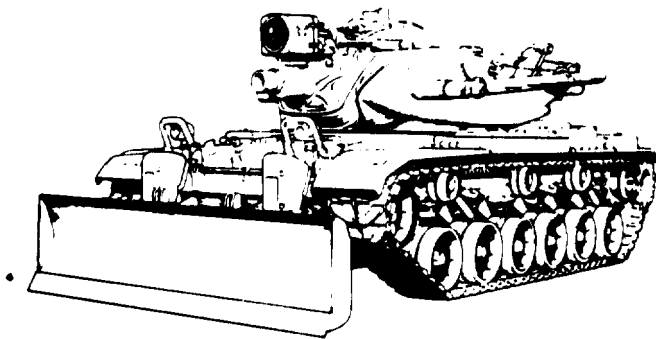


TECHNICAL MANUAL
ORGANIZATIONAL MAINTENANCE
VOLUME 4 OF 5
CHAPTERS 10 THRU 15



ELECTRICAL SYSTEM	10-1
TRANSMISSION AND SHIFTING MAINTENANCE	11-1
FINAL DRIVE AND UNIVERSAL JOINTS	12-1
BRAKE SYSTEM	13-1
TRACK AND SUSPENSION SYSTEM	14-1
STEERING SYSTEM	15-1

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

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

TA141004

WARNING

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

Some wiring harnesses and cables are hot even if MASTER BATTERY switch is set to OFF. Make sure the three battery ground cable assemblies are disconnected before disconnecting any wiring harness or cable.

Keep hands clear of areas where final drive could swing and crush them. Do not stand where final drive could fall on feet or legs.

Keep hands and feet from under final drive and from between hull and final drive to prevent injury in case final drive slips.

Acid fumes and copper sulphate particles are injurious to eyes and skin. Upon contact, immediately flush contacted area with water and immediately obtain medical attention.

Generator weighs approximately 100 pounds. Take care during removal and installation procedures.

CHANGE

NO. 5

HEADQUARTERS
DEPARTMENT OF THE ARMY
Washington D. C., 10 November 1993

TECHNICAL MANUAL
ORGANIZATIONAL MAINTENANCE

VOLUME 4 OF 5

CHAPTERS 10 THRU 15

COMBAT ENGINEER VEHICLE,
FULL-TRACKED, M728
2350-00-795-1797
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10-1 thru 10-4
10-33 and 10-34
None
10-217 thru 10-222
10-251 thru 10-258
10-259 and 10-260
10-325 and 10-326
10-327 thru 10-338
10-339 and 10-340
10-359 thru 10-362
10-363 and 10-364
10-367 thru 10-372
10-383 and 10-384
10-385 thru 10-390
10-390.1 thru 10-390.3 /(10-390.4 blank)
10-391 and 10-392
10-393 thru 10-396
11-1 and 11-2
11-39 thru 11-44
11-51 and 11-52

Insert Pages

10-1 thru 10-4
10-33 and 10-34
10-34.1 and 10-34.2
10-217 thru 10-222
None
10-259 and 10-260
10-325/(10-326 blank)
None
10-339 and 10-340
None
(10-363 blank)/ 10-364
10-367 and 10-372
10-383 and 10-384
None
None
None
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11-1 and 11-2
11-39 thru 11-44
11-51 and 11-52

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11-55 and 11-56
11-63 thru 11-70
11-73 and 11-74
12-1 and 12-2
12-4.1 and 12-4.2
12-11 thru 12-14
12-14.1 and 12-14.2
12-19 and 12-20
12-27 thru 12-29/(12-30 blank)
13-3 thru 13-8
13-98.1 and 13-98.2
13-99 thru 13-102
14-1 thru 14-4
14-7 thru 14-14
None
14-23 thru 14-26
14-29 thru 14-34
14-53 and 14-54
14-55 and 14-56
14-81 thru 14-84
14-89 and 14-90
None
14-91 thru 14-94
None
15-1 and 15-2
15-7 thru 15-14
None
15-31 and 15-32

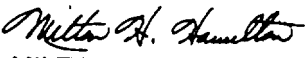
Insert Pages

11-55 and 11-56
11-63 thru 11-70
11-73 and 11-74
12-1 and 12-2
12-4.1 and 12-4.2
12-11 thru 12-14
12-14.1 and 12-14.2
12-19 and 12-20
12-27 thru 12-29/(12-30 blank)
13-3 thru 13-8
13-98.1 and 13-98.2
13-99 thru 13-102
14-1 thru 14-4
14-7 thru 14-14
14-14.1 thru 14-14 .3/(14-14.4 blank)
14-23 thru 14-26
14-29 thru 14-34
14-53 and 14-56
None
14-81 thru 14-84
14-89 and 14-90
14-90.1 thru 14-90.4
14-91 thru 14-94
14-98.1 thru 14-98.4
15-1 and 15-2
15-7 thru 15-14
15-24.1 thru 15-24 .5/(15-24.6 blank)
15-31 and 15-32

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Chief of Staff

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HEADQUARTERS
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Washington D. C., 25 May 1991

UNIT MAINTENANCE

COMBAT ENGINEER VEHICLE
FULL TRACKED, M728
NSN 2350-00-795-1797
HULL

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12-17 and 12-18	12-17 and 12-18
14-27 and 14-28	14-27 and 14-28

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ORGANIZATIONAL MAINTENANCE
COMBAT ENGINEER VEHICLE
FULL TRACKED, M728
NSN (2350-00-795-1797)
(HULL)

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10-3 and 10-4
10-283 and 10-284
None
14-1 and 14-2
14-55 thru 14-62
None
14-63 and 14-64
None

Insert Pages

b and c
i and ii
10-3 and 10-4
10-283 and 10-284
10-350.1 thru 10-350.21 /(10-350.22 blank)
14-1 and 14-2
14-55 thru 14-62
14-62.1 thru 14-62.12
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CHANGE }
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**ORGANIZATIONAL MAINTENANCE
VOLUME 4 OF 5
CHAPTERS 10 THRU 15
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FULL-TRACKED, M728
2350-00-795-1797
(HULL)**

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December 1982

CHANGE NO. 1

C1

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**ORGANIZATIONAL MAINTENANCE
COMBAT ENGINEER VEHICLE
FULL TRACKED, M728
NSN (2350-00-795-1797)
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Remove Pages	Insert Pages
i and ii 10-1 thru 10-4 10-19 thru 10-22	i and ii 10-1 thru 10-4 10-19 thru 10-22
10-47 and 10-48 10-51 thru 10-54 10-83 and 10-84 10-123 thru 10-126 10-151 and 10-152 10-155 and 10-156 10-163 thru 10-166	10-47 and 10-48 10-51 thru 10-54 10-83 and 10-84 10-123 thru 10-126 10-151 and 10-152 10-155 and 10-156 10-163 thru 10-166
NONE	10-166.1 (blank)/10-166.2
10-247 thru 10-250	10-247 thru 10-250
NONE	10-250.1/10-250.2 (blank)
10-351 thru 10-354	10-351 thru 10-354
10-385 thru 10-390	10-385 thru 10-390
NONE	10-390.1 thru 10-390.3/(10-390.4 blank)
10-395 thru 10-402	10-395 thru 10-402
10-405 thru 10-410	10-405 thru 10-410
10-413 thru 10-418	10-413 thru 10-418
11-1 and 11-2	11-1 and 11-2
11-5 thru 11-22	11-5 thru 11-22
11-25 and 11-26	11-25 and 11-26
11-33 thru 11-36	11-33 thru 11-36
11-39 thru 11-44	11-39 thru 11-44
NONE	11-44.1/(11-44.2 blank)
11-51 and 11-52	11-51 and 11-52
11-55 and 11-56	11-55 and 11-56

Remove Pages	Insert Pages
<p>11-59 and 11-60 12-1 thru 12-4 NONE 12-5 and 12-6 12-11 thru 12-14 NONE 12-19 thru 12-29/(12-30 blank) 13-1 and 13-2 13-13 thru 13-18 NONE 13-19 thru 13-22 13-35 and 13-36 13-39 and 13-40 13-43 thru 13-48 13-51 and 13-52 13-65 thru 13-70 13-79 and 13-80 13-87 thru 13-98 NONE 13-103 and 13-104 14-1 thru 14-100 15-1 and 15-2 15-7 thru 15-18 15-19 and 15-20 NONE 15-21 thru 15-40</p>	<p>11-59 and 11-60 12-1 thru 12-4 12-4.1 and 12-4.2 12-5 and 12-6 12-11 thru 12-14 12-14.1 and 12-14.2 12-19 thru 12-29/(12-30 blank) 13-1 and 13-2 13-13 thru 13-18 13-18.1 thru 13-18.6 (13-19 blank)/13-20 thru 13-22 13-35 and 13-36 13-39 and 13-40 13-43 thru 13-48 13-51 and 13-52 13-65 thru 13-70 13-79 and 13-80 13-87 thru 13-98 13-98.1 thru 13-98.7/(13-98.8 blank) 13-103 and 13-104 14-1 thru 14-100 15-1 and 15-2 15-7 thru 15-18 15-19/(15-20 blank) 15-20.1 and 15-20.2 15-21 thru 15-40</p>

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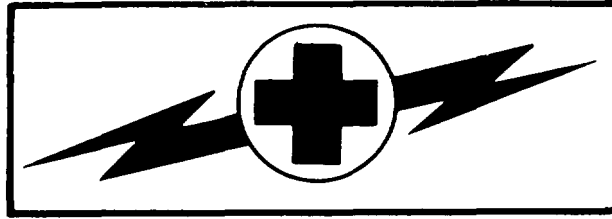
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WARNING

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 vehicle is operated for maintenance purposes or tactical use.

1. DO NOT operate heater or engine of vehicle 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 vehicle with inspection plates, cover plates, or engine compartment doors removed unless necessary for maintenance purposes.
4. BE ALERT at all times during vehicle operation for exhaust odors and exposure symptoms. If either are present, IMMEDIATELY VENTILATE personnel compartments. If symptoms persist, remove affected personnel from vehicle and treat as follows: expose to fresh air; keep warm; DO NOT PERMIT PHYSICAL EXERCISE.

THE BEST DEFENSE AGAINST CARBON MONOXIDE POISONING IS ADEQUATE VENTILATION.

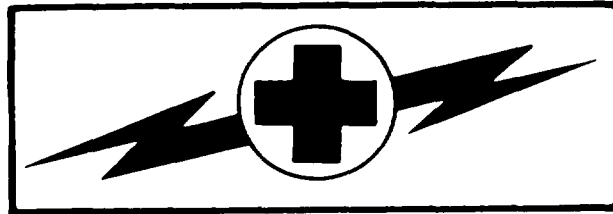
For artificial respiration, refer to FM 21-11,

WARNING

Dry cleaning solvent P-D-680 is toxic and flammable. To prevent personal injury, wear protective goggles and gloves and use only in a well-ventilated area. Avoid contact with skin, eyes, and clothes and don't breathe vapors. Do not use near open flame or excessive heat. The flash point for Type #1 Dry Cleaning Solvent is 100°F (38°C) and for Type #2 is 138°F (50°C). If you become dizzy while using cleaning solvent, get fresh air immediately and get medical aid. If contact with eyes is made, wash your eyes with water and get medical aid immediately.

TA249114

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 battery 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.

TA141011

Technical Manual
No. 9-2350-222-20-1

HEADQUARTERS
DEPARTMENT OF THE ARMY
Washington, D.C., 20 February 1981

**ORGANIZATIONAL MAINTENANCE
COMBAT ENGINEER VEHICLE
FULL TRACKED, M728
NSN (2350-00-795-1797)
(HULL)**

REPORTING ERRORS AND RECOMMENDING IMPROVEMENTS

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

**TABLE OF CONTENTS
VOLUME 1**

		Page
HOW TO USE THIS MANUAL		iii
CHAPTER	1. INTRODUCTION	1-1
Section	I. General Information	1-1
Section	II. Equipment Description and Data	1-2
CHAPTER	2. PRINCIPLES OF OPERATION	2-1
Section	I. Functional Description	2-1
Section	II. Systems Operation	2-1
CHAPTER	3. HULL MAINTENANCE INSTRUCTIONS	3-1
Section	I. Repair Parts, Special Tools, TMDE, and Support Equipment	3-1
Section	Service Upon Receipt	3-5
Section	III. Preventive Maintenance Checks and Services - Hull (Automotive)	3-7

VOLUME 2

CHAPTER	4. TROUBLESHOOTING	4-1
---------	------------------------------	-----

VOLUME 3

CHAPTER	5. POWER PLANT MAINTENANCE	5-1
CHAPTER	6. ENGINE MAINTENANCE	6-1

*This manual, together with TM 9-2350-222-20-1-1, 20 February 1981, TM 9-2350-222-20-1-2, 20 February 1981, TM 9-2350-222-20-1-3, 20 February 1981, and TM 9-2350-222-20-1-5, 20 February 1981, supersedes TM 9-2350-222-20, 27 September 1965, including all changes.

TABLE OF CONTENTS - Continued

Page

CHAPTER	7.	FUEL SYSTEM MAINTENANCE	7-1
CHAPTER	8.	EXHAUST SYSTEM MAINTENANCE	8-1
CHAPTER	9.	COOLING SYSTEM	9-1

VOLUME 4

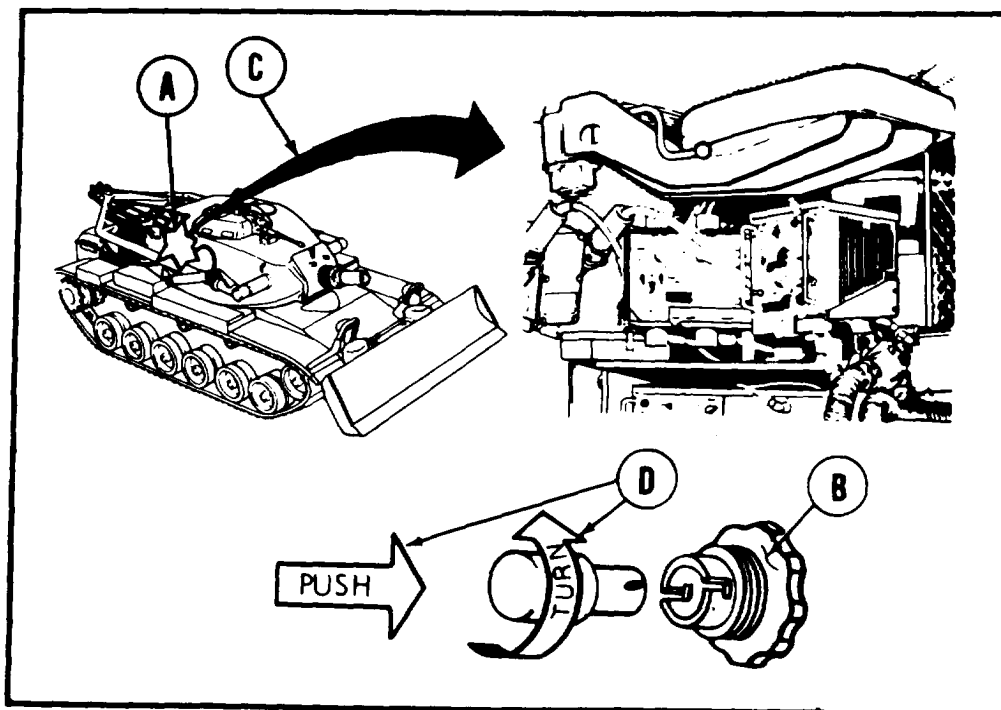
CHAPTER	10.	ELECTRICAL SYSTEM MAINTENANCE.	10-1
CHAPTER	11.	TRANSMISSION AND SHIFTING MAINTENANCE	11-1
CHAPTER	12.	FINAL DRIVE AND UNIVERSAL JOINTS MAINTENANCE	12-1
CHAPTER	13.	BRAKE SYSTEM MAINTENANCE	13-1
CHAPTER	14.	TRACKS AND SUSPENSION SYSTEM MAINTENANCE	14-1
CHAPTER	15.	STEERING CONTROL MAINTENANCE	15-1

VOLUME 5

CHAPTER	16.	EXTERIOR HULL MAINTENANCE..	16-1
CHAPTER	17.	INTERIOR HULL MAINTENANCE..	17-1
CHAPTER	18.	HYDRAULIC SYSTEM	18-1
CHAPTER	19.	PERSONNEL HEATER MAINTENANCE.	19-1
CHAPTER	19.1	BILGE PUMP AND GENERATOR EXHAUST MAINTENANCE	19.1-1
CHAPTER	20.	SPEEDOMETER AND TACHOMETER MAINTENANCE	20-1
CHAPTER	21.	FIRE EXTINGUISHER SYSTEM MAINTENANCE	21-1
CHAPTER	22.	GAS PARTICULATE SYSTEM MAINTENANCE	22-1
CHAPTER	23.	SMOKE GENERATOR MAINTENANCE	23-1
APPENDIX	A.	REFERENCES	A-1
APPENDIX	B.	MAINTENANCE ALLOCATION CHART	B-1
APPENDIX	C.	GENERAL MAINTENANCE	C-1
APPENDIX	D.	EXPENDABLE SUPPLIES AND MATERIALS	D-1
APPENDIX	E.	ELECTRICAL SCHEMATICS	E-1
APPENDIX	F.	ILLUSTRATED LIST OF MANUFACTURED ITEMS	F-1
		ALPHABETICAL INDEX	1-1
		MAINTENANCE INFORMATION INDEX	MI-1

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 Tools 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 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.
- Callout a 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.



TA141017

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 10

ELECTRICAL SYSTEM MAINTENANCE INDEX

PROCEDURE	PAGE
Generator Replacement	10-4
Voltage Regulator Assembly Replacement	10-19
Generator Voltage Adjustment	10-22
Voltage Control Box Replacement	10-24
Starter Replacement	10-26
Starter Low Voltage Relay Solenoid (Side Mounted) Replacement	10-33
Starter Low Voltage Relay Solenoid (Top Mounted) Replacement	10-34.1
Engine Fuel Injection Pump Fuel Shutoff Lead Replacement	10-35
Generator Switch or Guard Replacement	10-40
Generator Switch Bracket Replacement	10-42
Cluster Assembly Cushion Replacement	10-43
Cluster Assembly Mounting Bracket Replacement	10-44
Master Control Panel Displacement	10-45
Master Control Panel Replacement	10-48
Master Control Panel Repair Index	10-52
Starter Switch Replacement	10-55
Master Battery Switch and Indicator Light Replacement	10-57
Engine Fuel Shutoff and Fuel Pump Switch Replacement	10-61
IR/Night Vision Power Switch and Indicator Light Replacement	10-64
Lighting Control Switch and Hi-Beam Indicator Light Replacement	10-68
Blackout Selector Switch Replacement	10-72
Utility Outlet Replacement	10-74
Gas Particulate Switch and Indicator Light Replacement	10-76
Bilge Pump Switch and Indicator Light Replacement	10-80
IR/Night Vision, Bilge Pump, Gas Particulate, Fuel Shutoff, Manifold Preheat, Gage, Fuel Pump, and Utility Outlet Circuit Breaker Replacement	10-84
Master Heater Circuit Breaker, Hi-Lo Switch, and Indicator Light Replacement	10-91
Personnel Heater Wiring Harness Replacement	10-98
Accessories Wiring Harness Replacement	10-103
Master Battery Wiring Harness Replacement	10-107
Master Control Panel Wiring Harness Replacement	10-111
Bilge Pump/Gas Particulate Switch Cable Assembly Replacement	10-116
Fuel Shutoff/Fuel Pump Wiring Harness Replacement	10-118
Indicator Light Base Assembly Repair	10-120
Instrument Panel Cluster Assembly Displacement	10-121
Instrument Panel Cluster Assembly or Support Replacement	10-123
Instrument Panel Cluster Assembly or Support Maintenance Index	10-127
Engine Oil Pressure Indicator Replacement	10-128
Battery General or Indicator Replacement	10-130
Transmission Oil Pressure Indicator Replacement	10-132
Gage 11 Rumination Indicator Light Replacement	10-134
Engine Oil Temperature Indicator Replacement	10-136

ELECTRICAL SYSTEM MAINTENANCE INDEX - Continued

PROCEDURE

PAGE

Fuel Tank Liquid Quantity Indicator Replacement	10-138
Transmission Oil Temperature Indicator Replacement	10-141
Fuel Tank Selector Switch Replacement	10-143
Instrument Panel Wiring Harness Replacement	10-145
Fuel Tank Selector Switch Cable Assembly Replacement	10-149
Bilge Pump Stowage Receptacle Plate Replacement	10-150
Master Control Panel Plate Assembly Replacement	10-152
Infrared/Passive Receptacle Stowage Assembly Replacement	10-156
Headlight Stowage Lampholder Repair and Replacement	10-157
Hydraulic Pump Switch Replacement	10-159
Hydraulic Pump Circuit Breaker Replacement	10-160
Hydraulic Pump Indicator Light Replacement	10-161
Hydraulic Pump Indicator Light Repair	10-162
Hydraulic Pump Switch Bracket Replacement (Early Model)	10-164
Smoke Generator/Hydraulic Pump Switch Bracket Replacement	10-166
Master Relay Replacement	10-166.2
Protection Device Replacement	10-169
Starter Relay Assembly Replacement	10-172
Master Relay/Starter Relay Mounting Plate Replacement	10-175
Fire Extinguisher Relay Replacement	10-177
Air Cleaner Blower Motor Relay Replacement	10-180
Fire Extinguisher and Personnel Heater Circuit Breakers Replacement	10-182
Relays and Circuit Breakers Mounting Plate Replacement	10-185
Bilge Pump Relay Enclosure Assembly Replacement	10-188
Bilge Pump Relay Enclosure Assembly Repair Index	10-190
Circuit Breaker Replacement	10-190
Cable Assembly Replacement	10-193
Solenoid Relay Replacement	10-197
Infrared Power Supply and Shock Mount Assembly Replacement	10-202
Headlight Beam Selector Switch Assembly Replacement	10-207
Powerplant Warning Light Repair	10-208
Domelight Assembly Replacement	10-210
Domelight Resistor Assembly Bracket Replacement	10-212
Domelight Resistor Assembly Replacement	10-213
Domelight Assembly Repair	10-215
Right Taillight - Stoplight Assembly Replacement	10-223
Right Taillight - Stoplight Assembly Repair	10-226
Left Taillight - Stoplight Assembly Replacement	10-229
Left Taillight - Stoplight Assembly Repair	10-232
Taillight Grommet Replacement	10-235
Headlight Adjustment	10-236
Headlight Assembly (Left and Right) Replacement	10-238
Headlight Assembly Repair (Left and Right)	10-239
Headlight Harness Base Assembly Replacement	10-247
Headlight Tube Assembly Replacement	10-250.1

ELECTRICAL SYSTEM MAINTENANCE INDEX - Continued

PROCEDURE	PAGE
Engine Oil Temperature Transmitter (2D Engine)	10-259
Engine Oil High Temperature Switch Replacement (2D Engine)	10-262
Engine Oil Low Pressure Switch Replacement (2D Engine)	10-264
Engine Oil Pressure Transmitter Replacement (2D Engine)	10-267
Transmission Oil High Temperature Switch Replacement	10-270
Neutral Shift Switch Assembly Replacement	10-272
Transmission Oil Pressure Transmitter Replacement	10-274
Transmission Oil Pressure Transmitter Guard Plate Replacement	10-277
Transmission Oil Temperature Transmitter Protector Replacement	10-279
Transmission Oil Temperature Transmitter Replacement	10-281
Disconnect Battery Ground Straps	10-283
Battery Ground Cable Replacement	10-284
Battery Terminal Boot Replacement	10-287
Battery Testing and Replacement	10-289
Battery Supports Replacement	10-302
Battery Jumper Lead Assembly Replacement	10-304
Electrical Wiring Harness and Cable Connector Repair Index	10-307
Male Plug Repair	10-309
Male Connector Repair	10-312
Terminal Connector Repair	10-313
Female Plug Repair	10-315
Female Plug Repair	10-318
Female Connector with Washer (12 Gage Cable) Repair	10-321
Female Connector with Sleeve (14 and 16 Gage Cable) Repair	10-322
Female Receptacle Repair	10-323
Engine Wiring Harness Replacement (2D Engine)	10-339
Engine Wiring Harness (Dust Detector) Replacement	10-350.1
Hull Intermediate Lead Assembly Replacement	10-350.9
Dust Detector Warning Light Harness Assembly Replacement	10-350.13
Dust Detector Warning Light Box Assembly and Bracket Replacement	10-350.16
Dust Detector Operational Test	10-350.19
Driver-to-Turret Interphone Cable Assembly Replacement	10-351
Front Interphone Cable Assembly Replacement	10-356
Generator Electrical Leads Replacement (2D Engine)	10-364
Engine Starter Wiring Harness Replacement (2D Engine)	10-372
Transmission Wiring Harness Replacement	10-378
Engine Ground Lead Assembly Replacement	10-391
Capacitor and Housing Assembly Replacement, Left Fuel Tank	10-396
Capacitor and Housing Assembly Replacement, Right Fuel Tank	10.402
Capacitor and Housing Assembly Repair	10-411
Slave Receptacle Cover Replacement	10-413
Slave Receptacle Ground Cable Replacement	10-414
Slave Receptacle Replacement	10-416

GENERATOR REPLACEMENT (Sheet 1 of 15)

PROCEDURE INDEX

PRODEDURE	PAGE
Removal	10-5
Installation	10-12

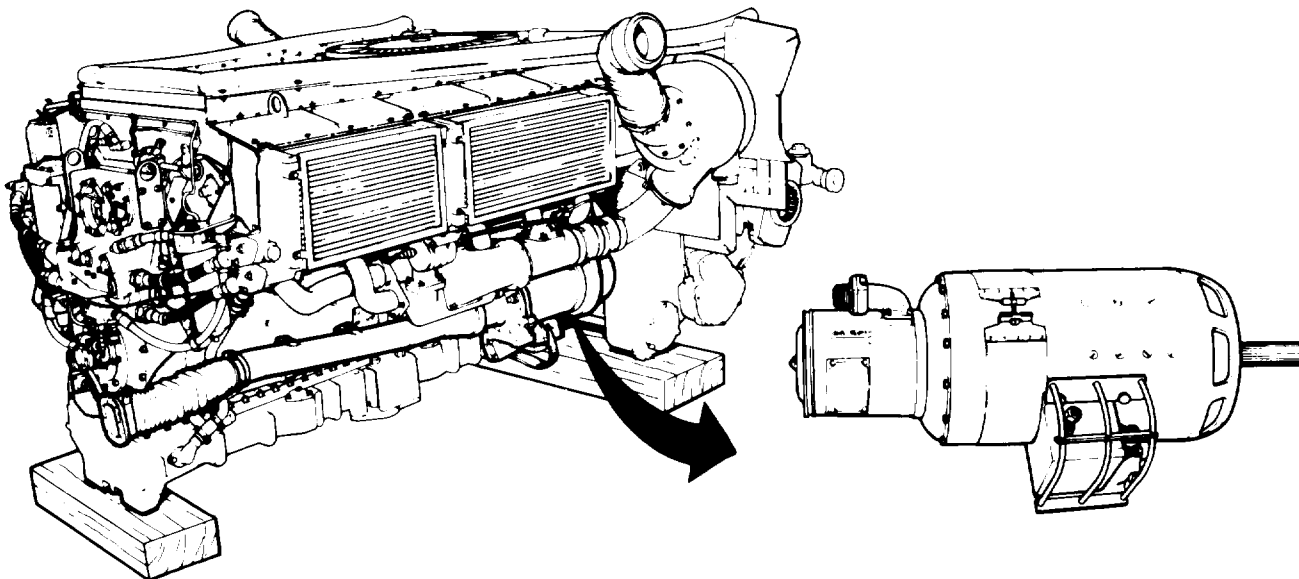
TOOLS: Slip joint pliers
 Flat-tip screwdriver
 Hydraulic jack
 3/8 in. combination box and open end wrench
 1/2 in. combination box and open end wrench
 9/16 in. combination box and open end wrench
 1-1/8 in. open end wrench
 Diagonal cutting pliers
 Putty knife

SUPPLIES: Drive adapter gasket.
 Self-locking nut (6 required)
 Self-locking nut (2 required)
 Self-locking nut (2 required)
 Self-locking nut (2 required)
 Lockwire (Item 60, Appendix D)
 Self-locking nut (2 required)
 Lockwasher (2 required)
 Lockwasher (2 required)
 Goggles (Item 74, Appendix D)
 Rubber gloves (Item 73, Appendix D)

SPECIAL TOOLS: Ground hop kit (Item 30, Chapter 3, Section I)
 Box wrench (Item 4.1, Chapter 3, Section I)

PERSONNEL: Two

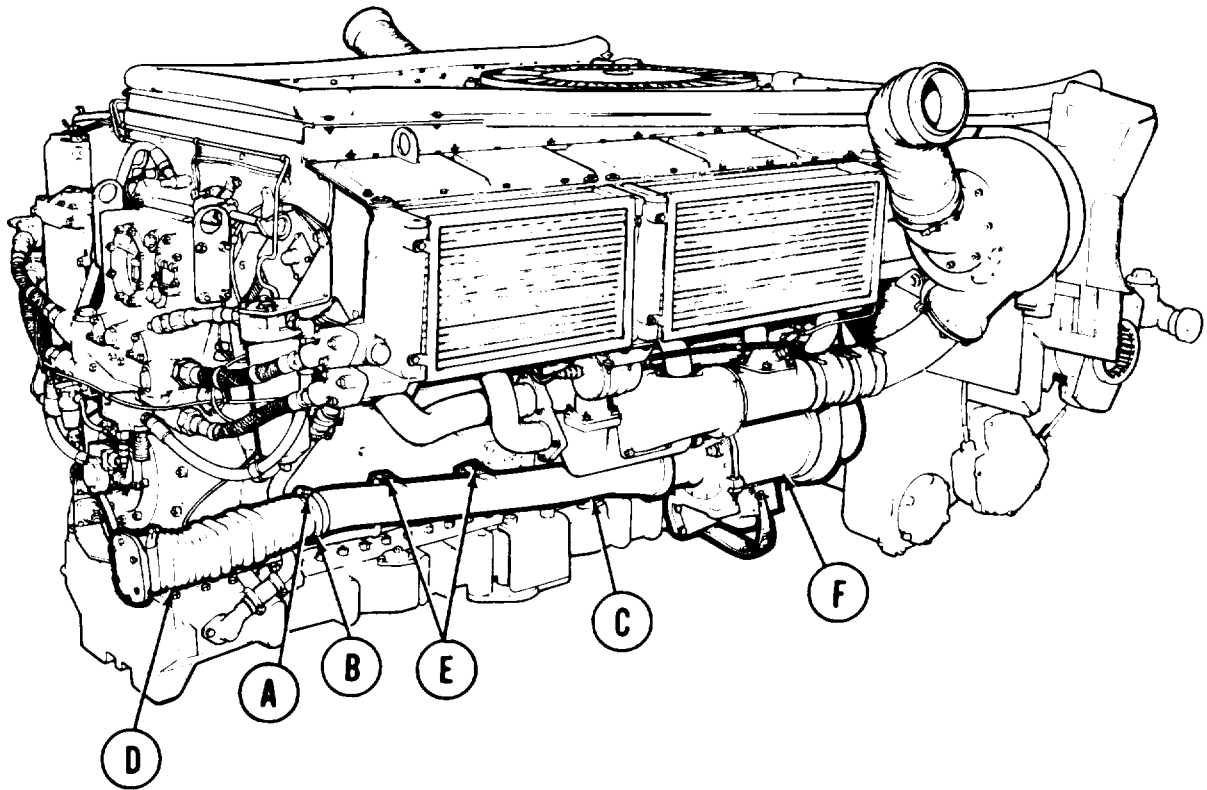
PRELIMINARY PROCEDURE: Remove powerplant (page 5-1)



Go on to Sheet 2

GENERATOR REPLACEMENT (Sheet 2 of 15)**REMOVAL:**

1. Using screwdriver, loosen screw (A).
2. Slide clamp (B) onto generator duct (C).
3. Remove flexible connector (D) from generator duct (C).
4. Remove clamp (B).
5. Using 1/2 inch wrench, remove two screws, lockwashers, and flat washers (E) securing generator duct (C) to engine. Throw lockwashers away.
6. Remove generator duct (C) from generator (F).



