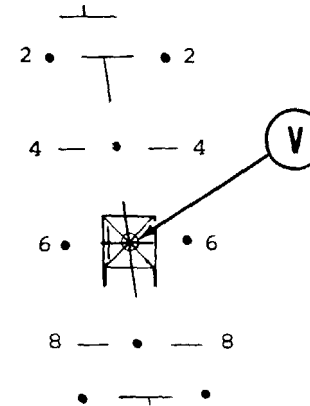


**ZERO SIGHTS (PERFORM INITIAL ZERO) - Continued**

**Gunner and Commander:**

19. Look to see where check round hits target.

- If check round hits inside 48 inch circle (V), telescope is zeroed. Continue beginning with step 22.
- If check round hits outside 48 inch circle (V), continue beginning with step 20.



**Gunner and Loader:**

20. Repeat steps 15, 16, 17 and 18 to fire second check round. Then go to step 21.

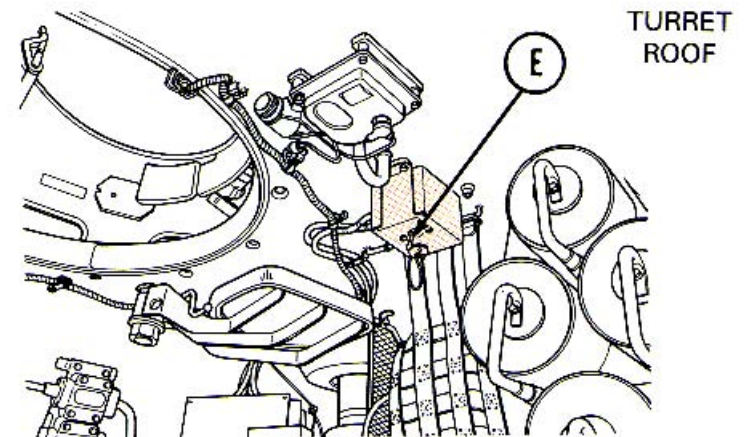
**Gunner and Commander:**

21. Look to see where second check round hits target.

- If within 48 inch circle (V), telescope is zeroed. Continue beginning with step 22.
- If outside 48 inch circle (V), do step 22 then stop. Tell organizational maintenance turret mechanic you are unable to zero.

**Loader:**

22. Set turret ventilating BLOWER switch (E) to OFF.



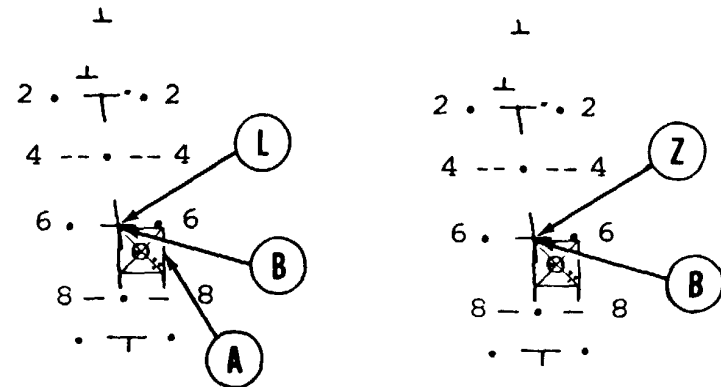
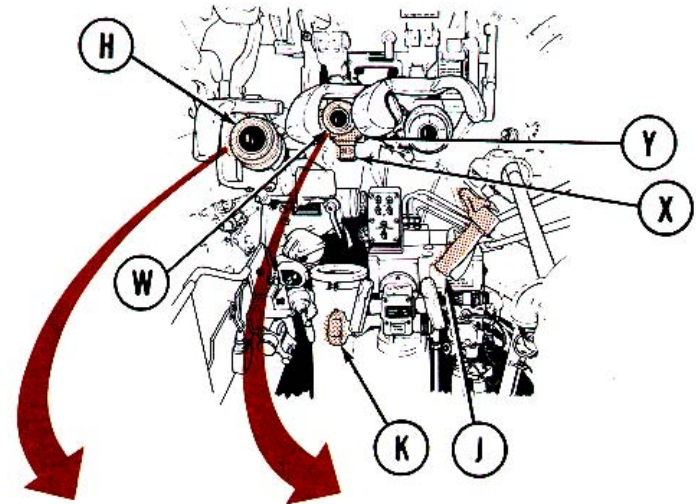
**ZERO SIGHTS (PERFORM INITIAL ZERO) - Continued**

**Gunner:**

**NOTE**

Use MANUAL TRAVERSE handle (J), MANUAL ELEVATION CONTROL handle (K), and G-box method to do step 23.

23. While looking through telescope eyepiece (H), align reticle 600 meter aiming cross (L) on target right angle (B) of target (A).
24. Once reticle 600 meter aiming cross (L) is aligned on right angle (B), do not move the gun.
25. Look into periscope daylight body eyepiece (W).
26. Pull out and turn elevation knob (X) and deflection knob (Y) to adjust reticle 600 meter aiming cross (Z) on target right angle (B).



**ZERO SIGHTS (PERFORM INITIAL ZERO) - Continued**

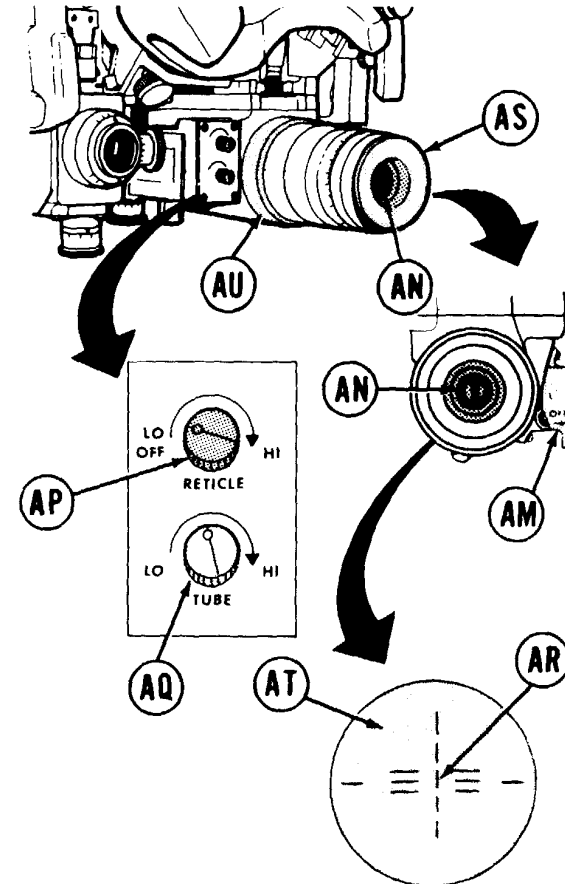
**Gunner:**

■ Steps 27 through 36 deleted.

**CAUTION**

**Steps 37 thru 44 should be done at dusk or during darkness to prevent damage to M32CE1 periscope.**

37. Push light shutter (AM) left to turn on power to passive elbow and open light shutter.
38. Look into passive body eyepiece (AN), rotate RETICLE knob (AP) until satisfied with reticle brightness.
39. Rotate TUBE control (AQ) until reticle (AR) is clear.
40. Rotate diopter ring (AS) until background grain (AT) is clear.
41. Rotate focus ring (AU) for best focus.

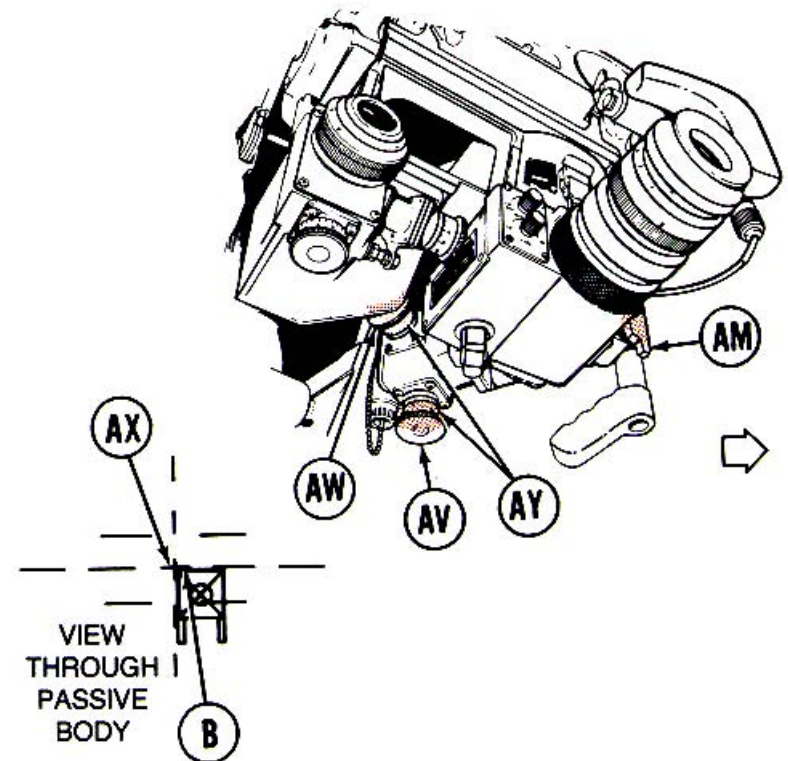


All data on pages 2-443 thru 2-445 deleted.

■ Change 9 (2-445 blank)/2-446)

**ZERO SIGHTS (PERFORM INITIAL ZERO) - Continued****Gunner:**

42. Pull out and turn passive body elevation knob (AV) and deflection knob (AW) to aline reticle aiming cross (AX) on target right angle (B).
43. Turn slipscales (AY) on elevation knob (AV) and deflection knob (AW) so each reads 4.
44. Push light shutter lever (AM) right to turn power off.



**ZERO SIGHTS (PERFORM INITIAL ZERO) - Continued**

**Commander and Gunner:**

**NOTE**

**Put recorded settings in a safe place. For future adjustments, recorded settings may be used after boresighting. This will make it unnecessary to repeat zeroing procedures.**

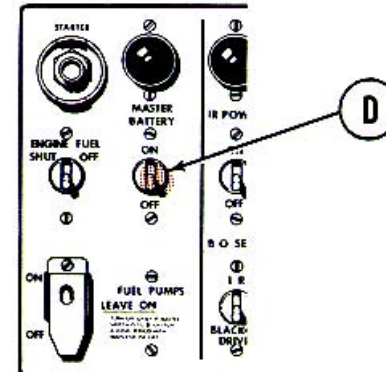
- 45. Record elevation knob and deflection knob settings for all sights. Record the same settings on DA Form 2408-10, Equipment Component Register, which is part of your vehicle logbook.

**CAUTION**

**Wait until searchlight (AN/VSS-2 only) blower stops running before turning off MASTER BATTERY switch (D) to prevent damage to searchlight.**

**Driver:**

- 46. If electrical power is no longer needed, set MASTER BATTERY switch (D) to OFF.



**ZERO SIGHTS (PERFORM REFERENCE ZERO}**

To Reference Zero a Sight:

**NOTE**

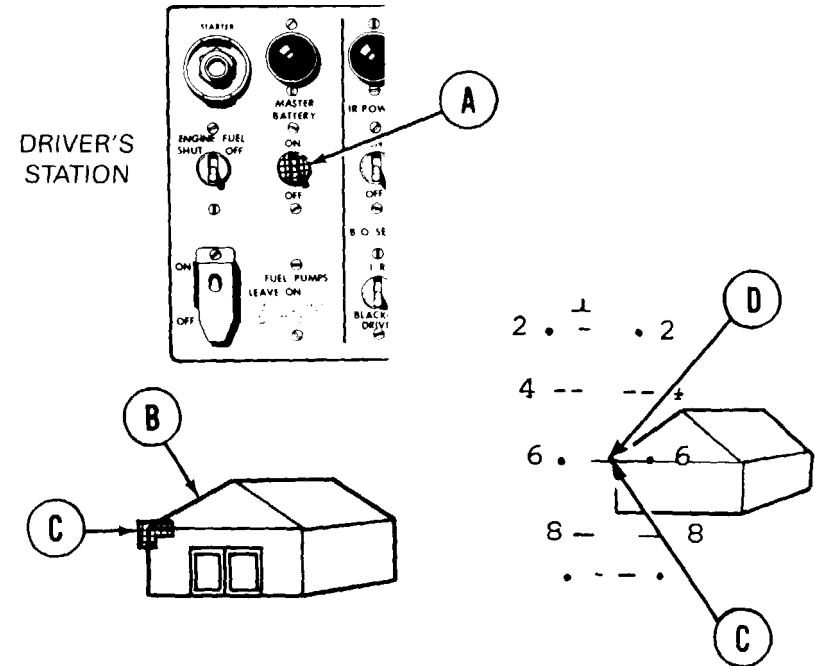
- Each M32CE1 periscope body can be removed and the same M32CE1 periscope body installed without loss of zero. However, if a periscope body is replaced with another one, the new one will require zeroing.

**Make Sure:**

- Your vehicle has at least one zeroed sight.
- MASTER BATTERY switch (A) is set to ON.

**Commander:**

- Pick a target (B) with a clearly defined right angle (C), as close to 600 meters as possible.
- Have gunner use manual controls to align 600 meter aiming cross (D) of zeroed sight on right angle (C) of target.





**ZERO SIGHTS (PERFORM REFERENCE ZERO) - Continued**

**Gunner:**

3. Find sight to be zeroed on list below and do steps indicated, then continue with step 4.

M105F telescope:

- a. Set telescope reticle selector (E) to right.
- b. Unlock ELEVATION LOCK (F) and DEFLECTION LOCK (G).
- c. Look into telescope eyepiece (H).
- d. Turn elevation knob (J) and deflection knob (K) to adjust 600 meter aiming cross (L) on right angle (C) of target.
- e. Lock ELEVATION LOCK (F) and DEFLECTION LOCK (G).

M32CE1 periscope daylight body:

- Do steps 25 and 26 (page 2-442).

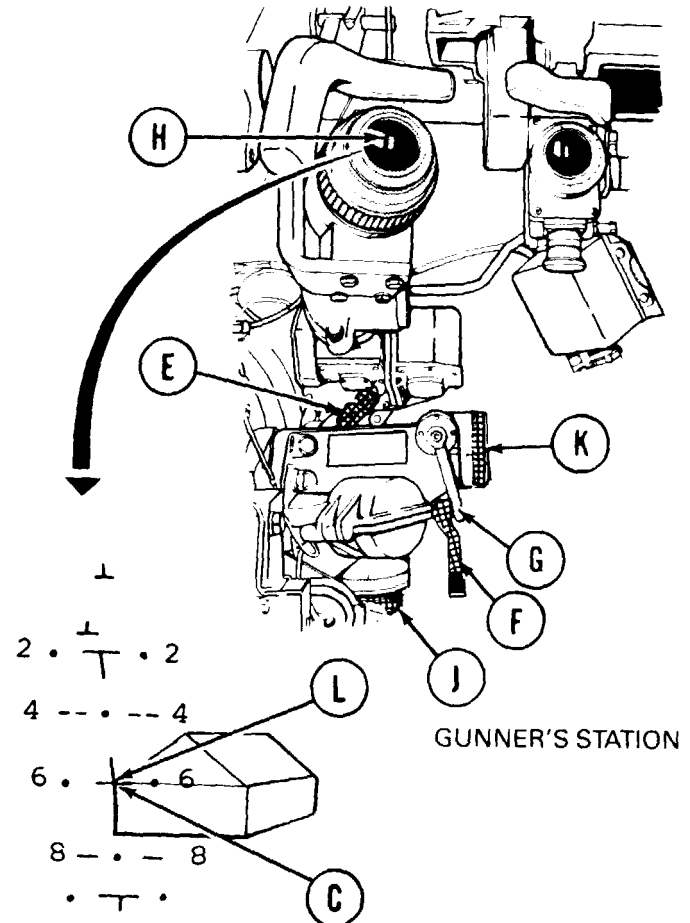
M32CE1 passive body:

- Do steps 37 through 44 (page 2-446).

4. Record elevation and deflection knob settings. Record same settings on DA Form 2408-4 in your logbook.

**Driver:**

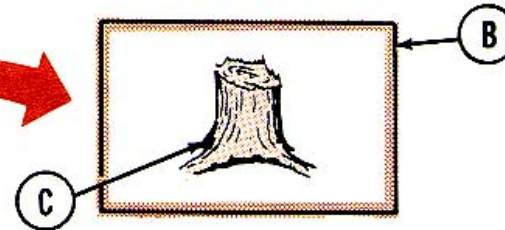
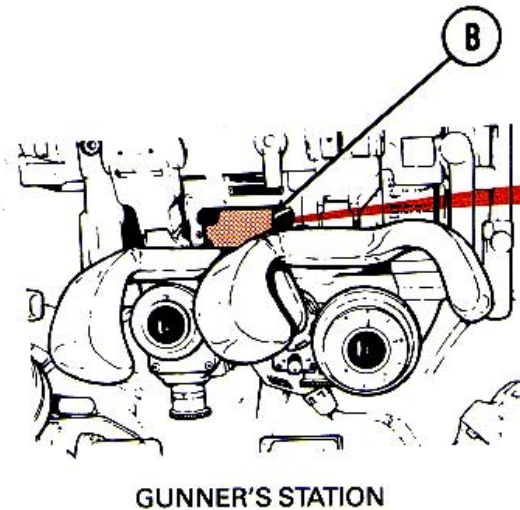
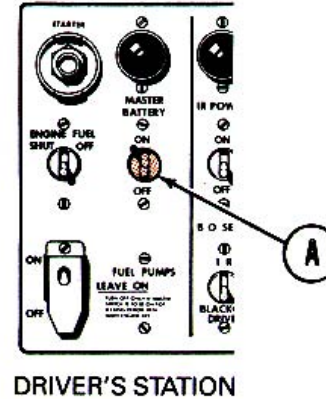
5. Set MASTER BATTERY switch to OFF.



**ZERO SIGHTS (ZERO INFINITY SIGHT TO 7.62-MM MACHINE GUN)**

**Make sure:**

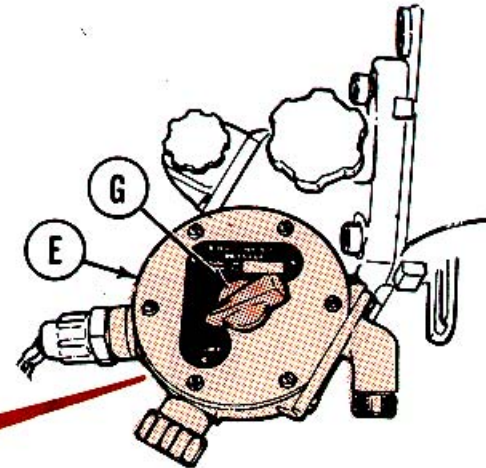
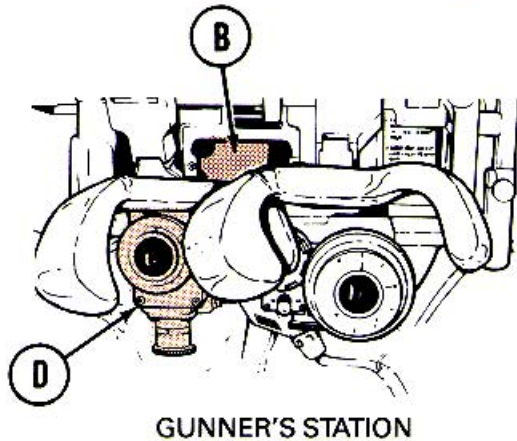
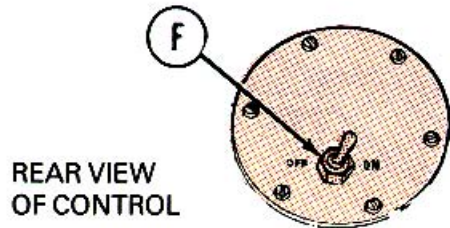
- Boresighting of weapons and sights has been completed.
  - 165-mm gun zeroed to sights (page 2-434).
  - MASTER BATTERY switch (A) is ON.
1. Look into gunner's periscope, 3 window (B). Pick a target (C) as close to 600 meters as possible.



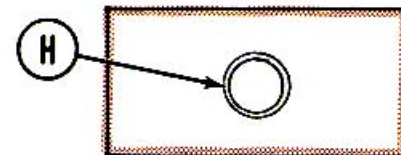
2. Load and charge machine gun (page 2-377) for M73 (if so equipped) or (page 2-373) for M240.

**ZERO SIGHTS (ZERO INFINITY SIGHT TO 7.62-MM MACHINE GUN) - Continued**

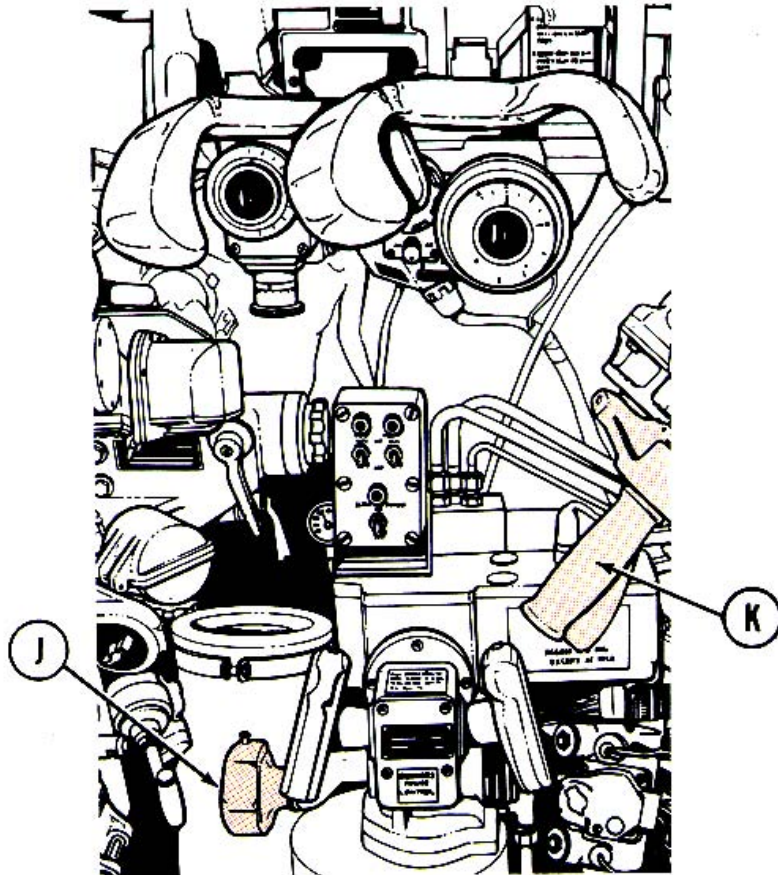
3. Look behind gunner's periscope (D). Locate infinity control (E).
4. Reach behind infinity control (E). Set switch (F) to ON by pushing toward front of turret.



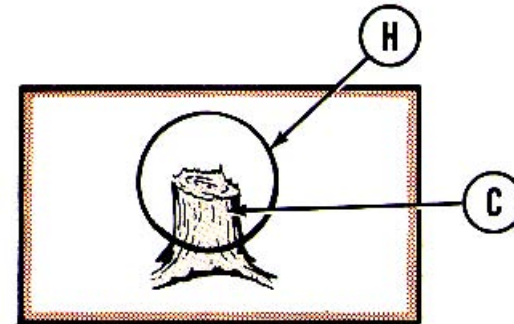
5. Look into periscope window (B). Turn knob (G) clockwise until reticle (red circle) (H) shows in window.



ZERO SIGHTS (ZERO INFINITY SIGHT TO 7.62-MM MACHINE GUN) - Continued



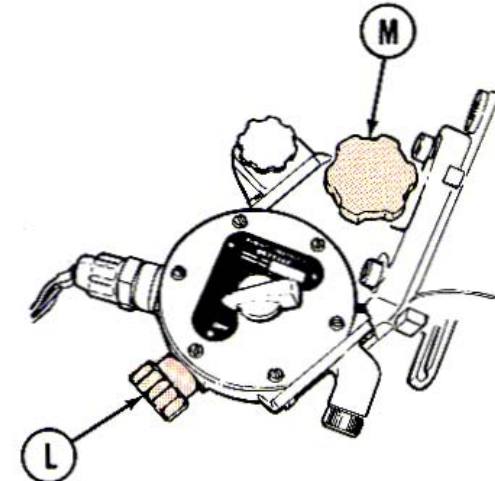
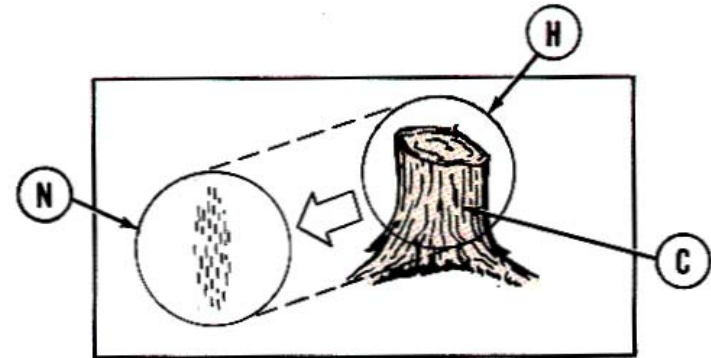
6. Use manual elevating handle (J) and traversing handle (K) to align reticle (H) on target (C).



7. Fire a burst of 20 to 25 rounds (page 2-482).

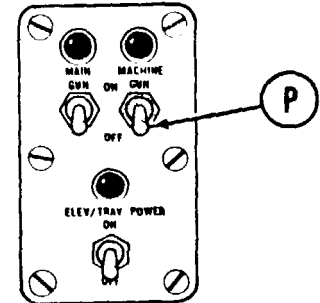
**ZERO SIGHTS (ZERO INFINITY SIGHT TO 7.62-MM MACHINE GUN) - Continued**

8. Look to see where rounds hit target.
  - If rounds hit center of target (C), machine gun is zeroed. Continue with step 15.
  - If rounds miss target (C), use elevation knob (L) and deflection knob (M) to aline reticle (H) on strike area (N). Continue with step 9.
9. Repeat step 6 to aline reticle (H) back on target (C).
10. Fire a burst of 20 to 25 rounds (page 2-482).
11. Look to see where second burst of rounds hits target.
  - If rounds hit center of target (C), machine gun is zeroed. Continue with step 15.
  - If rounds miss target (C), use elevation knob (L) and deflection knob (M) to aline reticle (H) on strike area (N). Continue with step 12.
12. Repeat step 6 to aline reticle (H) back on target (C).
13. Fire a burst of 20 to 25 rounds (page 2-482).
14. Look to see where third burst of rounds hits target.
  - If rounds hit center of target (C), machine gun is zeroed. Continue with step 15.
  - If rounds miss target (C), do not continue, notify organizational maintenance.

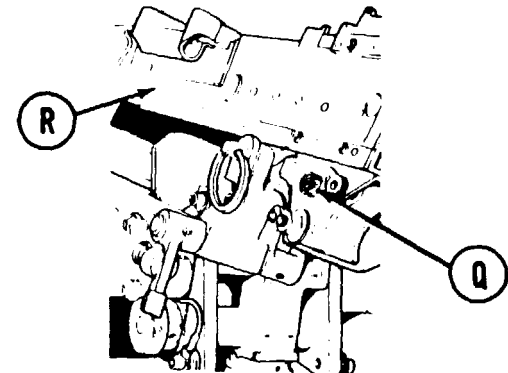


**ZERO SIGHTS (ZERO INFINITY SIGHT TO 7.62-MM MACHINE GUN) - Continued**

15. Gunner set MACHINE GUN switch (P) to OFF when firing is completed.
16. Loader set SAFETY switch (Q) on machine gun (R) to "S" (safe) when firing is completed.



**GUNNER'S STATION**

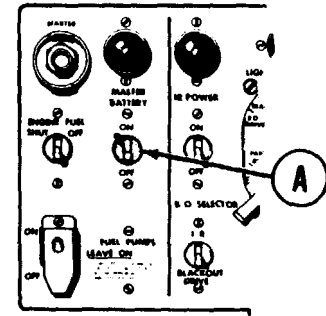


**M240 LOADER'S STATION**

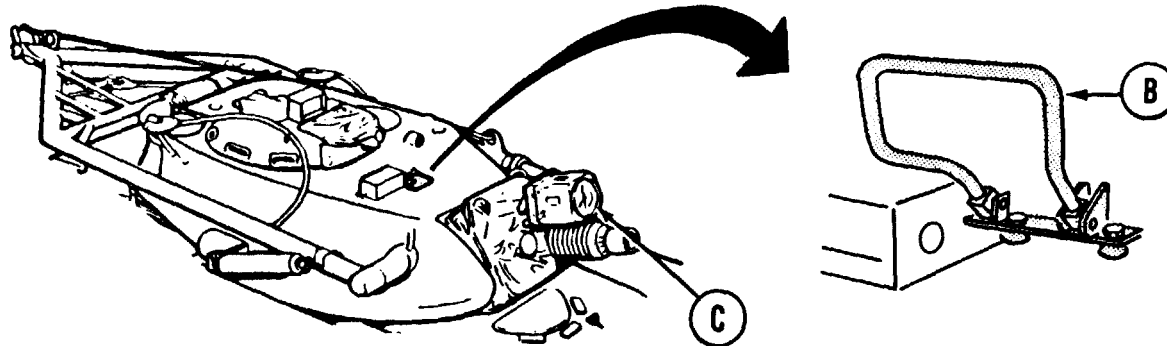
**ZERO SIGHTS (ZERO COMMANDER'S PERISCOPE TO CALIBER .50 MACHINE GUN)**

**Make Sure:**

- MASTER BATTERY switch (A) is set to ON.
- Commander's periscope M36 or M36E1 has been adjusted (page 2-349)
- Interrupter bar (B) is in upright position, and searchlight (C) is installed AN/VSS-2 (page 3-265) or AN/VSS-3A (page 3-271).
- Boresighting of weapons and sights has been completed (page 2-340).
- Vehicle is parked on as firm and level ground as possible.
- Vehicle is prepared for firing (page 2-324).



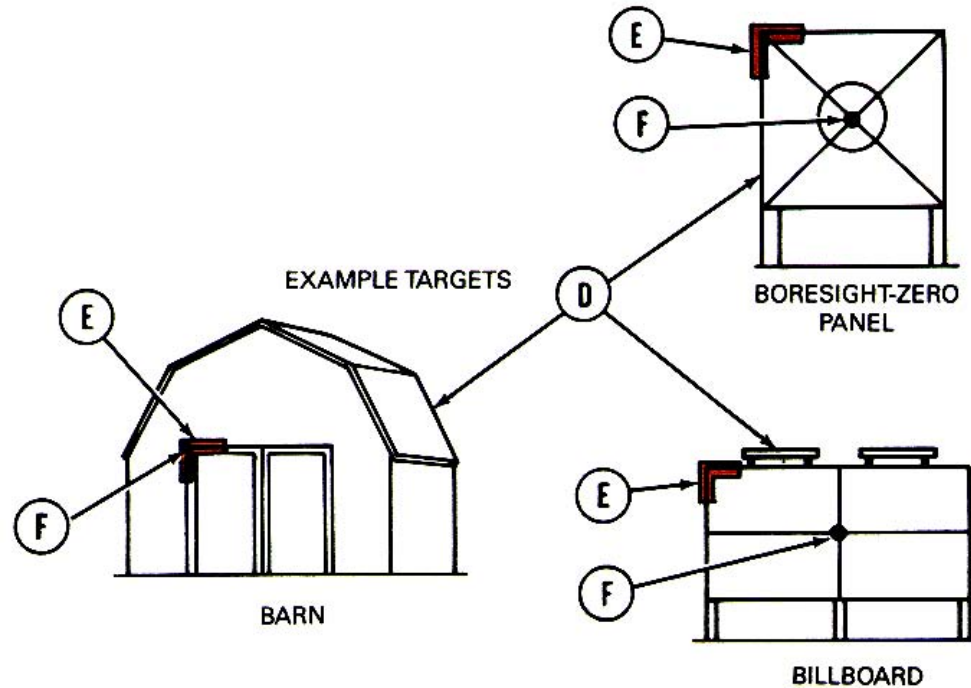
**DRIVER'S STATION**



Change 1 2-454

**ZERO SIGHTS (ZERO COMMANDER'S PERISCOPE TO CALIBER .50 MACHINE GUN) - Continued**

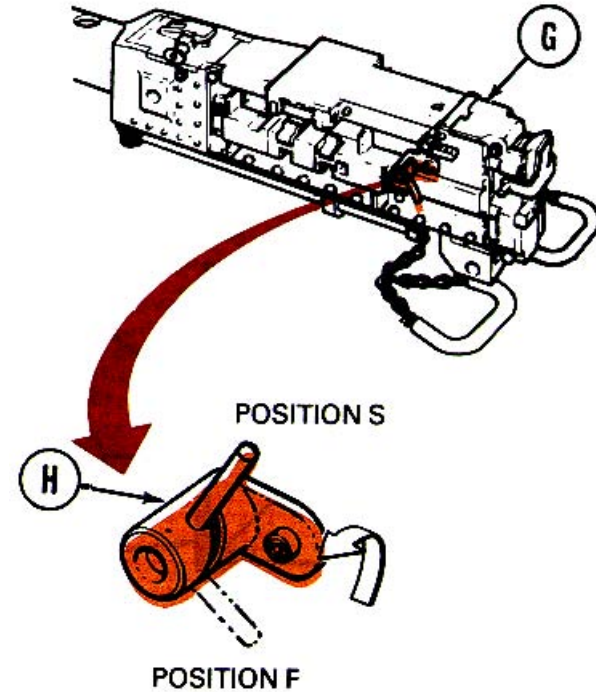
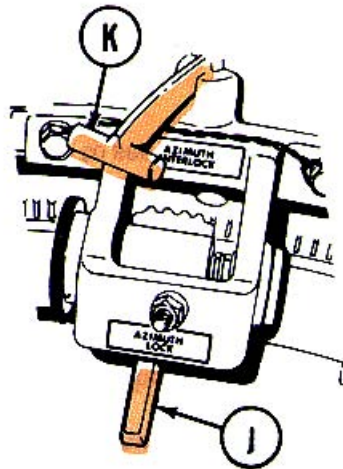
1. Select target according to following requirements:
  - a. Target (D) should be at known range as close to 500 meters as possible.
  - b. Target (D) should have a clearly defined right angle (E) for referring sights.
  - c. Target should have aiming point (F) surrounded by solid mass to see where rounds hit.





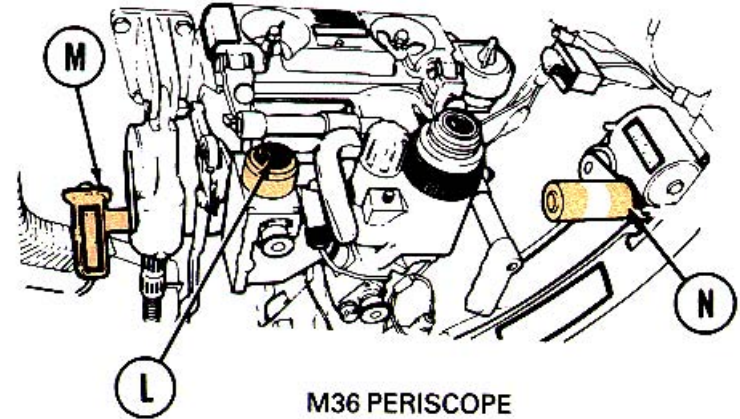
**ZERO SIGHTS (ZERO COMMANDER'S PERISCOPE TO CALIBER .50 MACHINE GUN) - Continued**

2. Load and charge caliber .50 machine gun (G) (page 2-382).
3. Set machine gun manual safety switch (H) to position S.
4. Unlock AZIMUTH LOCK (J) (page 2-332).
5. Unlock AZIMUTH INTERLOCK (K) (page 2-332).

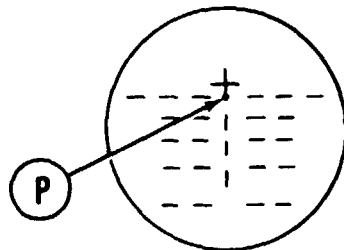


**ZERO SIGHTS (ZERO COMMANDER'S PERISCOPE TO CALIBER .50 MACHINE GUN) - Continued**

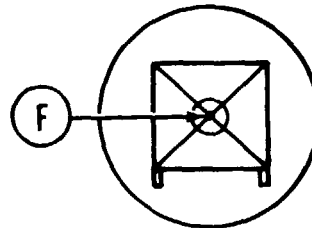
6. Sight through M36 or M36E1 daylight sight eyepiece (L). Rotate manual ELEVATION HANDLE (M) and TRAVERSE CONTROL handle (N) to align reticle 500 meter aiming point (P) with target aiming point (F).



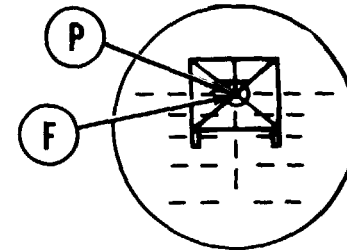
M36 PERISCOPE



RETICLE



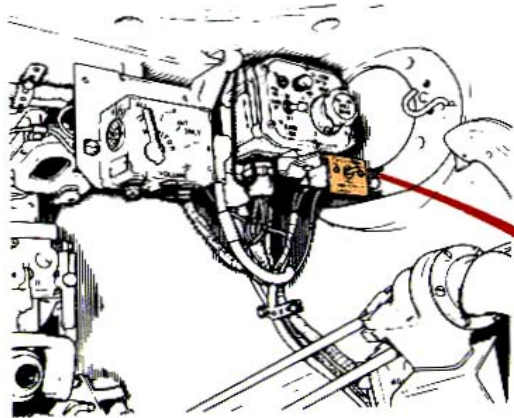
TARGET



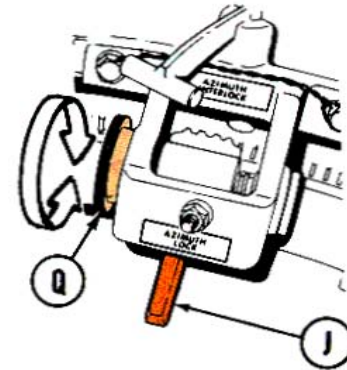
RETICLE OVER TARGET

**ZERO SIGHTS (ZERO COMMANDER'S PERISCOPE TO CALIBER .50 MACHINE GUN) - Continued**

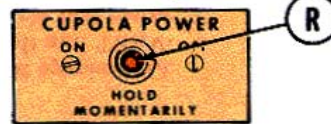
7. Lock cupola AZIMUTH LOCK (J) (page 2-569).
8. If necessary, make fine adjustments to AZIMUTH LOCK (J) by turning azimuth adjusting knob (Q).



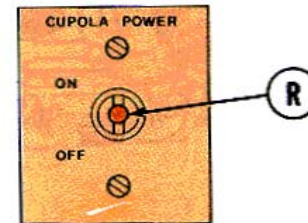
COMMANDER'S STATION



9. Set CUPOLA POWER switch (R) to ON, hold momentarily, then release.



EARLY MODEL

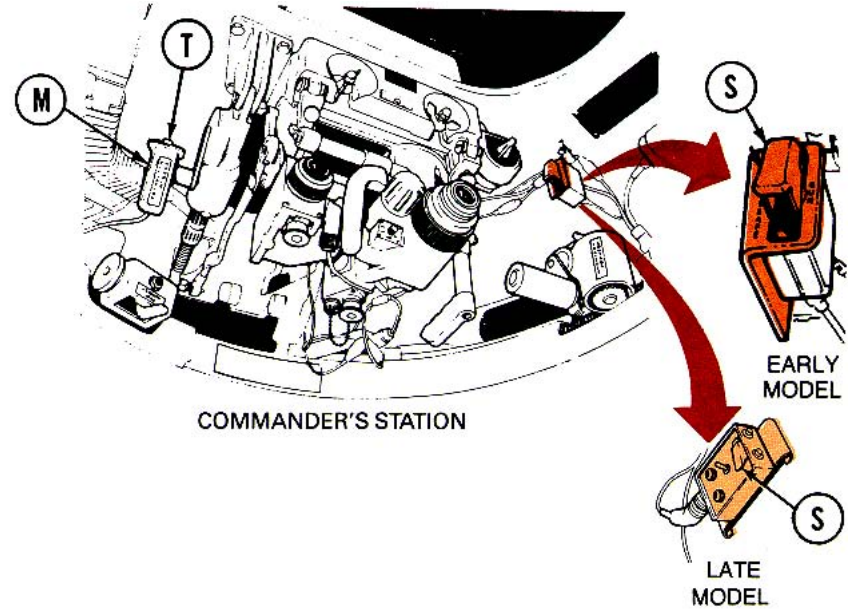
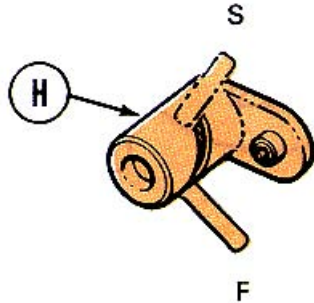


LATE MODEL

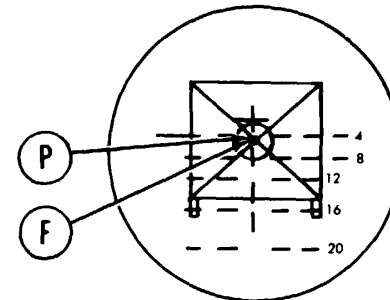
TA252810

**ZERO SIGHTS (ZERO COMMANDER'S PERISCOPE TO CAUBER .50 MACHINE GUN) - Continued**

- 10. Set cupola machine gun electrical safety switch (S) to ON.
- 11. Set machine gun manual safety switch (H) to position F.

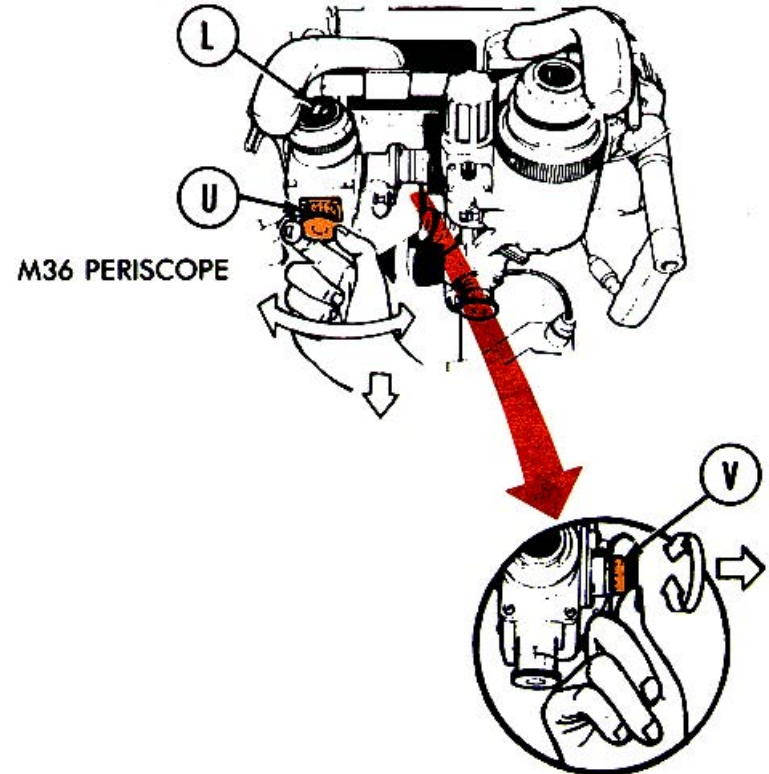
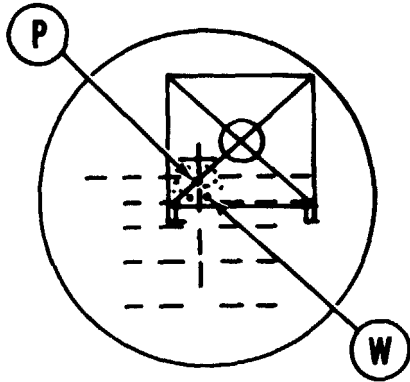


- 12. Press trigger (T) to fire a burst of 10 to 20 rounds to get a shot group.
- 13. If necessary, use cupola ELEVATION HANDLE (M) to relay reticle 500 meter aiming point (P) on target aiming point (F).



**ZERO SIGHTS (ZERO COMMANDER'S PERISCOPE TO CALIBER .50 MACHINE GUN) - Continued**

14. Look through M36 or M36E1 daylight sight eyepiece (L).
15. Pull out and turn elevation knob (U) and deflection knob (V) to aline 500 meter aiming point (P) on center of shot group (W).



TA252812

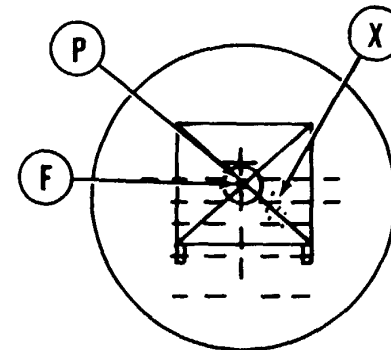
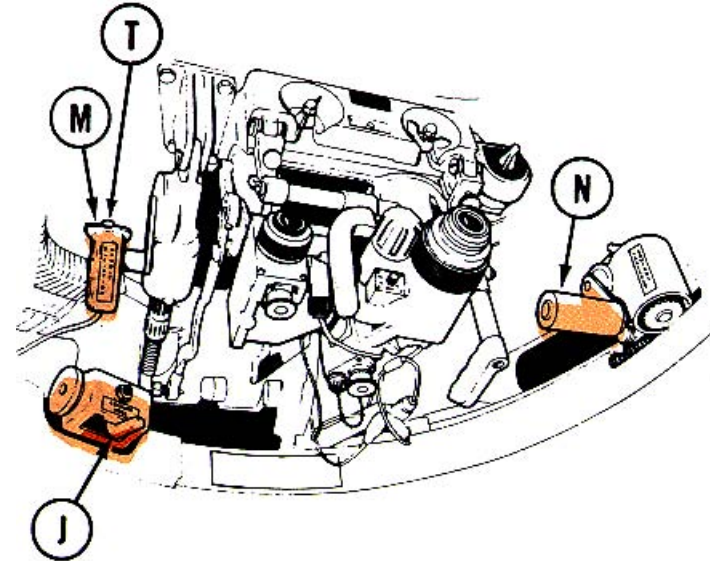
**ZERO SIGHTS (ZERO COMMANDER'S PERISCOPE TO CALIBER .50 MACHINE GUN) - Continued**

16. Unlock AZIMUTH LOCK (J) (page 2-332).
17. Use manual ELEVATION HANDLE (M) and TRAVERSE CONTROL handle (N) to re-lay 500 meter aiming point (P) on target aiming point (F).
18. Lock AZIMUTH LOCK (J) (page 2-564).
19. Press trigger (T) to fire a 10 to 20 round burst to check zero.

**NOTE**

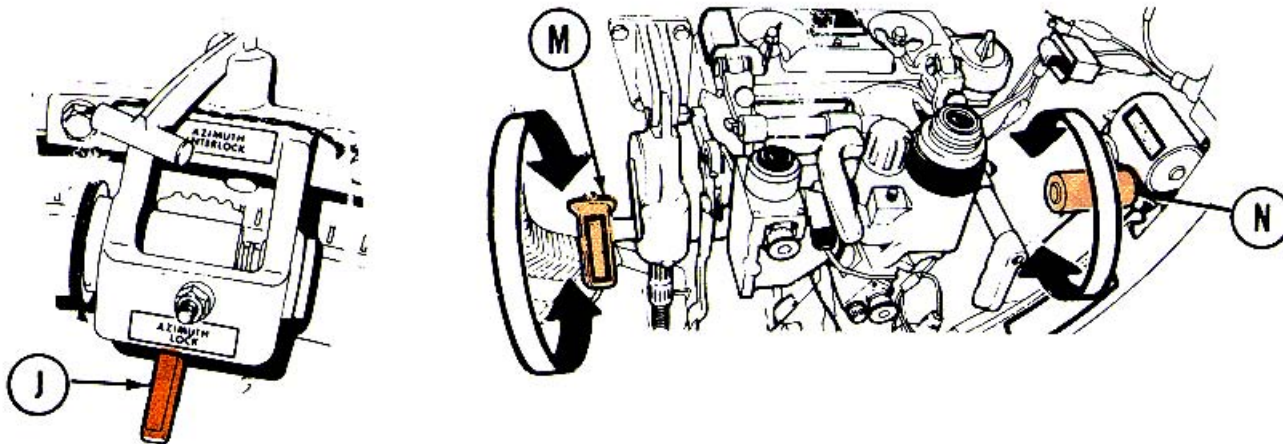
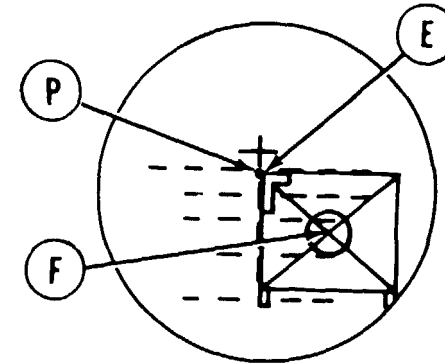
M36 or M36E1 periscope daylight body is zeroed if center of shot group of confirming rounds (X) is within 24 inches of target aiming point (F).

20. Look to see where check rounds hit target.
  - If check rounds (X) hit within 24 inches of target aiming point (F), machine gun is zeroed. Skip steps 21 and 22. Continue starting with step 23.
  - If check rounds (X) are not within 24 inches of target aiming point (F), continue starting with step 21.



**ZERO SIGHTS (ZERO COMMANDER'S PERISCOPE TO CALIBER .50 MACHINE GUN) - Continued**

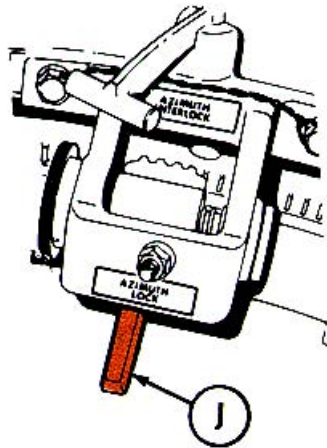
21. Repeat steps 13 through 19. Then continue with step 22.
22. Look to see where second check round group hits target.
  - If within 24 inches of target aiming point (F), machine gun is zeroed. Continue beginning with step 23.
  - If not within 24 inches of target aiming point (F), do not continue, notify organizational maintenance.
23. Unlock AZIMUTH LOCK (J) (page 2-332).



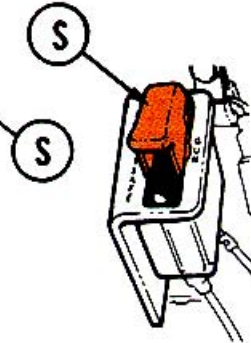
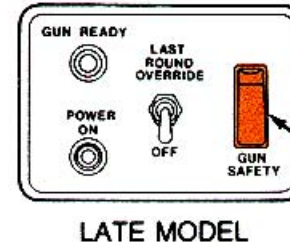
24. Use manual ELEVATION HANDLE (M) and TRAVERSE CONTROL handle (N) to re-lay 500 meter aiming point (P) on target right angle (E).

ZERO SIGHTS (ZERO COMMANDER'S PERISCOPE TO CALIBER .50 MACHINE GUN) - Continued

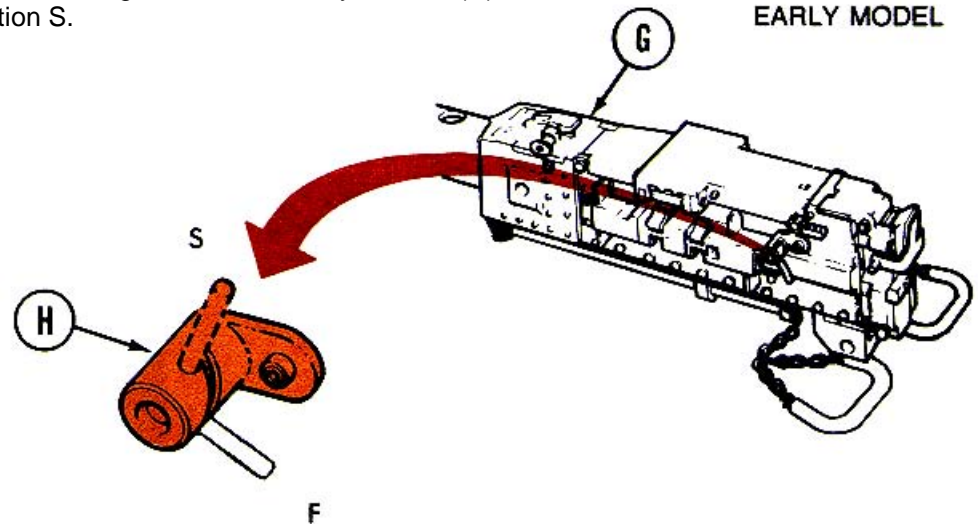
25. Lock AZIMUTH LOCK (J) (page 2-569).



28. Unload machine gun (G) (page 2-553).



26. Set caliber .50 machine gun electrical safety switch (S) to SAFE (down position).
27. Set machine gun manual safety switch (H) to position S.





**ZERO SIGHTS (ZERO COMMANDER'S PERISCOPE TO CALIBER .50 MACHINE GUN) - Continued**

**NOTE**

If your vehicle is equipped with M36 periscope:

- a. Do steps 29 thru 38.
- b. Skip steps 39 thru 46.
- c. Continue starting with step 47.

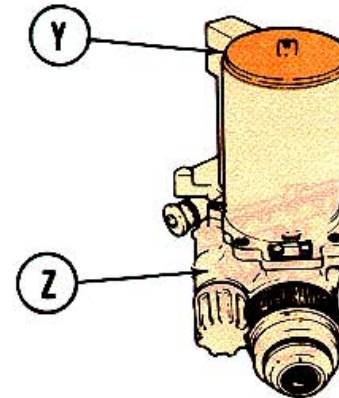
If your vehicle is equipped with M36E1 periscope:

- a. Skip steps 29 thru 38.
- b. Continue starting with step 39.

**CAUTION**

**Steps 29 thru 36 should be done during hours of darkness to prevent damage to M36 periscope.**

- 29 Remove opaque disc (Y) from M36 periscope IR body (Z) (page 2-356).



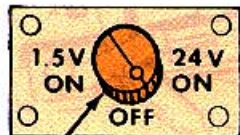
**M36 PERISCOPE**

**NOTE**

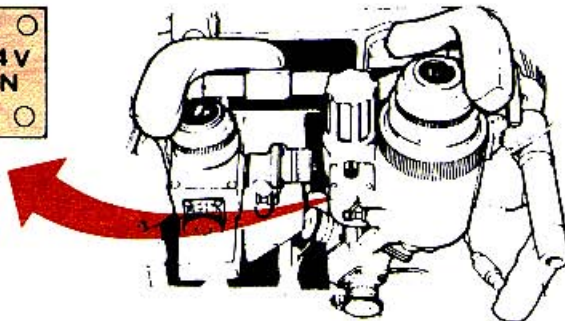
If power for IR comes from battery, set IR switch (AA) to 1.5V ON.

- 30. Set IR switch (AA) to 24V ON.

TA252815



AA



**M36 PERISCOPE**

**ZERO SIGHTS (ZERO COMMANDER'S PERISCOPE TO CALIBER .50 MACHINE GUN) - Continued**

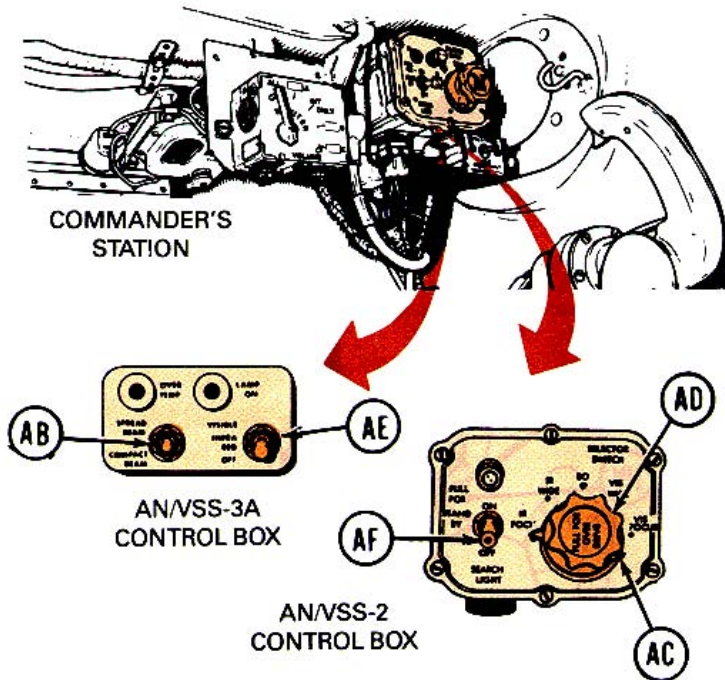
**NOTE**

You can get a clearer sight picture of target, if target is illuminated by second vehicle or tank.

31. Request commander of another vehicle or tank to illuminate target with compact IR searchlight beam.

If illumination is not available from another vehicle or tank:

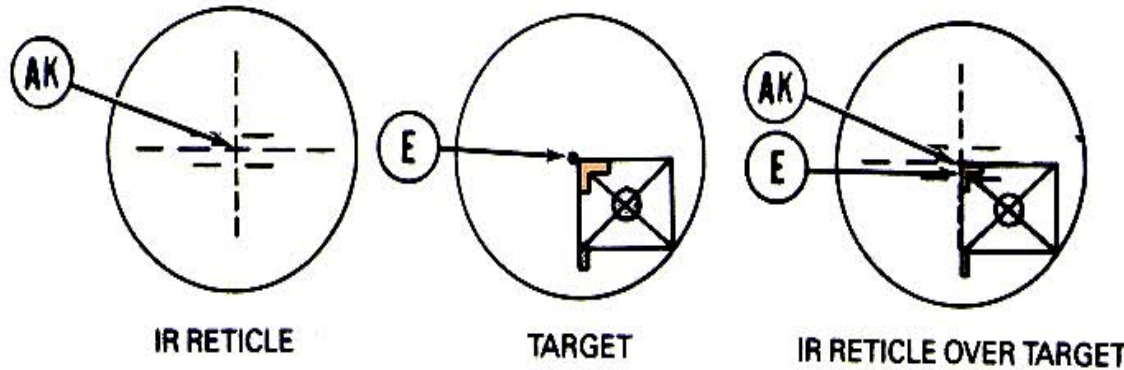
- a. Have driver start engine and idle engine at 1500 rpm (page 2-205).
- b. Set xenon searchlight master control to remote (TM 11-5855-217-12-1) (AN/VSS-3A only).
- c. Select searchlight beam:
  - If equipped with AN/VSS-3A, set switch (AB) to COMPACT BEAM.
  - If equipped with AN/VSS-2, press pin (AC) and turn SELECTOR SWITCH (AD) to IR FOCUS.



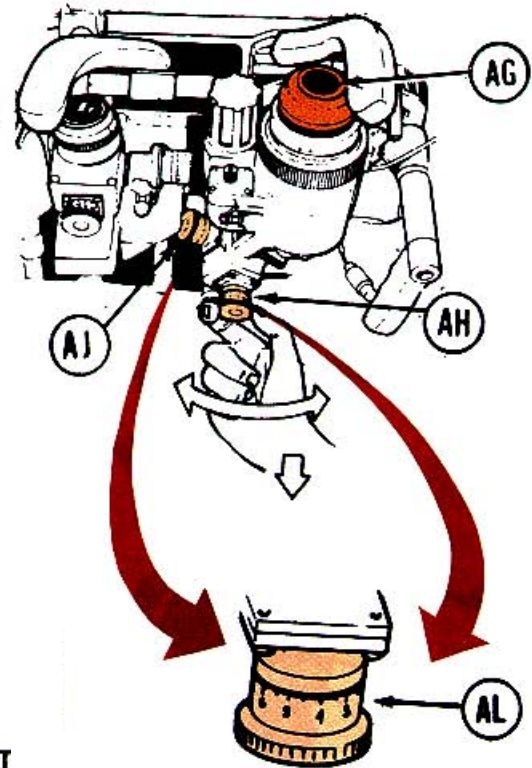
- d. Turn on searchlight:
  - If equipped with AN/VSS-3A, set switch (AE) to INFRA RED.
  - If equipped with AN/VSS-2, pull out and set SEARCHLIGHT switch (AF) to ON.

**ZERO SIGHTS (ZERO COMMANDER'S PERISCOPE TO CALIBER .50 MACHINE GUN) - Continued**

32. Look through IR body eyepiece (AG).
33. Pull out and turn elevation knob (AH) and deflection knob (AJ) to align reticle aiming cross (AK) on target right angle (E).
34. Turn slipscales (AL) on elevation knob (AH) and deflection knob (AJ) so each reads 4.



M36 PERISCOPE

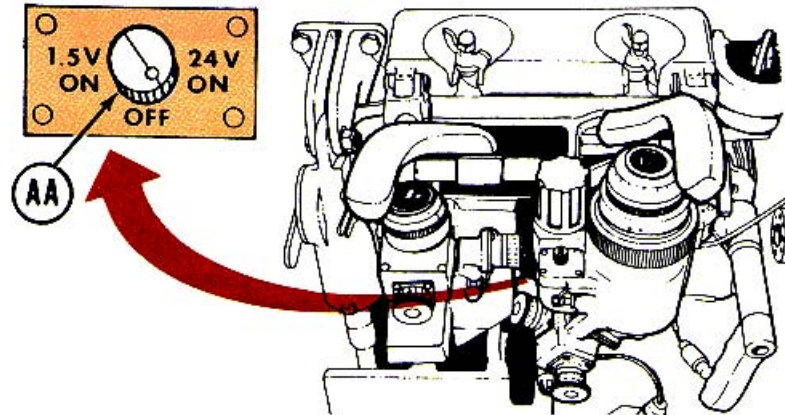


35. If using illumination from another vehicle or tank, notify them you are through.

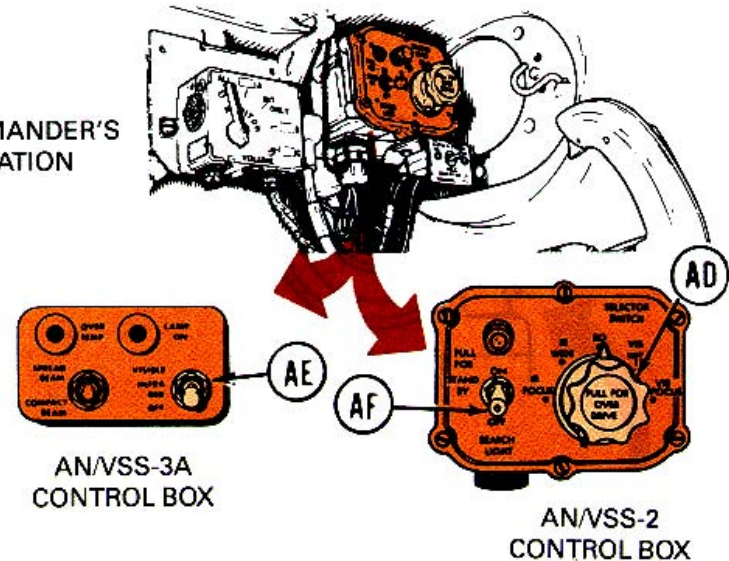
If using your tank searchlight:

- If equipped with AN/VSS-3A, set switch (AE) to OFF.
- If equipped with AN/VSS-2, turn SELECTOR SWITCH (AD) to BO. Set SEARCHLIGHT switch (AF) to OFF.

36. Set IR switch (AA) to OFF.



COMMANDER'S  
STATION



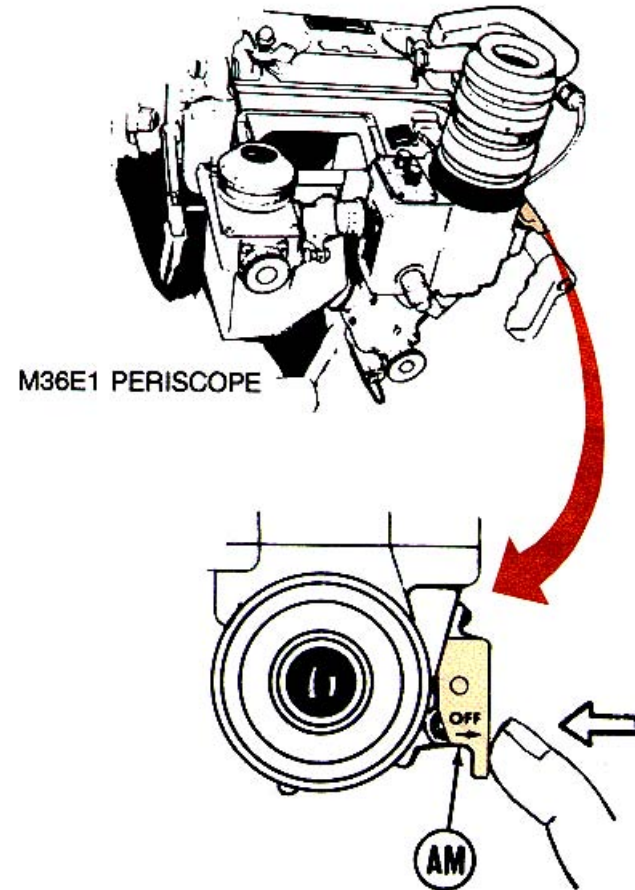
**CAUTION**

**Wait until searchlight blower motor stops running before turning off MASTER BATTERY switch to prevent damage to searchlight.**

37. Have driver stop engine (page 2-536) if not longer required
38. Replace opaque disc (page 2-540) if IR periscope is no longer required.

TA252816

ZERO SIGHTS (ZERO COMMANDER'S PERISCOPE TO CALIBER .50 MACHINE GUN) - Continued



**CAUTION**

Steps 39 thru 46 should be done at dusk or during darkness to prevent damage to M36E1 periscope.

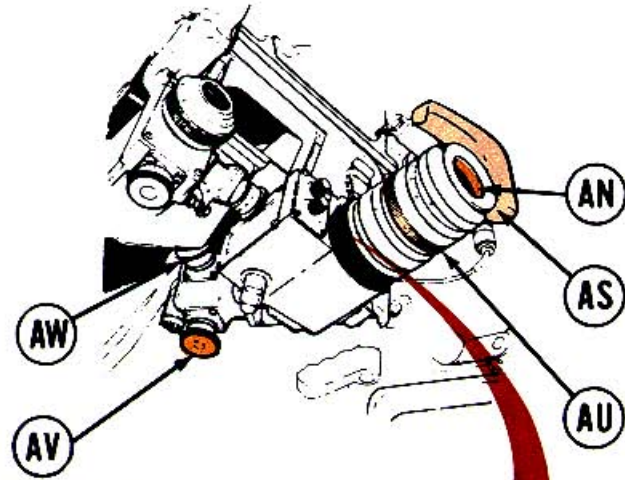
**NOTE**

If vehicle power is not available, use M30 instrument light (page 2-360.4)

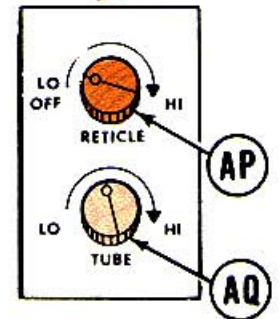
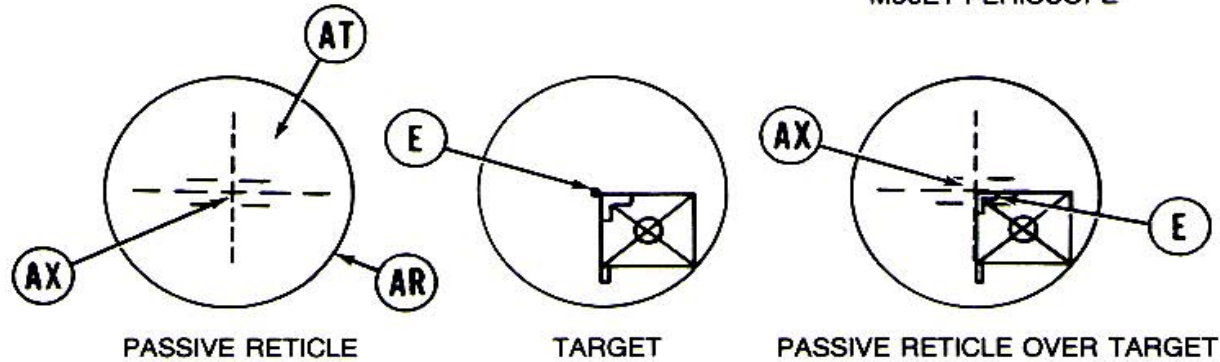
39. Move shutter lever (AM) left to turn on passive elbow and open shutter.

**ZERO SIGHTS (ZERO COMMANDER'S PERISCOPE TO CALIBER .50 MACHINE GUN) - Continued**

40. Look into passive body eyepiece (AN) rotate RETICLE knob (AP) until satisfied with reticle brightness.
41. Rotate TUBE control (AQ) until reticle (AR) is clear.
42. Rotate diopter ring (AS) until background grain (AT) is clear.
43. Rotate focus ring (AU) for best focus.
44. Pull out and turn elevation knob (AV), and deflection knob (AW) to align reticle cross (AX) on target right angle (E).



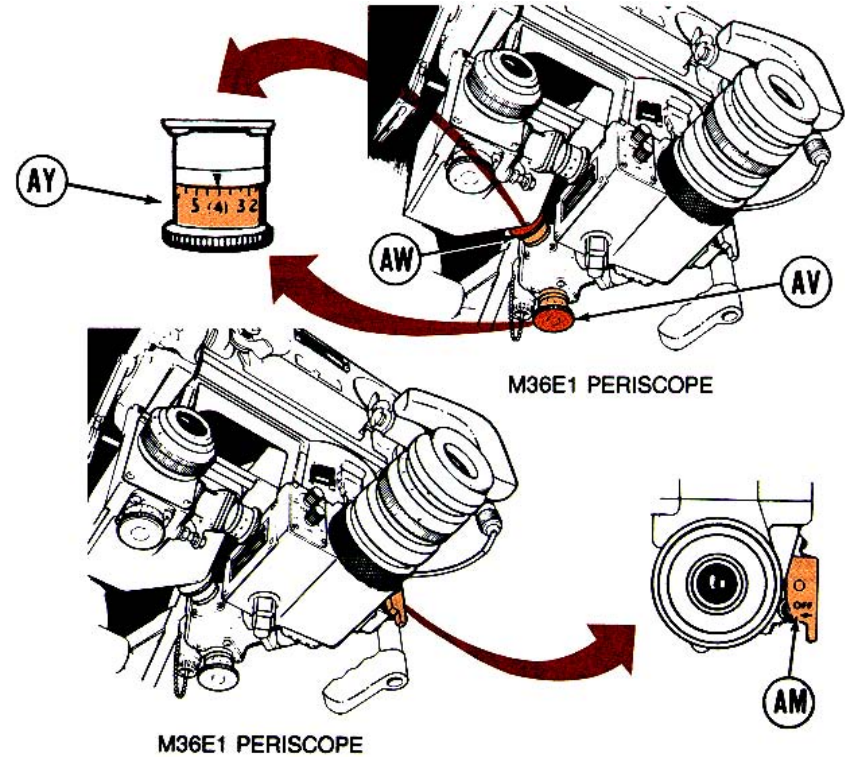
M36E1 PERISCOPE, L



TA252818

**ZERO SIGHTS (ZERO COMMANDER'S PERISCOPE TO CALIBER .50bO MACHINE GUN) - Continued**

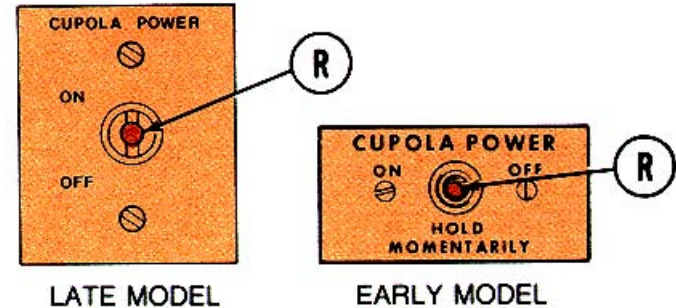
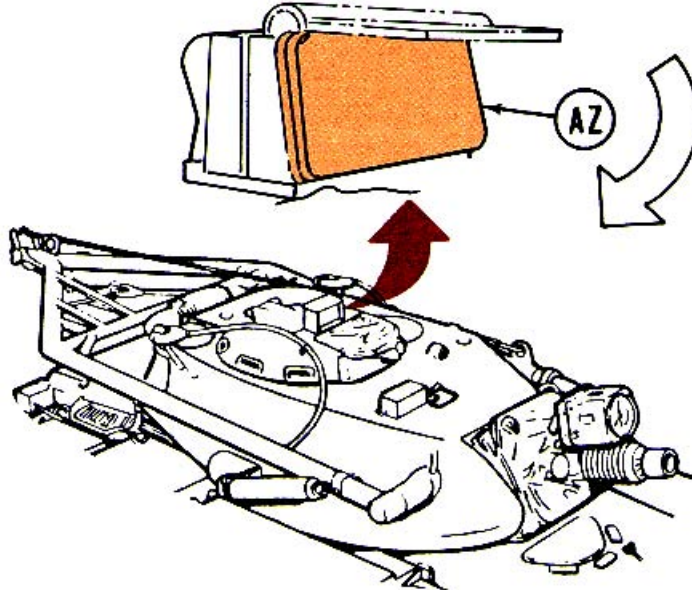
45. Turn slipscales (AY) on elevation knob (AV) and deflection knob (AW) so each reads 4.
46. Move shutter lever (AM) right to close shutter and turn off passive power.



TA252819

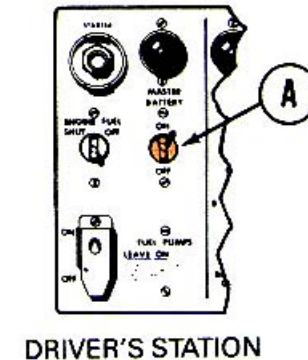
**ZERO SIGHTS (ZERO COMMANDERS PERISCOPE TO CALIBER .50 MACHINE GUN) - Continued**

47. Record periscope elevation and deflection knob settings. Put in a safe place in vehicle. For future sight adjustments, recorded setting may be used after boresighting. This will make it unnecessary to repeat zeroing procedures.
48. Set CUPOLA POWER switch (R) to OFF, hold momentarily, then release.
49. Close ballistic shield (AZ) (page 2-540).



COMMANDER'S STATION

50. Set MASTER BATTERY switch (A) to OFF.



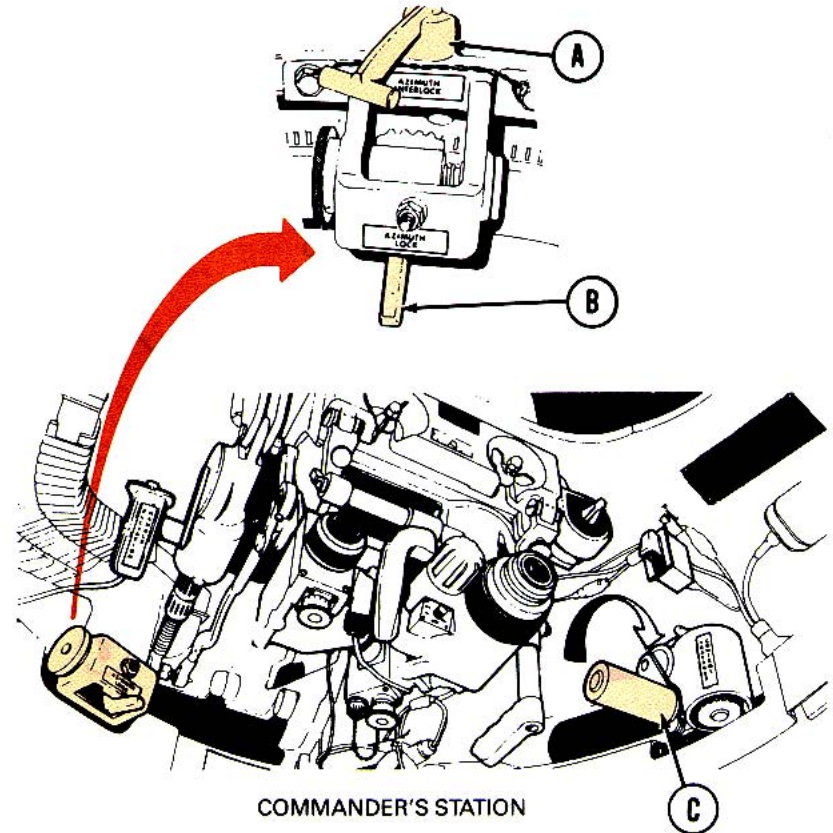
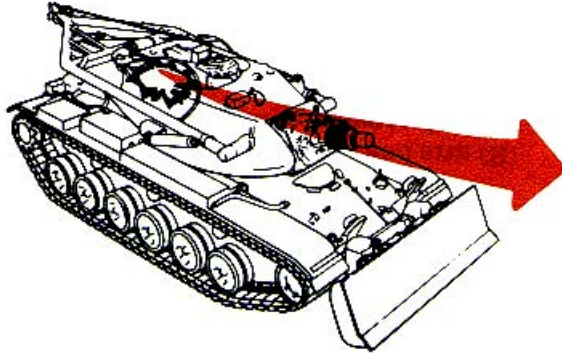


## ENGAGE TARGET WITH CALIBER .50 MACHINE GUN (TRACK)

### To Traverse Cupola:

#### Make Sure:

- Azimuth interlock (A) is unlocked (page 2-332).
  - Azimuth lock (B) is unlocked (page 2-332).
1. Rotate traverse control (C) in direction of arrow to traverse cupola right.
  2. Rotate traverse control (C) in direction opposite to arrow to traverse cupola left.

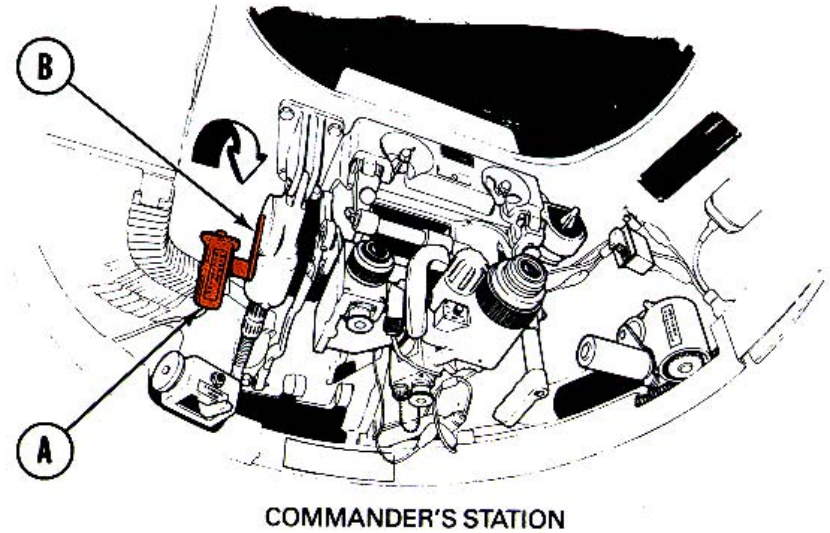


TA132609

**ENGAGE TARGET WITH CALIBER .50 MACHINE GUN (TRACK) - Continued**

**To Elevate Or Depress Machine Gun:**

1. Rotate elevation handle (A) and arm (B) in direction of arrow to elevate machine gun.
2. Rotate elevation handle (A) and arm (B) in direction opposite to arrow to depress machine gun.



TA132610

**ENGAGE TARGET WITH CAUBER .50 MACHINE GUN (RFIRE)**

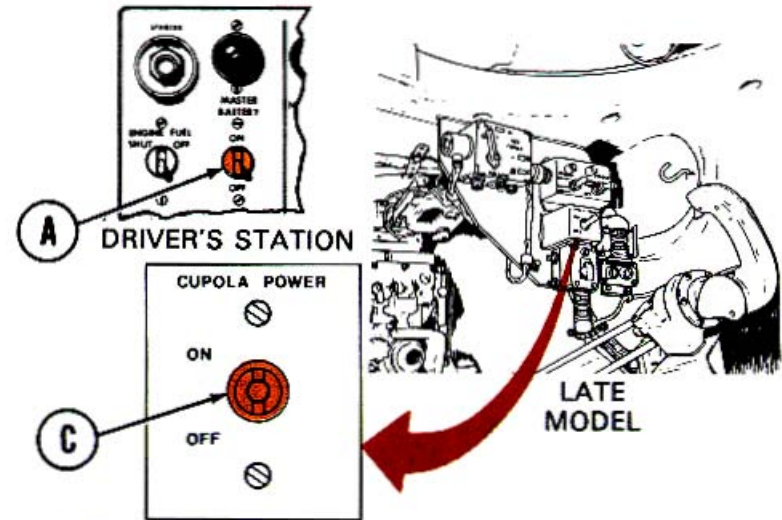
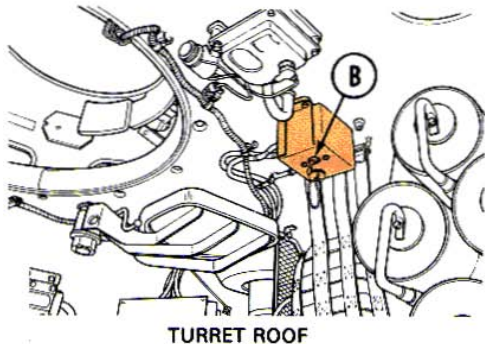
**CAUTION**

**DO NOT** open and dose cover once gun is loaded and ready to fire. This may disengage belt feed lever and lever assembly Then, if machine gun is fired, only one round will fire, damaging ejector and bolt.

**Make Sure:**

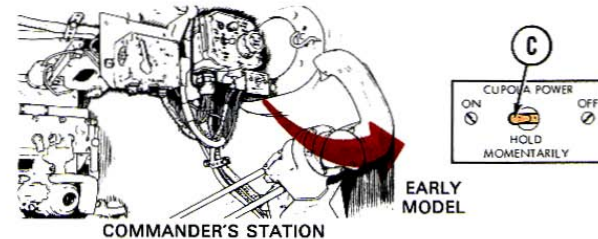
- Forward interrupter is raised (page 3-270) if searchlight is installed.
- Caliber .50 machine gun is loaded (page 2-382).

1. Set MASTER BATTERY switch (A) to ON.
2. Set turret ventilator BLOWER switch (B) to ON.



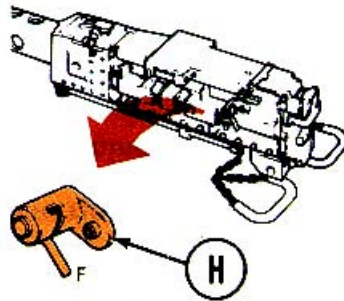
**Electrical Firing:**

1. Hold CUPOLA POWER switch (C) momentarily to ON.



**ENGAGE TARGET WITH CAUBER .50 MACHINE GUN (FIRE) - Continued**

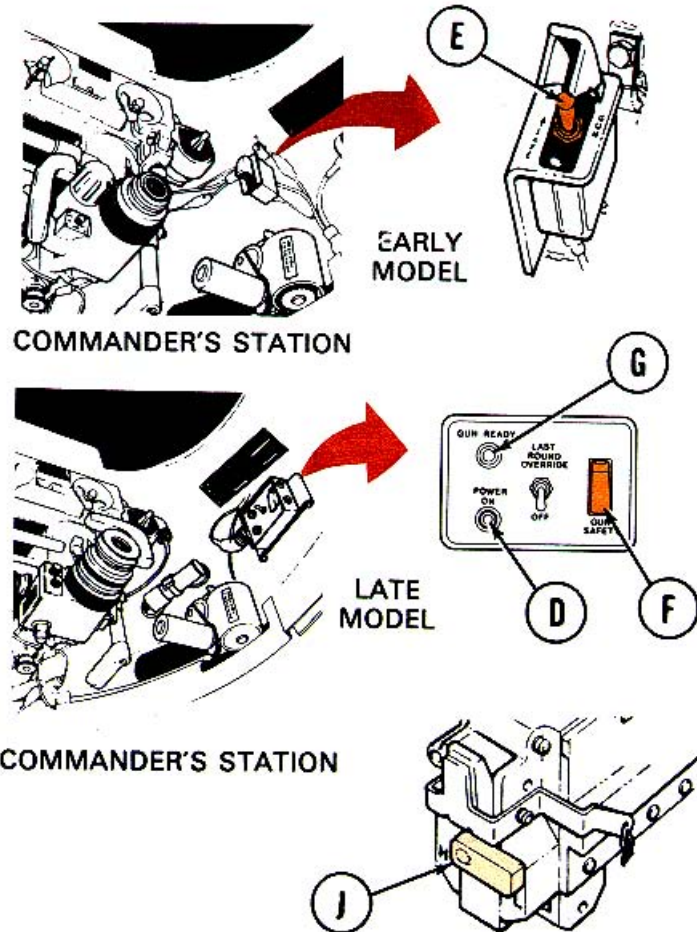
- 1.1 Check that POWER ON indicator (D) comes on. (Late model only)
2. Lift cover and set cupola GUN electrical safety switch (E) to ON. (Early model only)
- 2.1 Set cupola GUN SAFETY switch (F) to FIRE. (Late model only)
- 2.2 Check that GUN READY indicator (G) comes on. (Late model only)
3. Set gun safety (H) to F (fire).



**CAUTION**

**Do not change rate of fire while firing or gun will be damaged.**

4. Set rate of fire selector (J) left to H for high rate or right to L for low rate.



**ENGAGE TARGET WITH CALIBER .50 MACHINE GUN (FIRE) - Continued**

**WARNING**

Make sure machine gun is pointed at target before firing.

**CAUTION**

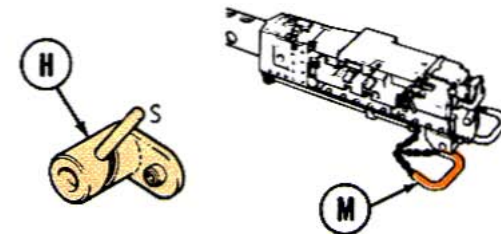
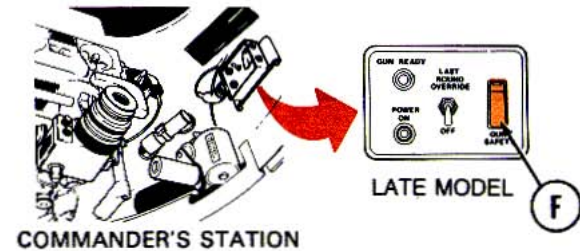
Fire machine gun in short bursts to prevent barrel overheating.

5. Depress firing trigger (K) on elevating handle (L) to fire machine gun.
6. When firing is complete, pull black charging handle (M) back to be sure that bolt is all the way back.

**WARNING**

If gun does not stop firing after trigger is released, pull black charging handle (L) back and hold.

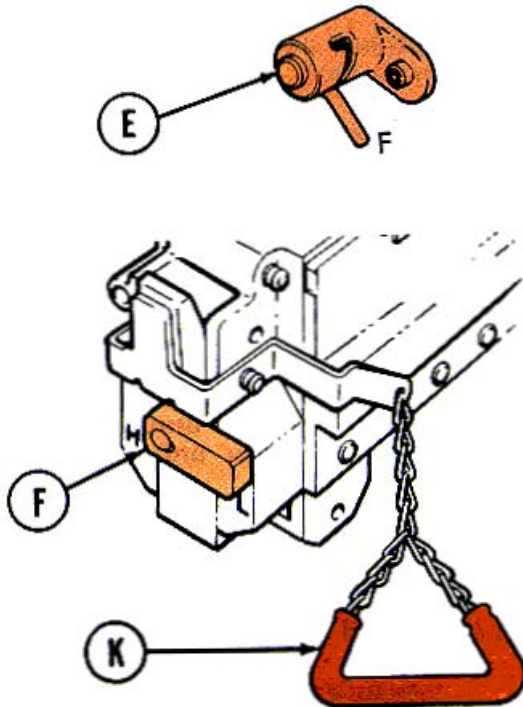
7. Set gun safety (H) to S (safe).
8. Set cupola gun safety switch (E) to safe. (Early model only.)
9. Set cupola GUN SAFETY switch (F) to SAFE. (Late model only.)



## ENGAGE TARGET WITH CALIBER .50 MACHINE GUN (FIRE) - Continued

**Manual Firing:**

1. Set gun safety (E) to F.

**CAUTION**

**Do not change rate of fire while firing or gun will be damaged.**

2. Set rate of fire selector (F) to left H for high rate or to right L for low rate.

**WARNING**

**Make sure machine gun is pointed at target before firing.**

**CAUTION**

**Fire machine gun in short bursts to keep barrel from overheating.**

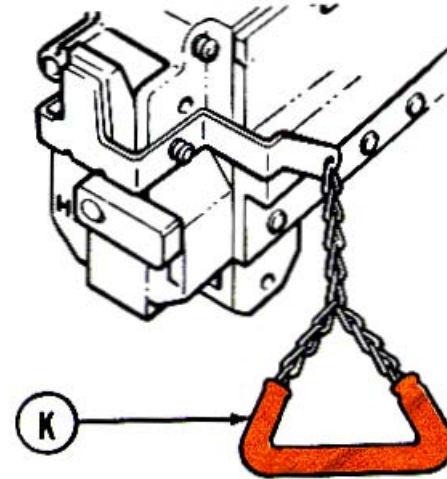
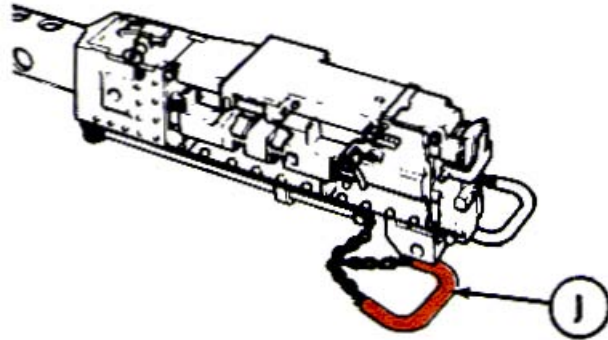
3. Pull manual red firing handle (K) to fire machine gun.

ENGAGE TARGET WITH CALIBER .50 MACHINE GUN (FIRE) - Continued

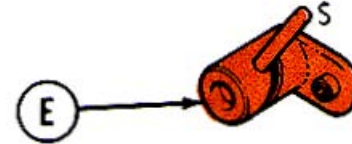
**WARNING**

If gun does not stop firing when trigger is released, pull back charging handle (J) back and hold while unloading gun (page 2-553).

4. Release manual red firing handle (K) to stop firing.
5. When firing is complete, pull black charging handle (J) to make sure bolt is fully rearward.



6. Set gun safety (E) to S. Then release black charging handle (J).



TA132615

**ENGAGE TARGET WITH CALIBER .50 MACHINE GUN (PERFORM FAILURE TO FIRE - IMMEDIATE ACTION)****WARNING**

When gun fails to fire, keep gun pointed at target. Keep all personnel clear of barrel.

**NOTE**

"Stoppage" is when gun stops firing due to faulty action of gun or ammunition.

1. Wait five seconds after stoppage.
2. Pull black charging handle (A) back to charge gun.
3. Try to fire gun (page 2-477).

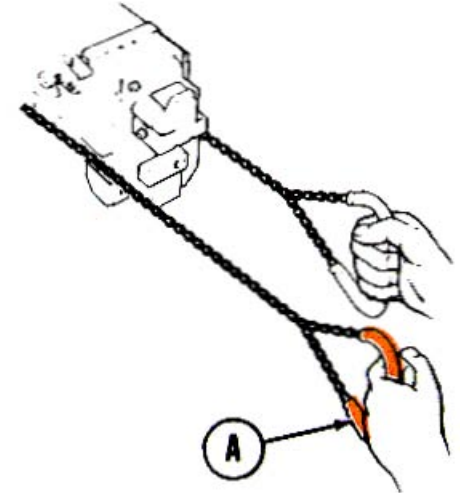
**NOTE**

"Cookoff" is when heat of gun causes a chambered round to fire.

**WARNING**

Danger of cookoff exists when gun is hot (150 to 200 rounds fired within 2 minutes). After a five-second waiting period, gun must be unloaded within five seconds. If a gun can not be cleared in five seconds, let bolt go forward, close cover, and keep gun pointed at target for fifteen minutes to cool.

4. If gun stops again, wait five seconds after second stoppage and unload gun (page 2-543).



TA132616

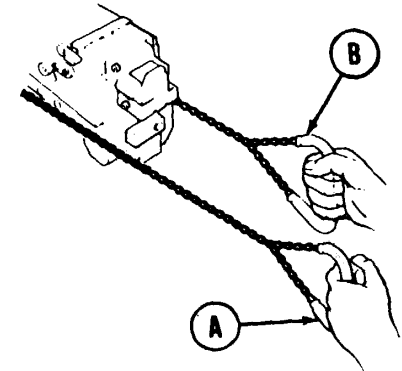


**ENGAGE TARGET WITH CALIBER .50 MACHINE GUN (PERFORM FAILURE TO FIRE - IMMEDIATE ACTION) - Continued**

5. Pull black charging handle (A) back to charge gun and hold.
6. Let black charging handle (A) go forward slowly while pulling manual red firing handle (B) back.
7. Load gun (page 2-382).
8. Attempt to fire gun manually (page 2-474).

**WARNING**

**Danger of cookoff exists when gun is hot (150 to 200 rounds fired within 2 minutes). After a five-second waiting period, gun must be unloaded within five seconds. If a gun can not be cleared in five seconds, let bolt go forward, close cover, and keep gun pointed at target for fifteen minutes to cool.**



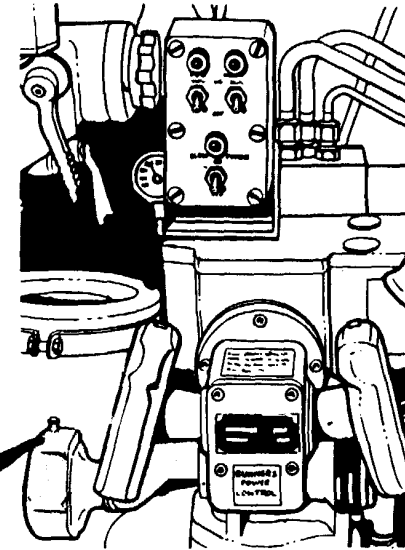
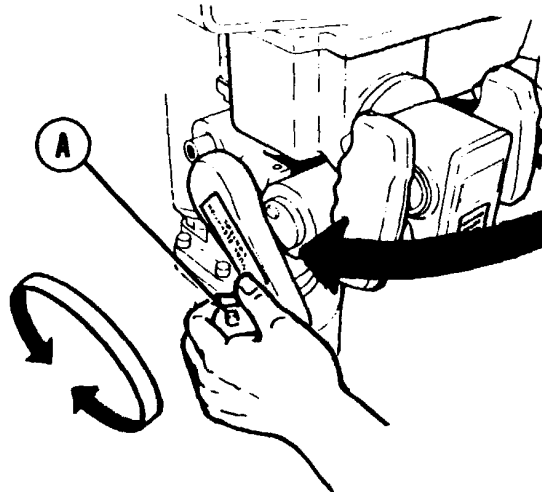
9. If gun stops again, wait five seconds after third stoppage and unload gun (page 2-553).
10. Troubleshoot gun (page 3-35).

TA132617

**ENGAGE TARGET WITH 7.62-MM MACHINE GUN (TRACK)**

**Make Sure:**

- Vehicle and surrounding area are clear of obstruction.
- Turret traverse lock is UNLOCKED (page 2-331).
- Area under breech is clear.
- No vehicle personnel are on top of vehicle.



