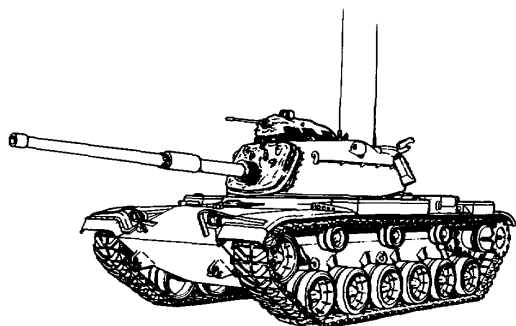


**TECHNICAL MANUAL**  
**ORGANIZATIONAL MAINTENANCE**  
**VOLUME 2 OF**  
**CHAPTERS 5 THRU 9**



**TANK, COMBAT, FULL TRACKED**  
**105-MM GUN, M60**  
**2350-00-678-5773**  
**(HULL)**

<b>POWERPLANT MAINTENANCE</b>	<b>5-1</b>
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<b>ENGINE MAINTENANCE</b>	<b>6-1</b>
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<b>FUEL SYSTEM MAINTENANCE</b>	<b>7-1</b>
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<b>EXHAUST SYSTEM</b>	<b>8-1</b>
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<b>COOLING SYSTEM</b>	<b>9-1</b>
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**WARNING**

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

Support brake access covers with hand to prevent personal injury when removing covers.

Powerplant weighs more than 8500 pounds. Careless handling may result in serious injury to personnel or damage to equipment. Do not permit powerplant to strike hull.

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

Do not allow smoking, open flames, tank or other vehicle operations within 50 feet while draining fuel tanks.

Do not let upper and lower fuel-water sensor probes come in direct contact with each other or with metal container during operational tests. Do not touch bare ends of sensor probe cables.

Assign one person with a fire extinguisher as fire guard during all powerplant tests.

Take all necessary safety precautions to eliminate possible injury to personnel or damage to equipment. Stand clear of transmission output flanges whenever engine is running. Hearing protection is required.

During engine fuel leak check, observe for fuel leakage from a safe distance. Fuel is delivered under high pressure from fuel pump to injector nozzles. Injury to personnel could result if contacted by spray from loose or defective fuel lines.

Ignition coils on engine are capable of producing extremely high voltage. Output of this ignition system is sufficient to cause a dangerous electrical shock. Never touch any uncovered or live connections.

Transmission shroud is hot after operation. Allow engine to cool one hour before removing shroud. Wear asbestos gloves for protection.

HEADQUARTERS  
DEPARTMENT OF THE ARMY  
Washington, D.C., 12 February 1986

ORGANIZATIONAL MAINTENANCE MANUAL  
TANK, COMBAT, FULL-TRACKED 105-MM GUN, M60  
NSN (2350-00-678-5773)  
(HULL)

TM 9-2350-260-20-1-2, February 1981, is changed as follows:

1. Remove old pages and insert new pages as indicated below.
2. New or changed material is indicated by a vertical bar in the margin of the page.
3. Added or revised illustrations are indicated by a vertical bar adjacent to the illustration identification number.

Remove Pages

5-59 and 5-60

Insert Pages

5-59 and 5-60

By Order of the Secretary of the Army:

Official:

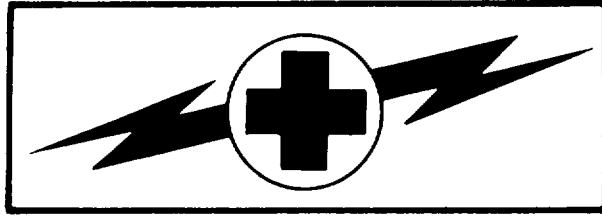
**JOHN A. WICKHAM, JR.**  
*General United States Army*  
*Chief of Staff*

**MILDRED E. HEDBERG**  
*Brigadier General United States Army*  
*The Adjutant General*

Distribution:

To be distributed in accordance with DA Form 12-37, Organizational Maintenance requirements for Tank, Combat, Full Tracked, 105-MM, M60.





**WARNING**

**CARBON MONOXIDE POISONING CAN BE DEADLY**

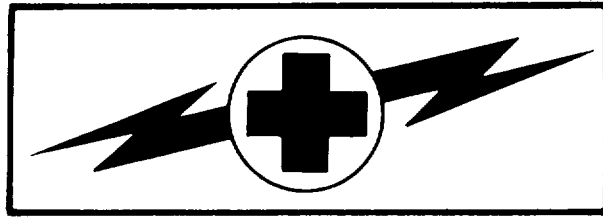
Carbon monoxide is a colorless, odorless, deadly poisonous gas, which when breathed deprives the body of oxygen and causes suffocation. Exposure to air contaminated with carbon monoxide produces symptoms of headache, dizziness, loss of muscular control, apparent drowsiness, and/or coma. Permanent brain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

1. **DO NOT** operate heater or engine of tank in an enclosed area unless the area is **ADEQUATELY VENTILATED**.
2. **DO NOT** idle engine for long periods without maintaining **ADEQUATE VENTILATION** in personnel compartments.
3. **DO NOT** drive any tank with inspection plates, cover plates, or engine compartment doors removed unless necessary for maintenance purposes.
4. **BE ALERT** at all times during tank operation for exhaust odors and exposure symptoms. If either are present **IMMEDIATELY VENTILATE** personnel compartments. If symptoms persist remove affected personnel from tank and treat as follows: expose to fresh air; keep warm; **DO NOT PERMIT PHYSICAL EXERCISE**.

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

For artificial respiration, refer to FM 21-11.

**WARNING**



**WARNING**

**HIGH VOLTAGE**

Used in the operation of this equipment

**DEATH ON CONTACT**

May result if personnel fail to observe safety precautions.

Never work on electronic equipment unless there is another person nearby who is familiar with the operation and hazards of the equipment and who is competent in administering first aid. When a technician is aided by operators, he must warn them about dangerous areas.

Whenever possible, the master control switch and battery ground straps should be either turned off or disconnected before beginning work on the equipment.

Whenever the nature of the operation permits, keep one hand away from the equipment to reduce the hazard of current flowing through vital organs of the body.

Before you work around tracked vehicles, remove rings, bracelets, and wristwatches. 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.

For artificial respiration, refer to FM 21-11.

**ORGANIZATIONAL MAINTENANCE MANUAL  
TANK, COMBAT, FULL-TRACKED, 105-MM GUN, M60  
NSN (2350-00-678-5773)  
(HULL)**

**REPORTING OF ERRORS AND RECOMMENDING IMPROVEMENTS**

You can help improve this manual. If you find any mistake or if you know of any way to improve the procedures, please let us know. Mail your letter, DA Form 2028 (Recommended Changes to Publications and Blank Forms), or DA Form 2028-2 located in the back of this manual, direct to: Commander, U.S. Army Tank Automotive Command, Attn: DRSTA-MB, Warren, Michigan 48090. A reply will be furnished directly to you.

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
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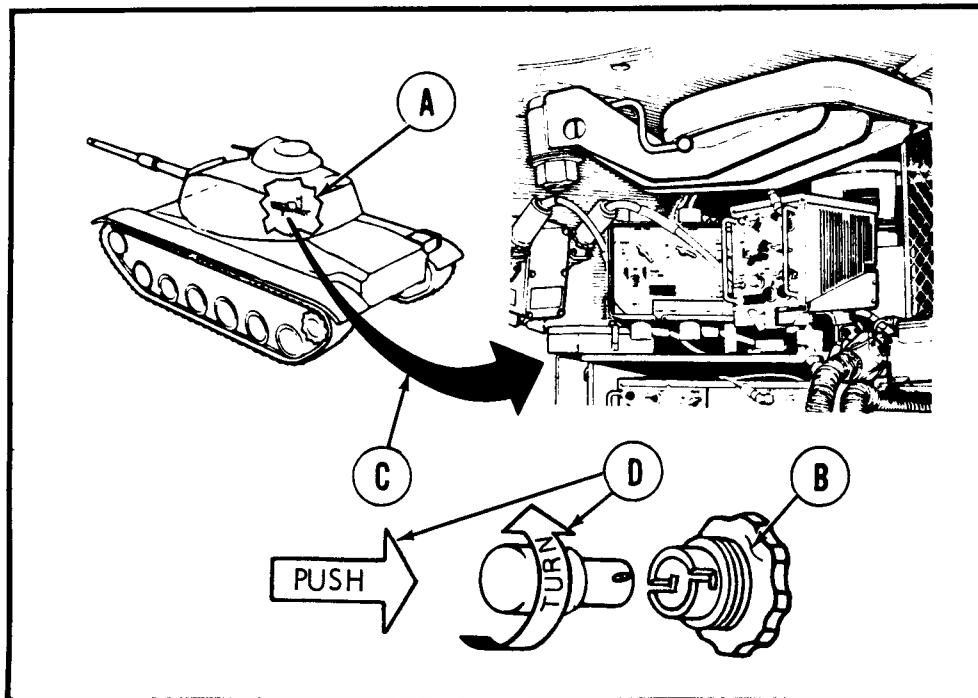
\*This manual, together with TM 9-2350-260-20-1-1, 13 February 1981; TM 9-2350.260-20-1-3, 13 February 1981; and TM 9-2350-260-20-1-4, 13 February 1981 supersedes so much of TM 9-350-215-20, 23 February 1965, as pertains to M60 Tank.

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## HOW TO USE THIS MANUAL

- This manual is divided into chapters.
- Chapters are by functional group code and are presented in same order as the RPSTL (Repair Parts and Special Tool List).
- Procedure indexes are on procedures that are four pages or more, and indicate how the procedure is set up, i.e., disassembly, removal, cleaning and inspection, etc.
- All manual references within this technical manual refer to page numbers.
- Steps are numbered and are to be performed in that order.
- Be sure to read all NOTES, WARNINGS, AND CAUTIONS.
- Locator views are included wherever necessary. These will help you locate the item for which the procedure is referencing.
- Jagged circle (  ) on locator (A) indicates a cutout and means the item is inside the vehicle.
- A (  ) symbol represents the outside surface (B) of a piece of equipment that cannot be shown in its entirety.
- Callouts are shown by a circle with a letter inside.
- Locator arrows (C) are black and mechanical motion arrows (D) are white.
- Broken leader arrow (  ) indicates the item is either inside or under the vehicle and cannot be seen.



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## HOW TO USE THIS MANUAL - Continued

- Certain sections of the manual have detailed 'how to use' instructions at the beginning of the section - for example, troubleshooting.
- A maintenance information index is located in back of this manual. It is set up in alphabetical order and maintenance function, for example; disassemble, clean, inspect, repair, remove, install, assemble, and test;
- An illustrated list of manufactured items, or better known as fabricated tools, is located in back of this manual. It is nothing more than direction on how to fabricate tools that are listed throughout the manual.

## CHAPTER 5

## POWERPLANT MAINTENANCE INDEX

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Powerplant Replacement (2A Engine)	5-2
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**POWERPLANT REPLACEMENT (2A ENGINE) (Sheet 1 of 24)**

PROCEDURE INDEX

PROCEDURE	PAGE
Removal	5-3
Installation	5-14

- TOOLS: 5 ton hoist or comparable lifting device capable of lifting powerplant 12 ft. high  
 Ratchet with 1/2 in. drive  
 9/16 in. socket with 1/2 in. drive  
 7/16 in. socket with 1/2 in. drive  
 3/4 in. socket with 1/2 in. drive  
 Ratchet with 3/4 in. drive  
 1-1/2 in. socket with 3/4 in. drive  
 Torque wrench with 3/4 in. drive (0-600 lb-ft)(0-813 N•m)  
 7/16 in. combination box and open end wrench  
 Adjustable wrench (10 inch)  
 Spanner wrench  
 Flat-tip screwdriver  
 Putty knife  
 Pliers  
 Flashlight (if required)  
 Pinch bar (commander's station right side wall)  
 Hammer  
 Cutting pliers

SPECIAL TOOLS: Powerplant lifting sling (Item 31, Chapter 3, Section I)

FABRICATED TOOLS: Final drive guide shield (Fig. 1, Appendix F) (2 required)

- SUPPLIES: Adhesive(Item 2, Appendix D)  
 Covers for fire extinguisher tubing fittings  
 Covers for fuel return line fittings and press  
 Covers for primary fuel line fittings  
 Covers for air cleaner outlet hose connect points  
 Grease (Item 36, Appendix D)  
 Heavy masking tape (Item 57, Appendix D)  
 Rags (Item 65, Appendix D)  
 Dry cleaning solvent (Item 54, Appendix D)  
 Rubber gloves  
 Wooden block, 12 x 12 x 12 in. (3 required)  
 Lockwire (Item 60, Appendix D)  
 Lockwasher (MS35338-44) (4 required)  
 Lockwasher (MS35338-53) (2 required)  
 Lockwasher (MS35338-65) (12 required)

PERSONNEL: Three

REFERENCE: TM 9-2350-260-10

Go on to Sheet 2

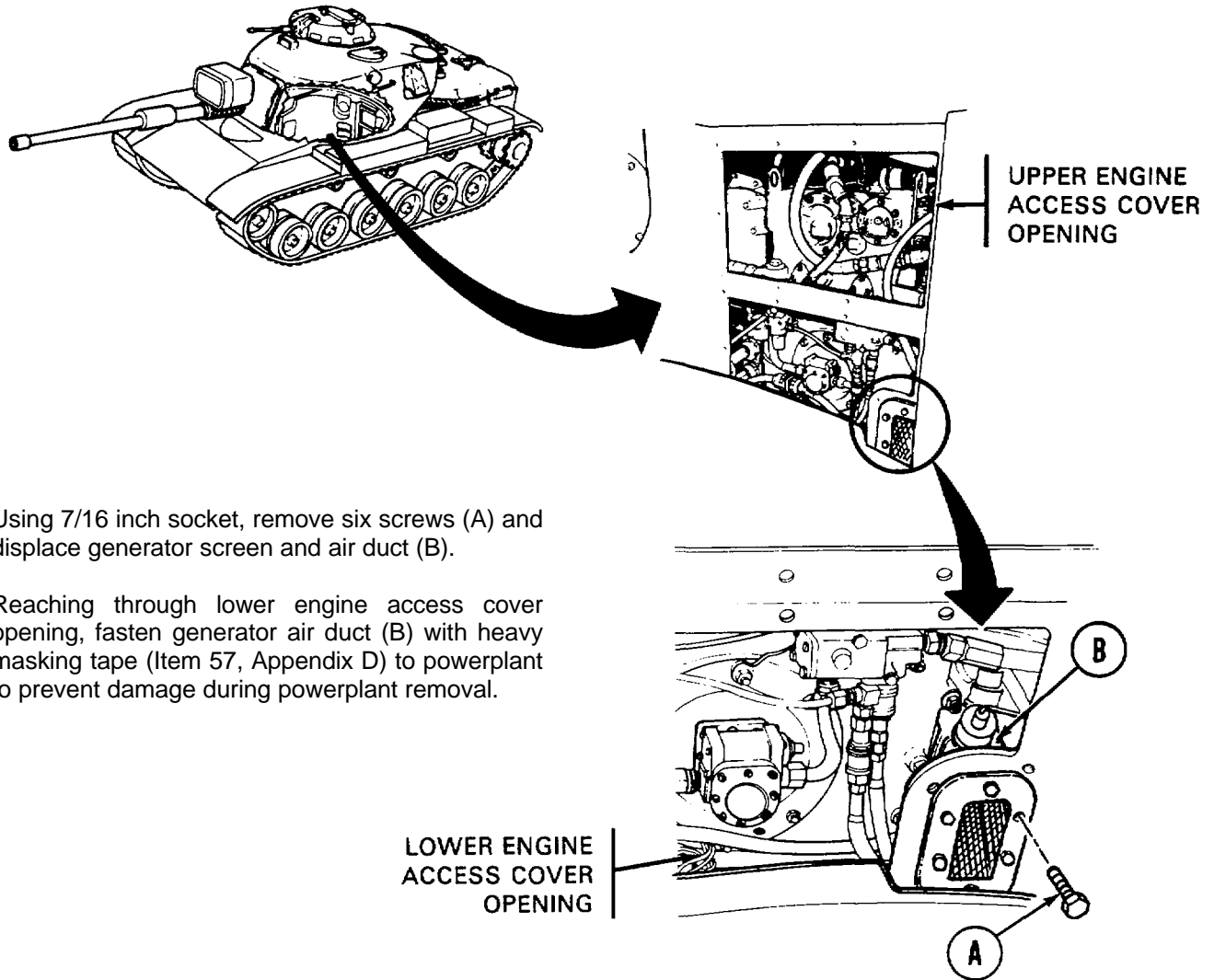
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**POWERPLANT REPLACEMENT (2A ENGINE) (Sheet 2 of 24)**

- PRELIMINARY PROCEDURES:**
- Release parking brake
  - Place shifting lever in P (park)
  - Remove top deck (page 16-20)
  - Remove transmission shroud (page 9-20)
  - Place MASTER CONTROL switch OFF (TM 9-2350-260-10)
  - Disconnect battery ground straps (page 10-294)
  - Manually traverse turret so engine access covers can be reached (TM 9-2350-260-10).
  - Remove upper engine access cover (page 16-44)

**REMOVAL:**



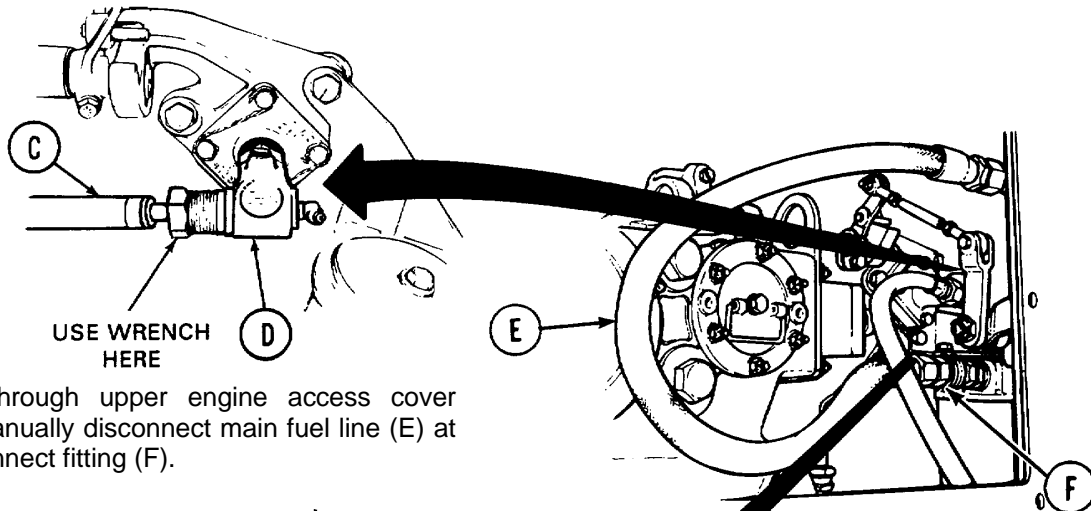
1. Using 7/16 inch socket, remove six screws (A) and displace generator screen and air duct (B).
2. Reaching through lower engine access cover opening, fasten generator air duct (B) with heavy masking tape (Item 57, Appendix D) to powerplant to prevent damage during powerplant removal.

POWERPLANT REPLACEMENT (2A ENGINE) (Sheet 3 of 24)

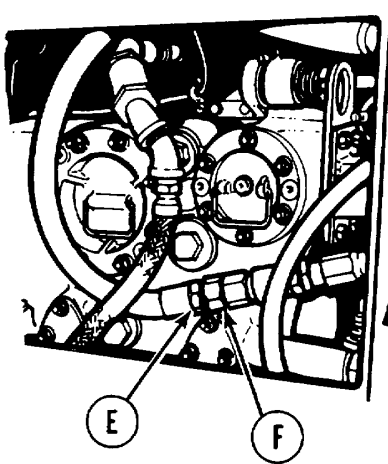
CAUTION

When tying off lines, position them so turret will clear them when traversed.

3. Reaching through upper engine access cover opening, use adjustable wrench to unscrew tachometer cable (C) at adapter (D).
4. Using heavy masking tape (Item 57, Appendix D), fasten tachometer cable (C) to bulkhead.



5. Reaching through upper engine access cover opening, manually disconnect main fuel line (E) at quick-disconnect fitting (F).

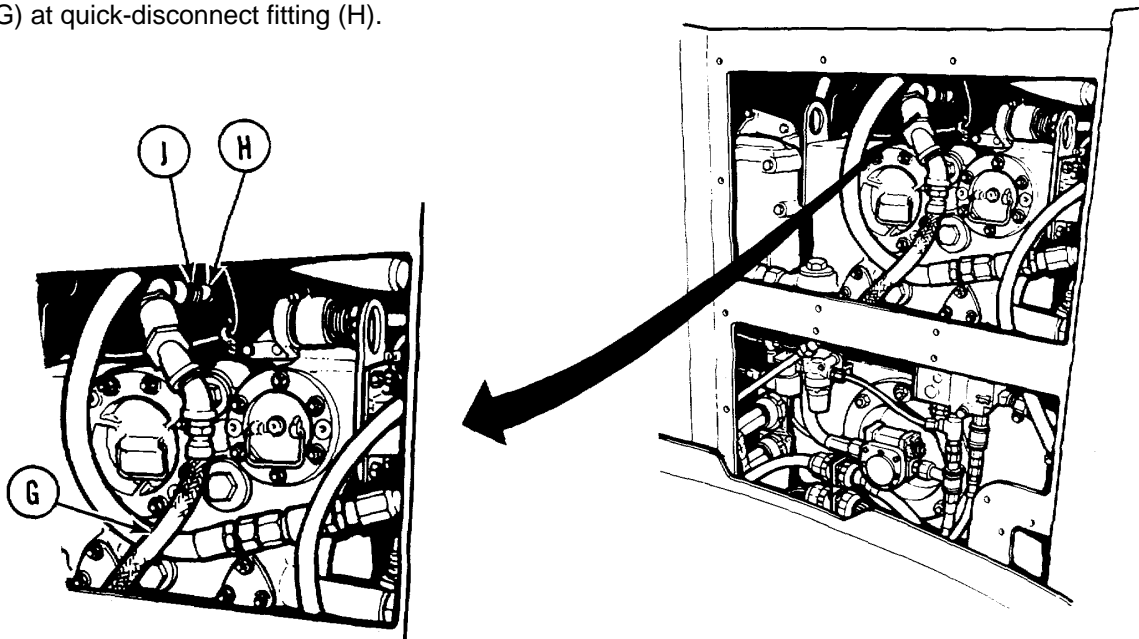


6. Put protective coverings over open end of fuel line (E) and fitting (F).

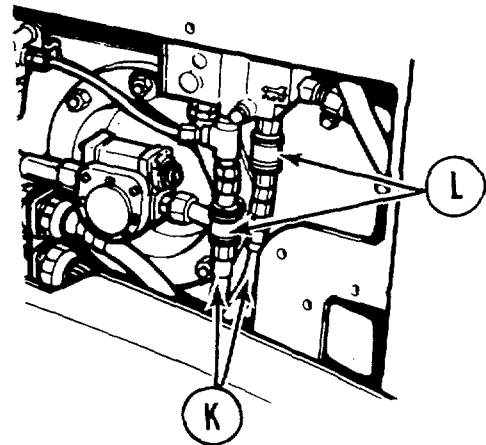
7. Using heavy masking tape (Item 57, Appendix D), fasten main fuel line (E) to bulkhead.

**POWERPLANT REPLACEMENT (2A ENGINE) (Sheet 4 of 24)**

8. Reaching through upper engine access cover opening, manually disconnect fire extinguisher tubing (G) at quick-disconnect fitting (H).



9. Using heavy masking tape (Item 57, Appendix D), tie free end of fire extinguisher tubing (G) out of the way.
10. Reaching through upper engine access cover opening, put protective coverings over end of fire extinguisher tubing (G) and its connect point (J) at engine.
11. Reaching through lower engine access cover opening, manually disconnect two priming fuel lines (K) at quick-disconnect fittings (L).



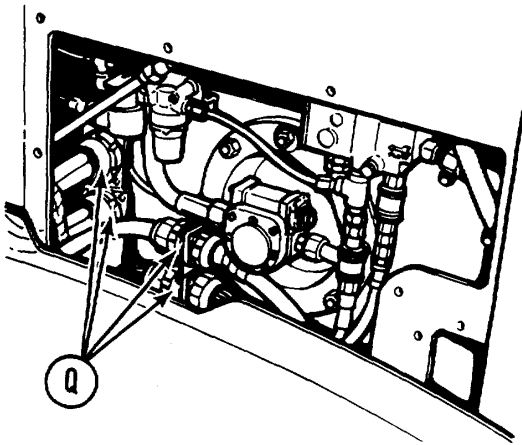
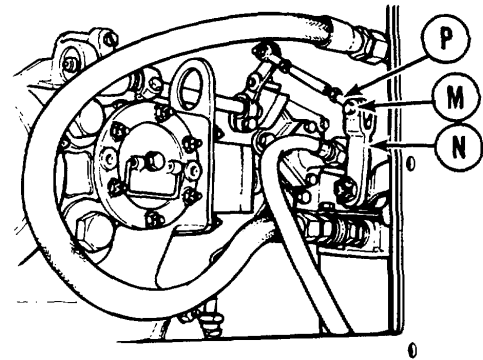
12. Put protective covering over ends of lines (K) and disconnect fittings (L).

Go on to Sheet 5

TA147906

**POWERPLANT REPLACEMENT (2A ENGINE) (Sheet 5 of 24)**

13. Reaching through upper engine access cover opening, use 7/16 inch wrench to remove bolt (M) holding accelerator linkage clevis (N) to rod end (P). Lift and displace rod end.
14. Reaching through lower engine access opening, use spanner wrench to loosen four connectors (Q). Manually disconnect connectors.



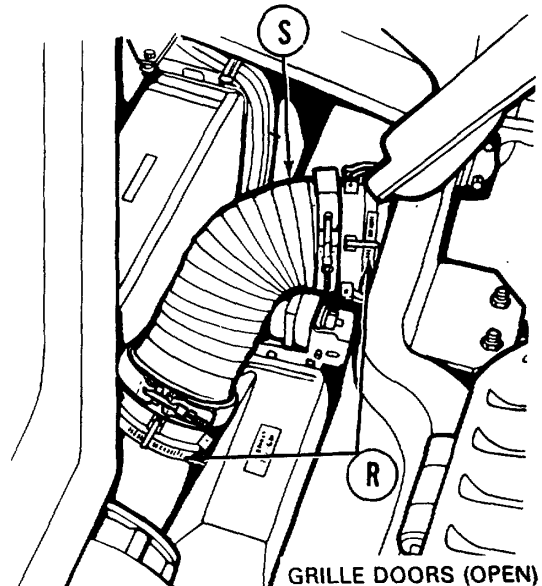
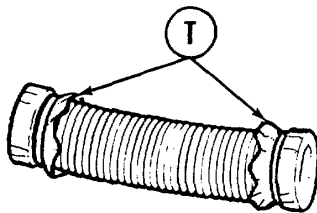
15. Using heavy masking tape (Item 57, Appendix D), fasten four loose electrical cables to bulkhead.

**NOTE**

**Make sure tied-off line is clear when traversing turret.**

17. Using 7/16 inch wrench, loosen nuts of outer clamp (R) holding air cleaner outlet hoses (S) on each side to air cleaner.
18. Remove clamps and manually displace two air cleaner outlet hoses (S) (each side of tank).
19. Put protective coverings over outlet hose connect point (T).

16. Close grille doors and manually traverse turret to bring gun tube over left or right fender box (TM 9-2350-260-10). Open grille doors.



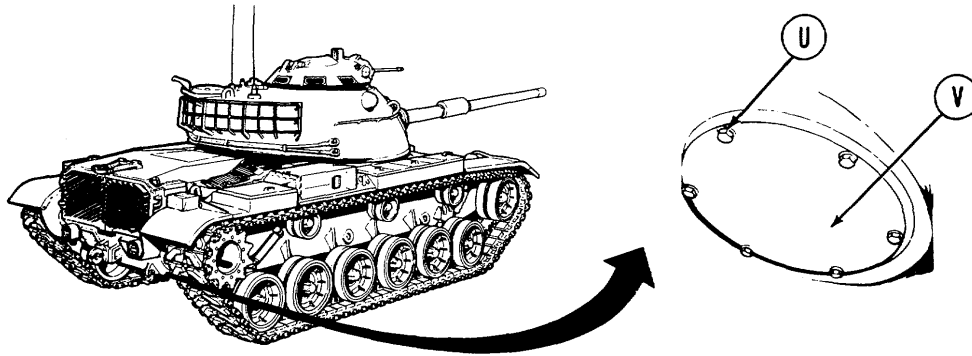
Go on to Sheet 6

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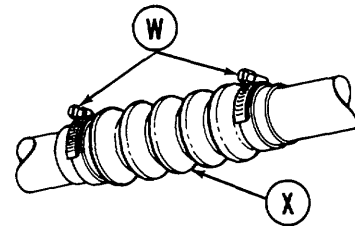
POWERPLANT REPLACEMENT (2A ENGINE) (Sheet 6 of 24)

**WARNING**

Support brake rod access covers (V) with hand to prevent personal injury.

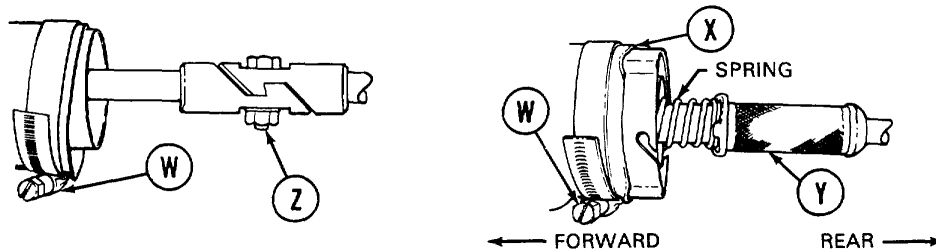


20. Using 9/16 inch socket remove 12 screws and lockwashers (U) from left and right brake rod access covers (V). Remove covers. Throw lockwashers away.
21. Using putty knife, remove left and right brake rod access cover gaskets. Throw gaskets away.
22. Reach through brake rod access opening with 5/16 inch wrench and loosen two clamps (W) and slide rubber boot (X) forward (both sides of tank).



**NOTE**

If your tank has a spring loaded sleeve (Y) type disconnect perform step 23. If it has a screw, lockwasher, and nut (Z) type, go to step 24.

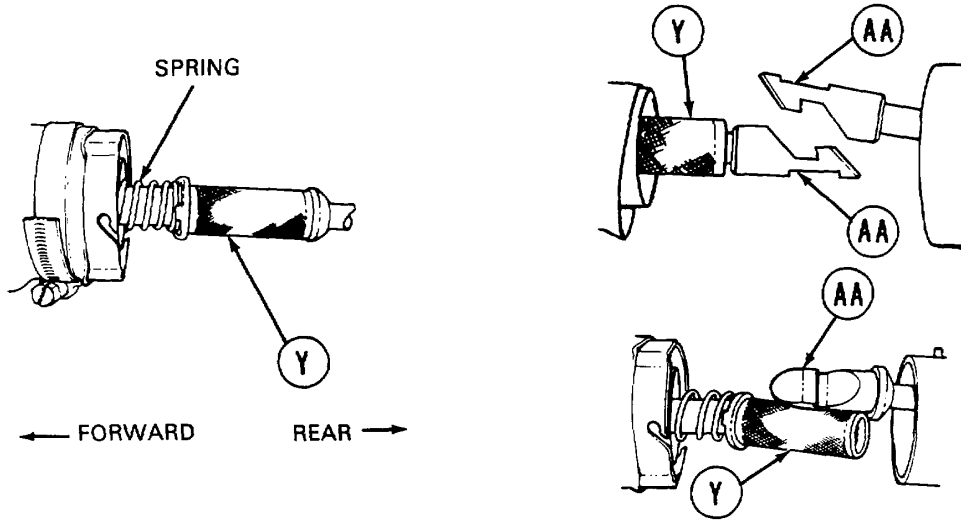


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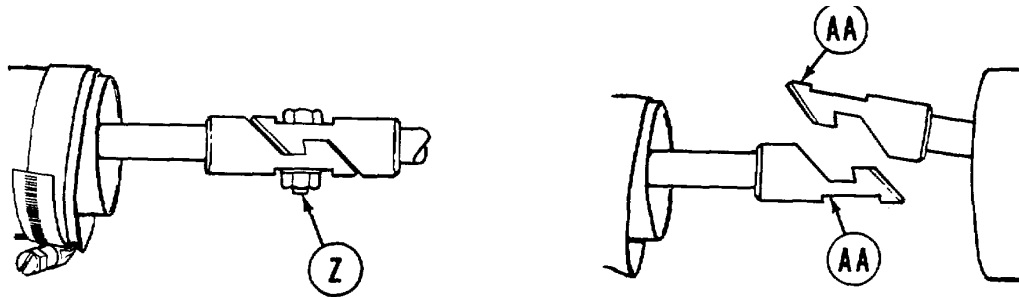
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**POWERPLANT REPLACEMENT (2A ENGINE) (Sheet 7 of 24)**

23. Using pliers, push sleeve (Y) toward front of tank till it clears connect points of rod ends (AA). Displace rod ends as shown below and allow sleeve (Y) to slide to rear (both sides of tank). Go on to step 25.

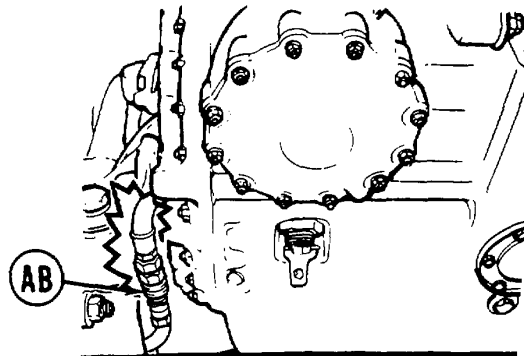


24. Using 7/16 inch wrench to hold nut, use another 7/16 inch wrench to remove screw, lockwasher, and nut (Z). Displace rod ends (AA) so rear one can't hang up at powerplant removal. Throw lockwasher away.



25. Reaching between transmission and under left transmission mount, manually push forward on quick-disconnect (AB) and release and displace it.

26. Put protective coverings over open ends of quick-disconnect (AB).

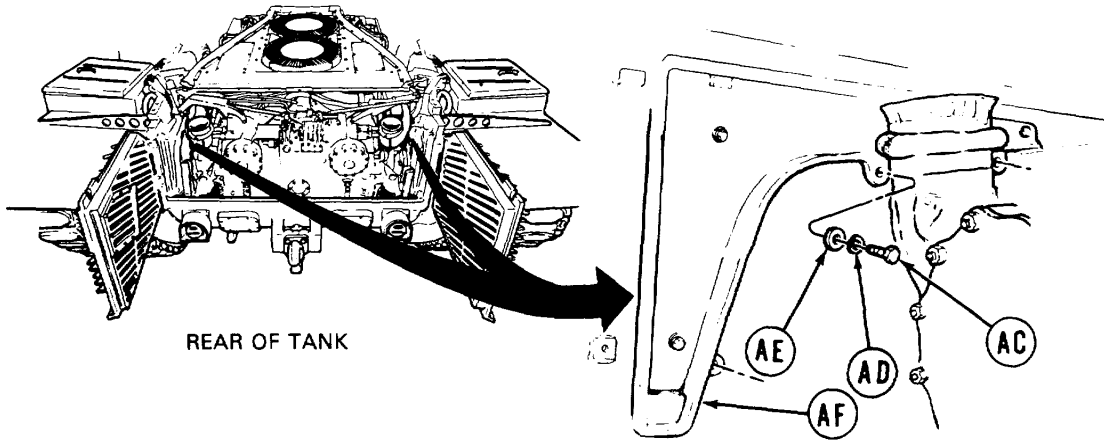


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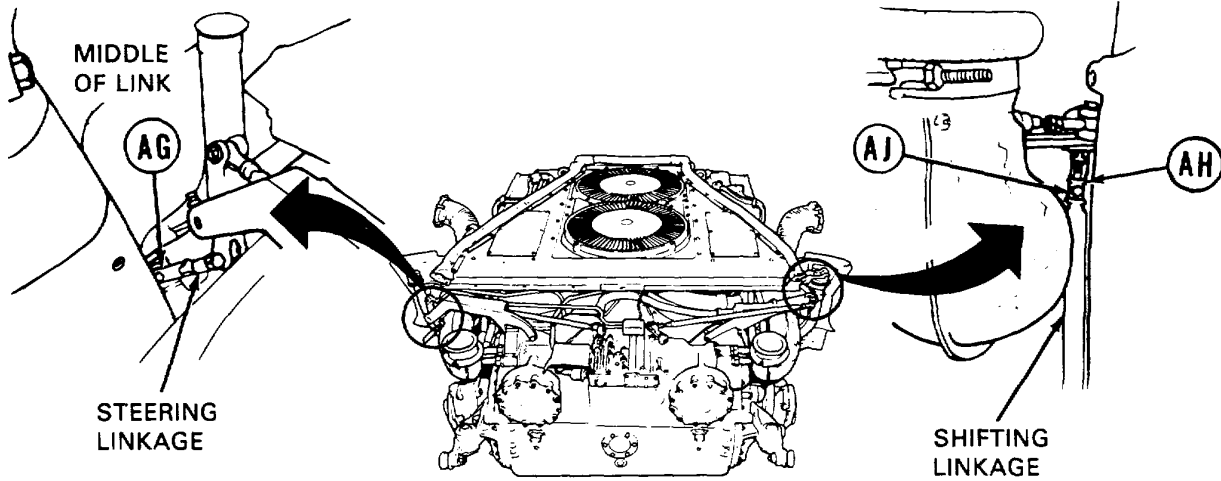
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**POWERPLANT REPLACEMENT (2A ENGINE) (Sheet 8 of 24)**

27. Using 9/16 inch socket, remove three screws (AC), lockwashers (AD), and washers (AE) from each side. Throw lockwashers away.



28. Lift up on rear corners of two bracket (AF) to remove them.
29. Using cutting pliers, remove lockwire from screw (AG).
30. Using 7/16 inch wrench, remove screw (AG) securing steering linkage. Displace linkage at left side of transmission.



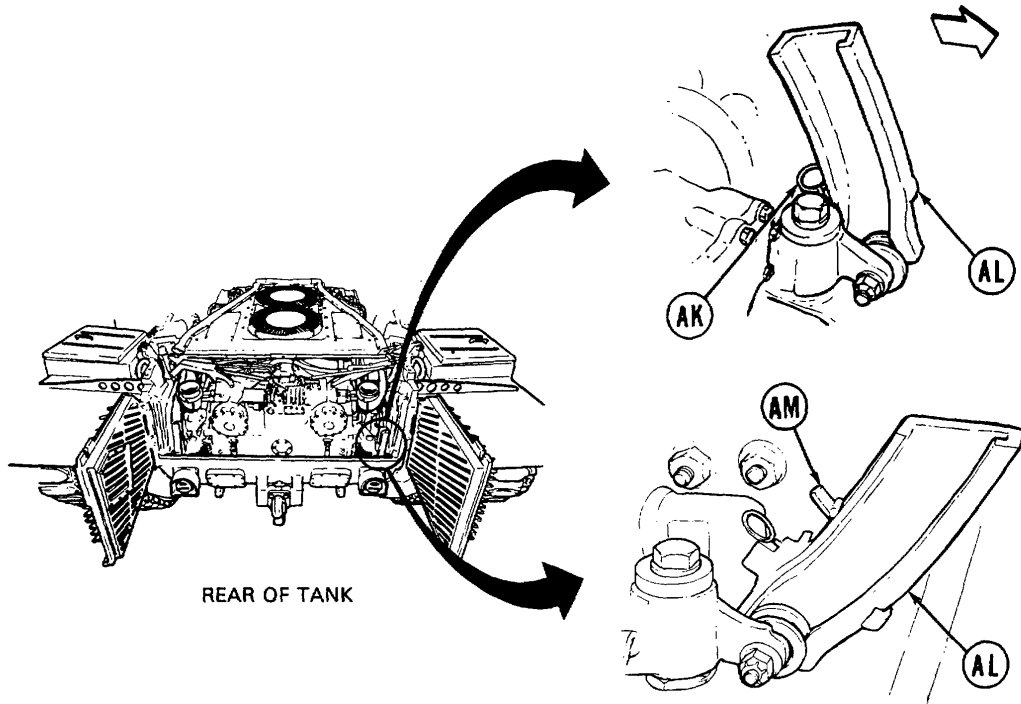
31. Using cutting pliers, remove lockwire (AH) from screw (AJ).
32. Using 7/16 inch wrench, remove screw (AJ) and displace shifting linkage.

Go on to Sheet 9

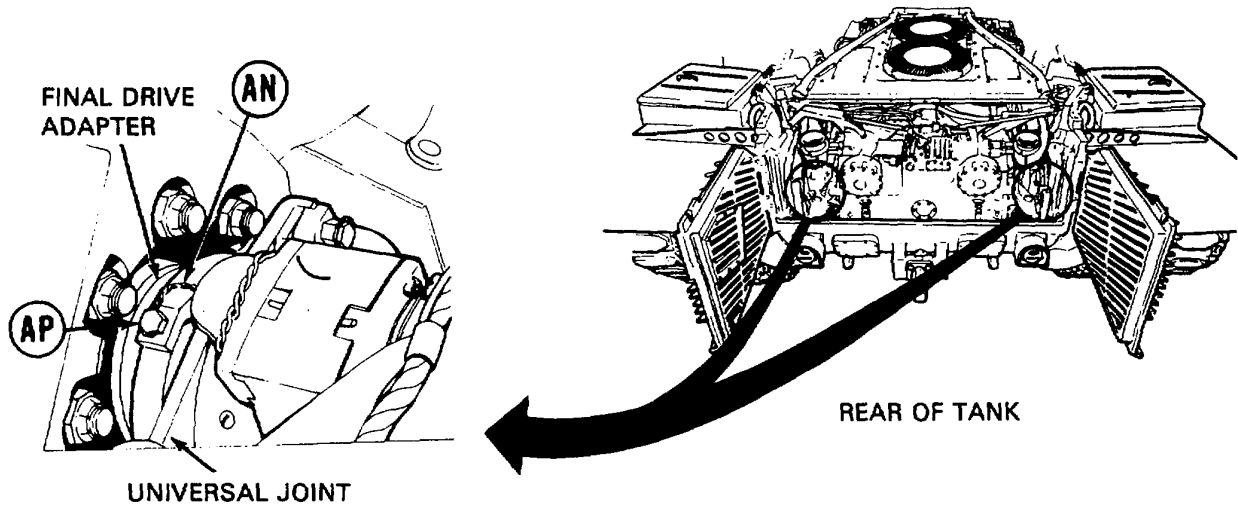
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**POWERPLANT REPLACEMENT (2A ENGINE) (Sheet 9 of 24)**

33. Manually pull one locking (AK) on each side of powerplant to unlock powerplant guide (AL). Pull guides (AL) away from powerplant until they lock.



34. Make sure powerplant guide locks (AM) engage when guides (AL) are all the way back.



35. Using cutting pliers, cut lockwire (AN) a screw (AP) and remove lockwire on both sides of transmission.

Go on to Sheet 10

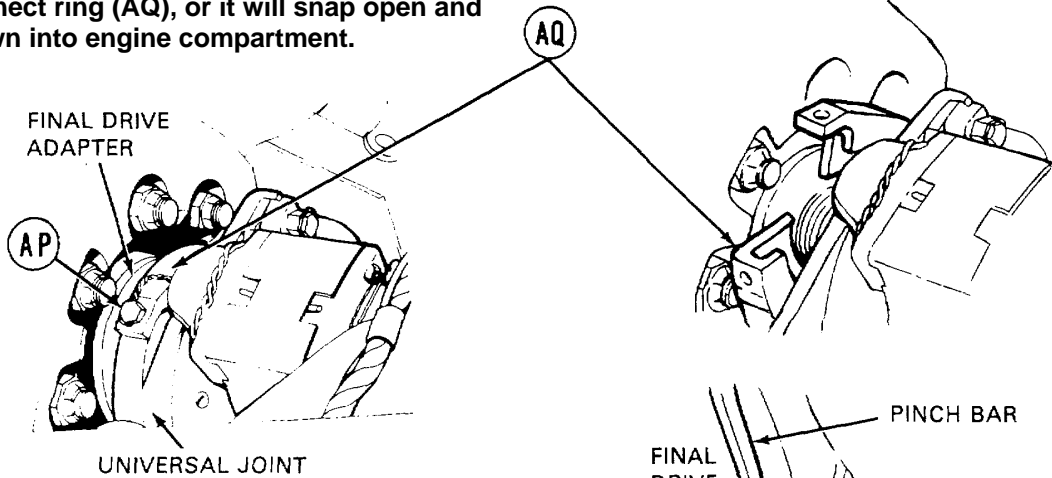
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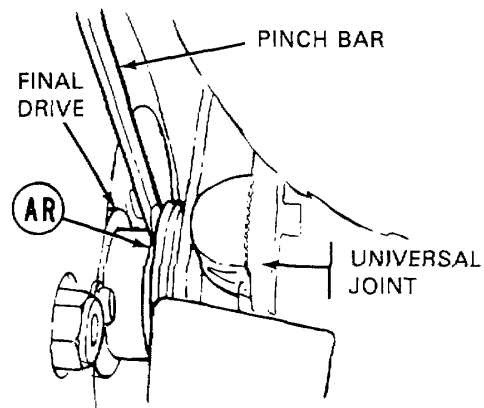
POWERPLANT REPLACEMENT (2A ENGINE) (Sheet 10 of 24)

NOTE

When removing screw (AP), hold onto quick-disconnect ring (AQ), or it will snap open and fall down into engine compartment.



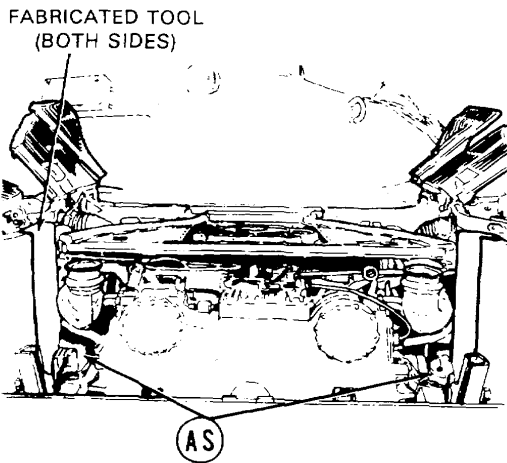
36. Using 3/4 inch socket, remove screw (AP) securing quick-disconnect ring (AQ).
37. Remove both rings (AQ).
38. Using hammer and pinch bar, tap final drive adapter (AR) toward final drive each side of tank far enough to free adapter from universal joint.



NOTE

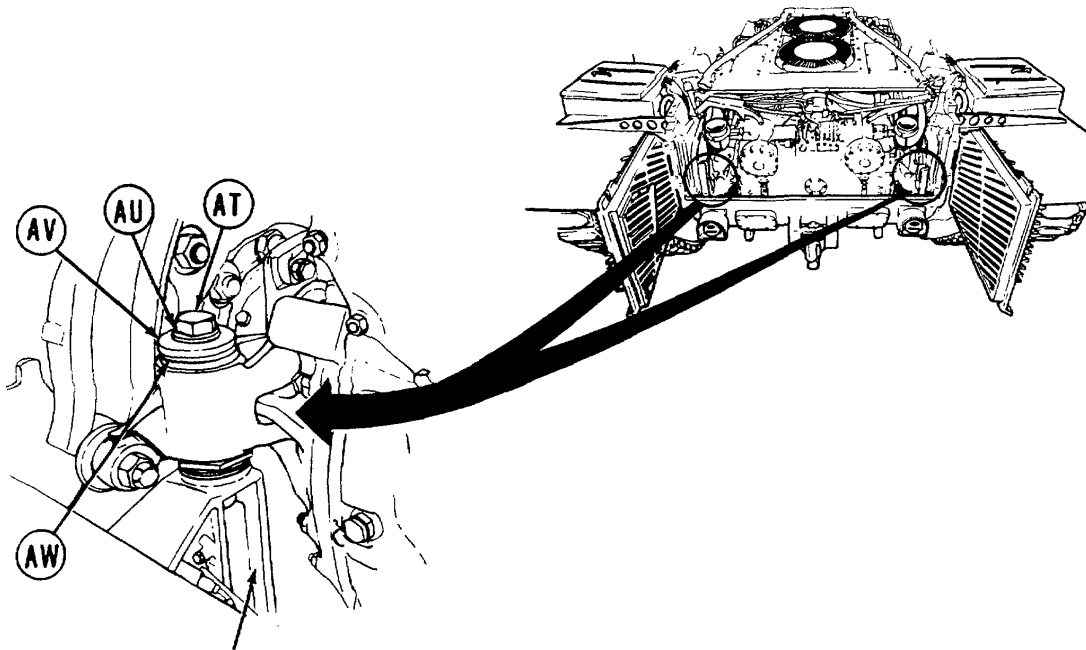
Continue tapping final drive adapter (it will move 1-1/2 inches) until gears release.

39. Hang two fabricated final drive guide shields (Fig. 1, Appendix F) (one on each side of tank) at final drive universal joints (AS) to prevent hangups when powerplant is removed.



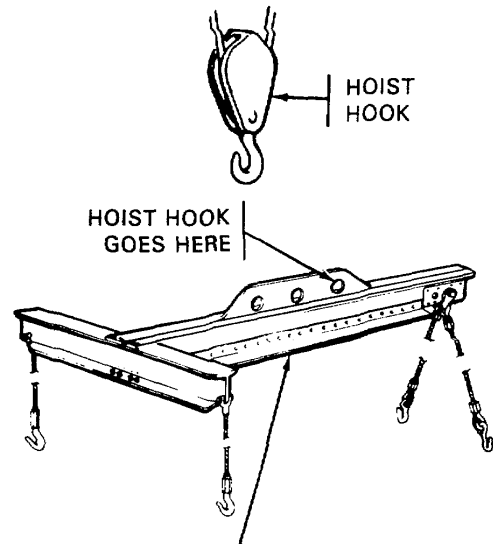
**POWERPLANT REPLACEMENT (2A ENGINE) (Sheet 11 of 24)**

40. Using 1-1/2 inch socket, loosen two screws (AT) at transmission mounts (both sides).



**TRANSMISSION MOUNT**

41. Remove two screws (AT), lockwashers (AU), recessed washers (AV), and washers (AW) securing two mounting brackets to transmission mounts. Throw lockwasher away.
42. Check all disconnected rod and line ends to make sure they are out of way during powerplant removal.
43. Connect hoist hook to sling. Make sure hoist hook is put through indicated hole of sling.



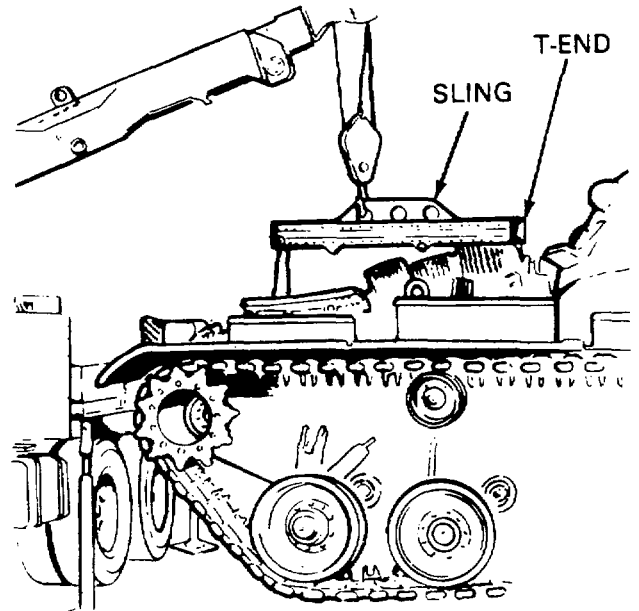
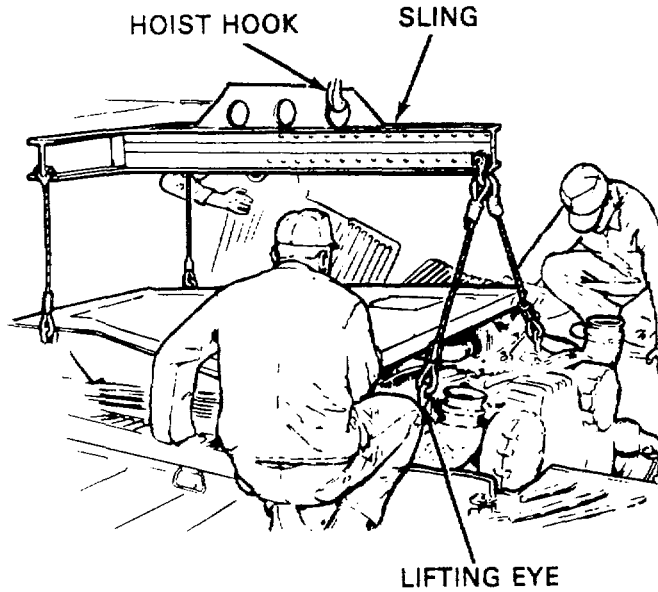
**POWERPLANT LIFTING SLING**

Go on to Sheet 12

TA147913

**POWERPLANT REPLACEMENT (2A ENGINE) (Sheet 12 of 24)**

44. Using hoist with sling, position sling over powerplant so T-end is to front of tank.

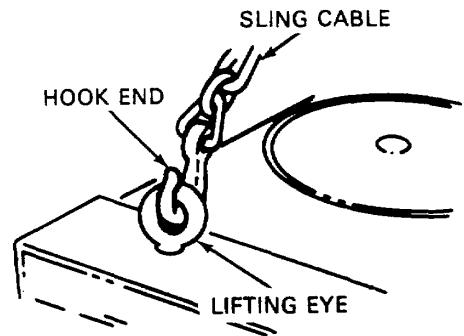


45. Attach four sling hooks to four lifting eyes on powerplant. Make sure sling cables hang naturally; don't twist them when inserting hook ends.

46. Have persons station themselves to help guide powerplant as it is hoisted out of tank.

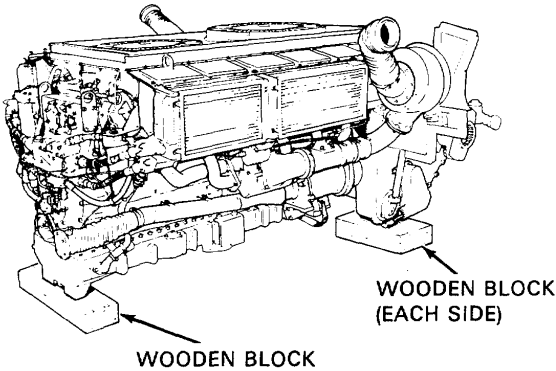
**WARNING**

**Powerplant weighs more than 8500 pounds. Careless handling can result in serious injury to personnel or damage to equipment. Do not permit powerplant to strike hull.**



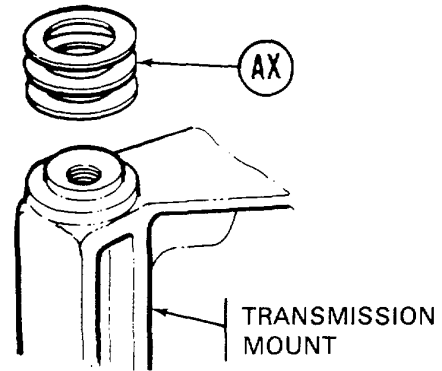
**POWERPLANT REPLACEMENT (2A ENGINE) (Sheet 13 of 24)**

- 47. Lift powerplant in short, even lifts while checking that everything is clear.
- 48. Move hoist rearward between lifts. Rear of powerplant comes out first.



- 49. Remove powerplant. Move it away from tank. Lower it to a few feet from ground level.
- 50. Position three wooden blocks under powerplant for support.
- 51. Position block under left side of transmission.

- 52. Position second block under right side of transmission.
- 53. Position block under crankcase pad at front of engine.
- 54. Lower powerplant carefully onto supporting blocks.
- 55. Remove six spring washers (AX) (three each side) from transmission mounts (late model M60 only).
- 56. Remove two fabricated final drive guide shields from each side of tank at final drive universal joints.

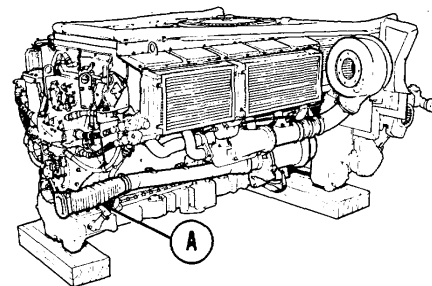


**INSTALLATION:**

**NOTE**

**Working area where powerplant mounts is tight and limited, make sure all connections are ready. Remove tools, rags, and any other materials not required from engine compartment before installing powerplant.**

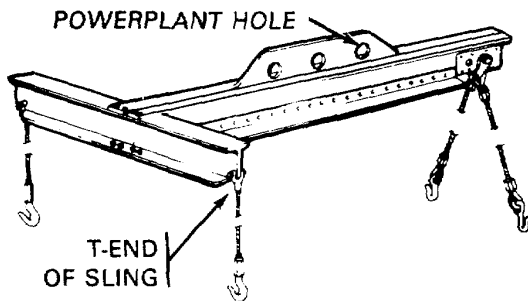
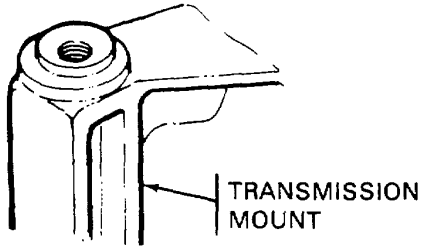
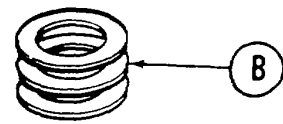
- 1. Make sure all surfaces in compartment are clean.
- 2. Apply light coat of grease (Item 36, Appendix D) to contact surfaces of engine and transmission mounts.
- 3. Using heavy masking tape (Item 57, Appendix D), fasten generator air duct (A) to engine to prevent damage during installation.



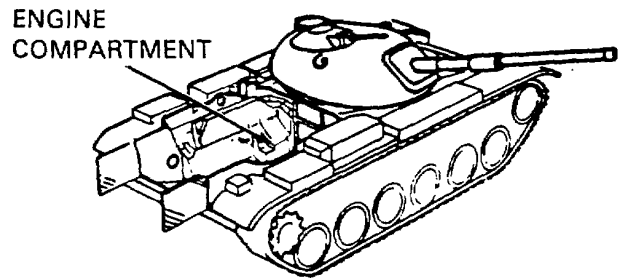
Go on to Sheet 14

TA147915

POWERPLANT REPLACEMENT (2A ENGINE) (Sheet 14 of 24)



- Position six spring washers (B) (three on each side) on top of transmission mounts in engine compartment (late model M60 only).



**NOTE**

**T-end of sling should be toward front (engine end of powerplant).**

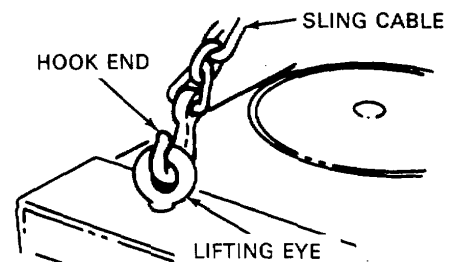
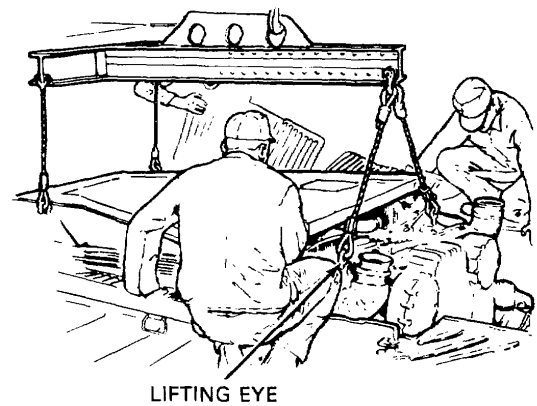
- Make sure hoist hook is in powerplant hole of sling (Item 33, Chapter 3, Section ).

- Using hoist, pick up sling and install four sling hooks through four lifting eyes on powerplant.
- Make sure sling cables hang naturally; don't twist them when inserting hook ends.

**WARNING**

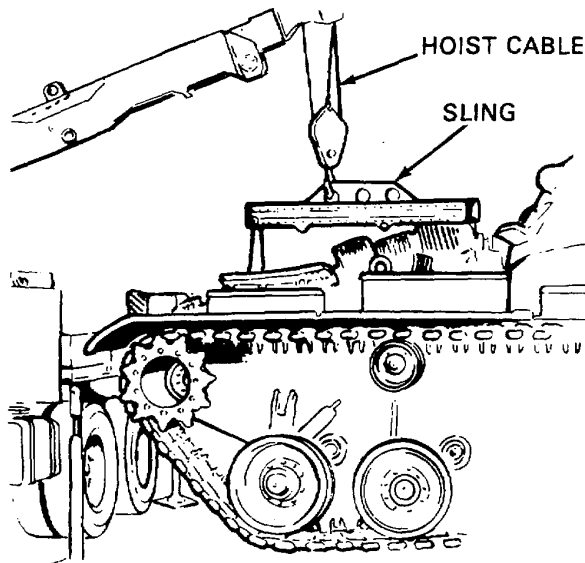
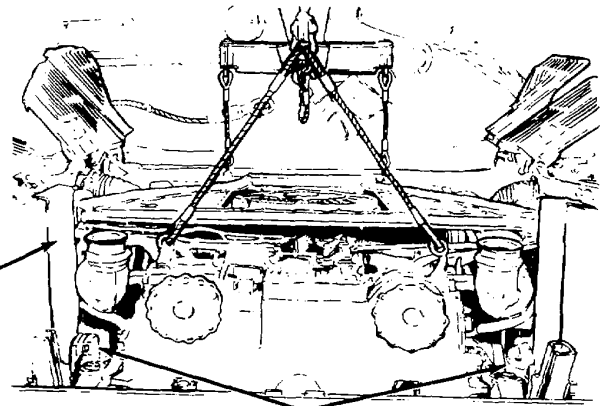
**Be careful when lifting powerplant. Serious injury to personnel can result from careless handling. Also, powerplant can be damaged if bumped against hull.**

- Make sure turret is turned so gun tube is pointing directly to side. Make sure turret clears grille doors.



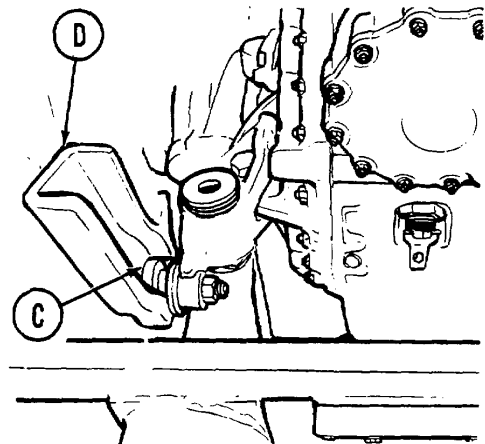
**POWERPLANT REPLACEMENT (2A ENGINE) (Sheet 15 of 24)**

9. Install two fabricated final drive guide shields (Fig. 1, Appendix F) (one behind each final drive universal joint).
10. Using hoist with sling, lift powerplant over open grille doors into position over engine compartment.



11. Have persons station themselves to help guide powerplant as it is lowered into tank.
12. Lower powerplant slowly with frequent stops while checking for clearance all around powerplant.

13. Guide transmission rollers (C) to top of powerplant guides (D).
14. Make sure transmission rollers (C) fit into guides (D) on both sides of tank.
15. When powerplant is seated, remove both fabricated final drive guide shields.

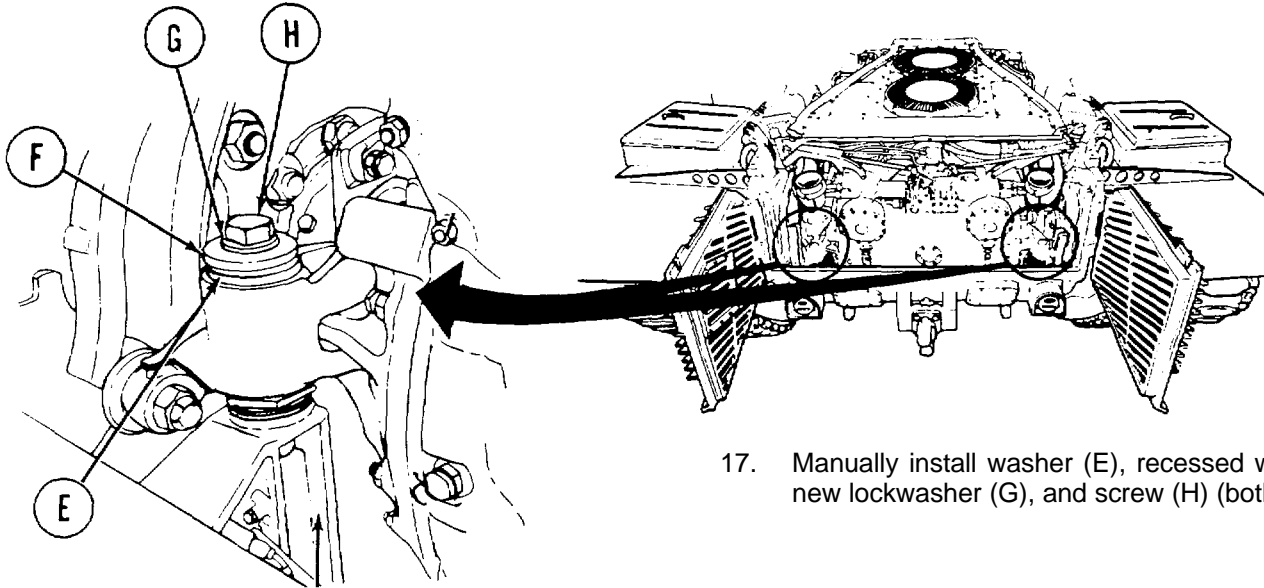


Go on to Sheet 16

TA147917

**POWERPLANT REPLACEMENT (2A ENGINE) (Sheet 16 of 24)**

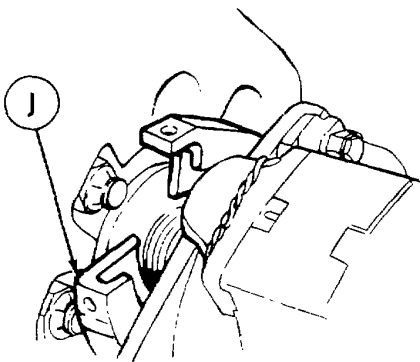
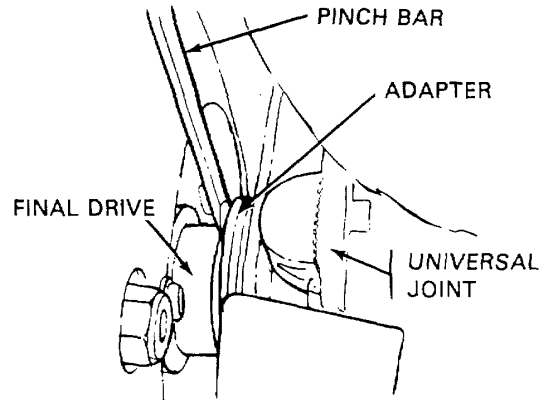
16. Check that powerplant is correctly seated. Check all clearances around powerplant.



17. Manually install washer (E), recessed washer (F), new lockwasher (G), and screw (H) (both sides).

**TRANSMISSION MOUNT**

18. Remove four sling chain hooks from four lifting eyes of powerplant.
19. Using torque wrench and 1-1/2 inch socket, tighten screw (H) securing transmission mounting bracket to 360-380 lb-ft (488-515 N•m).



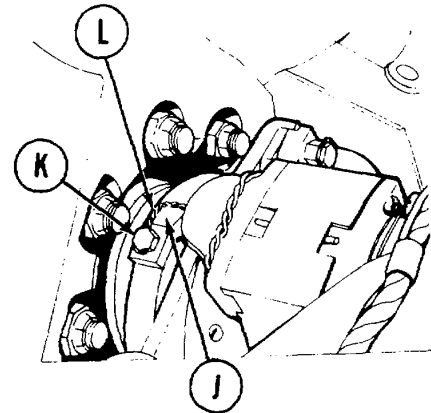
20. Have one person hold universal joint gears in alignment with final drive adapter, while another person, using pinch bar, pries final drive adapter away from final drive into universal joint (each side).
21. Fit quick-disconnect ring (J) around final drive adapter.

POWERPLANT REPLACEMENT (2A ENGINE) Sheet 17 of 24)

**NOTE**

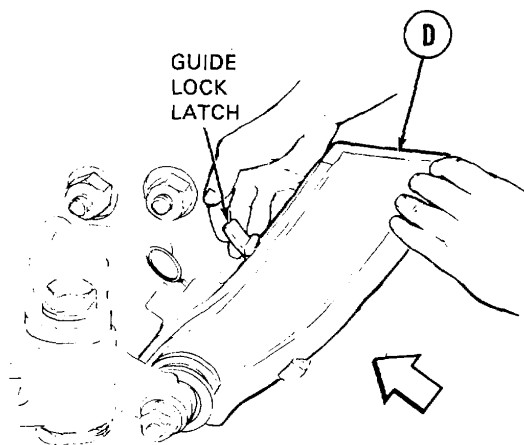
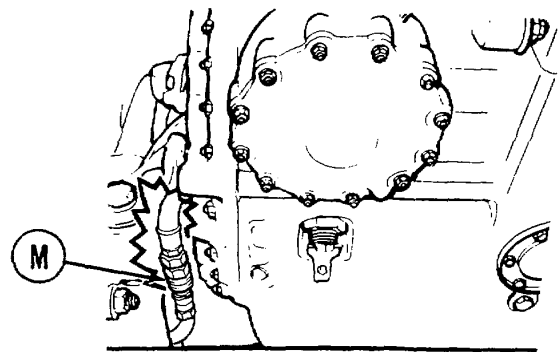
**When installing screw (K), hold onto quick-disconnect ring (J) or it will snap open and fall down into engine compartment.**

22. Install screw (K). Using 3/4 inch socket, tighten screw on both sides of tank.
23. String new lockwire (L) (Item 60, Appendix D) through screw (K) and opening in quick-disconnect ring (J) on both sides of tank.
24. Reach between transmission and under left transmission mount and remove protective coverings from fuel return line (M) openings.
25. Reach between transmission and under left transmission mount and manually connect quick-disconnect (M).



**NOTE**

**It may be necessary to reach between left transmission mount and universal joint to connect quick-disconnect (M).**

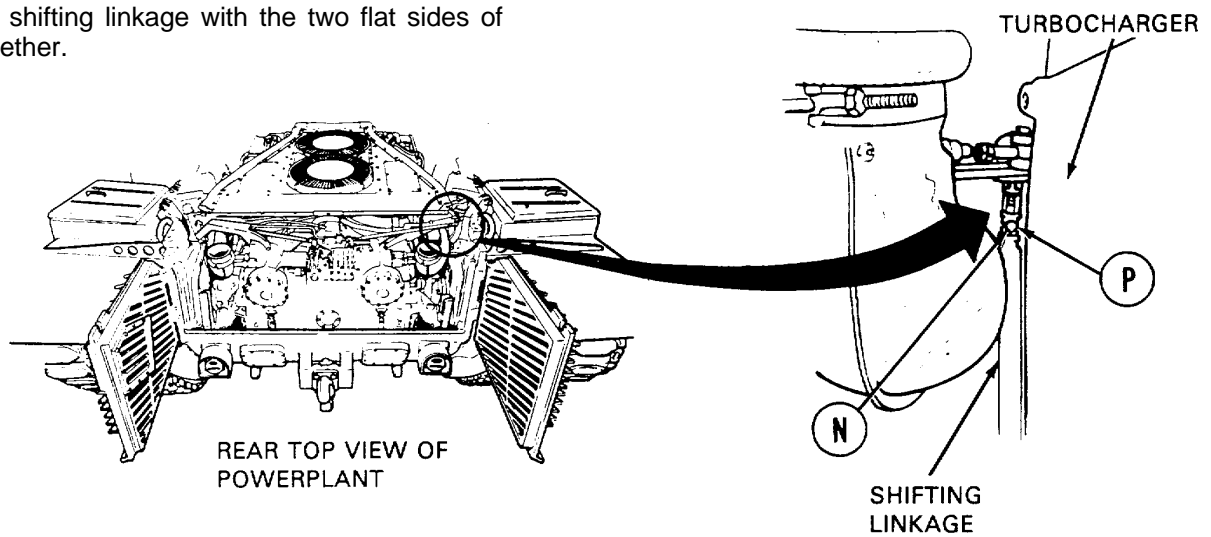


26. Raise guide lock latches.
27. Push powerplant guide (D) forward until locking snaps into place. Guide is now locked into position.



**POWERPLANT REPLACEMENT (2A ENGINE) (Sheet 18 of 24)**

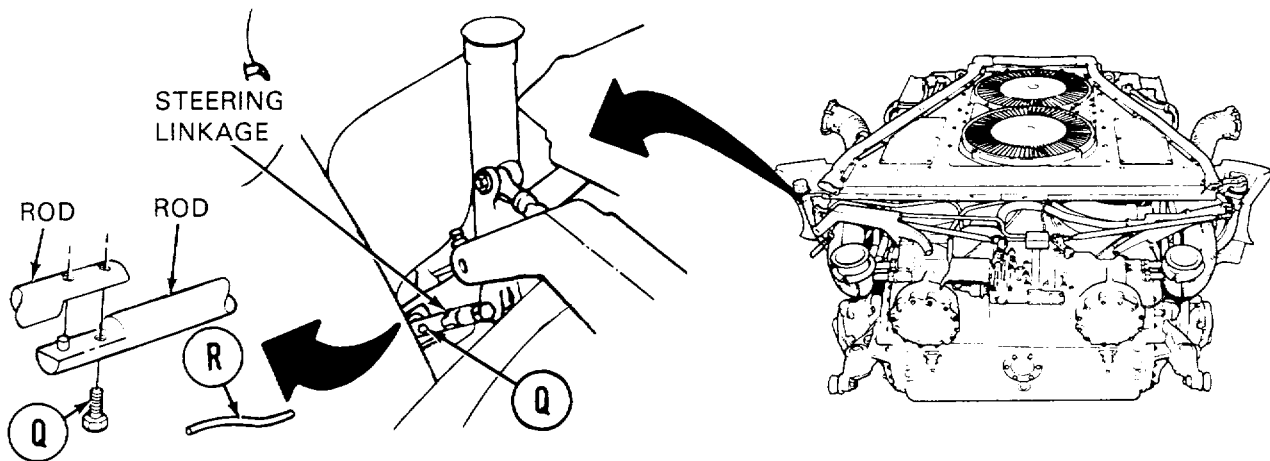
28. Position shifting linkage with the two flat sides of rods together.



29. Install screw (N). Using 7/16 inch socket, tighten screw.
30. Using pliers, install new lockwire (P) (Item 60, Appendix D) through screw (N) and around shifting linkage.

**NOTE**

**Check assembled shifting linkage rods. Clearance should be at least 1/4 inch between rods and turbocharger.**



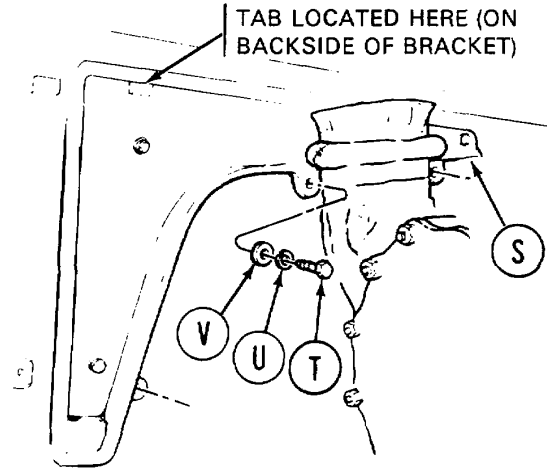
31. Position two rods of steering linkage with two flat sides of rods together. Using 7/16 inch wrench, install screw (Q).
32. Using pliers, install new lockwire (R) through screw (Q) and around steering linkage.

Go on to Sheet 19

TA147920

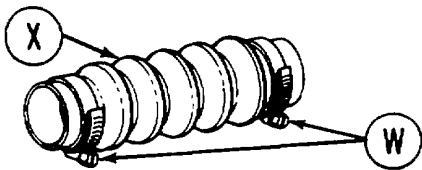
**POWERPLANT REPLACEMENT (2A ENGINE) (Sheet 19 of 24)**

33. Position angle bracket (S) to rear side wall (by powerplant guide). Hang tab of bracket onto tab on compartment side wall.
34. Install three screws (T), new lockwashers (U), and washers (V) to secure angle bracket (S) to side wall (both sides).
35. Using 9/16 inch socket, tighten three screws (T) (both sides) to secure bracket (S) to side wall.



**NOTE**

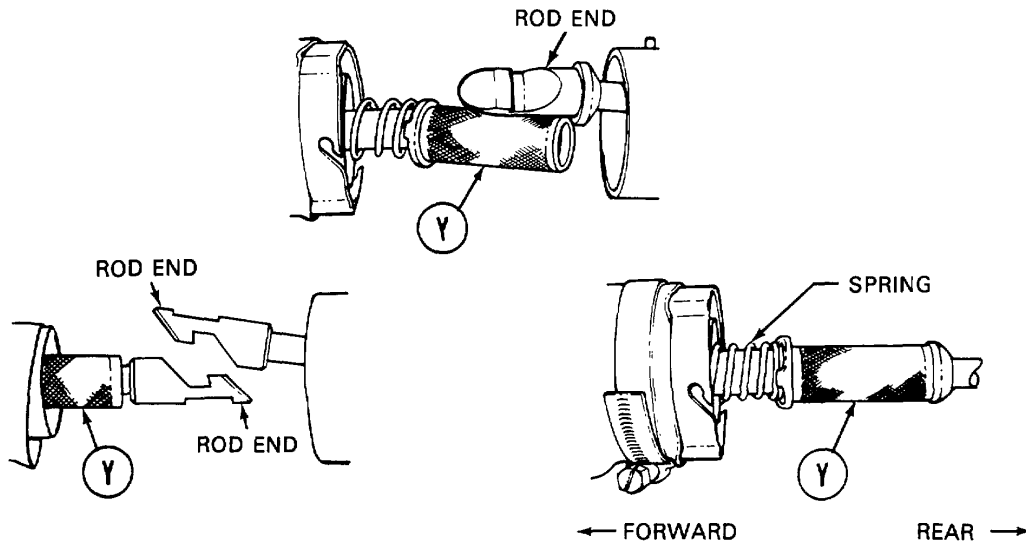
Before connecting brake rod ends, make sure two clamps (W) are on each boot (X).



**NOTE**

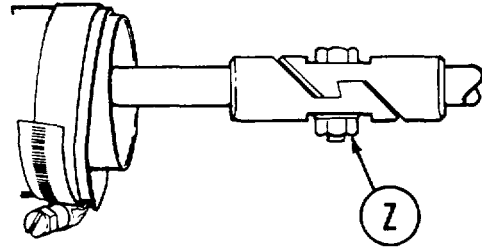
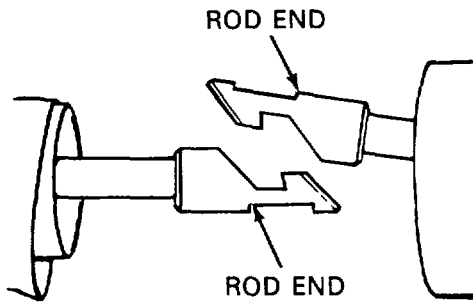
If your tank has a spring loaded sleeve type disconnect, perform step 36. If it has screw, lockwasher, and nut type, go to step 37.

36. Push sleeve (Y) forward, engage rod ends (use pliers if necessary), and push sleeve to rear to retain rod ends (each side of tank). Go on to step 38.



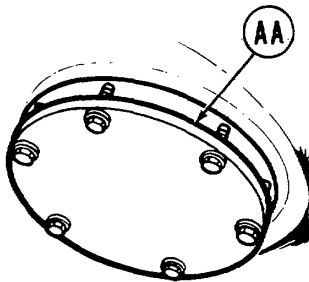
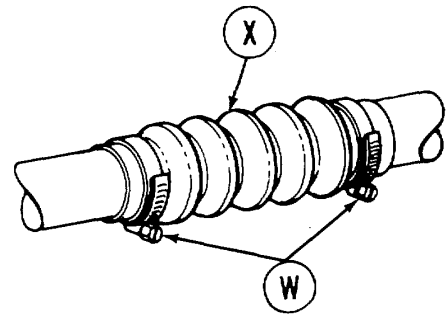
**POWERPLANT REPLACEMENT (2A ENGINE) (Sheet 20 of 24)**

37. Engage rod ends (use pliers if necessary) and manually install screw, new lockwasher, and nut (Z) (each side of tank).



38. Using 7/16 inch socket on screw and 7/16 inch wrench to hold nut, tighten screw, lockwasher, and nut (Z).

39. Manually position boot (X) and two clamps (W) and, using 5/16 wrench, tighten two clamps (W) (each side of tank).

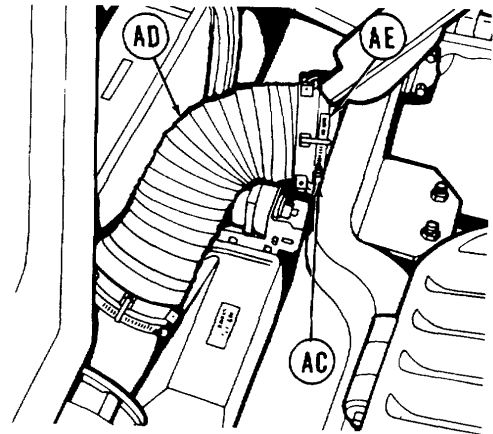
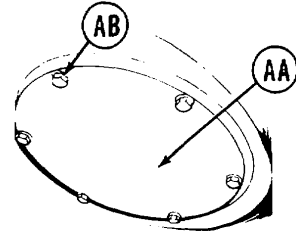


40. Wearing rubber gloves, use rags (Item 65, Appendix D) and dry cleaning solvent (Item 54, Appendix D) to clean contact areas of brake rod access covers (AA) and hull.
41. Apply adhesive (Item 2, Appendix D) to both sides of two new gaskets. Position two new gaskets onto inner side of two brake rod access covers (AA).

**POWERPLANT REPLACEMENT (2A ENGINE) (Sheet 21 of 24)****WARNING**

**Support brake rod access covers (AA) with hand to prevent personal injury.**

42. Position left and right brake rod access covers (AA) to hull. Manually install 12 screws and new lockwashers (AB).
43. Using 9/16 inch socket, tighten 12 screws and lockwashers (AB).
44. Remove protective coverings from air cleaner outlet hose connect points (AC) on each side of tank.
45. Manually install two air cleaner outlet hoses (AD) on each side of tank.
46. Position clamp (AE) and, using 7/16 inch wrench, tighten nut of clamp (AE) to hold air cleaner outlet hose (AD) on each side of tank.

**NOTE**

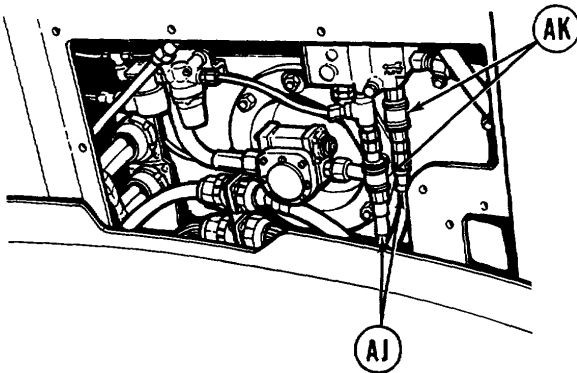
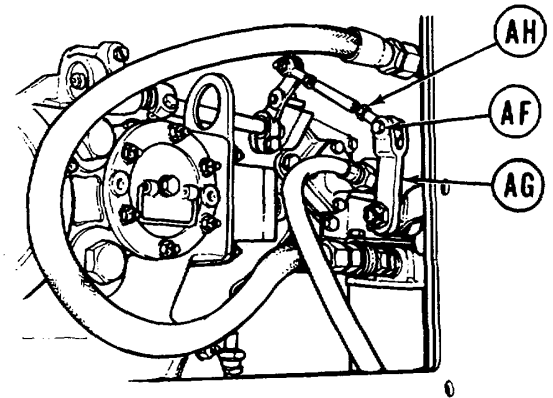
**Close grille doors and manually traverse turret to bring gun tube over driver's position (TM 9-2350-260-10).**

Go on to Sheet 22

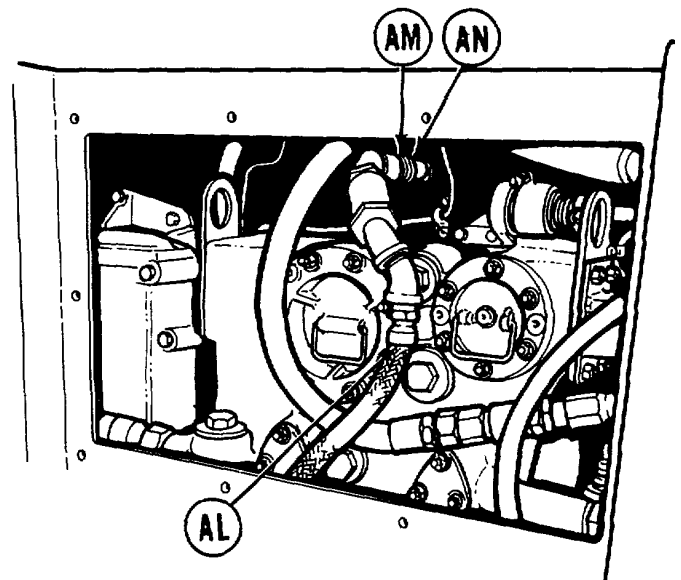
TA147923

**POWERPLANT REPLACEMENT (2A ENGINE) (Sheet 22 of 24)**

- 47. Reaching through upper engine access cover opening, use 7/16 inch wrench to install bolt (AF) to hold clevis (AG) to rod end (AH).
- 48. Reaching through lower engine access cover opening, remove four protective coverings from two priming fuel lines (AJ) and quick-disconnect fittings (AK).



- 49. Reaching through lower engine access cover opening, manually connect two priming fuel lines (AJ) at quick-disconnect fittings (AK) by pulling back on quick-disconnect fittings (AK) and pushing them on.

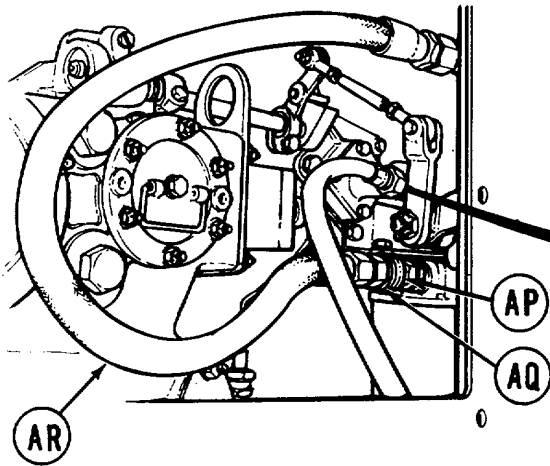


- 50. Reaching through upper engine access cover opening, remove light rope or heavy masking tape holding free end of fire extinguisher tubing (AL).
- 51. Reaching through upper engine access cover opening, remove protective coverings from ends of quick-disconnect (AM) and engine fitting (AN).

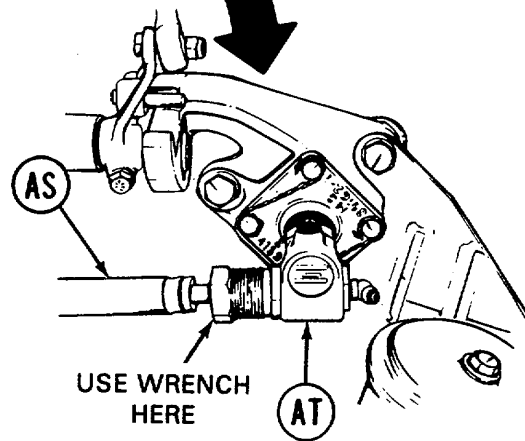
- 52. Reaching through upper engine access cover opening, manually connect fire extinguisher quick-disconnect (AM) to engine fitting (AN) by pulling back on quick-disconnect (AM) and pushing it on.

**POWERPLANT REPLACEMENT (2A ENGINE) (Sheet 23 of 24)**

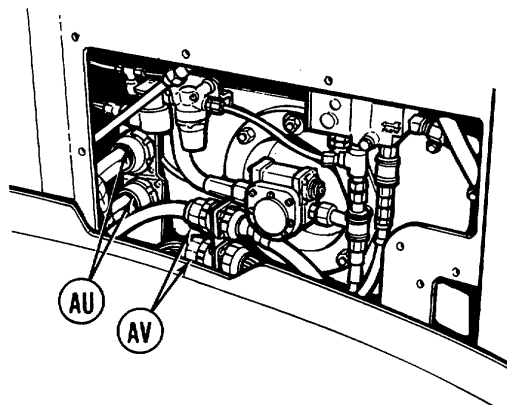
53. Reaching through upper engine access cover opening, remove protective coverings from main fuel line fittings (AP) and quick-disconnect (AQ).



54. Reaching through upper engine access cover opening, manually connect main fuel line (AR) to engine fitting (AP) by pulling back quick-disconnect (AQ) and pushing it on.



55. Reaching through upper engine access cover opening, use adjustable wrench to install tachometer cable (AS) to adapter (AT).



56. Reaching through lower engine access cover, remove rope or tape holding four electrical cables to bulkhead.

57. Reaching through lower engine access cover, manually plug in two rear connectors (AU), and using spanner wrench tighten them.

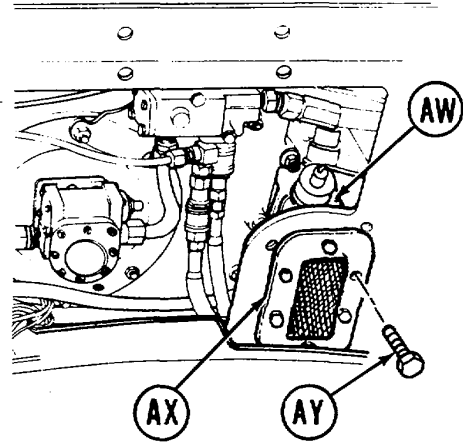
58. Reaching through lower engine access cover, manually plug in two forward connectors (AV) and, using spanner wrench, tighten them.

Go on to Sheet 24

TA147925

**POWERPLANT REPLACEMENT (2A ENGINE) (Sheet 24 of 24)**

59. Remove rope or tape holding generator air duct (AW) and position duct on bulkhead.
60. Position screen (AX) to bulkhead and, using 7/16 inch socket, install six screws (AY).
61. Install upper engine access cover (page 16-44).
62. Connect battery ground straps (page 10-294).
63. Install top deck (page 16-22).
64. Install transmission shroud (page 9-23).
65. Traverse turret to travel lock position. Lock gun tube (TM 9-2350-260-10). Apply brakes and place shifting lever in P (park).
66. Remove blocks from both tracks at front and rear.
67. Perform operational test (TM 9-2350-260-10).



End of Task

TA147926

**POWERPLANT REPLACEMENT (2D ENGINE) (Sheet 1 of 26)**

PROCEDURE INDEX

PROCEDURE	PAGE
Removal	5-3
Installation	5-14

- TOOLS:
- 5/16 in. combination box and open end wrench
  - 5 ton hoist or comparable lifting device capable of lifting powerplant 12 ft. high
  - Ratchet with 1/2 in. drive
  - 2 in. extension with 1/2 in. drive
  - 9/16 in. socket with 1/2 in. drive
  - Ratchet with 3/4 in. drive
  - 1-1/2 in. socket with 3/4 in. drive
  - Torque wrench with 3/4 in. drive (0-600 lb-ft) (0-813 N•m)
  - 7/16 in. combination box and open end wrench (2 required)
  - Adjustable wrench
  - Spanner wrench
  - Long round nose pliers
  - Flat-tip screwdriver
  - Putty knife
  - Pinch bar

SPECIAL TOOLS: Powerplant sling (Item 31, Chapter 3, Section I)

FABRICATED TOOLS: Final drive guide shield (Fig. 1, Appendix F) (2 required)

- SUPPLIES:
- Covers for fire extinguisher tubing fittings
  - Covers for prima fuel line fittings
  - Covers for hydraulic brake line fittings
  - Covers for fuel return line fittings
  - Covers for air cleaner outlet hose connect point
  - Grease (Item 36, Appendix D)
  - Heavy masking tape (Item 57, Appendix D)
  - Wooden blocks, 12 x 12 x 14 in. (3 required)
  - Lockwasher (MS35338-44) (4 required)
  - Lockwasher (MS35338-53) (2 required)
  - Lockwasher (MS35338-65) (12 required)
  - Gasket (2 required)
  - Rag (Item 65, Appendix D)
  - Lockwire (Item 60, Appendix D)
  - Adhesive (Item 2, Appendix D)

PERSONNEL: Three

REFERENCE: TM 9-2350-260-10

Go on to Sheet 2

TA147927

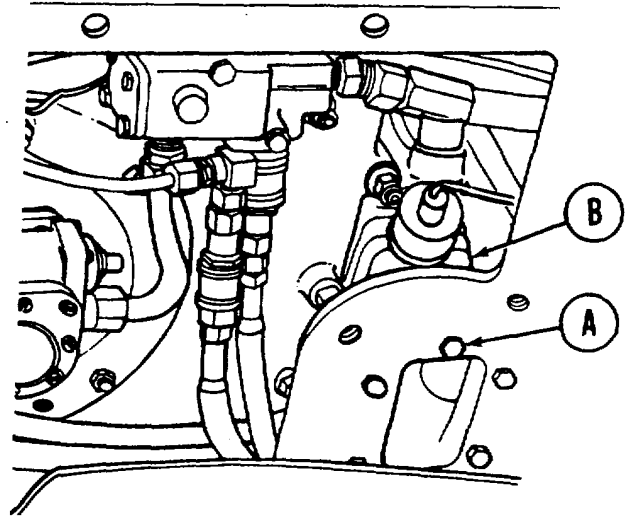


**POWERPLANT REPLACEMENT (2D ENGINE) (Sheet 2 of 26)**

**PRELIMINARY PROCEDURES** Park tank on level ground. Block both tracks at front and rear  
Release parking brake (TM 9-2350-260-10)  
Place MASTER CONTROL switch to OFF (TM 9-2350-260-10)  
Disconnect battery ground straps (page 10-294)  
Remove upper engine access cover (page 16-44)  
Remove top deck (page 16-20)  
Remove transmission shroud (page 9-20)

**REMOVAL:**

1. Using 7/16 inch wrench, remove six screws (A) holding generator air duct (B) to bulkhead wall.
2. Fasten generator air duct (B) to engine with heavy masking tape (Item 57, Appendix D) to prevent damage during powerplant removal.

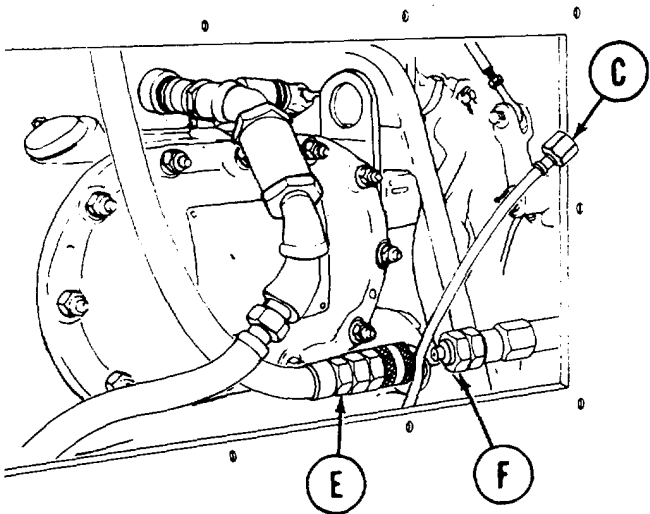
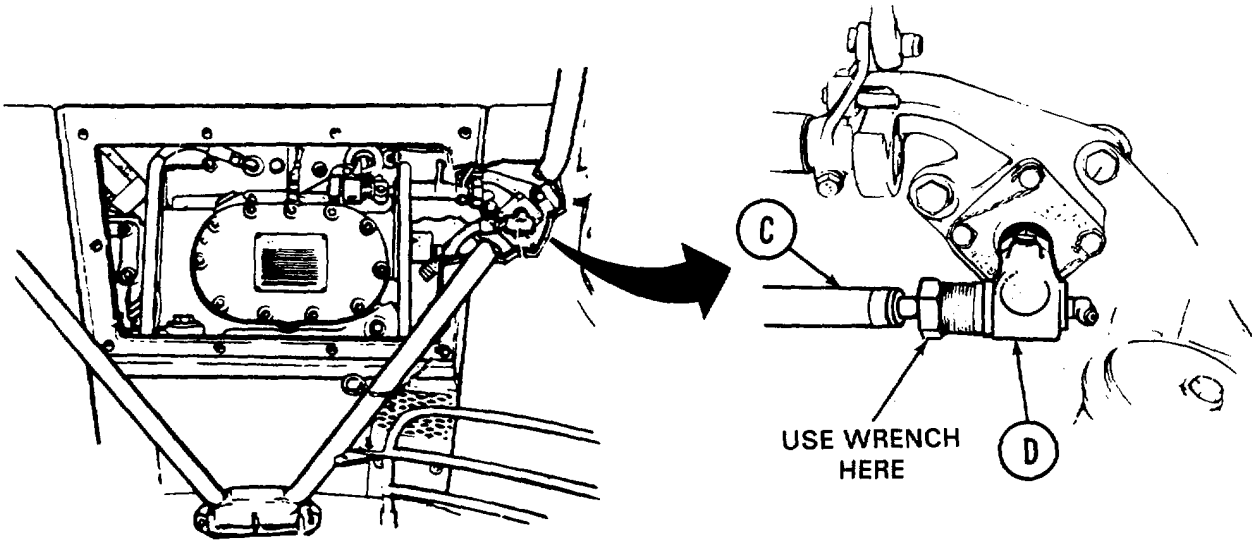


Go on to Sheet 3

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**POWERPLANT REPLACEMENT (2D ENGINE) (Sheet 3 of 26)**

3. Reaching through engine access cover opening, use adjustable wrench to remove tachometer cable (C) at adapter (D).



4. Using heavy masking tape (Item 57, Appendix D), tie free end of tachometer cable (C) to inside of turret.
5. Reaching through engine access cover opening, manually disconnect main fuel line (E) at quick-disconnect fitting (F). Put protective coverings on ends of fuel line (E) and quick-disconnect fitting (F).

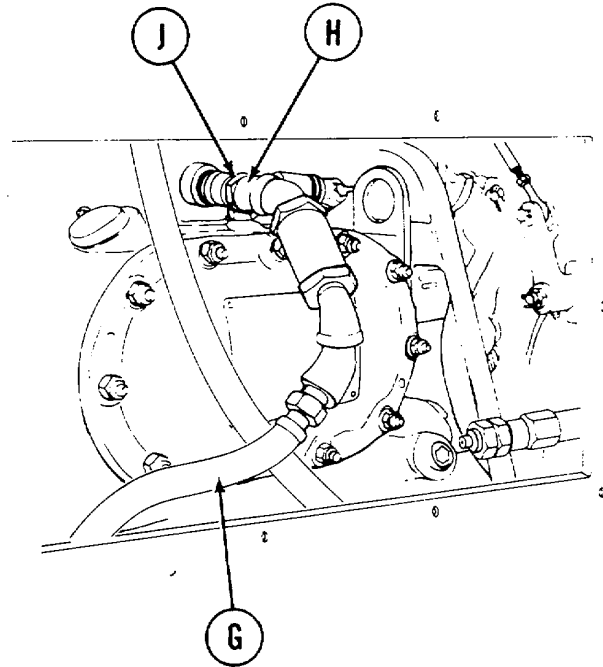
Go on to Sheet 4

TA147929

**POWERPLANT REPLACEMENT (2D ENGINE) (Sheet 4 of 26)**

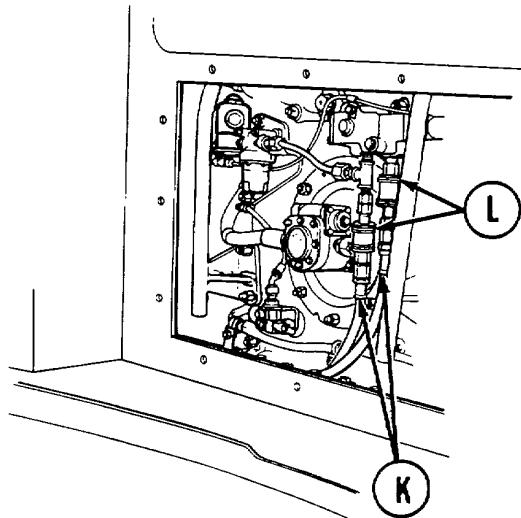
6. Reaching through engine access cover opening, manually disconnect fire extinguisher tubing (G) at quick-disconnect fitting (H).

7. Using heavy masking tape (Item 57, Appendix D), tie free end of fire extinguisher tubing (G) out of the way.



8. Reaching through engine access cover opening, put protective coverings over end of fire extinguisher tubing (G) and its connect point (J) at engine.

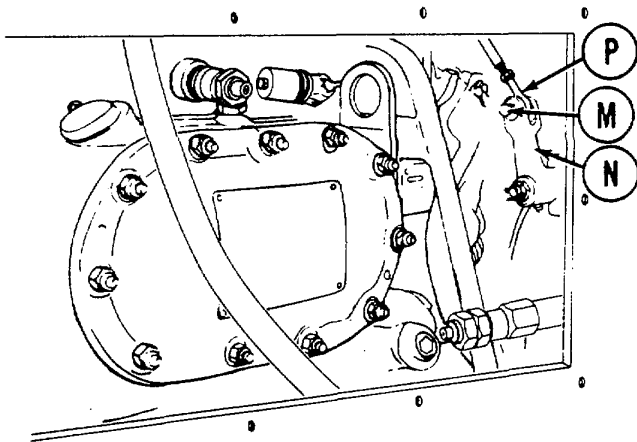
9. Reaching through engine access cover opening, manually disconnect two priming fuel lines (K) at quick-disconnect fittings (L). Put protective coverings over open ends of both fittings (L).



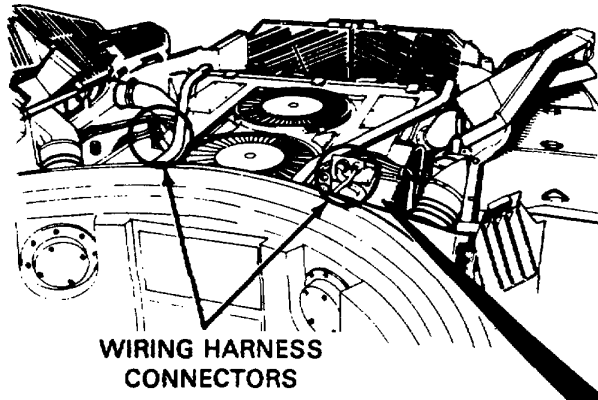
Go on to Sheet 5

TA147930

POWERPLANT REPLACEMENT (2D ENGINE) (Sheet 5 of 26)

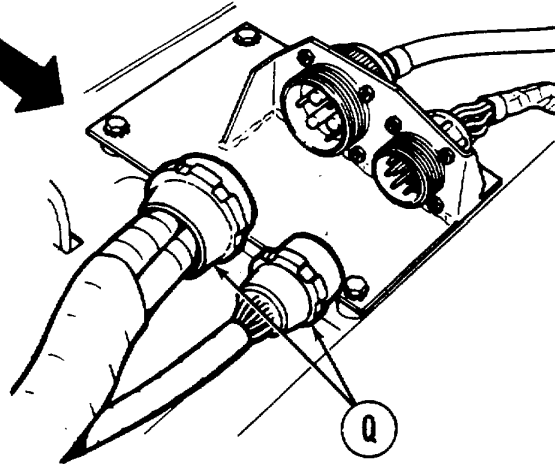


10. Reaching through engine access cover opening, use 7/16 inch wrench to remove bolt (M) holding accelerator linkage clevis (N) to rod end (P).



11. Using spanner wrench, remove four electrical harness connectors (Q).

12. Using heavy masking tape (Item 57, Appendix D), tie electrical connectors out of way of powerplant.

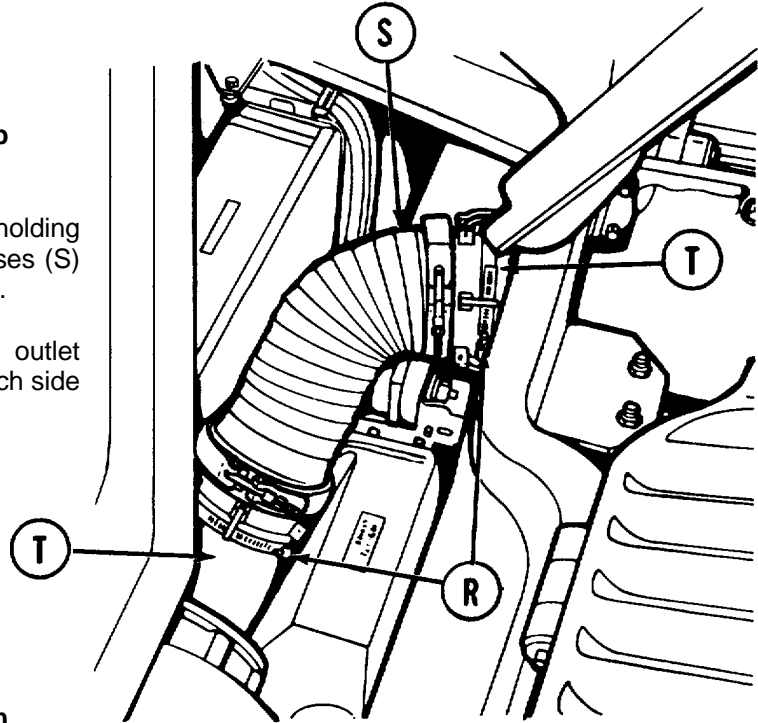


**POWERPLANT REPLACEMENT (2D ENGINE) (Sheet 6 of 26)**

**NOTE**

**Clamps (R) may require flat-tip screwdriver for removal.**

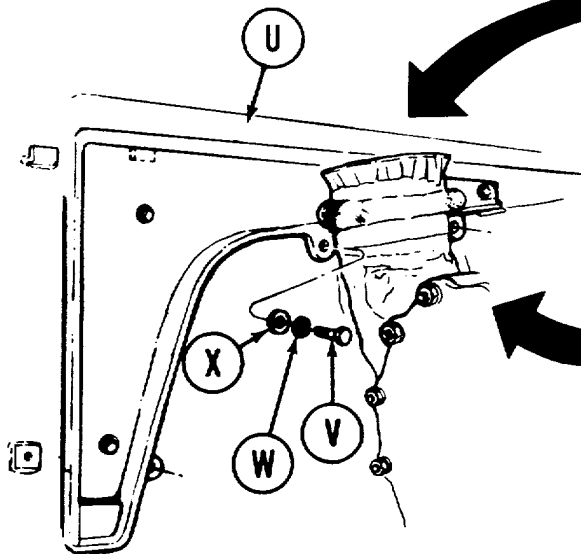
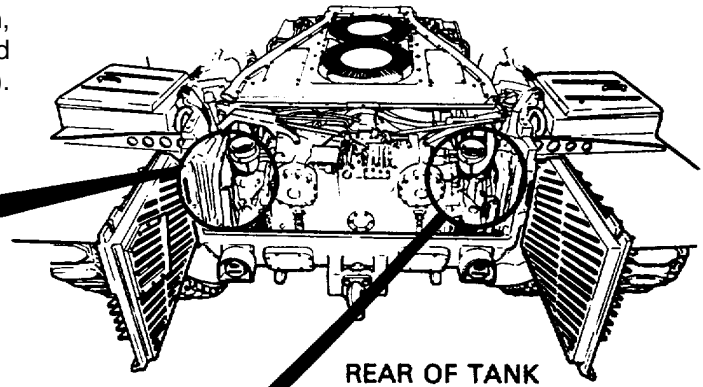
13. Using 7/16 inch wrench, remove two nuts holding two clamps (R) to two air cleaner outlet hoses (S) on each side of powerplant. Remove hoses.
14. Put protective covering over air cleaner outlet elbow (T) and turbocharger elbow (T) on each side of powerplant.



**NOTE**

**One angle bracket (U) is located on each side at rear of tank.**

15. Using 9/16 inch socket with 2 inch extension, remove three screws, lockwashers (W), and washers (X) securing each angle bracket (U). Throw lockwashers away.



16. Lift up rear corner of bracket (U) to remove it.

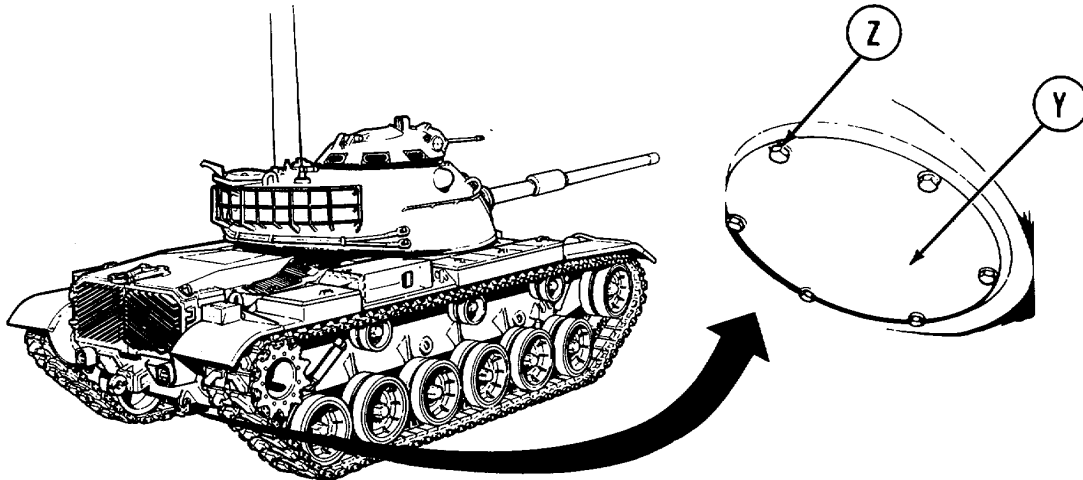
Go on to Sheet 7

TA147932

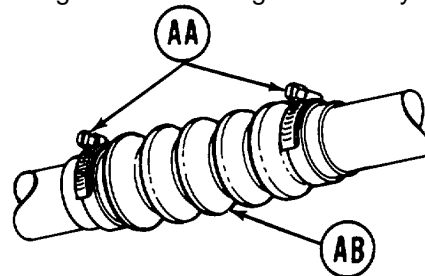
POWERPLANT REPLACEMENT (2D ENGINE) (Sheet 7 of 26)

**WARNING**

Support brake rod access covers (Y) with hand to prevent personal injury.

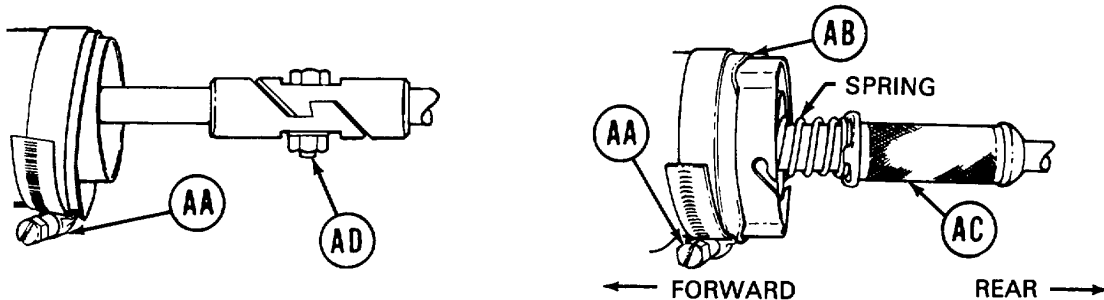


17. Using 9/16 inch socket, remove 12 screws and lockwashers (Z) from left and right brake rod access covers (Y). Remove covers. Throw lockwashers away.
18. Using putty knife, remove left and right brake rod access cover gaskets. Throw gaskets away.
19. Reach through brake rod access opening with 5/16 inch wrench and loosen two clamps (AA) and slide rubber boot (AB) forward (both sides of tank).



**NOTE**

If your tank has a spring loaded sleeve (AC) type disconnect perform step 20. If it has a screw, lockwasher and nut (AD) type, go to step 21.

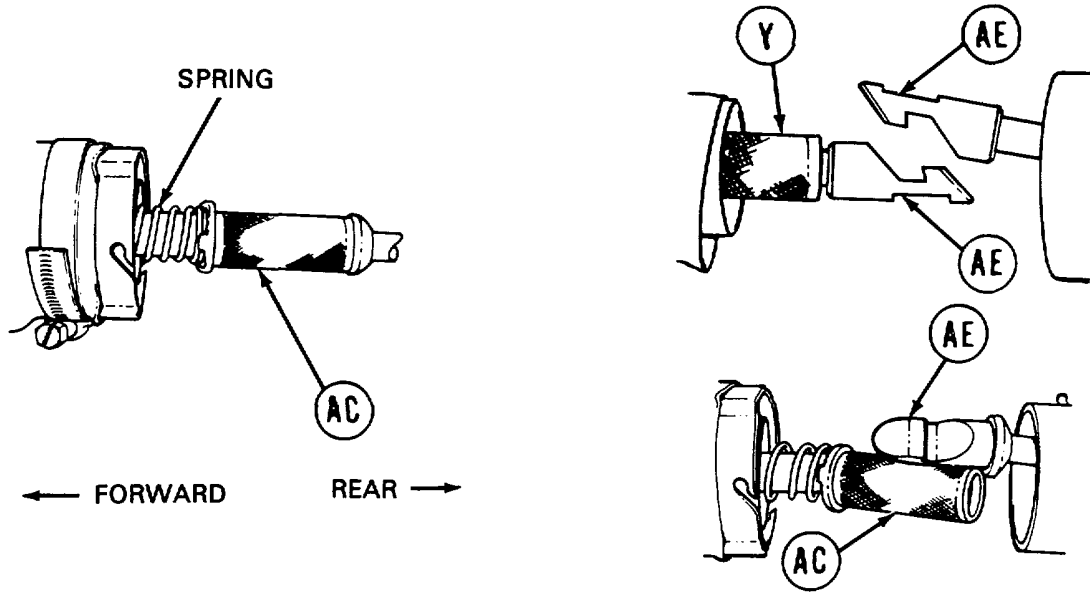


Go on to Sheet 8

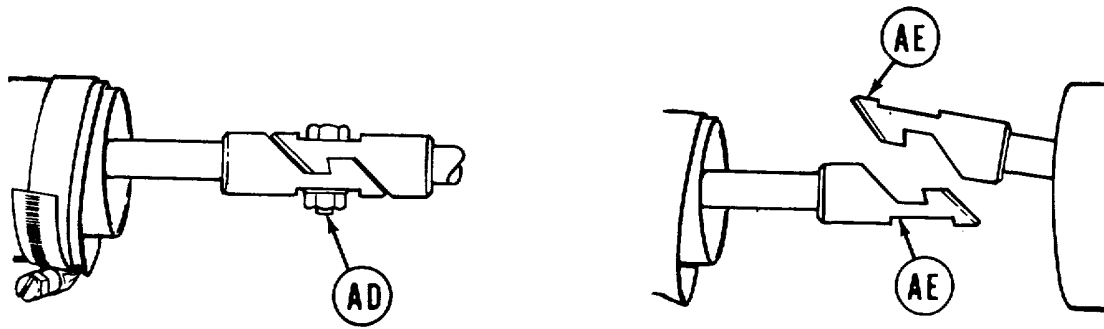
TA147933

**POWERPLANT REPLACEMENT (2D ENGINE) (Sheet 8 of 26)**

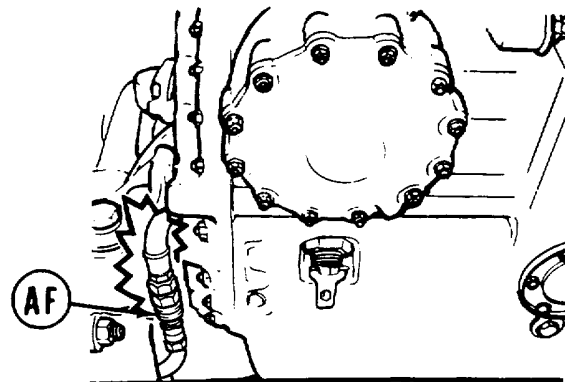
20. Using pliers, push sleeve (AC) toward front of tank till it clears connect points of rod ends (AE). Displace rod ends as shown below and allow sleeve (AC) to slide to rear (both sides of tank). Go on to step 22.



21. Using 7/16 inch wrench to hold nut, use another 7/16 inch wrench to remove screw, lockwasher, and nut (AD). Displace rod ends (AE) so the one to the rear will not hang up at powerplant removal. Throw lockwasher away.



22. Reaching between transmission and under left transmission mount manually push forward on quick-disconnect (AF) and release and displace it.  
 23. Put protective coverings over open ends of quick-disconnect (AF).



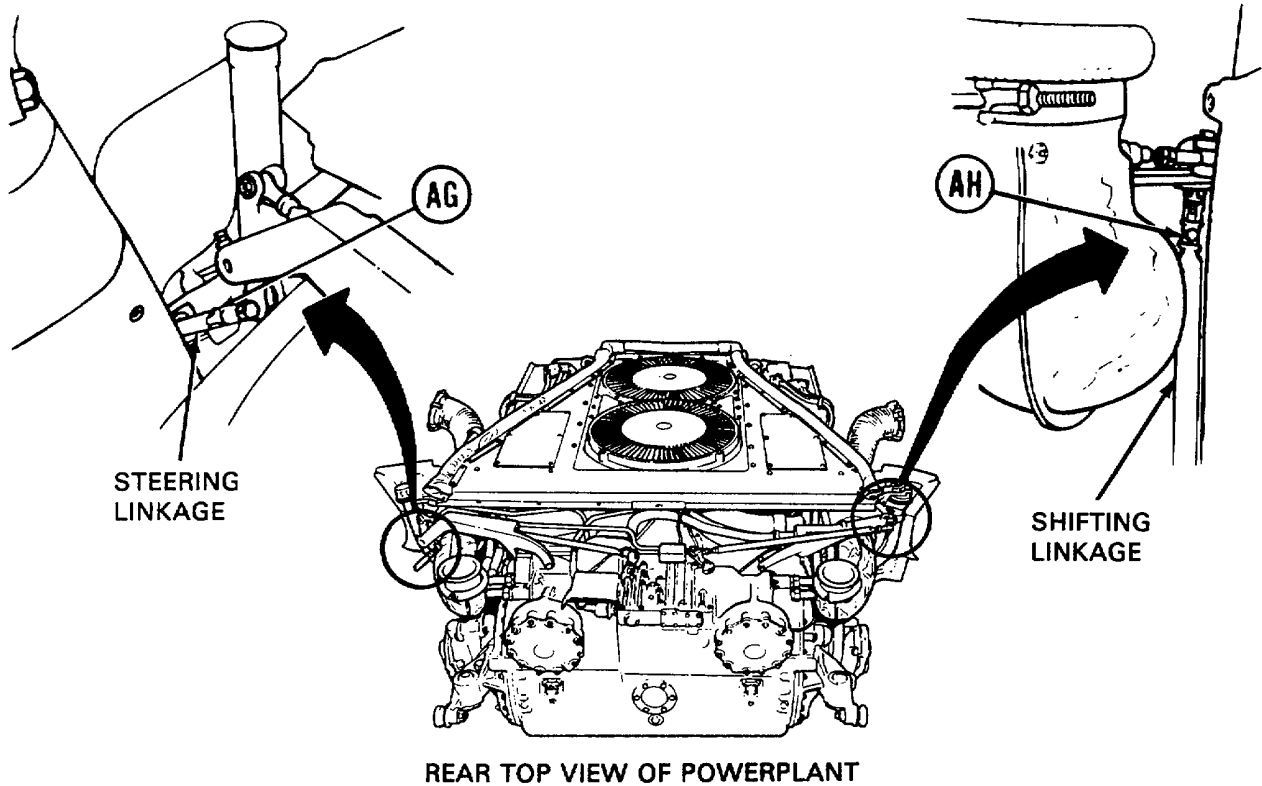
Go on to Sheet 9

TA147934

**POWERPLANT REPLACEMENT (2D ENGINE) (Sheet 9 of 2)****NOTE**

If bolt (AG) or screw (AH) is safety wired, use diagonal cutting pliers to remove safety wire.

24. Using 7/16 inch wrench, remove bolt (AG) holding steering linkage and screw (AH) holding shifting linkage at sides of transmission.
25. Manually separate steering and shifting linkages from connecting linkages on transmission.



Go on to Sheet 10

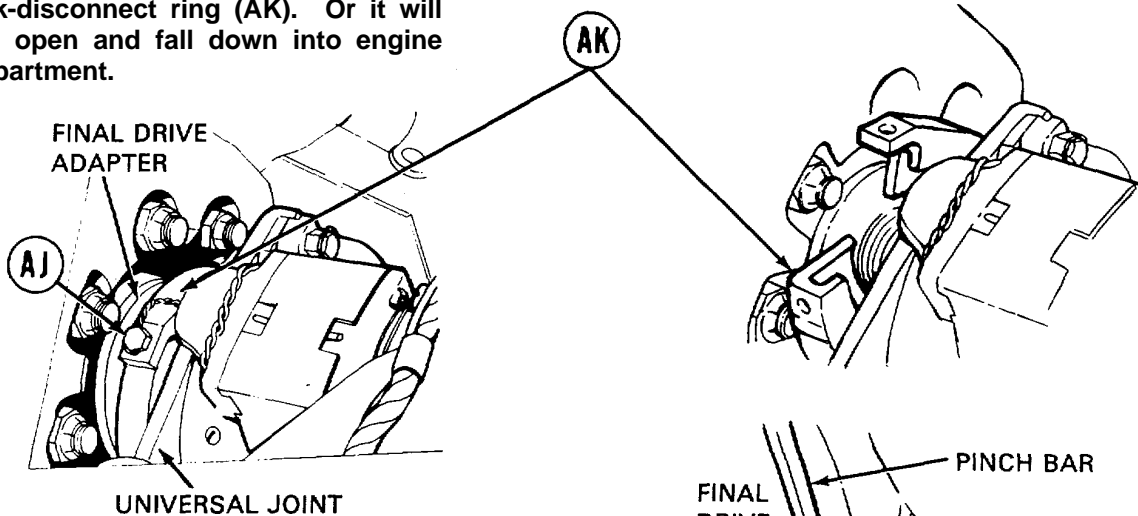
TA147935



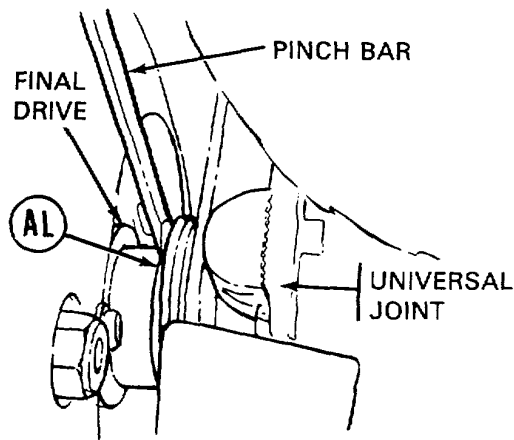
POWERPLANT REPLACEMENT (2D ENGINE) (Sheet 10 of 26)

NOTE

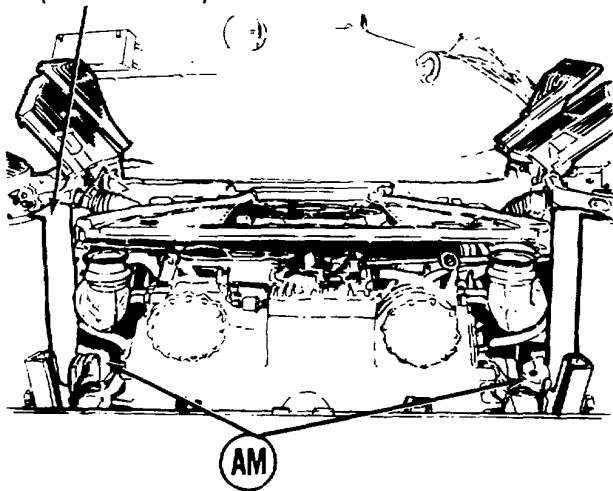
When removing screw (AJ) hold onto quick-disconnect ring (AK). Or it will snap open and fall down into engine compartment.



- 26. Using 3/4 inch socket, remove screw (AJ) securing quick-disconnect ring (AK).
- 27. Remove both rings (AK).
- 28. Using hammer and pinch bar, tap final drive adapter (AL) toward final drive (both sides) far enough to free adapter from universal joint.



FABRICATED TOOL (BOTH SIDES)



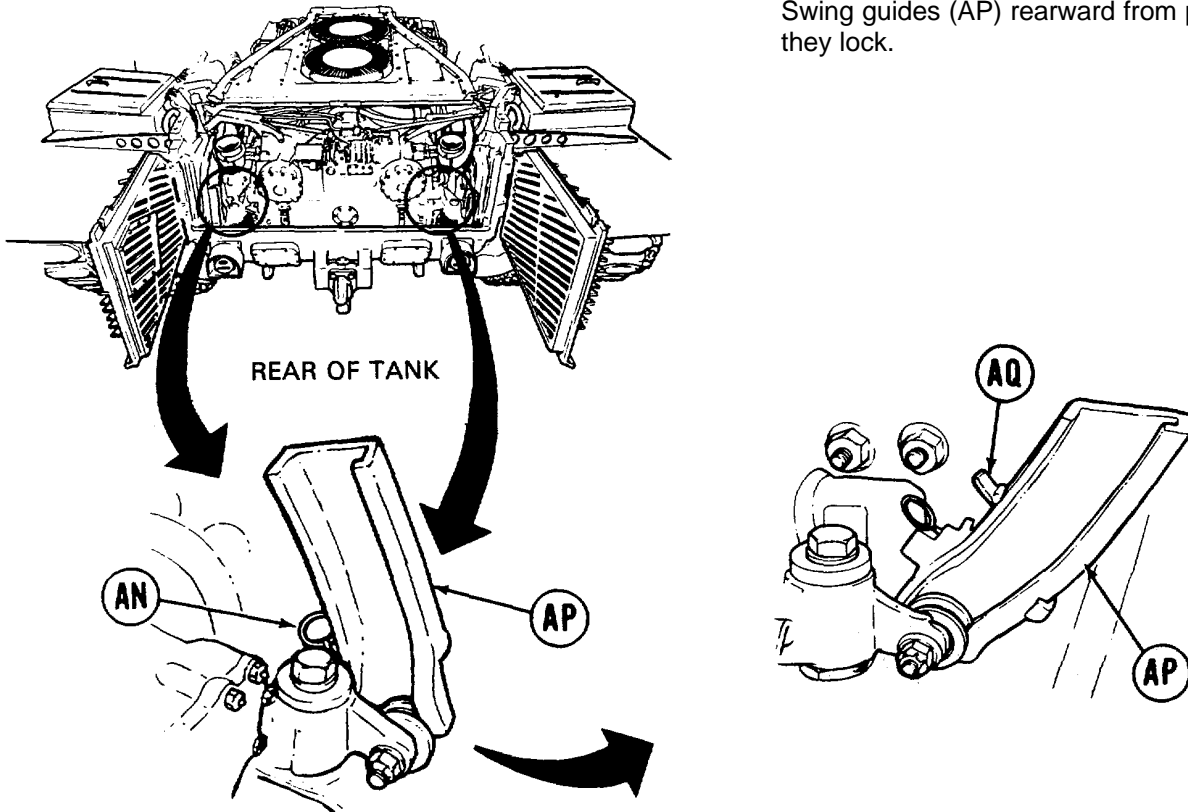
NOTE

Continue tapping final drive adapter (it will move 1-1/2 inches) until gears release.

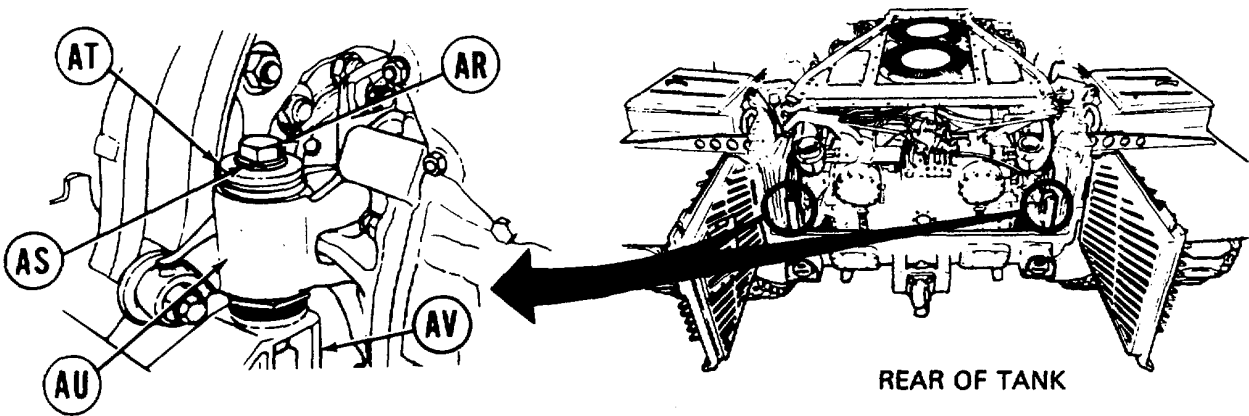
- 29. Hang two fabricated final drive guide shields (Fig. 1, Appendix F) (one on each side) at final drive universal joints (AM) to prevent hangups when powerplant is removed.

POWERPLANT REPLACEMENT (2D ENGINE) (Sheet 11 of 26)

30. Manually pull one locking (AN) on each side of powerplant to unlock powerplant guide (AP). Swing guides (AP) rearward from powerplant -until they lock.



31. Make sure powerplant guide locks (AQ) engage when guides (AP) are all the way back.



32. Using 1-1/2 inch socket, remove two capscrews (AR), two lockwashers (AS), and two flat washer assemblies (AT) holding two mounting brackets (AU) to transmission mounts (AV). Throw lockwasher away.

Go on to Sheet 12

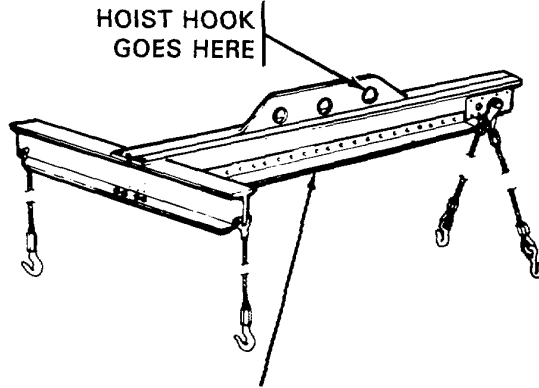
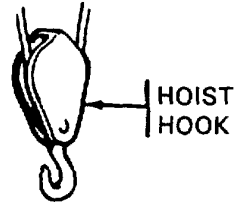
TA147937

**POWERPLANT REPLACEMENT (2D ENGINE) (Sheet 12 of 26)**

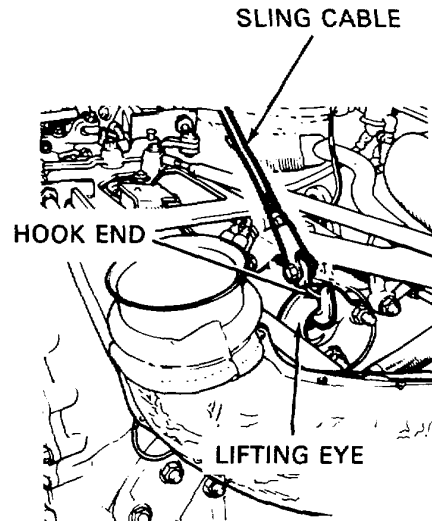
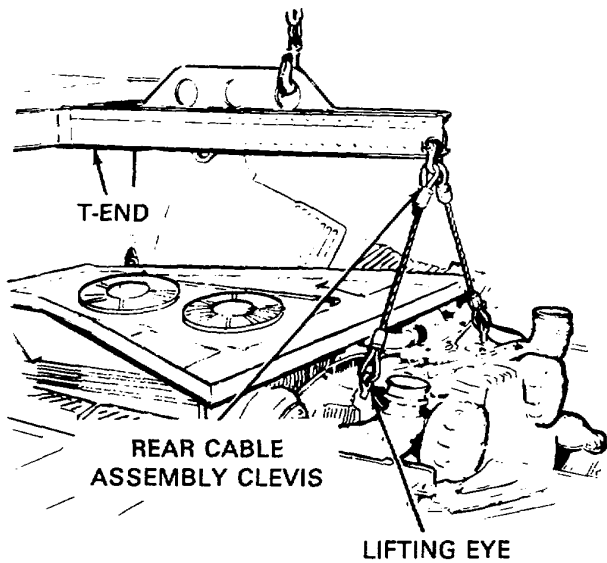
**CAUTION**

**Check all disconnected rod and line ends, hoses, and cables to make sure they will be out of the way during powerplant removal.**

33. Connect hoist hook to sling. Make sure hoist hook is put through hole used to lift powerplant.
34. Using hoist with sling, position sling over powerplant so T-end is to front of tank.
35. Attach four cable hooks of sling to four lifting eyes on powerplant. Make sure hook ends are toward outside of tank
36. Position personnel to guide powerplant as it is hoisted out of tank.



**POWERPLANT LIFTING SLING**



POWERPLANT REPLACEMENT (2D ENGINE) (Sheet 13 of 28)

**WARNING**

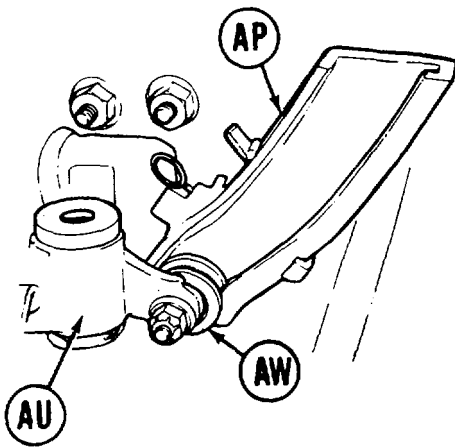
The powerplant weighs more than 8500 pounds. Careless handling can result in serious injury to personnel or damage to equipment.

**CAUTION**

The powerplant can be damaged by bumping against the hull or by a sudden drop onto the support brackets.

**NOTE**

The rear of the powerplant will rise first while the front remains in place.



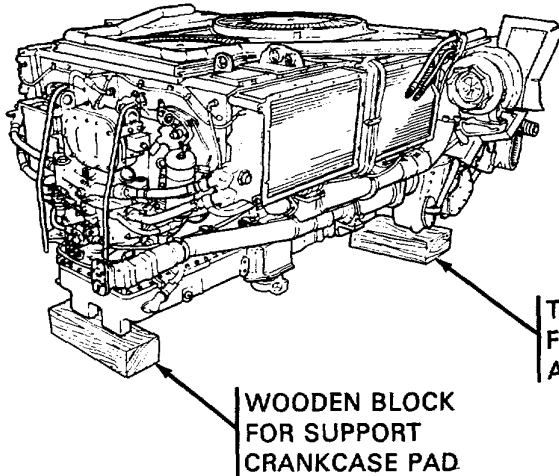
37. Using hoist, slowly lift powerplant until rollers (AW) on transmission mounting brackets (AU) contact lower surfaces of top of powerplant guides (AP).

**CAUTION**

Maintain straight, upward lift when lifting powerplant. Move hoist rearward between lifts. Keep checking clearances between powerplant and hull. Rear of powerplant comes out first.

**POWERPLANT REPLACEMENT (2D ENGINE) (Sheet 14 of 26)**

38. Lift powerplant in short, even lifts.

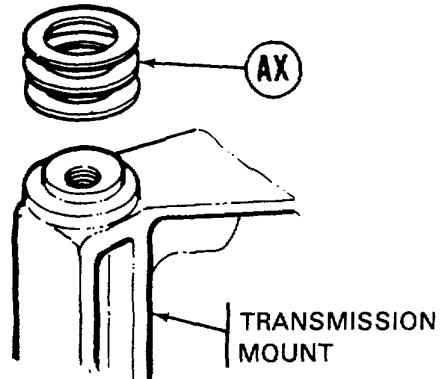


39. Remove powerplant. Move it away from tank. Lower it to a few feet from ground level and top.

40. Position one block under left side of transmission.

41. Position another block under right side of transmission.

42. Position third block under crankcase pad at front of engine.



43. Carefully lower powerplant onto supporting blocks.

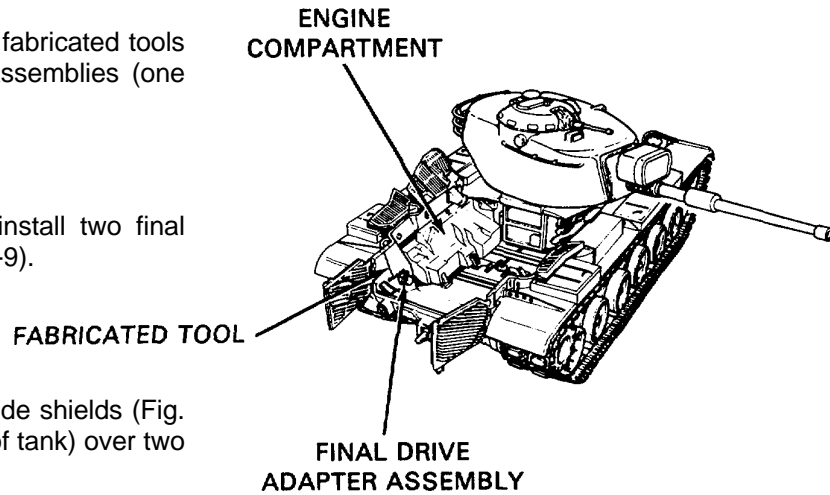
44. Remove six spring washers (AX) (three each side) from transmission mounts.

45. Remove two fabricated final drive guide shields from each side of tank at final drive universal joints.

**POWERPLANT REPLACEMENT (2D ENGINE) (Sheet 15 of 28)**

**INSTALLATION:**

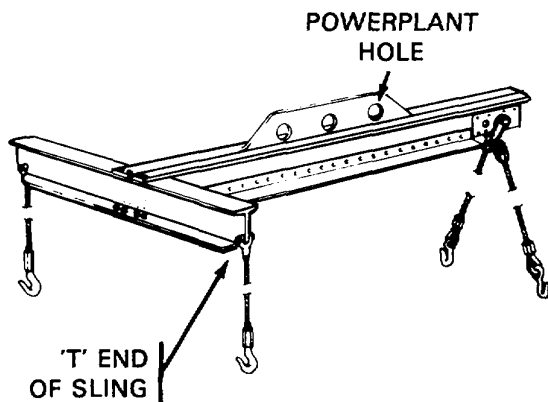
1. If not previously removed, remove fabricated tools covering two final drive adapter assemblies (one on each side of tank).
2. Remove, clean, lubricate, and reinstall two final drive adapter assemblies (page 12-9).
3. Install two fabricated final drive guide shields (Fig. 1, Appendix F) (one on each side of tank) over two final drive adapter assemblies.
4. Apply light coat of grease (Item 36, Appendix D) to powerplant mounting surfaces.



5. Make sure hoist hook is in powerplant hole of sling (Item 31, Chapter 3, Section I).

**NOTE**

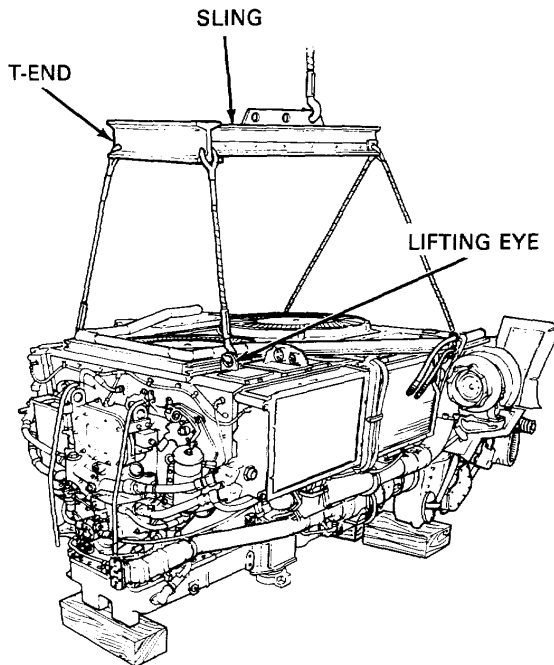
**T-end of sling should be toward front (engine end of power-plant).**



## POWERPLANT REPLACEMENT (2D ENGINE) (Sheet 16 of 26)

**NOTE**

Working area where powerplant mounts is tight and limited, make sure all connections are ready. Remove tools, rags, and any other materials not required from engine compartment before installing powerplant.



6. Make sure main gun is over left center fender.
7. Using hoist, pick up sling and install four sling hooks through four lifting eyes on powerplant.
8. Ends of sling hooks should point toward outer side of powerplant.

**WARNING**

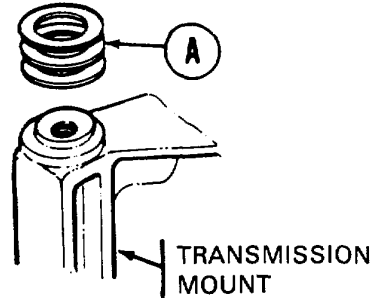
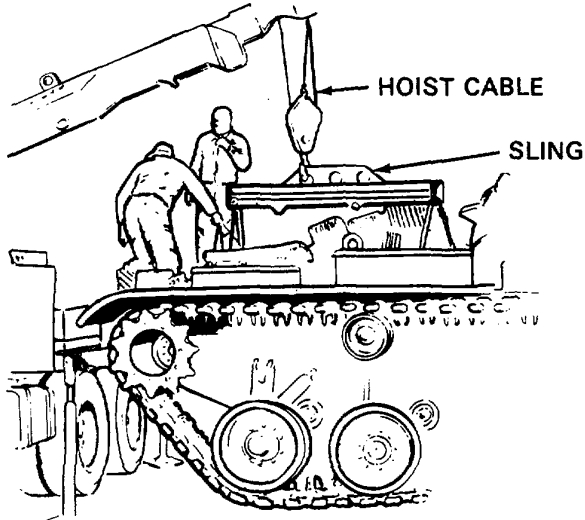
Be careful when lifting powerplant. Serious injury to personnel can result from careless handling.

**CAUTION**

Powerplant can be damaged if bumped against hull.

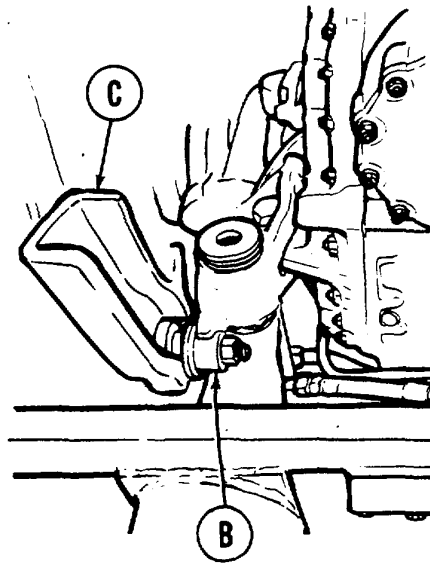
**POWERPLANT REPLACEMENT (2D ENGINE) (Sheet 17 of 28)**

9. Install six spring washers (A) (three on each side) to top of transmission mounts.



10. Using hoist with sling, lift powerplant into position over engine compartment.
11. Use personnel to guide powerplant into hull.

12. Make sure transmission rollers (B) fit into both powerplant guides (C).
13. Lower powerplant into installed position. When powerplant is seated, remove both fabricated final drive guide shields.
14. Check that powerplant is correctly seated. Check all clearances around powerplant
15. Remove four sling hooks from four lifting eyes of powerplant.



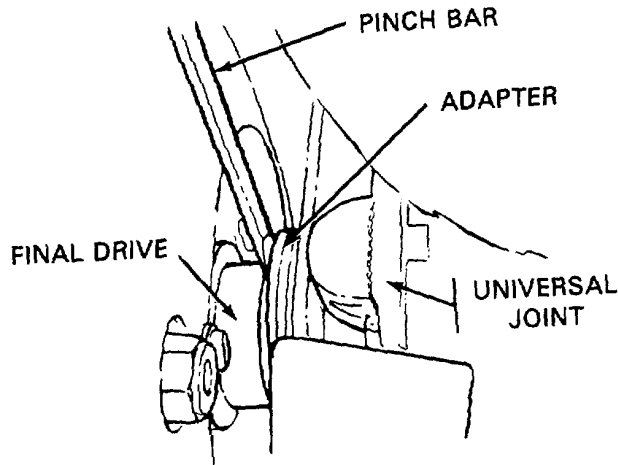
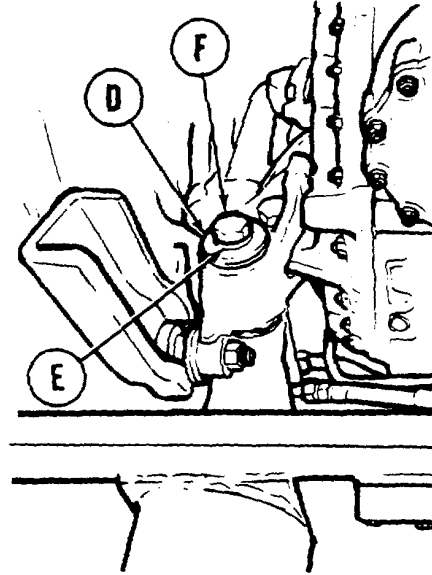
Go on to Sheet 18

TA147943



**POWERPLANT REPLACEMENT (2D ENGINE) (Sheet 18 of 26)**

16. Using 1-1/2 inch socket, install two flat washers (D), two new lockwashers (E) and two capscrews (F).
17. Using torque wrench and 1-1/2 inch socket, tighten two capscrews (F) 360-380 lb-Ft (48515 N.⋅m).



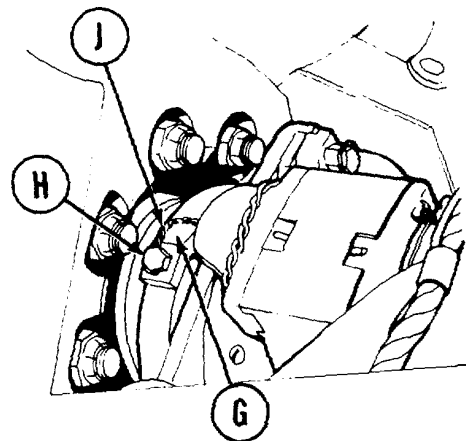
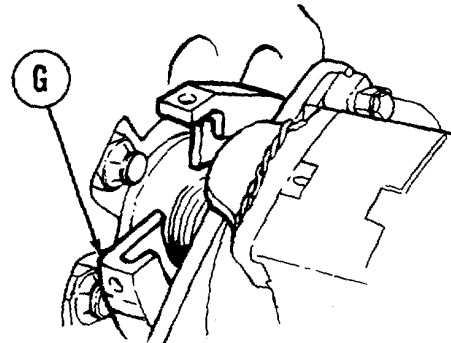
18. Have one person hold universal joint gears in alignment with final drive adapter while another person, using pinch bar, pries final drive adapter away from final drive into universal joint (each side).

19. Fit quick-disconnect ring (G) around final drive adapter.

**NOTE**

**When installing screw (H) hold onto quick-disconnect ring (J) or it will snap open and fall into engine compartment.**

20. Instal screw (H). Using 3/4 inch socket, tighten screw on both sides of tank.
21. String new lockwire (J) (Item 60, Appendix D) through screw (H) and opening quick-disconnect ring (G) on both sides of tank.

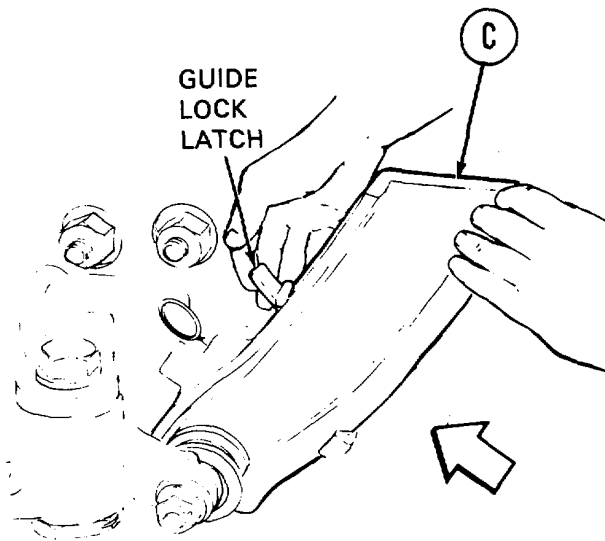
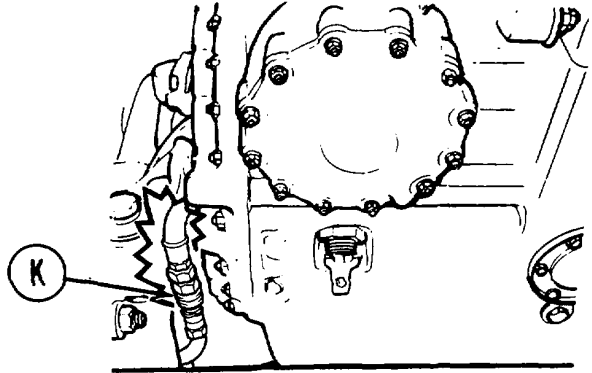


**POWERPLANT REPLACEMENT (2D ENGINE) (Sheet 19 of 26)**

22. Reach between transmission and under left transmission mount and remove protective coverings from fuel return line (K) openings.
23. Reach between transmission and under left transmission mount and manually connect quick-disconnect (K).

**NOTE**

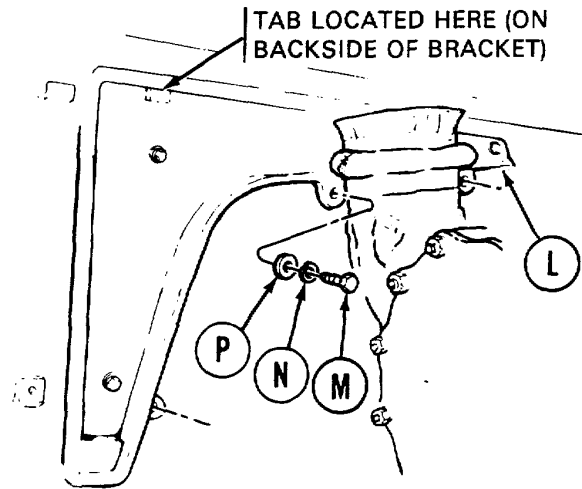
**It may be necessary to reach between left transmission mount and universal joint to connect quick-disconnect (K).**



24. Raise guide lock latches.
25. Push powerplant guide (C) forward until locking snaps into place. Guide is now locked into position.

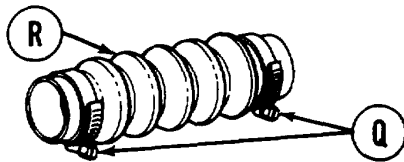
**POWERPLANT REPLACEMENT (2D ENGINE) (Sheet 20 of 26)**

26. Position angle bracket (L) to rear side wall (by powerplant guide). Hang tab of bracket onto tab on compartment side wall.
27. Install three screws (M), new lockwashers (N), and washers (P) to secure angle bracket (L) to side wall (both sides).
28. Using 9/16 inch socket, tighten three screws (M) (both sides) to secure bracket (L) to side wall.



**NOTE**

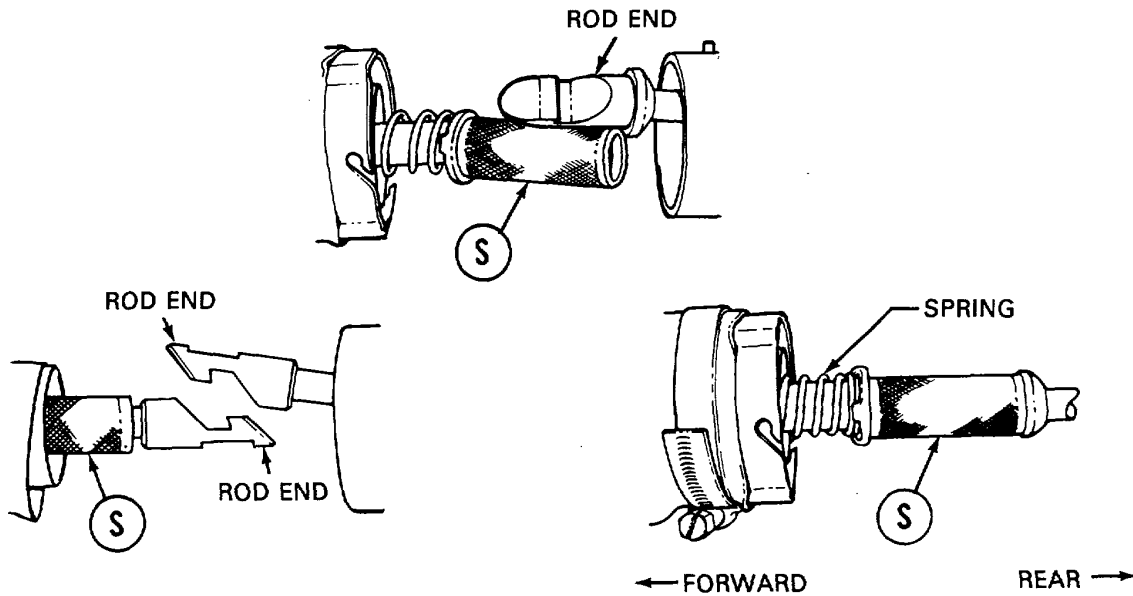
Before connecting brake rod ends, make sure two clamps (Q) are on each boot (R).



**NOTE**

If your tank has a spring loaded sleeve type disconnect (S), perform step 29. If it has screw, lockwasher, and nut type, go to step 30.

29. Push sleeve (S) forward, engage rod ends (use pliers if necessary), and push sleeve to rear to retain rod ends (each side of tank). Go on to step 31.

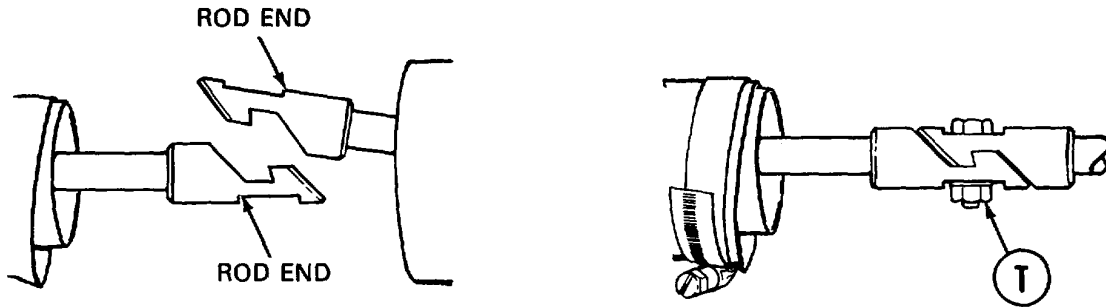


Go on to Sheet 21

TA147946

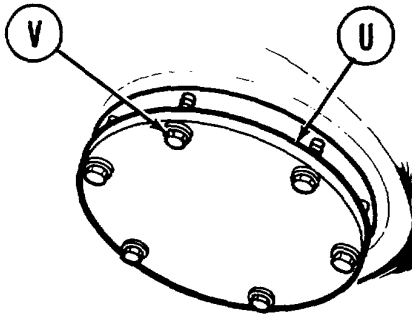
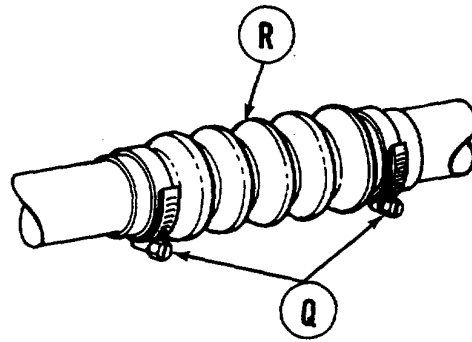
**POWERPLANT REPLACEMENT (2D ENGINE) (Sheet 21 of 26)**

30. Engage rod ends (use pliers if necessary) and manually install screw, new lockwasher, and nut (T) (each side of tank).



31. Using 7/16 inch socket on screw and 7/16 inch wrench to hold nut, tighten screw, lockwasher, and nut (T).

32. Manually position boot (R) and two clamps (Q) and using 5/16 inch wrench, tighten two clamps (Q) (each side of tank).



33. Wearing rubber gloves, use rags (Item 65, Appendix D) and cleaning solvent (Item 54, Appendix D) to clean contact areas of brake rod access covers (U) and hull.
34. Apply adhesive (Item 2, Appendix D) to both sides of two new gaskets. Position two new gaskets onto inner side of two brake rod access covers (U).

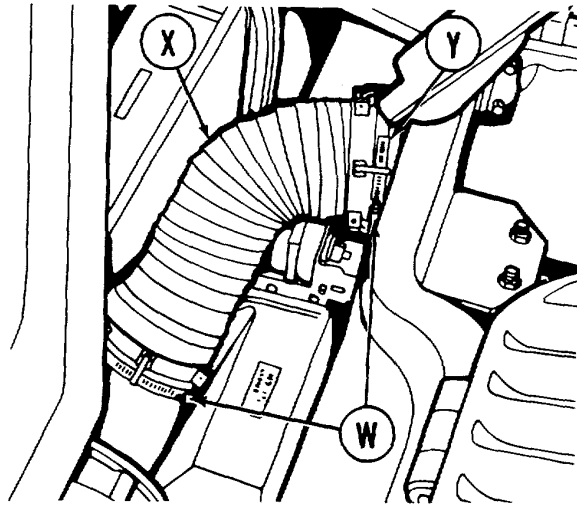
**WARNING**

**Support brake rod access covers (U) with hand to prevent personal injury.**

35. Position left and right brake rod access covers (U) to hull. Manually install 12 screws and new lockwashers (V).
36. Using 9/16 inch socket, tighten 12 screws and lockwashers (V).

**POWERPLANT REPLACEMENT (2D ENGINE) (Sheet 22 of 26)**

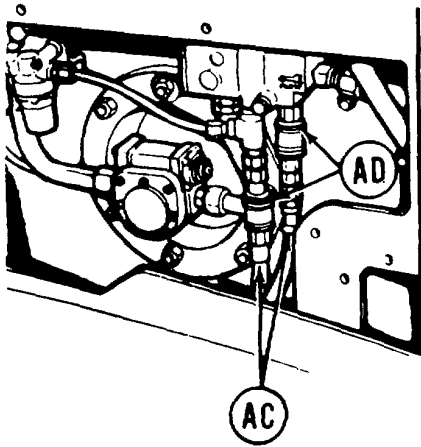
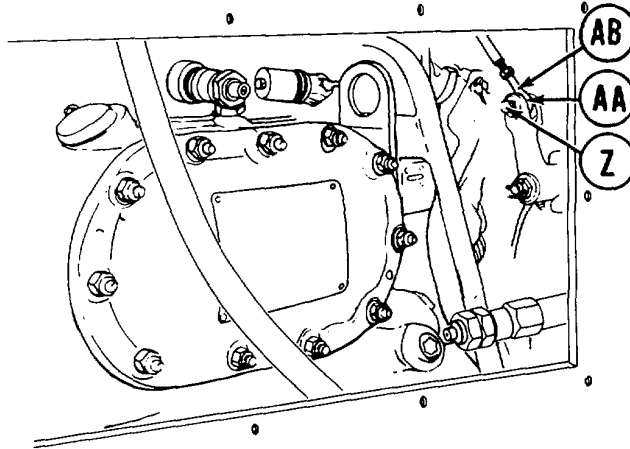
37. Remove protective coverings from air cleaner outlet hose connect points (W) on each side of tank.
38. Manually install two air cleaner outlet hoses (X) on each side of tank.
39. Position clamps (Y) and, using 7/16 inch wrench, tighten nut of clamp (Y) to hold air cleaner outlet hose (X) on each side of tank.

**NOTE**

Close grille doors and manually traverse turret to bring gun tube over driver's position (TM 9-2350-260-10).

## POWERPLANT REPLACEMENT (2D ENGINE) (Sheet 23 of 26)

40. Reaching through engine access cover opening, use 7/16 inch wrench to install accelerator bolt (Z) to hold accelerator linkage clevis (AA) to rod end (AB).



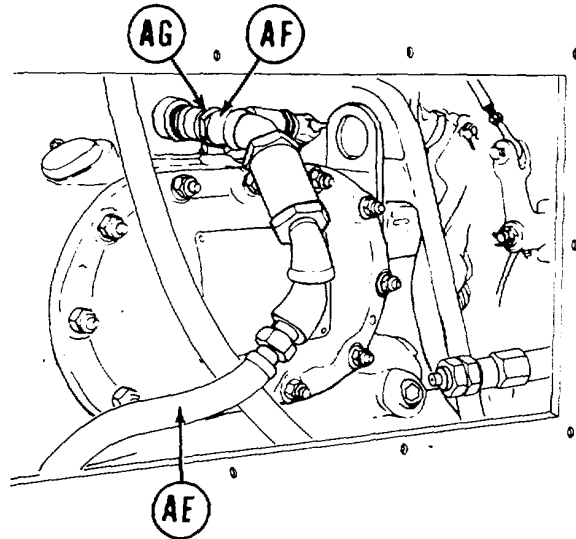
41. Reaching through engine access cover opening, remove protective coverings from two priming fuel lines (AC) and quick-disconnect fittings (AD).
42. Reaching through engine access cover opening, manually connect two priming fuel lines (AC) to quick-disconnect fittings (AD) by pulling back on quick-disconnect fittings (AD) and inserting male connectors into female connectors.

Go on to Sheet 24

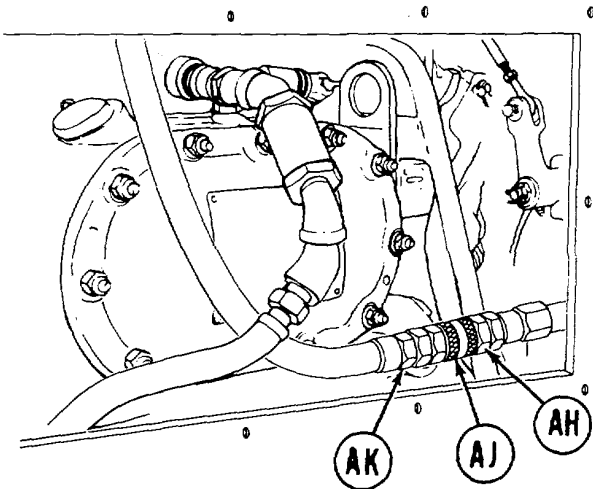
TA147949

**POWERPLANT REPLACEMENT (2D ENGINE) (Sheet 24 of 26)**

- 43. Reaching through engine access cover opening, remove light rope or heavy masking tape holding free end of fire extinguisher tubing (AE).
- 44. Reaching through engine access cover opening, remove protective coverings from ends of fire extinguisher tubing fitting (A) and engine fitting (AG).



- 45. Reaching through engine access cover opening, manually connect fire extinguisher tubing fitting (AF) to engine fitting (AG) by pulling back on tubing fitting (AF) and inserting male connector into female connector.
- 46. Reaching through engine access cover opening, remove protective coverings from main fuel line fittings (AH) and (AJ).

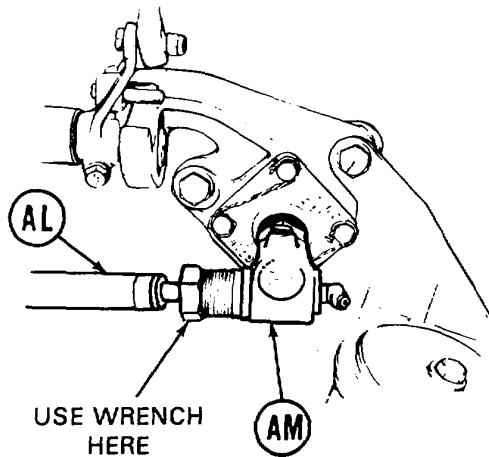


- 47. Reaching through engine access cover opening, manually connect main fuel line (AK) to quick-disconnect fitting (AH) by pulling back on fitting (AK) and inserting male connector into female connector.

Go on to Sheet 25

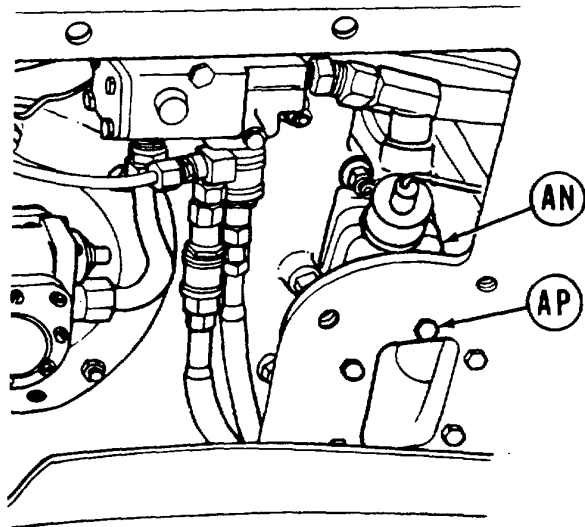
TA147950

POWERPLANT REPLACEMENT (2D ENGINE) (Sheet 25 of 26)



48. Reaching through engine access cover opening, use adjustable wrench to install tachometer cable (AL) to adapter (AM).

49. Position generator air duct (AN) to bulkhead wall.  
 50. Using 7/16 inch wrench, install six screws (AP) to hold generator air duct (AN) to bulkhead wall.



51. If engine, transmission, or shifting control linkage was replaced, check shifting control linkage adjustment. Adjust linkage if necessary (page 11-2).  
 52. If engine, transmission, or steering control linkage was replaced, check steering control linkage adjustment. Adjust linkage if necessary (page 15-2).



**POWERPLANT REPLACEMENT (2D ENGINE) (Sheet 26 of 26)**

53. If engine, transmission, or accelerator control linkage was replaced, check accelerator control linkage adjustment. Adjust linkage if necessary (page 7-376).
54. Install upper engine access cover (page 16-44).
55. Connect battery ground straps (page 10-294).
56. Install transmission shroud (page 9-23).
57. Install top deck (page 16-22).
58. Turn turret to travel lock position. Lock gun tube (TM 9-2350-260-10).
59. Remove blocks from both tracks at front and rear.

End of Task

TA147952

## 2A ENGINE AND 2D ENGINE POWERPLANT TESTS (GROUND HOP) (Sheet 1 of 16)

## NOTE

If you have and choose to use STE/ICE, there are two tests that you can perform:  
 Test No. 13 (page 4-64) and Test No. 14 (page 4-69).

## PROCEDURE INDEX

PROCEDURE	PAGE
Test Hookup	5-54
Idle Test	5-57
Governed No-Load Test	5-58
Stall Test	5-60
Engine Fuel Leak Test	5-65
After-Test Disconnect	5-67

**WARNING**

Assign one crewmember with a fire extinguisher as fire guard during all powerplant tests.

**WARNING**

Take all necessary safety precautions to prevent possible injury to personnel or damage to equipment. Stand clear of both transmission output flanges whenever engine is running. Hearing protection is required.

**2A ENGINE AND 2D ENGINE POWERPLANT TESTS (GROUND HOP) (Sheet 2 of 16)**

TOOLS: 3/8 in. socket head screw key (allen wrench)  
1/2 in. combination box and open end wrench  
3/4 in. combination box and open end wrench  
3/4 in. socket with 1/2 in. drive  
Flat-tip screwdriver with 1/4 in. blade  
Ratchet with 1/2 in. drive  
Torque wrench with 1/2 in. drive (0-175 lb-ft) (0-237 N•m)  
1-1/4 in. socket with 1/2 in. drive  
Spanner wrench  
Industrial goggles

SPECIAL TOOLS: Ground hop kit (Item 30, Chapter 3, Section I)

FABRICATED TOOLS: Throttle linkage adjusting go/no-go gage (Fig. 3, Appendix F)  
Engine air cleaner (2 required) (Fig. 4, Appendix F)  
Tachometer (Fig. 2, Appendix F)

PERSONNEL: Three

REFERENCE: TM 9-2350-260-20-1-2  
LO 9-23504260-12

PRELIMINARY PROCEDURE: Remove powerplant (page 5-1)

**NOTE**

**Tests can be performed in any order. If more than one test is to be performed, do not disconnect test hookup.**

**Disconnect test hookup only when test or tests are complete.**

Go on to Sheet 3

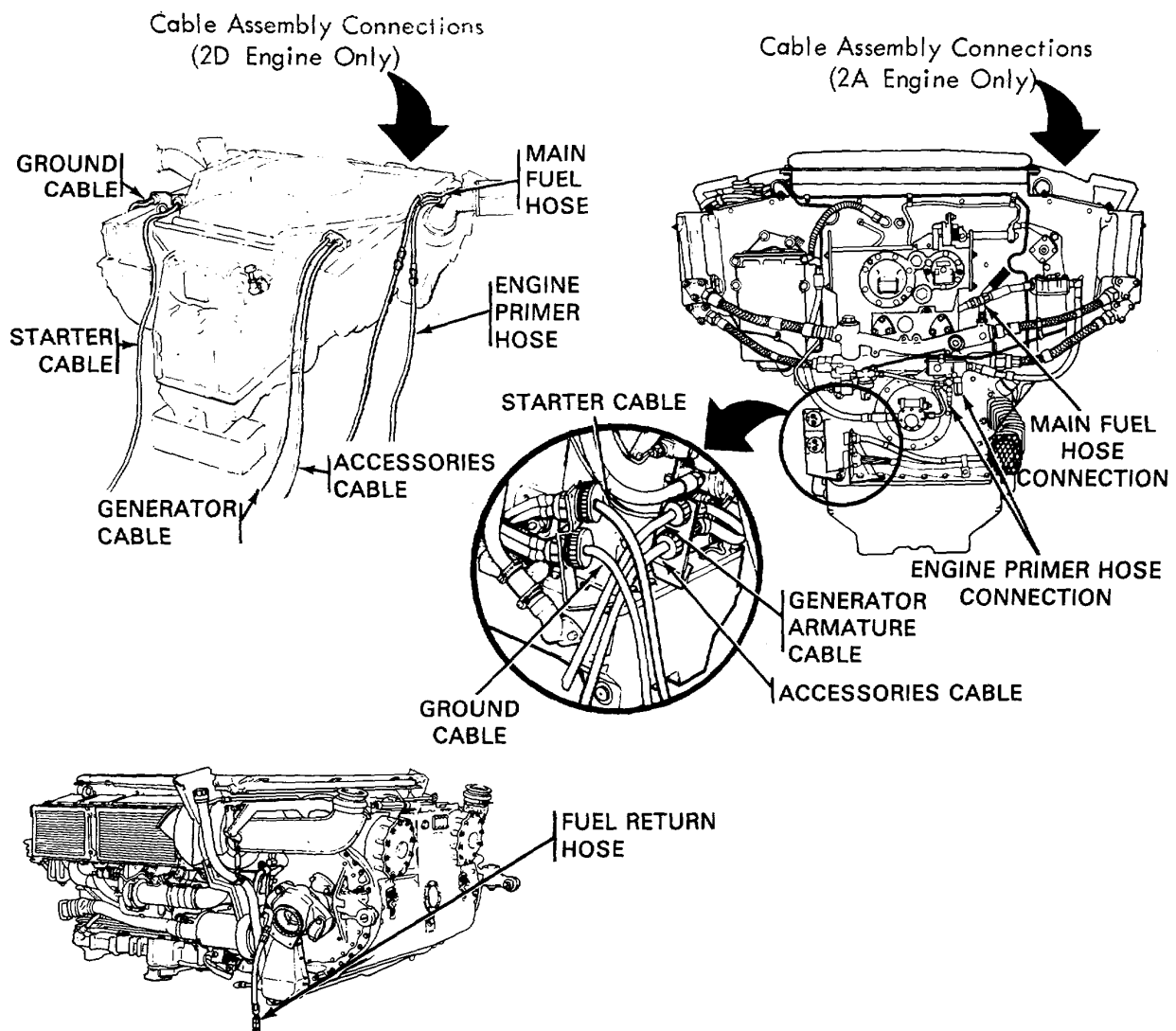
2A ENGINE AND 2D ENGINE POWERPLANT TESTS (GROUND HOP) (Sheet 3 of 16)

TEST HOOK-UP:

1. Position powerplant dose to hull to permit connection of electrical cable assemblies and fuel hose assemblies.
2. Connect cable assemblies and hose assemblies to powerplant as shown.
3. Using spanner wrench, tighten cable assemblies.

**NOTE**

No two cable and hose connectors are the same. Match ground hop cable and hose connectors with engine cable and hose connectors for hookup procedures.



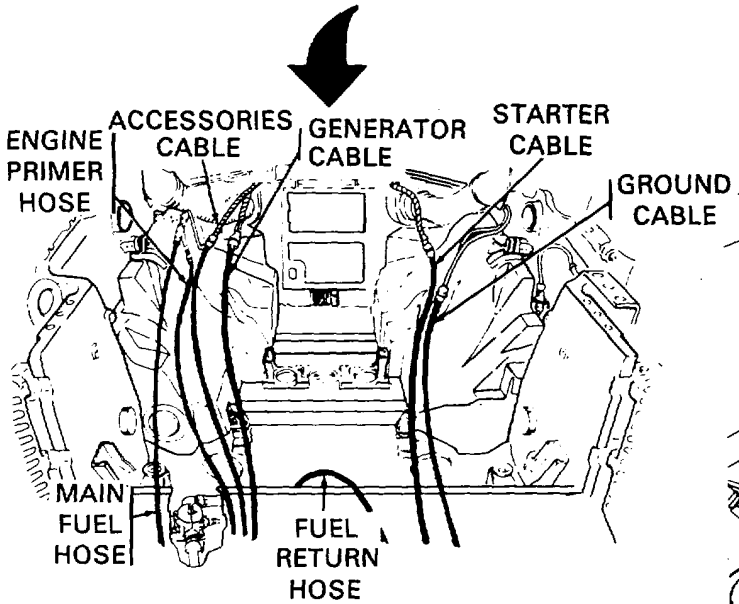
Go on to Sheet 4

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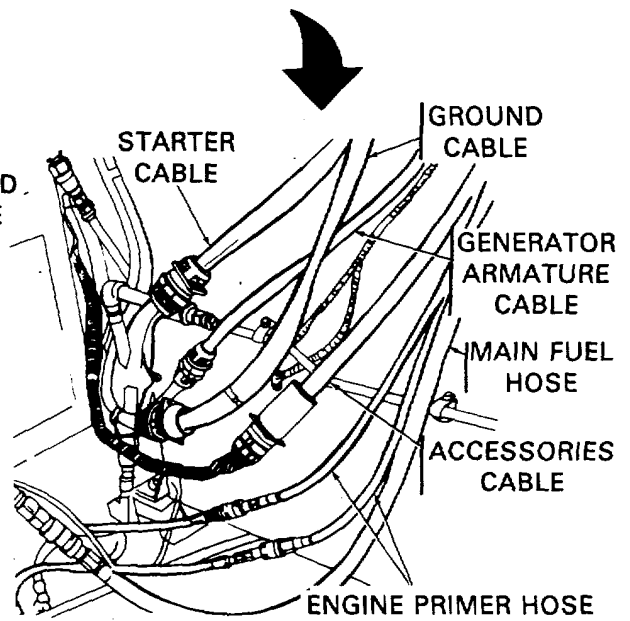
2A ENGINE AND 2D ENGINE POWERPLANT TESTS (GROUND HOP) (Sheet 4 of 16)

4. Connect cable assemblies and hose assemblies to hull as shown.

CABLE AND FUEL HOSE CONNECTIONS  
(2D ENGINE ONLY)



CABLE AND FUEL HOSE CONNECTIONS  
(2A ENGINE ONLY)



5. Using spanner wrench, tighten cable assemblies.

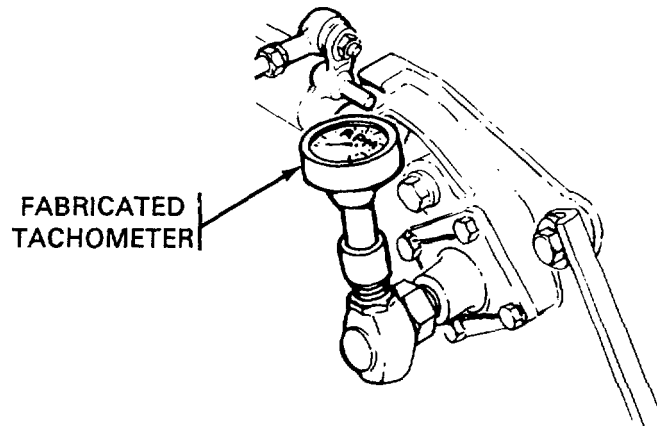
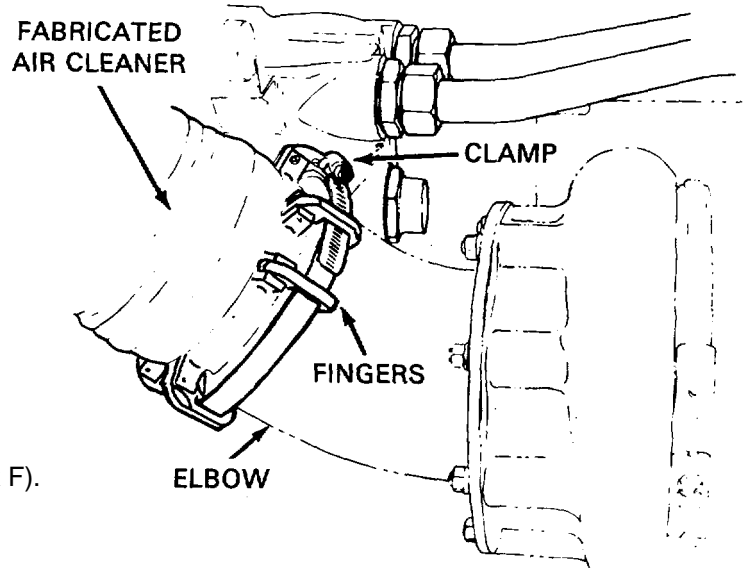
**2A ENGINE AND 2D ENGINE POWERPLANT TESTS (GROUND HOP) (Sheet 5 of 16)**

6. Position fabricated air cleaner (Fig. 4, Appendix F) to turbosupercharger elbow (left and right).
7. Using screwdriver, tighten clamp. Be sure all fingers engage flange on turbosupercharger elbow.

**NOTE**

During these tests, electrical instruments, switches, and warning lights in tank will be operative. All mechanical and hydraulic controls and tank tachometer will be inoperative. It will be necessary to manually position or actuate throttle or shifting control and fuel shutoff.

8. Install fabricated tachometer (Fig. 2, Appendix F).
9. Connect battery ground cables (page 10-296).

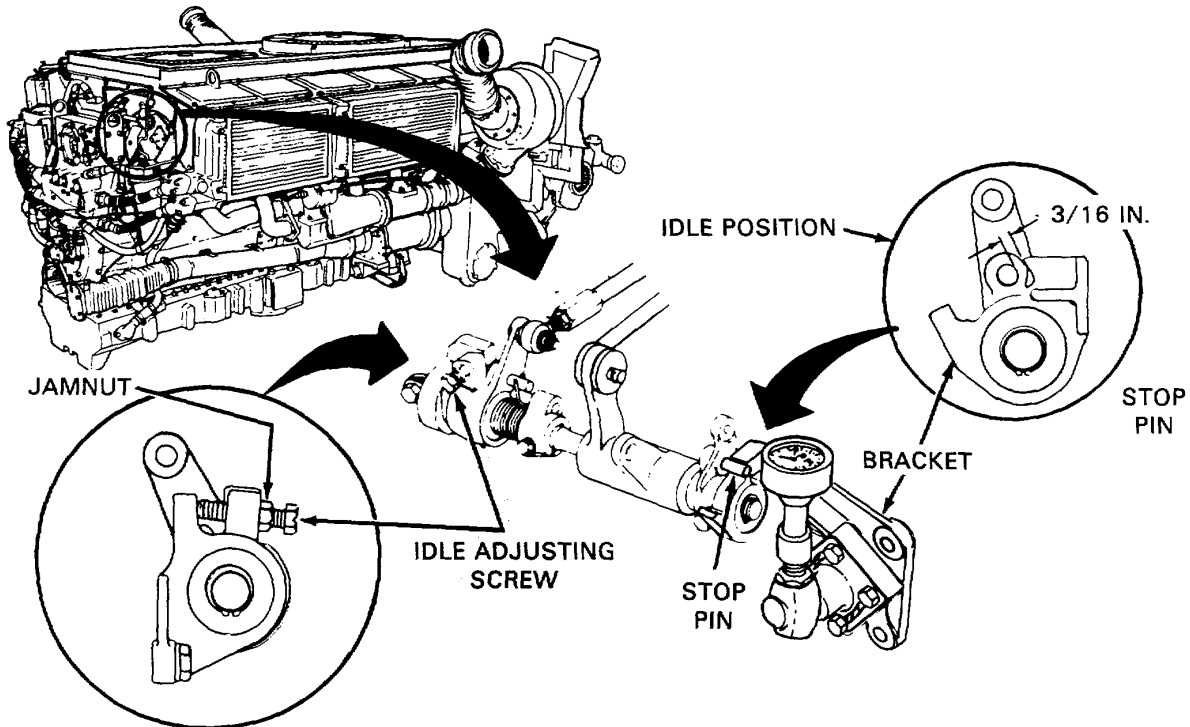


## 2A ENGINE AND 2D ENGINE POWERPLANT TESTS (GROUND HOP) (Sheet 6 of 16)

IDLE TEST:

**WARNING**

Take all necessary safety precautions to eliminate possible injury to personnel or damage to equipment. Stand clear of both transmission output flanges whenever the engine is running. Hearing protection is required.



1. Start and operate engine until engine oil and transmission oil normal operating temperatures are reached (TM 9-2350-260-10).
2. Check fabricated tachometer for indication of 700-750 rpm. If indication is not within range, adjust idle adjusting screw according to steps 3 thru 6.
3. Using 1/2 inch wrench, loosen jamnut on idle adjusting screw.
4. Using 1/2 inch wrench, adjust idle adjusting screw until 700-750 rpm shows on fabricated tachometer.
5. Using 1/2 inch wrench, tighten jamnut.
6. Install 3/16 inch end of fabricated throttle linkage adjusting gage (Fig. 3, Appendix F) between stop pin and bracket shoulder. If distance is not a minimum of 3/16 inch, notify support maintenance.
7. Check fabricated tachometer. If indication is not between 700-750 rpm, notify maintenance supervisor.

Go on to Sheet 7

TA147957

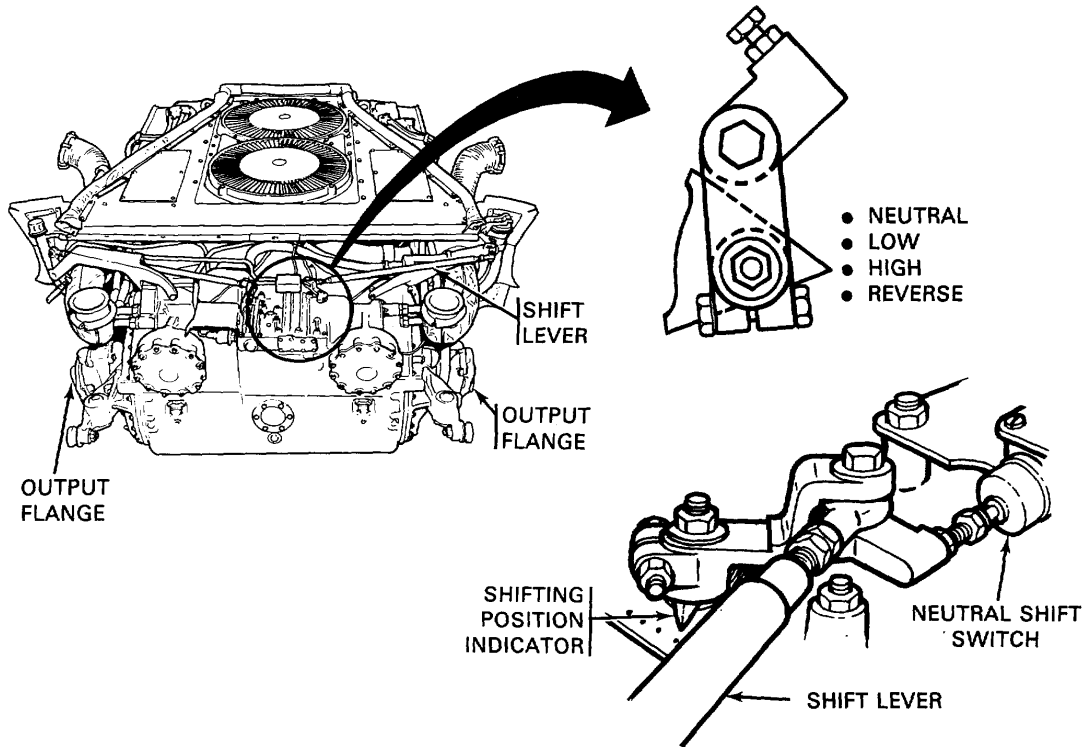
2A ENGINE AND 2D ENGINE POWERPLANT TESTS (GROUND HOP) (Sheet 7 of 16)

GOVERNED NO-LOAD TEST:

1. Start and operate engine until engine oil and transmission oil normal operating temperatures are reached (TM 9-2350-260-10).

**WARNING**

Take all necessary safety precautions to eliminate possible injury to personnel or damage to equipment. Stand clear of both transmission output flanges whenever engine is running. Hearing protection is required.



**NOTE**

An indicator on the linkage shaft and four dots on the body transmission valve casting indicate shift position.

2. Be sure transmission is in neutral position by checking shifting position indicator. If not in neutral position, grasp shift lever and pull or push lever to set indicator to desired position.

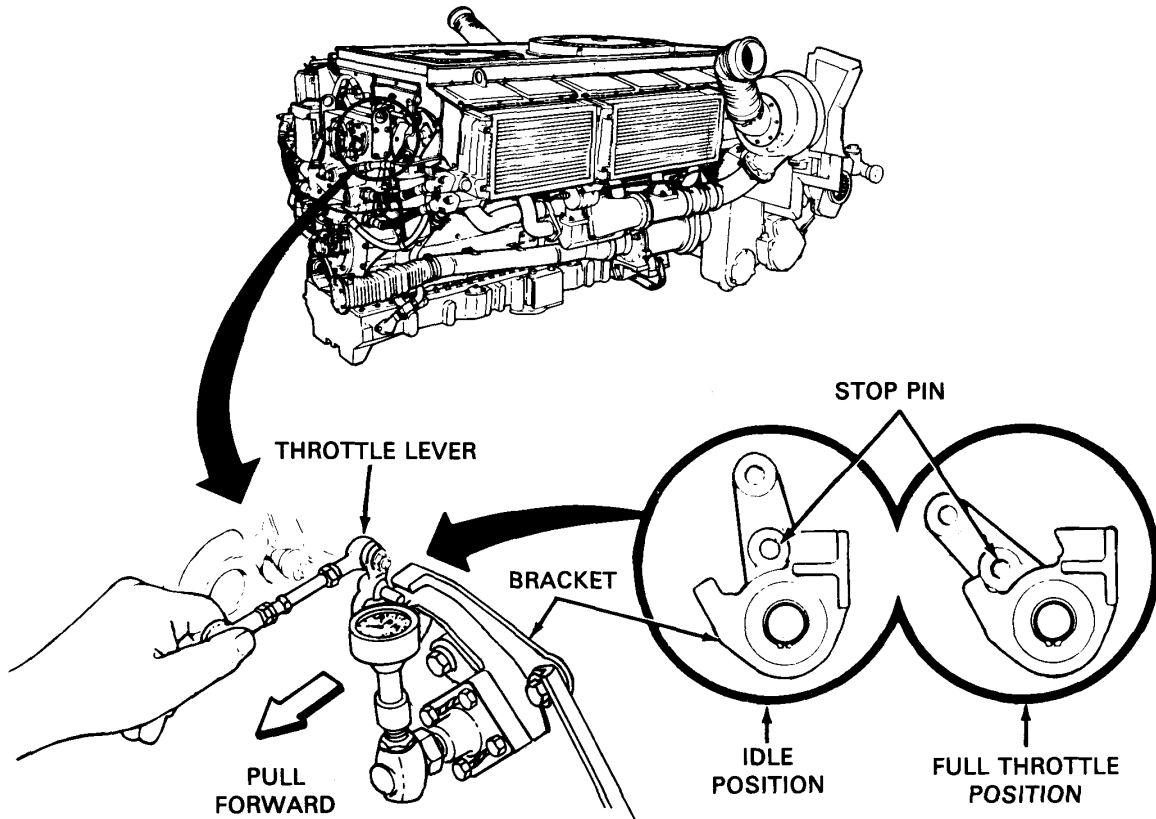


## 2A ENGINE AND 2D ENGINE POWERPLANT TESTS (GROUND HOP) (Sheet 8 of 16)

**CAUTION**

The engine speed must not be permitted to exceed 2640 rpm for more than 2 or 3 seconds in the event of governor malfunction.

3. Manually and gradually actuate throttle by pulling forward on throttle lever to full open position.



4. Watch fabricated tachometer (Fig. 2, Appendix F). In most cases, engine speed will surge over 2600 rpm and then stabilize within 30 seconds between 2550 and 2640 rpm. If rpm does not fall within this range or keeps changing, notify maintenance supervisor.
5. Gradually lease throttle lever, allowing engine to return to idle speed (700-750 rpm).

2A ENGINE AND 2D ENGINE POWERPLANT TESTS (GROUND HOP) (Sheet 9 of 16)

STALL TEST:

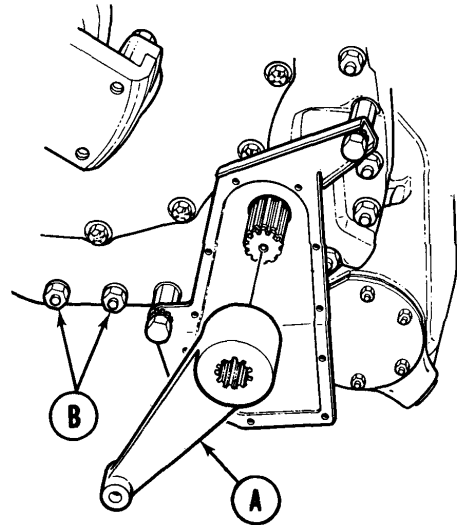
NOTE

This test is performed only to determine engine power loss or transmission slippage.

NOTE

Before performing stall test, check brake adjustment (page 13-2)

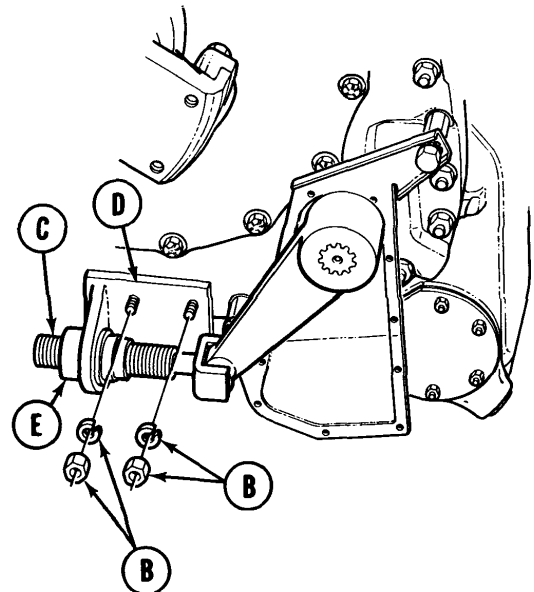
1. Adjust brakes (page 13-2).
2. Remove brake lever assembly from each side of transmission (page 13-91).
3. Install long brake apply levers (A) supplied with stall check it.
4. Using 3/4 inch wrench, remove two nut and lockwashers (B) from transmission.
5. Using nuts and lockwashers removed in step 4, install brake stall check tool (D) to transmission.
6. Using 3/4 inch wrench, tighten two nut and lockwashers (B).



CAUTION

Rotation of retainer (E) should be limited to one-half turn.

7. Using alien wrench, turn brake apply screw (C) in clockwise direction until retainer (E) begins to turn. Brakes will then be applied to preset loading.



Go on to Sheet 10

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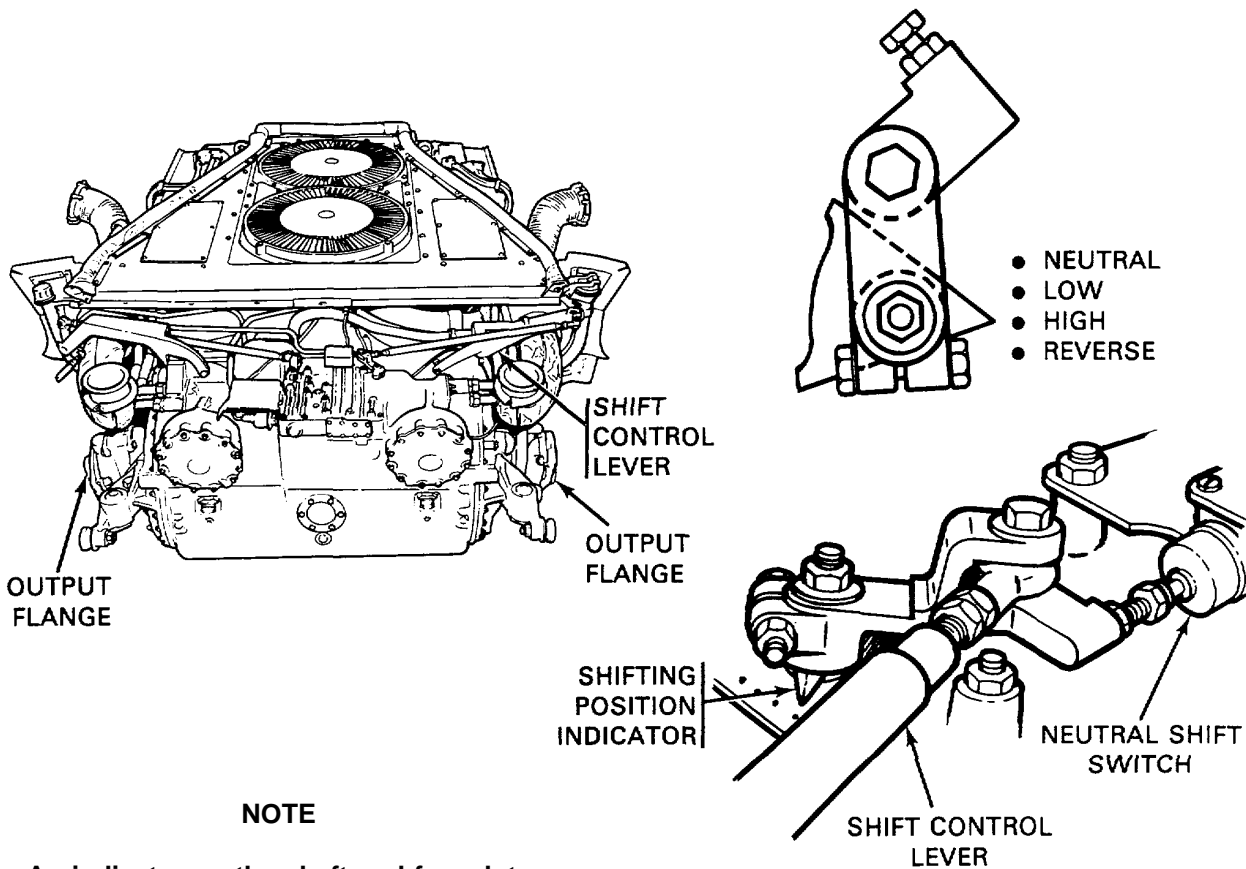
**2A ENGINE AND 2D ENGINE POWERPLANT TESTS (GROUND HOP) (Sheet 10 of 16)**

8. Check oil levels in engine and transmission (LO 9-2350-260-12). Make sure levels are up to Hull range on level gages.

**WARNING**

**Take all necessary safety precautions to eliminate possible injury to personnel or damage to equipment. Stand clear of transmission output flanges whenever engine is running. Hearing protection is required.**

9. Start and operate engine until normal operating temperatures of engine oil and transmission oil are reached (TM 9-2350-260-10).



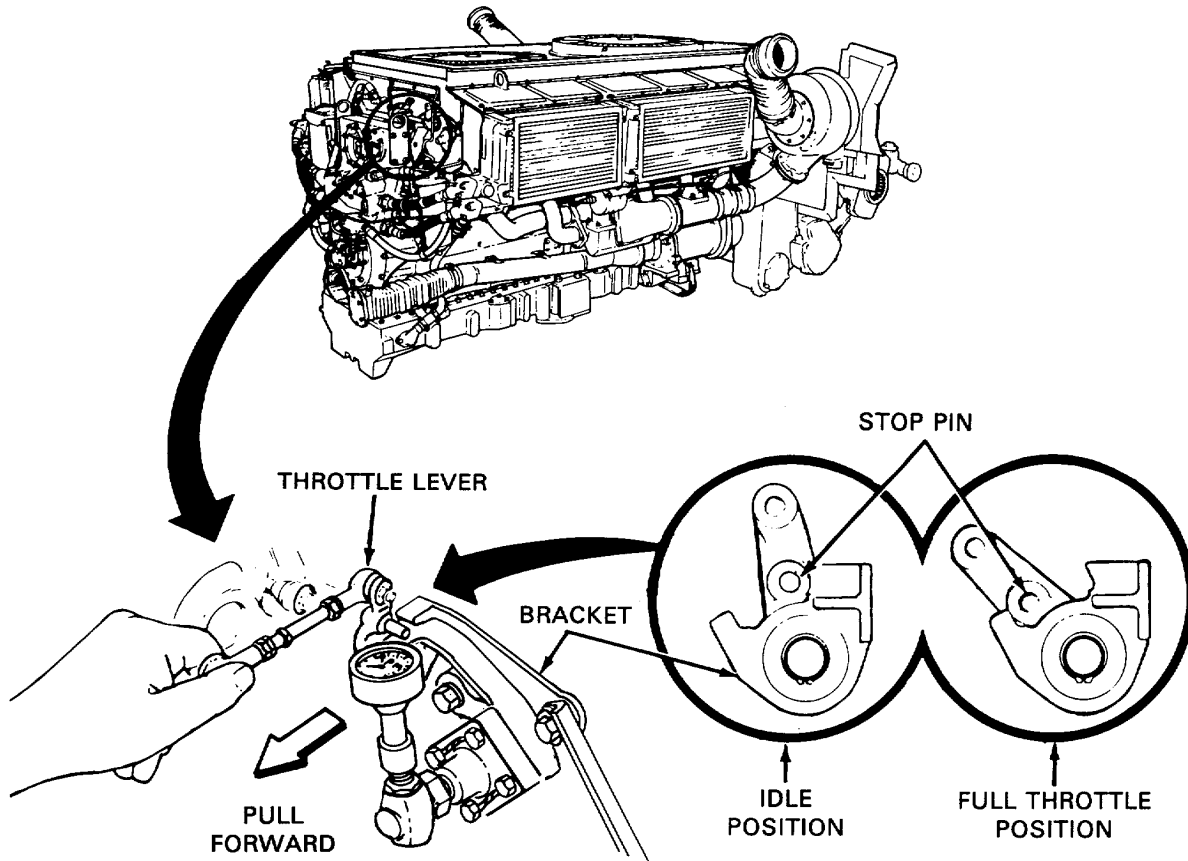
**NOTE**

**An indicator on the shaft and four dots on the body transmission valve casting indicate shift position.**

10. Set transmission in high range by grasping shift lever and pull or push lever to set indicator to high range.

2A ENGINE AND 2D ENGINE POWERPLANT TESTS (GROUND HOP) (Sheet 11 of 16)

11. Manually and gradually actuate throttle by pulling forward on throttle lever to full open position.



**CAUTION**

**Do not do stall test for more than 30 seconds at full throttle or allow transmission oil temperature to go into red area on transmission oil temperature indicator.**

12. Watch fabricated tachometer and operate engine at full throttle for no more than 30 seconds, three times.
13. If engine speed is below 1800 rpm, engine is not operating properly. Notify support maintenance that check of engine performance is required.

**2A ENGINE AND 2D ENGINE POWERPLANT TESTS (GROUND HOP) (Sheet 12 of 16)**

14. If engine speed is over 2050 rpm, there is clutch slippage in transmission. Verify that shift control lever is in high (check control indicator position). Notify support maintenance.

**NOTE**

**This test may also be used to determine if the low-range or reverse range transmission servobands are slipping.**

15. Set transmission in low or reverse range by gasping shift control lever and pull or push lever to set indicator to selected range.

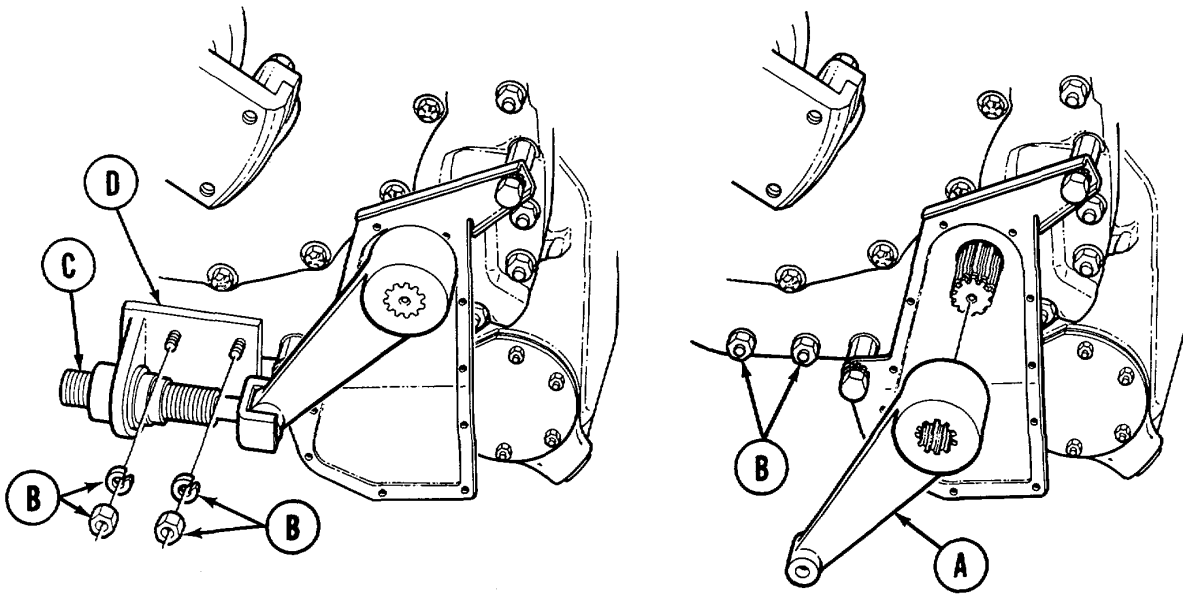
**CAUTION**

**Do not do stall test for more than 30 seconds at full throttle or allow transmission oil temperature to go into red area on transmission oil temperature indicator.**

16. Watch fabricated tachometer and operate engine at full throttle for no more than 15 seconds, three times.
17. If engine speed is below 1800 rpm after three checks, engine is not operating properly. Notify maintenance that check of engine performance is required.
18. If engine speed exceeds 2050 rpm, servobands are slipping. Verify that shift control lever is in selected range (check position of control indicator) and adjust forward or reverse servobands (page 11-4).

**2A ENGINE AND 2D ENGINE POWERPLANT TESTS (GROUND HOP) (Sheet 13 of 16)**

19. After adjusting servobands, repeat steps 15 thru 18. If slippage still exists, notify support maintenance
20. When test are completed, shut down engine (TM 9-2350-260-10).
21. Using allen wrench, turn brake apply screw (C) counterclockwise until brakes are fully released.
22. Using 3/4 inch wrench, remove two nuts and lockwashers (B). Remove brake stall check tool (D) from transmission. Throw lockwashers away.
23. Using 3/4 inch socket, install two nuts and new lockwashers (B) to transmission.
24. Using torque wrench and 3/4 inch socket tighten nuts (B) to 70-80 lb-ft (90-108 N•m).
25. Remove brake apply lever (A) from brake apply shaft.
26. Install brake lever assembly to both sides of transmission (page 13-93).

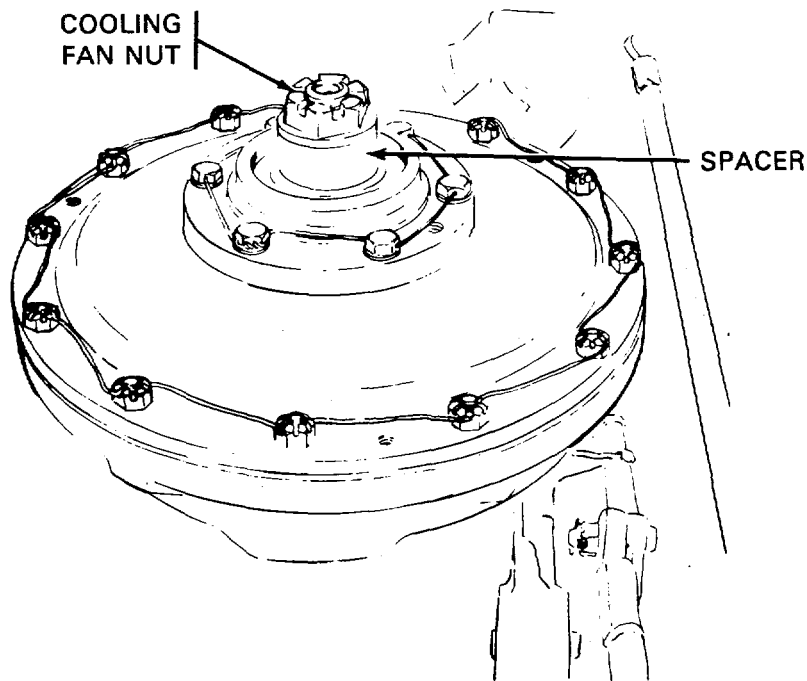


Go on to Sheet 14

TA147964

**2A ENGINE AND 2D ENGINE POWERPLANT TESTS (GROUND HOP) (Sheet 14 of 16)****ENGINE FUEL LEAK CHECK:**

1. Remove engine shroud (page 9-2).
2. Remove right bank engine access covers 2A engine (page 6-77) or 2D engine (page 6-79).
3. Remove left bank engine access covers 2A engine (page 6-84) or 2D engine (page 6-88).
4. Remove cooling fans (page 9-48).
5. Install spacer (Item 2, Chapter 3, Section I) onto each fan drive shaft.
6. Using 1-1/4 inch socket, install cooling fan nut.
7. Using torque wrench and 1-1/4 inch socket, tighten cooling fan nut to 45-55 lb-ft (61-75 N•m).



**2A ENGINE AND 2D ENGINE POWERPLANT TESTS (GROUND HOP) (Sheet 15 of 16)****WARNING**

**Fuel is delivered under high pressure from fuel pump to injector nozzles. Injury to personnel could result if contacted by spray from loose or defective fuel line.**

**CAUTION**

**DO NOT run engine for more than 10 minutes and do not exceed 700-750 rpm.**

**WARNING**

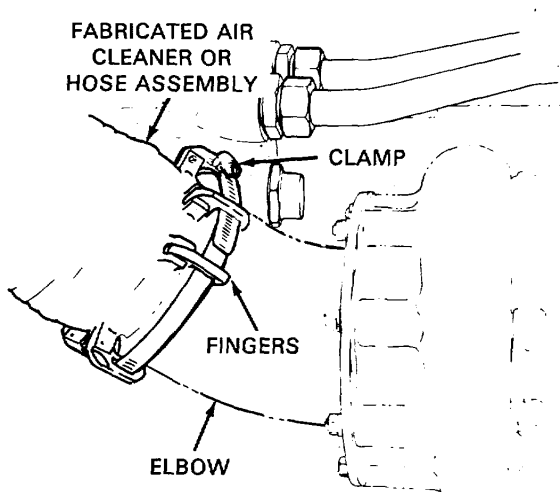
**Take all necessary safety precautions to eliminate possible injury to personnel or damage to equipment. Stand clear of both transmission output flanges whenever the engine is running. Hearing protection is required.**

8. Start engine and run engine at idle speed (700-750 rpm) (TM 9-2350-260-10).
9. Wearing goggles, check for leakage at all fuel line connections.
10. If leak is observed, shut down engine (TM 9-2350-260-10) and tighten or replace bad fuel line or fittings.
11. When no leaks are observed, shut down engine (TM 9-2350-260-10).
12. Using 1-1/4 inch socket remove cooling fan nut.
13. Remove spacers from fan drive shafts.
14. Install cooling fans (page 9-49).
15. Install left bank engine access covers 2A engine (page 6-86) or 2D engine (page 6-91).
16. Install right bank engine access covers 2A engine (page 6-78 or 2D engine (page 6-82).
17. Install engine shroud (page 9-3).



**2A ENGINE AND 2D ENGINE POWERPLANT TESTS (GROUND HOP) (Sheet 16 of 16)****AFTER-TEST DISCONNECT:**

1. Disconnect three battery ground cables (page 10-295).
2. Using spanner wrench, loosen four electrical cable assemblies from powerplant and hull.
3. Disconnect four electrical cable assemblies and three hose assemblies from powerplant and hull.
4. Remove fabricated tachometer.



5. Using screwdriver or 7/16 inch wrench, loosen clamps that secure left and right air cleaners.
6. Disengage fingers from turbosupercharger elbow and remove fabricated air cleaners.
7. Install powerplant 2A engine (page 5-14) or 2D engine (page 5-40).

End of Task

TA147967

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## CHAPTER 6

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**FRONT POWERPLANT GUIDE (LEFT AND RIGHT) REPLACEMENT (Sheet 1 of 1)**

**TOOLS:** 15/16 in. combination box and open end wrench  
 15/16 in. socket with 1/2 in. drive  
 Ratchet with 1/2 in. drive  
 Hinged handle with 1/2 in. drive  
 Torque wrench with 1/2 in. drive (0-175 ft-lb) (0-237 N•m)

**SUPPLIES:** Lockwasher (MS35338-50) (6 required)

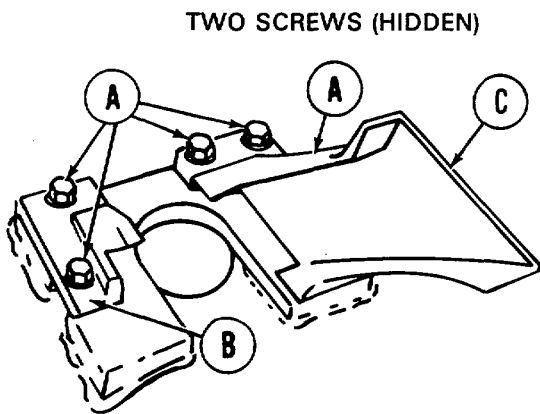
**PRELIMINARY PROCEDURE:** Remove powerplant (page 5-1)

**REMOVAL:**

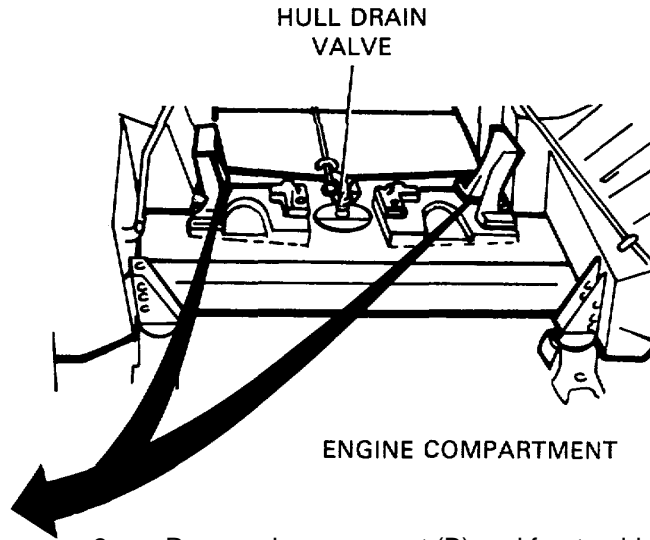
**NOTE**

**Three screws on right guide cannot be loosened or removed using socket. Use wrench to remove screws that cannot be removed using socket**

1. Using socket with hinged handle, loosen screws (A).
2. Using socket or wrench, remove six screws and lockwashers (A). Throw lockwashers away.



(RIGHT SIDE SHOWN)



3. Remove inner support (B) and front guide (C).

**INSTALLATION:**

1. Mount inner support (B) and front guide (C).
2. Install six screws and new lockwashers (A).

**NOTE**

**Three screws on right guide and two screws on left guide cannot be torqued. Use wrench to tighten screws that cannot be torqued.**

3. Using socket with torque wrench, tighten screws (A) to 157-212 lb-ft (212-286 N•m).
4. Install 2A powerplant (page 5-14) or 2D powerplant (page 5-40).

End of Task

TA147458

**REAR POWERPLANT GUIDE (LEFT AND RIGHT) REPLACEMENT (Sheet 1 of 2)**

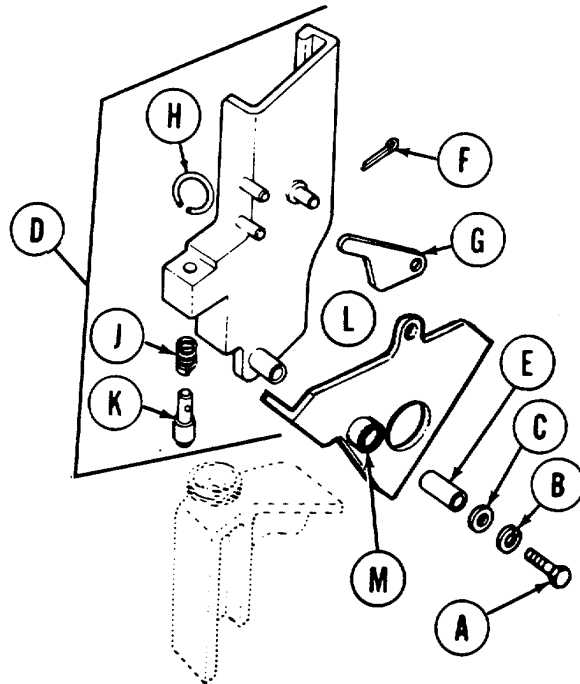
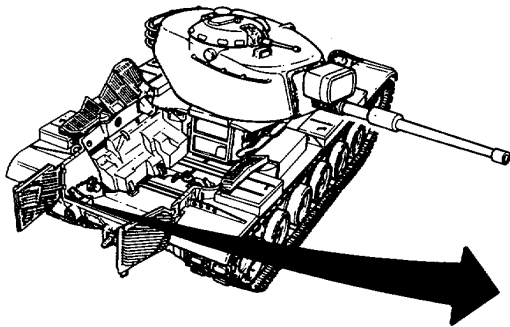
**TOOLS:** 9/16 in. socket with 1/2 in. drive  
 Hinged handle with 1/2 in. drive (breaker bar)  
 Ball peen hammer  
 Long round nose pliers  
 Slip joint pliers  
 Chisel  
 Brass drift

**SUPPLIES:** Cotter pin (MS24665-136)  
 Connecting ring (8744683)  
 Sleeve bearing (5160090)  
 Wood block, 4 in. x 6 in. (approximately)  
 Lockwasher (MS35338-46)

**PRELIMINARY PROCEDURE:** Remove powerplant (page 5-1)

**REMOVAL:**

1. Using socket remove screw (A), lockwasher (B), and flat washer (C) securing rear powerplant guide (D) to support. Throw lockwasher away.
2. Using hammer, tap guide (D) from mounting place. Remove guide from tank.



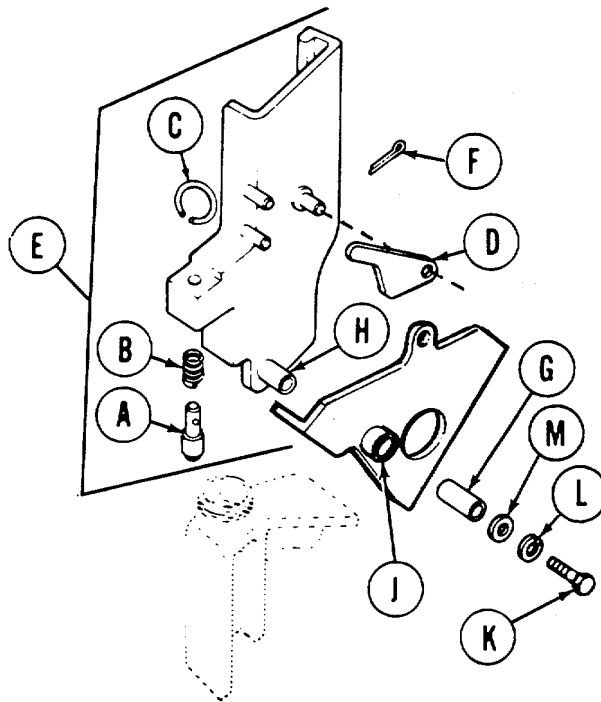
3. Using punch, drive bearing (E) from support. Throw bearing away.
4. Using long nose pliers, remove cotter pin (F) and latch (G). Throw cotter pin away.
5. Using chisel, cut ring (H).
6. Using slip joint pliers, separate ring (H) and remove ring (H), spring (J), and pin (K). Throw ring away.

Go on to Sheet 2

TA147459

**REAR POWERPLANT GUIDE (LEFT AND RIGHT) REPLACEMENT (Sheet 2 of 2)****INSTALLATION:**

1. Place pin (A) and spring (B) in position.
2. Using slip joint pliers, install new ring (C).
3. Place latch (D) on guide (E).
4. Using long nose pliers, install new cotter pin (F).
5. Using hammer and wood block, install new bearing (G) in mounting hole (J).
6. Mount guide (E) with arm (H) through support mounting hole (J).



7. Using socket, install screw (K), new lockwasher (L), and fiat washer (M).
8. Have ring (C) brazed at ring opening.
9. Install 2A powerplant (page 5-14) or 2D powerplant (page 5-40).

End of Task

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**ENGINE MOUNTS (LEFT AND RIGHT) REPLACEMENT (Sheet 1 of 3)**

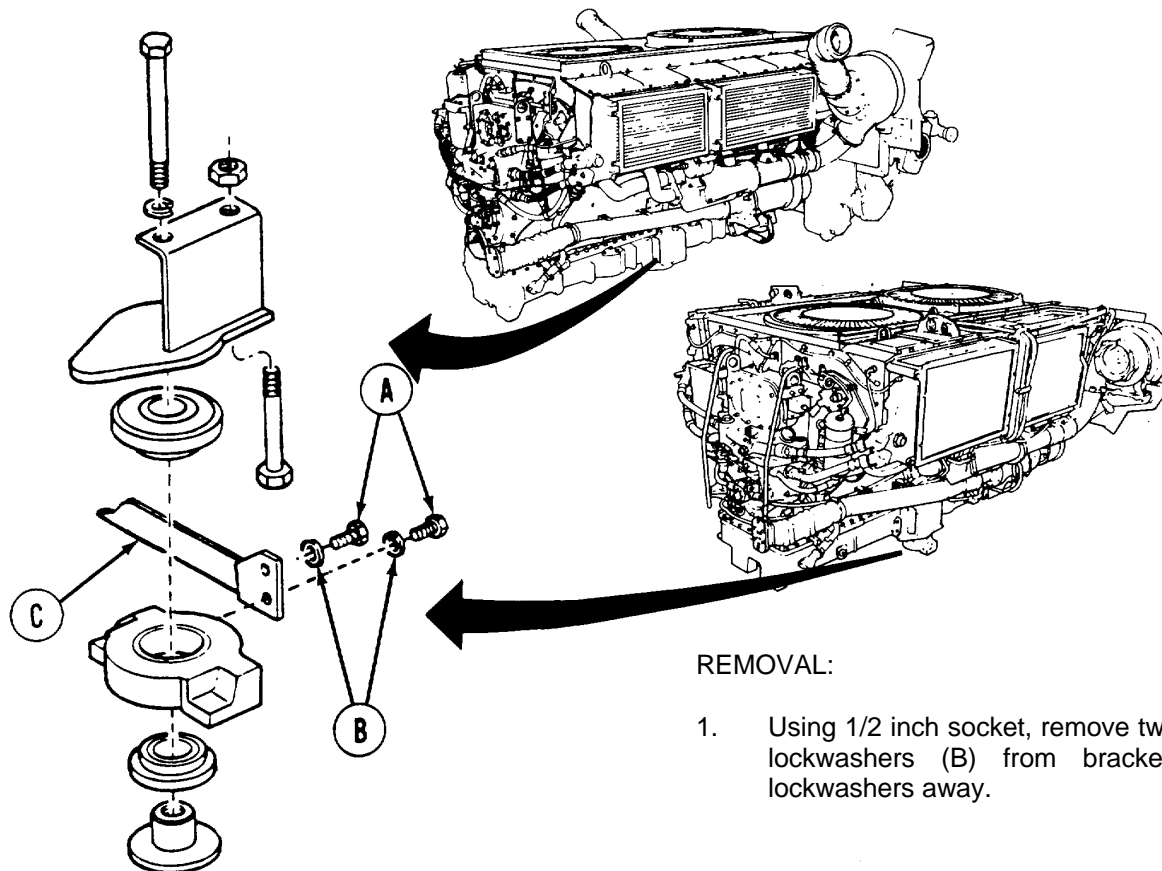
**TOOLS:** 1-1/16 in. open end wrench  
 1-1/8 in. socket with 3/4 in. drive  
 Ratchet with 3/4 in. drive  
 1/2 in. socket with 1/2 in. drive  
 Ratchet with 1/2 in. drive  
 36 in. extension with 3/4 in. drive  
 T-slide handle with 3/4 in. drive

**SUPPLIES:** Dry cleaning solvent (Item 54, Appendix D)  
 Rags (Item 65, Appendix D)  
 Lockwasher (MS35338-45) (2 required)  
 Lockwasher (MS35338-51)

**PRELIMINARY PROCEDURE:** Remove powerplant (page 5-1)

**NOTE**

**Removal and installation of left and right engine mounts are the same.**



**REMOVAL:**

1. Using 1/2 inch socket, remove two screws (A) and lockwashers (B) from bracket (C). Throw lockwashers away.

Go on to Sheet-2

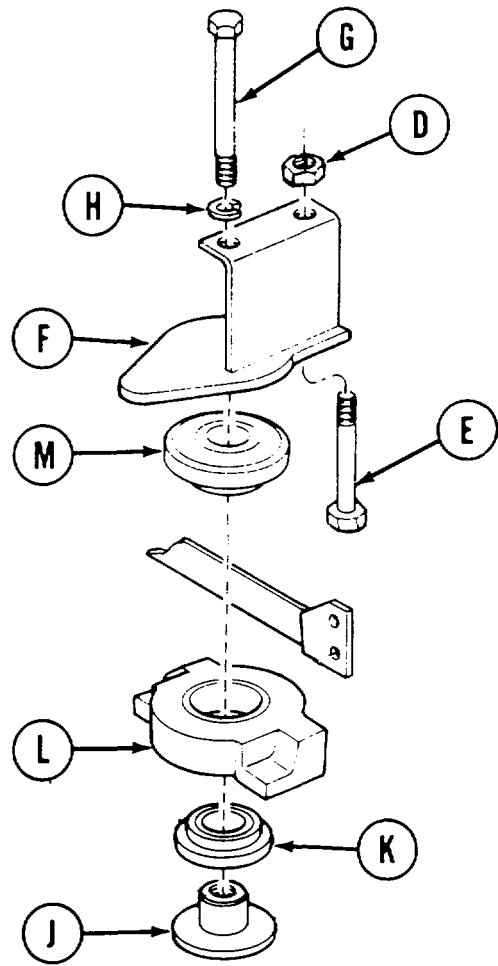
TA147461

**ENGINE MOUNTS (LEFT AND RIGHT) REPLACEMENT (Sheet 2 of 3)**

2. Using 1-1/8 inch wrench to hold nut (D) and 1-1/8 inch socket on bolt (E), remove nut (D) and bolt (E) from bracket (F).
3. Using 1-1/8 inch socket, remove bolt (G) and lockwasher (H) from bracket (F) while holding bushing (J) with 3/4 inch drive T-slide and 36 inch extension bar. Throw lockwasher away.
4. Remove bushing (J), mount (K), mounting (L), and mount (M) from engine assembly.

**CLEANING AND INSPECTION:**

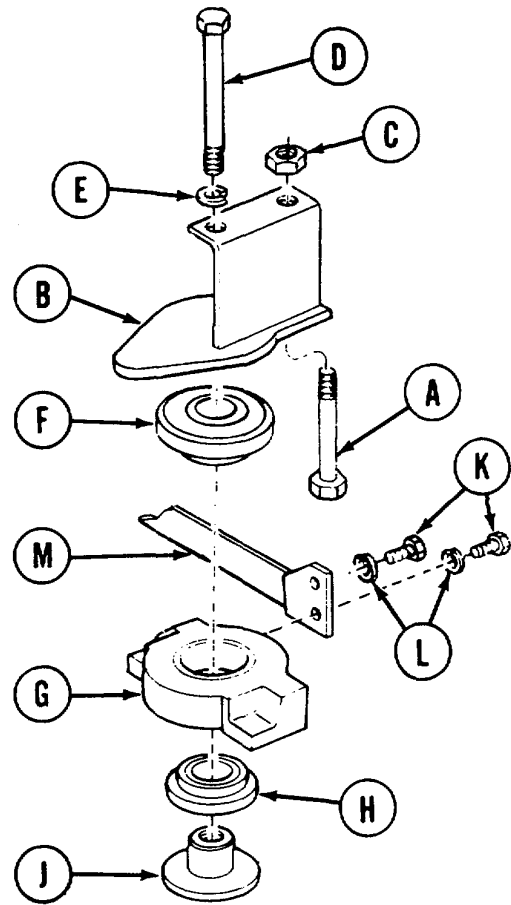
1. Clean all parts with dry cleaning solvent (Item 54, Appendix D) and wipe dry with clean rag (Item 65, Appendix D).
2. Inspect bushing, mounts, and mountings for nicks and burrs. Replace damaged parts.





**ENGINE MOUNTS (LEFT AND RIGHT) REPLACEMENT (Sheet 3 of 3)****INSTALLATION:**

1. Position bolt (A) through bracket (B) and install nut (C). Using 1-1/16 inch wrench to hold nut (C) and 1-1/8 inch socket, tighten bolt (A).
2. Position bolt (D) through new lockwasher (E), bracket (B), mount (F), mounting (G), mount (H), and bushing (J). Use 1-1/8 inch socket to tighten bolt (D) while holding bushing (J) with 3/4 inch drive T-slide and 36 inch extension bar.
3. Using 1/2 inch socket, install two screws (K) through new lockwashers (L) and bracket (M) into mounting (G).
4. Install 2A powerplant (page 5-14) or 2D powerplant (page 5-40).



End of Task

TA147463

**TRANSMISSION MOUNTS (LEFT AND RIGHT) REPLACEMENT (Sheet 1 of 4)**

PROCEDURE INDEX

PROCEDURE	PAGE
Removal	6-10
Cleaning and Inspection	6-11
Installation	6-11

- TOOLS:
- 3-1/8 in. socket with 3/4 in. drive
  - T-slide handle with 3/4 in. drive
  - Diagonal cutting pliers
  - 36 in. extension with 3/4 in. drive
  - Slip joint pliers
  - 1-1/2 in. open end wrench
  - 1-1/2 in. socket with 3/4 in. drive
  - Ratchet with 3/4 in. drive
  - 3/4 in. socket with 1/2 in. drive
  - Ratchet with 1/2 in. drive
  - 1-5/16 in. open end wrench
  - Bench vise
  - Torque wrench with 3/4 in. drive (0-600 lb-ft) (0-813 N•m)
  - Bit screwdriver with 1/2 in. drive
  - Torque wrench with 1/2 in. drive (0-175 lb-ft) (0-237 N•m)
  - Ball peen hammer

SPECIAL TOOLS: Resilient mount mechanical puller (Item 34, Chapter 3, Section I)

- SUPPLIES:
- Dry cleaning solvent (Item 54, Appendix D)
  - Lockwire (Item 59, Appendix D)
  - Rags (Item 65, Appendix D)
  - Lockwasher (MS35338-53)
  - Lockwasher (MS35338-48) (3 required)
  - Self-locking nut (MS51922-68)

PERSONNEL: Two

PRELIMINARY PROCEDURE: Remove powerplant (page 5-1)

**NOTE**

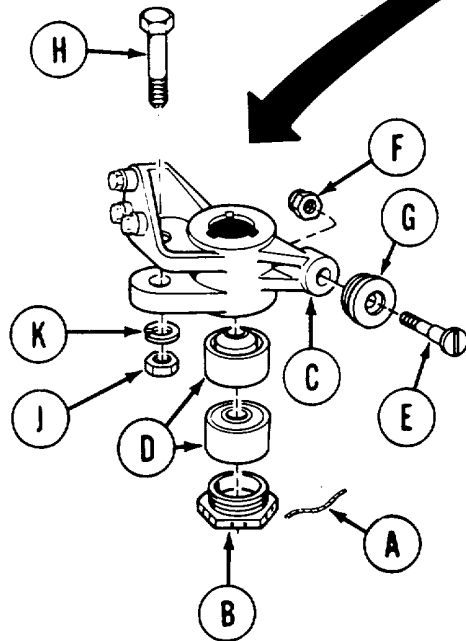
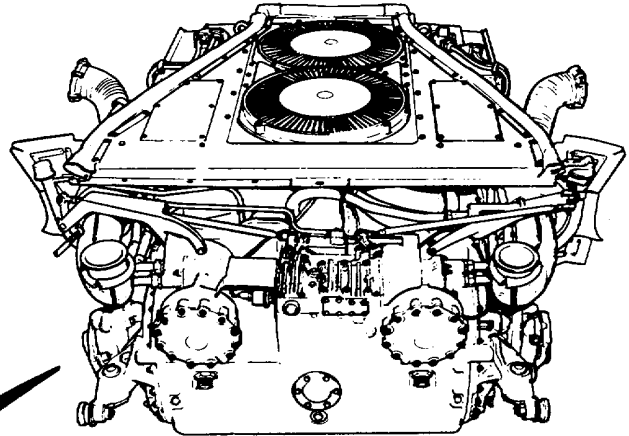
**The procedure applies to both right and left transmission mounts.**

Go on to Sheet 2

**TRANSMISSION MOUNTS (LEFT AND RIGHT) REPLACEMENT (Sheet 2 of 4)**

**REMOVAL:**

1. Using diagonal cutting pliers, cut safety wire (A) and remove it from bushing (B) and bracket (C).
2. Using 3-1/8 inch socket and T-slide wrench, remove bushing (B) from bracket (C).



3. Using resilient mount mechanical puller (Item 34, Chapter 3, Section I), remove two mounts (D) from bracket (C).
4. Using bit screwdriver to hold screw (E), use 14/16 inch wrench to remove self-locking nut (F) from screw (E). Throw nut away.
5. Remove screw (E) and roller (G) from bracket (C).
6. With second person using 1-1/2 inch wrench to hold bolt (H), use 1-1/2 inch socket and extension to remove nut (J) from bolt (H).

7. Remove lockwasher (K) and bolt (H) from bracket (C). Throw lockwasher away.

Go on to Sheet 3

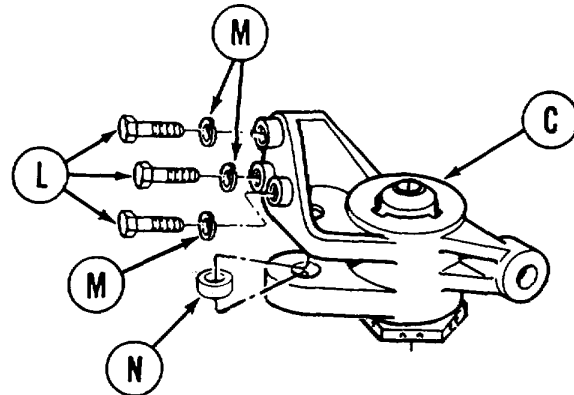
TA147464

**TRANSMISSION MOUNTS (LEFT AND RIGHT) REPLACEMENT (Sheet 3 of 4)**

**NOTE**

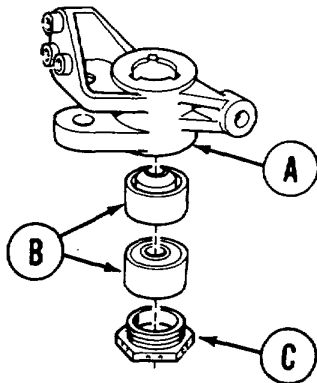
**It may be necessary to turn universal joint to gain access to screw (L).**

8. Using 3/4 inch socket, remove three screws (L) and lockwashers (M) from bracket (C). Throw lockwashers away.
9. Remove bracket (C) from transmission.
10. Using hammer, remove spacer (N) from bracket (C).



**CLEANING AND INSPECTION:**

1. Inspect bushing, mounts, and roller for damages. If any parts are nicked, burred, or out-of-round, replace damaged part.
2. Clean all parts with dry cleaning solvent (Item 54, Appendix D) and wipe dry with rags (Item 65, Appendix D).

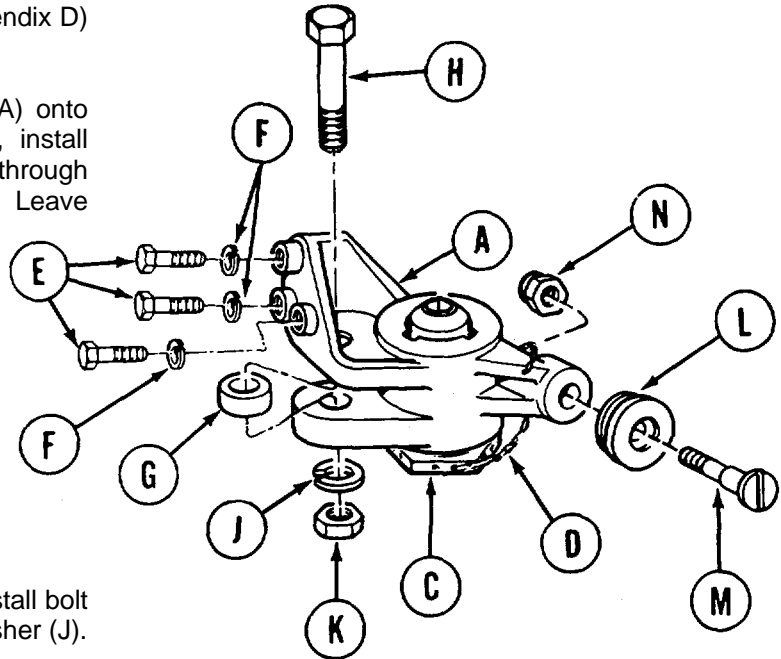


**INSTALLATION:**

1. Position bracket (A) in vise and, using resilient mount mechanical puller (Item 34, Chapter 3, Section I), install two mounts (B) into bracket (A).
2. Using 3-1/8 inch socket and T-slide wrench, install bushing (C) into bracket (A).

**TRANSMISSION MOUNTS (LEFT AND RIGHT) REPLACEMENT (Sheet 4 of 4)**

3. Using pliers, install lockwire (Item 59, Appendix D) (D) between bushing (C) and bracket (A).
4. Remove from vise and position bracket (A) onto transmission and, using 3/4 inch socket, install three screws (E) and new lockwashers (F) through mount on transmission into bracket (A). Leave screws loose.



5. Position spacer (G) into bracket (A) and install bolt (H) through spacer (G), mount (A), and washer (J).
6. With second person using 1-1/2 inch wrench to hold bolt (H), use 1-1/2 inch socket and torque wrench to tighten nut (K) to 380-415 lb-ft (515-562 N•m).
7. Position roller (L) onto screw (M) and install screw (M) through bracket (A).
8. Using bit screwdriver and 1/2 inch drive ratchet to hold screw (M), use 1-5/16 inch wrench to install new self-locking nut (N) into screw (M).

**NOTE**

**It may be necessary to turn universal to gain access to screw (E).**

9. Using torque wrench and 3/4 inch socket, tighten screws (E) to 70-75 lb-ft (95-102 N•m).
10. Install 2A powerplant (page 5-14) or 2D powerplant (page 5-40).

End of Task

TA147466

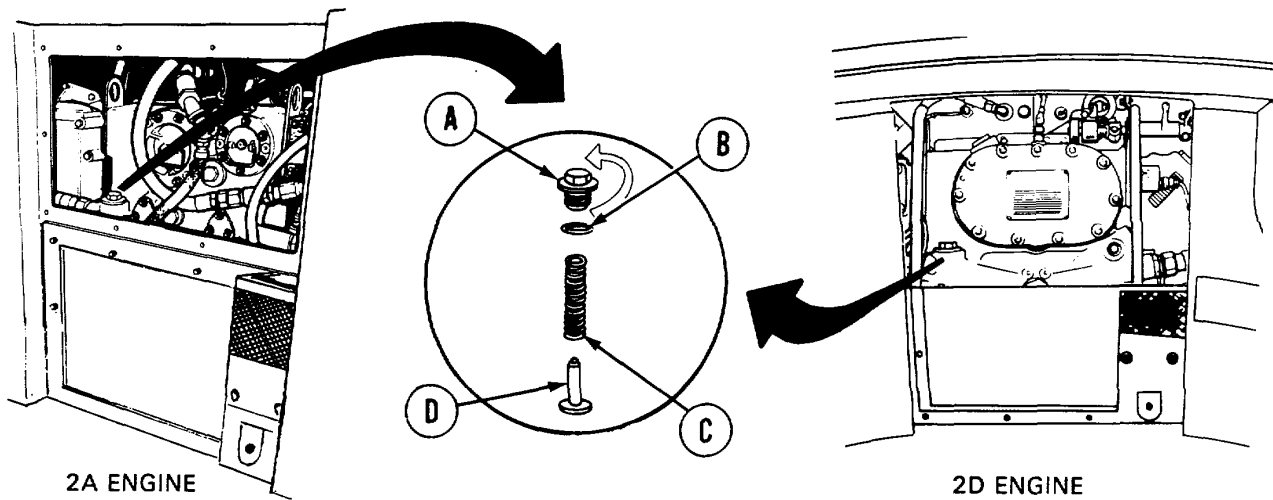
**ENGINE OIL COOLER BYPASS VALVE ASSEMBLY REPLACEMENT (Sheet 1 of 2)**

TOOLS: 1-1/8 in. open end wrench

SUPPLIES: Gasket (MS35769-47)  
Oil (Item 43, Appendix D)

REFERENCES: TM 9-2350-260-20-1-2  
LO 9-2350-260-12

PRELIMINARY PROCEDURES: Traverse turret to forward position with gun tube over forward slope  
(TM 9-2350-260-10)  
Drain engine oil (2A engine, page 6-47) (2D engine, page 6-49)  
Remove upper engine access cover (page 16-44)

**REMOVAL:**

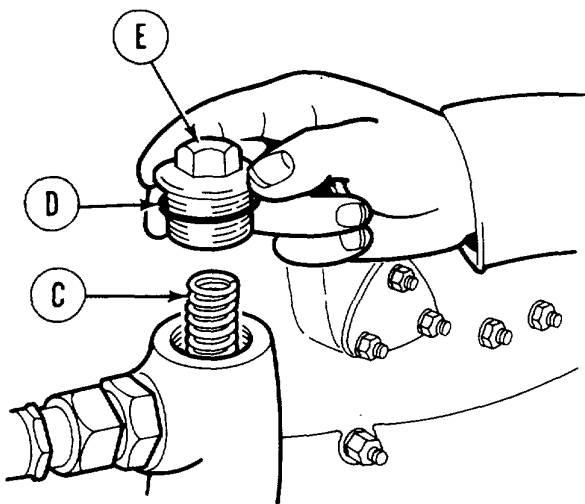
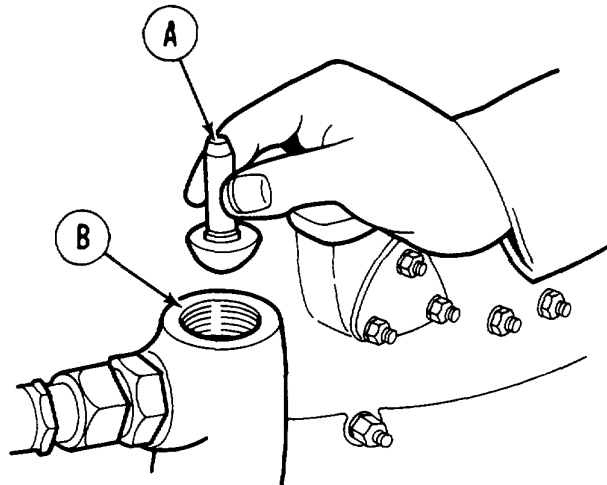
1. Using wrench, remove plug (A).
2. Pull gasket (B) from plug (A). Throw gasket (B) away.
3. Lift spring (C) and plunger (D) from hole.

Go on to Sheet 2

TA147467

**ENGINE OIL COOLER BYPASS VALVE ASSEMBLY REPLACEMENT (Sheet 2 of 2)****INSTALLATION:**

1. Put plunger (A) into hole (B).
2. Put spring (C) onto plunger (A). Make plunger shank align with inside of spring.



3. Put new gasket (D) on plug (E).
4. Start threads of plug (E) into hole (B) by hand.
5. Using wrench, tighten plug (E).

6. Install upper engine access cover (page 16.44).
7. Replenish engine with new oil (LO 9-2350-260-12).

End of Task

TA147468

**MAIN OIL FILTER REPLACEMENT (2A ENGINE) (Sheet 1 of 5)**

PROCEDURE INDEX

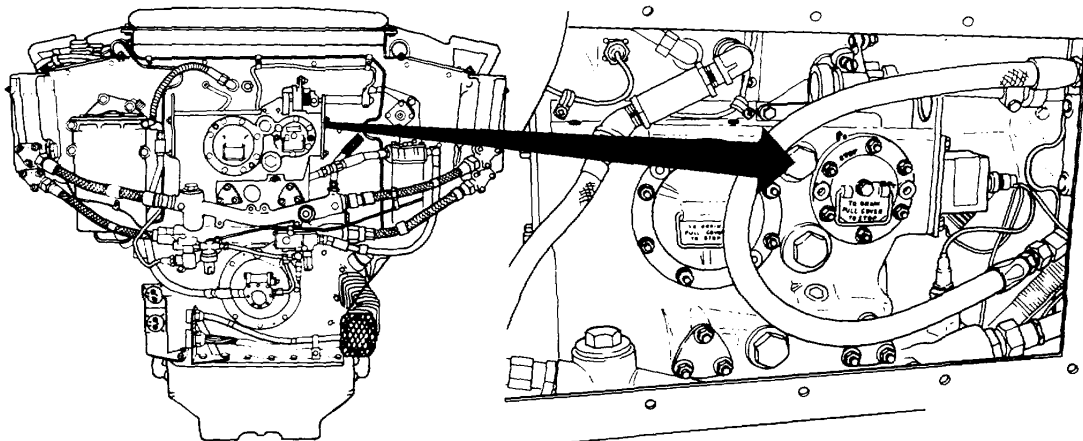
PROCEDURE	PAGE
Removal	6-16
Cleaning and Inspection	6-17
Disassembly	6-17
Assembly	6-18
Installation	6-19

TOOLS: 1/2 in. socket with 1/2 in. drive  
 Diagonal cutting pliers  
 1/2 in. combination box and open end wrench  
 9/16 in. combination box and open end wrench  
 Jackscrew 5/16 in. - 24NC x 3 in. (2 required)  
 1/2 in. socket with 3/8 in. drive  
 Torque wrench with 3/8 in. drive (0-200 lb-in) (0-23 N•m)  
 9/16 in. socket with 3/8 in. drive  
 Ratchet with 1/2 in. drive

SUPPLIES: Rags (Item 65, Appendix D)  
 Dry cleaning solvent (Item 54, Appendix D)  
 Engine oil (Item 43, Appendix D)  
 Lockwire (Item 60, Appendix D)  
 Container to catch drained oil  
 Gasket (8725203)  
 Self-locking nuts (503345) (6 required)

REFERENCES: TM 9-2350-260-10  
 LO 9-2350-260-12

PRELIMINARY PROCEDURES: Traverse turret to access engine access cover (TM 9-2350-260-10)  
 Remove upper engine access cover (page 16-44)



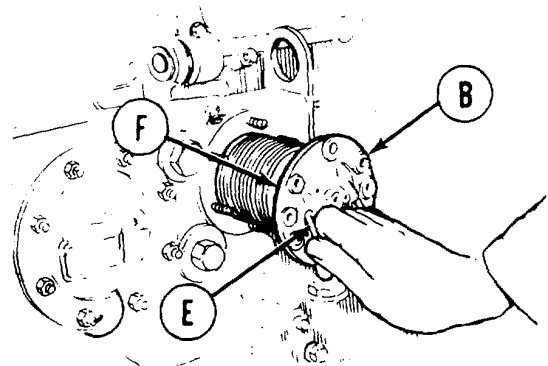
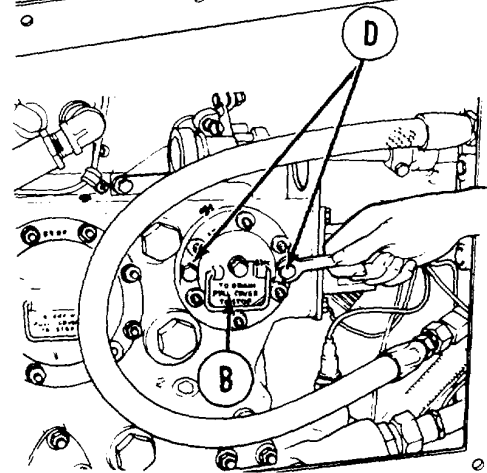
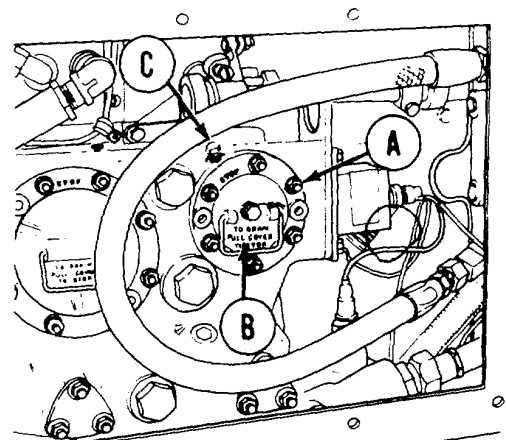
Go on to Sheet

TA147469



**MAIN OIL FILTER REPLACEMENT (2A ENGINE) (Sheet 2 of 5)****REMOVAL:**

1. Place rags (Item 65, Appendix D) under oil filters to catch drained oil.
2. Using 1/2 inch socket, remove six self-locking nut and flat washes (A) from oil filter (B). Throw self-locking nut away.
3. Using 1/2 inch wrench, loosen stop bolt (C).
4. Install two jackscrews (D) into oil filter (B).
5. Using 1/2 inch socket on jackscrews (D), turn jackscrews evenly into filter (B) to separate filter from housing. When filter is separated from housing, remove both jackscrews from filter (B).
6. Grasp handle (E) by hand and pull filter (B) out of housing to stop bolt and let oil drain out of housing into container.
7. Remove filter (B) from housing and throw away gasket (F) on housing.



Go on to Sheet 3

TA147470

**MAIN OIL FILTER REPLACEMENT (2A ENGINE) (Sheet 3 of 5)****CLEANING AND INSPECTION:**

1. Wash oil filter in dry cleaning solvent (Item 54, Appendix D).
2. Remove all dirt from filter elements.

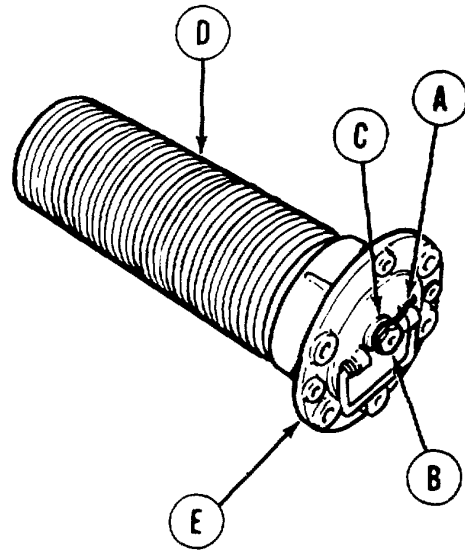
**WARNING**

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

3. Dry filter and blow out elements with low pressure compressed air.
4. Inspect filter elements for breaks or tears in fine mesh screens.
5. If filter is very dirty or filter elements are damaged, disassemble filter and clean or replace damaged or dirty elements.

**DISASSEMBLY:**

1. Using pliers, cut lockwire (A) and remove lockwire (A) from bolt (B) and handle bracket.
2. Using 9/16 inch wrench on bolt (B), remove bolt (B) and gasket (C). Throw gasket away and take filter elements (D) off body (E).

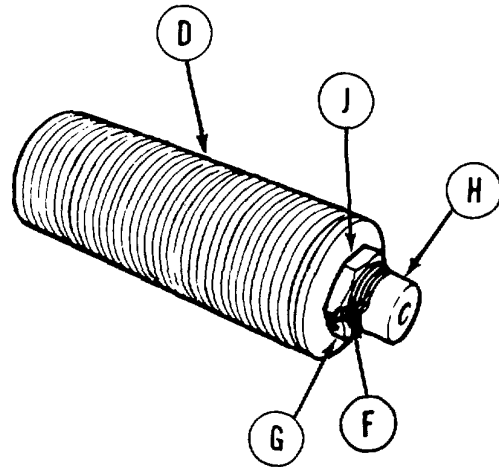


Go on to Sheet 4

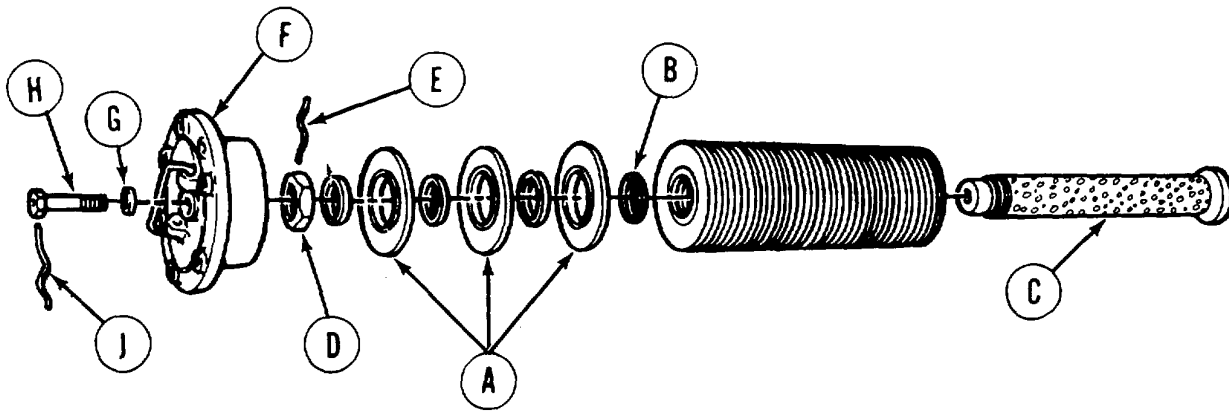
TA147471

**MAIN OIL FILTER REPLACEMENT (2A ENGINE) (Sheet 4 of 5)**

3. Using pliers, cut lockwire (F) and remove lockwire (F) from nut (G) and tube (H).
4. Using 1-1/2 inch wrench, remove nut (G) from tube (H).
5. Remove 42 washers (J) and 42 filter elements (D) from tube (H).
6. Clean elements (D) with dry cleaning solvent (Item 54, Appendix D) and dry. Replace damaged elements and washers (J).



**ASSEMBLY:**



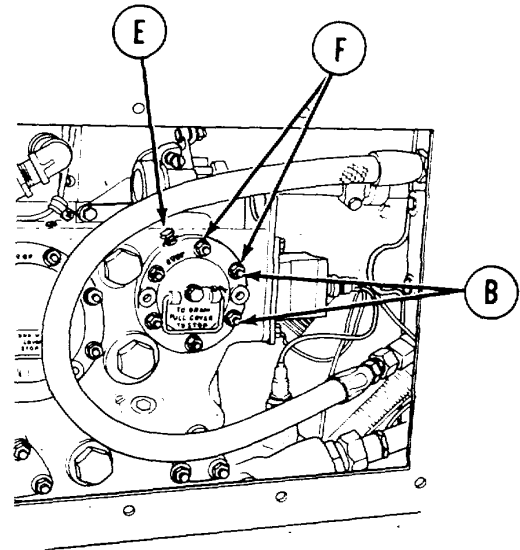
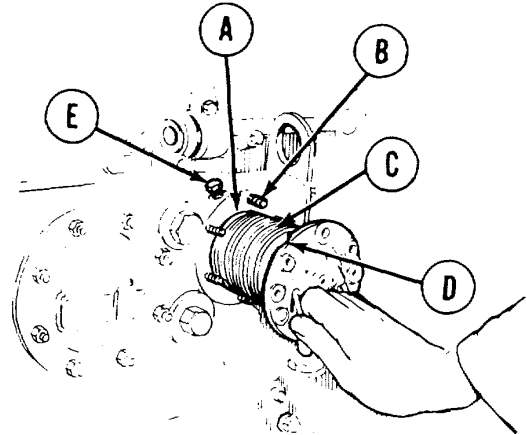
1. Install 42 elements (A) and washers (B) onto tube (C) as shown and check fit for seal.
2. Install nut (D) onto tube (C) and fasten with lockwire (Item 60, Appendix D) (E) through nut (D) and tube (C).
3. Install body (F) onto tube (C) with new gasket (G) and bolt (H).
4. Using 9/16 inch socket and torque wrench, tighten bolt (H) to 150-200 lb-in (17-23 N•m).
5. Fasten bolt (H) with lockwire (J) to handle mount.

Go on to Sheet 5

TA147472

**MAIN OIL FILTER REPLACEMENT (2A ENGINE) (Sheet 5 of 5)****INSTALLATION:**

1. Install new gasket (A) onto six studs (B) on filter housing.
2. Install filter (C) into housing as shown making sure slot (D) in top of filter (C) is aligned with stop bolt (E).
3. Push filter (C) over six studs (B) and onto housing.
4. Install six nuts and flat washers (F) onto six studs (B). Using 1/2 inch socket, tighten nuts (F) onto studs (B).
5. Using 1/2 inch wrench, tighten stop bolt (E).
6. Fill engine with oil (Item 43, Appendix D) (LO 9-2350260-12).
7. Start engine and check for leaks (TM 9-2350-260-10).
8. Stop engine.
9. Install upper engine access cover onto bulkhead (page 16-44).



End of Task

TA147473

**AUXILIARY OIL FILTER REPLACEMENT (2A ENGINE) (Sheet 1 of 5)**

PROCEDURE INDEX

PROCEDURE	PAGE
Removal	6-21
Cleaning and Inspection	6-23
Installation	6-23

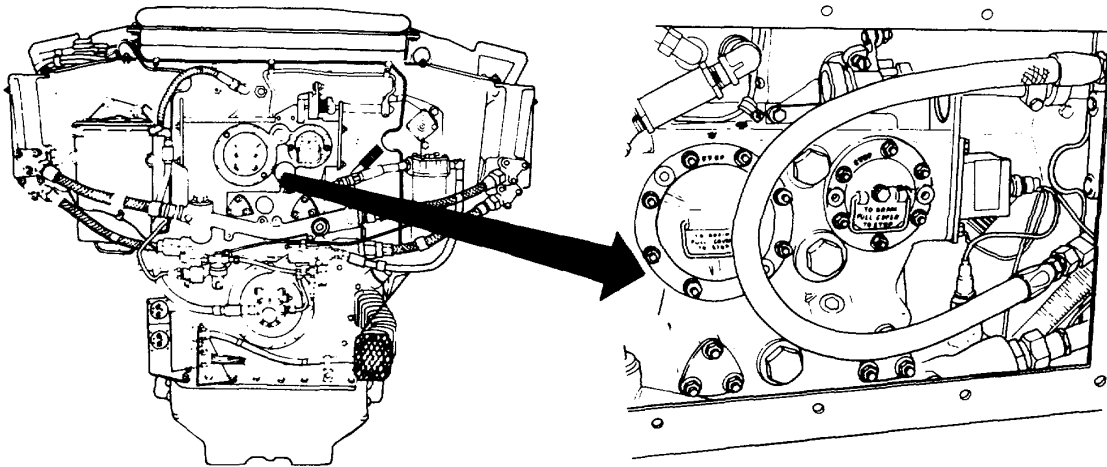
TOOLS: 1/2 in. combination box and open end wrench  
 1/2 in. socket with 1/2 in. drive  
 Diagonal cutting pliers  
 Jackscrew 5/16 in. - 24NC x 3 in. (2 required)  
 1/2 in. socket with 3/8 in. drive  
 Torque wrench with 3/8 in. drive (0-200 lb-in) (0-23 N•m)  
 Ratchet with 1/2 in. drive

SUPPLIES: Auxiliary oil filter kit (5702659)  
 Rags (Item 65, Appendix D)  
 Dry cleaning solvent (Item 54, Appendix D)  
 Engine oil (Item 43, Appendix D)  
 Container to catch drained oil  
 Self-locking nut (503345) (8 required)

PERSONNEL: Two

REFERENCES: TM 9-2350-260-10  
 LO 9-2350-260-12

PRELIMINARY PROCEDURES: Traverse turret to access engine access cover (TM 9-2350-26010)  
 Remove upper engine access cover (page 16-44)

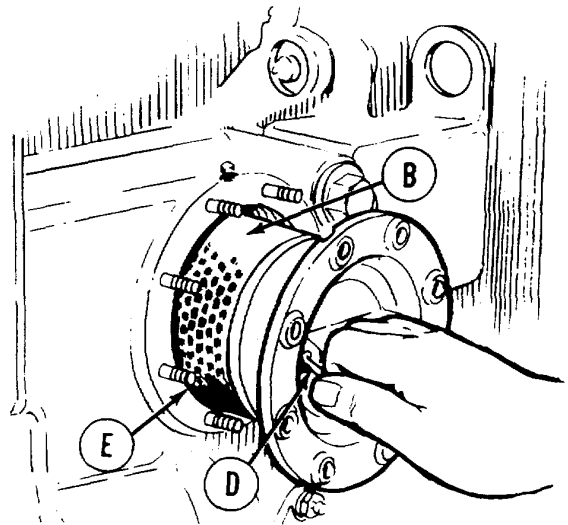
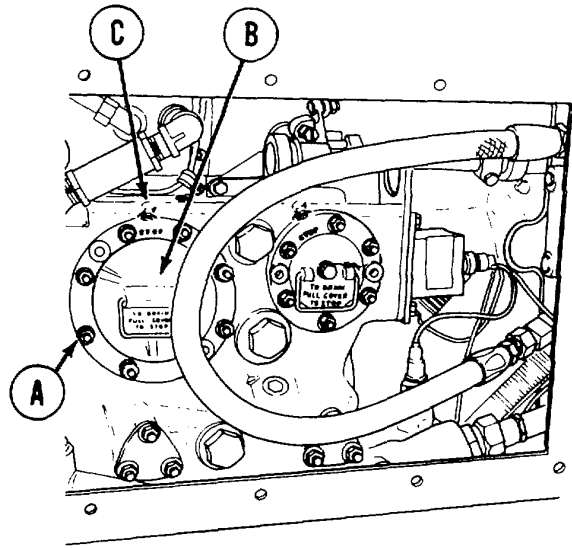


Go on to Sheet 2

TA147474

**AUXILIARY OIL FILTER REPLACEMENT (2A ENGINE) (Sheet 2 of 5)****REMOVAL:**

1. Place rags (Item 65, Appendix D) and container under oil filters to catch drained oil.
2. Using 1/2 inch socket, remove eight self-locking nuts and flat washers (A) from oil filter (B). Throw self-locking nuts away.
3. Using 1/2 inch wrench, loosen stop bolt (C).
4. Install two jackscrews into oil filter (B).
5. Using 1/2 inch socket on jackscrews, turn jackscrews evenly into filter (B) to separate filter from housing. When filter is separated from housing, remove both jackscrews from filter (B).
6. Grasp handle (D) by hand and pull filter (B) out of housing to stop bolt and let oil drain out of housing into container.
7. Remove filter (B) from housing and throw away gasket (E) on housing.



Go on to Sheet 3

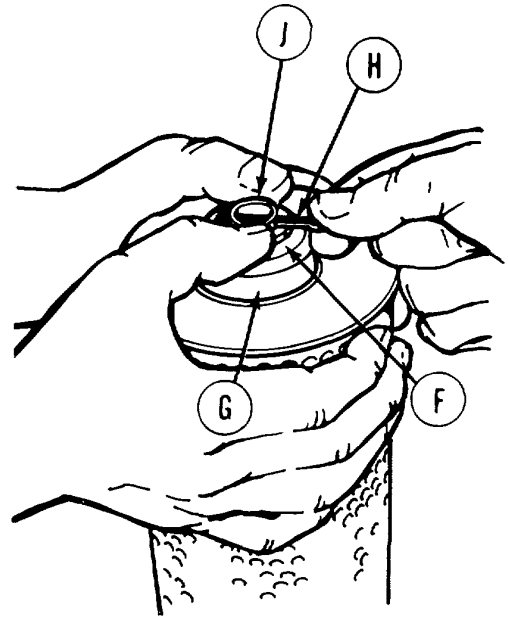
TA147475

## AUXILIARY OIL FILTER REPLACEMENT (2A ENGINE) (Sheet 3 of 5)

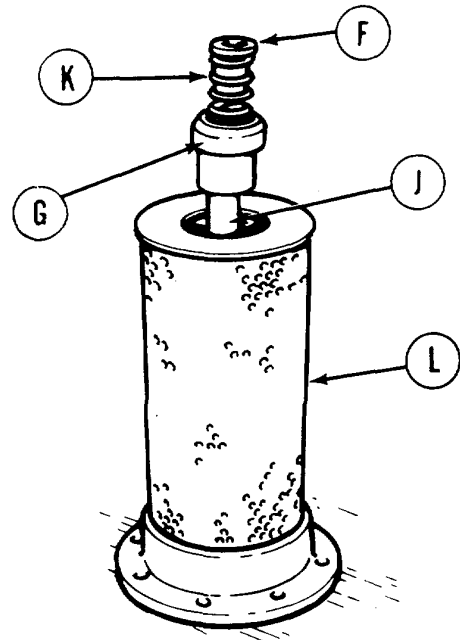
**WARNING**

Exercise caution when depressing bushing as springs under extreme compression. Personal injury could result if retainer slips.

8. Place filter on working surface with face downward.
9. By hand, compress bushing (F) and retainer (G) as shown.
10. Remove cotter pin (H) from support (J).



11. Remove bushing (F), spring (K), retainer (G), and filter element (L) from support (J). Throw filter element away.

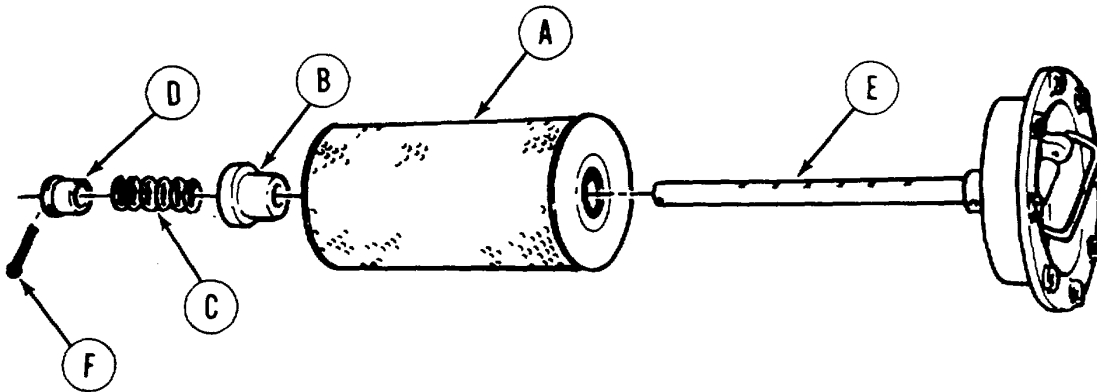


Go on to Sheet 4

TA147476

**AUXILIARY OIL FILTER REPLACEMENT (2A ENGINE) (Sheet 4 of 5)****CLEANING AND INSPECTION:**

1. Using rags (Item 65, Appendix D) and dry cleaning solvent (Item 54, Appendix D), clean filter parts and dry.
2. Using rags and dry cleaning solvent, clean filter housing and dry.
3. Inspect parts for damage.
4. Replace damaged parts.

**INSTALLATION:**

1. Install new filter element (A), retainer (B), spring (C), and bushing (D) onto support (E).

**WARNING**

**Exercise caution. when depressing or releasing bushing as spring is under extreme compression. Personal injury could result if retainer should slip.**

2. By hand, compress bushing (D) and spring (C) onto support (E) and install cotter pin (F) into top of support (E).

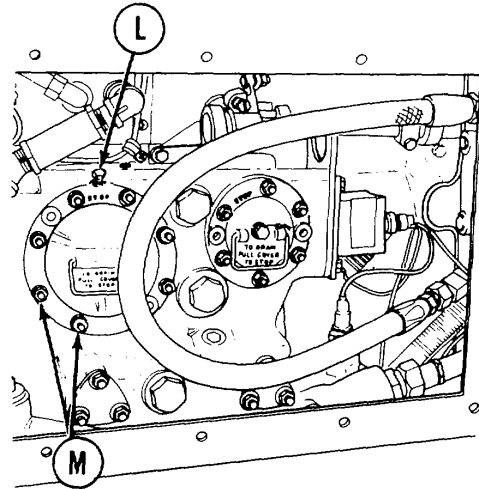
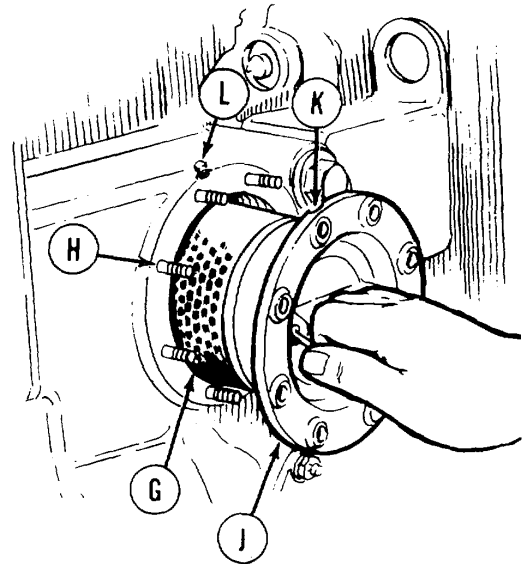
Go on to Sheet 5

TA147477



**AUXILIARY OIL FILTER REPLACEMENT (2A ENGINE) (Sheet 5 of 5)**

3. Install new gasket (G) onto eight studs (H) on housing.
4. Install filter assembly (J) into housing. Push filter onto eight studs (H). Make sure slot (K) on top of filter (J) is aligned with stop bolt (L) on housing.
5. By hand, install eight new self-locking nuts and washers (M) onto eight studs (H).
6. Using 1/2 inch socket, tighten nuts (M) onto studs (H).
7. Using 1/2 inch wrench on stop bolt (L), tighten stop bolt.
8. Fill engine with oil (Item 43, Appendix D) (LO 9-2350-260-12).
9. Start engine and check for leaks (TM 9-2350-260-10).
10. Stop engine.
11. Install upper access cover onto bulkhead (page 16-44).



End of Task

TA147478

**ENGINE OIL FILTER ELEMENT REPLACEMENT (2D ENGINE) (Sheet 1 of 5)**

PROCEDURE INDEX

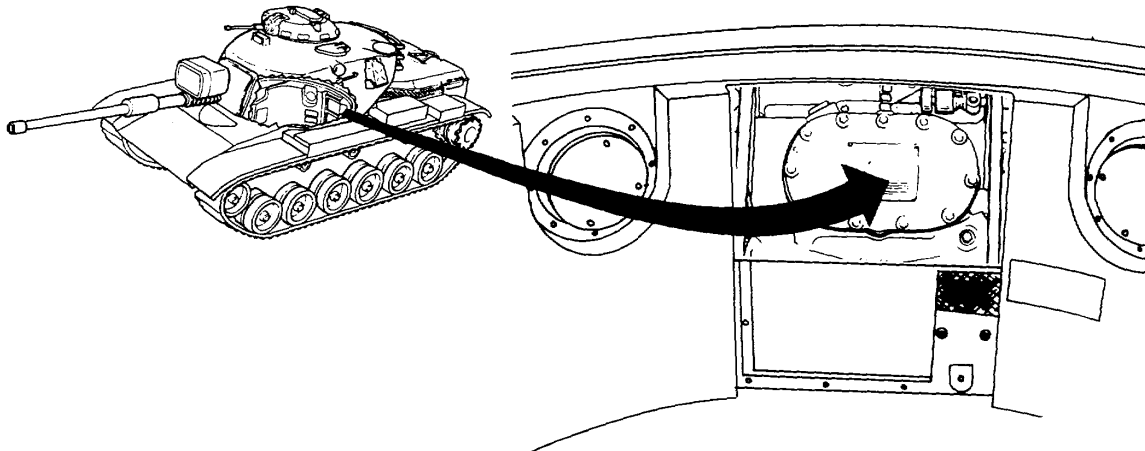
PROCEDURE	PAGE
Removal	6-26
Cleaning and Inspection	6-27
Installation	6-28

TOOLS: Ratchet with 1/2 in. drive  
 9/16 in. socket with 1/2 in. drive  
 3/4 in. combination box and open end wrench

SUPPLIES: Cloth (Item 12, Appendix D)  
 3/8-24NF by 3 in. screws (2 required)  
 Sealing washer (MS9320-12)  
 Gasket (11684047)  
 Self-locking nut (MS21045-6) (10 required)

REFERENCES: TM 9-2350-26010  
 LO 9-2350-260-12

PRELIMINARY PROCEDURES: Remove upper engine access cover (page 16-44)  
 Remove fire extinguisher line (page 5-5, step 8)  
 Open engine compartment drain valve (TM 9-2350-260-10)  
 Drain engine oil (2A engine, page 6-47) (2D engine, page 6-49)



Go on to Sheet 2

TA147479

**ENGINE OIL FILTER ELEMENT REPLACEMENT (20 ENGINE) (Sheet 2 of 5)**

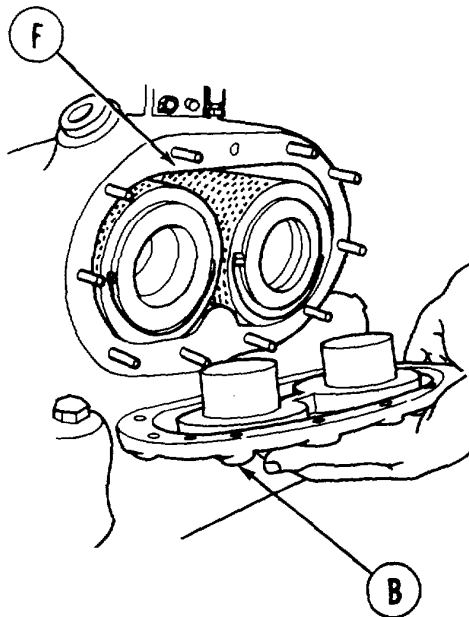
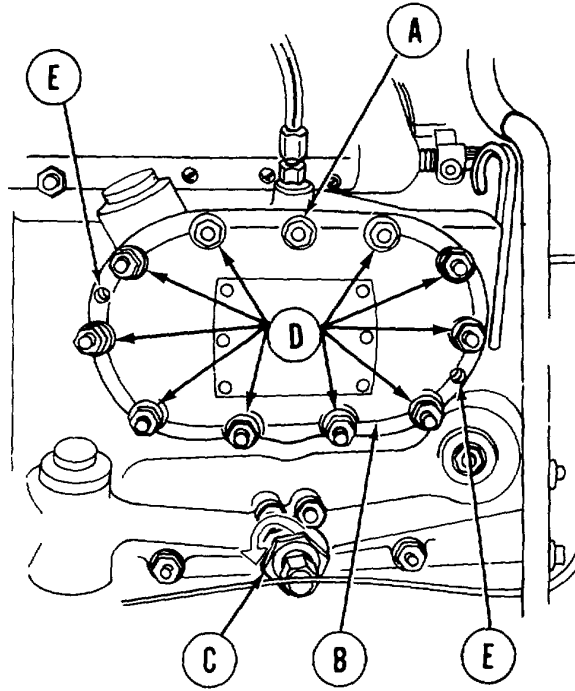
**REMOVAL:**

1. Using socket, remove screw (A) and sealing washer from filter element cover (B). Throw sealing washer away.
2. Using wrench, turn screw (C) to the left six full turns.

**NOTE**

**Wait about 5 minutes before doing steps 3 thru 7.**

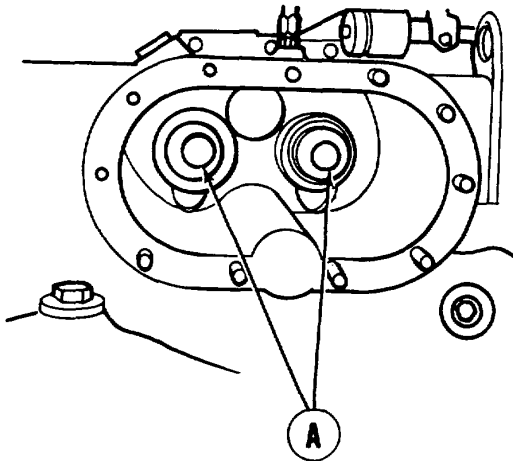
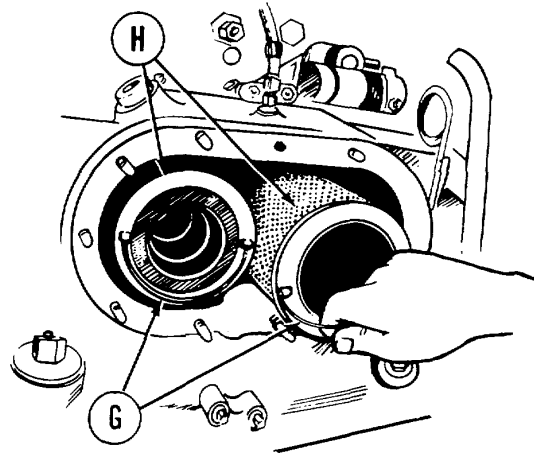
3. Using socket, remove 10 self-locking nuts and washers (D). Throw self-locking nuts away.
4. Install two 3/8-24NF by 3 inch screws in threaded holes (E).



5. Using socket, tighten screws in hole (E) and remove filter cover (B).
6. Remove gasket (F) and throw away.

**ENGINE OIL FILTER ELEMENT REPLACEMENT (2D ENGINE) (Sheet 3 of 5)**

7. Using handles (G), remove two filter elements (H) and throw away.

**CLEANING AND INSPECTION:**

1. Using clean, dry cloth (Item 12, Appendix D), clean oil ports (A).
2. Check retaining screws for stripped threads.
3. Inspect filter cover for holes, chips, and cracks.
4. Check sealing washer and packing for cracks and wear.
5. Replace parts as needed.

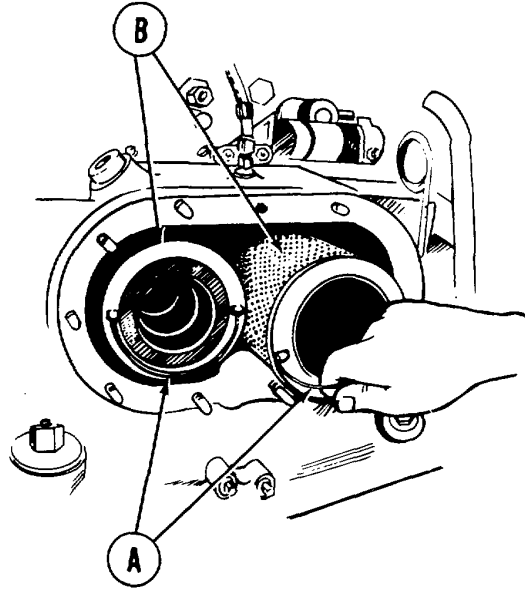
Go on to Sheet 4

TA147481

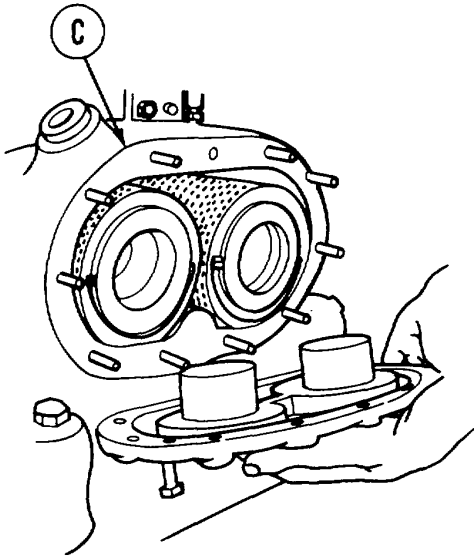
**ENGINE OIL FILTER ELEMENT REPLACEMENT (2D ENGINE) (Sheet 4 of 5)**

**INSTALLATION:**

1. Using handles (A), install two new filter elements (B).



2. Install new gasket (C).

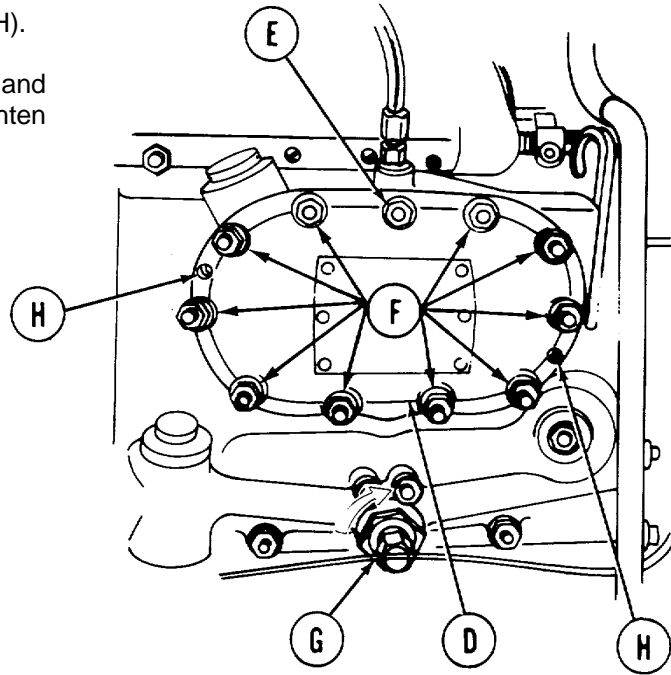


Go on to Sheet 5

TA147482

**ENGINE OIL FILTER ELEMENT REPLACEMENT (2D ENGINE) (Sheet 5 of 5)**

3. Install filter cover (D), making sure hole (E) is at the top.
4. Using socket, remove two screws from holes (H).
5. Using socket, install 10 new self-locking nut and washers (F) to secure cover. Do not overtighten stripping may result.



6. Using socket, install screw and new sealing washer in cover at hole (E). Do not overtighten as stripping may result.
7. Using wrench, turn screw (G) to right until tight.
8. Install fire extinguisher line (page 5-23, step 52).
9. Check for leaks.
10. Install upper engine access cover (page 16-44).
11. Close engine compartment drain valve (TM 9-2350-260-10).
12. Replenish engine oil (LO 9-2350-260-12).

End of Task

TA147483

**OIL DAMPER HOUSING STRAIGHT TUBE HOSE ADAPTER REPLACEMENT (Sheet 1 of 4)**

PROCEDURE INDEX

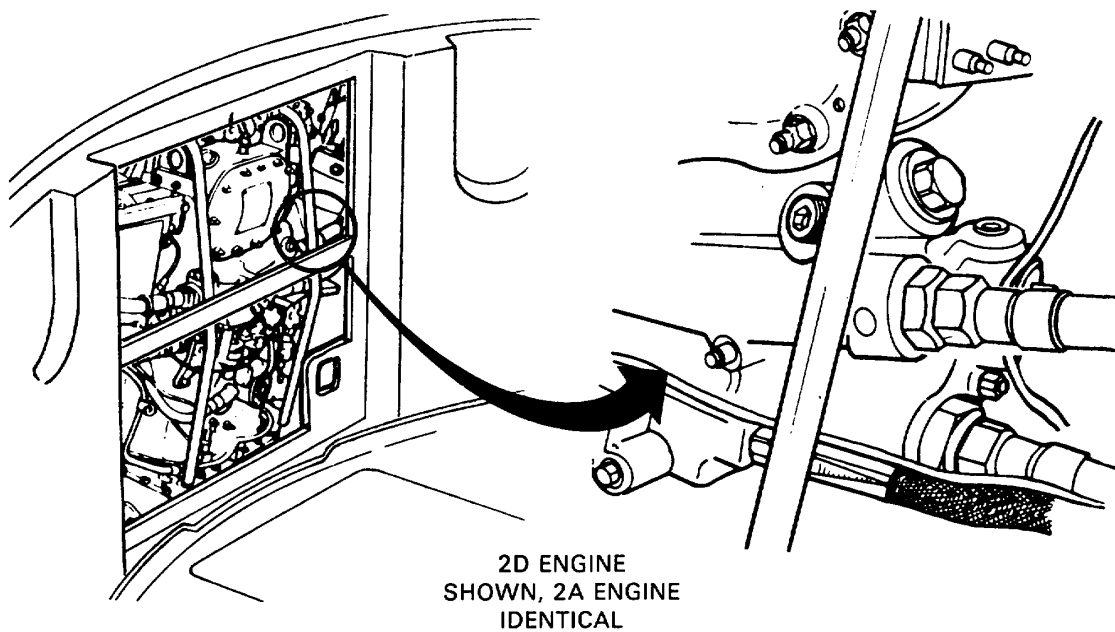
PROCEDURE	PAGE
Removal	6-31
Installation	6-32

TOOLS: 3/4 in. socket with 1/2 in. drive  
 9/16 in. socket with 1/2 in. drive  
 3/4 in. combination box and open end wrench  
 1-1/2 in. open end wrench  
 1-9/16 in. open end wrench  
 Ratchet with 1/2 in. drive

SUPPLIES: Spacer ring (7403580-1) Washer (NAS1598-6Y)  
 Rags (Item 65, Appendix D)

REFERENCES: TM 9-2350-260-10  
 LO 9-2350-260-12

PRELIMINARY PROCEDURE: Remove lower engine access cover (page 16-45)



Go on to Sheet 2

TA147484

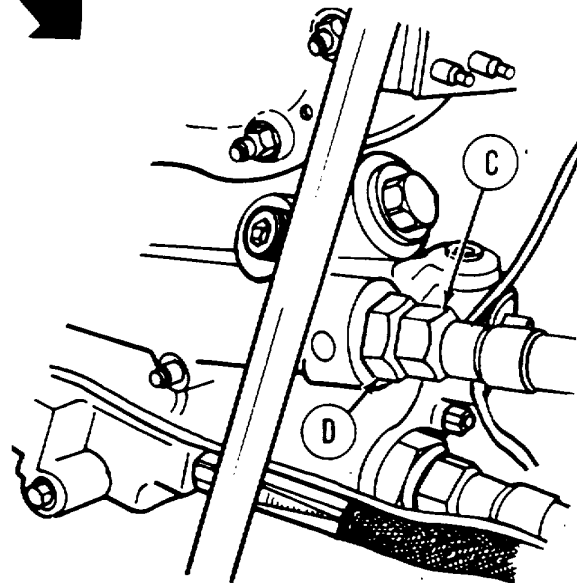
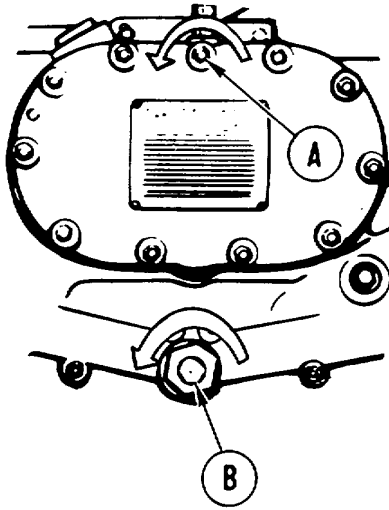
## OIL DAMPER HOUSING STRAIGHT TUBE HOSE ADAPTER REPLACEMENT (Sheet 2 of 4)

## REMOVAL:

## NOTE

If replacing adapter on 2A engine, go to step 3.

1. Using 9/16 inch socket, remove screw (A) and washer. Throw washer away.
2. Using 3/4 inch wrench, loosen valve (B) six complete turns.



3. Place rags (Item 65, Appendix D) under coupling (C) to catch dripping oil.
4. Hold adapter (D) with 1-9/16 inch wrench and, using 1-1/2 inch wrench, remove hose coupling (C).

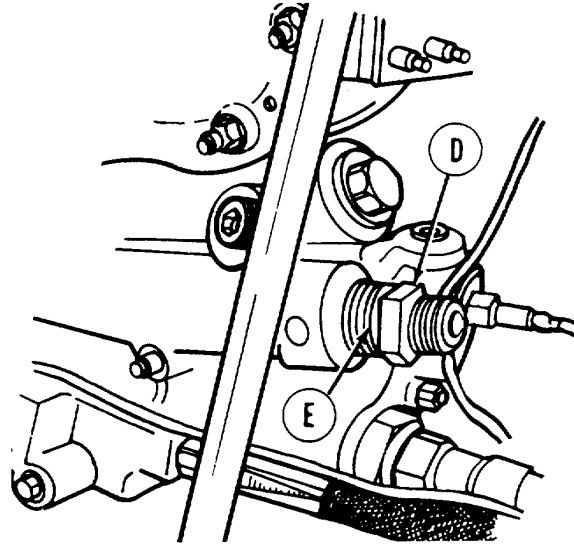
Go on to Sheet 3

TA147485

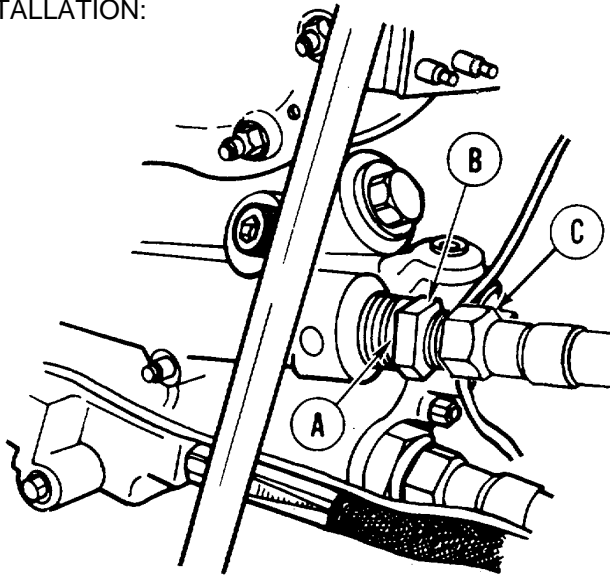


**OIL DAMPER HOUSING STRAIGHT TUBE HOSE ADAPTER REPLACEMENT (Sheet 3 of 4)**

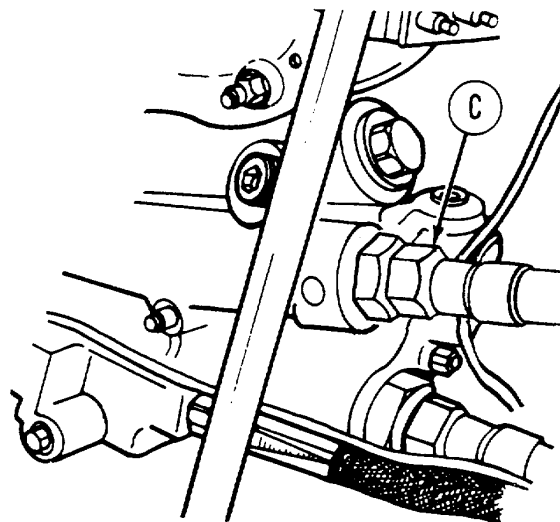
5. Using 1-9/16 inch wrench, remove adapter (D) and spacer ring (E). Throw spacer ring away.
6. Check adapter for cracks and thread damage. Replace damaged adapter.



**INSTALLATION:**



1. Install new spacer ring (A) on adapter (B).
2. Using 1-9/16 inch wrench, install adapter (B) and new spacer ring (A).



3. Using 1-9/16 inch wrench to hold adapter (B), use 1-1/2 inch wrench to install coupling (C).
4. Remove rags (Item 65, Appendix D) placed under coupling (C) to catch dripping oil. Discard rags.

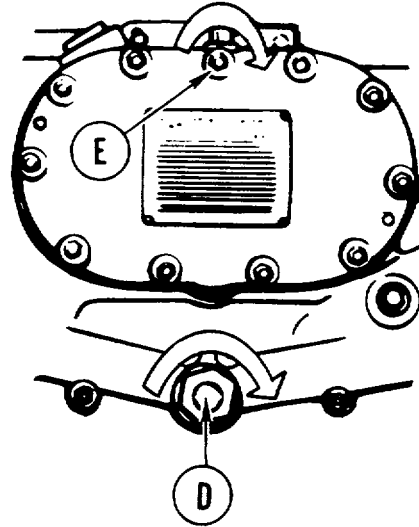
Go on to Sheet 4

TA147486

**OIL DAMPER HOUSING STRAIGHT TUBE HOSE ADAPTER REPLACEMENT (Sheet 4 of 4)****NOTE**

**If replacing adapter on 2A engine, go to step 8.**

5. Using 3/4 inch socket, tighten valve (D) with torque wrench not more than 150 lb-in (17 N•m).
6. Install new washer on screw (E).
7. Using 9/16 inch socket, install screw (E).
8. Check engine oil level (TM 9-2350-260-10).
9. Replenish engine oil lost during adapter replacement (LO 9-2350-260-12).
10. Install lower engine access cover (page 16-46).



End of Task

TA147487

**ENGINE OIL LEVEL GAGE CAP REPLACEMENT (2A ENGINE) (Sheet 1 of 4)**

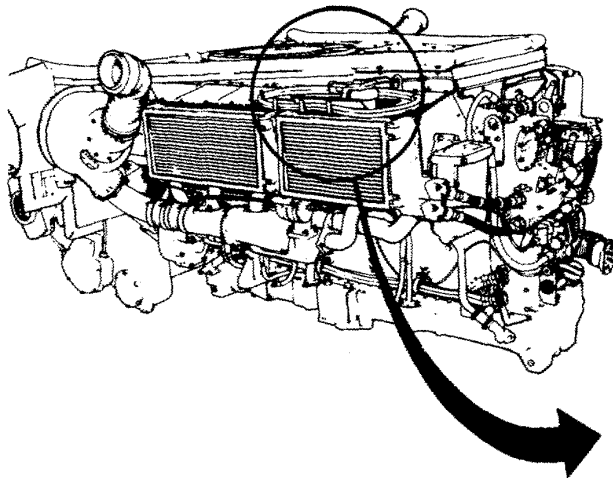
PROCEDURE INDEX

PROCEDURE	PAGE
Removal	6-34
Installation	6-36

TOOLS: 3/8 in. combination box and open end wrench  
 1/2 in. socket with 1/2 in. drive  
 5 in. extension with 1/2 in. drive  
 Ratchet with 1/2 in. drive

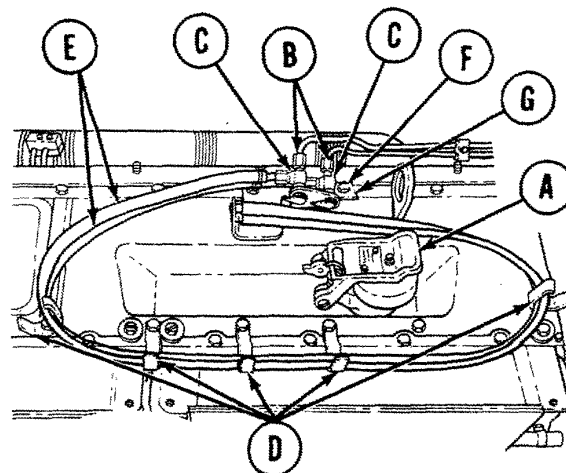
SUPPLIES: Gasket (10935621)  
 Preformed packing (MS28775-327) (2 required)  
 Lockwasher (MS90726-31) (2 required)

PRELIMINARY PROCEDURE: Remove powerplant (page 5-2)



REMOVAL:

1. Open cap assembly (A) and remove oil level gage.
2. Using 3/8 inch wrench, disconnect fuel drain tubes (B) from valves (C).