Go on to Sheet 3

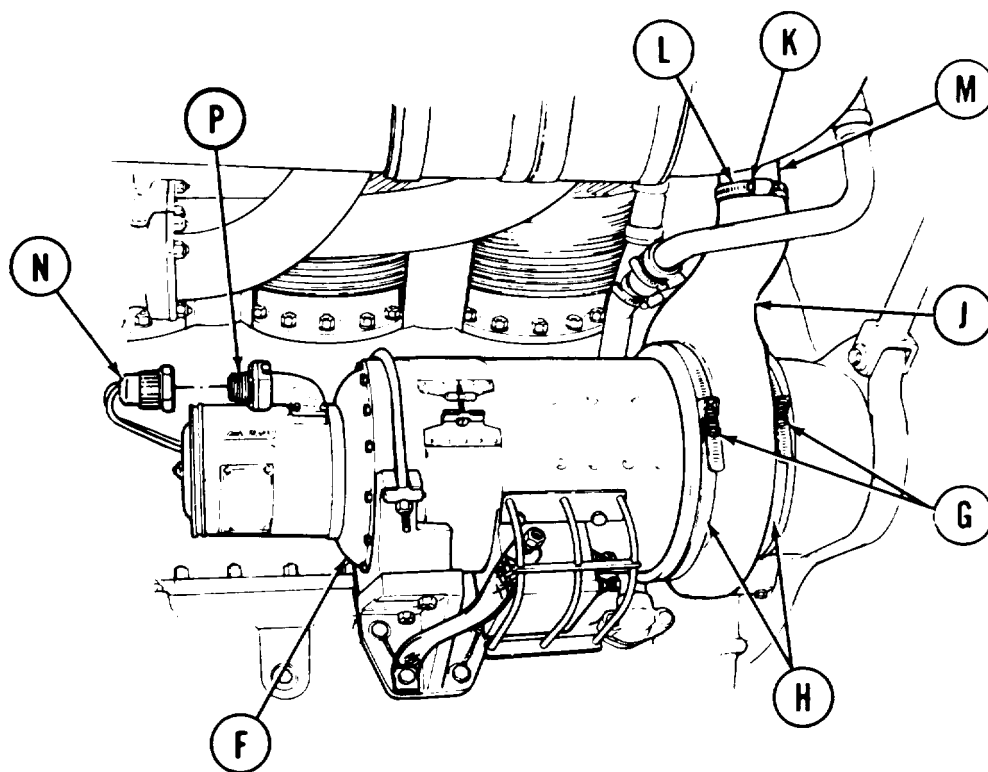
TA139560

GENERATOR REPLACEMENT (Sheet 3 of 15)

NOTE

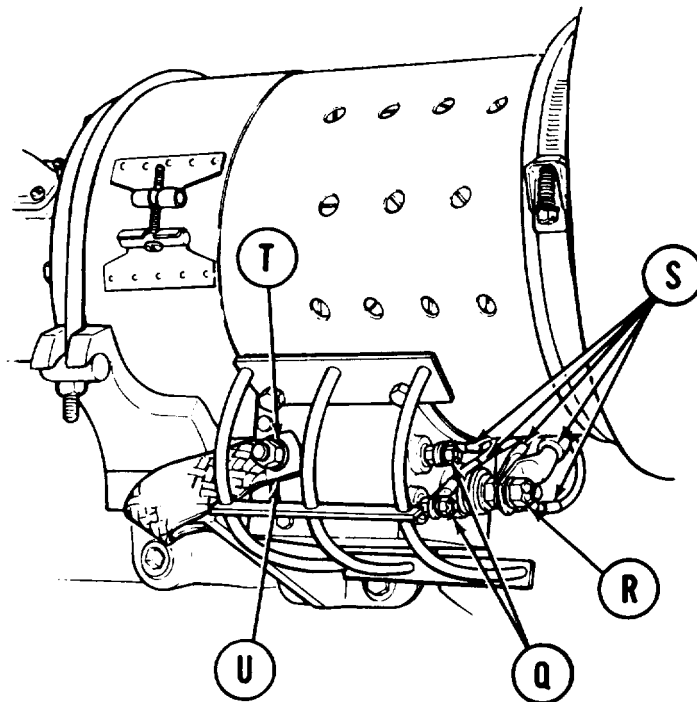
During the remainder of the removal procedure, the screws and clamps are all one piece. The screws are turned until the clamp comes apart.

7. Using screwdriver, turn two screws (G) removing clamps (H) securing flexible boot (J) to generator (F).
8. Using screwdriver, turn screw (K) removing clamp (L) from flexible boot (J)
9. Disconnect flexible boot (J) from exhaust tube (M).
10. Using 1-1/8 inch wrench, remove electrical connector (N) from generator connector (P).



GENERATOR REPLACEMENT (Sheet 4 of 15)

11. Using 3/8 inch wrench, remove two self-locking nuts and washers (Q). Throw self-locking nuts away.
12. Using 9/16 inch wrench, remove self-locking nut and washer (R). Throw self-locking nut away.
13. Using fingers, remove five wires (S) and position aside.
14. Using 9/16 inch wrench, remove self-locking nut and washer (T). Throw self-locking nut away.
15. Remove ground strap and lockwasher (U). Throw lockwasher away.



Go on to Sheet 5

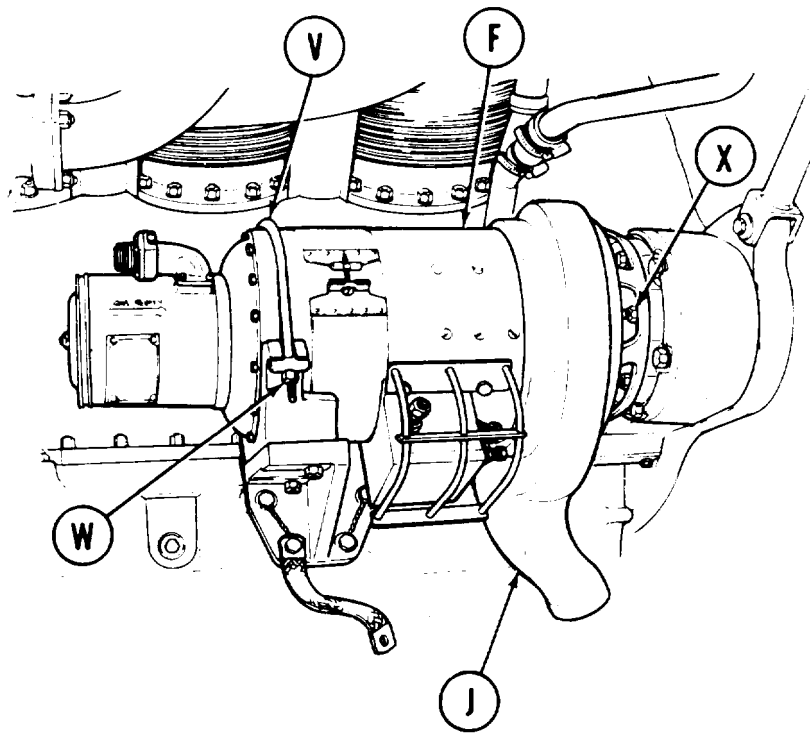
TA139562

GENERATOR REPLACEMENT (Sheet 5 of 15)

NOTE

When removing U-bolt (V) from generator, lift bar and rod out of cradle holder in front of generator. Lift U-bolt over top of generator and slide out of identical holder in back of generator.

16. Using 1/2 inch wrench, loosen two self-locking nuts (W).
17. Remove U-bolt (V) from generator (F)
18. Turn exhaust opening of flexible boot (J) down.
19. Pull flexible boot (J) onto generator (F).
20. Using 9/16 inch half-moon wrench, loosen six self-locking nuts (X).

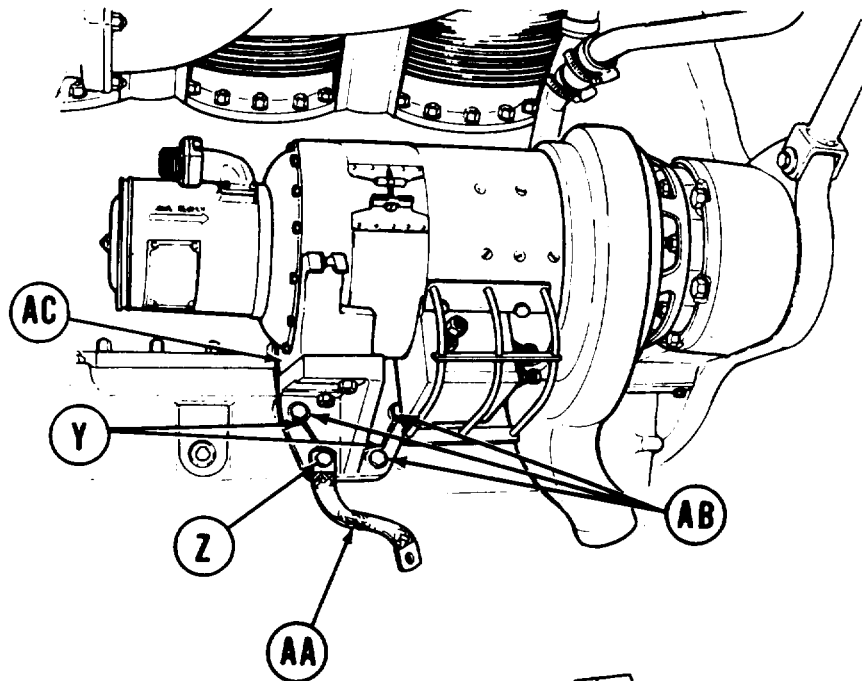


Go on to Sheet 6

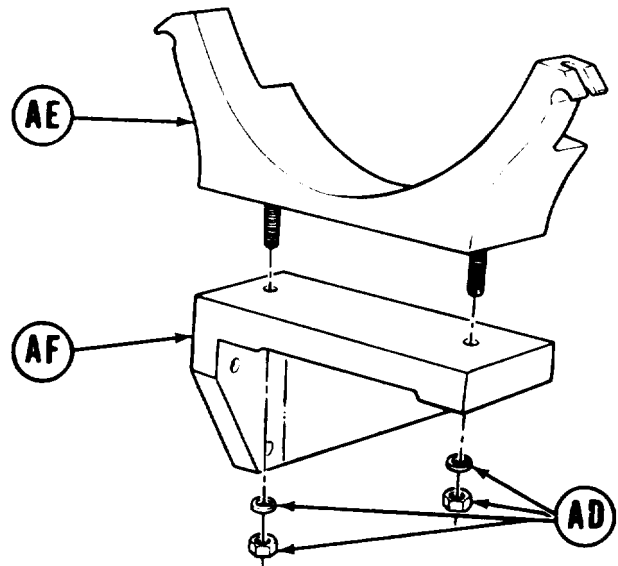
TA139563

GENERATOR REPLACEMENT (Sheet 6 of 15)

21. Using diagonal pliers, remove lockwires (Y).
22. Using 9/16 inch wrench, remove screw and flat washer (Z).
23. Remove ground strap and lockwasher (AA). Throw lockwasher away.
24. Using 9/16 inch wrench, remove three screws and flat washers (AB).
25. Remove cradle assembly (AC) from engine.



26. Using 9/16 inch wrench, remove two nuts and flat washers (AD).
27. Remove cradle (AE) from cradle bracket (AF).



Go on to Sheet 7

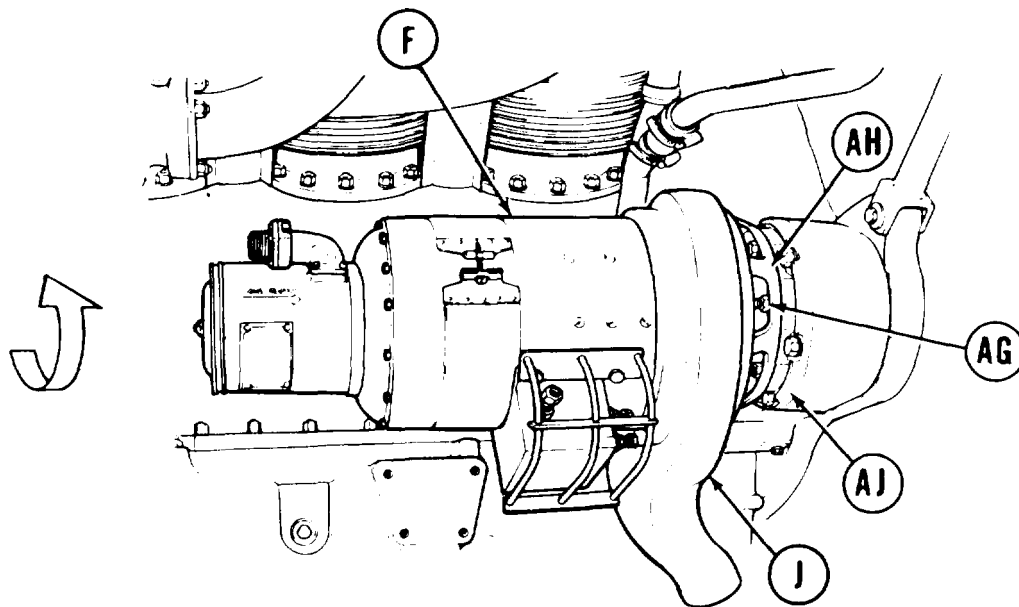
TA139564

GENERATOR REPLACEMENT (Sheet 7 of 15)

WARNING

Generator weighs approximately 100 pounds; therefore, two personnel are required to handle generator during removal. Care must be used to prevent damage to splined shaft and housing when removing generator.

28. Using hydraulic jack, support generator (F).
29. Rotate generator (F) counter clockwise (in direction of arrow) until self-locking nuts (AG) align with elongated holes in mounting flange (AH).
30. Slide generator (F) away from drive adapter (AJ) until drive shaft is disengaged.
31. Remove generator (F) and flexible boot (J) and place on work bench.

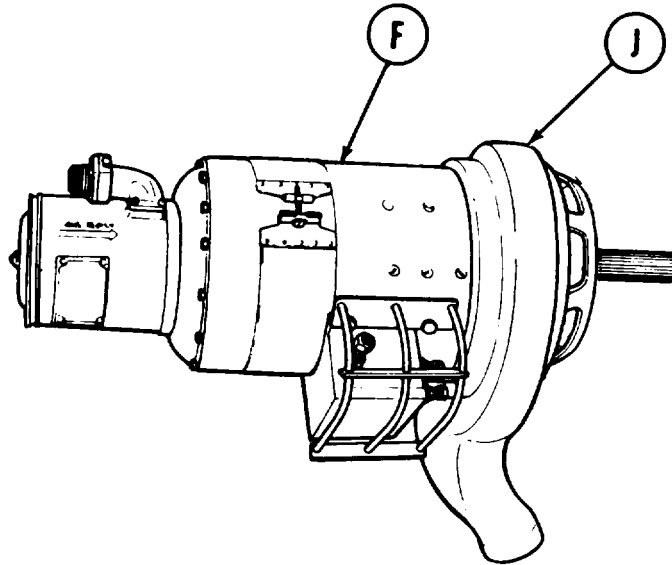


Go on to Sheet 8

TA139565

GENERATOR REPLACEMENT (Sheet 8 of 15)

32. Remove flexible boot (J) from generator (F).



33. Using 9/16 inch wrench, remove six self-locking nuts (AK). Throw self-locking nuts away.

34. Using putty knife, remove gasket (AL). Throw gasket away.

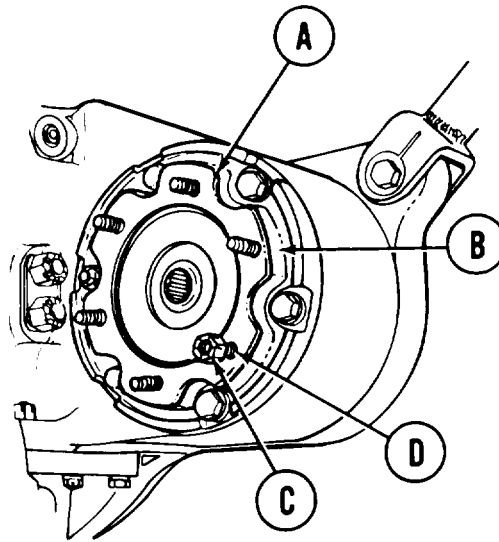
Go on to Sheet 9

TA139566

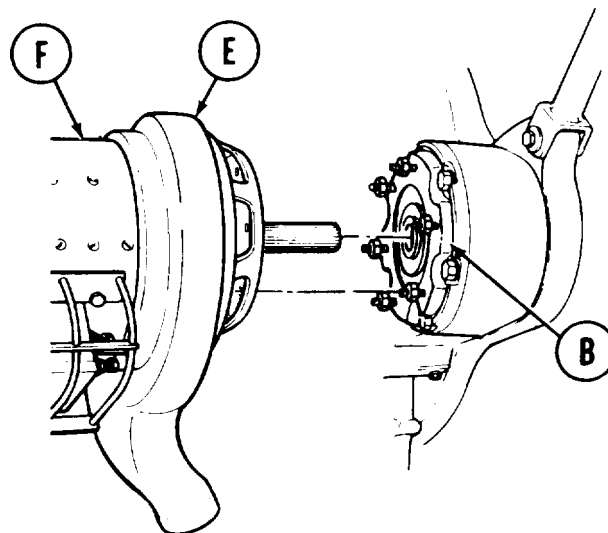
GENERATOR REPLACEMENT (Sheet 9 of 15)

INSTALLATION:

1. Install new gasket (A) on drive adapter (B).
2. Using fingers, install six new self-locking nuts (C) on end of mounting studs (D).



3. Install flexible boot (E) on generator (F).
4. Using hydraulic jack, align generator (F) in position with drive adapter (B).

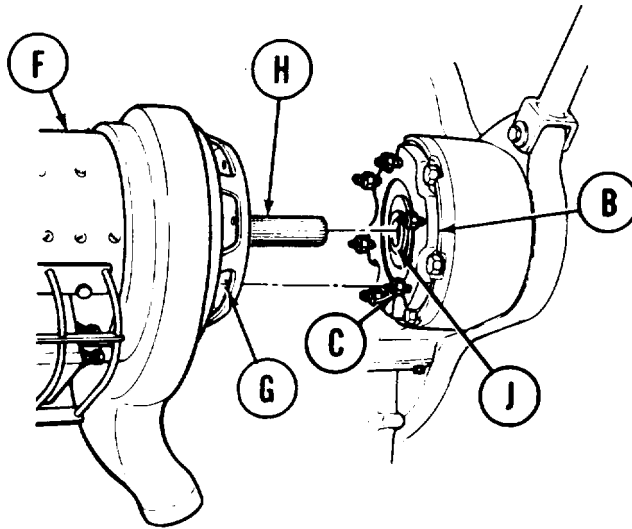


Go on to Sheet 10

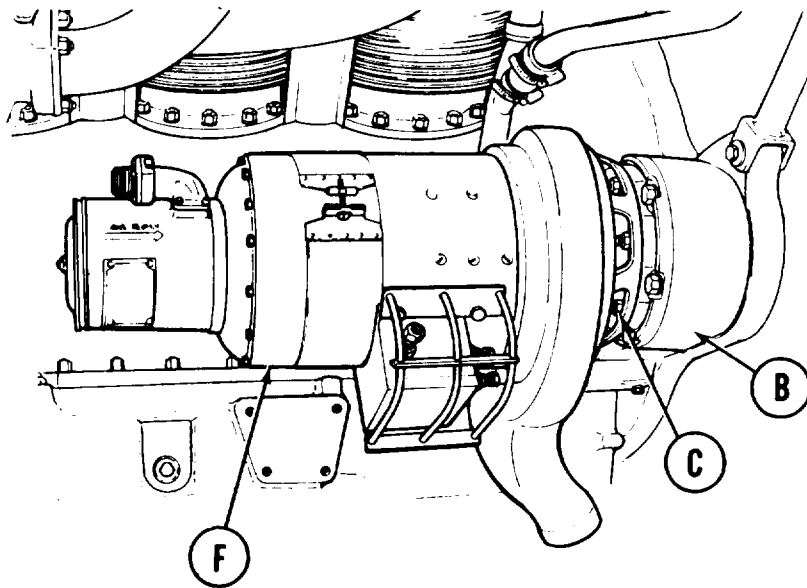
TA139567

GENERATOR REPLACEMENT (Sheet 10 of 15)

5. Aline mounting flange holes (G) with six self-locking nuts (C), and generator shaft splines (H) with drive adapter splines (J).
6. Push generator (F) onto drive adapter (B) and rotate generator (F) clockwise.



7. Using 9/16 inch half-moon wrench, tighten six self-locking nuts (C) securing generator (F) to drive adapter (B).

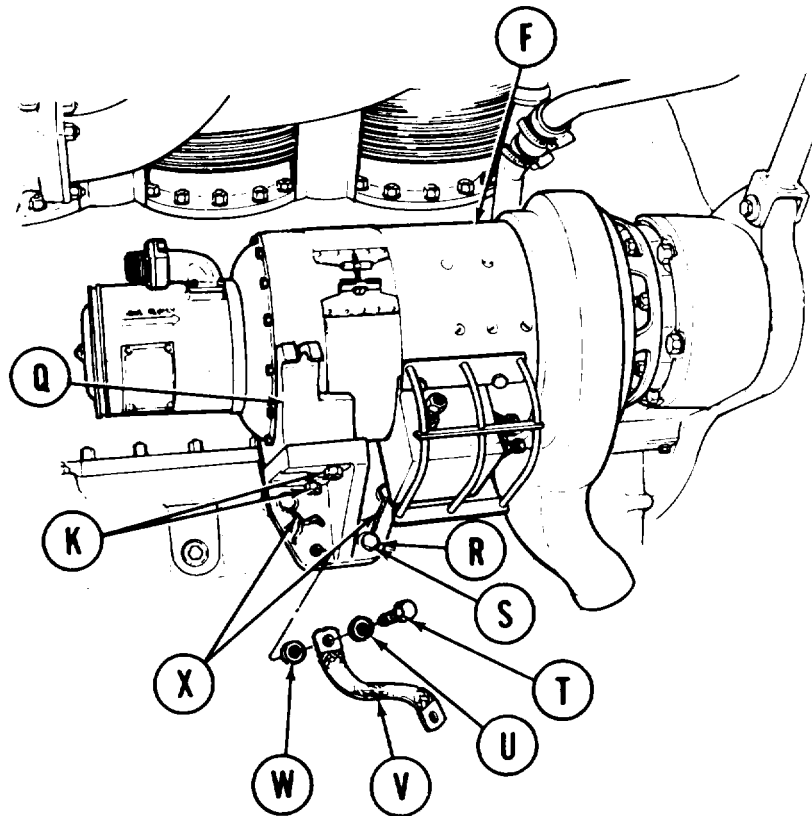
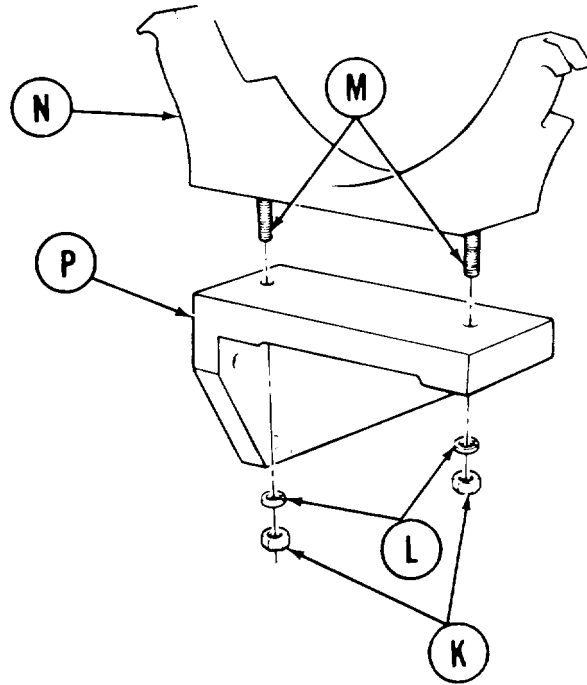


Go on to Sheet 11

TA139568

GENERATOR REPLACEMENT (Sheet 11 of 15)

8. Using fingers, install two nuts (K) and flat washers (L) on studs (M) securing cradle (N) to cradle bracket (P).
9. position cradle assembly (Q) to generator (F) and engine.
10. Using 9/16 inch wrench, install three screws (R) and flat washers (S) securing cradle assembly (Q) to engine.
11. Using 9/16 inch wrench, install new lockwasher (W), ground strap (V), flat washer (U), and screw (T).
12. Using pliers, install two lockwires (X) (Item 60, Appendix D).
13. Using 9/16 inch wrench, tighten nuts (K).

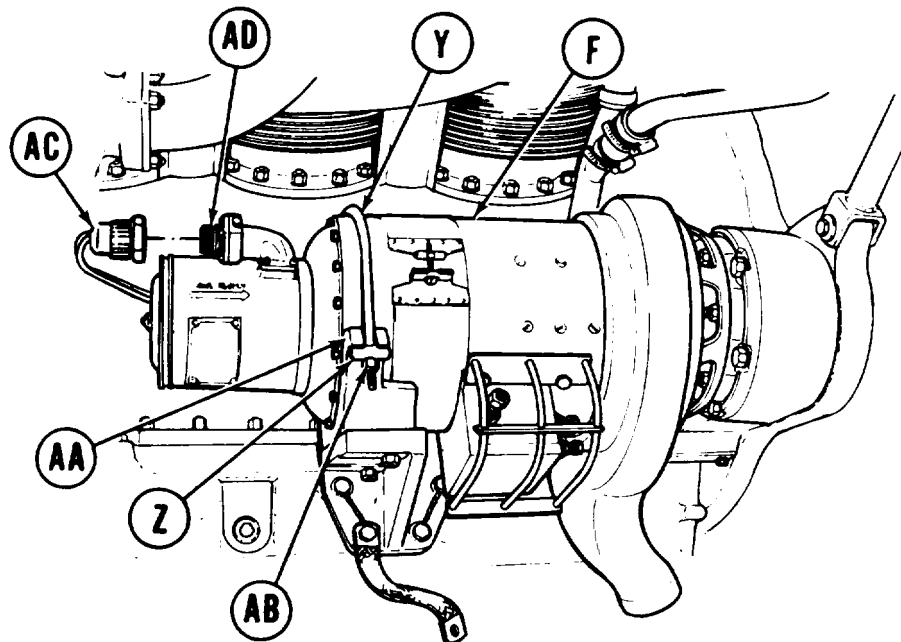


Go on to Sheet 12

TA139569

GENERATOR REPLACEMENT (Sheet 12 of 15)

14. Position U-bolt (Y) over generator (F).
15. Position two U-bolt bars (Z) into cradle assembly holders (AA).
16. Using 9/16 inch wrench, tighten two self-locking nuts (AB).
17. Using 1-1/8 inch wrench, connect electrical connector (AC) to generator connector (AD).



Go on to Sheet 13

TA139570

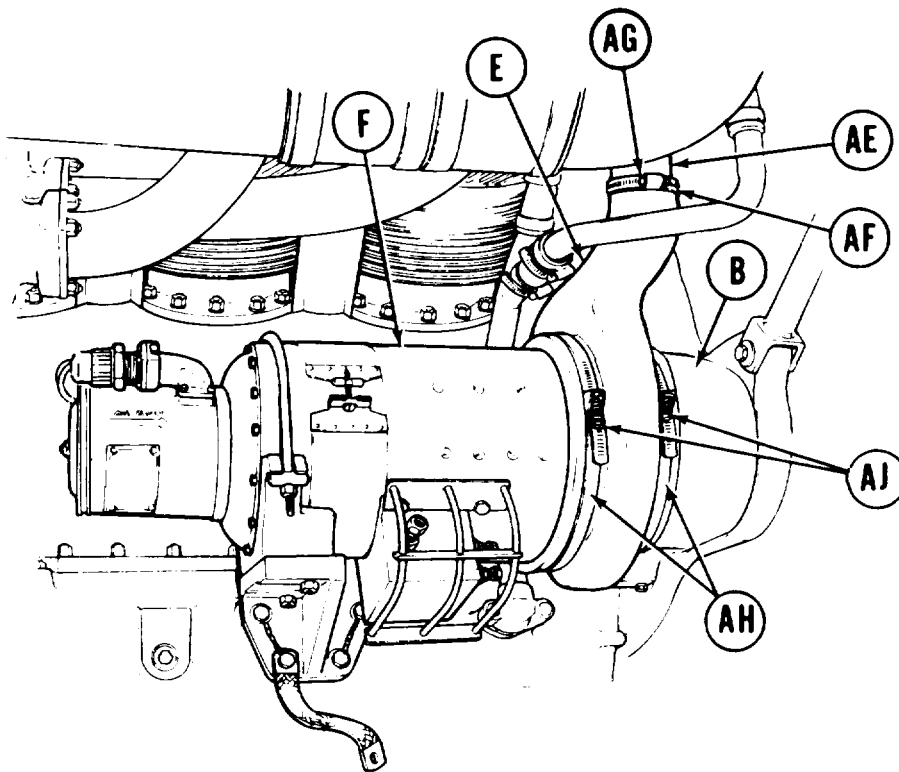
GENERATOR REPLACEMENT (Sheet 13 of 15)

18. Position flexible boot (E) on exhaust tube (AE).
19. Position clamp (AF) on flexible boot (E).
20. Using screwdriver, turn screw (AG) securing clamp (AF).

CAUTION

Do not damage flexible boot during steps 22 thru 24.

21. Position flexible boot (E) in place on generator (F) and drive adapter (B).
22. Position two clamps (AH) in place on flexible boot (E).
23. Using screwdriver, turn two screws (AJ) securing clamps (AH).