**GUNNER'S STATION**

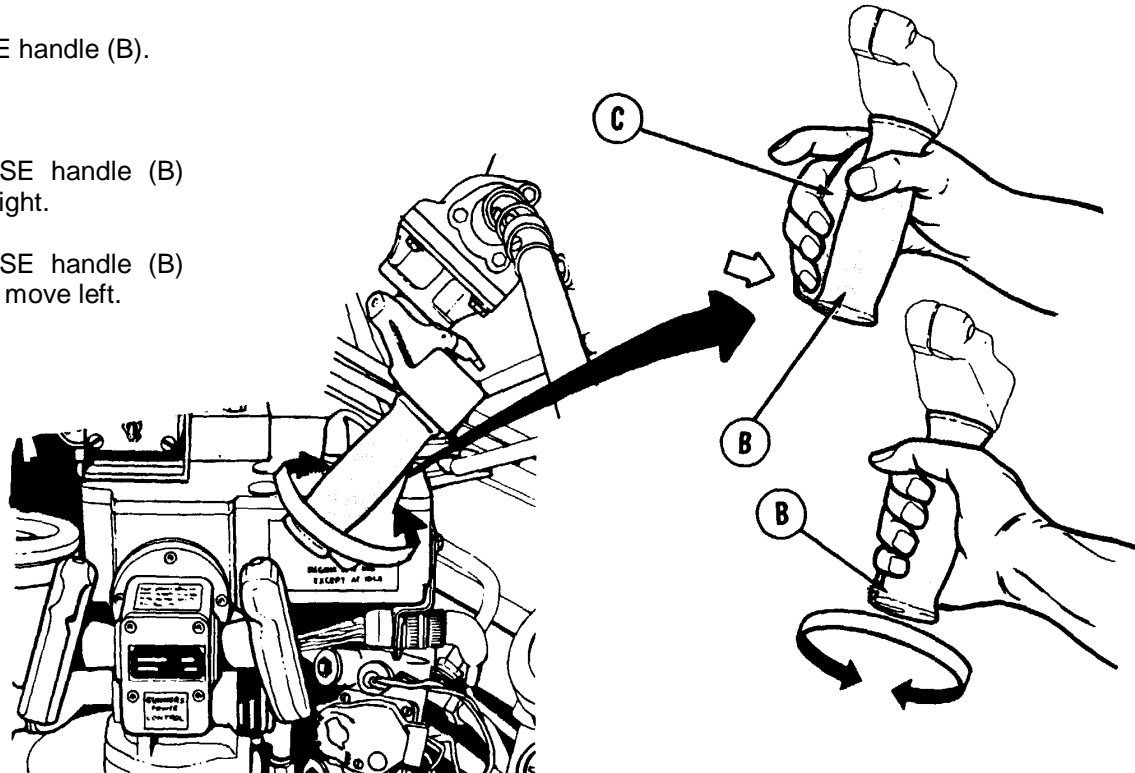
**To Control Turret and Gun - Manual Mode:**

**Gunner elevate and depress gun:**

1. Grasp MANUAL ELEVATION CONTROL handle (A).
2. Rotate clockwise to elevate gun.
3. Rotate counterclockwise to depress gun.

**ENGAGE TARGET WITH 7.62-MM MACHINE GUN (TRACK) - Continued****Gunner Traverse Turret:**

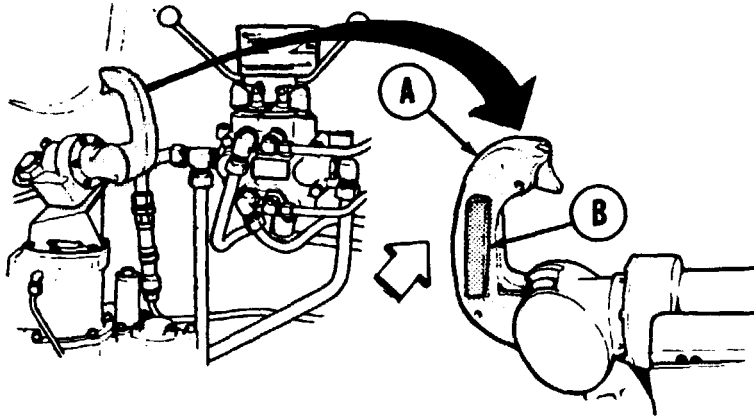
1. Grasp MANUAL TRAVERSE handle (B).
2. Squeeze lever (C).
3. Rotate MANUAL TRAVERSE handle (B) clockwise; turret will move right.
4. Rotate MANUAL TRAVERSE handle (B) counterclockwise; turret will move left.



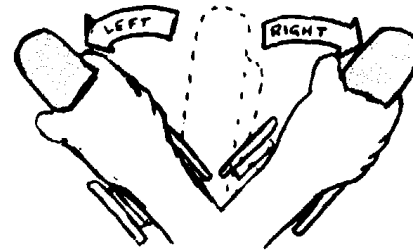
TA132619

**ENGAGE TARGET WITH 7.62-MM MACHINE GUN (TRACK) - Continued**

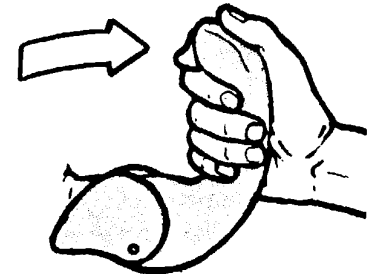
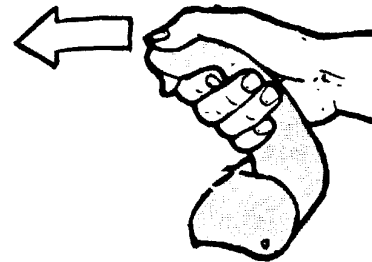
To Control Turret and Gun - Power Mode (Commander):



- 1 Turn turret power on (page 2-389).
- 2 Grasp COMMANDER'S CONTROL handle (A).
- 3 Squeeze switch (B).
- 4 Turn left to traverse turret left.
- 5 Turn right to traverse turret right.



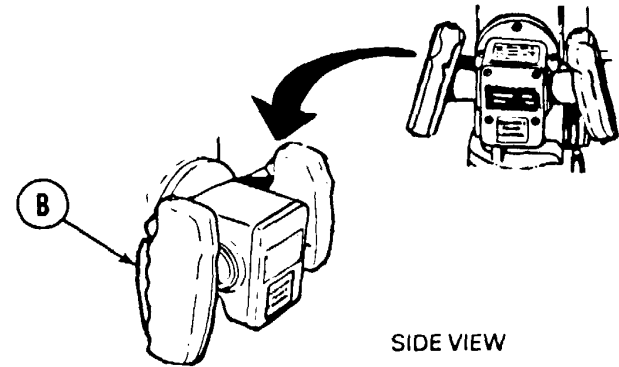
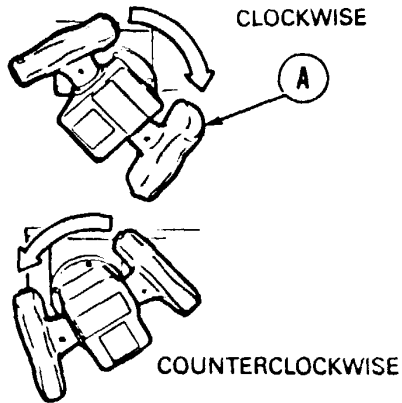
6. Push forward to depress gun.
7. Pull back to elevate gun.



**ENGAGE TARGET WITH 762-MM MACHINE GUN (TRACK) - Continued**

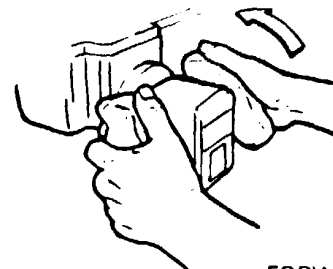
**To Control Turret And Gun - Power Mode (Gunner):**

- 1 Turn turret power on (page 2-389).
- 2 Grasp GUNNER'S POWER CONTROL handles (A).
- 3 Squeeze switch (B).
- 4 Turn handles clockwise to traverse turret right.
- 5 Turn handles counterclockwise to traverse turret left.

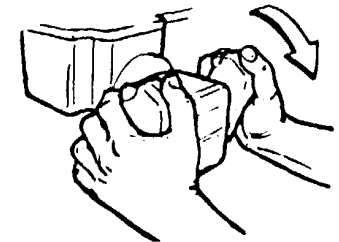


SIDE VIEW

- 6 Tilt handles forward to depress gun.
- 7 Tilt handles back to elevate gun.



FORWARD



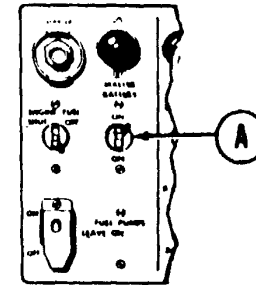
BACK

**ENGAGE TARGET WITH 7.62-MM MACHINE GUN (FIRE)**

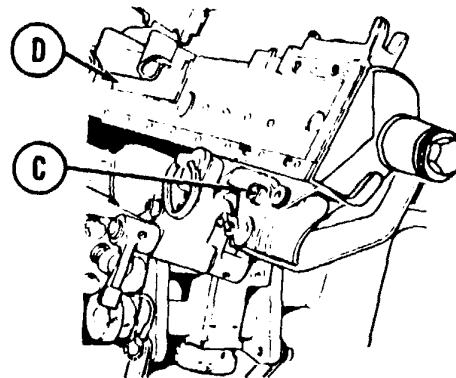
**To Fire M240 Electrically Using Gunner's Control:**

**Make Sure:**

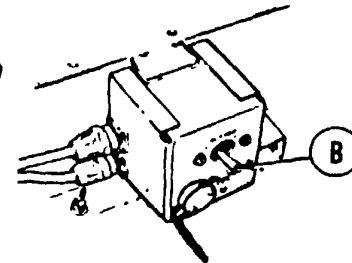
- Machine gun is loaded (M240, page 2-377).
- MASTER BATTERY switch (A) is set to ON.
- Turret ventilator BLOWER switch (B) is set to ON.
- SAFETY switch (C) on machine gun (D) is set to "F" (fire).



DRIVER'S STATION



M240 LOADER'S STATION



TURRET ROOF

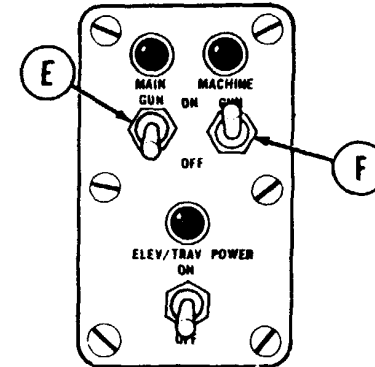
**ENGAGE TARGET WITH 7.62-MM MACHINE GUN (FIRE) - Continued**

- **MAIN GUN switch (E) is set to OFF.**
- 1 Set MACHINE GUN switch (F) to ON.
  - 2 Squeeze either trigger (G) on GUNNER'S POWER CONTROL handle (H) or press firing button (J) on MANUAL ELEVATION CONTROL handle (K).

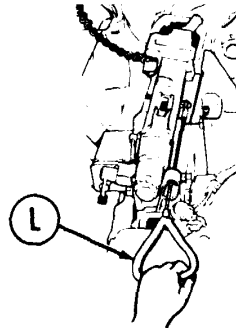
**NOTE**

**Have loader pull and hold charger handle (L) back if machine gun fails to stop firing when trigger (G) or (J) is released.**

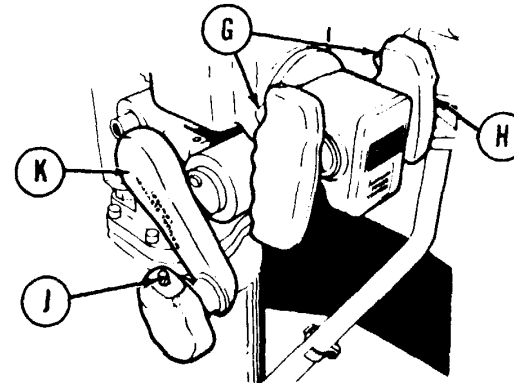
- 3 Release trigger (G) or (J) to stop machine gun firing.



**GUNNER'S STATION**



**M240 LOADER'S STATION**

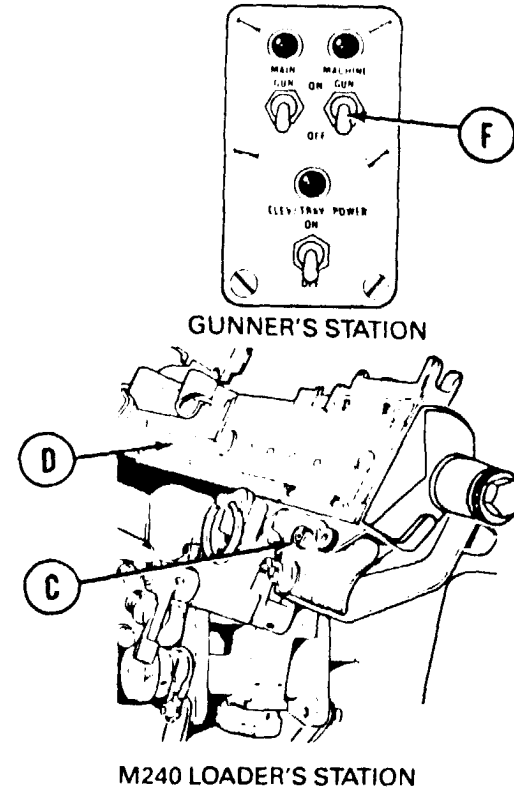


**GUNNER'S STATION**



**ENGAGE TARGET WITH 7.62-MM MACHINE GUN (FIRE) - Continued**

4. Set MACHINE GUN switch (F) to OFF when firing is completed.
5. Have loader set SAFETY switch (C) on machine gun (D) to "S" (safe) when firing is completed.

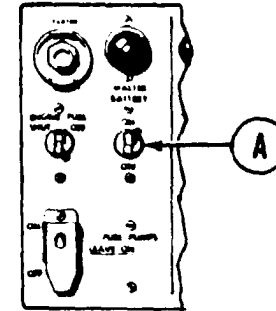


**ENGAGE TARGET WITH 7.62-MM MACHINE GUN (FIRE) - Continued**

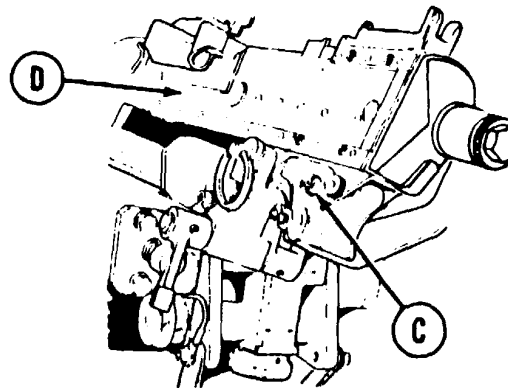
■ **To Fire M240 Electrically Using Commander's Controls:**

**Make Sure:**

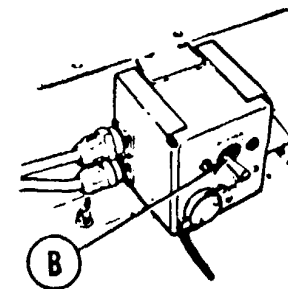
- Machine gun is loaded (M240, page 2-377).
- MASTER BATTERY switch (A) is set to ON.
- Turret ventilator BLOWER switch (B) is set to ON.
- SAFETY switch (C) on machine gun (D) is set to "F" (fire.)



**DRIVER'S STATION**



**M240 LOADER'S STATION**



**TURRET ROOF**

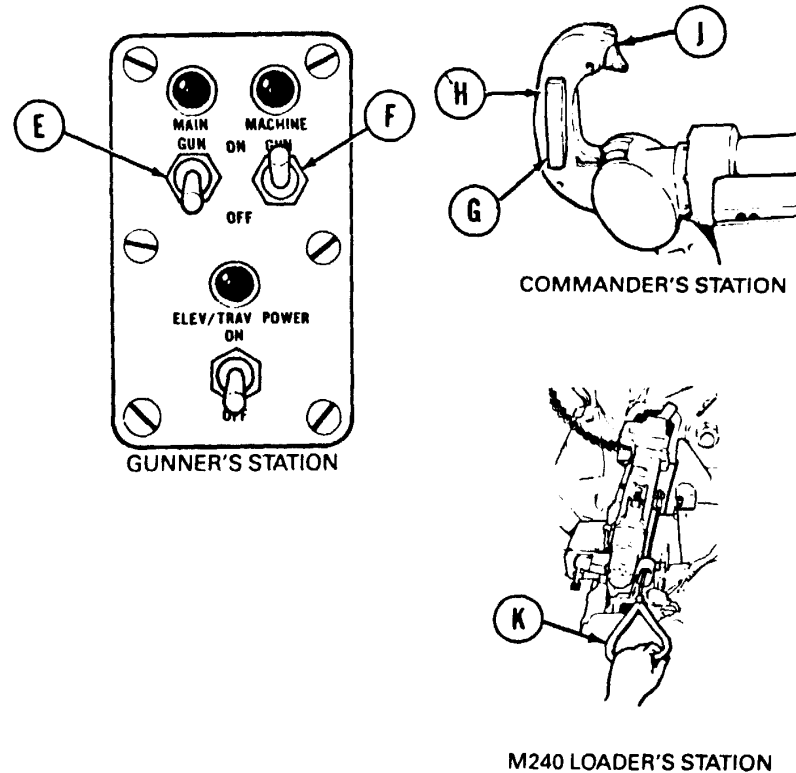
**ENGAGE TARGET WITH 7.62-MM MACHINE GUN (FIRE) - Continued**

- MAIN GUN switch (E) is set to OFF.
  - MACHINE GUN switch (F) is set to ON.
1. Squeeze and hold override switch (G) on COMMANDER'S CONTROL handle (H).
  2. Squeeze firing trigger (J).

**NOTE**

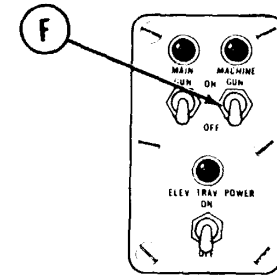
Have loader pull and hold charger handle (K) back if machine gun fails to stop firing when trigger (J) is released.

3. Release trigger (J) to stop machine gun firing.

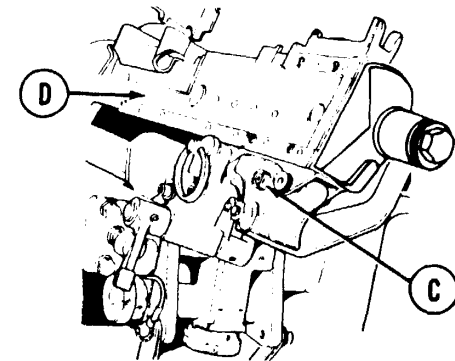


**ENGAGE TARGET WITH 7.62-MM MACHINE GUN (FIRE) - Continued**

4. Have gunner set MACHINE GUN switch (F) to OFF when firing is completed.
5. Have loader set SAFETY switch (C) on machine gun (D) to "S" (safe) when firing is completed.



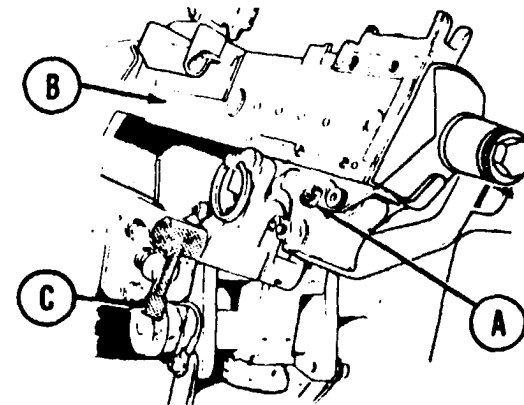
**GUNNER'S STATION**



**M240 LOADER'S STATION**

**ENGAGE TARGET WITH 7.62-MM MACHINE GUN (FIRE) - Continued****To Fire Manually:****Make Sure:**

- Machine gun is loaded (M240, page 2-377).
- 1. Set SAFETY switch (A) on machine gun (B) to "F" (fire).
- 2. Push trigger (C) to fire machine gun.

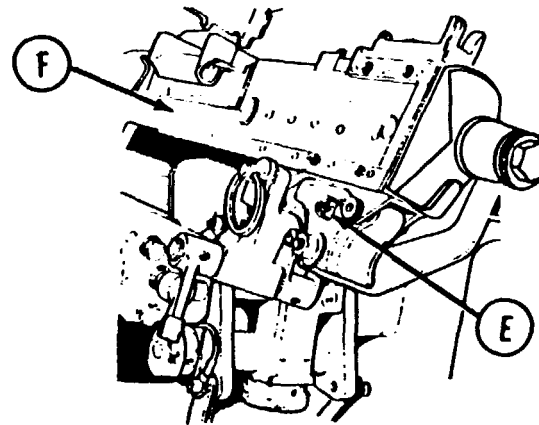
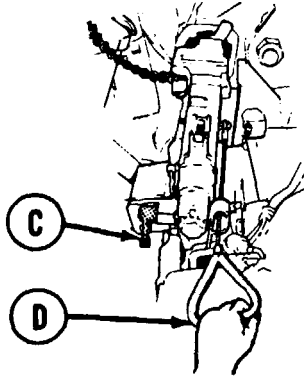
**M240 LOADER'S STATION**

**ENGAGE TARGET WITH 7.62-MM MACHINE GUN (FIRE) - Continued**

**NOTE**

**Pull and hold charger handle (D) back if machine gun fails to stop firing when trigger (C) is released.**

3. Release trigger (C) to stop machine gun firing.
4. Set SAFETY switch (E) on machine gun (F) to "S" (safe) when firing is completed.



**M240 LOADER'S STATION**

**ENGAGE TARGET WITH 7.62-MM MACHINE GUN (PERFORM FAILURE TO FIRE-IMMEDIATE ACTION) - Continued****WARNING**

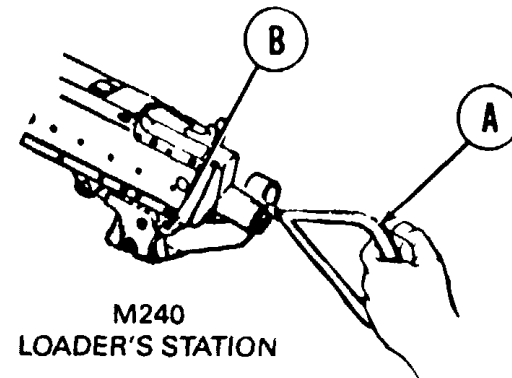
**When gun fails to fire, keep gun aimed at target.  
Keep all personnel clear of barrel.**

**NOTE**

**“Stoppage” is when gun stops firing due to faulty  
action of gun or ammunition.**

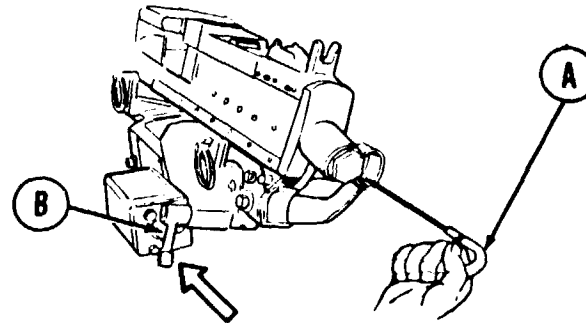
**For a Cold Gun (Less Than 200 Rounds Fired in Two Minutes):**

1. Wait five seconds after stoppage.
2. Pull charger handle (A) back to charge gun.
3. Try to fire gun (page 2-482).
4. If gun stops again, wait five seconds, then unload gun. (Page 2-559) for M240 machine gun.
5. Set machine gun safety (B) to "F".
6. Pull charger handle (A) to charge gun.



**ENGAGE TARGET WITH 7.62-MM MACHINE GUN (PERFORM FAILURE TO FIRE-IMMEDIATE ACTION) - Continued**

7. For M240 let charger handle (A) go forward slowly while pushing trigger (B) forward.
8. Load gun. Machine gun is loaded (M240, page 2-377).
9. Try to fire gun manually (page 2-483).
10. If gun stops again, wait five seconds after third stoppage and unload gun. (Page 2-559) for M240 machine gun.
11. Troubleshoot gun. (Page 3-33) for M240 machine gun.



**M240  
LOADER'S STATION**



**ENGAGE TARGET WITH 7.62-MM MACHINE GUN (PERFORM FAILURE TO FIRE-IMMEDIATE ACTION) - Continued**

**For a Hot Gun (200 or More Rounds Fired in Two Minutes):**

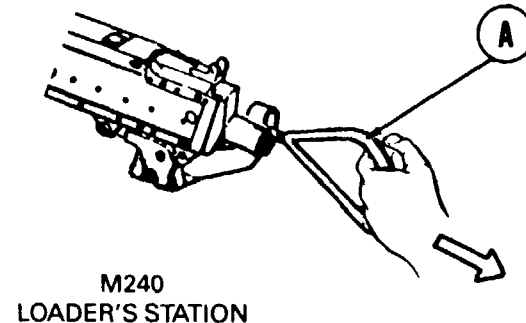
1. Wait five seconds after stoppage.
2. Pull charger handle (A) back to charge gun.
3. Try to fire gun (page 2-482).

**NOTE**

“Cookoff” is when heat of gun causes a chambered round to fire

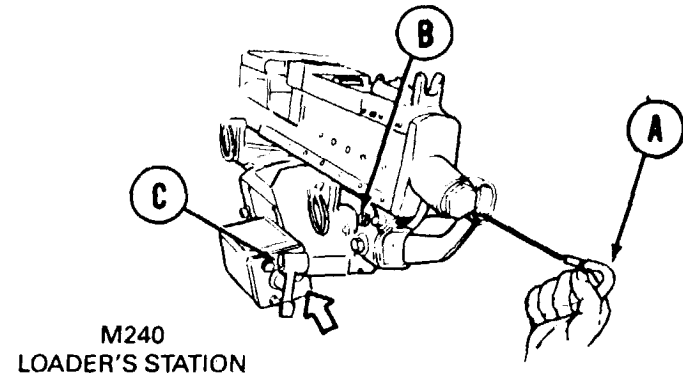
**WARNING**

Danger of a cookoff exists when gun is hot. After waiting five seconds, gun must be unloaded within next five seconds. If gun cannot be unloaded in five seconds, let bolt go forward, close cover, and keep gun pointed at target 15 minutes to cool.



**ENGAGE TARGET WITH 7.62-MM MACHINE GUN (PERFORM FAILURE TO FIRE-IMMEDIATE ACTION) - Continued**

4. If gun stops again, wait five seconds and unload. (Page 2-559) for M240 machine gun.
5. Set machine gun safety (B) to "F" (fire).
6. Pull charger handle (A) back to charge gun,
7. For M240 let charger handle (A) go forward slowly while pushing trigger (C) forward.
8. Load gun. (Page 2-377) for M240 machine gun.
9. Try to fire gun manually (page 2-483).

**WARNING**

**Danger of a cookoff exists when gun is hot. After waiting five seconds, gun must be unloaded within next five seconds. If gun cannot be unloaded in five seconds, let bolt go forward, close cover, and keep gun pointed at target 15 minutes to cool.**

**ENGAGE TARGET WITH 7.62-MM MACHINE GUN (PERFORM FAILURE TO FIRE-IMMEDIATE ACTION) - Continued**

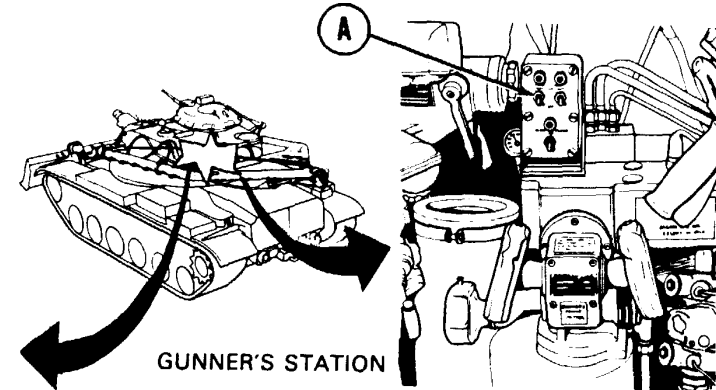
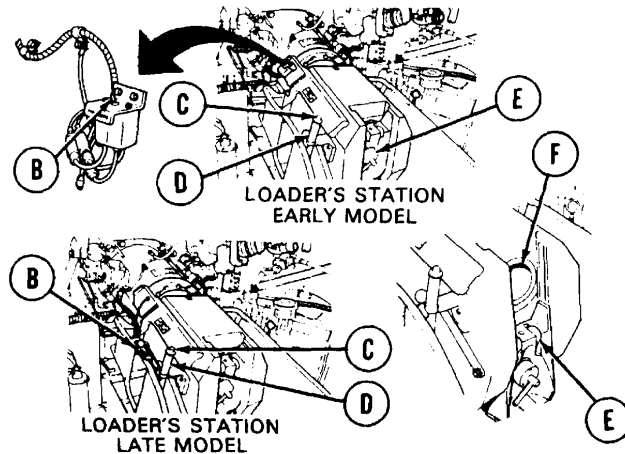
10. If gun stops again, wait five seconds after third stoppage and unload gun. (Page 2-559) for M240 machine gun.
11. Troubleshoot gun. (Page 3-33) for M240 machine gun.

**Change 8 2-495**

## ENGAGE TARGET WITH 165-MM MAIN GUN (LOAD)

### Make Sure:

- MAIN GUN switch (A) is set to OFF.
  - Indicator tape on replenisher shows one rough edge and one smooth edge (2-108).
1. Set safety switch (B) to SAFE.
  2. Push down and hold plunger (C).
  3. Pull back BREECH OPERATING HANDLE (D) until breechblock (E) is locked open.



### WARNING

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

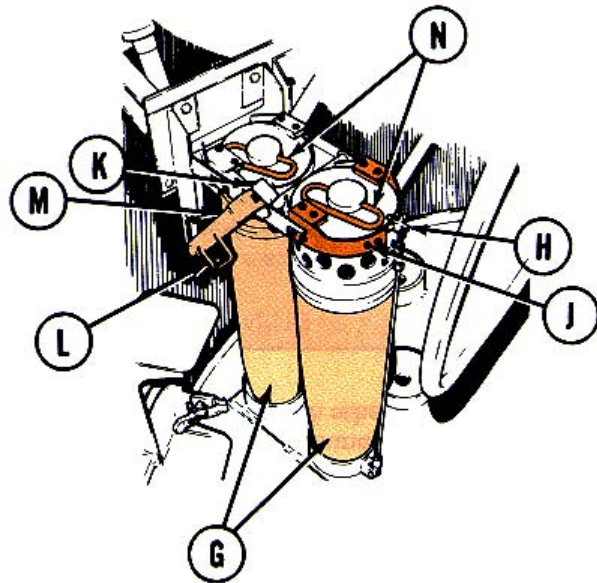
4. Return BREECH OPERATING HANDLE (D) to original position. Make sure it latches.
5. Check that chamber (F) is empty and clean.

**ENGAGE TARGET WITH 165-MM MAIN GUN (LOAD) - Continued**

6. Remove 165-mm round (G) from one of the ammunition racks as follows:

**NOTE**

**Rounds in ready rack are stowed in two rows. Round from front row must be removed before round from back row.**



- Ready Rack
  - a. Turn locking knob (H) counterclockwise until loose.
  - b. Remove locking knob (H) from outer bracket (J).
  - c. Hold round (G) and lift outer bracket (J).
  - d. Turn locking knob (K) counterclockwise until loose.
  - e. Hold round (G).
  - f. Grasp handle (L) and lift support arm (M) from bottom slot and move to top slot.
  - g. When round in ready rack is loose, grasp handle (N) of round (G) with right hand and center of round with left hand and lift out of ready rack.

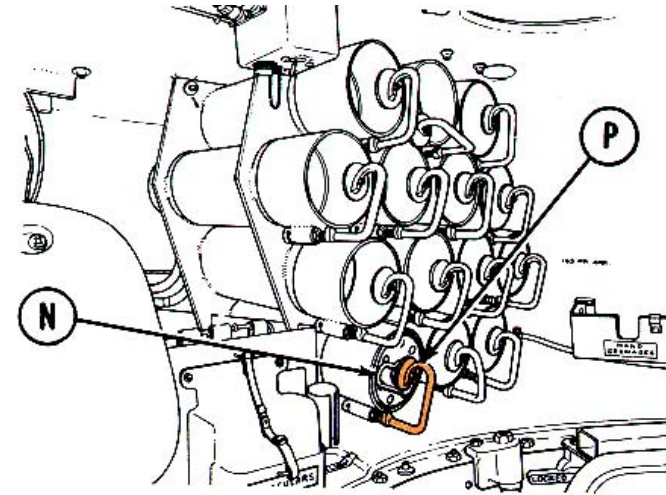
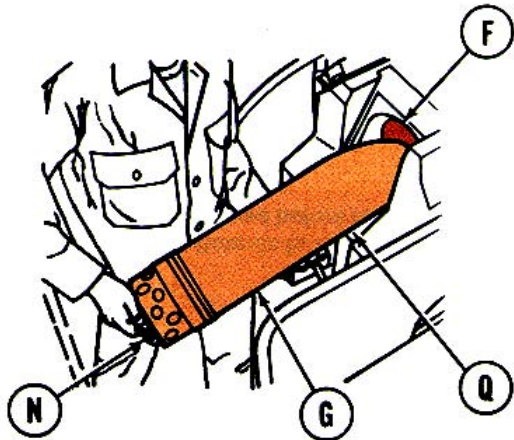
TA132637

**ENGAGE TARGET WITH 165-MM MAIN GUN (LOAD) - Continued**

- Tubular Stowage Rack
  - a. Push in and rotate handle (P) counterclockwise.
  - b. Grasp handle (N) and pull round from stowage position while supporting round with other hand.

**WARNING**

Gun must not be elevated above 178 mils (10 degrees) quadrant reading when loading a round.



TUBULAR STOWAGE RACK

7. Carefully place front of round (G) on breechblock rollers (Q).
8. Align round with chamber (F).
9. Push round all the way forward into chamber (F).

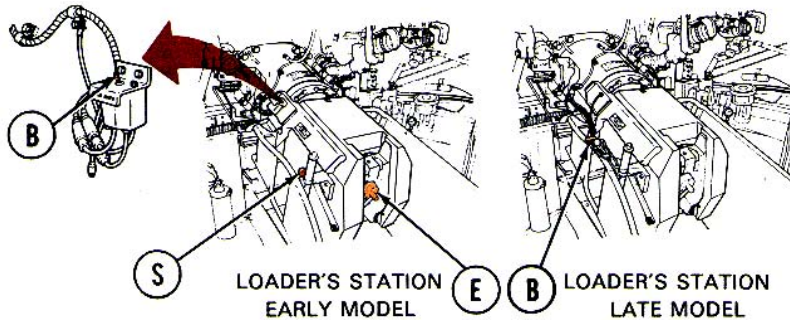
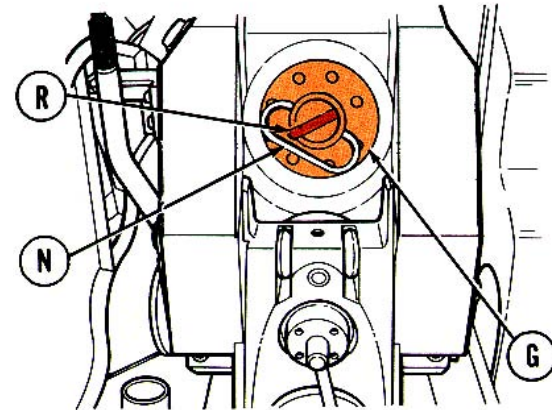
**ENGAGE TARGET WITH 165-MM MAIN GUN (LOAD) - Continued**

10. Lift latch (R) on round (G).
11. Rotate handle (N) counterclockwise and remove from round.

**WARNING**

**Keep hands away from breechblock (E). Breechblock may close suddenly and cause injury.**

12. Lift breechblock release lever (S) to close breechblock (E).



13. Make sure breechblock (E) is fully seated against breech. If breechblock does not fully seat, close breechblock.
14. Set safety switch (B) to FIRE.

**ENGAGE TARGET WITH 165-MM MAIN GUN (CLOSE BREECH IN EMERGENCY)**

**NOTE**

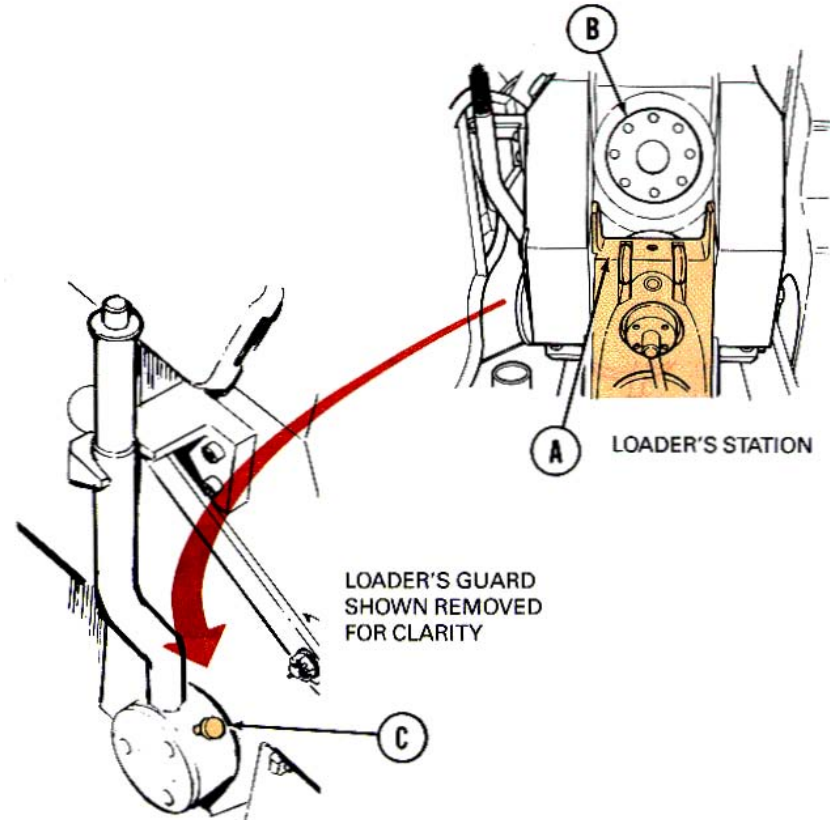
Follow these steps when 165-mm main gun breech does not close after loading.

**WARNING**

Keep hands away from breechblock (A). Breechblock may close suddenly and cause injury.

**Make Sure:**

- Rear of round has crossed breechblock (A) and gone entirely into chamber (B).
1. Locate clutch (C).

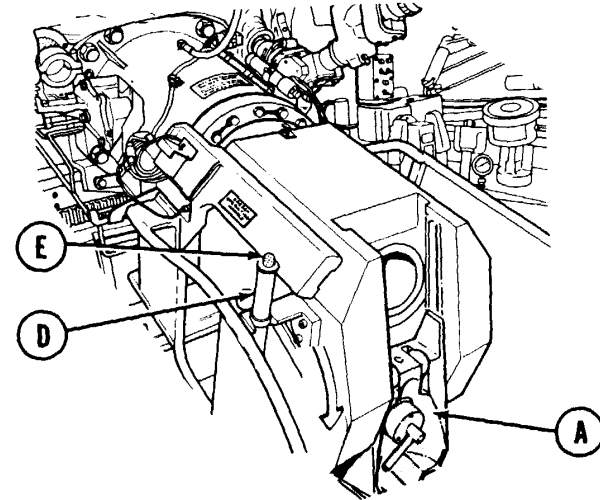
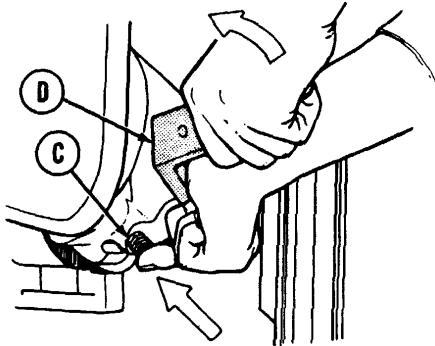




**ENGAGE TARGET WITH 165-MM MAIN GUN (CLOSE BREECH IN EMERGENCY) - Continued****WARNING**

**Always keep a firm grip on BREECH OPERATING HANDLE (D) when it is not in latched position.**

2. Depress plunger (E).
3. Pull BREECH OPERATING HANDLE (D) to rear and down until it is hard to move. Hold BREECH OPERATING HANDLE (D) in down position.
4. Push in on clutch (C) and hold.

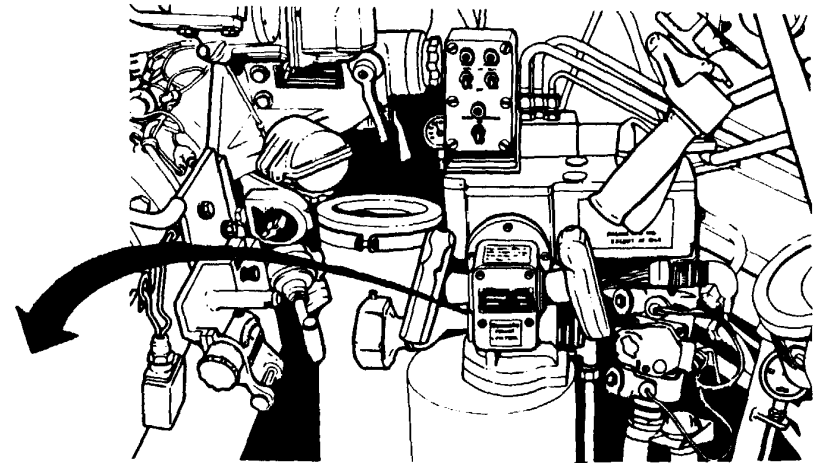
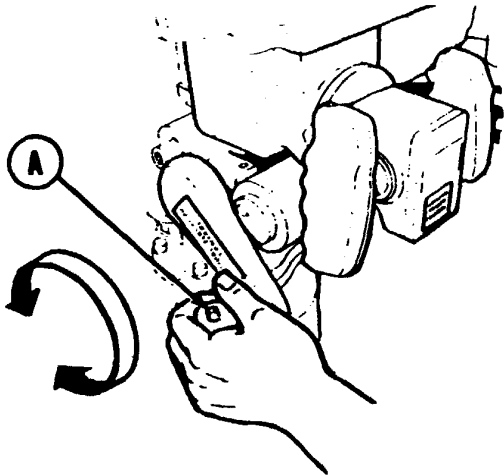


5. While holding clutch (C) in, pull BREECH OPERATING HANDLE (D) up and forward until latched.
6. Release clutch (C), pull back on BREECH OPERATING HANDLE (D) until clutch disengages (when click is heard) and push handle forward until latched. Breechblock (A) should be fully seated.
7. If breech does not close, unload round (page 2-550).
8. Troubleshoot as soon as you can (page 3-31).

## ENGAGE TARGET WITH 165-MM MAIN GUN (TRACK)

### Make Sure:

- Vehicle and surrounding area are clear of obstruction.
- traverse lock is UNLOCKED (page 2-331).
- Area under breech is clear.
- No personnel are on top of vehicle.
- Hoist and winch cables are stowed (page 2-305) and (page 2-284).



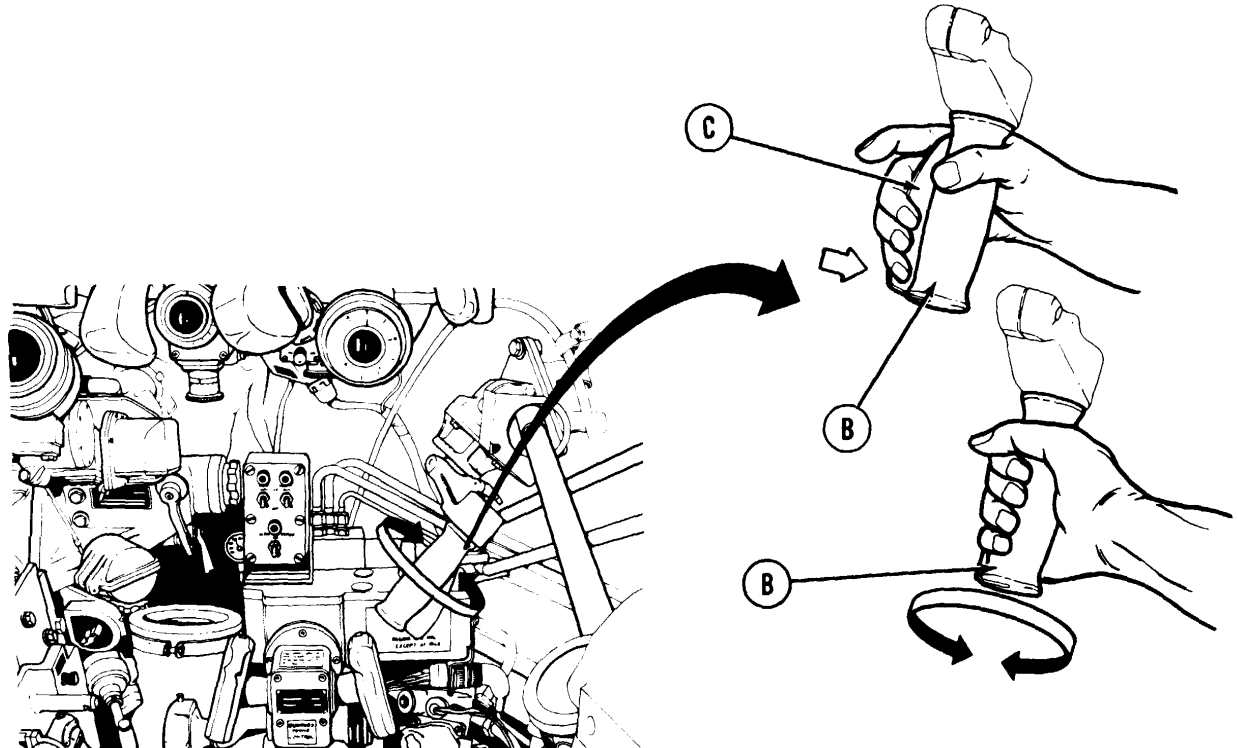
GUNNER'S STATION

### To Control Turret and Gun - Manual Mode:

1. Grasp MANUAL ELEVATION CONTROL handle (A).
2. Rotate clockwise to elevate gun.
3. Rotate counterclockwise to depress gun.

**ENGAGE TARGET WITH 165-MM MAIN GUN (TRACK) - Continued**

4. Grasp turret MANUAL TRAVERSE handle (B).
5. Squeeze lever (C).
6. Rotate MANUAL TRAVERSE handle (B) clockwise to move turret right.
7. Rotate MANUAL TRAVERSE handle (B) counterclockwise to move turret left.



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**ENGAGE TARGET WITH 165-MM MAIN GUN (TRACK) - Continued**

**To Control Turret and Gun - Power Mode (Gunner):**

**WARNING**

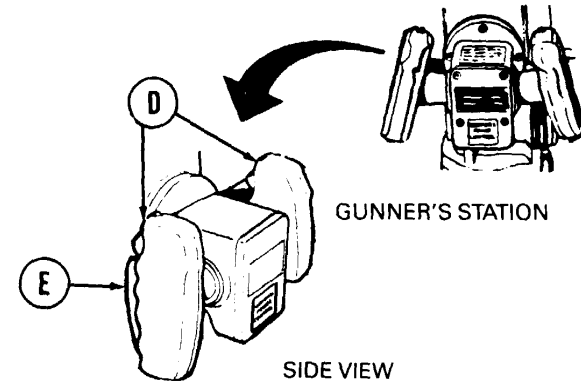
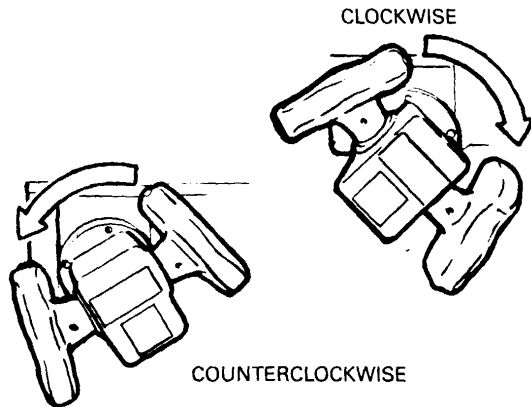
- **Do not apply turret power or operate turret controls until all personnel are in safe positions and prepared for turret or gun movement.**
- **Do not operate turret in power or manual mode until all personnel are in proper position, turret ring has been cleared, and shell ejection plate and all platform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

1. Turn turret power on (page 2-389).

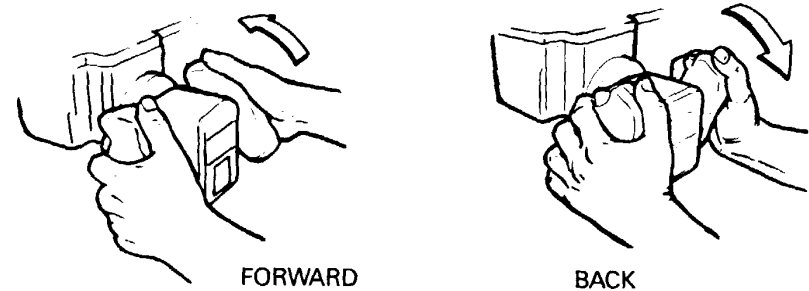
**Change 4 2-504**

**ENGAGE TARGET WITH 165-MM MAIN GUN (TRACK) - Continued**

2. Grasp GUNNER'S POWER CONTROL handles (D).
3. Squeeze switch (E).
4. Turn handles clockwise to traverse turret right.
5. Turn handles counterclockwise to traverse turret left.



6. Tilt handles forward to lower gun.
7. Tilt handles back to raise gun.



**ENGAGE TARGET WITH 165-MM MAIN GUN (TRACK) - Continued**

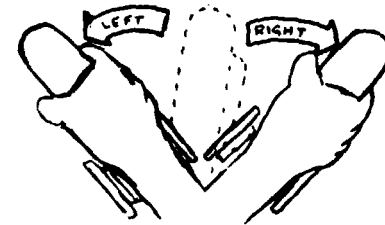
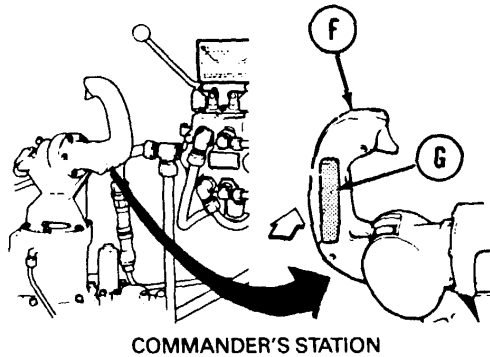
**To Control Turret and Gun - Power Mode (Commander):**

**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.**

**ENGAGE TARGET WITH 165-MM MAIN GUN (TRACK) - Continued**

**To Control Turret and Gun - Power Mode (Commander):**



5. Push handle forward to depress gun.
6. Pull handle back to elevate gun.

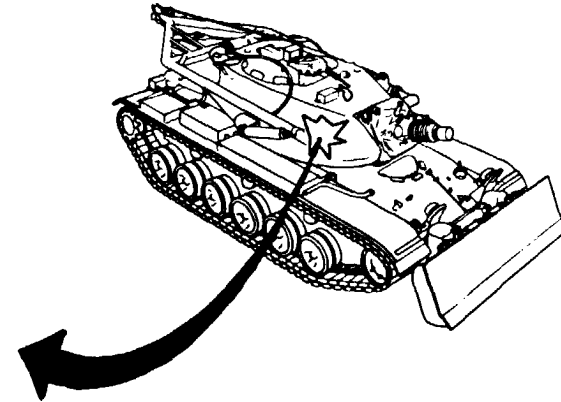
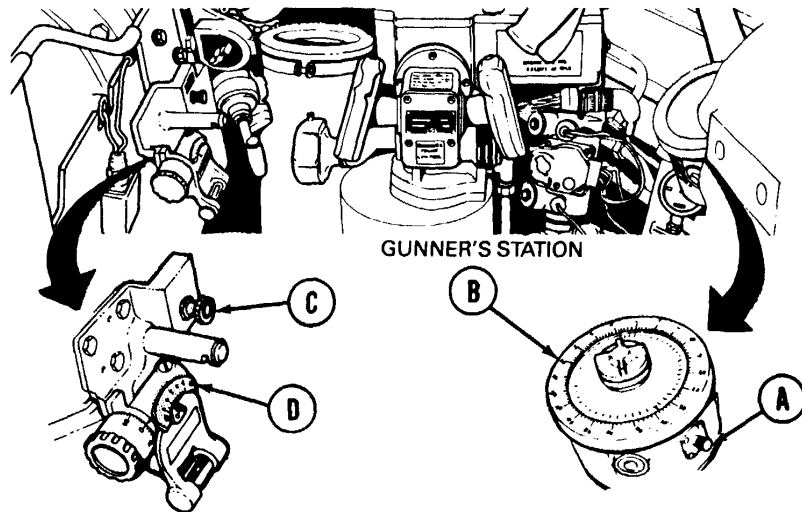
**Make Sure:**

- Turret power is on (page 2-389).
1. Grasp COMMANDER'S CONTROL handle (F).
  2. Squeeze switch (G).
  3. Turn handle left to traverse turret left.
  4. Turn handle right to traverse turret right.



**ENGAGE TARGET WITH 165-MM MAIN GUN (AUXILIARY FIRE CONTROL)****Make Sure:**

- MASTER BATTERY switch is set to ON.
- Turret traverse lock is UNLOCKED (page 2-331).

**To Find Existing Azimuth and Elevator Readings:**

1. Rotate knob (A) on azimuth indicator (B) to adjust brightness of lights if necessary.
2. Rotate knob (C) on elevation quadrant (D) to adjust brightness of light if necessary.

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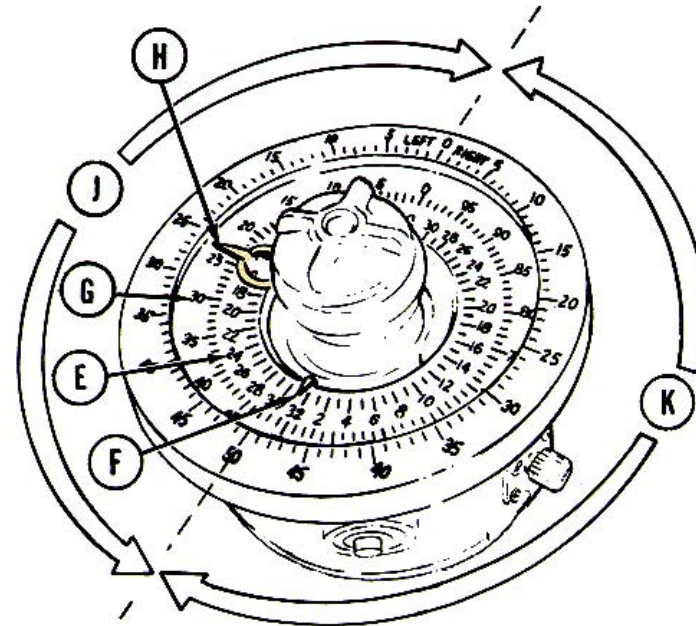


**ENGAGE TARGET WITH 165-MM MAIN GUN (AUXILIARY FIRE CONTROL) - Continued**

3. Read inner scale (E) at small pointer (F) (reading shown in drawing is 31).
4. Read middle scale (G) at large pointer (H) (reading shown in drawing is 23).
5. See if pointer (F) is on left side (J) or right side (K) of inner scale (E) (in drawing shown, pointer is to left).

**NOTE**

Combined readings of scales (E) and (G), and position of pointer (F) will give azimuth reading. Reading shown in drawing is 3123 left.



6. Combine readings from scales (E) and (G) with position of pointer (F).

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**ENGAGE TARGET WITH 165-MM MAIN GUN (AUXILIARY FIRE CONTROL) - Continued**

7. Rotate micrometer knob (L) on elevation quadrant (M) until bubble (N) is centered in vial (P).

**NOTE**

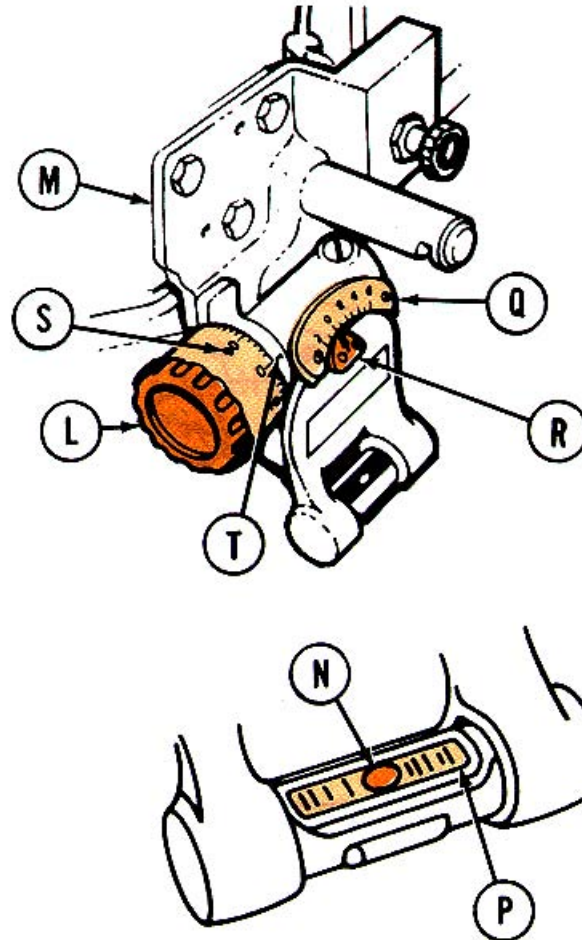
If pointer (R) shows a reading in the black numbers on elevation scale (Q), the reading is plus "+". If pointer (R) shows a reading in the red numbers on elevation scale (Q), the reading is minus "-".

8. Read elevation scale (Q) at pointer (R).

**NOTE**

If reading from elevation scale (Q) is plus "+", use black numbers on micrometer scale (S). If reading from elevation scale (Q) is minus "-", use red numbers on micrometer scale (S). The micrometer scale is numbered every ten mils. The line between the numbers show one mil each.

9. Read micrometer scale (S) at line (T).

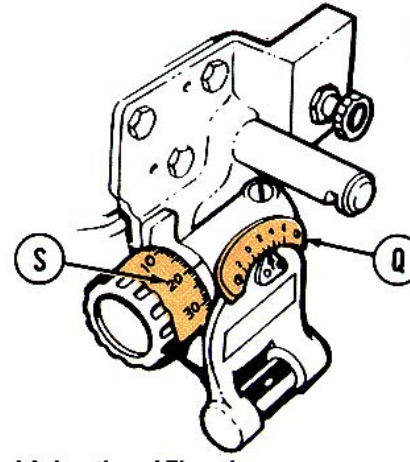
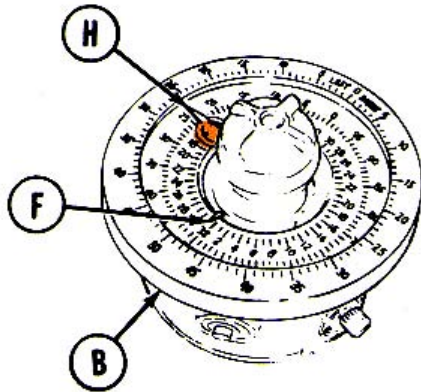


ENGAGE TARGET WITH 165-MM MAIN GUN (AUXILIARY FIRE CONTROL) - Continued

NOTE

Combined readings of scales (Q) and (S) will give elevation reading. Reading shown in drawing is plus “+” 221.

- Combine readings from scales (Q) and (S).



To Set Desired Azimuth and Elevation:

- Find existing azimuth reading shown on azimuth indicator (B).

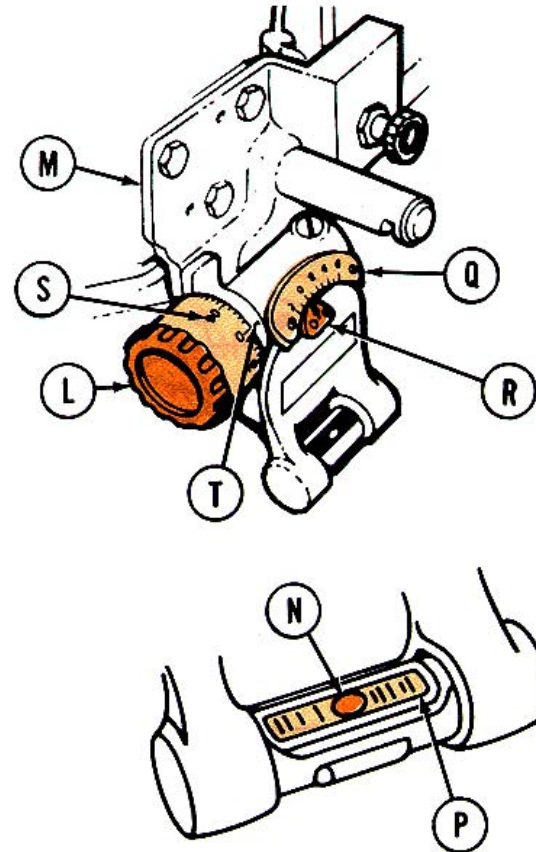
**CAUTION**

Use care when traversing turret with headlights installed. Winch or boom cables may hit headlights.

- Watch pointers (F) and (H) while traversing turret manually (page 2-502) or in power (page 2-504).
- Stop traversing when pointers (F) and (H) indicate desired azimuth reading.

**ENGAGE TARGET WITH 165-MM MAIN GUN (AUXILIARY FIRE CONTROL) - Continued**

4. Rotate micrometer knob (L) until elevation scale (Q) and micrometer scale (S) show desired elevation reading.
5. Elevate or depress main gun (page 2-502) as needed until bubble (N) is centered in vial (P) on elevation quadrant (M) to set gun to desired elevation.

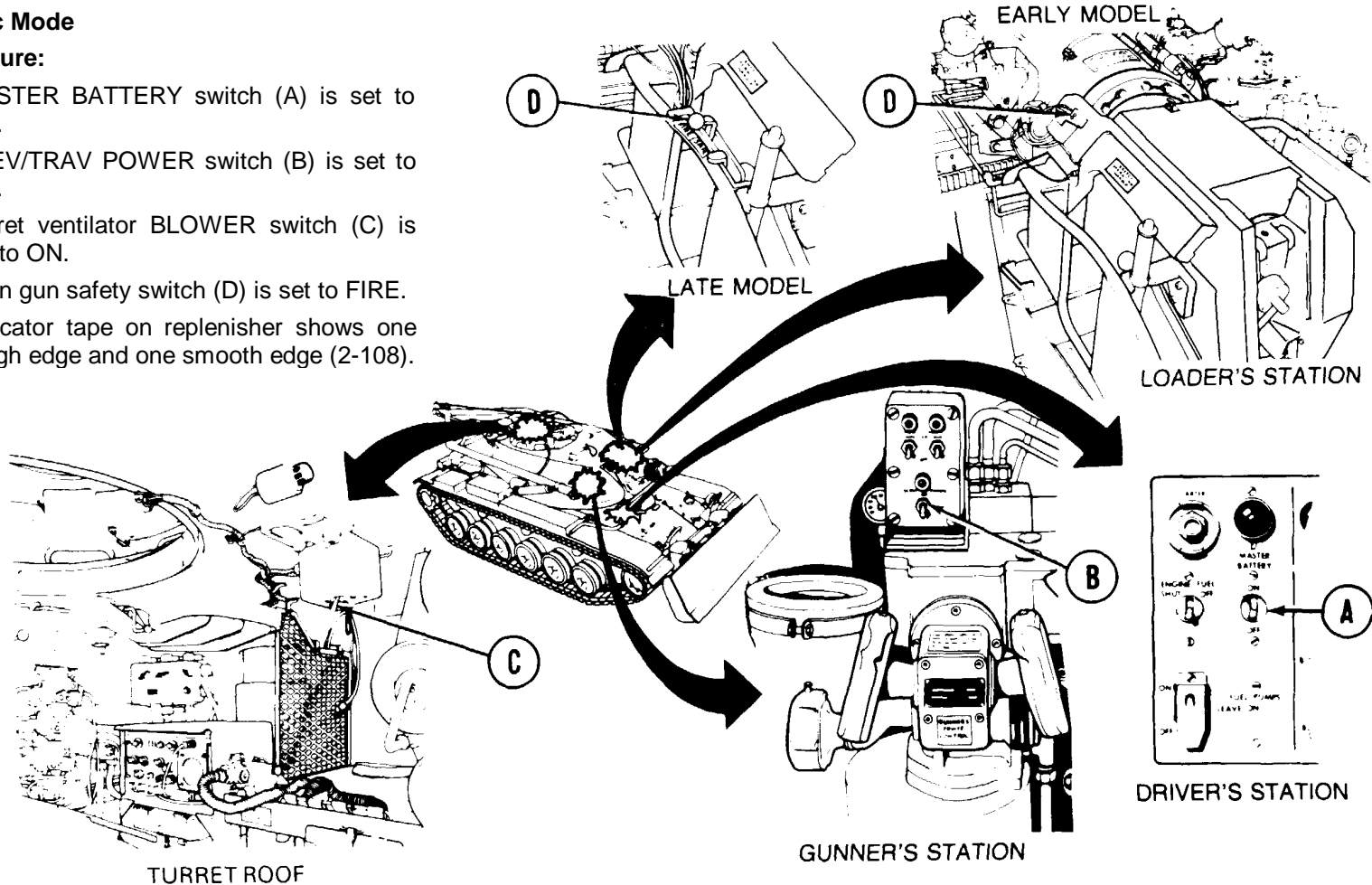


**ENGAGE TARGET WITH 165-MM MAIN GUN (FIRE)**

**Electric Mode**

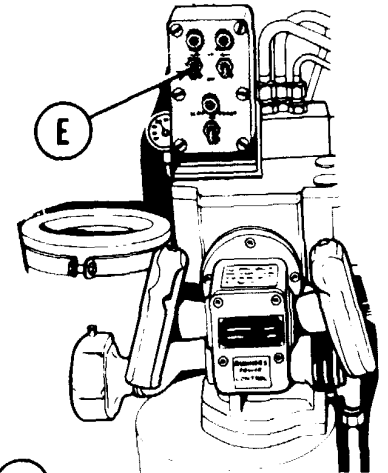
**Make Sure:**

- MASTER BATTERY switch (A) is set to ON.
- ELEV/TRAV POWER switch (B) is set to ON.
- Turret ventilator BLOWER switch (C) is set to ON.
- Main gun safety switch (D) is set to FIRE.
- Indicator tape on replenisher shows one rough edge and one smooth edge (2-108).

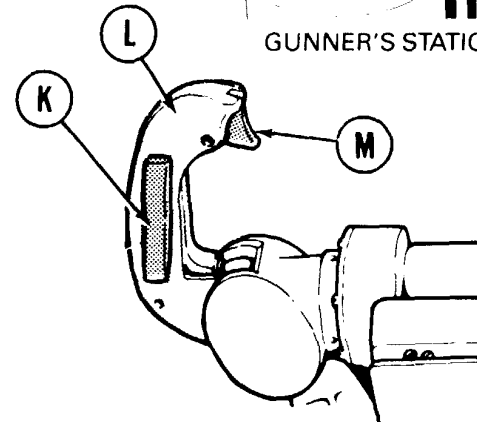
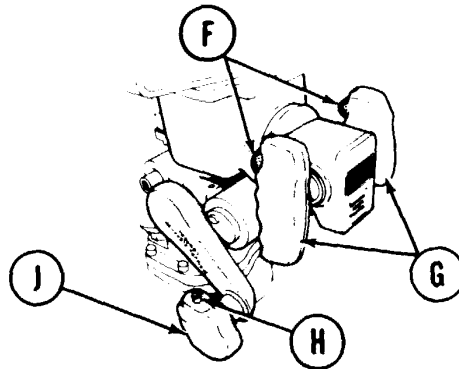


**ENGAGE TARGET WITH 165-MM MAIN GUN (FIRE) - Continued**

1. To fire using gunner's controls:
  - a. Set MAIN GUN switch (E) to ON.
  - b. Press either firing trigger (F) on GUNNER'S POWER CONTROL handles (G), or press firing trigger (H) on MANUAL ELEVATION CONTROL handle (J).
  
2. To fire using commander's controls:
  - a. Set MAIN GUN switch (E) to ON.
  - b. Squeeze and hold override switch (K) on COMMANDER'S CONTROL handle (L).
  - c. Squeeze firing trigger (M).



GUNNER'S STATION



COMMANDER'S STATION

**ENGAGE TARGET WITH 165-MM MAIN GUN (FIRE) - Continued**

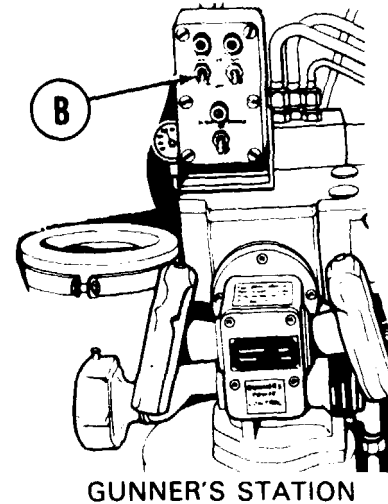
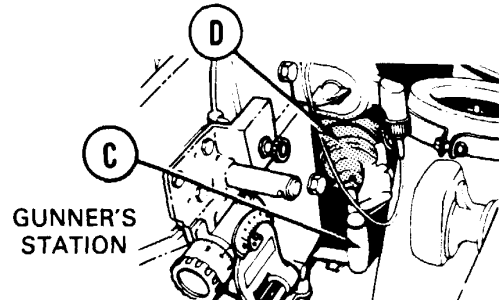
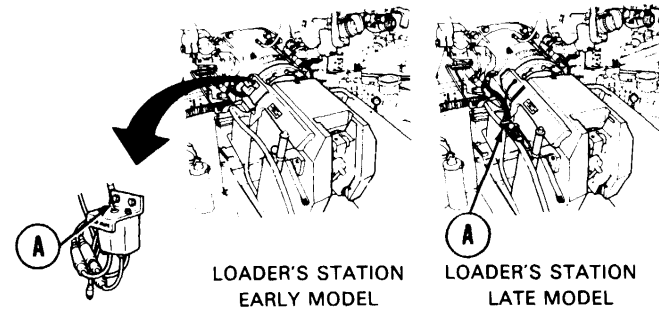
**Manual Mode:**

**WARNING**

Inspect gun tube for obstruction. Firing of gun with obstruction may cause damage to gun tube and possible injury to personnel.

**Make Sure:**

- Main gun safety switch (A) is set to FIRE.
- 1. Set MAIN GUN switch (B) to OFF.
- 2. Grasp handle (C) of MANUAL FIRING device (D).
- 3. Give handle (C) a fast turn clockwise as far as possible.
- 4. If gun does not fire, repeat step 3 three or four more times.

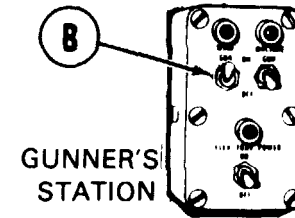
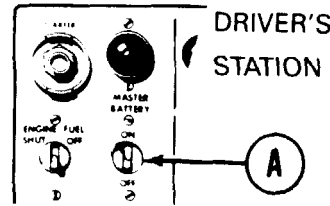


TA252828

**ENGAGE TARGET WITH 165-MM MAIN GUN (PERFORM FAILURE TO FIRE-IMMEDIATE ACTION)**

**Make Sure:**

- MASTER BATTERY switch (A) is set to ON.
- Breech is closed.
- MAIN GUN switch (B) is set to ON.
- Loader's safety switch (C) is set to FIRE.
- Indicator tape on replenisher shows one rough edge and one smooth edge (2-108).

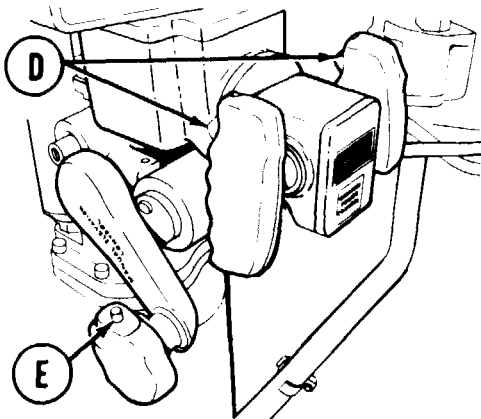


**NOTE**

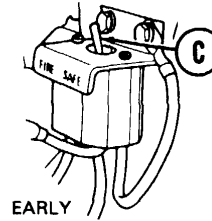
Do the following steps in order until gun is clear:

**Try to Fire Round:**

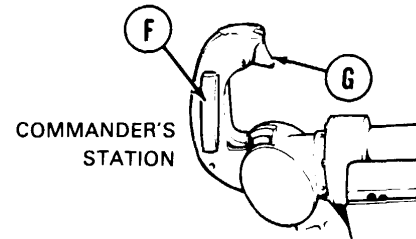
1. Gunner: Depress GUNNER'S POWER CONTROL handle triggers (D) one at a time and release.
2. Gunner: Depress MANUAL ELEVATION CONTROL



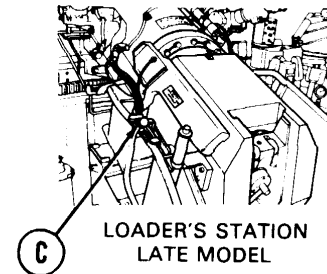
**GUNNER'S STATION**



**EARLY MODEL**



**COMMANDER'S STATION**



**LOADER'S STATION LATE MODEL**

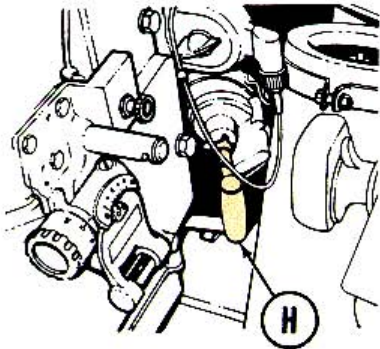
3. Commander: While squeezing override switch (F), depress trigger (G) and release.

**Change 3 2-514**



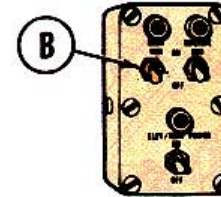
**ENGAGE TARGET WITH 165-MM MAIN GUN (PERFORM FAILURE TO FIRE-IMMEDIATE ACTION) - Continued**

4. Gunner: Sharply twist MANUAL FIRING device (H) three times clockwise as far as possible.

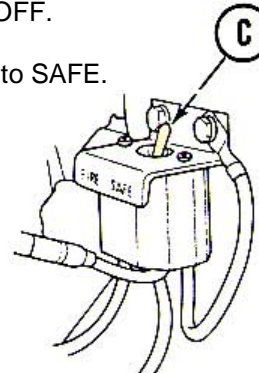


5. Set MAIN GUN switch (B) to OFF.

6. Set loader's safety switch (C) to SAFE.

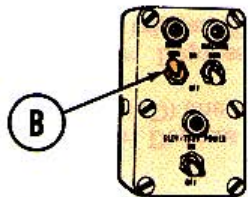


**GUNNER'S STATION**



**LOADER'S STATION  
EARLY MODEL**

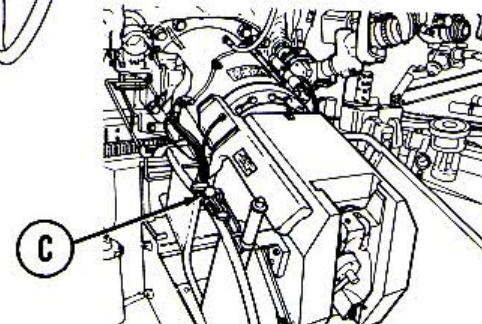
7. Wait two minutes.



**GUNNER'S STATION**

**Try to Fire Again:**

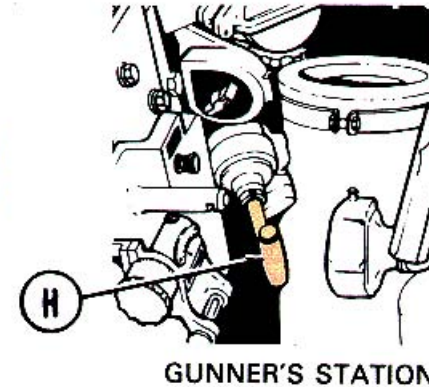
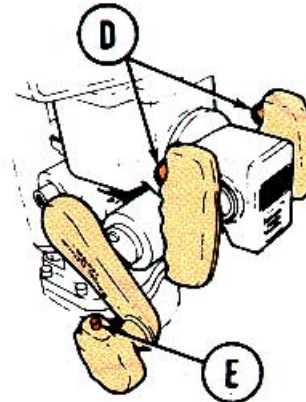
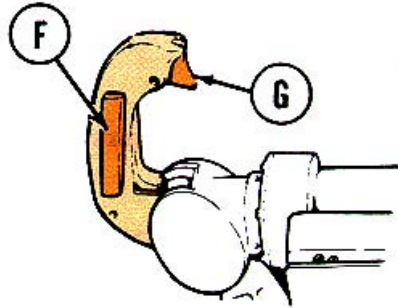
1. Set MAIN GUN switch (B) to ON.
2. Set loader's safety switch (C) to FIRE.



**LOADER'S STATION  
LATE MODEL**

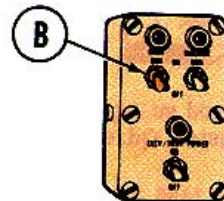
**ENGAGE TARGET WITH 165-MM MAIN GUN (PERFORM FAILURE TO FIRE-IMMEDIATE ACTION) - Continued**

3. Gunner: Depress GUNNER'S CONTROL handle triggers (D) one at a time and release.
4. Gunner: Depress MANUAL ELEVATION CONTROL handle trigger (E) and release.

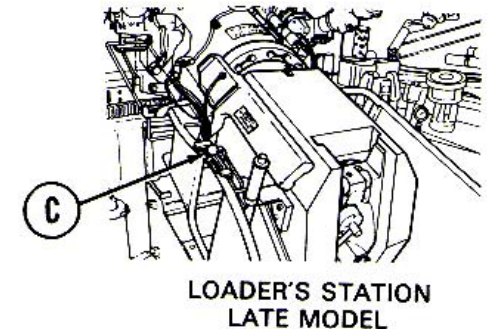
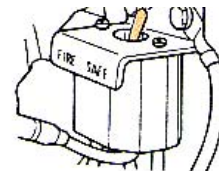


**Unload Round:**

1. Set MAIN GUN switch (B) to OFF.



5. Commander: While squeezing override switch (F), depress trigger (G) and release.
  6. Gunner: Sharply twist MANUAL FIRING device (H) three times clockwise as far as possible Unload Round:
2. Set loader's safety switch (C) to SAFE.



**ENGAGE TARGET WITH 165-MM MAIN GUN (PERFORM FAILURE TO FIRE-IMMEDIATE ACTION - Continued)****WARNING**

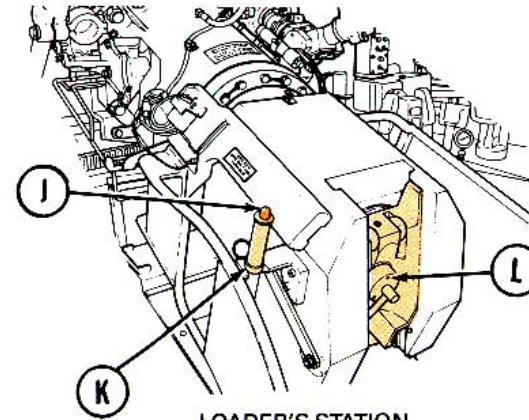
Have crewmember ready to catch round when you open breech. Keep control of **BREECH OPERATING HANDLE** until you have returned it to latched position.

3. Press in and hold plunger (J).
4. Slowly pull **BREECH OPERATING HANDLE** (K) back until breechblock (L) is locked open.

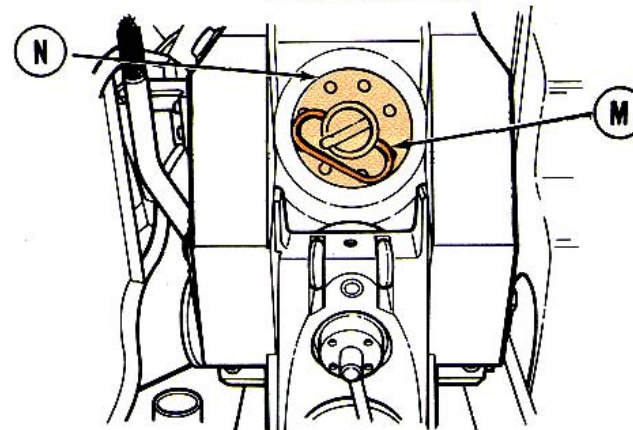
**WARNING**

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

5. Return **BREECH OPERATING HANDLE** (K) forward to latched position.
6. Attach handle (M) to base of round (N).
7. Grasp handle (M) with right hand and pull from chamber. Support center of round with left hand as round is extracted from gun.



LOADER'S STATION



**ENGAGE TARGET WITH 1MM MAIN GUN (PERFORM FAILURE TO FIRE-IMMEDIATE ACTION) - Continued**

**Dispose of Round:**

**NOTE**

**If tactical situation does not permit disposal of round, you may be forced to stow round in vehicle temporarily (page 2-310).**

**NOTE**

**Disposing of round requires three crewmembers. One crewmember inside turret, one crewmember outside turret, and one crewmember on ground.**

1. Crewmember inside turret, hand round to crewmember outside turret.
2. Crewmember outside turret, hand round to crewmember on ground.
3. Crewmember on ground, carry round to a safe distance from all personnel, to a misfire bunker if possible. Report it to ORD or EOD personnel for disposal.

**Test Firing Circuit**

Perform firing circuit test before loading another round (page 3-191).

TA132657

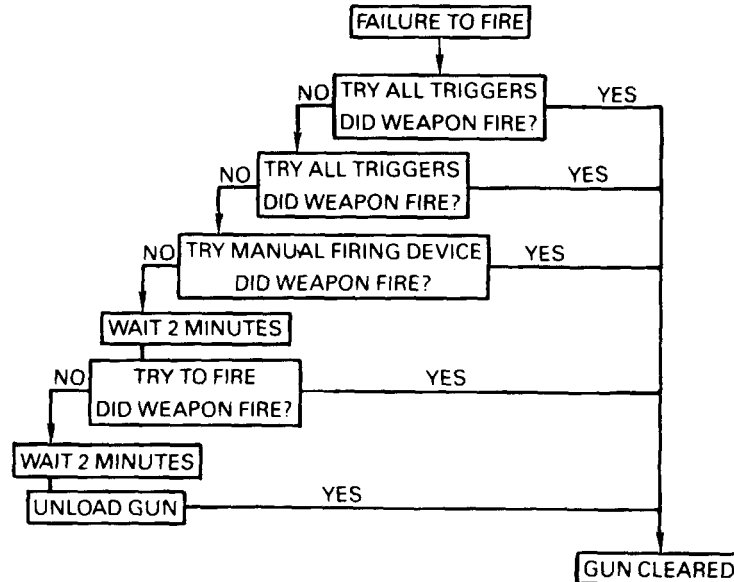
ENGAGE TARGET WITH 165-MM MAIN GUN (PERFORM FAILURE TO FIRE-IMMEDIATE ACTION) - Continued:

NOTE

This is a summary of your actions when a round fails to fire. Use it for reference after you are thoroughly familiar with complete procedure.

WARNING

Always keep gun aimed at target. Keep all personnel clear of muzzle and recoil path.



**PERFORM SMOKE SCREENING (TURN ON SMOKE GENERATOR)**

**Make Sure:**

- Engine is running (page 2-205).
1. Operate engine at 1600 rpm or higher.

**WARNING**

**Never operate smoke generator in a building, in a closed area, or with personnel near.**

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

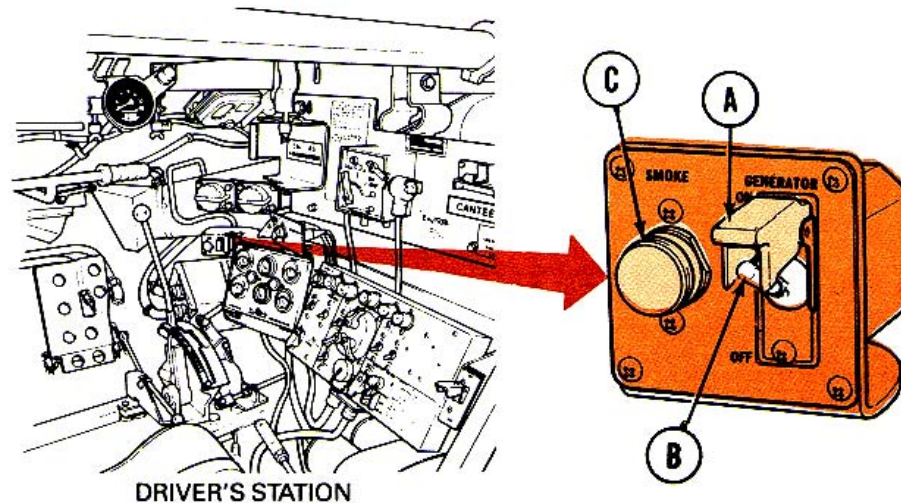
**PERFORM SMOKE SCREENING (TURN ON SMOKE GENERATOR) - Continued****CAUTION**

To prevent damage to solenoid valves, smoke generator should not be operated longer than 15 minutes. When ON cycle is 15 minutes, OFF cycle should be 15 minutes or more. ON/OFF cycle is not necessary if operated less than 15 minutes.

**NOTE**

Do not operate smoke generator if fuel supply is low.

2. Lift cover (A).
3. Set SMOKE GENERATOR switch (B) to ON.  
Lamp (C) will light.
4. To make lamp brighter, rotate lamp (C) 1/8 turn counterclockwise.

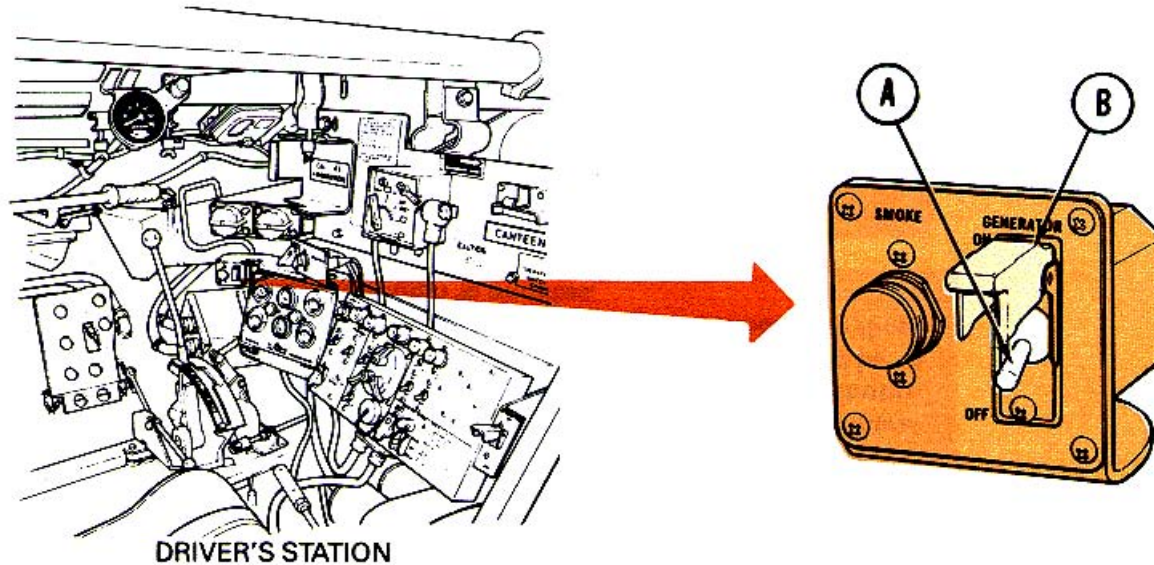


## PERFORM SMOKE SCREENING (TURN OFF SMOKE GENERATOR)

### NOTE

Let engine run a few minutes after smoke generator is turned off to clear exhaust.

1. To set SMOKE GENERATOR switch (A) to OFF, close cover (B).

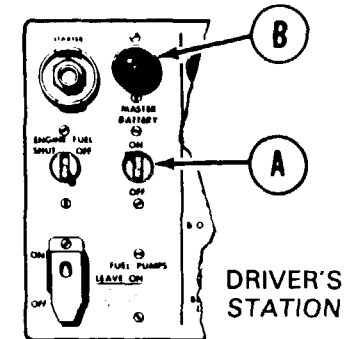
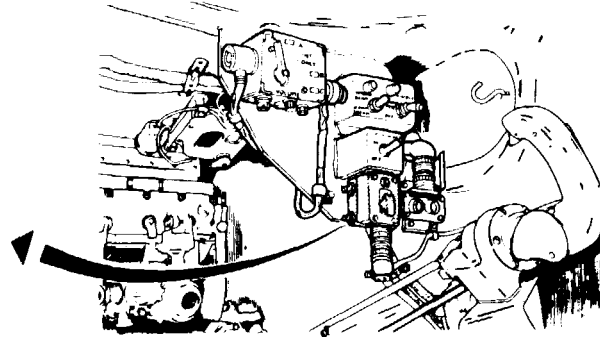
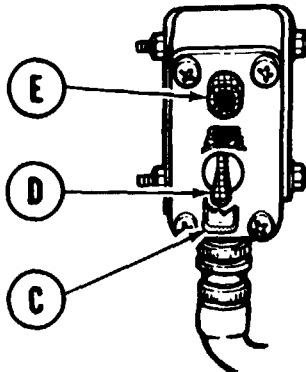




**PERFORM SMOKE SCREENING (FIRE SMOKE GRENADE DISCHARGER)**

**Make Sure:**

- Covers are removed (page 2-388.2).
- Smoke grenade dischargers are loaded (page 2-388.1).
- All crewmen are at stations. Friendly personnel are at least 200 meters (219 yards) from direction of fire.
- All hatches are locked: Cupola hatch (page 2-161), loader's hatch (page 2-154), driver's hatch (page 2-166).
- MASTER BATTERY switch (A) is set to ON. Light (B) will light.
- Intercom is ON (page 2-169).
  1. Traverse turret to firing position (page 2-502).
  2. Lift safety cover (C). Set power switch (D) to ON. Light (E) will light.



Change 9 2-522.1

**PERFORM SMOKE SCREENING (FIRE SMOKE GRENADE DISCHARGER) - Continued**

**WARNING**

When a misfire or dud occurs, all personnel must remain at least 200 meters (219 yards) from vehicle for at least 5 minutes after final attempt to fire. Crew will remain in vehicle with hatches closed.

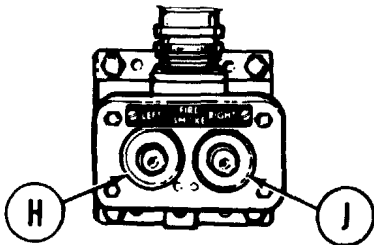
**NOTE**

Left pattern consists of three grenades from left discharger (F) and three grenades from right discharger (G). Right pattern consists of three grenades from left discharger and three grenades from right discharger.

3. Press FIRE SMOKE button (H) to fire left pattern.
4. Press FIRE SMOKE button (J) to fire right pattern.

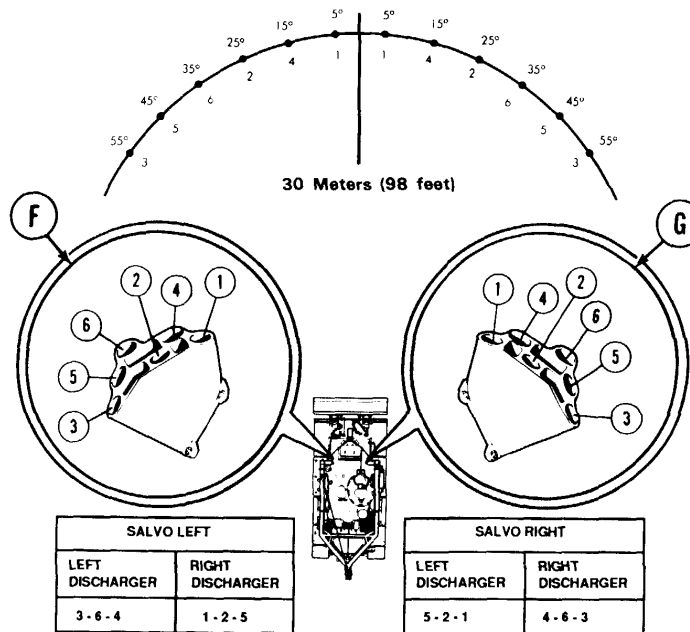
**NOTE**

To fire all grenades, buttons (H) and (J) must be pressed.



**WARNING**

Particles of the L8A1 grenade fired from the M239 system may blow back into the vehicle if fired into gusty winds, and may cause a fire.



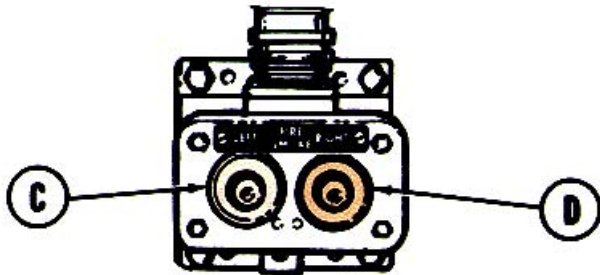
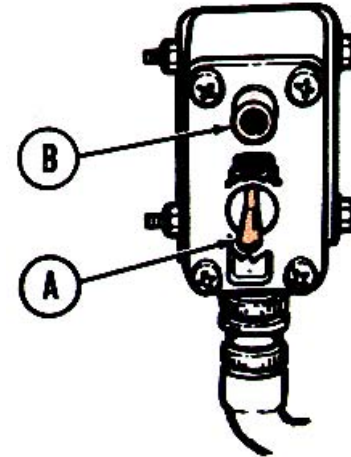
**PERFORM SMOKE SCREENING (PERFORM FAILURE TO FIRE - IMMEDIATE ACTION)**

**Make Sure:**

- All items listed on page 2-522.1 are done.
- Power switch (A) is ON.
- Light (B) is ON.

**Misfire (Failure of Grenade to Fire)**

1. Wait 10 seconds, press buttons (C) or (D).



2. If grenades do not fire, check power switch (A) again.
3. Wait 10 seconds, press buttons (C) or (D).
4. Wait 5 minutes, if grenades still do not fire, treat as a dud (page 2-522.4).

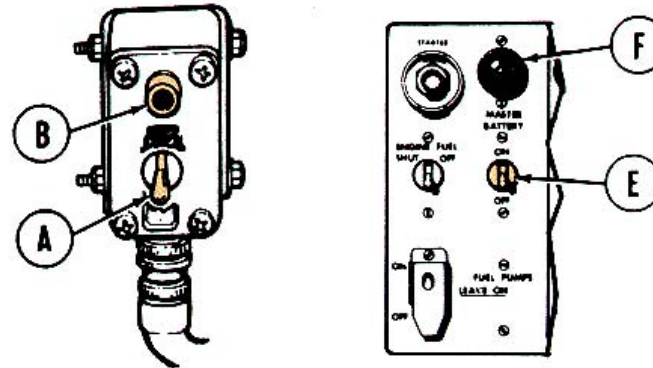
**PERFORM SMOKE SCREENING (PERFORM FAILURE TO FIRE IMMEDIATE ACTION) - Continued**  
**DUD (Failure of Misfire to Fire)**

1. If grenade still does not fire. set power switch (A) to OFF
2. Make sure light (B) is OFF.
3. Set MASTER BATTERY switch (E) to OFF Light (F) will go out.
4. Lock turret traversing lock (page 2-568).

**WARNING**

**Never place any part of your body in front of discharger when unloading grenades.**

5. Crewman remove dud grenades.
6. Place grenades in shipping and storage container.



**DUD (Grenade That Has Been Fired From Discharger But Failed to Burst or Burn)**

**WARNING**

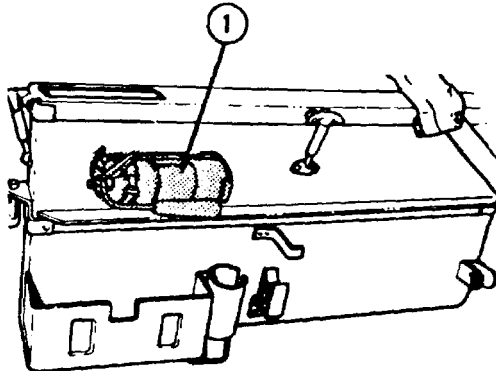
**Do not attempt to move grenade.**

1. Keep hatches closed for 15 minutes.
2. Notify EOD personnel, give type and location of dud grenade.

TA252835

**PORTABLE FIRE EXTINGUISHER**

1. Remove portable fire extinguisher (1) from rack on 7.62-MM machine gun ammunition box.
2. Break wire and pull out pin (2).
3. Pull horn (3) up to level position.
4. Take fire extinguisher (1) as close to fire as possible and point horn (3) directly at base of flames.



**WARNING**

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

**NOTE**

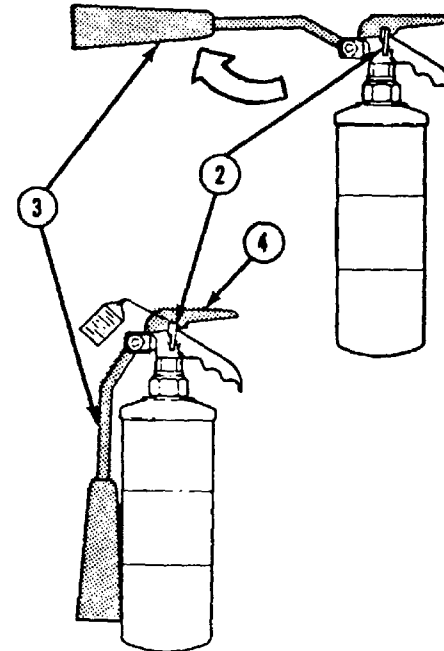
- **Fire extinguisher does most good when held within five feet of fire.**
5. Press down and hold trigger (4) to shoot fire extinguisher at fire.