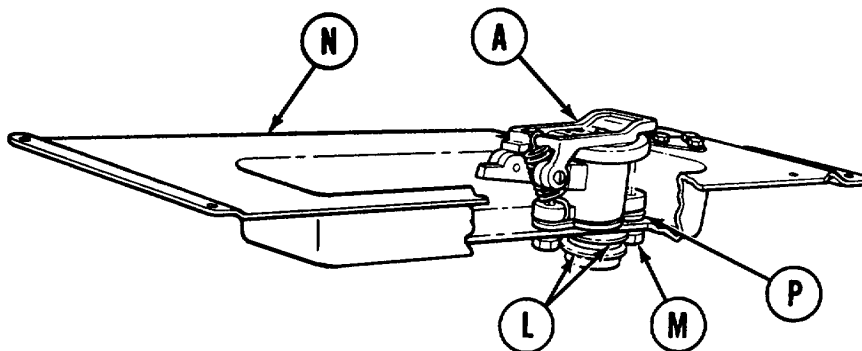
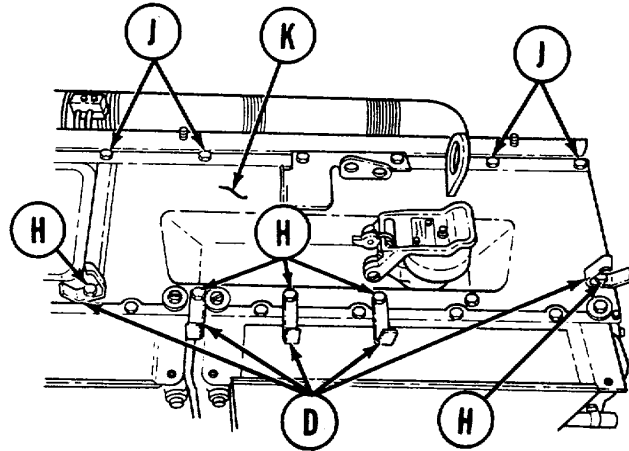
3. Open straps (D) and remove fuel drain hoses (E).
4. Using 1/2 inch socket, remove two screws (F) securing valves (C) and bracket (G).
5. Remove bracket (G), valves (C), and hoses (E) as a unit from engine.

Go on to Sheet 2

TA147488

**ENGINE OIL LEVEL GAGE CAP REPLACEMENT (2A ENGINE) (Sheet 2 of 4)**

6. Using 1/2 inch socket, remove five screws (H) securing straps (D). Remove straps from engine.
7. Using 1/2 inch socket, remove five screws (J) securing cover and cap assembly (K) to engine.
8. Remove cover and cap assembly (K) from engine.



9. Remove and throw away two preformed packings (L).
10. Using 1/2 inch socket, remove two bolts and lockwashers (M) securing cap assembly (A) to cover (N). Throw lockwasher away.
11. Remove cap assembly (A) and gasket (P) from cover (N). Throw gasket away.

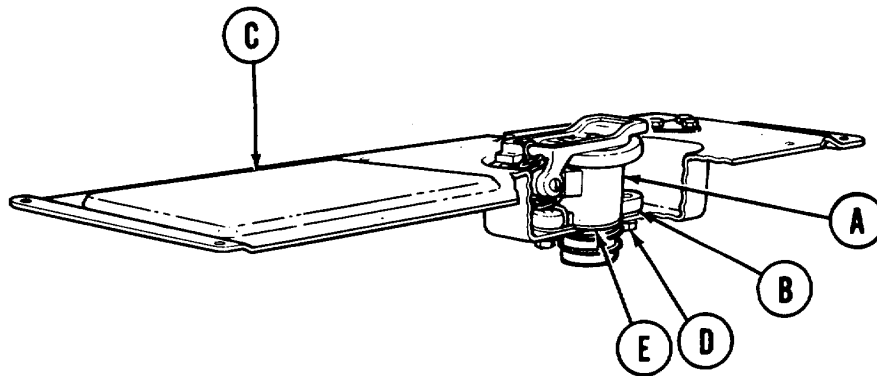
Go on to Sheet 3

TA147489

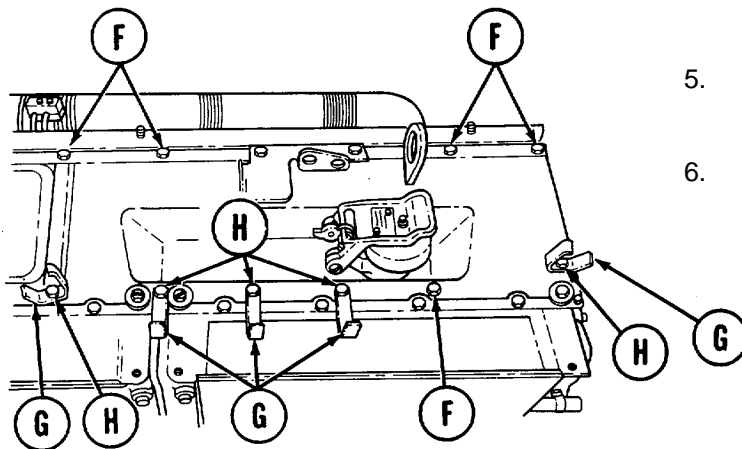
**ENGINE OIL LEVEL GAGE CAP REPLACEMENT (2A ENGINE) (Sheet 3 of 4)**

**INSTALLATION:**

1. Position cap assembly (A) and new gasket (B) onto cover (C).
2. Using 1/2 inch socket, install and tighten two screws and new lockwashers (D) to secure cap assembly (A) to cover (C).
3. Install two new preformed packings (E) onto cap assembly (A).



4. Position cap assembly (A) and cover (C) as a unit onto engine



5. Using 1/2 inch socket, install and tighten five screws (F) securing cover to engine.
6. Position five straps (G) onto cover and engine.

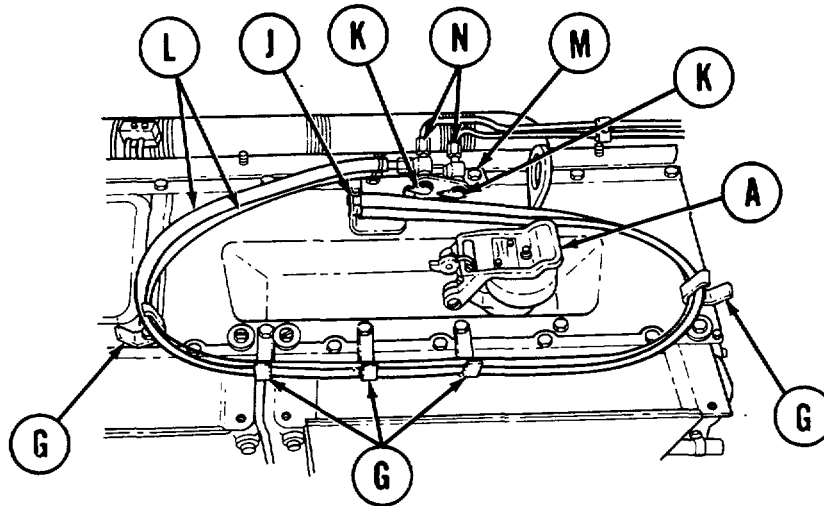
7. Using 1/2 inch socket, install and tighten five screws (H) securing straps (G).

Go on to Sheet 4

TA147490

**ENGINE OIL LEVEL GAGE CAP REPLACEMENT (2A ENGINE) (Sheet 4 of 4)**

8. Position bracket (J) with valves (K) and fuel drain hoses (L) onto cover and engine.
9. Using 1/2 inch socket install and tighten two screws (M) securing bracket (J).



10. Position drain hoses (L) into straps (G) and bend straps (G) over hoses (L).
11. Position drain tubes (N) onto valves (K). Using 3/8 inch wrench, tighten tube nuts onto valves.
12. Open cap assembly (A) and insert oil level gage.
13. Install powerplant (page 5-14).

End of Task

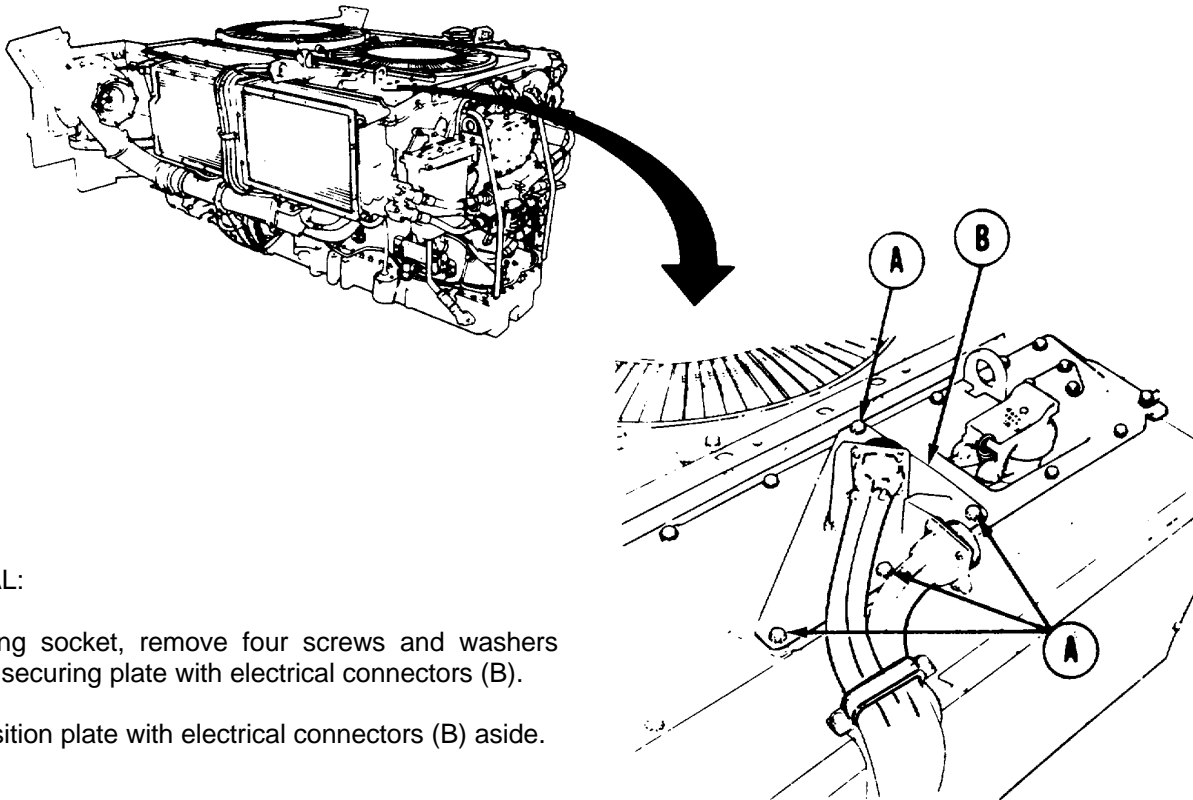
TA147491

**ENGINE OIL LEVEL GAGE CAP REPLACEMENT (2D ENGINE) (Sheet 1 of 3)**

**TOOLS:** 1/2 in. socket with 1/2 in. drive  
Ratchet with 1/2 in. drive

**SUPPLIES:** Gasket (10935621)  
Lockwasher (7410218) (2 required)

**PRELIMINARY PROCEDURES:** Remove powerplant (page 5-27)  
Remove engine shroud (page 9-2)



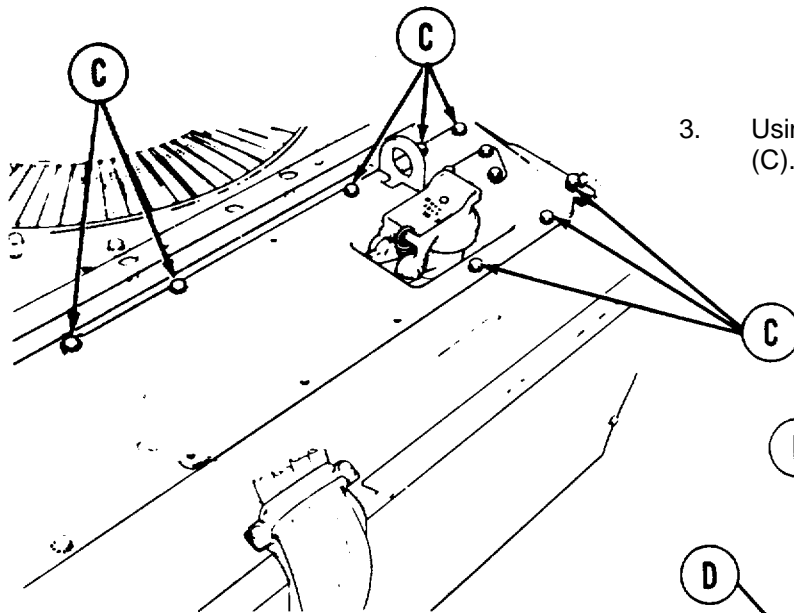
**REMOVAL:**

1. Using socket, remove four screws and washers (A) securing plate with electrical connectors (B).
2. Position plate with electrical connectors (B) aside.

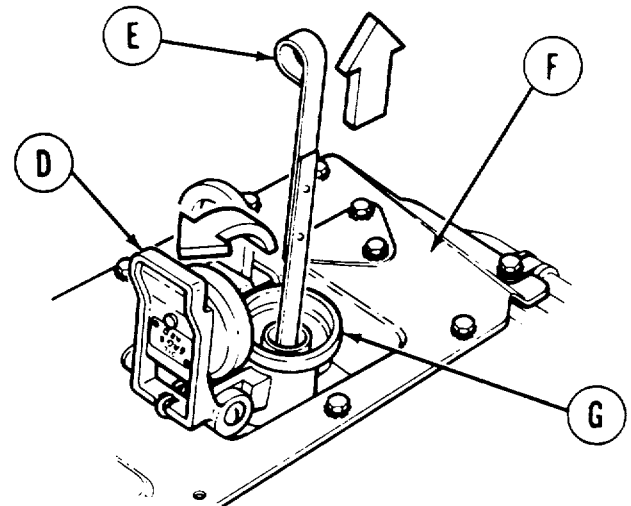
Go on to Sheet 2

TA147492

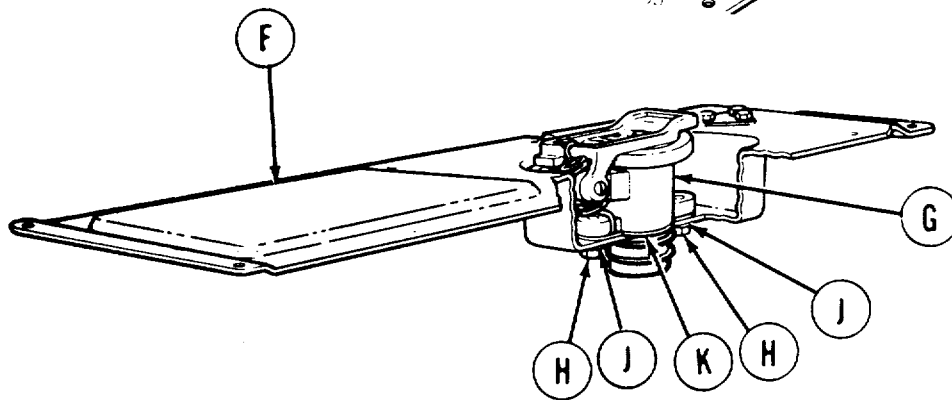
ENGINE OIL LEVEL GAGE CAP REPLACEMENT (2D ENGINE) (Sheet 2 of 3)



3. Using socket, remove eight screws and washers (C).



4. Open filler cap (D) and remove gage (E) from inside of cap.
5. Remove front engine access plate (1) and cap assembly (G) by pulling up on cap (D).



6. Using socket, remove two screws (H) and lockwashers (J). Throw lockwashers away.
7. Remove cap assembly (G) and gasket (K) from access plate (F). Throw gasket (K) away.

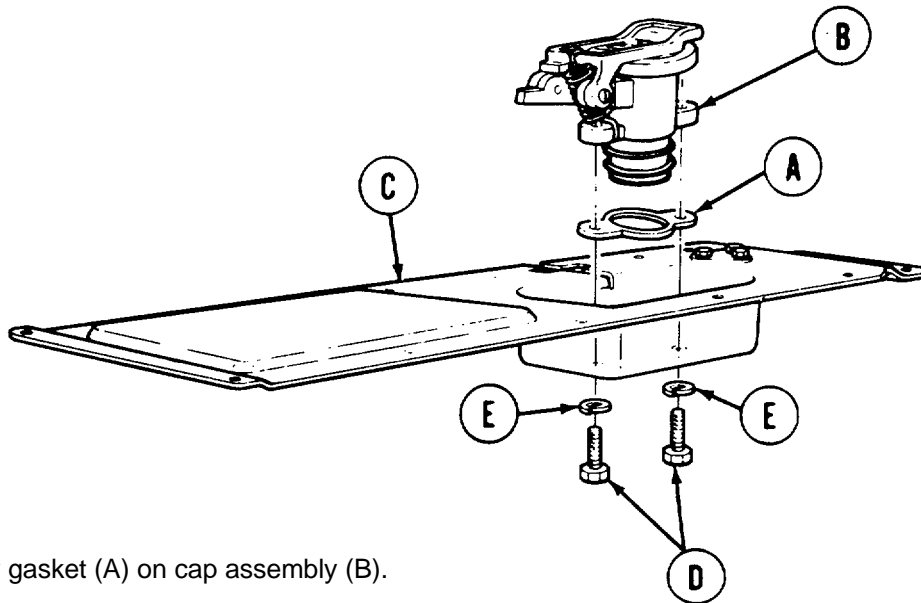
Go on to Sheet 3

TA147498

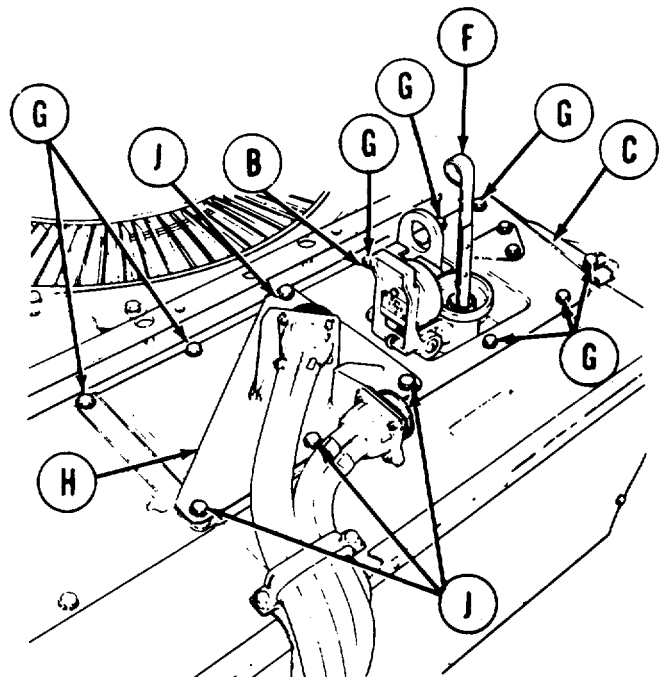


**ENGINE OIL LEVEL GAGE CAP REPLACEMENT (2D ENGINE) (Sheet 3 of 3)**

**INSTALLATION:**



1. Place new gasket (A) on cap assembly (B).
2. Place cap assembly (B) in position on engine access plate (C).
3. Using socket, install two screws (D) and new lockwashers (E).
4. Place engine access plate (C) in position on powerplant and push down until seated.
5. Using socket, install eight screws and washers (G).
6. Place plate with electrical connectors (H) in position.
7. Using socket, install four screws and washers (J).
8. Open filler cap (B), insert gage (F), and close filler cap (B).
9. Install engine shroud (page 9-3).
10. Install powerplant page (page 5-40).



End of Task

TA147494

**OIL FILLER TUBE (UPPER) REPLACEMENT (Sheet 1 of 4)**

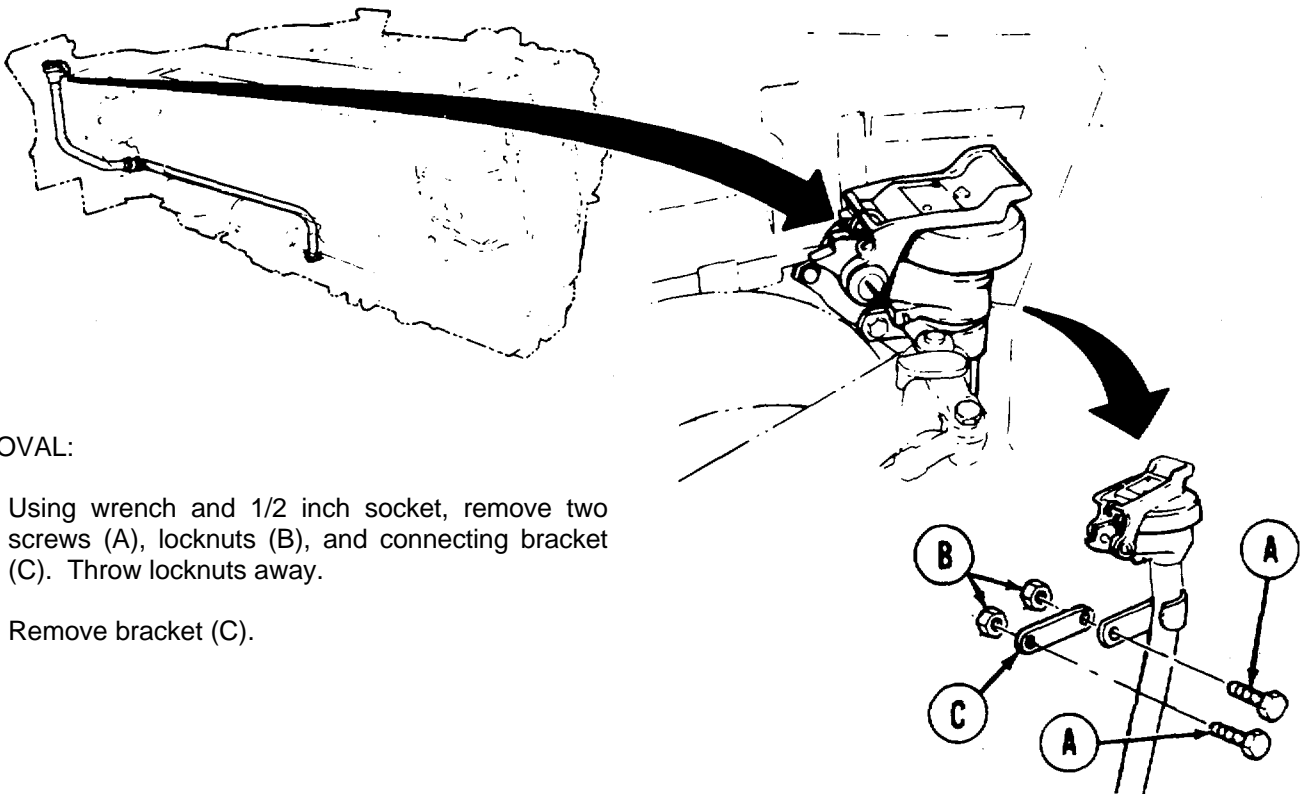
## PROCEDURE INDEX

PROCEDURE	PAGE
Removal	6-41
Installation	6-43

TOOLS: 5/16 in. socket with 1/2 in. drive  
 5 in. extension with 1/2 in. drive  
 Ratchet with 1/2 in. drive  
 1/2 in. socket with 1/2 in. drive  
 1/2 in. combination box and open end wrench  
 Putty knife  
 Flat-tip screwdriver  
 Vise  
 Hammer

SUPPLIES: Packing (8717158)  
 Locknuts (MS21044N5) (2 required)  
 Lockwashers (7410218) (2 required)

PRELIMINARY PROCEDURE: Remove powerplant (page 5-1)



## REMOVAL:

1. Using wrench and 1/2 inch socket, remove two screws (A), locknuts (B), and connecting bracket (C). Throw locknuts away.
2. Remove bracket (C).

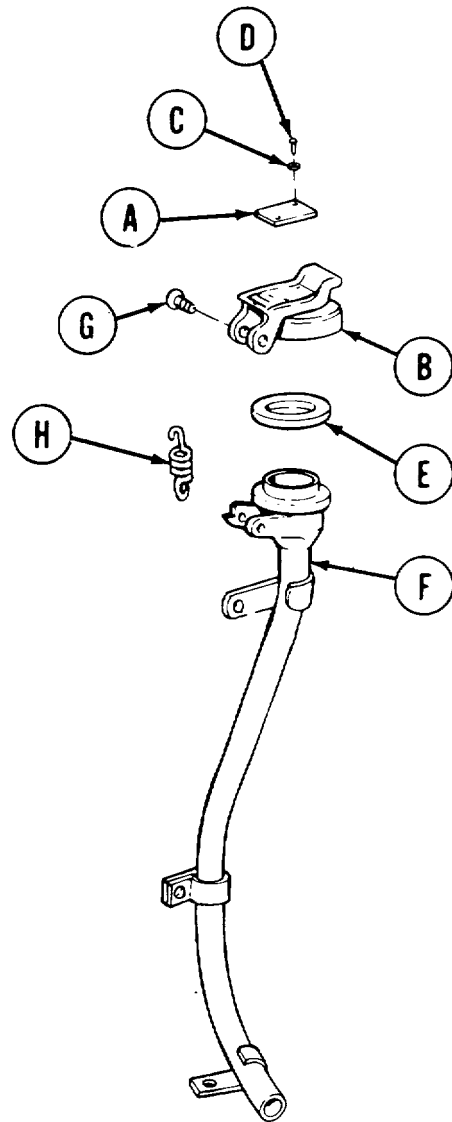
Go on to Sheet 2

TA147495



**OIL FILLER TUBE (UPPER) REPLACEMENT (Sheet 3 of 4)****INSTALLATION:**

1. Position plate (A) on cap assembly (B).
2. Place two flat washers (C) on two drive screws (D).
3. Using hammer; carefully tap two drive screws through holes in plate (A) into cap assembly (B).



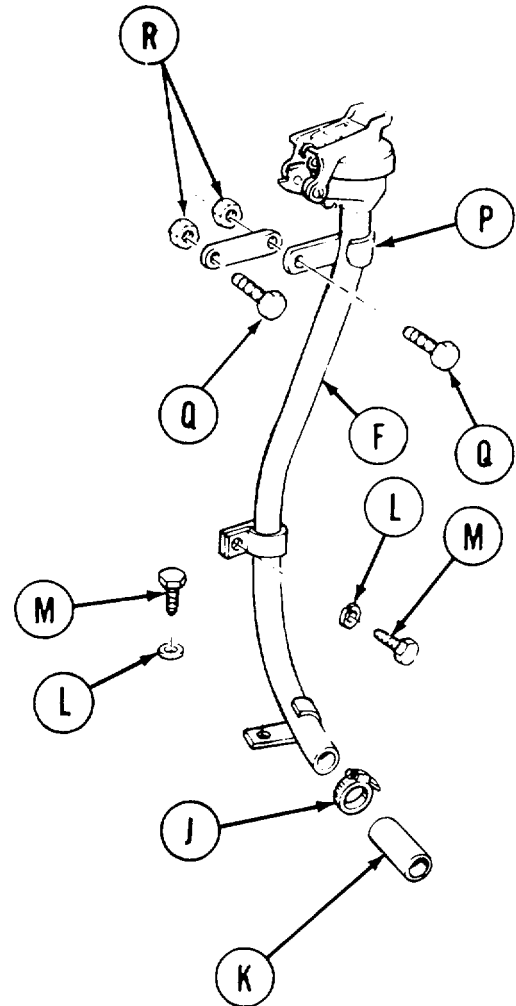
4. Press new packing (E) under lip of cap assembly (B).
5. Position cap assembly (B) on tube assembly (F).
6. Using screwdriver, install two screws (G).
7. Place tube assembly (F) in vise, place rounded end of spring (H) in notch of cap assembly (B) and, using screwdriver, work end of spring in notch of tube assembly (F).

Go on to Sheet 4

TA147497

**OIL FILLER TUBE (UPPER) REPLACEMENT (Sheet 4 of 4)**

8. Place clamp (J) on hose (K) with nut facing you.
9. Position tube assembly (F) with its assembled parts on powerplant.
10. Push tube assembly (F) into hose (K).
11. Position clamp (J) over end of hose (K).
12. Place two new lockwashers (L) on two screws (M).
13. Start two screws (M) through clamps of tube assembly (F).
14. Using 1/2 inch socket, tighten two screws (M).
15. With clamp (J) positioned over end of hose, use 5/16 inch socket and tighten nut of clamp (J).
16. Position bracket (N), clamp (P), and screw (Q).
17. Start new locknuts (R) on screw (Q).
18. Using 1/2 inch socket and wrench, tighten nuts (R).
19. Install 2A powerplant (page 5-14) or 2D powerplant (page 5-40).



End of Task

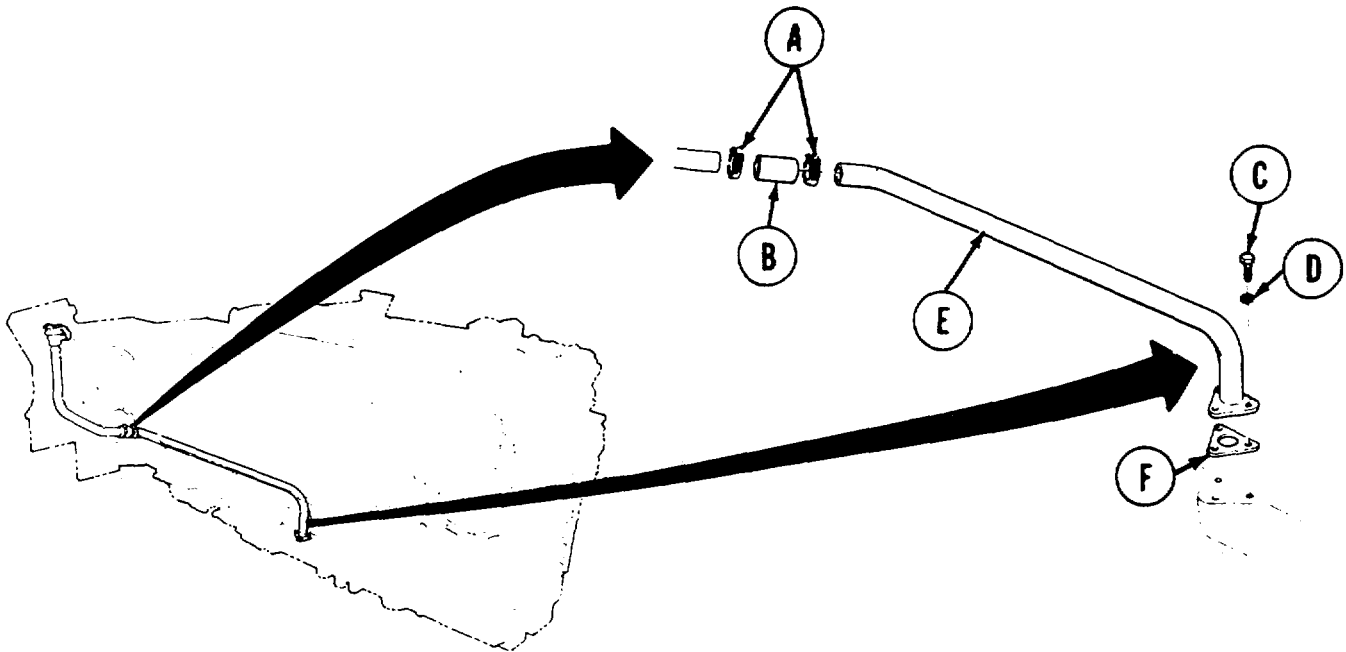
TA147498

**OIL FILLER TUBE AND HOSE (LOWER) REPLACEMENT (Sheet 1 of 2)**

**TOOLS:** 5/16 in. socket with 1/2 in. drive  
 5 in. extension with 1/2 in. drive  
 1/2 in. combination box and open end wrench  
 Putty knife  
 Ratchet with 1/2 in. drive

**SUPPLIES:** Gasket (8682523)  
 Rags (Item 65, Appendix D)-  
 Dry cleaning solvent (Item 54, Appendix D)  
 Lockwasher (7045881) (3 required)

**PRELIMINARY PROCEDURE:** Remove powerplant (page 5-1)

**REMOVAL:****NOTE**

**Using dry cleaning solvent (Item 65, Appendix D) and rags (Item 65, Appendix D), clean all parts and general area prior to removal.**

1. Using socket, loosen two clamps (A) from hose (B).
2. Using 1/2 inch wrench, remove three screws (C) and lockwashers (D) from tube assembly (E). Throw lockwashers away.
3. Pull tube assembly (E) and hose (B) loose and slip off two clamps (A).
4. Using putty knife, remove gasket (F) and throw away.

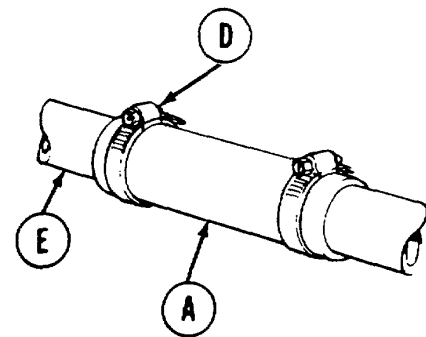
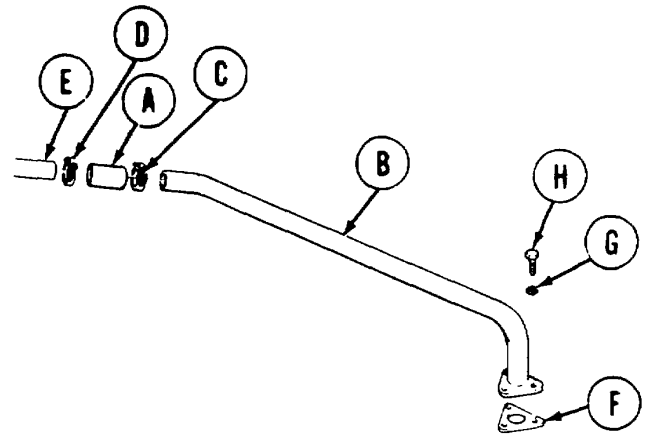
Go on to Sheet 2

TA147499

**OIL FILLER TUBE AND HOSE (LOWER) REPLACEMENT (Sheet 2 of 2)**

INSTALLATION:]

1. Push hose (A) over tube assembly (B).
2. Position clamp (C) over tube assembly (B) end of hose (A).
3. Using socket tighten nut of clamp (C).
4. Place clamp (D) loosely over hose (A) with clamp nut facing you.
5. Place assembled parts (A) through (D) in position on powerplant.
6. Push end of hose (A) over upper tube end (E).
7. Position new gasket (F) and tube assembly (B) on powerplant port.
8. Place new lockwashers (G) on three screws (H).
9. Inset three screws (H) in flange of tube assembly (B) and tighten finger tight.
10. Using wrench, tighten screws (H).
11. Position clamp (D) on hose (A) over end of upper tube end (E).
12. Using socket, tighten nut of clamp (D).
13. Install 2A powerplant (page 5-14) or 2D powerplant (page 5-40).



End of Task

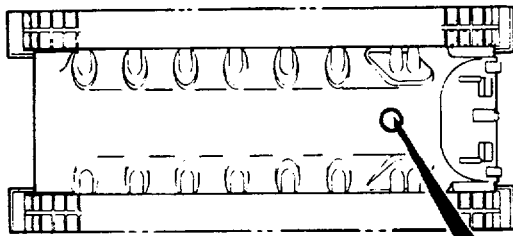
TA147500

**DRAIN ENGINE OIL (2A ENGINE) (Sheet 1 of 2)**

**TOOLS:** 3/4 in. socket with 1/2 in. drive  
 10 in. extension with 1/2 in. drive  
 Diagonal cutting pliers  
 Ratchet with 1/2 in. drive  
 Flat-tip screwdriver  
 Putty knife

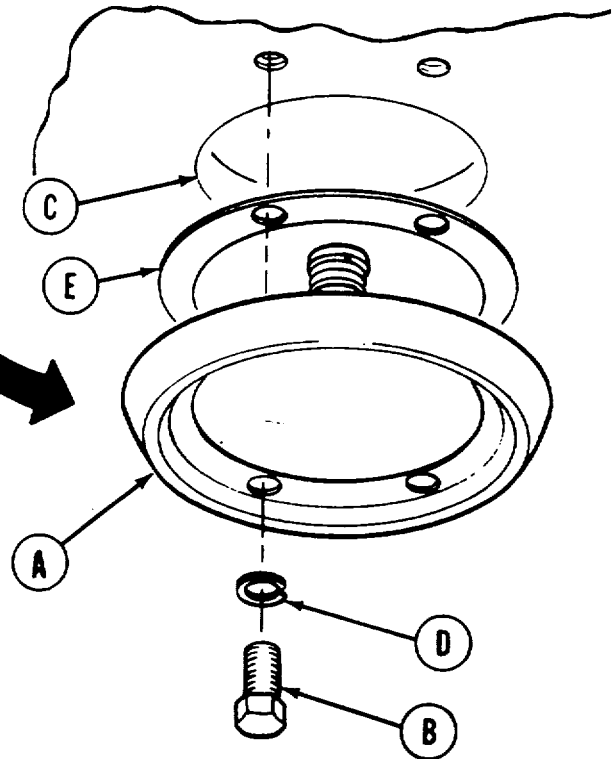
**SUPPLIES:** Container to catch oil (minimum 20 gal. capacity)  
 Gasket (7320462)  
 Lockwire (Item 59, Appendix D)  
 Rags (Item 65, Appendix D)  
 Lockwasher (MS35338-67) (4 required)

**REFERENCE:** LO 9-2350-260-12

**WARNING**

**Hold up valve seat (A) when removing last screw (B) attaching valve seat (A) to hull floor (C). Valve seat (A) is heavy and can cause injury if it falls.**

1. Using 3/4 inch socket, remove four screws (B) and lockwashers (D) holding valve seat (A) and gasket (E) to hull floor (C). Throw lockwashers away.
2. While holding valve seat (A), use screwdriver and pry valve seat (A) from hull floor (C).
3. Using putty knife, scrape gasket (E) from hull floor (C) and valve seat (A). Throw gasket away.



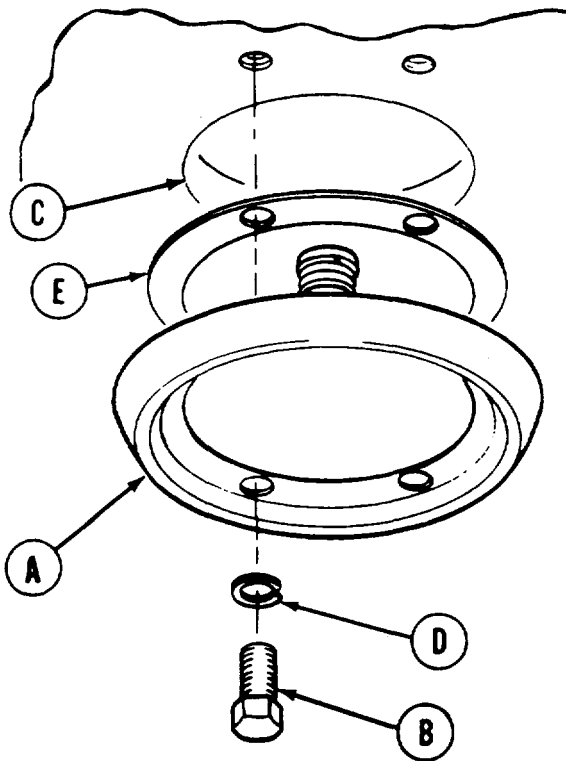
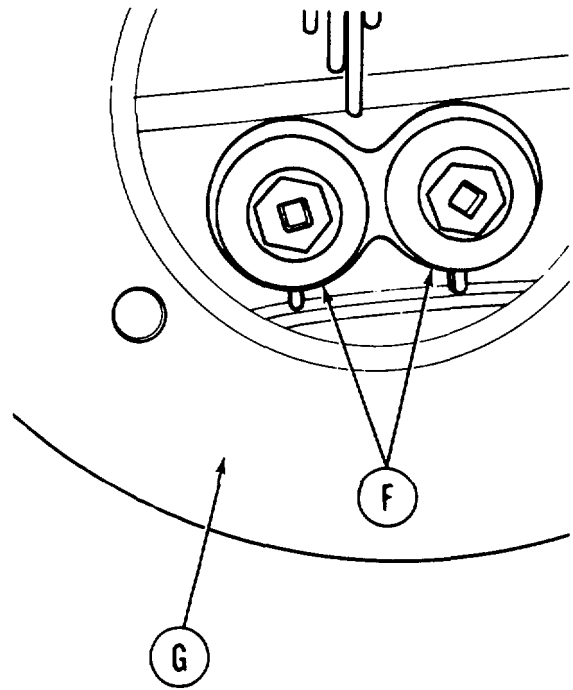
Go on to Sheet 2

TA147501



**DRAIN ENGINE OIL (2A ENGINE) (Sheet 2 of 2)**

4. Position container under drain valve opening.
5. Cut lockwire from drain plugs (F).
6. Using ratchet and extension, remove two oil drain plugs (F) from engine oil pan (G).
7. Allow engine oil to drain into container.
8. After draining, using rags (Item 65, Appendix D), clean area around drain plugs (F) and, using ratchet and extension, install drain plugs (F) into engine oil pan (G).
9. Using lockwire (Item 59, Appendix D), safety wire drain plugs (F).
10. Refill crankcase (LO 9-2350-260-12).



11. Line up four holes in valve seat (A), new gasket (E), and hull floor (C) under tank.
12. Using 3/4 inch socket install four screws (B) and new lockwashers (D) holding valve seat (A) and gasket (E) to hull floor (C).
13. Operate rear drain valve to make sure valve opens and closes smoothly. If valve does not open or close properly, remove, inspect and install valve assembly again.

End of Task

TA147502

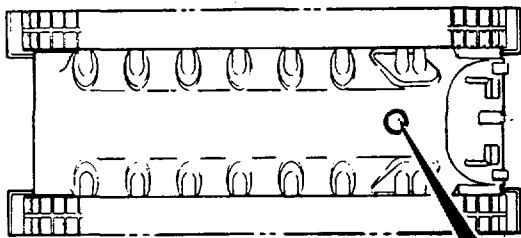
**DRAIN ENGINE OIL (2D ENGINE) (Sheet 1 of 3)**

**TOOLS:** 9/16 in. socket with 3/8 in. drive  
 10 in. extension with 1/2 in. drive  
 Torque wrench with 3/8 in. drive (0-200 lb-in) (0-23 Nm)  
 Ratchet with 1/2 in. drive  
 Flat-tip screwdriver  
 Putty knife  
 9/16 in. combination box and open end wrench  
 3/4 in. socket with 1/2 in. drive

**SUPPLIES:** Container to catch oil (minimum 20 gal. capacity)  
 Gasket (11684054)  
 Sealing washer (NAS1598-6Y)  
 Rags (Item 65, Appendix D)  
 Lockwashers (MS35338-67) (4 required)

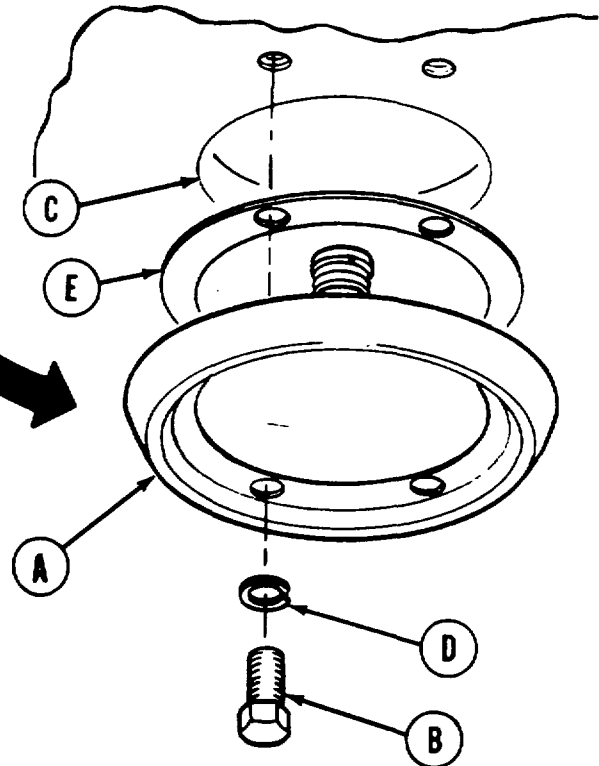
**REFERENCES:** LO 9-2350-26042  
 TM 9-2350-260-10

**PRELIMINARY PROCEDURES:** Open rear drain valve (TM 9-2350-260-10)  
 Remove upper engine access cover (page 16-44)

**WARNING**

Hold valve seat (A) up when removing last screw (B) attaching valve seat (A) to hull floor (C). Valve seat (A) is heavy and can cause injury if it falls.

1. Using 3/4 inch socket, remove four screws (B) and lockwashers (D) holding valve seat (A) and gasket (E) to hull floor (C). Throw lockwashers away.
2. While holding valve seat (A), use screwdriver and pry valve seat (A) from hull floor (C).
3. Using putty knife, scrape gasket (E) from hull floor (C) and valve seat (A). Throw gasket away.

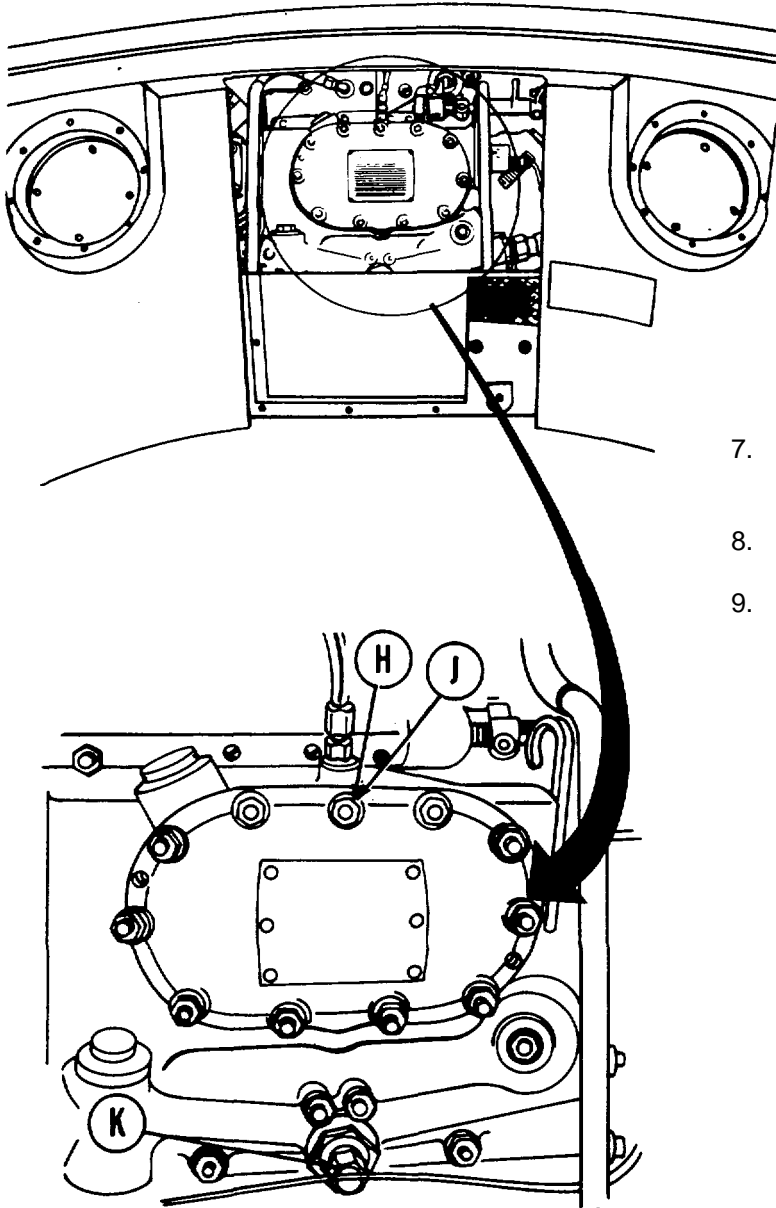
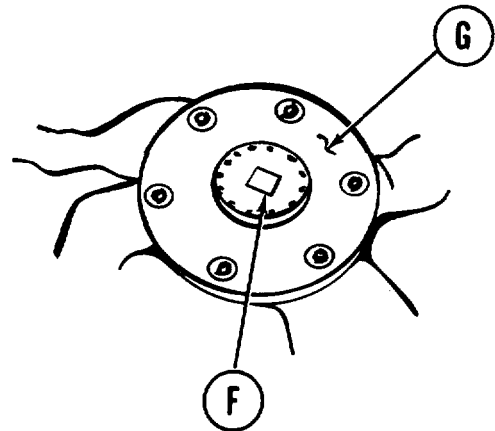


Go on to Sheet 2

TA147503

**DRAIN ENGINE OIL (2D ENGINE) (Sheet 2 of 3)**

4. Position container under drain valve opening.
5. Using ratchet and extension, remove oil drain plug (F) from engine oil pan (G).
6. Using 9/16 inch socket with extension, remove vent bolt (H) and sealing washers (J). Throw washers away.

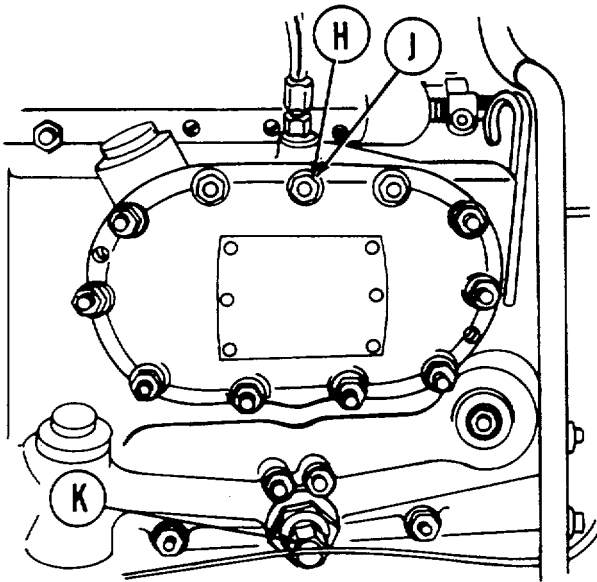


7. Using 3/4 inch socket, loosen oil drain valve (K) six complete turns.
8. Allow engine oil to drain into container.
9. After draining, clean area around drain plug (F) with rags (Item 65, Appendix D) and, using ratchet and extension, install drain plug (F) into engine oil pan (G).

Go on to Sheet 3

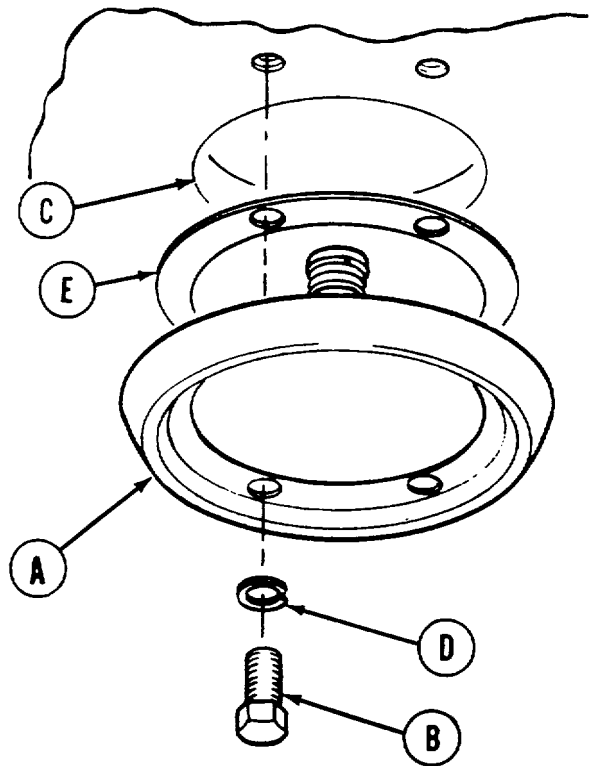
TA147504

**DRAIN ENGINE OIL (2D ENGINE) (Sheet 3 of 3)**



10. Using 3/4 inch socket, tighten oil drain valve (K).
11. Using torque wrench, tighten oil drain valve (K) to 150 lb-in (17 N-m).
12. Using 9/16 inch socket with extension, install vent bolt (H) and new sealing washer (J).
13. Refill crankcase (LO 9-235026012).

14. Install upper engine access cover (page 16-44).
15. Line up four holes in valve seat (A), new gasket (E), and hull floor (C) under vehicle.
16. Using 3/4 inch socket, install four screws (B) and new lockwashers (D) holding valve seat (A) and new gasket (E) to hull floor (C).
17. Operate rear drain valve to make sure valve opens and closes smoothly. If valve does not open or close properly, remove, inspect, and install valve assembly again.



End of Task

TA147505

**CYLINDER HEAD AND OIL PAN DRAIN TUBES (LEFT AND RIGHT) REPLACEMENT (Sheet 1 of 4)**

PROCEDURE INDEX

PROCEDURE	PAGE
Removal	6-52
Inspection	6-53
Installation	6-54

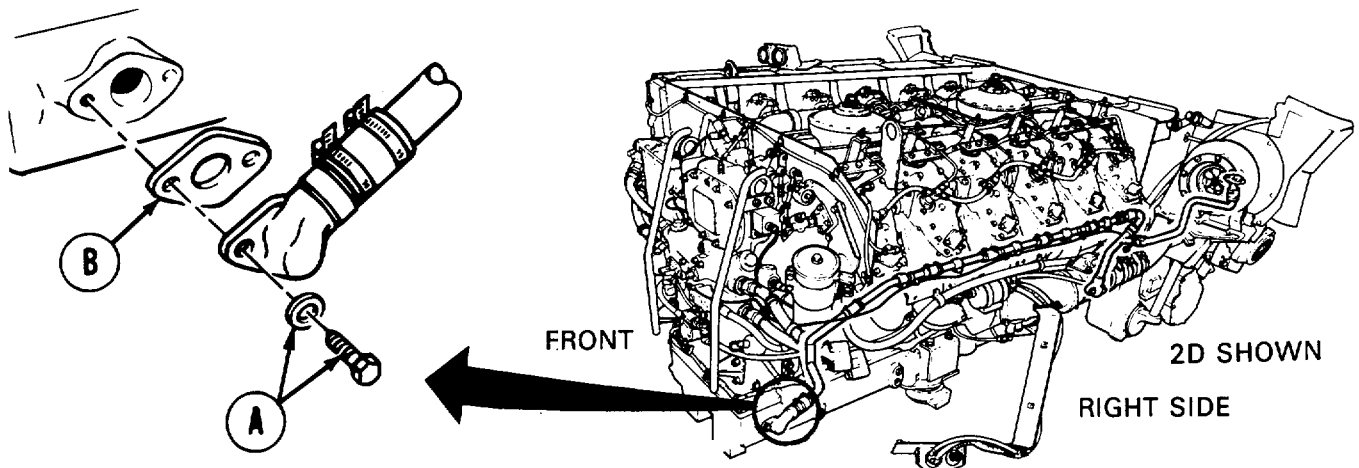
TOOLS: 7/8 in. socket with 1/2 in. drive  
 Flat-tip screwdriver  
 1/2 in. socket with 1/2 in. drive  
 Ratchet with 1/2 in. drive  
 Diagonal cutting pliers  
 Slip joint pliers  
 3/8 in. combination box and open end wrench

SUPPLIES: Lockwire (Item 59, Appendix D)  
 Gasket (8682772)  
 Lockwasher (7410218) (2 required)

SPECIAL TOOLS: Ground hop kit (Item 32, Chapter 3, Section D)

REFERENCE: LO 9-2350-260-12

PRELIMINARY PROCEDURE: Remove powerplant (page 5-1)  
 Drain engine oil (2A engine, page 6-47) (2D engine, page 6-49)  
 Remove powerplant left bank oil cooler frame and brackets (2D engine, page 6-108) (as required)  
 Remove powerplant right bank oil cooler frame and brackets (2D engine, page 6-99) (as required)  
 Remove powerplant oil coolers frame and brackets (2A engine, page 6-94)



REMOVAL:

1. Using 1/2 inch socket, remove two bolts and lockwashers (A). Throw lockwashers away.
2. Remove gasket (B) and throw away.

Go on to Sheet 2

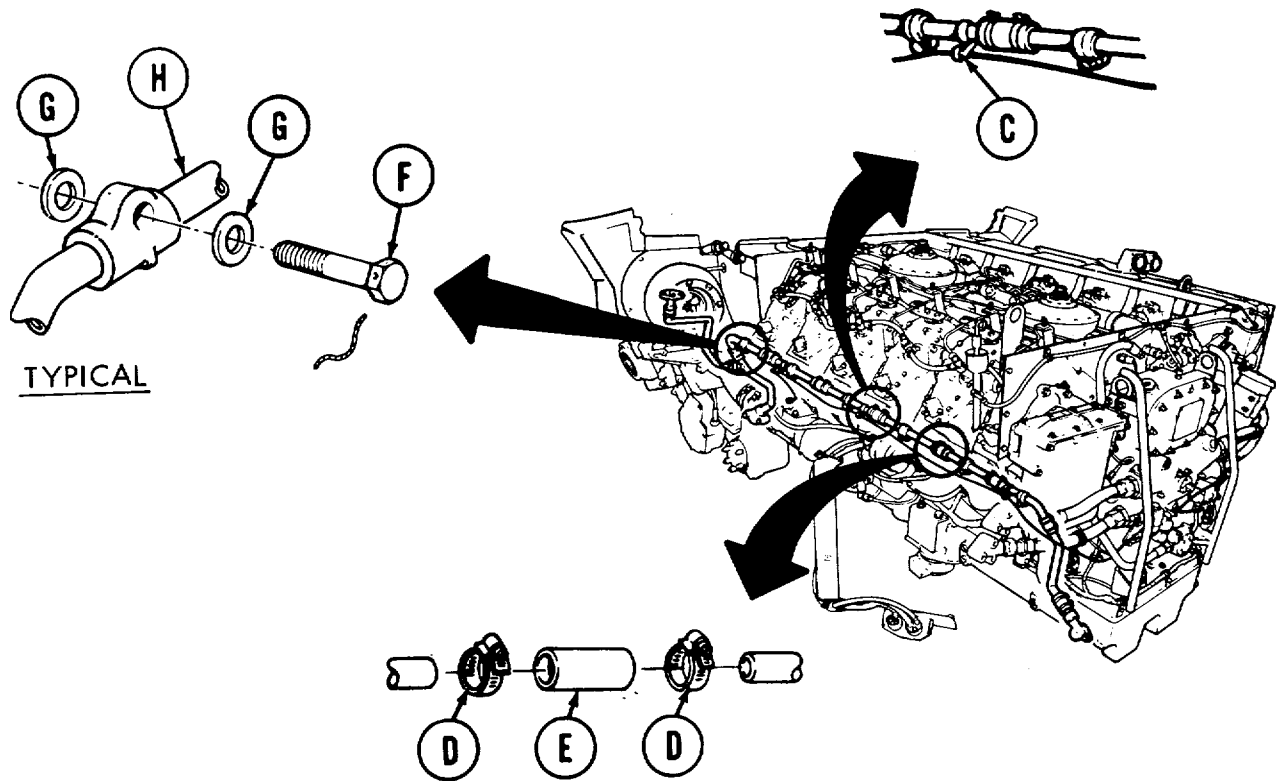
TA147506

**CYLINDER HEAD AND OIL PAN DRAIN TUBES (LEFT AND RIGHT) REPLACEMENT (Sheet 2 of 4)**

3. Holding nut with wrench and using screwdriver, disconnect four fuel line clamps (C) from oil drain line.
4. Using screwdriver, loosen 16 clamps (D) on 8 hoses (E) on each end of drain tube assembly.
5. Using pliers, cut lockwire on six capscrews (F).
6. Using 7/8 inch socket, remove 6 capscrews (F) and 12 washers (G).
7. Remove washers (G) and throw away.
8. Remove drain tube assembly (H) from engine.

**INSPECTION:**

1. Inspect capscrews for stripped threads.
2. Inspect hose clamps for general serviceability.
3. Replace defective part as required.



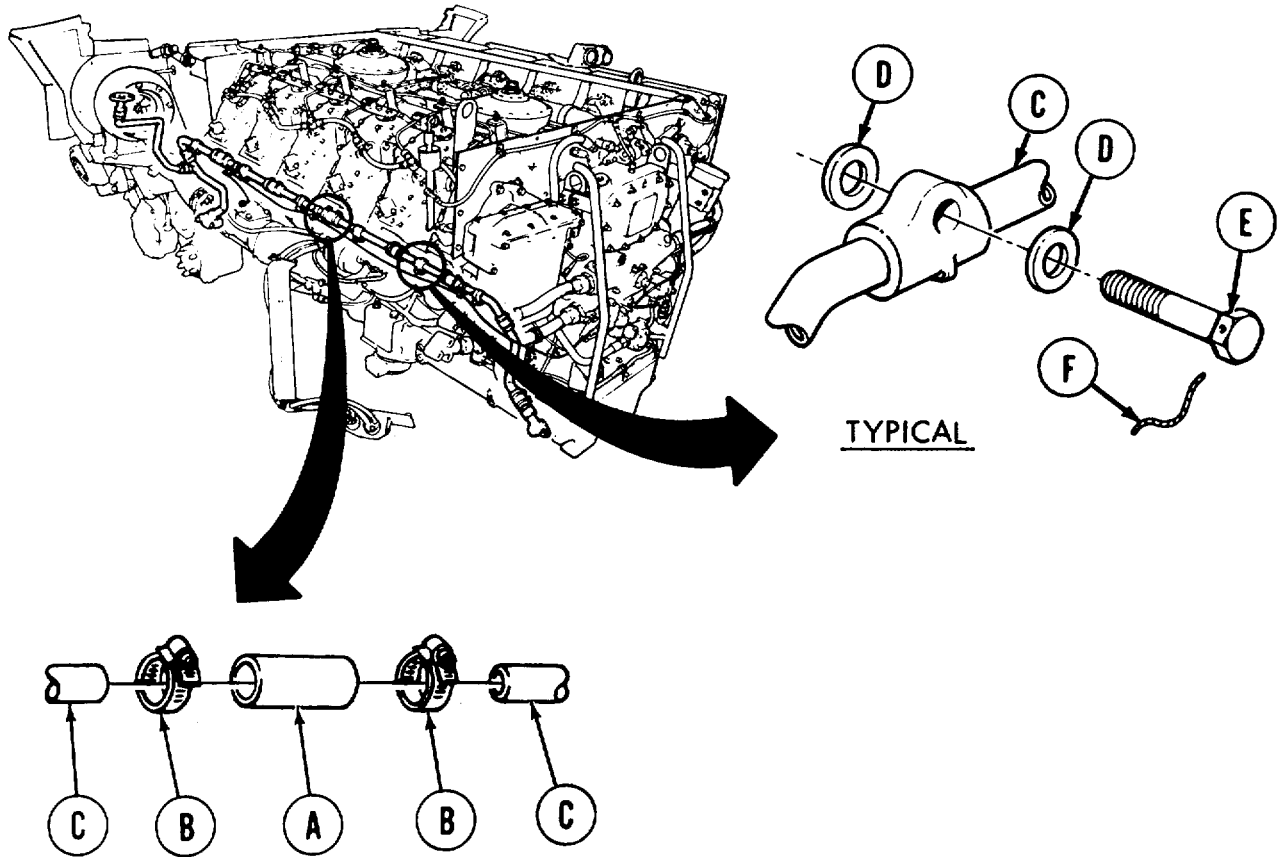
Go on to Sheet 3

TA147507

**CYLINDER HEAD AND OIL PAN DRAIN TUBES (LEFT AND RIGHT) REPLACEMENT (Sheet 3 of 4)**

**INSTALLATION:**

1. Cut eight hoses (A) to prescribed length (3 inches).
2. Install 16 clamps (B) on drain line assembly (C).
3. Install eight hoses (A) on drain line assembly (C).
4. Position assembled drain tube assembly (C) to engine.
5. Install 12 washers (D) on 6 capscrews (E).
6. Using 7/8 inch socket, install six capscrews (E).
7. Using pliers, install lockwire (Item 59, Appendix D) (F).

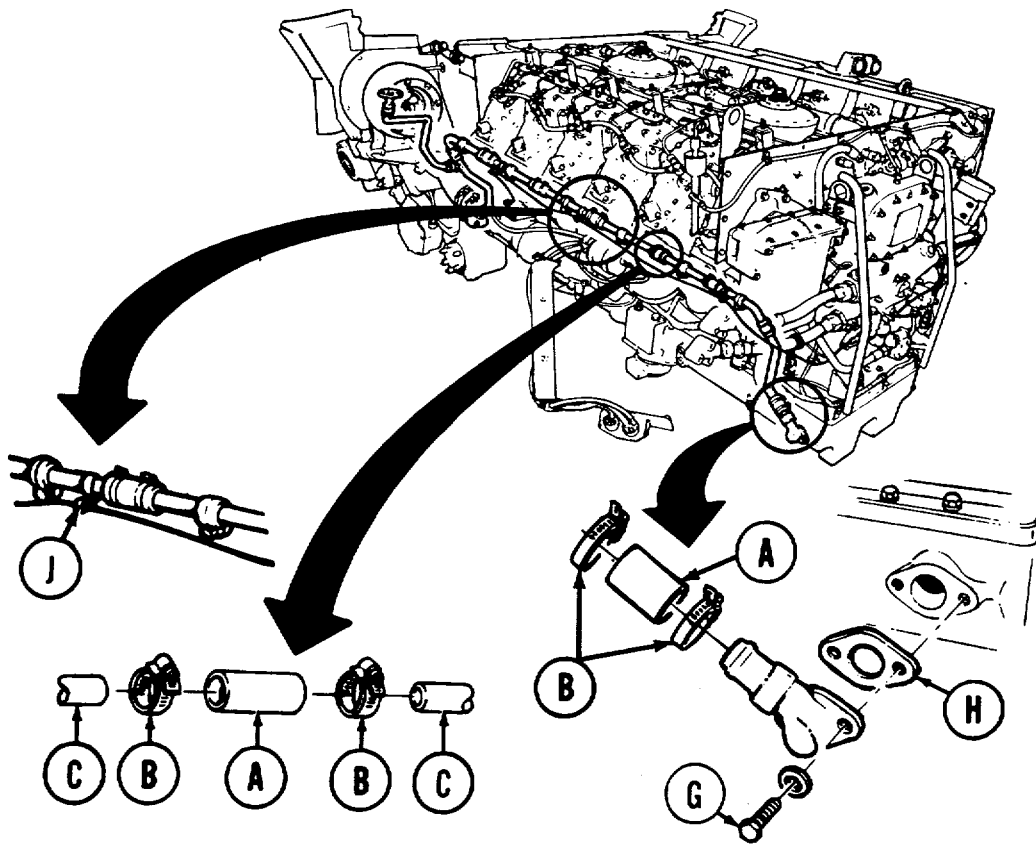


Go on to Sheet 4

TA147508

**CYLINDER HEAD AND OIL PAN DRAIN TUBES (LEFT AND RIGHT) REPLACEMENT (Sheet 4 of 4)**

8. Position two bolts and new lockwashers (G) through lower drain tube end and place new gasket (H) over bolts.
9. Using 1/2 inch socket, tighten two bolts and lockwashers (G) to engine.
10. Using screwdriver, tighten 16 clamps (B) on hoses on each end of lower drain lines assembly.
11. Holding nut with 3/8 inch wrench and using screwdriver, connect four fuel line clamps (J) to oil drain line.
12. Install powerplant left bank oil cooler frame and brackets (2D engine, page 6112) as required).
13. Install powerplant right bank oil cooler frame and brackets (2D engine, page 6102) (as required).
14. Install powerplant (2A engine) oil coolers frame and brackets (page 6-95).
15. Replenish engine oil (LO 9-2350-260-12).
16. Connect powerplant test equipment (ground hop kit) (Item 32, Chapter 3, Section I) (page 5-54).
17. Start engine and check for leaks.
18. Disconnect powerplant test equipment (ground hop kit) (page 5-67).
19. Install 2A powerplant (page 5-14) or 2D powerplant (page 540).



End of Task

TA147509



**TURBOSUPERCHARGER OIL DRAIN TUBE (RIGHT BANK) REPLACEMENT (Sheet 1 of 4)**

PROCEDURE INDEX

PROCEDURE	PAGE
Removal	6-56
Inspection	6-57
Installation	6-58

TOOLS: 1/2 in. socket with 1/2 in. drive  
 Ratchet with 1/2 in. drive  
 Flat-tip screwdriver  
 9/16 in. combination box and open end wrench  
 5/8 in. combination box and open end wrench

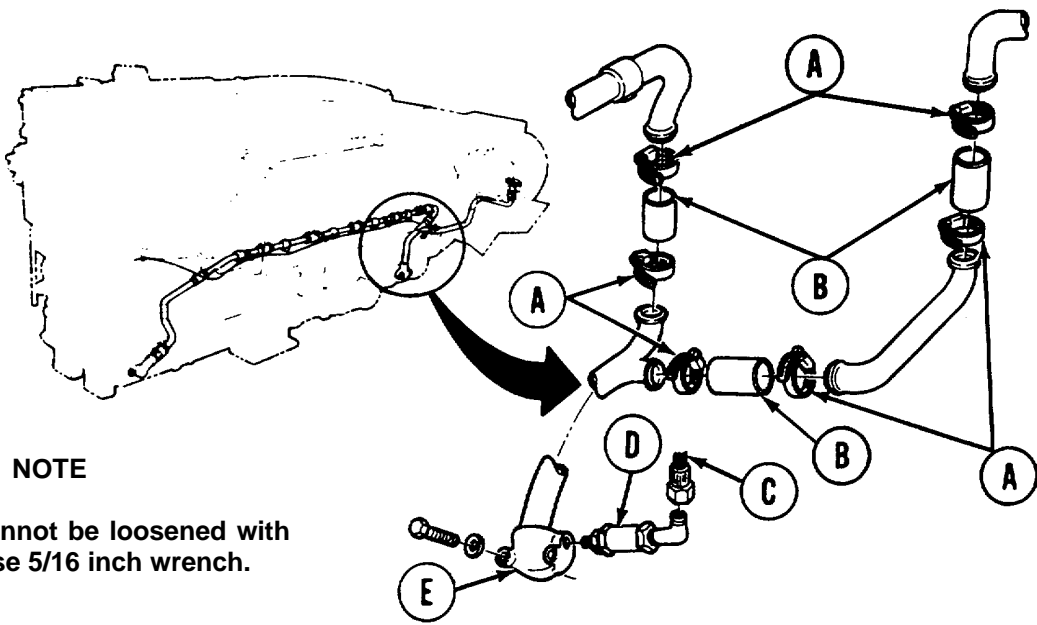
SPECIAL TOOLS: Ground hop kit (Item 30, Chapter 3, Section I)

SUPPLIES: Gasket (8682772)  
 Lockwasher (7410218) (2 required)

REFERENCE: LO 9-2350-26012

PRELIMINARY PROCEDURES: Remove powerplant (page 5-1)  
 Drain engine oil (2A engine, page 6-47) (2D engine, page 6-49)  
 Remove generator (page 10-8)

REMOVAL:



**NOTE**

**If clamp (A) cannot be loosened with screwdriver, use 5/16 inch wrench.**

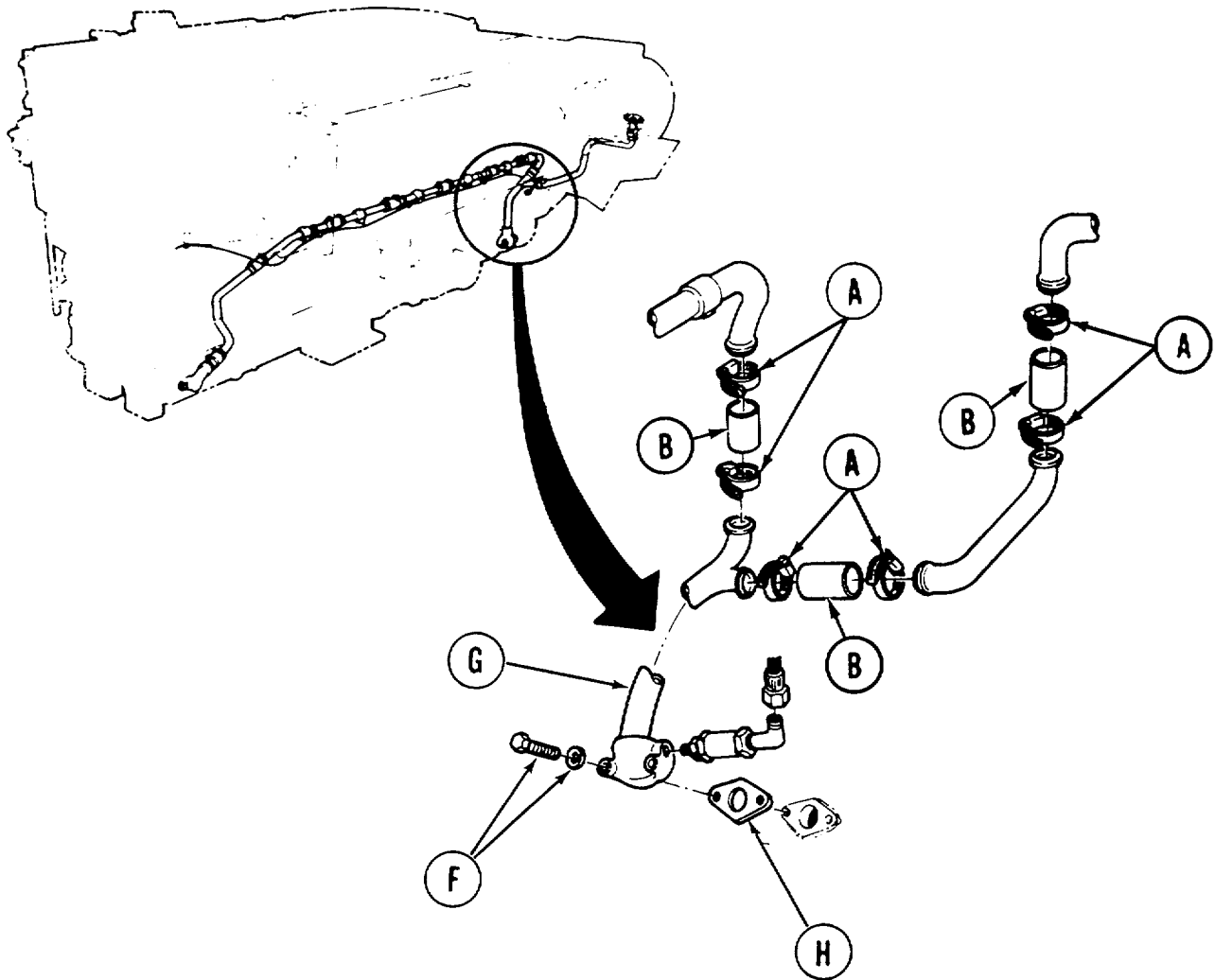
1. Using screwdriver, loosen six clamps (A) on three hoses (B) on each end of upper drain tube.
2. Using 9/16 inch wrench, disconnect hose (C) from generator oil drain check valve (D).
3. Using 5/8 inch wrench, disconnect generator oil drain check valve (D) from tube assembly (E).

Go on to Sheet 2

TA147510

**TURBOSUPERCHARGER OIL DRAIN TUBE (RIGHT BANK) REPLACEMENT (Sheet 2 of 4)**

4. Using socket, remove two bolts and lockwashers (F) securing tube (G) to engine. Throw lockwashers away.
5. Remove oil drain tube assembly (G) from engine.



6. Remove gasket (H) and throw away.
7. Separate three hoses (B) and clamps (A) from tube (G).

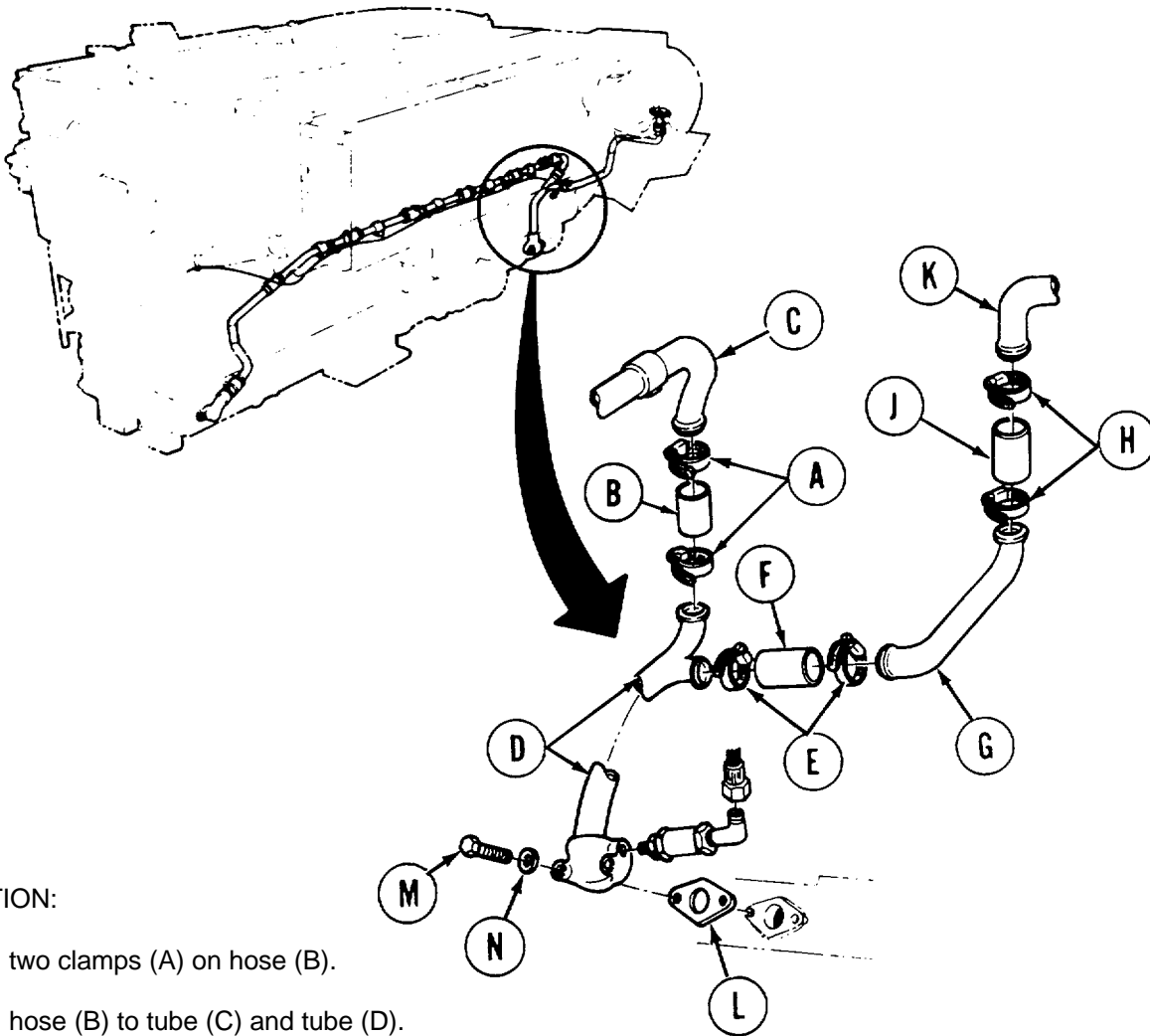
**INSPECTION:**

1. Inspect hose clamps for general serviceability.
2. Replace defective parts as required.

Go on to Sheet 3

TA147511

**TURBOSUPERCHARGER OIL DRAIN TUBE (RIGHT BANK) REPLACEMENT (Sheet 3 of 4)**



**INSTALLATION:**

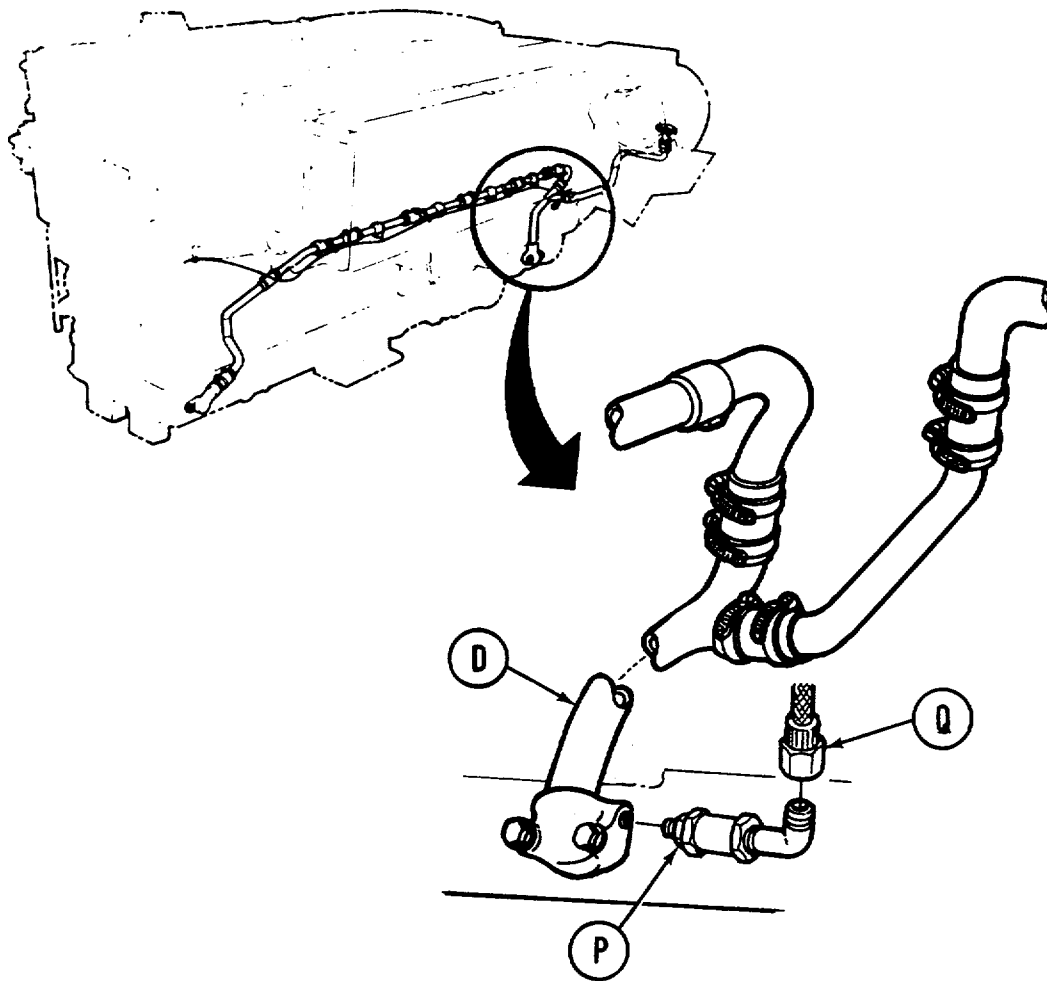
1. Install two clamps (A) on hose (B).
2. Install hose (B) to tube (C) and tube (D).
3. Install two clamps (E) on hose (F).
4. Install hose (F) to tube (D) and tube (G).
5. Install two clamps (H) on hose (J).
6. Install hose (J) to tube (G) and tube (K).
7. Install new gasket (L), two bolts (M), and new lockwashers (N) to secure tube (D) to engine.
8. Using socket, tighten two bolts (M).
9. Using screwdriver, tighten clamps (A), (E), and (H).

Go on to Sheet 4

TA147512

**TURBOSUPERCHARGER OIL DRAIN TUBE (RIGHT BANK) REPLACEMENT (Sheet 4 of 4)**

10. Using 5/8 inch wrench, connect generator oil drain check valve (P) to tube (D).
11. Using 9/16 inch wrench, connect hose (Q) to generator oil drain check valve (P).
12. Replenish engine oil (LO 9-2350-206-12).
13. Install generator (page 10-15)
14. Connect powerplant test (ground hop) equipment (page 5-54).
15. Start engine and check for leaks.
16. Disconnect powerplant test (ground hop) equipment (page 5-67).
17. Install 2A powerplant (page 5-14) or 2D powerplant (page 5-40).



End of Task

TA147513

**TURBOSUPERCHARGER OIL DRAIN TUBE (LEFT BANK) REPLACEMENT (Sheet 1 of 4)**

PROCEDURE INDEX

PROCEDURE	PAGE
Removal	6-60
Inspection	6-61
Installation	6-62

TOOLS: 1/2 in. socket with 1/2 in. drive  
 Flat-tip screwdriver  
 Ratchet with 1/2 in. drive  
 5/16 in. combination box and open end wrench

SUPPLIES: Hose (3 required)  
 Gasket (8682772)  
 Lockwasher (7410218) (2 required)

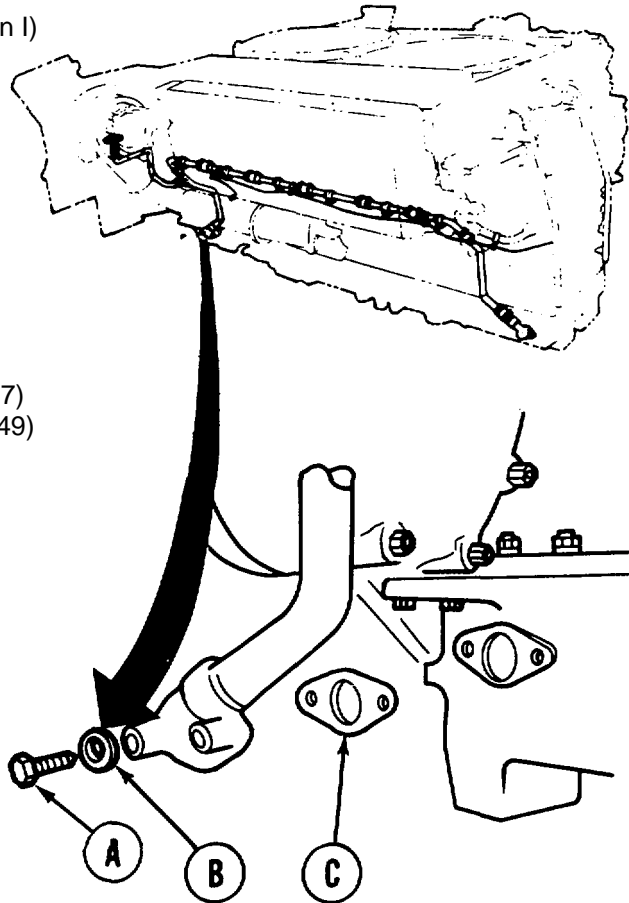
SPECIAL TOOLS: Ground hop kit (Item 30 Chapter 3, Section I)

REFERENCE: LO 9-2350260-12

PRELIMINARY PROCEDURES: Remove powerplant (page 51)  
 Drain engine oil (2A engine, page 647)  
 (2D engine, page 6-49)

REMOVAL:

1. Using socket, remove two bolts (A) and two lockwashers (B). Throw lockwashers away.
2. Remove gasket (C).
3. Throw gasket away.



Go on to Sheet 2

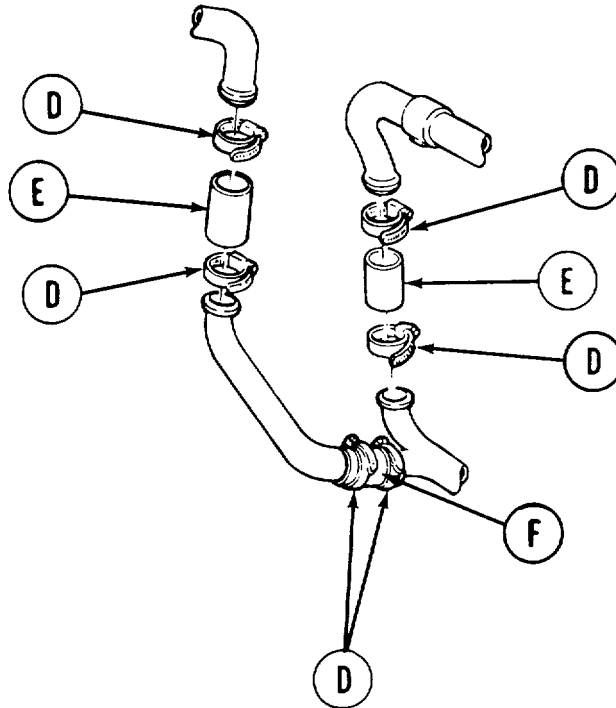
TA147514

## TURBOSUPERCHARGER OIL DRAIN TUBE (LEFT BANK) REPLACEMENT (Sheet 2 of 4)

## NOTE

If clamps (D) cannot be loosened using a screwdriver, use 5/16 inch wrench.

4. Using screwdriver, loosen six clamps (D) on hose (E).



5. Remove tube assembly oil drain from engine.
6. Remove six clamps (D) and three hoses (E) from tube assembly.

## INSPECTION:

1. Inspect capscrews for stripped threads.
2. Inspect hose clamps for general serviceability.
3. Replace defective parts as required.

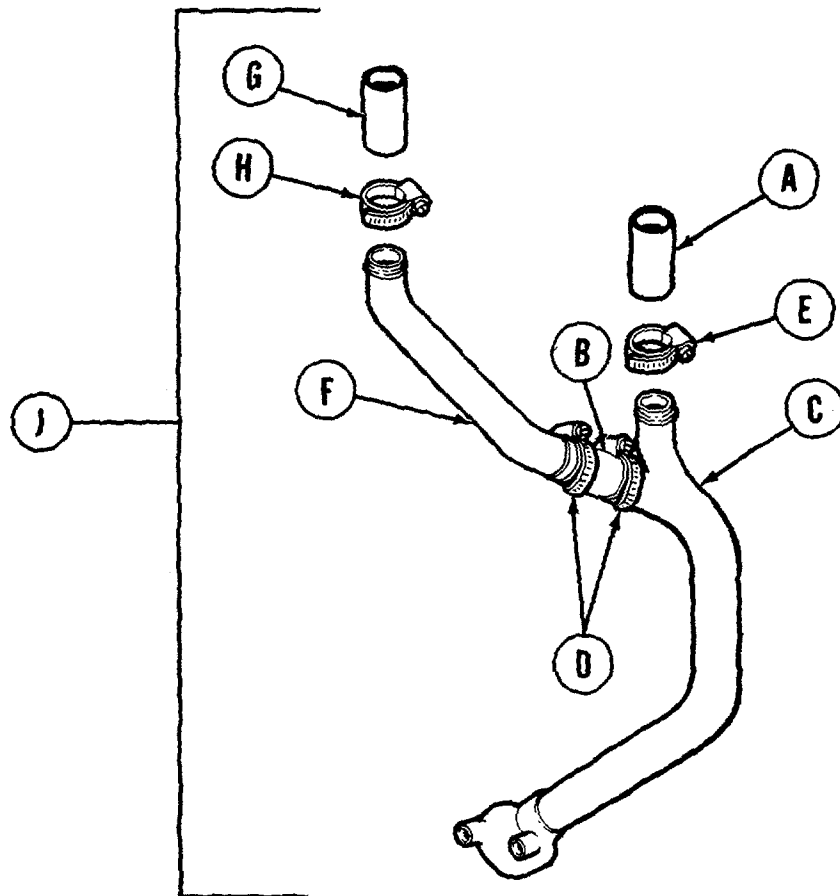
Go on to Sheet 3

TA147515

**TURBOSUPERCHARGER OIL DRAIN TUBE (LEFT BANK) REPLACEMENT (Sheet 3 of 4)**

**INSTALLATION:**

1. Cut three hoses to prescribed length (approximately 3 inches).
2. Install two new hoses (A) and (B) on tube (C).
3. Install two clamps (D) on hose (B).
4. Install clamp (E) on hose (A).
5. Connect tube (F) to hose (B).
6. Connect hose (G) to tube (F).
7. Install clamp (H) to hose (G).
8. Position tube assembly (J) to engine.

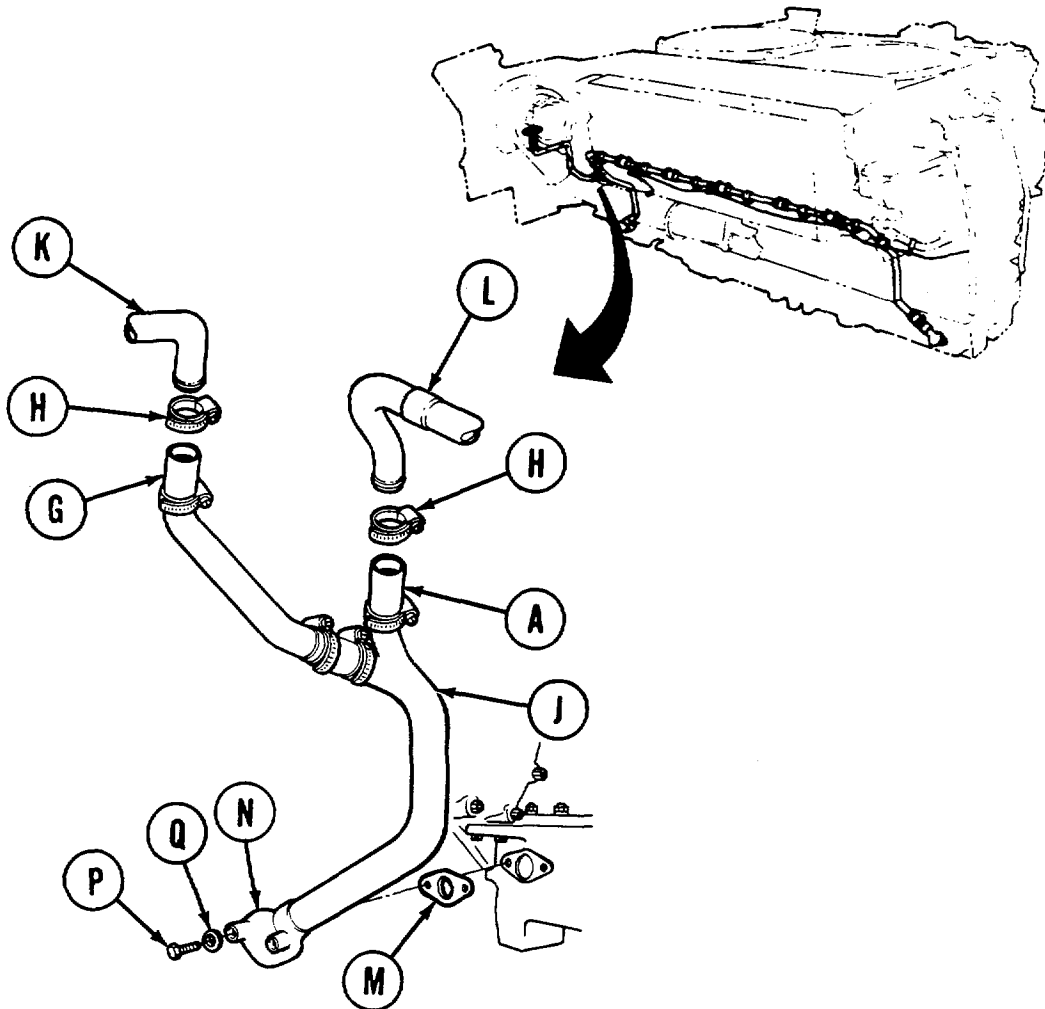


Go on to Sheet 4

TA147516

**TURBOSUPERCHARGER OIL DRAIN TUBE (LEFT BANK) REPLACEMENT (Sheet 4 of 4)**

9. Install two dampers (H) on hoses (A) and (G).
10. Install tube assembly (J) between tube (K) and tube (L).
11. Position new gasket (M) on flange (N) of tube assembly (J).
12. Using socket, install two bolts (P) and two new lockwashers (Q) to secure tube assembly (J).
13. Using screwdriver, tighten six clamps to secure hoses to tubes.
14. Replenish engine oil (LO 9-2350-260-12).
15. Connect powerplant test (ground hop) equipment (page 5.54).
16. Start engine and check oil drain line assembly for leaks.
17. Disconnect powerplant test (ground hop) equipment (page 5-67).
18. Install 2A powerplant (page 5-14) or 2D powerplant (page 5-40).



End of Task

TA147517



**MULTIPLE FLUID PRESSURE LINE CONNECTOR REPLACEMENT (Sheet 1 of 6)**

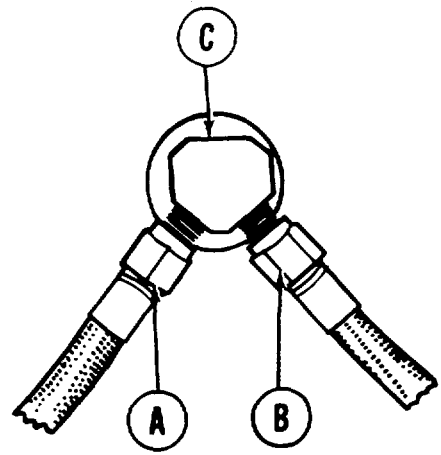
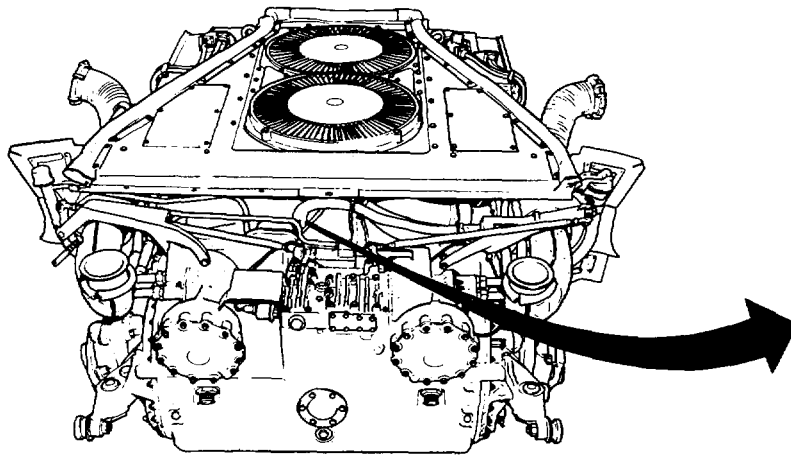
PROCEDURE INDEX

PROCEDURE	PAGE
Removal	6-64
Inspection	6-66
Installation	6-66

TOOLS: 1/2 in. combination box and open end wrench  
 1-1/8 in. deep well socket with 1/2 in. drive  
 1/2 in. socket with 1/2 in. drive  
 Ratchet with 1/2 in. drive  
 11/16 in. combination box and open end wrench  
 1 in. combination box and open end wrench  
 1-1/8 in. open end wrench  
 Flat-tip screwdriver

SPECIAL TOOLS: Ground hop kit (Item 30, Chapter 3, Section I)

PRELIMINARY PROCEDURES: Remove powerplant (page 5-1)  
 Remove rear engine cooling fan (page 948)



REMOVAL:

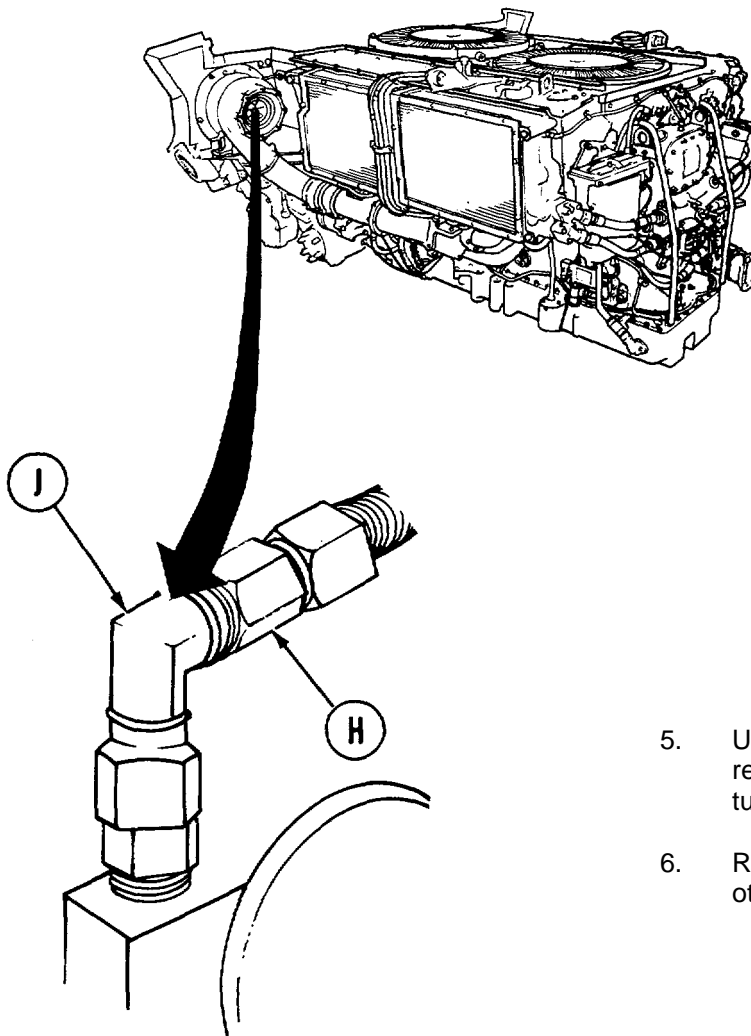
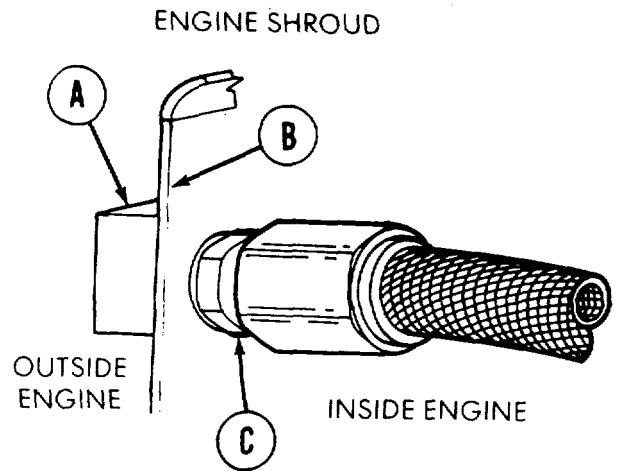
1. Using 11/16 inch wrench, disconnect hoses (A) and (B) from connector (C).

Go on to Sheet 2

TA147518

**MULTIPLE FLUID PRESSURE LINE CONNECTOR REPLACEMENT (Sheet 2 of 6)**

2. Using 1 inch wrench, loosen hose connector (D) while holding retaining nut (E) with 1-1/8 inch wrench.
3. Remove hose (F) from connector (G).
4. Using 1-1/8 inch deep well socket, remove retaining nut (E) and washer from connector (G).



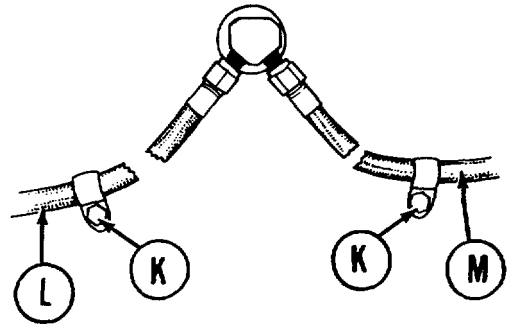
5. Using 11/16 inch wrench, loosen hose (H) and remove it from elbow (J) on right turbosupercharger.
6. Repeat step 5 on left turbosupercharger to remove other hose.

Go on to Sheet 3

TA147519

**MULTIPLE FLUID PRESSURE LINE CONNECTOR REPLACEMENT (Sheet 3 of 6)**

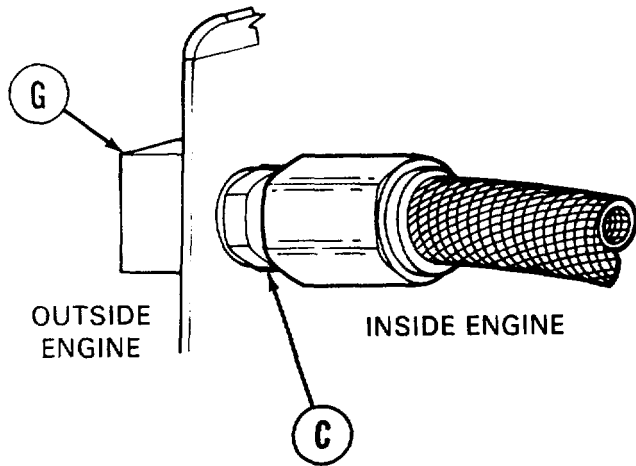
7. Using 1/2 inch wrench, remove loop clamp (K) that secures left hose (L) to engine shroud.
8. Using 1/2 inch socket, remove loop clamp (K) that secures right hose (M) to engine shroud.
9. Remove hose grommets from left and right side engine shrouds.
10. Remove hoses (M) and (L) to inside.



**INSPECTION:**

1. Check hoses for cracks, holes, and leaks.
2. Check hose connectors for stripped thread and wear.
3. Check loop clamps for serviceability.
4. Replace parts as needed.

**ENGINE SHROUD**



**INSTALLATION:**

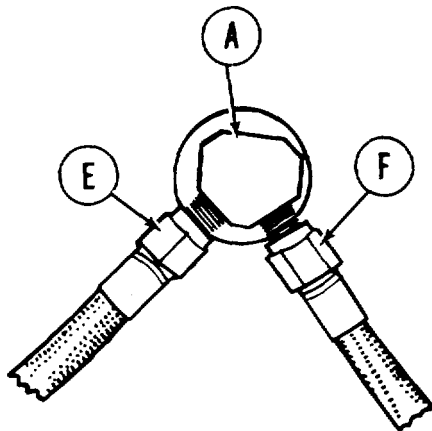
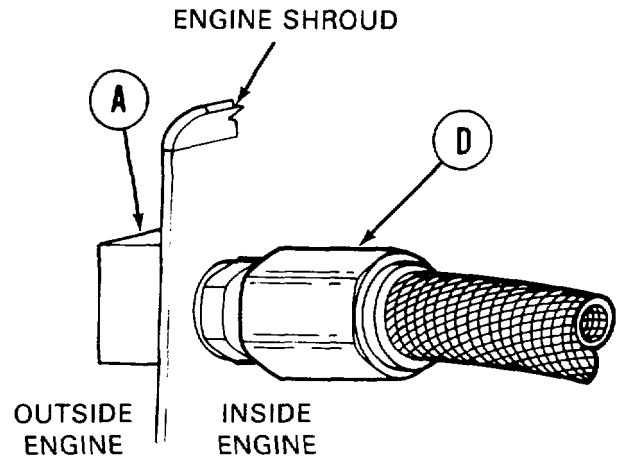
1. Using 1-1/8 inch socket, secure connector (A) with flat washer and retaining nut (C).

Go on to Sheet 4

TA147520

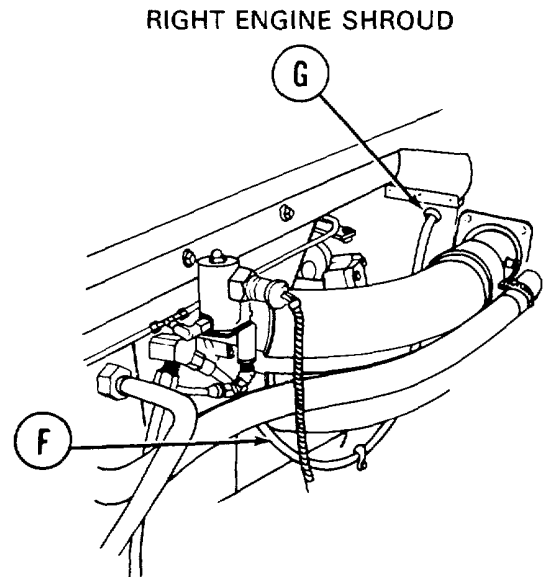
**MULTIPLE FLUID PRESSURE LINE CONNECTOR REPLACEMENT (Sheet 4 of 6)**

2. Connect hose (D) to connector (A).
3. Using 1 inch wrench, tighten hose connector (D). Make sure connector (A) is installed with hose fittings pointed down.



4. Connect hoses (E) and (F) to connector (A).
5. Using 11/16 inch wrench, tighten connectors (E) and (F).

6. Position hose (F) so that free end passes through right engine shroud. Using fingers and screwdriver, position grommet (G) over hose and into shroud.



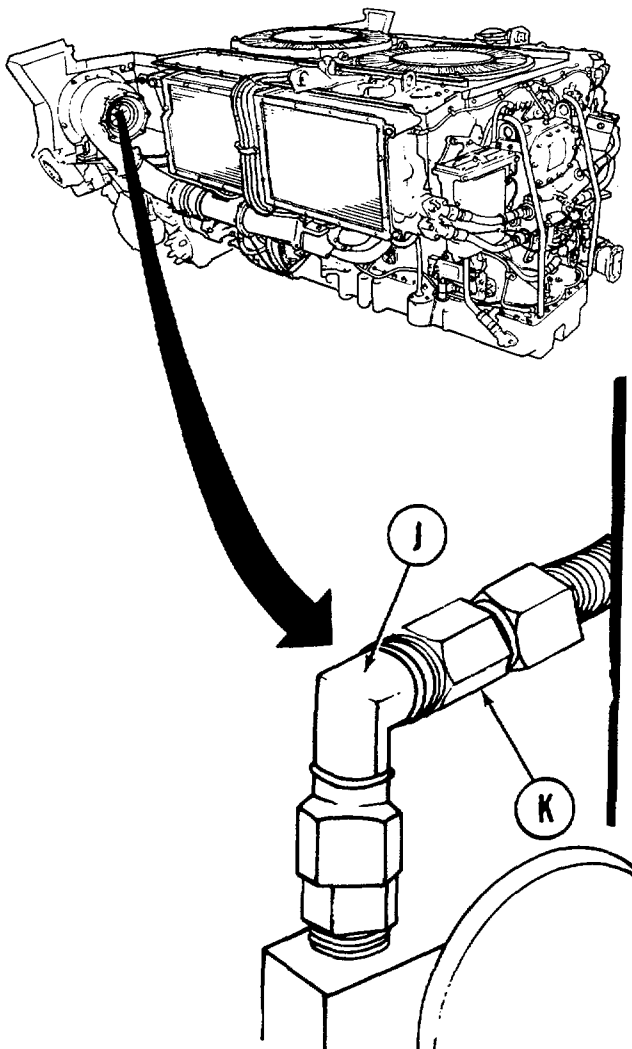
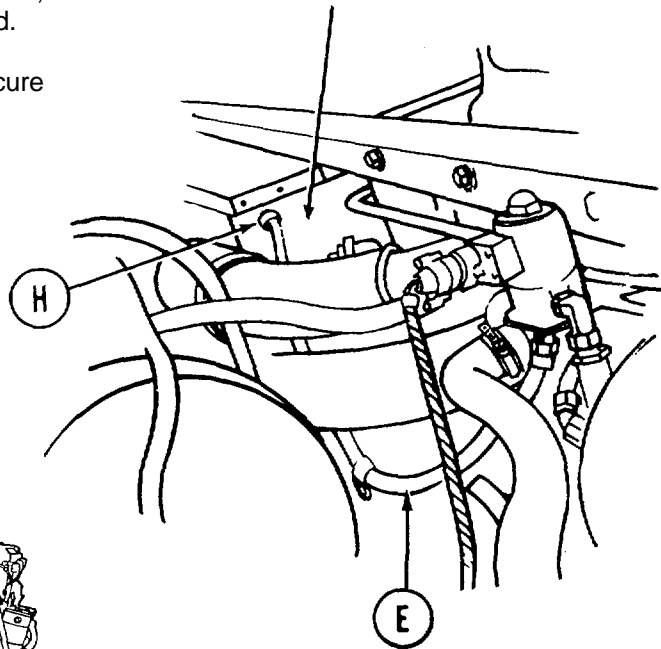
Go on to Sheet 5

TA147521

**MULTIPLE FLUID PRESSURE LINE CONNECTOR REPLACEMENT (Sheet 5 of 6)**

7. Position hose (E) so that free end passes through left engine shroud. Using fingers and screwdriver, position grommet (H) over hose and into shroud.
8. Using 1/2 inch wrench and 1/2 inch socket, secure each he with loop clamp.

LEFT ENGINE SHROUD



9. Using 11/16 inch wrench, connect hose connector (K) to elbow (J) on right turbosupercharger.
10. Repeat step 9 on left turbosupercharger to connect hose (E).

Go on to Sheet 6

TA147522

**MULTIPLE FLUID PRESSURE LINE CONNECTOR REPLACEMENT (Sheet 6 of 6)**

**CAUTION**

**Do not operate powerplant longer than 10 minutes with cooling fans removed.  
Engine speed should not exceed 750 rpm.**

11. Ground hop powerplant (page 5-54).
12. Check all connections for leaks.
13. Disconnect ground hop equipment (page 5-67).
14. Install rear engine cooling fan (page 9-49).
15. Install 2A powerplant (page 5-14) or 2D powerplant (page 5-40).

End of Task

**CRANKCASE BREATHER TEE AND REAR TUBE REPLACEMENT (Sheet 1 of 4)**

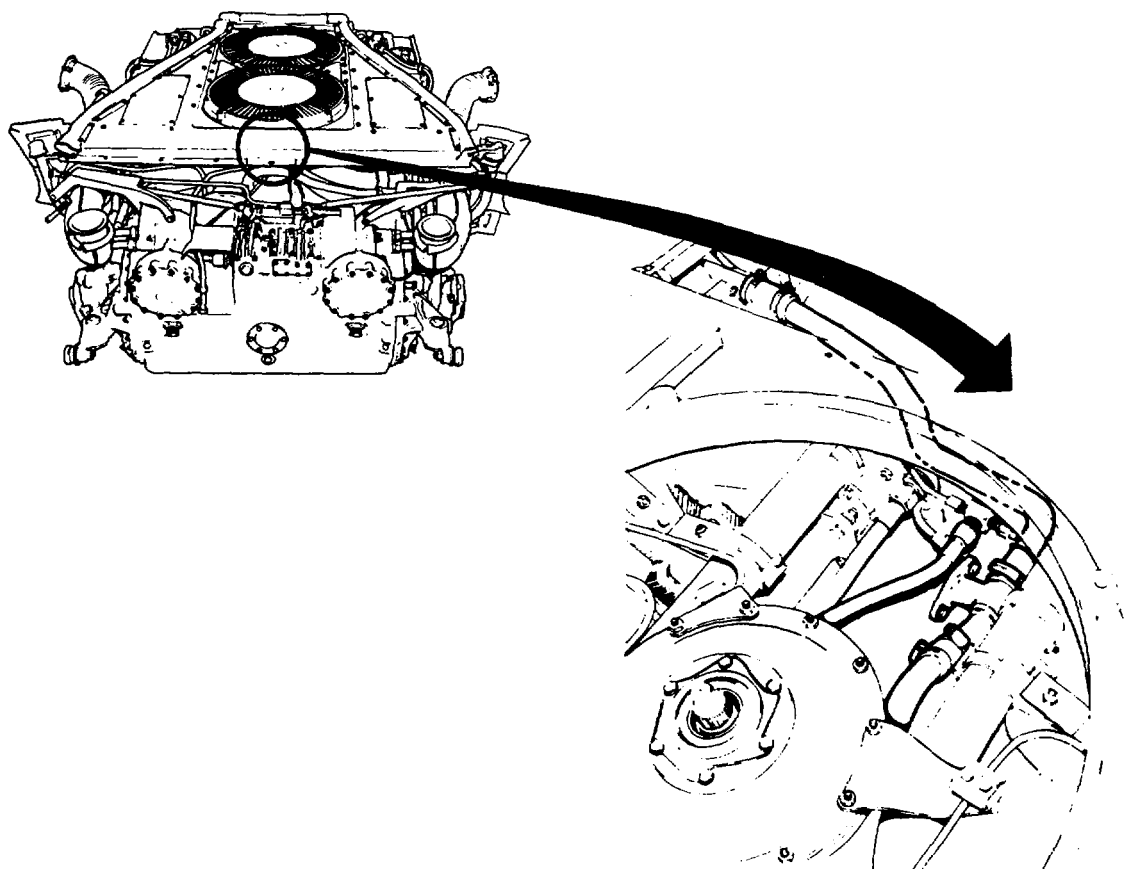
PROCEDURE INDEX

PROCEDURE	PAGE
Removal	6-71
Installation	6-72

TOOLS: 1/2 in. combination box and open end wrench  
 Flat-tip screwdriver with 1/4 in. blade

SUPPLIES: Gasket (8682770) ( required)  
 Hose (10898793)  
 Hose (10898793-1)  
 Hose (10898794)  
 Lockwasher (7410218) (2 required)

PRELIMINARY PROCEDURES: Remove top deck (page 16-20)  
 Remove transmission shroud (page 9-20)  
 Remove rear engine cooling fan (page 9-52)



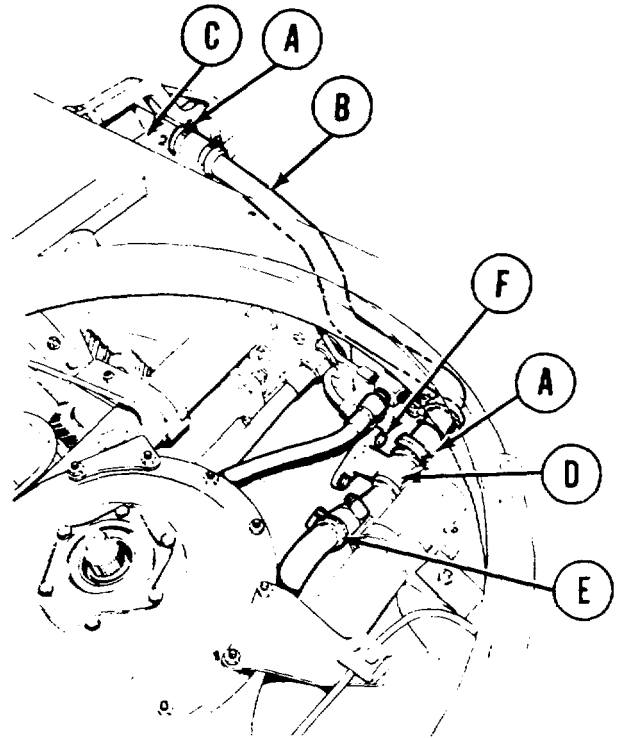
Go o to Sheet 2

TA147523

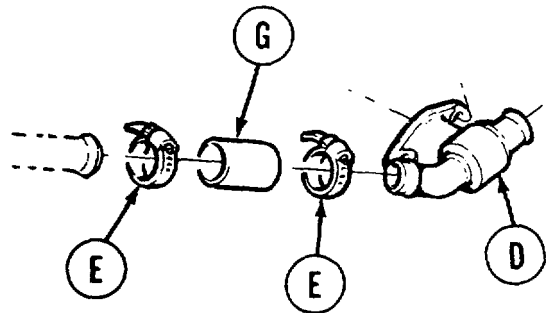
**CRANKCASE BREATHER TEE AND REAR TUBE REPLACEMENT (Sheet 2 of 4)**

**REMOVAL:**

1. Using screwdriver, loosen two dampers (A) holding breather tube (B) to exhaust tube (C) and breather tee (D).
2. Remove breather tube (B) from tank.
3. Using screwdriver, loosen clamp (E).
4. Using wrench, remove two screws and lockwashers (F) holding breather tee (D) to engine.



5. Remove breather tee (D), spacer, and two gasket from engine. Throw gaskets away.
6. Using screwdriver, remove two clamps (E) and hose (G) from breather tee (D). Throw hose (G) away.



Go on to Sheet 3

TA147524

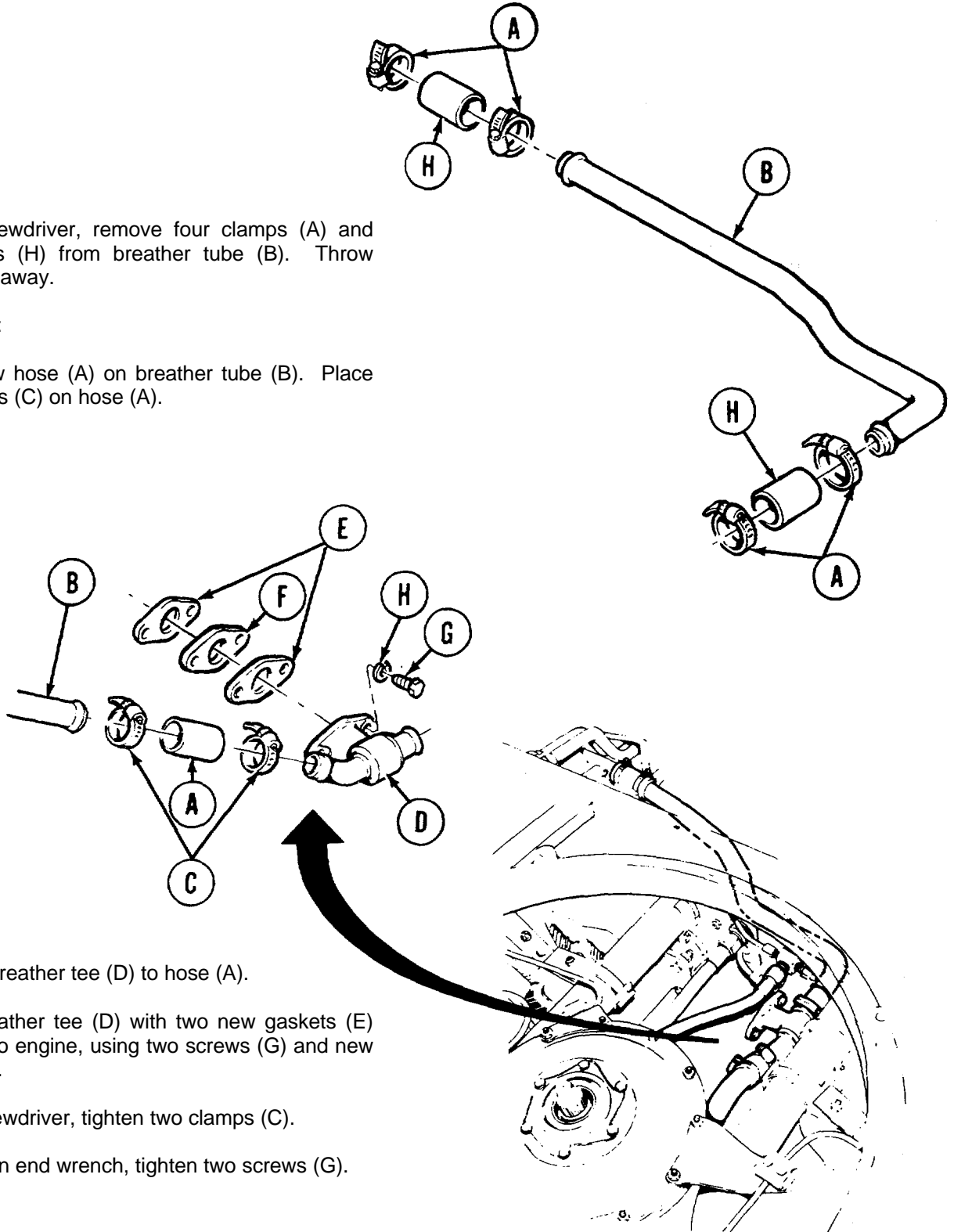


**CRANKCASE BREATHER TEE AND REAR TUBE REPLACEMENT (Sheet 3 of 4)**

- Using screwdriver, remove four clamps (A) and two hoses (H) from breather tube (B). Throw hoses (H) away.

**INSTALLATION:**

- Install new hose (A) on breather tube (B). Place two clamps (C) on hose (A).



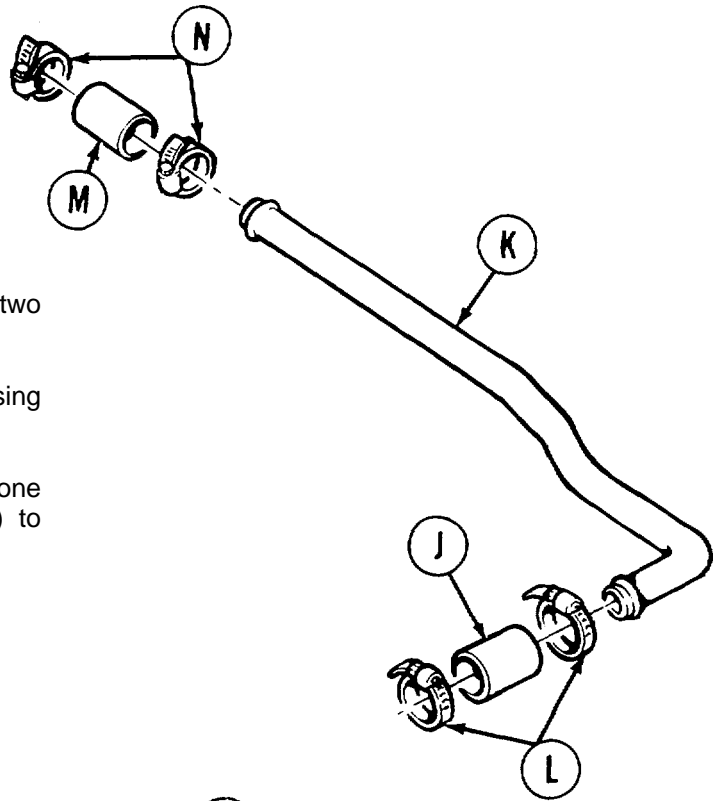
- Connect breather tee (D) to hose (A).
- Install breather tee (D) with two new gaskets (E) and spacer (F) to engine, using two screws (G) and new lockwashers (H).
- Using screwdriver, tighten two clamps (C).
- Using open end wrench, tighten two screws (G).

Go on to Sheet 4

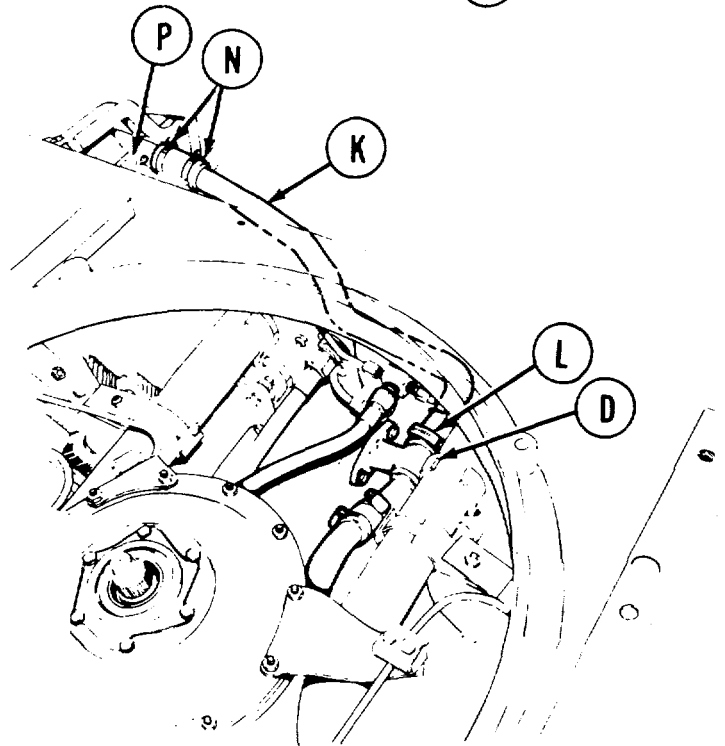
TA147525

**CRANKCASE BREATHER TEE AND REAR TUBE REPLACEMENT (Sheet 4 of 4)**

6. Install new hose (J) to breather tube (K), using two clamps (L).
7. Install new hose (M) to breather tube (K), using two clamps (N).
8. Using screwdriver, tighten one clamp (L) and one clamp (N) to secure hose (J) and hose (M) to breather tube (K).



9. Install breather tube (K) to breather tee (D) and exhaust tube (P).
10. Using screwdriver, tighten clamps (N) and (L).
11. Install rear engine cooling fan (page 9-49).
12. Install transmission shroud (page 9-23).
13. Install top deck (page 16-22).



End of Task

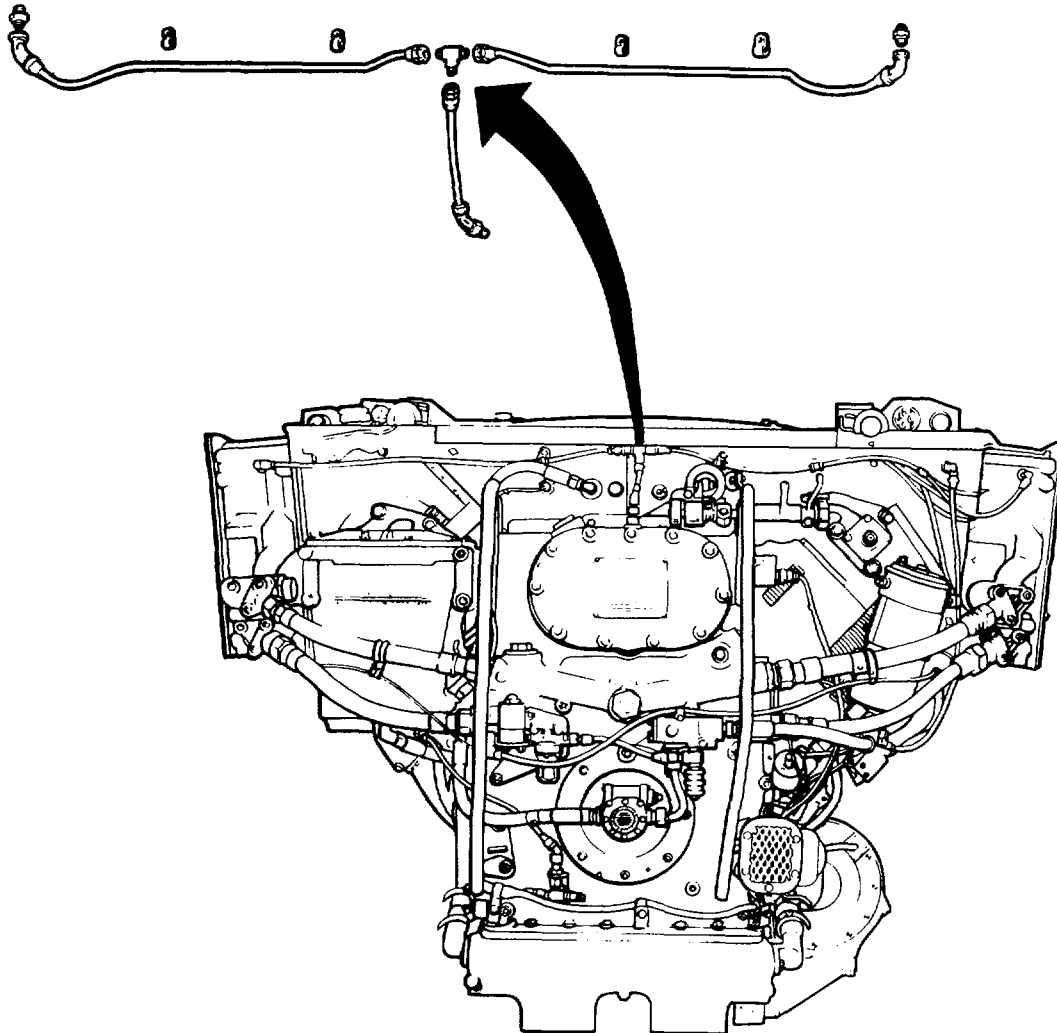
TA147526

**OIL COOLER VENT HOSES AND FITTINGS REPLACEMENT (2D ENGINE) (Sheet 1 of 3)**

TOOLS: 1/2 in. socket with 1/2 in. drive  
 Ratchet with 1/2 in. drive  
 9/16 in. combination box and open end wrench  
 11/16 in. combination box and open end wrench  
 7/16 in. combination box and open end wrench

SUPPLIES: Packing (MS9388-012) (2 required)

PRELIMINARY PROCEDURE: Remove powerplant (page 527)

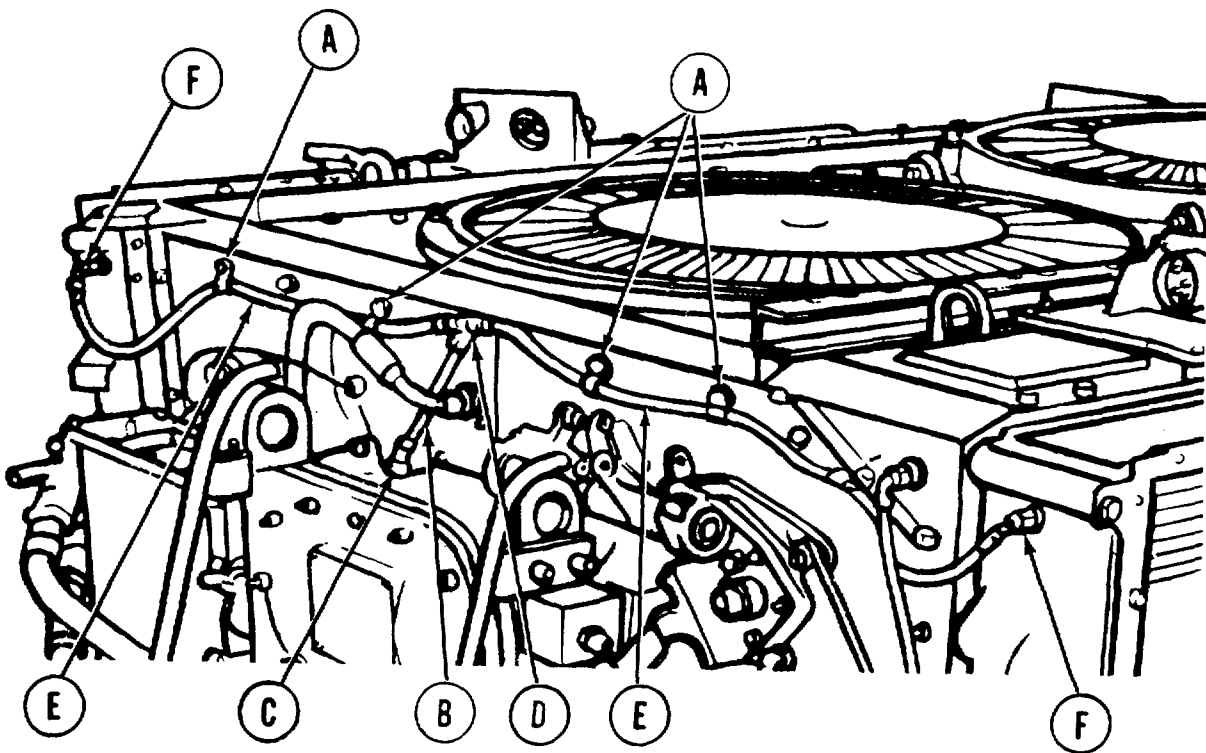


Go on to Sheet 2

TA147527

**OIL COOLER VENT HOSES AND FITTINGS REPLACEMENT (2D ENGINE) (Sheet 2 of 3)****REMOVAL:**

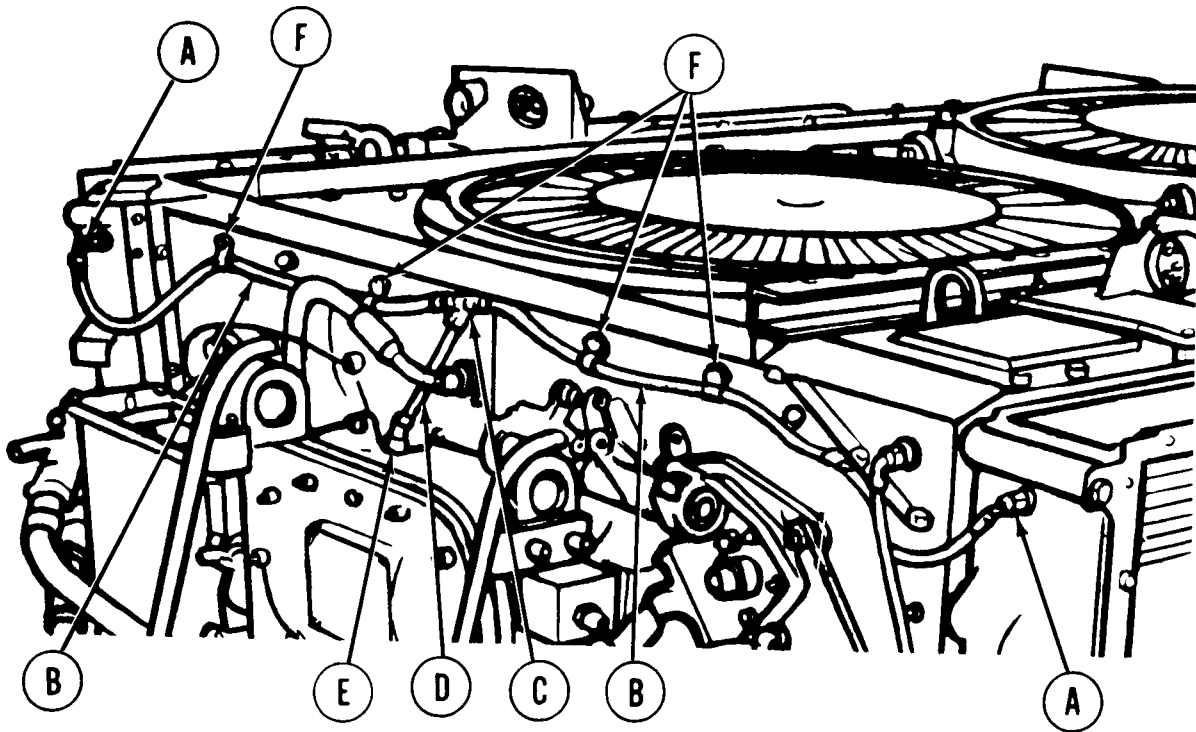
1. Using socket, remove four screws (A) holding loop clamps.
2. Using 9/16 inch wrench, remove hose assembly (B) from adapter (C).
3. Using 9/16 inch wrench, remove hose assembly (B) from tee tube (D).
4. Holding tee tube (D) with 7/16 inch wrench and using 9/16 inch wrench, remove two hose assemblies (E) from tee tube (D).
5. Using 9/16 inch wrench, remove two hose assemblies (E) from two adapters (F).
6. Using 11/16 inch wrench, remove two adapters (F) from oil coolers.
7. Using 9/16 inch wrench, remove adapter (C).
8. Remove packing from two adapters (F). Throw packing away.
9. Check two hoses (B) for frayed covering and damaged threads. Replace damaged hoses.
10. Check fittings for cracks and thread damage. Replace damaged fittings.



Go on to Sheet 3

TA147528

## OIL COOLER VENT HOSES AND FITTINGS REPLACEMENT (2D ENGINE) (Sheet 3 of 3)



## INSTALLATION:

1. Install new packing into two adapters (A).
2. Using 11/16 inch wrench, install two adapters (A) into oil coolers.
3. Using 9/16 inch wrench, install adapter (E).
4. Using 9/16 inch wrench, install two hose assemblies (B) to two adapters (A).
5. Holding tee tube C with 7/16 inch open end wrench and using 9/16 inch wrench, install two hose assemblies (B) to tee tube (C).
6. Using 9/16 inch wrench, install hose assembly (D) to tee tube (C).
7. Using 9/16 inch wrench, install hose assembly (D) to adapter (E).
8. Using socket, install four screws (F) holding loop clamps.
9. Install powerplant (page 5-40).

End of Task

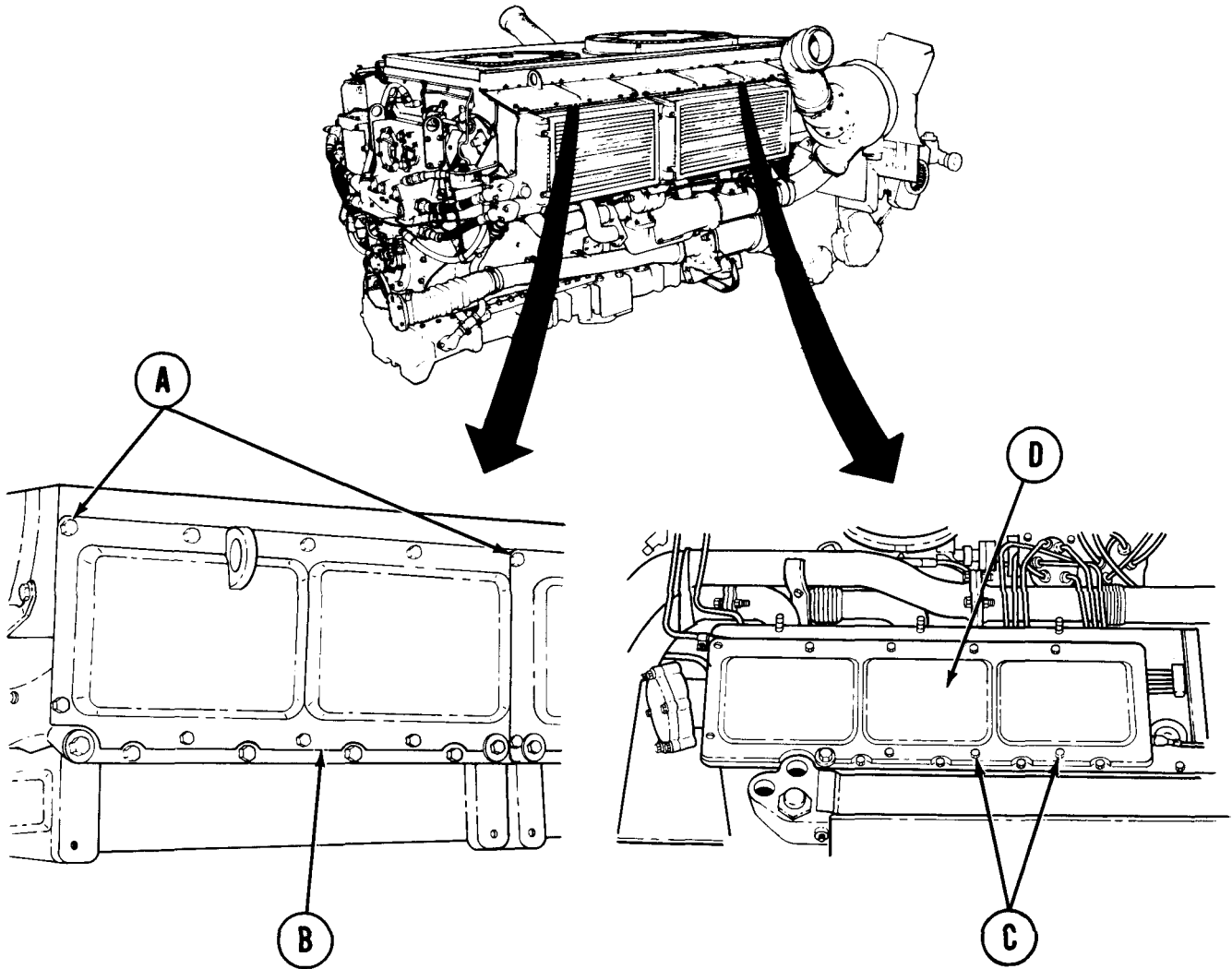
TA147529

**ENGINE ACCESS COVERS (RIGHT BANK) REPLACEMENT (2A ENGINE) (Sheet 1 of 2)**

TOOLS: 1/2 in. socket with 1/2 in. drive  
 3 in. extension with 1/2 in. drive  
 Ratchet with 1/2 in. drive

PRELIMINARY PROCEDURES: Remove powerplant (page 5-2)  
 Remove engine shroud (page 9-2)

REMOVAL:



1. Using socket, remove 10 bolts (A) securing cover (B).
2. Remove cover (B).
3. Using socket, remove 11 bolts (C) securing cover (D).
4. Remove cover (D).

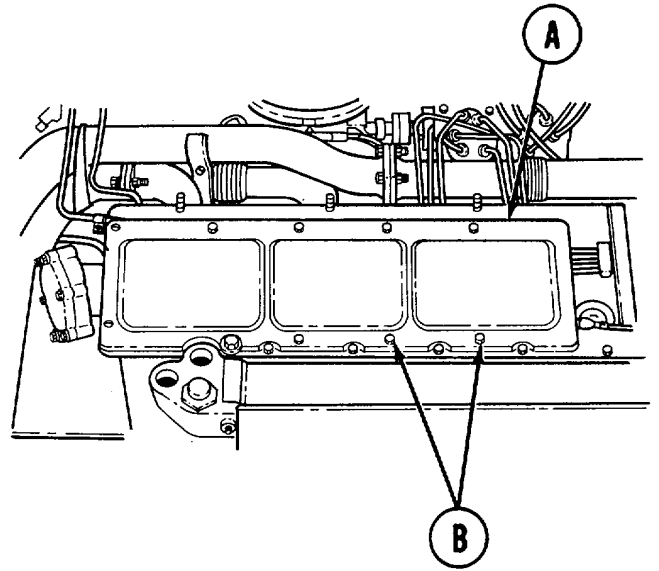
Go on to Sheet 2

TA147530

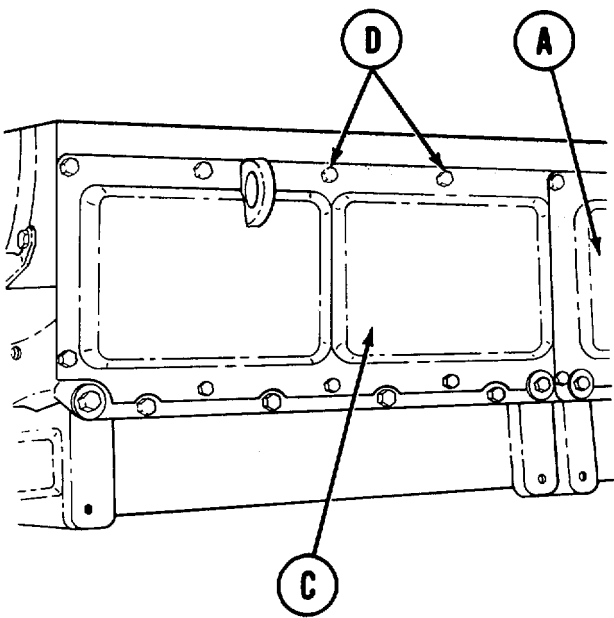
**ENGINE ACCESS COVERS (RIGHT BANK) REPLACEMENT (2A ENGINE) (Sheet 2 of 2)**

**INSTALLATION:**

1. Position cover (A) onto engine.
2. Using socket, install and tighten 11 bolts (B) securing cover and shroud. Do not install bolts in holes toward front of engine.



3. Position cover (C) onto engine.
4. Using socket, install and tighten 10 bolts (D) securing covers (C and A).
5. Install engine shroud (page 9-3).
6. Install powerplant (page 5-14).



End of Task

TA147531

**ENGINE ACCESS COVERS (RIGHT BANK) REPLACEMENT (2D ENGINE) (Sheet 1 of 5)**

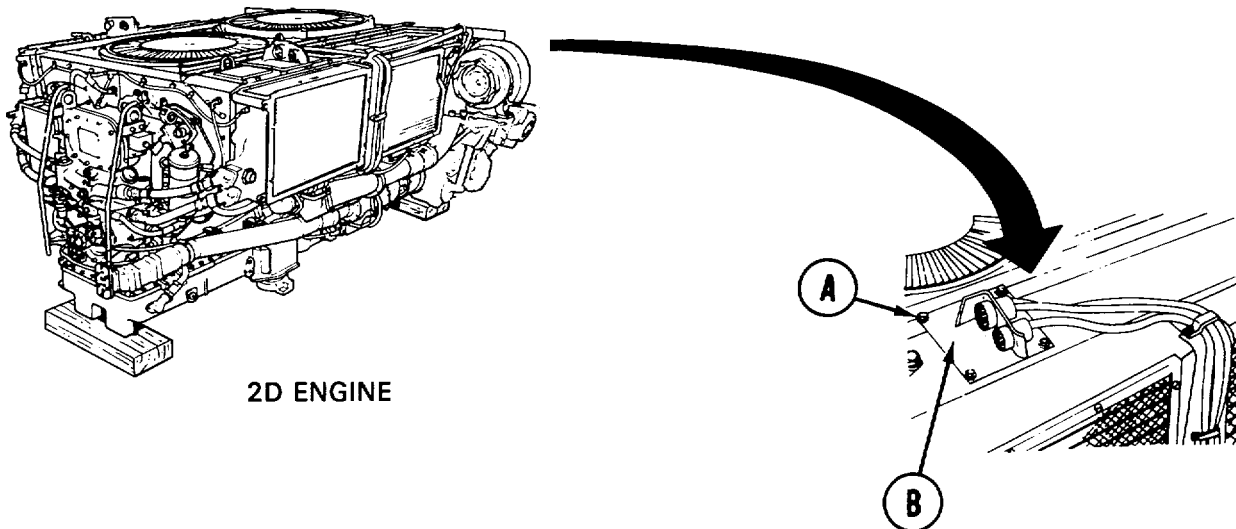
PROCEDURE INDEX

PROCEDURE	PAGE
Removal	6-79
Installation	6-82

TOOLS: 1/2 in. socket with 1/2 in. drive  
 4 in. extension with 1/2 in. drive  
 Ratchet with 1/2 in. drive  
 9/16 in. combination box and open end wrench  
 11/16 in. combination box and open end wrench  
 Container

SUPPLIES: Rags (Item 65, Appendix D)

PRELIMINARY PROCEDURES: Remove powerplant (page 5-27)  
 Remove engine shroud (page 9-2)



REMOVAL:

1. Using socket, remove four screws and washers (A) securing plat with electrical connectors (B) to front engine access cover.
2. Place plate with electrical connectors (B) aside.

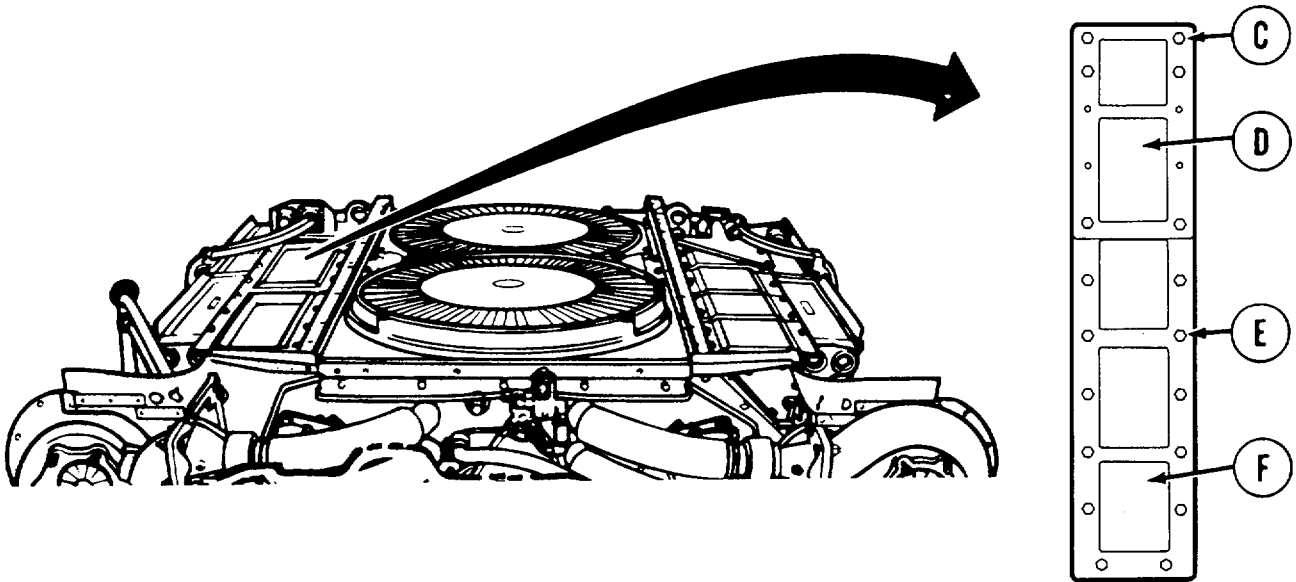
Go on to Sheet 2

TA147532



**ENGINE ACCESS COVERS (RIGHT BANK) REPLACEMENT (2D ENGINE) (Sheet 2 of 5)**

3. Using socket, remove remaining six screws and washers (C) securing front engine access cover (D).
4. Remove front engine access cover (D).



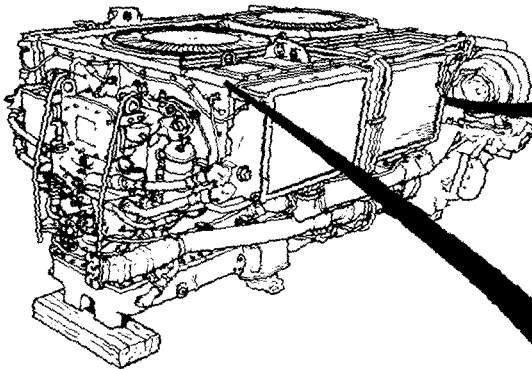
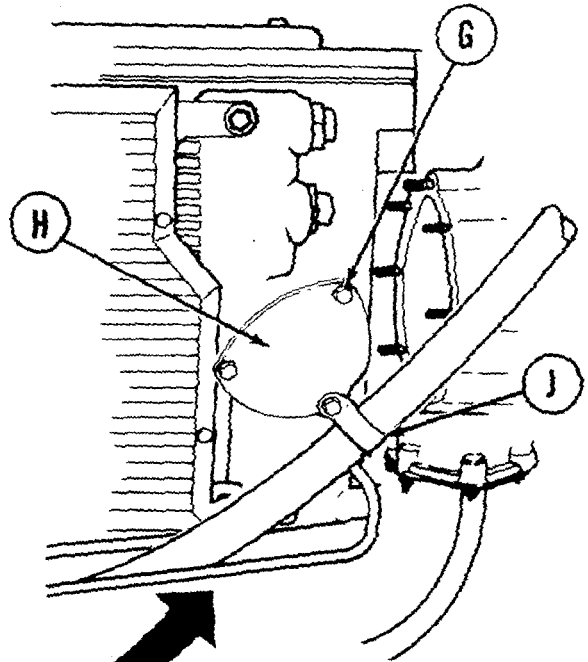
5. Using socket, remove remaining 12 screws and washers (E) securing rear engine access cover (F).
6. Remove rear engine access cover (F).

Go on to Sheet 3

TA147533

**ENGINE ACCESS COVERS (RIGHT BANK) REPLACEMENT (2D ENGINE) (Sheet 3 of 5)**

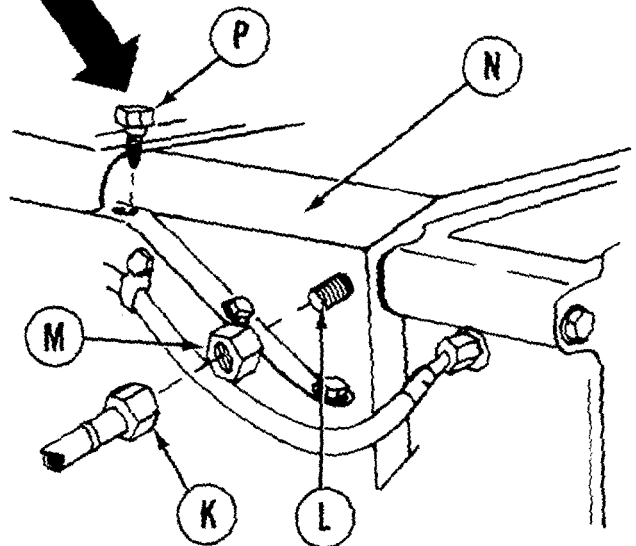
7. Using socket, remove three screws and washers (G) securing timing access cover (H) to engine.
8. Remove timing access cover (H) and fuel line hose and clamp (J) from cover (H)..



**NOTE**

Use a container or rags (Item 65, Appendix D) to catch fuel leakage when any fuel line or fitting is loosened or disconnected.

9. Using 9/16 inch wrench, disconnect fuel return hose, fitting (K) from union (L).
10. Using 11/16 inch wrench, remove nut (M) securing union (L) to access cover (N).
11. Pull union (L) with hose attached out of access cover. (Pull union and hose toward rear of engine.)
12. Using socket and extension, remove three screws and washers (P).
13. Remove access cover (N).



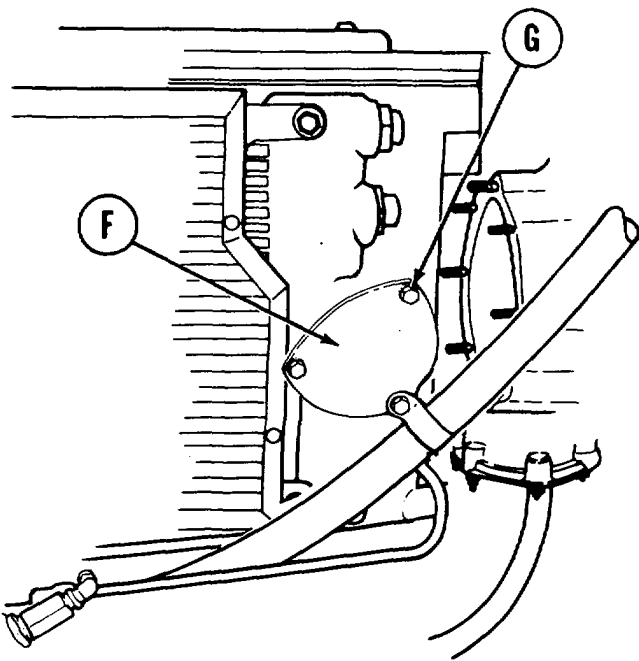
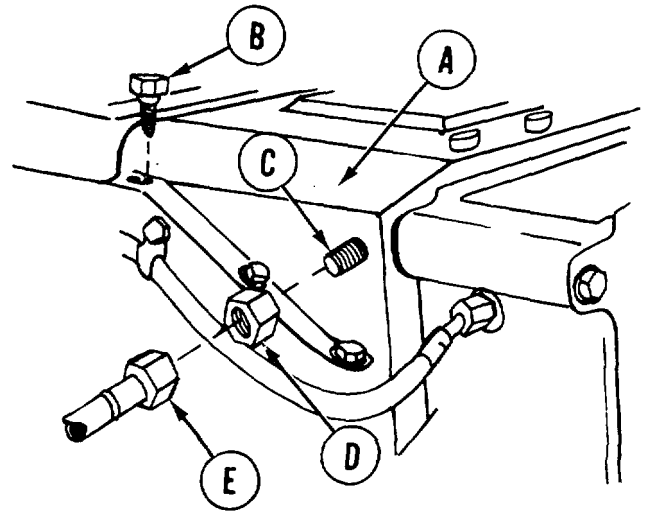
Go on to Sheet 4

TA147534

**ENGINE ACCESS COVERS (RIGHT BANK) REPLACEMENT (2D ENGINE) (Sheet 4 of 5)**

**INSTALLATION:**

1. Position access cover (A) in place on engine.
2. Install three screws and washers (B) to secure access cover.
3. Using socket and extension, tighten three screws (B).
4. Install union (C) with hose attached in access cover (A).
5. Install nut (D) onto union (C). Using 11/16 inch wrench, tighten nut (D).
6. Connect fuel return hose fitting (E) to union (C). Using 9/16 inch wrench, tighten hose fitting (E).



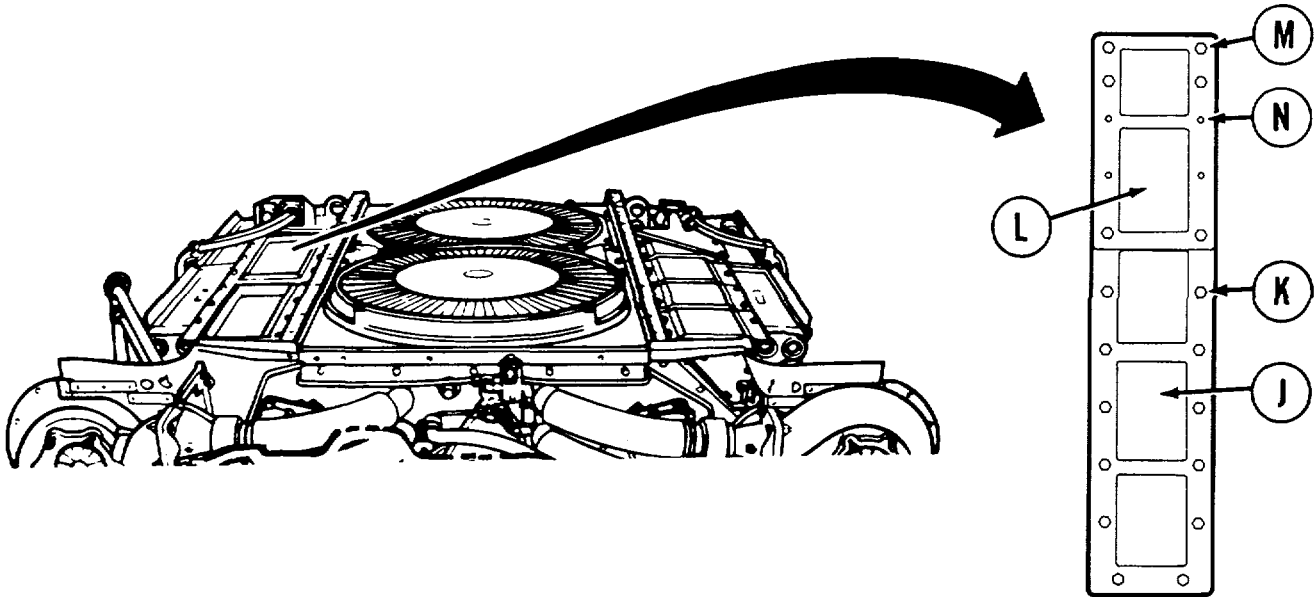
7. Position timing access cover (F) in place on engine.
8. Install three screws and washers (G) to secure timing access cover (F) and fuel line hose clamp (H) on engine. Using socket, tighten three screws (G).

Go on to Sheet 5

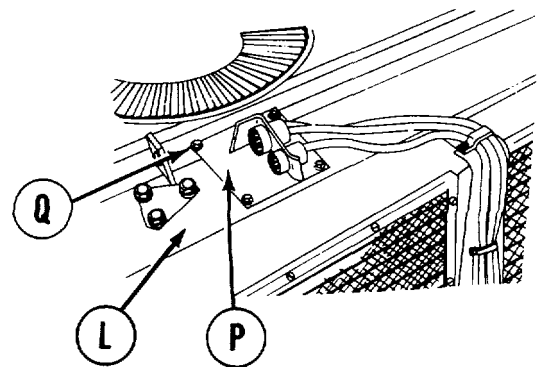
TA147535

**ENGINE ACCESS COVERS (RIGHT BANK) REPLACEMENT (20 ENGINE) (Sheet 5 of 5)**

9. Position rear engine access cover (J) in place on engine.
10. Install 12 screws and washers (K). Do not install screws in last holes toward front of engine. Using socket, tighten 12 screws (K).



11. Position front engine access cover (L) in place on engine.
12. Install six screws and washers (M). Do not install screw in four holes (N). Using socket tighten six screws (M).
13. Position plate with electrical connector (P) on front engine access cover (L). Aline screw holes in plate (P) with those in front engine access plate).
14. Install four screws and washers (Q) to secure plate to shroud. Using socket, tighten four screws (Q).
15. Install engine shroud (page 9-3).
16. Install powerplant (page 5-40).



End of Task

TA147536

**ENGINE ACCESS COVERS (LEFT BANK) REPLACEMENT (2A ENGINE) (Sheet 1 of 4)**

PROCEDURE INDEX

PROCEDURE	PAGE
Removal	6-84
Installation	6-86

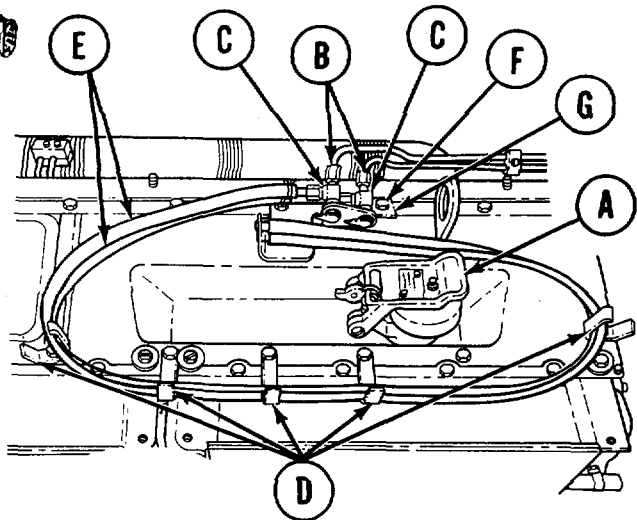
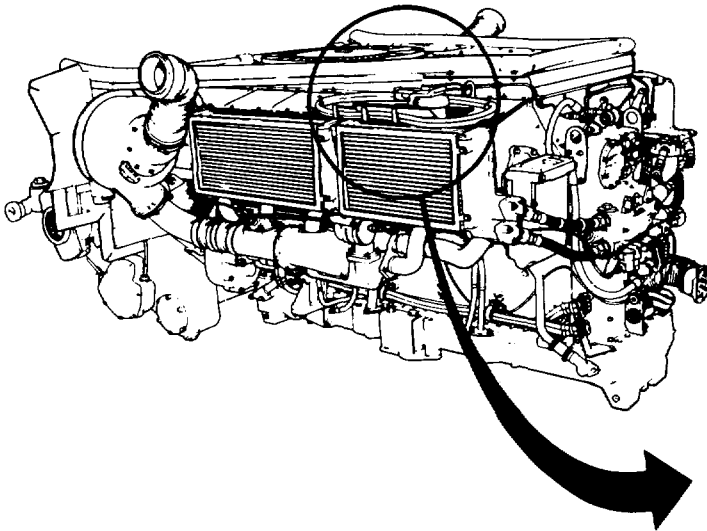
**TOOLS:** 3/8 in. combination box and open end wrench  
 1/2 in. socket with 1/2 in. drive  
 5 in. extension with 1/2 in. drive  
 Ratchet with 1/2 in. drive

**SUPPLIES:** Gasket (10935621)  
 Preformed packing (MS28775-327)  
 Lockwasher (7410218) (2 required)

**PRELIMINARY PROCEDURES:** Remove powerplant (page 5-2)  
 Remove engine oil level gage cap and access cover (page 6-34)

**REMOVAL:**

1. Open cap assembly (A) and remove oil level gage.
2. Using 3/8 inch wrench, disconnect fuel drain tubes (B) from valves (C).



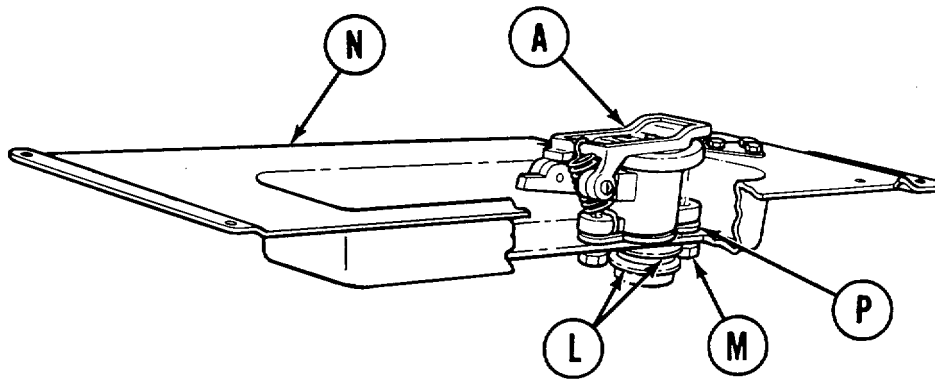
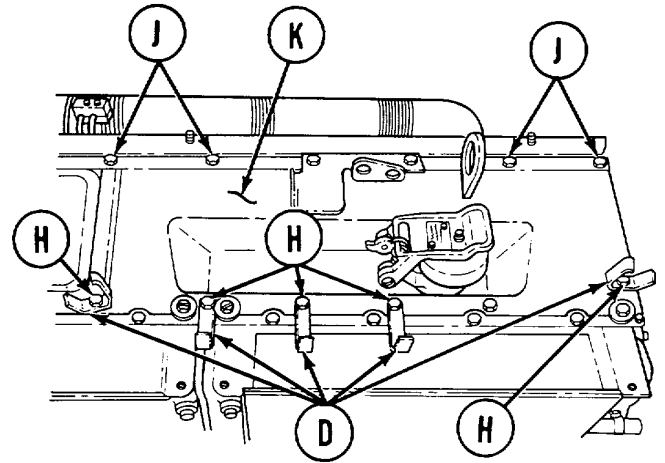
3. Open traps (D) and remove fuel drain hoses (E).
4. Using 1/2 inch socket, remove two screws (F) securing valves (C) and bracket (G).
5. Remove bracket (G), valves (C), and hoses (E) as a unit from engine.

Go on to Sheet 2

TA147537

**ENGINE ACCESS COVERS (LEFT BANK) REPLACEMENT (2A ENGINE) (Sheet 2 of 4)**

6. Using 1/2 inch socket remove five screws (H) securing straps (D). Remove straps from engine.
7. Using 1/2 inch socket, remove five screws (J) securing cover and cap assembly (K) to engine.
8. Remove cover and cap assembly (K) from engine.



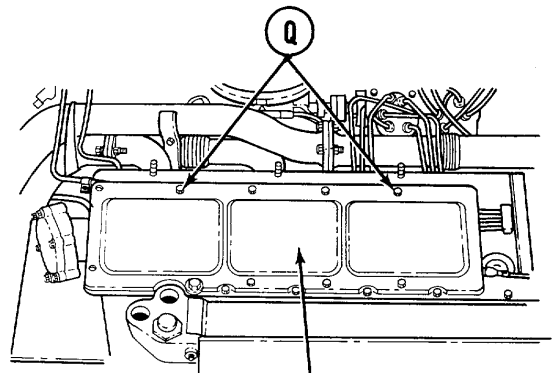
9. Remove and throw away two preformed packings (L).
10. Using 1/2 inch socket, remove two bolts and lockwashers (M) securing cap assembly (A) to cover (N). Throw lockwashers away.
11. Remove cap assembly (A) and gasket (P) from cover (N). Throw gasket away.

Go on to Sheet 3

TA147538

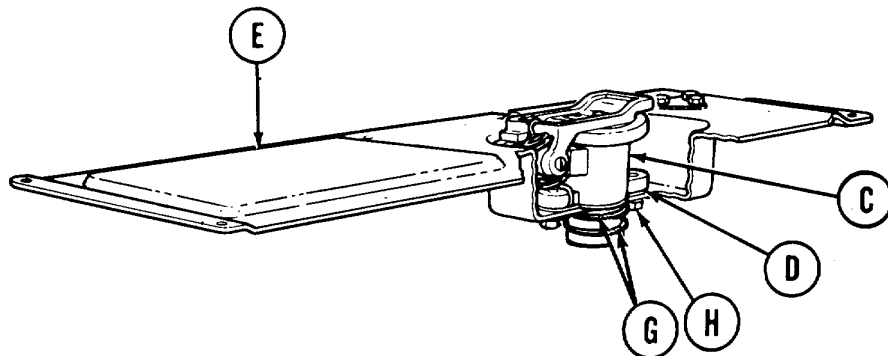
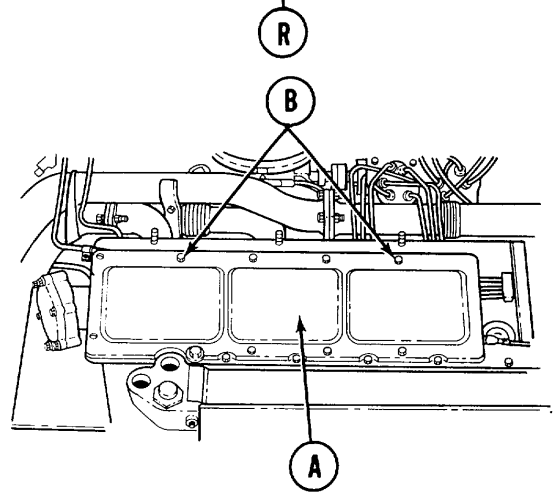
**ENGINE ACCESS COVERS (LEFT BANK) REPLACEMENT (2A ENGINE) (Sheet 3 of 4)**

12. Using socket, remove nine bolts (Q) securing cover (R).
13. Remove cover (R).



**INSTALLATION:**

1. Position cover (A) onto engine.
2. Using 1/2 inch socket, install and tighten nine bolt (B) securing cover (A). Do not install bolts in last two holes toward front of engine.
3. Position cap assembly (C) and new gasket (D) onto cover (E).
4. Using 1/2 inch socket, install and tighten two screws and new lockwashers (H) to secure cap assembly (C) to cover (E).
5. Install two new preformed packings (G) onto cap assembly (C).

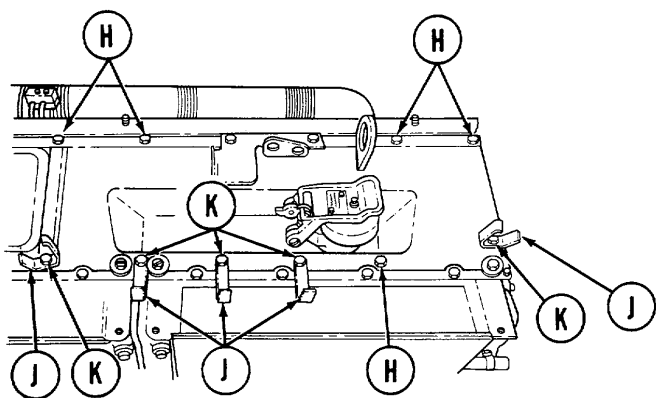


6. Position cap assembly (C) and cover (E) as a unit onto engine.

Go on to Sheet 4

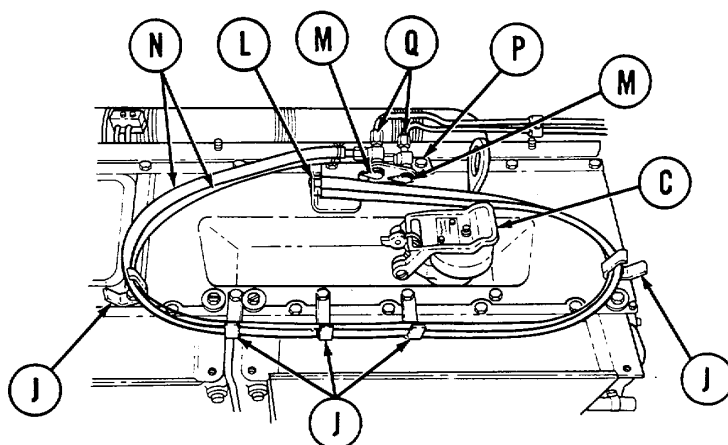
TA147539

**ENGINE ACCESS COVERS (LEFT BANK) REPLACEMENT (2A ENGINE) (Sheet 4 of 4)**



7. Using 1/2 inch socket, install and tighten five screws (H) securing cover to engine.
8. Position five traps (J) onto cover and engine.

9. Using 1/2 inch socket, install and tighten five screws (K) securing straps (J).
10. Position bracket (L) with valves (M) and fuel drain hoses (N) onto cover and engine.
11. Using socket, install and tighten two bolts (P) securing bracket (L).
12. Position drain hoses (N) into straps (J) and bend straps ( over hoses (N).
13. Position drain tubes (Q) onto valves (M). Using 3/8 inch wrench, tighten tube nuts onto valves.
14. Open cap assembly (C) and insert oil level gage.
15. Install powerplant (page 5-14).



End of Task

TA147540



## ENGINE ACCESS COVERS (LEFT BANK) REPLACEMENT (2D ENGINE) (Sheet 1 of 5)

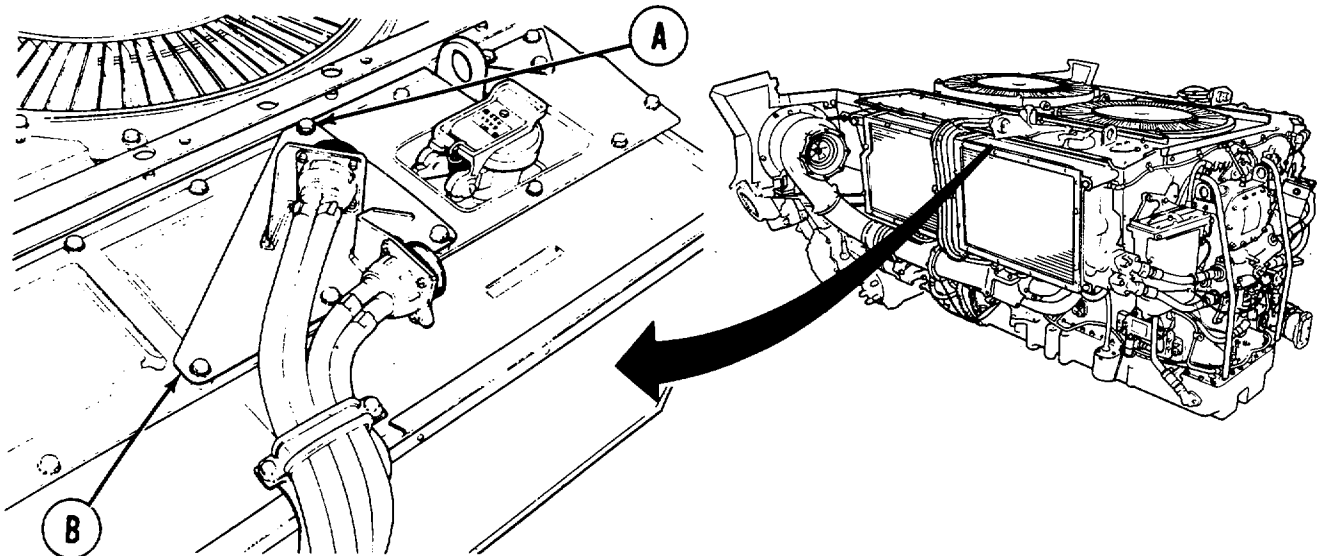
## PROCEDURE INDEX

PROCEDURE	PAGE
Removal	6-88
Installation	6-91

TOOLS: 1/2 in. socket with 1/2 in. drive  
 Ratchet with 1/2 in. drive  
 3 in. extension with 1/2 in. drive  
 1/2 in. combination box and open end wrench

SUPPLIES: Gasket (10935621)  
 Lockwasher (7410218) (2 required)

PRELIMINARY PROCEDURES: Remove powerplant (page 5-27)  
 Remove engine shroud (page 9-2)



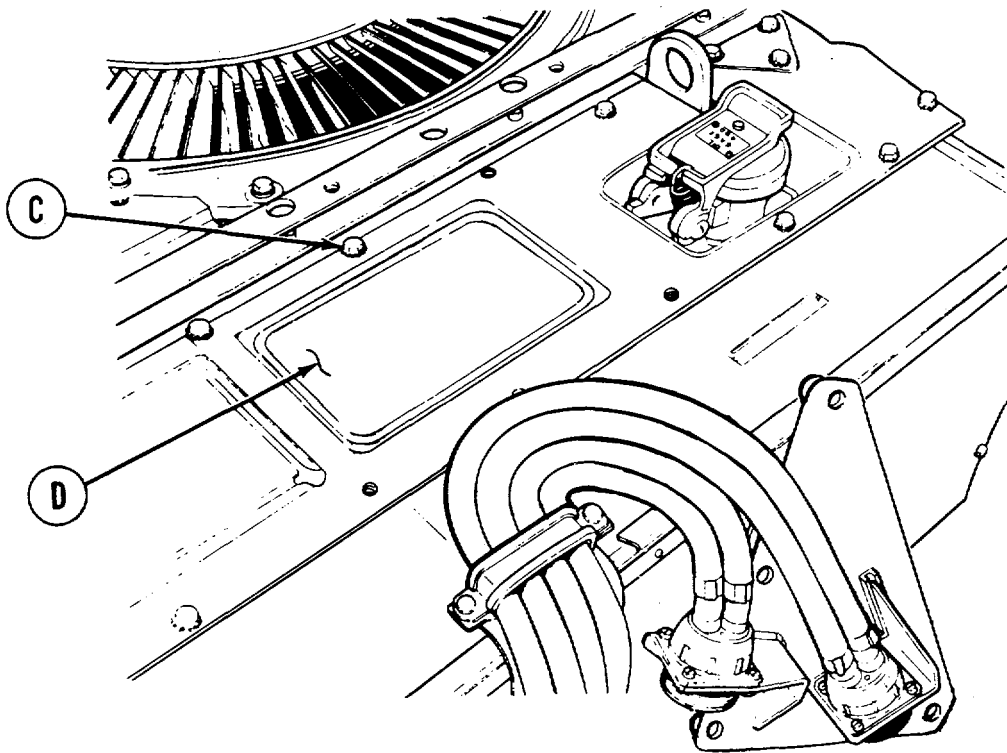
## REMOVAL:

1. Using socket, remove four screws and washers (A) securing plate with electrical connectors (B).
2. Position plate with electrical connectors (B) aside.

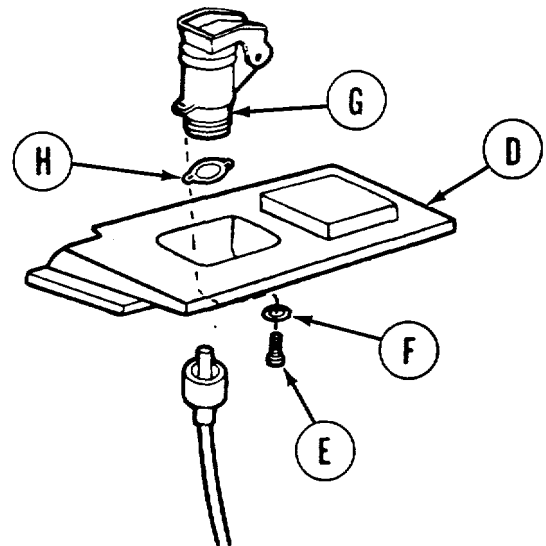
Go on to Sheet 2

TA147541

ENGINE ACCESS COVERS (LEFT BANK) REPLACEMENT (2D ENGINE) (Sheet 2 of 5)



3. Using socket, remove eight screws and washers (C).
4. Remove front engine access plate (D) with cap assembly (G).
5. Using socket, remove two screws (E) and lockwashers (F).
6. Remove cap assembly (G) and gasket (H) from access plate (D). Throw gasket (H) away.

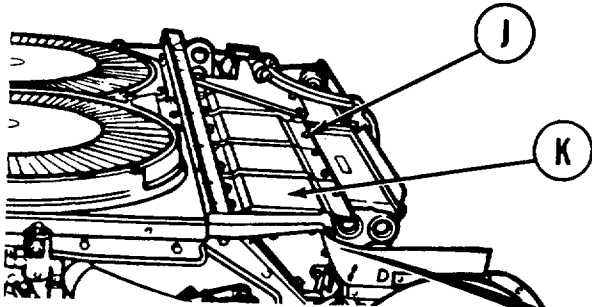


Go on to Step 3

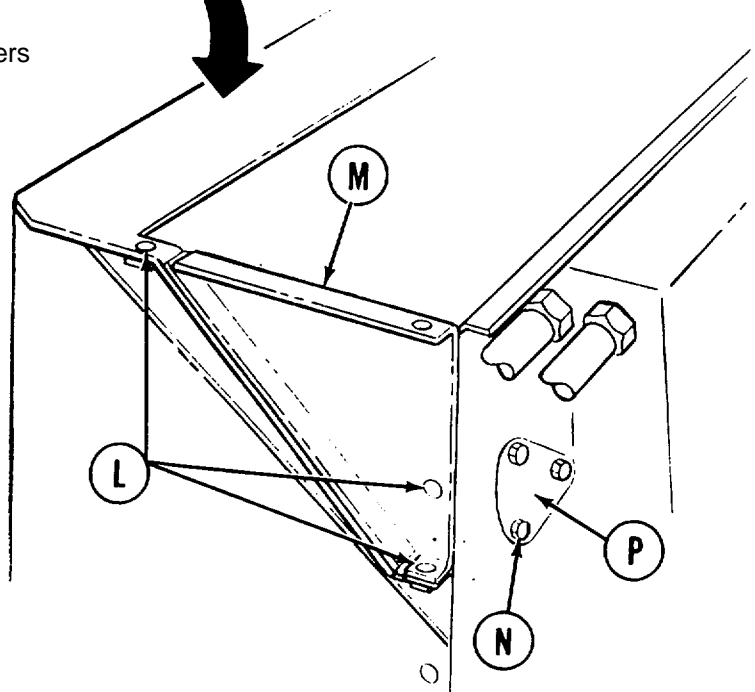
TA147542

**ENGINE ACCESS COVERS (LEFT BANK) REPLACEMENT (2D ENGINE) (Sheet 3 of 5)**

7. Using socket, remove 10 screws and washers (J).
8. Remove rear engine access cover (K).



9. Using wrench or socket, remove six screws and washers (L).
10. Remove access cover (M).
11. Using wrench, remove three screws and washers (N).
12. Remove timing access cover (P).



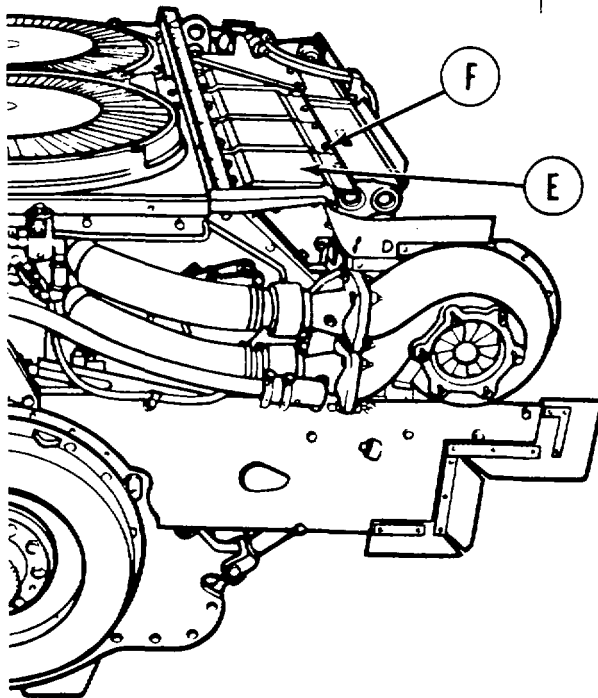
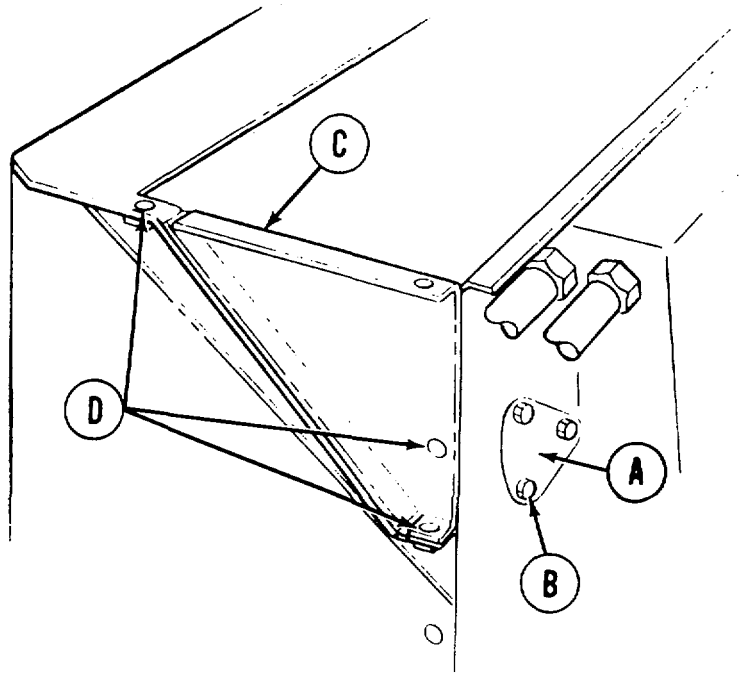
Go on to Sheet 4

TA147543

**ENGINE ACCESS COVERS (LEFT BANK) REPLACEMENT (2D ENGINE) (Sheet 4 of 5)**

**INSTALLATION:**

1. Position timing access cover (A) to engine.
2. Install three screws and washers (B) to secure timing access cover (A) to engine. Using wrench, tighten screws.
3. Position access cover (C) in place on engine.
4. Install six screws and washers (D) to secure access cover (C). Using wrench or socket, tighten screws.



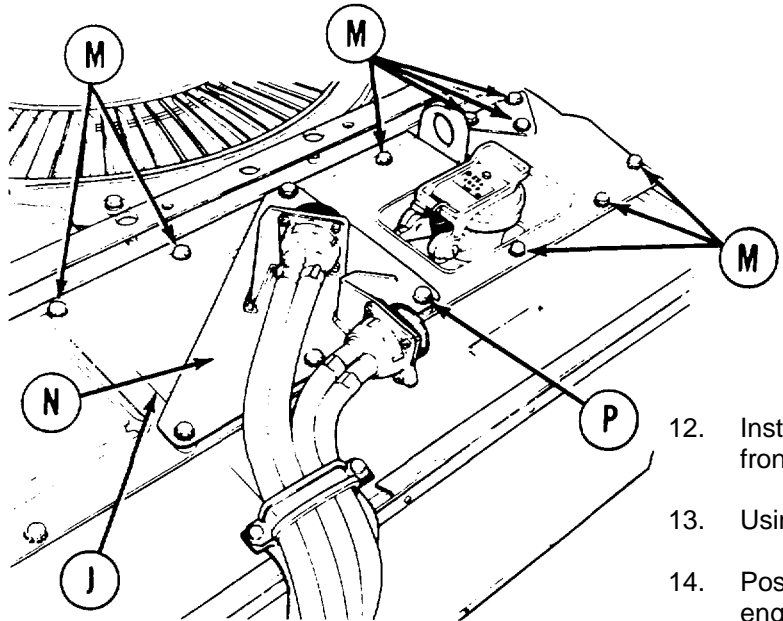
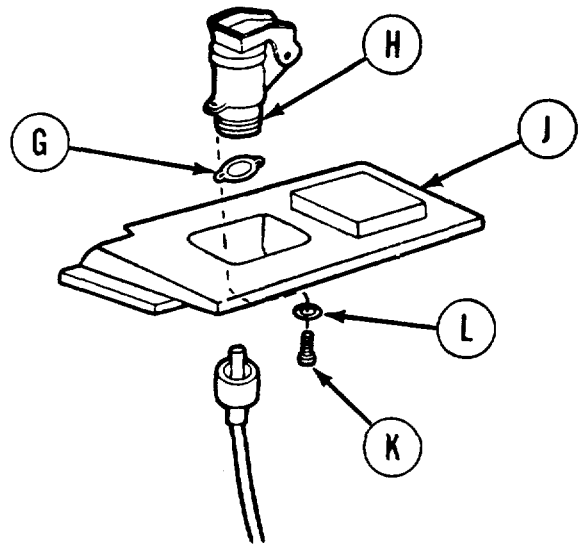
5. Position rear engine access cover (E) to engine.
6. Install 10 screws and washers (F) to secure rear engine access cover (E). Do not install screws in last two holes toward front of engine.
7. Using socket, tighten screws (F).

Go on to Sheet 5

TA147544

**ENGINE ACCESS COVERS (LEFT BANK) REPLACEMENT (2D ENGINE) (Sheet 5 of 5)**

8. Position new gasket (G) and cap assembly (H) to front engine access cover (J).
9. Install two screws (K) and lockwashers (L) to secure cap assembly (H) to front engine access cover (J).
10. Using socket, tighten screws (K).
11. Position front engine access cover (J) and cap assembly (H) in place on engine.



12. Install eight screws and washers (M) to secure front engine access cover.
13. Using socket, tighten screws (M).
14. Position plate with electrical connectors (N) on engine.

15. Install four screws and washers (P) to secure plate with electrical connectors (N).
16. Using socket, tighten screws (P).
17. Install engine shroud (page 9-3).
18. Install powerplant (page 5-40).

End of Task

TA147545

**POWERPLANT OIL COOLERS FRAME AND BRACKETS REPLACEMENT (2A ENGINE) (Sheet 1 of 5)**

PROCEDURE INDEX

PROCEDURE	PAGE
Removal	6-94
Installation	6-95

TOOLS: Flat-tip screwdriver  
 1/2 in. socket with 1/2 in. drive  
 5 in. extension with 1/2 in. drive  
 Ratchet with 1/2 in. drive

SUPPLIES: Self-locking nut (MS21045-5) (12 required)

PRELIMINARY PROCEDURES: Remove powerplant (page 5-2)  
 Remove engine shroud (page 9-2)  
 Remove engine oil cooler (page 6-120)  
 Remove transmission oil cooler (page 6-134)  
 Remove engine access covers (page 6-77 or 6-84)  
 Remove engine cooling fan shroud (page 9-52)  
 Remove engine cooling fans (page 9-48)  
 Remove centrifugal fan housing (page 9-59)

**NOTE**

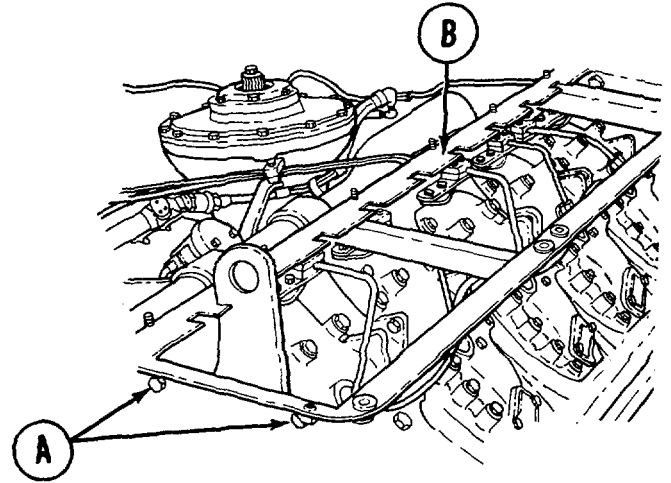
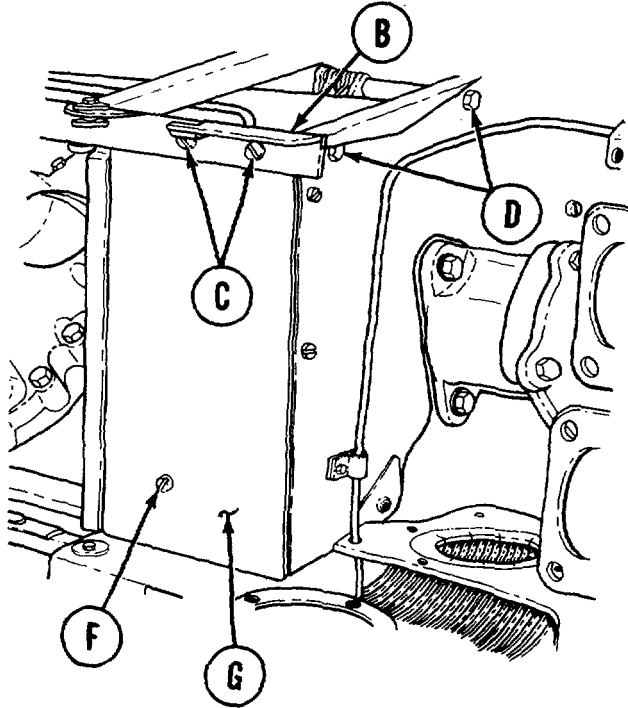
**Replacement of the right and left bank oil cooler frames and brackets are similar. Only the right bank is shown.**

Go on to Sheet 2

**POWERPLANT OIL COOLERS FRAME AND BRACKETS REPLACEMENT (2A ENGINE) (Sheet 2 of 5)**

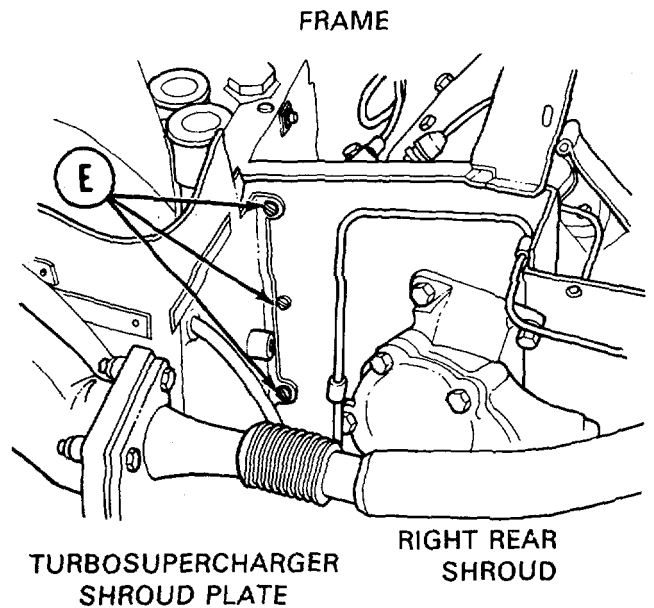
**REMOVAL:**

1. Using 1/2 inch socket, remove two bolts (A) securing frame (B) to front shroud.



2. Using screwdriver, remove two screws (C).
3. Using 1/2 inch socket, remove two bolts (D) securing shroud to frame (B).
4. Remove frame (B).

5. Using screwdriver, remove three screws (E).
6. Using screwdriver, remove screw (F).
7. Remove shroud (G).

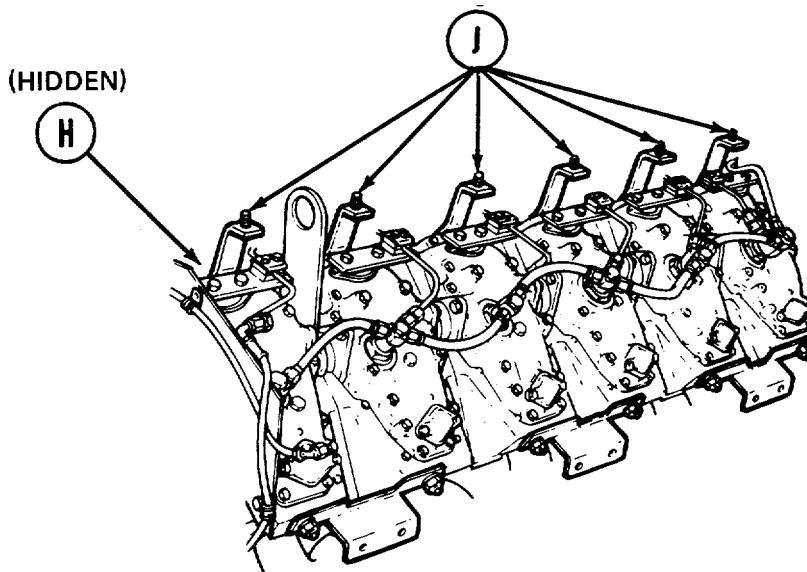
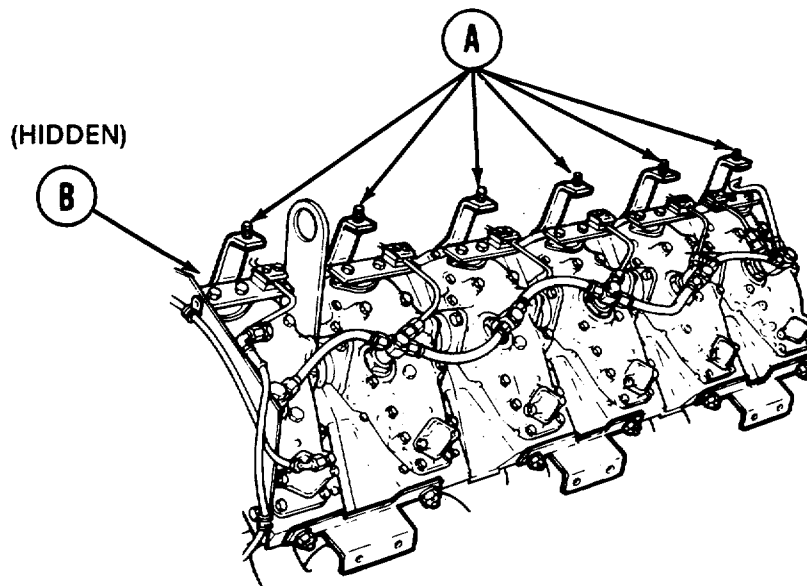


Go on to Sheet 3

TA147546

**POWERPLANT OIL COOLERS FRAME AND BRACKETS REPLACEMENT (2A ENGINE) (Sheet 3 of 5)**

8. Using 1/2 inch socket, remove 12 self-locking nuts (H) securing brackets )to engine. Throw self-locking nuts away.
9. Remove bracket from engine.

**INSTALLATION:**

1. Position brackets (A) onto engine. Using 1/2 inch socket, install and tighten two new self-locking nuts (B) securing each bracket (A) to engine.

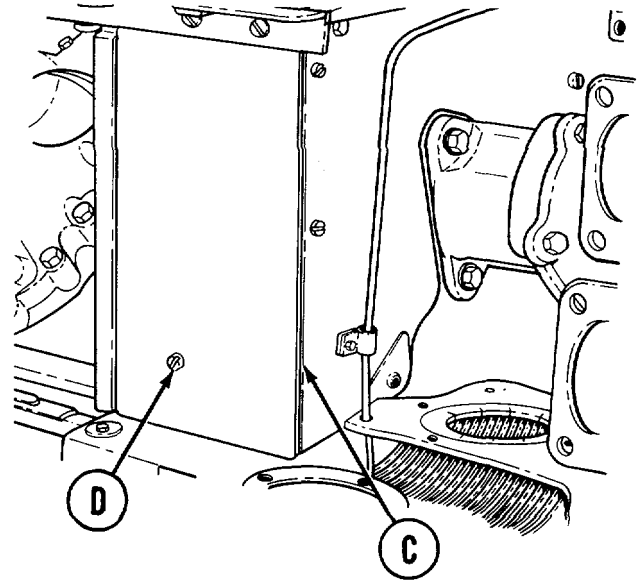
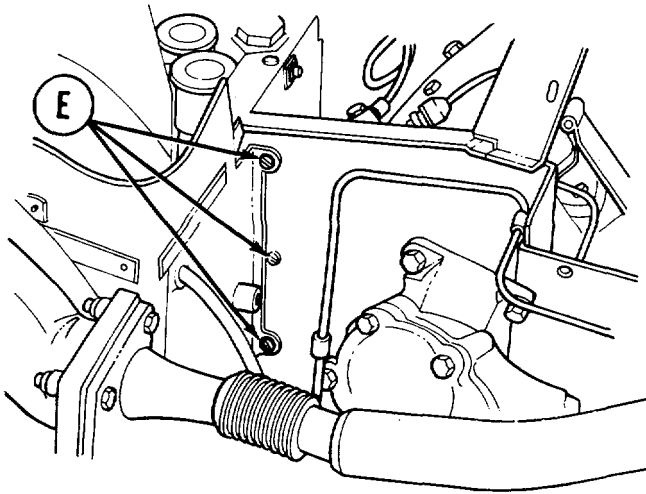
Go on to Sheet 4

TA147547



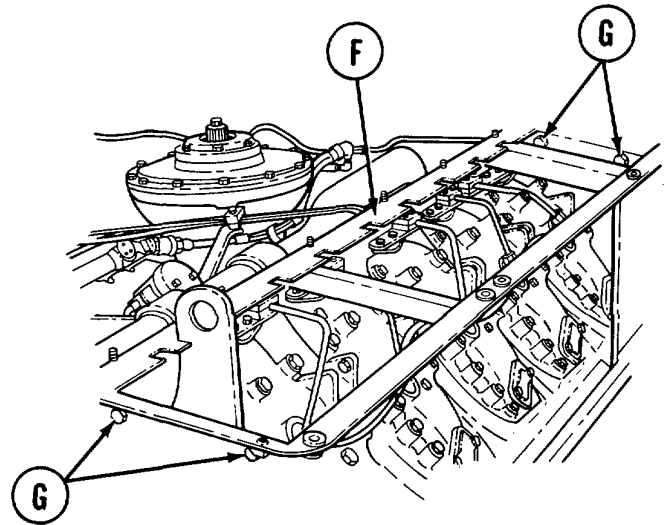
**POWERPLANT OIL COOLERS FRAME AND BRACKETS REPLACEMENT (2A ENGINE) (Sheet 4 of 5)**

2. Position shroud (C) onto engine. Using screwdriver, install screw (D) to secure shroud.



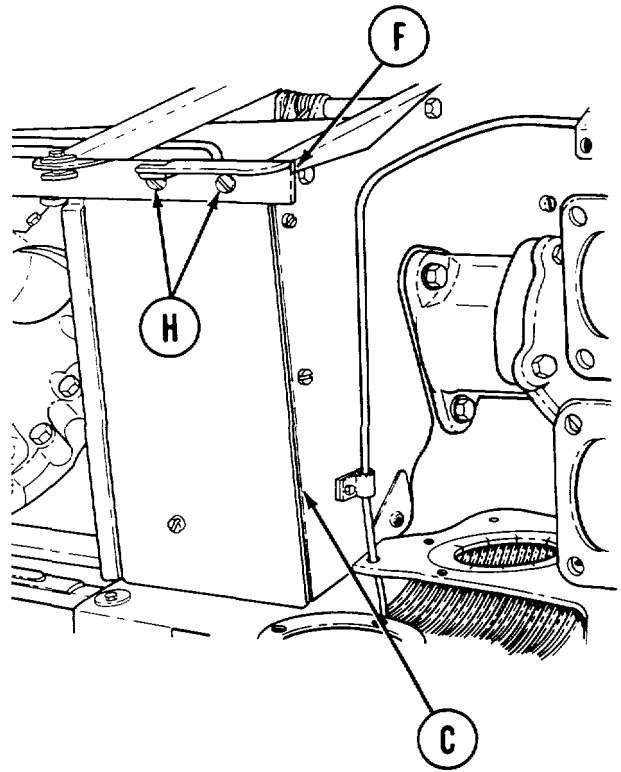
3. Using screwdriver, install and tighten three screws (E) securing shrouds.
4. Position frame (F) onto brackets (A) and shrouds.

5. Using 1/2 inch socket, install and tighten four bolts (G) securing frame and shrouds.



**POWERPLANT OIL COOLERS FRAME AND BRACKETS REPLACEMENT (2A ENGINE) (Sheet 5 of 5)**

6. Using screwdriver, install and tighten two screws (H) securing shroud (C) to frame (F).
7. Install engine access covers (page 6-78 or 6-86).
8. Install centrifugal fan housing (page 9-60).
9. Install engine cooling fans (page 9-49).
10. Install engine cooling fan shroud (page 9-55).
11. Install transmission oil cooler (page 6-140).
12. Install engine oil cooler (page 6-125).
13. Install engine shroud (page 9-3).
14. Install powerplant (page 5-14).



End of Task

TA147549

**POWERPLANT RIGHT BANK OIL COOLER FRAME AND BRACKETS REPLACEMENT (2D ENGINE) (Sheet 1 of 9)**

PROCEDURE INDEX

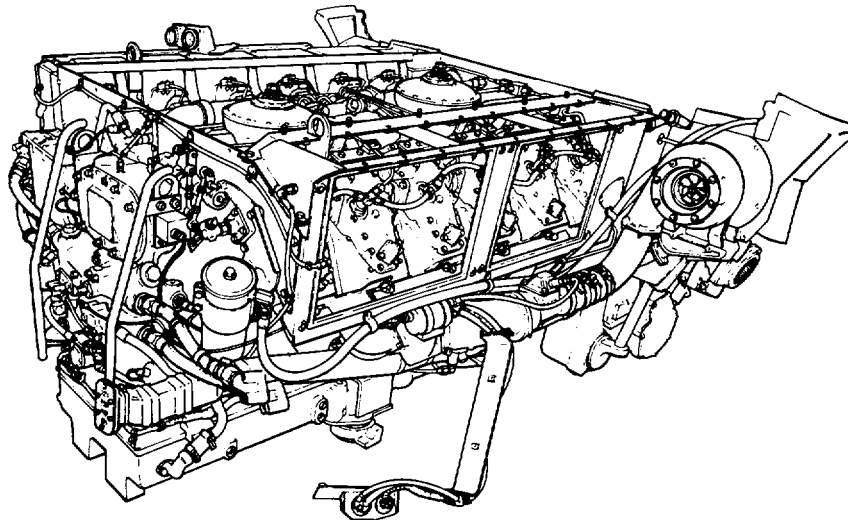
PROCEDURE	PAGE
Removal	6-99
Installation	6-102

TOOLS: Ratchet with 1/2 in. drive  
 Hinged handle with 1/2 in. drive  
 6 in. extension with 1/2 in. drive  
 1/2 in. socket with 1/2 in. drive  
 9/16 in. socket with 1/2 in. drive  
 Alining punch  
 3/4 in. combination box and open end wrench  
 1/2 in. combination box and open end wrench  
 7/16 in. combination box and open end wrench  
 9/16 in. combination box and open end wrench  
 11/16 in. socket with 1/2 in. drive

SUPPLIES: Self-locking nut (MS21044N5) (2 required)  
 Self-locking nuts (MS21045-6) (6 required)  
 Self-locking nut (MS210450) (6 required)

PERSONNEL: Two

PRELIMINARY PROCEDURES: Remove powerplant (page 5-25)  
 Remove engine shroud (page 9-2)  
 Remove engine right oil cooler (page 6-128)  
 Remove transmission right oil cooler (page 6-145)  
 Remove engine cooling fan shroud (page 942)  
 Remove engine cooling fans (page 9-48)  
 Remove centrifugal fan housings (page 99)  
 Remove engine access covers (right bank) (page 6-79)



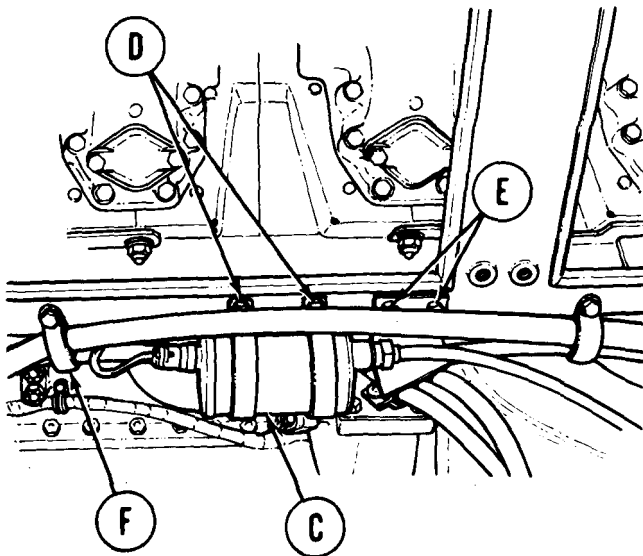
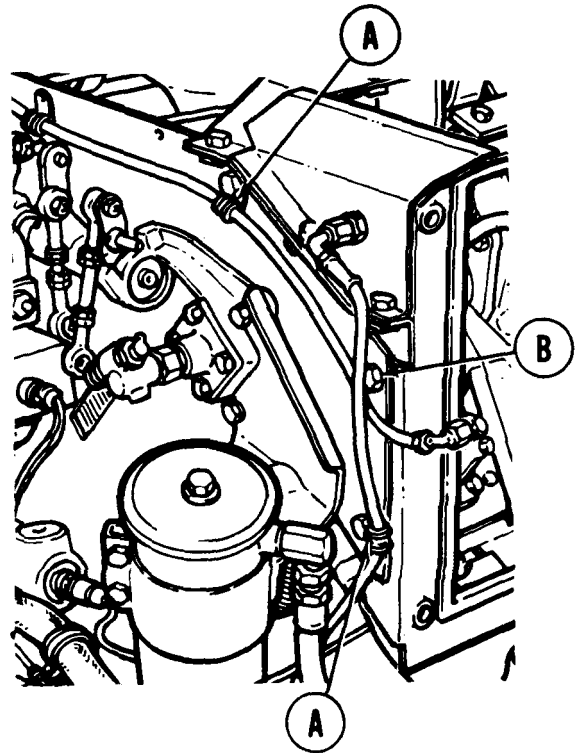
## POWERPLANT RIGHT BANK OIL COOLER FRAME AND BRACKETS REPLACEMENT (20 ENGINE) (Sheet 2 of 9)

## NOTE

Because of space limitations, it may be necessary to interchange like-size sockets and wrenches to get at a particular screw.

## REMOVAL:

1. Using 1/2 inch socket and extension, remove two assembled washer bolts and cushioned clamps (A).
2. Using 1/2 inch socket and extension, remove washer bolt (B).
3. While supporting ignition unit (C), and using 1/2 inch wrench, remove two capscrews (D).
4. Remove ignition unit (C) with clamps and leads from frame.

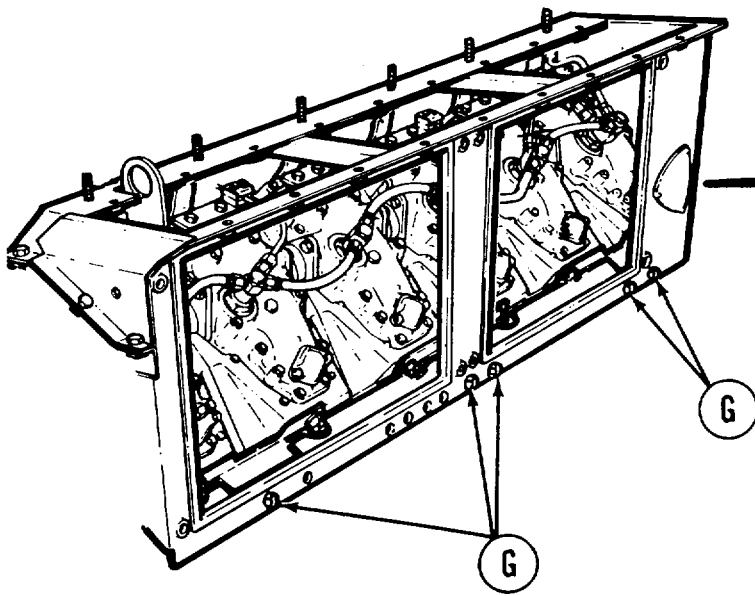


5. Using 1/2 inch socket, remove two capscrews (E) and self-locking nuts from bracket. Use 1/2 inch wrench to keep nuts from turning. Throw self-locking nut away.
6. Using 9/16 inch socket, remove screw with cushioned clamp (F) holding cable assembly. Use 9/16 inch wrench to keep nut from turning.

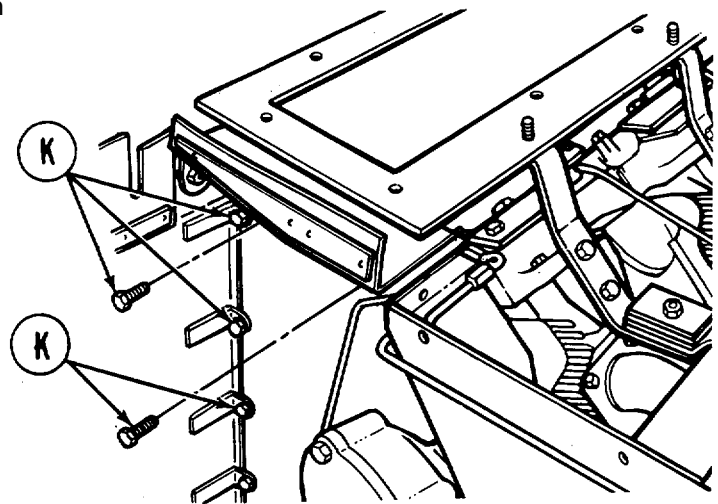
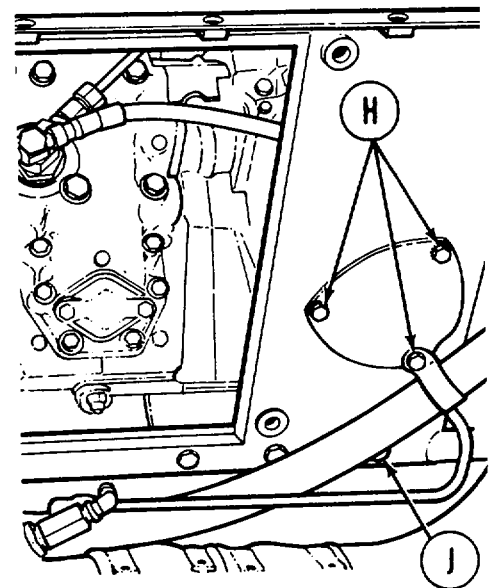
Go on to Sheet 3

TA147551

POWERPLANT RIGHT BANK OIL COOLER FRAME AND BRACKETS REPLACEMENT (2D ENGINE) (Sheet 3 of 9)



7. Using 9/16 inch socket remove five cap screws (G) and self-locking nuts. Use 9/16 inch wrench to keep nuts from turning. Throw self-locking nut away.
8. Using 1/2 inch socket, remove three screws (H) and cushioned clamp holding timing access cover to support frame.
9. Using 9/16 inch socket, remove cap screw (J) and self-locking nut. Use 9/16 inch wrench to keep nut from turning. Throw self-locking nut away.
10. Using 1/2 inch socket with extension, or 1/2 inch wrench, remove five screws (K).



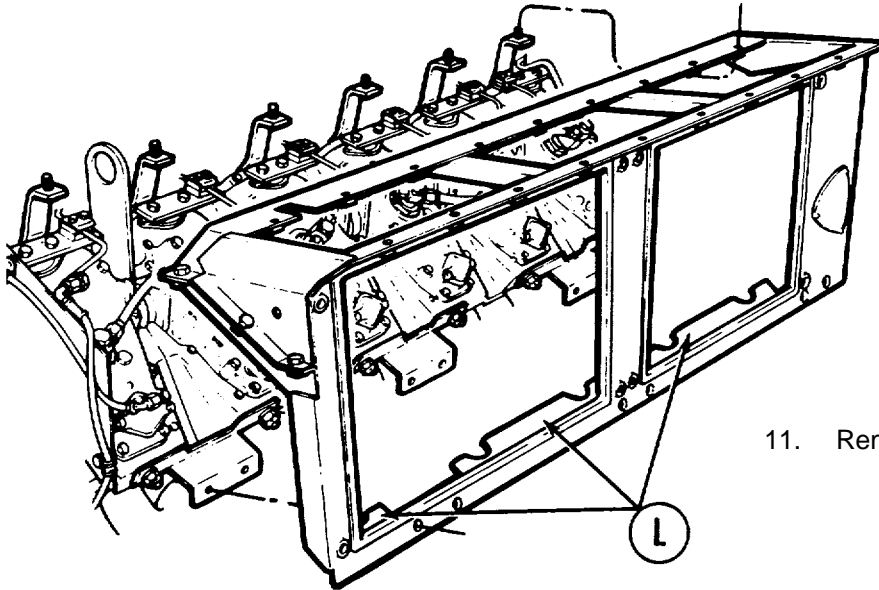
Go on to Sheet 4

TA147552

POWERPLANT RIGHT BANK OIL COOLER FRAME AND BRACKETS REPLACEMENT (2D ENGINE) (Sheet 4 of 9)

NOTE

It may be necessary to depress three flanges (L) on frame bottom during removal to clear protruding obstacles on the engine.

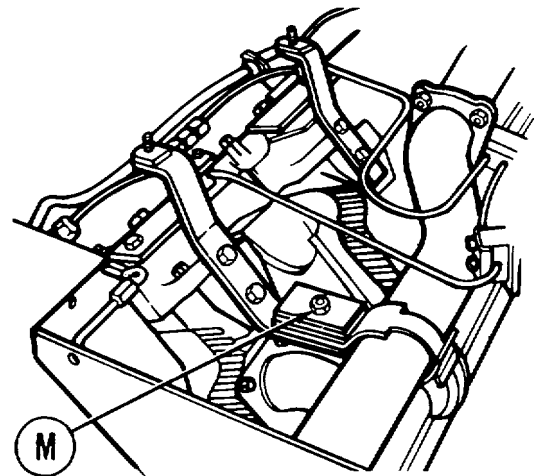


11. Remove oil cooler support frame.

NOTE

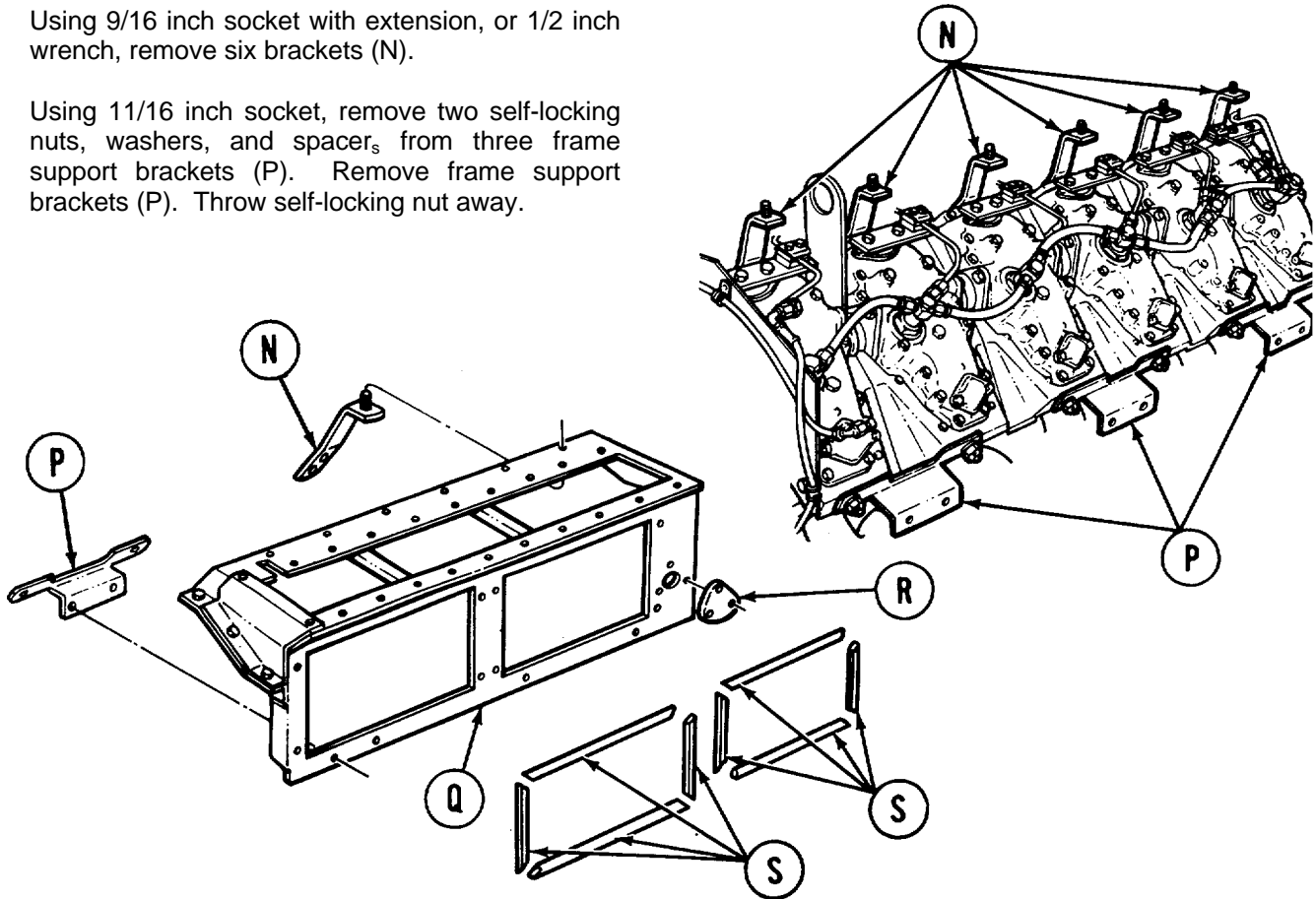
Five of the six cooler frame upper brackets are identical and are mounted the same way. The sixth bracket (M) is located closest to the engine flywheel end and requires three shims and an additional screw with self-locking nut for proper installation.

12. Using 9/16 inch socket with extension, remove nut securing shims (M) Hold screw head below shims with 9/16 inch wrench to keep screw from turning.



**POWERPLANT RIGHT BANK OIL COOLER FRAME AND BRACKETS REPLACEMENT (2D ENGINE) (Sheet 5 of 9)**

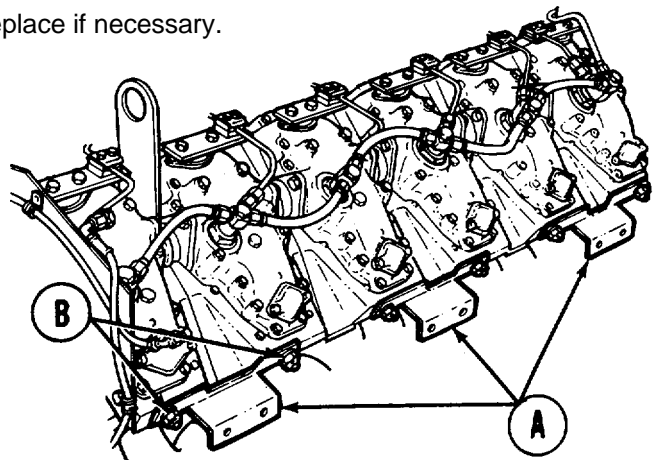
13. Using 9/16 inch socket with extension, or 1/2 inch wrench, remove six brackets (N).
14. Using 11/16 inch socket, remove two self-locking nuts, washers, and spacers from three frame support brackets (P). Remove frame support brackets (P). Throw self-locking nut away.



15. Check oil cooler support frame (Q) for dents and breaks. Repair if possible, or replace if necessary.
16. Check timing access cover (R) for breaks. Replace if necessary.
17. Check rubber strips (S) for tears and breaks. Replace if necessary.
18. Check brackets (P) and (N) for cracks and breaks. Replace if necessary.

**INSTALLATION:**

1. Position each frame support bracket (A) for mounting.
2. Using 11/16 inch socket, install two washers, spacers, and n self-locking nuts (B) to secure each bracket.



Go on to Sheet 6

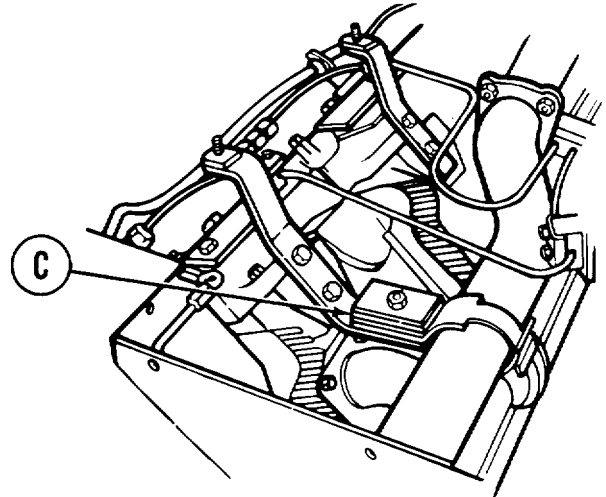
TA147554

## POWERPLANT RIGHT BANK OIL COOLER FRAME AND BRACKETS REPLACEMENT (2D ENGINE) (Sheet 6 of 9)

## NOTE

Five of the six cooler frame upper brackets are identical and are mounted the same way. The sixth bracket (C) is located closest to the engine flywheel end and requires shims and an additional screw and self-locking nut for proper installation.

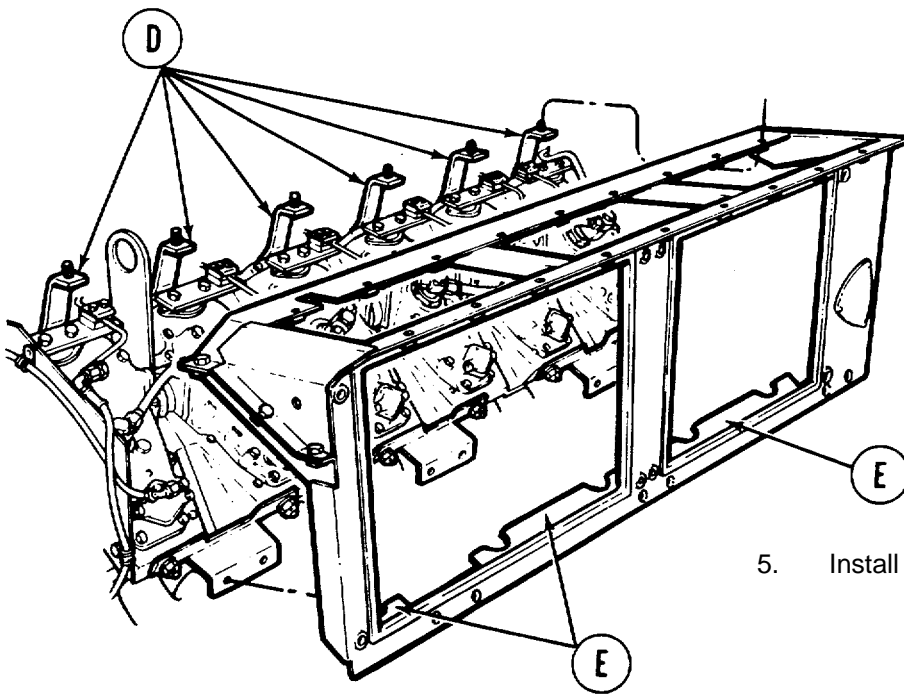
- Using 9/16 inch socket with extension, install shims (C). Hold screw head below shims with 9/16 inch wrench to keep screw from turning.



- Using 1/2 inch socket with extension, install six brackets (D).

## NOTE

It may be necessary to depress three flanges (E) on frame bottom during installation to clear protruding obstacles on the engine.



- Install oil cooler support frame.

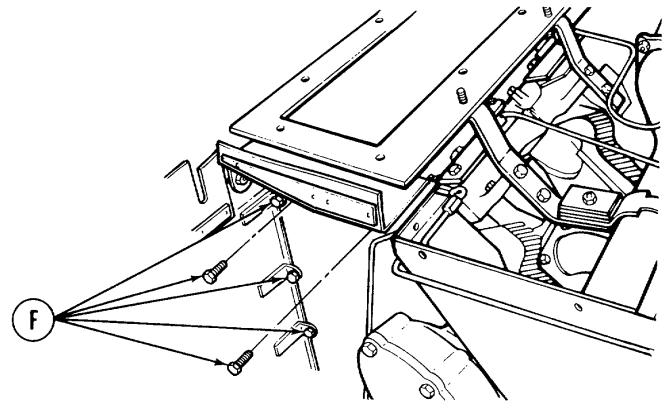
Go on to Sheet 7

TA147555

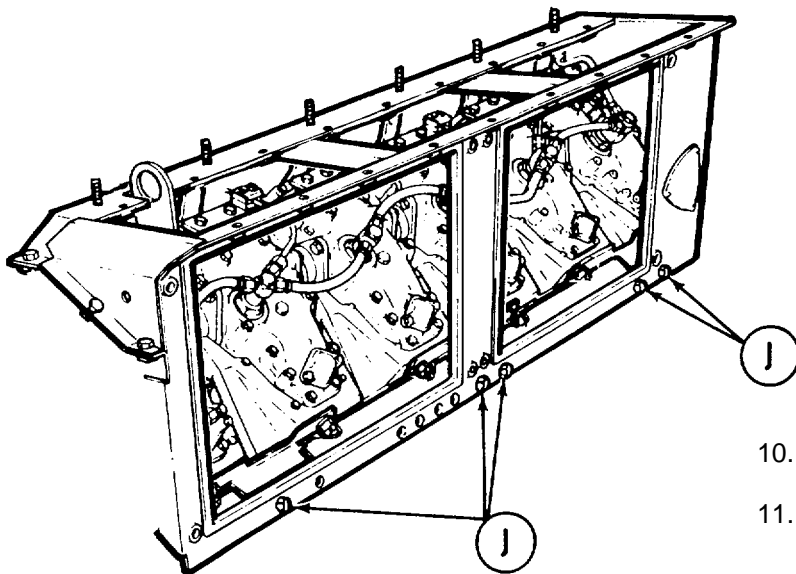
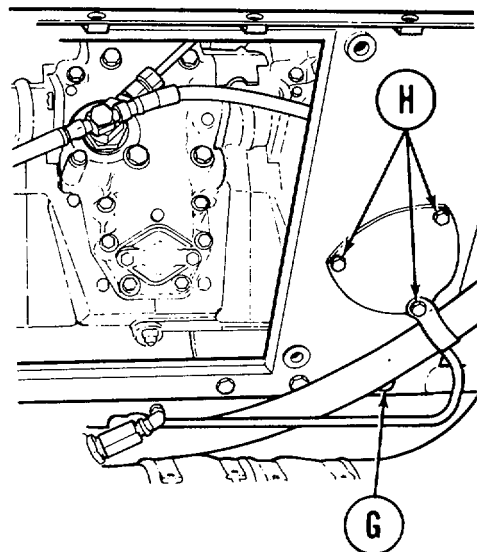


**POWERPLANT RIGHT BANK OIL COOLER FRAME AND BRACKETS REPLACEMENT (2D ENGINE) (Sheet 7 of 9)**

6. Using alining punch, line up holes (F).
7. Using 1/2 inch socket with extension, or 1/2 inch wrench, install five screws (F).



8. Using 9/16 inch socket, install capscrew (G) and new self-locking nut. Use 9/16 inch wrench to keep nut from turning.
9. Using 1/2 inch socket, install three screws (H) and cushioned clamp holding timing access cover to frame.



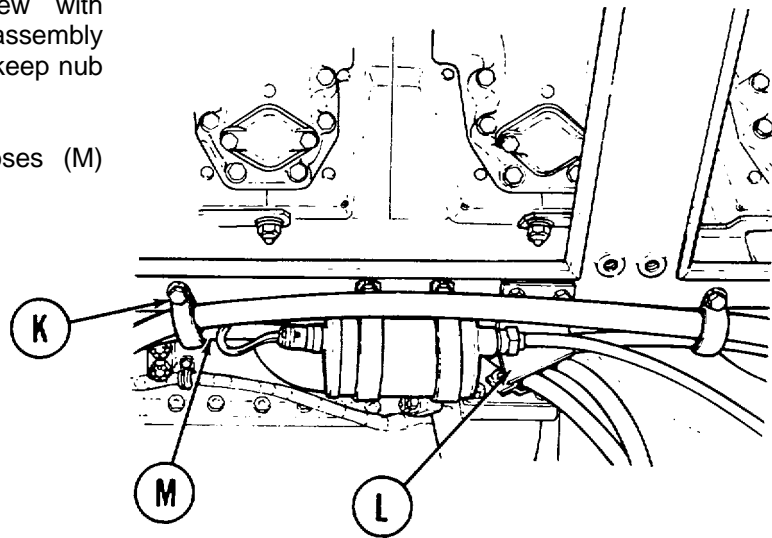
10. Using alining punch, line up holes (J).
11. Using 9/16 inch socket, install five capscrews (J) and new self-locking nut. Use 9/16 inch wrench to keep nuts from turning.

Go on to Sheet 8

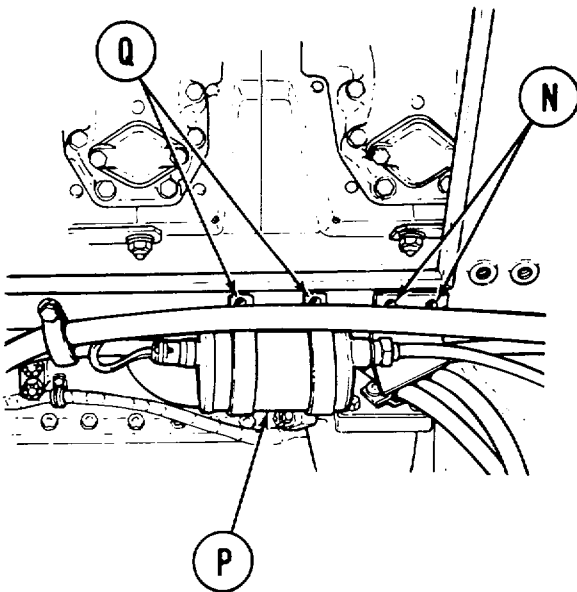
TA147556

**POWERPLANT RIGHT BANK OIL COOLER FRAME AND BRACKETS REPLACEMENT (2D ENGINE) (Sheet 8 of 9)**

12. Using 9/16 inch wrench, install screw with cushioned clamp (K) to hold cable assembly against frame. Use 9/16 inch wrench to keep nub from turning.
13. Position bracket (L) to frame with hoses (M) behind bracket (L).

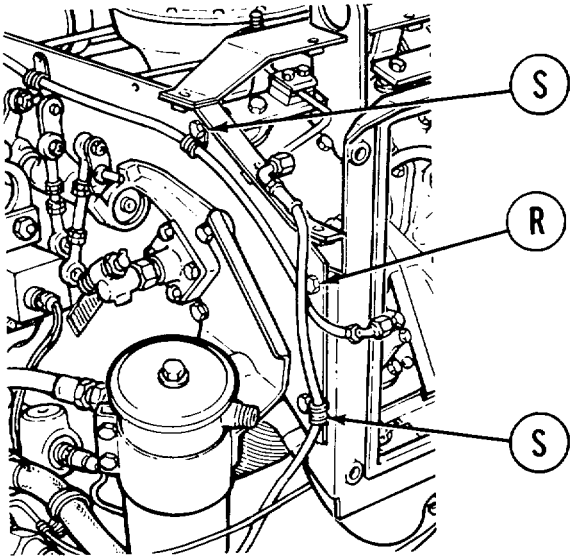


14. Using 1/2 inch socket install two capscrews (N) and new self-locking nuts. Use 1/2 inch wrench to keep nub from turning.



15. Position ignition unit (P) with clamps and leads to frame.
16. Using 1/2 inch wrench, install two capscrews (Q).

**POWERPLANT RIGHT BANK OIL COOLER FRAME AND BRACKETS REPLACEMENT (2D ENGINE) (Sheet 9 of 9)**



17. Using alining punch, line up hole (R).

18. Using 1/2 inch socket and extension, install washer bolt (R).

19. Using 1/2 inch socket and extension, install two assembled washer bolt and cushioned clamps (S).

20. Install engine access covers (right bank) (page 6-82).

21. Install centrifugal fan housings (page 9-60).

22. Install engine cooling fans (page 9-49).

23. Install engine cooling fan shroud (page 9-55).

24. Install transmission right oil cooler (page 6-149).

25. Install engine right oil cooler (page 6-131).

26. Install engine shroud (page 9-3).

27. Install powerplant (page 5-40).

End of Task

TA147558

**POWERPLANT LEFT BANK OIL COOLER FRAME AND BRACKETS REPLACEMENT (2D ENGINE) (Sheet 1 of 9)**

PROCEDURE INDEX

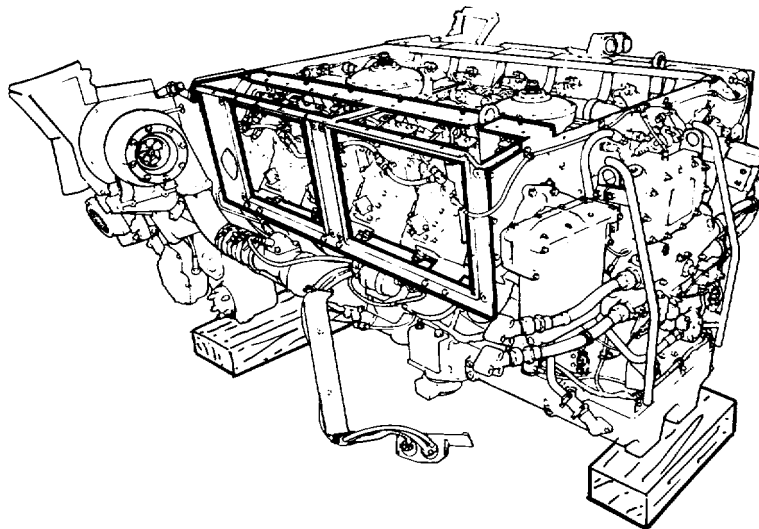
PROCEDURE	PAGE
Removal	6-108
Installation	6-112

- TOOLS:** Ratchet with 1/2 in. drive  
 5 in. extension with 1/2 in. drive  
 1/2 in. socket with 1/2 in. drive  
 5/8 in. socket with 1/2 in. drive  
 9/16 in. socket with 1/2 in. drive  
 11/16 in. socket with 1/2 in. drive  
 4 in. flat-tip screwdriver
- Alining punch  
 1/2 in. combination box and open end wrench  
 3/8 in. combination box and open end wrench  
 9/16 in. combination box and open end wrench

- SUPPLIES:** Lockwasher (7410218) (4 required)  
 Self-locking nut (MS21045-6) (2 required)  
 Self-locking nut (MS21044N5) (8 required)  
 Self-locking nut (MS21045-7) (6 required)  
 Self-locking nut (8764639)  
 Self-locking nut (MS21045-5)

**PERSONNEL:** Two

- PRELIMINARY PROCEDURES:** Remove powerplant (page 5-1)  
 Remove engine shroud (page 9-2)  
 Remove centrifugal fan housing (page 9-59)  
 Remove engine cooling fans (page 9-48)  
 Remove engine cooling fan shroud (page 9-52)  
 Remove powerplant access (left bank) covers (page 6-88)  
 Remove engine left oil cooler (page 6-93)  
 Remove transmission left oil cooler (page 6-145)



Go on to Sheet 2

TA147559

**POWERPLANT LEFT BANK OIL COOLER FRAME AND BRACKETS REPLACEMENT (2D ENGINE) (Sheet 2 of 9)**

**NOTE**

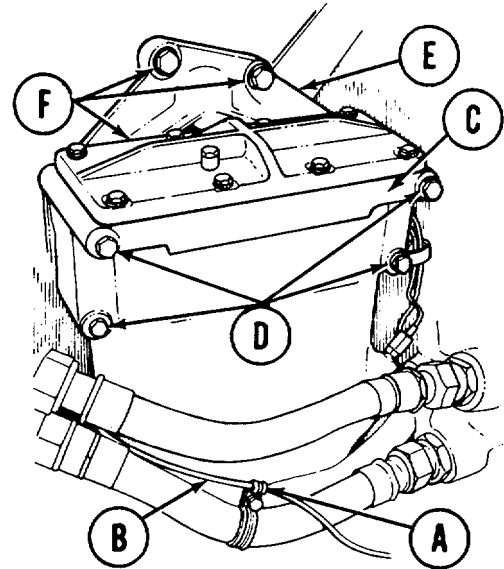
Because of space limitations, it may be necessary to interchange like-size sockets and wrenches to get at a particular screw.

**REMOVAL:**

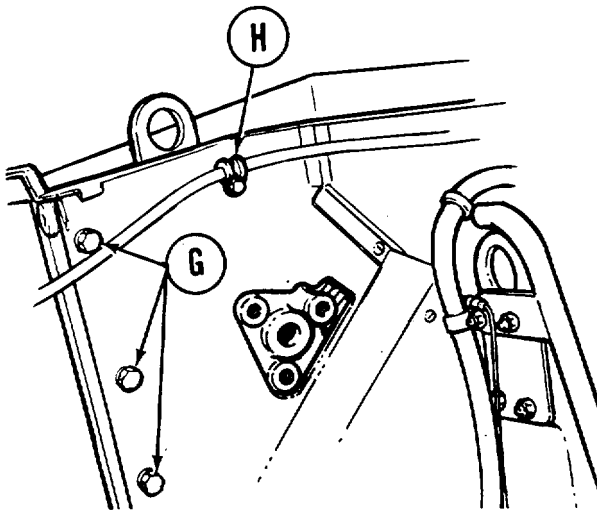
**NOTE**

It may be necessary to use screwdriver and 3/8 inch wrench to remove clamp (A) and move tube (B) before fuel-water separator filter (C) can be lowered.

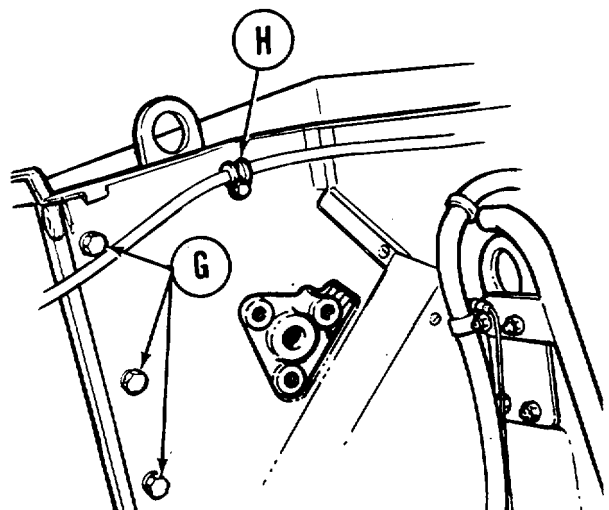
1. Using 1/2 inch socket, remove four capscrews, lockwashers, and flat washers (D). Throw lockwashers away.



2. Lower fuel-water separator filter (C) away from mounting bracket (E).
3. Using 5/8 inch socket, remove three screws (F) securing mounting bracket (E) to engine. Remove mounting bracket (E).
4. Using 1/2 inch socket, remove three assembled washer bolts (G).



5. Using 1/2 inch socket, remove screw and clamp (H).
6. Using 1/2 inch socket with extension and 1/2 inch wrench, remove two screws and nuts (J).
7. Remove ignition unit (K) with clamps and leads from frame.



Go on to Sheet 3

TA147560

**POWERPLANT LEFT BANK OIL COOLER FRAME AND BRACKETS REPLACEMENT (2D ENGINE) (Sheet 3 of 9)**

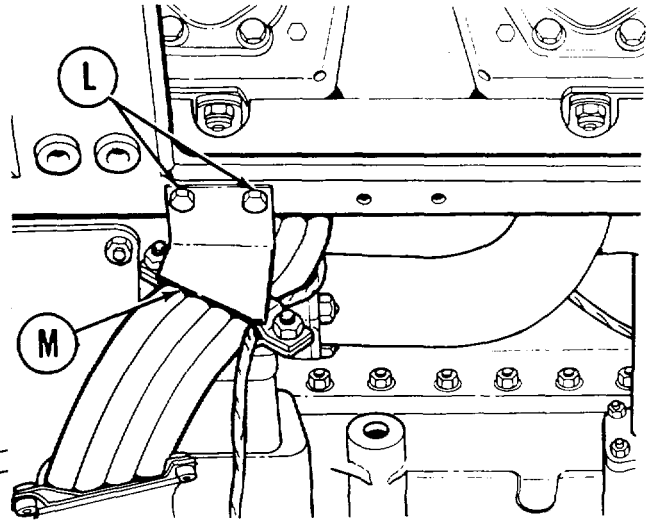
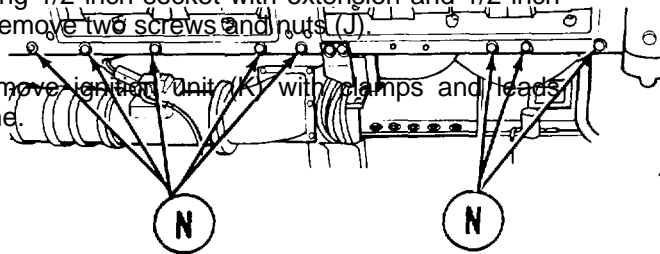
8. Using 1/2 inch socket and 1/2 inch wrench, remove two capscrews and self-locking nuts (L). Throw self-locking nuts away.

9. Remove bracket (M) with harness attached from frame.

5. Using 1/2 inch socket, remove screw and clamp (H).

6. Using 1/2 inch socket with extension and 1/2 inch wrench, remove two screws and nuts (J).

7. Remove ignition unit (K) with clamps and leads from frame.



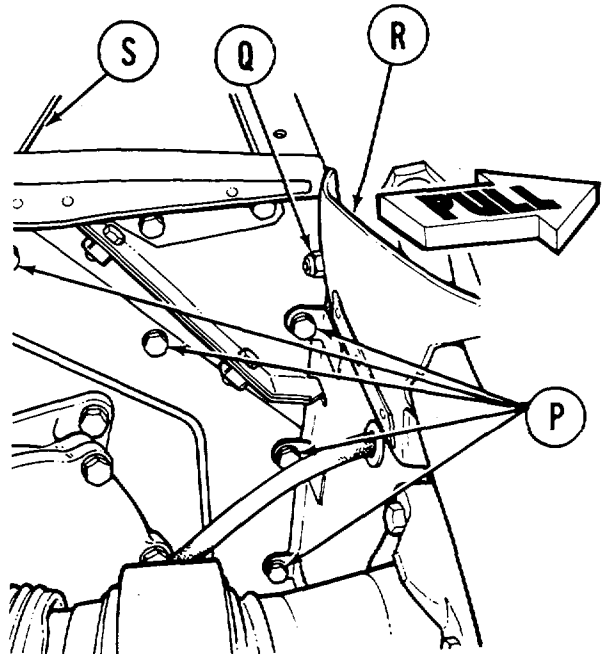
10. Using 9/16 inch socket and 9/16 inch wrench, remove eight capscrews and self-locking nuts (N). Use 9/16 inch wrench to keep nuts from turning. Throw self-locking nuts away.

11. Using 1/2 inch socket with extension, remove five screws (P).

12. Using 1/2 inch socket and 1/2 inch wrench, remove screw and self-locking nut (Q). Throw self-locking nut away.

**NOTE**

**It may be necessary to pull frame (R) out before oil cooler support frame (S) can be removed.**

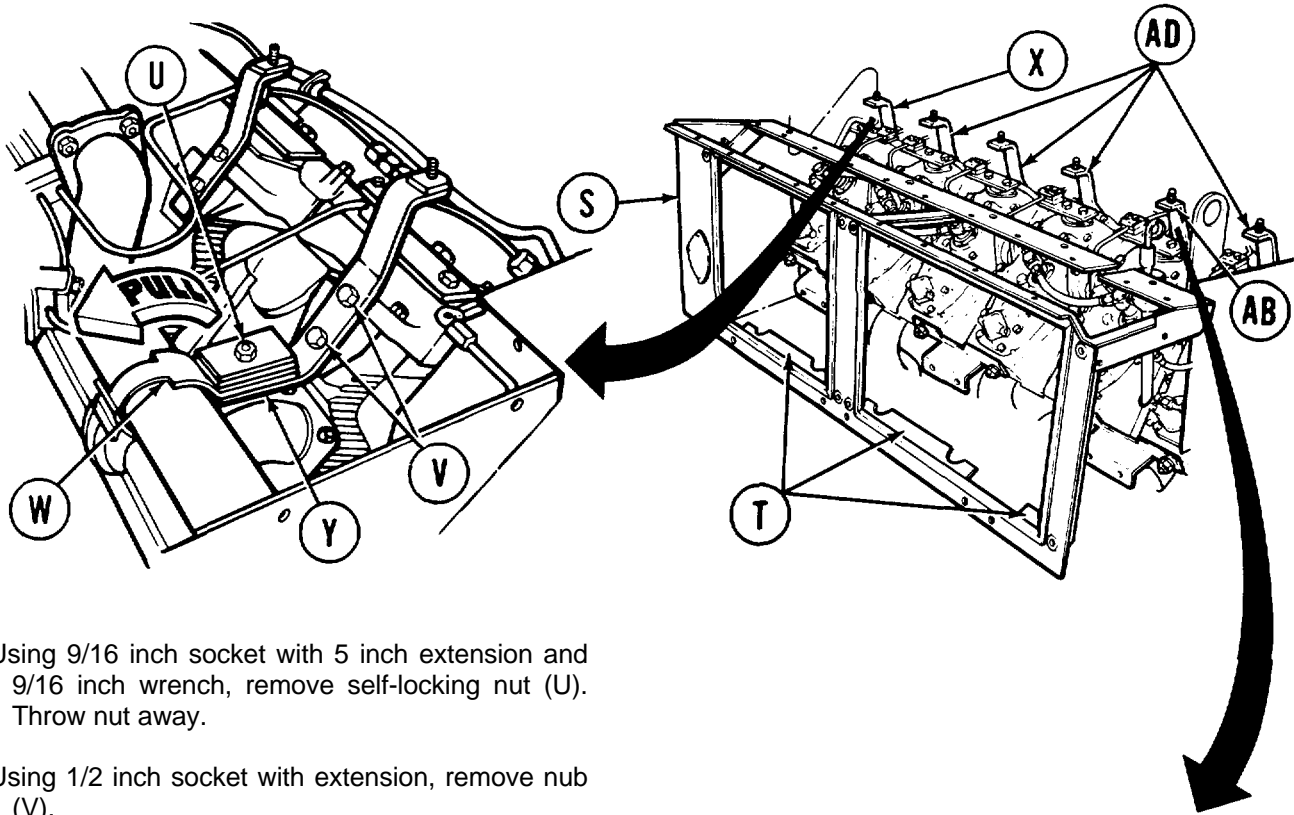


POWERPLANT LEFT BANK OIL COOLER FRAME AND BRACKETS REPLACEMENT (2D ENGINE) (Sheet 4 of 9)

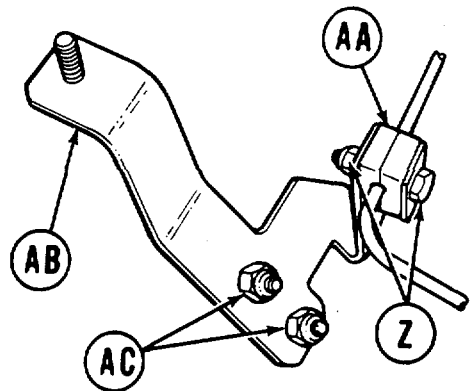
NOTE

It may be necessary to depress three flanges (T) on frame bottom during removal to clear protruding obstacles on the engine.

13. Remove oil cooler support frame (S).



14. Using 9/16 inch socket with 5 inch extension and 9/16 inch wrench, remove self-locking nut (U). Throw nut away.
15. Using 1/2 inch socket with extension, remove nub (V).
16. Move clamp (W) to up position and remove bracket (X) and screw (Y).
17. Remove screw (Y) from bracket (X).
18. Using 1/2 inch socket and 1/2 inch wrench, remove screw and nut (Z).
19. Remove clamp (AA) from bracket (AB) and fuel line.
20. Using 1/2 inch socket with extension, remove self-locking nuts (AC). Throw nuts away.
21. Remove bracket (AB).
22. Using 1/2 inch socket with extension, remove four brackets (AD).

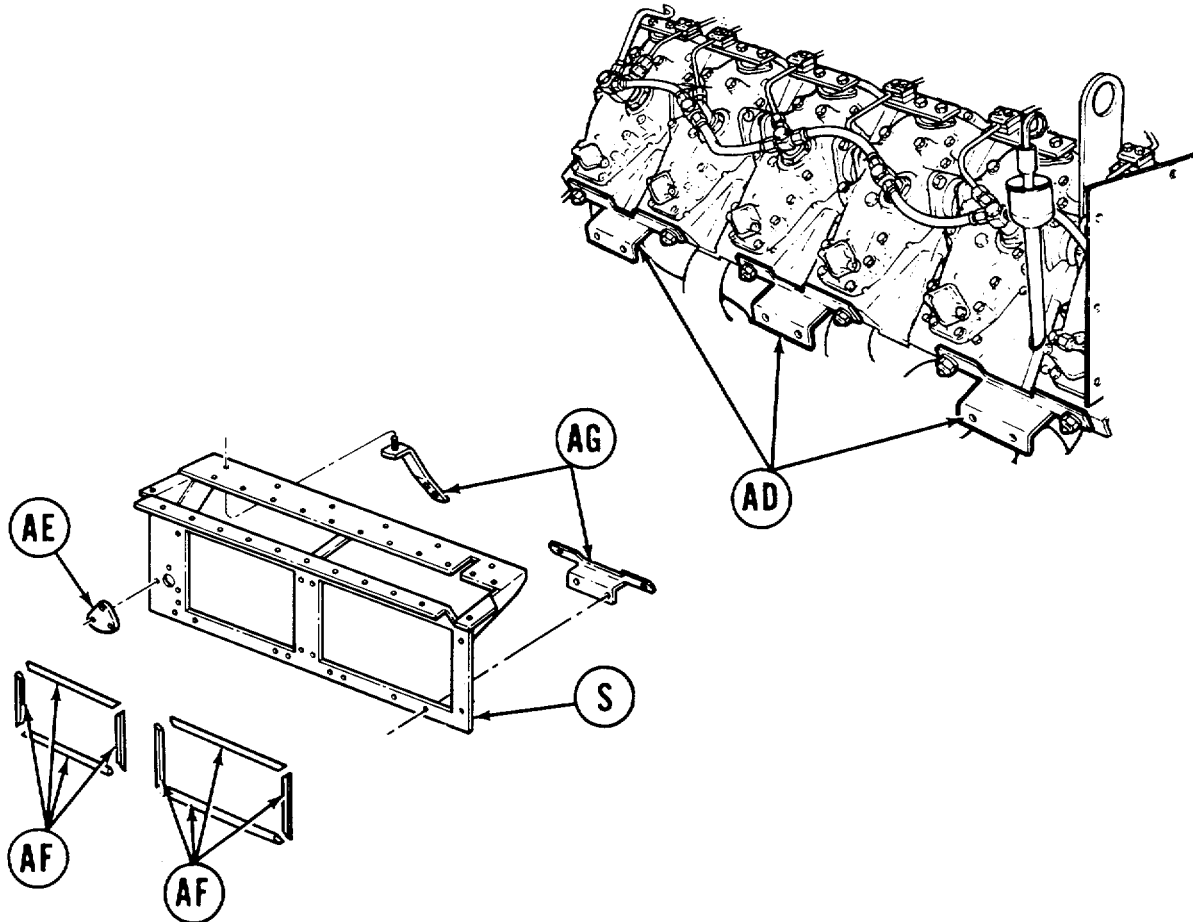


Go on to Sheet 5

TA147562

**POWERPLANT LEFT BANK OIL COOLER FRAME AND BRACKETS REPLACEMENT (2D ENGINE) (Sheet 5 of 9)**

23. Using 11/16 inch socket, remove two self-locking nuts and spacers from three frame support brackets (AD). Remove three frame support brackets. Throw self-locking nuts away.



24. Check oil cooler support frame (S) for dents and breaks. Repair if possible, or replace if necessary.
25. Check timing access cover (AE) for breaks. Using 1/2 inch socket, replace if necessary.
26. Check rubber strips (AF) for breaks and tears. Replace if necessary.
27. Check brackets (AG) for cracks and breaks. Replace if necessary.

Go on to Sheet 6

TA147563



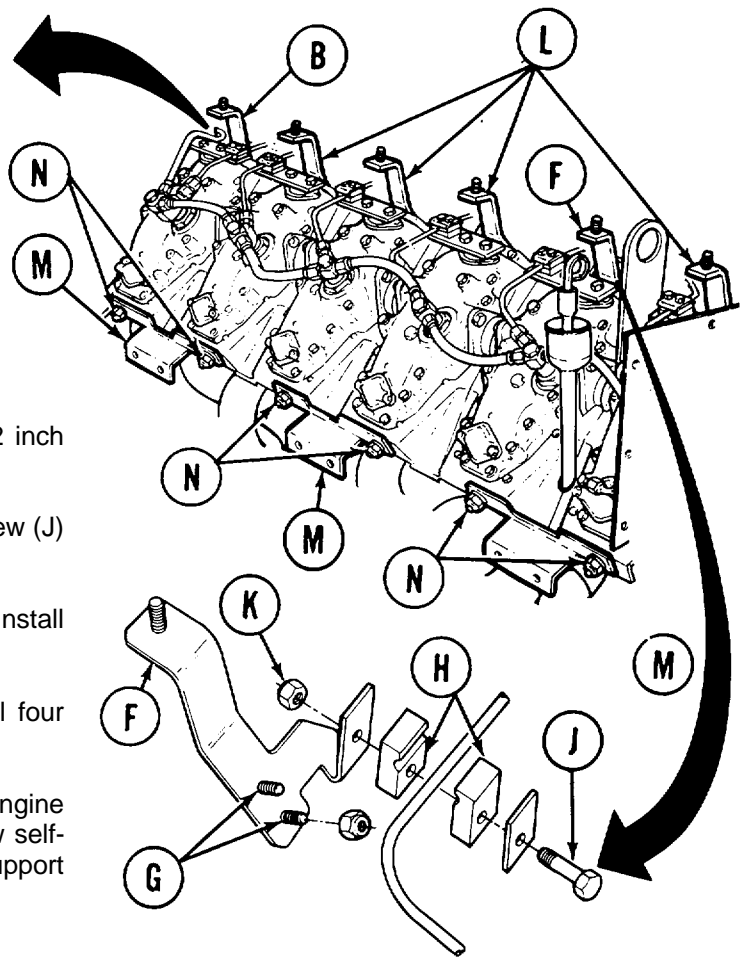
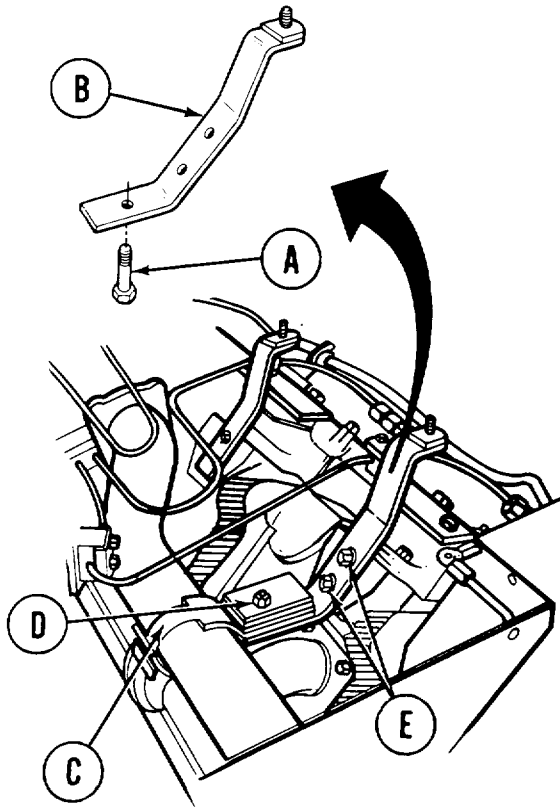
**POWERPLANT LEFT BANK OIL COOLER FRAME AND BRACKETS REPLACEMENT (2D ENGINE) (Sheet 6 of 9)**

**INSTALLATION:**

**NOTE**

**Because of space limitations, it may be necessary to interchange like-size sockets with wrenches to get at a particular screw.**

1. Install screw (A) through bracket (B).
2. Position bracket (B) and screw (A) on engine.
3. Install clamp (C) on screw (A).
4. Using 9/16 inch socket and 9/16 inch wrench, install new self-locking nut (D).
5. Using 1/2 inch socket with extension, install new self-locking nuts (E).
6. Position bracket (F) on engine.



7. Using 1/2 inch socket with extension, or 1/2 inch wrench, install nuts (G).
8. Position clamp (H) on fuel line and install screw (J) through clamp (H) and bracket (F).
9. Using 1/2 inch socket and 1/2 inch wrench, install nut (K) on screw (J).
10. Using 1/2 inch socket with extension, install four brackets (L).
11. Position frame support brackets (M) on engine and, using 11/16 inch socket, install two new self-locking nuts (N) to secure each frame support bracket (M).

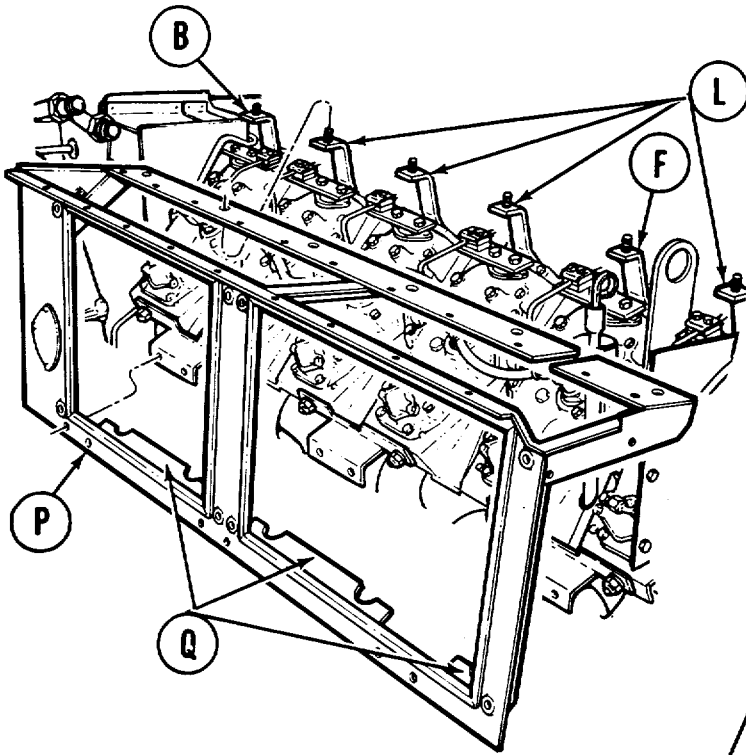
Go on to Sheet 7

TA147564

## POWERPLANT LEFT BANK OIL COOLER FRAME AND BRACKETS REPLACEMENT (2D ENGINE) (Sheet 7 of 9)

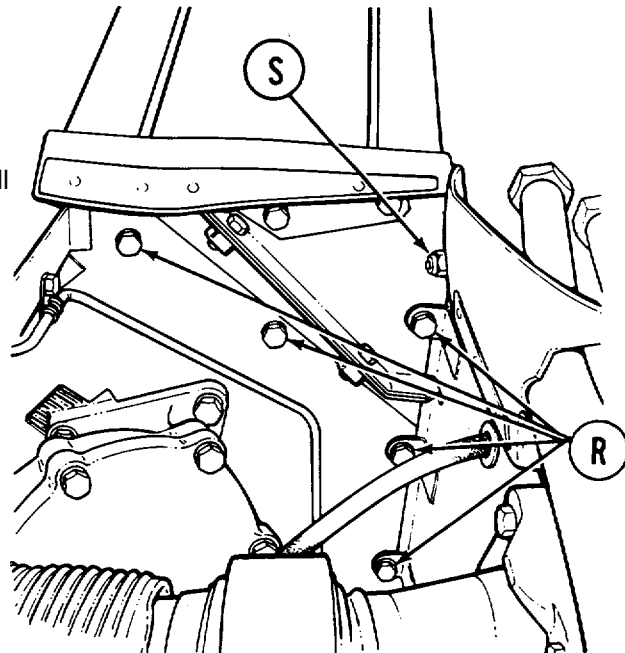
## NOTE

It may be necessary to pull frame (P) out and depress three flanges (Q) on frame bottom during installation to clear protruding obstacles on the engine. It may be necessary to loosen and move brackets (B), (F), and (L) slightly before oil cooler support frame can be installed.



12. Install oil cooler support frame.
13. Using alining punch, aline screw holes and, using 1/2 inch socket with extension, install five screws (R).

14. Using 1/2 inch socket and 1/2 inch wrench, install screw and new self-locking nut (S).

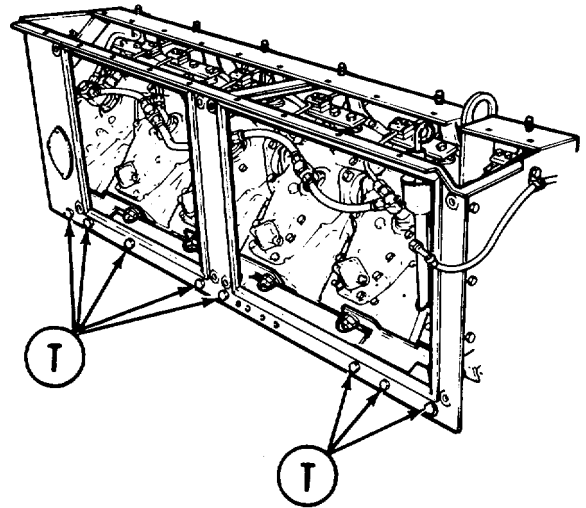
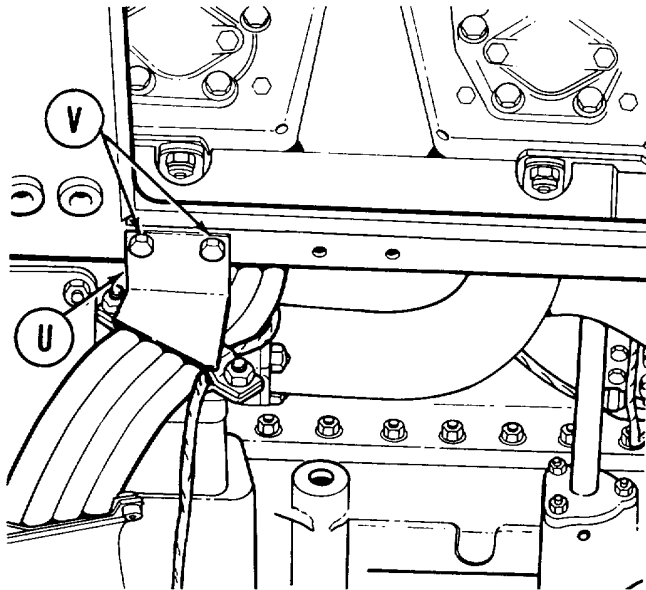


Go on to Sheet 8

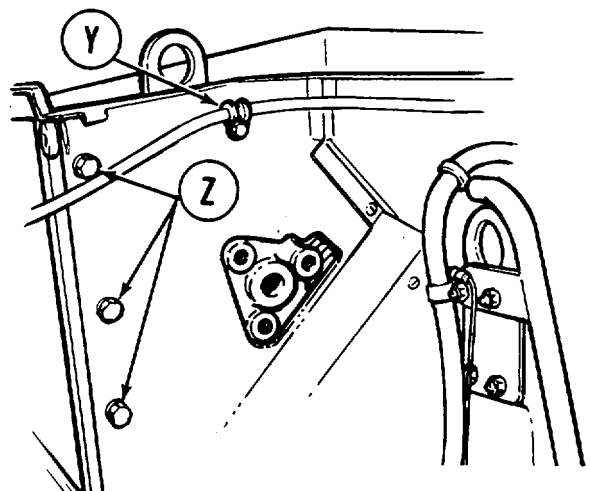
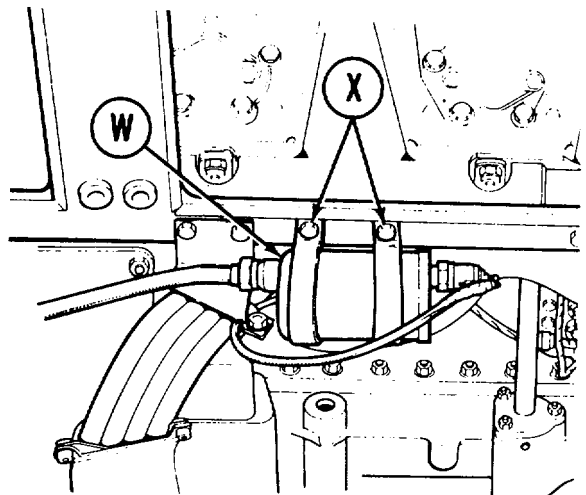
TA147565

## POWERPLANT LEFT BANK OIL COOLER FRAME AND BRACKETS REPLACEMENT (2D ENGINE) (Sheet 8 of 9)

15. Using alining punch, aline screw holes and, using 9/16 inch socket and 9/16 inch wrench, install eight capscrews and new self-locking nuts (T).



16. Position bracket (U) to frame.
17. Using 1/2 inch socket and 1/2 inch wrench, install two capscrews and new self-locking nuts (V) to hold bracket (U) to frame.
18. Position ignition unit (W) with clamps and leads to frame.
19. Using 1/2 inch socket and 1/2 inch wrench, install two capscrews and new self-locking nuts (X).
20. Using 1/2 inch socket, install screw and cushioned clamp (Y).
21. Using 1/2 inch socket, install three assembled washer bolts (Z).

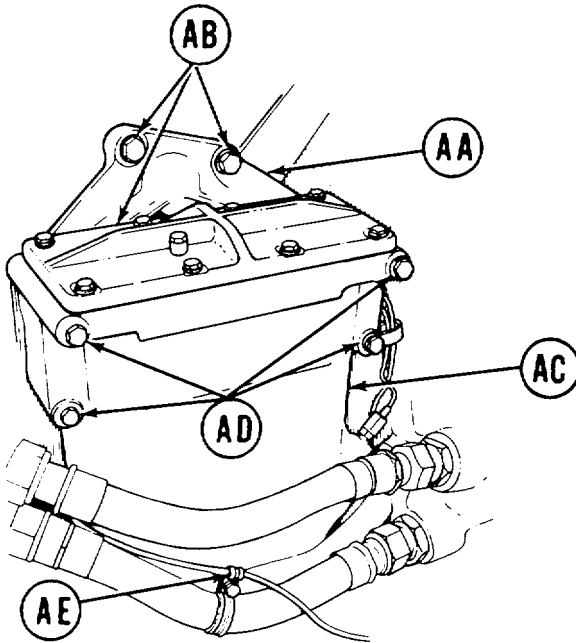


Go on to Sheet 9

TA147566

**POWERPLANT LEFT BANK OIL COOLER FRAME AND BRACKETS REPLACEMENT (2D ENGINE) (Sheet 9 of 9)**

22. Place mounting bracket (AA) in position and, using 5/8 inch socket, tighten three screws (AB).



23. Position fuel-water separator (AC) to mounting bracket (AA).

**CAUTION**

**Mounting bracket (AA) is made of aluminum. Overtightening of capscrews (AD) could strip threads.**

24. Using 1/2 inch socket, install four capscrews, new lockwashers, and flat washers (AD).

25. Using screwdriver and 3/8 inch wrench, install clamp (AE) if removed.
26. Install transmission left oil cooler (page 6-149).
27. Install engine left oil cooler (page 6-131).
28. Install powerplant access covers (left bank) (page 6-91).
29. Install engine cooling fan shroud (page 9-55).
30. Install engine cooling fans (page 9-49).
31. Install centrifugal fan housing (page 9-60).
32. Install engine shroud (page 9-3).
33. Install powerplant (page 5-40).

End of Task

TA147567

**ENGINE OIL COOLER SCREEN REPLACEMENT (Sheet 1 of 2)**

TOOLS: 1/2 in. socket with 1/2 in. drive  
 Ratchet with 1/2 in. drive  
 5 in. extension with 1/2 in. drive

PRELIMINARY PROCEDURE: Remove powerplant (page 5-1)

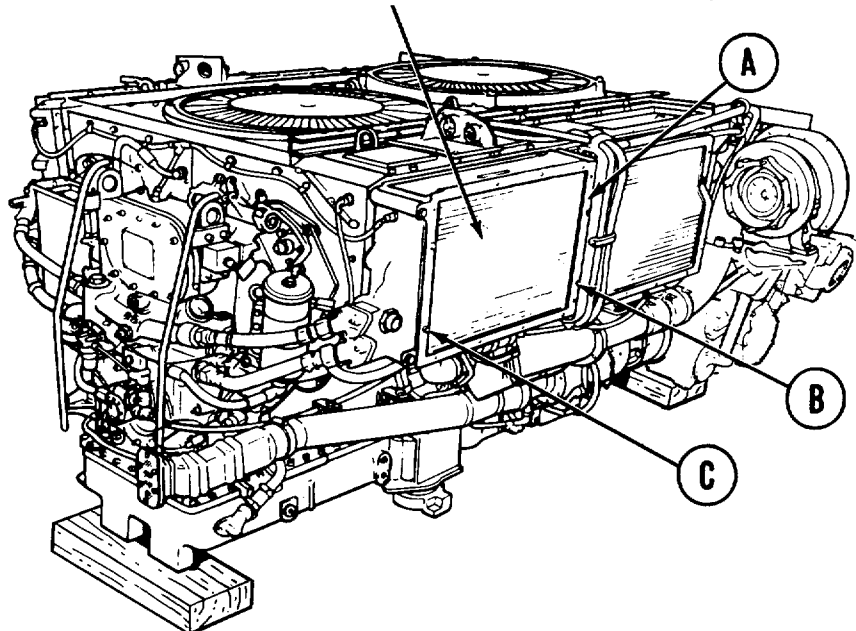
**NOTE**

**If removing screens on 2A engine, go to step 3.**

**REMOVAL:**

1. Using socket with extension through harness and into bracket (A), remove two screws with assembled washers (B).
2. Pull harness and bracket (A) to left side of oil cooler screen for access to screws (C).
3. Using socket, remove four screws and assembled washers (C).
4. Lift cooler screen away.

**ENGINE OIL COOLER SCREEN  
 (RIGHT SIDE SHOWN, LEFT SIDE SIMILAR)**

**INSPECTION:**

1. Check screen and brackets for cracks, tears, bending, and dents.
2. Replace bad parts.

Go on to Sheet 2

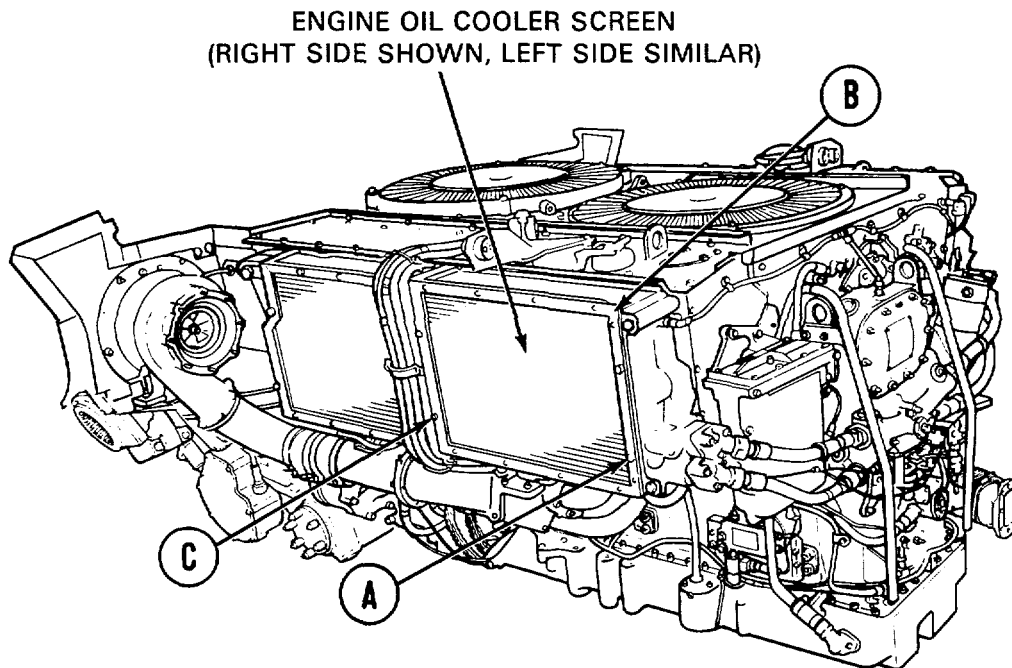
TA147568

**ENGINE OIL COOLER SCREEN REPLACEMENT (Sheet 2 of 2)****NOTE**

**If installing screens on 2A engine, do steps 1, 2, 3, and 5.**

**INSTALLATION:**

1. Place cooler screen on oil cooler.
2. Start threads of four screws with assembled washers (A) by hand to hold screen in place.
3. Using socket, tighten screws and assembled washers (A).
4. Using socket with extension through harness and into bracket (B), install and tighten two screws with assembled washers (C).
5. Install 2A powerplant (page 5-14) or 2D powerplant (page 5-40).



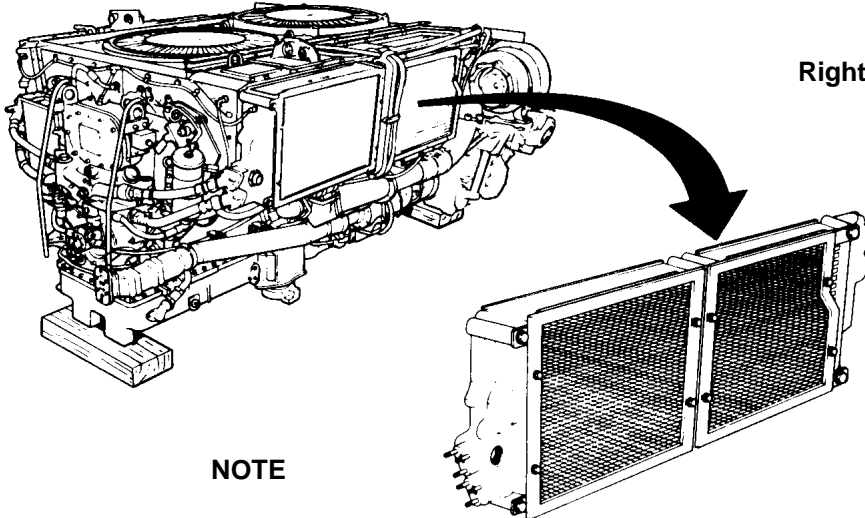
End of Task

TA147569

**TRANSMISSION OIL COOLER SCREEN REPLACEMENT (Sheet 1 of 2)**

**TOOLS:** 1/2 in. socket with 1/2 in. drive  
 6 in. extension with 1/2 in. drive  
 Ratchet with 1/2 in. drive

**PRELIMINARY PROCEDURE:** Remove powerplant (page 5-1)



**NOTE**

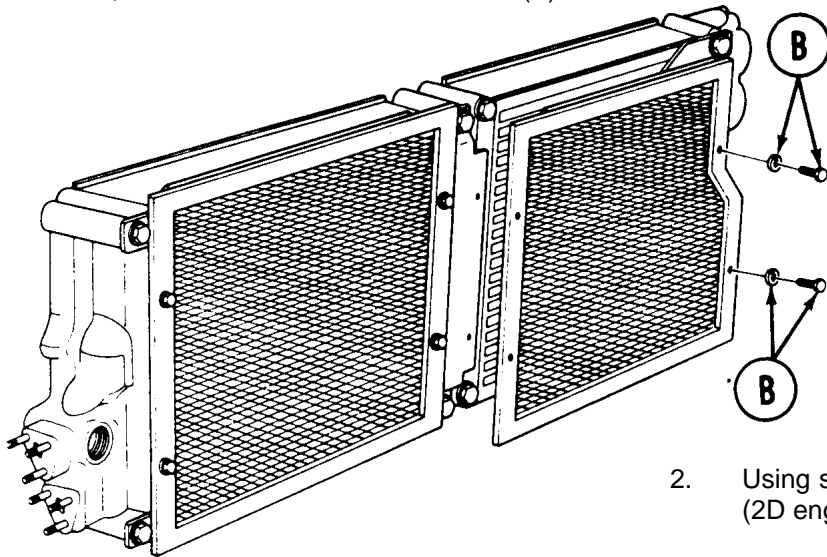
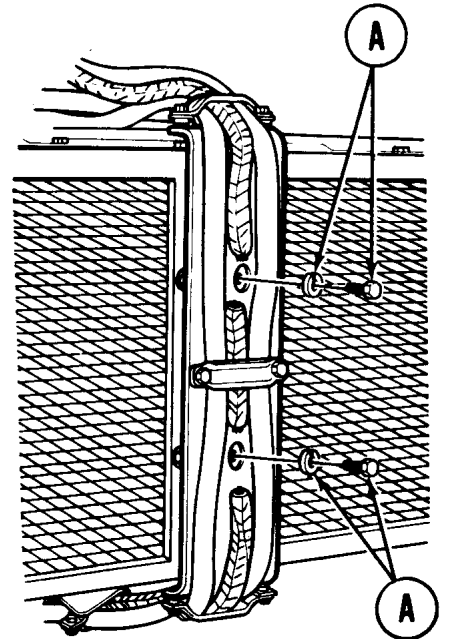
Right side shown, left side similar.

**NOTE**

If removing screens on 2A engine, go to steps 3 and 4.

**REMOVAL:**

1. Using socket and extension through harness and into bracket, remove two screws and washers (A).



2. Using socket remove two screws and washers (B) (2D engine).
3. Using socket remove four screws and washers (B) (2A engine).
4. Lift oil cooler screen away from oil cooler.

Go on to Sheet 2

TA147570

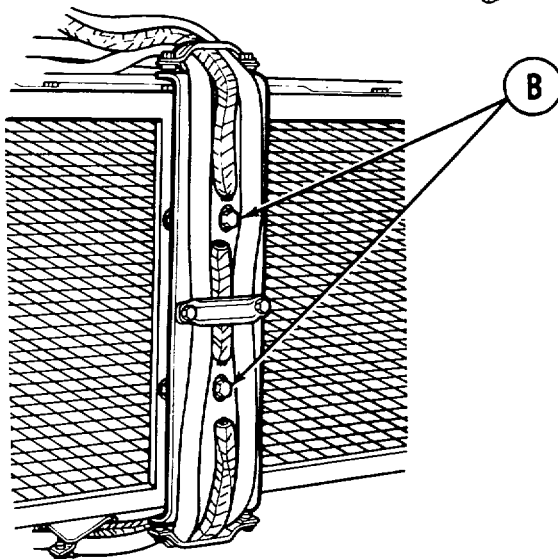
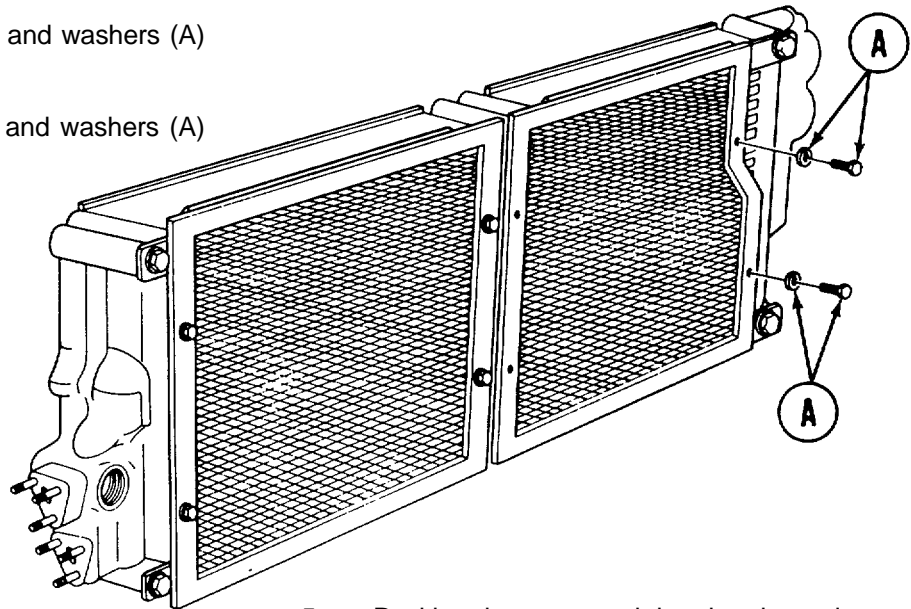
## TRANSMISSION OIL COOLER SCREEN REPLACEMENT (Sheet 2 of 2)

## NOTE

If installing screens on 2A engine, do steps 1, 4, and 6.

## INSTALLATION:

1. Position oil cooler screen into place on oil cooler.
2. Start threads of two screws (A) with washers by hand.
3. Using socket, tighten two screws and washers (A) (2D engine).
4. Using socket, install four screws and washers (A) (2A engine).



5. Position harness and bracket into place on oil coolers.
6. Using socket and extension through harness and into bracket, install screws and washers (B).
7. Install 2A powerplant (page 5-14) or 2D powerplant (page 5-40).

End of Task

TA147571



**ENGINE OIL COOLER REPLACEMENT (2A ENGINE) (Sheet 1 of 8)**

PROCEDURE INDEX

PROCEDURE	PAGE
Removal	6-121
Installation	6-125

TOOLS: 1/2 in. socket with 1/2 in. drive  
 9/16 in. combination box and open end wrench  
 1-1/2 in. combination box and open end wrench  
 9/16 in. socket with 1/2 in. drive  
 Ratchet with 1/2 in. drive  
 Slip joint pliers  
 Putty knife  
 Diagonal cutting pliers  
 1-3/4 in. open end wrench

SPECIAL TOOLS: Ground hop kit (Item 30, Chapter 3, Section I)

SUPPLIES: Lockwire (Item 60, Appendix D)  
 Engine oil cooler connector gaskets (8682679) (2 required)  
 Thermostatic bypass valve gasket (7403580)  
 Drip pan  
 Roll of masking tape, 1/2 in. wide (Item 57, Appendix D)  
 Plastic barrier material (Item 41, Appendix D)  
 Self-locking nut (MS21045-5) (6 required)

REFERENCES: TM 9-2350-260-10  
 LO 9-2350-260-12

PRELIMINARY PROCEDURES: Remove powerplant (page 5-1)

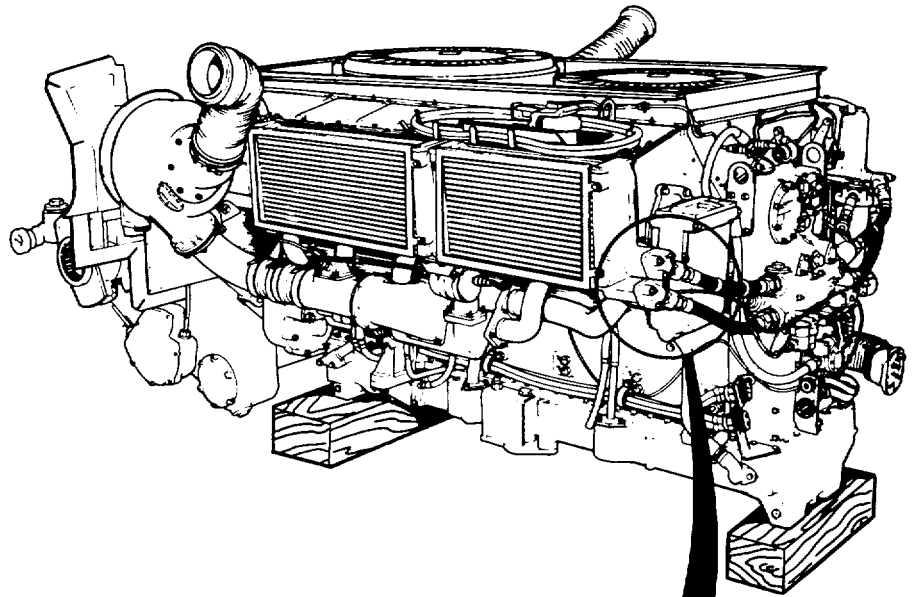
Go on to Sheet 2

## ENGINE OIL COOLER REPLACEMENT (2A ENGINE) (Sheet 2 of 8)

## NOTE

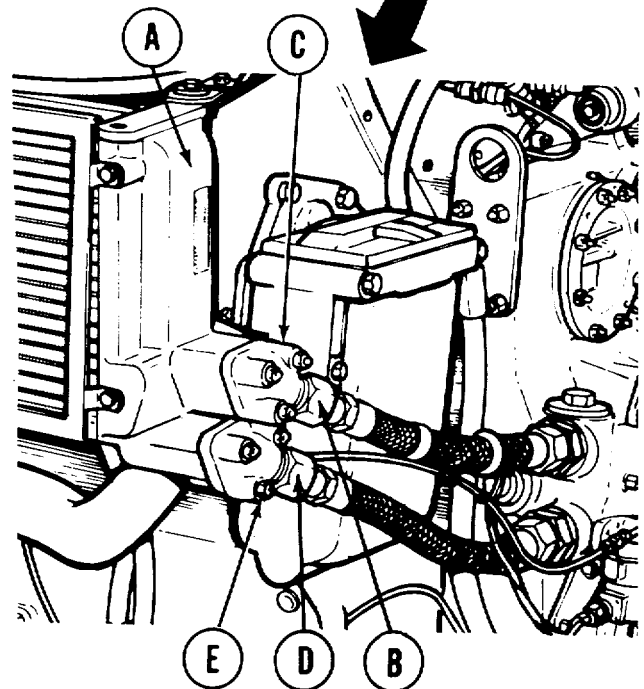
Procedures are identical for both left and right coolers.

LEFT SIDE SHOWN



## REMOVAL:

1. Position drip pan under engine oil cooler (A).
2. Using 1-1/2 inch wrench, remove oil inlet hose nut (B) from engine oil cooler connector (C).
3. Using 1-1/2 inch wrench, remove oil outlet hose nut (D) from engine oil cooler connector (E).
4. After oil has drained into drip pan, use plastic material (Item 41, Appendix D) and masking tape (Item 57, Appendix D) to cover ends of hoses (B) and (D) and oil cooler connectors (C) and (E).