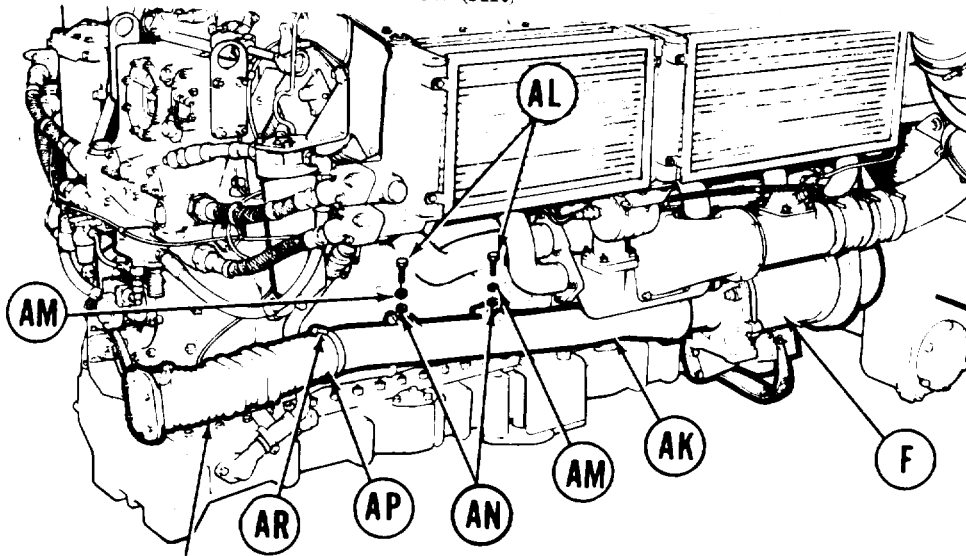


Go on to Sheet 14

TA139571

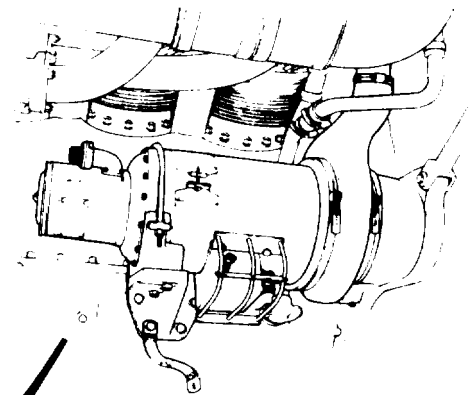
GENERATOR REPLACEMENT (Sheet 14 of 15)

24. Position generator duct (AK) on generator (F).
25. Using 1/2 inch wrench, install two screws (AL), new lockwashers (AM), and flat washers (AN) securing generator duct (AK) to engine.
26. Slide clamp (AP) on generator duct (AK).
27. Position flexible connector (AQ) on generator duct (AK).
28. Position clamp (AP) on flexible connector (AQ).
29. Using screwdriver, turn screw (AR) to secure clamp (AP).



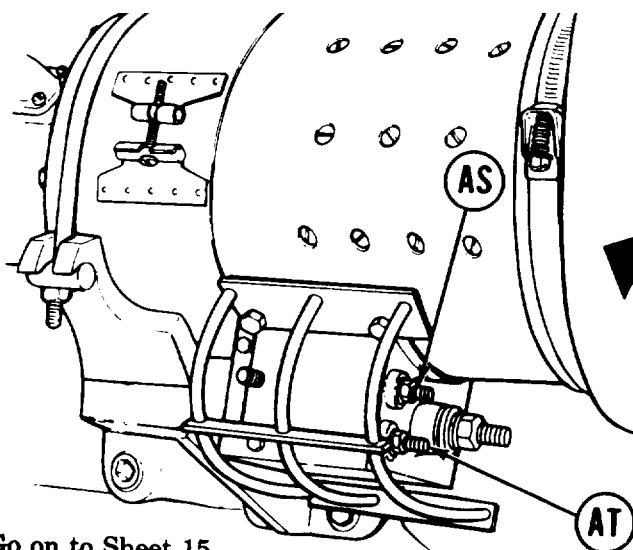
WARNING

Wear protective goggles when polarizing the generator because sparks may fly into your face.



NOTE

Polarize the generator. Using a 6-24 vdc power source, connect positive (+) lead of power source to generator terminal (AS). Touch negative (-) lead of power source to generator terminal (AT) for a period of less than five seconds. Disconnect positive lead from generator terminal (AS).

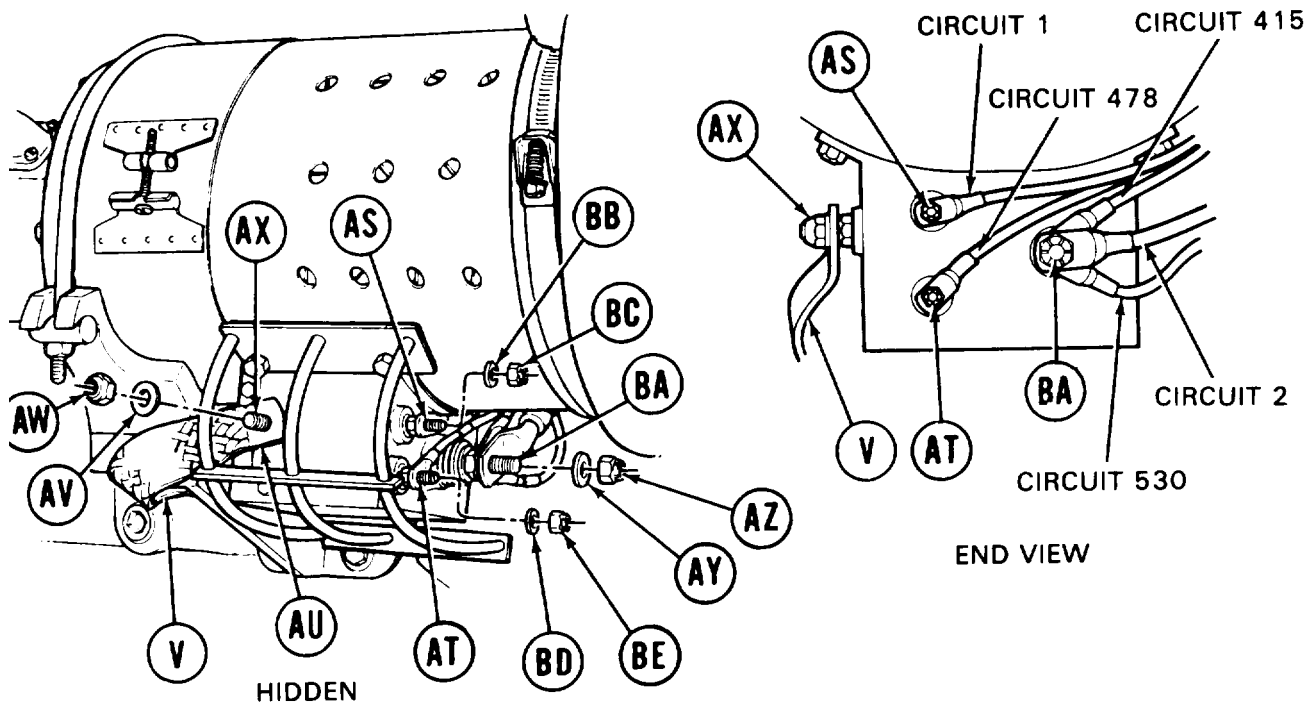


Go on to Sheet 15

TA139572

GENERATOR REPLACEMENT (Sheet 15 of 15)

30. Using 9/16 inch wrench, install new lockwasher (AU), ground strap (V), flat washer (AV), and new self-locking nut (AW) to terminal (AX).
31. Using 9/16 inch wrench, install electrical lead (circuit 530), electrical lead (circuit 415), electrical lead (circuit 2), flat washer (AY) and new self-locking nut (AZ) to terminal (BA).
32. Using 3/8 inch wrench, install electrical lead (circuit 1), flat washer (BB) and new self-locking nut (BC) to terminal (AS).
33. Using 3/8 inch wrench, install electrical lead (circuit 478), flat washer (BD), and new self-locking nut (BE) to terminal (AT).



34. Connect engine for powerplant test run ground hop (page 5-48).
35. Start and run engine at idle speed according to procedures for powerplant test run (page 5-52).
36. Check BATTERY-GENERATOR indicator in driver's compartment for proper indication.
37. Shut down and disconnect engine as prepared for powerplant test run (ground hop) (page 5-62).
38. Install 2A powerplant (page 5-14) or 2D powerplant (5-37).

End of Task

TA139573

VOLTAGE REGULATOR ASSEMBLY REPLACEMENT (Sheet 1 of 3)

PROCEDURE INDEX

PROCEDURE	PAGE
Removal	10-19
Installation	10-21

TOOLS:

- 10 in. extension with 1/2 in. drive
- Ratchet with 1/2 in. drive
- Spanner wrench
- 7/16 in. combination box and open end wrench
- 3/8 in. combination box and open end wrench
- 3/8 in. socket with 1/2 in. drive

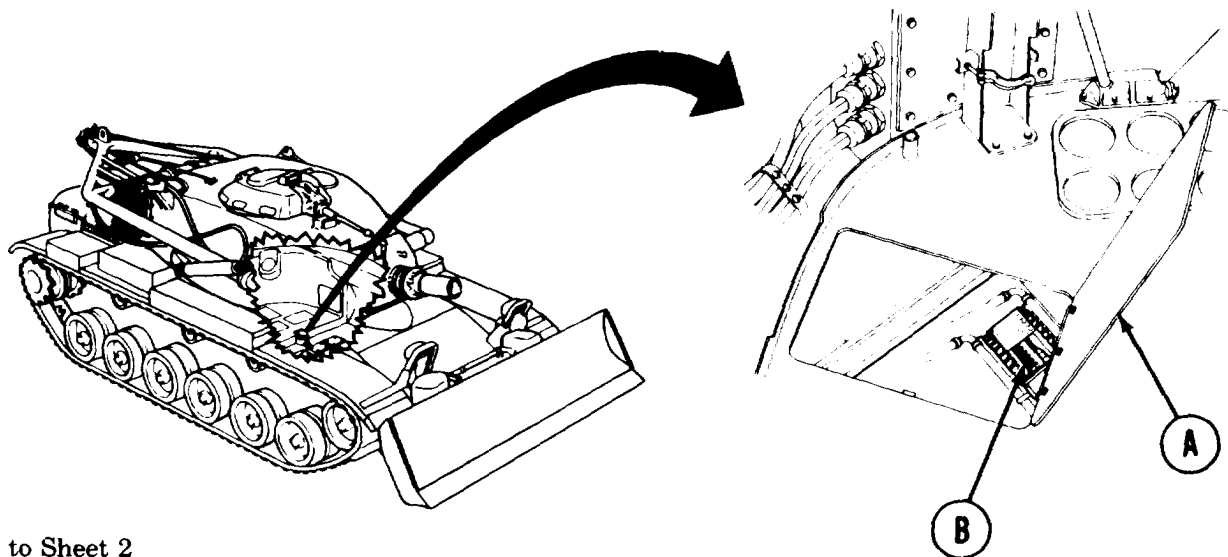
SUPPLIES: Lockwasher (MS35338-44) (4 required)
 Lockwasher (MS45904-76)

REFERENCE TM 9-2350-222-10

PRELIMINARY PROCEDURE: Disconnect three battery ground straps (Pg. 10-283)

REMOVAL:

1. Open turret platform access cover (A) (TM 9-2350-222-10).
2. Manually traverse turret to gain access to voltage regulator (B) (TM 9-2350-222-10).



Go on to Sheet 2

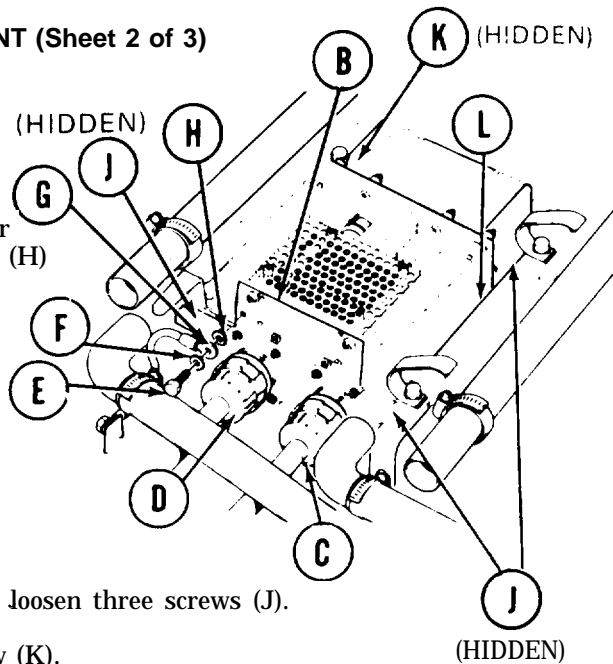
TA139574

VOLTAGE REGULATOR ASSEMBLY REPLACEMENT (Sheet 2 of 3)

3. Using spanner wrench, remove connectors (C) and (D) from voltage regulator (B).
4. Using 5/16 inch wrench, remove screw (E), star washer (F), ground lead (G), and star washer (H) from voltage regulator (B).

NOTE

Screws (J) and (K) are part of voltage regulator (B) and cannot be removed. Completely loosen screws (J) and (K) when doing steps 5 and 6.

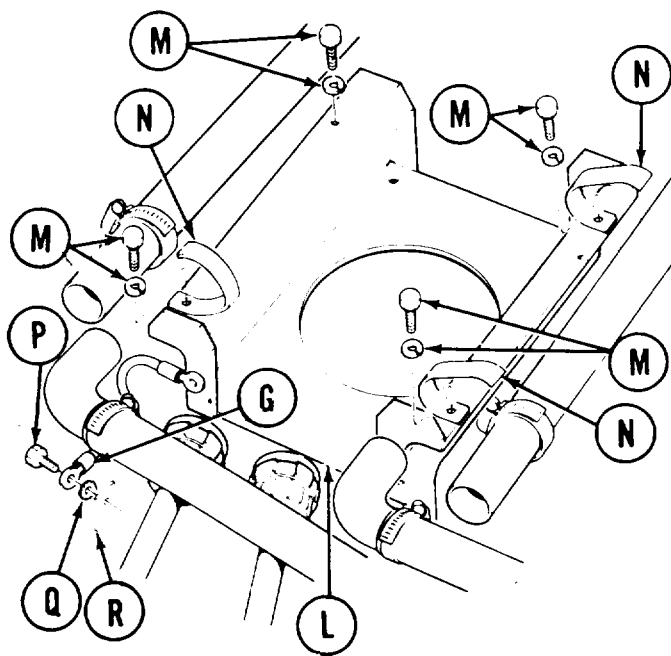


5. Using 3/8 inch socket and extension, completely loosen three screws (J).
6. Using 3/8 inch wrench, completely loosen screw (K).
7. Using hands, remove voltage regulator (B) from bracket (L).

8. Using 7/16 inch wrench, remove four screws and lockwashers (M) and three clamps (N). Throw lockwashers away.

9. Using hands, remove bracket (L).

10. Using 7/16 inch wrench, remove screw (P), lockwasher (Q), and ground lead (G) from terminal (R) on hull. Throw lockwasher away.



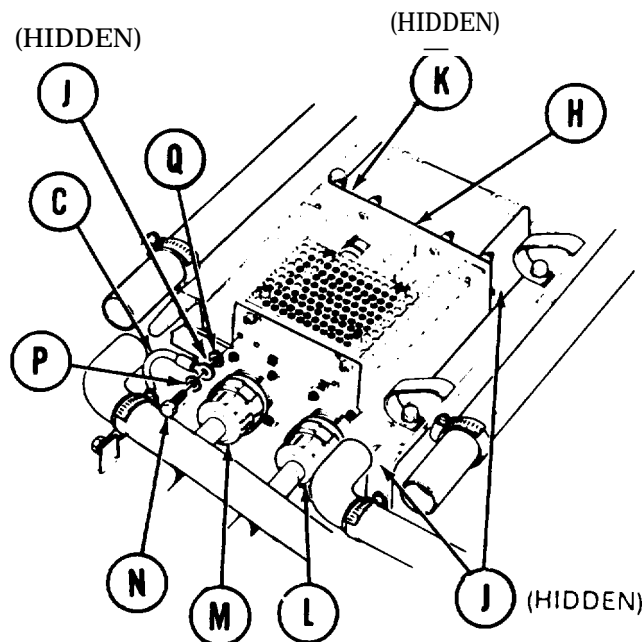
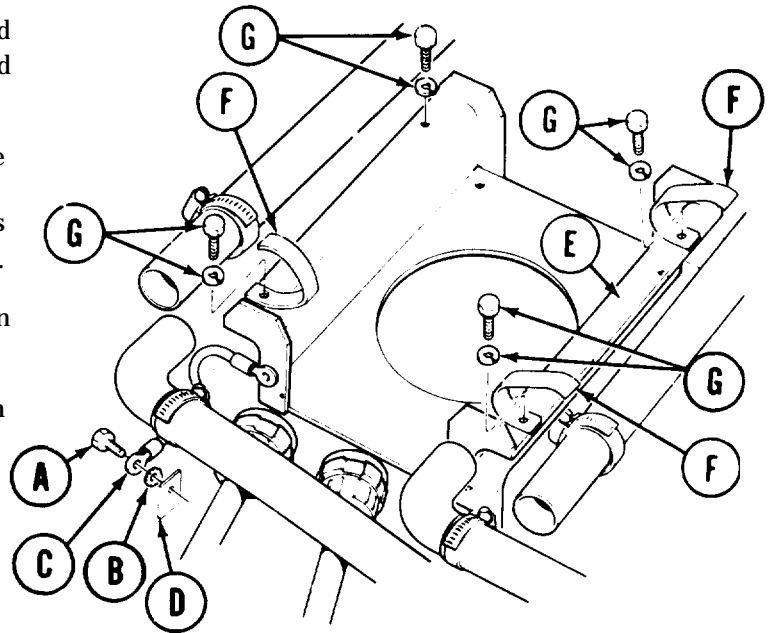
Go on to Sheet 3

TA253217

VOLTAGE REGULATOR ASSEMBLY REPLACEMENT (Sheet 3 of 3)

INSTALLATION:

1. Using 7/16 inch wrench, install screw (A) and new lockwasher (B) securing one end of ground lead (C) to terminal (D) on hull.
2. Using hands, position bracket (E) in vehicle
3. Using 7/16 inch wrench, install three clamps (F) and four screws and new lockwashers (G).
4. Using hands, position voltage regulator (H) in bracket (E).
5. Using 3/8 inch socket and extension, tighten three screws (J).
6. Using 3/8 inch wrench, tighten screw (K).
7. Using spanner wrench, install connectors (L) and (M) to voltage regulator (H).
8. Using 5/16 inch wrench, install screw (N), small star washer (P), ground lead (C), and large star washer (Q) to voltage regulator (H).
9. Connect three battery ground cables (Pg. 10-283).
10. Close turret platform access cover (TM 9-2350-222-10).



End of Task

TA253218

Change 1 10-21

TM 9-2350-222-20-1-4

GENERATOR VOLTAGE ADJUSTMENT (Sheet 1 of 2)

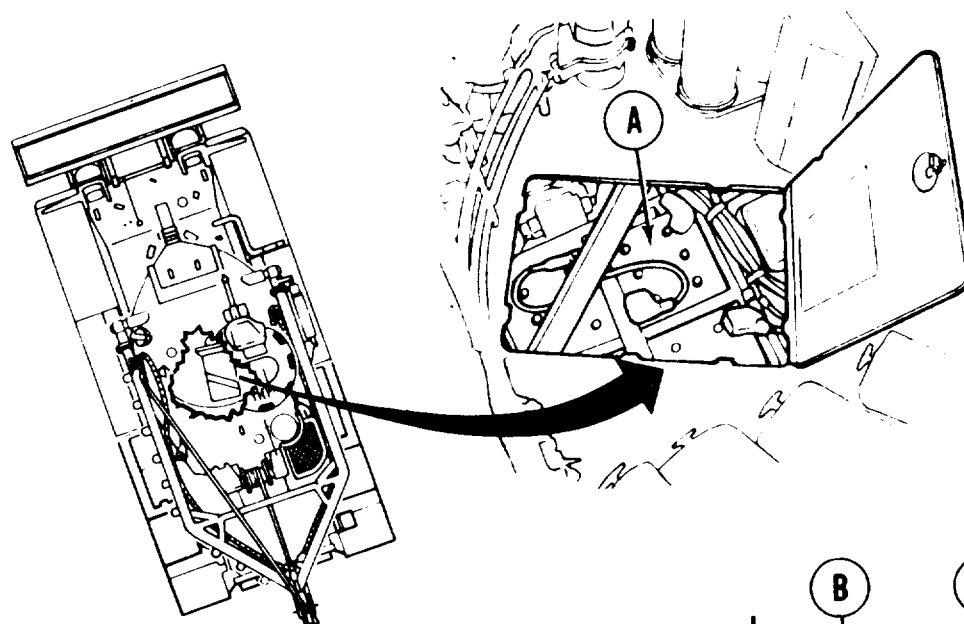
TOOLS: Flat-tip screwdriver
7/8 in. combination box and open end wrench

TEST EQUIPMENT: Multimeter

REFERENCES: TM 9-2350-222-10
TM 9-6140-200-14

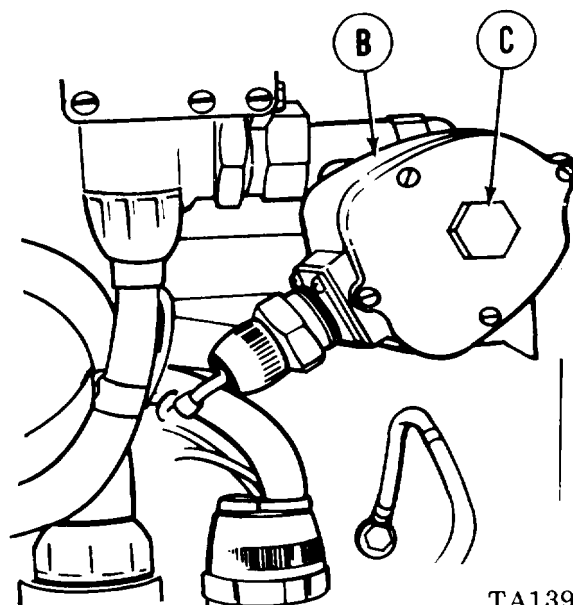
PERSONNEL: TWO

PRELIMINARY PROCEDURES: Open turret platform access door (TM 9-2350-222-10)
Traverse turret to locate batteries (TM 9-2350-222-10)



ADJUSTMENT:

1. Check batteries (A) for full charge (page 10-289).
2. Charge batteries if they are not at full charge (TM 9-6140-200-14).
3. Traverse turret to locate voltage control box (B) (TM 9-2350-222-10).
4. Using wrench, remove access plug (C).



Go on to Sheet 2

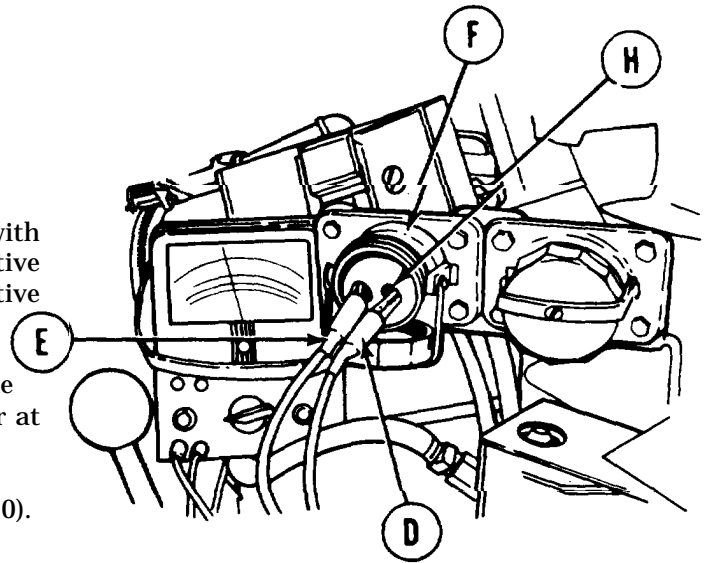
TA139577

GENERATOR VOLTAGE ADJUSTMENT (Sheet 2 of 2)

NOTE

There is a positive (+) and negative (-) shown on slave receptacle.

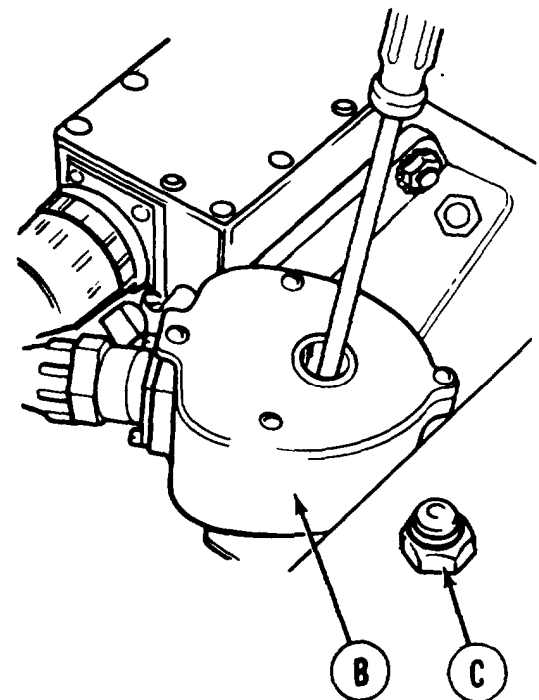
5. Set multimeter to 0-50 volt DC range.
6. With one person in driver's compartment with multimeter, place red test lead (D) in positive (+) (H) side and black test lead (E) in negative (-) side of slave receptacle (F)
7. Person in drive's compartment, start engine (TM 9-2350-222-10) and run for one half hour at 1000 RPM.
8. Turn on service headlights (TM 9-2350-222-10).



NOTE

Make sure person in turret has full view of multimeter.

9. Person in turret, using screwdriver, adjust voltage control box (B) until multimeter indicates 26-30 VDC.
10. If voltage cannot be obtained, refer to troubleshooting (page 4-5261).
11. Shut down engine and turn off service headlights (TM 9-2350-222-10).
12. Install access plug (C) in voltage control box (B).
13. Remove test leads (D) and (E) from slave receptacle (F).



End of Task

TA139578

TM 9-2350-222-20-1-4

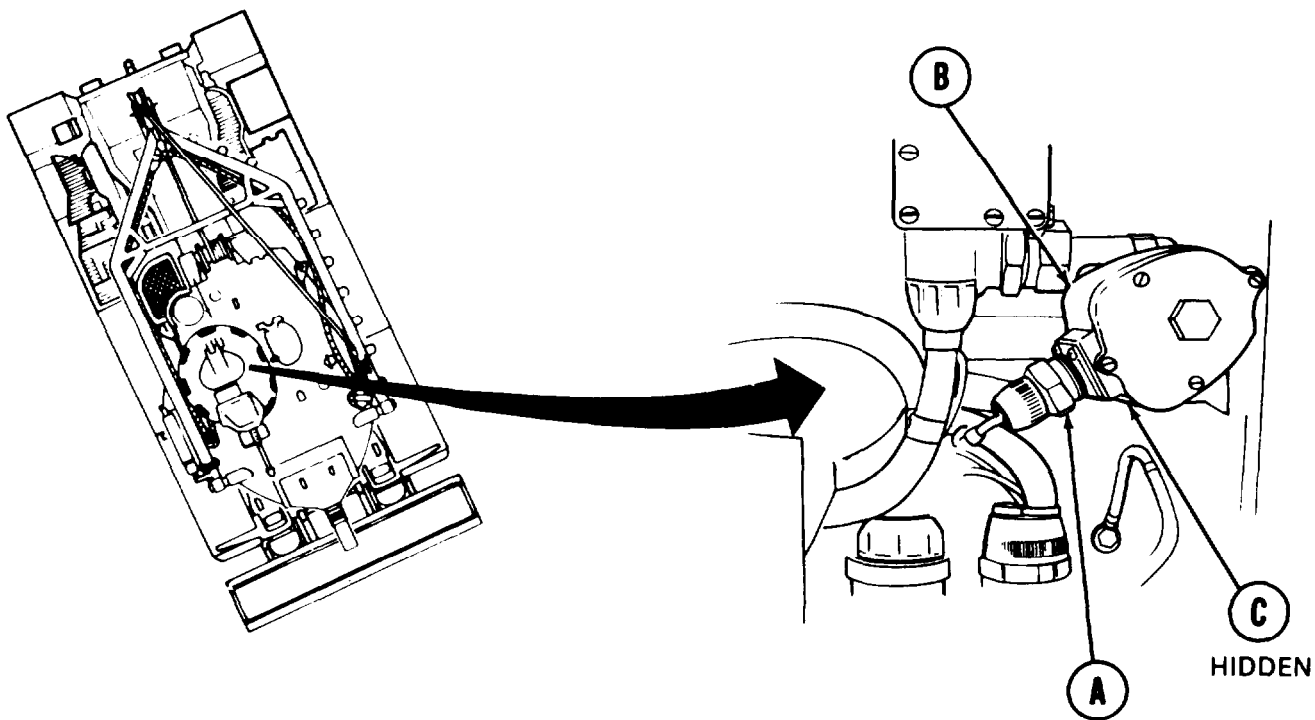
VOLTAGE CONTROL BOX REPLACEMENT (Sheet 1 of 2)

TOOLS: 7/16 in. combination box and open end wrench
Spanner wrench

REFERENCE: TM 9-2350-222-10

SUPPLIES: Lockwasher (MS35336-44) (2 required)

PRELIMINARY PROCEDURES: Open turret platform access door (TM 9-2350-222-10)
Traverse turret to gain access to voltage control box (TM 9-2350-222-10)



REMOVAL:

1. Using spanner wrench, disconnect electrical connector (A) from voltage control box (B).

NOTE

Screws and lockwashers (C) securing voltage control box (B) are located under the voltage control box.

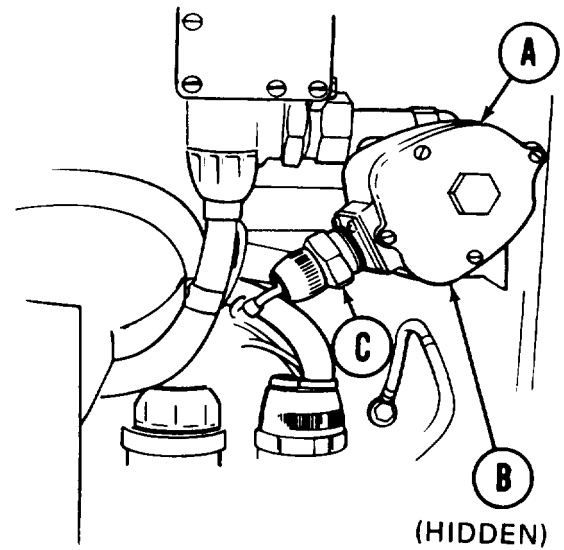
2. Using 7/16 inch wrench, remove two screws and lockwashers (C) securing voltage control box (B) to bracket. Throw lockwashers away.
3. Remove voltage control box (B) from mounting bracket and vehicle.

Go on to Sheet 2

TA139579

VOLTAGE CONTROL BOX REPLACEMENT (Sheet 2 of 2)**INSTALLATION:**

1. Position voltage control box (A) onto mounting bracket.
2. Using 7/16 inch wrench, install two screws and new lockwashers (B) to underside of voltage control box (A) to secure control box (A) to bracket.
3. Connect electrical connector (C) to voltage control box (A).
4. Perform generator voltage adjustment (page 10-22).