**NOTE**

**Fire was inside tank, open all hatches and let tank air out for five minutes to remove all extinguisher fumes before continuing operation.**

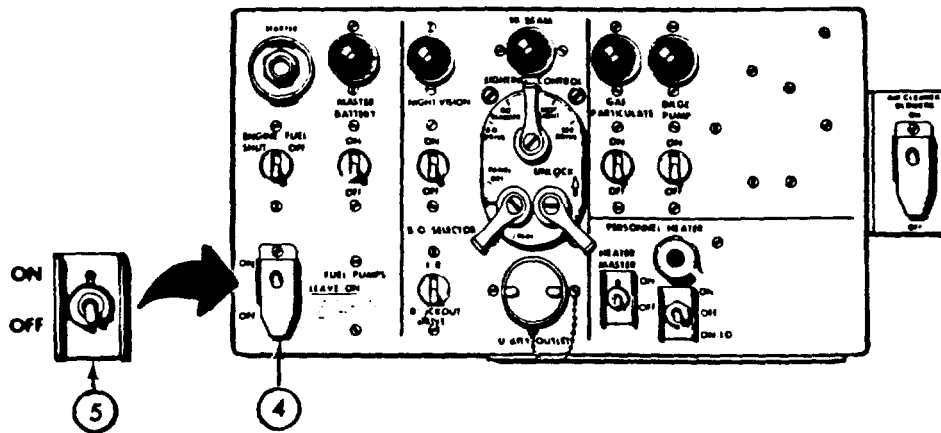
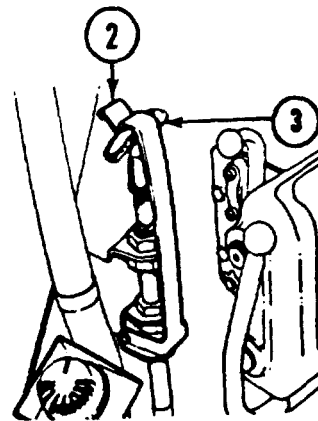
6. Put pin (2) back into trigger (4).

7. Turn horn (3) down.
8. Tag fire extinguisher (1) with word EMPTY.
9. Replace empty fire extinguisher (1) as soon as possible.



**OPERATE FIXED FIRE EXTINGUISHER SYSTEM FROM DRIVERS COMPARTMENTM728**

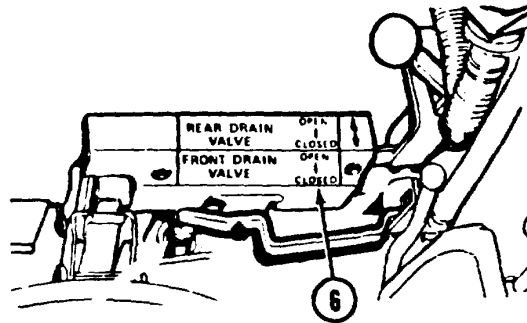
1. Crewman observing fire or possible fire notifies commander of condition.
2. Commander orders driver to activate fixed fire extinguisher system.
3. Stop vehicle. If possible, position vehicle facing into the wind.
4. Shift transmission to PARK position (1) and set parking brakes.
5. Release clip (2) and pull up on manual fuel shut-off handle (3) to stop engine.
6. Raise guard on drivers master panel (4) and place in-tank fuel pump switch (5) to OFF position.



Change 6 2-524

## OPERATE FIXED FIRE EXTINGUISHER SYSTEM FROM DRIVERS COMPARTMENT-M728 Continued

7. Insure hull drain valves (6) are in CLOSED position.



8. Pull FIRE-PULL HARD handle (7) out hard and then push back in.

## NOTE

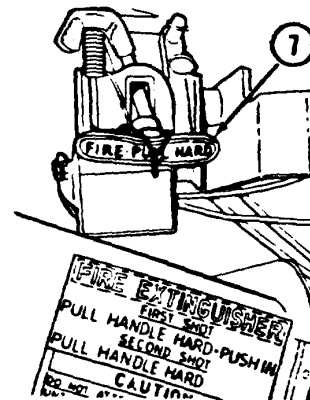
Commander will observe for effectiveness of FIRST SHOT in extinguishing fire. If FIRST SHOT fails to activate or does not extinguish fire, commander will order driver to activate SECOND SHOT

9. Upon -commander's order to activate SECOND SHOT, pull FIRE-PULL HARD (7) handle out again. If FIRST or SECOND SHOTS fail to operate and conditions permit, activate fire extinguisher system using handles on bottle valve assemblies (refer to page 2-183).

## NOTE

Commander will observe effectiveness of SECOND SHOT in extinguishing fire. If SECOND SHOT does not extinguish fire, commander will order crew to abandon the vehicle. If conditions permit, continue to fight the fire using portable fire extinguishers.

10. Notify unit maintenance of fire and need to replace discharged fire extinguisher bottles.



FIRING SYSTEM USING CONTROL VALVE HANDLE

**WARNING**  
Do not operate vehicle further until cause of fire has been repaired and expended fire extinguisher bottle assemblies have been replaced. Operating the vehicle without charged fixed fire extinguishers could result in loss of life or equipment damage/loss should the fire re-ignite.

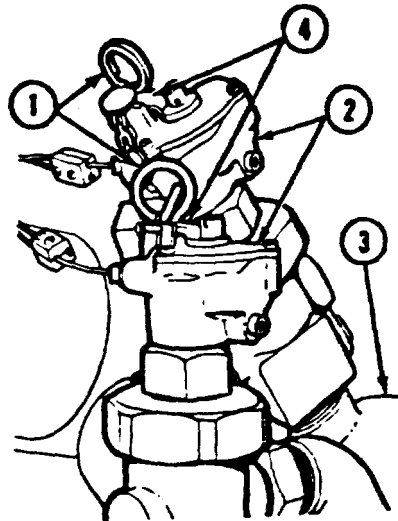
Change 6 2-525

## OPERATE FIXED FIRE EXTINGUISHER SYSTEM USING BOTTLE VALVE ASSEMBLIES M728

### NOTE

This procedure is to be used in the event that the fire extinguisher system cannot be activated using the driver's compartment control handle.

1. Notify commander of intention to activate fire extinguisher system using bottle control valves.
2. Pull two safety pins (1) from valve assemblies (2) on top of fire extinguisher bottles (3).
3. Rotate handle (4) on one valve assembly clock-wise as far as possible.



### NOTE

Commander will observe for effectiveness of **FIRST SHOT** in extinguishing fire. If **FIRST SHOT** does not extinguish fire, commander will order driver to activate **SECOND SHOT**.

4. Upon commanders order to activate **SECOND SHOT**, rotate the handle on the remaining bottle assembly clockwise as far as possible.

### NOTE

Commander will observe for effectiveness of **SECOND SHOT** in extinguishing fire. If **SECOND SHOT** does not extinguish fire, commander will order crew to abandon the vehicle. If conditions permit, continue to fight the fire using portable fire extinguishers.

### WARNING

Do not operate vehicle further until cause of fire has been repaired and expended fire extinguisher bottle assemblies have been replaced. Operating the vehicle without charged fixed fire extinguishers could result in loss of life or equipment damage/loss should the fire re-ignite.

5. Notify unit maintenance of fire and need to replace discharged fire extinguisher bottles.



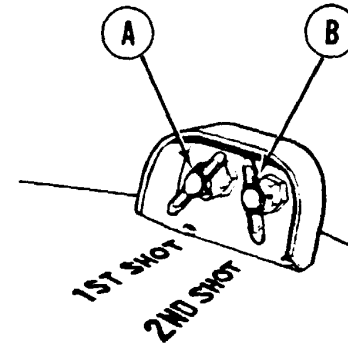
**IMMEDIATE ACTION- OPERATE FIRE PROTECTION SYSTEM (OPERATE FIXED EXTERNAL CONTROLS)****WARNING**

Never enter a burning vehicle to attempt to fight a fire or to shut down engine. Death or serious injury could result. If conditions permit, attempt to reach thru drivers hatch opening and shut down engine using manual fuel shut-off.

**CAUTION**

External fire extinguisher handles do not stop fuel supply to engine. If engine is operating and conditions permit, engine should be shut down prior to activating fire extinguisher system. Air flow from engine cooling fans will intensify burning and dissipate extinguishing agent making it more difficult to extinguish the fire.

1. Crewman observing fire or possible fire notifies commander of condition.
2. If conditions permit stop engine.
3. Pull first shot handle (A) located at left front of glacis plate.
4. Observe for effectiveness of first shot in extinguishing fire.
5. If first shot does not extinguish fire, pull second handle(B) hard located below first shot handle.



6. Observe for effectiveness of SECOND SHOT in extinguishing fire. If SECOND SHOT does not extinguish fire and conditions permit, continue to fight the fire using portable fire extinguishers.

**WARNING**

Do not operate vehicle further until cause of fire has been repaired and expended fire extinguisher bottle assemblies have been replaced. Operating the vehicle without charged fixed fire extinguishers could result in loss of life or equipment damage/loss should the fire re-ignite.

7. Notify unit maintenance of fire and need to replace discharged fire extinguisher bottles.

**All data on page 2-528 deleted.  
Change 9 2-527/(2-528 blank)**

**PERFORM EMERGENCY ESCAPE (DUMP DRIVER'S SEAT)****WARNING**

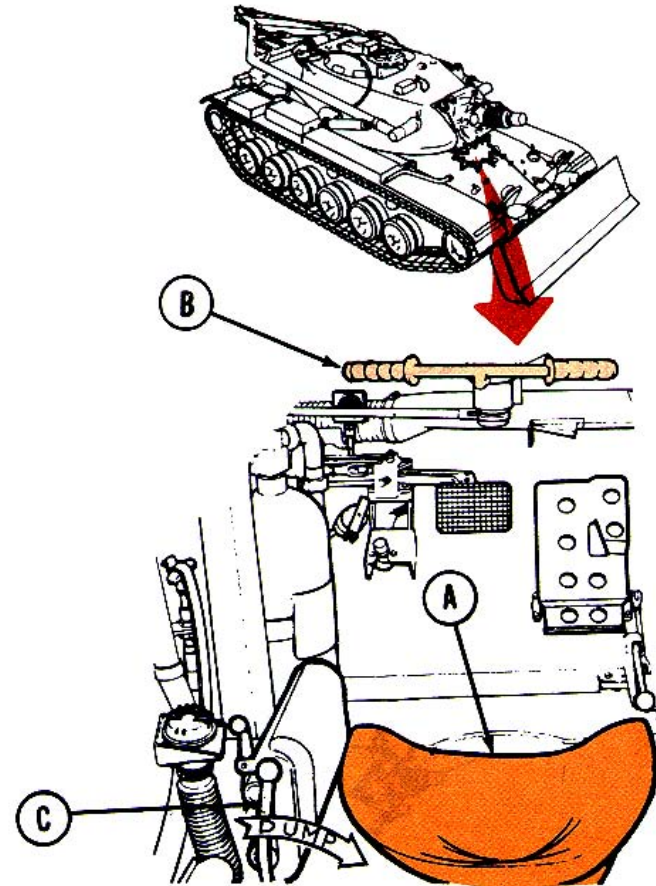
Do not dump seat while vehicle is moving or while engine is running.

1. Seated in driver's seat (A), hold steering control (B) with right hand to support body weight.
2. Position feet and legs clear of area under seat.

**WARNING**

Shift body weight from driver's seat (A) by holding steering control (B) before pulling red dump lever (C).

3. Pull red lever (C) to dump seat.



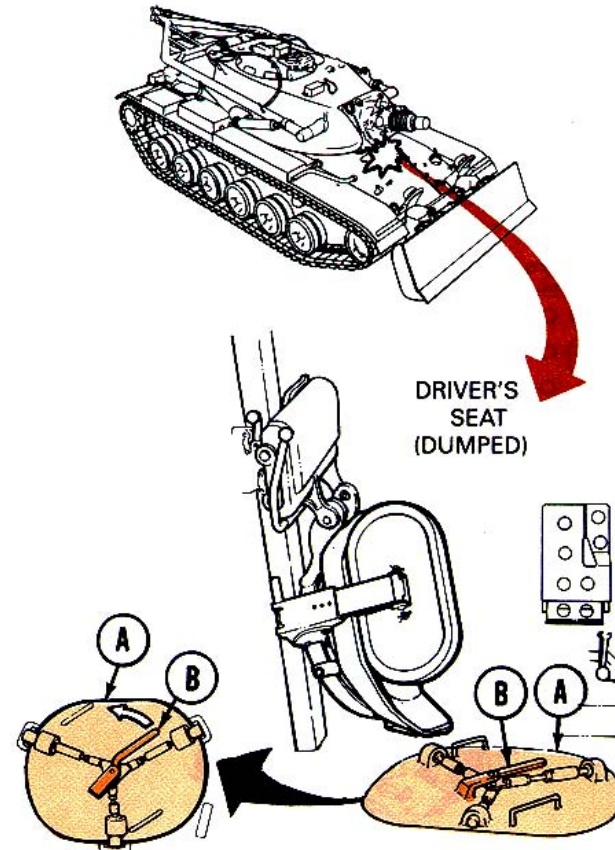
**PERFORM EMERGENCY ESCAPE (DROP DRIVER'S ESCAPE HATCH)****Make Sure:**

- Vehicle is stopped.
- Engine is not running.
- Driver's seat is dumped (page 2-529).

**NOTE**

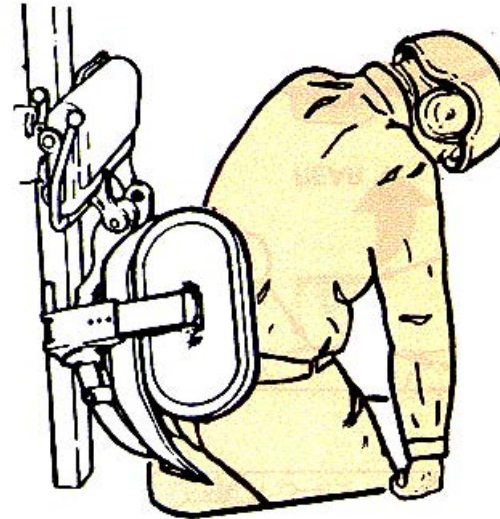
**Escape hatch (A) is very heavy. Do not try to lower it to ground. Let it fall.**

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



**PERFORM EMERGENCY ESCAPE (EXIT FROM VEHICLE)****Make Sure:**

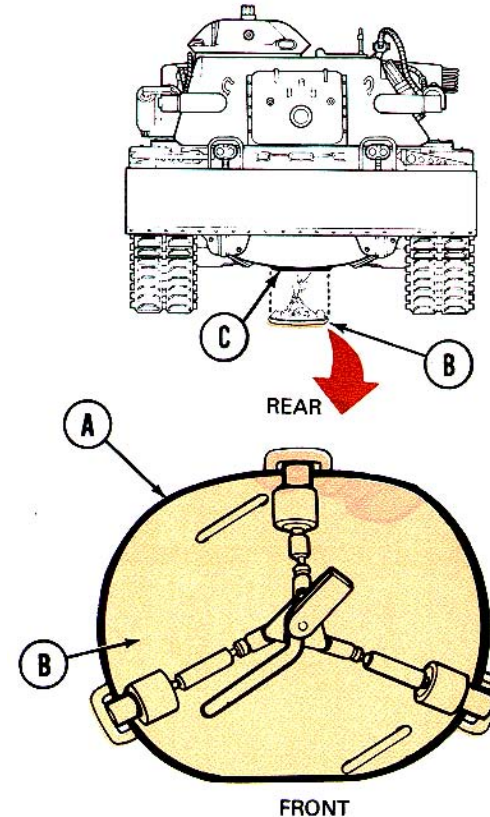
- Vehicle is stopped.
  - Engine is not running.
  - Driver's seat is dumped (page 2-529).
  - Escape hatch is dropped (page 2-530).
  - Communication cord is disconnected from CVC helmet.
1. Step down through escape opening.
  2. Crawl underneath vehicle to leave area.



**INSTALL DRIVER'S ESCAPE HATCH (INSPECT HATCH AND SEAL)**

**Make Sure:**

- Vehicle is stopped.
  - Engine is not running (page 2-529).
  - Driver's seat is dumped (page 2-530).
  - Driver's hatch is open (page 2-146).
1. Inspect hatch seal (A) for cracks and tears.
  2. If seal (A) is defective, notify organizational maintenance.
  3. Clean edge of escape hatch (B) and edge of escape hatch opening (C).



**INSTALL DRIVER'S ESCAPE HATCH (INSTALL HATCH)**

**NOTE**

Normally, this task is organizational maintenance responsibility. In an emergency, crew can replace as follows:

**Tools, Equipment, and Supplies:**

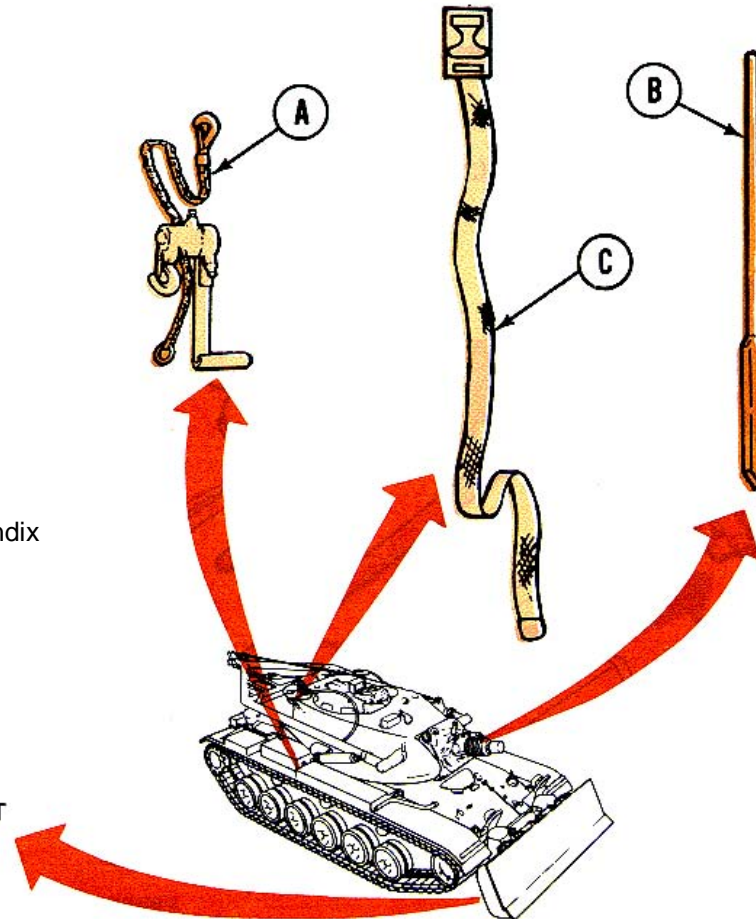
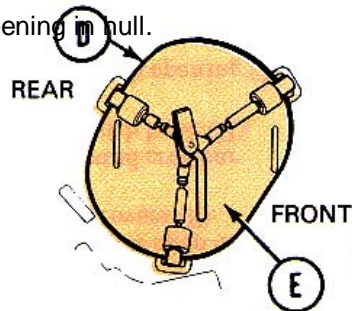
Get chain hoist (A) from right front fender box.

Get crowbar (B) from left front fender box.

Get one long strap (C) from turret bustle.

Get silicone lubricant (item 59, Appendix D).

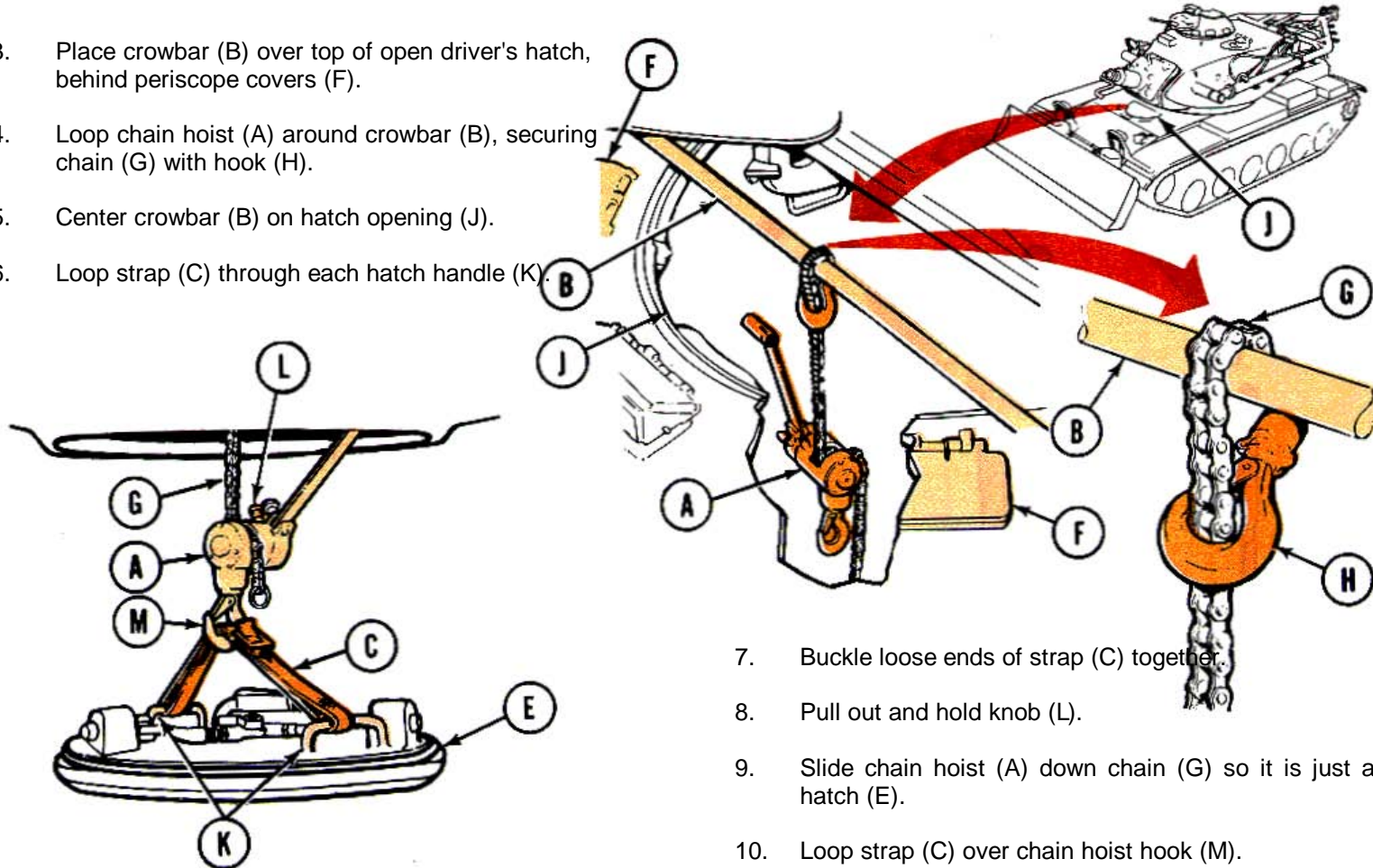
1. Lubricate seal (D) with silicone lubricant (item 59, Appendix D).
2. Position hatch (E) below opening in hull.



TA132672

**INSTALL DRIVER'S ESCAPE HATCH (INSTALL HATCH) - Continued**

3. Place crowbar (B) over top of open driver's hatch, behind periscope covers (F).
4. Loop chain hoist (A) around crowbar (B), securing chain (G) with hook (H).
5. Center crowbar (B) on hatch opening (J).
6. Loop strap (C) through each hatch handle (K).

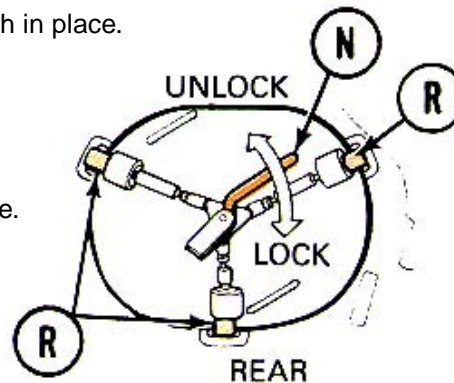


7. Buckle loose ends of strap (C) together.
8. Pull out and hold knob (L).
9. Slide chain hoist (A) down chain (G) so it is just above hatch (E).
10. Loop strap (C) over chain hoist hook (M).

TA132673

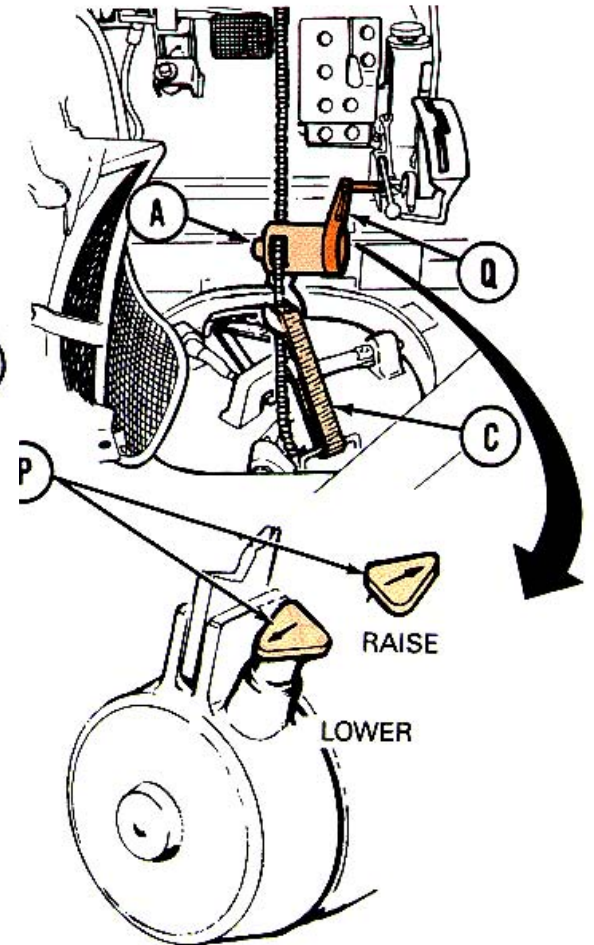
**INSTALL DRIVER'S ESCAPE HATCH (INSTALL HATCH) - Continued**

11. Push latch lever (N) all the way left to unlock.
12. Pull out and turn knob (P) on chain hoist to raise or lower hatch.
13. Turn hoist handle (Q) to raise hatch into opening.
14. Push latch lever (N) all the way right to lock hatch in place.
15. Remove hoist (A) and crowbar.
16. Remove strap (C).
17. Return tools, equipment, and supplies to stowage.



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

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

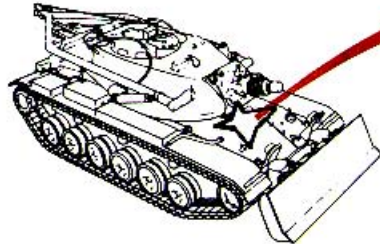




**PERFORM POST-OPERATING PROCEDURES (SHUT DOWN VEHICLE)**

**Make Sure:**

- Vehicle has stopped moving.
- Transmission is in N or P.
- Moldboard is stowed (page 2-261).
- Boom is stowed (page 2-305).
- Winch cable is stowed (page 2-284).
- Hydraulic system is turned off (page 2-252).

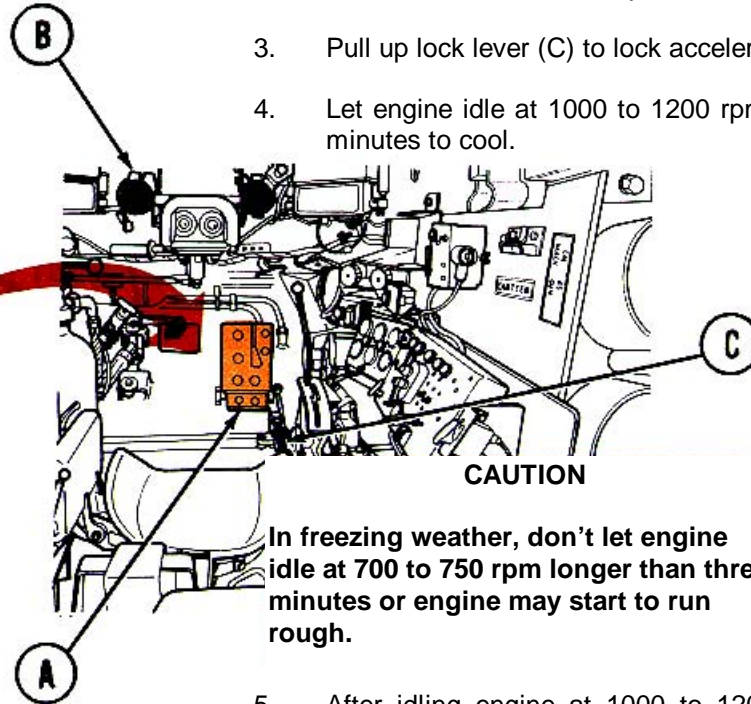


**Driver:**

**CAUTION**

**Do not set parking brake if weather is freezing.**

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



**CAUTION**

**In freezing weather, don't let engine idle at 700 to 750 rpm longer than three minutes or engine may start to run rough.**

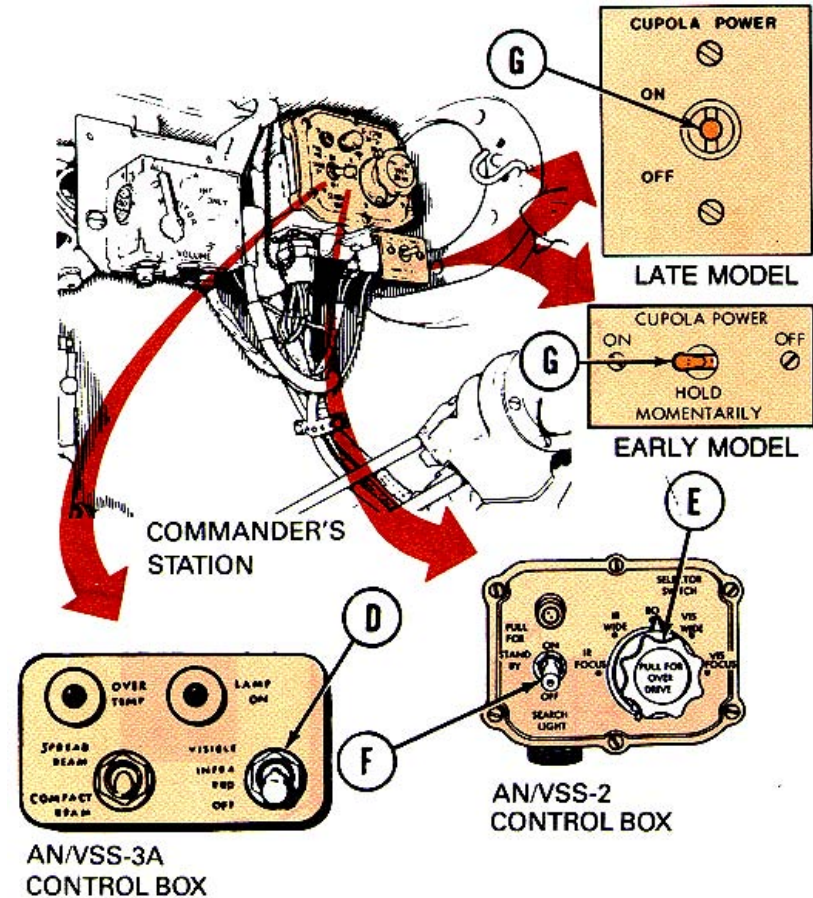
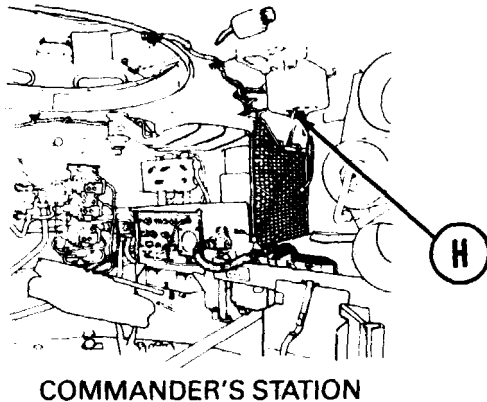
2. Press accelerator (A) until tachometer (B) indicates between 1000 and 1200 rpm.
3. Pull up lock lever (C) to lock accelerator.
4. Let engine idle at 1000 to 1200 rpm for about five minutes to cool.
5. After idling engine at 1000 to 1200 rpm for five minutes, let it idle at 700 to 750 rpm for about three minutes.

TA132675

**PERFORM POST-OPERATING PROCEDURES (SHUT DOWN VEHICLE) - Continued**

**Commander:**

6. Turn off searchlight:
  - If equipped with AN/VSS-3A, set switch (D) to OFF.
  - If equipped with AN/VSS-2, turn SELECTOR SWITCH (E) to BO. Set SEARCH LIGHT switch (F) to OFF.
7. Hold CUPOLA POWER switch (G) momentarily to OFF.



**PERFORM POST-OPERATING PROCEDURES (SHUT DOWN VEHICLE) - Continued**

**Gunner:**

9. Set ELEV/TRAV POWER switch (J) to OFF.

**Driver:**

10. Set ON-OFF lever (K) to OFF.

**NOTE**

**If you must use MANUAL FUEL shutoff, notify organizational maintenance.**

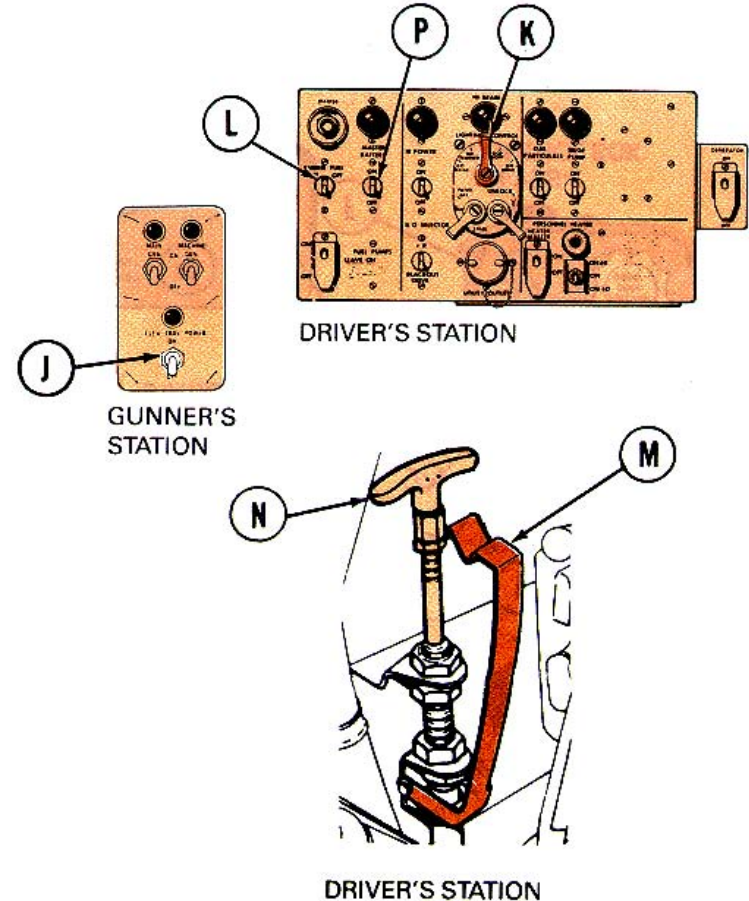
11. Push ENGINE FUEL SHUTOFF switch (L) up. Hold until engine stops.

- If engine does not stop within 15 seconds, release spring clip (M), (if so equipped). Pull MANUAL FUEL shutoff handle (N) all the way up.

**CAUTION**

**If searchlight was on, do not turn off MASTER BATTERY switch until searchlight blower has stopped**

12. Set MASTER BATTERY switch (P) to OFF.

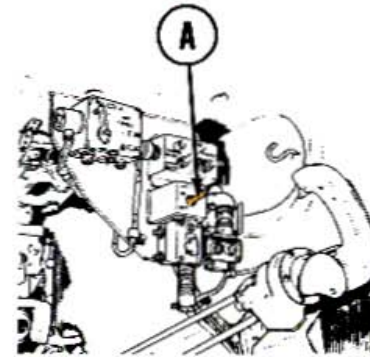


**PERFORM POST-OPERATING PROCEDURES (TURN OFF EQUIPMENT)**

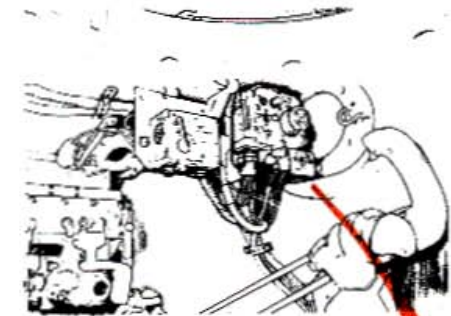
**To Turn Off Equipment in Commander's Station:**

**Make Sure:**

- Vehicle is parked.
  - Vehicle is shut down (page 2-536).
1. Set these switches to the following positions:
    - a. CUPOLA POWER switch (A) momentarily to OFF.
    - b. M36 periscope IR switch (B) to OFF.
    - c. Light source control rotary switch (C) to OFF.
    - d. M36E1 periscope passive elbow reticle control



LATE MODEL



EARLY MODEL

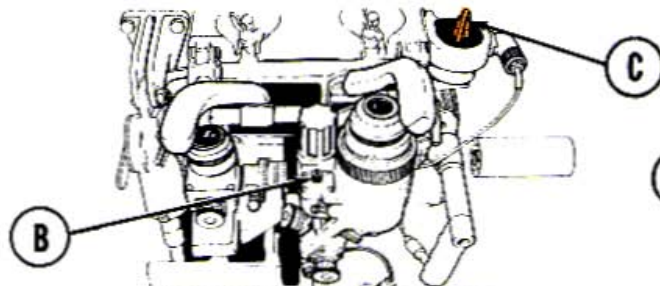


B.2



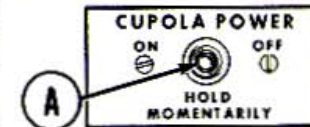
B.1

2. Lock cupola azimuth interlock and azimuth lock (page 2-332).
3. Unload caliber .50 machine gun if loaded (page 2-554).
4. Remove caliber .50 machine gun if required (page 2-578).



COMMANDER'S STATION

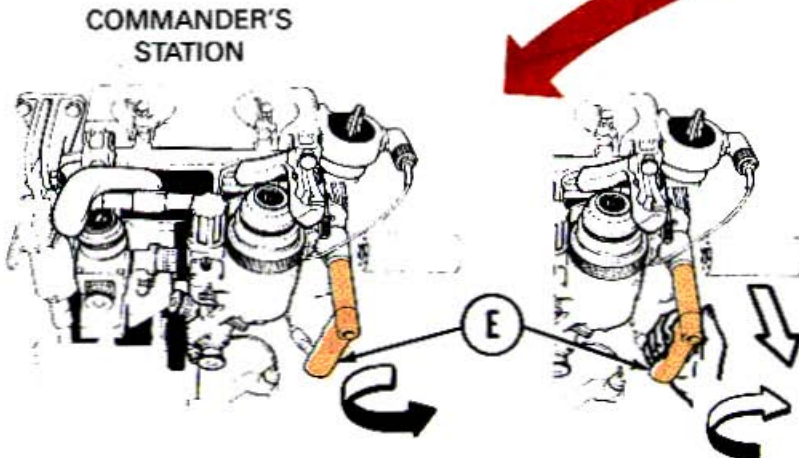
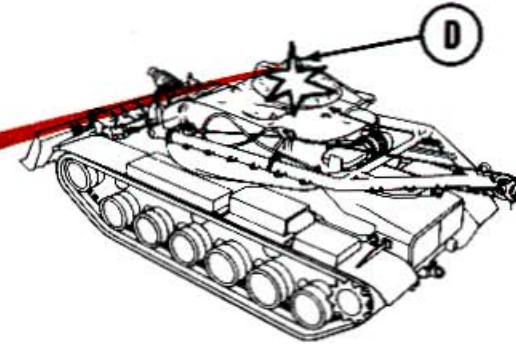
- e. M36E1 periscope passive elbow shutter lever (B.2) to off.



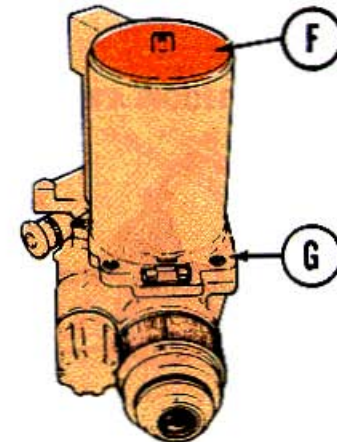
A

**PERFORM POST-OPERATING PROCEDURES (TURN OFF EQUIPMENT) - Continued**

5. Close ballistic shield (D).
  - a. Turn handle (E) to left.
  - b. Pull handle (E) down.
  - c. Turn handle (E) to right.



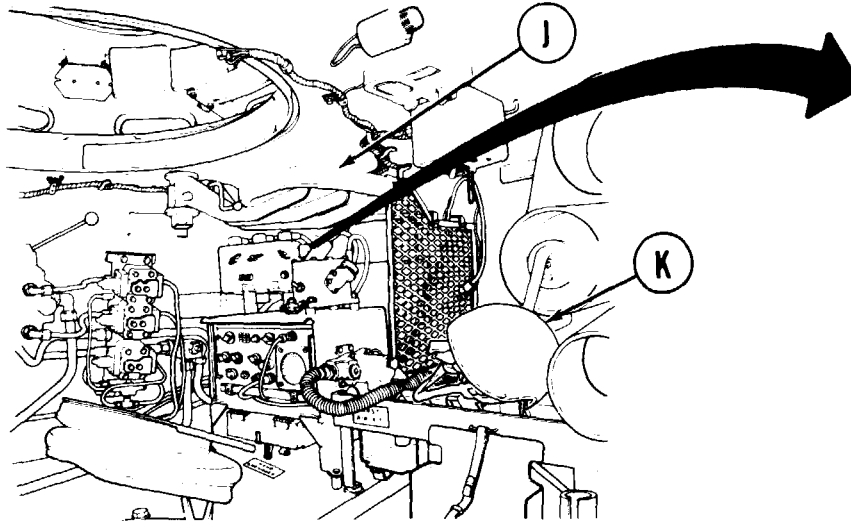
6. Close commander's hatch if open (page 2-161).



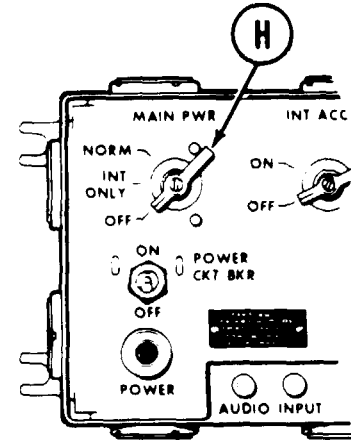
7. If opaque disc (F) is removed from M36IR body (G):
  - a. Remove M36IR body (page 3-211).
  - b. Replace opaque disc (F) into IR body (G) as shown.
  - c. Install M36IR body (page 3-221).

**PERFORM POST-OPERATING PROCEDURES (TURN OFF EQUIPMENT) - Continued**

8. Make sure that amplifier MAIN PWR switch (H) is OFF.



**COMMANDER'S STATION**



9. Stow commander's observation seat (J) if required (page 2-163).
10. Remove combat vehicle crewman's helmet and stow helmet in oddment tray (K).
11. Exit vehicle through loader's hatch.

**PERFORM POST-OPERATING PROCEDURES (TURN OFF EQUIPMENT) - Continued****To Turn OFF Equipment in Gunner's Station:****Make Sure:**

- Vehicle is parked.
- Vehicle is shut down (page 2-536)

1. If driver's IR periscope or night vision viewer must be stowed:

**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.

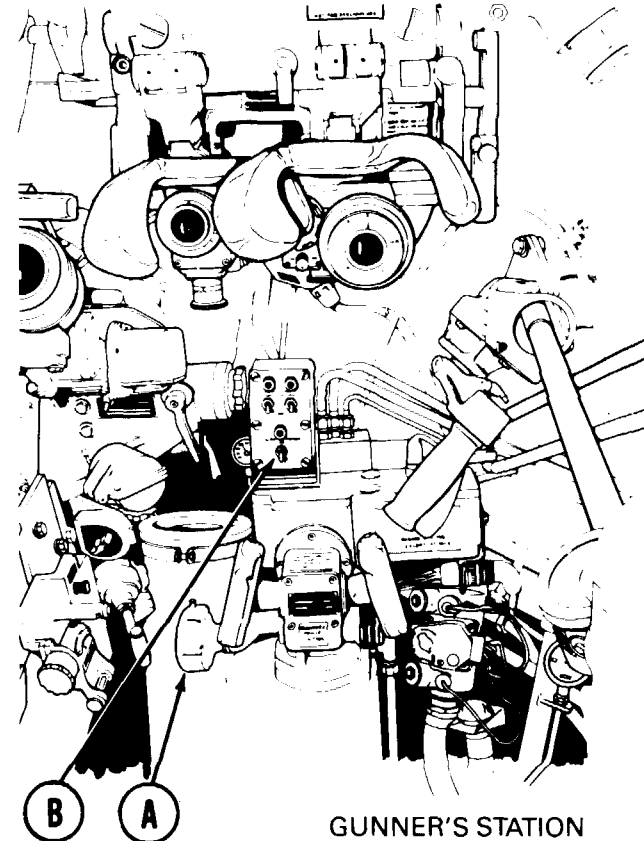
**PERFORM POST-OPERATING PROCEDURES (TURN OFF EQUIPMENT) - Continued**

- a. Using GUNNER'S POWER CONTROL handles (A), traverse turret (page 2-504) so main gun is over driver's compartment.
- b. Set ELEV/TRAV POWER switch (B) to OFF.
- c. Make sure loader locks turret lock (page 2-568).
- d. Inform driver it is safe to stow periscope

**WARNING**

**Make sure driver is clear of turret floor before unlocking turret lock and turning ELEV/TRAV POWER switch to ON.**

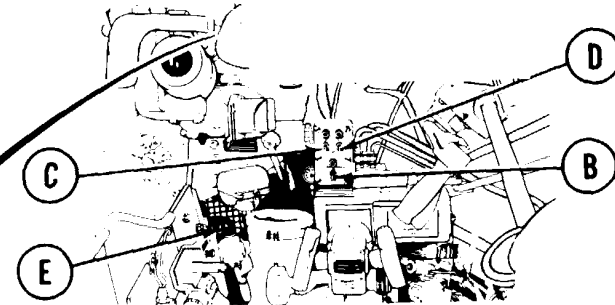
2. Request loader to unlock turret lock (page 2-331).
3. Set ELEV/TRAV POWER switch (B) to ON.
4. Using GUNNER'S POWER CONTROL handles (A), traverse turret (page 2-504) until main gun is over rear of vehicle.
5. Set ELEV/TRAV POWER switch (B) to OFF.



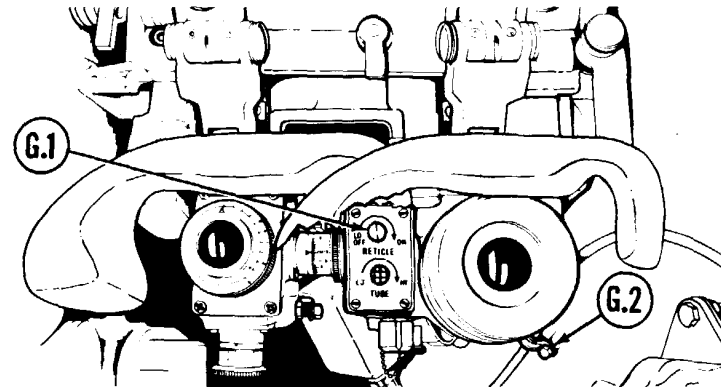
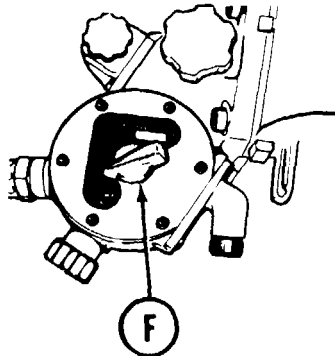


**PERFORM POST-OPERATING PROCEDURES (TURN OFF EQUIPMENT) - Continued**

6. Set or make sure these switches are set to the following positions:
  - a. MAIN GUN switch (C) to OFF.
  - b. MACHINE GUN switch (D) to OFF.
  - c. ELEV/TRAV POWER switch (B) to OFF.
  - d. Telescope light source control (E) to OFF.
  - e. Periscope light source control (F) to OFF.
  - f. M32CE1 periscope reticle control switch (G.1) to OFF.
  - g. M32CE1 periscope shutter lever (G.2) to off.

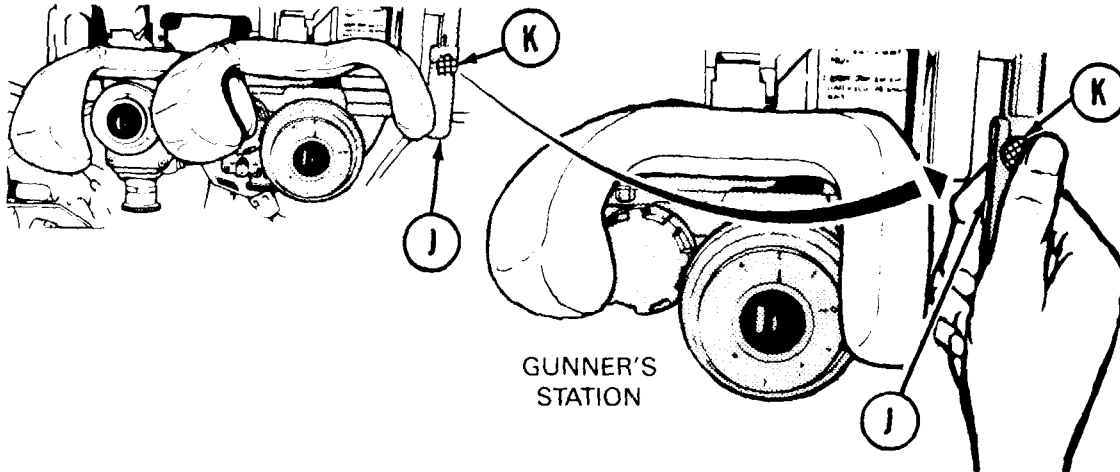
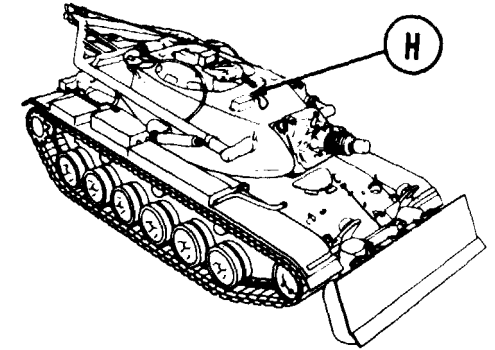


GUNNER'S STATION



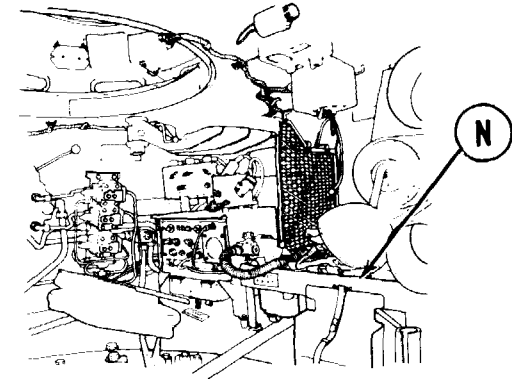
**PERFORM POST-OPERATING PROCEDURES (TURN OFF EQUIPMENT) - Continued**

7. Close ballistics shield (H) if open.
  - a. Grasp handle (J).
  - b. Depress button (K) with thumb.
  - c. Pull handle (J) down to close shield.

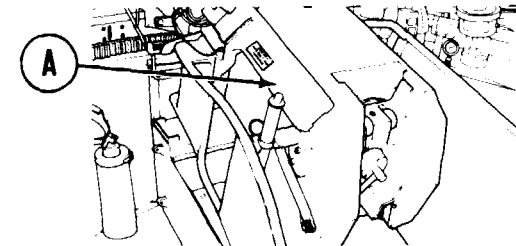
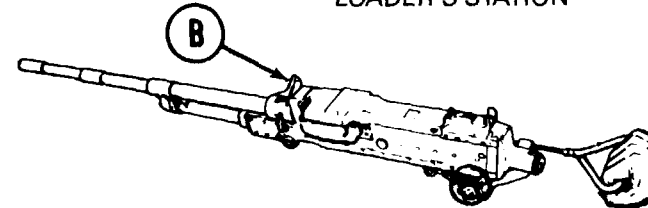


**PERFORM POST-OPERATING PROCEDURES (TURN OFF EQUIPMENT) - Continued**

8. Remove combat vehicle crewman's helmet. Stow in oddment tray (N) in commander's station.
9. Exit vehicle through loader's hatch.

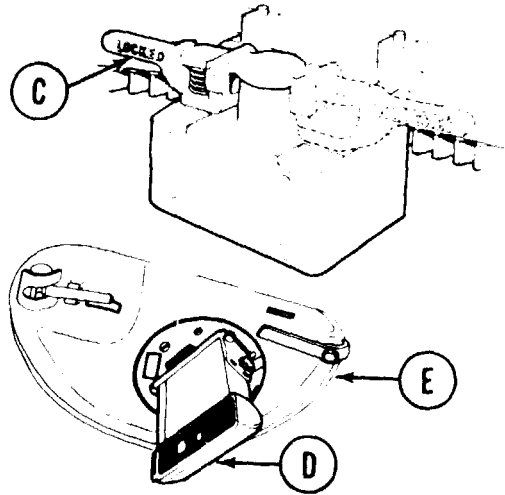
**To Turn OFF Equipment in Loader's Station:****Make Sure:**

- Vehicle is parked.
  - Vehicle is shut down (page 2-536).
1. Check that main gun (A) is clear of ammunition (page 2-550).
  2. Check that 7.62-mm machine gun (B) is clear of ammunition (page 2-559).
  3. Remove 7.62-mm machine gun if required (page 2-586).
  4. Check that 165-mm (page 2-310) and 7.62-mm (page 2-320) ammunition is stowed properly.

**COMMANDER'S STATION****LOADER'S STATION**

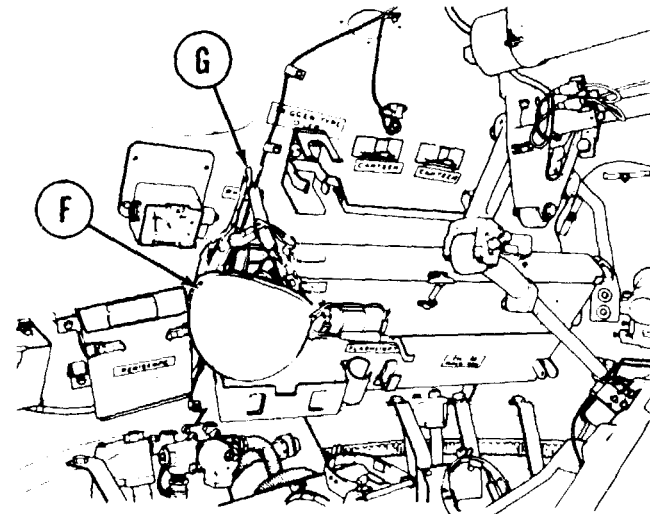
**PERFORM POST-OPERATING PROCEDURES (TURN OFF EQUIPMENT) - Continued**

LOADER'S STATION



9. Remove combat vehicle crewman's helmet (F).
10. Stow helmet (F) on PHONE hook (G).
11. Exit vehicle through loader's hatch.

5. Lock turret lock (C) (page 2-568) while driver stows periscope, if required.
6. Unlock turret lock (C) (page 2-331) after driver is clear of turret.
7. Remove and stow loader's periscope (D) if installed (page 2-601).
8. Open loader's hatch (E if closed (page 2-567).



**PERFORM POST-OPERATING PROCEDURES (TURN OFF EQUIPMENT) - Continued****To Turn Equipment off in Driver's Station:****Make Sure:**

- Vehicle is parked.
  - Vehicle is shut down (page 2-536).
1. If driver's periscope (A) is installed:

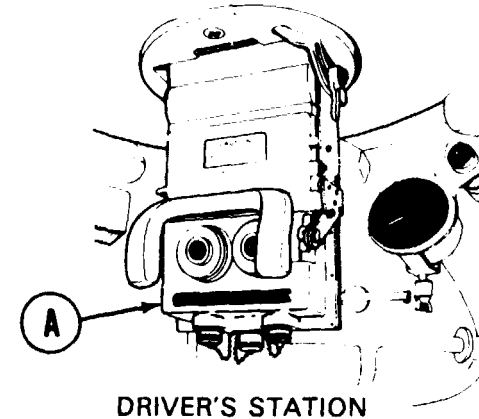
**WARNING**

- 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.

- a. If necessary, request gunner to traverse turret so main gun is pointed to front.

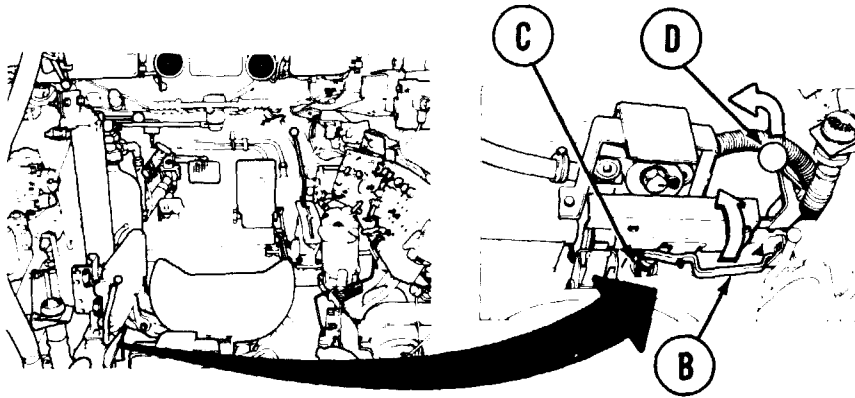
**WARNING**

**Gunner will tell driver then it is safe to open periscope stowage box. ELEV/TRAV POWER switch must be off and turret lock locked before opening stowage box.**



- b. Remove and stow periscope (A) (page 2-597) for M24 or page 2-600.1 for Night Vision Viewer AN/VVS-2.
- c. Notify gunner when you have completed stowing periscope and are clear of turret.

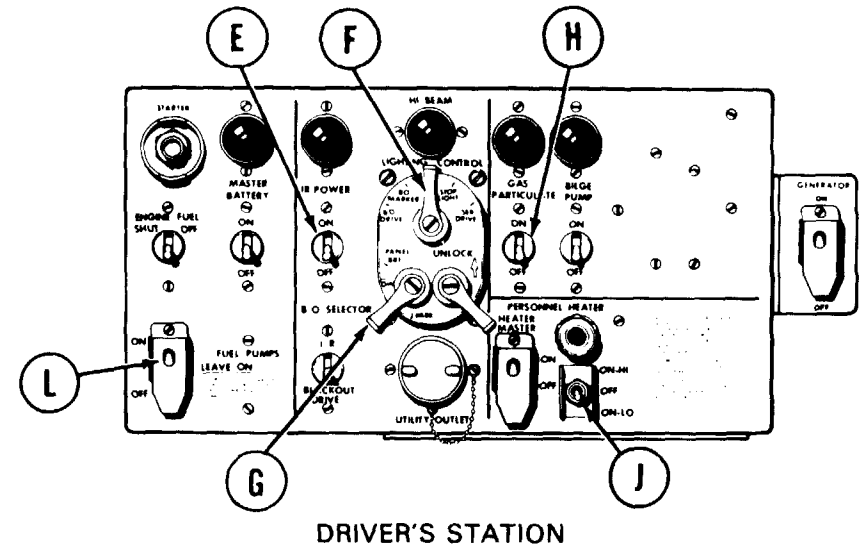
**PERFORM POST-OPERATING PROCEDURES (TURN OFF EQUIPMENT) - Continued**



2. Open front and rear drain valves:
  - a. Pull lever (B) up and to rear into detent. Front drain valve (C) opens.
  - b. Push lever (D) to rear and left into detent. Rear drain valve opens.

3. Set or make sure these switches are set to the following positions:

- a. IR POWER or NIGHT VISION switch (E) to OFF.
- b. LIGHTING CONTROL switch lever (F) to OFF.
- c. PANEL switch lever (G) to OFF.
- d. GAS PARTICULATE switch (H) to OFF.
- e. PERSONNEL HEATER ON-HI, OFF, ON-LO, switch (J) to OFF (center position).
- f. HEATER MASTER switch (K) to ON.
- g. FUEL PUMP switch (L) to ON.

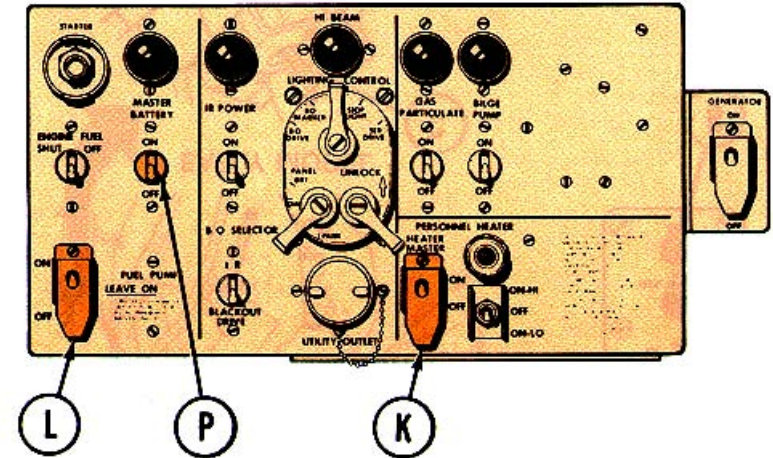
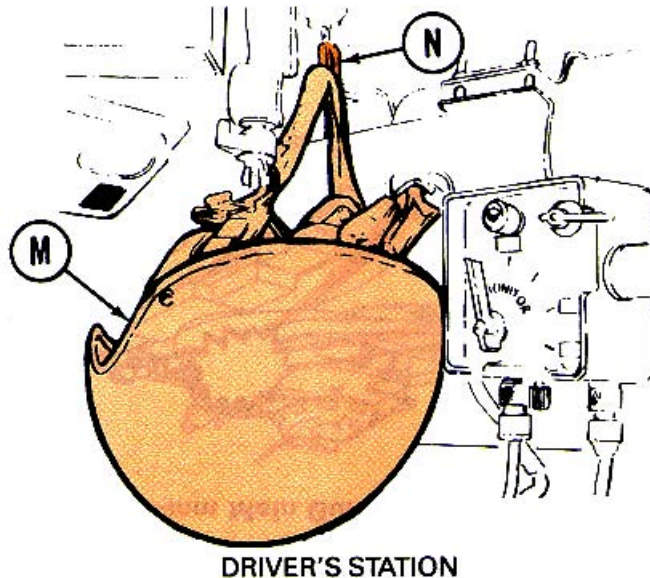


PERFORM POST-OPERATING PROCEDURES (TURN OFF EQUIPMENT) - Continued

CAUTION

Leave HEATER MASTER switch (K) in ON position. Leave FUEL PUMPS switch (L) in ON position.

4. Close and lock driver's hatch if open (page 2-166).
5. Remove combat vehicle crewman's helmet (M).



6. Hang helmet (M) on PHONE hook (N).
7. Wait until all other crewmembers have finished turning off equipment.
8. When all other crewmembers have exited vehicle, set MASTER BATTERY switch (P) to OFF.
9. Exit vehicle through loader's hatch.

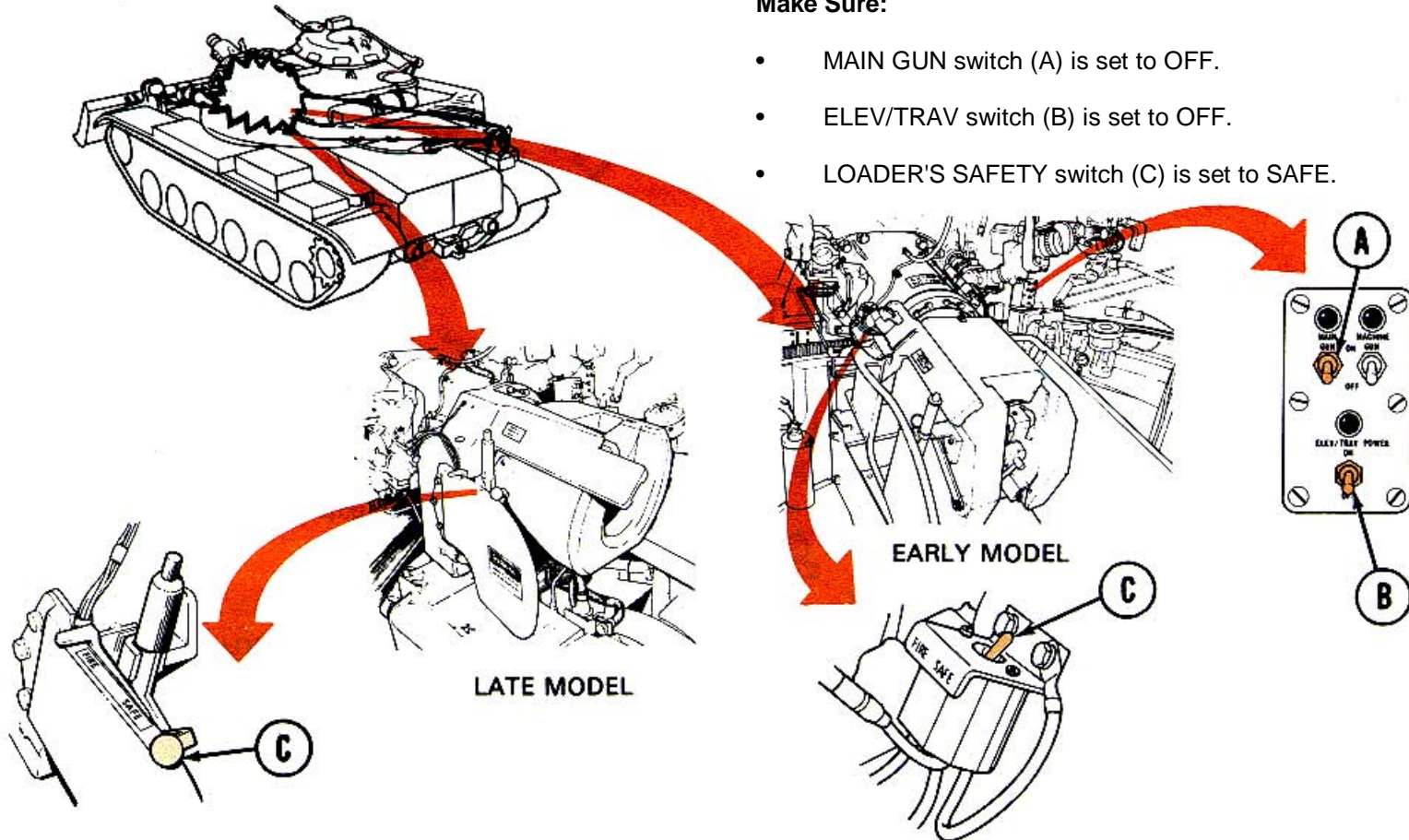


**PERFORM POST-OPERATING PROCEDURES (UNLOAD WEAPONS)**

**To Unload 165-mm Main Gun:**

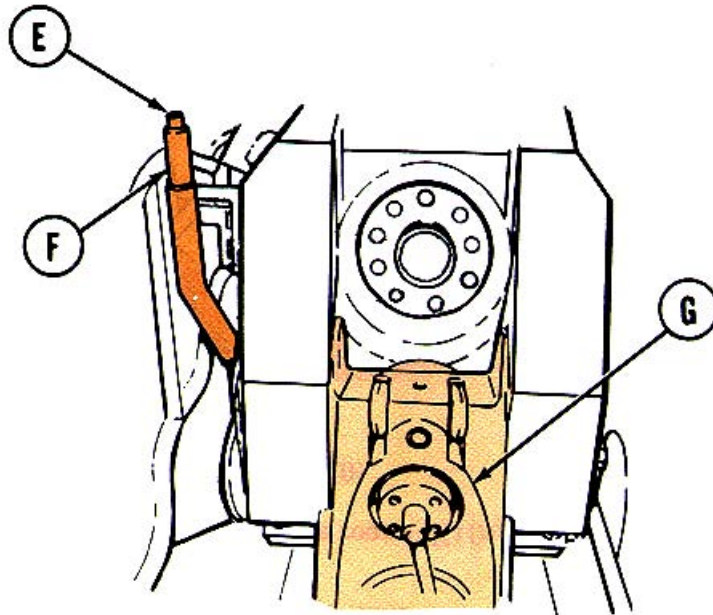
**Make Sure:**

- MAIN GUN switch (A) is set to OFF.
- ELEV/TRAV switch (B) is set to OFF.
- LOADER'S SAFETY switch (C) is set to SAFE.

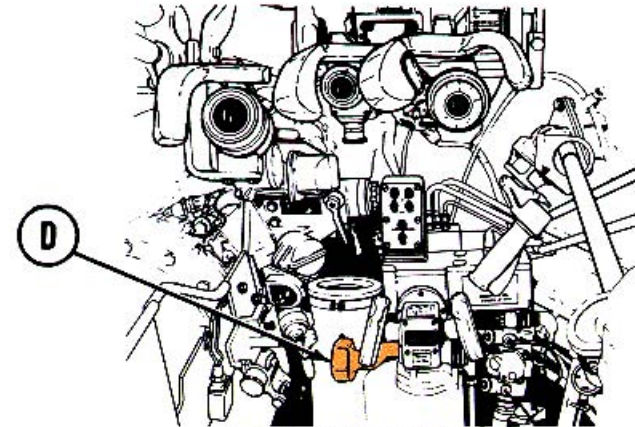


**PERFORM POST-OPERATING PROCEDURES (UNLOAD WEAPONS) - Continued**

1. Rotate elevating handle (D) until main gun is level.



LOADER'S STATION



GUNNER'S STATION

2. Push down and hold plunger (E).
3. Pull back BREECH OPERATING HANDLE (F) until breechblock (G) is locked open.

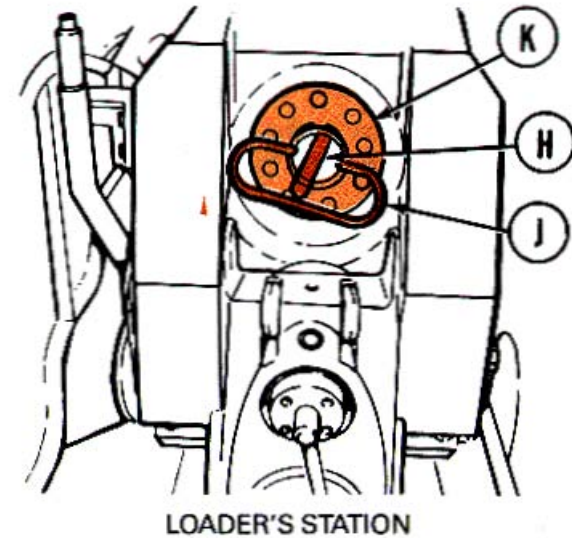
**WARNING**

**Be sure BREECH OPERATING HANDLE (F) is latched. AN unlatched handle can injure you and damage equipment.**

4. Return BREECH OPERATING HANDLE (F) to original position. Be sure handle latches.

**PERFORM POST-OPERATING PROCEDURES (UNLOAD WEAPONS) - Continued**

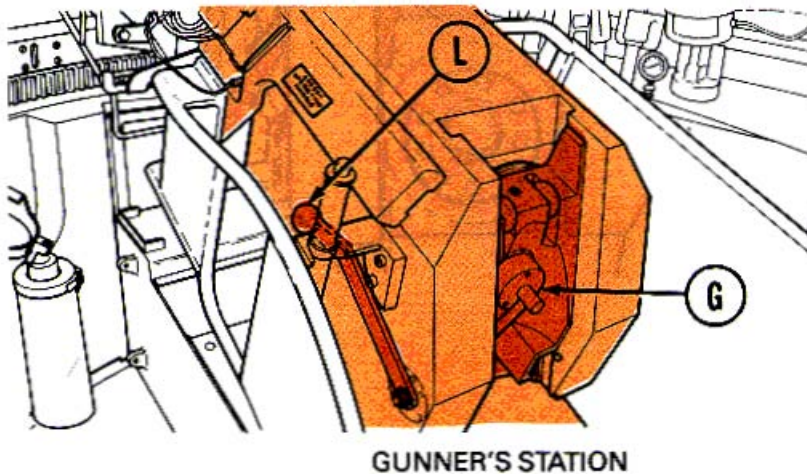
5. Lift latch (H).
6. Place handle (J) onto base of round (K).
7. Rotate handle (J) clockwise until it stops.
8. Press latch (H) down.
9. Pull handle (J) to remove round (K) from breech.
10. Stow round (K) (page 2-310).



**WARNING**

Keep hands clear of breech when closing breechblock (G).

11. Lift breechblock release handle (L) to close breechblock (G).

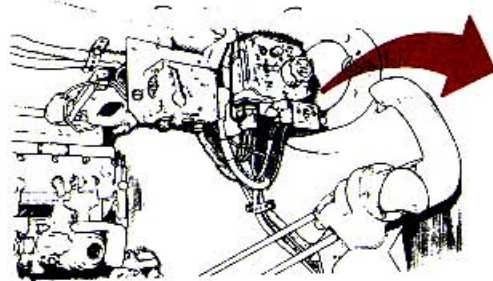
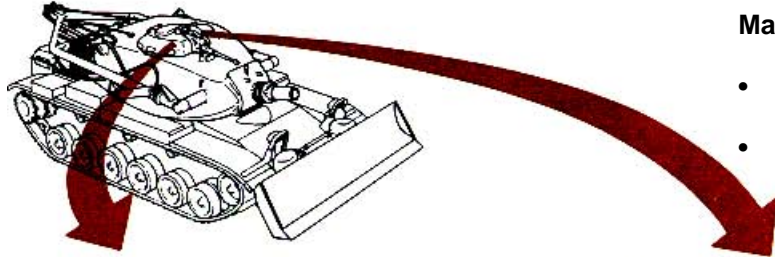


PERFORM POST-OPERATING PROCEDURES (UNLOAD WEAPONS) - Continued

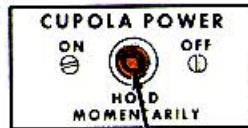
To Unload M85 Caliber .50 Machine Gun:

Make Sure:

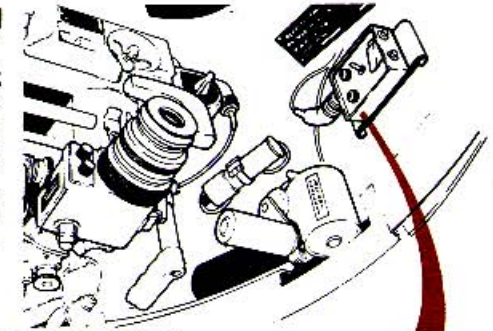
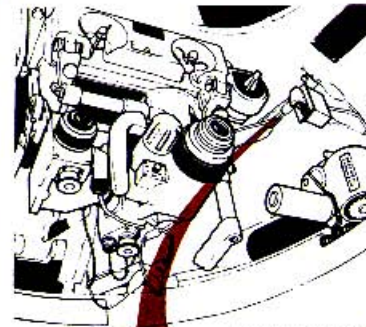
- Machine gun electric safety switch (A) is set to OFF.
- CUPOLA POWER switch (B) is OFF.



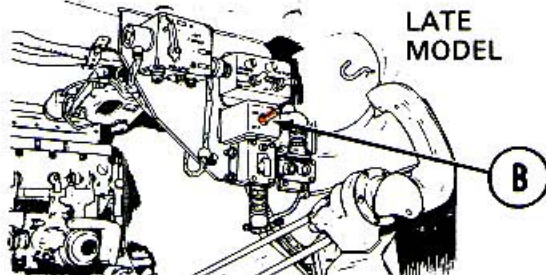
EARLY MODEL



B

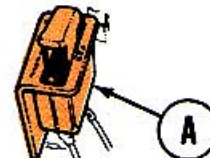


COMMANDER'S STATION

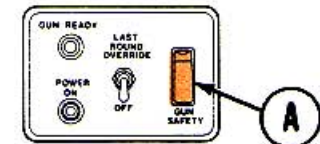


LATE MODEL

B



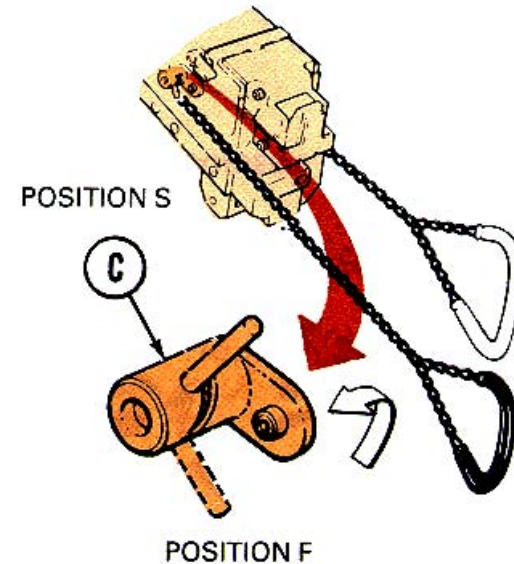
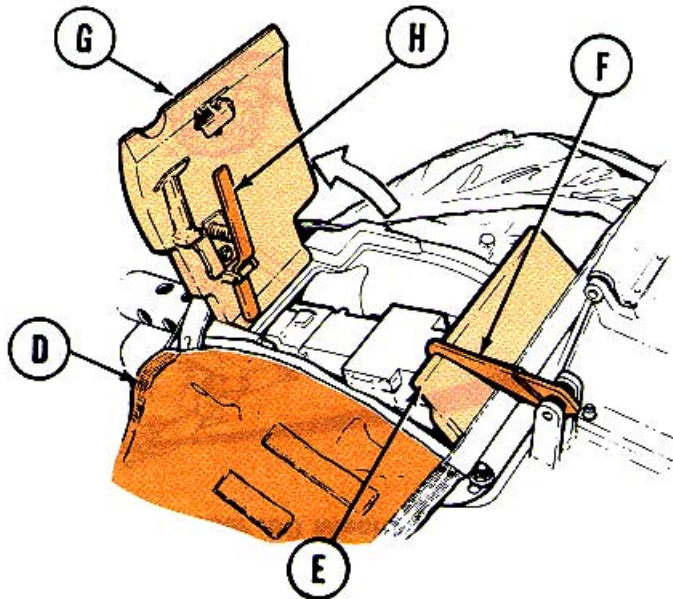
EARLY MODEL



LATE MODEL

**PERFORM POST-OPERATING PROCEDURES (UNLWAD WEAPONS) - Continued**

1. Set machine gun safety (C) to S (safe).
2. Lower caliber .50 machine gun to minimum elevation (page 2-470).
3. Open press-on fastener and fold back cradle cover (D).
4. Lift top access door (E).



5. Lock top access door (E) in place with hold-open latch (F).
6. Lift access door (G). Latch (H) will lock access door in place.

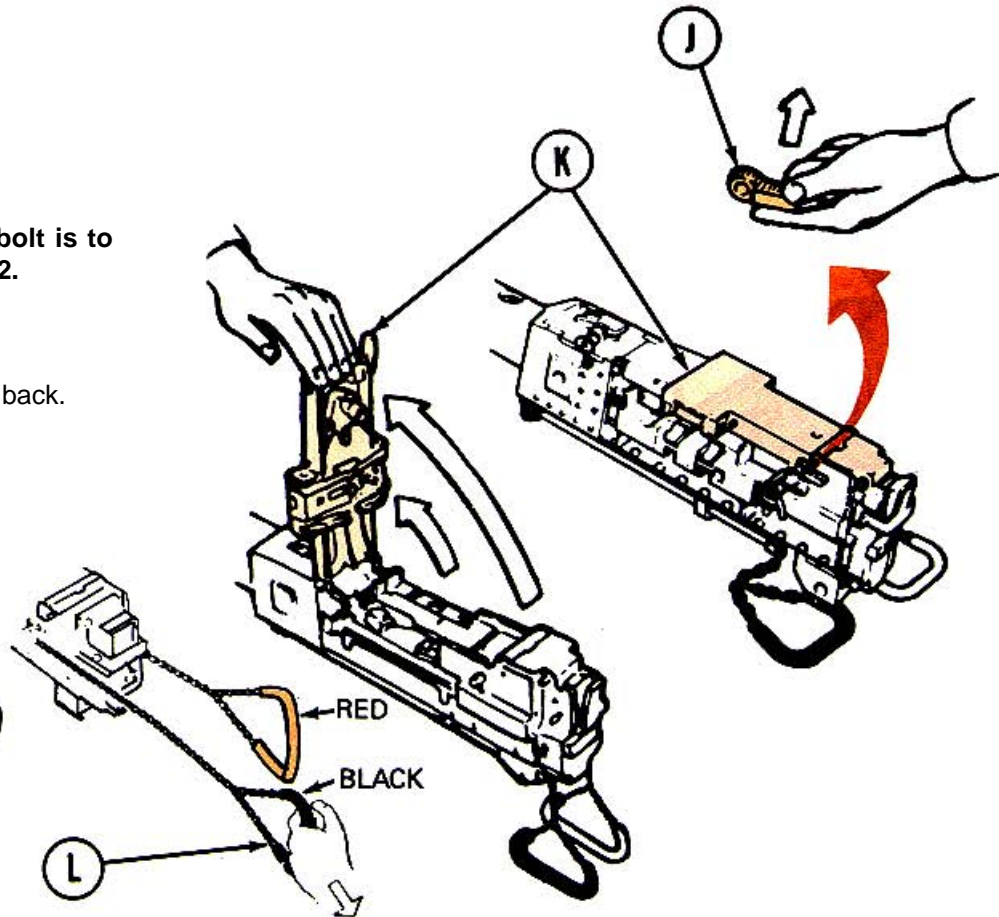
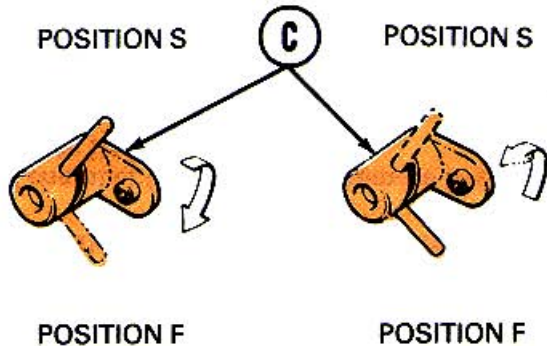
**PERFORM POST-OPERATING PROCEDURES (UNLOAD WEAPONS) - Continued**

7. Lift latch (J). Raise cover (K).
8. Remove any ammunition.

**NOTE**

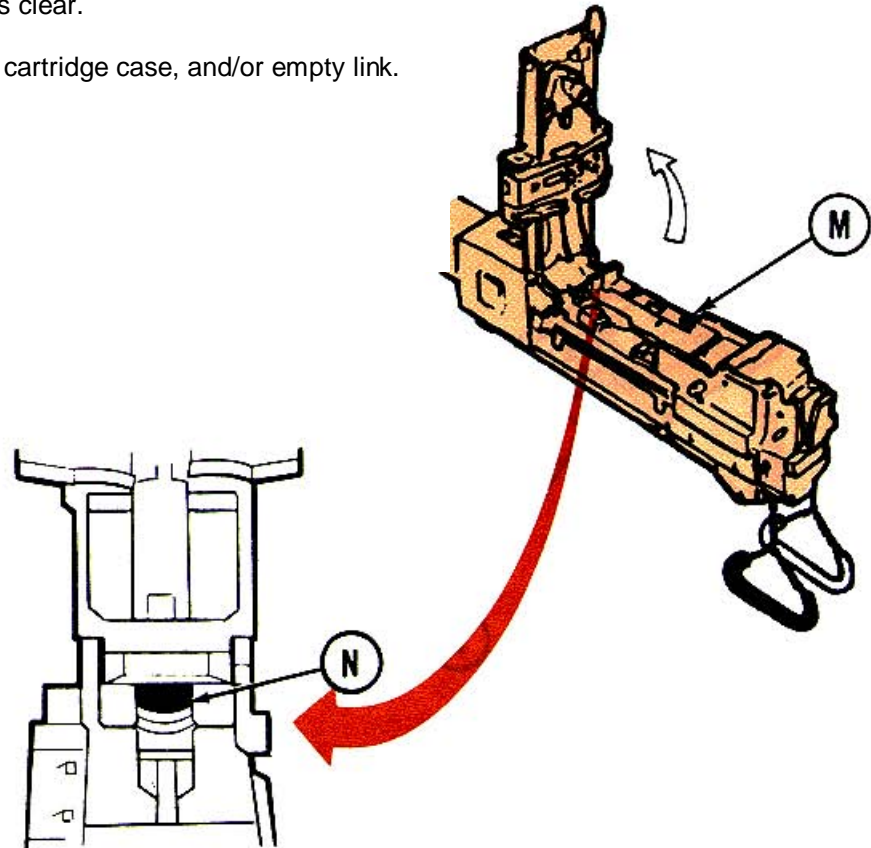
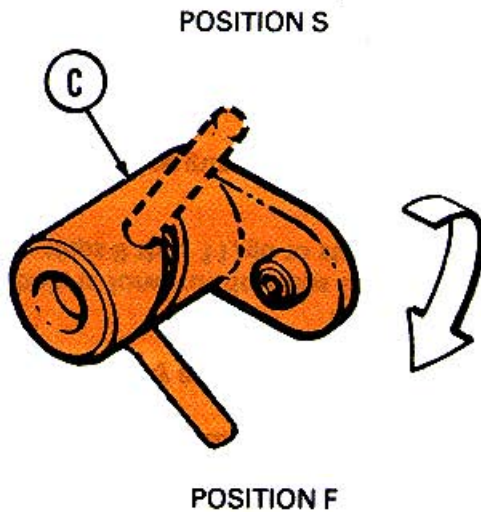
**If bolt is forward, do steps 9 thru 11. If bolt is to the rear, skip steps 9 thru 11, go to step 12.**

9. Set machine gun safety (C) to F (fire).
10. Pull black charging handle (L) back to pull bolt back.
11. Set machine gun safety (C) to S (safe).



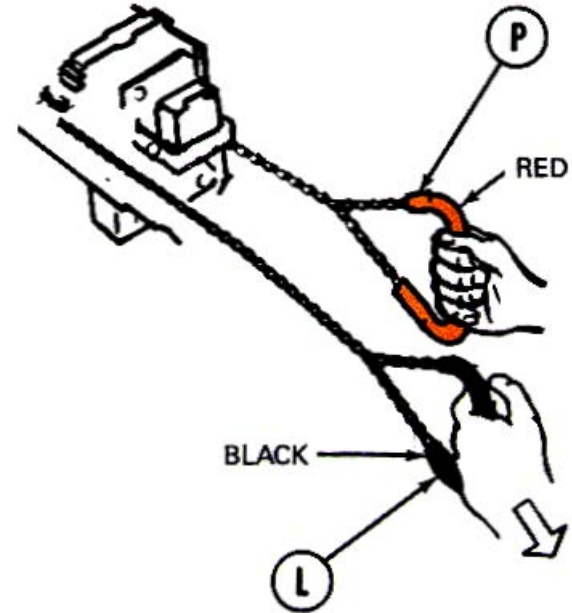
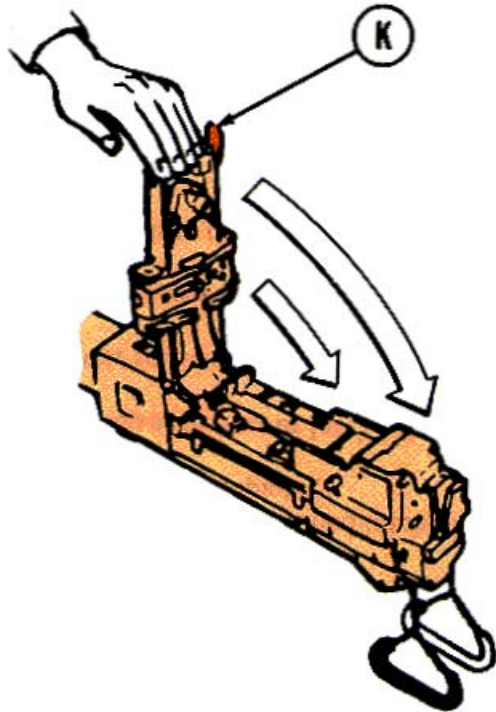
**PERFORM POST-OPERATING PROCEDURES (UNLOAD WEAPONS) - Continued**

12. Raise feed tray (M).
13. Visually inspect machine gun to make sure chamber (N) is clear.
14. If chamber (N) is not clear, remove live cartridge or spent cartridge case, and/or empty link.
15. Lower feed tray (M).
16. Set machine gun mechanical safety (C) to F (fire).



**PERFORM POST-OPERATING PROCEDURES (UNLOAD WEAPONS) - Continued**

17. Pull black charging handle (L) back and hold.
18. Pull manual red firing handle (P) and allow charging handle (L) and bolt to go forward slowly.

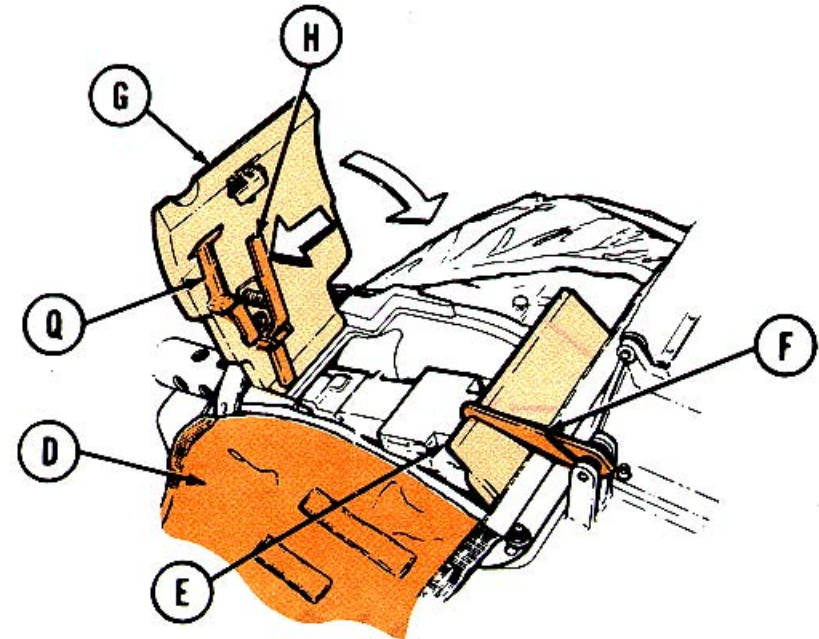


19. Close and latch machine gun cover (K).



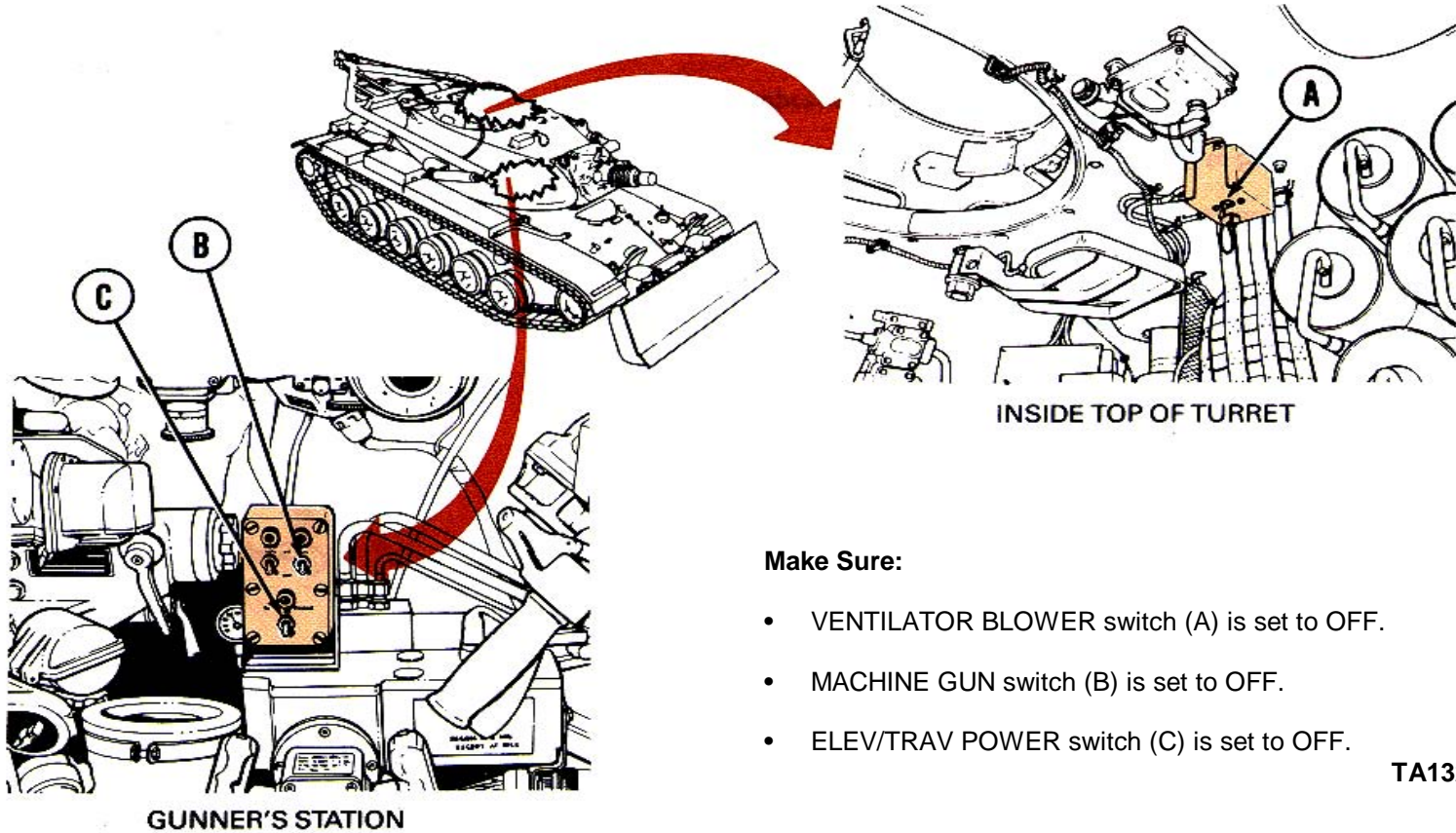
**PERFORM POST-OPERATING PROCEDURES (UNLOAD WEAPONS) - Continued**

20. Push access cover latch (H).
21. Lower access cover (G).
22. Pull up on spring loaded latch (Q) to allow access cover (G) to close completely.
23. Lift top access cover latch (F).
24. Lower top access cover (E).
25. Cover access covers with cradle cover (D).
26. Press edges of cradle cover (D) to make secure.