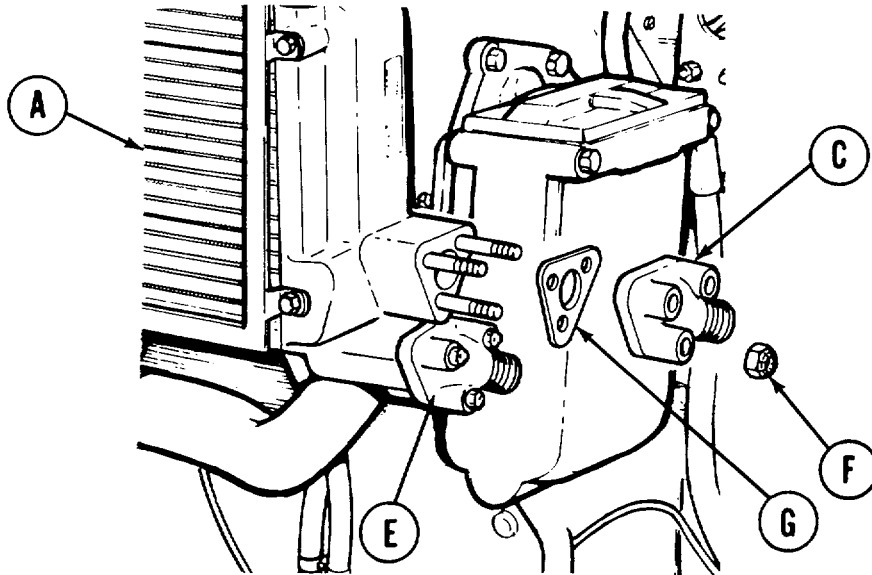


Go on to Sheet 3

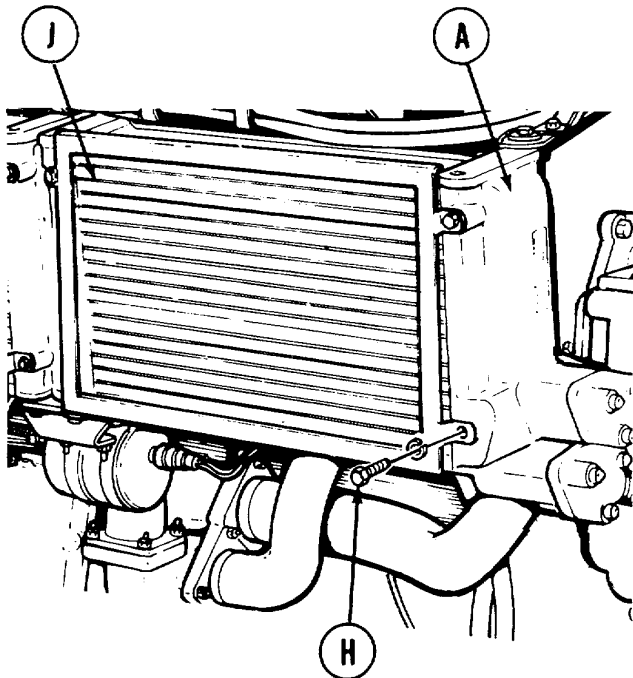
TA147572

**ENGINE OIL COOLER REPLACEMENT (2A ENGINE) (Sheet 3 of 8)**

5. Using 1/2 inch socket, remove six self-locking nuts (F) securing two engine oil connectors (C) and (E) from oil cooler (A). Throw nuts away.
6. Remove engine oil connectors (C) and (E).
7. Using putty knife, remove gaskets (G). Throw gaskets away.



8. Using 1/2 inch socket remove four screws with assembled washers (H) securing engine oil cooler screen (J) to engine oil cooler (A).
9. Remove engine oil cooler screen (J).

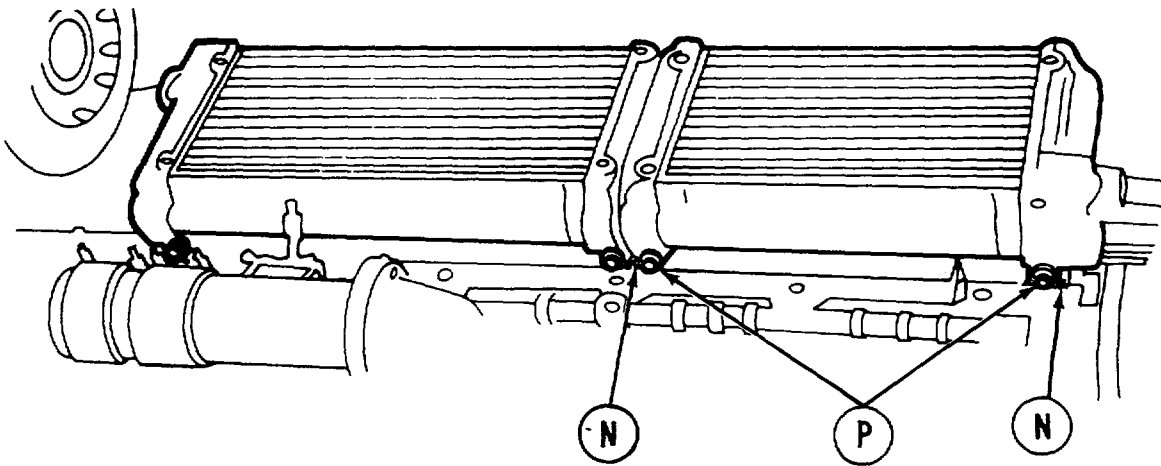
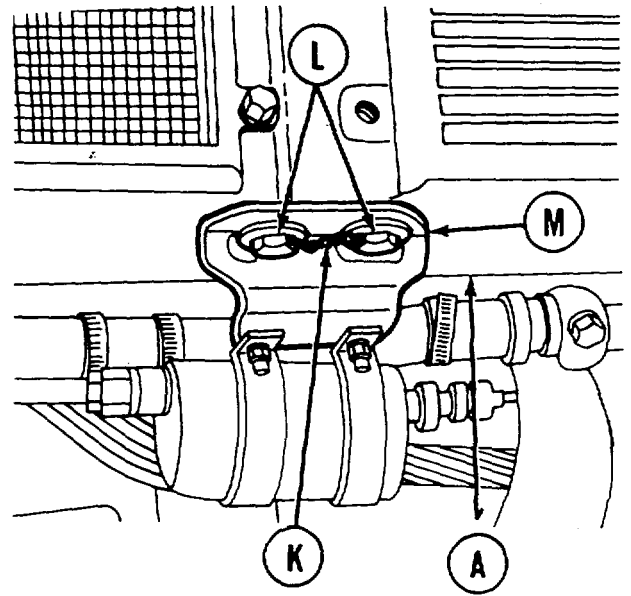


Go on to Sheet 4

TA147573

**ENGINE OIL COOLER REPLACEMENT (2A ENGINE) (Sheet 4 of 8)**

10. Using diagonal pliers, remove lockwire (K).
11. Using 9/16 inch wrench, remove two screws (L) securing ignition unit bracket (M) to oil cooler (A).
12. Position ignition unit bracket (M) aside.

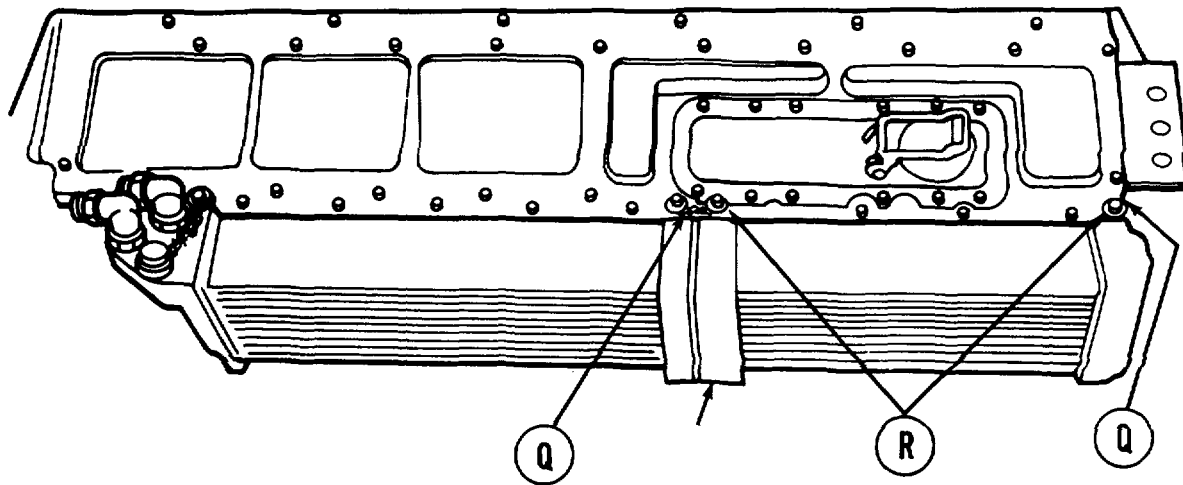


13. Using diagonal pliers, remove lockwires (N).
14. Using 9/16 inch socket, remove two screws (P).

Go on to Sheet 5

TA147574

ENGINE OIL COOLER REPLACEMENT (2A ENGINE) (Sheet 5 of 8)

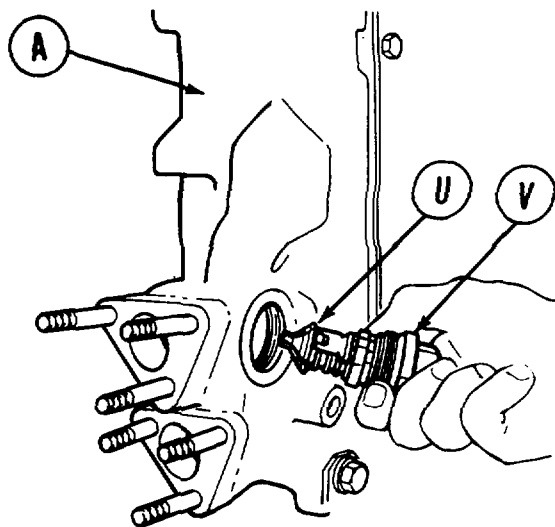
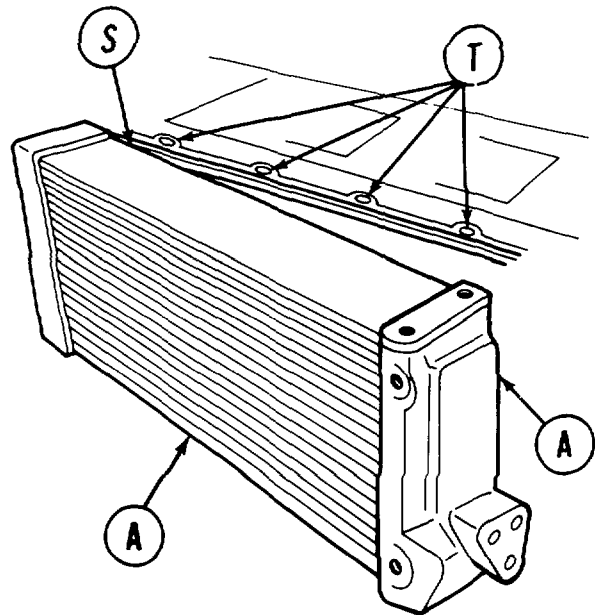


15. Using diagonal pliers, remove lockwire (Q).

**CAUTION**

**Support engine oil cooler (A) with hand while doing step 16.**

16. Using 9/16 inch socket, remove two screws and fiat washers (R).
17. Remove engine oil cooler (A).
18. Using screwdriver, pry seal (S) from four fasteners (T).



19. Using 1-3/4 inch wrench, remove thermostatic bypass valve (U) from engine oil cooler (A).
20. Using putty knife, remove gasket (V) from bypass valve (U). Throw gasket (V) away.

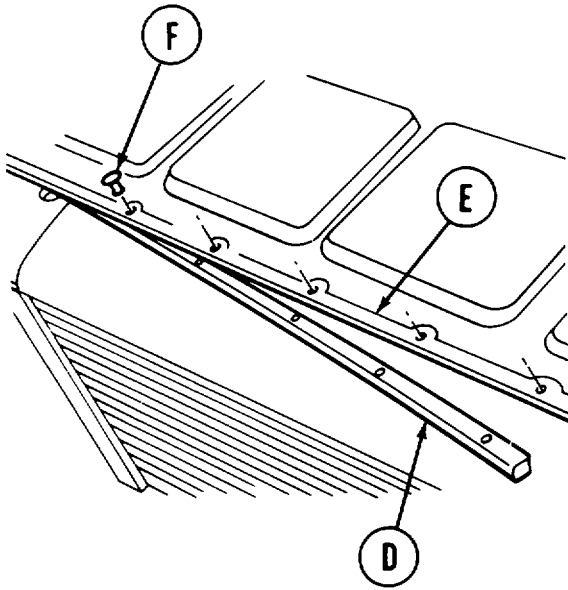
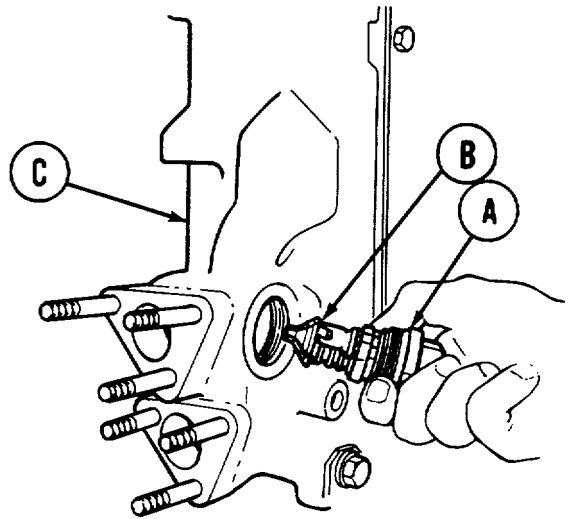
Go on to Sheet 6

TA147575

**ENGINE OIL COOLER REPLACEMENT (2A ENGINE) (Sheet 6 of 8)**

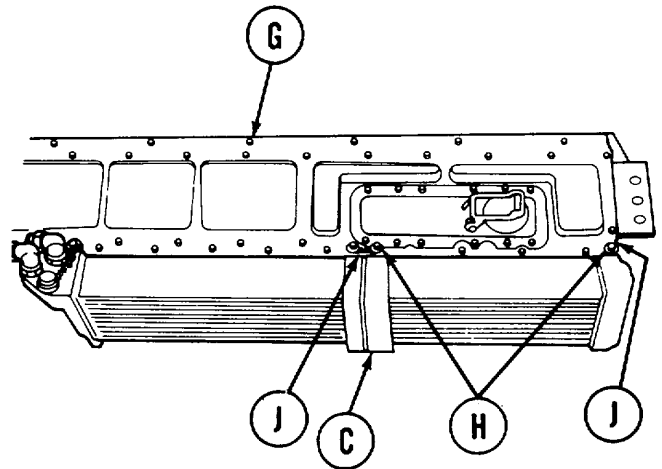
**INSTALLATION:**

1. Install new gasket (A) onto thermostatic bypass valve (O).
2. Using 1-3/4 Inch wrench, install thermostatic bypass valve (B) in engine oil cooler (C).



3. Position retainer and seal (D) under top frame (E).
4. Using hand, install four fasteners (F) securing retainer and seal (D) to top frame (E).

5. Position engine oil cooler (C) to engine (G).
6. Using 9/16 Inch socket, install two screws and flat washer (H).
7. Using slip joint pliers, install lockwire (Item 60, Appendix D) (J).

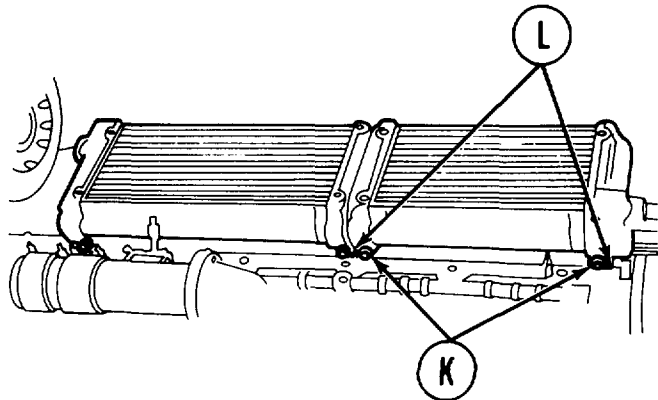


Go on to Sheet 7

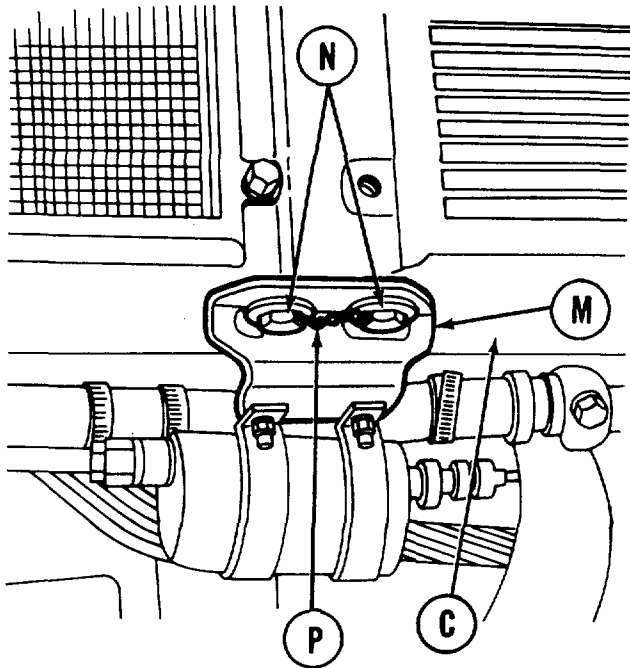
TA147576

**ENGINE OIL COOLER REPLACEMENT (2A ENGINE) (Sheet 7 of 8)**

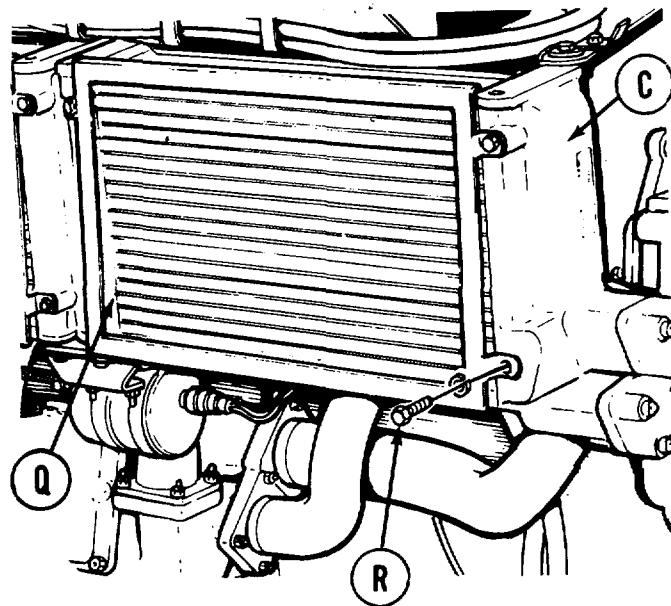
8. Using 9/16 inch socket, install two screws (K).
9. Using slip joint pliers, install lockwire (Item 60, Appendix D) (L).



10. Position Ignition unit bracket (M) on engine oil cooler (C).
11. Using 9/16 inch wrench, install two screws (N) securing ignition bracket (M) to engine oil cooler (C).
12. Using slip joint pliers, install lockwire (Item 60, Appendix D) (P).



13. Position engine oil cooler screen (Q) on engine oil cooler (C).
14. Using 1/2 inch socket, install four screws with assembled washers (R).

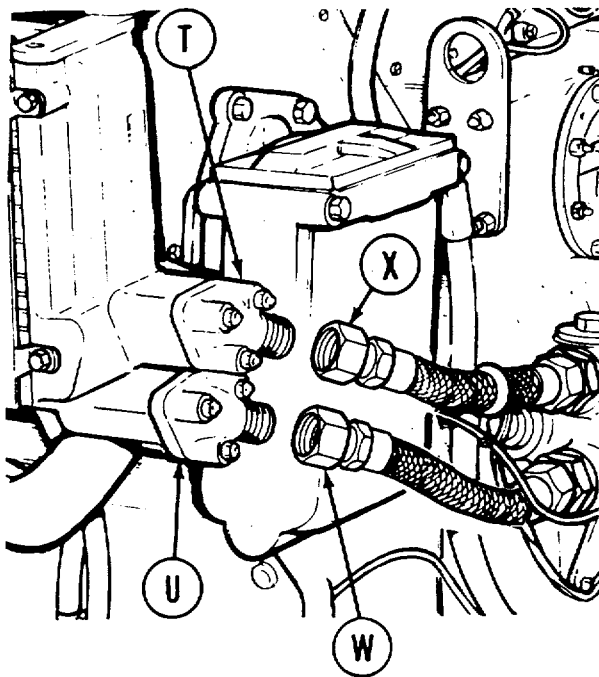
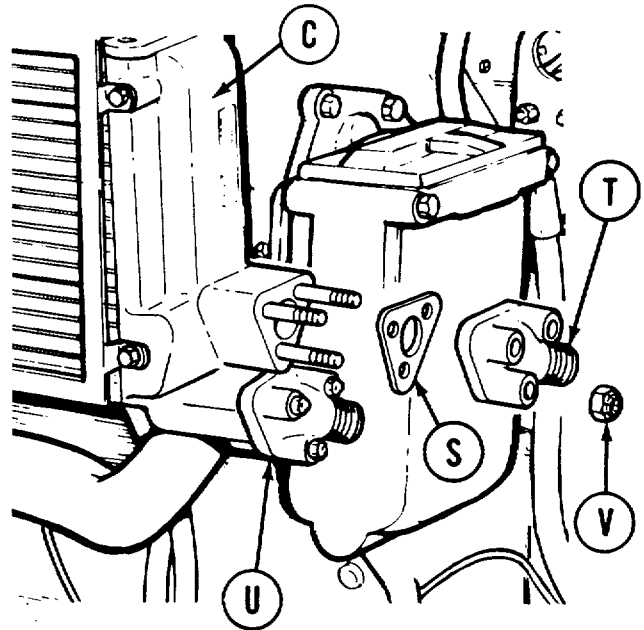


Go on to Sheet 8

TA147577

**ENGINE OIL COOLER REPLACEMENT (2A ENGINE) (Sheet 8 of 8)**

15. Position two new gaskets (S) on engine oil cooler (C).
16. Remove tape and plastic and position engine oil cooler connectors (T) and (U) on oil cooler (C).
17. Using 1/2 inch socket, install six new self-locking nub (V) securing two engine oil connectors (T) and (U) to engine oil cooler (C).



18. Remove masking tape and plastic from hoses (W) and (X).
19. Using 1-1/2 inch wrench, install hose nut (W) to connector (U).
20. Using 1-1/2 inch wrench, install hose nut (X) to connector (T).
22. Replenish lubricating oil lot during engine oil cooler replacement (LO 9-2350-260-12). Start and run engine.
23. Ground hop engine (page 5-54). Check for oil leaks at oil cooler and hose connections. Tighten any connections that are leaking.

24. Stop engine and disconnect ground hop kit (page 67).
25. Install powerplant (page 5-14).

End of Task

TA147578



**ENGINE OIL COOLER REPLACEMENT (2D ENGINE) (Sheet 1 of 6)**

PROCEDURE INDEX

PROCEDURE	PAGE
Removal	6-128
Installation	6-131

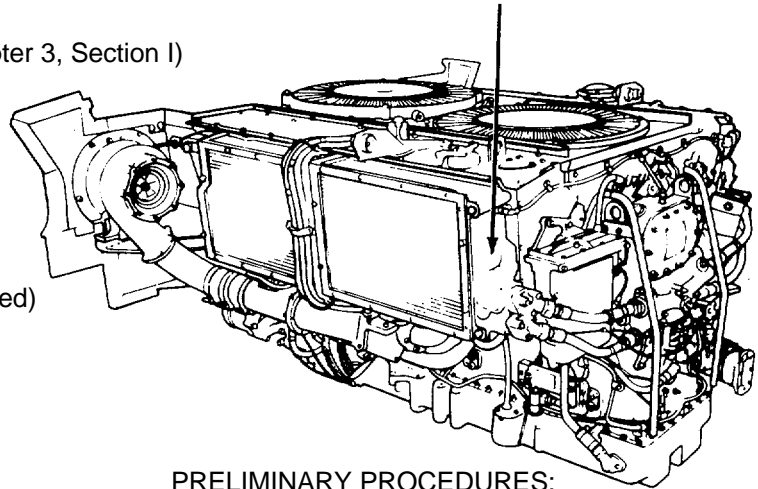
**TOOLS:** 1/2 in. socket with 1/2 in. drive  
 Ratchet with 1/2 in. drive  
 5 in. extension with 1/2 in. drive  
 1/2 in. combination box and open end wrench  
 3/4 in. combination box and open end wrench  
 1-1/2 in. open end wrench

**SPECIAL TOOLS:** Ground hop kit (Item 30, Chapter 3, Section I)

**SUPPLIES:** Washer (MS9320-12)  
 Drip pan  
 Masking tape (Item 57, Appendix D)  
 Plastic barrier material (Item 41, Appendix D)  
 Lockwasher (MS35335-34) (4 required)

**REFERENCES:** TM 9-2350-260-10  
 LO 9-2350-260-12

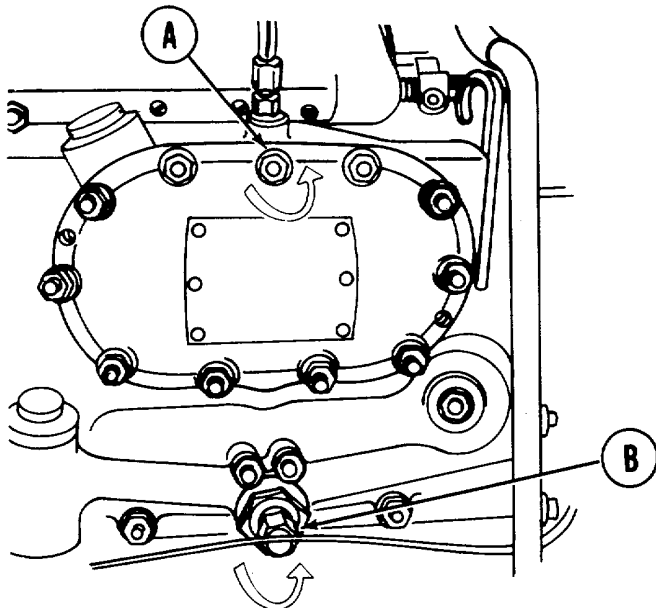
(LEFT SIDE SHOWN, RIGHT SIDE SIMILAR)



**PRELIMINARY PROCEDURES:**  
 Remove powerplant (page 5-27)  
 Remove engine shroud (page 9-2)

**REMOVAL:**

1. Using 1/2 inch socket, remove screw (A) and washer. Throw washer away.
2. Using 3/4 inch wrench, loosen valve (B) six complete turns.

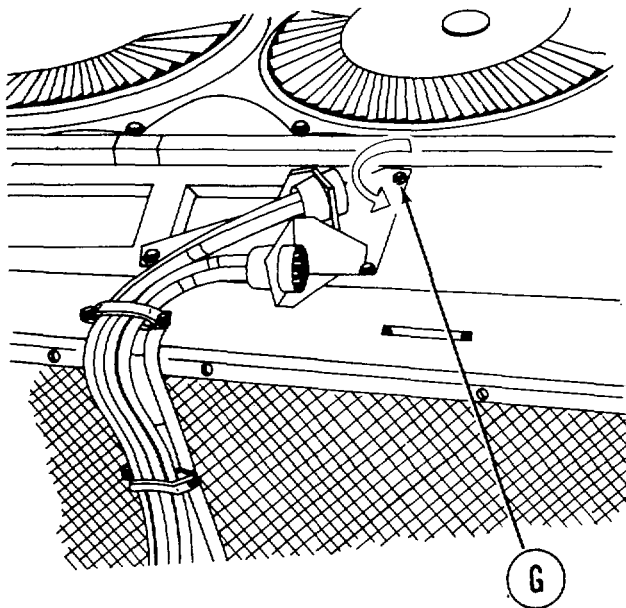
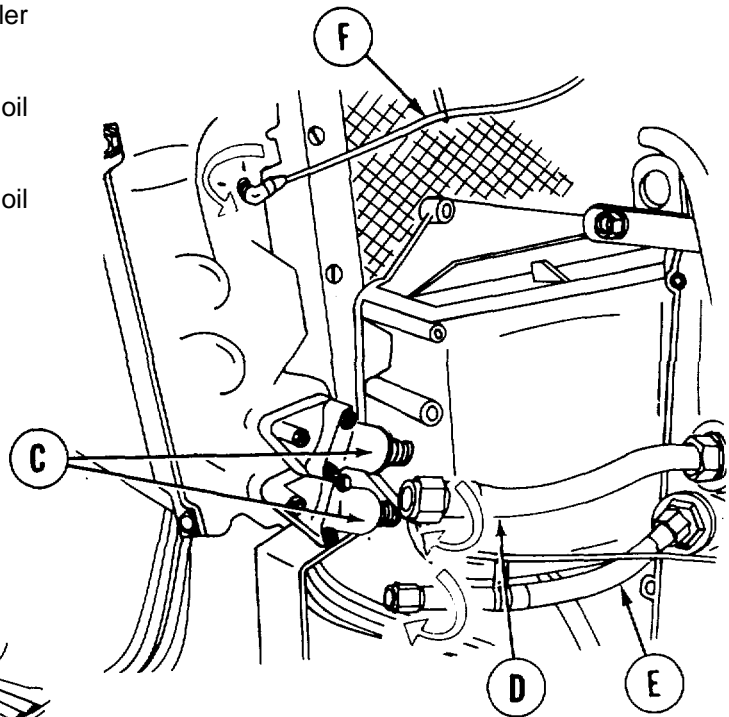


Go on to Sheet 2

TA147579

**ENGINE OIL COOLER REPLACEMENT (2D ENGINE) (Sheet 2 of 6)**

3. Put drip pan on flat surface under oil cooler connectors (C).
4. Using 1-1/2 inch wrench, remove hose (D) from oil cooler connector (C).
5. Using 1-1/2 inch wrench, remove hose (E) from oil cooler connector (C).



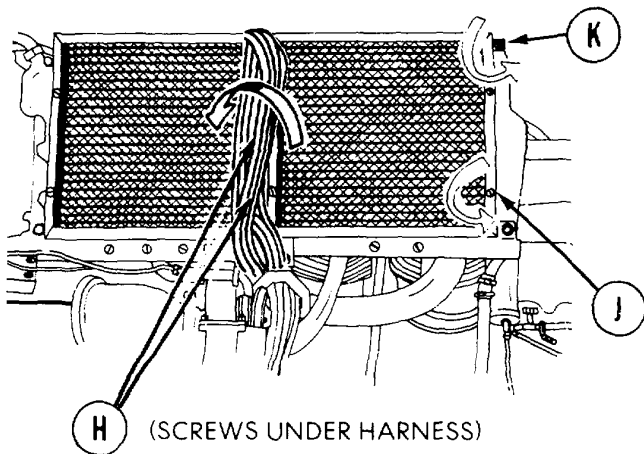
6. Using plastic material (Item 41, Appendix D) and masking tape (Item 57, Appendix D), wrap ends of hoses (D) and (E) and oil cooler connectors (C) to keep them clean and from dripping.
7. Using 1/2 inch wrench, remove oil cooler vent hose (F) at top of cooler.

8. Using 1/2 inch wrench, remove four screws and lockwashers (G). Throw lockwashers away.

Go on to Sheet 3

TA147580

## ENGINE OIL COOLER REPLACEMENT (2D ENGINE) (Sheet 3 of 6)



9. Using 1/2 inch socket with extension through harness and into bracket, remove two screws and washers (H).
10. Lower harness from coolers with bracket attached.

11. Using 1/2 inch socket, remove two screws and washers (J) holding oil cooler screen to cooler.
12. Remove oil cooler screen from cooler.

**CAUTION**

**Support oil cooler to keep it from falling while doing step 13.**

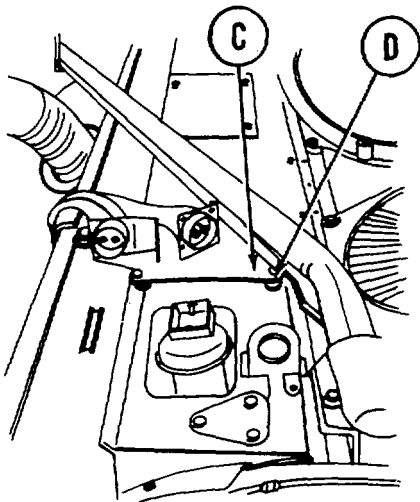
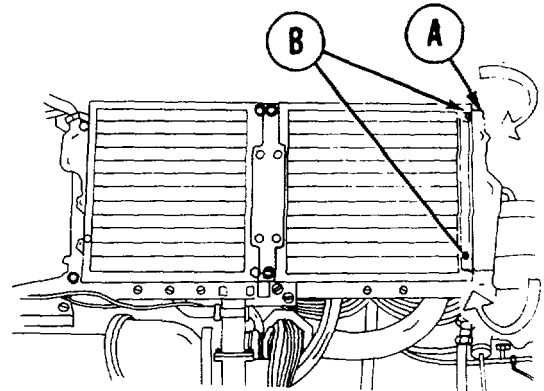
13. Using 3/4 inch wrench, remove four screws and washers (K) holding oil cooler frame.
14. Remove oil cooler and mounting brackets.

Go on to Sheet 4

TA147581

**ENGINE OIL COOLER REPLACEMENT (2D ENGINE) (Sheet 4 of 6)****INSTALLATION:**

1. Place oil cooler and oil cooler screen mounting bracket into place on oil cooler frame.
2. Start threads of four screws with washers (A) by hand to hold oil cooler in place.
3. Using 3/4 inch wrench, tighten screws (A).
4. Lift screen into place on oil cooler.
5. Start threads of four screws with washers (B) by hand to hold oil cooler screen in place.
6. Using 1/2 inch socket, tighten screws and washers (B).

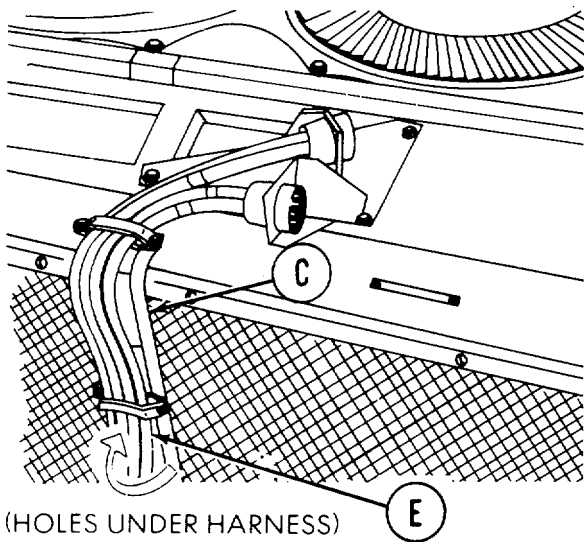


7. Lift starter cable mounting bracket (C) into place at top of oil cooler.
8. Start threads of four screws with new lockwashers (D) by hand.
9. Using 1/2 inch wrench, tighten screws and lockwashers (D).

Go on to Sheet 5

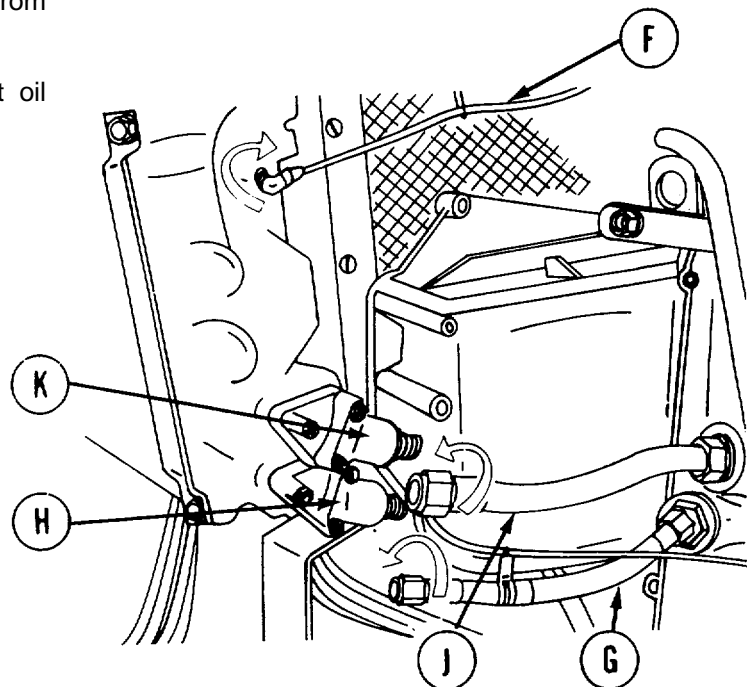
TA147582

ENGINE OIL COOLER REPLACEMENT (2D ENGINE) (Sheet 5 of 6)



10. Using 1/2 inch socket with extension through harness and into bracket, install two washes and screws (E).

11. Using 1/2 inch wrench, install oil cooler vent hose (F) at top of cooler.
12. Remove plastic material and masking tape from hose (G) and oil cooler connector (H).
13. Using 1-1/2 inch wrench, install hose (G) at oil cooler connector (H).
14. Remove plastic material and masking tape from hose (J) and oil cooler connector (K).
15. Using 1-1/2 inch wrench, install hose (J) at oil cooler connector (K).

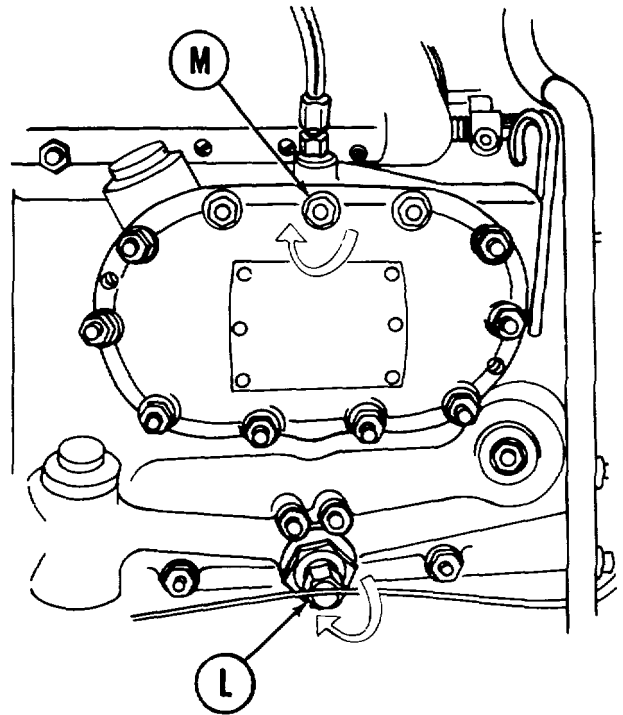


Go on to Sheet 6

TA147583

**ENGINE OIL COOLER REPLACEMENT (2D ENGINE) (Sheet 6 of 6)**

16. Using 3/4 inch socket, tighten valve (L).
17. Install new washer on screw (M).
18. Using 1/2 inch socket, install washer and screw (M).
19. Check engine oil level indicator gage rod (TM 9-2350-260-10).
20. Replenish lubricating oil lost during oil cooler replacement (LO 9-2350-260-1-2).
21. Connect engine for powerplant ground hop (page 5-54).
22. Start and run engine. Check for oil leaks at oil cooler and hose connections.
23. Shut down engine. Disconnect engine from powerplant ground hop kit (page 5-67).
24. Install engine shroud (page 9-3).
25. Install powerplant (page 5-40).



End of Task

TA147584

**TRANSMISSION OIL COOLER REPLACEMENT (2A ENGINE) (Sheet 1 of 10)**

PROCEDURE INDEX

PROCEDURE	PAGE
Removal	6-135
Installation	6-140

TOOLS: 1/2 in. combination box and open end wrench  
 1-1/2 in. combination box and open end wrench  
 Diagonal cutting pliers  
 Flat-tip screwdriver  
 1/2 in. socket with 1/2 in. drive  
 9/16 in. socket with 1/2 in. drive  
 Ratchet with 1/2 in. drive  
 1-3/4 in. open end wrench  
 9/16 in. combination box and open end wrench  
 1-5/8 in. combination box and open end wrench  
 Slip joint pliers

SPECIAL TOOLS: Ground hop kit (Item 30, Chapter 3, Section I)

SUPPLIES: Masking tape (Item 57, Appendix D)  
 Plastic barrier material (Item 41, Appendix D)  
 Transmission oil cooler bypass valve gasket (NAS1598-6V)  
 Lockwire (Item 60, Appendix D)  
 Shroud-to-oil-cooler lockwasher ( ) (2 required)

REFERENCES: TM 9-2350-260-10  
 LO 9-2350-260-12

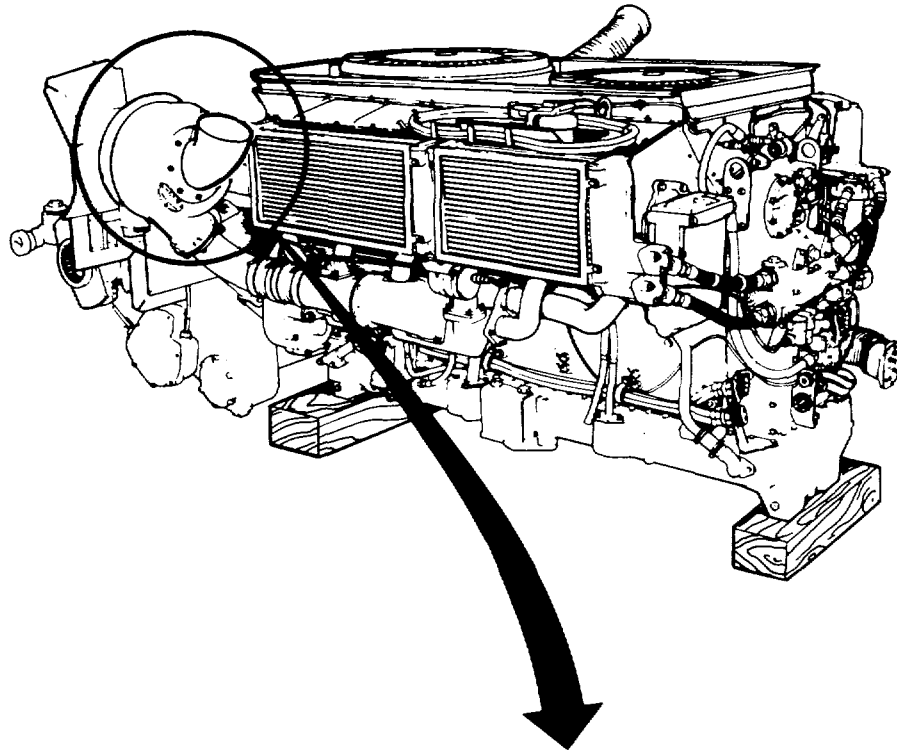
PRELIMINARY PROCEDURES: Remove powerplant (page 5-2)  
 Remove engine shroud (page 9-2)

TRANSMISSION OIL COOLER REPLACEMENT (2A ENGINE) (Sheet 2 of 10)

NOTE

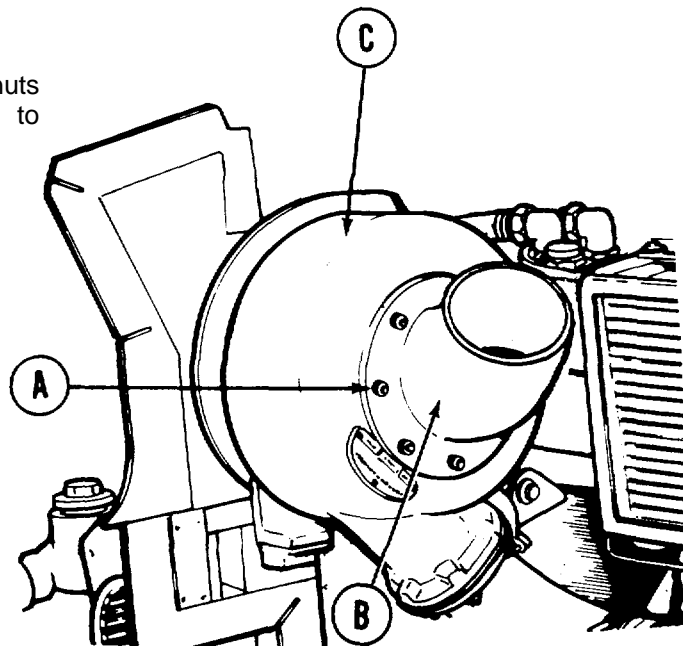
Procedures are same for left and right cooler removal.

LEFT SIDE SHOWN



REMOVAL:

1. Using 1/2 inch wrench, remove eight nuts washers (A) securing air inlet elbow (B) to turbocharger (C).
2. Remove air inlet elbow (B).



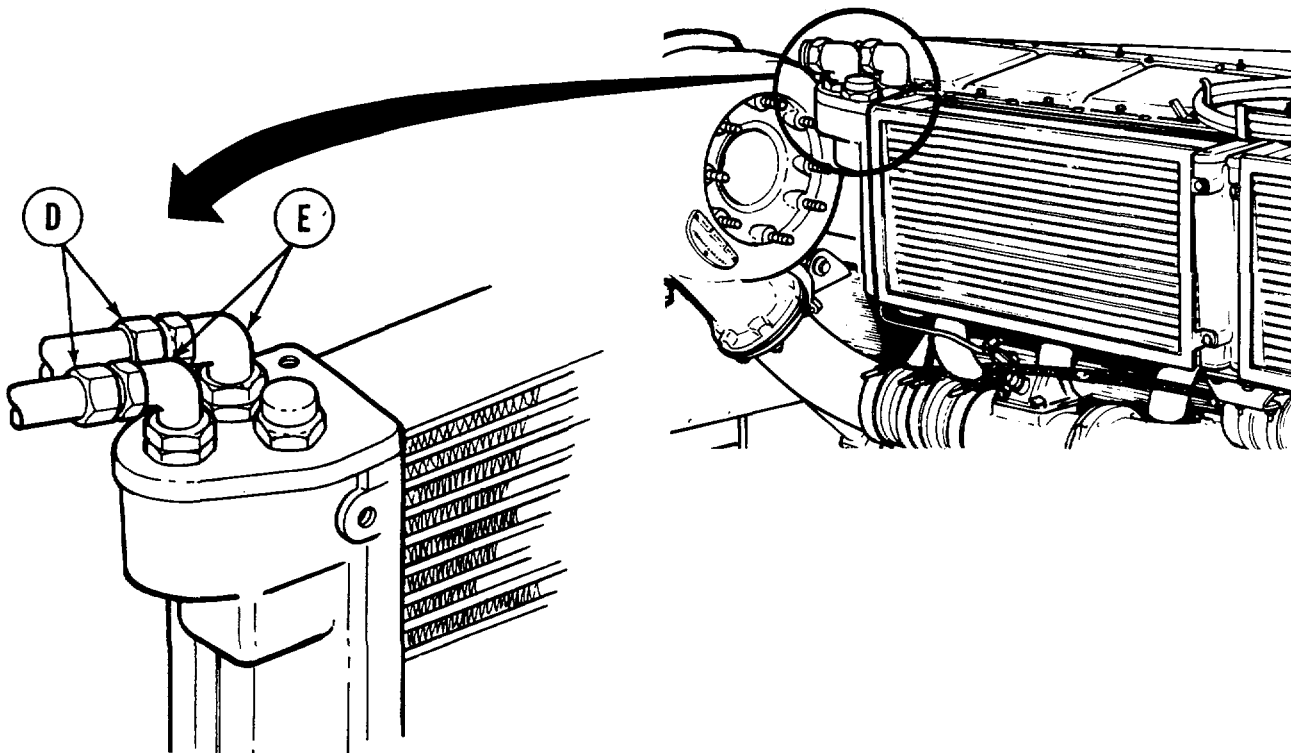
Go on to Sheet 3

TA147586

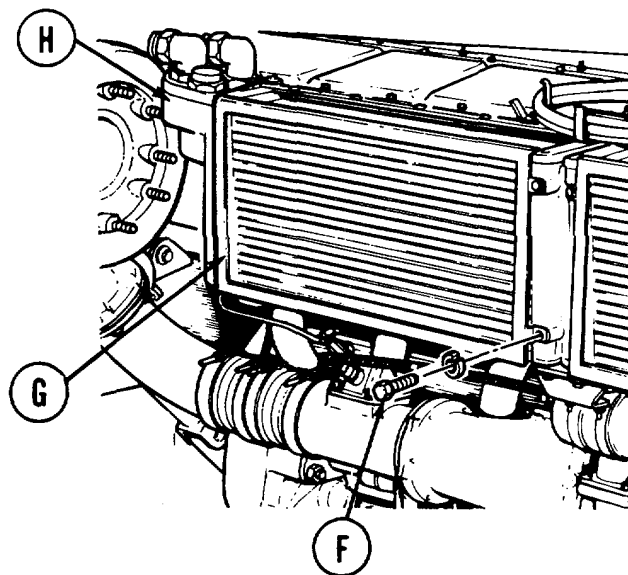


## TRANSMISSION OIL COOLER REPLACEMENT (2A ENGINE) (Sheet 3 of 10)

3. Using 1-1/2 inch wrench, remove two oil cooler hose nuts (D) from oil cooler connectors (E).
4. Using plastic material (Item 41, Appendix D) and masking tape (Item 57, Appendix D), wrap ends of oil cooler hoses (D).



5. Using 1/2 inch socket, remove four bolts with assembled washers (F) securing oil cooler screen (G) to oil cooler (H).
6. Remove oil cooler screen (G).

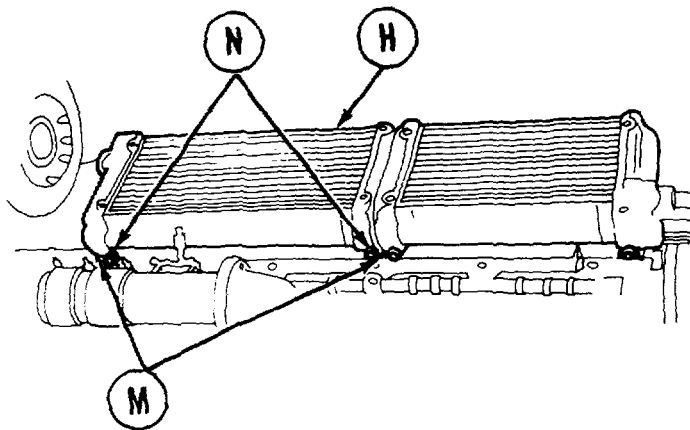
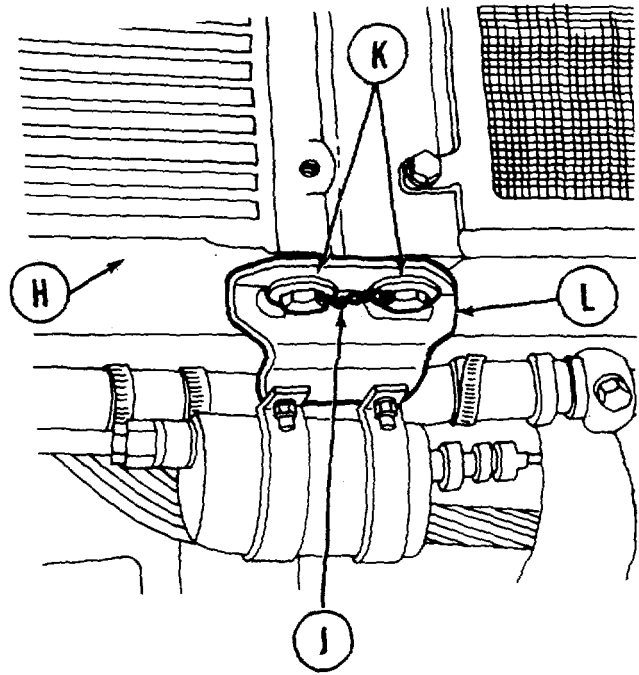


Go on to Sheet 4

TA147587

**TRANSMISSION OIL COOLER REPLACEMENT (2A ENGINE) (Sheet 4 of 10)**

7. Using diagonal pliers, remove lockwire (J).
8. Using 9/16 inch wrench, remove two screws (K) securing ignition unit bracket (A) to oil cooler (H).
9. Position ignition bracket (L) aside.

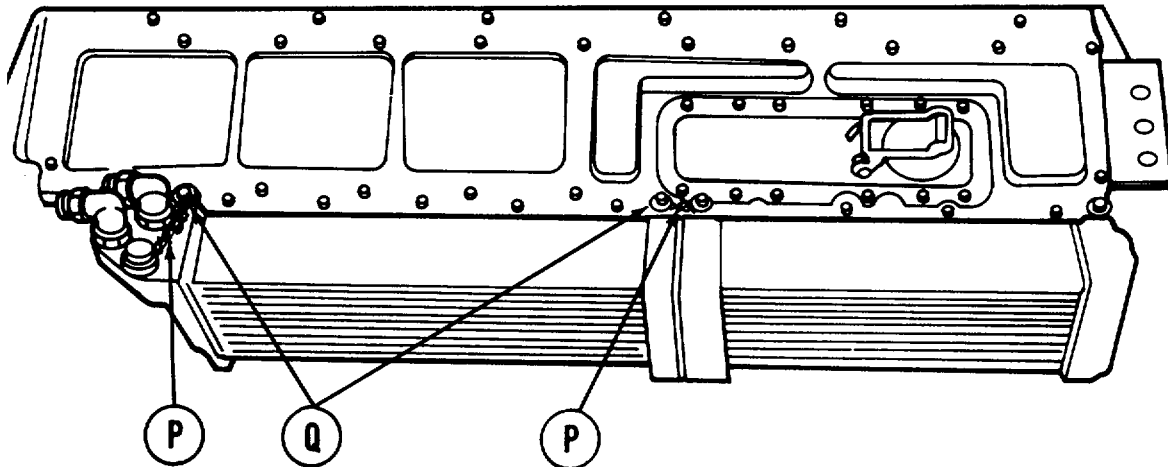


10. Using diagonal pliers, remove lockwire (M).
11. Using 9/16 inch socket, remove two screws (N) securing oil cooler (H) to engine.

Go on to Sheet 5

TA147588

TRANSMISSION OIL COOLER REPLACEMENT (2A ENGINE) (Sheet 5 of 10)

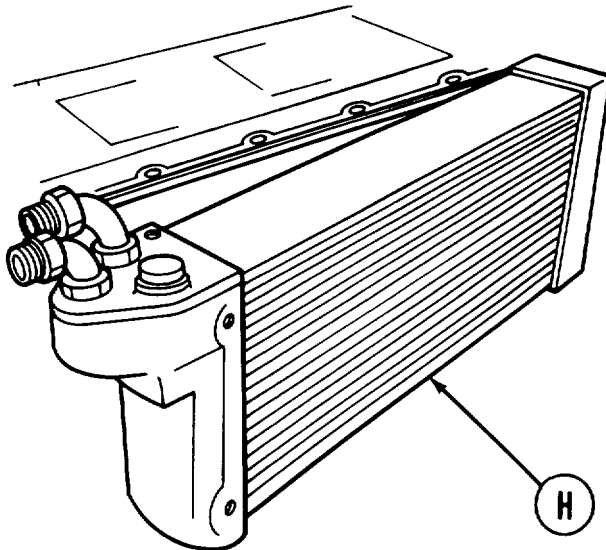


12. Using diagonal pliers, remove lockwires (P).

**CAUTION**

**Using hand, support transmission oil cooler while performing step 13.**

13. Using 9/16 inch socket, remove two screws (Q).



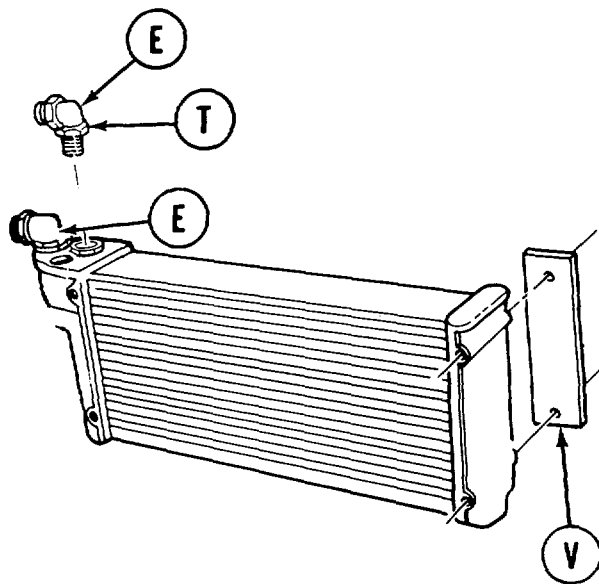
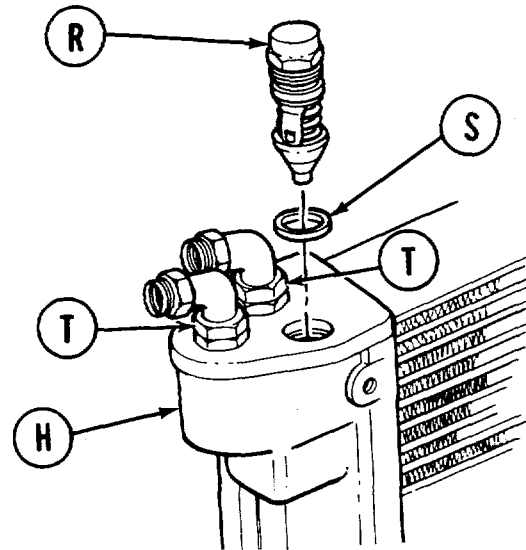
14. Using hands, remove oil cooler (H) by pulling out on left end, then sliding oil cooler to left.

Go on to Sheet 6

TA147589

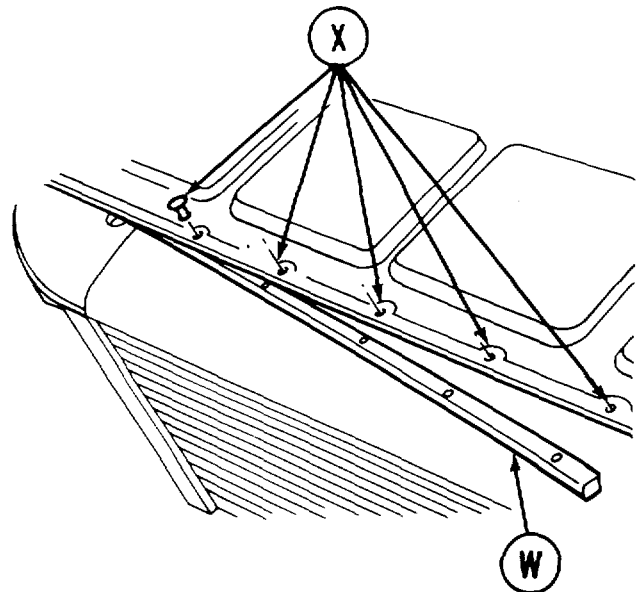
**TRANSMISSION OIL COOLER REPLACEMENT (2A ENGINE) (Sheet 6 of 10)**

15. Using 1-3/4 inch wrench, remove bypass valve (R).
16. Remove gasket (S) from bypass valve (R).
17. Using 1-1/2 inch wrench, loosen two locknuts (T).
18. Using 1-5/8 inch wrench, remove two connectors (E).



19. Using 1/2 inch socket, remove two screws and lockwashers (U) securing shroud (V) to oil cooler (H). Throw lockwashers away.

20. Remove shroud plate (V).



21. Using screwdriver, remove seal and retainer (W) from five fasteners (X).

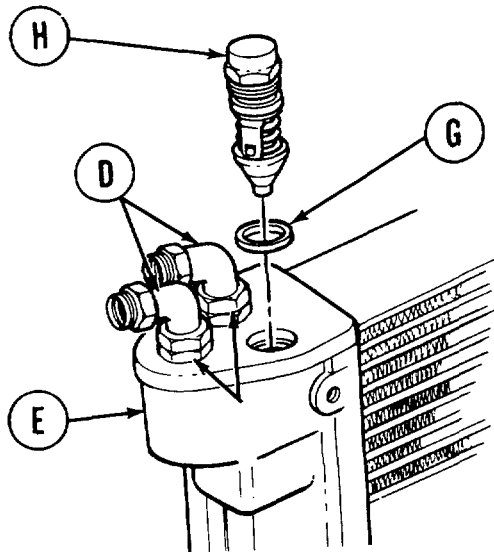
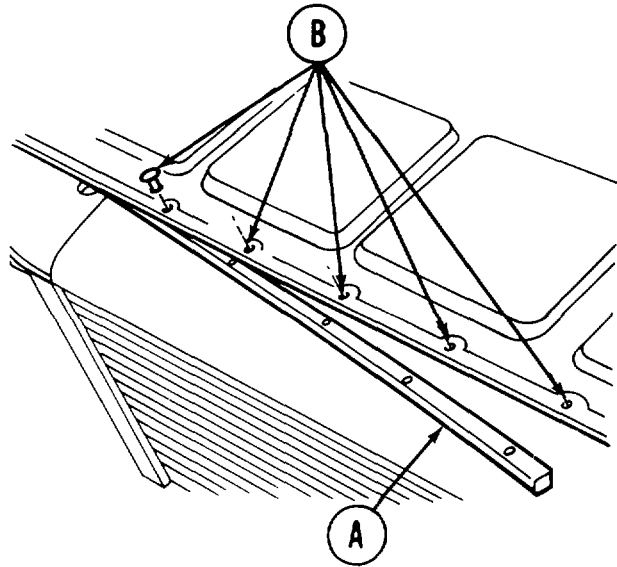
Go on to Sheet 7

TA147590

**TRANSMISSION OIL COOLER REPLACEMENT (2A ENGINE) (Sheet 7 of 10)**

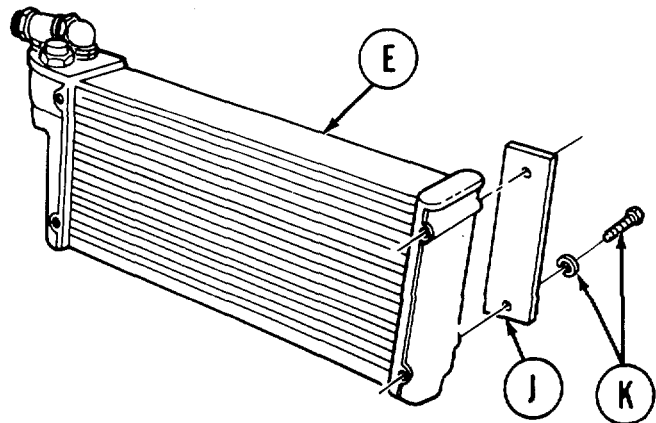
**INSTALLATION:**

1. Position retainer and seal (A) under top frame and secure with five fasteners (B).
2. Using hands install connectors (C) and (D) in oil cooler (E).
3. Using 1-5/8 inch wrench, tighten two locknuts (F).



4. Install gasket (G) on bypass valve (H).
5. Using 1-3/4 inch wrench, install bypass valve (H) in oil cooler (E).

6. Position shroud plate (J) and oil cooler (E).
7. Using 1/2 inch socket, install two new lockwashers and screws (K) securing shroud plate (J) to oil cooler (E).
8. Position engine shroud (J) on oil cooler (E) behind engine oil cooler, then push left end of oil cooler (E) into place.



Go on to Sheet 8

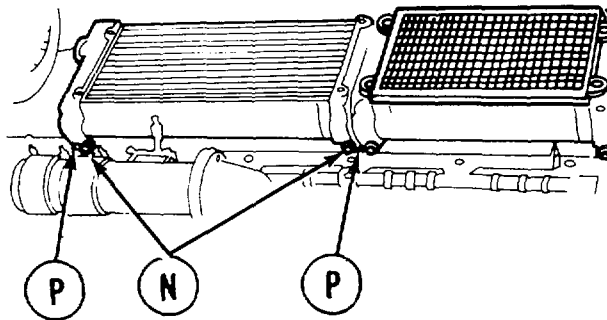
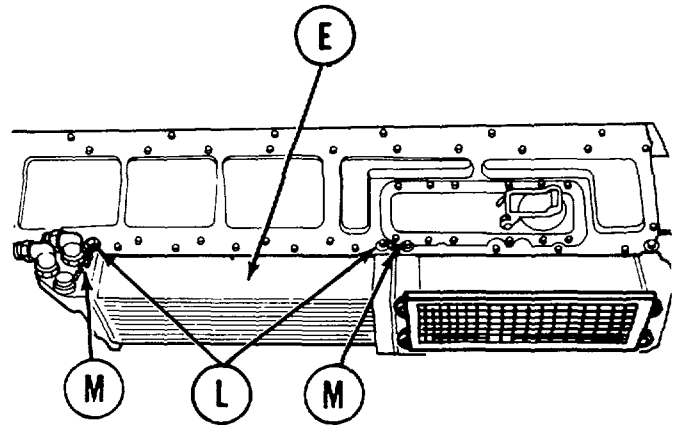
TA147592

TRANSMISSION OIL COOLER REPLACEMENT (2A ENGINE) (Sheet 8 of 10)

**CAUTION**

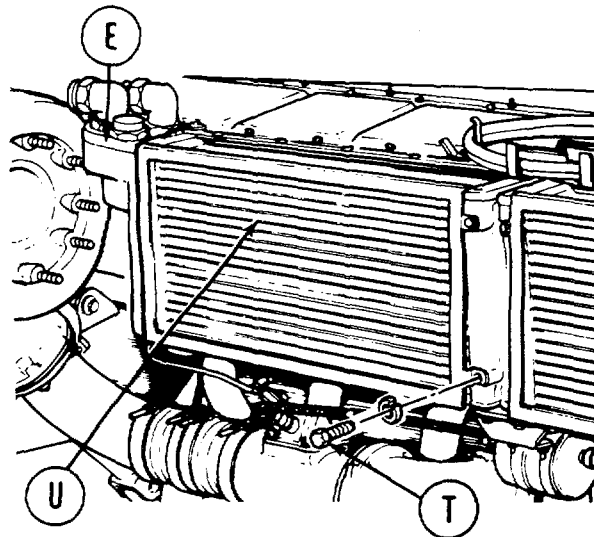
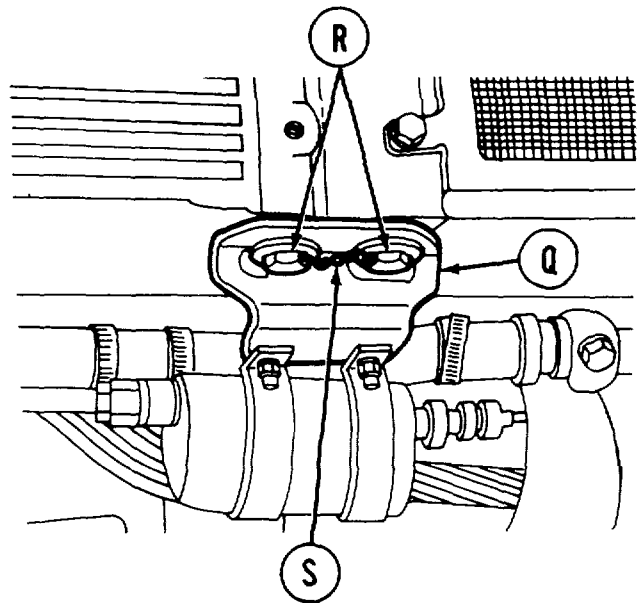
Support oil cooler (E) with hand while performing step 9.

9. Using 9/16 inch socket, install two screws (L).
10. Using pliers, install lockwires (M) (Item 60, Appendix D).



11. Using 9/16 inch socket, install two screws (N).
12. Using pliers, install lockwires (P).

13. Position ignition unit bracket (Q) on engine.
14. Using 9/16 inch wrench, install two screws (R).
15. Using pliers, install lockwire (S).



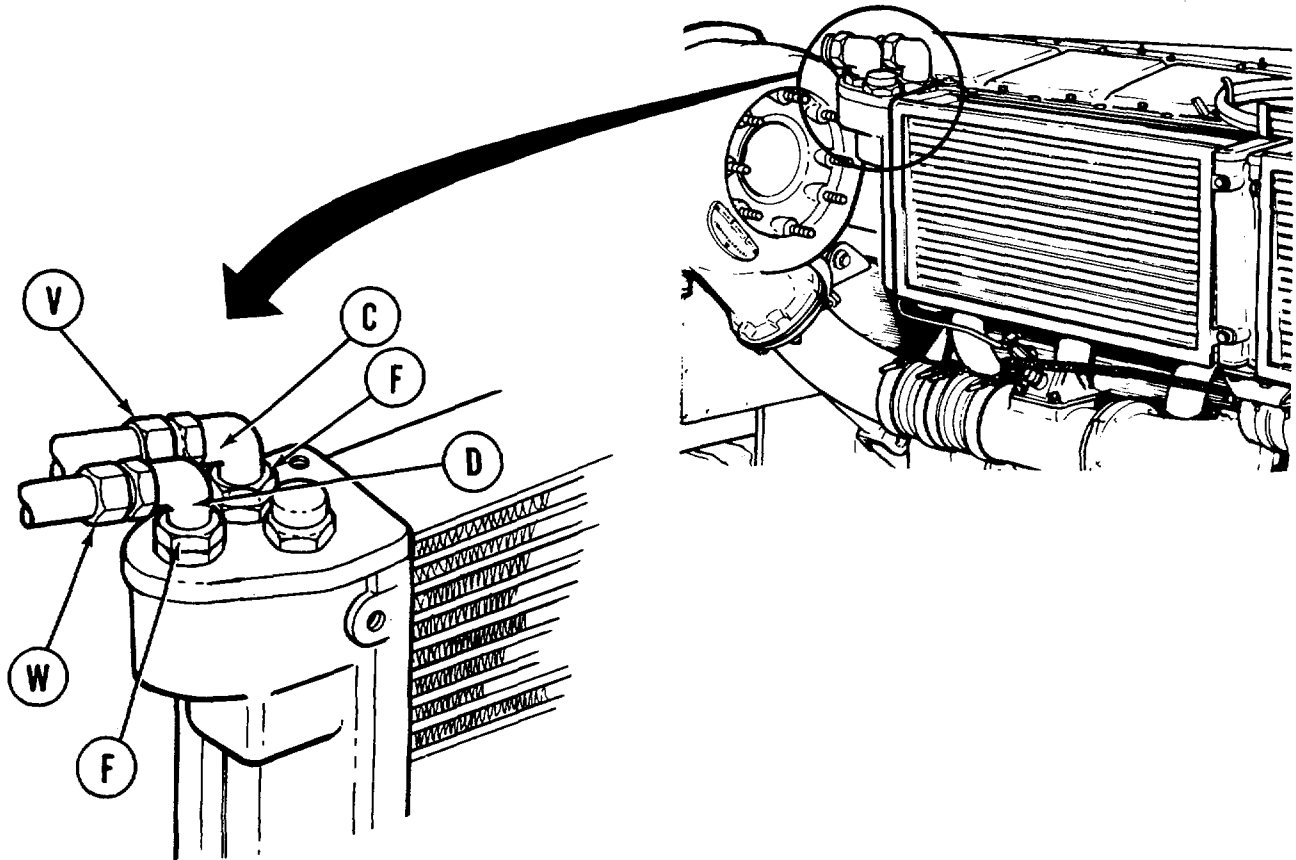
16. Using 1/2 inch socket, install four bolts with assembly washers (T) securing oil cooler screen (U) to oil cooler (E).

Go on to Sheet 9

TA147591

**TRANSMISSION OIL COOLER REPLACEMENT (2A ENGINE) (Sheet 9 of 10)**

17. Remove masking tape and plastic material from end of oil cooler hose (V).
18. Using 1-1/2 inch wrench, install oil cooler hose nut (V) to transmission oil cooler connector (C).
19. Remove masking tape and plastic material from end of oil cooler hose (W).
20. Using 1-1/2 inch wrench, install oil cooler hose nut (W) to transmission oil cooler connector (D).
21. Using 1-1/2 inch wrench, tighten two locknuts (F).

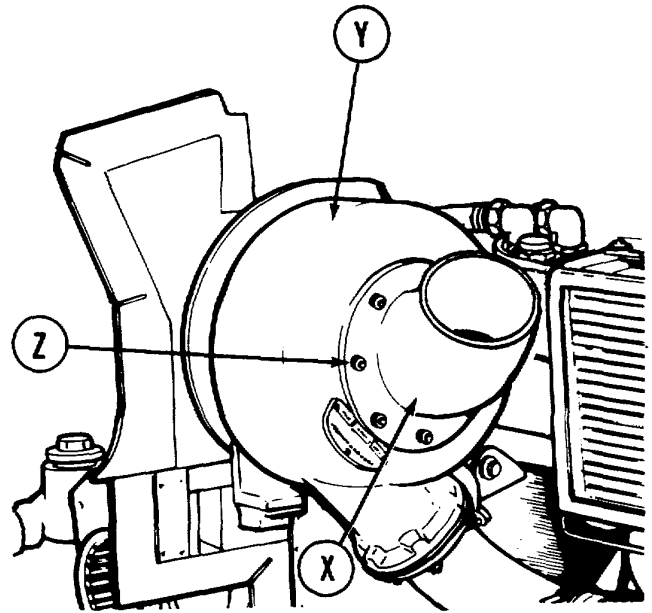


Go on to Sheet 10

TA147593

**TRANSMISSION OIL COOLER REPLACEMENT (2A ENGINE) (Sheet 10 of 10)**

22. Position elbow (X) onto turbocharger (Y).
23. Using 1/2 inch wrench, install eight nuts and washers (Z) securing elbow (X) to turbocharger (Y).



24. Replenish oil lost during transmission oil cooler replacement (LO 9-235-260-12).
25. Ground hop powerplant (page 5-54).
26. Start and run engine. Check for oil leaks at transmission oil cooler and line connectors.
27. Disconnect ground hop kit (page 5-67).
28. Install engine shroud (page 9-3).
29. Install powerplant (page 5-14).

End of Task

TA147594



**TRANSMISSION OIL COOLER REPLACEMENT (2D ENGINE) (Sheet 1 of 10)**

PROCEDURE INDEX

PROCEDURE	PAGE
Removal	6-145
Installation	6-149

**TOOLS:** 1/2 in. socket with 1/2 in. drive  
 6 in. extension with 1/2 in. drive  
 Ratchet with 1/2 in. drive  
 3/4 in. combination box and open end wrench  
 1-1/2 in. open end wrench  
 Flat-tip screwdriver

**SPECIAL TOOLS:** Ground hop kit (Item 30, Chapter 3, Section I)

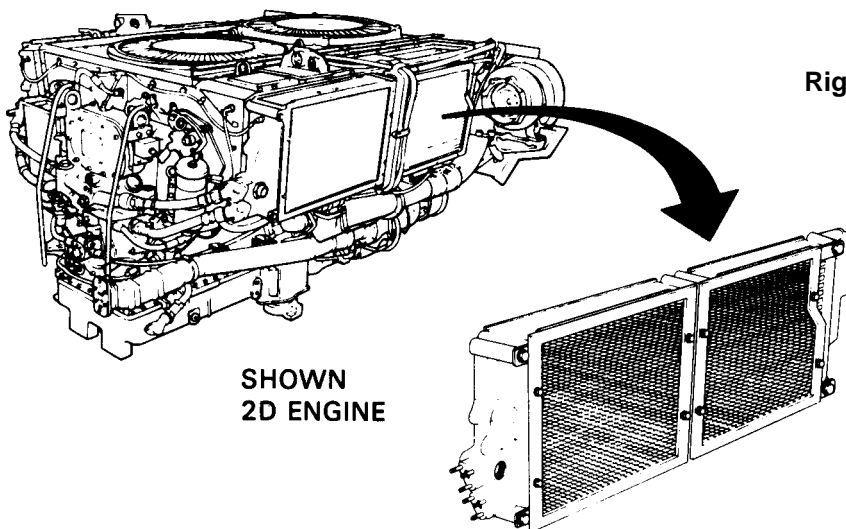
**SUPPLIES:** Drip pan  
 Masking tape (Item 57, Appendix D)  
 Plastic barrier material (Item 41, Appendix D)  
 Rag (Item 65, Appendix D)  
 Cover for turbosupercharger air inlet port  
 Lockwasher (MS35335-34) (4 required)

**REFERENCE:** LO 9-235026012

**PRELIMINARY PROCEDURES:** Remove powerplant (page 5-27)  
 Remove engine shroud (page 9-2)

**NOTE**

Right side shown, left side similar.



Go on to Sheet 2

TA147595

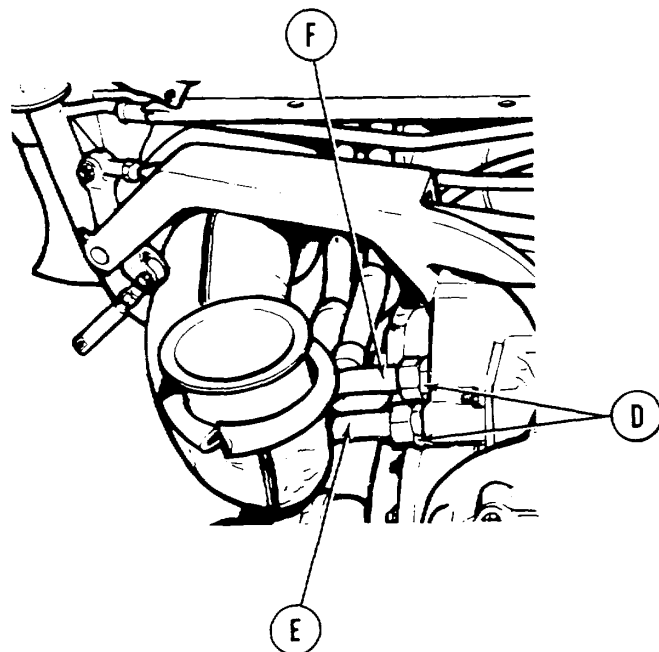
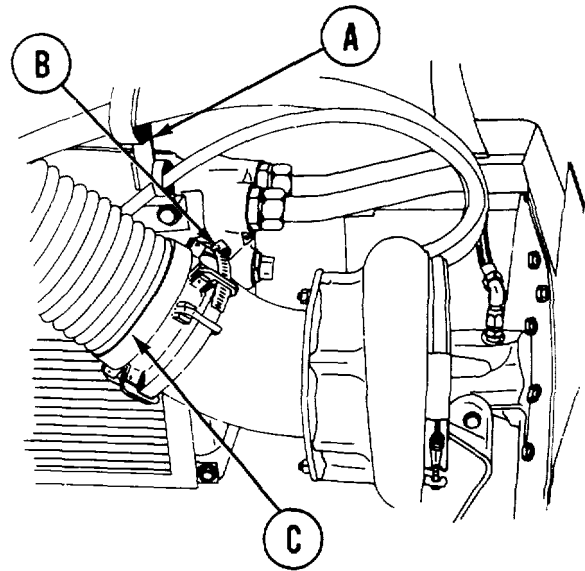
## TRANSMISSION OIL COOLER REPLACEMENT (2D ENGINE) (Sheet 2 of 10)

## REMOVAL:

## NOTE

Removal procedures are the same for the right and left coolers except that the upper rear mount bolt on the right cooler additionally secures support bracket (A).

1. Using screwdriver, loosen clamp (B) to remove air inlet hose (C). Remove air inlet hose (C).
2. Place cover over air inlet port to keep out dirt.
3. Place drip pan or rags under transmission connectors (D).

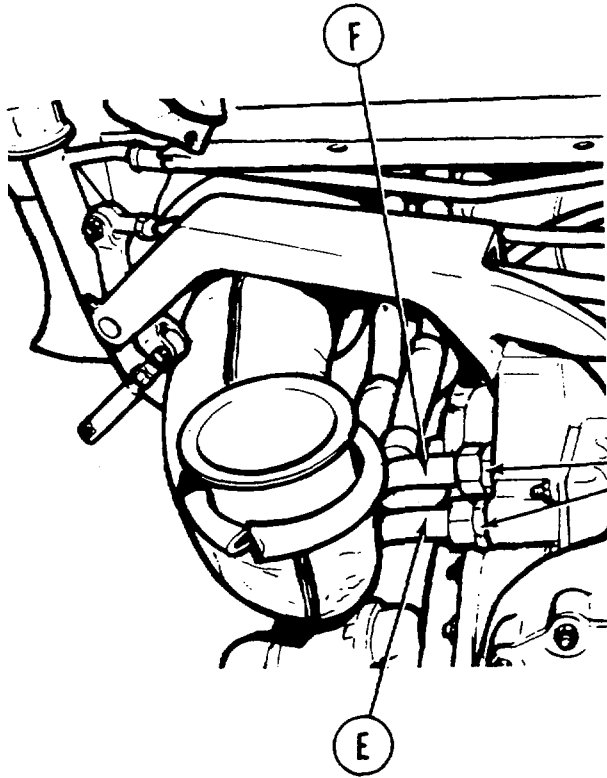


4. Using 1-1/2 inch wrench, remove hose (E) at transmission connectors (D).
5. Using 1-1/2 inch wrench, remove hose (F) at transmission connectors (D).

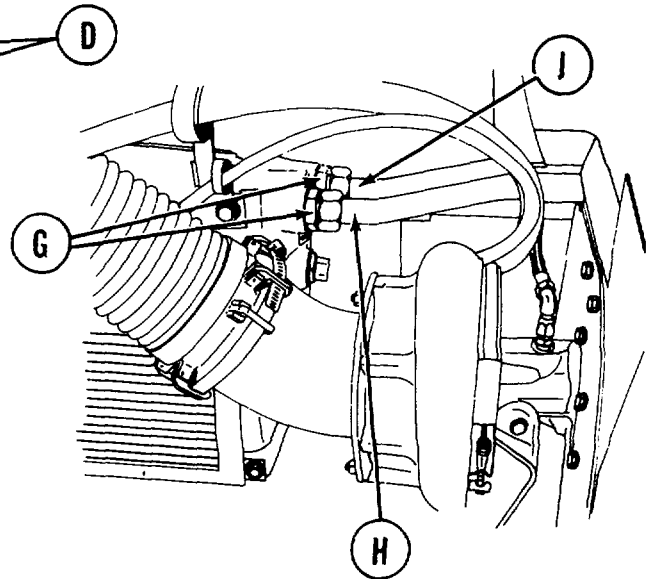
Go on to Sheet 3

TA147596

## TRANSMISSION OIL COOLER REPLACEMENT (2D ENGINE) (Sheet 3 of 10)



6. Using plastic barrier material (Item 41, Appendix D) and masking tape (Item 57, Appendix D), wrap ends of hoses (E) and (F) and transmission connectors (D) to keep out dirt.
7. Place drip pan or rags (Item 65, Appendix D) under cooler connectors (G).



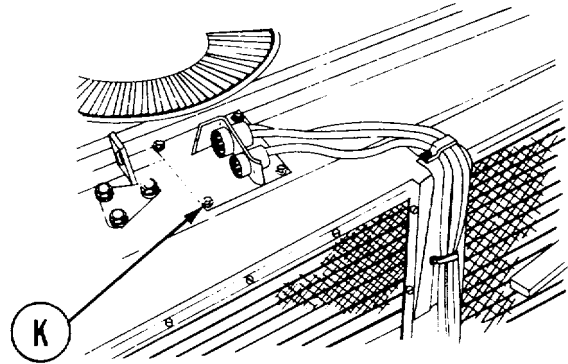
8. Using 1-1/2 inch wrench, remove hose (H) at cooler connectors (G).
9. Using 1-1/2 inch wrench, remove hose (J) from cooler connector (G).
10. Using plastic barrier material (Item 41, Appendix D) and masking tape (Item 57, Appendix D), wrap ends of hoses (H) and (J) and cooler connectors (G) to keep out dirt.
11. Move hoses out of the way toward rear of powerplant.

Go on to Sheet 4

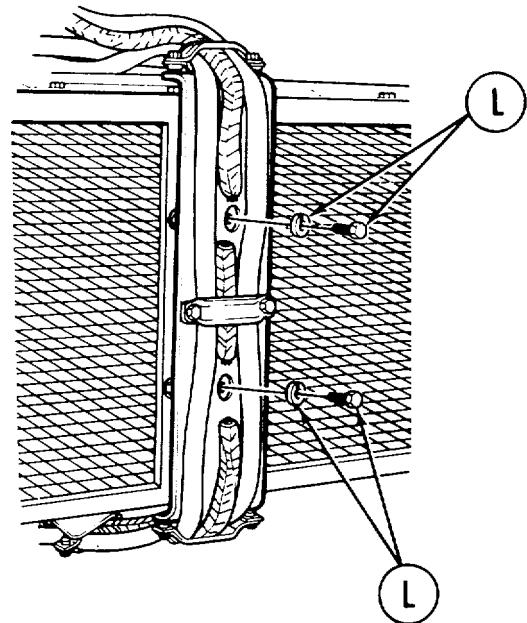
TA147597

**TRANSMISSION OIL COOLER REPLACEMENT (2D ENGINE) (Sheet 4 of 10)**

12. Using socket, remove four screws and lockwashers (K). Throw lockwashers away.



13. Using socket and extension through harness and into bracket, remove two screws and washers (L).



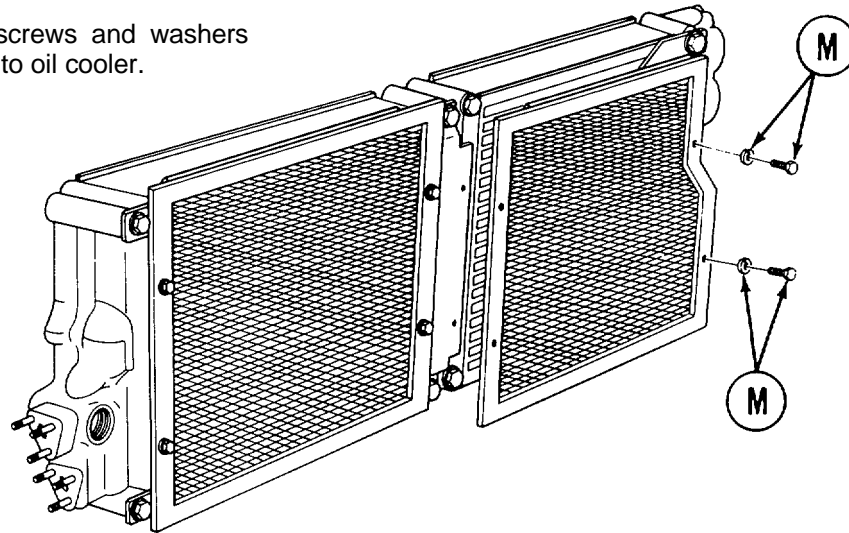
14. Lower harness away from coolers with brackets attached.

Go on to Sheet 5

TA147598

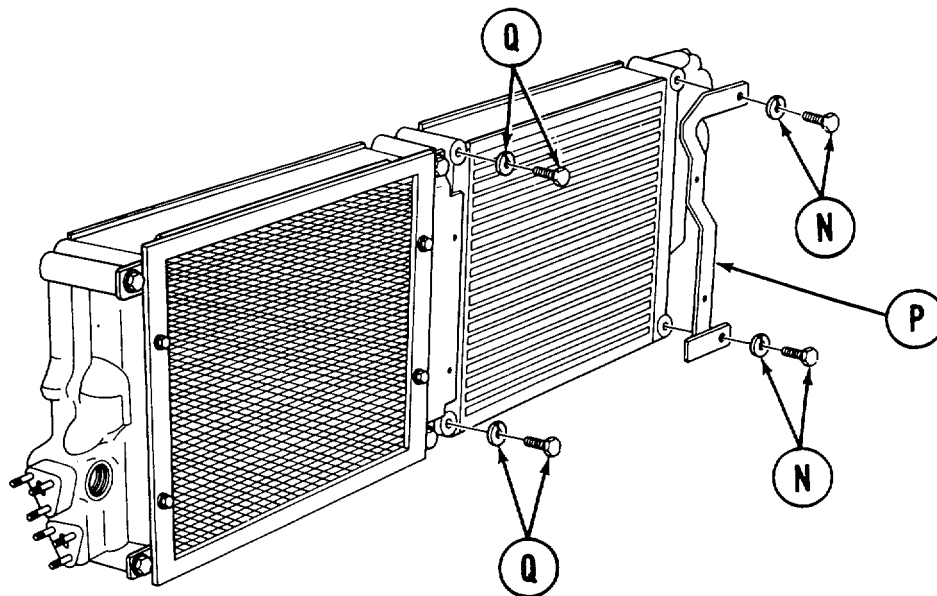
**TRANSMISSION OIL COOLER REPLACEMENT (2D ENGINE) (Sheet 5 of 10)**

15. Using socket, remove two screws and washers (M) holding oil cooler screen to oil cooler.
16. Remove oil cooler screen.

**CAUTION**

**Using another person, support oil cooler to keep it from falling while doing steps 17 through 19.**

17. Using 3/4 inch wrench, remove two screws and washers (N) holding oil cooler screen mounting bracket (P) to oil cooler and oil cooler to oil cooler frame.
18. Remove oil cooler screen mounting bracket (P).
19. Using 3/4 inch wrench, remove two screws and washers (Q) holding oil cooler to oil cooler frame.
20. Remove oil cooler.



Go on to Sheet 6

TA147599

## TRANSMISSION OIL COOLER REPLACEMENT (2D ENGINE) (Sheet 6 of 10)

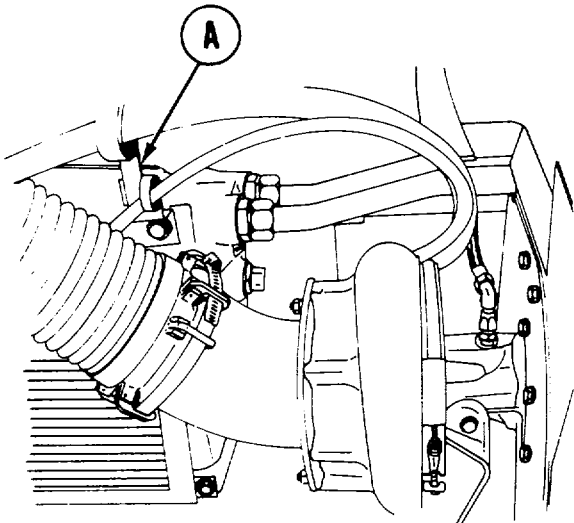
## INSTALLATION:

## NOTE

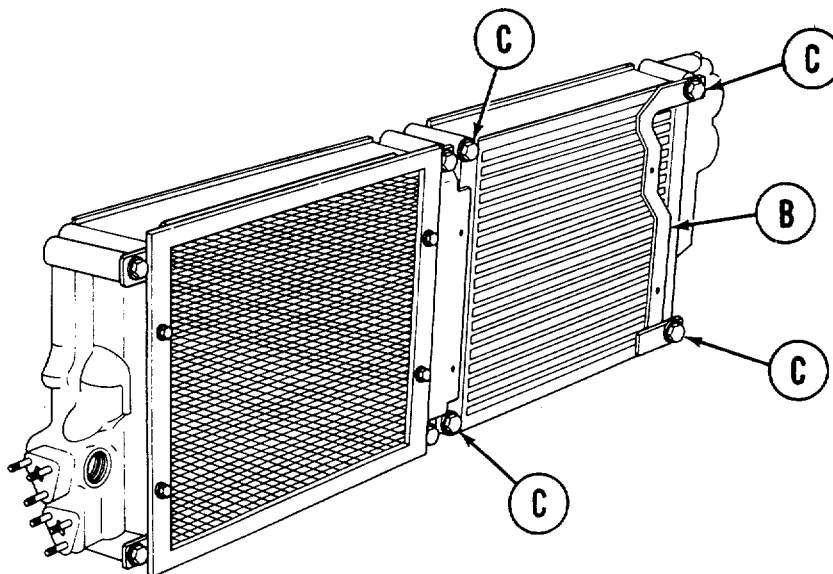
Installation procedures are the same for the right and left coolers except that the upper rear mount bolt on the right cooler additionally secures support bracket (A).

## CAUTION

Using another person, support oil cooler to keep it from falling while doing steps 1 through 3.



1. Position oil cooler and oil cooler screen mounting bracket (B) into place on oil cooler frame.
2. Start threads of four screws with washers (C) by hand to hold oil cooler and oil cooler screen mounting bracket in place.
3. Using 3/4 inch wrench, tighten screws and washers (C).
4. Position oil cooler screen into place on oil cooler.

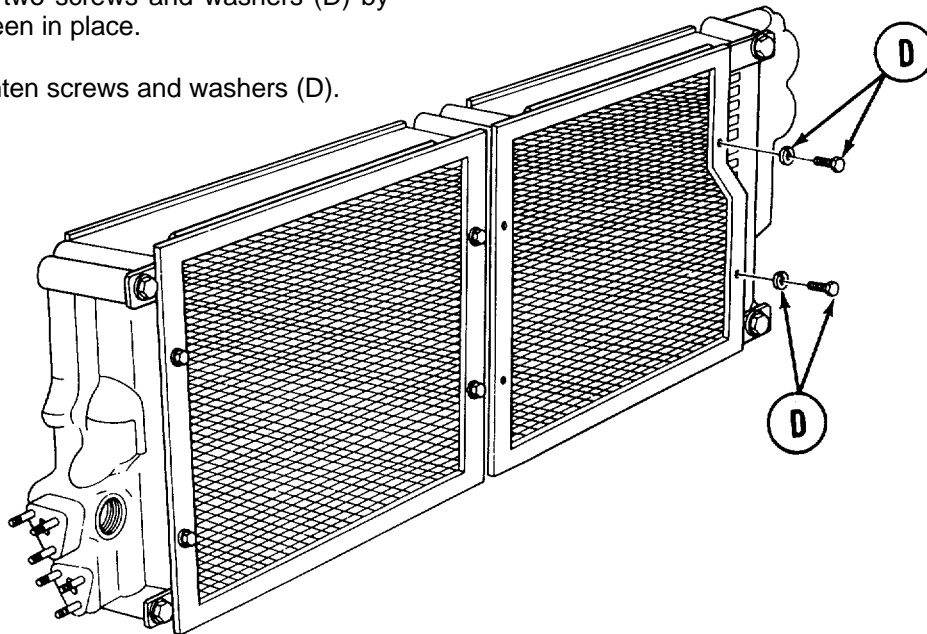


Go on to Sheet 7

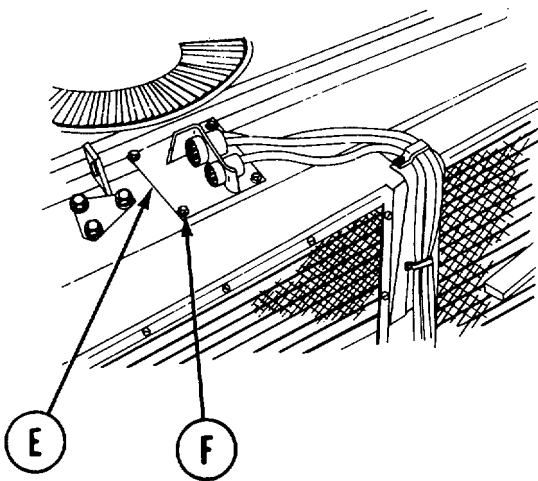
TA147600

**TRANSMISSION OIL COOLER REPLACEMENT (2D ENGINE) (Sheet 7 of 10)**

5. Start thread. of two screws and washers (D) by hand to hold screen in place.
6. Using socket tighten screws and washers (D).



7. Lift starter cable mounting bracket (E) into place at top of oil cooler.

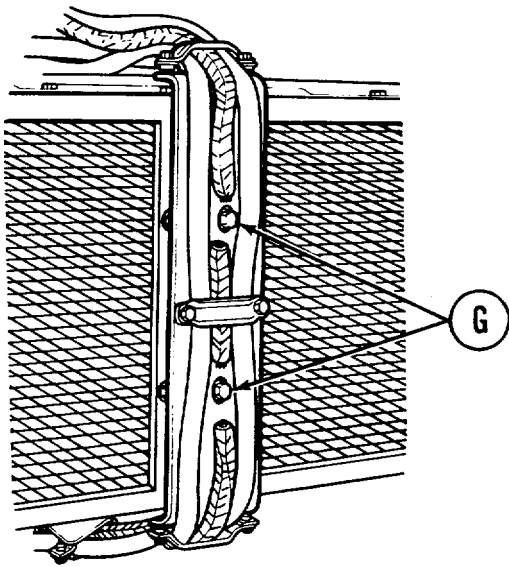


8. Start threads of four screws with new lockwashers (F) by hand.
9. Using socket, tighten four screws and new lockwashers (F).

Go on to Sheet 8

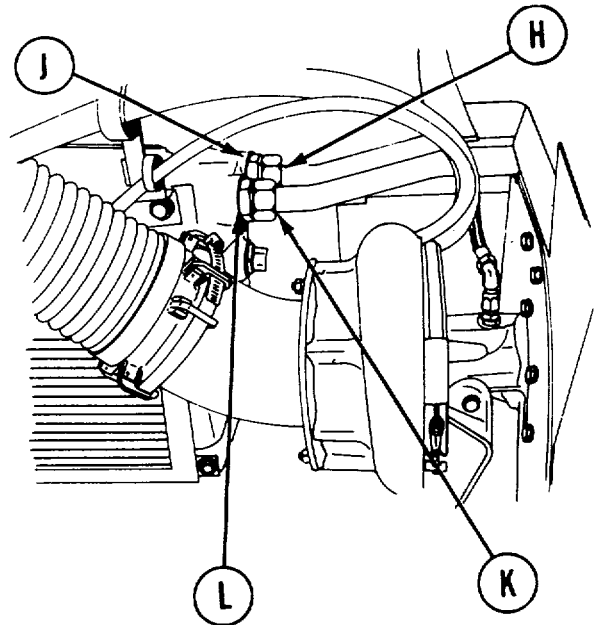
TA147601

TRANSMISSION OIL COOLER REPLACEMENT (2D ENGINE) (Sheet 8 of 10)



10. Using socket with extension through harness, install screws and washes (G).

11. Remove plastic barrier material and masking tape from end of hose (H) and cooler connector (J).
12. Using 1-1/2 inch wrench, install hose (H) to cooler connector (J).
13. Remove plastic barrier material and masking tape from ends of hose (K) and cooler connector (L).
14. Using 1-1/2 inch wrench, install hose (K) to cooler connector (L).



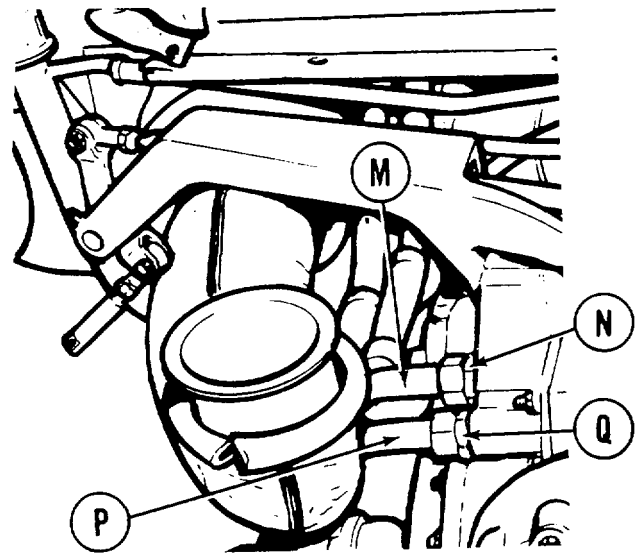
Go on to Sheet 9

TA147602

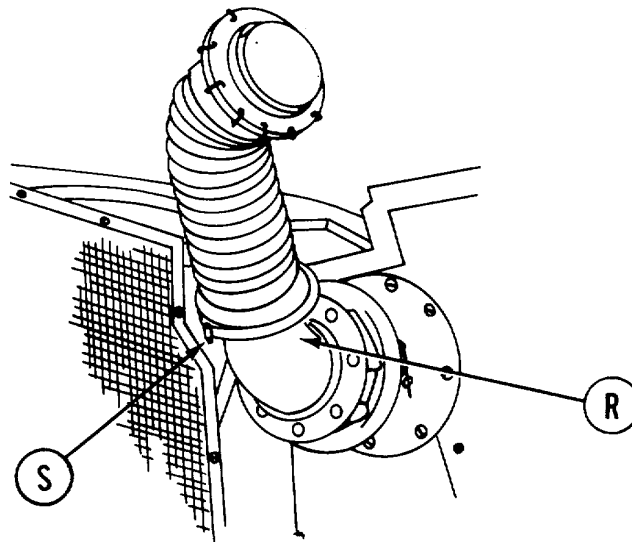


**TRANSMISSION OIL COOLER REPLACEMENT (2D ENGINE) (Sheet 9 of 10)**

15. Remove drip pan or rags from under cooler connectors.
16. Remove plastic barrier material and masking tape from ends of hose (M) and transmission connector (N).
17. Using 1-1/2 inch wrench, install hose (M) to transmission connector (N).



18. Remove plastic barrier material and masking tape from ends of hose (P) and transmission connector (Q).
19. Using 1-1/2 inch wrench, install hose (P) to transmission connector (Q).



Go on to Sheet 10

TA147603

**TRANSMISSION OIL COOLER REPLACEMENT (2D ENGINE) (Sheet 10 of 10)**

24. Replenish oil lost during oil cooler replacement (LO 9-2350-260-12).
25. Connect engine for powerplant ground hop (page 5-54).
26. Start and run engine. Check for oil leaks at oil cooler and line connections.
27. Shut down engine. Disconnect engine from powerplant ground hop kit (page 5-67).
28. Install engine shroud (page 9-3).
29. Install powerplant (page 540).

End of Task

**ENGINE OIL COOLER FLUID PUMP CONNECTOR REPLACEMENT (2D ENGINE) (Sheet 1 of 4)**

## PROCEDURE INDEX

PROCEDURE	PAGE
Removal	6-155
Inspection	6-156
Installation	6-156

TOOLS: 9/16 in. combination box and open end wrench  
 1/2 in. combination box and open end wrench  
 3/8 in. combination box and open end wrench  
 1-1/2 in. open end wrench (2 required)  
 3/4 in. combination box and open end wrench  
 Flat-tip screwdriver  
 Torque wrench with 1/2 in. drive (0-200 lb-in) (0-23 N•m)  
 3/4 in. socket with 1/2 in. drive

SPECIAL TOOLS: Ground hop kit (Item 30, Chapter 3, Section I)

SUPPLIES: Dry cleaning solvent (Item 54, Appendix D)  
 Rags  
 Gasket (8682679)  
 Washer (MS9320-12)  
 Self-locking nuts (MS21044N5) (3 required)

REFERENCES: TM 9-2350-260-10  
 LO 9-2350-260-12

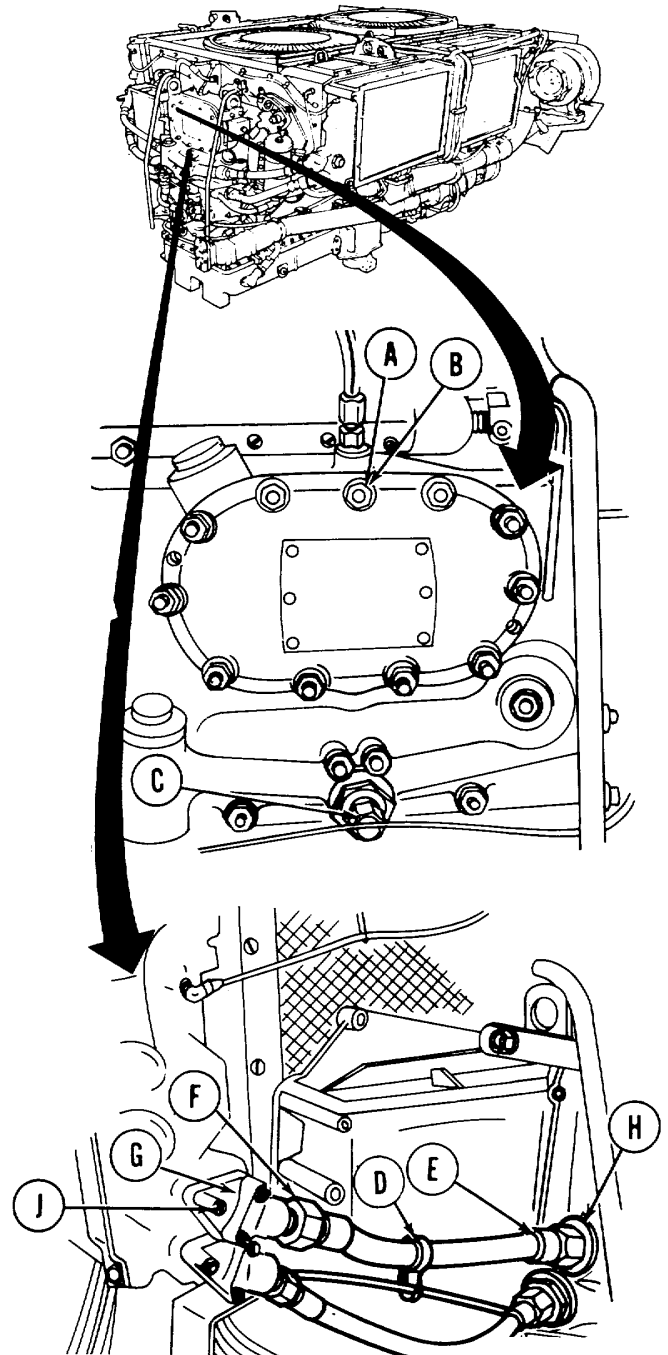
PRELIMINARY PROCEDURE: Remove powerplant (page 5-27)

Go on to Sheet 2

## ENGINE OIL COOLER FLUID PUMP CONNECTOR REPLACEMENT (2D ENGINE) (Sheet 2 of 4)

## REMOVAL:

1. Using 9/16 inch wrench, remove vent bolt (A) and sealing washer (B).
2. Throw washer (B) away.
3. Using 3/4 inch wrench, loosen oil drain valve (C) six complete turns.
4. Using screwdriver and 3/8 inch wrench, remove clamp (D) on hose (E). If clamp (D) is not attached to hose (E), go to step 5.
5. Using 1-1/2 inch wrench, remove fitting (F) from connector (G).
6. Using two 1-1/2 inch wrenches on hose (E) and fitting (H), remove hose (E).
7. Using 1/2 inch wrench, remove three self-locking nuts (J) from connector (G).
8. Throw three nuts (J) away.
9. Remove connector (G).



Go on to Sheet 3

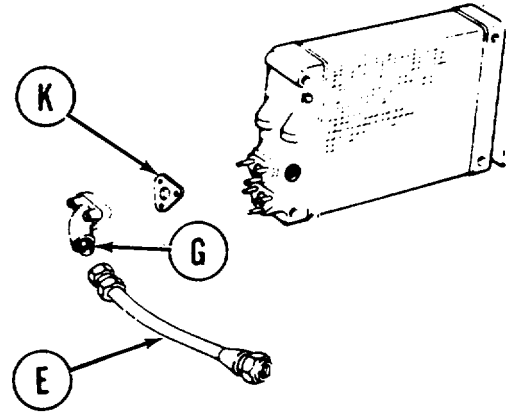
TA147604

**ENGINE OIL COOLER FLUID PUMP CONNECTOR REPLACEMENT (2D ENGINE) (Sheet 3 of 4)**

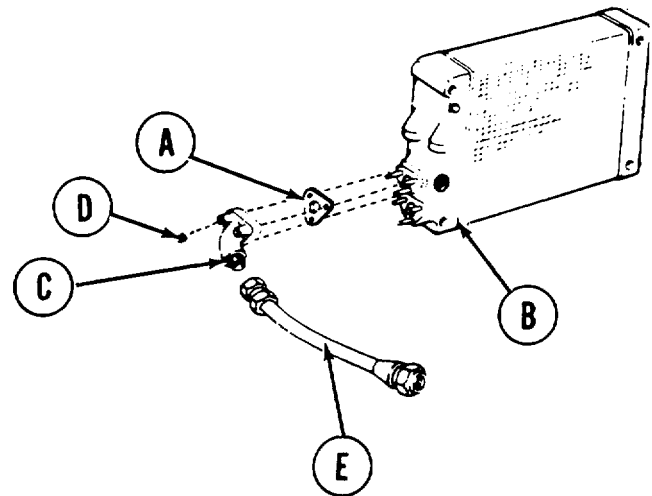
- Remove and throw away gasket (K) under connector (G).

**CLEANING AND INSPECTION:**

- Using dry cleaning solvent (Item 54, Appendix D), clean hose (E) and connector (G).
- Replace connector (G) if cracked or broken.
- Inspect threads on hose (E) and connector (G). Replace as required.
- Replace hose (E) if woven shielding is worn or broken.

**INSTALLATION:**

- Position new gasket (A) on oil cooler (B).
- Position connector (C) over gasket (A).
- Using 1/2 inch wrench, install three new self-locking nuts (D).
- Using 1-1/2 inch wrench, install hose (E) to connector (C).

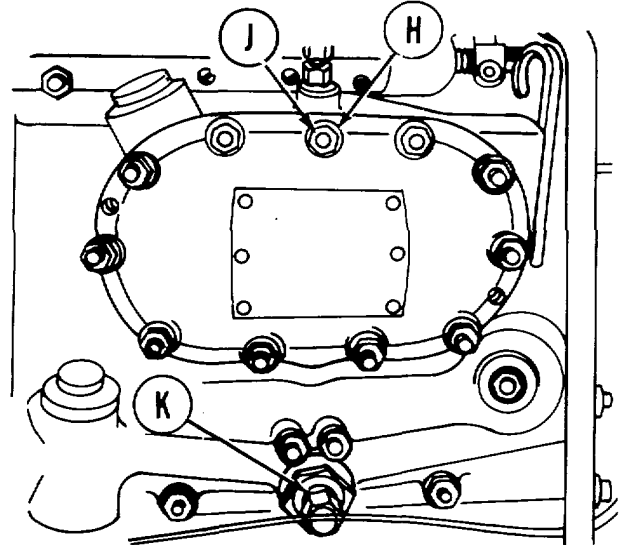
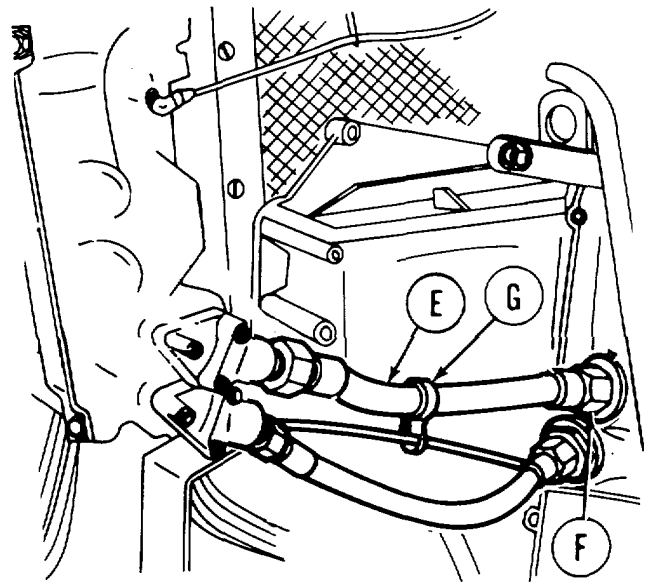


Go on to Sheet 4

TA147605

**ENGINE OIL COOLER FLUID PUMP CONNECTOR REPLACEMENT (2D ENGINE) (Sheet 4 of 4)**

5. Using two 1-1/2 inch wrenches, install hose (E) to fitting (F).
6. Using screwdriver and 3/8 inch wrench, install clamp (G) on hose (E) if removed during disassembly.
7. Position new sealing washer (H) over vent hole.
8. Using 9/16 inch wrench, install vent bolt (J) through washer (H).
9. Using socket and torque wrench, tighten drain valve (K) to a minimum of 150 lb-in (17 N•m). Do not overtighten.
10. Perform ground hop (page 5-57). Run engine at idle until oil temperature is in normal operating range (TM 9-2350-260-10).
11. Check oil level. Add oil as required (LO 9-2350-260-12).
12. Disconnect ground hop kit (page 5-67).
13. Install powerplant (page 5-40).



End of Task

**THERMOSTATIC ENGINE OIL COOLER VALVE ASSEMBLY (LEFT AND RIGHT) REPLACEMENT (Sheet 1 of 4)**

PROCEDURE INDEX

PROCEDURE	PAGE
Removal	6-159
Inspection	6-159
Test	6-160
Installation	6-161

TOOLS: 1-4 in. open end wrench  
 Ruler  
 Low-pressure compressed air facility

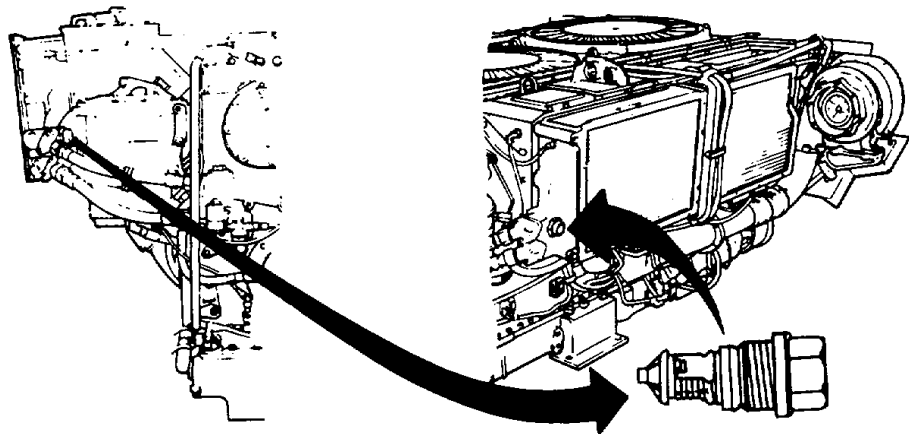
SPECIAL TOOLS: Ground hop kit (Item 30, Chapter 3, Section I)

SUPPLIES: Cooking stove (mounted in tank)                      Drip pan  
 12 in. length of scrap wire                                      Spacer ring (7403580)  
 Pencil    Sealing washer  
 Paper

REFERENCE: LO 923526512

PRELIMINARY PROCEDURES: Remove powerplant (page 5-1)  
 Remove engine oil filter vent bolt and sealing washer (page 6-128, step 1)  
 Drain engine oil (2A engine, page 6-47) (2D engine, page 6-49)  
 Loosen engine oil drain valve (page 6-128, 2D engine only, step 2)  
 Disconnect and cover engine oil return hose and fitting (page 6-129, steps 3 and 4)  
 Remove left side engine oil cooler when left thermostat is to be replaced (2A engine, page 6-121) (2D engine, page 6-128)

**2D ENGINE SHOWN  
 2A ENGINE IDENTICAL**

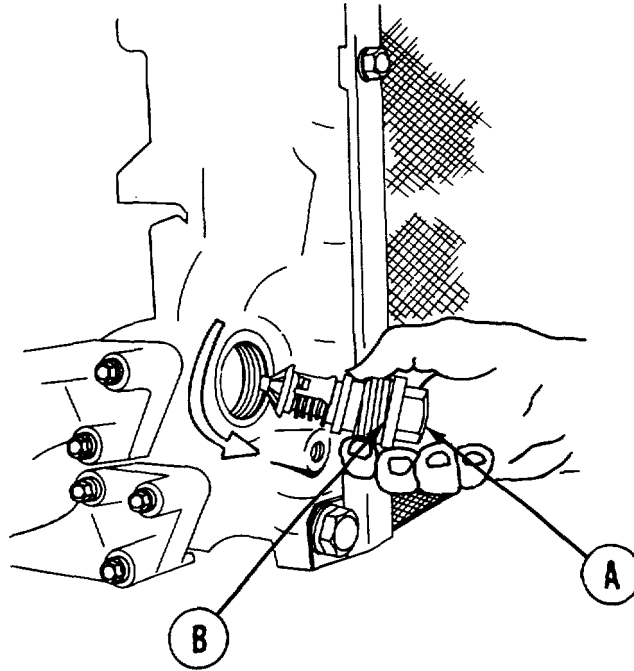


Go on to Sheet 2

TA147607

**THERMOSTATIC ENGINE OIL COOLER VALVE ASSEMBLY (LEFT AND RIGHT) REPLACEMENT (Sheet 2 of 4)****REMOVAL:**

1. Place drip pan on flat surface under valve and valve socket.
2. Using wrench, loosen valve (A).
3. Remove valve (A) from engine oil cooler.
4. Throw spacer ring (B) away.

**INSPECTION:**

1. Inspect valve for stripped or damaged threads.
2. Throw away and replace valve if threads are stripped or damaged.

Go on to Sheet 3

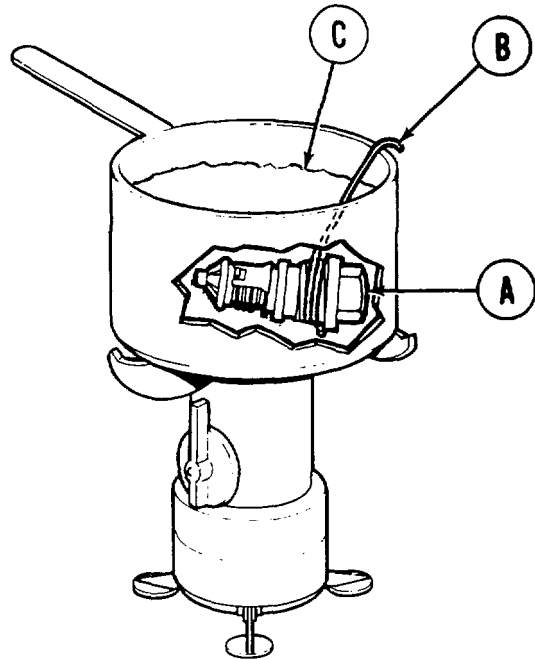
TA147608



## THERMOSTATIC ENGINE OIL COOLER VALVE ASSEMBLY (LEFT AND RIGHT) REPLACEMENT (Sheet 3 of 4)

## TEST:

1. Using ruler, measure overall length of valve (A) at room temperature.
2. Write down overall length of valve (A).
3. Using wire (B), wrap one end tightly around threads of valve (A).



4. Place valve (A) in water (C) just so it is covered. Let free end of wire (B) hang over edge of container.
5. Slowly increase temperature of water.
6. Using free end of wire (B), take valve out of water when water begins to boil.
7. Using ruler, immediately measure overall length of valve (A).
8. Write down overall length of valve (A).
9. Compare measurements written down when cool to the touch and at heated temperatures.

**NOTE**

**After heating, valve length must have increased by 1/4 inch minimum. If valve length increased less than 1/4 inch, throw valve away. Obtain new valve and repeat test. If new valve passes test install it.**

**WARNING**

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

10. Using low-pressure compressed air, dry valve.

Go on to Sheet 4

TA147609

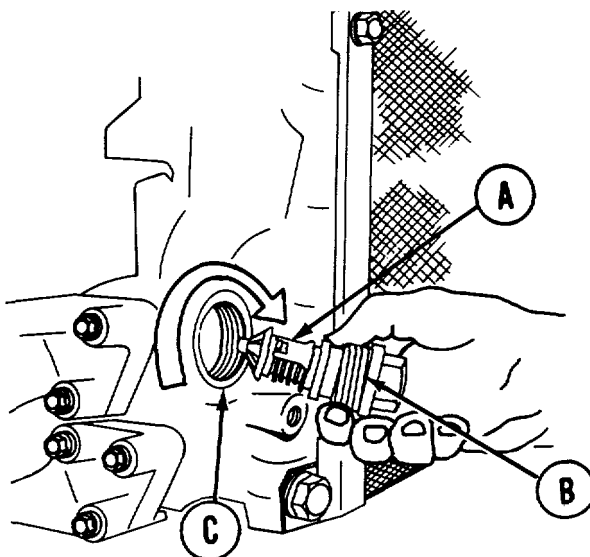
**THERMOSTATIC ENGINE OIL COOLER VALVE ASSEMBLY (LEFT AND RIGHT) REPLACEMENT (Sheet 4 of 4)**

## INSTALLATION:

**NOTE**

**If replacing valve assembly, the engine oil cooler bypass valve also must be replaced. Go to page 6-13 for replacement.**

1. Install new spacer ring (B) on valve (A).
2. Seat threads of valve (A) in engine oil cooler socket (C) by hand.
3. Using wrench, tighten valve (B).
4. Replace left engine cooler (2A engine, page 6-125) (2D engine, page 6-131) (if required).



5. Connect engine oil return hose to fitting (2A engine, page 6-127, steps 18 and 19) (2D engine, page 6-132, steps 14 and 15).
6. Tighten engine oil drain valve (2D engine, page 6-133, step 17) (2D engine).
7. Tighten engine oil filter vent bolt (2D engine) (page 6-133, steps 18 and 19).
8. Check engine oil level indicator gage rod (TM 9-2350-260-10).
9. Replenish lubricating oil lost during valve assembly replacement.
10. Perform ground hop (page 5-57).
11. Install 2A powerplant (page 514) or 2D powerplant (page 5-40).

End of Task

TA147610

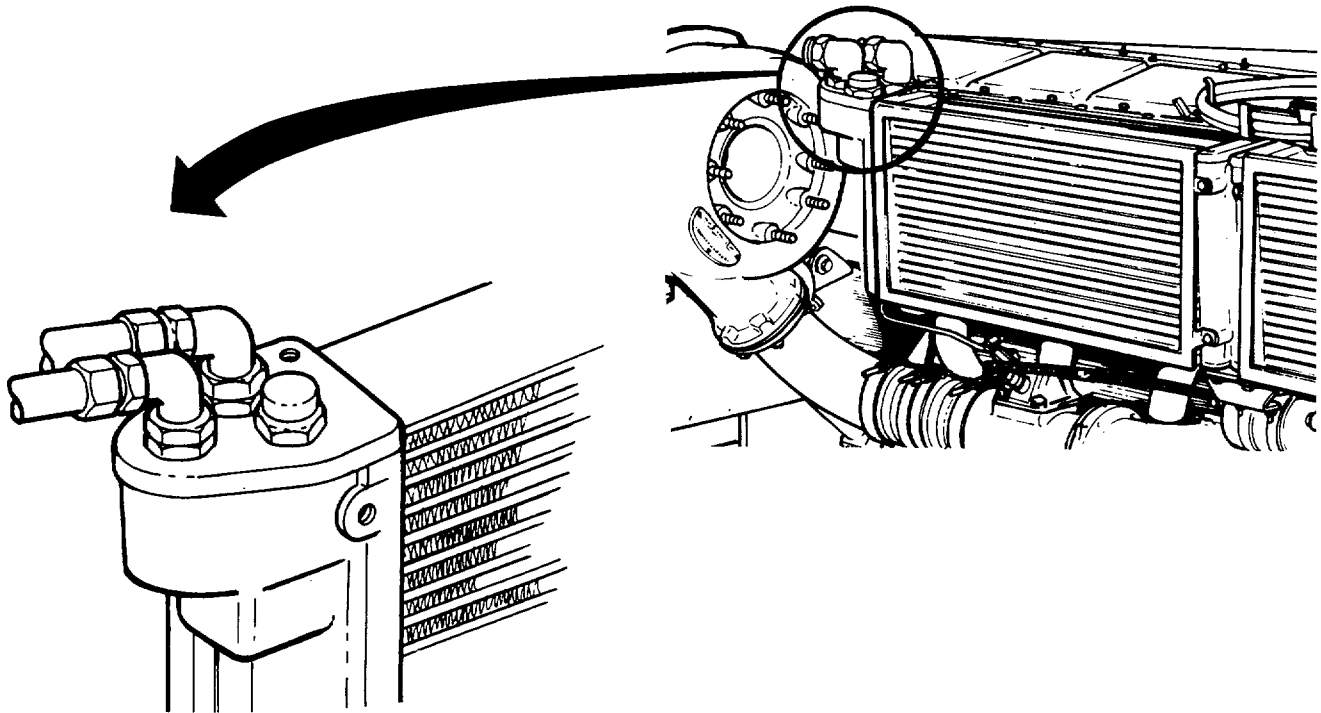
**THERMOSTATIC TRANSMISSION OIL COOLER VALVE ASSEMBLY (LEFT AND RIGHT) TEST AND REPLACEMENT (2A ENGINE) (Sheet 1 of 3)**

TOOLS: 1-3/4 in. open end wrench  
Ruler  
Low-pressure compressed air facility

SUPPLIES: Heat source, temperature adjustable (tanker stove)  
12 in. length of wire  
Pencil  
Spacer ring (7403580)

REFERENCE: TM 9-2350-260-10

PRELIMINARY PROCEDURE: Remove top deck (page 1620)



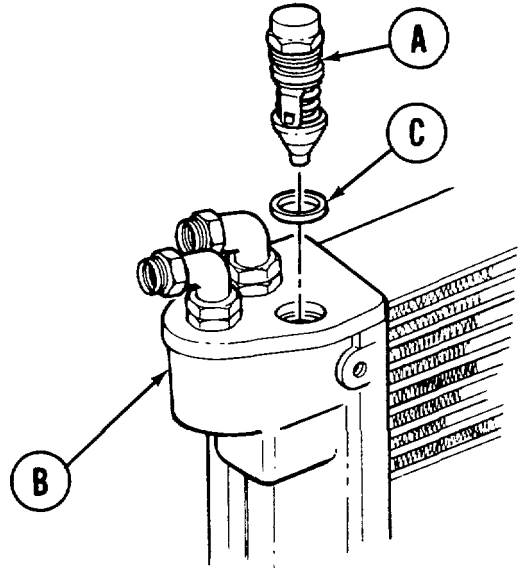
Go on to Sheet 2

TA147611

**THERMOSTATIC TRANSMISSION OIL COOLER VALVE ASSEMBLY (LEFT AND RIGHT) TEST AND REPLACEMENT (2A ENGINE) (Sheet 2 of 3)**

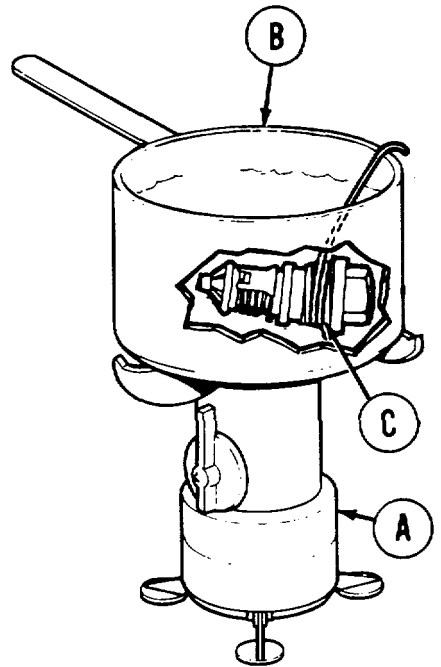
**REMOVAL:**

1. Using 1-3/4 inch wrench, remove valve assembly (A) from oil cooler (B).
2. Remove spacer ring (C) from valve assembly (A). Throw spacer ring away.



**TEST:**

1. Using heat source (A), heat container (B) of clean water to boiling.
2. Using ruler, measure overall length of valve at room temperature. Record length.
3. Using wire, wrap one end tightly around threads (C) on valve.



Go on to Sheet 3

TA147612

## THERMOSTATIC TRANSMISSION OIL COOLER VALVE ASSEMBLY (LEFT AND RIGHT) TEST AND REPLACEMENT (2A ENGINE) (Sheet 3 of 3)

4. Place valve in boiling water. Let free end of wire hang over edge of container.
5. After about 30 seconds, use free end of wire to take valve out of water.
6. Using ruler, measure overall length of valve. Record length.
7. Compare length of valve before and after heating. If valve length increased less than 1/4 inch, throw valve away. Get new valve and repeat test. If new valve passes test, install it.

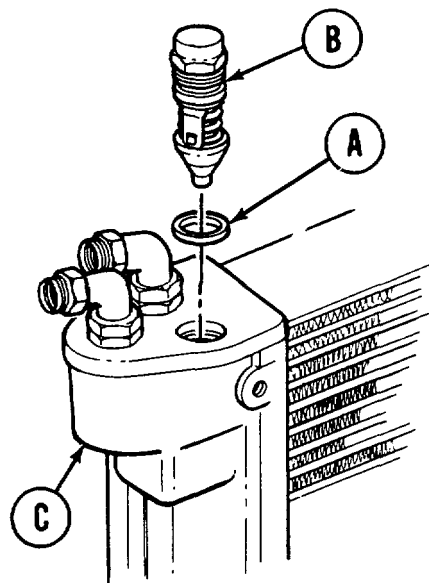
### **WARNING**

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

8. Using low-pressure compressed air, dry good valve.

### INSTALLATION:

1. Install new spacer ring (A) on valve assembly (B).
2. Using hands, install valve assembly (B) in oil cooler (C).
3. Using 1-3/4 inch wrench, tighten valve (B).
4. Start and run engine (TM 9-2350-260-10). Check for oil leaks.
5. Install top deck (page 16-22).



End of Task

TA147613

**THERMOSTATIC TRANSMISSION OIL COOLER VALVE ASSEMBLY (RIGHT SIDE) TEST AND REPLACEMENT  
(2D ENGINE) (Sheet 1 of 7)**

PROCEDURE INDEX

PROCEDURE	PAGE
Removal	6-167
Test	6-168
Installation	6-169

TOOLS: 1-1/2 in. open end wrench  
 1-5/8 in. open end wrench  
 Automotive adjustable wrench  
 Ruler  
 Low-pressure compressed air facility

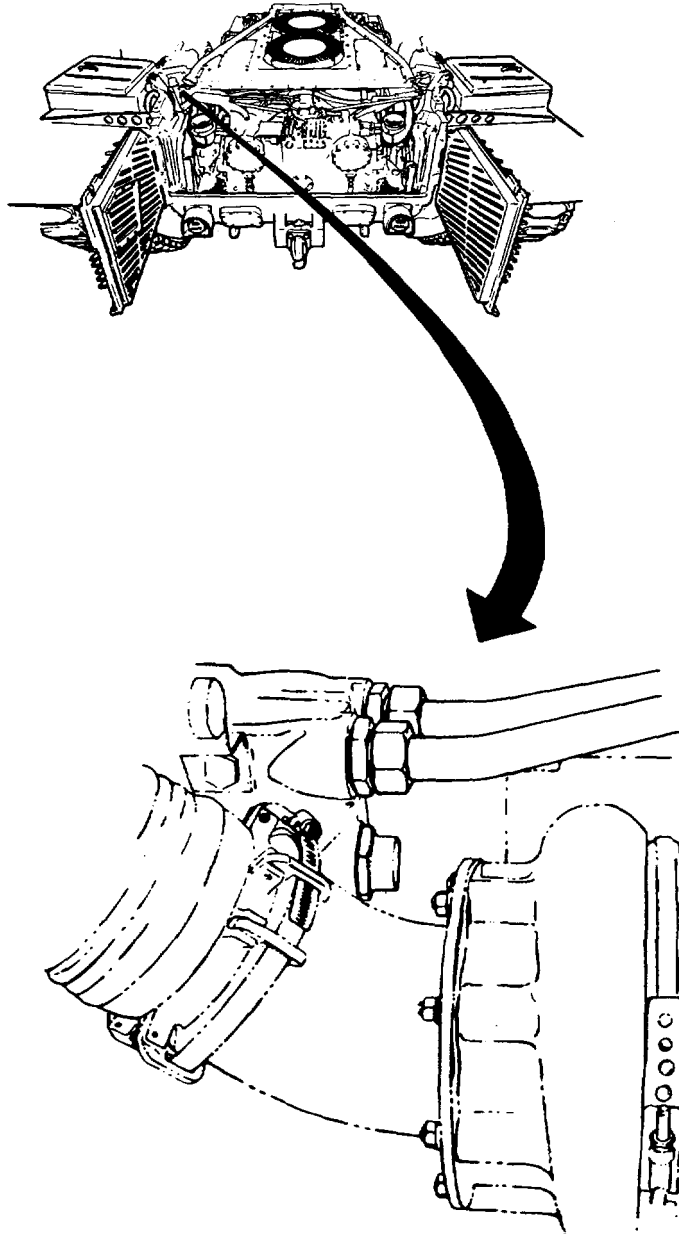
SUPPLIES: Heat source, temperature adjustable (tanker stove)  
 12 in. length of scrap wire  
 Pencil  
 Rags  
 Spacer ring (7403580)

REFERENCES: TM 9-2350-260-10  
 LO 9-2350-260-12

PRELIMINARY PROCEDURES: Remove transmission shroud (page 9-20)  
 Remove engine shroud (page 9-2)

Go on to Sheet 2

**THERMOSTATIC TRANSMISSION OIL COOLER VALVE ASSEMBLY (RIGHT SIDE) TEST AND REPLACEMENT (2D ENGINE) (Sheet 2 of 7)**



Go on to Sheet 3

TA147684

**THERMOSTATIC TRANSMISSION OIL COOLER VALVE ASSEMBLY (RIGHT SIDE) TEST AND REPLACEMENT (2D ENGINE) (Sheet 3 of 7)**

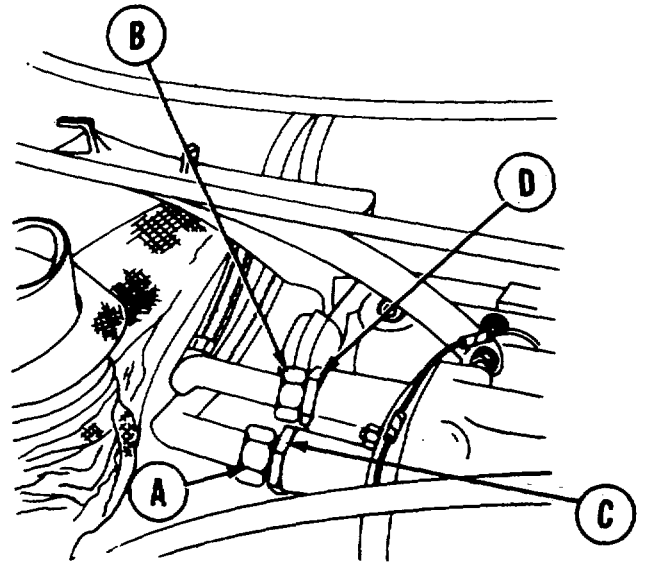
**REMOVAL:**

1. Place rags under tube end fittings (A) and (B) on transmission.

**NOTE**

It may be necessary to hold adapters (C) and (D) with 1-5/8 inch wrench while removing tube end fittings (A) and (B)

2. Using 1-1/2 inch wrench, remove tube end fitting (A) from adapter (C).

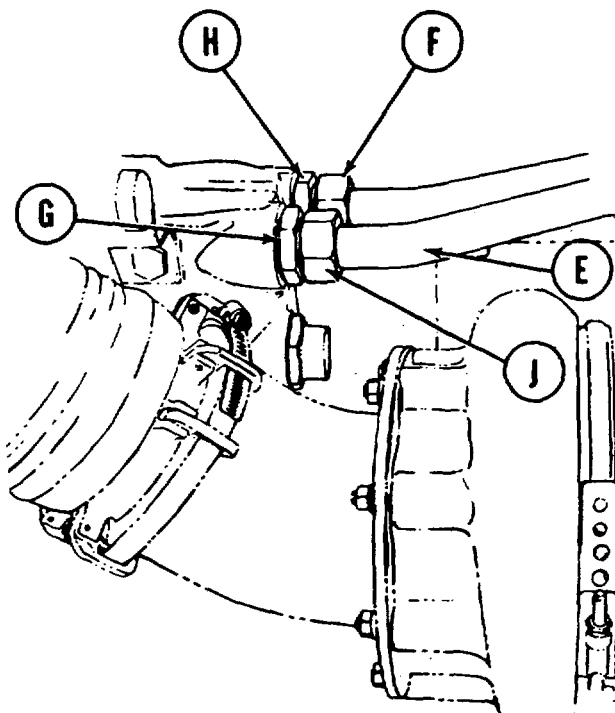


3. Place rags under tube end fittings (E) and (F) at oil cooler.

**NOTE**

It may be necessary to hold adapters (G) and (H) with 1-5/8 inch wrench while removing tube end fittings (E) and (F).

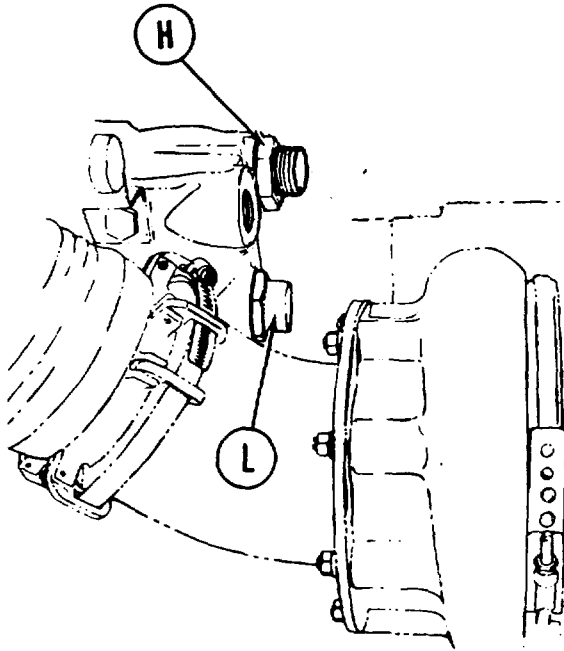
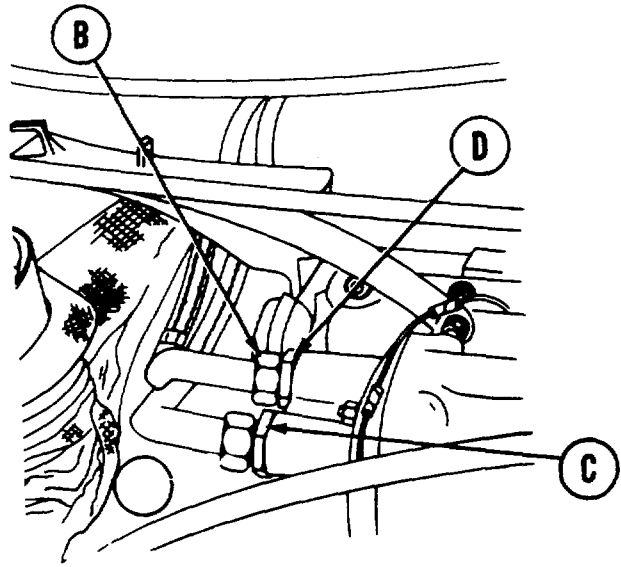
4. Using 1-1/2 inch wrench, remove outside tube end fitting (E) from adapter (G).
5. Displace tube (J).
6. Using 1-5/8 inch wrench, remove adapter (G).
7. Using 1-1/2 inch wrench, remove tube end fitting (F) from adapter (H).





**THERMOSTATIC TRANSMISSION OIL COOLER VALVE ASSEMBLY (RIGHT SIDE) TEST AND REPLACEMENT (2D ENGINE) (Sheet 4 of 7)**

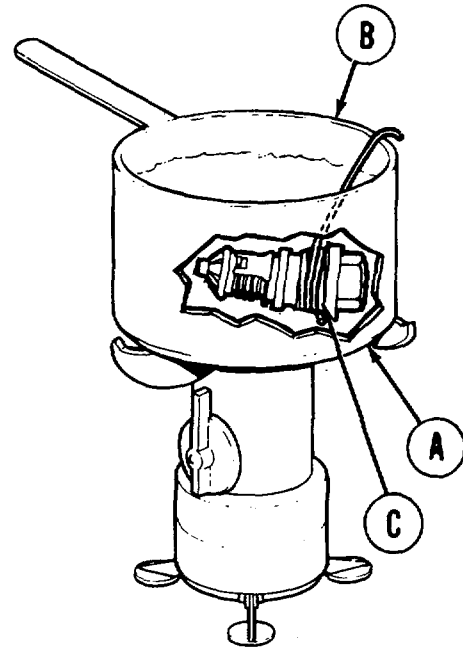
8. Using 1-5/8 inch wrench, remove adapter (C).
9. Using 1-1/2 inch wrench, remove tube end fitting (B) from adapter (D).
10. Displace tube (K).



11. Using 1-5/8 inch wrench, remove adapter (H).
12. Using automotive wrench, remove valve assembly and spacer ring (L). Throw spacer ring away

**TEST:**

1. Using heat source (A), heat container (B) of clean water to boiling.
2. Using ruler, measure overall length of valve at room temperature. Record length.
3. Using wire, wrap one end tightly around threads (C) on valve.



Go on to Sheet 5

TA147616

## THERMOSTATIC TRANSMISSION OIL COOLER VALVE ASSEMBLY (RIGHT SIDE) TEST AND REPLACEMENT (2D ENGINE) (Sheet 5 of 7)

4. Place valve in boiling water. Let free end of wire hang over edge of container.
5. After about 30 seconds, use free end of wire to take valve out of water.
6. Using ruler, measure overall length of valve. Record length.
7. Compare length of valve before and after heating. If valve length increased less than 1/4 inch, throw valve away. Obtain new valve and repeat test. If new valve passes test, install it.

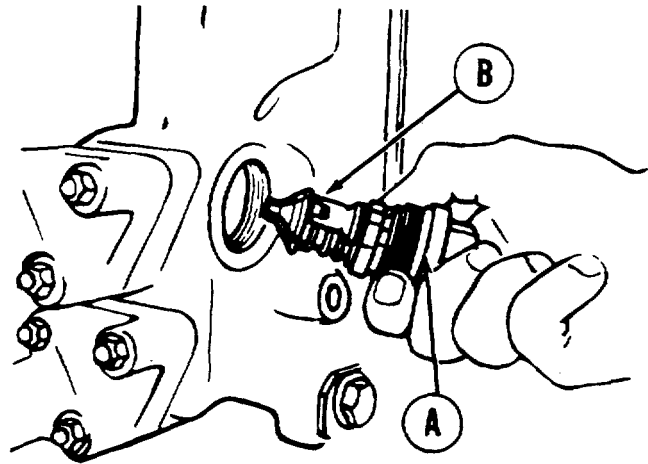
### **WARNING**

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

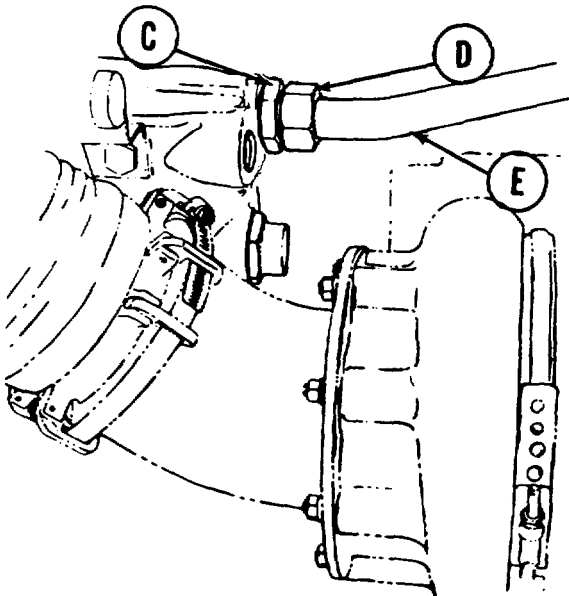
8. Using low-pressure compressed air, dry god valve.

### INSTALLATION:

1. Install new spacer ring (A) on valve (B).
2. Using hands, install valve (B) to transmission oil cooler.
3. Using automotive wrench, tighten valve ( ).



4. Using 1-5/8 inch wrench, install inside adapter (C).
5. Using hands, install tube end fitting (D) on adapter (C).
6. Go to other end of tube (E).

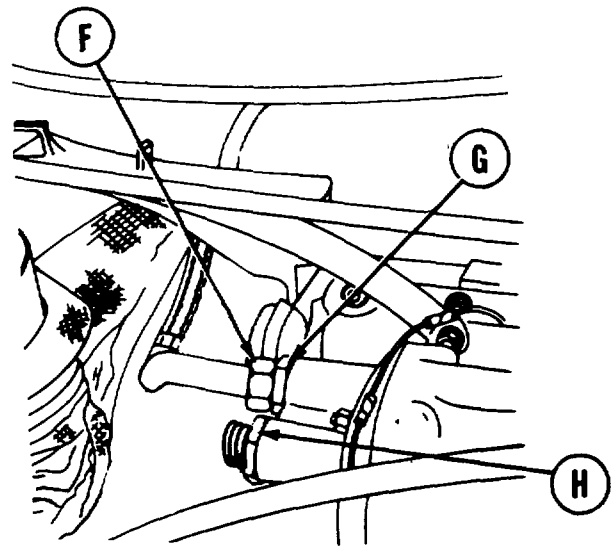


Go on to Sheet 6

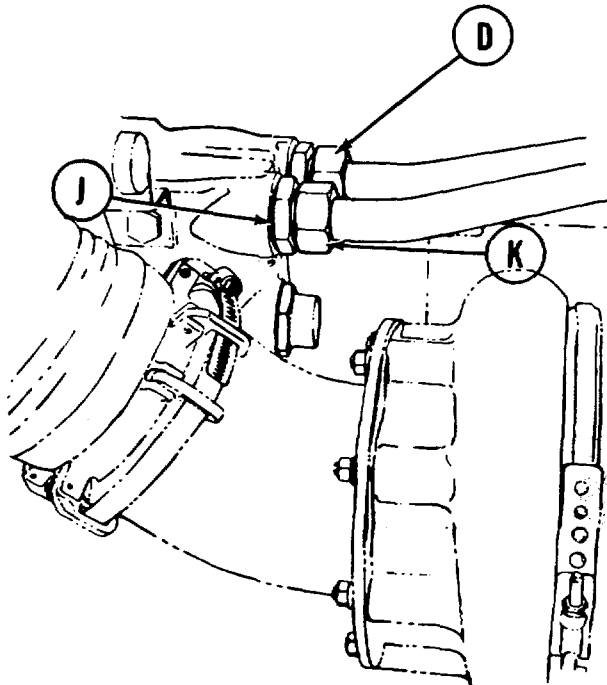
TA147617

**THERMOSTATIC TRANSMISSION OIL COOLER VALVE ASSEMBLY (RIGHT SIDE) TEST AND REPLACEMENT (2D ENGINE) (Sheet 6 of 7)**

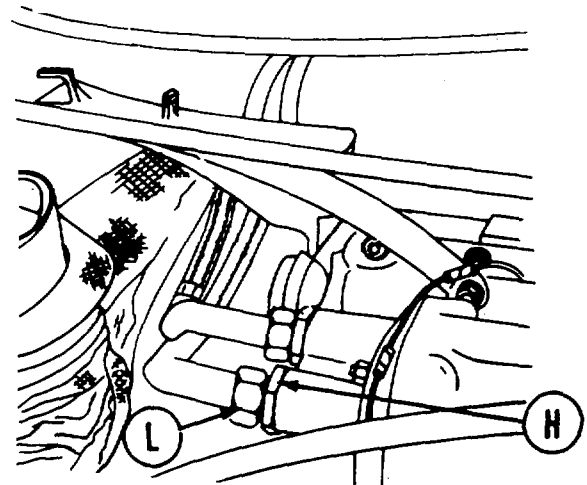
7. Using 1-1/2 inch wrench, install tube end fitting (F) on adapter (G).
8. Using 1-5/8 inch wrench, install adapter (H).



9. Using 1-1/2 inch wrench, tighten tube end fitting (D).
10. Using 1-5/8 inch wrench, install adapter (J).
11. Using hands, install tube end fitting (K) on adapter (J).



12. Using 1-1/2 inch wrench, install tube end fitting (L) on adapter (H).
13. Using 1-1/2 inch wrench, tighten tube end fitting (K) at oil cooler.



Go on to Sheet 7

TA147618

**THERMOSTATIC TRANSMISSION OIL COOLER VALVE ASSEMBLY (RIGHT SIDE) TEST AND REPLACEMENT (2D ENGINE) (Sheet 7 of 7)**

14. Replenish oil lost during valve assembly replacement (LO 9-235-260-12).
15. Remove rags from transmission and oil cooler.
16. Start and run engine (TM 9-2350-260-10). Check for oil leaks.
17. Install engine shroud (page 9-3).
18. Install transmission shroud (page 9-23).

End of Task

**THERMOSTATIC TRANSMISSION OIL COOLER VALVE ASSEMBLY (LEFT SIDE) TEST AND REPLACEMENT (2D ENGINE) (Sheet 1 of 6)**

PROCEDURE INDEX

PROCEDURE	PAGE
Removal	6-174
Test	6-175
Installation	6-176

TOOLS: 1-1/2 in. open end wrench  
 1-5/8 in. open end wrench  
 Automotive wrench  
 Ruler  
 Low-pressure compressed air facility

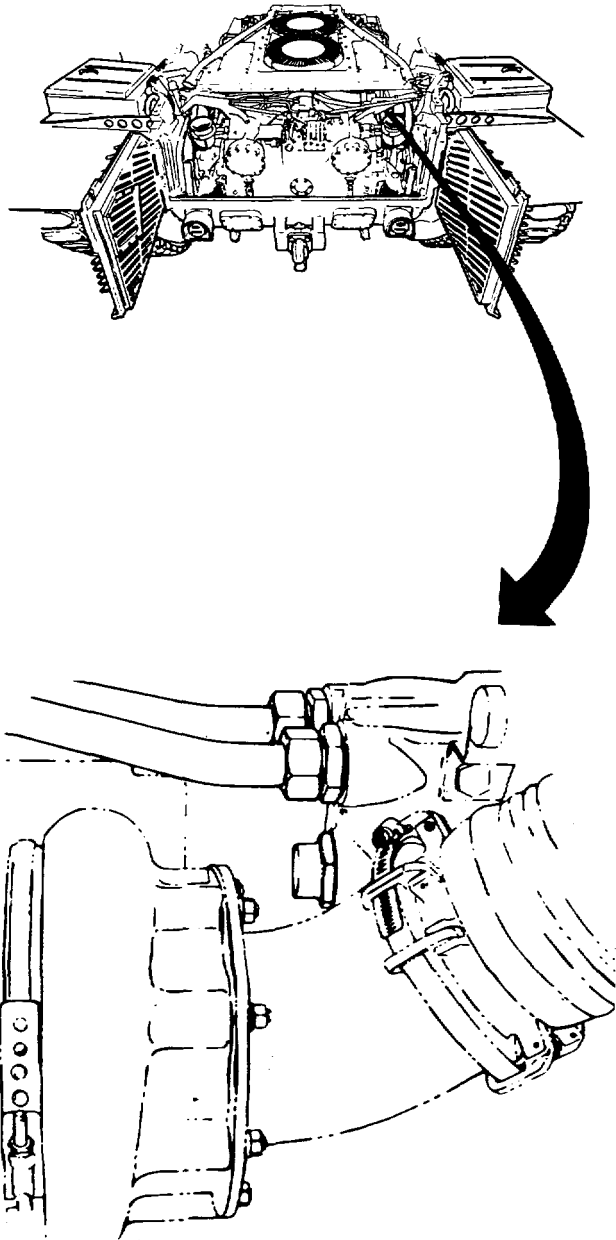
SUPPLIES: Heat source, temperature adjustable (tanker stove)  
 12 in. length of scrap wire  
 Pencil  
 Spacer ring (7403580)

REFERENCES: TM 9-2350-260-10  
 LO 9-2350-260-12

PRELIMINARY PROCEDURES: Remove transmission shroud (page 9-20)  
 Remove engine shroud (page 9-2)

Go on to Sheet 2

**THERMOSTATIC TRANSMISSION OIL COOLER VALVE ASSEMBLY (LEFT SIDE) TEST AND REPLACEMENT (2D ENGINE) (Sheet 2 of 6)**



Go on to Sheet 3

TA147619

**THERMOSTATIC TRANSMISSION OIL COOLER VALVE ASSEMBLY (LEFT SIDE) TEST AND REPLACEMENT (2D ENGINE) (Sheet 3 of 6)**

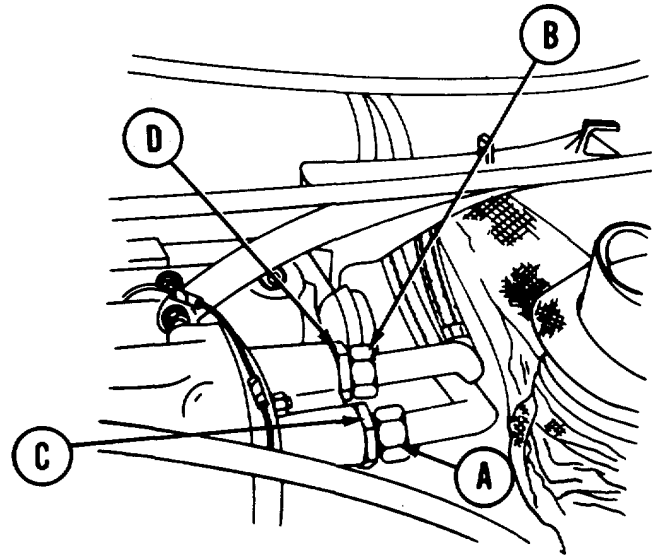
**REMOVAL:**

1. Place rags under tube end fittings (A) and (B) on transmission.

**NOTE**

**It may be necessary to hold adapters (C) and (D) with 1-5/8 inch wrench while removing tube end fittings (A) and (B).**

2. Using 1-1/2 inch wrench, remove tube end fitting (A) from adapter (C).
3. Using 1-1/2 inch wrench, remove tube end fitting (B) from adapter (D).

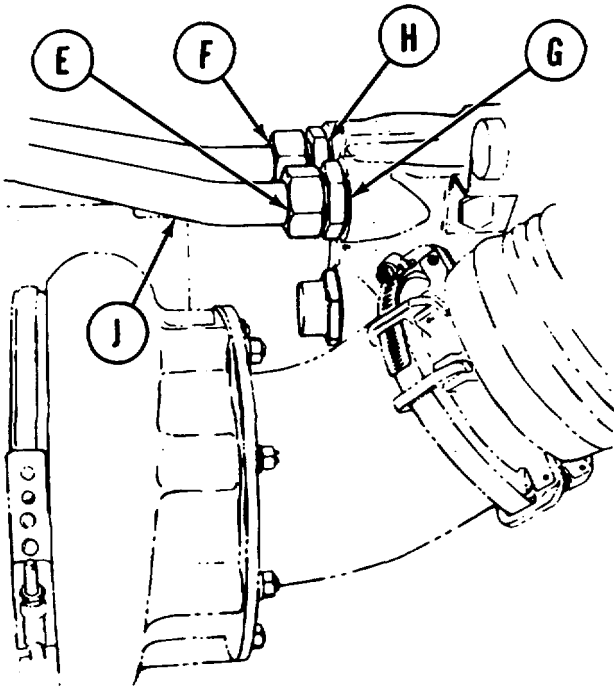


4. Place rags under tube end fittings (E) and (F) on oil cooler.

**NOTE**

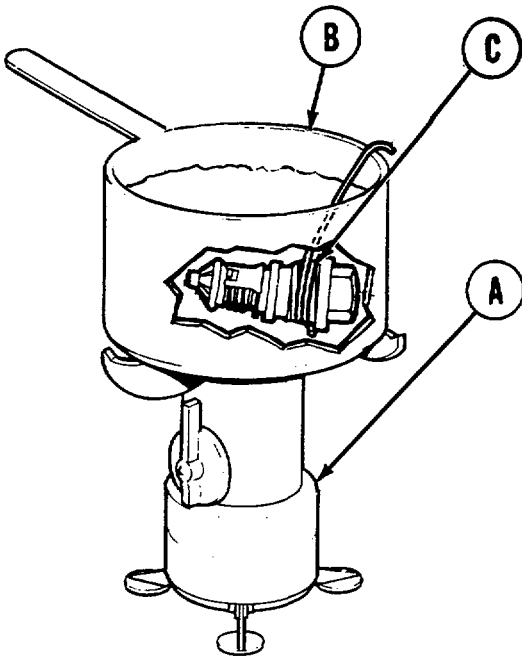
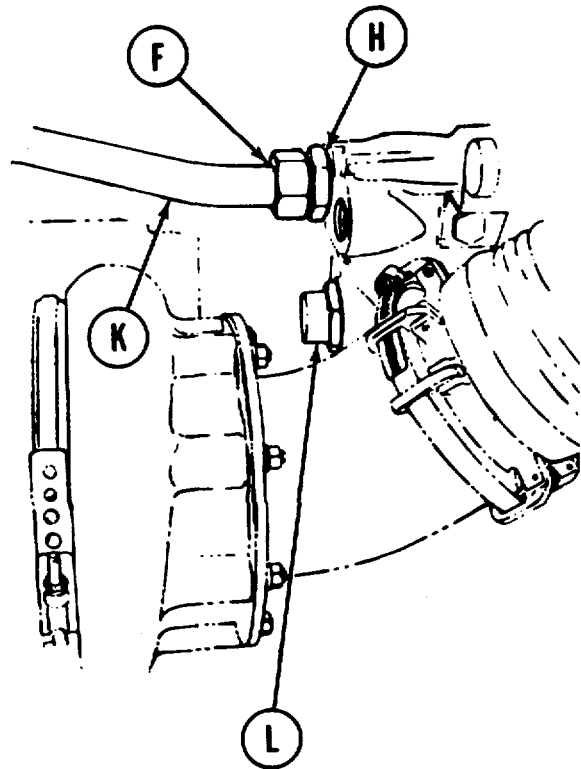
**It may be necessary to hold adapters (G) and (H) with 1-5/8 inch wrench while removing tube end fittings (E) and (F).**

5. Using 1-1/2 inch wrench, remove outside tube end fitting (E) from adapter (G).
6. Using hands, displace outside tube (J).
7. Using 1-5/8 inch wrench, remove adapter (G).



**THERMOSTATIC TRANSMISSION OIL COOLER VALVE ASSEMBLY (LEFT SIDE) TEST AND REPLACEMENT (2D ENGINE) (Sheet 4 of 6)**

8. Using 1-1/2 inch wrench, remove tube end fitting ) from adapter (H).
9. Using hands, displace tube (K).
10. Using 1-5/8 inch wrench, remove adapter (H).
11. Using automotive wrench, remove valve assembly and spacer ring (L). Throw spacer ring away.



**TEST:**

1. Using heat source (A), heat container (B) of clean water to boiling.
2. Using ruler, measure overall length of valve at room temperature. Write down overall length of valve.

3. Using wire, wrap one end tightly around threads (C) of valve.
4. Place valve in boiling water just so valve is covered. Let free end of wire hang over edge of container.
5. After about 30 seconds, use free end of wire to take valve out of water.

Go on to Sheet 5

TA147621



**THERMOSTATIC TRANSMISSION OIL COOLER VALVE ASSEMBLY (LEFT SIDE) TEST AND REPLACEMENT (2D ENGINE) (Sheet 5 of 6)**

6. Using ruler, measure overall length of valve. Write down overall length of valve.
7. Compare measurements written down at room temperature and at heated temperature.

**WARNING**

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

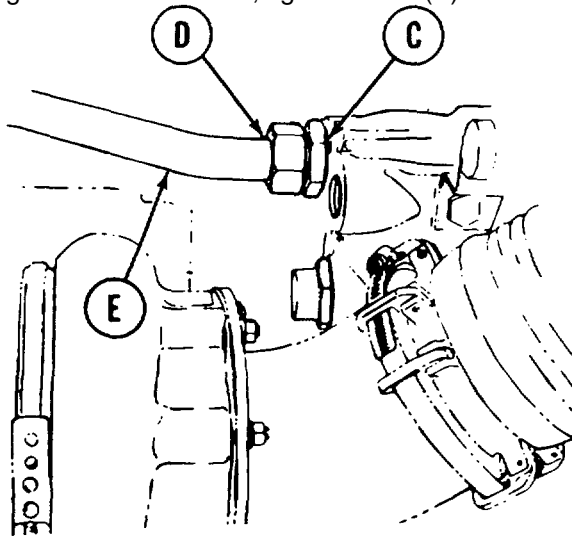
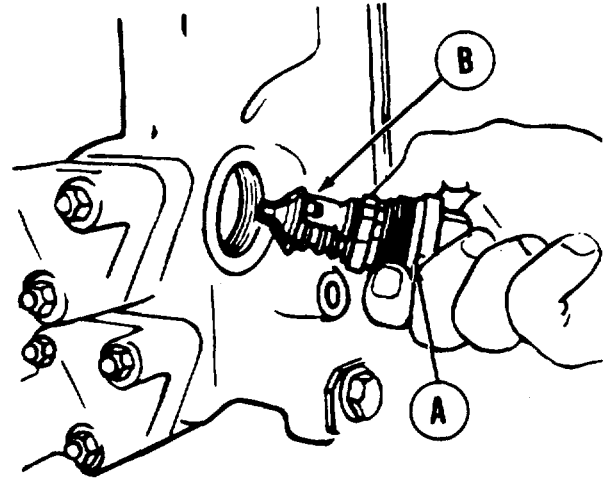
8. Using low-pressure compressed air, dry valve.

**NOTE**

**After heating, valve length must have increased by 1/4 inch minimum. If valve length increased less than 1/4 inch, throw valve away. Obtain new valve and repeat test. If new valve passes test install it.**

**INSTALLATION:**

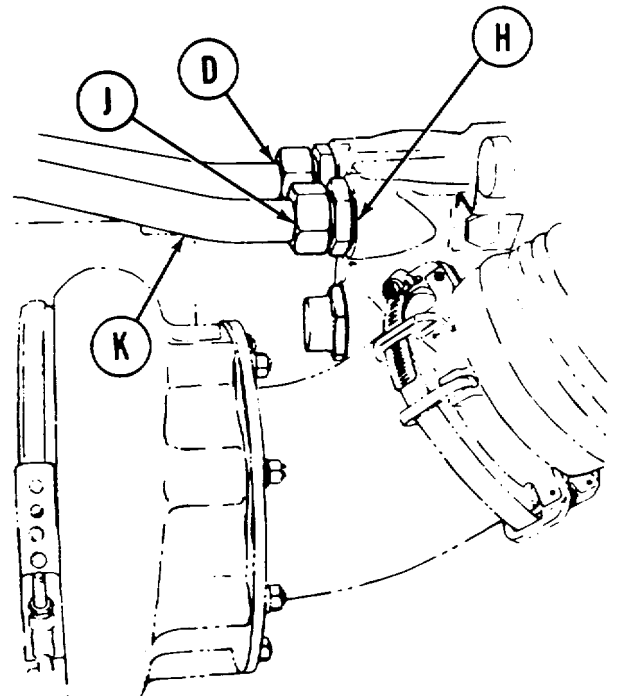
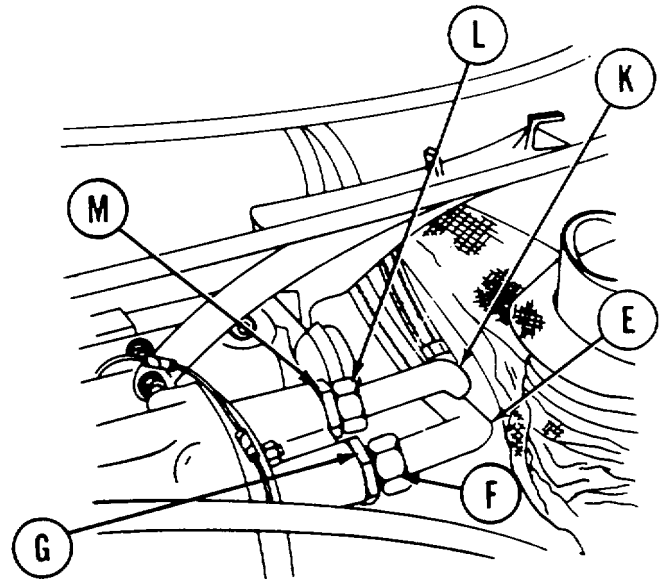
1. Install new spacer ring (A) on valve (B).
2. Using hands, install valve (B) to transmission oil cooler.
3. Using automotive wrench, tighten valve (B).



4. Using 1-5/8 inch wrench, install inside adapter (C).
5. Using hands, install tube end fitting (D) on adapter (C).
6. Go to other end of tube (E).

### THERMOSTATIC TRANSMISSION OIL COOLER VALVE ASSEMBLY (LEFT SIDE) TEST AND REPLACEMENT (2D ENGINE) (Sheet 6 of 6)

7. At other end of tube (E), using 1-1/2 inch wrench, install tube end fitting (F) on adapter (G).
8. Using 1-1/2 inch wrench, tighten tube end fitting (D) at oil cooler.
9. Using 1-5/8 inch wrench, install adapter (H).
10. Using hands, install tube end fitting (J) on adapter (H).
11. Go to other end of tube (K) and, using 1-1/2 inch wrench, install tube end fitting (L) on adapter (M).
12. Using 1-1/2 inch wrench, tighten tube end fitting (J) at oil cooler.
13. Replenish oil lost during valve assembly replacement (LO 9-2350-260-12).
14. Remove rags from transmission and oil cooler.
15. Start and run engine (TM 9-2350-260-10). Check for oil leaks.
16. Install engine shroud (page 9-3).
17. Install transmission shroud (page 9-23).



End of Task

TA147623

**ENGINE TO TRANSMISSION OIL LINE TUBE ASSEMBLES (INNER AND OUTER) REPLACEMENT (2A ENGINE)  
(Sheet 1 of 5)**

PROCEDURE INDEX

PROCEDURE	PAGE
Removal	6-179
Installation	6-181

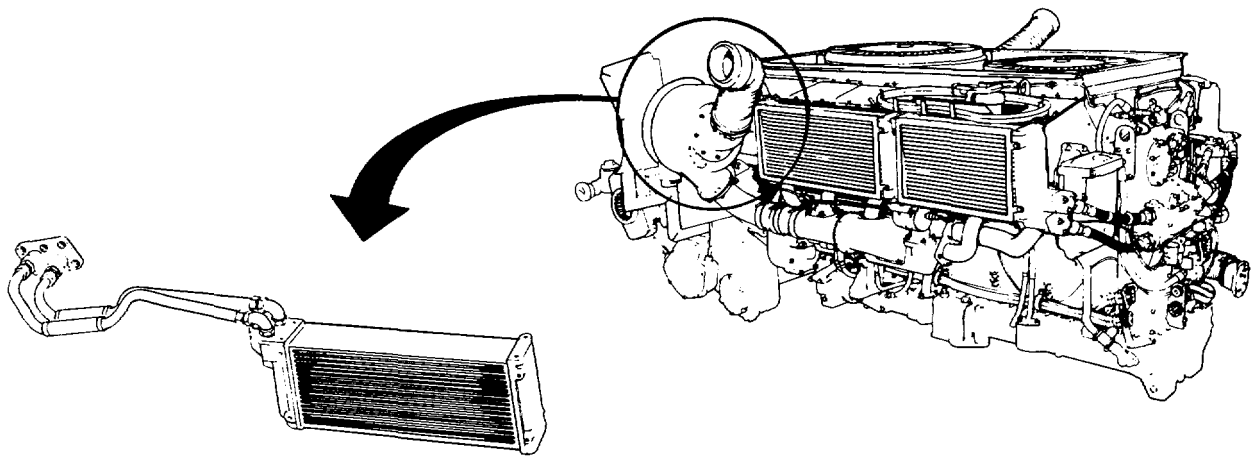
TOOLS: 1-1/2 in. open end wrench  
1-5/8 in. open end wrench

SPECIAL TOOLS: Ground hop kit (Item 30, Chapter 3, Section I)

SUPPLIES: Masking tape (Item 57, Appendix D)  
I.D. tags  
Plastic barrier material (Item 41, Appendix D)  
Gasket (MS35769-34) (2 required)  
Lubricating oil (Item 43, Appendix D)  
Gasket (MS35769-31) (2 required)

REFERENCE: TM 9-2350-260-10

PRELIMINARY PROCEDURES: Remove powerplant (page 5-2)  
Remove engine shroud (page 9-2)  
Remove rear engine shroud support (page 94)



**NOTE**

**Left side shown, right side identical.**

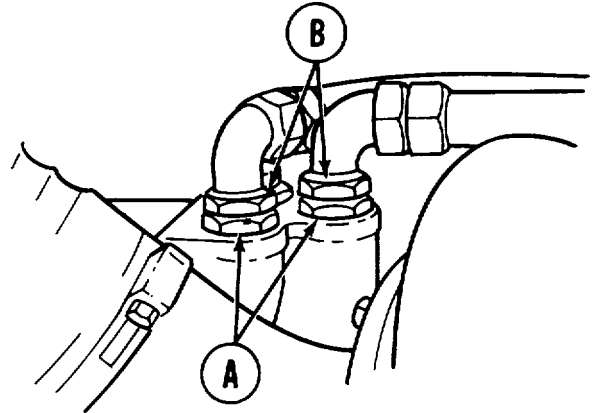
## ENGINE TO TRANSMISSION OIL LINE TUBE ASSEMBLIES (INNER AND OUTER) REPLACEMENT (2A ENGINE) (Sheet 2 of 5)

### REMOVAL:

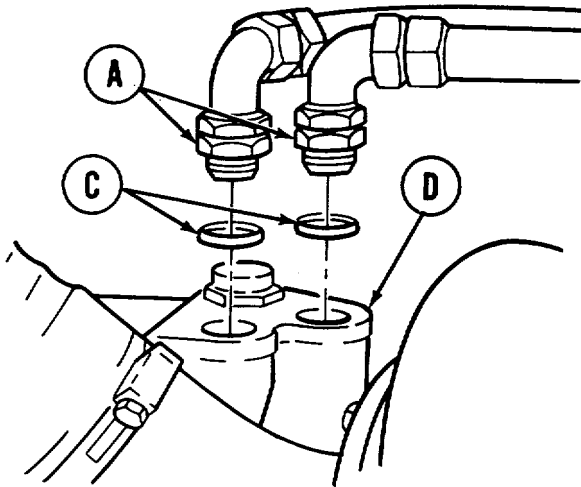
#### NOTE

Tag oil cooler tubes as they are removed for later installation. Removal of left and right side oil cooler tubes is the same.

1. Using 1-5/8 inch wrench, hold two adapters (A) one at a time and, using 1-1/2 inch wrench, loosen two jamnuts (B) one at a time.
2. Using 1-5/8 inch wrench, remove two adapters (A) and gaskets (C) from oil cooler (D).
3. Throw gaskets (C) away.



TURBOCHARGER



#### NOTE

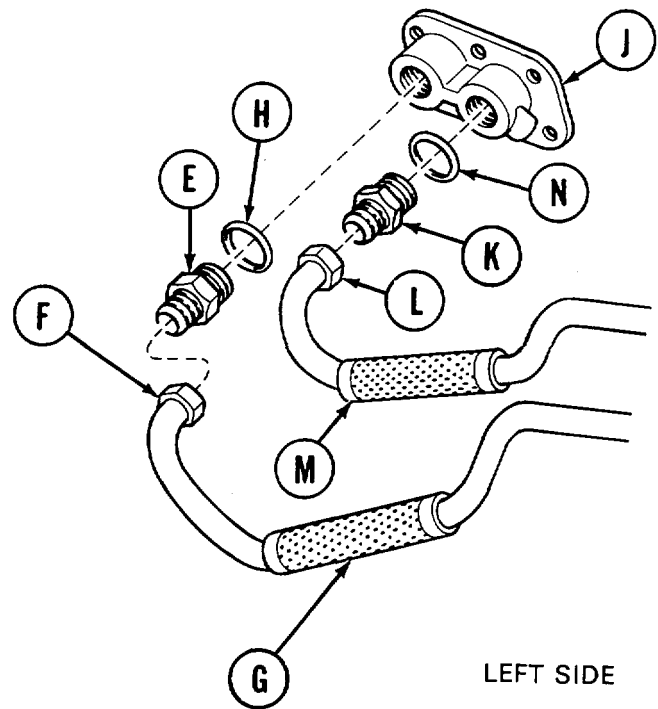
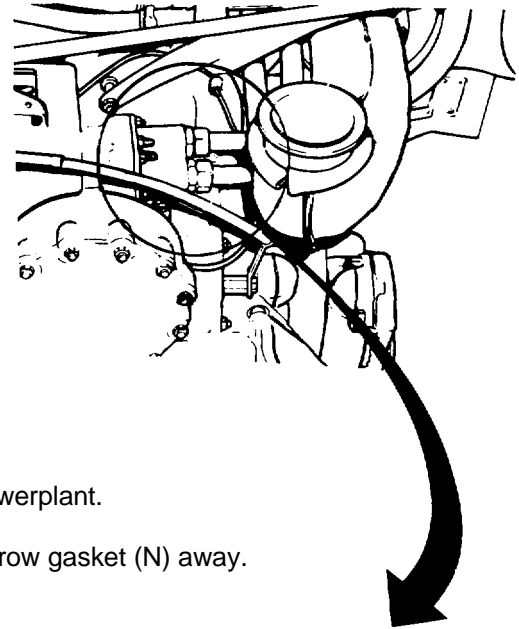
Upon removing tubes and fittings, seal powerplant openings with plastic barrier material (Item 41, Appendix D) and masking tape (Item 57, Appendix D) to prevent unnecessary exposure to moisture and contamination. Remove plastic barrier material and masking tape when installing tubes and fittings.

**ENGINE TO TRANSMISSION OIL LINE TUBE ASSEMBLIES (INNER AND OUTER) REPLACEMENT (2A ENGINE)  
(Sheet 3 of 5)**

**NOTE**

**Outer tube and adapter have to be removed first.**

4. Using 1-5/8 inch wrench to hold adapter (E), use 1-1/2 inch wrench to loosen tube nut (F).
5. Using hands, disconnect and remove tube assembly (G) from powerplant.
6. Using 1-5/8 inch wrench, remove adapter (E) and gasket (H) from transmission oil line mount (J). Throw gasket away.
7. Using 1-5/8 inch wrench to hold adapter (K), use 1-1/2 inch wrench to loosen tube nut (L).
8. Using hands, disconnect and remove tube assembly (M) from powerplant.
9. Using 1-5/8 inch wrench, remove adapter (K) and gasket (N). Throw gasket (N) away.



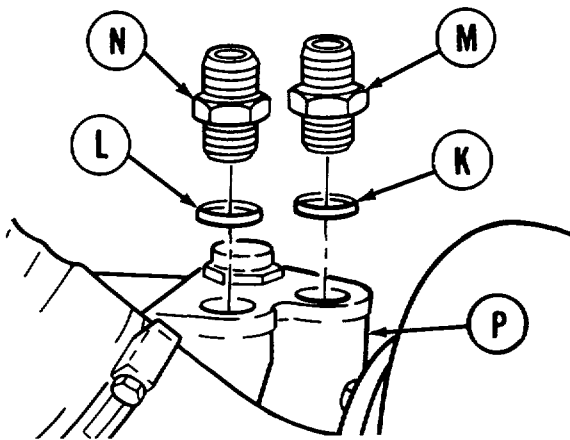
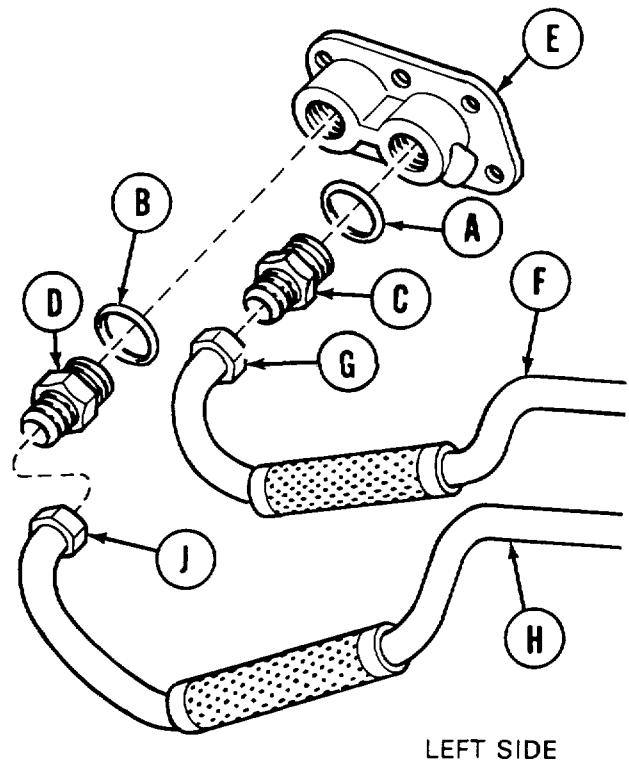
Go on to Sheet 4

TA147626

**ENGINE TO TRANSMISSION OIL LINE TUBE ASSEMBLIES (INNER AND OUTER) REPLACEMENT (2A ENGINE)  
(Sheet 4 of 5)**

**INSTALLATION:**

1. Position new gaskets (A) and (B) onto adapters (C) and (D).
2. Using 1-5/8 inch wrench, install adapter (C) into transmission oil line mount (E).
3. Using 1-5/8 inch wrench, install adapter (D) into transmission oil line mount (E).
4. Position tube assembly (F) through engine shroud and, using 1-1/2 inch wrench on connector (G), tighten connector (G) onto adapter (C).
5. Position tube assembly (H) through engine shroud and, using 1-1/2 inch wrench on connector (J), tighten connector (J) onto adapter (D).
6. Position new washers (K) and (L) onto adapters (M) and (N).
7. Using 1-5/8 inch wrench, install adapter (M) to oil cooler (P).
8. Using 1-5/8 inch wrench, install adapter (N) to oil cooler (P).

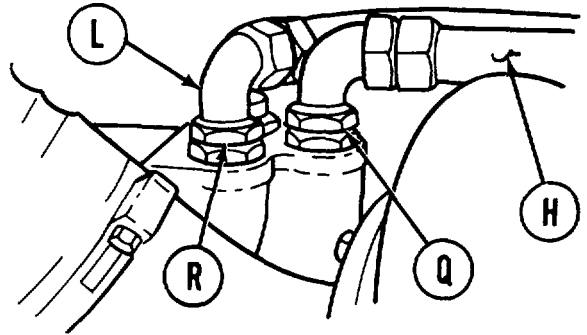


Go on to Sheet 5

TA147627

## ENGINE TO TRANSMISSION OIL LINE TUBE ASSEMBLIES (INNER AND OUTER) REPLACEMENT (2A ENGINE) (Sheet 5 of 5)

9. Place tube assembly (H) in position and, using 1-1/2 inch wrench, tighten jamnut (Q).
10. Place tube assembly (L) in position and, using 1-1/2 inch wrench, tighten jamnut (R).
11. Replenish lubricating oil (Item 43, Appendix D) lost during oil line tube assemblies removal.



12. Connect powerplant for powerplant ground hop (page 5-54).
13. Start and run engine (TM 9-2350-260-10). Check for oil leaks at oil cooler and transmission oil line tube assembly connections.
14. Shut down powerplant (TM 9-2350-260-10). Disconnect powerplant from ground hop (page 5-67).
15. Install engine shroud (page 9-).
16. Install rear engine shroud support (page 9-5).
17. Install powerplant (page 5-14).

End of Task

TA147628

**ENGINE TO TRANSMISSION OIL LINE TUBE ASSEMBLIES (RIGHT INNER AND OUTER) REPLACEMENT (2D ENGINE) (Sheet 1 of 4)**

PROCEDURE INDEX

PROCEDURE	PAGE
Removal	6-184
Installation	6-185

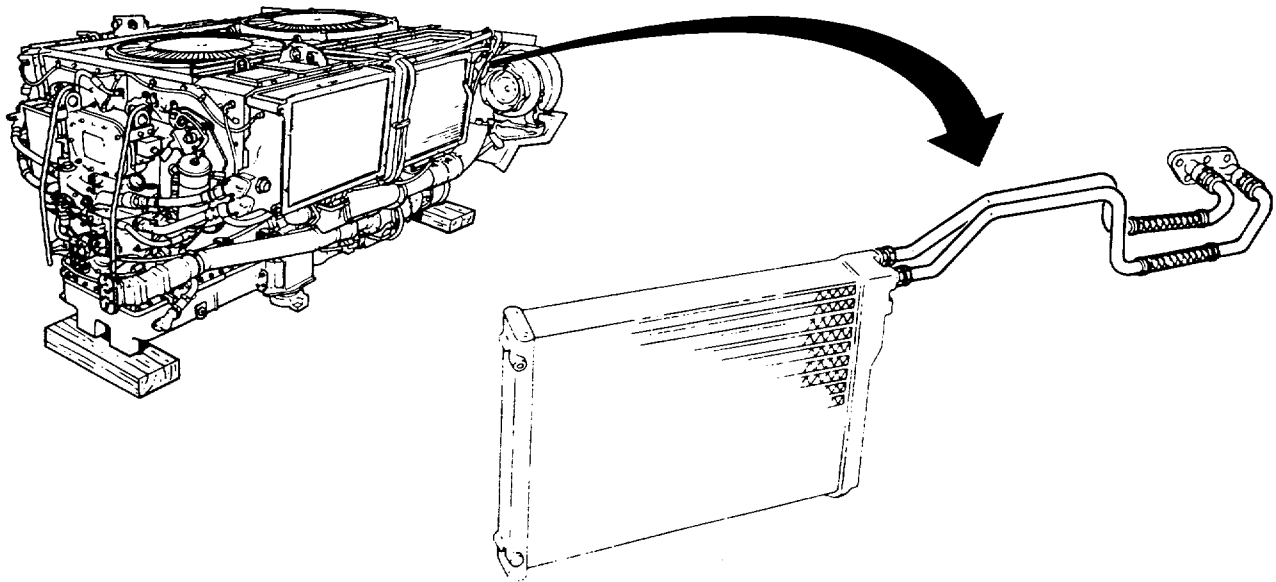
TOOLS: 1-1/2 in. open end wrench  
 1-5/8 in. open end wrench

SPECIAL TOOLS: Ground hop kit (Item 30, Chapter 3, Section I)

SUPPLIES: Drip pan  
 Masking tape (Item 57, Appendix D)  
 Plastic barrier material (Item 41, Appendix D)  
 Rag (Item 65, Appendix D)  
 Gasket (MS35769-31) (4 required)

REFERENCE: LO 9-350-260-12

PRELIMINARY PROCEDURES: Remove powerplant (page 5-25)  
 Remove engine shroud (page 9-2)  
 Remove rear engine shroud support (page 9-4)



Go on to Sheet 2

TA147629



**ENGINE TO TRANSMISSION OIL LINE TUBE ASSEMBLES (RIGHT INNER AND OUTER) REPLACEMENT (2D ENGINE) (Sheet 2 of 4)**

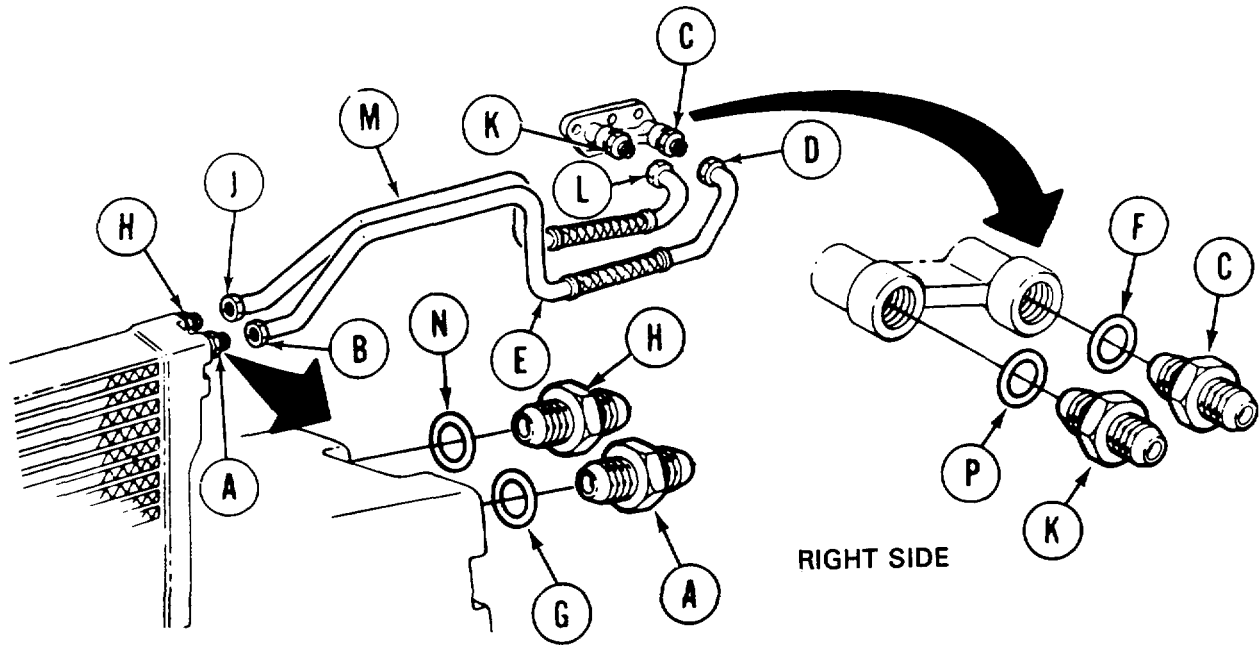
**NOTE**

Before removing tubes and fittings, put rags (Item 65, Appendix D) under disconnect points to catch oil drippings.

Upon removing tubes and fittings seal powerplant openings with plastic barrier material (Item 41, Appendix D) and masking tape (Item 57, Appendix D) to prevent unnecessary exposure to moisture and contamination. Remove plastic barrier material and masking tape when installing tubes and fittings.

**REMOVAL:**

1. Using 1-5/8 inch wrench to hold adapter (A), use 1-1/2 inch wrench and loosen connector (B).
2. Using 1-5/8 inch wrench to hold adapter (C), use 1-1/2 inch wrench and loosen connector (D).
3. Using hands, disconnect and remove tube (E) from powerplant



4. Using 1-5/8 inch wrench, remove adapters (A) and (C) and gaskets (F) and (G). Throw gaskets away.
5. Using 1-5/8 inch wrench to hold adapter (H), use 1-1/2 inch wrench and loosen connector (J).
6. Using 1-5/8 inch wrench to hold adapter (K), use 1-1/2 inch wrench and loosen connector (L).
7. Using hands, disconnect and remove tube (M) from powerplant.
8. Using 1-5/8 inch wrench, remove adapters (H) and (K) and gaskets (N) and (P). Throw gaskets away.

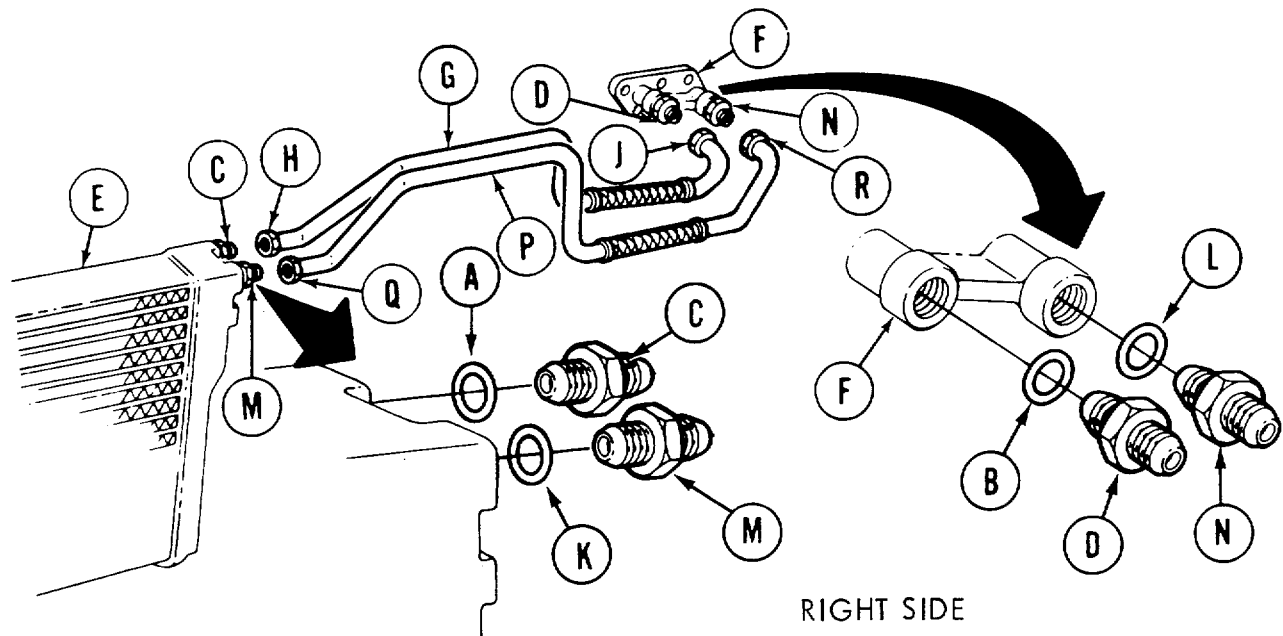
Go on to Sheet 3

TA147630

**ENGINE TO TRANSMISSION OIL LINE TUBE ASSEMBLES (RIGHT INNER AND OUTER) REPLACEMENT (2D ENGINE) (Sheet 3 of 4)**

**INSTALLATION:**

1. Position new gaskets (A) and (B) onto adapters (C) and (D).
2. Using 1-5/8 inch wrench, install adapter (C) into oil cooler (E).
3. Using 1-5/8 inch wrench, install adapter (D) into transmission oil line mount (F).
4. Position tube (G) through engine shroud and, using 1-1/2 inch wrench on connector (H), tighten connector (H) onto adapter (C).
5. Using 1-1/2 inch wrench on connector (J), tighten connector (J) onto adapter (D).
6. Position new gaskets (K) and (L) onto adapters (M) and (N).
7. Using 1-5/8 inch wrench, install adapter (M) into oil cooler (E).

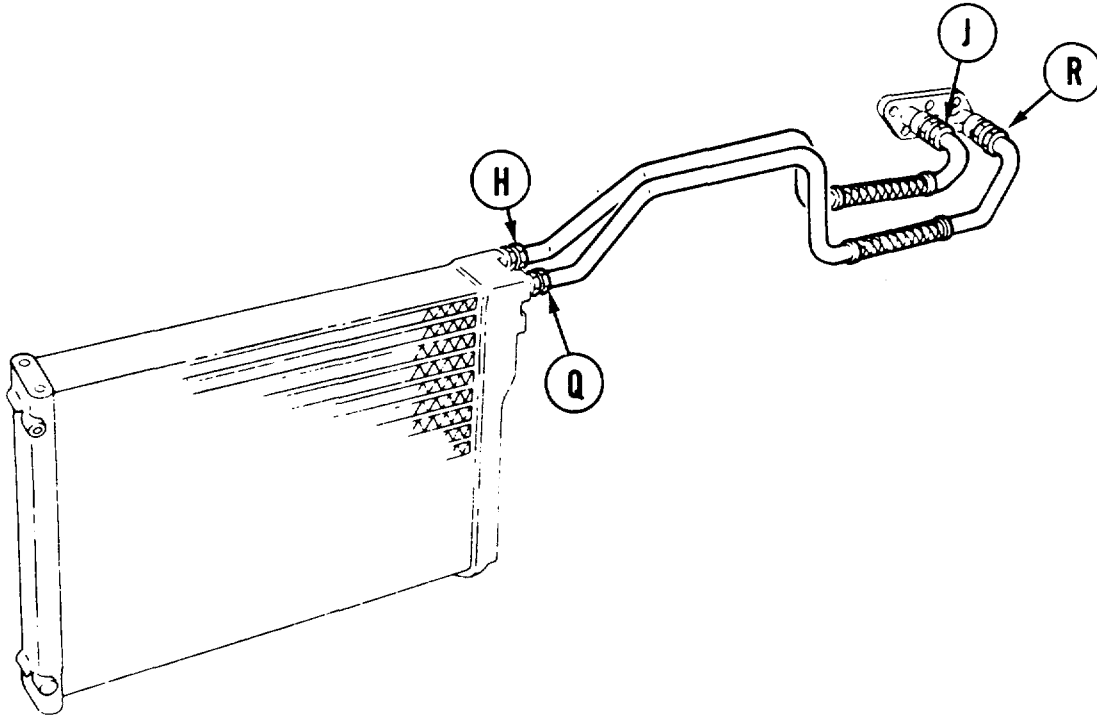


8. Using 1-5/8 inch wrench, install adapter (N) into transmission oil line mount (F).
9. Position tube (P) through engine shroud and, using 1-1/2 inch wrench on connector (Q), tighten connector (Q) onto adapter (M).
10. Using 1-1/2 inch wrench on connector (R), tighten connector (R) onto adapter (N).

Go on to Sheet 4

TA147631

**ENGINE TO TRANSMISSION OIL LINE TUBE ASSEMBLIES (RIGHT INNER AND OUTER) REPLACEMENT (2D ENGINE) (Sheet 4 of 4)**



11. Remove rags placed under transmission connectors (J) and (R) and oil cooler connectors (H) and (Q).
12. Replenish oil lost during oil line tube assemblies removal (LO 9-2350-260-12).
13. Connect powerplant for powerplant ground hop (page 5-54).
14. Start and run engine. Check for oil leaks at oil cooler and transmission oil line tube assembly connections.
15. Shut down engine. Disconnect powerplant from ground hop kit (page 5-67).
16. Install engine shroud (page 9-3).
17. Install rear engine shroud support (page 9-5).
18. Install powerplant (page 5-40).

End of Task

TA147632

**ENGINE TO TRANSMISSION OIL LINE TUBE ASSEMBLIES (LEFT INNER AND OUTER) REPLACEMENT (2D ENGINE) (Sheet 1 of 4)**

PROCEDURE INDEX

PROCEDURE	PAGE
Removal	6-188
Installation	6-189

TOOLS: 1-1/2 in. open end wrench  
 1-5/8 in. open end wrench

SPECIAL TOOLS: Ground hop kit (Item 30, Chapter 3, Section I)

SUPPLIES: Drip pan  
 Masking tape (Item 57, Appendix D)  
 Plastic barrier material (Item 41, Appendix D)  
 Rag (Item 65, Appendix D)  
 Gaskets (MS35769-31) (4 required)

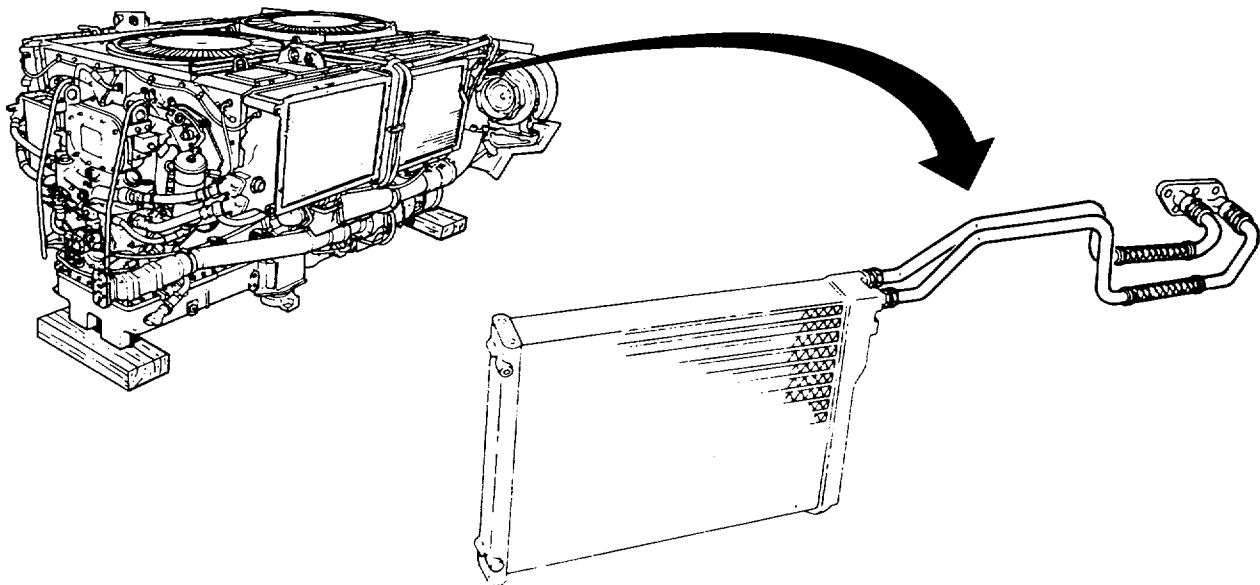
REFERENCE: LO 9-2350260-12

PRELIMINARY PROCEDURES: Remove powerplant age 5-1)  
 Remove engine shroud (page 9-2)  
 Remove rear engine shroud support (page 94)

**NOTE**

**Right side shown, left side identical.**

**Right side shown, left side identical.**



Go on to Sheet 2

TA147633

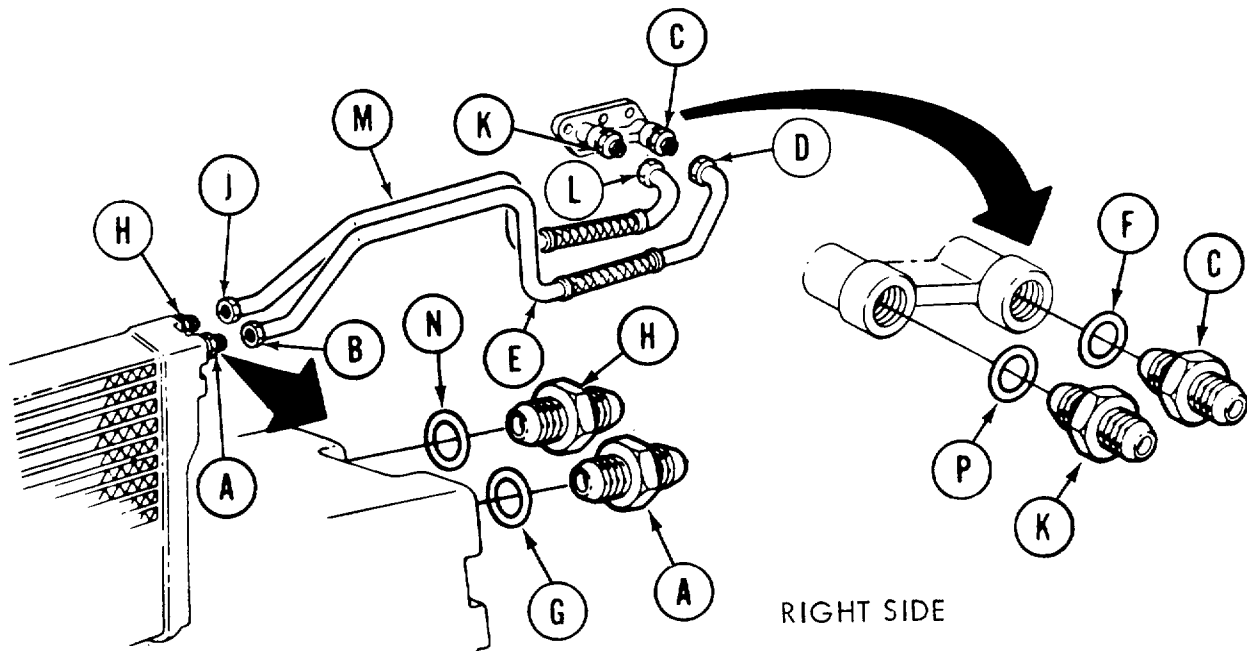
## ENGINE TO TRANSMISSION OIL LINE TUBE ASSEMBLIES (LEFT INNER AND OUTER) REPLACEMENT (2D ENGINE) (Sheet 2 of 4)

### NOTE

Place rags (Item 65, Appendix D) under fittings (J), (A), (K), and (C). Upon removing tubes and fittings, seal powerplant openings with plastic barrier material (Item 41, Appendix D) and masking tape (Item 57, Appendix D) to prevent unnecessary exposure to moisture and contamination. Remove plastic barrier material and masking tape when installing tubes and fittings.

### REMOVAL:

1. Using 1-5/8 inch wrench to hold adapter (A), use 1-1/2 inch wrench and loosen connector (B).
2. Using 1-5/8 inch wrench to hold adapter (C), use 1-1/2 inch wrench and loosen connector (D).
3. Using hands, disconnect and remove tube (E) from powerplant.



4. Using 1-5/8 inch wrench, remove adapters (A) and (C) and gaskets (F) and (G). Throw gaskets away.
5. Using 1-5/8 inch wrench to hold adapter (H), use 1-1/2 inch wrench and loosen connector (J).
6. Using 1-5/8 inch wrench to hold adapter (K), use 1-1/2 inch wrench and loosen connector (L).
7. Using hands, disconnect and remove tube (M) from powerplant.
8. Using 1-5/8 inch wrench, remove adapters (H) and (K) and gaskets (N) and (P). Throw gaskets away.

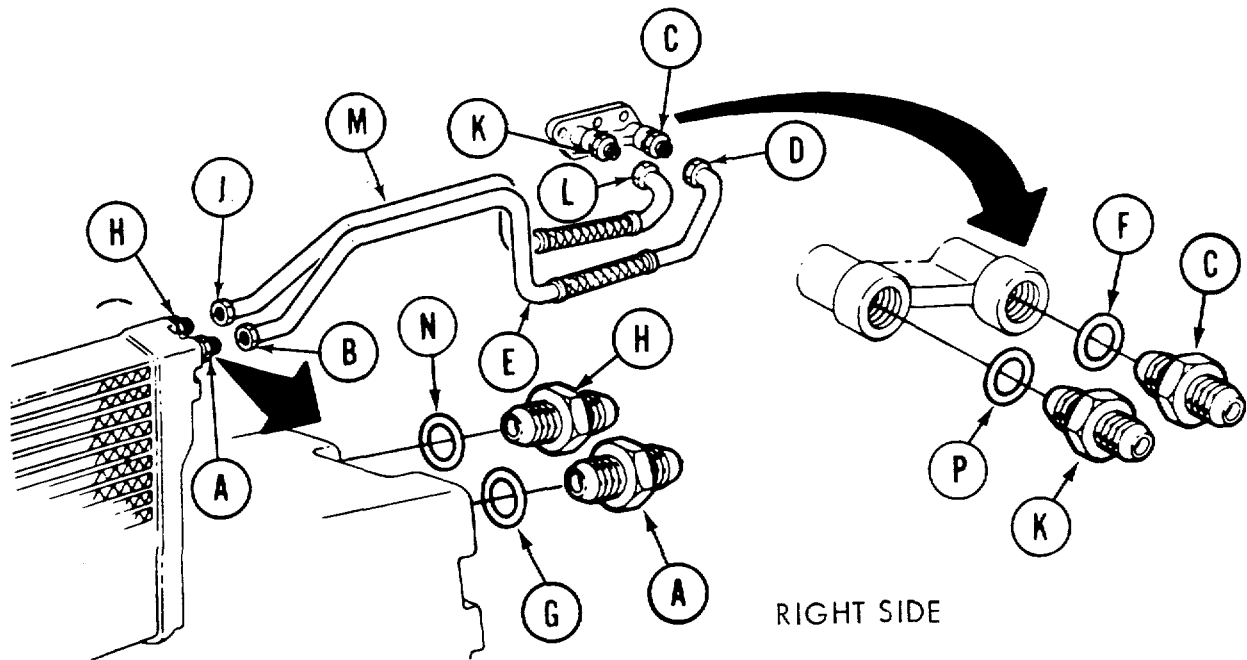
Go on to Sheet 3

TA147634

**ENGINE TO TRANSMISSION OIL LINE TUBE ASSEMBLIES (LEFT INNER AND OUTER) REPLACEMENT (2D ENGINE) (Sheet 3 of 4)**

**INSTALLATION:**

1. Position new gaskets (A) and (B) onto adapters (C) and (D).
2. Using 1-5/8 inch wrench, install adapter (C) into oil cooler (E).
3. Using 1-5/8 inch wrench, install adapter (D) into transmission mount (F).
4. Position tube (G) through engine shroud and, using 1-1/2 inch wrench on connector (H), tighten connector (H) onto adapter (C).
5. Using 1-1/2 inch wrench on connector (J), tighten connector (J) onto adapter (D).
6. Position new gaskets (K) and (L) onto adapters (M) and (N).
7. Using 1-5/8 inch wrench, install adapter (M) into oil cooler (E).

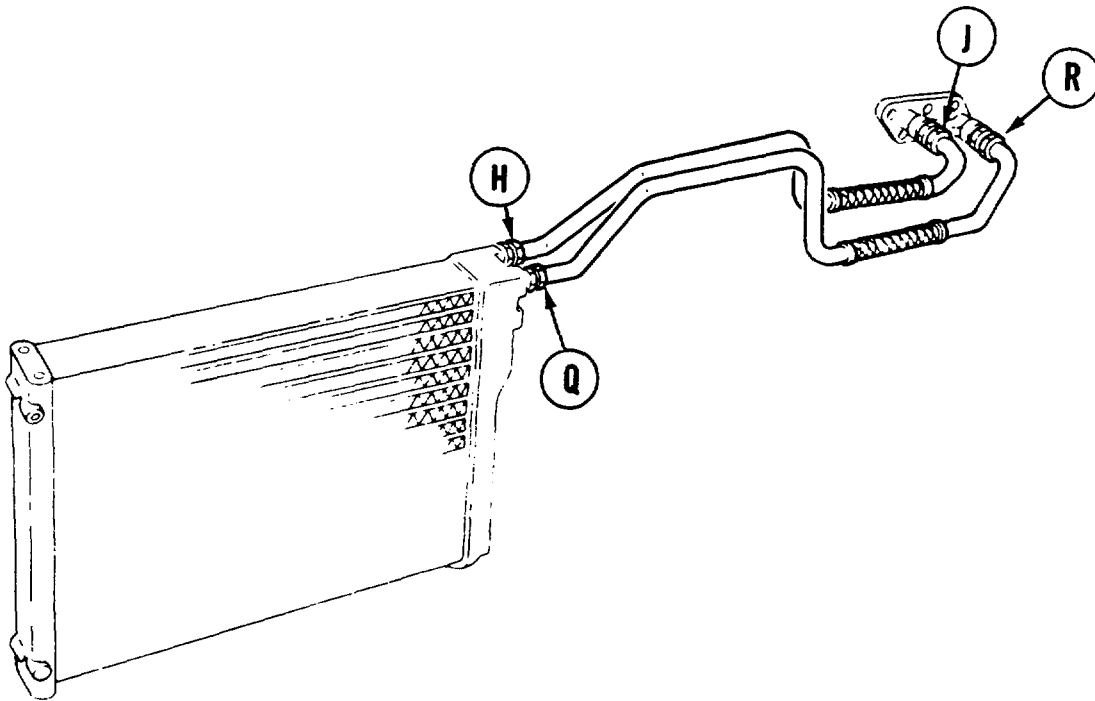


8. Using 1-5/8 inch wrench, install adapter (N) into transmission oil line mount (F).
9. Position tube (P) through engine shroud and, using 1-1/2 inch wrench on connector (Q), tighten connector (Q) onto adapter (M).
10. Using 1-1/2 inch wrench on connector (R), tighten connector (R) onto adapter (N).

Go on to Sheet 4

TA147635

**ENGINE TO TRANSMISSION OIL LINE TUBE ASSEMBLES (LEFT INNER AND OUTER) REPLACEMENT (2D ENGINE) (Sheet 4 of 4)**



11. Remove rags placed under transmission connectors (J) and (R) and oil cool connectors (H) and (Q).
12. Replenish oil lost during oil line tube assemblies removal (LO 9-2350-260-12).
13. Connect powerplant for powerplant ground hop (page 5-54).
14. Start and run engine. Check for oil leaks at oil cooler and transmission oil line tube assembly connections.
15. Shut down engine. Disconnect powerplant from ground hop kit (page 5-67).
16. Install engine shroud (page 9-3).
17. Install rear engine shroud support (page 9-5).
18. Install 2D powerplant (page 5-40).

End of Task

TA147636

**OIL COOLERS - CLEANING (Sheet 1 of 3)**

TOOLS: Oil cooler cleaning tool

SUPPLIES: Detergent (Item 33, Appendix D)  
Water source  
50 to 90 psi air supply  
Water hose  
Container for cleaning solution

REFERENCE: TM 9-2350-260-10

PRELIMINARY PROCEDURES: Remove top deck (page 16-20)  
Remove engine shroud (page 9-2)  
Remove engine access covers (2A engine, pages 6-77 and 684) (2D engine, pages 6-79 and 6-88)  
Open hull drains (TM 9-2350-260-10)

CLEANING:

**NOTE**

**For any engine, the oil cooler cleaning tool will clean the two engine oil coolers as well as the two transmission oil coolers with the powerplant in or out of the tank. This applies to both the 2A and the 2D engines.**

**If oil coolers are to be cleaned with powerplant removed, oil cooler screens must be removed as part of preliminary procedures (pages 6-116 and 6-118).**

**WARNING**

**Always wear safety glasses or goggles when cleaning oil coolers to prevent dirt particles and cleaning agent from splashing in eyes.**

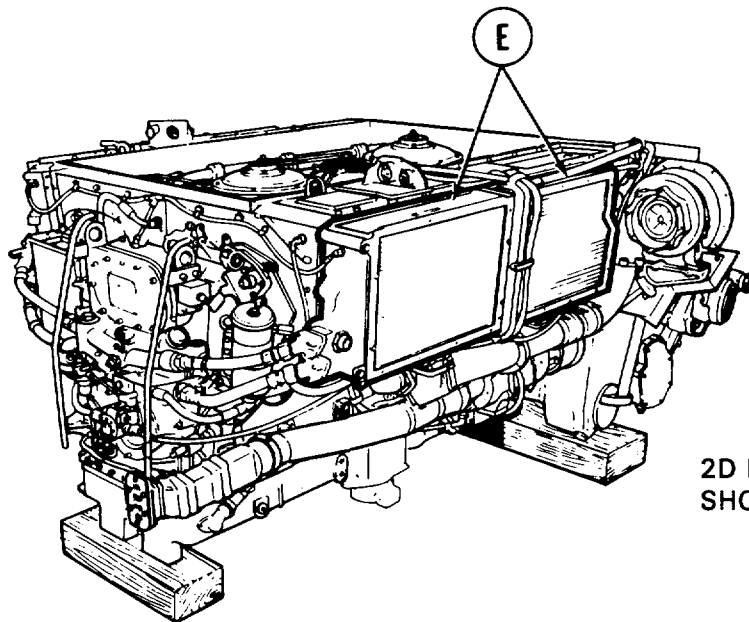


## OIL COOLERS - CLEANING (Sheet 2 of 3)

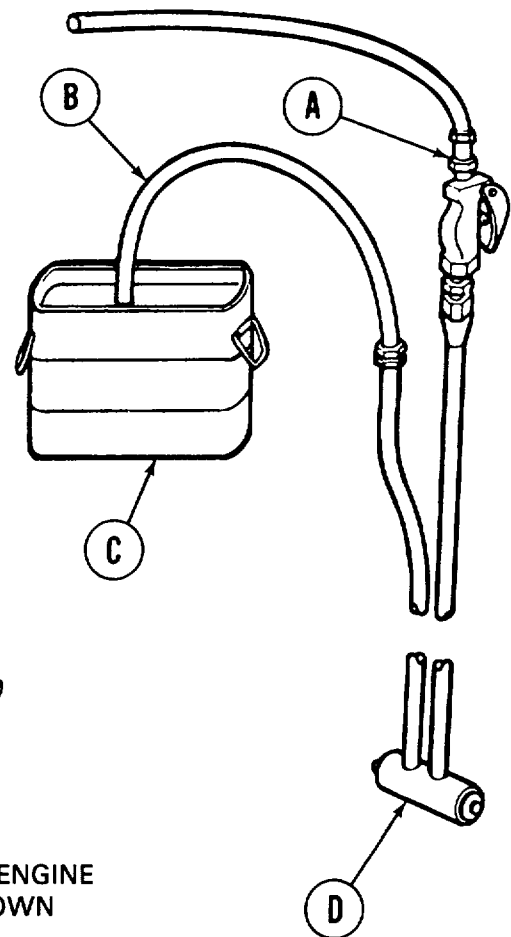
## NOTE

If powerplant is installed in tank, all preliminary procedures must be accomplished prior to cleaning. For cleaning coolers in or out of tank, make sure oil filter and indicator covers are tightly closed. Cover all exposed engine openings.

1. Connect cleaner air inlet (A) to a 50 to 90 psi air supply.
2. Mix one part detergent (Item 33, Appendix D) to approximately five parts of water as cleaning solution. Insert siphon hose (B) into cleaning solution container (C).
3. Position cleaner head (D) behind oil cooler fins (E) with spray holes toward fins.



2D ENGINE SHOWN



Go on to Sheet 3

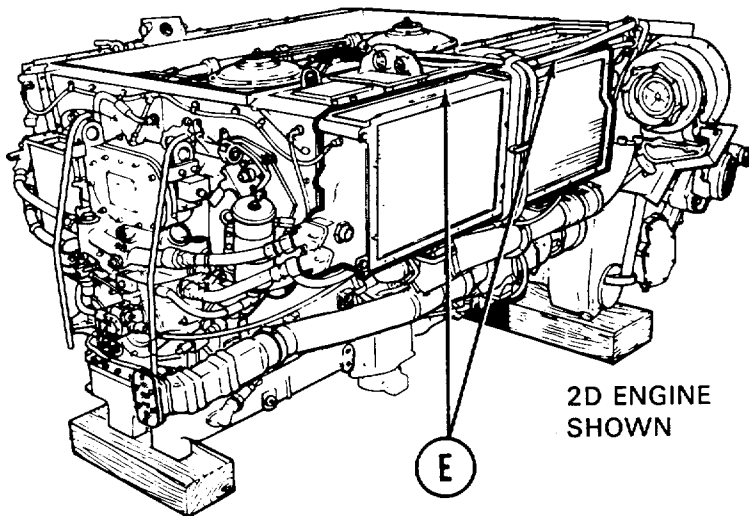
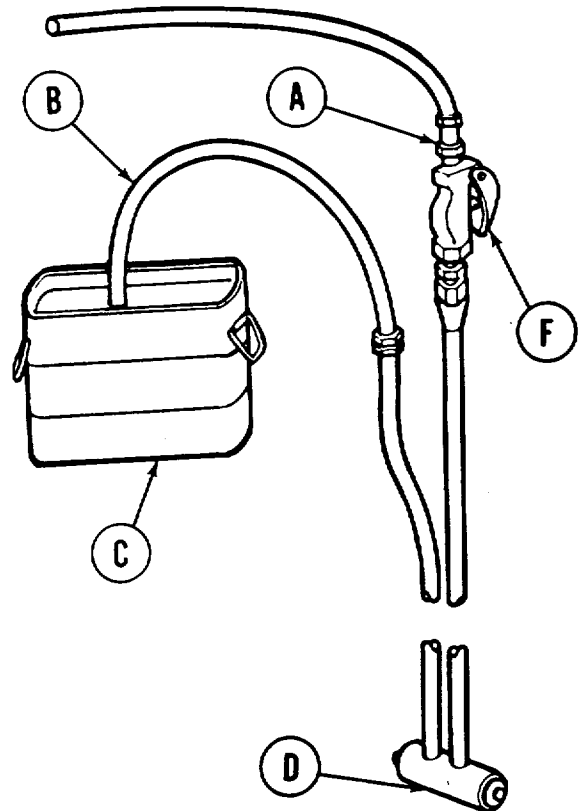
TA147638

**OIL COOLERS - CLEANING (Sheet 3 of 3)**

4. Squeeze lever (F) to obtain an air-liquid mixture and spray fins (E) with cleaning solution. Allow time for solution to soak between oil cooler fins.
5. Clean oil coolers by alternately moving cleaner head (D) from left to right and up and down. Cleaning solution flows freely through entire oil cooler area.

**NOTE**

If oil coolers were cleaned with powerplant installed, use hose and water to make sure oil cooler screens are clear.



6. When oil cooler fins (E) are clean, use hose to flush with water.
7. Dry all parts with air by removing end of siphon hose (B) from cleaning solution container (C) and squeezing lever (F).

8. Remove engine opening protective coverings.
9. Close hull drains (TM 9-2350-260-10).
10. Install engine access covers (2A engine, pages 6-78 and 6-86) (2D engine, pages 6-82 and 6-91).
11. Install engine shroud (page 9-3).
12. Install screens, if removed (pages 6-117 and 6-119).
13. Install top deck (page 16-22).

End of Task

TA147639

CHAPTER 7

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**PURGE FUEL SYSTEM (2A ENGINE) (Sheet 1 of 3)**

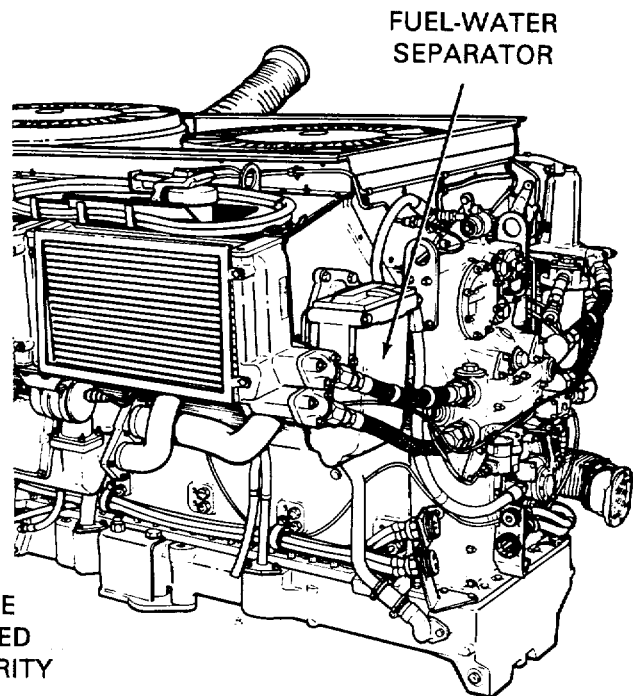
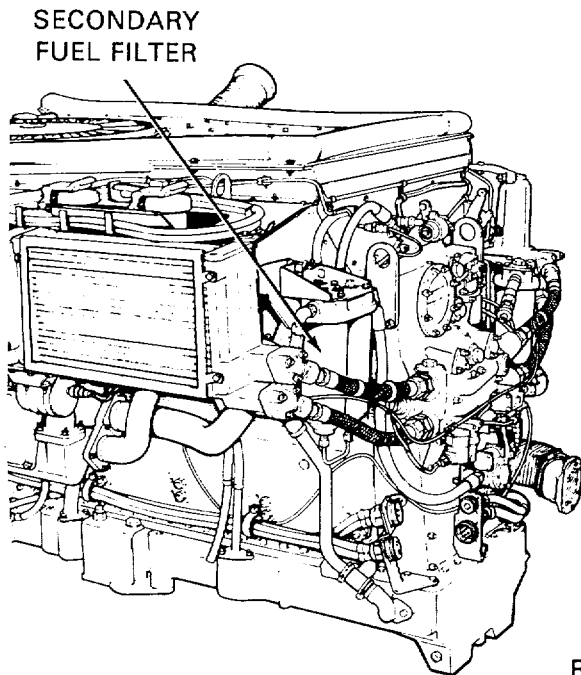
**TOOLS:** 7/16 in. combination box and open end wrench  
Flashlight

**SUPPLIES:** 1 gal. container  
Rags (Item 65, Appendix D)

**PERSONNEL:** Two

**REFERENCE:** TM 9-2350-260-10

**PRELIMINARY PROCEDURE:** Remove upper engine access cover (page 16-44)  
Open right side grille doors (TM 9-2350-260-10)



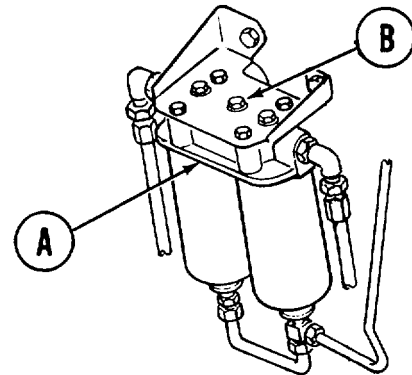
**NOTE**

**M60 tanks with 2A engines may have one of two different types of fuel filtering systems. This procedure covers both.**

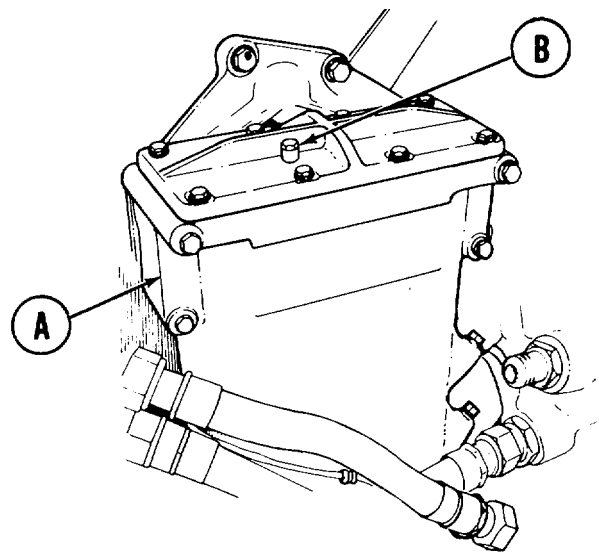


**PURGE FUEL SYSTEM (2A ENGINE) (Sheet 2 of 3)****PURGING:**

1. Turn MASTER CONTROL switch OFF.
2. Place rags (Item 65, Appendix D) and container under secondary fuel filter (A) or fuel water separator (A).
3. Using wrench and flashlight, reach through access hatch and loosen bleed cap (B).
4. Operate primer pump handle (TM 9-2350-260-10).
5. Observe for air bubbles coming from secondary fuel filter or fuel water separator bleed cap (B).
6. Operate primer pump handle until constant fuel flow is observed from bleed cap (B).
7. Using wrench, close bleed cap (B).



**SECONDARY  
FUEL FILTER**



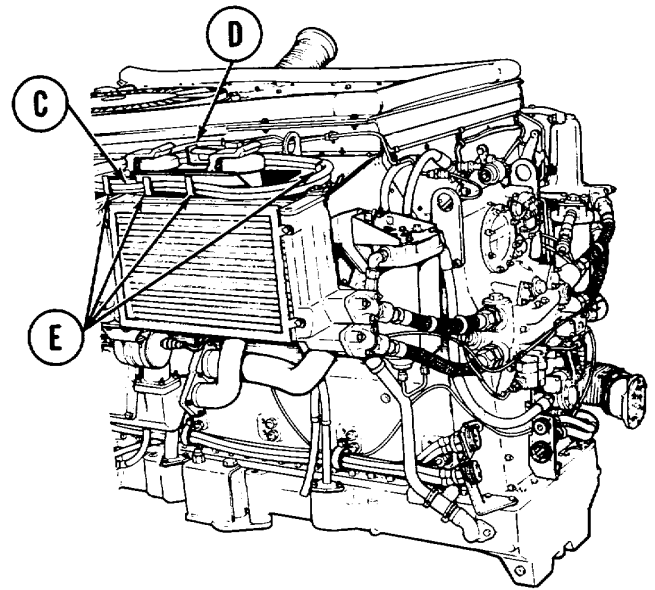
**FUEL-WATER  
SEPARATOR**

Go on to Sheet 3

TA148083

**PURGE FUEL SYSTEM (2A ENGINE) (Sheet 3 of 3)**

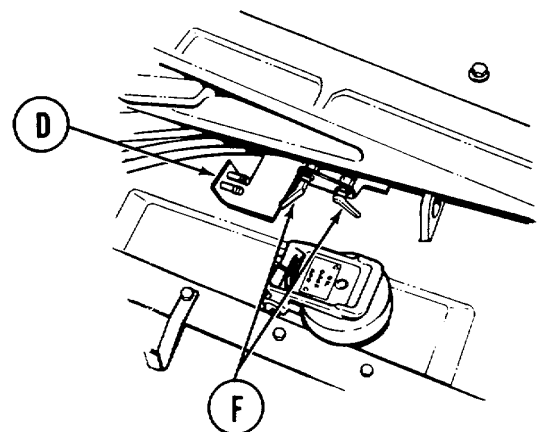
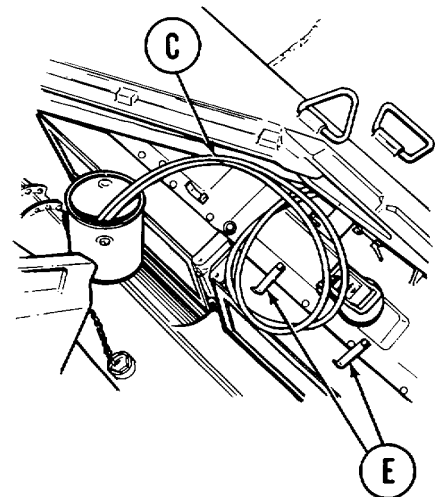
8. Turn MASTER CONTROL switch ON, set FUEL PUMPS switch ON (TM 9-2350-260-10).
9. Disconnect drain hoses (C) from retaining bracket (D).
10. Unwind hoses (C) from support brackets (E) and place ends of tubes (C) into container.
11. Open fuel drain valves (F) by pulling valve arms outward and let fuel continue to flow until pure fuel is being discharged (about 3 quarts).



**WARNING**

**Make sure valves (F) are closed. Failure to close valves will cause fuel to be pumped into hull creating a fire hazard.**

12. Close fuel drain valves (F).
13. Rewind hoses (C) around support brackets (E).
14. Connect ends of hoses (C) to retaining bracket (D).
15. Turn MASTER CONTROL switch OFF.
16. Install engine upper access cover (page 16-44).
17. Close grille doors (TM 9-2350-260-10).



End of Task

TA148084

**PURGE FUEL SYSTEM (2D ENGINE) (Sheet 1 of 2)**

TOOLS: 7/16 in. combination box and open end wrench  
Flashlight

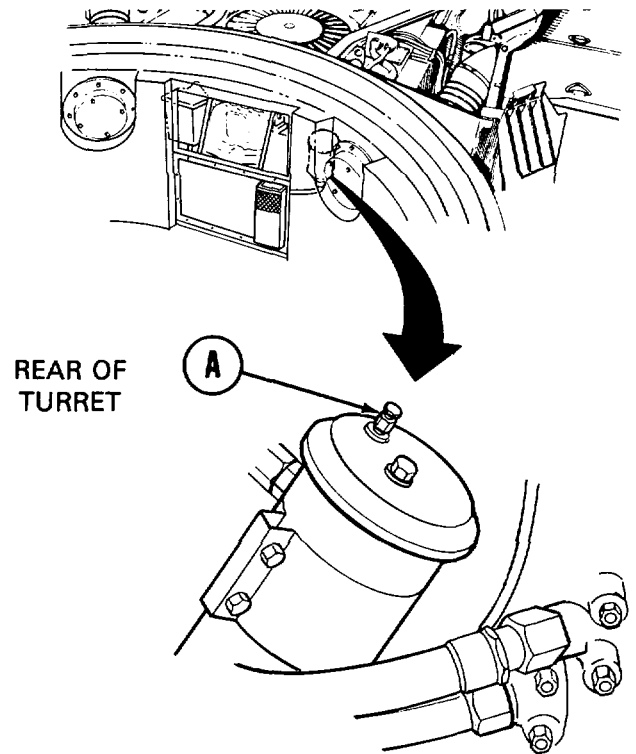
PERSONNEL: Two

REFERENCE: TM 9-2350-260-10

PRELIMINARY PROCEDURE: Remove upper engine access cover (page 16-44)

**PURGING:**

1. Using wrench and flashlight, reach through access and loosen fuel filter bleed cap (A).
2. Set FUEL PUMPS switch to ON (TM 9-2350-260-10).
3. Set MASTER CONTROL switch to ON (TM 9-2350-260-10).

**NOTE**

**If no air bubbles are observed in step 4, go to step 7.**

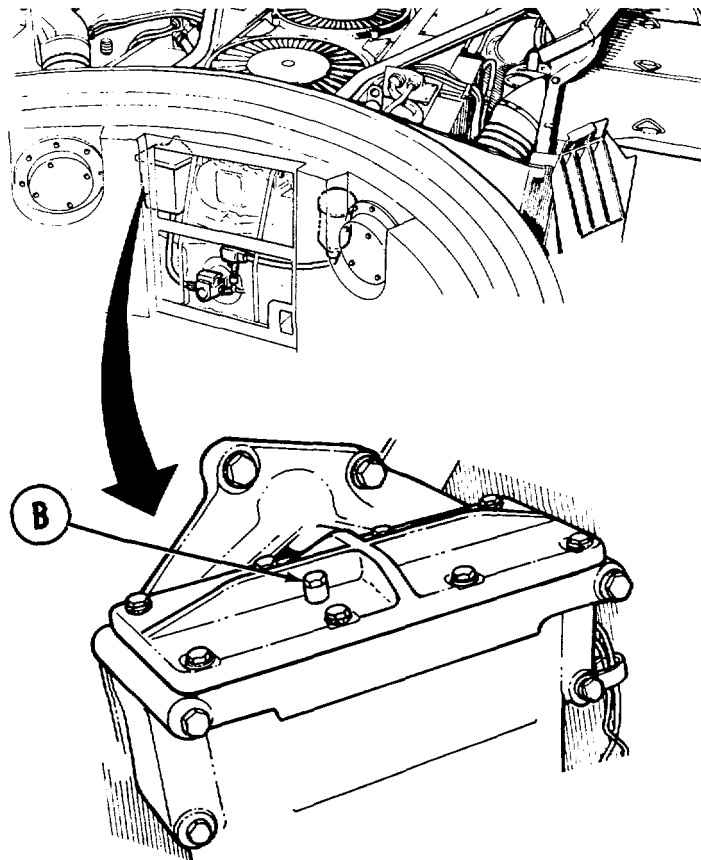
4. Observe for air release bubbles from bleed cap (A).
5. Set MASTER CONTROL switch to OFF (TM 9-2350-260-10).
6. Wait approximately one minute, then repeat steps 3 and 4 until a constant fuel flow is observed from bleed cap (A).
7. Using wrench, tighten bleed cap (A).
8. Set MASTER CONTROL and FUEL PUMPS switches to OFF (TM 9-2350-260-10).

Go on to Sheet 2

TA148085

**PURGE FUEL SYSTEM (2D ENGINE) (Sheet 2 of 2)**

9. Using wrench and flashlight, reach through access hatch and loosen fuel water separator bleed cap (B).
10. Manually operate primer pump handle (TM 9-2350.260-10).
11. Observe air release bubbles from fuel water separator bleed cap (B).
12. Continue to operate primer pump until a constant fuel flow is observed from bleed cap (B).
13. Using wrench, close bleed cap (B).
14. Install engine upper access cover (page 16-44).



End of Task

TA148086

**INSPECT FUEL INJECTOR NOZZLES AND HOLDERS (Sheet 1 of 3)**

**TOOLS:** Ratchet with 1/2 in. drive  
 1-1/4 in. socket with 1/2 in. drive  
 Torque wrench with 1/2 in. drive (0 to 175 lb-ft) (0-237 N•m)

**SPECIAL TOOLS:** Spacers (Item 2, Chapter 3, Section I)  
 Open end wrench (Item 3, Chapter 3, Section I)

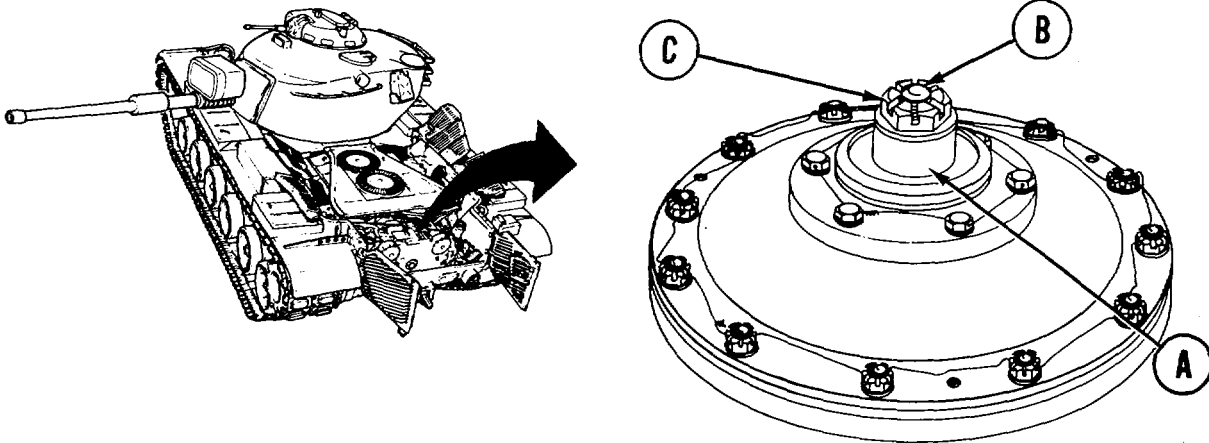
**PERSONNEL:** Two

**REFERENCE:** TM 9-2350-260-10

**PRELIMINARY PROCEDURES:** Remove engine cooling fan (page 9-48)  
 Remove engine access cover (right bank) (2A, page 6-78) (D, page 6-79)  
 Remove engine access cover (left bank) (2A, page 6-84) (2, page 6-88)

**INJECTOR NOZZLE AND HOLDER TIGHTENING:**

1. Using socket, install spacers (A) (Item 2, Chapter 3, Section I) on fan drive shafts (B) and secure with nuts (C).



Go on to Sheet 2

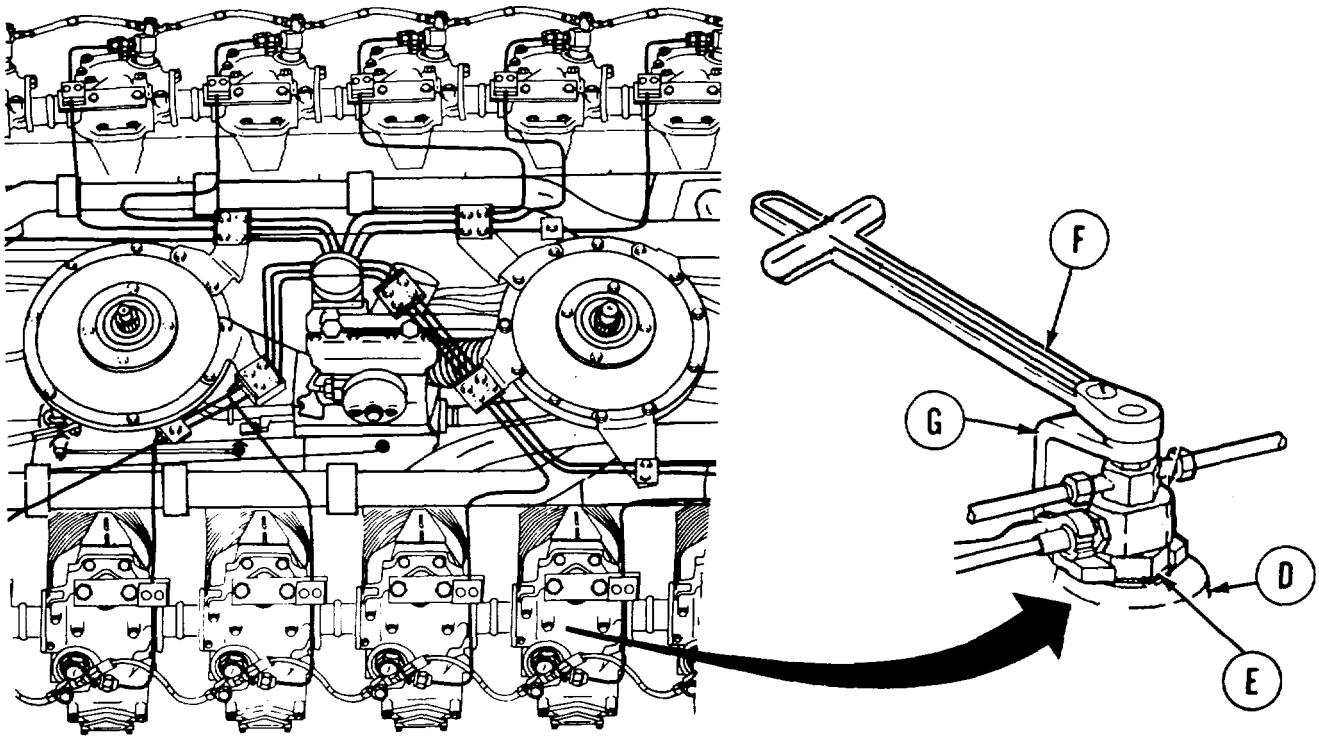
TA148087

## INSPECT FUEL INJECTOR NOZZLES AND HOLDERS (Sheet 2 of 3)

## CAUTION

Do not exceed 700 to 750 rpm and do not run engine for more than 10 minutes at a time. Before restarting, allow engine to cool.

2. Start engine (TM 9-2350-260-10).
3. Place hand between nozzle heads (D) and top of holders (E) on each fuel injector. If movement is felt, stop the engine. If movement is not felt, go to step 7.
4. Using torque wrench (F) and fixed open end wrench (G) (Item 3, Chapter 3, Section I) tighten nozzle holders (E) to 42 lb-ft (57 N•m).



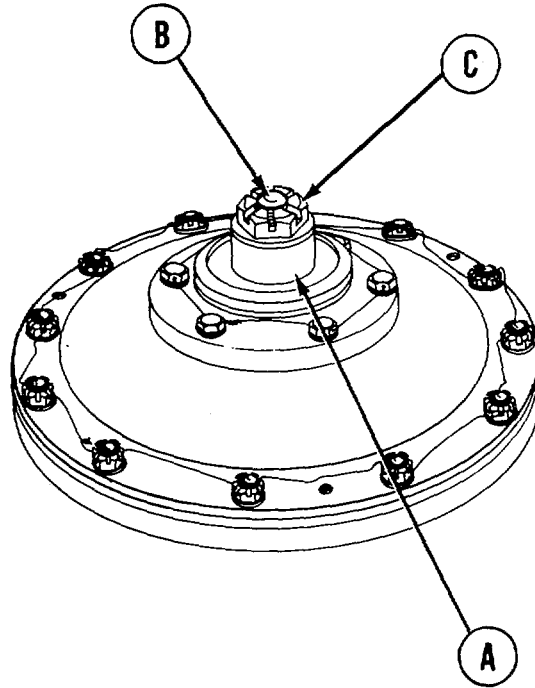
5. Start engine (TM 9-2350-260-10).
6. Place hand between nozzle heads (D) and top of holders (E) on each fuel injector. If movement is still felt, notify support maintenance.

Go on to Sheet 3

TA148088

**INSPECT FUEL INJECTOR NOZZLES AND HOLDERS (Sheet 3 of 3)**

7. Using socket, remove nut (C) and spaces (A) (Item 2, Chapter 3, Section I) from fan drive shaft (B).
8. Install cooling fans (page 9-49).
9. Install engine access covers (2A, right bank, page 6-80), (2D, right bank, page 6-82), (left bank, 2A, page 6-86) (left bank, 2D, page 6-91).



End of Task

TA148089

**FUEL RETURN LINES REPLACEMENT (2A ENGINE) (Sheet 1 of 7)**

PROCEDURE INDEX

PROCEDURE	PAGE
Removal	7-16
Cleaning and Inspection	7-19
Installation	7-19

TOOLS: 1/2 in. socket with 1/2 in. drive  
 11/16 in. socket with 1/2 in. drive  
 Ratchet with 1/2 in. drive  
 5 in. extension with 1/2 in. drive  
 1/2 in. combination box and open end wrench  
 9/16 in. combination box and open end wrench  
 7/8 in. combination box and open end wrench  
 1 in. combination box and open end wrench  
 1-1/8 in. combination box and open end wrench  
 1-1/4 in. combination box and open end wrench

SUPPLIES: Rags (Item 65, Appendix D)  
 Dry cleaning solvent (Item 54, Appendix D)  
 Sealing compound (Item 27, Appendix D)

PRELIMINARY PROCEDURES: Remove engine shroud supports (page 9-4)  
 Remove engine cooling fans (page 9-48)  
 Remove engine access covers (page 6-78 and/or 6-84)

Go on to Sheet 2

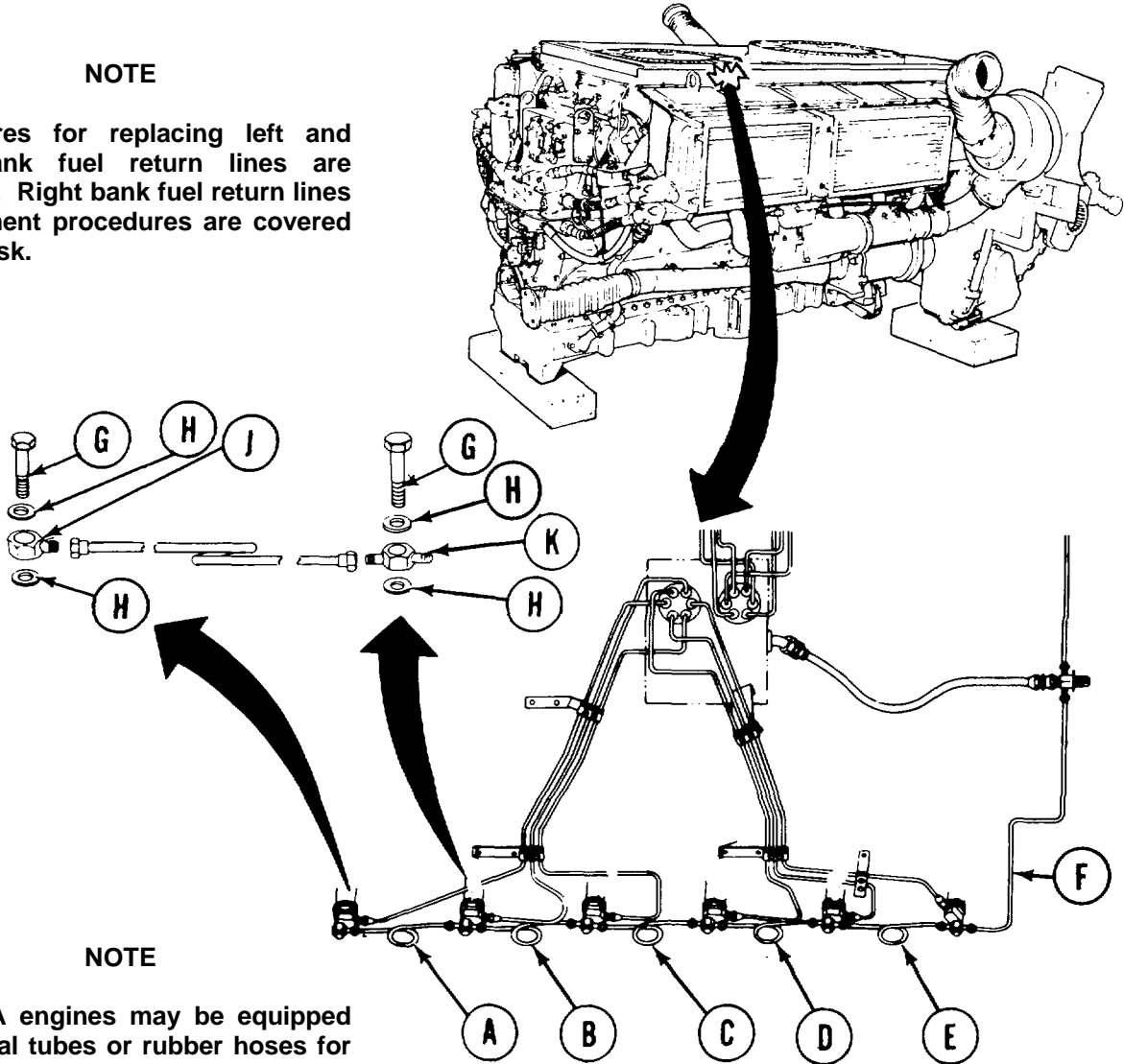


FUEL RETURN LINES REPLACEMENT (2A ENGINE) (Sheet 2 of 7)

REMOVAL:

NOTE

Procedures for replacing left and right bank fuel return lines are identical. Right bank fuel return lines replacement procedures are covered in this task.



NOTE

Some 2A engines may be equipped with metal tubes or rubber hoses for items (A) thru (E). Replacement procedures are the same.

1. Using 9/16 inch wrench, loosen end fittings and remove fuel return lines (A), (B), (C), (D), (E), and (F).
2. Using 11/16 inch socket remove bolts (G) and washers (H) holding connectors (J) and (K).

NOTE

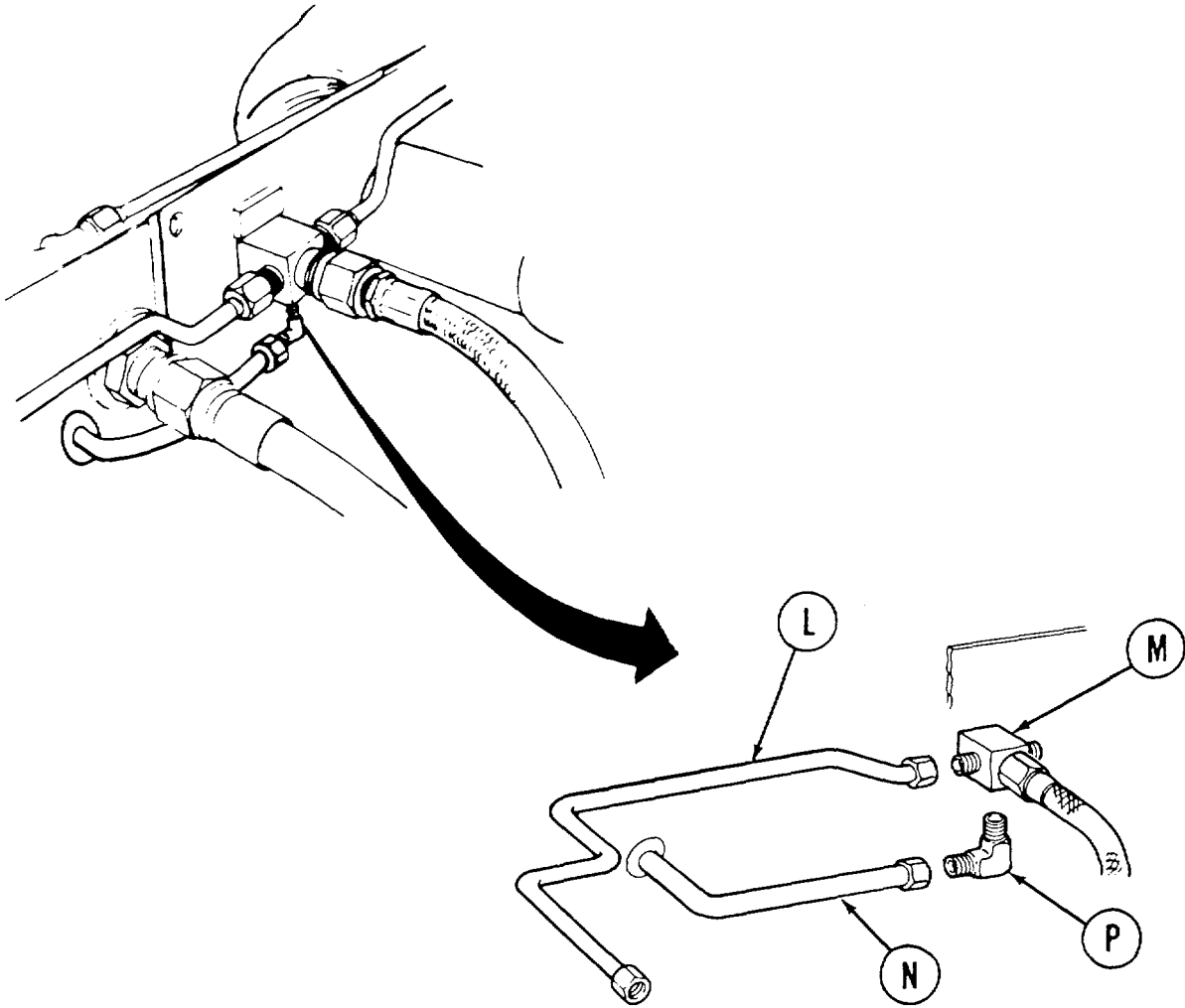
Lines (B), (C), (D) and (E) have connectors (K).

3. Using fingers, remove connectors (J) and (K).

Go on to Sheet 3

TA148091

## FUEL RETURN LINES REPLACEMENT (2A ENGINE) (Sheet 3 of 7)



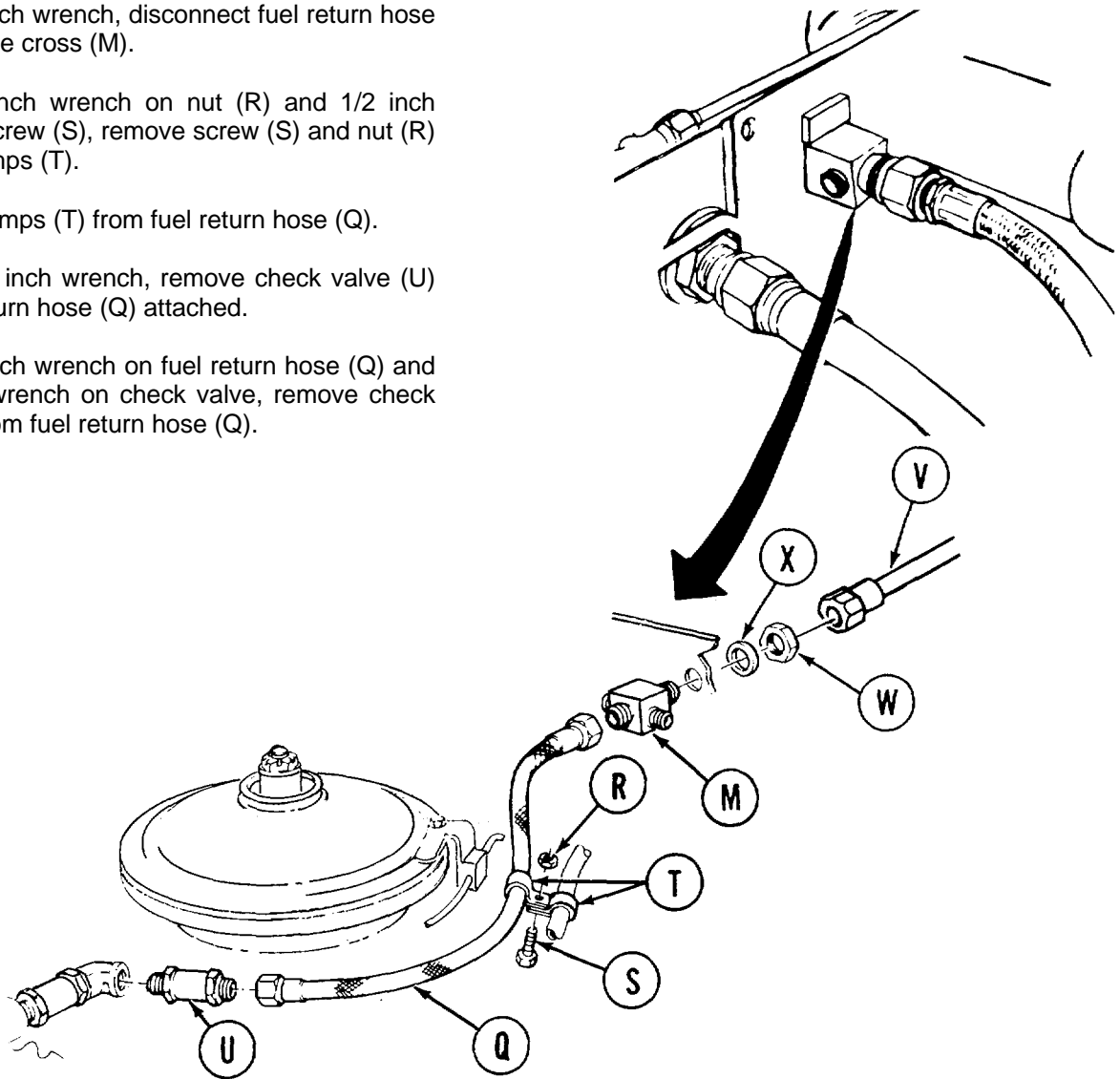
4. Using 9/16 inch wrench on tube fitting, disconnect tube assembly (L) from tube cross (M). Remove tube assembly.
5. Using 9/16 inch wrench on tube fitting and 1/2 inch wrench on elbow, disconnect tube assembly (N) from elbow (P).

Go on to Sheet 4

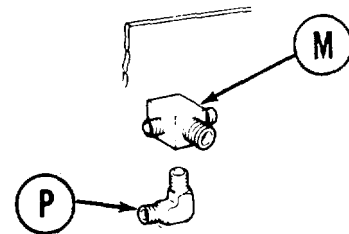
TA148092

**FUEL RETURN LINES REPLACEMENT (2A ENGINE) (Sheet 4 of 7)**

6. Using 7/8 inch wrench, disconnect fuel return hose (Q) from tube cross (M).
7. Using 1/2 inch wrench on nut (R) and 1/2 inch socket on screw (S), remove screw (S) and nut (R) holding clamps (T).
8. Remove clamps (T) from fuel return hose (Q).
9. Using 1-1/4 inch wrench, remove check valve (U) with fuel return hose (Q) attached.
10. Using 7/8 inch wrench on fuel return hose (Q) and 1-1/4 inch wrench on check valve, remove check valve (U) from fuel return hose (Q).



11. Using 1 inch wrench on tube cross (M) and 1-1/8 inch wrench on fitting of hose (V), disconnect hose (V) from tube cross (M).
12. Using 1 inch wrench on tube cross (M) and 1-1/8 inch wrench on nut (W), remove nut (W) and washer (X) securing tube cross (M).
13. Remove tube cross (M) and elbow (P).
14. Using 1/2 inch wrench, remove elbow (P) from tube cross (M).



Go on to Sheet 5

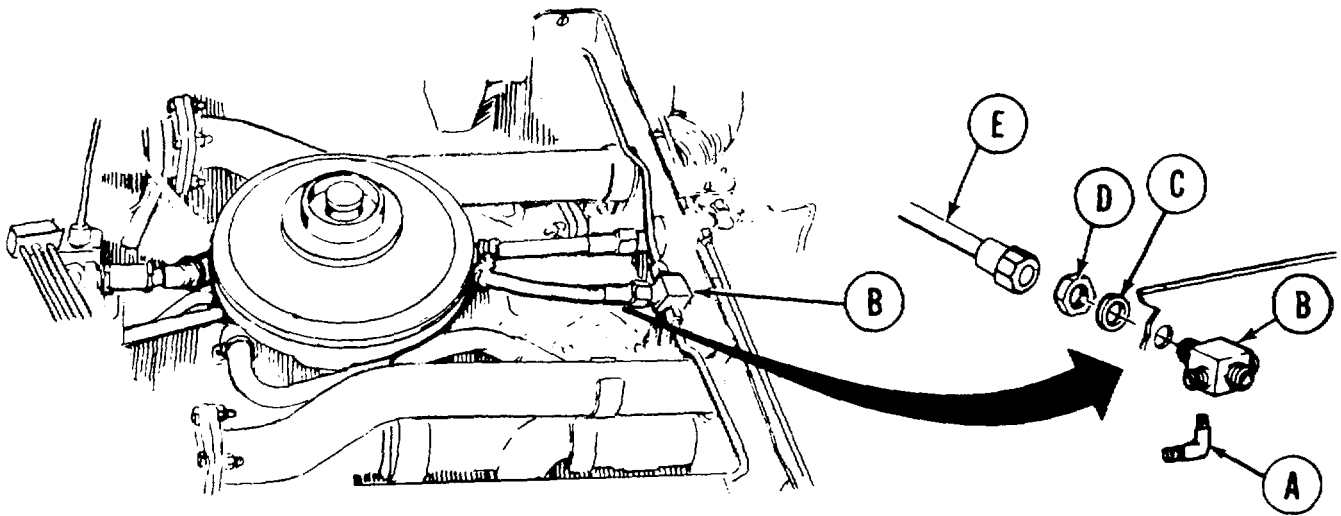
TA148093

**FUEL RETURN LINES REPLACEMENT (2A ENGINE) (Sheet 5 of 7)****CLEANING AND INSPECTION:**

1. Using rags (Item 65, Appendix D) and dry cleaning solvent (Item 54, Appendix D), clean fittings clamps, and mounting hardware thoroughly.
2. Inspect fittings, clamps, and mounting hardware for nicks, cracks, stripped threads, or wear. Replace if required.

**NOTE**

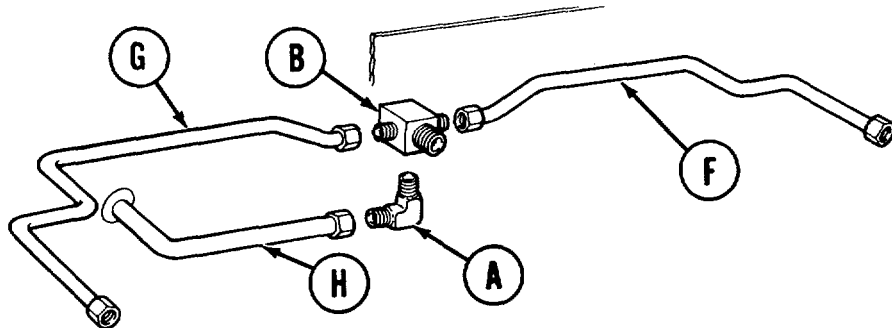
**Coat threads of fittings with sealing compound (Item 27, Appendix D) before installation.**

**INSTALLATION:**

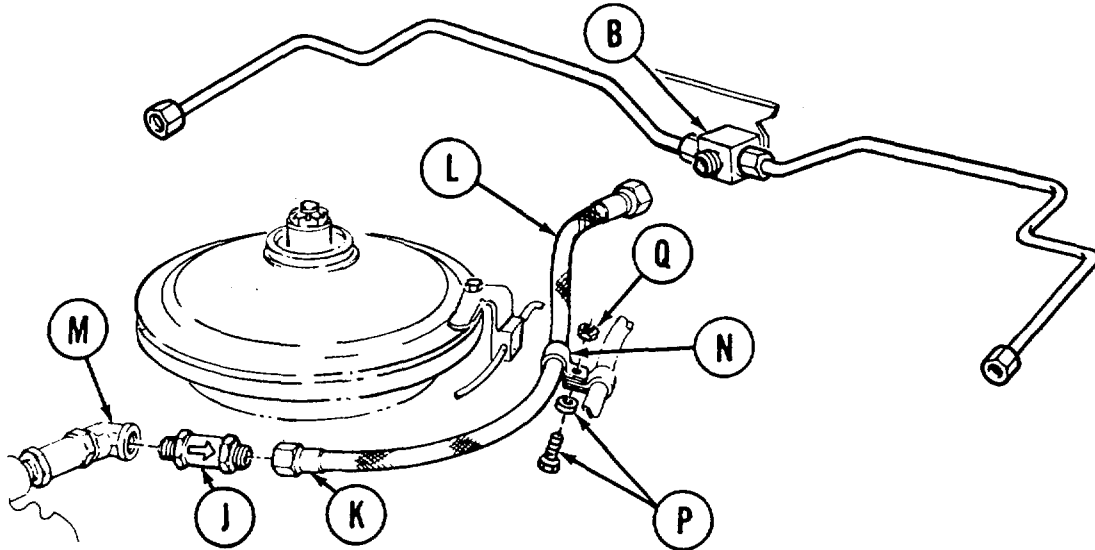
1. Using 1/2 inch wrench, install elbow (A) into tube cross (B).
2. Install tube cross (B) in rear shroud and secure with washer (C) and nut (D).
3. Using 1 inch wrench on tube cross (B) and 1-1/8 inch wrench on nut (D), tighten nut (D).
4. Using 1-1/8 inch wrench on hose fitting and 1 inch wrench on tube cross, connect and tighten hose (E) onto tube cross (B).

**FUEL RETURN LINES REPLACEMENT (2A ENGINE) (Sheet 6 of 7)**

5. Using 9/16 inch wrench, connect and secure tube assembly (F) to tube cross (B).
6. Using 9/16 inch wrench, connect and secure tube assembly (G) to tube cross (B).



7. Using 9/16 inch wrench, connect tube assembly (H) to elbow (A).



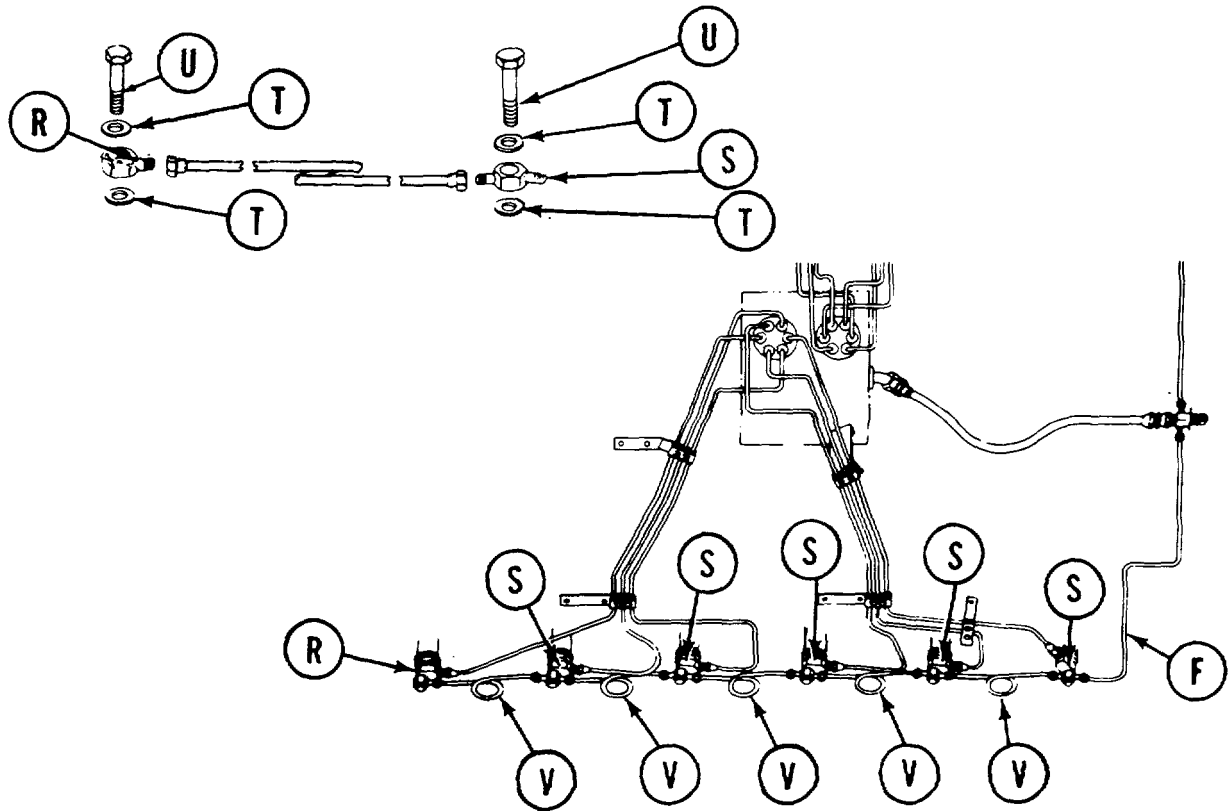
8. Using 14-/16 inch wrench on check valve (J) and 7/8 inch wrench on hose fitting (K), connect hose (L) to check valve (J).
9. Using 1-/16 inch wrench, secure check valve (J) with hose (L) attached to elbow (M).
10. Install clamp (N) onto hose (L).
11. Using 1/2 inch wrench and 1/2 inch socket, install and secure clamps with screw and washer (P) and nut (Q).
12. Using 7/8 inch wrench, connect and secure hose (L) to tube cross (B).

Go on to Sheet 7

TA148095

**FUEL RETURN LINES REPLACEMENT (2A ENGINE) (Sheet 7 of 7)**

13. Position connectors (R) and (S) to injectors and secure with two washers (T) on bolts (U). Tighten finger tight.



14. Using 9/16 inch wrench, connect and secure fuel return lines (V) and (F) to connectors (R) and (S) as shown above.
15. Using 11/16 inch socket, tighten bolts (U).
16. Perform engine fuel leakage test (page 5-65).
17. Install engine access covers (page 6-80 and/or 6-86).
18. Install engine cooling fans (page 949).
19. Install engine shroud supports (page 9-5).

**FUEL RETURN LINES REPLACEMENT (2D ENGINE) (Sheet 1 of 10)**

PROCEDURE INDEX

PROCEDURE	PAGE
Removal	7-43
Cleaning and Inspection	7-26
Installation	7-27

TOOLS: 1/2 in. socket with 1/2 in. drive  
 9/16 in. combination box and open end wrench  
 Ratchet with 1/2 in. drive  
 11/16 in. socket with 1/2 in. drive  
 7/8 in. combination box and open end wrench  
 1-1/8 in. open end wrench  
 5 in. extension with 1/2 in. drive  
 1/2 in. combination box and open end wrench  
 7/16 in. combination box and open end wrench  
 3/4 in. combination box and open end wrench  
 15/16 in. combination box and open end wrench  
 Flat-tip screwdriver  
 Drip pan

SPECIAL TOOL: Ground hop kit (Item 32, Chapter 3, Section I)

SUPPLIES: Self-locking nut (MS21083N3)  
 Self-locking nut (MS21044N5) (2 required)

PRELIMINARY PROCEDURES: Remove cooling fins (page 9-48)  
 Remove engine access cover (left) (page 6-88)  
 Remove engine access cover (right) (page 6-79)

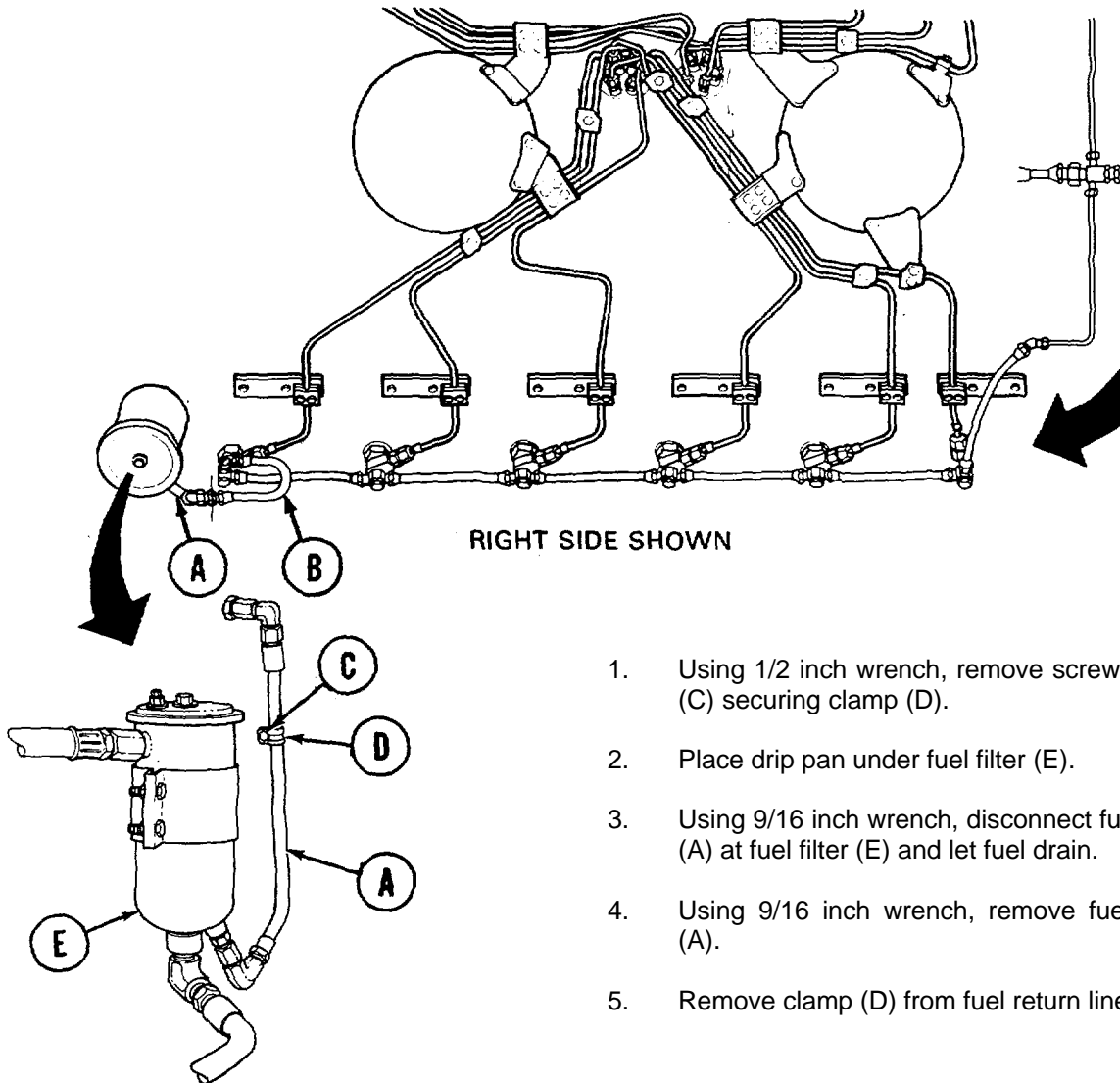
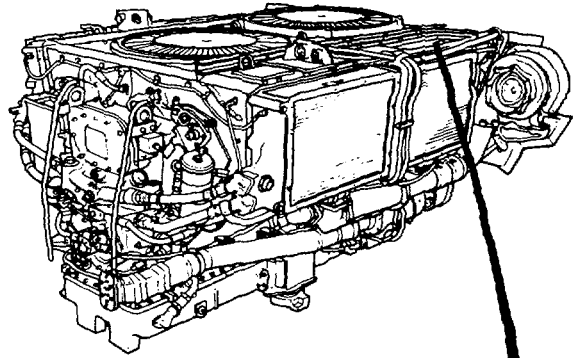
Go on to Sheet 2

FUEL RETURN LINES REPLACEMENT (2D ENGINE) (Sheet 2 of 10)

REMOVAL:

NOTE

Left and right side fuel return lines are removed the same except for fuel return lines (A) and (B) on right side. For left side fuel return lines removal, go to step 5, skip steps 1 through 4.



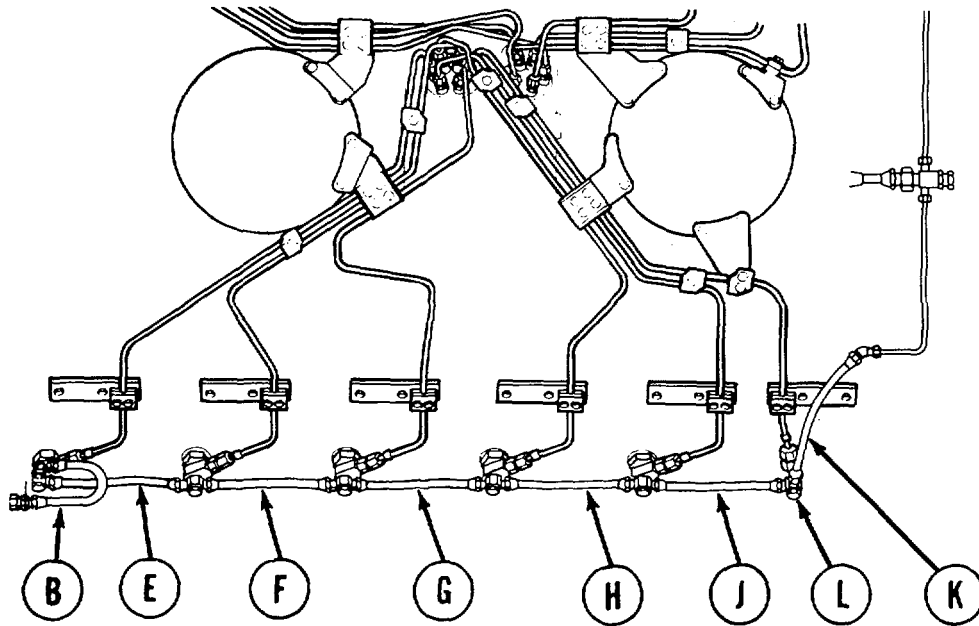
1. Using 1/2 inch wrench, remove screw and washer (C) securing clamp (D).
2. Place drip pan under fuel filter (E).
3. Using 9/16 inch wrench, disconnect fuel return line (A) at fuel filter (E) and let fuel drain.
4. Using 9/16 inch wrench, remove fuel return line (A).
5. Remove clamp (D) from fuel return line (A).

Go on to Sheet 3

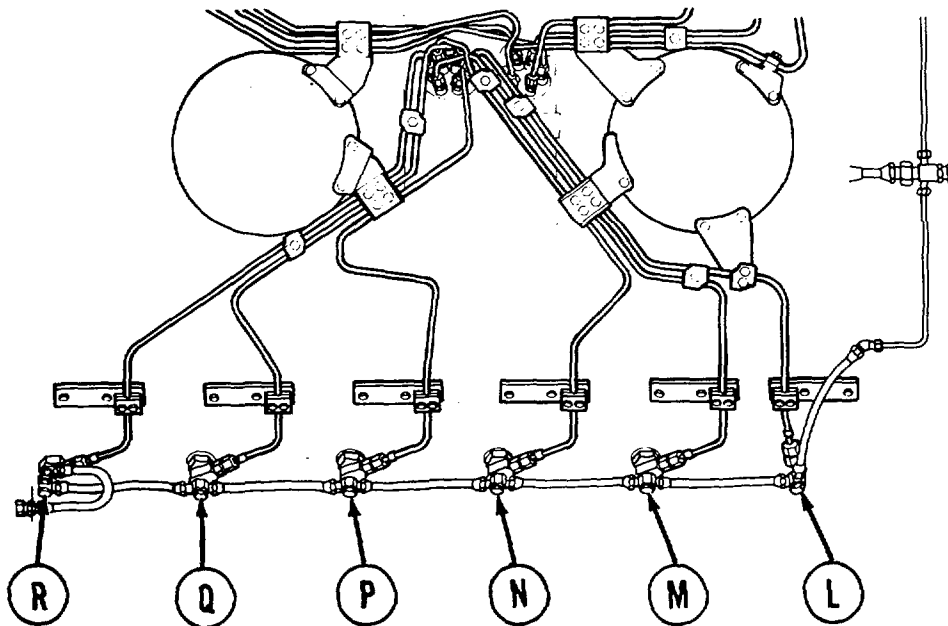
TA148098



FUEL RETURN LINES REPLACEMENT (2D ENGINE) (Sheet 3 of 10)



6. Using 9/16 inch wrench, remove fuel return line (B).
7. Using 9/16 inch wrench, remove fuel return lines (E), (F), (G), (H), and (J).
8. Using 9/16 inch wrench, disconnect fuel return line (K) from connector (L).

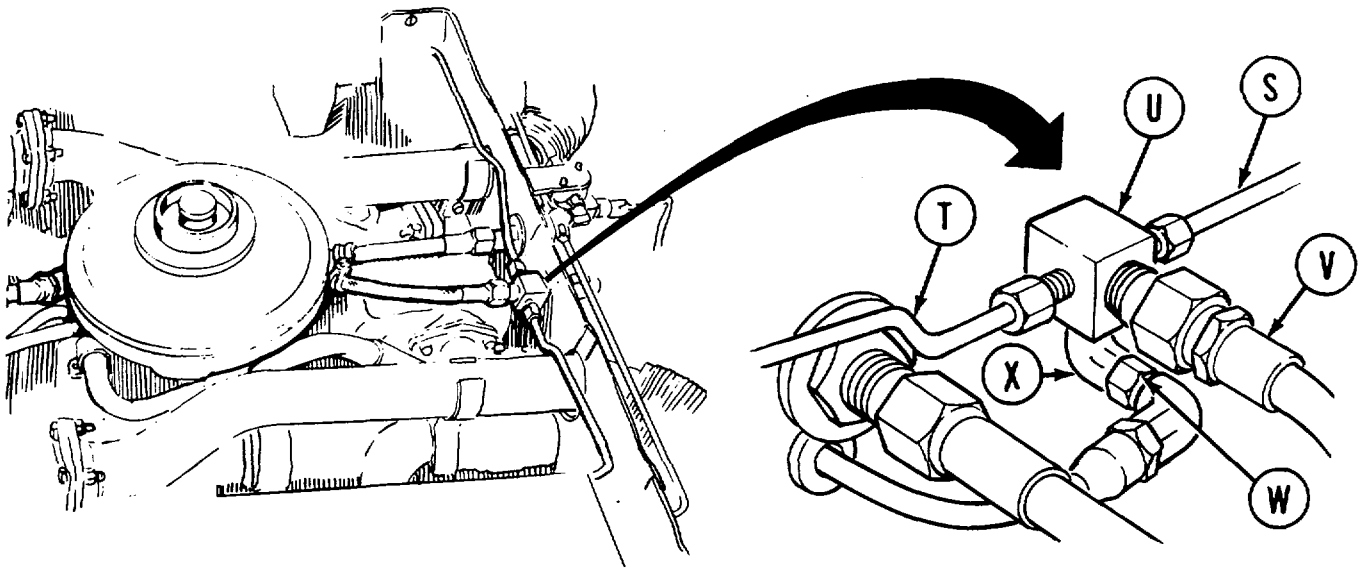


9. Using 11/16 inch socket, remove bolts, washers, and connectors (L), (M), (N), (P), (Q), and (R).

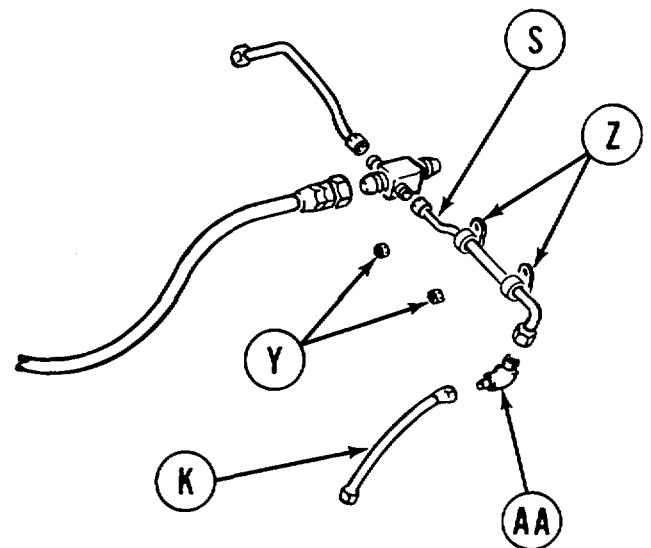
Go on to Sheet 4

TA148099

FUEL RETURN LINES REPLACEMENT (2D ENGINE) (Sheet 4 of 10)



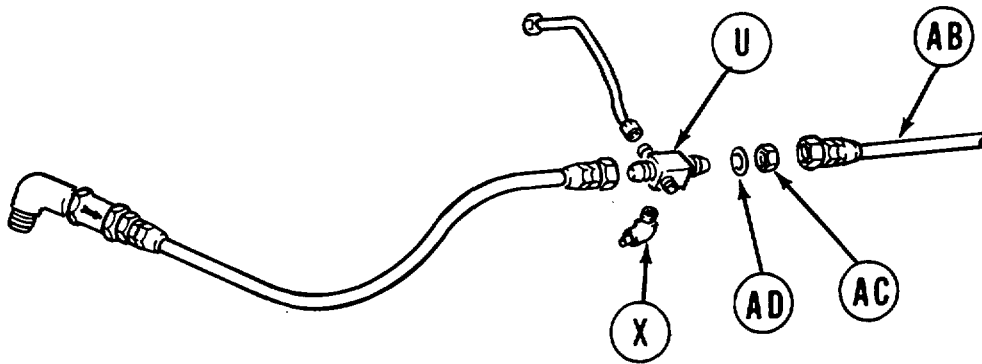
10. Using 9/16 inch wrench, disconnect fuel return lines (S) and (T) from tube cross (U).
11. Using 7/8 inch wrench, disconnect fuel return line (V) from tube cross (U).
12. Using 9/16 inch wrench, disconnect hose (W) from elbow (X).
13. Using 1/2 inch socket and 1/2 inch wrench, remove two self-locking nut (Y) securing two clamps (Z). Throw self-locking nuts away.
14. Remove fuel return lines (K) and (S) from engine.
15. Using screwdriver, remove two clamps (Z) from fuel return line (S).
16. Using 7/16 inch wrench on elbow (AA) and 9/16 inch wrench on fuel return line (K), remove fuel return line (K).
17. Using 1/2 inch wrench on elbow (AA) and 9/16 inch wrench on fuel return line (S), remove fuel return line (S).



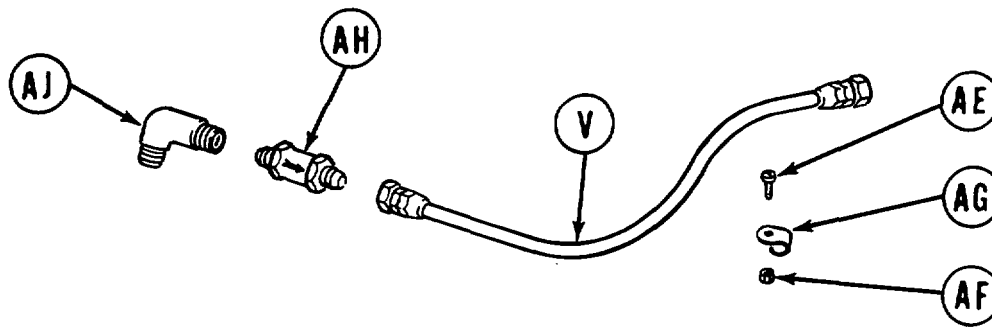
Go on to Sheet 5

TA148100

FUEL RETURN LINES REPLACEMENT (2D ENGINE) (Sheet 5 of 10)



18. Using 1-1/8 inch wrench, disconnect fuel return line (AB) from tube cross (U).
19. Using 1-1/8 inch wrench, remove nut (AC) from tube cross (U).
20. Remove flat washer (AD) and tube cross (U).
21. Place tube cross (U) in vise and using 7/16 inch wrench, remove elbow (X).
22. Remove tube cross (U) from vise.



23. Using screwdriver and 7/16 inch wrench, remove screw (AE) and self-locking nut (AF) securing clamp (AG). Throw self-locking nut away.
24. Remove clamp (AG) from fuel return line (V).
25. Using 3/4 inch wrench on vent valve (AH) and 7/8 inch wrench on fuel return line (V), remove vent valve (AH) from fuel return line (V).
26. Using 15/16 inch wrench on elbow (AJ) and 3/4 inch wrench on vent valve (AH), remove vent valve (AH) from elbow (AJ).

CLEANING AND INSPECTION:

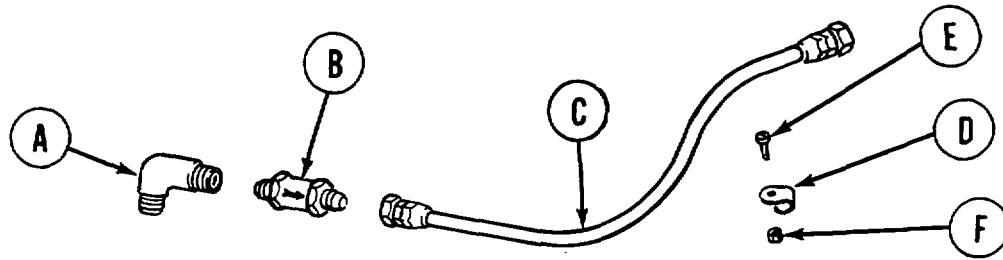
Inspect fuel return lines for deterioration, cracks, stripped threads, and clogging of lines. Replace unserviceable parts as required.

Go on to Sheet 6

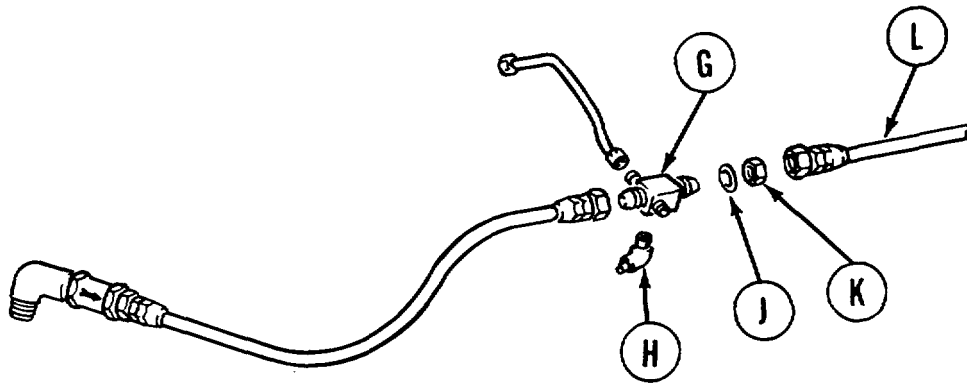
TA148101

## FUEL RETURN LINES REPLACEMENT (2D ENGINE) (Sheet 6 of 10)

### INSTALLATION:



1. Using 15/16 inch wrench on elbow (A) and 3/4 inch wrench on vent valve (B), install vent valve (B) in elbow (A).
2. Using 3/4 inch wrench on vent valve (B) and 7/8 inch wrench on fuel return line (C), install fuel return line (C) on vent valve (B).
3. Install clamp (D) on fuel return line (C).
4. Using screwdriver and 7/16 inch wrench, install screw (E) and new self-locking nut (F) securing clamp (D).



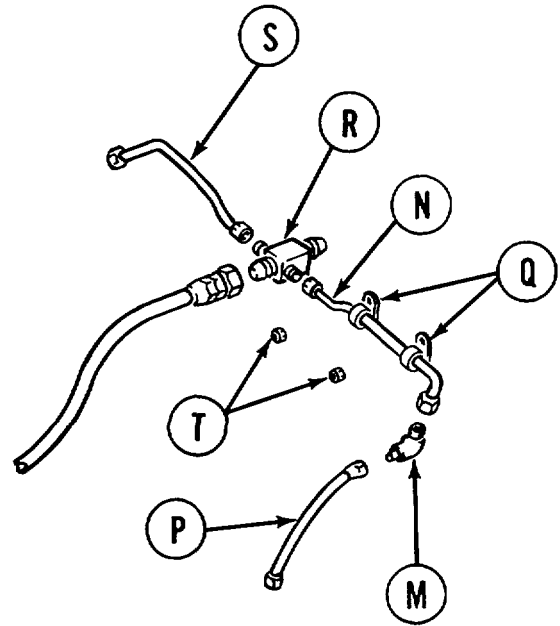
5. Place tube cross (G) in vise and using 7/16 inch wrench, install elbow (H) in tube cross (G). Remove from vise.
6. Place tube cross (G) in position and using hands, install flat washer (J), nut (K), and fuel return line (L) on tube cross (G).
7. Using 1-1/8 inch wrench, tighten nut (K) and fuel return line (L) on tube cross (G).

Go on to Sheet 7

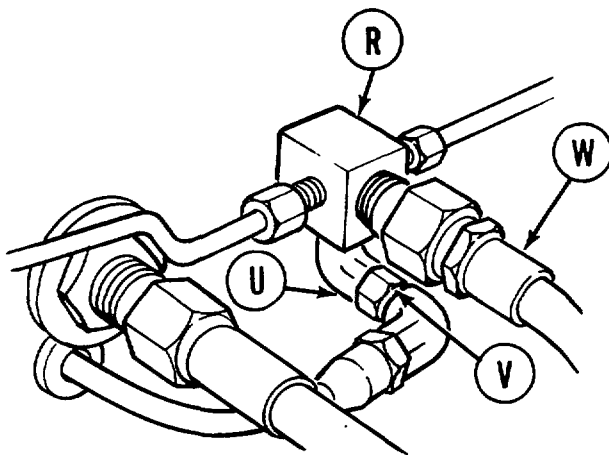
TA148102

**FUEL RETURN LINES REPLACEMENT (2D ENGINE) (Sheet 7 of 10)**

8. Using 1/2 inch wrench on elbow (M) and 9/16 inch wrench on fuel return line (N), install fuel return line (N) on elbow (M).
9. Using 1/2 inch wrench on elbow (M) and 9/16 inch wrench on fuel return line (P), install fuel return line (P) on elbow (M).
10. Install two clamps (Q) on fuel return line (N).
11. Place fuel return lines (N) and (P) in position on engine.

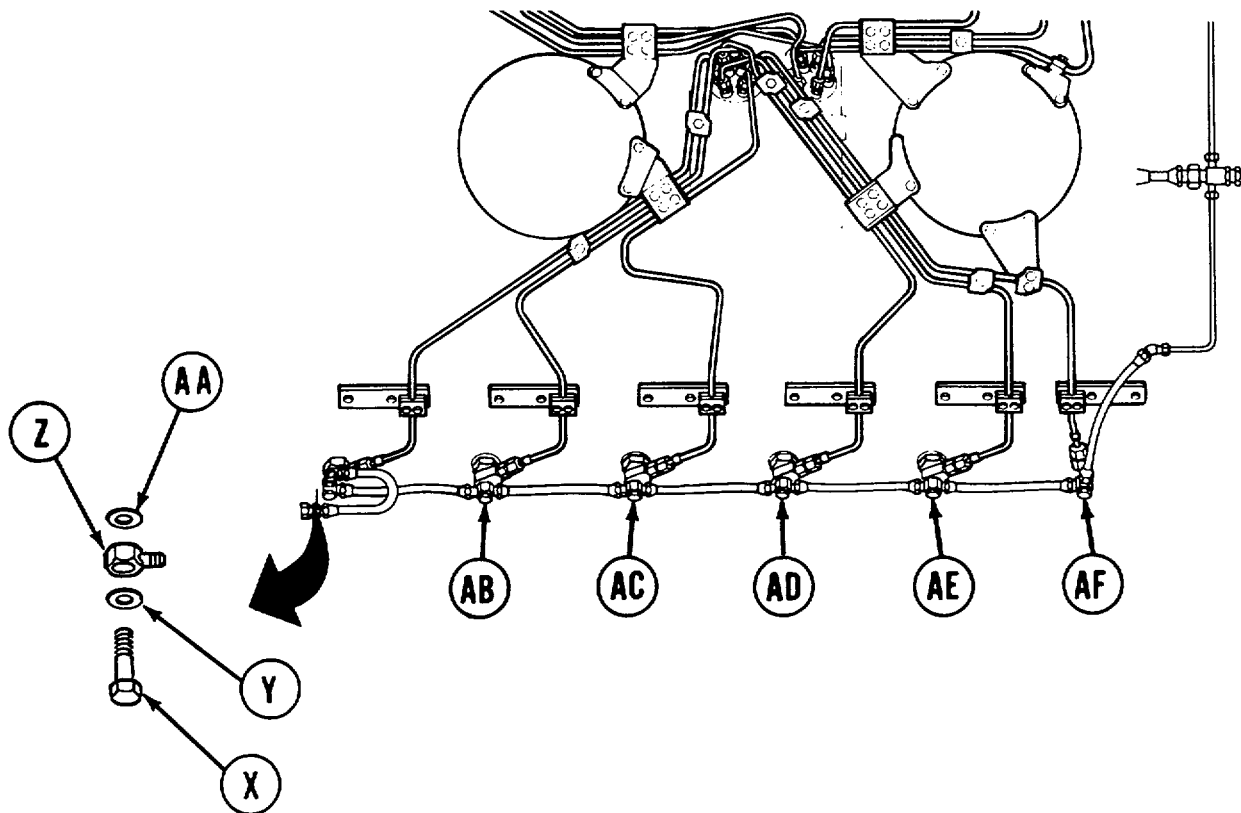


12. Using 9/16 inch wrench, install fuel return line (N) on tube cross (R).
13. Using 9/16 inch wrench, install fuel return line (S) on tube cross (R).
14. Using 1/2 inch socket with extension and 1/2 inch wrench, install two new self-locking nuts (T) securing two clamps (Q).



15. Using 9/16 inch wrench on hose (V), install hose (V) on elbow (U).
16. Using 7/8 inch wrench, install fuel return line (W) on tube cross (R).

## FUEL RETURN LINES REPLACEMENT (2D ENGINE) (Sheet 8 of 10)

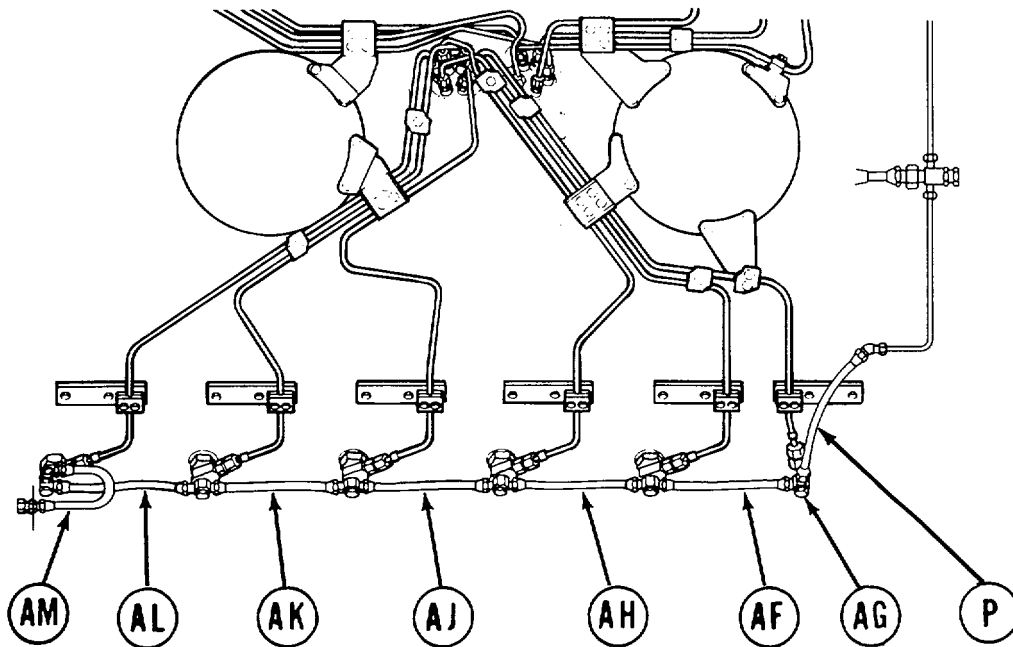


## NOTE

Connectors on left and right sides are same except for last connector at accessory end of engine. Connector at accessory end on left side of engine has only one connection.