End of Task

TA139580

STARTER REPLACEMENT (Sheet 1 of 7)

PROCEDURE INDEX

PROCEDURE	PAGE
Removal	10-27
Installation	10-30

TOOLS: Diagonal cutting pliers
 Flat-tip screwdriver
 Slip joint pliers
 Ratchet with 1/2 in. drive
 10 in. extension with 1/2 in. drive
 1/2 in. socket with 1/2 in. drive
 3/4 in. socket with 3/8 in. drive
 9/16 in. socket with 1/2 in. drive
 3/4 in. socket with 1/2 in. drive
 1/2 in. combination box and open end wrench
 3/4 in. combination box and open end wrench
 13/16 in. combination box and open end wrench
 15/16 in. combination box and open end wrench
 Torque wrench with 3/8 in. drive (0-200 lb-in.) (0-22 N-m)

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

SUPPLIES: Pencil
 Two tags
 Lockwire (10 in.) (Item 59, Appendix D)
 Glyptol (Item 38, Appendix D)
 Self-locking nut (MS21044-N15) (3 required)
 Self-locking nut (MS21044-N5) (2 required)
 Lockwasher (MS35335-34) (4 required)
 Lockwasher (MS45904-76)

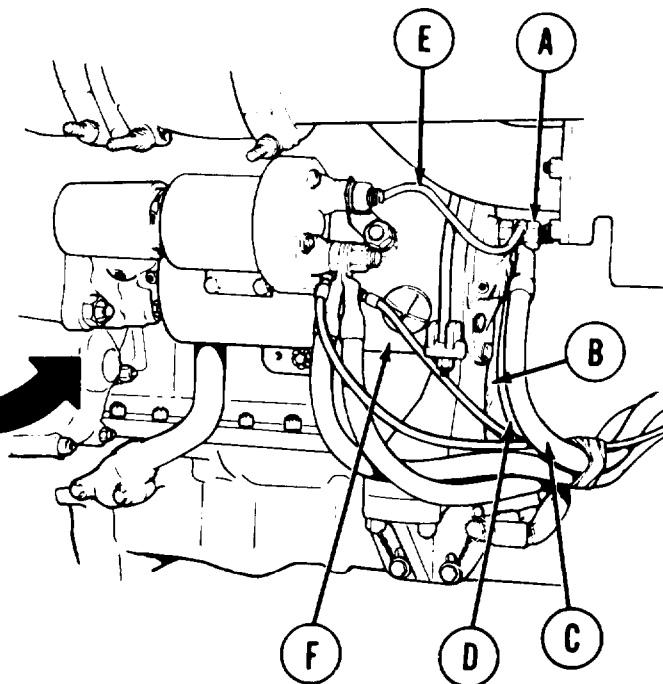
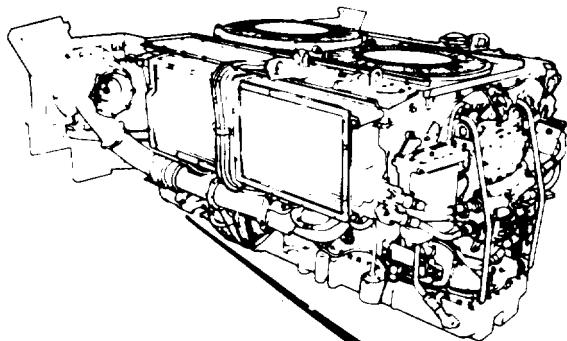
PERSONNEL: Two

REFERENCES: TM 9-2350-222-10

PRELIMINARY PROCEDURES: Remove powerplant (page 5-1)
 Remove starter low voltage relay solenoid (page 10-33)
 (2D engine only)

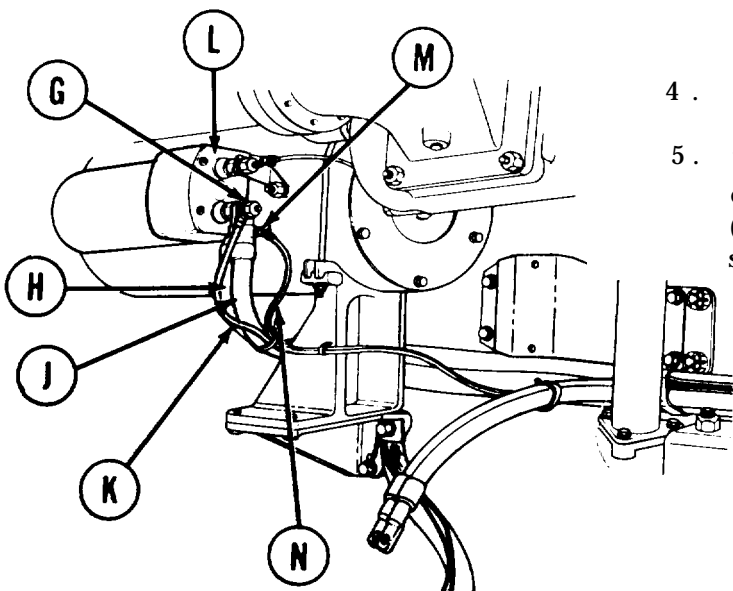
STARTER REPLACEMENT (Sheet 2 of 7)

REMOVAL:



1. Using 13/16 inch wrench, remove nut and lockwasher (A) securing ground straps (B), heavy cables (C) and (D) and light cable (E) to terminal on front of starter (F). Throw lockwasher away.
2. Remove all cables and tag.

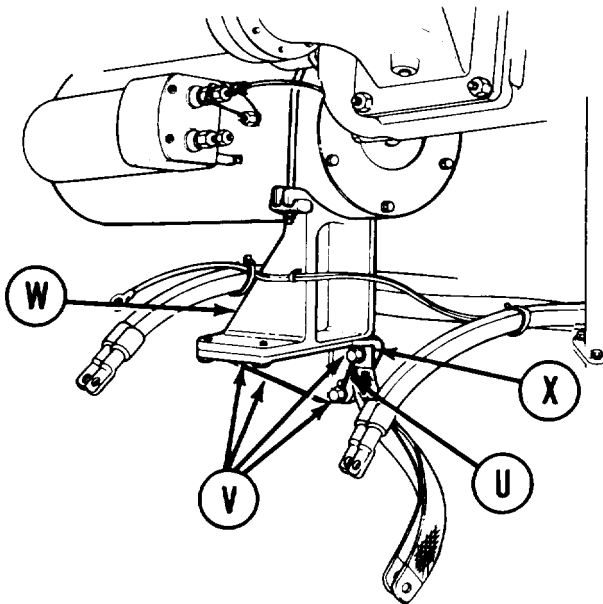
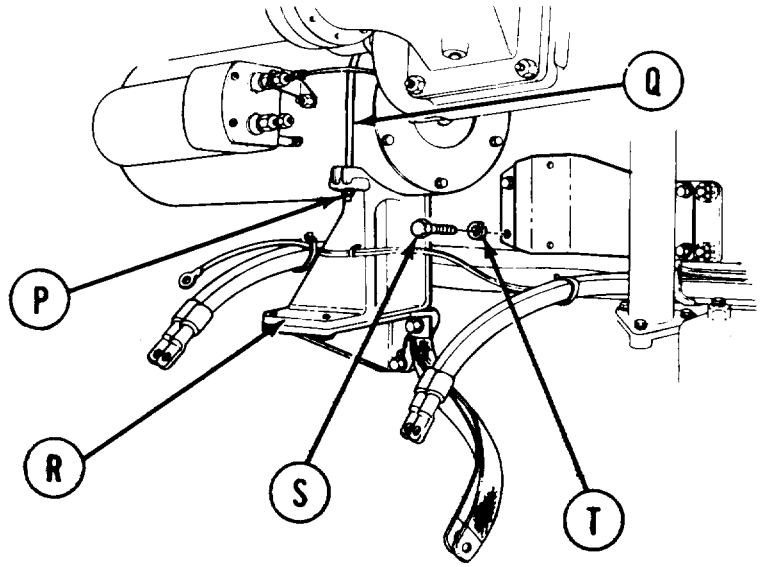
3. Using 3/4 inch socket, remove nut, external tooth lockwasher, and split lockwasher (G) securing two heavy cables (H) and (J) and one light cable (K) to terminal on front of starter relay solenoid (L).
4. Remove and tag all cables.
5. Using screwdriver, remove screw and external tooth lockwasher (M) securing cable (N) to terminal at lower front of starter switch relay solenoid (L). Remove cable.



TA139582

STARTER REPLACEMENT (Sheet 3 of 7)

6. Using 1/2 inch wrench, loosen two self-locking nuts (P) securing U-bolt (Q) to cradle assembly (R). Throw self-locking nuts away.
7. Using 1/2 inch wrench, remove four screws (S) and lockwashers (T) securing relay solenoid bracket to engine oil pan. Throw lockwashers away.



8. Using pliers, cut and remove lockwire (U) on four screws (V) securing starter cradle assembly (W) and bracket (X) to engine oil pan.
9. Using 9/16 inch socket and extension, loosen and remove four screws and flat washers (V) securing starter cradle assembly (W) and bracket (X) to engine oil pan. Remove starter cradle bracket and U-bolt as an assembly.

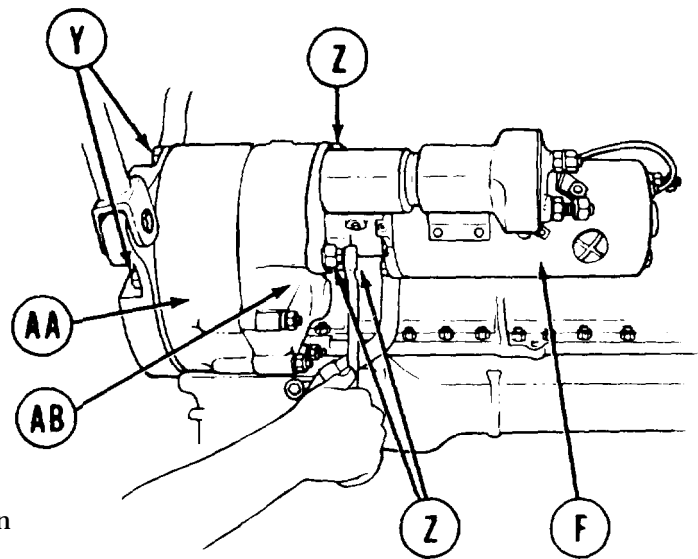
Go on to Sheet 4

TA139583

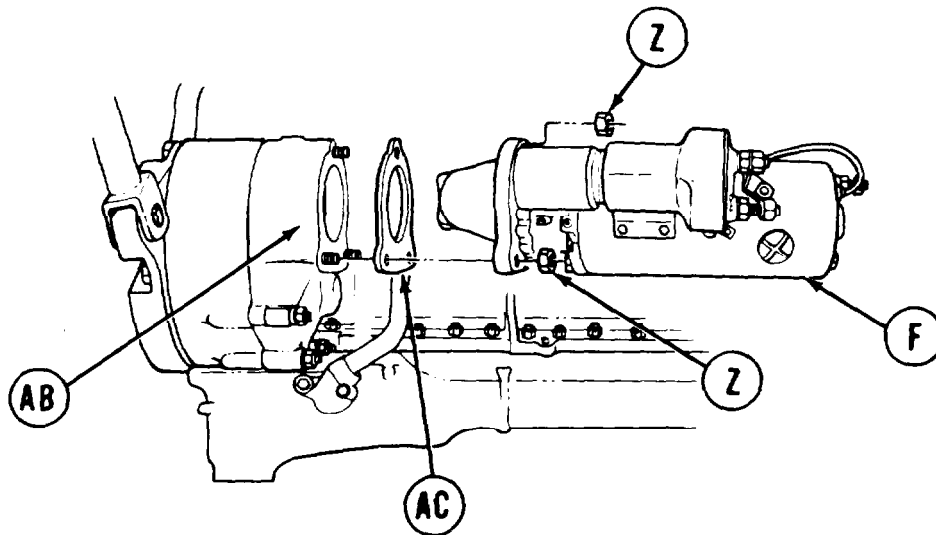
STARTER REPLACEMENT (Sheet 4 of 7)

NOTE

The top and front fasteners have bolts (Y) which pass through the engine hull housing (AA) and must be held in place when removing the self-locking nuts (Z). The inboard fastener has a stud and will not require a wrench to hold it in place.



10. Using 15/16 inch wrench on bolts (Y) and special wrench (Item 3, Chapter 3, Section I) on self-locking nuts (Z), loosen and remove three self-locking nuts (Z) securing starter (F) to starter drive adapter (AB). Throw nuts away.
11. Using two persons, ease starter out of starter drive adapter (AB). Remove starter from engine.



12. Remove gasket (AC) from starter drive adapter (AB). Throw gasket away.

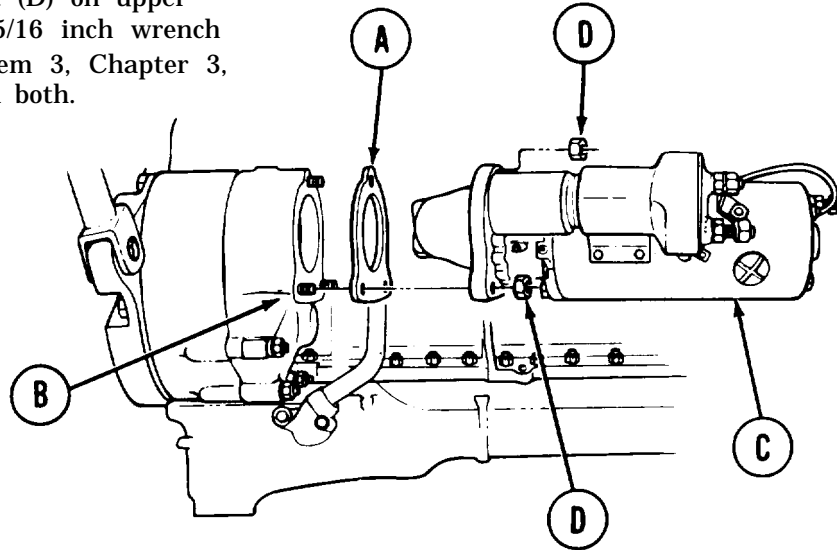
Go on to Sheet 5

TA 139584

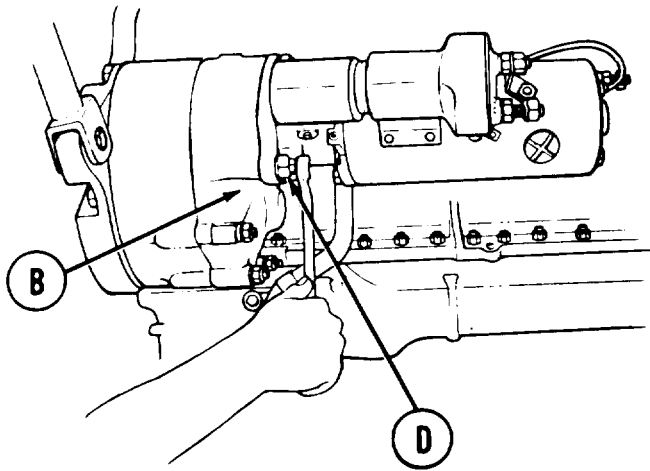
STARTER REPLACEMENT (Sheet 5 of 7)

INSTALLATION:

1. Install new gasket (A) on starter drive adapter (B).
2. Using two persons, ease starter (C) into place in starter drive adapter (B). Support starter and install one new self-locking nut (D) on upper bolt of drive adapter. Using 15/16 inch wrench on bolt and special wrench (Item 3, Chapter 3, Section I) on nut, secure nut on both.



3. Install lower new self-locking nut on bolt in same way as upper self-locking nut on bolt in step 2.
4. Using special wrench, secure last new self-locking nut (D) onto bolt.



Go on to Sheet 6

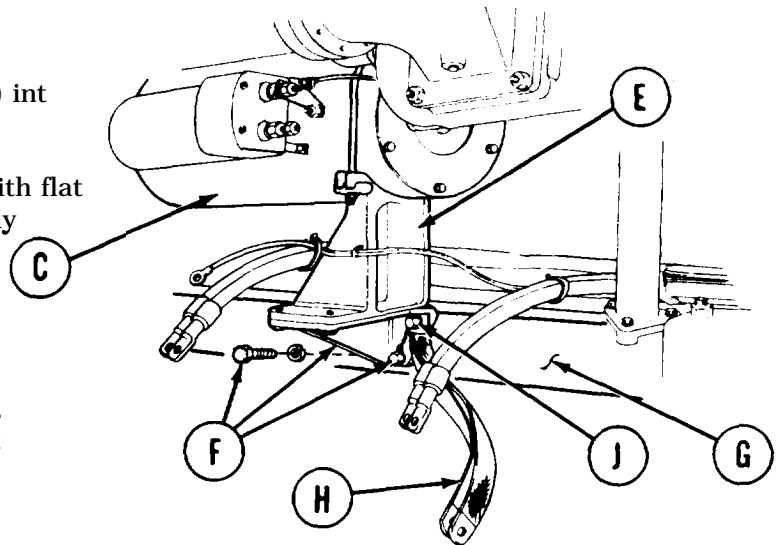
TA139585

STARTER REPLACEMENT (Sheet 6 of 7)

5. Slide starter cradle assembly bracket (E) into position on starter (C).
6. Using fingers, install three screws (F) with flat washers to secure starter cradle assembly bracket (E) to engine oil pan (G).

NOTE

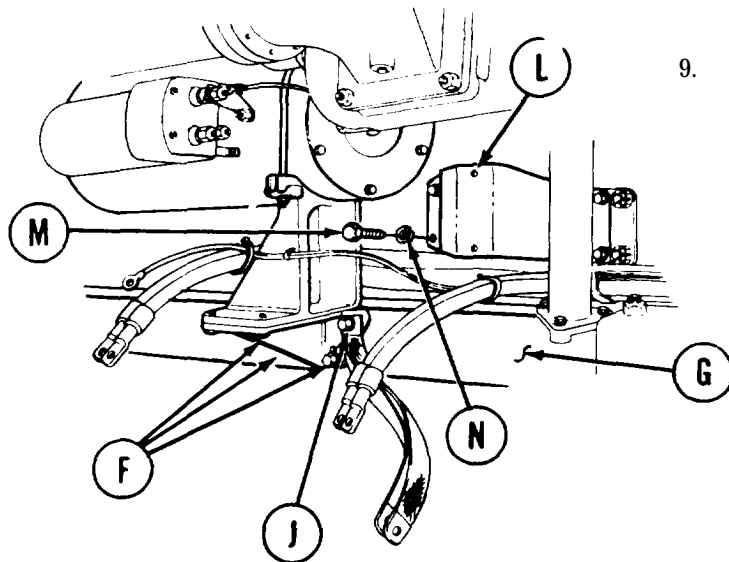
When installing double-braided ground strap (H) to screw (J), make sure flat washer seats flat against bracket face.



7. Using fingers, install double-braided ground strap (H) with screw and flat washer (J), and install screw to starter cradle assembly bracket (E) and engine oil pan (G) as in step 6.

8. Using 1/2 inch wrench, tighten two self-locking nuts evenly to be sure nuts and U-bolts seat properly.

9. Using 9/16 inch socket and extension, secure four screws and flat washers (F) and (J).



NOTE

After securing bolts and flat washers (F) and (J), check front of starter case to be sure there is no gap between starter case and support cradle assembly. If there is a gap, loosen bolts (F) and (J) and adjust position of cradle assembly so there is no gap.

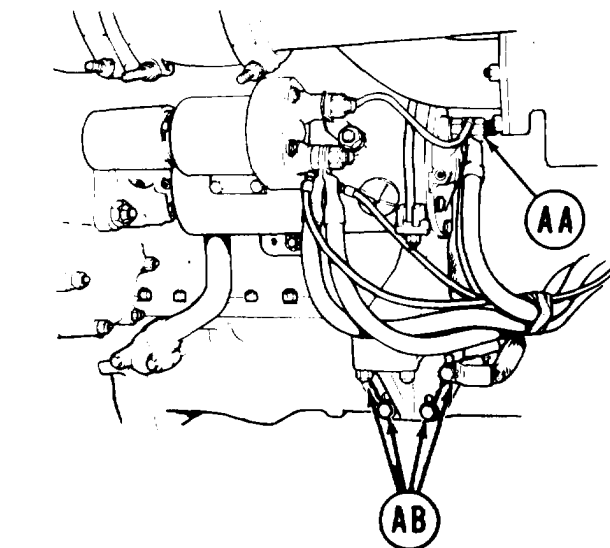
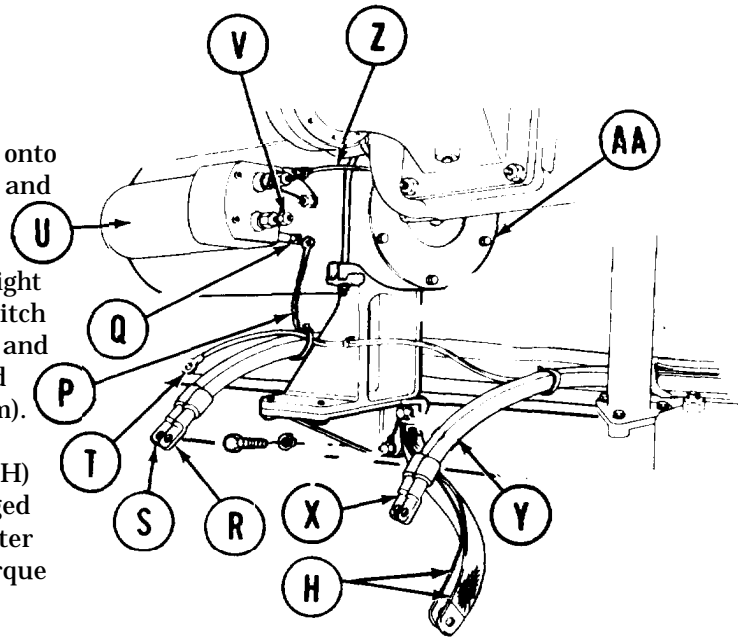
10. Using 1/2 inch socket and extension, secure low voltage relay solenoid bracket (L) to engine oil pan (G) with four screws (M) and new lockwashers (N).

Go on to Sheet 7

TA139586

STARTER REPLACEMENT (Sheet 7 of 7)

11. Using screwdriver, secure small cable (P) onto bottom front of solenoid relay with screw and external tooth lockwasher (Q).
12. Install heavy cables (R) and (S) and tagged light cable (T) onto lower terminal of starter switch relay solenoid (U). Using 3/4 inch socket and torque wrench, secured cables with nut and lockwashers (V) to 168-192 lb-in (19-22 N-m).
13. Install two double-braided ground straps (H) and two heavy cables (X) and (Y) and tagged light cable (Z) onto large terminal at starter motor (AA). Using 3/4 inch socket and torque wrench, secure cables with nut and new lockwashers to 168-192 lb-in (19-22 N-m).
14. Install starter low voltage relay solenoid (page 10-34) (2D engine only).
15. Connect powerplant for ground hop (page 5-48).
16. Start engine (TM 9-2350-222-10),



17. Stop engine (TM 9-2350-222-10).
18. Using pliers, secure four bracket bolts with lockwire (Item 59, Appendix D) (AB), exactly as shown in the figure, to prevent them from loosening.
19. Coat all exposed terminal fittings with glyptol (Item 38, Appendix D).
20. Disconnect ground hop kit (page 5-62).
21. Install 2A powerplant (page 5-14) or 2D powerplant (page 5-37).

End of Task

TA139587

STARTER LOW VOLTAGE RELAY SOLENOID (SIDE MOUNTED) REPLACEMENT (sheet 1 of 2)

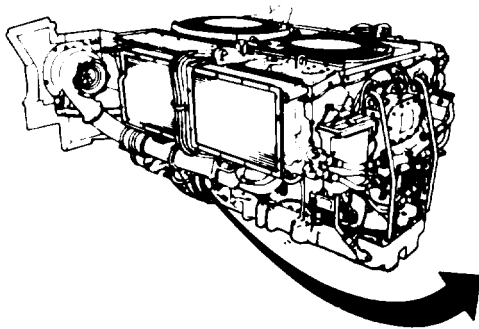
TOOLS: Ratchet with 1/2 in. drive
5 in. extension with 1/2 in. drive
7/16 in. socket with 1/2 in. drive
7/16 in. combination box and open
end wrench
Spanner wrench

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

SUPPLIES: Self-locking nut (MS21045-4) (2 required)

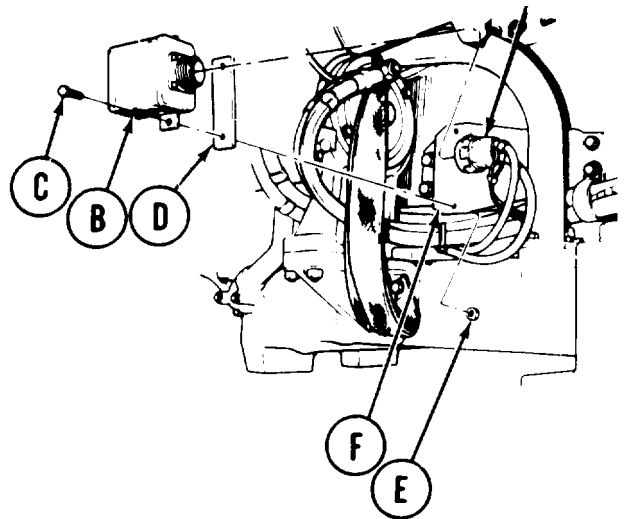
REFERENCE: TM 9-2350-222-10

PRELIMINARY PROCEDURES: Remove powerplant (page 5-25)



REMOVAL:

1. Using spanner wrench, unscrew electrical plug (A) from front of relay solenoid (B).
2. Using socket and 7/16 inch wrench, remove two capscrews (C), insulators (D), and self-locking nuts (E) securing relay solenoid (B) to mounting bracket (F). Remove relay solenoid. Throw nuts away.



INSPECTION:

Inspect insulator (D) and wiring harness (G) with connector plug (A) for cracks or damage. Replace if damaged.

Go on to Sheet 2

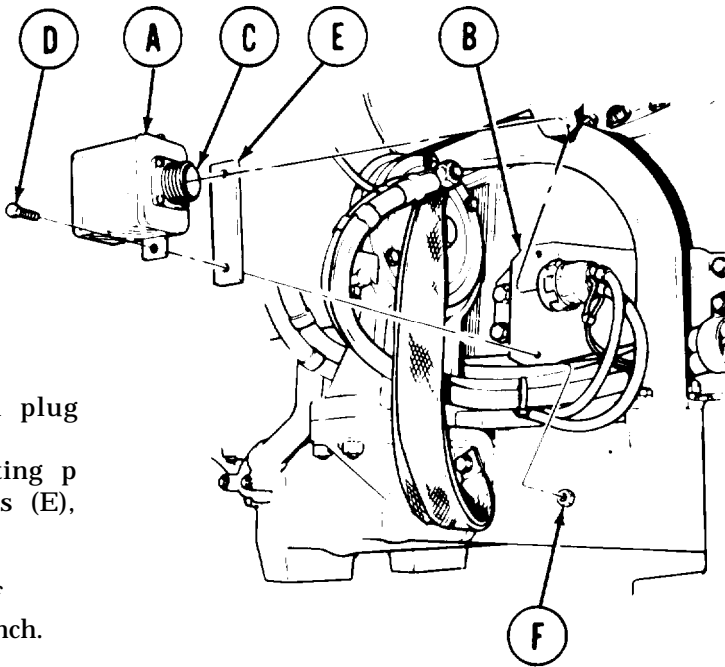
STARTER LOW VOLTAGE RELAY SOLENOID (SIDE MOUNTED) REPLACEMENT

(Sheet 2 of 2)

INSTALLATION:

NOTE

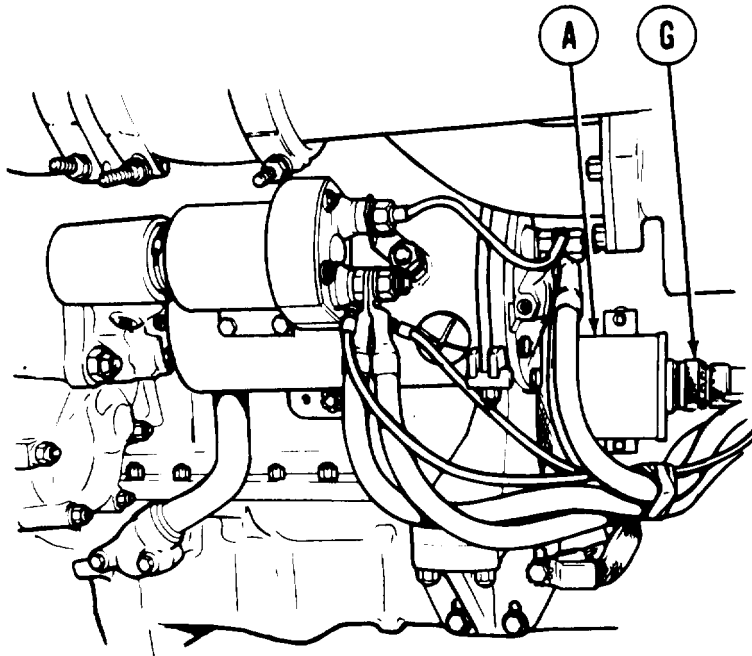
Be sure insulators (E) are placed between relay solenoid (A) and engine mounting bracket (B) as shown.



1. Place relay solenoid (A) in position over mounting bracket (B) with electrical plug facing front. Using socket and 7/16 inch wrench, secure solenoid (A) to mounting p (B) with two capscrews (D), insulators (E), new self-locking nuts (F).
2. screw electrical connector (G) to front of solenoid (A). Tighten, using spanner wrench.

TEST:

1. Connect powerplant for ground hop (page 5-48).
2. Start engine (TM 9-2350-222-10). Check to be sure engine starts smoothly.
3. Stop engine. Disconnect powerplant from test set-up (page 5-62).
4. Install powerplant (page 5-37).



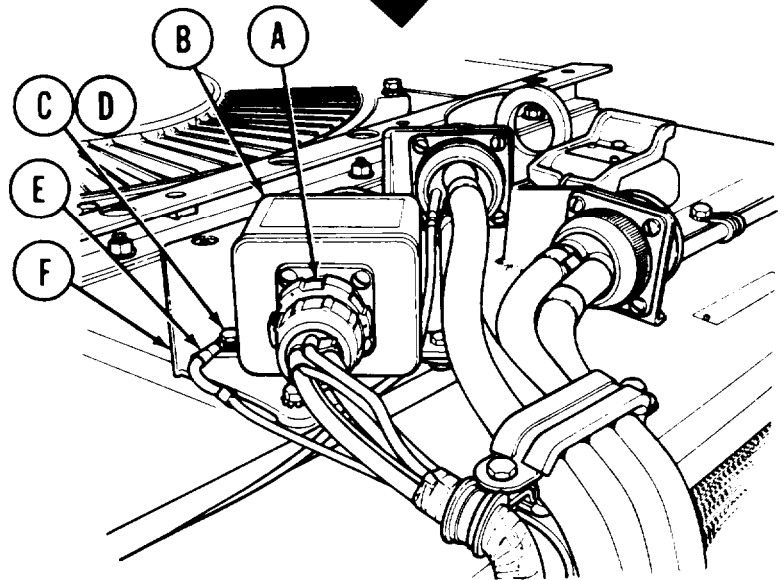
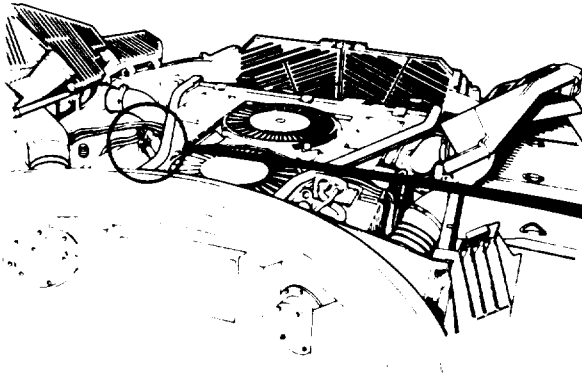
End of Task

STARTER LOW VOLTAGE RELAY SOLENOID (TOP MOUNTED) REPLACEMENT (Sheet 1 of 2)

TOOLS: Ratchet with 1/2 in. drive
 5 in. extension with 1/2 in. drive
 7/16 in. socket with 1/2 in. drive
 Spanner wrench

REFERENCE: TM 9-2350-222-10

PRELIMINARY PROCEDURE: Open top deck mine doors (TM 9-2350-222-10)



REMOVAL:

1. Using spanner wrench, disconnect electrical connector (A) from relay solenoid (B).
2. Using socket, extension and ratchet, remove two screws (C) and lockwashers (D) securing relay solenoid (B) and ground lead (E) to mounting bracket (F). Remove relay solenoid (B).