**PERFORM POST-OPERATING PROCEDURES (UNLOAD WEAPONS) - Continued**

**To Unload M240 7.62-MM Machine Gun:**



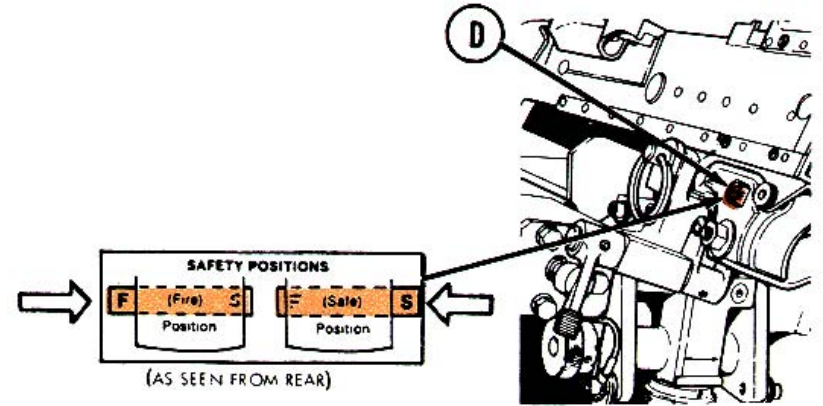
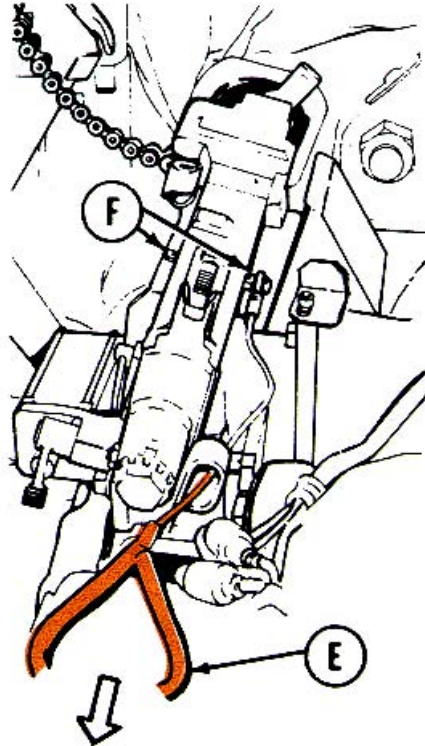
**Make Sure:**

- VENTILATOR BLOWER switch (A) is set to OFF.
- MACHINE GUN switch (B) is set to OFF.
- ELEV/TRAV POWER switch (C) is set to OFF.

**TA132698**

**PERFORM POST-OPERATING PROCEDURES (UNLOAD WEAPONS) - Continued**

1. Push machine gun safety switch (D) to F (fire).

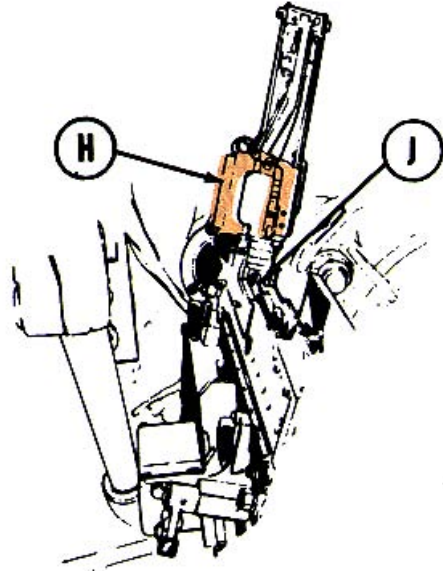


TA132699

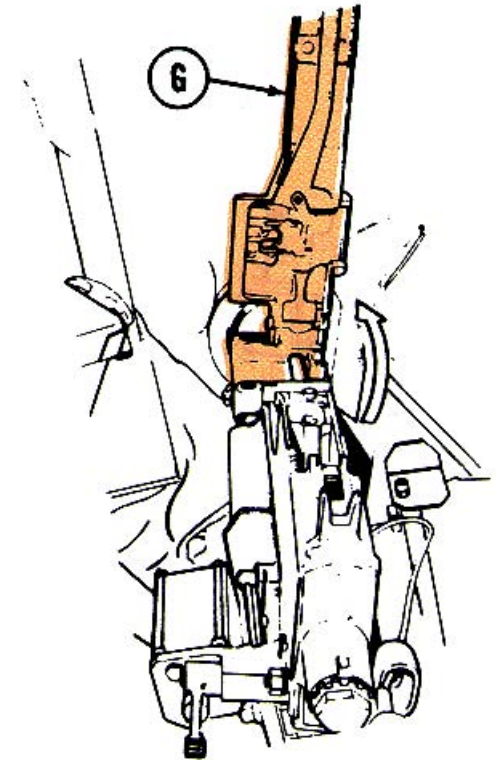
2. Pull machine gun charger handle (E) back to lock bolt.
3. Push machine gun safety switch (D) to S (safe).
4. Depress cover latches (F).

**PERFORM POST-OPERATING PROCEDURES (UNLOAD WEAPONS) - Continued**

5. Raise machine gun cover (G).
6. Remove ammunition belt from machine gun, if present.



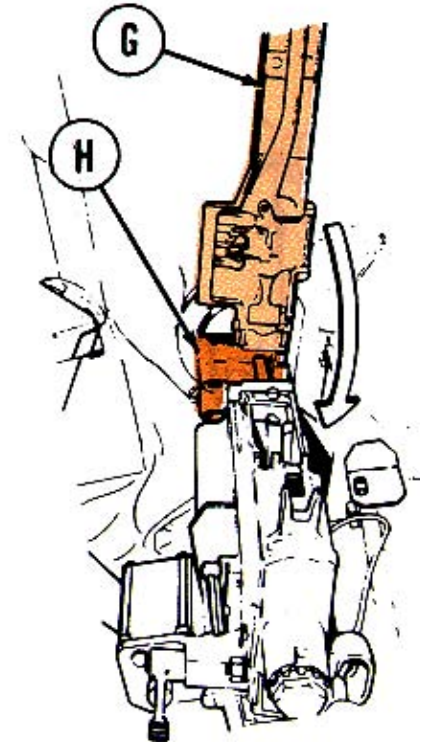
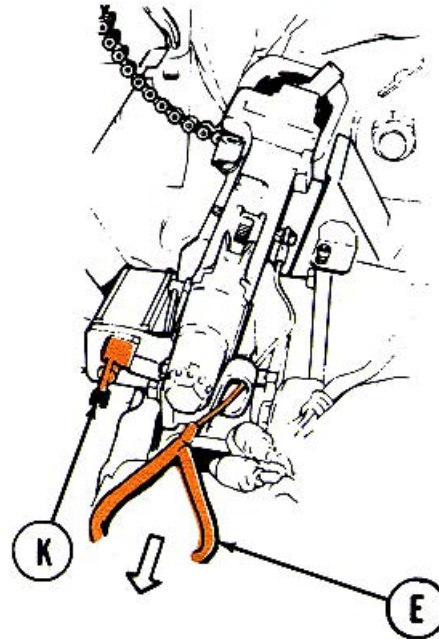
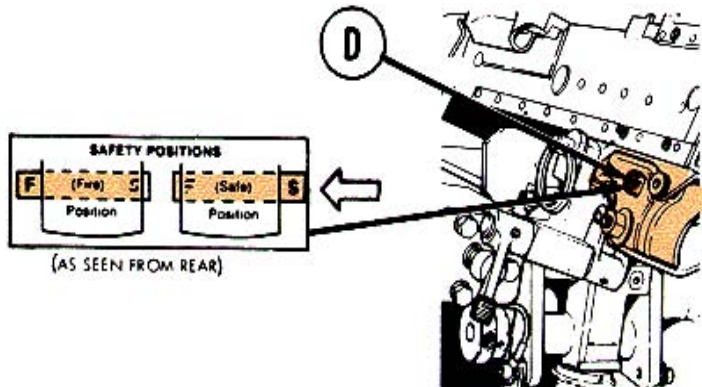
7. Raise feed tray (H).
8. Visually inspect machine gun to make sure chamber (J) is clear.
9. Clear chamber if necessary.



TA132700

**PERFORM POST-OPERATING PROCEDURES (UNLOAD WEAPONS) - Continued**

10. Lower feed tray (H).
11. Close and latch machine gun cover (G).
12. Push machine gun safety switch (D) to F (fire).

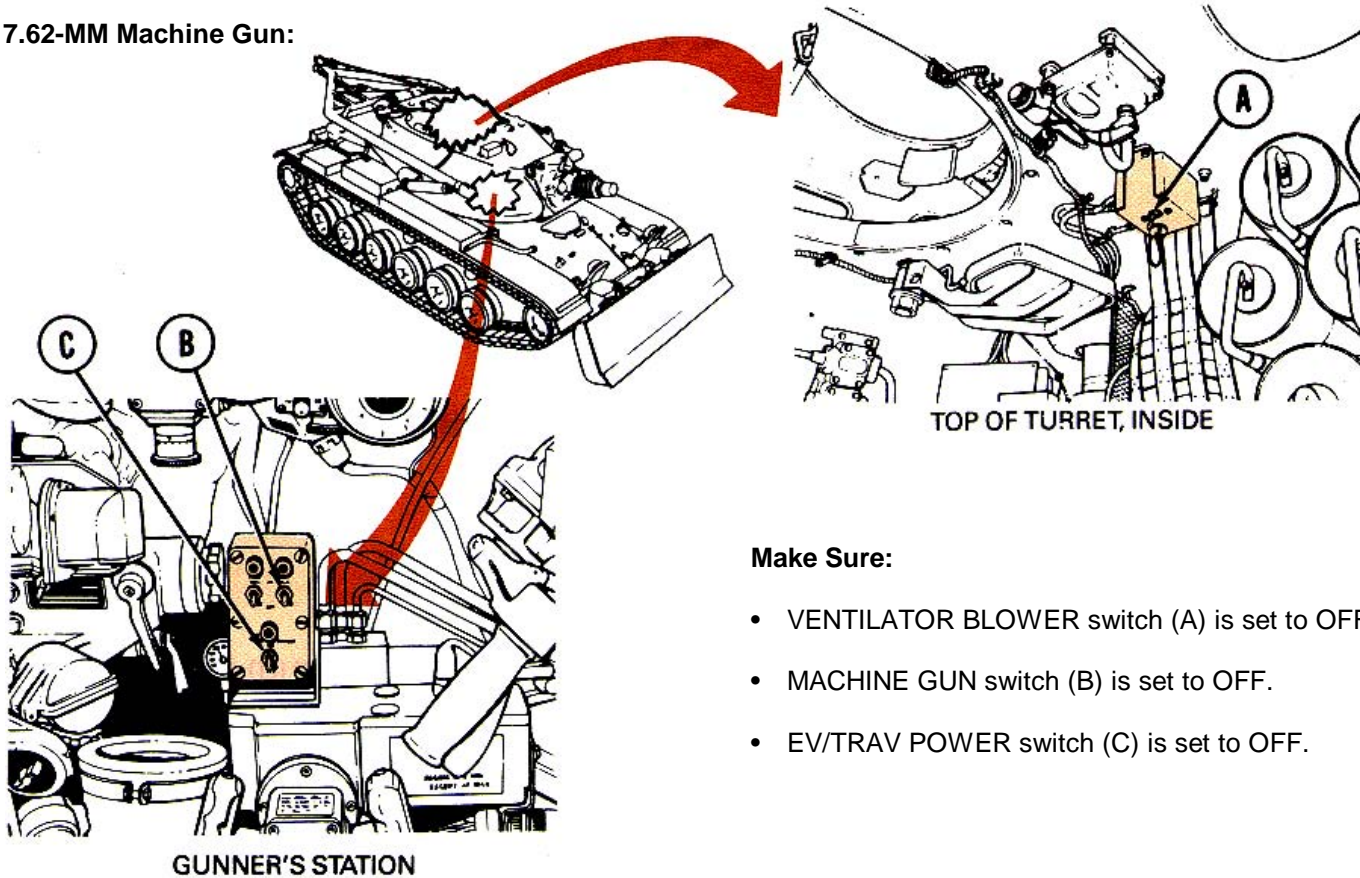


13. Pull charger handle (E) back and hold.
14. Depress manual firing trigger (K) and allow charger handle (E) to move forward slowly.

TA132701

**PERFORM POSTOPERATING PROCEDURES (UNLOAD WEAPONS) - Continued**

**To Unload M73 7.62-MM Machine Gun:**



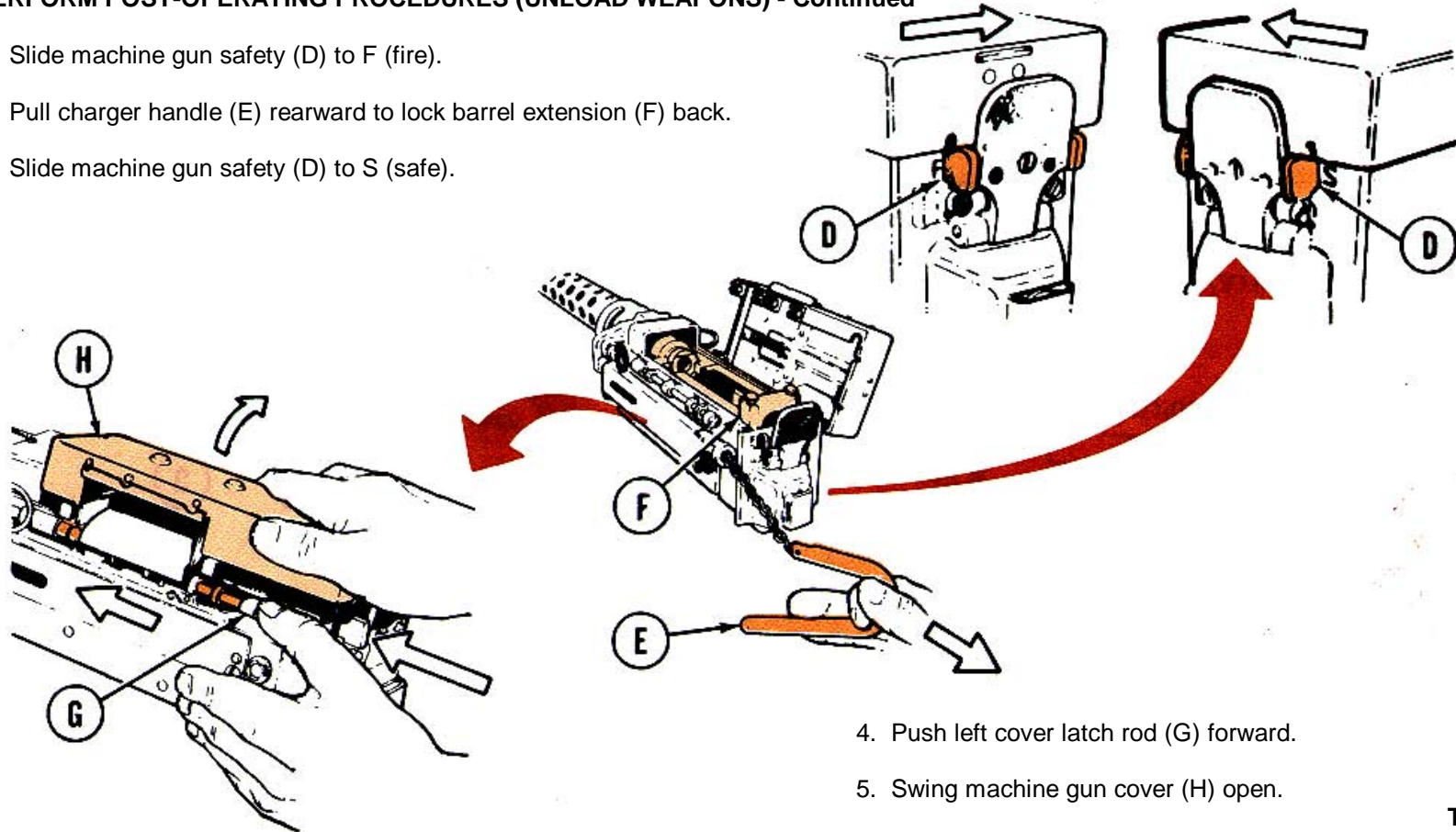
**Make Sure:**

- VENTILATOR BLOWER switch (A) is set to OFF.
- MACHINE GUN switch (B) is set to OFF.
- EV/TRAV POWER switch (C) is set to OFF.

TA132702

**PERFORM POST-OPERATING PROCEDURES (UNLOAD WEAPONS) - Continued**

1. Slide machine gun safety (D) to F (fire).
2. Pull charger handle (E) rearward to lock barrel extension (F) back.
3. Slide machine gun safety (D) to S (safe).

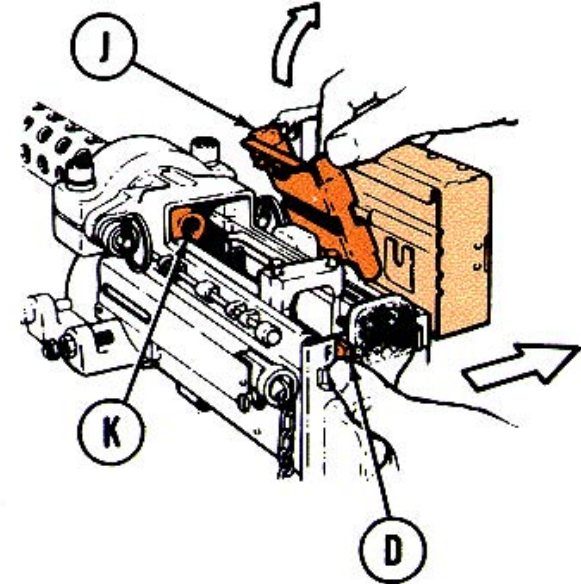
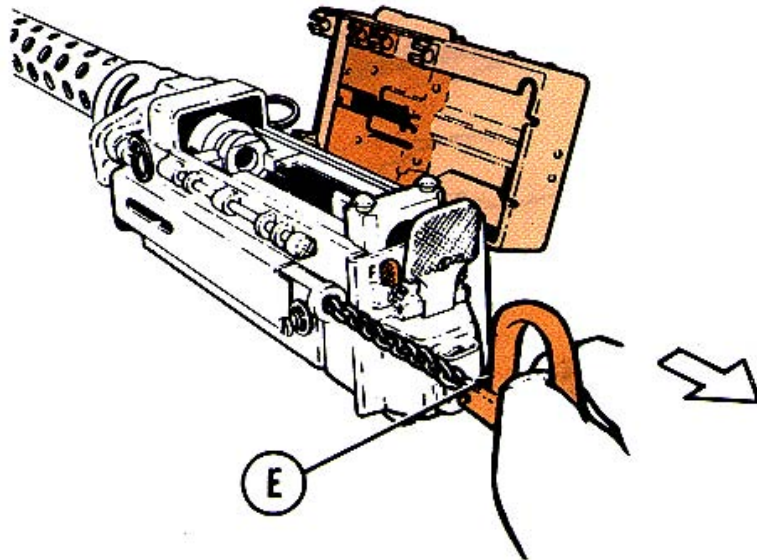


4. Push left cover latch rod (G) forward.
5. Swing machine gun cover (H) open.

TA132703

**PERFORM POST-OPERATING PROCEDURES (UNLOAD WEAPONS) - Continued**

6. Remove ammunition belt, if present, from machine gun.
7. Swing feed tray (J) open.
8. Visually inspect machine gun to make sure chamber (K) is clear.
9. Clear chamber if necessary.



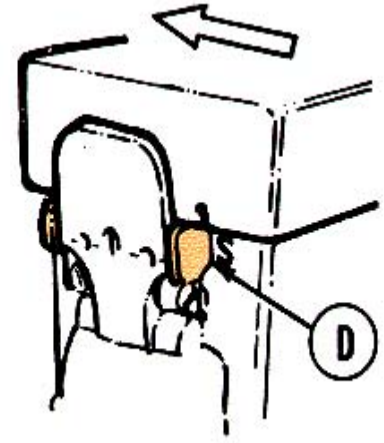
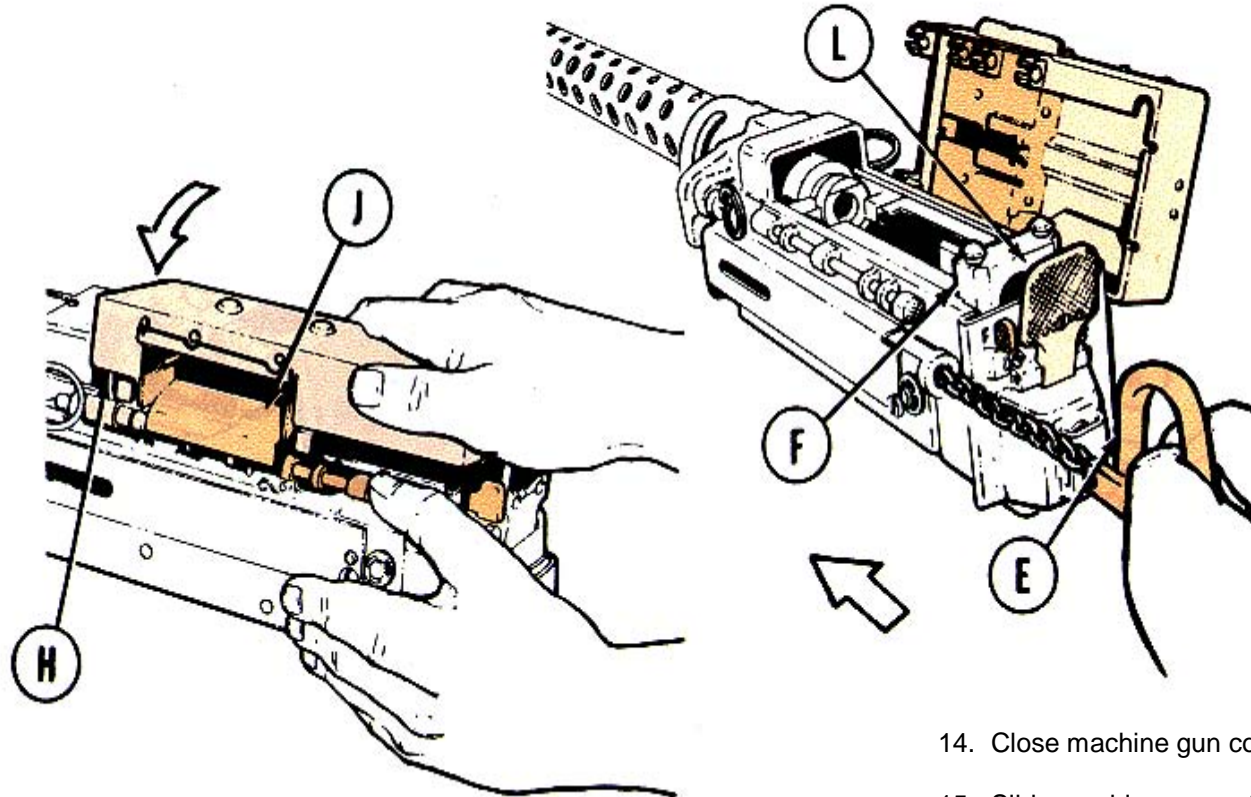
10. Slide machine gun safety (D) to F (fire).
11. Pull charger handle (E) to the rear and hold.

TA132704



**PERFORM POST-OPERATING PROCEDURES (UNLOAD WEAPONS) - Continued**

12. Depress manual firing trigger (L) and allow charger handle (E) and barrel extension (F) to close slowly.
13. Close feed tray (J).



14. Close machine gun cover (H).
15. Slide machine gun safety (D) to S (safe).

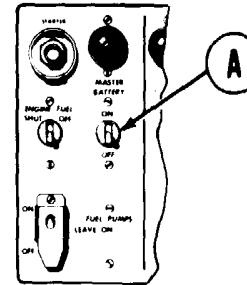
TA132705

**PERFORM POST-OPERATING PROCEDURES (UNLOAD WEAPONS) - Continued**

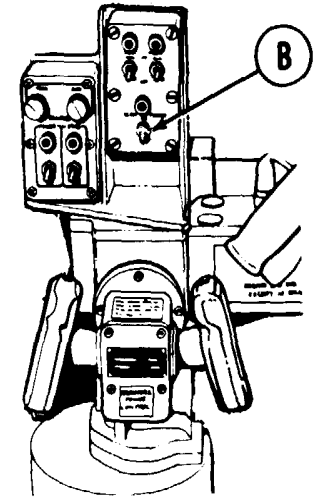
■ To Unload Smoke Grenade Dischargers:

**Make Sure:**

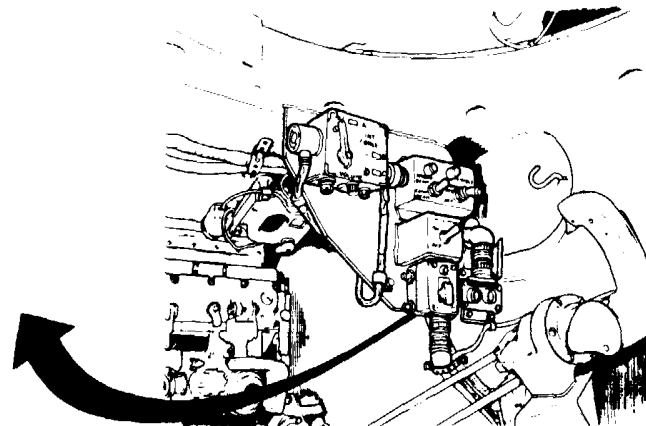
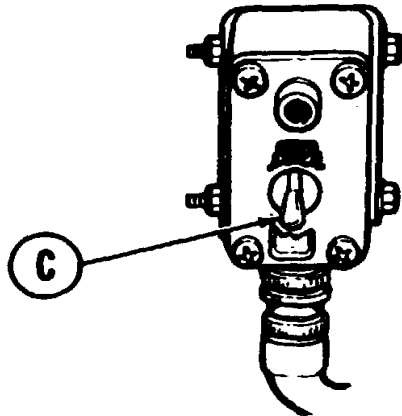
- MASTER BATTERY switch (A) is set to OFF.
- ELEV/TRAV POWER switch (B) is set to OFF.
- Turret lock is locked (page 2-568).
- Smoke grenade launcher power switch (C) is OFF.



DRIVER'S STATION



GUNNER'S STATION



Change 9 2-566.1

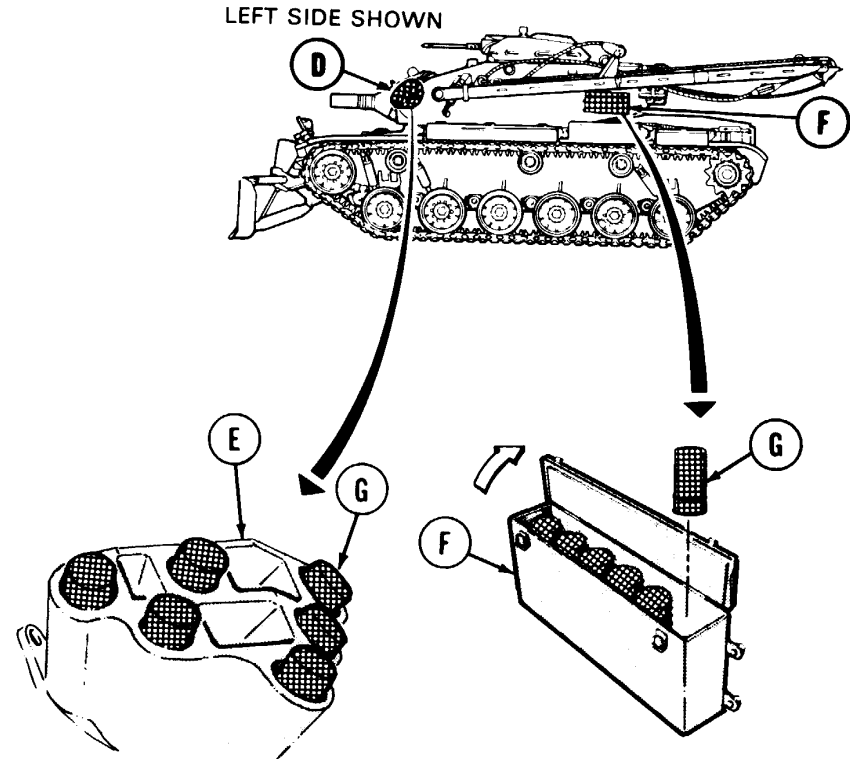
TA252847

## PERFORM POST-OPERATING PROCEDURES (UNLOAD WEAPONS) - Continued

## Warning

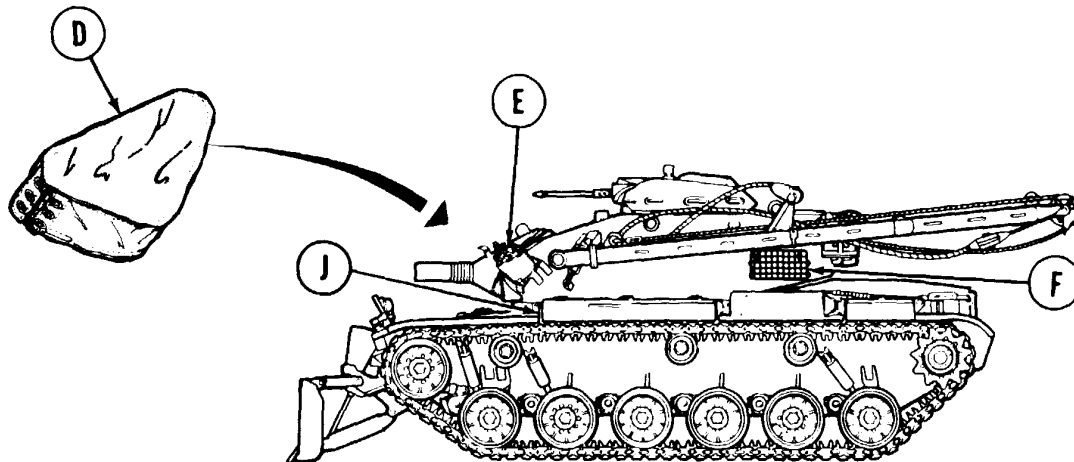
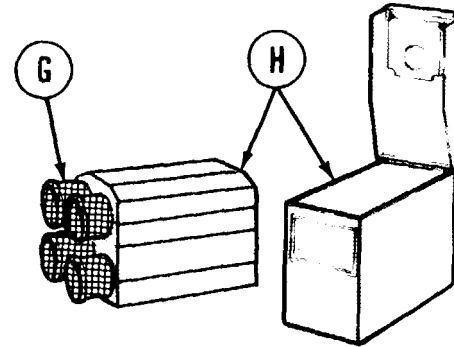
Follow standard vehicle weapon handling procedures when handling and unloading grenades. Smoke grenades contain RP (red phosphorous). This is a fire hazard and is dangerous to all personnel outside vehicle. Never place part of your body in front of the discharger when removing or installing discharger covers.

1. Remove covers (D), if installed, from right and left smoke grenade dischargers (E).
2. Unlatch and open right and left stowage boxes (F).
3. Remove all grenades (G) from both grenade dischargers (E) and both stowage boxes (F).



**PERFORM POST-OPERATING PROCEDURES (UNLOAD WEAPONS) - Continued**

4. Return all grenades (G) to ammunition shipping container (H).  
Latch container (H).
5. Close and latch both stowage boxes (F).
6. Get discharger covers (D), if stowed, from fender box (J).
7. Install discharger covers (D) on both grenade dischargers (E).



LEFT SIDE SHOWN

Change 9 2-566.3/(2-566.4 blank)

**PERFORM POST-OPERATING PROCEDURES (OPEN LOADER'S HATCH FROM INSIDE)****To Open Loader's Hatch:**

1. Remove loader's M37 periscope if installed (page 2-601).
2. Grip hatch release handle (A). Squeeze plate (B) to unlock.
3. Push handle full forward (C) to unlock hatch. Hatch will open slightly.
4. Push hatch to position (D).

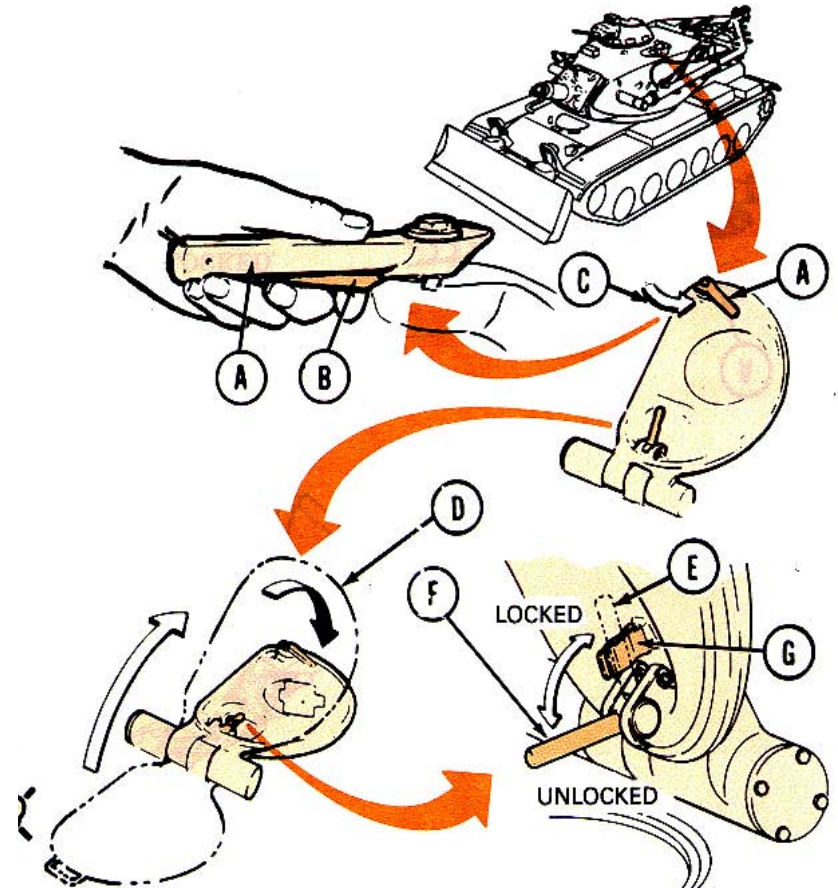
**NOTE**

**Spring-loaded lock will lock hatch in position (D).**

5. Pull lock handle (E) to UNLOCKED position (F).
6. Push hatch to fully open.
7. Release lock handle.

**Warning**

**Be sure lock handle is secured in spring clip (G) when hatch is open.**

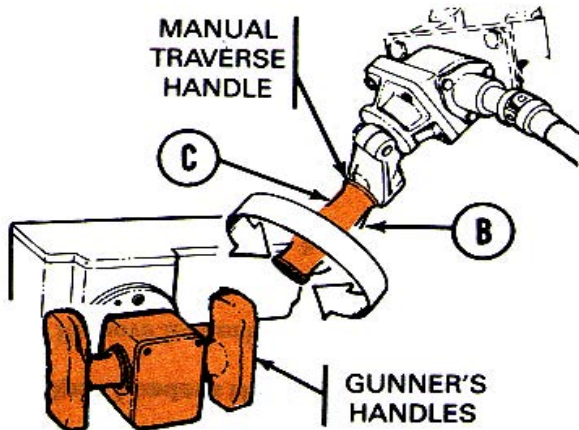
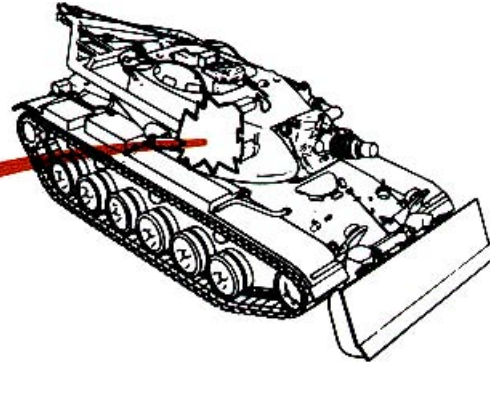


TA132706

**PERFORM POST-OPERATING PROCEDURES (LOCK TURRET TRAVERSE LOCK)**

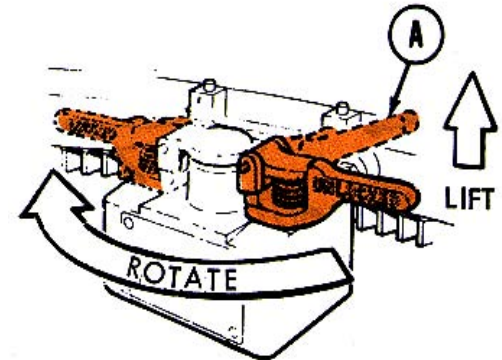
**Make Sure:**

- Loader's seat is located on pins to left of turret traverse lock (page 2-154).



**To Lock:**

1. Lift lever (A).
2. Rotate lever (A) all the way to LOCKED.
3. If lever (A) won't go all the way to LOCKED, squeeze lever (B) and rotate handle (C) slightly until lever (A) goes to LOCKED.

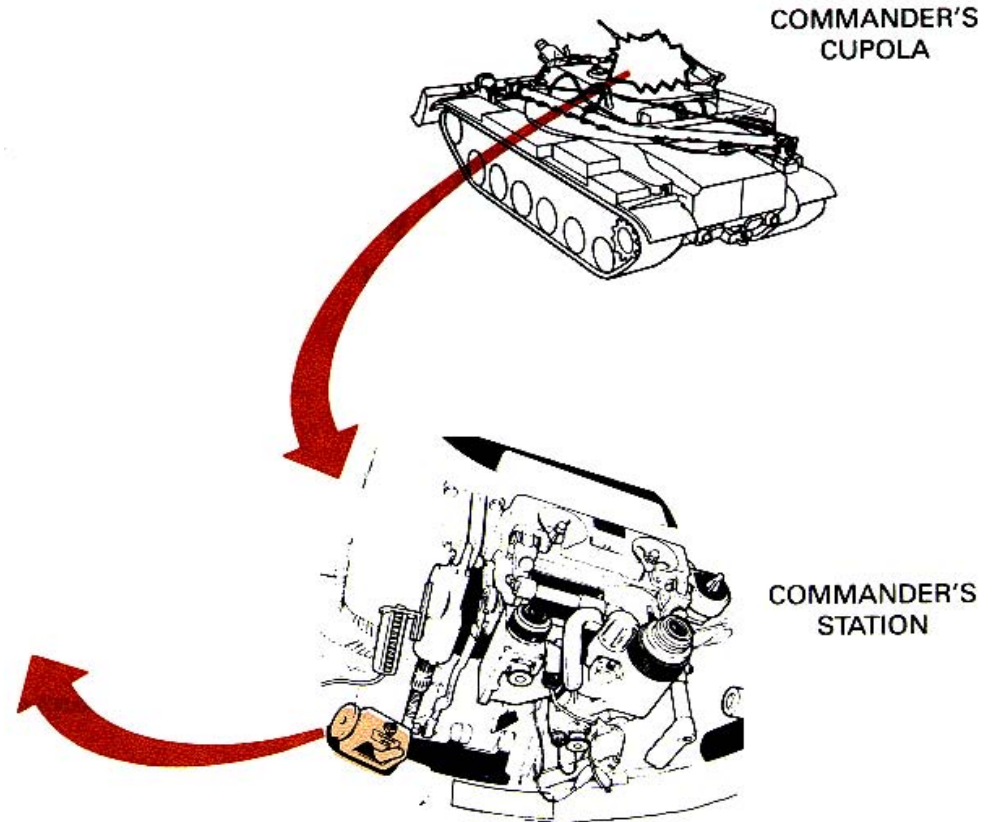
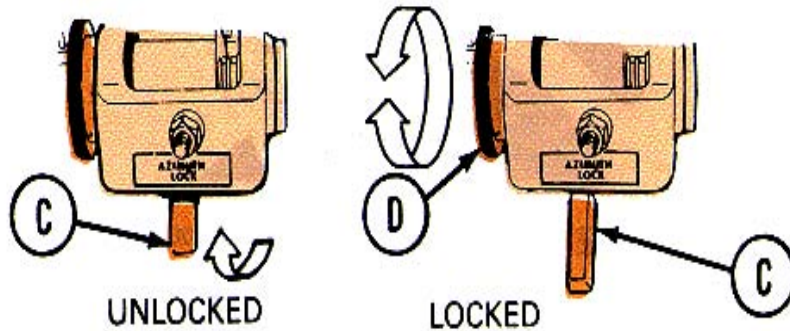


TA132708

**PERFORM POST-OPERATING PROCEDURES (LOCK CUPOLA LOCKS)**

**To Lock AZIMUTH LOCK Only:**

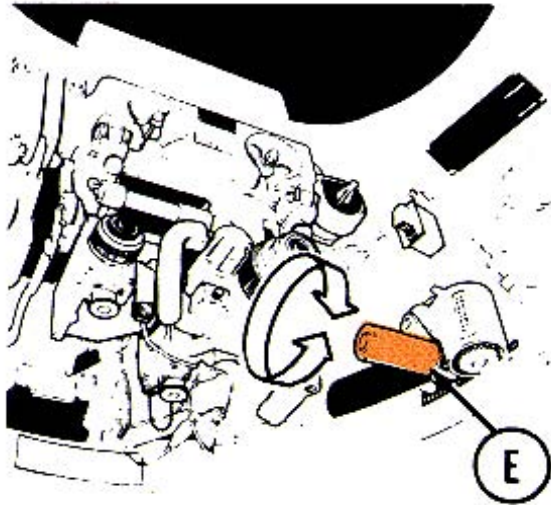
1. Lift up on AZIMUTH LOCK handle (C).
2. Turn knob (D) until AZIMUTH LOCK locks.



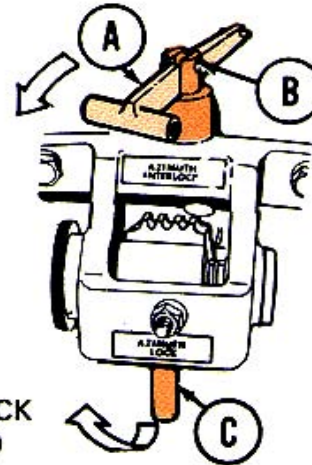
**PERFORM POST-OPERATING PROCEDURES (LOCK CUPOLA LOCKS) - Continued**

**To Lock AZIMUTH LOCK and AZIMUTH INTERLOCK (Cupola Machine Gun Alined With Main Gun):**

1. Turn cupola TRAVERSE CONTROL handle (E) until cupola machine gun is almost alined with main gun.
2. Pull AZIMUTH INTERLOCK handle (A) in direction shown as far as it will go.
3. Release handle (A).
4. Turn cupola TRAVERSE CONTROL (E) handle until pin (B) drops into detent.

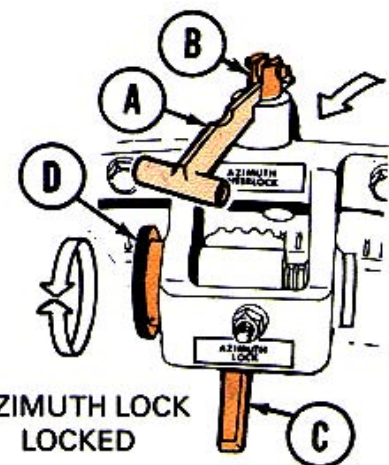


**AZIMUTH INTERLOCK UNLOCKED**



**AZIMUTH LOCK UNLOCKED**

**AZIMUTH INTERLOCK LOCKED**



**AZIMUTH LOCK LOCKED**

5. Pull AMIUTH LOCK handle (C) in direction shown. Turn knob (D) until AZIMUTH LOCK locks.

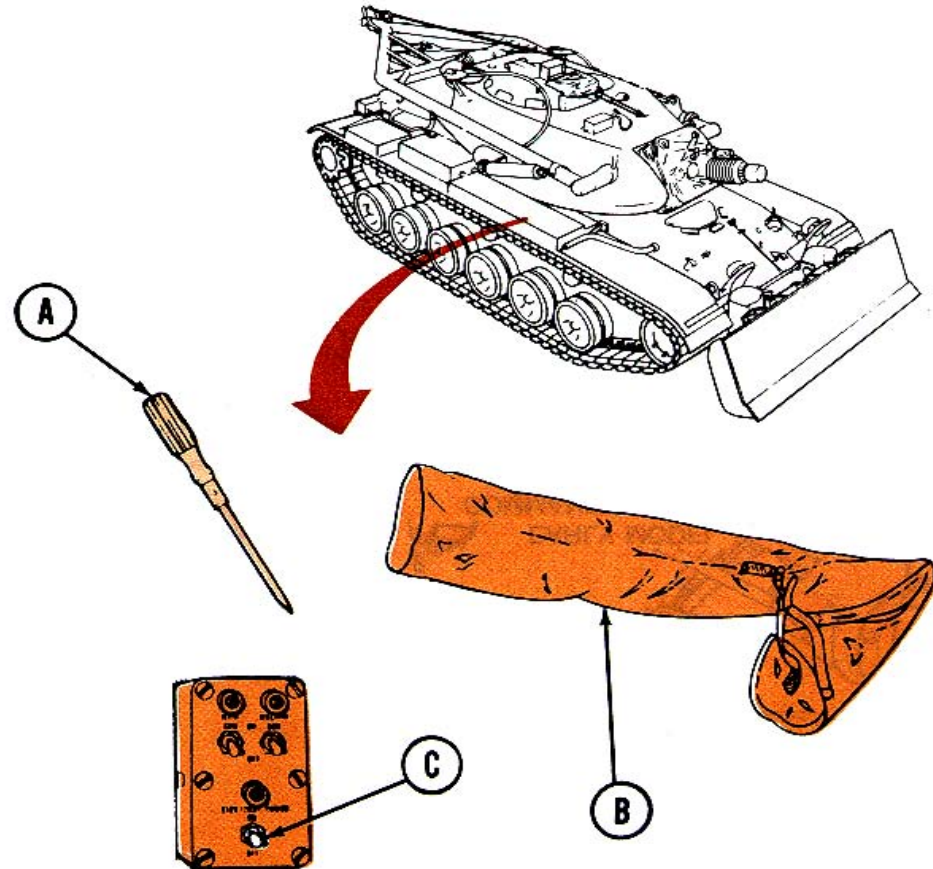
TA132709



**PERFORM POST-OPERATING PROCEDURES (INSTALL COVERS)****To Install Caliber .50 Machine Gun Cover:****tools and Equipment:**

Get from right front fender box:

- 6 inch flat-tipped screwdriver (A).
- Caliber .50 machine gun cover (B).

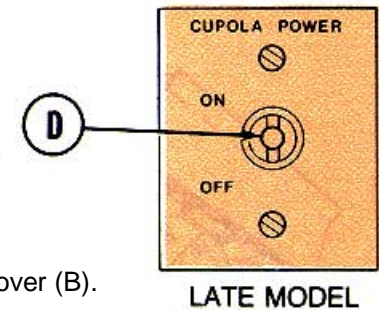
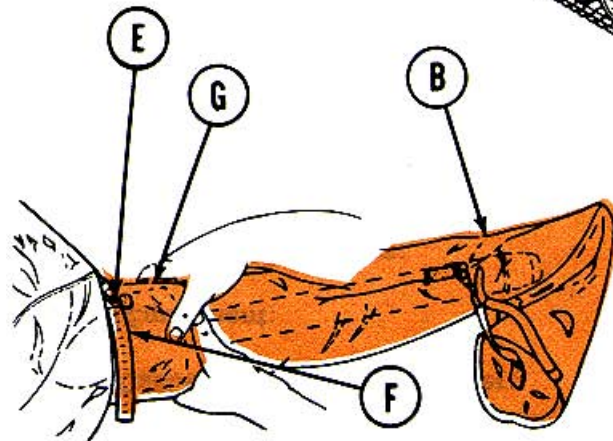
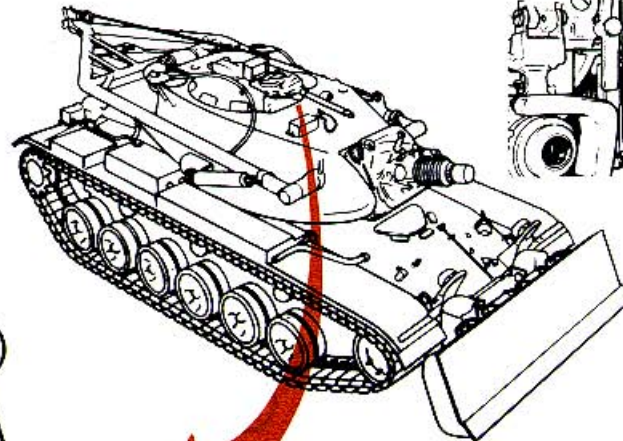
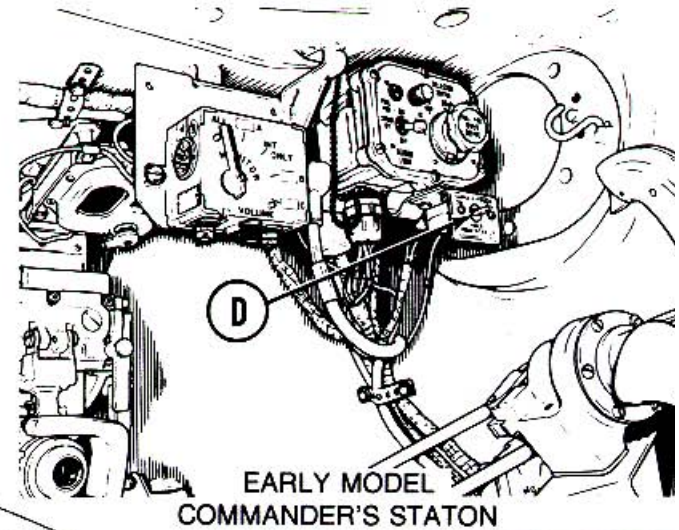
**Make Sure:**

- Caliber .50 machine gun is unloaded (page 2-553).
- ELEV/TRAV POWER switch (C) is set to OFF.
- Cupola AZIMUTH LOCK is locked (page 2-564).

GUNNER'S STATION

**PERFORM POST-OPERATING PROCEDURES (INSTALL COVERS) - Continued**

1. Hold CUPOLA POWER CONTROL switch (D) momentarily to OFF.
2. Using flat-tip screwdriver, loosen screw (E).
3. Remove clamp (F) from housing (G).



4. Put clamp (F) on open end of cover (B).
5. Place cover (B) all the way over housing (G).
6. Using flat-tip screwdriver, tighten screw (E) snug.
7. Return screwdriver to stowage.

**PERFORM POST-OPERATING PROCEDURES (INSTALL COVERS) - Continued****To Install 7.62-MM Machine Gun Cover:****Tools and Equipment:**

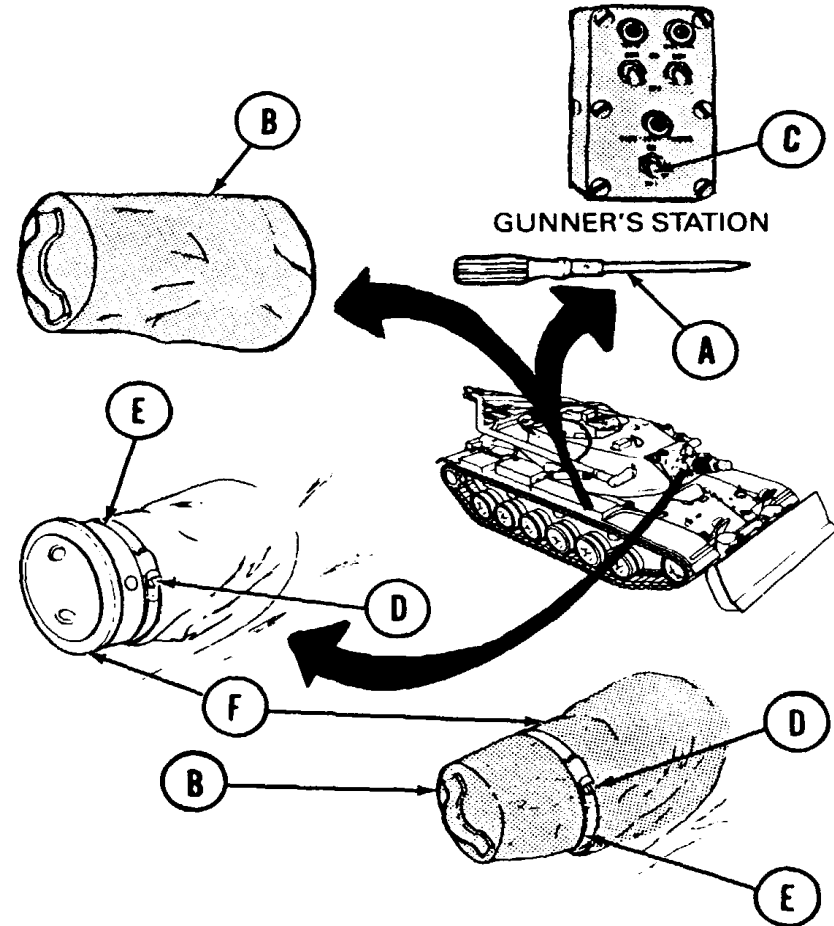
Get from right front fender box:

- 6 inch flat-tipped screwdriver (A).
- 7.62-mm machine gun cover (B).

**Make Sure:**

- 7.62-mm machine gun is unloaded (page 2-546) M240.
- Turret lock is locked (page 2-568).
- ELEV/TRAV POWER switch (C) is set to OFF.

1. Using flat-tip screwdriver, loosen screw (D) on clamp (E).
2. Remove clamp (E) from housing (F).
3. Place cover (B) over housing (F).
4. Place clamp (E) on cover (B).
5. Using flat-tip screwdriver, tighten screw (D) snug.
6. Return screwdriver to stowage.



**PERFORM POST-OPERATING PROCEDURES (INSTALL COVERS) - Continued****To Install Telescope Cover:****Tools and Equipment:**

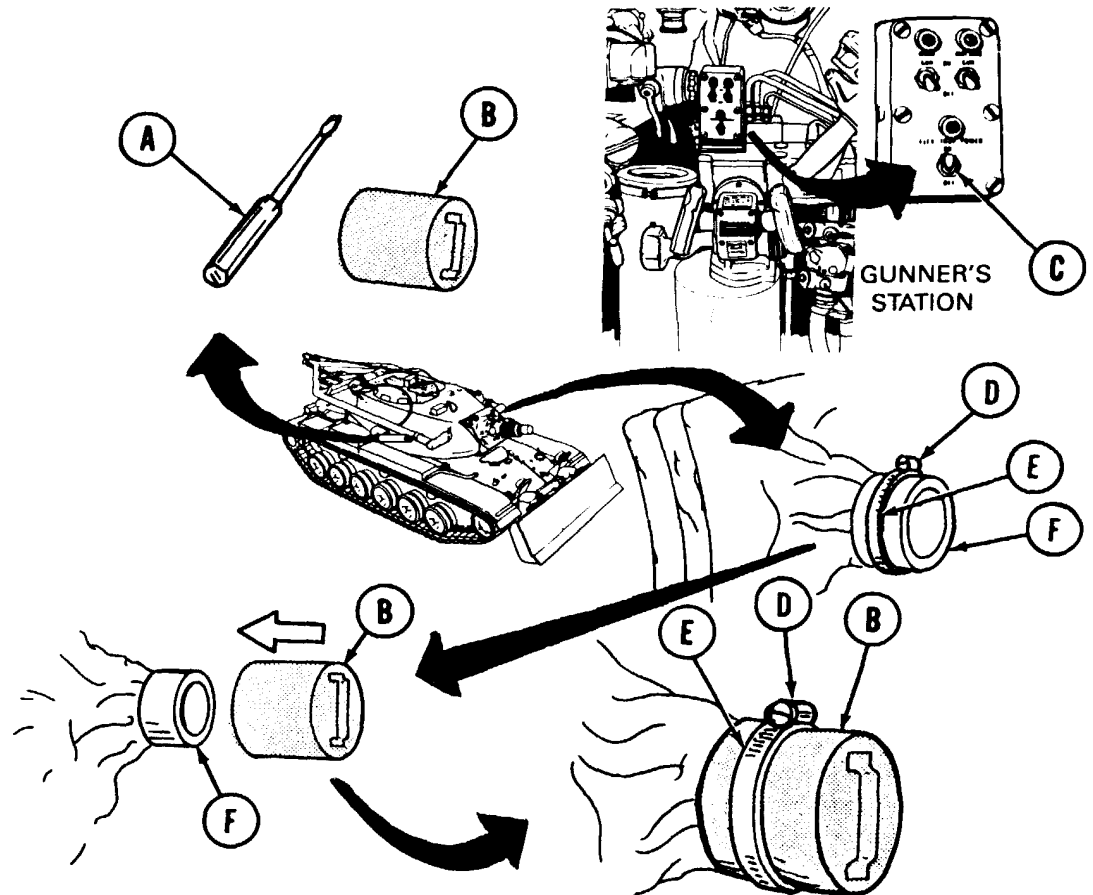
Get from right front fender box:

- Flat-tip screwdriver (A)
- Telescope cover (B).

**Make Sure:**

- Turret lock is locked (page 2-568).
- ELEV/TRAV POWER switch (C) is set to OFF.

1. Using screwdriver (A), loosen screw (D).
2. Remove clamp (E) from housing (F).
3. Place cover (A) over housing (F).
4. Place clamp (E) on cover (B).
5. Tighten screw (D).
6. Return screwdriver to stowage.



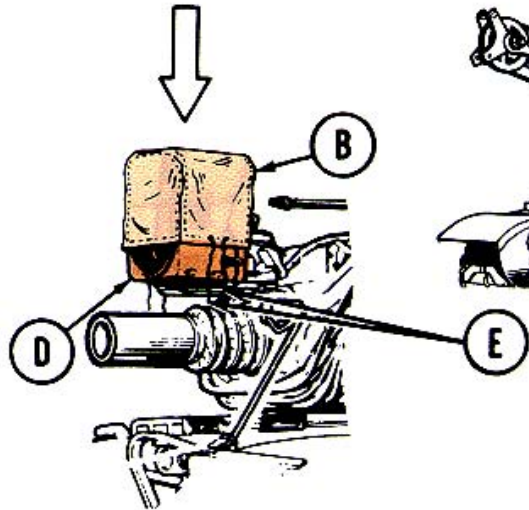
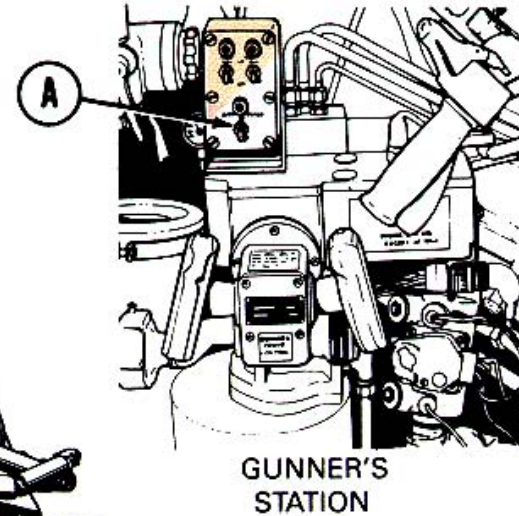
**PERFORM POST-OPERATING PROCEDURES (INSTALL COVERS) - Continued**

**To Install Cover on AN/VSS-3A Searchlight (If So Equipped):**

**Make Sure:**

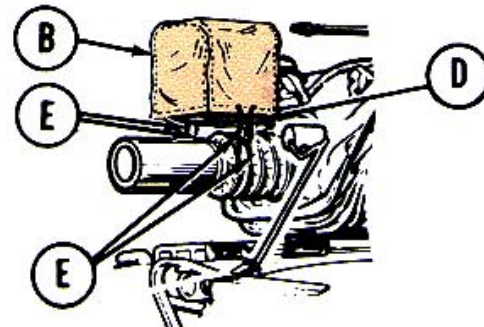
- ELEV/TRAV POWER switch (A) is set to OFF.

1. Get cover (B) from bustle rack (C).
2. Unfold cover (B).



3. Pull cover (B) down over searchlight (D) as shown.

4. Pull drawstrings (E) from either side of cover (B).
5. Tie drawstrings (E) underneath searchlight.



TA132714

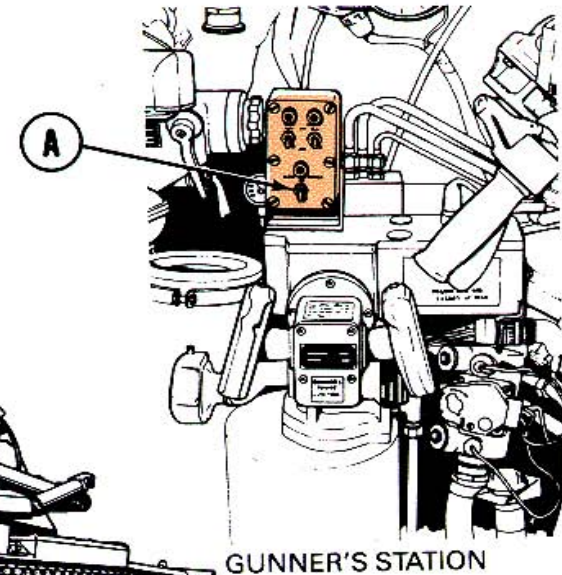
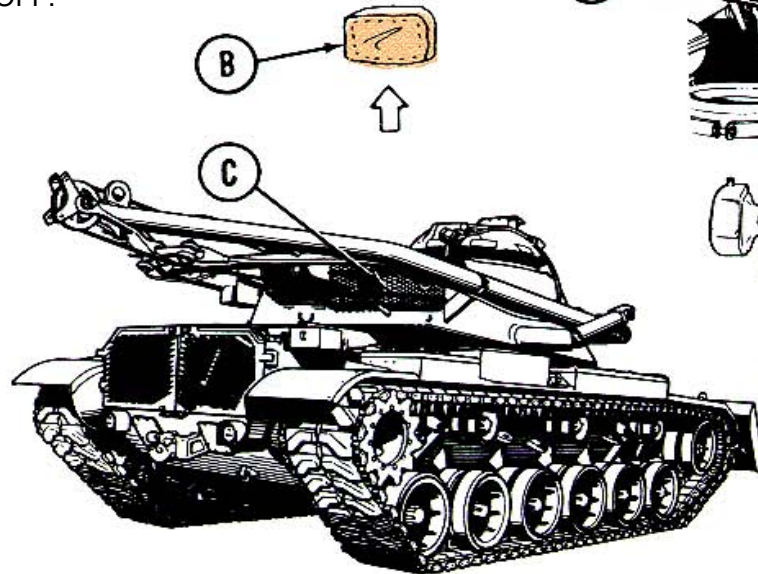
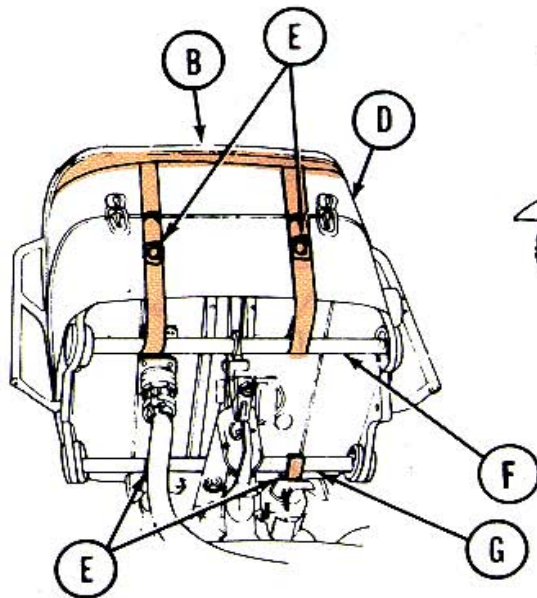
**PERFORM POST-OPERATING PROCEDURES (INSTALL COVERS) - Continued**

**To Install Cover on ANSS-2 Searchlight (If So Equipped):**

**Make Sure:**

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

1. Get cover (B) from bustle rack (C).



GUNNER'S STATION

2. Place cover (B) over front of searchlight (D) as shown.
3. Buckle four straps (E), two around top bar (F), two around bottom bar (G).

TA132705

**PERFORM POST-OPERATING PROCEDURES (INSTALL COVERS) - Continued**

**To Install Main Gun Muzzle Cap:**

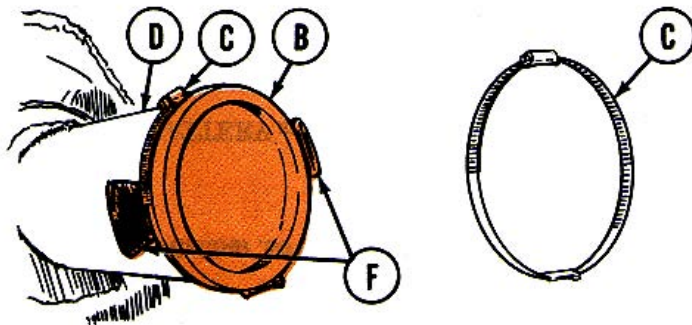
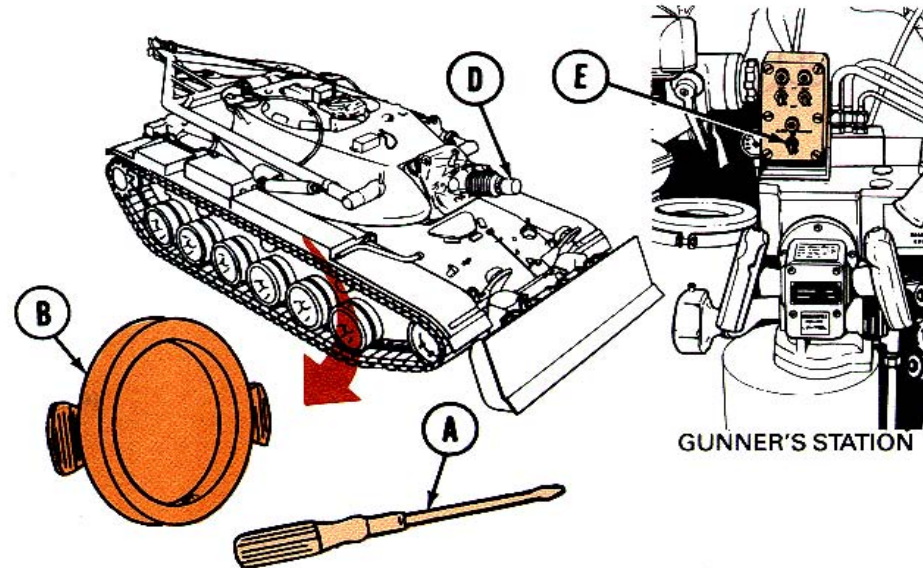
**Tools and Equipment:**

Get from right front fender box:

- Six inch flat-tipped screwdriver (A).
- Muzzle cap (B).
- Clamp (C).

**Make Sure:**

- Main gun (D) is unloaded (page 2-550).
- Turret traversing lock is locked (page 2-568).
- ELEV/TRAV POWER switch (E) is set to OFF.



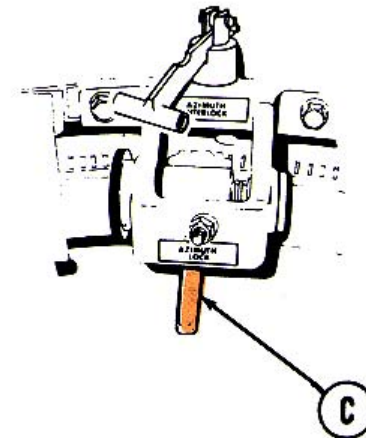
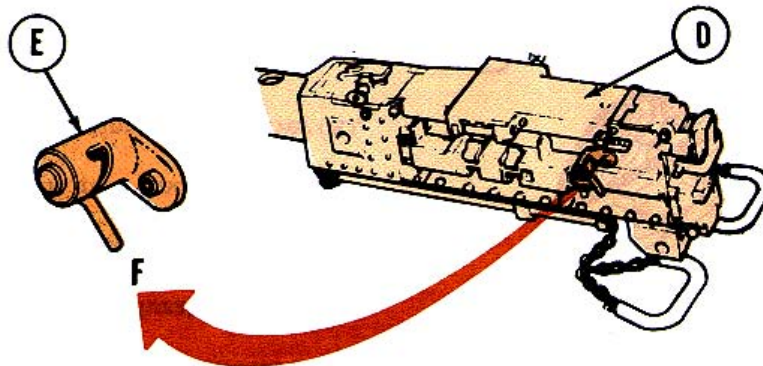
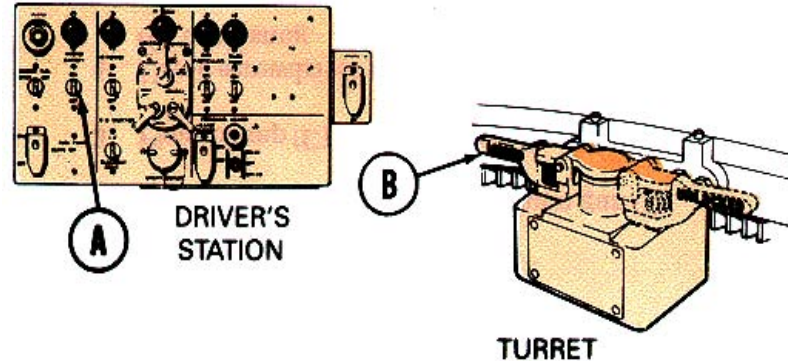
1. Grasp muzzle cap (B) by tabs (F).
2. Place muzzle cap (B) on end of main gun (D).
3. Place clamp (C) on muzzle cap (B) as shown.
4. Using screwdriver (A), tighten screw on clamp (C) until snug.
5. Return screwdriver (A) to stowage.

**PERFORM POSTOPERATING PROCEDURES (REMOVE WEAPONS)**

**To Remove M85 Caliber .50 Machine Gun:**

**Make Sure:**

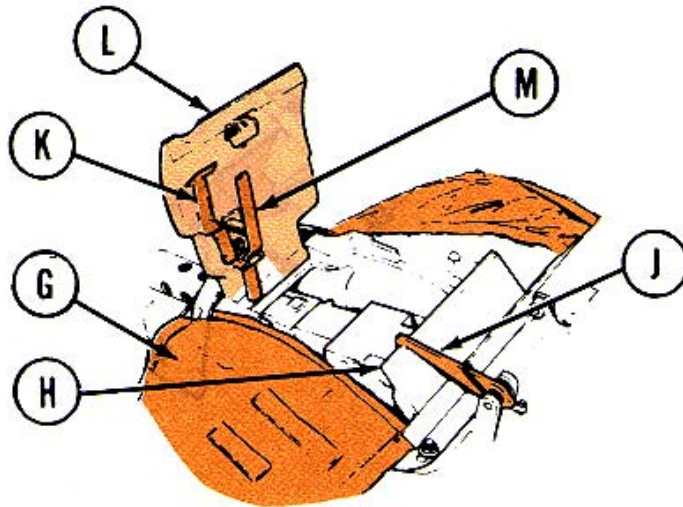
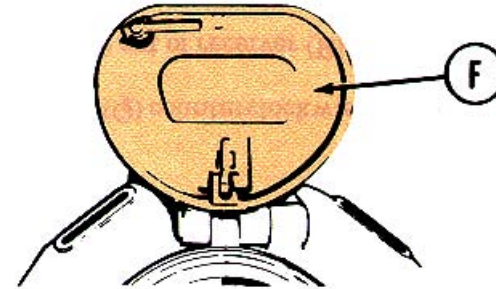
- MASTER BATTERY switch (A) is set to OFF.
- Turret traverse lock (B) is set to LOCKED (page 2-568).
- Cupola AZIMUTH LOCK (C) is lifted into locked position (page 2-569).
- Machine gun (D) is not loaded (page 2-553).
- Bolt assembly is in forward position.
- Machine gun mechanical safety (E) is set to F (fire).





**PERFORM POST-OPERATING PROCEDURES (REMOVE WEAPONS) - Continued**

1. Open cupola hatch door (F) and lock (page 2-145).
2. Lower machine gun to minimum elevation (page 2-470).

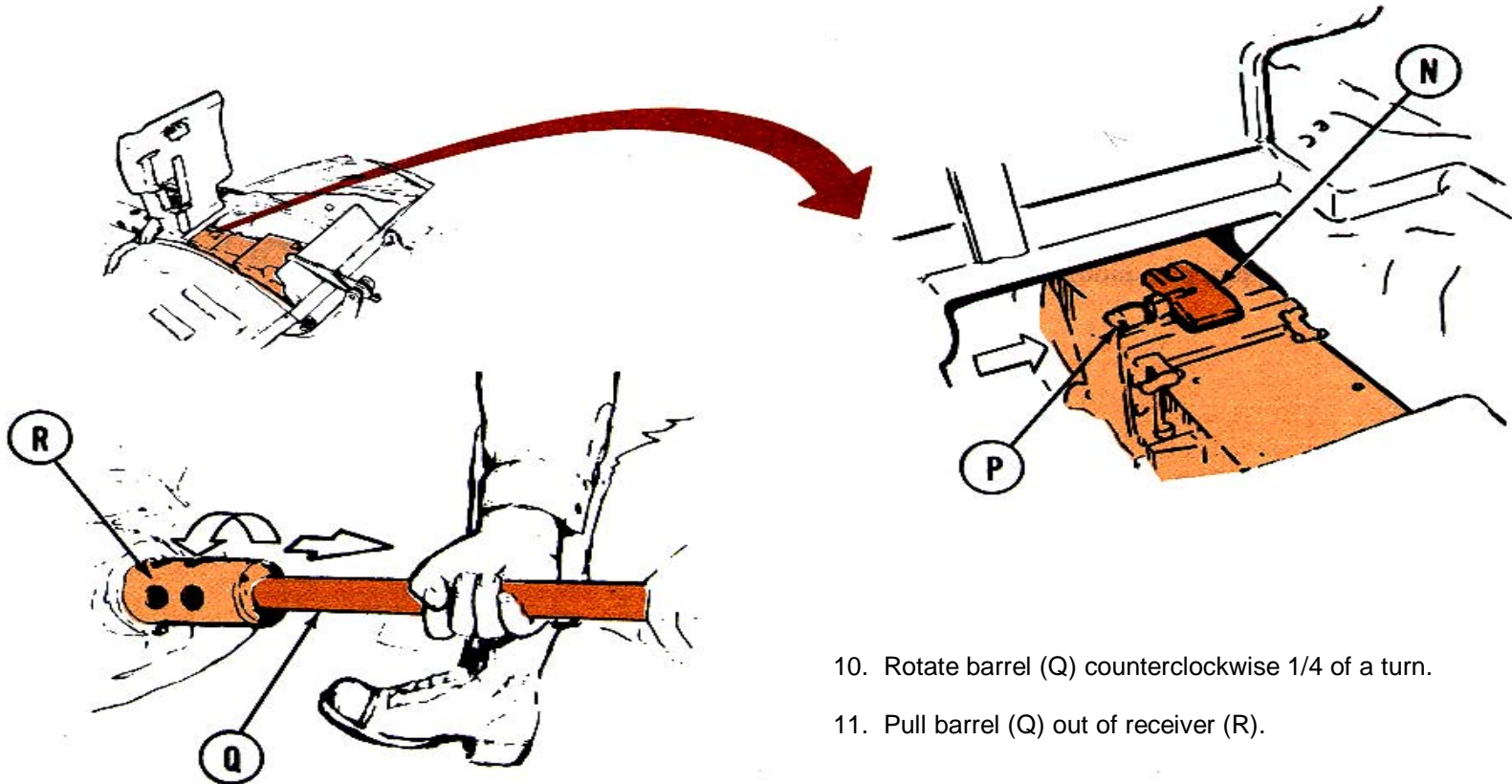


3. Open press-on type fastener and fold back cupola machine gun cradle cover (G).
4. Lift top access door (H).
5. Lock top access door (H) in place with hold-open latch (J).
6. Pull latch (K) and lift open cradle access door (L).
7. Spring loaded cradle access door latch (M) will lock access door (L) open.
8. Elevate machine gun to a level position (page 2-470).

TA132718

**PERFORM POST-OPERATING PROCEDURES (REMOVE WEAPONS) - Continued**

9. Push in pin (P) and press lever (N) until barrel is removed from the receiver.

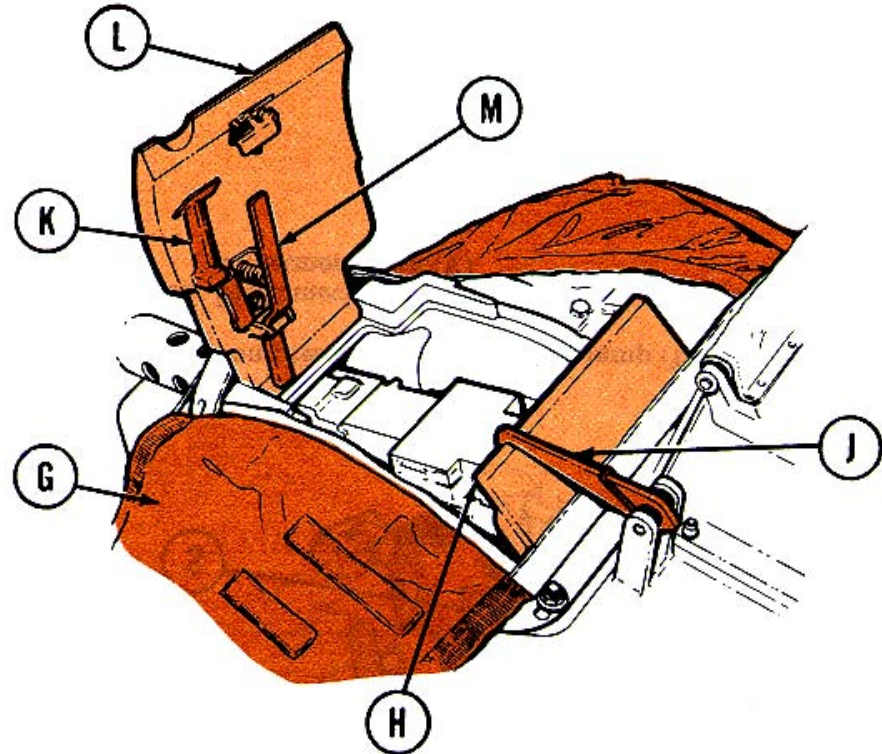


10. Rotate barrel (Q) counterclockwise 1/4 of a turn.

11. Pull barrel (Q) out of receiver (R).

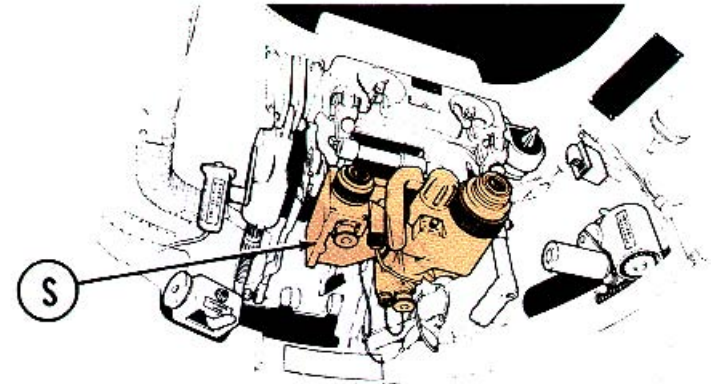
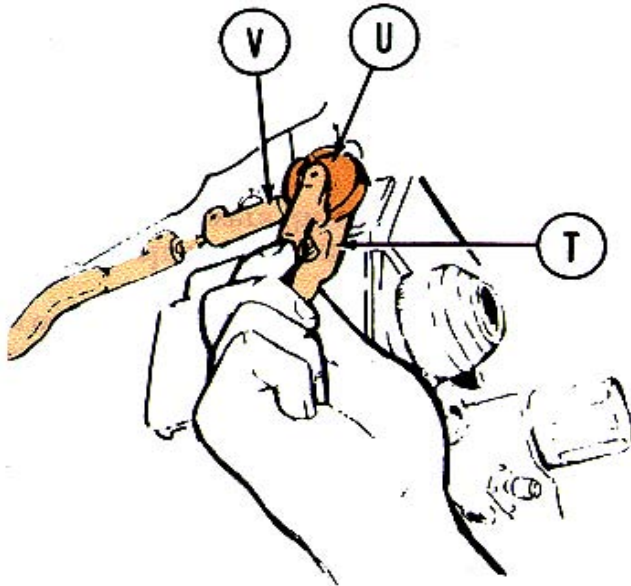
**PERFORM POST-OPERATING PROCEDURES (REMOVE WEAPONS) - Continued**

12. Lower machine gun to minimum elevation (page 2-470).
13. Lower latch (M) and close cradle access door (L).
14. Lift hold-open latch (J) and close top access door (H)
15. Pull latch (k) to fully close cradle access door (L).
16. Fold back cupola machine gun cradle cover (G) until it covers the access doors.
17. Secure press-on type fastener o cradle cover (G).
18. Elevate machine gun (page 2-470).



**PERFORM POST-OPERATING PROCEDURES (REMOVE WEAPONS) - Continued**

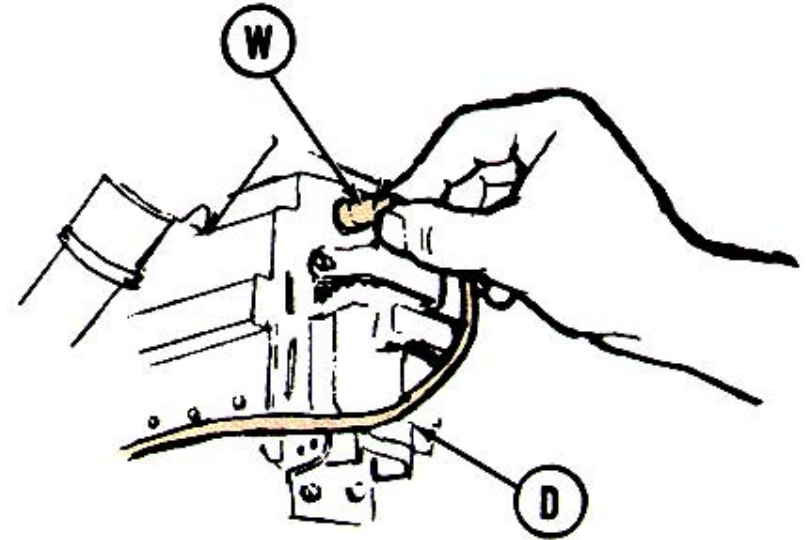
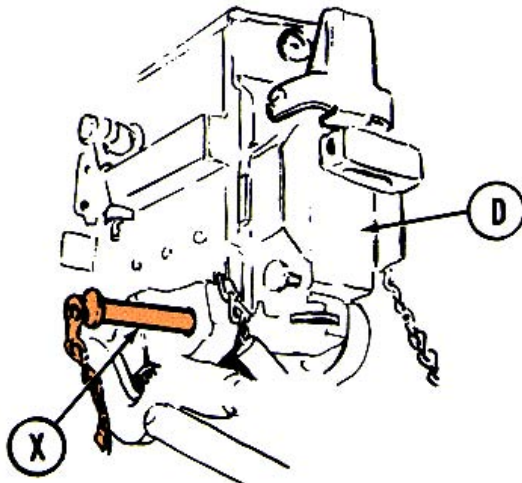
19. Remove commander's periscope daylight body (S) (page 3-212) M36 or (page 3-210.3) M36E1.



20. Compress quick-disconnect clamp (T) to adjusting link (U).
21. Disconnect adjusting link (U) from periscope elevation adjustment arm (V).

**PERFORM POST-OPERATING PROCEDURES (REMOVE WEAPONS) - Continued**

22. Disconnect solenoid lead connect (W) from machine gun (D).



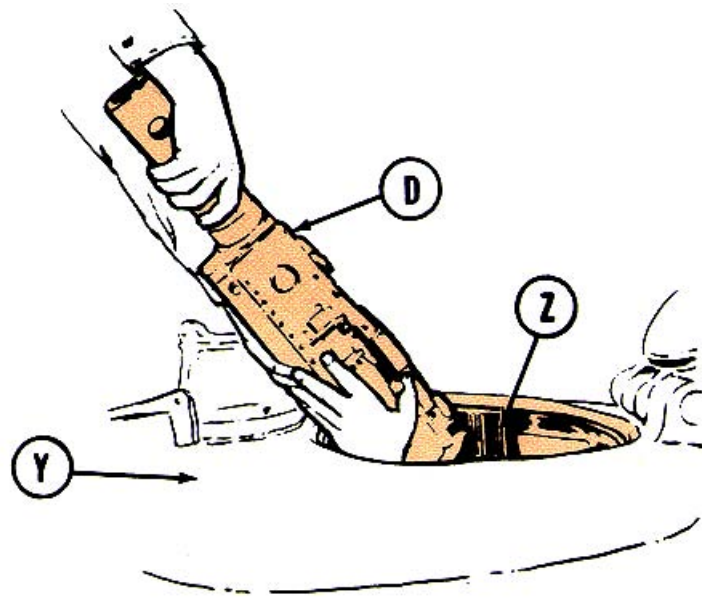
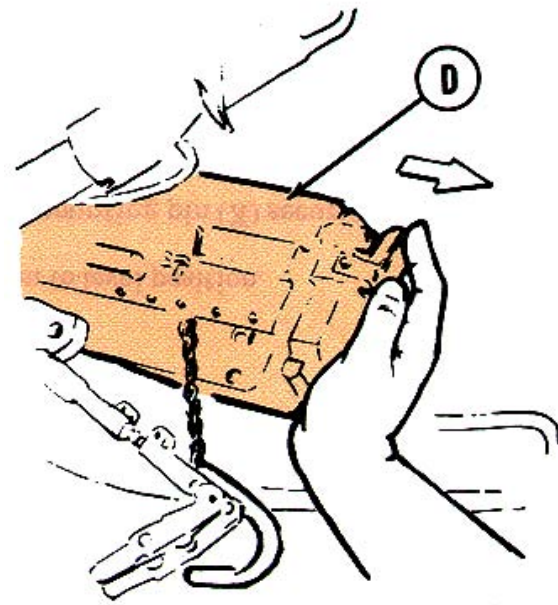
23. Lower gun to level position.

24. Pull rear mounting pin (X) securing machine gun (D), from mount hole.

TA132722

**PERFORM POST-OPERATING PROCEDURES (REMOVE WEAPONS) - Continued**

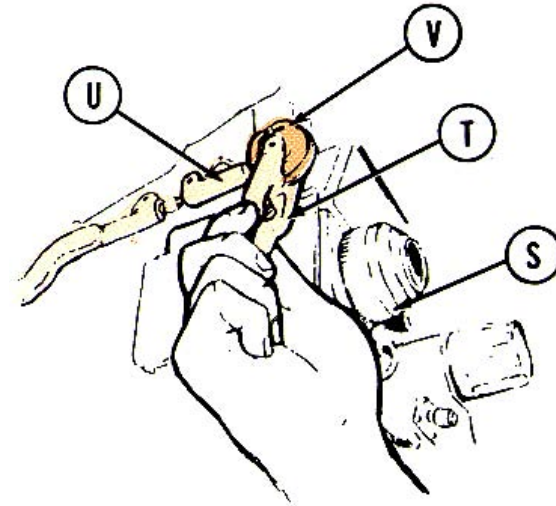
- 25. Support machine gun (D) with right hand and elevate gun to maximum elevation.
- 26. Side machine gun (D) rearward until it is free from mount and cradle.



- 27. Man on inside of cupola (Y) hands machine gun (D) through cupola hatch opening (Z) to man outside cupola.

**PERFORM POST-OPERATING PROCEDURES (REMOVE WEAPONS) - Continued**

28. Install commander's periscope daylight body (S) (page 3-222) M36 or (page 3-220.4) M36E1.
29. Compress quick-disconnect clamp (T).
30. Connect adjusting link (U) to periscope elevation adjustment arm (V).
31. Depress gun cradle to level position (page 2-470).



TA252852

**PERFORM POST-OPERATING PROCEDURES (REMOVE WEAPONS) - Continued**

**To Remove M240 7.62-MM Machine Gun:**

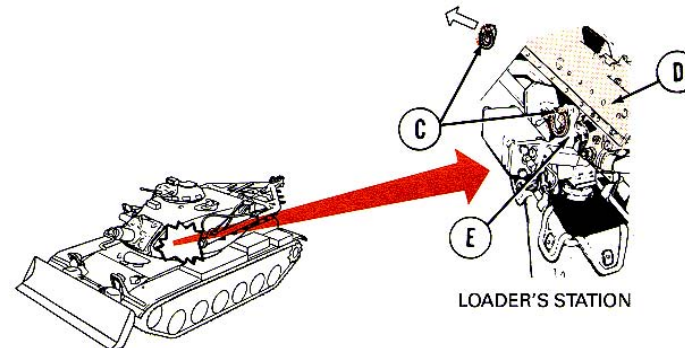
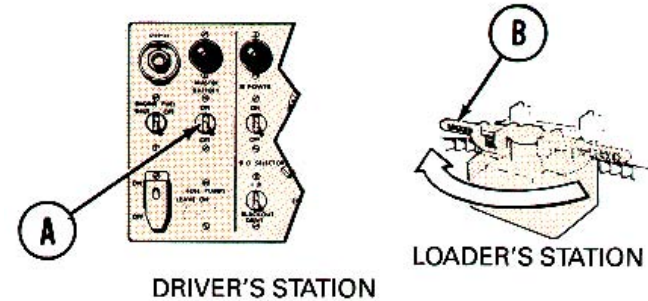
**Make Sure:**

- MASTER BATTERY switch (A) is set to OFF.
- Turret traverse lock (B) is set to LOCKED (page 2-568).

**WARNING**

**Check visually to make sure gun is cleared of ammunition (page 2-559)**

1. Pull pins (C) out until they stop.
2. Slide machine gun (D) from machine gun mount (E).  
Lift up and rotate gun clockwise to remove.

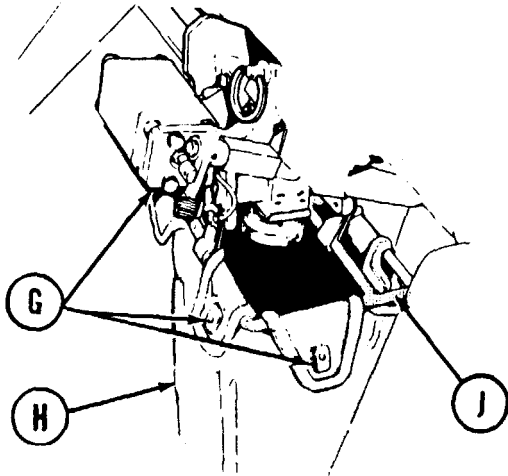
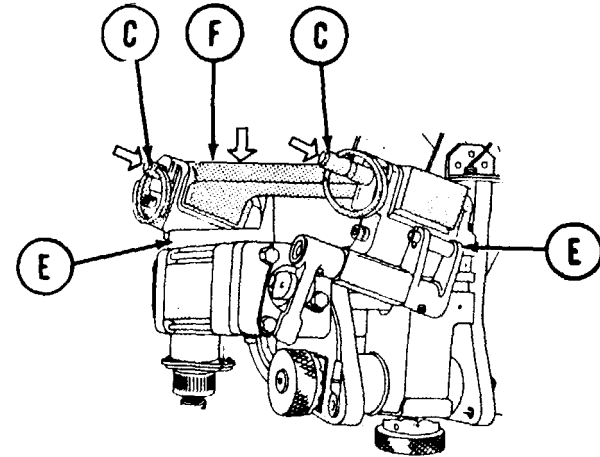


TA132725



**PERFORM POST-OPERATING PROCEDURES (REMOVE WEAPONS) - Continued**

3. Place travel lock (F) on machine gun mount (E).
4. Aline holes on travel lock (F) with holes on machine gun mount (E).
5. Push in pins (C) until they snap into place to secure travel lock (F).



6. Unsnap snap fasteners (G) securing cartridge bag (H).
7. Remove cartridge bag (H) from shield support (J).

All data on pages 2-588 thru 2-590 deleted.

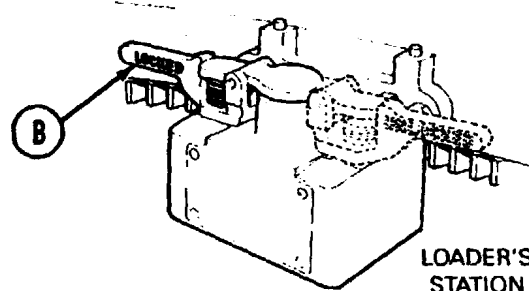
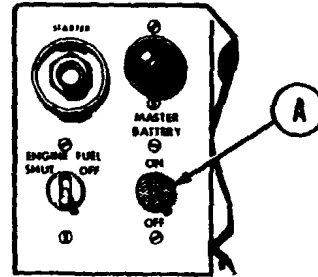
Change 8 2-587/(2-588 blank)

**PERFORM POST-OPERATING PROCEDURES (REMOVE CARTRIDGE BAG)**

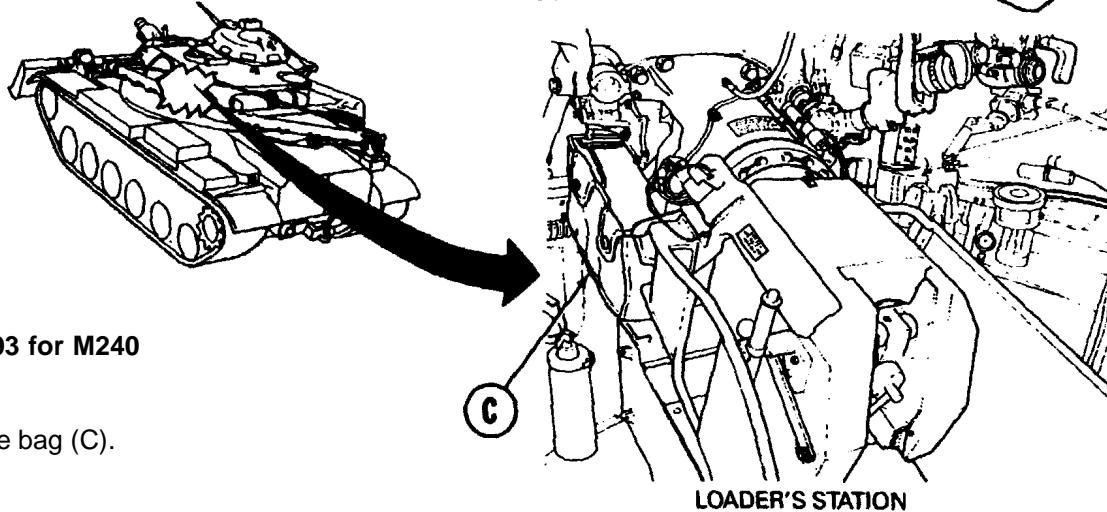
**Make Sure:**

- MASTER BATTERY switch (A) is set to OFF.
- Turret traverse lock (B) is set to LOCKED (page 2-568).
- Machine gun is not installed M240 (page 2-586).

**DRIVER'S STATION**



**LOADER'S STATION**



**LOADER'S STATION**

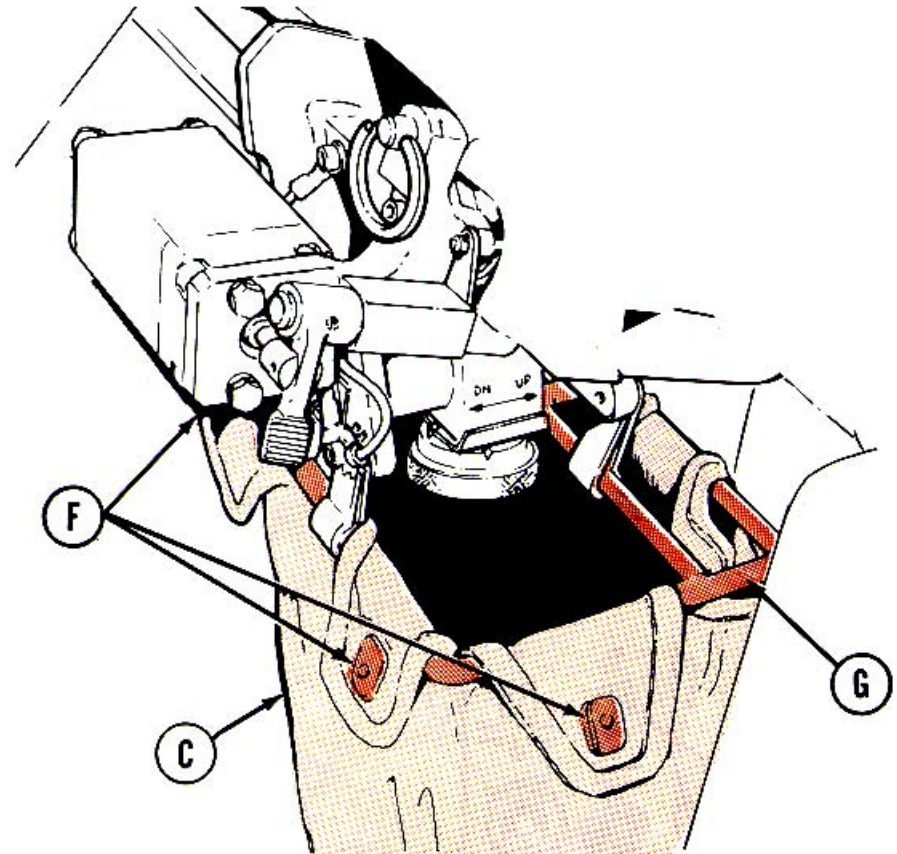
**NOTE**

See for page 2-593 for M240 cartridge bag.