17. Using 11/16 inch socket, install bolt (X) securing new washer (Y), connector Z), and new washer (AA).
18. Using 11/16 inch socket, install bolts, new washers, and connectors (AB), (AC), (AD), (AE), and (AF).

## FUEL RETURN LINES REPLACEMENT (2D ENGINE) (Sheet 9 of 10)



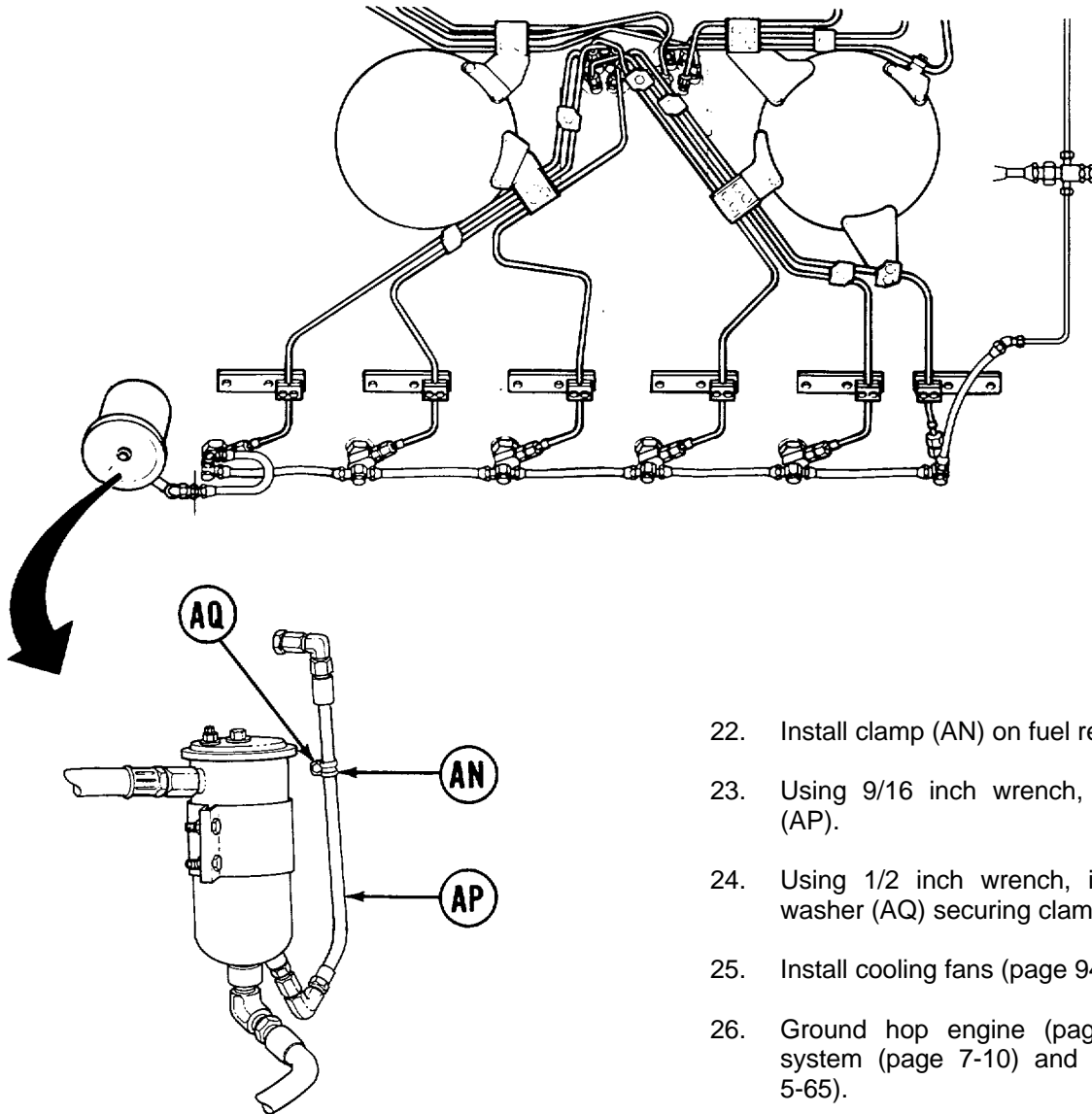
19. Using 9/16 inch wrench, install fuel return line (P) to connector (AG).
20. Using 9/16 inch wrench, install fuel return lines (AF), (AH), (AJ), (AK) and (AL).

**NOTE**

**Steps 21 thru 24 are for right side only. If left side fuel return lines are being replaced, go on to step 25, skip steps 21 thru 24.**

21. Using 9/16 inch wrench, install fuel return line (AM).

FUEL RETURN LINES REPLACEMENT (2D ENGINE) (Sheet 10 of 10)



22. Install clamp (AN) on fuel return line (AP).
23. Using 9/16 inch wrench, install fuel return line (AP).
24. Using 1/2 inch wrench, install screw and new washer (AQ) securing clamp (AN).
25. Install cooling fans (page 949).
26. Ground hop engine (page 5-54). Purge fuel system (page 7-10) and check for leaks (page 5-65).
27. Install engine access covers (right bank) (page 6-82).
28. Install engine access covers (left bank) (page 6-91).

End of Task

TA148106



**TUBE ASSEMBLY (FUEL INJECTION PUMP INLET TO BULKHEAD ELBOW) REPLACEMENT (Sheet 1 of 5)**

PROCEDURE INDEX

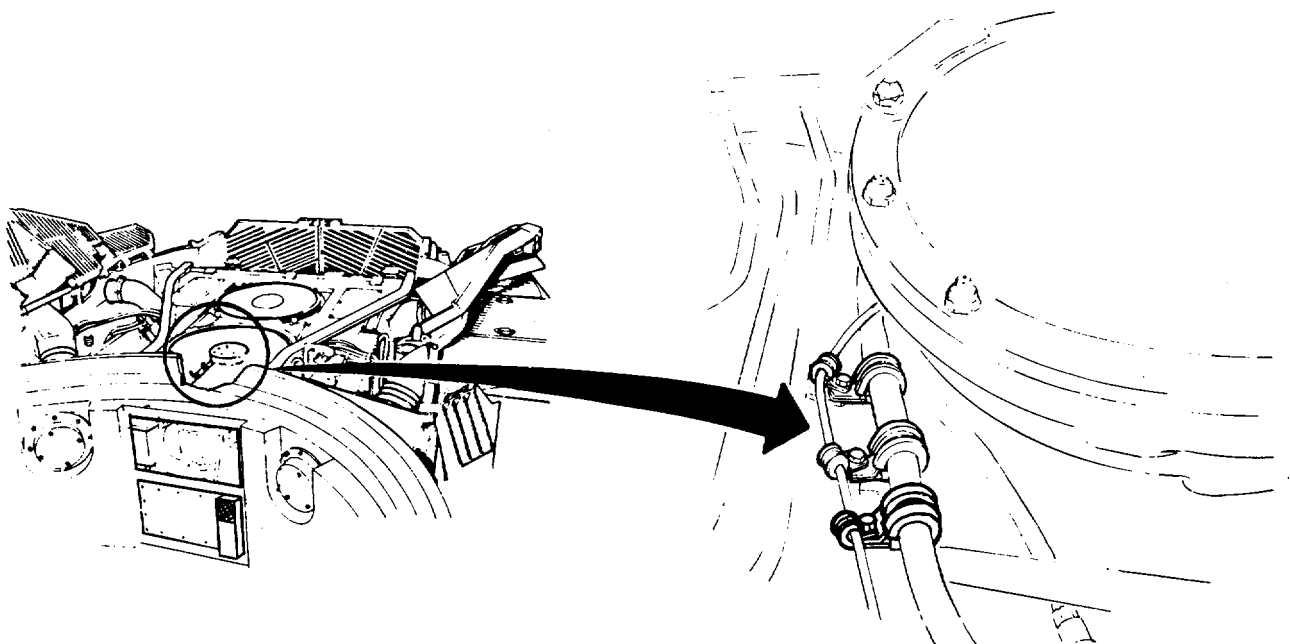
PROCEDURE	PAGE
Removal	7-33
Cleaning and Inspection	7-34
Installation	7-34

TOOLS: 1 in. combination box and open end wrench  
 7/8 in. combination box and open end wrench  
 3/4 in. combination box and open end wrench  
 3/8 in. combination box and open end wrench  
 Wire brush  
 Flat-tip screwdriver

SPECIAL TOOLS: Ground hop kit (Item 32, Chapter 3, Section I)

SUPPLIES: Rags (Item 65, Appendix D)  
 Drain pan  
 Sealing compound (Item 27, Appendix D)  
 Dry cleaning solvent (Item 54, Appendix D)  
 Lockwasher (MS35335-40)  
 Self-locking nut (MS21044-N3) (3 required)

PRELIMINARY PROCEDURES: Remove powerplant (page 5-1)  
 Remove cooling fans (page 9-48)



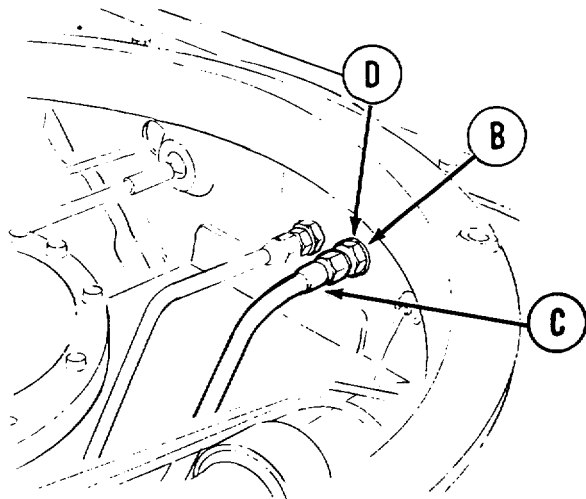
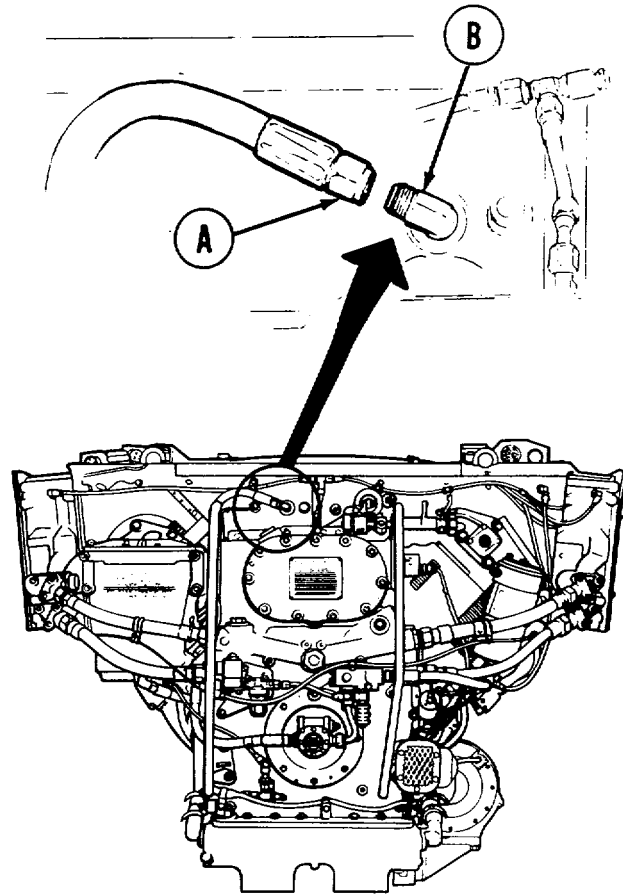
**TUBE ASSEMBLY (FUEL INJECTION PUMP INLET TO BULKHEAD ELBOW) REPLACEMENT (Sheet 2 of 5)**

**NOTE**

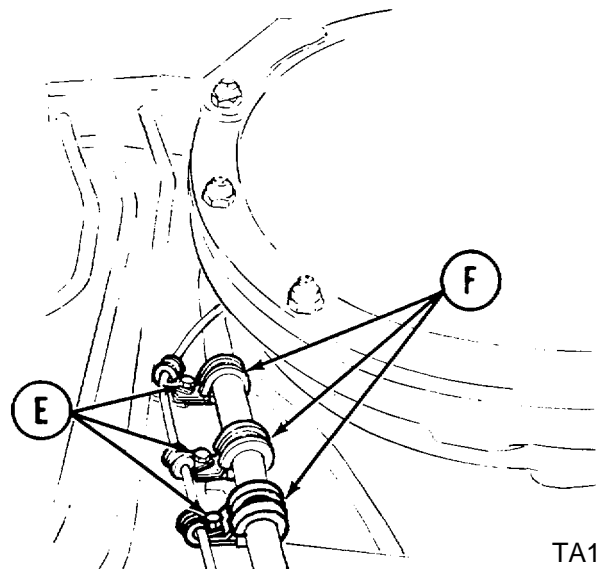
**Use drain pan and rags to catch fuel in hose and tube assemblies.**

**REMOVAL:**

1. Using 7/8 inch wrench, remove hose assembly (A) from bulkhead elbow (B).
2. Using 1 inch wrench to hold nut of bulkhead elbow (B) and 7/8 inch wrench, remove tube assembly (C) from bulkhead elbow (B).
3. Using 3/4 inch wrench to hold bulkhead elbow (B) and 1 inch open end wrench, remove nut, lockwasher, and flat washer (D) from bulkhead elbow (B). Throw lockwasher away.
4. Remove bulkhead elbow (B) from engine bulkhead.



5. Using 3/8 inch wrench and screwdriver, remove three screws and self-locking nuts (E) from tube clamps (F). Throw self-locking nuts away.



6. Using fingers, remove three tube clamps (F) from tube assembly (C).

Go on to Sheet 3

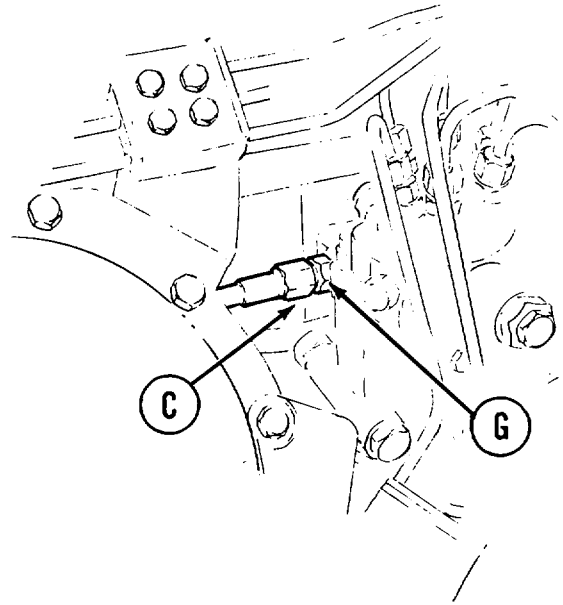
TA148108

**TUBE ASSEMBLY (FUEL INJECTION PUMP INLET TO BULKHEAD ELBOW) REPLACEMENT (Sheet 3 of 5)**

7. Using 7/8 inch wrench, remove tube assembly (C) from fuel injection pump adapter (G).
8. Using fingers, remove tube assembly (C) from tank.

**CLEANING AND INSPECTION:**

1. Using rags (Item 65, Appendix D) and dry cleaning solvent (Item 54, Appendix D), clean elbow and tube assembly mounting hardware thoroughly. Using wire brush, clean threaded parts.
2. Inspect elbow and tube assembly mounting hardware for bends, breaks, rounded edges, wear, or thread damage. Replace if required.
3. Inspect adapter on fuel injection pump for thread damage.

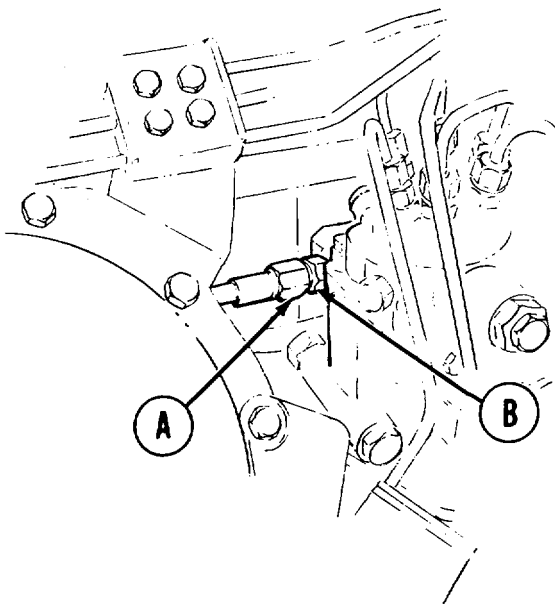


**INSTALLATION:**

**NOTE**

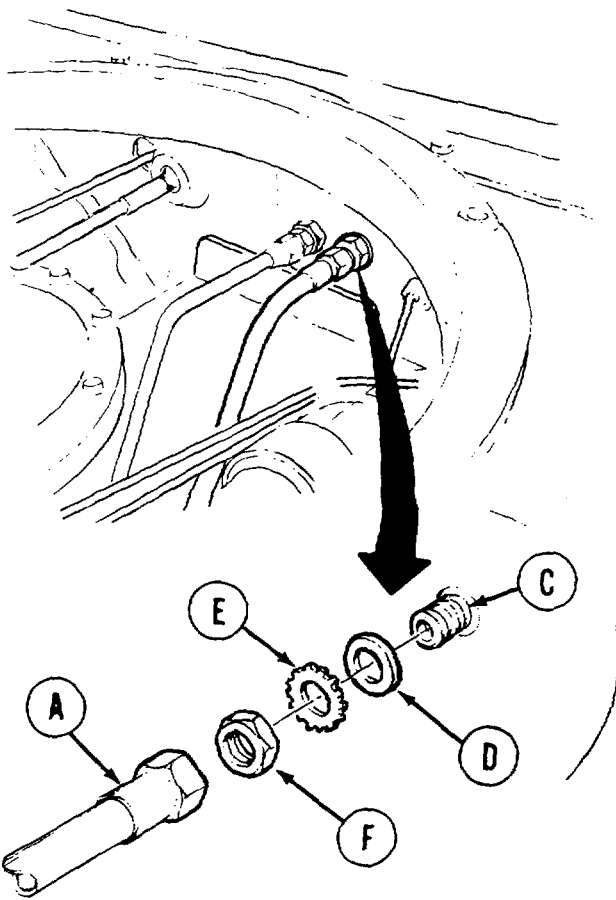
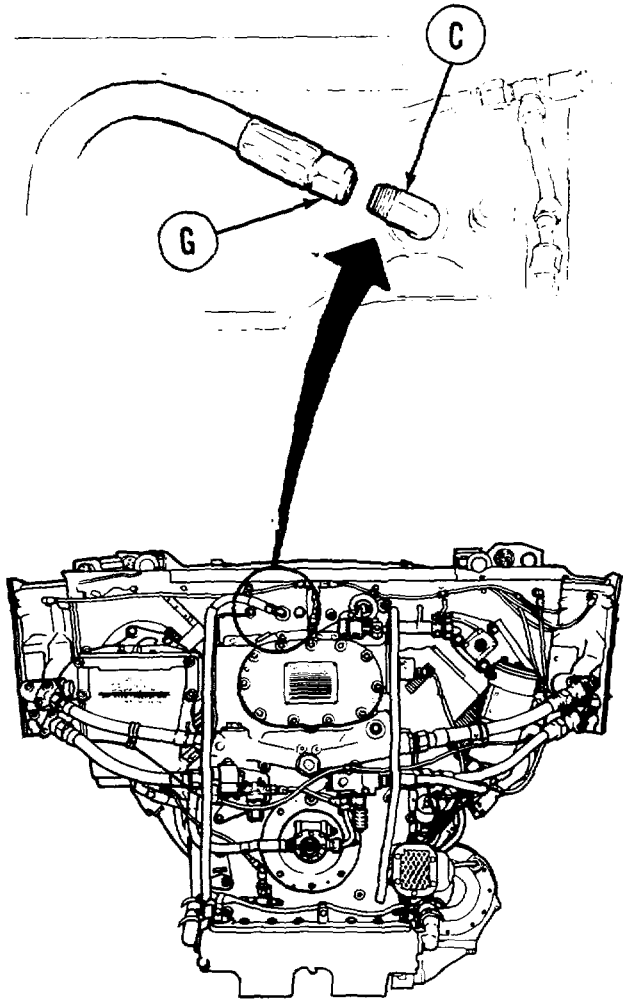
**Coat pipe threads of fittings with sealing compound (Item 27, Appendix D) before installation.**

1. Using 7/8 inch wrench, install tube assembly (A) on fuel injection pump adapter (B).



**TUBE ASSEMBLY (FUEL INJECTION PUMP INLET TO BULKHEAD ELBOW) REPLACEMENT (Sheet 4 of 5)**

2. Using fingers, install bulkhead elbow (C) in hole in front side of engine bulkhead.
3. Using 3/4 inch wrench to hold bulkhead elbow (C) and 1 inch wrench, install flat washer (D), new lockwasher (E), and nut (F), on bulkhead elbow (C).
4. Using 3/4 inch wrench, turn bulkhead elbow (C) until alined with hose assembly (G). Tighten nut (F).



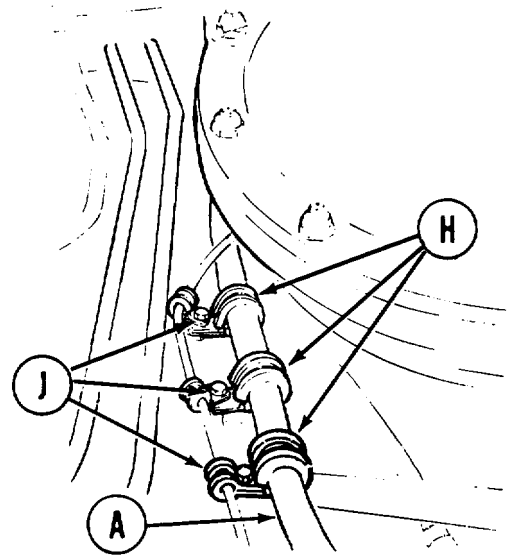
5. Using 1 inch wrench to hold nut (F) and 7/8 inch wrench, install tube assembly (A) on bulkhead elbow (C).
6. Using 7/8 inch wrench, install hose assembly (G) on bulkhead elbow (C).

Go on to Sheet 5

TA148110

**TUBE ASSEMBLY (FUEL INJECTION PUMP INLET TO BULKHEAD ELBOW) REPLACEMENT (Sheet 5 of 5)**

7. Using fingers, install three tube clamps (H) on tube assembly (A).
8. Using 3/8 inch wrench and screwdriver, install three screws and new self-locking nuts (J) through tube clamps (H).
9. Install cooling fans (page 9-49).
10. Install ground hop kit (Item 32, Chapter 3, Section I) (page 5-54).
11. Perform powerplant test run (page 5-65).
12. Install 2A powerplant (page 5-14) or 2D powerplant (page 5-40).



End of Task

TA148111

**ENGINE FUEL PUMP REPLACEMENT (Sheet 1 of 4)**

## PROCEDURE INDEX

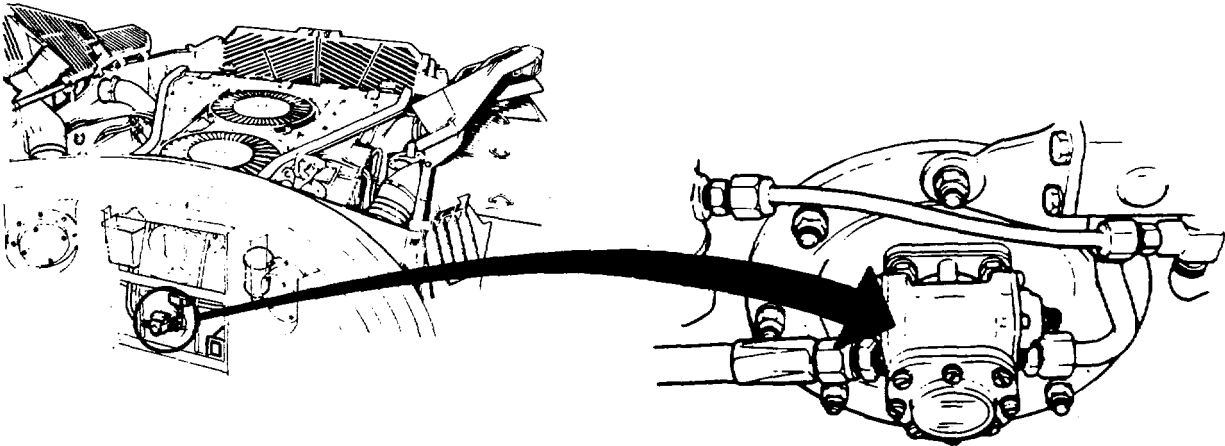
PROCEDURE	PAGE
Removal	7-38
Cleaning and Inspection	7-39
Installation	7-39

TOOLS: 3/4 in. combination box and open end wrench  
 13/16 in. combination box and open end wrench  
 7/8 in. combination box and open end wrench  
 1/2 in. combination box and open end wrench  
 5/8 in. combination box and open end wrench

SUPPLIES: Dry cleaning solvent (Item 54, Appendix D)  
 Fuel pump replacement kit (8725292)  
 Sealing compound (Item 27, Appendix D)  
 Container  
 Gasket (7415354)  
 Self-locking nut (MS21044N5) (4 required)

REFERENCE: TM 9-2350-260-10

PRELIMINARY PROCEDURE: Remove lower engine access panel (page 16-45)

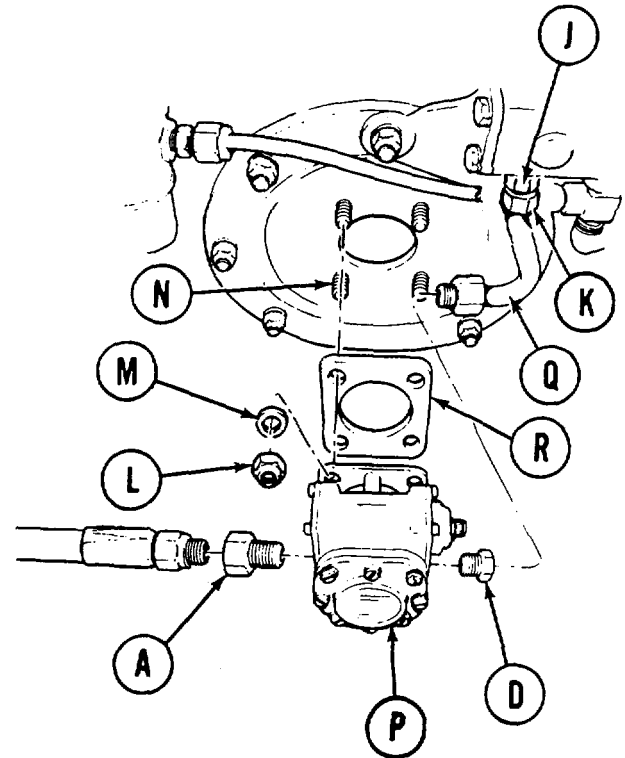
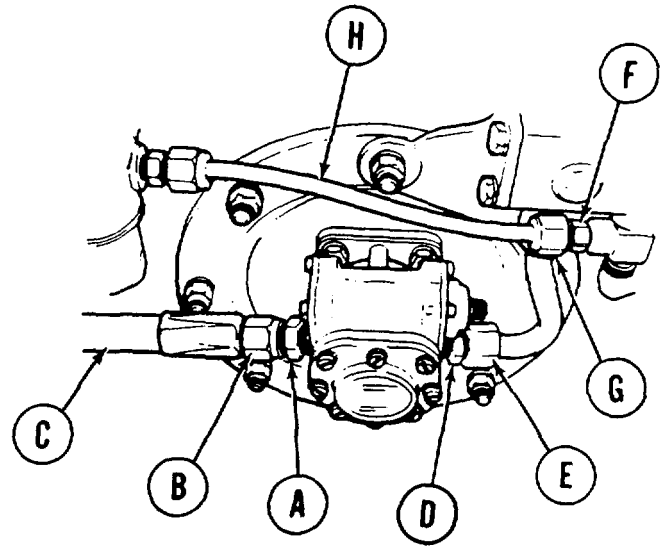


Go on to Sheet 2

TA148112

**ENGINE FUEL PUMP REPLACEMENT (Sheet 2 of 4)****REMOVAL:**

1. Using 13/16 inch wrench on adapter (A) and 7/8 inch wrench on line nut (B), remove hose assembly (C).
2. Using 3/4 inch wrench on adapter (D) and 7/8 inch wrench on line nut (E), loosen line nut (E).
3. Using 3/4 inch wrench, loosen adapter (D) 1/2 turn. Do not remove adapter (D) at this time.
4. Using 1/2 inch wrench to hold adapter (F) and 5/8 inch wrench on hose fitting (G), loosen fitting (G).
5. Using fingers, pull hose assembly (H) loose from adapter (F).
6. Using 1/2 inch wrench, remove adapter (F).
7. Using 3/4 inch wrench on adapter (J) and 7/8 inch wrench on line nut (K), loosen line nut (K).
8. Using 13/16 inch wrench, remove adapter (A).
9. Using 1/2 inch wrench, remove four self-locking nut (L) and washers (M) from mounting studs (N). Throw self-locking nut away.
10. Using both hands, carefully remove fuel pump (P) from mounting studs (N). Tube (Q) will disconnect.
11. Remove tube (Q).
12. Using 3/4 inch wrench, remove adapter (D).
13. Using fingers, remove gasket (R) from mounting studs (N).
14. Throw gasket (R) away.



Go on to Sheet 3

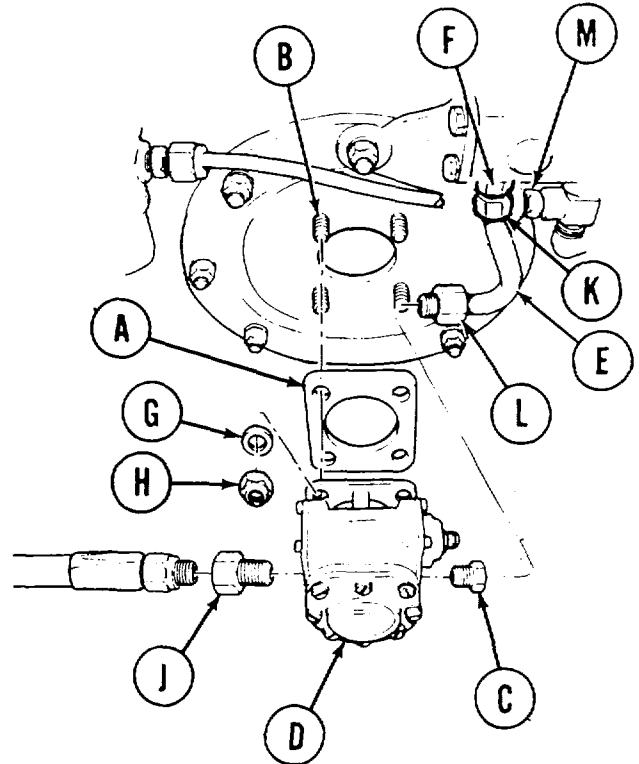
TA148113

**ENGINE FUEL PUMP REPLACEMENT (Sheet 3 of 4)****CLEANING AND INSPECTION:**

1. Using rags (Item 65, Appendix D) and dry cleaning solvent (Item 54, Appendix D), clean fitting and mounting hardware thoroughly.
2. Inspect fittings and mounting hardware for nicks, cracks, wear, or thread damage. Replace if required.

**INSTALLATION:**

1. Using finger install new gasket (A) on mounting studs (B).
2. Using 3/4 inch wrench, Install adapter (C).
3. Using both hands, carefully install fuel pump assembly (D) on mounting studs (B) and, at the same time, install tube (E) into adapters (F) and (C).
4. Using 1/2 inch wrench, install four washer (G) and new self-locking nuts (H) on mounting studs (B).
5. Coat threads of all fittings with sealing compound (Item 27, Appendix D).
6. Using 13/16 inch wrench, install adapter (J) on fuel pump assembly (D).
7. Using 7/8 inch wrench, tighten line nut (K) on adapter (F).
8. Using 7/8 inch wrench, tighten line nut (L) on adapter (C).
9. Using 1/2 inch wrench, install adapter (M).



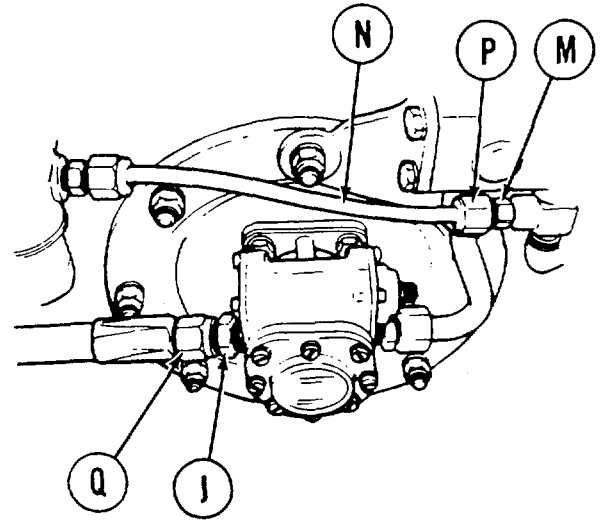
Go on to Sheet 4

TA148114



**ENGINE FUEL PUMP REPLACEMENT (Sheet 4 of 4)**

10. Using finger install hose assembly (N) into adapter (M).
11. Using 1/2 inch wrench to hold adapter (M) and 5/8 inch wrench on hose fitting (P), tighten fitting (P).
12. Using 7/8 inch wrench, install hose assembly (Q) on adapter (J).
13. Perform engine fuel leak test (page 5-65).
14. Install lower engine access panel (page 16-46).



End of Task

TA148115

**FUEL BACKFLOW VALVE REPLACEMENT (Sheet 1 of 7)**

PROCEDURE INDEX

PROCEDURE	PAGE
Removal	7-42
Cleaning and Inspection	7-45
Installation	7-45

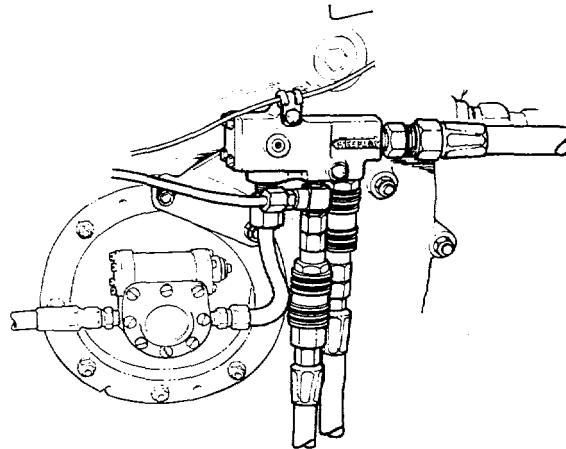
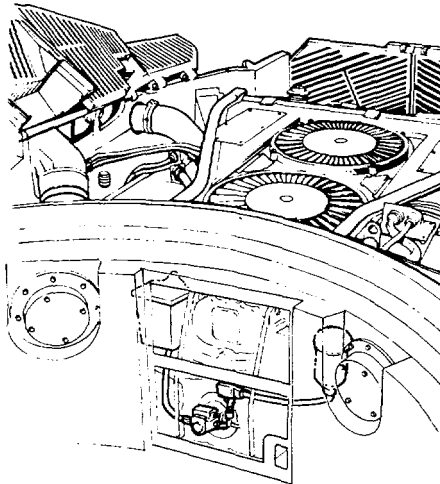
- TOOLS:**
- 9/16 in. combination box and open end wrench
  - 5/8 in. combination box and open end wrench
  - 13/16 in. combination box and open end wrench
  - 7/8 in. combination box and open end wrench
  - Ratchet with 1/2 in. drive
  - 7/16 in. socket with 1/2 in. drive
  - 1 in. combination box and open end wrench
  - 1/2 in. combination box and open end wrench
  - 11/16 in. combination box and open end wrench (2 required)
  - 3/4 in. combination box and open end wrench

- SUPPLIES:**
- Rags (Item 65, Appendix D)
  - Dry cleaning solvent (Item 54, Appendix D)
  - Sealing compound (Item 27, Appendix D)
  - Fuel line plug
  - Lockwasher (23E06) (2 required)

**PRELIMINARY PROCEDURE:** Remove lower engine access panel (page 16-45)

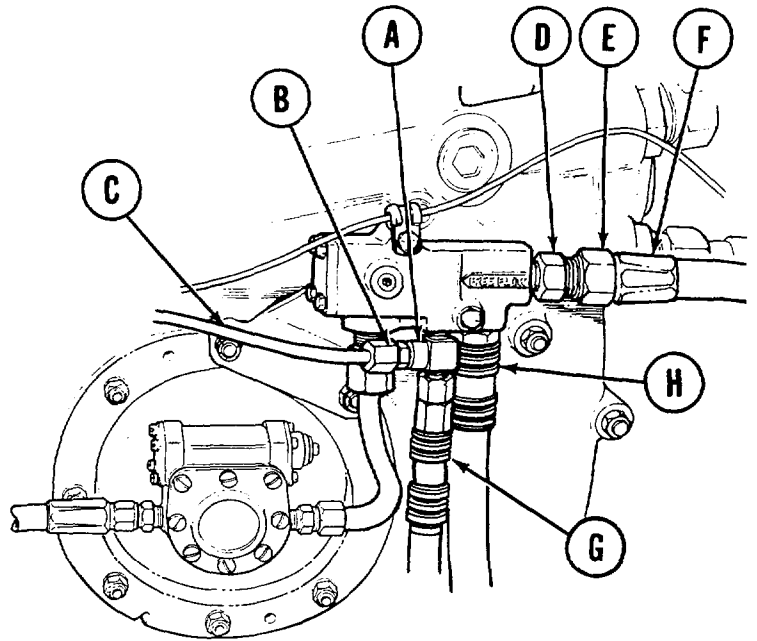
**NOTE**

**Place rags (Item 65, Appendix D) under disconnect points to soak up fuel spilled when disconnecting fuel lines.**



**FUEL BACKFLOW VALVE REPLACEMENT (Sheet 2 of 7)****REMOVAL:**

1. Using 1/2 inch wrench to hold adapter (A) and 5/8 inch wrench on hose fitting (B), loosen fitting (B).
2. Using fingers, pull hose assembly (C) loose from adapter (A).
3. Using 13/16 inch wrench to hold adapter (D) and 7/8 inch wrench on hose fitting (E), loosen fitting (E).
4. Using fingers, pull hose assembly (F) loose from adapter (D).
5. Insert fuel line plug into hose assembly (F).



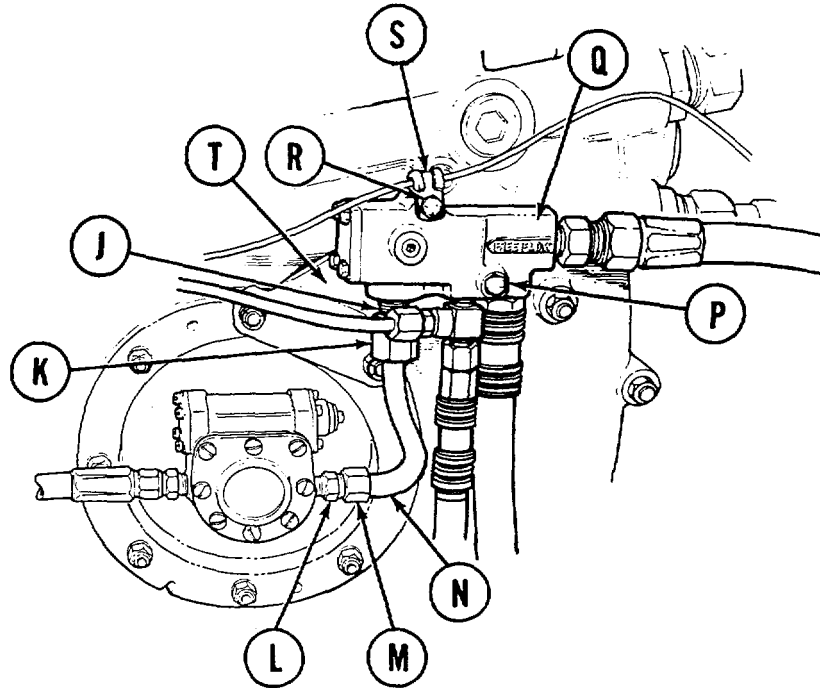
6. Using fingers, disconnect two primer fuel lines from fuel backflow valve quick-disconnects (G) and (H).

Go on to Sheet 3

TA148117

**FUEL BACKFLOW VALVE REPLACEMENT (Sheet 3 of 7)**

7. Using 3/4 inch wrench to hold adapter (J) and 7/8 inch wrench on coupling nut (K), loosen coupling nut (K) until completely loose from adapter (J).
8. Using 3/4 inch wrench to hold adapter (L) and 7/8 inch wrench on coupling nut (M), loosen coupling nut (M). Do not completely loosen coupling nut (M) at this time. Tube assembly (N) will be removed later.

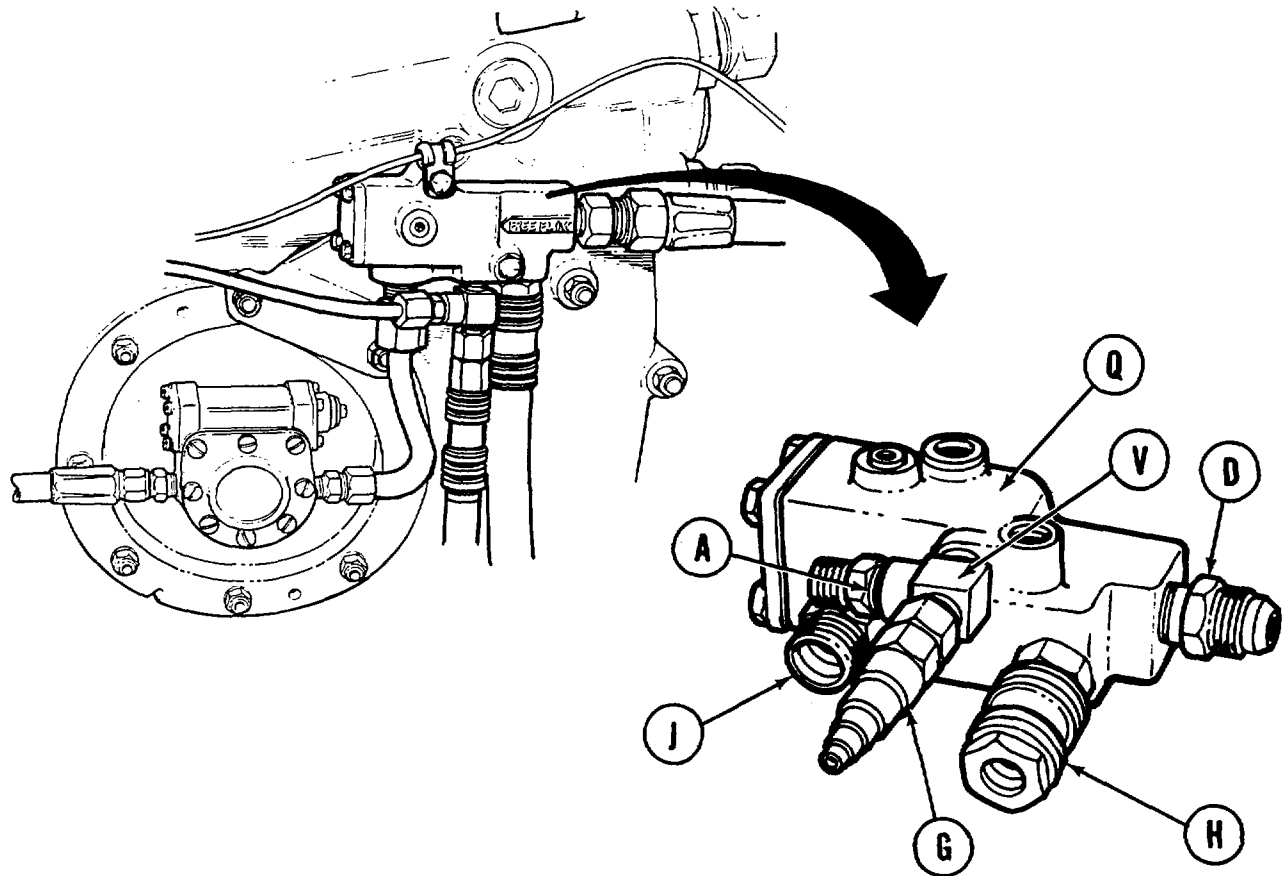


9. Using socket, remove screw, lockwasher, and washer (P) from fuel backflow valve assembly (Q). Throw lockwasher away.
10. Using socket, remove screw and lockwasher (R) and clamp (S) securing fuel backflow valve assembly (Q) to mounting bracket (T). Throw lockwasher away.
11. Remove backflow valve assembly (Q) from mounting bracket (T).
12. Using 7/8 inch wrench, loosen coupling nut (M). Remove tube assembly (N).

Go on to Sheet 4

TA148118

## FUEL BACKFLOW VALVE REPLACEMENT (Sheet 4 of 7)



13. Using 11/16 inch wrench, remove quick-disconnect (G) from tee (V).
14. Using 1 inch wrench on quick-disconnect (H), remove quick-disconnect (H) from check valve (Q).
15. Using 1/2 inch wrench, remove adapter (A) from tee (V).
16. Using 3/4 inch wrench, remove tee (V) from fuel backflow valve assembly (Q).
17. Using 13/16 inch wrench, remove adapter (D) from fuel backflow valve assembly (Q).
18. Using 3/4 inch wrench, remove adapter (J) from fuel backflow valve assembly (Q).

Go on to Sheet 5

TA148119

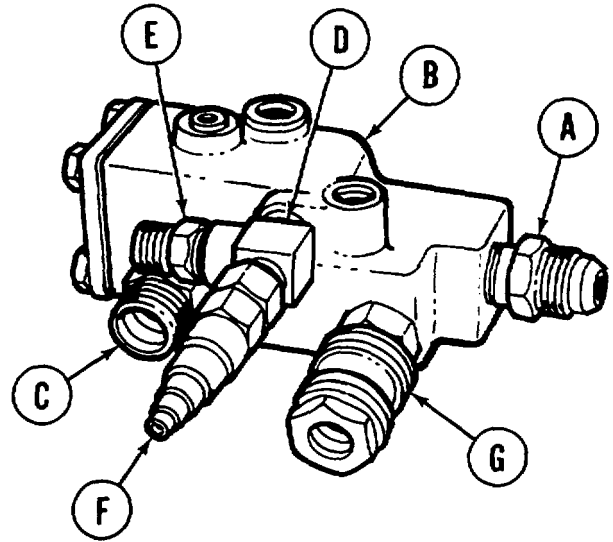
**FUEL BACKFLOW VALVE REPLACEMENT (Sheet 5 of 7)****CLEANING AND INSPECTION:**

1. Using clean rags (Item 65, Appendix D) and dry cleaning solvent (Item 54, Appendix D), clean fittings and mounting hardware thoroughly.
2. Inspect fittings and mounting hardware for nicks, cracks, wear, or thread damage. Replace if required.

**INSTALLATION:****NOTE**

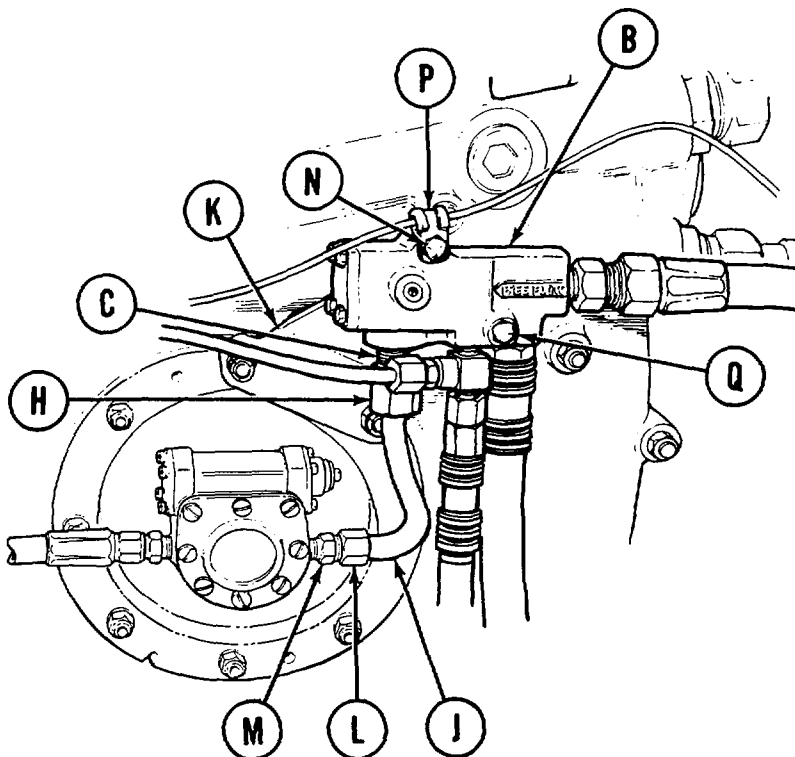
**Coat threads of fitting with sealing compound (Item 27, Appendix D) before installation.**

1. Using 13/16 inch wrench, install adapter (A) on fuel backflow valve assembly (B).
2. Using 3/4 inch wrench, install adapter (C) on fuel backflow valve assembly (B).
3. Using 3/4 inch wrench, install tee (D) on fuel backflow valve assembly (B). Make sure tee (D) is positioned as shown in illustration.
4. Using 1/2 inch wrench, install adapter (E) on tee (D).
5. Using 3/4 inch wrench, hold tee (D) in position for steps 6 thru 8 following.
6. Using 9/16 inch wrench, install quick-disconnect (F) on tee (D).
7. Using 1 inch wrench, install coupling assembly (G) on fuel backflow valve (B).



**FUEL BACKFLOW VALVE REPLACEMENT (Sheet 6 of 7)**

8. Using fingers, loosely connect coupling nut (H) of tube assembly (J) to adapter (C).
9. Position fuel backflow valve assembly (B) on mounting bracket (K). Aline holes on valve assembly with those on brackets.



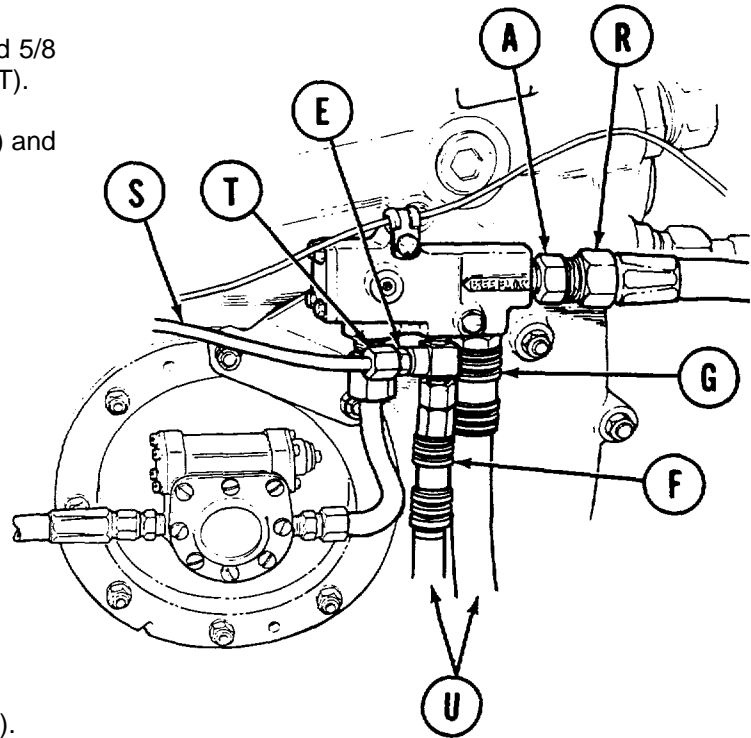
10. Using fingers, loosely connect coupling nut (L) to adapter (M).
11. Using socket, install screw and new lockwasher (N) through clamp (P) mounting fuel backflow valve assembly (B) on mounting bracket (K).
12. Using socket, install screw, new lockwasher, and washer (Q) mounting fuel backflow valve assembly (B) on mounting bracket (K).
13. Using 7/8 inch wrench, tighten coupling nuts (H) and (L).

Go on to Sheet 7

TA148121

**FUEL BACKFLOW VALVE REPLACEMENT (Sheet 7 of 7)**

14. Remove fuel line plug from hose (R).
15. Using 7/8 inch wrench, install hose assembly (R) on adapter (A).
16. Using fingers, install hose assembly (S) into adapter (E).
17. Using 1/2 inch wrench to hold adapter (E) and 5/8 inch wrench on hose fitting (T), tighten fitting (T).
18. Connect two primer lines (U) to connectors (F) and (G).



19. Perform engine fuel leak test (page 5-46).
20. Install lower engine access panel (page 16-46).

End of Task

TA148122



**PRIMARY FUEL FILTER OUTLET-TO-FUEL BACKFLOW VALVE HOSE ASSEMBLY REPLACEMENT (2A ENGINE)  
(Sheet 1 of 2)**

**TOOLS:** 7/8 in. combination box and open end wrench  
13/16 in. combination box and open end wrench

**SUPPLIES:** Sealing compound (Item 27, Appendix D)  
Container  
Rag (Item 65, Appendix D)

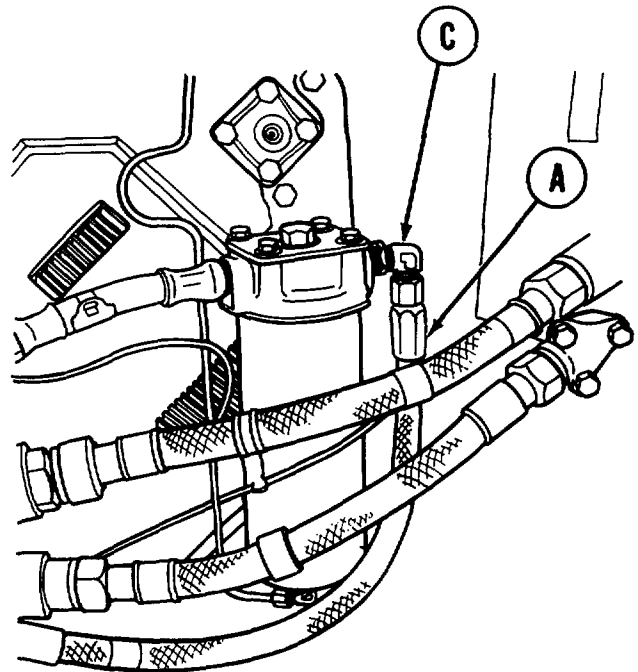
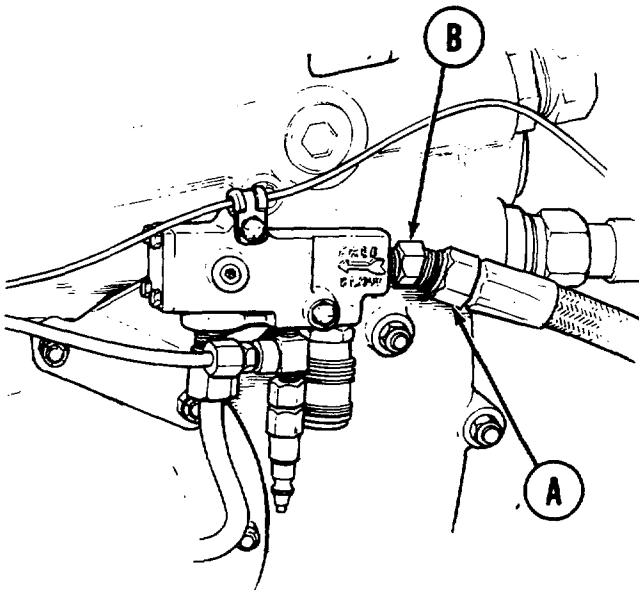
**PRELIMINARY PROCEDURE:** Remove powerplant (page 5-2)

**NOTE**

**Use container and rags (Item 65, Appendix D) to catch fuel in line and filter.**

**REMOVAL:**

1. Using 7/8 inch wrench, disconnect hose (A) from elbow (B).
2. Using wrench, remove hose (A) from elbow (C).
3. Remove hose from powerplant.

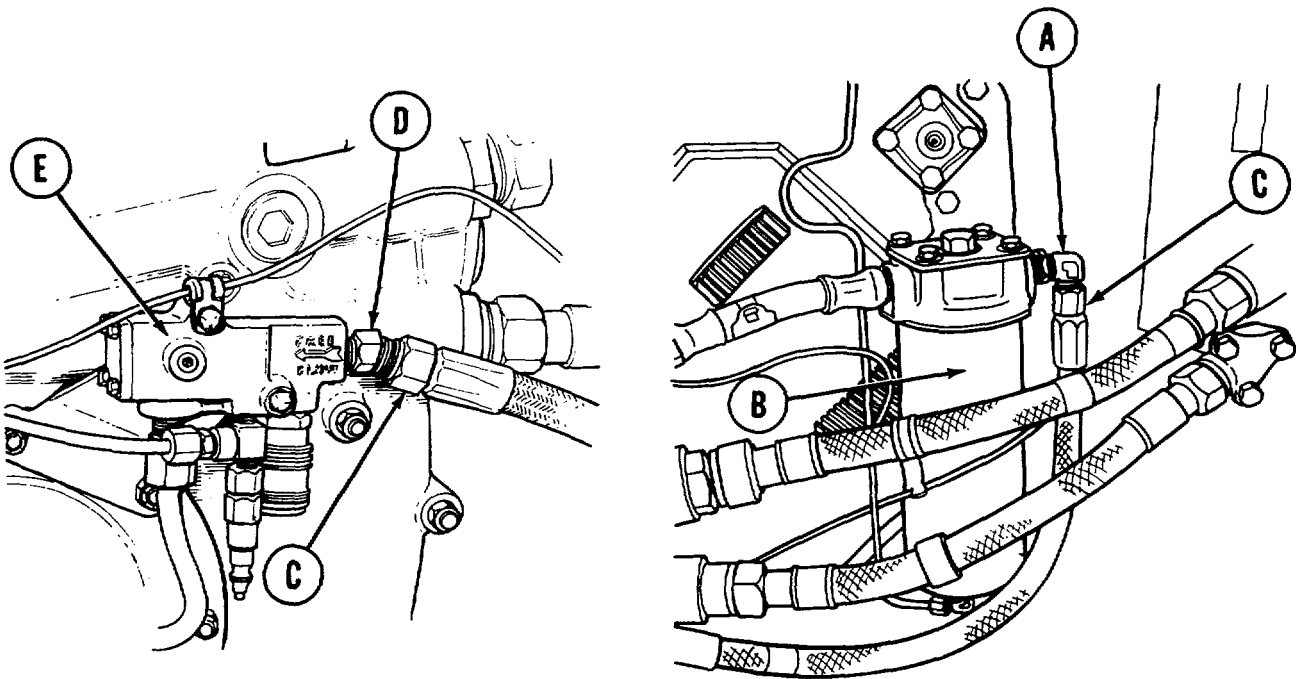


Go on to Sheet 2

TA148123

**PRIMARY FUEL FILTER OUTLET-TO-FUEL BACKFLOW VALVE HOSE ASSEMBLY REPLACEMENT (2A ENGINE)  
(Sheet 2 of 2)****INSTALLATION:**

1. Coat threads of elbow (A) on primary fuel filter (B) with sealing compound (Item 27, Appendix D).
2. Using 7/8 inch wrench, install hose assembly (C) on elbow (A) of primary fuel filter (B).
3. Coat threads of elbow (D) on fuel backflow valve (E) with sealing compound (Item 27, Appendix D).
4. Using 7/8 inch wrench, install hose assembly (C) on elbow (D) of fuel backflow valve (E).
5. Perform engine fuel leak test (page 5-65).
6. Install powerplant (page 5-14).



End of Task

TA148124

**PRIMARY FUEL FILTER OUTLET-TO-FUEL BACKFLOW VALVE HOSE ASSEMBLY REPLACEMENT (2D ENGINE)**  
 (Sheet 1 of 2)

**TOOLS:** 7/8 in. combination box and open end wrench  
 13/16 in. combination box and open end wrench

**SUPPLIES:** Sealing compound (Item 27, Appendix D)  
 Container  
 Rags (Item 65, Appendix D)

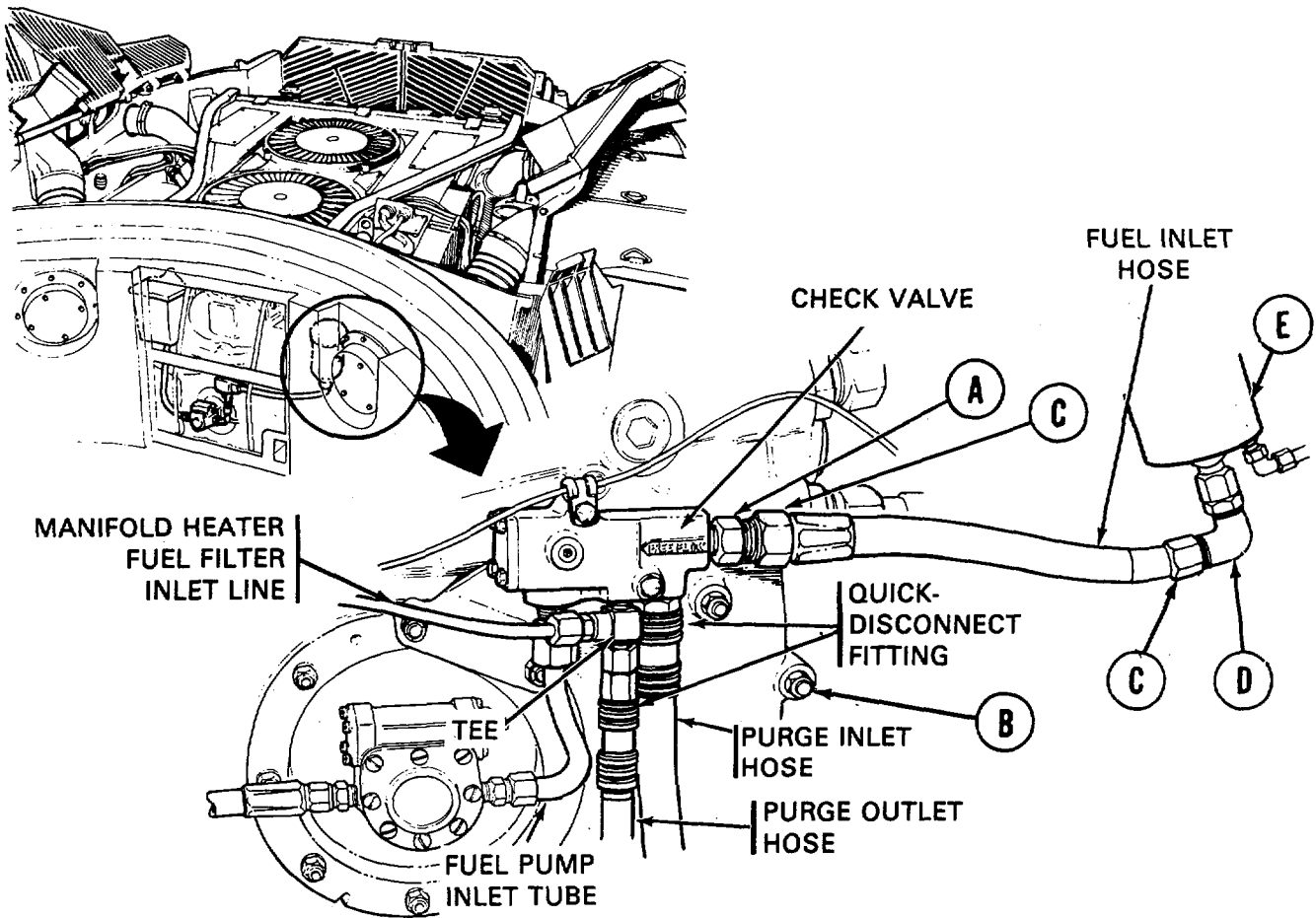
**PRELIMINARY PROCEDURE:** Remove powerplant (page 5-27)

**NOTE**

**Use container and rags (Item 65, Appendix D) to catch fuel in line and filter.**

**REMOVAL:**

1. Using 13/16 Inch wrench on adapter (A) of fuel backflow valve (B) and 7/8 inch wrench on hose assembly (C), remove hose assembly (C) from adapter (A).
2. Using 7/8 inch wrench, remove hose assembly (C) from elbow (D) of primary filter (E).

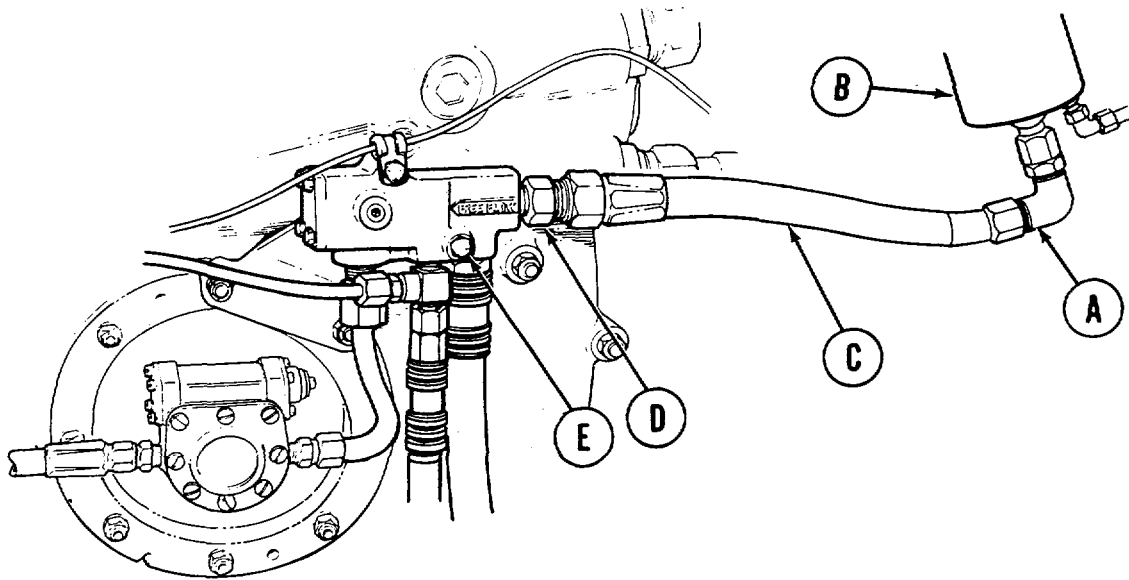


Go on to Sheet 2

TA148125

**PRIMARY FUEL FILTER OUTLET-TO-FUEL BACKFLOW VALVE HOSE ASSEMBLY REPLACEMENT (2D ENGINE)  
(Sheet 2 of 2)****INSTALLATION:**

1. Coat threads of elbow (A) on primary fuel filter (B) with sealing compound (Item 27, Appendix D).
2. Using 7/8 inch wrench, install hose assembly (C) on elbow (A) of primary fuel filter (B).
3. Coat threads of adapter (D) on fuel backflow valve (E) with sealing compound (Item 27, Appendix D).
4. Using 7/8 inch wrench, install hose assembly (C) on adapter (D) of fuel backflow valve (E).
5. Perform engine fuel leak test (page 545).
6. Install powerplant (page 5.40).



End of Task

TA148126

**FUEL PUMP REPLACEMENT - LEFT FUEL TANK (Sheet 1 of 9)**

PROCEDURE INDEX

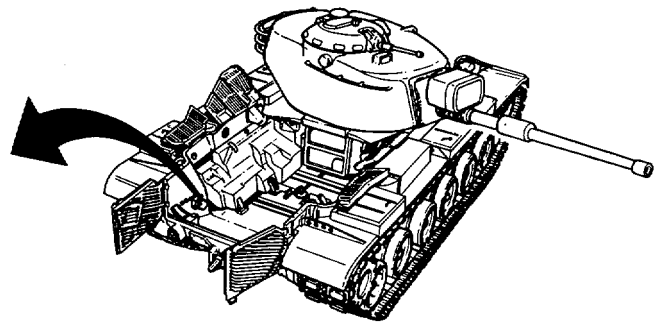
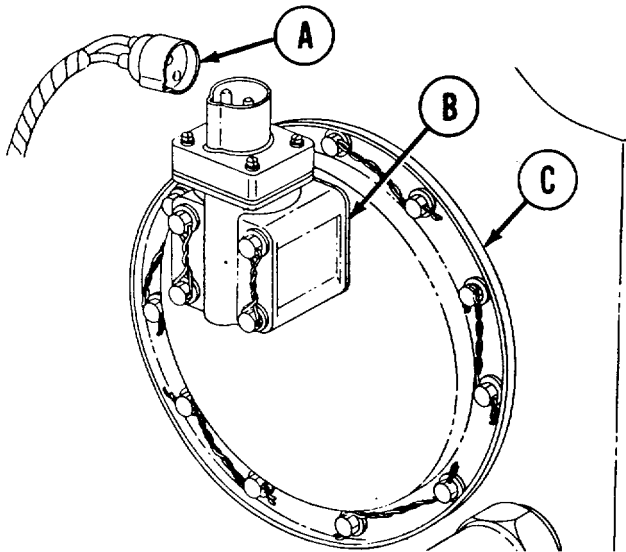
PROCEDURE	PAGE
Removal	7-52
Installation	7-57

TOOLS: 1/4 in. combination box and open end wrench  
 1/2 in. combination box and open end wrench  
 1/2 in. socket with 3/8 in. drive  
 Ratchet with 3/8 in. drive  
 Diagonal cutting pliers  
 Torque wrench with 3/8 in. drive (0-200 lb-in) (0-23 N•m)  
 Slip joint pliers  
 Flat-tip screwdriver

SUPPLIES: Lockwire (Item 60, Appendix D)  
 Gasket (10873918)  
 Lockwasher (MS35333-38) (2 required)  
 Lockwasher (MS45904-72)

REFERENCE: TM 9-2350-260-10

PRELIMINARY PROCEDURES: Isolate left fuel tank (TM 9-2350-260-10)  
 Drain left fuel tank (page 7-153)  
 Remove powerplant (page 5-1)



REMOVAL:

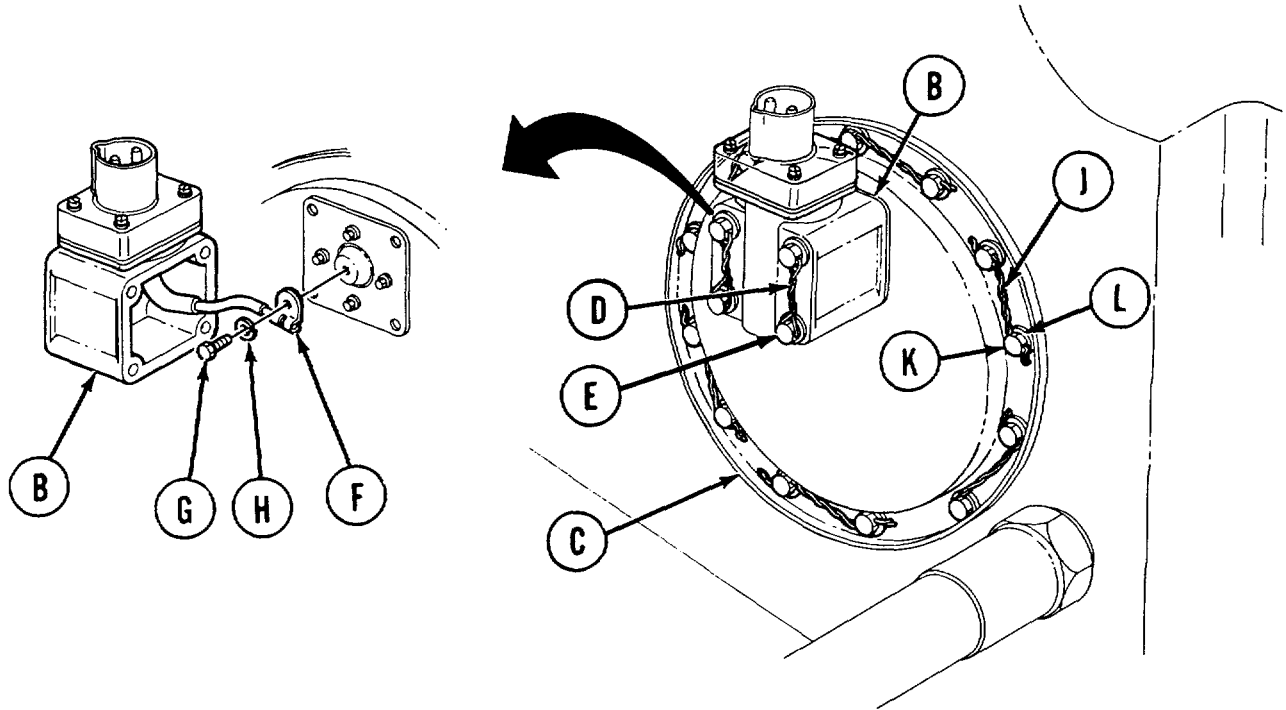
- Using hands, unplug electrical lead (A) from capacitor and housing assembly (B) located on fuel tank access cover (C).

Go on to Sheet 2

TA148127

**FUEL PUMP REPLACEMENT - LEFT FUEL TANK (Sheet 2 of 9)**

2. Using diagonal cutting pliers, remove lockwire (D) securing four screws (E).
3. Using screwdriver, remove four screws (E) from capacitor and housing assembly (B). Slowly separate capacitor and housing assembly (B) from fuel pump access cover (C). Capacitor and housing assembly is connected to cover (C) by electrical lead (F).



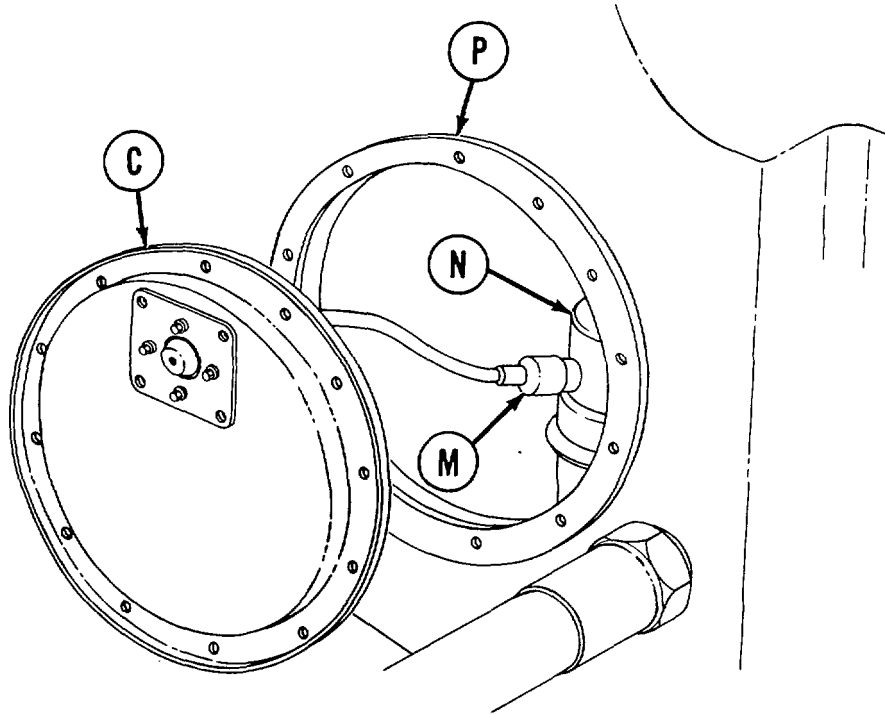
4. Using screwdriver, remove screw (G) and lockwasher (H) that secure electrical lead (F). Throw lockwasher (H) away. Remove capacitor and housing assembly (B) from cover (C).
5. Using diagonal cutting pliers, remove lockwire (J) securing 12 screws (K) on fuel pump access cover (C).
6. Using socket, remove 12 screws (K) and flat washers (L).

Go on to Sheet 3

TA148128

**FUEL PUMP REPLACEMENT- LEFT FUEL TANK (Sheet 3 of 9)**

7. Slowly pull back fuel pump access cover (C) to expose electrical lead (M) connecting fuel pump access cover to fuel pump (N).
8. Using hand, disconnect electrical lead (M) from fuel pump (N). Remove gasket (P) and throw gasket away.

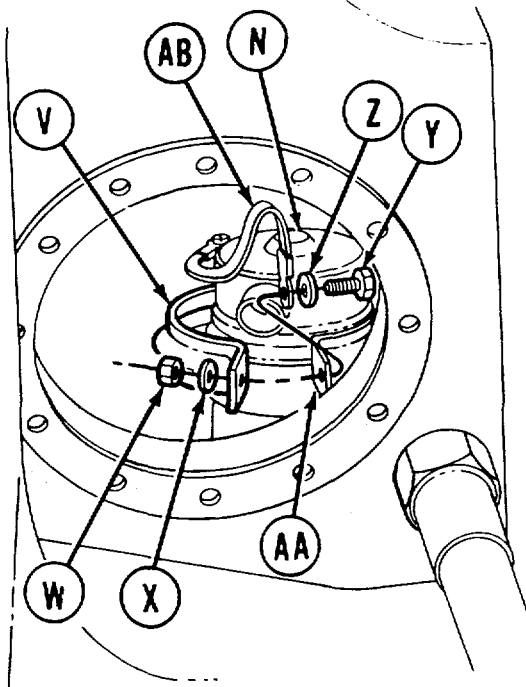
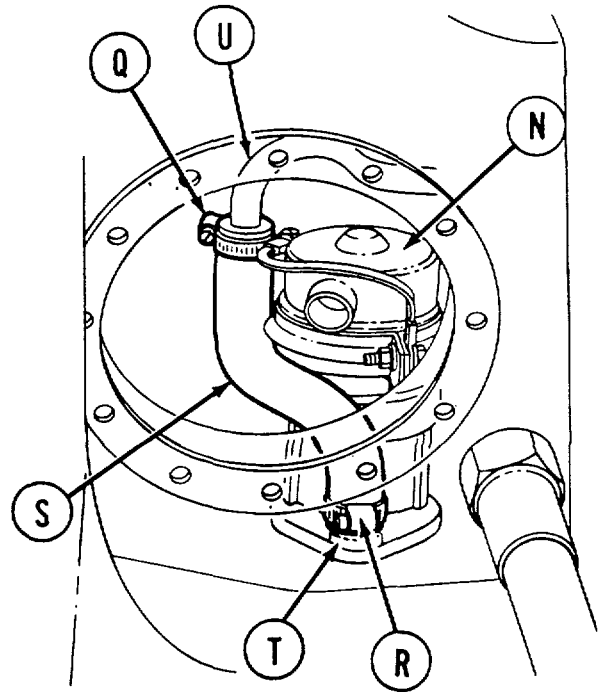


Go on to Sheet 4

TA148129

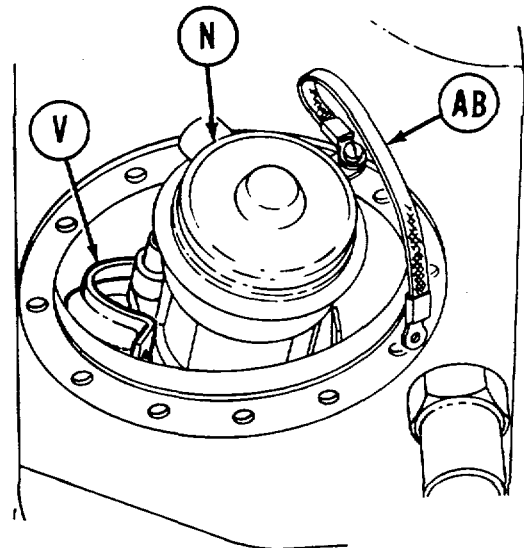
**FUEL PUMP REPLACEMENT - LEFT FUEL TANK (Sheet 4 of 9)**

9. Using screwdriver, loosen two hose clamps (Q) and (R) on hose (S) attached to fuel pump (N).
10. Remove bottom of hose (S) off fuel pump hose connection (T).
11. Remove top of hose (S) off fuel line (U). Remove hose (S).



12. Hold retainer (V) in place against body of fuel pump (N).
  13. Using socket and 1/2 inch wrench, remove nut (W) and lockwasher (X) from screw (Y). Throw lockwasher (X) away.
  14. Remove screw (Y) and washer (Z) from mounting bracket (AA). Let ground lead (AB) fall away.
15. Hold fuel pump (N). Swing back retainer (V).
  16. Remove fuel pump (N).

12. Hold retainer (V) in place against body of fuel pump (N).
13. Using socket and 1/2 inch wrench, remove nut (W) and lockwasher (X) from screw (Y). Throw lockwasher (X) away.
14. Remove screw (Y) and washer (Z) from mounting bracket (AA). Let ground lead (AB) fall away.



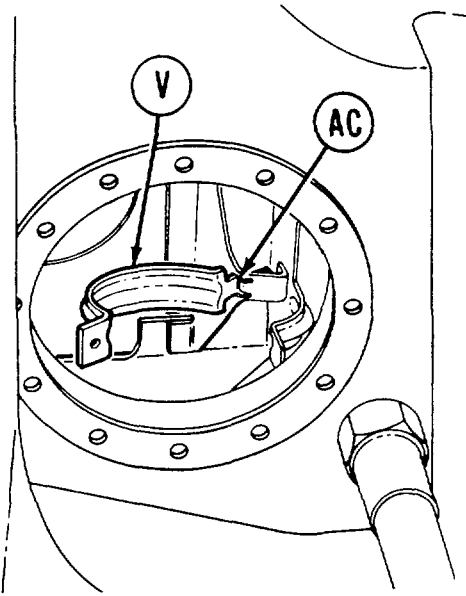
Go on to Sheet 5

TA148130

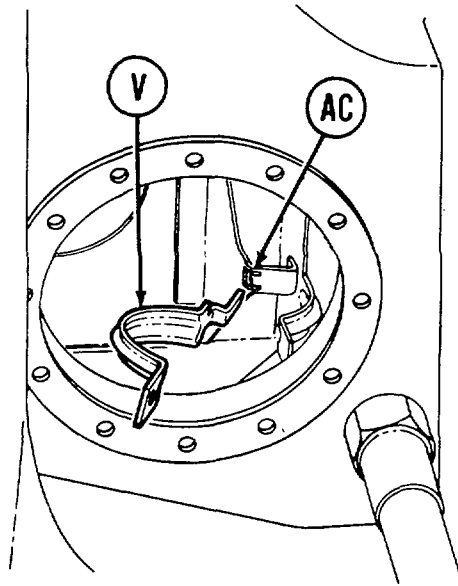


FUEL PUMP REPLACEMENT - LEFT FUEL TANK (Sheet 5 of 9)

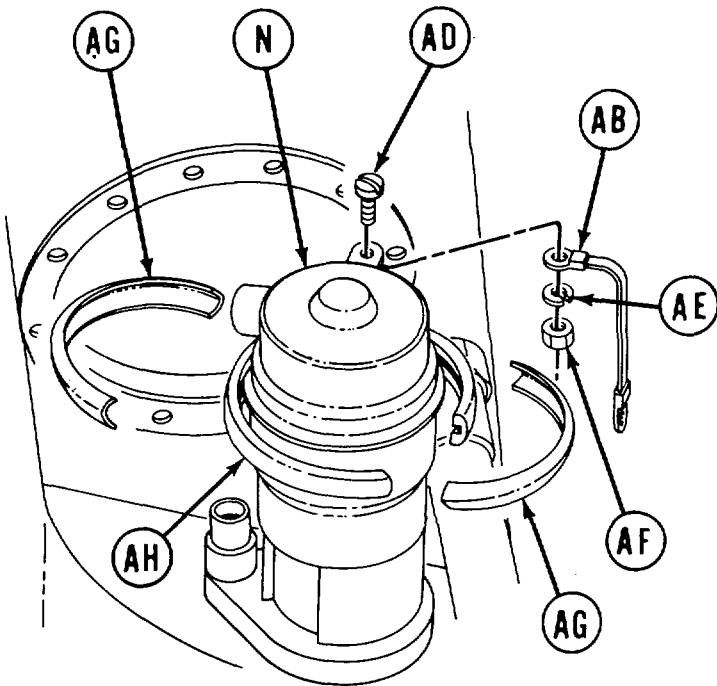
17. Remove retainer (V) from slot (AC).



18. Remove retainer (V).



19. Using screwdriver and 1/4 inch wrench, remove screw (AD), lockwasher (AE), and nut (AF), and remove ground lead (AB) from fuel pump (N). Throw lockwasher away.
20. Using hands, remove two dampers (AG) and packing (AH) from pump.



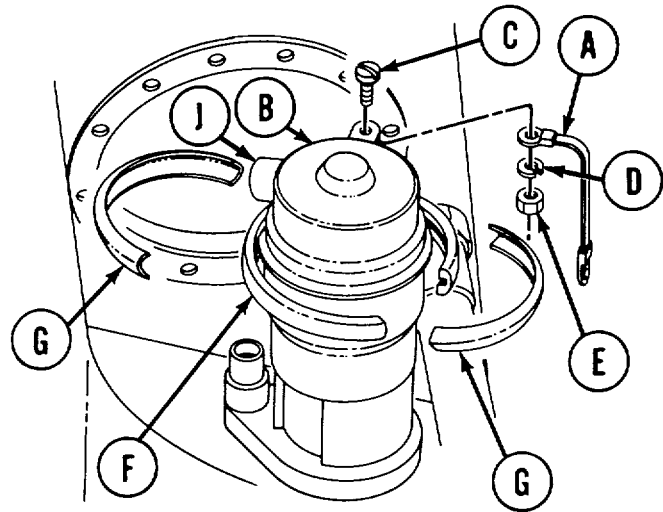
Go on to Sheet 6

TA148131

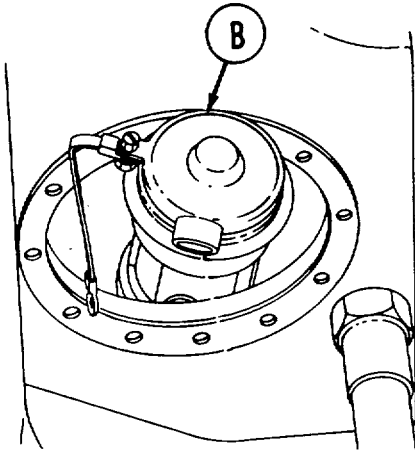
**FUEL PUMP REPLACEMENT - LEFT FUEL TANK (Sheet 6 of 9)**

**INSTALLATION:**

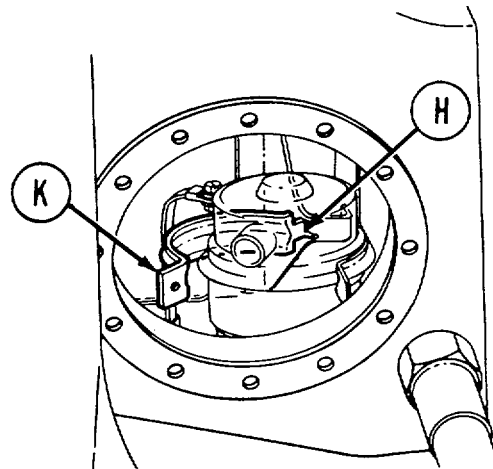
1. Using screwdriver and 1/4 inch wrench, install ground strap (A) of fuel pump (B) with screw (C), new lockwasher (D), and nut (E). Using flat-tip screwdriver, tighten screw (C).
2. Using hands position packing (F) and two clamps (G) on fuel pump (B).



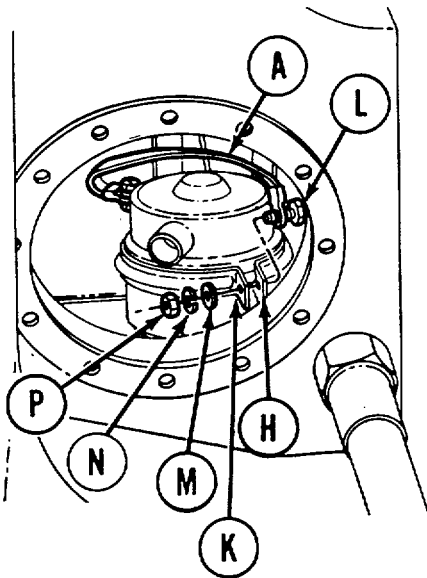
3. Insert fuel pump (B) through opening in fuel tank and onto mounting bracket (H) so that electrical connector (J) is to the left as shown.



4. Insert end of retaining strap (K) into mounting bracket (H) slot.



5. Position ground strap (A) terminal on mounting bracket (H). Insert screw (L) through terminal of ground strap (A), mounting bracket (H), and retaining strap (K). Using fingers, install washer (M) and new lockwasher (N).
6. Using fingers, install nut (P) loosely onto screw (L).

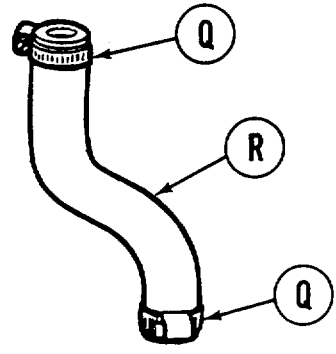
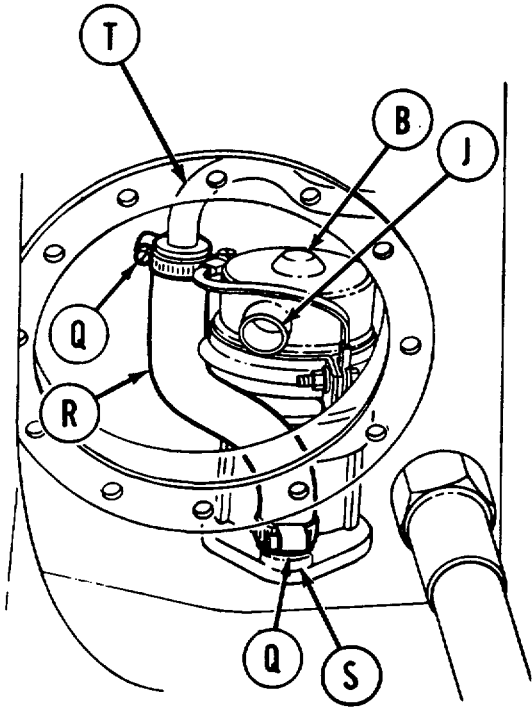


Go on to Sheet 7

TA148132

**FUEL PUMP REPLACEMENT - LEFT FUEL TANK (Sheet 7 of 9)**

7. Install clamp (Q) on each end of hose (R).

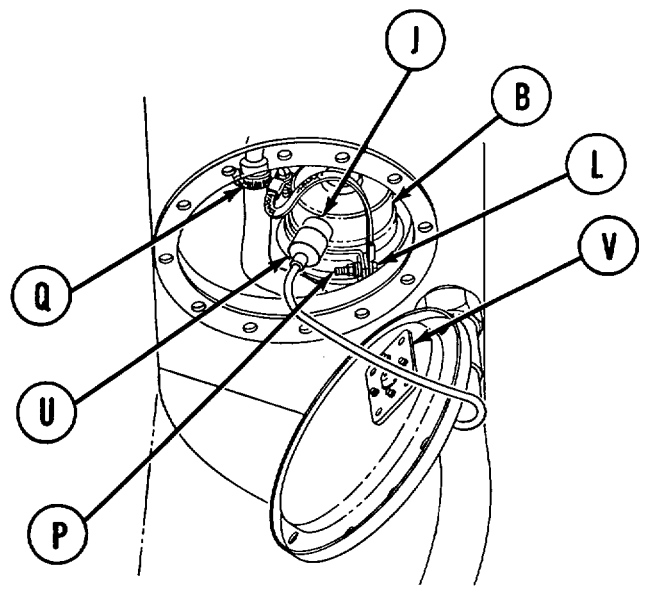


**NOTE**

It may be necessary to turn fuel pump (B) 1/4 turn in order to install hose (R) onto fuel pump outlet (S).

8. Install hose (R) between fuel pump outlet (S) and fuel line (T). Using screwdriver, tighten screws on clamps (Q).

9. Turn fuel pump (B) so electrical connector (J) is clear of top clamp (Q). Using hands, connect electrical connector (U) at back of capacitor housing (V) to electrical connector (J).
10. Using 1/2 inch wrench to hold screw (L), use socket and tighten nut (P).

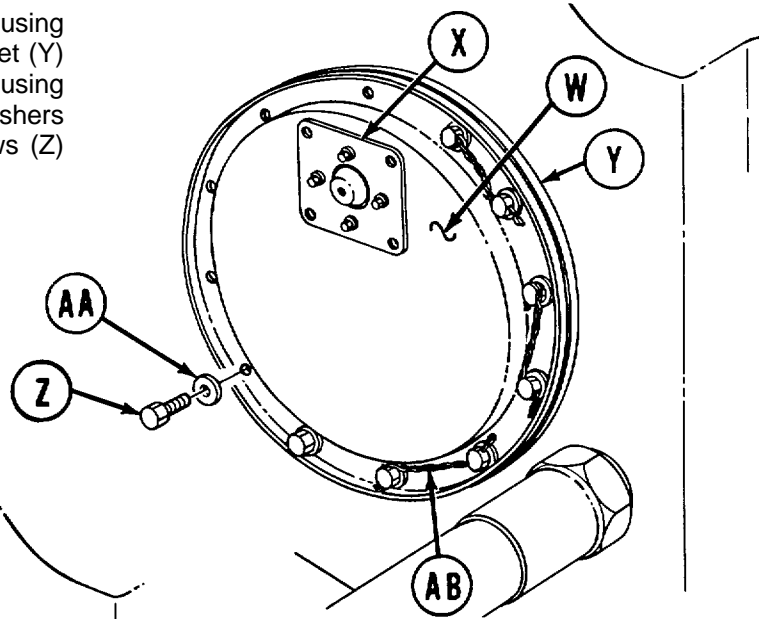


Go on to Sheet 8

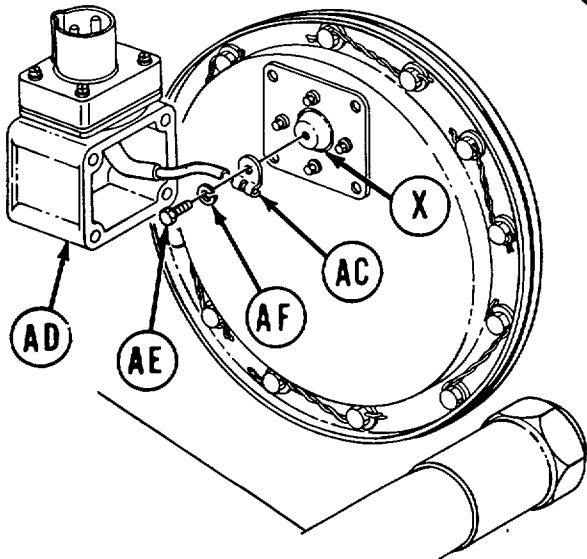
TA148133

**FUEL PUMP REPLACEMENT- LEFT FUEL TANK (Sheet 8 of 9)**

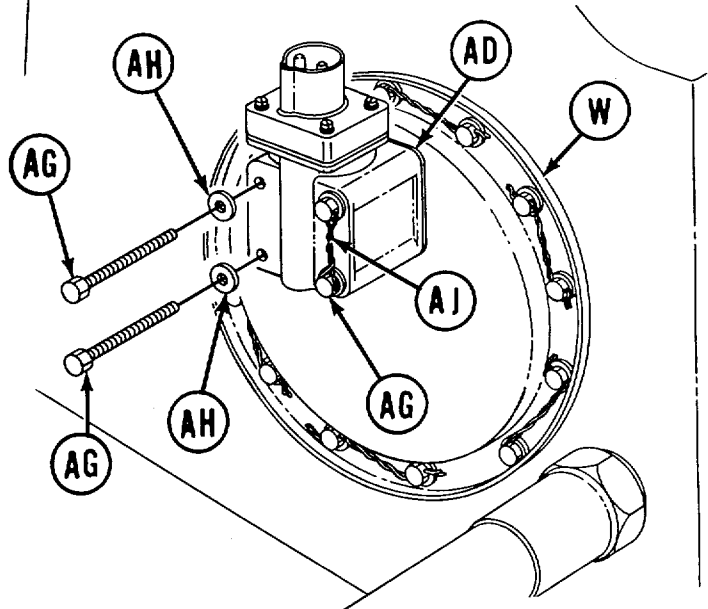
- Position access cover (W) with capacitor housing adapter (X) up (as shown). Install new gasket (Y) over fuel tank opening with holes lined, and using 1/2 inch socket, install 12 screws (Z) and washers (AA). Use torque wrench and tighten screws (Z) to 50 to 85 lb-in (6-10 N•m).



- Using slip joint pliers, install lockwire (AB) between screws (Z).
- Using screwdriver, secure electrical lead (AC) of housing and capacitor (AD) to adapter (X) with screw (AE) and new lockwasher (AF).



- Position capacitor and housing (AD) onto cover (W). Using screwdriver, install four screws (AG) and washers (AH) securing capacitor and housing (AD) to cover (W).
- Using slip joint pliers, install lockwire (AJ) (Item 60, Appendix D) into screws (AG).

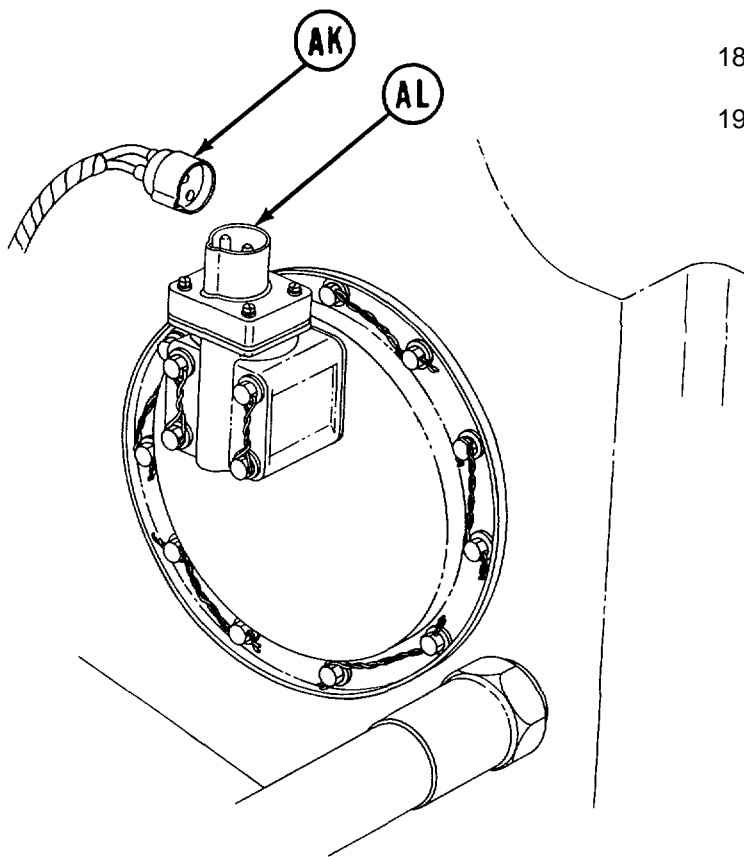


Go on to Sheet 9

TA148134

## FUEL PUMP REPLACEMENT - LEFT FUEL TANK (Sheet 9 of 9)

16. Install electrical lead (AK) to connector (AL).
17. Turn fuel isolate valves back to original position (TM 9-2350-260-10).
18. Fill fuel tank.
19. Install 2A powerplant (page 5-14) or 2D powerplant (page 5-40).



End of Task

TA148135

FUEL PUMP REPLACEMENT - RIGHT FUEL TANK (Sheet 1 of 6)

PROCEDURE INDEX

PROCEDURE	PAGE
Removal	7-61
Installation	7-64

TOOLS: 7/16 in. socket with 1/2 in. drive  
 1/2 in. socket with 1/2 in. drive  
 9/16 in. socket with 1/2 in. drive  
 Ratchet with 1/2 in. drive  
 Torque wrench with 1/2 in. drive (0-175 lb-ft)  
 (0-237 N•m)  
 Diagonal cutting pliers  
 Flat-tip screwdriver  
 Offset fat-tip screwdriver  
 3/8 in. combination box and open end wrench  
 Cross-tip screwdriver

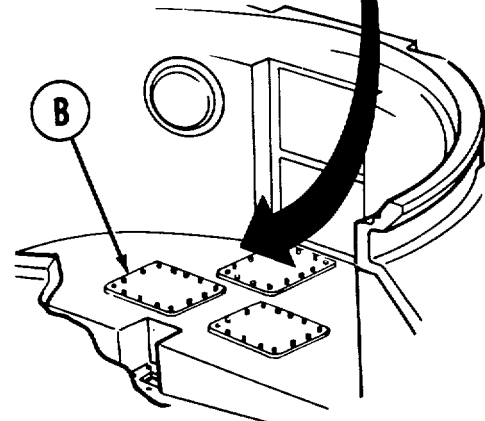
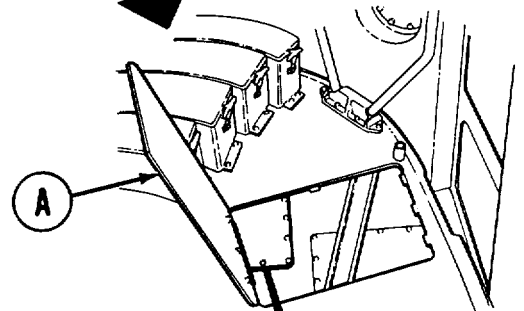
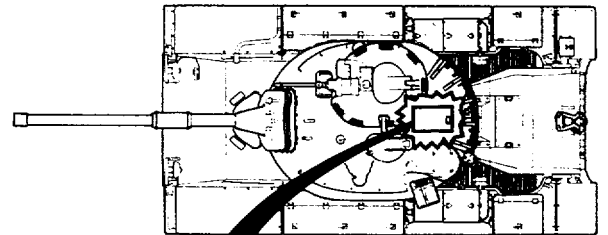
SUPPLIES: Sealing compound (Item 28, Appendix D)  
 Silicone compound (Item 32, Appendix D)  
 Lockwire (Item 59, Appendix D)  
 Gasket (10873918)  
 Gasket (11637078)  
 Lockwasher (MS35333-38)  
 Lockwasher (MS35338-44) (2 required)

REFERENCE: TM 9-2350-260-10

PRELIMINARY PROCEDURES: Isolate right fuel tank (TM 9-2350-260-10)  
 Drain right fuel tank (page 7-152)

REMOVAL:

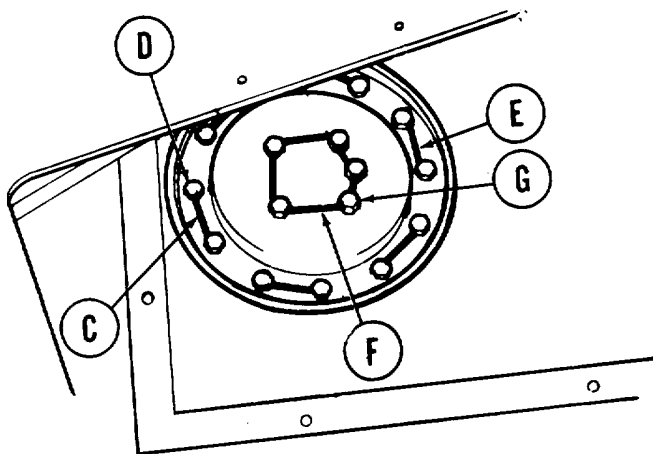
1. Open turret platform access door (A) (TM 9-2350-260-10).
2. Traverse turret to gain access t cover (B) in subfloor over right fuel tank (TM 9-2350-260-10).
3. Using offset flat-tip screwdriver, remove 14 screws securing access cover (B). Remove access cover.



Go on to Sheet 2

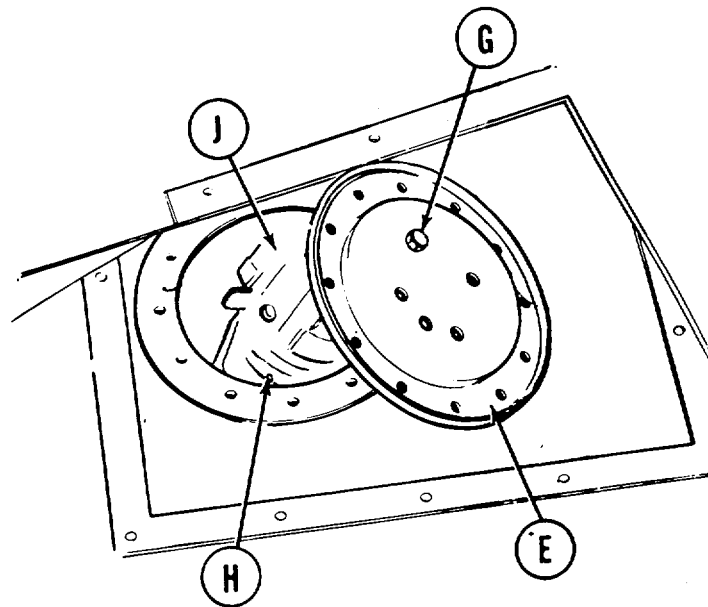
TA148136

## FUEL PUMP REPLACEMENT - RIGHT FUEL TANK (Sheet 2 of 6)



4. Using pliers, cut lockwire (C). Using 1/2 inch socket, remove 12 screws and washers (D) securing fuel pump access cover (E).

5. Using pliers, cut lockwire (F). Using 9/16 inch socket, remove four of five screws (G) securing access cover (E) to fuel pump mounting bracket (underneath cover). Loosen, but do not remove, fifth screw.
6. Swivel access cover (E) on fifth screw (G) until you can withdraw mounting bracket (H) with fuel pump (J) attached part way out of fuel tank.

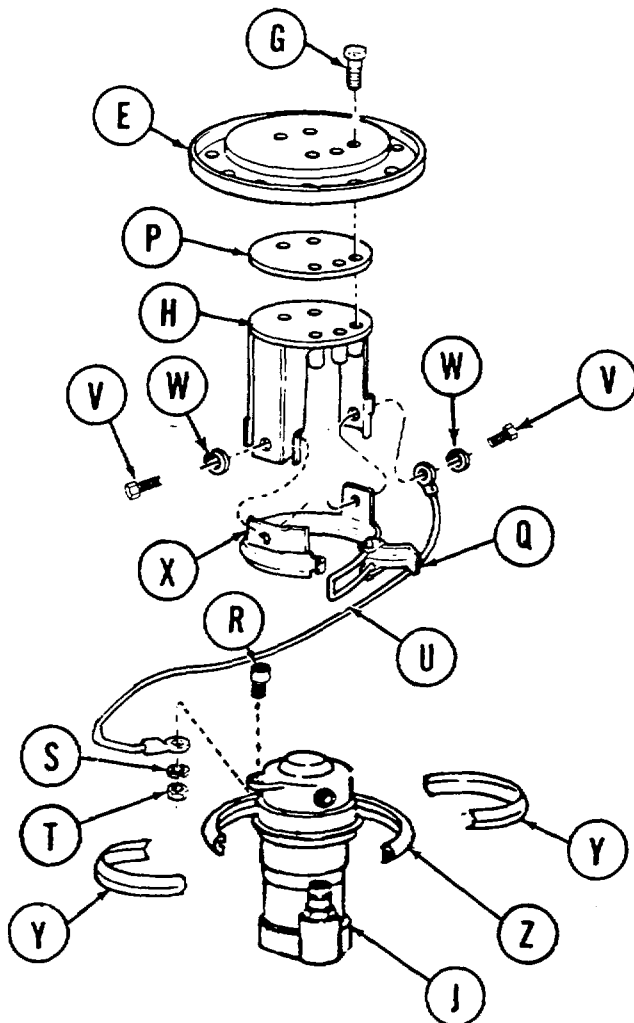
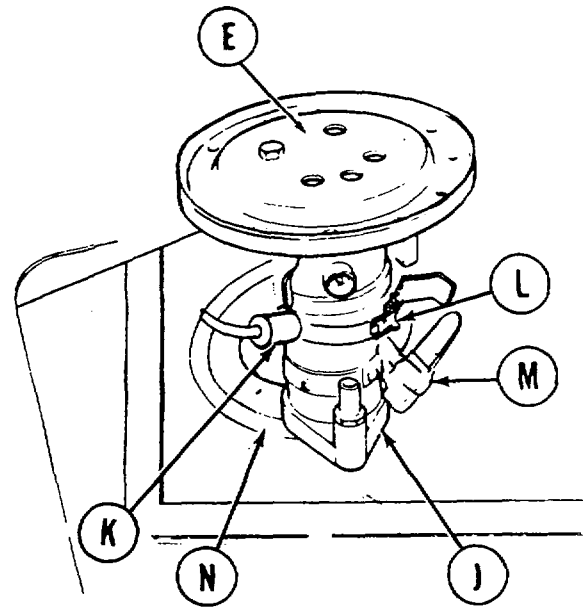


Go on to Sheet 3

TA148137

**FUEL PUMP REPLACEMENT - RIGHT FUEL TANK (Sheet 3 of 6)**

7. Disconnect electrical connector (K).
8. Using flat-tip screwdriver, loosen hose clamp (L). Remove hose (M) from fuel pump (J).
9. Remove gasket (N) and fuel pump (J) from fuel pump opening. Throw gasket away.



10. Remove remaining screw (G) from access cover (E).
11. Separate cover (E), gasket (P), and mounting bracket (H). Throw gasket away.
12. Open clamp lever (Q) and remove fuel pump (J) from mounting bracket (H).
13. Using screwdriver and 3/8 inch wrench, remove screw (R), lockwasher (S), and nut (T) securing ground lead (U) to pump (J). Remove ground lead from pump. Throw lockwasher away.
14. Using 7/16 inch socket, remove two screws (V), and two lockwashers (W) securing clamp (X) to bracket (H). Remove clamp. Throw lockwashers away.
15. Using hands, remove two clamps (Y) and packing (Z) from pump (J).

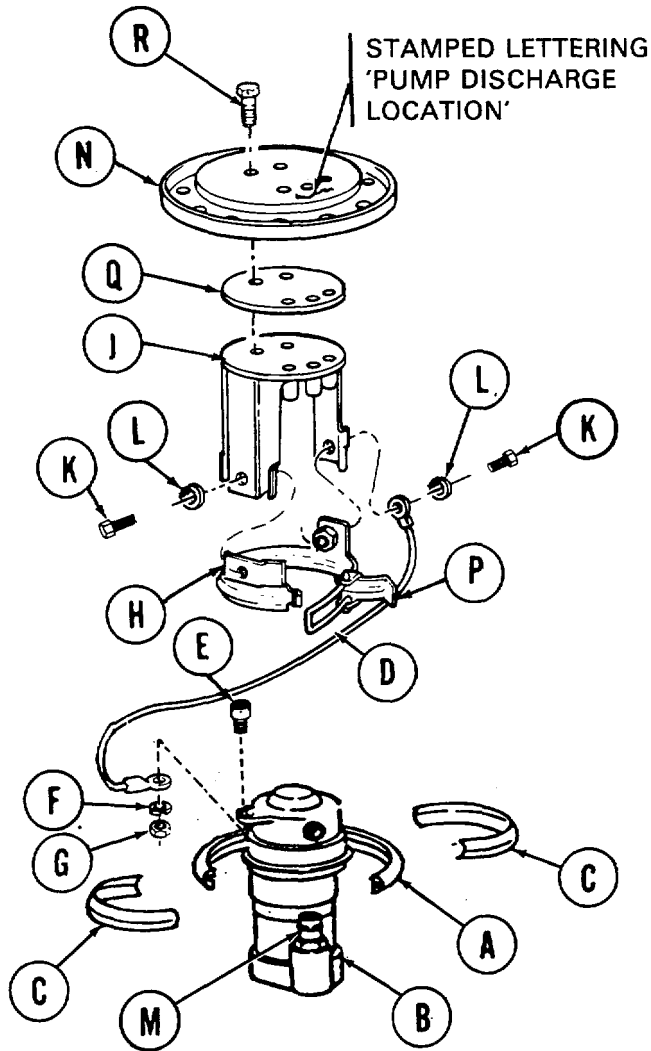
Go on to Sheet 4

TA148138



FUEL PUMP REPLACEMENT. RIGHT FUEL TANK (Sheet 4 of 6)

INSTALLATION:

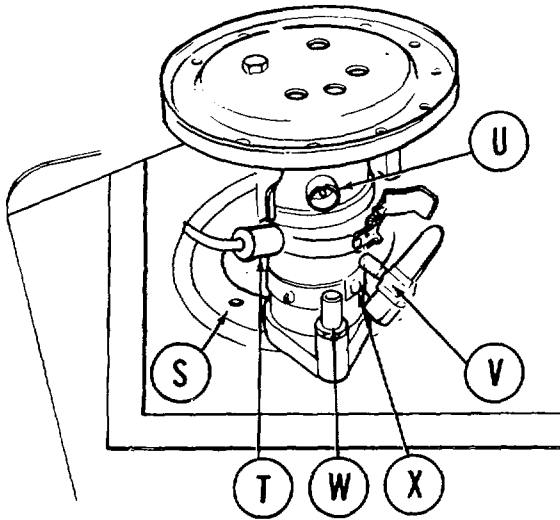


1. Position packing (A) around pump (B), and using hands install clamps (C) around packing (A) and pump (B).
2. Using screwdriver and 3/8 inch wrench, secure ground lead (D) to fuel pump (B) with screw (E), new lockwasher (F), and nut (G).
3. Using 7/16 inch socket, secure clamp (H) to bracket (J) with two screws (K) and two new lockwashers (L).
4. Position fuel pump (B) in mounting bracket (J) so that pump discharge port (M) will be directly beneath stamped lettering 'PUMP DISCHARGE LOCATION' on access cover (N). Lock pump in bracket by closing clamp lever (P).
5. Position new gasket (Q) on mounting bracket (J). Apply sealing compound (Item 28, Appendix D) to threads of one screw (R). Install one screw (R) through access cover (N) and new gasket (Q) into mounting bracket (J). Leave screw (R) loose.

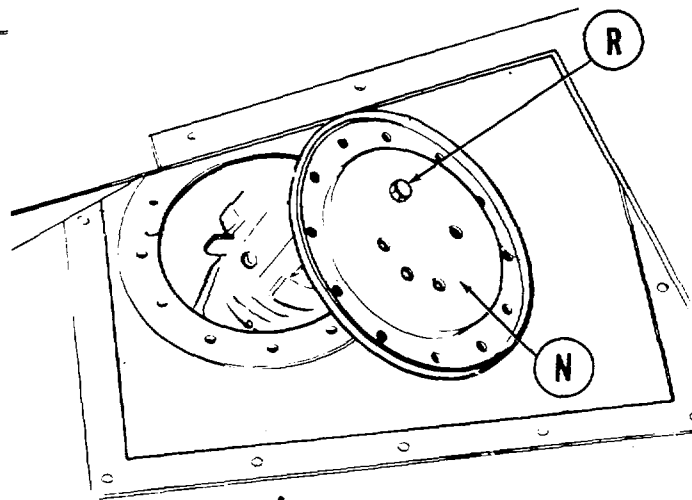
Go on to Sheet 5

TA148139

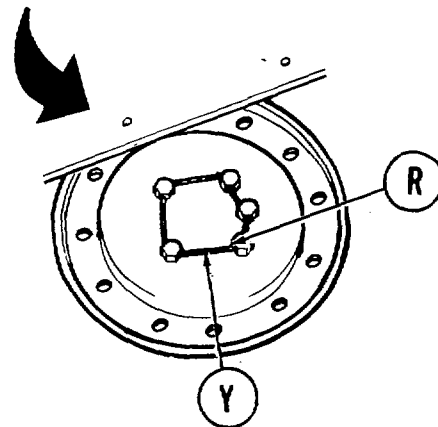
FUEL PUMP REPLACEMENT - RIGHT FUEL TANK (Sheet 5 of 6)



6. Place new gasket (S) over opening in fuel tank.
7. Place silicone compound (Item 32, Appendix D) on electrical lead (T).
8. Place fuel pump close to opening of fuel tank. Connect electrical lead (T) to electrical connector (U).
9. Place hose (V) on pump outlet port (W). Using screwdriver, tighten clamp (X) on hose.



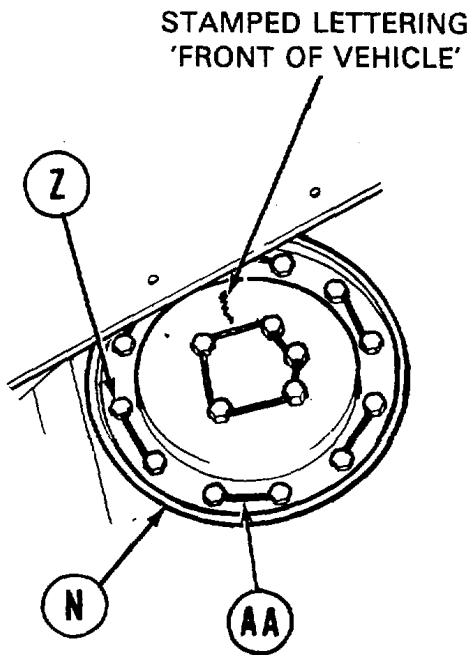
10. Swivel access cover (N) on single installed screw (R) to work fuel pump into position in fuel tank.
11. Position access cover and gasket on mounting bracket (J).
12. Apply sealing compound (Item 28, Appendix D) to threads of remaining four screws (R). Using 9/16 inch socket, install and tighten all five screws (R). Secure screws with lockwire (Y) (Item 59, Appendix D).



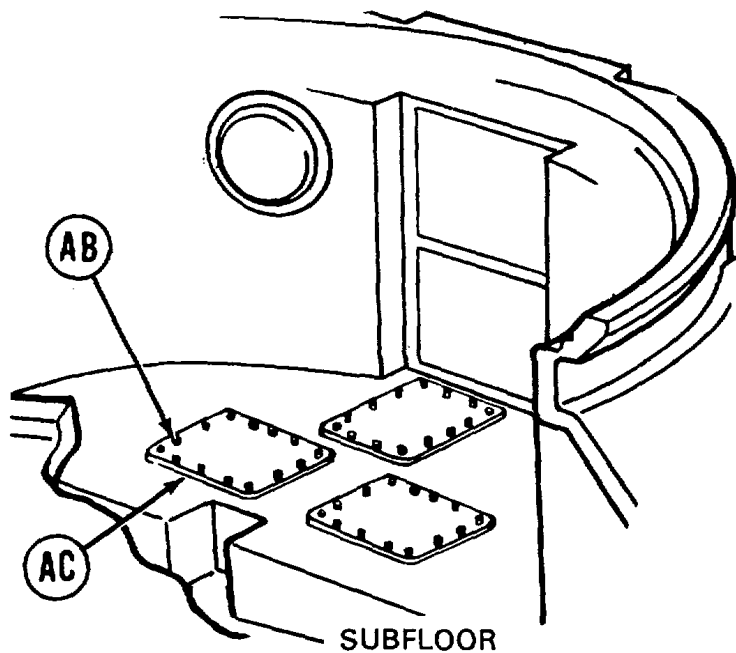
Go on to Sheet 6

TA148140

FUEL PUMP REPLACEMENT- RIGHT FUEL TANK (Sheet 6 of 6)



13. Position access cover (N) over fuel tank opening so that lettering 'FRONT OF VEHICLE' stamped on cover is facing toward front of tank.
14. Using 1/2 inch socket, install 12 screws and 12 washers (Z) securing cover (N).
15. Using torque wrench, tighten screws to 10-15 lb-ft (13-20 N•m).
16. Secure screws with lockwire (AA) (Item 59, Appendix D).
17. Using offset flat-tip screwdriver, install 14 screws (AB) securing access cover (AC).
18. Open fuel tank crossover valve (TM 9-2350-260-10).
19. Fill fuel tanks.



End of Task

TA148141

**PERSONNEL HEATER FUEL PUMP REPLACEMENT (Sheet 1 of 3)**

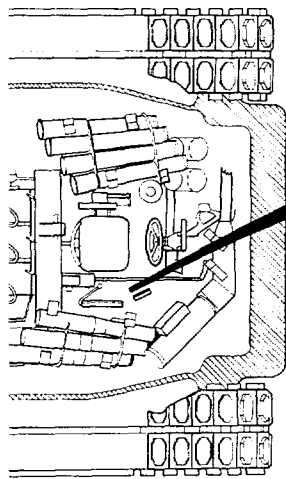
**TOOLS:** 9/16 in. combination box and open end wrench  
 5/8 in. combination box and open end wrench  
 7/16 in. socket with 1/2 in. drive

Ratchet with 1/2 in. drive  
 5 in. extension with 1/2 in. drive  
 7/16 in. combination box and open end wrench  
 1/2 in. combination box and open end wrench

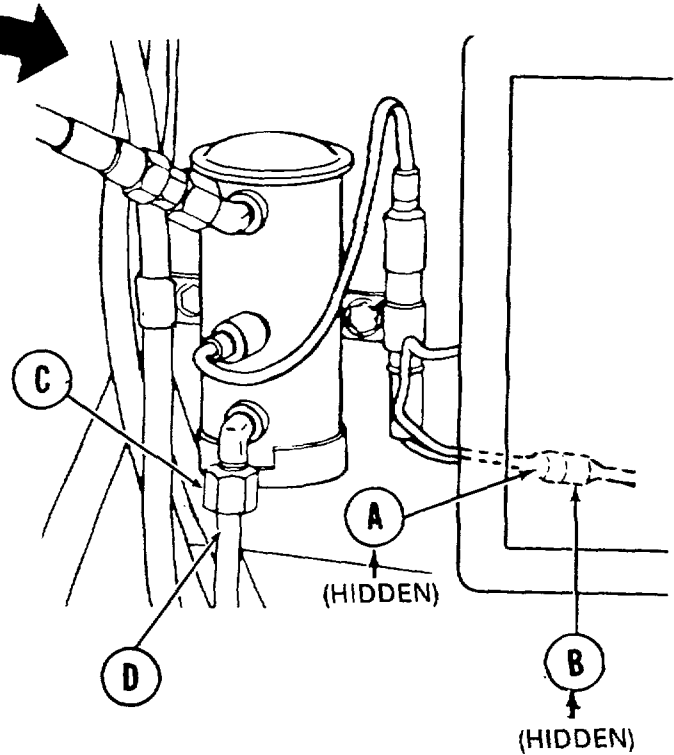
**SUPPLIES:** Container  
 Chalk  
 Lockwasher (MS35338-44) (2 required)

**REFERENCE:** TM 9-2350-260-10

**PRELIMINARY PROCEDURE:** Turn MASTER HEATER switch OFF



**DRIVER'S STATION  
 (RIGHT SIDE)**



**REMOVAL:**

1. Pull electrical plug (A) from harness connector (B).
2. Using 9/16 inch wrench, loosen tube nut (C).

**NOTE**

**Before doing step 3, have container ready to catch any excess fuel.**

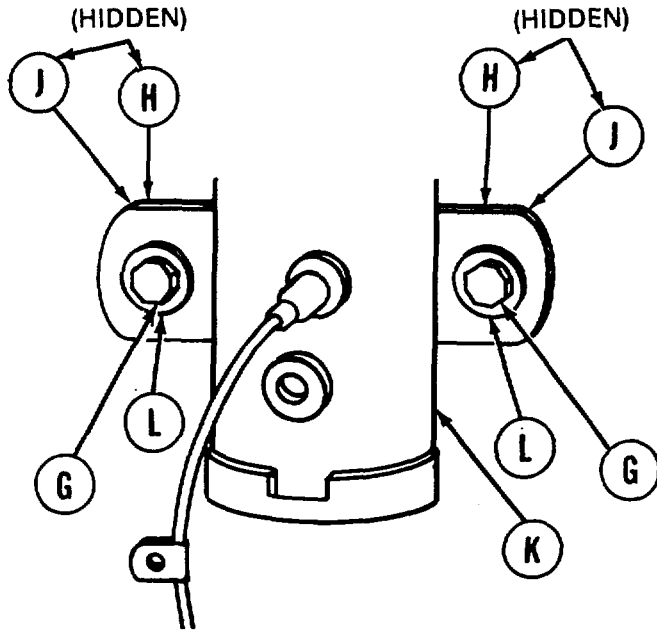
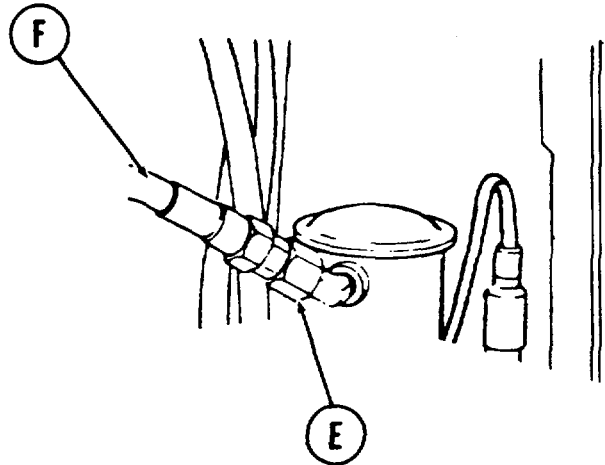
3. Disconnect tube (D) from elbow.

Go on to Sheet 2

TA148142

**PERSONNEL HEATER FUEL PUMP REPLACEMENT (Sheet 2 of 3)**

4. Using 5/8 inch wrench, loosen nut (E).
5. Disconnect hose (F) from elbow.
6. Using socket, loosen two screws (G), while holding nuts (H) with 7/16 inch wrench.

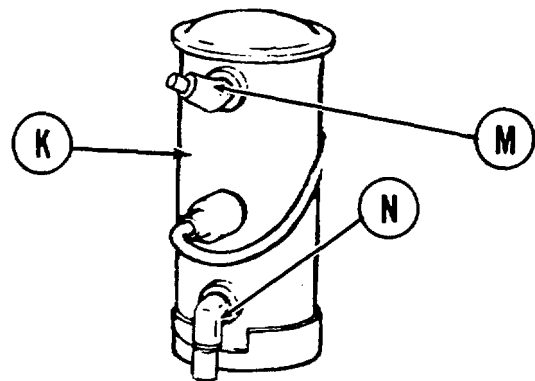


7. Remove two nuts (H) and two lockwashers (J). Throw lockwashers away.
8. Lift fuel pump (K) along with two screws (G), flat washer (L), and condenser bracket from mounting place.

**NOTE**

**Using chalk, mark direction each elbow is pointing on body of fuel pump.**

9. Using 1/2 inch wrench, remove elbow (M) from pump (K).
10. Using 7/16 inch wrench, remove elbow (N) from pump (K).



Go on to Sheet 3

TA148143

**PERSONNEL HEATER FUEL PUMP REPLACEMENT (Sheet 3 of 3)**

**INSTALLATION:**

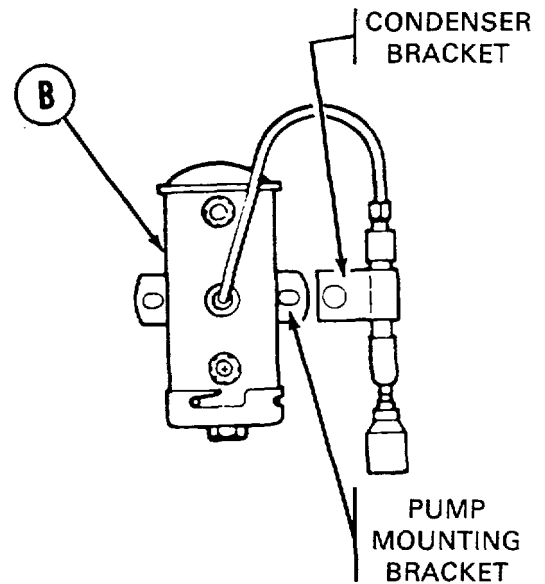
1. Using 1/2 inch wrench, install elbow (A) into pump (B).
2. Using 7/16 inch wrench, install elbow (C) into pump (B).

**NOTE**

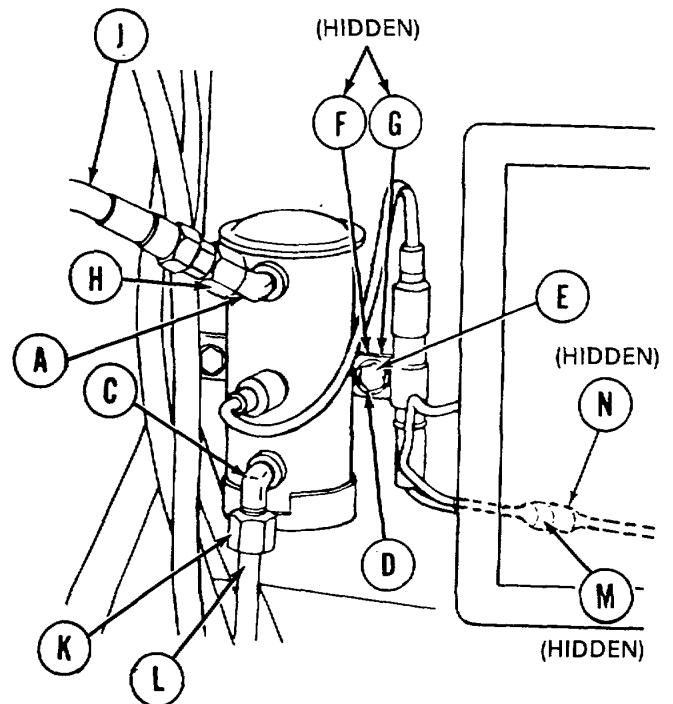
**When installing heater pump, make sure cable condenser bracket is secured with pump mounting bracket.**

**NOTE**

**Be sure elbows (A) and (C) are aligned with the chalk marks on the pump.**



3. Mount condenser bracket and fuel pump (B) to plate. Using fingers, install two screws (D) and flat washers (E).
4. Install two new lockwashers (F) and nuts (G) to other side of mounting plate.
5. Using socket, tighten screws (D) while holding nuts (G) with 7/16 inch open end wrench.
6. Using 5/8 inch wrench, connect and tighten nut (H) to connect hose (J) to 45° elbow.
7. Using 9/16 inch wrench, connect and tighten nut (K) of tube (L) to 90° elbow.
8. Plug electrical connector (M) to harness (N).
9. Operate personnel heater (TM 9-2350-260-10).



End of Task

TA148144

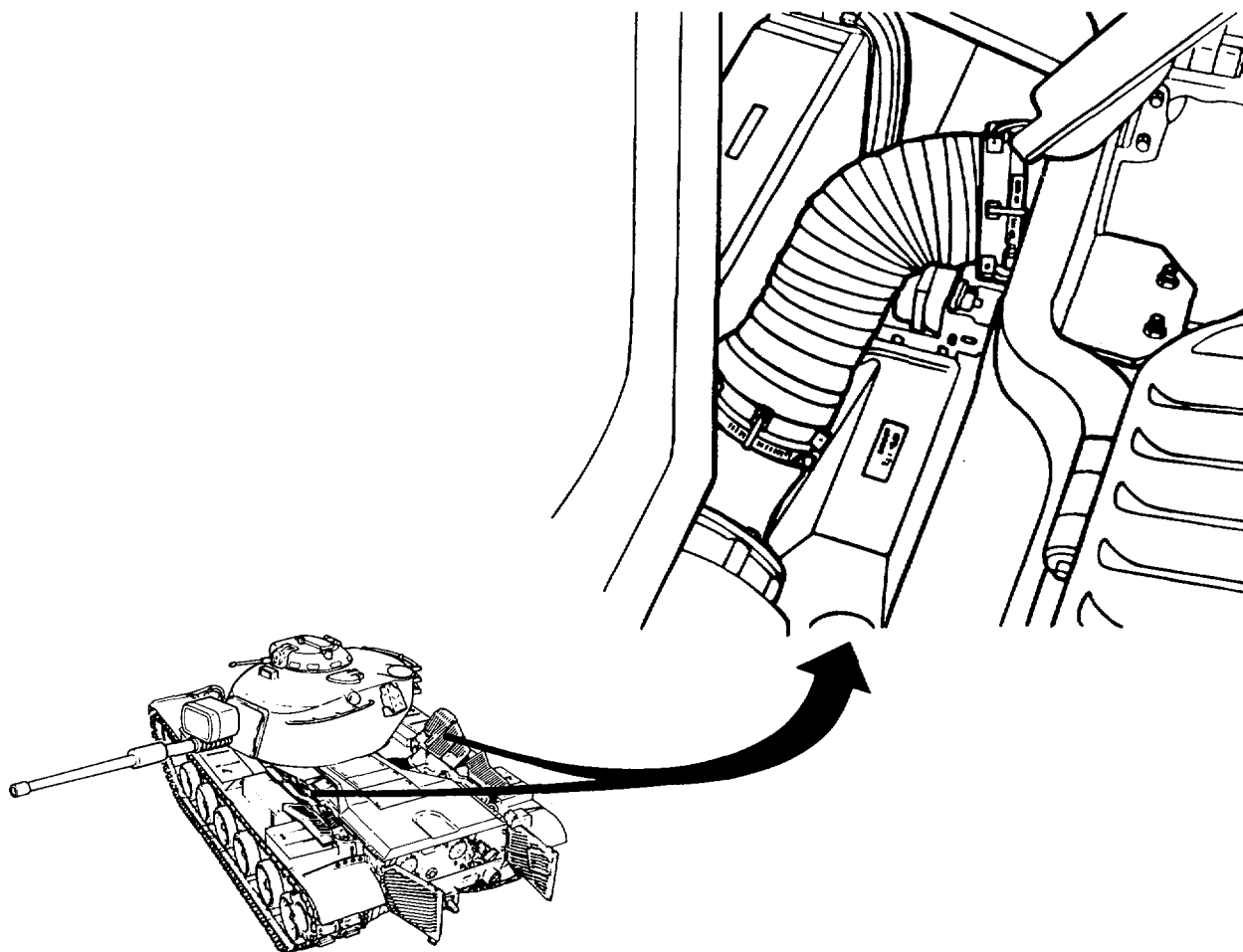
**AIR CLEANER TURBOCHARGER ELBOW REPLACEMENT (Sheet 1 of 3)**

**TOOLS:** Flat-tip screwdriver  
 1/2 in. socket with 1/2 in. drive  
 Ratchet with 1/2 in. drive  
 1/2 in. combination box and open end wrench  
 10 in. extension with 1/2 in. drive

**SUPPLIES:** Gasket (8762780)  
 Lockwasher (MS35338-45) (8 required)

**REFERENCE:** TM 9-2350-260-10

**PRELIMINARY PROCEDURES:** Traverse turret so gun tube is over left or right fender (TM 9-2350-260-10)  
 Open top deck grille doors (TM 9-2350-260-10)



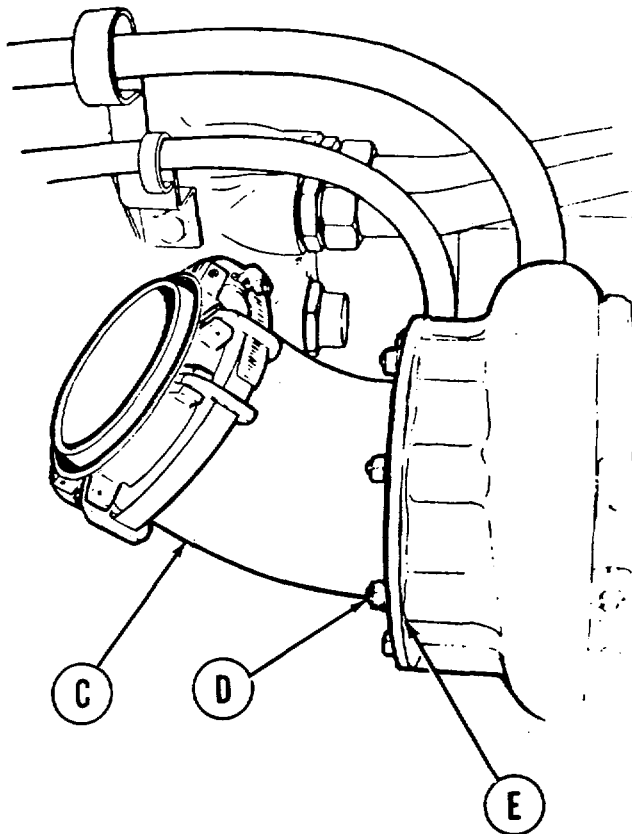
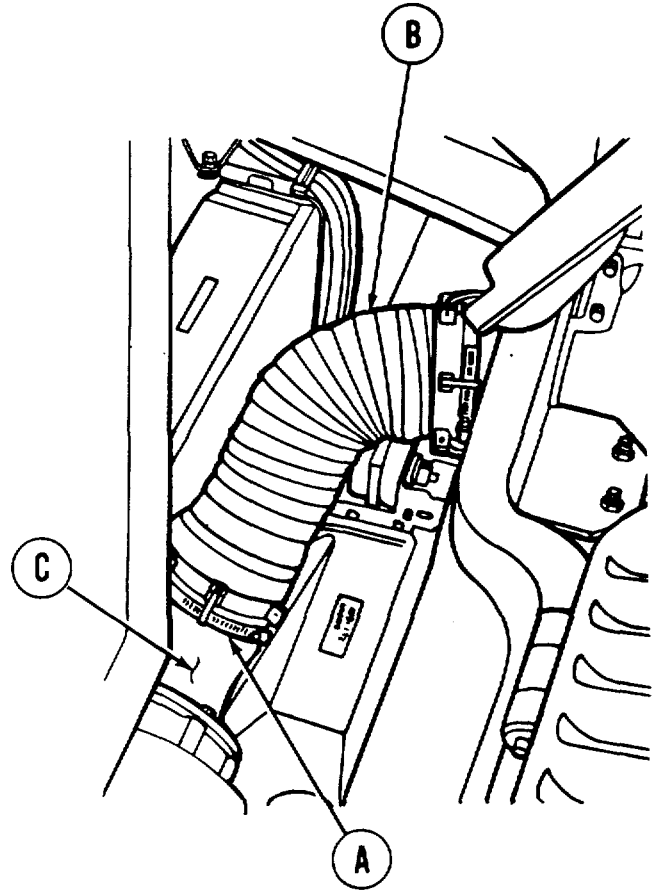
Go on to Sheet 2

TA148145

**AIR CLEANER TURBOCHARGER ELBOW REPLACEMENT (Sheet 2 of 3)**

**REMOVAL:**

1. Using screwdriver, loosen two clamp (A) securing hose (B) to turbocharger elbow (C).
2. Remove hose (B).



3. Using socket and wrench, remove eight nuts, lockwashers, and fiat washers (D) securing elbow (C) to turbocharger. Throw lockwashers away.
4. Remove elbow (C) and gasket (E). Throw gasket away.
5. Make sure elbow (C) and turbocharger inlet mating surfaces are not nicked, burred, or damaged. Make sure eight nut and studs are not stripped or damaged.

Go on to Sheet 3

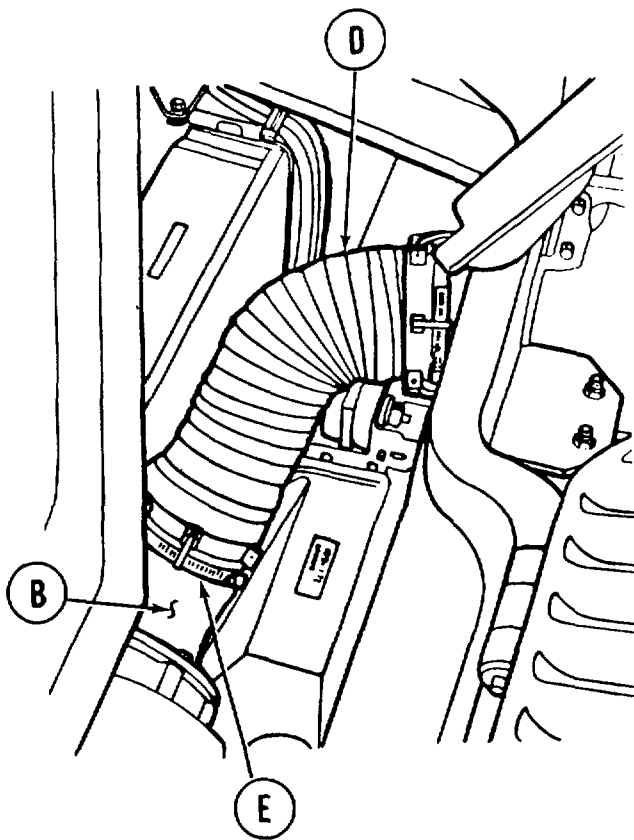
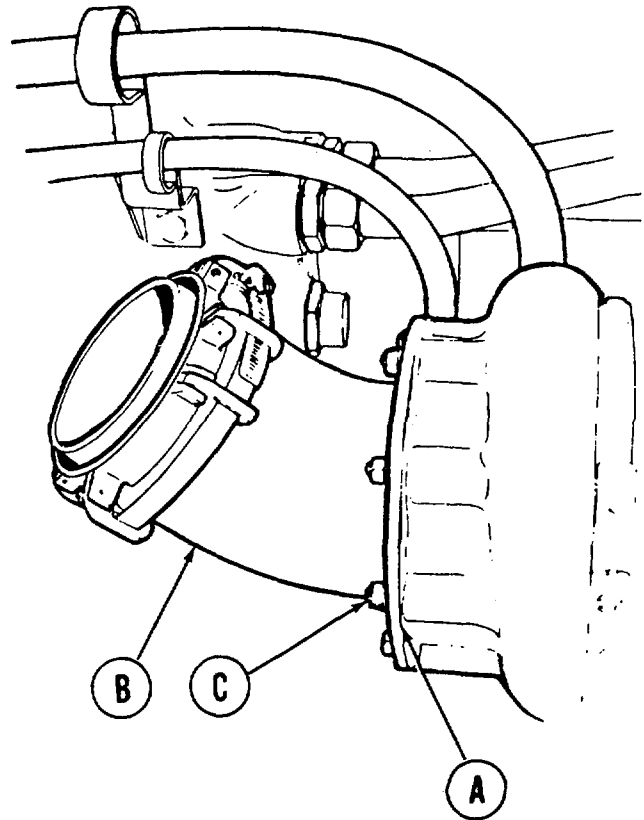
TA148146



**AIR CLEANER TURBOCHARGER ELBOW REPLACEMENT (Sheet 3 of 3)**

**INSTALLATION:**

1. Position new gasket (A) onto studs of turbocharger.
2. Position elbow (B) onto stud of turbocharger.
3. Install eight flat washers, new lockwashers, and nut (C) onto studs to secure elbow (B).
4. Using socket and wrench, tighten nut (C).



5. Install hose (D).
6. Using screwdriver, tighten two clamps (E) to secure hose to elbow.

**NOTE**

**Make sure fingers of clamp (E) grip lip of elbow.**

7. Close top deck grille doors (TM 9-2350-260-10).

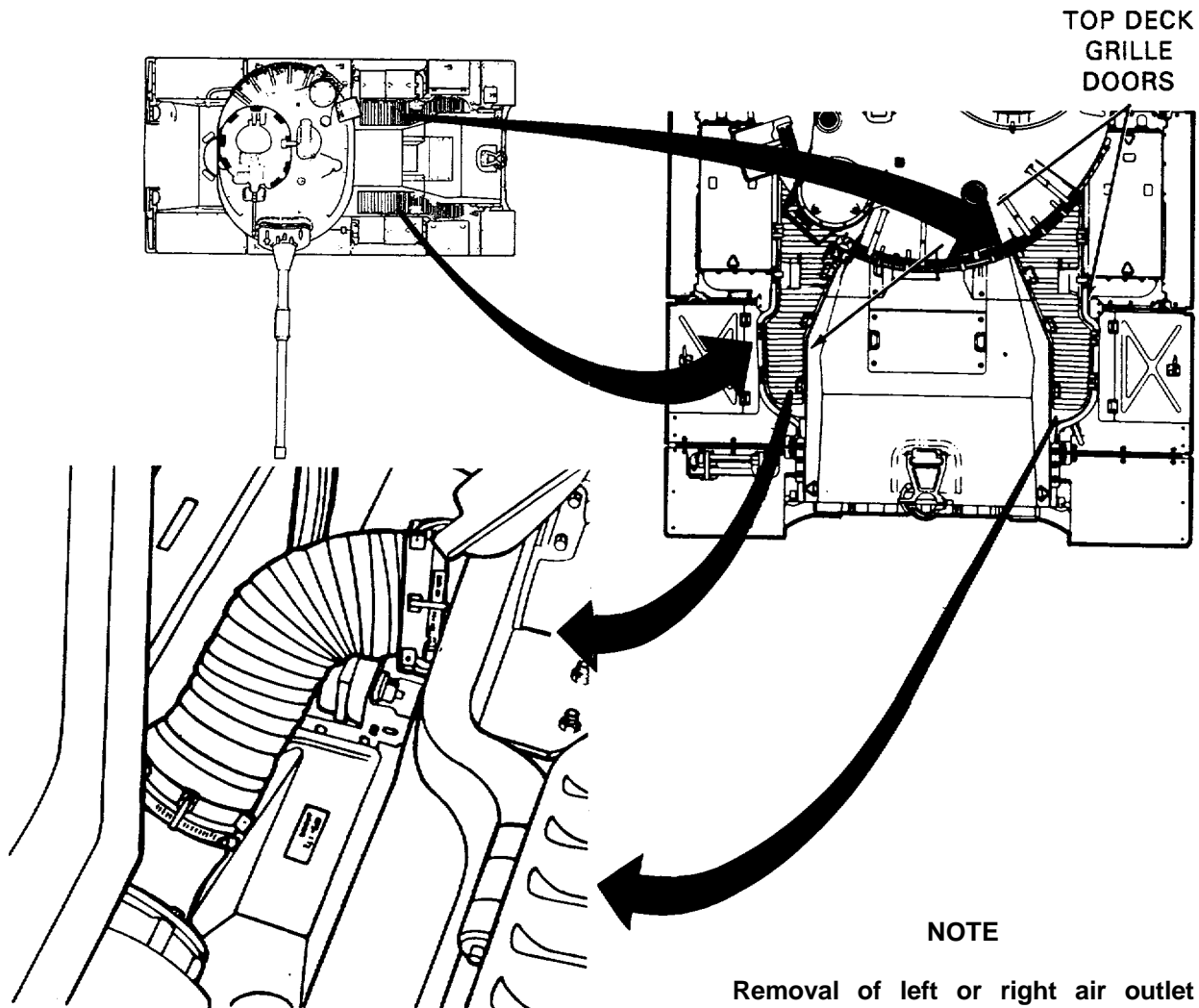
**AIR CLEANER OUTLET HOSE REPLACEMENT (Sheet 1 of 3)**

**TOOLS:** Flat-tip screwdriver  
 1/8 in. drive punch  
 Hammer  
 Long round nose pliers

**SUPPLIES:** Preformed packing (10870861) (2 required)  
 Adhesive (Item 4, Appendix D)

**REFERENCE:** TM 9-2350-260-10

**PRELIMINARY PROCEDURES:** Open top deck grille doors (TM 9-2350-260-10)  
 Traverse turret so main gun is centered over left or right fender (TM 9-2350-260-10)

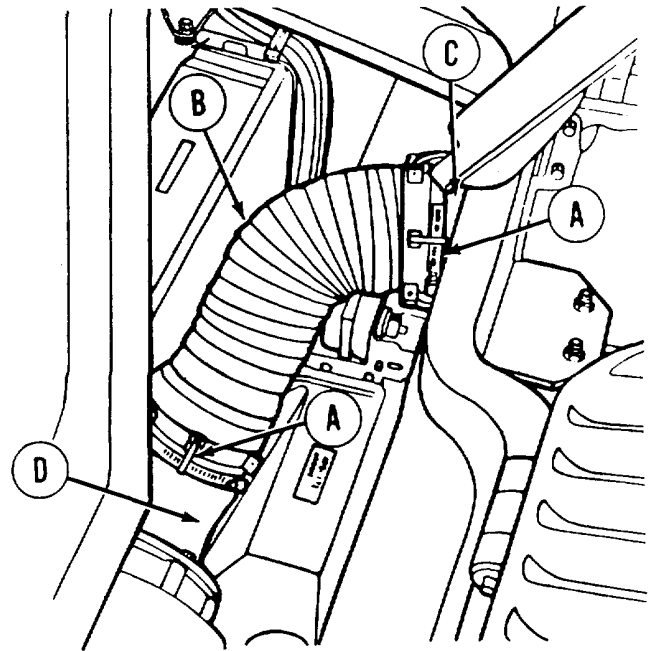


**NOTE**  
 Removal of left or right air outlet hose is same. Right side shown.

**AIR CLEANER OUTLET HOSE REPLACEMENT (Sheet 2 of 3)**

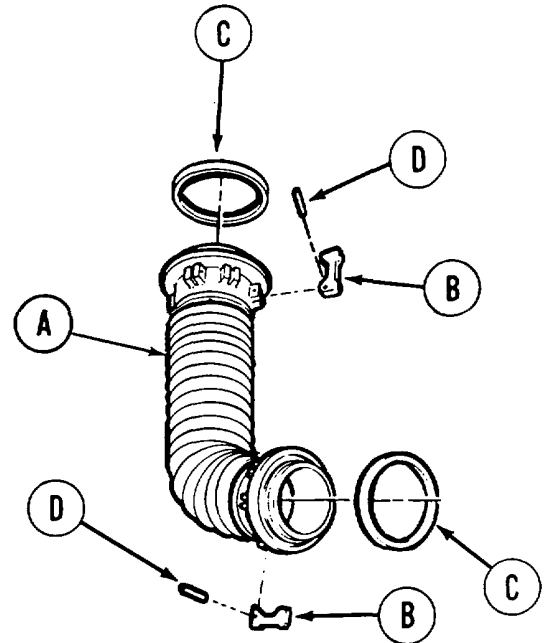
**REMOVAL:**

1. Using screwdriver, loosen two clamps (A).
2. Disconnect hose assembly (B) from outlet elbow (C) of air cleaner and elbow (D) of turbocharger.
3. Remove hose assembly (B).
4. Using screwdriver, unscrew clamps (A) and (E) and remove from hose assembly.



**INSPECTION AND REPAIR:**

1. Inspect hose assembly (A) for damaged or defective parts. If hose or flange is unserviceable, replace complete hose assembly (A). If fingers (B) or preformed packing (C) are defective, replace.
2. Using punch and hammer, drive out pins (D) to replace defective fingers (B).
3. Position new finger (B) to hose assembly (A). Using pliers, install pin (D) to secure finger (B) to hose assembly. Using hammer, tap pin (D) in.
4. Throw defective preformed packing (C) away.
5. Apply adhesive (Item 4, Appendix D) in groove of flange of hose assembly (A) and install new preformed packing (C).

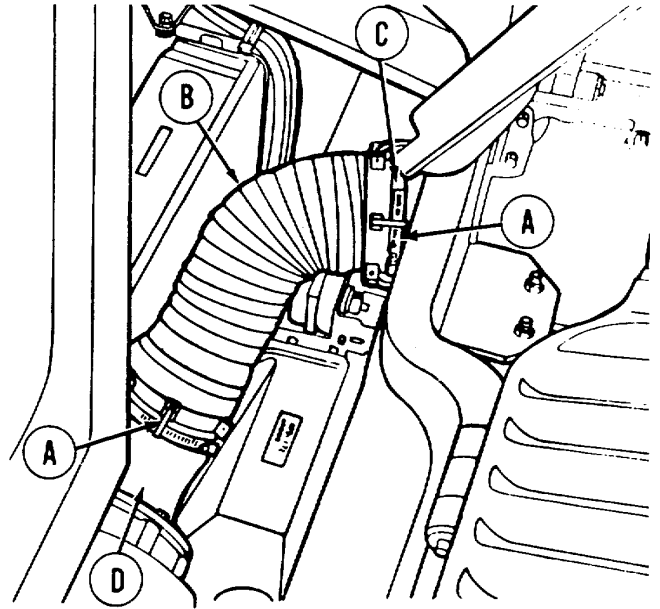


Go on to Sheet 3

TA148149

**AIR CLEANER OUTLET HOSE REPLACEMENT (Sheet 3 of 3)****INSTALLATION:**

1. Thread clamps (A) through slot in fingers.
2. Position one end of hose assembly (B) onto outlet elbow (C) of air cleaner and other end over elbow (D) of turbocharger.
3. Make sure that fingers of hose assembly grip lip of elbows. Using screwdriver, tighten clamps (A).
4. Close top deck grille doors (TM 9-2350260-10).



End of Task

TA148150

**AIR CLEANER OUTLET ELBOW REPLACEMENT (Sheet 1 of 2)**

**TOOLS:** 9/16 in. socket with 1/2 in. drive  
 Ratchet with 1/2 in. drive  
 10 in. extension with 1/2 in. drive  
 Prybar  
 9/16 in. combination box and open end wrench  
 Universal joint with 1/2 in. drive

**SUPPLIES:** Gasket (8762774)  
 Self-locking nuts (MS21044N6) (14 required)

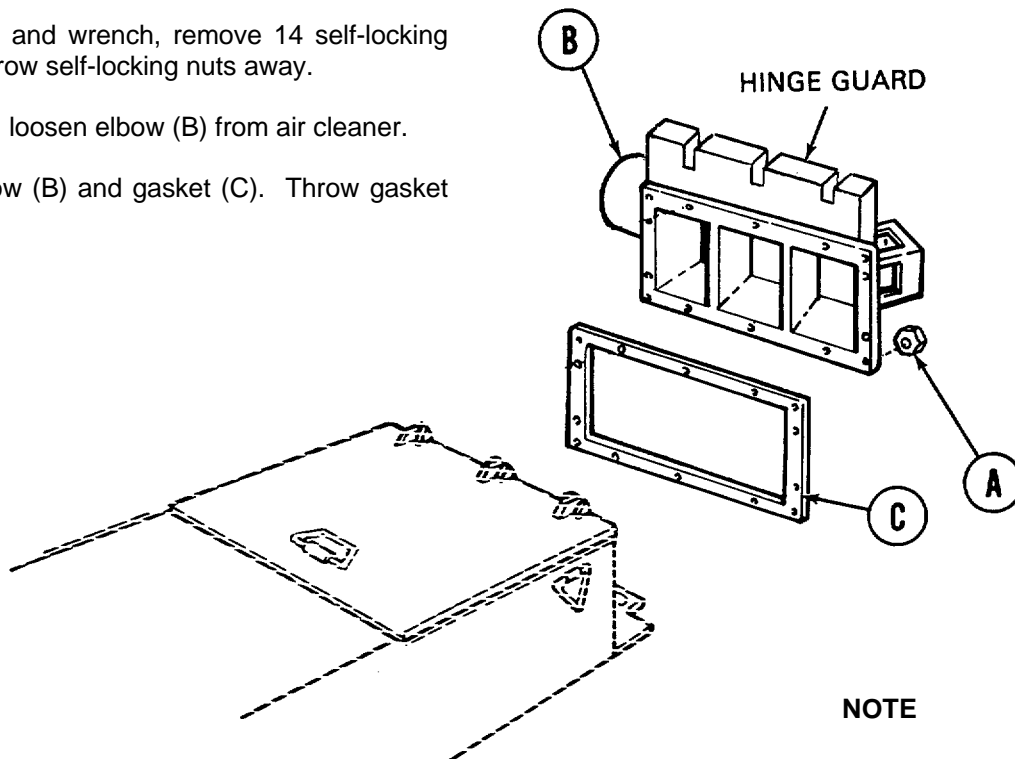
**PRELIMINARY PROCEDURES:** Remove air cleaner (page 7-88 or 7-94)  
 Remove restriction indicator (page 7-78)

**NOTE**

**Removal of left or right outlet elbow from side loading air cleaners and top loading aluminum and armored air cleaners is the same. Left side shown.**

**REMOVAL:**

1. Using socket and wrench, remove 14 self-locking nuts (A). Throw self-locking nuts away.
2. Using prybar, loosen elbow (B) from air cleaner.
3. Remove elbow (B) and gasket (C). Throw gasket away.

**NOTE**

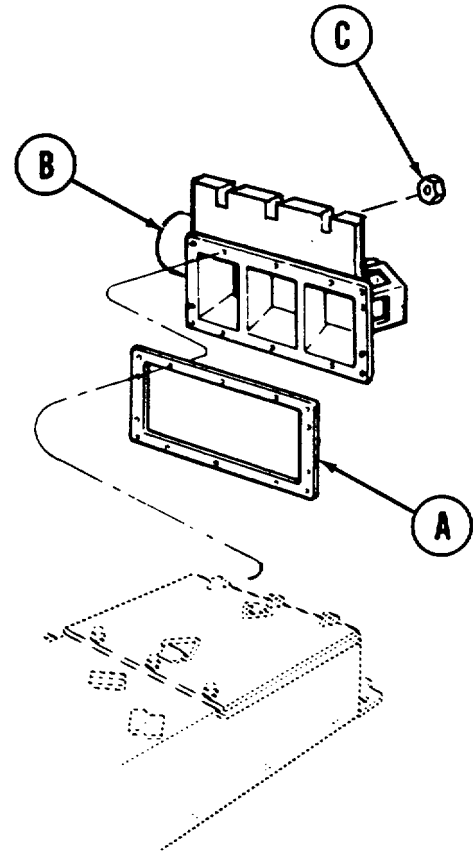
**Some air cleaners may be equipped with hinge guard. Removal is the same.**

Go on to Sheet 2

TA148151

**AIR CLEANER OUTLET ELBOW REPLACEMENT (Sheet 2 of 2)****INSTALLATION:**

1. Position new gasket (A) and elbow (B) onto studs on air cleaner.
2. Install 14 new self-locking nuts (C) to secure elbow (B).
3. Using socket and wrench, tighten nut (C).
4. Install restriction indicator (page 7-78).
5. Install air cleaner (page 7-90 or 77).

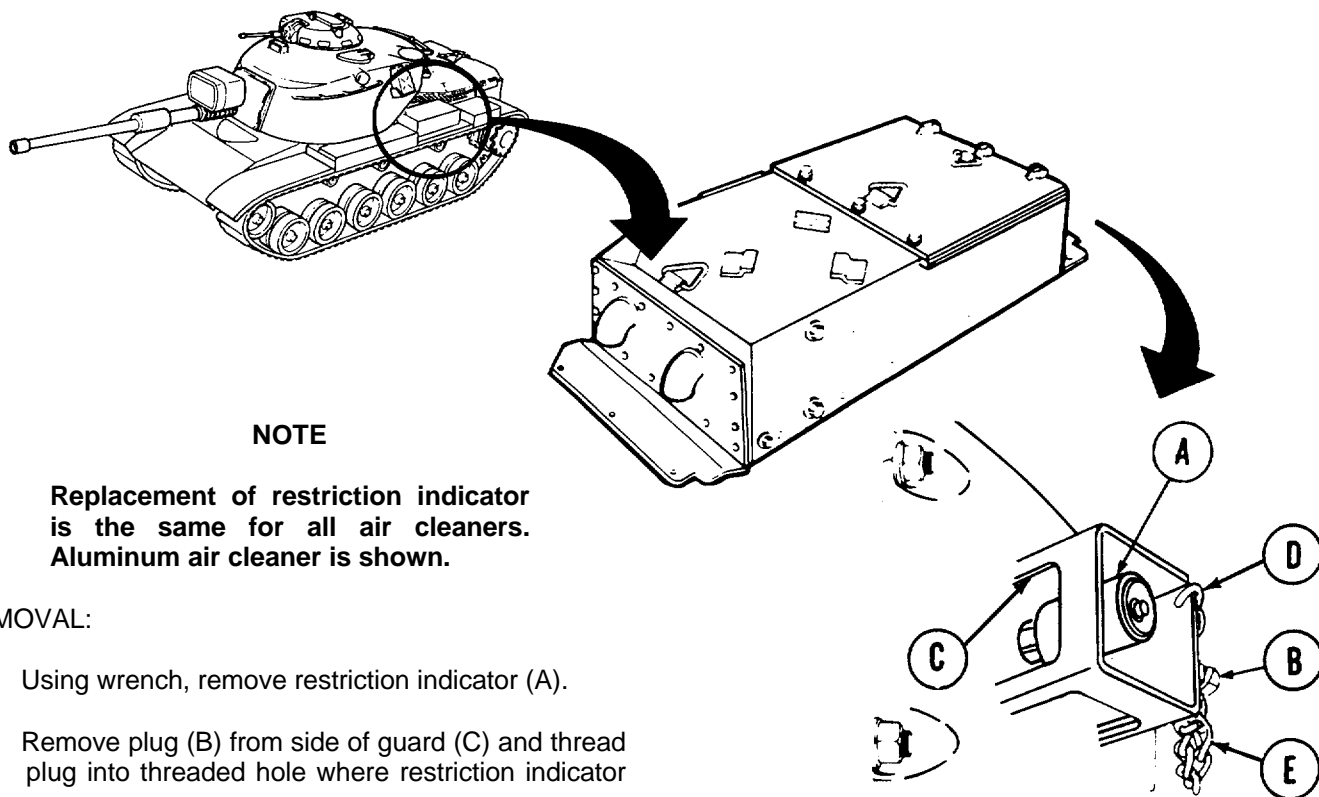


End of Task

TA148152

**AIR CLEANER (LEFT AND RIGHT) RESTRICTION INDICATOR REPLACEMENT (Sheet 1 of 1)**

TOOLS: 7/16 in. combination box and open end wrench  
Slip joint pliers

**NOTE**

Replacement of restriction indicator is the same for all air cleaners. Aluminum air cleaner is shown.

**REMOVAL:**

1. Using wrench, remove restriction indicator (A).
2. Remove plug (B) from side of guard (C) and thread plug into threaded hole where restriction indicator was.
3. Using pliers, open hooks (D) and replace hooks (D), chain (E), or plug (B), as necessary.

**INSTALLATION:**

1. Remove plug (B) from restriction indicator mounting hole.
2. Install restriction indicator (A). Using wrench, tighten restriction indicator.
3. Thread plug (B) into threaded hole on side of guard (C).

End of Task

TA148158

**AIR CLEANER INTAKE ELBOW REPLACEMENT (Sheet 1 of 3)**

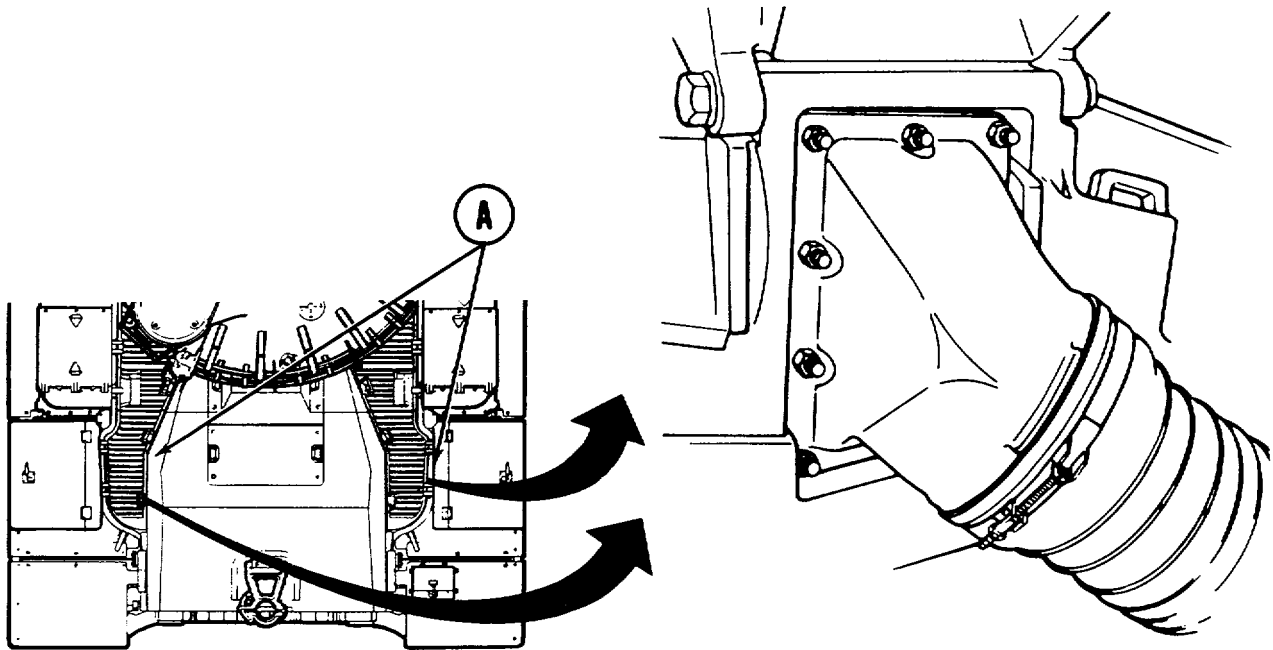
**TOOLS:** 3/8 in. combination open and box end wrench  
9/16 in. socket with 1/2 in. drive  
10 in. extension with 1/2 in. drive  
Ratchet with 1/2 in. drive  
9/16 in. combination open and box end wrench  
Universal joint with 1/2 in. drive  
Prybar

**SUPPLIES:** Gasket (8762775)  
Rags (Item 65, Appendix D)  
Self-locking nuts (MS21044-N6) (10 required)

**REFERENCE:** TM 9-2350-260-10

**REMOVAL:**

1. Open top deck grille doors (A) (TM 9-2350.260-10).



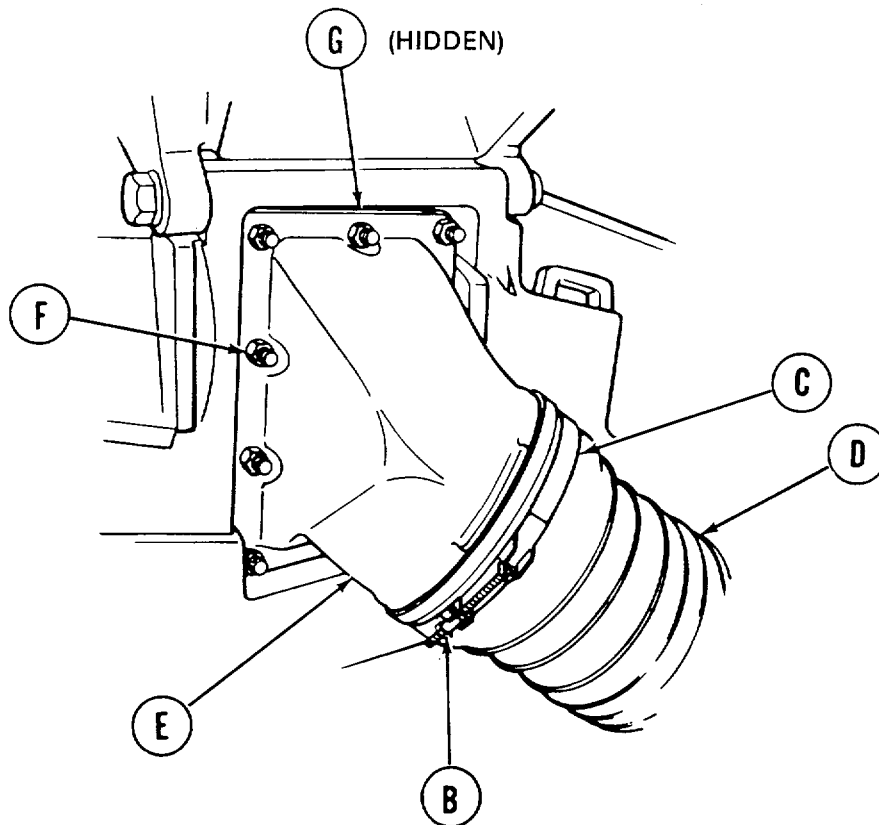
Go on to Sheet 2

TA148154



**AIR CLEANER INTAKE ELBOW REPLACEMENT (Sheet 2 of 3)**

2. Using 3/8 inch wrench, loosen clamp nut (B).
3. Slide clamp (C) down over hose (D).
4. Disconnect hose (D) from elbow (E).
5. Using socket, universal joint and 9/16 inch wrench, as necessary, remove ten self-locking nuts (F) securing elbow (E). Throw self-locking nuts away.



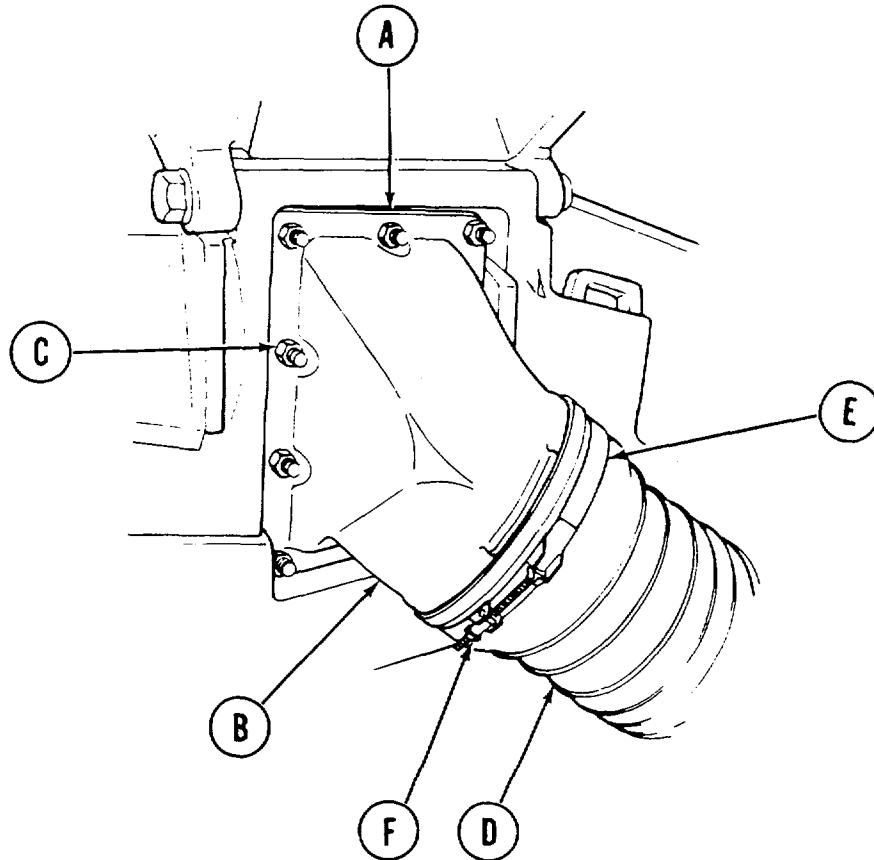
6. Using prybar, pry elbow (E) away from air cleaner.
7. Remove elbow (E) off studs of air cleaner.
8. Remove gasket (G) from studs of air cleaner. Throw gasket away.

Go on to Sheet 3

TA148155

**AIR CLEANER INTAKE ELBOW REPLACEMENT(Sheet 3 of 3)****INSTALLATION:**

1. Position new gasket (A) onto studs of air cleaner.
2. Install elbow (B) onto studs of air cleaner.
3. Install ten new self-locking nuts (C) onto studs to secure elbow (B) to air cleaner.



4. Using socket or 9/16 inch wrench, tighten ten nut (C).
5. Install hose (D) onto elbow (B).
6. Slide clamp (E) up over hose (D) and onto elbow (B).
7. Using 3/8 inch wrench, tighten clamp nut (F) to secure clamp (E).
8. Close top deck grille doors (TM 9-2350-260-10).

End of Task

TA148156

**AIR CLEANER INTAKE AND HOSE REPLACEMENT (Sheet 1 of 5)**

PROCEDURE INDEX

PROCEDURE	PAGE
Removal	7-83
Installation	7-85

TOOLS: 9/16 in. socket with 1/2 in. drive  
 Ratchet with 1/2 in. drive  
 5 in. extension with 1/2 in. drive  
 1/2 in. socket with 1/2 in. drive  
 Flat-tip screwdriver  
 Putty knife  
 3/8 in. combination box and open end wrench  
 Universal joint with 1/2 in. drive

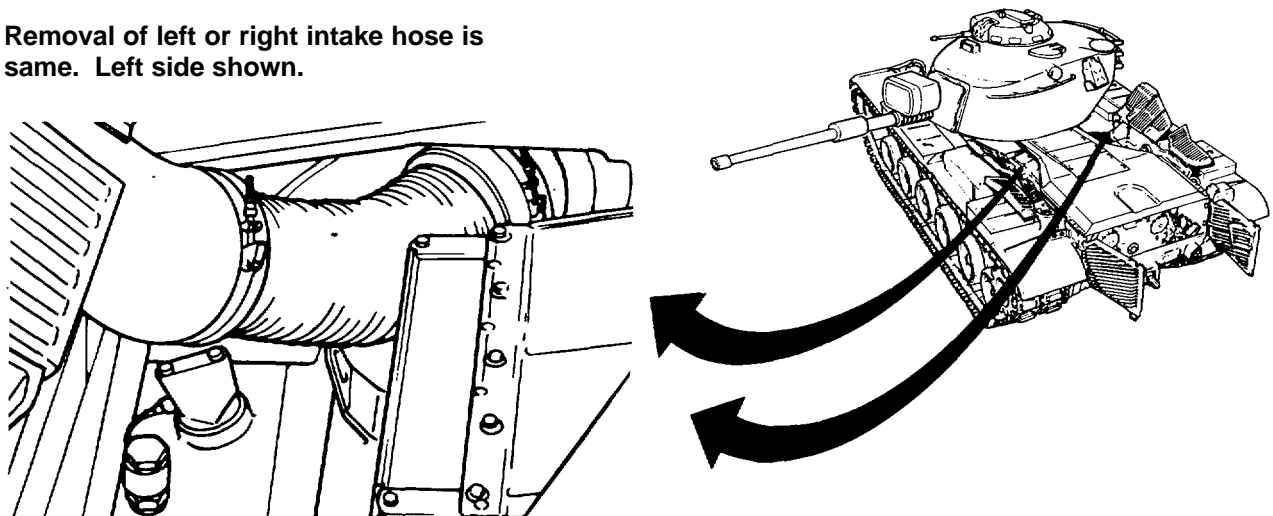
SUPPLIES: Gasket (11591585) (2 required)  
 Gasket (8762871)  
 Gasket (10863870)  
 Adhesive (Item 2, Appendix D)  
 Rags  
 Lockwasher (MS35333-41) (4 required)  
 Lockwasher (MS35338-46) (14 required)  
 Screws (MS90725-32) (4 required) (Early M60 only)

REFERENCE: TM 9-2350-260-10

PRELIMINARY PROCEDURES: Traverse turret so gun tube points over left or right side of tank (TM 9-2350-260-10)  
 Open top deck grille doors (TM 9-2350-260-10)

**NOTE**

Removal of left or right intake hose is same. Left side shown.



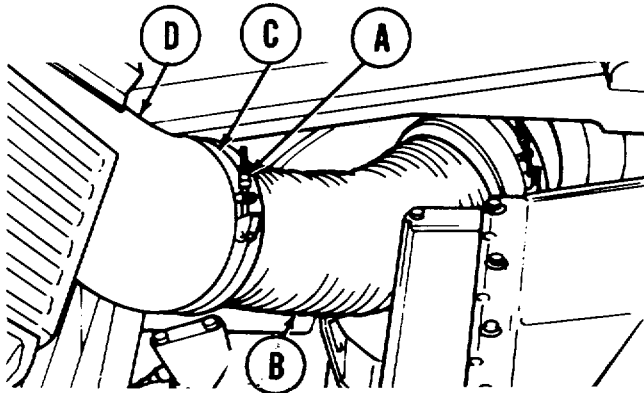
Go on to Sheet 2

TA148157

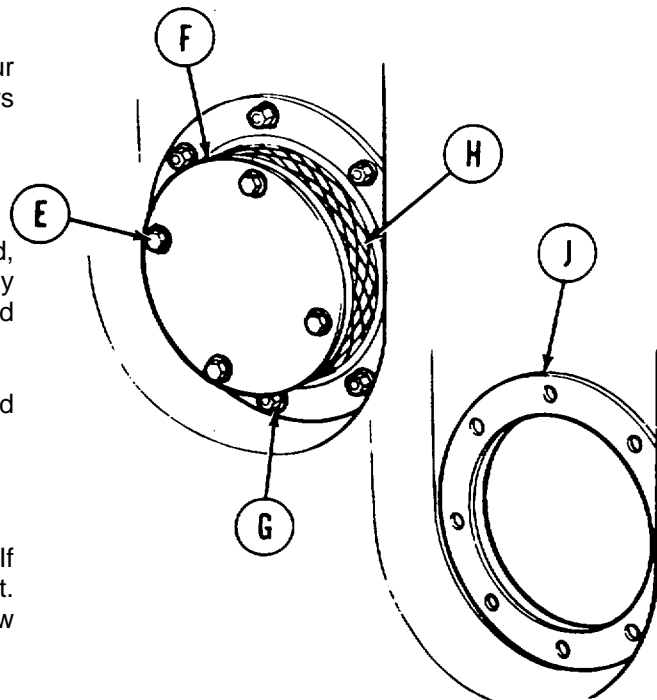
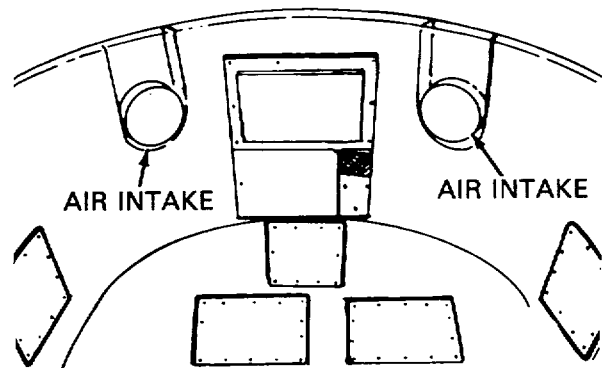
**AIR CLEANER INTAKE AND HOSE REPLACEMENT (Sheet 2 of 5)**

**REMOVAL:**

1. Using wrench, loosen clamp nut (A) at end of intake hose (B).
2. Slide clamp (C) over intake hose (B) to middle of hose.
3. Using screwdriver, pry hose (B) from elbow (D) and remove clamp (C).



4. Close grille door and go inside turret.
5. Traverse turret to gain access to air intake.
6. (Early M60). Using 1/2 inch socket remove four assembled screws and washers (E). Throw screws away.
7. (Late M60). Using 1/2 inch socket, remove four screws and lockwashers (E). Throw lockwashers away.
8. Remove cover and gasket (F).
9. Inspect gasket cemented to cover (F). If damaged, use putty knife and remove gasket. Apply adhesive (Item 2, Appendix D) to new gasket and portion onto cover.
10. Using 9/16 inch socket, remove eight nut and lockwashers (G). Throw lockwashers away.
11. Remove air intake flange assembly (H) and hose.
12. Inspect gasket (J) cemented to bulkhead. If damaged, use putty knife and remove gasket. Apply adhesive (Item 2, Appendix D) to new gasket (J) and position on bulkhead.

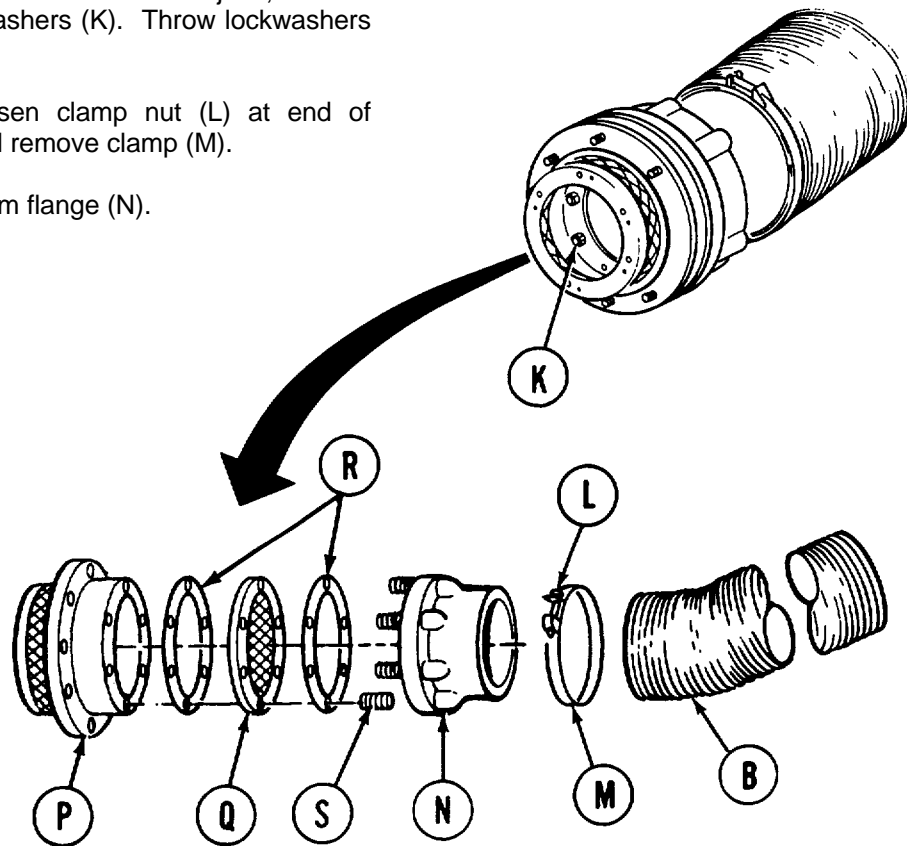


Go on to Sheet 3

TA148158

**AIR CLEANER INTAKE AND HOSE REPLACEMENT (Sheet 3 of 5)**

13. Using 9/16 inch socket and universal joint, remove six nuts and lockwashers (K). Throw lockwashers away.
14. Using wrench, loosen clamp nut (L) at end of intake hose (B) and remove clamp (M).
15. Remove hose (B) from flange (N).



16. Separate intake (P) and screen (Q) with gaskets (R) from flange (N).
17. Clean and inspect screen and gaskets. If screen is damaged or defective, replace.
18. If one or both gaskets (R) are damaged, scrape gaskets (R) from screen (Q). Apply adhesive (Item 2, Appendix D) to new gasket and position onto screen.
19. Inspect and replace studs (S) in flange (N) as necessary.

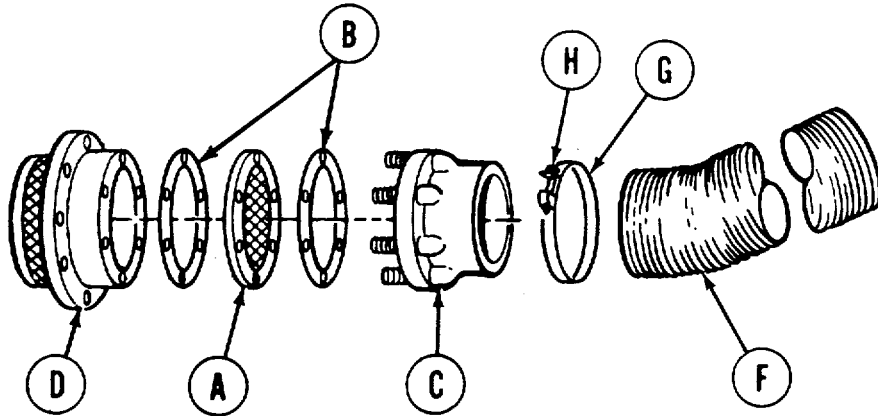
Go on to Sheet 4

TA148159

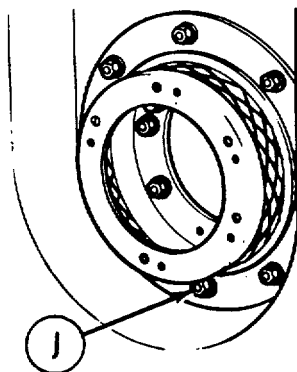
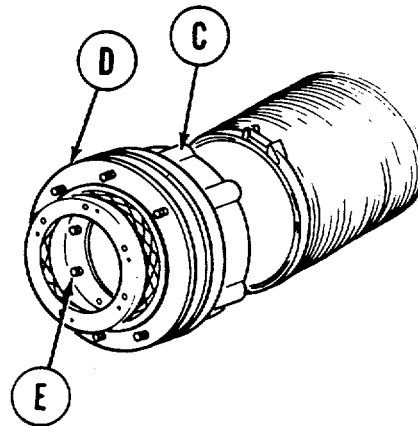
**AIR CLEANER INTAKE AND HOSE REPLACEMENT (Sheet 4 of 5)**

**INSTALLATION:**

1. Position screen (A) with gaskets (B) over studs onto flange (C).
2. Position intake (D) over studs onto flange (C).



3. Install six nuts and new lockwashers (E) to secure intake (D), screen (A), and flange (C). Using 9/16 inch socket and universal joint, tighten nuts (E).
4. Position hose (F) and clamp (G) onto flange (C), and, using 3/8 inch wrench, tighten nut (H) on clamp (G) securing hose (F) to flange (C).
5. Position intake (D) and flange (C) assembly (assembled in steps 1 through 4) with flange (C) toward engine, over studs on bulkhead.
6. Install eight new lockwashers and nuts (J) to secure intake and flange assembly to bulkhead. Using 9/16 inch socket, tighten nuts (J).

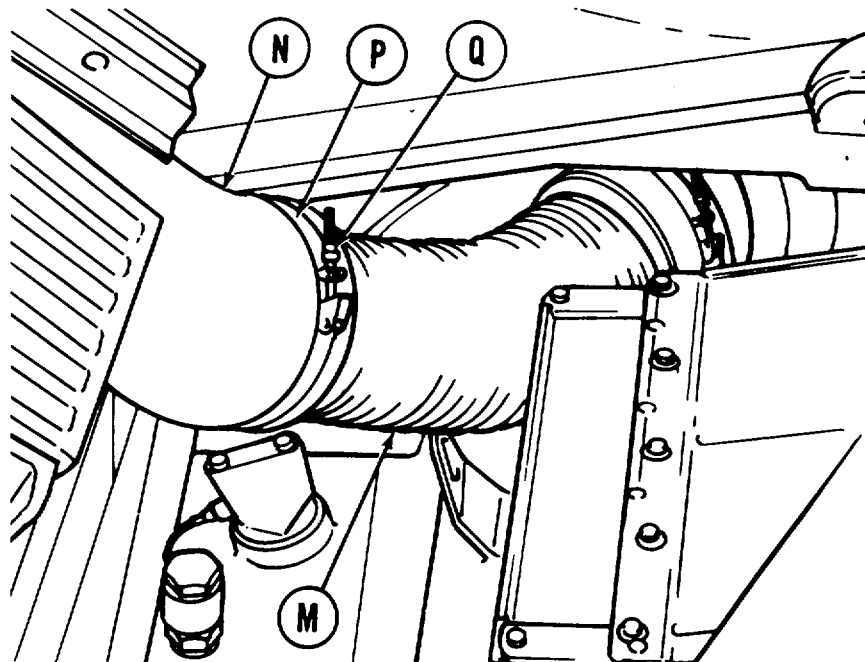
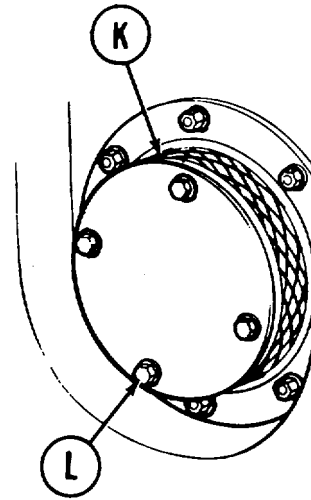


Go on to Sheet 5

TA148160

**AIR CLEANER INTAKE AND HOSE REPLACEMENT (Sheet 5 of 5)**

7. Position cover and gasket (K) onto intake.
8. Install four screws and new lockwashers (L) to secure cover and gasket (K) to intake. Using 1/2 inch socket, tighten screws (L).
9. Traverse turret so gun tube points over left or right side of tank. Open top deck grille doors (TM 9-2350-260-10).
10. Install hose (M) on elbow (N).
11. Position clamp (P) onto edge of hose. Using wrench, tighten clamp nut (Q) securing hose (M) to elbow (N).
12. Close top deck grille doors (TM 9-2350-260-10).



End of Task

TA148161

**AIR CLEANER REPLACEMENT (SIDE LOADING) (Sheet 1 of 6)**

PROCEDURE INDEX

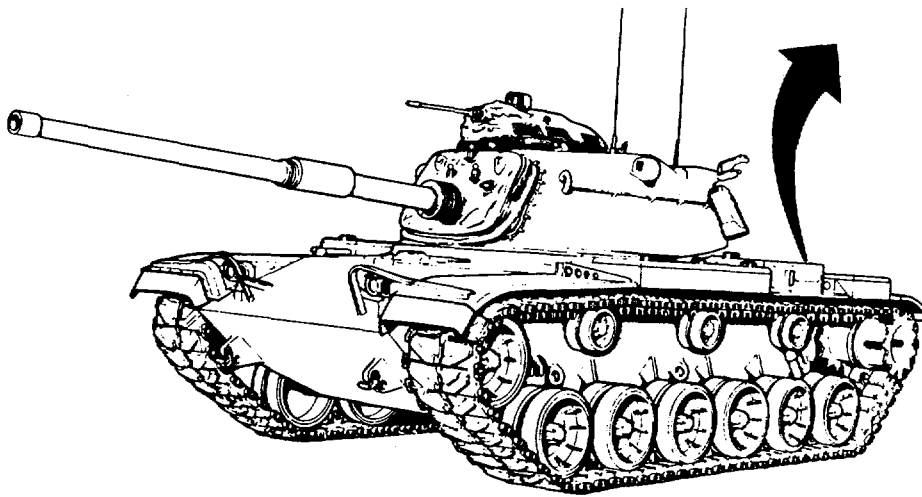
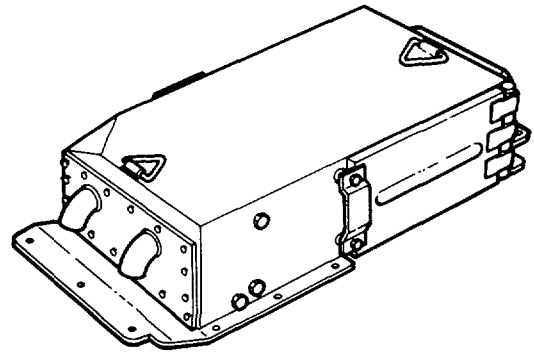
PROCEDURE	PAGE
Removal	7-88
Installation	7-90

TOOLS: 7/16 in. combination box and open end wrench  
 Flat-tip screwdriver  
 9/16 in. combination box and open end wrench  
 9/16 in. socket with 1/2 in. drive  
 Ratchet with 1/2 in. drive  
 10 in. extension with 1/2 in. drive  
 Hoist-capable of lifting 500 lbs.  
 Chain hoist  
 Two-point sling

SUPPLIES: Silicone compound (Item 32, Appendix D)  
 Cover (for turbocharger hose)  
 Lockwire (Item 59, Appendix D)  
 Self-locking nuts (MS51988-7) (2 required)  
 Lockwasher (M353846)  
 Self-locking bolts (MS35763-831) (4 required)

PERSONNEL: Three

REFERENCE: TM 9-2350-260-10

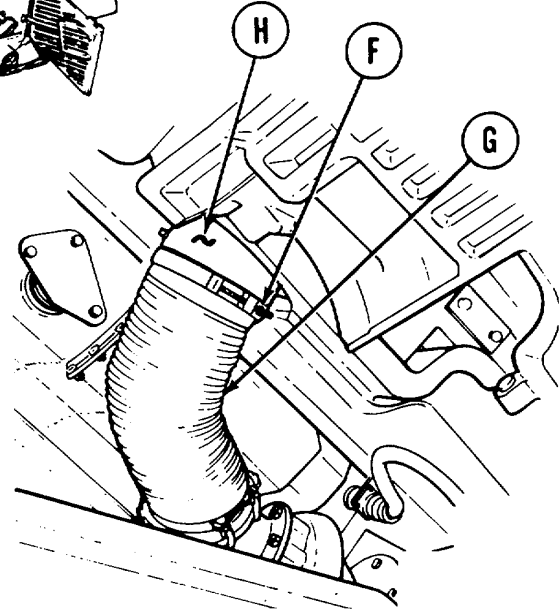
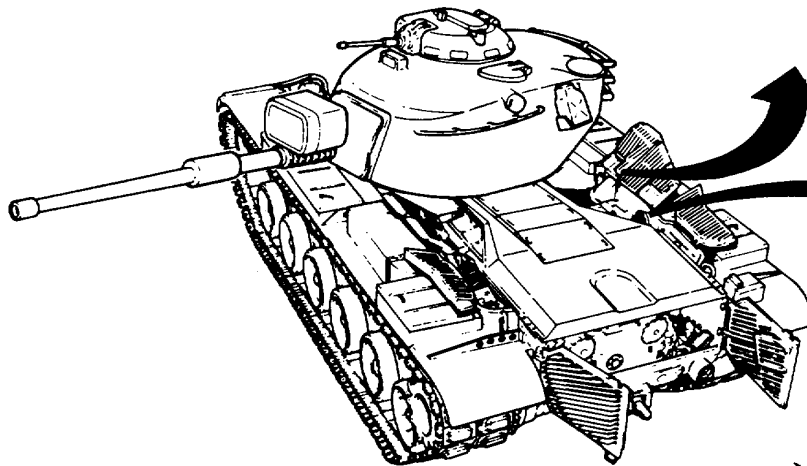
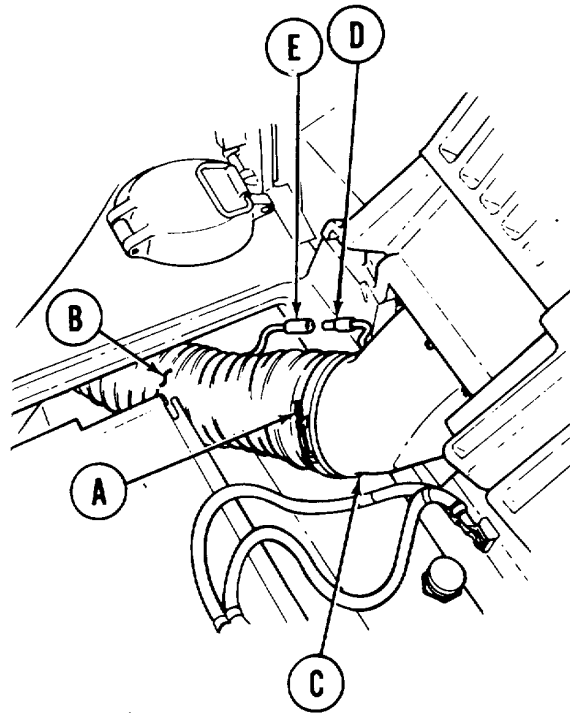




**AIR CLEANER REPLACEMENT (SIDE LOADING) (Sheet 2 of 6)****REMOVAL:****NOTE**

**Left and right side replacement procedures are identical. Right side shown.**

1. Open top deck grille doors (TM 9-2350-260-10).
2. Using 7/16 inch wrench, loosen clamp (A) nut securing inlet hose (B) to elbow (C).
3. Separate hose (B) far enough from inlet elbow (C) to allow air cleaner to be removed without pulling hose.
4. Pull air cleaner electrical lead (D) from harness connector (E).



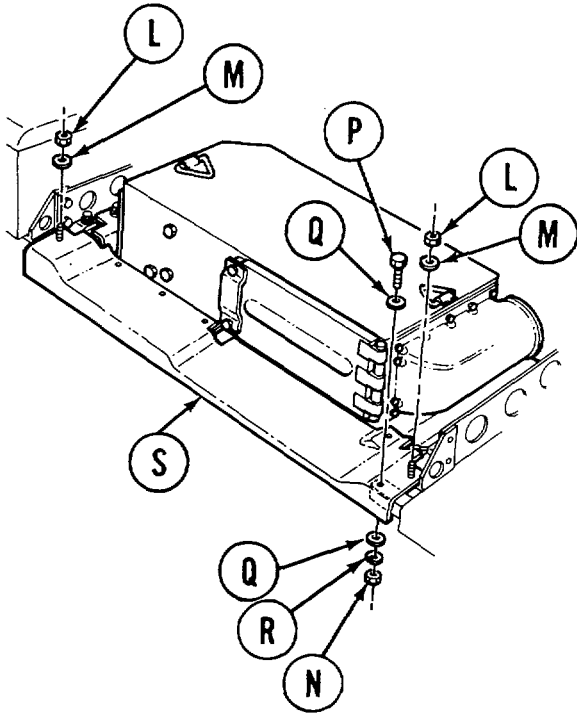
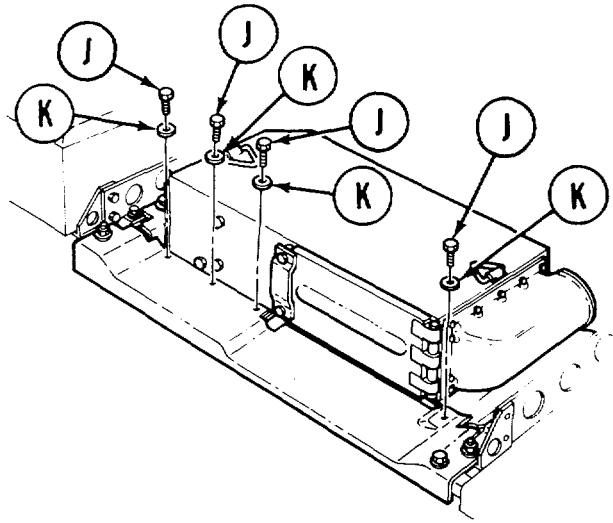
5. Using 7/16 inch wrench, loosen clamp (F) securing air cleaner outlet hose (G) to elbow (H).
6. Disconnect hose from air cleaner elbow (H). Cover hose (G) opening. Close top deck grille door (TM 9-2350-260-10).

Go on to Sheet 3

TA148163

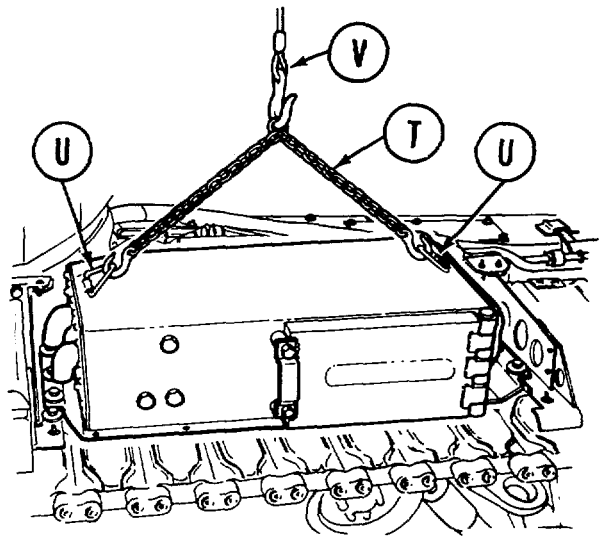
**AIR CLEANER REPLACEMENT (SIDE LOADING) (Sheet 3 of 6)**

- Using 9/16 inch socket and 9/16 inch wrench, remove four self-locking bolts (J) and washers (K). Throw self-locking bolts away.



- Using 9/16 inch socket, remove two self-locking nuts (L) and washers (M). Throw self-locking nuts away.
- Using 9/16 inch wrench to hold nut (N), use a 9/16 inch socket and remove screw (P), two flat washers (Q), lockwasher (R), and nut (N). Throw lockwasher away.
- Remove fender skirt (S).

- Attach two-point sling (T) to lifting eyes (U). Take up slack on sling (T) with hoist (V).



Go on to Sheet 4

TA148164

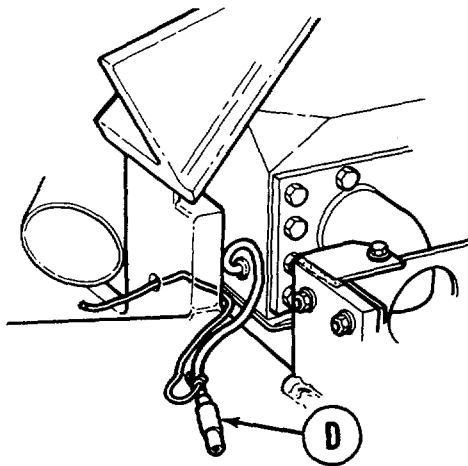
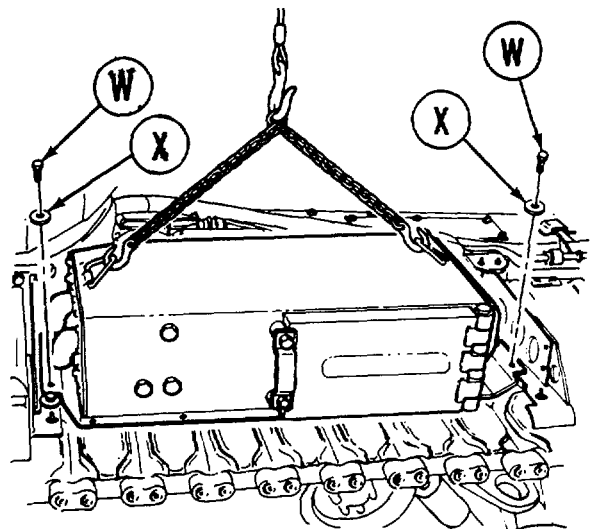
**AIR CLEANER REPLACEMENT (SIDE LOADING) (Sheet 4 of 6)**

- Using 9/16 inch socket and 10 inch extension, remove six screws (W) and flat washers (X).

**CAUTION**

**Be sure to guide electrical lead out of hole in hull when removing air cleaner.**

- Using one person to operate hoist, have two people guide air cleaner and lift it off tank.
- Remove air cleaner outlet elbow (page 7-76).
- Remove air cleaner inlet elbow (page 7-79).



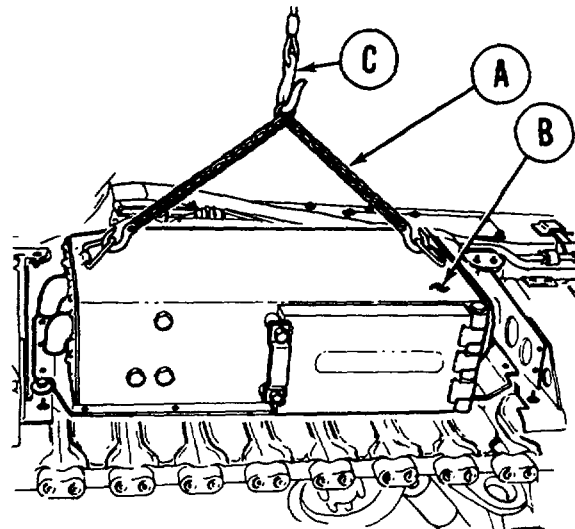
- Open grille doors (TM 9-2350-260-10).
- Attach lockwire (Item 59, Appendix D) to electrical lead (D) of air cleaner. Thread lockwire through hole in hull and pull wire and electrical lead (D) through hole as two people position air cleaner onto mounting.
- Close grille doors after air cleaner is positioned.

**INSTALLATION:**

**NOTE**

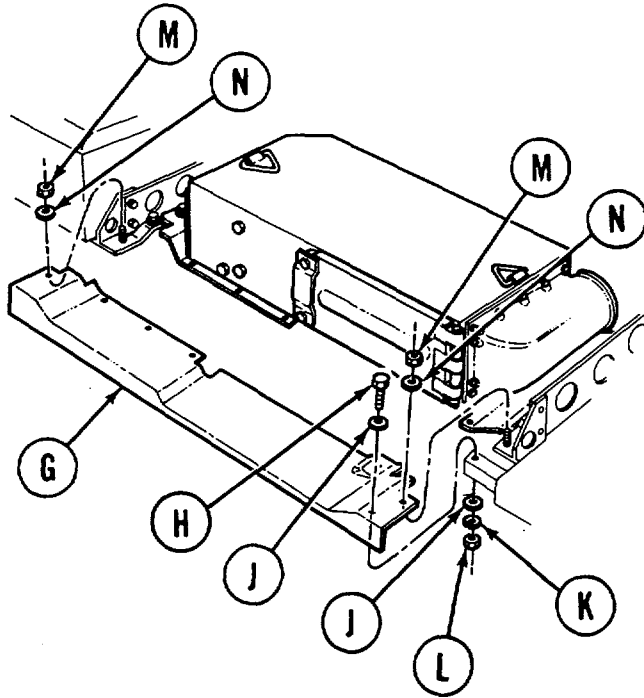
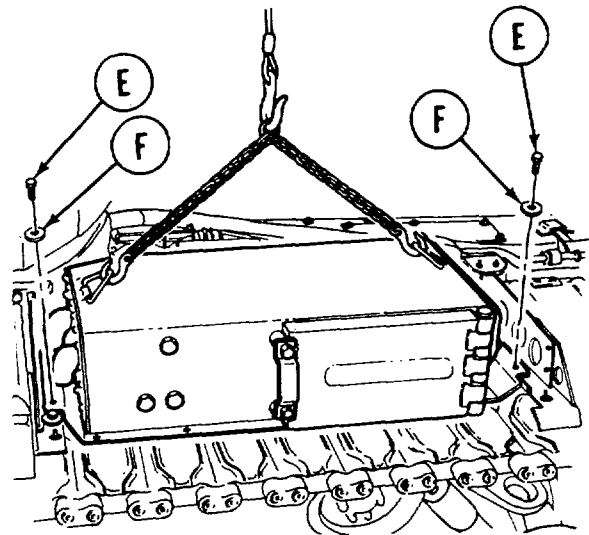
**Clean mounting area before installing air cleaner.**

- Install air cleaner outlet elbow (page 7-77).
- Install air cleaner inlet elbow (page 7-81).
- Attach a two-point sling (A) to air cleaner (B) and hoist (C).



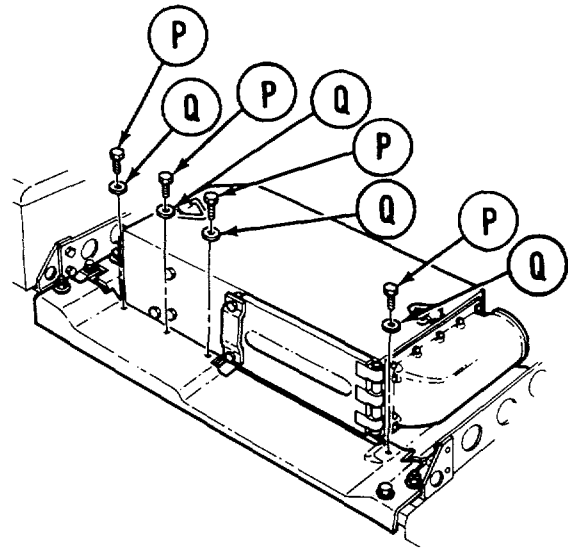
**AIR CLEANER REPLACEMENT (SIDE LOADING) (Sheet 5 of 6)**

7. Using 9/16 inch socket and 10 inch extension, install six screws (E) and fiat washers (F).
8. Remove sling from air cleaner.



9. Position fender skirt (G) to support
10. Using 9/16 inch wrench and 9/16 inch socket, install screw (H), two flat washers (J), new lockwasher (K) and nut (L).
11. Using 9/16 inch socket, install two new self-locking nuts (M) and washers (N).

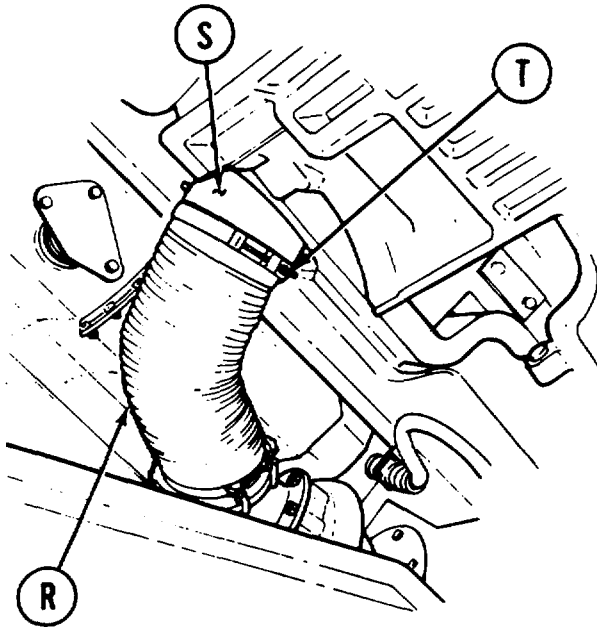
12. Using 9/16 inch socket, install four new self-locking bolts (P) and washers (Q).
13. Using 9/16 inch socket, tighten screws (H) and (P) and nuts (M).



Go on to Sheet 6

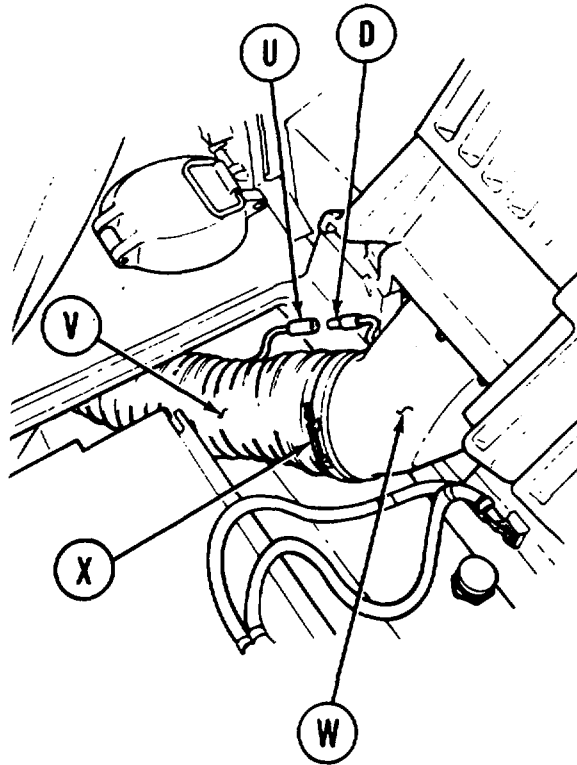
TA148166

**AIR CLEANER REPLACEMENT (SIDE LOADING) (Sheet 6 of 6)**



14. Open grille doors (TM 9-2350-260-10) and remove cover from hose (R) opening.
15. Connect outlet hose (R) from turbocharger to air cleaner elbow (S).
16. Using 7/16 inch wrench, or screwdriver as required, tighten clamp (T).

17. Remove wire from electrical lead (D).
18. Coat electrical leads D and U) with silicone compound. Connect air cleaner lead (D) to lead (U).
19. Connect inlet hose (V) to elbow (W).
20. Using 7/16 inch wrench, tighten clamp (X) nut to secure hose (V) to elbow (W).
21. Start engine. Test air cleaner (TM 9-2350-260-10).
22. Close grille doors (TM 9-2350-260-10).



End of Task

TA148167

**AIR CLEANER REPLACEMENT (TOP LOADING) (Sheet 1 of 8)**

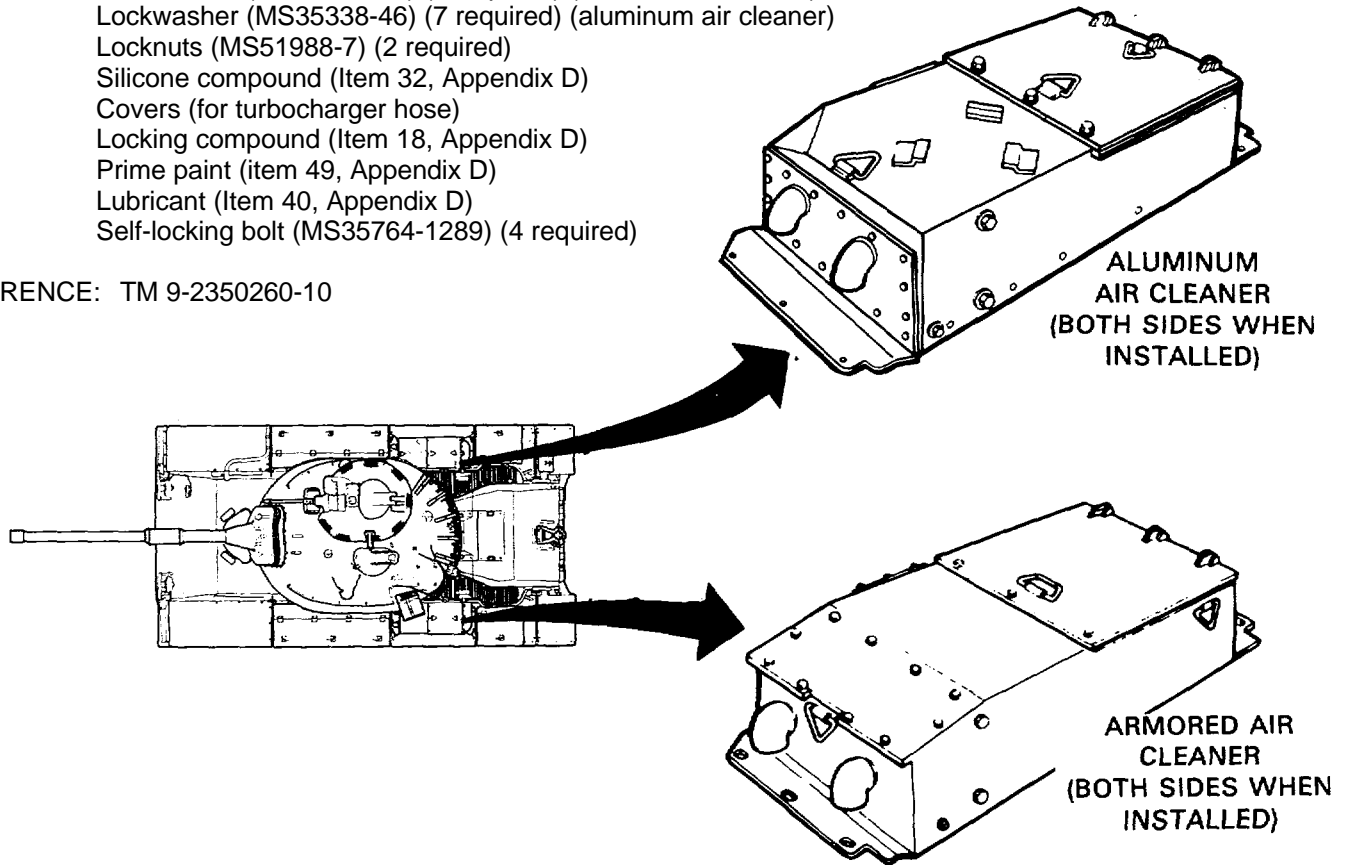
PROCEDURE INDEX

PROCEDURE	PAGE
Removal	7-94
Installation	7-97

- TOOLS:** 3/8 in. combination box and open end wrench  
 9/16 in. socket with 1/2 in. drive  
 Flat-tip screwdriver  
 9/16 in. combination box and open end wrench  
 Torque wrench with 1/2 in. drive  
 5/8 in. socket with 1/2 in. drive  
 drive (0.175 lb-ft) (0-237 N•m)  
 5/8 in. combination box and open end wrench  
 Ratchet with 1/2 in. drive  
 10 in. extension with 1/2 in. drive  
 Hinged handle with 1/2 in. drive  
 Two-point sling  
 Chain hoist  
 (for aluminum cleaner)

- SUPPLIES:** Lockwasher (MS35338-46) (1 required) (armored air cleaner)  
 Lockwasher (MS35338-46) (7 required) (aluminum air cleaner)  
 Locknuts (MS51988-7) (2 required)  
 Silicone compound (Item 32, Appendix D)  
 Covers (for turbocharger hose)  
 Locking compound (Item 18, Appendix D)  
 Prime paint (item 49, Appendix D)  
 Lubricant (Item 40, Appendix D)  
 Self-locking bolt (MS35764-1289) (4 required)

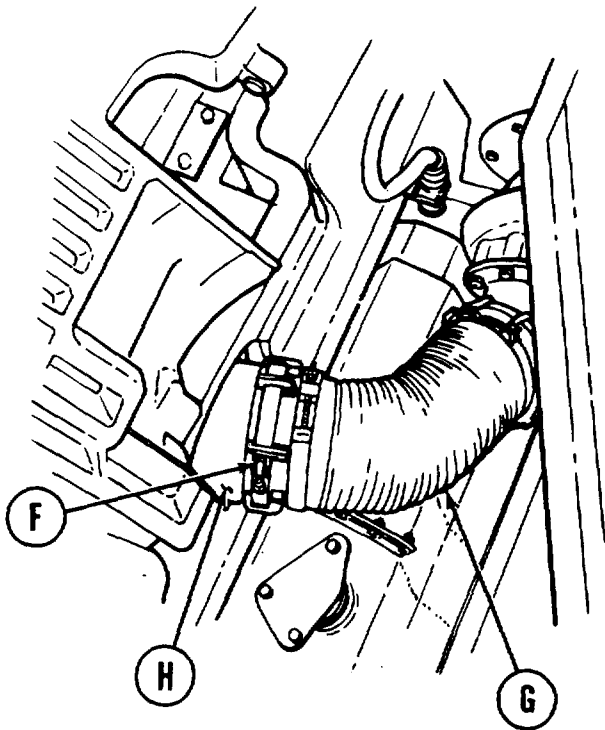
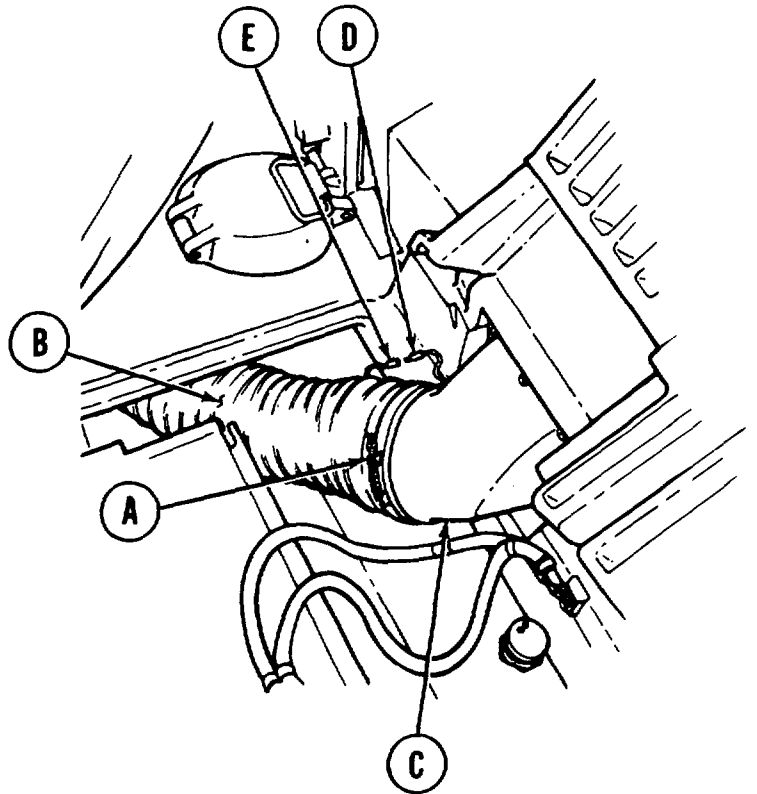
REFERENCE: TM 9-2350260-10



**AIR CLEANER REPLACEMENT (TOP LOADING) (Sheet 2 of 8)****REMOVAL:****NOTE**

**M60 tanks can have either armored or aluminum top loading air cleaners.**

1. Open top deck grille door (TM 9-2350-260-10).
2. Using 3/8 inch wrench, loosen clamp (A) nut securing inlet hose (B) to inlet elbow (C).
3. Separate hose (B) far enough from inlet elbow (C) to allow air cleans to be removed without pulling hose.
4. Pull air cleaner electrical lead (D) from harness connector (E).



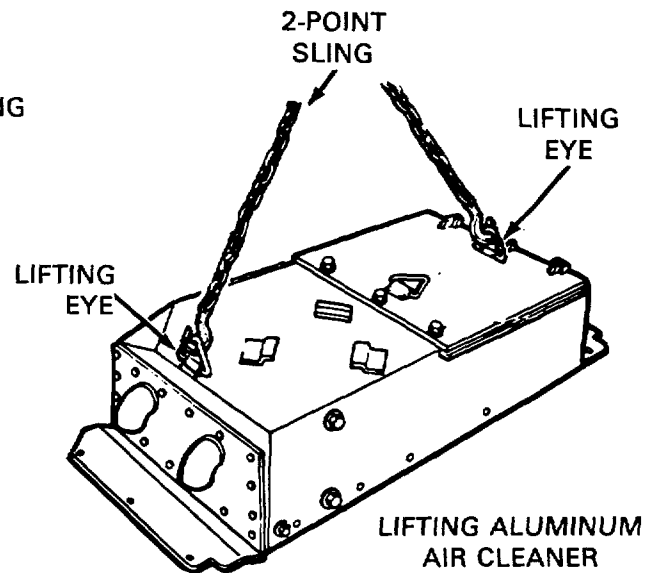
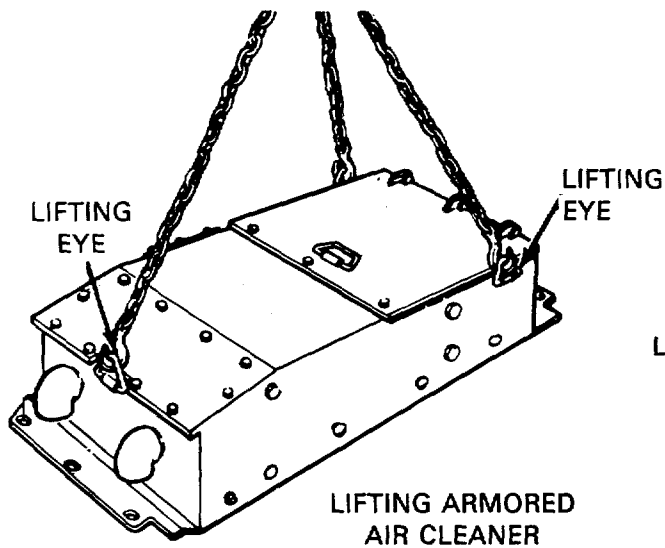
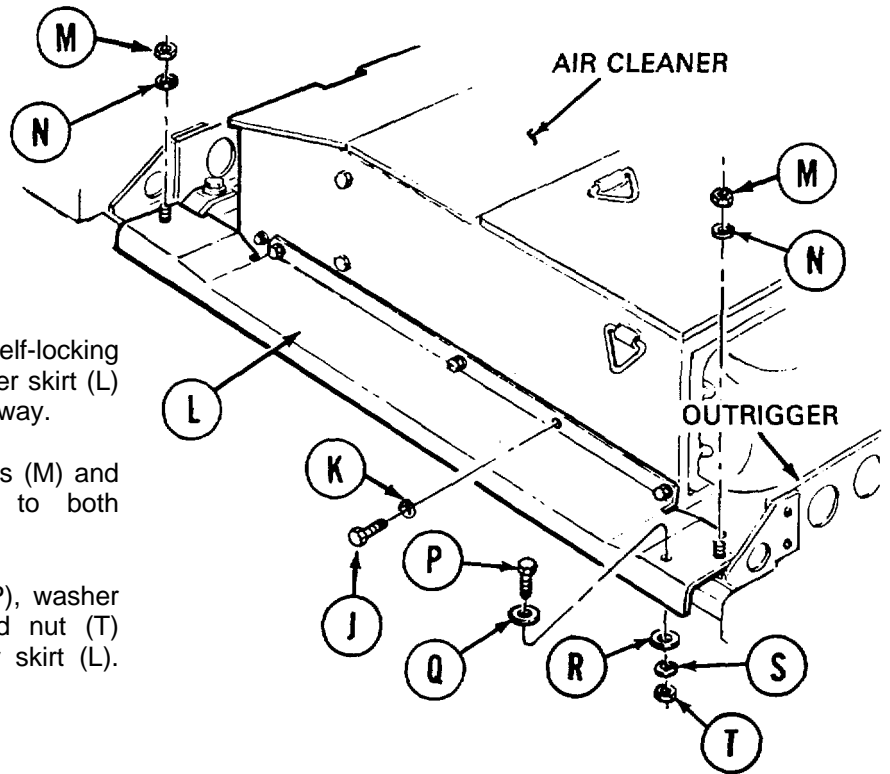
5. Using screwdriver, loosen clamp (F) securing air cleaner outlet hose (G) to turbocharger.
6. Disconnect hose from air cleaner elbow (H). Cover hose (G). Close top deck grille door (TM 9-2350-260-10).

Go on to Sheet 8

TA148169

**AIR CLEANER REPLACEMENT (TOP LOADING) (Sheet 3 of 8)**

7. Using 9/16 inch socket, remove four self-locking bolts (J) and washers (K) securing fender skirt (L) to air cleaner. Throw self-locking bolts away.
8. Using 9/16 inch socket, remove locknuts (M) and washers (N) securing fender skirt to both outriggers. Throw locknuts away.
9. Using 9/16 inch socket, remove bolt (P), washer (Q), washer (R), lockwasher (S), and nut (T) securing fender skirt. Remove fender skirt (L). Throw lockwasher away.



10. On armored air cleaners, attach sling to three lifting eyes. On aluminum air cleaners, attach sling to two lifting eyes. Take up slack on sling with hoist.

Go on to Sheet 4

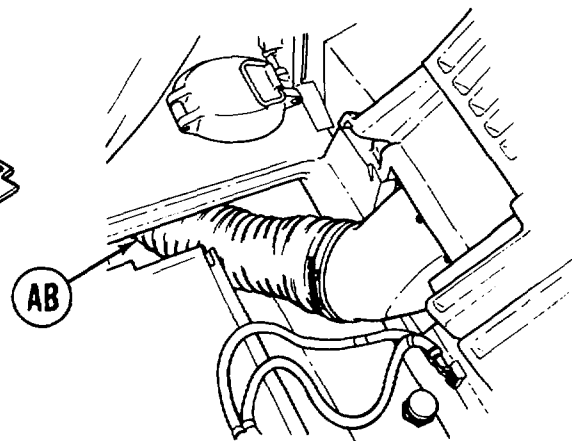
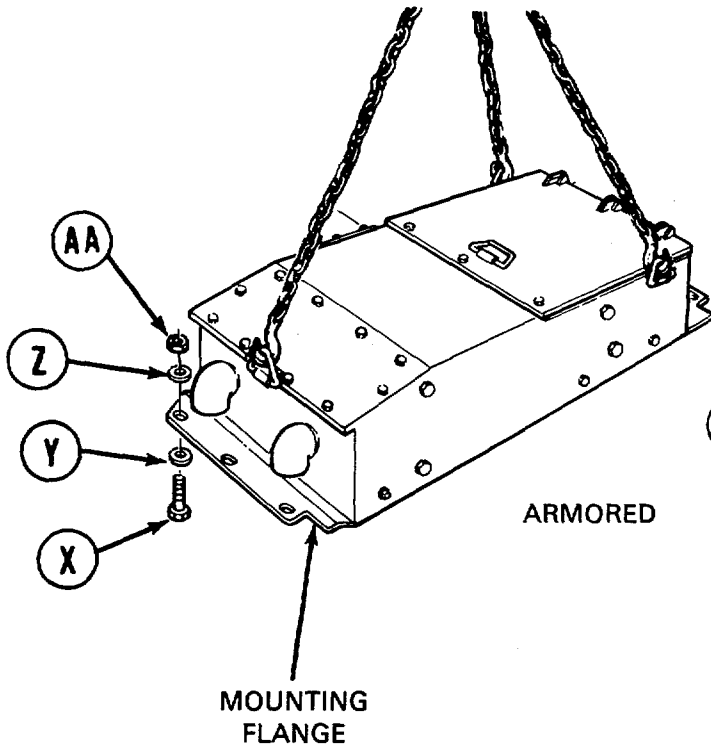
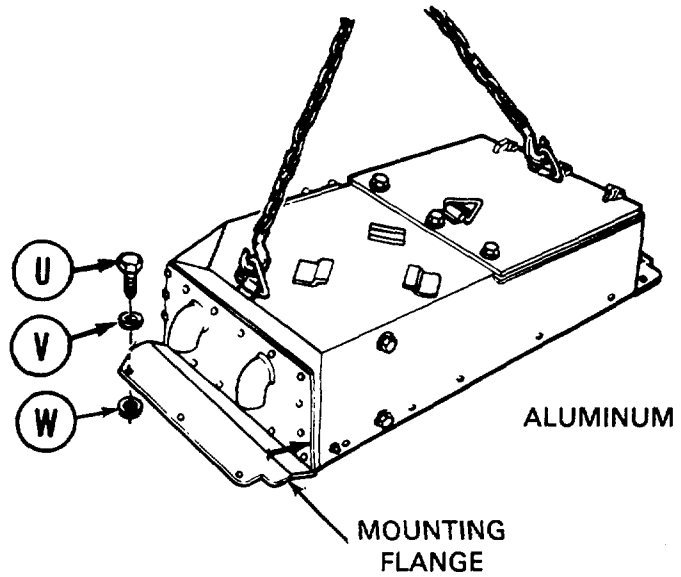
TA148170



AIR CLEANER REPLACEMENT (TOP LOADING) (Sheet 4 of 8)

NOTE

If removing armored air cleaner, proceed to step 12. If removing aluminum air cleaner, proceed to step 11.



11. On aluminum air cleaner, using 5/8 inch socket, remove six screws (U), lockwashers (V) and washers (W) securing aluminum air cleaner. Throw lockwashers away.
12. On armored air cleaner, using 5/8 inch socket to hold nut and 5/8 inch open end wrench to hold bolt, remove six bolts (X), washers (Y), washers (Z), and nut (AA) securing armored air cleaner.
13. Have two persons guide air cleaner and lift it off tank.
14. Install hose covers on hose (AB).

**AIR CLEANER REPLACEMENT (TOP LOADING) (Sheet 5 of 8)**

INSTALLATION:

**NOTE**

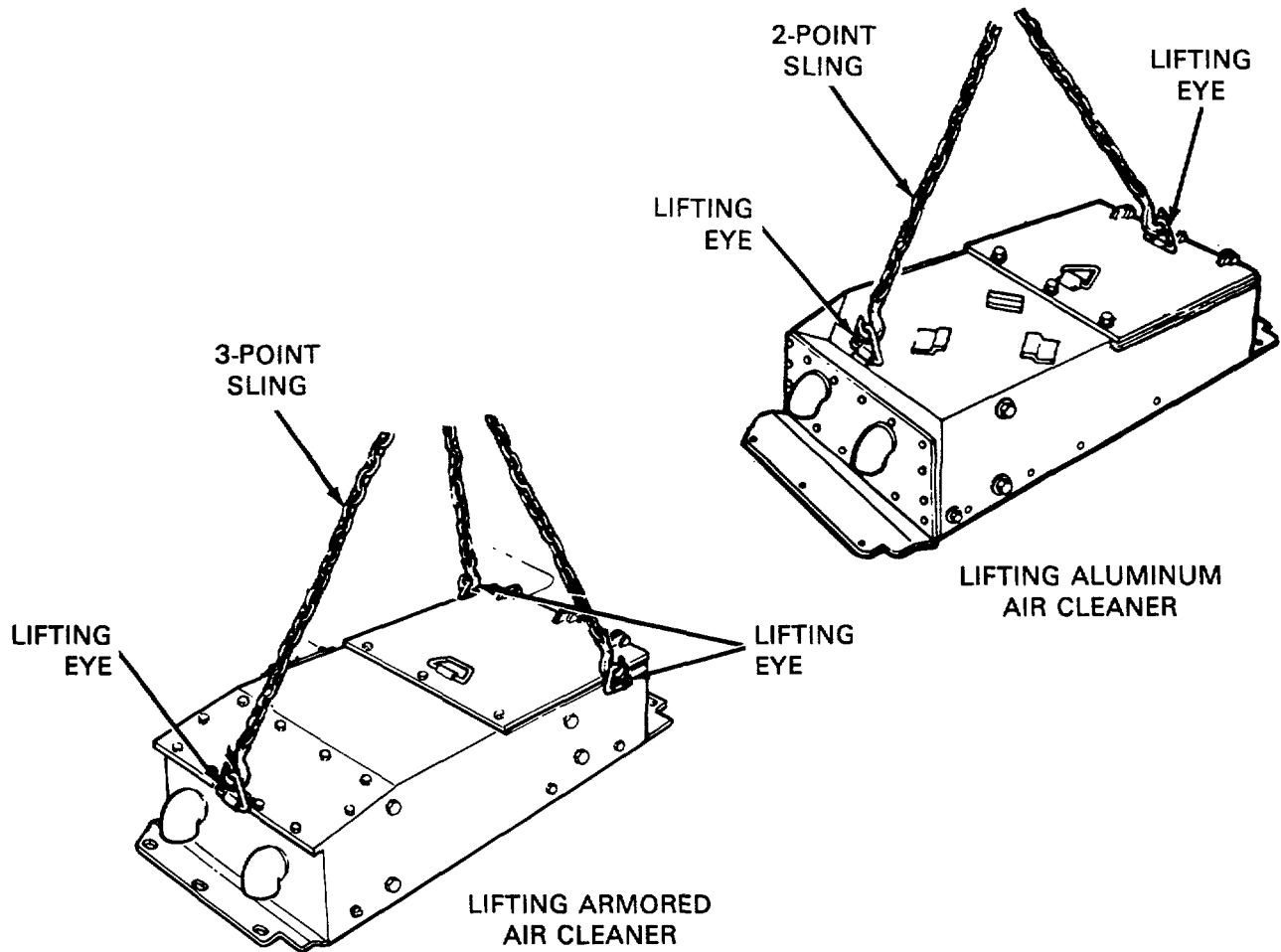
**Clean all dirt and debris from mounting area before installing air cleaner.**

1. Using three-point sling to install armored air cleaner, or two-point sling for aluminum air cleaner, lift air cleaner to mounting place on tank.

**NOTE**

**It may be necessary to open top deck grille doors while guiding air cleaner into place. Close doors after air cleaner is positioned.**

2. Have two persons guide air cleaner into mounting place. Make sure electrical lead goes through hull access opening.



**AIR CLEANER REPLACEMENT (TOP LOADING) (Sheet 6 of 8)**

**NOTE**

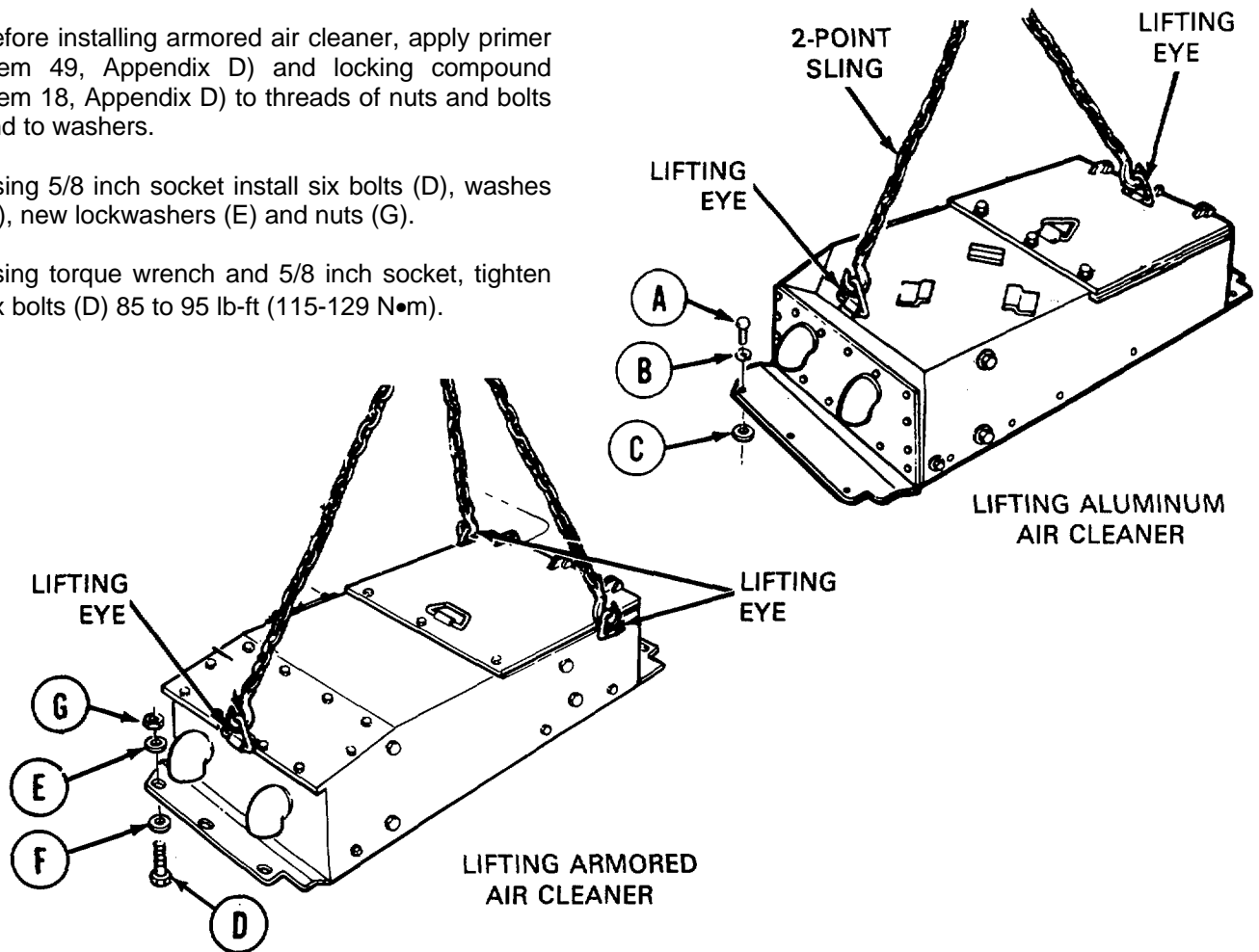
**If you are installing an aluminum air cleaner, do steps 3, 4, and 6, then go to steps 10 and 11. If you are installing an armored air cleaner, go to step 7.**

3. Before installing aluminum air cleaner, apply primer (Item 49, Appendix D) and locking compound (Item 18, Appendix D) to screw threads, lockwashers, and washers.
4. Using 5/8 inch socket, install six screws (A), washers (B), and washers (C) to secure air cleaner. Do not overtighten (crews must be torqued in following step).
5. Using 5/8 inch socket, torque wrench, and extension, tighten six screws (A) to 2230 lb-ft (30-40 N•m).
6. If gap shows between air cleaner mounting flange and outrigger fender, remove screws and use washers (C) to fill gap and perform step 4 again.

**NOTE**

**Use up to three washers (C) (as shims) for each bolt, if necessary, to fill gap.**

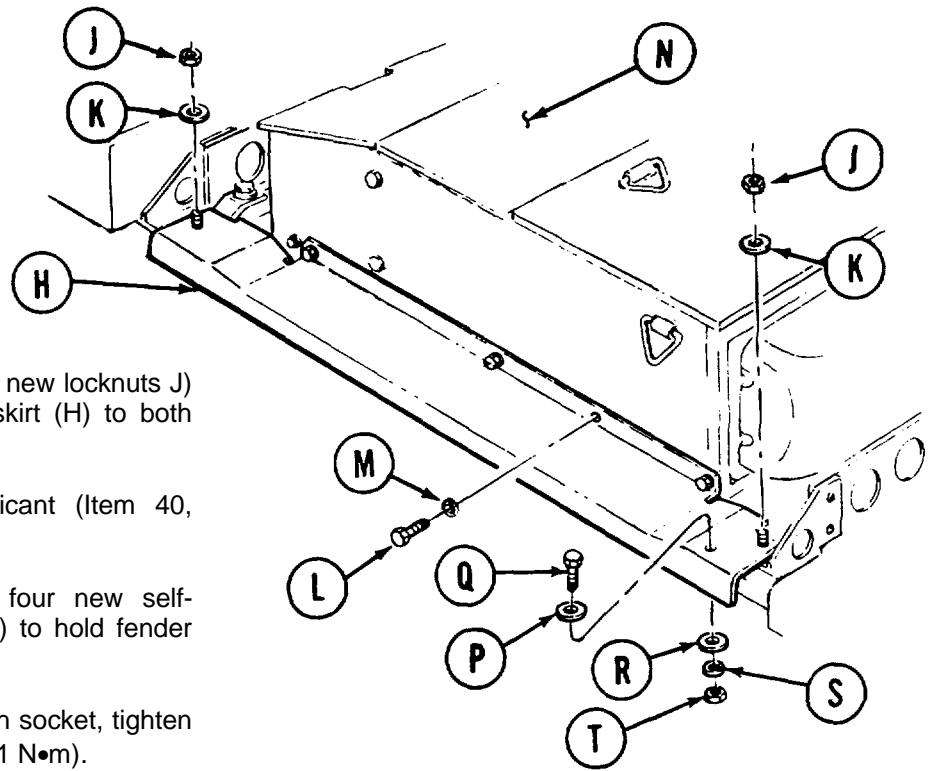
7. Before installing armored air cleaner, apply primer (Item 49, Appendix D) and locking compound (Item 18, Appendix D) to threads of nuts and bolts and to washers.
8. Using 5/8 inch socket install six bolts (D), washes (F), new lockwashers (E) and nuts (G).
9. Using torque wrench and 5/8 inch socket, tighten six bolts (D) 85 to 95 lb-ft (115-129 N•m).



Go on to Sheet 7

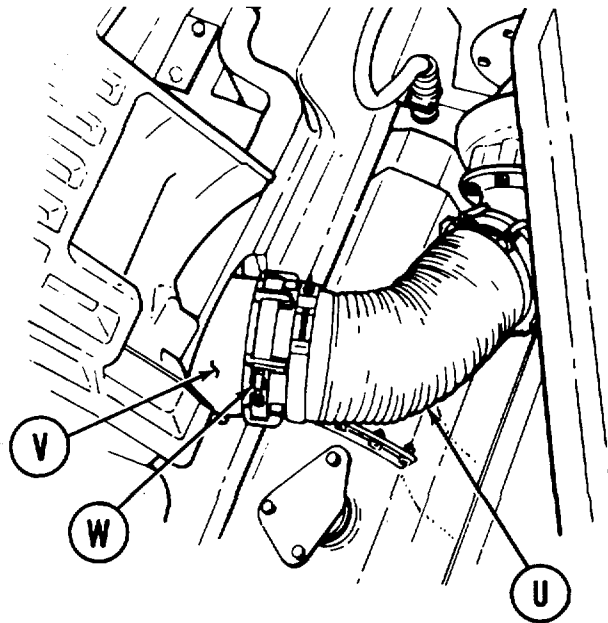
TA148173

**AIR CLEANER REPLACEMENT (TOP LOADING) (Sheet 7 of 8)**



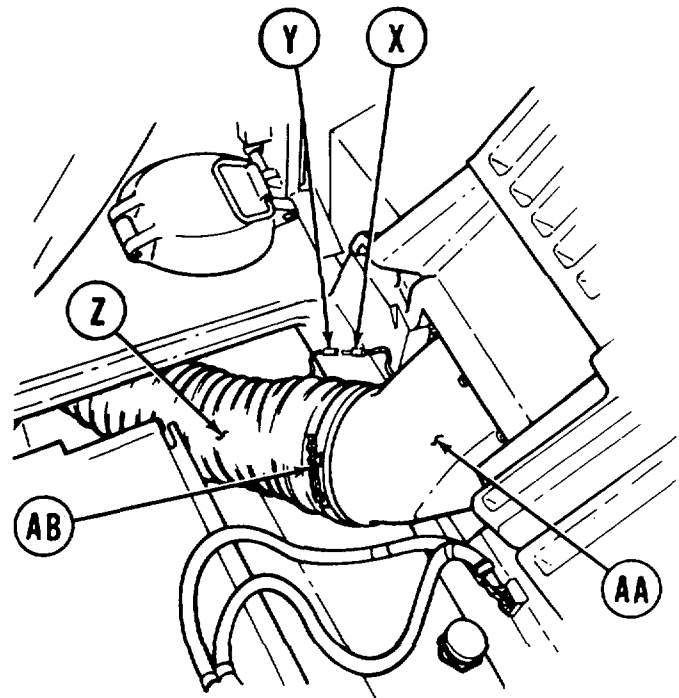
10. Position fender skirt (H).
11. Using 9/16 inch socket, install two new locknuts J and washers K to hold fender skirt (H) to both outriggers.
12. Coat four screws (L) with lubricant (Item 40, Appendix D).
13. Using 9/16 inch socket, install four new self-locking bolts (L) and washers (M) to hold fender skirt (H) to air cleaner (N).
14. Using torque wrench and 9/16 inch socket, tighten four screws (L) to 20-30 lb-ft (27-41 N•m).
15. Install washer (P) and bolt (Q from top of fender skirt).
16. Install bolt (Q) through washer (P) and fender skirt.
17. Place washer (R), new lockwasher (S), and nut (T) on bolt (Q). Using 9/16 inch socket on bolt (Q) and 9/16 inch open end wrench on nut (T), tighten nut (T).

**AIR CLEANER REPLACEMENT (TOP LOADING) (Sheet 8 of 8)**



18. Open top deck grille doors (TM 9-2350-260-10) and remove cover from hose (U) opening.
19. Connect outlet hoses (U) to turbocharger air cleaner elbow (V).
20. Using screwdriver or 7/16 inch wrench (as required), tighten clamp (W) in place.

21. Coat electrical leads (X) and (Y) with silicone compound (Item 32, Appendix D).
22. Connect air cleaner lead (X) to wiring harness lead (Y).
23. Remove hose cover and connect inlet hose (Z) to inlet elbow (AA).
24. Using 3/8 inch wrench, tighten clamp (AB) nut to hold hose (AA) to elbow (V).
25. Test air cleaner (TM 9-2350-260-10).
26. If air cleaner is operational, close top deck grille doors.



End of Task

TA148175

**AIR CLEANER DOOR REPLACEMENT (SIDE LOADING) (Sheet 1 of 2)**

**TOOLS:** 9/16 in. socket with 1/2 in. drive  
 Ratchet with 1/2 in. drive  
 Pliers, slip-joint  
 Punch, drive pin  
 Hammer, ball peen

**SUPPLIES:** Adhesive (Item 2, Appendix D)  
 Gasket (10887603)  
 Lockwasher (MS35333-38) (2 required)  
 Dry cleaning solvent (Item 54, Appendix D)

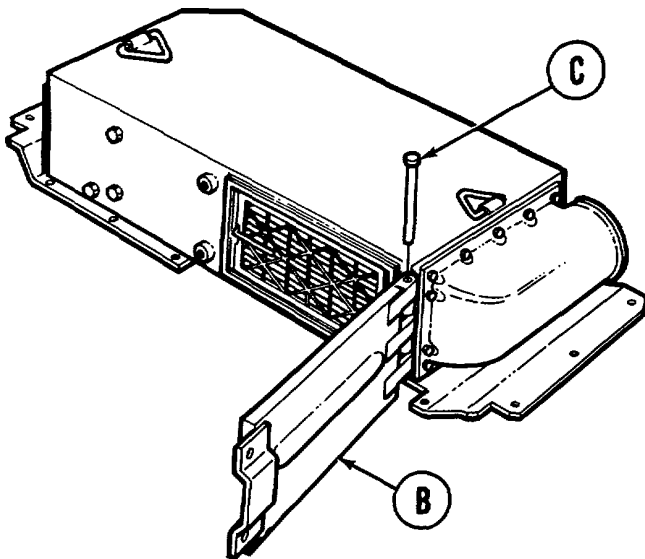
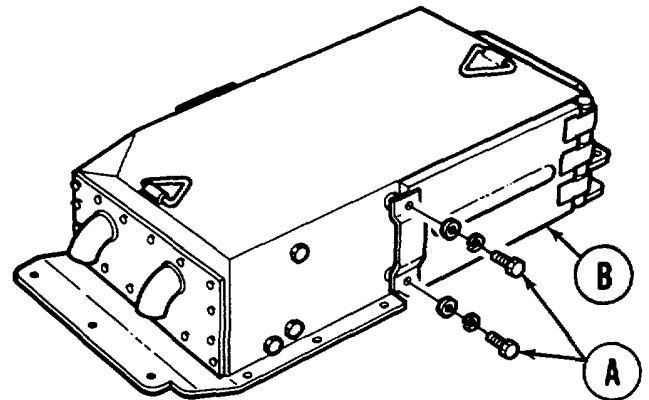
**PRELIMINARY PROCEDURE:** Remove air cleaner (page 7-88)

**REMOVAL:**

1. Using 9/16 inch socket, remove two screws, lockwashers, and flat washers (A) securing door (B). Throw lockwashers away.
2. Open door (B).

**NOTE**

**Air cleaner must be positioned to allow you to drive out pin (C).**



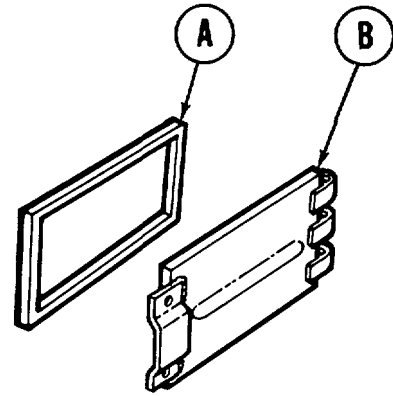
3. Using hammer and punch, drive out pin (C) securing door (B) to air cleaner housing. If necessary, use pliers to completely remove pin.
4. Remove door.

Go on to Sheet 2

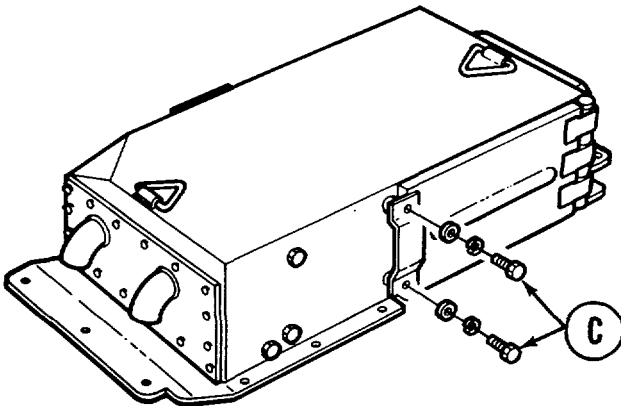
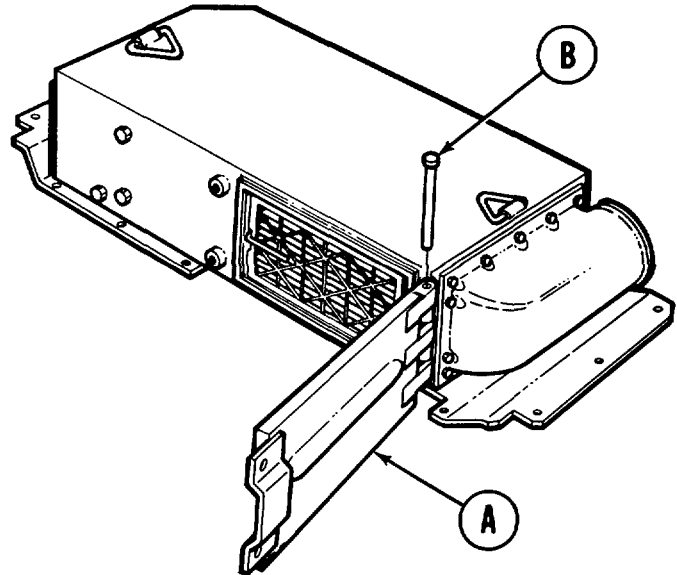
TA148176

**AIR CLEANER DOOR REPLACEMENT (SIDE LOADING) (Sheet 2 of 2)****INSPECTION AND REPAIR:**

1. Inspect gasket (A) on door (B). If missing, damaged, or deteriorating, replace.
2. To replace, remove old gasket. Using dry cleaning solvent (Item 54, Appendix D), remove old adhesive from mounting surface.
3. Apply adhesive (Item 2, Appendix D) to mounting surface and install new gasket (A).

**INSTALLATION:**

1. Position door (A) to air cleaner housing.
2. Install pin (B) to secure door (A) to housing. If necessary, use hammer to tap in pin (B).



3. Using 9/16 inch socket, install two screws, new lockwashers, and flat washers (C) to lock door (A) to air cleaner housing.
4. Install air cleaner (page 7-90).

End of Task

TA148177

**AIR CLEANER DOOR REPLACEMENT (TOP LOADING) (Sheet 1 of 2)**

**TOOLS:** 9/16 in. combination box and open end wrench  
 Long round nose pliers  
 Hammer (or mallet)  
 Slip joint pliers  
 Low pressure compressed air source

**SUPPLIES:** Gasket (12251909)  
 Cotter pins (MS24665-285) (3 required)  
 Sealing compound (Item 22, Appendix D)  
 Sealing compound (Item 24, Appendix D)

**REMOVAL:**

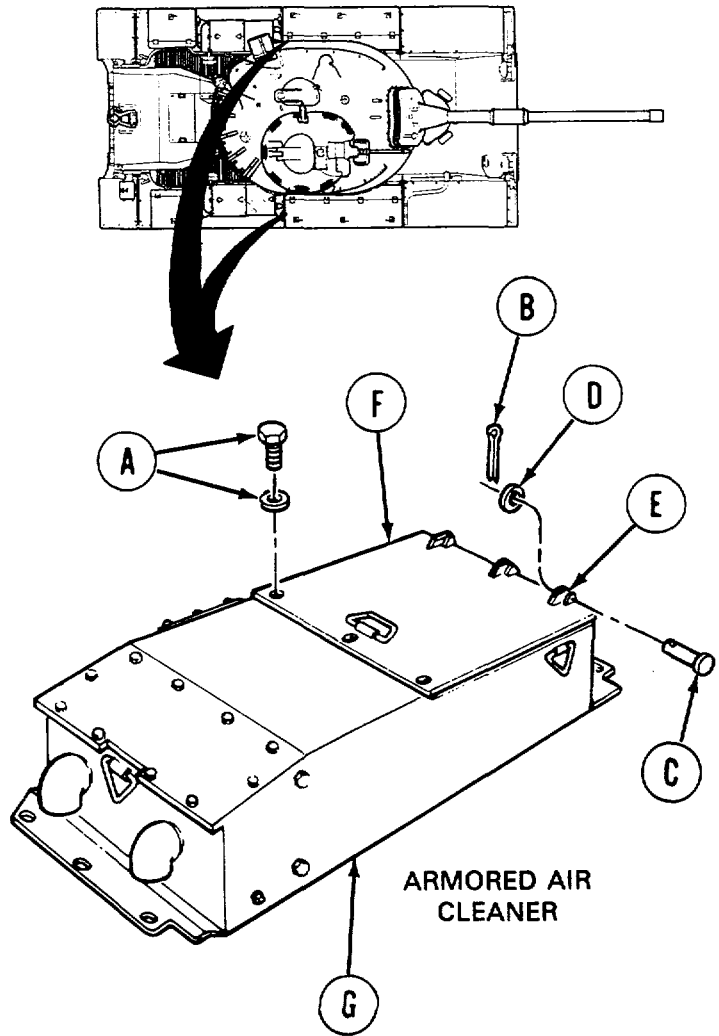
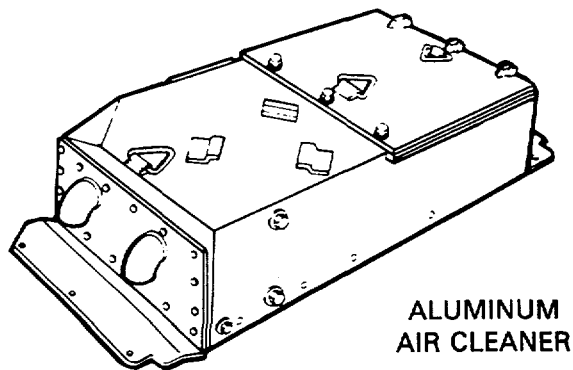
**NOTE**

**If captive screws are used, they will only be loosened and not removed.**

1. Using wrench, remove three screws and washers (A).
2. Using pliers, remove three cotter pins (B).
3. Using pliers, pull three cotter pins (B) out of three pins (C). Throw cotter pins away.
4. Remove flat washers (D).
5. Using hammer, tap straight pins (C) free of door hinges (E).
6. Using pliers, pull three pins (C) from door hinges.
7. Lift door assembly (F) and remove it from air cleaner housing (G).

**NOTE**

**Procedures for replacement of door for aluminum and armored air cleaner are the same.**

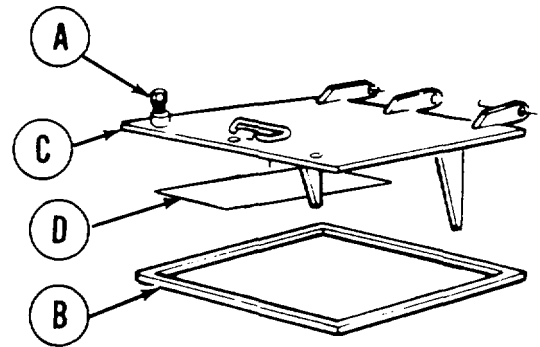




**AIR CLEANER DOOR REPLACEMENT (TOP LOADING) (Sheet 2 of 2)**

**REPAIR:**

1. Inspect screws (A) and gasket (B).
2. If gasket (B) is damaged in any way, replace it.
3. Apply sealing compound (Item 24, Appendix D), on new gasket (B). Install gasket into groove at underside of door (C).
4. Replace decal (D), as necessary. Install decal so it can be read from center of tank.



**INSTALLATION:**

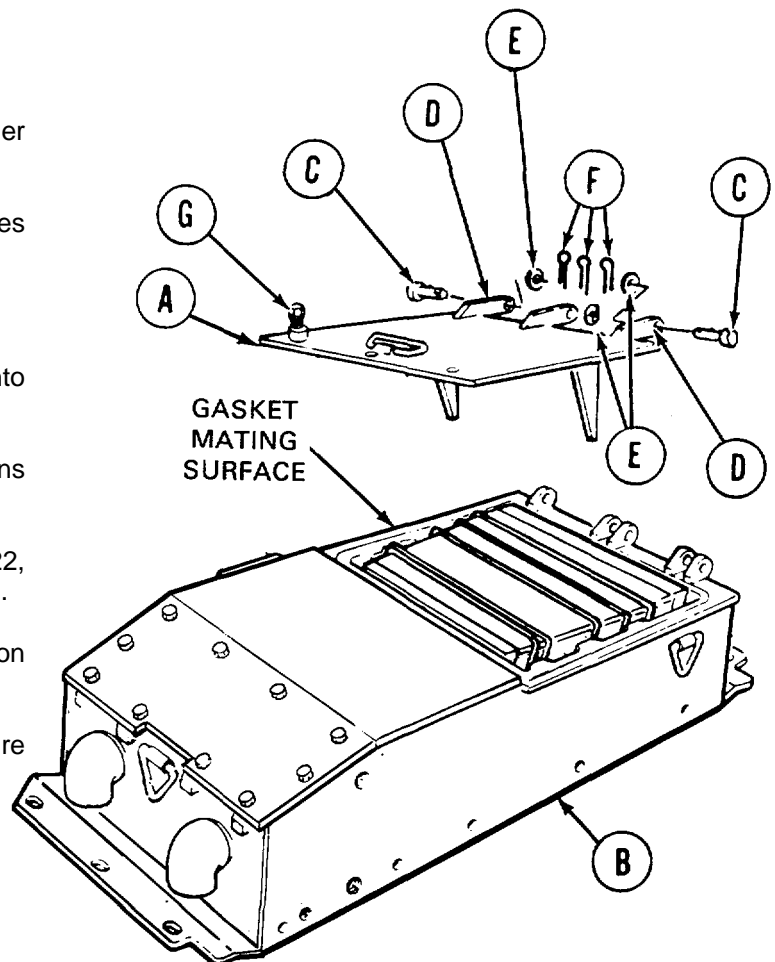
**NOTE**

**Check three door bolts and bolt holes on top of air cleaner. If bolt threads are stripped, replace bolts. If holes are not drilled through, use compressed air to remove sand, dirt, or debris from holes.**

1. Lift door assembly (A) into place on air cleaner housing (B).
2. Using hammer, tap three pins (C) into three hinges (D).
3. Install three flat washers (E) onto three pins (C).
4. Using hammer, tap three new cotter pins (F) into holes in pins (C).
5. Using hammer, tap cotter pins around straight pins (C) to secure washers (E) and pins in place.
6. Apply thin film of sealing compound (Item 22, Appendix D) to gasket mating surface of housing.
7. Make sure door assembly (A) is in closed position (lowered).
8. Using wrench, tighten three screws (G) to secure door (A) to air cleaner housing (B).

**WARNING**

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



End of Task

TA148179

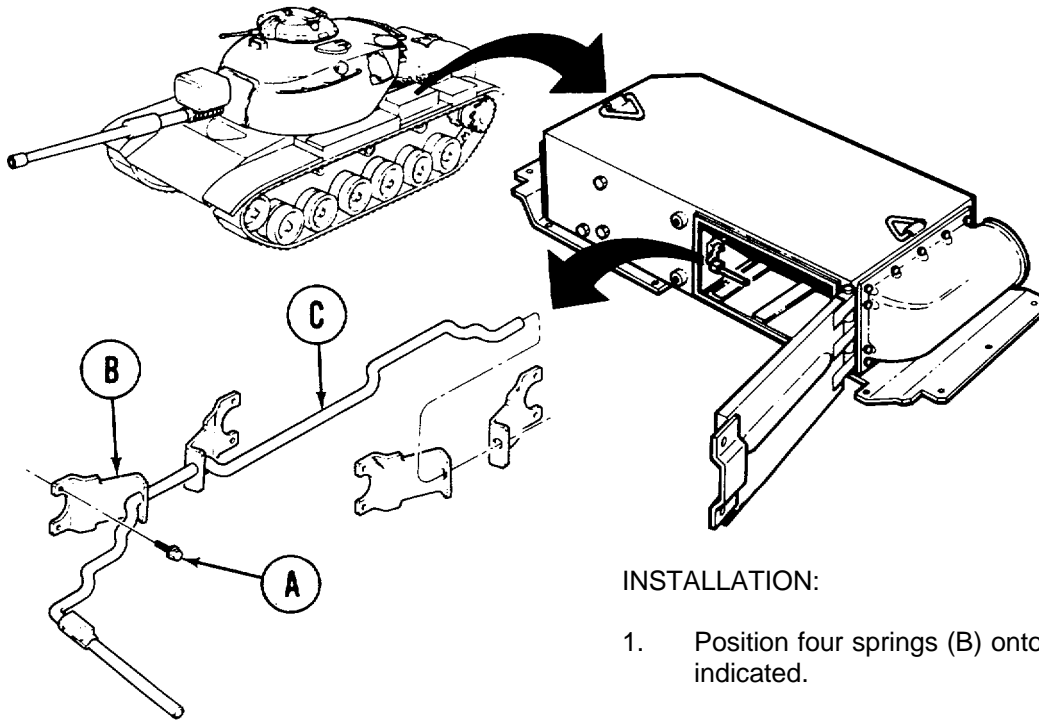
**AIR CLEANER FILTER LOCKING ROD HANDLE OR SPRING REPLACEMENT (SIDE LOADING) (Sheet 1 of 1)**

TOOLS: 9/16 in. socket with 1/2 in. drive  
 Ratchet with 1/2 in. drive  
 7/16 in. socket with 1/2 in. drive

PRELIMINARY PROCEDURES: Remove air cleaner filter assembly (page 7-106).

**REMOVAL:**

1. Using 7/16 inch socket, remove eight assembled washer screws (A) securing four springs (B).
2. Remove four springs (B) and rod assembly (C) from air filter compartment.
3. Remove springs (B) from rod assembly (C), and replace defective components as necessary.

**INSTALLATION:**

1. Position four springs (B) onto rod assembly (C) as indicated.
2. Position springs (B) and rod assembly (C) into air filter compartment.
3. Using 7/16 inch socket, install eight assembled washer screws (A) to secure springs (B) to inside of air cleaner housing.
4. Install air cleaner filter assembly (page 7-109).

End of Task

TA148180

**AIR CLEANER FILTER ASSEMBLY REPAIR AND REPLACEMENT (SIDE LOADING) (Sheet 1 of 5)**

PROCEDURE INDEX

PROCEDURE	PAGE
Removal	7-106
Disassembly	7-107
Cleaning and Inspection	7-108
Assembly	7-109
Installation	7-109

**TOOLS:** 9/16 in. socket with 1/2 in. drive  
 Ratchet with 1/2 in. drive  
 Slip joint pliers

**SUPPLIES:** Low pressure air system  
 Liquid detergent (Item 33, Appendix D)  
 Rags (Item 65, Appendix D)  
 Lockwasher (MS35333-38) (2 required)

**NOTE**

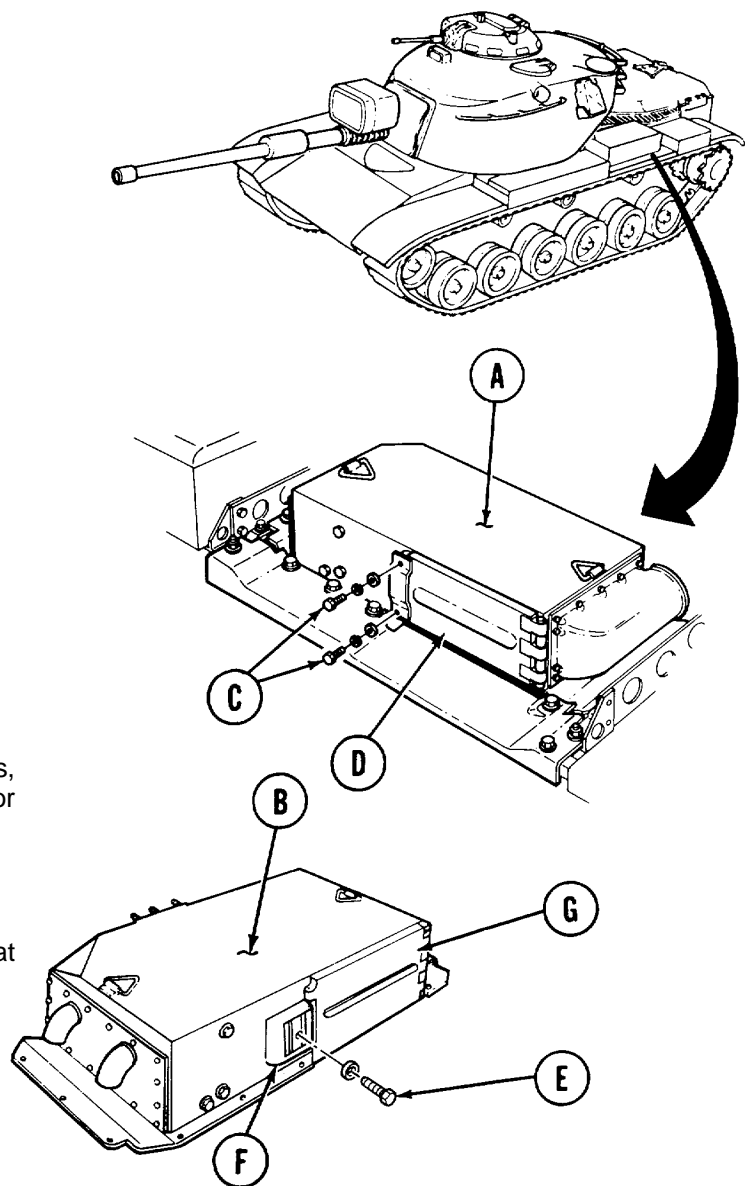
Two types of side loading air cleaners are found on M60 tanks. If your tank has type (A), start with step 1. If your tank has type (B), skip steps 1 and 2, go on to step 3.

**REMOVAL:**

**NOTE**

Replacement and repair of air cleaner filter assembly is the same for left or right side. Left side shown.

1. Using 9/16 inch socket, remove two screws, lockwashers, and flat washers (C) securing door (D). Throw lockwashers away.
2. Open door (D) and go to step 5.
3. Using 9/16 inch socket, remove screw and flat washer (E) securing handle (F).
4. Using handle (F), open door (G).

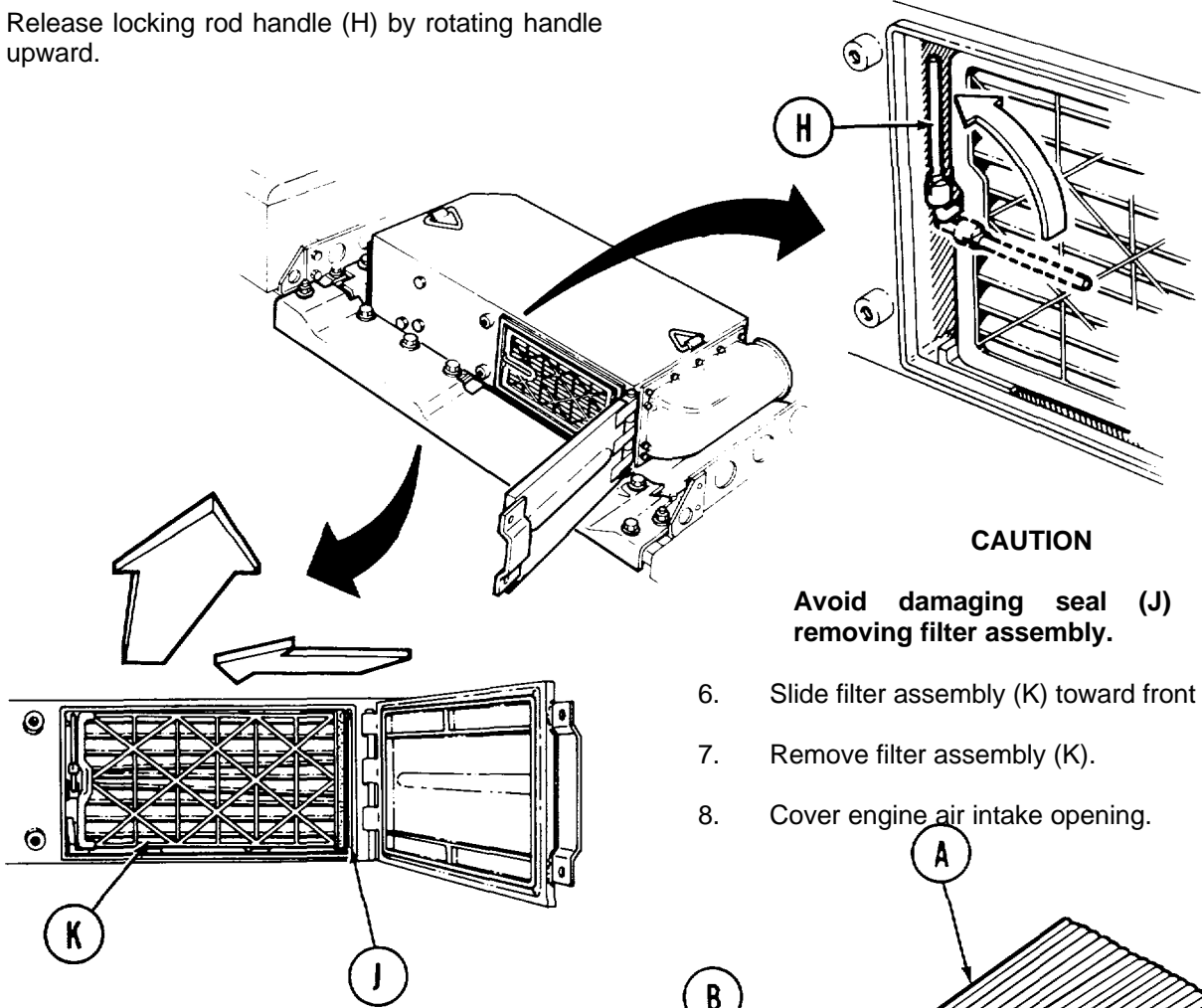


Go on to Sheet 2

TA148181

**AIR CLEANER FILTER ASSEMBLY REPAIR AND REPLACEMENT (SIDE LOADING) (Sheet 2 of 5)**

5. Release locking rod handle (H) by rotating handle upward.



**CAUTION**

**Avoid damaging seal (J) when removing filter assembly.**

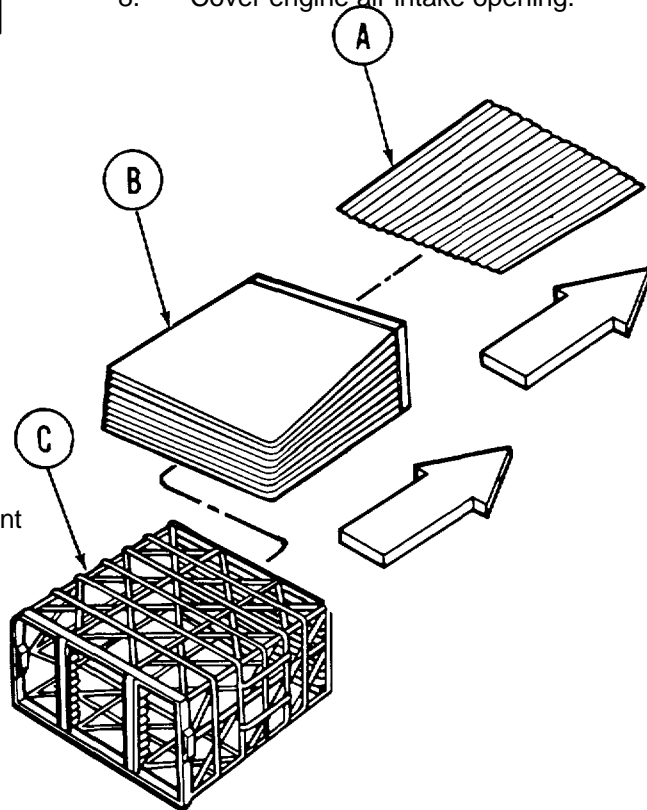
6. Slide filter assembly (K) toward front of tank.
7. Remove filter assembly (K).
8. Cover engine air intake opening.

**DISASSEMBLY:**

**CAUTION**

**It may be necessary to use pliers to remove top and bottom baffle. Be careful not to damage baffles (A).**

1. Remove 12 baffles (A) from inside of filter element (B).
2. Remove filter element (B) from basket (C).

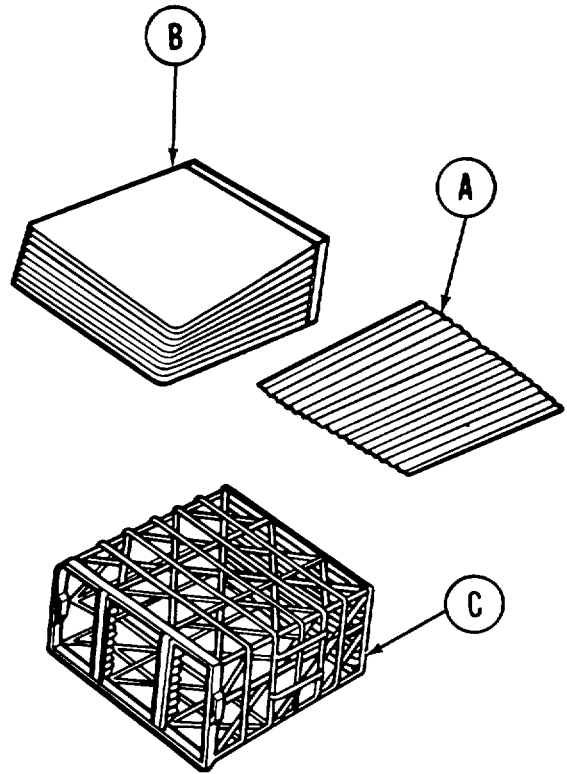


Go on to Sheet 3

TA148182

**AIR CLEANER FILTER ASSEMBLY REPAIR AND REPLACEMENT (SIDE LOADING) (Sheet 3 of 5)****INSPECTION:**

1. Inspect baffles (A) for cracks, bends, or broken out sections.
2. Inspect filter element (B) for holes or damaged seal.
3. Inspect basket (C) for breaks or dents.
4. Replace any part that is defective.

**CLEANING:****CAUTION**

**When shaking element, keep dust from inside pockets of element. Make sure all creases and seams are free of dust, never hit element against any surface.**

1. Grasp filter element at the sealing end and shake vigorously to shake out dust

**WARNING**

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

2. Use low pressure compressed air to blow out any remaining dust from each pocket by moving nozzle back and forth.

**CAUTION**

**Never use steam. Thoroughly dry element before installing.**

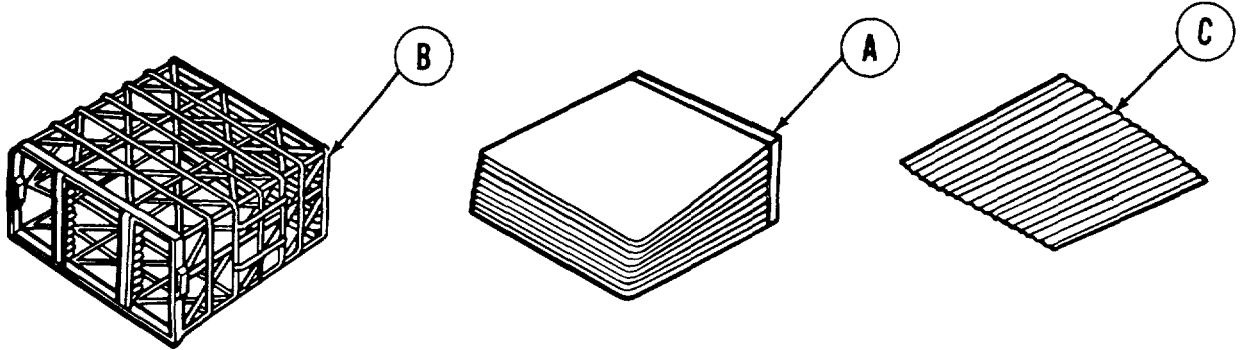
3. If low pressure compressed air is not available, remove remaining dust by washing in warm or cold water and liquid detergent (Item 33, Appendix D).
4. Use a clean, damp rag and wipe out filter compartment.

Go on to Sheet 4

TA148183

**AIR CLEANER FILTER ASSEMBLY REPAIR AND REPLACEMENT (SIDE LOADING) (Sheet 4 of 5)**

**ASSEMBLY:**



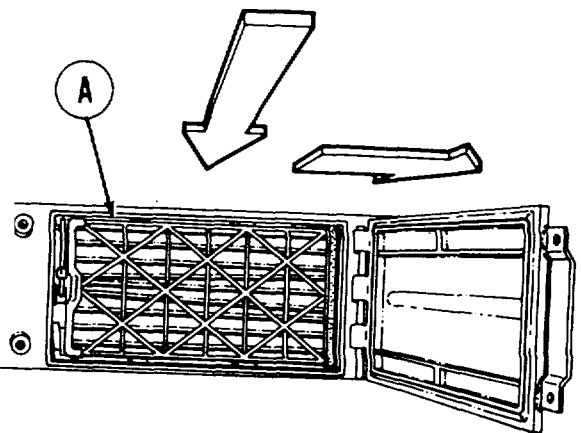
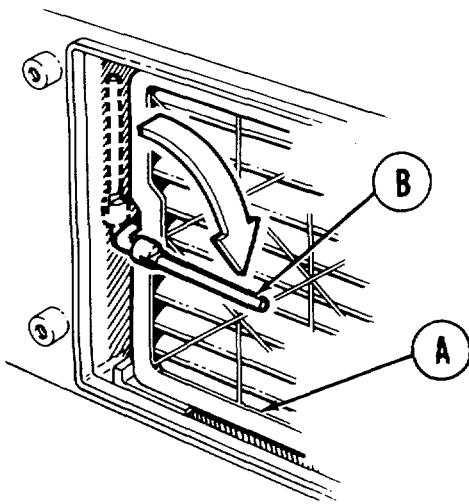
**NOTE**

**For ease of installing you may want to stand basket (B) on its end.**

1. Install filter element (A) into basket (B). Be sure each fold of filter element (A) is seated in groove in bottom of basket (B).
2. Install 12 baffles (C) into pockets of filter element (B).

**INSTALLATION:**

1. Install filter assembly (A) into filter compartment.



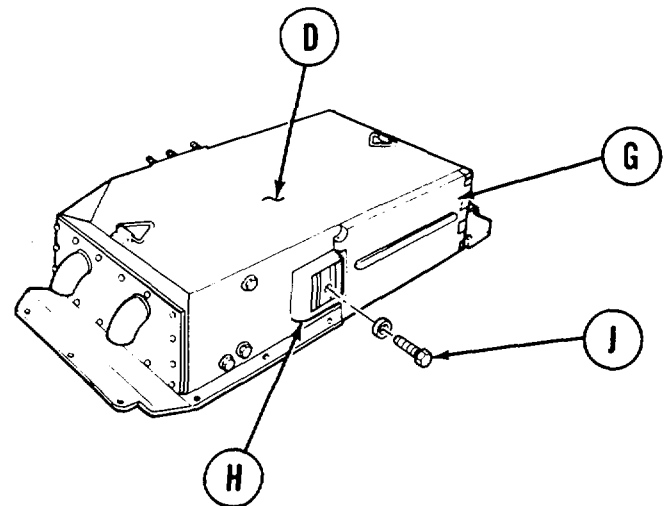
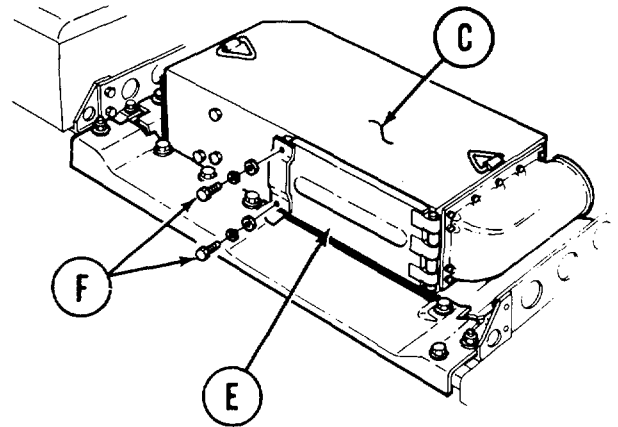
2. Slide filter assembly (A) toward rear of tank to seat seal of filter element against inlet gasket inside filter compartment.
3. Secure filter assembly (A) in place by rotating locking rod handle (B) downward.

## AIR CLEANER FILTER ASSEMBLY REPAIR AND REPLACEMENT (SIDE LOADING) (Sheet 5 of 5)

## NOTE

If you removed filter from type (C) air cleaner, go to step 4. If you removed filter from type (D) air cleaner, go to step 6 and skip steps 4 and 5.

4. Close air cleaner side door (E).
5. Using 9/16 inch socket, install two screws, new lockwashers, and flat washers (F) to secure door (E).
6. Close air cleaner side door (G).
7. Using handle (H), secure door (G) to air cleaner (D).
8. Using 9/16 inch socket, install screw and flat washer (J) to secure handle (H).



End of Task

TA148185

**AIR CLEANER FILTER ELEMENT CLEANING OR REPLACEMENT (TOP LOADING) (Sheet 1 of 5)**

PROCEDURE INDEX

PROCEDURE	PAGE
Removal	7-112
Inspection	7-113
Cleaning	7-113
Installation	7-114

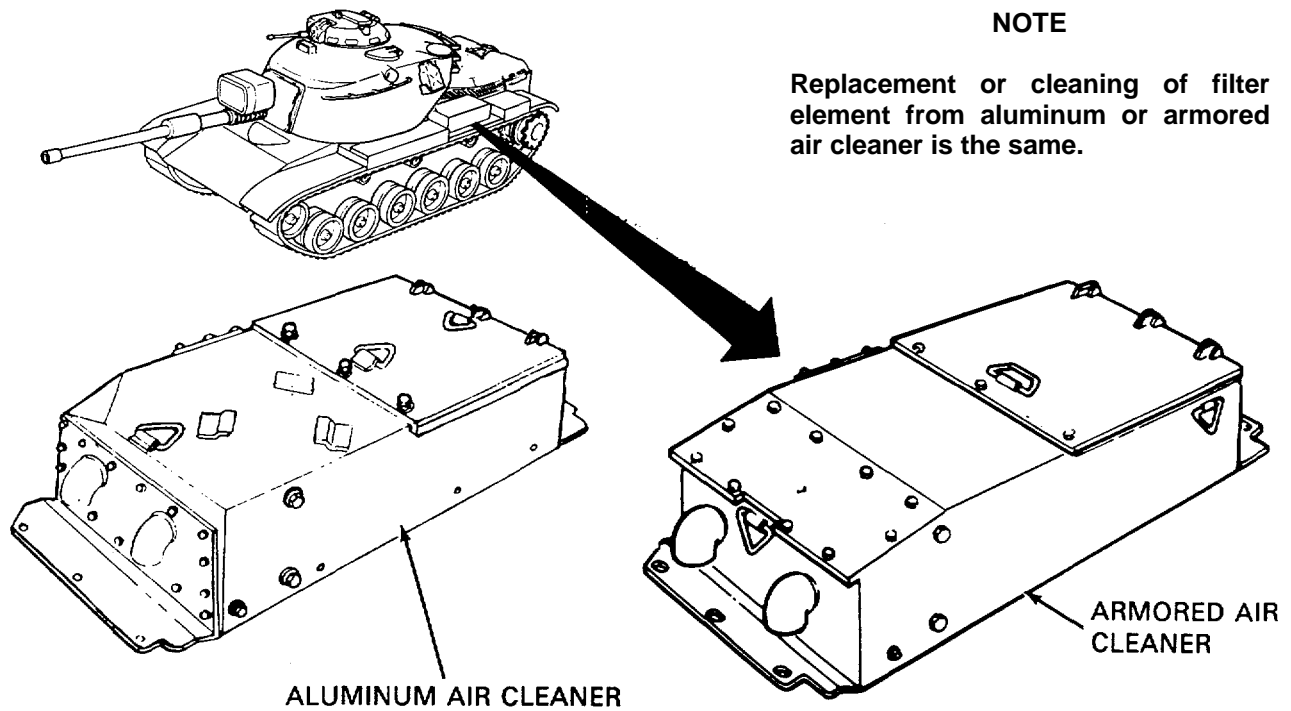
TOOLS: 9/16 in. socket with 1/2 in. drive  
Ratchet with 1/2 in. drive

SPECIAL TOOLS: Vacuum cleaner (Item 5, Chapter 3, Section I)

SUPPLIES: Liquid detergent (Item 33, Appendix D)  
Rags (Item 65, Appendix D)  
Watch  
Container for washing filter  
Low-pressure air supply  
Water  
Extension light

**NOTE**

Replacement or cleaning of filter element from aluminum or armored air cleaner is the same.

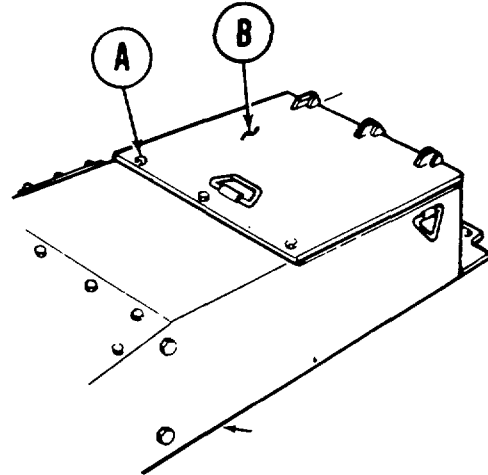




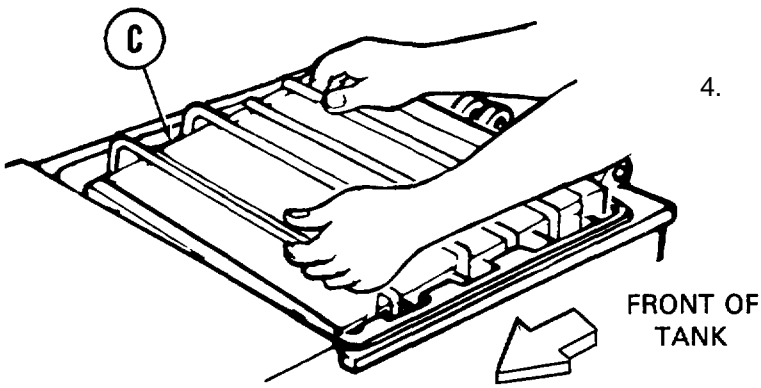
**AIR CLEANER FILTER ELEMENT CLEANING OR REPLACEMENT (TOP LOADING) (Sheet 2 of 5)**

**REMOVAL:**

1. Using socket, loosen three screws (A) and remove from door (B).
2. Open door (B) until it rests on rear fender box or hinge guard.
3. Inspect gasket on door (B). If damaged, replace (page 7-104).



4. Slide filter element (C) toward front of tank.

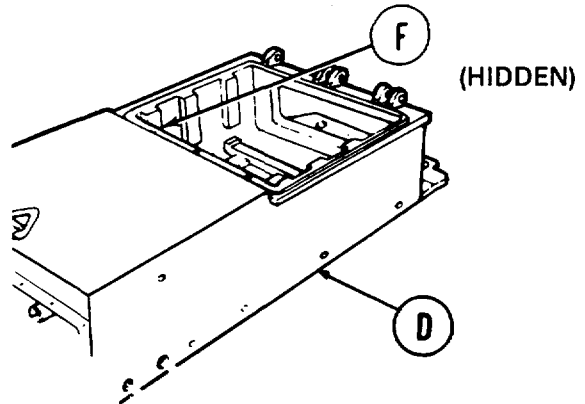
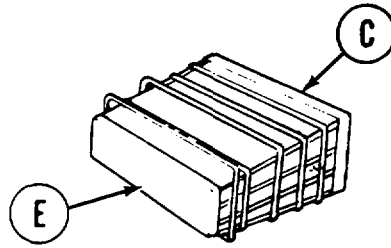


5. Carefully lift filter element (C) out of air cleaner housing (D).

**CAUTION**

**When removing filter element (C), use care not to damage filter seal (E). Do not stand filter element on seal end.**

6. Cover engine air intake opening (F) to keep out dust



**AIR CLEANER FILTER ELEMENT CLEANING OR REPLACEMENT (TOP LOADING) (Sheet 3 of 5)****INSPECTION:**

1. Inspect filter element for rupture in filter material or damage or looseness of seal. Replace element if damaged in any way.
2. Inspect filter element to determine if contaminated with dust or oil. Element can be cleaned by using compressed air or by washing.
3. If filter is contaminated with dust, clean by using low-pressure, compressed air.
4. If filter is contaminated with carbon or oil deposits, clean by washing.

**CLEANING:****WARNING**

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

**Compressed Air:**

1. Direct stream of compressed air against inside of filter element.
2. Move air stream up and down length of pleats until no dust is visibly being blown out.

**Washing:****CAUTION**

**Do not hit element against solid object. Damage may occur to element.**

1. Shake or blow off dust before wetting filter element.
2. Prepare solution of warm water (80° F to 110° F) and liquid detergent (Item 33, Appendix D) in container large enough to hold filter element.
3. Soak filter element in cleaning solution for 15 to 20 minutes, then gently shake it back and forth for 2 to 3 minutes to free dirt deposits.
4. Rinse filter element with cool water (35° F to 80° F) until all traces of dirt and detergent are removed.
5. If hose is used to rinse filter element, maximum line pressure of 40 psi should be used.
6. Make sure filter element is completely dry before using.
7. Air dry at normal room temperature until filter element is completely dry. If circulating air is used, temperature must not exceed 180° F.

Go on to Sheet 4

TA148188

**AIR CLEANER FILTER ELEMENT CLEANING OR REPLACEMENT (TOP LOADING) (Sheet 4 of 5)**

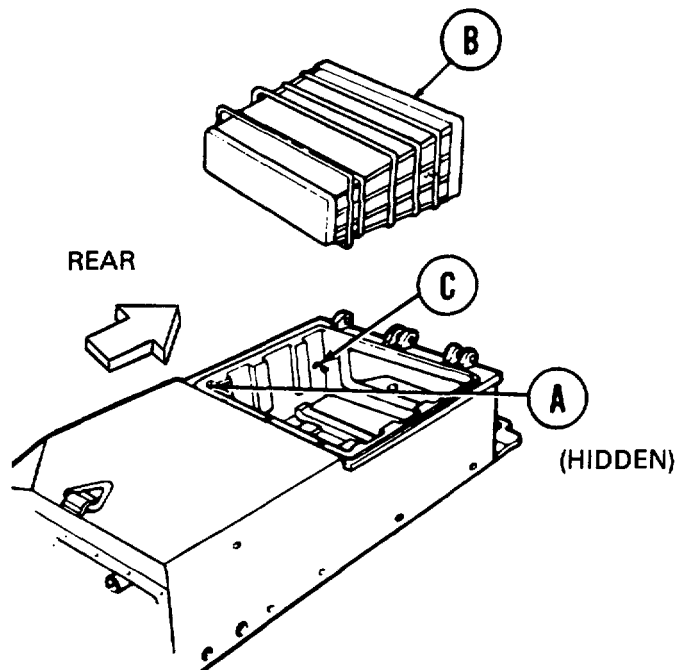
8. After cleaning, inspect filter element for damage to seal or ruptured filter material, place light inside filter element, and inspect from outside. If ruptured, replace with new filter element.
9. Using vacuum cleaner (Item 5, Chapter 3, Section I) vacuum inside of filter compartment.
10. If vacuum cleaner is not available, use a clean, damp rag and wipe out filter compartment.