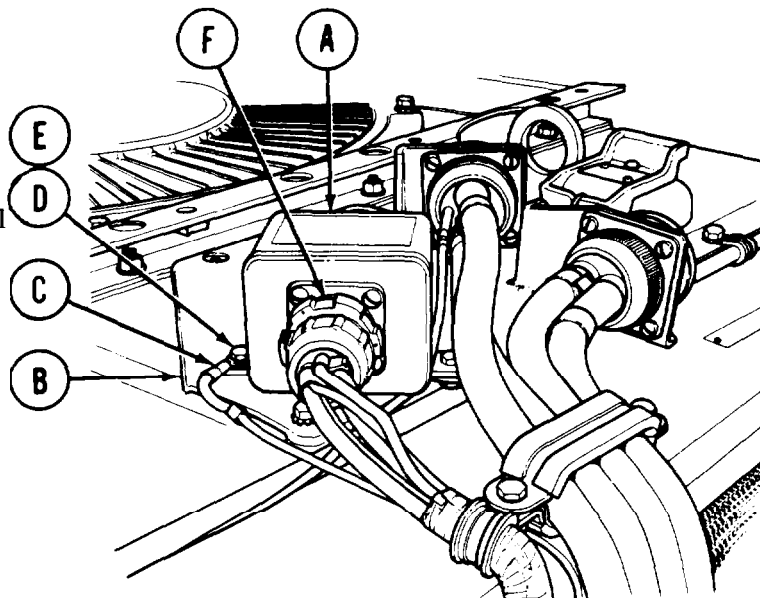
STARTER LOW VOLTAGE RELAY SOLENOID (TOP MOUNTED) REPLACEMENT (Sheet 2 of 2)

INSPECTION:

Inspect wiring harness and electrical connector for missing, broken, cracked, or bent pins, or damaged wires. Replace as necessary.

INSTALLATION:

1. Position relay solenoid (A) on mounting bracket (B) with electrical connector facing rear of vehicle.
2. Position ground lead (C) on relay solenoid (A) and install two lockwashers (D) and screws (E). Use socket, extension and ratchet to tighten screws.
3. Connect electrical connector (F) to relay solenoid (A). Use spanner wrench to tighten electrical connector (F).



End of Task

ENGINE FUEL INJECTION PUMP FUEL SHUTOFF LEAD REPLACEMENT (Sheet 1 of 5)

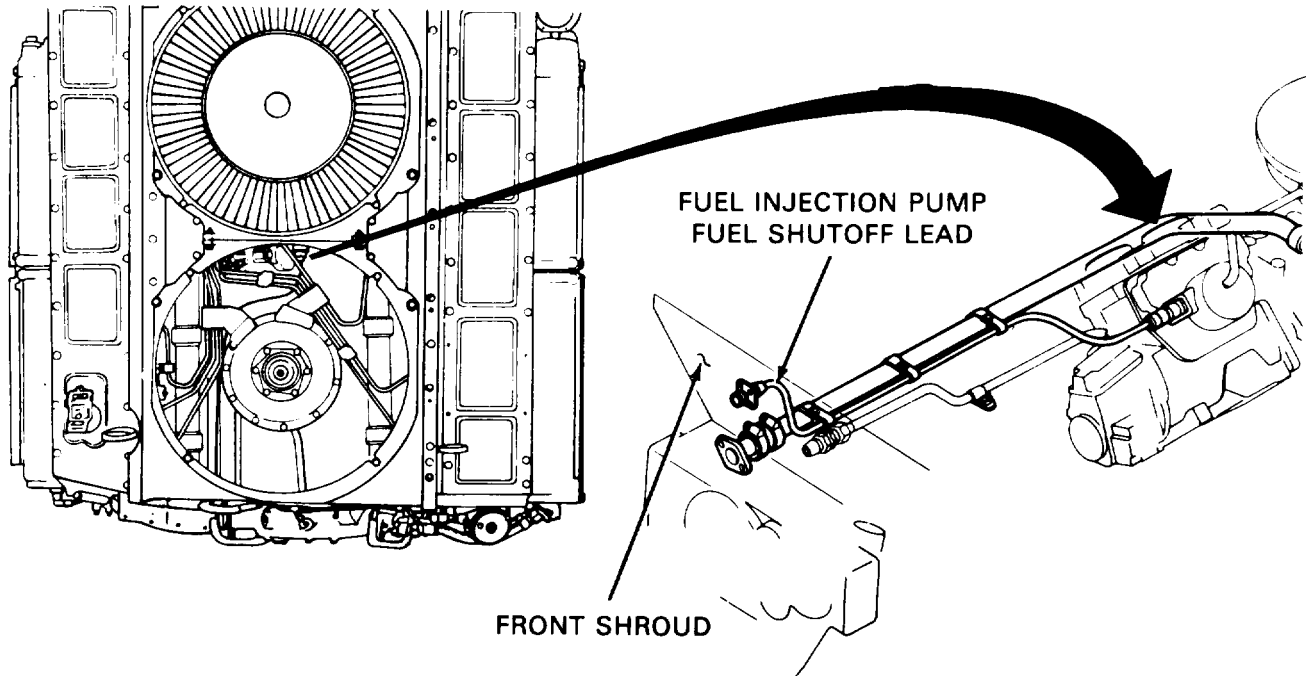
PROCEDURE INDEX

PROCEDURE	PAGE
Removal	10-36
Inspection	10-37
Installation	10-38

TOOLS: Slip joint pliers
 Cross-tip screwdriver with No. 1 tip
 Flat-tip screwdriver
 1/4 in. combination box and open end wrench
 7/8 in. combination box and open end wrench
 3/8 in. combination box and open end wrench

SUPPLIES: Lockwasher (MS35335-20) (4 required)
 Self-locking nut (MS21083-N3) (3 required)
 Lockwire (Item 60, Appendix D)

PRELIMINARY PROCEDURES: Remove powerplant (page 5-1)
 Remove engine cooling fan (page 9-47)



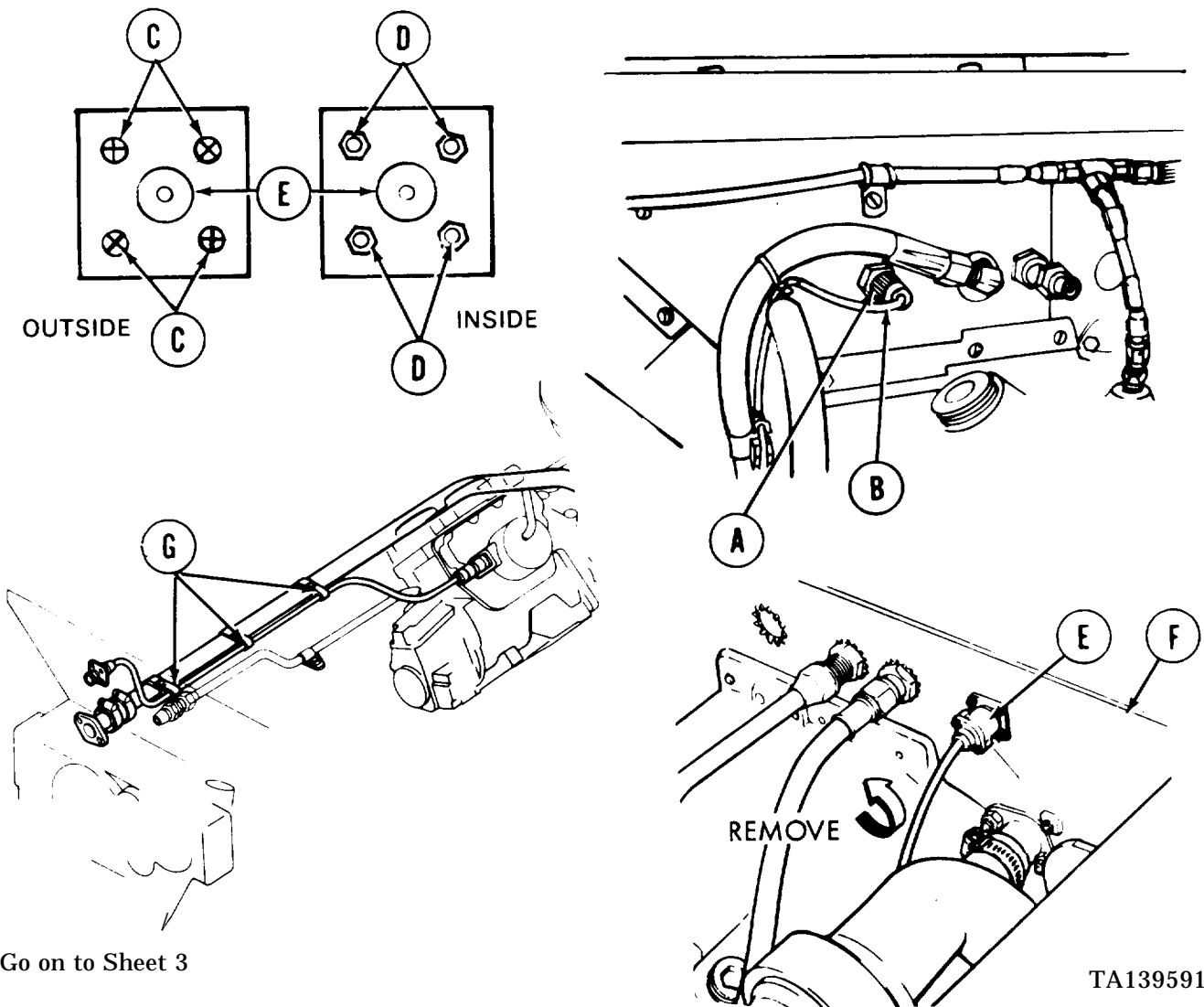
Go on to Sheet 2

TA139590

ENGINE FUEL INJECTION PUMP FUEL SHUTOFF LEAD REPLACEMENT (Sheet 2 of 5)

REMOVAL:

1. Using 7/8 inch wrench, loosen retaining nut (A) on electrical connector (B).
2. Remove connector (B).
3. Using Phillips screwdriver and 1/4 inch wrench, remove four screws (C), and lockwashers and nuts (D) on connector (E). Throw lockwashers away.
4. Remove connector (E) from engine shroud (F).
5. Using flat-tip screwdriver and 3/8 inch wrench, remove three loop clamps and self-locking nuts (G). Throw self-locking nuts away.



Go on to Sheet 3

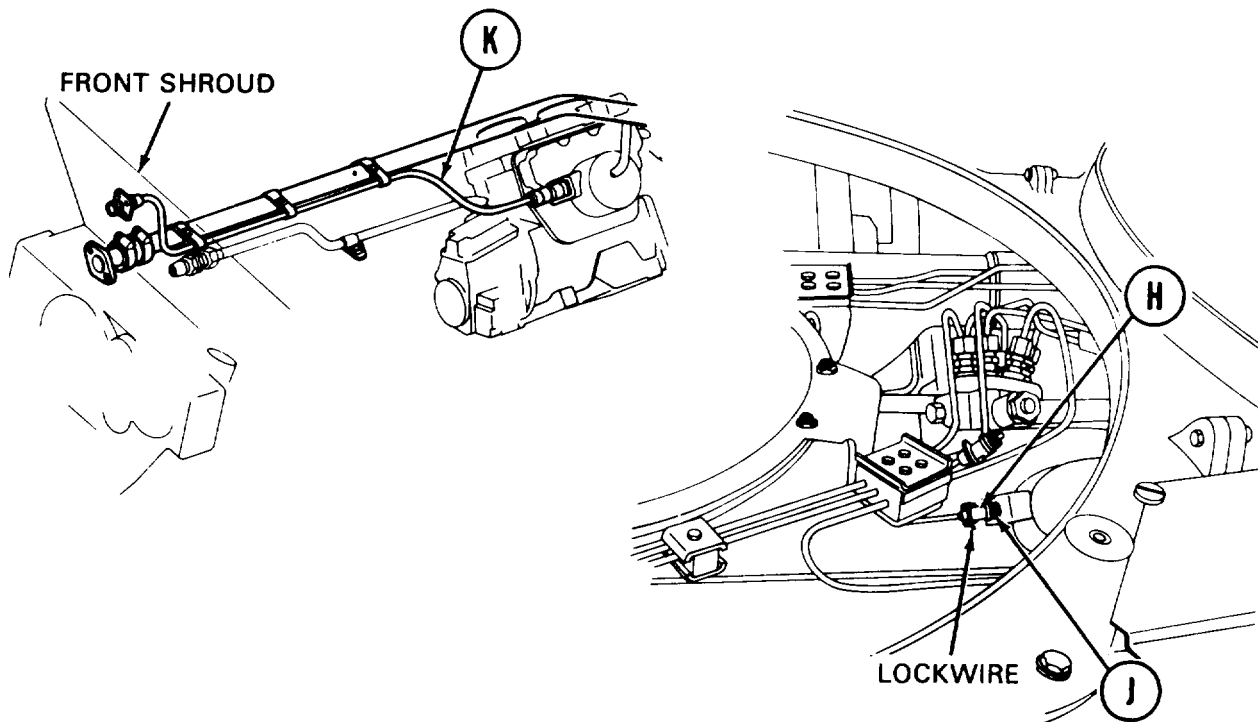
TA139591

ENGINE FUEL INJECTION PUMP FUEL SHUTOFF LEAD REPLACEMENT (Sheet 3 of 5)

6. Using pliers, remove lockwire from retaining nut (H).
7. Using pliers, loosen retaining nut (H) on connector (J).
8. Remove connector (J).
9. Remove lead (K).

INSPECTION:

1. Check loop clamps for cracks and proper shape.
2. Check screws and nuts for stripped threads.
3. Replace parts as necessary.



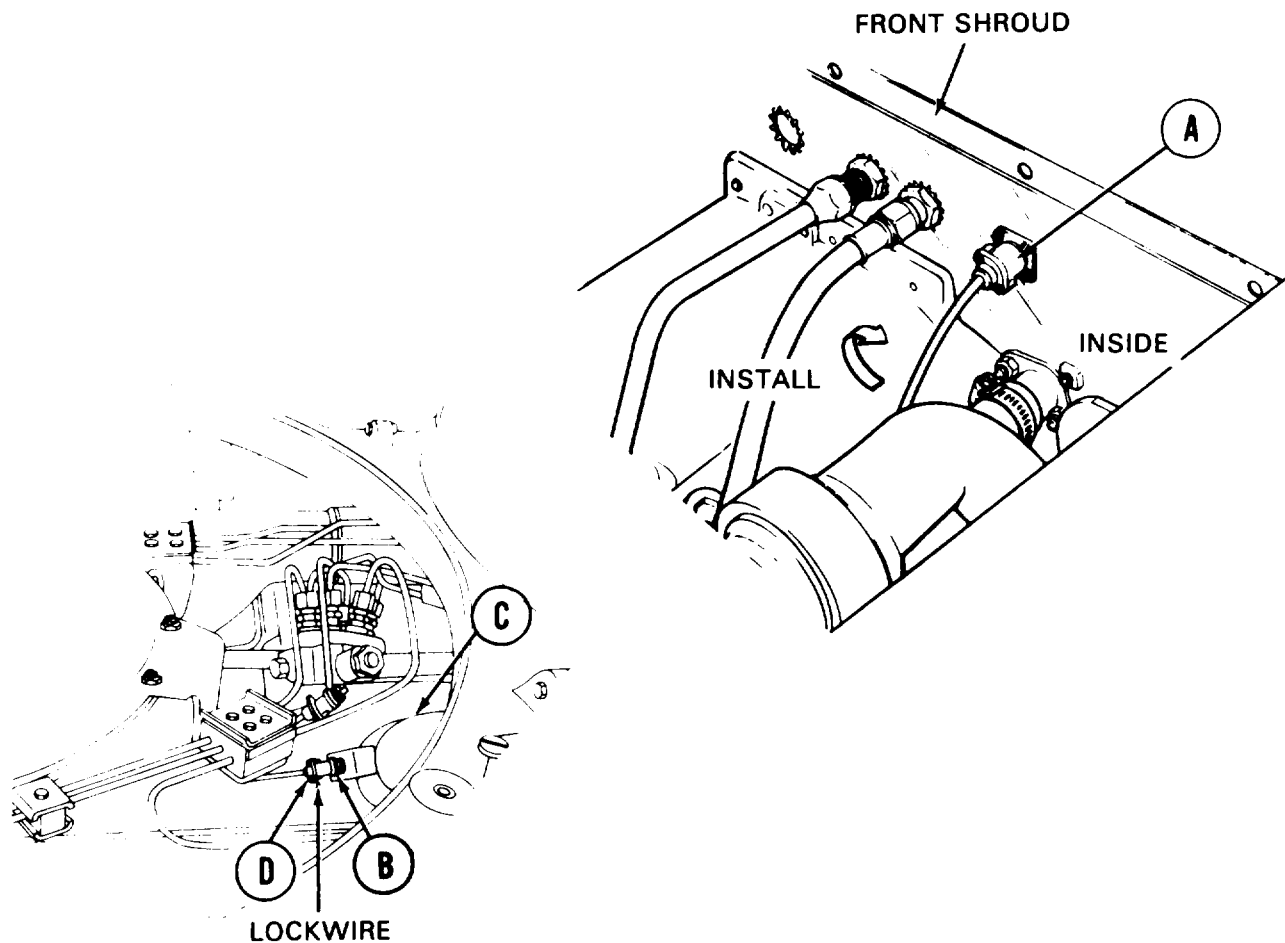
Go on to Sheet 4

TA139592

ENGINE FUEL INJECTION PUMP FUEL SHUTOFF LEAD REPLACEMENT (Sheet 4 of 5)

INSTALLATION:

1. Install connector (A) of replacement lead through engine shroud from inside of engine.
2. Using Phillips screwdriver and 1/4 inch wrench, secure connector (A) with four screws, new lockwashers, and nuts. Make sure nuts are inside engine shroud.
3. Install connector (B) on fuel pump (C).
4. Tighten retaining nut (D), using slip joint pliers.
5. Using pliers, install lockwire (Item 60, Appendix D).

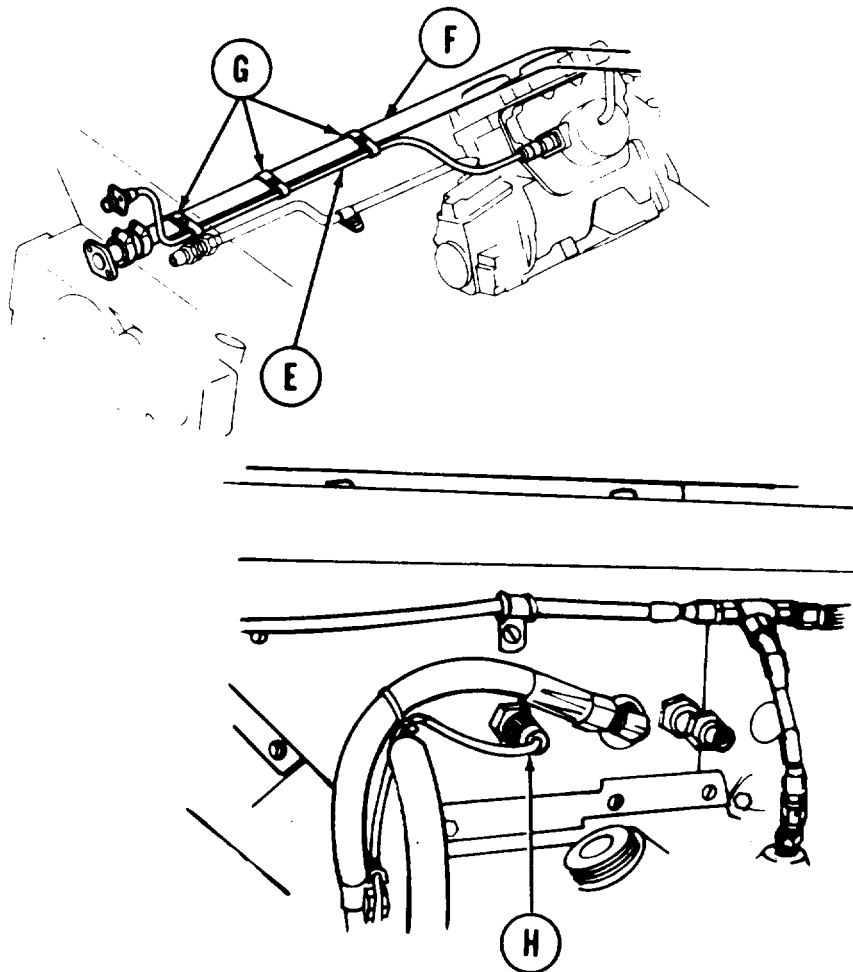
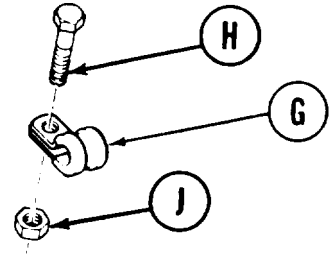


Go on to Sheet 5

TA139593

ENGINE FUEL INJECTION PUMP FUEL SHUTOFF LEAD REPLACEMENT (Sheet 5 of 5)

6. Position lead (E) next to line (F) and install three loop clamps (G).
7. Using 3/8 inch wrench and flat-tip screwdriver, secure three loop clamps (G) with three screws and new self-locking nuts.
8. Using 7/8 inch wrench, install electrical connector (H).
9. Install engine cooling fan (page 9-49).
10. Install 2A powerplant (page 5-14) or 2D powerplant (page 5-37).



End of Task

TA139594

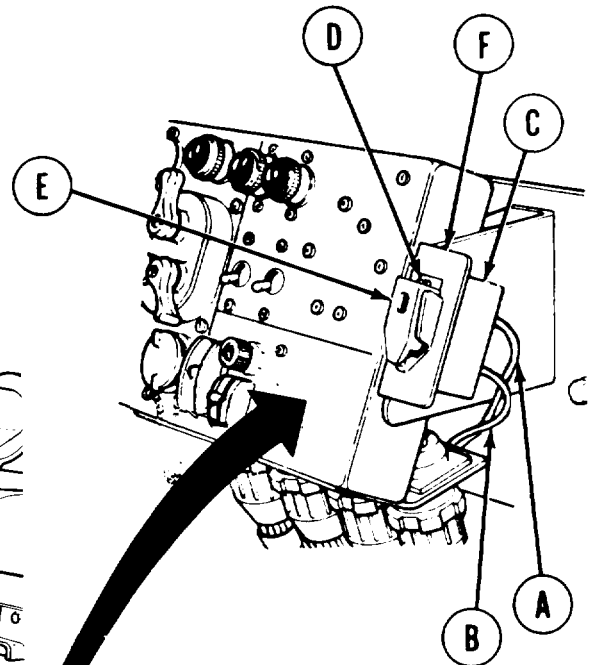
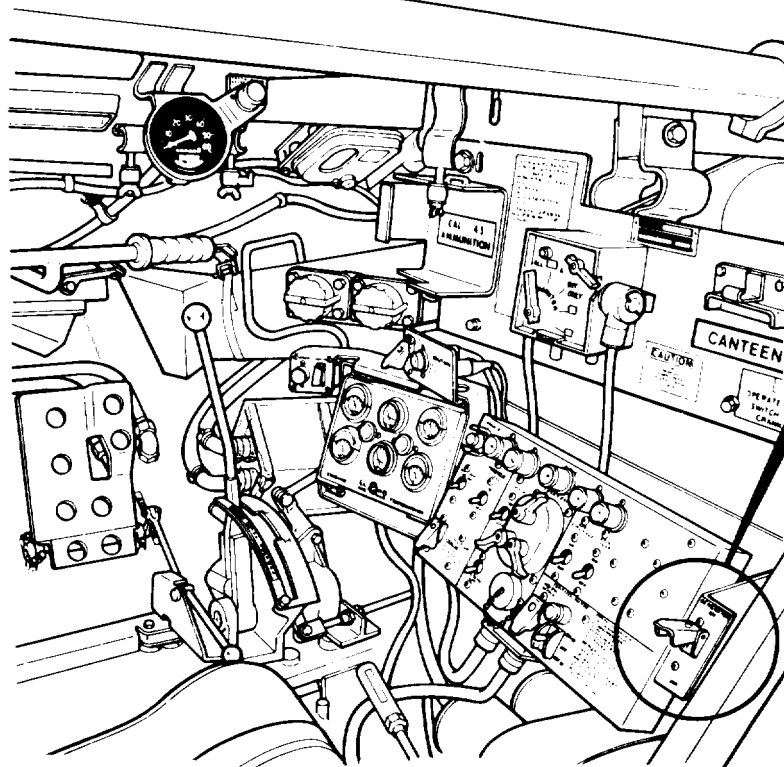
GENERATOR SWITCH OR GUARD REPLACEMENT (Sheet 1 of 2)

TOOLS: Cross-tip screwdriver

TEST EQUIPMENT: Multimeter

SUPPLIES: Silicone compound (Item 32, Appendix D)
Lockwasher (MS35333-38) (2 required)

REFERENCE: TM 94J350-222-10



REMOVAL:

1. Disconnect two leads (A) and (B) from switch (c).
2. Using cross-tip screwdriver, remove two screws and lockwashers (D) securing guard (E) and switch (C) to bracket (F). Throw lockwashers away.
3. Remove guard (E) and switch (C) from bracket (F).

Go on to Sheet 2

TA139595

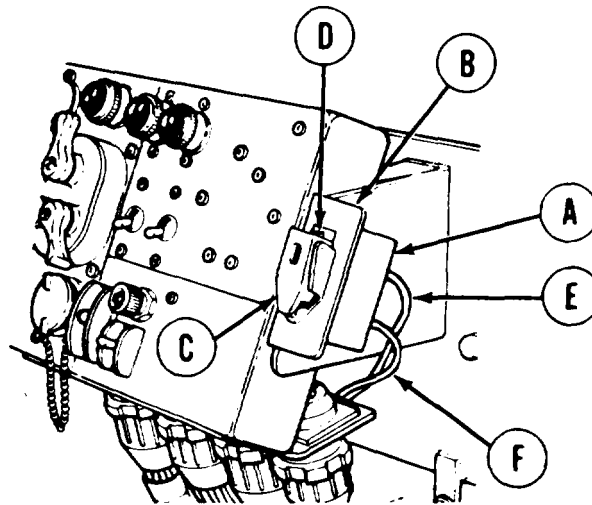
GENERATOR SWITCH OR GUARD REPLACEMENT (Sheet 2 of 2)

INSTALLATION:

NOTE

Use multimeter to verify continuity that switch (A) is in ON position.

1. Position switch (A) with ON position up thru rear of mounting bracket (B).
2. Position guard (C) over switch (A) toggle and front of mounting bracket (B).
3. Using cross-tip screwdriver, install and tighten two screws and new lockwashers (D) securing guard (c) and switch (A) to mounting bracket (B).



4. Coat outside surface of lead (E) and (F) connectors with silicone compound (Item 32, Appendix D) and connect to switch (A).
5. Start engine (TM 9-2350-222-10) and check operation of generator.
6. Shut down engine.

End of Task

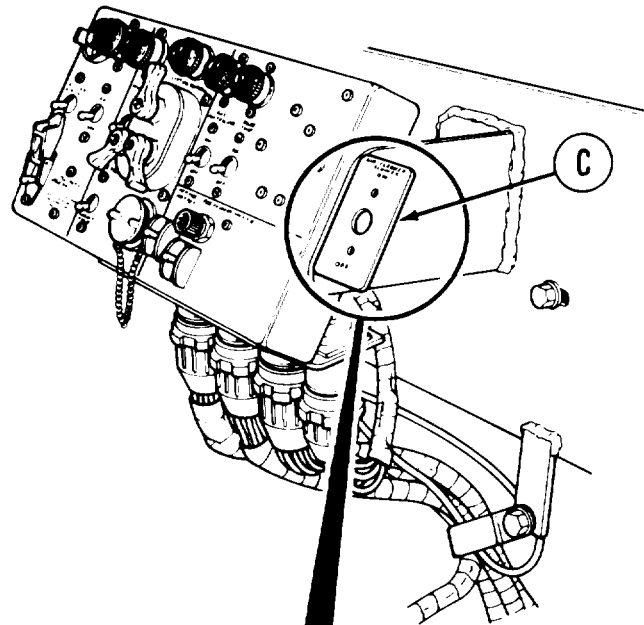
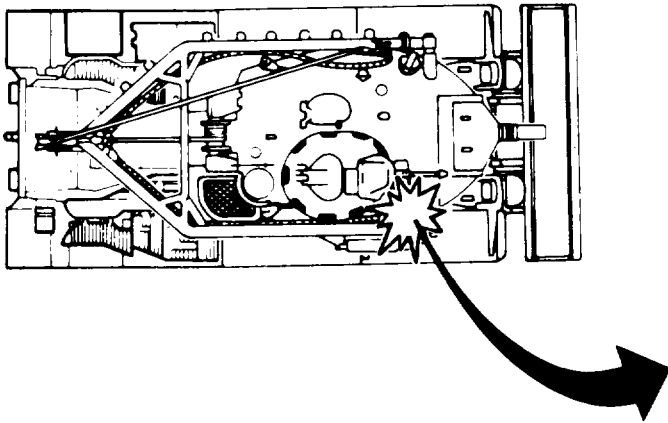
TA139596

GENERATOR SWITCH BRACKET REPLACEMENT (Sheet 1 of 1)

TOOLS: 7/16 in. combination box and open end wrench

SUPPLIES: Lockwasher (MS35338-43) (2 required)

PRELIMINARY PROCEDURE: Remove generator switch (page 10-40)



NOTE

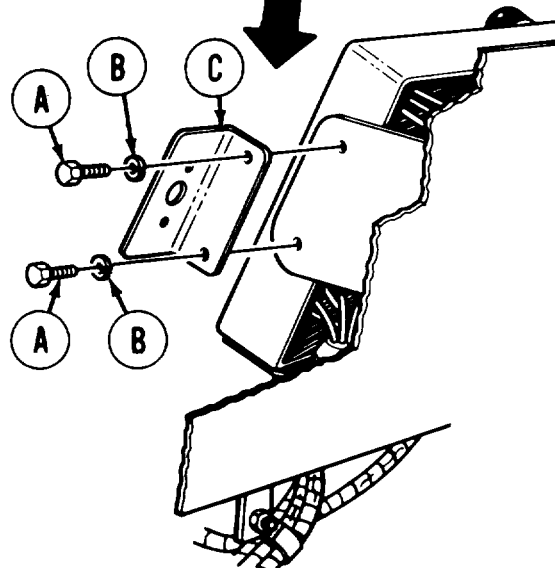
Generator switch is only on vehicles which are equipped for deep water fording.