1. Locate cartridge bag (C).

**PERFORM POST-OPERATING PROCEDURES (REMOVE CARTRIDGE BAG) - Continued****To Remove M240 Machine Gun Cartridge Bag:**

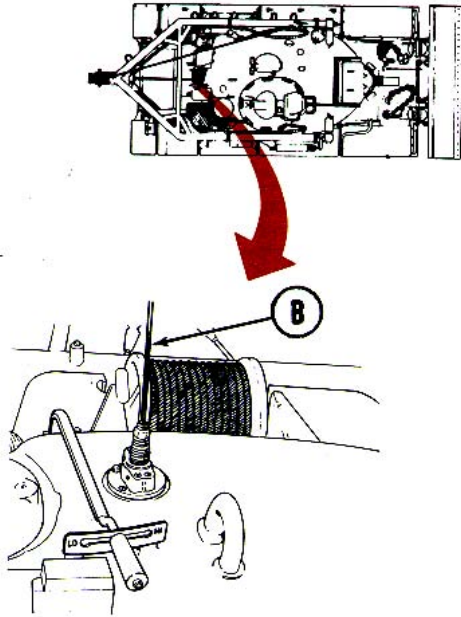
1. Unsnap snap fasteners (F).
2. Remove cartridge bag (C) from bag support (G).



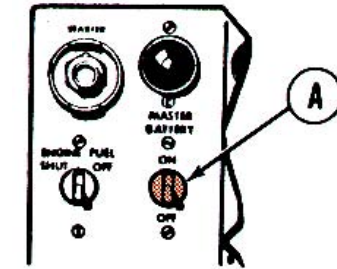
**PERFORM POST-OPERATING PROCEDURES (REMOVE ANTENNA)**

**Make sure**

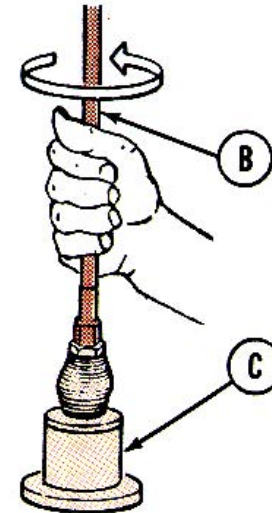
- MASTER BATTERY switch (A) is set to OFF.



1. Locate antenna (B).
2. Remove antenna tie down (nylon cord) from antenna (B).
3. Turn antenna (B) counterclockwise to unscrew.
4. Remove antenna (B) from base support (C).



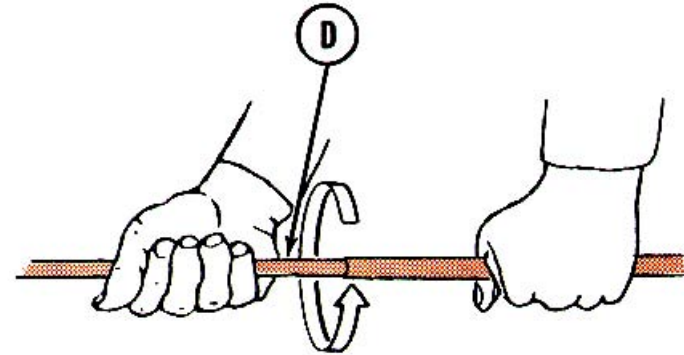
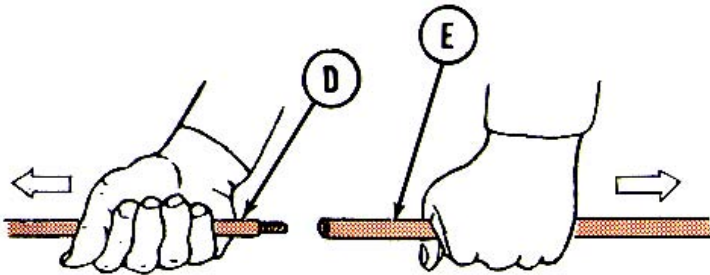
DRIVER'S STATION



TA132733

**PERFORM POST-OPERATING PROCEDURES (REMOVE ANTENNA) - Continued**

5. Turn antenna top section (D) in direction shown.



6. Separate antenna top section (D) from base section (E).

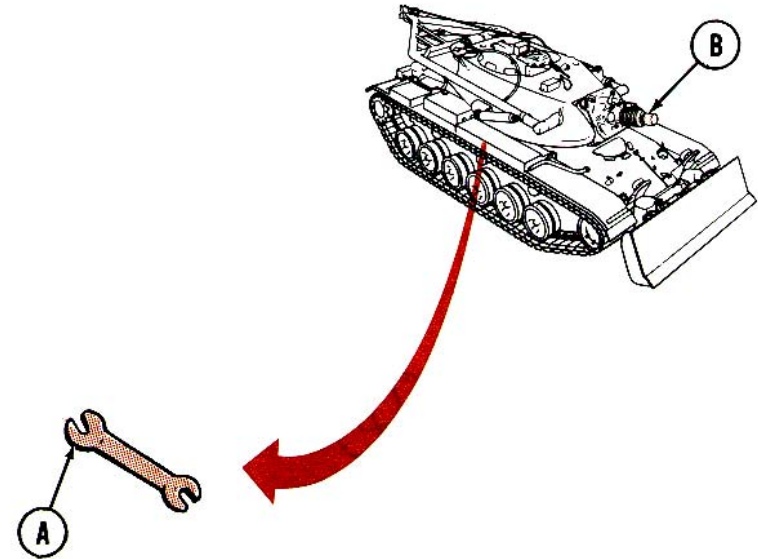
7. Return equipment to stowage

**PERFORM POST-OPERATING PROCEDURES (STOW SIGHTS)****To Remove Driver's M24 IR Periscope:****Tools:**

Get 1/2 inch open end wrench (A) from right front fender box.

**Make Sure:**

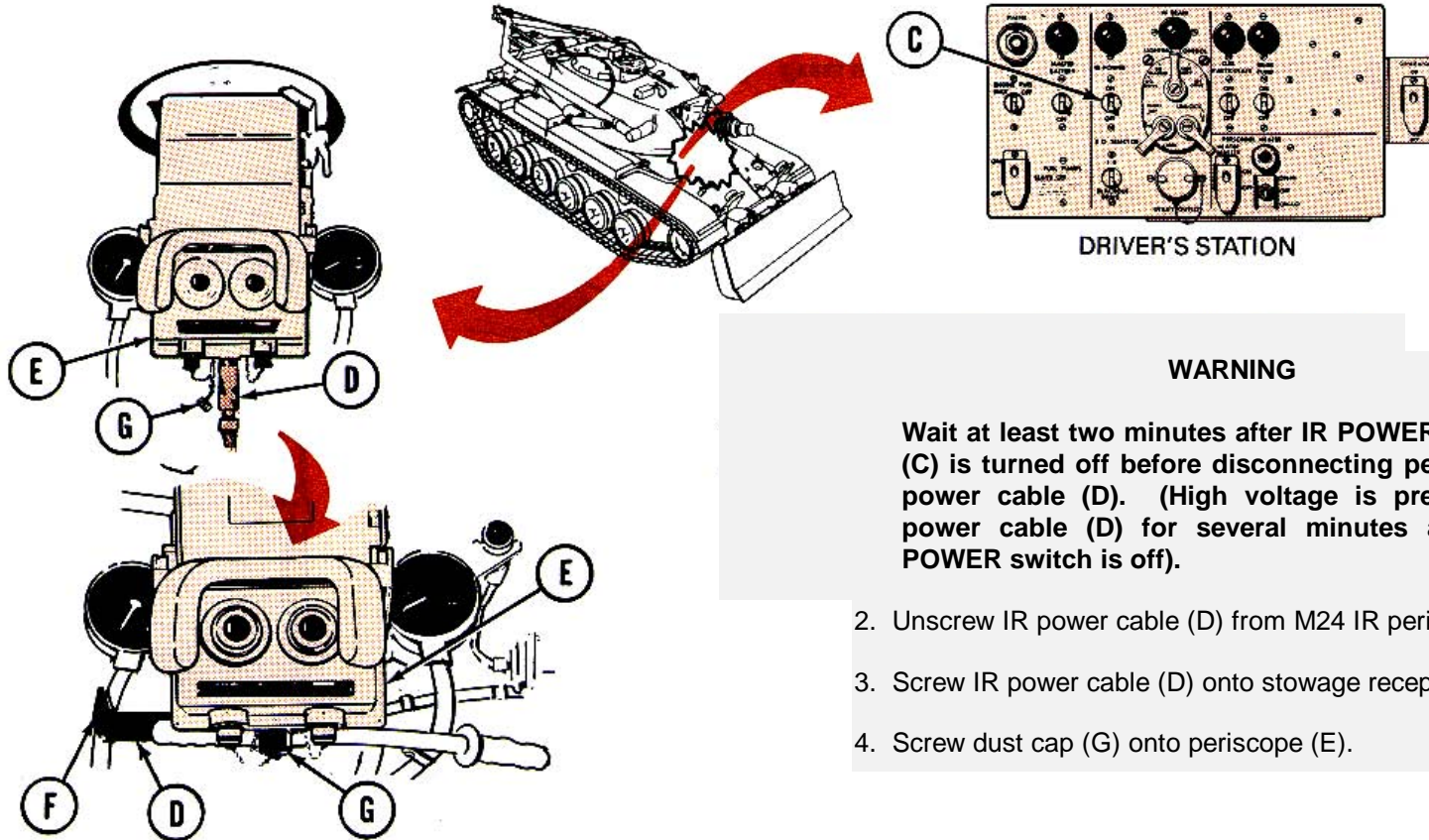
- Vehicle is stopped.
- Main gun (B) is pointed to front.
- Turret lock is locked (page 2-568).



TA132735

**PERFORM POST-OPERATING PROCEDURES (STOW SIGHTS) - Continued**

1. Set IR POWER switch (C) to OFF.



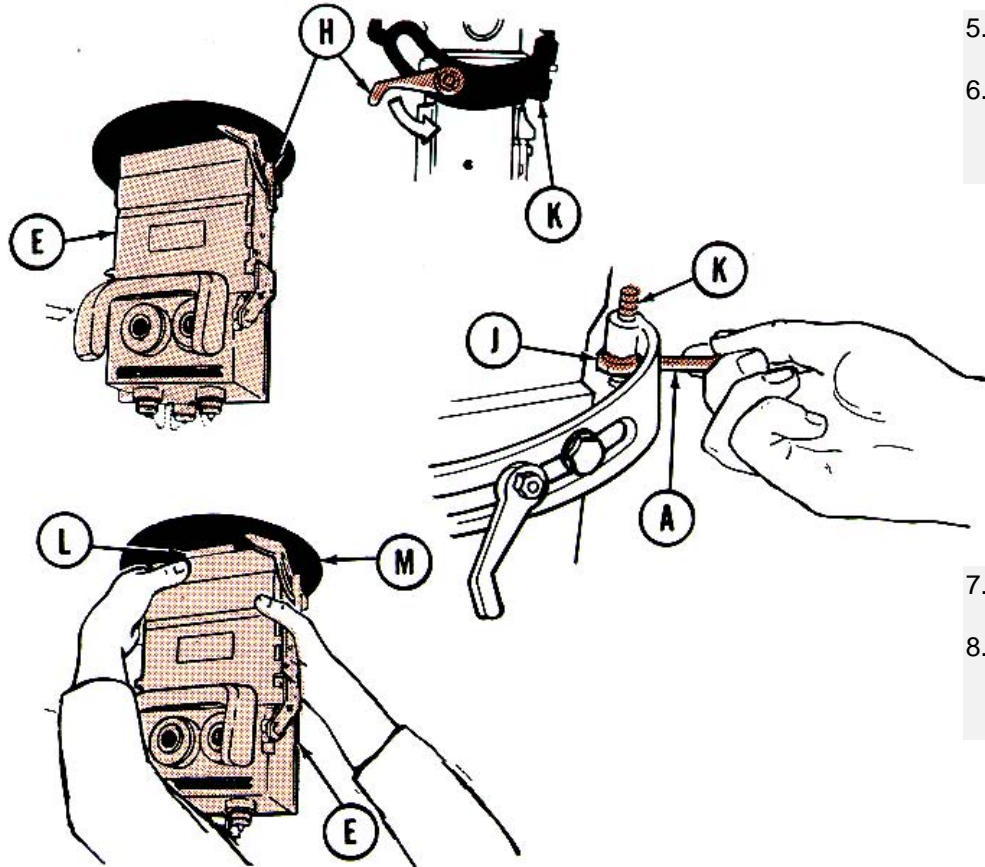
DRIVER'S STATION

**WARNING**

Wait at least two minutes after IR POWER switch (C) is turned off before disconnecting periscope power cable (D). (High voltage is present at power cable (D) for several minutes after IR POWER switch is off).

2. Unscrew IR power cable (D) from M24 IR periscope (E).
3. Screw IR power cable (D) onto stowage receptacle (F).
4. Screw dust cap (G) onto periscope (E).

PERFORM POST-OPERATING PROCEDURES (STOW SIGHTS) - Continued



5. Turn elevation lock lever (H) forward to loosen.

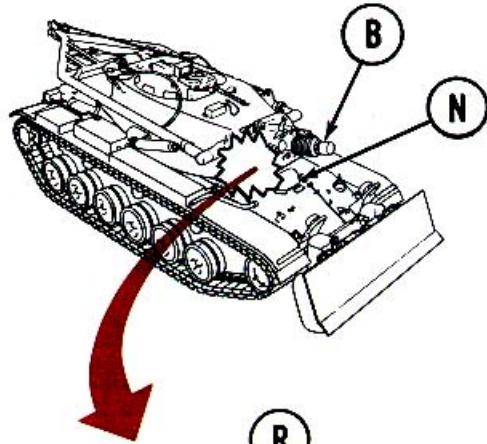
6. Loosen jam nut (J) on thumbscrew (K) behind periscope (E) using wrench (A).

7. Press up on latch (L) or release M24 IR periscope (E).

8. Lower periscope (E) carefully down from periscope mount (M).



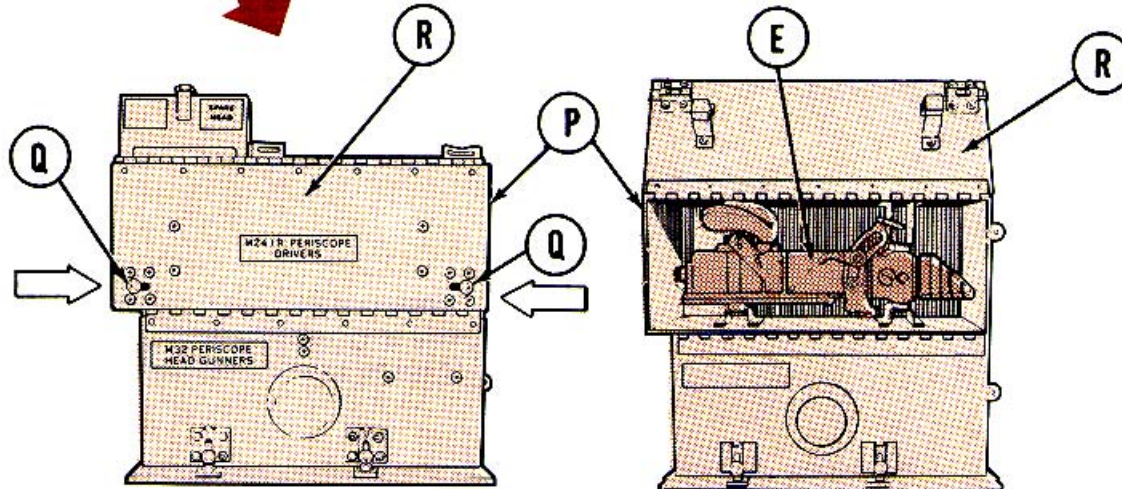
PERFORM POST-OPERATING PROCEDURES (STOW SIGHTS) - Continued



**NOTE**

When main gun (B) is over driver's hatch (N), stowage box (P) is behind driver on turret floor.

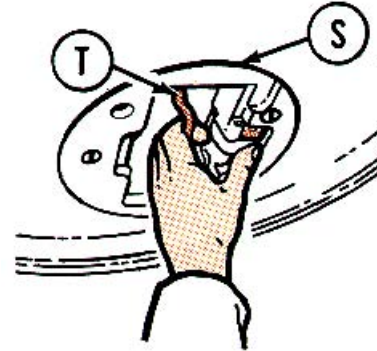
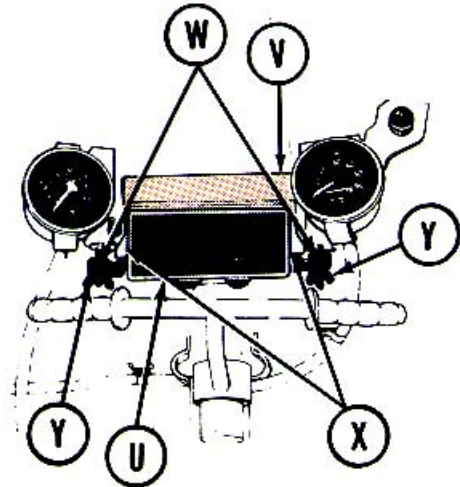
9. Push both latches (Q) on M24 IR periscope stowage box (P).
10. Open stowage box door (R).



11. Stow M24 IR periscope (E) in stowage box (P) as shown.
12. Close door (R). Make sure latches (Q) latch.

**PERFORM POST-OPERATING PROCEDURES (STOW SIGHTS) - Continued**

13. Latch periscope mount lid (S) by pulling down hard on handle (T). It may be necessary to slam lid (S) to lock it closed.



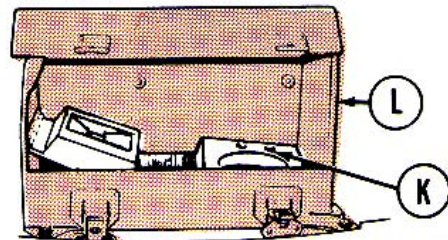
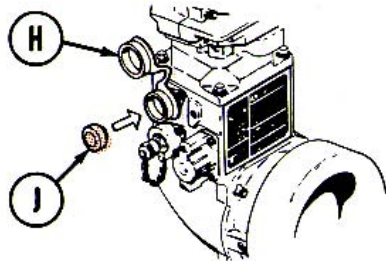
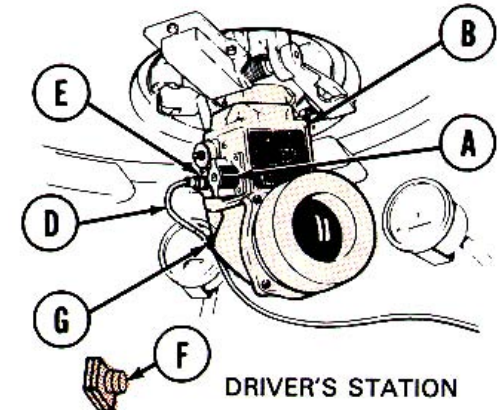
14. Lift M27 periscope (U) up into mount (V).
15. Turn two retainers (W) to align with lugs (X) on periscope (U).
16. Tighten two wing nuts (Y).
17. Return 1/2 inch open end wrench to stowage.

**TA132739**

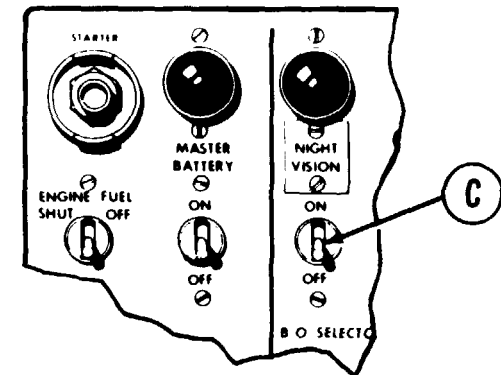
**PERFORM POST-OPERATING PROCEDURES (STOW SIGHTS)**

**To Remove Driver's AN/VVS-2 Night Vision Viewer:**

1. Set OFF-BRIGHT rotary switch (A) to OFF.
2. If vehicle power is connected to viewer (B):
  - a. Set NIGHT VISION switch (C) to OFF.
  - b. Disconnect power cable (D) from viewer power receptacle (E).

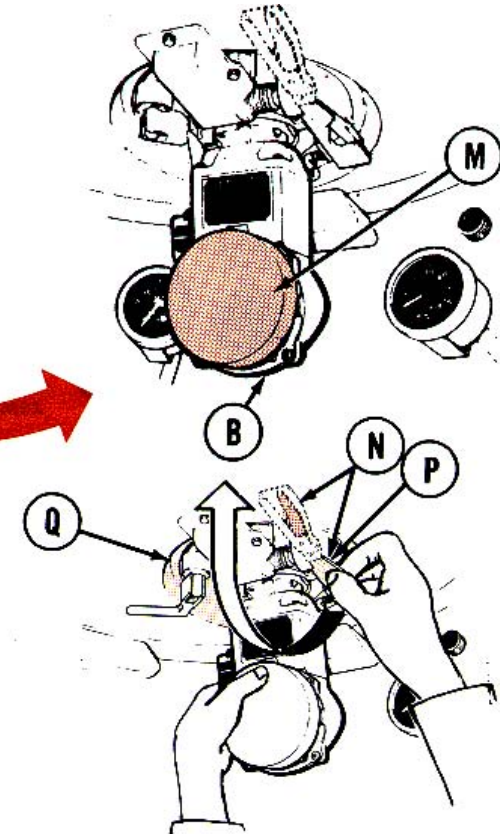
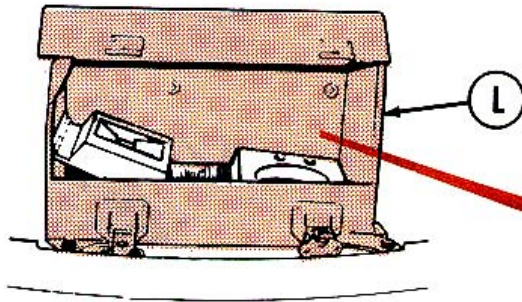


- c. Connect power cable (D) to stowage receptacle (F).
  - d. Connect dust cap (G) to viewer power receptacle (E).
3. If battery power was being used:
    - a. Unscrew battery cap (H).
    - b. Remove battery (J).
    - c. Stow battery (J) in holes (K) in night vision viewer stowage box (L).
    - d. Replace battery cap (H).



**PERFORM POST-OPERATING PROCEDURES (STOW SIGHTS) - Continued**

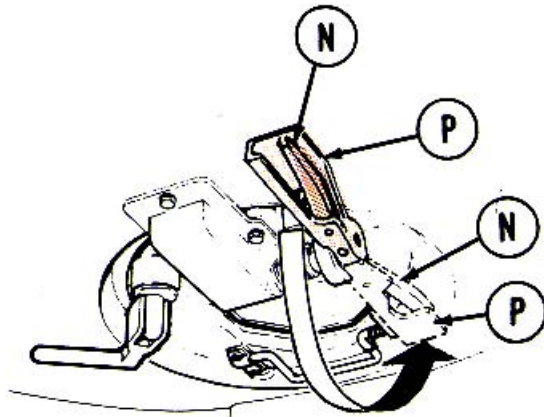
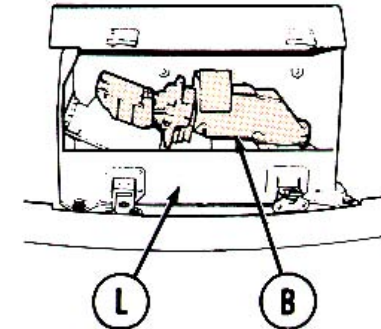
4. Remove eyepiece cover (M) from viewer stowage box (L).  
Put cover (M) over eyepiece of viewer (B).



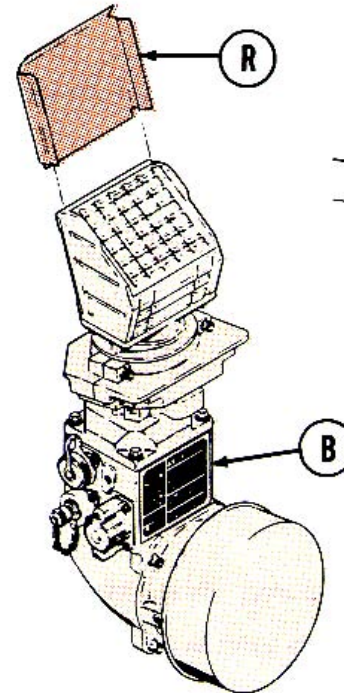
5. Support viewer (B) with left hand.
6. Press lever (N) to unlock handle (P).
7. Turn handle (P) in direction shown to unlock viewer (B).
8. Make sure handle (P) catches in unlock position.
9. Tip bottom of viewer (B) toward front of vehicle.
10. Carefully lower viewer (B) down from hatch mount (Q).

**PERFORM POST-OPERATING PROCEDURES (STOW SIGHTS) - Continued**

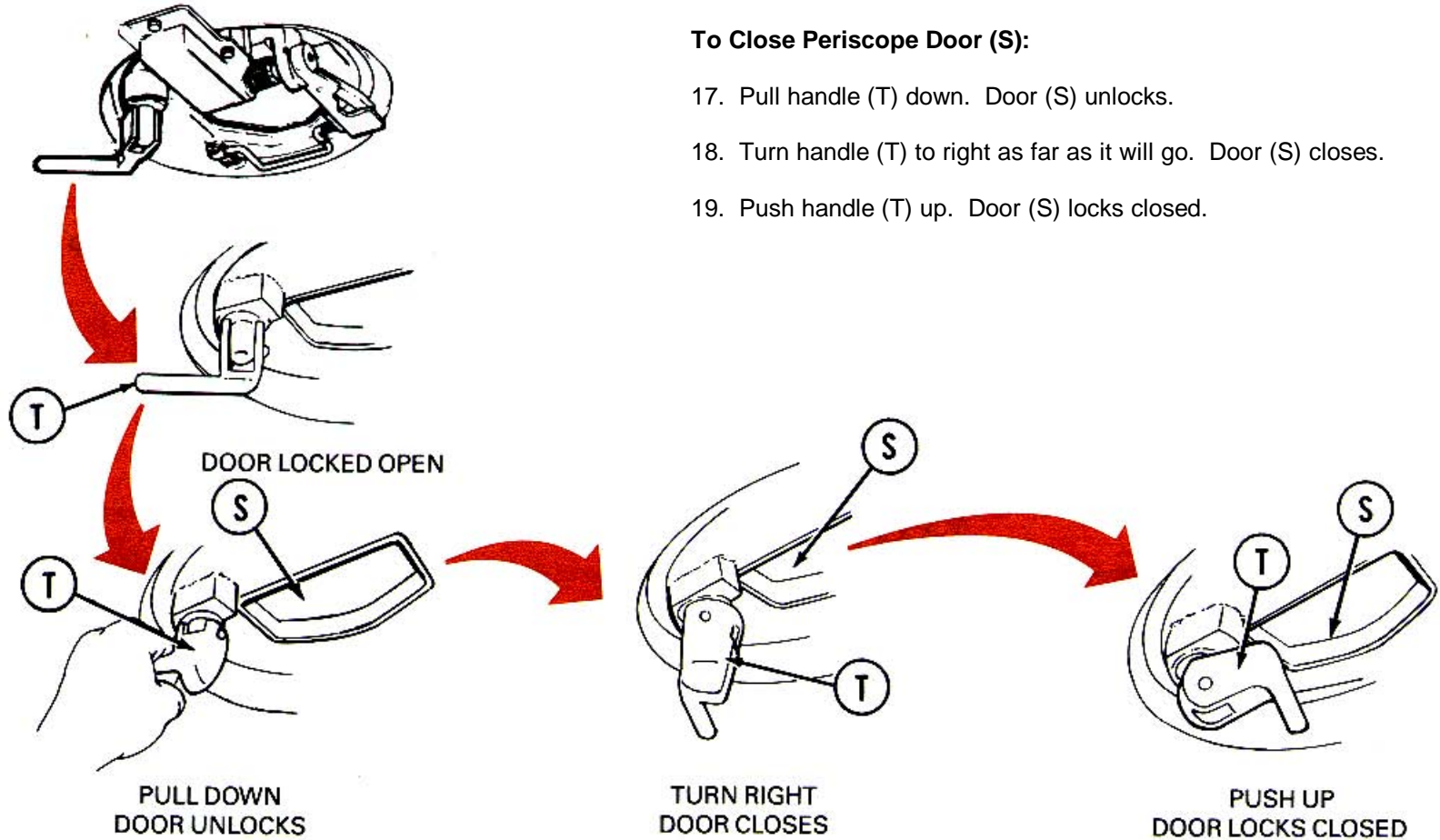
11. Remove lens cover (R) from stowage box (L). Slide cover (R) over viewer (B) as shown.
12. Place viewer (B) into stowage box (L) as shown.
13. Close and latch viewer stowage box (L).



14. Press lever (N) to unlock handle (P).
15. Turn handle (P) in direction shown.
16. Make sure handle (P) catches in lock position.



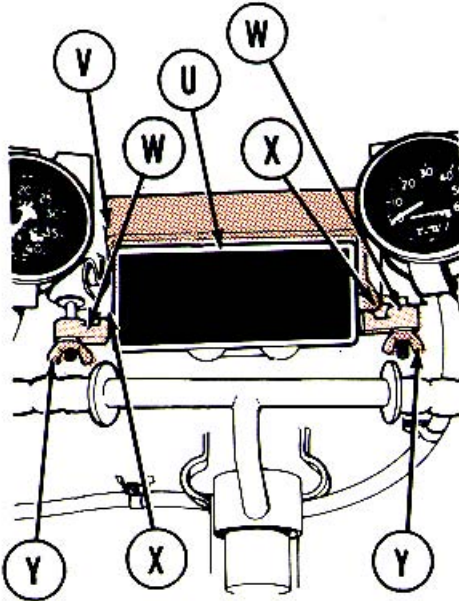
PERFORM POST-OPERATING PROCEDURES (STOW SIGHTS) - Continued



To Close Periscope Door (S):

17. Pull handle (T) down. Door (S) unlocks.
18. Turn handle (T) to right as far as it will go. Door (S) closes.
19. Push handle (T) up. Door (S) locks closed.

## PERFORM POST-OPERATING PROCEDURES (STOW SIGHTS) - Continued

**To Install M27 Periscope:**

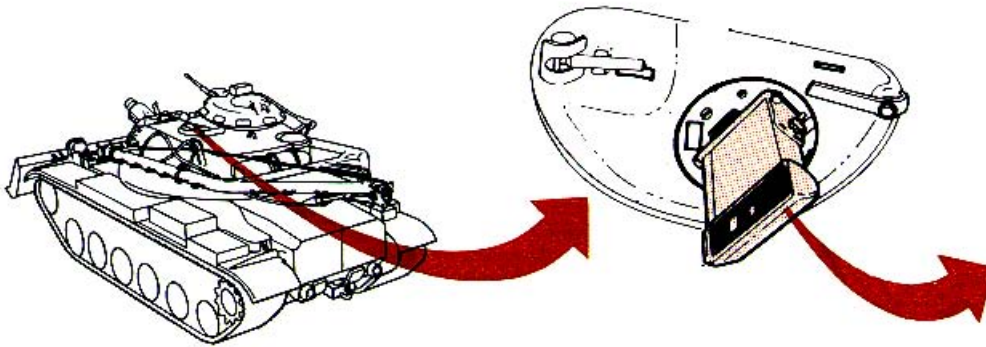
20. Lift M27 periscope (U) up into mount (V).
21. Rotate two retainers (W) and align with lugs (X) on periscope (U).
22. Tighten two wing nuts (Y) to hold periscope.

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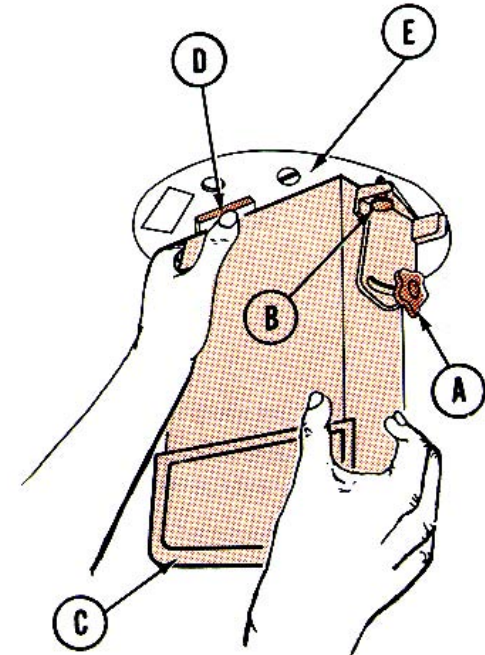
Change 1 2-600.5/(2-600.6 blank)

**PERFORM POST-OPERATING PROCEDURES (STOW SIGHTS) - Continued****To Remove Loader's M37 Periscope:****Make Sure:**

- Vehicle is stopped.

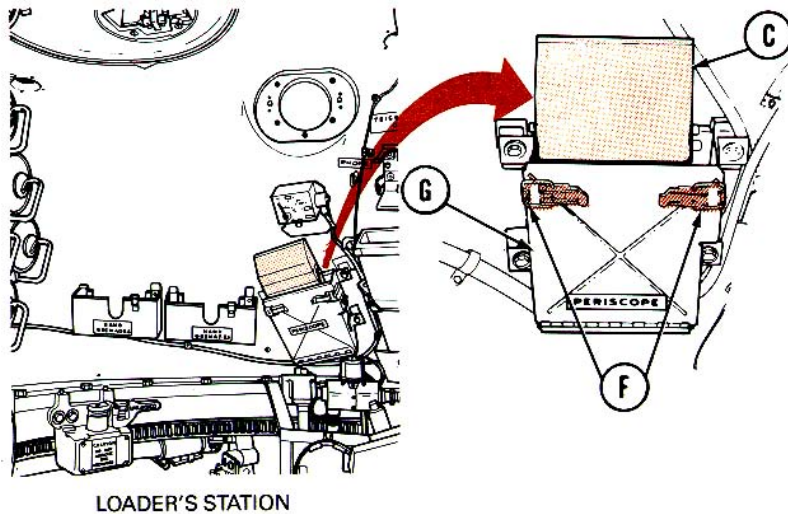


1. Loosen knob (A).
2. Loosen thumbscrew (B).
3. Support M37 periscope (C) with one hand.
4. Press up on latch (D) to release periscope (C).
5. Lower periscope (C) carefully down from mount (E).

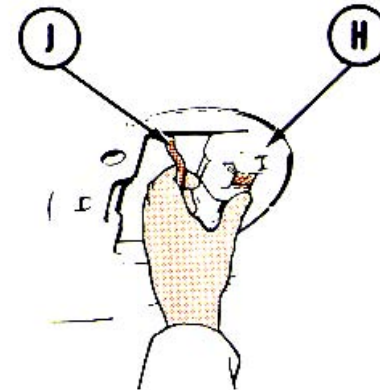




PERFORM POST-OPERATING PROCEDURES (STOW SIGHTS) - Continued



6. Unlatch periscope stowage box latches (F). Open periscope stowage box (G).
7. Put periscope (C) into box (G) and snap retaining strap in place.
8. Close box (G). Lock latches (F).



9. Pull down periscope lid (H).
10. Latch lid (H) by pulling down hard on handle (J). It may be necessary to slam lid (H) to lock it closed.

TA132741

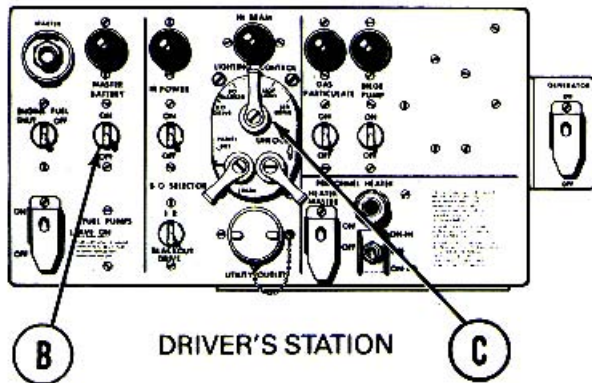
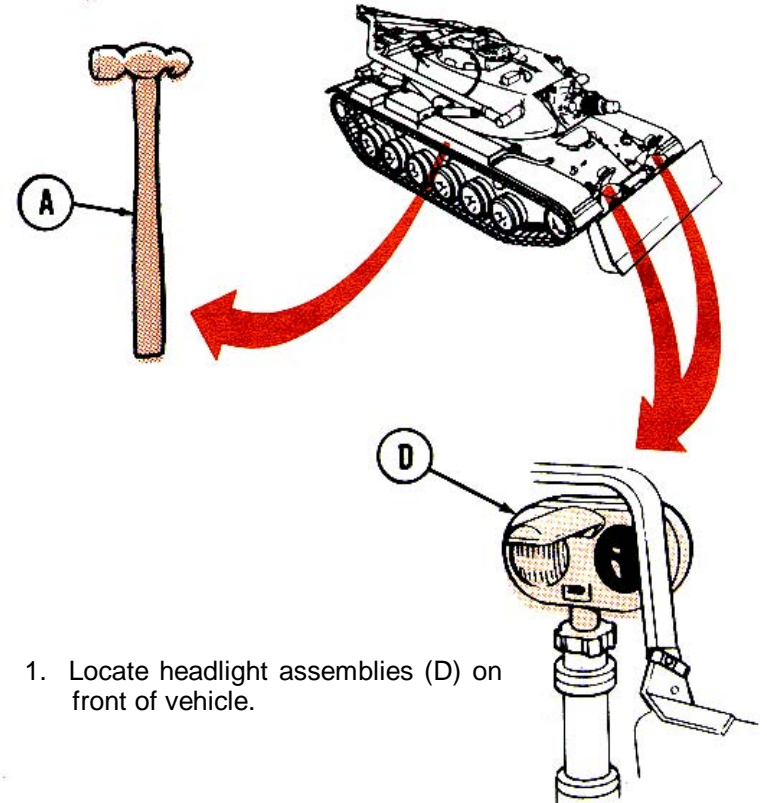
**PERFORM POST-OPERATING PROCEDURES (REMOVE AND STOW HEADLIGHT ASSEMBLIES)**

**Tools:**

Get hammer (A) from right front fender box.

**Make Sure:**

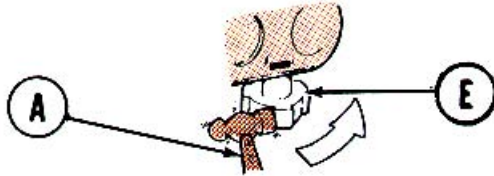
- MASTER BATTERY switch (B) is set to OFF.
- LIGHTING CONTROL lever (C) is set to OFF.
- Brush guards are lowered (page 2-606).



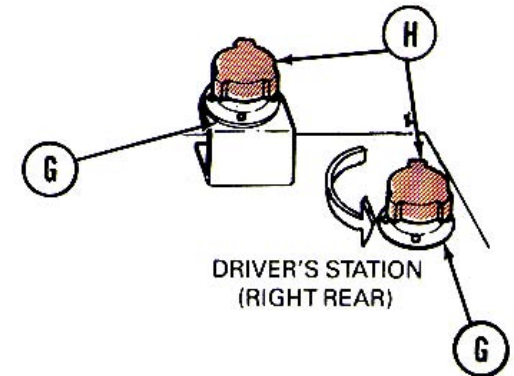
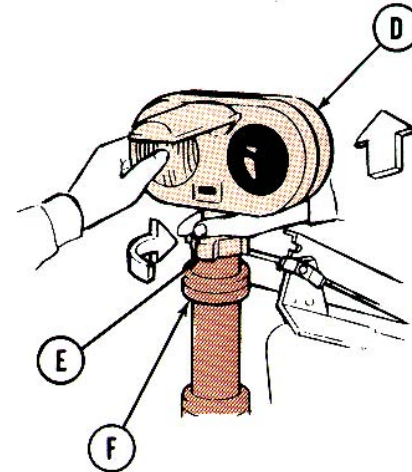
TA132742

**PERFORM POST-OPERATING PROCEDURES (REMOVE AND STOW HEADLIGHT ASSEMBLIES) - Continued**

2. Unscrew retainer nut (E), tapping with hammer (A) if required.

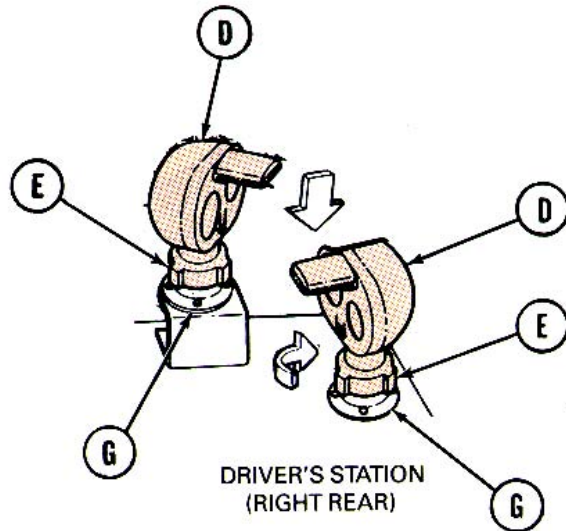


- 3. Lift headlight assembly (D) straight up to remove from outside mount (F).
- 4. Locate both inside stowage mounts (G).



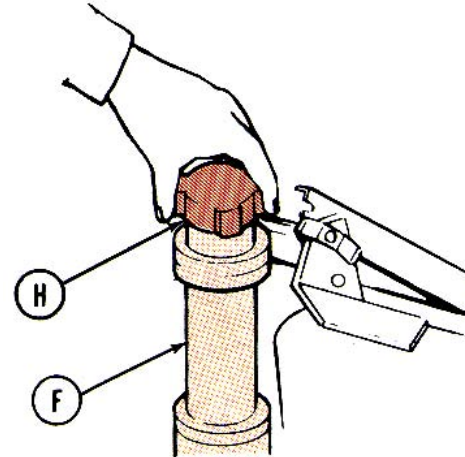
5. Unscrew caps (H) from both mounts (G).

PERFORM POST-OPERATING PROCEDURES (REMOVE AND STOW HEADLIGHT ASSEMBLIES) - Continued



8. Screw caps (H) onto external mounts (F).
9. Return hammer to stowage.

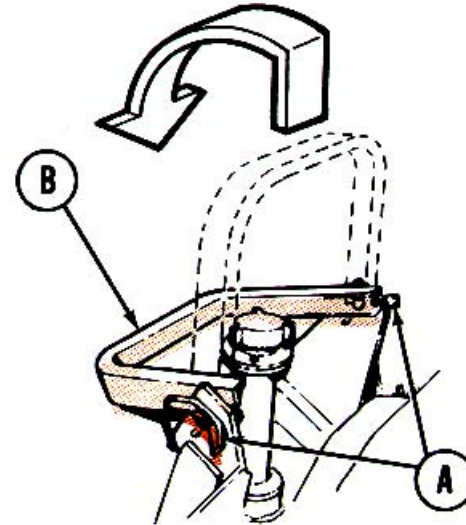
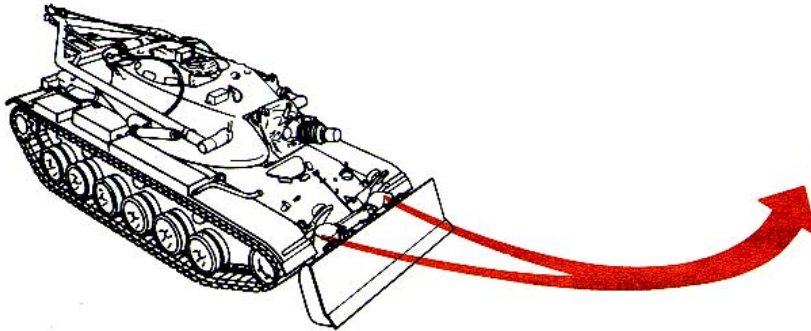
6. Put headlight (D) on each inside stowage mount (G).
7. Screw on retainer (E).



TA132744

**PERFORM POST-OPERATING PROCEDURES (REMOVE AND STOW HEADLIGHT ASSEMBLIES) - Continued****To Lower Headlight Brush Guards:**

1. Loosen two wing nuts (A) on headlight guard (B).
2. Lift up and push headlight guard (B) back until it rests on hull.
3. Tighten two wing nuts (A).
4. Repeat steps 1 thru 3 for other headlight guard.



**PERFORM POST-OPERATING PROCEDURES (SFCURE AND PADLOCK VEHICLE)**

**Make Sure:**

- MASTER BATTERY switch (A) is set to OFF.

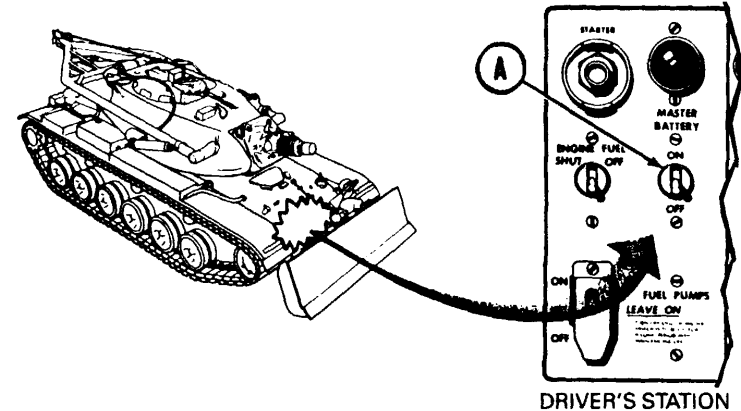
**WARNING**

Use care in stepping from floor to seat.

**CAUTION**

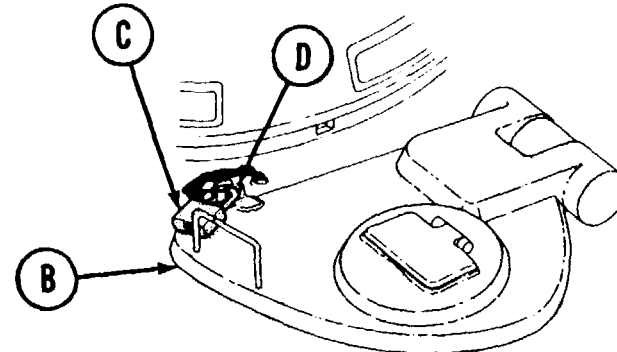
When exiting vehicle, do not step on:

- Supports
- Ammo racks
- Operational controls
- Armament, sighting, or fire controls



**To Exit Through Loader's Hatch:**

1. Make sure commander's hatch and driver's hatch are closed and locked. See (page 2-161) for commander's and (page 2-166) for driver's.
2. Open loader's hatch, if closed (page 2-567).
3. Exit through loader's hatch.
4. Close loader's hatch (B) and hold down.
5. Fit padlock (C) through hatch bracket and vehicle bracket (D) and lock.



TA132746

Section IV. OPERATION UNDER UNUSUAL CONDITIONS

OPERATIONAL INDEX	Page
Operate under unusual conditions	
Change engine air intakes .....	2-659
Conclude towing.....	2-652
Deflate hull-turret seal .....	2-669
Drain brake control housing .....	2-672
Inflate hull-turret seal .....	2-263
Operate bilge pump .....	2-664
Operate crew compartment drain valve .....	2-671
Operate engine compartment drain valve .....	2-670
Operate in dusty or sandy areas .....	2-608.1
Operate in hot, humid, or salty areas .....	2-608.1
Perform deep water fording .....	2-668.1
Perform shallow water fording .....	2-664.2
Prepare two vehicles for towing .....	2-620
Service engine air cleaners .....	2-675
Slave starting .....	2-609
Tow disabled vehicle .....	2-638
Tow start .....	2-641

Change 7 2-608

**OPERATE UNDER UNUSUAL CONDITIONS (OPERATE IN HOT, HUMID, OR SALTY AREAS)**

1. If you operate your tank for long periods at high speeds, on long hard pulls in low or reverse on steep grades, or in soft terrain, you may cause engine to overheat. Avoid using low and reverse for long periods whenever possible. Keep an eye on ENGINE and TRANSMISSION TEMP F indicators. If either indicates in red area, stop vehicle and run engine at 1000 to 1200 rpm until indicator is in green area. Resume operation. If temperature does not return to normal or if overheating recurs, shut down engine and notify organizational maintenance.
2. Frequently check for moisture, corrosion, and fungus growth. Dry all exposed unpainted surfaces and lubricate as prescribed in the LO (lubrication order).
3. Weapons require cleaning and lubricating more often when weapons are not in use. Cover exposed metal surfaces with a film of general purpose lubricating oil as prescribed in the LO and keep covers in place.
4. Shield sighting instruments as much as possible from direct rays of the sun.
5. See TM 9-6140-200-14 for battery care and maintenance.

**OPERATE IN DUSTY OR SANDY AREAS**

**CAUTION**

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

**NOTE**

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



**OPERATE UNDER UNUSUAL CONDITIONS (OPERATE IN DUSTY OR SANDY AREAS) - Continued**

1. Operation in dusty and sandy areas shortens service life of an air cleaner. Service inspection parts, air cleaner filter element, and air cleaner box assembly, more frequently, when operating in these types of areas. When at halt for extended periods, cover entire tank with canvas. Where entire tank cannot be covered, protect periscopes and other optical surfaces against etching by wind blown sand. Protect engine compartment against entry of sand or dust.
2. Inspect tracks/sprockets often for signs of track guide and sprocket tooth wear.
3. Avoid sharp high speed turns in loose or fine sand.
4. Track tension is particularly important in loose or fine sand.

**NOTE**

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

**Change 9 2-608.2**

**OPERATE UNDER UNUSUAL CONDITIONS (SLAVE STARTING)**

**Prepare to Slave Start:**

1. Get two two-battery vehicles (armored personnel carriers or large trucks) to start the dead vehicle.

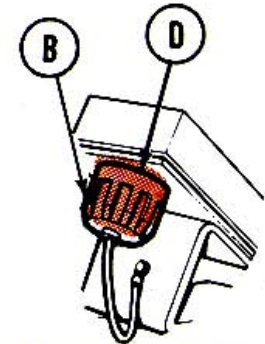
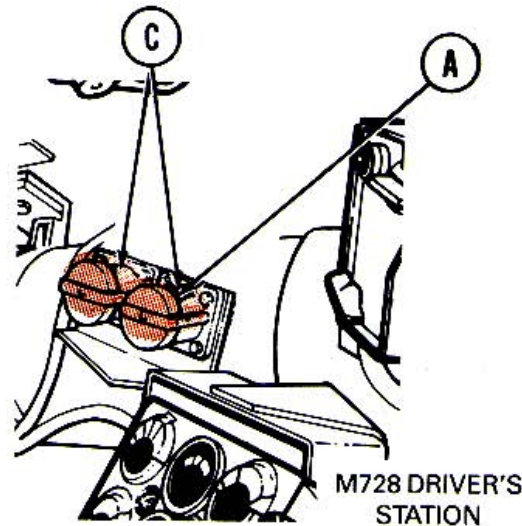
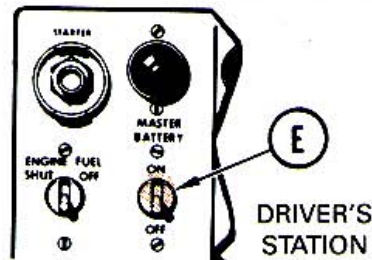
**NOTE**

You can also start dead vehicle with one vehicle such as another CEV or a tank. The steps are the same, but you only need one live vehicle and one slave cable. If live vehicle is a tank, see tank operator's manual.

2. Get three other vehicle operators to help.

**CAUTION**

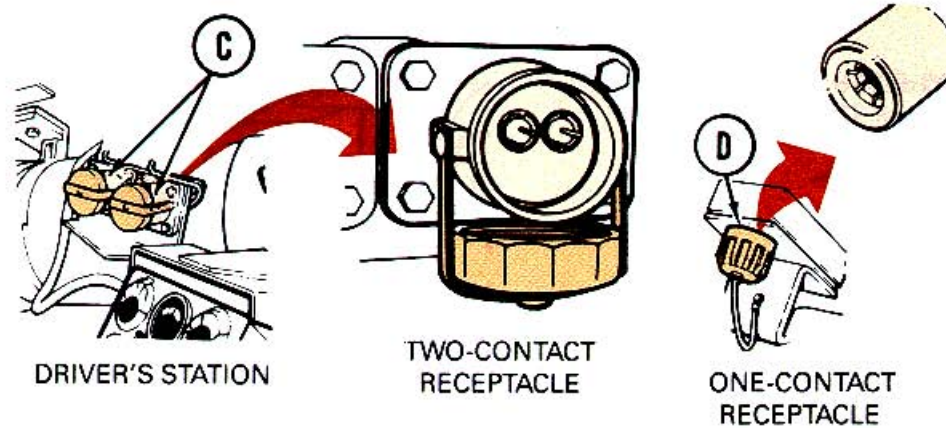
Never remove protective caps (A or B) from slave receptacles (C or D) until MASTER BATTERY switch (E) is set to OFF. You could damage equipment.



OPERATE UNDER UNUSUAL CONDITIONS (SLAVE STARTING) - Continued

**CAUTION**

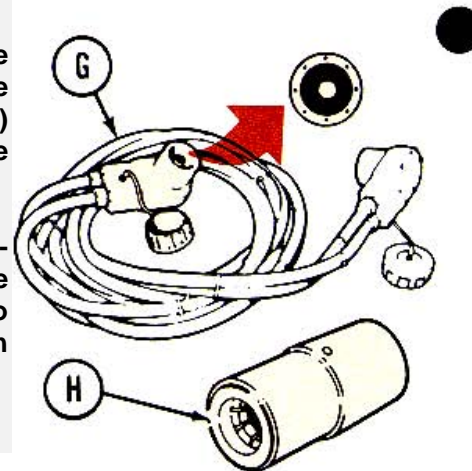
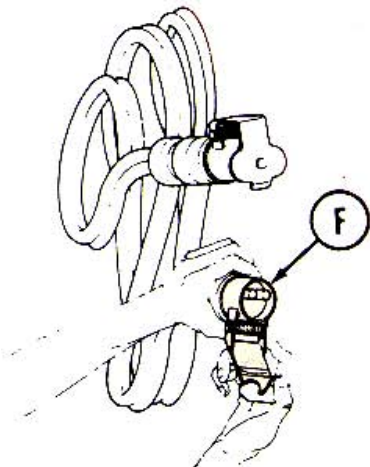
An organizational mechanic must be present during slave starting procedures, to insure proper hook-up and to preclude damage to equipment.



**NOTE**

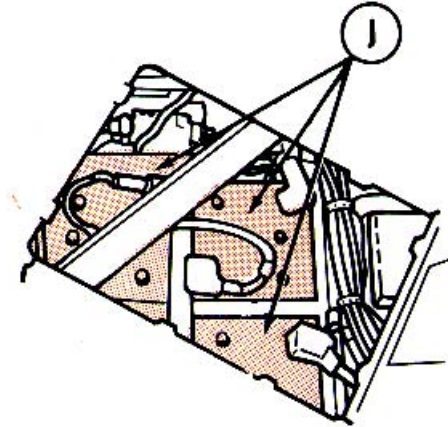
To get the right slave cables, first check the slave receptacles in all vehicles. Some receptacles (C) have two contacts. Others (D) have one contact. There are two kinds of slave cables.

The two-prong cable (F) fits only the two-contact receptacle. The one-prong NATO cable (G) fits the one-contact receptacle. It can also fit the two-contact receptacle if you use an adapter (H).



**OPERATE UNDER UNUSUAL CONDITIONS (SLAVE STARTING) - Continued**

3. Get two cables and adapters, if you need them, from organizational maintenance.



**TA132750**

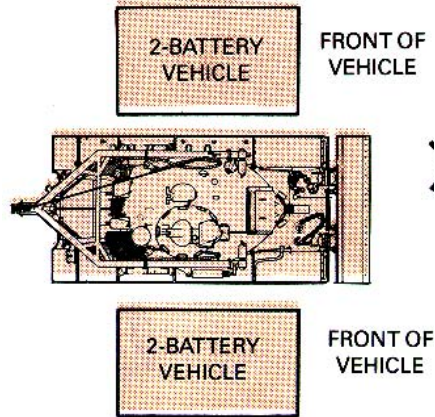
4. Dead vehicle:

- a. Service batteries (J) (page 3-107).
- b. Check and correct electrolyte level (page 3-109).

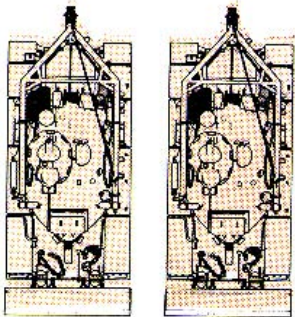
5. Station one man in driver's station in each vehicle. Give directions from the ground.

**OPERATE UNDER UNUSUAL CONDITIONS (SLAVE STARTING) - Continued**

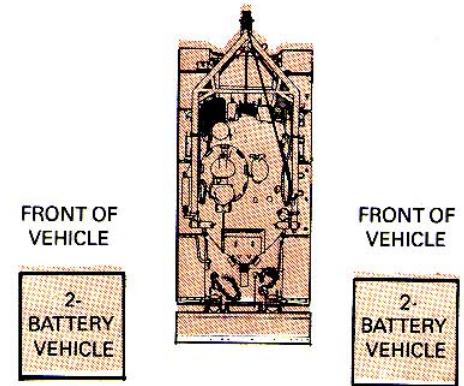
6. Live vehicles: Start engine (see operator's manual for other vehicles).



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



- 7. Live vehicles: Park close beside dead vehicle. If not possible, park as close as you can, making sure that no vehicle is facing another.
- 8. All vehicles: Set parking brake. (For CEV, see page 2-213. See operator's manual for other vehicles.)



**OPERATE UNDER UNUSUAL CONDITIONS (SLAVE STARTING) - Continued**

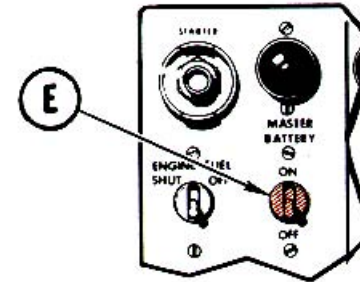
**To Hook Up Vehicles:**

**CAUTION**

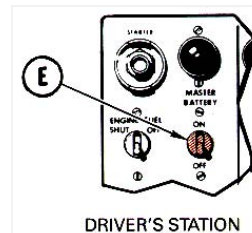
To prevent damage to electrical system of your vehicle, see slave starting instructions in operator's manual of other vehicle,

**Make Sure:**

- All vehicles:
  - a. Parking brakes are set (page 2-213).
  - b. Driver's hatch is locked open.
- Dead vehicle:
  - a. MASTER BATTERY switch (E) is OFF.
  - b. All electrical equipment is off (page 2-539).



DRIVER'S STATION



1. Live vehicles: Set MASTER BATTERY switch (E) (on track vehicles) or MASTER switch (on wheeled vehicles) to OFF. Keep engine running.

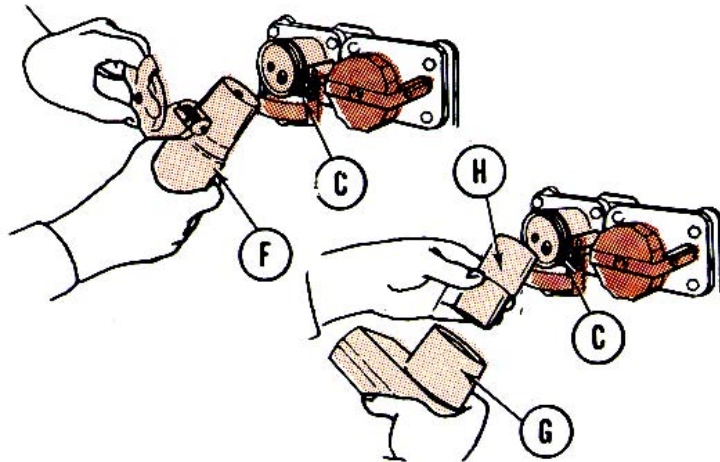
TA132752

**OPERATE UNDER UNUSUAL CONDITIONS (SLAVE STARTING) - Continued**

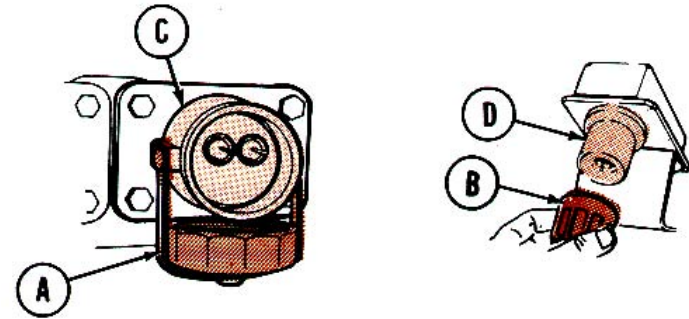
**CAUTION**

Do not remove protective caps (A or B) from slave receptacles (C or D) until MASTER BATTERY switch is set to OFF

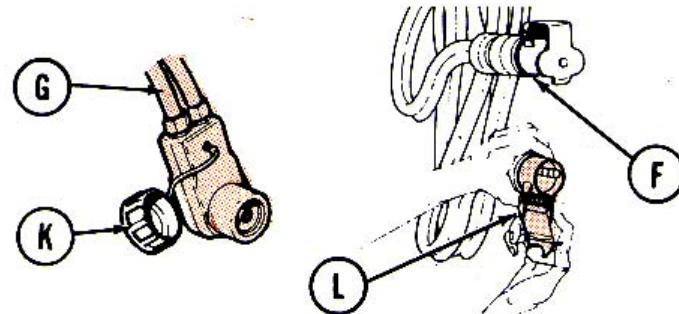
2. All vehicles: Remove protective caps (A or B) from slave receptacles (C or D).



5. All vehicles: Connect slave cables (F or G) to the slave receptacles (C or D). Use adapter (H) if you are connecting cable (G) to receptacle (C).



3. Dead vehicle: Put one end of both cables through driver's hatch.
4. All vehicles: Remove protective caps (K or L) from cables.



TA132753

**OPERATE UNDER UNUSUAL CONDITIONS (SLAVE STARTING) - Continued**

NOTE If you do not have time to charge batteries, go to page 2-616.

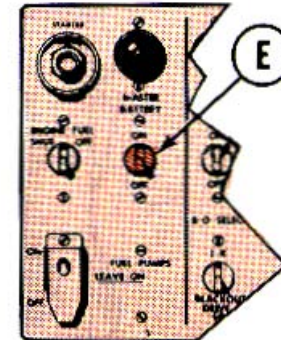
**To Charge Dead Vehicle's Batteries:**

Live vehicles:

1. Set engine to run above idle. (If using a single CEV or tank, set engine to run at 1000 to 1200 rpm. See operator's manual of other vehicles for correct rpm.)
2. Set MASTER BATTERY switch (E) (for track vehicles) or MASTER switch (for wheeled vehicles) to ON.
3. Let engine run for up to 30 minutes if you have time.
4. Return engine speed to normal idle (750 rpm for CEV or tank. See operator's manual of other vehicles for correct rpm.)



TACHOMETER



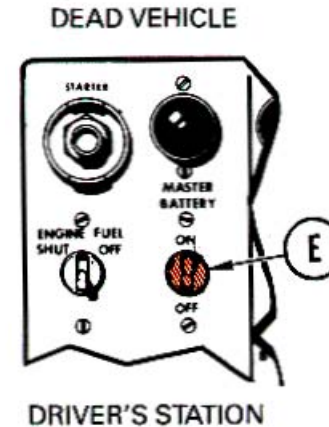
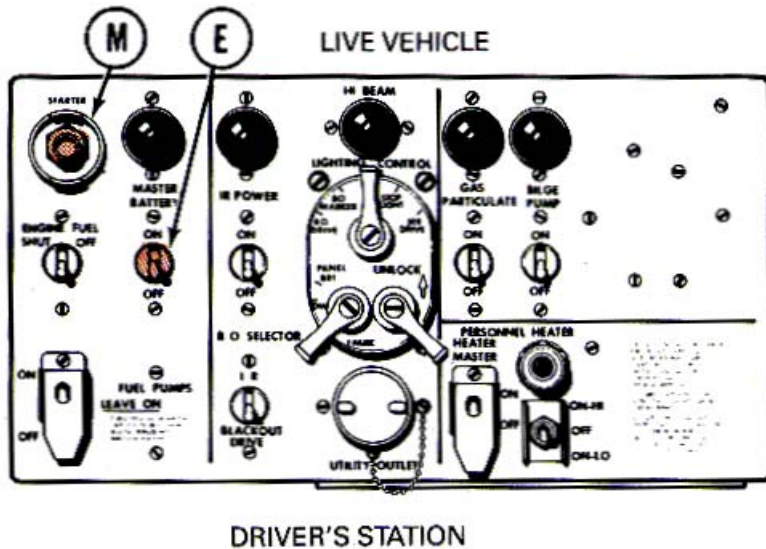
DRIVER'S STATION  
IN A CEV OR TANK



**OPERATE UNDER UNUSUAL CONDITIONS (SLAVE STARTING) - Continued**

**To Start Dead Vehicle:**

1. Live vehicles: Set MASTER BATTERY switch (E) (track vehicles) or MASTER switch (wheeled vehicles) to OFF.



TA132755

2. Dead vehicle: Set MASTER BATTERY switch (E) to ON.

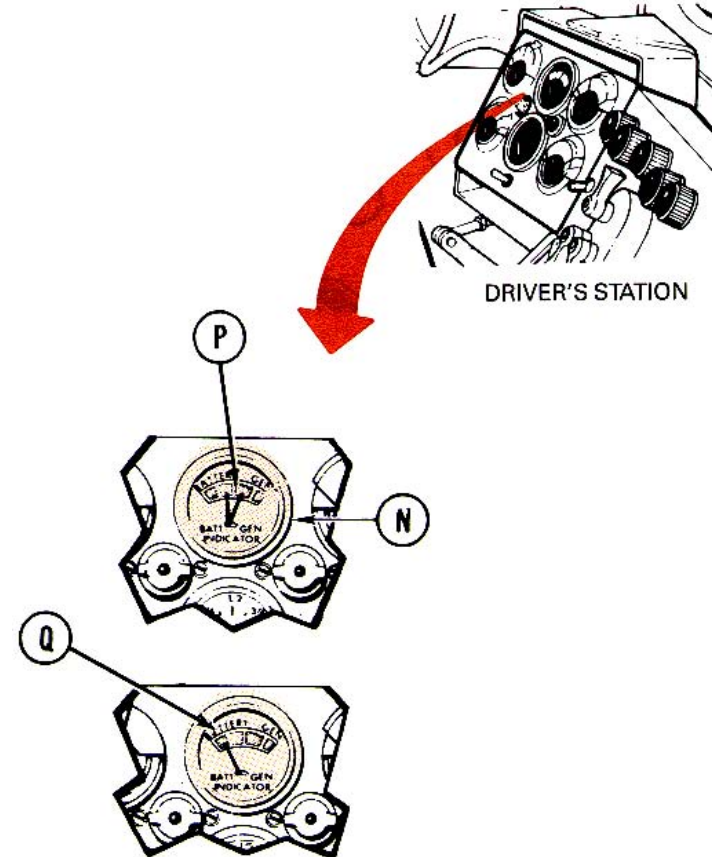
**CAUTION**

**When you try to start dead vehicle, do not hold STARTER switch (M) longer than 15 seconds. Wait 3 to 5 minutes before using starter again.**

3. Try to start engine once (page 2-205).
  - If engine starts, skip next page. Go on to directions for disconnecting cables (page 2-618).

**OPERATE UNDER UNUSUAL CONDITIONS (SLAVE STARTING) - Continued**

- If engine does not start within 15 seconds:  
 Dead vehicle:  
 a. Release STARTER switch.  
 b. Read BATT GEN INDICATOR (N)
- Indicator needle is yellow or green (P): Wait 3 to 5 minutes and go back to step 3 (page 2-616).
- Indicator needle in left red area (Q): Go back to step 1 (page 2-615). If you do not have time to charge batteries, go to step 3 (page 2-616) and try a second time.
- If batteries will not charge or vehicle will not start after two attempts, see page 3-7 to troubleshoot.



TA252861

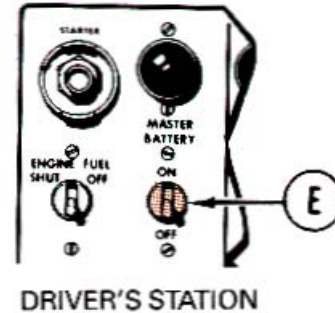
**OPERATE UNDER UNUSUAL CONDITIONS (SLAVE STARTING) - Continued**

**To Disconnect Cables:**

1. All vehicles: When engine is running smoothly, set MASTER BATTERY switch (E) (track vehicles) or MASTER switch (wheeled vehicles) to OFF.

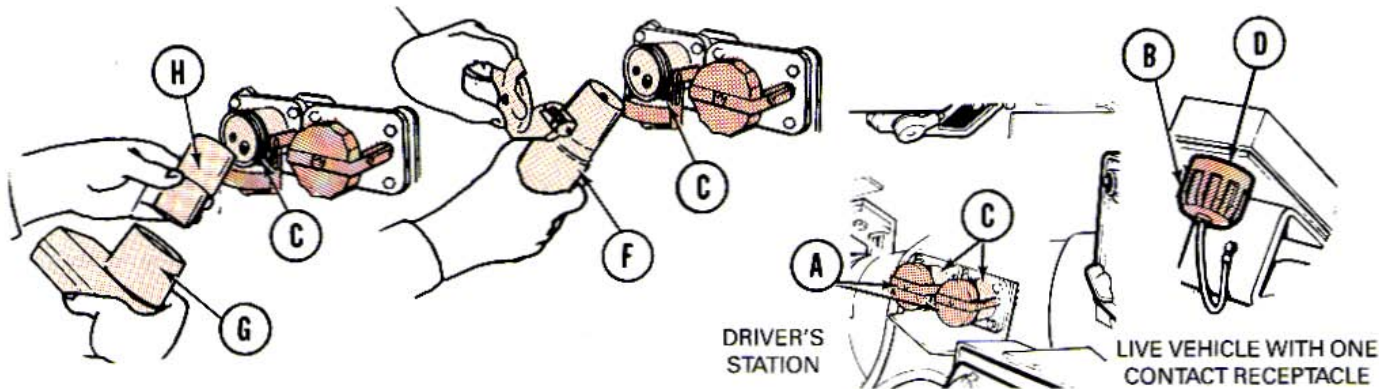
**CAUTION**

**Do not remove slave cables (F or G) from receptacles (C or D) until MASTER BATTERY (E) or MASTER switch is set to OFF.**



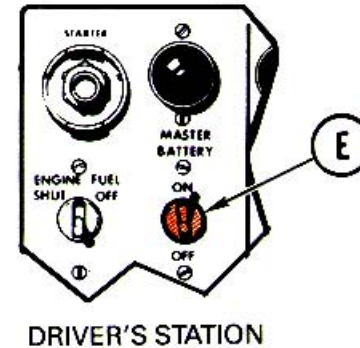
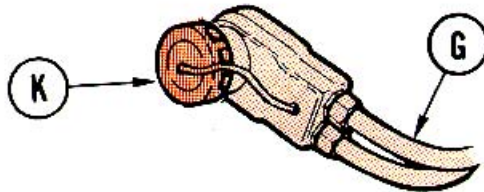
2. All vehicles: Disconnect slave cable (F), or slave cable (G) and adapter (H), from receptacle (C or D).

3. All vehicles: Install protective caps (A or B) on slave receptacles (C or D).



**OPERATE UNDER UNUSUAL CONDITIONS (SLAVE STARTING) - Continued**

4. All vehicles: Install protective caps (K) on slave cable (G).



TA132758

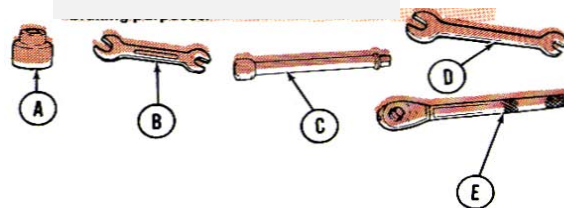
5. All vehicles: Set MASTER BATTERY switch (E) (track vehicles) or MASTER switch (wheeled vehicles) to ON.
6. All vehicles: Set engine to run above idle to charge batteries. (For CEV or tank set at 1000 to 1200 rpm. See operator's manual of other vehicles for correct rpm.) Run vehicles for 30 minutes, if you have time.
7. Return slave cables and adapters, if used, to organizational maintenance.

**OPERATE UNDER UNUSUAL CONDITIONS (PREPARE TWO VEHICLES FOR TOWING)****WARNING**

Driver of towed vehicle is exposed to carbon monoxide fumes. Change drivers often to prevent overexposure. Neither the gas particulate unit nor the M25A1 C-B tank mask will protect against carbon monoxide poisoning. **THE BEST DEFENSE AGAINST CARBON MONOXIDE POISONING IS GOOD VENTILATION.**

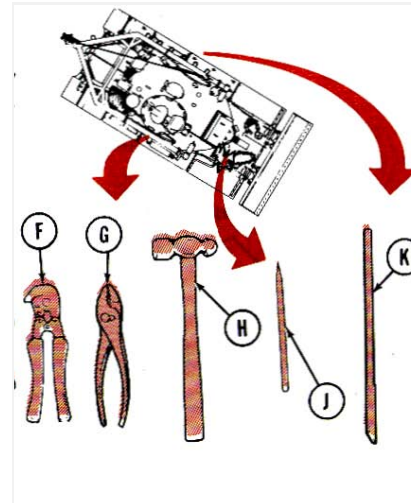
**CAUTION**

If engine or transmission of disabled vehicle is damaged, or if vehicle will be towed more than one mile, disconnect universal joints from final drives. Vehicle will have no brakes with universal joints disconnected. If towing with cables, use a third vehicle for braking purposes.



Get from right front fender box:

- 1-1/8 inch socket (A)
- 7/16 inch open end wrench (B)
- 8 inch extension with 3/4 inch drive (C)
- 3/4 inch open end wrench (D)
- Ratchet with 3/4 inch drive (E)



- Wire cutters (F)
- Slip joint pliers (G)
- Hammer (H)

Get pinch bar (J) from inside turret right wall.

Get crowbar (K) from left front fender box.

TA132759

**OPERATE UNDER UNUSUAL CONDITIONS (PREPARE TWO VEHICLES FOR TOWING) Continued**

**WARNING**

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

Tow tank with tow cables when disabled tank's universal joints are disconnected.

Use another operable tank connected at rear to avoid loss of steering and braking.

To Disconnect Universal Joints:

**WARNING**

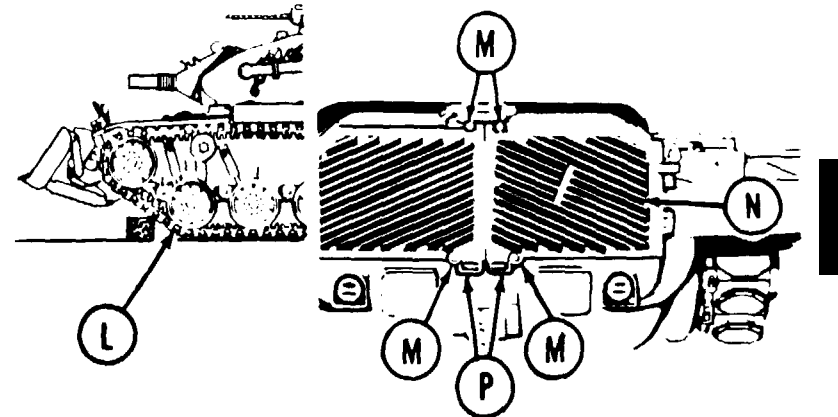
Make sure tracks and roadwheels are blocked with logs, stones, or blocks. If tracks are not properly blocked, vehicle may roll backward or forward and injure personnel.

1. Place logs, blocks, or stones in front and rear of tracks and roadwheels (L).

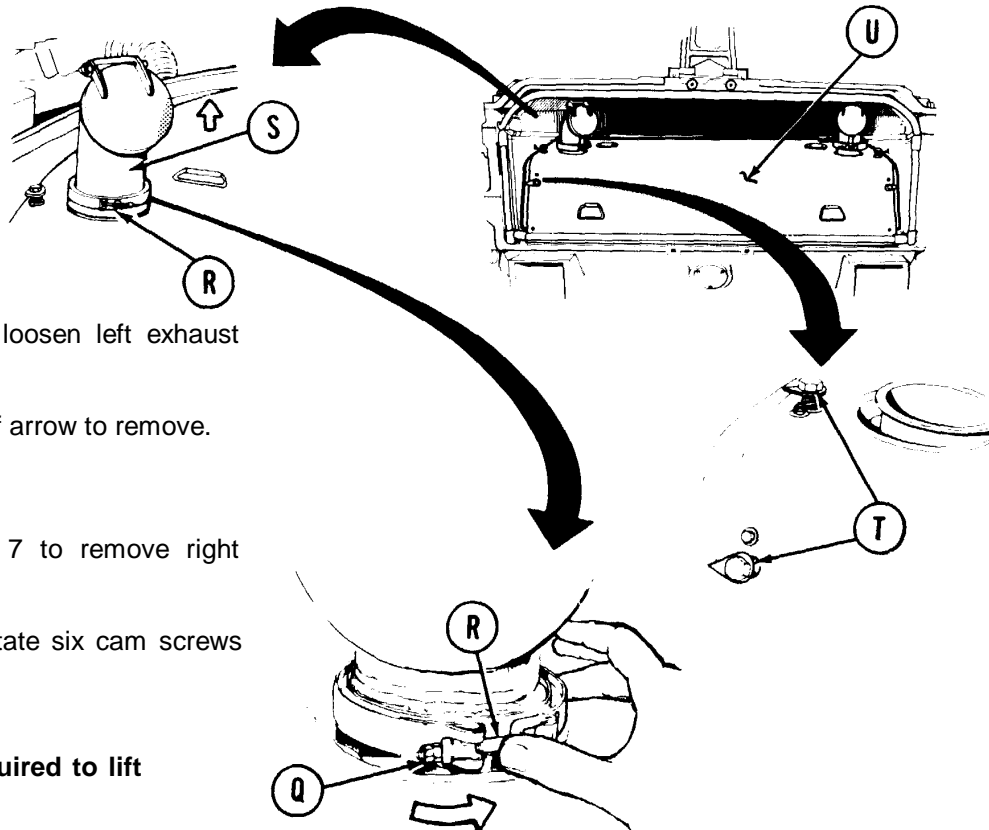
**NOTE**

If roadwheels cannot be blocked, connect tow bar (page 2-626), before disconnecting final drive.

2. Release parking brake (page 2-214).
3. Using 1-1/8 inch socket, extension, and ratchet, remove four bolts (M) from rear grille doors (N).
4. Pull handles (P) and open doors (N).



OPERATE UNDER UNUSUAL CONDITIONS (PREPARE TWO VEHICLES FOR TOWING) Continued



5. Using 7/16 inch wrench, loosen left exhaust elbow clamp nut (Q).
6. Pry clamp (R) in direction of arrow to remove.
7. Lift elbow (S) to remove.
8. Repeat steps 5 through 7 to remove right exhaust elbow.
9. Using 3/4 inch wrench, rotate six cam screws (T) toward center of vehicle.

**NOTE**

Two persons are required to lift shroud (U).

10. Lift and remove shroud (U).

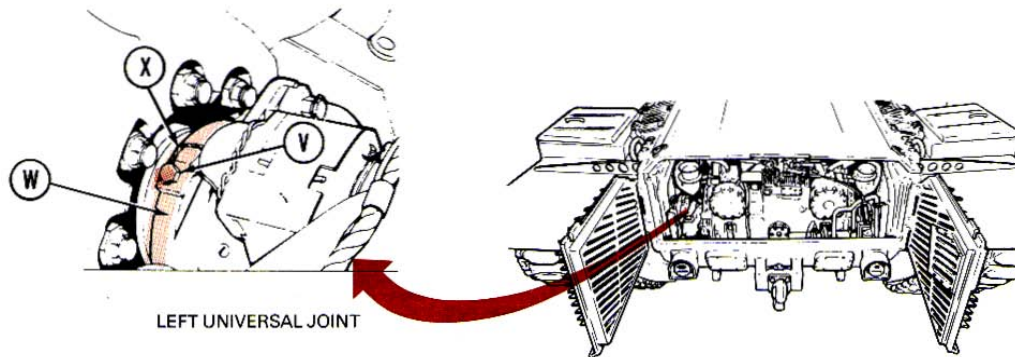
**OPERATE UNDER UNUSUAL CONDITIONS (PREPARE TWO VEHICLES FOR TOWING) Continued**

**WARNING**

If it was necessary to remove blocks, replace blocks on tracks before continuing.

**NOTE**

It may be necessary to move vehicle slightly (page 2-638) for access to screw (V) on ring assembly (W). If movement is necessary, remove blocks from tracks and roadwheels.



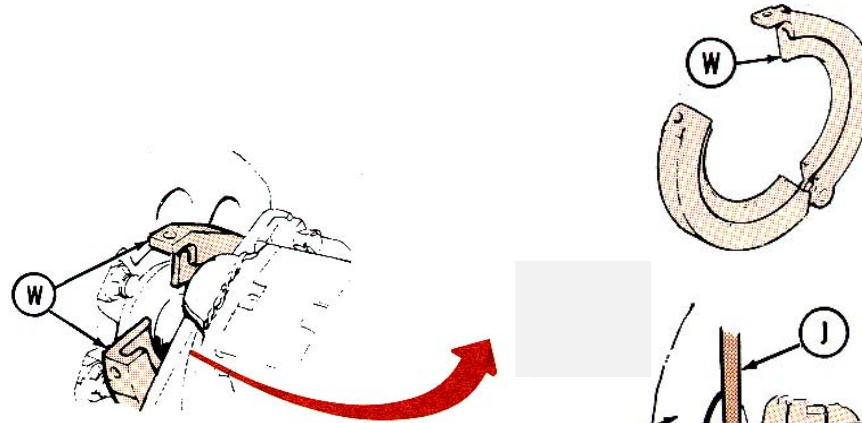
11. Cut lockwire (X) with wire cutters.
12. Remove lockwire (X).
13. Remove screw (V) with 3/4 inch wrench.

TA132762

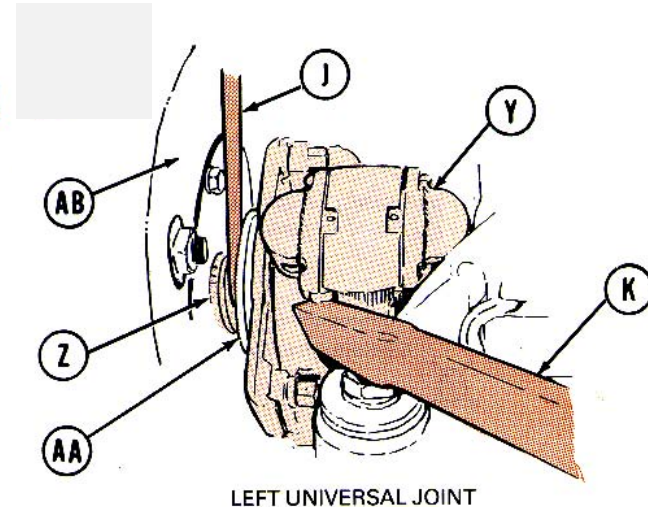


**OPERATE UNDER UNUSUAL CONDITIONS (PREPARE TWO VEHICLES FOR TOWING) Continued**

14. Open ring assembly (W).
15. Remove ring assembly (W).



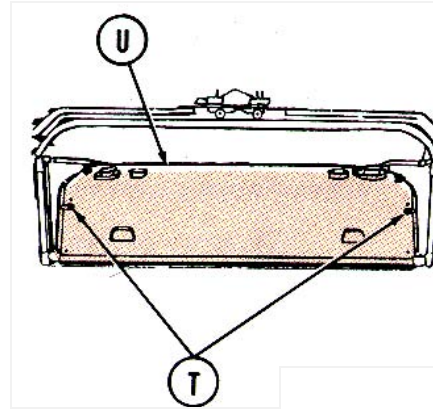
16. Put crowbar (K) under universal joint (Y) to relieve pressure on final drive adapter (Z).
17. Put pinch bar (J) between final drive adapter (Z) and flange (AA).
18. Disconnect final drive adapter (Z) by prying toward outer wall of hull (AB).
19. Repeat steps 11 through 18 to disconnect right universal joint.



**OPERATE UNDER UNUSUAL CONDITIONS (PREPARE TWO VEHICLES FOR TOWING) Continued**

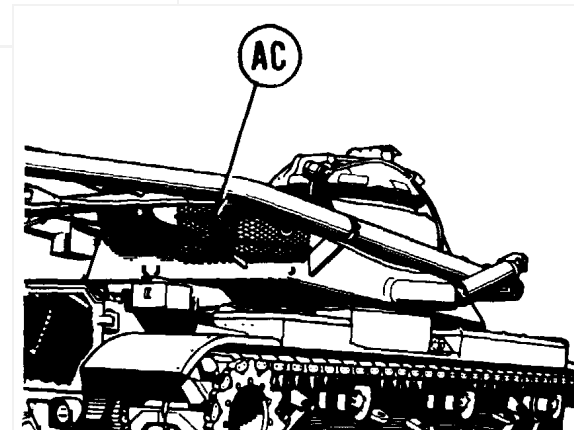
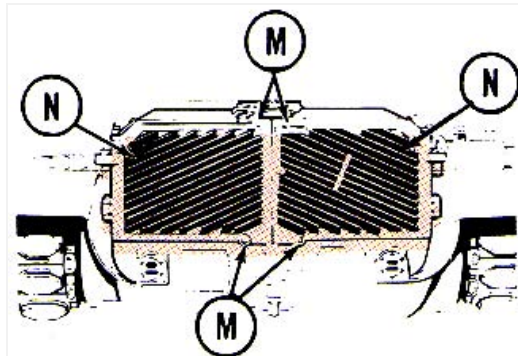
20. Replace shroud (U).

21. Push and rotate six cam screws (T) toward hull using 3/4 inch wrench to lock in place.



22. Close rear grille doors (N).

23. Using 1-1/8 inch socket, install four bolts (M) to secure grille doors (N).



24. Stow exhaust elbows and ring assembly in turret bustle rack (AC) until vehicle is repaired.

TA132764

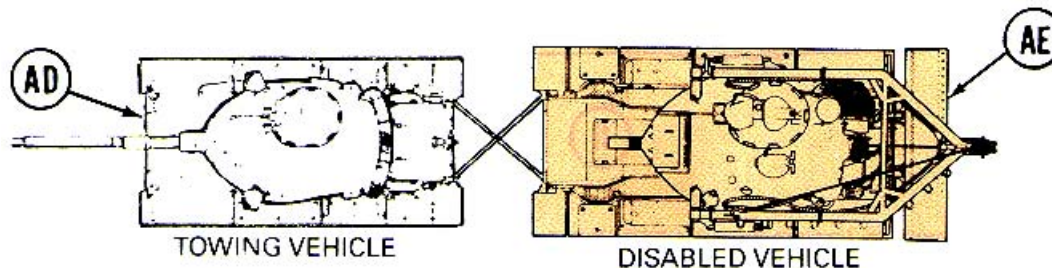
**OPERATE UNDER UNUSUAL CONDITIONS (PREPARE TWO VEHICLES FOR TOWING) Continued****To Connect Tow Bar:****WARNING**

Moldboard must be stowed (page 2-261). If moldboard does not operate, use emergency moldboard lift procedure (page 2-263). Make sure transmission of disabled vehicle is in neutral. Tow vehicle backwards until moldboard locks in carrying hooks

**NOTE**

When possible use tow bar to tow M728 from the rear. Five men are needed for this procedure. Tow bar must be borrowed from organizational maintenance.

1. Position rear of towing vehicle (AD) directly to rear of disabled vehicle (AE).
2. Point main gun of towing vehicle (AD) forward, and main gun of disabled vehicle (AE) to the rear.



2-626

TA132765

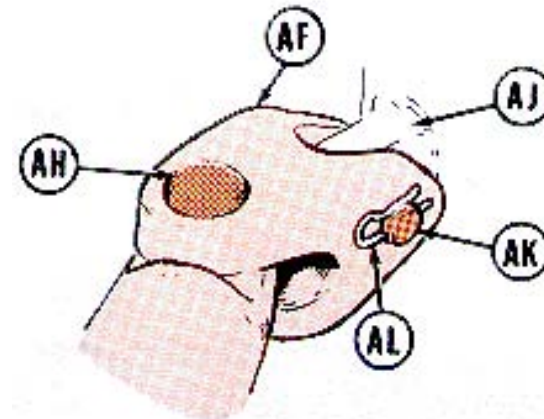
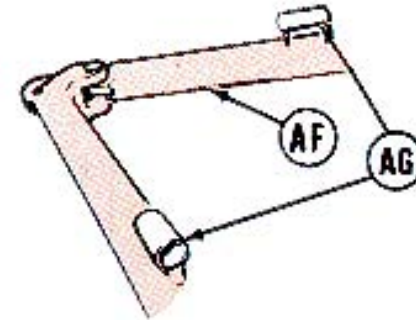
**OPERATE UNDER UNUSUAL CONDITIONS (PREPARE TWO VEHICLES FOR TOWING) Continued****WARNING**

Tow bar (AF) must be positioned with handles (AG) and tow pin heads (AH) up. If positioned upside-down, tow pins could fall out and cause tow bar sections to separate.

**NOTE**

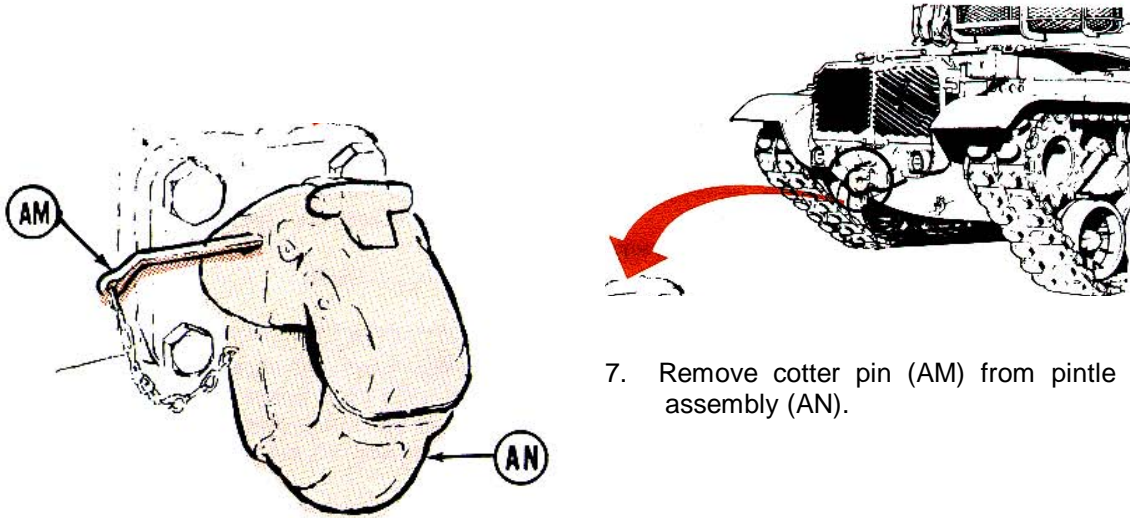
Check tow bar (AF) for broken welds or cracks. If damaged, do not use tow bar. Notify organizational maintenance.

3. Place tow bar (AF) connector over tow eye (AJ) of disabled vehicle.
4. Insert tow pin (AK) through connector of tow bar (AF) and tow eye (AJ).
5. Secure tow pin (AK) with locking pin (AL).
6. Perform steps 3 through 5 on other towing eye (AJ) of disabled vehicle.

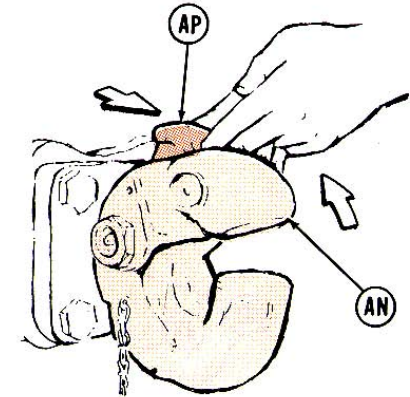


TA132766

OPERATE UNDER UNUSUAL CONDITIONS (PREPARE TWO VEHICLES FOR TOWING) Continued



7. Remove cotter pin (AM) from pintle assembly (AN).



TA132767

8. Pull release latch (AP) away from vehicle and raise top portion of pintle assembly (AN) until it locks in open position.

**OPERATE UNDER UNUSUAL CONDITIONS (PREPARE TWO VEHICLES FOR TOWING) Continued****NOTE**

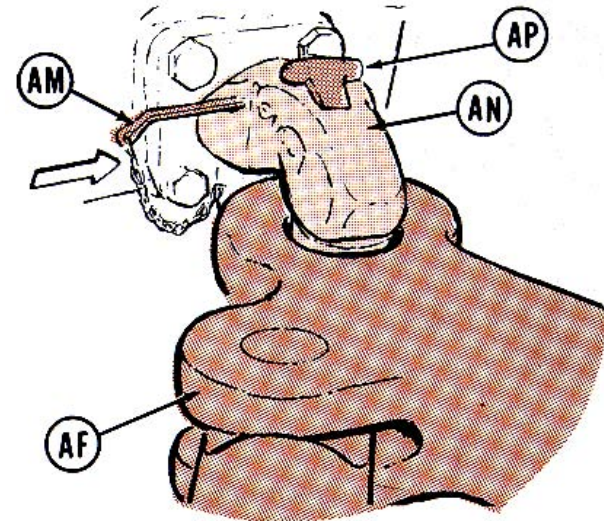
It will be necessary to reposition towing vehicle to align tow bar (AF) and pintle assembly (AN).

9. Lower tow bar (AF) onto pintle hook (AN).
10. Pull release latch (AP) away from vehicle to lower pintle assembly (AN) back into locked, closed position.
11. Insert cotter pin (AM) back into pintle assembly to lock.

**CAUTION**

If engine or transmission of disabled vehicle is damaged, or if vehicle will be towed more than one mile, disconnect universal joints from final drives. Vehicle will have no brakes with universal joints disconnected. If towing with cables, use third vehicle for braking purposes.

Remove blocks from roadwheels and tracks before moving vehicle.



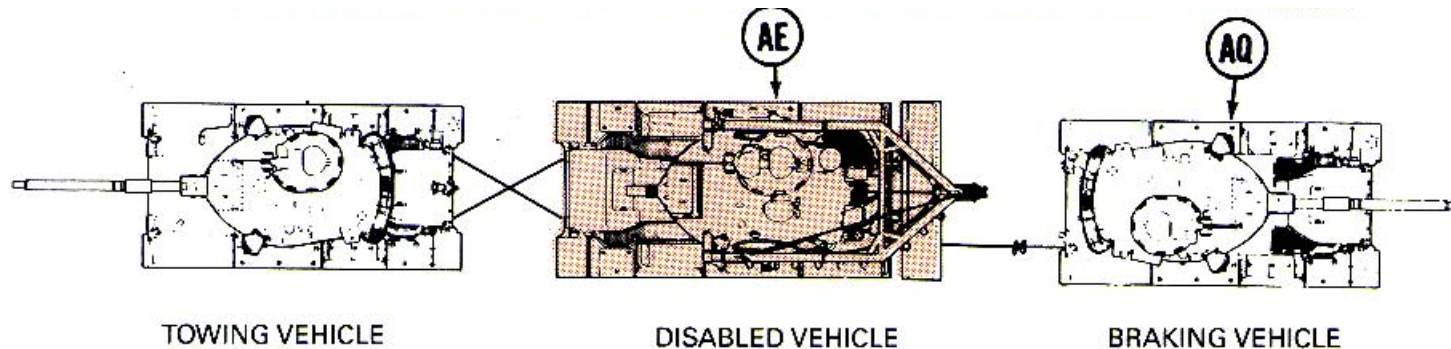
**OPERATE UNDER UNUSUAL CONDITIONS (PREPARE TWO VEHICLES FOR TOWING) Continued****To Connect Tow Cables:****WARNING**

Moldboard must be stowed (page 2-261) when attaching tow cables to front of disabled vehicle.

If moldboard will not operate, use emergency moldboard lift procedures (page 2263). Make sure transmission of disabled vehicle is in neutral. Tow vehicle backwards until moldboard locks in carrying hooks Use tow cables to tow vehicle when universal joints are disconnected from final drives only in emergency.

**NOTE**

If universal joints are disconnected from final drives, attach tow cables to rear of disabled vehicle (AE). Attach cable of braking vehicle (AQ) to front of disabled vehicle.