INSTALLATION:

**CAUTION**

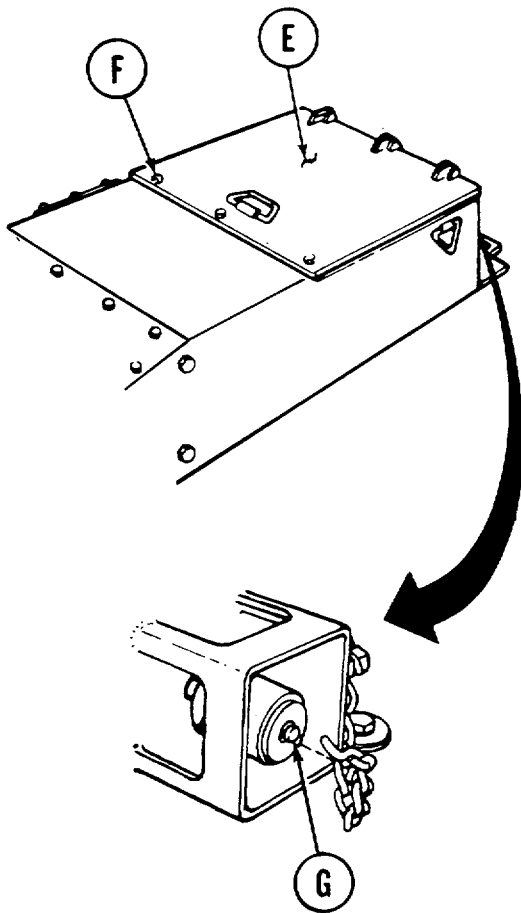
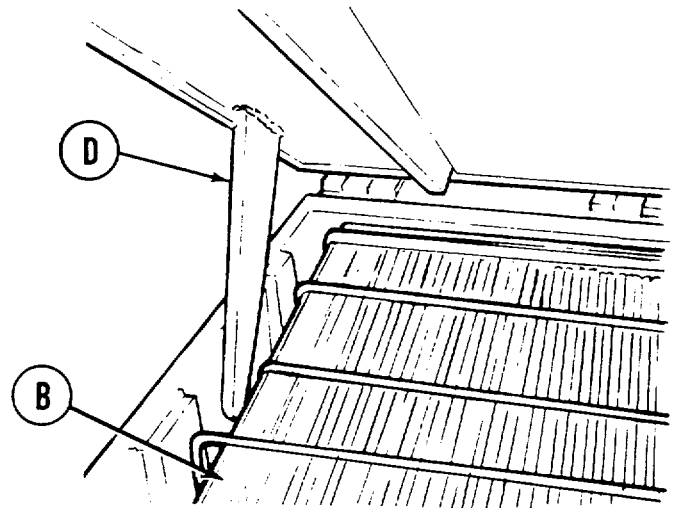
**Be careful when installing filter element not to damage filter seal.**

1. Remove cover from engine air intake opening (A).
2. Install filter element (B) by lowering it to bottom of filter compartment (C).
3. Slide filter element (B) rearward to seal element in position.



**AIR CLEANER FILTER ELEMENT CLEANING OR REPLACEMENT (TOP LOADING) (Sheet 5 of 5)**

4. Make sure that filter element (B) is properly positioned so that door arms (D) engage locking pins on sides of filter element.



5. Close door (E), and using socket, install screws (F).
6. Using socket, tighten screws (F) to secure door (E).

**NOTE**

**Step 7 applies to armored air cleaners only.**

7. Press indicator reset button (G) to make sure indicator shows clear window.

**AIR CLEANER (ALUMINUM AND SIDE LOADING) CIRCUIT BREAKER REPLACEMENT (Sheet 1 of 1)**

TOOL: Flat-tip screwdriver

SUPPLIES: Lockwasher (MS35335-17) (4 required)

REFERENCE: TM 9-2350-260-10

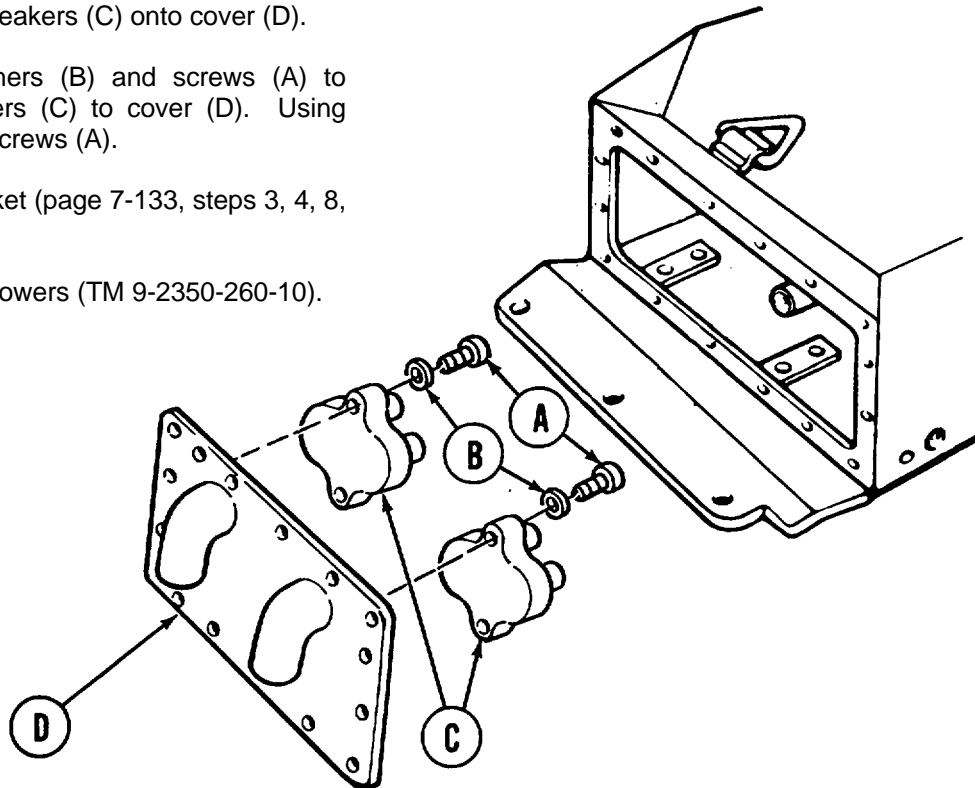
PRELIMINARY PROCEDURE: Remove air cleaner cover and gasket (page 7-132, steps 1 thru 3)

**REMOVAL:**

1. Using screwdriver, remove four screws (A) and lockwashers (B) securing two circuit breakers (C) to cover (D). Throw lockwashers away.
2. Remove two circuit breaker. (C).

**INSTALLATION:**

1. Position two circuit breakers (C) onto cover (D).
2. Install new lockwashers (B) and screws (A) to secure circuit breakers (C) to cover (D). Using screwdriver, tighten screws (A).
3. Install cover and gasket (page 7-133, steps 3, 4, 8, and 9).
4. Check operation of blowers (TM 9-2350-260-10).



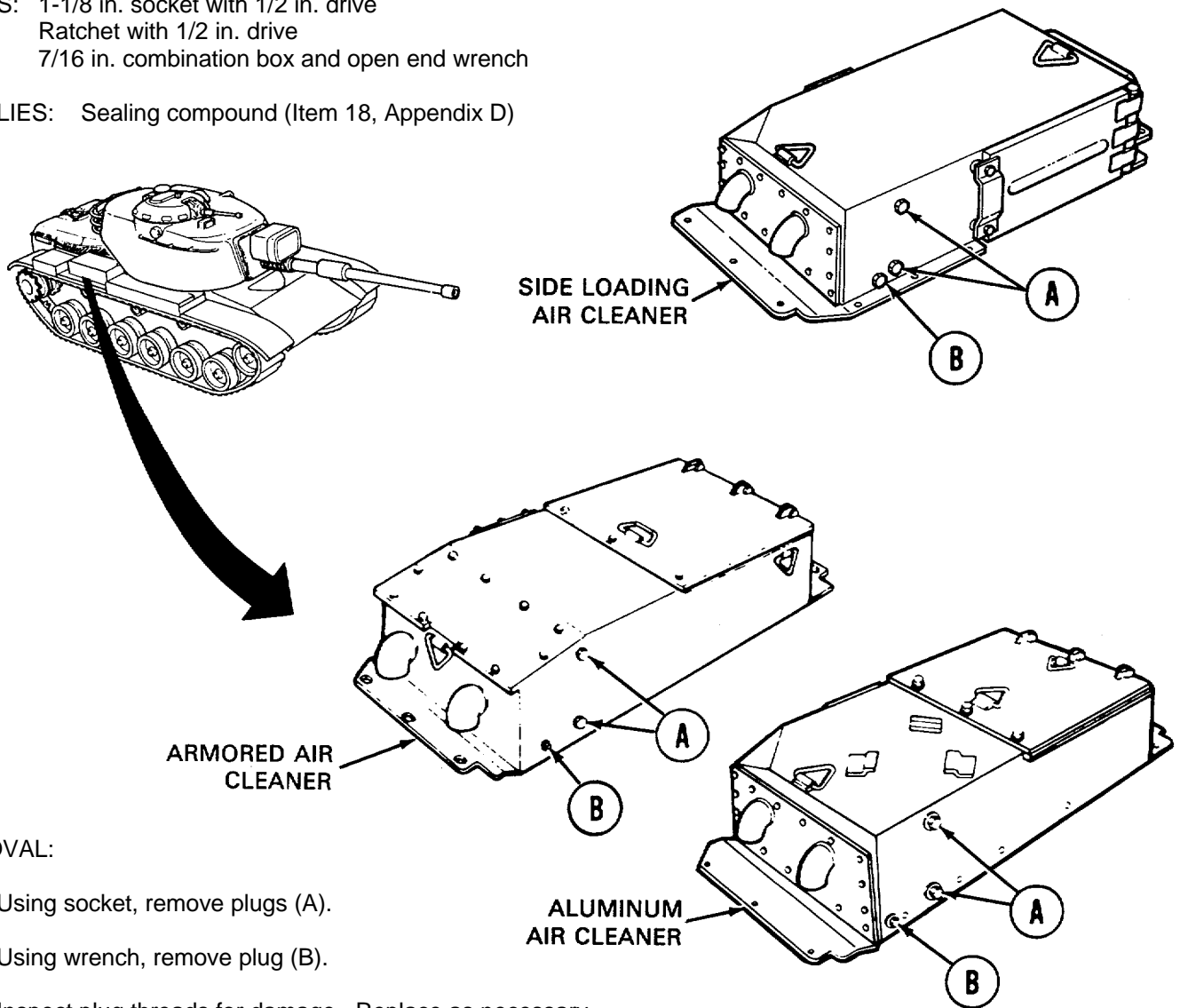
End of Task

TA148191

**AIR CLEANER PLUG REPLACEMENT (Sheet 1 of 1)**

**TOOLS:** 1-1/8 in. socket with 1/2 in. drive  
 Ratchet with 1/2 in. drive  
 7/16 in. combination box and open end wrench

**SUPPLIES:** Sealing compound (Item 18, Appendix D)



**REMOVAL:**

1. Using socket, remove plugs (A).
2. Using wrench, remove plug (B).
3. Inspect plug threads for damage. Replace as necessary.

**INSTALLATION:**

1. Coat threads of plugs (A) and (B) with sealer (Item 18, Appendix D) and install into air cleaner housing.
2. Using socket, tighten plugs (A).
3. Using wrench, tighten plug (B).

End of Task

TA148192

**AIR CLEANER (ALUMINUM AND SIDE LOADING) BLOWER FAN POWER LEAD REPLACEMENT (Sheet 1 of 4)**

PROCEDURE INDEX

PROCEDURE	PAGE
Removal	7-118
Installation	7-120

TOOLS: 1 in. combination box and open end wrench  
Slip joint pliers

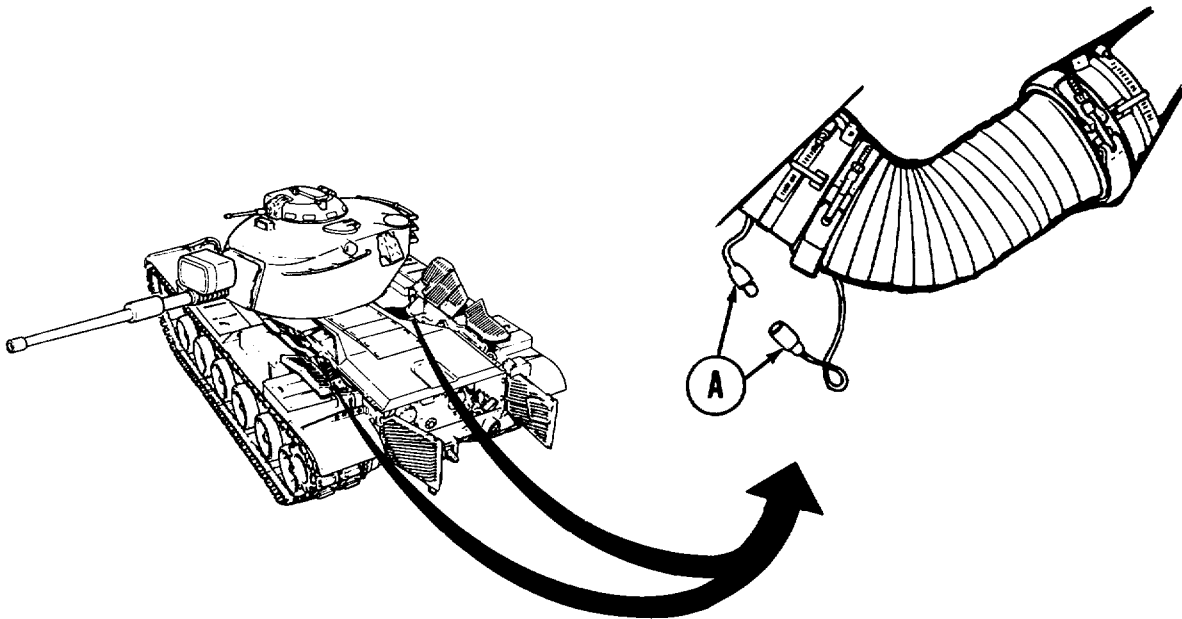
SUPPLIES: Gasket (10933723)

REFERENCE: TM 9-2350-260-10

PRELIMINARY PROCEDURES: Remove blower fans (page 7-126)  
Open top deck grille doors (TM 9-2350.260-10)

REMOVAL:

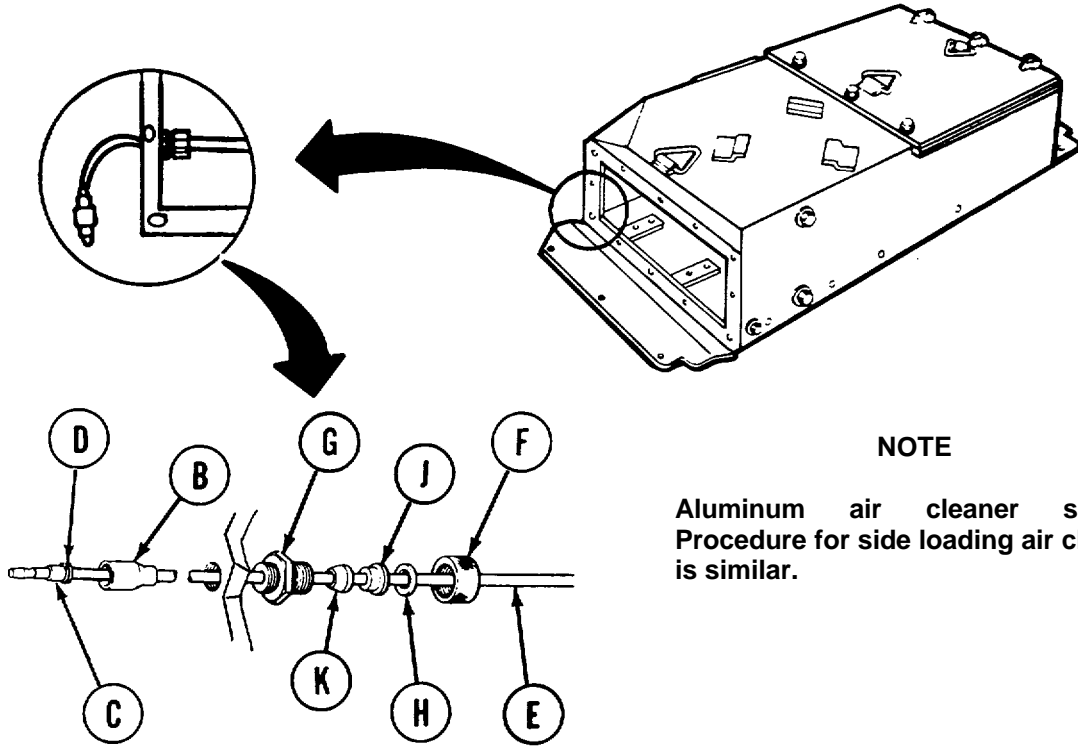
1. Disconnect electrical connector (A).



Go on to Sheet 2

TA148183

**AIR CLEANER (ALUMINUM AND SIDE LOADING) BLOWER FAN POWER LEAD REPLACEMENT (Sheet 2 of 4)**



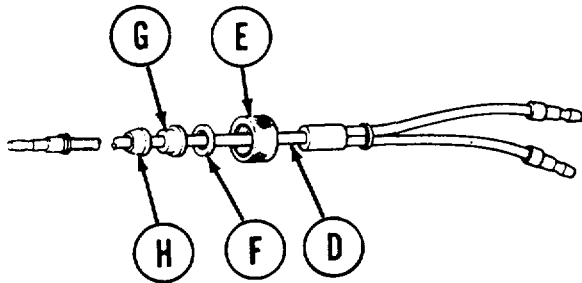
**NOTE**

Aluminum air cleaner shown. Procedure for side loading air cleaner is similar.

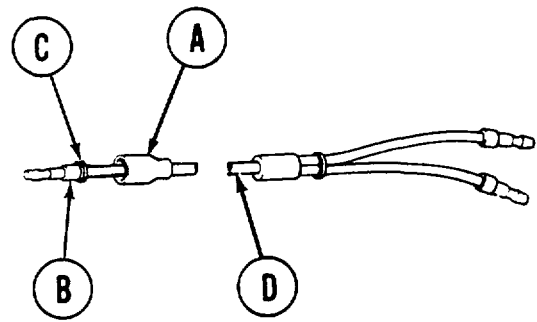
2. Push shell (B) back away from contact (C).
3. Using pliers, remove washer (D) from lead (E).
4. Remove shell (B).
5. Using pliers, loosen and back off nut (F).
6. Pull lead (E) out of adapter (G). When lead is pulled, washers (H), (J), and gasket (K) will also be pulled out.
7. Remove lead (E). Remove washers (H) and (J), gasket (K), and nut (F) from lead (E). Throw gasket away.
8. Inspect all remaining parts for defects or deterioration. Replace as necessary.



**AIR CLEANER (ALUMINUM AND SIDE LOADING) BLOWER FAN POWER LEAD REPLACEMENT (Sheet 3 of 4)**

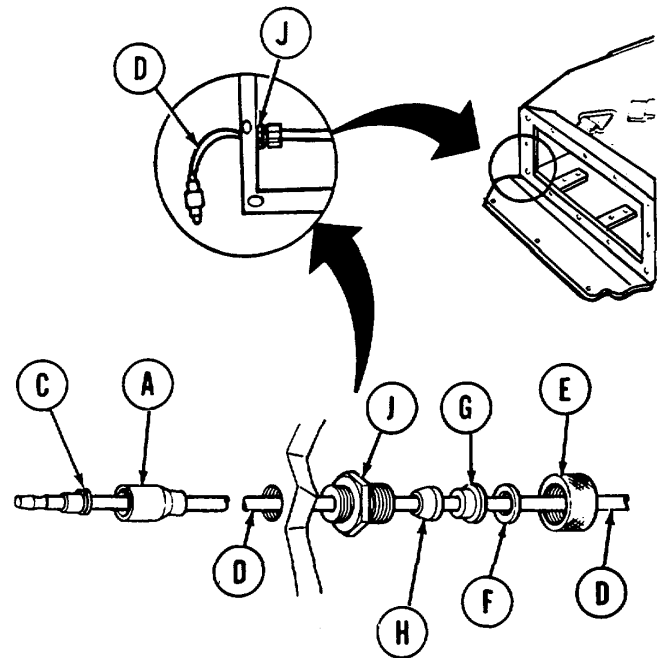


4. Install lead (D) through adapter (J). Pull approximately 10 inches of lead out of adapter.
5. Install shell (A) over end of lead and install washer (Q).
6. Pull shell (A) toward end until it is stopped by washer.
7. Push gasket (H) and washes (G) and (F) down in adapter (J).
8. Thread nut (E) onto adapter (J). Using pliers, tighten nut.



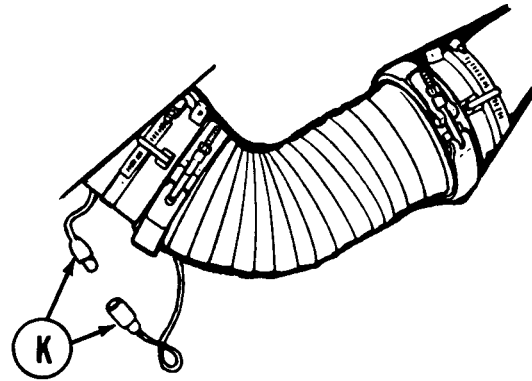
**INSTALLATION:**

1. Push shell (A) back away from contact (B).
2. Remove washer (C) from lead (D). Remove shell (A).
3. Install the following parts onto lead (D) nut (E), washer (F), washer (G), and new gasket (H).



**AIR CLEANER (ALUMINUM AND SIDE LOADING) BLOWER FAN POWER LEAD REPLACEMENT (Sheet 4 of 4)**

9. Install blower fan (page 7-129).
10. Connect electrical connector (K).
11. Check operation of air cleaner (TM 9-2350-260-10).
12. Close top deck grille doors (TM 9-2350-260-10).



End of Task

TA148196

**AIR CLEANER (ALUMINUM AND SIDE LOADING) BLOWER FAN HOSE REPLACEMENT (Sheet 1 of 1)**

TOOLS: Flat-tip screwdriver

SUPPLIES: Silicone compound (Item 32, Appendix D)

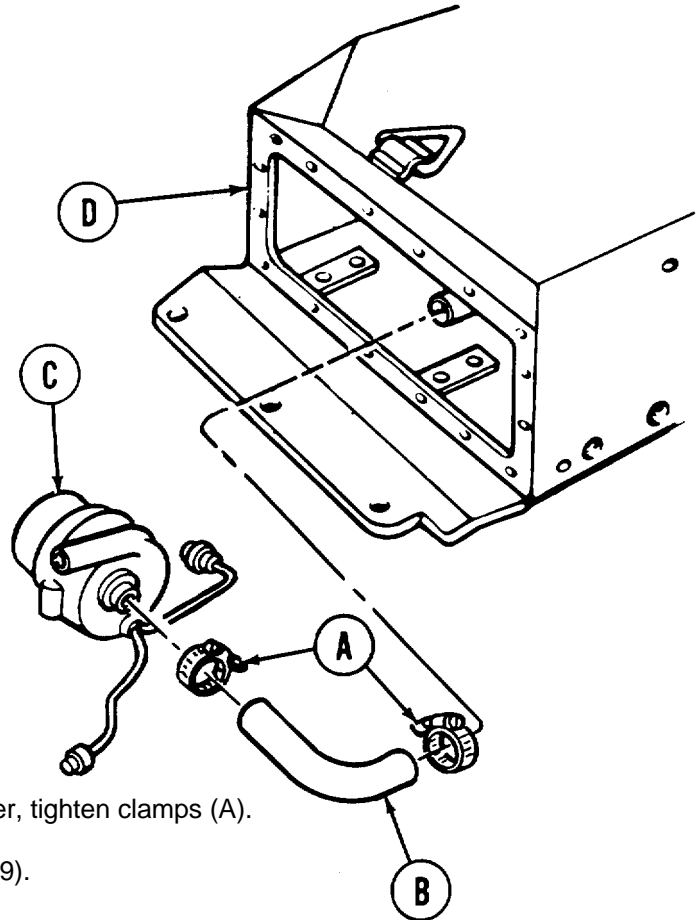
PRELIMINARY PROCEDURES: Remove air cleaner cover and gasket (page 7-131, steps 1 thru 3)  
Remove air cleaner blower fan, if necessary (page 7-125)

**NOTE**

**Aluminum air cleaner shown. Procedure for side loading air cleaner is similar.**

**REMOVAL:**

1. Using screwdriver, loosen two clamps (A).
2. Slide clamps (A) onto hose (B).
3. Remove hose (B) from blower fan (C) and housing (D).
4. Inspect hose (B) and clamps (A). Replace as necessary.

**INSTALLATION:**

1. Position clamps (A) onto hose (B).
2. Coat inside diameter of hose ends with silicone compound (Item 32, Appendix D) and install hose (B) to blower fan (C) and housing (D).
3. Slide clamps (A) to ends of hose. Using screwdriver, tighten clamps (A).
4. Install air cleaner blower fan, if required (page 7-129).
5. Install air cleaner cover and gasket (page 7-133, steps S thru 5).

End of Task

TA148197

**AIR CLEANER (ALUMINUM AND SIDE LOADING) BLOWER FAN GROUND LEAD REPLACEMENT (Sheet 1 of 2)**

TOOLS: 7/16 in. combination box and open end wrench

SUPPLIES: Lockwasher (MS35338-33) (2 required)

REFERENCE: TM 9-2350-260-10

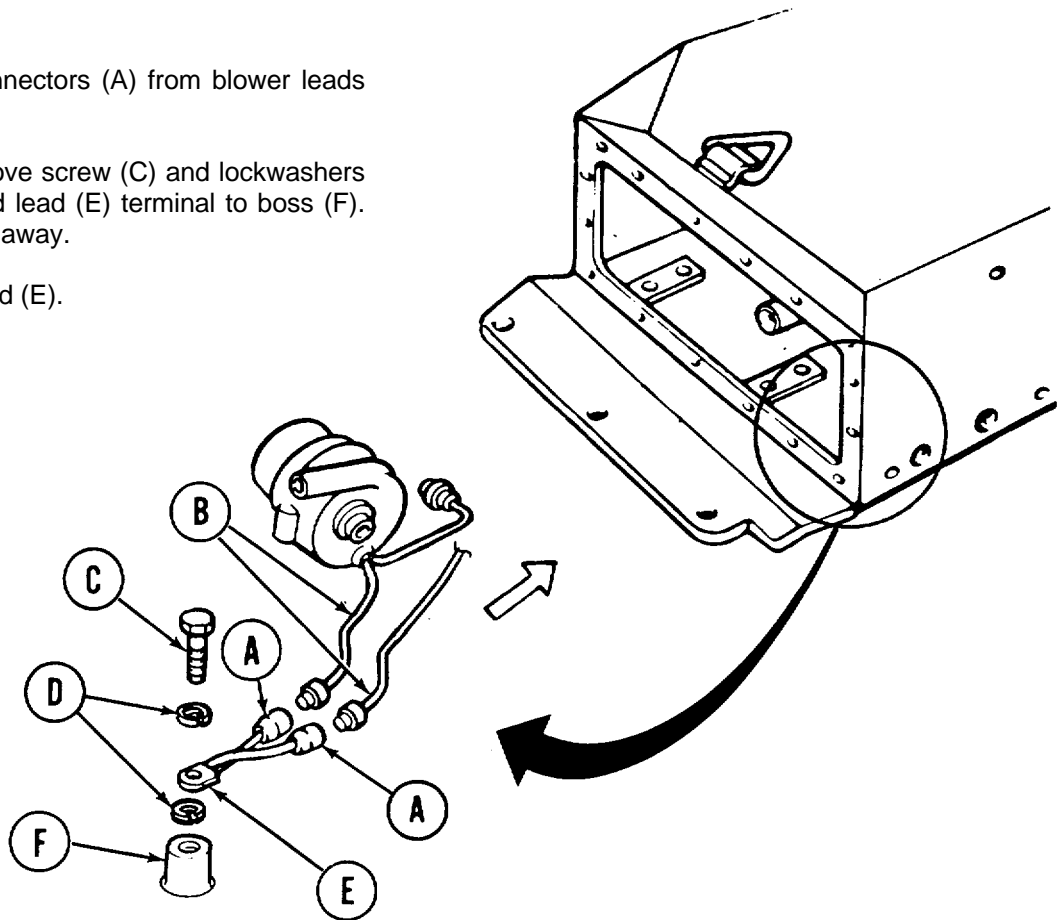
PRELIMINARY PROCEDURES: Remove air cleaner cover and gasket (page 7-131, steps 1 thru 3)  
Make sure MASTER CONTROL switch is OFF (TM 9-2350-260-10)

**NOTE**

Aluminum air cleaner shown. Procedure for side loading air cleaner is similar.

**REMOVAL:**

1. Disconnect two connectors (A) from blower leads (B).
2. Using wrench, remove screw (C) and lockwashers (D) securing ground lead (E) terminal to boss (F). Throw lockwashers away.
3. Remove ground lead (E).

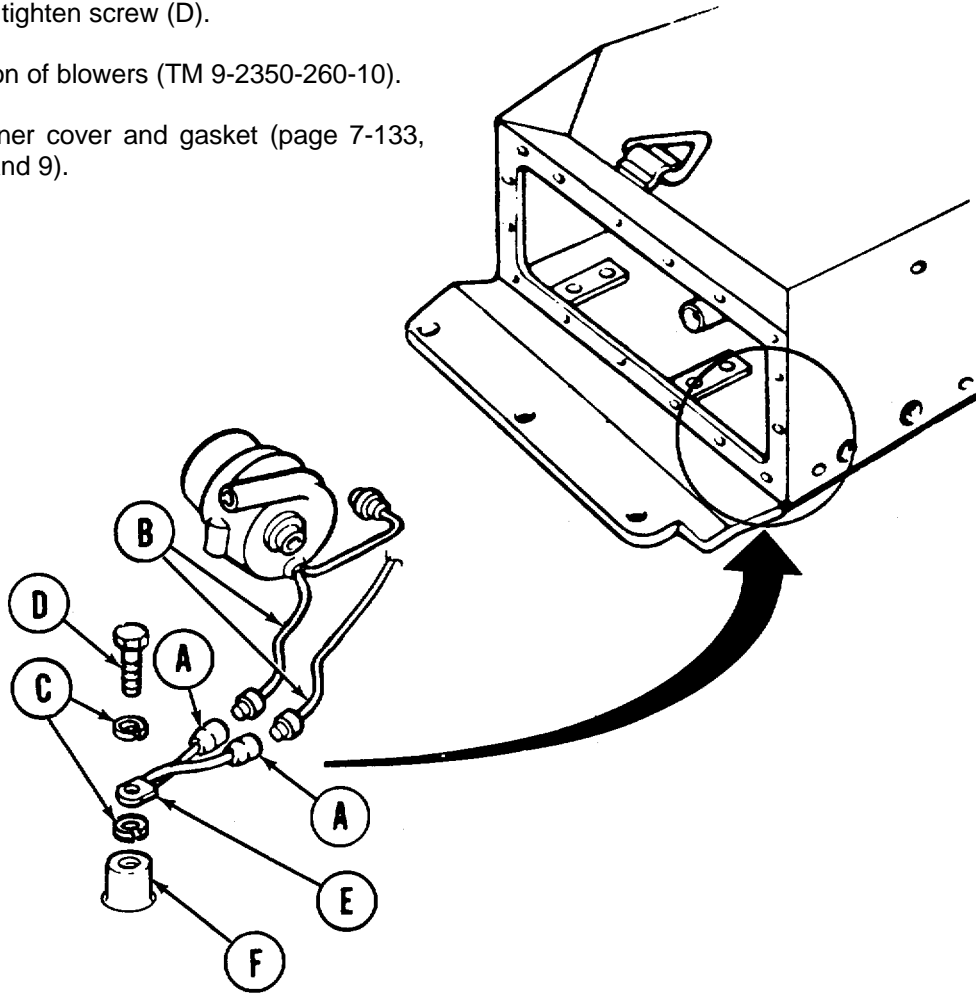


Go on to Sheet 2

TA148198

**AIR CLEANER (ALUMINUM AND SIDE LOADING) BLOWER FAN GROUND LEAD REPLACEMENT(Sheet 2 of 2)****INSTALLATION:**

1. Connect two connectors (A) to blower leads (B).
2. Install new lockwashers (C) and screws (D) to secure ground lead (E) terminal to boss (F).
3. Using wrench, tighten screw (D).
4. Check operation of blowers (TM 9-2350-260-10).
5. Install air cleaner cover and gasket (page 7-133, steps 3, 4, 8, and 9).



End of Task

TA148199

**AIR CLEANER (ALUMINUM AND SIDE LOADING) BLOWER FAN REPLACEMENT (Sheet 1 of 6)**

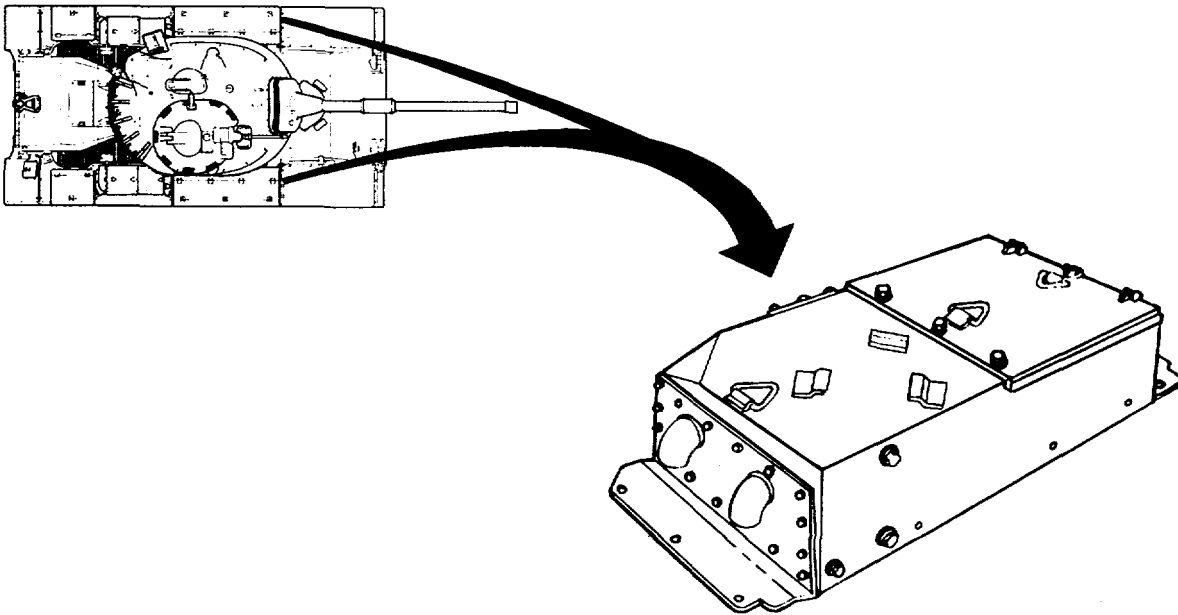
PROCEDURE INDEX

PROCEDURE	PAGE
Removal	7-126
Inspection and Repair	7-128
Installation	7-129

TOOLS: 9/16 in. socket with 1/2 in. drive  
 7/16 in. socket with 1/2 in. drive  
 1/2 in. socket with 1/2 in. drive  
 2 in. extension with 1/2 in. drive  
 Ratchet with 1/2 in. drive  
 Flat-tip screwdriver  
 5 in. extension with 1/2 in. drive  
 7/16 in. combination box and open end wrench

SUPPLIES: Sealing compound (Item 24, Appendix D)  
 Sealer (Item 53, Appendix D)  
 Gasket (11675966)  
 Lockwasher (MS35338-45) (2 required)  
 Lockwasher (MS35338-46) (2 required)

REFERENCE: TM 9-2350-260-10



Go on to Sheet 2

TA148200

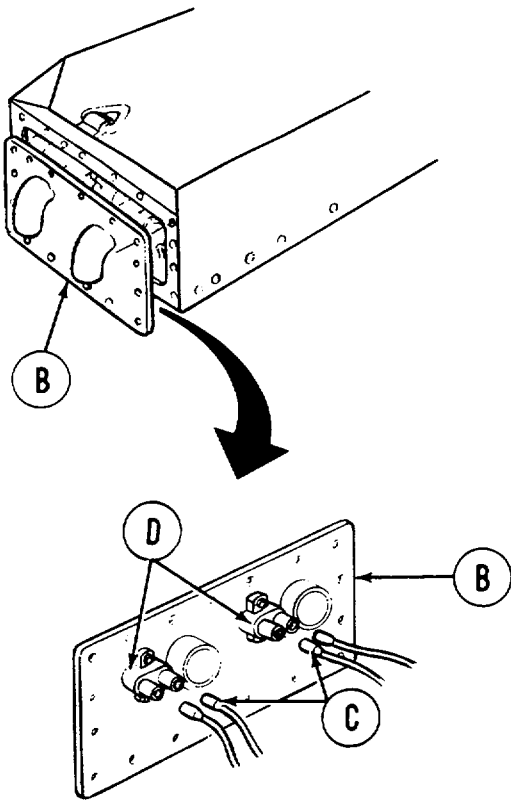
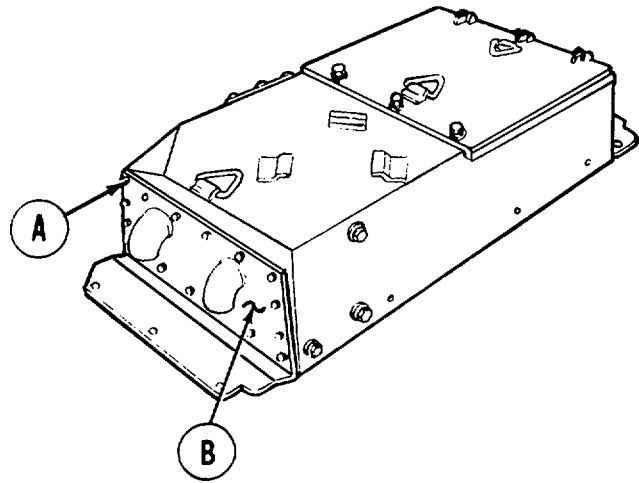
**AIR CLEANER (ALUMINUM AND SIDE LOADING) BLOWER FAN REPLACEMENT (Sheet 2 of 6)**

**NOTE**

There are two blower fans. Both are replaced the same way.

**REMOVAL:**

1. Using 7/16 inch socket and wrench, remove 16 screws and fiat washers (A).

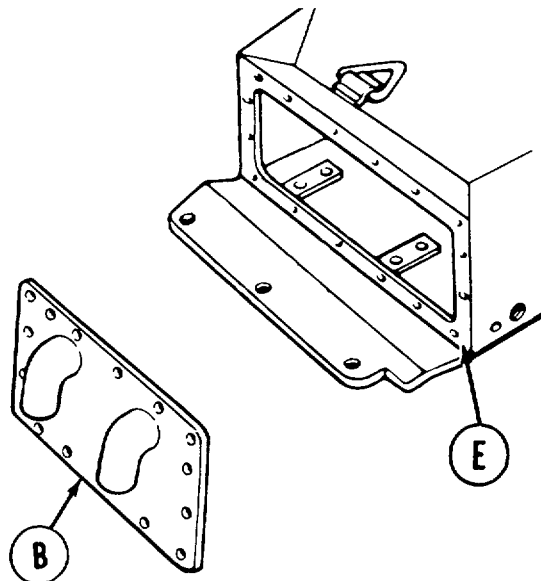


**NOTE**

Aluminum air cleaner shown. Procedure for side loading air cleaner is similar.

2. Pull cover (B) away from air cleaner housing, just far enough to reach connectors (C).
3. Disconnect four connectors (C) from two circuit breakers (D) on cover (B).

4. Remove cover (B) and gasket (E). Throw gasket (E) away.

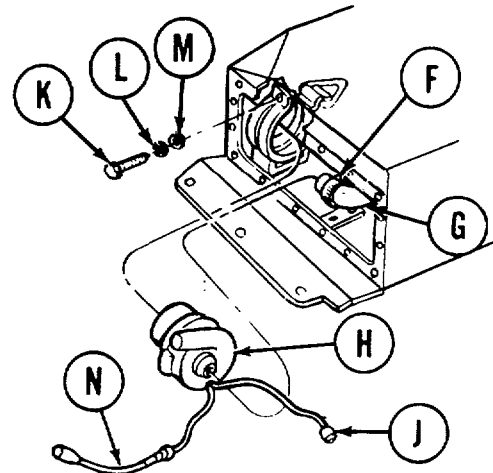


Go on to Sheet 3

TA148201

**AIR CLEANER (ALUMINUM AND SIDE LOADING) BLOWER FAN REPLACEMENT (Sheet 3 of 6)**

5. Using screwdriver, loosen hose clamp (F) assuring hose (G) to blower inlet.
6. Slide clamp (F) away from blower (H).
7. Disconnect hose (G) from blower (H).
8. Disconnect electrical lead (g) from ground lead.



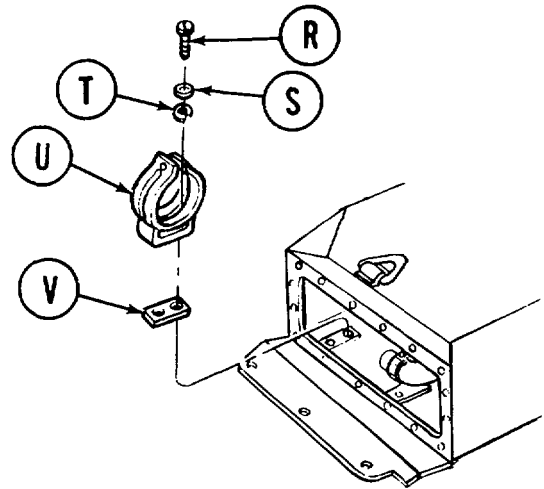
**RIGHT BLOWER FAN  
REMOVED FOR CLARITY**

9. Using 1/2 inch socket and extension, remove two screws (K), lockwashers (L), and flat washers (M). Throw lockwashers away.
10. Carefully remove blower (H).
11. Disconnect jumper lead (N) from blower lead.



**AIR CLEANER (ALUMINUM AND SIDE LOADING) BLOWER FAN REPLACEMENT (Sheet 4 of 6)**

12. Using 9/16 inch socket, remove two screws (R), lockwashers (S), and flat washers (T) securing bracket (U) to housing. Throw lockwashers away.
13. Remove bracket (U) and pad (V).

**INSPECTION AND REPAIR:**

1. Inspect bracket (U) for defects or damage. Replace or repair as necessary.
2. Inspect condition of pad (V). If defective or deteriorating, replace.

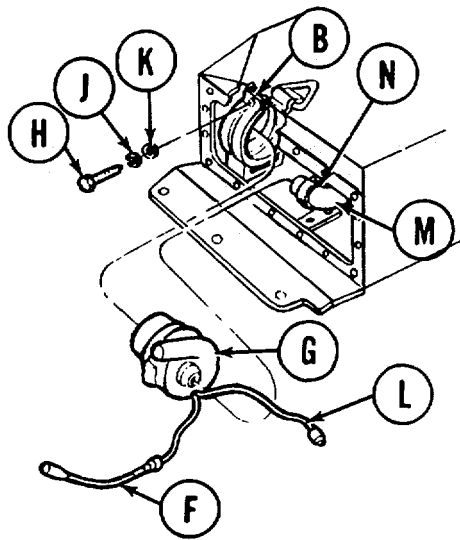
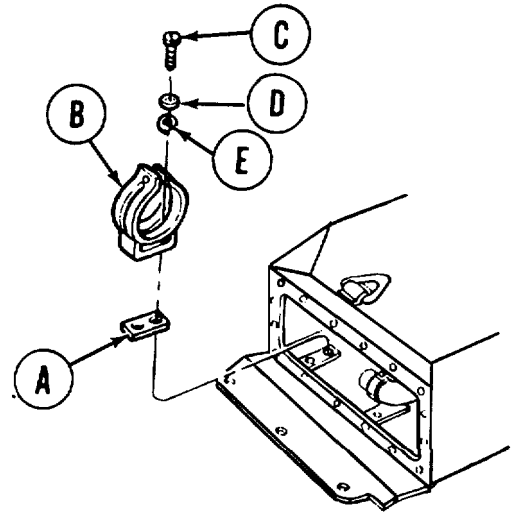
Go on to Sheet 5

TA148203

**AIR CLEANER (ALUMINUM AND SIDE LOADING) BLOWER FAN REPLACEMENT (Sheet 5 of 6)**

**INSTALLATION:**

1. Position pad (A) and bracket (B) in housing.
2. Coat threads of two screws (C) with sealer (Item 53, Appendix D), and install two screws (C, new lockwashers (D), and flat washers (E) to secure bracket (B).
3. Using 9/16 inch socket, tighten screws (C).
4. Connect jumper lead (F) to longer blower lead.
5. Position blower (G) into bracket (B).

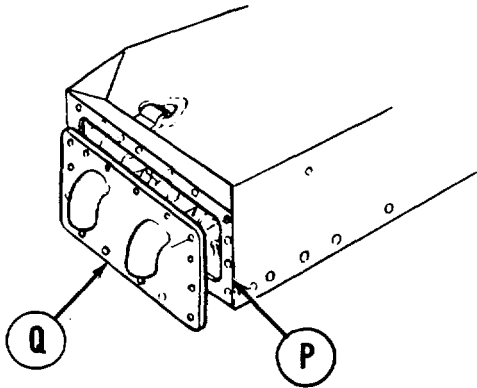


6. Position bracket (B) around blower (G) and install two screws (H), new lockwashers (J), and flat washers (K) to secure band.
7. Using 1/2 inch socket, tighten screws (H).
8. Connect short electrical lead (L) of blower to ground lead.
9. Connect hose (M) to inlet port of blower (G).
10. Slide hose clamp (N) over hose (M) and inlet port of blower (G).
11. Using screwdriver, tighten nut of clamp (N).

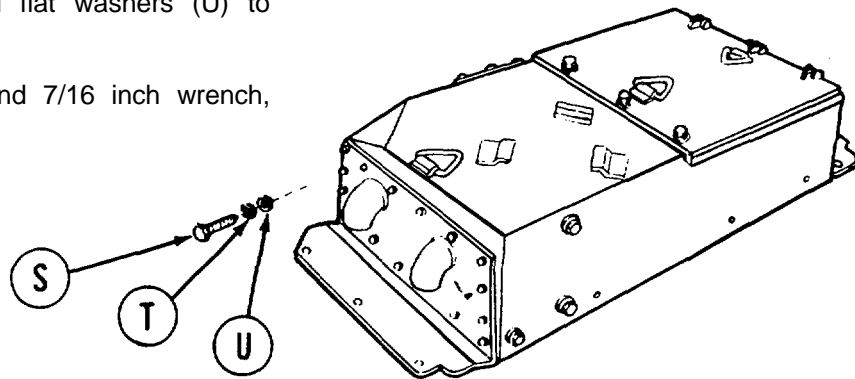
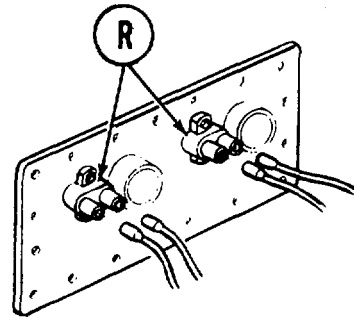
Go on to Sheet 6

TA148204

**AIR CLEANER (ALUMINUM AND SIDE LOADING) BLOWER FAN REPLACEMENT (Sheet 6 of 6)**



12. Position new gasket (P) on housing with sealing compound (Item 24, Appendix D).
13. Position cover (Q) in front of housing.
14. Connect lead with jumper from blower to each circuit breaker (R).
15. Connect one connector from power lead to each circuit breaker. (The power lead is the one coming from the side of the housing.)
16. Check operation of air cleaner blower fan (TM 9-2350-260-10).
17. Position cover (Q) to housing and install 16 screws (S), lockwashers (T), and flat washers (U) to secure cover.
18. Using 7/16 inch socket and 7/16 inch wrench, tighten screws (S).



End of Task

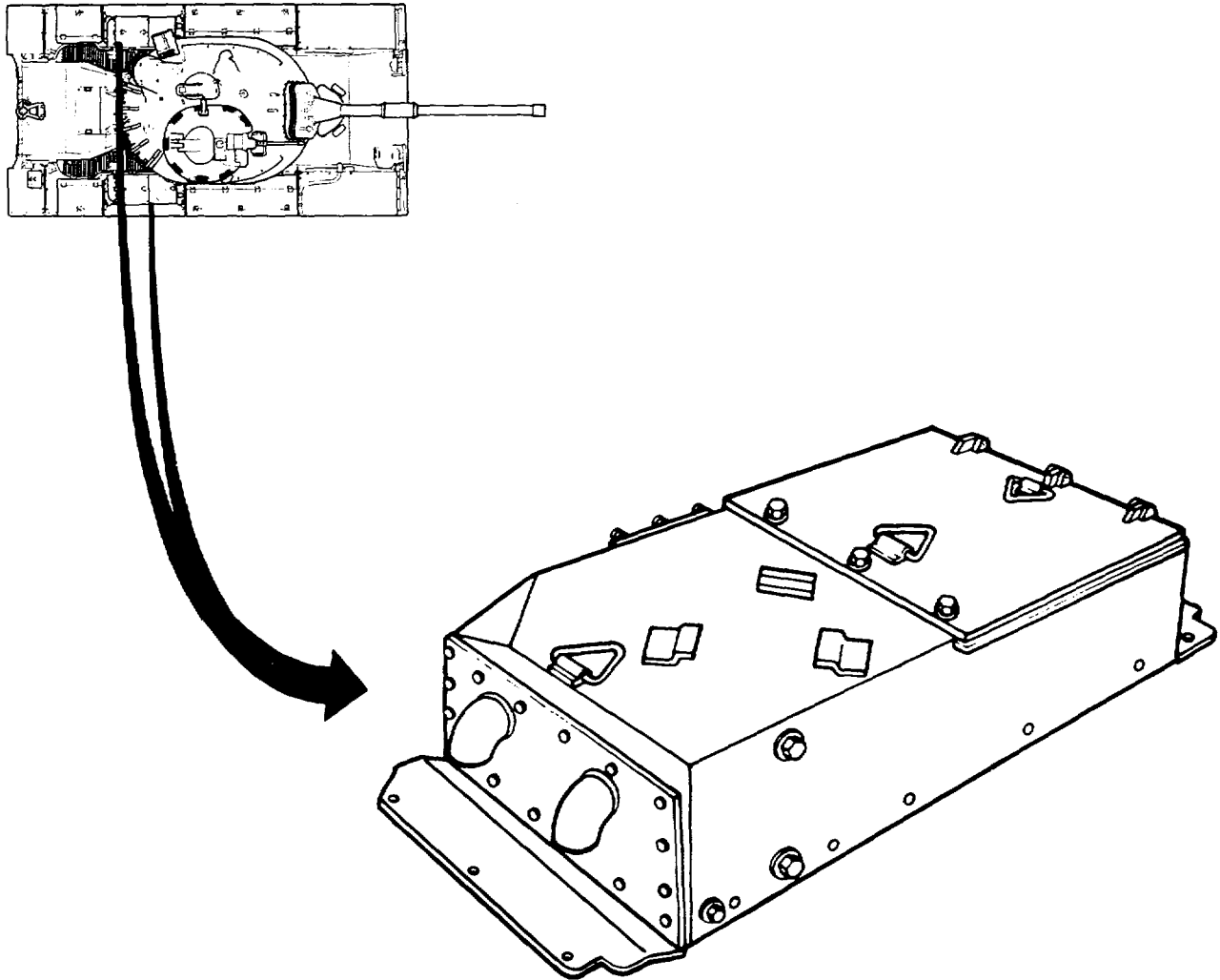
TA148205

**AIR CLEANER (ALUMINUM AND SIDE LOADING) BLOWER COVER AND GASKET REPLACEMENT (Sheet 1 of 3)**

TOOLS: 7/16 n. socket with 1/2 in. drive  
7/16 in. combination box and open end wrench  
Ratchet with 1/2 in. drive  
Flat-tip screwdriver

SUPPLIES: Sealing compound (Item 24, Appendix D)  
Gasket (11675966)  
Lockwasher (MS35335-31) (4 required)

REFERENCE: TM 9-2350-260-10



Go on to Sheet 2

TA148206

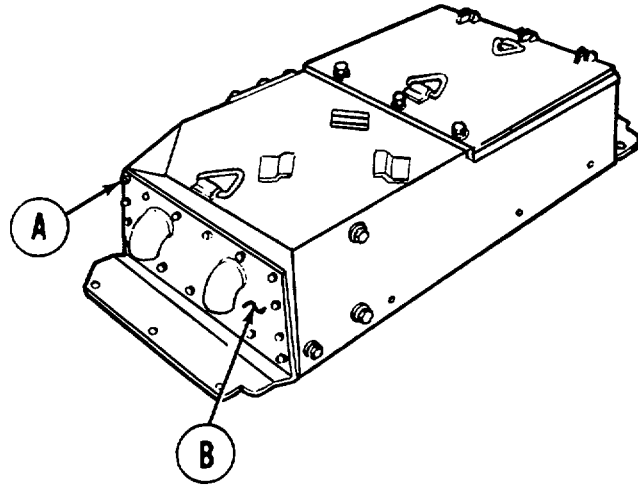
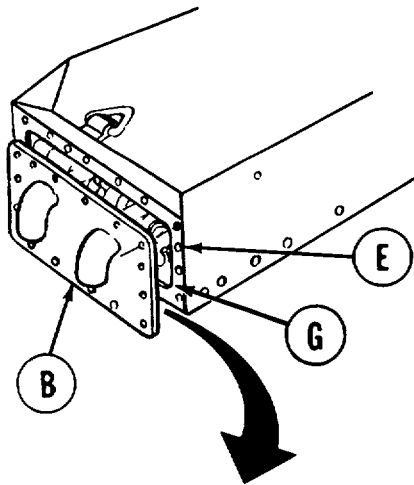
**AIR CLEANER (ALUMINUM AND SIDE LOADING) BLOWER COVER AND GASKET REPLACEMENT (Sheet 2 of 3)**

**REMOVAL:**

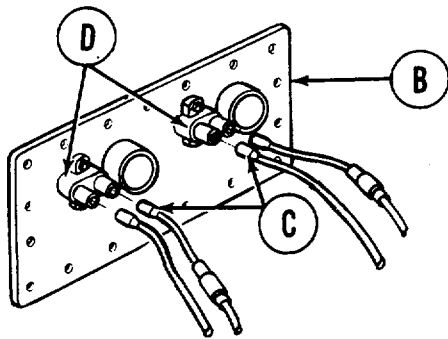
1. Using socket and wrench, remove 16 assembled screws and flat washers (A).

**NOTE**

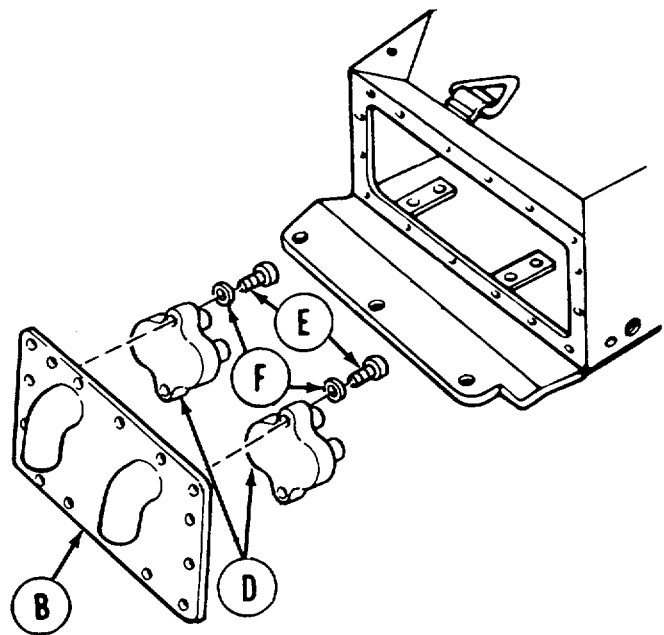
Aluminum air cleaner shown. Procedure for side loading air cleaner is similar.



2. Pull cover (B) away from air cleaner housing just far enough to reach connectors (C).
3. Disconnect four connectors (C) from two circuit breakers (D) on cover (B).



4. Using screwdriver, remove four screws (E) and lockwashers (F) securing two circuit breakers (D) to cover (B). Throw lockwashers away.
5. Remove cover (B) and gasket (G). Throw gasket (G) away.



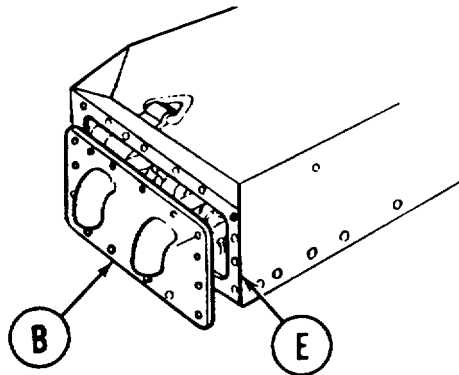
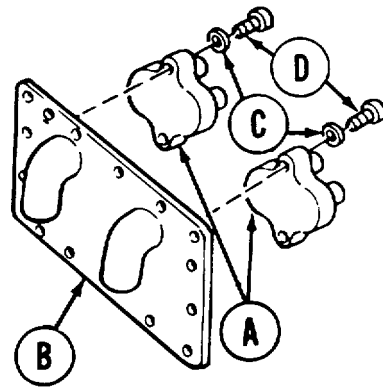
Go on to Sheet 3

TA148207

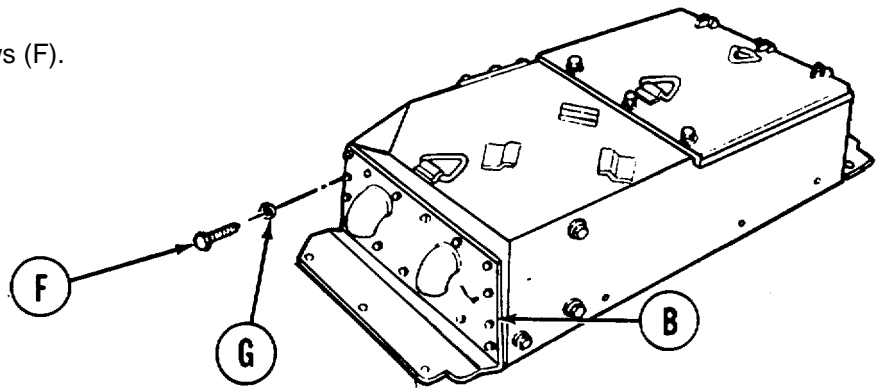
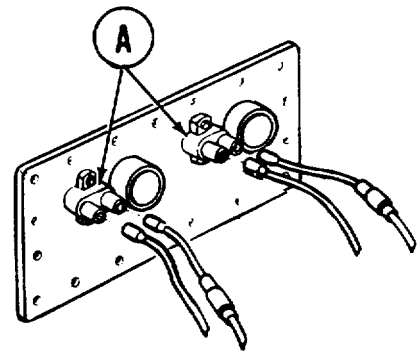
**AIR CLEANER (ALUMINUM AND SIDE LOADING) BLOWER COVER AND GASKET REPLACEMENT (Sheet 3 of 3)**

**INSTALLATION:**

1. Position two circuit breakers (A) onto cover (B).
2. Install new lockwashers (C) and screws (D) to secure circuit breakers (A) to cover (B). Using screwdriver, tighten screws (D).
3. Position new gasket (E) on housing with sealing compound (Item 24, Appendix D).



4. Position cover (B) in front of housing.
5. Connect lead with jumper from blower to each circuit breaker (A).
6. Connect one connector from power lead to each circuit breaker (A). (Power lead is the one coming from side of housing.)
7. Check operation of air cleaner blower fan (TM 9-2350-260-10).
8. Position cover (B) to housing and install 16 assembled screws (F) and fiat washers (G) to secure cover.
9. Using socket and wrench, tighten screws (F).



End of Task

TA148208

**AIR CLEANER (ARMORED) CIRCUIT BREAKER REPLACEMENT (Sheet 1 of 1)**

TOOLS: Cross-tip screwdriver

SUPPLIES: Lockwasher (MS35338-41) (4 required)

REFERENCE: TM 9-2350-260-10

PRELIMINARY PROCEDURE: Remove air cleaner cover and gasket (page 7-149, steps 1 thru 4)

**NOTE**

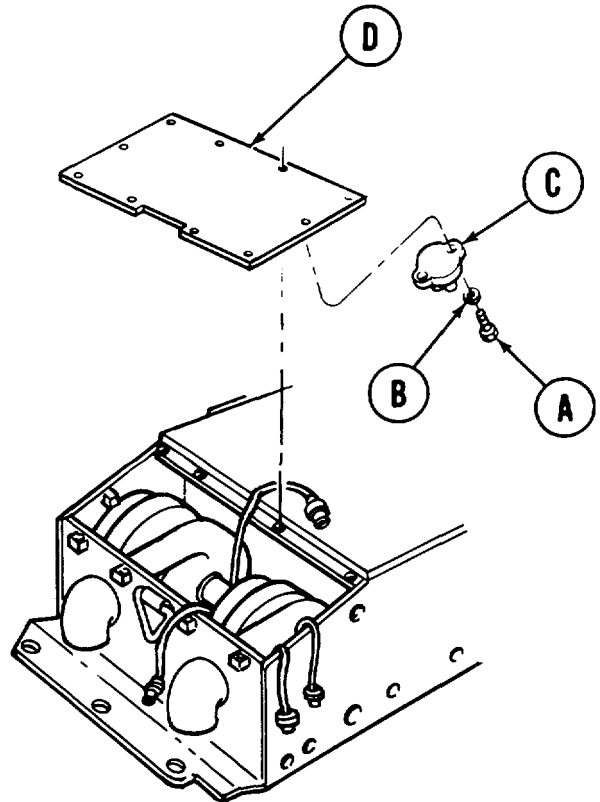
**All air cleaner circuit breakers are removed and installed the same.**

**REMOVAL:**

1. Using screwdriver, remove screws (A) and lockwashers (B) securing circuit breaker (C) to cover (D). Throw lockwashers away.
2. Remove circuit breaker (C).
3. Disconnect two electrical leads (circuit 415).

**INSTALLATION:**

1. Position circuit breaker (C) onto cover (D).
2. Install new lockwashers (B) and screws (A) to secure circuit breaker (C) to cover (D). Using screwdriver, tighten screws (A).
3. Connect two electrical leads (circuit 415).
4. Install cover and gasket (D) (page 7-150, steps 3 thru 7).
5. Check operation of blowers (TM 9-2350-260-10).



End of Task

TA148209

**AIR CLEANER (ARMORED) BLOWER FAN POWER LEAD REPLACEMENT (Sheet 1 of 3)**

TOOLS: Slip joint pliers

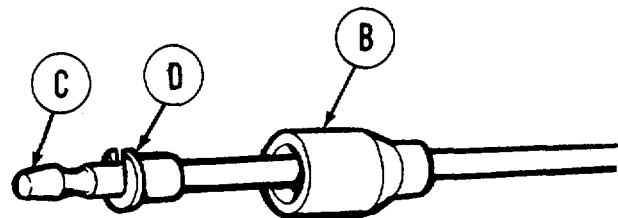
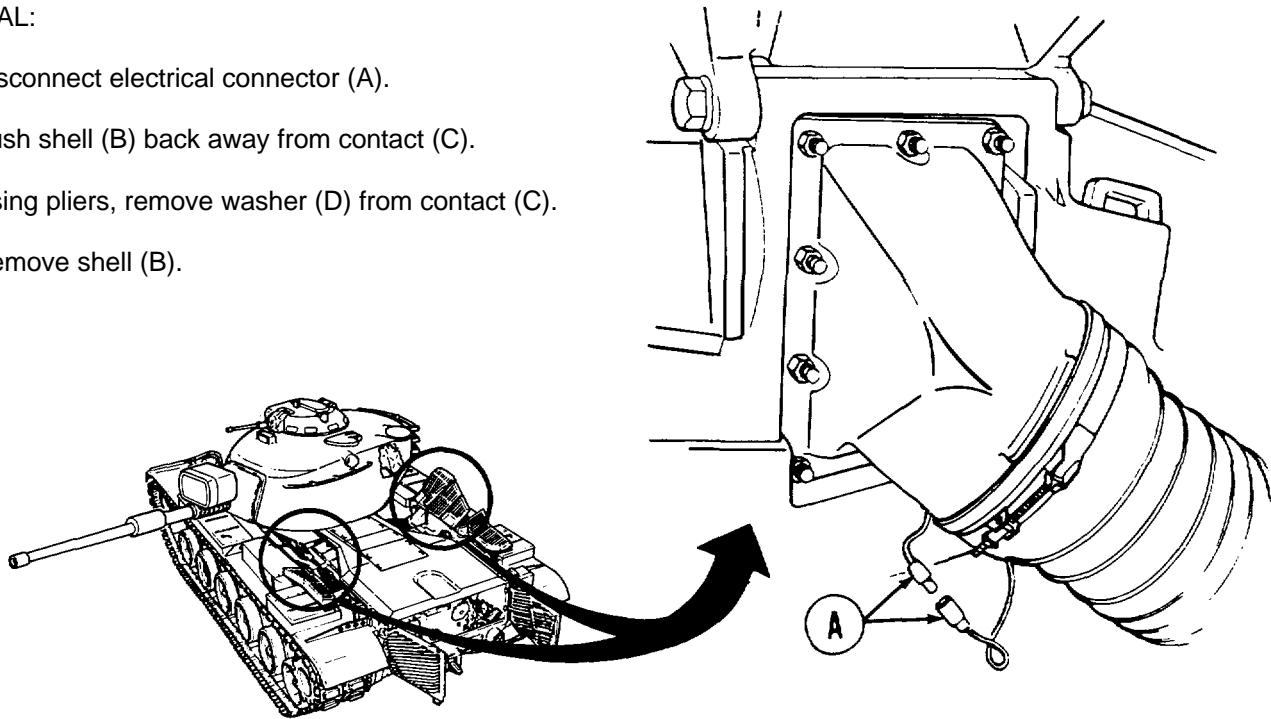
SUPPLIES: Gasket (10933723)

REFERENCE: TM 9-2350-260-10

PRELIMINARY PROCEDURES: Open top deck grille doors (TM 9-2350-260-10)  
Remove blower fans (page 7-142)

REMOVAL:

1. Disconnect electrical connector (A).
2. Push shell (B) back away from contact (C).
3. Using pliers, remove washer (D) from contact (C).
4. Remove shell (B).

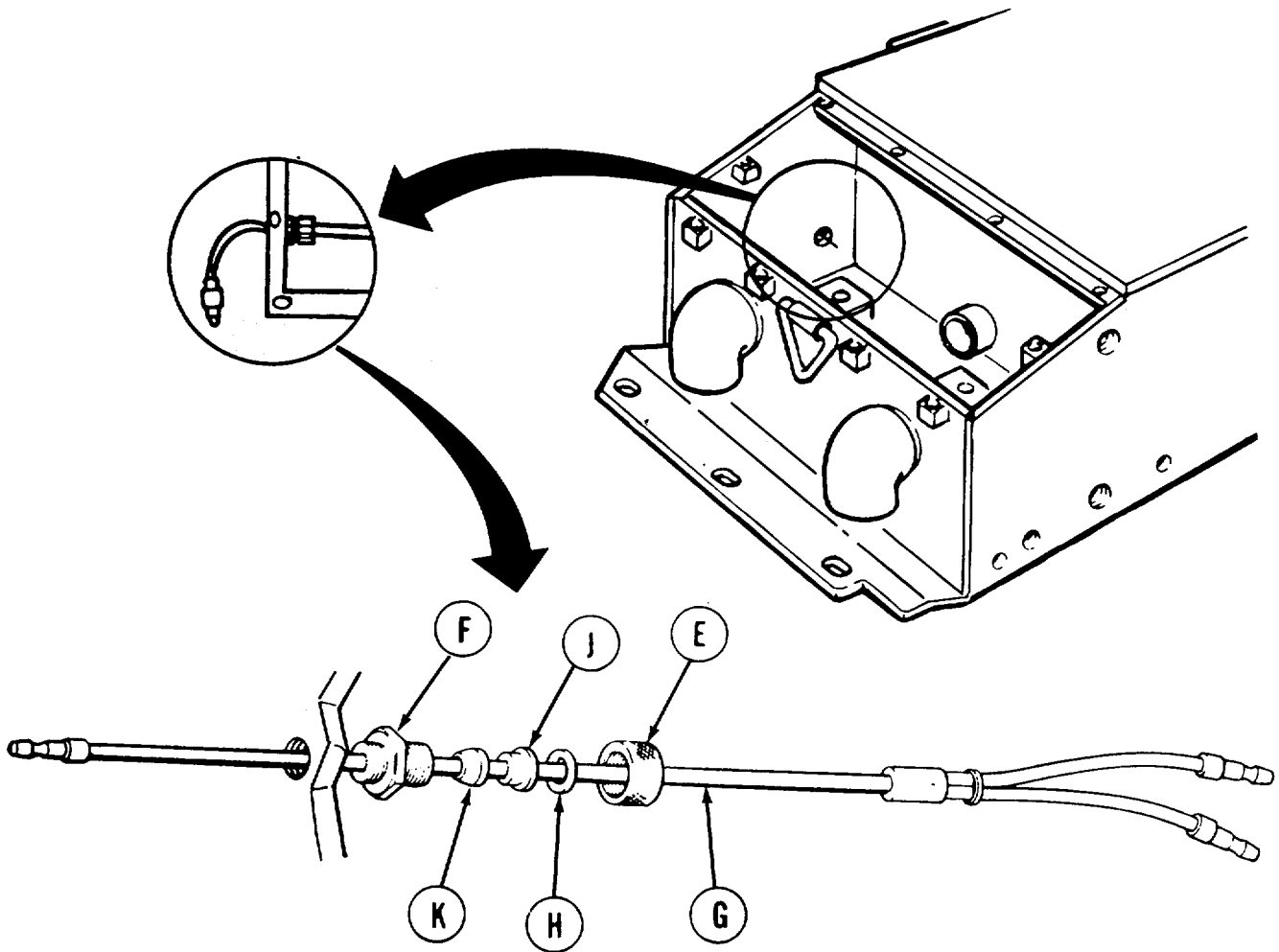


Go on to Sheet 2

TA148210



## AIR CLEANER (ARMORED) BLOWER FAN POWER LEAD REPLACEMENT (Sheet 2 of 3)

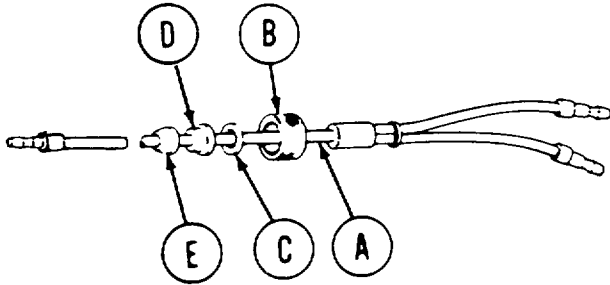


5. Using pliers, disconnect nut (E) from adapter (F).
6. Pull lead (G) out of adapter (F). When lead is pulled washers (H) and (J) and gasket (K) will also be pulled out.
7. Remove lead (G). Remove washer (H) and (J) and nut (E) from lead (G). Throw gasket (K) away.
8. Inspect all parts removed for defects or deterioration. Replace a necessary.

Go on to Sheet 3

TA148211

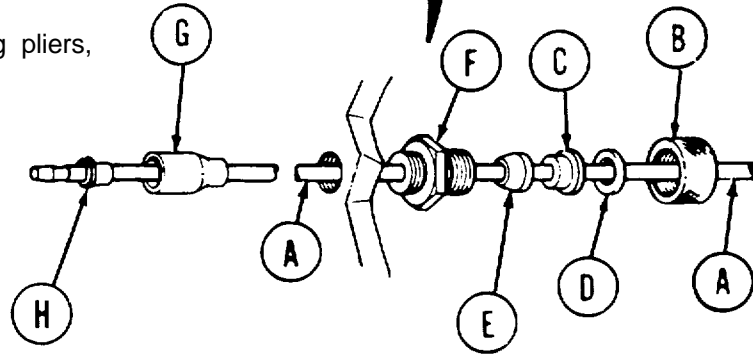
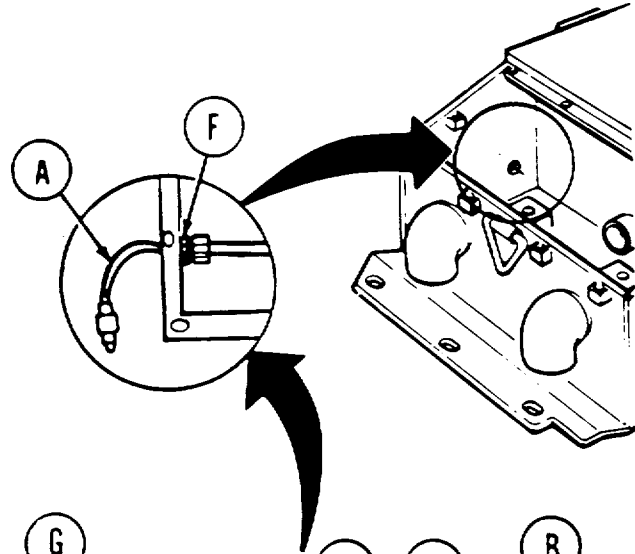
**AIR CLEANER (ARMORED) BLOWER FAN POWER LEAD REPLACEMENT (Sheet 3 of 3)**



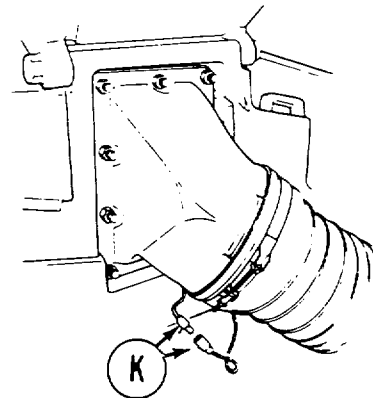
**INSTALLATION:**

1. Install the following parts onto lead (A): nut (B), washer (C), washer (D), and new gasket (E).

2. Install lead (A) through adapter (F). Pull approximately 10 inches of lead out of adapter.
3. Install shell (G) approximately 5 inches over end of lead (A) and install washer (H).
4. Pull shell (G) toward end until it is stopped by washer (H).
5. Push gasket (E) and washers (C) and (D) into adapter (F).
6. Thread nut (B) onto adapter (F). Using pliers, tighten nut.



7. Install blower fans (page 7-144).
8. Connect electrical connector (K).
9. Check operation of air cleaner (TM 9-2350-260-10).
10. Close top deck grille doors (TM 9-2350-260-10).



End of Task

TA148212

**AIR CLEANER (ARMORED) BLOWER FAN HOSE REPLACEMENT (Sheet 1 of 1)**

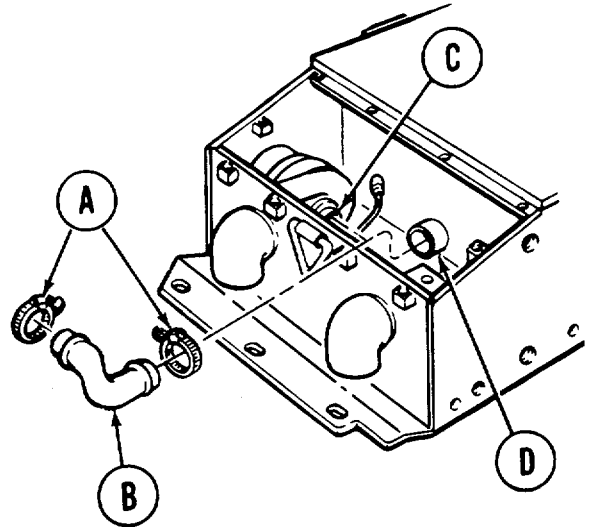
TOOLS: Flat-tip screwdriver

SUPPLIES: Silicone compound (Item 32, Appendix D)

PRELIMINARY PROCEDURE: Remove air cleaner cover and gasket (page 7-149, steps 1 thru 4)

**REMOVAL:**

1. Using screwdriver, loosen clamps (A).
2. Slide clamps (A) onto hose (B).
3. Remove hose (B) from blower fan (C) and housing (D).
4. Inspect hose (B) and clamps (A). Replace as necessary.

**INSTALLATION:**

1. Position clamps (A) onto hose (B).
2. Coat inside diameter of hose ends with silicone compound (Item 32, Appendix D) and install hose (B) to blower fan (C) and housing (D).
3. Slide clamps (A) to ends of hose. Using screwdriver, tighten clamps (A).
4. Install air cleaner cover and gasket (page 7-150, steps 3 thru 7).

End of Task

TA148213

**AIR CLEANER (ARMORED) BLOWER FAN GROUND LEAD REPLACEMENT (Sheet 1 of 2)**

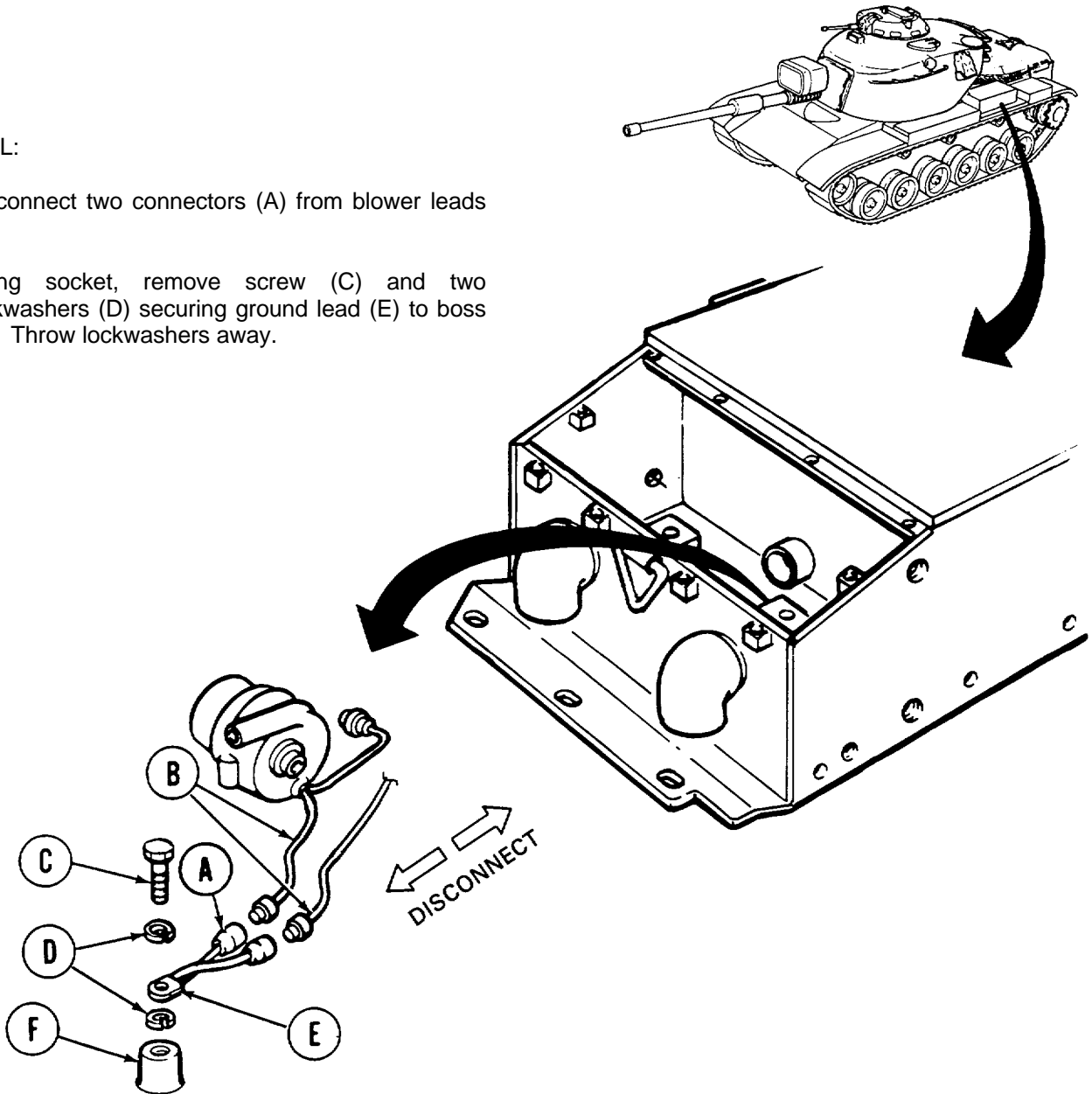
TOOLS: 7/16 in. socket with 1/2 in. drive  
 Ratchet with 1/2 in. drive  
 10 in. extension with 1/2 in. drive

REFERENCE: TM 9-2350-260-10

PRELIMINARY PROCEDURE: Remove air cleaner cover and gasket (page 7-149, steps 1 thru 4)

REMOVAL:

1. Disconnect two connectors (A) from blower leads (B).
2. Using socket, remove screw (C) and two lockwashers (D) securing ground lead (E) to boss (F). Throw lockwashers away.

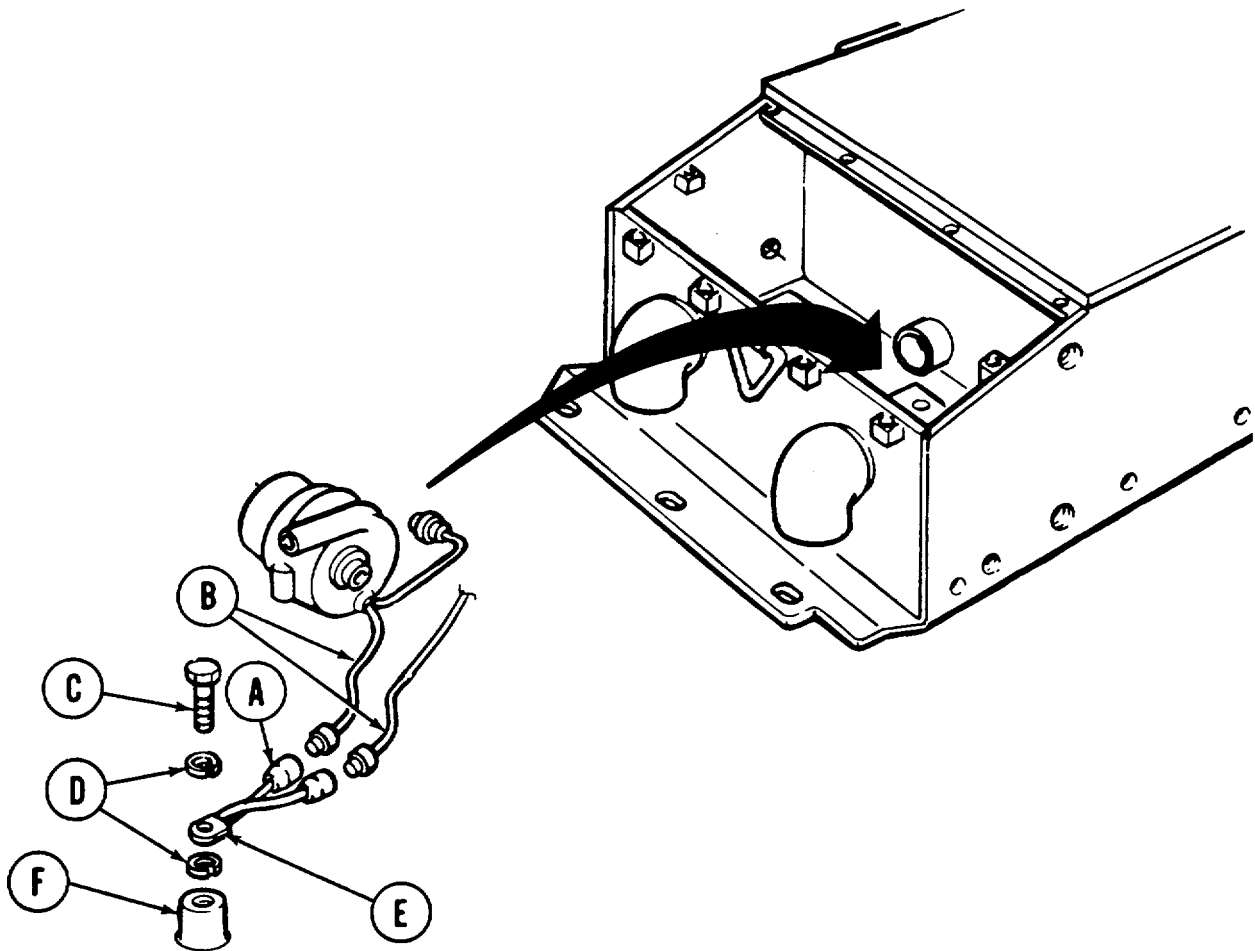


Go on to Sheet 2

TA148214

**AIR CLEANER (ARMORED) BLOWER FAN GROUND LEAD REPLACEMENT (Sheet 2 of 2)****INSTALLATION:**

1. Connect two connectors (A) to blower leads (W).
2. Install screw (C) and two new lockwashers (D) to secure ground lead (E) terminal to boss (F).
3. Using socket, tighten screw (C).
4. Install air cleaner cover and gasket (page 7-150, steps 3 thru 7).
5. Check operation of blower (TM 9-2350-260-10).



End of Task

TA148215

**AIR CLEANER (ARMORED) BLOWER FAN REPLACEMENT (Sheet 1 of 7)**

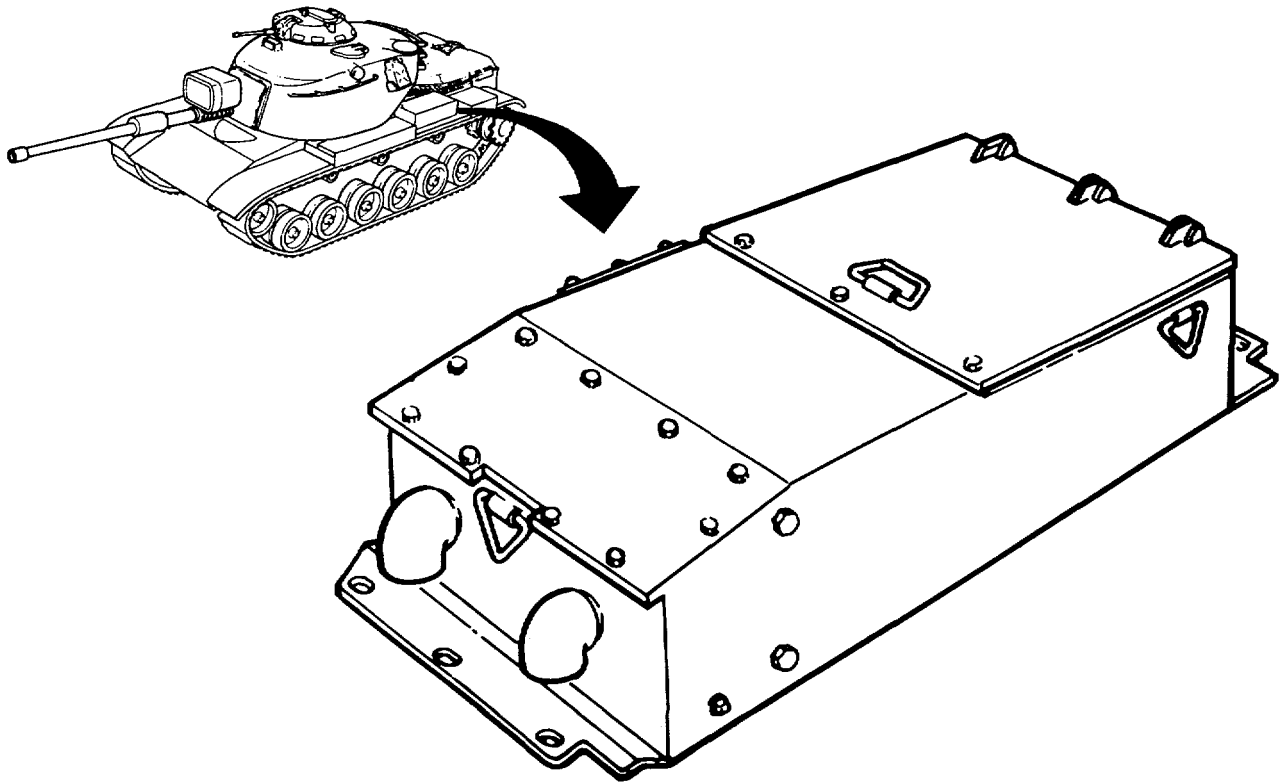
PROCEDURE INDEX

PROCEDURE	PAGE
Removal	7-142
Inspection and Repair	7-143
Installation	7-144

TOOLS: 1/2 in. socket with 1/2 in. drive  
 Ratchet with 1/2 in. drive  
 10 in. extension with 1/2 in. drive  
 Flat-tip screwdriver  
 Multimeter

SUPPLIES: Sealing compound (Item 24, Appendix D)  
 Silicone compound (Item 32, Appendix D)  
 Gasket(12251902)  
 Lockwasher (MS35338-4) (16 required)

REFERENCE: TM 9-2350-260-10



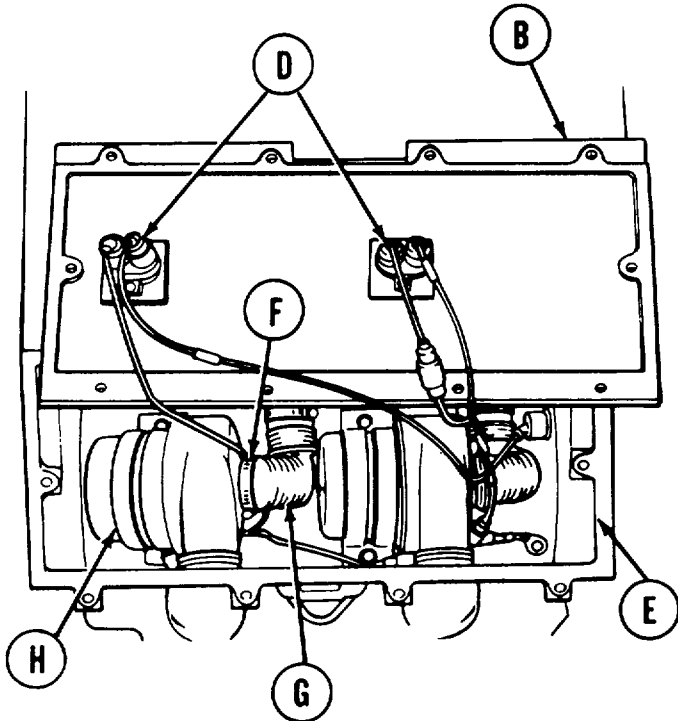
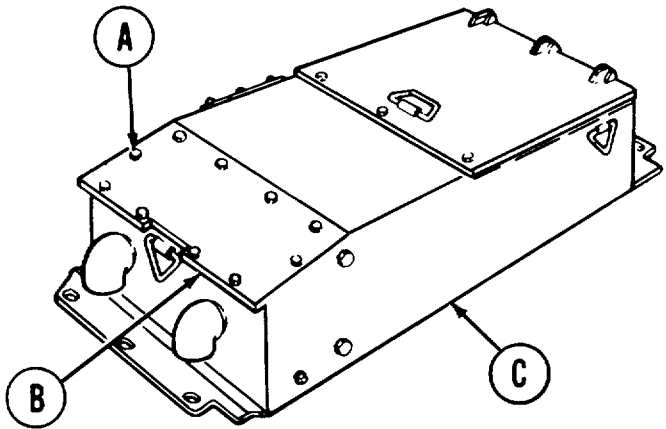
Go on to Sheet 2

TA148216

**AIR CLEANER (ARMORED) BLOWER FAN REPLACEMENT (Sheet 2 of 7)**

**REMOVAL:**

1. Using socket, remove ten screws and lockwashers (A) securing cover (B). Throw lockwashers away.
2. Lift cover (B) from opening and place onto top of housing (C).



3. Disconnect four electrical leads from two circuit breakers (D) mounted to underside of cover (B).
4. Remove cover (B) and gasket (E). Throw gasket away.

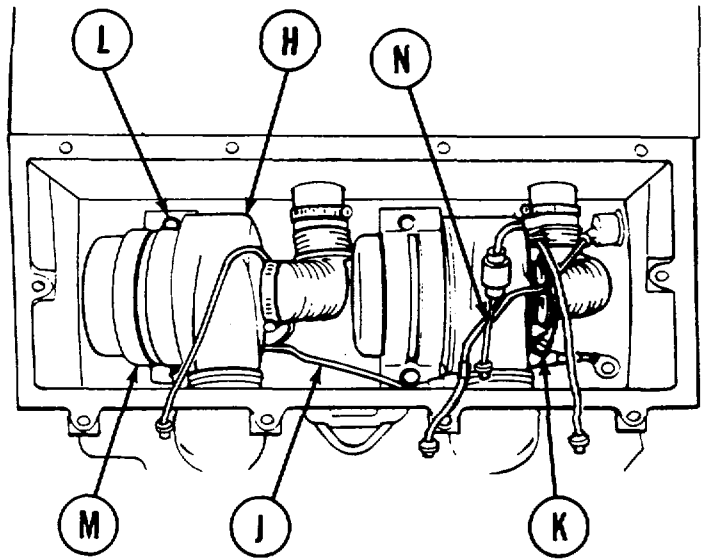
**NOTE**

**There are two blower fans in each air cleaner. Each blower fan is removed in the same way.**

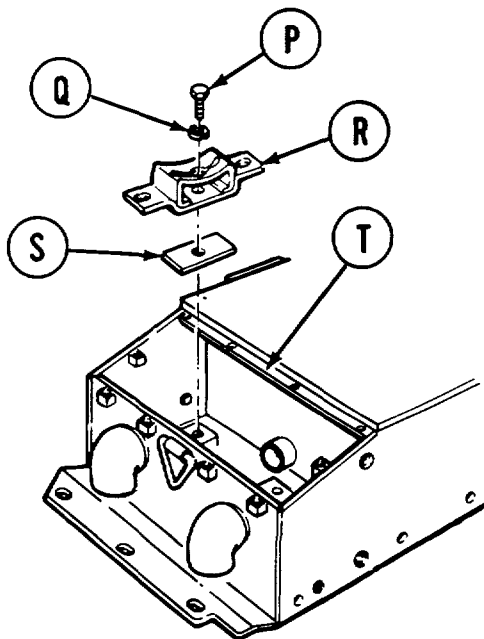
5. Using screwdriver, loosen clamp (F) securing hose (G) to inlet of blower fan (H). Slide clamp onto hose.
6. Remove hose (G) from inlet of blower fan (H).

**AIR CLEANER (ARMORED) BLOWER FAN REPLACEMENT (Sheet 3 of 7)**

7. Disconnect blower fan lead (J) from ground lead (K).
8. Using socket and extension, remove two screws and lockwashers (L) securing strap (M). Throw lockwashers away.
9. Remove strap (M).
10. Remove blower fan (H).



11. Disconnect jumper lead (N) from blower fan lead.
12. Using socket and extension, remove screw (P) and lockwasher Q. Throw lockwasher away.
13. Remove support (R) and pad (S).



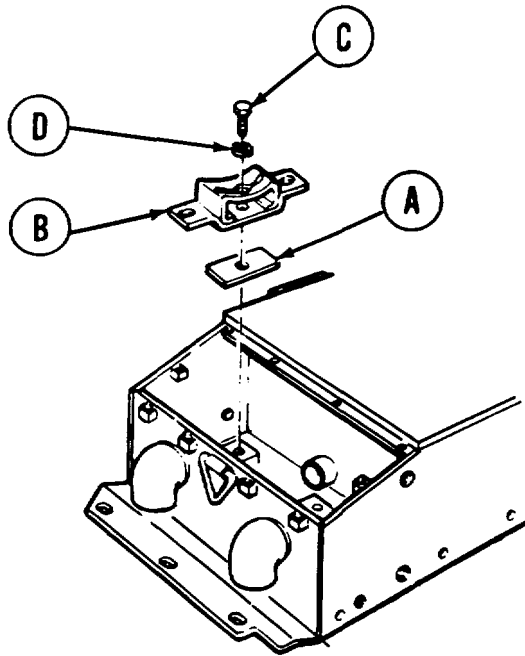
**INSPECTION AND REPAIR:**

1. Inspect gasket (T) on housing. If damaged or deteriorating, replace.



**AIR CLEANER (ARMORED) BLOWER FAN REPLACEMENT (Sheet 4 of 7)**

2. Inspect support for defects or damage. Replace or repair a necessary.
3. Inspect condition of pad. If defective or deteriorating, replace.
4. Inspect jumper lead. Check condition of insulation, connectors, and for continuity. Replace as necessary.
5. Inspect all threaded holes for damage or defects. Repair a necessary.

**INSTALLATION:**

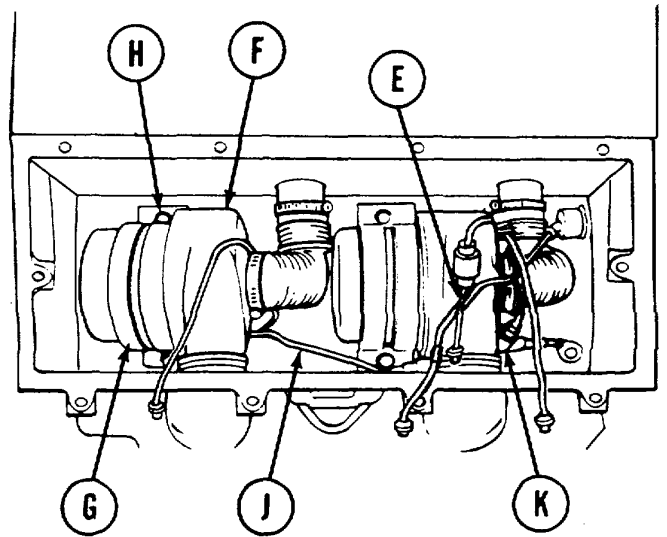
1. Position pad (A) and support (B) into housing.
2. Coat threads of screw (C) with sealing compound (Item 24, appendix D) and install with new lockwasher (D) to secure support (B).
3. Using socket with extension, tighten screw (C).

Go on to Sheet 5

TA148219

**AIR CLEANER (ARMORED) BLOWER FAN REPLACEMENT (Sheet 5 of 7)**

4. Connect jumper lead (E) to short lead from blower fan (F).
5. Position blower fan (F) into housing (with exhaust outlet of blower facing exhaust elbows) onto support.
6. Position strap (G) over blower fan (F).

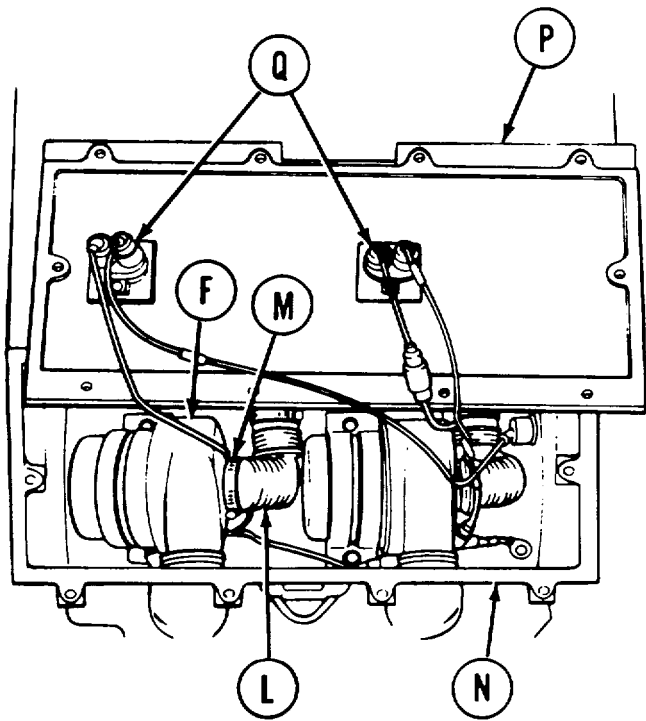


7. Install two screws and new lockwashers (H) to secure strap (G) to support
8. Using socket with extension, tighten screws (H).
9. Connect long lead (J) from blower fan (F) to ground lead connector (K).

Go on to Sheet 6

TA148220

**AIR CLEANER (ARMORED) BLOWER FAN REPLACEMENT (Sheet 6 of 7)**



10. Apply silicone compound (Item 32, Appendix D) to inside diameter of hose end and connect hose (L) to inlet of blower fan (F).
11. Slide clamp (M) up over hose and inlet of blower fan (F).
12. Using screwdriver, tighten clamp (M).

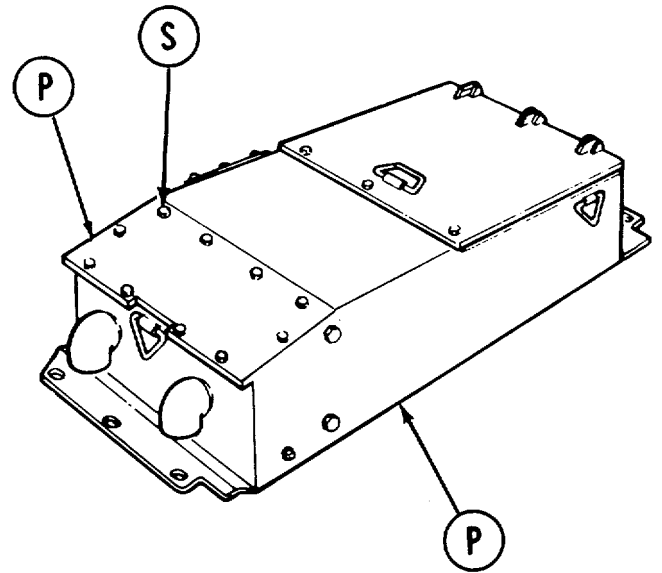
13. If new gasket (N) is being used, apply sealing compound (Item 24, Appendix D) to gasket and position onto housing.
14. Lay cover (P) (with circuit breakers facing up) on air cleaner housing.
15. Connect four electrical leads to two circuit breakers (Q).
16. Check operation of blower fan (TM 9-2350-260-10).

Go on to Sheet 7

TA148221

**AIR CLEANER (ARMORED) BLOWER FAN REPLACEMENT (Sheet 7 of 7)**

17. Position cover (P) onto housing (R).
18. Install ten screws and new lockwashers (S) to secure cover (P).
19. Using socket, tighten screws (S).



End of Task

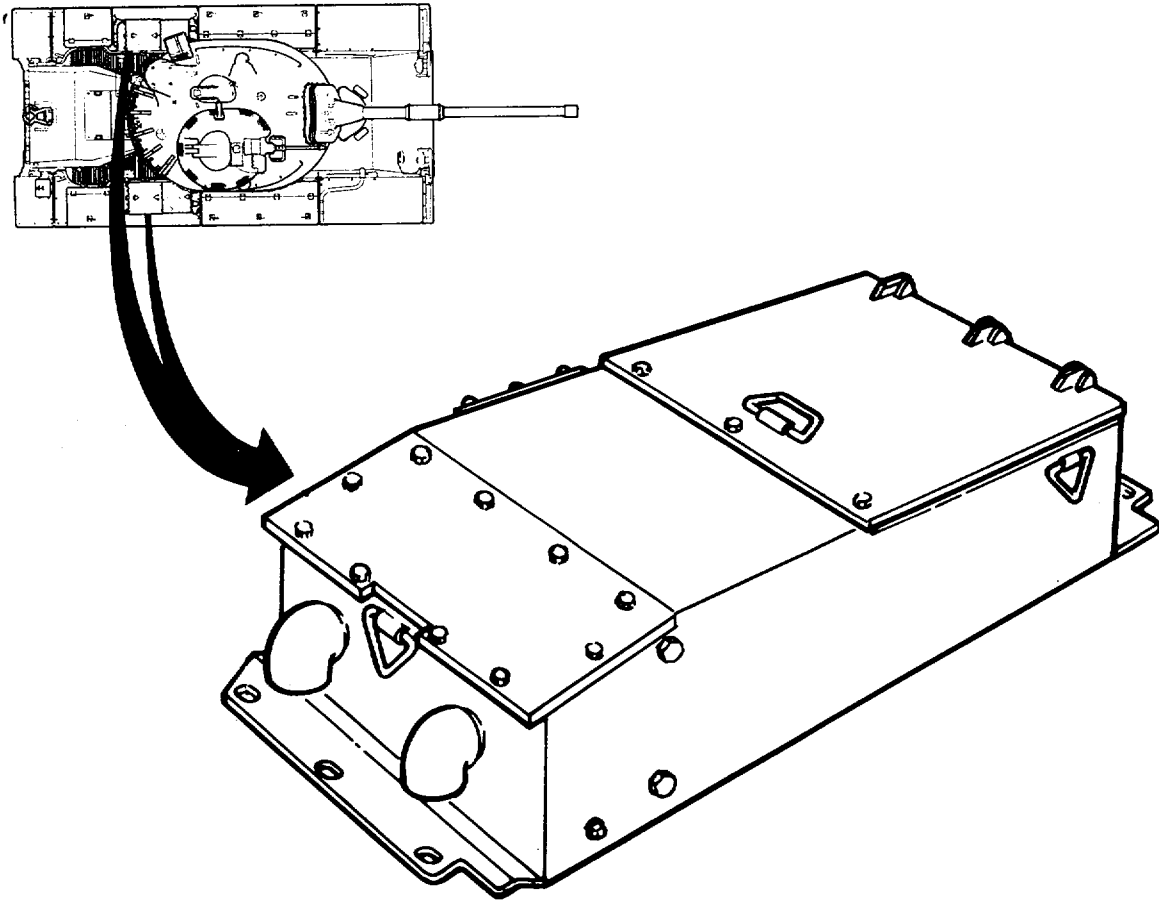
TA148222

**AIR CLEANER (ARMORED) BLOWER COVER AND GASKET REPLACEMENT (Sheet 1 of 3)**

**TOOLS:** 1/2 in. socket with 1/2 in. drive  
 Ratchet with 1/2 in. drive  
 2 in. extension with 1/2 in. drive  
 Cross-tip screwdriver

**SUPPLIES:** Sealing compound (Item 24, Appendix D)  
 Silicone compound (Item 32, Appendix D)  
 Gasket (12251902)  
 Lockwasher (MS35338-41) (4 required)  
 Lockwasher (MS35338-45) (10 required)

**REFERENCE:** TM 9-2350-260-10



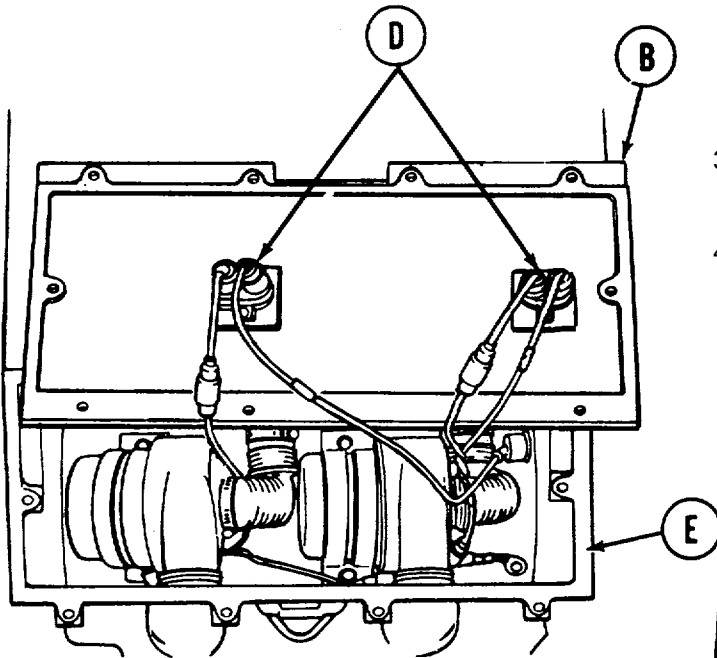
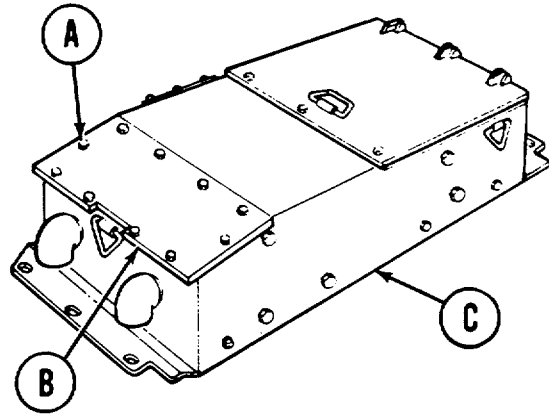
Go on to Sheet 2

TA148223

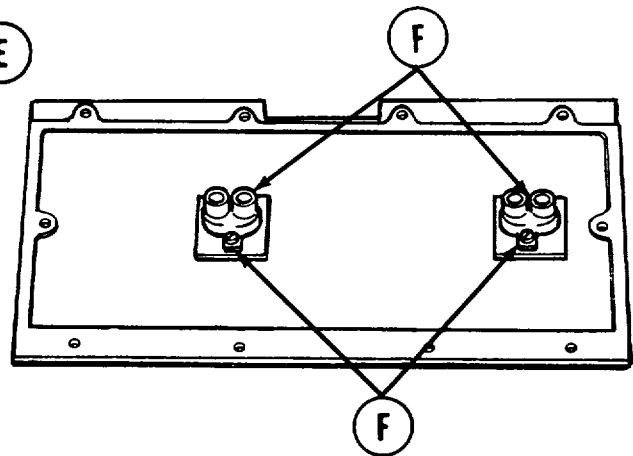
**AIR CLEANER (ARMORED) BLOWER COVER AND GASKET REPLACEMENT (Sheet 2 of 3)**

**REMOVAL:**

1. Using socket, remove ten screws and lockwashers (A) securing cover (B). Throw lockwashers away.
2. Place cover (B) on top of housing (C).



3. Disconnect four electrical leads from two circuit breakers (D) mounted to underside of cover (B).
4. Remove cover (B) and gasket (E). Throw gasket away.



5. Using screwdriver, remove four screws and lockwasher (F) securing two circuit breakers to cover (B). Throw lockwashers away.

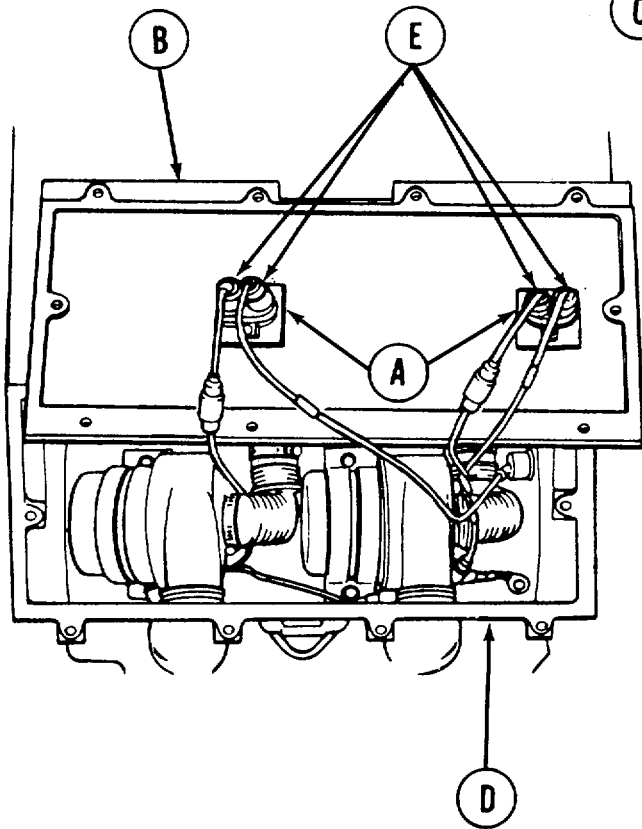
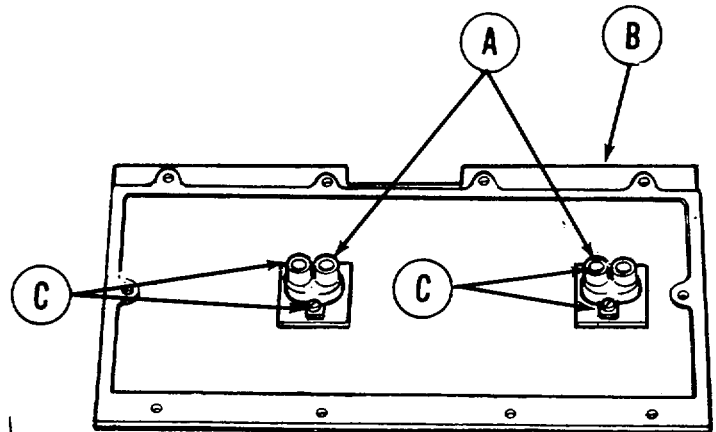
Go on to Sheet 3

TA148224

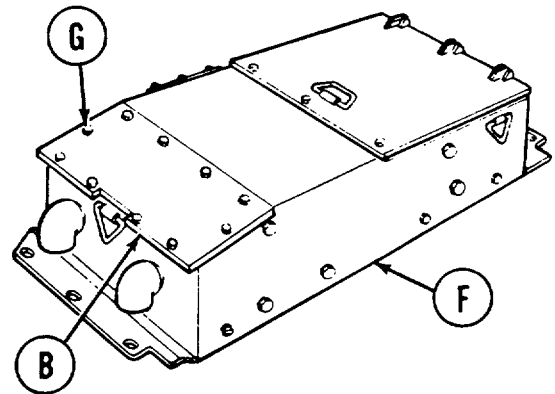
**AIR CLEANER (ARMORED) BLOWER COVER AND GASKET REPLACEMENT (Sheet 3 of 3)**

**INSTALLATION:**

1. Place two circuit breakers (A) in position on cover (B).
2. Using screwdriver, install four screws and new lockwashers (C) securing circuit breaker (A) to cover (B).



3. Apply sealing compound (Item 24, Appendix D) on new gasket (D) and place in position.
4. Apply silicone compound (Item 32, Appendix D) to four male leads (E).
5. Connect leads (E) to two circuit breakers (A).



6. Place cover (B) in position on air cleaner (F).
7. Using socket, install ten screws and new lockwashers (G).

End of Task

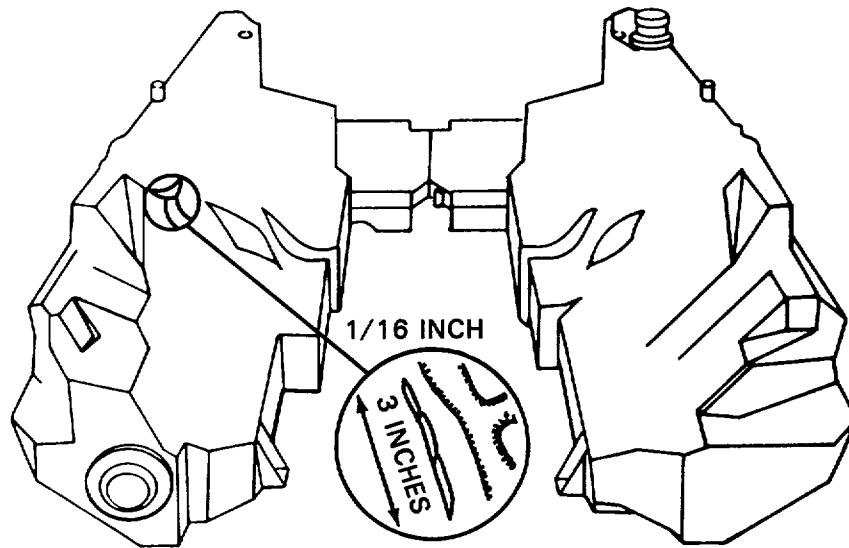
TA148225

**FUEL TANK REPAIR (Sheet 1 of 2)**

**TOOLS:** 1/4 in. portable electric drill  
1/8 in. dia. twist drill  
6 in. steel rule

**SUPPLIES:** Accelerator and sealer (Item 62, Appendix D)  
Dry cleaning solvent (Item 54, Appendix D)  
Sandpaper (Item 51, Appendix D)  
Grease (Item 36, Appendix D)  
Container (to mix accelerator and sealer)

**PRELIMINARY PROCEDURES:** Remove powerplant (page 5-1)  
Drain fuel tank to level approximately 3 in. below crack (page 7-184)

**NOTE**

Repair of minor cracks in fuel tanks (up to 3 inches long and 1/16 inch wide) can be made. Cracks in excess of these dimensions will be repaired by support maintenance.

Go on to Sheet 2

TA148226



**FUEL TANK REPAIR (Sheet 2 of 2)****WARNING**

**Use dry cleaning solvent in a well-ventilated area only.**

**CLEANING:**

1. Using dry cleaning solvent (Item 54, Appendix D), clean area around crack to remove all traces of dirt and grease. Wipe dry with rags.
2. Using sandpaper (Item 51, Appendix D), sand area around crack for proper adhesion of sealer. Wipe with rag after sanding.

**REPAIR:**

1. Coat drill bit with grease (Item 36, Appendix D) to minimize amount of metal chips falling into fuel tank.
2. Using drill, bore hole about 1/2 to 1 inch from visible ends of crack as shown.
3. Clean crack and surrounding area with rag dampened in dry cleaning solvent (Item 54, Appendix D). Wipe dry. Do not allow fingerprints, oil, or moisture on cleaned surface.

**NOTE**

**Do not apply sealer at temperatures below 45 degrees F. Sealer will cure in approximately 24 hours at room temperature.**

4. Mix accelerator and sealer (Item 62, Appendix D) in container.
5. Apply 3/16 inch thickness of sealer to cleaned surface and at least 1/2 inch beyond crack.
6. Install 2A powerplant (page 5-14) or 2D powerplant (page 5-40).

**DRAINING FUEL TANK AND REMOVING CONDENSATE (Sheet 1 of 7)**

PROCEDURE INDEX

PROCEDURE	PAGE
Installing Hand Pump	7-154
Removing Condensate	7-157
Removing Hand Pump	7-157
Draining Fuel Tank	7-159

TOOLS: Hand fuel pump assembly (7971068)  
 Hoes (8724493) (2 required)  
 Adapter (1087033)

SUPPLIES: 55 gallon drum  
 Rags (Item 65, Appendix D)  
 Drain pan

REFERENCE: TM 9-2350-260-10

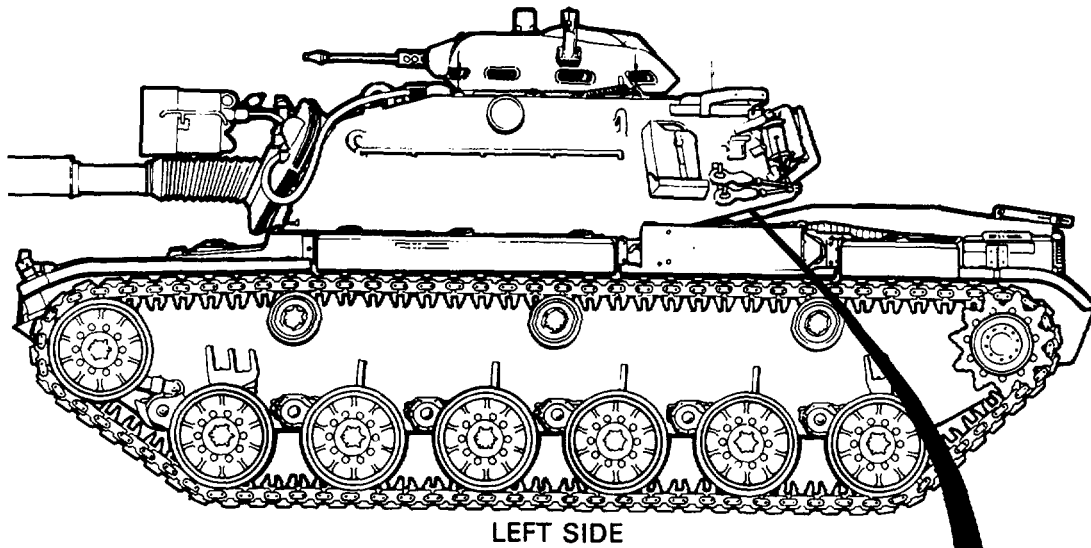
PRELIMINARY PROCEDURE: Open top deck grille doors (TM 9-2350-260-10)

**DRAINING FUEL TANK AND REMOVING CONDENSATE (Sheet 2 of 7)**

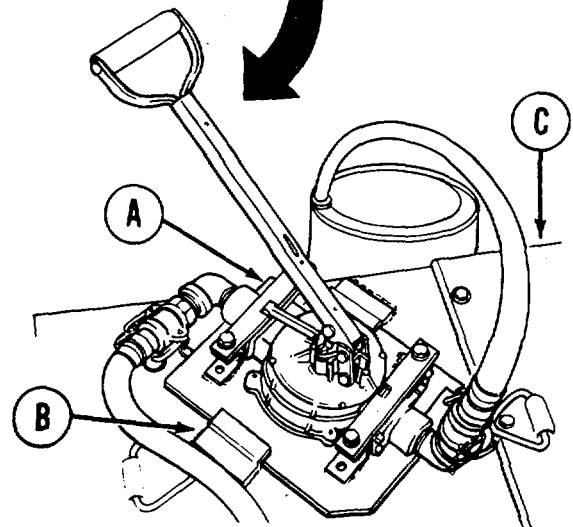
**INSTALLING HAND PUMP:**

**NOTE**

Procedures for removing condensate from left and right fuel tanks are identical.  
Left fuel tank condensate removal is covered in this task.



1. Install hand fuel pump (A) inside lips of welded brackets (B) on air cleaner (C).

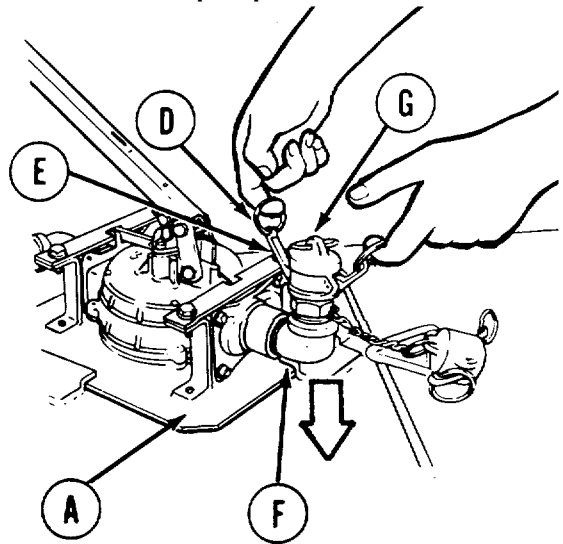


**DRAINING FUEL TANK AND REMOVING CONDENSATE (Sheet 3 of 7)**

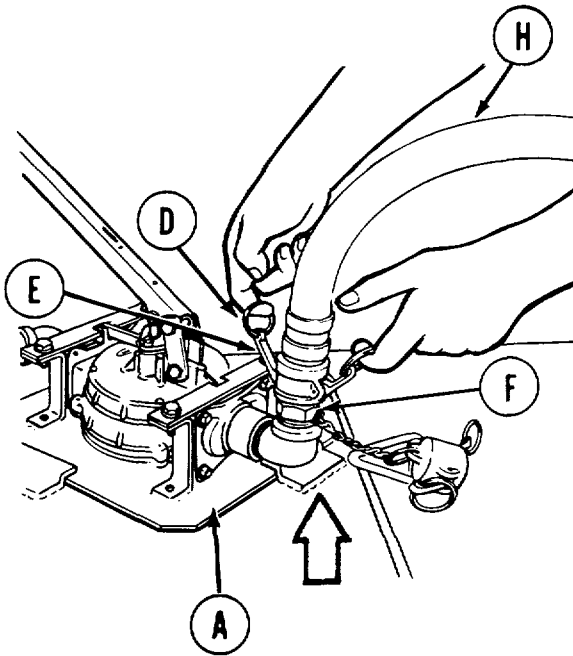
**NOTE**

**Steps 2 and 3 apply to removal of dust covers from hand fuel pump and hoses.**

2. Using fingers in clamp ring (D), pull clamps (E) out and down against body of connector (F) to loosen dust cover (G).
3. Remove dust cover (G) from connector (F).
4. Install hose (H) on connector (F) on discharge side of hand fuel pump (A).



5. Using fingers in clamp ring (D), pull clamp (E) out and up against hose (H) to clamp hose (H) in place.
6. Repeat steps 4 and 5 for installing hose on suction side of hand fuel pump (A).

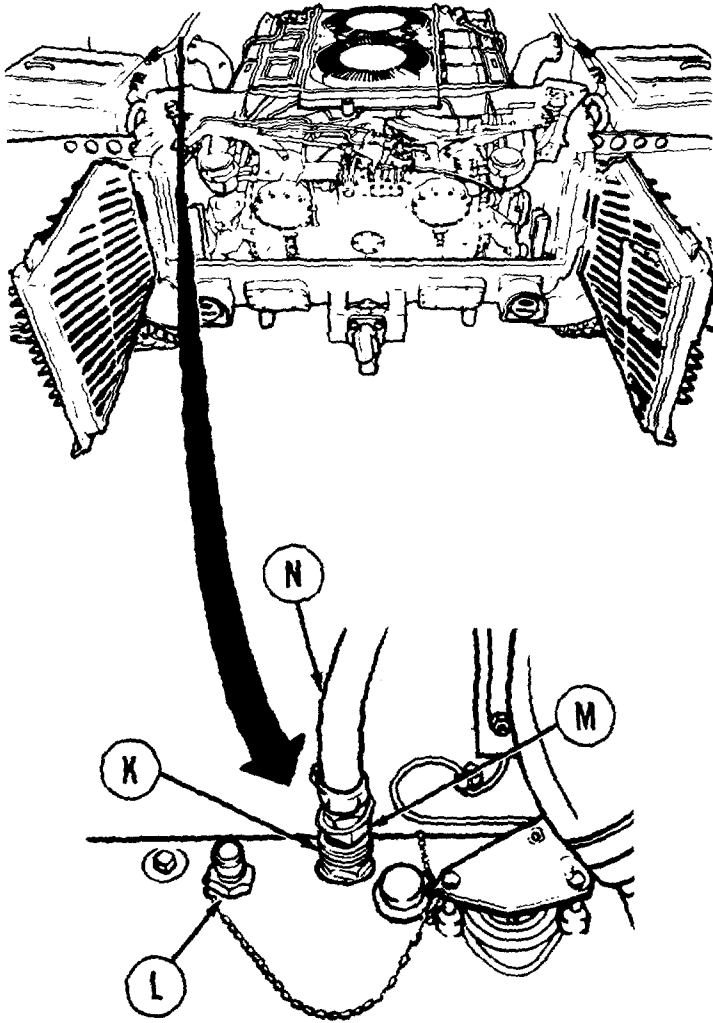
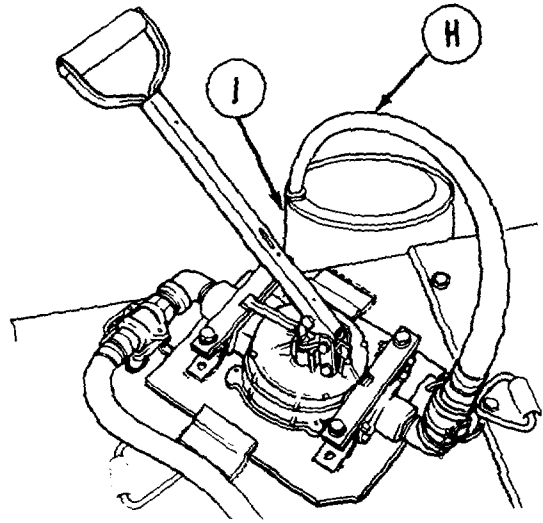


Go on to Sheet 4

TA148230

**DRAINING FUEL TANK AND REMOVING CONDENSATE (Sheet 4 of 7)**

7. Install loose end of discharge hose (H) in 55 gallon drum (J).



8. Using one hand to push quick-disconnect (K) down, remove dust cover (L).
9. Install adapter (M) on suction hose (N).
10. Install adapter (M) on quick-disconnect (K) by pushing adapter down until it snaps into place.

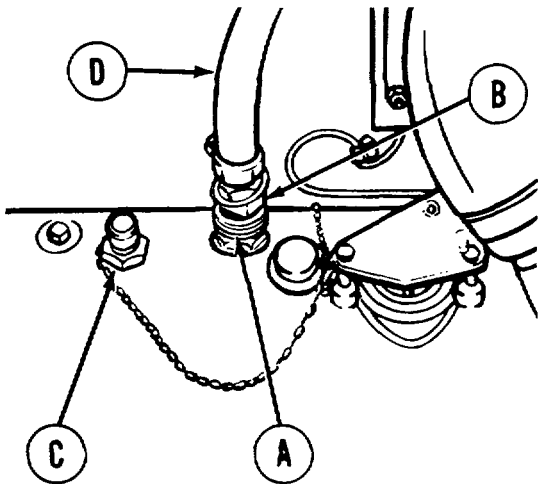
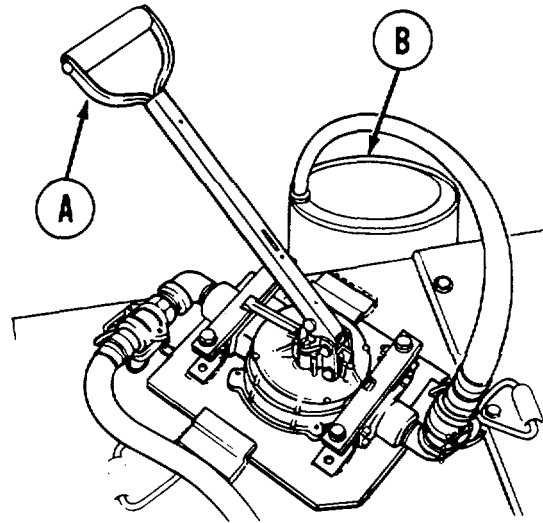
Go on to Sheet 5

TA148231

**DRAINING FUEL TANK AND REMOVING CONDENSATE (Sheet 5 of 7)****REMOVING CONDENSATE:****CAUTION**

Use care not to spill fuel over tank. Wipe away any spilled fuel immediately with rags.

1. Operate pump handle (A) to transfer fuel from fuel tank to 55 gallon drum (B).
2. Continue operating pump handle (A) until all fuel has been removed from fuel tank.

**REMOVAL OF HAND PUMP:**

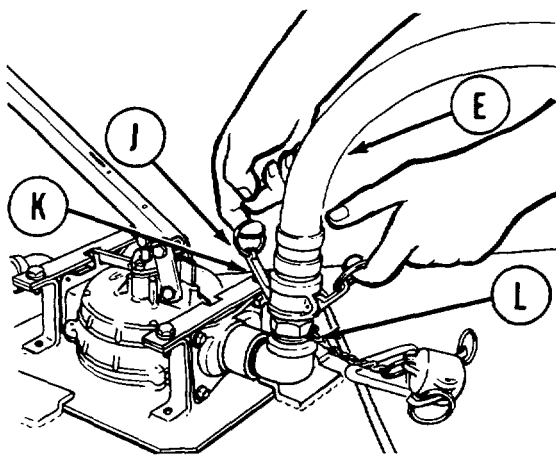
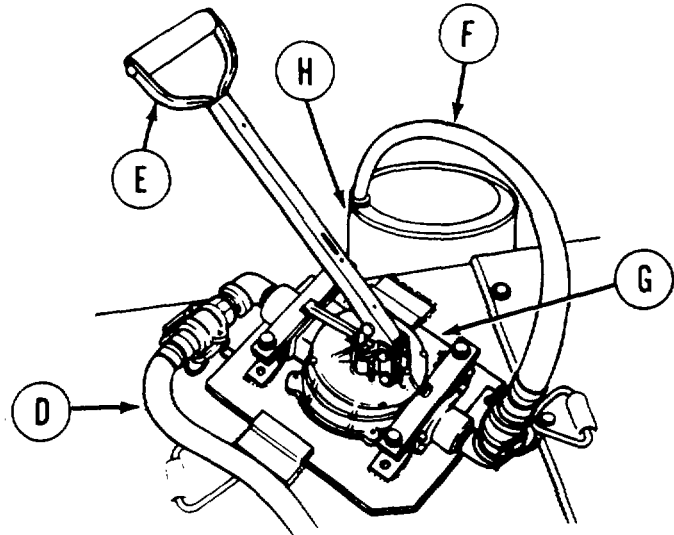
1. Using one hand to push quick-disconnect (A) down, remove adapter (B) from quick-disconnect (A).
2. Install dust cover (C) on quick-disconnect (A) by pushing dust cover (C) down until it snaps into place.
3. Remove adapter (B) from suction hose (D).

Go on to Sheet 6

TA148232

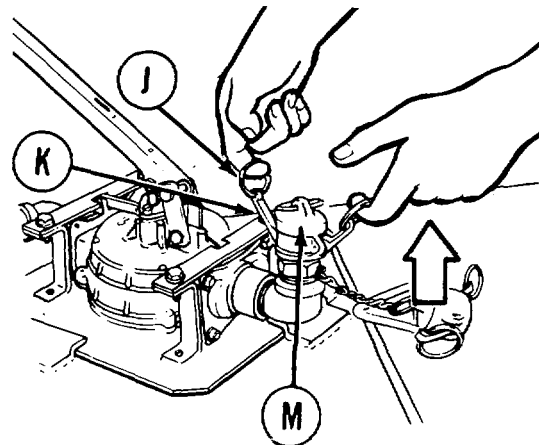
**DRAINING FUEL TANK AND REMOVING CONDENSATE (Sheet 6 of 7)**

4. Operate pump handle (E) several times to drain any fuel left in hoses (D) and (F) and hand fuel pump (G).
5. Remove discharge hose (F) from 55 gallon drum (H), and let hose hang over side of tank.



6. Using fingers in clamp rings (J), pull clamps (K) out and down to loosen discharge connector (L).
7. Remove discharge hose (E) from pump discharge connector (L).
8. Repeat steps 6 and 7 for removal of suction hose.

9. Install dust cover (M) on discharge connector (L).
10. Using fingers in clamp rings (J), pull clamps (K) out and up against dust cover (M) to clamp dust cover in place.
11. Repeat steps 9 and 10 for installing dust cover on hand fuel pump suction connector and hoses.

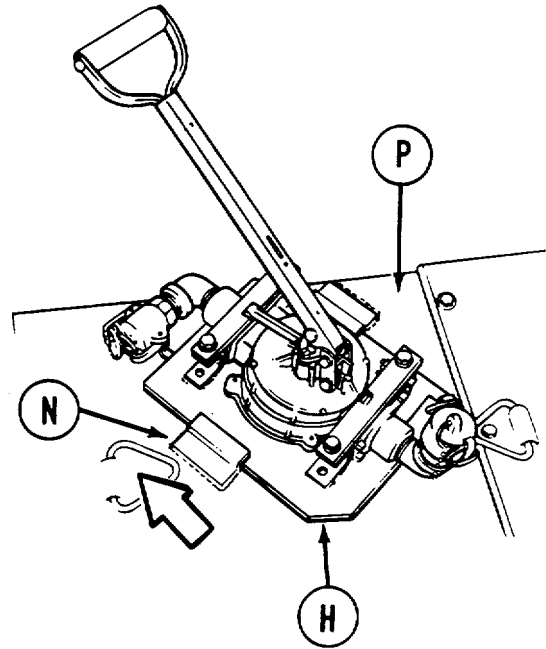


Go on to Sheet 7

TA148233

**DRAINING FUEL TANK AND REMOVING CONDENSATE (Sheet 7 of 7)**

12. Using both hands, slide hand fuel pump (H) out of lips of welded brackets (N).
13. Remove hand fuel pump (H) from tank air cleaner (P).
14. Close top deck grille doors (TM 9-2350-260-10).



**DRAINING FUEL TANK:**

**WARNING**

**Do not allow smoking, open flames, tank or other vehicle operation within 50 feet while draining fuel tanks.**

**NOTE**

**Whenever possible, start draining procedure when minimum amount of fuel is indicated on fuel level indicator.**

**NOTE**

**Fuel may be drained from both fuel tanks by removing drain plug from left fuel tank. Some fuel will still be trapped in bottom of fuel tanks after draining.**

1. Position drain pan under tank.
2. Remove fuel tank drain plug (page 7-184).
3. Allow time for fuel to drain from fuel tank.
4. Install drain plug (page 7-184).

End of Task

TA148234



FUEL TANK (RIGHT) FILLER REPAIR (Sheet 1 of 6)

PROCEDURE INDEX

PROCEDURE	PAGE
Removal	7-160
Cleaning	7-163
Inspection	7-163
Installation	7-164

TOOLS: Ratchet with 1/2 in. drive  
 3/4 in. socket with 1/2 in. drive  
 Putty knife  
 Diagonal cutting pliers  
 Slip joint pliers  
 10 in. extension with 1/2 in. drive  
 Flat-tip screwdriver, 1/4 in. blade

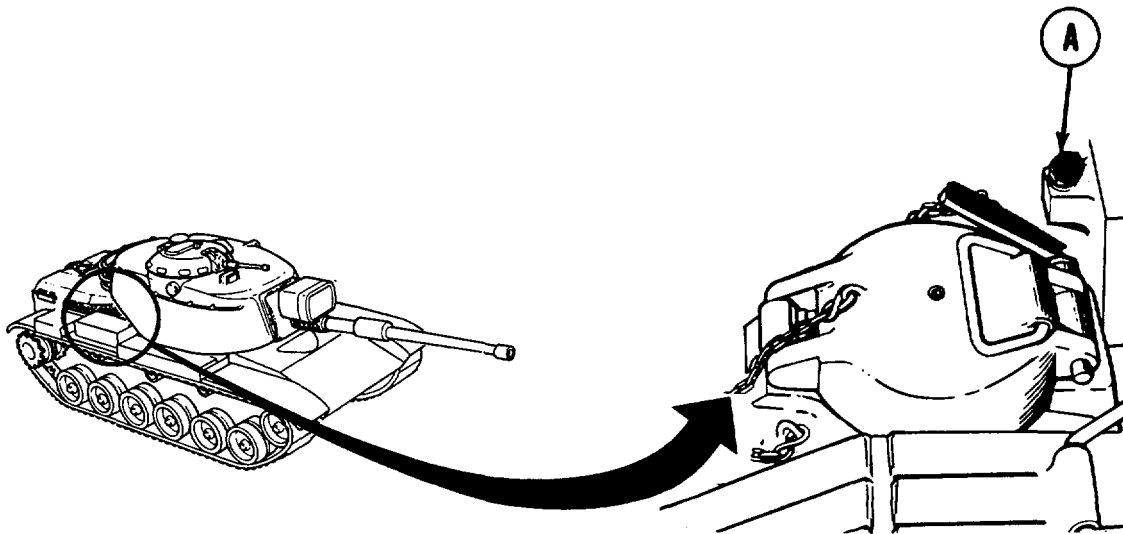
SUPPLIES: Dry cleaning solvent (Item 54, Appendix D)  
 Gasket (7398888)  
 Gasket (7398887)  
 Lockwire (Item 59, Appendix D)

Lint-free cloth (Item 12, Appendix D)  
 Washer, Nonmetallic (7398889)  
 Washer, Nonmetallic (7398890)  
 Screw (128232) (8 required)

REFERENCE: TM 9-2350260-10

REMOVAL:

1. Point gun tube to the rear (TM 9-2350-260-10).
2. Using socket, loosen fuel filler cover lock screw (A).

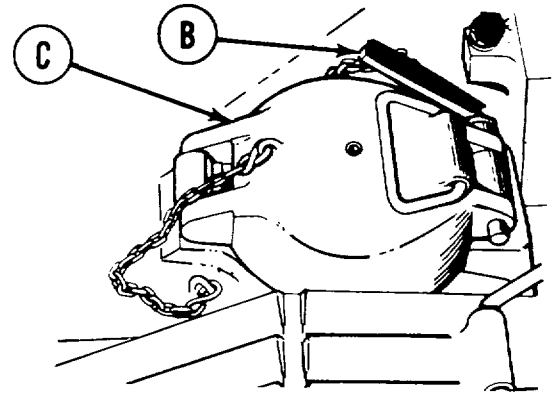


Go on to Sheet 2

TA148235

**FUEL TANK (RIGHT) FILLER REPAIR (Sheet 2 of 6)**

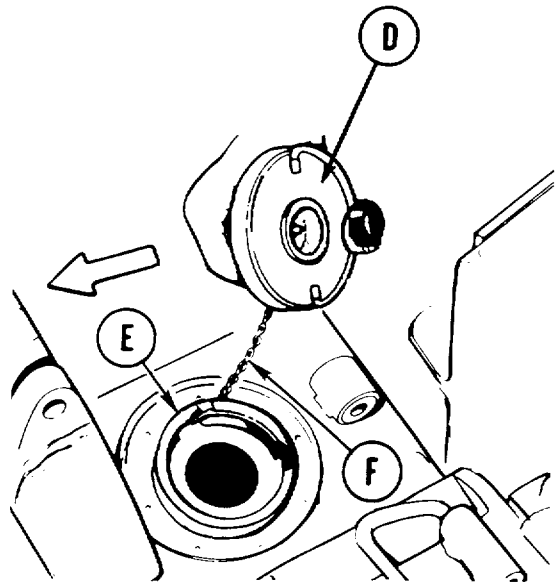
3. Remove lockpin (B) securing fuel filler cover (C).



4. Raise cover, pull up and out to remove fuel filler cover (C) to gain access to fuel tank filler.

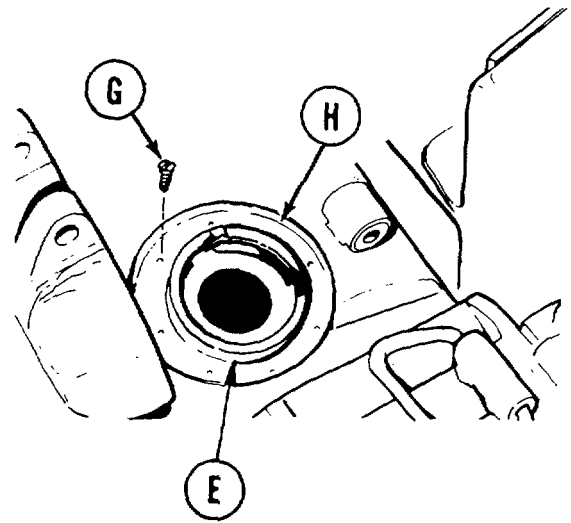
5. Rotate filler cap (D) 1/4 turn counterclockwise and remove from filler neck (E).

6. Disconnect filler cap retaining chain (F) from filler neck (E).

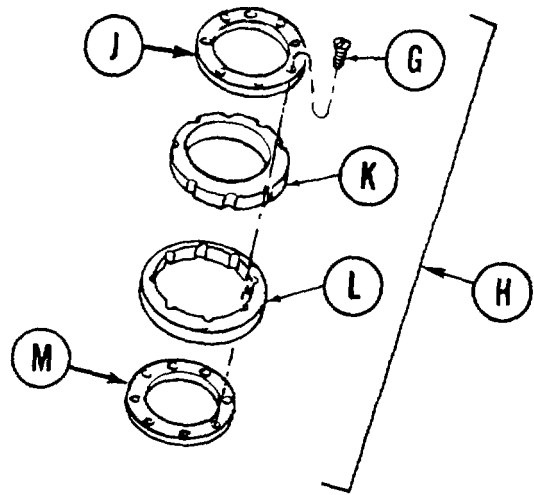


**FUEL TANK (RIGHT) FILLER REPAIR (Sheet 3 of 6)**

7. Using screwdriver, remove eight screws (G) securing filler neck seal assembly (H) between filler neck (E) and hull. Throw screws away.
8. Remove filler neck seal washer (J), two gaskets (K) and (L) and neck washer (M) from between filler neck (E) and hull.



9. Throw away seal assembly (H) (items J, K, L, and M).

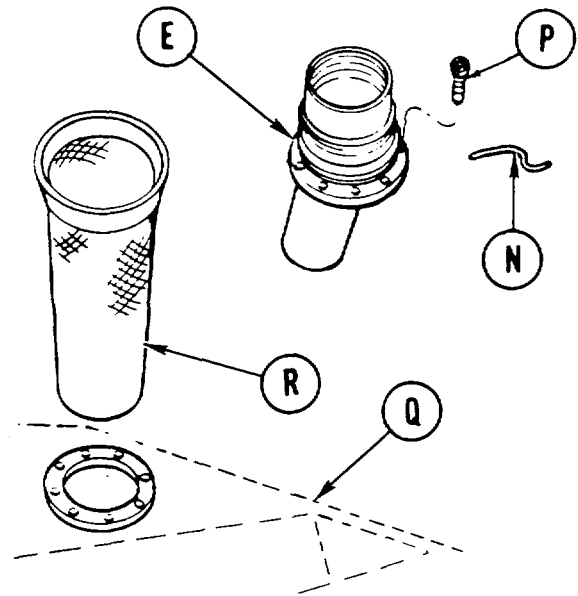


Go on to Sheet 4

TA148237

**FUEL TANK (RIGHT) FILLER REPAIR (Sheet 4 of 6)**

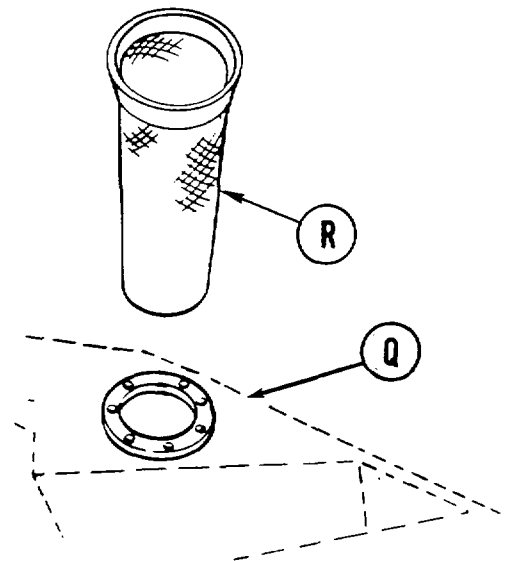
10. If required, use diagonal cutting pliers to remove lockwire (N) securing screws (P).
11. Using screwdriver, remove eight screws (P) securing filler neck (E) to fuel tank (Q).
12. Remove filler neck (E) from fuel tank (Q).
13. Remove strainer element (R) from fuel tank (Q).

**CLEANING:**

1. Using dry cleaning solvent (Item 54, Appendix D), clean strainer (R).
2. Using putty knife, dry cleaning solvent, and lint-free cloth (tem 12, Appendix D), clean around filler hole area of fuel tank (Q).

**INSPECTION:**

Inspect strainer (R) for contamination or damage.  
Replace strainer (R) if unserviceable.



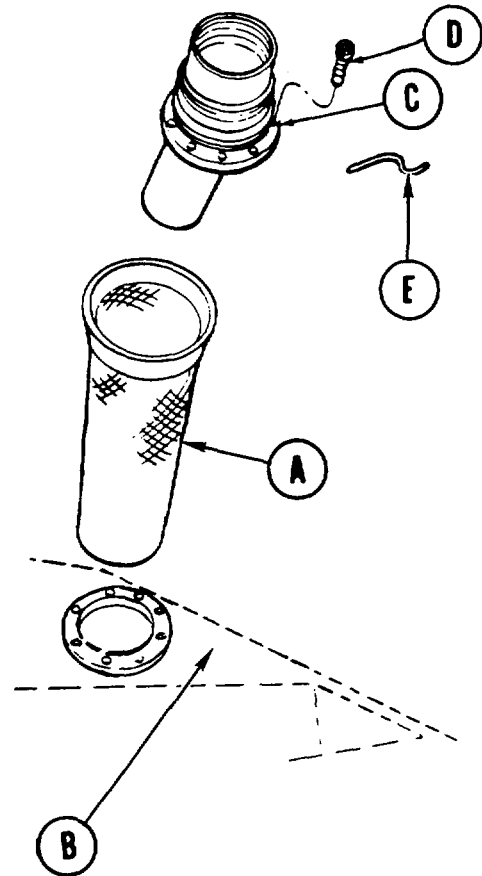
Go on to Sheet 5

TA148238

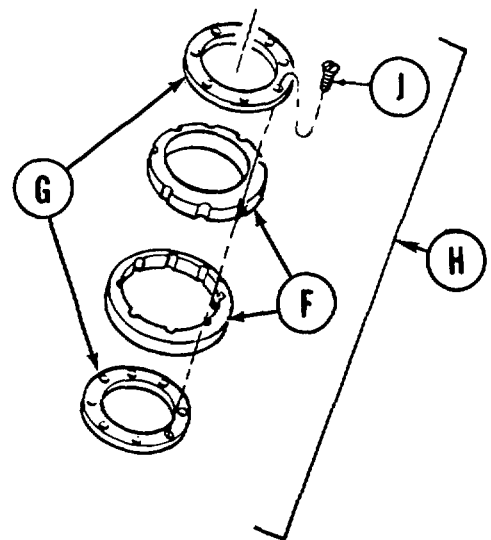
**FUEL TANK (RIGHT) FILLER REPAIR (Sheet 5 of 6)**

**INSTALLATION:**

1. Install strainer (A) in fuel tank (B).
2. Install filler neck (C) on fuel tank (B).
3. Using screwdriver, secure filler neck (C) to fuel tank (B) using eight screws (D).
4. If required, use slip joint pliers and install lockwire (Item 59, Appendix D) (E) in eight screws (D).



5. Using two new gaskets (F) and new washers (G), assemble seal assembly (H) and install eight new screws (J) finger tight
6. Install seal assembly (H) on filler neck. While holding filler neck in position, use screwdriver and tighten screws (J) until gaskets (F) and (G) are compressed to form tight seal between filler neck and hull.

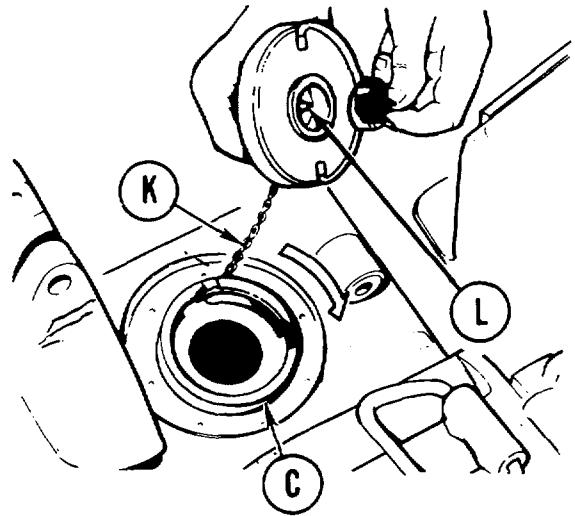


Go on to Sheet 6

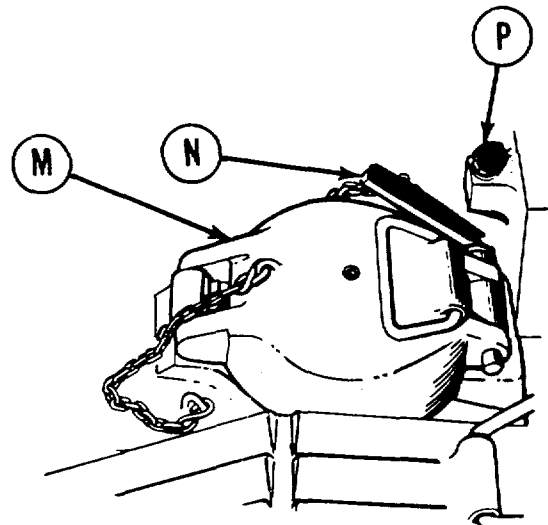
TA148239

## FUEL TANK (RIGHT) FILLER REPAIR (Sheet 6 of 6)

7. Connect filler cap retaining chain (K) to filler neck (C).
8. Install filler cap (L) and rotate cap 1/4 turn clockwise to secure to filler neck (C).



9. Close fuel filler cover (M) and secure with lockpin (N).
10. Using socket, tighten lock screw (P).



End of Task

TA148240

**FUEL TANK (LEFT) EMERGENCY FILLER REPAIR (Sheet 1 of 2)**

**TOOLS:** Ratchet with 1/2 in. drive  
 7/16 in. socket with 1/2 in. drive  
 10-1/2 in. socket extension  
 Diagonal cutting pliers  
 Slip joint pliers  
 Putty knife

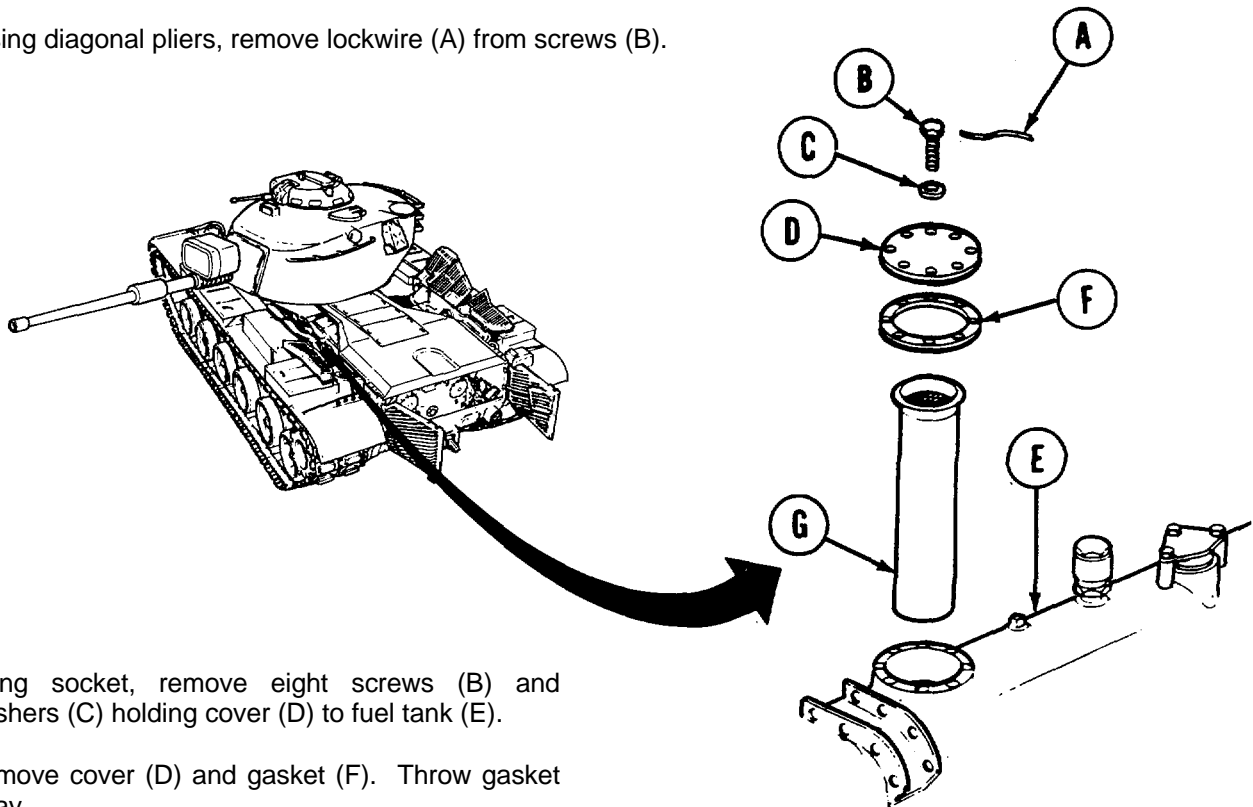
**SUPPLIES:** Dry cleaning solvent (Item 54, Appendix D)  
 Lint-free cloth (Item 1, Appendix D)  
 Gasket (10884006)  
 Lockwire (Item 60, Appendix D)

**REFERENCE:** TM 9-2350-260-10

**PRELIMINARY PROCEDURE:** Open left top deck grille door assembly (TM 9-2350-260- 10)

**REMOVAL:**

1. Using diagonal pliers, remove lockwire (A) from screws (B).



2. Using socket, remove eight screws (B) and washers (C) holding cover (D) to fuel tank (E).
3. Remove cover (D) and gasket (F). Throw gasket away.
4. Lift out strainer (G) from fuel tank (E).

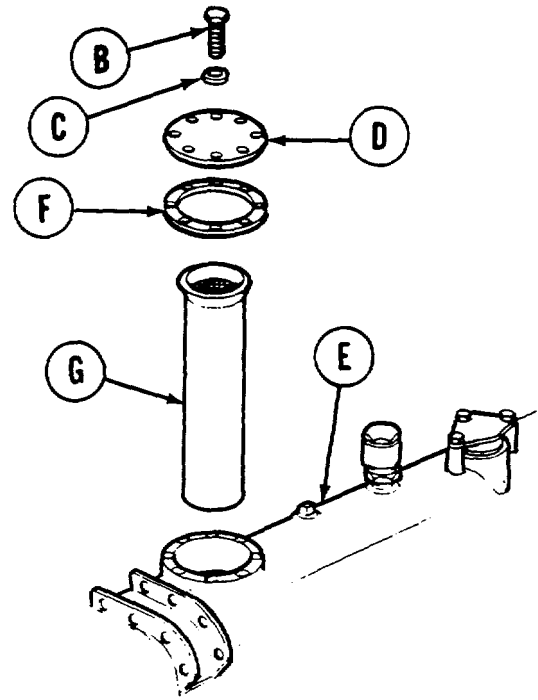
Go on to Sheet 2

TA148241

**FUEL TANK (LEFT) EMERGENCY FILLER REPAIR (Sheet 2 of 2)**

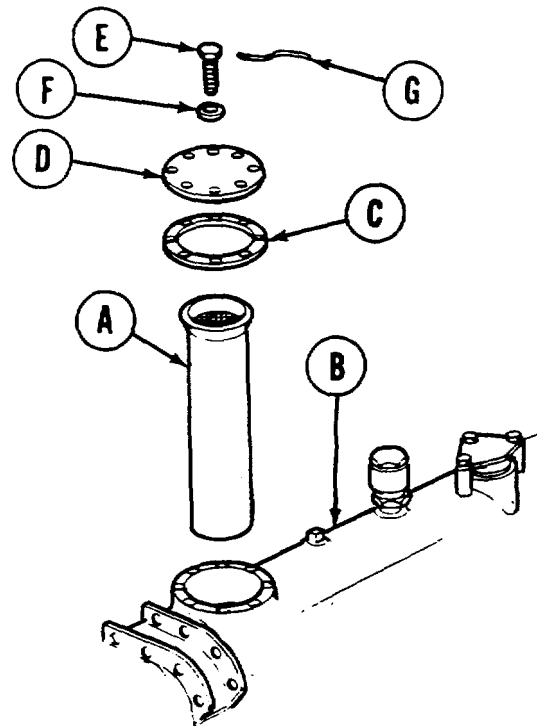
**CLEANING AND INSPECTION:**

1. Using dry cleaning solvent (Item 54, Appendix D) clean strainer (G).
2. Using putty knife, dry cleaning solvent (Item 54, Appendix D), and lint-free cloth (Item 12, Appendix D), clean excess gasket material from fuel tank (E) and cover (D).
3. Inspect strainer (G) for contamination or damaged element. Replace strainer (G) if unserviceable.



**INSTALLATION:**

1. Install strainer (A) in fuel tank (B).
2. Install new gasket (C) and cover (D), using eight screws (E) and washers (F).
3. Using socket, tighten eight screws (E).
4. Using slip joint pliers, install lockwire (G) (Item 60, Appendix D), through eight screws (E).
5. Close left top deck grille doors (TM 9-2350-260-10).



End of Task

TA148242



FUEL TANKS (LEFT AND RIGHT) LEVEL GAGE TRANSMITTER REPLACEMENT (Sheet 1 of 4)

PROCEDURE INDEX

PROCEDURE	PAGE
Removal	7-168
Installation	7-170

TOOLS: 7/16 in. combination box and open end wrench  
 1/2 in. socket with 1/2 in. drive  
 Ratchet with 1/2 in. drive  
 7/16 in. socket with 1/2 in. drive  
 Diagonal cutting pliers  
 Flat-tip screwdriver  
 Putty knife

SUPPLIES: Gasket (8378722)  
 Lockwire (Item 59, Appendix D)  
 Rags (Item 65, Appendix D)  
 Lockwasher (MS35338-45) (3 required)

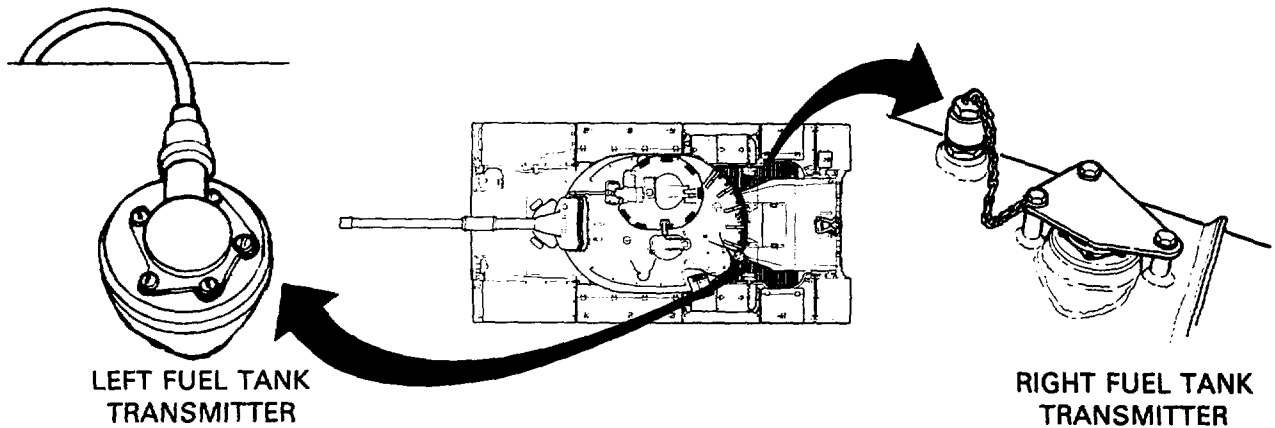
REFERENCE: TM 9-2350-260-10

PRELIMINARY PROCEDURE: Open left or right top deck grille door (TM 9-2350-260-10)

REMOVAL:

NOTE

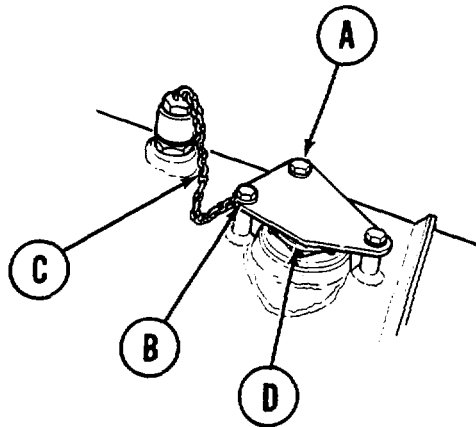
This procedure applies to both the left and right fuel gage transmitters unless otherwise noted.



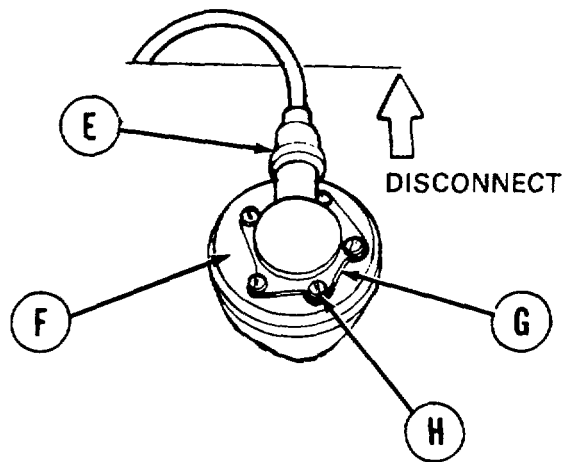
Go on to Sheet 2

TA148243

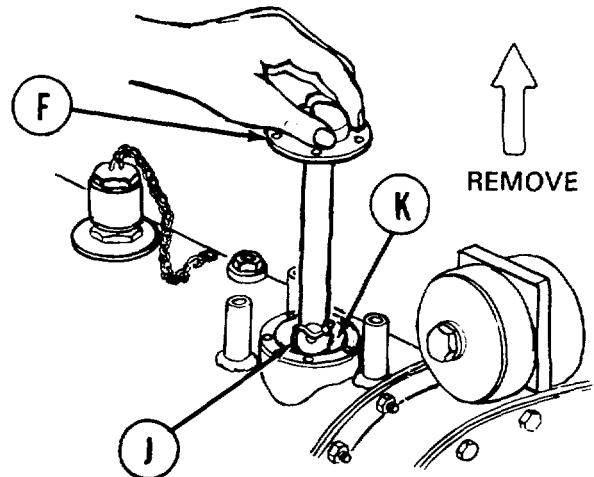
FUEL TANKS (LEFT AND RIGHT) LEVEL GAGE TRANSMITTER REPLACEMENT (Sheet 2 of 4)



1. Using 1/2 inch socket, remove three screws and lockwashers (A) and one flat washer (B) securing safety chain (C) and cover (D) to fuel tank. Throw lockwashers away.
2. Remove cover (D).
3. Disconnect electrical lead (E) from transmitter (F).
4. Using pliers, cut and remove lockwire (G).
5. Using screwdriver, remove five screws and washers (H) securing transmitter (F) to fuel tank.



6. Carefully lift transmitter (F) out of fuel tank until float arm gears (J) are visible in fuel tank opening (K).
7. Reach in with finger and pull up on visible tip of float arm. Pull transmitter (F) out of fuel tank opening (K) until float appears.

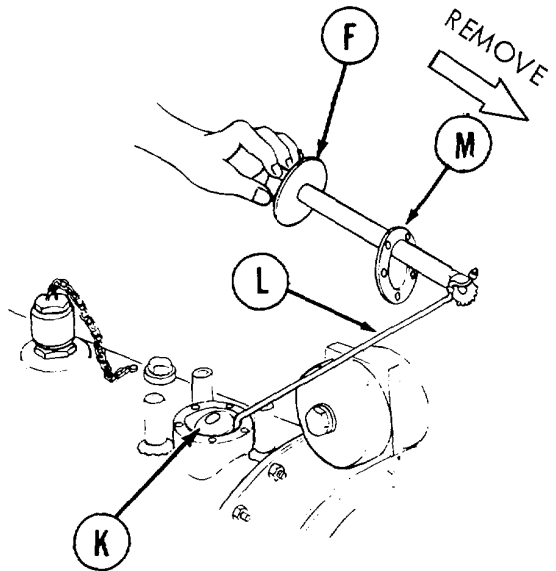


Go on to Sheet 3

TA148244

**FUEL TANKS (LEFT AND RIGHT) LEVEL GAGE TRANSMITTER REPLACEMENT (Sheet 3 of 4)**

9. Tilt transmitter (F). Withdraw float arm (L) from fuel tank opening (K).
10. Using putty knife, remove gasket (M) from transmitter (F). Throw gasket away.
11. Cover opening (K) with clean rags to keep dirt out of fuel tank.

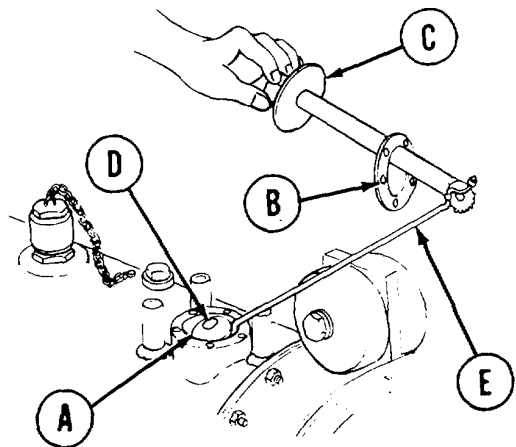


**INSTALLATION:**

**NOTE**

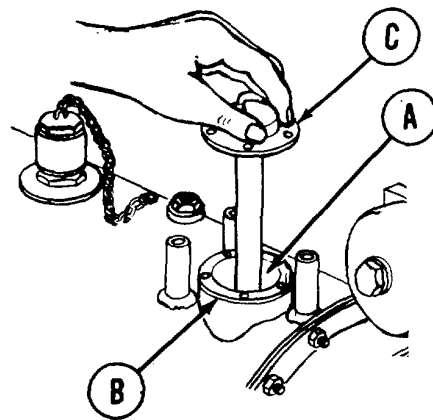
**This procedure applies to both left and right fuel transmitters unless otherwise noted.**

1. Remove rags covering fuel tank opening (A).
2. Slip new gasket (B) onto transmitter (C).
3. Carefully work float (D) and float arm (E) into fuel tank opening (A).
4. Place gasket (B) in position on fuel tank opening (A).
5. Carefully lower transmitter (C) into position.

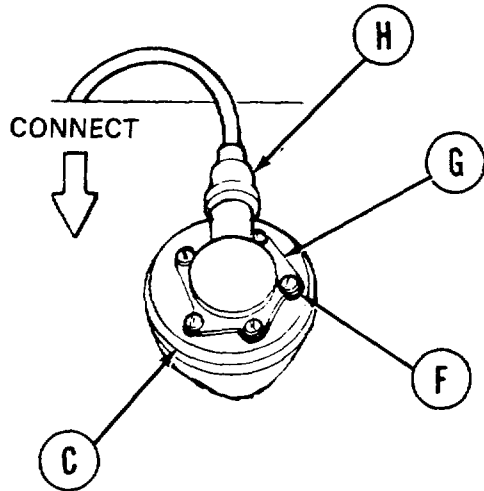


**NOTE**

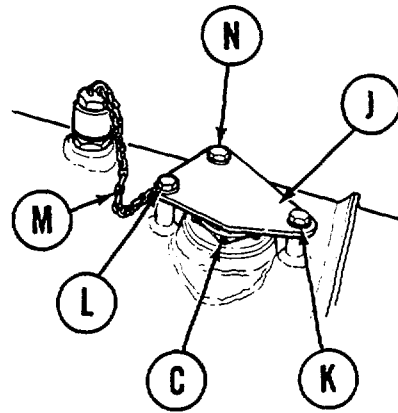
**Transmitter mounting holes are patterned so that transmitter can only be installed with electrical connector facing hull wall.**



FUEL TANKS (LEFT AND RIGHT) LEVEL GAGE TRANSMITTER REPLACEMENT (Sheet 4 of 4)



6. Using screwdriver, install five screws and washers (F) securing transmitter (C) to fuel tank.
7. Secure screws (F) with new lockwire (G) (Item 59, Appendix D).
8. Connect electrical connector (H) to transmitter (C).
9. Check fuel gage for proper operation (TM 9-2350-260-10).



10. Place cover (J) in position over transmitter (C) and install two screws and lockwashers (K) and (L).
11. Position safety chain (M) on cover (J) and install flat washer, new lockwasher, and screw (N).
12. Using 1/2 inch socket, tighten three screws and new lockwashers (K), (L), and (N) securing cover (J) to fuel tank.
13. Check fuel gage for proper operation (TM 9-2350-260-10).
14. Close top deck grille doors (TM 9-2350-260-10).

End of Task

TA148246

## FUEL TANK (LEFT AND RIGHT) CONDENSATE RELIEF VALVE REPLACEMENT (Sheet 1 of 4)

## PROCEDURE INDEX

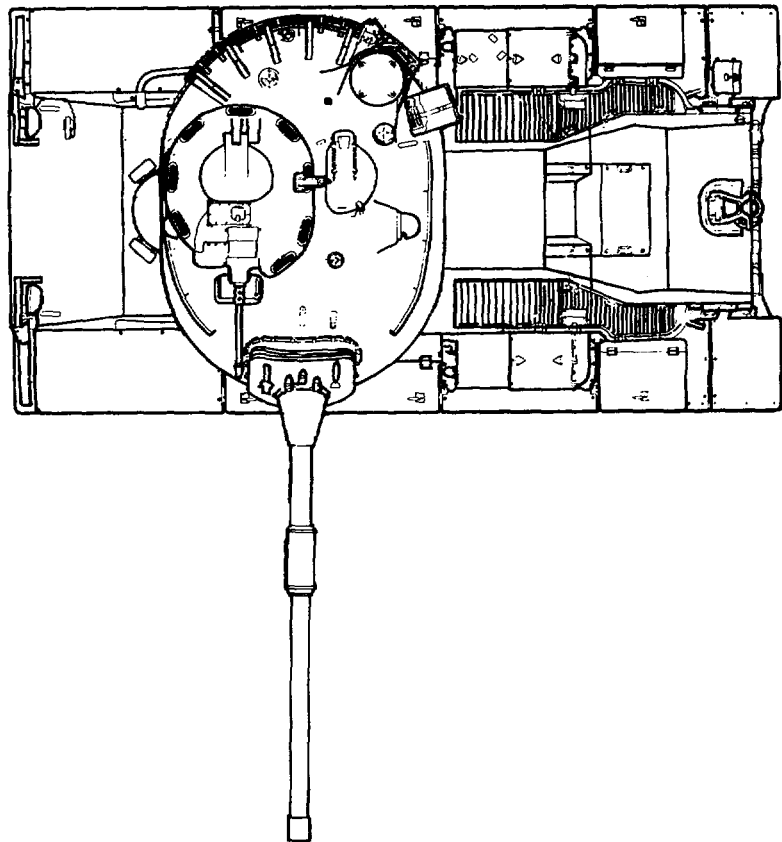
PROCEDURE	PAGE
Removal	7-172
Cleaning and Inspection	7-174
Installation	7-174

TOOLS: 1-3/4 in. open end wrench  
 6 in. ruler  
 Retaining ring pliers  
 Slip joint pliers  
 Ratchet with 1/2 in. drive  
 15/16 in. socket with 1/2 in. drive

SUPPLIES: Dry cleaning solvent (Item 54, Appendix D)  
 Preformed packing (MS28775-214)  
 Rags (Item 65, Appendix D)

## REMOVAL:

- Using socket, loosen bolts (A) securing top assembly doors (B). Open doors (B) to gain access to left and right fuel tanks.

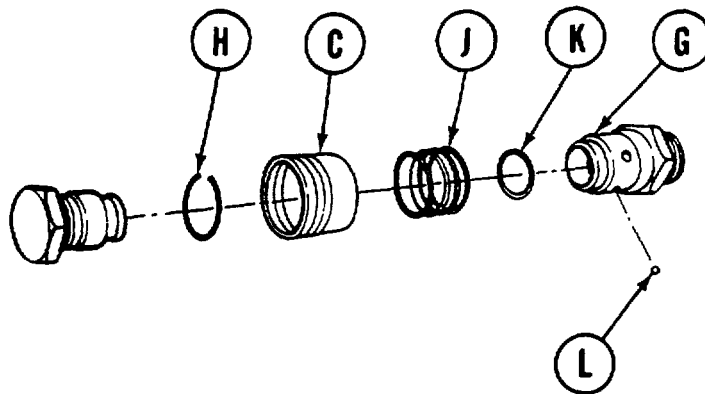
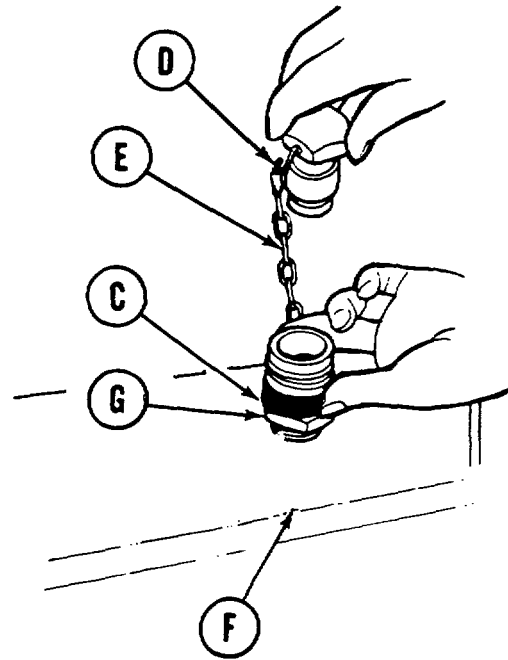


Go on to Sheet 2

TA148247

**FUEL TANK (LEFT AND RIGHT) CONDENSATE RELIEF VALVE REPLACEMENT (Sheet 2 of 4)**

2. Press down on connector sleeve (C) and remove plug (D).
3. Using slip joint pliers, remove chain (E) from plug (D).
4. Using wrench, remove pipe adapter (G) from fuel tank (F). Cover fuel tank opening (F) with clean rags.
5. Press and hold down connector sleeve (C). Using retaining ring pliers, remove retaining ring (H).
6. Remove connector sleeve (C), spring (J), preformed packing (K), and three ball bearing (L) from pipe adapter (G). Throw preformed packing (K) away.



Go on to Sheet 3

TA148248

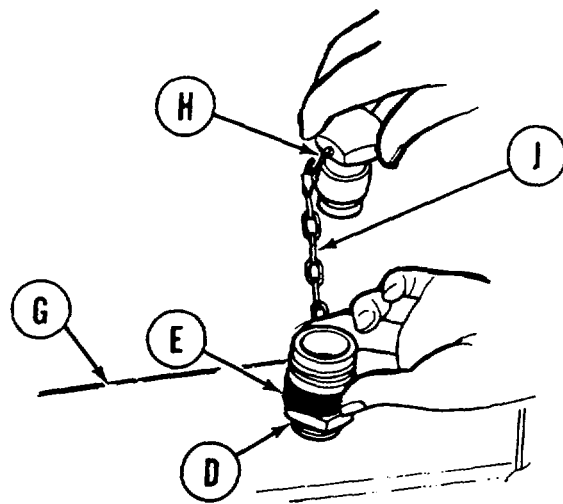
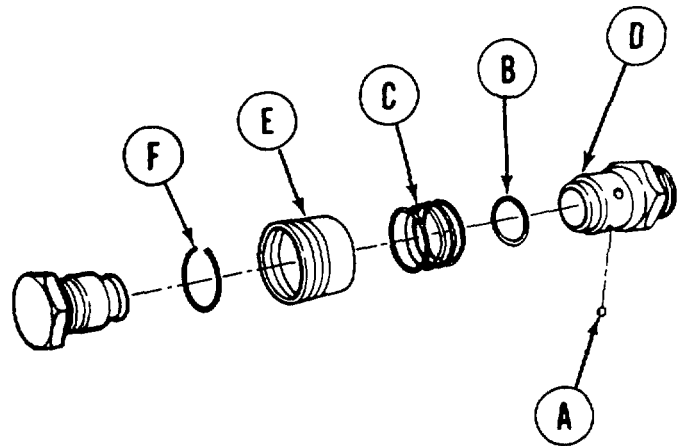
**FUEL TANK (LEFT AND RIGHT) CONDENSATE RELIEF VALVE REPLACEMENT (Sheet 3 of 4)**

**CLEANING AND INSPECTION:**

1. Using dry cleaning solvent (Item 54, Appendix D), clean all components.
2. Inspect components for cracks or breaks. Replace unserviceable components.
3. Using 6-inch ruler, check that free length of spring is one inch long or longer.

**INSTALLATION:**

1. Position three ball bearings (A), new preformed packing (B), and spring (C) on pipe adapter (D).
2. Press connector sleeve (E) down on pipe adapter (D). Using snap ring pliers, install retaining ring (F).
3. Remove rags from fuel tank.
4. Using wrench, install pipe adapter (D) in fuel tank (G).
5. Press down on connector sleeve (E) and install plug (H).
6. Using slip joint pliers, install chain (J) on plug (H).

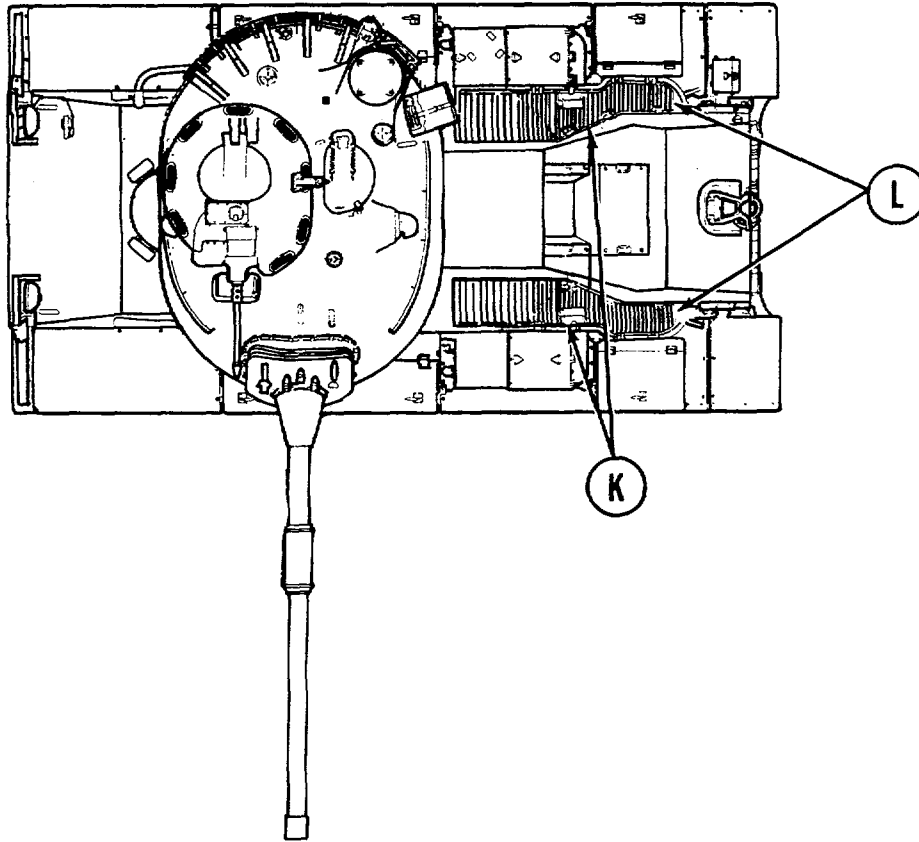


Go on to Sheet 4

TA148249

FUEL TANK (LEFT AND RIGHT) CONDENSATE RELIEF VALVE REPLACEMENT (Sheet 4 of 4)

7. Close top assembly doors (K). Using socket, tighten bolts (L) to secure doors (K).



End of Task

TA148250

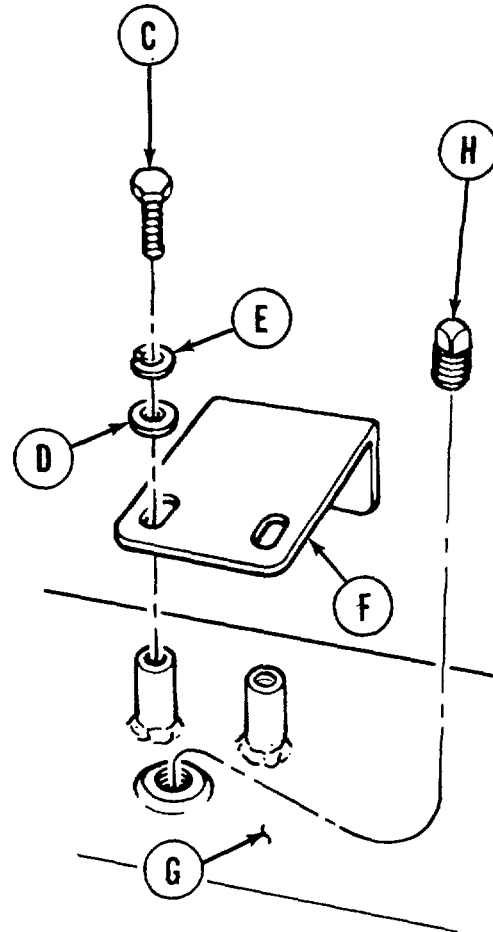
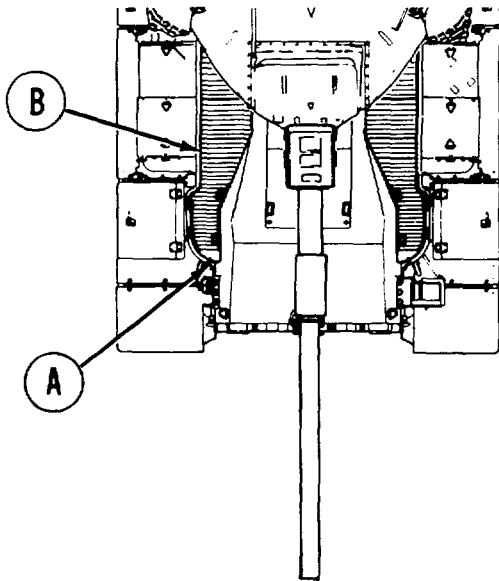


**FUEL TANK PLUG AND BRACKET REPLACEMENT (Sheet 1 of 3)**

**TOOLS:** Ratchet with 1/2 in. drive  
 1/2 in. socket with 1/2 in. drive  
 1/2 in. combination box and open end wrench  
 3/4 in. socket with 1/2 in. drive  
 9/16 in. combination box and open end wrench  
 Stud remover

**SUPPLIES:** Lockwasher (MS35338-45) (2 require)

**REFERENCE:** TM 9-2350-260-10

**REMOVAL:**

1. Using 3/4 inch socket, loosen bolt (A) holding doors (B). Open three doors (B) to gain access to left fuel tank.
2. Using 1/2 inch socket, remove two screws (C), washers (D), and lockwashers (E) holding bracket (F) to fuel tank (G). Throw lockwashers away.

**NOTE**

**If flats of plug (H) are badly rounded or deformed, throw plug away.**

3. Using 9/16 inch wrench or stud remover, remove plug (H) from fuel tank (G).

Go to Sheet 2

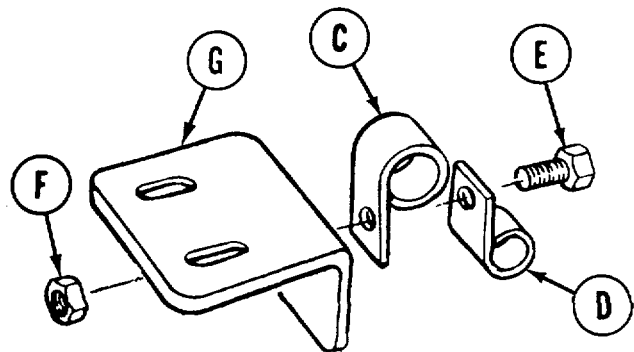
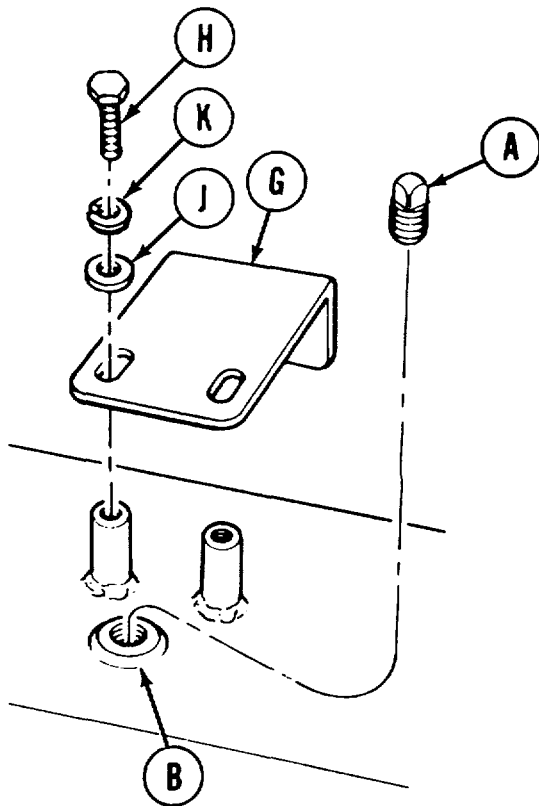
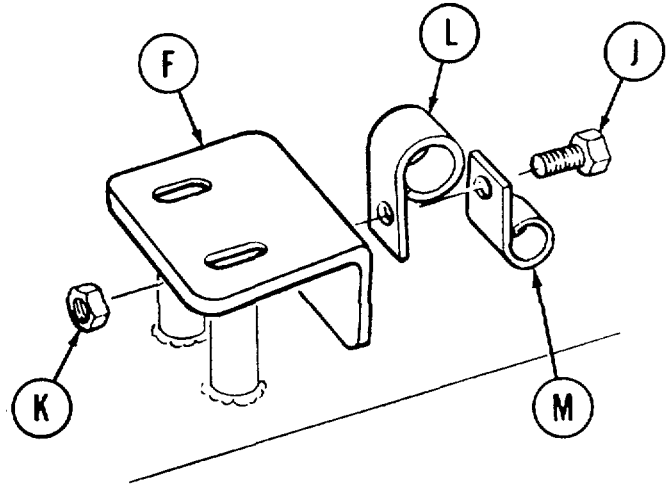
TA148251

**FUEL TANK PLUG AND BRACKET REPLACEMENT (Sheet 2 of 3)**

4. Using 1/2 inch socket and 1/2 inch wrench, remove screw (J) and nut (K) holding clamps (L) and (M).
5. Remove clamps (L) and (M).
6. Remove bracket (F) from fuel tank.

**INSTALLATION:**

1. Using 9/16 inch wrench, install plug (A) in fuel tank (B).
2. Install hose clamps (C) and (D) to bracket (G) using screw (E) and nut (F).
3. Using 1/2 inch socket and 1/2 inch wrench, tighten screw (E) and nut (F).
4. Install bracket (G) using two screws (H), washers (J), and new lockwashers (K).
5. Using 1/2 inch socket, tighten screws (H).

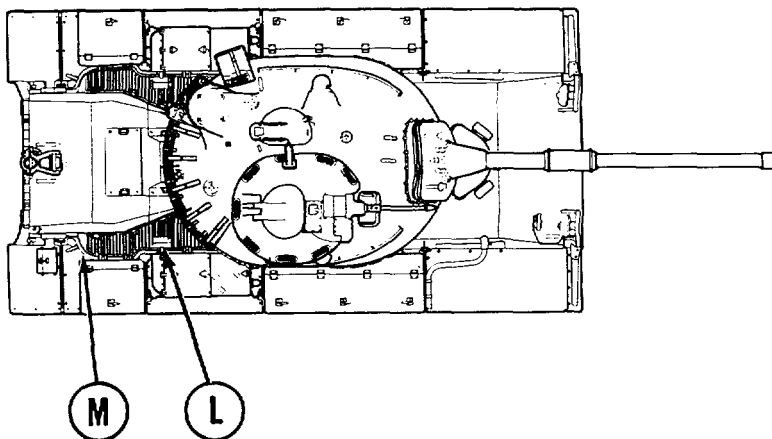


Go on to Sheet 3

TA148252

**FUEL TANK PLUG AND BRACKET REPLACEMENT (Sheet 3 of 3)**

6. Close three top door assemblies (L).
7. Using 3/4 inch socket, tighten bolt (M) securing top door assemblies (L).



End of Task

TA148253

FUEL TANK BREATHER LINE REPLACEMENT (Sheet 1 of 5)

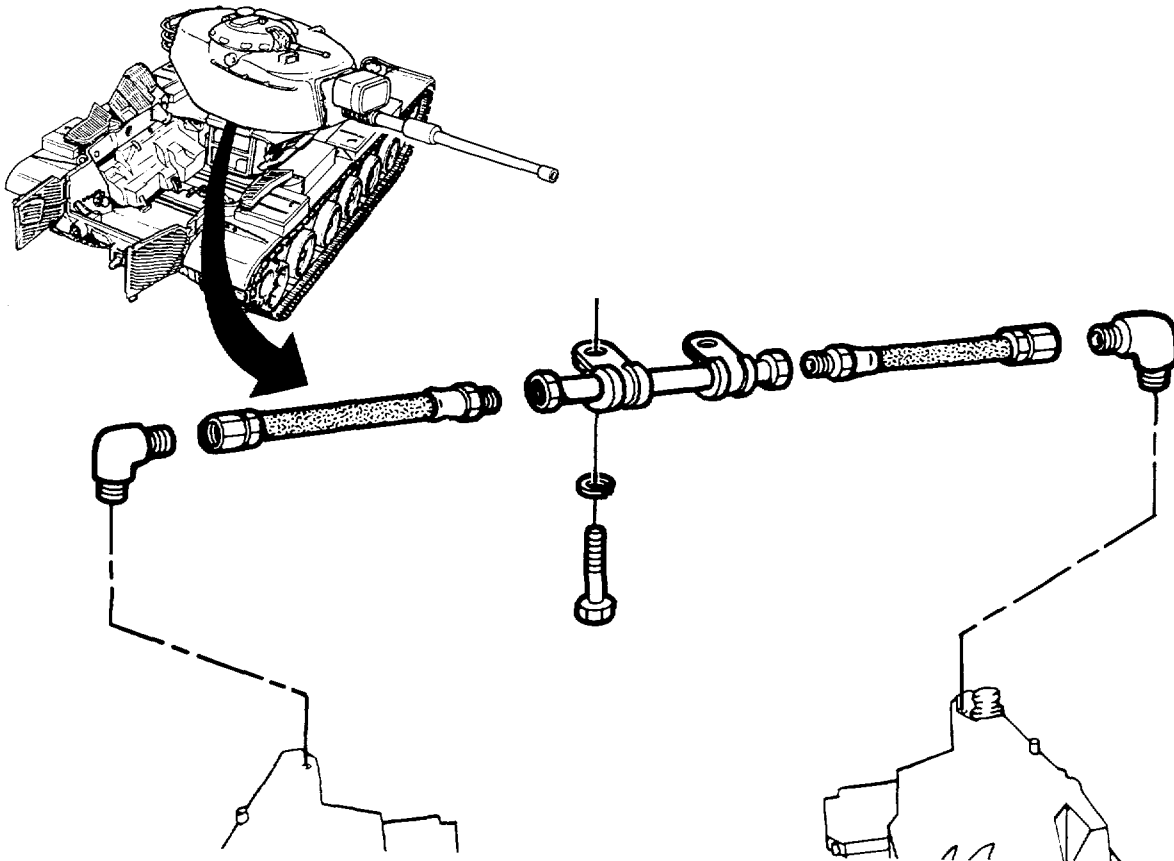
PROCEDURE INDEX

PROCEDURE	PAGE
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Inspection	7-181
Installation	7-182

TOOLS: Ratchet with 1/2 in. drive  
 7/16 in. socket with 1/2 in. drive  
 1-1/2 in. open end wrench (2 required)  
 Pipe wrench

SUPPLIES: Lockwasher (MS35338-44) (2 required)

PRELIMINARY PROCEDURES: Remove powerplant (page 5-1)  
 Remove air cleaner intake hoses (page 7-83)



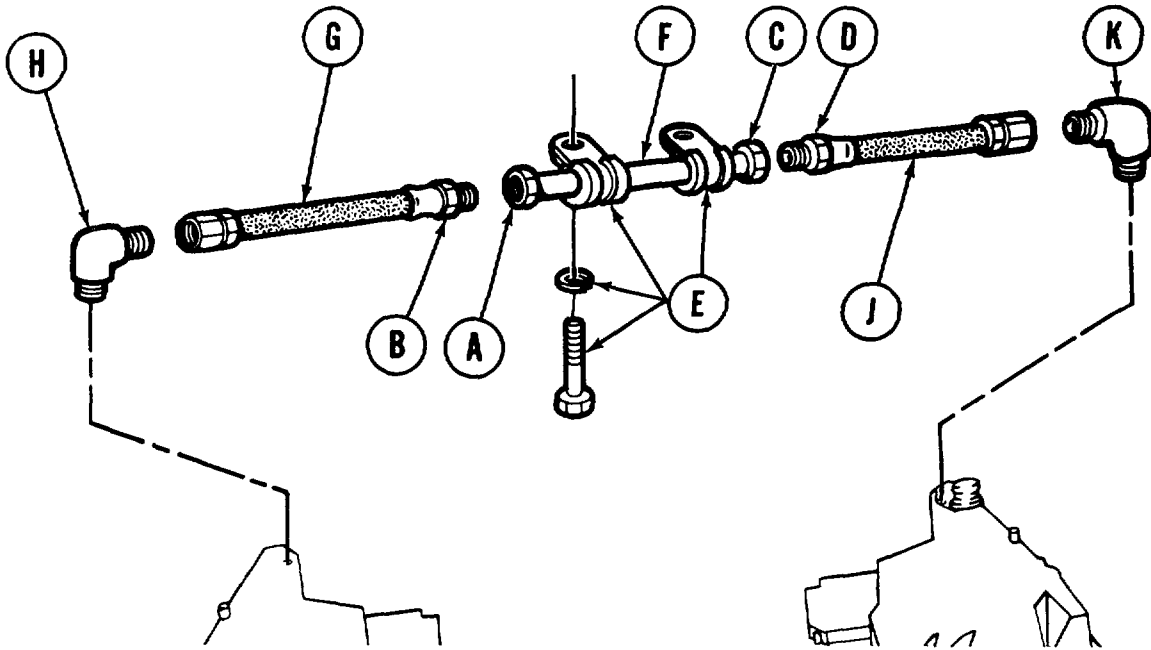
Go on to Sheet 2

TA148254

**FUEL TANK BREATHER LINE REPLACEMENT (Sheet 2 of 5)**

**REMOVAL:**

- Using two wrenches, disconnect tube nut (A) from connector (B) and tube nut (C) from connector (D).



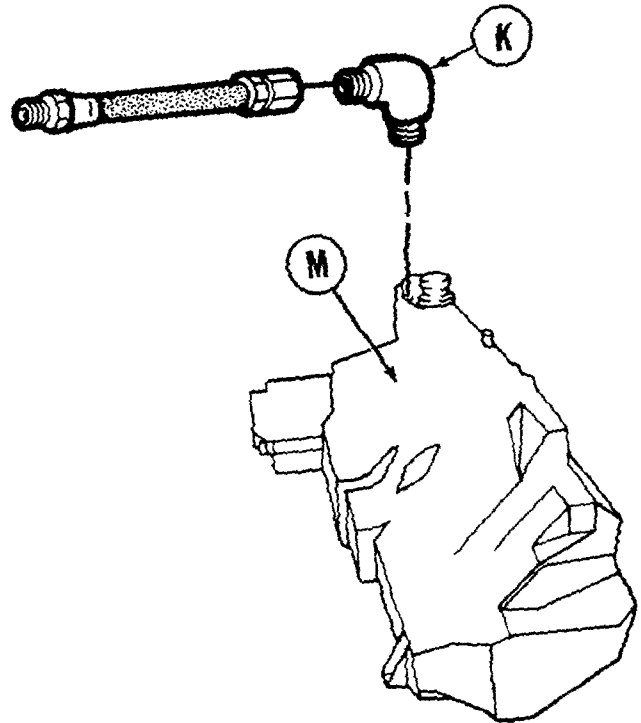
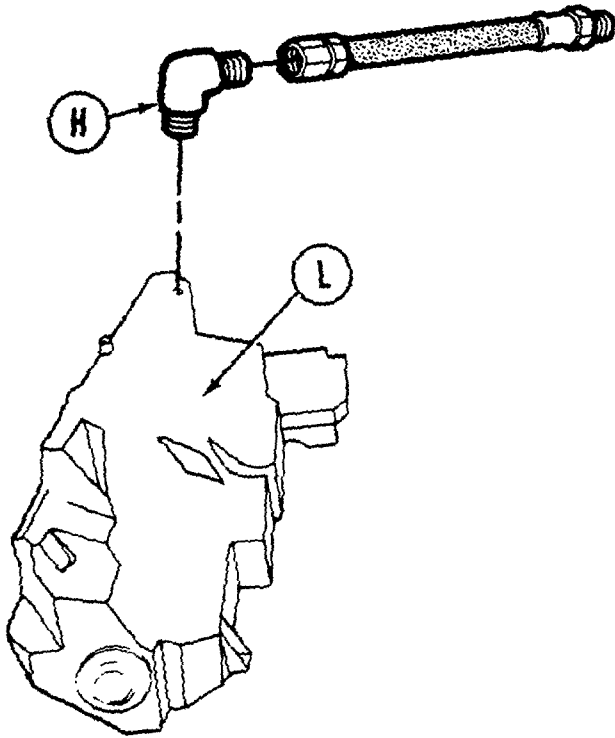
- Using socket, remove two screws, lockwashers, and loop clamps (E) and remove metal tube (F). Throw lockwashers away.
- Using wrench, disconnect hose (G) from elbow (H) and hose (J) from elbow (K).

FUEL TANK BREATHER LINE REPLACEMENT (Sheet 3 of 5)

NOTE

If may be necessary to use pipe wrench.

4. Using wrench, remove elbow (H) from left fuel tank (L) and elbow (K) from right fuel tank (M).



INSPECTION:

1. Check all hoses for cracks and holes.
2. Check all hose connections for tightness and stripped threads.
3. Replace parts as needed.

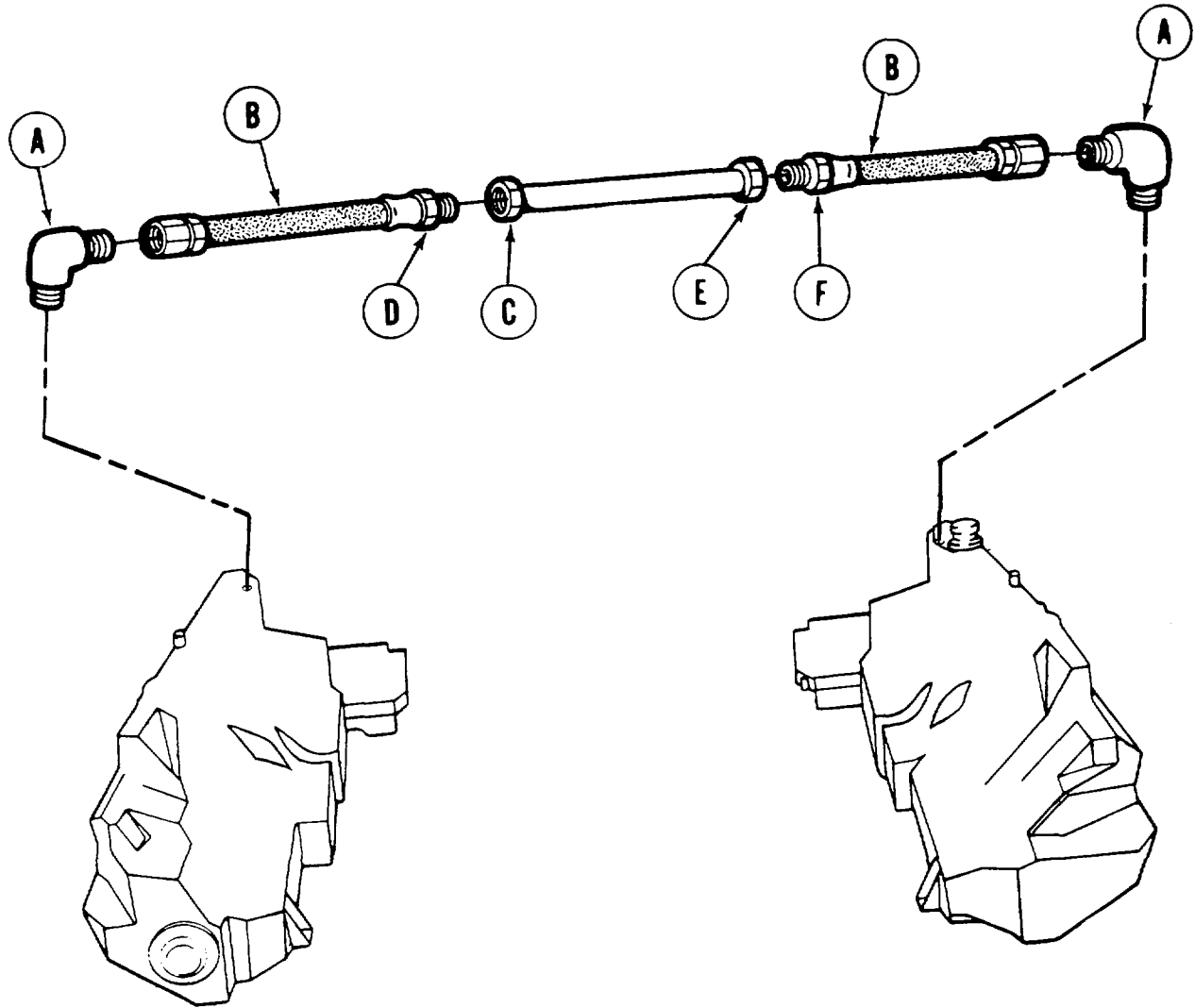
Go on to Sheet 4

TA148256

**FUEL TANK BREATHER LINE REPLACEMENT (Sheet 4 of 5)**

**INSTALLATION:**

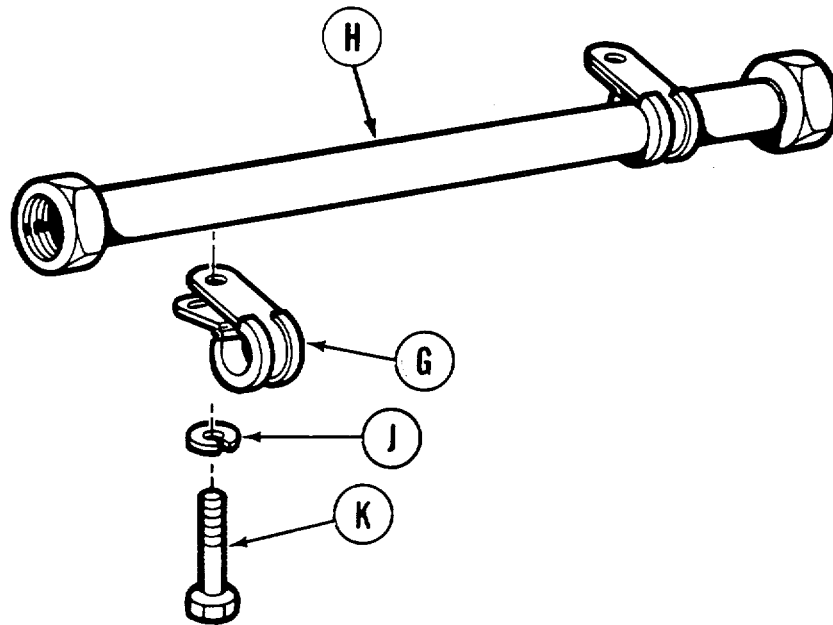
1. Using wrench, install elbow (A) on left and right fuel tanks.
2. Using wrench, install rubber breather hose (B) on each elbow.



3. Using two wrenches, connect tube nut (C) to hose connector (D) and tube nut (E) to hose connector (F).

**FUEL TANK BREATHER LINE REPLACEMENT (Sheet 5 of 5)**

4. Install two loop clamps (G) on metal breather tube (H).



5. Using socket, install new lockwashers (J), and screws (K).
6. Check all hose connections for tightness.
7. Tighten if necessary.
8. Install air cleaner intake hoses (page 7-85).
9. Install 2A powerplant (page 5-14) or 2D powerplant (5-40).

End of Task

TA148258



**FUEL TANK (LEFT AND RIGHT) DRAIN PLUG REPLACEMENT (Sheet 1 of 1)**

**TOOLS:** 10 in. extension with 1/2 in. drive  
 Hinged handle with 1/2 in. drive  
 3/4 in. combination box and open end wrench

**SUPPLIES:** Grease (Item 36, Appendix D)  
 Lockwasher (MS35338-67) (4 required)

**PRELIMINARY PROCEDURE:** Drain fuel tanks (page 7-153)

**REMOVAL:**

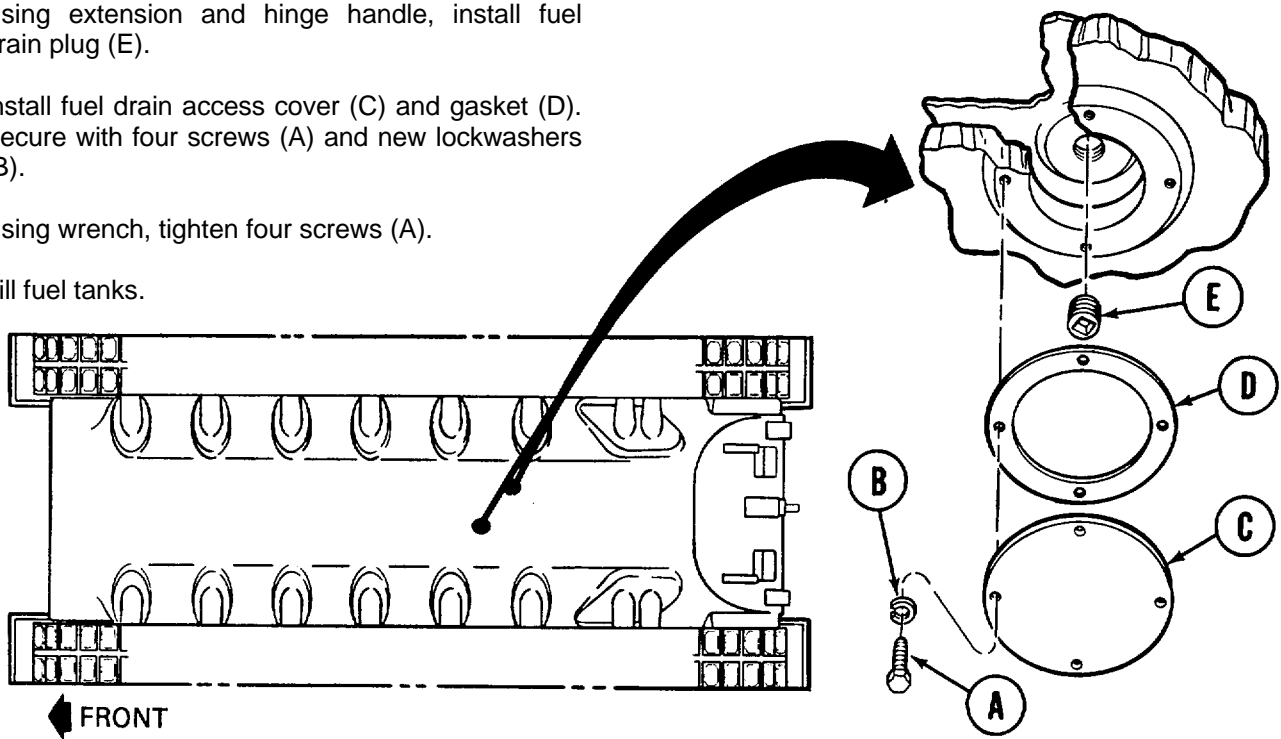
1. Using wrench, remove four screws (A) and lockwashers (B). Hold access cover to keep from falling. Throw lockwashers away.
2. Remove access cover (C) and gasket (D).
3. Using extension and handle, remove drain plug (E).

**INSPECTION:**

Inspect fuel drain plug for stripped threads or damaged flats. Throw unserviceable plug away.

**INSTALLATION:**

1. Coat fuel drain plug threads with grease (Item 36, Appendix D).
2. Using extension and hinge handle, install fuel drain plug (E).
3. Install fuel drain access cover (C) and gasket (D). Secure with four screws (A) and new lockwashers (B).
4. Using wrench, tighten four screws (A).
5. Fill fuel tanks.



End of Task

TA148259

**FUEL TANK CROSSOVER VALVE REPLACEMENT (Sheet 1 of 7)**

PROCEDURE INDEX

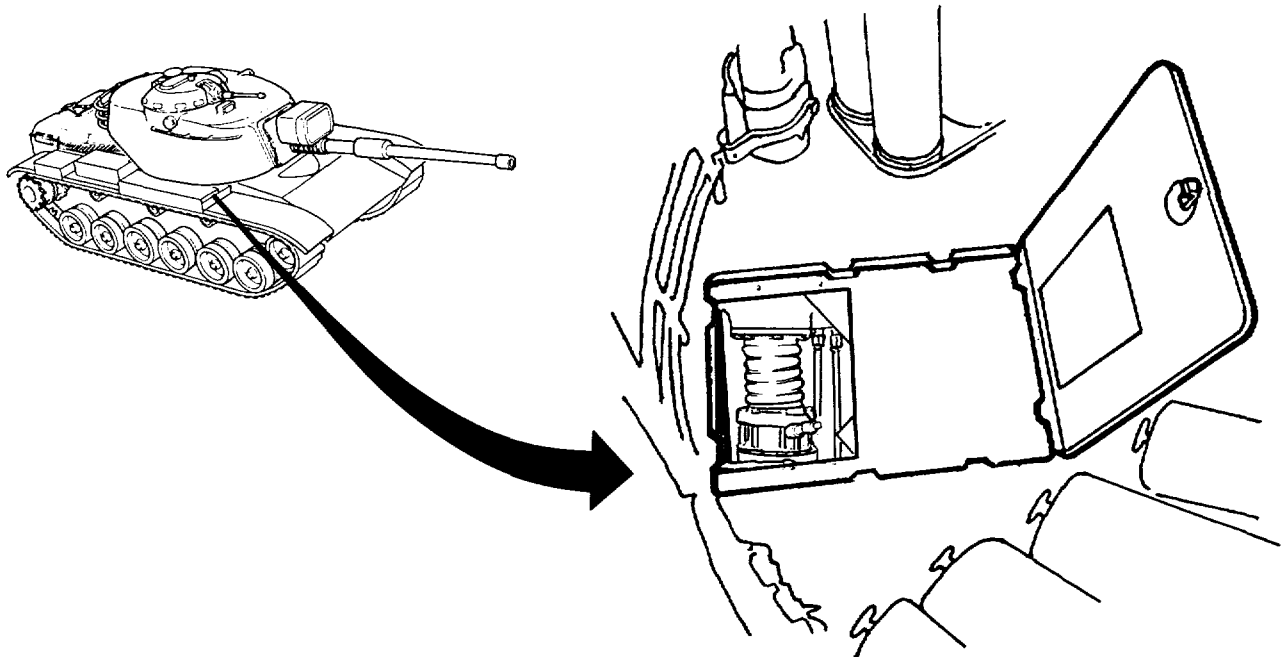
PROCEDURE	PAGE
Removal	7-186
Installation	7-188

**TOOLS:** Ratchet with 1/2 in. drive  
 5 in. extension with 1/2 in. drive  
 1/2 in. socket with 1/2 in. drive  
 Torque wrench with 1/2 in. drive (0-175 lb-ft) (0-238 N•m)  
 1/2 in. combination box and open end wrench  
 Slip joint pliers  
 Diagonal cutting pliers  
 Putty knife

**SUPPLIES:** Dry cleaning solvent (Item 54, Appendix D)  
 Rags (Item 65, Appendix D)  
 Gasket (10864231)  
 Lockwire (Item 59, Appendix D)

**REFERENCE:** TM 9-2350-260-10

**PRELIMINARY PROCEDURE:** Drain both fuel tanks (page 7-153)  
 Remove powerplant (page 5-1)  
 Remove fuel crossover access cover (page 16-41)

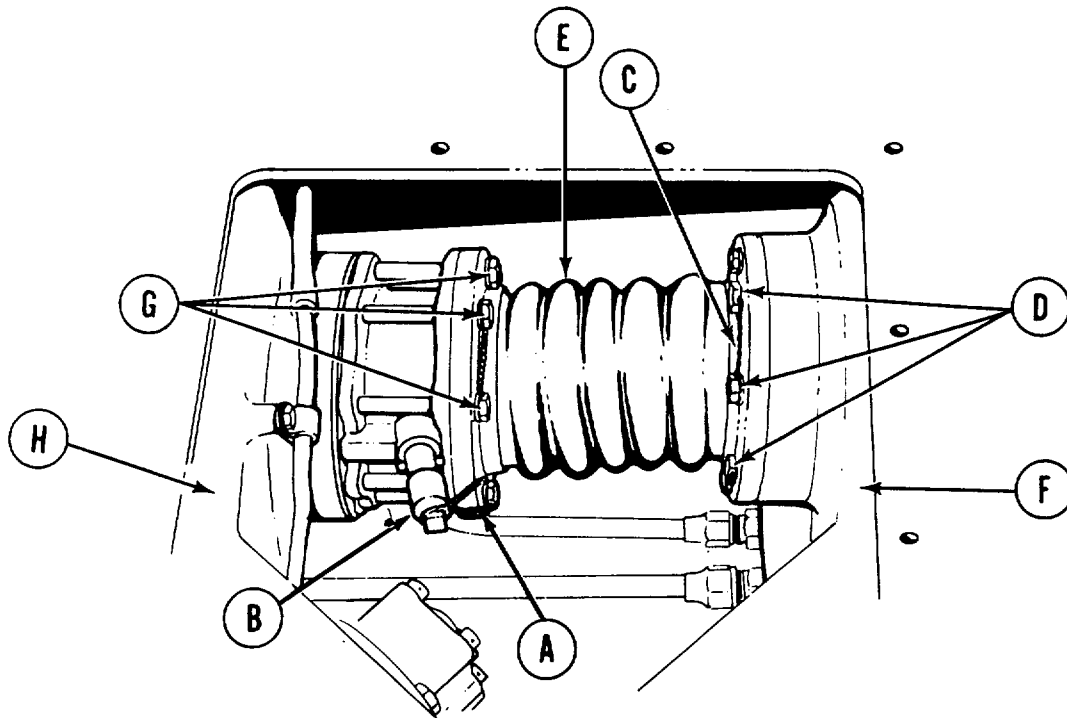


Go on to Sheet 2

TA148260

**FUEL TANK CROSSOVER VALVE REPLACEMENT (Sheet 2 of 7)****REMOVAL:**

1. Using diagonal cutting pliers, remove lockwire (A) from crossover control valve (B).



2. Using diagonal cutting pliers, reach through crossover access and remove lockwire (C) from three screws (D) holding preformed hose (E) to left fuel tank (F), and three screws (G) holding preformed hose (E) to right fuel tank (H).
3. Using 1/2 inch wrench, remove three screws and washers (D) holding preformed hose (E) to left fuel tank (F).
4. Using 1/2 inch wrench, remove three screws and washers (G) from valve (B) to right fuel tank (H).

Go on to Sheet 3

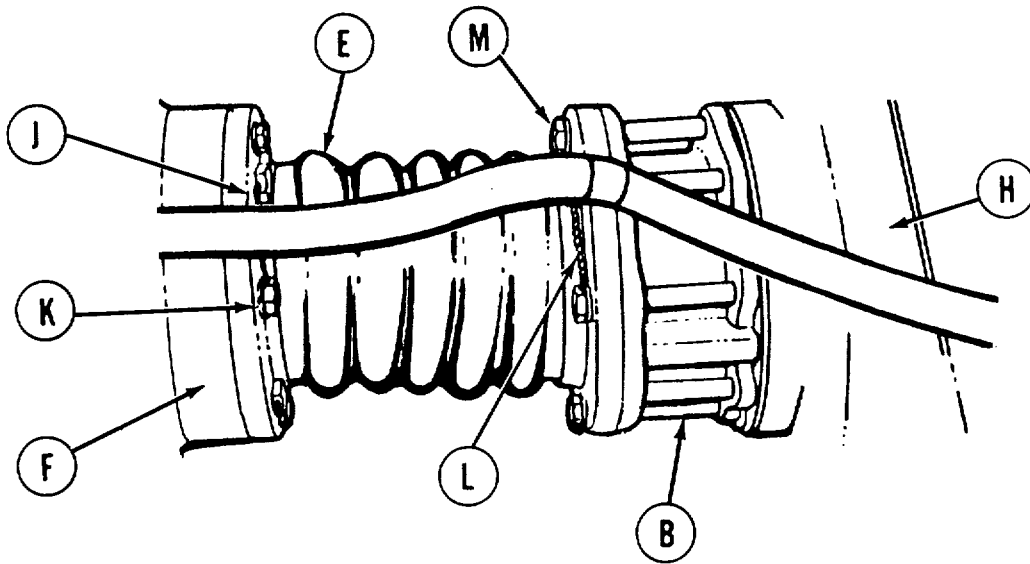
TA148261

## FUEL TANK CROSSOVER VALVE REPLACEMENT (Sheet 3 of 7)

## NOTE

Remaining steps for removal of butterfly valve will be performed in engine compartment.

5. Using diagonal cutting pliers, remove lockwire (J) from five screws (K) holding preformed hose (E) to left fuel tank (F).
6. Using diagonal cutting pliers, remove lockwire (L) from five screws (M) holding valve (B) to right fuel tank (H).



7. Using 1/2 inch wrench, remove five screws (K) holding preformed hose (E) to left fuel tank (F).
8. Using 1/2 inch wrench, remove five screws (M) holding valve (B) to right fuel tank (H).
9. Remove crossover valve (B), preformed hose (E), and gasket from fuel tank. Throw gasket away.

Go on to Sheet 4

TA148262

**FUEL TANK CROSSOVER VALVE REPLACEMENT (Sheet 4 of 7)**

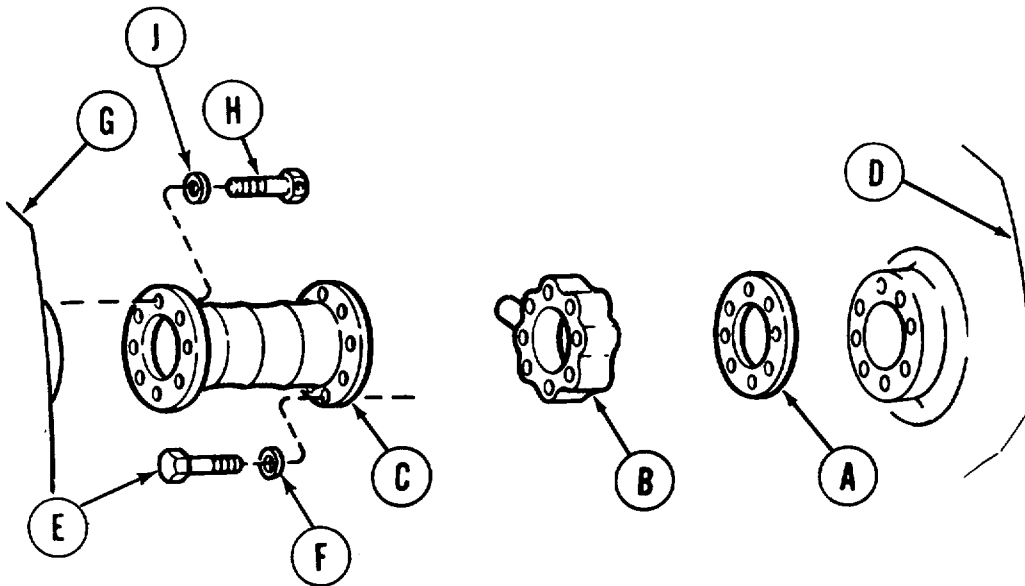
10. Using dry cleaning solvent (Item 54, Appendix D), rags, and putty knife, clean excess material from fuel tank.

**NOTE**

**The following steps of valve installation will be performed in engine compartment**

**INSTALLATION:**

1. Install new gasket (A), crossover valve (B), and preformed hose (C) to right fuel tank (D) using five screws (E) and washers (F).
2. Install preformed hose (C) to left fuel tank (G) using five screws (H) and washers (J).



3. Using 1/2 inch wrench, tighten five screws (E) and five screws (H).

Go on to Sheet 5

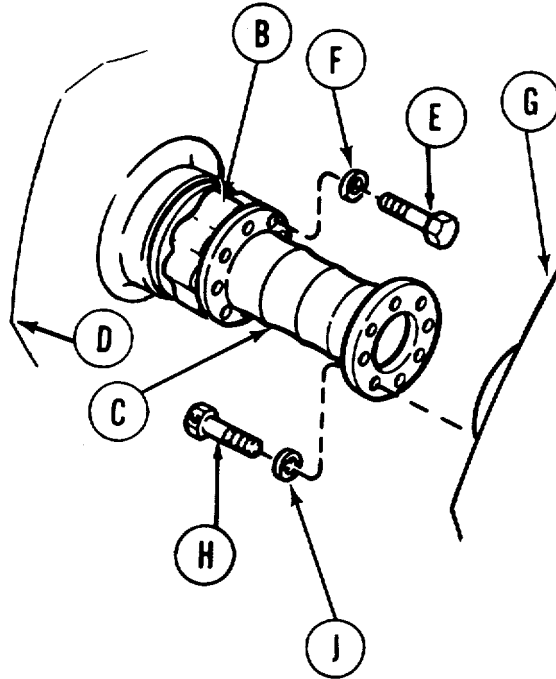
TA148263

## FUEL TANK CROSSOVER VALVE REPLACEMENT (Sheet 5 of 7)

## NOTE

The following steps of valve installation will be performed through the butterfly valve access in turret.

4. Install remaining three screws (E) and washers (F) holding crossover valve (B) and preformed hose (C) to right fuel tank (D).



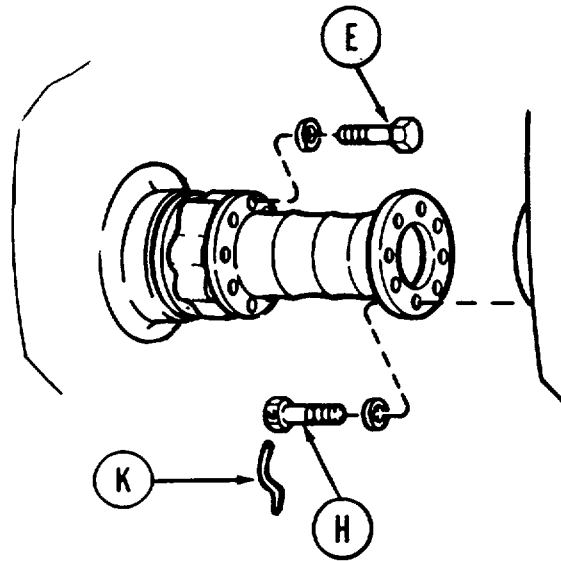
5. Install remaining three screws (H) and washers (J) holding preformed hose (C) to left fuel tank (G).
6. Using 1/2 inch wrench, tighten three screws (E) and (H).

Go on to Sheet 6

TA148264

**FUEL TANK CROSSOVER VALVE REPLACEMENT (Sheet 6 of 7)**

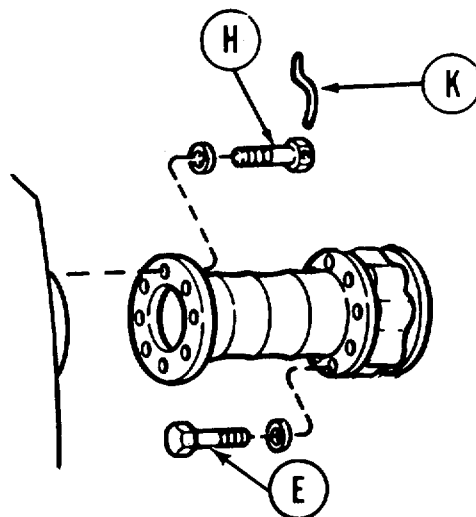
7. Using torque wrench, tighten three screws (E) and three screws (H) to 10-15 lb-ft (13-20 N•m).
8. Using slip joint pliers, install lockwire (K) (Item 59, Appendix D) in three screws (E) and (H).



**NOTE**

**The following steps of valve installation will be performed in engine compartment**

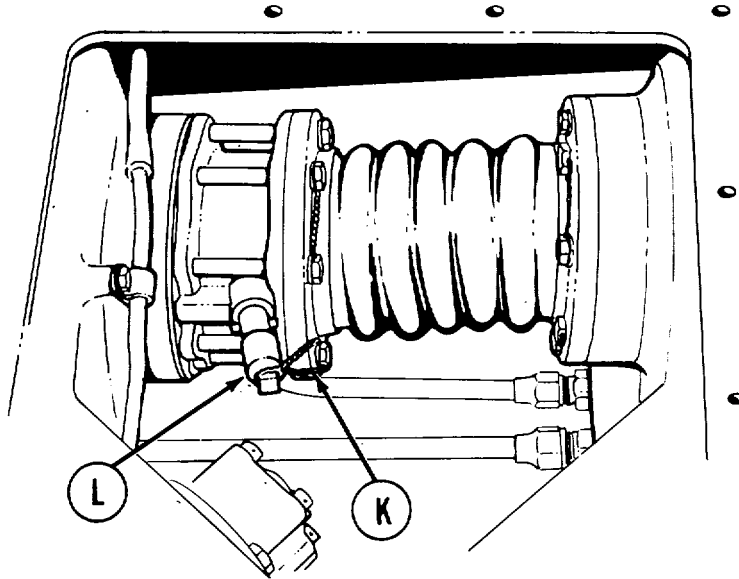
9. Using torque wrench, tighten the remaining five screws (E) and (H) to 10-15 lb-ft (13-20 N•m).
10. Using slip joint pliers, install lockwire (K) (Item 59, Appendix D) in five screws (E) and (H).



**FUEL TANK CROSSOVER VALVE REPLACEMENT (Sheet 7 of 7)****NOTE**

**The remaining steps of valve installation will be performed in turret.**

11. Using slip joint pliers, install lockwire (K) (Item 59, Appendix D) to valve control (L).



12. Install fuel crossover access plate (page 16-41).
13. Fill fuel tanks (TM 9-2350-260-10).
14. Install 2A powerplant (page 5-14) or 2D powerplant (page 5-40).

End of Task

TA148266



**FUEL SHUTOFF VALVE, LEVER, LINK, AND BRACKET REPLACEMENT (Sheet 1 of 9)**

PROCEDURE INDEX

PROCEDURE	PAGE
Removal	7-193
Cleaning and Inspection	7-196
Installation	7-196

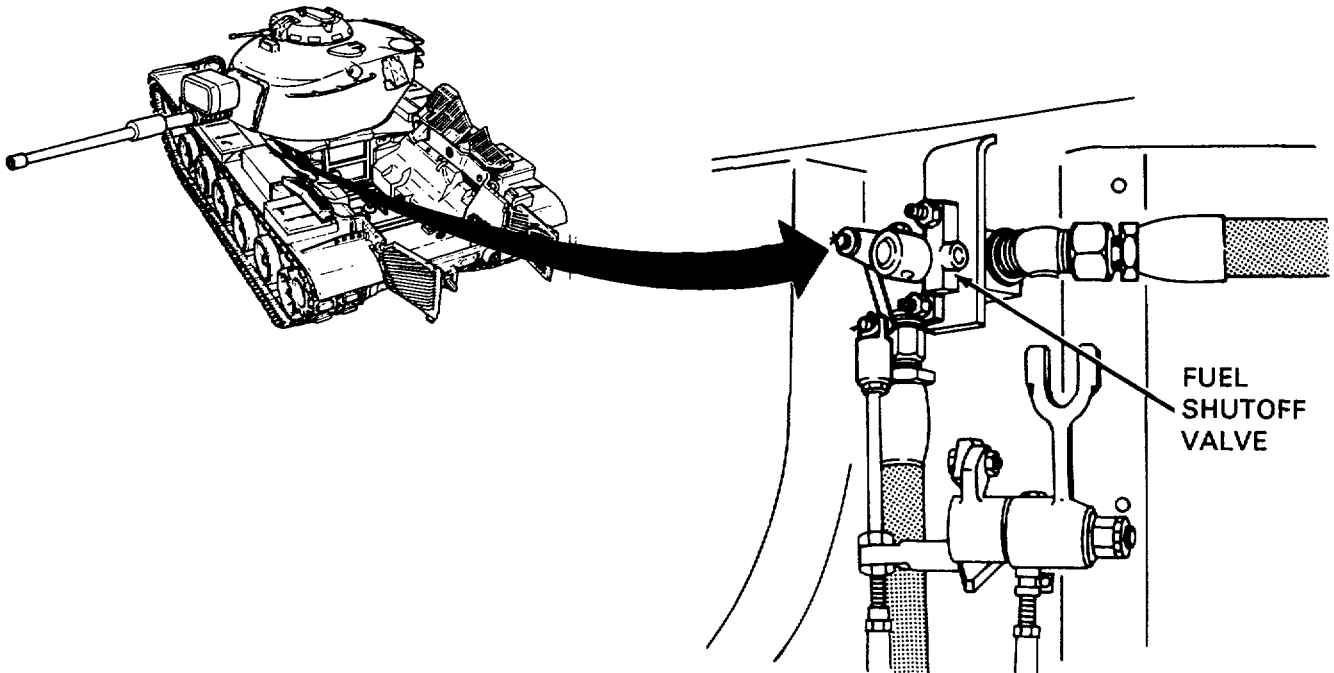
TOOLS: Ratchet with 1/2 in. drive  
 5 in. extension with 1/2 in. drive  
 1/2 in. socket with 1/2 in. drive  
 7/16 in. combination box and open end wrench  
 10 in. adjustable wrench  
 7/16 in. socket with 1/2 in. drive  
 Long round nose pliers  
 Ball peen hammer  
 1/8 in. drive pin punch  
 Wire brush  
 Vise  
 1 in. open end wrench  
 1-1/8 in. open end wrench

SUPPLIES: Sealing compound (Item 24, Appendix D)  
 Cotter pins (MS24665-132) (2 required)  
 Lockwasher (MS35338-46) (2 required)  
 Preformed packings (MS28778-10) (2 required)  
 Plastic cap  
 Lockwashers (MS35338-44) (2 required)  
 Spring pin (589784)

REFERENCE: TM 9-2350-260-10

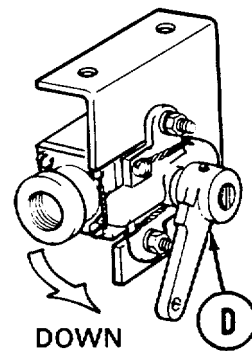
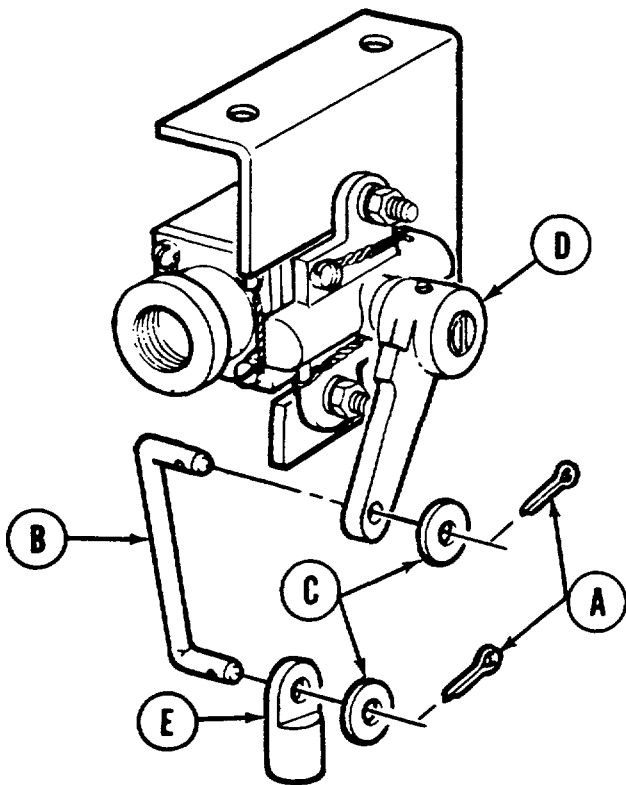
PRELIMINARY PROCEDURES: Remove powerplant (page 5-1)  
 Pull fuel shutoff valve handle half way out (TM 9-2350-260-10)

FUEL SHUTOFF VALVE, LEVER, LINK, AND BRACKET REPLACEMENT (Sheet 2 of 9)



REMOVAL:

1. Using pliers, remove two cotter pins (A) from link (B). Throw cotter pins away.
2. Slide two flat washers (C) from link (B).
3. Remove link (B) from lever (D) and connector (E).
4. Push lever (D) so it is pointing down.

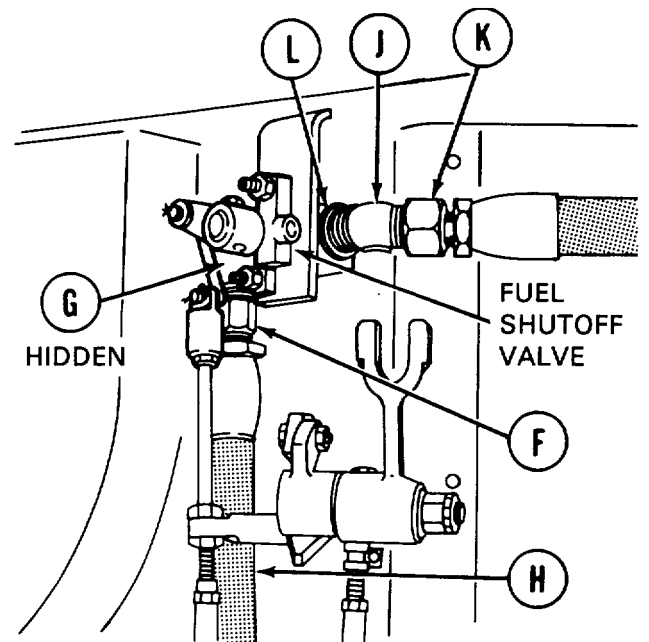


Go on to Sheet 3

TA148268

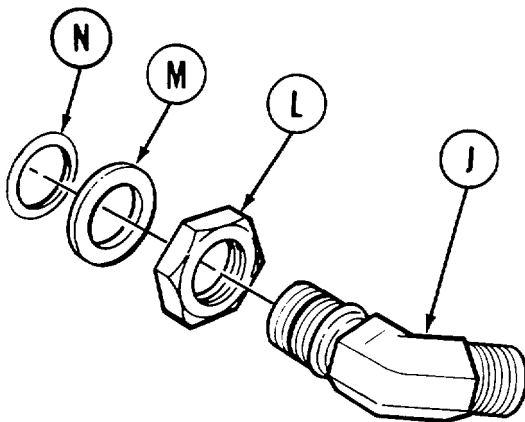
**FUEL SHUTOFF VALVE, LEVER, LINK, AND BRACKET REPLACEMENT (Sheet 3 of 9)**

- Using 1-1/8 inch wrench, remove tube nut (F) from elbow (G).



- Using plastic cap, cap end of hose (H) to prevent fuel loss.

- Using adjustable wrench to hold elbow (J), use 1 inch wrench to remove tube nut (K) from elbow (J).
- Using adjustable wrench to hold elbow (J), use 1-1/8 inch wrench to loosen nut (L) about 1/2 turn.



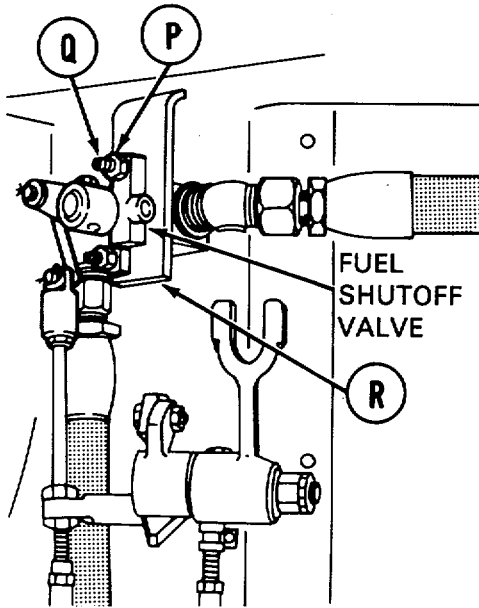
- Using adjustable wrench, remove elbow (J) with nut (L), washer (M), and preformed packing (N) from fuel shutoff valve as an assembly.

- Manually remove preformed packing (N) and washer (M) from elbow (J). Throw preformed packing (N) away.
- Using adjustable wrench to hold elbow (J), use 1-1/8 inch wrench to remove nut (L) from elbow (J).

Go on to Sheet 4

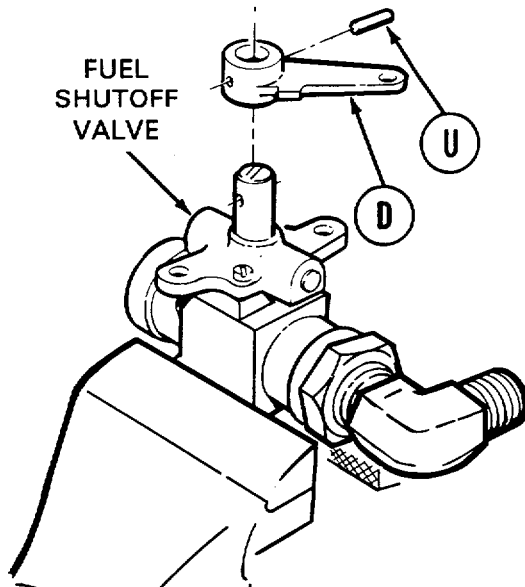
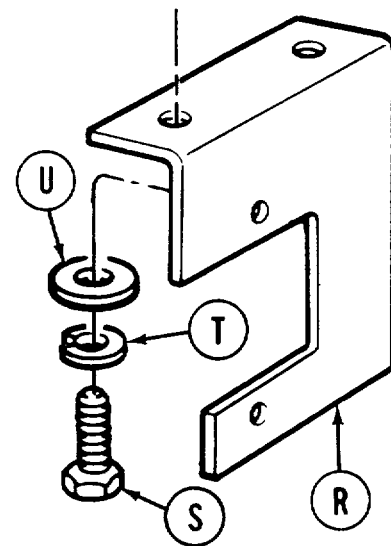
TA148269

FUEL SHUTOFF VALVE, LEVER, LINK, AND BRACKET REPLACEMENT (Sheet 4 of 9)



12. Using 7/16 inch wrench and 7/16 inch socket with extension, remove two nuts and lockwashers (P) and two screws (Q). Throw lockwashers away.
13. Remove fuel shutoff valve from bracket (R).

14. Using 1/2 inch socket with extension, remove two screws (S), lockwashers (T), and flat washers (U) holding bracket (R). Throw lockwashers (T) away.
15. Remove fuel shutoff valve and bracket (B) from tank.
16. Manually install fuel shutoff valve into vise.



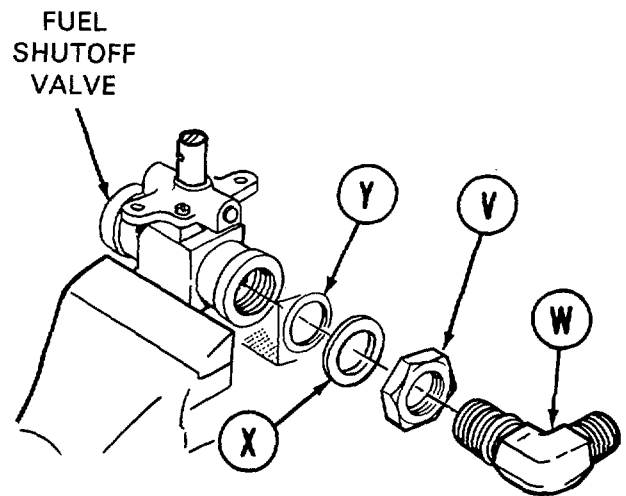
17. Using hammer and drive pin punch, start spring pin (U) out of lever (D).
18. Using pliers, remove spring pin (U) from lever (D). Throw pin away.
19. Manually remove lever (D) from fuel shutoff valve.

Go on to Sheet 5

TA148270

**FUEL SHUTOFF VALVE, LEVER, LINK, AND BRACKET REPLACEMENT (Sheet 5 of 9)**

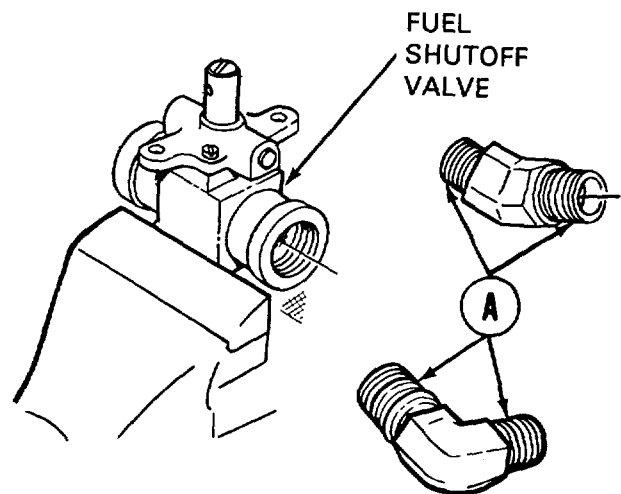
20. Using 1-1/8 inch wrench, loosen nut (V) about 1/2 turn.
21. Using adjustable wrench, remove elbow (W) with nut (V), washer (X), and preformed packing (Y) from fuel shutoff valve as an assembly.



22. Manually remove preformed packing (Y) and washer (X) from elbow (W). Throw preformed packing (Y) away.
23. Using adjustable wrench to hold elbow (W), use 1-1/8 inch wrench to remove nut (V) from elbow (W).

**CLEANING AND INSPECTION:**

1. Using wire brush, clean threads on two elbows.
2. Inspect parts for damage. Replace as necessary.

**INSTALLATION:**

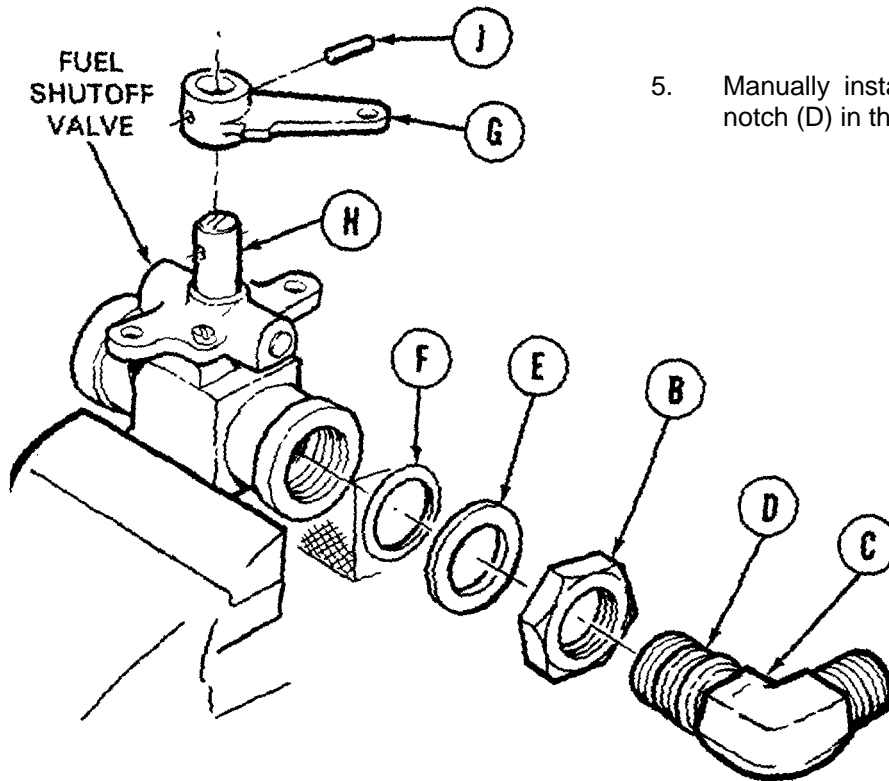
1. Manually install fuel shutoff valve into vise.
2. Using sealing compound (Item 24, Appendix D), lightly coat threads (A) on two elbows.

Go on to Sheet 6

TA148271

**FUEL SHUTOFF VALVE, LEVER, LINK, AND BRACKET REPLACEMENT (Sheet 6 of 9)**

3. Manually thread nut (B) onto 90 degree elbow (C) past notch (D) in threads.
4. Manually slide washer (E) onto elbow (C).



5. Manually install new preformed packing (F) into notch (D) in threads of elbow (Q).

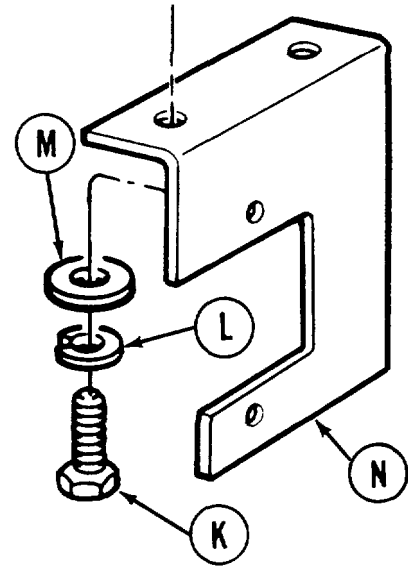
6. Using adjustable wrench, install elbow (C) with nut (B), washer (E), and new preformed packing (F) into fuel shutoff valve as an assembly, to correct position for tank installation.
7. Using adjustable wrench to hold elbow (C), use 1-1/8 inch wrench to tighten nut (B) against fuel shutoff valve.
8. Alining holes in lever (G) with holes in shaft (H), install lever (G) onto fuel shutoff valve.
9. Using hammer, install new spring pin (J) through lever (G) and shaft (H).
10. Remove fuel shutoff valve from vise.

Go on to Sheet 7

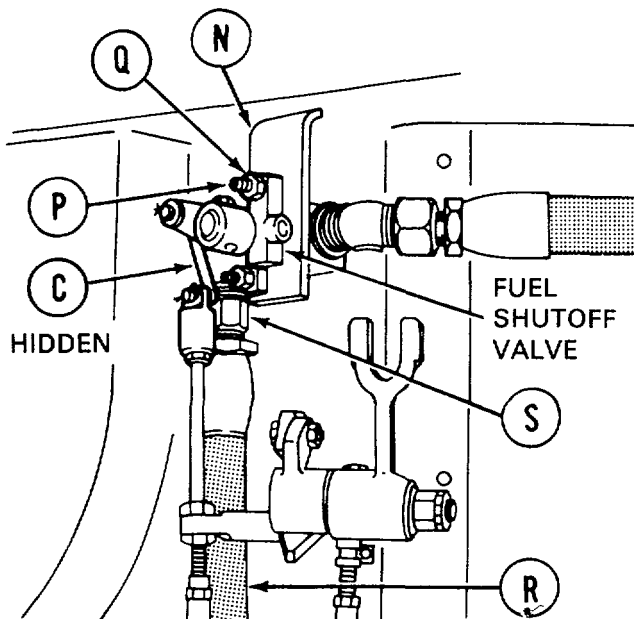
TA148272

**FUEL SHUTOFF VALVE. LEVER, LINK. AND BRACKET REPLACEMENT (Sheet 7 of 9)**

11. Using 1/2 inch socket with extension, install two screws (K), new lockwashers (L), and flat washers (M) to hold bracket (N) to hull.
12. Position fuel shutoff valve for installation to bracket (N).



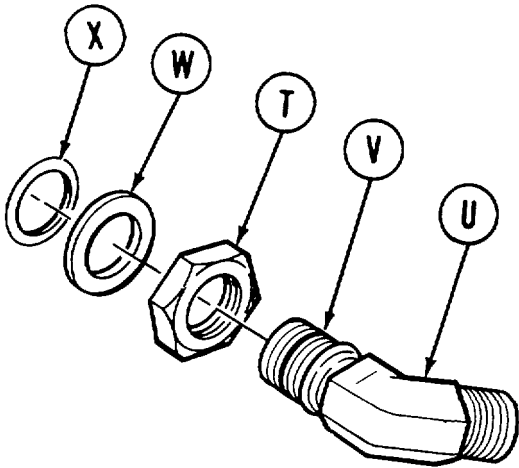
13. Using 7/16 inch wrench and 7/16 inch socket with extension, install two screws (P) and two new lockwashers and nuts (Q).



14. Remove plastic cap from end of hose (R).
15. Using 1-1/8 inch wrench, install tube nut (S) to elbow (C).

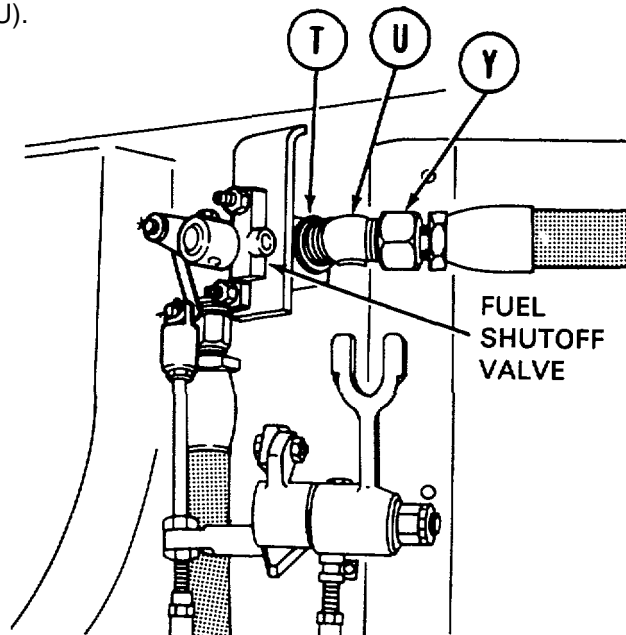
**FUEL SHUTOFF VALVE, LEVER, LINK, AND BRACKET REPLACEMENT (Sheet 8 of 9)**

16. Manually thread nut (T) onto 45 degree elbow (U) past notch (V) in threads



17. Manually slide washer (W) onto elbow (U).

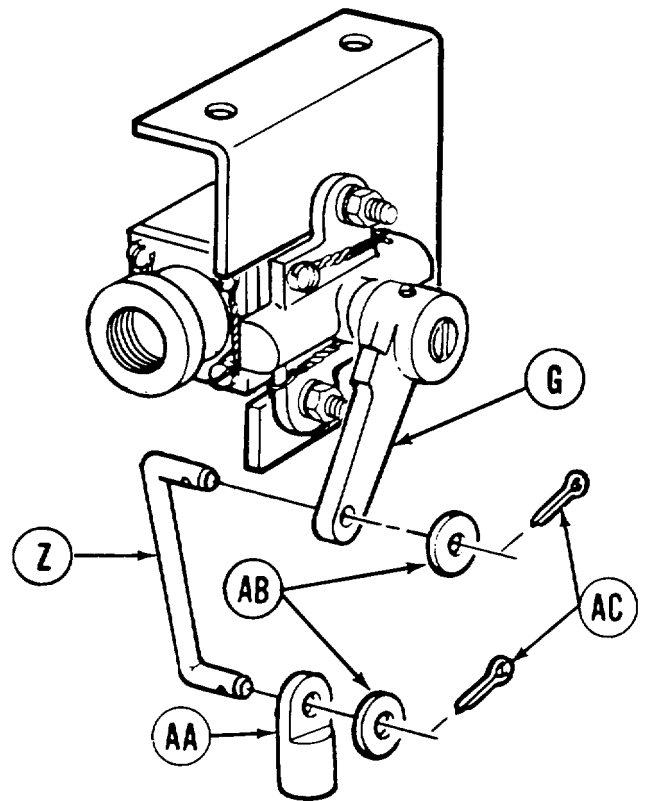
18. Manually install new preformed packing (X) into notch (V) in threads of elbow (U).
19. Using adjustable wrench, install elbow (U) with nut (T), washer (W), and new preformed packing (X) into fuel shutoff valve as an assembly, to correct position for tank installation.
20. Using adjustable wrench to hold elbow (U), use 1-1/8 inch wrench to tighten nut (T) against fuel shutoff valve.
21. Using 1 inch wrench, install tube nut (Y) to elbow (U).





**FUEL SHUTOFF VALVE, LEVER, LINK, AND BRACKET REPLACEMENT (Sheet 9 of 9)**

22. Install link (Z) to lever (G) and rod end (AA).
23. Install two flat washers (AB), one onto each end of link (Z).
24. Using pliers, install two new cotter pins (AC), one into each end of link (Z).
25. Install 2A powerplant (page 5-14) or 2D powerplant (page 540).



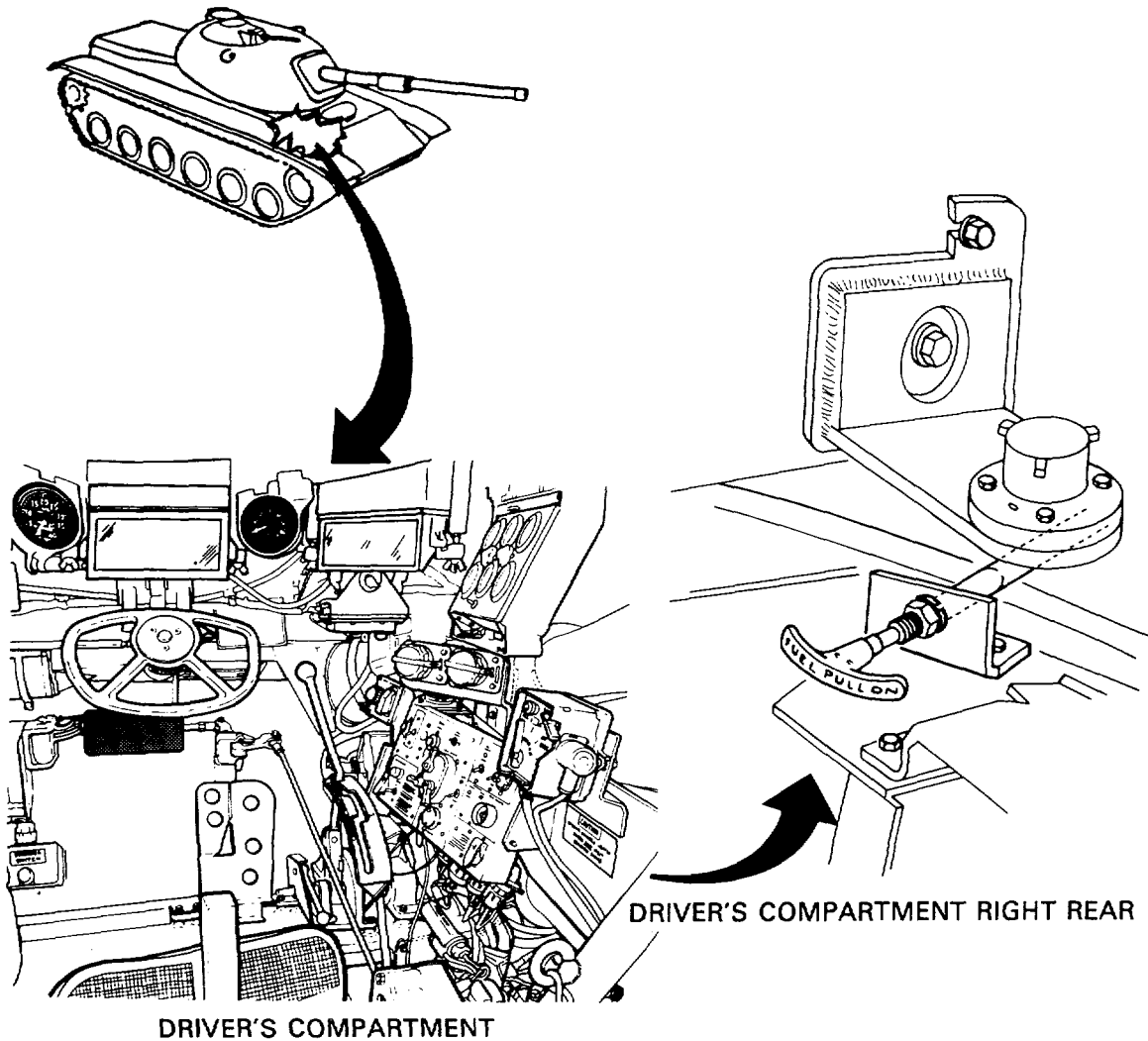
End of Task

TA148275

**FUEL SHUTOFF HANDLE AND CABLE BRACKET REPLACEMENT (Sheet 1 of 3)**

**TOOLS:** Ratchet with 1/2 in. drive  
 7/16 in. socket with 1/2 in. drive  
 7/16 in. combination box and open end wrench  
 3/4 in. combination box and open end wrench (2 required)  
 Slip joint pliers

**SUPPLIES:** Lockwasher (MS35338-21) (2 required)  
 Lockwasher (MS35338-25) (2 required)

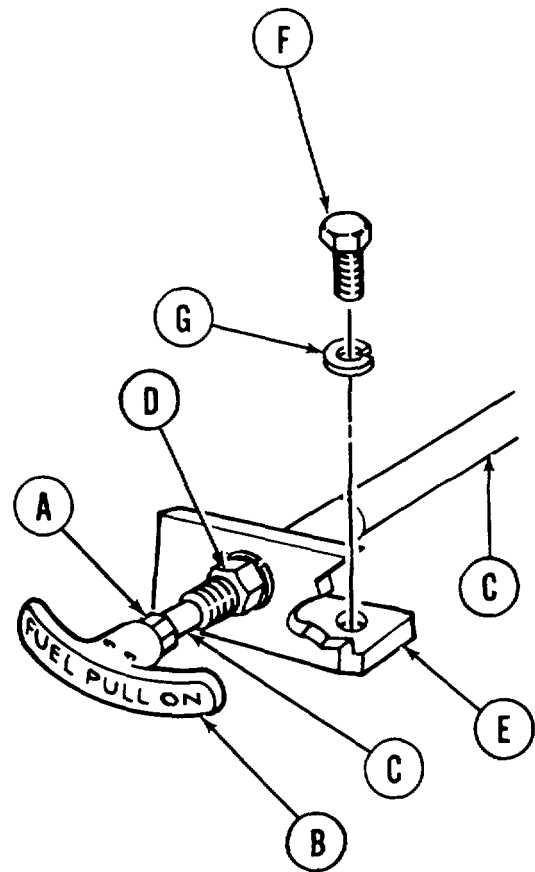


Go on to Sheet 2

TA148276

**FUEL SHUTOFF HANDLE AND CABLE BRACKET REPLACEMENT (Sheet 2 of 3)****REMOVAL:**

1. Using 7/16 inch wrench, loosen jamnut (A).
2. Using hands, turn handle (B) counterclockwise and remove handle from cable (C).
3. Using pliers, hold unthreaded portion of cable (C) and, using 7/16 inch wrench, remove nut (A) from cable (C).
4. Using two 3/4 inch wrenches, remove nut and lockwasher (D) from cable. Throw lockwasher away.
5. Push cable (C) towards rear of vehicle to remove from bracket (E). Remove lockwasher from cable and throw away.
6. Using 7/16 inch socket, remove two screws (F) and lockwashers (G). Throw lockwashers away.
7. Remove bracket (E).

**INSPECTION:**

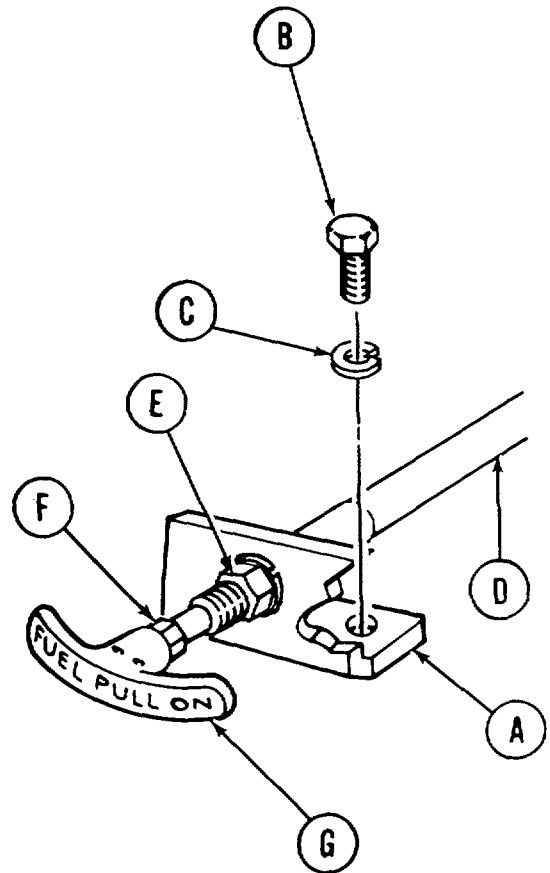
1. Inspect all threaded parts for thread damage.
2. Repair or replace if defective.

End of Task

TA148277

**FUEL SHUTOFF HANDLE AND CABLE BRACKET REPLACEMENT (Sheet 3 of 3)****INSTALLATION:**

1. Using 7/16 inch socket, install bracket (A) with two screws (B) and new lockwashers (C) on mounting plate.
2. Install new cable (D).
3. Install cable (D) through bracket (A).
4. Using two 3/4 inch wrenches, install nut and new lockwasher (E) onto cable (D).
5. Using pliers to hold cable (D), use 7/16 inch wrench to install jamnut (F) on cable (D).
6. Using hands, install handle (G) on cable (D) by turning clockwise.
7. Using 7/16 inch wrench, tighten jamnut (F) to handle (G).



End of Task

TA148278

**FUEL TANK (LEFT) ENGINE OUTLET TUBE ASSEMBLY REPLACEMENT (Sheet 1 of 4)**

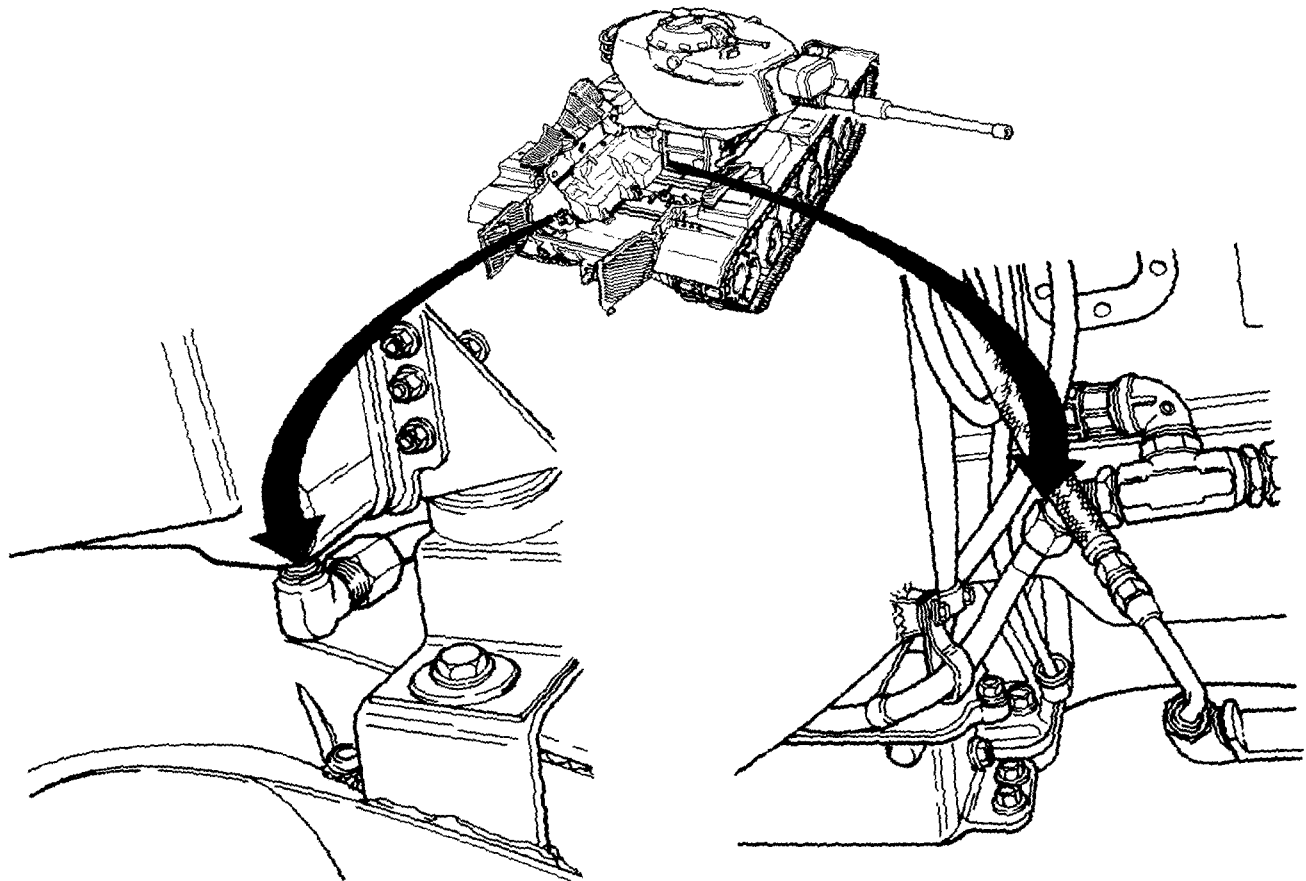
**TOOLS:** Ratchet with 1/2 in. drive  
 7/16 in. socket with 1/2 in. drive  
 1-1/8 in. open end wrench (2 required)  
 7/8 in. combination box and open end wrench (2 required)  
 1 in. open end wrench  
 1-1/4 in. open end wrench

**SPECIAL TOOLS:** Ground hop kit (Item 32, Chapter 3, Section I)

**SUPPLIES:** Sealing compound (Item 24, Appendix D)  
 Lockwasher (MS35338-44)  
 Rags (Item 65, Appendix D)

**REFERENCE:** TM 9-2350260-10

**PRELIMINARY PROCEDURES:** Remove powerplant (page 5-1)  
 Drain left fuel tank (page 7-153)



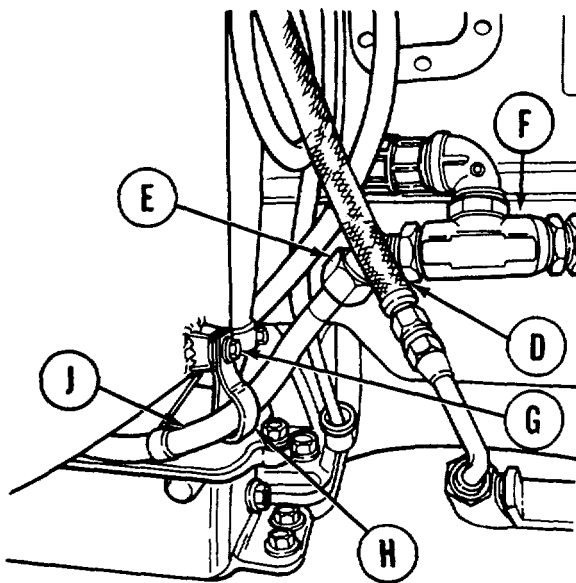
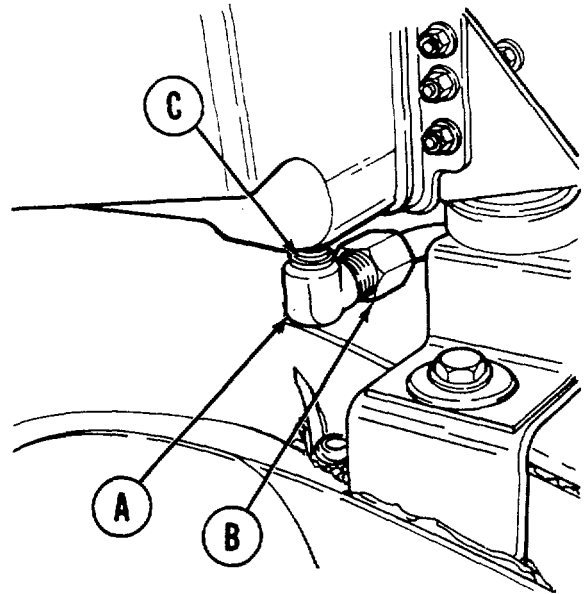
Go on to Sheet 2

TA148279

**FUEL TANK (LEFT) ENGINE OUTLET TUBE ASSEMBLY REPLACEMENT (Sheet 2 of 4)**

**REMOVAL:**

1. Place rags under elbow (A).
2. Using 1 inch wrench, remove tube nut (B) from elbow (A).
3. Using 7/8 inch wrench to hold adapter (C), use 7/8 inch wrench to remove elbow (A) from adapter (C).
4. Place rags under elbow (D).
5. Using 1 inch wrench, remove tube nut (E) from elbow (D).



6. Using 1-1/4 inch wrench on check valve (F) and 7/8 inch wrench on elbow (D), remove elbow (D) from check valve (F).
7. Using socket, remove screw and lockwasher (G) holding clamp (H). Throw lockwasher away.
8. Remove clamp (H) from tube (J) for use with new tube.

9. Remove elbow (A), elbow (D), and tube (J) from tank.

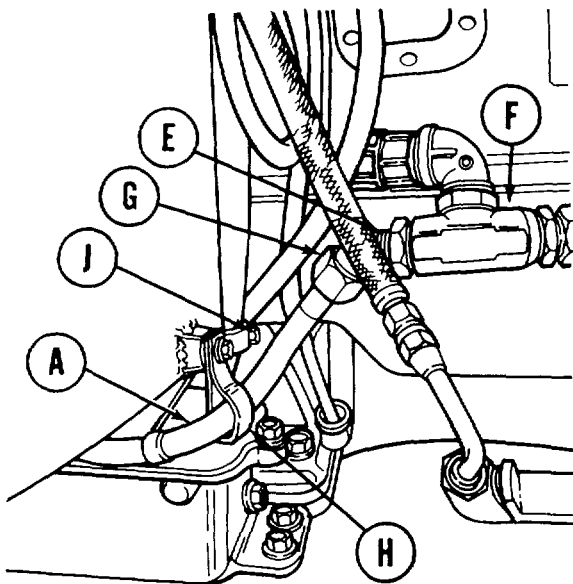
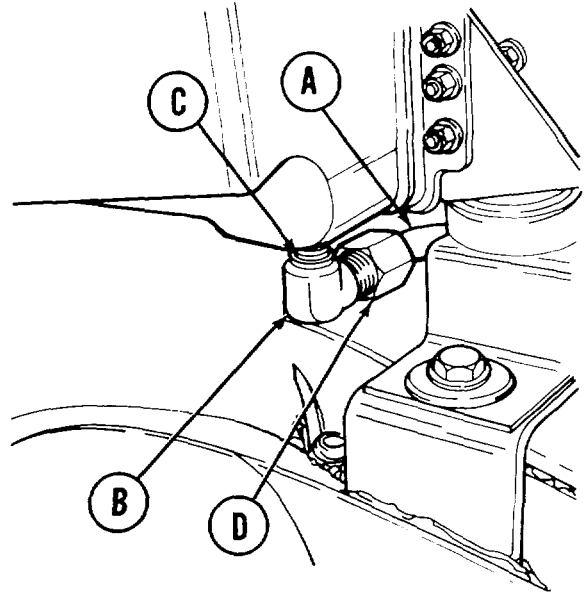
## FUEL TANK (LEFT) ENGINE OUTLET TUBE ASSEMBLY REPLACEMENT (Sheet 3 of 4)

## INSTALLATION:

## NOTE

Apply a light coating of sealing compound (Item 24, Appendix D), to outer threads of fuel line fittings before installing.

1. Position tube (A) into tank.
2. Using 7/8 inch wrench, install elbow (B) into adapter (C).
3. Using 1 inch wrench, install tube nut (D) onto elbow (B).



4. Using 1-1/4 inch wrench on check valve (F), and 7/8 inch wrench on elbow (E), install elbow (E) into check valve (F).
5. Using 1 inch wrench, install tube nut (G) onto elbow (E).
6. Place clamp (H) onto tube (A).

7. Using socket, install screw and new lockwasher (J) to hold clamp (H).
8. Transfer some fuel from right fuel tank to left fuel tank (TM 9-2350-260-10).

Go on to Sheet 4

TA148281

**FUEL TANK (LEFT) ENGINE OUTLET TUBE ASSEMBLY REPLACEMENT (Sheet 4 of 4)**

9. Connect engine for powerplant ground hop (page 5-54).
10. Start and run engine (TM 9-2350-260-10).

**NOTE**

**If any replaced fitting leaks while engine is running, shut down engine and tighten or reinstall fitting.**

11. Check replaced fitting for leaks (page 5-65).
12. Shut down engine (TM 9-2350-260-10).
13. Disconnect engine from powerplant ground hop (page 5-67).
14. Remove rags from engine compartment.
15. Install 2A powerplant (page 5-14) or 2D powerplant (page 5-40).

End of Task



**FUEL SHUTOFF VALVE HOSE ASSEMBLY REPLACEMENT (Sheet 1 of 5)**

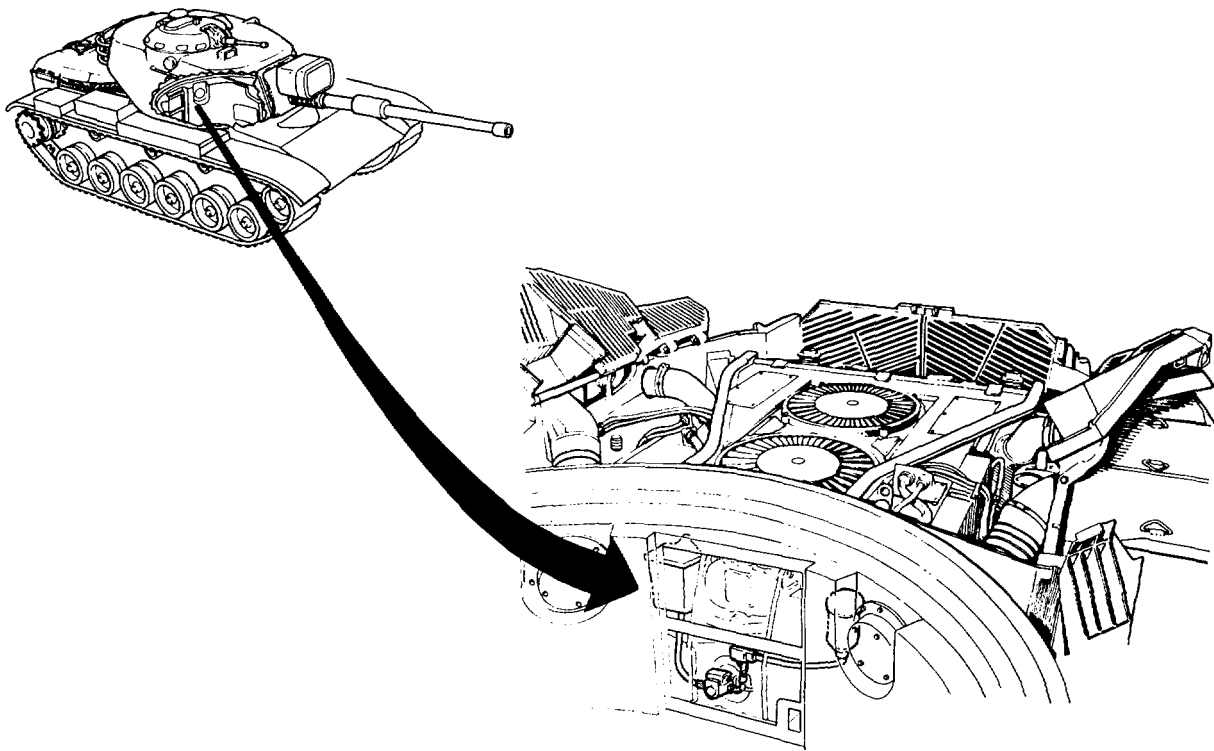
PROCEDURE INDEX

PROCEDURE	PAGE
Removal	7-209
Installation	7-211

TOOLS: 1-1/4 in. open end wrench  
 Ratchet with 1/2 in. drive  
 7/16 in. socket with 1/2 in. drive  
 10 in. adjustable wrench

SUPPLIES: Rags (Item 65, Appendix D)  
 Lockwasher (MS35338-44) (2 required)

PRELIMINARY PROCEDURE: Remove powerplant (page 5-1)

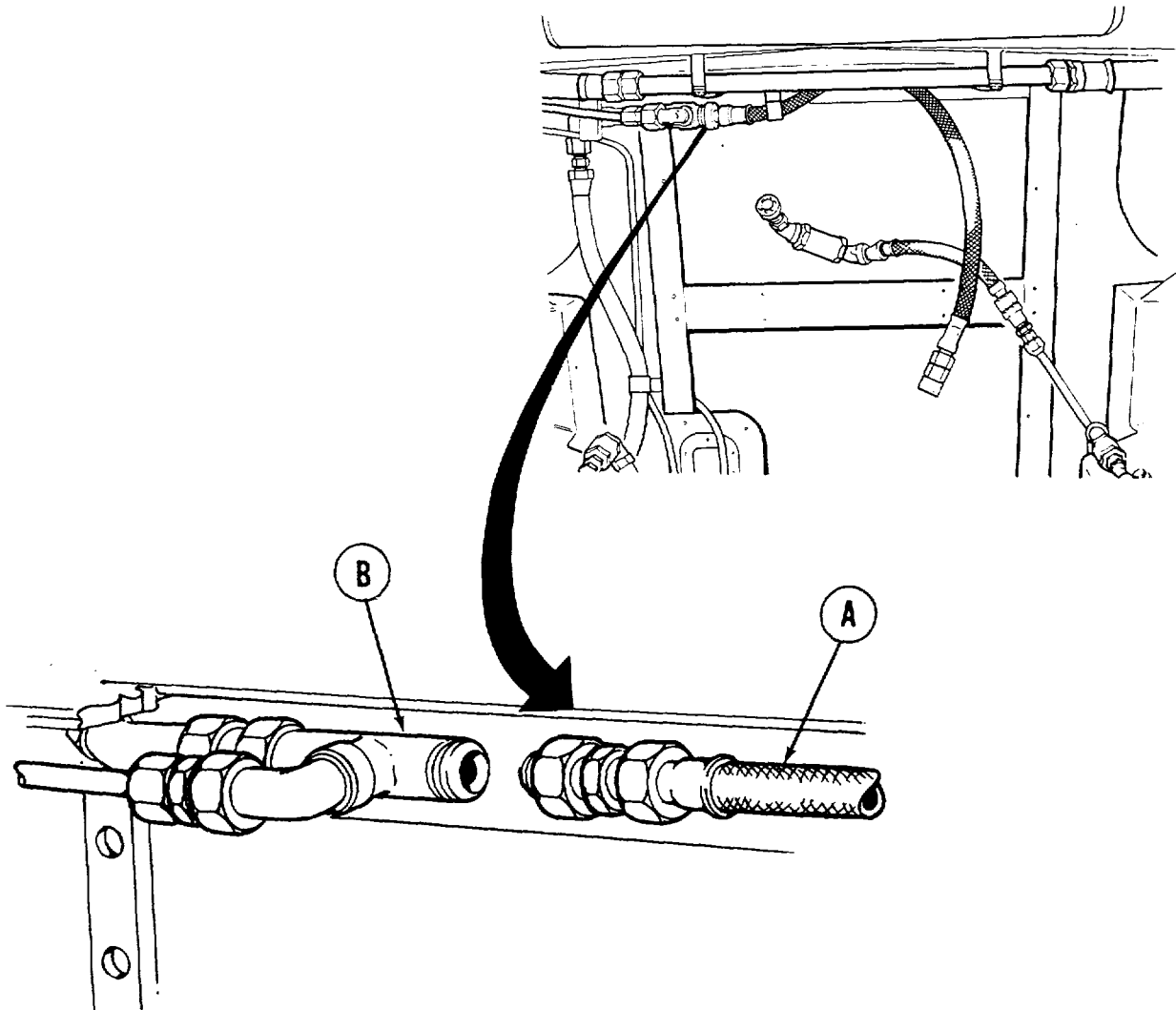


Go on to Sheet 2

TA148283

**FUEL SHUTOFF VALVE HOSE ASSEMBLY REPLACEMENT (Sheet 2 of 5)****REMOVAL:**

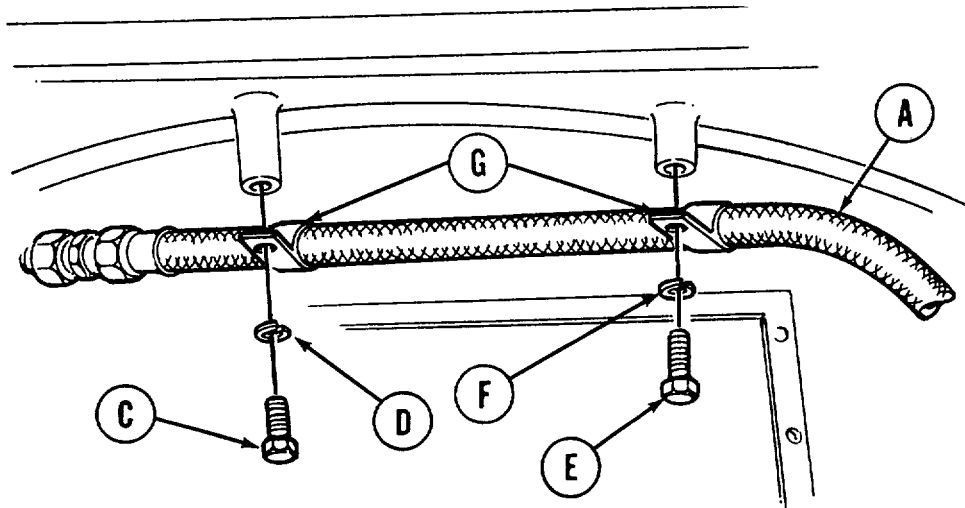
1. Using 1-1/4 inch wrench and 10 inch adjustable wrench, disconnect hose assembly (A) from tee (B).



Go on to Sheet 3

TA148284

## FUEL SHUTOFF VALVE HOSE ASSEMBLY REPLACEMENT (Sheet 3 of 5)



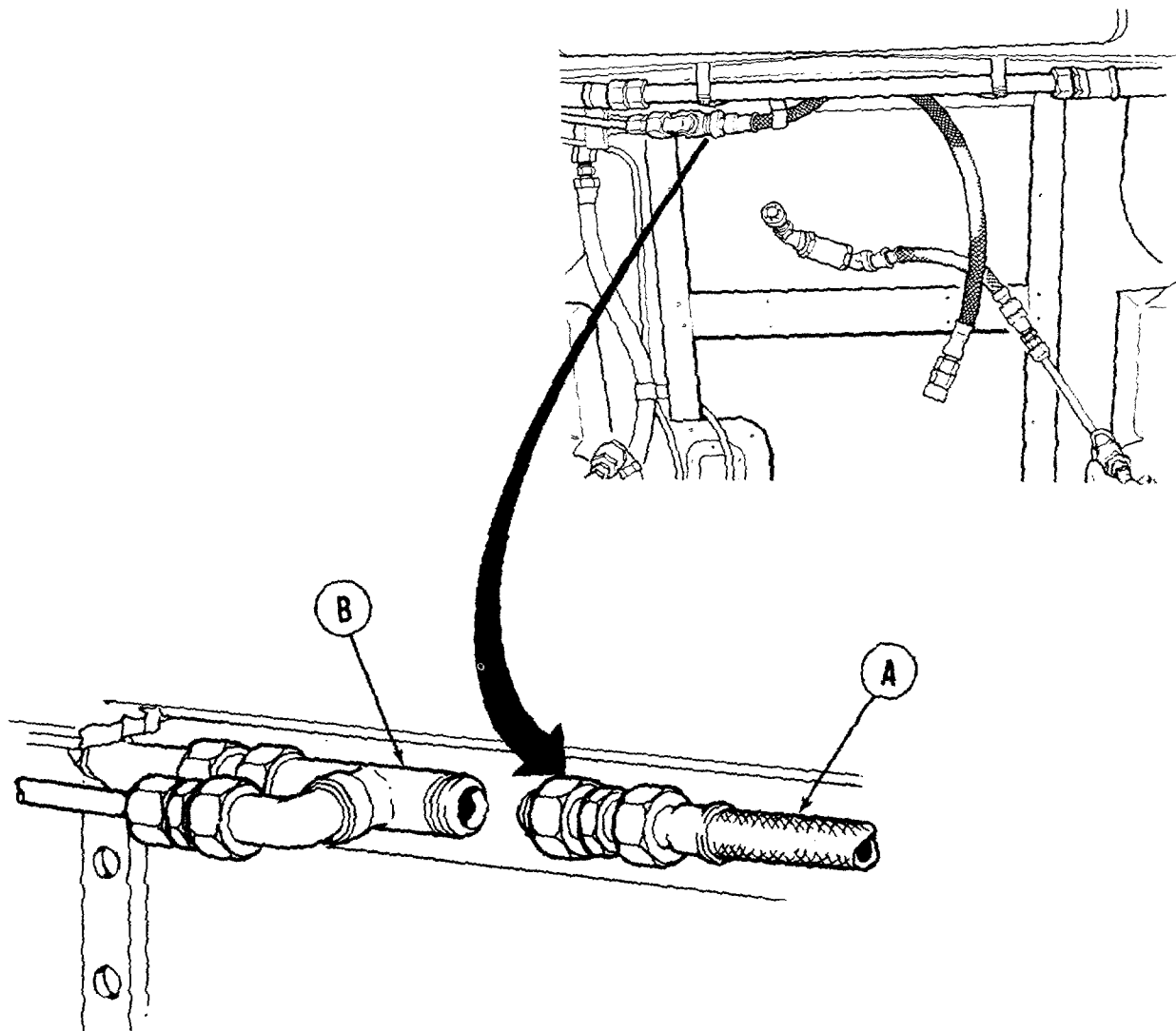
2. Using socket, remove screw (C) and lockwasher (D). Throw lockwasher away.
3. Using socket, remove screw (E) and lockwasher (F).
4. Remove hose assembly (A) with clamps (G).
5. Remove clamps (G) from hose assembly.
6. Remove hose assembly (A) from tank.

Go on to Sheet 4

TA148285

**FUEL SHUTOFF VALVE HOSE ASSEMBLY REPLACEMENT (Sheet 4 of 5)****INSTALLATION:**

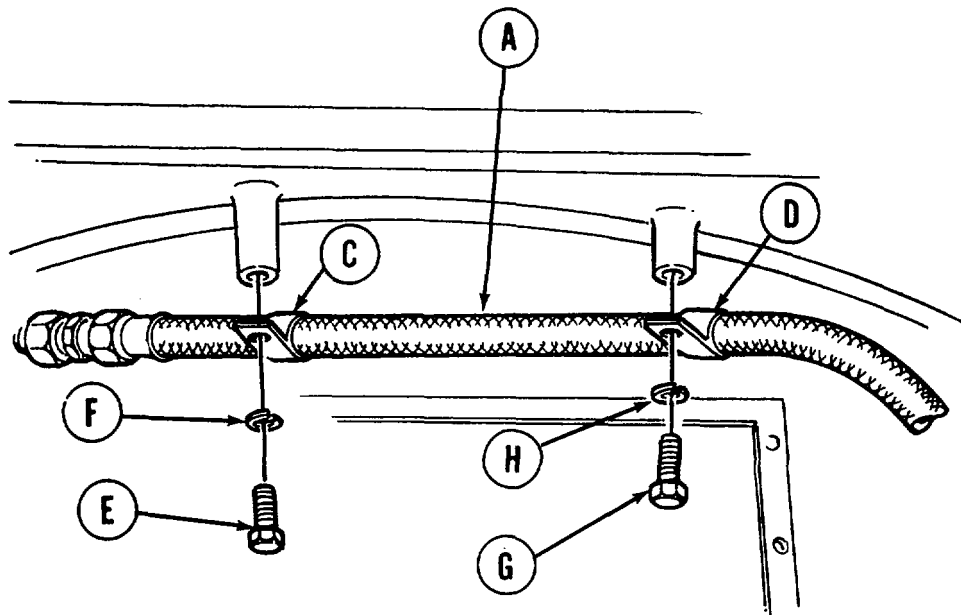
1. Position hose assembly (A) into tank.
2. Using 1-1/4 inch wrench and 10 inch adjustable wrench, secure hose assembly (A) onto tee (B).



Go on to Sheet 5

TA148286

## FUEL SHUTOFF VALVE HOSE ASSEMBLY REPLACEMENT (Sheet 5 of 5)



2. Install clamps (C) and (D) on hose assembly (A).
3. Using socket, install screw (E) and new lockwasher (F) to secure clamp (C).
4. Using socket install screw (G) and new lockwasher (H) to secure clamp (D).
5. Install 2A powerplant (page 5-14) or 2D powerplant (page 5-40).