REMOVAL:

1. Using socket, remove two screws (A) and lockwashers (B). Throw lockwashers away.
2. Remove switch bracket (C).

INSTALLATION:

1. Place switch bracket (C) in position.
2. Using socket, install two screws (A) and new lockwashers (B).
3. Install generator switch (page 10-41).



ROTATED 180° FOR CLARITY TA139597

End of Task

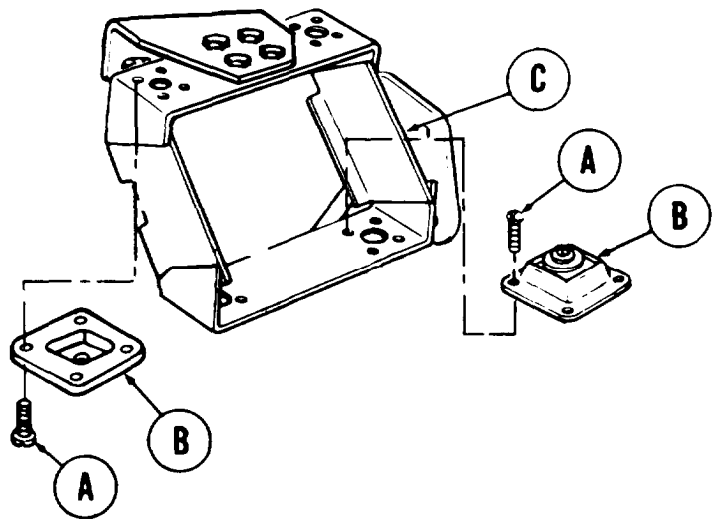
CLUSTER ASSEMBLY CUSHION REPLACEMENT (Sheet 1 of 1)

TOOLS: Flat-tip screwdriver

PRELIMINARY PROCEDURE: Remove cluster assembly (page 10-123)

REMOVAL:

1. Using screwdriver, remove 16 screws (A) from 4 cushions (B).
2. Remove four cushions (B) from panel support (c).

**INSTALLATION:**

1. Position four cushions (B) in position on panel support (C).
2. Using screwdriver, install sixteen screws (A) securing four cushions (B) on panel support (C).
3. Install cluster assembly (page 10-125).

Go on to Sheet 2

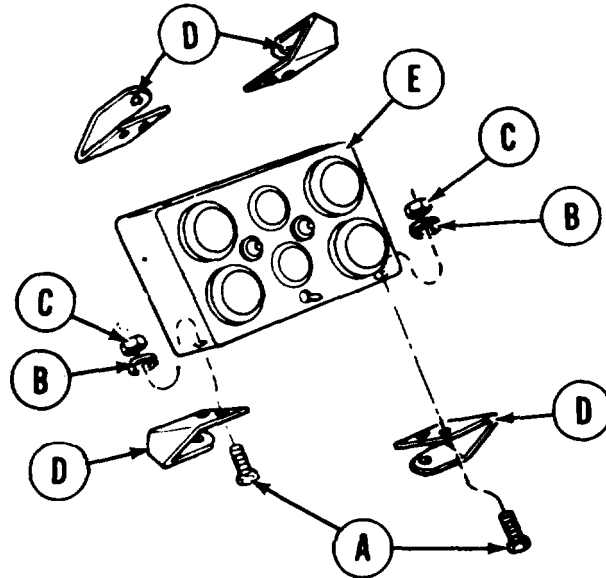
TA139598

CLUSTER ASSEMBLY MOUNTING BRACKET REPLACEMENT (Sheet 1 of 1)

TOOLS: 5/16 in. combination box and open end wrench
Cross-tip screwdriver

SUPPLIES: Lockwashers (MS35338-42) (8 required)

PRELIMINARY PROCEDURE: Remove instrument panel
cluster assembly (10-1 23)



REMOVAL:

1. Using wrench and screwdriver, remove eight screws (A), lockwashers (B), and nuts (C) securing four brackets (D) to panel (E). Throw lockwashers away.
2. Remove four brackets (D).

INSTALLATION:

1. Place brackets (D) in position on panel (E).
2. Using wrench and screwdriver, install eight screws (A), new lockwashers (B), and nuts (C).
3. Install cluster assembly (page 10-125).
4. Make sure cluster assembly is secure in panel support.

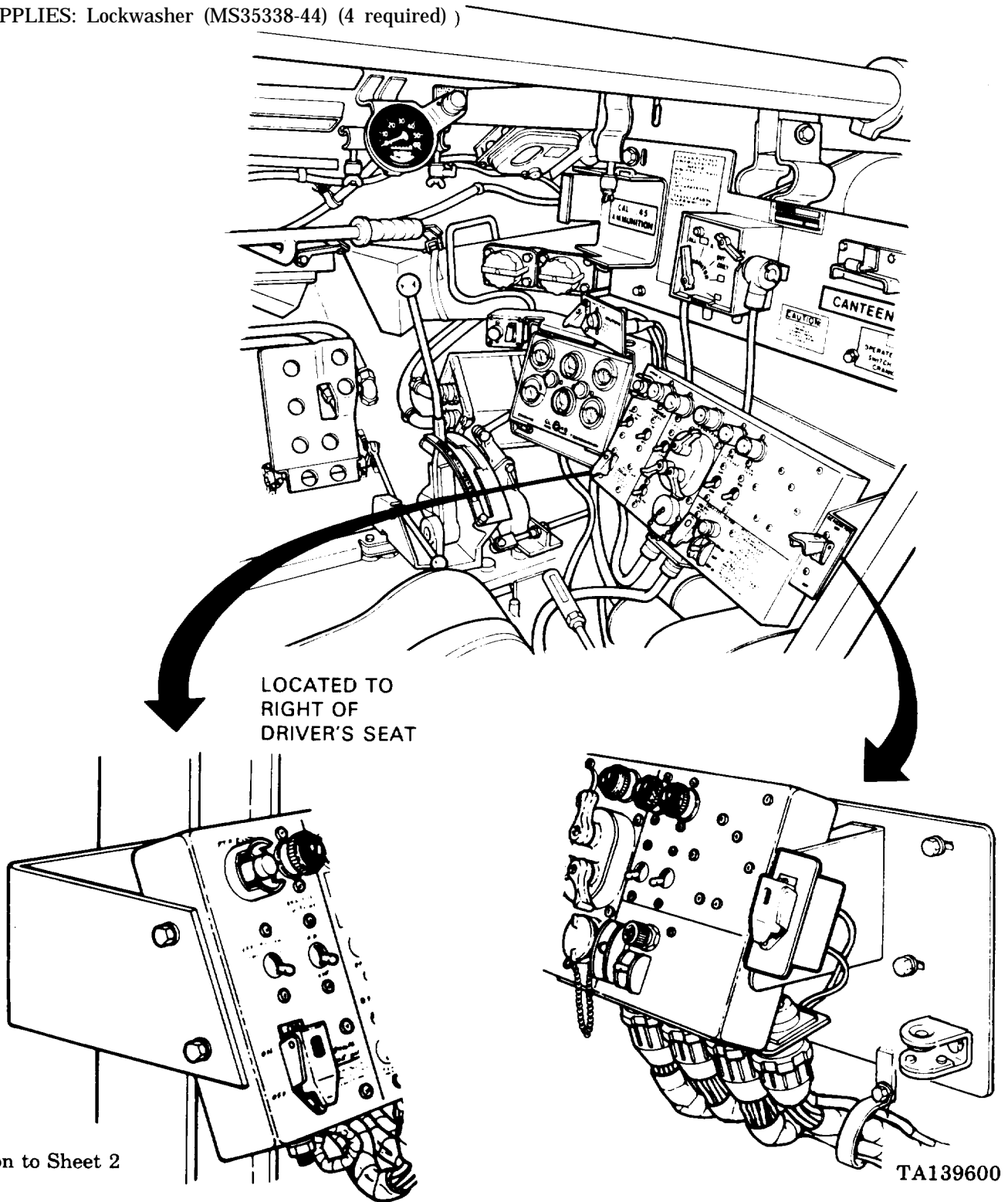
End of Task

TA139599

MASTER CONTROL PANEL DISPLACEMENT (Sheet 1 of 3)

TOOLS: 7/16 in. combination box and open end wrench (2 required)

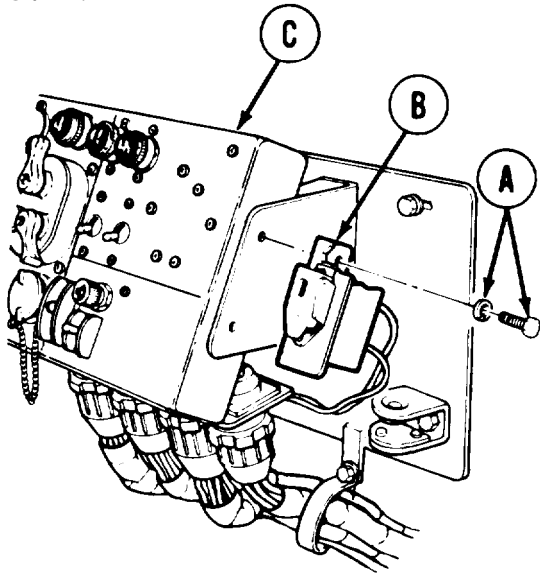
SUPPLIES: Lockwasher (MS35338-44) (4 required)



Go on to Sheet 2

MASTER CONTROL PANEL DISPLACEMENT (Sheet 2 of 3)

REMOVAL:



1. Set MASTER BATTERY switch to OFF.

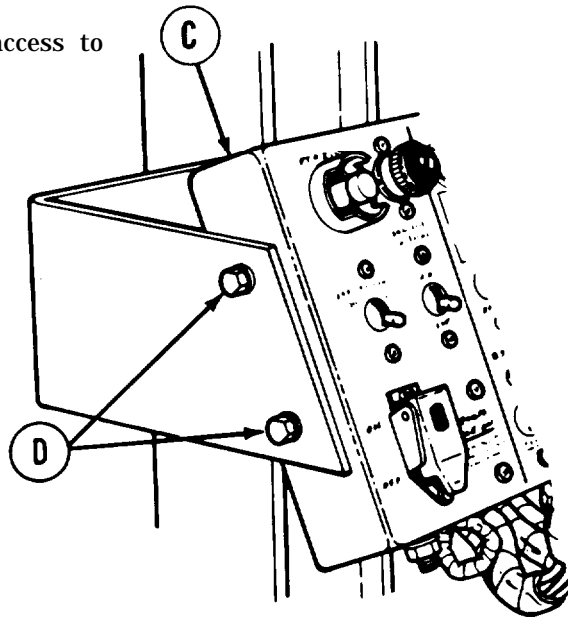
NOTE

Support master control panel while performing the following steps.

NOTE

Only late model tanks will have the air cleaner blower motor switch bracket. If switch bracket is not present, perform step two to remove screws (A) only.

2. Using wrenches, remove two screws and lockwashers (A) securing air cleaner blower switch bracket (B) on right side of master control panel (C). Throw lockwashers away.
3. Position air cleaner blower switch bracket (B) aside.
4. Using wrenches, remove two screws and lockwashers (D) securing left side of master control panel (C). Throw lockwashers away.
5. Lower master control panel (C) to gain access to rear of panel.



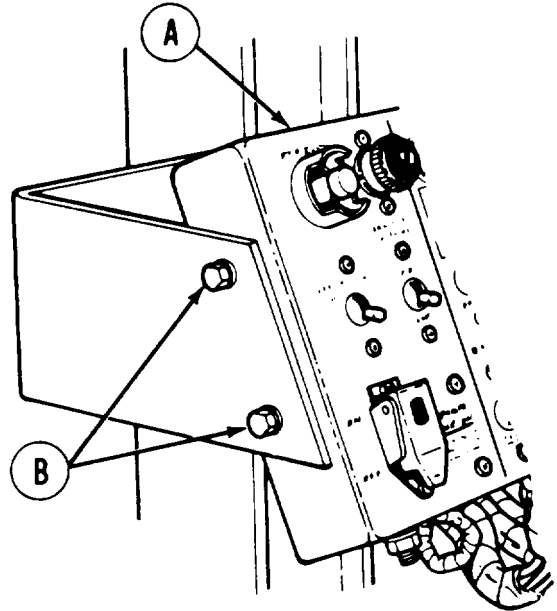
Go on to Sheet 3

TA139602

MASTER CONTROL PANEL DISPLACEMENT (Sheet 3 of 3)

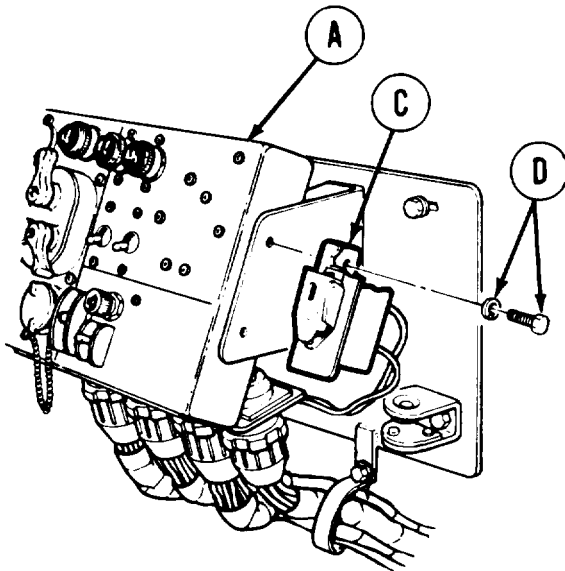
INSTALLATION:

1. Position and support master control panel (A) to its mounting brackets.
2. Install two screws and new lockwashers (B) to secure left side of master control panel (A).



NOTE

Only late model vehicles will have the blower motor switch bracket. If switch bracket is not present, go to step 9 to install screws (D) only.



3. Position air cleaner blower switch bracket (C) to bracket on right side of master control panel (A).
4. Install two screws and new lockwashers (D) to secure right side of master control panel (A) and air cleaner switch bracket (C).
5. Using wrenches, tighten screws and washers (B) and (D).

End of Task

TA253219

PROCEDURE INDEX

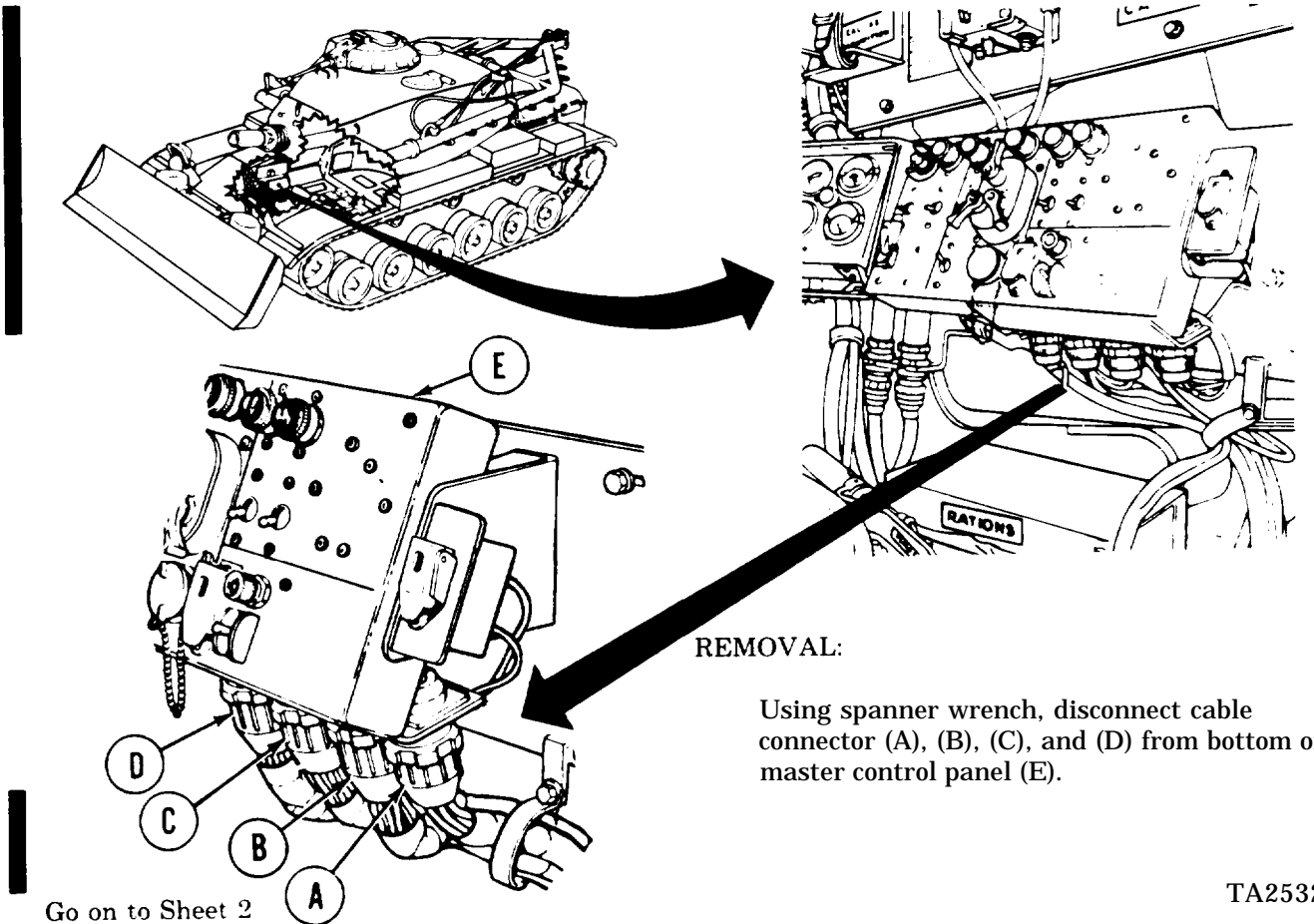
PROCEDURE	PAGE
Removal	10-48
Installation	10-50

TOOLS: 7/16 in. combination box and open end wrench
7/16 in. socket with 1/2 in. drive
6 in. extension with 1/2 in. drive
Ratchet with 1/2 in. drive
Spanner wrench

REFERENCES: TM 9-2350-222-10

SUPPLIES: Lockwashers (MS35338-44) (4 required)

PRELIMINARY PROCEDURE: Disconnect three battery ground cables (page 10-284)



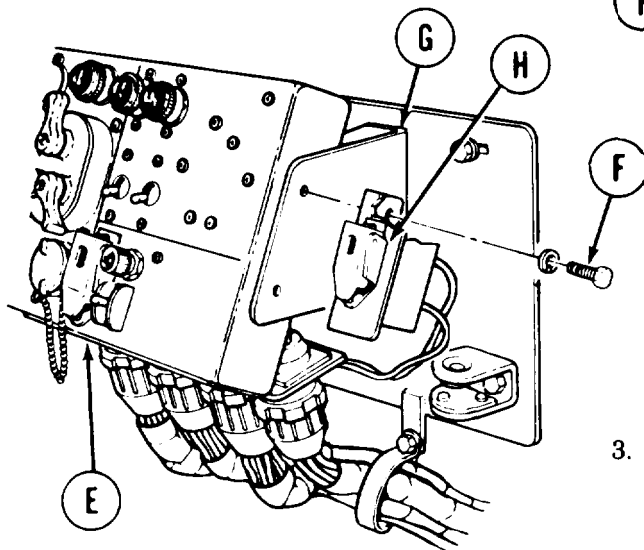
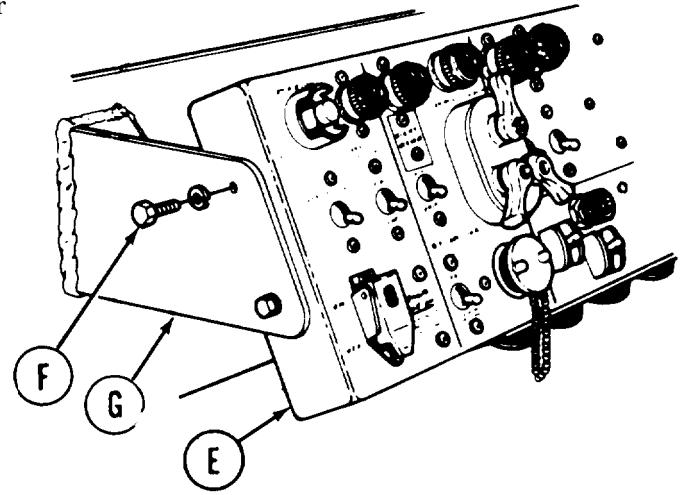
TA253221

MASTER CONTROL PANEL REPLACEMENT (Sheet 2 of 4)

- Using 7/16 inch wrench, remove two screws and lockwashers (F) securing left side of master control panel (E) to bracket (G). Throw lockwashers away.

NOTE

Support master control panel while removing remaining two screws.

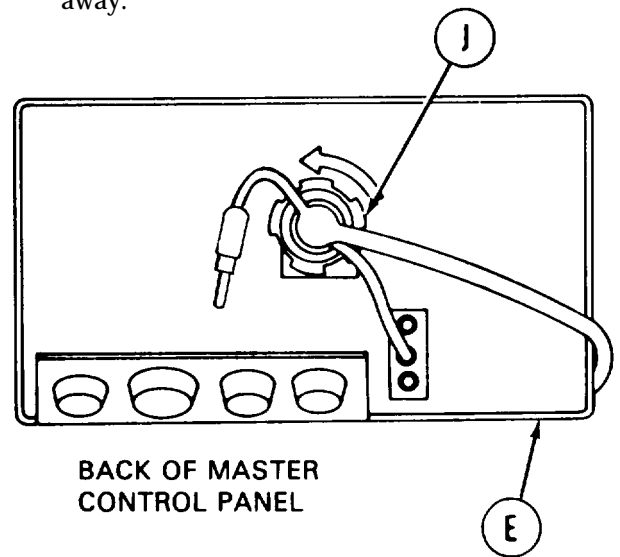


NOTE

Only vehicles which are equipped for deep water fording have the generator switch assembly.

- Using socket, remove two screws and lockwashers (F) securing right side of master control panel (E) and generator switch assembly (H) (if so equipped) to bracket (G). Throw lockwashers away.

- Lower master control panel (E) away from brackets (G) to gain access to back of panel.
- Using spanner wrench, disconnect connector (J) from back of master control panel (E).



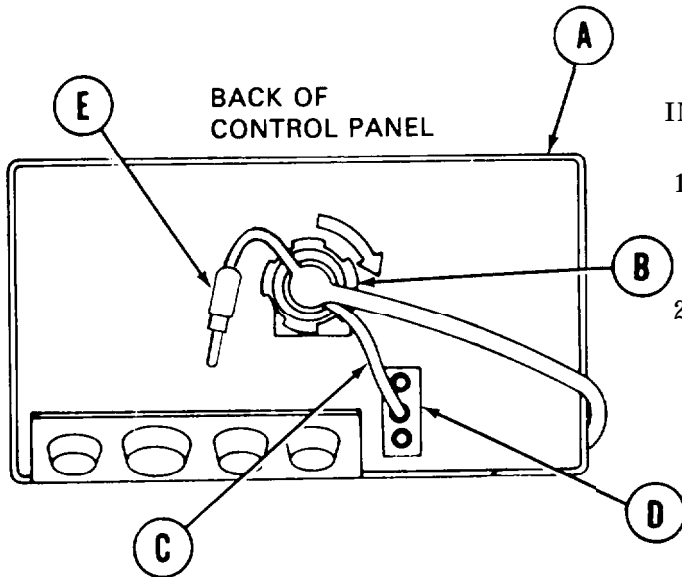
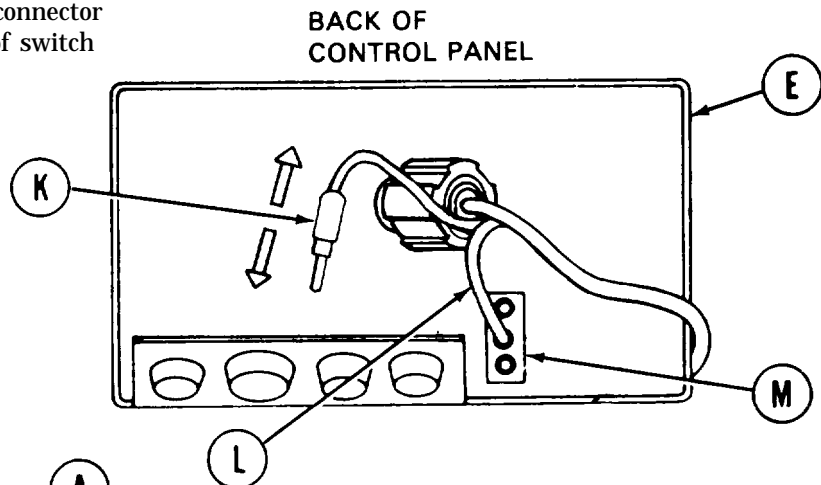
Go on to Sheet 3

TA139605

MASTER CONTROL PANEL REPLACEMENT (Sheet 3 of 4)

- 6. Separate electrical connector (K), circuit number 15, by pulling apart.
- 7. Using fingers, disconnect electrical connector (L), circuit number 19, from center of switch (M) by pulling out.

- 8. Remove panel (E) from vehicle.



INSTALLATION:

- 1. Position new master control panel (A) in vehicle just below mounting bracket so that back of panel is accessible.
- 2. Using hand, connect connector (B) to back of control panel (A).

- 3. Connect electrical connector (C), circuit 19, to center of switch (D) by pushing in.
- 4. Connect electrical connector (E), circuit 15, by pushing together.

Go on to Sheet 4

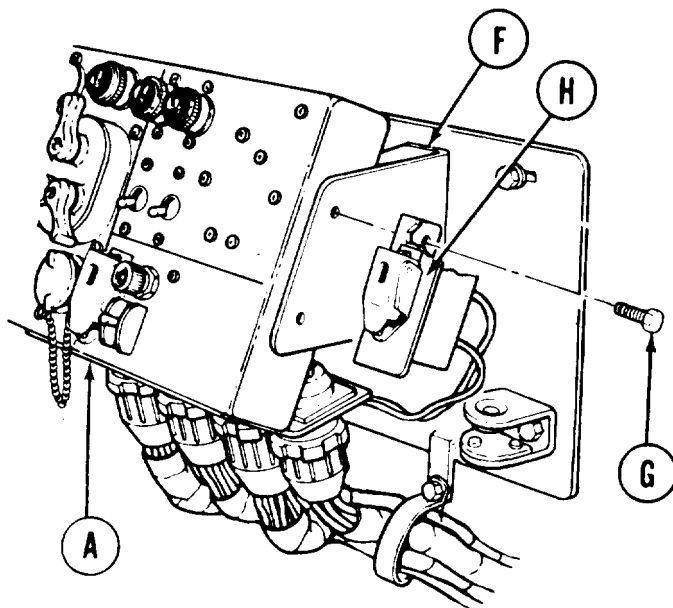
TA139606

5. Aline control panel (A) between mounting bracket (F).

NOTE

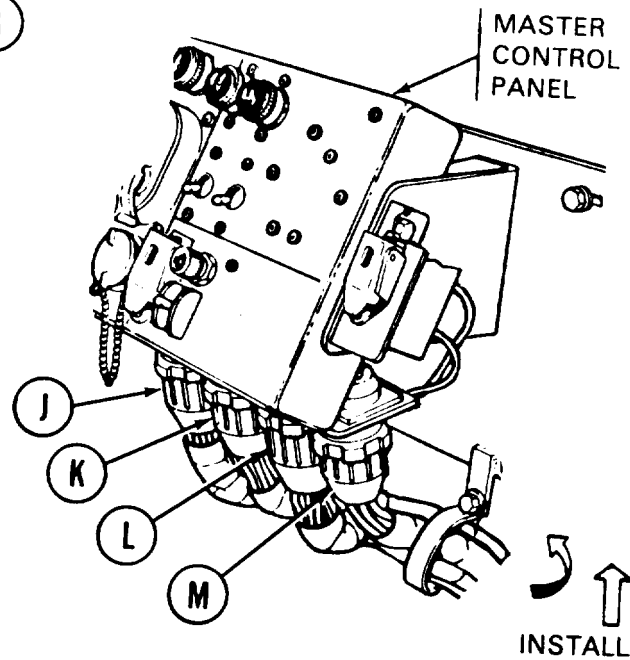
Support panel in mounting location while installing screws (G).

6. Install two screws and new lockwashers (G) on left side of control panel (A) securing panel to bracket (F).



7. Install two screws and new lockwashers (G) on right side of control panel (A) securing panel and generator switch assembly (H) (if so equipped) to bracket (F).
8. Using combination wrench, tighten two screws (G) on left side of control panel.
9. Using socket, extension, and ratchet, tighten two screws (G) on right side of control panel (A).

10. Using spanner wrench install cable connector: (J), (K), (L), and (M).
11. Connect three battery ground cables (page 10-285).
12. Perform functional test (TM 9-2350-222-10).

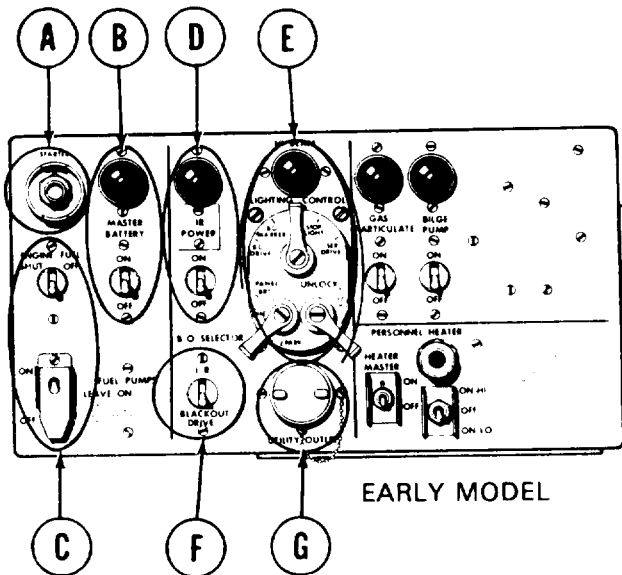


End of Task

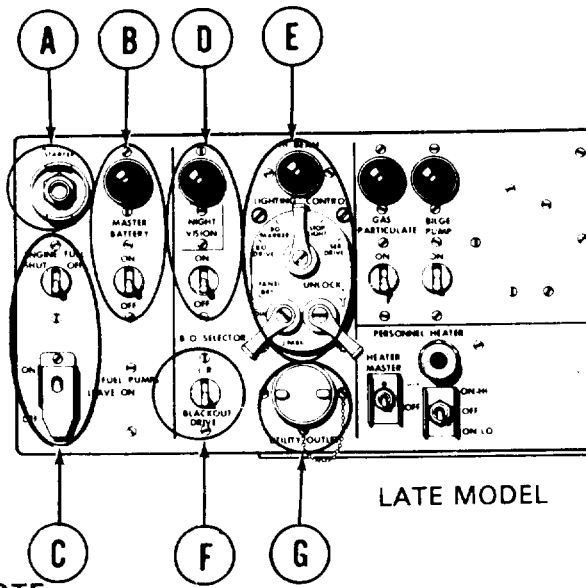
MASTER CONTROL PANEL REPAIR INDEX (Sheet 1 of 3)

PROCEDURE INDEX

PROCEDURE	PAGE
A Starter Switch Replacement	10-55
B Master Battery Switch and Indicator Light Replacement	10-57
C Engine Fuel Shutoff and Fuel Pump Switch Replacement	10-61
D AIR Power/Night Vision Switch and Indicator Light Replacement	10-64
E Lighting Control Switch and Hi-Beam Indicator Light Replacement	10-68
F Blackout Selector Switch Replacement	10-72
G Utility Outlet Replacement	10-74



EARLY MODEL



LATE MODEL

NOTE

Your vehicle may be equipped with either configuration. Repair procedures are the same for either configuration. Only the early configuration is shown.