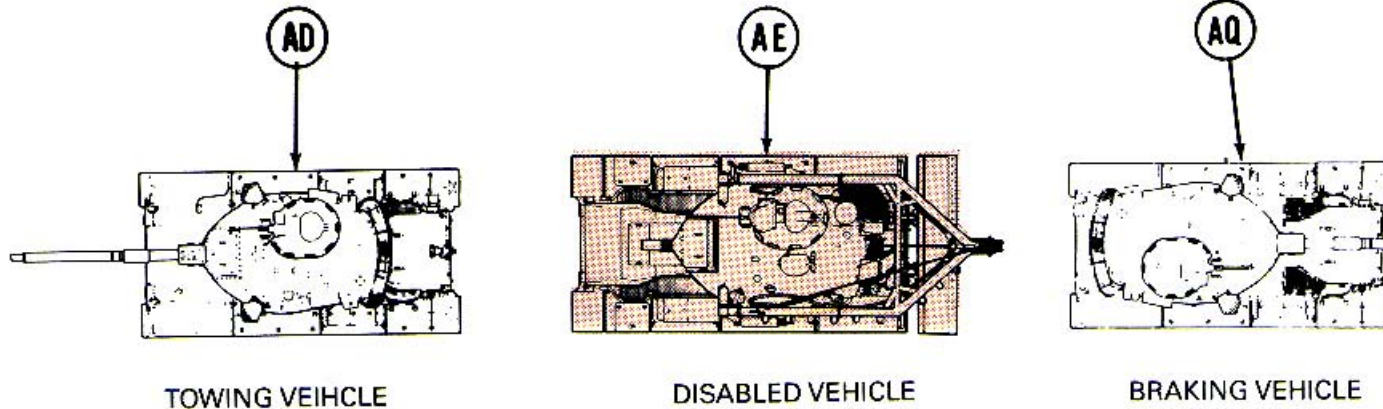


TA132769

**OPERATE UNDER UNUSUAL CONDITIONS (PREPARE TWO VEHICLES FOR TOWING) Continued**

**Make Sure:**

- Boom is stowed (page 2-305) and locked in travel locks.
- Track and roadwheels are blocked with logs, stones or blocks.
- Towing vehicle (AD) is backed to rear of disabled vehicle.
- Front of braking vehicle (AQ) is facing front of disabled vehicle.
- Main gun of towing vehicle (AD) is pointing over front of vehicle.
- Main gun of braking vehicle (AQ) is pointing over rear deck.
- Main gun of disabled vehicle (AE) is pointing over rear deck.

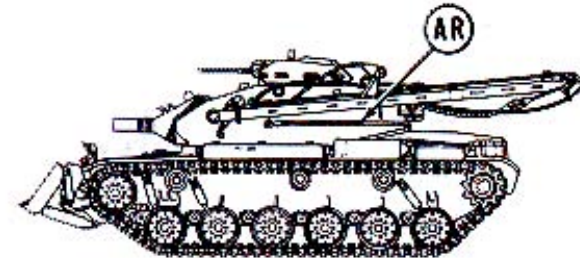




**OPERATE UNDER UNUSUAL CONDITIONS (PREPARE TWO VEHICLES FOR TOWING) Continued**

**NOTE**

You will need four tow cables (AR). Get two from disabled vehicle and two from braking vehicle.

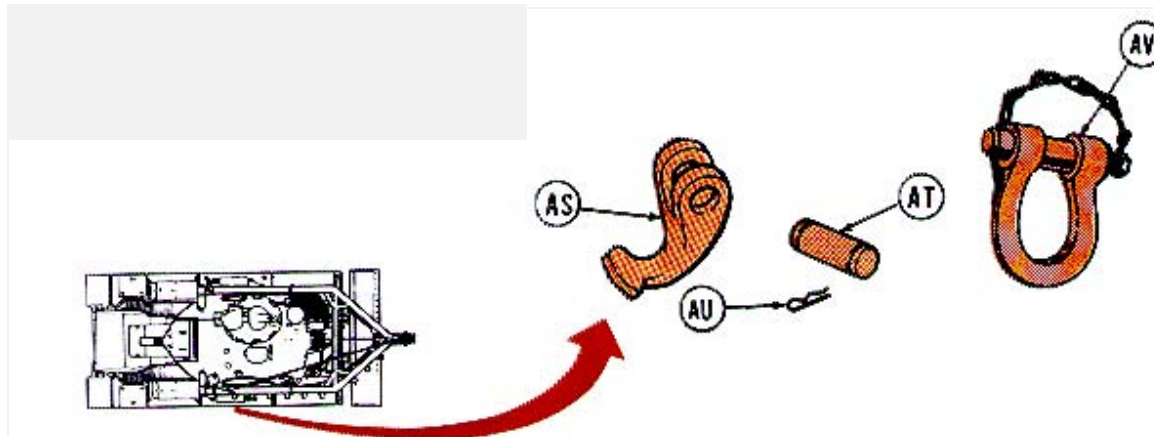


1. Remove tow cables (AR) from around turret.

**NOTE**

You will need six tow hooks (AS), six tow pins (AT), twelve locking pins (AU) and one shackle assembly (AV).

2. Remove tow hooks (AS), tow pins (AT), locking pins (AU) and shackle assembly (AV) from right front fender box.



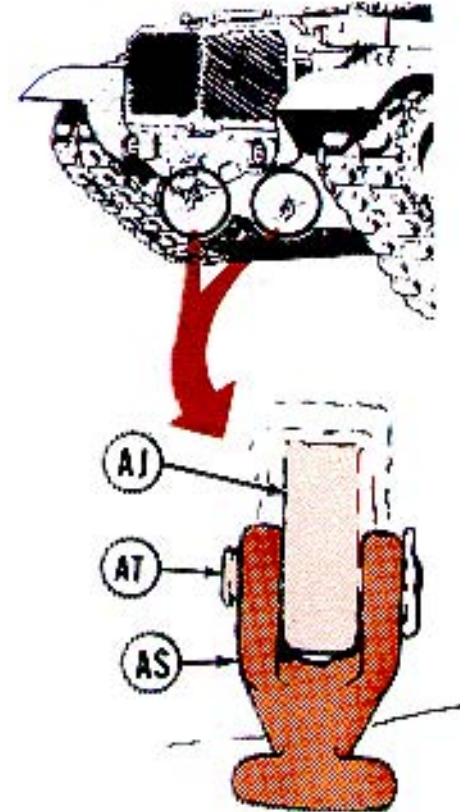
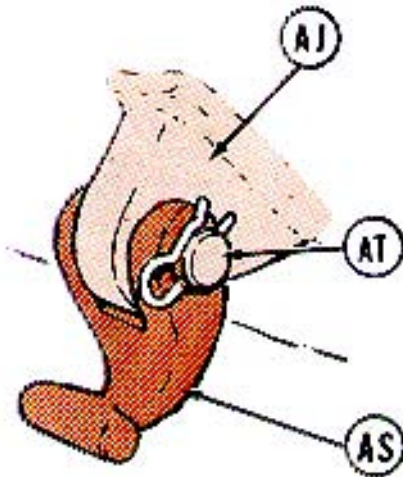
TA132771

## OPERATE UNDER UNUSUAL CONDITIONS (PREPARE TWO VEHICLES FOR TOWING) Continued

**NOTE**

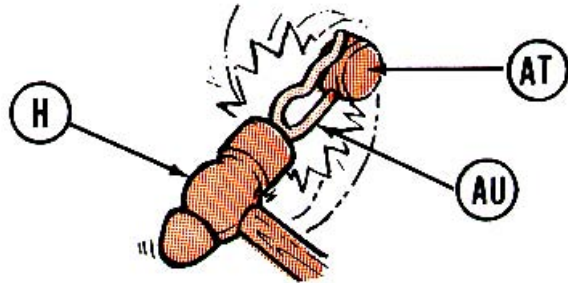
Make sure hook (AS) is pointed away from vehicle.

3. Install tow hook (AS) over tow eye (AJ) on towing vehicle.
4. Insert tow pin (AT) through tow hook (AS) and tow eye (AJ).

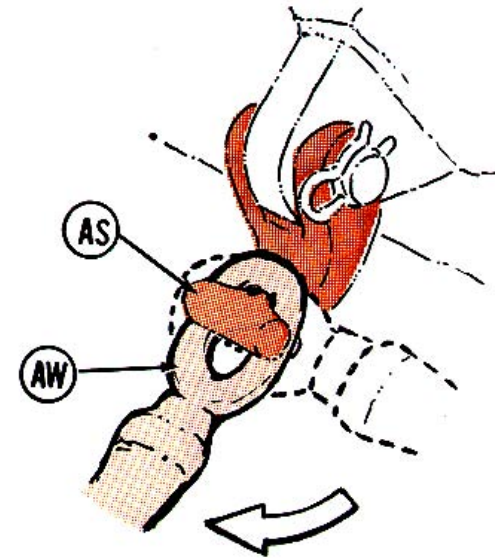


**OPERATE UNDER UNUSUAL CONDITIONS (PREPARE TWO VEHICLES FOR TOWING) Continued**

5. Use hammer (H) to install two locking pins (AU) on both ends of tow pin (AT).



6. Repeat steps 3 thru 5 on second tow eye of towing vehicle.
7. Repeat steps 3 thru 5 on both front towing eyes on vehicle to be towed.



TA132773

**WARNING**

**Always make sure that towing vehicle has parking brakes on when connecting cables**

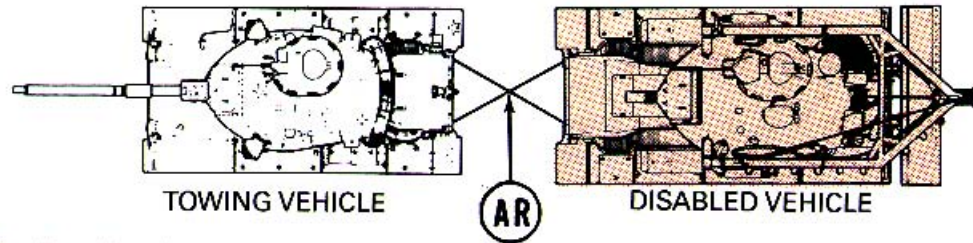
**Connect cables with eye of cable (AW) Do not loop cables over hooks.**

8. Place tow cable eye (AW) over tow hooks (AS) on both vehicles.

**OPERATE UNDER UNUSUAL CONDITIONS (PREPARE TWO VEHICLES FOR TOWING) Continued****NOTE**

Always cross cables between towing vehicle and disabled vehicle for greatest steering control.

9. Cross connect tow cables (AR) to tow hooks of both vehicles.



TA132774

**CAUTION**

Remove blocks from roadwheels and tracks before moving vehicle.

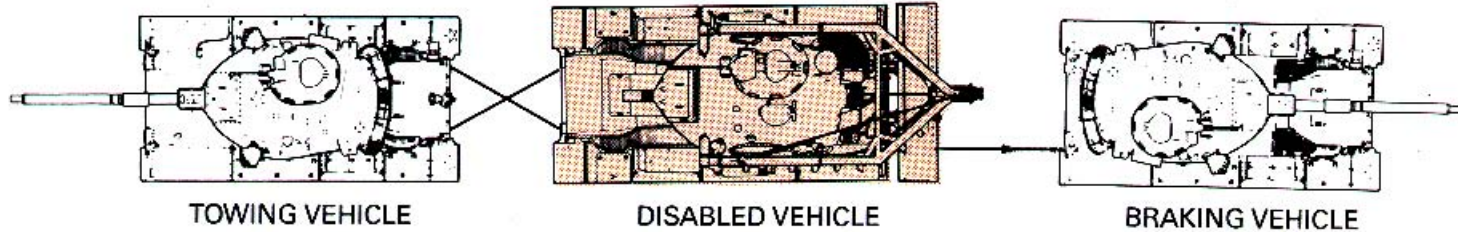
**WARNING**

Moldboard must be stowed (page 2261). If moldboard does not . " use emergency moldboard lift procedures (page 2-263). Make sure transmission of disabled vehicle is in neutral. Tow vehicle backwards until moldboard locks in carry hooks.

10. Repeat steps 3 thru 5 on right front tow eye of disabled vehicle.

**OPERATE UNDER UNUSUAL CONDITIONS (PREPARE TWO VEHICLES FOR TOWING) Continued**

11. Repeat steps 3 thru 5 on left front tow eye of braking vehicle.

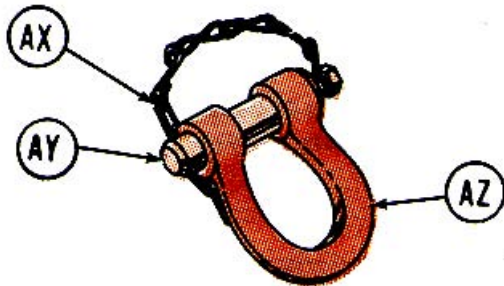


**NOTE**

**One cable is not long enough for connection under moldboard. Use two tow cables to make connection.**

12. Remove locking pin (AX) from shackle pin (AY).

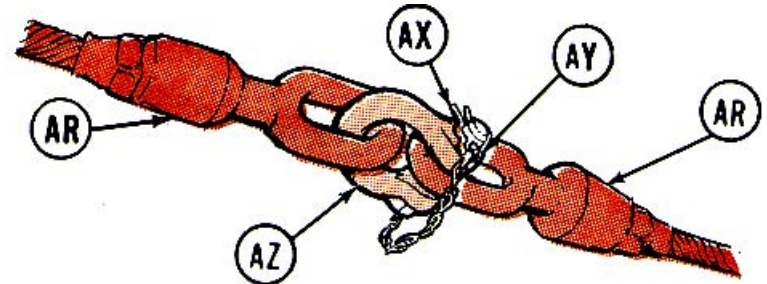
13. Remove shackle pin (AY) from shackle (AZ).



14. Using shackle assembly, connect two tow cables (AR) together.

15. Install shackle pin (AY) into shackle (AZ).

16. Install locking pin (AX) into shackle pin (AY).

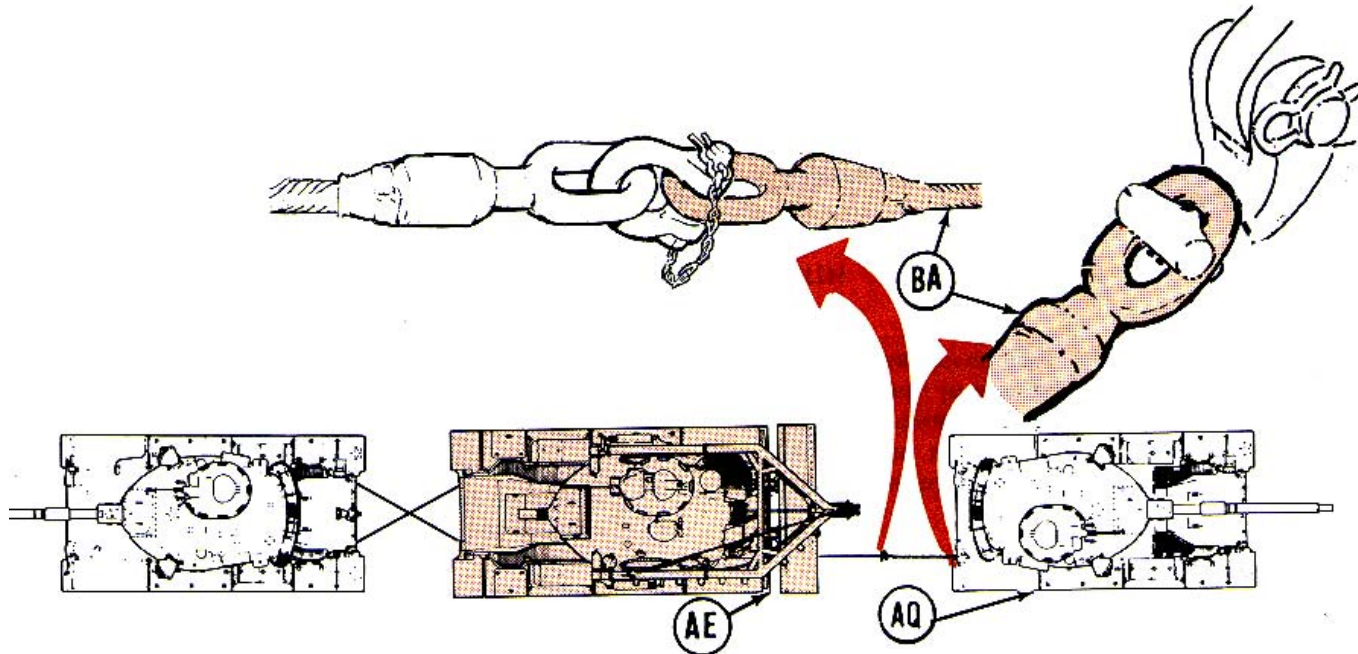


TA132775

**OPERATE UNDER UNUSUAL CONDITIONS (PREPARE TWO VEHICLES FOR TOWING) Continued****NOTE**

**Connect joined cable (BA) in a straight line to tow hook of braking vehicle.**

17. Set parking brakes in braking vehicle (AQ) before connecting cable (page 2-636).
18. Place tow cable eye of joined cables over tow hook of braking vehicle (AQ) and disabled vehicle (AE).



2-637

TA132776

**OPERATE UNDER UNUSUAL CONDITIONS (TOW DISABLED VEHICLE)**

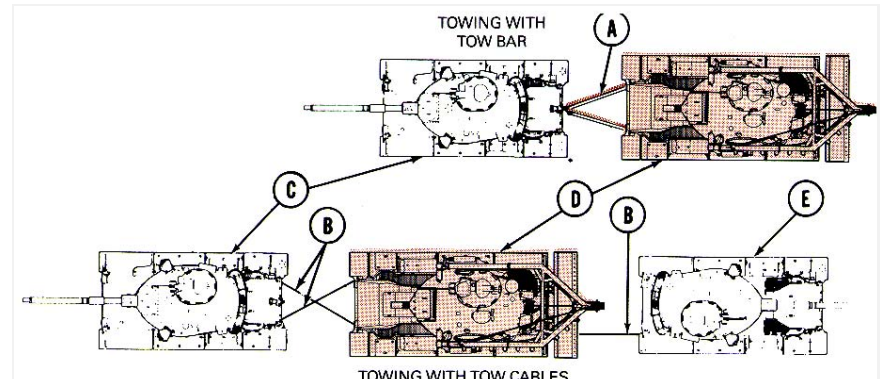
**WARNING**

Driver of towed vehicle is exposed to carbon monoxide fumes. Change drivers often to prevent overexposure. Neither gas particulate unit nor M25A1. C-B tank mask will protect against carbon monoxide poisoning. **THE BEST DEFENSE AGAINST CARBON MONOXIDE POISONING IS GOOD VENTILATION.** Braking vehicle must be used, if towing with tow cables

**NOTE**

Towing vehicle commander is commander of this operation. Communication between vehicles will be by radio system. In addition, hand signals will be used for coordinating all driver

1. Using tow bar (A) (page 2-626) or tow cables (B) (page 2-630), connect towing vehicle (C) to disabled vehicle (D).
2. If tow cables are used, connect braking vehicle (E) to disabled vehicle (D).
3. Towing vehicle: Release parking brake (page 2-214).
4. If final drives are disconnected on disabled vehicle, remove blocks from tracks.



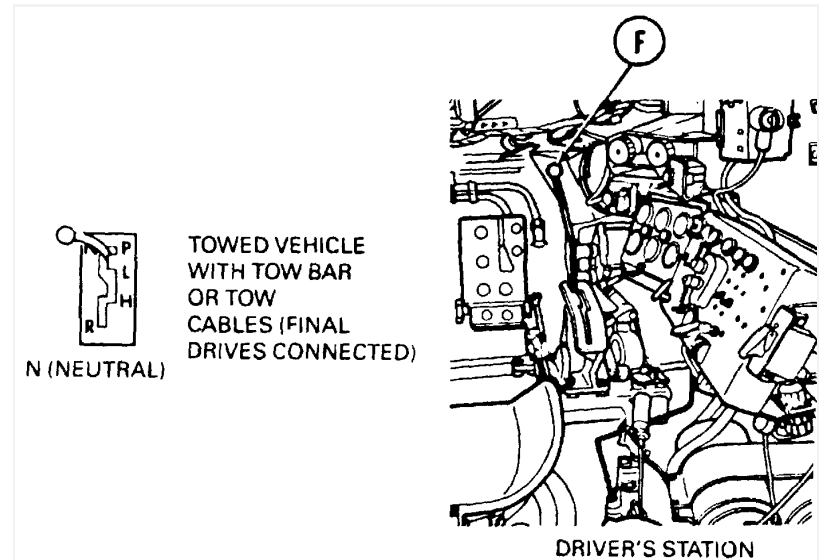
TA132777

**OPERATE UNDER UNUSUAL CONDITIONS (TOW DISABLED VEHICLE) - Continued**

**NOTE**

When towing with tow bar, steering control is provided by towing vehicle. Always keep towed vehicle in N. When towing with tow cables, towed vehicle must have a driver.

5. Shift transmission lever (F) of towed vehicle to:
  - N (neutral) when towing with tow bar.
  - N (neutral) when towing with tow cables.
6. Shift transmission lever (F) of towing vehicle (and braking vehicle if used) to L.



TOWING (AND BRAKING) VEHICLE



L (LOW)

**WARNING**

When towing a disabled vehicle, a second vehicle is required when descending a grade of 20 degrees or more. A second vehicle is also required when the road or road conditions dictate. Under no circumstances should the vehicles exceed eight MPH.

**CAUTION**

Tow vehicle in straight line. Use wide, sweeping curves when towing.

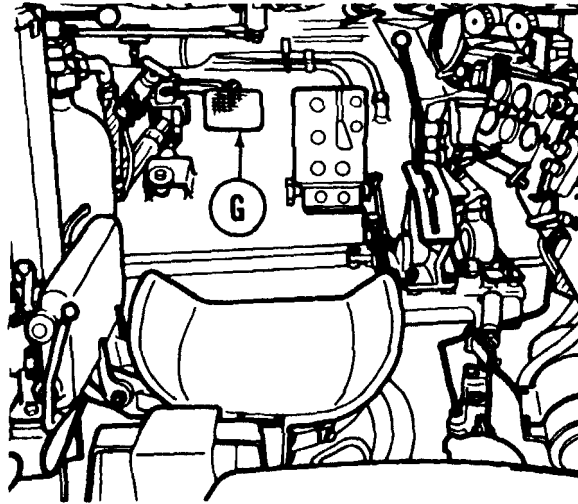
With tracks removed or final drives disconnected, do not exceed 3 mph under any condition during towing.

With final drives connected and tracks installed, do not exceed 8 mph under any condition during towing.

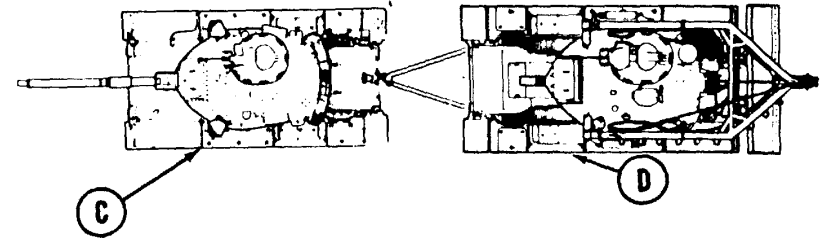


**OPERATE UNDER UNUSUAL CONDITIONS (TOW DISABLED VEHICLE) - Continued**

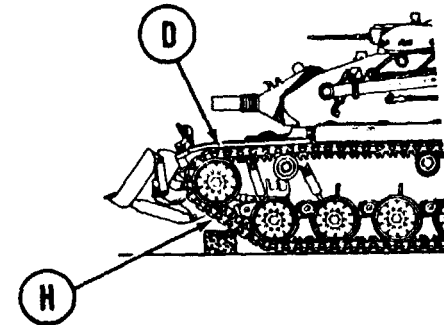
7. Drive to desired location, towing disabled vehicle (D) with towing vehicle (C).
8. To slow down vehicle, towing vehicle (C) apply service brakes (G) (page 2-213). If braking vehicle is used, apply its service brakes to stop vehicle.



DRIVER'S STATION



9. All vehicles apply parking brakes (page 2-213).
10. If final drives are disconnected, block track (H) of disabled vehicle (D).



TA132779

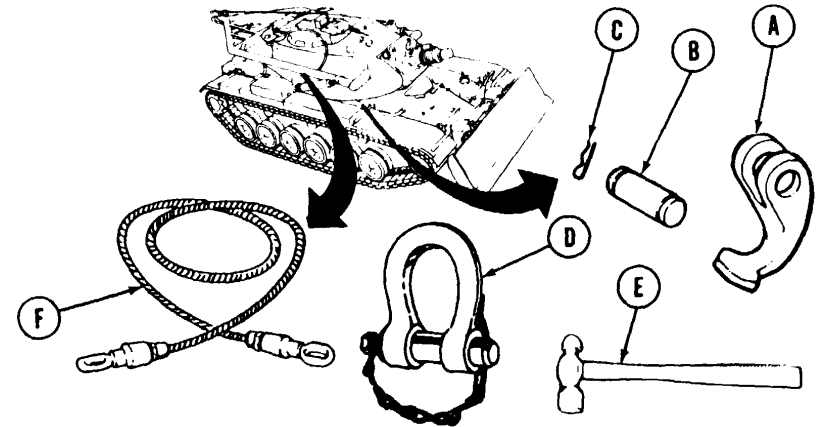
**OPERATE UNDER UNUSUAL CONDITIONS (TOW START)****To Connect Tow Cables:****WARNING**

**Moldboard must be stowed (page 2-261) when attaching tow cables to front of disabled vehicle.**

**If moldboard is not stowed, use emergency moldboard lift procedures page 2-263). Make sure transmission of disabled vehicle is in neutral. Tow vehicle backwards until moldboard locks in carrying hooks.**

**Tools and Equipment:**

- Get from right front fender box:
- Four tow hooks (A)
- Four tow pins (B)
- Eight lock pins (C)
- Two shackle assemblies (D)
- Hammer (E)



Get four tow cables (F) from around turret (two from disabled vehicle and from towing vehicle).

**OPERATE UNDER UNUSUAL CONDITIONS (TOW START) - Continued**

**Make Sure**

- Boom is stowed (page 2-305) and locked in travel locks.
- Track and road wheels are blocked with logs, stones or blocks.
- Towing vehicle (G) is backed to front of disabled vehicle (H).  
Main gun of towing vehicle (G) is pointed over rear of vehicle.
- Main gun of disabled vehicle (H) is pointed over front of vehicle.

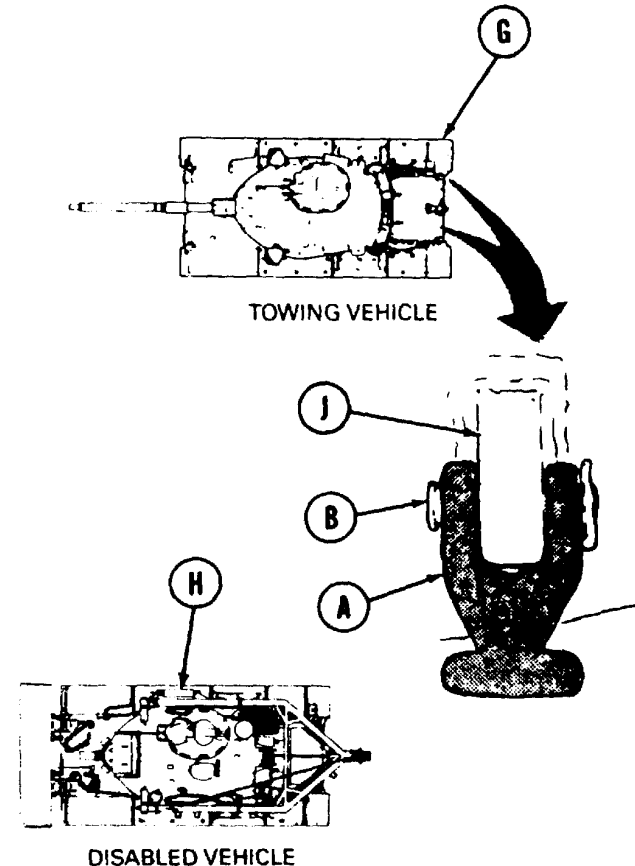
**CAUTION**

Before attempting TOW start, notify organizational maintenance. To TOW start, use TOW bar. Use TOW cables only in an EMERGENCY. Do not attempt to TOW start by towing vehicle backwards.

**NOTE**

Make sure hook (A) is pointed away from vehicle.

1. Install tow hook (A) over tow eye (J) on towing vehicle.
2. Insert tow pin (B) through tow hook (A) and tow eye (J).



**OPERATE UNDER UNUSUAL CONDITIONS (TOW START) - Continued**

3. Using hammer (E), install two locking pins (C) on both ends of tow pin (B).
4. Repeat steps 1 thru 3 on second tow eye of towing vehicle.
5. Repeat steps 1 thru 3 on both front towing eyes of disabled vehicle.

**WARNING**

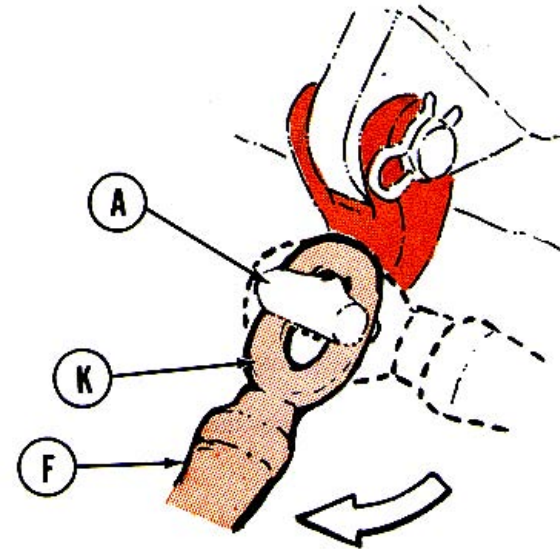
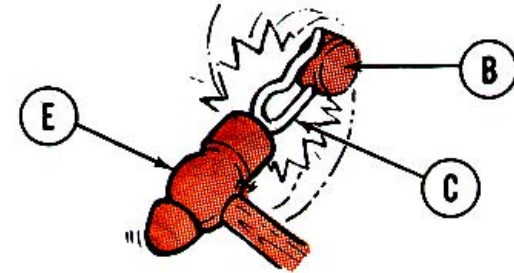
Always make sure that towing vehicle has parking brakes on when connecting cables (F).

Connect cables with eye of cable (K) only. Do not loop cables over hooks.

**NOTE**

One cable is not long enough for connection under moldboard. Use two tow cables for each connection.

6. Using one cable (F) for each hook (A), place tow cable eye (K) over tow hooks (A) on both vehicles.

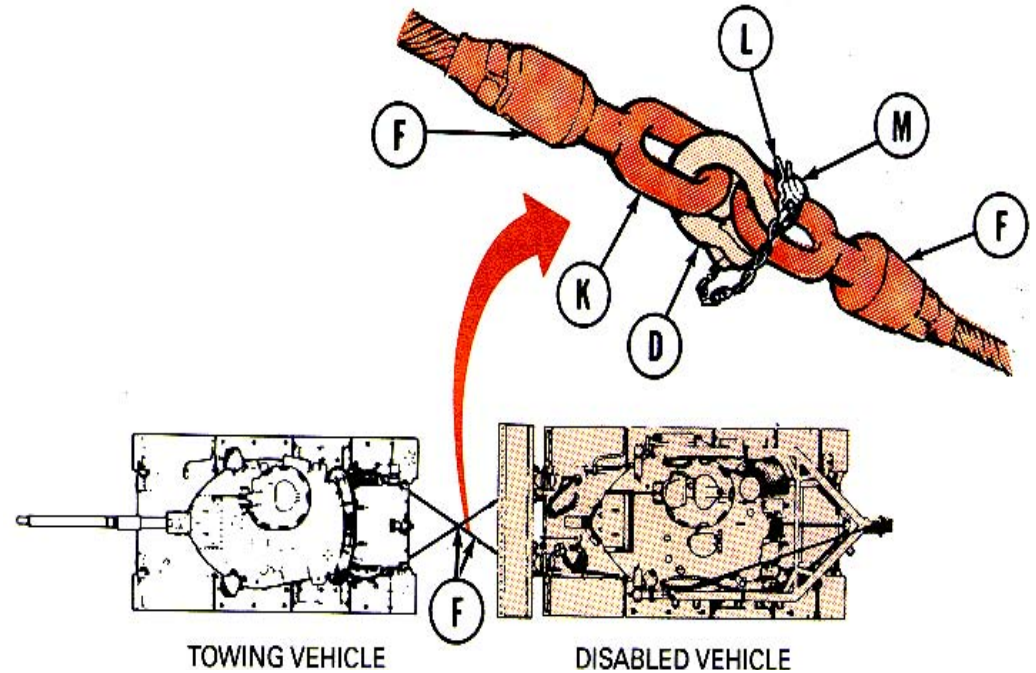


**OPERATE UNDER UNUSUAL CONDITIONS (TOW START) - Continued**



9. sing shackle assembly, connect two tow cables (F) together.
10. Install shackle pin (M) into shackle (D).
11. Install locking pin (L) into shackle pin (M).
12. Repeat steps 7 thru 11 for second tow cable Connection.
13. Return hammer to stowage.

7. Remove locking pin (L) from shackle pin (M).
8. Remove shackle pin (M) from shackle (D).

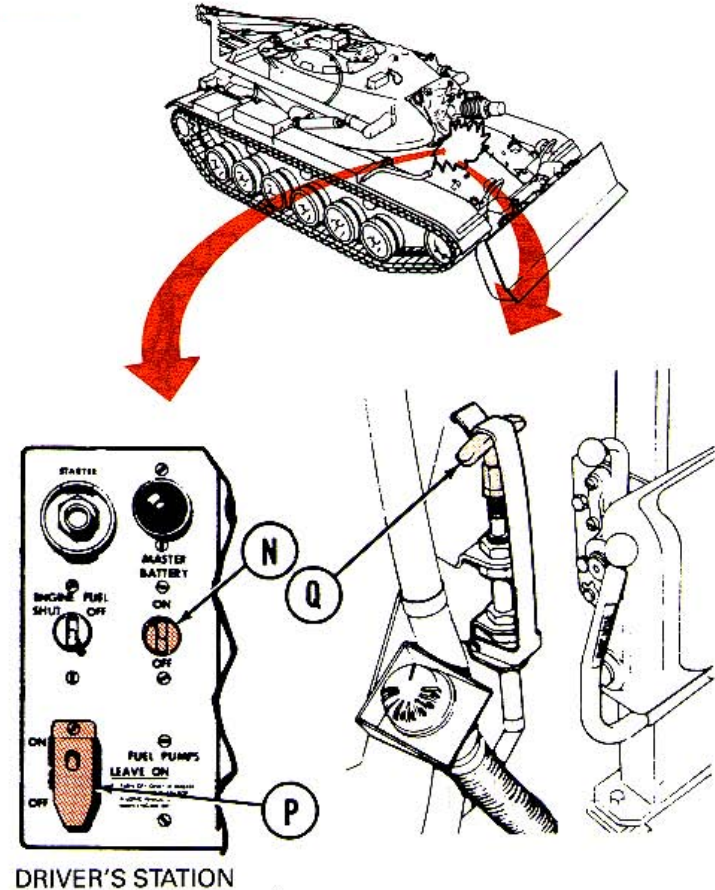


**OPERATE UNDER UNUSUAL CONDITIONS (TOW START) - Continued**

**To Tow Start:**

**WARNING**

- Driver of disabled vehicle is exposed to carbon monoxide fumes. Change drivers often to prevent overexposure. Neither gas particulate unit nor M25A1 C-B tank mask will protect against carbon monoxide poisoning. **THE BEST DEFENSE AGAINST CARBON MONOXIDE POISONING IS GOOD VENTILATION.**
  - Do not allow personnel between vehicles.
1. Connect tow cables (page 2-641).
  2. On disabled vehicle:
    - Set MASTER BATTERY switch (N) to ON.
    - Set FUEL PUMPS switch (P) to ON.
    - Push manual FUEL SHUTOFF handle (Q) down and latch (if so equipped).
    - Make sure parking brakes are unlocked (page 2-214).



**OPERATE UNDER UNUSUAL CONDITIONS (TOW START) - Continued**

**CAUTION**

Remove blocks from roadwheels and tracks before moving vehicle.

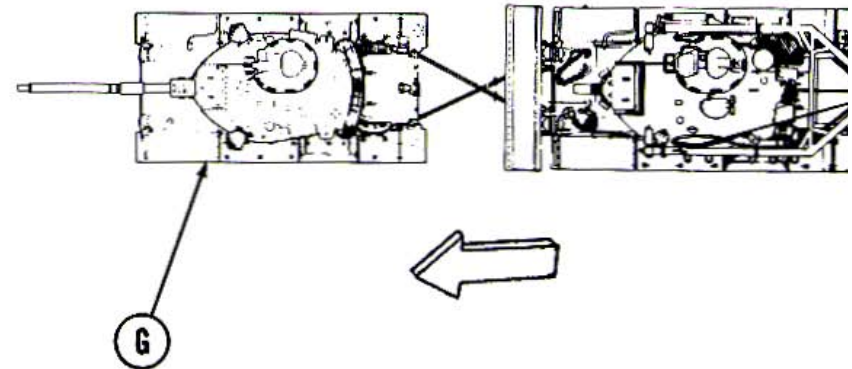
**NOTE**

Towing vehicle commander is commander of this operation. Communication between vehicles will be by radio system. In addition, hand signals will be used for coordinating all drivers.

3. Drive towing vehicle (G) forward slowly in L (low) to take up slack in cables.

**CAUTION**

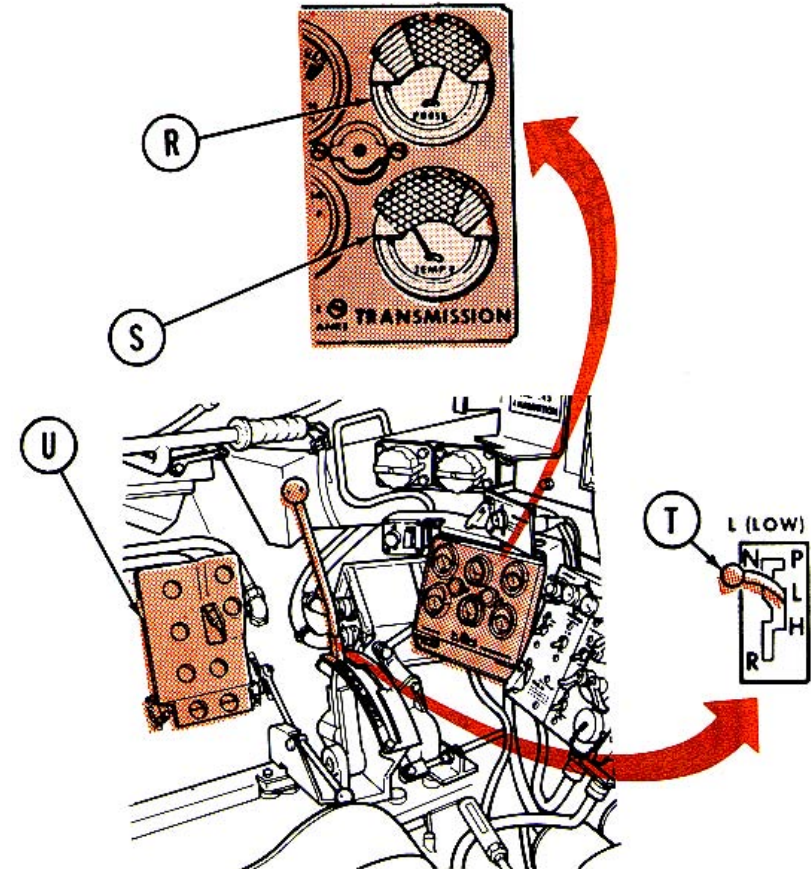
Do not tow in reverse. Do not exceed 8 mph when towing. Tow only in a straight line (or use wide, sweeping turns when necessary).



## OPERATE UNDER UNUSUAL CONDITIONS (TOW START) - Continued

## NOTE

- Transmission oil pressure gage (R) of disabled vehicle will indicate in the red during towing. If pressure goes into green area during towing, stop and notify organizational maintenance.
  - If transmission oil temperature gage (S) of disabled vehicle goes into red area, stop and notify organizational maintenance.
4. Drive towing vehicle slowly in L (low).
  5. Move transmission shift lever (T) of disabled vehicle to L (low) as soon as it starts moving.
  6. Depress accelerator (U) of disabled vehicle not more than 1/2 inch.



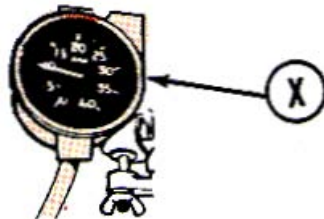
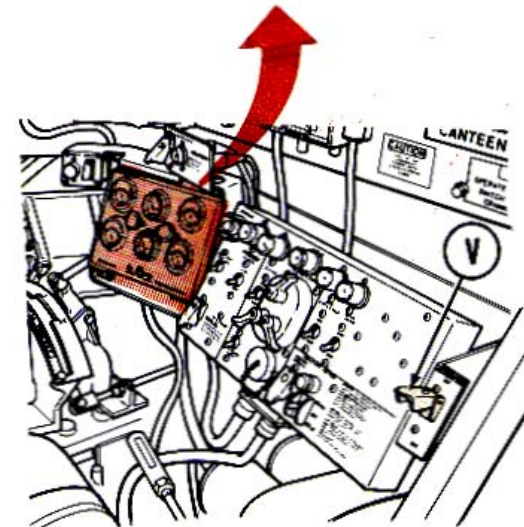
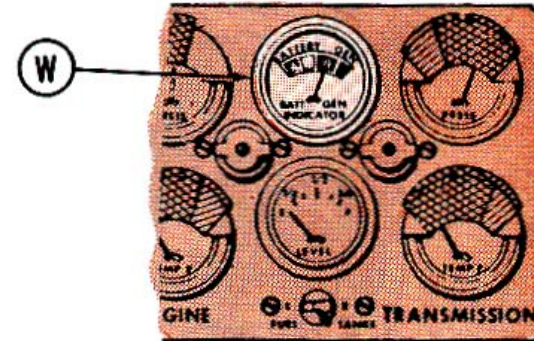


**OPERATE UNDER UNUSUAL CONDITIONS (TOW START) - Continued**

**NOTE**

**If engine of disabled vehicle fails to start in 3 to 5 minutes, stop and troubleshoot (page 3-8).**

7. Stop all vehicles after disabled vehicle engine starts.
8. Apply parking brakes to all vehicles when stopped (page 2-213).
9. On disabled vehicle make sure that:
  - GENERATOR switch (V) is ON.
  - BAT-GEN INDICATOR (W) registers in green area.
10. If batteries are discharged, and disabled vehicle is not to be driven for an extended period, set engine idle to show 1000 to 1200 rpm on tachometer (X) (page 2-211).
11. Disconnect tow cables (page 2-649).



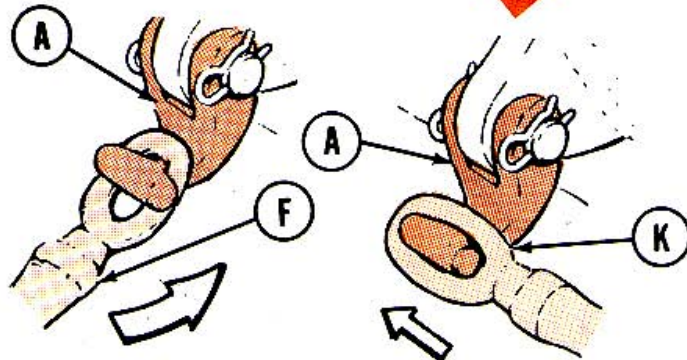
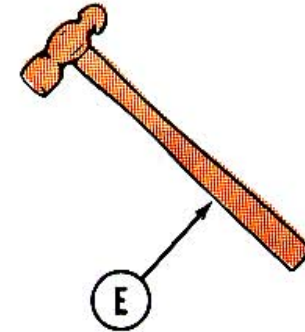
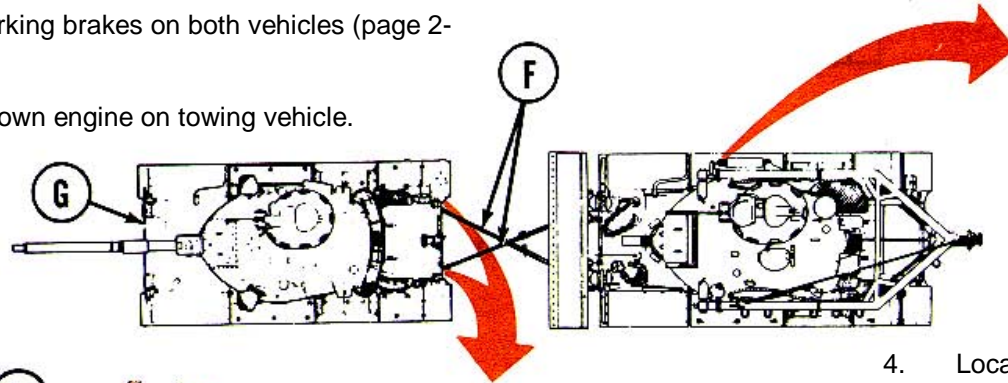
**OPERATE UNDER UNUSUAL CONDITIONS (TOW START) - Continued**

**To Remove Tow Cables:**

**Tools:**

Get hammer (E) from right front fender box.

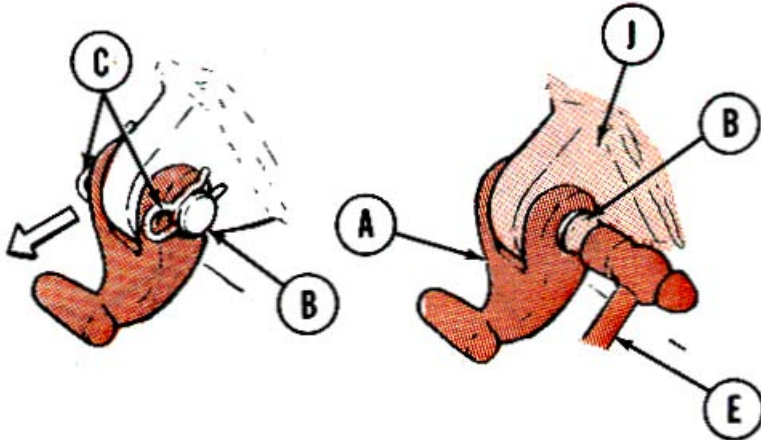
1. Move towing vehicle (G) backward about 3 feet.
2. Set parking brakes on both vehicles (page 2-213).
3. Shut down engine on towing vehicle.



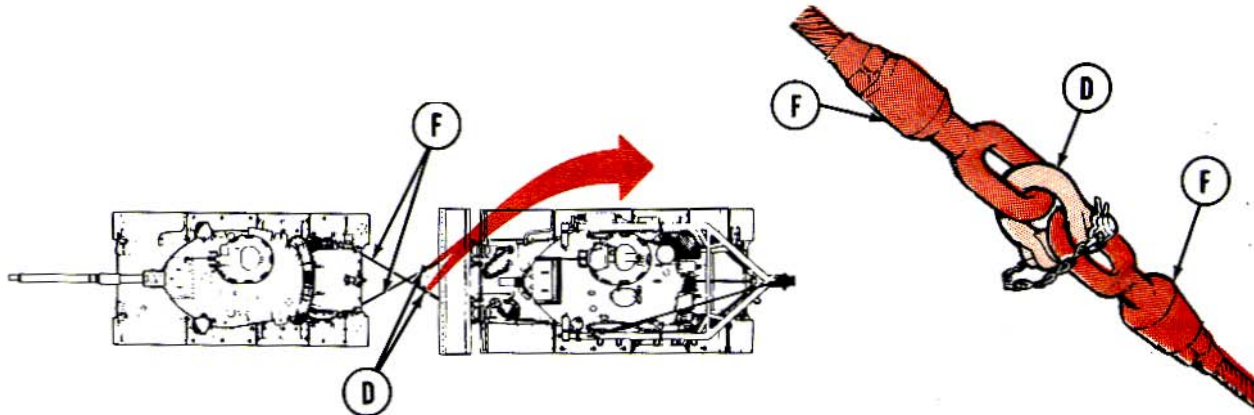
4. Locate one of two tow hooks (A) with tow cables (F) attached on towing vehicle (G).
5. Turn tow cable (F) so that tow cable eye (K) will slide over tow hook (A).
6. Lift tow cable eye (K) off of tow hook (A).
7. Repeat steps 4 and 5 for other three cable connections (one on towing vehicle, and two on disabled vehicle).

OPERATE UNDER UNUSUAL CONDITIONS (TOW START) - Continued

8. Pull lock pins (C) from end of tow pin (B).
9. Using hammer (E), remove tow pin (B) from tow hook (A).
10. Remove tow hook (A) from tow eye (J).
11. Repeat steps 7 thru 9 for three other tow hooks (A) (one on towing vehicle, two on disabled vehicle).

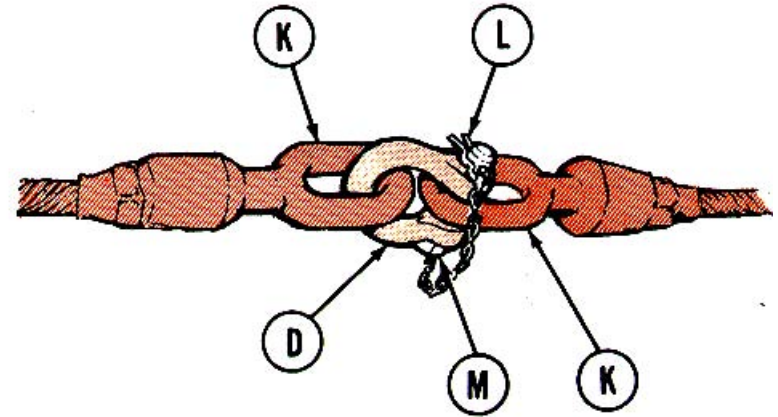


12. Locate shackle assemblies (D) joining tow cables (F) together.

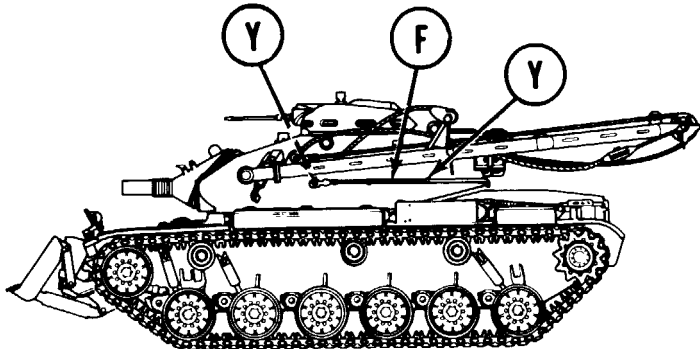


**OPERATE UNDER UNUSUAL CONDITIONS (TOW START) - Continued**

13. Pull locking pin (L) from end of shackle pin (M).
14. Pull shackle pin (M) from shackle assembly (D).
15. Remove shackle assembly (D) from tow cable eyes (K).
16. Secure shackle pin (M) in shackle assembly (D).
17. Repeat steps 12 thru 15 for other shackle.



18. Hang tow cables (F) from hooks (Y) going around turrets of disabled vehicle and towing vehicle.
19. Return tools and equipment to stowage.



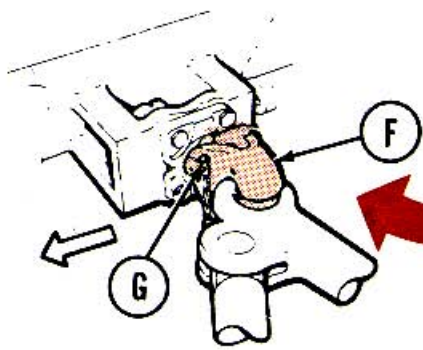
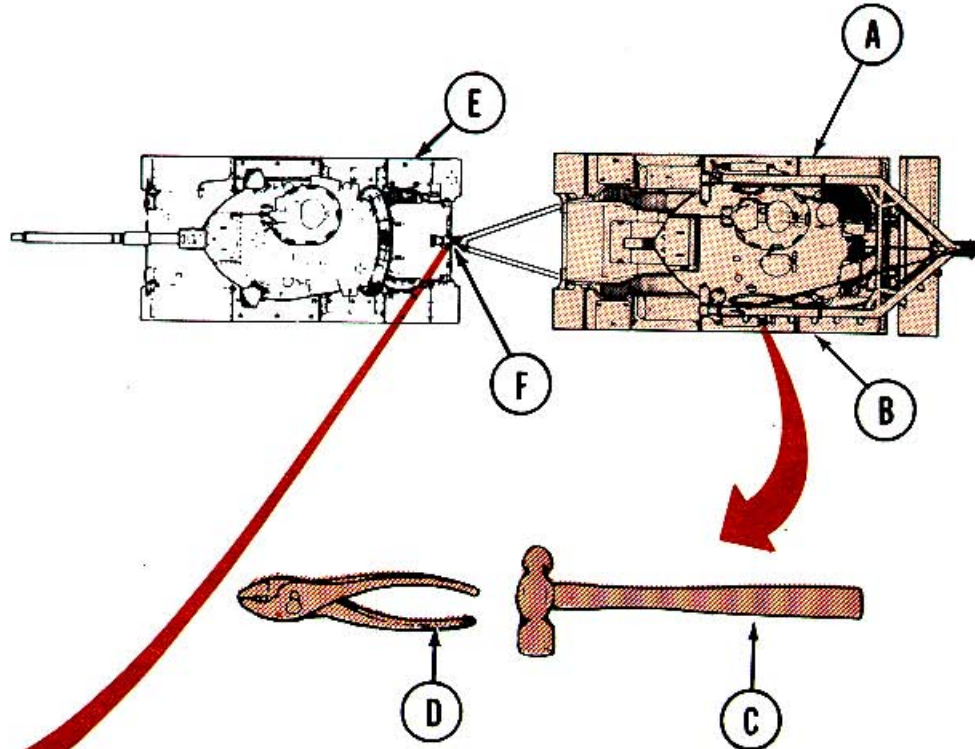
**OPERATE UNDER UNUSUAL CONDITIONS (CONCLUDE TOWING)**

**To Remove Tow Bar:**

**NOTE**

**Four men are needed to perform the following steps.**

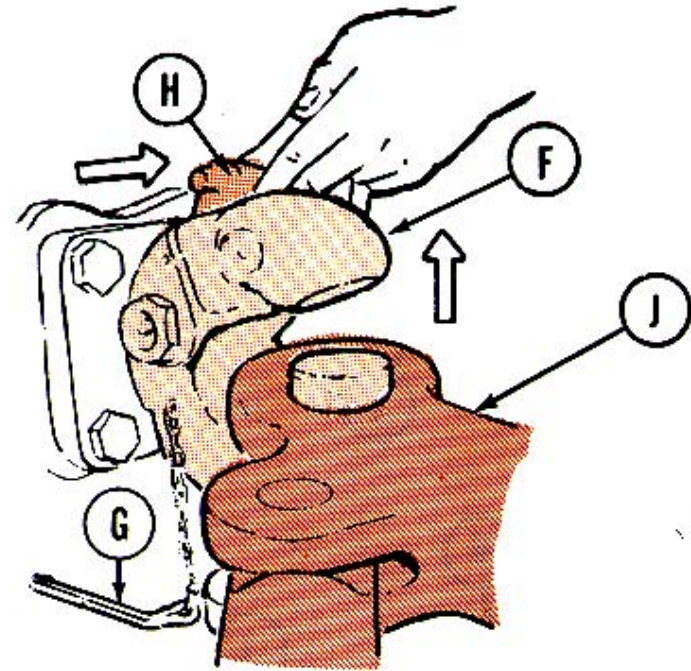
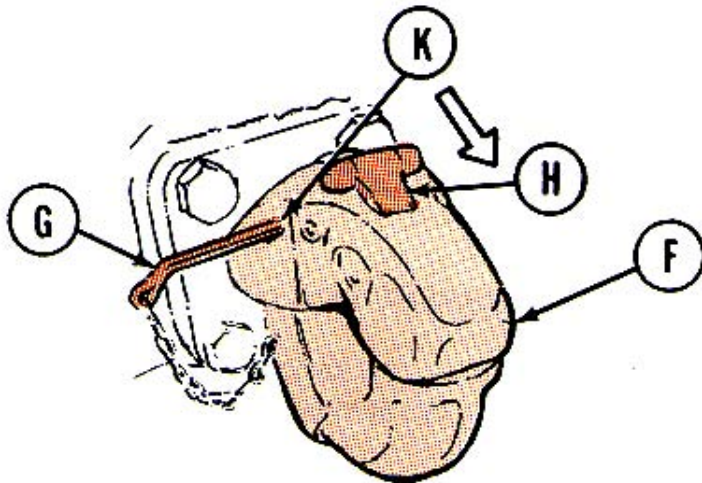
1. Set parking brakes on disabled vehicle (A).
2. Go to right front fender box (B) on disabled vehicle. Get hand hammer (C) and 8 inch pliers (D).
3. Go to rear of towing vehicle (E). Locate pintle assembly (F).
4. Pull cotter pin (G) from pintle assembly (F).



5. Move towing vehicle (E) forward until pressure is off of tow bar at pintle assembly (F).
6. Set parking brakes on towing vehicle (E) (page 2-213).

**OPERATE UNDER UNUSUAL CONDITIONS (CONCLUDE TOWING) - Continued**

7. Pull release latch (H).
8. Lift top part of pintle assembly (F).
9. Lift tow bar (J) from pintle assembly (F).
10. Drive vehicle forward until pintle assembly (F) is clear of tow bar (J).
11. Set parking brakes (page 2-213).



12. Pull release latch (H).
13. Lower top part of pintle assembly (F).
14. Insert cotter pin (G) into hole (K) to lock pintle assembly (F).

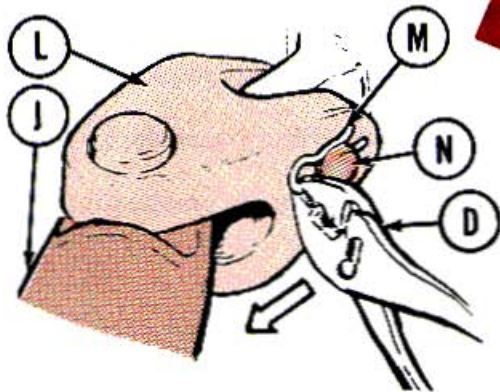
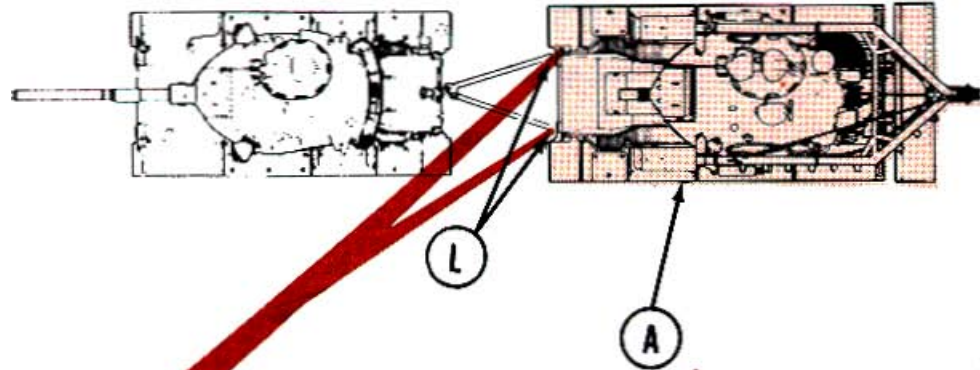
**OPERATE UNDER UNUSUAL CONDITIONS (CONCLUDE TOWING) - Continued**

15. Go to rear of disabled vehicle (A).  
Locate tow bar connectors (L).
16. Using pliers (D), pull locking pin (M) out of tow pin (N).

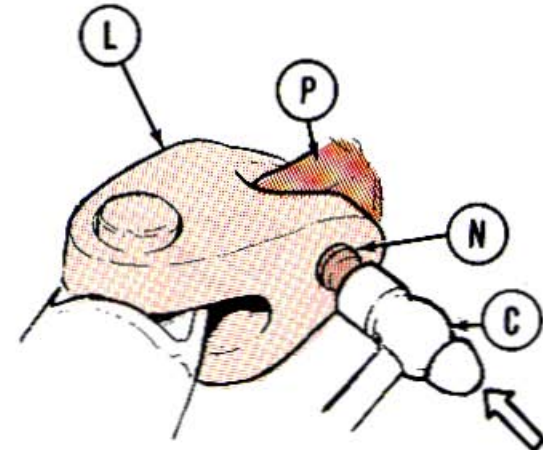
**WARNING**

**When tow pins (N) are removed, tow bar may drop. Have other crewmembers support tow bar during steps 17 thru 19.**

17. Using hand hammer (C), knock tow pin (N) out of tow bar connector (L) and tow eye (P).

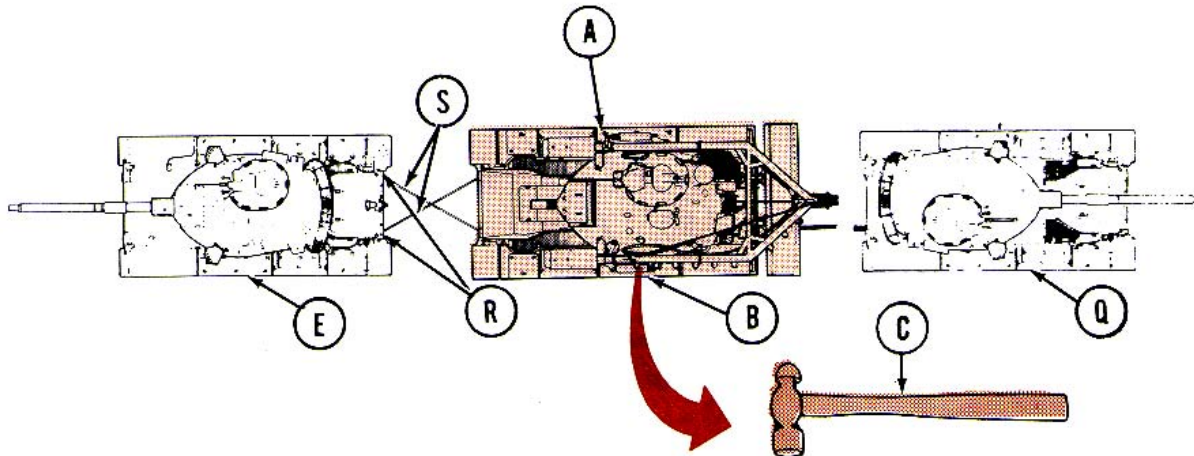


18. Repeat steps 16 and 17 to disconnect other tow bar connector.
19. Remove tow bar (J).
20. Stow hammer (C) and pliers (D) in right front fender box on disabled vehicle.
21. Take tow bar (J) to organizational maintenance.



**OPERATE UNDER UNUSUAL CONDITIONS (CONCLUDE TOWING) - Continued****To Remove Tow Cables:****Make Sure:**

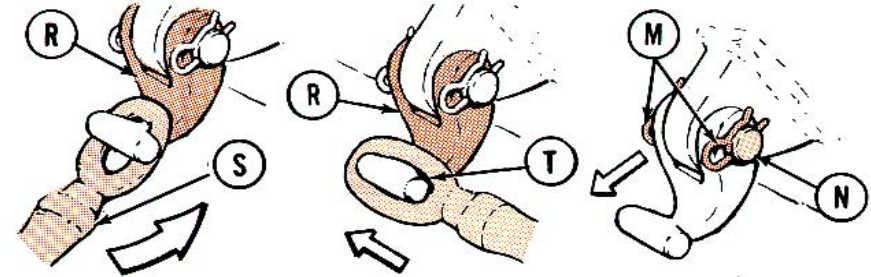
- Moldboard is stowed (page 2-261).
  - Roadwheels and tracks of disabled vehicle are blocked if final drives are disconnected.
1. Set parking brakes on disabled vehicle (A) (page 2-213).
  2. Move braking vehicle (Q) forward about 3 feet.
  3. Set parking brakes on braking vehicle (Q) (page 2-213).
  4. Move towing vehicle (E) backwards about 3 feet.
  5. Set parking brakes on towing vehicle (page 2-213).
  6. Go to right front fender box (B) on disabled vehicle (A). Get hand hammer (C).
  7. Locate one of two tow hooks (R) with tow cables (S) attached on towing vehicle (E).



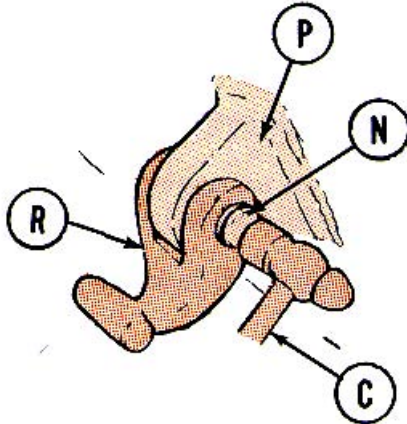


**OPERATE UNDER UNUSUAL CONDITIONS (CONCLUDE TOWING) - Continued**

8. Turn tow cable (S) so that tow cable eye (T) will slide over tow hook (R).
9. Lift tow cable eye (T) off of tow hook (R).
10. Repeat steps 8 and 9 for other five cable connections (one on tow vehicle, one on braking vehicle and three on disabled vehicle).
11. Pull lock pin (M) from end of tow pin (N).

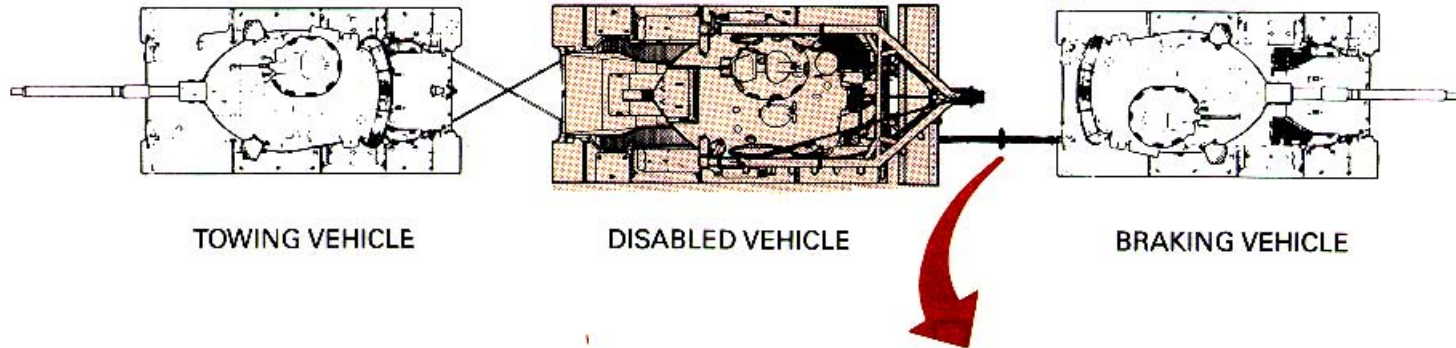


12. Using hand hammer (C), remove tow pin (N) from tow hook (R).
13. Remove tow hook (R) from tow eye (P).
14. Repeat steps 11 thru 13 for five other tow hooks (R) (one on towing vehicle, one on braking vehicle and three on disabled vehicle).

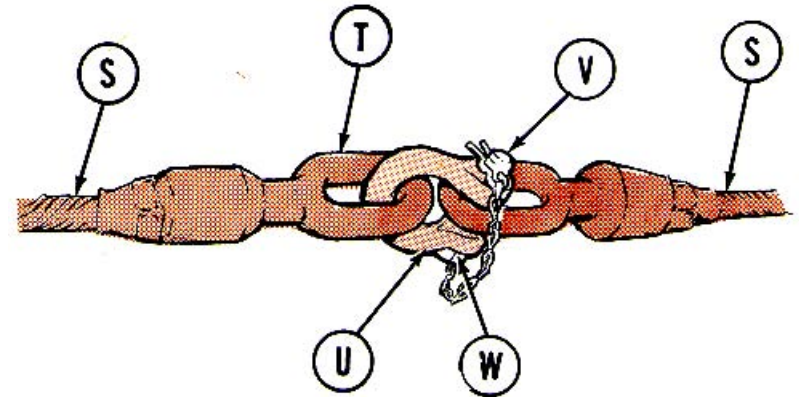


**OPERATE UNDER UNUSUAL CONDITIONS (CONCLUDE TOWING) - Continued**

15. Locate shackle assembly (U) joining braking tow cables (S) together.

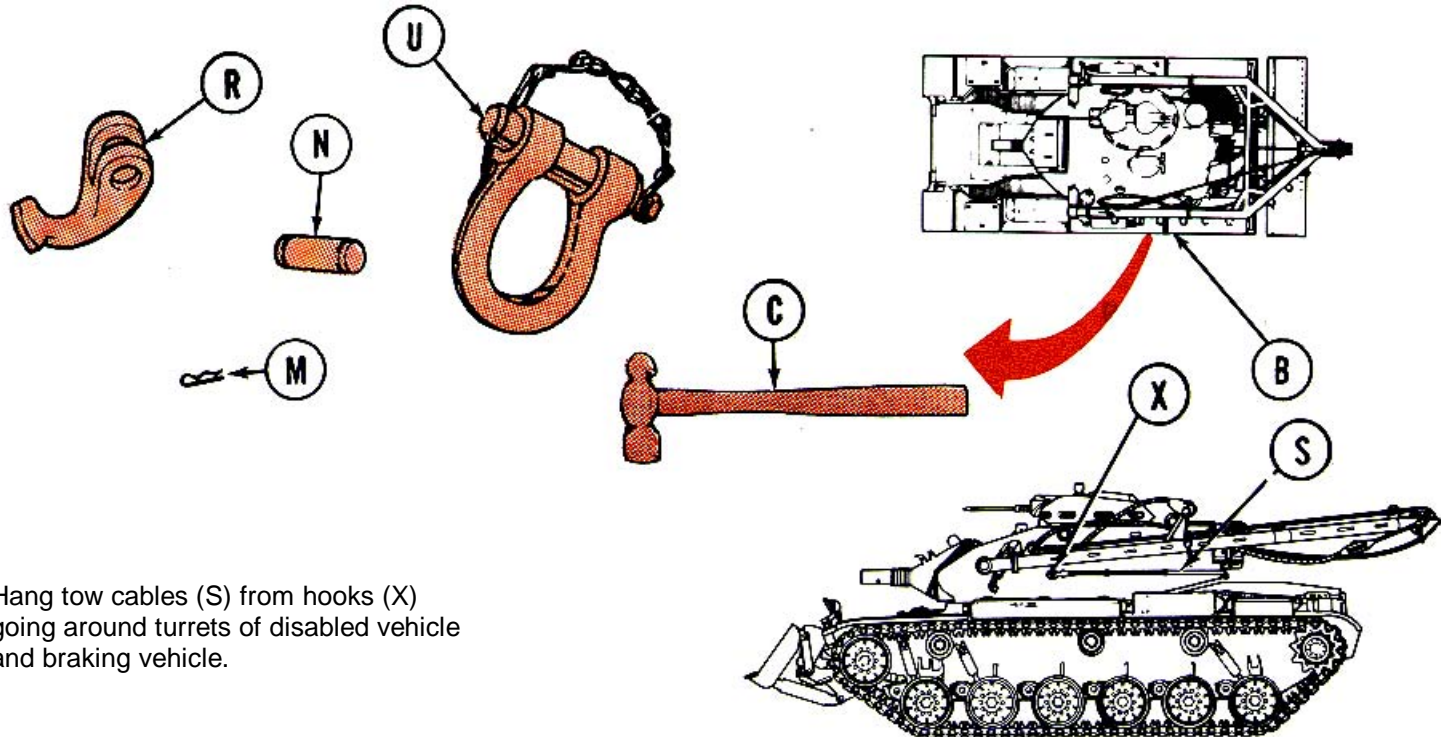


16. Pull locking pin (V) from end of shackle pin (W).
17. Pull shackle pin (W) from shackle assembly (U).
18. Remove shackle assembly (U) from tow cable eyes (T).
19. Secure locking pin (V) in shackle assembly (U).



**OPERATE UNDER UNUSUAL CONDITIONS (CONCLUDE TOWING) - Continued**

- 20. Stow two tow pins (N), two tow hooks (R) and four locking pins (M) in right front fender box (B) of each vehicle.
- 21. Stow hammer (C) and shackle assembly (U) in right front fender box (B) of disabled vehicle.



- 22. Hang tow cables (S) from hooks (X) going around turrets of disabled vehicle and braking vehicle.

**OPERATE UNDER UNUSUAL CONDITIONS (CHANGE ENGINE AIR INTAKES)**

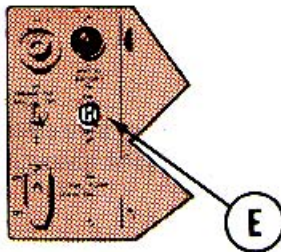
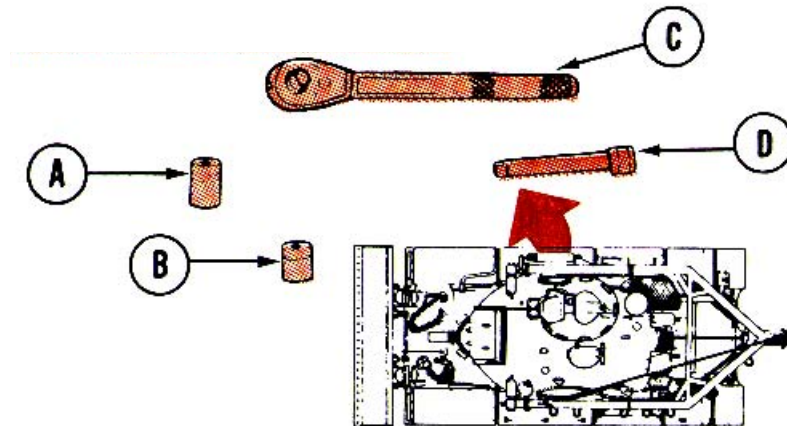
**To Change Engine Air Intakes:**

**NOTE**

Normally, and when fording water, engine air intakes are set to draw air from crew compartment. Change intakes to draw air from engine compartment when outside air is extremely cold or when CBR attack is expected.

1. Get tools from right front fender box:

- 1/2 inch socket (A)
- 9/16 inch socket (B)
- 1/2 inch drive ratchet (C)
- 5 inch extension, 1/2 inch drive (D)

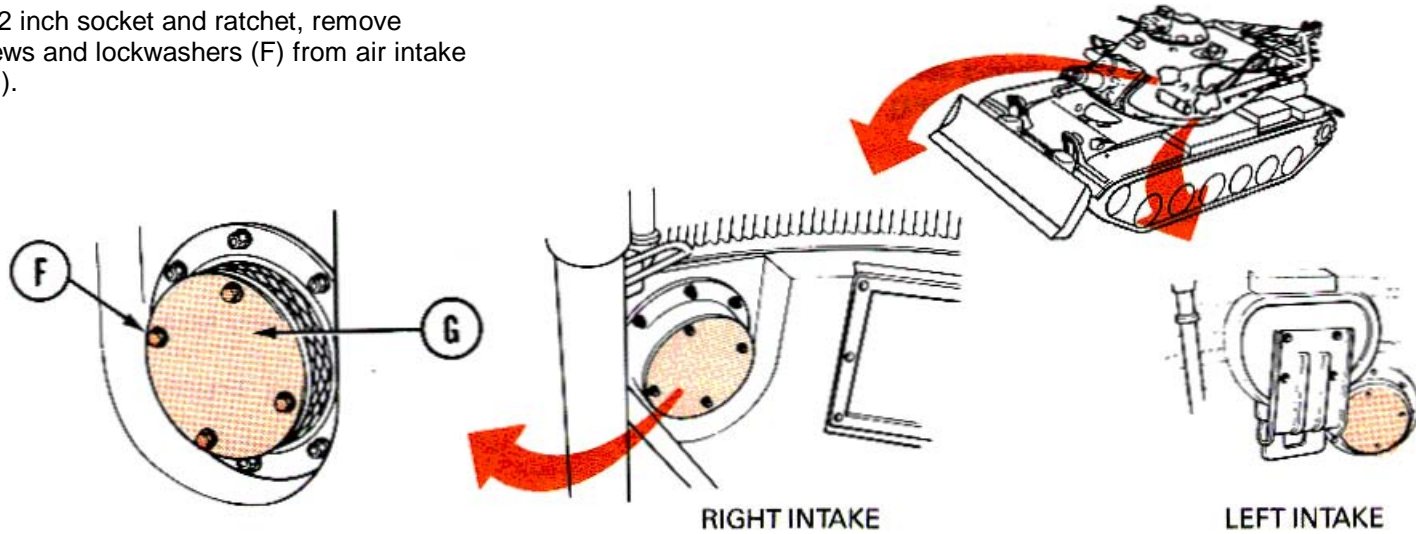


DRIVER'S STATION

2. Traverse turret so main gun is facing forward (page 2-503).
3. Make sure MASTER BATTERY switch (E) is set to OFF.

**OPERATE UNDER UNUSUAL CONDITIONS (CHANGE ENGINE AIR INTAKES) - Continued**

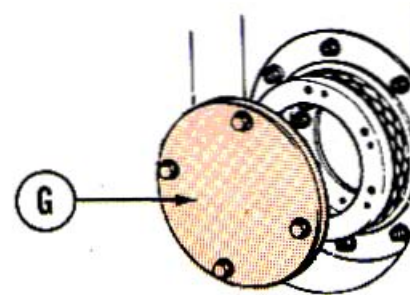
- 4. Using 1/2 inch socket and ratchet, remove four screws and lockwashers (F) from air intake cover (G).



**NOTE**

**A gasket is glued to cover.**

- 5. Carefully remove cover (G) and gasket.



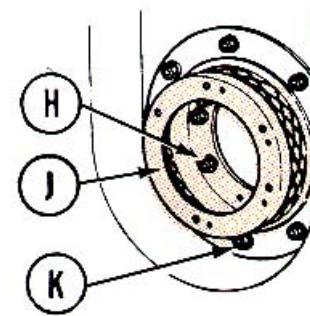
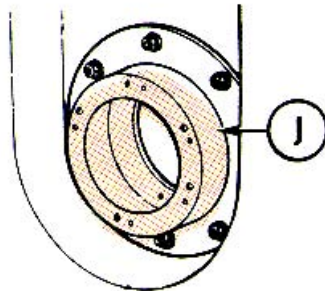
**OPERATE UNDER UNUSUAL CONDITIONS (CHANGE ENGINE AIR INTAKES) - Continued**

6. Using 9/16 inch socket, extension and ratchet, remove six nuts and lockwashers (H) from inside intake (J).
7. Using 9/16 inch socket, extension and ratchet, remove eight nuts and lockwashers (K) on rim of intake (J).

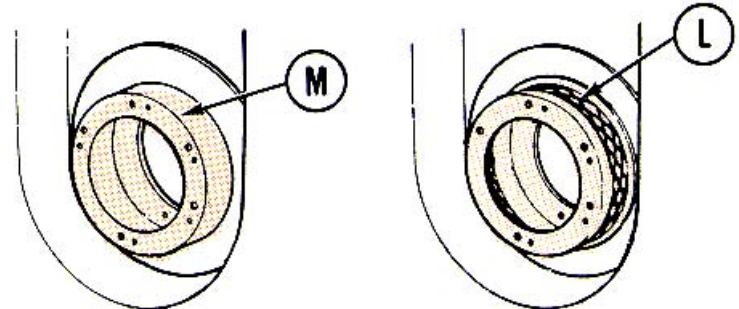
**NOTE**

**A gasket is glued to bulkhead.**

8. Carefully pull intake (J) from bulkhead.



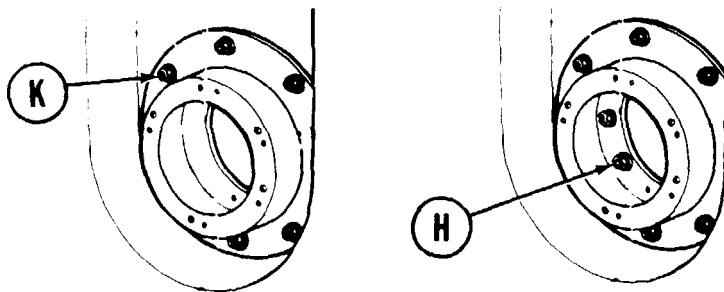
9. Set intake with screen end (L) out toward turret to draw air from crew compartment.



10. Set intake with closed end (M) in (screen toward engine) to draw air from engine compartment.

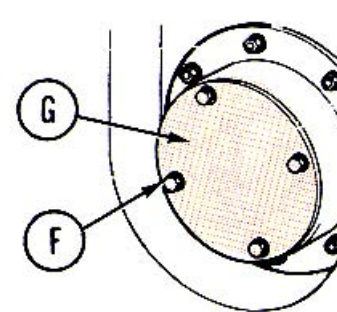
**OPERATE UNDER UNUSUAL CONDITIONS (CHANGE ENGINE AIR INTAKES) - Continued**

11. Install eight nuts and lockwashers (K) on outside rim.
12. Using 9/16 inch socket, extension and ratchet, tighten nuts (K).



13. Using 9/16 inch socket, extension and ratchet, install six nuts and lockwashers (H) on inside of intake.
14. Using 9/16 inch socket, extension and ratchet, tighten screws (H).

15. Place cover (G) with gasket on intake.
16. Install four screws and lockwashers (F) in cover.
17. Using 1/2 inch socket and ratchet, tighten screws (F).
18. Repeat steps 4 thru 17 for other intake.
19. Return tools to stowage.



**OPERATE UNDER UNUSUAL CONDITIONS (INFLATE HULL-TURRET SEAL)****Make Sure:**

- Turret traverse lock is locked (page 2-568).
- Driver's hatch is locked (page 2-166).

**CAUTION**

**Never traverse turret while seal is inflated. Seal would be damaged.**

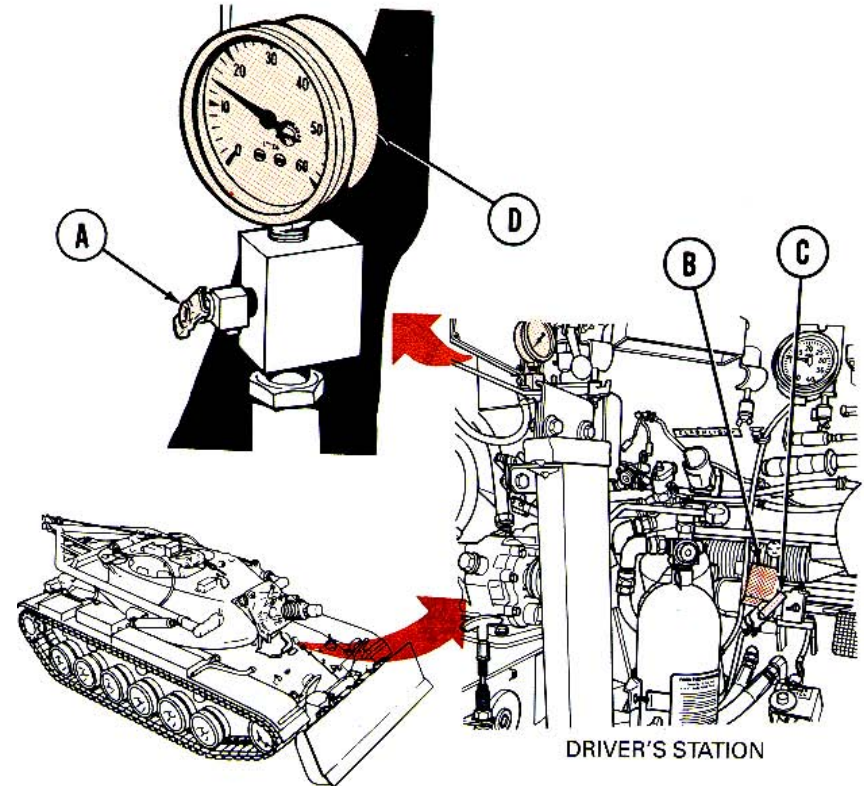
**Inflate Seal:**

1. Turn turret seal drain cock (A) clockwise to close.

**NOTE**

**25 pounds pressure called for on instruction plate (B) is necessary only when fording water over four feet deep.**

2. Pump hand pump (C) until gage (D) indicates 12 to 14 pounds pressure.





**OPERATE UNDER UNUSUAL CONDITIONS (OPERATE BILGE PUMP) (IF SO EQUIPPED)**

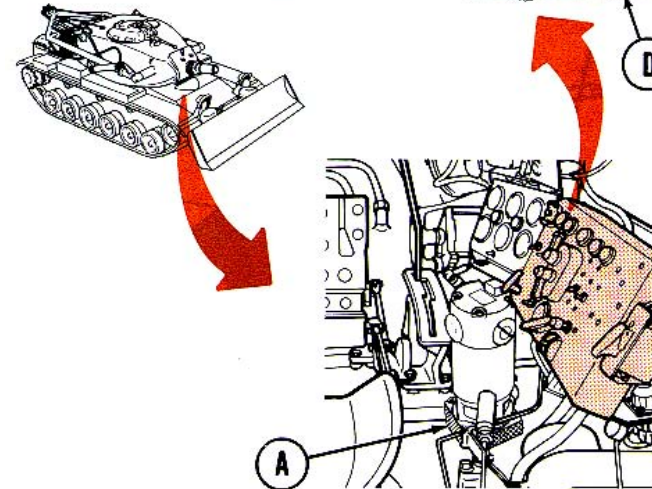
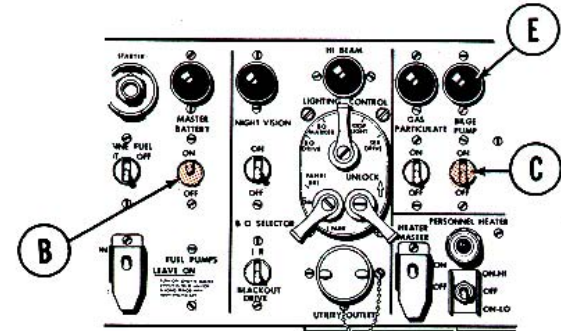
**CAUTION**

Do not operate bilge pump longer than 30 seconds if water is below top of intake screen (A).

1. Set MASTER BATTERY switch (B) to ON.
2. Set BILGE PUMP switch (C) on master control panel (D) to ON. BILGE PUMP light (E) will light.

**To Turn Off:**

1. Set BILGE PUMP switch (C) to OFF. BILGE PUMP light (E) goes out.
2. Set MASTER BATTERY switch (B) to OFF unless it is needed for other operations.



**OPERATE UNDER UNUSUAL CONDITIONS (PERFORM SHALLOW WATER FORDING)**

**To Prepare for Fording:**

**Make Sure:**

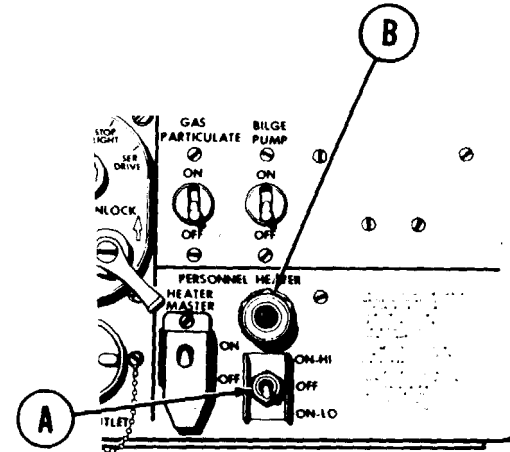
- Parking brakes are on (page 2-213).
- Turret lock is in locked position (page 2-568).
- Filler caps on batteries are tight.
- Driver's escape hatch is installed and secure (page 2-533).

**NOTE**

**This procedure applies only when fording water less than 4 feet (1.22 meters) deep.**

1. Set personnel heater (ON-HI/OFF/ON-LO) switch (A) to OFF.
2. Wait until heater lamp (B) goes out before doing next step if heater was running.

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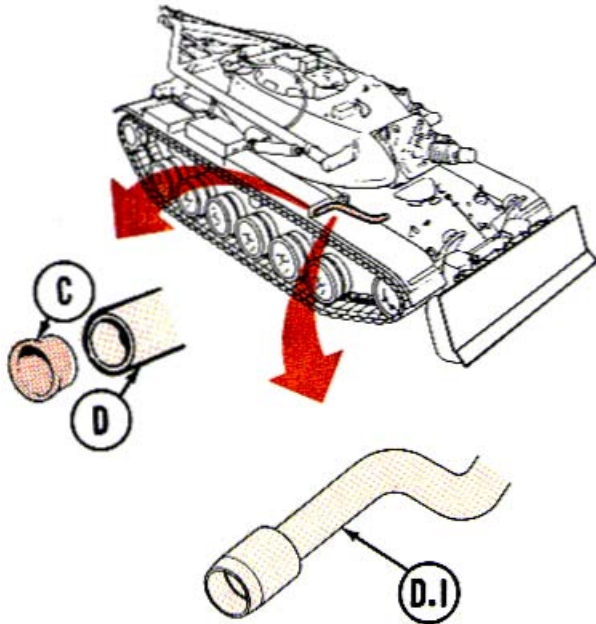


**DRIVER'S STATION**

## OPERATE UNDER UNUSUAL CONDITIONS (PERFORM SHALLOW WATER FORDING) - Continued

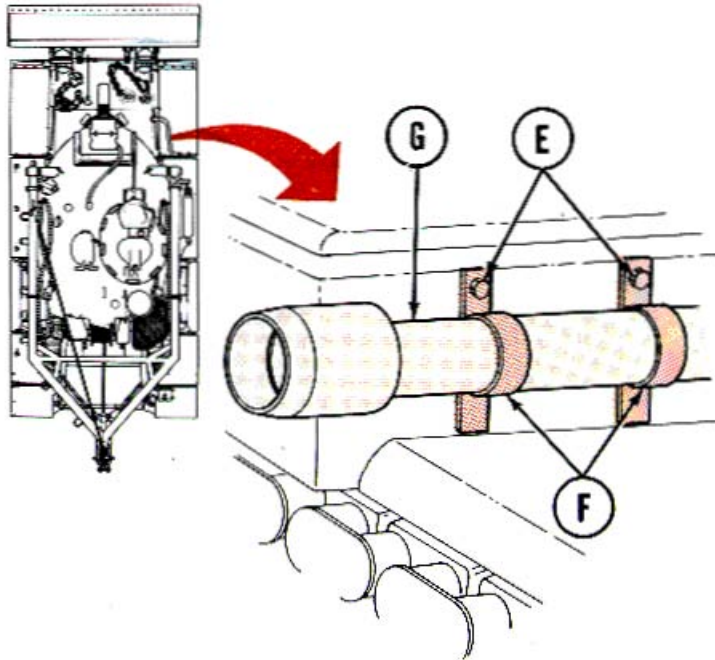
## NOTE

- If your vehicle is equipped with the early exhaust tube (D) perform steps 3, 4, and 5.
- If your vehicle is equipped with the late exhaust tube (D.1) proceed to step 6.

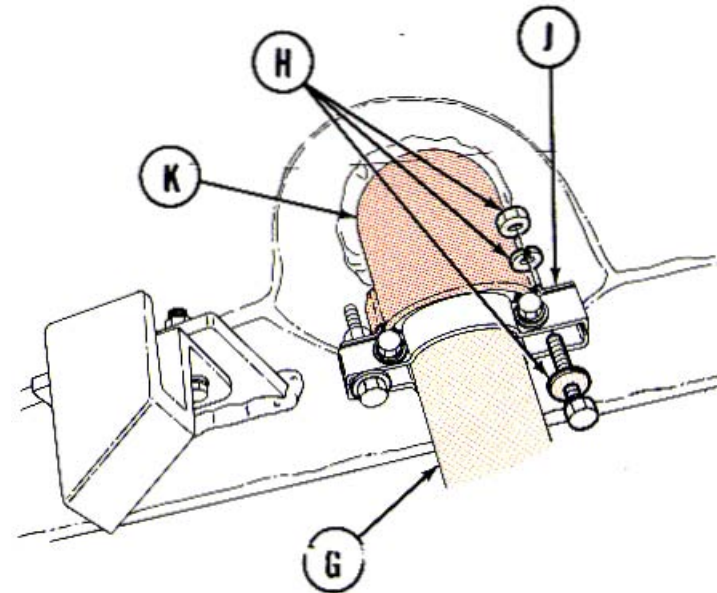


3. Get heater exhaust plug (C) from right front fender box.
4. Install heater exhaust plug (C) on personnel heater exhaust pipe (D).
5. Proceed to step 16.

## OPERATE UNDER UNUSUAL CONDITIONS (PERFORM SHALLOW WATER FORDING)- Continued

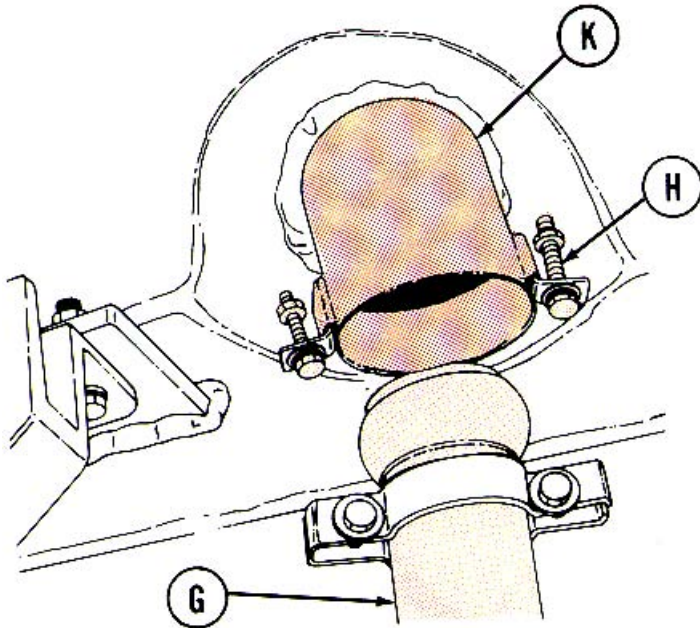


6. Using 9/16 inch socket and ratchet, loosen two screws (E) securing clamps (F) that hold personnel heater exhaust tube (G) to right front fender.



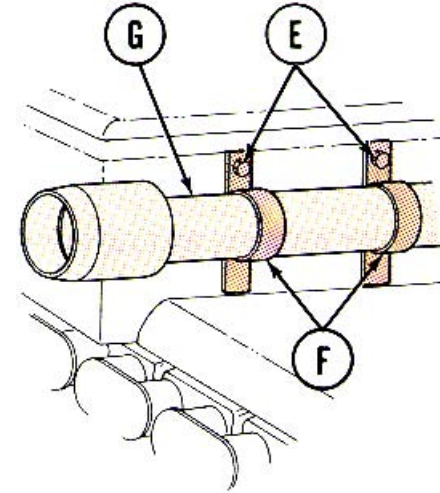
7. Go to inboard end of exhaust tube (G) using 7/16 inch socket, ratchet, and 7/16 inch open end wrench, remove two nuts, two screws, and four washers (H). These hold clamp (J) and exhaust tube (G) to exhaust elbow (K).

## OPERATE UNDER UNUSUAL CONDITIONS (PERFORM SHALLOW WATER FORDING) - Continued

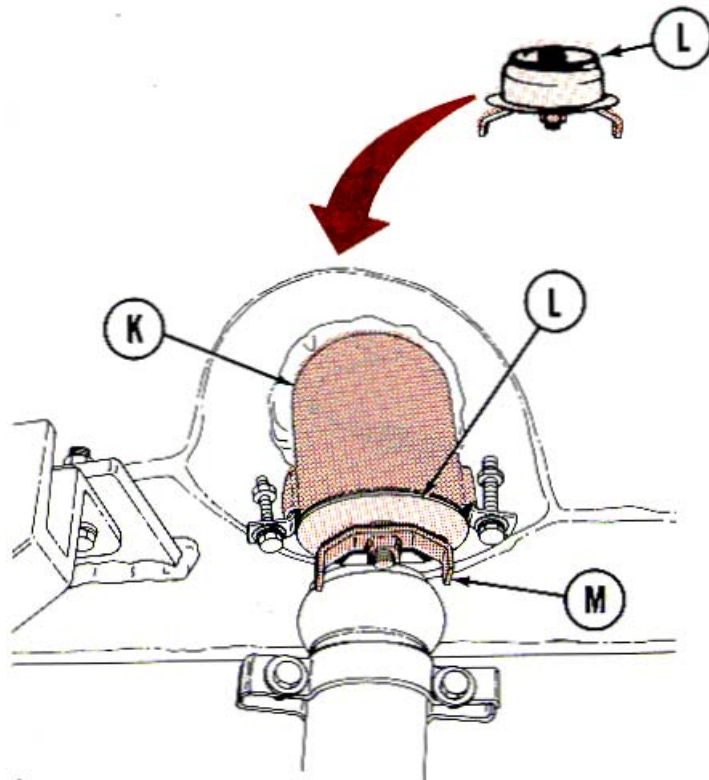


12. Tighten two screws (E) to secure clamps (F) holding exhaust tube (G) to fender.

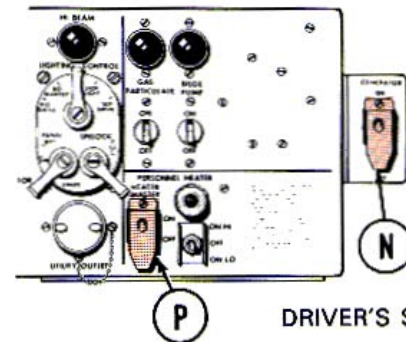
8. Pull exhaust tube (G) from elbow (K). Put end of tube on fender.
9. Slide exhaust tube (G) back about 2 inches.
10. Place two nuts, two screws, and four washers (H) in elbow (K) and tighten.
11. Using rag, clean inside surface of elbow (K).