End of Task

TA148287

**FUEL PRIMER INLET LINE TO QUICK-DISCONNECT HOSE ASSEMBLY REPLACEMENT (Sheet 1 of 2)**

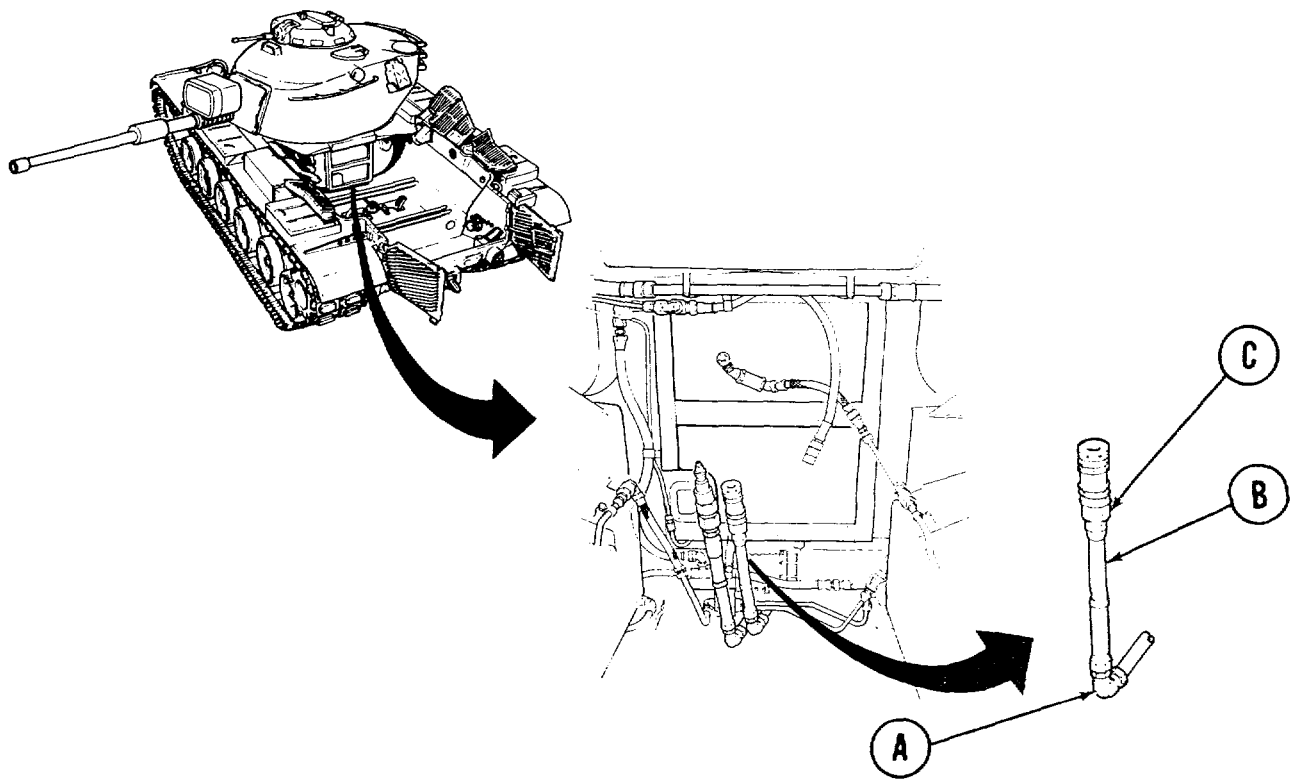
**TOOLS:** 9/16 in. combination box and open end wrench  
 3/4 in. combination box and open end wrench  
 10 in. adjustable wrench

**SUPPLIES:** Lint-free cloth (Item 12, Appendix D)  
 Dry cleaning solvent (Item 54, Appendix D)  
 Sealing compound (Item 27, Appendix D)

**PRELIMINARY PROCEDURE:** Remove powerplant (page 5-1)

**REMOVAL:**

1. Clean fittings with lint-free cloth (Item 12, Appendix D) moistened with dry cleaning solvent (Item 54, Appendix D).
2. Using adjustable wrench, hold elbow (A) to keep from turning.
3. Using 9/16 inch wrench, remove hose assembly (B) from elbow (A).
4. Using 9/16 inch wrench and 3/4 inch wrench, remove quick-disconnect (C) from hose assembly (B).



Go on to Sheet 2

TA148288

**FUEL PRIMER INLET LINE TO QUICK-DISCONNECT HOSE ASSEMBLY REPLACEMENT (Sheet 2 of 2)****CLEANING AND INSPECTION:**

1. Clean fittings and replacement parts with dry cleaning solvent (Item 54, Appendix D).
2. Inspect threaded fittings for nicks, burrs, or other defects which could cause leakage. Replace any damaged parts.

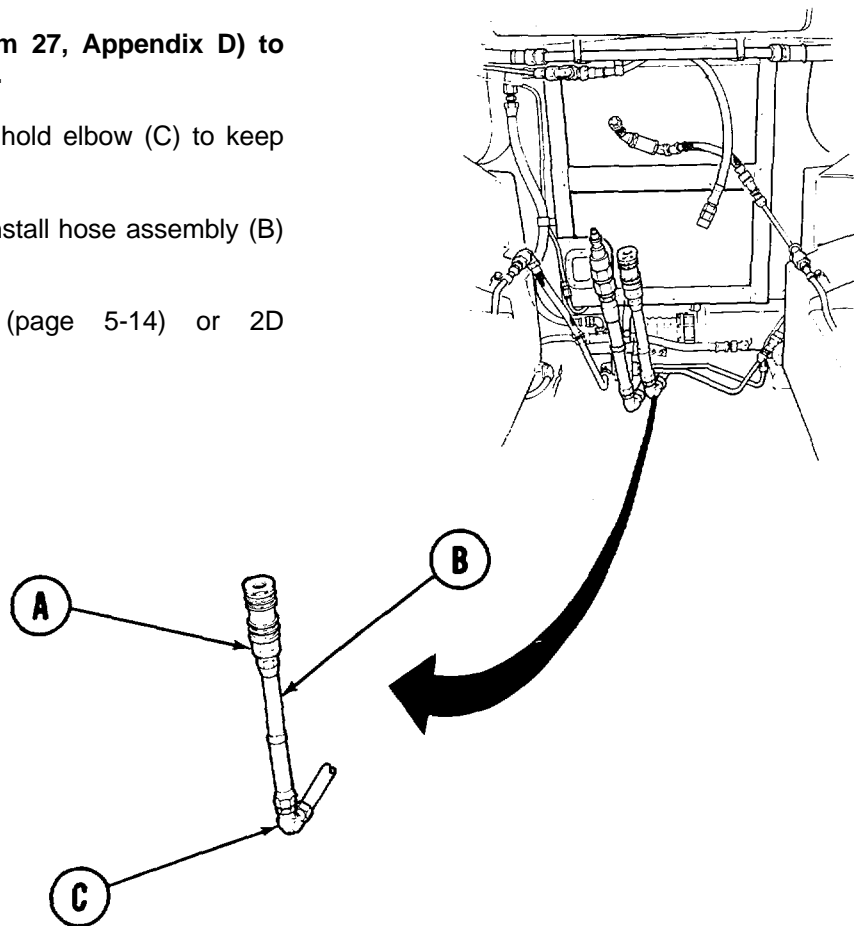
**INSTALLATION:**

1. Using 9/16 inch wrench and 3/4 inch wrench, install quick-disconnect (A) on hose assembly (B).

**NOTE**

**Apply sealing compound (Item 27, Appendix D) to threads before installing parts.**

2. Using adjustable wrench, hold elbow (C) to keep from turning.
3. Using 9/16 inch wrench, install hose assembly (B) to elbow (C).
4. Install 2A powerplant (page 5-14) or 2D powerplant (page 5-40).



End of Task

TA148289

**INTER-TANK SWING CHECK VALVE REPLACEMENT (Sheet 1 of 5)**

PROCEDURE INDEX

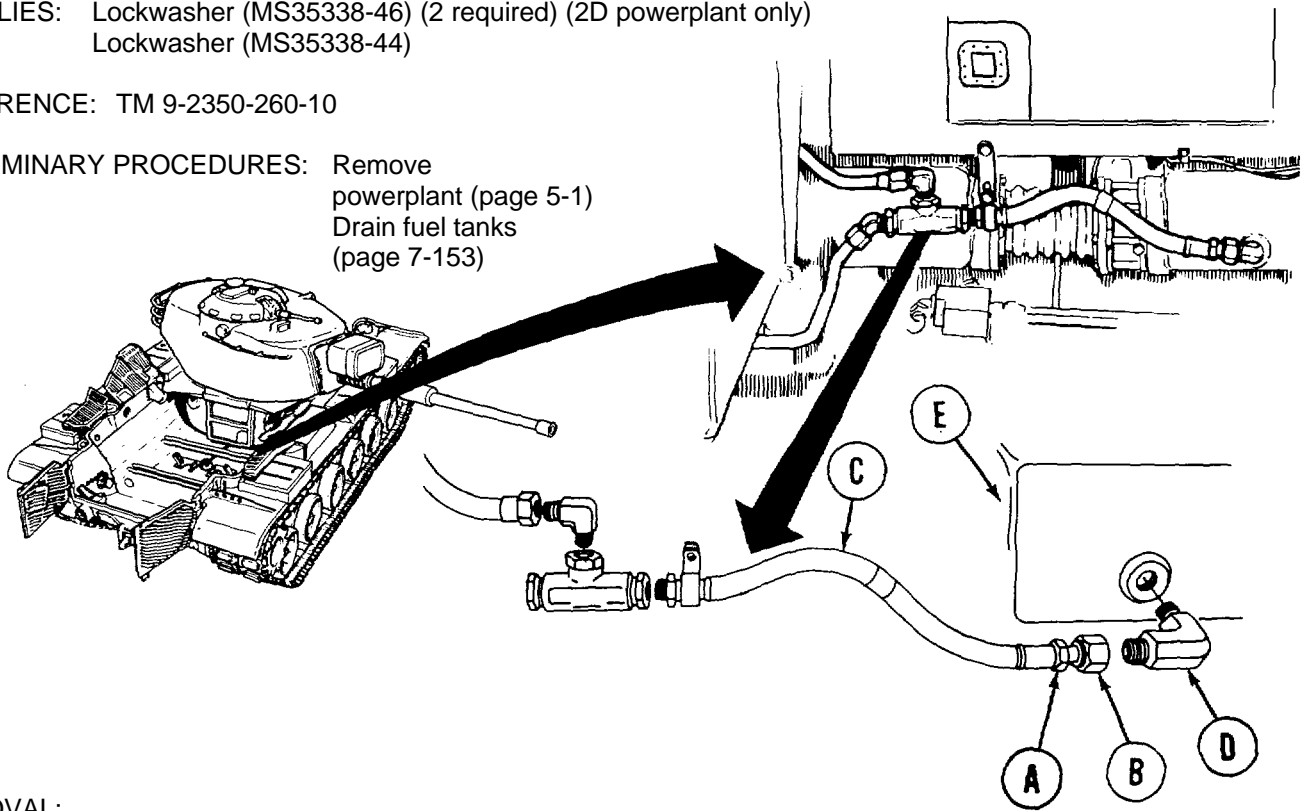
PROCEDURE	PAGE
Removal	7-215
Inspection	7-217
Installation	7-217

**TOOLS:** Automotive wrench  
 1-1/8 in. open end wrench  
 9/16 in. socket with 1/2 in. drive  
 Ratchet with 1/2 in. drive  
 1-1/4 in. open end wrench  
 Vise  
 7/16 in. socket with 1/2 in. drive  
 7/8 in. combination box and open end wrench  
 9/16 in. combination box and open end wrench  
 1 in. combination box and open end wrench

**SUPPLIES:** Lockwasher (MS35338-46) (2 required) (2D powerplant only)  
 Lockwasher (MS35338-44)

**REFERENCE:** TM 9-2350-260-10

**PRELIMINARY PROCEDURES:** Remove powerplant (page 5-1)  
 Drain fuel tanks (page 7-153)



**REMOVAL:**

1. Using 7/8 inch wrench to hold connector (A), use 1-1/8 inch wrench on connector (B) and remove hose (C) from elbow (D).
2. Using automotive wrench, remove elbow (D) from right fuel tank (E).

Go on to Sheet 2

TA148290



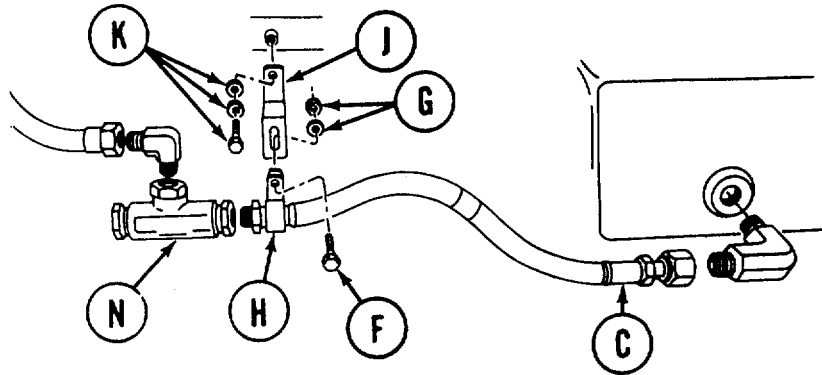
**INTER-TANK SWING CHECK VALVE REPLACEMENT (Sheet 2 of 5)**

**NOTE**

**If your tank has 2A powerplant. skip steps 3 thru 6 and go on to step 7.**

3. Using 9/16 inch socket and 9/16 inch wrench, remove screw (F) and nut and lockwasher (G) holding clamp (H) to bracket (J). Throw lockwasher away.

4. Remove clamp (H) from hose (C).



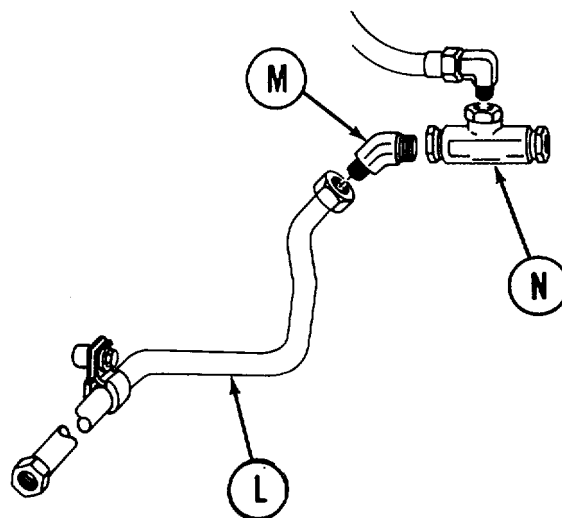
5. Using 9/16 inch socket, remove screw, lockwasher, and washer (K) holding bracket (J) to hull. Throw lockwasher away.

6. Remove bracket (J).

7. Using 1 inch wrench on fuel hose (L) and 7/8 inch wrench on elbow (M), loosen fuel line (L) from elbow (M).

8. Using 7/8 inch wrench on fuel hose (C) coupling nut and 1-1/4 inch wrench on check valve (N), remove fuel hose (C).

9. Using 1-1/4 inch wrench on check valve (N) and 7/8 inch wrench on elbow (M), remove elbow (M). Use vise if necessary.

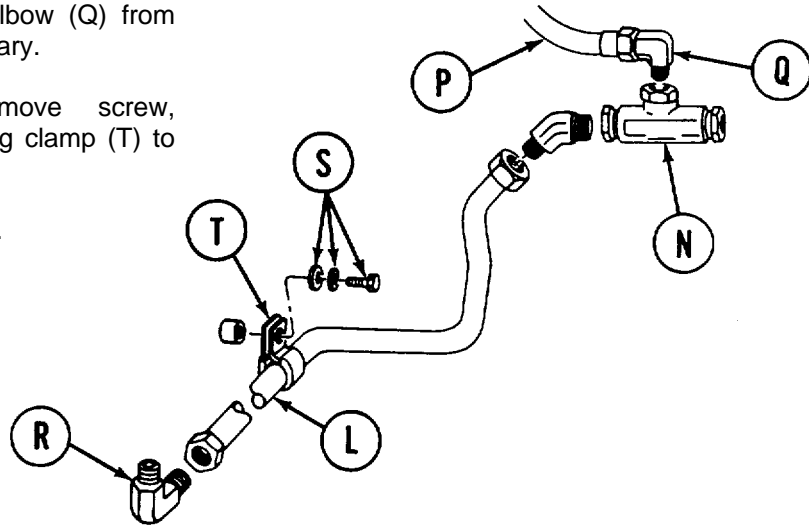


Go on to Sheet 3

TA148291

**INTER-TANK SWING CHECK VALVE REPLACEMENT (Sheet 3 of 5)**

10. Using 1 inch wrench on fuel line (P) and 7/8 inch wrench on elbow (Q), loosen fuel line (P) from elbow (Q).
11. Using 7/8 inch wrench, remove elbow (Q) from check valve (N). Use vise if necessary.
12. Using 7/16 inch socket, remove screw, lockwasher, and washer (S) holding clamp (T) to fuel tank. Throw lockwasher away.
13. Remove clamp (T) from fuel line (L).



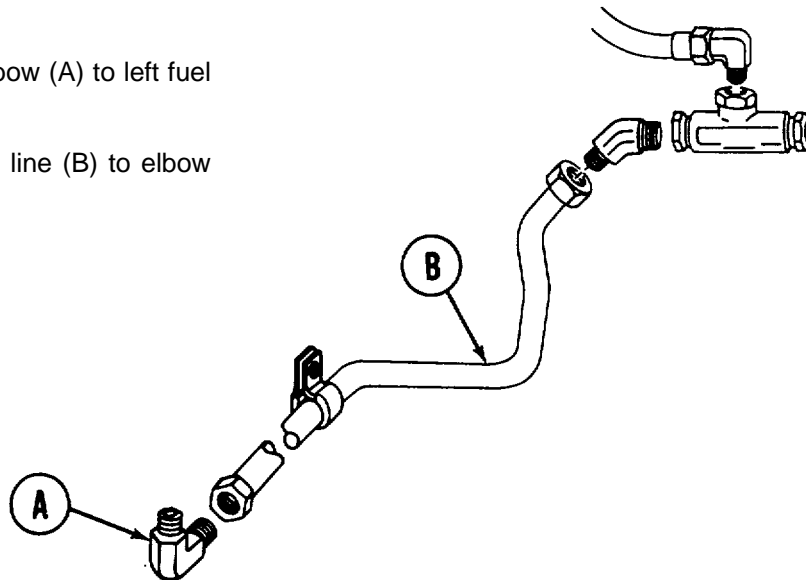
14. Using 1 inch wrench on fuel line (L) and 7/8 inch wrench on elbow (R), loosen fuel line (L) from elbow (R) (located behind left fuel tank rear mount).
15. Using 7/8 inch wrench, remove elbow (R) from left fuel tank.
16. Remove fuel line (L).

**INSPECTION:**

Inspect threaded parts for bad threads. Check tubing for cracks or bends. Replace defective parts.

**INSTALLATION:**

1. Using 7/8 inch wrench, install elbow (A) to left fuel tank.
2. Using 1 inch wrench, install fuel line (B) to elbow (A).

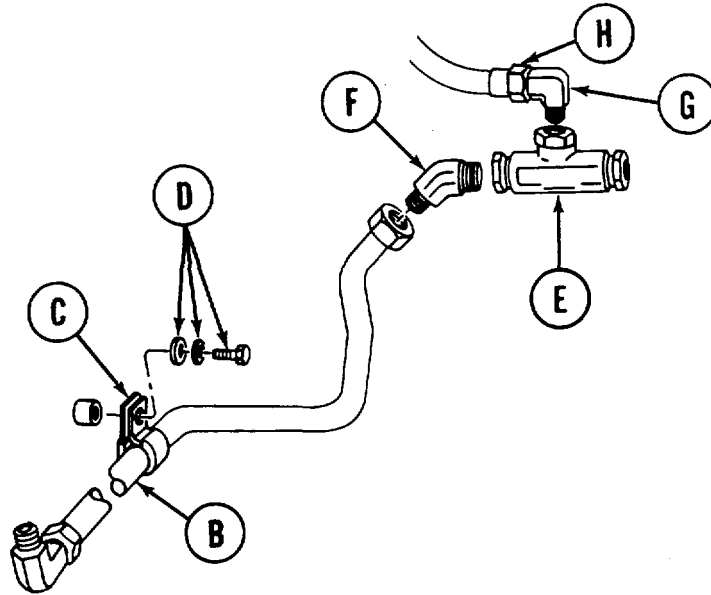


Go on to Sheet 4

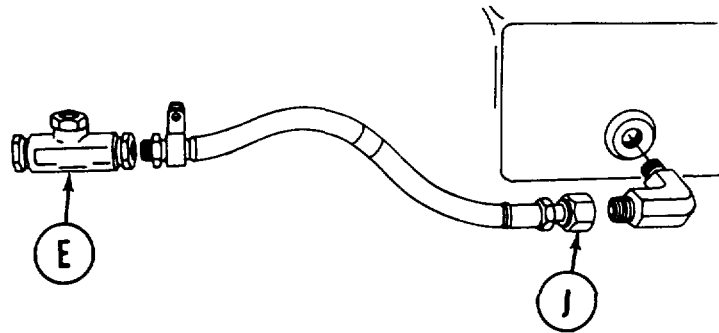
TA148292

**INTER-TANK SWING CHECK VALVE REPLACEMENT (Sheet 4 of 5)**

3. Install clamp (C) to fuel line (B).
4. Using 7/16 inch socket, install screw, new lockwasher, and washer (D) to secure clamp (C) to hull.



5. Using 1-1/4 inch wrench on check valve (E) and 7/8 inch wrench on elbow (F), install elbow (F) to check valve (E).
6. Using 1-1/4 inch wrench on check valve (E) and 7/8 inch wrench on elbow (G), install elbow (G) on check valve (E).
7. Using 7/8 inch wrench on elbow (F) and 1 inch wrench on fuel line (B) install fuel line (B) to elbow (F).
8. Using 7/8 inch wrench on elbow (G) and 1 inch wrench on fuel line (H), install fuel line (H) to elbow (G).
9. Using 1-1/4 inch wrench on check valve (E) and 7/8 inch wrench on fuel line (J), install fuel line (J) to check valve (E).

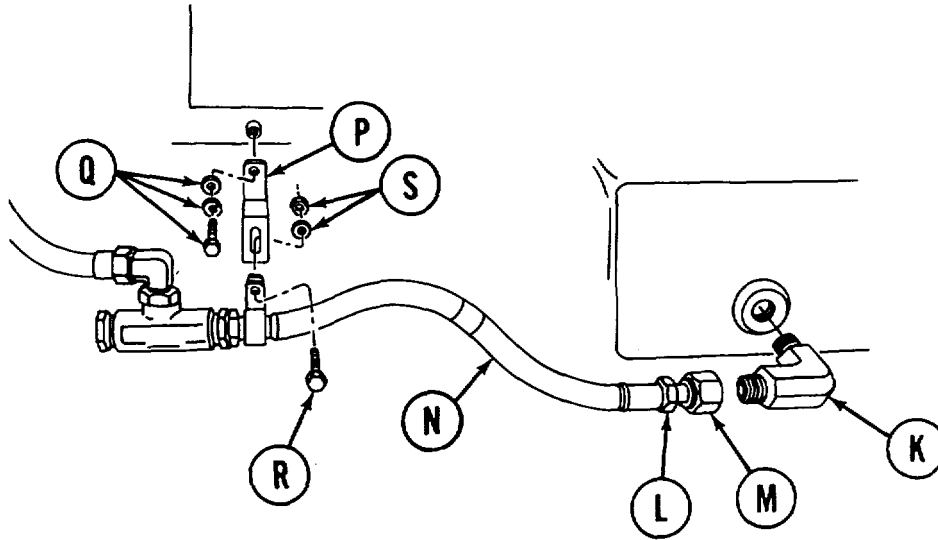


Go on to Sheet 5

TA148293

**INTER-TANK SWING CHECK VALVE REPLACEMENT (Sheet 5 of 5)**

10. Using 7/8 inch wrench, install elbow (K) to right fuel tank.
11. Using 7/8 inch wrench to hold connector (L) and 1-1/8 inch wrench on connector (M), install fuel line (N) to elbow (K).

**NOTE**

**If your tank has 2A powerplant skip steps 13 thru 15 and go on to step 16.**

12. Using 9/16 inch socket, install bracket (P) to hull using screw, new lockwasher, and washer (Q).
13. Install clamp (T) to hose (N).
14. Using 9/16 inch socket on screw (R) and 9/16 inch wrench on nut (S), install screw (R) and new lockwasher and nut (S) through clamp (T) and bracket (P).
15. Tighten screw (R) and nut and lockwasher (S).
16. Install 2A powerplant (page 5-14) or 2D powerplant (page 5-40).
17. Fill fuel tanks.

**ENGINE FUEL RETURN TUBE REPLACEMENT (Sheet 1 of 4)**

PROCEDURE INDEX

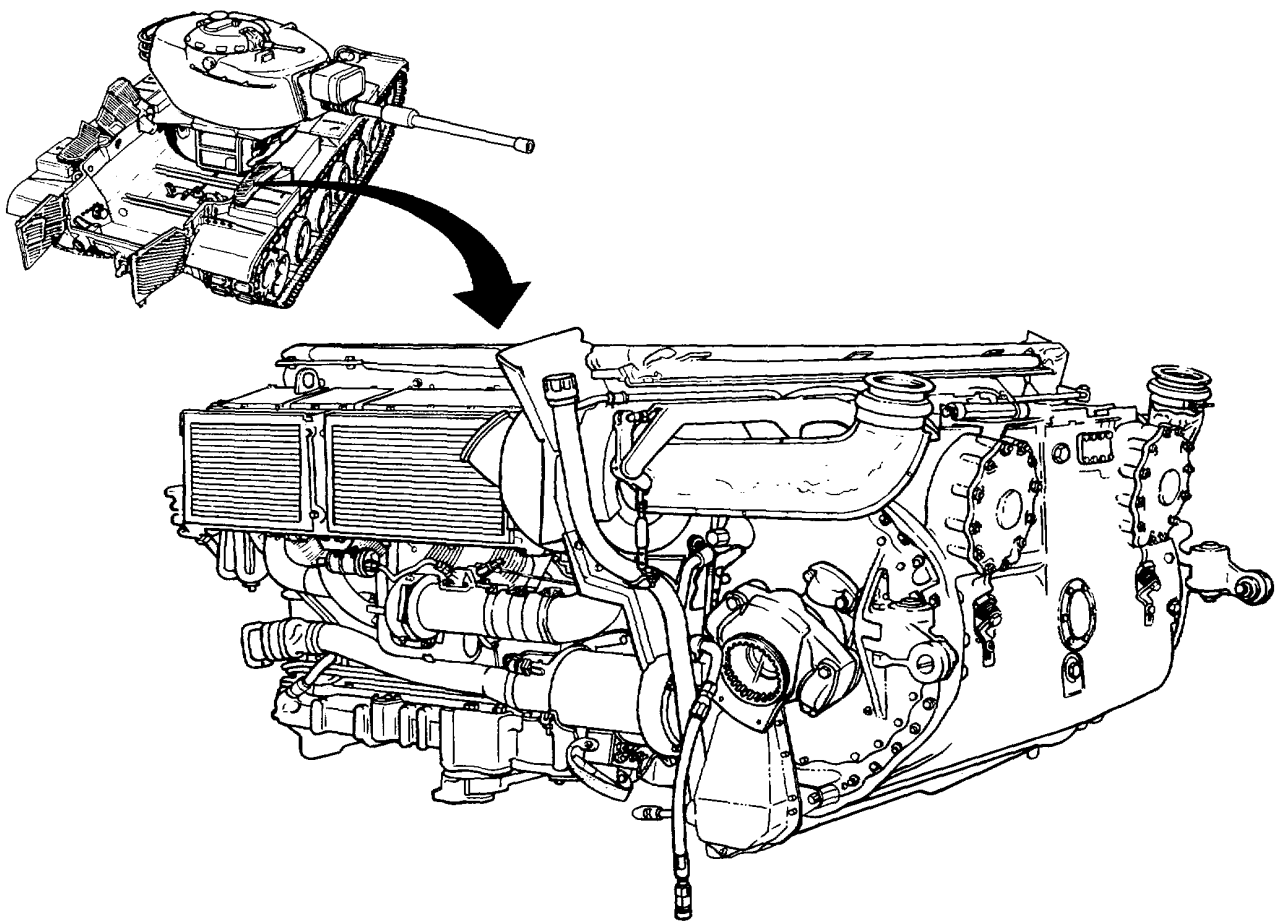
PROCEDURE	PAGE
Removal	7-221
Installation	7-222

TOOLS: 1-1/8 in. open end wrench  
 7/16 in. combination box and open end wrench  
 Ratchet with 1/2 in. drive  
 1/2 in. socket with 1/2 in. drive

SPECIAL TOOLS: Ground hop kit (Item 32, Chapter 3, Section I)

SUPPLIES: Lockwasher (MS35338-45) (2 required)

PRELIMINARY PROCEDURE: Remove powerplant (page 5-1)  
 Remove engine shroud (page 9-2)  
 Remove engine fuel return hose (page 7-226)



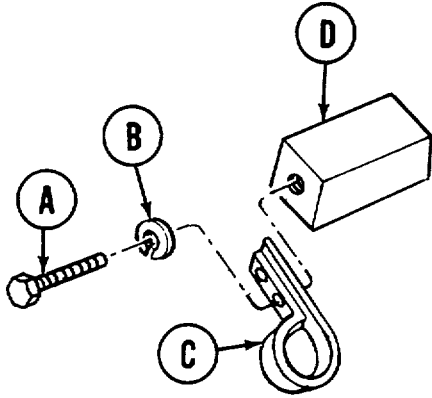
Go on to Sheet 2

TA148295

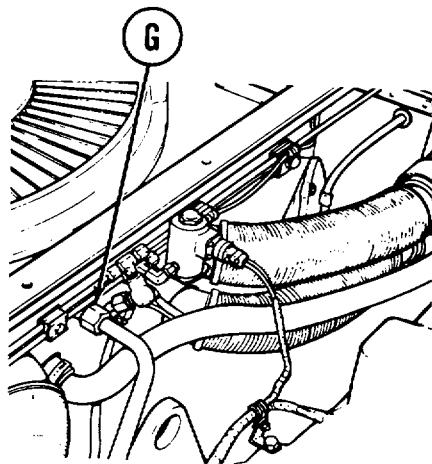
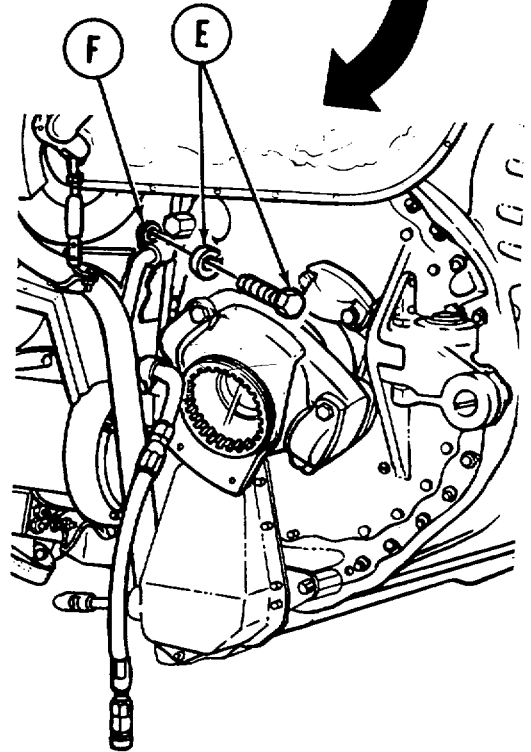
**ENGINE FUEL RETURN TUBE REPLACEMENT (Sheet 2 of 4)**

**REMOVAL:**

1. Using 7/16 inch socket, remove screw (A), lockwasher (B), clamp (C), and block (D), securing tube assembly to transmission block. Throw lockwasher away.

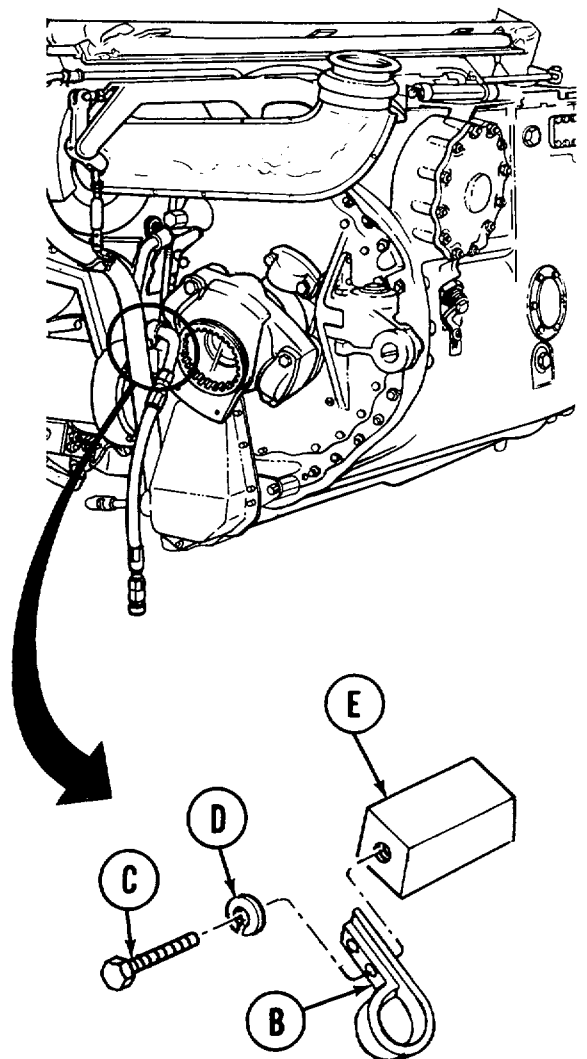
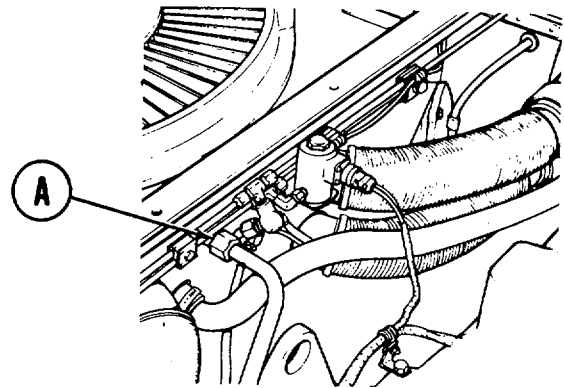


2. Using 1/2 inch socket, remove screw and lockwasher (E) securing clamp (F). Throw lockwasher away.
3. Remove clamp (F).
4. Using 1-1/8 inch wrench, disconnect nut (G) securing tube assembly to engine.



**ENGINE FUEL RETURN TUBE REPLACEMENT (Sheet 3 of 4)****INSTALLATION:**

1. Place engine fuel return tube assembly (A) between engine and transmission and above flywheel housing.
2. Use fingers to install tube assembly (A) to engine fuel return line.
3. Use 1-1/8 inch wrench to secure tube assembly (A) to engine fuel return line.
4. Place clamp (B) around fuel return tube assembly (A).
5. Aline screw (C), new lockwasher (D), clamp (B), and block (E), then install on the transmission block and using 7/16 inch wrench, tighten securely.

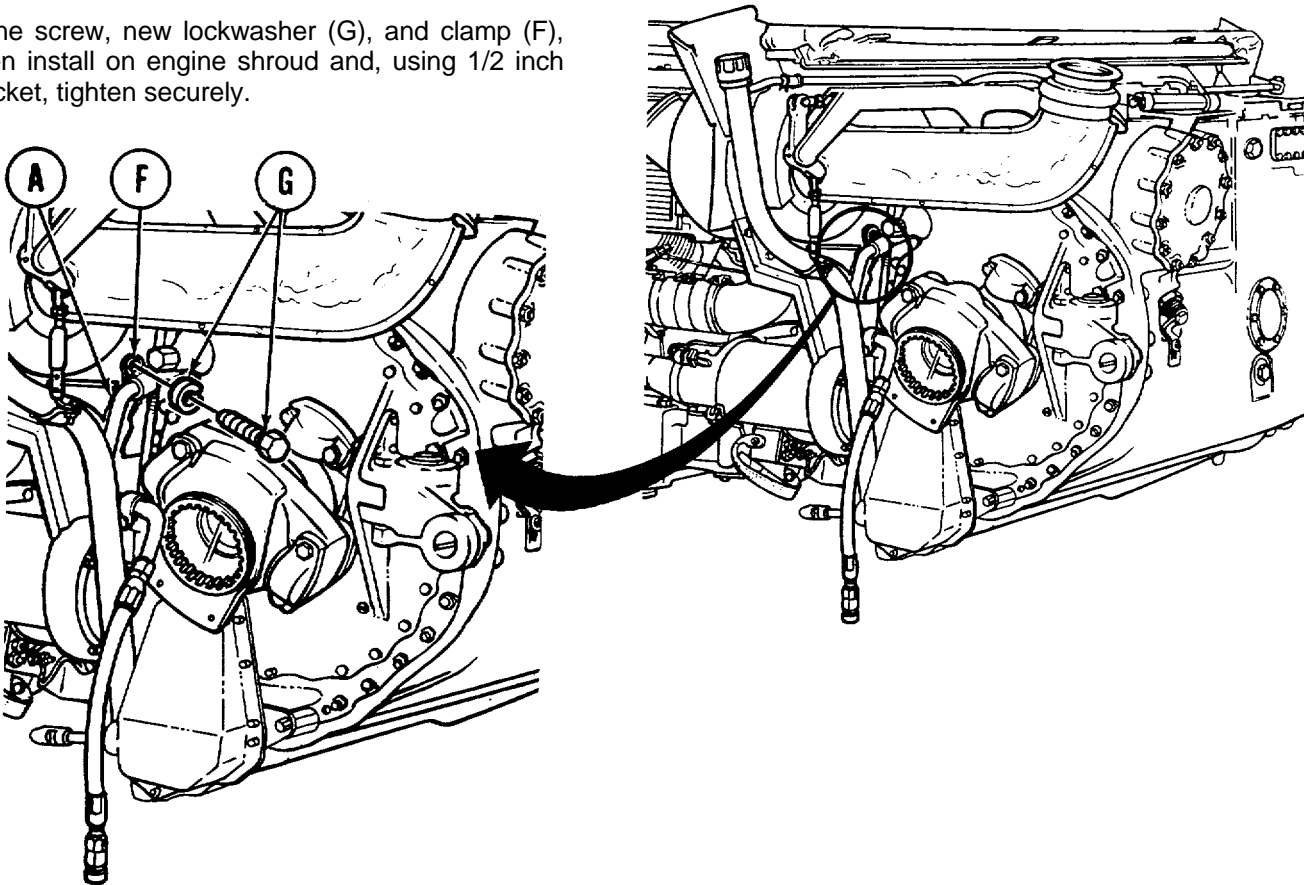


Go on to Sheet 4

TA148297

**ENGINE FUEL RETURN TUBE REPLACEMENT (Sheet 4 of 4)**

6. Place clamp (F) around fuel return tube assembly (A).
7. Align screw, new lockwasher (G), and clamp (F), then install on engine shroud and, using 1/2 inch socket, tighten securely.



8. Attach ground hop kit (page 5-54).
9. Start engine and allow it to run briefly while checking for leaks (engine fuel leak test, page 5-65).
10. Disconnect ground hop kit (page 5-67).
11. Install engine shroud (page 9-3).
12. Install engine fuel return hose (page 7-226).
13. Install 2A powerplant (page 5-14) or 2D powerplant (page 5-40).

End of Task

TA148298



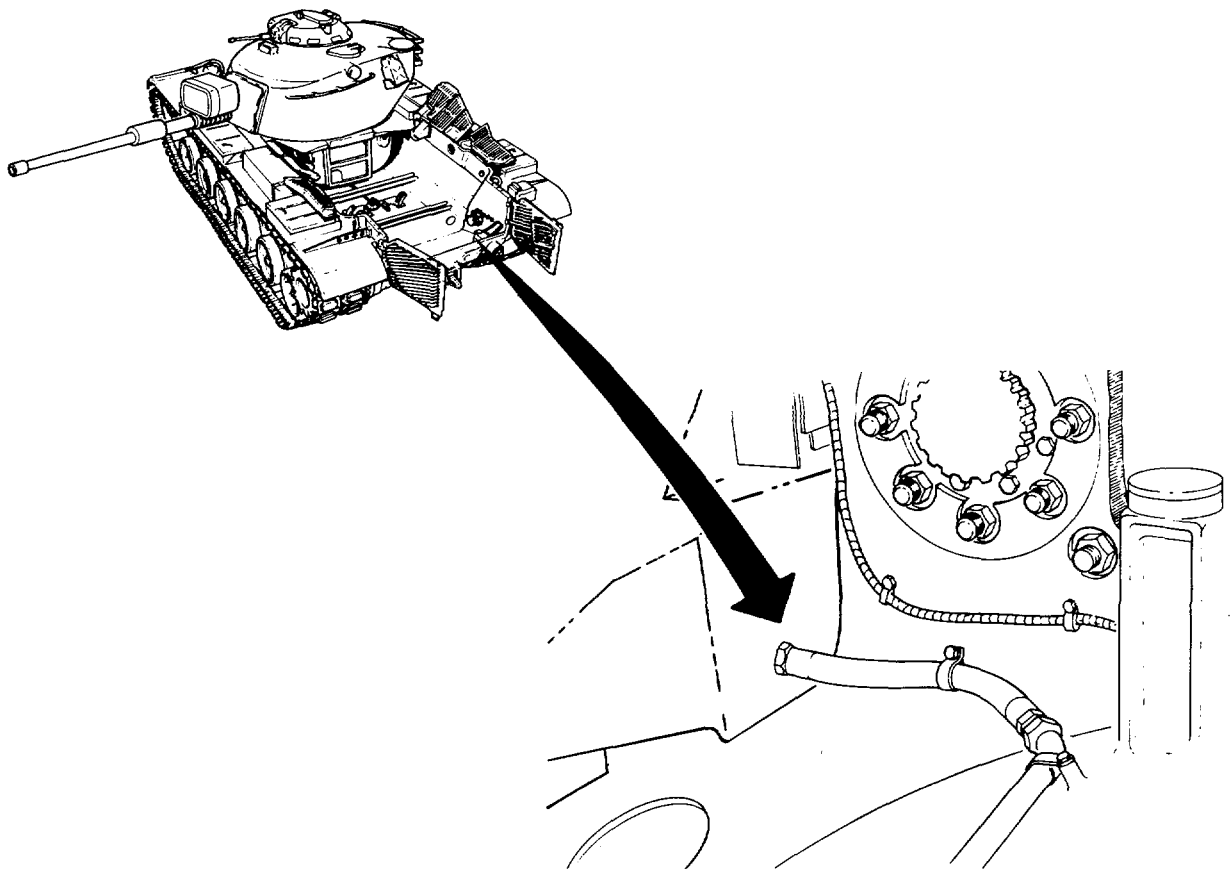
**FUEL RETURN HOSE (RIGHT FUEL TANK) REPLACEMENT (Sheet 1 of 2)**

**TOOLS:** 1/2 in. socket with 1/2 in. drive  
 Ratchet with 1/2 in. drive  
 1-1/2 in. open end wrench  
 1-7/16 in. open end wrench  
 Wire brush

**SPECIAL TOOLS:** Ground hop kit (Item 32, Chapter 3, Section 1)

**SUPPLIES:** Sealing compound (Item 24, Appendix D)  
 Rags (Item 65, Appendix D)  
 Lockwasher (MS35338-44)

**PRELIMINARY PROCEDURES:** Remove powerplant (page 5-1)  
 Drain fuel tanks (page 7-153)



Go on to Sheet 2

TA148299

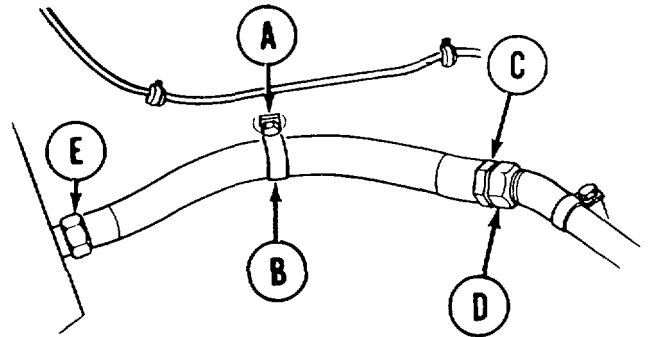
## FUEL RETURN HOSE (RIGHT FUEL TANK) REPLACEMENT (Sheet 2 of 2)

### NOTE

Put rags under each connection before removing hose end fittings.

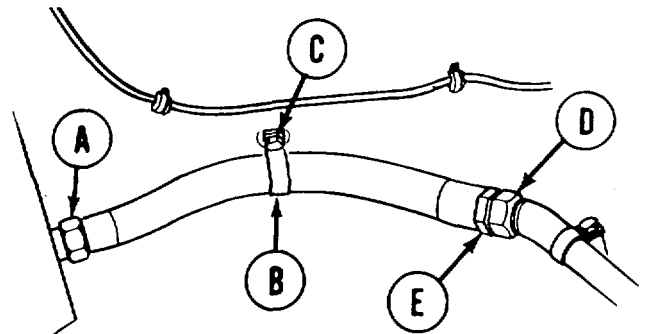
#### REMOVAL:

1. Using socket, loosen and remove screw and lockwasher (A) from hose clamp (B). Throw lockwasher away.
2. Using 1-7/16 inch wrench on hose and fitting (C), and 1-1/2 inch wrench on fitting (D), hold hose at point (C) while loosening fitting (D) away from hose and fitting (C).
3. Using 1-7/16 inch wrench, loosen fitting (with hose) (E). Remove hose.



#### INSTALLATION:

1. Lightly coat threads of both male hose ends with sealing compound (Item 24, Appendix D).
2. Using 1-7/16 inch wrench, secure fitting (with hose) (A).
3. Using socket, secure clamp (B) with screw and new lockwasher (C).
4. Using 1-7/16 inch wrench on hose and fitting and 1-1/2 inch wrench on fitting (E), hold hose at point (D) while securing fitting (E).
5. Ground hop engine (page 5-54) and allow it to run for brief time while checking for leaks (page 5-65). If leak is detected, stop engine and tighten fitting. If fittings do not leak, disconnect ground hop kit (page 5-67).
6. Install 2A powerplant (page 5-14) or 2D powerplant (page 5-40).
7. Fill fuel tanks.



End of Task

TA148300

**ENGINE FUEL RETURN HOSE REPLACEMENT (Sheet 1 of 1)**

TOOLS: 1 in. open end wrench  
1-1/8 in. open end wrench

SPECIAL TOOLS: Ground hop kit (Item 32, Chapter 3, Section I)

SUPPLIES: Rags (Item 65, Appendix D)

PRELIMINARY PROCEDURES: Remove powerplant (page 5-1)

**REMOVAL:**

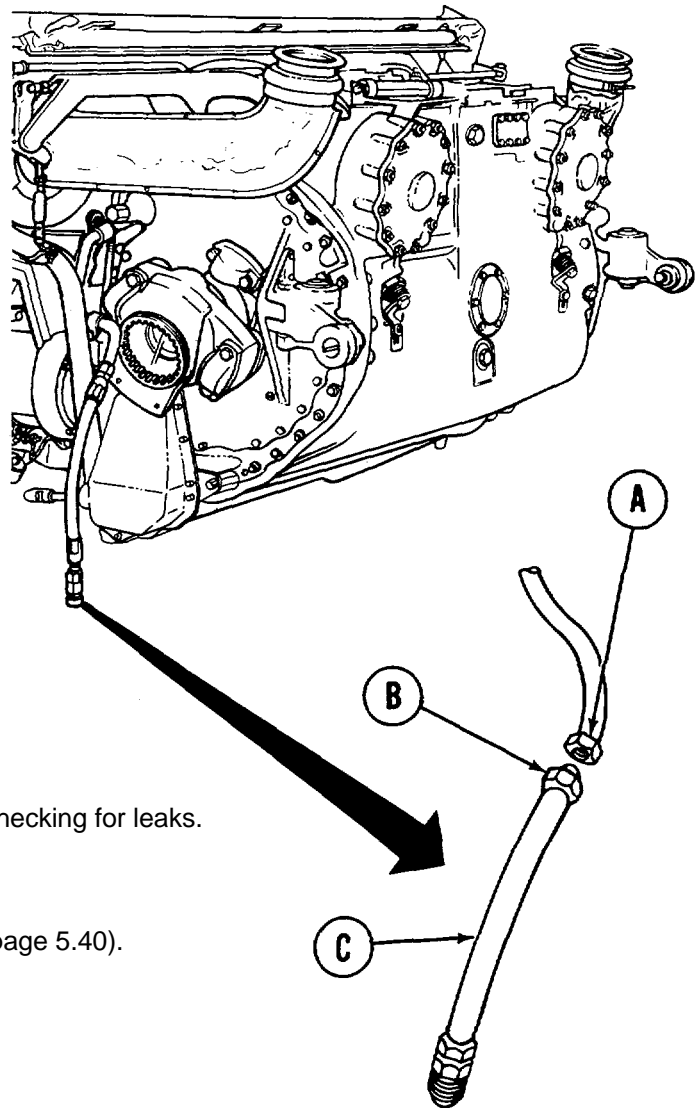
1. Using 1-1/8 inch wrench to hold fitting (A) secure.
2. Loosen fitting (B) with 1 inch wrench and remove hose assembly (C).

**INSPECTION:**

Inspect hose assembly for damage or wear. Replace if necessary.

**INSTALLATION:**

1. Hand tighten hose assembly (C) into tube assembly fitting (A).
2. Use 1-1/8 inch wrench to hold fitting (A) and use 1 inch wrench to tighten fitting (B).
3. Fill fuel tanks.
4. Attach ground hop kit (page 5-54).
5. Start engine and allow it to run for a brief time while checking for leaks.
6. Disconnect ground hop kit (page 5-67).
7. Install 2A powerplant (page 5-14) or 2D powerplant (page 5.40).



End of Task

TA148301

**FUEL RETURN TUBE ASSEMBLY (RIGHT FUEL TANK) REPLACEMENT (Sheet 1 of 3)**

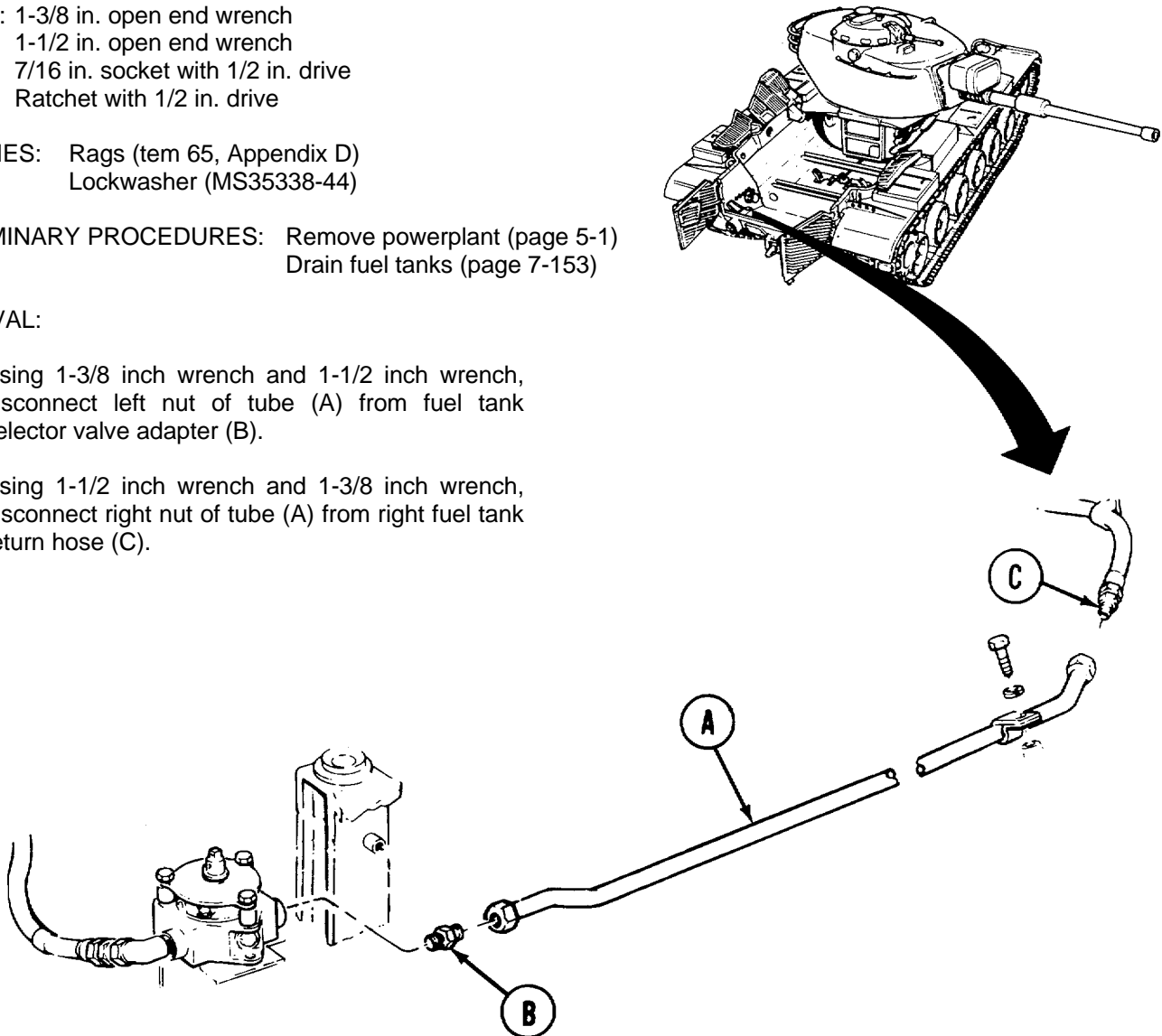
TOOLS: 1-3/8 in. open end wrench  
 1-1/2 in. open end wrench  
 7/16 in. socket with 1/2 in. drive  
 Ratchet with 1/2 in. drive

SUPPLIES: Rags (tem 65, Appendix D)  
 Lockwasher (MS35338-44)

PRELIMINARY PROCEDURES: Remove powerplant (page 5-1)  
 Drain fuel tanks (page 7-153)

**REMOVAL:**

1. Using 1-3/8 inch wrench and 1-1/2 inch wrench, disconnect left nut of tube (A) from fuel tank selector valve adapter (B).
2. Using 1-1/2 inch wrench and 1-3/8 inch wrench, disconnect right nut of tube (A) from right fuel tank return hose (C).

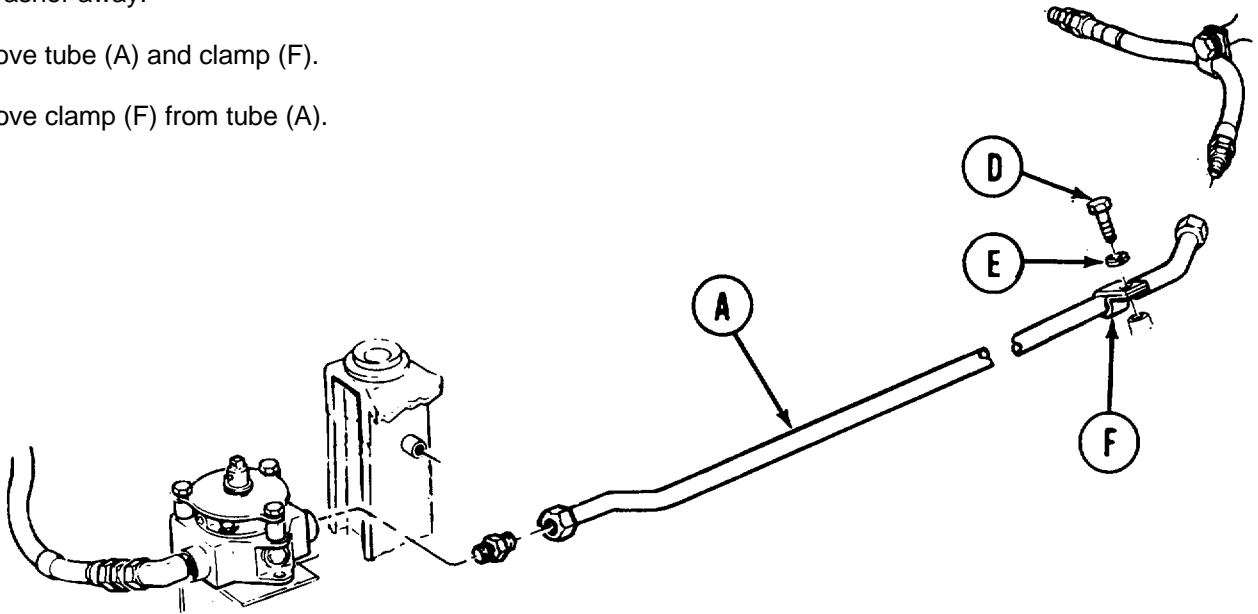


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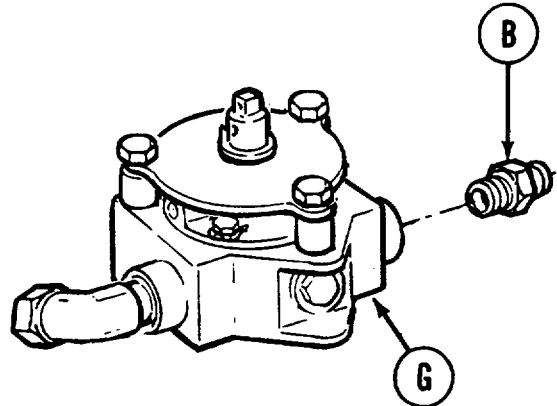
TA148302

**FUEL RETURN TUBE ASSEMBLY (RIGHT FUEL TANK) REPLACEMENT (Sheet 2 of 3)**

3. Using socket, remove screw (D) and lockwasher (E) holding tube (A) and clamp (F) to threaded stud. Throw lockwasher away.
4. Remove tube (A) and clamp (F).
5. Remove clamp (F) from tube (A).



6. Using 1-3/8 inch wrench, remove adapter (B) from fuel tank selector valve (G).



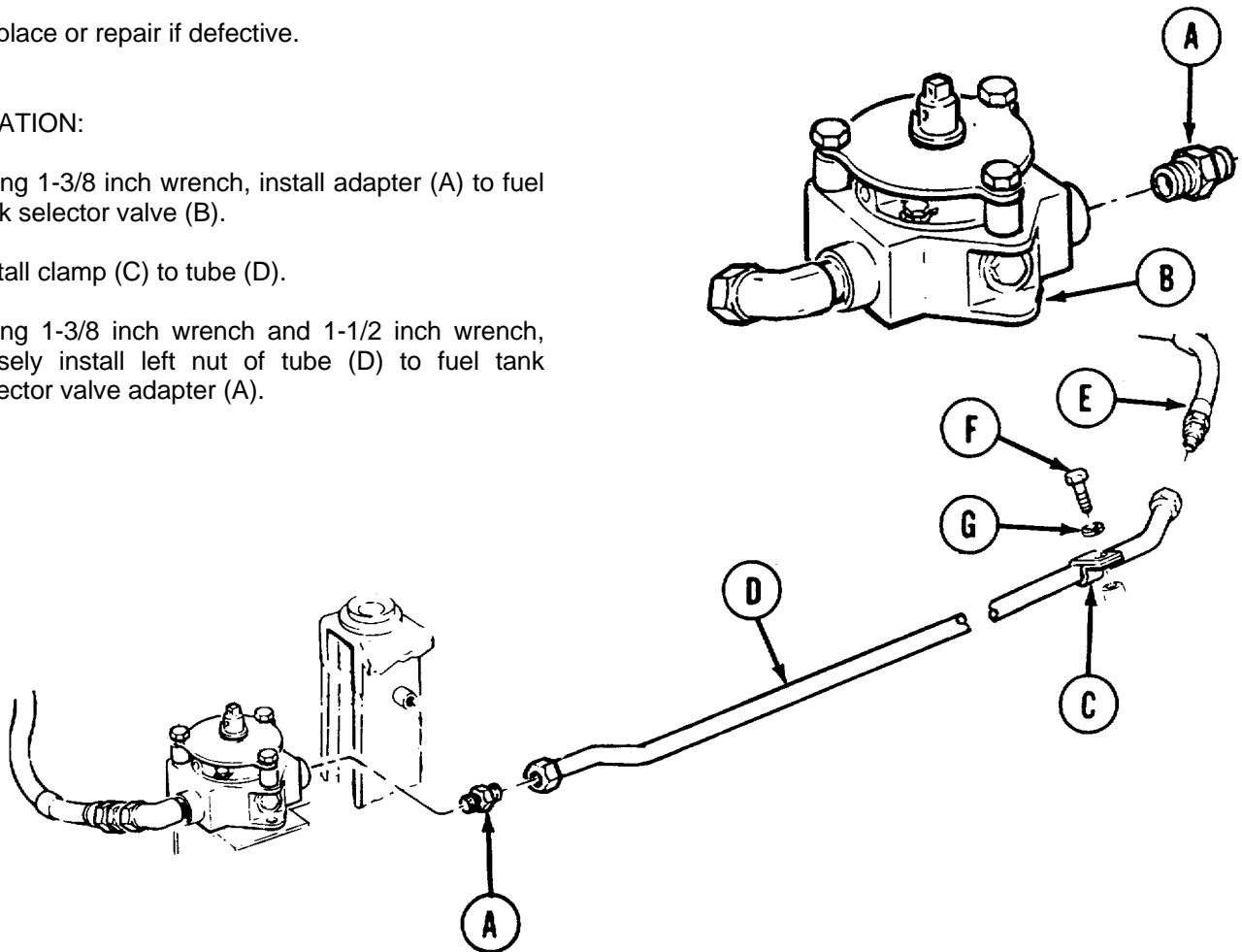
**FUEL RETURN TUBE ASSEMBLY (RIGHT FUEL TANK) REPLACEMENT (Sheet 3 of 3)**

**INSPECTION:**

1. Inspect threaded components for thread damage.
2. Replace or repair if defective.

**INSTALLATION:**

1. Using 1-3/8 inch wrench, install adapter (A) to fuel tank selector valve (B).
2. Install clamp (C) to tube (D).
3. Using 1-3/8 inch wrench and 1-1/2 inch wrench, loosely install left nut of tube (D) to fuel tank selector valve adapter (A).



4. Using 1-1/2 inch wrench and 1-3/8 inch wrench, loosely install right nut of tube (D) to right fuel tank return hose (E).
5. Using socket, secure clamp (C) and tube (D) to hull floor with screw (F) and new lockwasher (G).
6. Tighten right and left nut of tube (D).
7. Install 2A powerplant (page 5-14) or 2D powerplant (page 5-40).
8. Fill fuel tanks.

End of Task

TA148304

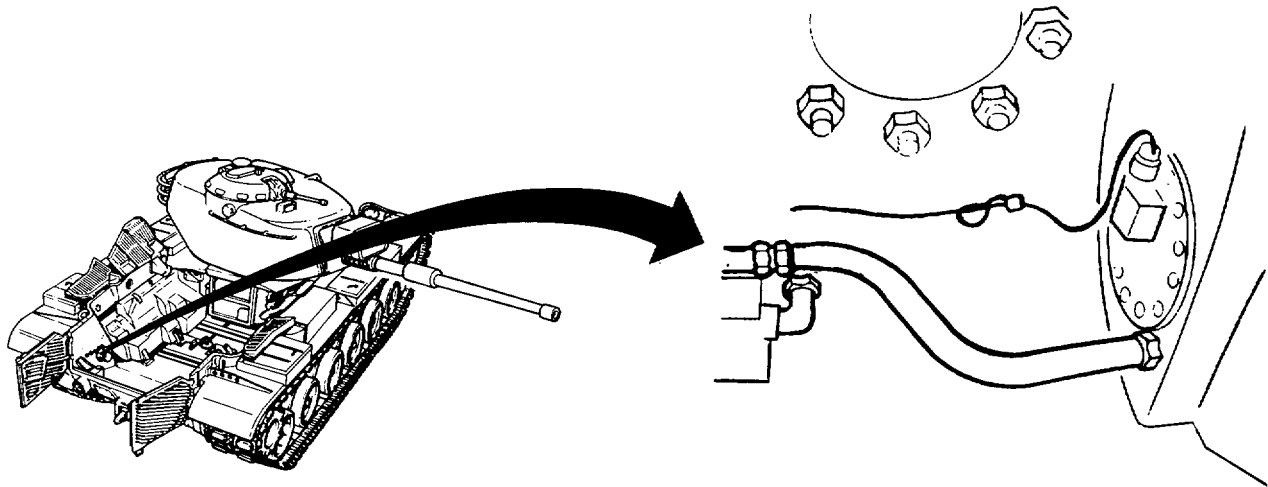
**FUEL RETURN HOSE (LEFT FUEL TANK) REPLACEMENT (Sheet 1 of 2)**

TOOLS: 1-1/4 in. open end wrench  
 1-1/2 in. open end wrench  
 1-3/8 in. open end wrench

SPECIAL TOOLS: Ground hop kit (Item 32, Chapter 3, Section I)

SUPPLIES: Sealing compound (Item 24, Appendix D)  
 Rags (Item 65, Appendix D)

PRELIMINARY PROCEDURES: Remove powerplant (page 5-1)  
 Drain fuel tanks (page 7-153)  
 Remove engine fuel return hose (page 7-226)

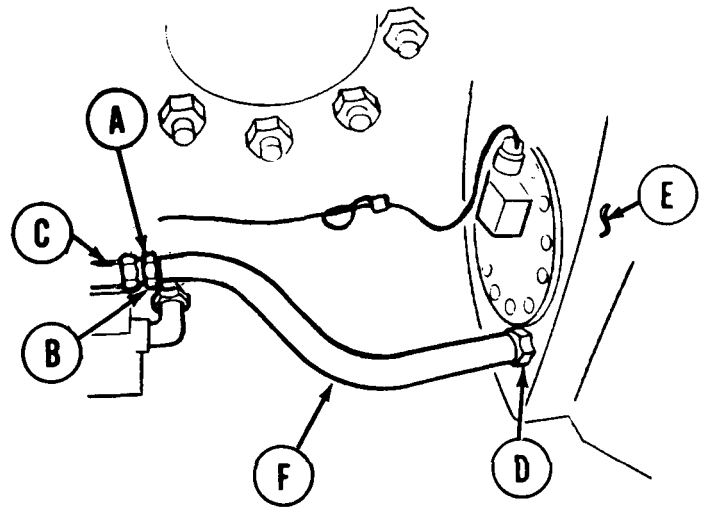


Go on to Sheet 2

TA148305

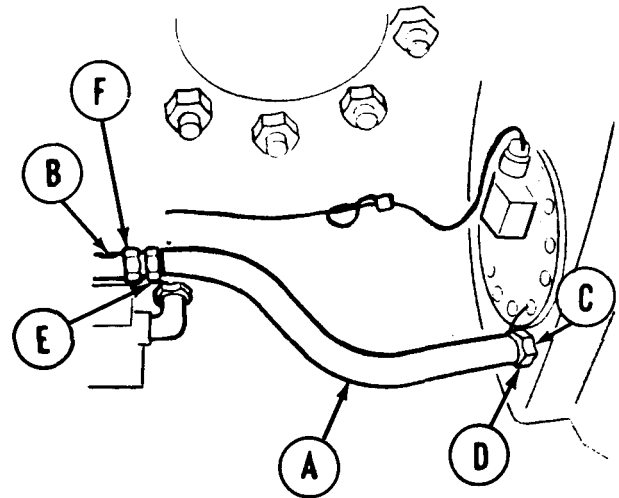
**FUEL RETURN HOSE (LEFT FUEL TANK) REPLACEMENT (Sheet 2 of 2)****REMOVAL:**

1. Using 1-1/4 inch wrench to hold fitting (A), use 1-1/2 inch wrench and loosen fitting (B) from elbow (C).
2. Using 1-3/8 inch wrench, loosen fitting (D) from fuel tank (E).
3. Carefully remove hose (F) from elbow (C) and fuel tank (E).

**INSTALLATION:****CAUTION**

**Make sure that drain plugs of both fuel tanks are correctly sealed.**

1. Lightly coat threads of each hose end fitting with sealing compound (Item 24, Appendix D).
2. Position hose (A) onto elbow (B) and fuel tank mount (C).
3. Using 1-3/8 inch wrench, tighten fitting (D) to fuel tank mount (C).
4. Using 1-1/4 inch wrench to hold fitting (E), use 1-1/2 inch wrench and tighten fitting (F) to elbow (B).
5. Install engine fuel return hose (page 7-227).
6. Ground hop engine (page 5-54).
7. Allow engine to run for a brief time while checking for leaks. If a leak is detected, stop engine and tighten fittings.
8. Disconnect ground hop kit (page 5-67).
9. Install 2A powerplant (page 5-14) or 2D powerplant (page 5-40).



End of Task

TA148306



**ENGINE FUEL RETURN SELECTOR COCK REPLACEMENT (Sheet 1 of 4)**

PROCEDURE INDEX

PROCEDURE	PAGE
Removal	7-233
Inspection	7-234
Installation	7-234

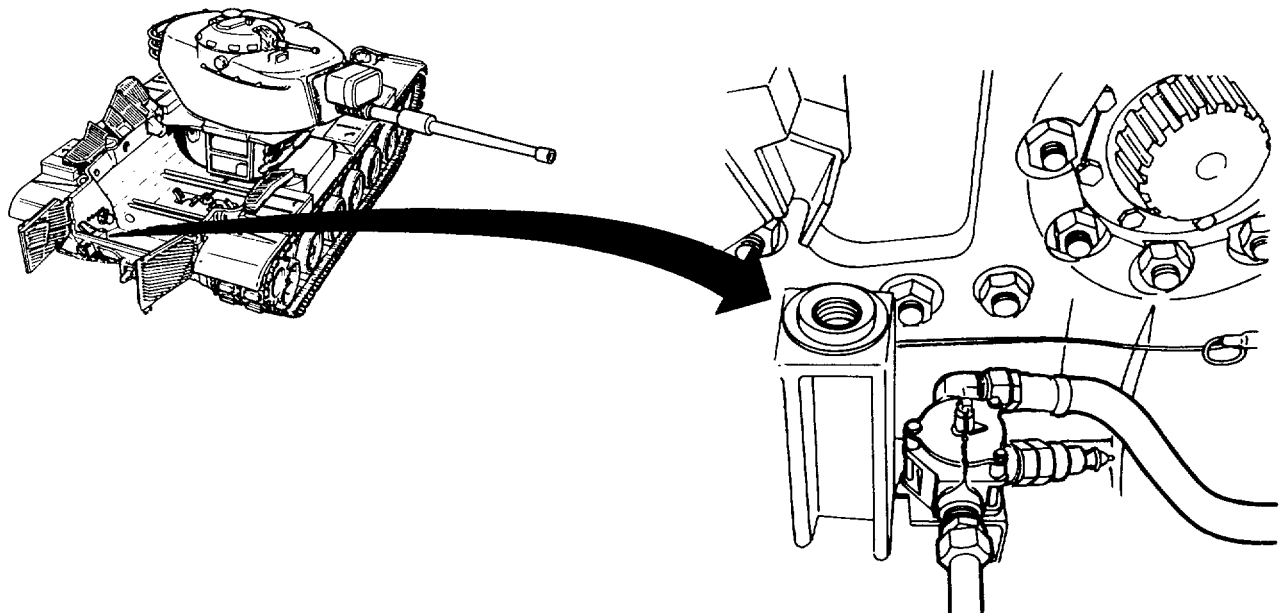
TOOLS:   Vise  
           10 in. adjustable wrench  
           7/16 in. socket with 1/2 in. drive  
           1-1/2 in. open end wrench  
           1-3/8 in. open end wrench  
           1-1/8 in. open end wrench  
           Diagonal cutting pliers  
           Slip-joint pliers  
           Ratchet with 1/2 in. drive

SPECIAL TOOLS:   Ground hop kit (Item 30, Chapter 3, Section I)

SUPPLIES:   Sealing compound (Item 23, Appendix D)  
               Rags (Item 65, Appendix D)  
               Lockwire (Item 59, Appendix D)  
               Cotter pin (112726)  
               Lockwasher (MS35338-44) (3 required)

REFERENCE: TM 9-2350-26010

PRELIMINARY PROCEDURES:   Remove powerplant (page 5-1)  
                                       Drain fuel tank (page 7-153)



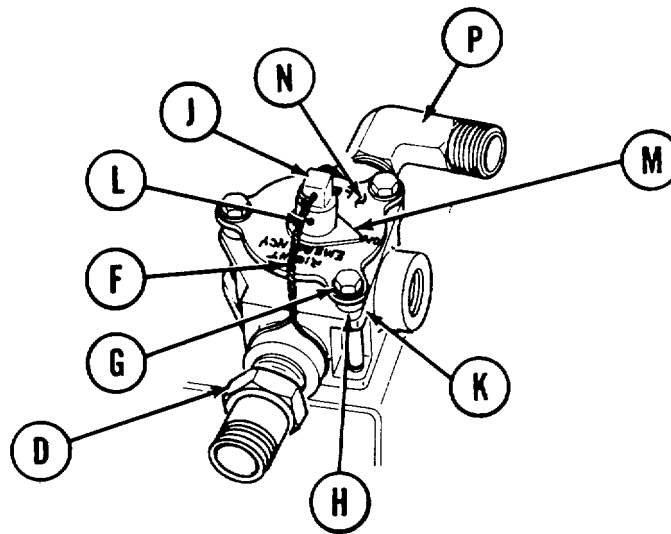
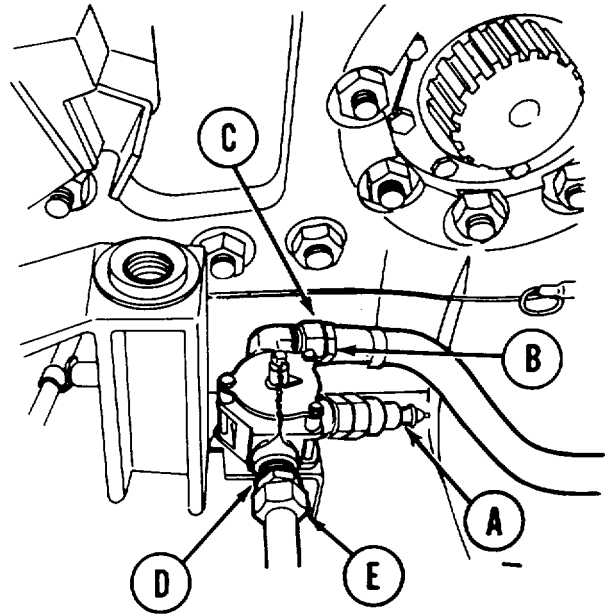
Go on to Sheet 2

TA148307

**ENGINE FUEL RETURN SELECTOR COCK REPLACEMENT (Sheet 2 of 4)**

**REMOVAL:**

1. Using 1-1/8 inch wrench, remove coupler (A).
2. Using 1-1/8 inch wrench, hold fitting (B) secure and loosen fitting (C) with 1-1/2 inch wrench.
3. Using 1-3/8 inch and 1-1/2 inch wrenches, hold adapter (D) secure with 1-3/8 inch wrench. Loosen fitting (E) with 1-1/2 inch wrench.
4. Using cutting pliers, cut lockwire (F) and remove.
5. Using socket, remove three screws and lockwashers (G) and spacers (H) securing return selector cock (J) to mounting brackets (K). Remove selector cock. Throw lockwashers away.
6. Remove cotter pin and headless straight pin (L). Throw cotter pin away.
7. Remove pointer assembly (M).
8. Remove instruction plate (N).
9. Using adjustable wrench, remove elbow (P).
10. Using 1-3/8 inch wrench, remove adapter (D).

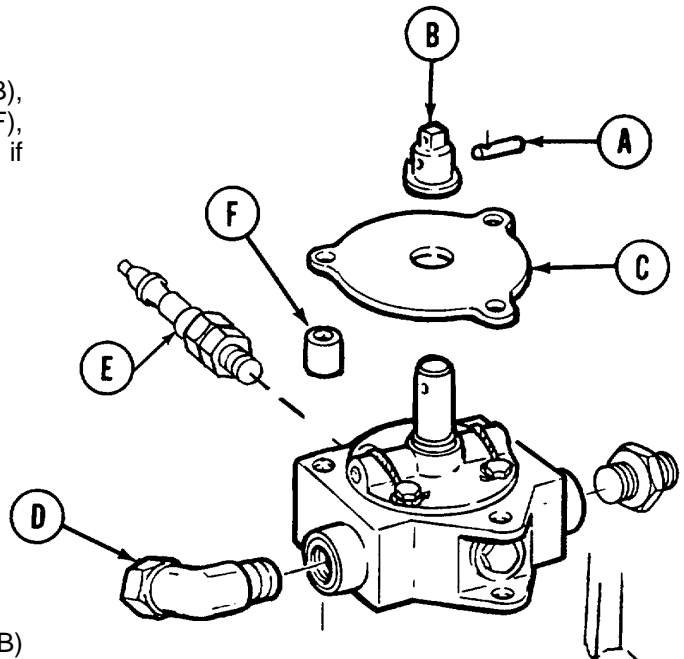


Go on to Sheet 3

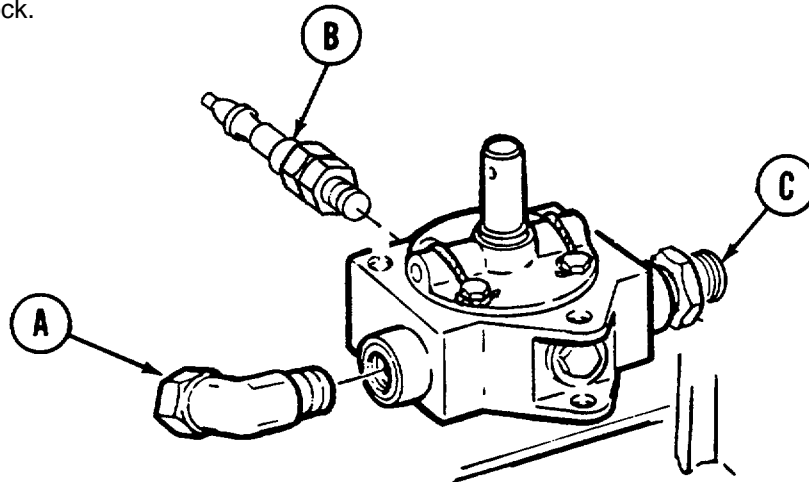
TA148308

**ENGINE FUEL RETURN SELECTOR COCK REPLACEMENT (Sheet 3 of 4)****INSPECTION:**

Inspect headless straight pin (A), pointer assembly (B), instruction plate (C), elbow (D), coupler (E), spacers (F), and adapter (G) for damage or wear. Replace if necessary.

**INSTALLATION:**

1. Lightly coat male ends of elbow (A), coupler (B) and adapter (C) with sealing compound (Item 23, Appendix D).
2. Using adjustable wrench, install elbow (A) and coupler (B) on return selector cock.
3. Using 1-3/8 inch wrench, install adapter (C) on return selector cock.

**NOTE**

Be sure elbow, when tightened, faces in direction shown in figure.

Go on to Sheet 4

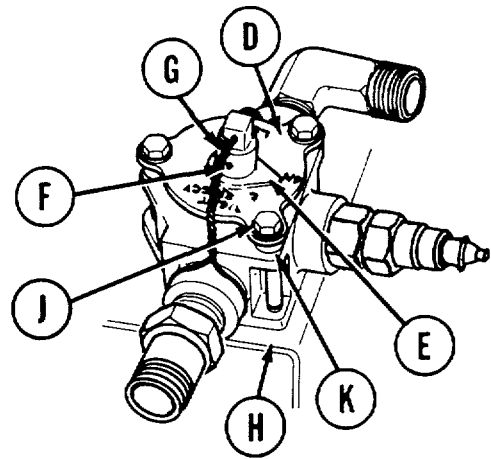
TA148309

**ENGINE FUEL RETURN SELECTOR COCK REPLACEMENT (Sheet 4 of 4)**

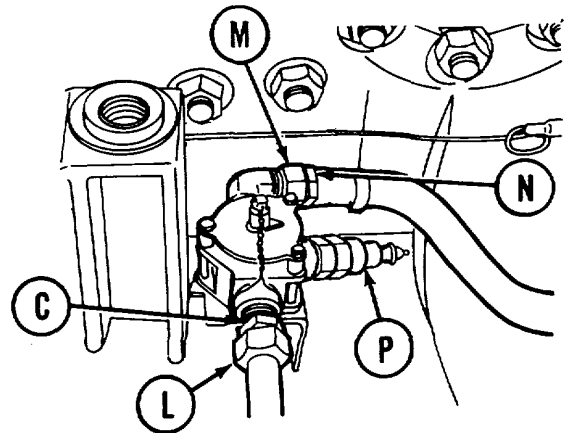
4. Position indicator plate (D) on return selector cock with word BOTH at engine fuel return tube elbow (center outlet).
5. Position pointer assembly (E) at BOTH position.

**NOTE**

**Check to be sure all three openings in return selector cock are open.**



6. Install headless straight pin (F) in pointer assembly (E) and secure with new cotter pin.
7. Secure pointer assembly (E) in BOTH position with lockwire (G) (Item 59, Appendix D).
8. Using socket, secure return selector cock on mounting bracket (H) with three screws and new lockwashers (J) and spacers (K).
9. Using 1-3/8 inch wrench on fitting (C) and 1-1/2 inch wrench on fitting (L), hold fitting (C) in a fixed position while securing fitting (L).
10. Using one 1-1/2 inch wrench on fitting (M) and one 1-1/8 inch wrench on fitting (N), hold fitting (N) in a fixed position while securing fitting (M).
11. Using 1-1/8 inch wrench, secure coupler (P).



12. Fill fuel tanks.
13. Attach ground hop kit (page 5-54).
14. Start engine (TM 9-2350-260-10) and allow it to run for a brief time while checking for leaks (page 5-65).
15. Disconnect ground hop kit (page 5-67).
16. Replace 2A powerplant (page 514) or 2D powerplant (page 5-40).

End of Task

TA148310

**ENGINE FUEL RETURN SELECTOR COCK INSTRUCTION PLATE REPLACEMENT (Sheet 1 of 2)**

**TOOLS:** 7/16 in. socket with 1/2 in. drive  
 Extension with 1/2 in. drive, 3 in. long  
 Ratchet with 1/2 in. drive  
 Diagonal cutting pliers  
 Slip joint pliers

**SUPPLIES:** Rags (Item 65, Appendix D)  
 Lockwire (Item 59, Appendix D)  
 Cotter pin (112726)  
 Lockwasher (MS35338-44)(3 required)

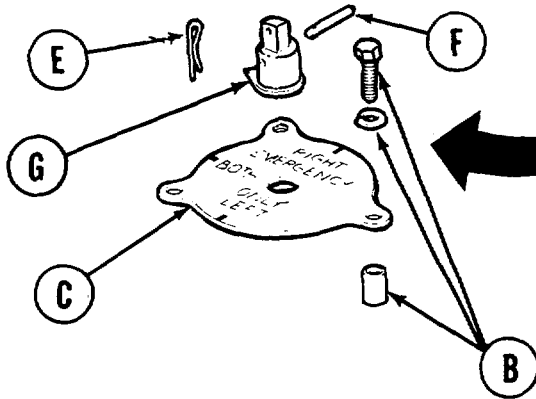
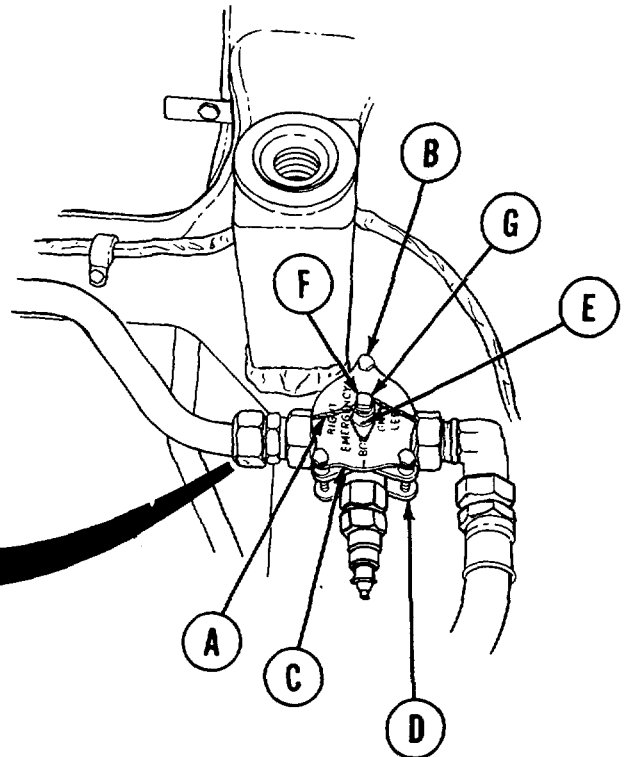
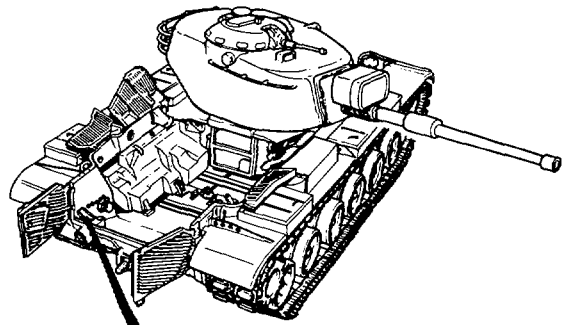
**PRELIMINARY PROCEDURE:** Remove powerplant (page 5-1)

**REMOVAL:**

1. Using cutting pliers, remove lockwire (A). Throw lockwire away.
2. Using socket, remove three screws, lockwashers, and spacers (B) securing instruction plate (C) to mounting brackets (D). Throw lockwashers away.
3. Using slip joint pliers, remove cotter pin (E) (hidden). Remove pin (F). Throw cotter pin away.
4. Remove pointer assembly (G).
5. Remove instruction plate (C).

**INSPECTION:**

Inspect headless straight pin (F), pointer assembly (G), instruction plate (C), and spacers (B) for damage or wear. Replace if necessary.



Go on to Sheet 2

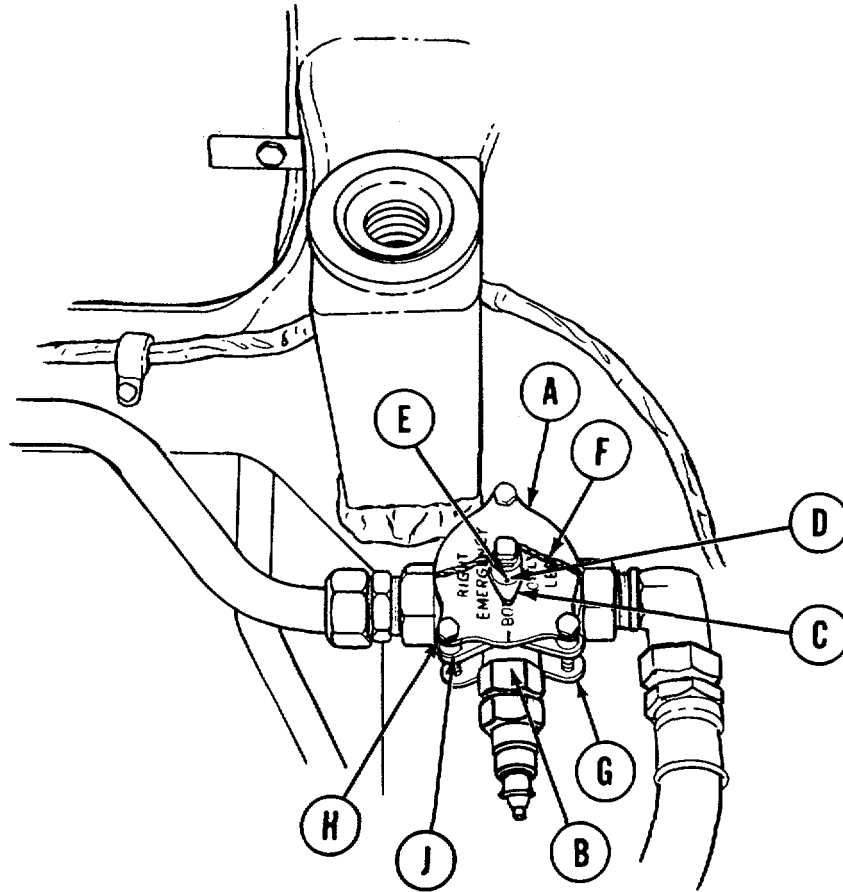
TA148311

**ENGINE FUEL RETURN SELECTOR COCK INSTRUCTION PLATE REPLACEMENT (Sheet 2 of 2)****INSTALLATION:**

1. Position instruction plate (A) on return selector cock with word BOTH at engine fuel return tube quick-disconnect (center outlet) (B).
2. Position pointer assembly (C) at BOTH position.

**NOTE**

**Check to make sure all three openings in fuel selector cock valve are open.**



3. Install straight pin (D) in pointer assembly (C) and secure with new cotter pin (E) (hidden).
4. Secure pointer assembly (C) in BOTH position with lockwire (F) (Item 59, Appendix D).
5. Using socket, secure instruction plate (A) on mounting bracket (G) with three screws and new lockwashers (H) and spacers (J).
6. Install 2A powerplant (page 5-14) or 2D powerplant (page 5-40).

End of Task

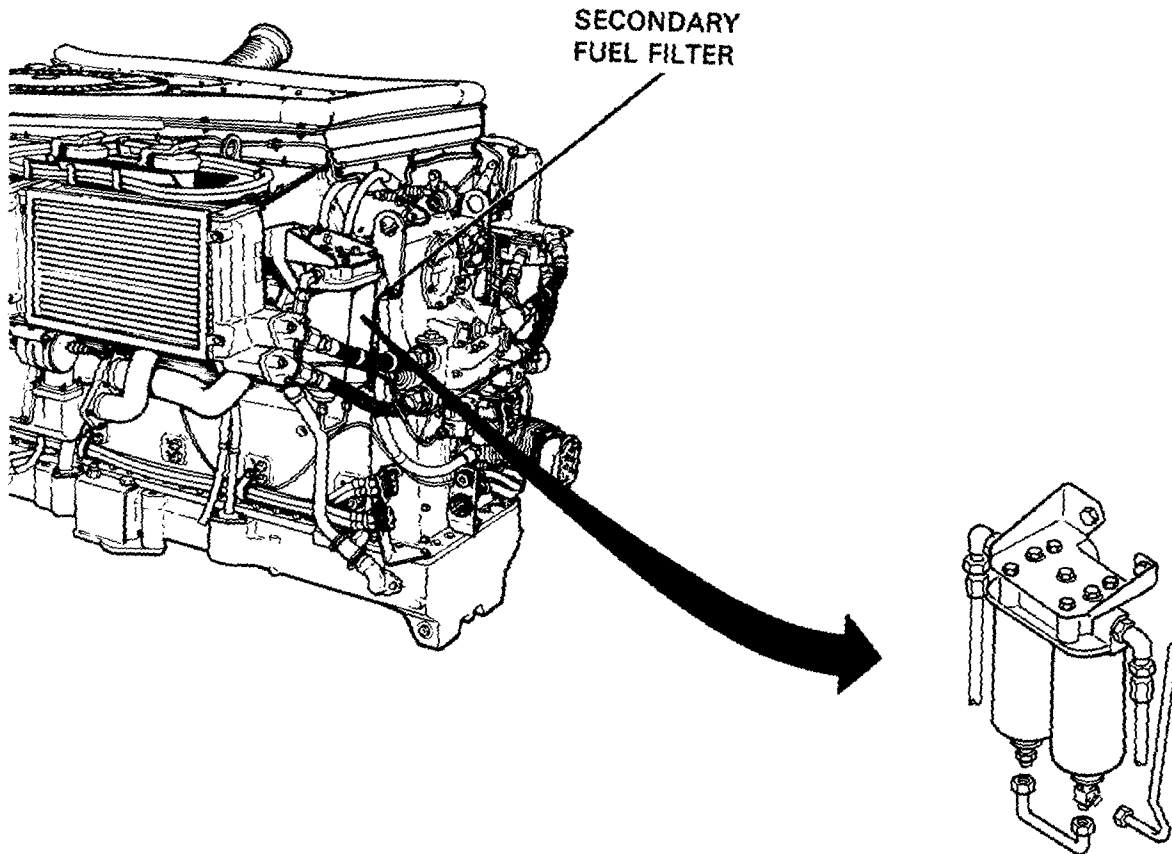
TA148312

**SECONDARY FUEL FILTER ASSEMBLY REPLACEMENT (Sheet 1 of 3)**

**TOOLS:** 9/16 in. socket with 1/2 in. drive  
 5/8 in. combination box and open end wrench (2 required)  
 Ratchet with 1/2 in. drive  
 3/4 in. combination box and open end wrench  
 7/8 in. combination box and open end wrench  
 1/2 in. combination box and open end wrench  
 7/16 in. combination box and open end wrench

**SUPPLIES:** 1 gal. container  
 Lockwasher (MS35338-46) (4 required)

**PRELIMINARY PROCEDURE:** Remove 2A powerplant (page 5-2)

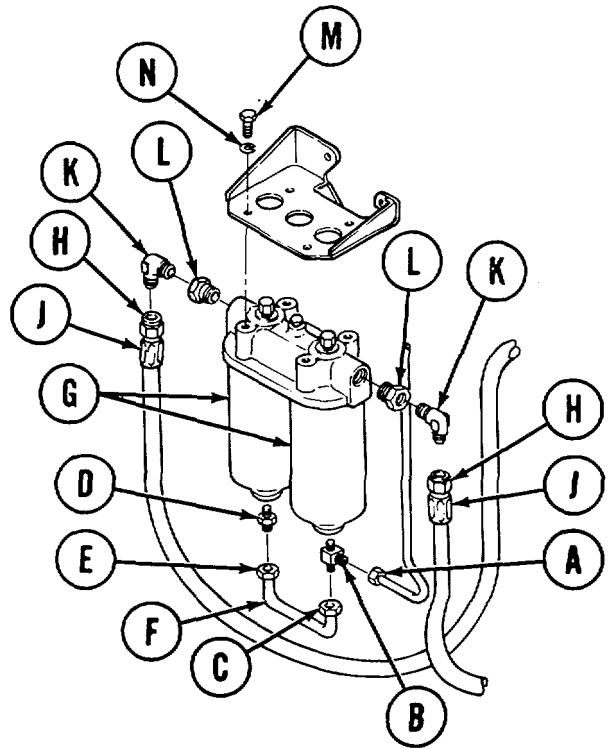


Go on to Sheet 2

TA148313

**SECONDARY FUEL FILTER ASSEMBLY REPLACEMENT (Sheet 2 of 3)****REMOVAL:**

1. Place suitable container beneath secondary fuel filter to catch fuel from filters and tubes.
2. Using 5/8 inch wrench, remove nut (A) from tee (B).
3. Using 7/16 inch wrench to hold tee (B) and 5/8 inch wrench, remove nut (C).
4. Using 1/2 inch wrench to hold adapter (D) and 5/8 inch wrench, remove nut (E).
5. Remove tube assembly (F).
6. Using 7/16 inch wrench, remove tee (B) from filter assembly (G).
7. Using 1/2 inch wrench, remove adapter (D) from filter assembly (G).
8. Using 7/8 inch wrench, loosen two nuts (H) and remove two hose assemblies (J) from elbows (K).
9. Using 7/8 inch wrench to hold adapters (L) and 3/4 inch wrench, remove two elbows (K).
10. Using 7/8 inch wrench, remove two adapters (L).
11. Using 9/16 inch socket, remove four screws (M) and four lockwashers (N). Throw lockwashers away.
12. Remove filter assembly (G) from powerplant.



Go on to Sheet 3

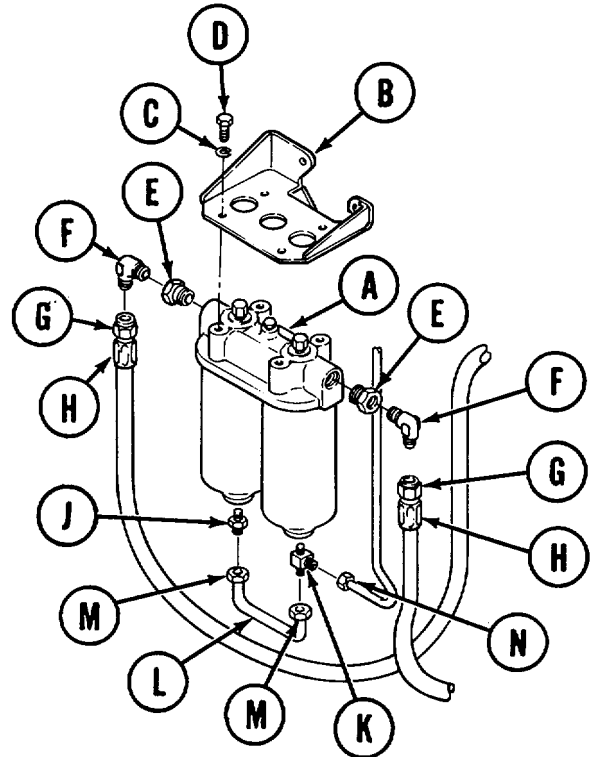
TA148314



**SECONDARY FUEL FILTER ASSEMBLY REPLACEMENT (Sheet 3 of 3)**

**INSTALLATION:**

1. Place filter assembly (A) in position under bracket (B).
2. Using 9/16 inch socket, install four new lockwashers (C) and four screws (D).
3. Using 7/8 inch wrench, install two adapters (E).
4. Using 3/4 inch wrench, install two elbows (F).
5. Using 7/8 inch wrench, install two nuts (G) and two hose assemblies (H) on two elbows (F).
6. Using 1/2 inch wrench, install adapter (J).
7. Using 7/16 inch wrench, install tee (K).
8. Using 5/8 inch wrench, install tube assembly (L) and tighten two nuts (M).
9. Using 5/8 inch wrench, install nut (N) on tee (K).
10. Install 2A powerplant (page 5-14).
11. Purge fuel system (page 7-7).



End of Task

TA148315

**SECONDARY FUEL FILTER ELEMENT REPLACEMENT (Sheet 1 of 4)**

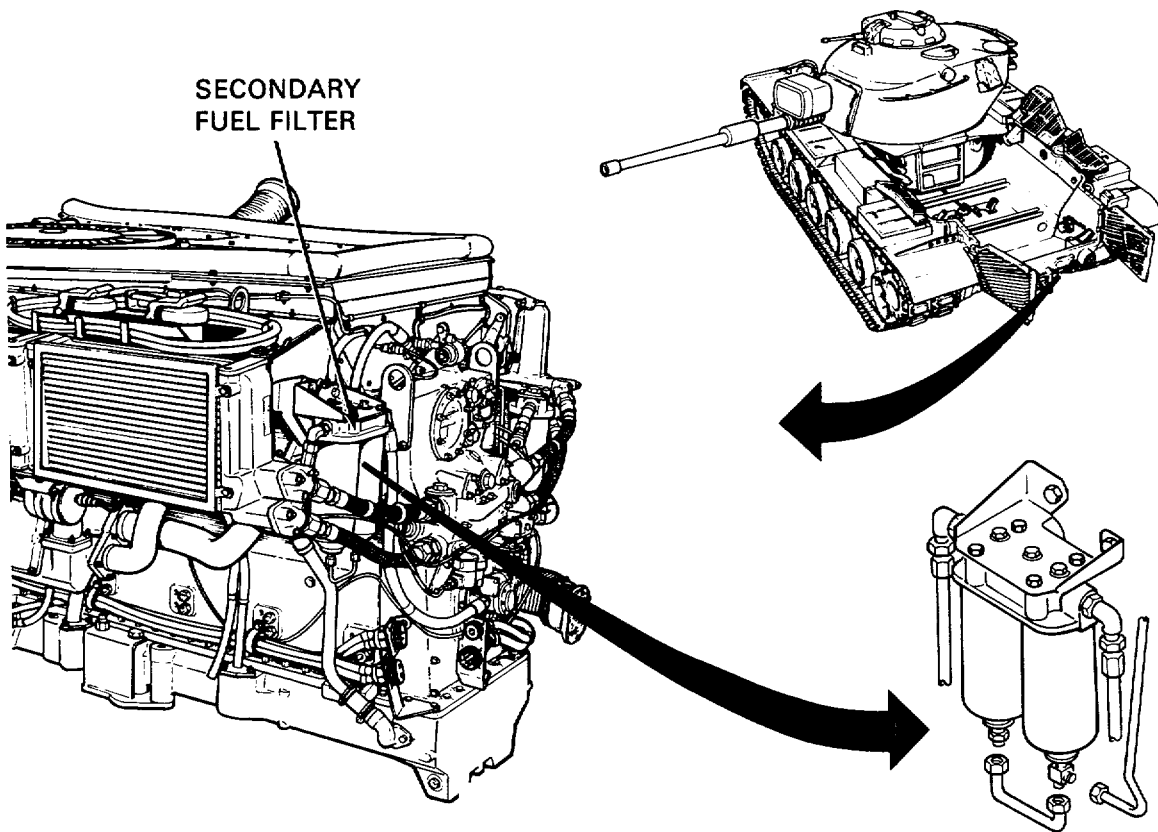
PROCEDURE INDEX

PROCEDURE	PAGE
Removal	7-242
Cleaning and Inspection	7-243
Installation	7-243

**TOOLS:** 5/8 in. combination box and open end wrench (2 required)  
 7/16 in. combination box and open end wrench

**SUPPLIES:** Parts kit (5702690)  
 Container  
 Lint free cloth (Item 12, Appendix D)  
 Dry cleaning solvent (Item 54, Appendix D)

**PRELIMINARY PROCEDURE:** Remove 2A powerplant (page 5-2)

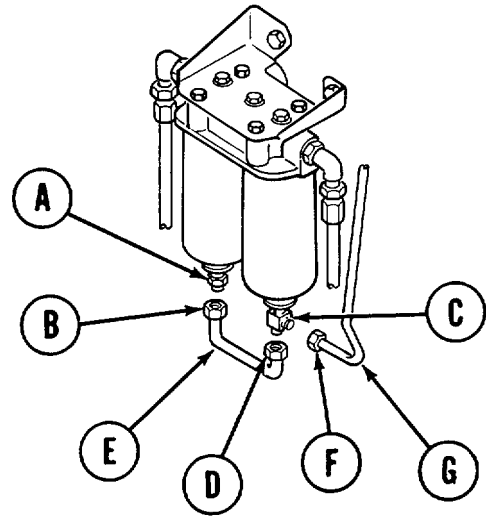


Go on to Sheet 2

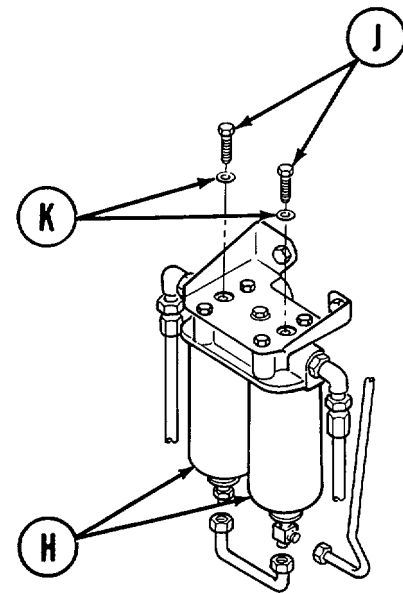
TA148316

**SECONDARY FUEL FILTER ELEMENT REPLACEMENT (Sheet 2 of 4)****REMOVAL:**

1. Place suitable container beneath secondary fuel filter to catch fuel from filters and tubes.
2. Using two 5/8 inch wrenches, hold adapter (A) and loosen nut (B).
3. Using two 5/8 inch wrenches, hold tee (C) and loosen nut (D).
4. Remove tube assembly (E).



5. Using two 5/8 inch wrenches, loosen nut (F). Remove nut (F) from tee (C) and move tube assembly (G) aside.
6. Hold filter body (H) by hand to prevent turning and falling during the next step.
7. Using 7/16 inch wrench, remove two screws (J) and two gaskets (K).
8. Throw gaskets (K) away.
9. Remove two filter bodies (H).

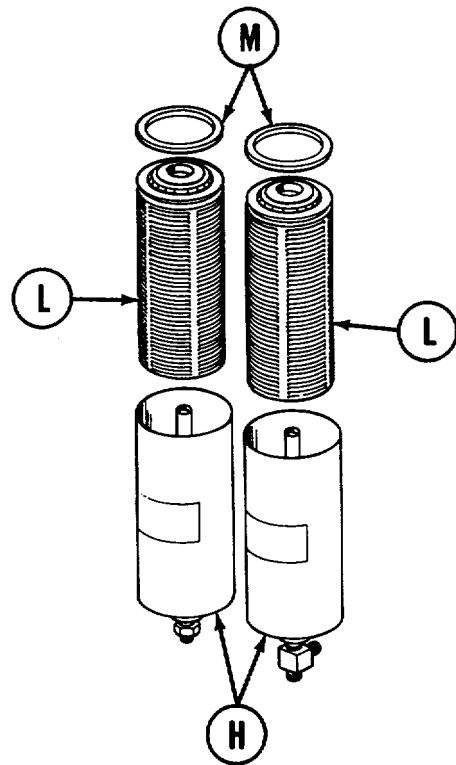


Go on to Sheet 3

TA148317

**SECONDARY FUEL FILTER ELEMENT REPLACEMENT (Sheet 3 of 4)**

10. Remove two filter elements (L) from filter bodies (H).
11. Throw filter elements (L) and head gaskets (M) away.

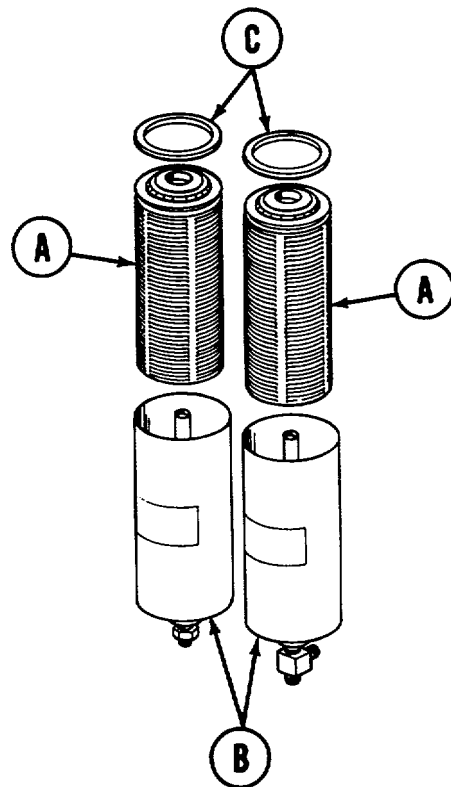


**CLEANING AND INSPECTION:**

1. Clean two filter bodies with lint free cloth (Item 12, Appendix D) and dry cleaning solvent (Item 54, Appendix D).
2. Inspect all parts for damage or worn threads. Replace any damaged or worn part.

**INSTALLATION:**

1. Insert new filter element (A) in filter body (B).
2. Install two new head gaskets (C).

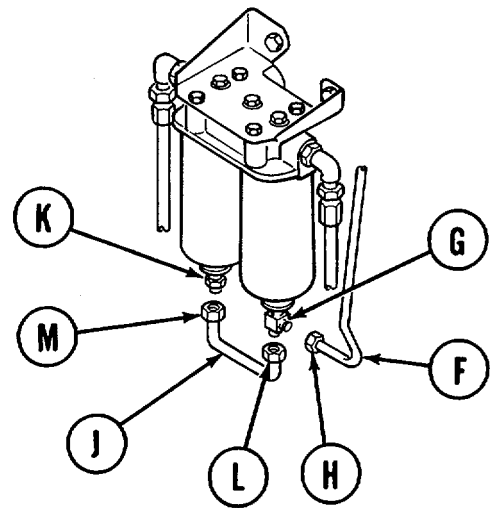
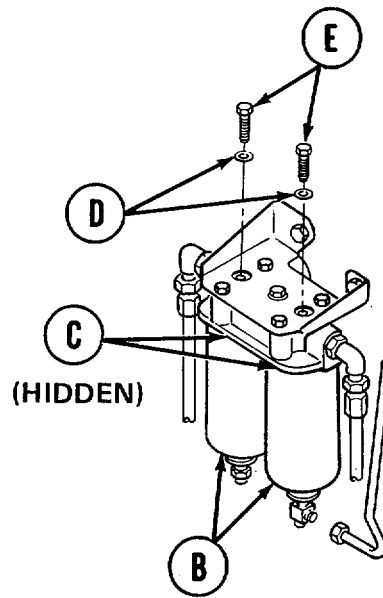


Go on to Sheet 4

TA148318

**SECONDARY FUEL FILTER ELEMENT REPLACEMENT (Sheet 4 of 4)**

3. Install two new gaskets (D) on two screws (E).
4. Place filter bodies (B) in position. Make sure filter bodies (B) and head gaskets (C) are seated properly.
5. Using 7/16 inch wrench, install two screws (E) and two gaskets (D).
6. Place tube assembly (F) into position on tee (G).
7. Using 5/8 inch wrenches, hold tee (G) and tighten nut (H).
8. Place tube assembly (J) into position on tee (G) and adapter (K).
9. Using two 5/8 inch wrenches, hold tee (G) and tighten nut (L).
10. Using two 5/8 inch wrenches, hold adapter (K) and tighten nut (M).
11. Install 2A powerplant (page 5-14).
12. Purge fuel system (page 7-7).



End of Task

TA148319

FUEL-WATER SEPARATOR OPERATIONAL TESTS (2D ENGINE) (Sheet 1 of 11)

PROCEDURE INDEX

PROCEDURE	PAGE
Manual Drain Test	7-246
Automatic Drain Test	7-248
15-Second Drain Test	7-250
Sequential Drain Test	7-252

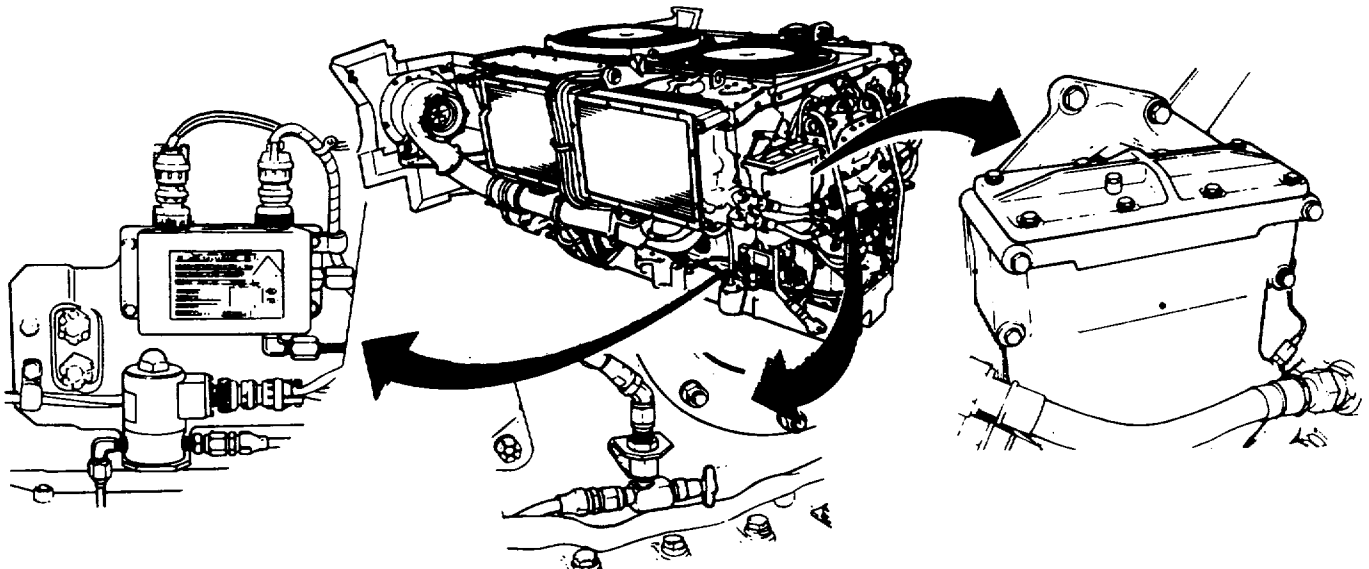
TOOLS: Slip joint pliers  
 6 in. adjustable wrench  
 1/2 in. socket with 1/2 in. drive  
 5 in. extension with 1/2 in. drive  
 Ratchet with 1/2 in. drive  
 1/2 in. combination box and open end wrench  
 7/16 in. combination box and open end wrench  
 9/16 in. combination box and open end wrench

FABRICATED TOOLS: One 3 ft cable (Figure F-8, Appendix F)  
 One 10 ft cable (Figure F-7, Appendix F)

SUPPLIES: 24 vdc power source  
 1/8 in. pipe plug (2 required)  
 Metal containers  
 (1 gal. capacity) (2 required)  
 Fuel can (1 gal. capacity)  
 Watch with second hand  
 Drip pan  
 Lockwasher (7410218) (4 required)  
 Lockwasher (11657469) (8 required)  
 Gasket (part of kit 5702738)  
 Lockwashers (11657469-3) (8 required)  
 Parts kit (5702738)

PERSONNEL: Two

PRELIMINARY PROCEDURE: Remove 2D powerplant (page 5-27)



**FUEL-WATER SEPARATOR OPERATIONAL TESTS (2D ENGINE) (Sheet 2 of 11)**

**NOTE**

**In order to perform any of the tests in this procedure, they must be performed in the sequence listed.**

**MANUAL DRAIN TEST:**

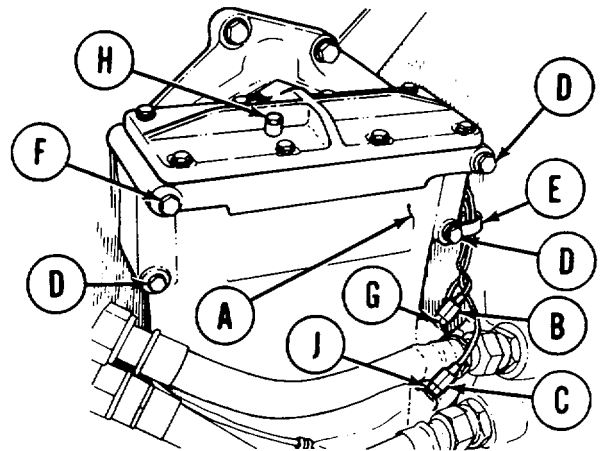
1. Place drip pan under fuel-water separator (A) and sensor probes (B) and (C).
2. Using socket, remove three capscrews, lockwashers, and flat washers (D). Throw lockwashers away.
3. Using hands, remove clamp (E) from sensor probe wires (B) and (C).
4. Using socket, loosen capscrew (F) to provide movement of fuel-water separator.

**CAUTION**

**Be very careful not to disturb center filter element. Center filter element must be replaced if disturbed in any way.**

**NOTE**

**It may be necessary to use hammer and punch to unseat sensors (B) and (C) by tapping upward on edge of sensor retaining nut.**



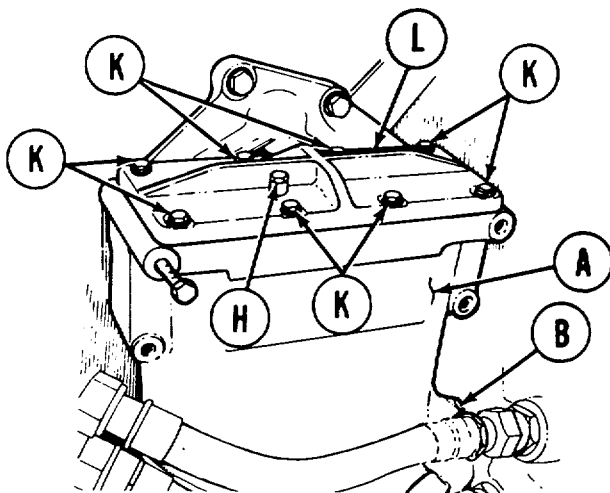
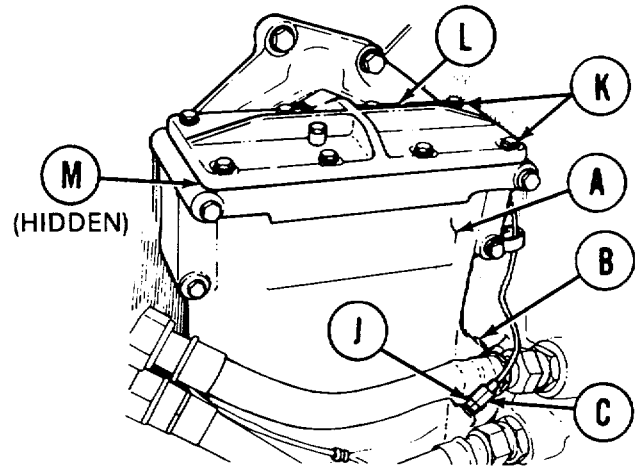
5. Using 1/2 inch wrench to hold sensor retaining nut (G), use 9/16 inch wrench and remove upper sensor (B) from fuel-water separator.
6. Using 7/16 inch wrench, open and then close bleed cap (H).
7. Check to see if fluid level is above upper sensor probe (B) hole by noting leakage from upper sensor probe (B) hole when bleed cap (H) is open.
8. Using 1/2 inch wrench, remove sensor retaining nut (G).
9. Using 1/2 inch wrench to hold sensor retaining nut (J), use 9/16 inch wrench and remove lower sensor (C) from fuel-water separator.
10. Using adjustable wrench, install pipe plug into lower sensor probe (C) hole.

**NOTE**

**It may be necessary to remove capscrew (F) and move fuel-water separator (A) before lower sensor (C) can be removed. If removed, capscrew-(F) should be reinstalled after step 10.**

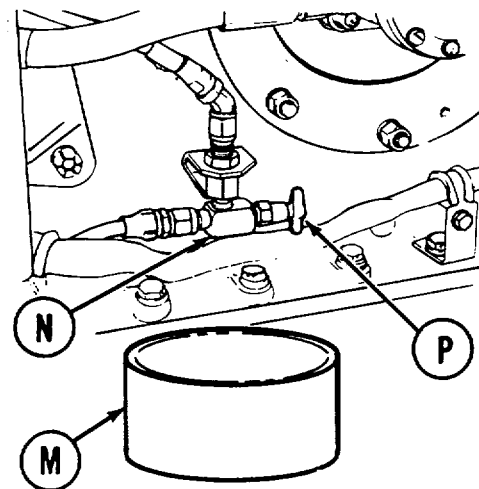
**FUEL-WATER SEPARATOR OPERATIONAL TESTS (2D ENGINE) (Sheet 3 of 11)**

11. Using 1/2 inch wrench, remove sensor retaining nut (J).
12. Using adjustable wrench, install pipe plug into lower sensor probe (C) hole.
13. If fuel did not leak from upper sensor (B) hole, use adjustable wrench to remove pipe plug from upper sensor (B) hole and go to step 14. If fuel did leak from upper sensor (B) hole, go to step 18.
14. Using 7/16 inch wrench, remove eight screws, lockwashers, and flat washers (K) securing cover (L) to separator (A). Remove cover (L) from separator (A). Throw lockwashers away.
15. Remove preformed packing (M) from cover (L). Throw packing away.
16. Add fuel to fuel-water separator (A) until fuel leaks from upper sensor (B) hole.
17. Using adjustable wrench, install pipe plug in upper sensor (B) hole.



18. Place cover (L) in position and, using 7/16 inch wrench, install eight screws, lockwashers, and flat washers (K).
19. Using 7/16 inch wrench, open bleed cap (H) by turning counterclockwise.
20. Place metal container (M) under outlet of manual drain valve (N).

21. Open manual drain valve (N) by turning petcock (P) counterclockwise. Allow small amount of fluid to drain into metal container (M), and then close manual drain valve (N).
22. If fluid does not drain, refer to troubleshooting procedure (page 4-256).
23. If fluid does drain, go on to automatic drain test on next page.



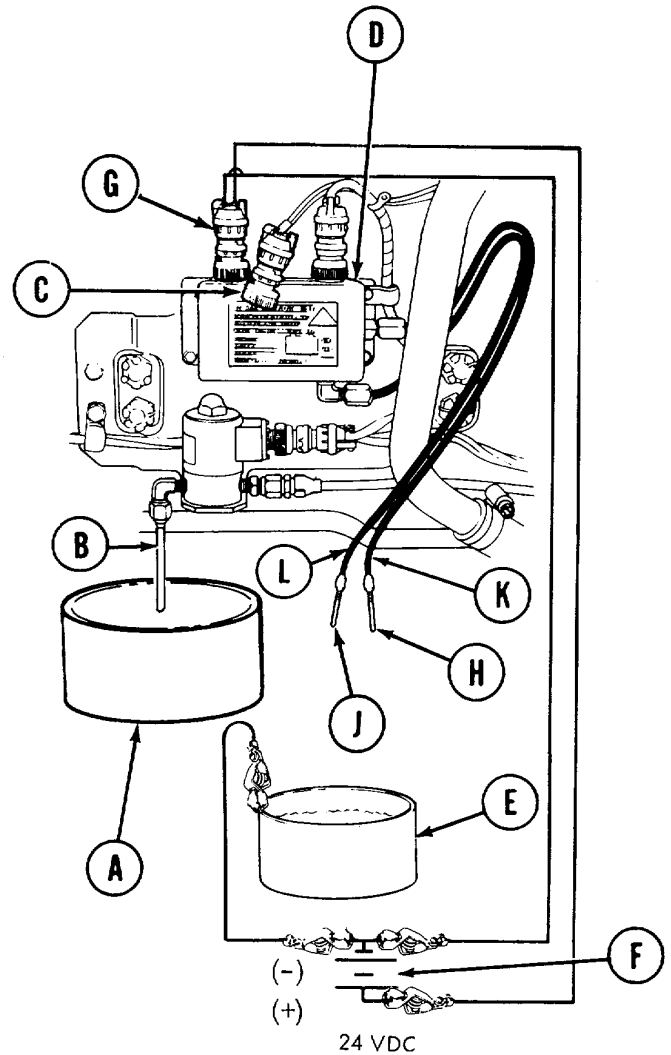
Go on to Sheet 4

TA148322



**FUEL-WATER SEPARATOR OPERATIONAL TESTS (2D ENGINE) (Sheet 4 of 11)****AUTOMATIC DRAIN TEST:**

1. Place metal container (A) under solenoid drain valve drain tube (B).
2. Using pliers, disconnect engine electrical harness connector (C) from fuel-water separator control box (D) by turning counterclockwise.
3. Fill metal container (E) with water.
4. Connect cable (Figure F-8, Appendix F) from negative (-) terminal of power source (F) to metal container (E).
5. Connect connector (G) of cable (Figure F-7, Appendix F) to fuel water separator control box.

**WARNING**

**Do not let upper (H) and lower (J) sensor probes come in contact with each other or with bottom or side of metal container (E). When moving sensor probes, do so by holding insulated cables (K) and (L). Do not touch probes (H) or (J) with hands.**

6. Connect red wire of cable to positive terminal of power source (F).
7. Connect black wire of cable to negative (-) terminal of power source (F).

Go on to Sheet 5

TA148323

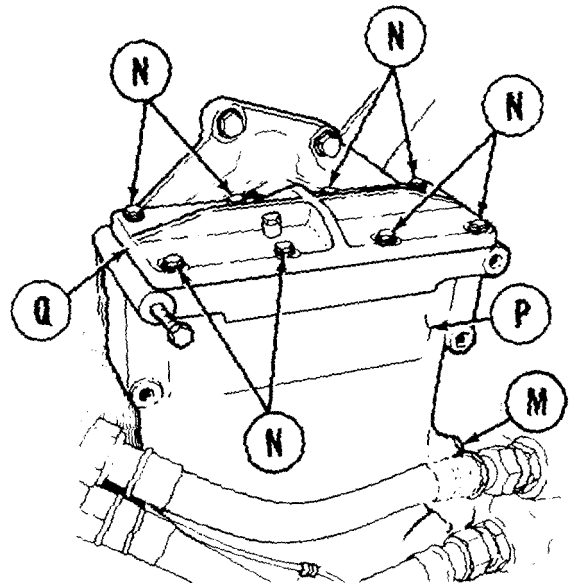
**FUEL-WATER SEPARATOR OPERATIONAL TESTS (2D ENGINE) (Sheet 5 of 11)**

7. Using adjustable wrench, loosen pipe plug in upper sensor hole enough to allow fuel to leak.
8. Check to see if fuel leaks from upper sensor hole (M).
9. If fuel does not leak from upper sensor hole (M), remove pipe plug from upper sensor hole (M) and go on to step 10. If fuel does leak from upper sensor hole (M), use adjustable wrench to tighten pipe plug in upper sensor hole (M) and go to step 14.

**CAUTION**

**Be very careful not to disturb center filter element. Center filter element must be replaced if disturbed in any way.**

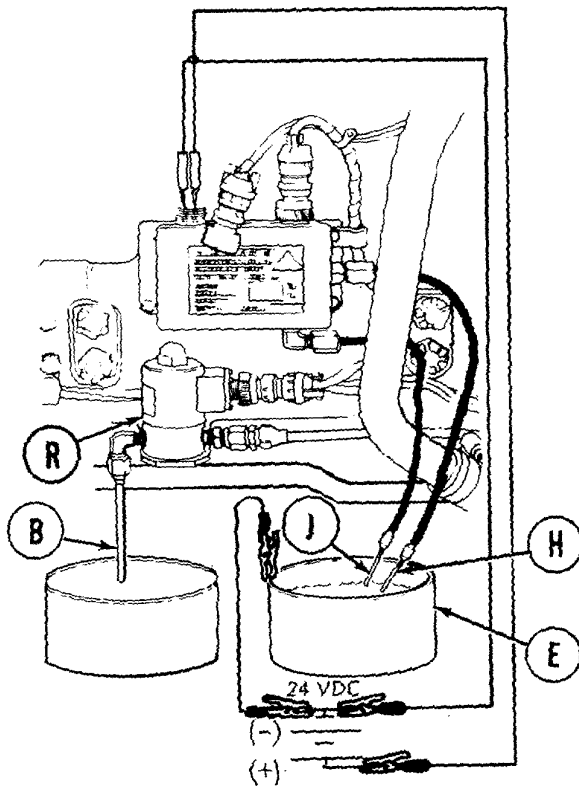
10. Using 7/16 inch wrench, remove eight screws, lockwashers, and flat washers (N) securing cover to separator (P). Remove cover (Q) from separator (P).



11. Add fuel to fuel-water separator (P) until fuel leaks from upper sensor hole (M).
12. Using adjustable wrench, install pipe plug into upper sensor hole (M).
13. Place cover (Q) in position and, using 7/16 inch wrench, install eight screws, lockwashers, and flat washers (N).
14. Hold tips of upper (H) and lower (J) sensor probes in water in metal container (E).

**NOTE**

**Remove both upper (H) and lower (J) sensor probes from water in metal container (E) as soon as fluid begins draining from drain tube (B).**



15. Listen for solenoid drain valve (R) to click and watch for fluid to begin draining from solenoid drain valve drain tube (B).
16. If fluid does not begin draining, refer to troubleshooting procedures (page 4-256).
17. If fluid does begin draining, go on to 15-second drain test on next page.

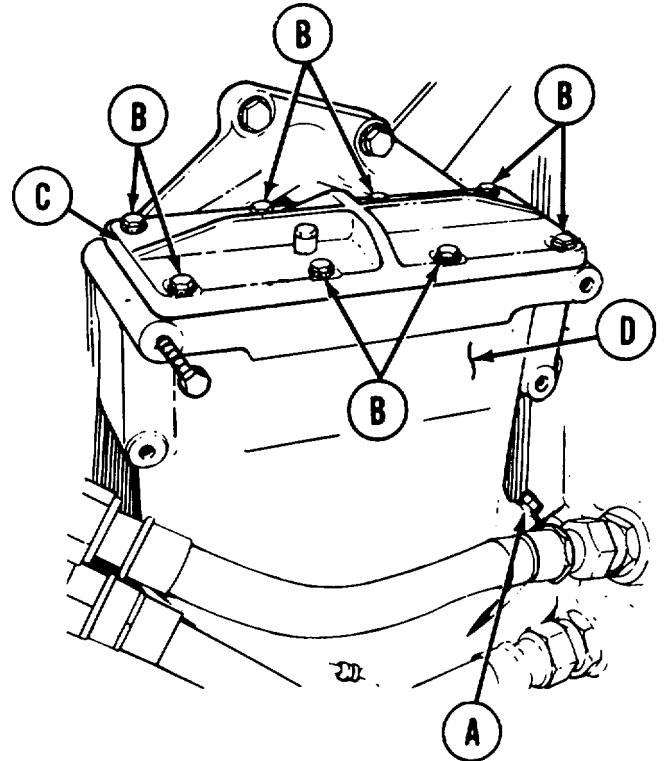
**FUEL-WATER SEPARATOR OPERATIONAL TESTS (2D ENGINE) (Sheet 6 of 11)****15-SECOND DRAIN TEST:**

1. Using adjustable wrench, loosen pipe plug in upper sensor hole (A) enough to allow fuel to leak.
2. Check to see if fuel leaks from upper sensor hole (A).
3. If fuel does not leak from upper sensor hole (A), remove pipe plug from upper sensor hole (A) and go on to step 4. If fuel does leak from upper sensor hole (A), use adjustable wrench to tighten pipe plug in upper sensor hole (A), and go to step 8.

**CAUTION**

**Be very careful not to disturb center filter element. Center filter element must be replaced if disturbed in any way.**

4. Using 7/16 inch wrench, remove eight screws, lockwashers, and flat washers (B) securing cover (C) to separator (D). Remove cover (C) from separator (D).
5. Add fuel to fuel-water separator (D) until fuel leaks from upper sensor hole (A).
6. Using adjustable wrench, install pipe plug into upper sensor hole (A).
7. Place cover (C) in position and, using 7/16 inch wrench, install eight screws, lockwashers, and flat washers (B).



Go on to Sheet 7

TA148325

FUEL-WATER SEPARATOR OPERATIONAL TESTS (2D ENGINE) (Sheet 7 of 11)

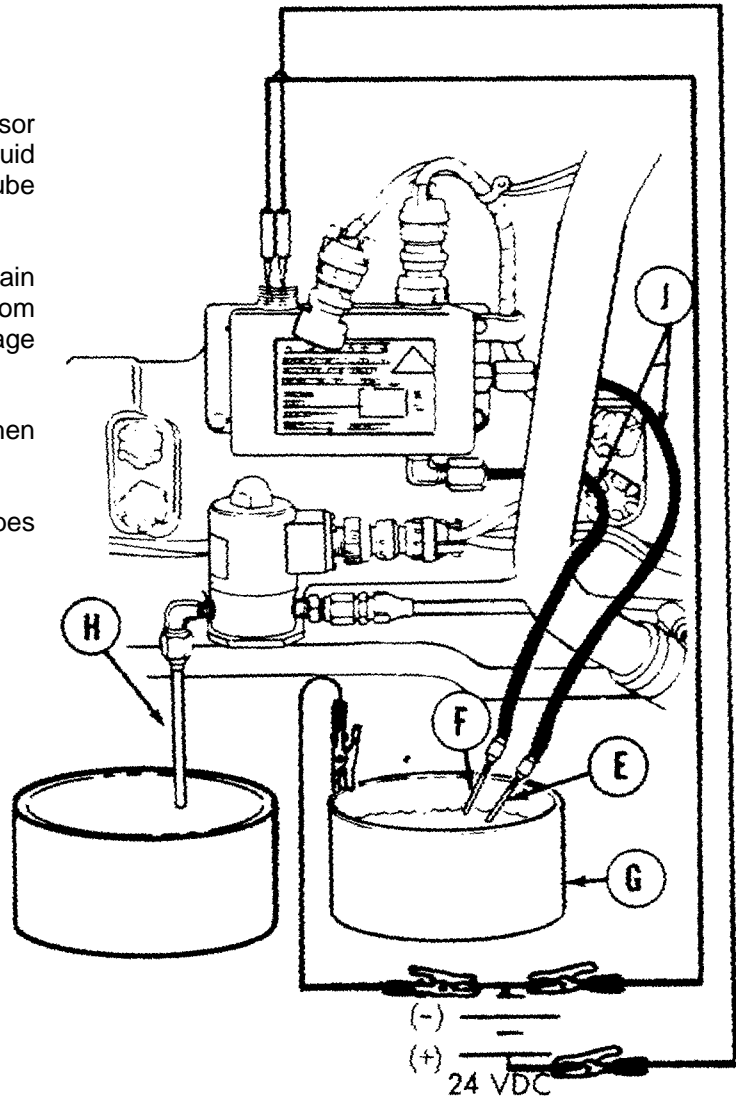
**WARNING**

Do not let upper (E) and lower (F) sensor probes come into direct contact with each other.

Do not let upper (E) or lower (F) sensor probes come into contact with metal container (G).

Hold insulated cables (J) attached to upper (E) and lower (F) sensor probes. Do not touch either probe.

8. Hold tips of both upper (E) and lower (F) sensor probes in water in metal container (G) until fluid stops draining from solenoid drain valve drain tube (H).
9. If fluid does not stop draining from solenoid drain valve drain tube (H) within 15-20 seconds from starting, refer to troubleshooting procedures (page 4-256).
10. If fluid does begin draining go to step 11 and then to sequential drain test on next page.
11. Remove upper (E) and lower (F) sensor probes from metal container (G).



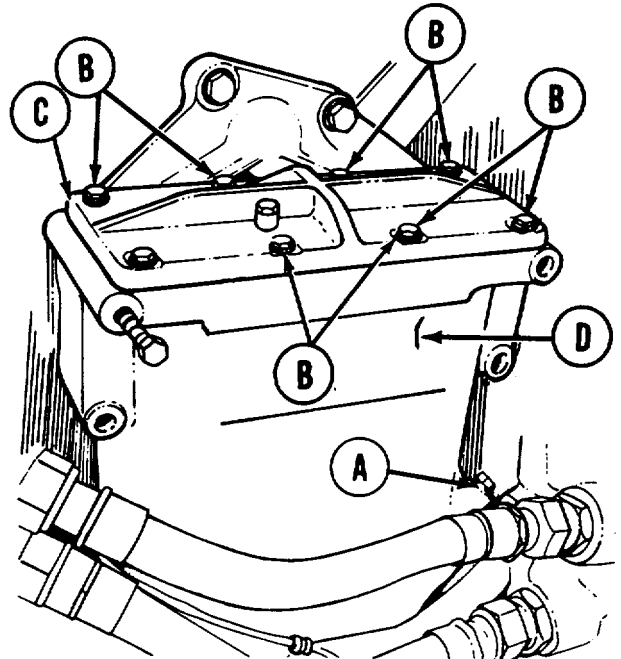
**FUEL-WATER SEPARATOR OPERATIONAL TESTS (2D ENGINE) (Sheet 8 of 11)****SEQUENTIAL DRAIN TEST:**

1. Using adjustable wrench, loosen pipe plug in upper sensor hole (A) enough to allow fuel to leak.
2. Check to see if fuel leaks from upper sensor hole (A).
3. If fuel does not leak from upper sensor hole (A), remove pipe plug from upper sensor hole (A) and go on to step 4. If fuel does leak from upper sensor hole (A), use adjustable wrench to tighten pipe plug in upper sensor hole (A) and go to step 8.

**CAUTION**

**Be very careful not to disturb center filter element. Center filter element must be replaced if disturbed in any way.**

4. Using 7/16 inch wrench, remove eight screws, lockwashers, and flat washers (B) securing cover (C) to separator (D). Remove cover (C) from separator (D). Throw lockwashers and gasket away.
5. Add fuel to fuel-water separator (D) until fluid level is above upper sensor hole (A).
6. Using adjustable wrench, install pipe plug into upper sensor hole (A).
7. Place cover and new gasket (C) in position and, using 7/16 inch wrench, install eight screws, new lockwashers, and flat washers (B).



Go on to Sheet 9

TA148327

FUEL-WATER SEPARATOR OPERATIONAL TESTS (2D ENGINE) (Sheet 9 of 11)

**WARNING**

Do not let upper (E) and lower (F) sensor probes come into direct contact with each other.

Do not let upper (E) or lower (F) sensor probes come into contact with metal container (G).

Hold insulated cables (H) attached to upper (E) and lower (F) sensor probes. Do not touch either probe.

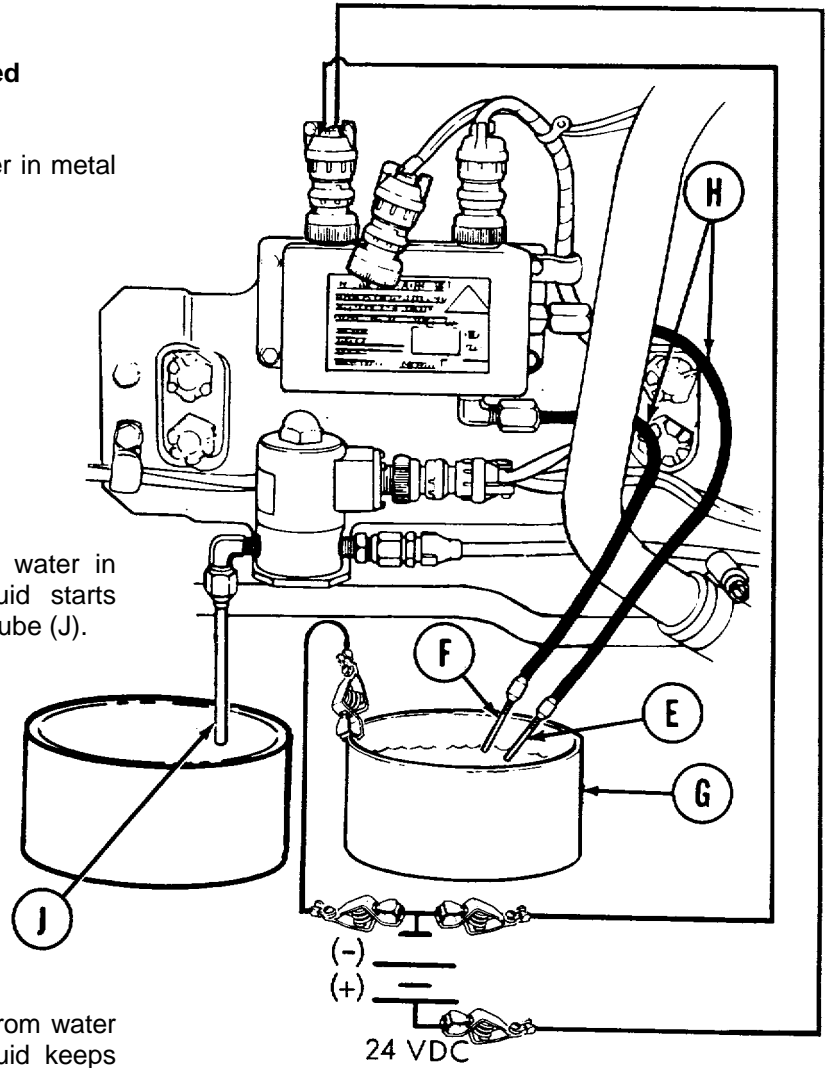
**NOTE**

Steps 8 thru 11 must be performed within 15 seconds.

8. Hold tip of lower (F) sensor probe in water in metal container (G).

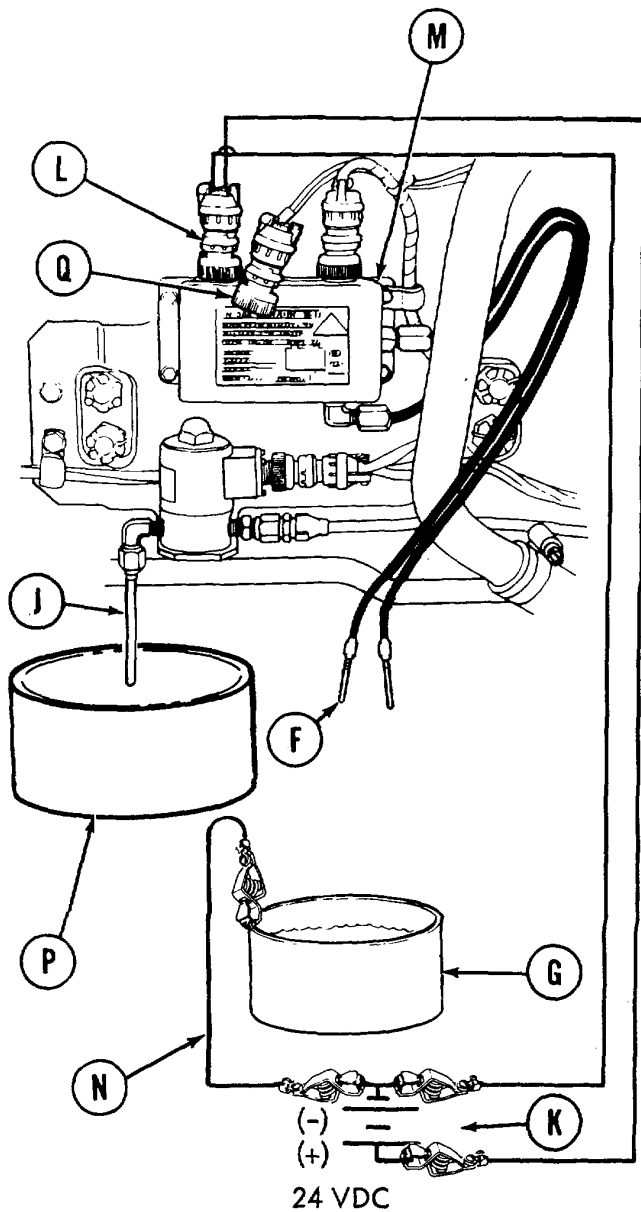
9. Hold tip of upper (E) sensor probe in water in metal container (G) and check if fluid starts draining from solenoid drain valve drain tube (J).

10. Remove tip of upper (E) sensor probe from water in metal container (G) and check if fluid keeps draining from solenoid drain valve drain tube (J).



FUEL-WATER SEPARATOR OPERATIONAL TESTS (2D ENGINE) (Sheet 10 of 11)

11. Remove tip of lower (F) sensor probe from water in metal container (G) before 15 seconds have gone by from time of putting it in and check if fluid stops draining from solenoid drain valve drain tube (J).



12. If fluid does not start draining (step 9), does not keep draining (step 10), or does not stop draining (step 11), refer to troubleshooting procedures (page 4-256).
13. Disconnect cable (Figure F-7, Appendix F) from both terminals of power source (K).
14. Disconnect connector (L) at fuel-water separator control box (M).
15. Disconnect cable (N) (Figure F-8, Appendix F) from power source (K).
16. Disconnect cable (N) (Figure F-8, Appendix F) from metal container (G).
17. Remove metal container (P) from under solenoid drain valve drain tube (J).
18. Using pliers, connect engine electrical harness connector (Q) to fuel-water separator control box (M) by turning clockwise.

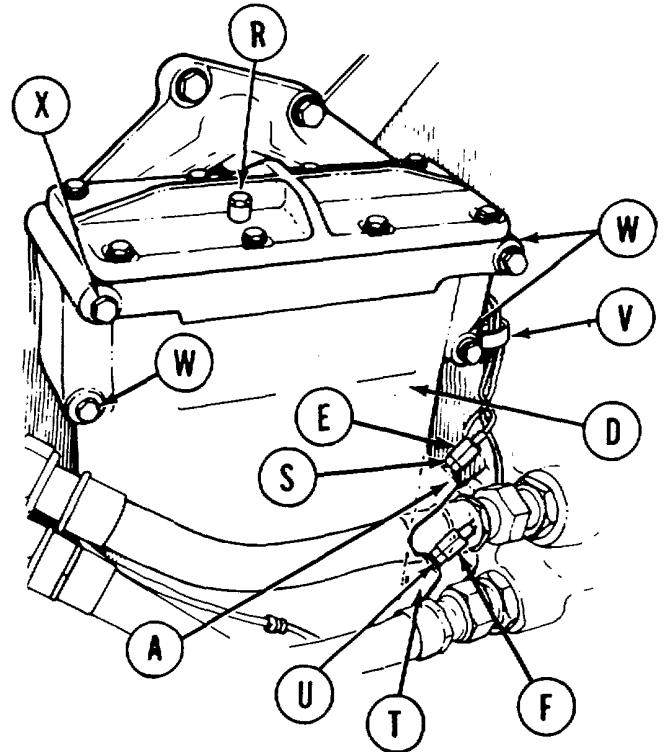
**FUEL-WATER SEPARATOR OPERATIONAL TESTS (2D ENGINE) (Sheet 11 of 11)**

19. Using 7/16 inch wrench if required, close bleed cap (R) until snug by turning clockwise.
20. Using adjustable wrench, remove pipe plug from upper sensor hole (A).
21. Using 1/2 inch wrench, install sensor retaining nut (S).

**NOTE**

**Upper sensor (E) is longer than lower sensor (F).**

22. Using 1/2 inch wrench to hold sensor retaining nut (S), use 9/16 inch wrench and install upper sensor (E) into fuel-water separator (D).
23. Using adjustable wrench, remove pipe plug from lower sensor hole (T).
24. Using 1/2 inch wrench, install sensor retaining nut (U).
25. Using 1/2 inch wrench to hold sensor retaining nut (U), use 9/16 inch wrench and install lower sensor (F) into fuel-water separator (D).
26. Position clamp (V) onto fuel-water separator and, using 1/2 inch socket, install three capscrews, new lockwashers, and flat washers (W).
27. Using 1/2 inch socket, tighten capscrew (X).
28. Install powerplant (page 5-40).
29. Purge fuel system (page 7-10).





**FUEL-WATER SEPARATOR FLUID PRESSURE FILTER REPLACEMENT (Sheet 1 of 7)**

PROCEDURE INDEX

PROCEDURE	PAGE
Removal	7-257
Installation	7-260
Test	7-262

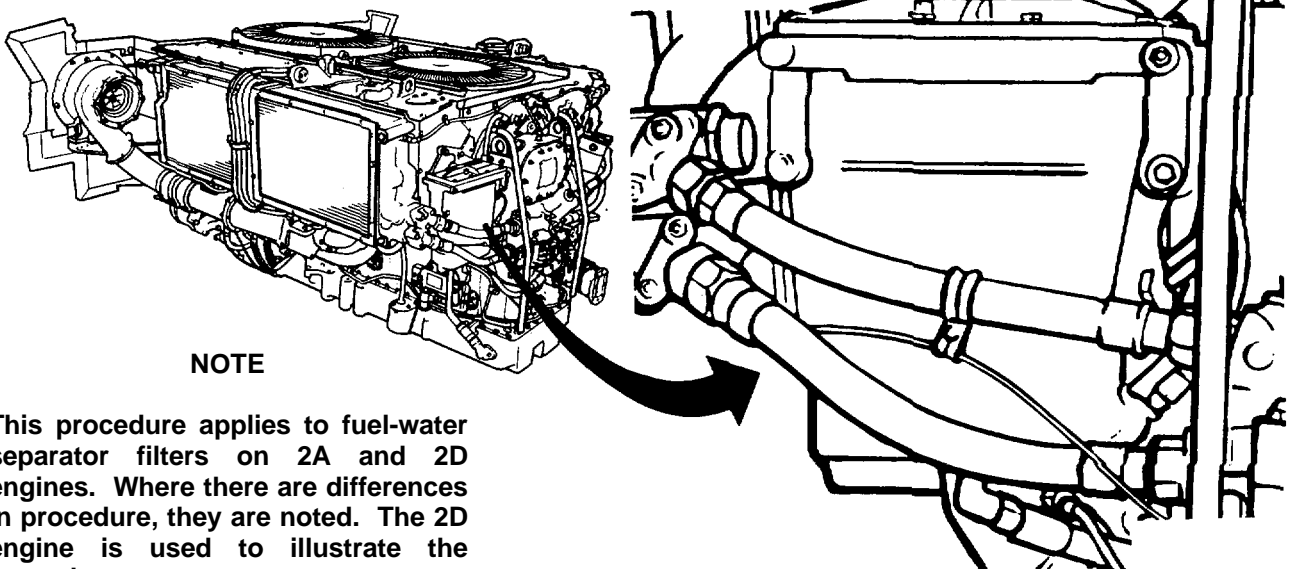
**TOOLS:** 1/2 in. socket with 1/2 in. drive  
 5 in. extension with 1/2 in. drive  
 Ratchet with 1/2 in. drive  
 7/16 in. combination box and open end wrench  
 7/8 in. combination box and open end wrench  
 9/16 in. combination box and open end wrench  
 Hammer  
 1/8 in. drive punch

**SPECIAL TOOLS:** Ground hop kit (Item 30, Chapter 3, Section I)

**SUPPLIES:** Drip pan  
 Rags (Item 65, Appendix D)  
 Masking tape (Item 57, Appendix D)  
 Plastic barrier material (Item 41, Appendix D)  
 Tags  
 Lockwasher (MS35338-45) (4 required)

**REFERENCE:** TM 9-2350-260-10

**PRELIMINARY PROCEDURE:** Remove powerplant (page 5-1)



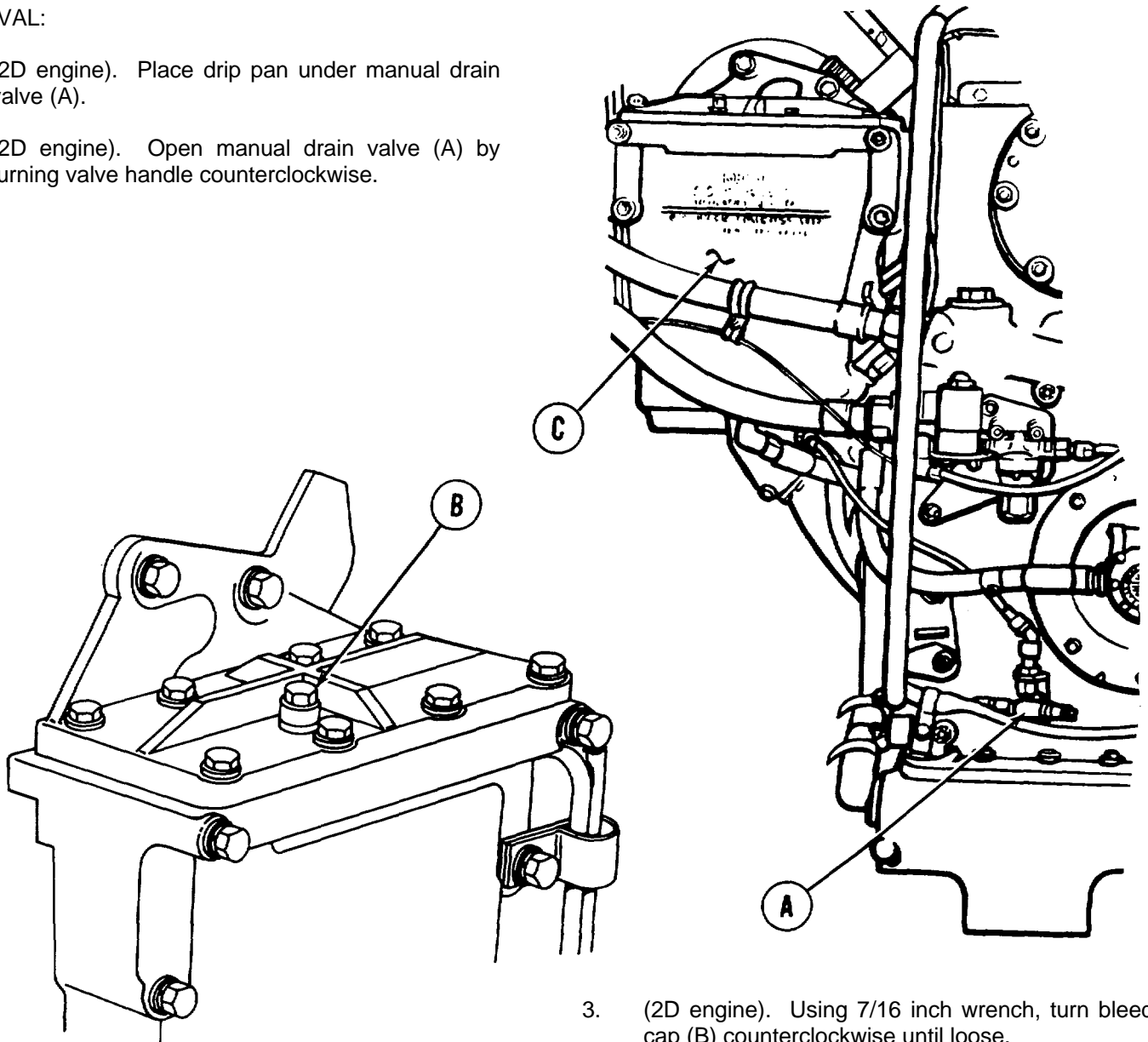
**NOTE**

This procedure applies to fuel-water separator filters on 2A and 2D engines. Where there are differences in procedure, they are noted. The 2D engine is used to illustrate the procedures.

## FUEL-WATER SEPARATOR FLUID PRESSURE FILTER REPLACEMENT (Sheet 2 of 7)

### REMOVAL:

1. (2D engine). Place drip pan under manual drain valve (A).
2. (2D engine). Open manual drain valve (A) by turning valve handle counterclockwise.

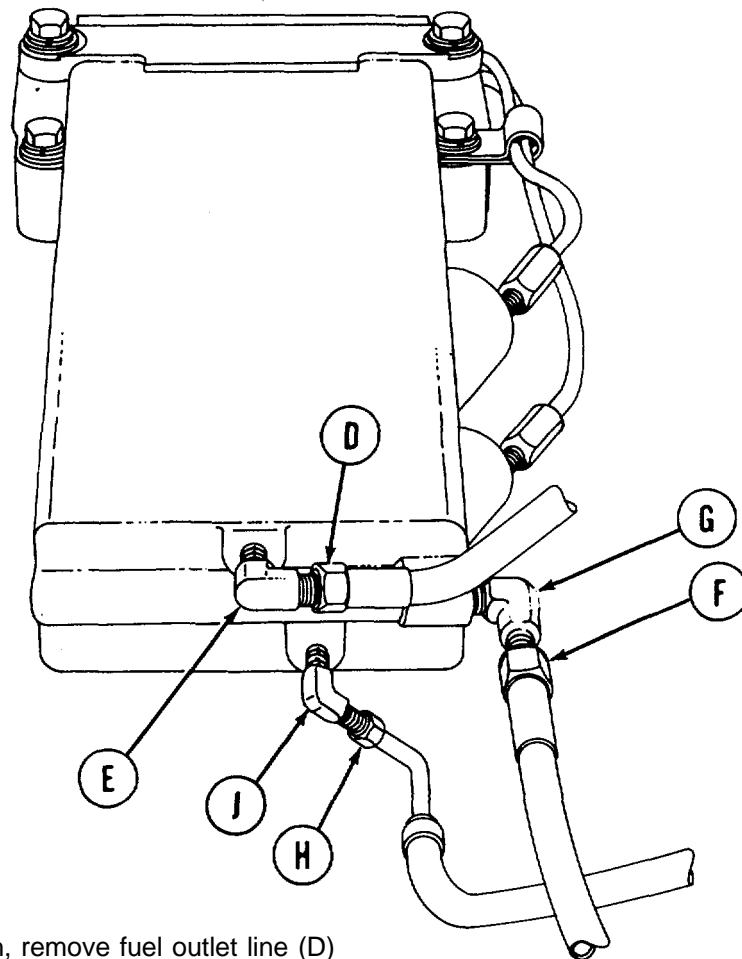


3. (2D engine). Using 7/16 inch wrench, turn bleed cap (B) counterclockwise until loose.
4. (2D engine). Allow fuel in fuel-water separator filter (C) to drain through manual drain valve (A).
5. (2D engine). Using 7/16 inch wrench, turn bleed cap (B) clockwise until snug.
6. Place drip pan under fuel-water separator filter (C).

Go on to Sheet 3

TA148332

## FUEL-WATER SEPARATOR FLUID PRESSURE FILTER REPLACEMENT (Sheet 3 of 7)



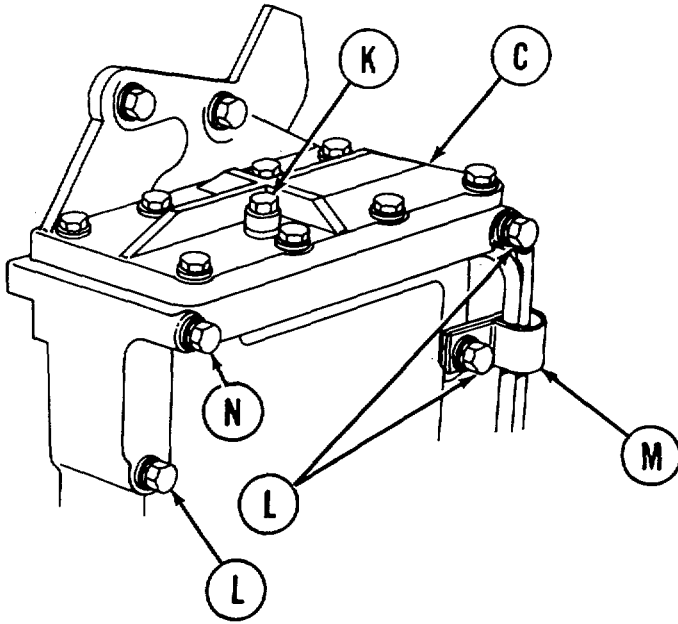
VIEW FROM BOTTOM OF FILTER  
(SHOWN REMOVED FROM ENGINE  
FOR CLARITY)

7. Using 7/8 inch wrench, remove fuel outlet line (D) from elbow (E).
8. Using plastic barrier material (Item 41, Appendix D) and tape (Item 57, Appendix D) seal openings of fuel outlet line (D) and elbow (E).
9. Using 7/8 inch wrench, remove fuel inlet line (F) from elbow (G).
10. Using plastic barrier material (Item 41, Appendix D) and tape (Item 57, Appendix D) seal openings of fuel inlet line (F) and elbow (G).
11. Using 9/16 inch wrench, remove condensate drain line (H) from elbow (J).

Go on to Sheet 4

TA148333

FUEL-WATER SEPARATOR FLUID PRESSURE FILTER REPLACEMENT (Sheet 4 of 7)



NOTE

It may be necessary to tap sensor just above threaded portion of adapter with 1/8 inch punch and hammer.

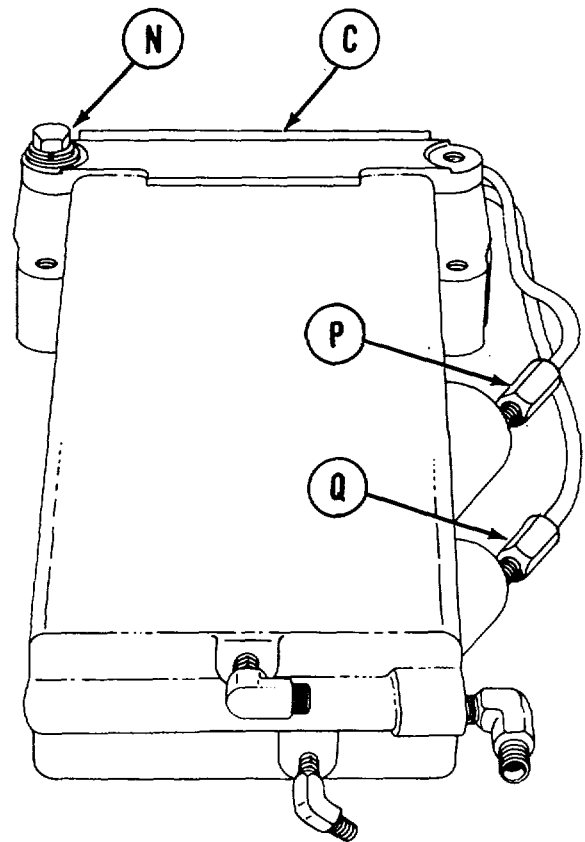
15. Using socket, loosen capscrew (N) to provide movement of fuel-water separator filter (C).

NOTE

Go to step 20 if you have a 2A engine.

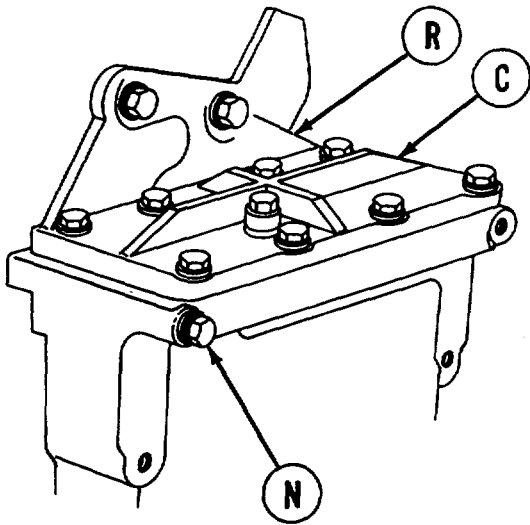
16. Using 9/16 inch wrench, remove upper sensor (P) from fuel-water separator filter (C).
17. Tag upper sensor (P) to make sure of correct installation.
18. Using 9/16 inch wrench, remove lower sensor (Q) from fuel-water separator filter (C).
19. Tag lower sensor (Q) to make sure of correct installation.

12. Using 7/16 inch wrench, turn bleed cap (K) counterclockwise until loose. Let fuel-water filter drain.
13. Using socket, remove three capscrews, lockwashers, and flat washers (L). Throw lockwashers away.
14. (2D engine). Remove clamp (M) from filter (C).



VIEW FROM BOTTOM OF FILTER  
(SHOWN REMOVED FROM ENGINE  
FOR CLARITY)

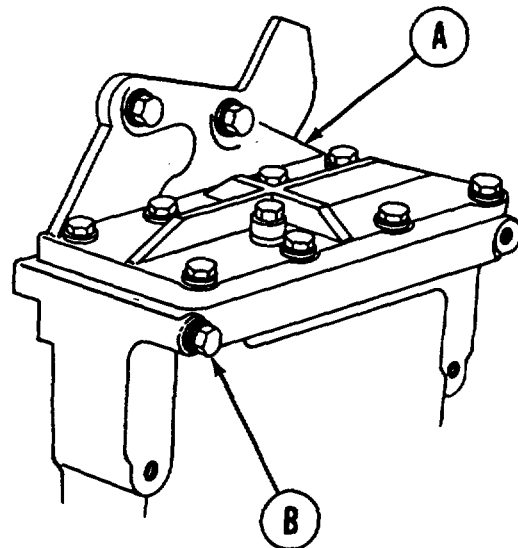
**FUEL-WATER SEPARATOR FLUID PRESSURE FILTER REPLACEMENT (Sheet 5 of 7)**



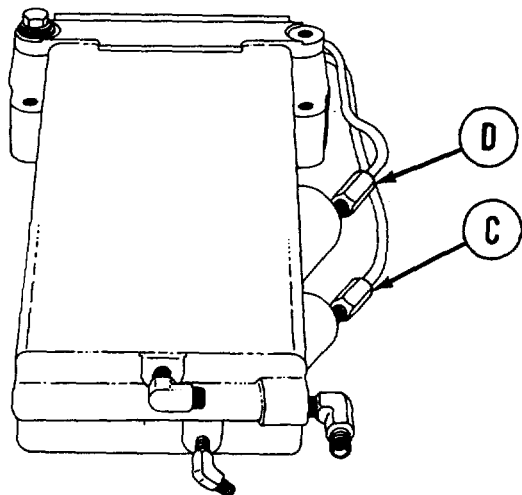
20. Support fuel-water separator filter (C) to keep it from falling.
21. Using socket, remove capscrew, lockwasher, and flat washer (N). Throw lockwasher away.
22. Lift fuel-water separator filter (C) away from mounting bracket (R).

**INSTALLATION:**

1. Position fuel-water separator filter on mounting bracket (A).
2. Using socket, loosely install capscrew, new lockwasher, and flat washer (B).



3. (2D engine). Using 9/16 inch wrench, install lower sensor (C) in fuel-water separator filter. Remove tag.
4. (2D engine). Using 9/16 inch wrench, install upper sensor (D) in fuel-water separator filter. Remove tag.

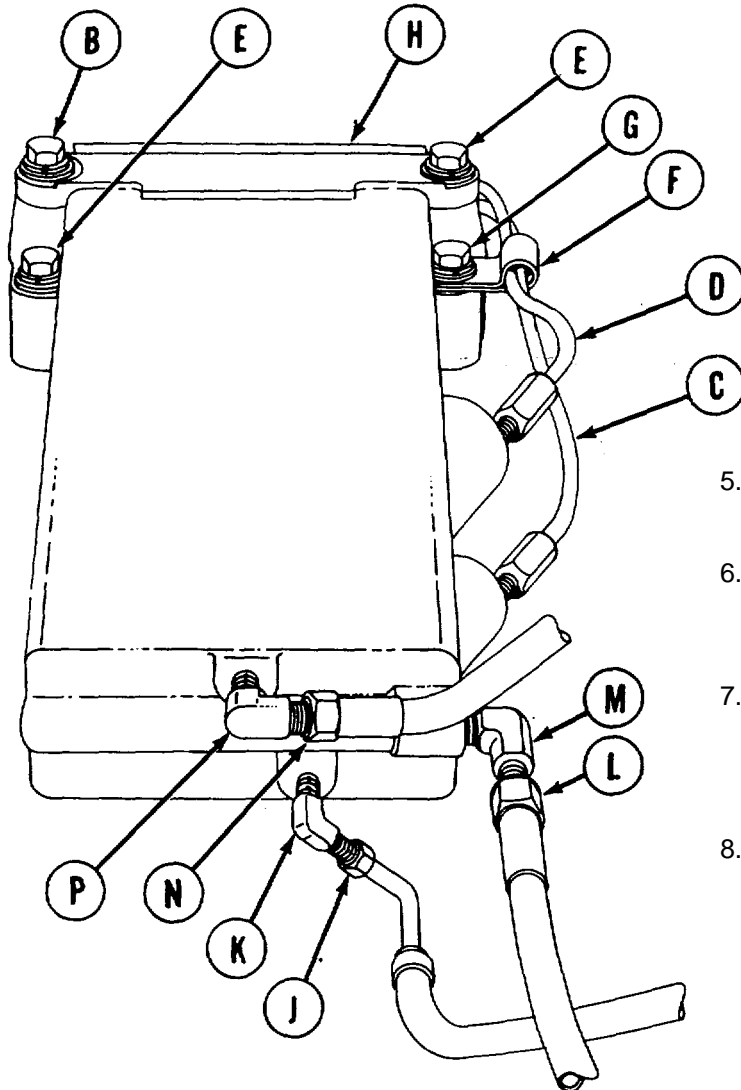


**VIEW FROM BOTTOM OF FILTER  
(SHOWN REMOVED FROM ENGINE  
FOR CLARITY)**

Go on to Sheet 6

TA148335

FUEL-WATER SEPARATOR FLUID PRESSURE FILTER REPLACEMENT (Sheet 6 of 7)



5. Using socket, install two cap screws, new lockwashers and flat washers (E).
6. (2A engine). Install cap screw, new lockwasher, and flat washer (G) onto fuel-water separator filter (H).
7. (2D engine). Position clamp (F) around sensor wires (C) and (D) and, using socket, install cap screw, new lockwasher, flat washer (G), and clamp (F) onto fuel-water separator filter (H).
8. Using socket, tighten cap screw (B).

**VIEW FROM BOTTOM OF FILTER  
(SHOWN REMOVED FROM ENGINE  
FOR CLARITY)**

9. Using 9/16 inch wrench, install condensate drain line (J) to elbow (K).
10. Remove plastic barrier material and tape from opening of fuel inlet line (L) and elbow (M).
11. Using 7/8 inch wrench, install fuel line (L) to elbow (M).
12. Remove plastic barrier material and tape from openings of fuel outlet line (N) and elbow (P).
13. Using 7/8 inch wrench, install outlet line (N) to elbow (P).

Go on to Sheet 7

TA148336

**FUEL-WATER SEPARATOR FLUID PRESSURE FILTER REPLACEMENT (Sheet 7 of 7)**

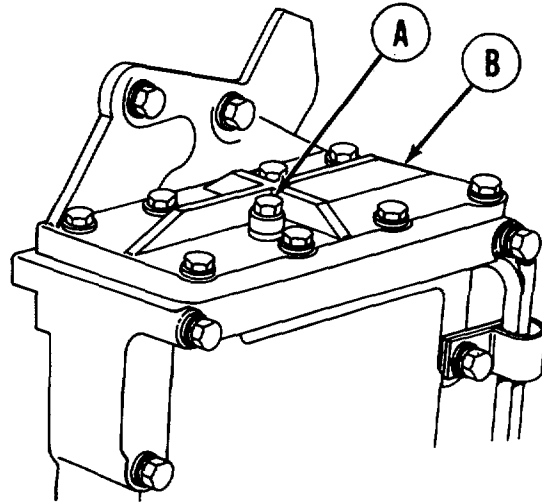
14. Using rags (Item 65, Appendix D), wipe bottom of fuel-water separator filter and connecting lines clean of fuel.
15. Remove drip pan.

**NOTE**

**If you have replaced fuel-water separator on 2A engine, do steps 2, 7, and 9 thru 12. If 2D engine fuel-water separator was replaced, do all 12 steps.**

**TEST:**

1. Perform operational check of automatic drain (page 7-246).
2. Connect engine for powerplant ground hop (page 5-54).
3. Using 7/16 inch wrench, open bleed cap (A).
4. Set FUEL PUMPS switch to ON (TM 9-2350-260-10).
5. Set MASTER CONTROL switch to ON (TM 9-2350-260-10). Watch bleed cap (A) of fuel water separator filter (B) for air release (bubbles).



6. Set MASTER CONTROL switch to OFF (TM 9-2350-260-10). After about one minute, repeat step 4. When constant fuel flow is seen, go to step 7.

**NOTE**

**It may be necessary to perform steps 4 and 5 several times until constant fuel flow (no bubbles) from bleed cap (A) is observed.**

7. Check for leaks and tighten or replace components as necessary.
8. Using 7/16 inch wrench, turn fuel-water separator bleed cap (A) to the right until snug.
9. Set FUEL PUMPS switch to OFF (TM 9-350-260-10).
10. Set MASTER CONTROL switch to OFF (TM 9-2350-260-10).
11. Disconnect engine from powerplant ground hop (page 5-67).
12. Install 2A powerplant (page 5-14) or 2D powerplant (page 5-40).

End of Task

TA148337

**PRIMARY FUEL FILTER REPLACEMENT (2A ENGINE) (Sheet I of 4)**

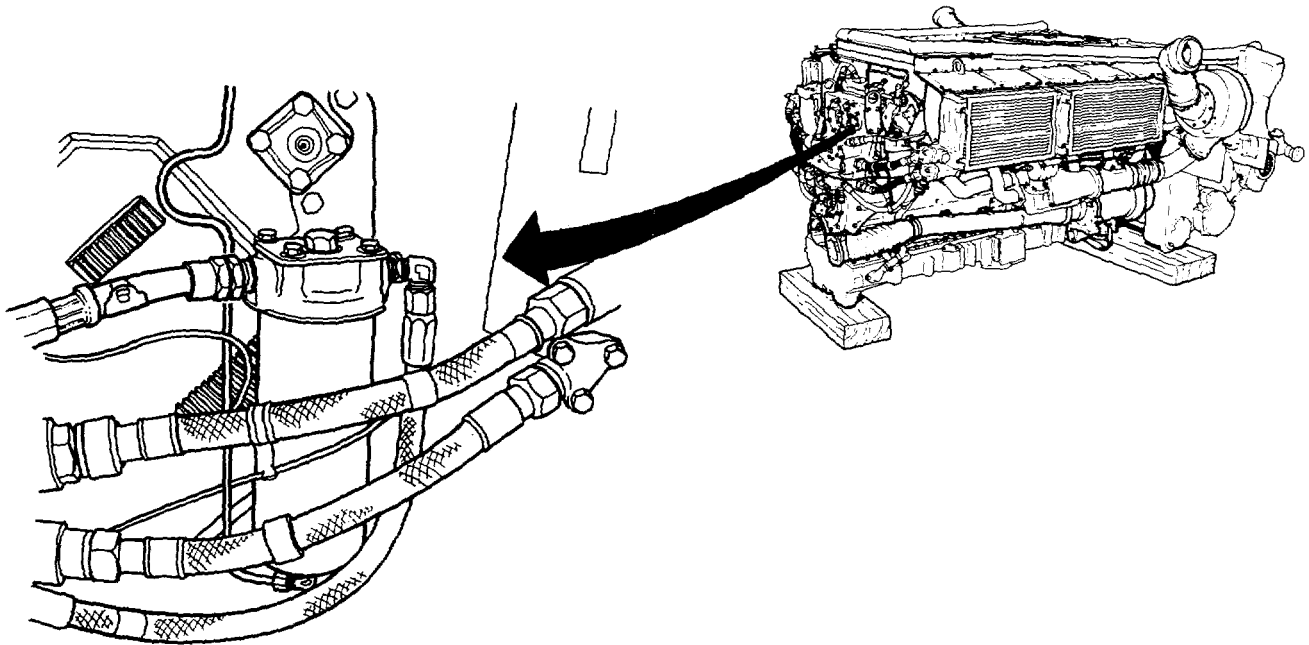
PROCEDURE INDEX

PROCEDURE	PAGE
Removal	7-264
Installation	7-265

TOOLS: 5/8 in. combination box and open end wrench  
 7/16 in. combination box and open end wrench  
 1-3/16 in. open end wrench  
 7/8 in. combination box and open end wrench  
 Adjustable wrench  
 15/16 in. combination box and open end wrench  
 15/16 in. socket with 1/2 in. drive  
 Hinged handle with 1/2 in. drive  
 9/16 in. combination box and open end wrench

SUPPLIES: Container (approx. 1 quart)  
 Dry cleaning solvent (Item 54, Appendix D)  
 Lockwashers (MS35338-46) (4 required)

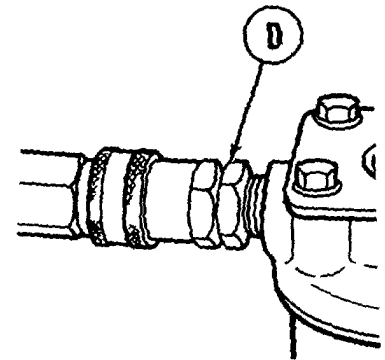
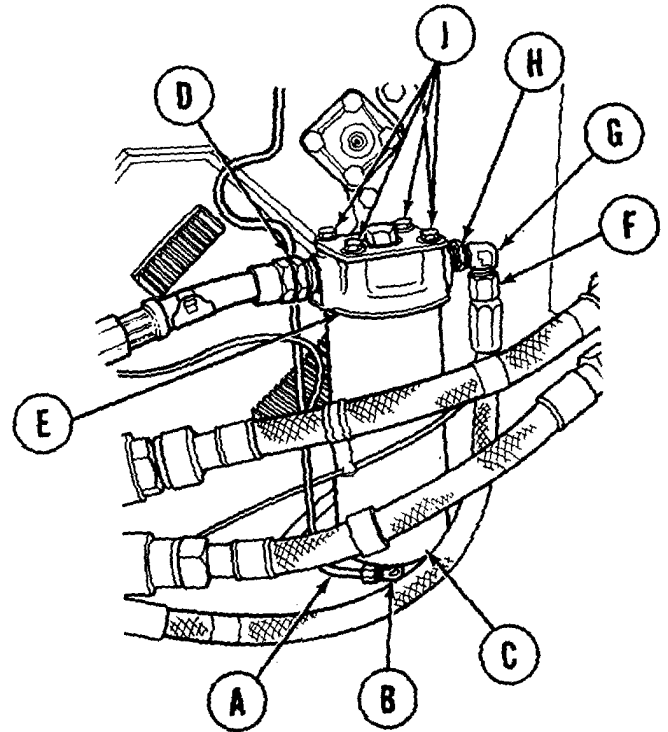
PRELIMINARY PROCEDURE: Remove powerplant (page 5-2)





**PRIMARY FUEL FILTER REPLACEMENT (2A ENGINE) (Sheet 2 of 4)****REMOVAL:**

1. Place container under filter assembly and, using 5/8 inch wrench, remove line (A) from elbow (B).
2. Using 7/16 inch wrench, remove elbow (B) from body (C).
3. Using 1-3/16 inch wrench, remove adapter and coupling (D) from filter head (E).
4. Using 7/8 inch wrench, remove hose assembly (F) from elbow (G).
5. Using adjustable wrench on elbow (G), and holding reducer (H) with 15/16 inch wrench, remove elbow (G) from reducer (H).
6. Using 15/16 inch socket and breaker bar on reducer (H), remove reducer from filter head (E).
7. Using 9/16 inch wrench, remove four screws and lockwashers (J) and move filter assembly from engine. Throw lockwashers away.

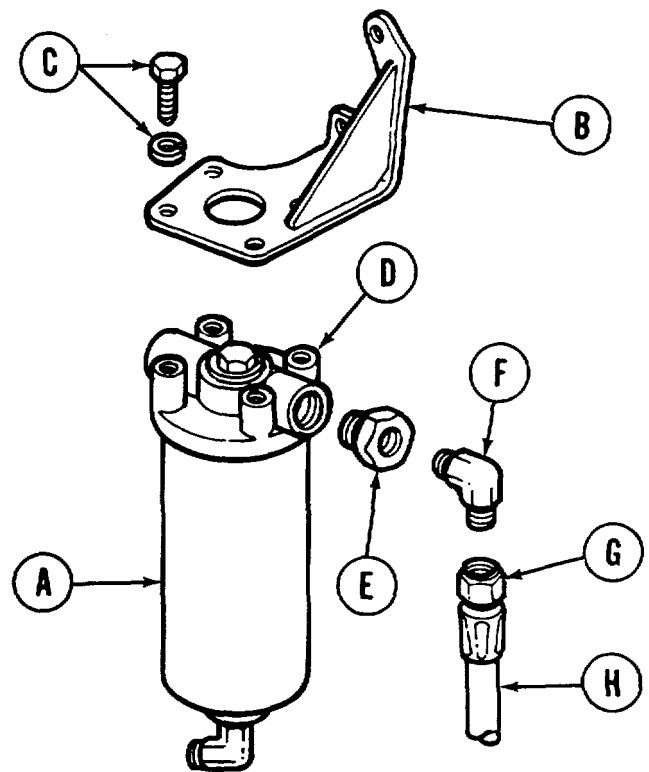


Go on to Sheet 3

TA148339

**PRIMARY FUEL FILTER REPLACEMENT (2A ENGINE) (Sheet 3 of 4)****INSTALLATION:****NOTE****IN port goes to your right**

1. Aline filter assembly (A) with holes in mounting bracket (B).
2. Install four screws and new lockwashers (C) through bracket (B) into filter head (D). Using 9/16 inch wrench, tighten screws.
3. Install reducer (E) into filter head (D). Using 15/16 inch socket, tighten reducer (E).
4. Install elbow (F) into reducer (E) and, using adjustable wrench, tighten elbow (F) into reducer (E).
5. Install nipple (G) end of hose assembly (H) onto elbow (F). Using 7/8 inch wrench on nipple (G), tighten nipple onto elbow (F).

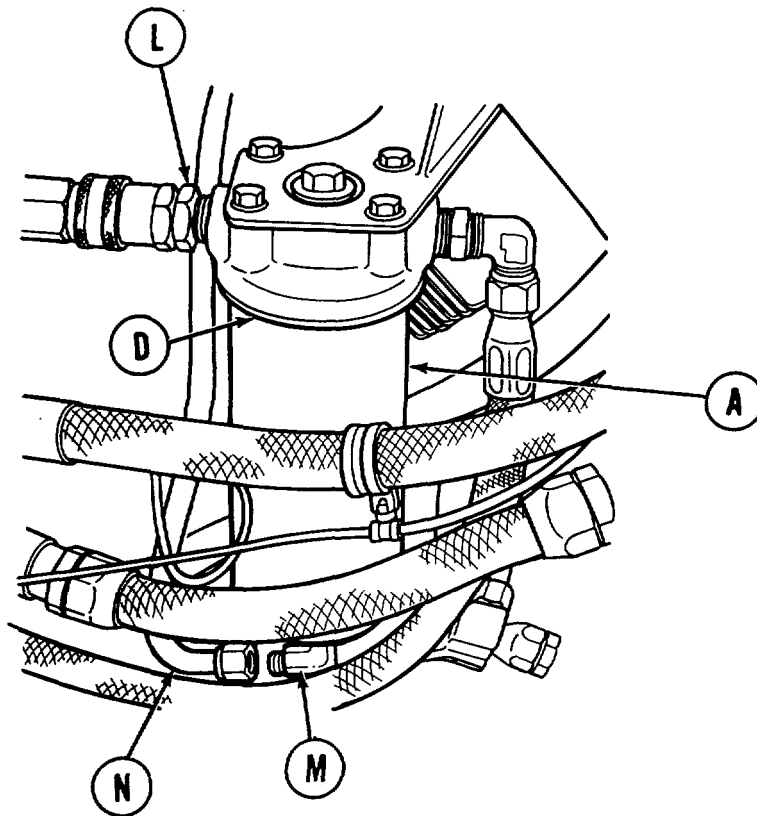
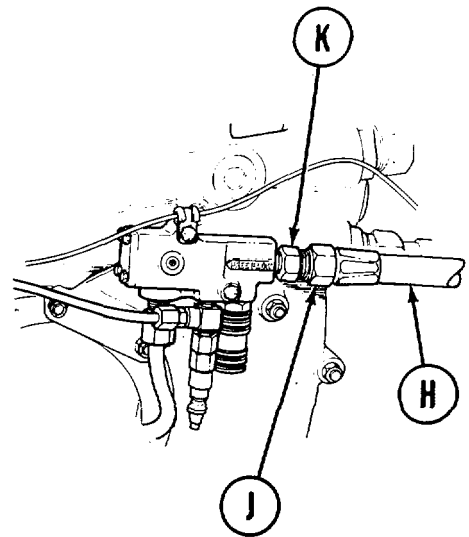


Go on to Sheet 4

TA148340

**PRIMARY FUEL FILTER REPLACEMENT (2A ENGINE) (Sheet 4 of 4)**

6. Install nipple (J) end of hose assembly (H) onto adapter (K). Using 7/8 inch wrench on nipple (J) tighten nipple (J) onto adapter (K).
7. Install adapter (L) into filter head (D). Using 1-3/16 inch wrench on adapter (L), tighten adapter (L) into filter head (D).
8. Using adjustable wrench, install elbow (M) to body (A).
9. Using 5/8 inch wrench, install tube (N) on elbow (M).
10. Install powerplant (page 5-14).



End of Task

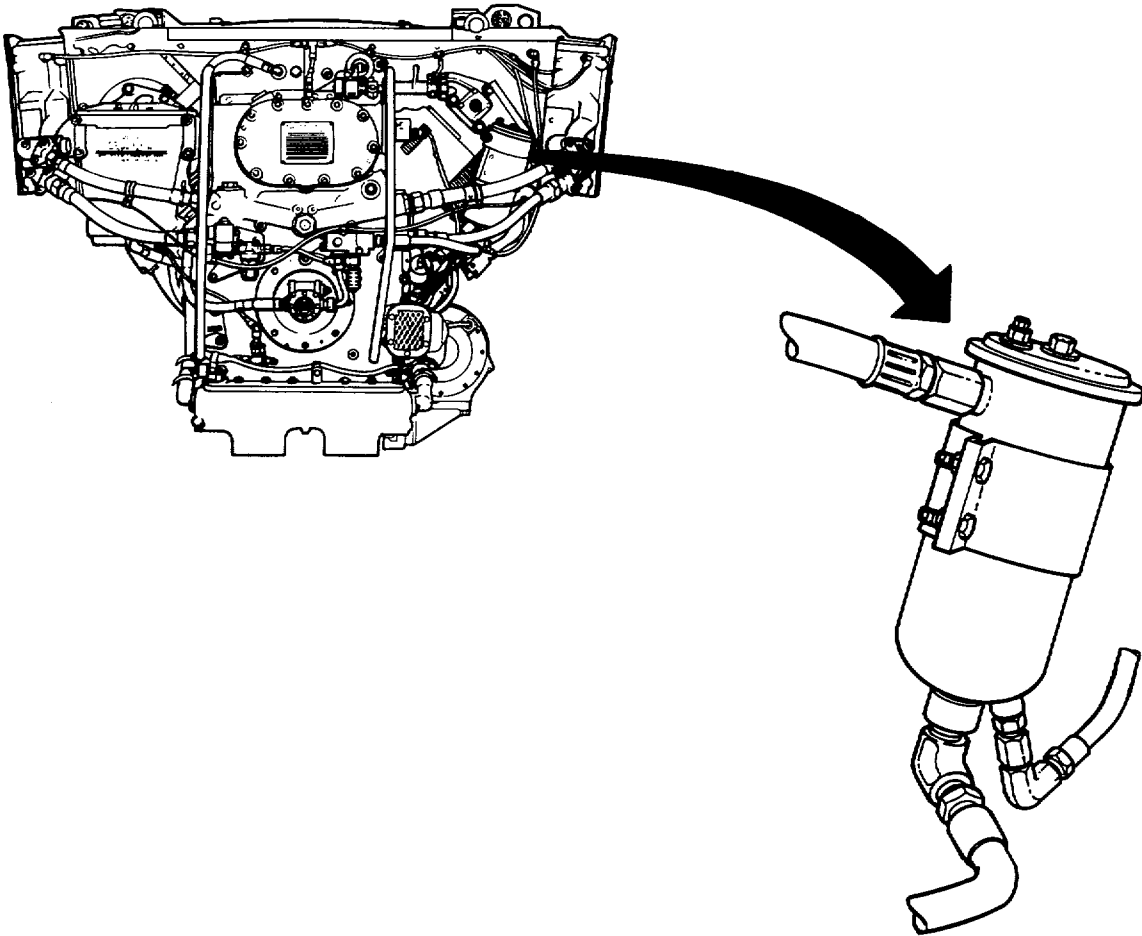
TA148341

**PRIMARY FUEL FILTER REPLACEMENT (2D ENGINE) (Sheet 1 of 3)**

**TOOLS:** 1/2 in. socket, with 1/2 in. drive  
 Ratchet with 1/2 in. drive  
 1/2 in. combination box and open end wrench  
 7/8 in. combination box and open end wrench  
 11/16 in. combination box and open end wrench  
 9/16 in. combination box and open end wrench

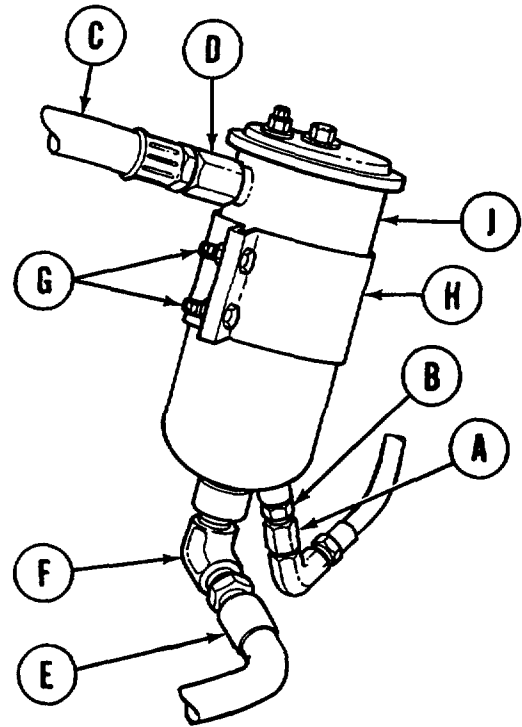
**SUPPLIES:** Sealing compound (Item 28, Appendix D)  
 Gallon can

**PRELIMINARY PROCEDURE:** Remove 2D powerplant (page 5-27)



**PRIMARY FUEL FILTER REPLACEMENT (2D ENGINE) (Sheet 2 of 3)****REMOVAL:**

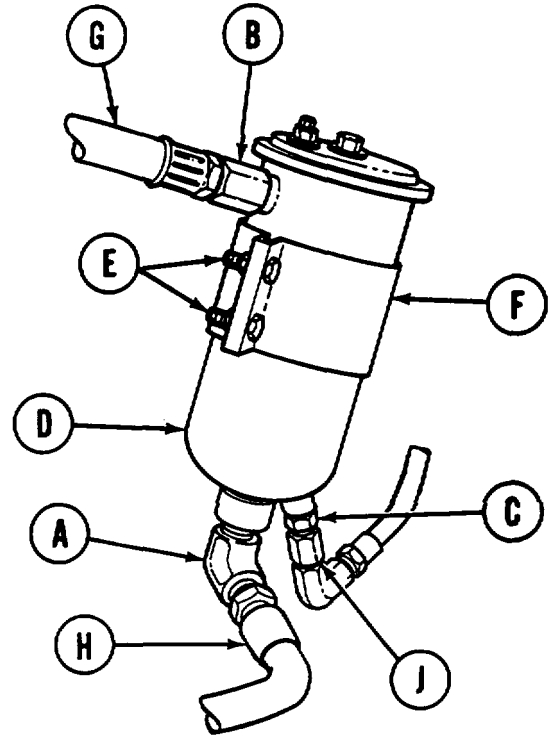
1. Using container, catch fuel drainage from disconnected lines.
2. Using 9/16 wrench, disconnect connector (A) from connector filter (B).
3. Using 7/8 inch wrench, disconnect fuel inlet hose (C) from fuel inlet adapter (D).
4. Using 7/8 inch wrench, disconnect fuel outlet hose (E) from fuel outlet elbow (F).
5. Using socket and 1/2 inch wrench, loosen bolts (G) on bracket (H).
6. Remove primary fuel filter (J).
7. Using 7/8 inch wrench, remove fuel inlet adapter (D).



8. Using 3/4 inch wrench, remove fuel outlet elbow (F).
9. Using 9/16 inch wrench, remove connector filter (B) from fuel filter (J).

**PRIMARY FUEL FILTER REPLACEMENT (20D ENGINE) (Sheet 3 of 3)****INSTALLATION:**

1. Lightly coat elbow assembly fittings with sealing compound (Item 28, Appendix D).
2. Using 3/4 inch wrench, install fuel outlet elbow (A).
3. Using 7/8 inch wrench, install fuel inlet adapter (B).
4. Using 9/16 inch wrench, install connector filter (C) to primary fuel filter (D).
5. Install primary fuel filter (D).
6. Using socket and 1/2 inch wrench, tighten bolts (E) on bracket (F).
7. Using 7/8 inch wrench, connect fuel inlet hose (G) to fuel inlet adapter (B).
8. Using 7/8 inch wrench, connect fuel outlet hose (H) to fuel outlet elbow (A).
9. Using 9/16 inch wrench, connect connector (J) to connector filter (C).
10. Purge fuel system and check for leaks (page 7-10).
11. Install 2D powerplant (page 5-40).



End of Task

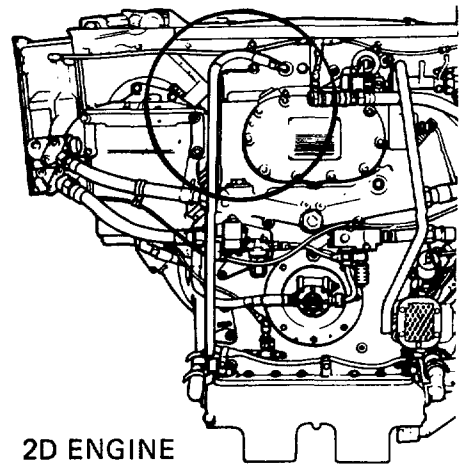
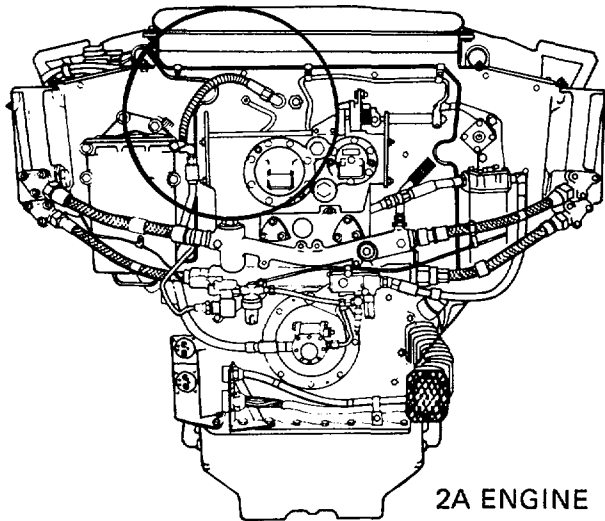
TA148344

**FUEL-WATER SEPARATOR FUEL FILTER OUTLET HOSE ASSEMBLY REPLACEMENT (Sheet 1 of 3)**

**TOOLS:** 7/8 in. combination box and open end wrench  
9/16 in. combination box and open end wrench

**SUPPLIES:** Rags (Item 65, Appendix D)  
Sealing compound (Item 27, Appendix D)  
Drain pan  
Dry cleaning solvent (Item 54, Appendix D)

**PRELIMINARY PROCEDURES:** Remove powerplant (page 5-1)  
Drain fuel-water separator fuel filter (page 7-257)

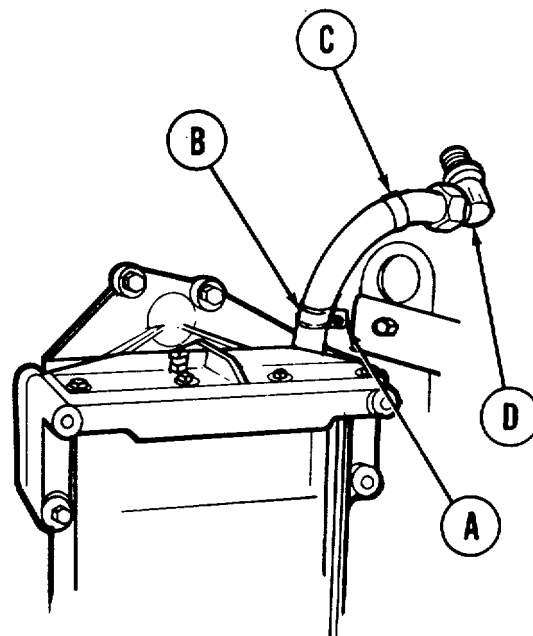


Go on to Sheet 2

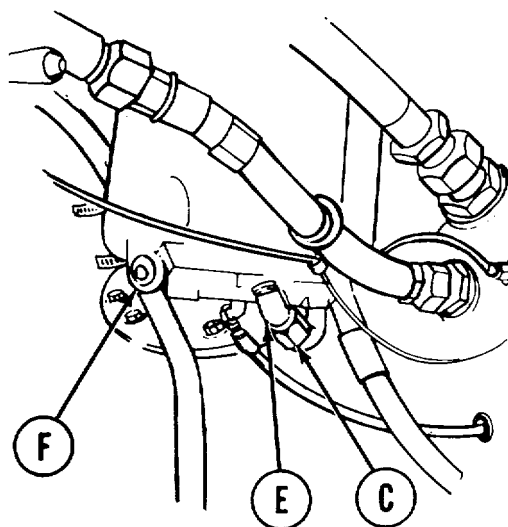
TA148345

**FUEL-WATER SEPARATOR FUEL FILTER OUTLET HOSE ASSEMBLY REPLACEMENT (Sheet 2 of 3)****REMOVAL:**

1. Using 9/16 inch wrench, remove self-locking nut (A) and hose clamp (B) from hose assembly (C). Throw self-locking nut away.
2. Using 7/8 inch wrench, remove hose assembly (C) from bulkhead elbow (D).
3. Using 7/8 inch wrench, remove hose assembly (C) from elbow (E) of fuel-water separator fuel filter outlet elbow (F).

**CLEANING AND INSPECTION:**

1. Using clean rags (Item 65, Appendix D) and dry cleaning solvent (Item 54, Appendix D), clean hose amp thoroughly.
2. Inspect hose clamp for wear or damage.
3. Inspect bulkhead elbow and fuel-water separator fuel filter outlet elbow for stripped threads.
4. Replace defective parts as required.



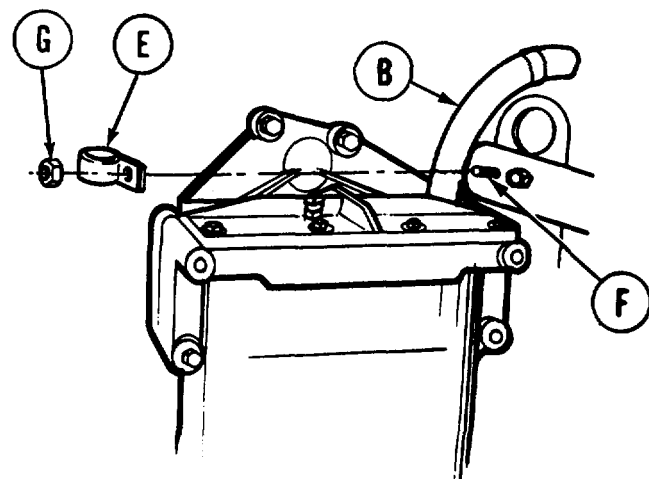
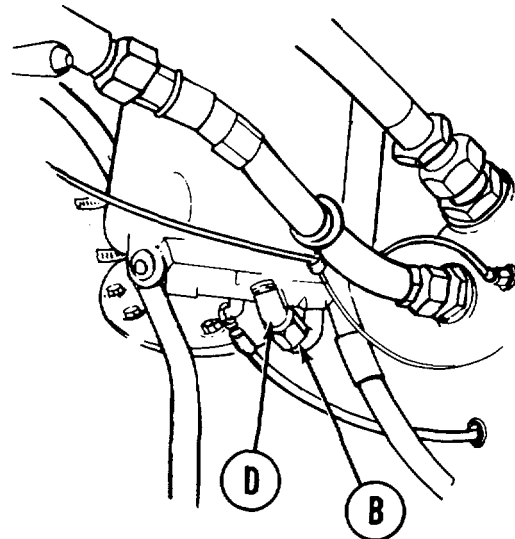
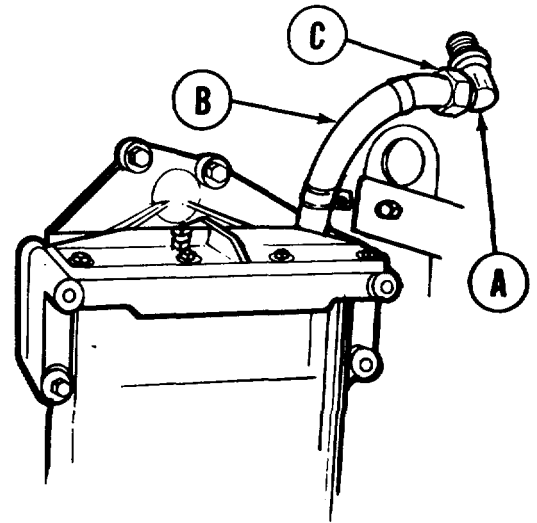
Go on to Sheet 3

TA148346



**FUEL-WATER SEPARATOR FUEL FILTER OUTLET HOSE ASSEMBLY REPLACEMENT (Sheet 3 of 3)****INSTALLATION:**

1. Coat threads of bulkhead elbow (A) with sealing compound (Item 27, Appendix D).
2. Using fingers, install hose assembly (B) on bulkhead elbow (A).
3. Using 7/8 inch wrench, tighten nut (C) of hose assembly (B) on bulkhead elbow (A).
4. Coat threads of fuel-water separator fuel filter outlet elbow (D) with sealing compound (Item 27, Appendix D).
5. Using fingers, install hose assembly (B) on fuel-water separator fuel filter outlet elbow (D).
6. Using 7/8 inch wrench, tighten nut of hose assembly (B) on fuel-water separator fuel filter outlet elbow (D).
7. Using fingers, install hose clamp (E) on hose assembly (B).
8. Using fingers, install hose clamp (E) and hose assembly (B) on mounting stud (F).
9. Using 9/16 inch wrench, install new self-locking nut (G) on hose clamp (E) and mounting stud (F).
10. Perform powerplant test run (page 5-65).
11. Install 2A powerplant (page 5-14) or 2D powerplant (page 5-40).



End of Task

TA148347

**FUEL PUMP-TO-FUEL-WATER SEPARATOR HOSE ASSEMBLY REPLACEMENT (Sheet 1 of 5)**

PROCEDURE INDEX

PROCEDURE	PAGE
Removal	7-274
Inspection	7-275
Installation	7-276
Test	7-276

TOOLS: 7/16 in. combination box and open end wrench  
 13/16 in. combination box and open end wrench  
 7/8 in. combination box and open end wrench

SPECIAL TOOLS: Ground hop kit (Item 30, Chapter 3, Section I)

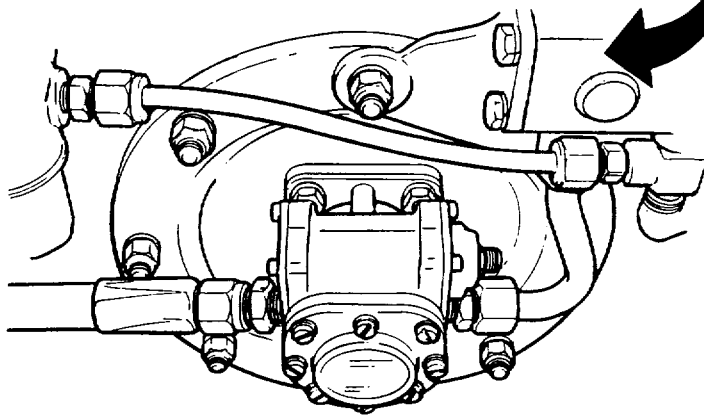
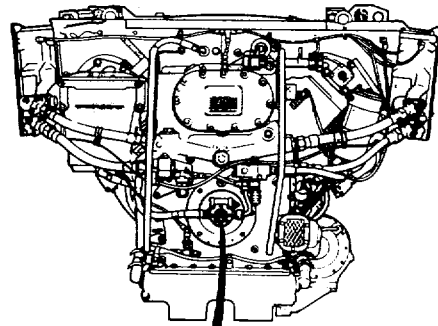
SUPPLIES: Rags (Item 65, Appendix D)  
 Drain pan

PERSONNEL: Two

PRELIMINARY PROCEDURE: Remove powerplant (page 5-1)

**NOTE**

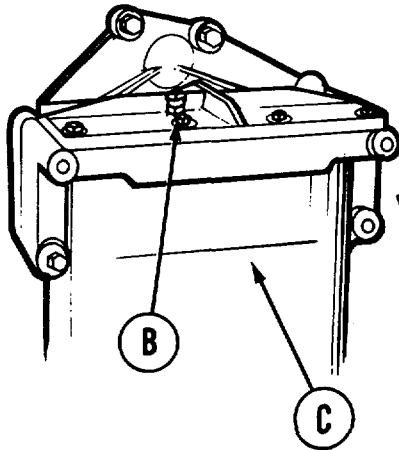
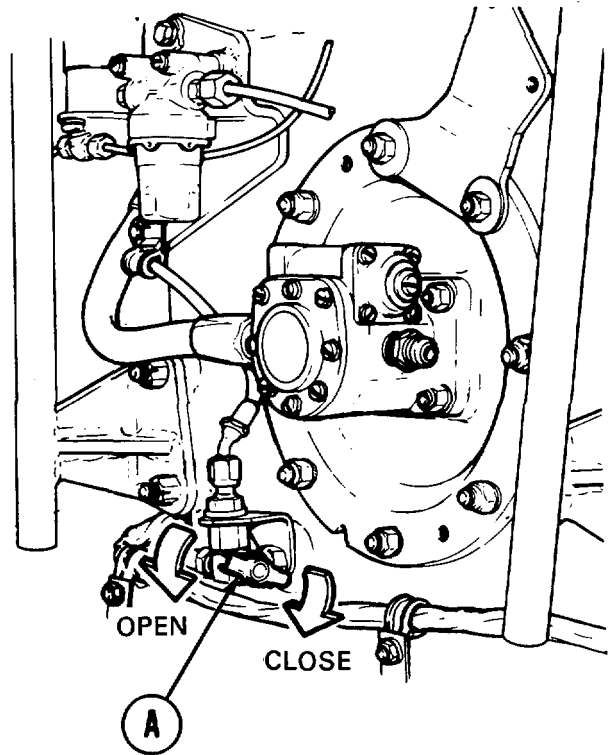
**2D engine is shown. Procedures for 2A engine are similar.**



**FUEL PUMP-TO-FUEL-WATER SEPARATOR HOSE ASSEMBLY REPLACEMENT (Sheet 2 of 5)**

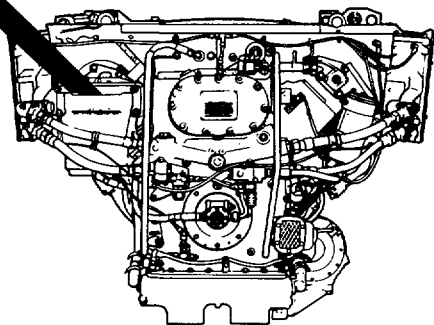
**REMOVAL:**

1. Place drain pan and rags as required under manual drain valve (A).
2. Open manual drain valve (A) by turning valve handle counterclockwise.
3. Using 7/16 inch wrench, turn fuel-water separator bleed cap (B) counterclockwise until loose.



4. Allow fuel in fuel-water separator filter (C) to drain through manual drain valve (A).
5. Using 7/16 inch wrench, turn bleed cap (B) clockwise until snug.

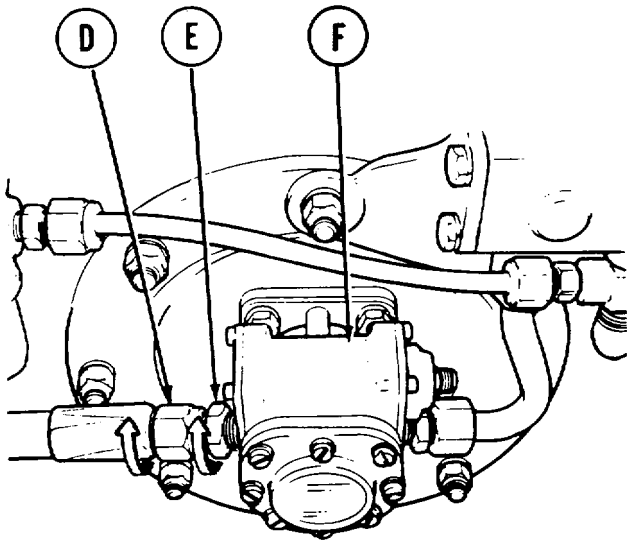
6. Close manual drain valve (A) by turning valve handle clockwise.



Go on to Sheet 3

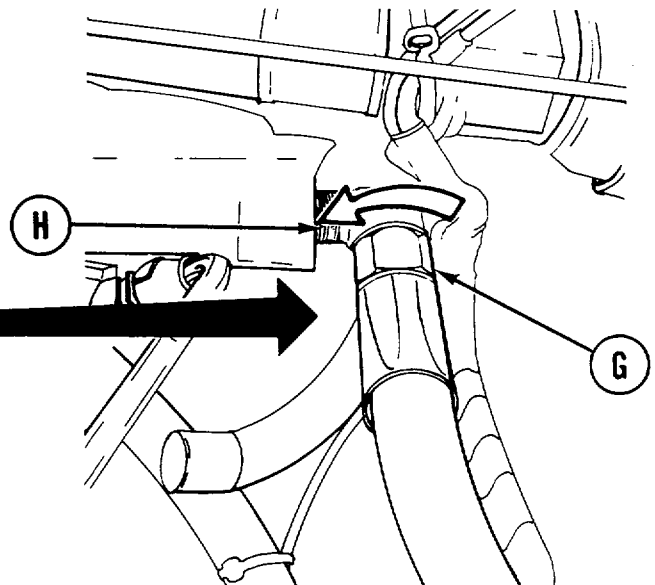
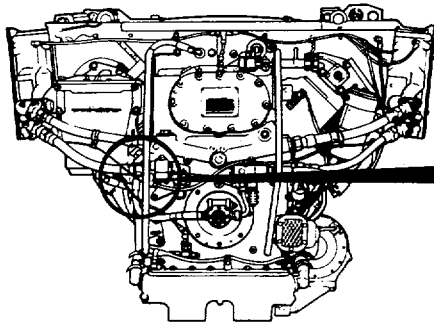
TA148349

**FUEL PUMP-TO-FUEL-WATER SEPARATOR HOSE ASSEMBLY REPLACEMENT (Sheet 3 of 5)**



7. Using 7/8 inch wrench on hose connector (D) and 13/16 inch wrench on adapter (E), remove hose connector (D) from adapter (E).
8. Using 13/16 inch wrench, remove adapter (E) from fuel pump (F).

9. Using 7/8 inch wrench, remove hose connector (G) from elbow (H).



**NOTE**

**2D engine is shown. Procedures for 2A engine are similar.**

**INSPECTION:**

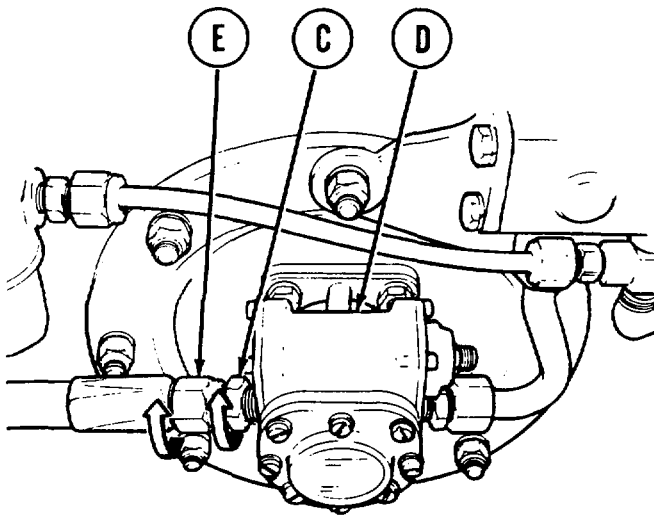
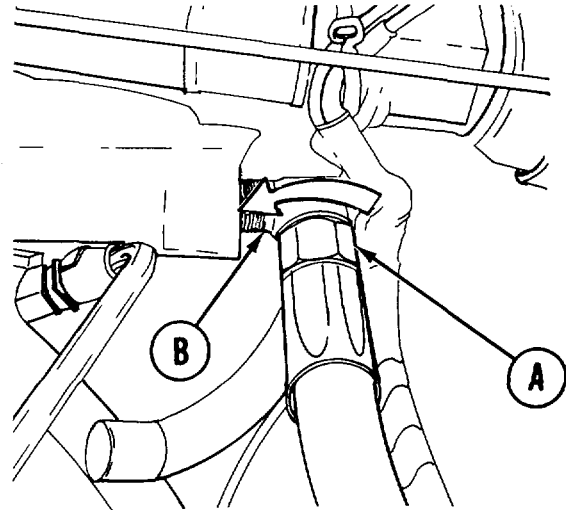
1. Check assembly components for cracks, breaks, frayed hose, crossed threads, and general serviceability.
2. Replace components as necessary.

Go on to Sheet 4

TA148350

**FUEL PUMP-TO-FUEL-WATER SEPARATOR HOSE ASSEMBLY REPLACEMENT (Sheet 4 of 5)****INSTALLATION:**

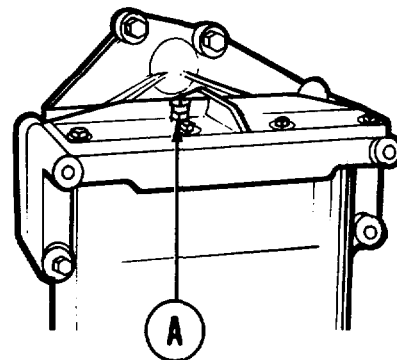
1. Using 7/8 inch wrench, install hose connector (A) to elbow (B).
2. Using 13/16 inch wrench, install adapter (C) to fuel pump (D).



3. Using 7/8 inch wrench, install hose connector (E) to adapter (C).
4. Remove drain pan and rags placed under manual drain valve.

**TEST:**

1. Connect engine for powerplant ground hop (page 5-54).
2. Using 7/16 inch wrench, turn fuel-water separator bleed cap (A) counterclockwise until loose.

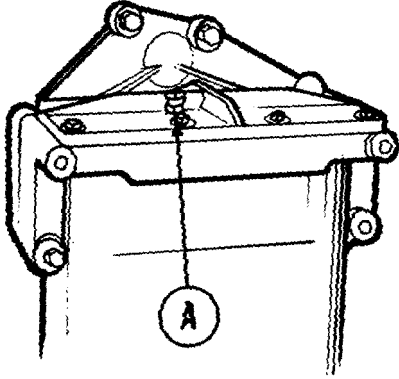


Go on to Sheet 5

TA148351

**FUEL PUMP-TO-FUEL-WATER SEPARATOR HOSE ASSEMBLY REPLACEMENT (Sheet 5 of 5)**

3. Set FUEL PUMPS switch to ON.
4. Set MASTER CONTROL switch to ON.
5. Watch fuel-water separator bleed cap (A) until air release (bubbles) appears, then set MASTER CONTROL switch to OFF.



**NOTE**

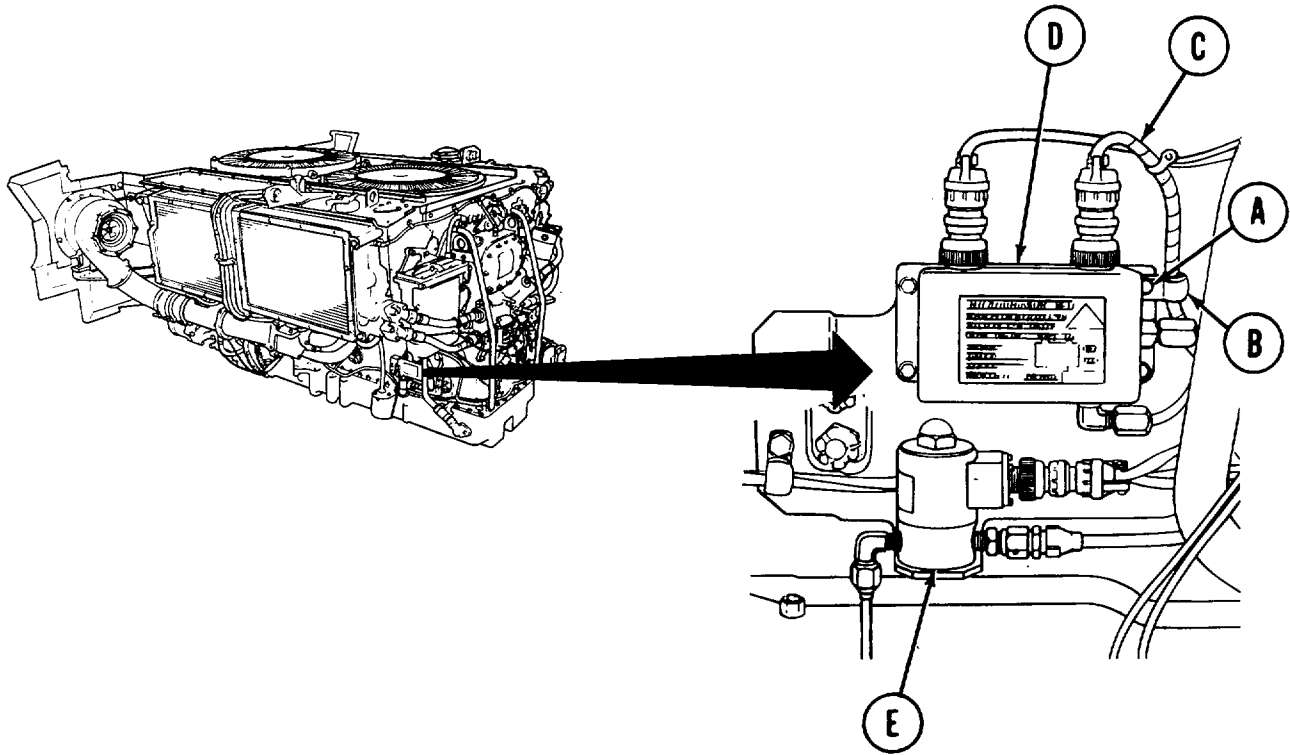
It may be necessary to perform steps 5 and 6 several times until a constant fuel flow (no bubbles) from the bleed cap (A) is observed. Two persons are required to perform steps 3, 4, and 5.

6. Wait about one minute and repeat step 4 until a constant free flow is observed at bleed cap (A).
7. Using 7/16 inch wrench, turn bleed cap (A) clockwise until snug.
8. Check for leaks. Tighten or replace components as necessary.
9. (2D engine only). Perform operational check of automatic drain (age 7-245).
10. Set MASTER CONTROL switch to OFF.
11. Disconnect engine from powerplant ground hop (page 5-67).
12. Install 2A powerplant (page 5-14) or 2D powerplant (page 5-40).

**FUEL-WATER SEPARATOR CONTROL ASSEMBLY TO FUEL-WATER SEPARATOR DRAIN SOLENOID WIRING HARNESS REPLACEMENT (2D ENGINE) (Sheet 1 of 1)**

TOOLS: 5/16 in. combination box and open end wrench  
Slip-joint pliers

PRELIMINARY PROCEDURE: Remove powerplant (page 5-27)



**REMOVAL:**

1. Using wrench, remove screw and washer (A) from clamp (B). Remove clamp from harness (C).
2. Using pliers, disconnect harness (C) from control assembly (D) and drain solenoid (E), and remove harness from powerplant.

**INSTALLATION:**

1. Connect harness (C) to control assembly (D) and drain solenoid (E) as shown.
2. Using pliers, tighten connectors on ends of harness (C).
3. Position clamp (B) around harness (C) as shown, being sure to place clamp around leads at control assembly.
4. Using wrench, install screw and washer (A) through clamp (B) into control assembly mount.
5. Install powerplant (page 540).

End of Task

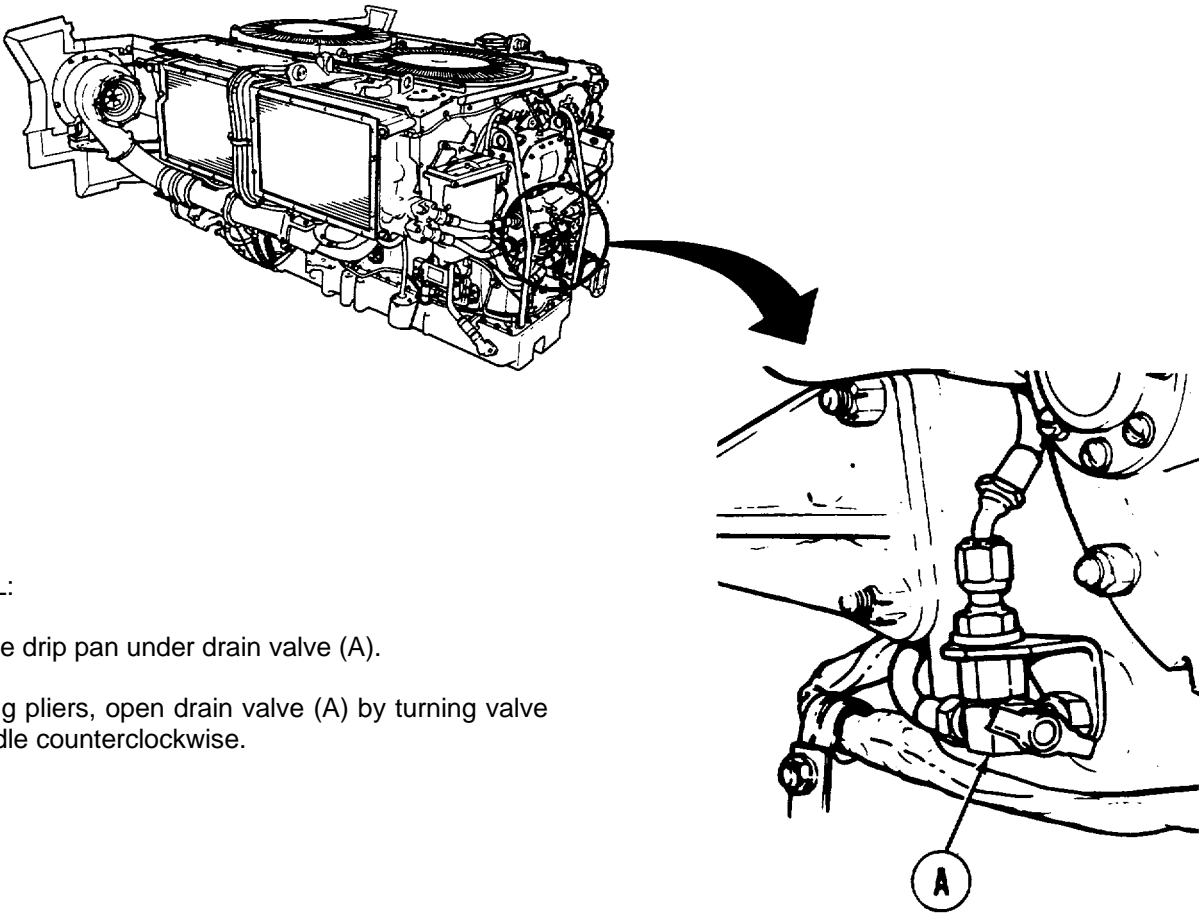
TA148353

**FUEL-WATER SEPARATOR DRAIN SOLENOID VALVE REPLACEMENT (2D ENGINE) (Sheet 1 of 3)**

**TOOLS:** 5/16 in. combination box and open end wrench  
7/16 in. combination box and open end wrench  
9/16 in. combination box and open end wrenches (2 required)  
Slip joint pliers

**SUPPLIES:** Drip pan  
Rags (Item 65, Appendix D)  
Zinc chromate primer (Item 50, Appendix D)-  
Washer (502244) (2 required)

**PRELIMINARY PROCEDURE:** Remove powerplant (page 5-27)

**REMOVAL:**

1. Place drip pan under drain valve (A).
2. Using pliers, open drain valve (A) by turning valve handle counterclockwise.

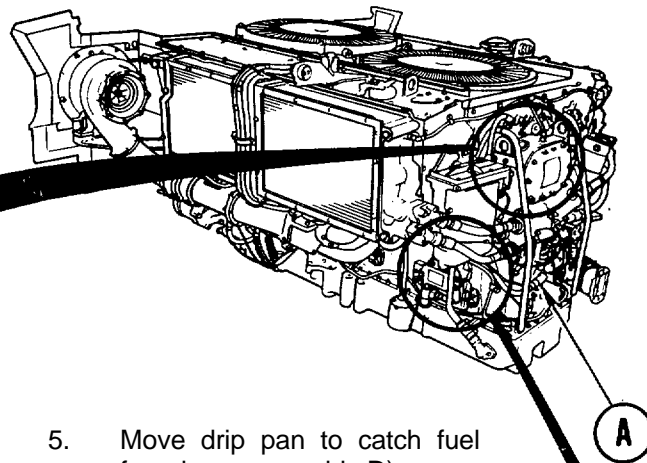
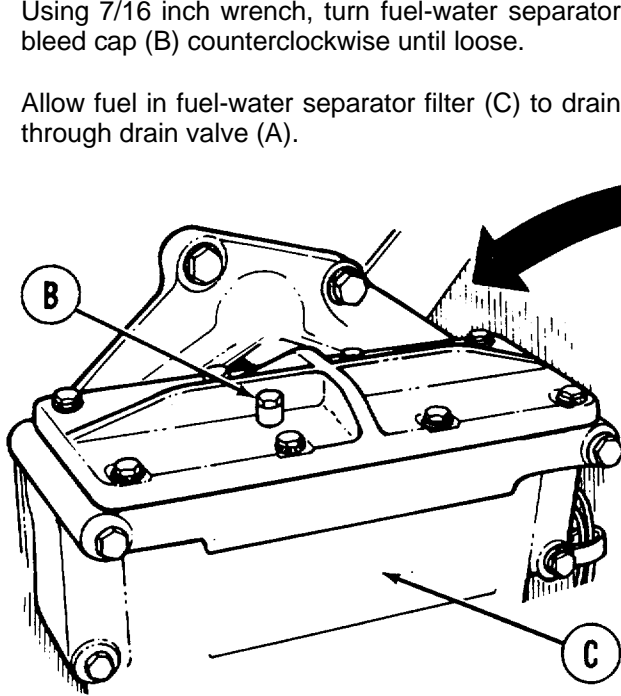
Go on to Sheet 2

TA148354



**FUEL-WATER SEPARATOR DRAIN SOLENOID VALVE REPLACEMENT (2D ENGINE) (Sheet 2 of 3)**

3. Using 7/16 inch wrench, turn fuel-water separator bleed cap (B) counterclockwise until loose.
4. Allow fuel in fuel-water separator filter (C) to drain through drain valve (A).



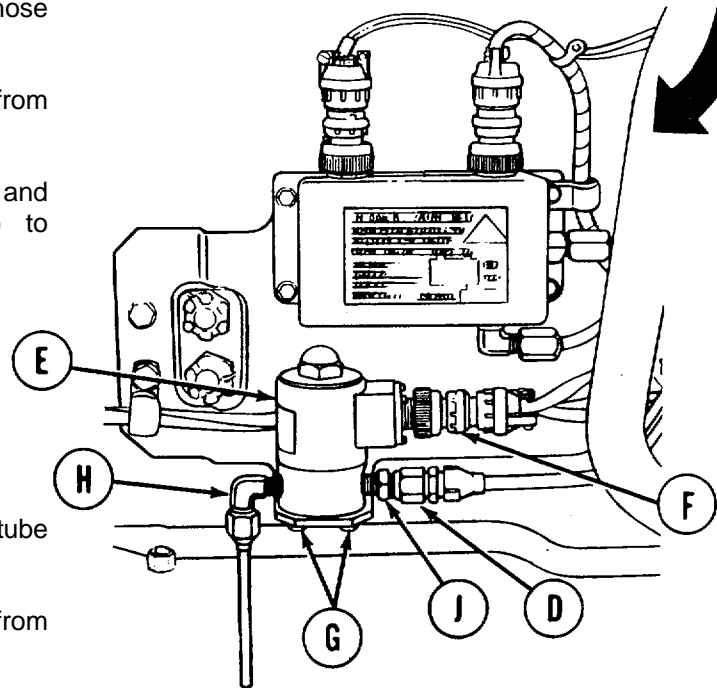
5. Move drip pan to catch fuel from hose assembly (D).

6. Using two 9/16 inch wrenches, disconnect hose assembly (D) from solenoid valve (E).
7. Using pliers, disconnect electrical lead (F) from solenoid valve (E).
8. Using 5/16 inch wrench, remove two screws and washers (G) securing solenoid valve (E) to bracket. Throw washers (G) away.
9. Remove solenoid valve (E).

**NOTE**

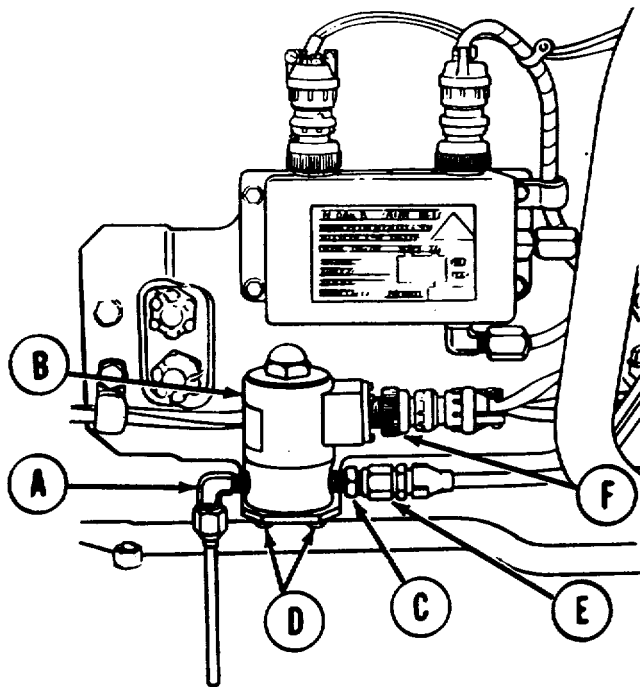
**It will be necessary to secure solenoid valve (E) in vise.**

10. Using 9/16 inch wrench, remove elbow and tube (H) as a unit from solenoid valve (E).
11. Using 9/16 inch wrench, remove adapter (J) from solenoid valve (E).



FUEL-WATER SEPARATOR DRAIN SOLENOID VALVE REPLACEMENT (20 ENGINE) (Sheet 3 of 3)

INSTALLATION:

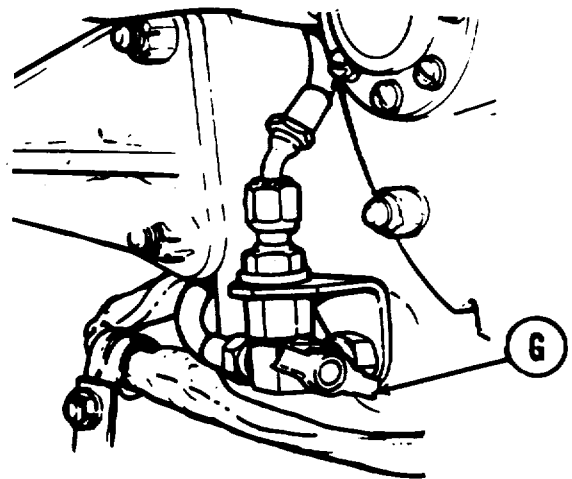
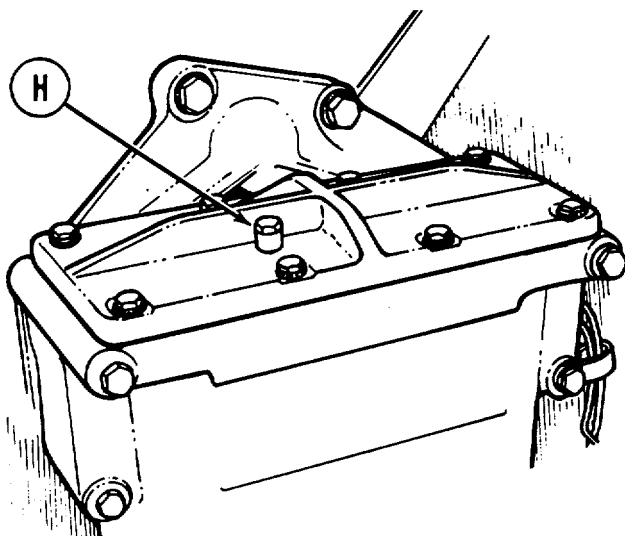


NOTE

Coat all exposed threads of adapter and elbow with zinc-chromate primer (Item 50, Appendix D) before installing.

1. Using 9/16 inch wrench, install elbow and tube (A) to solenoid valve (B).
2. Using 9/16 inch wrench, install adapter (C) on solenoid valve (B).
3. Position solenoid valve (B) to bracket
4. Using 5/16 inch wrench, install two screws and new washers (D) to secure solenoid valve (B) to bracket.
5. Using two 9/16 Inch wrenches, connect hose assembly (E) to adapter (C).
6. Connect electrical lead (F) to solenoid valve (B).

7. Close drain valve (G) by turning valve handle clockwise.



8. Using 7/16 inch wrench, turn bleed cap (H) clockwise until snug.
9. Test fuel-water separator (page 7-245, steps 1 thru 11).
10. Install powerplant (page 5-40).

End of Task

TA148356

**FUEL-WATER SEPARATOR DRAIN LINES REPLACEMENT (2D ENGINE) (Sheet 1 of 6)**

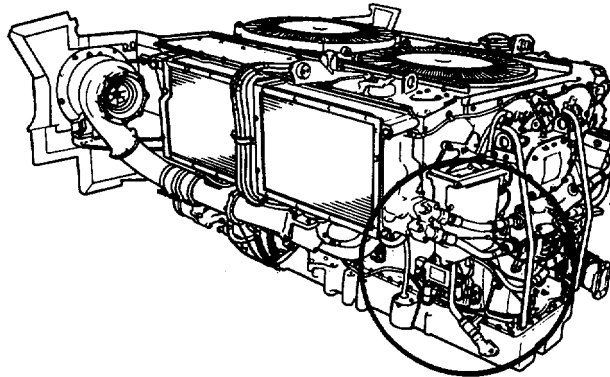
## PROCEDURE INDEX

PROCEDURE	PAGE
Removal	7-283
Installation	7-286

TOOLS: 11/16 in. combination box and open end wrench (2 required)  
 9/16 in. combination box and open end wrench  
 7/16 in. combination box and open end wrench  
 5/8 in. combination box and open end wrench  
 6 in. adjustable wrench  
 Vise  
 Slip joint pliers

SUPPLIES: Rags (Item 65, Appendix D)  
 Drip pan  
 Lockwasher (MS35337-28)

PRELIMINARY PROCEDURE: Remove powerplant (page 5-27)

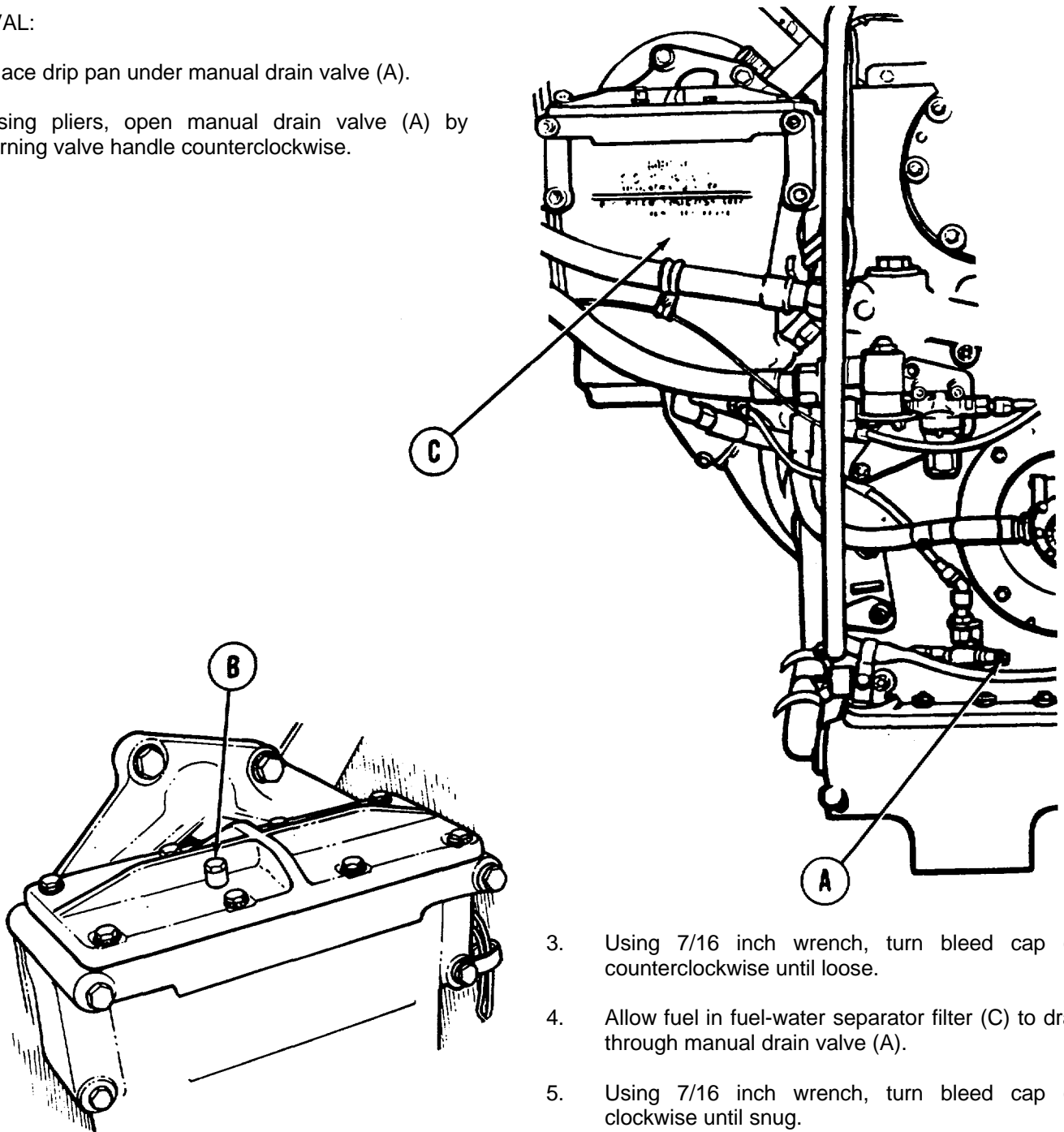
**NOTE**

**These procedures are given for the replacement of 2D engine fuel-water separator drain lines. Only perform those steps necessary to replace the defective part.**

## FUEL-WATER SEPARATOR DRAIN LINES REPLACEMENT (2D ENGINE) (Sheet 2 of 6)

### REMOVAL:

1. Place drip pan under manual drain valve (A).
2. Using pliers, open manual drain valve (A) by turning valve handle counterclockwise.

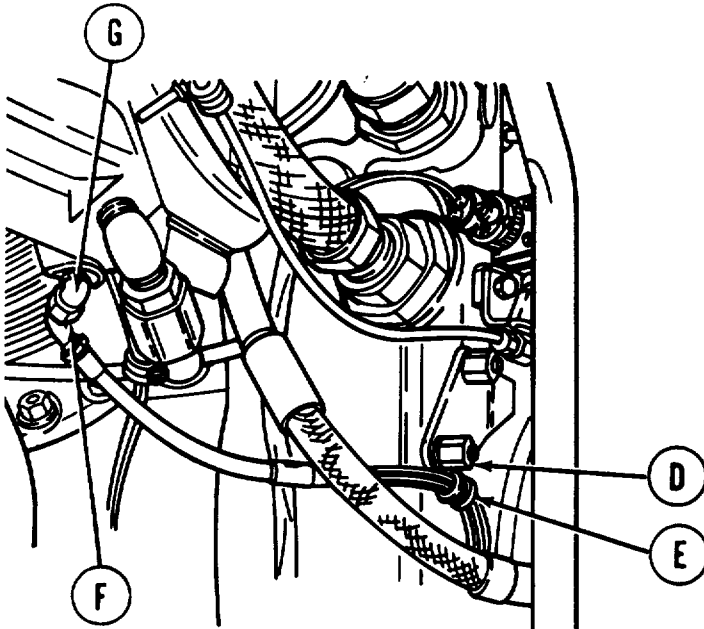


3. Using 7/16 inch wrench, turn bleed cap (B) counterclockwise until loose.
4. Allow fuel in fuel-water separator filter (C) to drain through manual drain valve (A).
5. Using 7/16 inch wrench, turn bleed cap (B) clockwise until snug.

Go on to Sheet 3

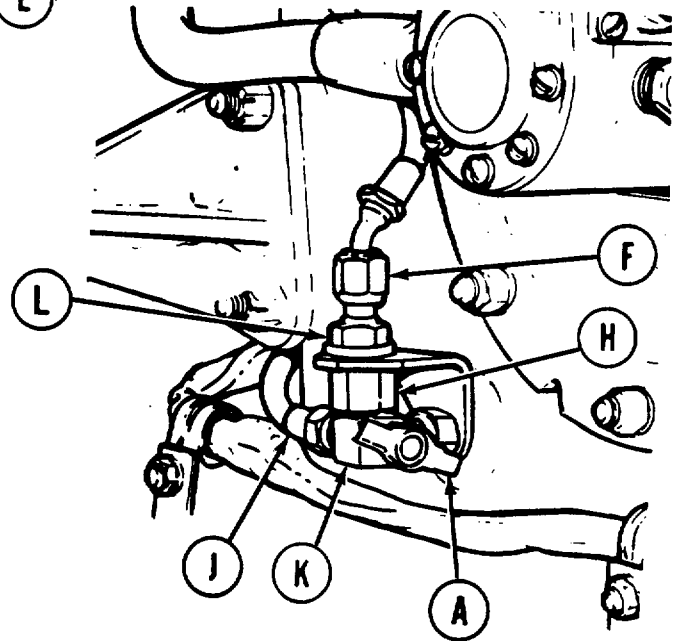
TA148358

FUEL-WATER SEPARATOR DRAIN LINES REPLACEMENT (2D ENGINE) (Sheet 3 of 6)

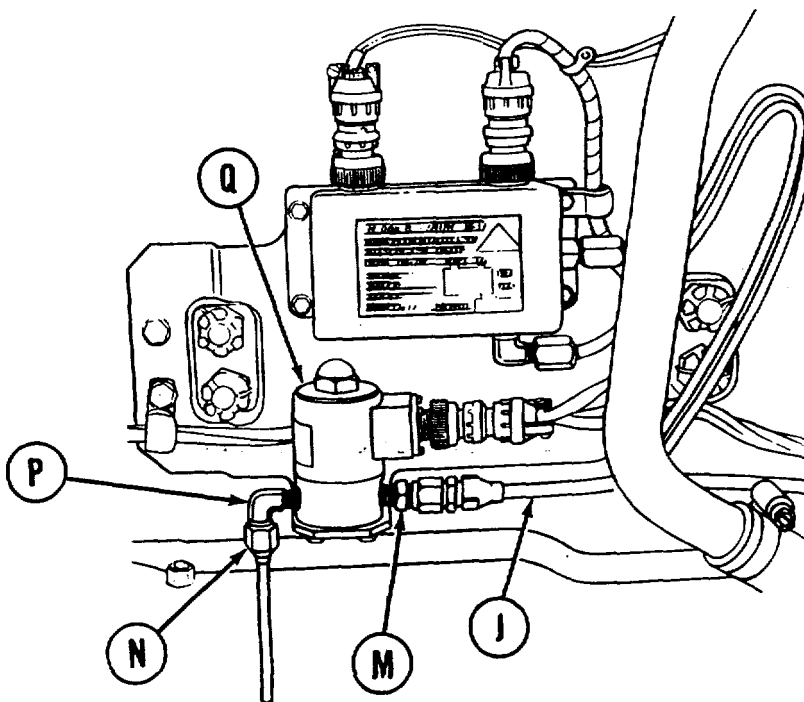


6. Using 9/16 inch wrench, remove nut (D) securing clamp (E).
7. Remove clamp (E) from hose assembly (F).
8. Using 9/16 inch wrench, disconnect hose assembly (F) from elbow (G).

9. Using 11/16 inch wrench to hold adapter (H), use 9/16 inch wrench and disconnect hose assembly (F) from adapter (H).
10. Remove hose assembly (F).
11. Using 9/16 inch wrench, disconnect hose assembly (J) from tee (K).
12. Using 5/8 inch wrench to hold tee (K), use adjustable wrench and remove drain valve (A).
13. Using 11/16 inch wrench to hold adapter (H), use 11/16 inch wrench and remove nut (L). Tee (K) and adapter (H) will fall free when nut (L) is removed. Throw lockwasher (L) away.
14. Install tee (K) into vise, and, using 11/16 inch wrench, remove adapter (H) from tee (K).



## FUEL-WATER SEPARATOR DRAIN LINES REPLACEMENT (2D ENGINE) (Sheet 4 of 6)



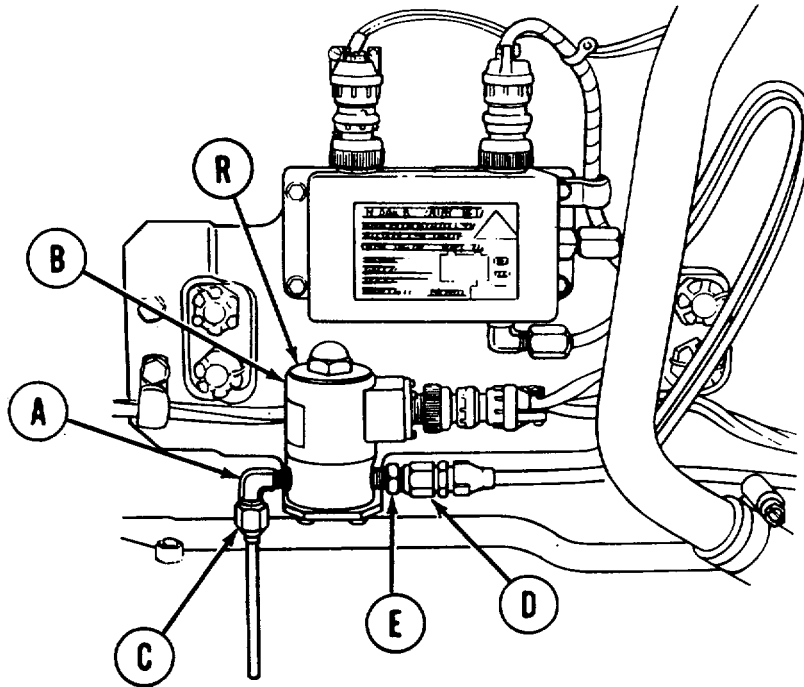
15. Using 9/16 inch wrench, disconnect hose assembly (J) from solenoid valve adapter (M).
16. Remove hose assembly (J).
17. Using 9/16 inch wrench, disconnect tube assembly (N) from elbow (P).
18. Using 9/16 inch wrench, remove elbow (P) from solenoid valve (Q).
19. Using 9/16 inch wrench, remove adapter (M) from solenoid valve (Q).

Go on to Sheet 5

TA148360

**FUEL-WATER SEPARATOR DRAIN LINES REPLACEMENT (2D ENGINE) (Sheet 5 of 6)**

**INSTALLATION:**



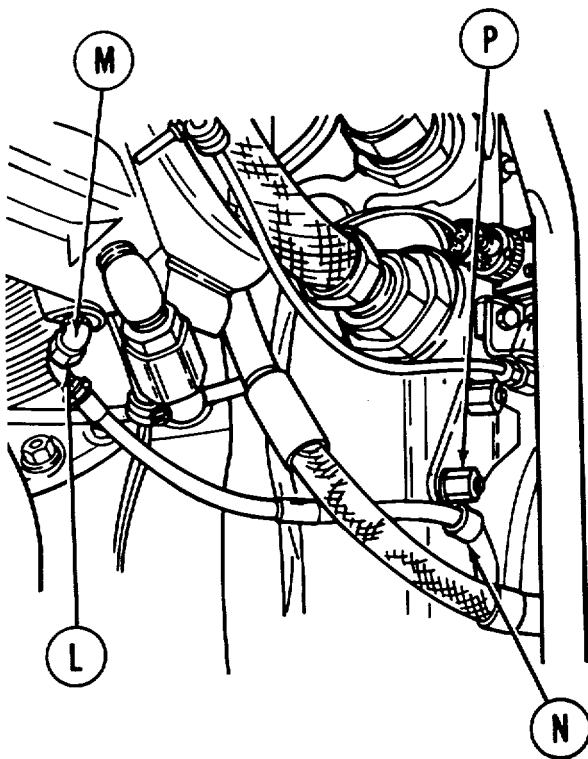
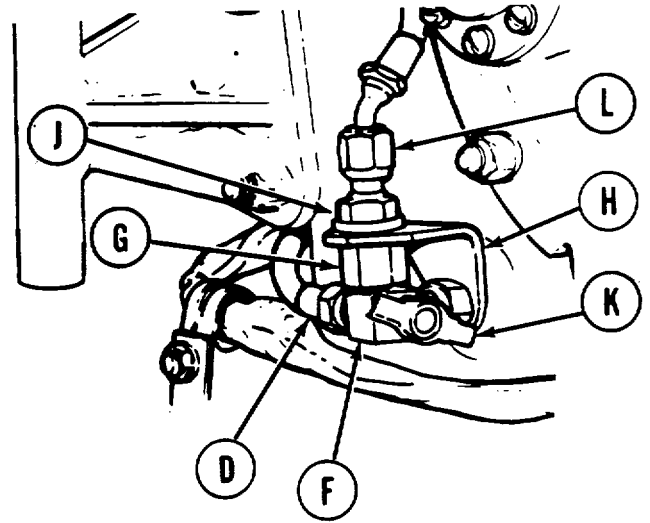
1. Using 9/16 inch wrench, install elbow (A) to solenoid valve (B).
2. Using 9/16 inch wrench, install tube assembly (C) onto elbow (A).
3. Using 9/16 inch wrench, install adapter (E) into solenoid valve (B).
4. Position hose assembly (D) to solenoid valve (B) and along engine block.
5. Using 9/16 inch wrench, install hose assembly (D) to solenoid valve adapter (E).

Go on to Sheet 6

TA148361

**FUEL-WATER SEPARATOR DRAIN LINES REPLACEMENT (2D ENGINE) (Sheet 6 of 6)**

6. Install tee (F) into vise, and, using 11/16 inch wrench, install adapter (G) into tee (F).
7. Remove tee (F) and adapter (G) assembly from vise.
8. Position tee (F) and adapter (G) assembly into mounting bracket (H):
9. Using 11/16 inch wrench to hold adapter (G), use 11/16 inch wrench and install new lockwasher and nut (J) onto adapter (G).
10. Using adjustable wrench, install drain valve (K) into tee (F).



11. Position hose assembly (L) to adapter (G) and elbow (M).
12. Using 9/16 inch wrench, install hose assembly (L) to adapter (G) and elbow (M).
13. Using 9/16 inch wrench, install hose assembly (D) to tee (F).
14. Position clamp (N) onto hose assembly (L).
15. Using 9/16 inch wrench, install nut (P) to secure clamp (N).
16. Close drain valve (K) by turning clockwise.
17. Test fuel-water separator (page 7-262, steps 1 thru 11).
18. Install powerplant (page 5-40).

End of Task

TA149362



## FUEL-WATER SEPARATOR CONTROL ASSEMBLY REPLACEMENT (2D ENGINE) (Sheet 1 of 8)

## PROCEDURE INDEX

PROCEDURE	PAGE
Removal	7-289
Installation	7-292
Test	7-294

TOOLS: Hammer  
 5/16 in. socket with 1/2 in. drive  
 1/2 in. socket with 1/2 in. drive  
 6 in. extension with 1/2 in. drive  
 Ratchet with 1/2 in. drive  
 5/16 in. combination box and open end wrench  
 7/16 in. combination box and open end wrench  
 9/16 in. combination box and open end wrench  
 1/2 in. combination box and open end wrench  
 Flat-tip screwdriver  
 Slip joint pliers  
 1/8 in. drive punch

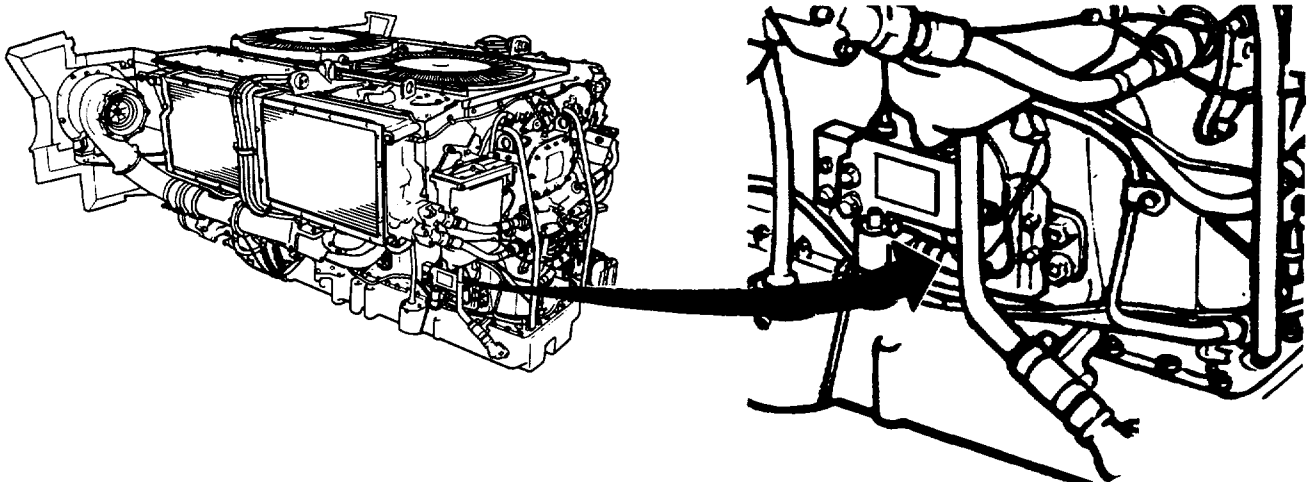
SPECIAL TOOLS: Ground hop kit (Item 30, Chapter 3, Section I)

SUPPLIES: Drip pan  
 Lockwasher (MS35338-45) (3 required)

PERSONNEL: Two

REFERENCE: TM 9-2350260-10

PRELIMINARY PROCEDURE: Remove powerplant (page 5-27)

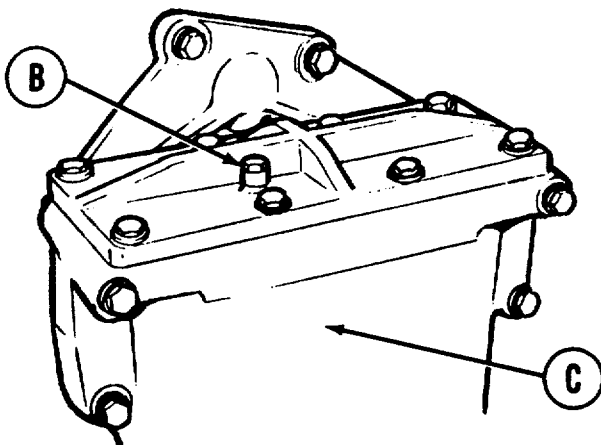
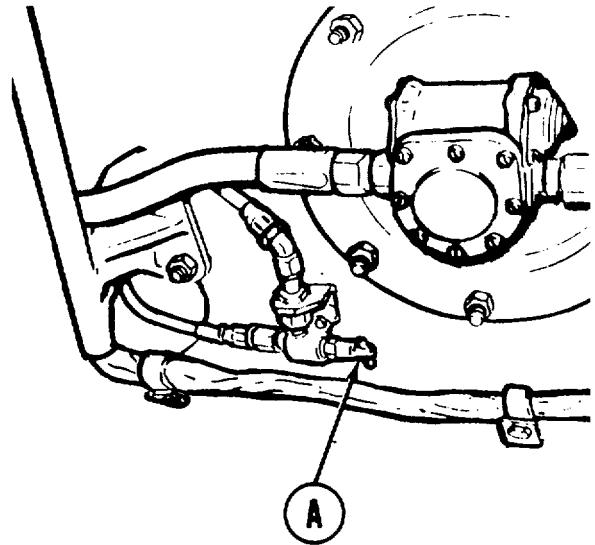


Go on to Sheet 2

TA148363

**FUEL-WATER SEPARATOR CONTROL ASSEMBLY REPLACEMENT (2D ENGINE) (Sheet 2 of 8)****REMOVAL:**

1. Place drip pan under manual drain valve (A).
2. Open manual drain valve (A) by turning valve handle to the left.
3. Using 7/16 inch wrench, turn fuel-water separator bleed cap (B) to the left until loose.



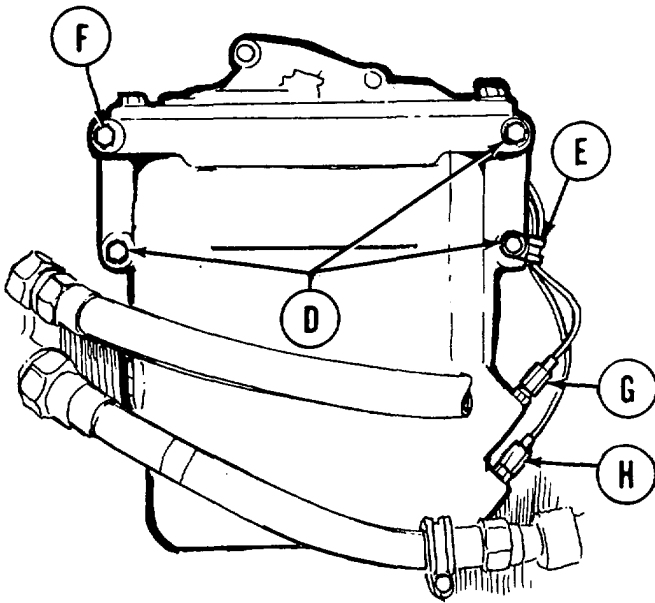
4. Allow fuel in fuel-water separator filter (C) to drain through manual drain valve (A).
5. Using 7/16 inch wrench, turn fuel-water separator bleed cap (B) to the right until snug.

6. Close manual drain valve (A) by turning valve handle to the right.
7. Remove drip pan placed under manual drain valve (A).

Go on to Sheet 3

TA148364

## FUEL-WATER SEPARATOR CONTROL ASSEMBLY REPLACEMENT (2D ENGINE) (Sheet 3 of 8)



8. Using 1/2 inch socket and extension, remove three capscrews, lockwashers, flat washers (D), and clamp (E). Throw lockwashers away.
9. Using 1/2 inch socket and extension, loosen capscrew (F) to provide movement to fuel-water separator filter.

**NOTE**

If adapters turn while removing sensors, use 1/2 inch wrench to hold them in place.

10. Using 9/16 inch wrench, remove upper sensor (G) from fuel-water separator filter.

**NOTE**

It may be necessary to use hammer and punch to unseat sensors (G) and (H) by tapping upward on the edge of the sensor retaining nut.

11. Using 9/16 inch wrench, remove lower sensor (H) fuel-water separator filter.

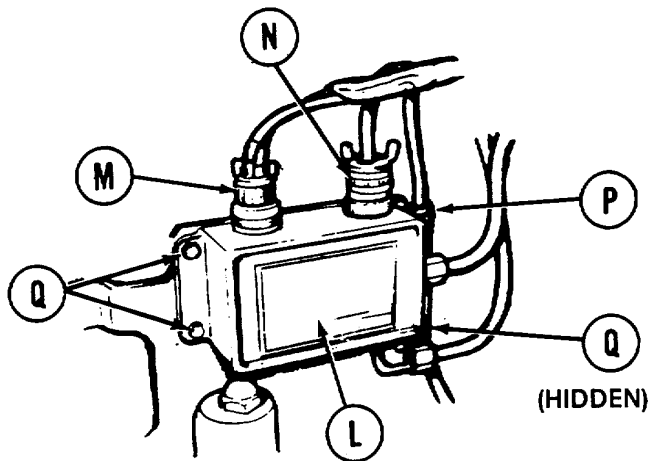
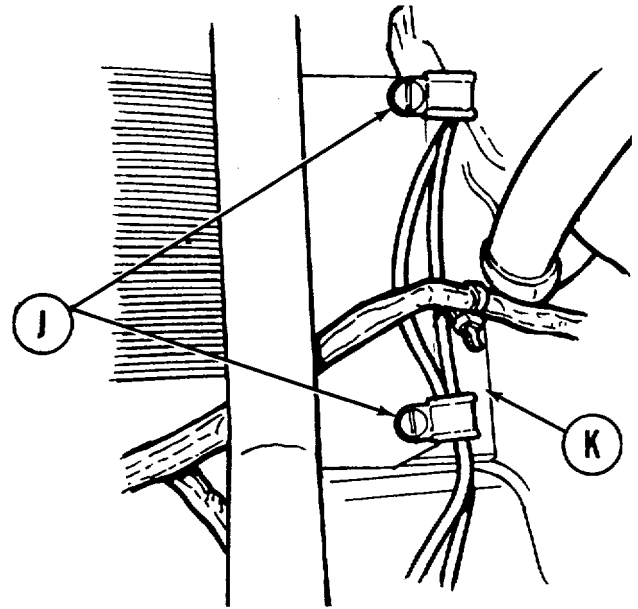
**FUEL-WATER SEPARATOR CONTROL ASSEMBLY REPLACEMENT (2D ENGINE) (Sheet 4 of 8)**

12. Using screwdriver, remove two screws and two cushioned clamps (J) and mounting plate (K) at right side and above fuel-water separator control assembly (L).

**NOTE**

**It may be necessary to use pliers to start removal of connectors in steps 13 and 14.**

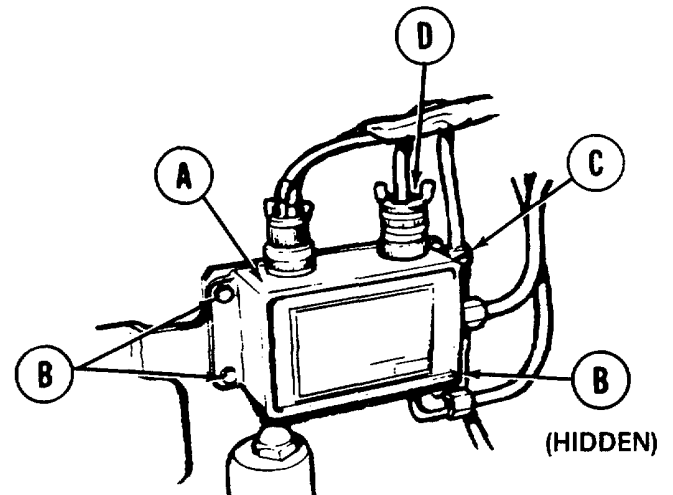
13. Manually disconnect engine electrical harness connector (M) from fuel-water separator control assembly (L).
14. Manually disconnect solenoid valve electrical lead (N) from fuel-water separator control assembly (L).



15. Using 5/16 inch wrench, remove screw and cushioned amp (P) holding solenoid valve electrical lead (N) to fuel-water separator control assembly (L).
16. Using 5/16 inch wrench, remove three remaining screws and washers (Q) holding fuel-water separator control assembly (L) to mounting plate. Remove control assembly.

**FUEL-WATER SEPARATOR CONTROL ASSEMBLY REPLACEMENT (2D ENGINE) (Sheet 5 of 8)****INSTALLATION:**

1. Position three cushioned clamps into sensor leads from replaced fuel-water separator control assembly.
2. Position fuel-water separator control assembly (A) onto mounting plate.
3. Using 5/16 inch socket with extension, install three screws and washers (B).
4. Using 5/16 inch wrench, install screw and cushioned clamp (C) holding solenoid valve electrical lead D) to fuel-water separator control assembly (A).



Go on to Sheet 6

TA148367

FUEL-WATER SEPARATOR CONTROL ASSEMBLY REPLACEMENT (2D ENGINE) (Sheet 6 of 8)

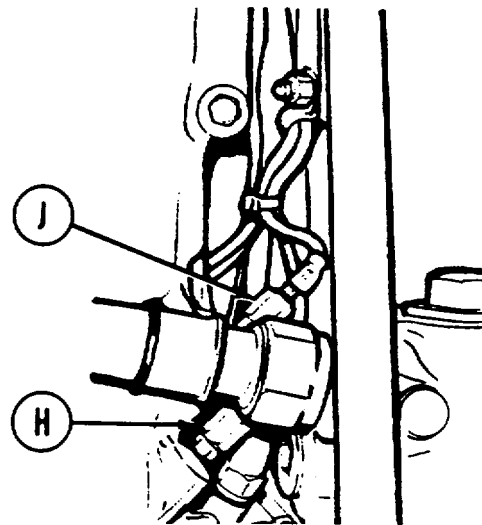
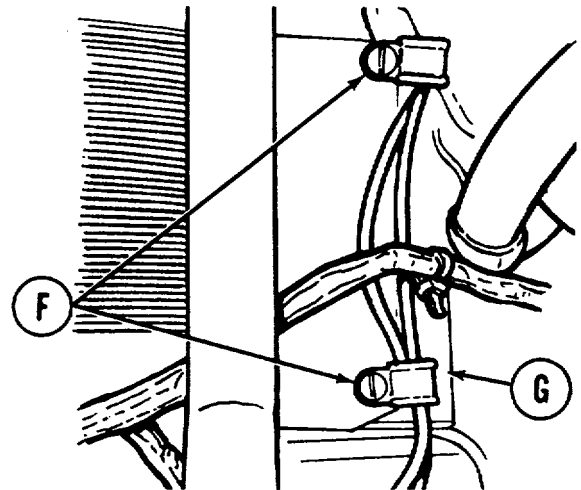
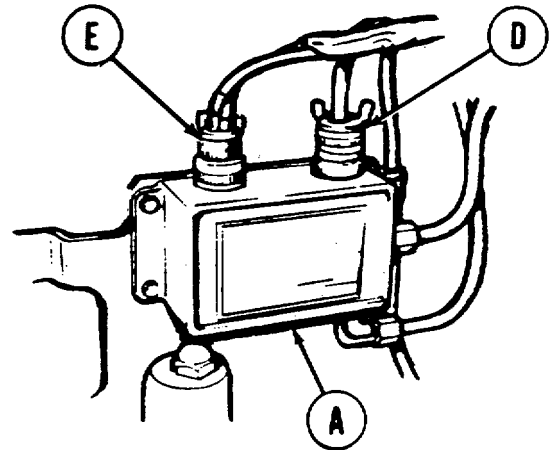
**CAUTION**

Be careful not to strike ends of sensors during installation or damage may result.

**NOTE**

Straight edge of mounting plate (G) must be installed to the right against the fuel-water separator.

5. Manually conned solenoid valve electrical lead (D) to fuel-water separator control assembly (A).
6. Manually connect engine electrical harness connector (E) to fuel-water separator control assembly (A).
7. Using screwdriver, install two screws and two cushioned clamps (F) and mounting plate (G) at right side and above fuel-water separator control assembly.
8. Using 9/16 inch wrench, install lower (shorter) sensor (H) to fuel-water separator filter.
9. Using 9/16 inch wrench, install upper (longer) sensor (J) to fuel-water separator filter.

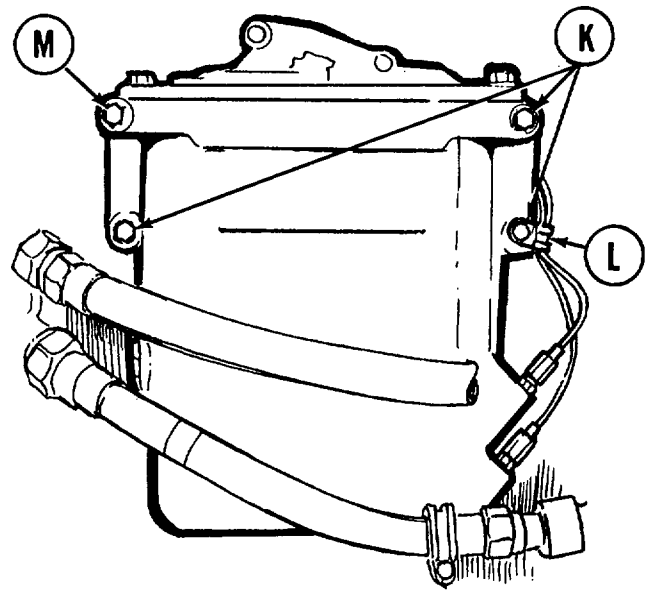


Go on to Sheet 7

TA148368

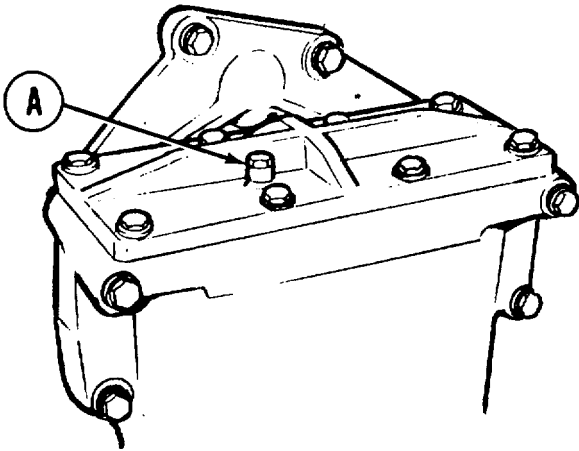
**FUEL-WATER SEPARATOR CONTROL ASSEMBLY REPLACEMENT (2D ENGINE) (Sheet 7 of 8)**

10. Using 1/2 inch socket and extension, install three capscrews, new lockwashers, and flat washers (K) and clamp (L).
11. Using 1/2 inch socket, tighten capscrew (M).

**TEST:**

1. Connect engine for powerplant ground hop (page 5-54).
2. Set FUEL PUMPS switch in ON position (TM 9-2350-260-10).

**FUEL-WATER SEPARATOR CONTROL ASSEMBLY REPLACEMENT (2D ENGINE) (Sheet 8 of 8)**



3. Set MASTER CONTROL switch to ON (TM 9-2350-260-10). Watch fuel-water separator bleed cap (A) for air release (bubbles).
4. Set MASTER CONTROL switch to OFF (TM 9-2350-260-10). After about one minute, repeat step 3.

**NOTE**

**It may be necessary to perform steps 4 and 5 several times until a constant fuel flow (no bubbles) from the bleed cap (A) is observed.**

5. Check for leaks and tighten or replace component as necessary.
6. Using 7/16 inch wrench, turn fuel-water separator bleed cap (A) to the right until snug.
7. Perform operational check of automatic drain (page 7-245).
8. Set FUEL PUMPS switch to OFF (TM 9-2350-260-10).
9. Set MASTER CONTROL switch to OFF (TM 9-2350-260-10).
10. Disconnect engine from powerplant ground hop (page 5-67).
11. Install powerplant (page 5-40).



**FUEL-WATER SEPARATOR FILTER ELEMENT REPLACEMENT (Sheet 1 of 6)**

PROCEDURE INDEX

PROCEDURE	PAGE
Removal	7-297
Cleaning and Inspection	7-298
Installation	7-298

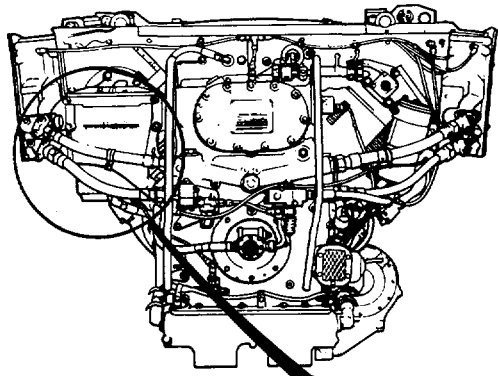
**TOOLS:** 7/16 in. combination box and open end wrench  
 7/8 in. combination box and open end wrench

**SUPPLIES:** Dry cleaning solvent (Item 54, Appendix D)  
 Parts kit (5702738)  
 Container  
 Rags (Item 65, Appendix D)  
 Crocus cloth (Item 14, Appendix D)  
 Lockwashers (MS35338-44) (8 required)

**REFERENCE:** TM 9-2350-260-10

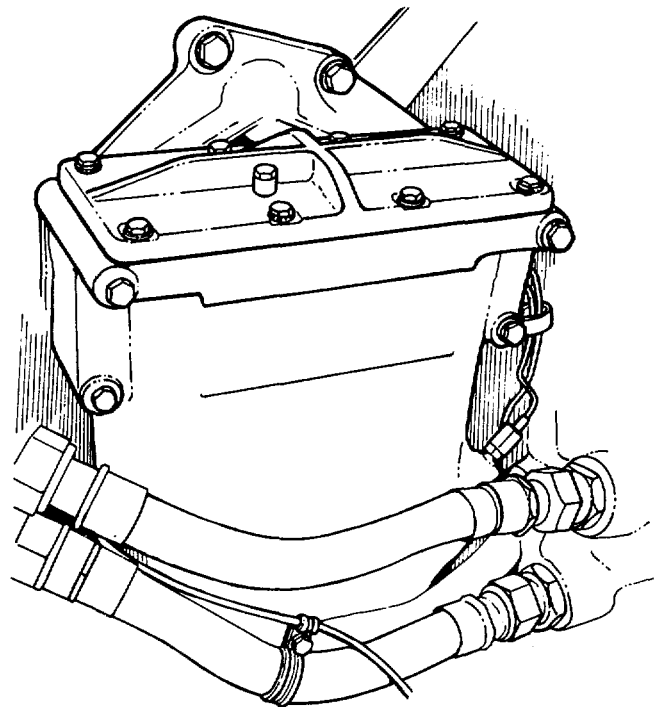
**PERSONNEL:** Two

**PRELIMINARY PROCEDURE:** Remove powerplant (page 5-1)



**NOTE**

2D engine is shown, procedures for 2A engine are similar.



FUEL-WATER SEPARATOR FILTER ELEMENT REPLACEMENT (Sheet 2 of 6)

REMOVAL:

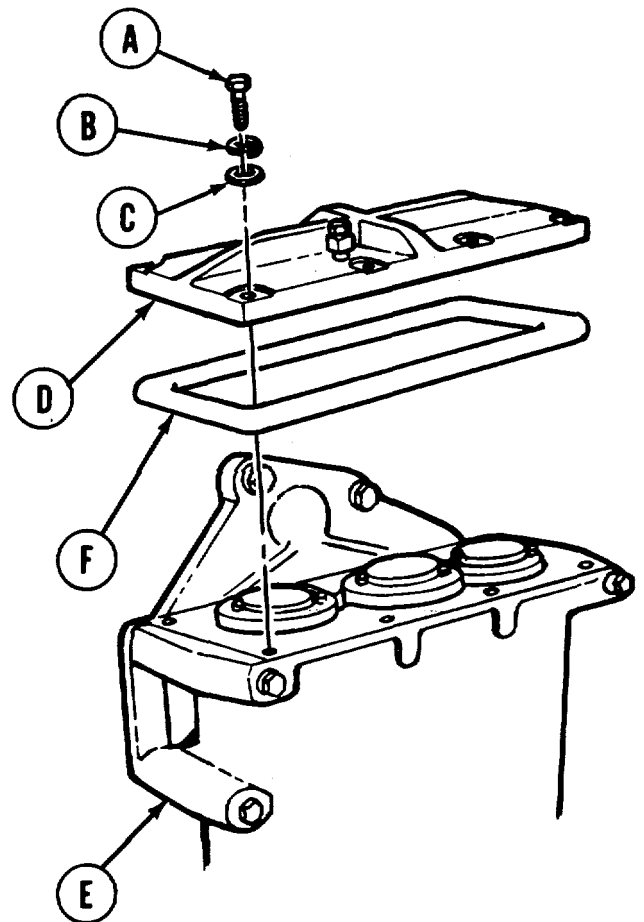
NOTE

Replacement of outer filter elements is required semi-annually or every 1500 miles of tank operation. Center filter element is to be replaced annually.

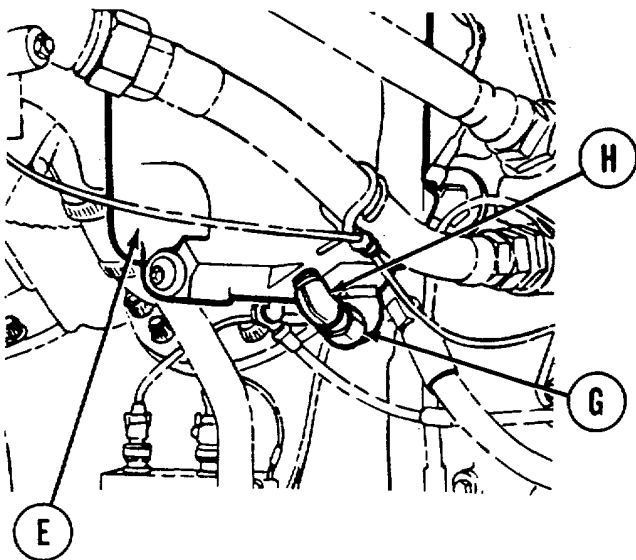
NOTE

When removing cover, make sure not to let any dirt fall into fuel-water separator.

1. Using 7/16 inch wrench, remove eight screws (A), lockwashers (B), and flat washers (C). Throw lockwashers away.
2. Remove cover (D) from fuel-water separator (E).
3. Remove preformed packing (F) from cover (D). Throw packing away.



4. Place container under fuel-water separator (E) to catch fuel from fuel outlet line.
5. Using 7/8 inch wrench, disconnect fuel outlet line (G) from elbow (H).
6. Using rags (Item 65, Appendix D), cover fuel outlet line (G) to prevent dirt getting into line.



Go on to Sheet 3

TA148372

## FUEL-WATER SEPARATOR FILTER ELEMENT REPLACEMENT (Sheet 3 of 6)

## NOTE

Do not remove or otherwise disturb the center element during outer filter element replacement unless all three elements are scheduled for replacement.

7. Using hands, remove two outer filter elements (J) by turning slightly and lifting out. Throw away filters.
8. Remove center filter element (K) in same manner as outer filters, if required.

## CLEANING AND INSPECTION:

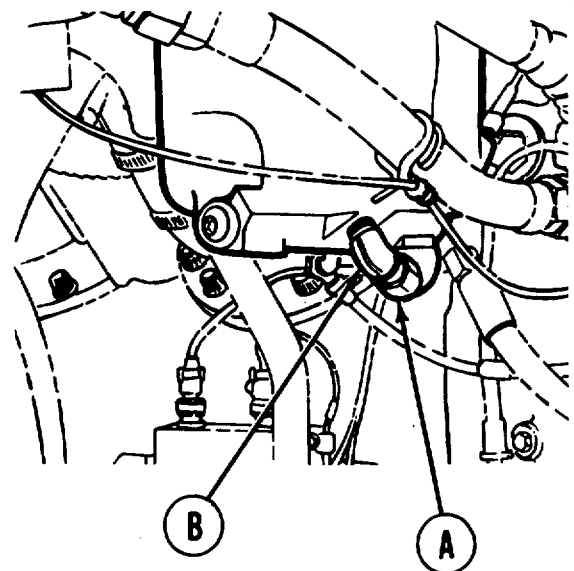
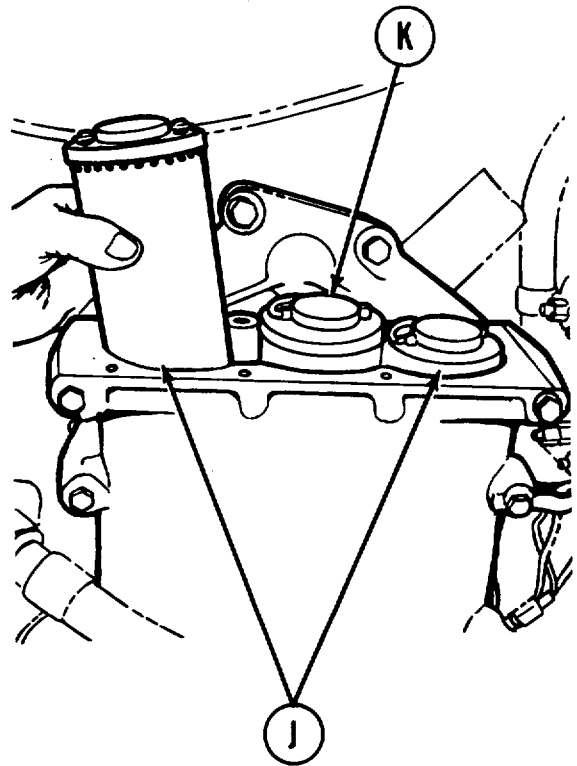
## NOTE

Take care when cleaning inside of fuel-water separator not to damage any internal parts.

1. Using dry cleaning solvent (Item 54, Appendix D) and rags, clean inside of fuel-water separator.
2. Inspect fuel-water separator for cracks or fractures. Inspect interior for scores and burrs.
3. Using dry cleaning solvent and crocus cloth (Item 14, Appendix D), remove minor burrs and scores. If cracked, excessively burred, or scored, contact your supervisor.
4. Flush with dry cleaning solvent.

## INSTALLATION:

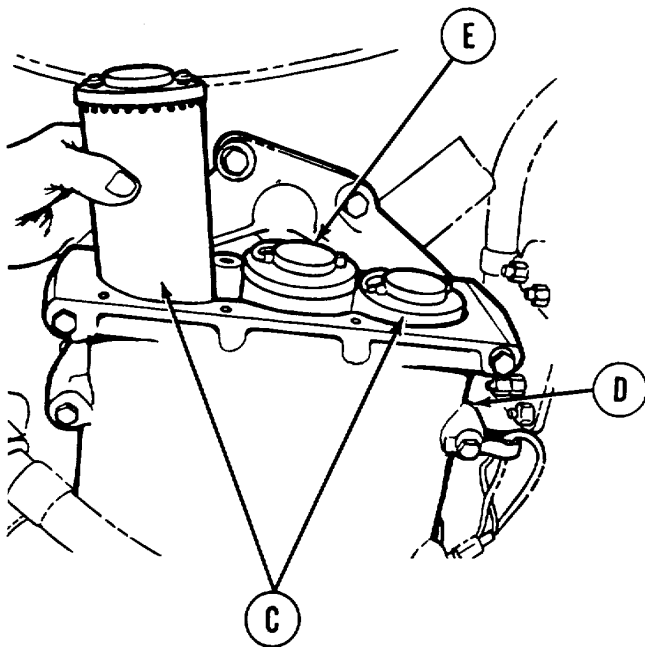
1. Remove container from under fuel-water separator.
2. Remove rag from fuel outlet line (A).
3. Using 7/8 inch wrench, install fuel outlet line (A) to elbow (B).



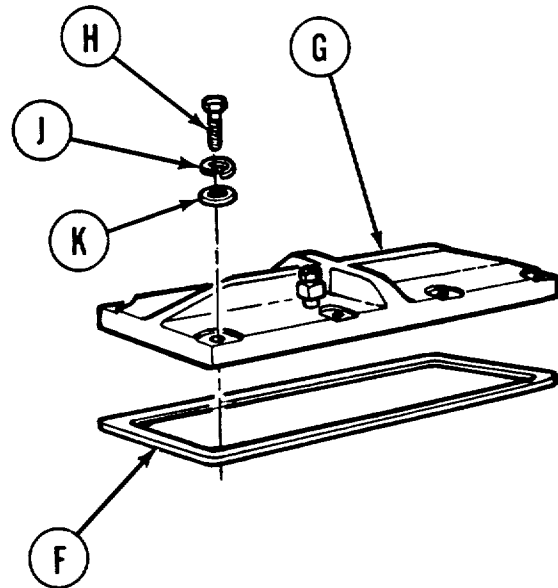
Go on to Sheet 4

TA148373

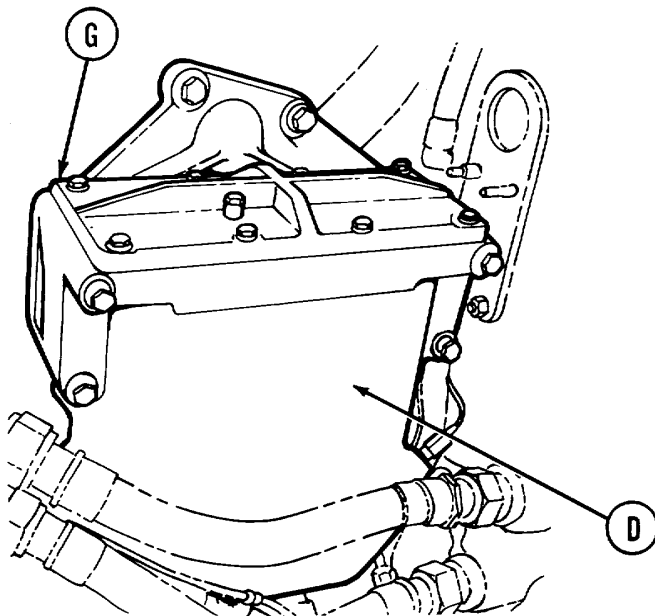
FUEL-WATER SEPARATOR FILTER ELEMENT REPLACEMENT (Sheet 4 of 6)



4. Place two outer filter elements (C) in position in fuel-water separator (D).
5. Place center filter element (E) in position in fuel-water separator (D), if required.



6. Place new preformed packing (F) in position in cover (G).



7. Place cover (G) in position on fuel-water separator (D).
8. Using 7/16 inch wrench, install eight screws (H) new lockwashers (J) and flat washers (K).

Go on to Sheet 5

TA148374

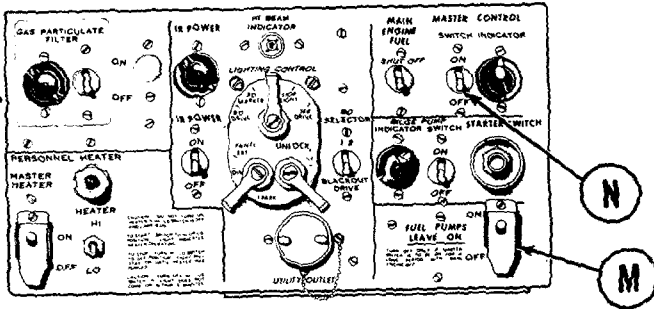
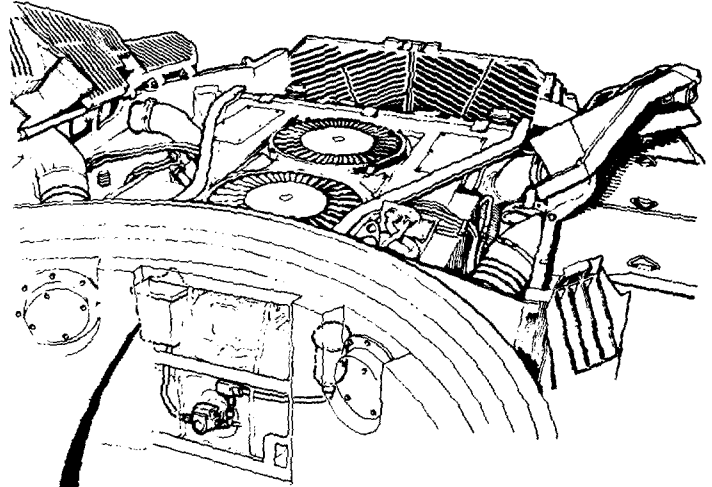
**FUEL-WATER SEPARATOR FILTER ELEMENT REPLACEMENT (Sheet 5 of 6)**

9. Install 2A powerplant (page 5-14) or 2D powerplant (page 5-40).

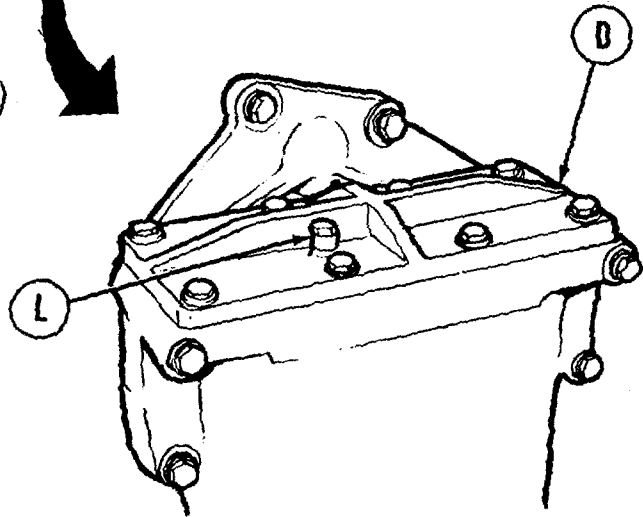
**NOTE**

The following steps require assistance of second person located at driver's station.

10. Remove upper engine access cover (page 16-44).
11. Locate fuel-water separator (D), and using 7/16 inch wrench, loosen bleeder valve (L). Do not remove.
12. Person in driver's station set FUEL PUMPS switch (M) ON and MASTER CONTROL switch (N) ON. (TM 9-2350-260-10).

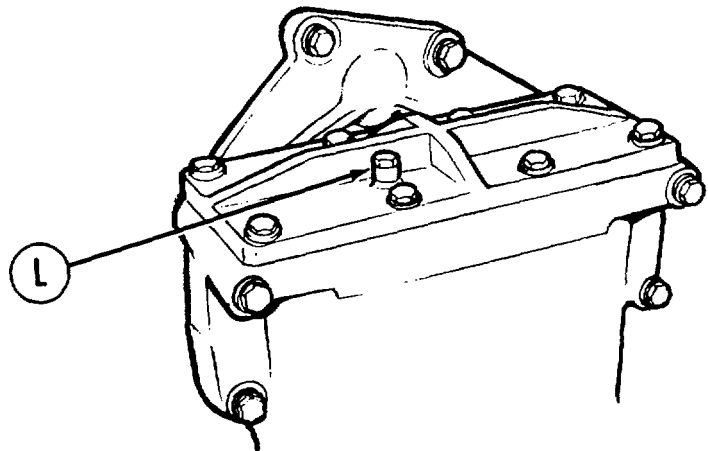


13. Person at fuel-water separator observe for air release (bubbles) from bleeder valve (L).
14. Person in driver's station set MASTER CONTROL switch (N) OFF (TM 9-2350-260-10).



**FUEL-WATER SEPARATOR FILTER ELEMENT REPLACEMENT (Sheet 6 of 6)**

15. Repeat steps 12 and 13. It may be necessary to do this several times until a constant flow of fuel (no bubbles) is observed.
16. Using 7/16 inch wrench, tighten bleeder valve (L).
17. Install upper engine access cover (page 16-44).



End of Task

TA148376

**PRIMARY FUEL FILTER ELEMENT REPLACEMENT (2A ENGINE) (Sheet 1 of 4)**

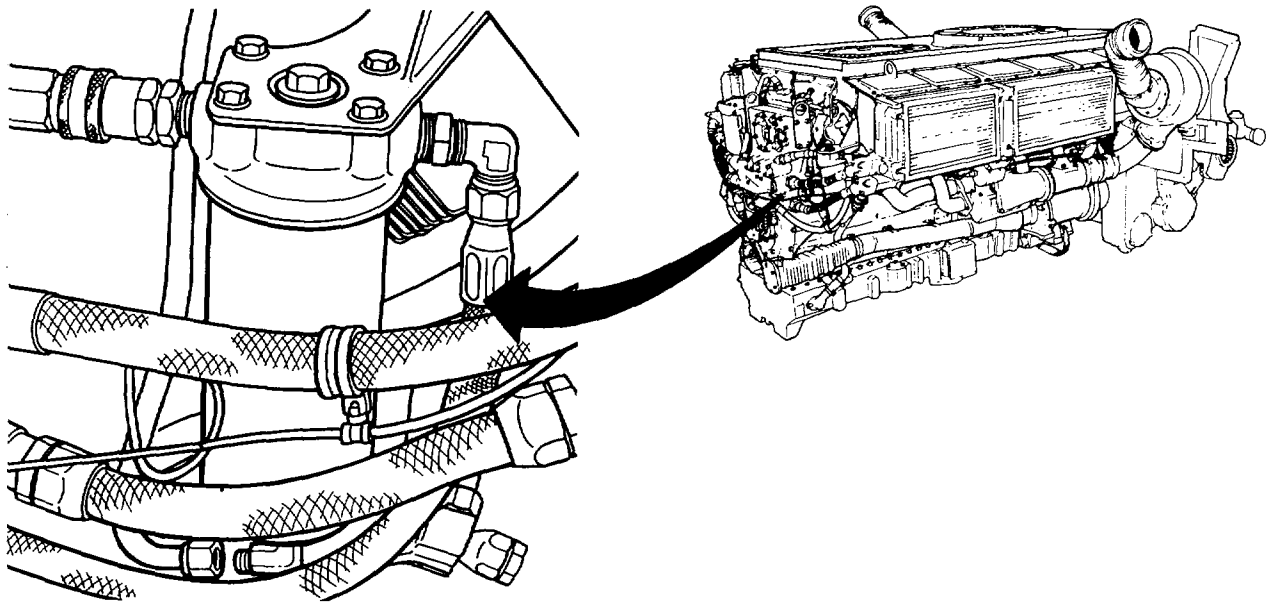
PROCEDURE INDEX

PROCEDURE	PAGE
Removal	7-303
Cleaning and Inspection	7-304
Installation	7-304

TOOLS: 1 in. combination box and open end wrench  
 5/8 in. combination box and open end wrench  
 7/16 in. combination box and open end wrench

SUPPLIES: Parts kit (5702757)  
 Container (approx. 1 quart)  
 Dry cleaning solvent (Item 54, Appendix D)

PRELIMINARY PROCEDURE: Remove powerplant (page 5-2)



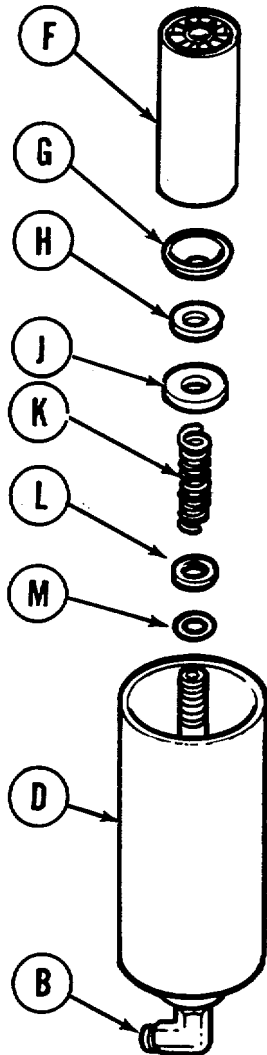
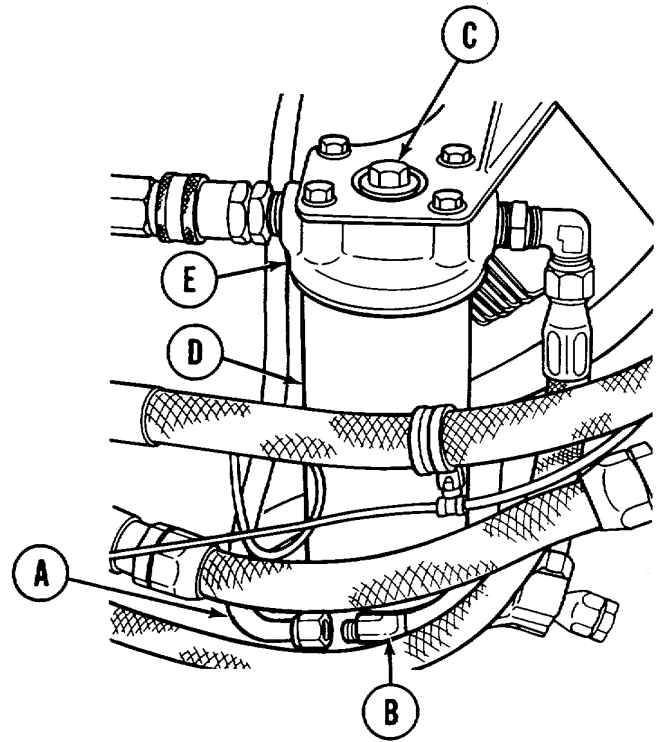
Go on to Sheet 2

TA148377

**PRIMARY FUEL FILTER ELEMENT REPLACEMENT (2A ENGINE) (Sheet 2 of 4)**

**REMOVAL:**

1. Place container under filter assembly and, using 5/8 inch wrench, remove line (H) from elbow (B).
2. Using 1 inch wrench, remove bolt (C) holding filter body (D) to head (E).
3. Remove body (D) from head (E). Throw gasket away.



4. Remove filter element (F), disc (G), gasket (H), washer (J), spring (K), washer (L), and retaining ring (M) from body (D).