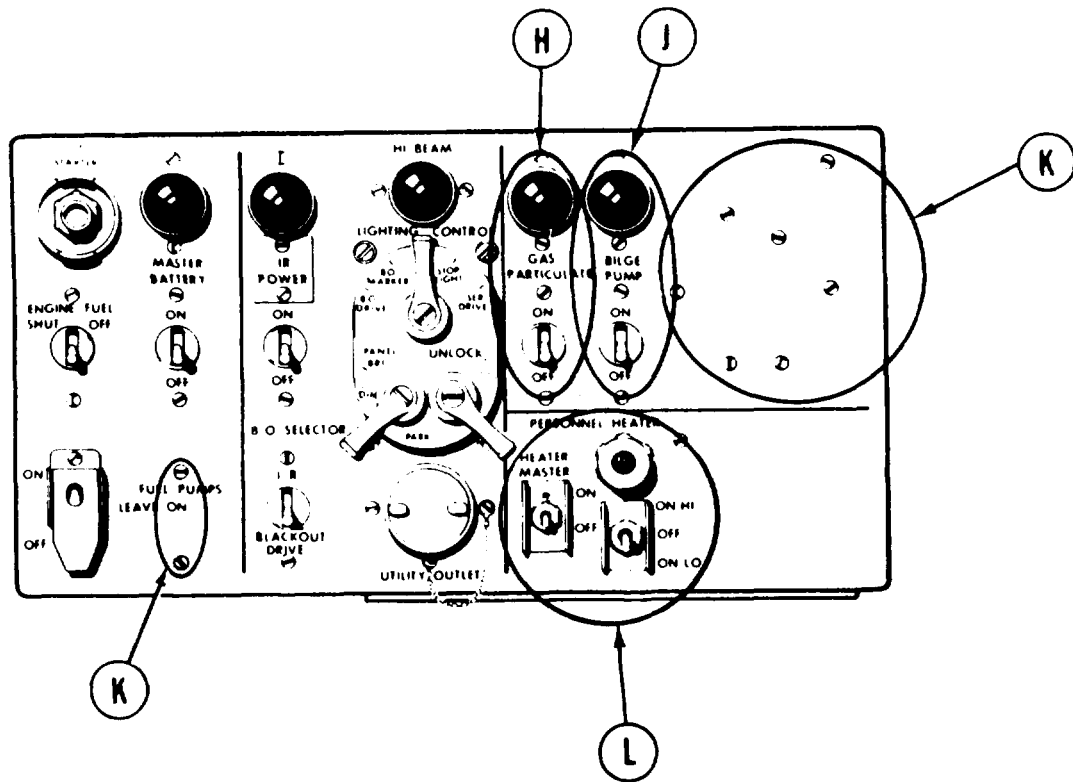
Go on to Sheet 2

TA253220

MASTER CONTROL PANEL REPAIR INDEX (Sheet 2 of 3)

PROCEDURE INDEX - CONTINUED

PROCEDURE	PAGE
H Gas Particulate Switch and Indicator Light Replacement	10-76
J Bilge Pump Switch and Indicator Light Replacement	10-80
K IR/Night Vision, Bilge Pump, Gas Particulate, Fuel Shutoff, Manifold Preheat, Gage, Fuel Pump, and Utility Outlet Circuit Breaker Replacement	10-84
L Master Heater Circuit Breaker, Hi-Lo Switch, and Indicator Light Replacement	10-91



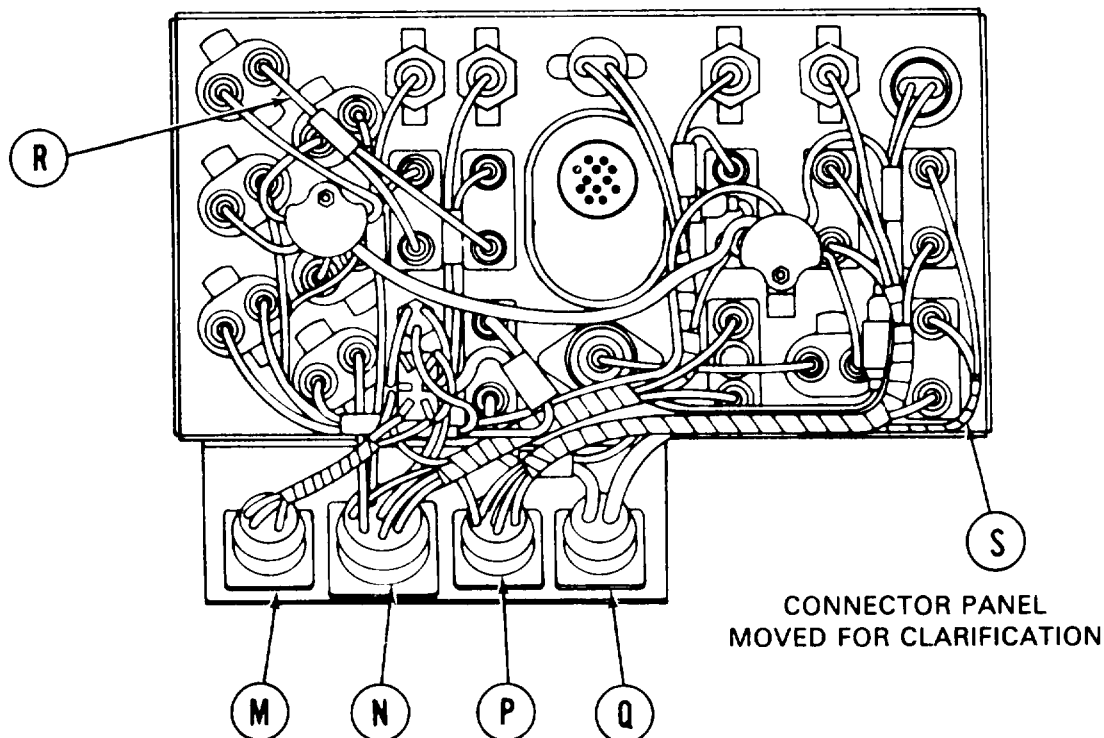
CIRCUIT BREAKERS
LOCATED ON REAR
OF PANEL

Go on to Sheet 3

TA253222

PROCEDURE INDEX - CONTINUED

PROCEDURE	PAGE
M Personnel Heater Wiring Harness Replacement	10-98
N Accessories Wiring Harness Replacement	10-103
P Master Battery Wiring Harness Replacement	10-107
Q Master Control Panel Wiring Harness Replacement	10-111
R Bilge Pump/Gas Particulate Switch Cable Assembly Replacement	10-116
S Fuel Shutoff/Fuel Pump Wiring Harness Replacement	10-118



End of Task

TA139610

MASTER CONTROL PANEL REPAIR (Sheet 1 of 65)
Starter Switch Replacement (Sheet 1 of 2)

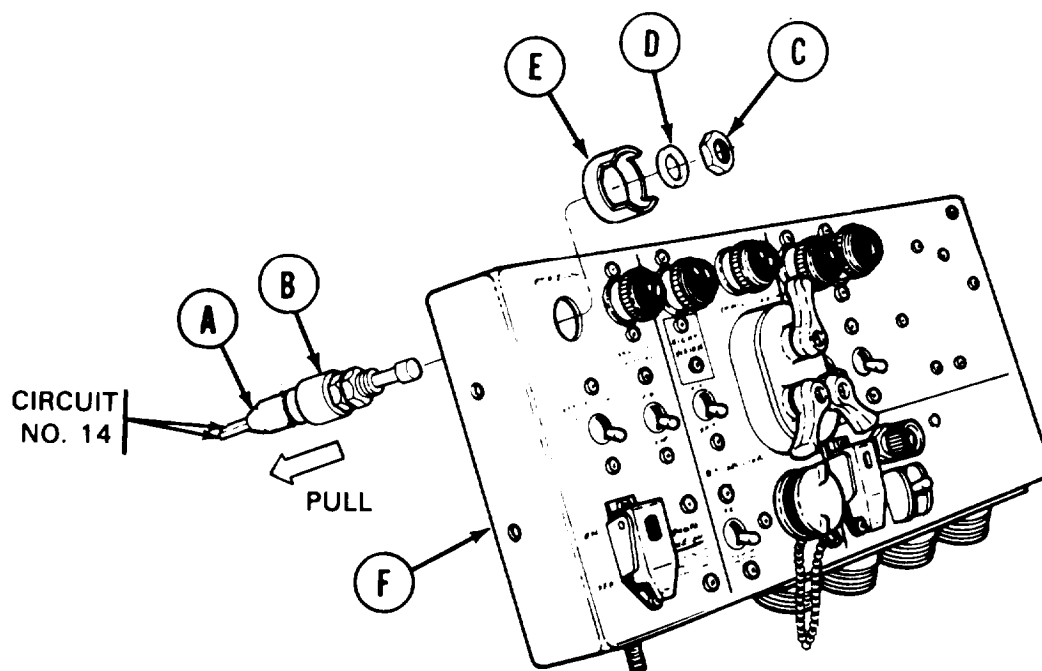
TOOLS: Ratchet with 1/2 in. drive
13/16 in. socket with 1/2 in. drive

SUPPLIES: Silicone compound (Item 32, Appendix D)
Lockwasher (7358625)

PRELIMINARY PROCEDURE: Remove panel from vehicle (page 10-48)

REMOVAL:

1. Using fingers, remove electrical connector (A) (circuit number 14) by pulling out from back of switch (B).
2. Using socket, remove nut (C) and lockwasher (D) securing switch (B) and guard (E) to panel (F). Throw lockwasher away.
3. Remove switch (B) and guard (E).



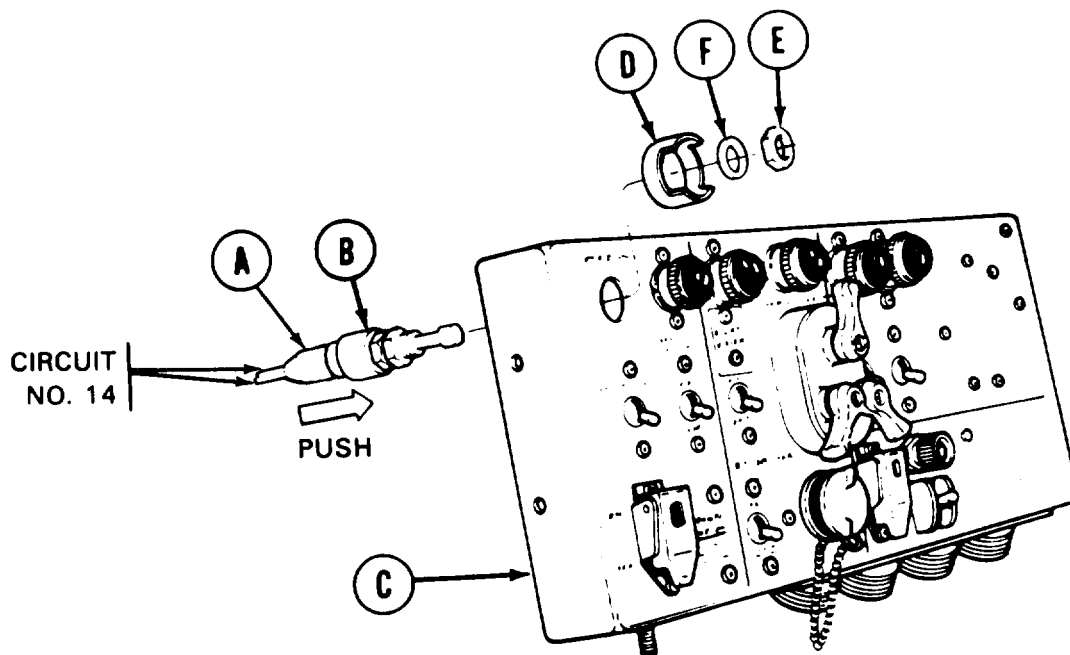
Go on to Sheet 2

TA139611

MASTER CONTROL PANEL REPAIR (Sheet 2 of 65)
Starter Switch Replacement (Sheet 2 of 2)

INSTALLATION:

1. Apply silicone compound (Item 32, Appendix D) to electrical connector (A).
2. Using fingers, insert electrical connector (A) (circuit 14) into switch (B).
3. Place switch (B) in position on panel (C).
4. Place guard (D) in position on switch (B).
5. Using fingers, install nut (E) and new lockwasher (F) securing guard (D) and switch (B) to panel (C).
6. Using socket, tighten nut (E).
7. Install panel in vehicle (page 10-50).



End of Task

TA139612

MASTER CONTROL PANEL REPAIR (Sheet 3 of 65)
Master Battery Switch and Indicator Light Replacement (Sheet 1 of 4)

PROCEDURE INDEX

PROCEDURE	PAGE
Removal	10-57
Installation	10-59

TOOLS: 4 in. cross-tip screwdriver
 10 in. adjustable wrench
 1 in. combination box and open end wrench

SUPPLIES: Silicone compound (Item 32, Appendix D)
 Preformed packing (MS28775-119)
 Lockwasher (MS35338-42) (4 required)

PRELIMINARY PROCEDURE: Remove panel from vehicle (page 10-48)

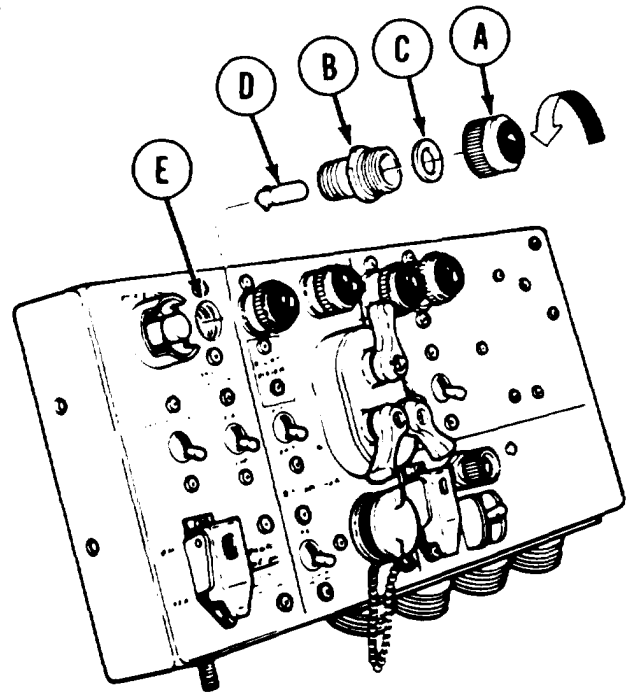
REMOVAL:

- Using fingers, remove lens (A) from adapter (B)..

NOTE

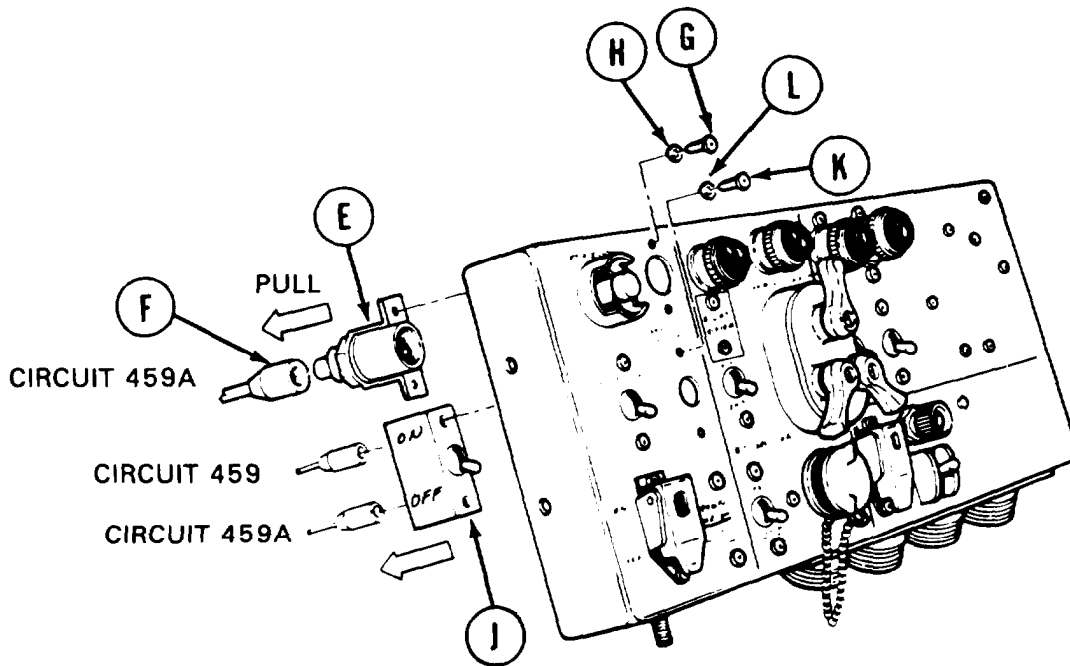
If necessary, use adjustable wrench to remove adapter (B).

- Using fingers, remove preformed packing (C) from adapter (B). Throw away preformed packing (C).
- Using fingers, remove lamp (D) from base assembly (E) by pushing in and turning counterclockwise.



Go on to Sheet 2

TA139613



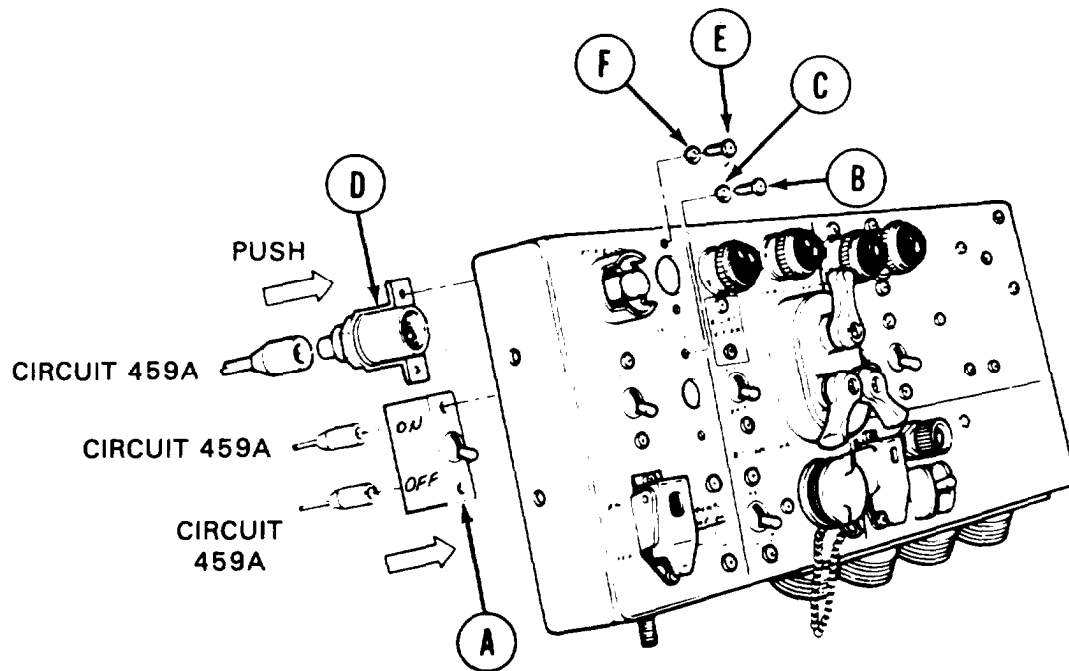
4. Using fingers, remove connector (F) from base assembly (E) by pulling out.
5. Using screwdriver, remove two screws (G) and lockwashers (H) securing base assembly (E) to panel. Throw lockwashers away.
6. Remove base assembly (E).
7. Using fingers, remove two connectors (circuits 459 and 459A) from back of switch (J) by pulling out.
8. Using screwdriver, remove two screws (K) and lockwashers (L) securing switch (J) to panel. Throw lockwashers away.
9. Remove switch (J).

Go on to Sheet 3

TA139614

MASTER CONTROL PANEL REPAIR (Sheet 5 of 65)

Master Battery Switch and Indicator Light Replacement (Sheet 3 of 4)



INSTALLATION:

1. Apply silicone compound (Item 32, Appendix D) to two male connectors for switch (A) (circuits 459 and 459A).
2. Using fingers, install two connectors (circuits 459 and 459A) to rear of switch (A) by pushing in.

NOTE

Before installing switch (A), make sure switch (A) is in OFF position. If OFF position is not marked on switch (A), use multimeter to make sure switch (A) is in OFF position.

3. Place switch (A) in position on panel.
4. Using screwdriver, install two screws (B) and new lockwashers (C).
5. Apply silicone compound to connector on base assembly (D).
6. Using fingers, install connector (circuit 459A) to rear of base assembly (D) by pushing in.
7. Place base assembly (D) in position on panel.
8. Using screwdriver, install two screws (E) and new lockwashers (F) securing base assembly (D) to panel.

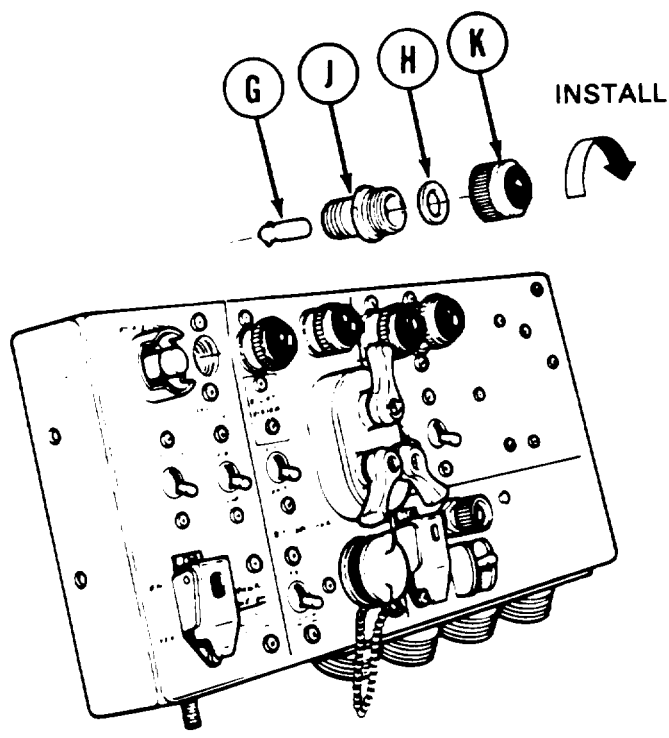
Go on to Sheet 4

TA139615

MASTER CONTROL PANEL REPAIR (Sheet 6 of 65)

Master Battery Switch and Indicator Light Replacement (Sheet 4 of 4)

9. Using fingers, install lamp (G) in position by pushing in and turning clockwise.
10. Install new preformed packing (H) in position in adapter (J).
11. Using fingers, install adapter (J) and lens (K) on panel.
12. Install master control panel in vehicle (page 10-50).



End of Task

TA139616

**MASTER CONTROL PANEL REPAIR (Sheet 7 of 65)
 Engine Fuel Shutoff and Fuel Pump Switch Replacement (Sheet 1 of 3)**

PROCEDURE INDEX

PROCEDURE	PAGE
Removal	10-61
Installation	10-62

TOOLS: 4 in. cross-tip screwdriver

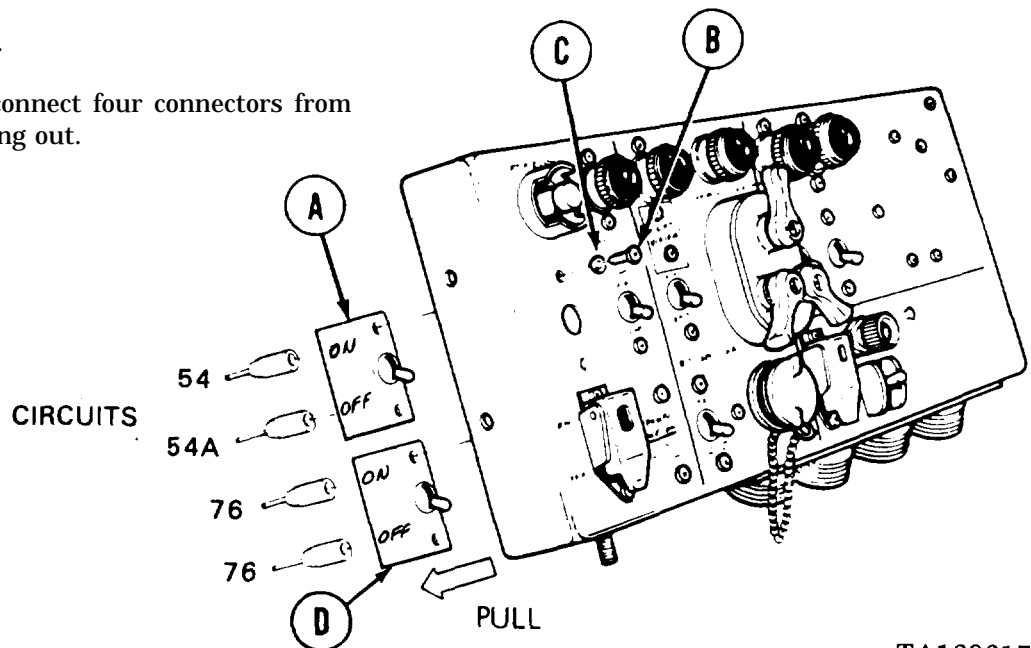
TEST EQUIPMENT: Multimeter

SUPPLIES: Silicone compound (Item 32, Appendix D)
 Lockwashers (MS35338-42) (4 required)

PRELIMINARY PROCEDURE: Remove panel from vehicle (page 10-48)

REMOVAL:

- Using fingers, remove two connectors from switch (A) by pulling out.
- Using screwdriver, remove two screws (B) and lockwashers (C) securing switch (A) to panel. Throw lockwashers away.
- Remove switch (A).
- Using fingers, disconnect four connectors from switch (D) by pulling out.



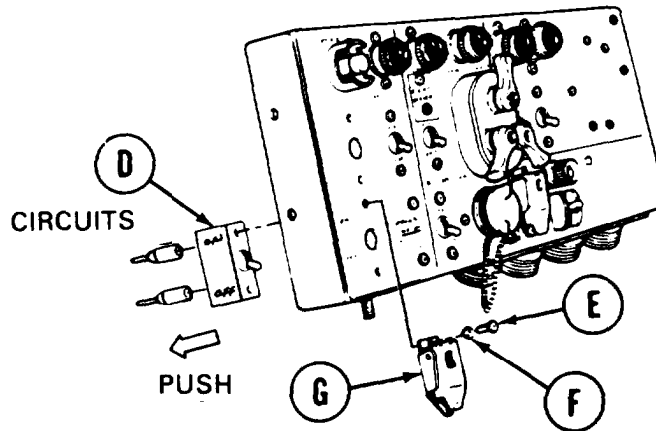
Go on to Sheet 2

TA139617

MASTER CONTROL PANEL REPAIR (Sheet 8 of 65)

Engine Fuel Shutoff and Fuel Pump Switch Replacement (Sheet 2 of 3)

5. Using screwdriver, remove two screws (E) and lockwashers (F) securing switch (D) to panel. Throw lockwashers away.
6. Remove guard (G) and switch (D).

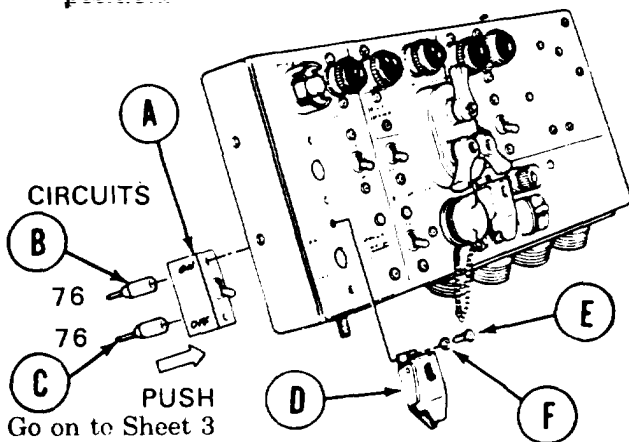


INSTALLATION:

1. Apply silicone compound (Item 32, Appendix D) to two male connectors (circuit 76).

NOTE

Before installing switch (A), make sure switch (A) is in OFF position. If OFF position is not marked on switch (A), use multimeter to make sure switch (A) is in OFF position.

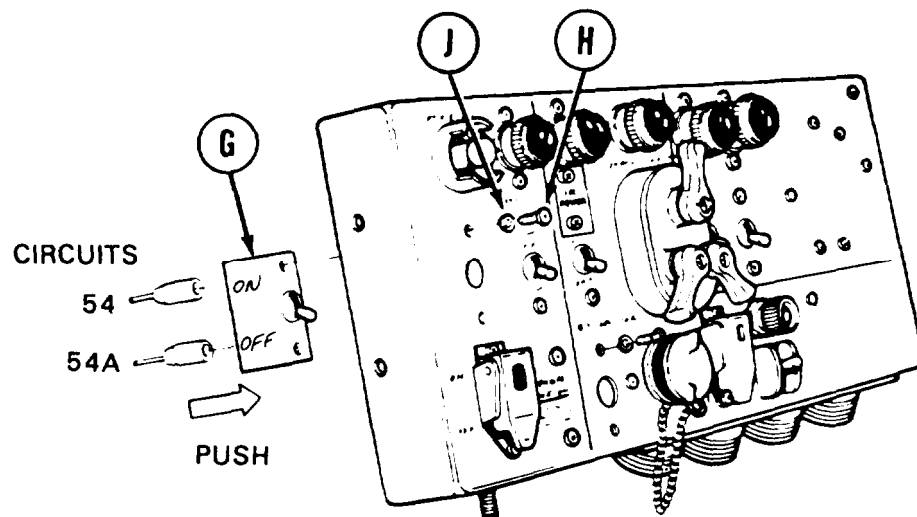


2. Using fingers, connect two connectors (circuits 76) (B) and (C) to switch (A).
3. Place switch (A) and guard (D) in position on panel.
4. Using screwdriver, install two screws (E) and new lockwashers (F).

TA139618

MASTER CONTROL PANEL REPAIR (Sheet 9 of 65)**Engine Fuel Shutoff and Fuel Pump Switch Replacement (Sheet 3 of 3)**

5. Apply silicone compound (Item 32, Appendix D) to two male connectors (circuits 54 and 54A).
6. Using fingers, connect connectors (circuits 54 and 54A) to switch (G) by pushing in.
7. Place spring-loaded switch (E) in position on panel,
8. Using screwdriver, install two screws (H) and new lockwashers (J).
9. Install panel in vehicle (page 10-50).