**OPERATE UNDER UNUSUAL CONDITIONS (PERFORM SHALLOW WATER FORDING) - Continued**



13. Place exhaust plug (L) (from water fording kit) in elbow (K) so that flat portion or rin is flush with exhaust elbow (K).
14. Hold plug in place and rotate handle (M) clockwise to tighten.
15. Set engine air intake to draw air from crew compartment (page 2-658).
16. Set GENERATOR switch (N) to OFF (if so equipped).
17. Set personnel HEATER MASTER switch (P) to OFF.
18. Close crew compartment drain valve (page 2-671).
19. Close engine compartment drain valve (page 2-670).
20. Close and lock driver's hatch (page 2-166).
21. Inflate hull-turret seal (page 2-663).



DRIVER'S STATION

**OPERATE UNDER UNUSUAL CONDITIONS (PERFORM SHALLOW WATER FORDING) -  
Continued**

**To Drive During Fording:**

**CAUTION**

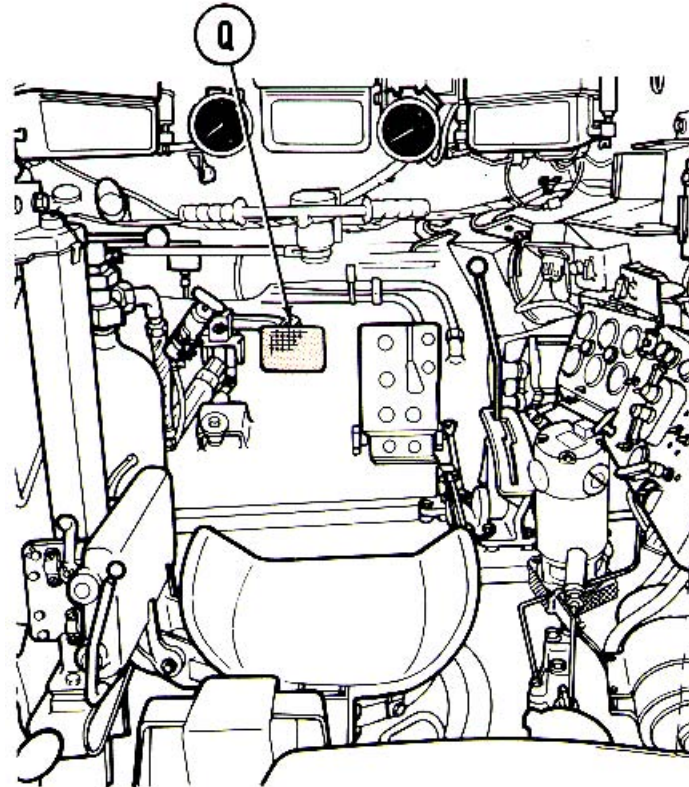
**Do not let engine idle below 1100 to  
1200 rpm during fording.**

1. Start engine and set engine idle to 1100-1200 rpm (page 2-205).
2. Release parking brake (page 2-213).
3. Shift transmission lever to L (Low) (page 2-215).

**NOTE**

**Use brake (Q) to slow vehicle during  
fording.**

4. Enter water slowly.



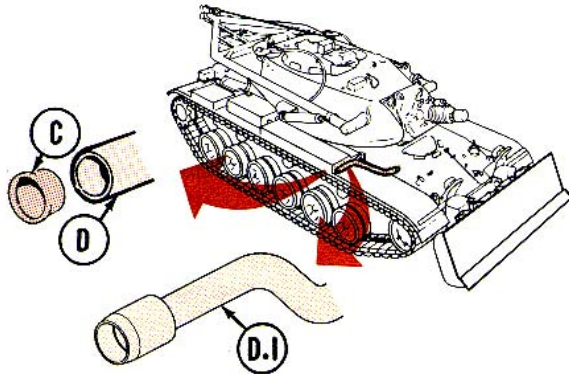
**DRIVER'S STATION**

**OPERATE UNDER UNUSUAL CONDITIONS (PERFORM SHALLOW WATER FORDING) - Continued****Immediately After Fording:**

1. Open crew compartment drain valve (page 2-671).
2. Open engine compartment drain valve (page 2-670).
3. Deflate hull-turret seal (page 2-669).

**NOTE**

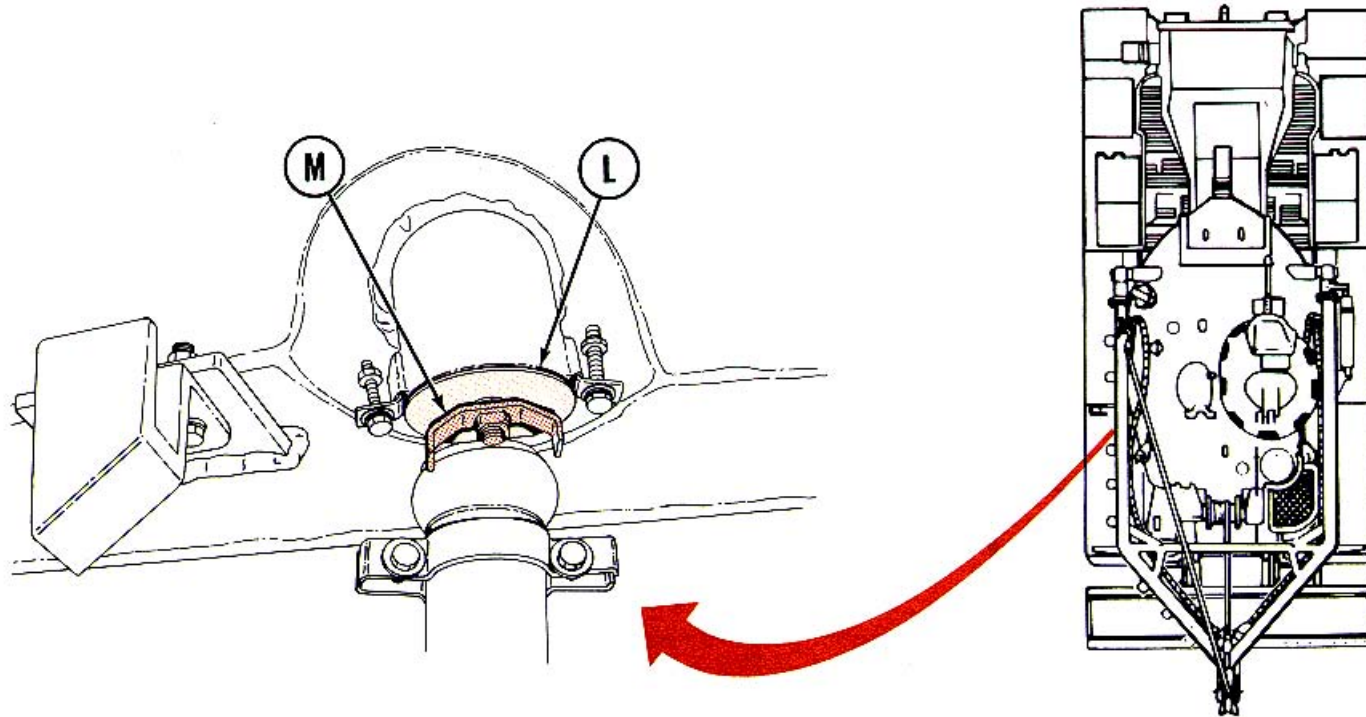
- If your vehicle is equipped with the early exhaust tube.(D) perform step 4 and continue with step 13.
- If your vehicle is equipped with the late exhaust tube (D.1) proceed to step 6.



4. Remove heater exhaust plug (C) from personnel heater exhaust pipe (D). Stow heater exhaust plug (C) in right front fender box.
5. Proceed to step 13.



OPERATE UNDER UNUSUAL CONDITIONS (PERFORM SHALLOW WATER FORDING) - Continued



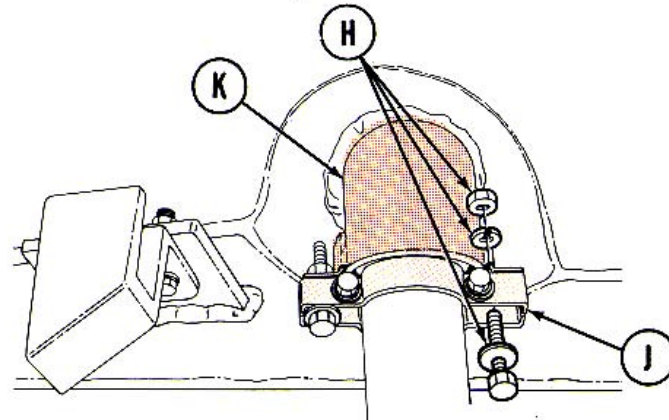
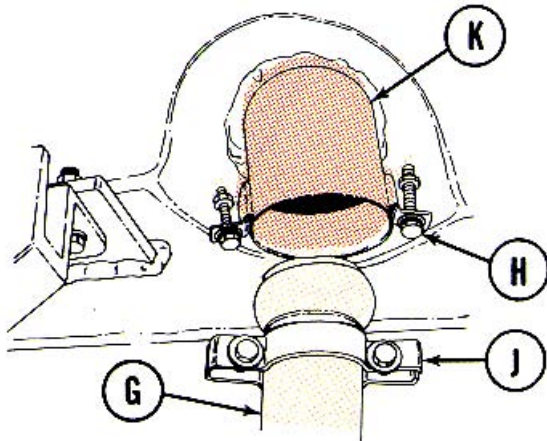
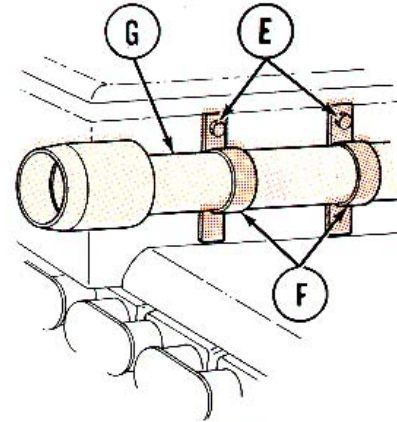
6. Turning handle (M) counterclockwise, unscrew personnel heater exhaust elbow plug (L).
7. Remove plug (L).

Change 1 2-666.5

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**OPERATE UNDER UNUSUAL CONDITIONS (PERFORM SHALLOW WATER FORDING)- Continued**

8. Loosen two mounting screws (E) securing clamps (F) holding personnel heater exhaust tube (G) to right front fender. Exhaust tube (G) will slide freely.
9. Unscrew two nuts and screws and four washers (H) from elbow (K).
10. Place exhaust tube (G) in exhaust elbow (K).
11. Place two nuts and screws and four washers (H) in clamp (J) and elbow (K). These hold clamp (J) and exhaust tube (G) to exhaust elbow (K). Tighten screws and nuts.



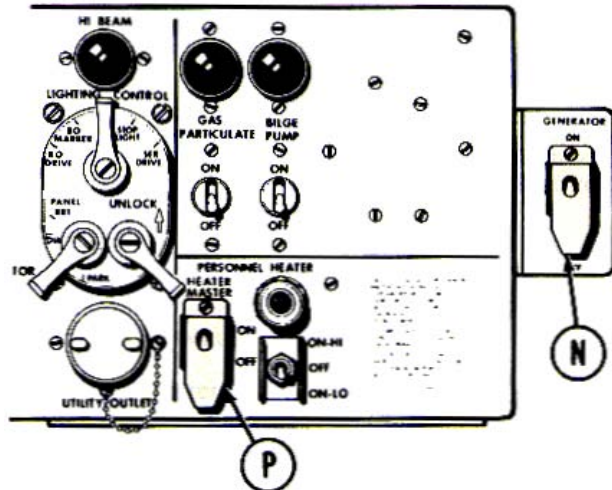
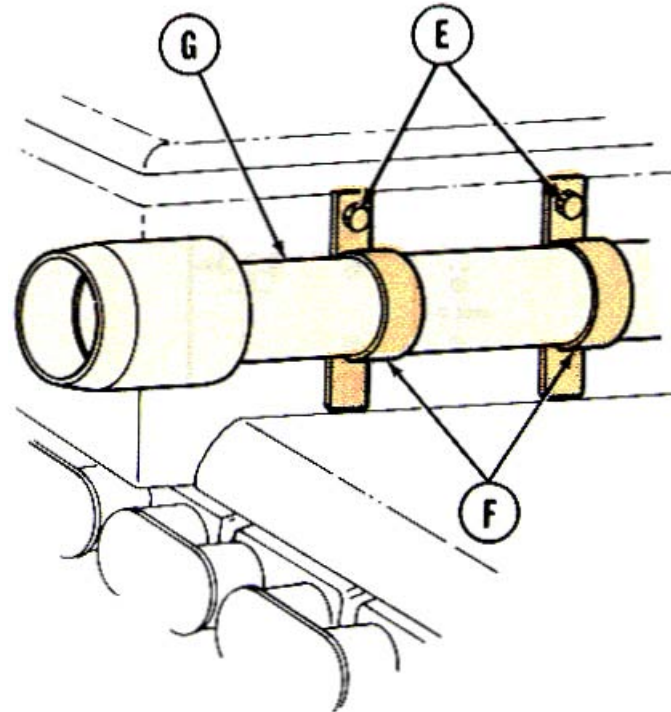
**OPERATE UNDER UNUSUAL CONDITIONS (PERFORM SHALLOW WATER FORDING) - Continued**

12. Tighten two mounting screws (E) to secure clamps (F) holding personnel heater exhaust tube (G) to right front fender.

**CAUTION**

**Do not set ON-HI/OFF/ON-OFF switch to ON until after HEATER MASTER switch is set to ON.**

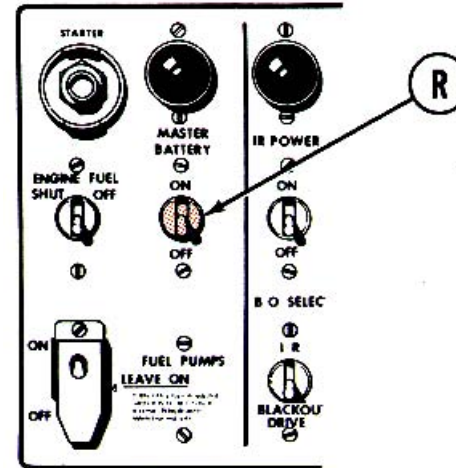
13. Set GENERATOR switch (N) to ON (if so equipped).
114. Set HEATER MASTER switch (P) to ON.



**OPERATE UNDER UNUSUAL CONDITIONS (PERFORM SHALLOW WATER FORDING) - Continued**

**As Soon As Possible After Fording:**

1. Stop vehicle (page 2-213).
2. Set MASTER BATTERY switch (R) to OFF.
3. If fording was in salt water, wash vehicle.
4. Check engine and transmission oil dipsticks for any sign of water. If water is present, notify organizational maintenance.
5. Remove fill plug. Check final drives for any signs of water (LO 9-2350-222-12). If water is present, notify organizational maintenance. Install fill plug.
6. Drain brake control housings (page 2-672).
7. Lubricate suspension system (LO 9-2350-222-12).
8. Check both air cleaners for water (page 2-675). If water is present, notify organizational maintenance.
9. Service batteries (page 3-107).



**DRIVER'S STATION**

**OPERATE UNDER UNUSUAL CONDITIONS (PERFORM DEEP WATER FORDING)****NOTE**

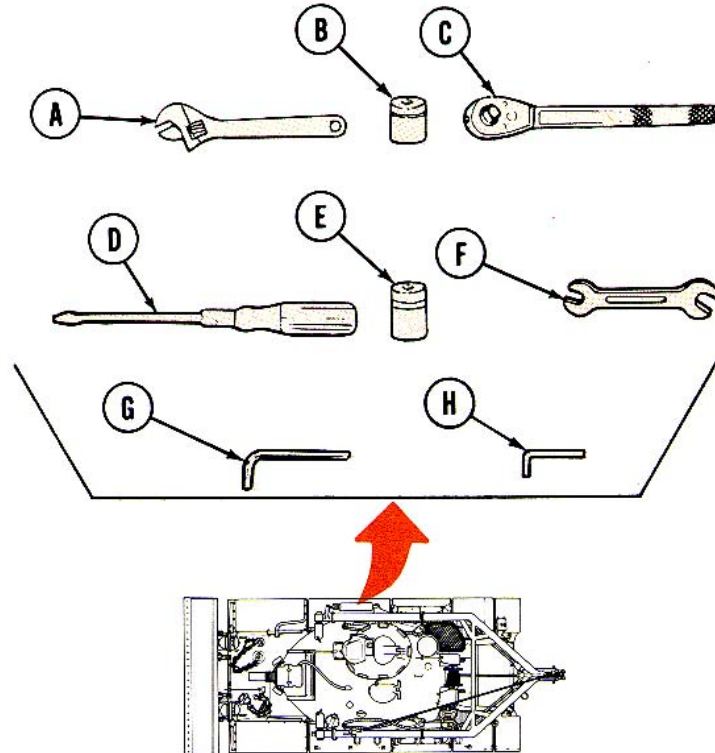
Use following procedure when fording water four to eight feet deep. Your vehicle can ford deep water only if equipped with bilge pump and deep water fording kit.

All four crewmen assist in preparing vehicle for fording water. One crewman inside vehicle manually operates turret, main gun, and performs inside procedure requirements.

**Tools:**

Get from right front fender box:

- 8 inch adjustable wrench (A)
- 9/16 inch socket with 1/2 inch drive (B)
- Ratchet with 1/2 inch drive (C)
- Flat-tip screwdriver with 6-inch blade (D)
- 7/16 inch socket with 1/2 inch drive (E)
- 7/16 inch open end wrench (F)
- 5/8 inch socket head screw key (G)
- 3/8 inch socket head screw key (H)



Change 1 2-668.1

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**OPERATE UNDER UNUSUAL CONDITIONS (PERFORM DEEP WATER FORDING) - Continued**

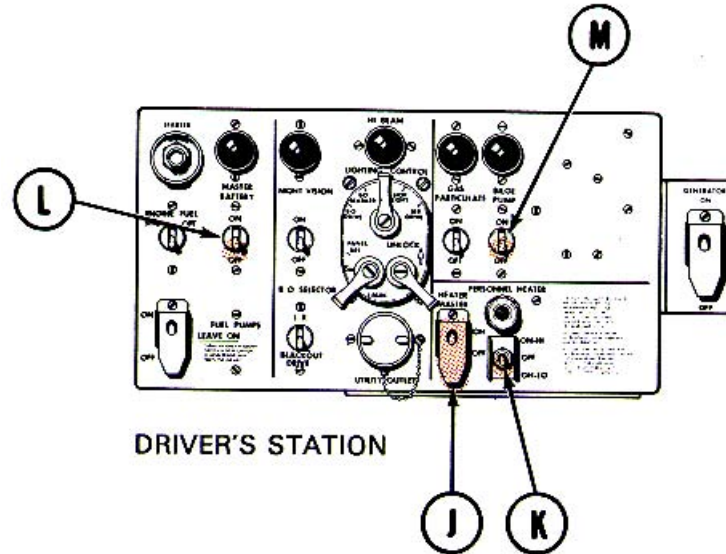
**Before Installing Water Fording Kit:**

1. Set HEATER MASTER switch (J) and ON-HI/OFF/ON-LOW switch (K) to OFF.
2. Tape HEATER MASTER switch (J) to OFF.
3. Set MASTER BATTERY switch (L) to ON.

**CAUTION**

**Running bilge pump for more than 30 seconds when dry will damage motor.**

4. Set BILGE PUMP switch (M) to ON and listen for motor to operate. Leave on for 10 seconds.
5. Set BILGE PUMP switch (M) to OFF.

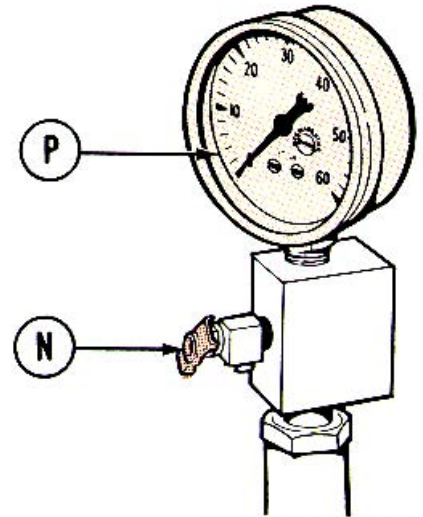


**OPERATE UNDER UNUSUAL CONDITIONS (PERFORM DEEP WATER FORDING) - Continued**

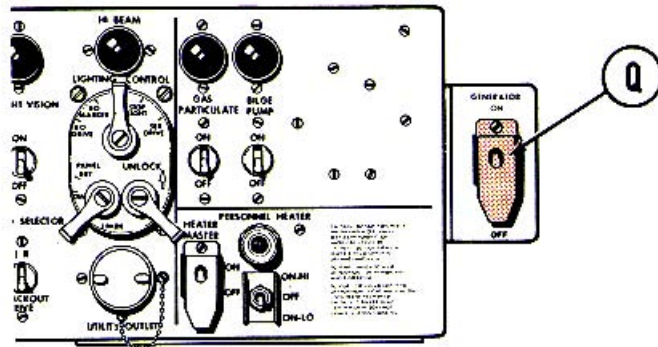
**CAUTION**

**Do not rotate turret when hull turret seal is inflated.**

6. Inflate hull-turret seal (page 2-663).
7. Turn hull-turret seal draincock (N) counterclockwise to open.
8. When gage (P) shows 0 pounds pressure, unlock turret traverse lock (page 2-331).
9. Start engine (page 2-205).



DRIVER'S STATION

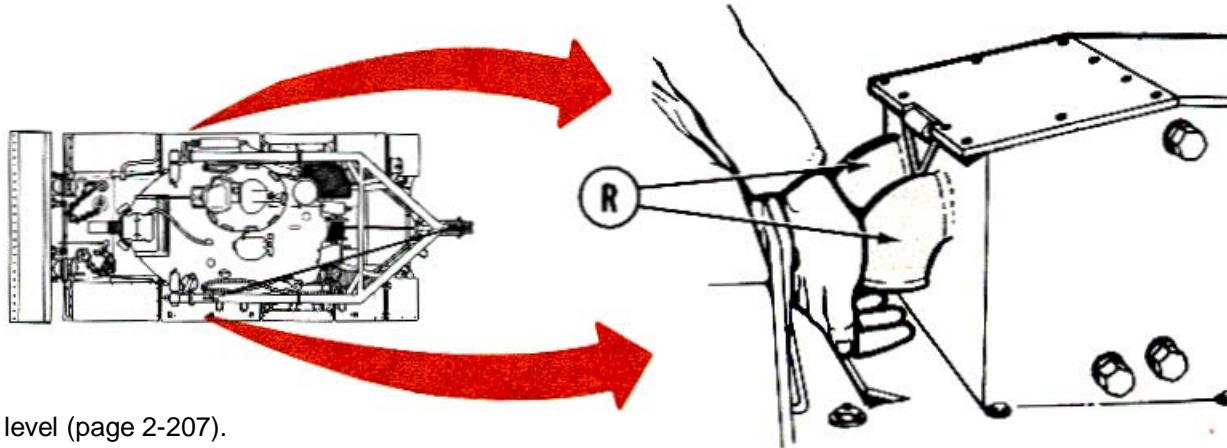


DRIVER'S STATION

10. Set GENERATOR switch (Q) to ON (if so equipped).

**OPERATE UNDER UNUSUAL CONDITIONS (PERFORM DEEP WATER FORDING) - Continued**

11. Have crewman outside of vehicle feel if air is being blown from exhaust ports (R) (two ports on right side and two ports on left side of vehicle).



12. Check fuel level (page 2-207).

**NOTE**

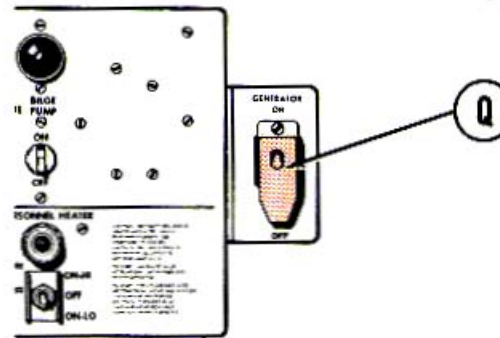
**If oil level is low for engine or transmission, see LO 9-2350-222-12.**

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

14. Check transmission oil level (page 2-74). Make sure cap and dipstick are secure.

15. Shut down engine (page 2-536).

16. Set GENERATOR switch (Q) to OFF (if so equipped).

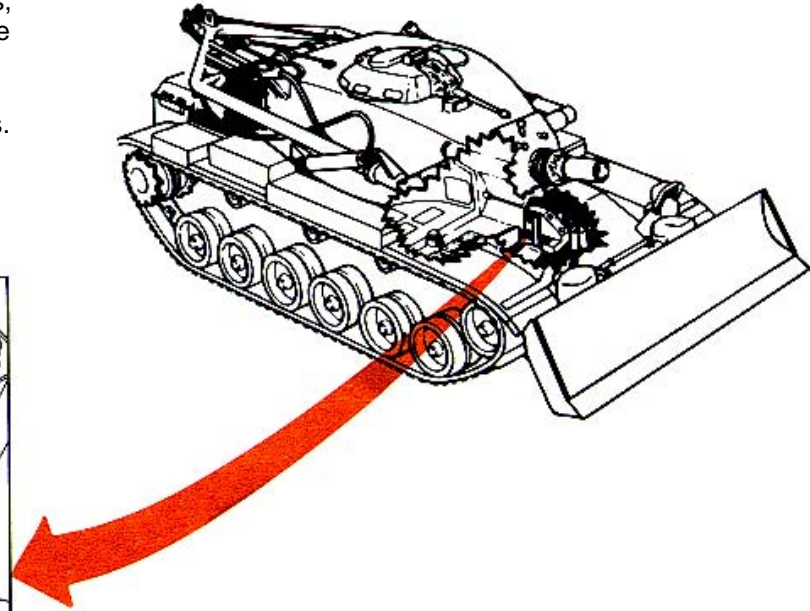
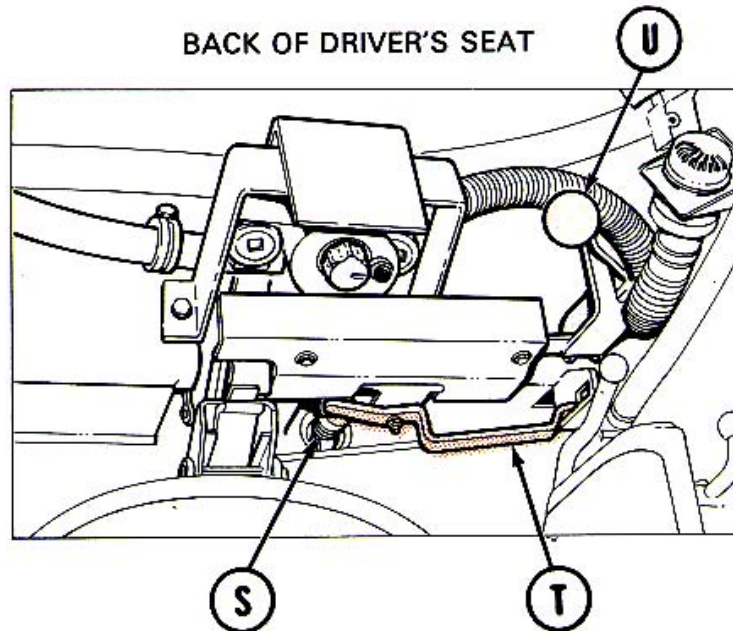


**DRIVER'S STATION**



**OPERATE UNDER UNUSUAL CONDITIONS (PERFORM DEEP WATER FORDING) - Continued**

17. Check that there are no obstructions (spent cartridges, cigarette butts, nuts or bolts, etc., blocking return of valve plunger (S).
18. Pull lever (T) forward then push lever down until it stops. This will close crew compartment drain valve.



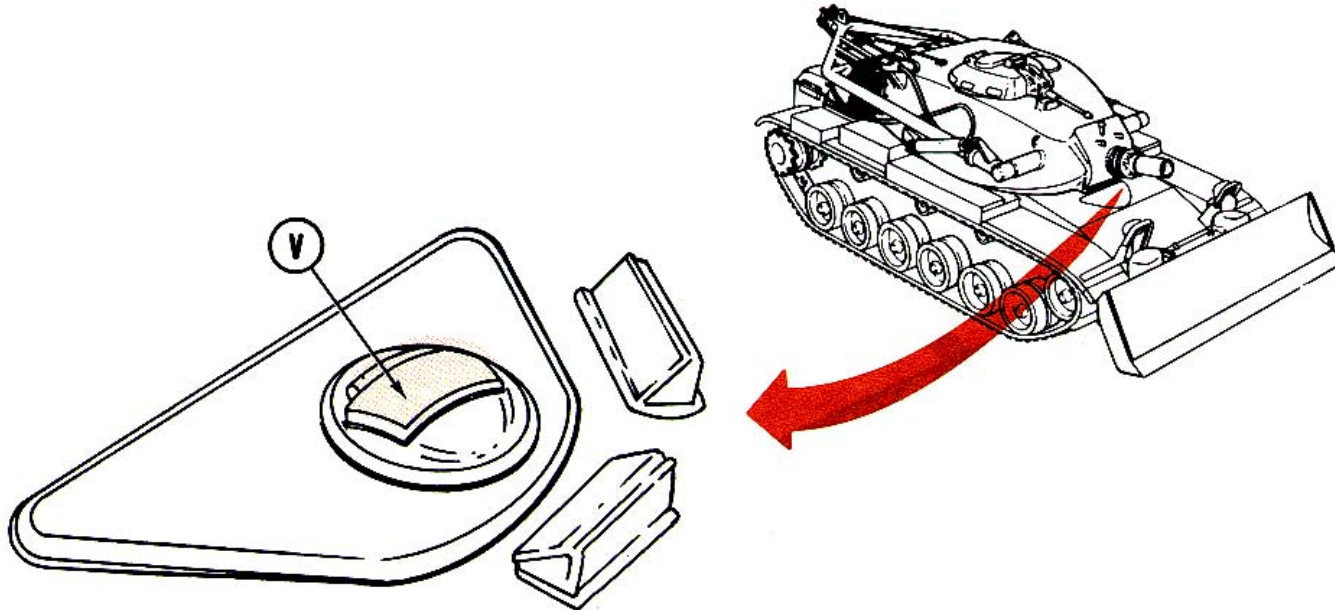
19. Check that engine compartment drain valve (U) is open.
20. Close and lock driver's hatch if hatch is open (page 2-166).

**OPERATE UNDER UNUSUAL CONDITIONS (PERFORM DEEP WATER FORDING) - Continued**

NOTE

Do not remove M27 periscopes.

21. Remove driver's night vision viewer or M24 IR periscope (if installed) and close viewer cover (V) (page 2-600.1 or page 2-596).



22. Inspect driver's escape hatch for secure placement (page 2-535).

**OPERATE UNDER UNUSUAL CONDITIONS (PERFORM DEEP WATER FORDING) - Continued**

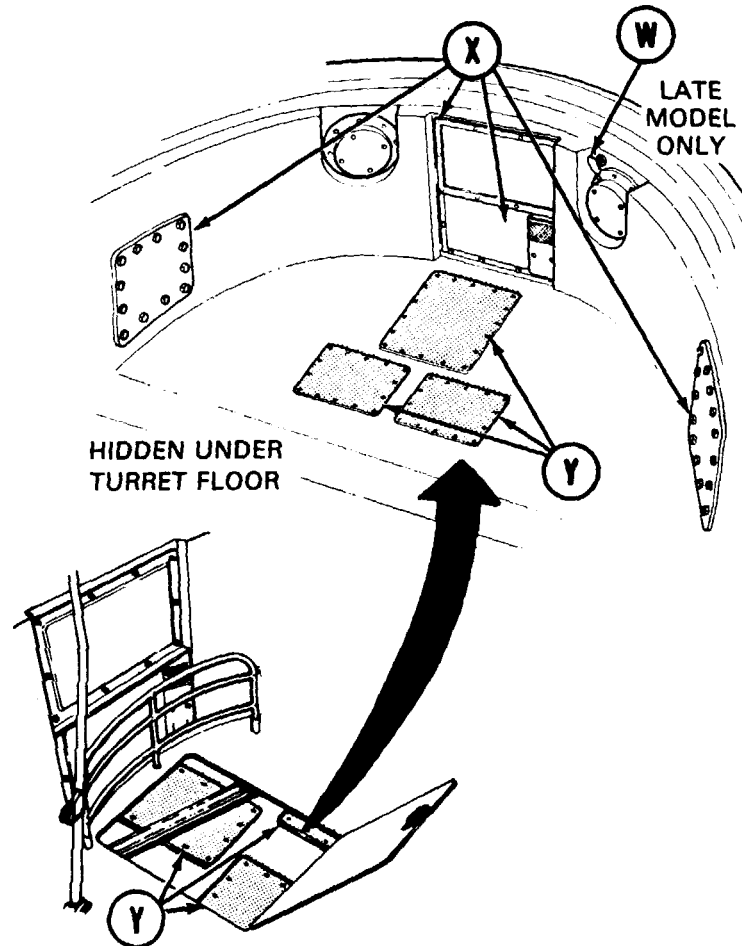
23. Set air intakes with screen end out to draw air from crew compartment (page 2-659).
24. (Late model only) pull FORDING EXHAUST handle (W) out to close and turn clockwise to lock generator exhaust valve closed.

**NOTE**

To reach bulkhead plates (X) you may have to traverse turret manually (page 2-479).

To find access plates (Y) open hinged turret platform access door (page 3-107). Look through open door and traverse turret (page 2479) until you see access plates (Y) on hull floor. To reach all screws, manually traverse turret as necessary.

25. Check that four bulkhead plates (X) and three turret floor access plates (Y) are not loose or missing screws. If loose, tighten using screwdriver and 9/16 inch socket wrench with ratchet.
26. Check that all intercom stations operate (page 2-169).

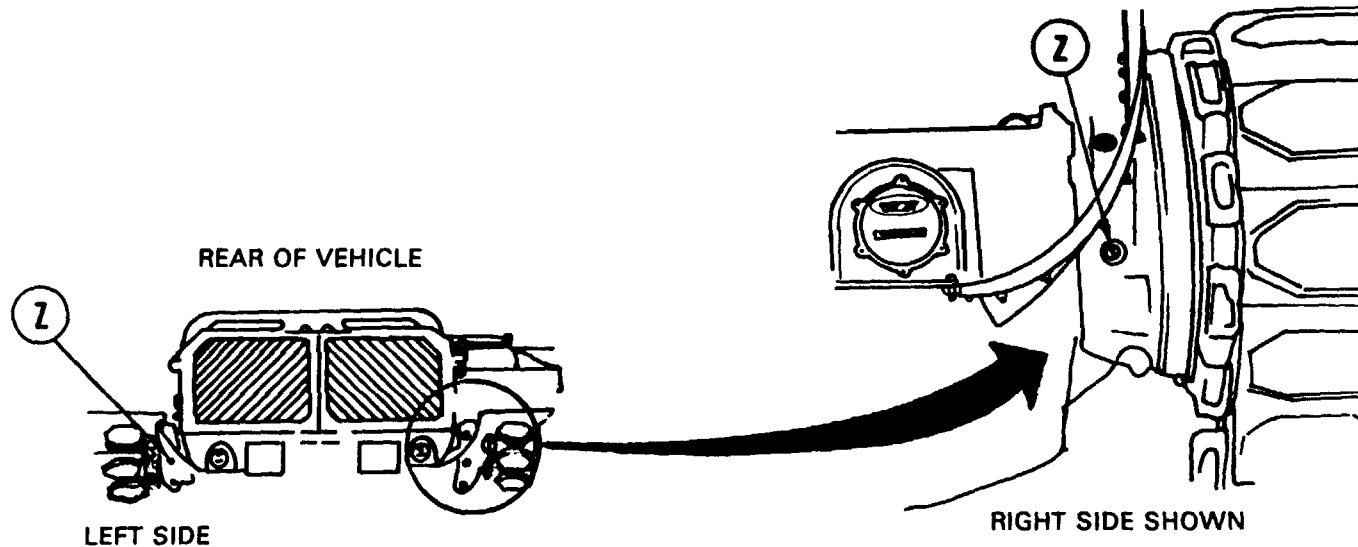


## OPERATE UNDER UNUSUAL CONDITIONS (PERFORM DEEP WATER FORDING) - Continued

## NOTE

If oil level is low for final drive, see LO 9.2350-222-12.

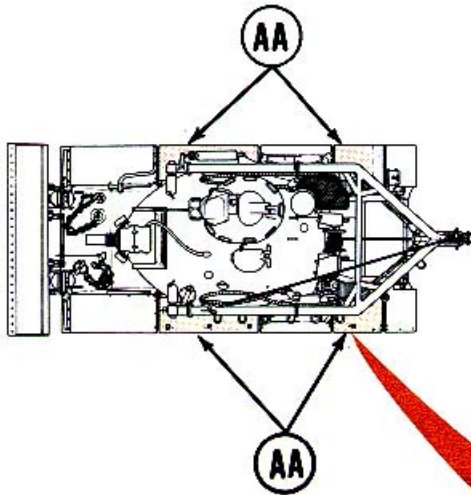
27. Using 5/8 inch key socket, remove screws (Z) on right and left final drive. If oil drips out final drive, oil level is good. Install screws. If oil does not drip out, level is low. Add oil per LO 92350-222-12.



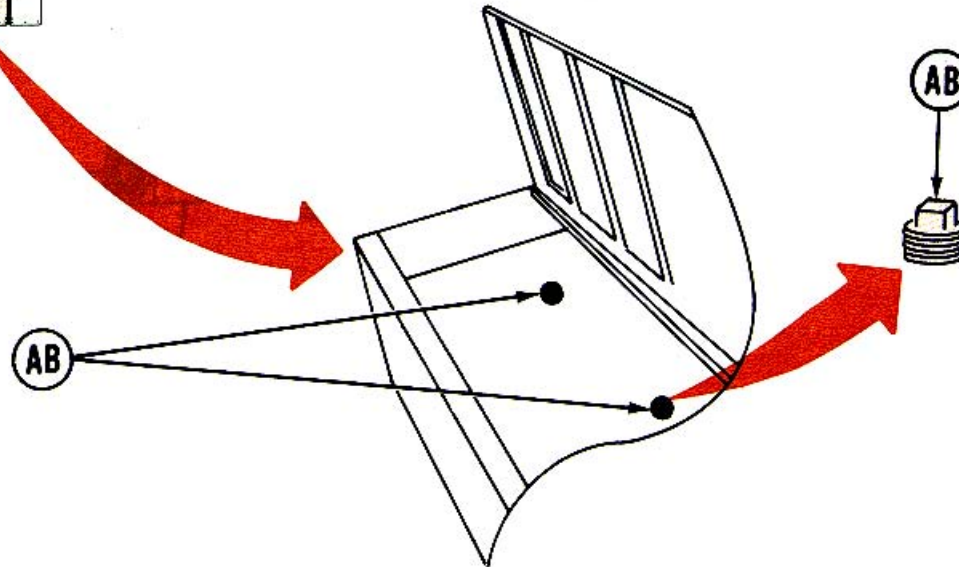
Change 1 2-668.8

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OPERATE UNDER UNUSUAL CONDITIONS (PERFORM DEEP WATER FORDING)- Continued



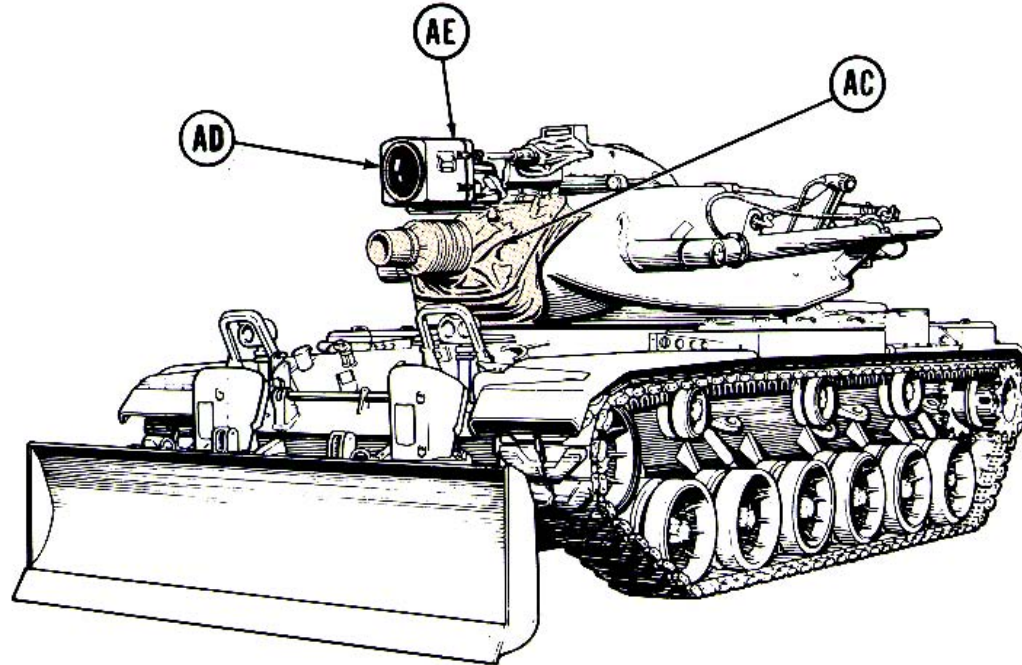
28. Open four fender boxes (AA).
29. Using adjustable wrench, remove eight fender stowage box drain plugs (AB) (two from each box).
30. Stow plugs in left rear fender box. Close all four fender box covers.



Change 1 2-668.9

**OPERATE UNDER UNUSUAL CONDITIONS (PERFORM DEEP WATER FORDING) - Continued**

31. Inspect main gun shield (AC) for cracks, tears, and other damage.
32. If installed, inspect searchlight window gasket (AD) and heat exchanger gasket (AE).
33. Check that air cleaner doors are secure (page 2-47).

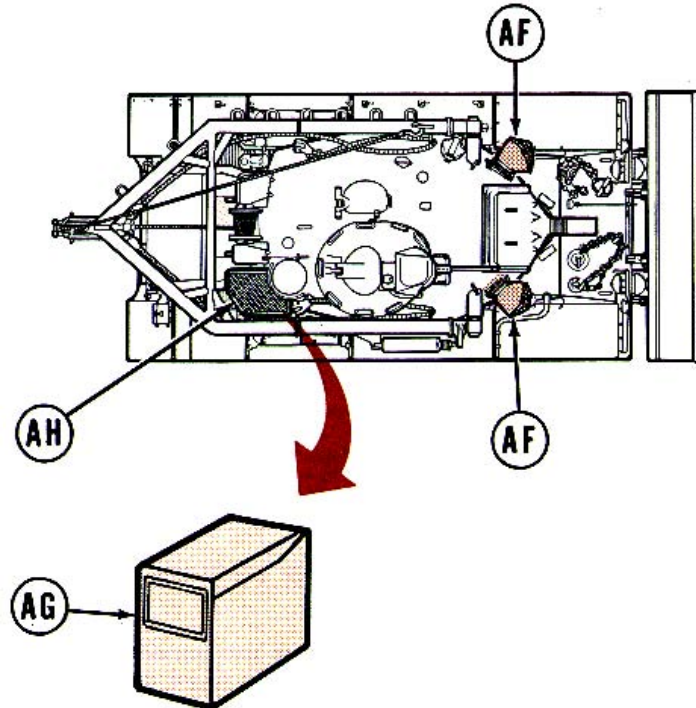


Change 1 2-668.10

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**OPERATE UNDER UNUSUAL CONDITIONS (PERFORM DEEP WATER FORDING)- Continued**

34. Unload smoke grenade launchers (AF) (page 2-566.1) (if loaded).



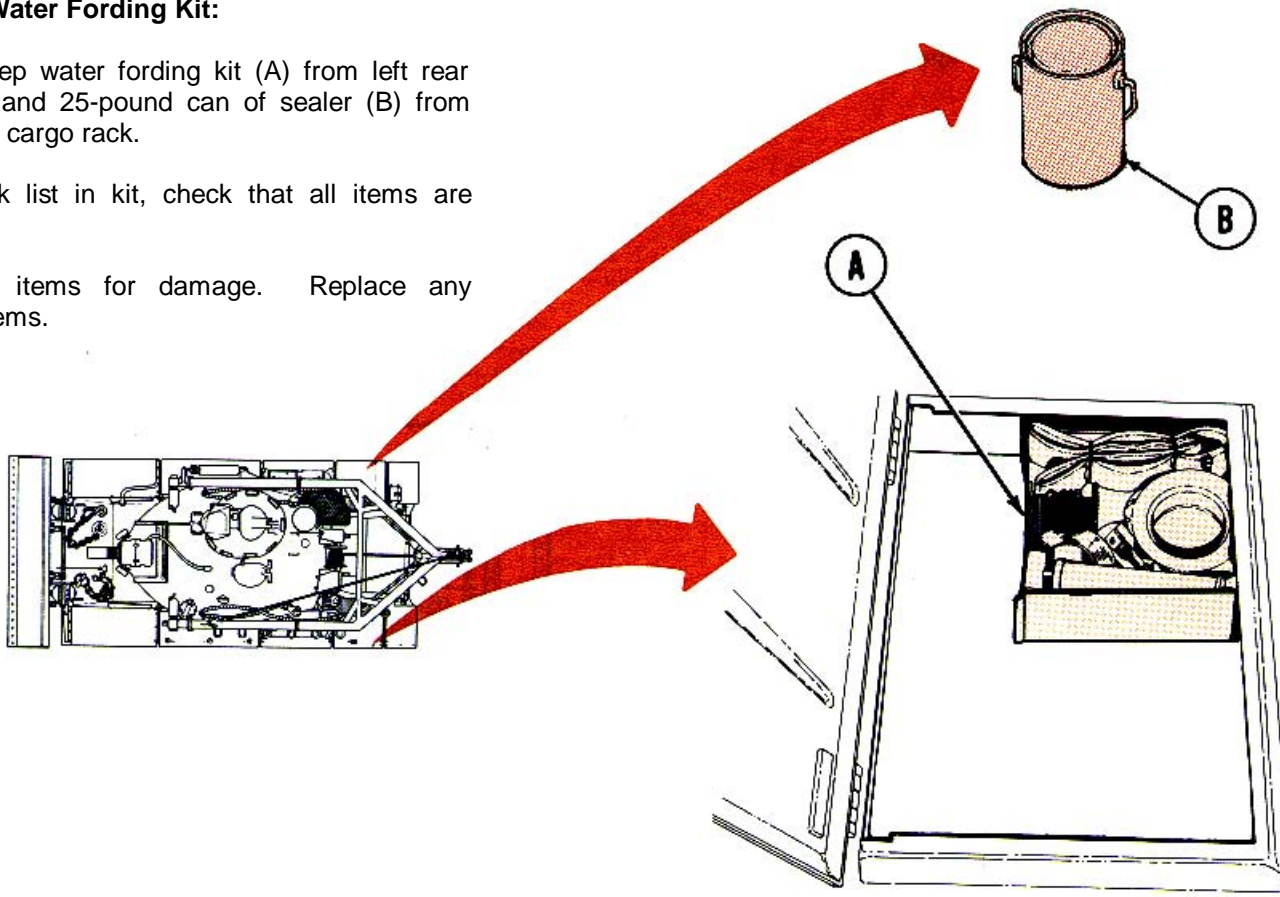
35. Stow and tie down smoke grenade ammunition stowage box (AG) in turret bustle cargo rack (AH).

Change 1 2-668.11

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**OPERATE UNDER UNUSUAL CONDITIONS (PERFORM DEEP WATER FORDING)- Continued****To Install Deep Water Fording Kit:**

1. Remove deep water fording kit (A) from left rear fender box and 25-pound can of sealer (B) from turret bustle cargo rack.
2. Using check list in kit, check that all items are removed.
3. Inspect all items for damage. Replace any damaged items.



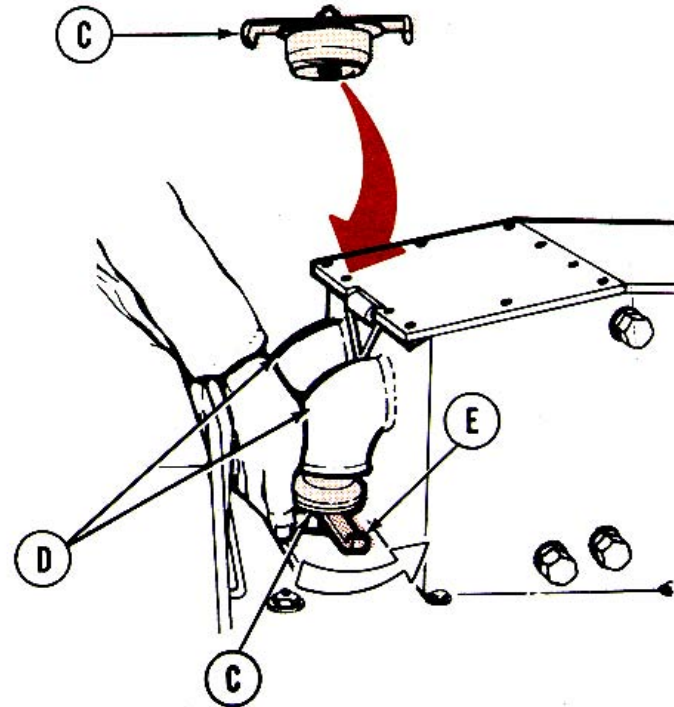
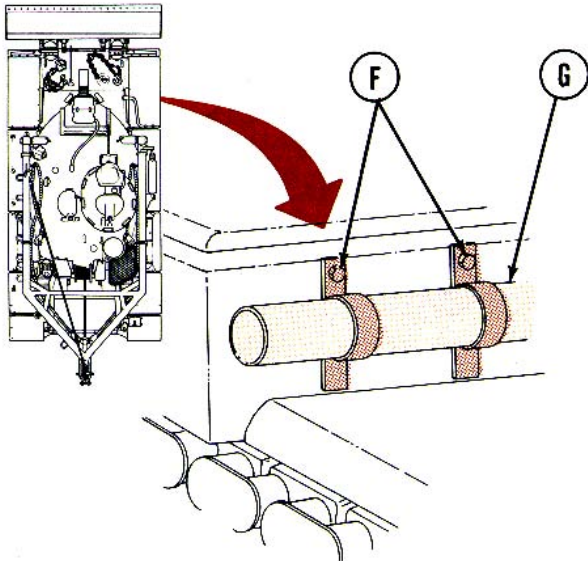
Change 1 2-668 12

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**OPERATE UNDER UNUSUAL CONDITIONS (PERFORM DEEP WATER FORDING)- Continued**

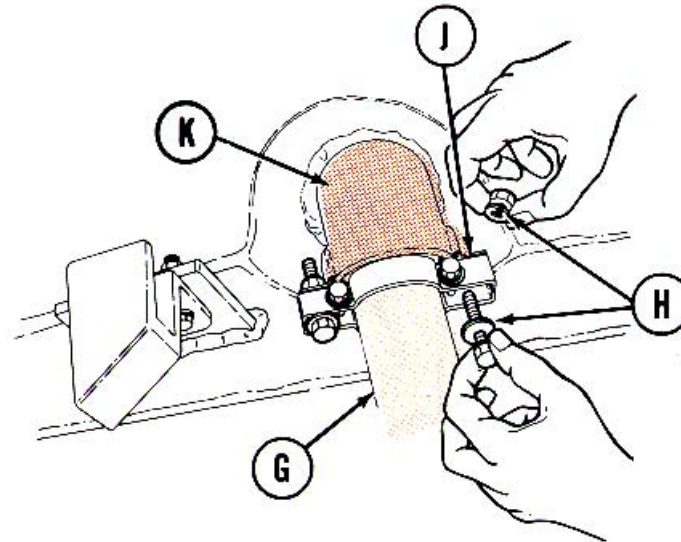
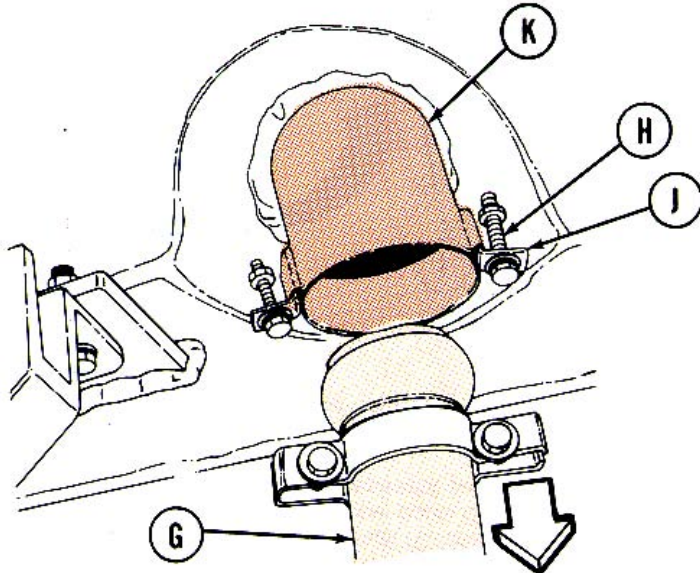
4. Get four air cleaner exhaust plugs (C) from water fording kit. Place two in exhaust ports (D) located on left side of vehicle and two in exhaust ports on right side of vehicle.
5. Hold plug in place and rotate handle (E) counterclockwise until plug fits tight.



6. Using 9/16 inch socket and ratchet, loosen two screws and clamps (F) that hold personnel heater exhaust tube (G) to right front fender.

**OPERATE UNDER UNUSUAL CONDITIONS (PERFORM DEEP WATER FORDING) - Continued**

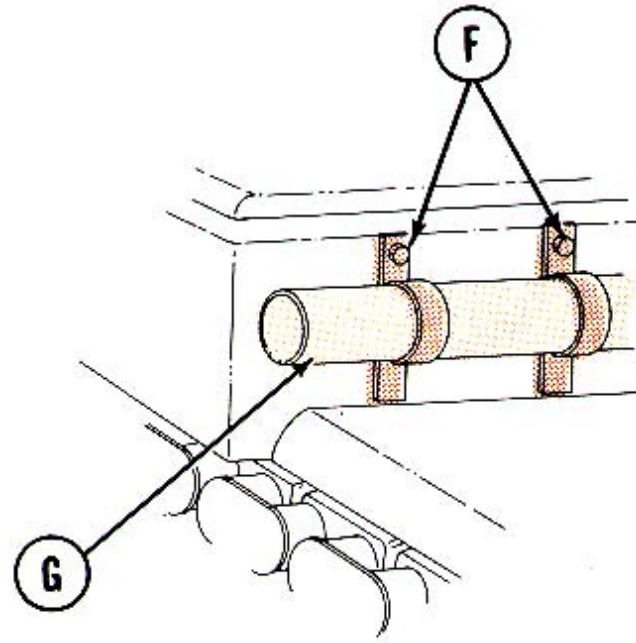
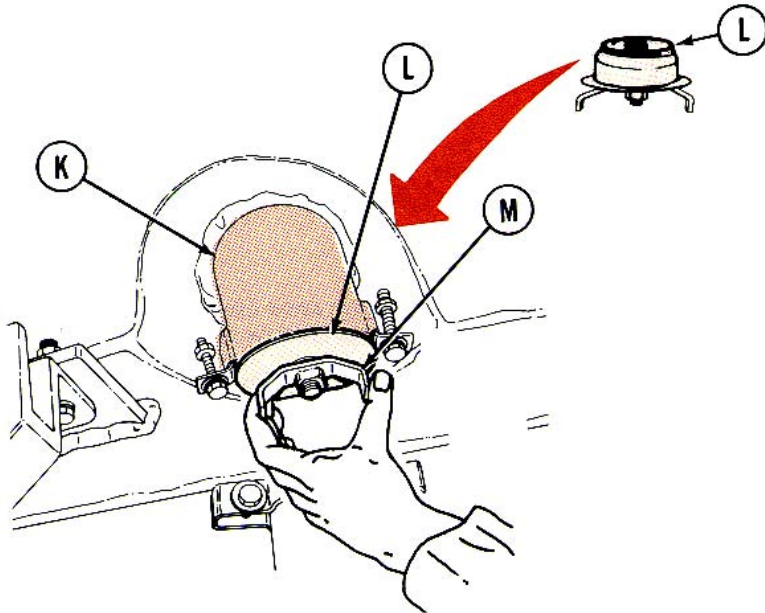
7. Go to inboard end of exhaust tube (G). Using 7/16 inch socket, ratchet, and 7/16 inch open end wrench, remove two nuts, two screws, and four washers (H). These hold clamp (J) and exhaust tube (G) to exhaust elbow (K).
8. Pull exhaust tube (G) from elbow (K). Put end of tube on fender.



9. Slide exhaust tube (G) back about 2 inches.
10. Place two nuts, two screws, and four washers (H) in clamp (J) and tighten.

**OPERATE UNDER UNUSUAL CONDITIONS (PERFORM DEEP WATER FORDING) - Continued**

11. Tighten two screws and clamp (F) holding exhaust tube (G) to fender.
12. Using rag, clean inside surface of elbow (K).



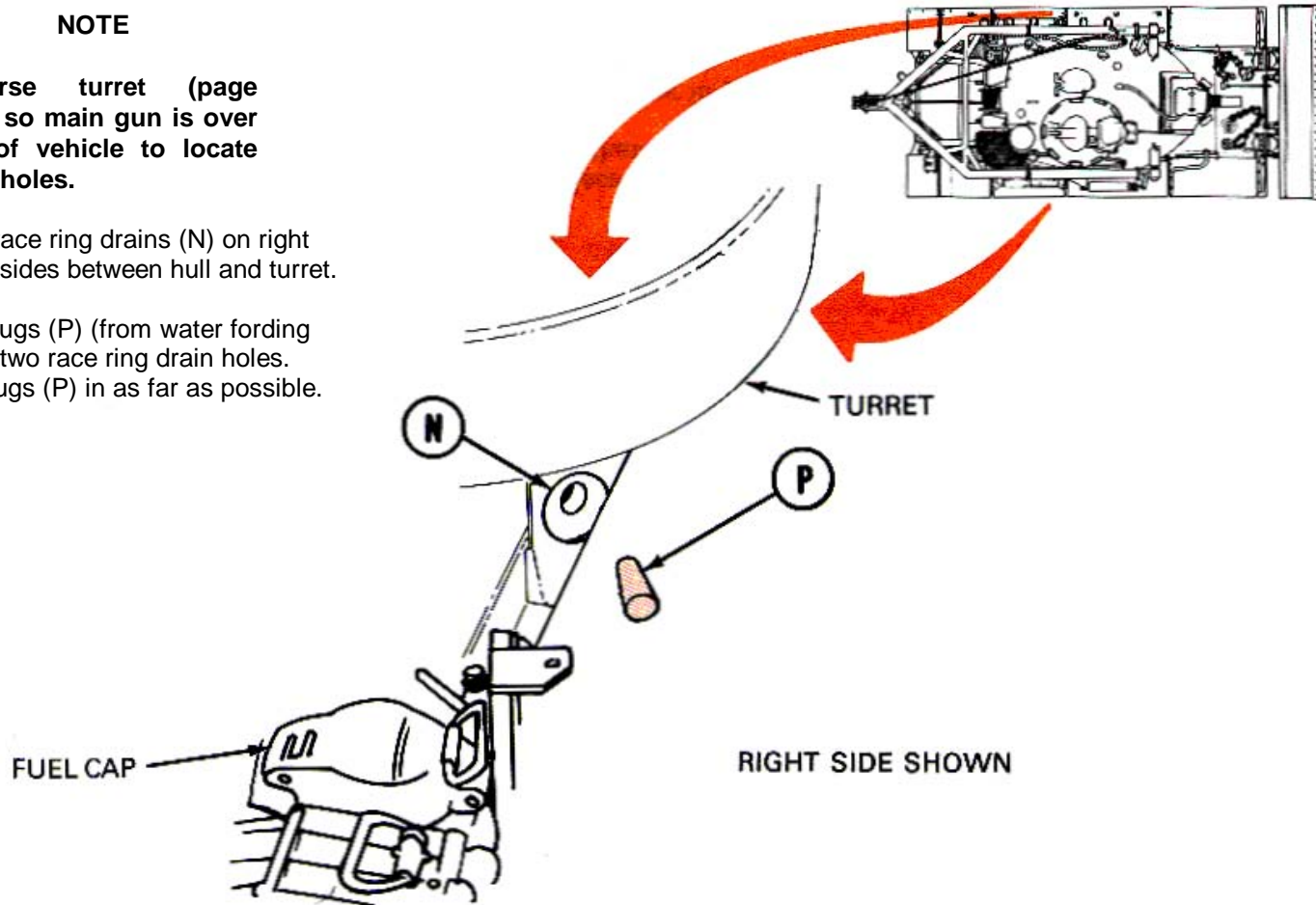
13. Place exhaust plug (L) (from water fording kit) in elbow so that flat portion of rim is flush with exhaust elbow (K).
14. Hold plug in place and rotate handle (M) clockwise to tighten.

OPERATE UNDER UNUSUAL CONDITIONS (PERFORM DEEP WATER FORDING) . Continued

NOTE

Traverse turret (page 2478) so main gun is over rear of vehicle to locate drain holes.

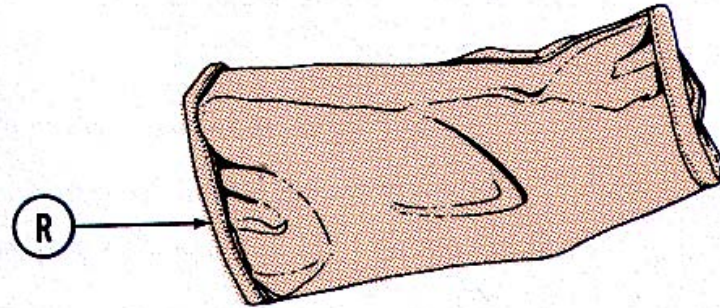
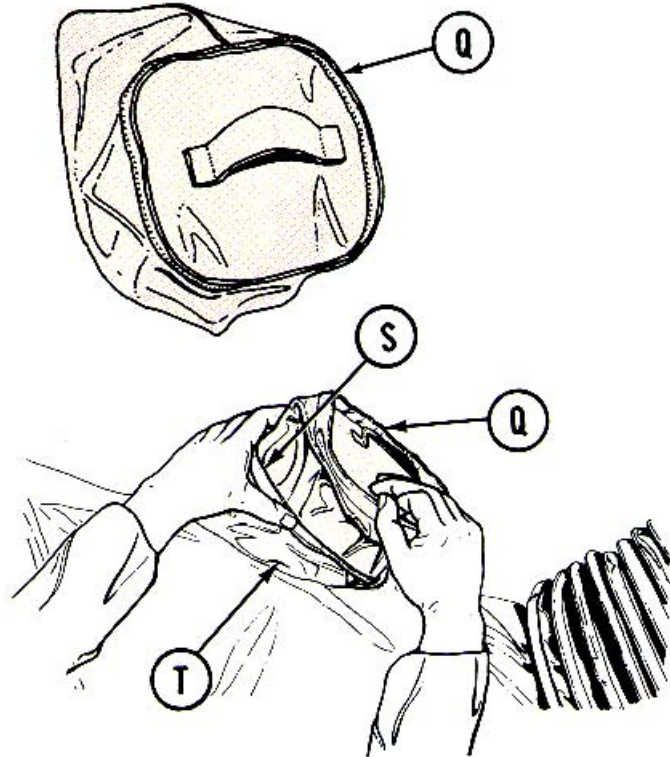
15. Locate race ring drains (N) on right and left sides between hull and turret.
16. Place plugs (P) (from water fording kit) into two race ring drain holes. Push plugs (P) in as far as possible.



RIGHT SIDE SHOWN

**OPERATE UNDER UNUSUAL CONDITIONS (PERFORM DEEP WATER FORDING) - Continued**

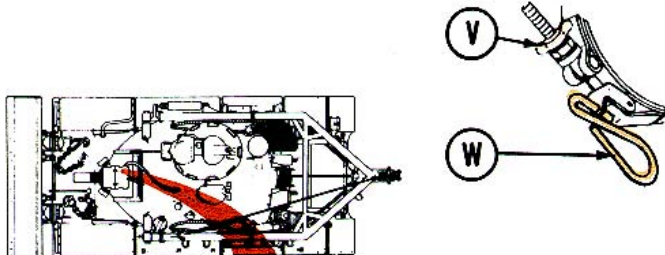
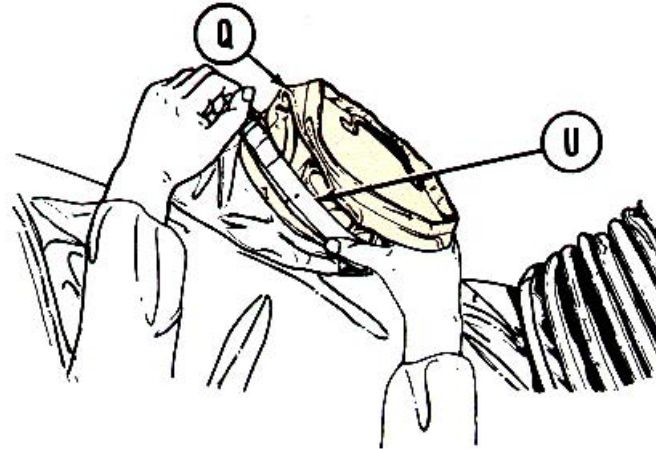
17. Get telescope port cover (Q) and machine gun cover (R) from right front fender stowage box.



18. Place telescope port cover (Q) over opening (S). Cover should overlap telescope shield (T).

**OPERATE UNDER UNUSUAL CONDITIONS (PERFORM DEEP WATER FORDING) - Continued**

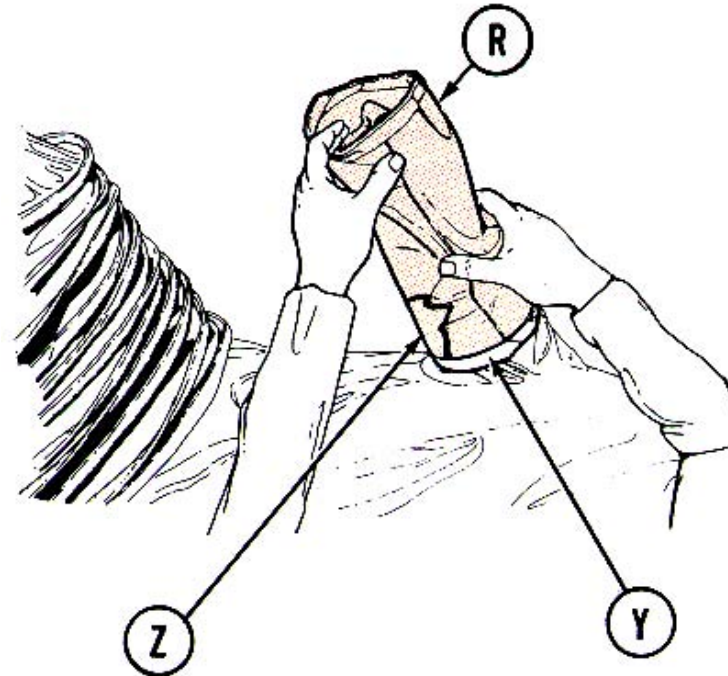
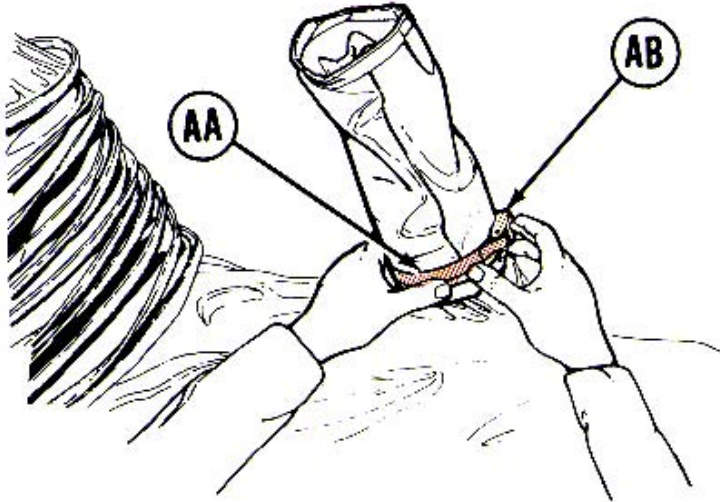
19. Place quick release clamp (U) (from water fording kit), around telescope port cover (Q).
20. Tighten nut (V). Nut should be facing up and Shook (W) should be facing toward fender.



21. Using screwdriver, loosen machine gun shield clamp (X).
22. Push gun shield (Y) down as far as possible.
23. Tighten gun shield clamp (X).

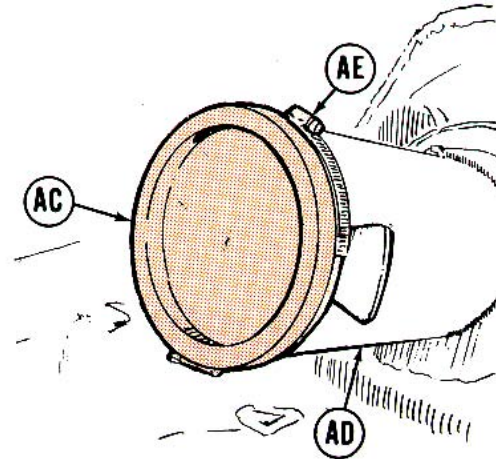
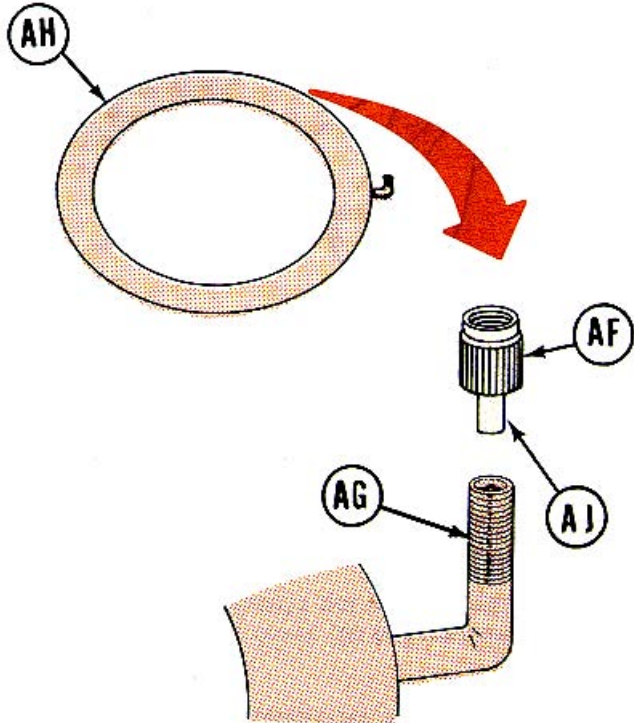
**OPERATE UNDER UNUSUAL CONDITIONS (PERFORM DEEP WATER FORDING) - Continued**

24. Put machine gun cover (R) over machine gun barrel and port (Z). Cover should not overlap onto gun shield (Y).
25. Place clamp (AA) (from water fording kit) around cover and tighten.
26. Nut should be facing up and S-hook (AB) should be facing toward fender (see step 20).



**OPERATE UNDER UNUSUAL CONDITIONS (PERFORM DEEP WATER FORDING) - Continued**

27. Put muzzle cap (AC) over main gun (AD).
28. Pull cap (AC) as far as possible along outside of gun tube.



29. Put clamp (AE) over muzzle cap (AC) and using flat-tip screwdriver tighten clamp (AE).

**NOTE**

**Valve stem cap of turret ventilator inflatable seal has two uses. One end is for covering valve stem and other end is for deflating seal.**

30. Unscrew valve stem cap (AF) from valve stem (AG) on turret ventilator inflatable seal (AH) (from water fording kit). Insert valve stem cap deflator end (AJ) down. Let all air out of seal.

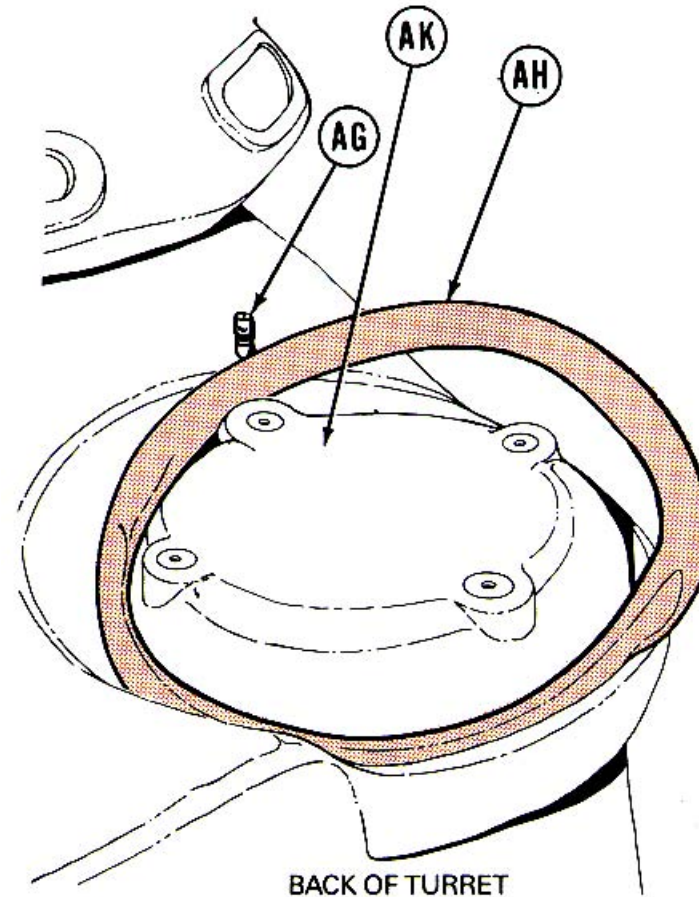


**OPERATE UNDER UNUSUAL CONDITIONS (PERFORM DEEP WATER FORDING) - Continued****NOTE**

If available, apply water to seal to help slide seal into place.

Make sure valve stem (AG) is up and pointing toward cupola.

31. Push seal (AH) under lip around blower cover (AK) with valve stem (AG) up. Valve stem must be at cupola side of blower cover.
32. Carefully stretch seal (AH) over blower cover (AK) and center evenly in blower air inlet. (It may be necessary to use screwdriver).



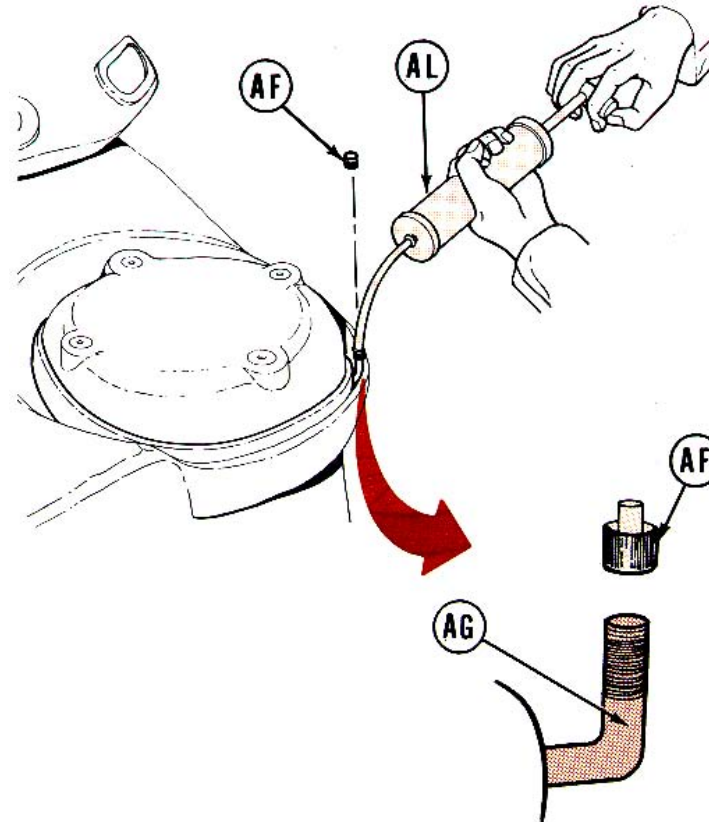
**OPERATE UNDER UNUSUAL CONDITIONS (PERFORM DEEP WATER FORDING)- Continued**

33. Remove valve stem cap (AF).

**CAUTION**

**Do not operate ventilator blower while seal is in air inlet because of possible damage to equipment.**

34. Attach hand pump (AL) (from water fording kit), to valve stem.
35. Inflate seal until tight in air inlet opening.
36. Disconnect hand pump (AL) and stow in left rear fender box.
37. Put valve stem cap (AF) on valve stem (AG) with deflator end out.

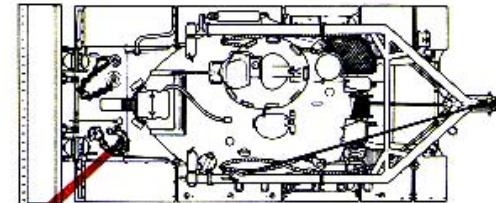
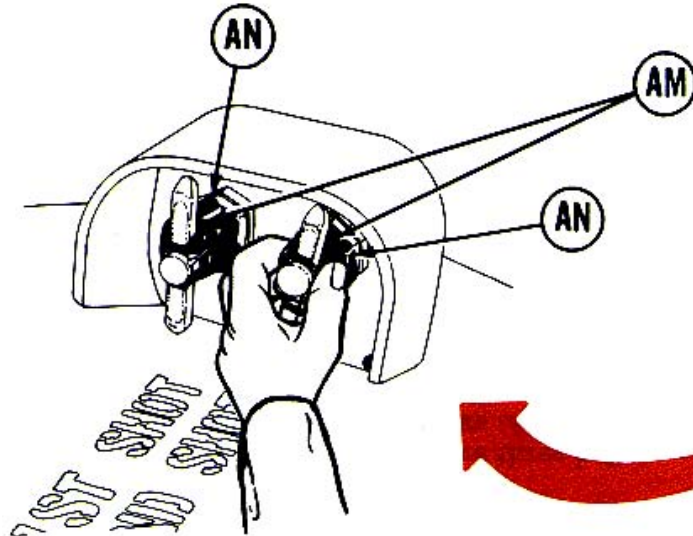
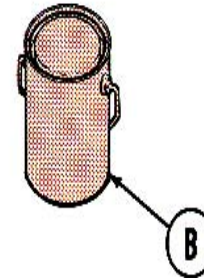


OPERATE UNDER UNUSUAL CONDITIONS (PERFORM DEEP WATER FORDING) - Continued

NOTE

- **Moisten hands with oil when using fording sealer to prevent sticking and from creating air bubbles.**
- **Work sealer until soft.**

38. Using sealer (AM) from 25-pound can (B), completely cover external fire extinguis



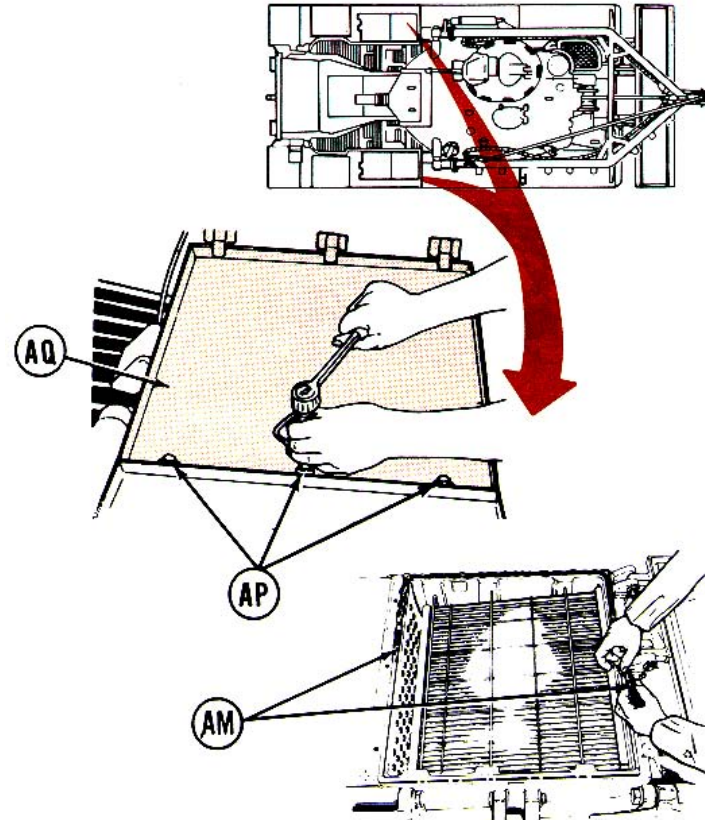
**OPERATE UNDER UNUSUAL CONDITIONS (PERFORM DEEP WATER FORDING)- Continued**

39. Using 9/16 inch socket with ratchet, remove three bolts and flat washers (AP) from air cleaner doors (AQ) (both sides of vehicle).
40. Open air cleaner doors (AQ).

**NOTE**

**Do not let any sealer fall into air cleaner filter unit.**

41. Apply one-inch-wide strip of sealer (AM) around top edge of air cleaner boxes.
42. Close air cleaner doors (AQ).
43. Put three bolts and flat washers (AP) in door. Using 9/16 inch socket with ratchet, tighten bolts.
44. Apply sealer (AM) to bolts and cracks on air cleaner boxes.



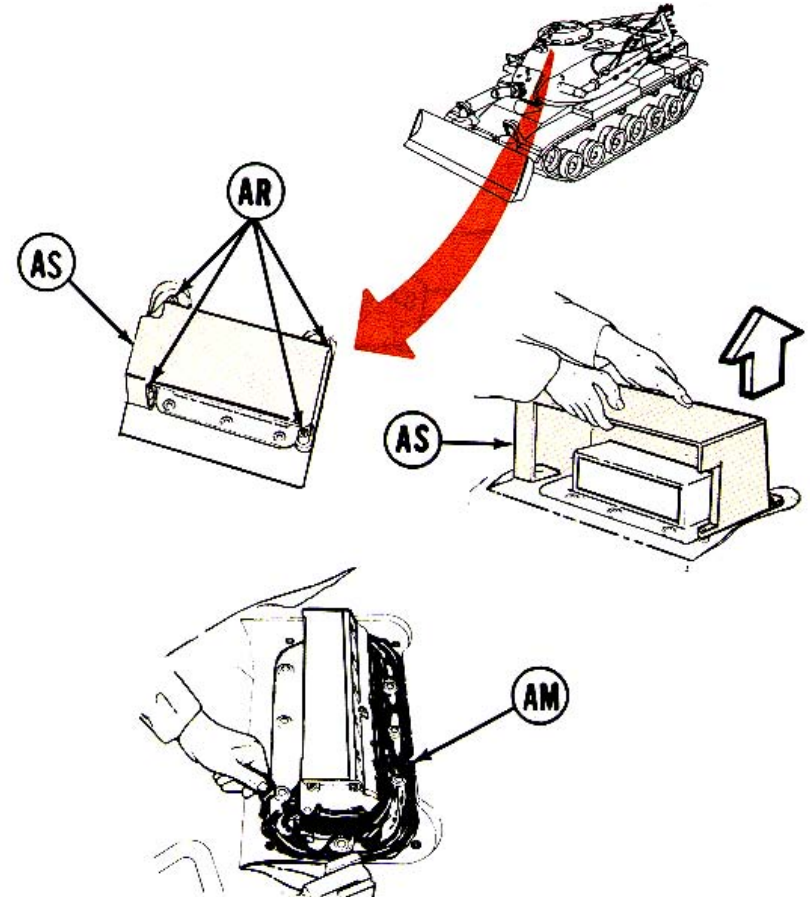
## OPERATE UNDER UNUSUAL CONDITIONS (PERFORM DEEP WATER FORDING)- Continued

45. Using 3/8 inch key socket, unscrew four screws (AR) from gunner's external periscope shield cover (AS).

**CAUTION**

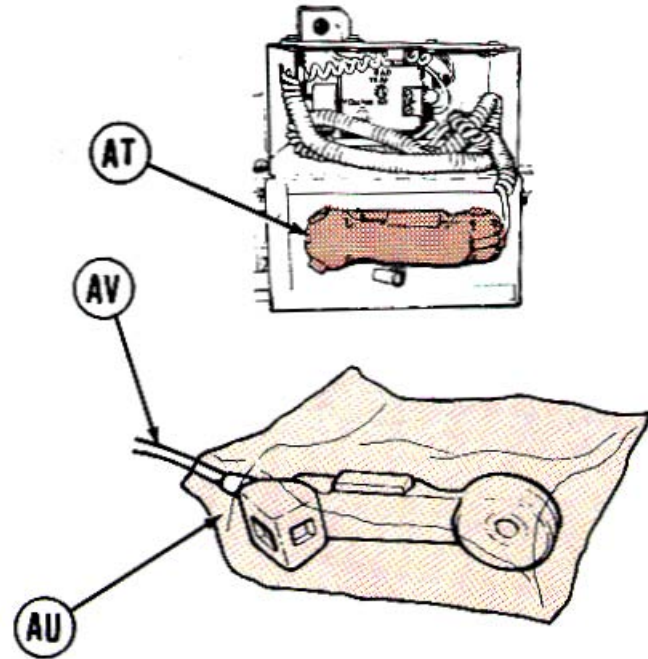
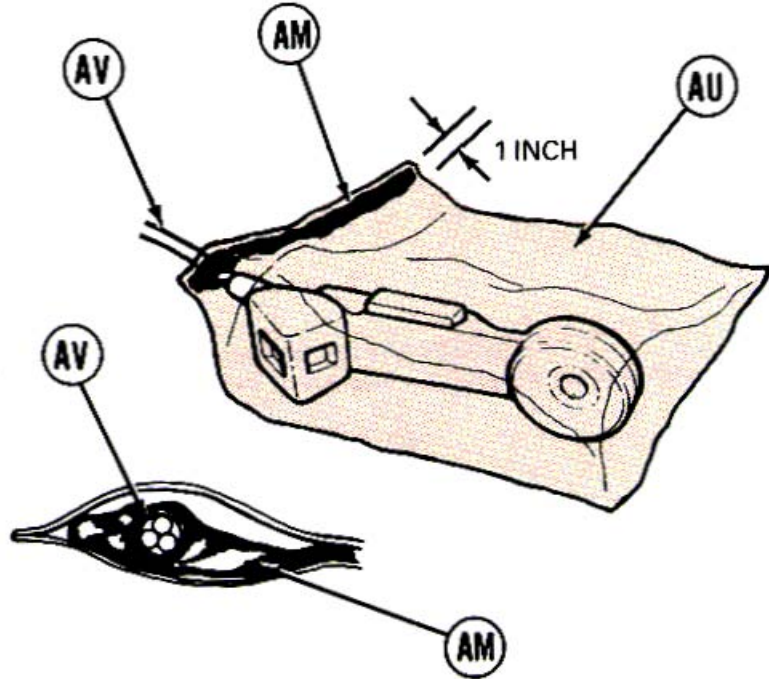
**Do not lift shield more than 2 inches to prevent damage to periscope actuating rod.**

46. Lift shield 1-1/2 to 2 inches.  
 47. Apply sealer (AM) to periscope opening.  
 48. Lower periscope shield cover over periscope.  
 49. Insert four screws and tighten.



**OPERATE UNDER UNUSUAL CONDITIONS (PERFORM DEEP WATER FORDING)- Continued**

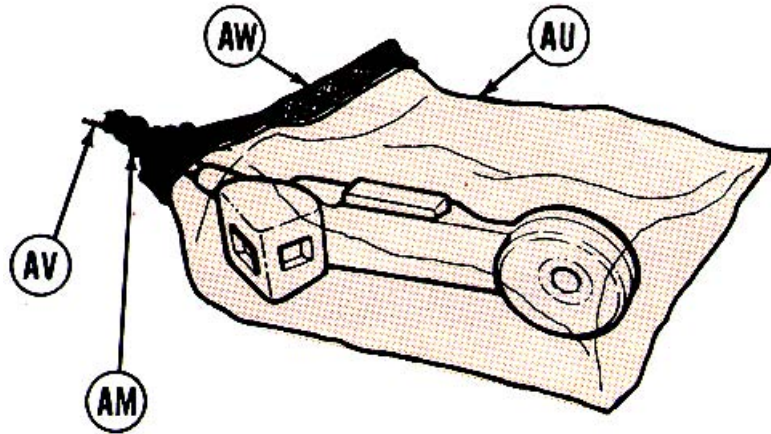
50. Remove external telephone handset (AT) from box on right rear fender.
51. Place handset phone in plastic bag (AU) (from water fording kit). Put cable (AV) to one side of bag opening.



52. Put strip of sealer (AM) one inch inside of plastic bag (AU) and around cable (AV).
53. Press plastic bag (AU) to force air from inside.

TA252900

OPERATE UNDER UNUSUAL CONDITIONS (PERFORM DEEP WATER FORDING)- Continued

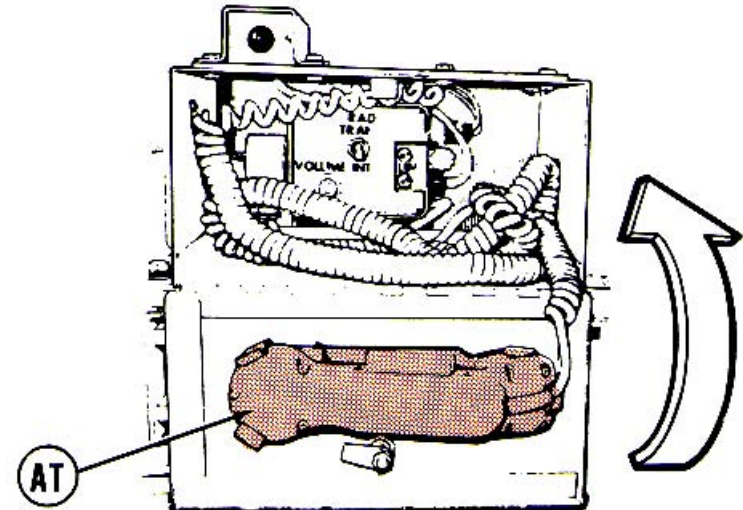


**CAUTION**

**Do not tear bag.**

- 56. Carefully place handset (AT) in external phone box.
- 57. Close box cover. Apply sealer (AM) to cracks around box.

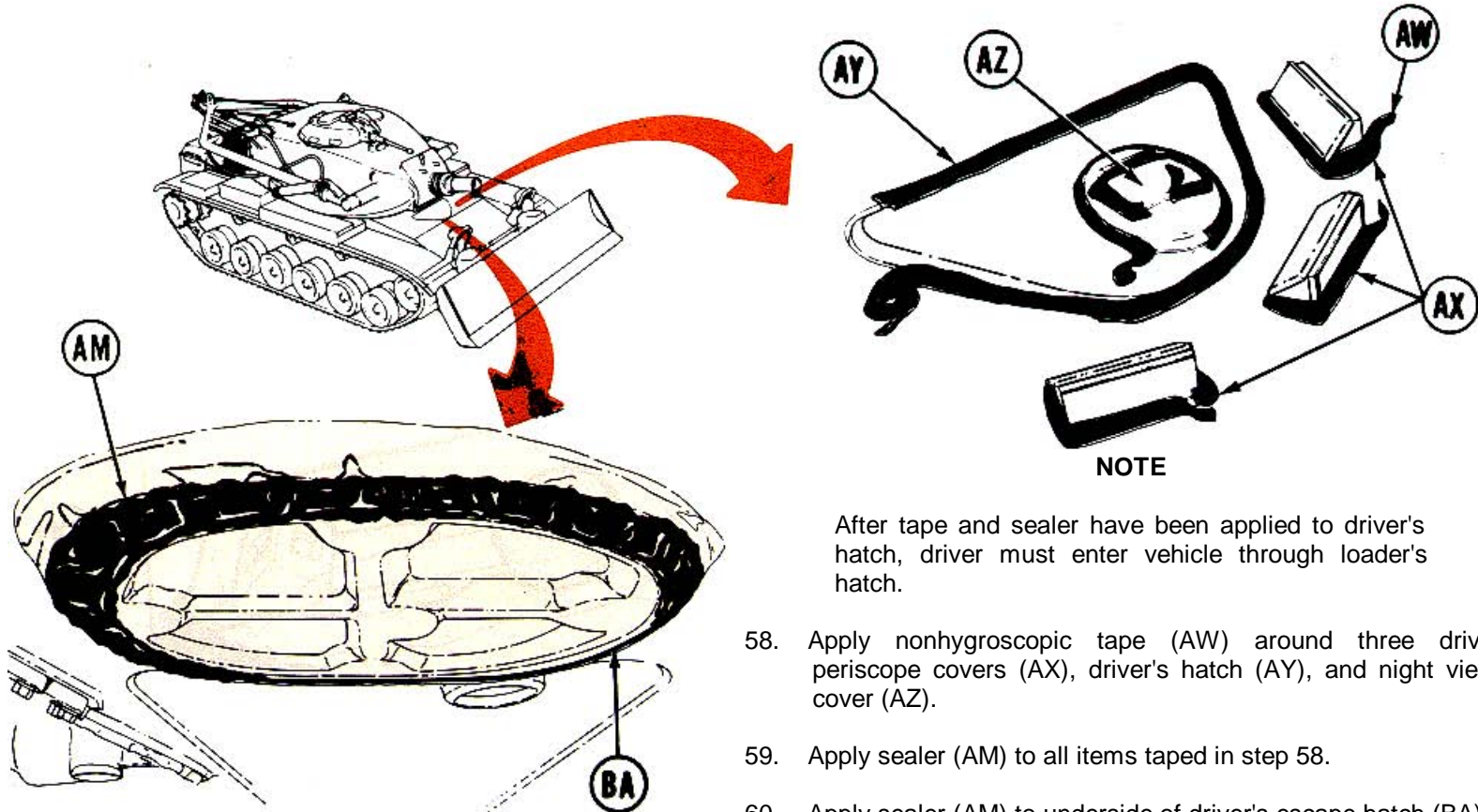
- 54. Fold edge of plastic bag (AU) over and tape in place using nonhygroscopic tape (AW). Bring tape around cable (AV).
- 55. Put small amount of sealer (AM) around cable where it exits from bag.



Change 1 2-668.27

TA252901

OPERATE UNDER UNUSUAL CONDITIONS (PERFORM DEEP WATER FORDING)- Continued



NOTE

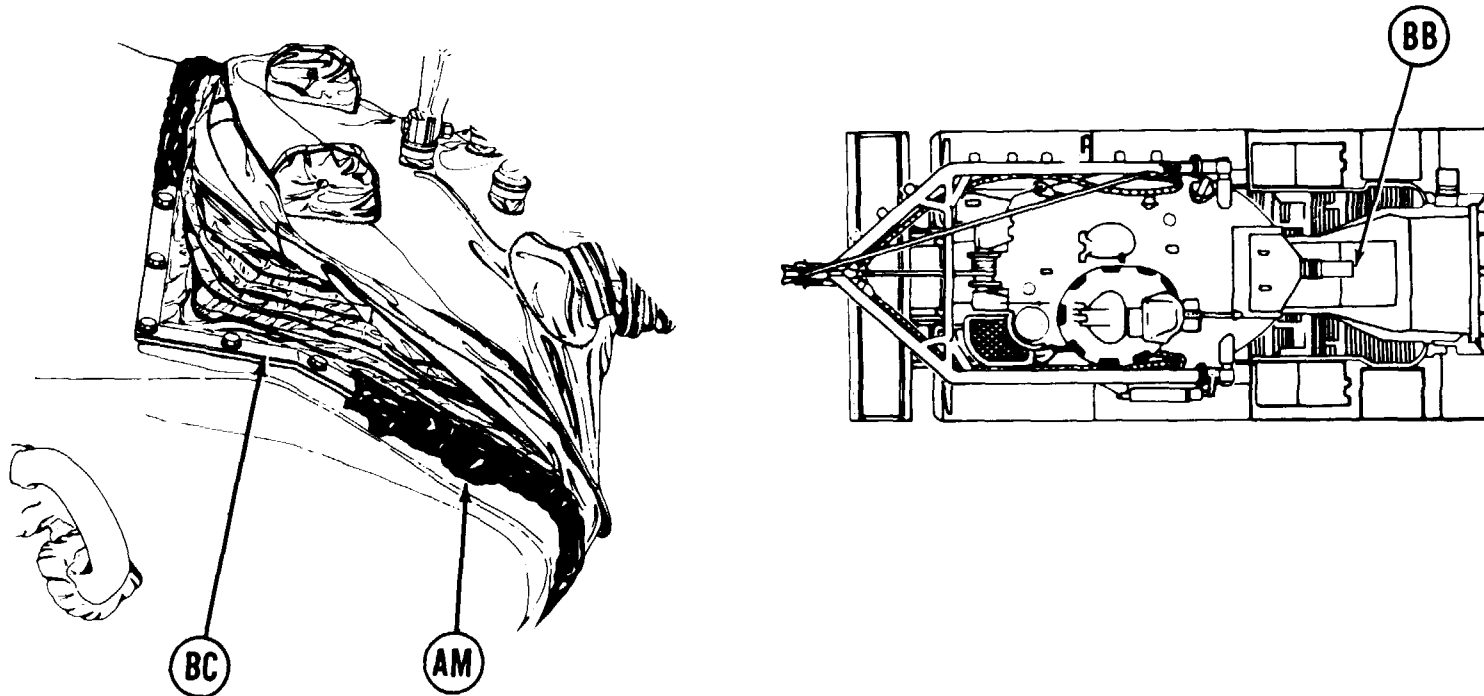
After tape and sealer have been applied to driver's hatch, driver must enter vehicle through loader's hatch.