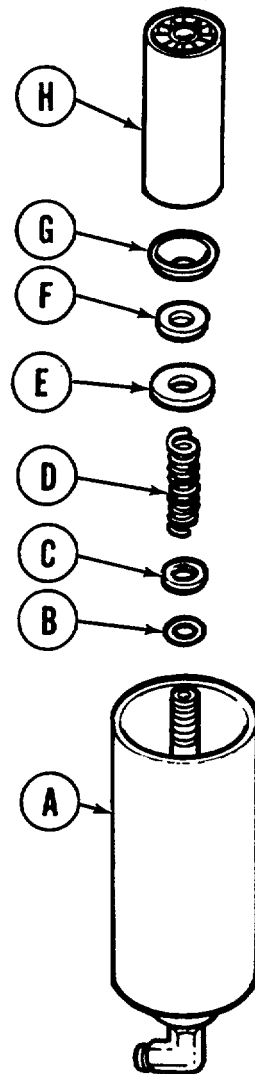


**PRIMARY FUEL FILTER ELEMENT REPLACEMENT (2A ENGINE) (Sheet 3 of 4)****CLEANING AND INSPECTION:**

1. Using dry cleaning solvent (Item 54, Appendix D) and brush, clean sludge and gum deposits from filter element, body, and head.
2. Dry parts with low pressure compressed air.
3. Inspect input hose for cracks or signs of leaks or damage.
4. Inspect threads-for damage.
5. Replace damaged parts.

**INSTALLATION:**

1. Assemble filter parts into filter body (A) in this order: retaining ring (B), washer (C), spring (D) washer (E), gasket (F), disc (G), and filter element (H).

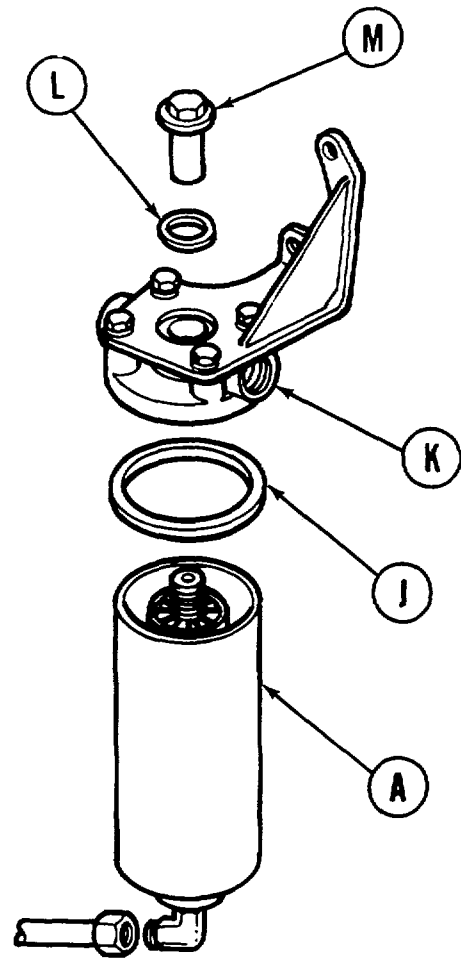


Go on to Sheet 4

TA148379

**PRIMARY FUEL FILTER ELEMENT REPLACEMENT (2A ENGINE) (Sheet 4 of 4)**

2. Install new gasket (J) into filter head (K).
3. Install filter body (A) onto head (K), making sure body (A) is seated onto gasket (J) and head (K).
4. Install new gasket (L) onto bolt (M) and install bolt through filter head (K) onto filter body (A).
5. Using 1 inch wrench, tighten bolt (M).
6. Using 5/8 inch wrench, install tube (N) on elbow (P).
7. Install powerplant (page 5-14).



End of Task

TA148380

**PRIMARY FUEL FILTER ELEMENT REPLACEMENT (2D ENGINE) (Sheet 1 of 5)**

PROCEDURE INDEX

PROCEDURE	PAGE
Removal	7-306
Cleaning and Inspection	7-308
Installation	7-308

TOOLS: 9/16 in. combination box and open end wrench  
8 in. adjustable wrench

SUPPLIES: Parts kit (5704487)  
Rags (Item 65, Appendix D)  
Watch

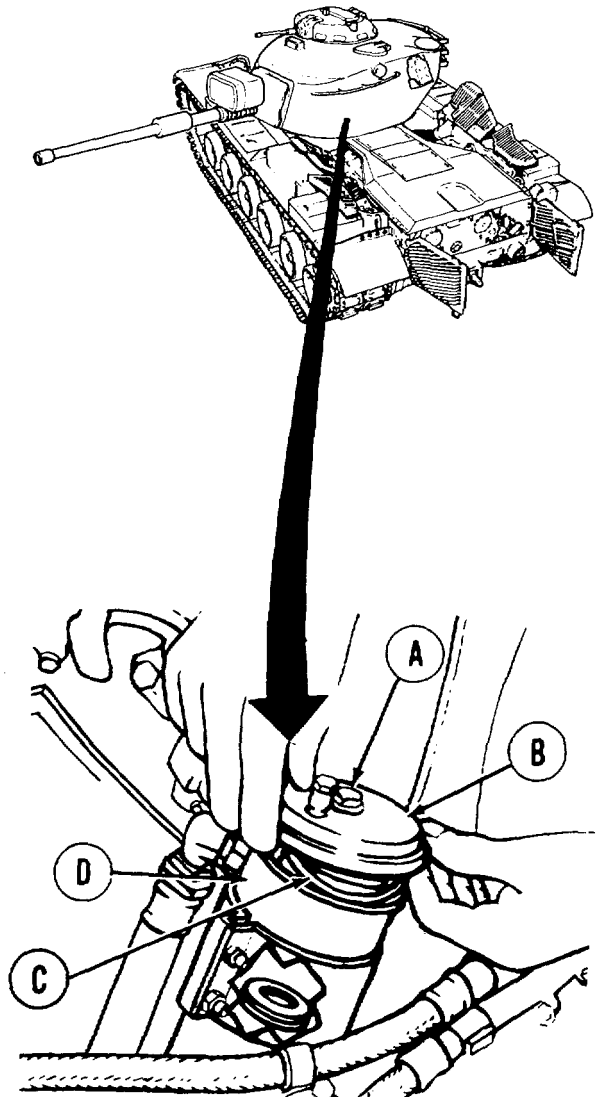
PERSONNEL: Two

REFERENCE: TM 9350260-10

PRELIMINARY PROCEDURES: Open front left intake grille door (TM 9-2350-260-10)

REMOVAL:

1. Position rags (Item 65, Appendix D) to catch fuel and, using 9/16 inch wrench, loosen capscrew (A) until capscrew turns free.
2. Lift cover (B) and gasket (C) off filter body (D). Throw gasket away.

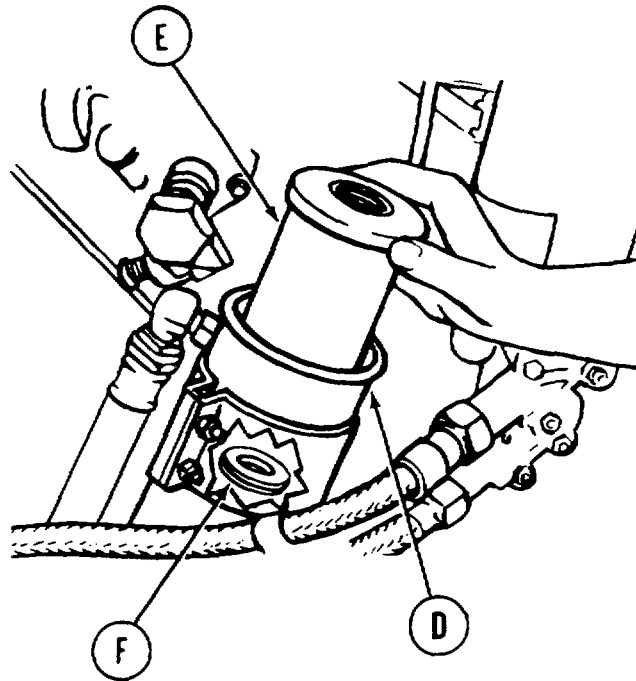


Go on to Sheet 2

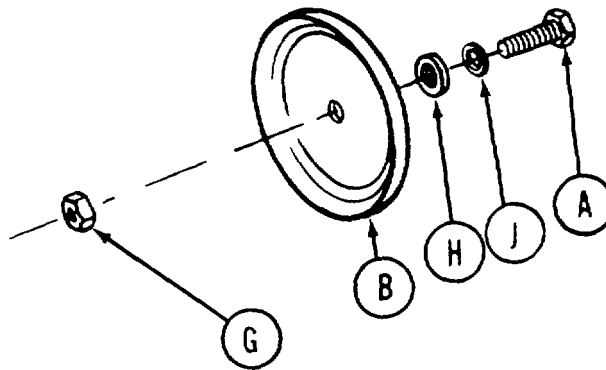
TA148381

**PRIMARY FUEL FILTER ELEMENT REPLACEMENT (2D ENGINE) (Sheet 2 of 5)**

3. Remove filter element (E) from filter body (D). Throw element away.



4. Remove preformed packing (F) from element seat inside filter body. Throw preformed packing away.



5. Using 9/16 inch wrench and adjustable wrench, remove nut (G), cover (B), gasket (H), and washer (J) from screw (A). Throw gasket (H) away.

Go on to Sheet 3

TA148382

**PRIMARY FUEL FILTER ELEMENT REPLACEMENT (2D ENGINE) (Sheet 3 of 5)****CLEANING AND INSPECTION:**

1. Using clean rags, clean inside filter body and around the filter body rim.
2. Inspect filter body and cover for cracks, holes, or dents on sealing edge.
3. Replace any damaged parts.

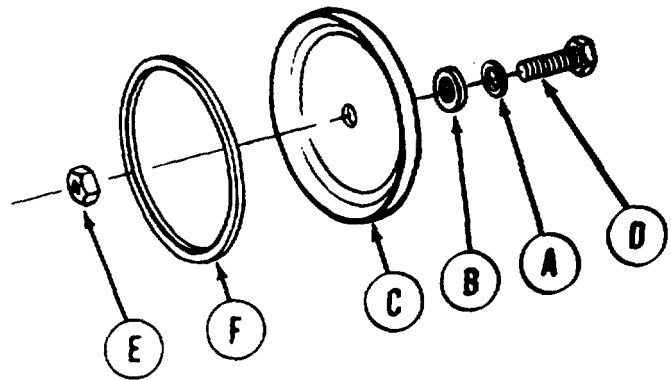
**INSTALLATION:**

1. Install washer (A), new gasket from element kit (B), and cover (C) on screw (D).

**NOTE**

**Do not tighten nut (E) down completely. Leave enough nut showing to allow removal**

2. Using 9/16 inch wrench and adjustable wrench, install nut (E) on screw (D) and tighten nut (E).
3. Install new gasket (F) from kit into seat on inside of cap (C).

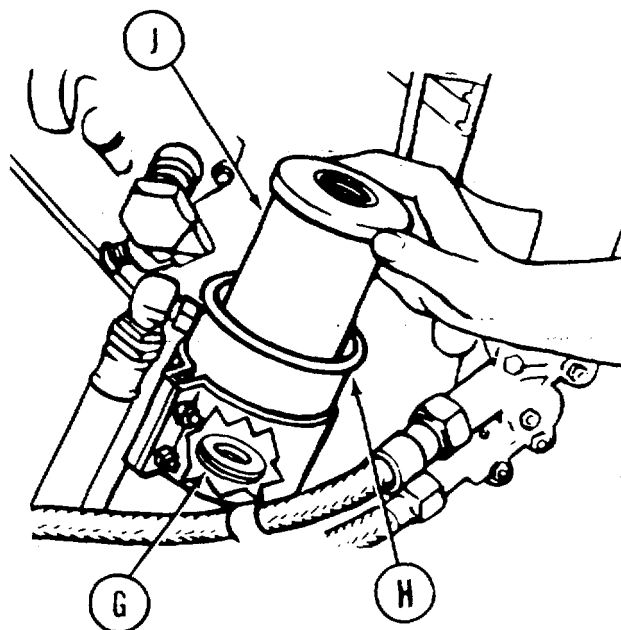


Go on to Sheet 4

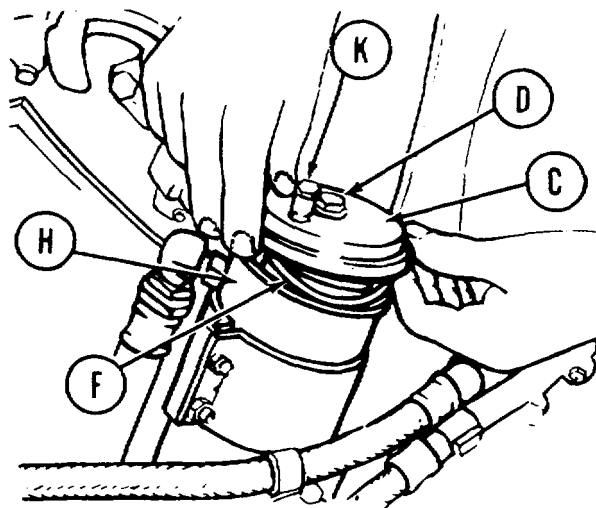
TA148383

**PRIMARY FUEL FILTER ELEMENT REPLACEMENT (2D ENGINE) (Sheet 4 of 5)**

4. Install new preformed packing (G) from kit onto seat inside filter body (H).
5. Install new filter element (J) inside filter body (H).
6. Install cap (C) with gasket (F) on rim of filter body (H) and tighten screw (D) enough to get good seal between cap (C) and filter body (H).



7. Unscrew bleed cap (K) until it can be opened or closed, using fingers. Leave valve open.

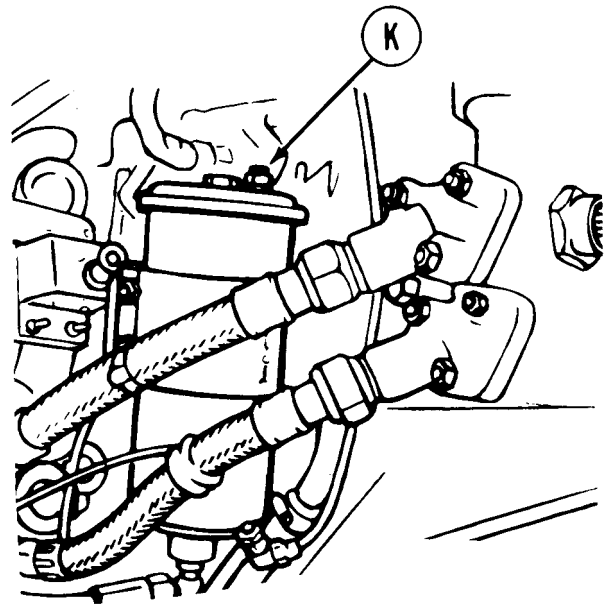


Go on to Sheet 5

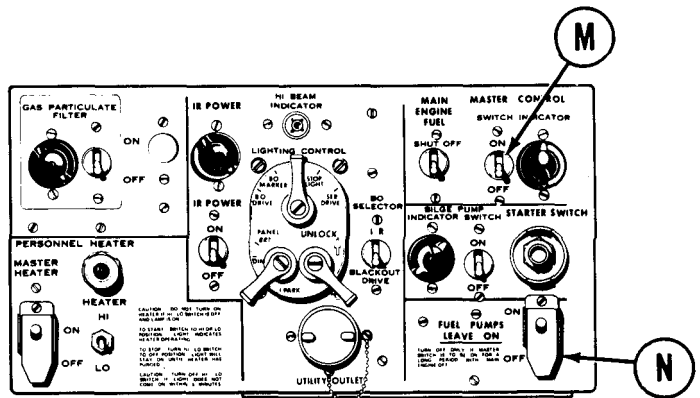
TA148384

**PRIMARY FUEL FILTER ELEMENT REPLACEMENT (2D ENGINE) (Sheet 5 of 5)**

8. Using another person, set FUEL PUMPS switch (L) on master control panel at driver's station to ON.
9. Set MASTER CONTROL switch (M) to ON and observe air release (bubbles) from bleed cap (K).



10. Set MASTER CONTROL switch (M) to OFF and, after about 1 minute, repeat step 9.



11. Repeat steps 9 and 10 until a steady flow of fuel comes out of bleed cap (K), then close bleed cap (K) and set MASTER CONTROL switch to OFF.
12. Using adjustable wrench, tighten bleed cap (K) enough so it cannot be opened with the fingers.
13. Close front left intake grille door (TM 9-2350-260-10).

End of Task

TA148385

FUEL PRIMER INLET LINE TUBE ASSEMBLY REPLACEMENT (Sheet 1 of 5)

PROCEDURE INDEX

PROCEDURE	PAGE
Removal	7-311
Cleaning and Inspection	7-313
Installation	7-313

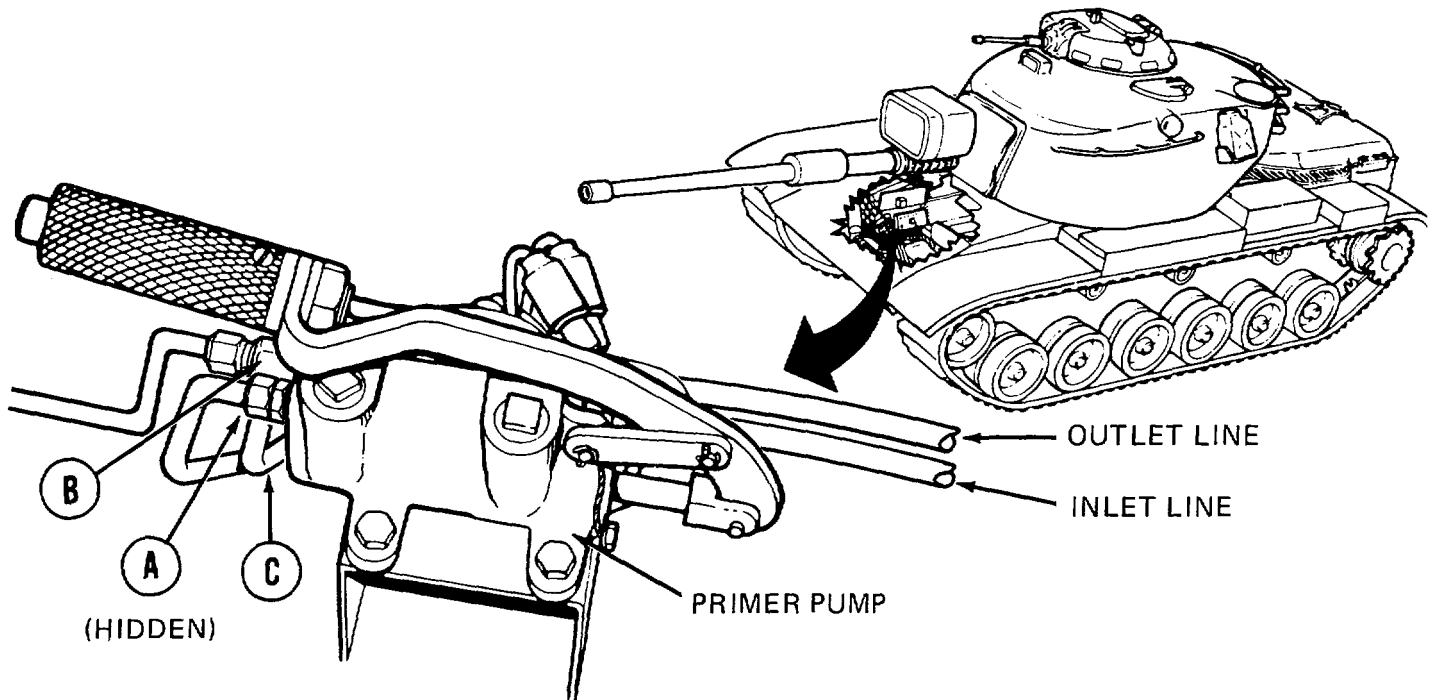
TOOLS: 5/8 in. combination box and open end wrench (2 required)  
 7/16 in. combination box and open end wrench  
 7/16 in. socket with 1/2 in. drive  
 Ratchet with 1/2 in. drive  
 11/16 in. combination box and open end wrench

SUPPLIES: Rags (Item 65, Appendix D)  
 Lockwasher (MS35338-44) (3 required)

PRELIMINARY PROCEDURES: Shut off el supply to primer pump

REMOVAL:

- Using 5/8 inch wrench, remove nut (A) from tee (B). Move tube assembly (C) slightly away from tee.



Go on to Sheet 2

TA148386

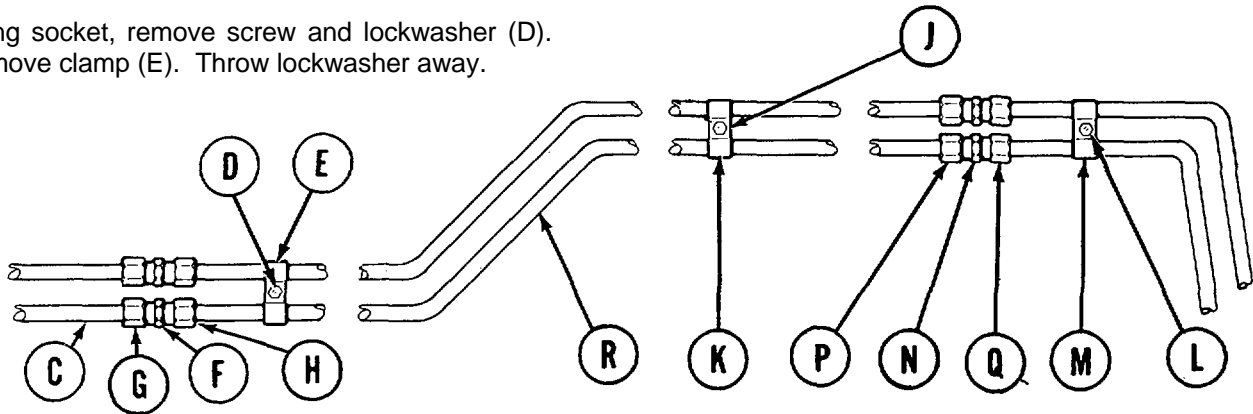


## FUEL PRIMER INLET LINE TUBE ASSEMBLY REPLACEMENT (Sheet 2 of 5)

## NOTE

Fuel primer inlet line tube assembly on some tanks may be one solid tube. If your tank has solid tube, skip steps 2 through 10 and go on to step 11. To replace solid tube, order three tube sections and two nipples.

- Using socket, remove screw and lockwasher (D). Remove clamp (E). Throw lockwasher away.



- Using 5/8 inch wrench, hold nipple (F).
- Using 5/8 inch wrench, remove two nuts (G) and (H).
- Remove tube assembly (C).

## NOTE

Traverse turret as necessary to get at the following parts.

## NOTE

It may be necessary to slightly bend tube assembly (A) before it can be placed in position.

- Using socket, remove screw and lockwasher (J). Remove clamp (K). Throw lockwasher away.
- Using 7/16 inch wrench, remove screw and lockwasher (L). Remove clamp (M). Throw lockwasher away.
- Using 5/8 inch wrench, hold nipple (N).
- Using 5/8 inch wrench, remove nuts (P) and (Q) from nipple (N).
- Remove tube assembly (R).

Go on to Sheet 3

TA148387

**FUEL PRIMER INLET LINE TUBE ASSEMBLY REPLACEMENT (Sheet 3 of 5)**

- Using 11/16 inch wrench to hold nipple (S) and 5/8 inch wrench on nut (T), remove nut (T).

**NOTE**

**It may be necessary to slightly bend tube assembly (U) before it can be removed.**

- Remove tube assembly (U).

**CLEANING AND INSPECTION:**

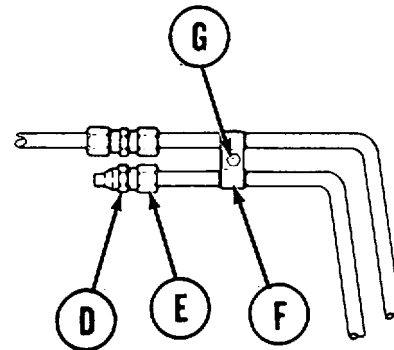
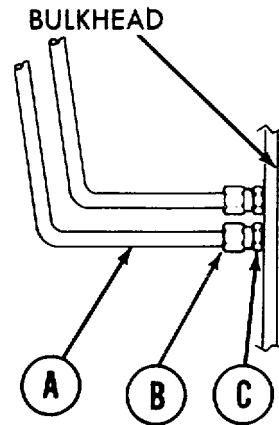
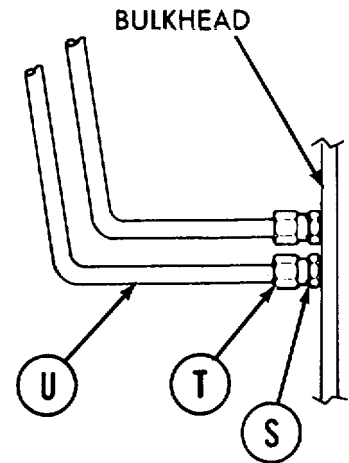
- Clean tube assemblies and nut with rags (Item 65, Appendix D).
- Inspect all parts for damage or wear. Replace any damaged or worn part.

**INSTALLATION:**

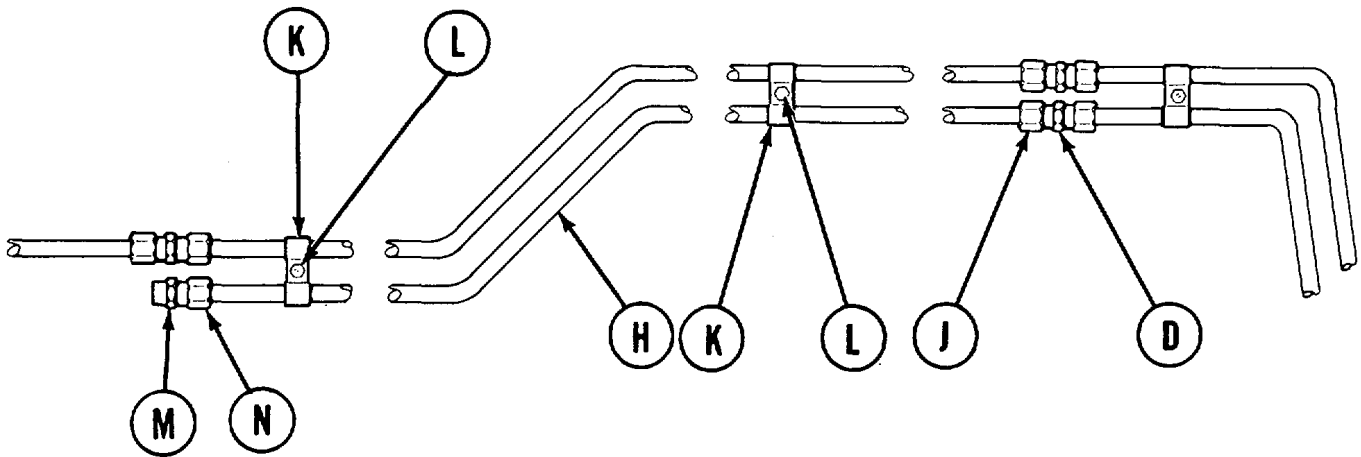
**NOTE**

**It may be necessary to slightly bend tube assembly (A) before it can be placed in position.**

- Place tube assembly (A) in position.
- Start nut (B) on nipple (C) and leave finger tight.
- Using two 5/8 inch wrenches, install nipple (D) in nut (E).
- Position tube assembly (A) and clamp (F).
- Using 7/16 inch wrench, install screw and lockwasher (G).
- Using 5/8 inch wrench, tighten nut (B).



## FUEL PRIMER INLET LINE TUBE ASSEMBLY REPLACEMENT (Sheet 4 of 5)



7. Position tube assembly (H).
8. Using fingers, start nut (J) on nipple (D).

**NOTE**

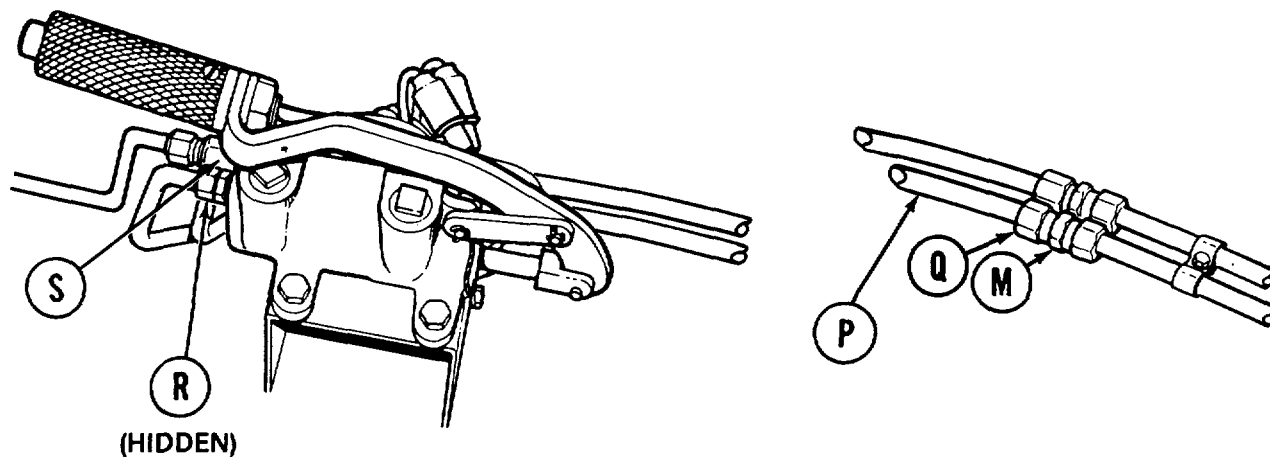
**Some tanks may have only one clamp (K).**

9. Position two clamps (K).
10. Using fingers, start two screws and new lockwashers (L) into position in clamps (K).
11. Using two 5/8 inch wrenches, install nipple (M) and tighten nut (N).
12. Using two 5/8 inch wrenches, tighten nut (J) on nipple (D).
13. Using 7/16 inch wrench, tighten two screws and lockwashers (L).

Go on to Sheet 5

TA148389

## FUEL PRIMER INLET LINE TUBE ASSEMBLY REPLACEMENT (Sheet 5 of 5)



14. Position tube assembly (P).
15. Hand tighten nut (Q) and nut (R).
16. Using two 5/8 inch wrench, tighten nut (Q) to nipple (M).
17. Using 5/8 inch wrench, tighten nut (R) to tee (S).
18. Using rags, clean all fuel spillage.
19. Open fuel supply to primer pump.

End of Task

TA148390

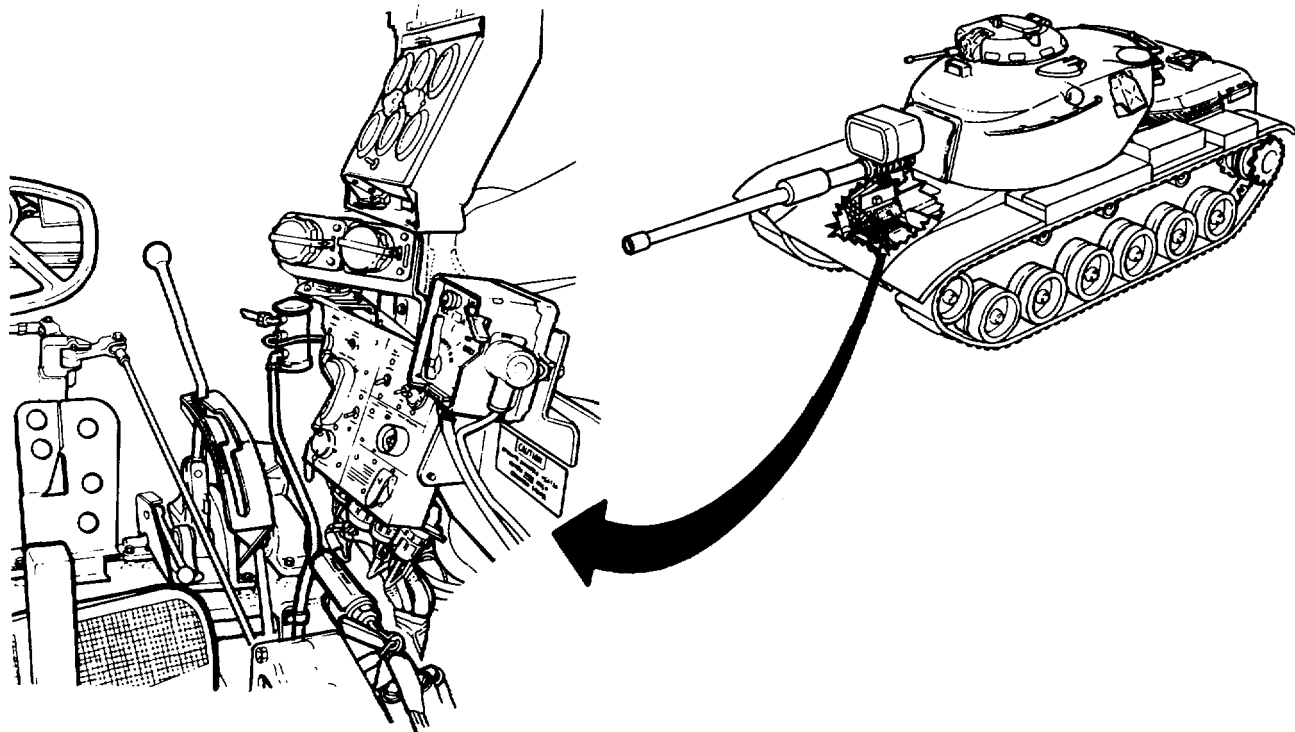
**PERSONNEL HEATER FUEL LINE REPLACEMENT (Sheet 1 of 3)**

TOOLS: 5/8 in. combination box and open end wrench  
7/16 in. combination box and open end wrench

SUPPLIES: Rags Item 65, Appendix D)  
Empty container  
Lockwasher (MS35338-44)

REFERENCE: TM 9-2350-26010

PRELIMINARY PROCEDURES: Shut off FUEL PUMPS switch (TM 9-2350-260-10).



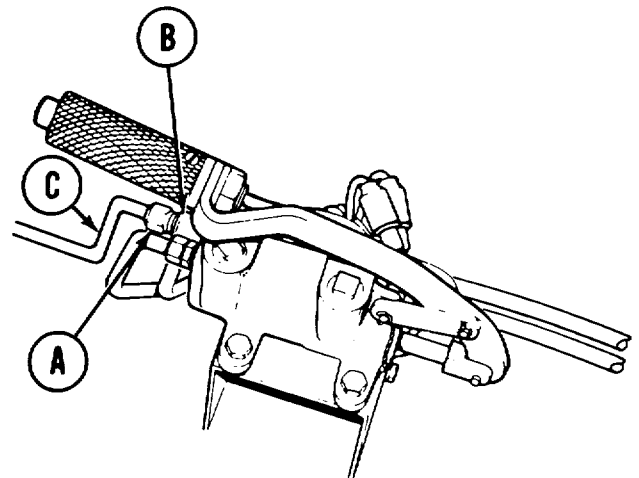
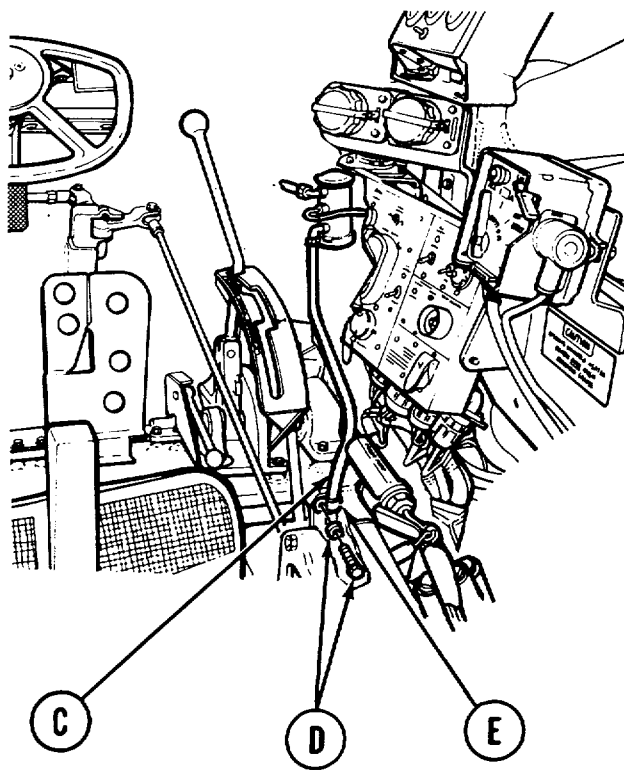
Go on to Sheet 2

TA148391

**PERSONNEL HEATER FUEL LINE REPLACEMENT (Sheet 2 of 3)**

**REMOVAL:**

1. Using 5/8 inch wrench, loosen fitting (A) from tee (B). Move tube assembly (C) slightly away from tee (B).



2. Using 7/16 inch wrench, remove screw and lockwasher (D) securing damp (E) to tube assembly (C). Throw lockwasher away.
3. Remove clamp (E) from tube assembly (C).

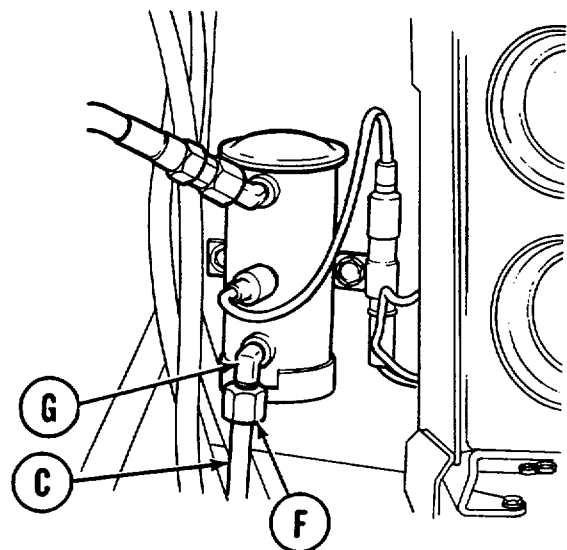
**NOTE**

**Use empty container to catch any fuel draining from fuel pump.**

4. Using 5/8 inch wrench, loosen fitting (F) from elbow (G) on fuel pump.
5. Remove tube assembly (C).

**INSPECTION:**

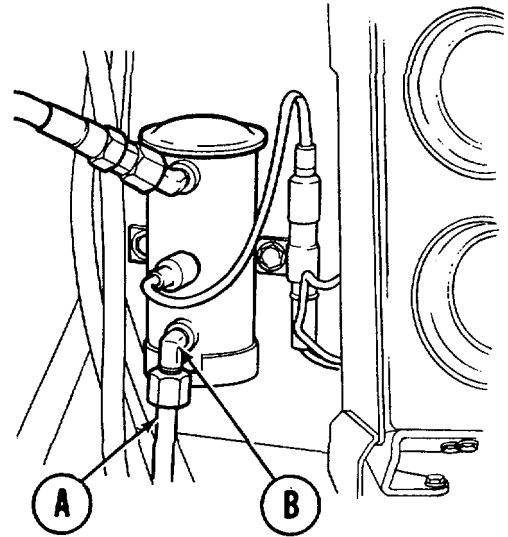
Inspect inlet and outlet elbows for cracks, thread damage, and burrs. Replace if necessary.



**PERSONNEL HEATER FUEL LINE REPLACEMENT (Sheet 3 of 3)**

**INSTALLATION:**

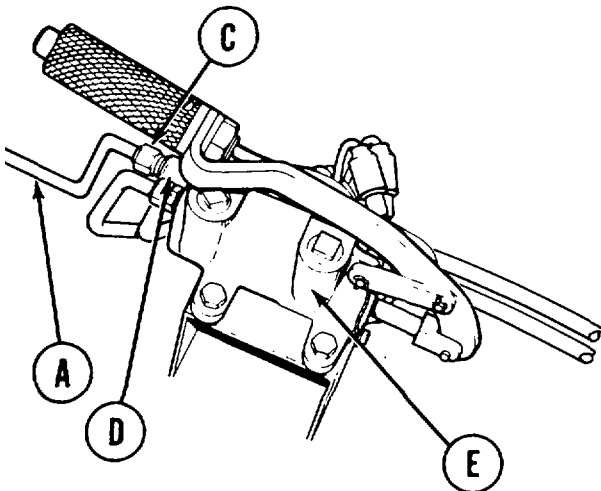
1. Position tube assembly (A) in tank.
2. Using 5/8 inch wrench, install tube assembly (A) on elbow (B) and tighten securely.



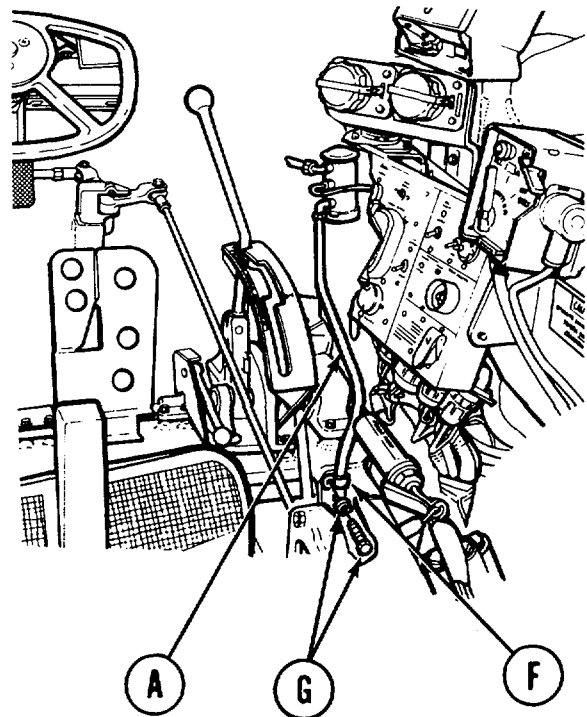
**NOTE**

**Be sure to inspect the routing of tube assembly (A) from personnel heater fuel pump to primer pump. Make sure it is not bent or crimped.**

3. Using 5/8 inch wrench, connect fitting (C) to tee (D) of the primer pump (E) and tighten securely.



4. Install clamp (F) on tube (A).
5. Using 7/16 inch wrench, install screw and new lockwasher (G) through clamp (F) and tighten.
6. Wipe up any fuel spills.



End of Task

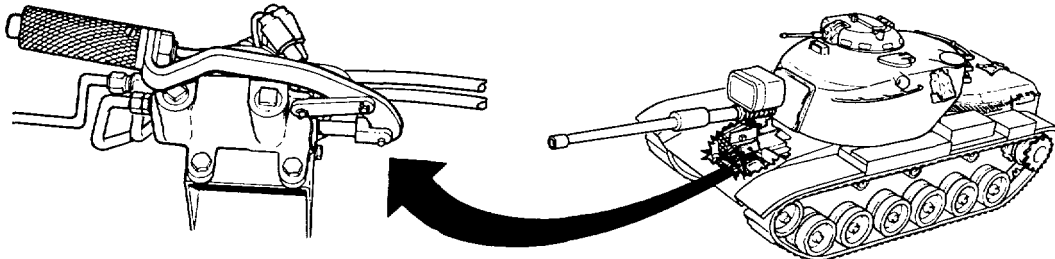
TA148393

**PRIMER PUMP INLET TEE REPLACEMENT (Sheet 1 of 1)**

TOOLS: 5/8 in. combination box and open end wrench  
 8 in. adjustable wrench (crescent)  
 9/16 in. combination box and open end wrench

SUPPLIES: Rags (Item 65, Appendix D)

PRELIMINARY PROCEDURES: Shut off fuel supply to primer pump (TM 9-2350-260-10)

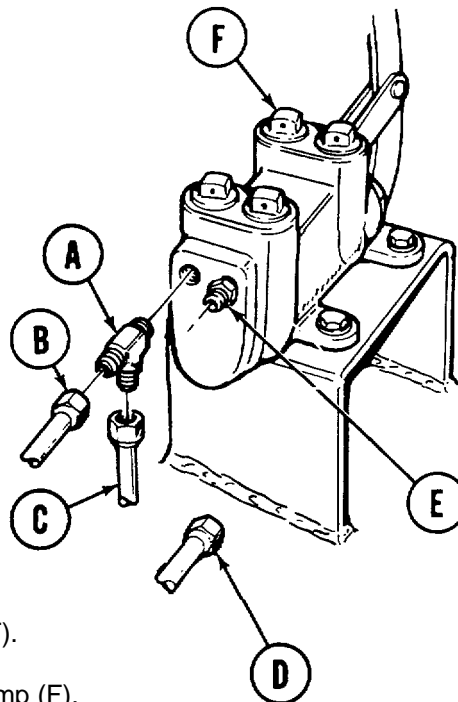


REMOVAL:

**CAUTION**

**Do not move tube assemblies which may cause bending.**

1. Using crescent wrench to hold tee (A), use 5/8 inch wrench to disconnect fitting (B) from tee (A). Move fitting (B) and tube assembly away from tee.
2. Using 5/8 inch wrench, disconnect fitting (C) from tee (B). Move fitting (C) and tube assembly away from tee.
3. Using 9/16 inch wrench, remove line (D).
4. Using 9/16 inch wrench, remove adapter (E).
5. Using crescent wrench, loosen tee (A) from primer pump (F) and remove.



INSTALLATION:

1. Using crescent wrench, install tee (A) into primer pump (F).
2. Using 9/16 inch wrench, install adapter (E) into primer pump (F).
3. Using 9/16 inch wrench, install line (D) in primer pump (F).
4. Using 5/8 inch wrench, install fitting (C) with tube assembly to tee (A).
5. Using 5/8 inch wrench, install fitting (B) with tube assembly to tee (A).

End of Task

TA148394



**PRIMER PUMP REPLACEMENT (Sheet 1 of 4)**

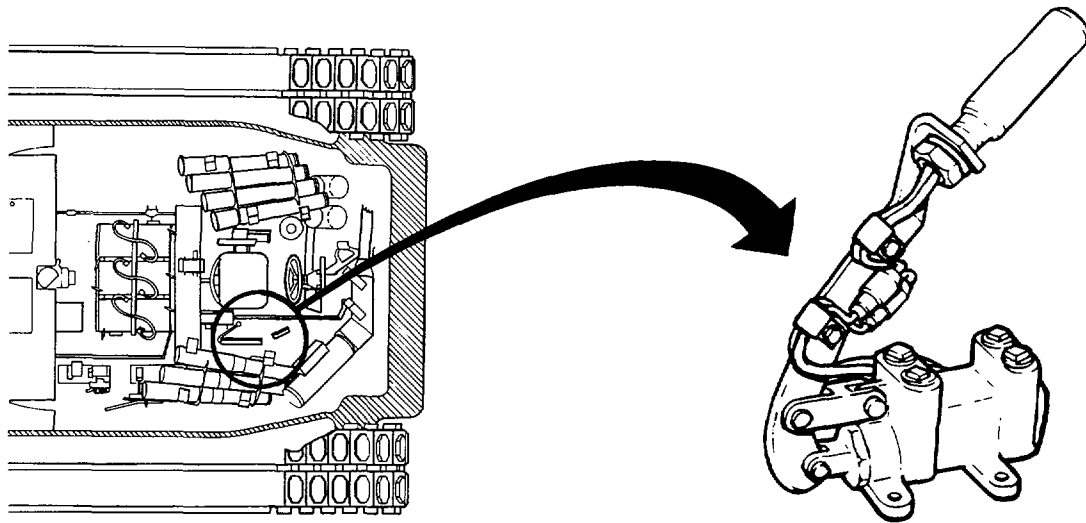
PROCEDURE INDEX

PROCEDURE	PAGE
Removal	7-321
Cleaning and Inspection	7-322
Installation	7-323

TOOLS: Wire brush  
 1/2 in. combination box and open end wrench  
 9/16 in. combination box and open end wrench  
 9/16 in. socket with 1/2 in. drive  
 Ratchet with 1/2 in. drive  
 3 in. extension with 1/2 in. drive  
 7/16 in. combination box and open end wrench

SUPPLIES: Sealing compound (Item 28, Appendix D)  
 Silicone compound (Item 32, Appendix D)  
 Rags (Item 65, Appendix D)  
 Lockwasher (MS35338-46) (4 required)

REFERENCE: TM 9-2350-260-10



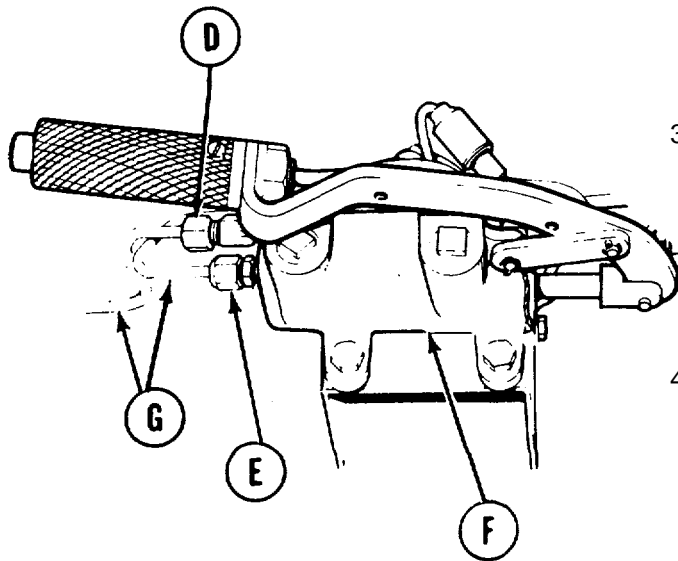
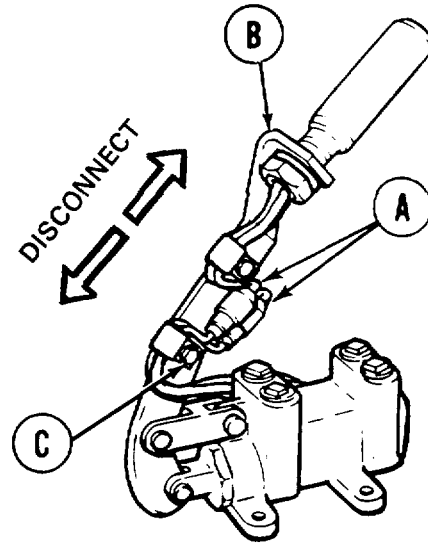
Go on to Sheet 2

TA148395

**PRIMER PUMP REPLACEMENT (Sheet 2 of 4)**

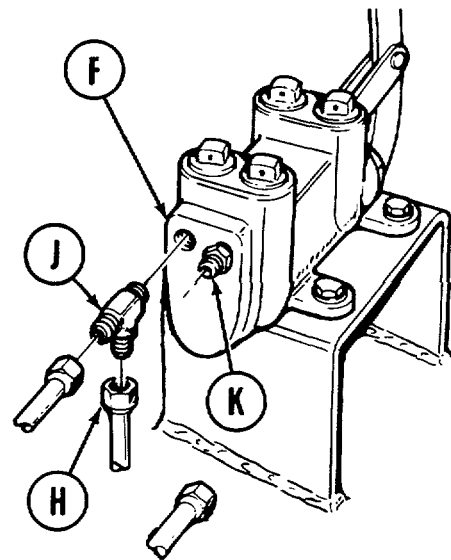
**REMOVAL:**

1. Disconnect two electrical connectors (A) located on handle support bracket (B) by pulling apart.
2. Raise handle to the up position. Using 7/16 inch wrench, remove bolt and wire bracket (C).



3. Using 9/16 inch wrench, remove heater tube nut (D) and outlet tube nut (E) from primer pump (F).
4. Pull back two tubes (G) from primer pump (F).

5. Using 9/16 inch wrench, remove inlet tube nut (H) from tee (J).
6. Using 1/2 inch wrench, remove tee (J) and adapter (K) from primer pump (F).



Go on to Sheet 3

TA148396

**PRIMER PUMP REPLACEMENT (Sheet 3 of 4)**

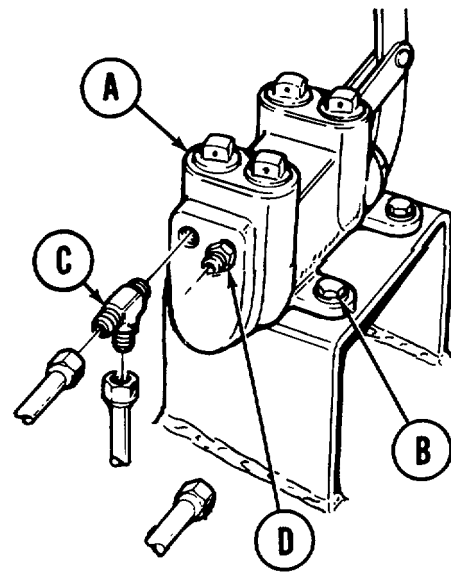
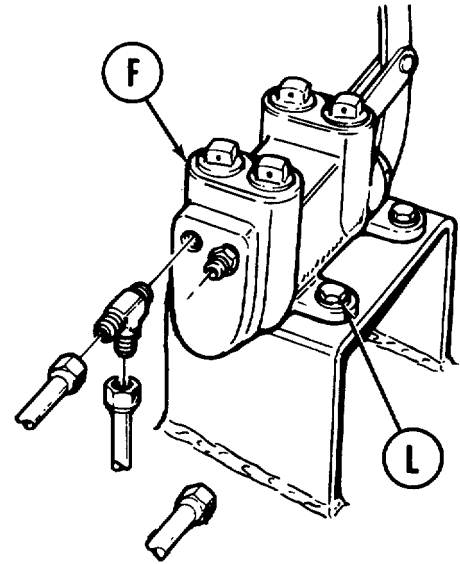
7. Using socket, remove four bolts, lockwashers, and flat washers (L) securing primer pump (F) to hull. Throw lockwashers away.
8. Remove primer pump (F).

**CLEANING AND INSPECTION:**

1. Clean all threads with wire brush.
2. Inspect all parts for cracks or crossed threads. Replace as required.

**INSTALLATION:**

1. Place primer pump (A) in position in tank.
2. Using socket, install four bolts, new lockwashers, and flat washers (B) securing primer pump (A) to hull.



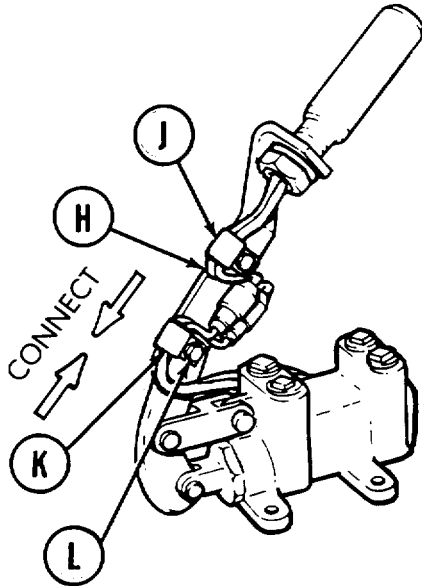
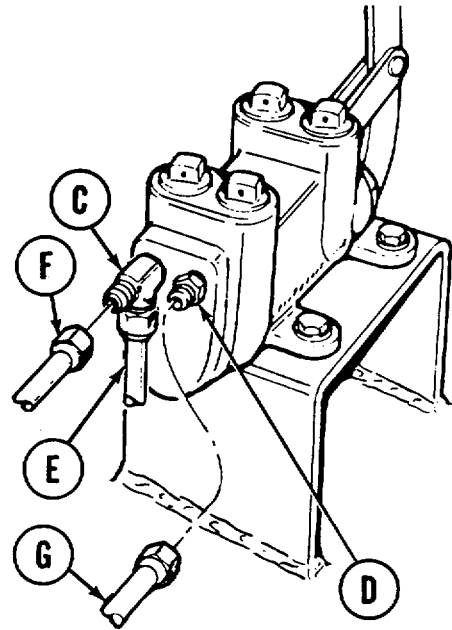
3. Place sealing compound (Item 28, Appendix D) on male pipe threads of tee (C) and adapter (D).
4. Using 1/2 inch wrench, install tee (C) and adapter (D) in primer pump (A).

Go on to Sheet 4

TA148397

**PRIMER PUMP REPLACEMENT (Sheet 4 of 4)**

5. Using 9/16 inch wrench, install inlet tube (E) and heater tube (F) on tee (C).
6. Using 9/16 inch wrench, install outlet tube (G) on adapter (D).



7. Apply silicone compound (Item 32, Appendix D) to two electrical connectors (H).
8. Connect two electrical connectors (H) located on handle support bracket (J) by pushing together.
9. Raise handle to up position. Using 7/16 inch wrench, install wire bracket (K) with bolt (L).

End of Task

TA148398

**MANIFOLD HEATER OPERATIONAL CHECK (Sheet 1 of 2)**

SPECIAL TOOLS: Ground hop kit (Item 30, Chapter 3, Section I)

PERSONNEL: Two

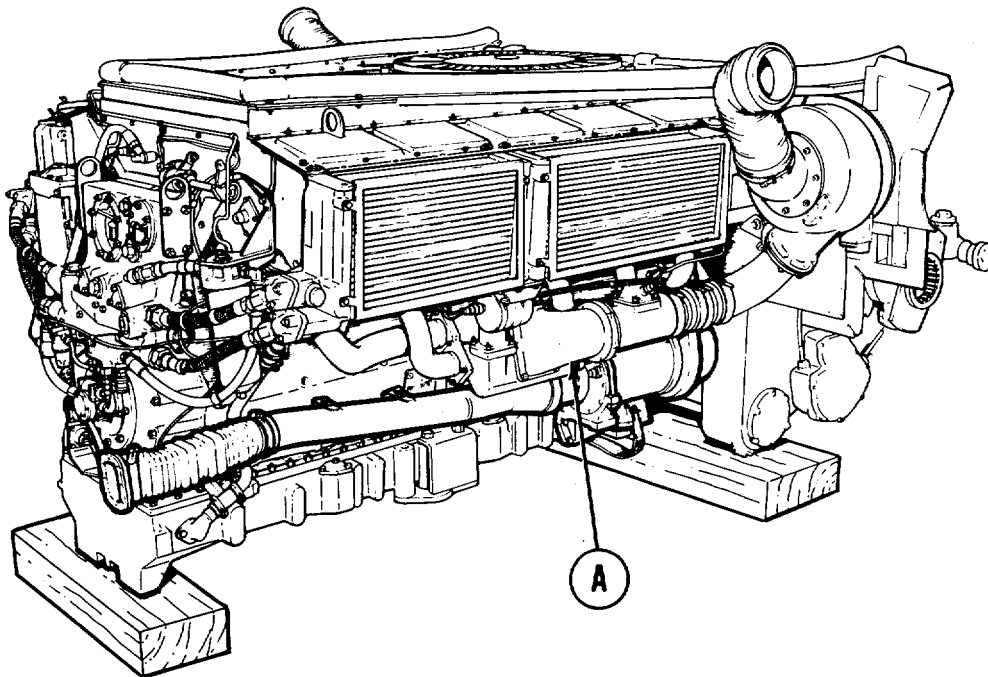
PRELIMINARY PROCEDURE: Remove powerplant (page 5-1)

OPERATIONAL CHECK:

**NOTE**

**This procedure applies to manifold heaters on both 2A and 2D powerplants. Make this check after any part of manifold heater system is replaced. It requires two persons to complete.**

1. Prepare engine for powerplant test run (page 5-4).
2. Station one person on side of engine that maintenance was performed, with one hand on intake manifold heater tube (A).

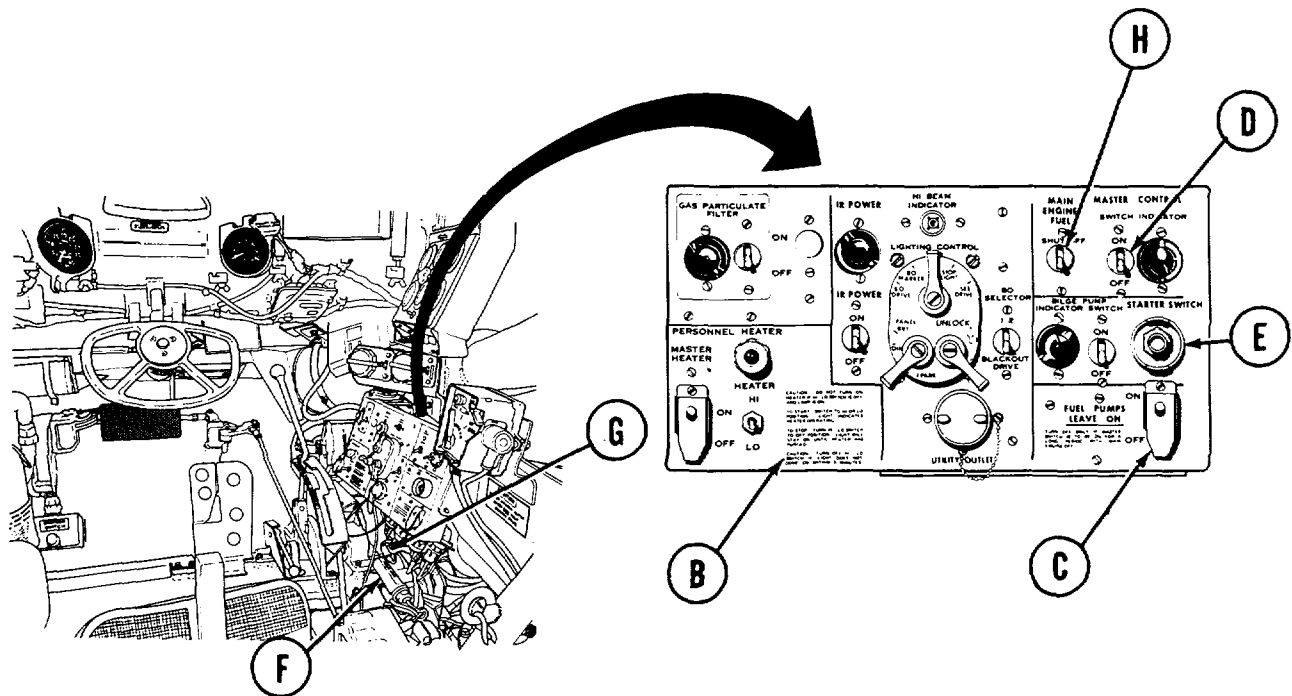


**2A ENGINE SHOWN, 2D LOCATION  
IS THE SAME**

Go on to Sheet 2

TA148399

## MANIFOLD HEATER OPERATIONAL CHECK (Sheet 2 of 2)



3. At driver's station on master control panel (B) set FUEL PUMPS switch (C) to OFF (down) and MASTER CONTROL switch (D) to ON (up).
4. Press STARTER SWITCH (E) and at same time operate primer pump handle (F) while pressing heater button (G) on end of handle.
5. Check system for leaks. Correct as necessary.
6. Check that heater is operating. Heat will be felt at intake manifold heater tube. If no heat is felt, troubleshoot and correct (Symptom 8, page 4-22).
7. When checks are complete, stop operating primer pump handle (F). Hold MAIN ENGINE FUEL SHUTOFF switch (H) to OFF. Set MASTER CONTROL switch to OFF (down).
8. Disconnect engine from powerplant test run hookup (page 5-67).
9. Install 2A powerplant (page 5-14) or 2D powerplant (page 5-40).

End of Task

TA148400

**MANIFOLD HEATER (LEFT AND RIGHT) REPLACEMENT (Sheet 1 of 4)**

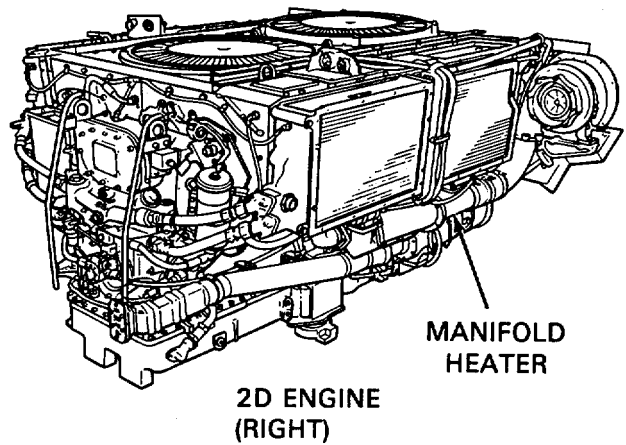
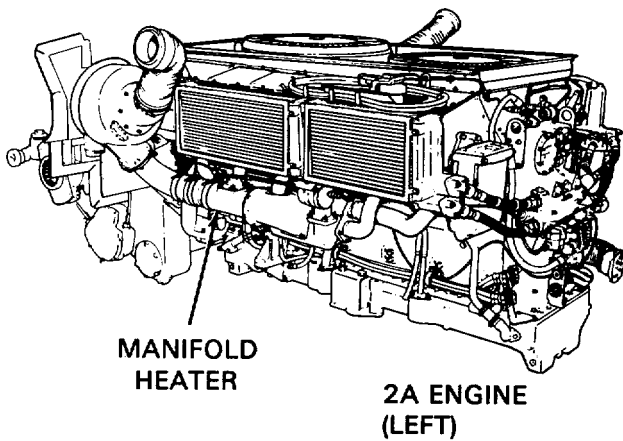
PROCEDURE INDEX

PROCEDURE	PAGE
Removal	7-326
Installation	7-327

**TOOLS:** 3/4 in. combination box and open end wrench  
 7/16 in. combination box and open end wrench  
 1/2 in. combination box and open end wrench  
 9/16 in. combination box and open end wrench  
 5/8 in. combination box and open end wrench

**SUPPLIES:** Container to catch fuel leaks  
 Rags (Item 65, Appendix D)  
 Gasket (8682503)  
 Filter (11610365-1) (2D1 engine only)  
 Filtering disc (11650355) (2D engine only)  
 Self-locking nuts (MS21044N5) (4 required)

**PRELIMINARY PROCEDURE:** Remove powerplant (page 51)



**NOTE**

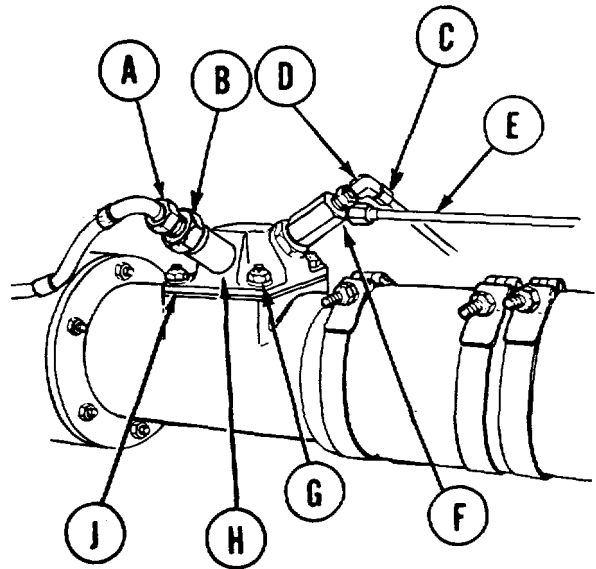
**Manifold heaters on 2A and 2D engines are the same. This procedure applies to both powerplants. Procedures for replacement of left or right manifold heater are the same. Procedures given here are for right manifold heater.**

**MANIFOLD HEATER (LEFT AND RIGHT) REPLACEMENT (Sheet 2 of 4)****REMOVAL:**

1. Using 3/4 inch wrench, disconnect ignition lead (A) from spark plug (B)

**NOTE**

**Use suitable container to catch fuel spillage whenever any fuel line or fitting is loosened or removed.**



2. Using 7/16 inch wrench, disconnect fuel input tube (C) from elbow (D).
3. Using 9/16 inch wrench, disconnect fuel return tube (E) from elbow (F).
4. Using 1/2 inch wrench, remove four nut and washer (G). Throw nut away.
5. Remove manifold heater (H) and gasket (J). Throw gasket away.

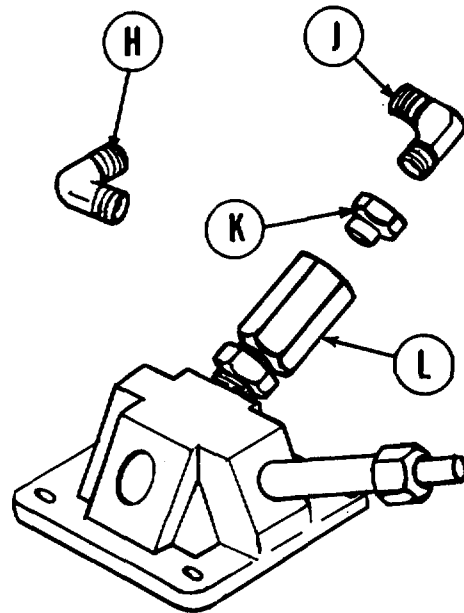


**MANIFOLD HEATER (LEFT AND RIGHT) REPLACEMENT (Sheet 3 of 4)**

**NOTE**

Some 2D engines have a filtering disc between elbow (H) and nozzle, and a filter between bushing (K) and nozzle (L). Remove and throw away filter and disc if present

6. Using 7/16 inch wrench, remove elbow (H).
7. Using 7/16 inch wrench, remove elbow (J).
8. Using 5/8 inch wrench, remove bushing (K) from nozzle (L).
9. Inspect all items disconnected or removed for cracks, nicks, or other damage. Replace as necessary.



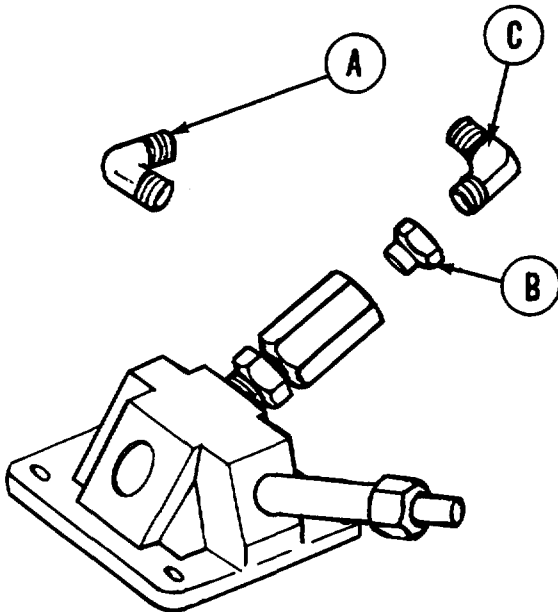
**NOTE**

Position and install elbows as shown.

**NOTE**

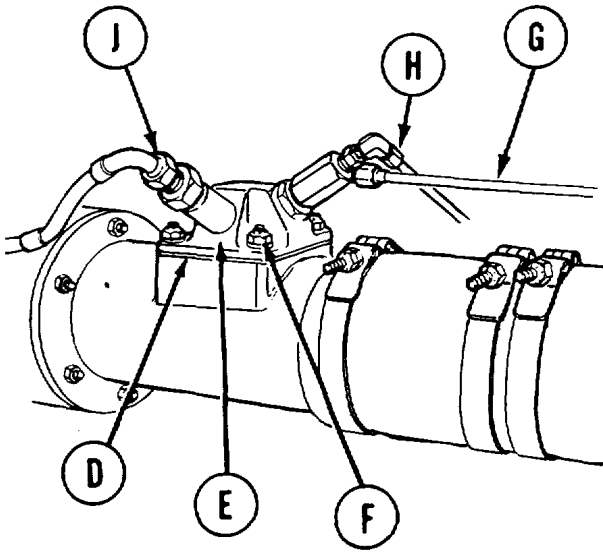
Some 2D engines require a filtering disc between elbow (A) and nozzle, and a filter between bushing (B) and fuel nozzle.

**INSTALLATION:**



1. Install elbow (A). Using 7/16 inch wrench, tighten elbow.
2. Install bushing (B). Using 5/8 inch wrench, tighten bushing.
3. Install elbow (C). Using 7/16 inch wrench, tighten elbow.

## MANIFOLD HEATER (LEFT AND RIGHT) REPLACEMENT (Sheet 4 of 4)



4. Position new gasket (D) and manifold heater (E) onto manifold.
5. Install four washers and new nut (F) to secure manifold heater.
6. Using 1/2 inch open end wrench, tighten nut (F).

**NOTE**

**Adjust elbows to align with fuel tube connectors.**

7. Connect fuel input tube (H) to elbow. Using 7/16 inch open end wrench, tighten tube.
8. Connect fuel return tube (G) to elbow. Using 9/16 inch open end wrench, tighten tube.
9. Connect ignition lead (J) to spark plug. Using 3/4 inch open end wrench, tighten ignition lead.
10. Perform manifold heater operational check (page 7-324).
11. Install 2A powerplant (page 5-14) or 2D powerplants (page 5-40).

End of Task

TA148404

**MANIFOLD HEATER NOZZLE REPLACEMENT (Sheet 1 of 3)**

**TOOLS:** 5/8 in. combination box and open end wrench  
 7/16 in. combination box and open end wrenches (2 required)  
 9/16 in. combination box and open end wrench  
 13/16 in. combination box and open end wrench  
 1/2 in. combination box and open end wrench  
 1 in. combination box and open end wrench

**SUPPLIES:** Rags (Item 65, Appendix D)  
 Filter (11640365-1) D engine only  
 Nozzle (7335555)  
 Filtering disc (11650365) (2D engine only)

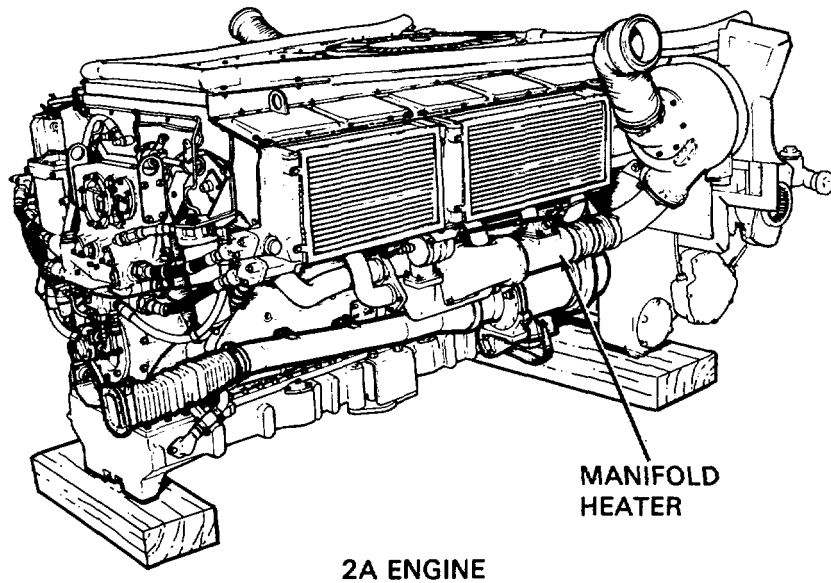
**PRELIMINARY PROCEDURE:** Remove powerplant (page 5-1)

**NOTE**

**Manifold heaters on 2A and 2D engines are similar. This procedure applies to both powerplants.**

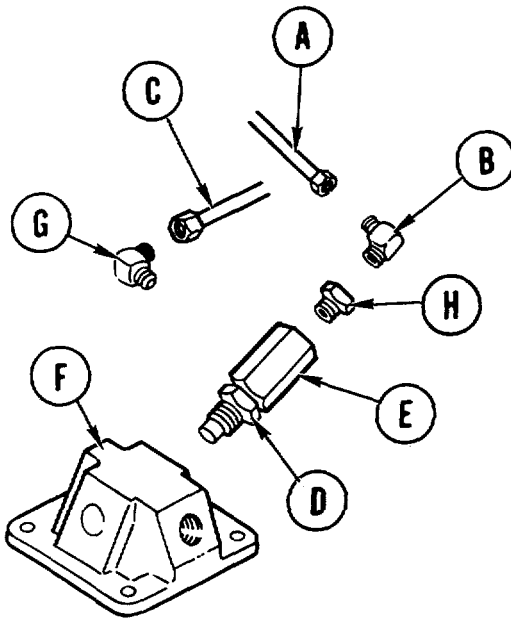
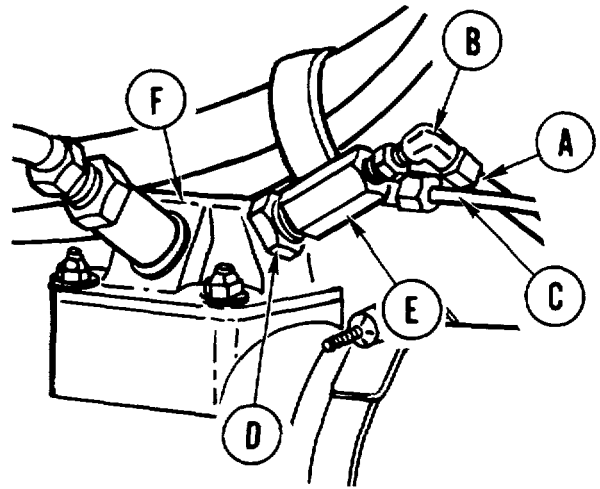
**NOTE**

**Nozzle on right manifold heater is shown. Nozzle on left manifold is similar.**



**MANIFOLD HEATER NOZZLE REPLACEMENT (Sheet 2 of 3)****REMOVAL:**

1. Using two 7/16 inch wrenches, disconnect fuel inlet line (A) from elbow (B).
2. Using 7/16 inch and 9/16 inch wrenches, disconnect fuel return line (C) from elbow.
3. Using 1 inch wrench, loosen jamnut (D).
4. Using 13/16 inch wrench, remove nozzle (E) and fitting from manifold heater (F).



5. Using 7/16 inch wrench, remove elbow (G) and (if present) filtering disc from nozzle. Throw filtering disc away.
6. Using 5/8 inch and 7/16 inch wrenches, remove elbow (B) from nozzle.
7. Using 5/8 inch and 13/16 inch wrenches, remove bushing (H) and (if present) filtering disc. Throw filtering disc away.
8. Throw nozzle (E) away.

9. Inspect all parts disconnected or removed. Replace all items as necessary.

Go on to Sheet 3

TA148406

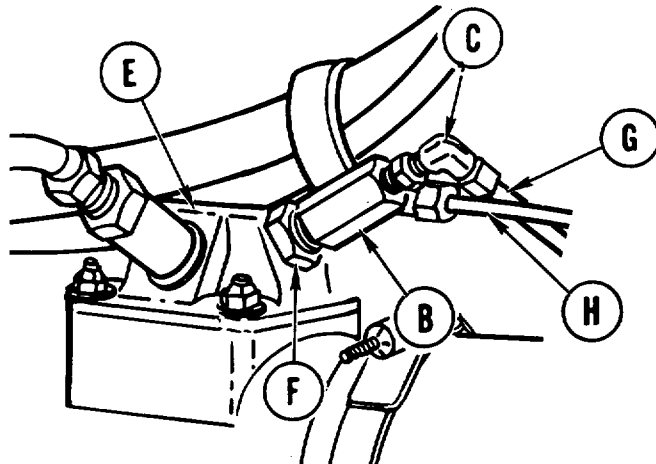
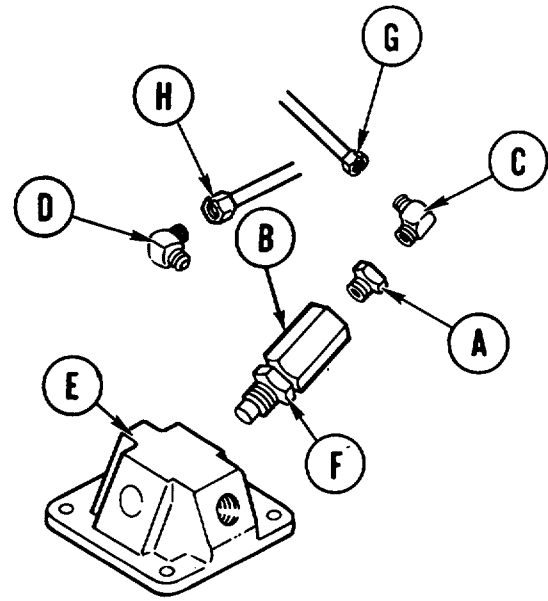
**MANIFOLD HEATER NOZZLE REPLACEMENT (Sheet 3 of 3)**

INSTALLATION:

**NOTE**

**On 2D engines, install new filter between bushing (A) and nozzle (B) and new filtering disc between elbow (D) and nozzle.**

1. Using 13/16 inch and 5/8 inch wrenches, install bushing (A) in new nozzle (B).
2. Using 5/8 inch and 7/16 inch wrenches, install elbow (C) to bushing (A).
3. Using 7/16 inch wrench, install elbow (D) into nozzle (B).



4. Install nozzle (B) and fittings into manifold heater (E).
5. Aline nozzle for ease of connecting fuel lines. Using 1 inch wrench, tighten jamnut (F).

6. Using two 7/16 inch wrenches, connect inlet fuel line (G) to elbow (C).
7. Using 7/16 inch and 9/16 inch wrenches, install return fuel line (H) to elbow (D).
8. Perform manifold heater operational check (page 7-324).
9. Install 2A powerplant (page 5-14) or 2D powerplant (page 5-40).

End of Task

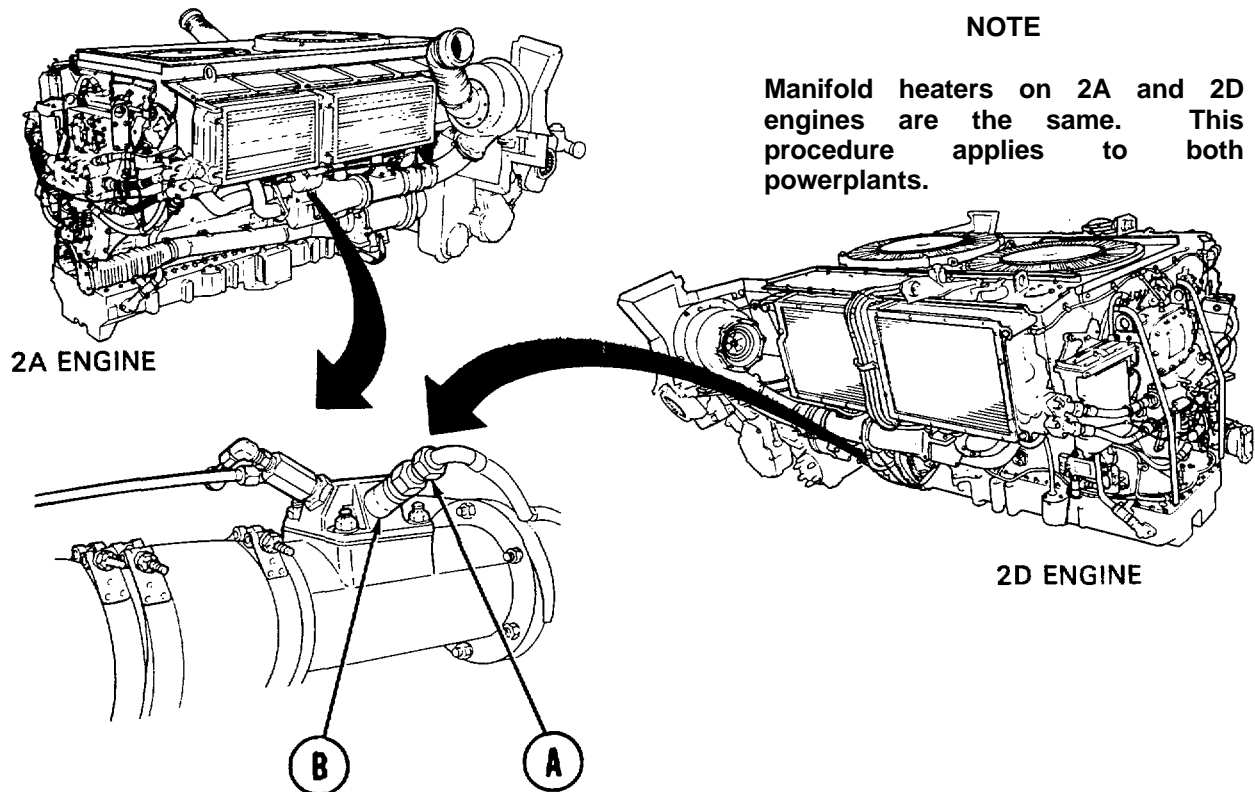
TA148407

**MANIFOLD HEATER SPARK PLUG REPLACEMENT (Sheet 1 of 1)**

TOOLS: 3/4 in. combination box and open end wrench  
 7/8 in. combination box and open end wrench  
 Feeler gage

SUPPLIES: Gasket (150190)

PRELIMINARY PROCEDURE: Remove powerplant (page 5-1)

**REMOVAL:**

1. Using 3/4 inch wrench, disconnect ignition cable (A) from spark plug (B).
2. Using 7/8 inch wrench, remove spark plug (B) with gasket. Throw gasket away.

**INSTALLATION:**

1. Using feeler gage, set spark plug gap at 0.097 inch (0.003 or +0.017).
2. Using 7/8 inch wrench, install spark plug (B) and new gasket.
3. Connect ignition cable (A) to spark plug (B). Using 3/4 inch wrench, tighten ignition cable (A) to spark plug (B).
4. Perform manifold heater operation check (page 7-324).
5. Install 2A powerplant (page 5-14) or 2D powerplant (page 5-40).

End of Task

TA148408

**MANIFOLD HEATER RETURN FUEL CHECK VALVE REPLACEMENT (Sheet 1 of 3)**

TOOLS: Wrench set (combination box and open end 5/16 in. thru 1 in. openings)  
Wire brush

SPECIAL TOOLS: Ground hop kit (Item 30, Chapter 3, Section I)

SUPPLIES: Drain pan  
Sealing compound (Item 28, Appendix D)  
Filtering disc (11610365) (2D engine only)

REFERENCES: TM 9-2350-260-10

PRELIMINARY PROCEDURES: Remove powerplant (page 5-1)  
Remove engine shroud (page 9-2)

REMOVAL:

**CAUTION**

**When removing or installing fuel lines, care must be taken not to damage fittings and threads or twist or distort fuel lines or hoses.**

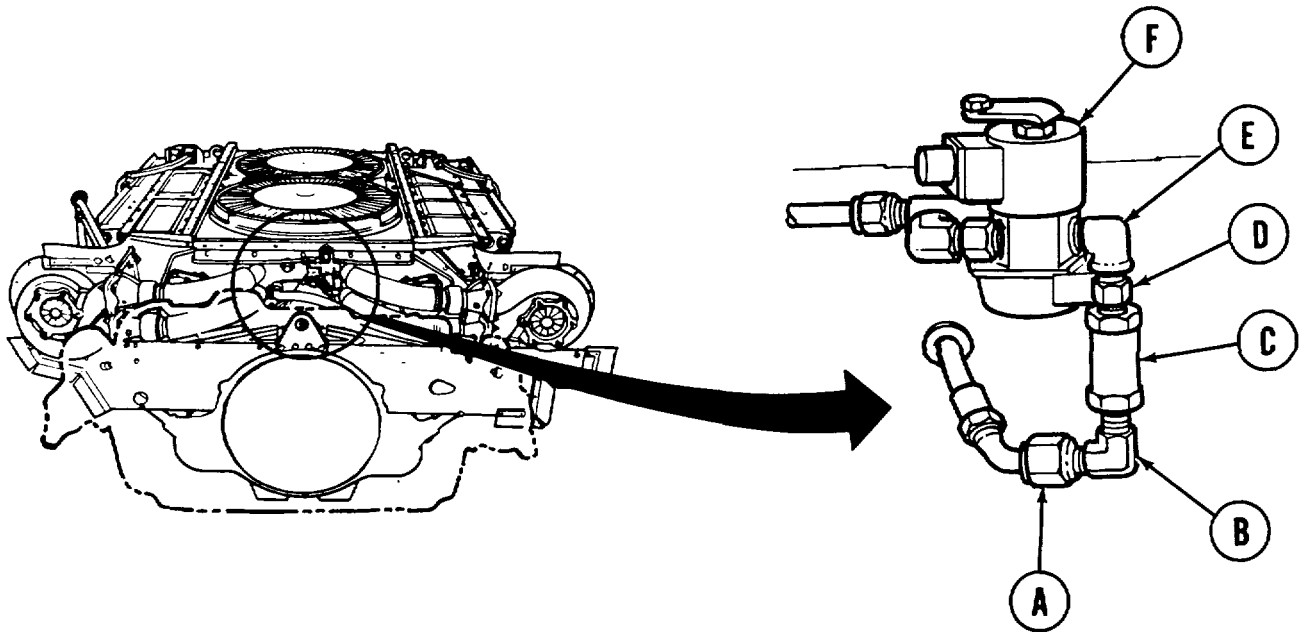
**NOTE**

**It may be necessary to use two wrenches for removal or installation of hoses and tubes.**

## MANIFOLD HEATER RETURN FUEL CHECK VALVE REPLACEMENT (Sheet 2 of 3)

## NOTE

Use suitable container to catch any fuel that may leak out whenever any part of fuel system is loosened or disconnected.



1. Using 7/16 inch and 9/16 inch wrenches, disconnect end fitting of hose assembly (A) from elbow (B).
2. Using 7/16 inch and 13/16 inch wrenches, remove elbow (B) from check valve (C).
3. Using 13/16 inch and 7/16 inch wrenches, remove check valve (C) from nipple (D).
4. Using 7/16 inch and 9/16 inch wrenches, remove nipple (D) from elbow (E).
5. Using 9/16 inch wrench, remove elbow (E) from solenoid valve (F).

## NOTE

Some 2D engines may have a filtering disc installed between elbow (E) and solenoid valve (F). If present remove disc and throw away.

## CLEANING AND INSPECTION:

1. Using wire brush, clean threaded parts.
2. Inspect all hoses, tube assemblies, and fittings. Replace as required.



**MANIFOLD HEATER RETURN FUEL CHECK VALVE REPLACEMENT (Sheet 3 of 3)**

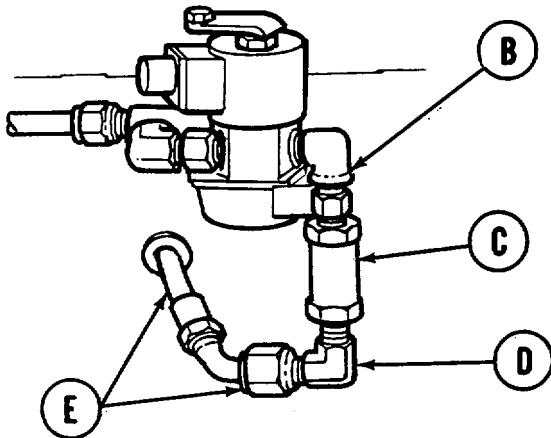
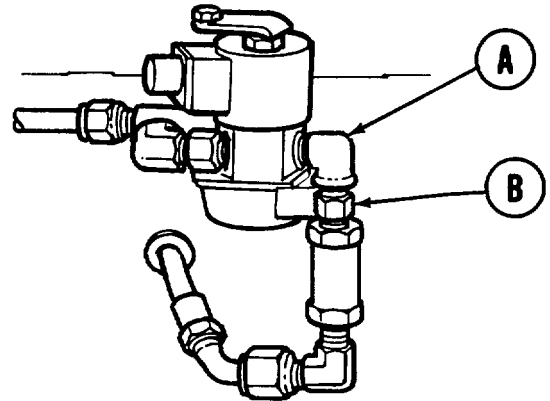
**INSTALLATION:**

1. Coat thread of elbow (A), nipple (B), check valve (C), and elbow (D) with sealing compound (Item 28, Appendix D).

**NOTE**

**Some 2D engines require a filtering disc between elbow (A) and solenoid valve.**

2. Using 9/16 inch wrench, install elbow (A) to solenoid valve in position shown.
3. Install nipple (B) to elbow (A).
4. Install check valve (C) to nipple (B).
5. Install elbow (D) to check valve (C).



6. Using proper wrenches, tighten and aline parts (B), (C), (D) to be able to connect end fitting of hose assembly (E) to elbow (D).
7. Connect hose assembly (E) to elbow (D).
8. Using 7/16 inch and 9/16 inch wrenches, tighten hose assembly (E) connection to elbow (D).

9. Connect for powerplant test run (page 5-54).
10. Operate primer pump (TM 9-2350-260-10) and check for leaks. If leaks are found, tighten connection as required.
11. Disconnect powerplant test kit (page 5-67).
12. Install engine shroud (page 9-3).
13. Install 2A powerplant (page 5-14) or 2D powerplant (page 5-40).

End of Task

TA148411

**MANIFOLD HEATER FUEL RETURN SOLENOID VALVE REPLACEMENT (Sheet 1 of 5)**

## PROCEDURE INDEX

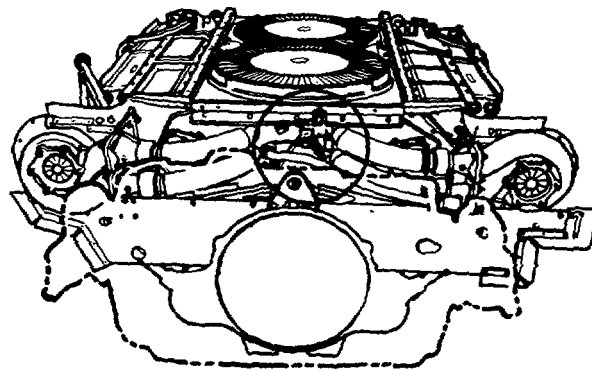
PROCEDURE	PAGE
Removal	7-338
Inspection	7-339
Installation	7-340

**TOOLS:** Spanner wrench  
 9/16 in. combination box and open end wrench  
 1/2 in. combination box and open end wrench  
 5/16 in. combination box and open end wrench  
 1/2 in. socket with 1/2 in. drive  
 5 in. extension with 1/2 in. drive  
 Ratchet with 1/2 in. drive

**SUPPLIES:** Filtering disc (11610365) (2 required) (2D engine only)  
 Container to catch fuel leakage  
 Rags (Item 65, Appendix D)  
 Sealing compound (Item 28, Appendix D)

**REFERENCE:** TM 9-2350-260-10

**PRELIMINARY PROCEDURE:** Remove engine shroud (page 9-2)

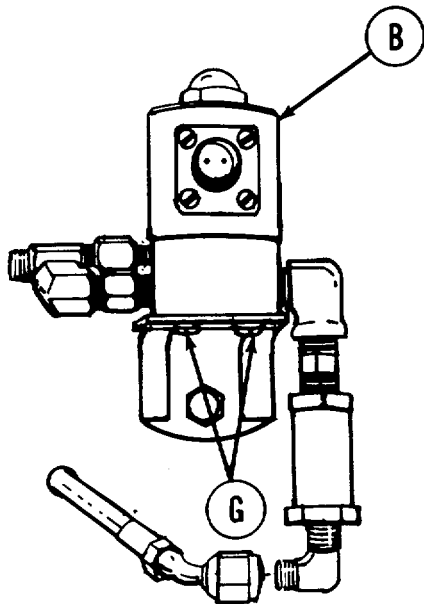
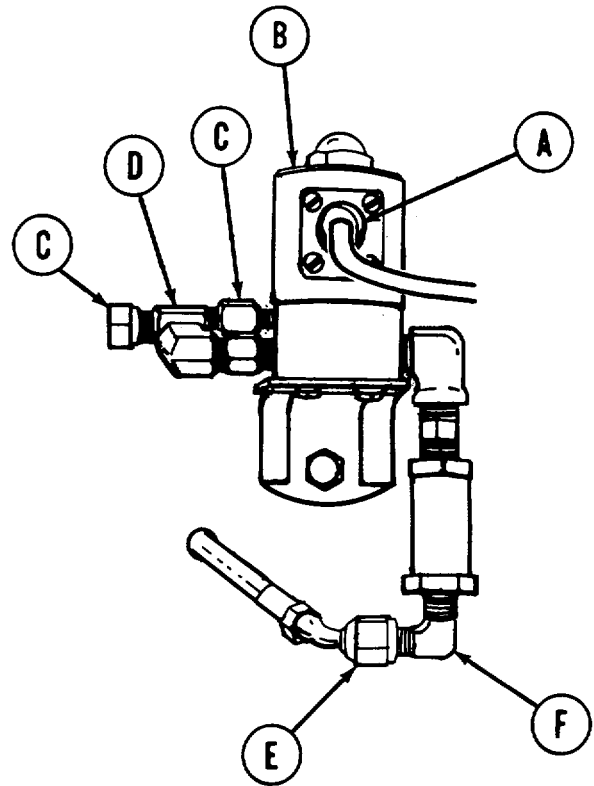
**NOTE**

**Use suitable container to catch any fuel that may leak out whenever any part of fuel system is loosened or disconnected.**

**MANIFOLD HEATER FUEL RETURN SOLENOID VALVE REPLACEMENT (Sheet 2 of 5)**

**REMOVAL:**

1. Using spanner wrench, disconnect electrical connector (A) from solenoid valve (B).
2. Using 9/16 inch wrench, disconnect two fuel lines (C) from tee (D).
3. Using 9/16 inch wrench, disconnect hose assembly (E) from elbow (F).

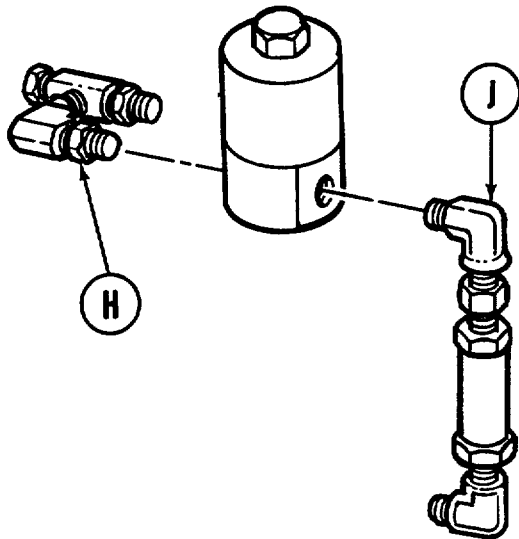


4. Using 5/16 inch wrench, remove two screws and washers (G) that secure solenoid valve (B) to bracket.
5. Remove solenoid valve (B) and fittings as a unit.

Go on to Sheet 3

TA148413

MANIFOLD HEATER FUEL RETURN SOLENOID VALVE REPLACEMENT (Sheet 3 of 5)



6. Using 1/2 inch wrench, remove coupling (H) with elbow and tee attached.
7. Using 9/16 inch wrench, remove elbow (J) with nipple, check valve, and elbow attached.

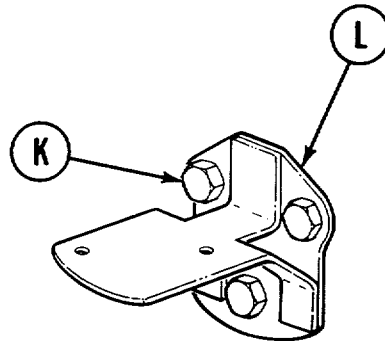
**NOTE**

Some 2D engine solenoid valves have discs installed in fuel openings. If present remove discs. Throw discs away.

8. Using 1/2 inch wrench and socket, remove three screws (K) that secure bracket (L) to shroud.
9. Remove bracket (L).

**INSPECTION:**

Inspect all items disconnected or removed. Replace defective parts as necessary.

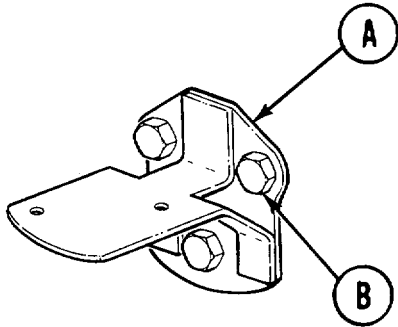


## MANIFOLD HEATER FUEL RETURN SOLENOID VALVE REPLACEMENT (Sheet 4 of 5)

## INSTALLATION:

## NOTE

Coat all male threads of fittings with sealing compound (Item 28, Appendix D) before installation.

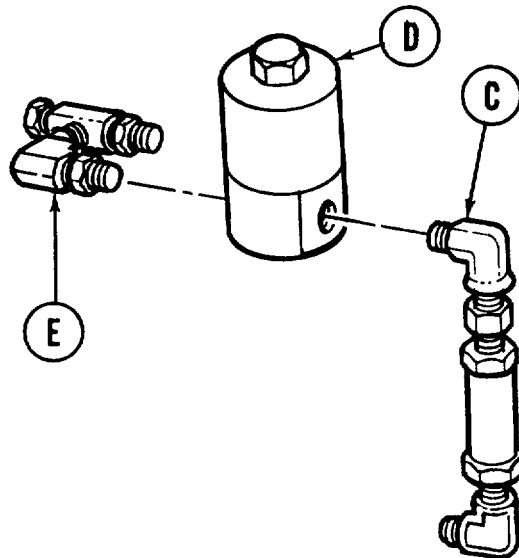


1. Position bracket (A) in place on shroud.
2. Using 1/2 inch wrench and socket, install three screws (B) to secure bracket to shroud.

## NOTE

Some 2D engine solenoid valves require filtering discs in fuel openings. Install new discs as required.

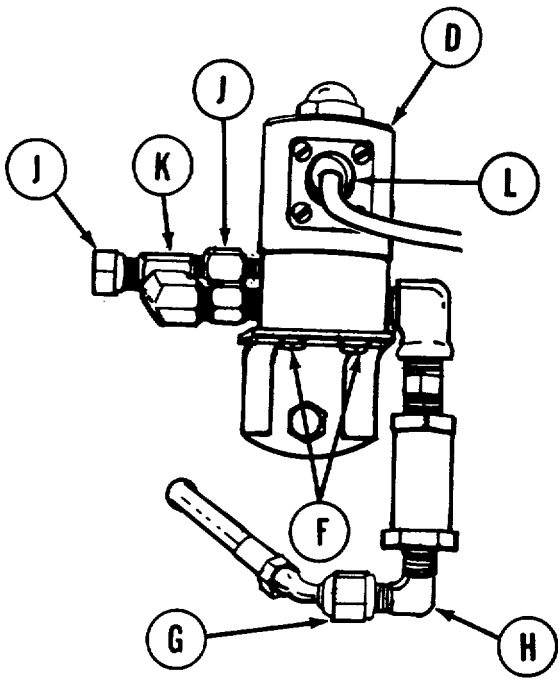
3. Using 9/16 inch wrench, install elbow with nipple, check valve, and elbow (C) as a unit on solenoid valve (D).
4. Using 1/2 inch wrench, install coupling with elbow and tee (E) on solenoid valve (D).



Go on to Sheet 5

TA148415

## MANIFOLD HEATER FUEL RETURN SOLENOID VALVE REPLACEMENT (Sheet 5 of 5)



5. Place solenoid valve (D) with fittings on bracket. Position solenoid valve so the electrical connector is facing rearward.
6. Using 5/16 inch wrench, install two screws and washers (F) to secure solenoid valve (D) to bracket.

7. Connect hose assembly (G) to elbow (H). Using 9/16 inch wrench, tighten hose assembly (G) to elbow (H).
8. Connect two fuel lines (J) to tee (K). Using 9/16 inch wrench, tighten fuel lines (J) to tee (K).
9. Using spanner wrench, install electrical connector (L) to valve.
10. Operate primer pump (TM 9-2350-260-10). Check for leaks. If leaks are found, correct as necessary.
11. Install engine shroud (page 9-3).

End of Task

TA148416

**MANIFOLD HEATER (LEFT AND RIGHT BANK) FUEL RETURN TUBE ASSEMBLY REPLACEMENT (Sheet 1 of 7)**

PROCEDURE INDEX

PROCEDURE	PAGE
Removal	7-343
Cleaning and Inspection	7-345
Installation	7-346

TOOLS: 5/16 in. combination box and open end wrench  
 8 in. adjustable wrench  
 Flat-tip screwdriver  
 Hammer  
 9/16 in. combination box and open end wrench (2 required)  
 1/2 in. socket with 1/2 in. drive  
 Ratchet with 1/2 in. drive  
 1/2 in. combination box and open end wrench

SUPPLIES: Rags (Item 65, Appendix D)  
 Sealing compound (Item 27, Appendix D)  
 Dry cleaning solvent (Item 54, Appendix D)  
 Container

PERSONNEL: Two

PRELIMINARY PROCEDURES: Remove powerplant (page 5-1)  
 Remove engine shroud (page 9-2)

**CAUTION**

**When removing or installing fuel lines, care must be taken not to damage fittings and threads or twist or distort fuel lines or hoses.**

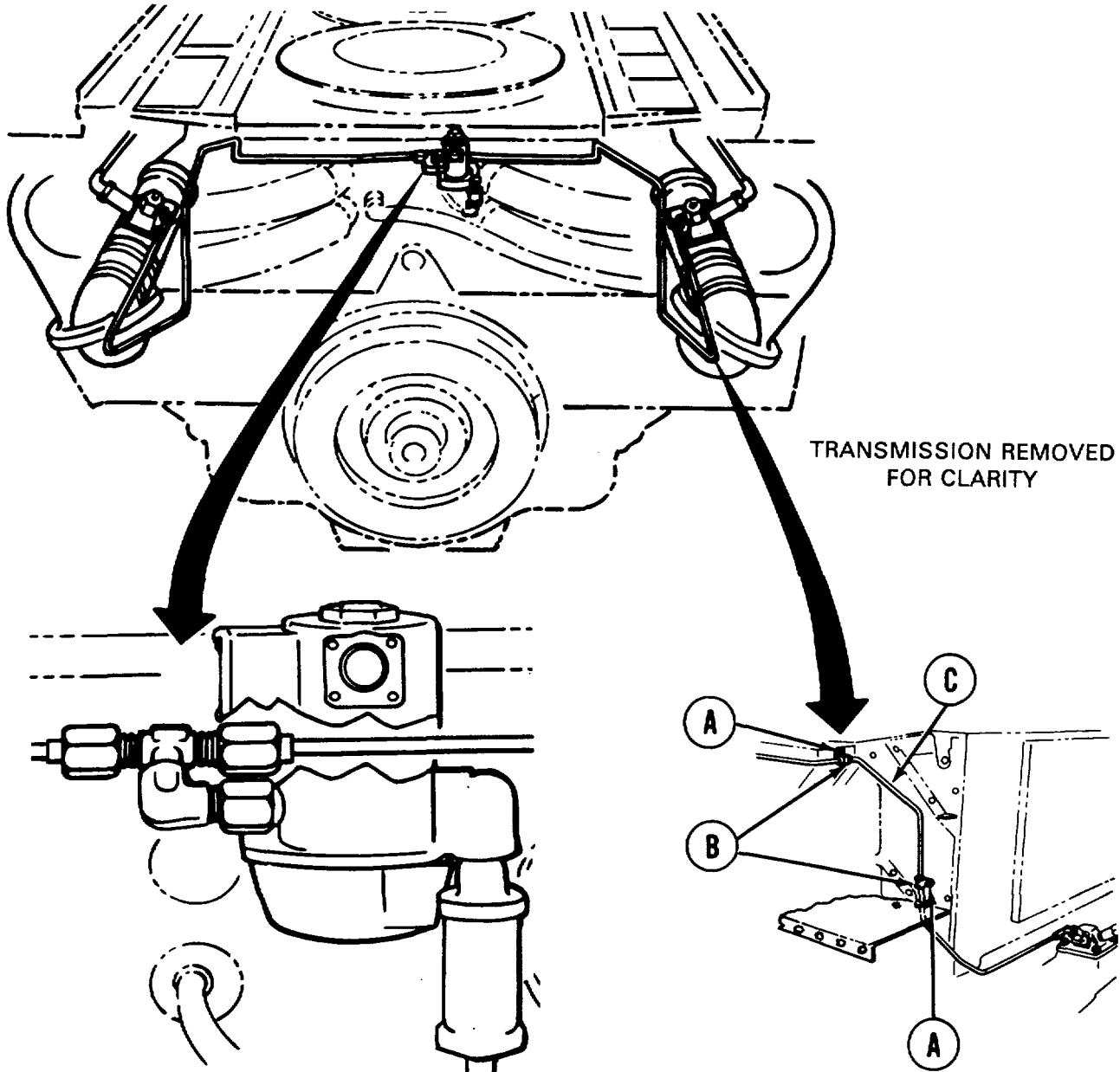
**NOTE**

**There are two manifold heater fuel return tube assemblies, one for left bank and one for right bank. Removal and installation procedures for both tube assemblies are similar. This procedure covers right bank tube assembly.**

MANIFOLD HEATER (LEFT AND RIGHT BANK) FUEL RETURN TUBE ASSEMBLY REPLACEMENT (Sheet 2 of 7)

NOTE

Use suitable container to catch any fuel that may leak out whenever any part of fuel system is loosened or disconnected.



REMOVAL:

1. Using screwdriver and 1/2 inch wrench, remove two screws and washers (A) from two clamps (B).
2. Using fingers, remove clamps (B) from tube assembly (C).

Go on to Sheet 3

TA148418



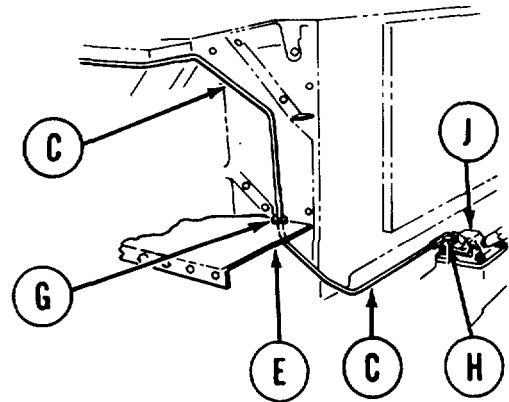
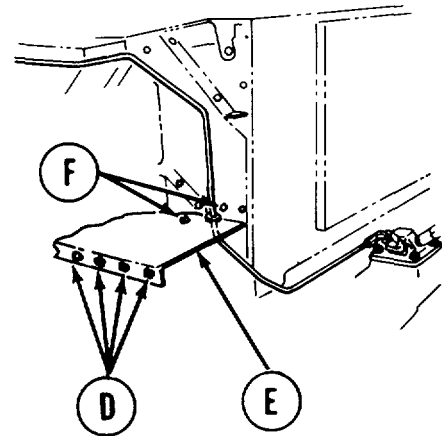
**MANIFOLD HEATER (LEFT AND RIGHT BANK) FUEL RETURN TUBE ASSEMBLY REPLACEMENT (Sheet 3 of 7)**

3. Using socket and 1/2 inch wrench, remove four screws and washers (D) from lower engine cooling fan shroud (E).
4. Using screwdriver, remove two screws and washers (F) from lower engine cooling fan shroud (E). (Left screw is hidden. You will have to feel for it.)

**NOTE**

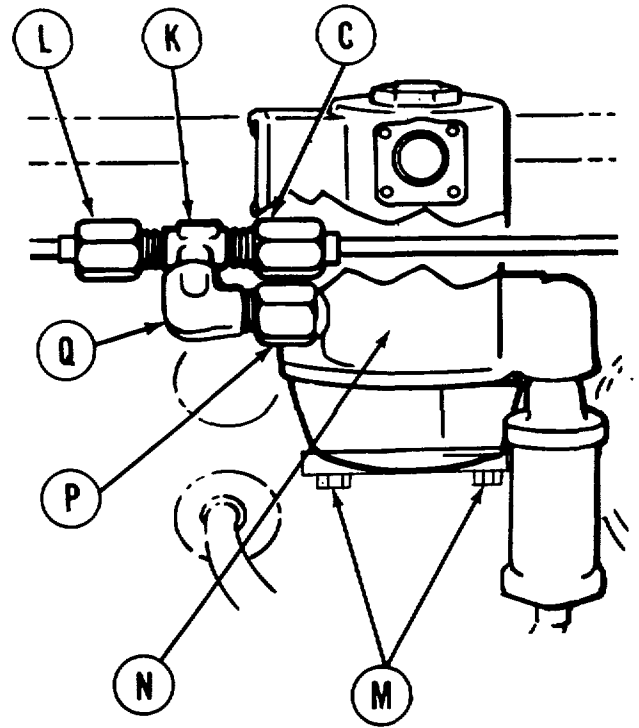
**Engine cooling fan shroud (E) must be slightly displaced in step 5 to allow clearance for removal of manifold heater return tube (C).**

5. Using hammer handle, tap on bottom of engine cooling fan shroud (E). Second person, using screwdriver, pry up on front lip of cooling fan shroud and slightly displace it.
6. Using fingers, remove grommet (G) from tube assembly (C).
7. Using 9/16 inch wrench, remove line nut of tube assembly (C) from elbow (H) on manifold heater (J).



**MANIFOLD HEATER (LEFT AND RIGHT BANK) FUEL RETURN TUBE ASSEMBLY REPLACEMENT (Sheet 4 of 7)**

8. Using 9/16 inch wrench, remove line nut of tube assembly (C) from tee (K).
9. Using 9/16 inch wrench, remove line nut of tube assembly (L) from tee (K).
10. Using 5/16 inch wrench, remove two screws (M) and pull solenoid valve (N) forward approximately one inch.
11. Using 1/2 inch wrench on coupling (P), remove coupling with elbow and tee attached.
12. Using 9/16 inch wrench on elbow (O) and adjustable wrench on tee (K), remove tee (K) from elbow (Q).
13. Using 9/16 inch wrench on elbow (Q) and 1/2 inch wrench on coupling (P), remove elbow (Q) from coupling (P).
14. Push engine cooling fan shroud aside to allow clearance for removal of tube assembly (C). Other person, using both hands, carefully remove tube assembly (C) from engine.

**CLEANING AND INSPECTION:**

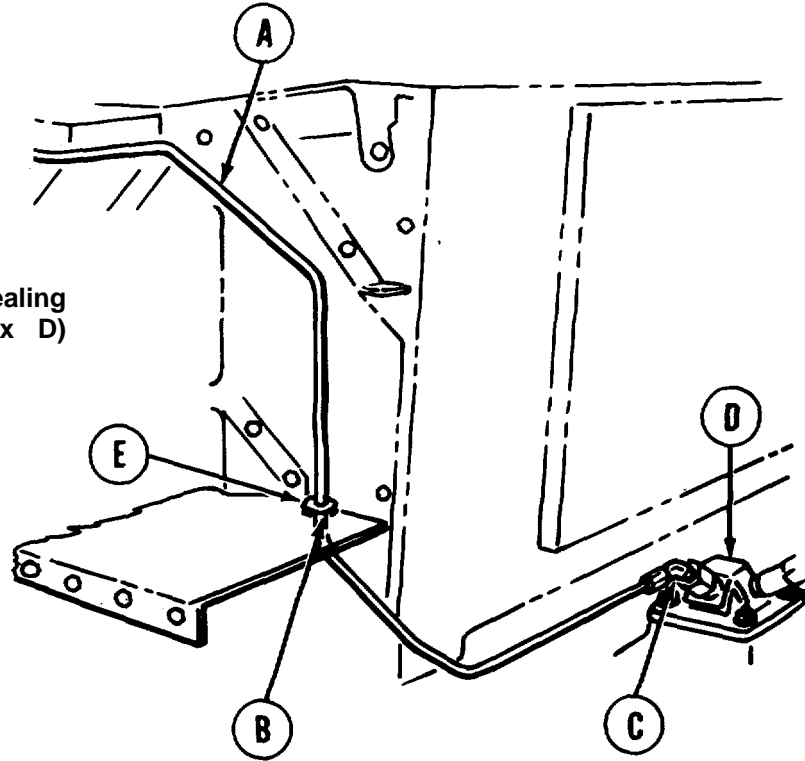
1. Using clean rags and dry cleaning solvent (Item 54, Appendix D), clean fittings thoroughly.
2. Inspect fittings for nicks, cracks, thread damage, or wear. Replace if required.
3. Inspect internal threads of manifold heater and solenoid adapter for damage.

## MANIFOLD HEATER (LEFT AND RIGHT BANK) FUEL RETURN TUBE ASSEMBLY REPLACEMENT (Sheet 5 of 7)

## INSTALLATION:

## NOTE

Coat pipe thread fittings with sealing compound (Item 27, Appendix D) before installation.



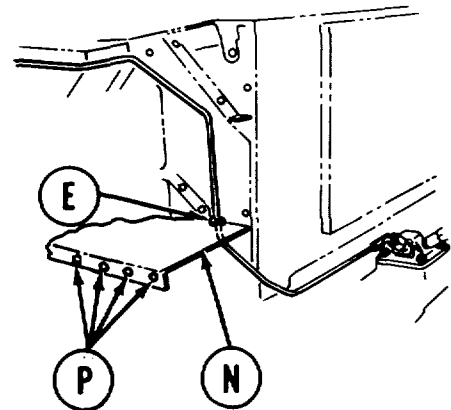
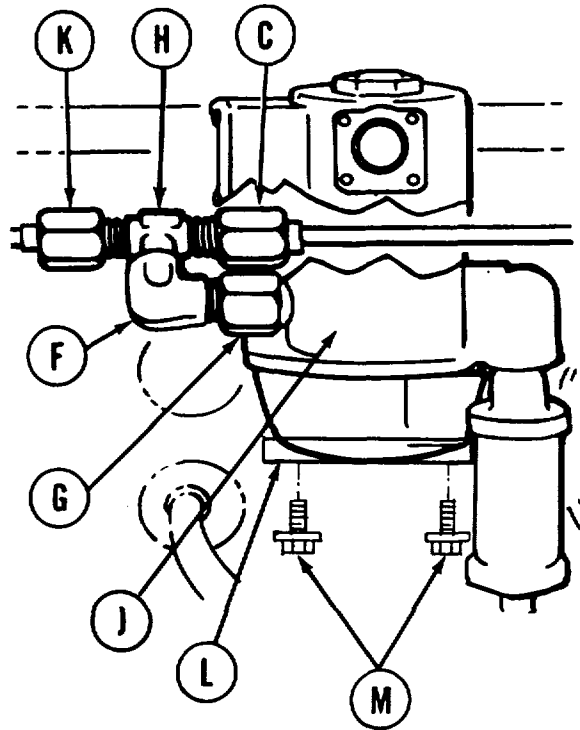
1. Using both hands, carefully push tube assembly (A) down through lower engine cooling shroud opening (B).
2. Using 9/16 inch wrench, install line nut of tube assembly (A) on elbow (C) at manifold heater (D).
3. Install grommet (E) on tube assembly (A) with flat side of grommet facing toward front of engine.

Go on to Sheet 6

TA148421

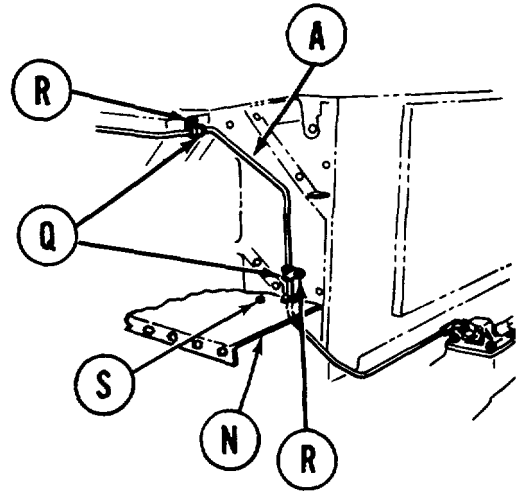
**MANIFOLD HEATER (LEFT AND RIGHT BANK) FUEL RETURN TUBE ASSEMBLY REPLACEMENT (Sheet 6 of 7)**

5. Using 9/16 inch wrench, install elbow (F) on adapter (G).
6. Using 9/16 inch wrench on elbow (F) and adjustable wrench on tee (H), install elbow (F) on tee (H).
7. Using 1/2 inch wrench, install adapter (G), elbow (F), and tee (H) to solenoid valve (J).
8. Using 9/16 inch wrench, install tube assembly line nut of tube (K) on tee (H).
9. Using 9/16 inch wrench, install line nut of tube assembly (C) on tee (H).
10. Position solenoid valve (J) on bracket (L).
11. Using 5/16 inch wrench, install two screws and washers (M) through bracket (L) and into solenoid valve (J).
12. Using fingers, install grommet (E) in slot of lower engine cooling fan shroud (N).
13. Using both hands, install lower engine cooling fan shroud (N) over mounting holes in engine bulkhead.
14. Using hands, manually install four screws and washers (P) in lower engine cooling fan shroud (N).
15. Using socket and 1/2 inch wrench, tighten four screws and washers (P) in lower engine cooling fan shroud (N).



**MANIFOLD HEATER (LEFT AND RIGHT BANK) FUEL RETURN TUBE ASSEMBLY REPLACEMENT (Sheet 7 of 7)**

16. Using fingers, install clamps (Q) on tube assembly (A).
17. Using screwdriver and 1/2 inch wrench, install two screws and washers (R) through clamps (Q).
18. Using screwdriver, install two screws and washers (P) in lower engine cooling fan shroud (N).
19. Perform operational test of manifold heaters (page 7-325).
20. Install engine shroud (page 9-3).
21. Install 2A powerplant (page 5-14) or 2D powerplant (page 5-40).



End of Task

TA148423

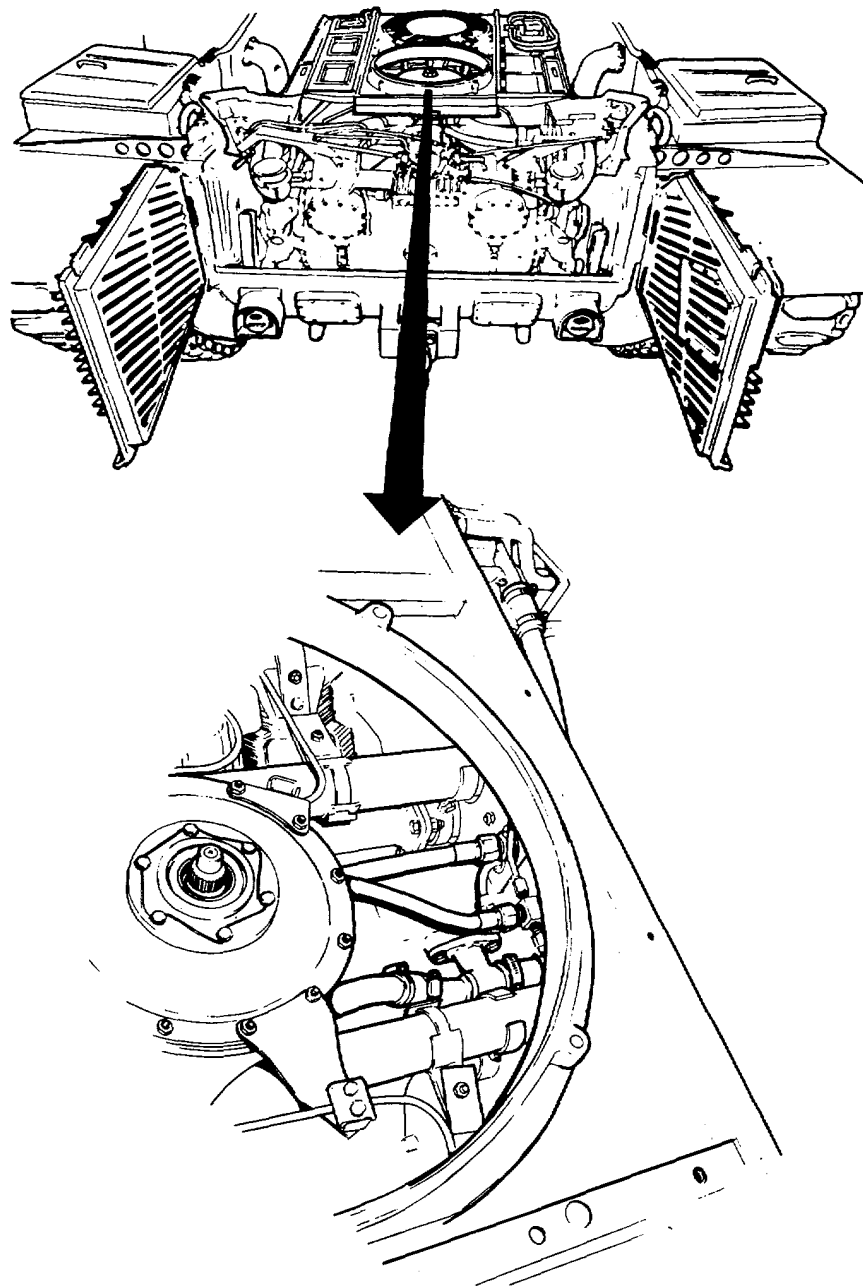
## MANIFOLD HEATER FUEL RETURN TUBE ASSEMBLY REPLACEMENT (Sheet 1 of 3)

TOOLS: 9/16 in. combination box and open end wrench

SUPPLIES: Grommet (MS35489-105)  
Rags (Item 65, Appendix D)  
Container to catch fuel

REFERENCE: TM 9-2350260-10

PRELIMINARY PROCEDURES: Remove rear cooling fan (page 948)



Go on to Sheet 2

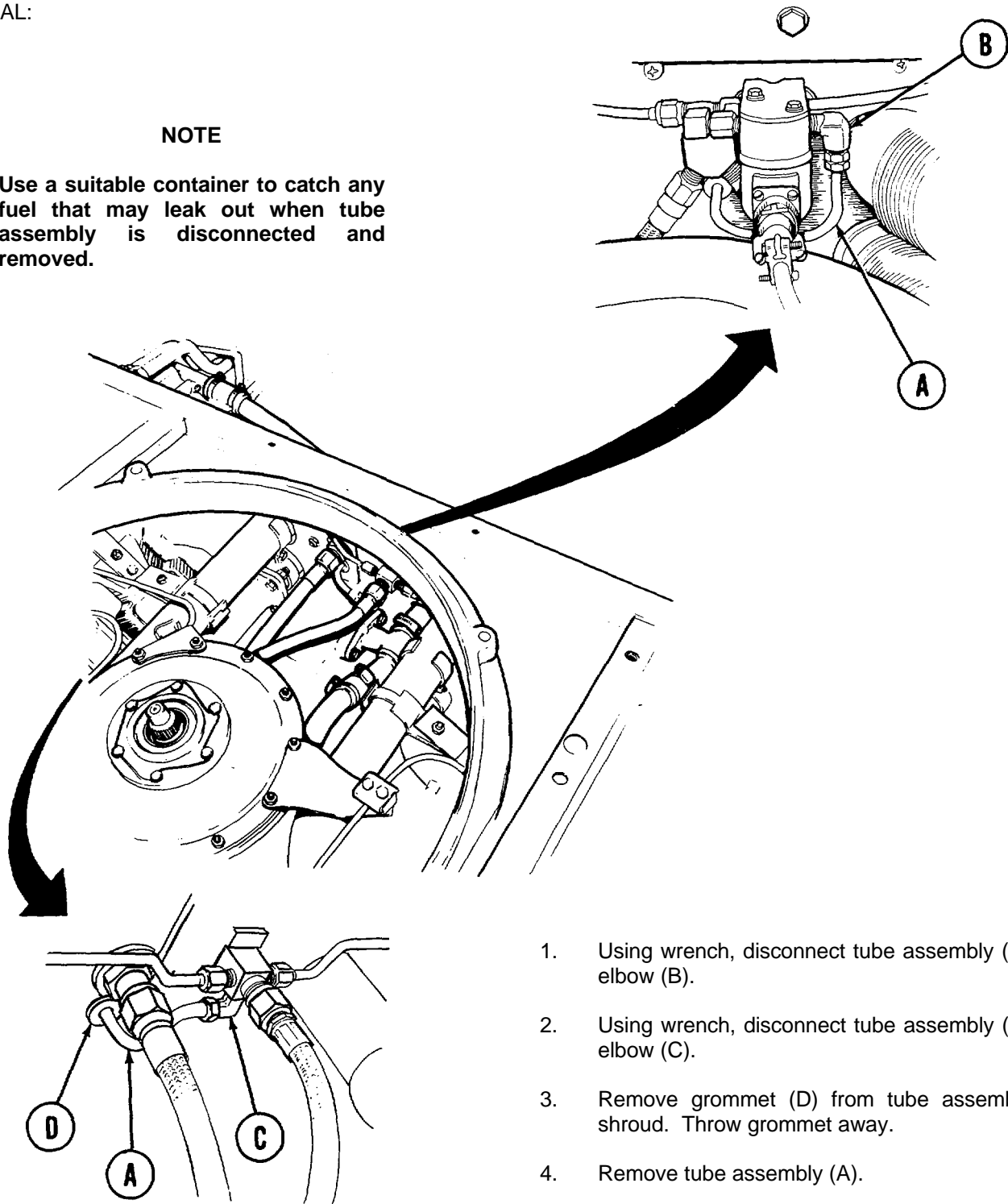
TA148424

MANIFOLD HEATER FUEL RETURN TUBE ASSEMBLY REPLACEMENT (Sheet 2 of 3)

REMOVAL:

**NOTE**

Use a suitable container to catch any fuel that may leak out when tube assembly is disconnected and removed.



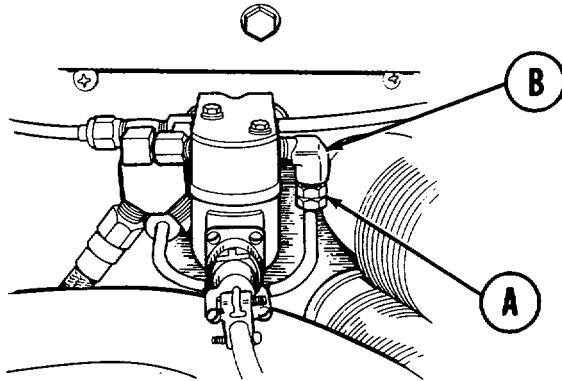
1. Using wrench, disconnect tube assembly (A) from elbow (B).
2. Using wrench, disconnect tube assembly (A) from elbow (C).
3. Remove grommet (D) from tube assembly and shroud. Throw grommet away.
4. Remove tube assembly (A).

Go on to Sheet 3

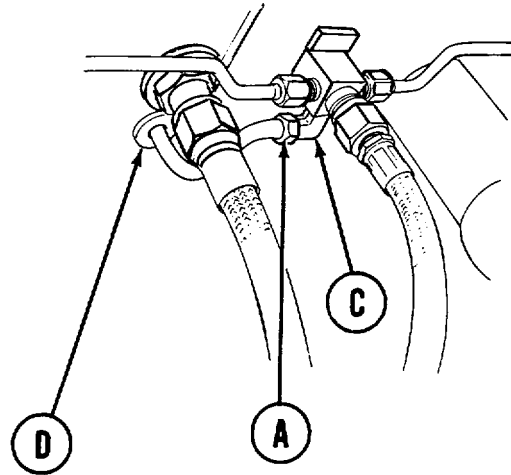
TA148425

**MANIFOLD HEATER FUEL RETURN TUBE ASSEMBLY REPLACEMENT (Sheet 3 of 3)****INSTALLATION:**

1. Install tube assembly (A) through opening in shroud.



2. Connect tube assembly (A) to elbow (B).



3. Connect tube assembly (A) to elbow (C).

4. Position new grommet (D) onto tube assembly (A) and to shroud.

5. Using wrench, tighten tube assembly (A) coupling nut at elbows (B) and (C).

6. Operate primer pump (TM 9-2350-260-10). Check for leaks. Make necessary repairs.

7. Install rear cooling fan (page 9-49).

End of Task

TA148426

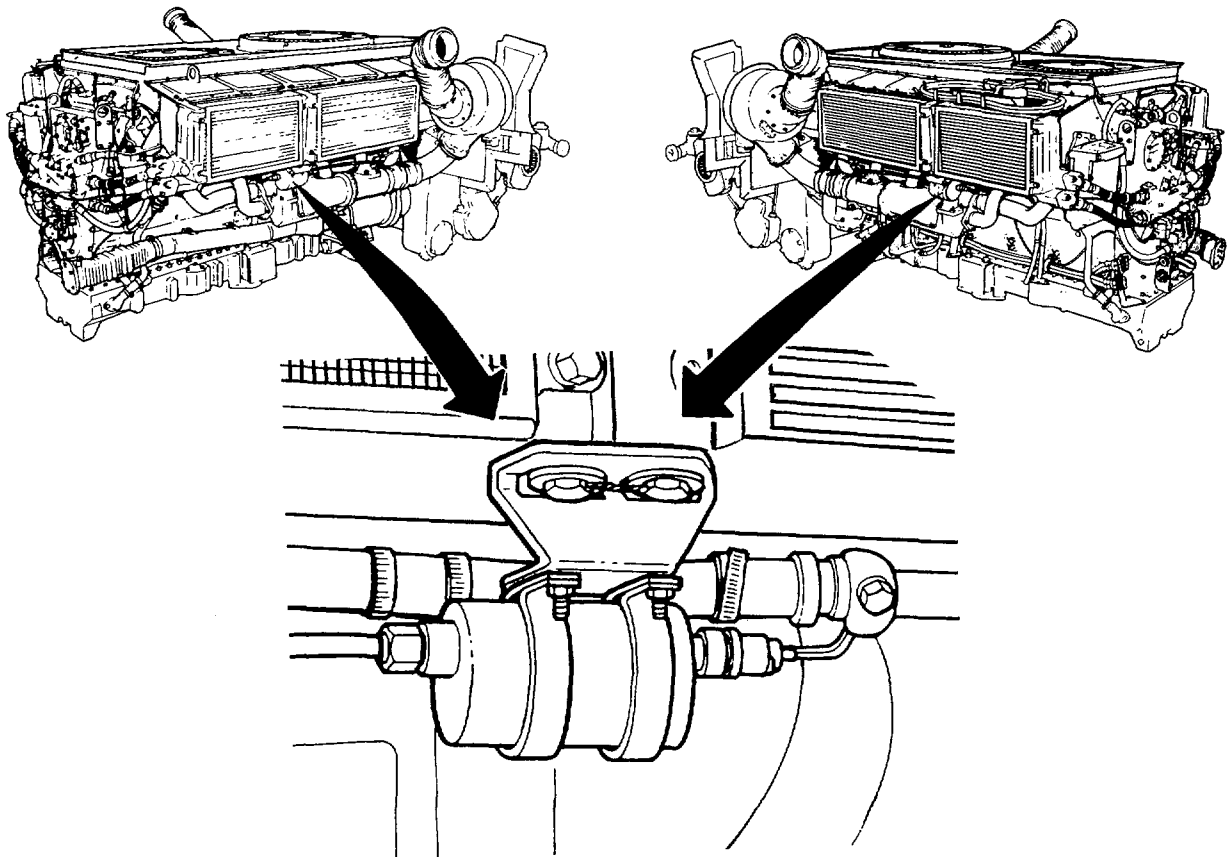


**MANIFOLD HEATER IGNITION COIL AND CABLE REPLACEMENT (2A ENGINE) (Sheet 1 of 3)**

TOOLS: 7/8 in. combination box and open end wrench  
 3/4 in. combination box and open end wrench  
 1/2 in. combination box and open end wrench  
 1/2 in. socket with 1/2 in. drive  
 Ratchet with 1/2 in. drive  
 5 in. extension with 1/2 in. drive  
 Spanner wrench  
 7/16 in. socket with 1/2 in. drive

REFERENCE: TM 9-2350-260-10

PRELIMINARY PROCEDURE: Remove powerplant (page 5-2)



**NOTE**

Replacement instructions are the same for both sides. Therefore only the left side is shown.

Go on to Sheet 2

TA148427

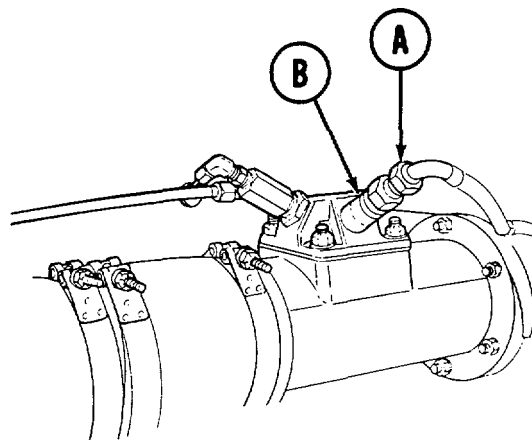
## MANIFOLD HEATER IGNITION COIL AND CABLE REPLACEMENT (2A ENGINE) (Sheet 2 of 3)

## REMOVAL:

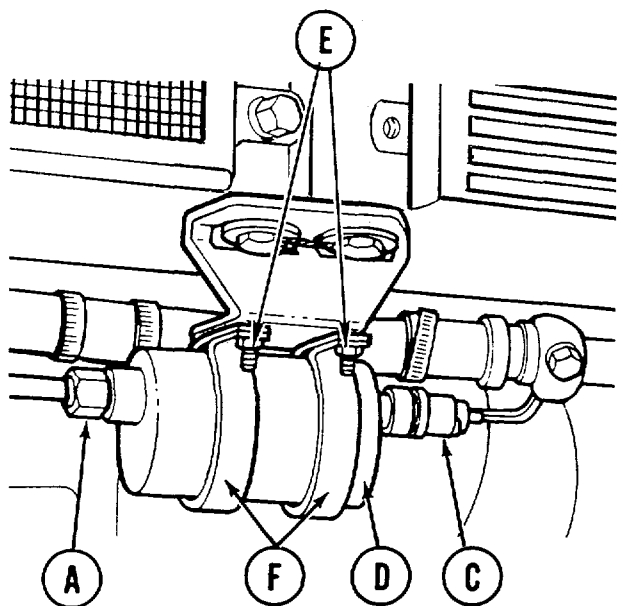
**WARNING**

Ignition coils on engine are capable of producing extremely high voltage. Output of this ignition system is sufficient to cause a dangerous electrical shock. Never touch any uncovered or live connections.

1. Using 3/4 inch wrench, disconnect cable (A) from spark plug (B).



2. Using spanner wrench, disconnect electrical connector (C) from coil (D).
3. Using 1/2 inch socket, and 1/2 inch wrench, remove two screws and nuts (E).
4. Remove coil (D), lead (A), and clamps (F) as a unit.
5. Remove clamps (F) from coil (D).
6. Using 7/8 inch wrench, disconnect cable (A) from coil (D).



## INSPECTION:

1. Inspect clamps and coil for cracks or other damage.
2. Check continuity and insulation resistance of cable.
3. Replace faulty parts as required.

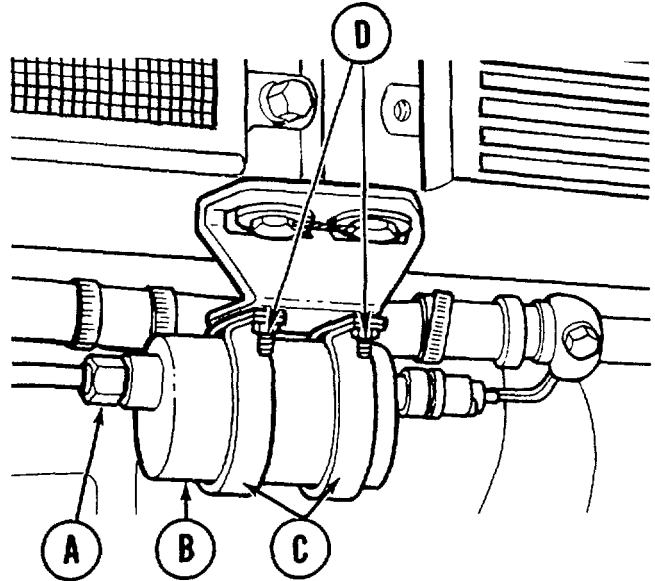
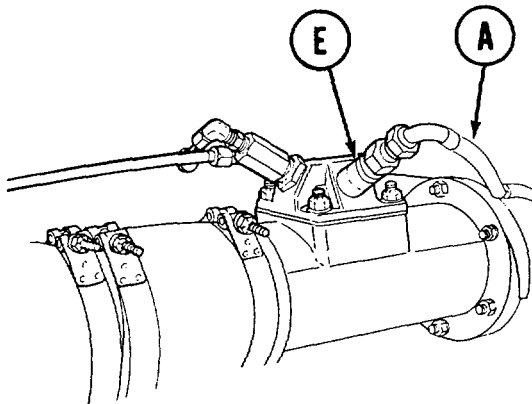
Go on to Sheet 3

TA148428

**MANIFOLD HEATER IGNITION COIL AND CABLE REPLACEMENT (2A ENGINE) (Sheet 3 of 3)**

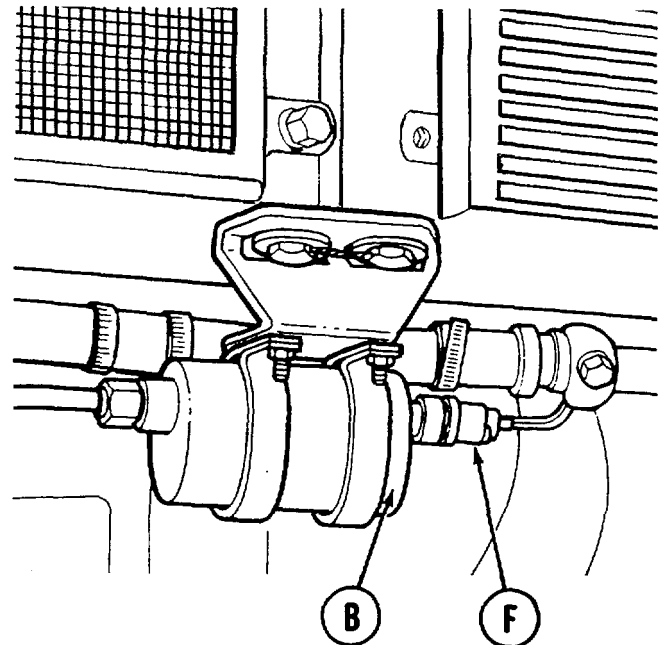
**INSTALLATION:**

1. Using 7/8 inch wrench, connect cable (A) to coil (B).
2. Position two clamps (C) onto coil (B).
3. Position coil (B) and clamps (C) on bracket



3. Using 1/2 inch socket and 1/2 inch wrench, install two screws and nuts (D) to bracket.

4. Connect cable (A) to spark plug (E).
5. Using 3/4 inch wrench, tighten cable (A) at spark plug (E).
6. Alining keyway, connect electrical connector (F) to coil (B).
7. Using spanner wrench, tighten electrical connector (F).
8. Perform manifold heater operational check (page 7-324).
9. Install powerplant (page 5-14).



End of Task

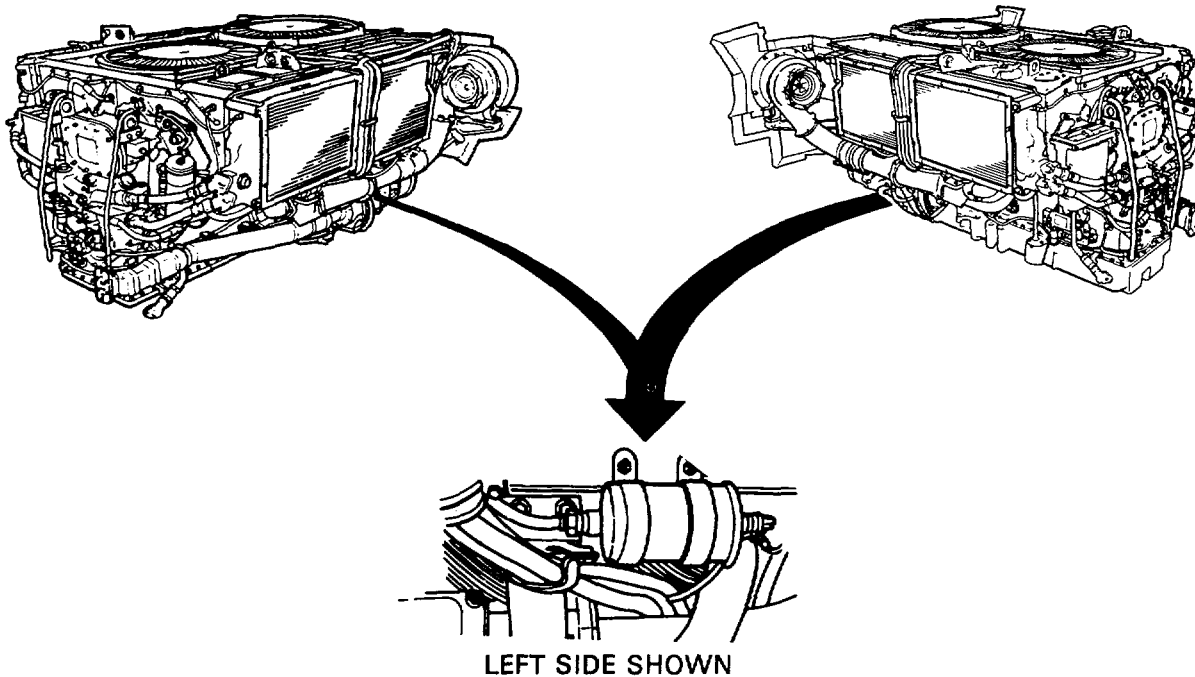
TA148429

**MANIFOLD HEATER IGNITION COIL AND CABLE REPLACEMENT (2D ENGINE) (Sheet 1 of 3)**

**TOOLS:** 7/8 in. combination box and open end wrench  
 3/4 in. combination box and open end wrench  
 1/2 in. combination box and open end wrench  
 1/2 in. socket with 1/2 in. drive  
 Ratchet with 1/2 in. drive  
 5 in. extension with 1/2 in. drive  
 Spanner wrench  
 7/16 in. socket with 1/2 in. drive

**REFERENCE:** TM 9-2350-260-10

**PRELIMINARY PROCEDURE:** Remove powerplant (page 5-27)



**NOTE**

Replacement instructions are the same for both sides. Therefore, only the left side is shown.

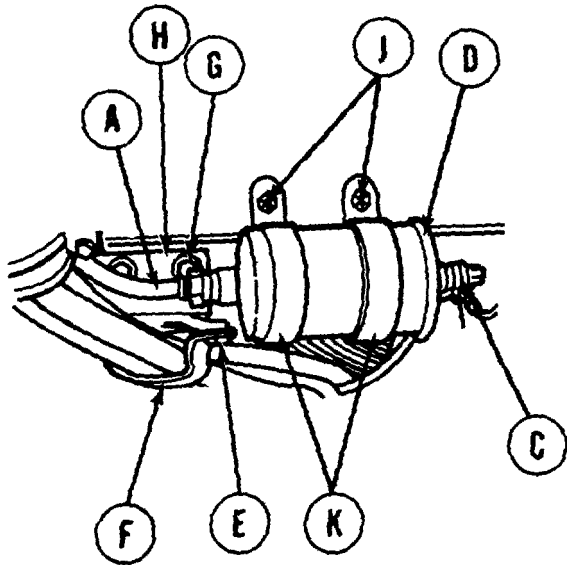
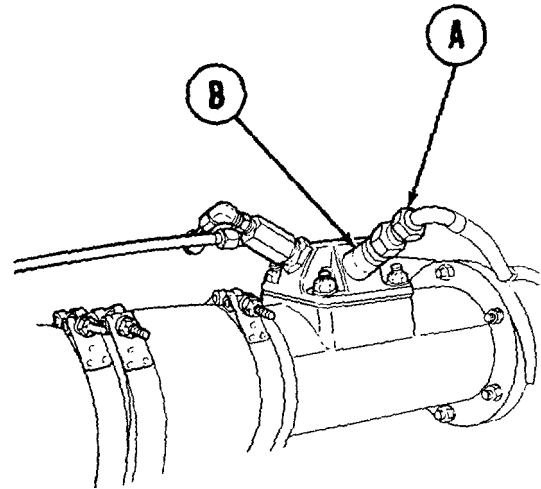
## MANIFOLD HEATER IGNITION COIL AND CABLE REPLACEMENT (2D ENGINE) (Sheet 2 of 3)

## REMOVAL:

**WARNING**

Ignition coils on engine are capable of producing extremely high voltage. Output of this ignition system is sufficient to cause a dangerous electrical shock. Never touch any uncovered or live connections.

1. Using 3/4 inch wrench, disconnect cable (A) from spark plug (B).



2. Using wrench, disconnect electrical connector (C) from coil (D).
3. Using 7/16 inch socket, remove two screws (E) and cable clamp (F).
4. Using 1/2 inch socket, extension, and 1/2 inch wrench, remove two screws (G) and cable bracket (H).
5. Using hands, put down pressure on coil (D) to give access to screws (J).
6. Using 1/2 inch socket and extension, remove two screws (J).
7. Remove coil (D), lead (A), and clamps (K) as a unit.
8. Remove clamps (K) from coil (D).
9. Using 7/8 inch wrench, disconnect cable (A) from coil (D).

## INSPECTION:

1. Inspect clamps and coil for cracks or other damage.
2. Check continuity and insulation resistance of cable.
3. Replace faulty parts as required.

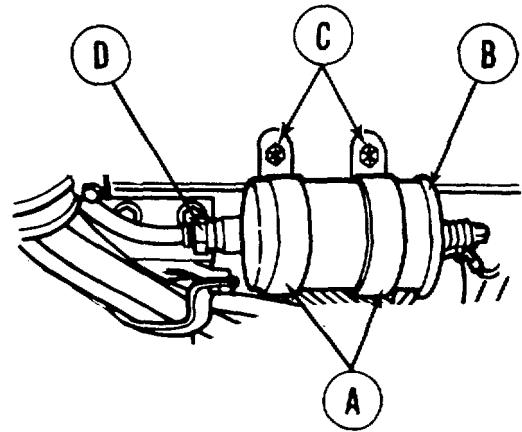
Go on to Sheet 3

TA148431

**MANIFOLD HEATER IGNITION COIL AND CABLE REPLACEMENT (2D ENGINE) (Sheet 3 of 3)**

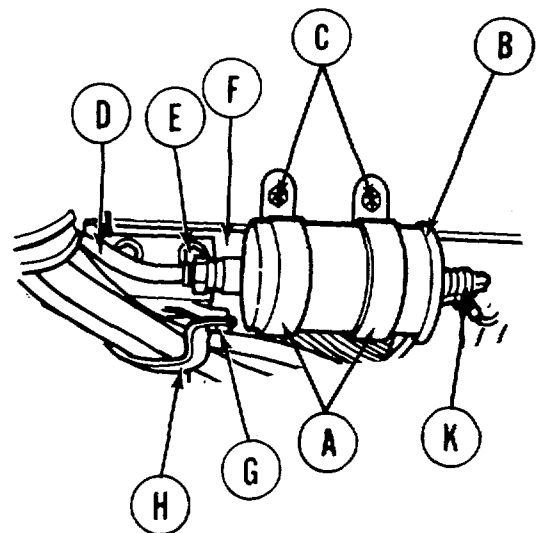
**INSTALLATION:**

1. Position two clamps (A) onto coil (B).
2. Position coil (B) and clamps (A) on frame.



3. Install two screws (C) to secure clamps (A) to frame. Do not tighten.
4. Connect cable (D) to coil (B).
5. Using 7/8 inch wrench, tighten lead.
6. Using 1/2 inch socket and 1/2 inch wrench, install two screws (E) to hold bracket (F) to frame.
7. Using 7/16 inch socket, install two screws (G) and clamp (H) to bracket (F).

8. Route cable (D) over bracket and connect to spark plug.
9. Using 3/4 inch wrench, tighten cable (J).
10. Using 1/2 inch socket, tighten screws (C).
11. Alining keyway, connect electrical connector (K) to coil (B).
12. Using spanner wrench, tighten electrical connector (K).
13. Perform manifold heater operational check (page 7-324).
14. Install powerplant (page 5-40).



End of Task

TA148432

**MANIFOLD HEATER INPUT SOLENOID VALVE AND FUEL LINE REPLACEMENT (Sheet 1 of 10)**

PROCEDURE INDEX

PROCEDURE	PAGE
Input Fuel Line Replacement	7-358
Input Solenoid Valve Replacement	7-363

**INPUT FUEL LINE REPLACEMENT (Sheet 1 of 5)**

PROCEDURE INDEX

PROCEDURE	PAGE
Removal	7-358
Installation	7-361

TOOLS: Ratchet wit 1/2 in. drive  
 9/16 in. socket with 1/2 in. drive  
 7/16 in. combination box and open end wrench  
 3/8 in. combination box and open end wrench  
 Flat-tip screwdriver

SUPPLIES: Container to catch fuel leakage  
 Rags (Item 65, Appendix D)

PRELIMINARY PROCEDURE: Remove powerplant (page 51)

REMOVAL:

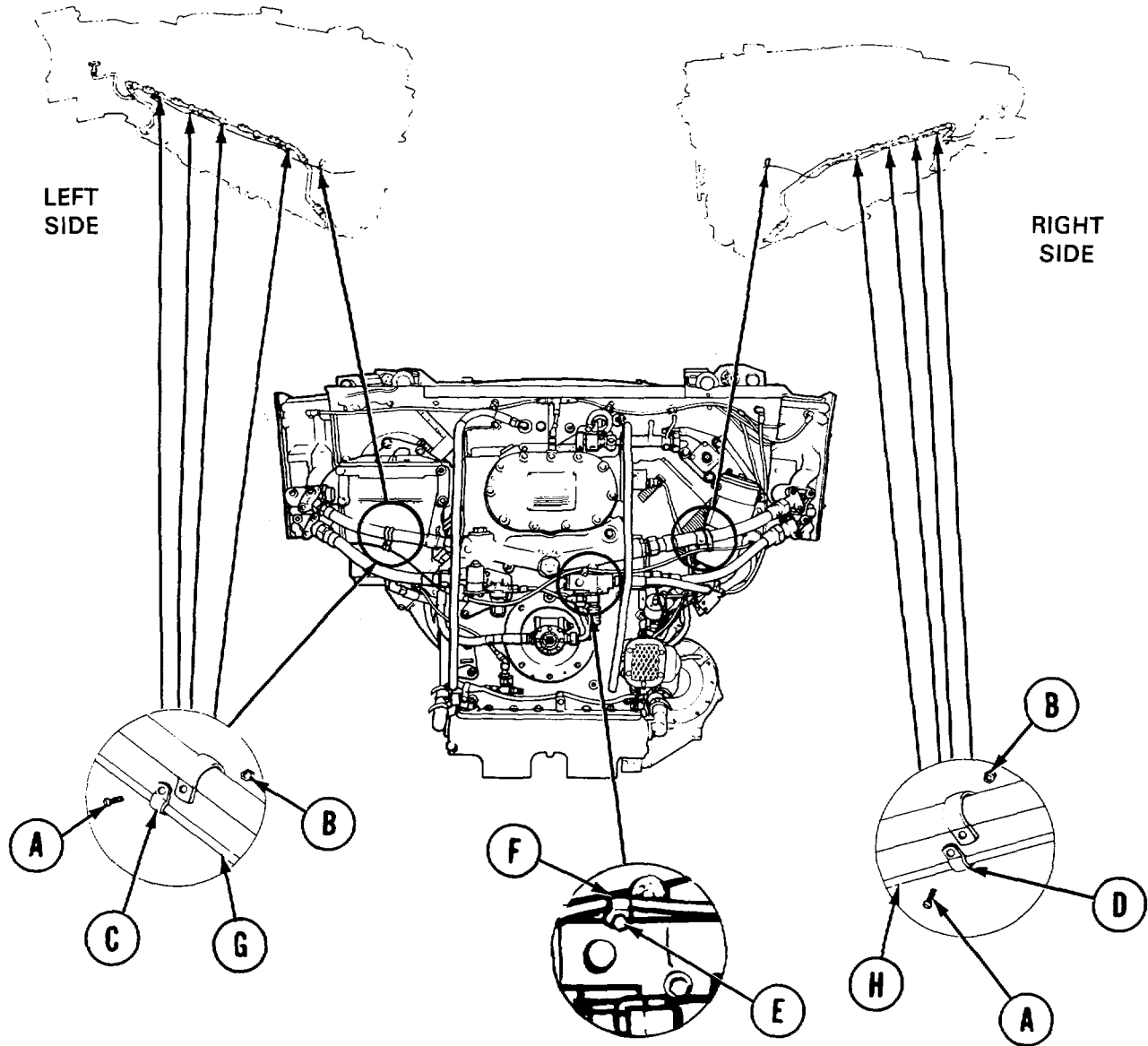
**NOTE**

**Replacement instructions for left or right side manifold heater input lines are same except as noted.**

**MANIFOLD HEATER INPUT SOLENOID VALVE AND FUEL LINE REPLACEMENT (Sheet 2 of 10)**

**Input Fuel Line Replacement (Sheet 2 of 5)**

1. Using 3/8 inch wrench and screwdriver, remove screws (A) and nut (B) that secure five clamps (C) on engine left side, or five clamps (D) on engine right side.
2. Using socket, remove bolt (E) that secures clamp (F) (right side only).
3. Remove clamps (C), (D), and (F) from tube assembly (G) or (H).



Go on to Sheet 3

TA148434



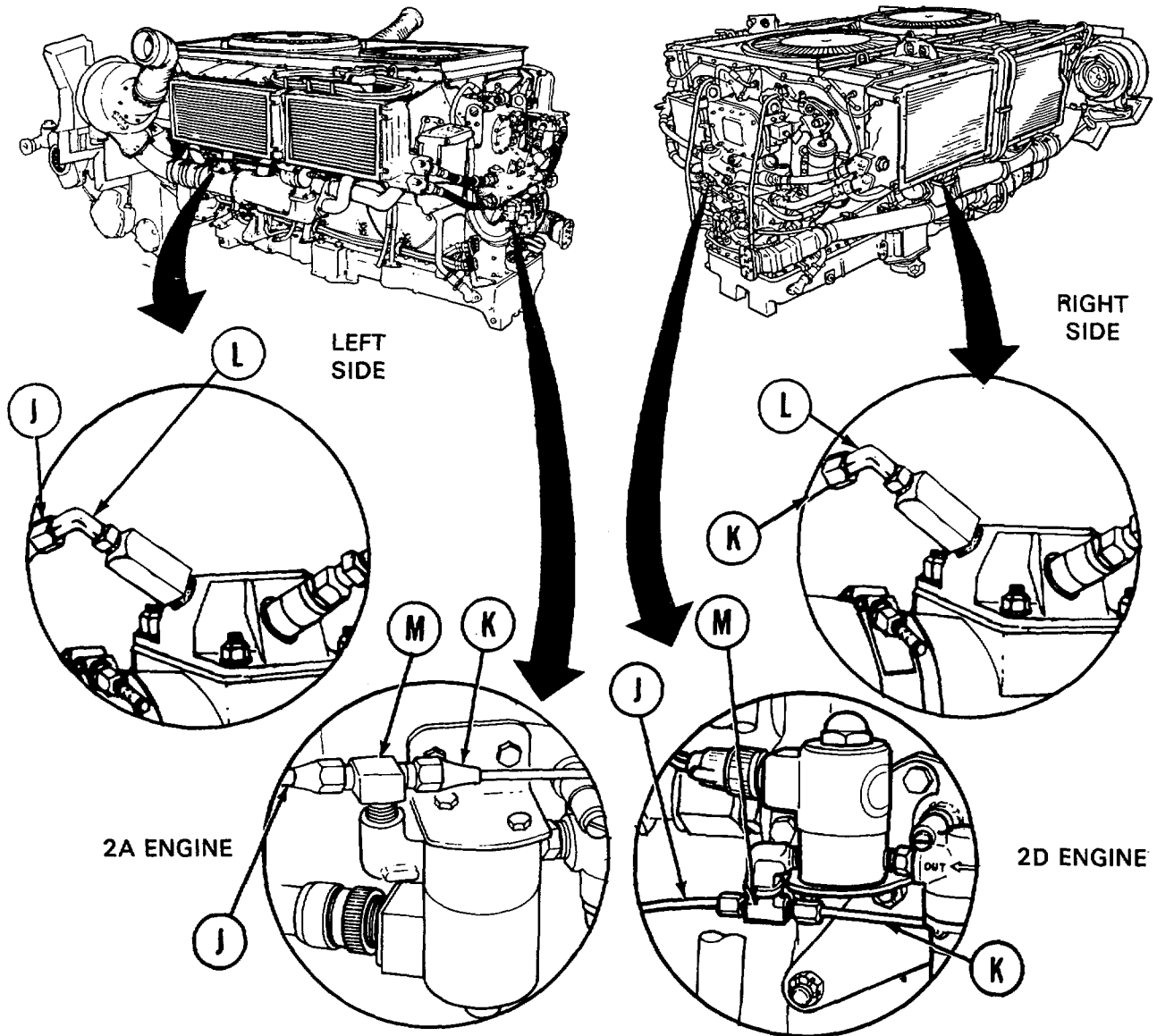
MANIFOLD HEATER INPUT SOLENOID VALVE AND FUEL LINE REPLACEMENT (Sheet 3 of 10)

Input Fuel Line Replacement (Sheet 3 of 5)

NOTE

Use suitable container to catch fuel whenever any fuel line or connection is loosened or disconnected. Use rags to wipe any spillage.

4. Using 7/16 inch wrench, disconnect input fuel line (J) or (K) from elbow (L) and tee (M).
5. Remove fuel input line (J) or (K).
6. Inspect elbows and tee for damage. Replace as necessary.



Go on to Sheet 4

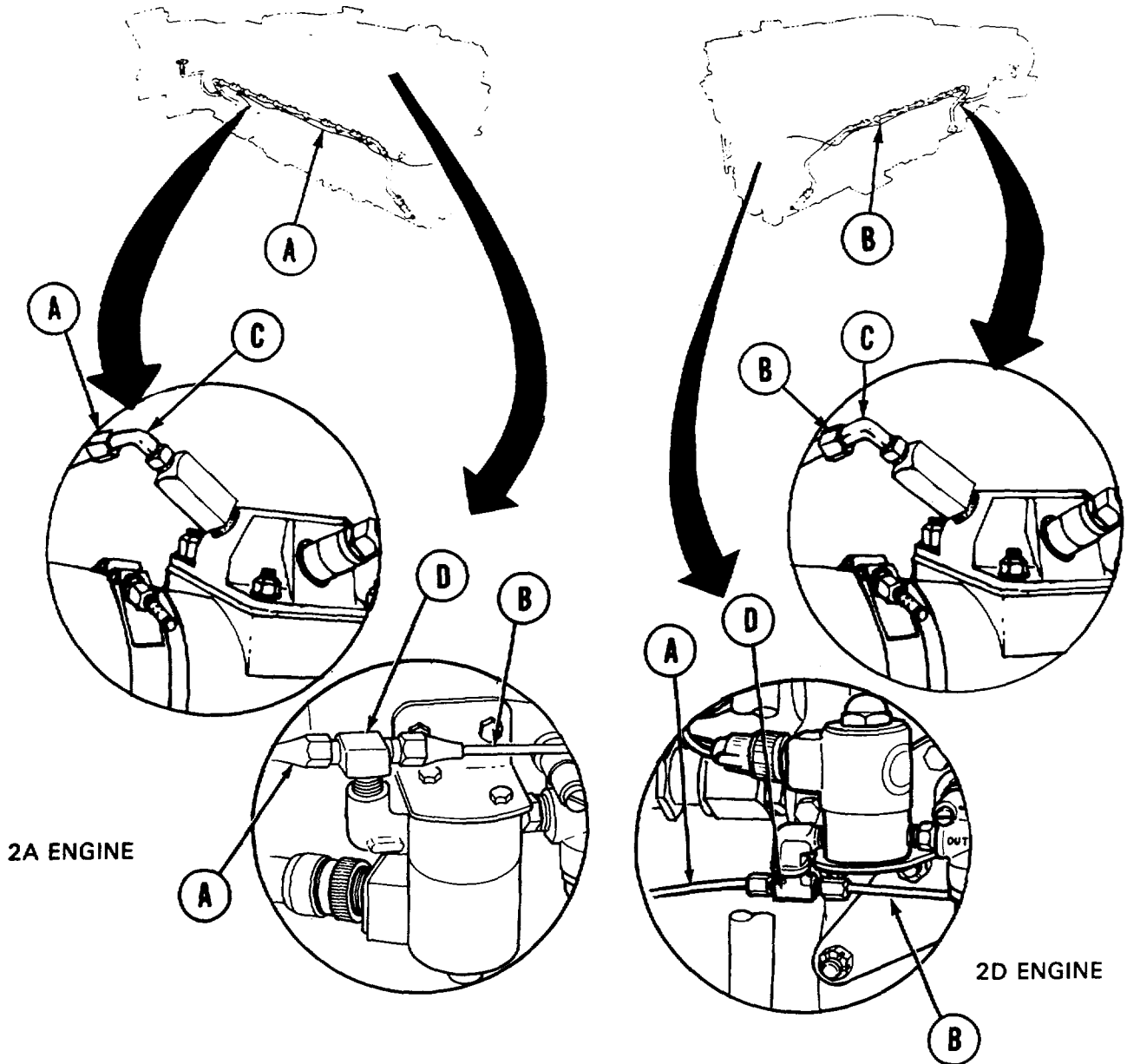
TA148435

MANIFOLD HEATER INPUT SOLENOID VALVE AND FUEL LINE REPLACEMENT (Sheet 4 of 10)

Input Fuel Line Replacement (Sheet 4 of 5)

INSTALLATION:

1. Position input fuel lines (A) or (B) in place on engine.



2. Connect input line (A) or (B) to elbow (C) and tee (D).
3. Using 7/16 inch wrench, tighten input line (A) or (B) to elbow (C) and tee (D).

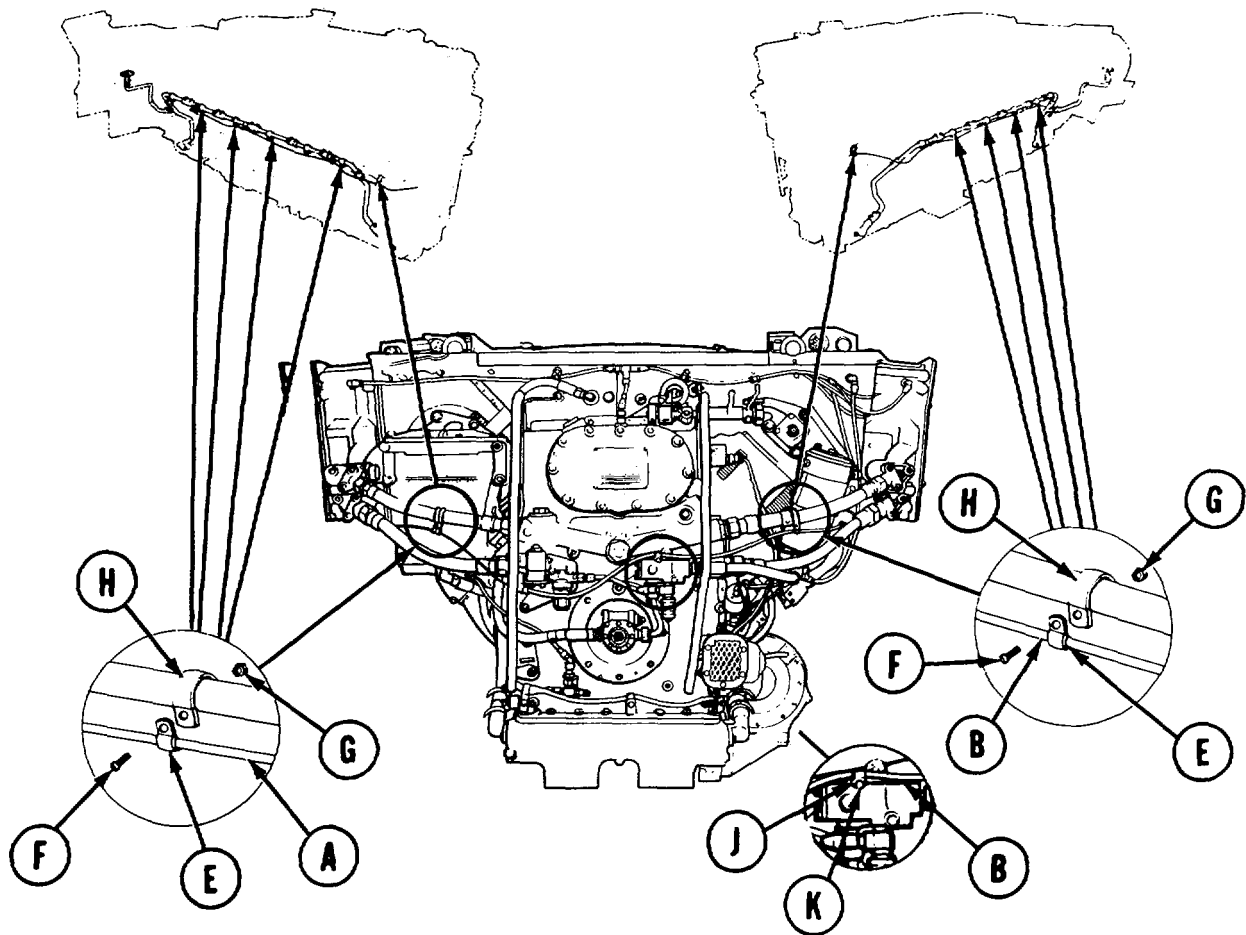
Go on to Sheet 5

TA148436

## MANIFOLD HEATER INPUT SOLENOID VALVE AND FUEL LINE REPLACEMENT (Sheet 5 of 10)

### Input Fuel Line Replacement (Sheet 5 of 5)

4. Install clamps (E) onto input fuel line (A) or (B).
5. Install screws (F) and nut (G) to secure clamps (E) to clamps (H). Using 3/8 inch wrench and screwdriver, tighten screws (F) and nut (G).
6. Install clamps (J) onto input line (B).
7. Install screw (K) to secure clamp (J). Using socket, tighten screw (K) (right side only).
8. Perform manifold heater operational check (page 7-325).
9. Install 2A powerplant (page 5-14) or 2D powerplant (page 5-40).



End of Task

TA148437

**MANIFOLD HEATER INPUT SOLENOID VALVE AND FUEL LINE REPLACEMENT (Sheet 6 of 10)**

**Input Solenoid Valve Replacement (Sheet 1 of 5)**

PROCEDURE INDEX

PROCEDURE	PAGE
Removal	7-364
Installation	7-366

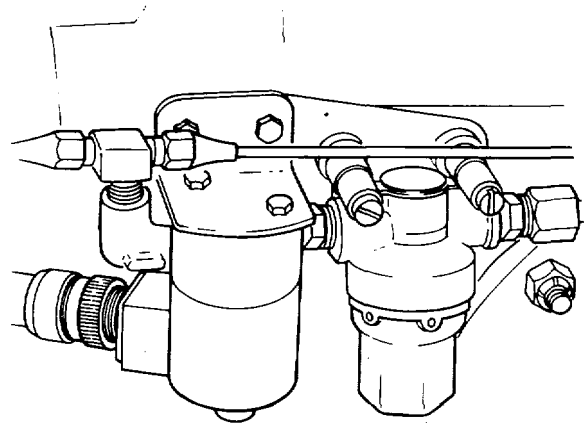
**TOOLS:** 7/16 in. combination box and open end wrench  
 1/2 in. combination box and open end wrench  
 5/8 in. combination box and open end wrench  
 5/16 in. combination box and open end wrench  
 9/16 in. combination box and open end wrench  
 3/8 in. combination box and open end wrench  
 Flat-tip screwdriver

**SPECIAL TOOLS:** Ground hop kit (Item 30, Chapter 3, Section I)

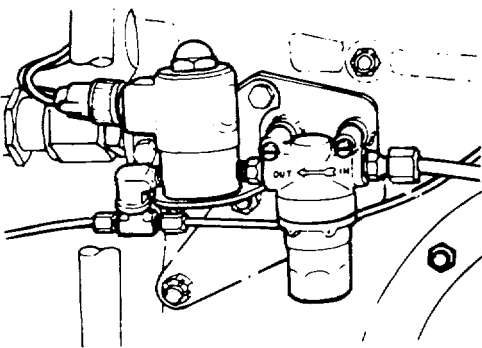
**SUPPLIES:** Container to catch fuel leakage  
 Rags (Item 65, Appendix D)  
 Sealing compound (Item 28, Appendix D)  
 Lockwasher (MS35338-43) (2 required)

**REFERENCE:** TM 9-2350-260-10

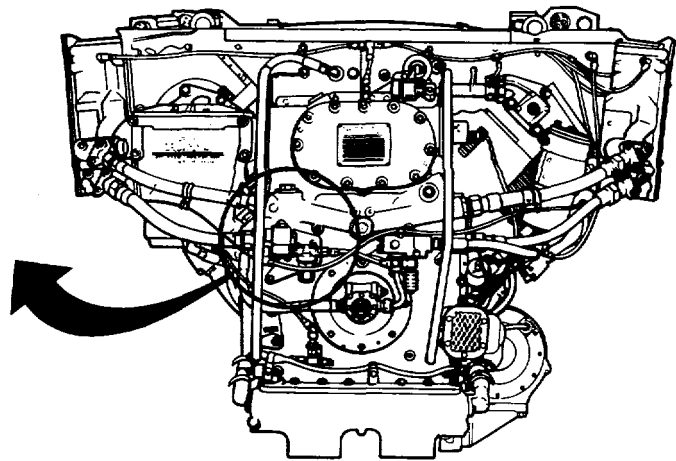
**PRELIMINARY PROCEDURE:** Remove powerplant (page 5-1)



2A ENGINE



2D ENGINE



Go on to Sheet 2

TA148438

MANIFOLD HEATER INPUT SOLENOID VALVE AND FUEL LINE REPLACEMENT (Sheet 7 of 10)

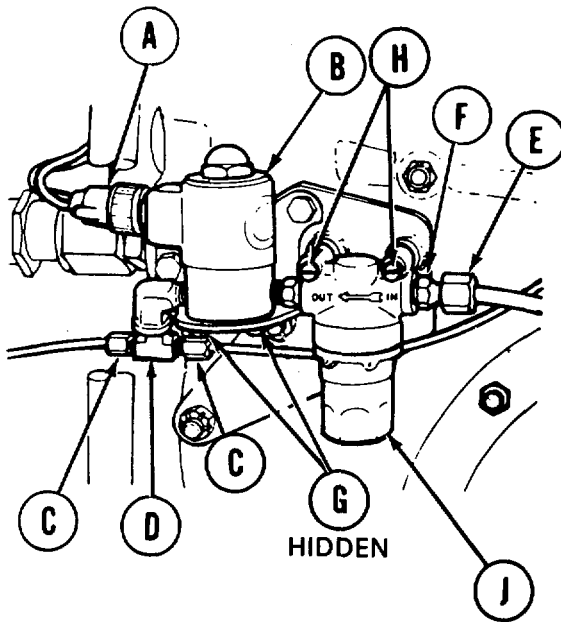
Input Solenoid Valve Replacement (Sheet 2 of 5)

NOTE

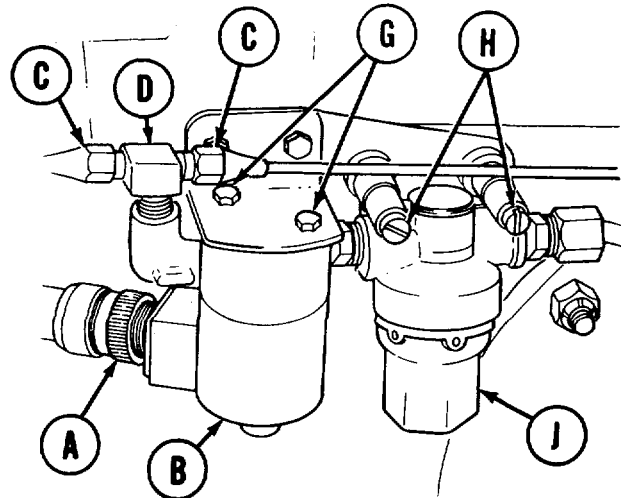
Use suitable container to catch fuel that may leak whenever any part of fuel system is loosened or disconnected.

REMOVAL:

1. Disconnect electrical lead (A) from solenoid valve (B).
2. Using 7/16 inch and 1/2 inch wrenches, disconnect two fuel lines (C) from tee (D).
3. Using 1/2 inch and 5/8 inch wrenches, remove fuel line (E) from adapter (F).
4. Using 5/16 inch wrench, remove two screws and washers (G).
5. Using screwdriver, remove two screws (H) with lockwashers and flat washers. Throw lockwashers away.
6. Remove solenoid valve (B), fuel filter (J), and attached fittings as a unit



2D ENGINE

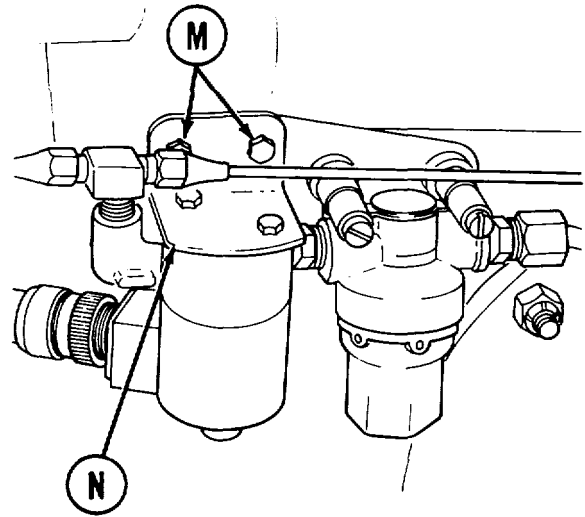


2A ENGINE

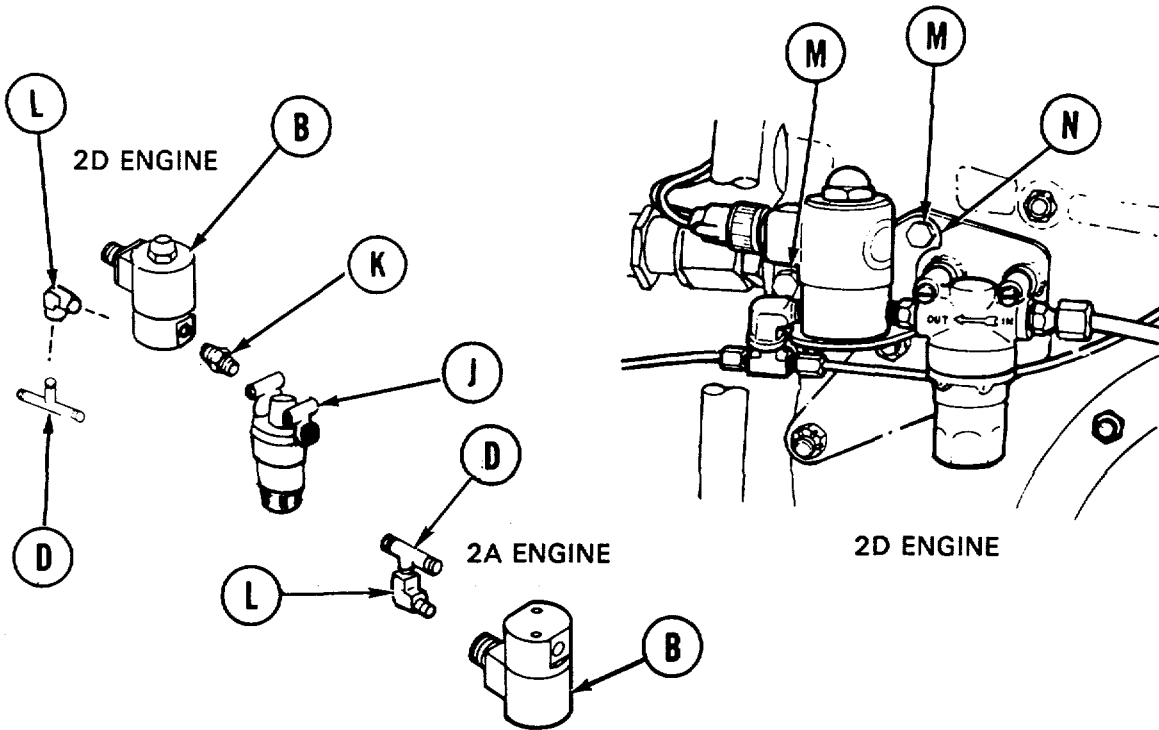
**MANIFOLD HEATER INPUT SOLENOID VALVE AND FUEL LINE REPLACEMENT (Sheet 8 of 10)**

**Input Solenoid Valve Replacement (Sheet 3 of 5)**

7. Using 7/16 inch wrench, hold nipple (K) and remove filter (J) from nipple (K).
8. Using 7/16 inch wrench, remove nipple (K) from solenoid valve (B).
9. Using 7/16 inch wrench, remove tee (D) from elbow (L).
10. Using 9/16 inch wrench, remove elbow (L) from solenoid valve (B).
11. Using 7/16 inch wrench, remove two screws (M) that secure bracket (N).
12. Remove bracket (N).
13. Inspect all removed parts for nicks, burrs, and cracks. Replace parts as necessary.



**2A ENGINE**



**2D ENGINE**

**2A ENGINE**

**2D ENGINE**

Go on to Sheet 4

TA148440

**MANIFOLD HEATER INPUT SOLENOID VALVE AND FUEL LINE REPLACEMENT (Sheet 9 of 10)**

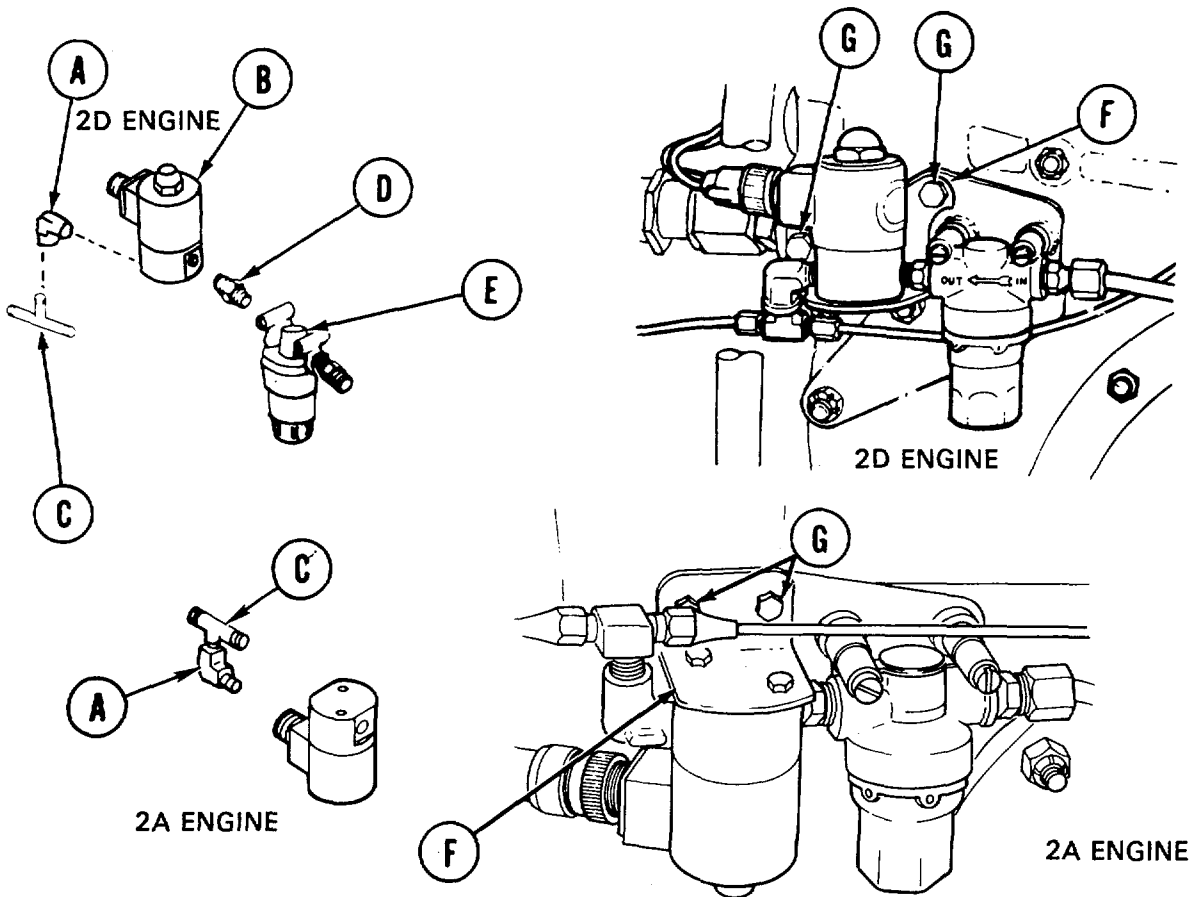
**Input Solenoid Valve Replacement (Sheet 4 of 5)**

INSTALLATION:

**NOTE**

**Coat male threads of elbow, tee, and adapter with sealing compound (Item 28, Appendix D) before installation.**

1. Install and align elbow (A) as shown to solenoid valve (B). Using 9/16 inch wrench, tighten elbow.
2. Install and align tee (C) as shown to elbow (A). Using 7/16 inch wrench, tighten tee.
3. Install nipple (D) to solenoid valve (B). Using 7/16 inch wrench, tighten nipple.
4. Use 7/16 inch wrench, hold nipple (D) and install fuel filter (E) on nipple. Align filter as shown.
5. Position bracket (F) in place on engine.
6. Install two screws (G) to secure bracket. Using 7/16 inch wrench, tighten screws.

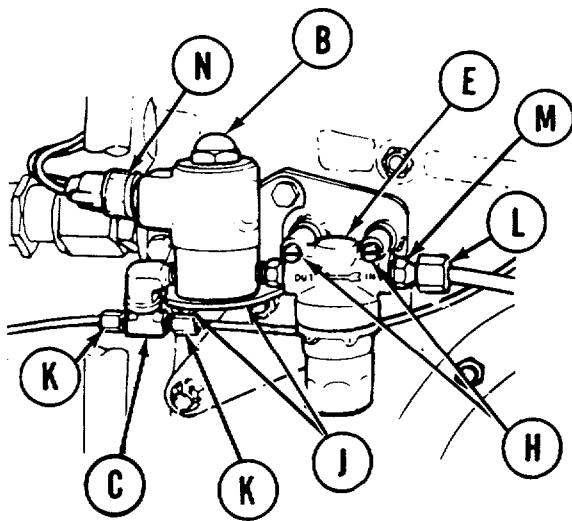


Go on to Sheet 5

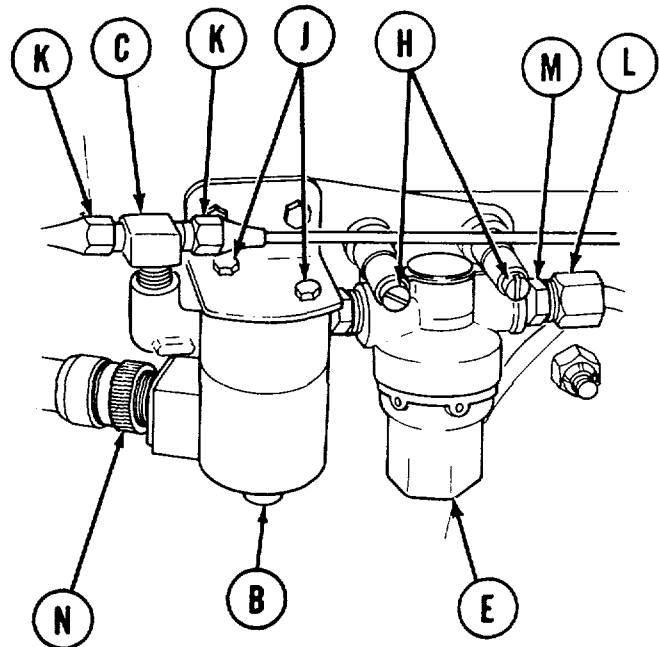
TA148441

**MANIFOLD HEATER INPUT SOLENOID VALVE AND FUEL LINE REPLACEMENT (Sheet 10 of 10)****Input Solenoid Valve Replacement (Sheet 5 of 5)**

7. Position solenoid valve (B) and fuel filter (E) with attached fittings to brackets on engine.
8. Install two screws (H) with new lockwashers and flat washers to secure fuel filter (E) to engine bracket. Using screwdriver, tighten screws.
9. Install two screws and washers (J) to secure solenoid valve (B) to bracket. Using 5/16 inch wrench, tighten screws.
10. Connect two fuel lines (K) to tee (C). Using 7/16 inch wrench, tighten fuel line nuts.
11. Connect hose assembly (L) to adapter (M). Using 1/2 inch and 5/8 inch wrenches, tighten hose nut to adapter.
12. Connect electrical lead (N) to solenoid valve (B).
13. Operate primer pump (TM 9-2350-260-10). Check for leaks. If leaks are found, tighten connections as required.
14. Install 2A powerplant (page 5-14) or 2D powerplant (page 5-40).



2D ENGINE



2A ENGINE

End of Task

TA148442



**MANIFOLD HEATER FUEL FILTER, ELEMENT, AND INPUT FUEL LINE REPLACEMENT (Sheet 1 of 8)**

PROCEDURE INDEX

PROCEDURE	PAGE
Fuel Filter Replacement	7-368
Fuel Filter Element Replacement	7-373
Fuel Filter Input Fuel Line Replacement	7-375

**FUEL FILTER REPLACEMENT (Sheet 1 of 5)**

PROCEDURE INDEX

PROCEDURE	PAGE
Removal	7-369
Installation	7-371

TOOLS: 5/16 in. thru 1 in. combination box and open end wrench set  
Flat-tip screwdriver

SUPPLIES: Sealing compound (Item 27, Appendix D)  
Drain pan  
Lockwasher (MS35338-43) (2 required)

REFERENCE: TM 9-2350-260-10

PRELIMINARY PROCEDURE: Remove lower engine access cove (page 16-45)

**CAUTION**

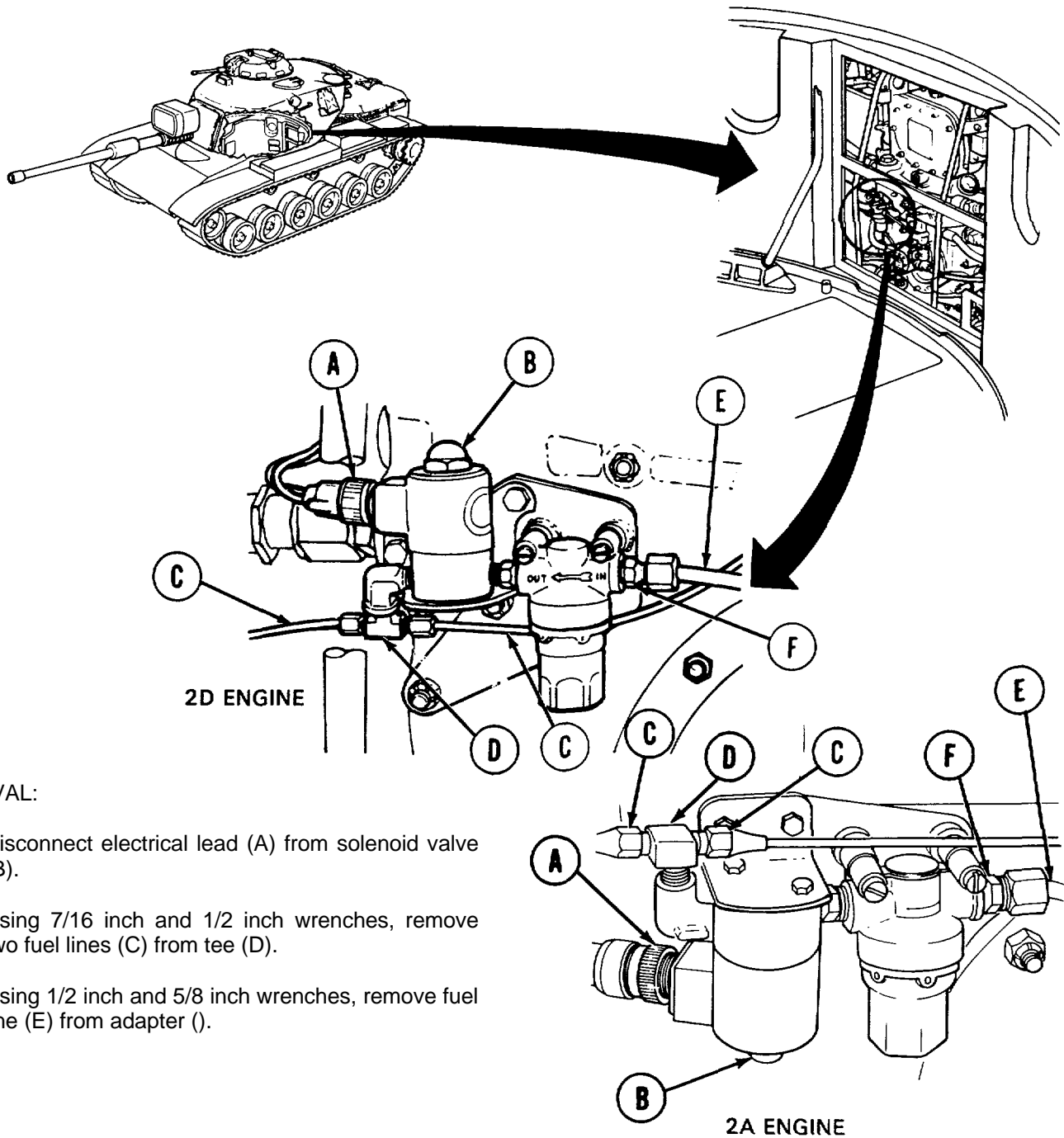
**When removing or installing fuel lines, care must be taken not to damage fittings and threads or twist or distort fuel lines or hoses.**

MANIFOLD HEATER FUEL FILTER, ELEMENT, AND INPUT FUEL LINE REPLACEMENT (Sheet 2 of 8)

Fuel Filter Replacement (Sheet 2 of 5)

NOTE

Use suitable container to catch any fuel that may leak out whenever any part of fuel system is loosened or disconnected.



REMOVAL:

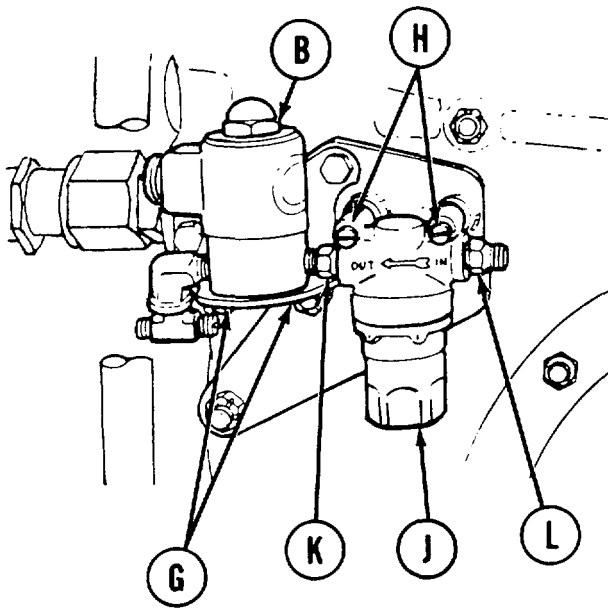
1. Disconnect electrical lead (A) from solenoid valve (B).
2. Using 7/16 inch and 1/2 inch wrenches, remove two fuel lines (C) from tee (D).
3. Using 1/2 inch and 5/8 inch wrenches, remove fuel line (E) from adapter (F).

Go on to Sheet 3

TA148444

MANIFOLD HEATER FUEL FILTER, ELEMENT, AND INPUT FUEL LINE REPLACEMENT (Sheet 3 of 8)

Fuel Filter Replacement (Sheet 3 of 5)



2D ENGINE

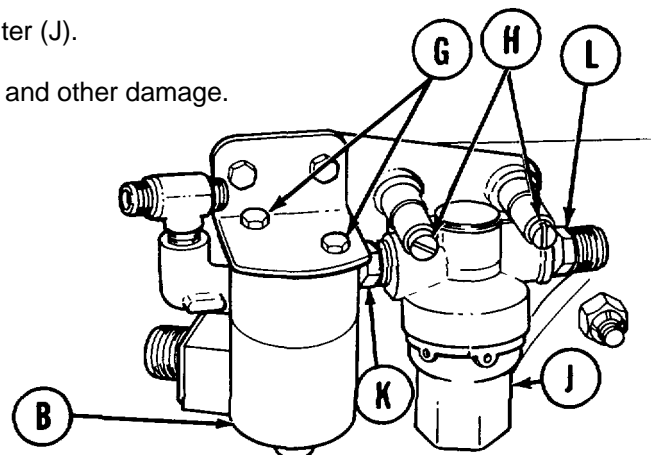
4. Using 5/16 inch wrench, remove two bolts and washers (G) securing solenoid valve (B) to bracket.
5. Using screwdriver, remove two screws, lockwashers, and flat washers (H) securing fuel filter (J) to bracket. Throw lockwashers away.

6. Remove solenoid valve (B), fuel filter (J), and attached fittings as a unit.

**NOTE**

**It will be necessary to place solenoid valve in a vise.**

7. Using 7/16 inch wrench, hold nipple (K) and remove fuel filter (J) from nipple.
8. Using 1/2 inch wrench, remove adapter (L) from fuel filter (J).
9. Inspect hoses, tube assemblies, and fittings for cracks and other damage.



2A ENGINE

Go on to Sheet 4

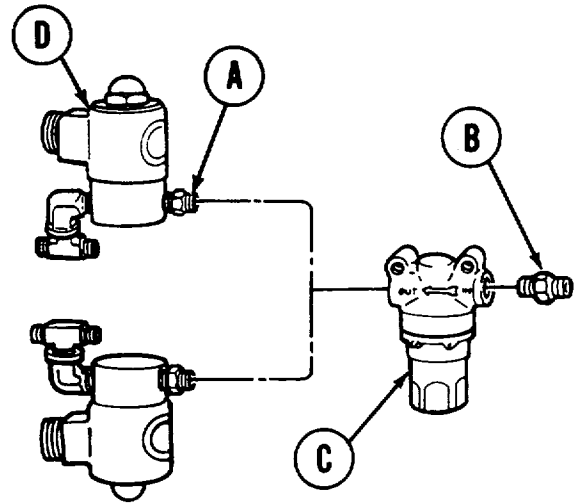
TA148445

**MANIFOLD HEATER FUEL FILTER, ELEMENT, AND INPUT FUEL LINE REPLACEMENT (Sheet 4 of 8)**

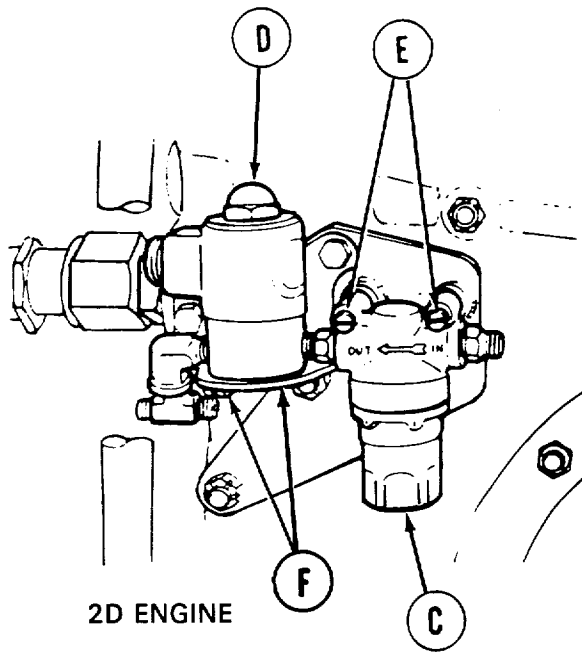
**Fuel Filter Replacement (Sheet 4 of 5)**

**INSTALLATION:**

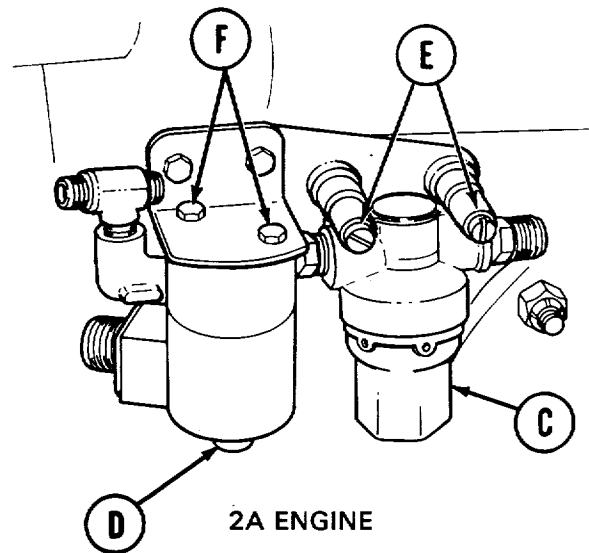
1. Coat threads of nipple (A) and adapter (B) with sealing compound (Item 27, Appendix D).
2. Using 1/2 inch wrench, install and secure adapter (B) to input port of fuel filter (C).
3. Using 7/16 inch wrench, hold nipple (A) and install fuel filter (C) securely onto nipple (A).
4. Aline fuel filter (C) and solenoid valve (D) as shown on illustration.



5. Position solenoid valve (D) and fuel filter (C) with attached fittings to brackets on engine.
6. Using screwdriver, secure fuel filter (C) to bracket with two screws, new lockwashers, and flat washers (E).



7. Using 5/16 inch wrench, secure solenoid valve (D) to bracket with two bolt and washers (F).



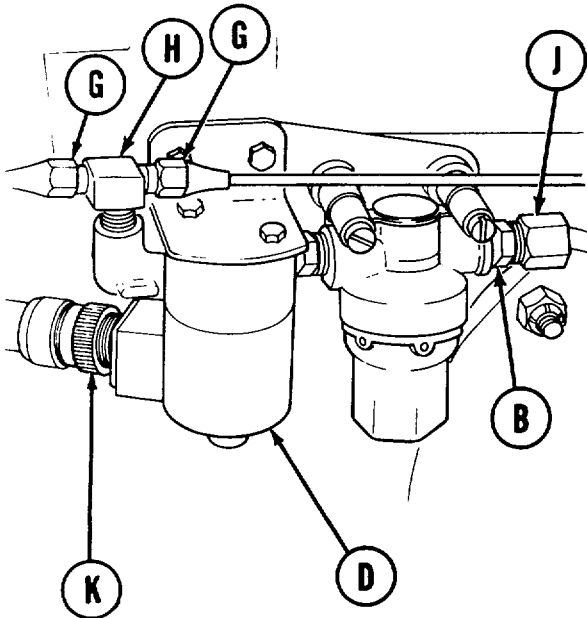
Go on to Sheet 5

TA148446

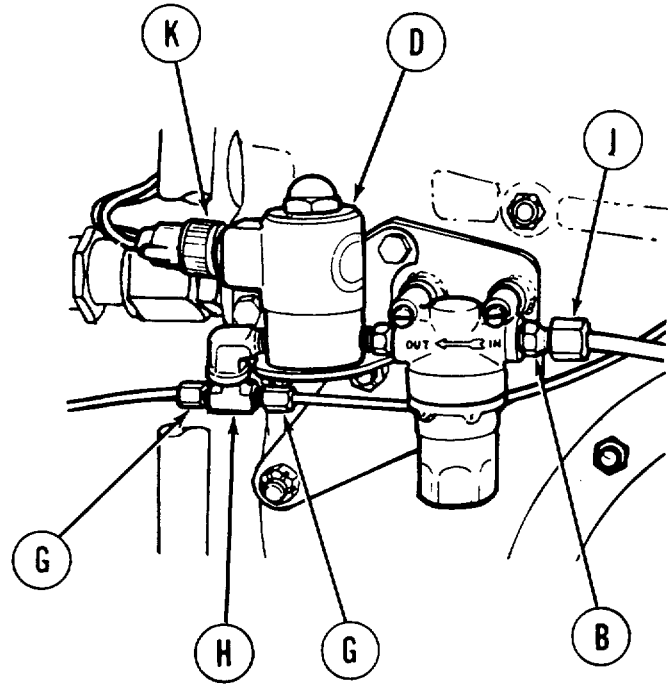
**MANIFOLD HEATER FUEL FILTER, ELEMENT, AND INPUT FUEL LINE REPLACEMENT (Sheet 5 of 8)**

**Fuel Filter Replacement (Sheet 5 of 5)**

8. Connect two fuel lines (G) to tee (H). Using 7/16 inch wrench, tighten fuel line nub.
9. Connect fuel line (J) to adapter (B). Using 1/2 inch and 5/8 inch wrenches, tighten line nut to adapter.



**2A ENGINE**



**2D ENGINE**

10. Connect electrical lead (K) to solenoid valve (D).
11. Operate primer pump (TM 9-2350-260-10) and check for fuel leaks. If leaks are found, tighten connections as required.
12. Install lower engine access cover (page 16-46).

**MANIFOLD HEATER FUEL FILTER, ELEMENT, AND INPUT FUEL LINE REPLACEMENT (Sheet 6 of 8)**

**Fuel Filter Element Replacement (Sheet 1 of 2)**

**TOOL:** Adjustable wrench

**SUPPLIES:** Dry cleaning solvent (Item 54, Appendix D)  
 Low-pressure compressed air  
 Rags (Item 65, Appendix D)

**REFERENCE:** TM 9-2350-260-10

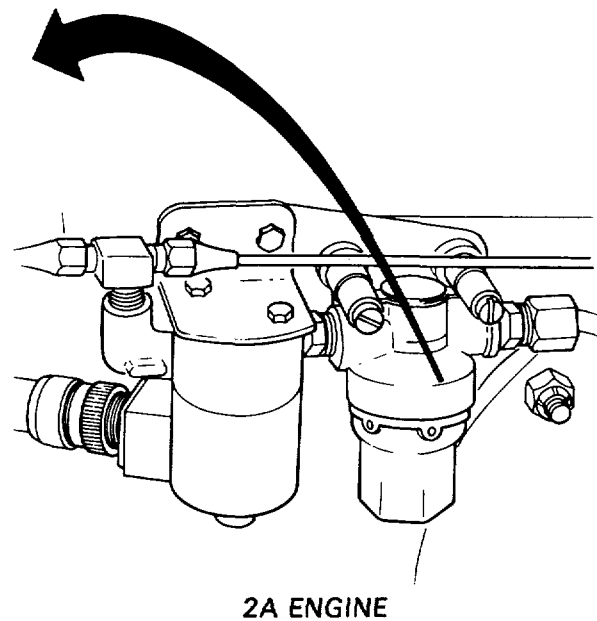
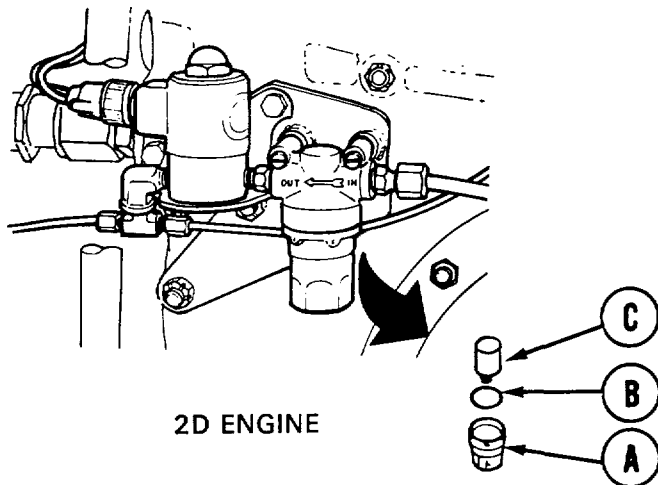
**PRELIMINARY PROCEDURE:** Remove lower access cover (page 16-45)

**REMOVAL:**

**NOTE**

Use suitable container to catch any fuel that may leak out when bowl is removed.

1. Using wrench, loosen filter bowl (A).



2. Remove bowl (A), preformed packing (B), and filter element (C).
3. Throw away preformed packing (B) and filter element (C).
4. Clean filter bowl with dry cleaning solvent (Item 54, Appendix D).

Go on to Sheet 2

TA148448

**MANIFOLD HEATER FUEL FILTER, ELEMENT, AND INPUT FUEL LINE REPLACEMENT (Sheet 7 of 8)**

**Fuel Filter Element Replacement (Sheet 2 of 2)**

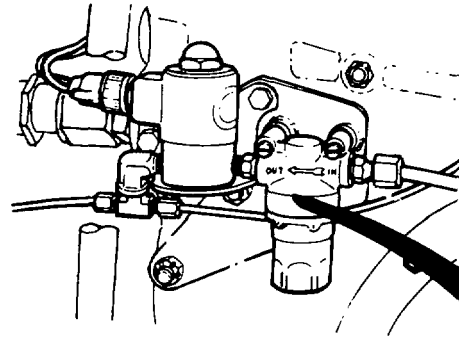
**WARNING**

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

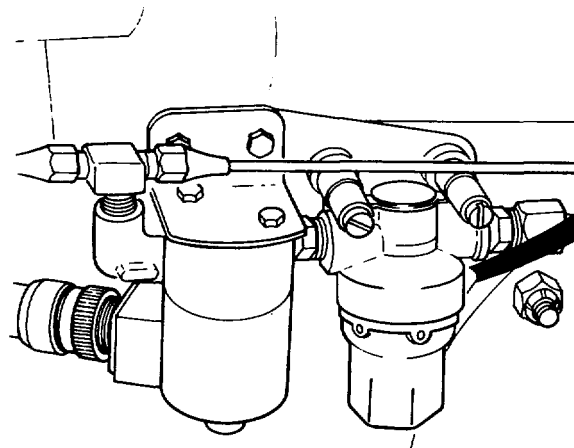
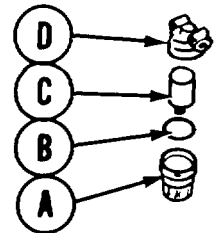
5. Wipe out bowl (A) and dry with compressed air.

**INSTALLATION:**

1. Position new filter element (C) in filter bowl (A).
2. Position new preformed packing (B) over lip of filter bowl (A) and install to filter head (D).
3. Using wrench, tighten filter bowl (A) to filter head (D).
4. Operate primer pump (TM 9-2350-260-10) and check for leaks. If leak is found, tighten filter bowl.
5. Install lower engine access cover (page 16-46).



**2D ENGINE**



**2A ENGINE**

End of Task

TA148449

**MANIFOLD HEATER FUEL FILTER, ELEMENT. AND INPUT FUEL LINE REPLACEMENT (Sheet 8 of 8)**

**Fuel Filter Input Fuel Line Replacement (Sheet 1 of 1)**

TOOLS: 1/2 in. combination box and open end wrench  
 5/8 in. combination box and open end wrench

SUPPLIES: Clean bucket or drip pan  
 Plastic Tubing (7017826), 7.125 in. 1g.  
 Nut (189894) (2 required)  
 Sleeve (189911) (2 required)

REFERENCE: TM 9-2350-260-10

PRELIMINARY PROCEDURE: Remove lower engine access cover (page 16-45)

REMOVAL:

**CAUTION**

**When removing or installing fuel lines, care must be taken not to damage fittings and threads or twist or distort fuel lines or hoses.**

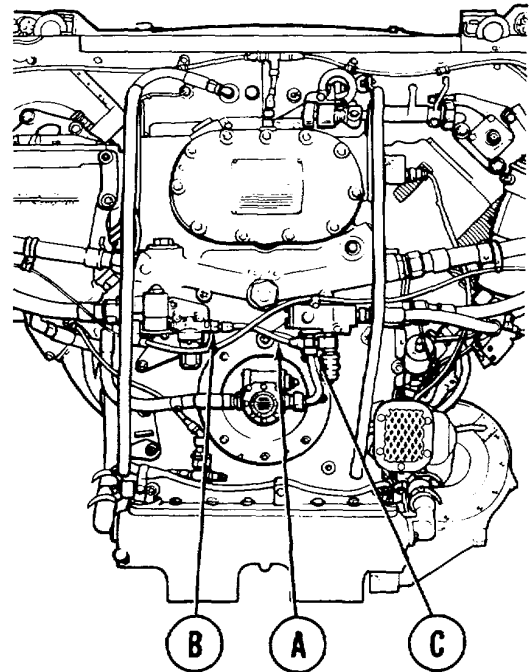
**NOTE**

**Use suitable container to catch any fuel that may leak out whenever any part of fuel system is loosened or disconnected.**

1. Using both wrenches, disconnect both ends of tube assembly (A) from adapters (B) and (C).
2. Remove tube assembly (A).

INSTALLATION:

1. Make new tube assembly (A).
2. Position tube assembly (A) to adapters (B) and (C).
3. Using both wrenches, install tube assembly to adapters.
4. Operate primer pump (TM 9-2350-260-10) and check for leaks. If leak is found, tighten connection as required.
5. Install lower engine access cover (page 16-46).



End of Task

TA148450



**ACCELERATOR LINKAGE ADJUSTMENT (Sheet 1 of 8)**

**TOOLS:** Long round nose pliers  
 9/16 in. combination box and open end wrench (2 required)  
 1/2 in. combination box and open end wrench (2 required)  
 7/16 in. combination box and open end wrench  
 Flashlight

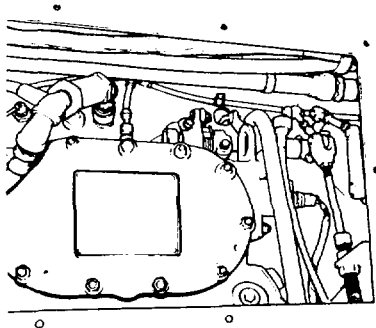
**FABRICATED TOOL:** Throttle linkage adjusting go/no-go gage (Figure F-3, Appendix F)

**SUPPLIES:** 1/8 in. dia. by 2 by 4 in. long locating pins (2 required)  
 1/16 in. dia. by 2 in. long pin  
 Cotter pin (MS24665-281) (4 required)

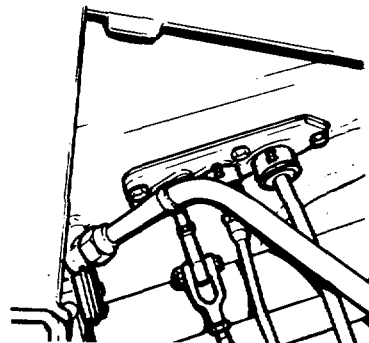
**PERSONNEL:** Two

**REFERENCE:** TM 9-2350-260-10

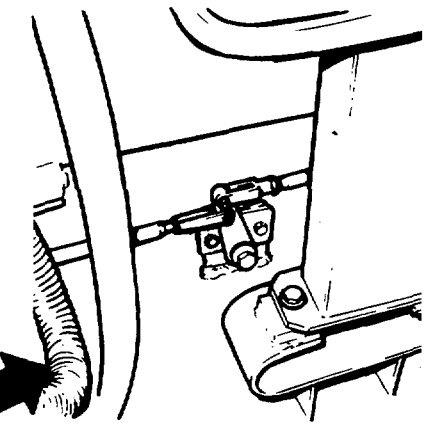
**PRELIMINARY PROCEDURE:** Place shift lever in P (park) position (TM 9-2350-260-10)  
 Block tracks to prevent tank movement (TM 9-2350-260-10)  
 Remove upper engine access cover (page 16-44)



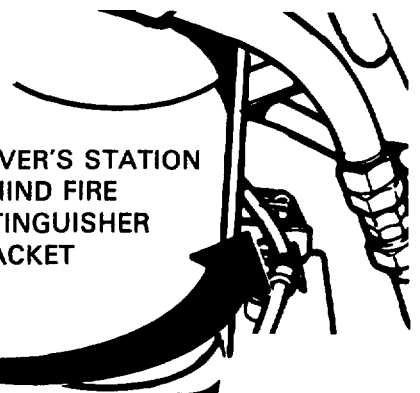
ENGINE COMPARTMENT



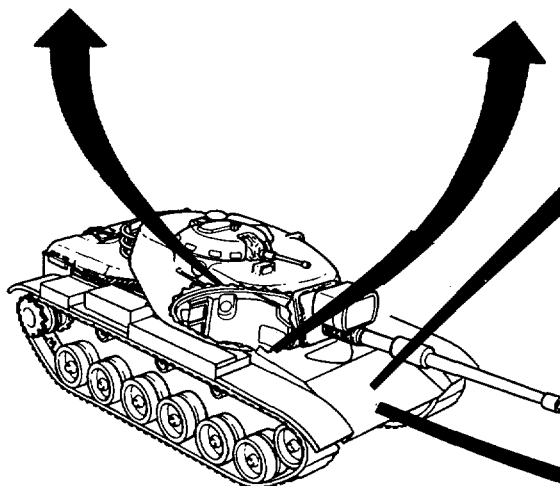
UNDER TURRET PLATFORM



DRIVER'S STATION  
 UNDER LEFT AMMO RACK



DRIVER'S STATION  
 BEHIND FIRE  
 EXTINGUISHER  
 BRACKET



Go on to Sheet 2

TA148451

**ACCELERATOR LINKAGE ADJUSTMENT (Sheet 2 of 8)**

**ADJUSTMENT**

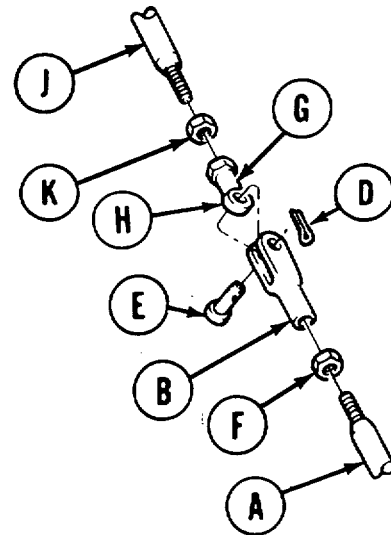
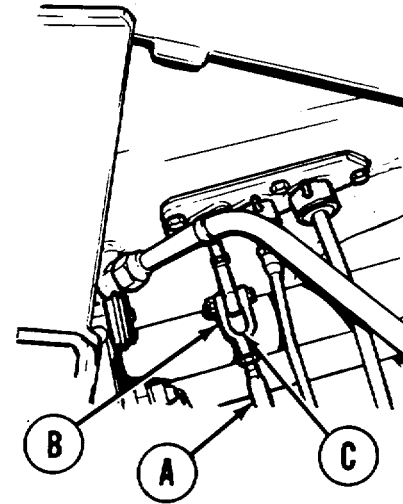
1. Open turret platform access door and traverse turret to position gun tube over right front fender stowage box (TM 9-2350-260-10).
2. Check to see that threaded shaft (A) is flush with inside of clevis (B) at location (C). If threaded shaft is flush, go to step 6. If threaded shaft is not flush, go to steps 3, 4, and 5.
3. Using pliers, remove cotter pin (D) and pin (E). Throw cotter pin away.
4. Using 9/16 inch wrench to hold clevis (B), use 1/2 inch wrench to loosen nut (F) and adjust clevis (B) so that shaft is flush with clevis.
5. Using 9/16 inch wrench to hold clevis (B), use 1/2 inch wrench to tighten nut (F).
6. Insert 1/16 inch diameter pin at location (G) in rod end bearing (H) to be sure that threads of tube assembly (J) go into rod end bearing beyond location (G). If tube assembly is not inserted beyond location (G), go to steps 7 and 8. If tube assembly is inserted beyond location (G), go to step 9.
7. Using 7/16 inch wrench to hold (on flats) rod end bearing (H) and 1/2 inch wrench to loosen nut (K), adjust rod end bearing as stated in step 6.
8. Using 7/16 inch wrench to hold (on flab) rod end bearing (H), use 1/2 inch wrench to tighten nut (K).

**NOTE**

**Rod (H) or clevis (B) may be pulled in order to insert pin (E).**

9. Insert pin (E) and, using pliers, install new cotter pin (D).

**UNDER TURRET PLATFORM**



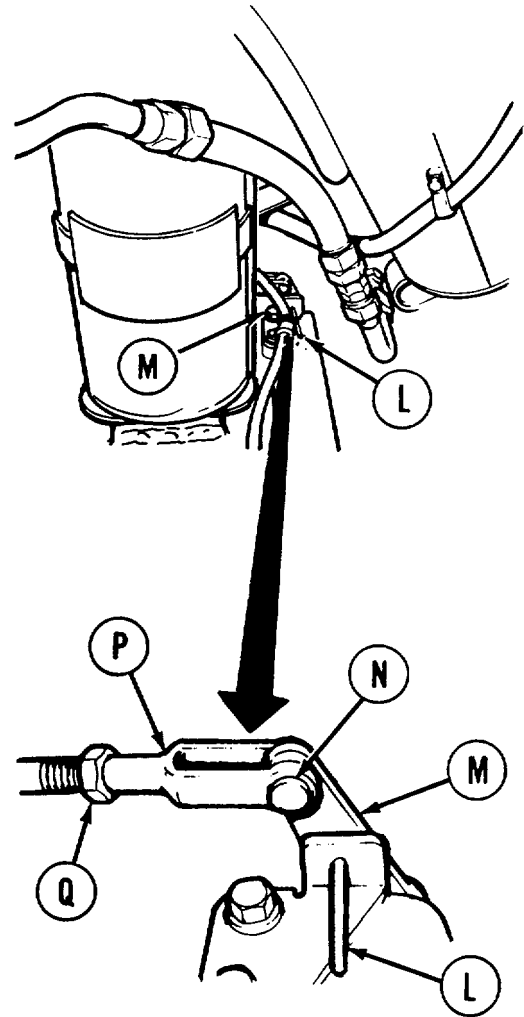
**ACCELERATOR LINKAGE ADJUSTMENT (Sheet 3 of 8)**

10. Close turret platform access door. Traverse turret to position gun tube to rear for entry to driver's station (TM 9-2350-260-10).
11. Insert 1/8 inch diameter locating pin (L) through alinement hole of remote control lever (M). If locating pin cannot be inserted, perform steps 12 thru 17. If locating pin (L) can be inserted, go to step 18.
12. Using pliers, remove cotter pin and pin (N). Throw cotter pin away.
13. Using 1/2 inch wrench to hold clevis (P), use 1/2 inch wrench to loosen nut (Q).
14. Position remote control lever (M). Insert locating pin (L) from behind.

**NOTE**

**If necessary, remove locator pin (L) and push remote control lever (M) forward to allow clevis (P) to turn. Then repeat steps 14 and 15.**

15. Turn clevis (P) until pin (N) slips freely into remote control lever (M).
16. Using pliers, install new cotter pin through pin (N).
17. Using 1/2 inch wrench to hold clevis (P), use 1/2 inch wrench to tighten nut (Q).
18. Leave locating pin (L) in position until step 36.

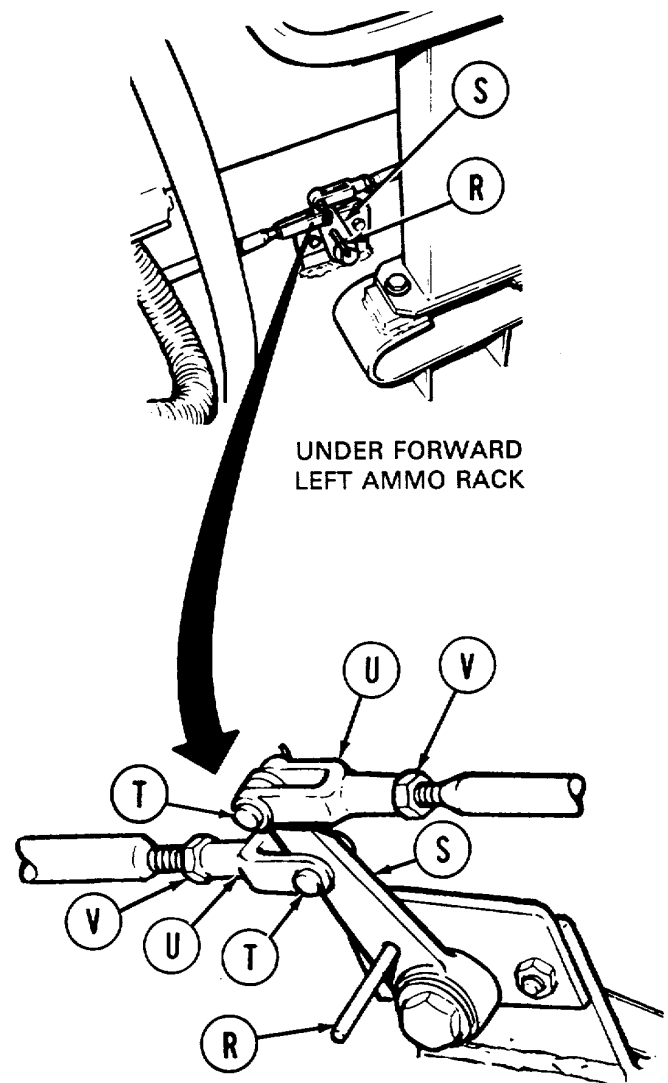
**BEHIND FIRE EXTINGUISHER BRACKET**

Go on to Sheet 4

TA148453

**ACCELERATOR LINKAGE ADJUSTMENT (Sheet 4 of 8)**

19. Insert 1/8 inch diameter pin (R) through alignment hole of lever assembly (S). If locating pin (R) cannot be inserted, perform steps 20 thru 25. If locating pin can be inserted, go to step 25.
20. Using pliers, remove two cotter pins and pins (T). Throw cotter pins away.
21. Using 1/2 inch wrench to hold each clevis (U), use 1/2 inch wrench to loosen each nut (V).
22. Position lever assembly (S) so that locating pin (R) can be inserted.
23. Turn two clevises (U) until two pins (T) slip freely into lever assembly (S). Using pliers, install two new cotter pins through pins (T).
24. Using 1/2 inch wrench to hold each clevis (U), use 1/2 inch wrench to tighten each nut (V).
25. Remove locating pin (R).



Go on to Sheet 5

TA148454

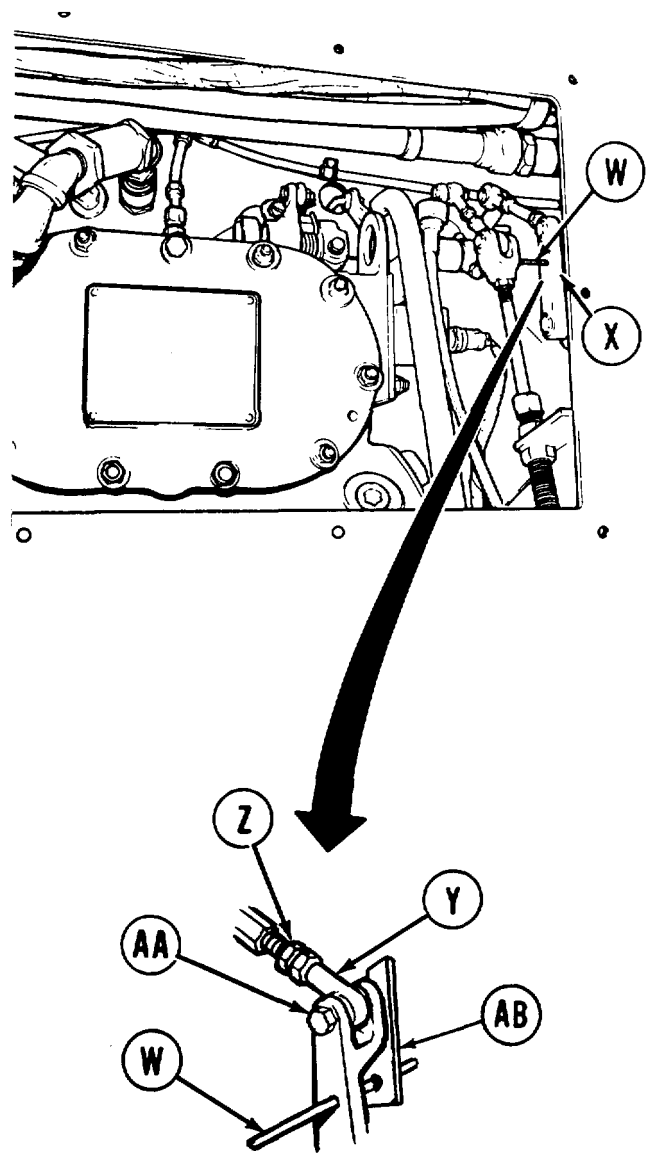
**ACCELERATOR LINKAGE ADJUSTMENT (Sheet 5 of 8)**

26. Traverse turret to position gun tube to front for access to engine compartment (TM 9-2350-260-10).
27. Insert 1/8 inch diameter locating pin (W) through alignment hole of remote control lever (X). If locating pin cannot be inserted, perform steps 28 through 34. If locating pin can be inserted, go to step 34.
28. Using 7/16 inch wrench to hold rod end bearing (Y) (on flats), use 1/2 inch wrench to loosen nut (Z).
29. Using 7/16 inch wrench, remove screw (AA).
30. Insert locating pin (W) through alignment hole into housing (AB).

**NOTE**

**If rod (Y) cannot be adjusted short enough for screw (AA) to slip freely through lever (X) push rod (Y) forward and insert screw (AA).**

31. Turn rod end bearing (Y) until screw (AA) slips freely through remote control lever (X) and rod end bearing.
32. Using 7/16 inch wrench to hold rod end bearing (Y), tighten nut (Z).
33. Using 7/16 inch wrench, tighten screw (AA).
34. Remove locating pin (W).

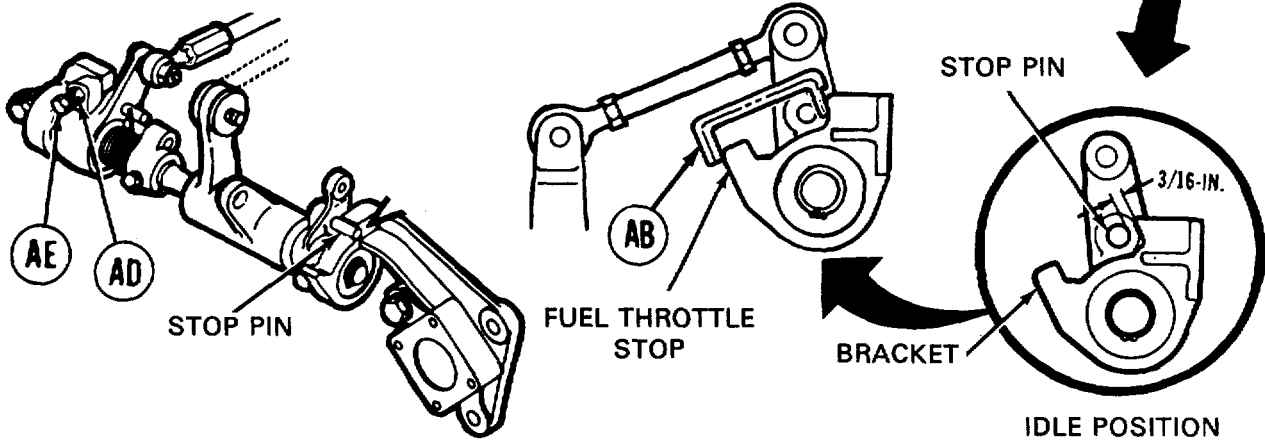
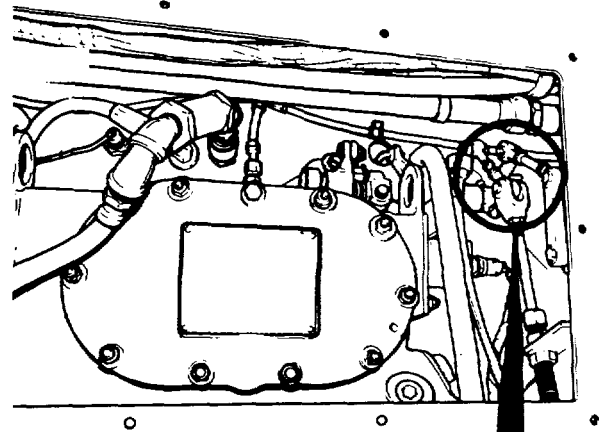
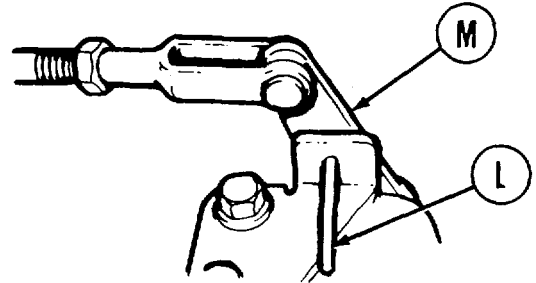


Go on to Sheet 6

TA148455

**ACCELERATOR LINKAGE ADJUSTMENT (Sheet 6 of 8)**

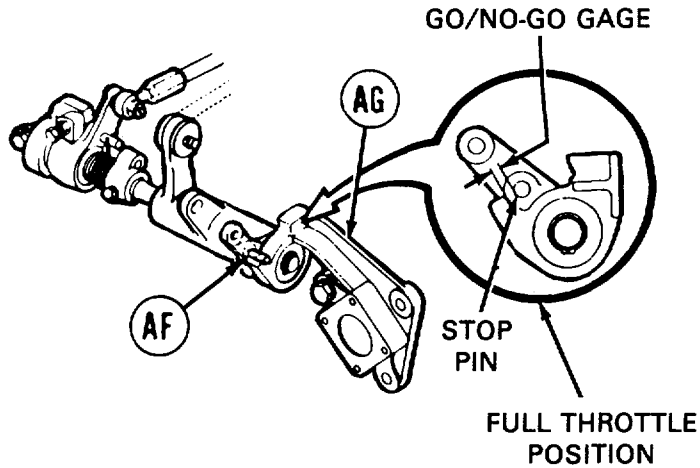
35. Traverse turret to position gun tube to rear for entry to driver's station (TM 9-2350-260-10).
36. Remove locating pin (L) from remote control lever (M).
37. Traverse turret to position gun tube to front for access to engine compartment (TM 9-2350-260-10).
38. Have one person in driver's station ready to start engine and watch tachometer while the other person measures accelerator travel at engine.
39. Start engine (TM 9-2350-260-10).
40. Using fabricated go/no-go gage (AB) (Figure F-3, Appendix F), measure for at least 1/8 inch clearance at idle speed 700 to 750 rpm. If idle adjustment is necessary, perform steps 41 and 42. If adjustment is not necessary, go on to step 43.
41. Using 1/2 inch wrench, loosen nut (AD). Adjust idle adjustment screw (AE) to the requirements of step 40. If requirements are met, go to step 42; if requirements cannot be met notify support maintenance.
42. Using 1/2 inch wrench, hold idle adjustment screw (AE). Using 1/2 inch wrench, tighten nut (AD).



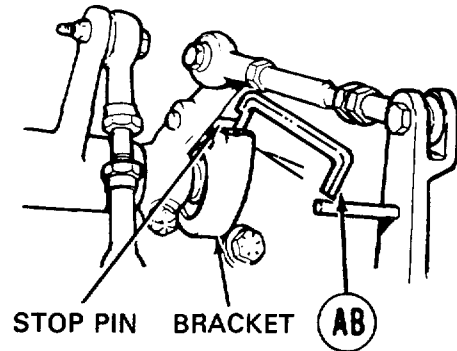
Go on to Sheet 7

TA148456

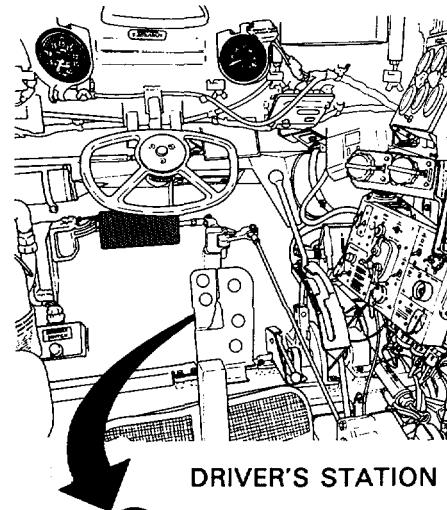
ACCELERATOR LINKAGE ADJUSTMENT (Sheet 7 of 8)



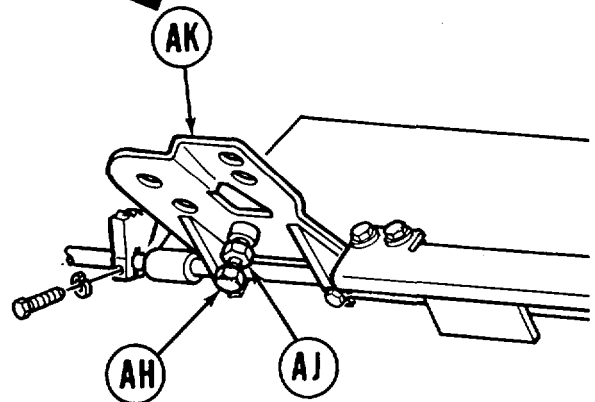
ENGINE COMPARTMENT



43. Stop engine (TM 9-2350-260-10).
44. Insert either end of go/no-go gage (AB) between stop pin (AF) and bracket (AG). Hold in this position while person in driver's station presses pedal to full throttle position.
45. With pedal in full throttle position, screw (AH) must contact floor and stop pin must contact either end of go/no-go gage (AB). If this requirement cannot be met, do steps 46 thru 48. If requirement is met, go to step 49.
46. Using two 9/16 inch wrenches, loosen jamnut (AJ) and screw (AH) on back side of accelerator pedal (AK).
47. Using two 9/16 inch wrenches, hold screw (AH) and tighten jamnut (AJ).



DRIVER'S STATION



Go on to Sheet 8

TA148457

**ACCELERATOR LINKAGE ADJUSTMENT (Sheet 8 of 8)**

49. Start engine (TM 9-2350-260-10).
50. Press accelerator pedal down to floor. Tachometer should read between 2550-2650 rpm. If engine will not accelerate to within 2550-2650 rpm, shut down engine (TM 9-2350-260-10). Go back and do steps 44 thru 50 to readjust. If engine does accelerate to between 2550.2650 rpm, go to step 51.
51. Stop engine (TM 9-2350-260-10).
52. Install upper engine access cover (page 16-44).
53. Remove blocks from track (TM 9-2350-260-10).

End of Task



**ENGINE IDLE ADJUSTMENT (Sheet 1 of 1)**

TOOLS: 7/16 in. combination box and open end wrench  
Flat-tip screwdriver

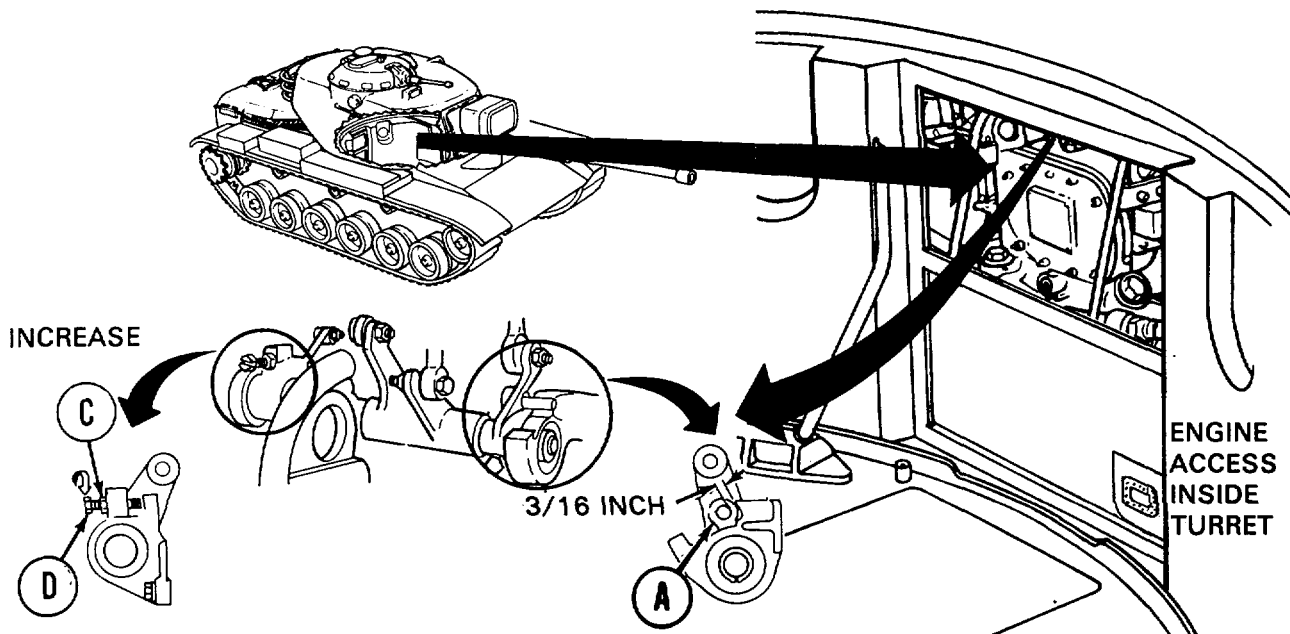
FABRICATED TOOLS: Gage (Figure F-3, Appendix F)

REFERENCE: TM 9-2350-260-10

PRELIMINARY PROCEDURES: Start engine, run at idle (TM 9-2350-260-10)  
Engage parking brake (TM 9-2350-260-10)  
Remove upper engine access cover (page 16-44)

**ADJUSTMENT:**

- Using 3/16 inch end of fabricated gage (Figure F-3, Appendix F) measure distance between stop pin (A) and bracket shoulder (B).



- If distance is more than or less than 3/16 inch, use wrench and loosen jamnut (C) on idle adjustment screw (D).
- Using screwdriver, turn screw (D) to the right to increase distance, and to the left to decrease distance.
- Using wrench, tighten jamnut (C).
- Check idle speed. If it is not between 700-750 rpm (shown on tachometer), notify support maintenance.
- Stop engine (TM 9-2350-260-10).
- Install upper engine access cover (page 16-44).

End of Task

TA148459

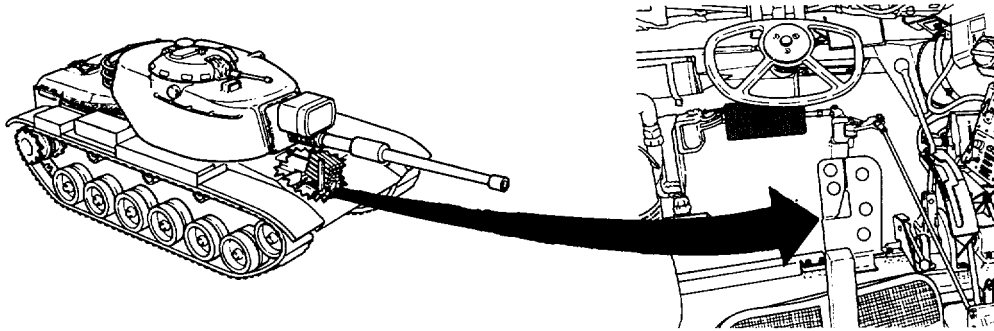
**ACCELERATOR PEDAL RETURN SPRING ADJUSTMENT (Sheet 1 of 2)**

TOOLS: 7/16 in. combination box and open end wrench  
Spring scale

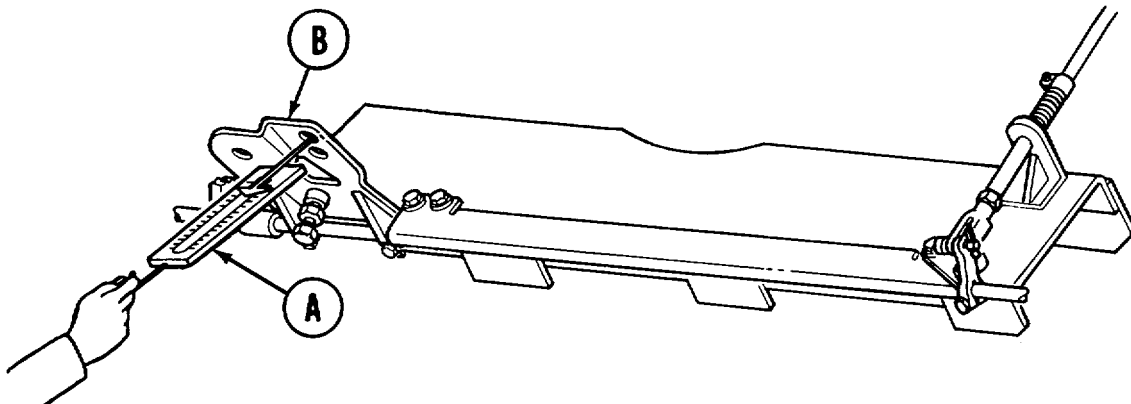
REFERENCE:

TM 9-2350260-10

PRELIMINARY PROCEDURES: Place shift lever in P (park) position (TM 9-2350-260-10)  
Disconnect accelerator linkage at powerplant (page 7-87, steps 28 and 29)

**ADJUSTMENT:**

1. Using spring scale (A), as shown from behind, check pressure required to depress accelerator pedal (B).
2. Scale should read between 7 and 8 pounds.
3. If scale reads more than 8 pounds, perform steps 5 thru 7.
4. If scale reads less than 7 pounds, perform steps 9 thru 11.

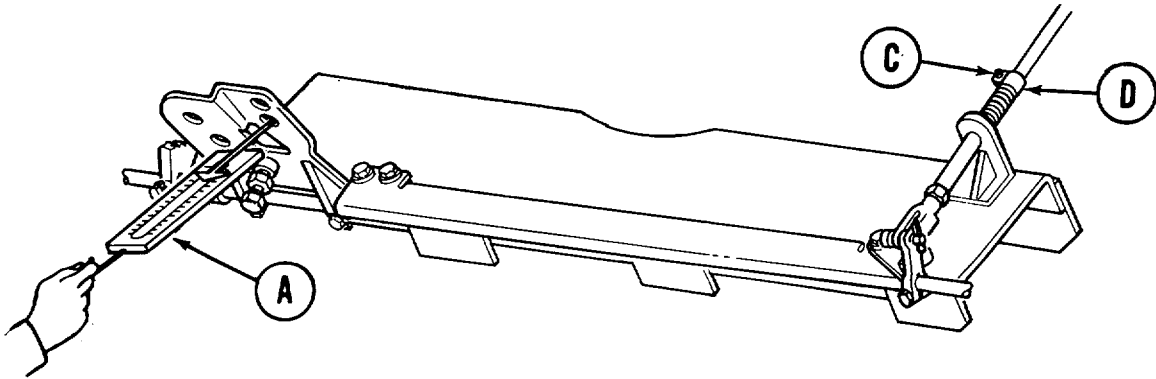


Go on to Sheet 2

TA148460

**ACCELERATOR PEDAL RETURN SPRING ADJUSTMENT (Sheet 2 of 2)**

5. Using wrench, loosen screw (C).
6. Using fingers, move clamp (D) slightly toward rear of tank.
7. Using wrench, tighten screw (C).



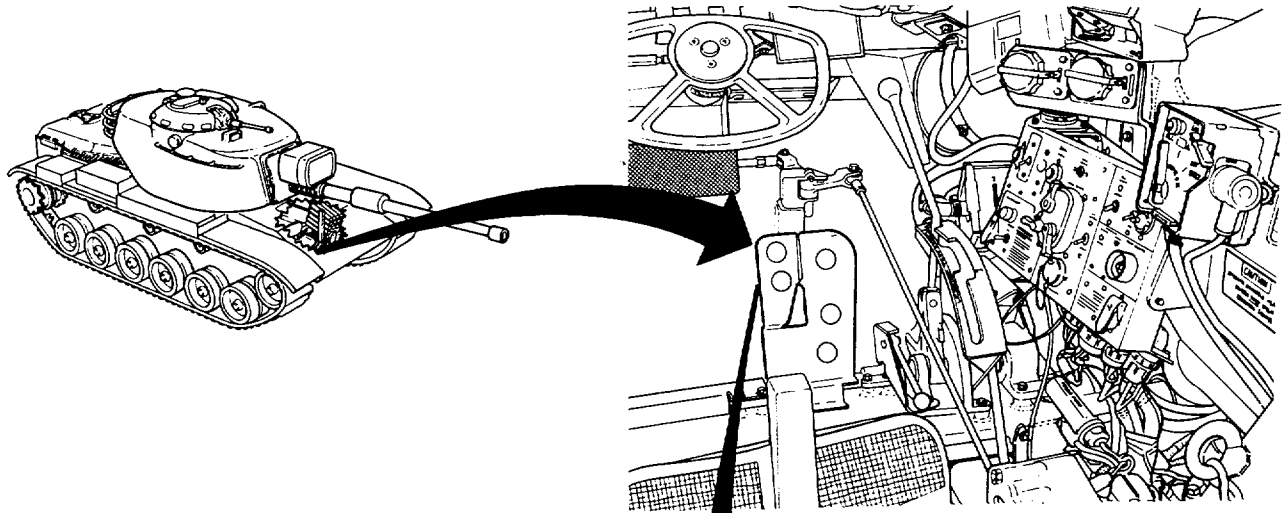
8. Repeat steps 1 and 2. If scale (A) still reads over 8 pounds, repeat steps 5 thru 7 until 8 pounds or less but more than 7 pounds are required to depress pedal.
9. Using wrench, loosen screw (C).
10. Using fingers, move clamp (D) slightly toward front of tank.
11. Using wrench, tighten screw (C).
12. Repeat steps 1 and 2. If scale (A) still reads less than 7 pounds, repeat steps 9 thru 11 until 7 pounds or more but not more than 8 pounds are required to depress pedal.
13. Connect accelerator linkage at powerplant (page 7-380, steps 32 and 33).

End of Task

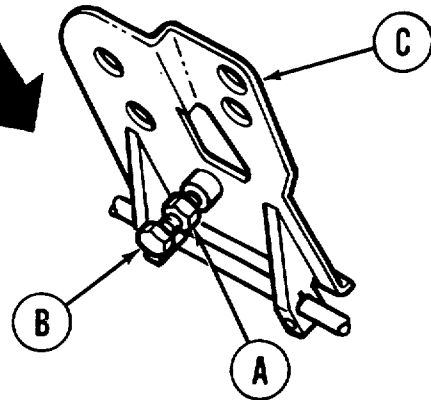
TA148461

**ACCELERATOR PEDAL ADJUSTMENT (Sheet 1 of 1)**

TOOLS: 9/16 in. combination box and open end wrench (2 required)

**ADJUSTMENT:**

1. Using wrench, loosen jamnut (A) holding stop screw (B).
2. Using wrench, tighten stop screw (B) into accelerator pedal (C).
3. Push and hold accelerator pedal (C) forward as far as it will go.
4. Using wrench, loosen stop screw (B) until it touches hull.
5. Releasing accelerator pedal, use wrench to hold stop screw (B) while using wrench to tighten jamnut (A).



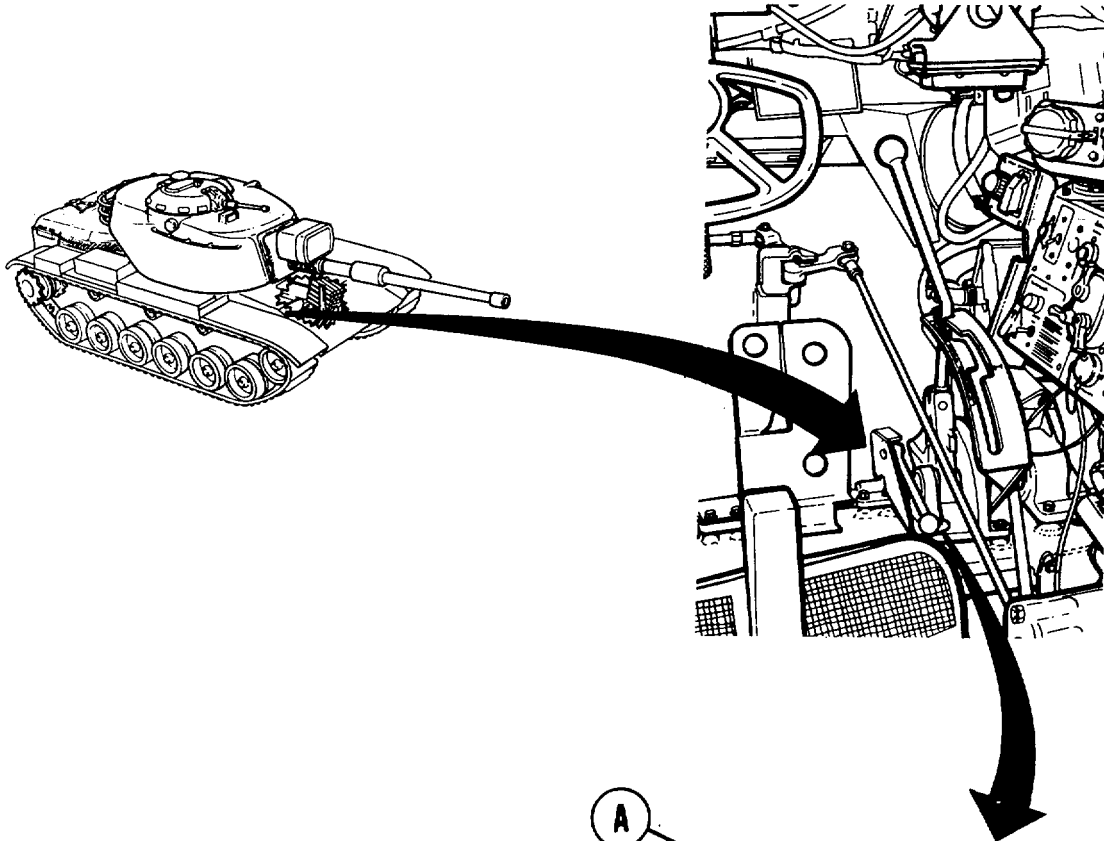
End of Task

TA148462

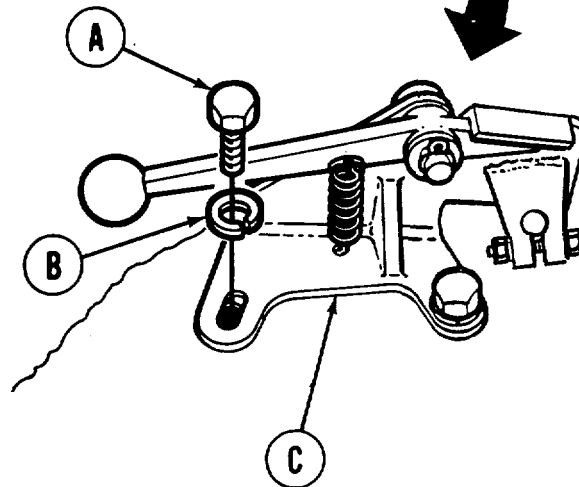
**ACCELERATOR FOOT PEDAL LOCK ASSEMBLY REPLACEMENT (Sheet 1 of 3)**

**TOOLS:** Slip joint pliers  
 Ratchet with 1/2 in. drive  
 9/16 in. socket with 1/2 in. drive  
 5 in. extension with 1/2 in. drive

**SUPPLIES:** Cotter pin (MS24665-283)  
 Rags (Item 65, Appendix D)  
 Dry cleaning solvent (Item 54, Appendix D)  
 Lockwasher (MS35338-46) (2 required)

**REMOVAL:**

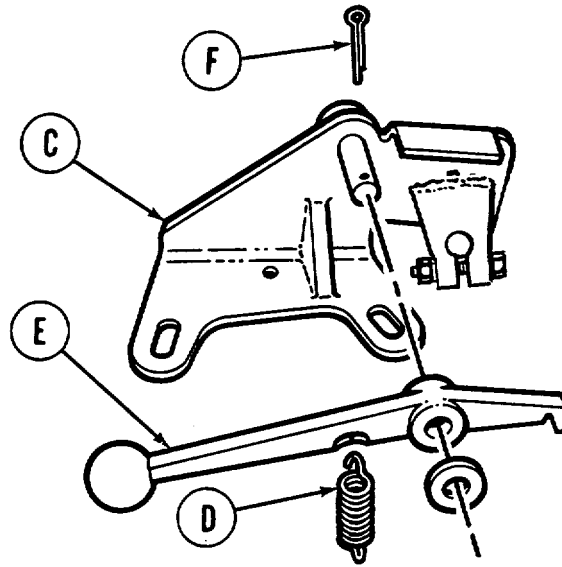
1. Using socket, remove two screws (A) and lockwashers (B). Throw lockwashers away.
2. Remove bracket (C) and attached parts from tank.



Go on to Sheet 2

TA148463

ACCELERATOR FOOT PEDAL LOCK ASSEMBLY REPLACEMENT (Sheet 2 of 3)



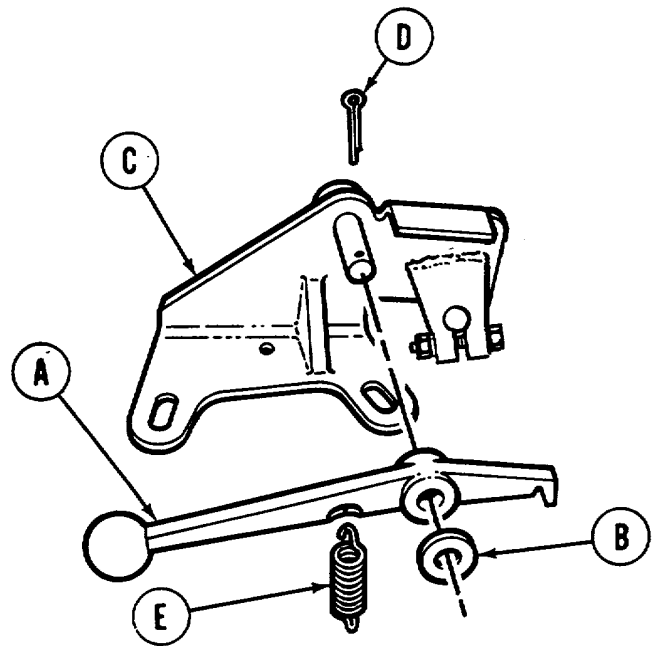
3. Unhook spring (D) from bracket (C) and from control lever (E).
4. Using pliers, remove cotter pin (F). Throw cotter pin away.
5. Remove washer (G) and control lever (E) from bracket (C).

CLEANING AND INSPECTION:

1. Clean all parts sing dry cleaning solvent (Item 54, Appendix D) and rags (Item 65, Appendix D).
2. Inspect all parts for cracks, bends, wear, or other defects. Replace defective parts.

INSTALLATION:

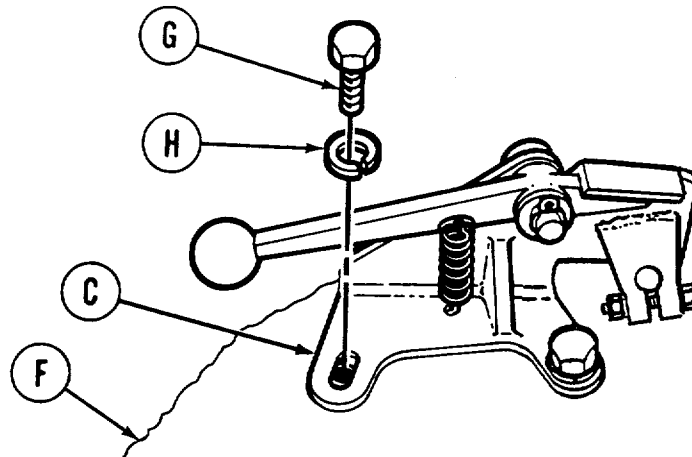
1. Install control lever (A) and washer (B) on bracket (C).
2. Using pliers, install new cotter pin (D).
3. Hook spring (E) on control lever (A) and on bracket (C).



Go on to Sheet 3

TA148464

## ACCELERATOR FOOT PEDAL LOCK ASSEMBLY REPLACEMENT (Sheet 3 of 3)



4. Line up holes in bracket (C) with holes in base (F).
5. Using socket and extension, install two screws (G) and new lockwashers (H) attaching bracket (C) to base (F).
6. Make sure accelerator lock operates properly. Check for things in the way, or missing parts, if accelerator lock does not operate properly.

End of Task

TA148465

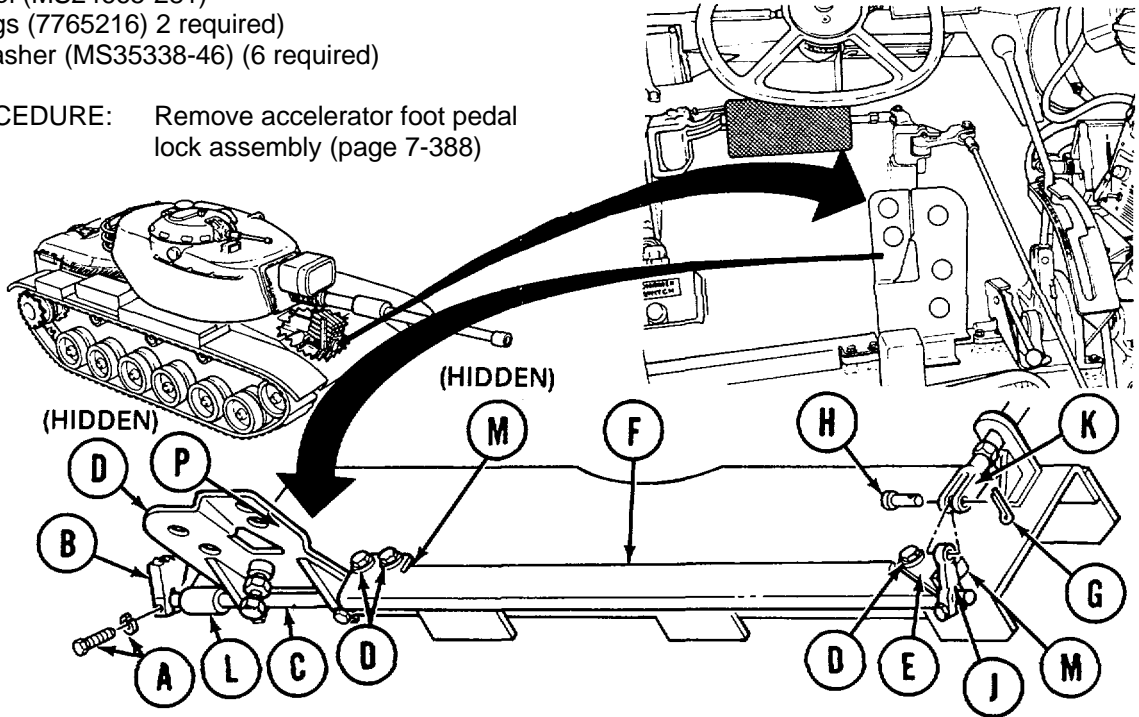
**ACCELERATOR PEDAL REPLACEMENT (Sheet 1 of 4)**

**TOOLS:** 9/16 in. combination box and open end wrench (2 required)  
 7/16 in. combination box and open end wrench  
 Slip joint pliers  
 1/8 in. drive pin punch

**SUPPLIES:** Paper tags  
 Pencil  
 Cotter pin (MS24665-281)  
 Bearings (7765216) 2 required  
 Lockwasher (MS35338-46) (6 required)

**PRELIMINARY PROCEDURE:** Remove accelerator foot pedal lock assembly (page 7-388)

**REMOVAL:**



**NOTE**

**Tag shims which may be located under housings (L) and (M) for installation.**

1. Using 7/16 inch wrench, remove screw and lockwasher (A) securing detent plate (B). Throw lockwasher away.
2. Remove detent plate (B) from shaft (C).
3. Using 9/16 inch wrench, remove six screws and lockwashers (D). Throw lockwasher away.
4. Remove bracket (E).
5. Remove cover (F).
6. Using pliers, remove cotter pin (G) from pin (H). Throw cotter pin away.
7. Remove pin (H) from lever (J) and clevis (K).
8. Remove pedal (P), control rod (C), and attached parts from tank as a unit.

Go on to Sheet 2

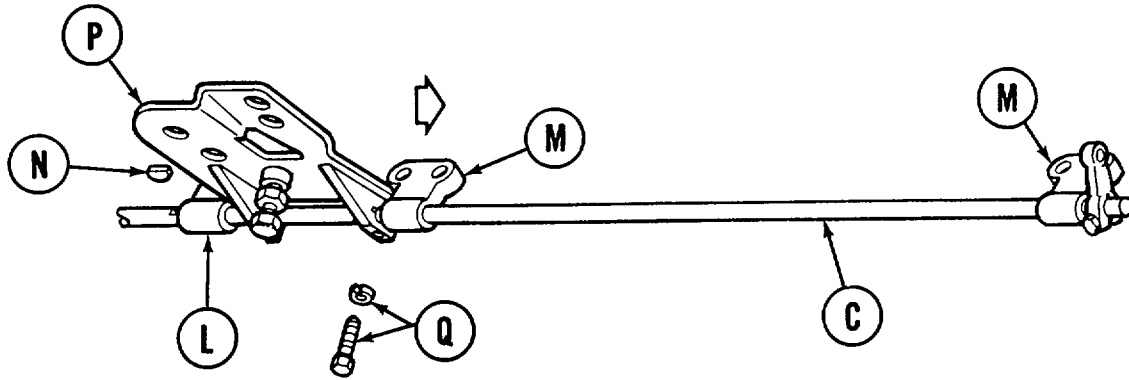
TA148466



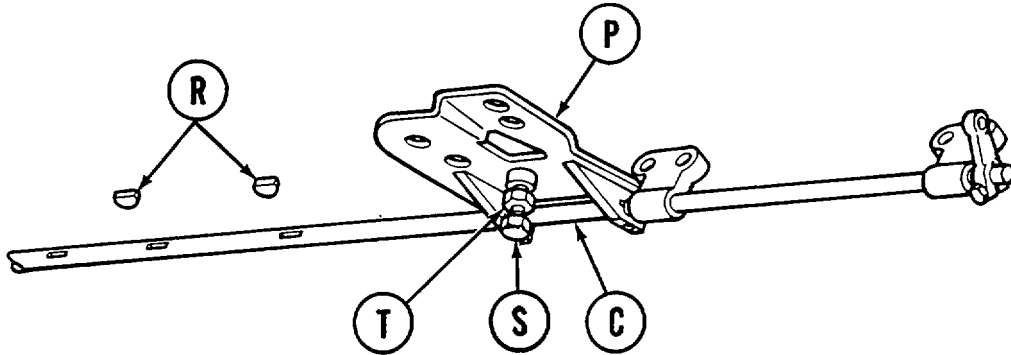
ACCELERATOR PEDAL REPLACEMENT (Sheet 2 of 4)

NOTE

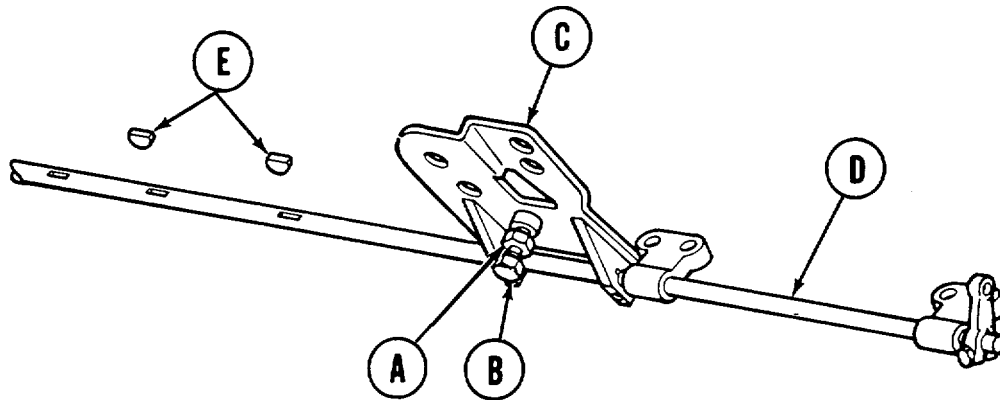
Tag shims which may be located under housings (L) and (M) for installation.



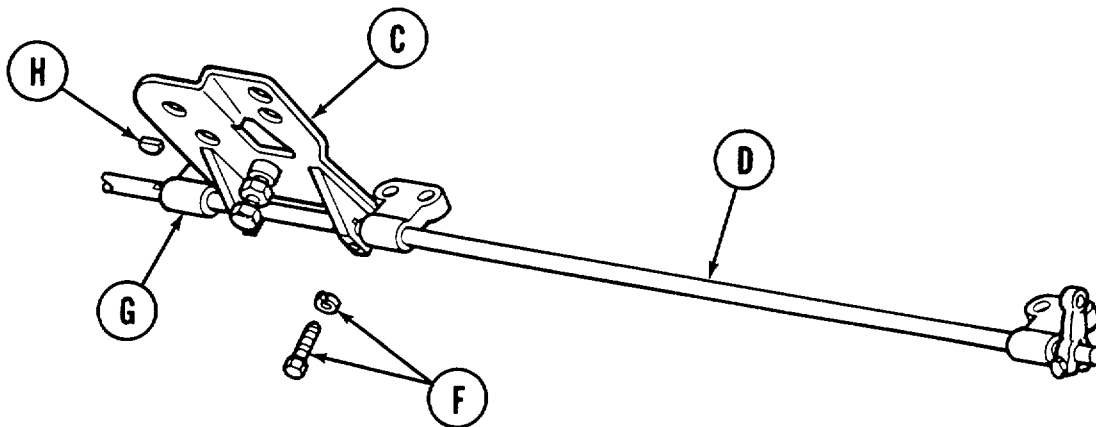
9. Using hammer and punch, remove woodruff key (N) from control rod (C).
10. Remove housing (L) from control rod (C). Using hammer and punch, remove two bearings (L) if bearings are damaged or worn.
11. Using 7/16 inch wrench, remove two screws and lockwashers (Q) securing pedal (P) to control rod (C).
12. Slide accelerator pedal (P) in direction of arrow to allow access to two woodruff keys (R).



13. Using hammer and punch, remove two woodruff keys (R).
14. Slide accelerator pedal (P) off control rod (C).
15. Using 9/16 inch wrench, remove screw (S) and nut (T) from accelerator pedal (P). Retain screw and nut for installation onto replacement accelerator pedal.

**ACCELERATOR PEDAL REPLACEMENT (Sheet 3 of 4)****INSTALLATION:**

1. Using 9/16 inch wrench, install nut (A) and screw (B) onto accelerator pedal (C).
2. Install accelerator pedal (C) onto control rod (D).
3. Install two woodruff keys (E) onto control rod (D) and align accelerator pedal (C) on woodruff keys (E).

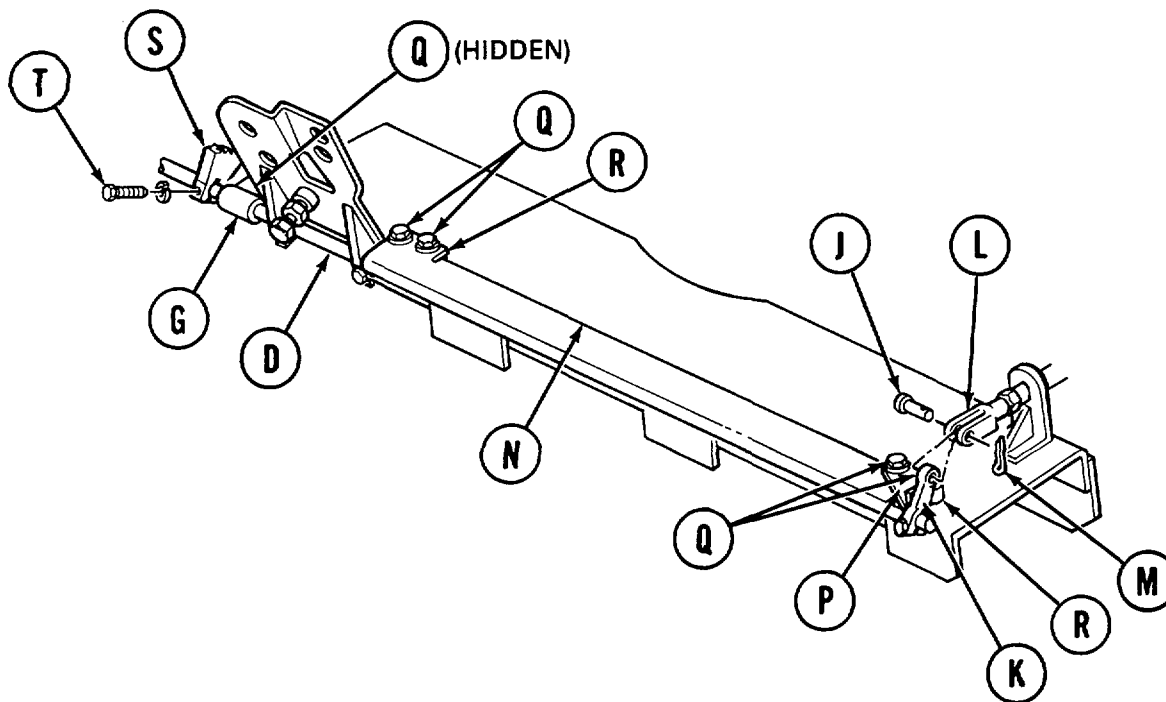


4. Using 7/16 inch wrench, install two screws and new lockwashers (F) securing accelerator pedal (C) to control rod (D).
5. Using vise, install two new bearings in housing (G) if bearings were removed. Using hands, install housing (G) onto control rod (D).
6. Install woodruff key (H) onto control rod (D).
7. Position accelerator pedal (C), control rod (D), and attached parts in tank as a unit.

Go on to Sheet 4

TA148468

## ACCELERATOR PEDAL REPLACEMENT (Sheet 4 of 4)



8. Install pin (J) through lever (K) and clevis (L).
9. Using pliers, install new cotter pin (M) through pin (J).
10. Position cover (N) over rod (D).

**NOTE**

**If shims were removed, they must be installed at this time.**

11. Position bracket (P) on cover (N).
12. Using 9/16 inch wrench, install two screws and new lockwashers (Q) through bracket (P), cover (N), and housing (R).
13. Using 9/16 inch wrench, install two screws and new lockwashers (Q) through cover (N) and housing (R) (hidden).
14. Using 9/16 inch wrench, install two screws and new lockwashers (Q) through housing (G).
15. Install detent plate (S) onto control rod (D) and woodruff key (H).
16. Adjust accelerator pedal (page 7-387).
17. Using 7/16 inch wrench, install new lockwasher and screw (T) to secure detent plate (S) to control rod (D).
18. Install accelerator foot pedal lock assembly (page 7-389).

End of Task

TA148469

ACCELERATOR FOOT PEDAL CONTROL ROD AND RELATED PARTS REPLACEMENT (Sheet 1 of 4)

PROCEDURE INDEX

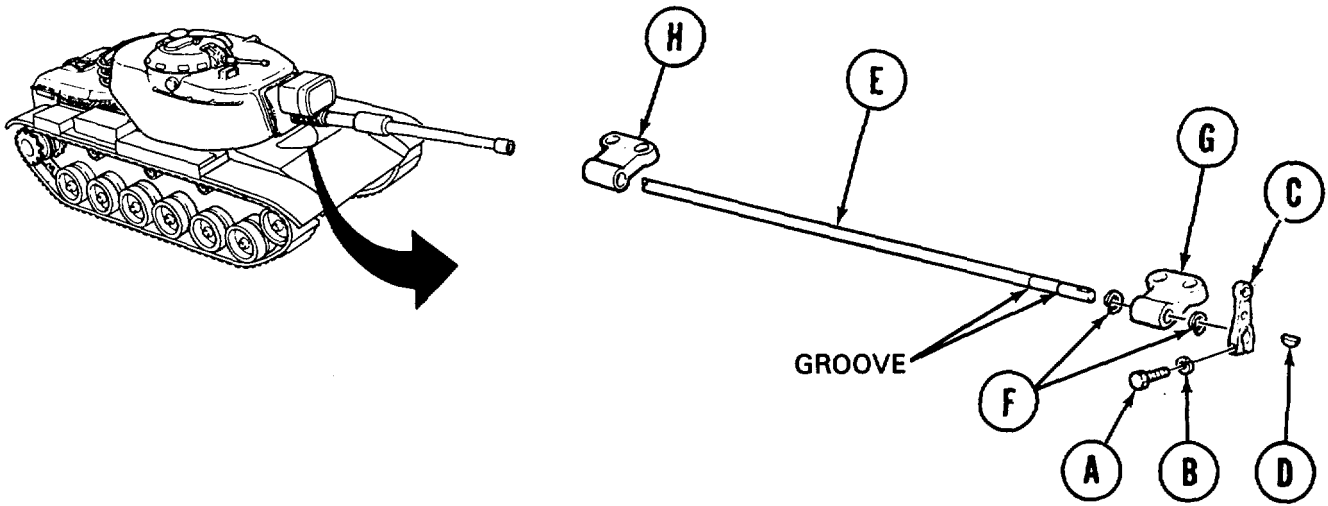
PROCEDURE	PAGE
Removal	7-396
Installation	7-397

TOOLS: 9/16 in. socket with 1/2 in. drive  
 1/8 in. straight drive pin punch  
 Ratchet with 1/2 in. drive  
 Slip joint pliers  
 Retaining ring pliers (outside)  
 Ball peen hammer  
 7/16 in. combination box and open end wrench  
 Vise

SUPPLIES: Pencil  
 Paper  
 Dry cleaning solvent (Item 54, Appendix D)  
 Rags  
 Lockwasher (MS35338-44)  
 Bearings (7765216) (4 required)

PRELIMINARY PROCEDURE: Remove accelerator pedal (page 7-391)

## ACCELERATOR FOOT PEDAL CONTROL ROD AND RELATED PARTS REPLACEMENT (Sheet 2 of 4)



## REMOVAL:

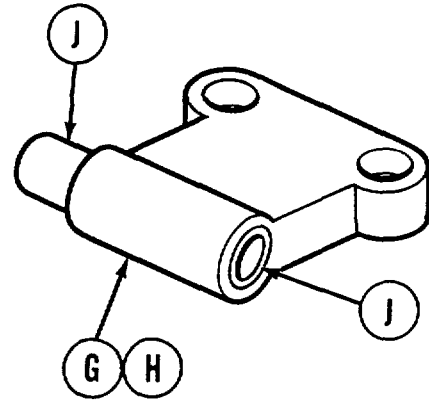
1. Using wrench, remove screw (A) and lockwasher ( ) from lever (C). Throw lockwasher away.
2. Using hammer, remove lever (C) and woodruff key (D) from control rod (E).
3. Using retaining ring pliers, remove retaining rings ( ) from grooves in control rod (E) and slide retaining rings (F) and housing (G) off control rod (E).
4. Slide housing (H) off control rod (E).

Go on to Sheet 3

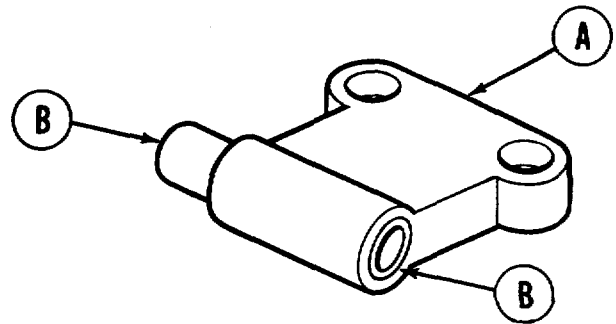
TA148471

**ACCELERATOR FOOT PEDAL CONTROL ROD AND RELATED PARTS REPLACEMENT (Sheet 3 of 4)**

5. Install housings (G) and (H) in vise.
6. Using hammer and punch, drive out two bearings (J).

**CLEANING AND INSPECTION:**

1. Using dry cleaning solvent (Item 54, Appendix D) and clean rags, clean all parts.
2. Check all parts for bends, wear in holes, and other defect. Replace defective parts.
3. Inspect bearings in housings. If defective or worn, replace.

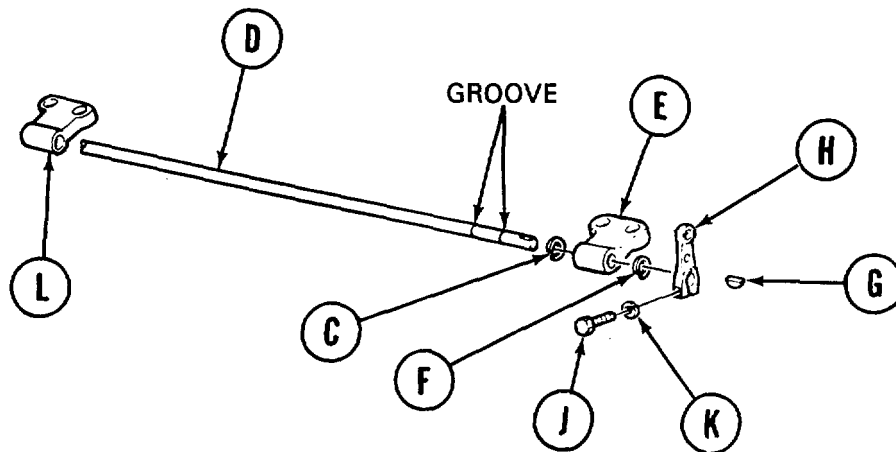
**INSTALLATION:**

1. Position bearing (B) into each side of housing (A).
2. Using vise, press bearings (B) into housing (A) until they are flush with housing surface.

Go on to Sheet 4

TA148504

## ACCELERATOR FOOT PEDAL CONTROL ROD AND RELATED PARTS REPLACEMENT (Sheet 4 of 4)



3. Using retaining ring pliers, install retaining ring (C) in inner groove on control rod (D).
4. Slide housing (E) on control rod (D).
5. Using retaining ring pliers, install retaining ring (F) in outer groove on control rod (D).
6. Install woodruff key (G) on control rod (D).
7. Slide lever (H) on control rod (D) until level (H) is over woodruff key (G).
8. Using wrench, install screw (J) and new lockwasher (K) to secure lever (H) to control rod (D).
9. Slide housing (L) on control rod (D).
10. Install accelerator pedal (page 7-393).
11. Press accelerator pedal and make sure linkage operates smoothly. Correct as necessary.

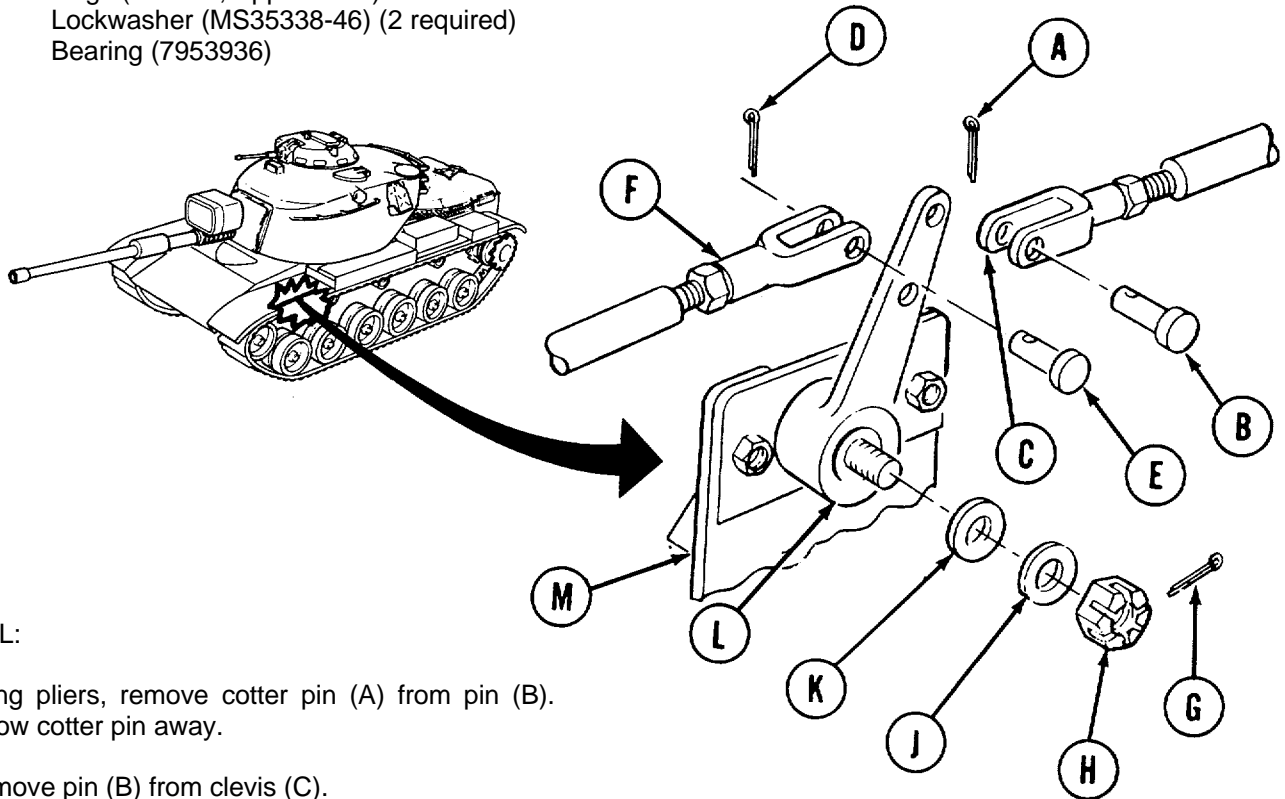
End of Task

TA148505

**ACCELERATOR LEVER ASSEMBLY REPLACEMENT (Sheet 1 of 3)**

**TOOLS:** Diagonal cutting pliers  
 9/16 in. socket with 1/2 in. drive  
 Ratchet with 1/2 in. drive  
 3/4 in. combination box and open end wrench  
 Torque wrench with 1/2 in. drive (0-175 lb-ft) (0-237 N•m)  
 Vice

**SUPPLIES:** Cotter pin (MS24665-287)  
 Cotter pin (MS24665-281) (2 required)  
 Dry cleaning solvent tem 54, Appendix D)  
 Rags (Item 65, Appendix D)  
 Lockwasher (MS35338-46) (2 required)  
 Bearing (7953936)

**REMOVAL:**

1. Using pliers, remove cotter pin (A) from pin (B). Throw cotter pin away.
2. Remove pin (B) from clevis (C).
3. Using pliers, remove cotter pin (D) from pin (E). Throw cotter pin away.
4. Remove pin (E) from clevis (F).
5. Using pliers, remove cotter pin (G) from nut (H). Throw cotter pin away.
6. Using wrench, remove nut (H), fiat washer (J), washer bearing (K), and lever (L) from support (M).

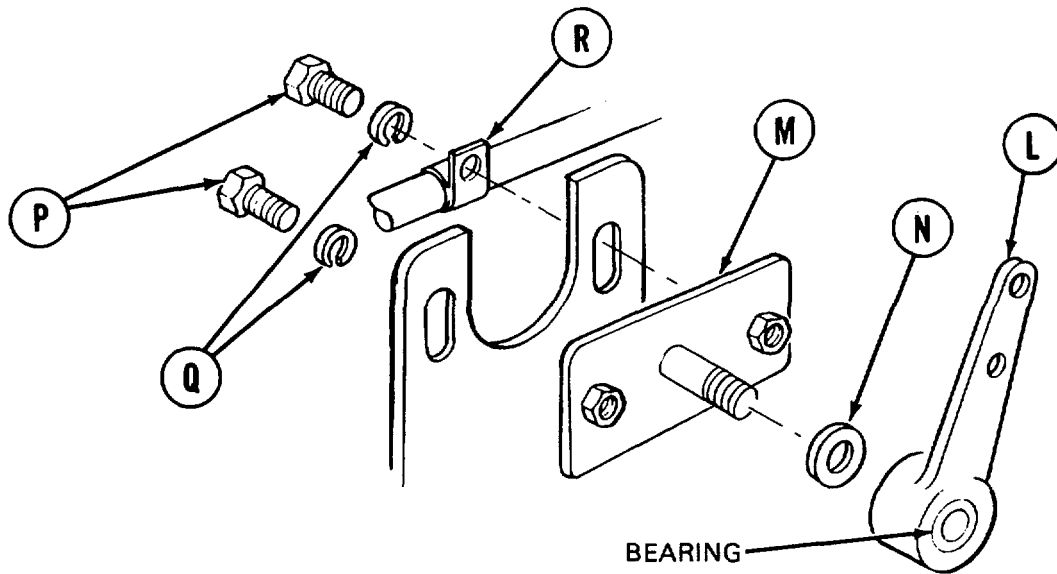
Go on to Sheet 2

TA148506



**ACCELERATOR LEVER ASSEMBLY REPLACEMENT (Sheet 2 of 3)**

7. Remove washer bearing (N) from support (M).
8. Using socket, remove two screws (P), lockwashers (Q), and cable clamp (R). Throw lockwashers away.
9. Remove support (M) from tank.
10. Inspect bearing in lever (L). If bearing is defective, use hammer and drive pin punch and drive bearing out of lever (L).

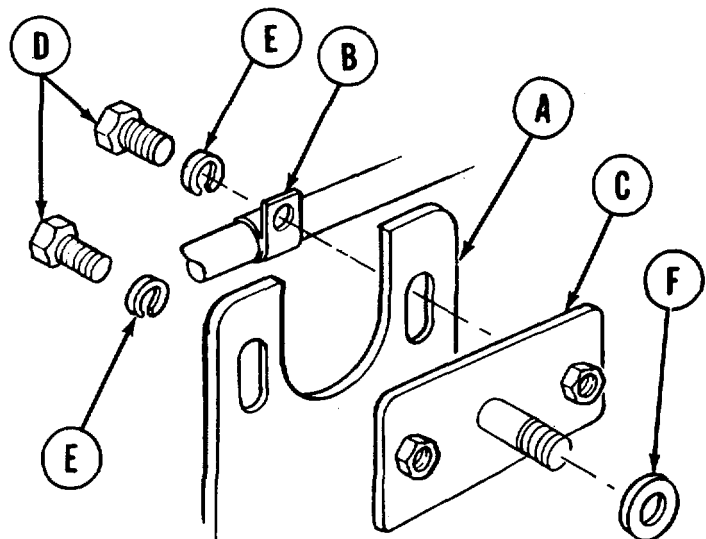


**CLEANING AND INSPECTION:**

1. Clean all parts using dry cleaning solvent (Item 54, Appendix D), and clean rags (Item 65, Appendix D).
2. Inspect all parts for cracks, bends, wear, and other defects.

**INSTALLATION:**

1. Line up holes in bracket (A), clamp (B), and support (C).
2. Using fingers, install two screws (D) and new lockwashers (E) in bracket (A), clamp (B), and support (C).
3. Install washer bearing (F) on support (C).

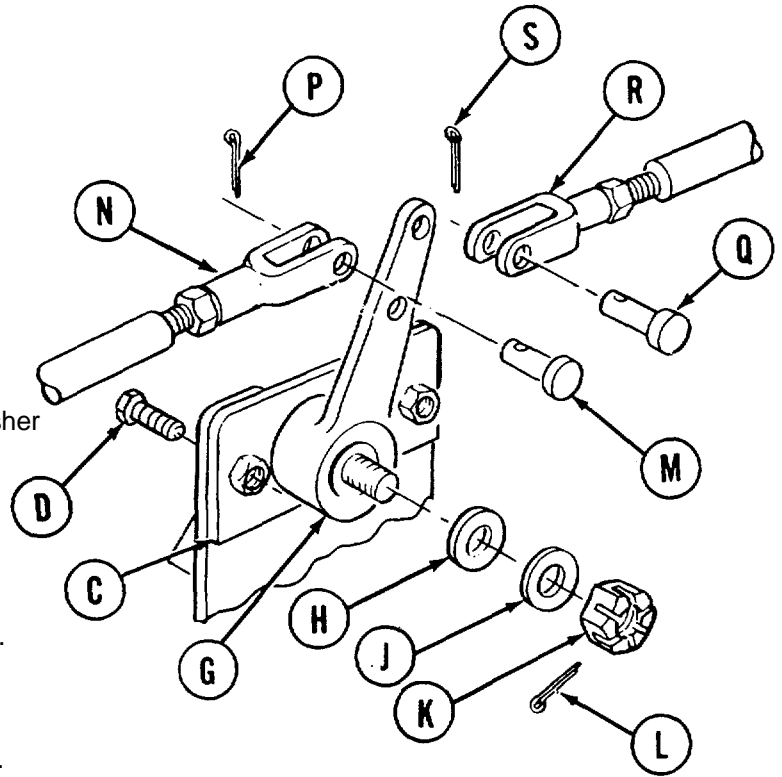


Go on to Sheet 3

TA148507

ACCELERATOR LEVER ASSEMBLY REPLACEMENT (Sheet 3 of 3)

4. Using vise, press new bearing into lever (G).
5. Install lever (G) on support (C).
6. Using wrench, install washer bearing (H), washer (J), and nut (K).
7. Using pliers, install new cotter pin (L).
8. Install pin (M) in clevis (N) on lever (G).
9. Using pliers, install new cotter pin (P) in pin (M).
10. Install pin (Q) in clevis (R) on lever (G).
11. Using pliers, install new cotter pin (S) in pin (Q).
12. Using socket and torque wrench, tighten two screws (D) to 15-17 lb-ft (0-23 N•m). Operate accelerator foot pedal to make sure linkage operates smoothly. If linkage does not operate smoothly, install any missing parts and remove things in the way.