58. Apply nonhygroscopic tape (AW) around three driver's periscope covers (AX), driver's hatch (AY), and night viewer cover (AZ).
59. Apply sealer (AM) to all items taped in step 58.
60. Apply sealer (AM) to underside of driver's escape hatch (BA).



**OPERATE UNDER UNUSUAL CONDITIONS (PERFORM DEEP WATER FORDING)- Continued**

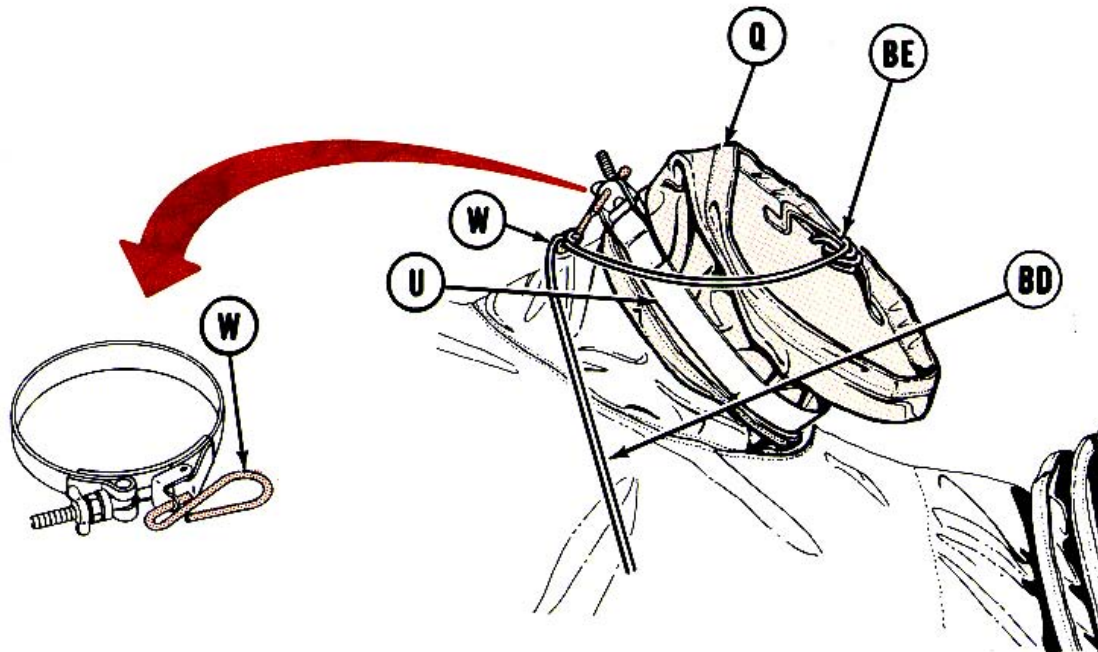
61. Manually traverse turret until main gun is positioned over rear center (BB) of vehicle. Lock turret traverse lock (page 2-568).
62. Elevate main gun manually as far as possible.
63. Apply sealer (AM) around gun shield edge (BC).



**OPERATE UNDER UNUSUAL CONDITIONS (PERFORM DEEP WATER FORDING)- Continued****NOTE**

Release cords from water fording kit must be as tight as possible without opening quick- release clamps. Cut cord into two pieces of about 16 feet each.

64. Tie first piece of release cord (BD) to loop (BE) in telescope port cover (Q).
65. Run cord to quick-release clamp (U) and tie to S-hook (W).

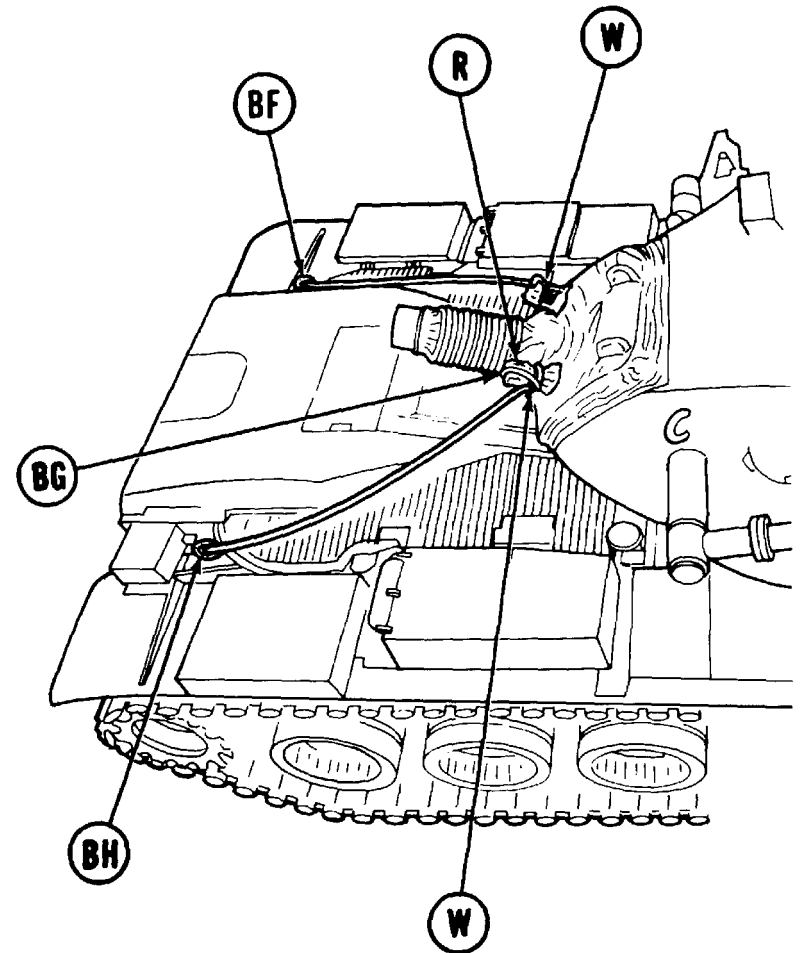


Change 1 2-668.30

TA252904

**OPERATE UNDER UNUSUAL CONDITIONS (PERFORM DEEP WATER FORDING)- Continued**

66. From Shook (W), run cord to left rear hull lifting eye (BF) and tie tightly.
67. Tie second piece release cord to loop (BG) in machine gun cover (R).
68. Run cord to Shook (W) and tie tightly.
69. Run cord to right rear hull lifting eye (BH) and tie tightly.
70. Return tools and equipment to stowage.



**OPERATE UNDER UNUSUAL CONDITIONS (PERFORM DEEP WATER FORDING)- Continued**

**Before Entering Water.**

**CAUTION**

**Do not enter water until engine temperature is in normal range.**

**NOTE**

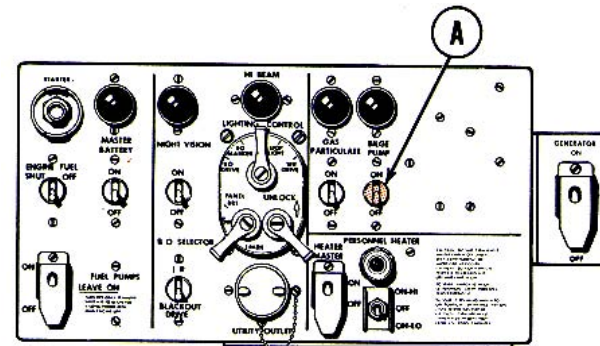
Before entering water, go through deep water fording check list (included in deep water fording kit).

1. Start engine. Warm up engine (page 2-205).
2. Set BILGE PUMP switch (A) to ON for five seconds and listen for motor to operate.
3. Set BILGE PUMP switch (A) to OFF.
4. Check that all intercom stations are working (page 2-169).

**CAUTION**

**Do not rotate turret when hull turret seal is inflated.**

5. Inflate turret seal (page 2-663).



**OPERATE UNDER UNUSUAL CONDITIONS (PERFORM DEEP WATER FORDING)- Continued****Dip Test:****NOTE**

Perform following test only if tactical conditions permit.

**Make Sure:**

- Vehicle is prepared for fording and ready to enter water.
- 1. Attach recovery vehicle winch cable to rear tow pintle (page 2-628).
- 2. Close loader's hatch (page 2-154), keep commander's hatch open.
- 3. Shift transmission to L (page 2-215).
- 4. Drive vehicle into water slowly (3 to 4 mph) to keep water out of commander's hatch. Keep tension on recovery vehicle winch cable.
- 5. Keep engine running at 1500 rpm.
- 6. Increase engine speed to approximately 1700-1800 rpm on entering water to allow for engine loading.
- 7. Adjust vehicle speed to keep recovery vehicle winch cable tight when driving in water.
- 8. Apply brakes to slow vehicle (page 2-213).
- 9. Check that engine temperature gage (located on driver's master control panel) is within green area.

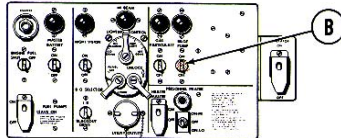
**OPERATE UNDER UNUSUAL CONDITIONS (PERFORM DEEP WATER FORDING)- Continued**

10. If water reaches top of pump screen (A), set BILGE PUMP switch (B) to ON.

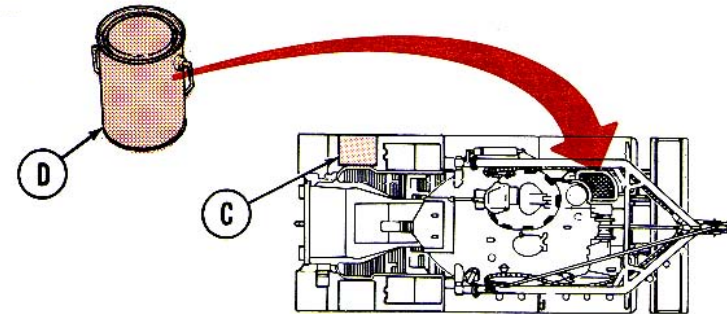
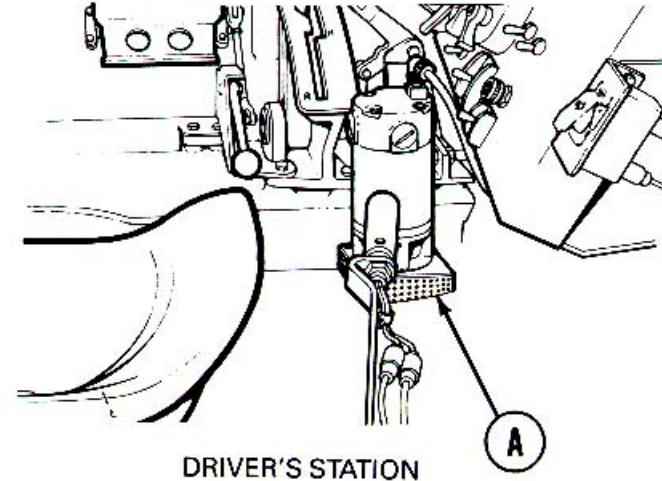
**CAUTION**

**Maintain 1500 rpm when shifting to reverse.**

11. Back vehicle out of water slowly (page 2-233), while recovery vehicle crew keeps winch cable tight.
12. Set BILGE PUMP switch (B) to OFF.
13. Stop vehicle.
14. Disconnect recovery vehicle tow cable.
15. Stop engine.
16. Check for leaks. If there are leaks, apply more sealer or tighten clamps to stop leaks.



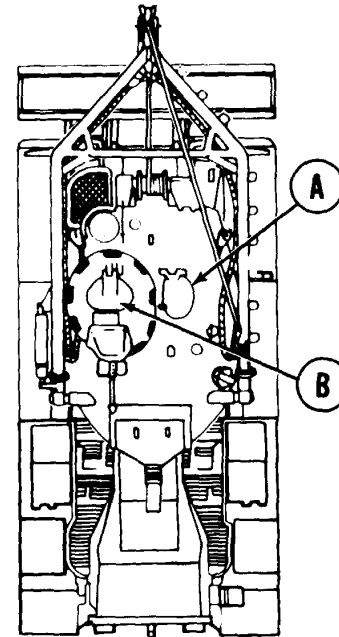
17. Stow unused deep water fording kit items and checklist in left rear fender box (C).
18. Stow 25-pound can of sealer (D) in bustle cargo storage rack.



**OPERATE UNDER UNUSUAL CONDITIONS (PERFORM DEEP WATER FORDING)- Continued****Driving During Fording****CAUTION**

**Do not stop engine while submerged. Keep engine speed at minimum of 1100 to 1200 rpm when entering water and while submerged.**

1. If open, close loader's hatch (A) (page 2-154).
2. Using low gear, drive vehicle into water slowly to keep water from entering commander's hatch (B).
3. Keep vehicle speed at 3 mph or slower when in 4 to 8 feet of water.
4. Apply brakes to slow vehicle (page 2-213).



**OPERATE UNDER UNUSUAL CONDITIONS (PERFORM DEEP WATER FORDING)- Continued**

5. Increase speed slightly (to 4 mph) in shallow water (less than 4 feet).
6. If water reaches top of intake screen (C), set BILGE PUMP switch (D) to ON.

**To Stop Vehicle During Fording (If necessary):**

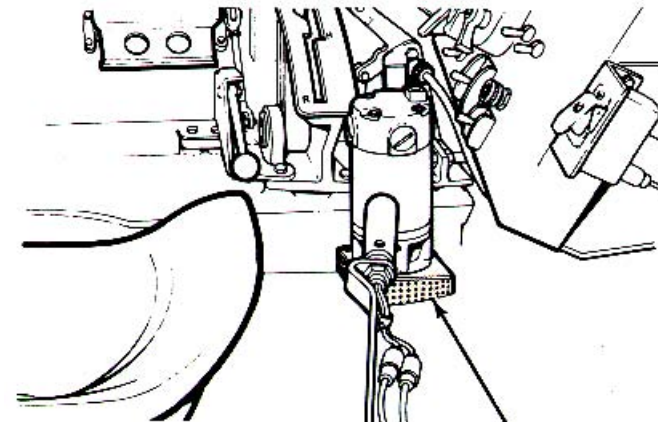
**CAUTION**

- Do not stop engine while under water. If engine stops running, do not try to restart. Have vehicle towed out as soon as possible.
- Maintain 1500 rpm when shifting gears.

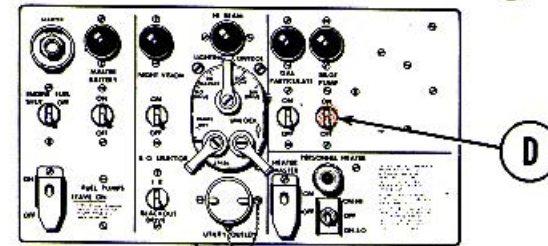
**NOTE**

Do not set parking brake.

1. Shift transmission to N (neutral) (page 2-215).
2. Apply brakes (page 2-213).
3. Keep engine speed between 1500 and 1700 rpm.



DRIVER'S STATION



DRIVER'S STATION



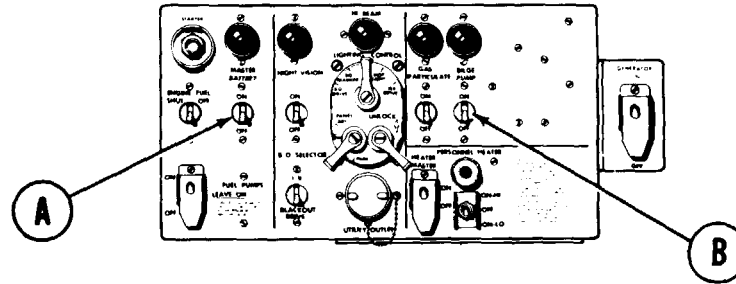
## OPERATE UNDER UNUSUAL CONDITIONS (PERFORM DEEP WATER FORDING)- Continued

## Emergency Exit During Fording

## CAUTION

Do not stop or stall engine while under water. If engine stops, do not try to restart. Have vehicle towed from water as soon as possible.

1. Set all electrical switches in driver's compartment to OFF, except MASTER BATTERY switch (A) and BILGE PUMP switch (B).



2. Shift transmission to N (page 2-215).

## NOTE

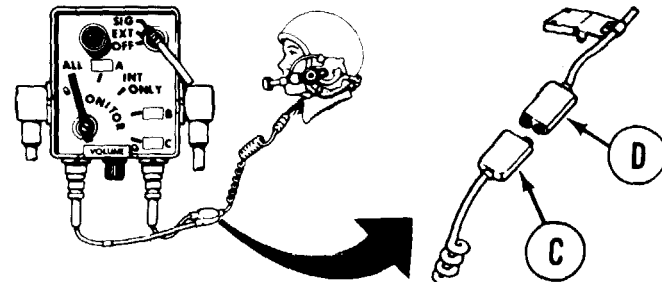
Do not set parking brake.

Change 4 2-668.37

## OPERATE UNDER UNUSUAL CONDITIONS (PERFORM DEEP WATER FORDING)- Continued

**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 in 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.
3. Lower driver's seat as far as possible (page 2-167).
  4. Move driver's seat to rear as far as possible (page 2-168).
  5. Disconnect driver's communications cord connector (C) from cord connector (D).
  6. Driver, lean back toward turret. Grab overhead equipment. Pull yourself into turret compartment.



Change 4 2-668.38

**OPERATE UNDER UNUSUAL CONDITIONS (PERFORM DEEP WATER FORDING)- Continued**

7. Set all electrical switches in turret and cupola to OFF. Dome lights may be used if necessary.
8. Leave vehicle through commander's hatch as soon as possible.

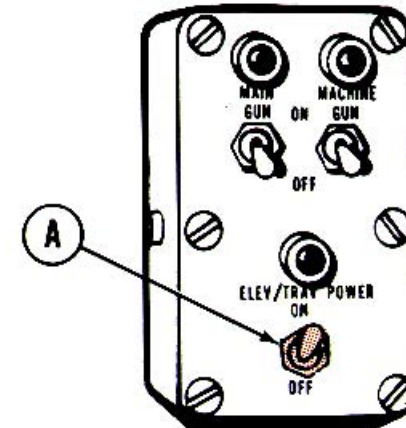
**Jettison Operations****CAUTION**

**Main gun must be raised as far as possible during jettison operations.**

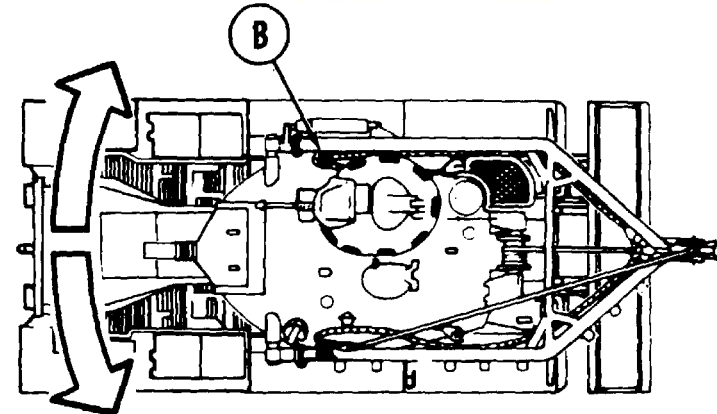
**NOTE**

**If situation arises after fording that demands use of weapons and fire control systems, perform following steps:**

1. Deflate hull-turret seal as soon as water is below turret ring (page 2-669).
2. Set turret lock to UNLOCKED (page 2-331).
3. Set ELEV/TRAV POWER switch (A) to ON.
4. Power-traverse turret (B) (page 2-504) left and right to release machine gun cover, and telescope port cover, then traverse 180° so guns are to the front.



GUNNER'S STATION



**OPERATE UNDER UNUSUAL CONDITIONS (PERFORM DEEP WATER FORDING)- Continued**

**Tactical Emergency Operations**

**NOTE**

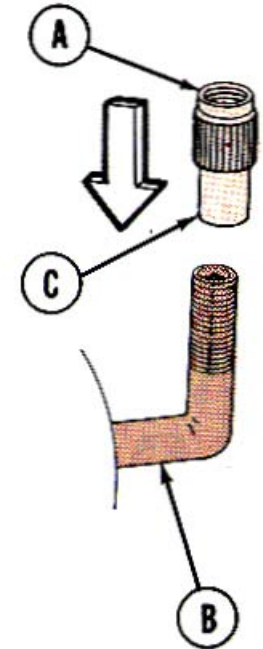
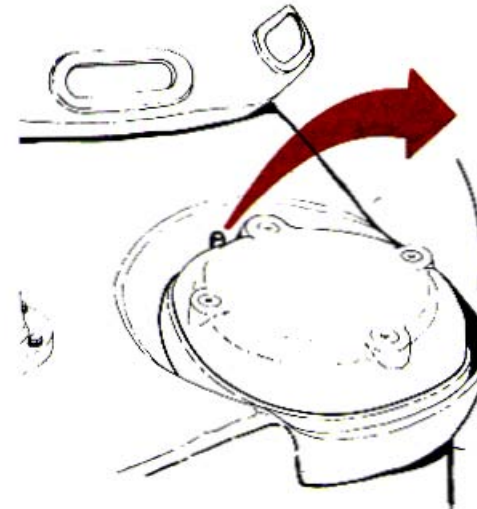
The following procedure is to be used if the machine gun must be fired before water fording equipment and materials are removed.

1. Perform steps 1 thru 4 of jettison operations (page 2-668.39).

**NOTE**

Turret ventilator blower motor seal should be removed. If this cannot be done, loader's and commander's hatches must be opened.

2. Unscrew valve stem cap (A) from valve stem (B). Install valve stem cap in valve stem (B), deflater end (C) down, and deflate seal.



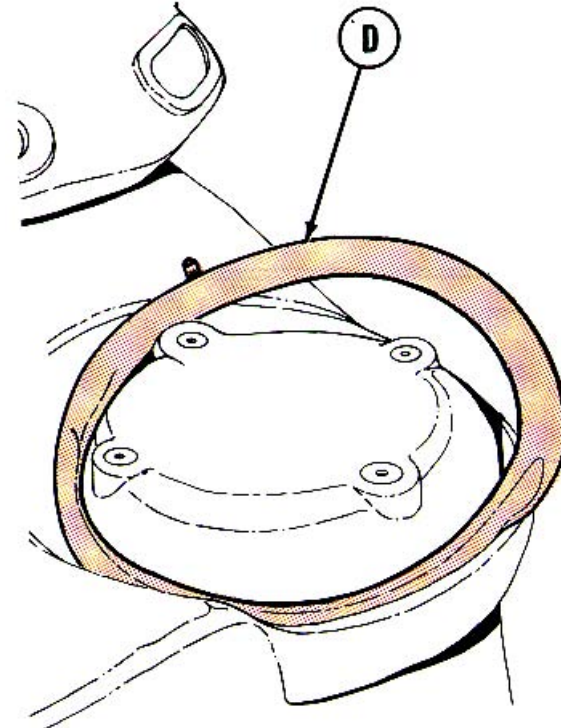
**OPERATE UNDER UNUSUAL CONDITIONS (PERFORM DEEP WATER FORDING)- Continued**

3. Carefully stretch seal (D) and pull up to remove from blower air inlet.
4. Stow seal (D) in left rear fender box.

**WARNING**

**Do not engage target with Main Gun until muzzle cover has been removed. Ammunition could detonate on contact with muzzle cover.**

5. Engage targets with 7.62mm machine gun and caliber .50 machine gun.



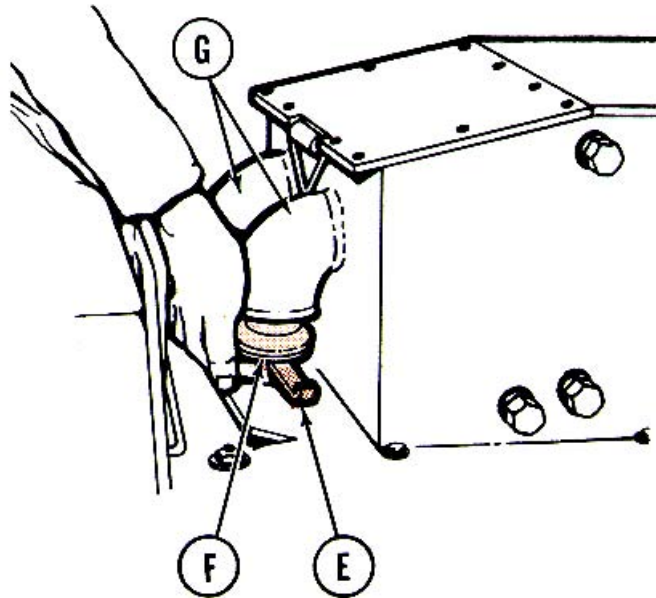
TA252915

OPERATE UNDER UNUSUAL CONDITIONS (PERFORM DEEP WATER FORDING)- Continued

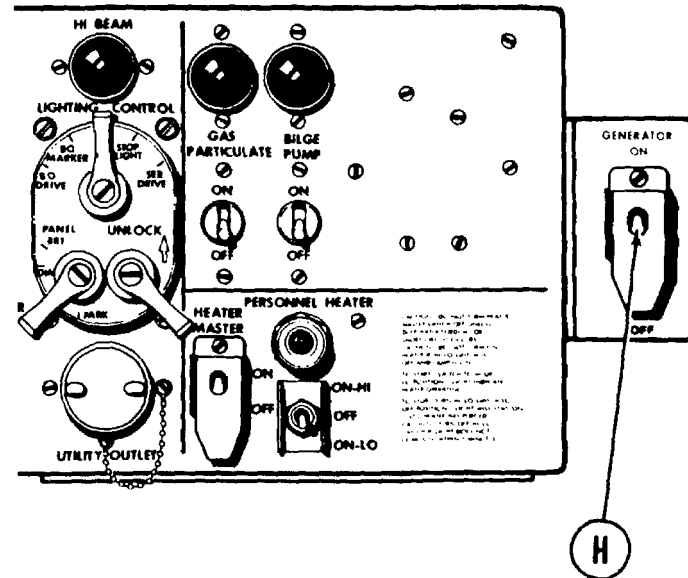
CAUTION

Following steps must be done within 45 minutes after air cleaner blower motors are turned on. Failure to do so will damage blower motor.

6. Hold plug and turn handle (E) clockwise until loose.



7. Remove four air exhaust plugs (F) in left and right air cleaner exhaust ports (G).
8. Stow plugs in left rear fender box.
9. Set GENERATOR switch (H) to ON (if so equipped).



## OPERATE UNDER UNUSUAL CONDITIONS (PERFORM DEEP WATER FORDING)- Continued

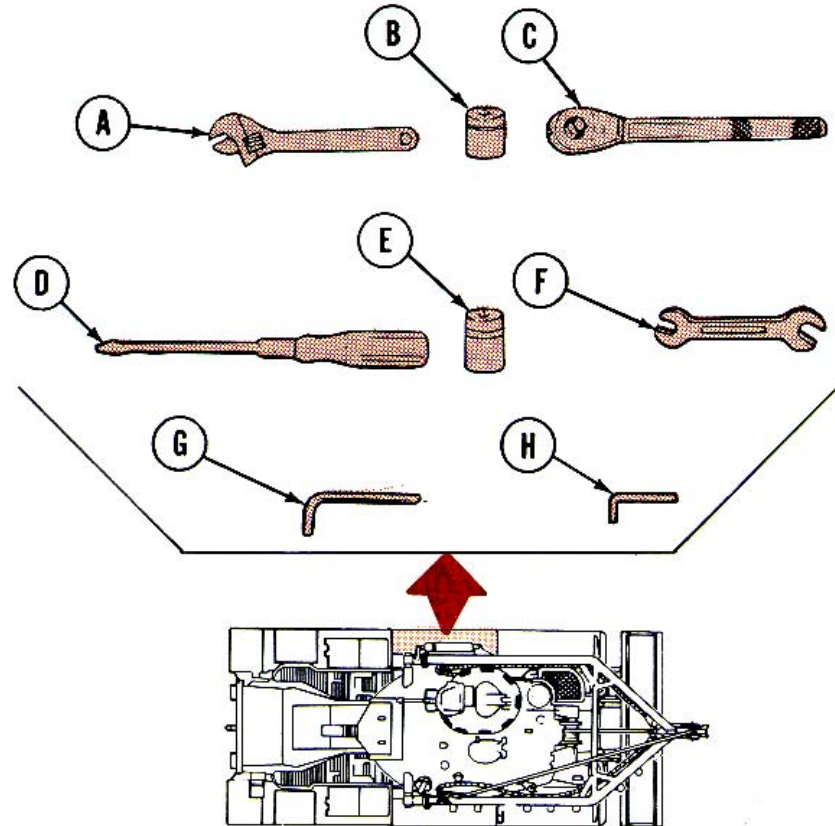
### After Fording

#### Tools:

Get from right front fender box:

- 8 inch adjustable wrench (A).
- 9/16 inch socket with 1/2 inch drive (B).
- ratchet with 1/2 inch drive (C).
- flat-tip screwdriver with 6 inch blade (D).
- 7/16 inch socket with 1/2 inch drive (E).
- 7/16 inch open end wrench (F).
- 5/8 inch socket head screw key (G).
- 3/8 inch socket head screw key (H).

1. Stop vehicle.

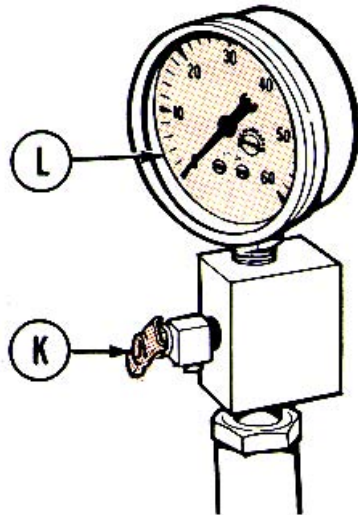


OPERATE UNDER UNUSUAL CONDITIONS (PERFORM DEEP WATER FORDING)- Continued

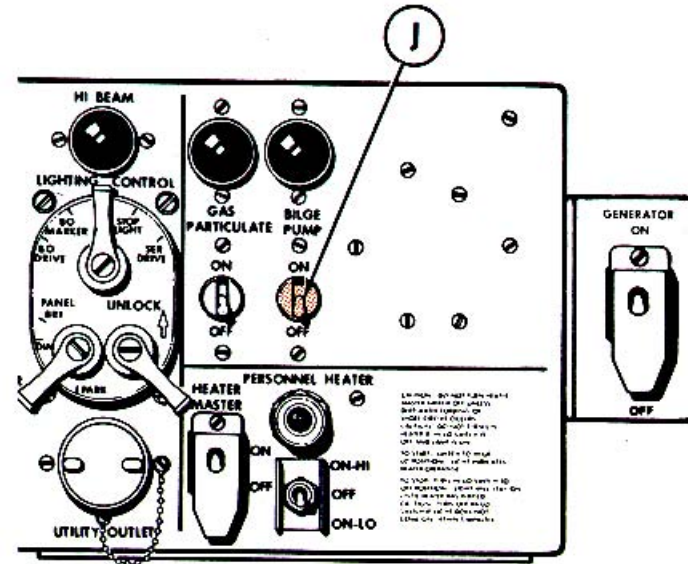
CAUTION

Do not let bilge pump operate dry for more than 30 seconds.

- Set BILGE PUMP switch (J) to OFF as soon as water is out of hull.



DRIVER'S STATION

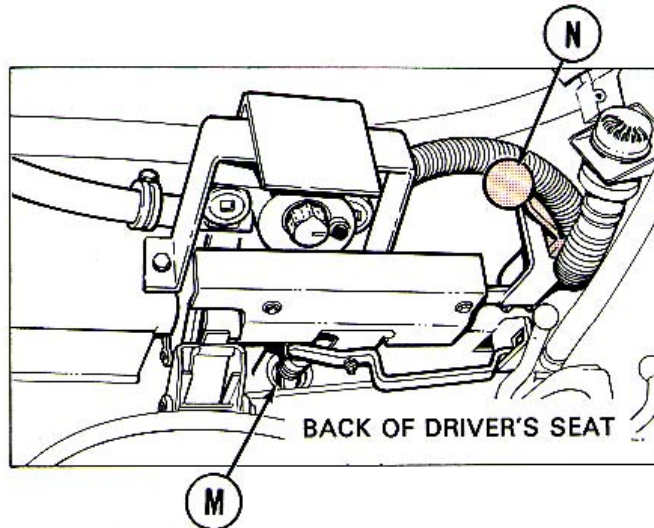


- Turn turret seal draincock (K) counterclockwise to deflate seal.
- When gage (L) shows 0 pounds pressure, turret may be unlocked.
- Unlock turret traverse lock (page 2-331).

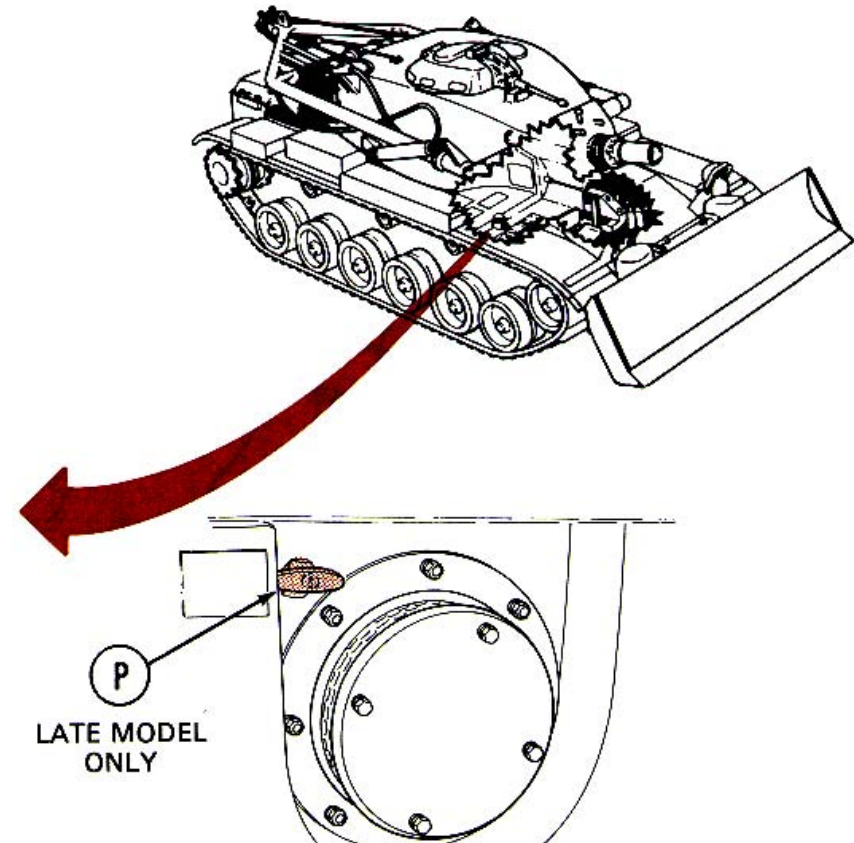


**OPERATE UNDER UNUSUAL CONDITIONS (PERFORM DEEP WATER FORDING)- Continued**

6. Pull crew compartment drain lever (M) up and push back to open crew compartment drain.
7. When water has drained out, close crew compartment drain lever (M) and engine compartment drain lever (N).
8. Shut down engine (page 2-536).
9. Set air intake with screen end in to draw air from engine compartment (page 2-659).

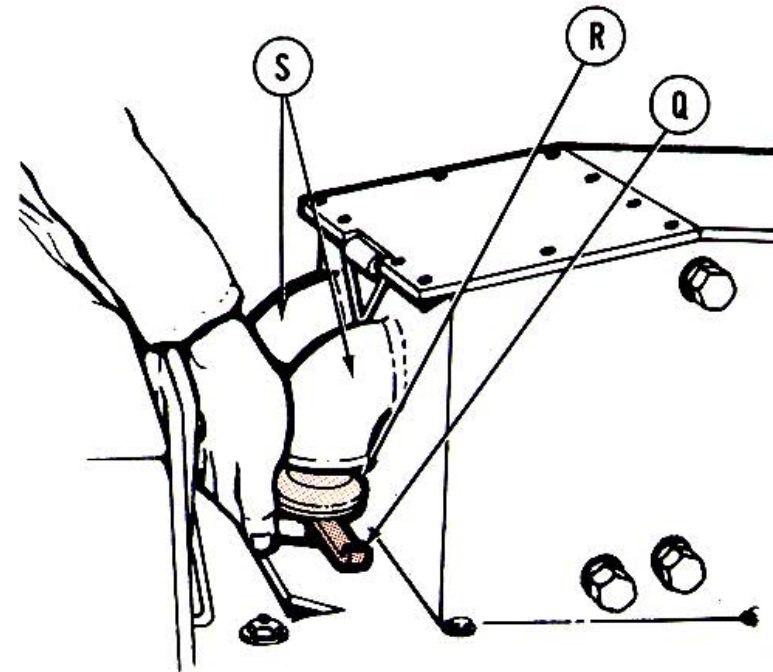
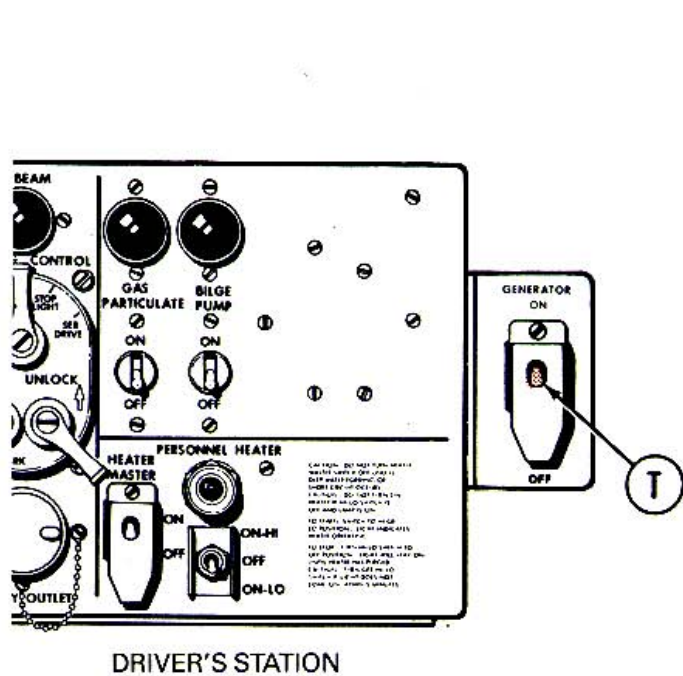


10. (Late model only) turn FORDING EXHAUST handle (P) counterclockwise and push in to open generator exhaust valve.



**OPERATE UNDER UNUSUAL CONDITIONS (PERFORM DEEP WATER FORDING)- Continued**

11. Hold plug and turn handle (Q) clockwise until loose. Remove four air cleaner exhaust plugs (R) in left and right air cleaner exhaust ports (S).
12. Set GENERATOR switch (T) to ON (if so equipped).

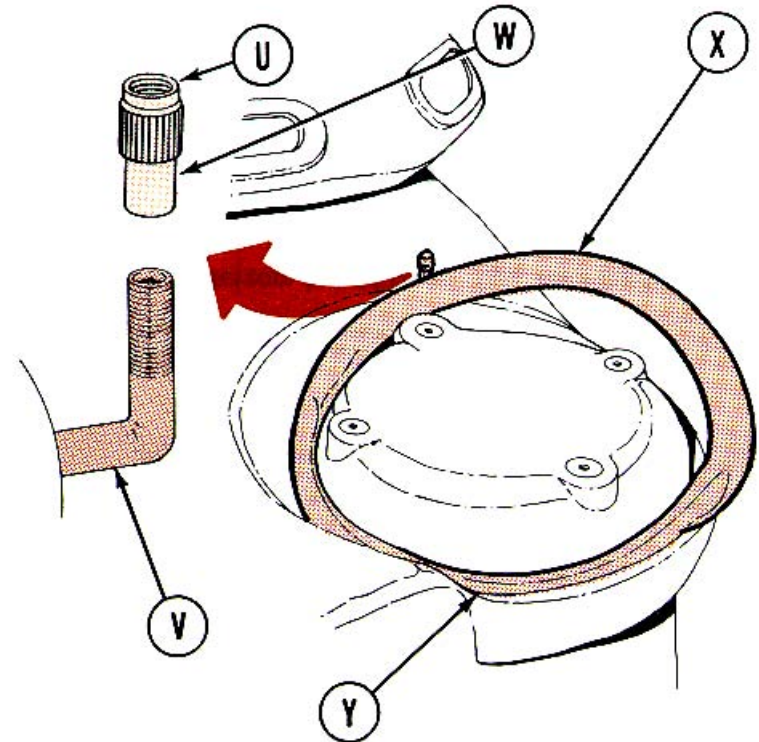
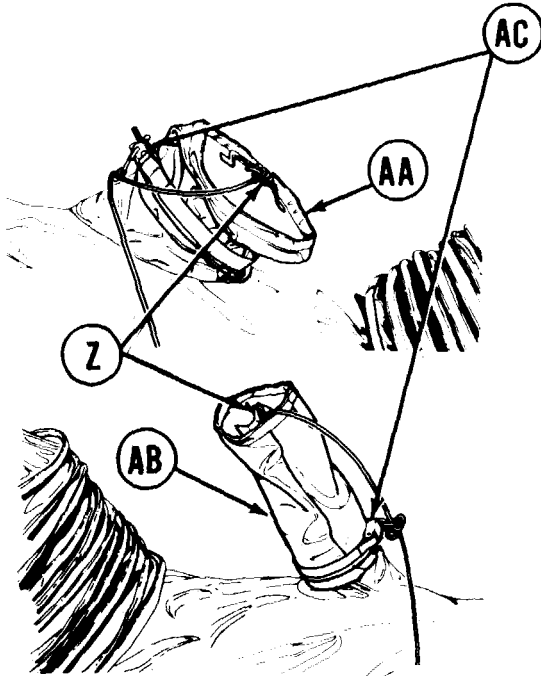


Change 1 2-668.46

TA252920

**OPERATE UNDER UNUSUAL CONDITIONS (PERFORM DEEP WATER FORDING)- Continued**

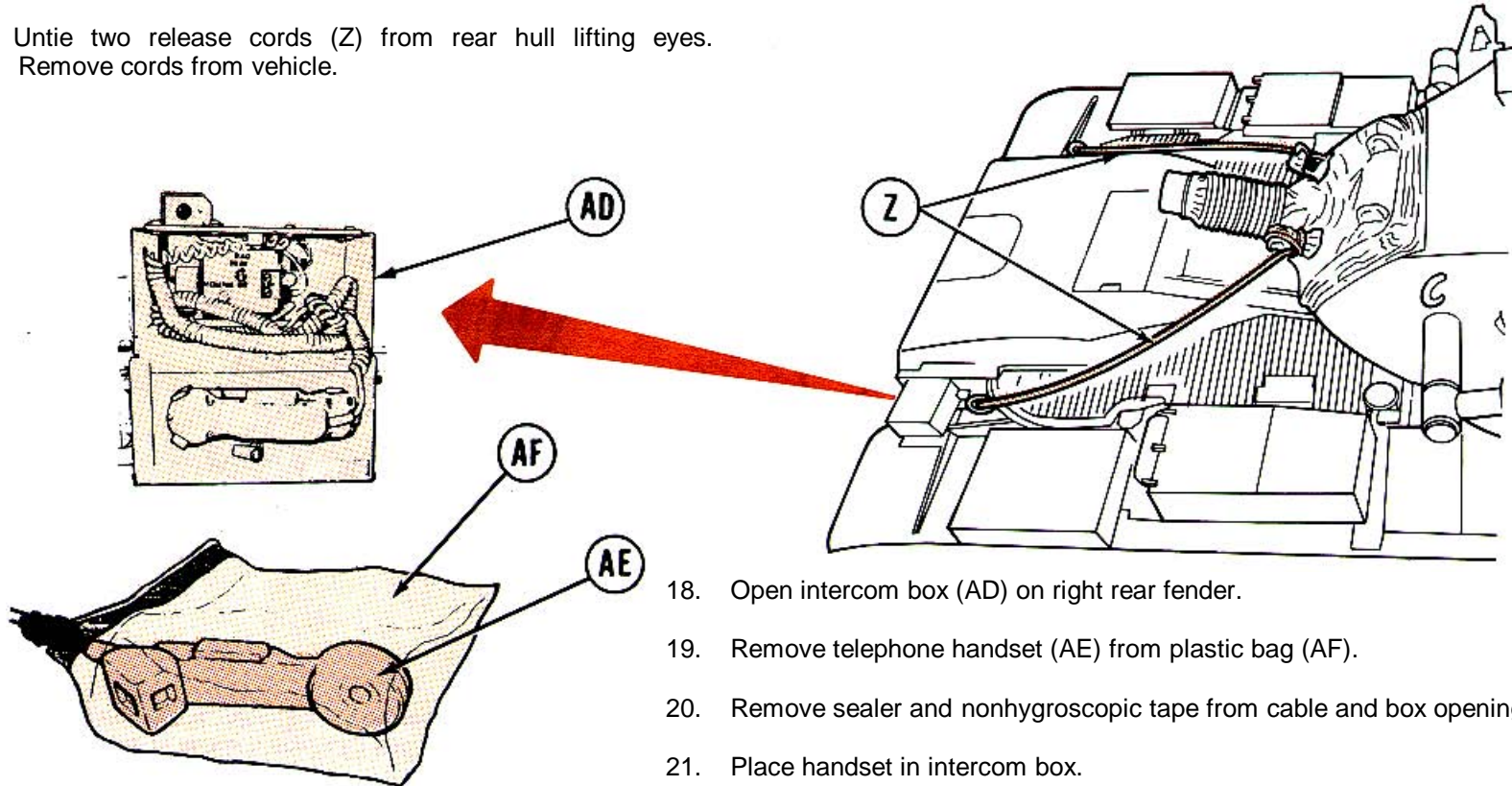
13. Remove valve stem cap (U). Replace on valve stem (V) deflater end (W) down and deflate seal (X).
14. Carefully stretch seal (X) and pull up to remove from blower air intake (Y). (You may have to use screw-driver.)



15. Untie release cords (Z) from telescope port cover (AA), machine gun port cover (AB), and quick-release clamps (AC).
16. Remove both release clamps (AC) with cover (AA) and (AB).

OPERATE UNDER UNUSUAL CONDITIONS (PERFORM DEEP WATER FORDING)- Continued

17. Untie two release cords (Z) from rear hull lifting eyes.  
Remove cords from vehicle.

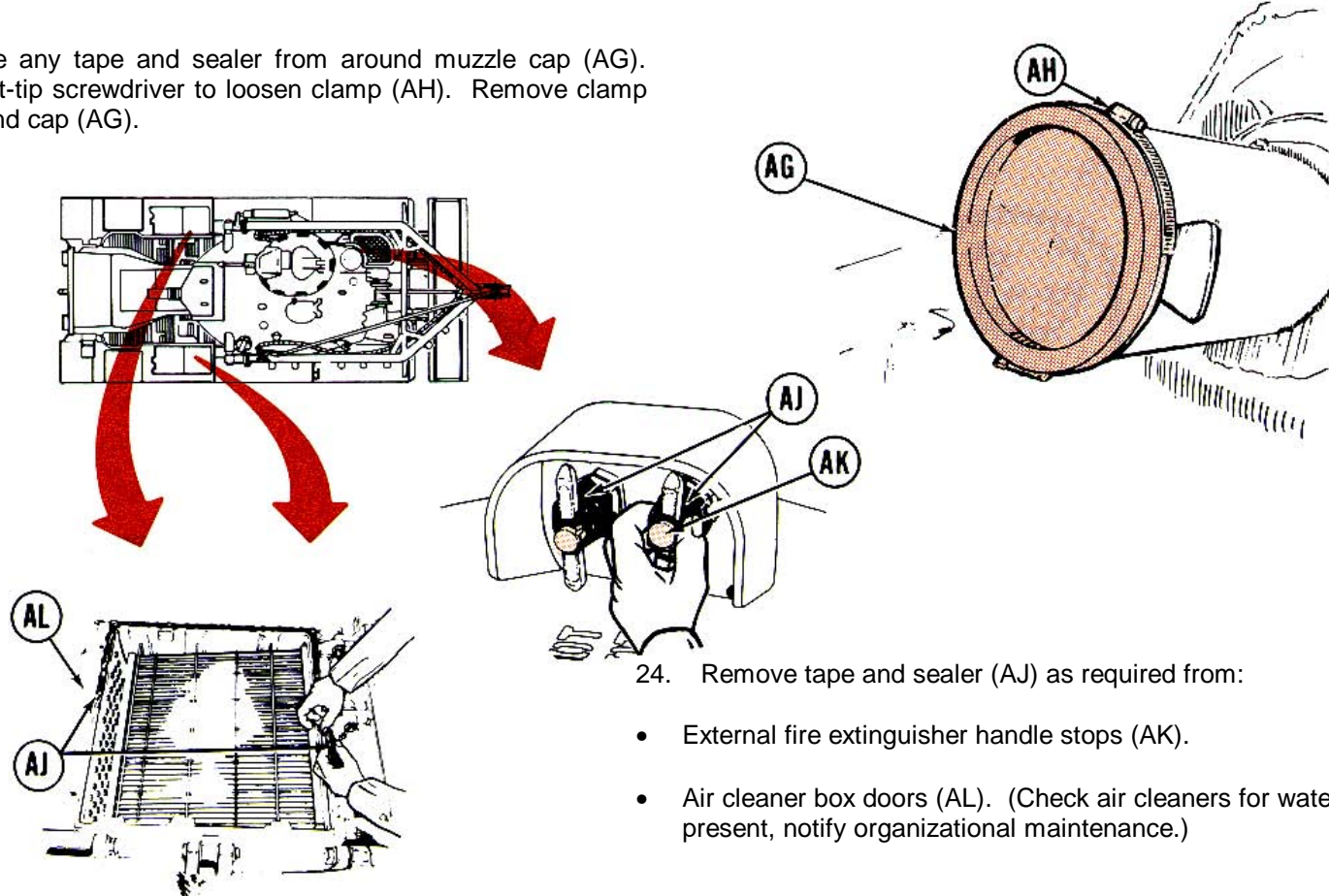


18. Open intercom box (AD) on right rear fender.
19. Remove telephone handset (AE) from plastic bag (AF).
20. Remove sealer and nonhygroscopic tape from cable and box openings.
21. Place handset in intercom box.

TA252922

OPERATE UNDER UNUSUAL CONDITIONS (PERFORM DEEP WATER FORDING)- Continued

23. Remove any tape and sealer from around muzzle cap (AG). Use flat-tip screwdriver to loosen clamp (AH). Remove clamp (AH) and cap (AG).

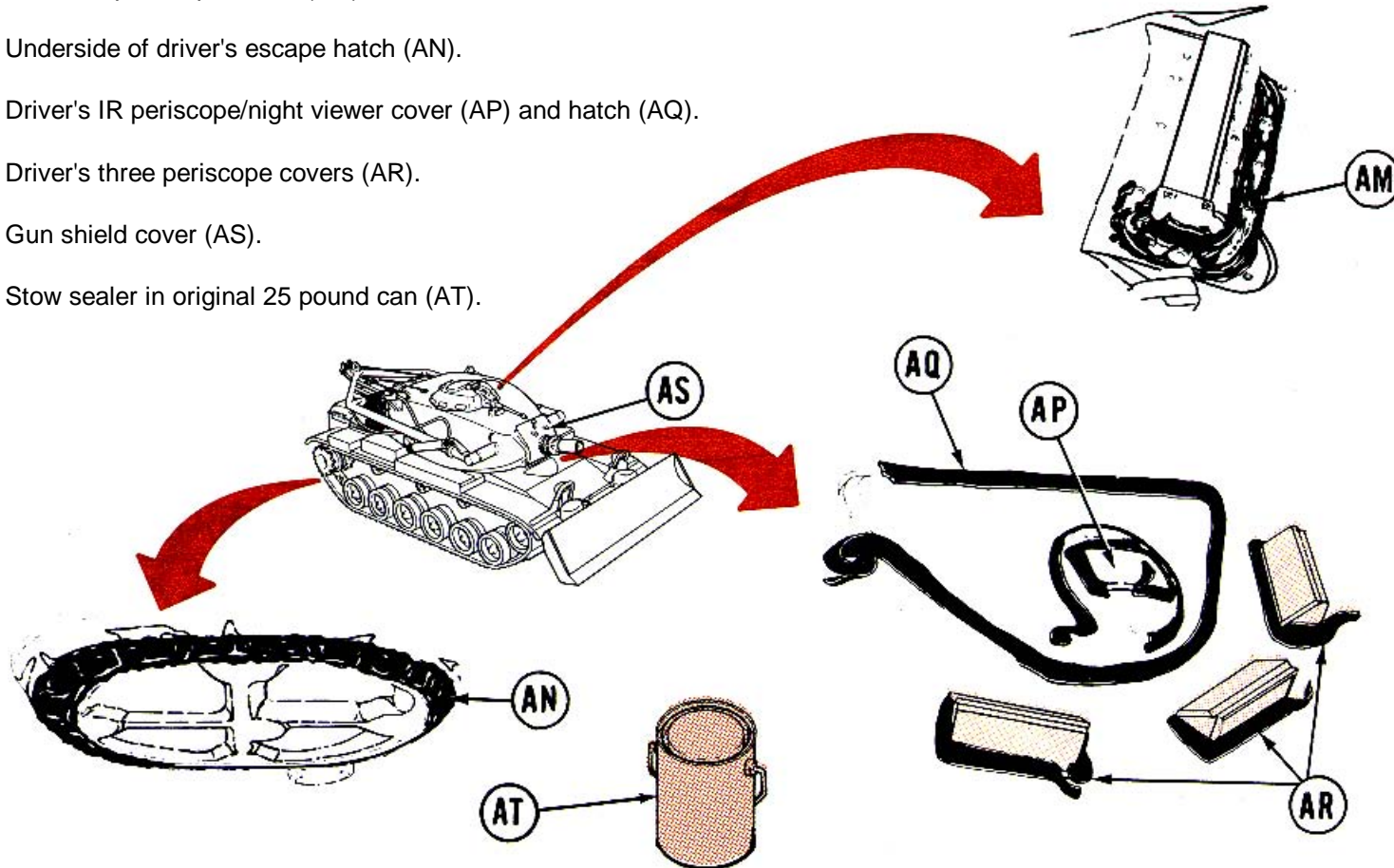


24. Remove tape and sealer (AJ) as required from:

- External fire extinguisher handle stops (AK).
- Air cleaner box doors (AL). (Check air cleaners for water. If present, notify organizational maintenance.)

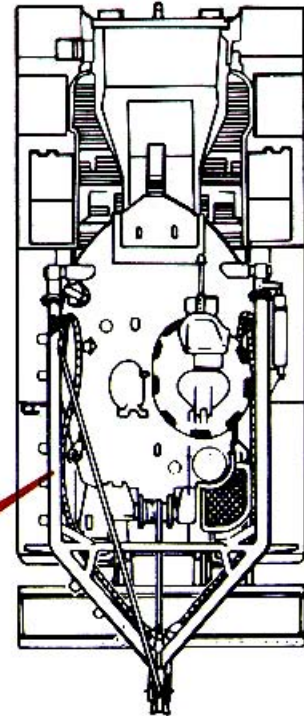
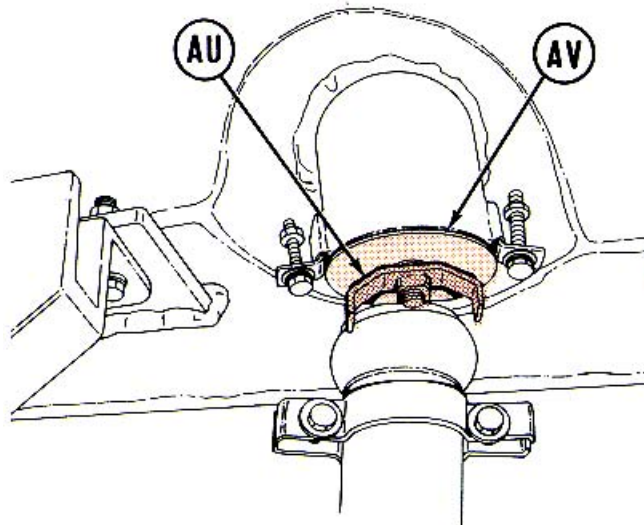
**OPERATE UNDER UNUSUAL CONDITIONS (PERFORM DEEP WATER FORDING)- Continued**

- Gunner's periscope shield (AM).
- Underside of driver's escape hatch (AN).
- Driver's IR periscope/night viewer cover (AP) and hatch (AQ).
- Driver's three periscope covers (AR).
- Gun shield cover (AS).
- Stow sealer in original 25 pound can (AT).



TA252924

OPERATE UNDER UNUSUAL CONDITIONS (PERFORM DEEP WATER FORDING)- Continued

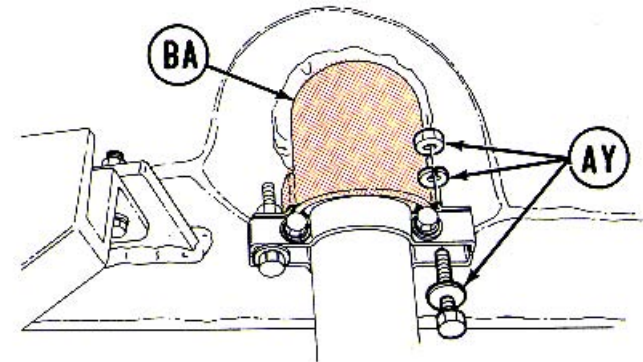
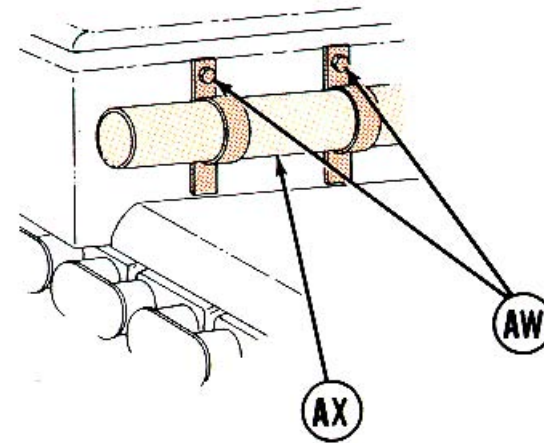
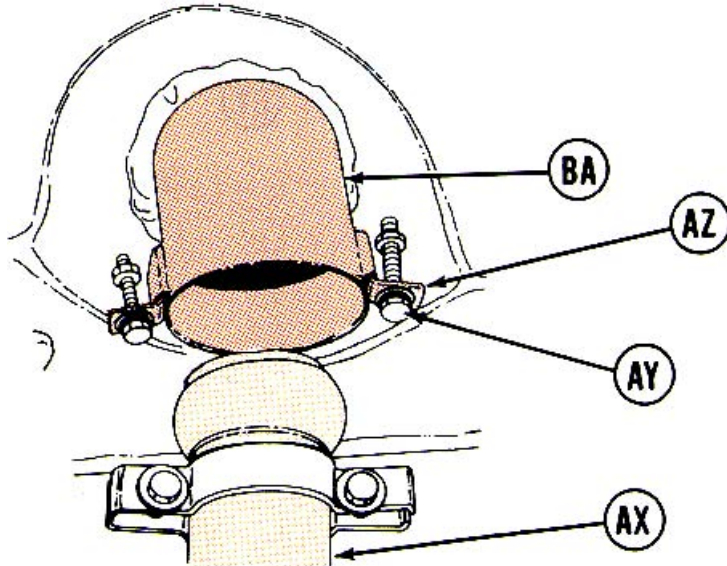


25. Turning handle (AU) counterclockwise, unscrew personnel heater exhaust elbow plug (AV).
26. Remove plug.

TA252925

### OPERATE UNDER UNUSUAL CONDITIONS (PERFORM DEEP WATER FORDING)- Continued

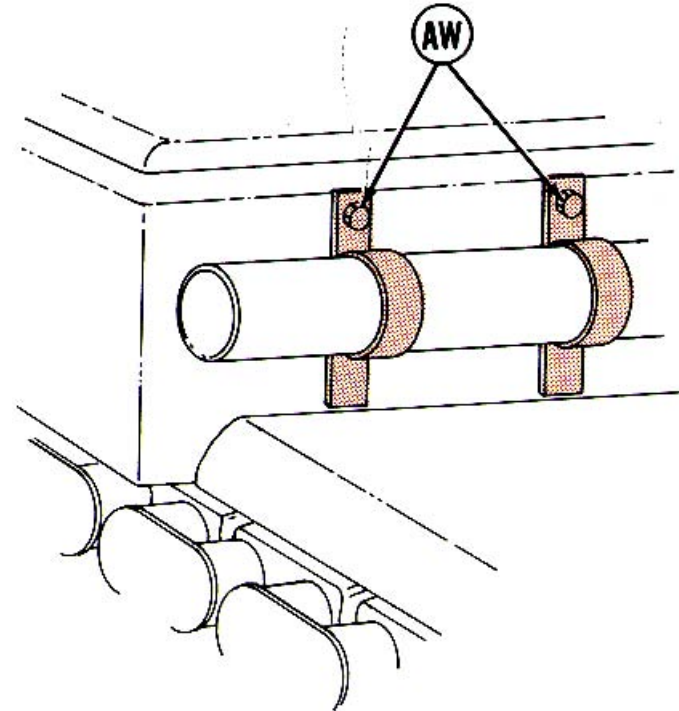
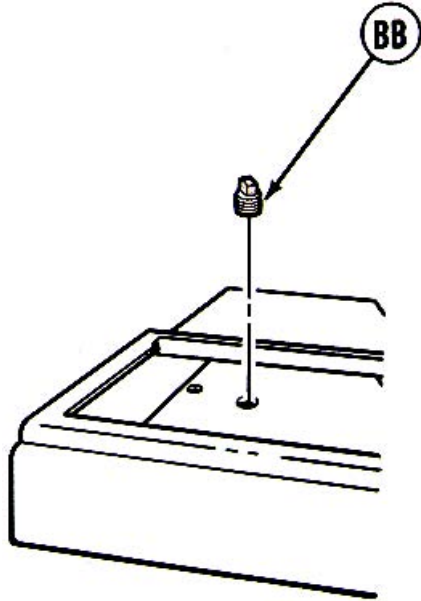
27. Loosen two mounting screws and clamps (AW) holding personnel heater exhaust tube (AX) to right front fender. Exhaust tube (AX) will slide freely.
28. Unscrew two nuts and screws and four washers (AY) from exhaust tube clamp (AZ).
29. Place exhaust tube (AX) on exhaust elbow (BA).
30. Place two nuts and screws and four washers (AY) in clamp. Screw clockwise until tight.





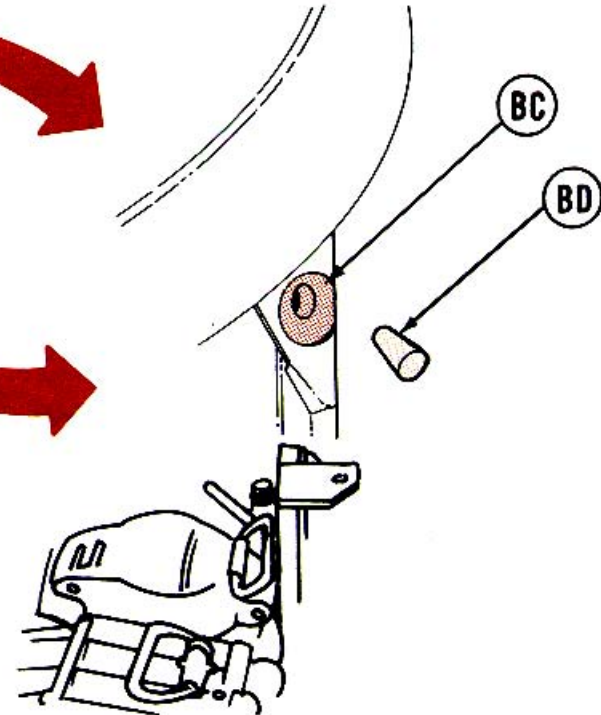
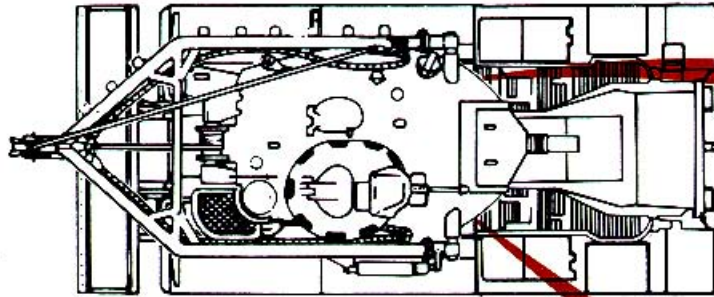
**OPERATE UNDER UNUSUAL CONDITIONS (PERFORM DEEP WATER FORDING)- Continued**

31. Tighten two mounting screws and clamps (AW) holding personnel heater exhaust tube to right front fender.



32. Get eight fender box drain plugs (BB) from left rear fender box.
33. Place plugs in fender box drains. Using adjustable wrench, rotate plugs clockwise until tight.

OPERATE UNDER UNUSUAL CONDITIONS (PERFORM DEEP WATER FORDING)- Continued



34. If required, rotate turret (page 2-478), to access two race ring drains (BC).
35. Remove drain plugs (BD) from right and left side of vehicle.

RIGHT SIDE SHOWN

TA252928

**OPERATE UNDER UNUSUAL CONDITIONS (PERFORM DEEP WATER FORDING) - Continued**

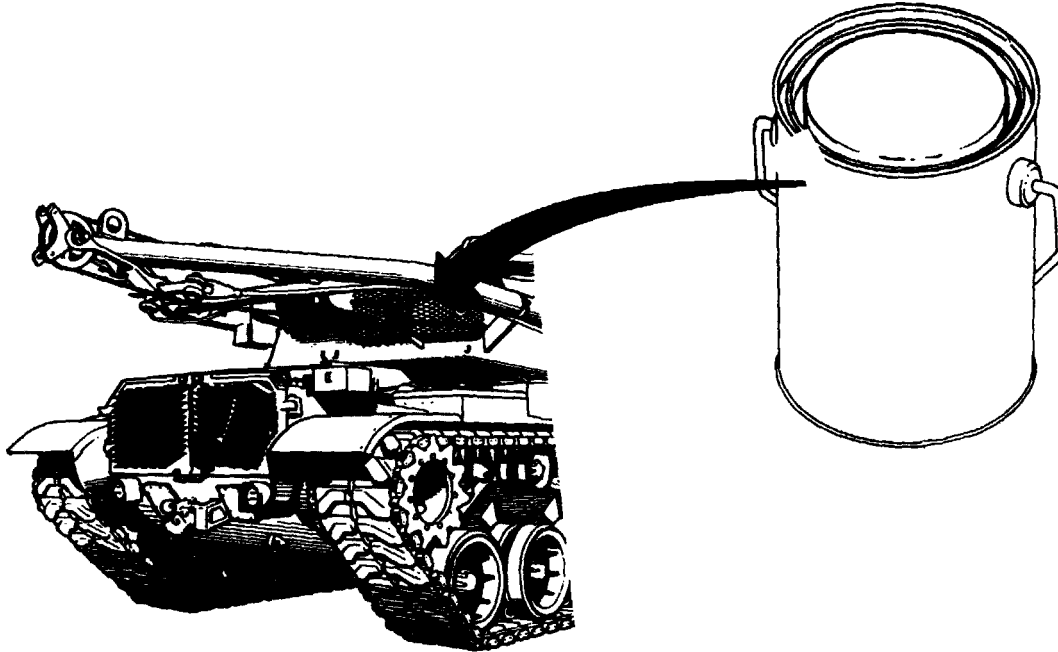
36. Check engine and transmission oil dipstick for any signs of water. If water is present, notify organizational maintenance.
37. Remove fill plugs and check final drives for any signs of water. If water is present, notify organizational maintenance.
38. Drain brake control housings (page 2-672).
39. Perform complete lubrication service (LO 92350-222-12).
40. Service batteries (page 3109).
- 40.1 Clean smoke grenade launchers (page 3-204.1).
41. Clean and inspect all water fording kit items.
42. Using kit check list, check that all kit items are complete.

**TA252929**

**Change 1 2-668.55**

**OPERATE UNDER UNUSUAL CONDITIONS (PERFORM DEEP WATER FORDING) - Continued**

43. Clean and spot paint damaged or defective paint areas on water fording components (TM 9-213).
44. Stow all kit items in left rear fender box.
45. Stow 25-pound can of sealer in turret bustle cargo rack.  
Tie can securely to rack.
- 46. Return tools to stowage.

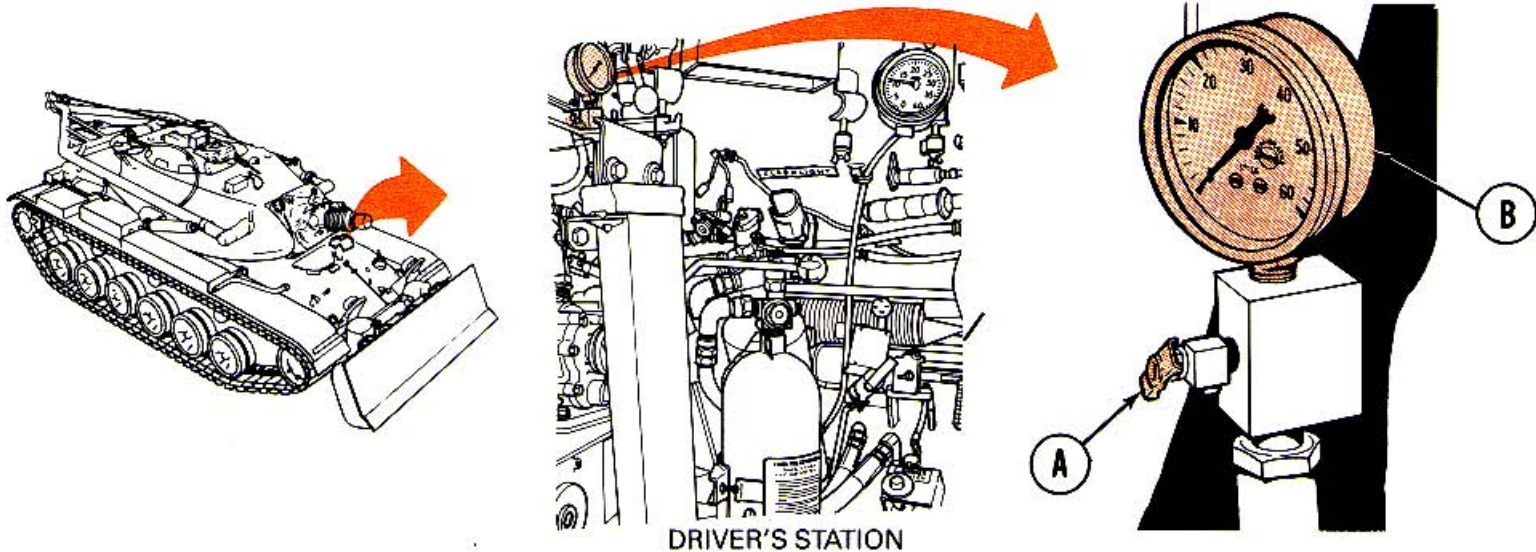


Change 8 2-668.56

**OPERATE UNDER UNUSUAL CONDITIONS (DEFLATE HULL-TURRET SEAL)****CAUTION**

**Never traverse turret while seal is inflated. Seal would be damaged.**

1. Turn turret seal draincock (A) counterclockwise to open.
2. When gage (B) shows zero pounds pressure, turret may be unlocked and traversed.



DRIVER'S STATION

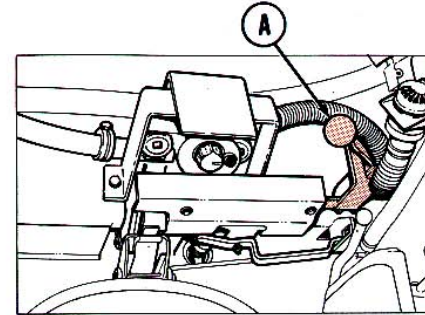
TA132808

**OPERATE UNDER UNUSUAL CONDITIONS (OPERATE ENGINE COMPARTMENT DRAIN VALVE)**

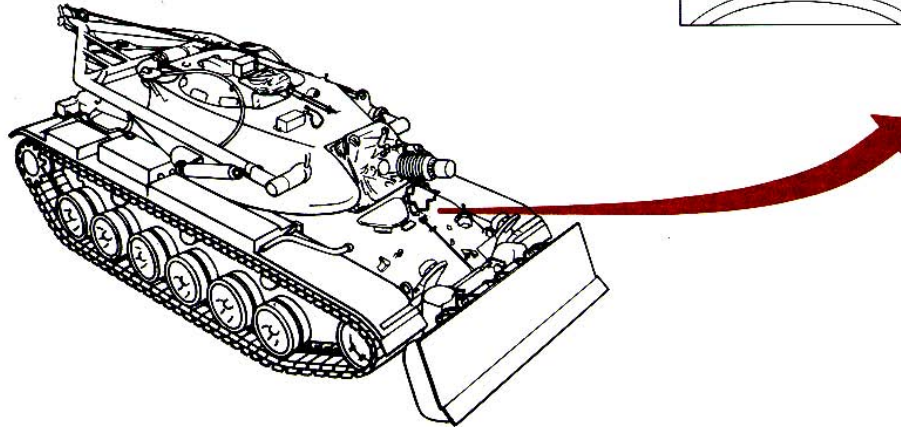
**To Open:**

1. Push lever (A) back to OPEN.
2. Insure that lever locks in OPEN position by moving lever slightly to the right.

To Close:



BEHIND  
DRIVER'S  
SEAT



**To Close:**

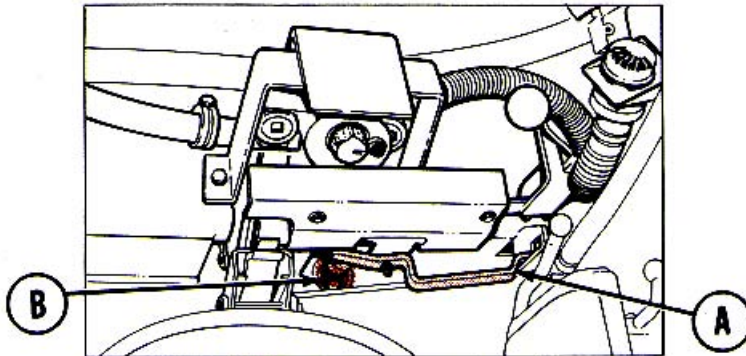
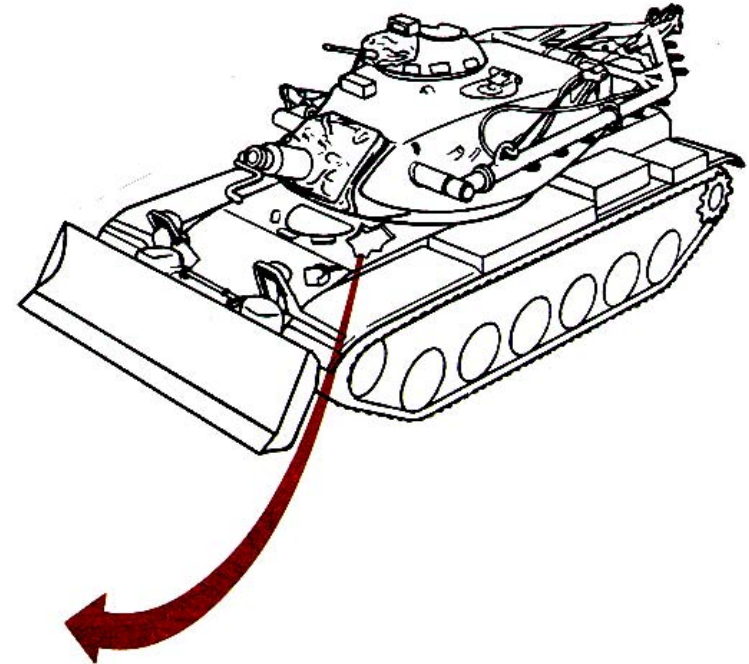
1. Move lever (A) slightly to the left, out of LOCKED position.
2. Pull lever forward to CLOSE.

**OPERATE UNDER UNUSUAL CONDITIONS (OPERATE CREW COMPARTMENT DRAIN VALVE)****To Open:**

1. Find lever (A) on floor behind driver's seat.
2. Pull lever (A) up.
3. Push lever back slightly until lever locks.

**To Close:**

1. Pull lever (A) forward.
2. Check that there are no obstructions (spent cartridges, cigarette butts, nuts or bolts, etc.) blocking return of valve plunger (B).
3. Push lever (A) down until it stops.



LEFT REAR OF DRIVER'S SEAT

**OPERATE UNDER UNUSUAL CONDITIONS (DRAIN BRAKE CONTROL HOUSING)**

**NOTE**

Two crewmembers are needed to do this procedure.

**Tools:**

Get from right front fender box:

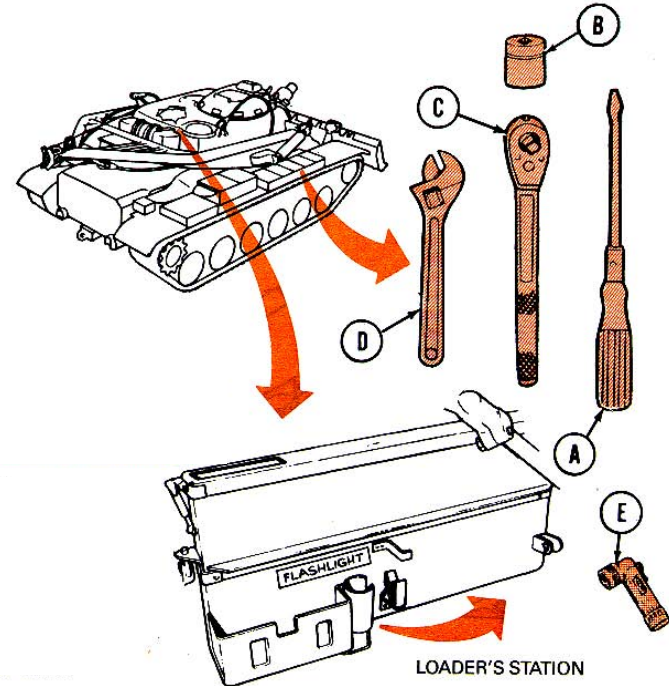
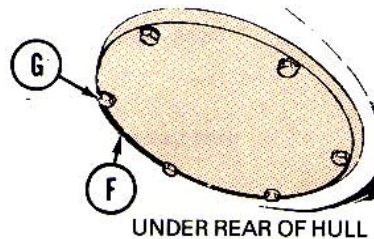
- Flat-tip screwdriver (A)
- 9/16 inch socket 1/2 inch driver (B)
- 1/2 inch drive ratchet (C)
- 8 inch adjustable wrench (D)

Get flashlight (E) from 7.62-mm ammunition ready box.

**WARNING**

Access plate (F) is heavy. One crewmember should hold access plate (F) while another crewmember removes screws and lockwashers (G).

1. Using socket and ratchet, unscrew six screws and lockwashers (G) from right rear access plate (F).



TA132810



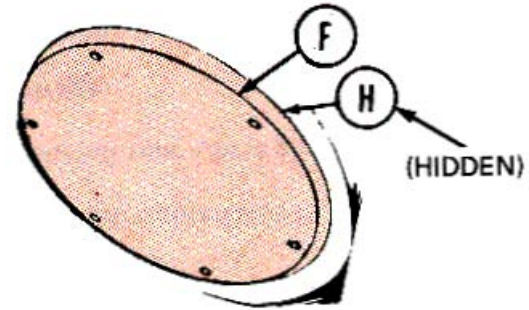
OPERATE UNDER UNUSUAL CONDITIONS (DRAIN BRAKE CONTROL HOUSING) - Continued

**CAUTION**

Do not damage gasket during removal.

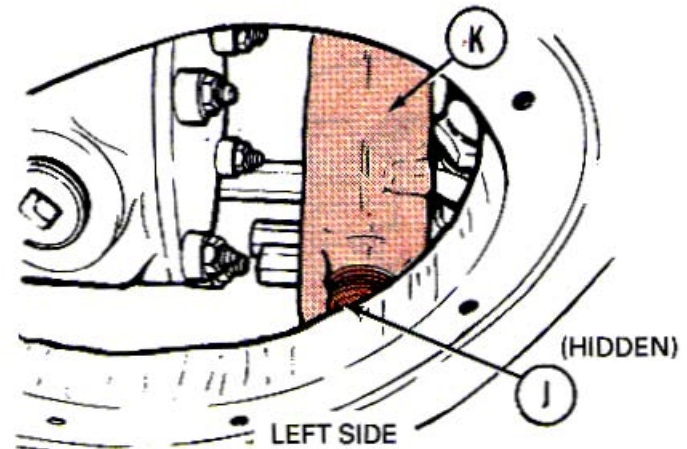
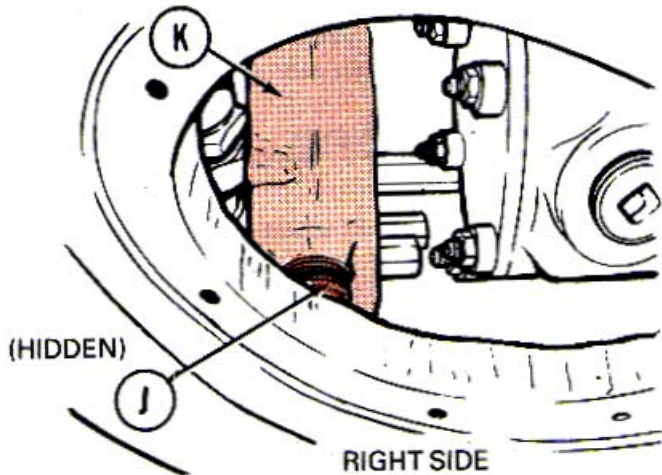
**NOTE**

You may have to use a screwdriver to loosen access plate (F) and gasket (H).



2. Remove access plate (F) and gasket (H).
3. Using flashlight, find drain plug (J) toward rear of opening.

4. Using adjustable wrench, unscrew drain plug (J) from brake control housing (K).
5. Allow all water to drain from housing.



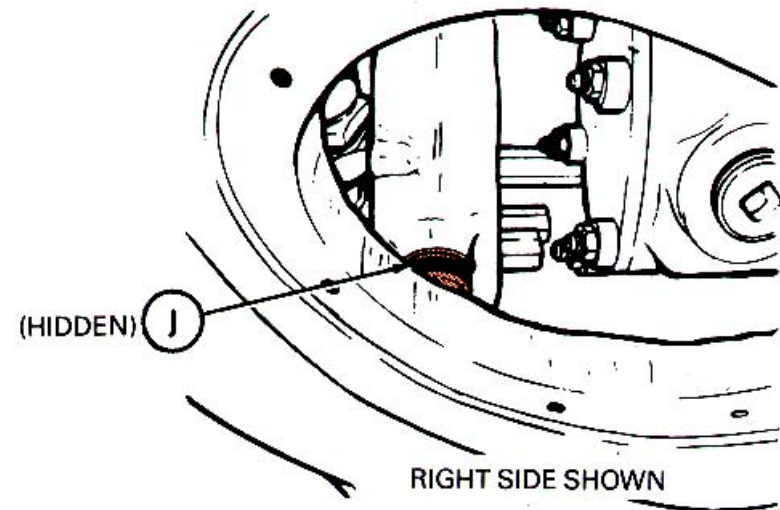
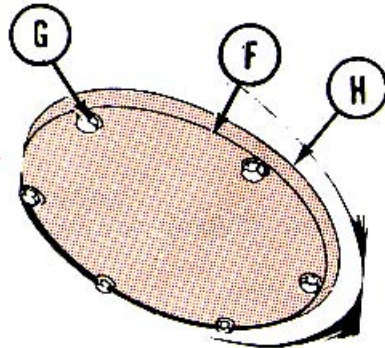
**OPERATE UNDER UNUSUAL CONDITIONS (DRAIN BRAKE CONTROL HOUSING) - Continued**

6. Install drain plug (J) in housing.
7. Using adjustable wrench, tighten drain plug.
8. Place gaskets (H) and access plates (F) on hull.

**WARNING**

Access plates (F) are heavy. One person must hold the plate in place while another person installs screws and lockwashers.

9. Install six screws and lockwashers (G).



10. Using socket and ratchet, tighten screws.
11. Do steps 3 thru 12 for left rear access plate.
12. Return tools to stowage.
13. Return flashlight to 7.62-mm ammunition ready boot

**OPERATE UNDER UNUSUAL CONDITIONS (SERVICE ENGINE AIR CLEANERS)**

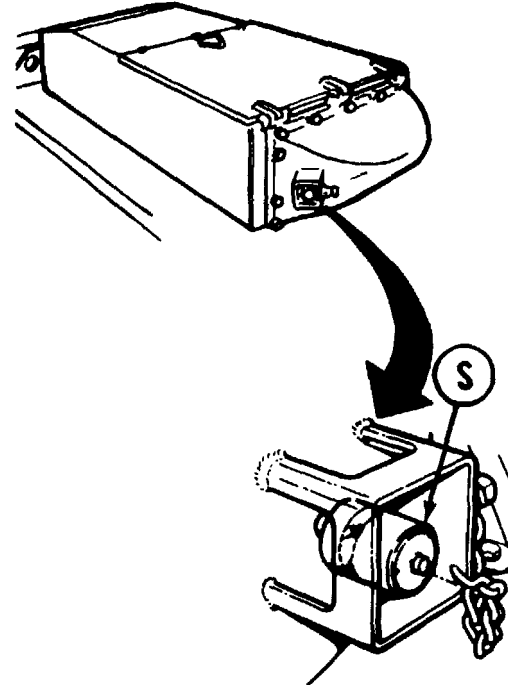
All information on pages 2-675 through 2-679 has been deleted

**NOTE**

Air cleaners are to be opened and serviced only by organizational maintenance personnel. If air restriction indicator (S) is present on air cleaner, continue with step 19. If not, continue with step 21.

19. If air restriction indicator (S) is not broken:

Late Model - A reading of 30 or more means that the filters require cleaning. Notify organizational maintenance. A reading of 25 indicates that the elements should be cleaned before any extensive move.

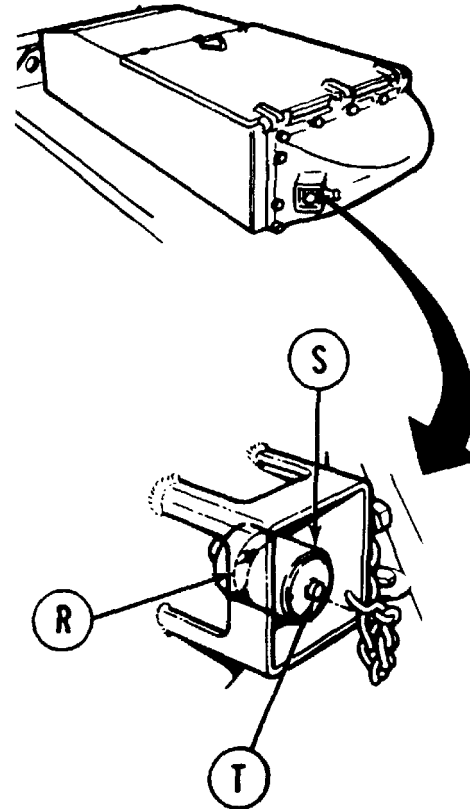


**OPERATE UNDER UNUSUAL CONDITIONS (SERVICE ENGINE AIR CLEANERS) - Continued**

**WARNING**

**Make sure are around vehicle is clear of personnel and equipment before performing the following step.**

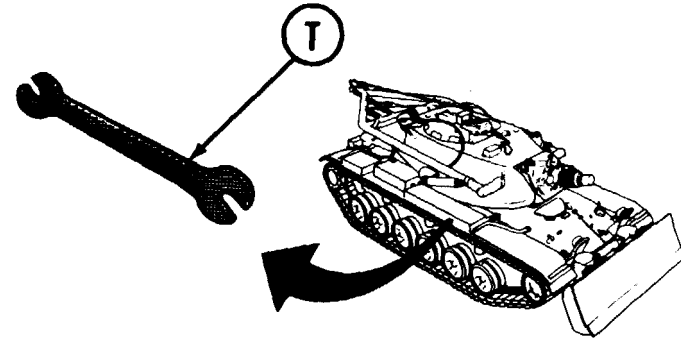
Early Model - Start engine (Page 2-2051 and after warm-up, apply vehicle brakes. Put transmission lever in high gear, accelerate to 1800/1900 rpm for no more than 30 seconds, and check air restriction indicator reading. If window (R) shows red, press reset button (T) and repeat procedure above. If window shows red again, notify organizational maintenance. If button (T) won't depress, air restriction indicator (S) is defective and must be replaced. Go to Step 20.



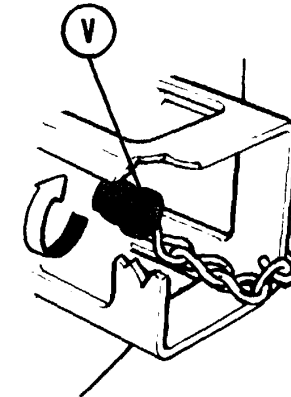
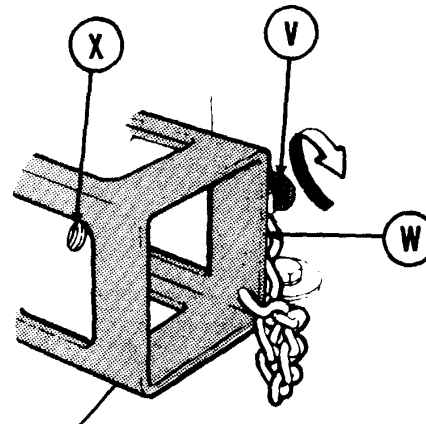
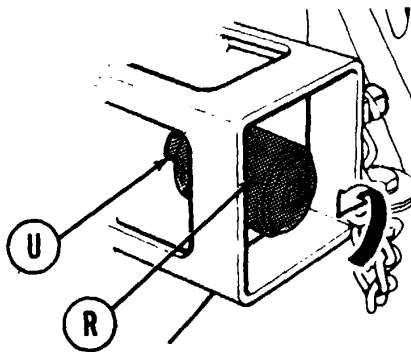
**OPERATE UNDER UNUSUAL CONDITIONS (SERVICE ENGINE AIR CLEANERS) - Continued**

20. If air restriction indicator (R) is broken:

- a. Get a combination 7/16 and 1/2 inch open end wrench (T) from right front fender box.
- b. Remove air restriction indicator (R) with wrench on nut (U).
- c. Remove pipe plug (V) from bracket (W).
- d. Screw pipe plug (V) tight into hole (X).
- e. Notify organizational maintenance as soon as possible that air restriction indicator is broken.



21. Return tools to stowage.



All information on pages 2-682 through 2-687/(2-688 blank) has been deleted.

RECOMMENDED CHANGES TO EQUIPMENT TECHNICAL PUBLICATIONS



THEN...JOT DOWN THE  
DOPE ABOUT IT ON THIS FORM.  
CAREFULLY TEAR IT OUT, FOLD IT  
AND DROP IT IN THE MAIL.

**SOMETHING WRONG WITH PUBLICATION**

FROM: (PRINT YOUR UNIT'S COMPLETE ADDRESS)

DATE SENT

PUBLICATION NUMBER

PUBLICATION DATE

PUBLICATION TITLE

BE EXACT PIN-POINT WHERE IT IS

PAGE  
NO.

PARA-  
GRAPH

FIGURE  
NO.

TABLE  
NO.

IN THIS SPACE, TELL WHAT IS WRONG  
AND WHAT SHOULD BE DONE ABOUT IT.

PRINTED NAME, GRADE OR TITLE AND TELEPHONE NUMBER

SIGN HERE

## THE METRIC SYSTEM AND EQUIVALENTS

### LINEAR MEASURE

1 Centimeter = 10 Millimeters = 0.01 Meters = 0.3937 Inches  
 1 Meter = 100 Centimeters = 1000 Millimeters = 39.37 Inches  
 1 Kilometer = 1000 Meters = 0.621 Miles

### WEIGHTS

1 Gram = 0.001 Kilograms = 1000 Milligrams = 0.035 Ounces  
 1 Kilogram = 1000 Grams = 2.2 Lb.  
 1 Metric Ton = 1000 Kilograms = 1 Megagram = 1.1 Short Tons

### LIQUID MEASURE

1 Milliliter = 0.001 Liters = 0.0338 Fluid Ounces  
 1 Liter = 1000 Milliliters = 33.82 Fluid Ounces

### SQUARE MEASURE

1 Sq. Centimeter = 100 Sq. Millimeters = 0.155 Sq. Inches  
 1 Sq. Meter = 10,000 Sq. Centimeters = 10.76 Sq. Feet  
 1 Sq. Kilometer = 1,000,000 Sq. Meters = 0.386 Sq. Miles

### CUBIC MEASURE

1 Cu. Centimeter = 1000 Cu. Millimeters = 0.06 Cu. Inches  
 1 Cu. Meter = 1,000,000 Cu. Centimeters = 35.31 Cu. Feet

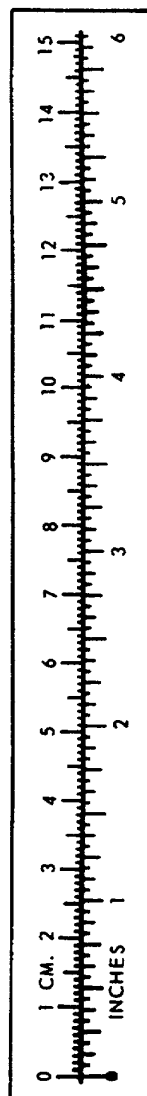
### TEMPERATURE

$\frac{5}{9}(^{\circ}\text{F} - 32) = ^{\circ}\text{C}$   
 212° Fahrenheit is equivalent to 100° Celsius  
 90° Fahrenheit is equivalent to 32.2° Celsius  
 32° Fahrenheit is equivalent to 0° Celsius  
 $\frac{9}{5}^{\circ}\text{C} + 32 = ^{\circ}\text{F}$

## APPROXIMATE CONVERSION FACTORS

TO CHANGE	TO	MULTIPLY BY
Inches	Centimeters	2.540
Feet	Meters	0.305
Yards	Meters	0.914
Miles	Kilometers	1.609
Square Inches	Square Centimeters	6.451
Square Feet	Square Meters	0.093
Square Yards	Square Meters	0.836
Square Miles	Square Kilometers	2.590
Acres	Square Hectometers	0.405
Cubic Feet	Cubic Meters	0.028
Cubic Yards	Cubic Meters	0.765
Fluid Ounces	Milliliters	29.573
Pints	Liters	0.473
Quarts	Liters	0.946
Gallons	Liters	3.785
Ounces	Grams	28.349
Pounds	Kilograms	0.454
Short Tons	Metric Tons	0.907
Pound-Feet	Newton-Meters	1.356
Pounds per Square Inch	Kilopascals	6.895
Miles per Gallon	Kilometers per Liter	0.425
Miles per Hour	Kilometers per Hour	1.609

TO CHANGE	TO	MULTIPLY BY
Centimeters	Inches	0.394
Meters	Feet	3.280
Meters	Yards	1.094
Kilometers	Miles	0.621
Square Centimeters	Square Inches	0.155
Square Meters	Square Feet	10.764
Square Meters	Square Yards	1.196
Square Kilometers	Square Miles	0.386
Square Hectometers	Acres	2.471
Cubic Meters	Cubic Feet	35.315
Cubic Meters	Cubic Yards	1.308
Milliliters	Fluid Ounces	0.034
Liters	Pints	2.113
Liters	Quarts	1.057
Liters	Gallons	0.264
Grams	Ounces	0.035
Kilograms	Pounds	2.205
Metric Tons	Short Tons	1.102
Newton-Meters	Pound-Feet	0.738
Kilopascals	Pounds per Square Inch	0.145
Kilometers per Liter	Miles per Gallon	2.354
Kilometers per Hour	Miles per Hour	0.621



**PIN: 047749-000**