End of Task

TA148508

**ACCELERATOR CONNECTING LINK ASSEMBLY REPLACEMENT (Sheet 1 of 4)**

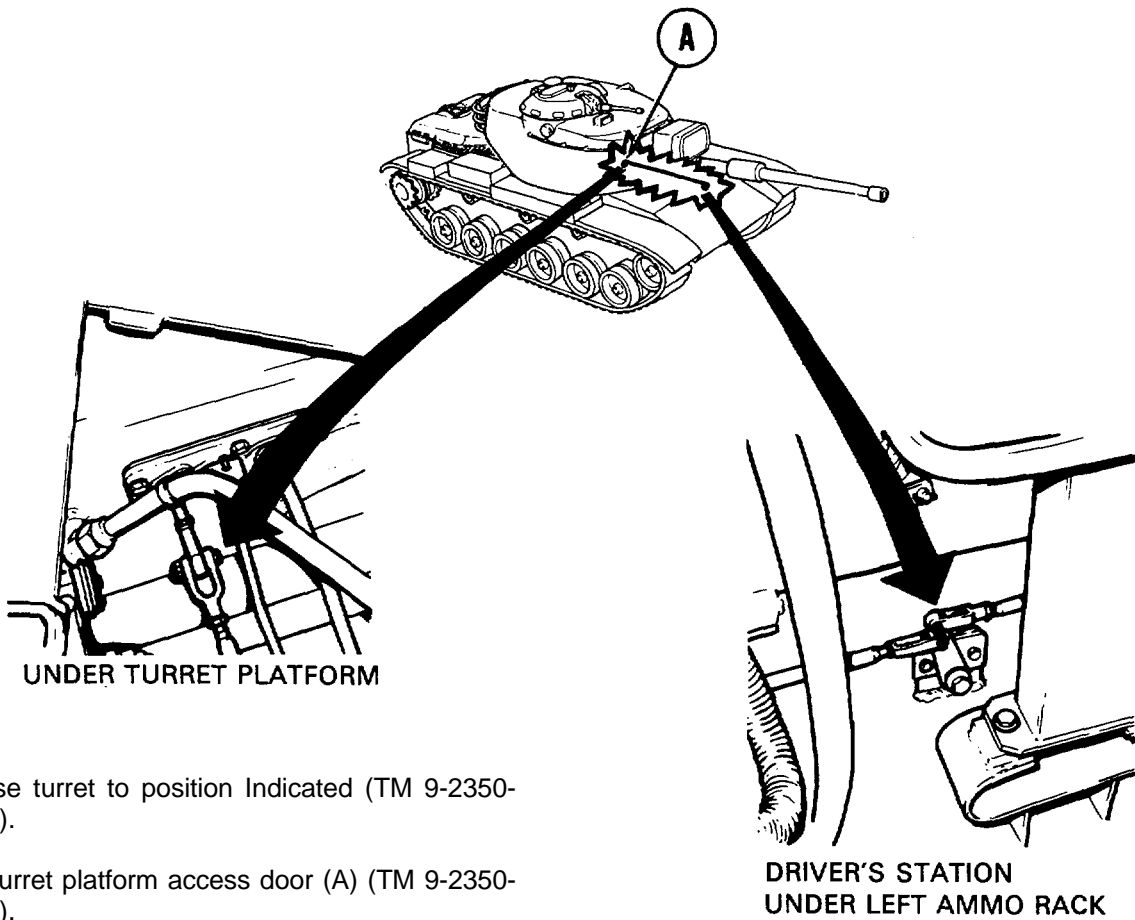
PROCEDURE INDEX

PROCEDURE	PAGE
Removal	7-402
Installation	7-404

TOOLS: Slip joint pliers  
 1/2 in. combination box and open end wrench  
 Flashlight

SUPPLIES: Pencil and paper  
 Cotter pin (MS24665-281) (2 required)

REFERENCE: TM 9-2350-260-10



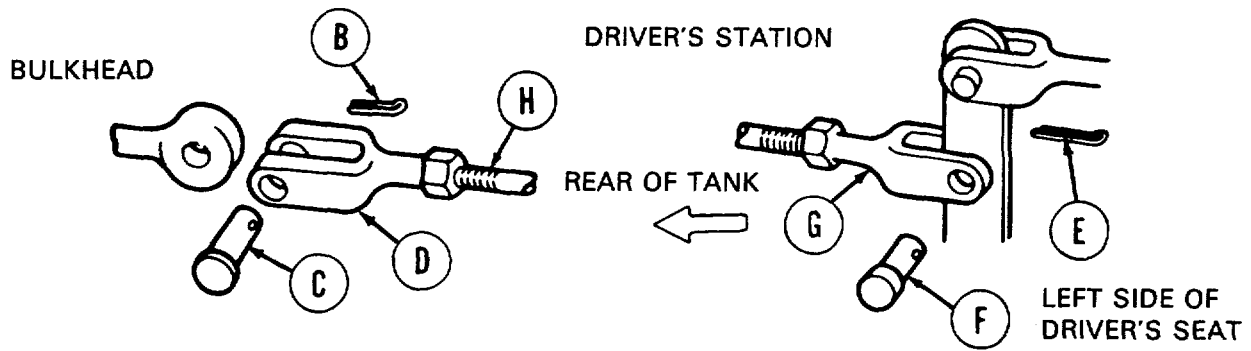
REMOVAL:

1. Traverse turret to position indicated (TM 9-2350-260-10).
2. Open turret platform access door (A) (TM 9-2350-260-10).

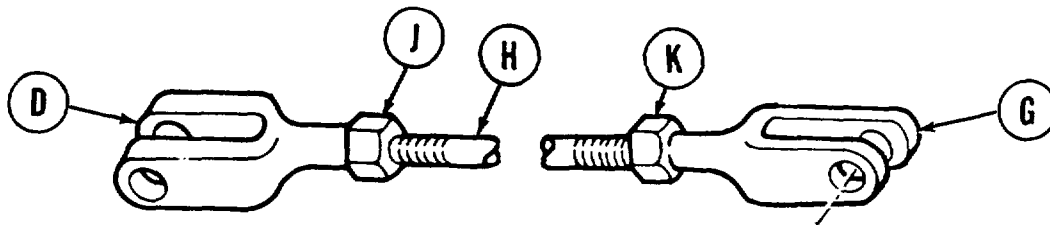
Go on to Sheet 2

TA148509

**ACCELERATOR CONNECTING LINK ASSEMBLY REPLACEMENT (Sheet 2 of 4)**



3. Using pliers, remove cotter pin (B) from pin (C). Throw cotter pin (B) away.
4. Remove pin (C) from clevis (D).
5. Go to driver's station.
6. Using pliers, remove cotter pin (E) from pin (F). Throw cotter pin away.
7. Remove pin (F) from clevis (G).
8. Remove connecting link (H) and attached part from tank.
9. Using wrench, loosen jamnut (J) while holding clevis (D) with pliers.



**NOTE**

**Write down number of turns needed to remove clevis (D).**

10. Remove clevis (D) and jamnut (J) from connecting link (H).
11. Using wrench, loosen jamnut (K) while holding clevis (G) with pliers.

**NOTE**

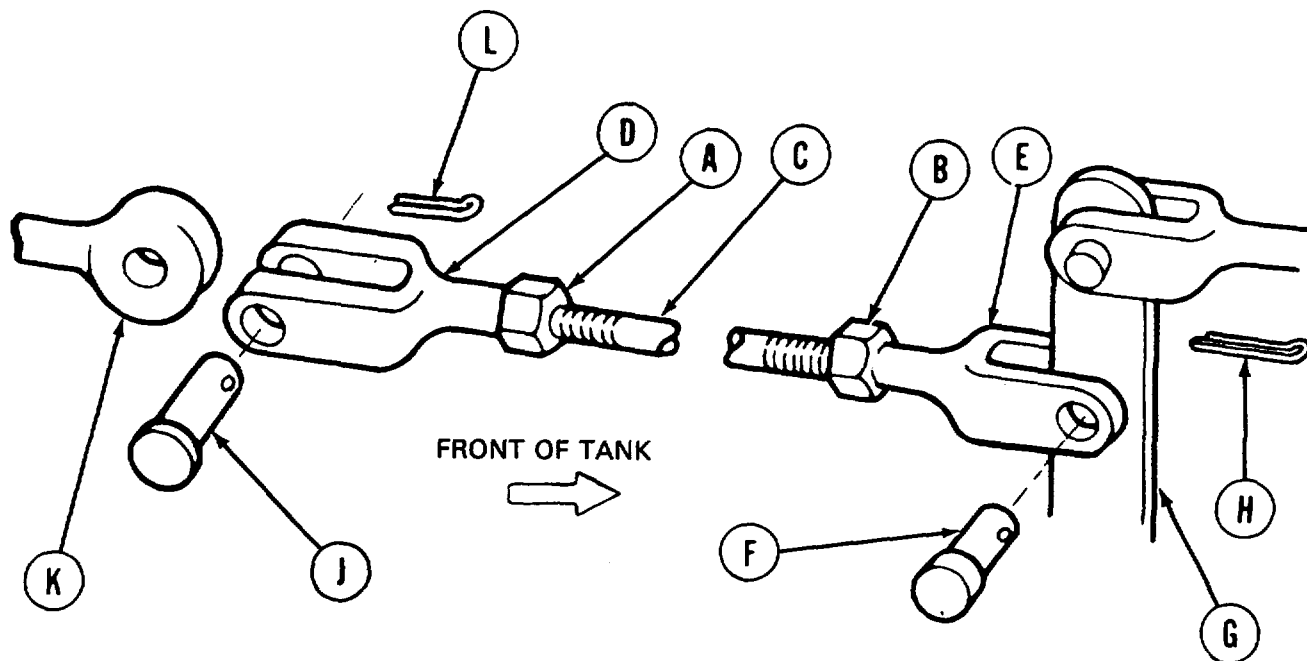
**Write down number of turns needed to remove clevis (G).**

12. Remove clevis (G) and jamnut (K) from connecting link (H).

Go on to Sheet 3

TA148510

## ACCELERATOR CONNECTING LINK ASSEMBLY REPLACEMENT (Sheet 3 of 4)



## INSTALLATION:

1. Screw jamnuts (A) and (B) all the way on ends of connecting link (C).
2. Screw clevises (D) and (E) on ends of connecting link (C) the recorded number of turns.
3. Using wrench, tighten jamnuts (A) and (B) securely against clevises (D) and (E) while holding clevises with pliers.
4. Position connecting link assembly in tank and install pin (F) in clevis (E) and lever (G).
5. Using pliers, install new cotter pin (H) in pin (F).
6. Install pin (J) in clevis (D) and in rod end (K).
7. Using pliers, install new cotter pin (L) in pin (J).

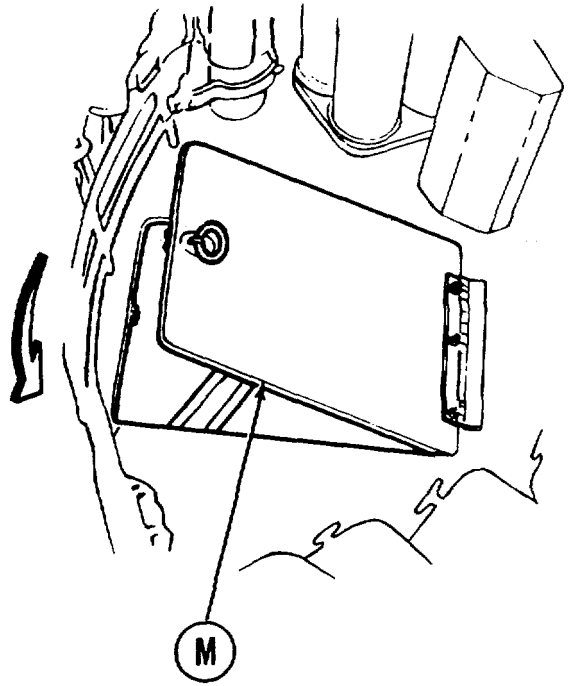
Go on to Sheet 4

TA148511

**ACCELERATOR CONNECTING LINK ASSEMBLY REPLACEMENT (Sheet 4 of 4)**

8. Perform accelerator pedal adjustment (page 7-387).

9. Close turret platform access door (M) (TM 9-2350-260-10).



End of Task

TA148512

7-405

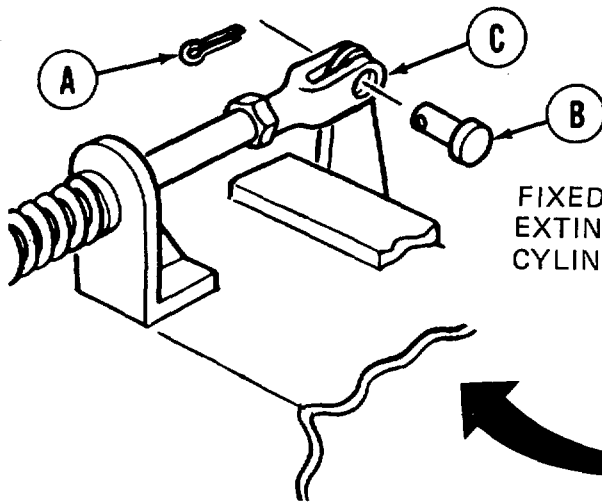
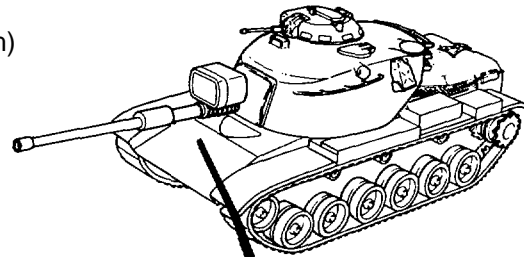
**ACCELERATOR TUBE ASSEMBLY REPLACEMENT (Sheet 1 of 4)**

PROCEDURE INDEX

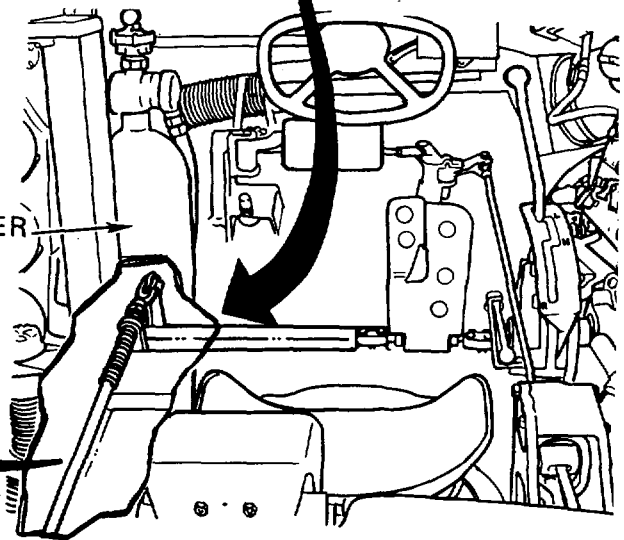
PROCEDURE	PAGE
Removal	7-406
Cleaning and Inspection	7-408
Installation	7-408

**TOOLS:** 1/2 in. combination box and open end wrench  
 Slip joint pliers  
 7/16 in. combination box and open end wrench  
 Mechanic's scribe  
 Torque wrench with 1/2 in. drive (0-175 lb-ft) (0-237 N•m)  
 1/2 in. crowfoot wrench with 1/2 in. drive  
 Hinged handle with 1/2 in. drive

**SUPPLIES:** Cotter pin (MS24665-281) (2 required)  
 Rags (Item 65, Appendix D)  
 Dry cleaning solvent (Item 54, Appendix D)  
 Pencil and paper  
 Lockwasher (MS35338-44)



FIXED FIRE  
 EXTINGUISHER  
 CYLINDER



**REMOVAL:**

**NOTE**

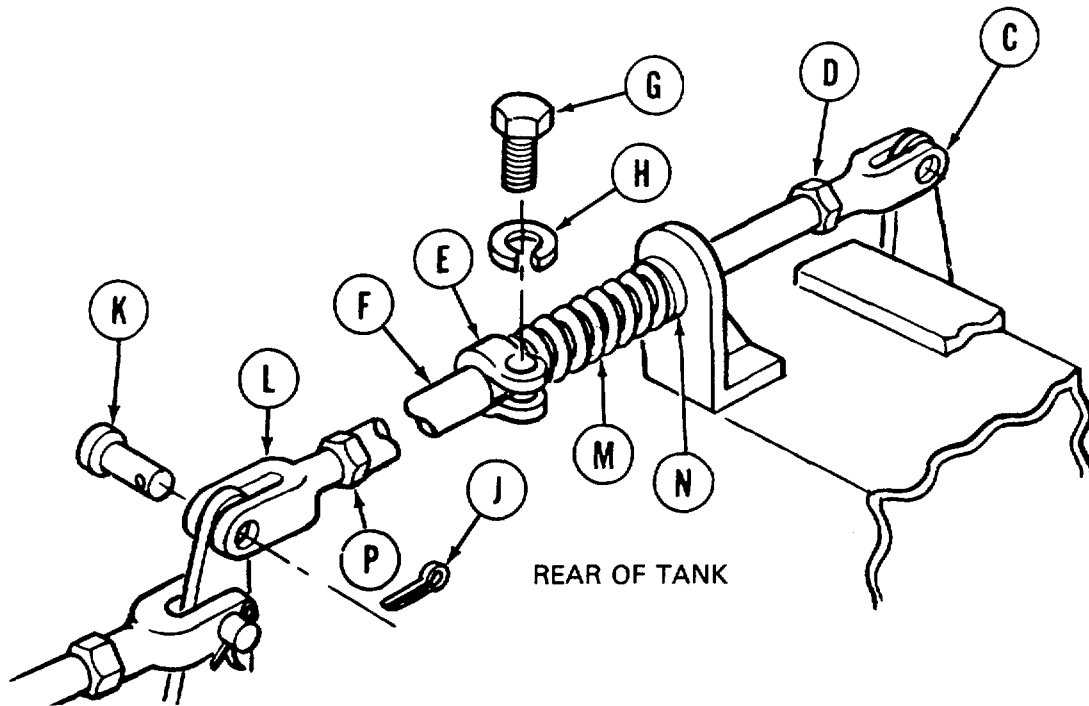
**Remove fixed fire extinguisher cylinder, if necessary to perform task (page 21-50).**

1. Using pliers, remove cotter pin (A) from pin (B). Throw cotter pin away.
2. Remove pin (B) from clevis (C).

Go on to Sheet 2

TA148513

## ACCELERATOR TUBE ASSEMBLY REPLACEMENT (Sheet 2 of 4)



3. Using 1/2 inch wrench, loosen nut (D) from clevis (C).
4. Using pencil, mark location of clamp (E) on tube (F).
5. Using 7/16 inch wrench, remove screw (G) and lockwasher (H) from clamp (D). Throw lockwasher away.

**NOTE**

**Count and write down number of turns needed to unscrew clevis (C).**

6. Unscrew clevis (C) and nut (D) from tube (F).
7. Using pliers, remove cotter pin (J) from pin (K). Throw cotter pin away.
8. Remove pin (K) from clevis (L).
9. Pull tube (F) toward rear of tank and remove tube (F).
10. Remove clamp (E), spring (M), and fiat washer (N) from tube (F).
11. Using crowfoot, loosen jamnut (P) while holding clevis (L) with pliers.

**NOTE**

**Count and write down number of turns needed to unscrew clevis (L).**

12. Unscrew clevis (L) and jamnut (P) from tube (F).

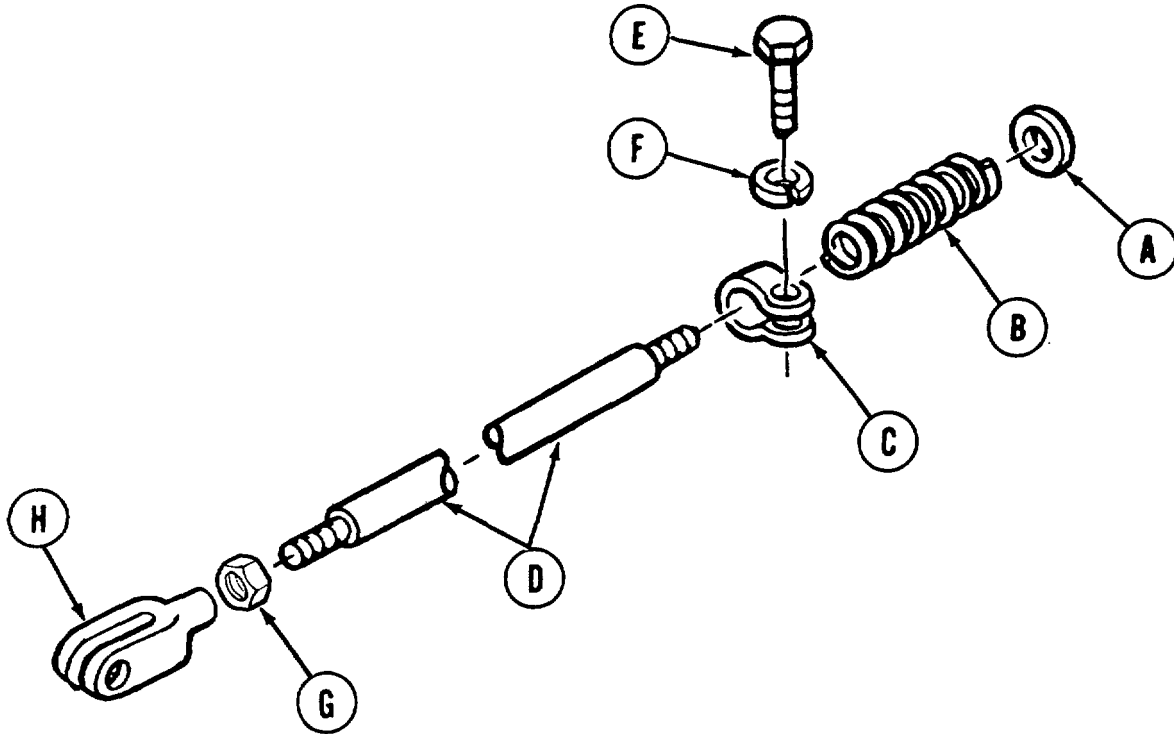
Go on to Sheet 3

TA148514



**ACCELERATOR TUBE ASSEMBLY REPLACEMENT (Sheet 3 of 41)****CLEANING AND INSPECTION:**

1. Clean all parts, using dry cleaning solvent (Item 54, Appendix D) and clean rags.
2. Inspect all parts for bends, cracks, stripped threads, wear, or other defects. Replace defective parts.

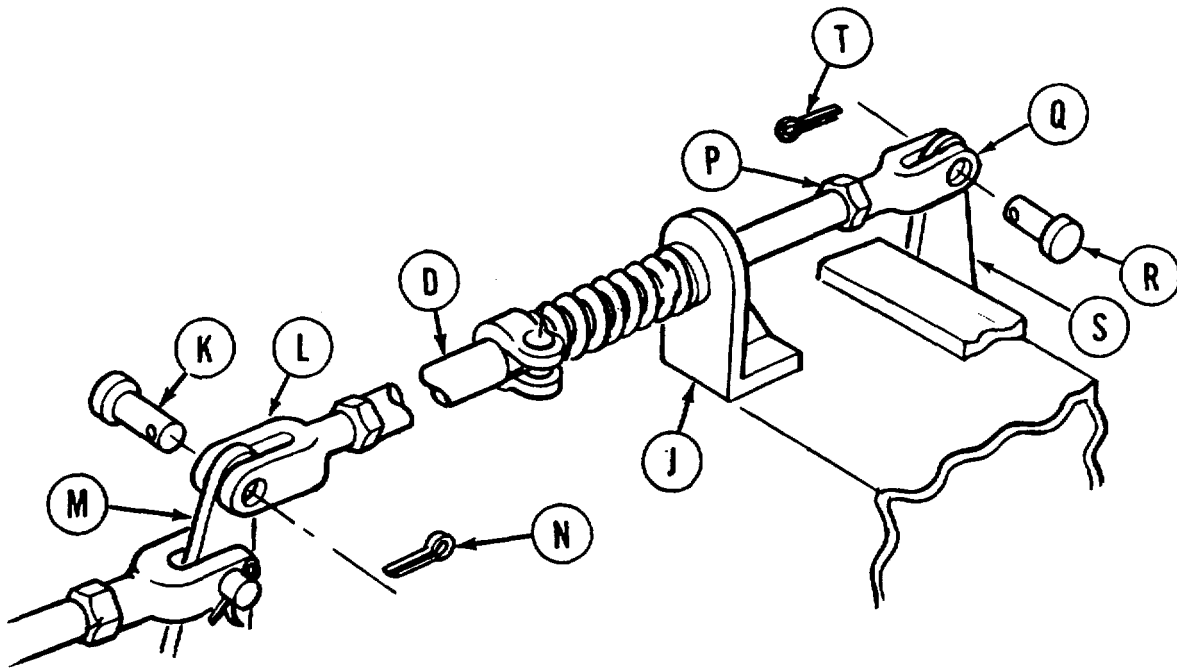
**INSTALLATION:**

1. Install flat washer (A), spring (B), and clamp (C) on tube (D) with clamp (C) on pencil mark on tube (D).
2. Using 7/16 Inch wrench, install screw (E) and new lockwasher (F) in clamp (C).
3. Screw jamnut (G) all the way on tube (D).
4. Screw clevis (H) on tube (D) the recorded number of turns.
5. Using torque wrench and crowfoot, tighten jamnut (G) against clevis (H) to 13-15 lb-ft (1820 N•m) while holding clevis (H) with pliers.

Go on to Sheet 4

TA148515

## ACCELERATOR TUBE ASSEMBLY REPLACEMENT (Sheet 4 of 4)



6. Push tube (D) through hole in bracket (J).
7. Install pin (K) in clevis (L) and lever (M) while pushing tube (D) toward front of tank.
8. Using pliers, install new cotter pin (N) in pin (K).
9. Screw jamnut (P) all the way on tube (D).
10. Screw clevis (Q) on tube (D) the recorded number of turns.
11. Using torque wrench and crowfoot wrench, tighten jamnut (P) against clevis (Q) to 13-15 lb-ft (18-20 N•m) while holding clevis (Q) with pliers.
12. Install pin (R) in clevis (Q) and lever (S).
13. Using pliers, install new cotter pin (T) on pin (R).
14. Press accelerator foot pedal and make sure linkage operates smoothly. If linkage does not operate smoothly, replace any missing parts and remove things in the way.
15. Adjust pedal return spring (page 7-385).
16. Install fixed fire extinguisher cylinder, if cylinder was removed (page 21-51).

End of Task

TA148516

**ACCELERATOR FLANGE ASSEMBLY REPLACEMENT (Sheet 1 of 4)**

PROCEDURE INDEX

PROCEDURE	PAGE
Removal	7-411
Installation	7-412

TOOLS: 7/16 in. combination box and open end wrench  
 1/2 in. combination box and open end wrench  
 9/16 in. combination box and open end wrench  
 Hammer  
 Slip joint pliers  
 1/8 in. drive pin punch

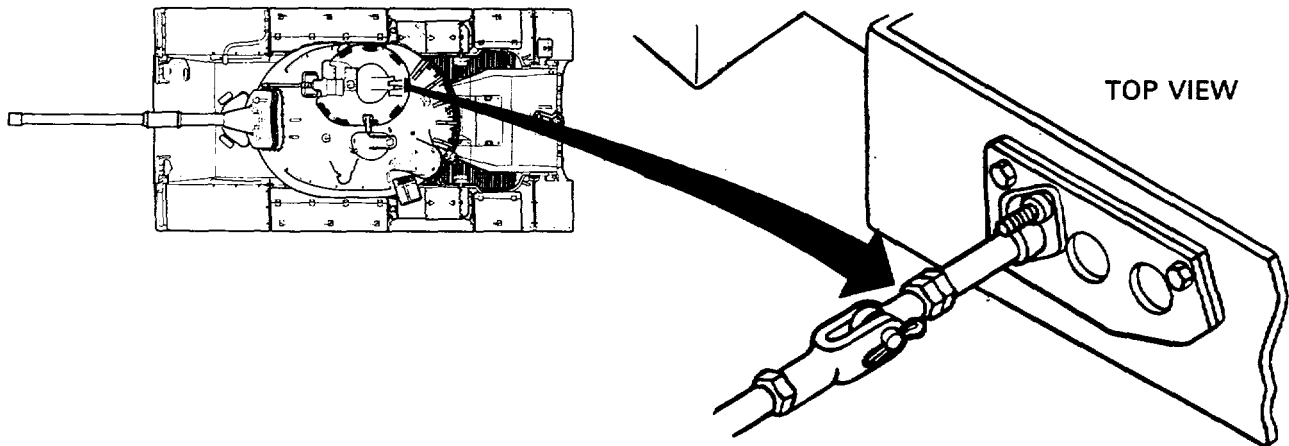
SUPPLIES: Cotter pin (MS24665-132)  
 Lockwasher (MS35338-46) (2 required)

REFERENCE: TM 9-2350-260-10

PRELIMINARY PROCEDURE: Traverse turret to gain access thru turret access cover (TM 9-2350-260-10)

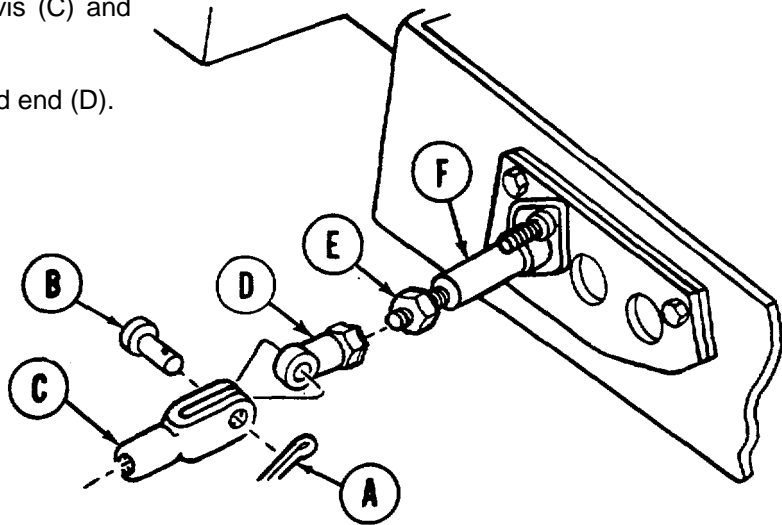
Go on to Sheet 2

ACCELERATOR FLANGE ASSEMBLY REPLACEMENT (Sheet 2 of 4)



REMOVAL:

1. Using pliers, remove cotter pin (A) from pin (B).
2. Throw cotter pin away.
3. Using fingers, remove pin (C) from clevis (C) and rod end (D).
4. Using hand, separate clevis (C) from rod end (D).



5. Using 1/2 inch wrench, loosen nut (E) on rod assembly (F).
6. Using 7/16 inch wrench, remove rod end (D).

Go on to Sheet 3

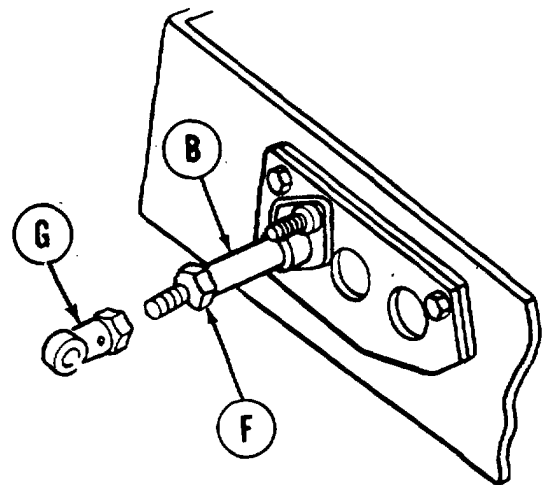
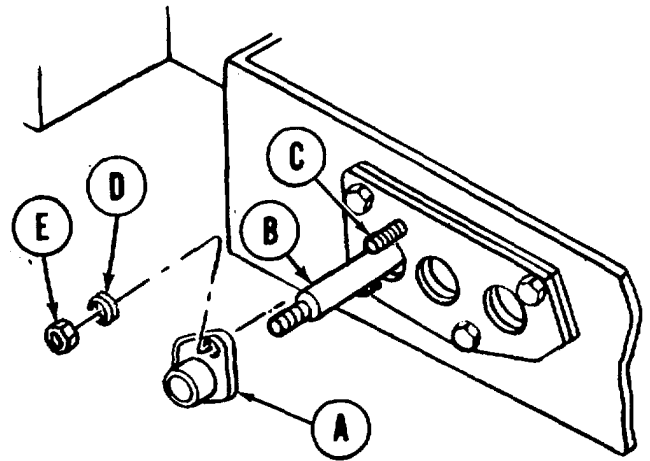
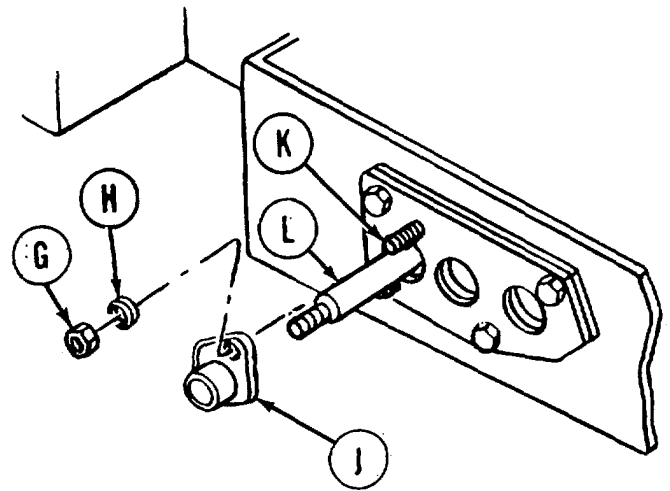
TA148517

**ACCELERATOR FLANGE ASSEMBLY REPLACEMENT (Sheet 3 of 4)**

7. Using 9/16 inch wrench, remove two nuts (G) and lockwashers (H) from flange assembly (J) and mounting stud (K). Throw lockwashers away.
8. Slide flange assembly (J) off end of rod assembly.

**INSTALLATION:**

1. Using fingers, slide flange assembly (A) over rod assembly (B) onto mounting studs (C).
2. Using 9/16 inch wrench, install two new lockwashers (D) and nut (E) on mounting studs (C).
3. Using fingers, turn nut (1) on rod assembly (B).
4. Using 7/16 inch wrench, install rod end (G) on rod assembly (B). Turn rod end (G) until holes in rod end (G) and rod assembly (B) are aligned.
5. Using 1/2 inch wrench, tighten nut (F) on rod assembly (B) against rod end (G).

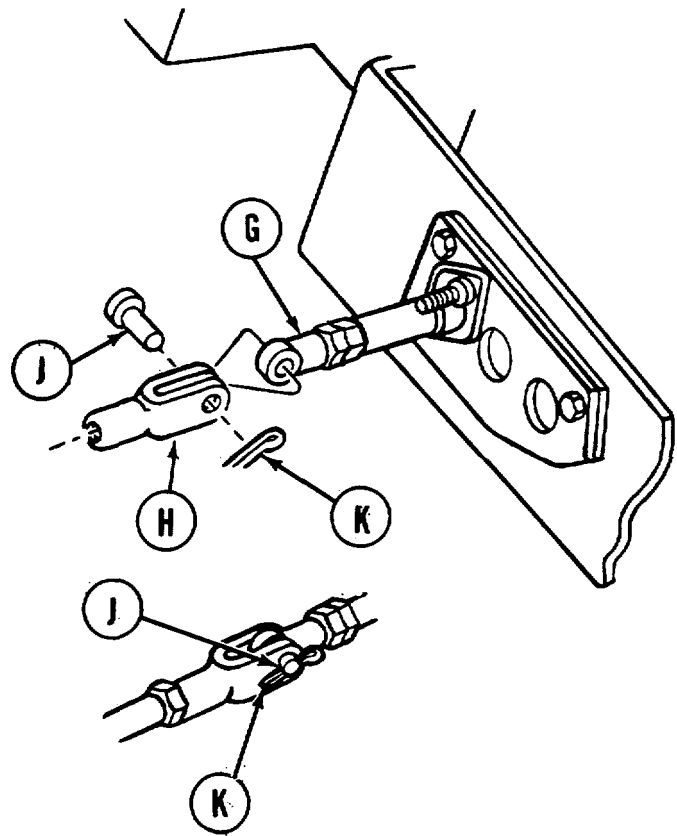


Go on to Sheet 4

TA148518

**ACCELERATOR FLANGE ASSEMBLY REPLACEMENT (Sheet 4 of 4)**

6. Using both hands, slide clevis (H) over rod end (G) with holes of clevis (H) aligned with hole of rod end (G).
7. Using fingers, push pin (J) through holes in clevis (H) and rod end (G).
8. Using fingers, insert new cotter pin (K) through hole in pin (J).
9. Using pliers, bend long end of cotter pin (K) around pin (J).



End of Task

TA148519

7-413

**ACCELERATOR FLANGE ASSEMBLY REPAIR (Sheet 1 of 2)**

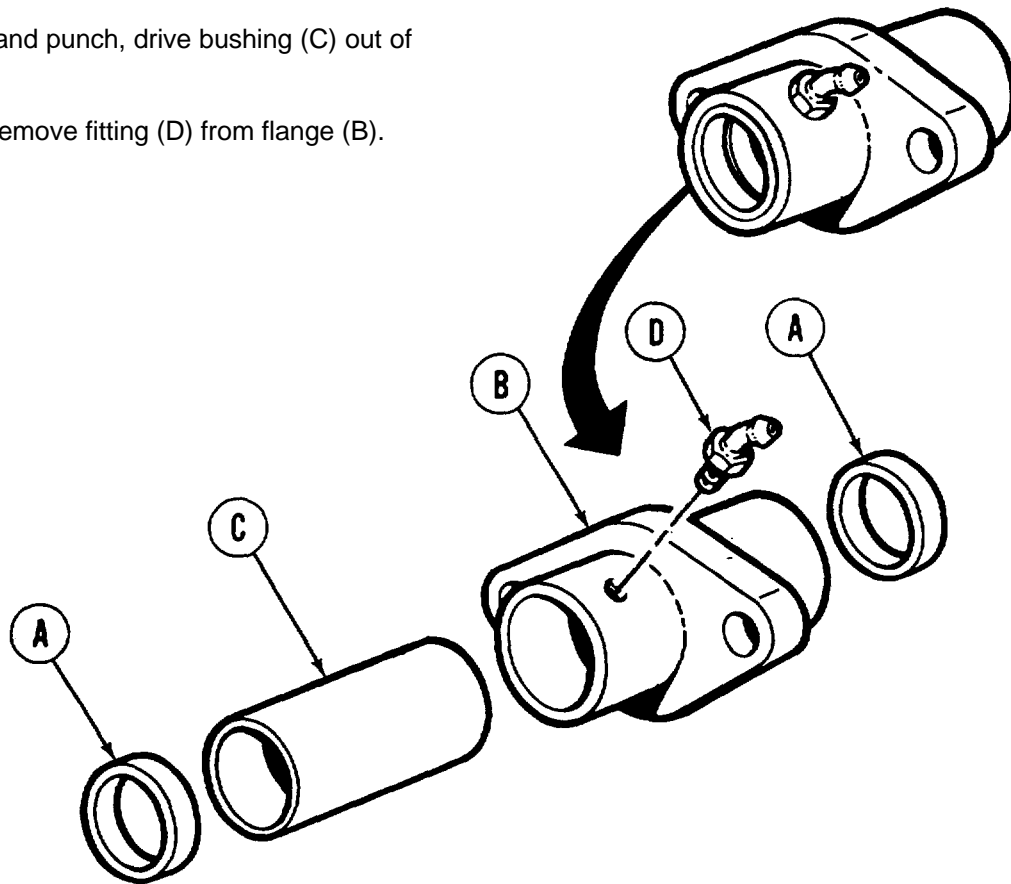
TOOLS: Vise  
Hammer  
5/8 in. drive punch  
3/8 in. combination box and open end wrench

SUPPLIES: Rags (Item 65, Appendix D)  
Dry cleaning solvent (Item 54, Appendix D)  
Seal (8711329) (2 required)  
Bushing (7992946)

PRELIMINARY PROCEDURE: Remove flange assembly (page 7-411)

**DISASSEMBLY:**

1. Remove two seals (A).
2. Throw seals away.
3. Using hammer and punch, drive bushing (C) out of flange (B).
4. Using wrench, remove fitting (D) from flange (B).



Go on to Sheet 2

TA148520

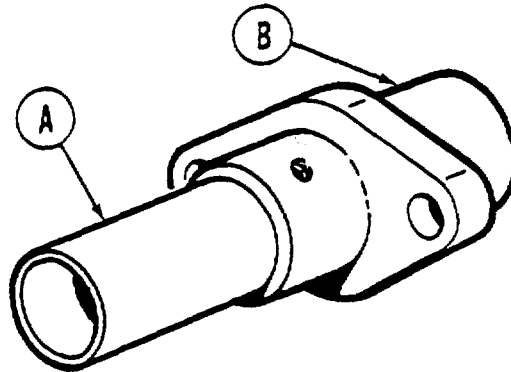
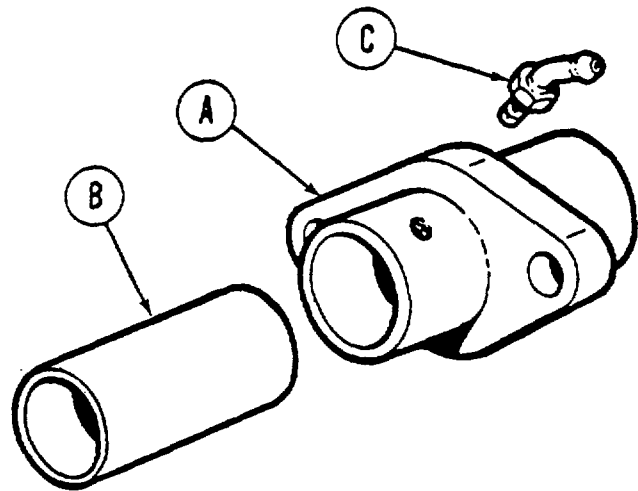
**ACCELERATOR FLANGE ASSEMBLY REPAIR (Sheet 2 of 2)**

**CLEANING AND INSPECTION:**

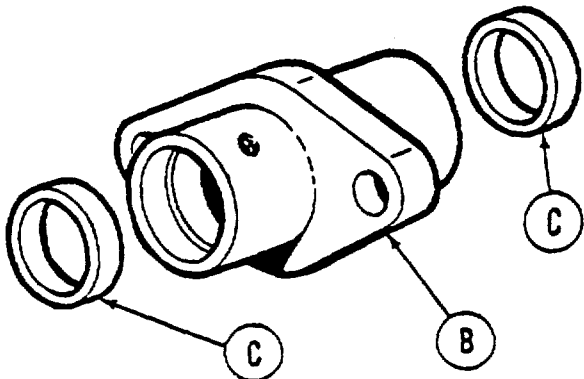
1. Using clean rags and dry cleaning solvent, (Item 54, Appendix D) clean flange (A), bushing (B), and fitting (C) thoroughly.
2. Check bushing (B), flange (A) and fitting (C) for damage or wear. Replace if required.

**ASSEMBLY:**

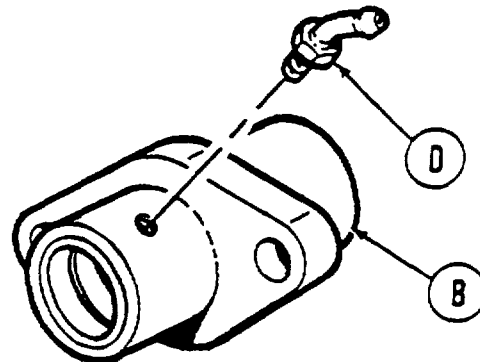
1. Position new bushing (A) in end of flange (B).
2. Place flange (B) and bushing (A) in vise.
3. Tighten vise against bushing (A) and flange (B) until bushing (A) is fully inserted in flange (B).
4. Remove flange (B) from vise.



5. Using fingers, press new seals (C) into ends of flange (B).



6. Using wrench, install fitting (D) on flange (B).
7. Install flange assembly (page 7-412).



End of Task

TA148521



**BULKHEAD PLATE ASSEMBLY REPLACEMENT (Sheet 1 of 6)**

PROCEDURE INDEX

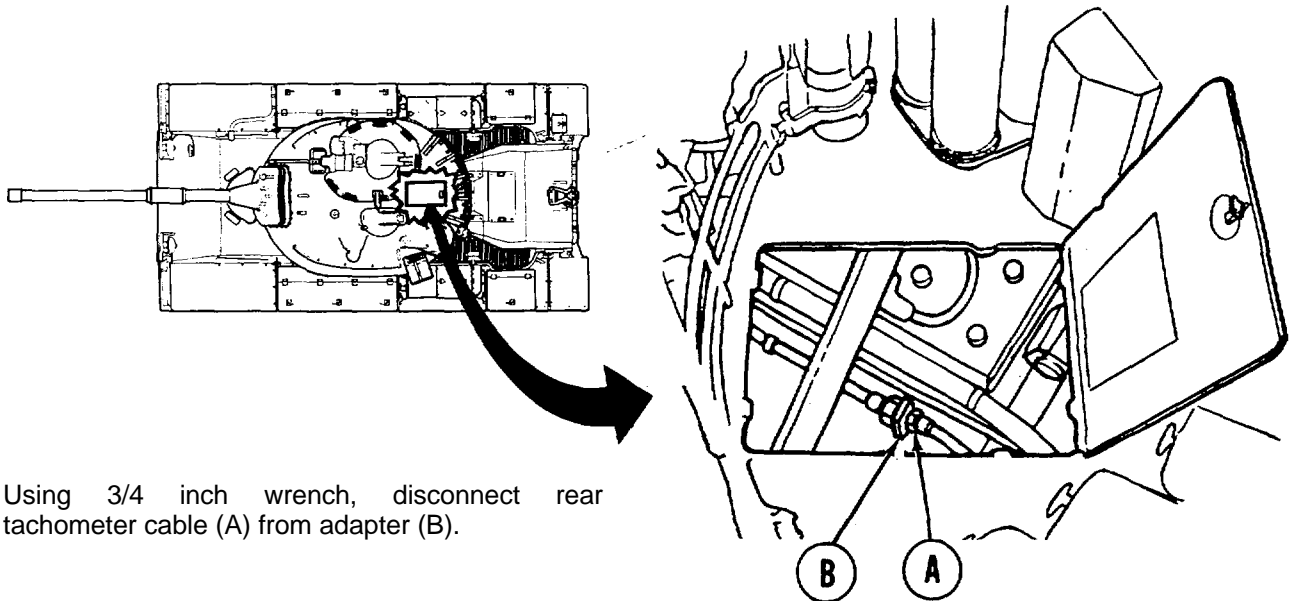
PROCEDURE	PAGE
Removal	7-416
Cleaning and Repair	7-418
Installation	7-419

**TOOLS:** Long round nose pliers  
 3/4 in. combination box and open end wrench  
 7/16 in. combination box and open end wrench  
 9/16 in. socket with 1/2 in. drive  
 Ratchet with 1/2 in. drive  
 3 in. extension with 1/2 in. drive  
 Flat-tip screwdriver  
 Hammer  
 1-1/8 in. drive pin punch  
 3/8 in. combination box and open end wrench  
 Hand grease gun

**SUPPLIES:** Grease (Item 36, Appendix D)                      Bushing (8720489)  
 Dry cleaning solvent (Item 54, Appendix D)              Seal (7748748) (2 required)  
 Cotter pin (MS24665-132)                                      Adhesive (Item 4, Appendix D)  
 Pencil    Lockwasher (MS35338-46) (6 required)  
 Gasket (8762310)

**PRELIMINARY PROCEDURE:** Remove flange assembly (page 7-411)

**REMOVAL:**



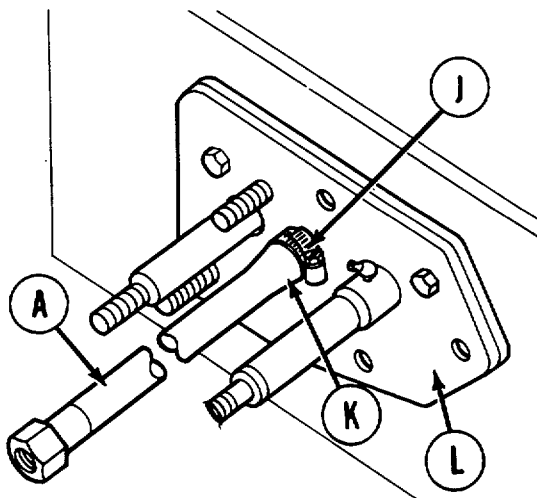
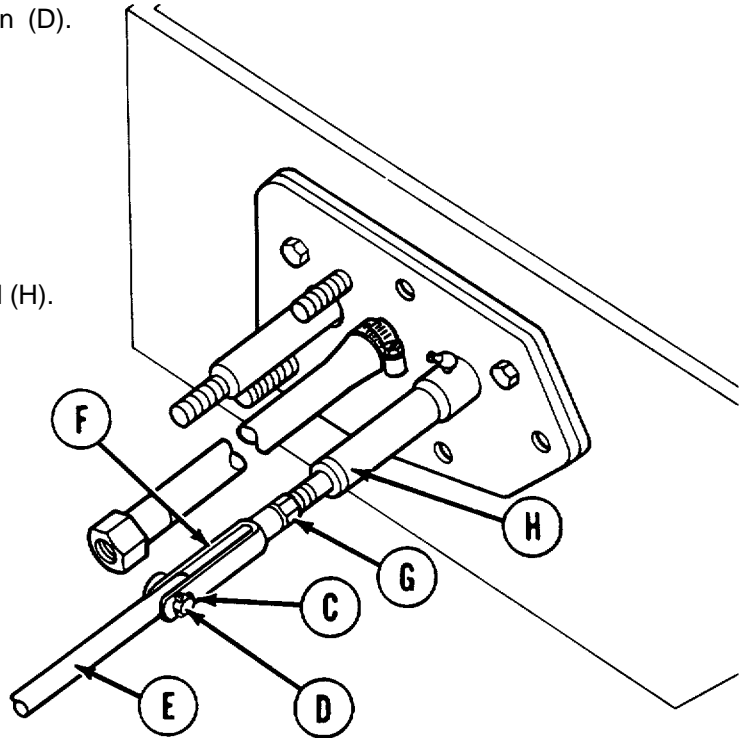
1. Using 3/4 inch wrench, disconnect rear tachometer cable (A) from adapter (B).

Go on to Sheet 2

TA148522

**BULKHEAD PLATE ASSEMBLY REPLACEMENT (Sheet 2 of 6)**

2. Using pliers, remove cotter pin (C) and pin (D). Throw cotter pin away.
3. Separate rod (E) from clevis (F).
4. Using 3/4 inch wrench, loosen nut (G).
5. Make position of clevis (F) on brake rod (H).
6. Remove clevis (F) and nut (G) from brake rod (H).



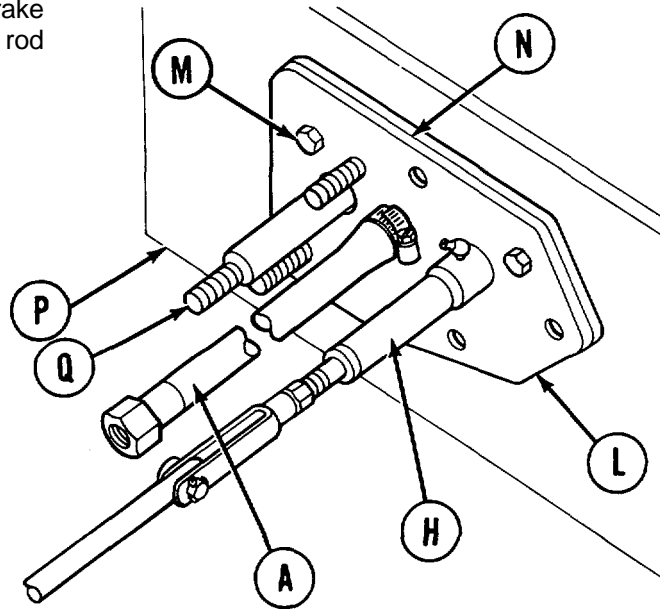
7. Using screwdriver, loosen damp (J) on boot and bushing (K).
8. Slide damp (J) off boot and bushing (K) and tachometer cable (A).
9. Using screwdriver, pry boot and bushing (K) out of plate assembly (L) and slide forward on tachometer cable (A).
10. Remove boot and bushing (K).
11. Inspect bushing. If damaged, replace.

Go on to Sheet 3

TA148523

**BULKHEAD PLATE ASSEMBLY REPLACEMENT (Sheet 3 of 6)**

12. Using 9/16 inch socket, remove six screws and lockwashers (M). Throw lockwashers away.
13. Remove plate assembly (L) and gasket (N) from bulkhead (P).
14. Slide plate assembly (L) and gasket (N) off brake rod (H), tachometer cable (A), and accelerator rod (Q). Throw gasket (N) away.

**CLEANING AND INSPECTION:**

1. Using dry cleaning solvent (Item 54, Appendix D), clean plate assembly.
2. Inspect seals in each end for nicks, tears, or cuts. If damaged, replace.
3. Inspect bushing inside sleeve for wear, loose, missing or defective bearings. If defective, replace.
4. Inspect lubrication fitting. If damaged, replace.

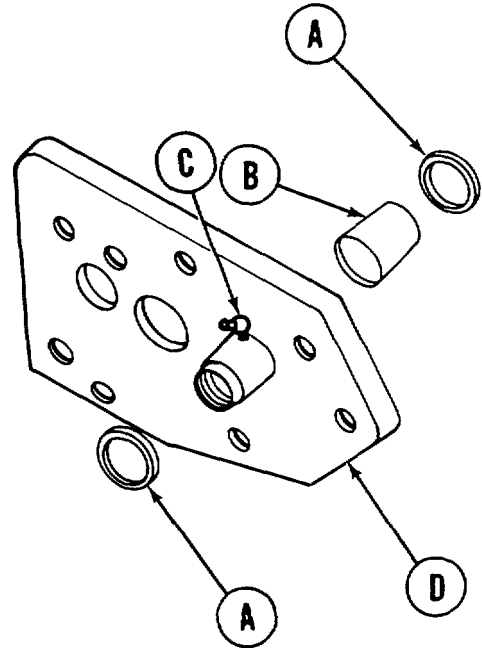
Go on to Sheet 4

TA148524

**BULKHEAD PLATE ASSEMBLY REPLACEMENT (Sheet 4 of 6)**

**DISASSEMBLY:**

1. Using screwdriver, pry out seal (A). Throw seal away.
2. Using hammer and 1-1/8 inch drive punch, remove bushing (B) Throw bushing away.
3. Using 3/8 inch wrench, remove lubrication fitting (C).



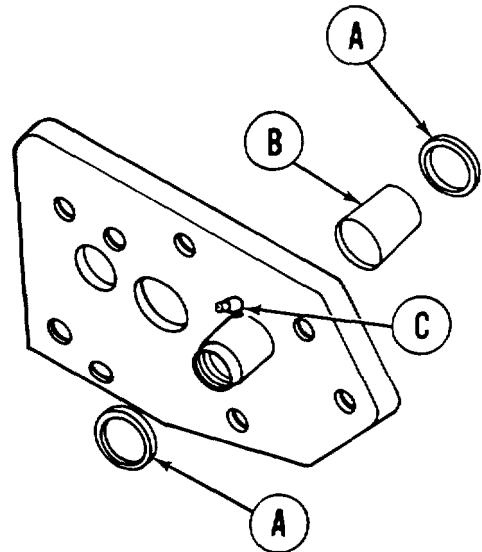
**ASSEMBLY:**

1. Using hammer and 1-1/8 inch drive punch, install bushing (A) into plate sleeve. Center bushing (A) in sleeve.

**NOTE**

**Install seals (B) with sealing lips facing same direction.**

2. Position seal (B) in sleeve. Using hammer, lightly tap seal into sleeve until seal is flush with sleeve.
3. Install lubrication fitting (C) in sleeve. Using 3/8 inch wrench, tighten and position lubrication fitting to face toward center of plate.



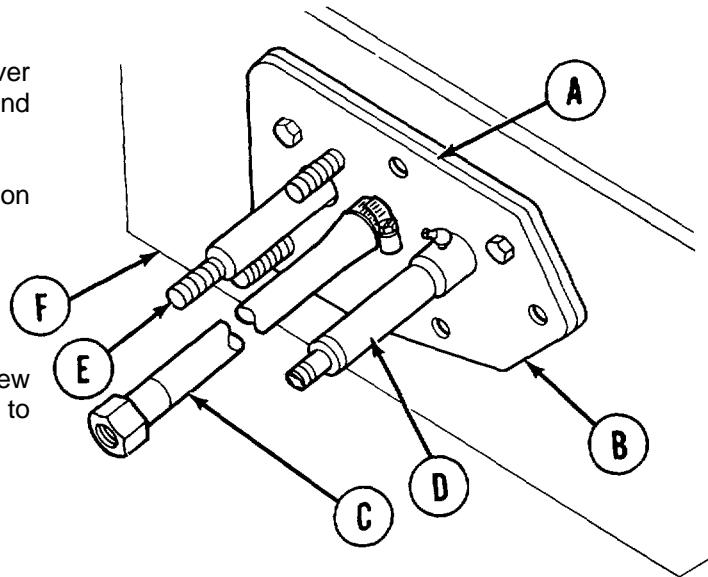
Go on to Sheet 5

TA148525

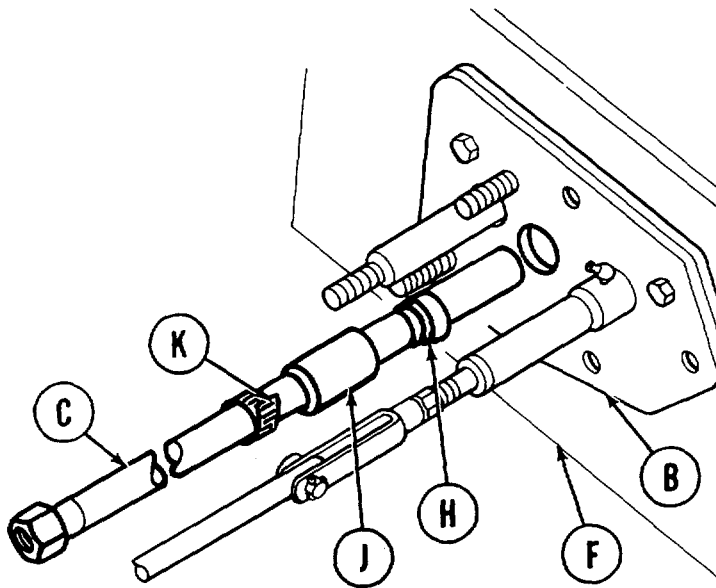
**BULKHEAD PLATE ASSEMBLY REPLACEMENT (Sheet 5 of 6)**

**INSTALLATION:**

1. Slide new gasket (A) and plate assembly (B) over tachometer cable (C), brake rod (D), and accelerator rod (E).
2. Position gasket (A) and plate assembly (B) on bulkhead (F).
3. Using 9/16 inch socket, install six screws and new lockwashers (G) to secure plate assembly (B) to bulkhead (F).



4. Install boot (H), bushing (J), and clamp (K) onto tachometer cable (C).
5. Slide boot (H) back on tachometer cable (C) until it contacts bulkhead (F).
6. Apply a coat of adhesive (Item 4, Appendix D) to outer surface of boot (H).
7. Position boot (H) into plate assembly (B).



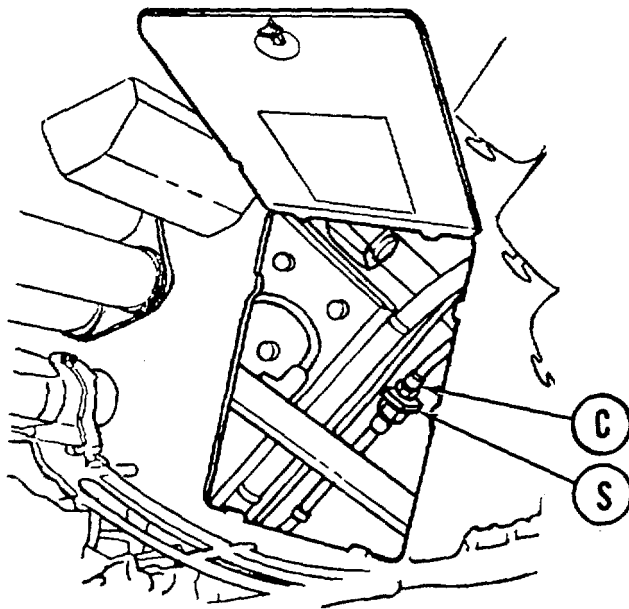
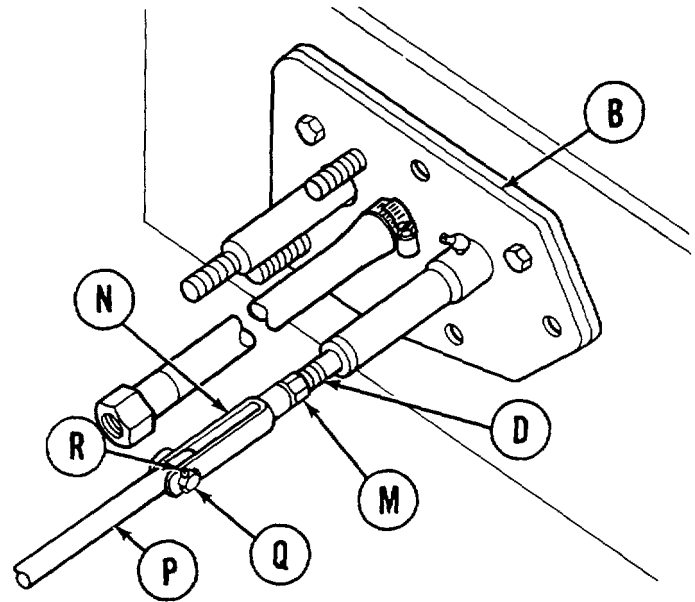
8. Hold tachometer cable (C) and slide bushing (J) back and into boot (H).
9. Position clamp (K) over boot (H) and into groove. Using flat-tip screwdriver, secure clamp (K).

Go on to Sheet 6

TA148526

**BULKHEAD PLATE ASSEMBLY REPLACEMENT (Sheet 6 of 6)**

10. Install nut (M) onto brake rod (D) and thread it all the way on.
11. Install clevis (N) onto brake rod (D). Screw clevis onto rod to marked position (marked during removal).
12. Position rod (P) to clevis (N).
13. Install pin (Q) through clevis (N) and end of rod (P).
14. Install new cotter pin (R) through pin (Q). Using pliers, bend cotter pin to lock it in place.
15. Using 3/4 inch wrench, tighten nut (M) up against shank of clevis (N).



16. Using hand grease gun and grease (Item 36, Appendix D), lubricate bushing in plate assembly (B).
17. Using 3/4 inch wrench, connect tachometer and cable (C) to adapter (S).
18. Install flange assembly (page 7-412).

End of Task

TA148527

7-421/(7-422 blank)

CHAPTER 8

EXHAUST SYSTEM MAINTENANCE INDEX

PROCEDURE	PAGE
Exhaust Pipe Cap Assembly Replacement	8-2
Exhaust Pipe (Left Side) Replacement	8-5
Exhaust Pipe (Right Side) Replacement	8-9

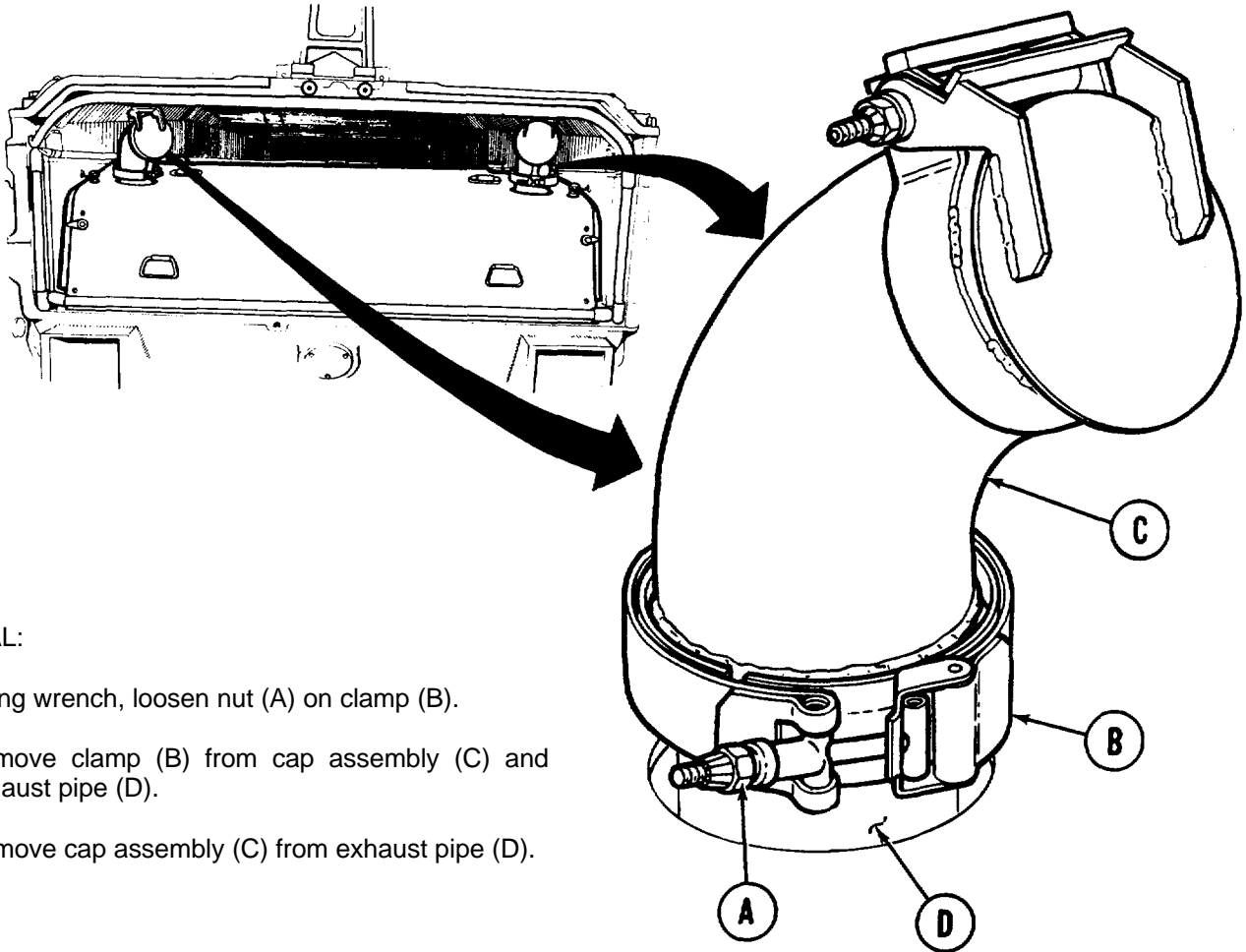
**EXHAUST PIPE CAP ASSEMBLY REPLACEMENT (Sheet 1 of 3)**

TOOL: 7/16 in. combination box and open end wrenches (2 required)

SUPPLIES: Rags  
 Dry cleaning solvent (Item 54, Appendix D)  
 Rubber gloves  
 Self-locking nut (MS20500-428)

REFERENCE: TM 9-2350-260-10

PRELIMINARY PROCEDURES: Open engine exhaust doors (TM 9-2350-260-10)

**REMOVAL:**

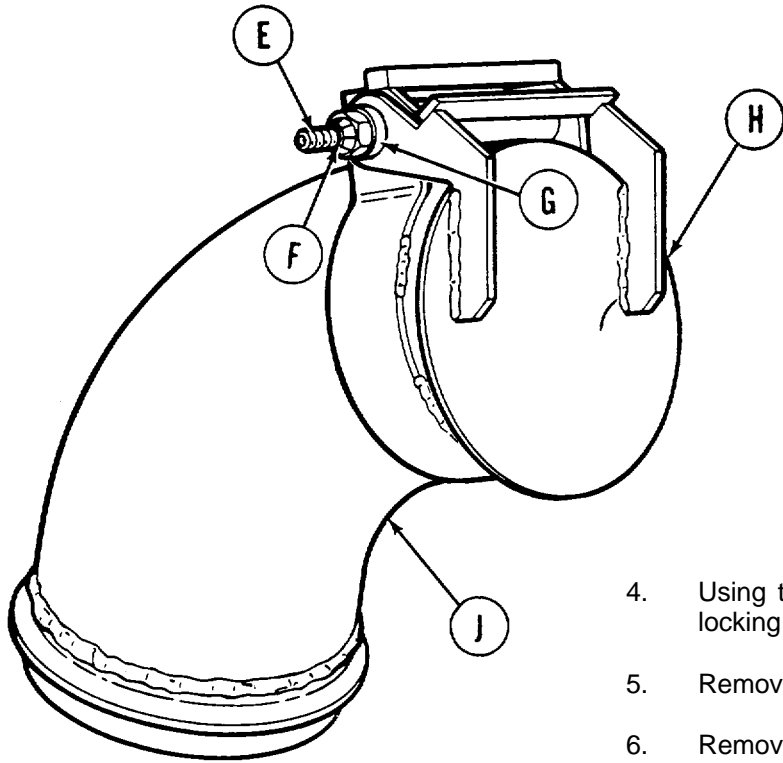
1. Using wrench, loosen nut (A) on clamp (B).
2. Remove clamp (B) from cap assembly (C) and exhaust pipe (D).
3. Remove cap assembly (C) from exhaust pipe (D).

Go on to Sheet 2

TA146418



EXHAUST PIPE CAP ASSEMBLY REPLACEMENT (Sheet 2 of 3)

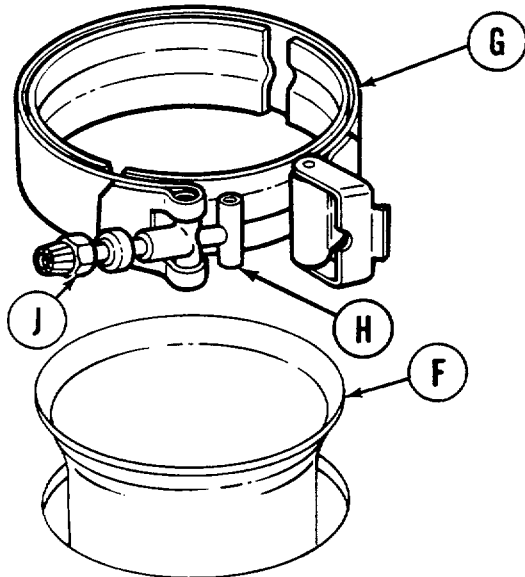
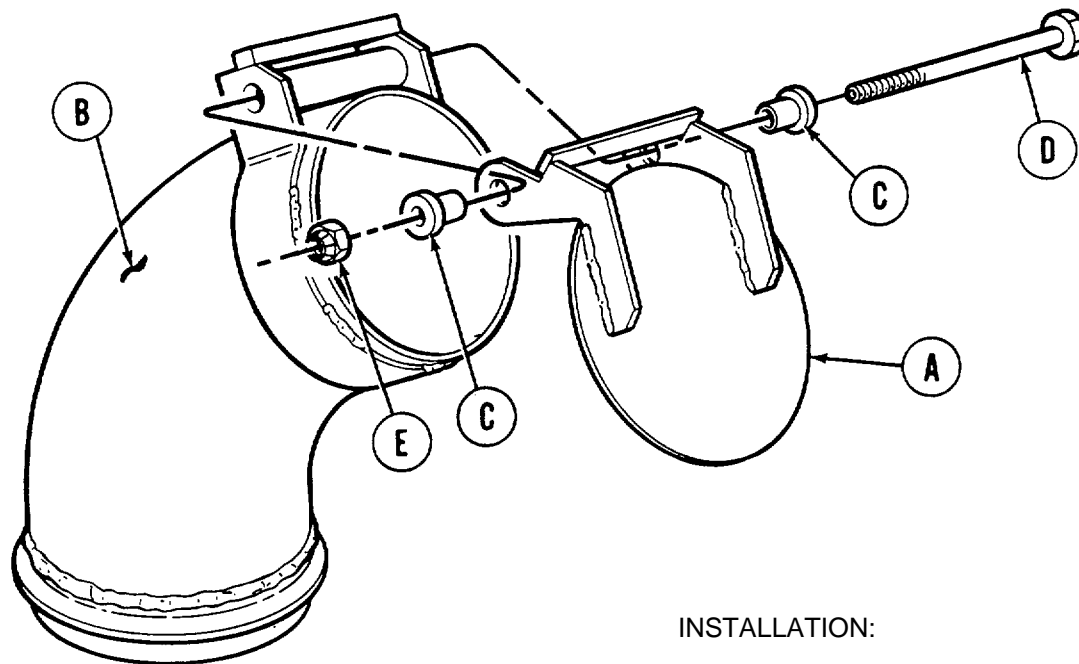


4. Using two wrenches, remove screw (E) and self-locking nut (F). Throw self-locking nut (F) away.
5. Remove two spacers (G) from tube cover (H).
6. Remove tube cover (H) from tube (J).

Go on to Sheet 3

TA146419

EXHAUST PIPE CAP ASSEMBLY REPLACEMENT (Sheet 3 of 3)



INSTALLATION:

1. Position tube cover (A) onto top of tube (B) with mounting holes of tube cover (A) aligned with mounting holes in tube (B).
2. Insert two spacers (C) into holes in top of tube cover (A).
3. Insert bolt (D) through spacer (C), tube cover (A), tube (B), tube cover (A), and spacer (C).
4. Start new self-locking nut (E) onto bolt (D).
5. Using two wrenches, tighten nut (E) to bolt (D).
6. Position cap assembly onto exhaust pipe (F) at same inward angle as exhaust pipe.
7. Position clamp (G) onto bottom of cap assembly and exhaust pipe (F). Latch clamp together with bolt (H).
8. Using wrench, tighten nut (J) on clamp (G) to hold cap assembly to exhaust pipe (F).
9. Close engine exhaust doors (TM 9-2350-260-10).

End of Task

TA146420

**EXHAUST PIPE (LEFT SIDE) REPLACEMENT (Sheet 1 of 4)**

PROCEDURE INDEX

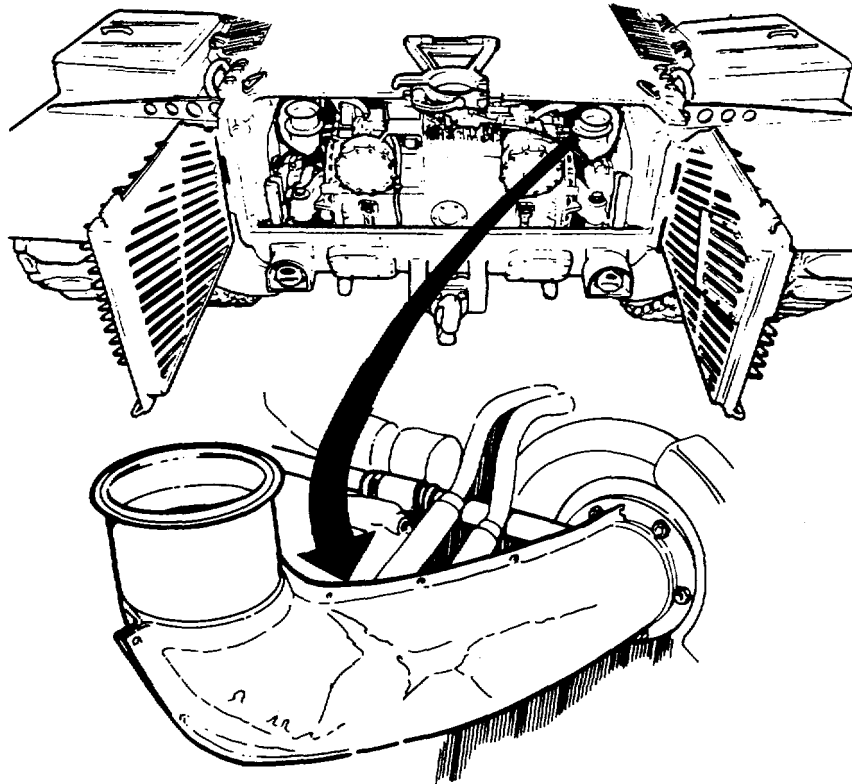
PROCEDURE	PAGE
Removal	8-6
Installation	8-7

TOOLS: Ratchet with 1/2 in. drive  
 10 in. extension with 1/2 in. drive  
 9/16 in. socket with 1/2 in. drive  
 Flat-tip screwdriver  
 Cross-tip screwdriver  
 5/16 in. combination box and open end wrench

SUPPLIES: Gasket (10864007)  
 Self-locking nut (11640132) (6 required)  
 Lockwasher (M353358) (14 required)

REFERENCE: TM 9-2350-260-10

PRELIMINARY PROCEDURE: Open top grille doors (TM 9-2350-260-10)  
 Remove transmission shroud (page 9-20)



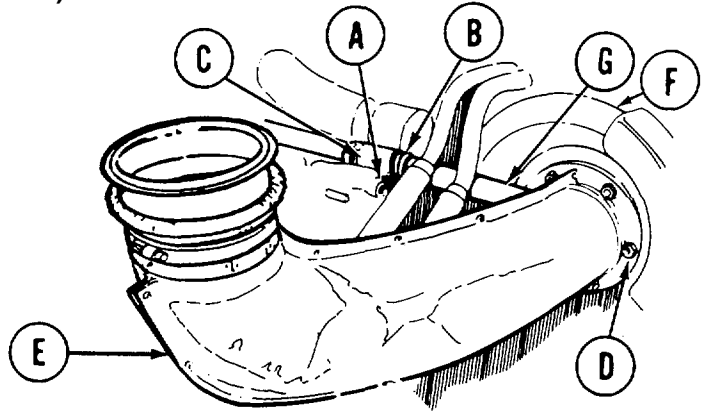
Go on to Sheet 2

TA146421

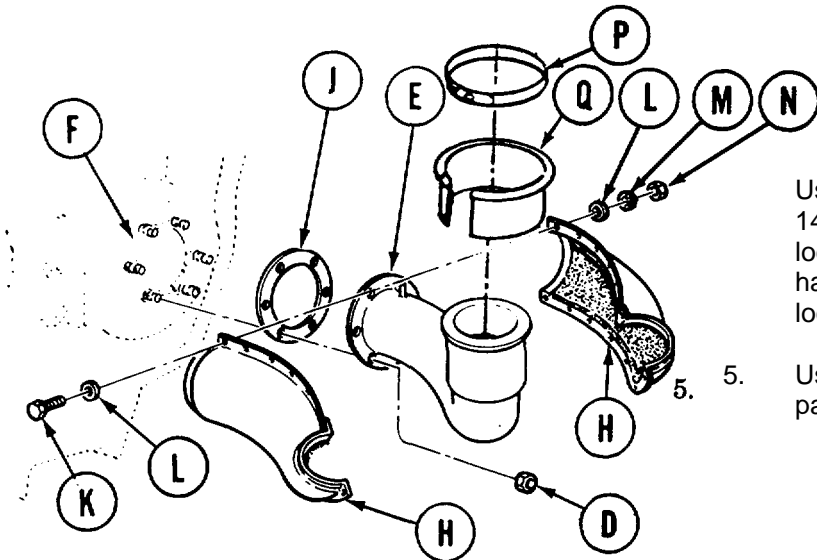
**EXHAUST PIPE (LEFT SIDE) REPLACEMENT (Sheet 2 of 4)**

**REMOVAL:**

1. Using flat-tip screwdriver, loosen screw (A) holding clamp (B) onto tube (C).



2. Using socket, remove six self-locking nub (D) holding exhaust pipe (E) to turbosupercharger housing (F). Throw self-locking nuts (D) away.
3. Sliding exhaust pipe extension (G) out of tube (C), remove exhaust pipe (E) with insulation halves (H) and gasket (J) from turbosupercharger housing (F). Throw gasket (J) away.



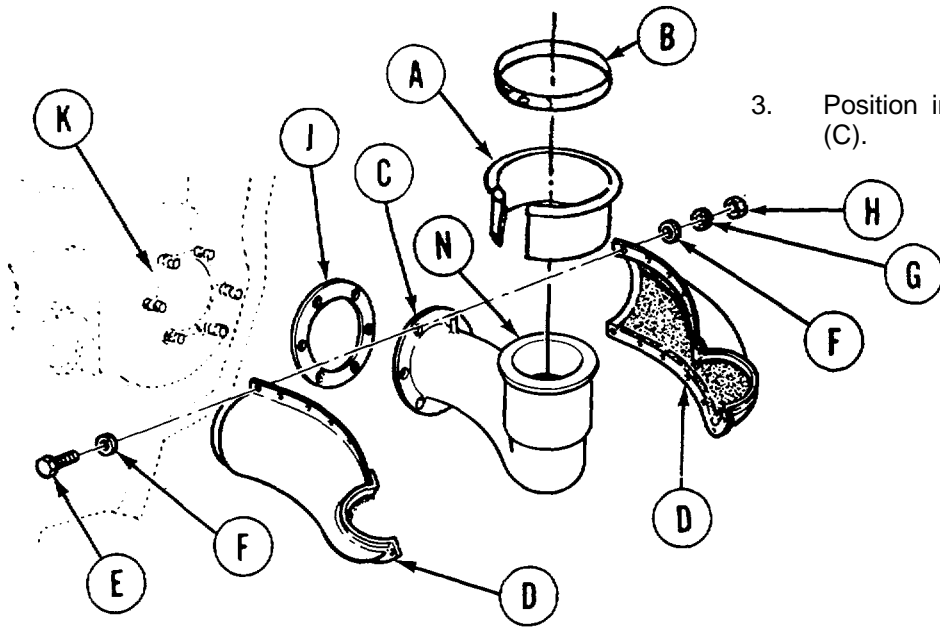
Using cross-tip screwdriver and wrench, remove 14 screws (K), each with two flat washers (L), one lockwasher (M), and one nut (N) holding insulation halves (H) to exhaust pipe (E). Throw lockwashers (M) away.

5. Using flat-tip screwdriver, remove clamp (P) from packing (Q). Remove packing (Q) from pipe (E).
6. Remove insulation halves (H) from exhaust pipe (E).

**EXHAUST PIPE (LEFT SIDE) REPLACEMENT (Sheet 3 of 4)**

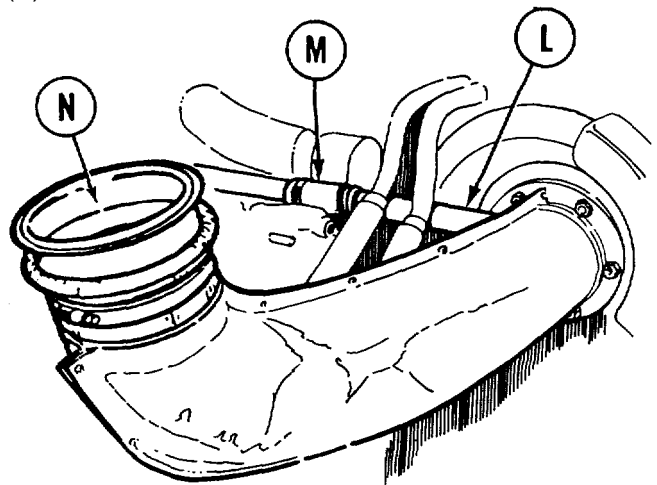
**INSTALLATION:**

1. Position packing (A) and clamp (B) onto pipe (C) and, using flat-tip screwdriver, tighten screw on clamp (B), securing packing to pipe (C).
2. Check insulation halves (D) and all attaching hardware for damage. Replace if necessary.



3. Position insulation halves (D) onto exhaust pipe (C).

4. Using wrench and cross-tip screwdriver, install 14 screws (E), each with two flat washers (F), one new lockwasher (G), and one nut (H) to hold insulation halves (D) to exhaust pipe (C).
5. Position new gasket (J) onto turbosupercharger housing (K).
6. Slide exhaust pipe extension (L) into tube (M) as far as it will go.
7. Position exhaust pipe (C) with installed insulation halves (D) onto turbosupercharger housing (K). Make sure exhaust port (N) is pointing up.

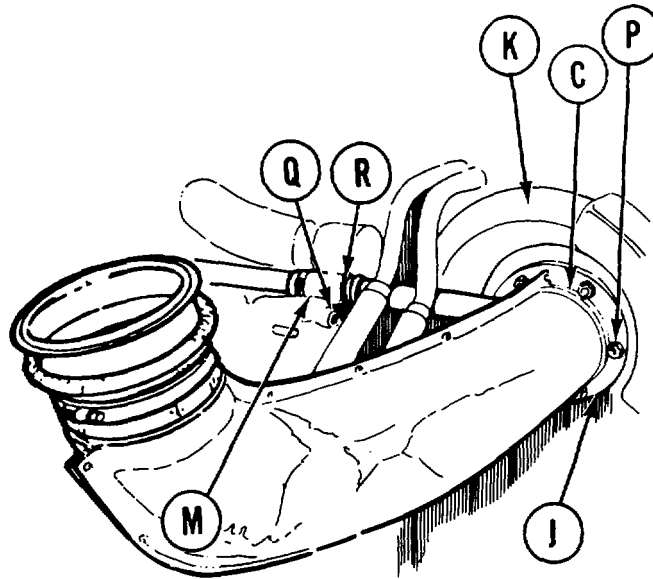


Go on to Sheet 4

TA146423

**EXHAUST PIPE (LEFT SIDE) REPLACEMENT (Sheet 4 of 4)**

8. Manually start six new self-locking nut (P) to hold exhaust pipe (C) to turbosupercharger housing (K).
9. Using socket, tighten six nuts (P).
10. Using flat-tip screwdriver, tighten screw (Q) to hold clamp (R) onto tube (K).
11. Start engine. Check for exhaust leaks around exhaust pipe gasket (J) and tube (M).
12. Install transmission shroud (page 9-23).
13. Close top grille doors (TM 9-2350-260-10).



End of Task

TA146424

**EXHAUST PIPE (RIGHT SIDE) REPLACEMENT (Sheet 1 of 4)**

PROCEDURE INDEX

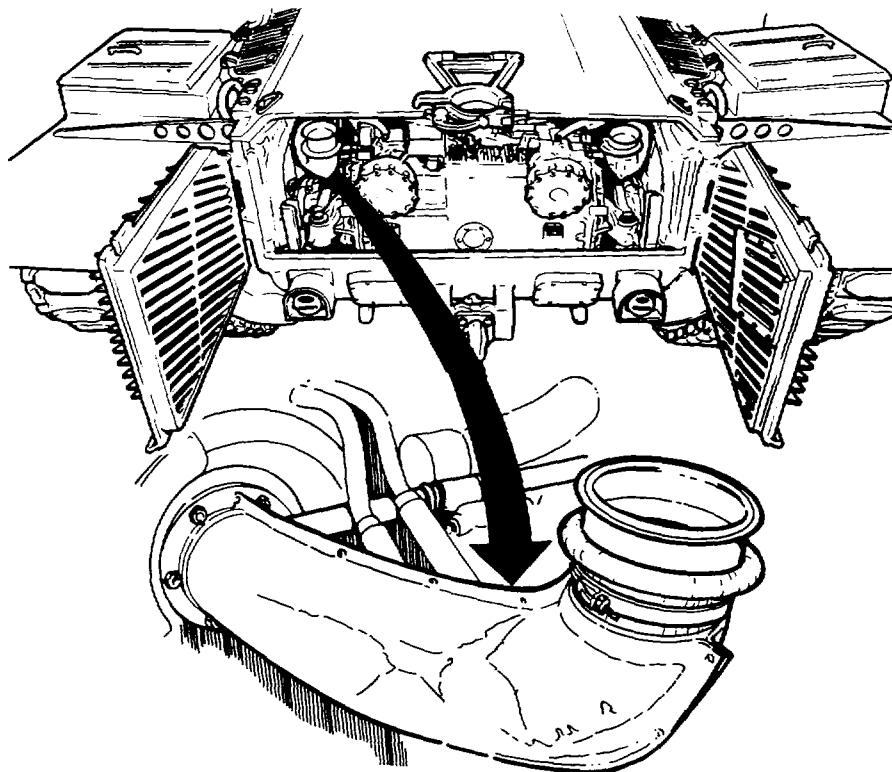
PROCEDURE	PAGE
Removal	8-10
Installation	8-11

TOOLS: Ratchet with 1/2 in. drive  
 9/16 in. socket with 1/2 in. drive  
 7/8 in. combination box and open end wrench  
 Cross-tip screwdriver  
 5/16 in. combination box and open end wrench  
 10 in. extension with 1/2 in. drive  
 Hammer  
 9/16 in. combination box and open end wrench  
 Flat-tip screwdriver  
 10 in. adjustable wrench

SUPPLIES: Gasket (10864007)  
 Self-locking nut (11640132 (6 required)  
 Lockwasher (MS35338-58) (14 required)

REFERENCE: TM 9-2350-260-10

PRELIMINARY PROCEDURES: Open top deck grill, doors (TM 9-2350-260-10)  
 Remove transmission shroud (page 9-20)



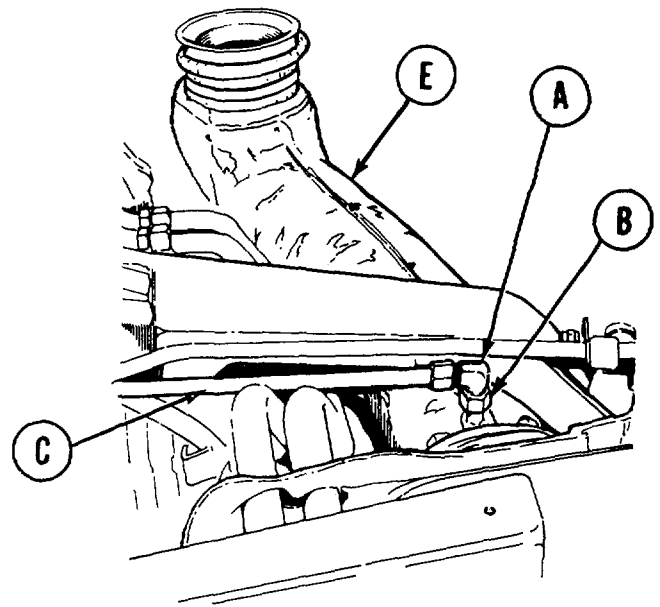
Go on to Sheet 2

TA146425

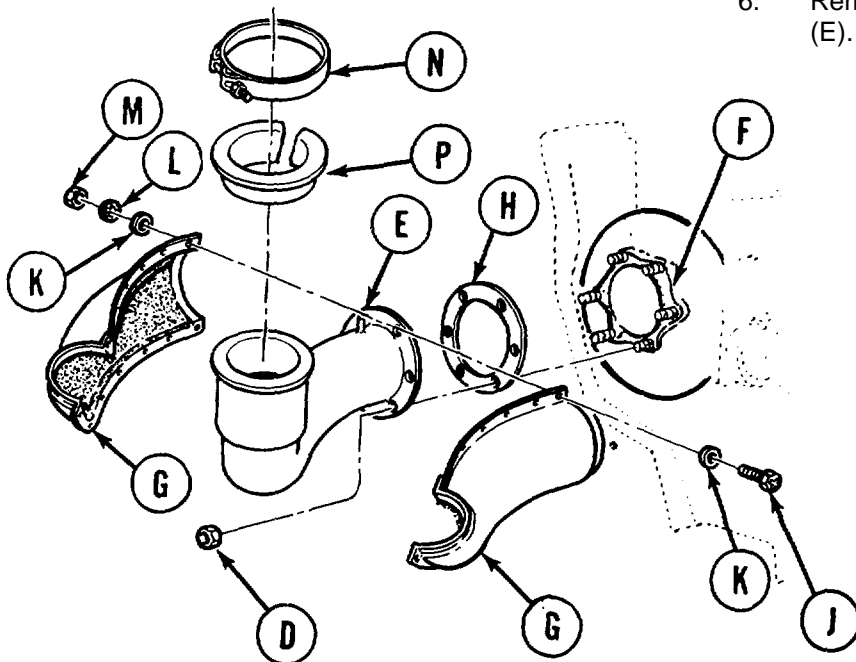
**EXHAUST PIPE (RIGHT SIDE) REPLACEMENT (Sheet 2 of 4)**

**REMOVAL:**

1. Using adjustable wrench to hold elbow (A), use 7/8 inch wrench and loosen fitting (B).
2. Using hammer, tap elbow (A) and lift tube (C) from exhaust pipe.
3. Using socket and open end wrench, remove six self-locking nuts (D) holding exhaust pipe (E) to turbosupercharger housing (F). Remove exhaust pipe (E) with insulation halve (G) and gasket (H) from turbosupercharger housing (F). Throw gasket (H) and self-locking nut (D) away.



4. Using cross-tip screwdriver and 5/16 inch wrench, remove 14 screws (J), each with two flat washes (K, one lockwasher (L), and one nut (M) holding insulation halves (G) to exhaust pipe (E). Throw lockwashers (L) away.
5. Using fiat-tip screwdriver, remove clamp (N) from pacing (P). Remove packing (P) from pipe (E).
6. Remove insulation halves (G) from exhaust pipe (E).



Go on to Sheet 3

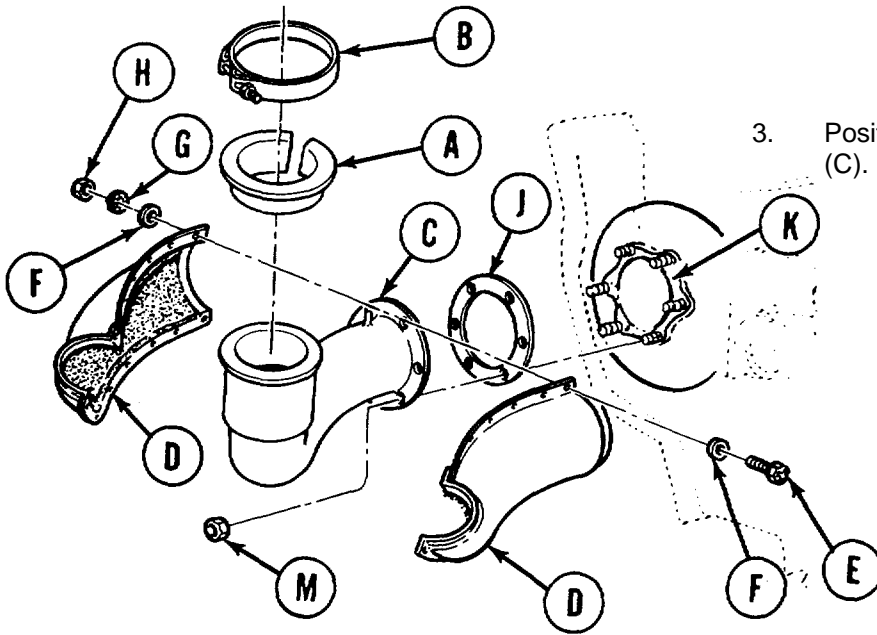
TA146426



**EXHAUST PIPE (RIGHT SIDE) REPLACEMENT (Sheet 3 of 4)**

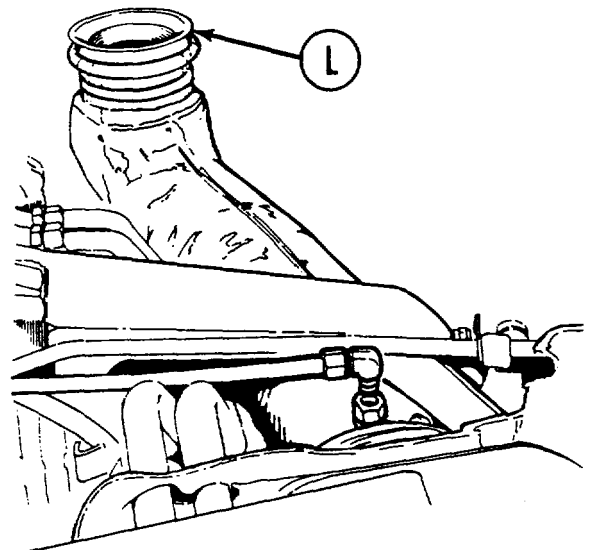
**INSTALLATION:**

1. Position packing (A) and clamp (E) onto pipe (C) and, using flat-tip screwdriver, tighten screw on clamp (B) securing packing to pipe (C).
2. Check insulation halves (D) and all attaching hardware for damage. Replace if necessary.



3. Position insulation halves (D) onto exhaust pipe (C).

4. Using 5/16 inch wrench and cross-tip screwdriver, install 14 screws (E), each with two flat washers (F), one new lockwasher (G), and one nut (H) to hold insulation halves (D) to exhaust pipe (C).
5. Position new gasket (J) onto turbosupercharger housing (K).
6. Position exhaust pipe (C) with installed insulation halves (D) onto turbosupercharger housing (K). Make sure exhaust port (L) is pointing up.
7. Using 9/16 inch socket and 7/8 inch wrench, install six new self-locking nut (M) securing exhaust pipe to housing.

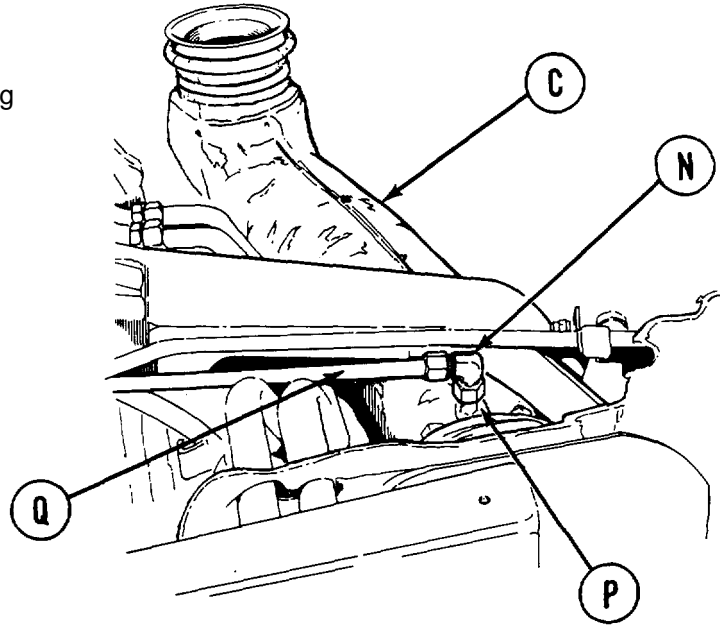


Go on to Sheet 4

TA146427

**EXHAUST PIPE (RIGHT SIDE) REPLACEMENT (Sheet 4 of 4)**

8. Using hands, position elbow (N) into nut (P).
9. Using 7/8 inch wrench, tighten nut (P) securing tube (Q) to exhaust pipe (C).



10. Start engine (TM 9-2350-260-10). Check for exhaust leaks around exhaust pipe gasket and transmission breather tube (Q) connections.
11. Install transmission shroud (page 9-23).
12. Close top deck grille doors (TM 9-2350-260-10).

End of Task

TA146428

**CHAPTER 9**  
**COOLING SYSTEM INDEX**

PROCEDURE	PAGE
Engine Shroud Replacement	9-2
Engine Shroud Support Replacement	9-4
Engine Shroud Repair On The Engine	9-4
Engine Shroud Repair Off Engine	9-11
Turbocharger Shrouds Replacement	9-13
Inner Shroud Replacement	9-13
Outer Shroud Replacement	9-17
Upper Shroud Replacement	9-18
Transmission Shroud Replacement	9-19
Transmission Shroud Repair	9-26
Transmission Shroud Bracket Repair	9-32
Transmission Shroud Supports (Left or Right Replacement	9-38
Transmission Shrouds Replacement	9-39
Right Intermediate Shroud Replacement	9-39
Lower Shroud Replacement	9-44
Left Intermediate Shroud Replacement	9-46
Engine Cooling Fan Replacement	9-47
Engine Cooling Fan Shroud Replacement	9-51
Centrifugal Fan Housing Replacement	9-59
Fan Drive Oil Seal Replacement	9-62

**ENGINE SHROUD REPLACEMENT (Sheet 1 of 2)**

**TOOLS:** Ratchet with 1/2 in. drive  
9/16 in. socket with 1/2 in. drive  
3 in. extension with 1/2 in. drive  
Torque wrench with 1/2 in. drive (0-175 lb-ft) (0-237 N•m)

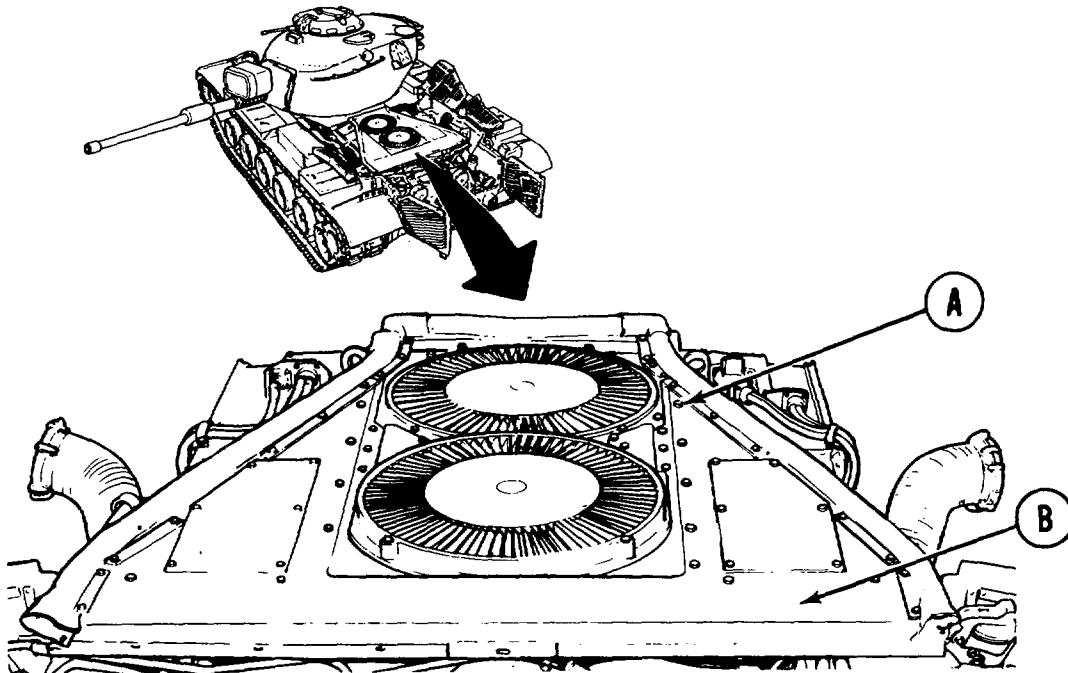
**SUPPLIES:** Lockwasher (MS27183-14) (22 required)

**PERSONNEL:** Two

**PRELIMINARY PROCEDURES:** Remove top deck assembly (page 16-20)  
Remove transmission shroud (page 9-20)

**REMOVAL:**

1. Using socket, remove 22 screws, washers, and lockwashers (A) securing engine shroud (B) to engine. Throw lockwashers away.



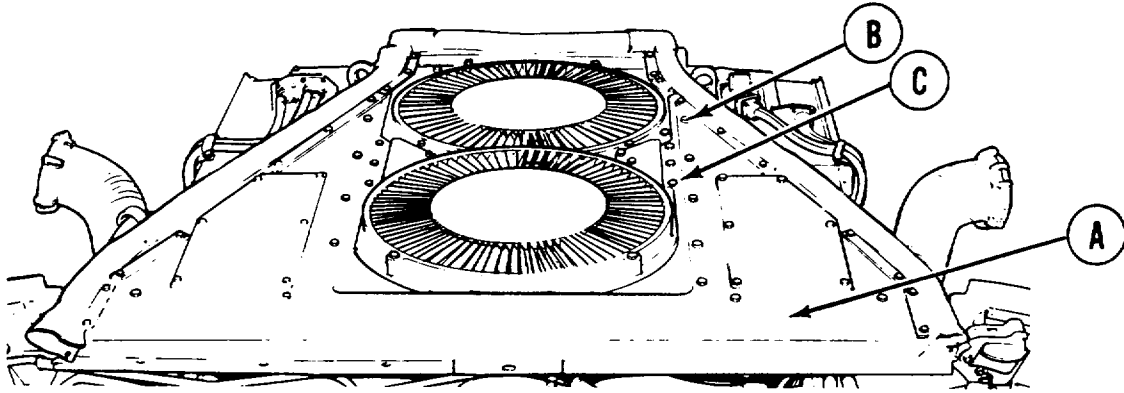
2. Remove engine shroud (B) from engine.

Go on to Sheet 2

TA146849

**ENGINE SHROUD REPLACEMENT (Sheet 2 of 2)****INSTALLATION:**

1. Position engine shroud (A) on engine.



2. Using socket, install 22 screws, washers, and new lockwashers (B) securing engine shroud (A) to engine.
3. Using socket and torque wrench, tighten 22 screws (C) to 20-30 b-ft (2741 N•m).
4. Install transmission shroud (page 9-23).
5. Install top deck (page 16-22).

End of Task

TA146850

**ENGINE SHROUD SUPPORT REPLACEMENT (Sheet 1 of 2)**

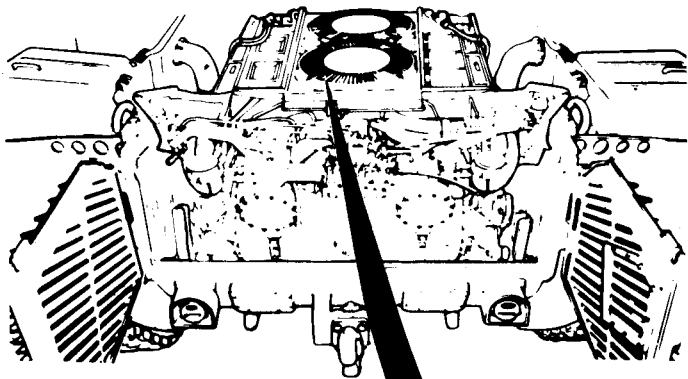
**TOOLS:** Putty knife  
 9/16 in. combination box and open end wrench

**SUPPLIES:** Adhesive (Item 1, Appendix D)  
 Insulation (8762981)  
 Insulation (10863503)  
 Lockwasher (MS35338-46) (8 required)  
 Dry cleaning solvent (Item 54, Appendix D)  
 Rags (Item 65, Appendix D)

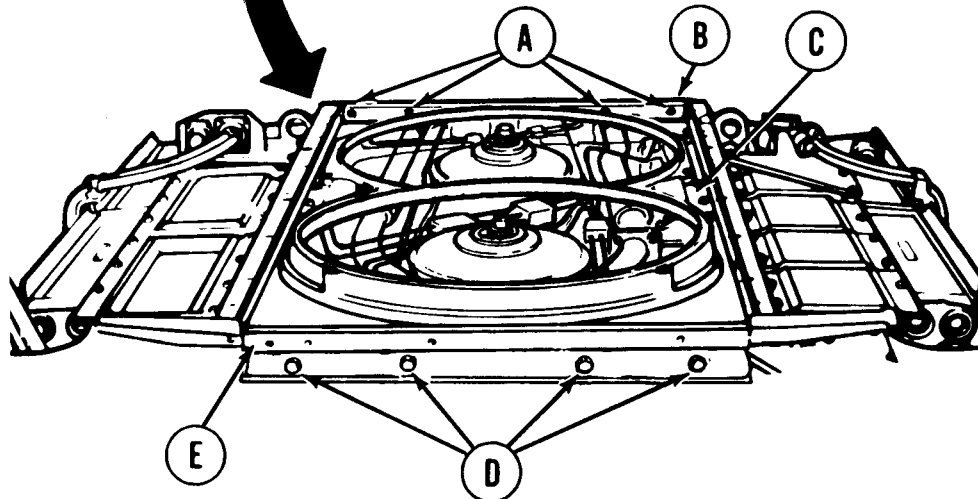
**PRELIMINARY PROCEDURES:** Remove top deck (page 16-20)  
 Remove transmission shroud (page 9-20)  
 Remove engine shroud (page 9-2)

**REMOVAL:**

1. Using wrench, remove four screws, washers, and lockwashers (A) holding front shroud support assembly (B) to engine (C). Throw lockwashers away.
2. Remove shroud support.



3. Using wrench, remove four screws, washers, and lockwashers (D) holding rear shroud support assembly (E) to engine (C). Throw lockwashers away.
4. Remove shroud support.

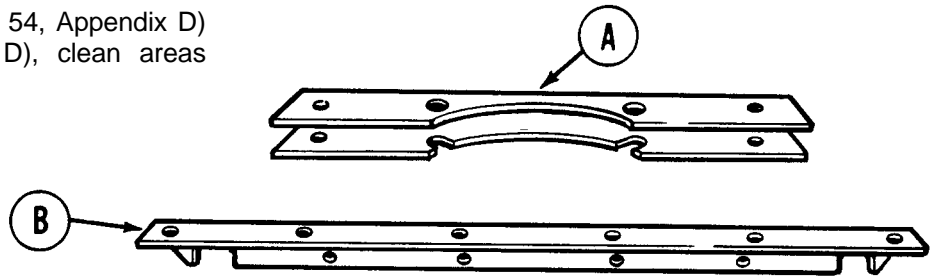


Go on to Sheet 2

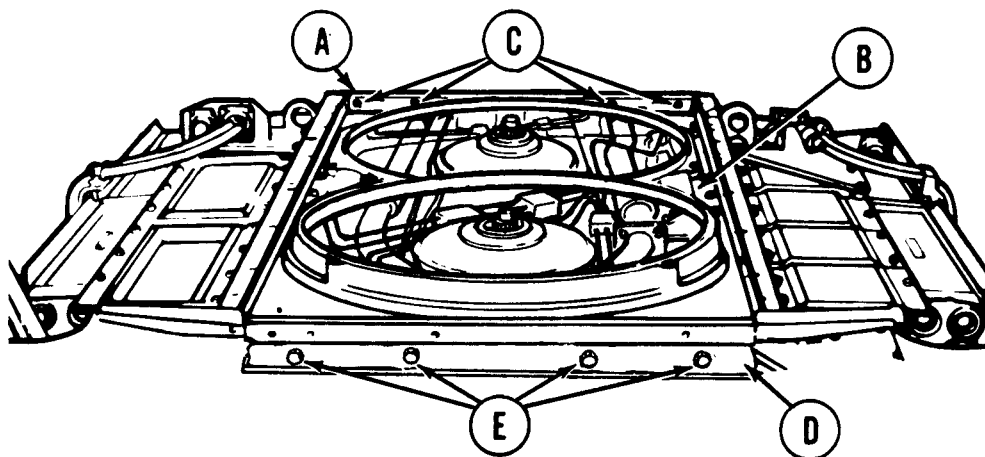
TA146851

**ENGINE SHROUD SUPPORT REPLACEMENT (Sheet 2 of 2)****CLEANING AND INSPECTION:**

1. Inspect supports (A) and (B) insulation for wear, tears, or loose areas.
2. If required, use putty knife to remove insulation (C) from shroud supports.
3. Using dry cleaning solvent (Item 54, Appendix D) and rags (Item 65, Appendix D), clean areas where insulation was removed.

**INSTALLATION:**

1. If required, use putty knife to apply adhesive (Item 1, Appendix D) to shroud supports. Install new insulation.
2. Position front support (A) onto engine (B). Using wrench, install four washers, new lockwashers, and screws (C) securing support (A) to engine (B).
3. Position rear support (D) onto engine (B). Using wrench, install four washers, new lockwashers, and screws (E) securing support (D) to engine (B).
4. Install engine shroud (page 9-3).
5. Install transmission shroud (page 9-23).
6. Install top deck (page 16-22).



End of Task

TA146852

## ENGINE SHROUD REPAIR ON THE ENGINE (Sheet 1 of 5)

## PROCEDURE INDEX

PROCEDURE	PAGE
Disassembly	9-6
Assembly	9-8

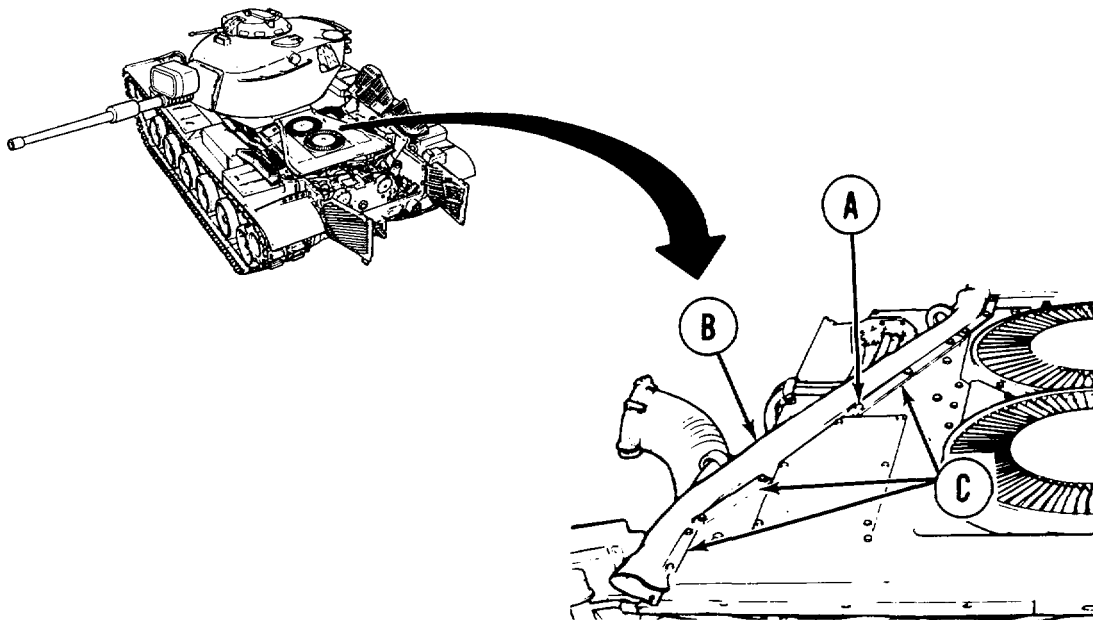
TOOLS: Ratchet with 1/2 in. drive  
 7/16 in. socket with 1/2 in. drive  
 9/16 in. socket with 1/2 in. drive  
 3 in. extension with 1/2 in. drive  
 Putty knife  
 Cross-tip screwdriver (Phillips)

SUPPLIES: Adhesive (Item 4, Appendix D)  
 Dry cleaning solvent (Item 54, Appendix D)  
 Rags (Item 65, Appendix D)  
 Lockwasher (MS35338-46) (29 required)  
 Gasket (8762922) (2 required)

PRELIMINARY PROCEDURES: Remove top deck assembly (page 16-20)  
 Remove transmission shroud (page 9-20)

## DISASSEMBLY:

- Using 7/16 inch socket, remove seven screws, washers, and lockwashers (A) holding three seal (B) retainers (C) to engine shroud right and left sides. Throw lockwashers away.
- Remove retainers (C) from shroud.



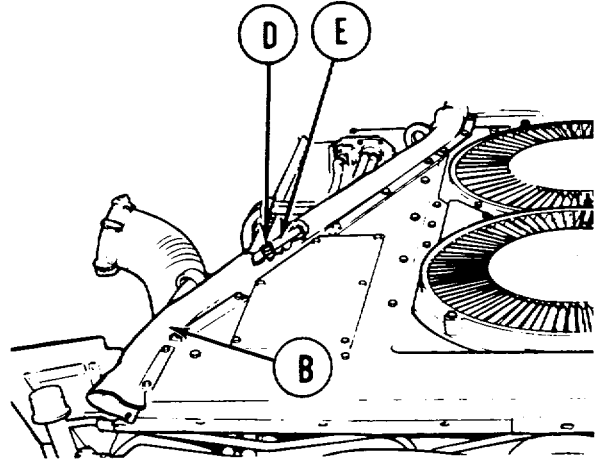
Go on to Sheet 2

TA146853



**ENGINE SHROUD REPAIR ON THE ENGINE (Sheet 2 of 5)**

3. Using screwdriver, remove two screws and lockwashers (D) hidden under seal, holding retainers (E) to engine shroud right and left sides. Throw lockwashers away.
4. Remove retainers (E) from shroud.
5. Displace seals (B) from shroud right and left sides.

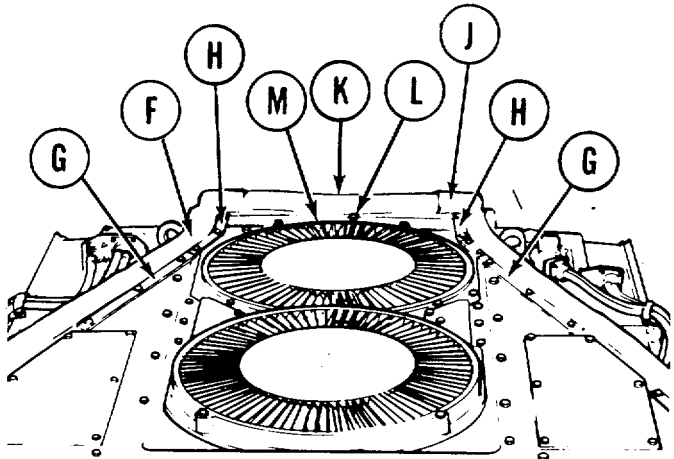


6. Using 7/16 inch socket, remove six screws, washers, and lockwashers (F) holding two elbow retainers (G) to engine shroud. Throw lockwashers away.

7. Remove retainers (G) from engine shroud.
8. Remove seals (H) and elbows (J) from engine shroud.

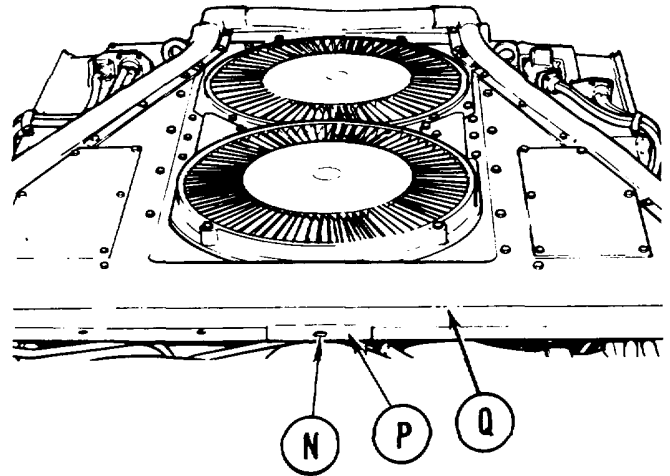
9. Using screwdriver, lift front seal (K) and remove two screws and lockwashers (hidden) (L) holding retainer (M). Throw lockwashers away.

10. Remove retainer (M) from shroud.
11. Remove seal (K) from shroud.

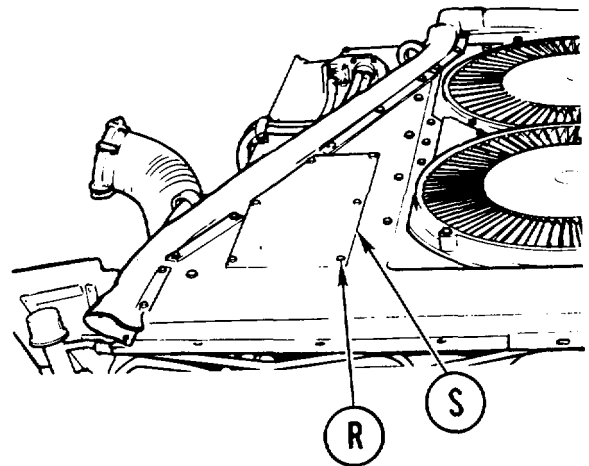


**ENGINE SHROUD REPAIR ON THE ENGINE (Sheet 3 of 5)**

12. Using screwdriver, remove six screws and lockwashers (N) from retainer (P). Throw lockwashers away.
13. Remove retainer (P) from shroud.
14. Remove seal (Q) from shroud.

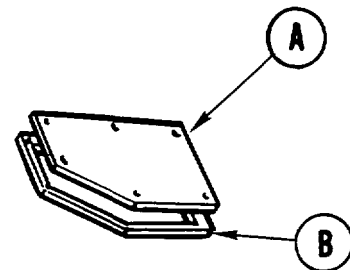


15. Using 9/16 inch socket, remove six screws, washers, and lockwashers (R) holding access plate (S) to right and left sides of shroud. Throw lockwashers away.
16. Remove access plate (S) with gasket from shroud.
17. Using putty knife, remove gasket from access plate (S). Throw gasket away.
18. Using dry cleaning solvent (Item 54, Appendix D) and rags (Item 65, Appendix D), clean areas where gasket was removed.



**ASSEMBLY:**

1. Using putty knife, apply adhesive (Item 4, Appendix D) to back side of access plates (A).
2. Install new gaskets (B) to access plates (A).

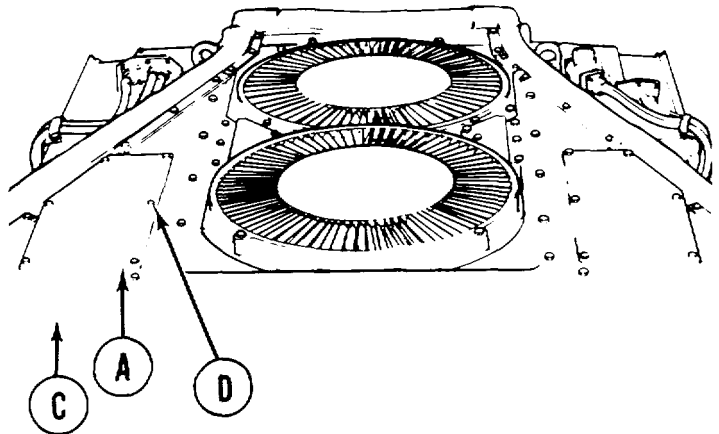


Go on to Sheet 4

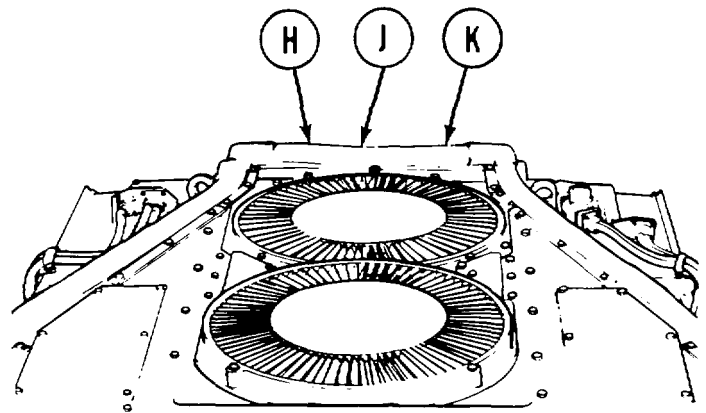
TA146855

**ENGINE SHROUD REPAIR ON THE ENGINE (Sheet 4 of 5)**

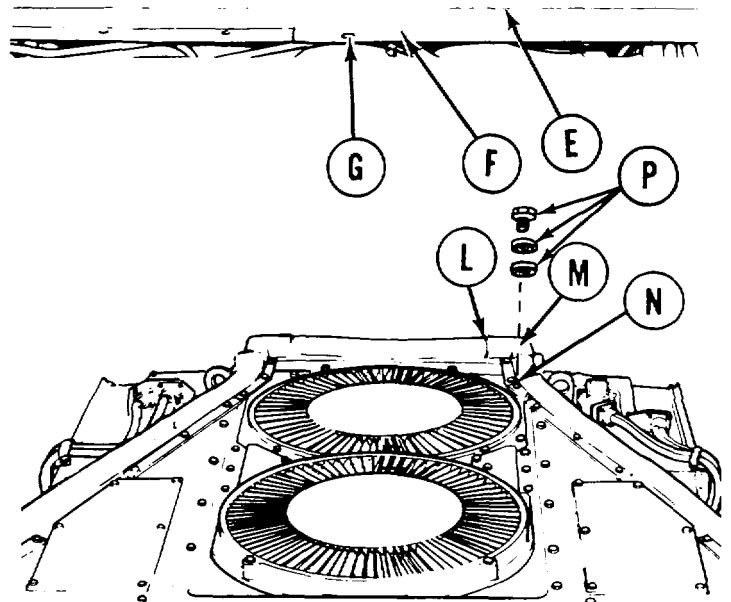
3. Position access plates (A) on engine shroud (C).
4. Using 9/16 inch socket, install six screws, washers, and new lockwashers (D) to secure access plate (A) to shroud (C).



5. Install seal (E) and retainer (F) to shroud (C), using six screws and new lockwashers (G).
6. Using screwdriver, tighten six screws (G).
7. Install seal (H) and retainer (J) to shroud (C), using two screws and new lockwashers (K) (hidden).
8. Using screwdriver, tighten two screws (K).



9. Install elbow (L), seals (M), and elbow retainer; (N) to shroud, using six screws, washers, and new lockwashers (P).
10. Using 7/16 inch socket, tighten six screws (P).

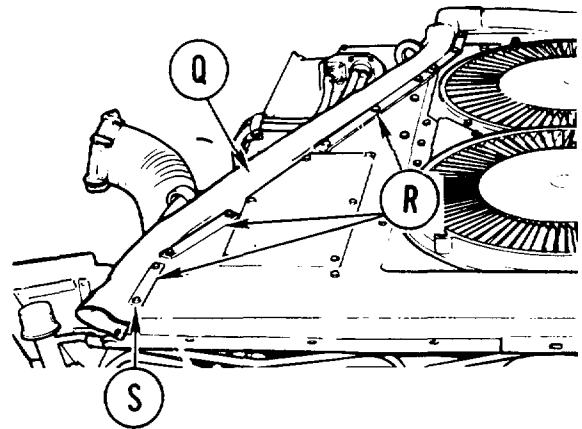


Go on to Sheet 5

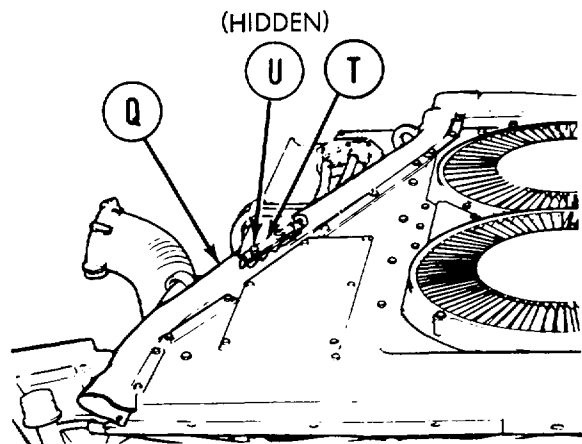
TA146856

**ENGINE SHROUD REPAIR ON THE ENGINE (Sheet 5 of 5)**

11. Install seals (Q) and three retainers (R) to shroud both side, using seven screws, washers, and new lockwashers (S).
12. Using 7/16 inch socket, tighten seven screws (S).



13. Install retainer (T) to seal (Q) and shroud, using two screws and new lockwashers (U) (hidden) under seals on both sides.
14. Using screwdriver, tighten two screws (U) on each side.
15. Install transmission shroud (page 9-23).
16. Install top deck assembly (page 16-22).



End of Task

TA146857

**ENGINE SHROUD REPAIR OFF ENGINE (Sheet 1 of 2)**

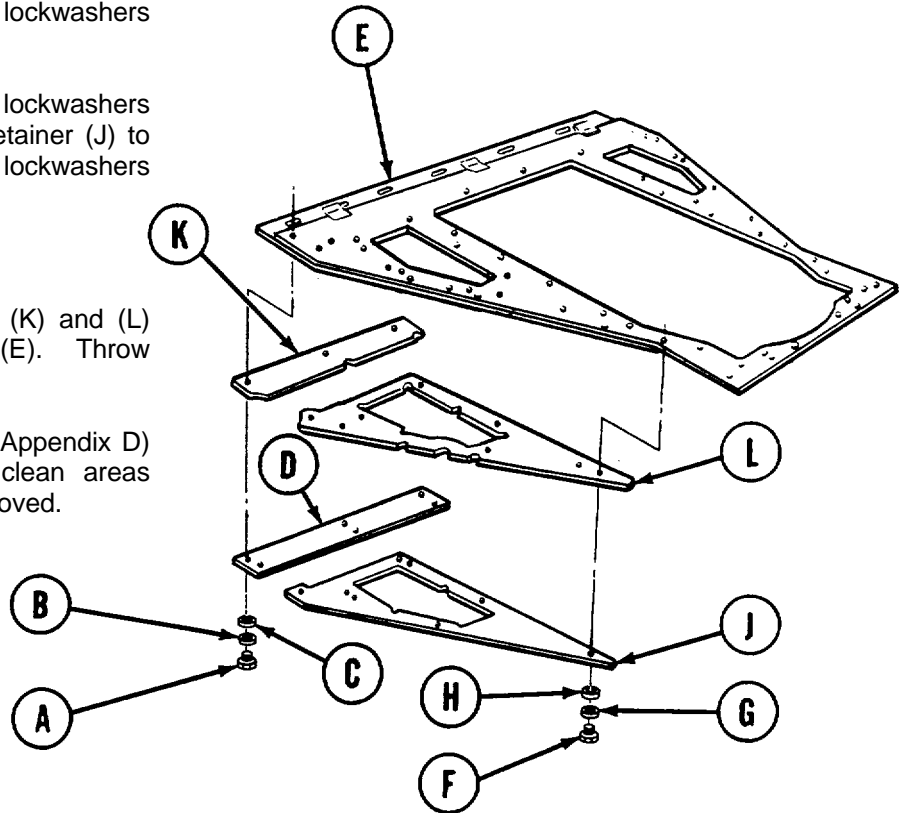
**TOOLS:** Putty knife  
 Ratchet with 1/2 in. drive  
 7/16 in. socket with 1/2 in. drive

**SUPPLIES:** Dry cleaning solvent (Item 54, Appendix D)  
 Rags (Item 65, Appendix D)  
 Adhesive (Item 4, Appendix D)  
 Insulation (10863512)  
 Insulation (8762924)  
 Lockwasher (MS35338-46) (12 required)

**PRELIMINARY PROCEDURE:** Remove engine shroud (page 9-2)

**DISASSEMBLY:**

1. Using socket, remove six screws (A), lockwashers (B), and flat washers (C) securing retainer (D) to engine shroud (E) both sides. Throw lockwashers (B) away.
2. Using socket, remove six screws (F), lockwashers (G), and fiat washers (H) securing retainer (J) to engine shroud (E) both sides. Throw lockwashers (G) away.
3. Remove retainers (D) and (J).
4. Using putty knife, remove insulation (K) and (L) from both sides of engine shroud (E). Throw insulation away.
5. Using dry cleaning solvent (Item 54, Appendix D) and rags (Item 65, Appendix D), clean areas where insulation (K) and (L) were removed.

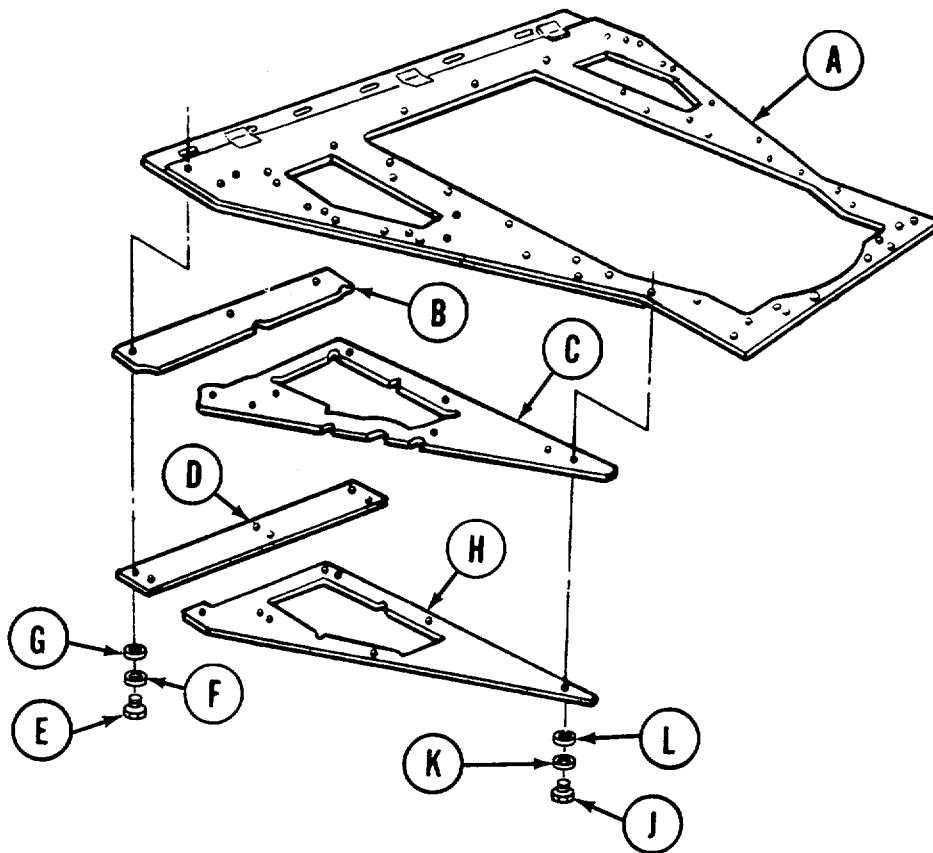


Go on to Sheet 2

TA146858

**ENGINE SHROUD REPAIR OFF ENGINE (Sheet 2 of 2)****ASSEMBLY:**

1. Using putty knife, apply adhesive (Item 4, Appendix D) to engine shroud (A) to hold new insulation (B) and (C) to both sides of engine shroud (A).
2. Install new insulation (B) and (C) to both sides of engine shroud (A).
3. Using socket, install retainers (D) with six screws (E), new lockwashers (F), and flat washers (G) to both sides of engine shroud (A).
4. Using socket, install retainers (H) with six screws (J), new lockwashers (K), and flat washers (L) to both sides of engine shroud (A).
5. Install engine shroud (page 9-3).



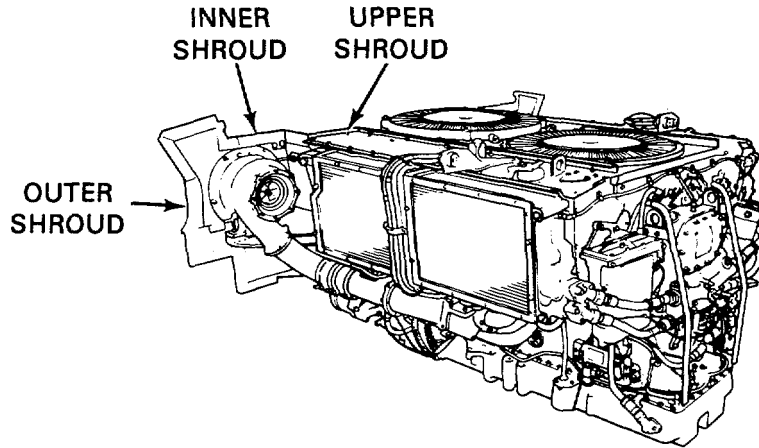
End of Task

TA146859

**TURBOCHARGER SHROUDS REPLACEMENT (Sheet 1 of 6)**

PROCEDURE INDEX

PROCEDURE	PAGE
Inner Shroud Replacement	9-13
Outer Shroud Replacement	9-17
Upper Shroud Replacement	9-18



**Inner Shroud Replacement**

PROCEDURE	PAGE
Removal	9-14
Installation	9-15

**TOOLS:** 11/16 in. combination box and open end wrench  
 1/2 in. combination box and open end wrench  
 1/2 in. socket with 1/2 in. drive  
 5 in. extension with 1/2 in. drive  
 Ratchet with 1/2 in. drive

**SUPPLIES:** Self-locking nut (MS21045-5)  
 Grommet (MS35490-16)

**PRELIMINARY PROCEDURES:** Remove powerplant (page 5-1)  
 Remove rear engine shroud support (9-4)  
 Remove transmission oil cooler lines (page 6-135 or 6-145).

Go on to Sheet 2

TA146860

**TURBOCHARGER SHROUDS REPLACEMENT (Sheet 2 of 6)**

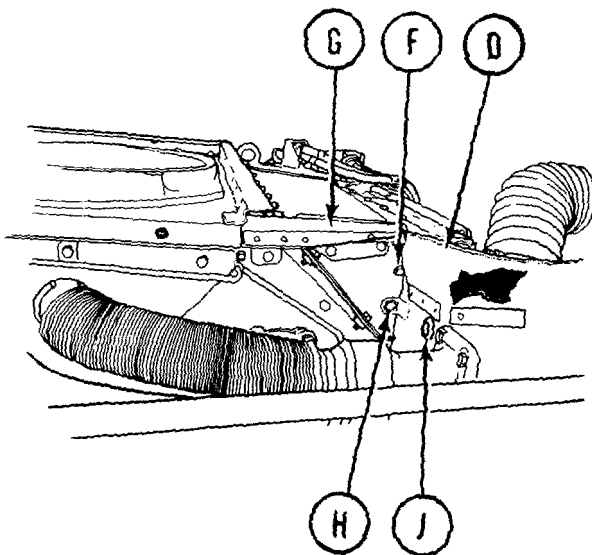
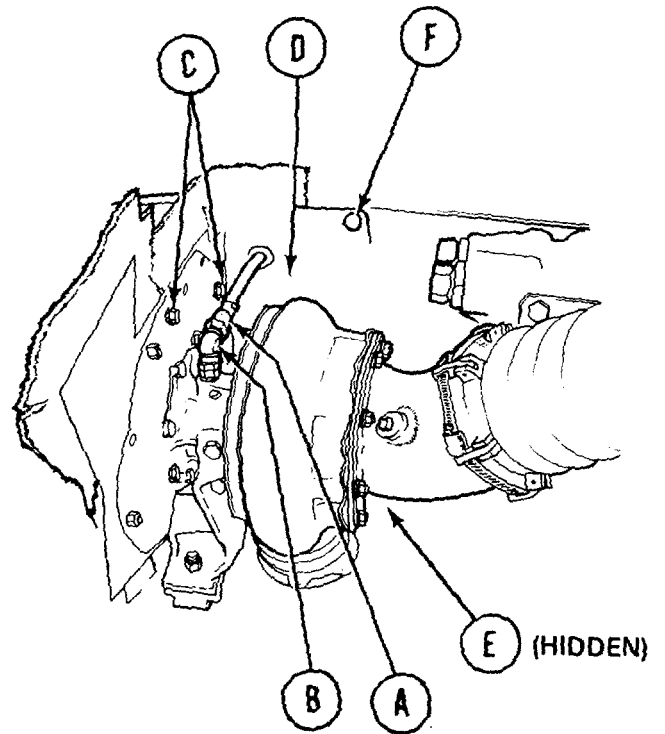
**Inner Shroud Replacement**

**NOTE**

Procedures for replacement of the left or right turbocharger shrouds are similar. Procedures for the left side are shown.

**REMOVAL:**

1. Using 11/16 inch wrench, disconnect hose assembly (A) from turbocharger elbow (B).
2. Using 1/2 inch socket, remove two screws and washers (C) securing inner shroud (D) to turbocharger plate.
3. Using 1/2 inch socket, remove two screws and washers (E) securing inner shroud (D) to turbocharger plate.



4. Using 1/2 inch wrench and 1/2 inch socket, remove screw and self-locking nut (F) securing inner shroud (D) to upper shroud (G). Throw self-locking nut away.
5. Using 1/2 inch socket, remove three screws and washers (H) securing inner shroud (D) to oil cooler frame.
6. Remove hose assembly (A) and grommet (J) from inner shroud (D).
7. Remove inner shroud (D).
8. Remove grommet (J) from hose assembly (A). Throw grommet away.

Go on to Sheet 3

TA146861

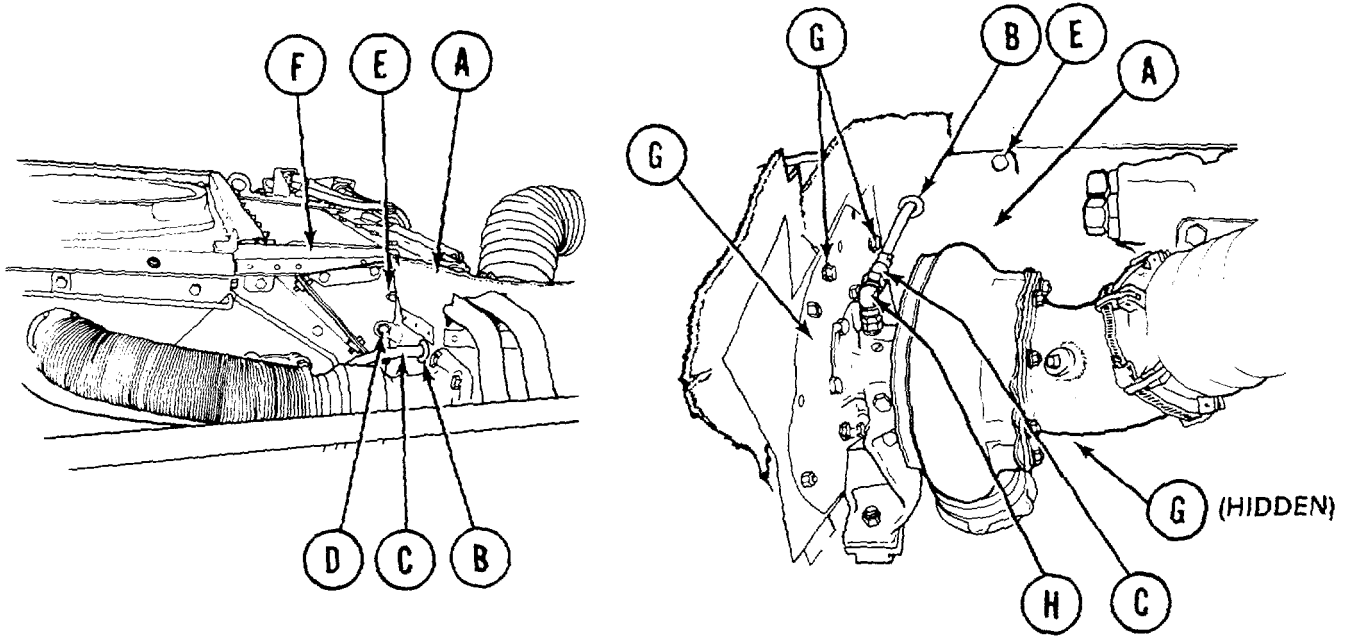


**TURBOCHARGER SHROUDS REPLACEMENT (Sheet 3 of 6)**

**Inner Shroud Replacement**

**INSTALLATION:**

1. Place inner shroud (A) into position.
2. Install new grommet (B) on hose assembly (C).
3. Install grommet (B) and hose assembly (C) in inner shroud (A).



4. Install three screws and washers (D) securing inner shroud (A) to oil cooler frame.
5. Install screw and new self-locking nut (E) to secure inner shroud (A) to upper shroud (F).
6. Install four screws and washers (G) securing inner shroud (A) to turbocharger plate.
7. Using 1/2 inch socket, tighten four screws (G).
8. Using 1/2 inch socket with extension, tighten three screws (D).
9. Using 1/2 inch socket and 1/2 inch wrench, tighten screw and nut (E).
10. Connect hose assembly (C) to elbow (H). Using 11/16 inch wrench, tighten hose assembly (C) onto elbow (H).

Go on to Sheet 4

TA146862

## **TURBOCHARGER SHROUDS REPLACEMENT (Sheen 4 of 6)**

### **Inner Shroud Replacement**

11. Install transmission oil cooler lines (page 6-140 or 6-149).
12. Ground hop engine (page 554) and check for oil leaks.
13. Install rear engine shroud support (page 9-5).
14. Disconnect engine from powerplant test run hookup (page 5-67).
15. Install engine shroud (page 9-3).
16. Install 2A powerplant (page 5-14) or 2D powerplant (page 5-40).

End of Task

**TURBOCHARGER SHROUDS REPLACEMENT (Sheet 5 of 6)****Outer Shroud Replacement (Sheet 1 of 1)**

TOOLS: 1/2 in. combination box and open end wrench  
 1/2 in. socket with 1/2 in. drive  
 Ratchet with 1/2 in. drive

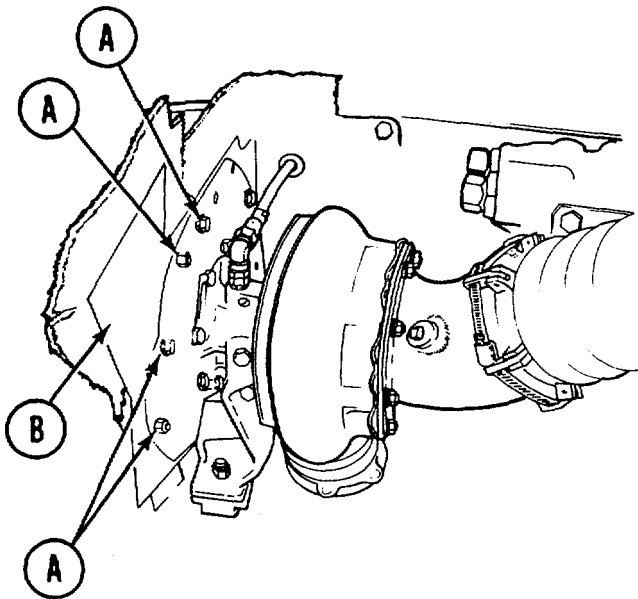
SUPPLIES: Self-locking nut (503345) (4 required)

PRELIMINARY PROCEDURE: Remove powerplant (page 5-1)

REMOVAL:

**NOTE**

**Procedures for replacement of the left or right turbocharger shrouds are similar. Procedures for the left side are shown.**



1. Using 1/2 inch socket and 1/2 inch wrench, remove four screws and self-locking nuts (A) securing outer shroud (B). Throw self-locking nut away.
2. Remove outer shroud (B).

INSTALLATION:

1. Position outer shroud (B) to turbocharger.
2. Install four screws and self-locking nut (A) to secure outer shroud (B) to turbocharger.
3. Using 1/2 inch socket and 1/2 inch wrench, tighten screws and self-locking nuts (A).
4. Install 2A powerplant (page 5-14) or 2D powerplant (page 540).

End of Task

TA146863

**TURBOCHARGER SHROUDS REPLACEMENT (Sheet 6 of 6)****Upper Shroud Replacement (Sheet 1 of 1)**

TOOLS: 1/2 in. combination box and open end wrench  
 1/2 in. socket with 1/2 in. drive  
 5 in. extension with 1/2 in. drive  
 Ratchet with 1/2 in. drive

SUPPLIES: Self-locking nut (MS21045-16)

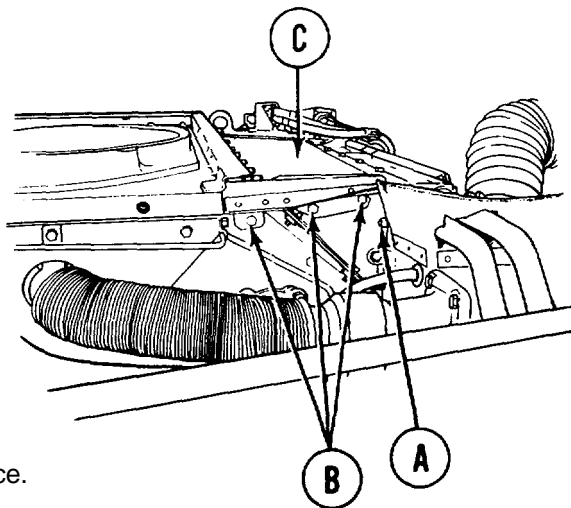
PRELIMINARY PROCEDURES: Remove powerplant (page 5-1)  
 Remove engine shroud (page 9-2)  
 Remove rear engine shroud support (page 9-4)

**NOTE**

**Procedures for replacement of the left or right turbocharger shrouds are similar.  
 Procedures for the left side are shown.**

**REMOVAL:**

- 1 Using 1/2 inch socket with extension and 1/2 inch wrench, remove bolt and self-locking nut (A). Throw self-locking nut (A) away.
2. Using 1/2 inch socket, remove three bolts (B).
3. Remove upper shroud (C).

**INSTALLATION:**

1. Position upper shroud (C) in place.
2. Install three bolts (B).
3. Install bolts and new self-locking nut (A).
4. Using 1/2 inch socket with extension and 1/2 inch wrench, tighten bolts (A) and (B).
5. Install rear engine shroud support (page 9-5).
6. Install engine shroud (page 9-3).
7. Install 2A powerplant (page 5-14) or 2D powerplant (page 5-40).

End of Task

TA146864

**TRANSMISSION SHROUD REPLACEMENT (Sheet 1 of 7)**

PROCEDURE INDEX

PROCEDURE	PAGE
Removal	9-20
Installation	9-23

TOOLS: Ratchet with 1/2 in. drive  
 3/4 in. socket with 1/2 in. drive  
 1-1/8 in. socket with 1/2 in. drive  
 7/16 in. combination box and open end wrench

SUPPLIES: Plastic covers for exhaust (2 required)

PERSONNEL: Two

**WARNING**

**Allow engine to cool one hour before removing shroud. Wear asbestos gloves for protection.**

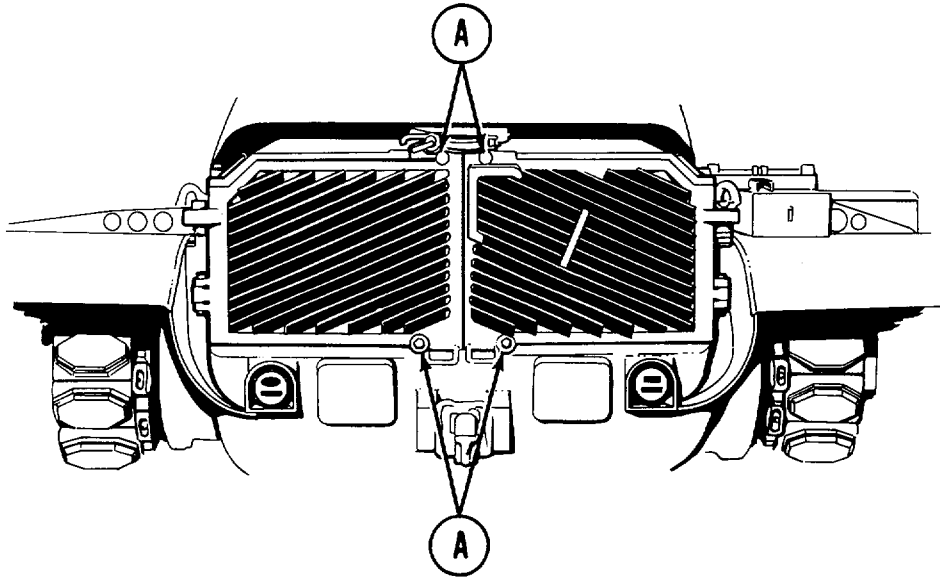
## TRANSMISSION SHROUD REPLACEMENT (Sheet 2 of 7)

## NOTE

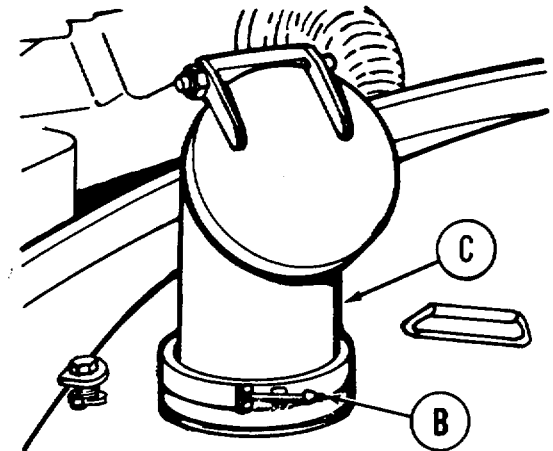
Remove bolts from right exhaust door first. Then remove bolts from left door.

## REMOVAL:

1. Using 1-1/8 inch socket, remove four bolts (A) securing exhaust doors to hull.
2. Open both exhaust doors.



3. Using wrench, loosen clamp assembly (B) securing cap assembly (C) to exhaust pipe (both sides of tank). Unlock clamp assembly (B).
4. Remove cap assembly (C) from exhaust pipe (both sides of tank).



Go on to Sheet 3

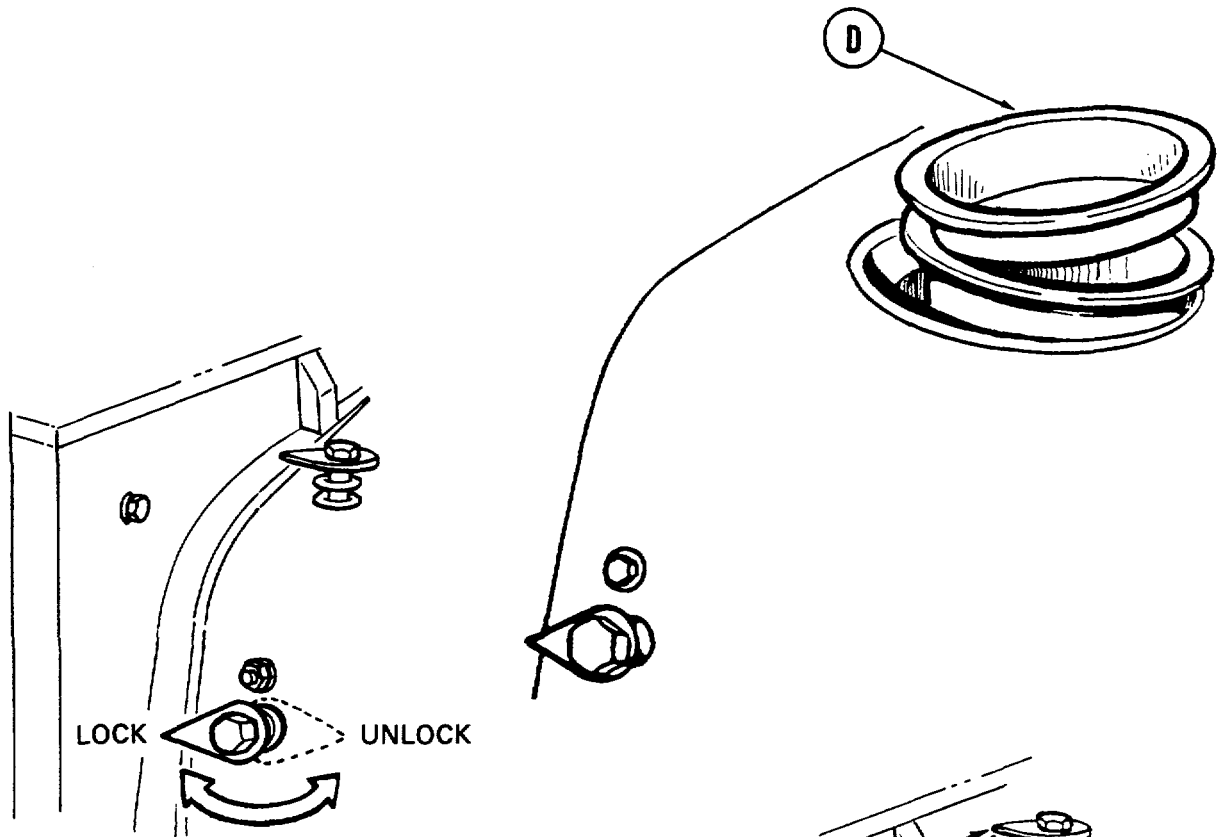
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**TRANSMISSION SHROUD REPLACEMENT (Sheet 3 of 7)**

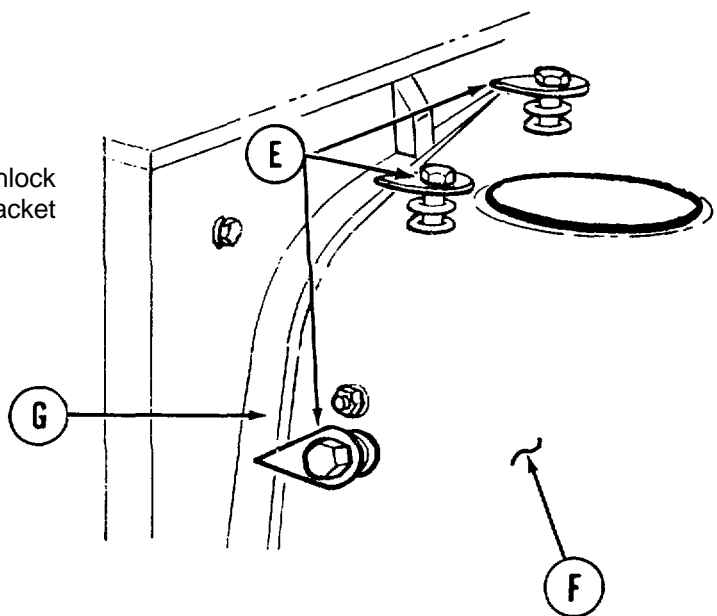
5. Install plastic cove (D) over exhausts.

**NOTE**

Narrow end of turnlock fasteners (E) must be rotated 180° from their original position so they point inside engine compartment



6. Using 3/4 inch socket, unlock three turnlock fasteners (E) holding shroud (F) to angle bracket (G) on both sides of tank.



Go on to Sheet 4

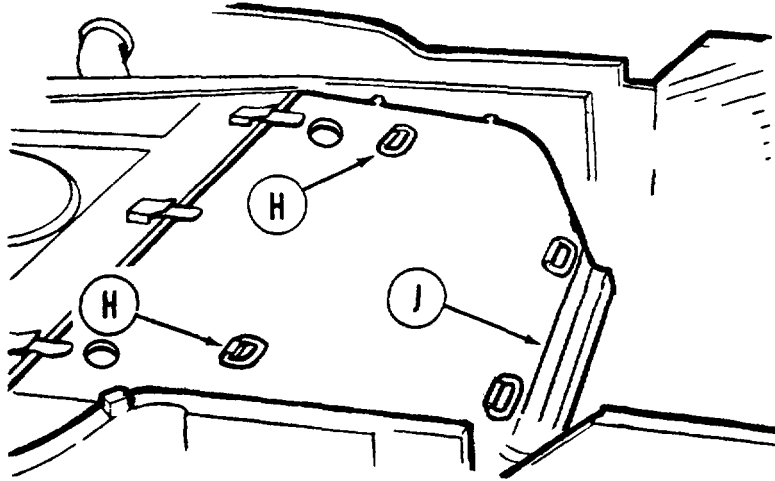
TA146867

**TRANSMISSION SHROUD REPLACEMENT (Sheet 4 of 7)**

7. Both persons grasp handles (H) and lift shroud up (to clear exhaust pipe) and out.

**CAUTION**

**Remove shroud carefully to avoid damage to shroud seal (J).**



Go on to Sheet 5

TA146868



**TRANSMISSION SHROUD REPLACEMENT (Sheet 5 of 7)**

**INSTALLATION:**

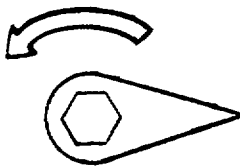
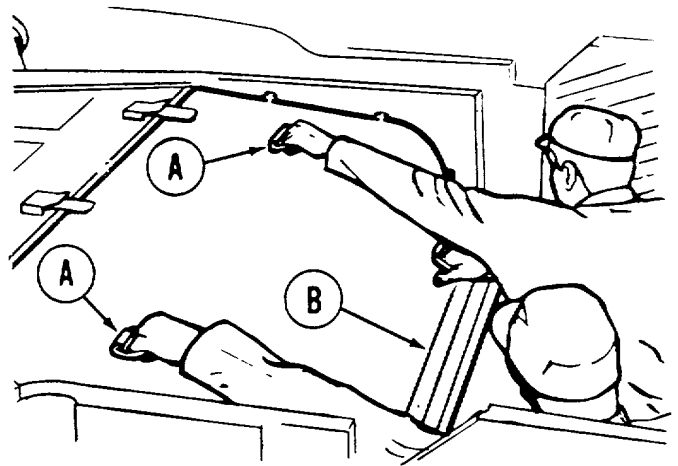
- Both persons grasp handles (A) of transmission shroud and lift shroud into position on tank.

**CAUTION**

Position shroud carefully onto tank to avoid damage to shroud seal (B).

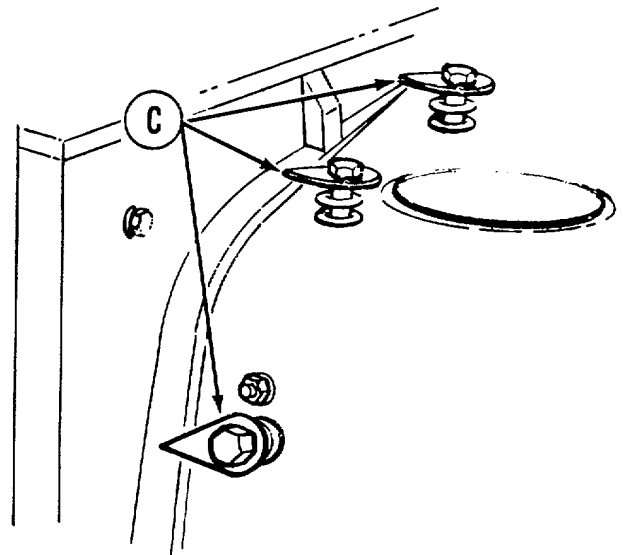
**NOTE**

Narrow end of turnlock fasteners must be rotated 180° to lock.



**LOCK      UNLOCK**

- Using 3/4 inch socket, lock three turnlock fasteners (C) on each side of tank.

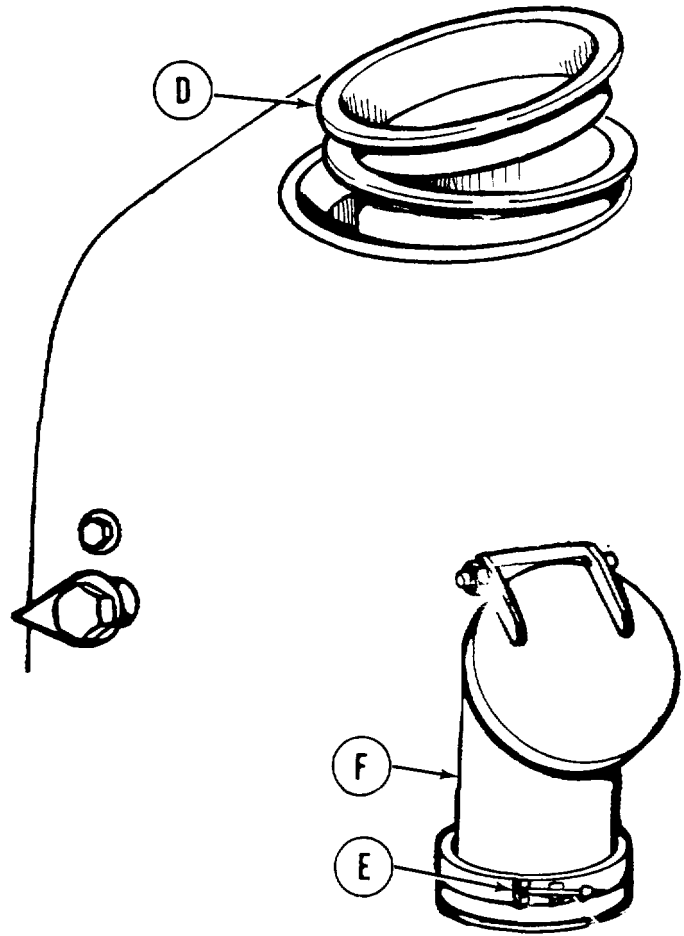


Go on to Sheet 6

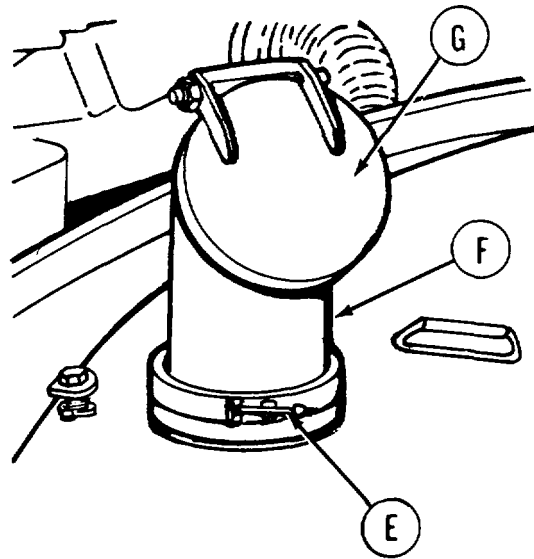
TA146869

**TRANSMISSION SHROUD REPLACEMENT (Sheet 6 of 7)**

3. Remove plastic covers (D) from exhausts.



4. Position clamp assembly (E) over cap assembly (F).
5. Position cap assembly (F) over exhaust pipe (both sides of tank). Orient cap assemblies so that outlets (G) face rear of tank. Lock clamp assembly (E).
6. Using wrench, tighten clamp assembly (E).

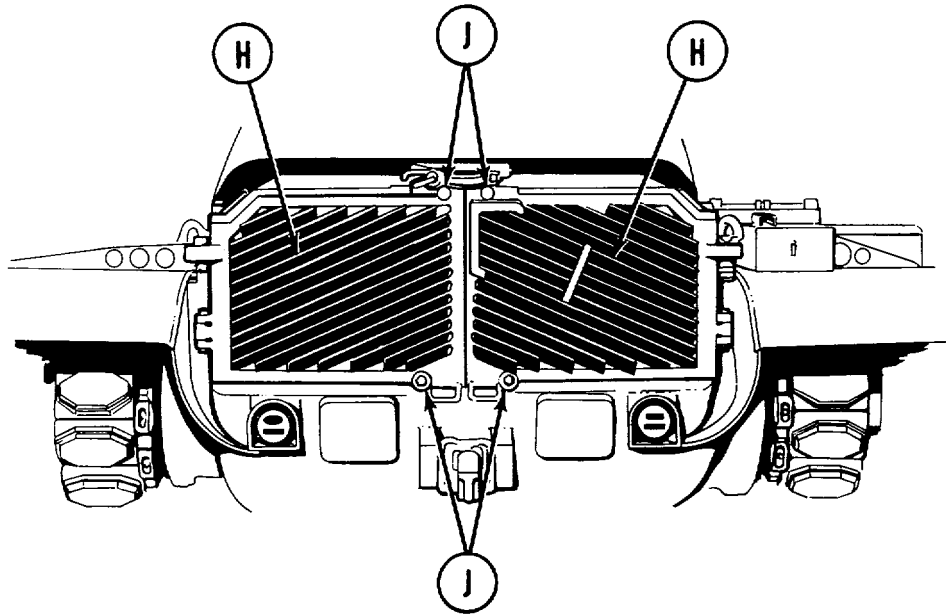


Go on to Sheet 7

TA146870

**TRANSMISSION SHROUD REPLACEMENT (Sheet 7 of 7)**

7. Close engine exhaust doors (H).
8. Using 1-1/8 inch socket, install and tighten four bolts (J).



End of Task

TA146871

**TRANSMISSION SHROUD REPAIR (Sheet 1 of 6)**

PROCEDURE INDEX

PROCEDURE	PAGE
Disassembly	9-27
Cleaning and Inspection	9-29
Assembly	9-30

TOOLS: 7/16 in. combination box and open end wrench  
 Diagonal cutting pliers  
 Ratchet with 1/2 in. drive  
 7/16 in. socket with 1/2 in. drive  
 3/4 in. socket with 1/2 in. drive  
 3/4 in. combination box and open end wrench  
 Putty knife  
 Slip joint pliers  
 Ball peen hammer  
 Cold chisel  
 Speeder brace with 1/2 in. drive

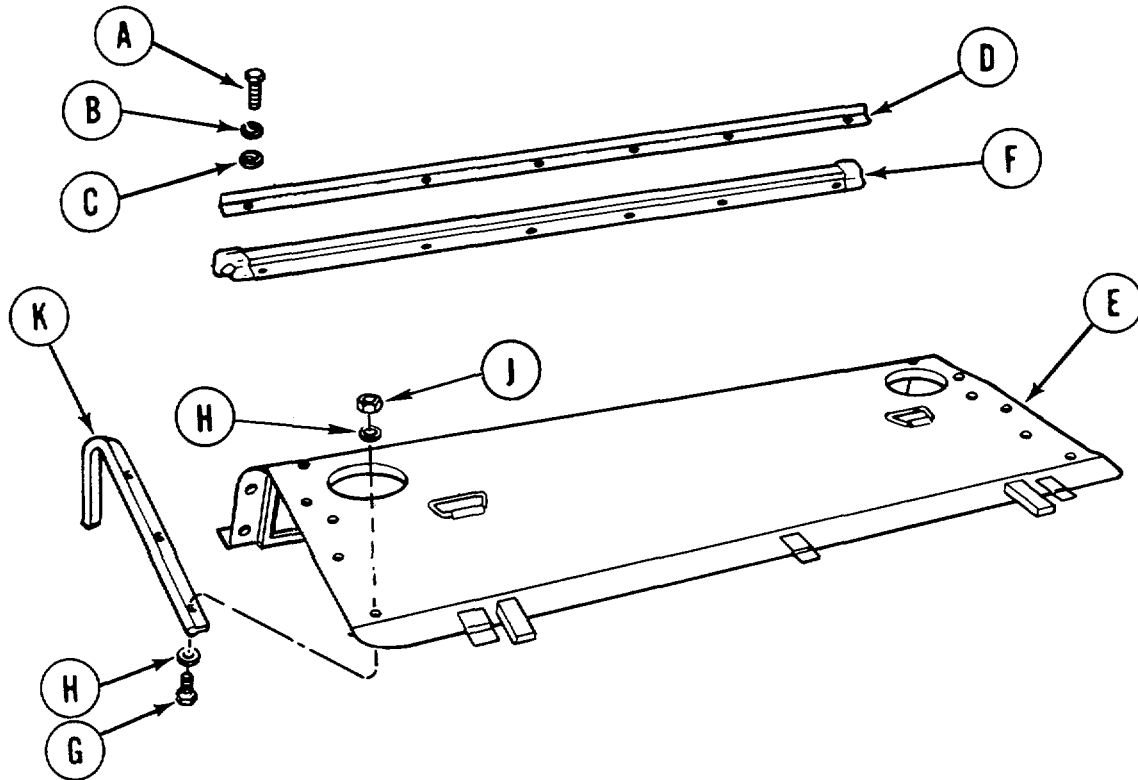
SUPPLIES: Lockwire (Item 59, Appendix D)  
 Dry cleaning solvent (Item 54, Appendix D)  
 Rags (Item 65, Appendix D)  
 Lockwasher (MS35338-44) (6 required)  
 Self-locking nut (MS20500-428) (10 required)  
 Self-locking nut (MS20500-820) (6 required)  
 Key washer (10873733) (4 required)

PRELIMINARY PROCEDURE: Remove transmission shroud (page 9-20)

## TRANSMISSION SHROUD REPAIR (Sheet 2 of 6)

## DISASSEMBLY:

- Using 7/16 inch socket remove six screws (A), lockwashers (B), and flat washers (C) holding retainer (D) to transmission shroud (E). Throw lockwashers away.



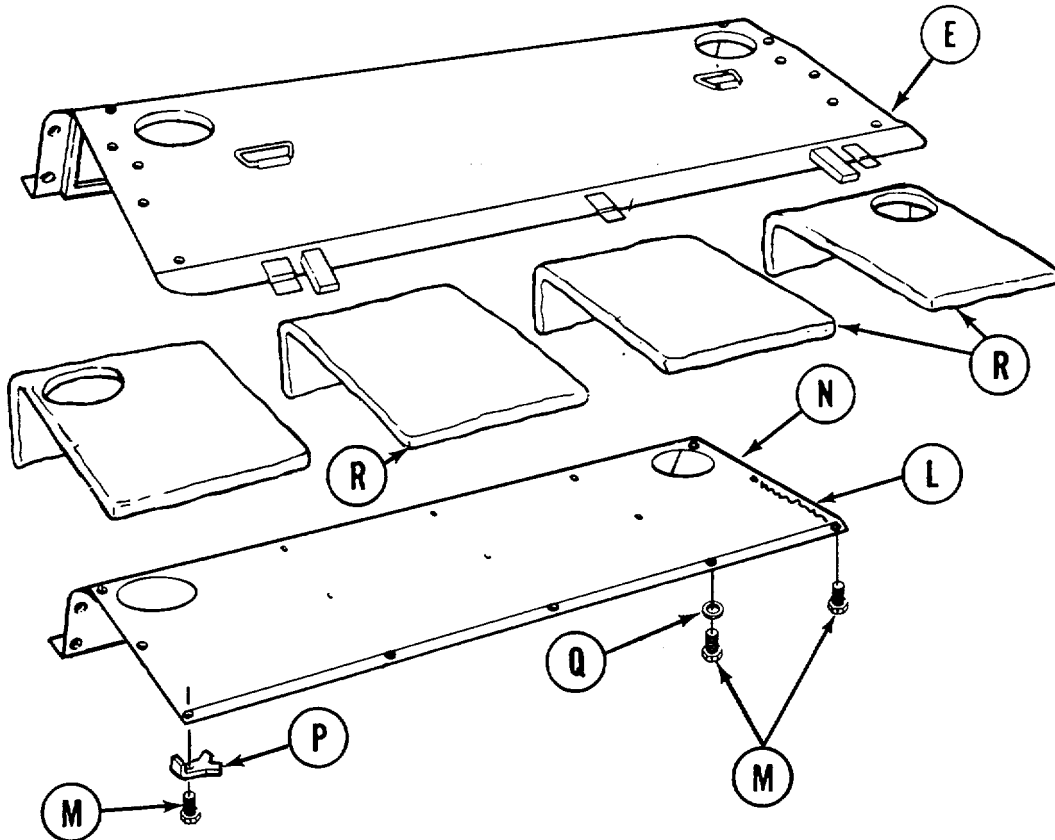
- Remove retainer (D) from shroud (E).
- Remove seal assembly (F) from shroud (E).
- Using 7/16 inch socket and 7/16 inch wrench, remove five screws (G), ten flat washers (H), and five self-locking nuts (J) holding seal (K) to transmission shroud (E) from both right and left sides. Throw self-locking nuts away.
- Remove seal assembly (K) from shroud (E).

Go on to Sheet 3

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**TRANSMISSION SHROUD REPAIR (Sheet 3 of 6)**

6. Using diagonal cutting plies, remove lockwire (L) from 25 screws (M) on back side of retainer (N).
7. Using hammer and chisel, bend tabs on four key washers (P) away from screw head.

**NOTE**

**If desired speeder brace may be used to remove screws (M).**

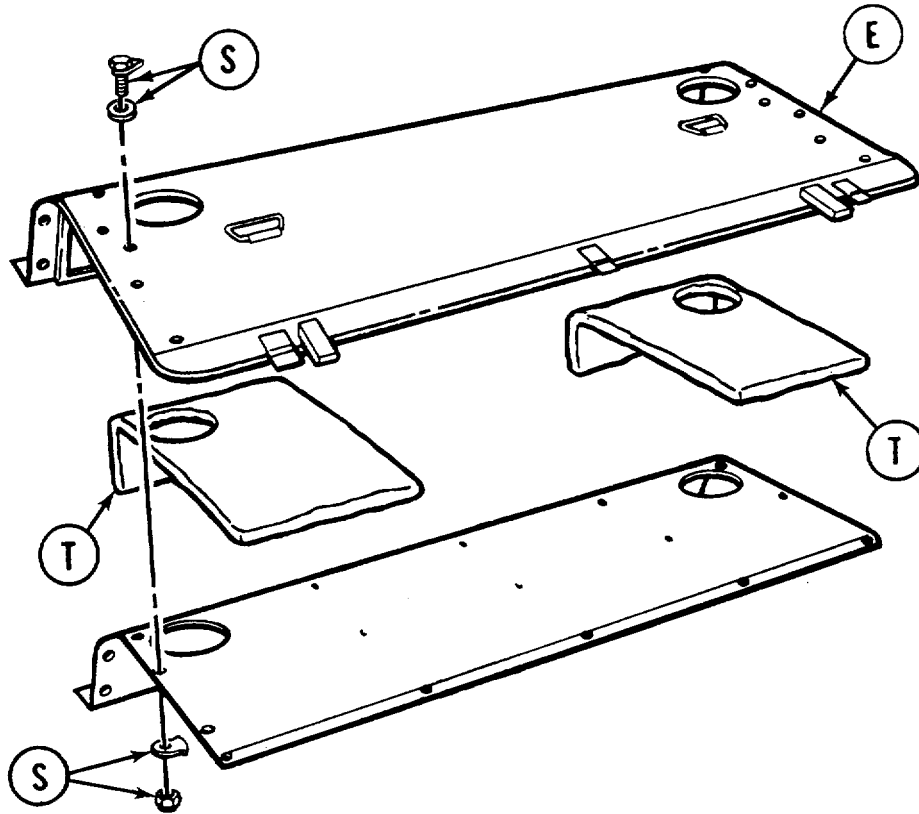
8. Using 7/16 inch socket, remove 25 screws (M), four key washers (P), and 21 flat washers (Q) holding retainer (N) to shroud (E). Throw key washers away.
9. Remove retainer (N) from shroud (E).
10. Remove insulation (R) from shroud (E).

Go on to Sheet 4

TA146874

**TRANSMISSION SHROUD REPAIR (Sheet 4 of 6)**

11. Using 3/4 inch socket and 3/4 inch wrench, remove three turnlock fasteners (S) from both sides of shroud (E). Throw self-locking nut away.
12. Using putty knife, remove insulation (T) from shroud (E).

**CLEANING AND INSPECTION:**

1. Using dry cleaning solvent (Item 54, Appendix D) and rags (Item 65, Appendix D), clean all parts of transmission shroud.
2. Inspect assembly for worn or damaged parts.
3. Replace faulty parts.

Go on to Sheet 5

TA146875

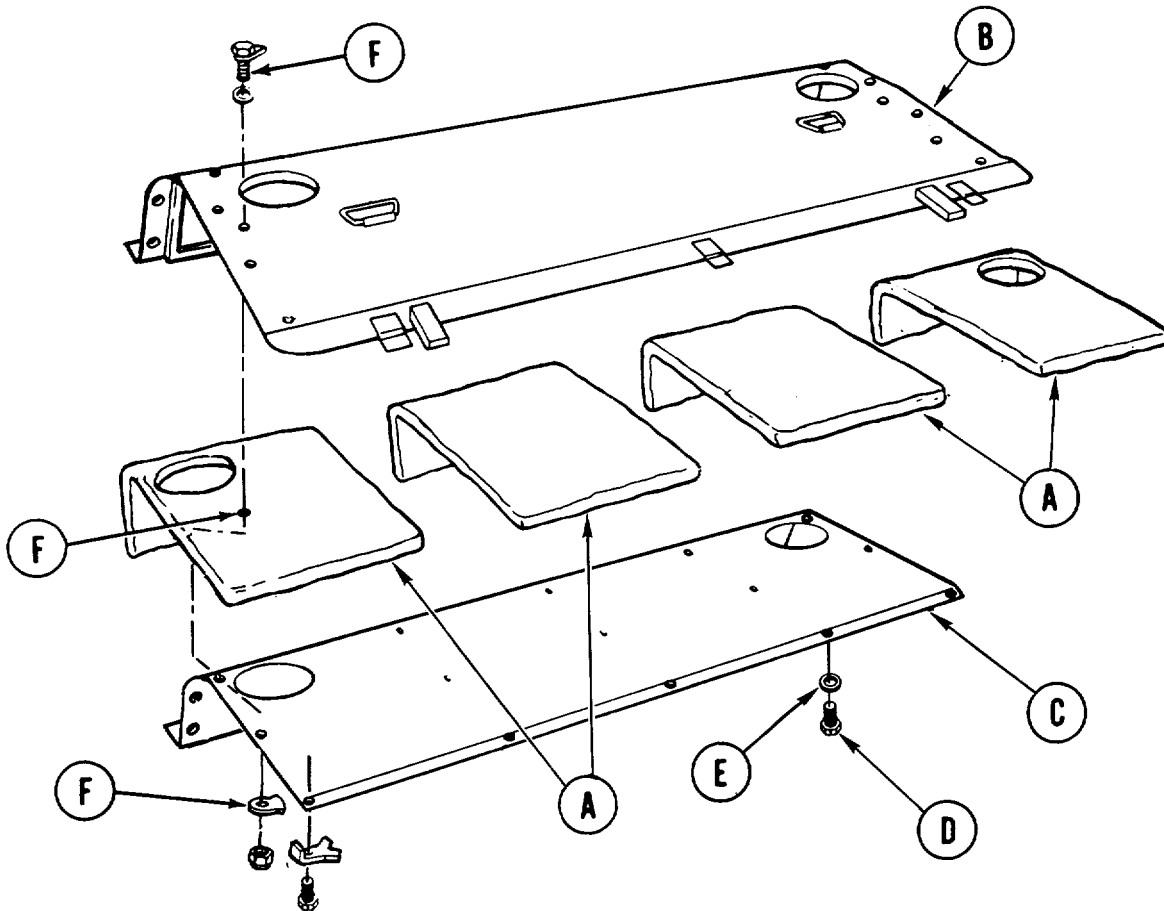
**TRANSMISSION SHROUD REPAIR (Sheet 5 of 6)****ASSEMBLY:**

1. Position insulation (A) on shroud (B).
2. Using 7/16 inch socket install retainer (C) to shroud with 25 screws (D), 21 washers (E), and 4 new key washers. Be sure to position 4 key washers properly and bend tabs with chisel and hammer.

**NOTE**

**Both parts of turnlock fasteners must be pointing in same direction.**

3. Using 3/4 inch socket and 3/4 inch wrench, install three turnlock fasteners (F) to both sides of shroud (B). Use new self-locking nuts.



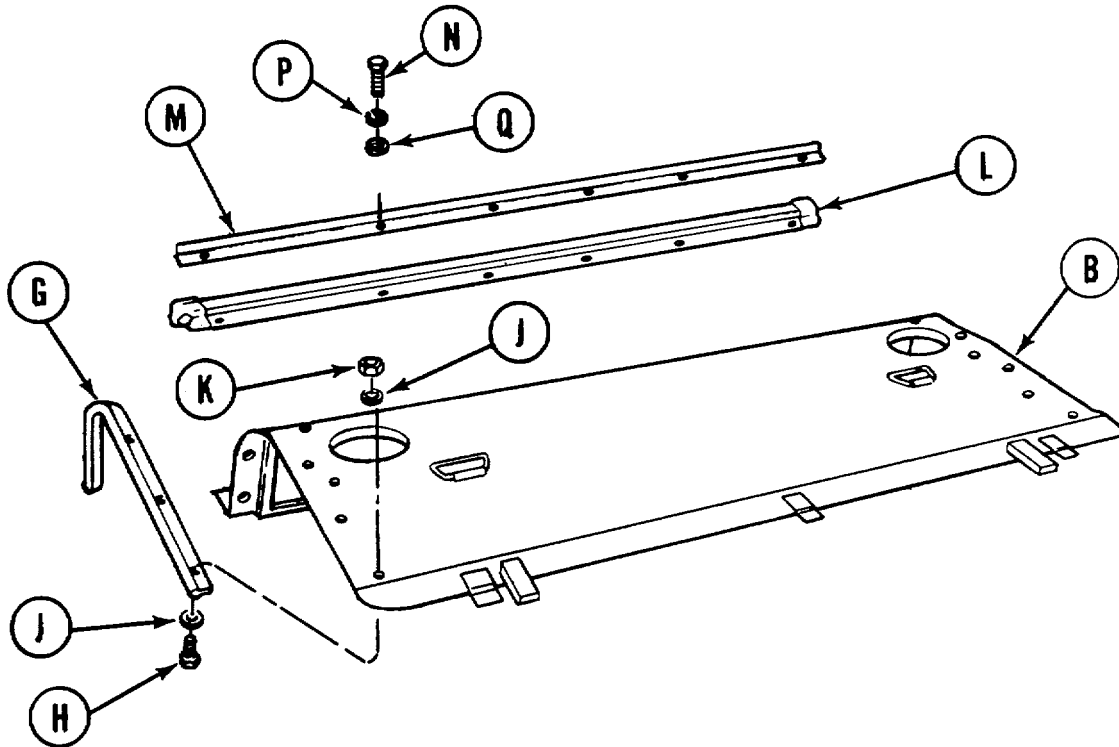
Go on to Sheet 6

TA146876



**TRANSMISSION SHROUD REPAIR (Sheet 6 of 6)**

4. Using slip joint piers, install new lockwire (Item 59, Appendix D) in 25 screws (D) (page 38, Appendix C).
5. Using 7/16 inch socket and 7/16 inch wrench, install seal (G) to shroud (B) on each side with five screws (H), ten flat washers (J), and five new self-locking nuts (K).



6. Position seal (L) and retainer (M) to shroud (B) with six screws (N), new lockwashers (P), and flat washers (Q).
7. Using 7/16 inch socket, tighten six screws (N).
8. Install transmission shroud (page 9-23).

**TRANSMISSION SHROUD BRACKET REPAIR (Sheet 1 of 6)**

PROCEDURE INDEX

PROCEDURE	PAGE
Disassembly	9-32
Assembly	9-35

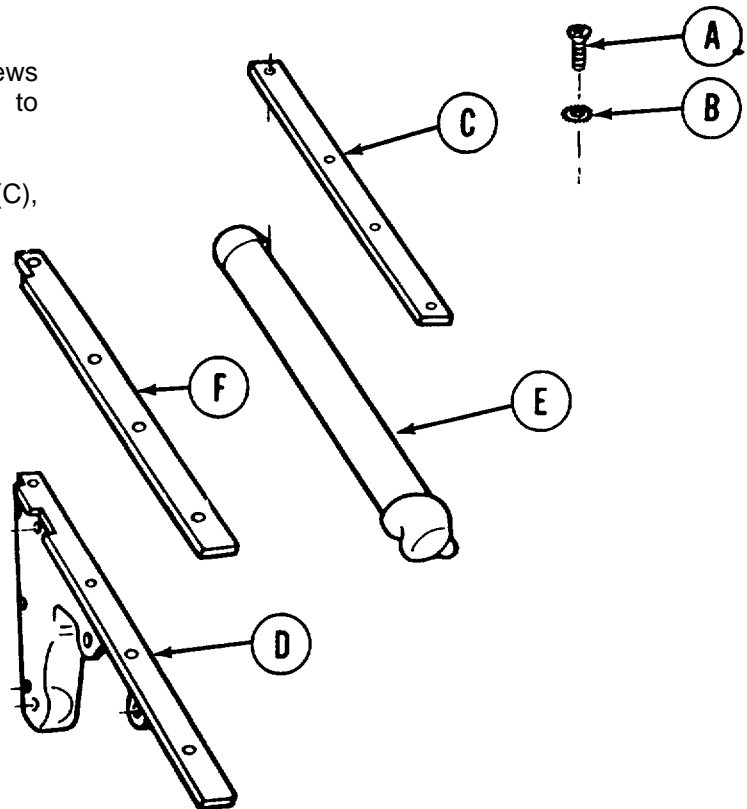
TOOLS: Putty knife  
 Ratchet with 1/2 in. drive  
 7/16 in. socket with 1/2 in. drive  
 Cross-tip screwdriver, No. 2  
 Flat-tip screwdriver

SUPPLIES: Dry cleaning solvent (Item 54, Appendix D)  
 Silicone adhesive (Item 7, Appendix D)  
 Rags (Item 65, Appendix D)  
 Lockwasher (MS35338-25) ( required)  
 Lockwasher (MS35336-26) (2 required)  
 Lockwasher (MS35336-27) (7 required)

PRELIMINARY PROCEDURE: Remove shroud support (page 9-38)

DISASSEMBLY:

- Using cross-tip screwdriver, remove four screws (A) and lockwashers (B) holding retainer (C) to bracket (D). Throw lockwashers away.
- Using flat-tip screwdriver, remove retainer (C), seal (E), and retainer (F) from bracket (D).

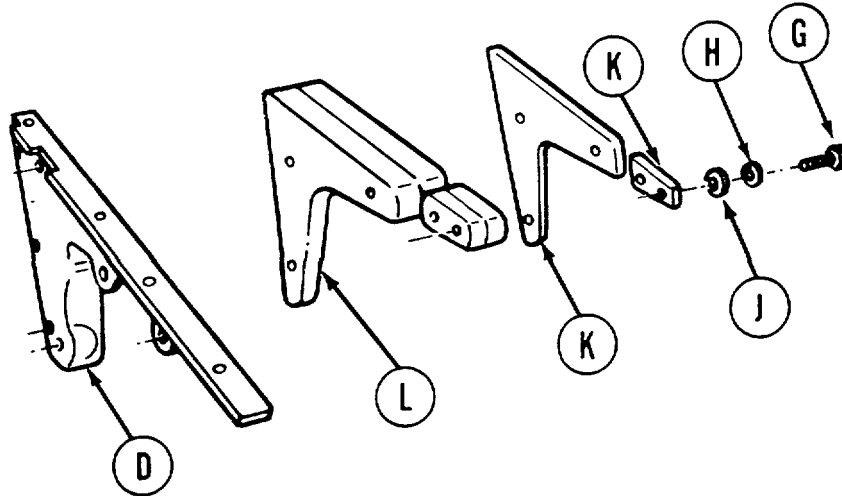


Go on to Sheet 2

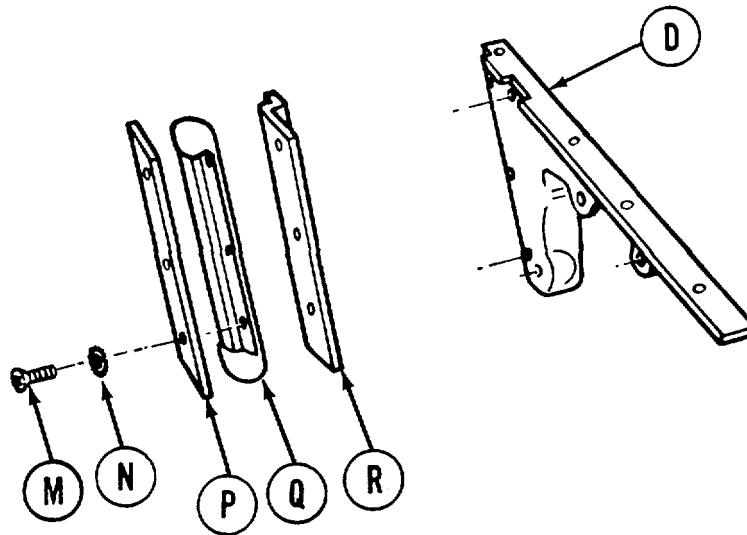
TA146878

**TRANSMISSION SHROUD BRACKET REPAIR (Sheet 2 of 6)**

3. Using socket, remove five screws (G), lockwashers (H), and flat washers (J) securing retainers (K) to shroud bracket (D). Throw lockwashers away.
4. Remove retainers (K) and side insulation (L) from shroud bracket (D).



5. Using cross-tip screwdriver, remove three screws (M) and lockwashers (N) securing retainer (P) to shroud bracket (D). Throw lockwashers away.
6. Using flat-tip screwdriver, remove retainer (P), seal (Q), and retainer (R) from shroud bracket (D).

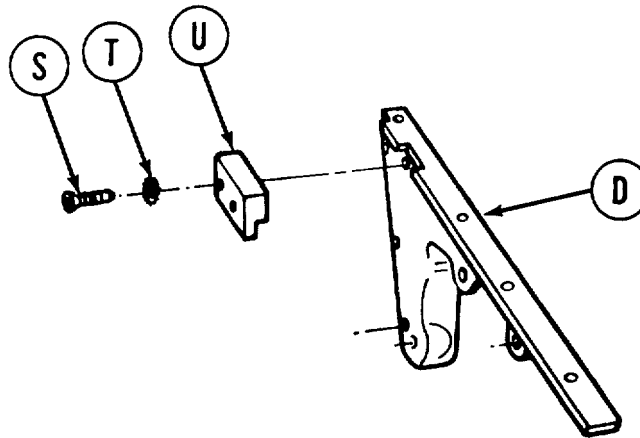


Go on to Sheet 3

TA146879

**TRANSMISSION SHROUD BRACKET REPAIR (Sheet 3 of 6)**

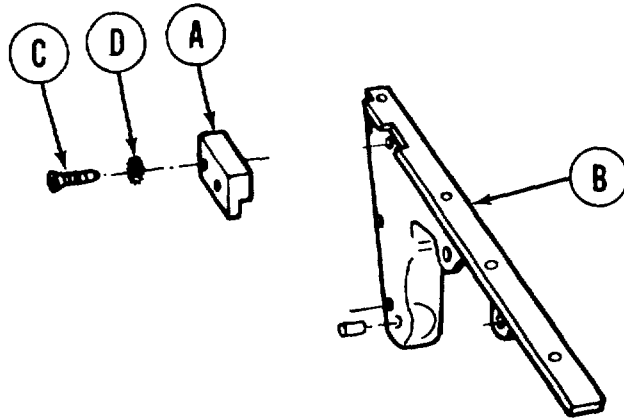
7. Using cross-tip screwdriver, remove two screws (S) and lockwashers (T) holding pad (U) to shroud bracket (D). Throw lockwashers away.



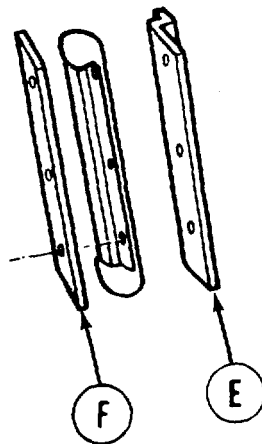
8. Using putty knife, dry cleaning solvent (Item 54, Appendix D), and rags (Item 65, Appendix D), clean insulation from shroud bracket (D).

**TRANSMISSION SHROUD BRACKET REPAIR (Sheet 4 of 6)****ASSEMBLY:**

1. Install pad (A) to shroud bracket (B), using two screws (C) and new lockwashers (D).
2. Using cross-tip screwdriver, tighten screws (C).



3. Using putt knife, apply adhesive (Item 7, Appendix D) to retainers (E) and (F).

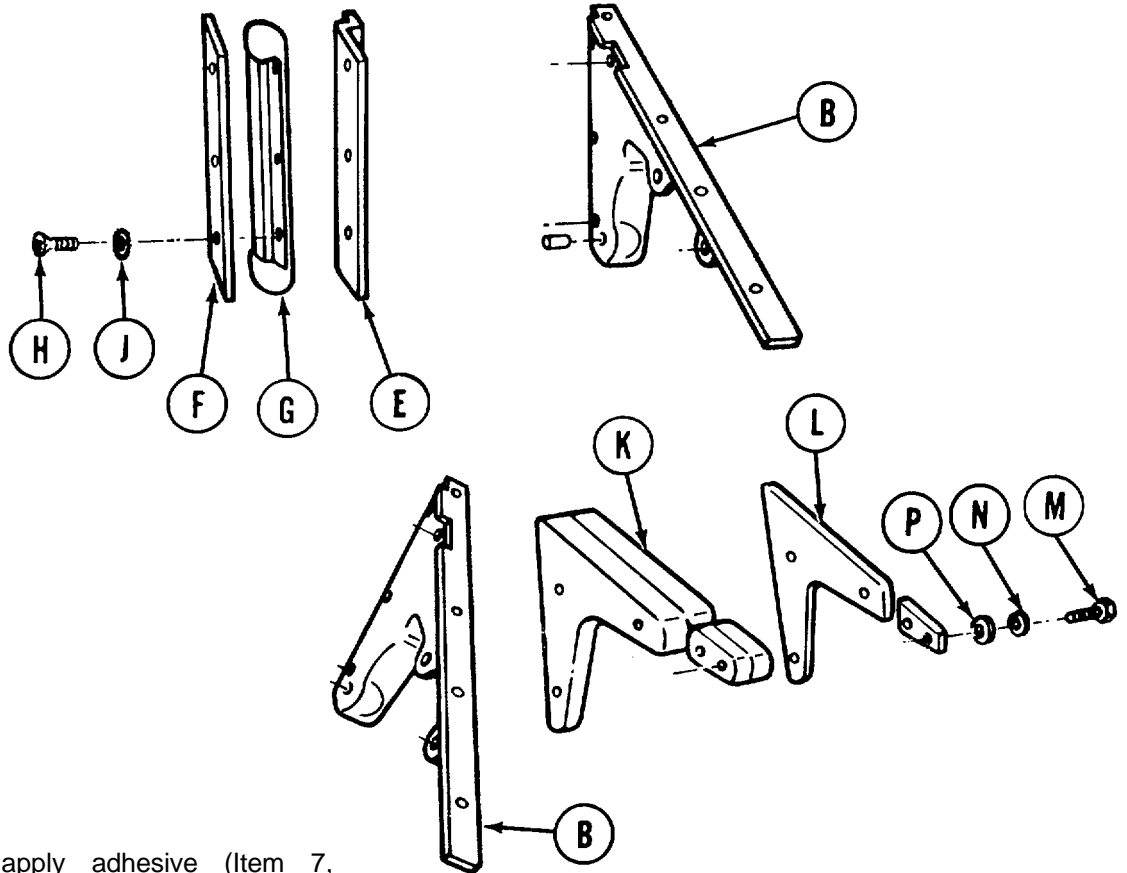


Go on to Sheet 5

TA146881

**TRANSMISSION SHROUD BRACKET REPAIR (Sheet 5 of 6)**

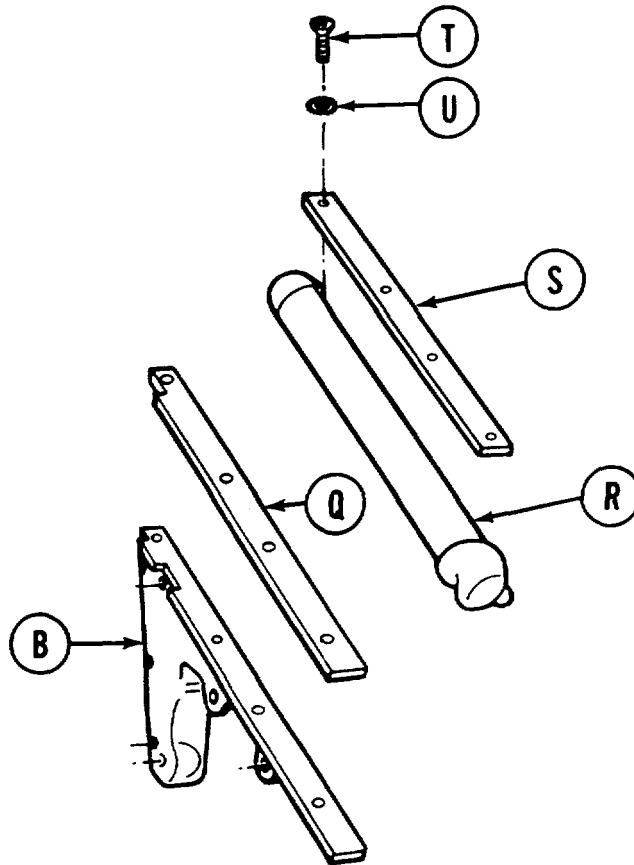
4. Install retainer (E), seal (G), and retainer (F) to bracket (B), using three screws (H) and new lockwashers (J).
5. Using cross-tip screwdriver, tighten screws (H).



6. Using putty knife, apply adhesive (Item 7, Appendix D) to shroud bracket (B) to hold insulation (K).
7. Install insulation (K) and retainers (L) to shroud bracket (B) using five screws (M), new lockwashers (N), and fiat washers (P).
8. Using socket, tighten screws (M).

**TRANSMISSION SHROUD BRACKET REPAIR (Sheet 6 of 6)**

9. Using putty knife, apply adhesive (Item 7, Appendix D) to retainer (Q) to hold seal (R).
10. Install retainer (Q), seal (R), and retainer (S) to bracket (B), using four screws (T) and new lockwashers (U).
11. Using cross-tip screwdriver, tighten screws (T).
12. Install shroud support (page 9-38).



End of Task

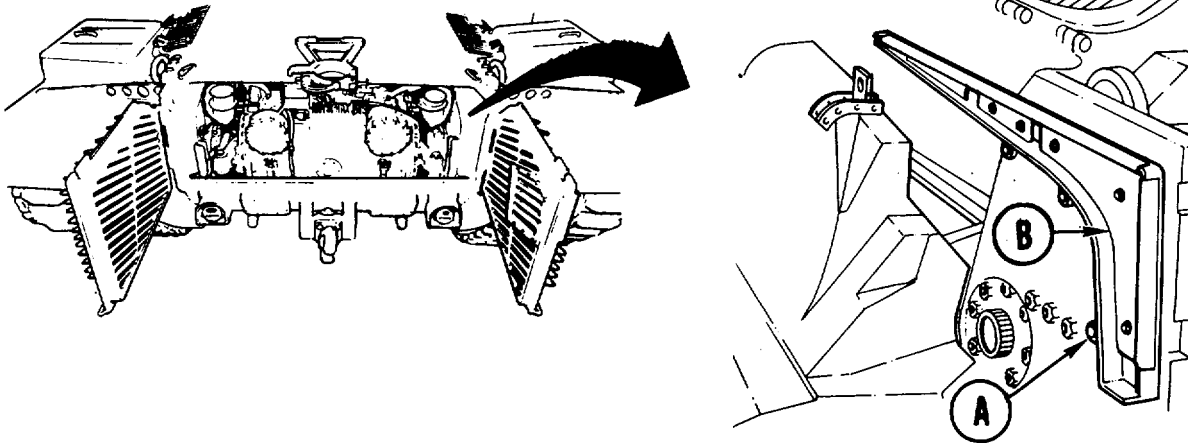
TA146883

**TRANSMISSION SHROUD SUPPORTS (LEFT AND RIGHT) REPLACEMENT (Sheet 1 of 1)**

TOOLS: Ratchet with 1/2 in. drive  
 9/16 in. socket with 1/2 in. drive  
 2 in. extension with 1/2 in. drive

SUPPLIES: Lockwasher (MS35338-46) (3 required)

PRELIMINARY PROCEDURE: Remove transmission shroud (page 9-20)

**REMOVAL:**

1. Using socket, remove three screws, washers, and lockwashers (A) holding (left or right) supports (B) to hull wall. Throw lockwashers away.
2. Remove supports from tank.

**INSTALLATION:**

1. Position supports (B) (left or right) on hull wall bracket and attach supports with three screws, washers, and new lockwashers (A).
2. Using socket, tighten three screws, washers, and lockwashers (A).
3. Install transmission shroud (page 9-23).

End of Task

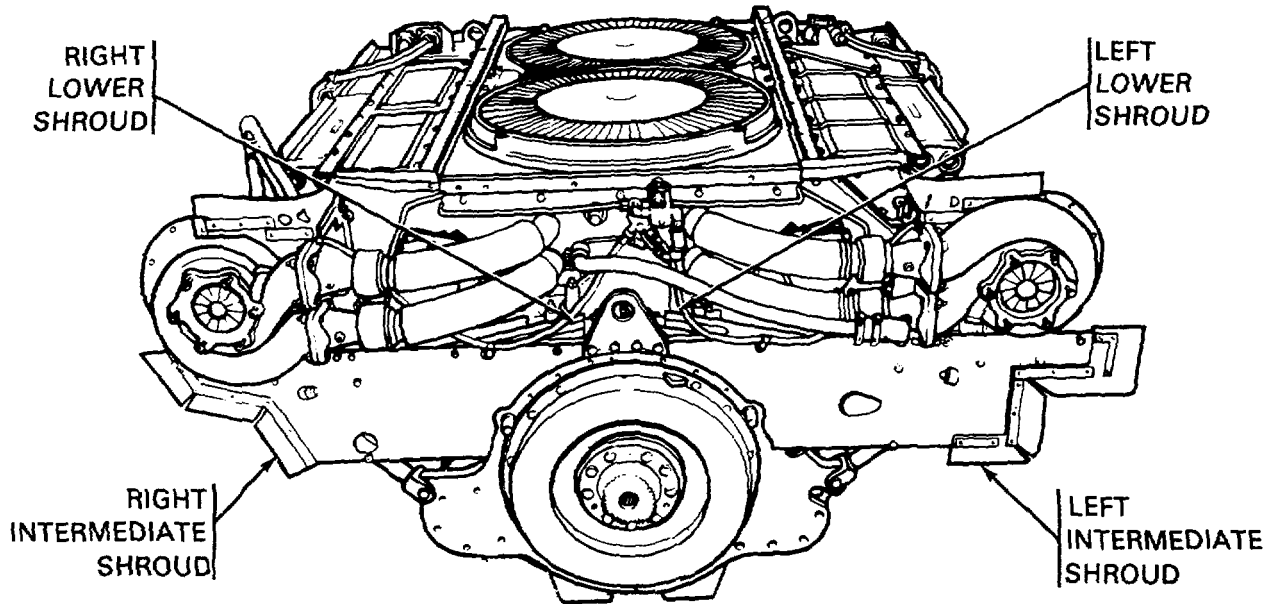
TA146884



**TRANSMISSION SHROUDS REPLACEMENT (Sheet 1 of 8)**

PROCEDURE INDEX

PROCEDURE	PAGE
Right Intermediate Shroud Replacement	9-39
Lower Shroud Replacement	9-44
Left Intermediate Shroud Replacement	9-46



**Right Intermediate Shroud Replacement**

PROCEDURE INDEX

PROCEDURE	PAGE
Removal	9-40
Installation	9-42

TOOLS: 1/2 in. socket with 1/2 in. drive  
 Ratchet with 1/2 in. drive  
 1/2 in. combination box and open end wrench  
 Spanner wrench

PRELIMINARY PROCEDURE: Remove powerplant (page 5-1)

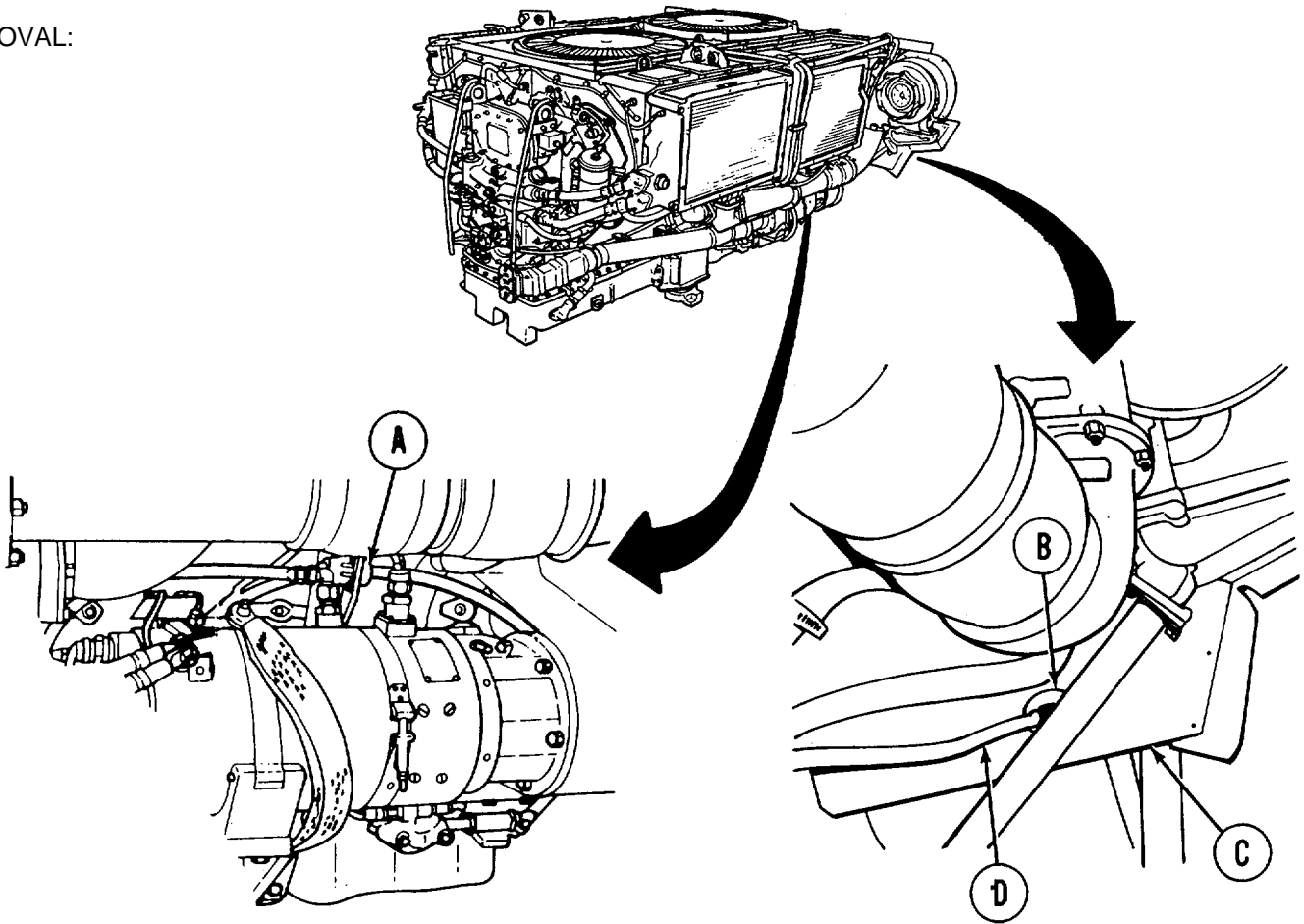
Go on to Sheet 2

TA146885

## TRANSMISSION SHROUDS REPLACEMENT (Sheet 2 of 8)

## Right Intermediate Shroud Replacement

## REMOVAL:



## NOTE

When removing the right intermediate shroud on a 2A engine, remove engine wiring harness according to page 10-338, steps 1 thru 7 and proceed to step 5 of this procedure. When removing the rigid intermediate shroud on a 2D engine, start with step 1 of this procedure.

1. Using spanner wrench, disconnect connector (A) from generator connector.
2. Remove grommet (B) from shroud (C) and cable assembly (D).
3. Inspect grommet (B) for defects. If defective, replace grommet.
4. Pull cable assembly (D) through shroud (C).

Go on to Sheet 3

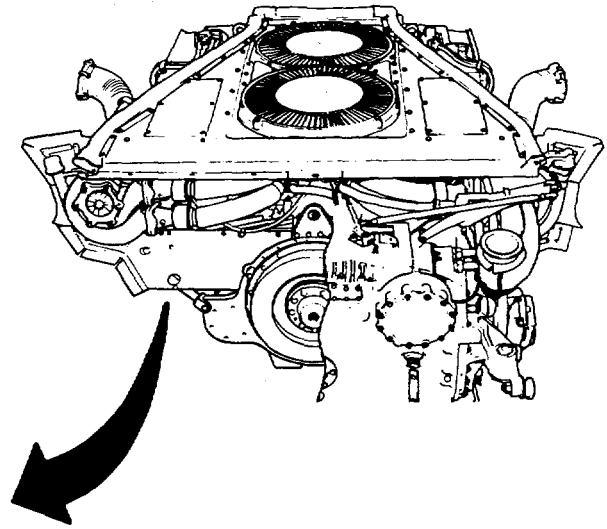
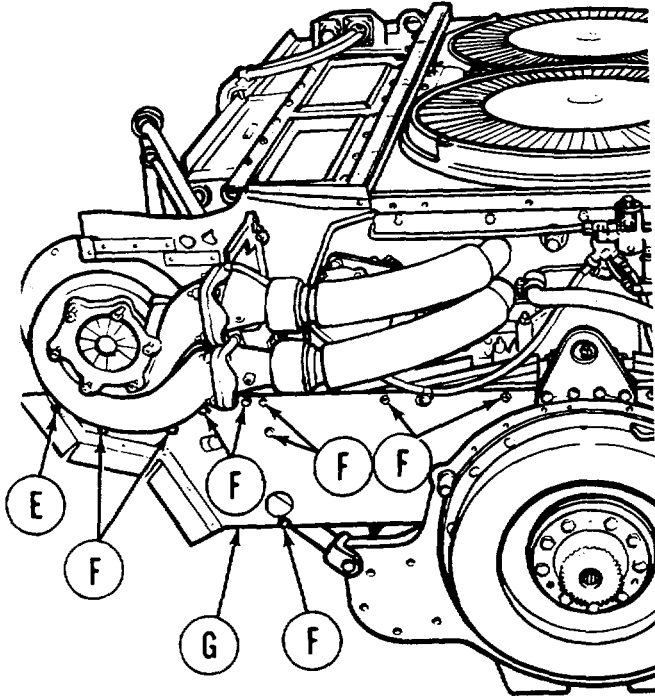
TA146886

## TRANSMISSION SHROUDS REPLACEMENT (Sheet 3 of 8)

## Right Intermediate Shroud Replacement

## NOTE

Intermediate shroud is located between transmission and engine.



5. Using socket and wrench, remove assembled washer bolt (E).
6. Using socket or wrench, remove nine assembled washer bolts (F).
7. Remove intermediate shroud (G).

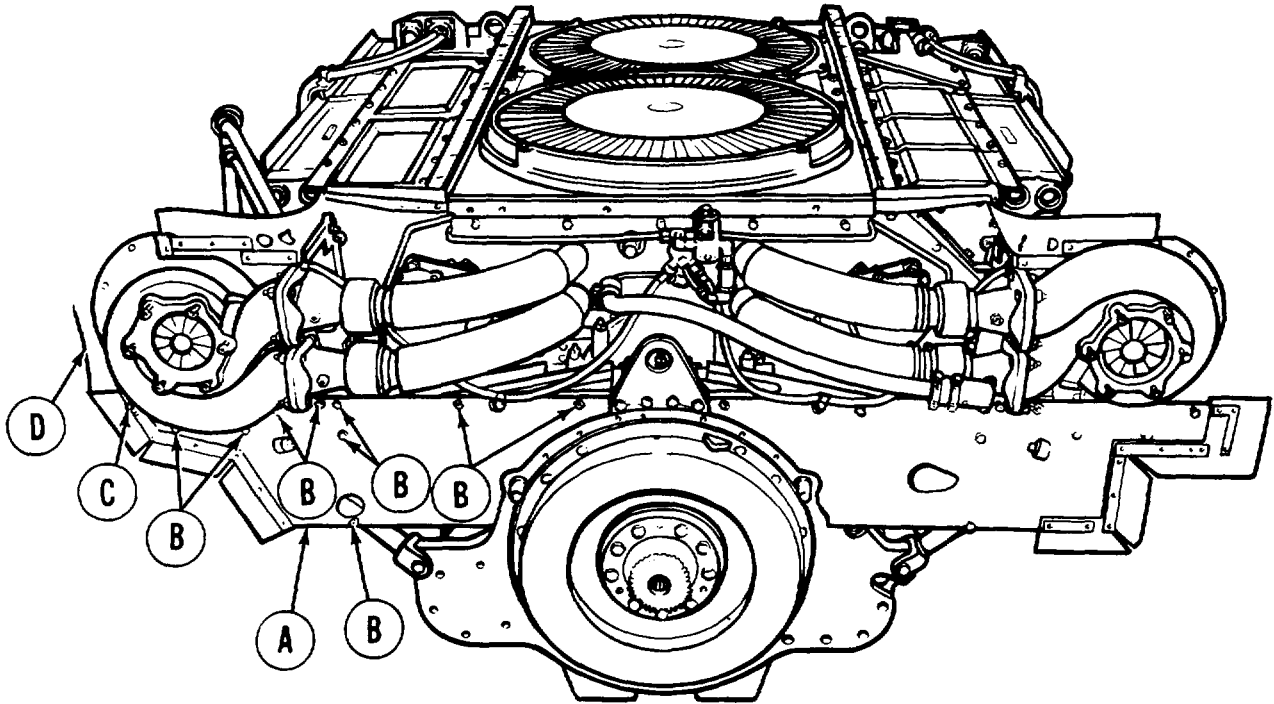
Go on to Sheet 4

TA146887

## TRANSMISSION SHROUDS REPLACEMENT (Sheet 4 of 8)

## Right Intermediate Shroud Replacement

## INSTALLATION:



## NOTE

**When installing the right intermediate shroud on a 2A engine, perform steps 1 thru 4 and proceed to page 10-344, step 1 and steps 22 thru 28. When installing the right intermediate shroud on 2D engine, start with step 1 of this procedure.**

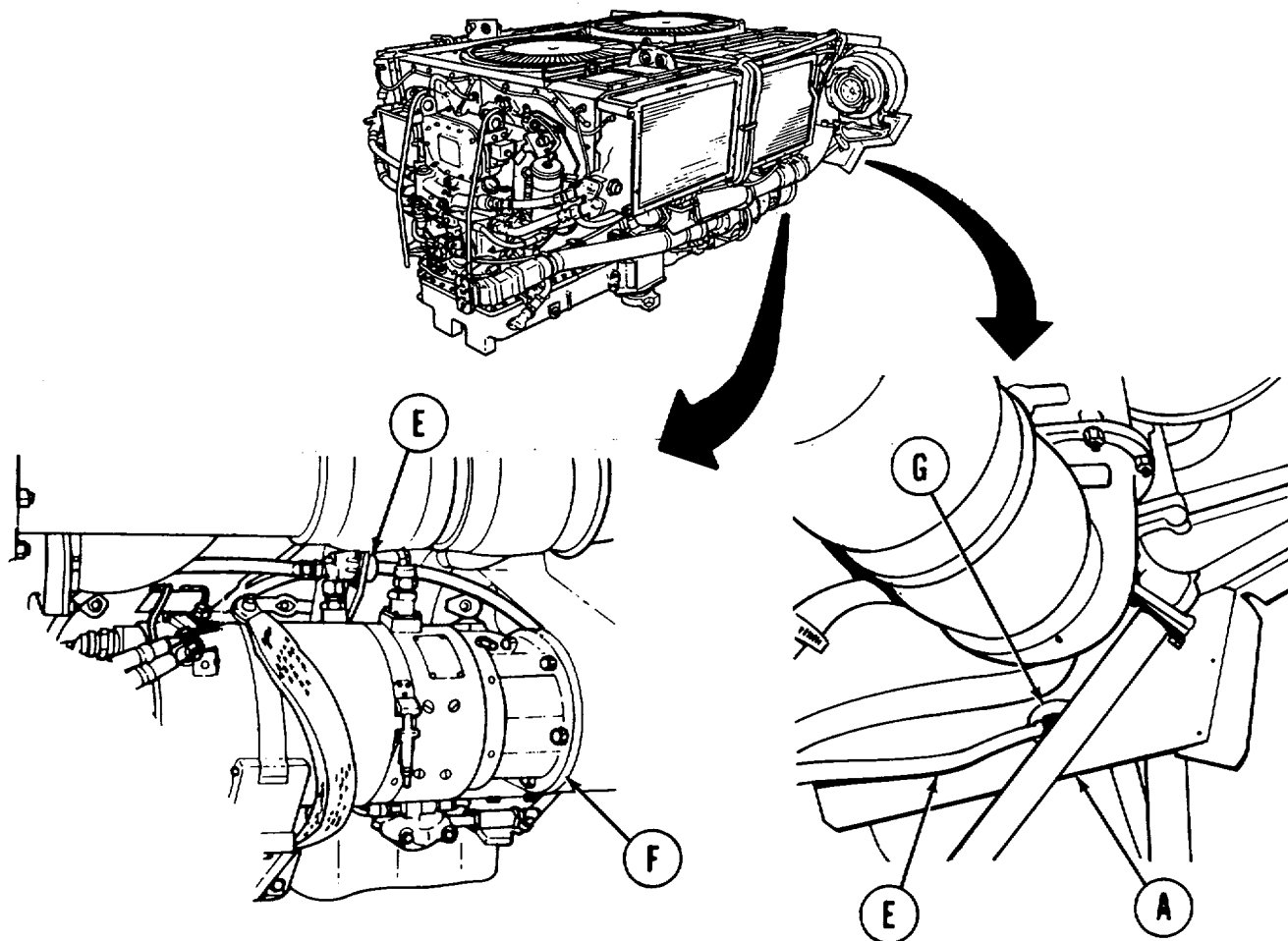
1. Position intermediate shroud (A) into place on engine.
2. Install nine assembled washer bolts (B) to secure intermediate shroud (A) to engine.
3. Install assembled washer bolt (C) to secure intermediate shroud (A) to turbocharger shroud (D).
4. Using socket and wrench, tighten bolts (B) and (C).

Go on to Sheet 5

TA146888

## TRANSMISSION SHROUDS REPLACEMENT (Sheet 5 of 8)

## Right Intermediate Shroud Replacement



5. Install cable assembly (E) through intermediate shroud (A).
6. Route cable assembly (E) to generator (F).
7. Using spanner wrench, connect cable assembly (E) connector to generator (F) connector.
8. Install grommet (G) around cable assembly (E) and into intermediate shroud (A).
9. Install 2A powerplant (page 5-14) or 2D powerplant (page 5-40).

End of Task

TA146889

**TRANSMISSION SHROUDS REPLACEMENT (Sheet 6 of 8)**

**Lower Shroud Replacement (Sheet 1 of 2)**

TOOLS: 1/2 in. socket with 1/2 in. drive  
 Ratchet with 1/2 in. drive  
 1/2 in. combination box and open end wrench  
 6 in. flat-tip screwdriver  
 2 in. fiat-tip screwdriver

PRELIMINARY PROCEDURES: Remove powerplant (page 5-1)  
 Remove engine shroud (page 9-2)

**NOTE**

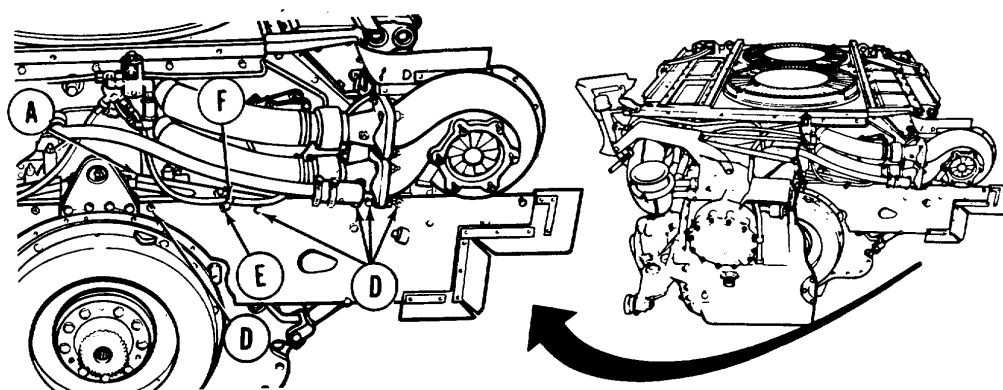
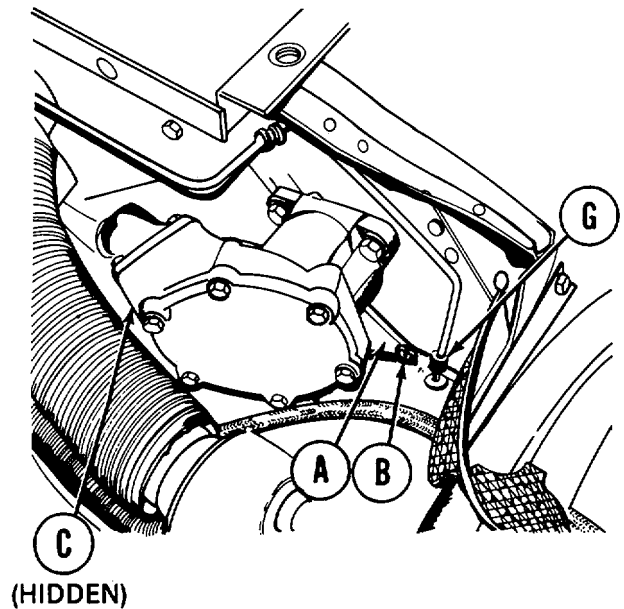
Replacement of right and left lower shrouds (A) is similar. Left lower shroud (A) is shown.

**NOTE**

When lower shroud is removed, grommet (G) may come out with it or stay on fuel return line.

**REMOVAL:**

1. Using 2 inch screwdriver, remove screw (B).
2. Using 6 inch screwdriver, remove screw (C).
3. Using socket or wrench, remove five screws and washers (D).
4. Using socket or wrench, remove screw and washer (E) securing clamp (F).
5. Remove lower shroud (A). Be careful not to damage fuel return line when removing shroud (A).
6. Inspect grommet (G) for tears or deterioration. Replace if defective.

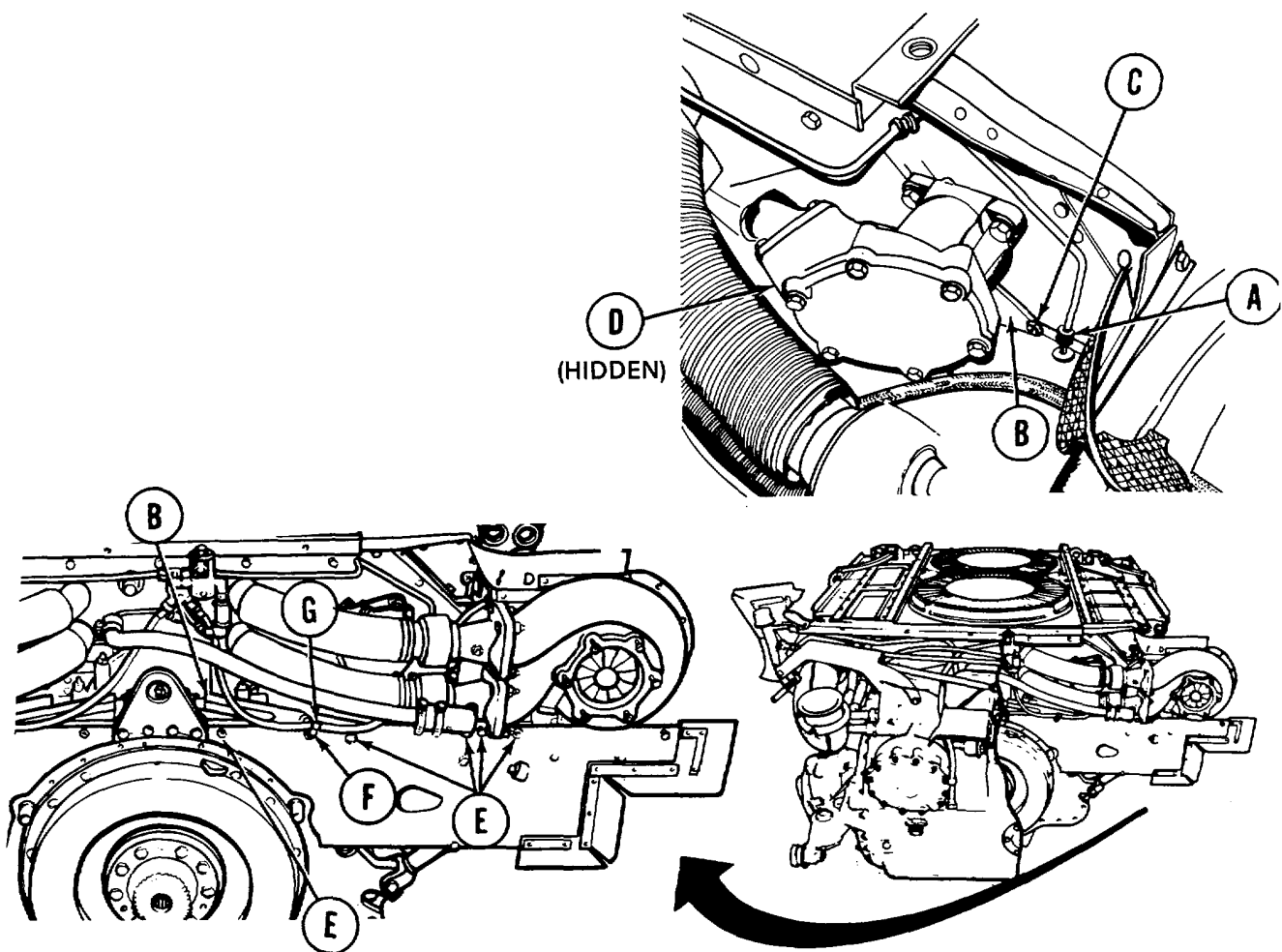


Go on to Sheet 2

TA146890

**TRANSMISSION SHROUDS REPLACEMENT (Sheet 7 of 8)****Lower Shroud Replacement****INSTALLATION:**

1. Position grommet (A) on fuel line.
2. Position lower shroud (B) in place on engine and on grommet (A).
3. Using 2 inch screwdriver, install screw (C).
4. Using 6 inch screwdriver, install screw (D).
5. Using 1/2 inch socket or wrench, install five screws and washers (E).
6. Using 1/2 inch socket or wrench, install screw and washer (F) securing clamp (G).
7. Install engine shroud (page 9-3).
8. Install 2A powerplant (page 14) or 2D powerplant (page 5-4).



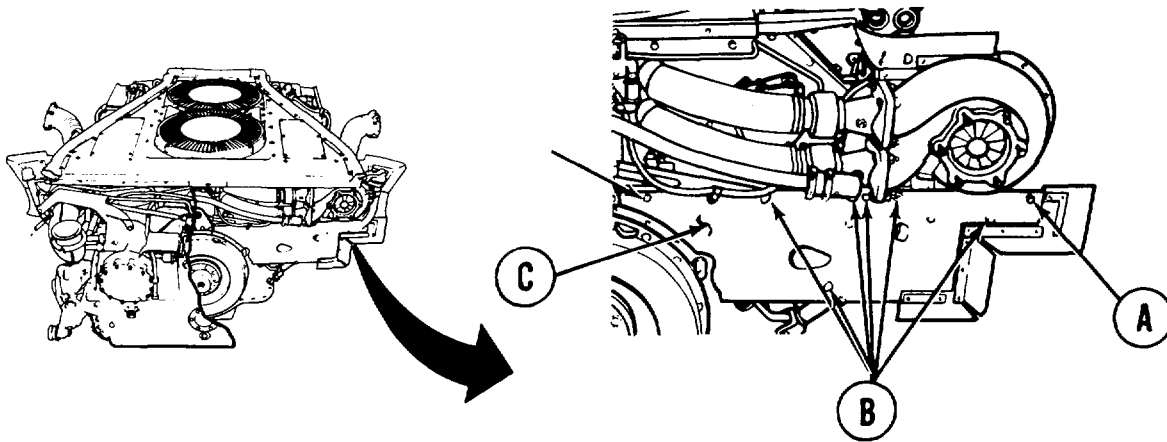
End of Task

TA146891

**TRANSMISSION SHROUDS REPLACEMENT (Sheet 8 of 8)****Left Intermediate Shroud Replacement**

TOOLS: 1/2 in. socket with 1/2 in. drive  
 Ratchet with 1/2 in. drive  
 1/2 in. combination box and open end wrench

PRELIMINARY PROCEDURES: Remove powerplant (page 5-1)  
 Remove oil filler (upper) tube (page 6-41)

**REMOVAL:**

1. Using socket and wrench, remove assembled washer bolt (A).
2. Using wrench or socket, remove seven screws and washers (B) securing intermediate shroud (C) to engine.
3. Remove intermediate shroud (C).

**INSTALLATION:**

1. Position intermediate shroud (C) into place on engine.
2. Install seven screws and washers (B) to secure intermediate shroud (C) to engine.
3. Install assembled washer bolt (A).
4. Using wrench and socket, tighten screws (A) and (B).
5. Install engine oil filler tube (page 6-43).
6. Install 2A powerplant (page 5-14) or 2D powerplant (page 5-40).

End of Task

TA146892



**ENGINE COOLING FAN REPLACEMENT (Sheet 1 of 4)**

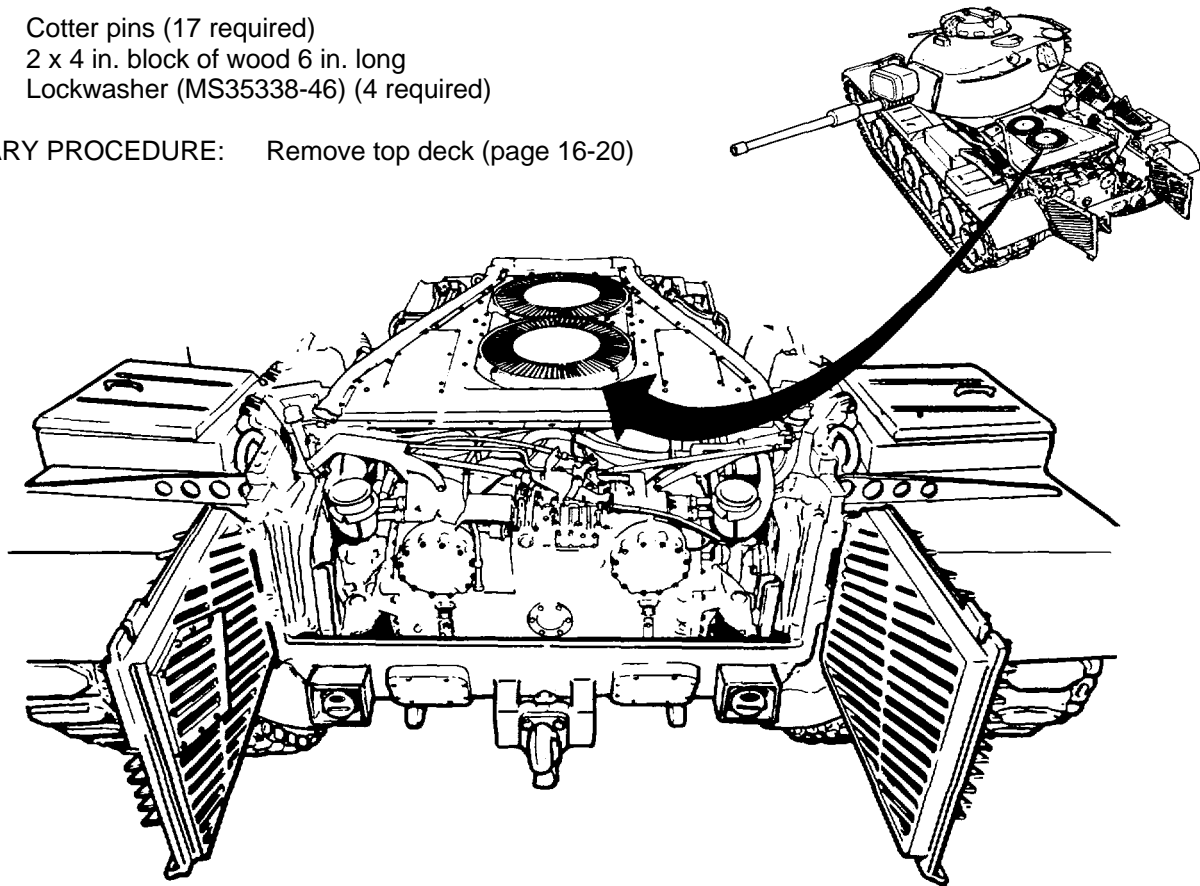
PROCEDURE INDEX

PROCEDURE	PAGE
Removal	9-48
Installation	9-49

- TOOLS:** Feeler gage  
 Torque wrench with 1/2 in. drive (0-175 ft-lb) (0-237 N•m)  
 Ratchet with 1/2 in. drive  
 9/16 in. socket with 1/2 in. drive  
 1/2 in. socket with 1/2 in. drive  
 1/2 in. combination box and open end wrench  
 Slip joint pliers  
 Hammer  
 1-1/4 in. socket with 1/2 in. drive

- SUPPLIES:** Cotter pins (17 required)  
 2 x 4 in. block of wood 6 in. long  
 Lockwasher (MS35338-46) (4 required)

**PRELIMINARY PROCEDURE:** Remove top deck (page 16-20)



## ENGINE COOLING FAN REPLACEMENT (Sheet 2 of 4)

## CAUTION

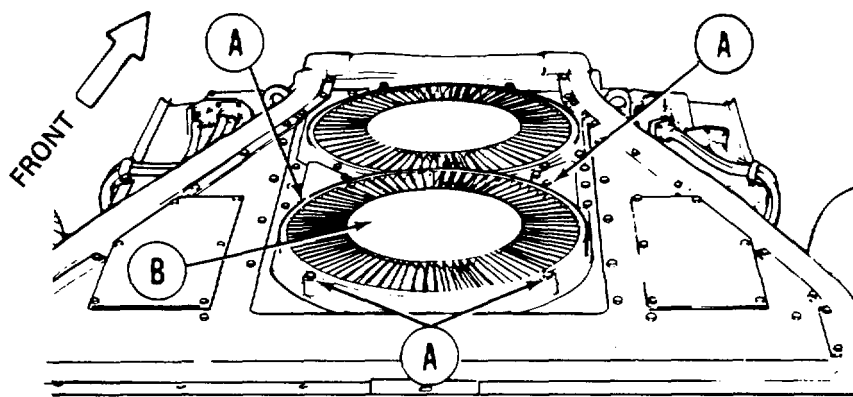
Do not drop screws and lockwashers into fan assembly.

## NOTE

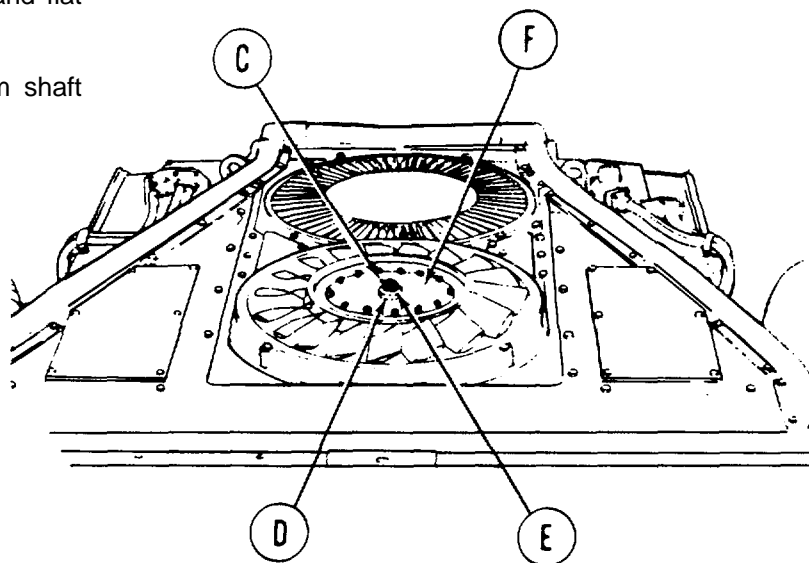
Both engine cooling fans are replaced the same.

## REMOVAL:

1. Using 9/16 inch socket, remove four screws and lockwashers (A) holding fan cover (B) to engine. Throw lockwashers away.
2. Remove fan cover a).



3. Using slip joint pliers, remove cotter pin (C) and throw away.
4. Using 1-1/4 inch socket, remove hex nut and fiat washer (D) holding fan to shaft (E).
5. Remove assembled fan and hub (D) from shaft (E).

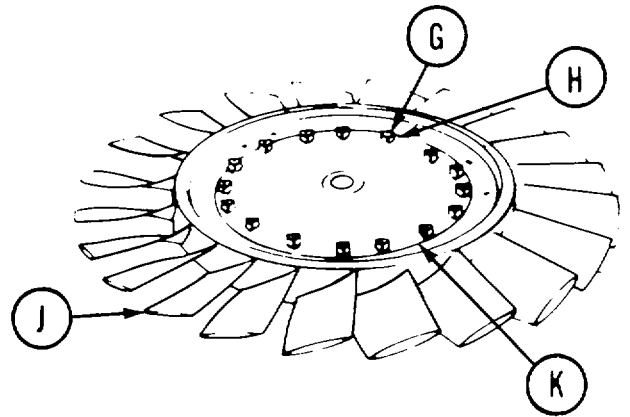


Go on to Sheet 3

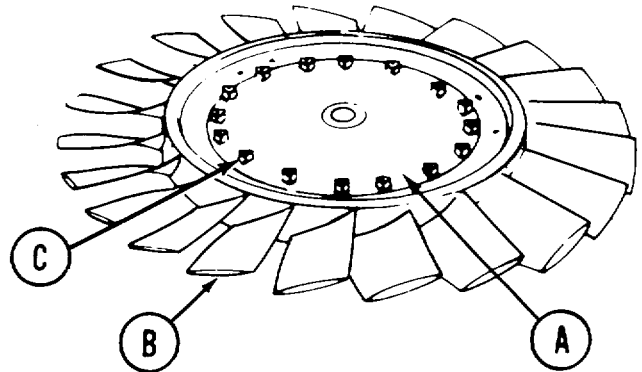
TA146894

**ENGINE COOLING FAN REPLACEMENT (Sheet 3 of 4)**

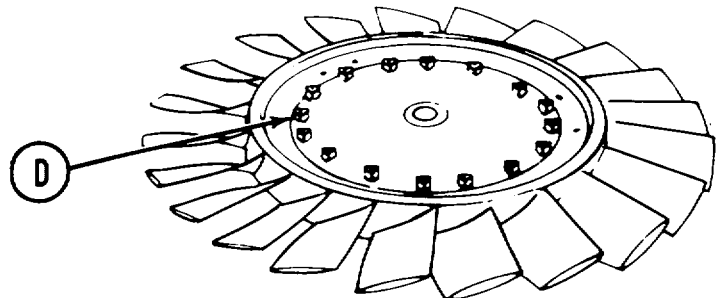
6. Using slip joint pliers, remove 16 cotter pins (G) and throw away.
7. Using 1/2 inch socket and wrench, remove 16 nuts, bolts, and washes (H) holding fan (J) to hub (K).
8. Place block of wood on hub (K). Using hammer, strike block wood until hub (K) is separated from fan (J).
9. Inspect hub (K) for damages. Replace hub if damaged.

**INSTALLATION:**

1. Position hub (A) on fan (B), machined surface up (marked TOP).
2. Using 1/2 inch socket and open end wrench, install 16 bolts, nuts, and washers (C). Using torque wrench, torque nut to 1-20 lb-ft (227 N•m).



3. Using slip joint pliers, install 16 new cotter pins (D).

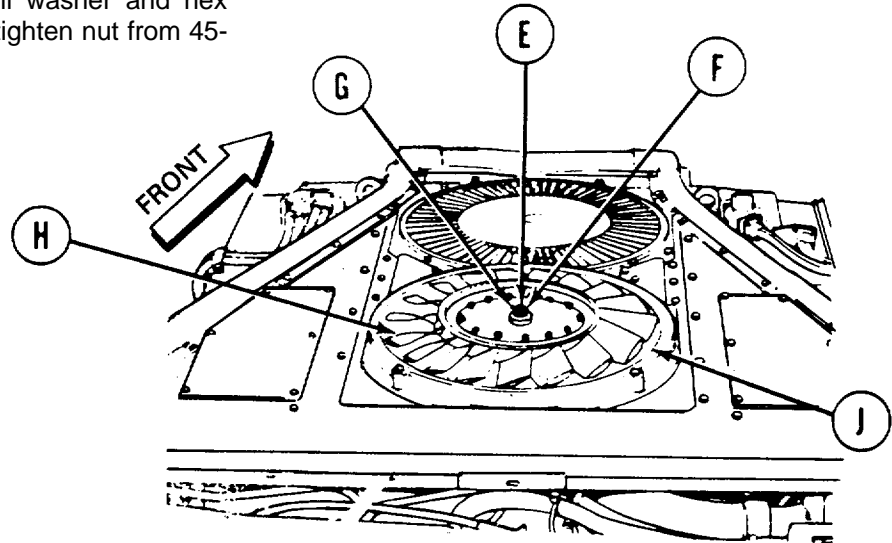


Go on to Sheet 4

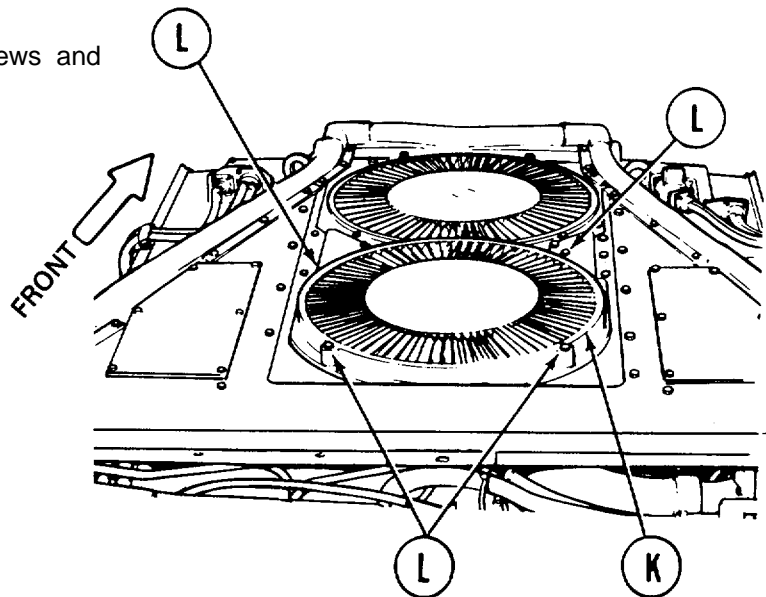
TA146895

**ENGINE COOLING FAN REPLACEMENT (Sheet 4 of 4)**

4. Install assembled fan and hub on shaft (E).
5. Using 1-1/4 inch socket, install washer and hex nut (F). Using torque wrench, tighten nut from 45-55 lb-ft (61-75 N•m).



6. Using feeler gage, check clearance between fan (H) and housing (J). If clearance is less than 0.62 inch all around, go to page 9-58, step 17, for adjustment procedures.
7. Using 1-1/4 inch socket and torque wrench, turn nut (F) clockwise and check that clutch releases (fan turns) between 20-25 ft-lb (27-34 N•m). If clutch does not release between 20-25 lb-ft (27-34 N•m), notify support maintenance.
8. Using slip joint pliers, install new cotter pin (G).
9. Position fan cover (K) over fans.
10. Using 9/16 inch socket, install four screws and new lockwashers (L).
11. Install top deck (page 16-22).



End of Task

TA146896

**ENGINE COOLING FAN SHROUD REPLACEMENT (Sheet 1 of 8)**

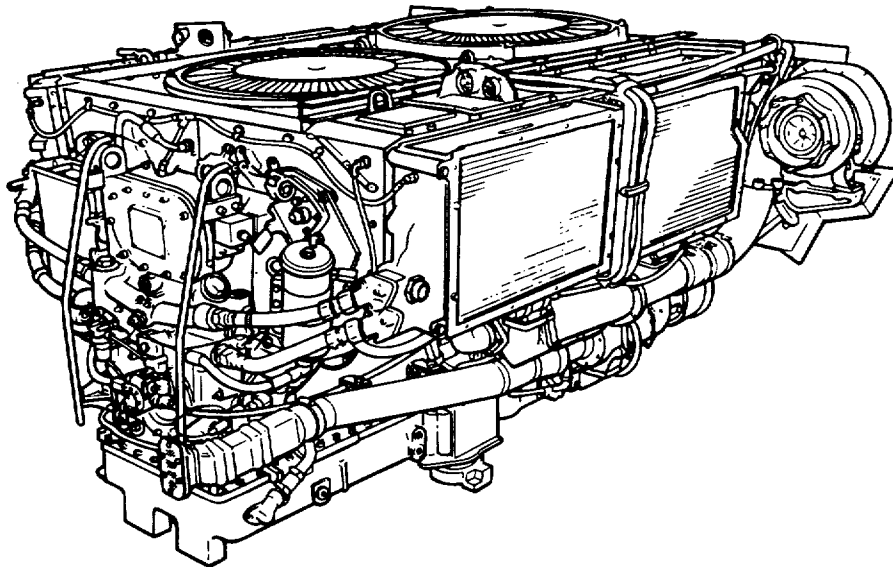
PROCEDURE INDEX

PROCEDURE	PAGE
Removal	9-52
Installation	9-55

TOOLS: Slip joint pliers  
 9/16 in. combination box and open end wrenches (2 required)  
 1/2 in. socket with 1/2 in. drive  
 3 in. extension with 1/2 in. drive  
 Ratchet with 1/2 in. drive  
 Thickness gage (feeler gage)  
 1-1/4 in. socket with 1/2 in. drive  
 1/2 in. combination box and open end wrench  
 Torque wrench with 1/2 in. drive (0-175 b-ft) (0-237 Nm)

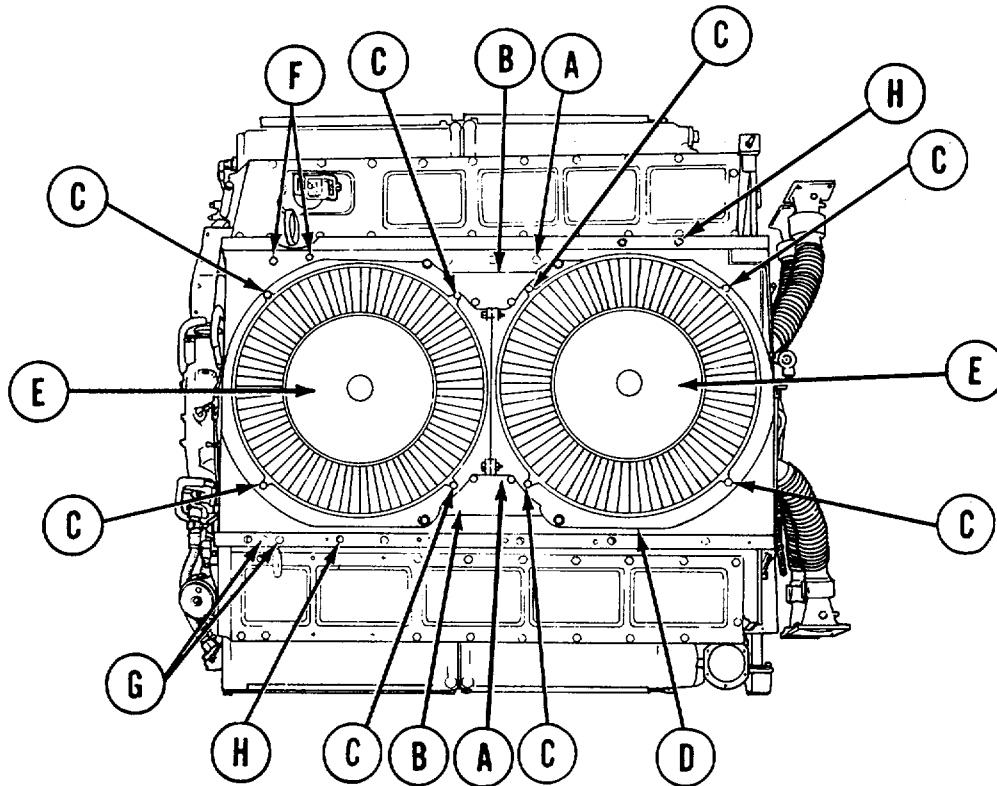
SUPPLIES: Cotter pin  
 Lockwasher (MS353348-46) (12 required)  
 Self-locking nut (MS21044N6) (2 required)

PRELIMINARY PROCEDURES: Remove powerplant (page 5-1)  
 Remove engine shroud supports (page 9-4)



**ENGINE COOLING FAN SHROUD REPLACEMENT (Sheet 2 of 8)****REMOVAL:**

1. Using 1/2 inch socket, remove ten bolts (A) securing two cover plates (B).
2. Remove two cover plates (B).
3. Using 9/16 inch socket, remove eight bolts and lockwashers (C) securing fan guards to shroud (D). Throw lockwashers away.
4. Remove fan guards (E) from shroud (D).



5. Using 1/2 inch socket, remove two bolts (F).

**NOTE**

**To gain access to bolts (G) and nuts (H) reach through holes in shroud rails.**

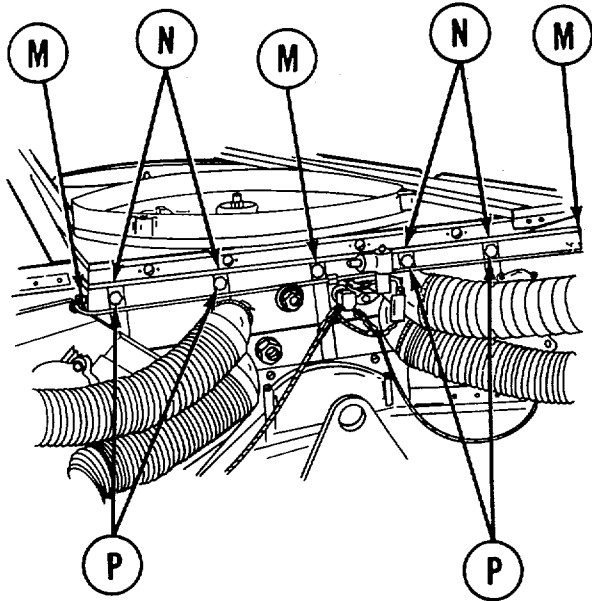
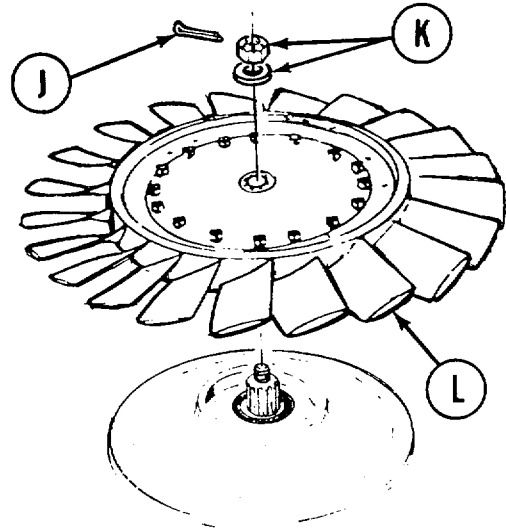
6. Using 1/2 inch socket, remove two bolts (G).
7. Using 1/2 inch socket, remove 12 nuts (H).

Go on to Sheet 3

TA146898

**ENGINE COOLING FAN SHROUD REPLACEMENT (Sheet 3 of 8)**

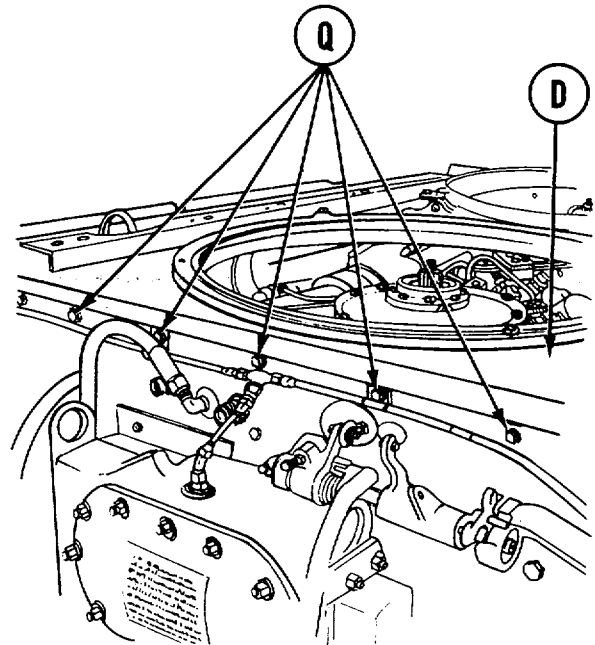
8. Using pliers, remove cotter pin (J) from nut (K). Throw cotter pin away.
9. Using 1-1/4 inch socket, remove nut and washer (K) securing rear fan (L) to engine.
10. Lift fan (L) from engine.



**NOTE**

Four nuts (N) are located under fan shroud and hold fuel line clamps. When nut (N) and screws (P) are removed, clamps will remain on fuel line.

11. Using 1/2 inch socket, remove three screws (M).
12. Using 1/2 inch wrench to hold nuts (N), use 1/2 inch socket and remove four screws (P) and nuts (N).
13. Using 1/2 inch socket, remove five screws (Q) securing shroud (D) to engine.



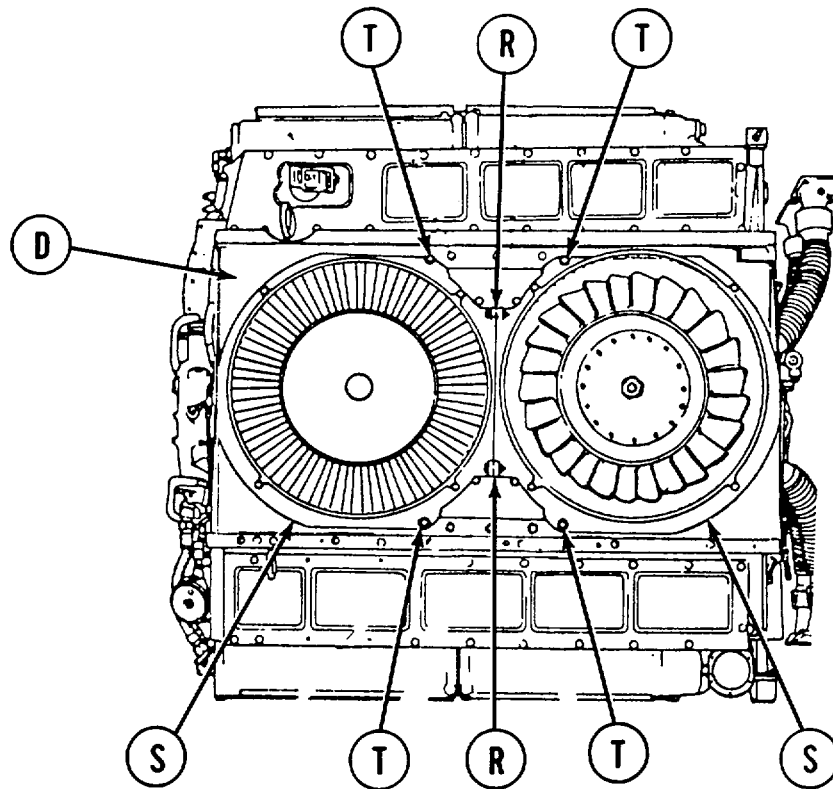
**FRONT OF ENGINE**

Go on to Sheet 4

TA146899

**ENGINE COOLING FAN SHROUD REPLACEMENT (Sheet 4 of 8)**

14. Using two 9/16 inch wrenches, remove two screws, washers, and self-locking nuts (R) from fan housing (S). Throw nuts away.

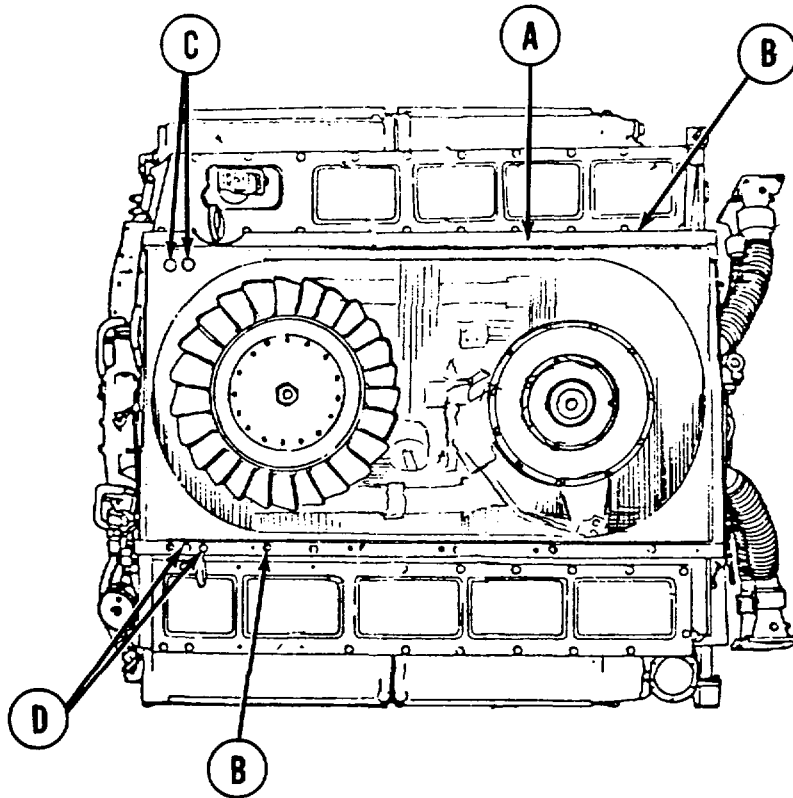


15. Using 9/16 inch socket, remove four screws and lockwashers (T) from fan housing (S). Throw lockwashers away.
16. Using hands, lift two pieces of fan housing (S) from powerplant.
17. Using hands, lift shroud (D) from powerplant.



**ENGINE COOLING FAN SHROUD REPLACEMENT (Sheet 5 of 8)****INSTALLATION:**

1. Position cooling fan shroud (A) on engine.

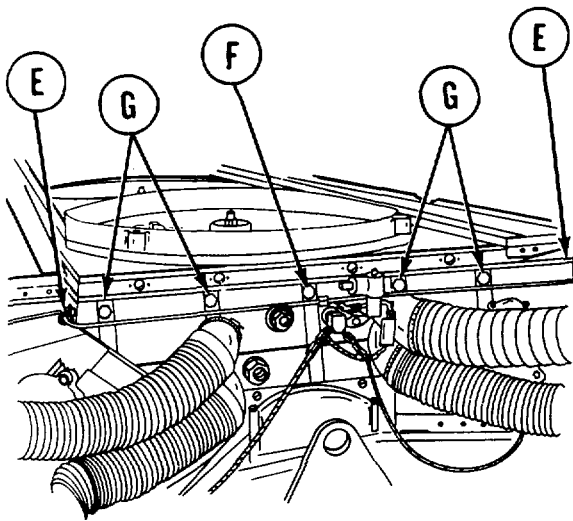


2. Using 1/2 inch socket, install 12 nut (B).
3. Using 1/2 inch socket, install two bolts (C).
4. Using 1/2 inch socket, install two bolts (D).

Go on to Sheet 6

TA146901

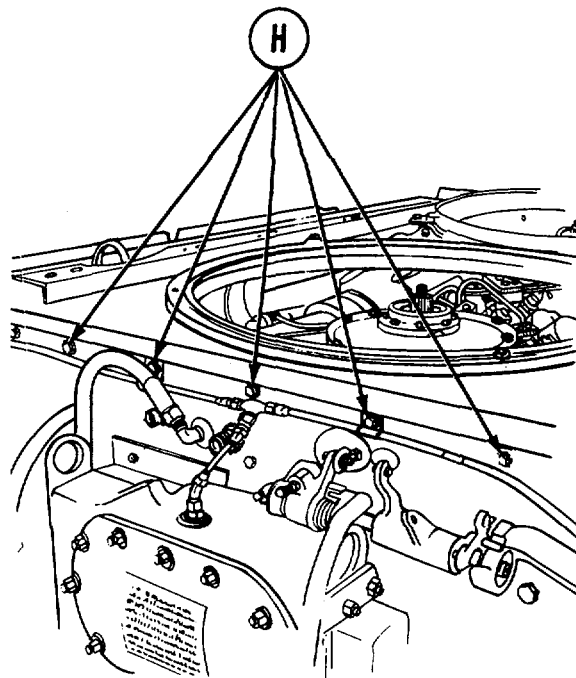
ENGINE COOLING FAN SHROUD REPLACEMENT (Sheet 6 of 8)



REAR OF ENGINE

5. Using 1/2 inch socket, install two screws (E) securing shroud and fuel line clamps to engine.
6. Using 1/2 inch socket, install one screw (F) securing shroud to engine.
7. Using 1/2 inch socket, install bur screws (G) securing shroud to engine.
8. Position camps on fuel line, located on underside of shroud, onto screws (G). Using 1/2 inch wrench, install four nut onto screws (G) securing fuel line clamp.

9. Using 1/2 inch socket, install five screws (H) securing dampers and engine shrouds to fan shrouds.



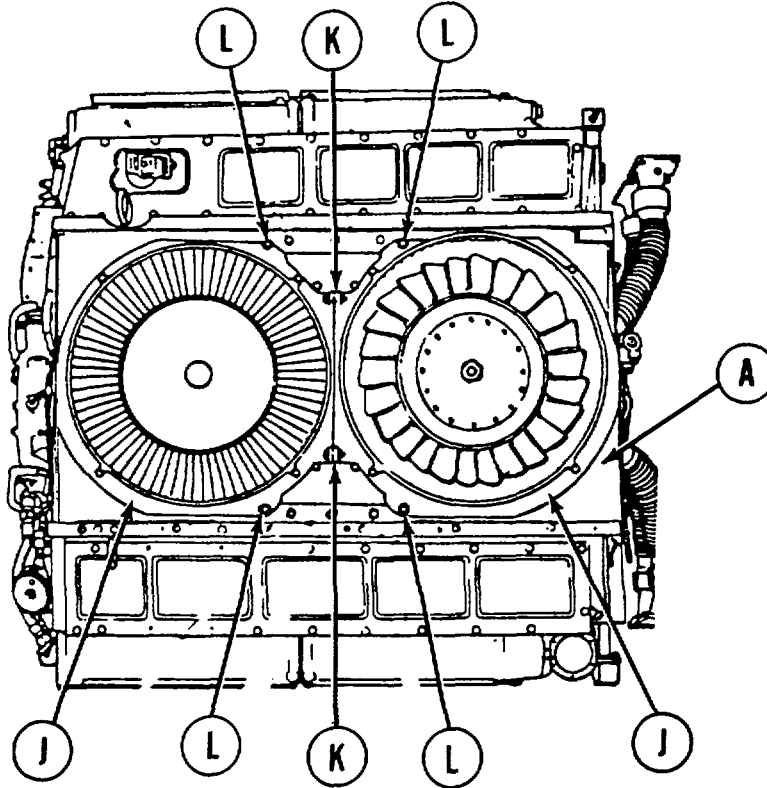
FRONT OF ENGINE

Go on to Sheet 7

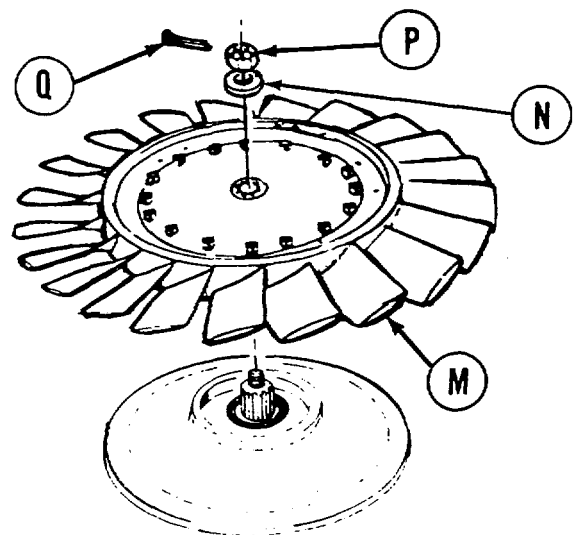
TA146902

**ENGINE COOLING FAN SHROUD REPLACEMENT (Sheet 7 of 8)**

10. Position two pieces of fan housing (J) onto powerplant.
11. Using two 9/16 inch wrenches, install two screws, washers, and self-locking nut (K) securing two pieces of fan housing (J) together.



12. Using 9/16 inch socket, install four screws and new lockwashers (L) securing fan housing (J) to fan shroud (A).
13. Using hands, position fan (M) onto engine.
14. Using 1-1/4 inch socket, install washer (N) and nut (P) securing fan (M) to engine.
15. Using 1-1/4 inch socket and torque wrench, tighten nut (P) to 50-55 lb-ft (68-75 N•m).
16. Back nut (P) off until slot in nut (P) aligns with hole in shaft. Using pliers, install new cotter pin (Q).

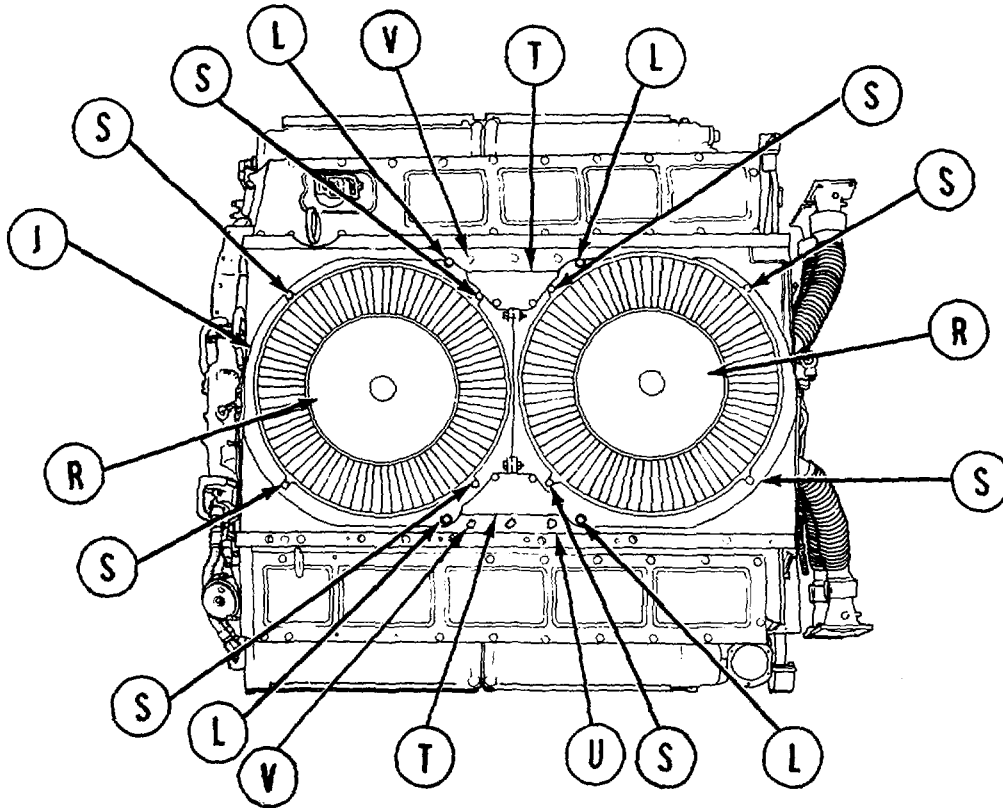


Go on to Sheet 8

TA146903

**ENGINE COOLING FAN SHROUD REPLACEMENT (Sheet 8 of 8)**

17. Using thickness gage, check clearance between tip of each fan blade and fan housing (J). If clearance is less than 0.062 inch (0.157 mm) all around, loosen screws (L) and shift fan housing (J) as necessary to obtain clearance.
18. When clearance is obtained, use 9/16 inch socket and tighten screws (L).
19. Position two fan guards (R) onto fan housing (J).
20. Install eight bolts and washers (S) to secure fan guards (R) to fan housing (J).
21. Using 9/16 inch socket, tighten bolts (S).



22. Position two cover plates (T) onto shroud (U).
23. Using 1/2 inch socket, install five bolts (V) to secure each cover plate (T).
24. Install engine shroud supports (page 9-5).
25. Install engine shroud (page 9-3).
26. Install 2A powerplant (page 5-14) or 2D powerplant (page 5-40).

End of Task

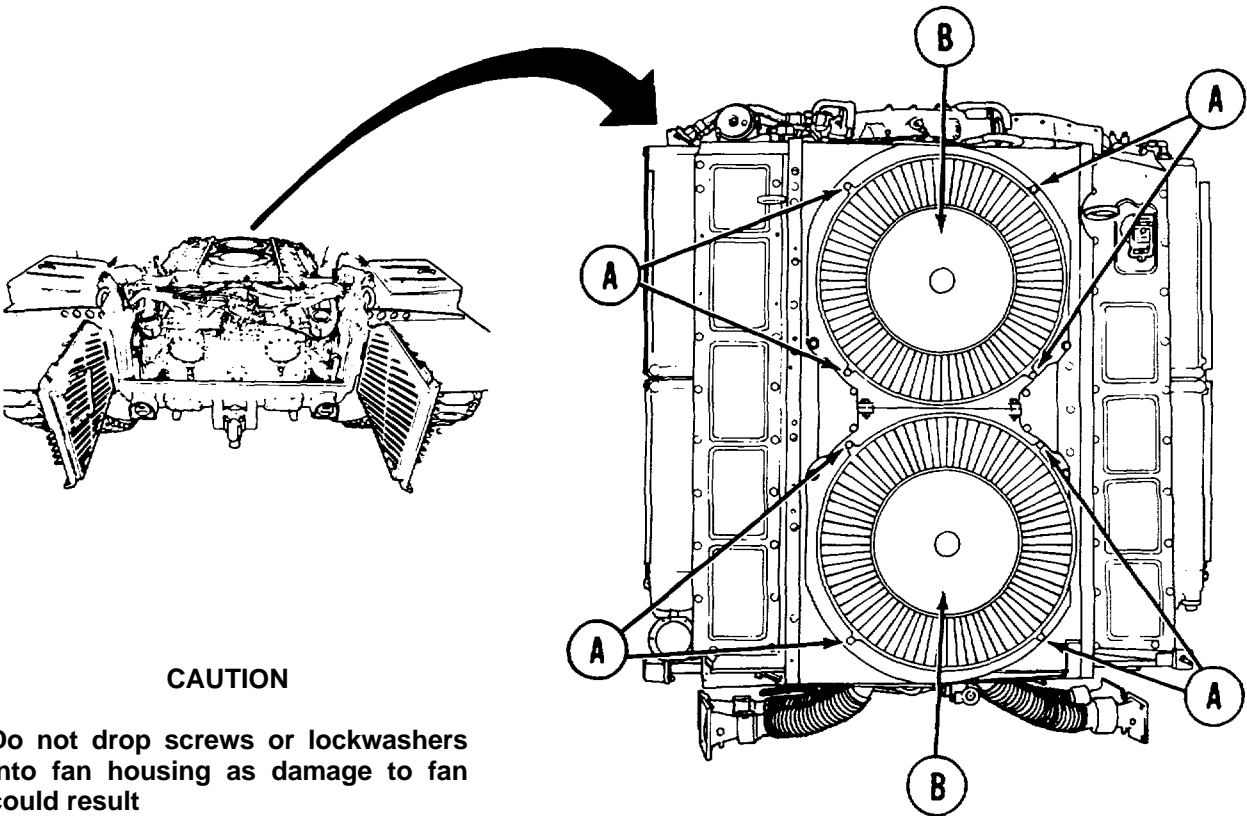
TA146904

**CENTRIFUGAL FAN HOUSING REPLACEMENT (Sheet 1 of 3)**

**TOOLS:** 1/2 in. socket with 1/2 in. drive  
 9/16 in. socket with 1/2 in. drive  
 Ratchet with 1/2 in. drive  
 Feeler gage  
 9/16 in. combination box and open end wrench (2 required)

**SUPPLIES:** Lockwasher (MS35338-46) (8 required)  
 Self-locking nuts (MS21044N6) (2 required)

**PRELIMINARY PROCEDURES:** Remove top deck (page 16-20)  
 Remove engine shroud (page 9-2)

**CAUTION**

**Do not drop screws or lockwashers into fan housing as damage to fan could result**

**REMOVAL:**

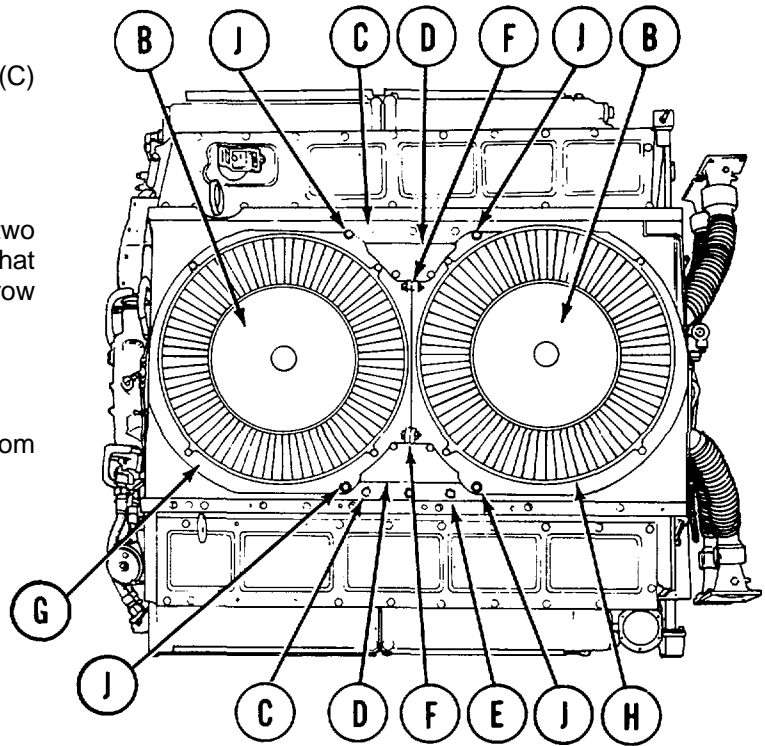
1. Using 9/16 inch socket, remove eight screws and lockwashers (A) holding two fan housings (B) to engine (front end and flywheel end). Throw lockwashers away.

Go on to Sheet 2

TA146905

**CENTRIFUGAL FAN HOUSING REPLACEMENT (Sheet 2 of 3)**

2. Remove fan housings (B) from powerplant.
3. Using 1/2 inch socket, remove ten screws (C) securing covers (D) to shroud (E).
4. Remove covers (D) from powerplant.
5. Using two 9/16 inch wrenches, remove two screws, washers, and self-locking nuts (F) that hold housing (G) and mount (H) together. Throw self-locking nuts away.
6. Using 9/16 inch socket, remove four screws (J).
7. Remove housing (G) and mount (H) from powerplant.

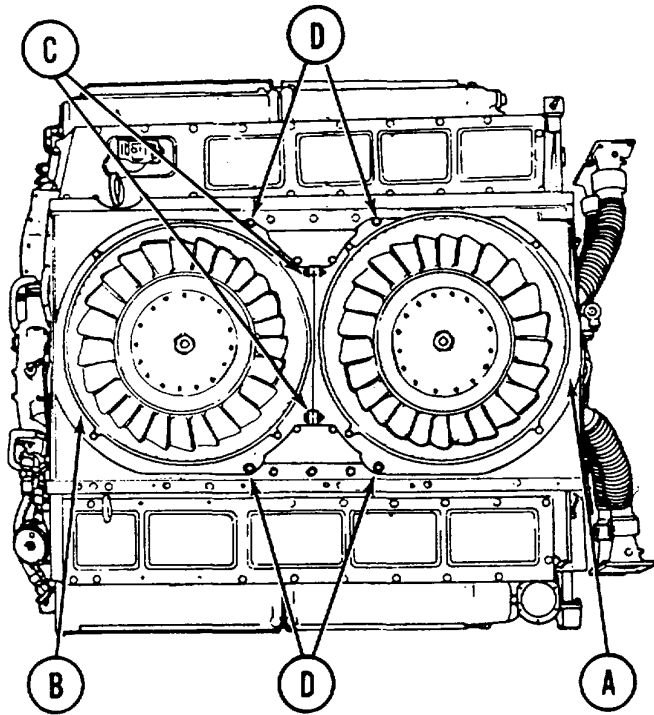


**INSTALLATION:**

**NOTE**

**Make sure no foreign matter is present in fan housing.**

1. Position mount (A) and housing (B) onto powerplant.
2. Using two 9/16 inch wrenches, install two screws, washers, and new self-locking nut (C) securing mount (A) and housing (B) together.
3. Using 9/16 inch socket, install four screws (D) securing mount (A) and housing (B) to engine shroud.
4. Using feeler gage, check clearance between tip of each fan blade and mount (A) and housing (B). If clearance is less than 0.062 inch, go to page 9-58, step 17, for adjustment procedures.

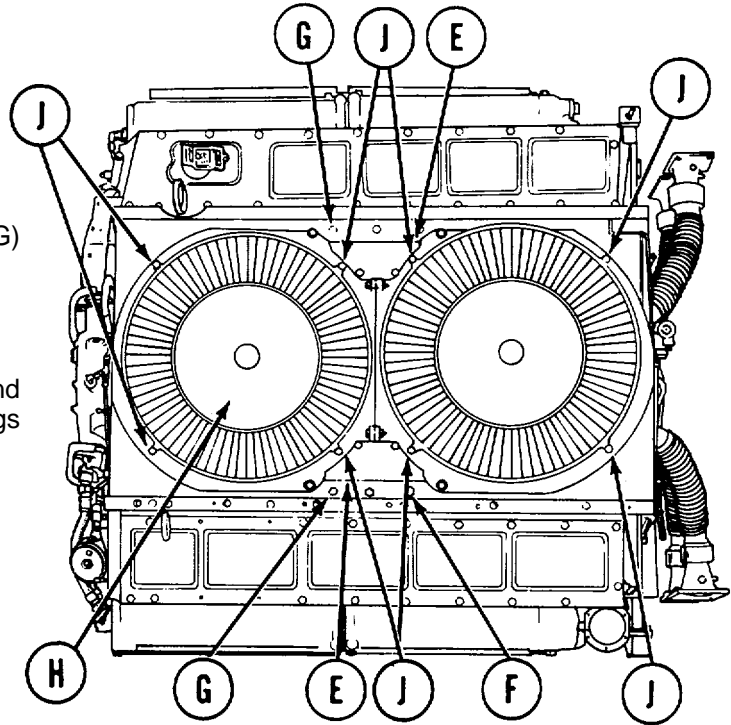


Go on to Sheet 3

TA146906

**CENTRIFUGAL FAN HOUSING REPLACEMENT (Sheet 3 of 3)**

5. Position covers (E) onto shroud (F).
6. Using 1/2 inch socket, install ten screws (G) securing covers (E) to shroud (F).
7. Position fan housings (H) onto powerplant.
8. Using 9/16 inch socket, install eight screws and new lockwashers (J) securing two fan housings (H) to powerplant.
9. Install engine shroud (page 9-3).
10. Install top deck (page 16-2).



End of Task

TA146907

FAN DRIVE OIL SEAL REPLACEMENT (Sheet 1 of 5)

PROCEDURE INDEX

PROCEDURE	PAGE
Removal	9-63
Installation	9-64

TOOLS: Ratchet with 3/8 in. drive  
 Putty knife  
 Diagonal cutting pliers  
 Slip joint pliers  
 Hammer  
 1/2 in. socket with 3/8 in. drive  
 Brass drift  
 5 in. extension with 3/8 in. drive  
 Torque wrench with 3/8 in. drive (0-200 lb-in) (0-23 N•m)

SPECIAL TOOLS: Screw pullers (Item 1, Chapter 3, Section I) (2 required)  
 Spacers (Item 2, Chapter 3, Section I)

SUPPLIES: Sealing compound (Item 24, Appendix D)  
 Seal (10935537)  
 Lockwire (Item 59, Appendix D)  
 Dry cleaning solvent (Item 54, Appendix D)  
 Rags tem 65, Appendix D)  
 Watch  
 Boards (2 in. x 4 in. x 24 in.) (2 required)

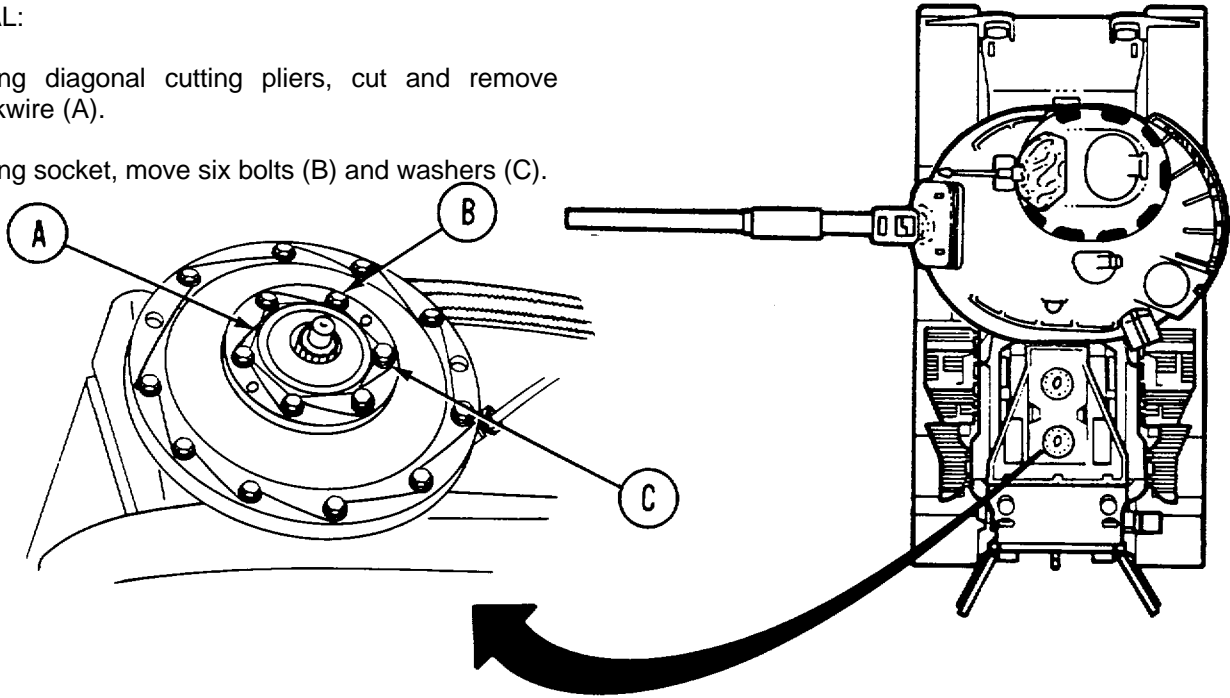
PRELIMINARY PROCEDURES: Remove top deck (page 16-20)  
 Remove engine cooling fans (page 9-48)



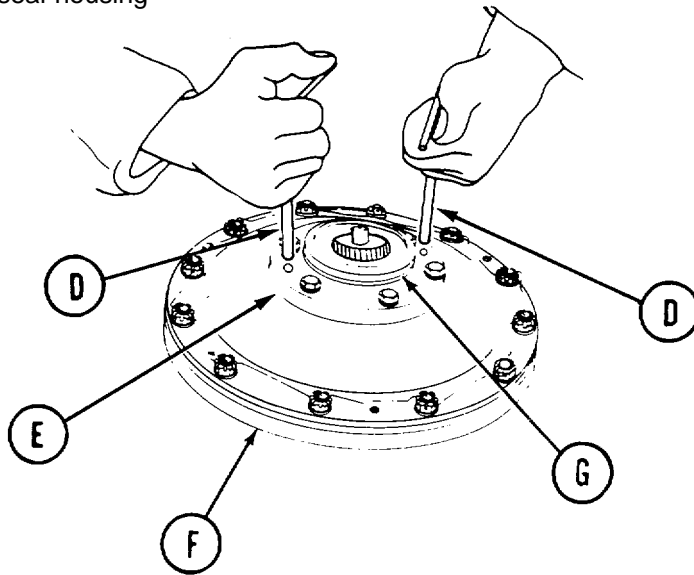
**FAN DRIVE OIL SEAL REPLACEMENT (Sheet 2 of 5)**

**REMOVAL:**

1. Using diagonal cutting pliers, cut and remove lockwire (A).
2. Using socket, move six bolts (B) and washers (C).



3. Install two pullers (D) in screw holes in oil seal housing (E).
4. Alternately tighten pullers (D) until oil seal housing separates from fan drive housing (F).



Go on to Sheet 3

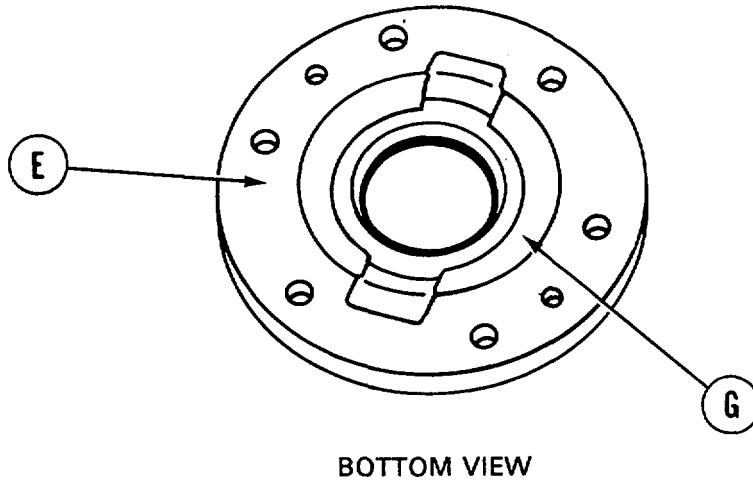
TA146909

## FAN DRIVE OIL SEAL REPLACEMENT (Sheet 3 of 5)

## NOTE

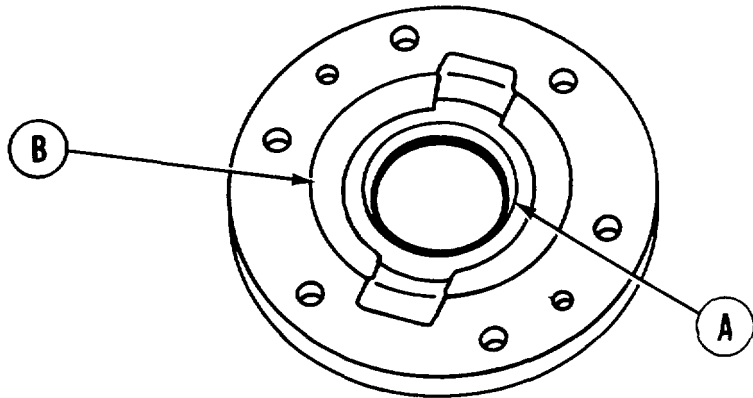
Place housing-on boards before driving out seal.

5. Using hammer and brass drift, drive out oil seal (G) from housing (E) and throw meal away.
6. Clean housing (E) with dry cleaning solvent (Hem 54, Appendix D) and rags (Item 65, Appendix D) and remove any dried adhesive and oil.



## INSTALLATION:

1. Using putty knife, coat sides of replacement oil seal with sealing compound (Item 24, Appendix D). Use care to prevent sealing compound from contacting felt part of seal.
2. Position new oil seal (A) in housing with lip of seal toward gasket surface of oil seal housing (B).

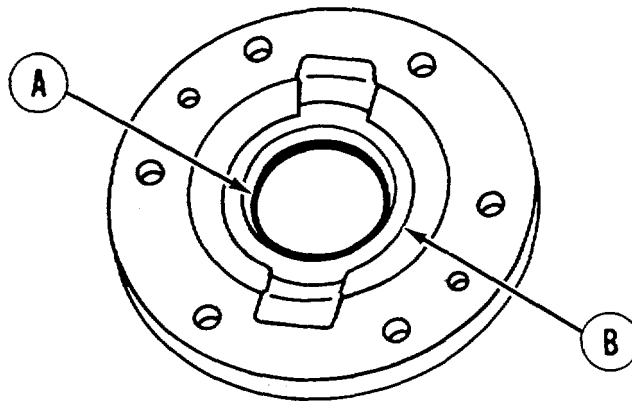


Go on to Sheet 4

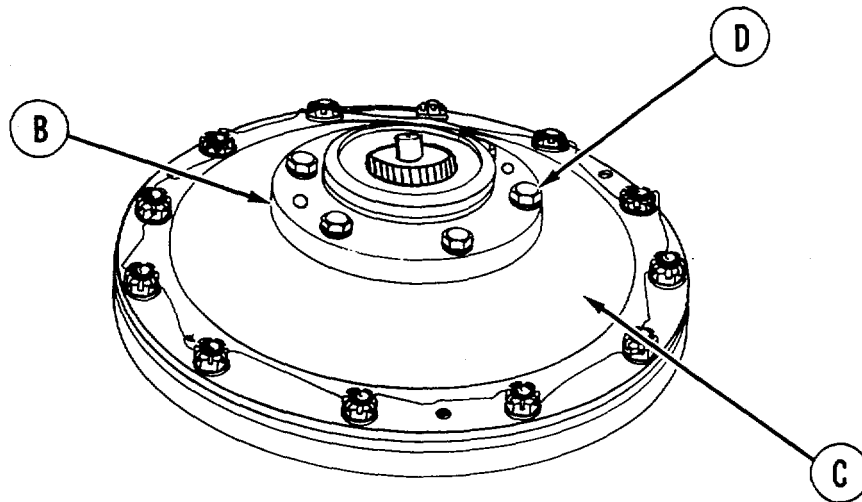
TA146910

**FAN DRIVE OIL SEAL REPLACEMENT (Sheet 4 of 5)**

3. Using hammer and brass drift, drive new seal (A) into housing (B), seating seal. Remove excess sealing compound.



4. Position assembled oil seal housing (B) on fan drive housing (C). Be sure puller holes in housing (B) align with indents in fan housing (C).
5. Install and hand tighten six bolts and washers (D) finger tight.
6. Using torque wrench, tighten bolts (D) to 150-175 lb-in (17-20 N•m).

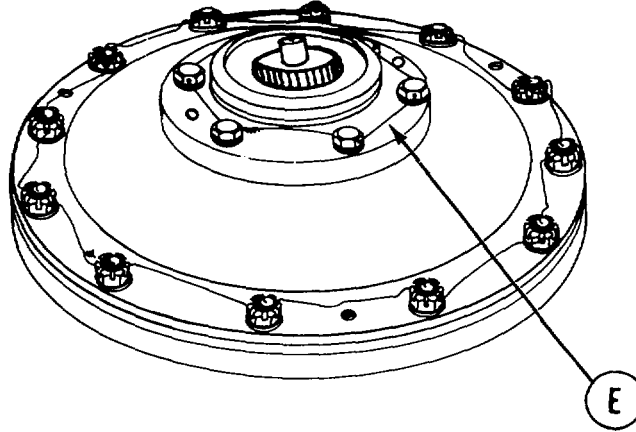


Go on to Sheet 5

TA146911

**FAN DRIVE OIL SEAL REPLACEMENT (Sheet 5 of 5)**

7. Install spacers (Item 2, Chapter 3, Section I). Operate engine for 5 minutes. Stop engine, remove fan and check for off leak around seal.
8. Using slip joint pliers, install lockwire (E) (Item 59, Appendix D) through bolt heads.



9. Install engine cooling fans (page 9-49).
10. Install top deck (page 16-22).

End of Task

TA146912

**By Order of the Secretary of the Army:**

**E. C. Meyer**  
**General, United States Army**  
**Chief of Staff**

**Official:**

**J. C. PENNINGTON**  
**Major General, United States Army**  
**The Adjutant General**

To be distributed in accordance with DA Form 12-37, Organizational Maintenance requirements for Combat Engineer, Full-Tracked: 105MM, M60, M60A1.

☆ U.S. GOVERNMENT PRINTING OFFICE: 1981-750002/1011

**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

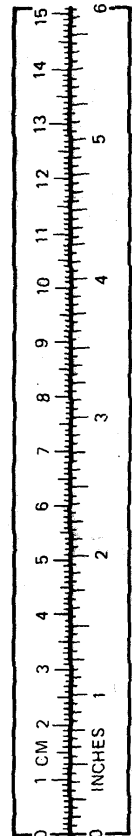
**TEMPERATURE**

$5/9 (°F - 32) = °C$   
 212° Fahrenheit is equivalent to 100° Celsius  
 90° Fahrenheit is equivalent to 32° Celsius  
 32° Fahrenheit is equivalent to 0° Celsius  
 $9/5 C° + 32 = °F$

**APPROXIMATE CONVERSION FACTORS**

<b>TO CHANGE</b>	<b>TO</b>	<b>MULTIPLY BY</b>
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.....	0.0907
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

<b>TO CHANGE</b>	<b>TO</b>	<b>MULTIPLY BY</b>
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



TA08991