End of Task

TA139619

MASTER CONTROL PANEL REPAIR (Sheet 10 of 65)
 IR Power Switch and Indicator Light Replacement (Sheet 1 of 4)

PROCEDURE INDEX

PROCEDURE	PAGE
Removal	10-64
Installation	10-66

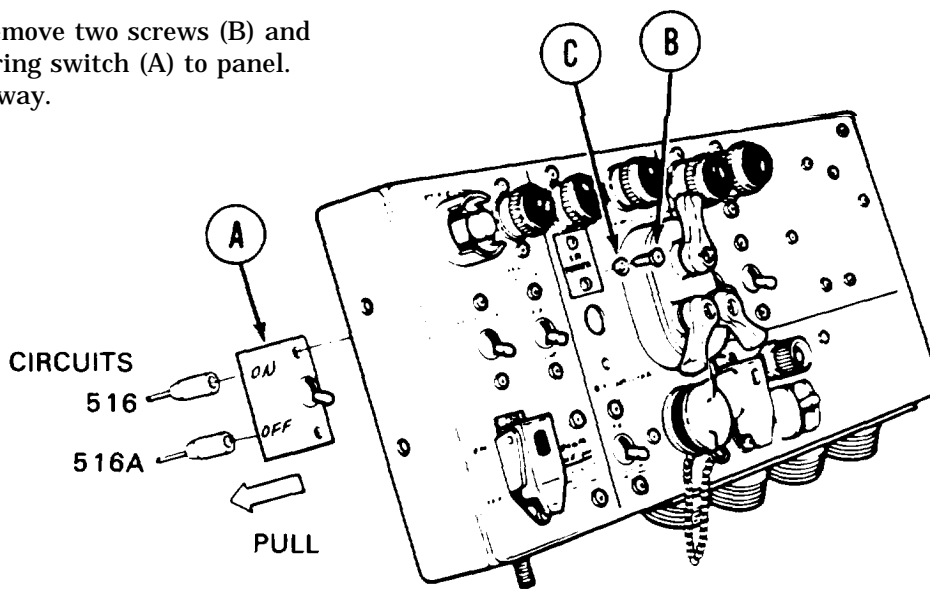
TOOLS: 4 in. cross-tip screwdriver
 10 in. adjustable wrench
 1 in. combination box and open end wrench

SUPPLIES: Silicone compound (Item 32, Appendix D)
 Preformed packing (MS28775-119)
 Lockwasher (MS35338-42) (4 required)

PRELIMINARY PROCEDURE: Remove panel from vehicle (page 10-48)

REMOVAL:

- Using fingers, remove two connectors from rear of switch (A),
- Using screwdriver, remove two screws (B) and lockwashers (C) securing switch (A) to panel. Throw lockwashers away.
- Remove switch (A).



Go on to Sheet 2

TA139620

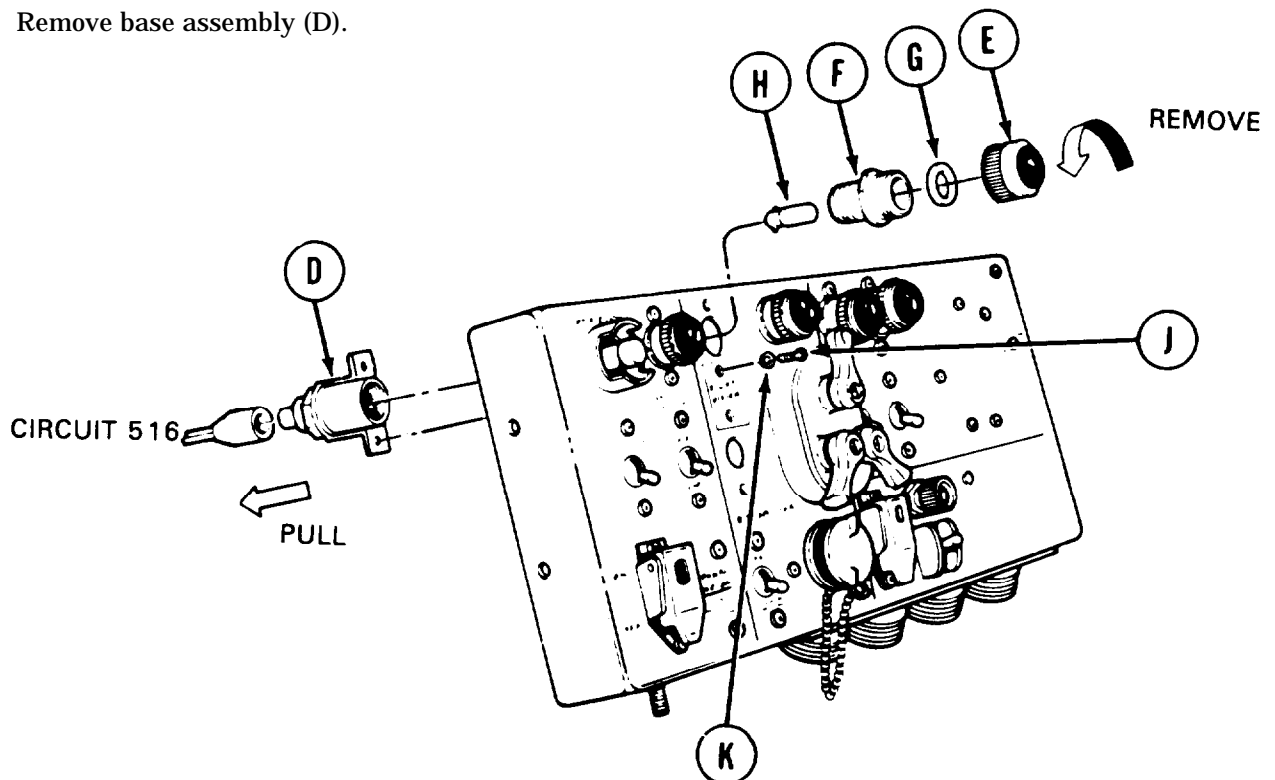
MASTER CONTROL PANEL REPAIR (Sheet 11 of 65)
IR Power Switch and Indicator Light Replacement (Sheet 2 of 4)

4. Using fingers, remove connector from rear of base assembly (D).

NOTE

If necessary, use adjustable wrench to remove adapter. It may be necessary to remove screws before adapter can be turned.

5. Remove lens (E) and adapter (F) from base assembly (D) by turning counterclockwise.
6. Using fingers, remove preformed packing (G) from adapter (F). Throw preformed packing (G) away.
7. Using fingers, remove lamp (H) by pushing in and turning counterclockwise.
8. Using screwdriver, remove two screws (J) and lockwashers (K) securing base assembly (D) to panel. Throw lockwashers away.
9. Remove base assembly (D).



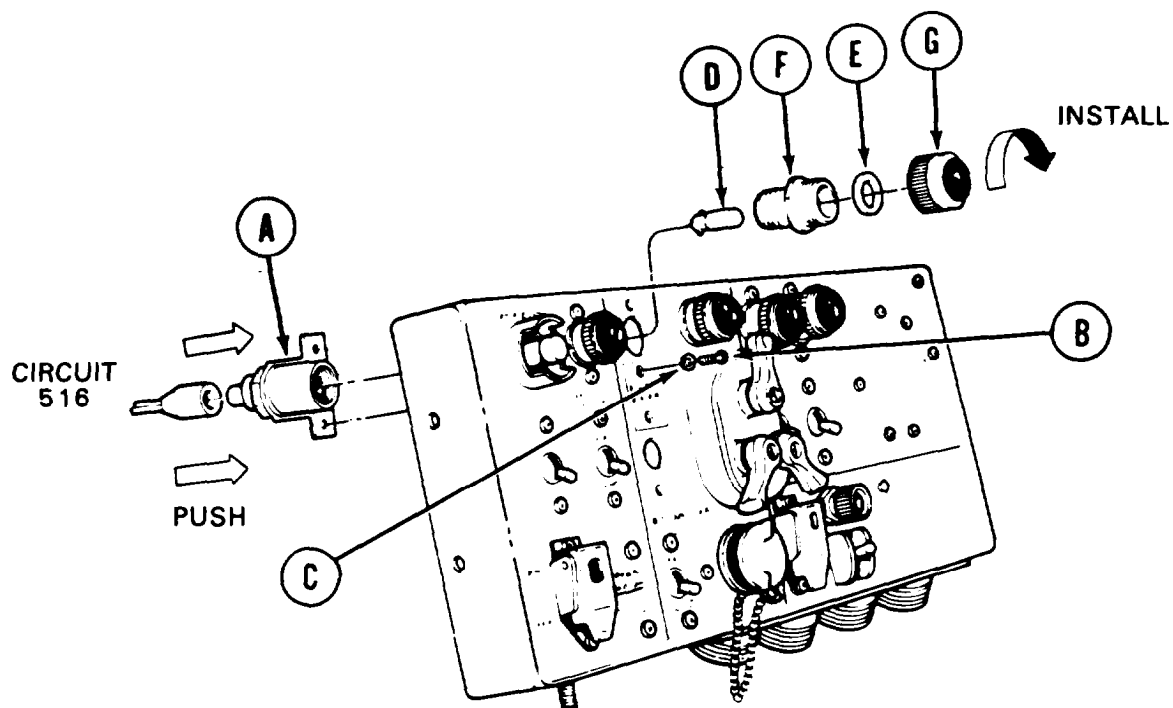
Go on to Sheet 3

TA139621

MASTER CONTROL PANEL REPAIR (Sheet 12 of 65)
IR Power Switch and Indicator Light Replacement (Sheet 3 of 4)

INSTALLATION:

1. Apply silicone compound (Item 32, Appendix D) to connector on base assembly (A).
2. Using fingers, connect electrical connector (circuit 516) to base assembly (A) by pushing in.
3. Place base assembly (A) in position on panel.
4. Using screwdriver, install two screws (B) and new lockwashers (C) securing base assembly (A) to panel.



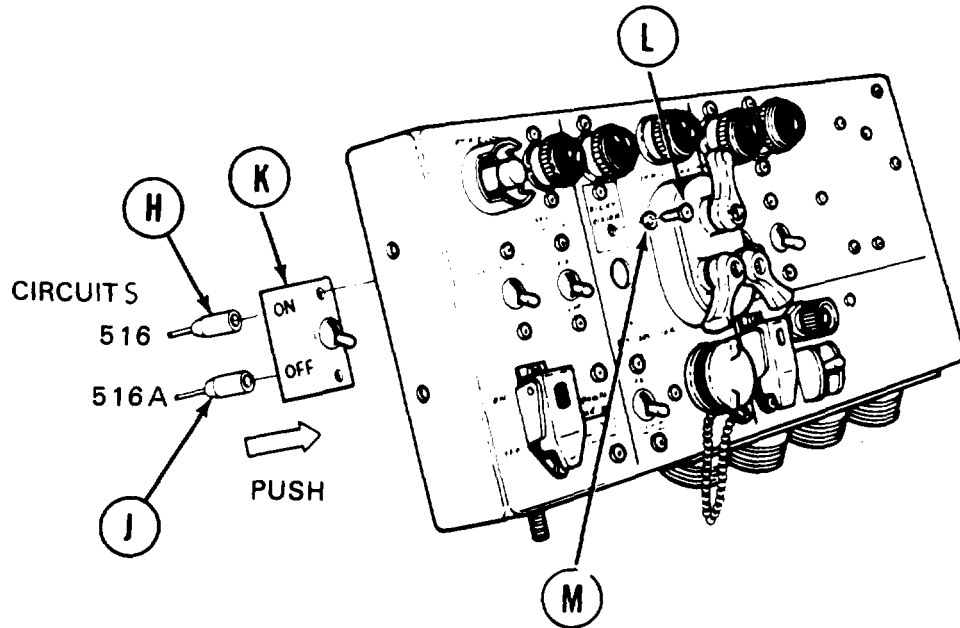
5. Using fingers, install lamp (D) by pushing in and turning clockwise.
6. Install new preformed packing (E) on adapter (F).
7. Using fingers, install adapter (F) and lens (G) in panel by turning clockwise.

Go on to Sheet 4

TA139622

MASTER CONTROL PANEL REPAIR (Sheet 13 of 65)
 IR Power Switch and Indicator Light Replacement (Sheet 4 of 4)

8. Apply silicone compound (Item 32, Appendix D) to two circuit 516 male electrical connectors,
9. Using fingers, connect two electrical connectors (circuit 516) (H) and (J) to rear of switch (K) by pushing in.



NOTE

Before installing switch (K), make sure switch is in OFF position. If OFF position is not marked on switch, use multimeter to make sure switch is OFF.

10. Place switch (K) in position on panel.
11. Using screwdriver, install two screws (L) and new lockwashers (M) securing switch (K) to panel.
12. Install panel in vehicle (page 10-50).

End of Task

TA139623

PROCEDURE INDEX

PROCEDURE	PAGE
Removal	10-68
Installation	10-70

TOOLS: 4 in. flat-tip screwdriver
 4 in. cross-tip screwdriver
 10 in. adjustable wrench
 1 in. combination box and open end wrench

SUPPLIES: Silicone compound (Item 32, Appendix D)
 Preformed packing (MS28775-119)
 Lockwasher (MS35338-43) (4 required)
 Lockwasher (MS35338-42) (3 required)

PRELIMINARY PROCEDURE: Remove panel from vehicle (page 10-48)

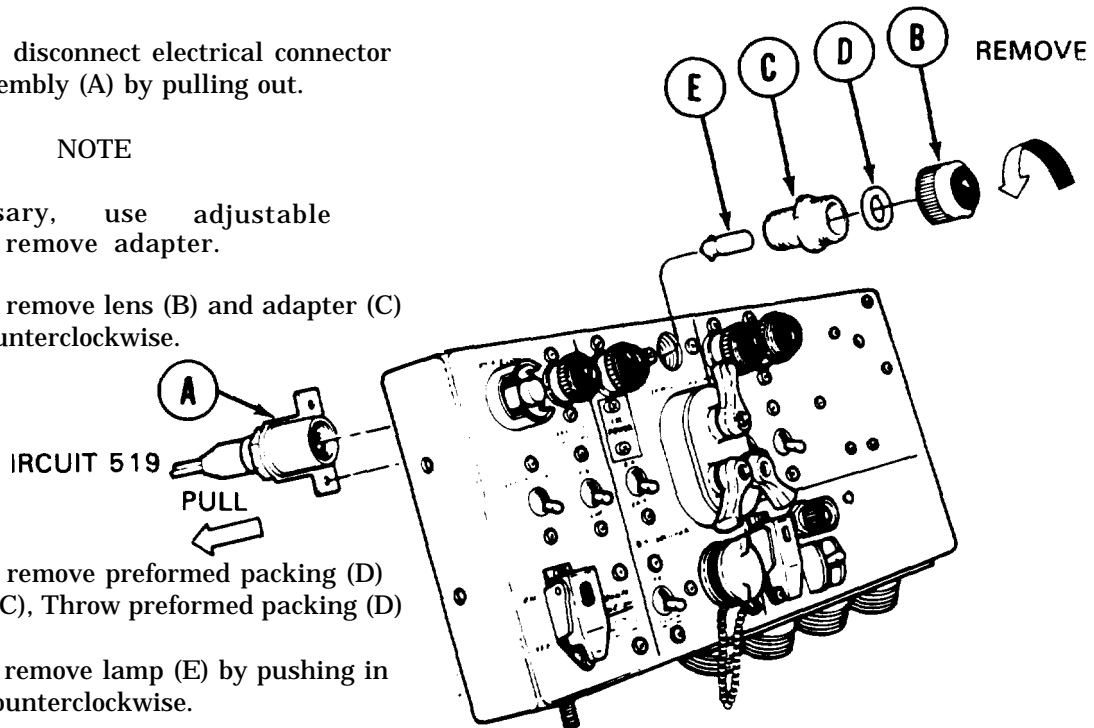
REMOVAL:

- Using fingers, disconnect electrical connector from base assembly (A) by pulling out.

NOTE

If necessary, use adjustable wrench to remove adapter.

- Using fingers, remove lens (B) and adapter (C) by turning counterclockwise.



- Using fingers, remove preformed packing (D) from adapter (C), Throw preformed packing (D) away.
- Using fingers, remove lamp (E) by pushing in and turning counterclockwise.

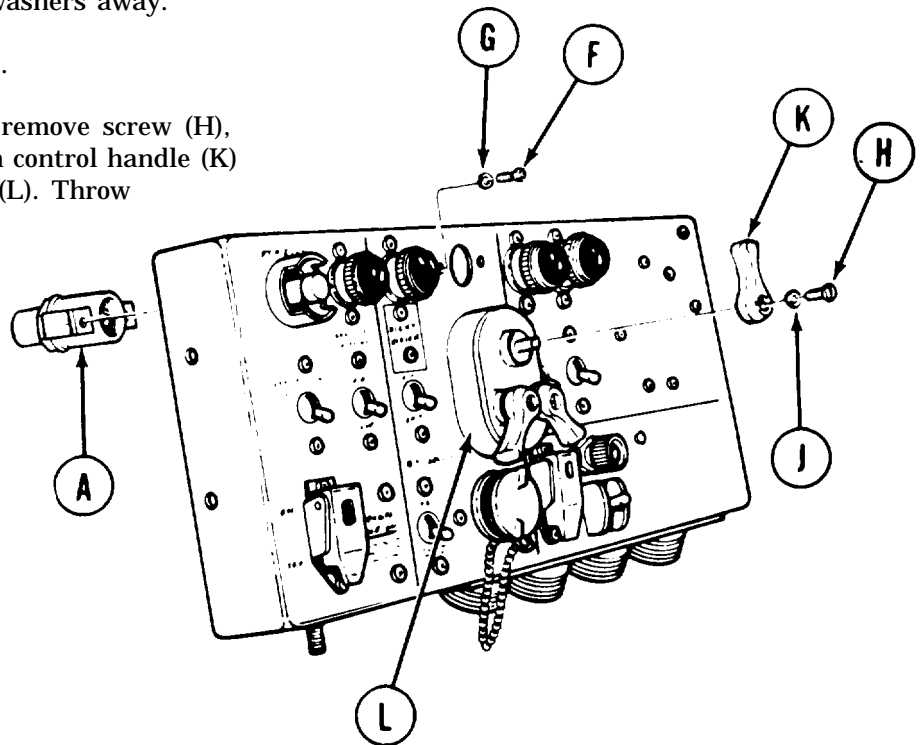
Go on to Sheet 2

TA139624

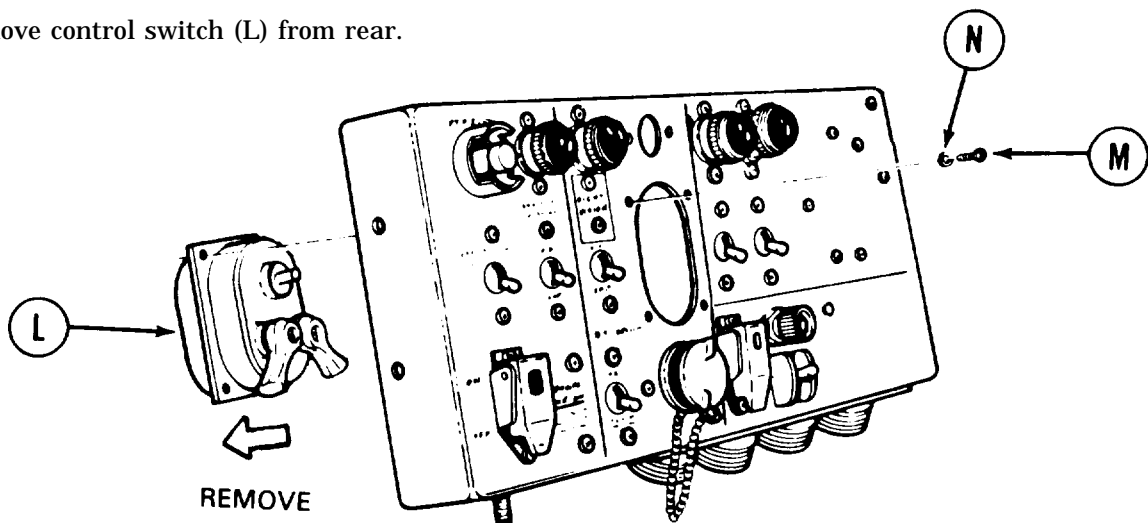
MASTER CONTROL PANEL REPAIR (Sheet 15 of 65)

Lighting Control Switch and Hi-Beam Indicator Light Replacement (Sheet 2 of 4)

5. Using cross-tip screwdriver, remove two screws (F) and lockwashers (G) securing base assembly (A) to panel. Throw lockwashers away.
6. Remove base assembly (A).
7. Using flat-tip screwdriver, remove screw (H), lockwasher (J), and switch control handle (K) from light control switch (L). Throw lockwasher away.



8. Using cross-tip screwdriver, remove four screws (M) and lockwashers (N) securing lighting control switch (L) to panel. Throw lockwashers away.
9. Remove control switch (L) from rear.



Go on to Sheet 3

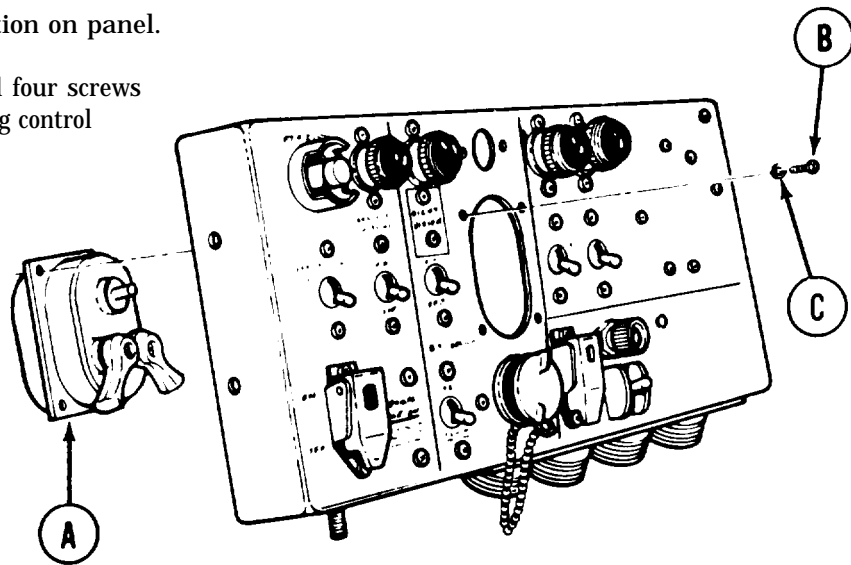
TA139625

MASTER CONTROL PANEL REPAIR (Sheet 16 of 65)

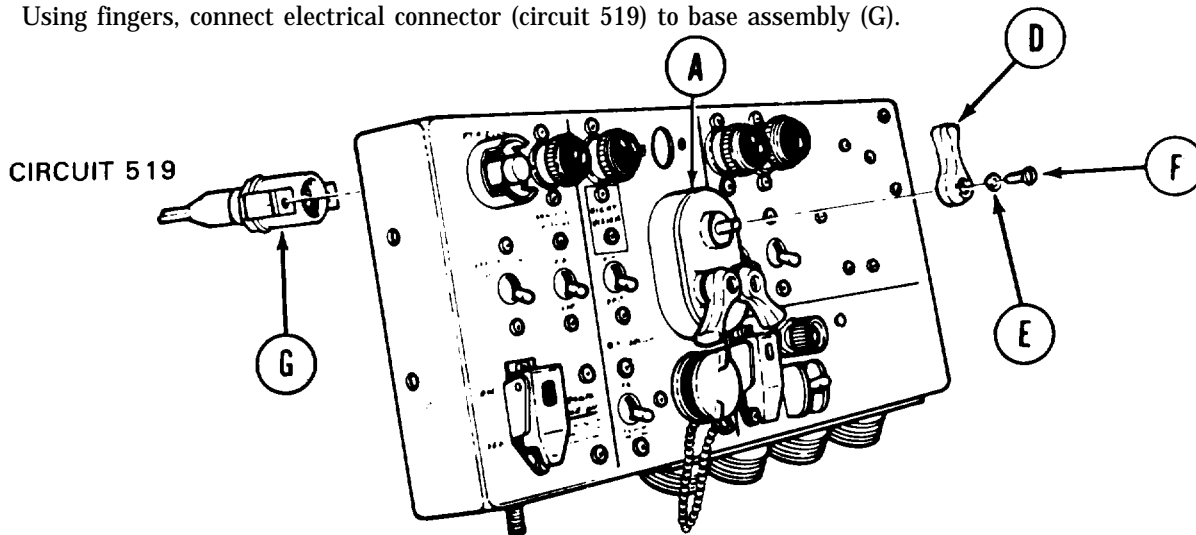
Lighting Control Switch and Hi-Beam Indicator Light Replacement (Sheet 3 of 4)

INSTALLATION:

1. Place control switch (A) in position on panel.
2. Using cross-tip screwdriver, install four screws (B) and new lockwashers (C) securing control switch (A) to panel.



3. Using flat-tip screwdriver, install switch control handle (D), new lockwasher (E), and screw (F) to control switch (A).
4. Apply silicone compound (Item 32, Appendix D) to base assembly electrical connector (circuit 519).
5. Using fingers, connect electrical connector (circuit 519) to base assembly (G).



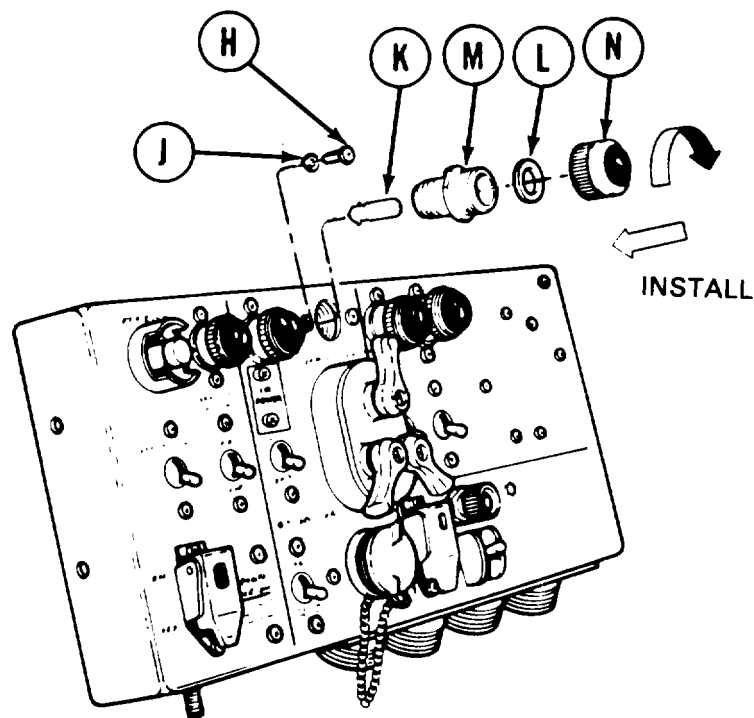
6. Place base assembly (G) in position on panel.

Go on to Sheet 4

TA139626

MASTER CONTROL PANEL REPAIR (Sheet 17 of 65)**Lighting Control Switch and Hi-Beam Indicator Light Replacement (Sheet 4 of 4)**

7. Using cross-tip screwdriver, install two screws (H) and new lockwashers (J) securing base assembly to panel.
8. Using fingers, install lamp (K) in base assembly by pushing in and turning clockwise.
9. Install new preformed packing (L) on adapter (M).
10. Using fingers, install adapter (M) and lens (N) in panel by turning clockwise.
11. Install panel in vehicle (page 10-50).



End of Task

TA139627

PROCEDURE INDEX

PROCEDURE	PAGE
Removal	10-72
Installation	10-72

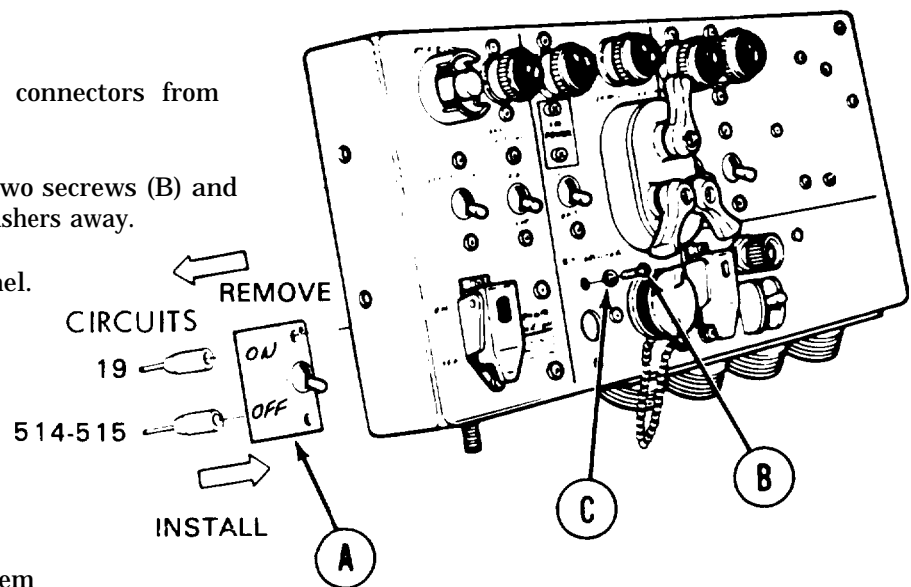
TOOLS: 4 in. cross-tip screwdriver

SUPPLIES: Silicone compound (Item 32, Appendix D)
 Lockwasher (MS35338-42) (2 required)

PRELIMINARY PROCEDURE: Remove panel from vehicle (page 10-48)

REMOVAL:

1. Using fingers, remove two connectors from switch (A) by pulling out.
2. Using screwdriver, remove two screws (B) and lockwashers (C). Throw lockwashers away.
3. Remove switch (A) from panel.



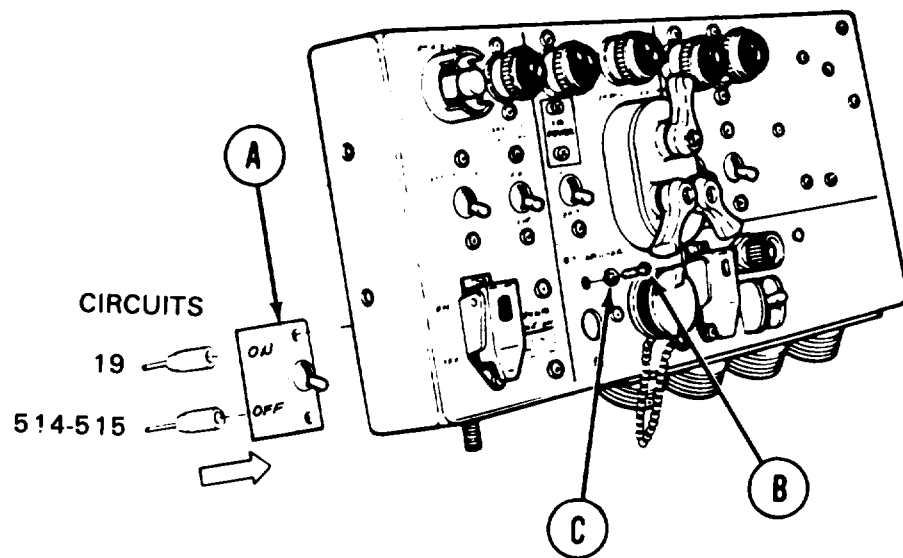
INSTALLATION:

1. Apply silicone compound (Item 32) to two male connectors.
2. Using fingers, connect two connectors (circuits 19 and 514-515) to switch (A).

Go on to Sheet 2

MASTER CONTROL PANEL REPAIR (Sheet 19 of 65)
Blackout Selector Switch Replacement (Sheet 2 of 2)

3. Place switch (A) in position on panel.
4. Using screwdriver, install two screws (B) and new lockwashers (C) securing switch (A) to panel.
5. Install panel in vehicle (page 10-50).



End of Task

TA139629

PROCEDURE INDEX

PROCEDURE	PAGE
Removal	10-74
Installation	10-75

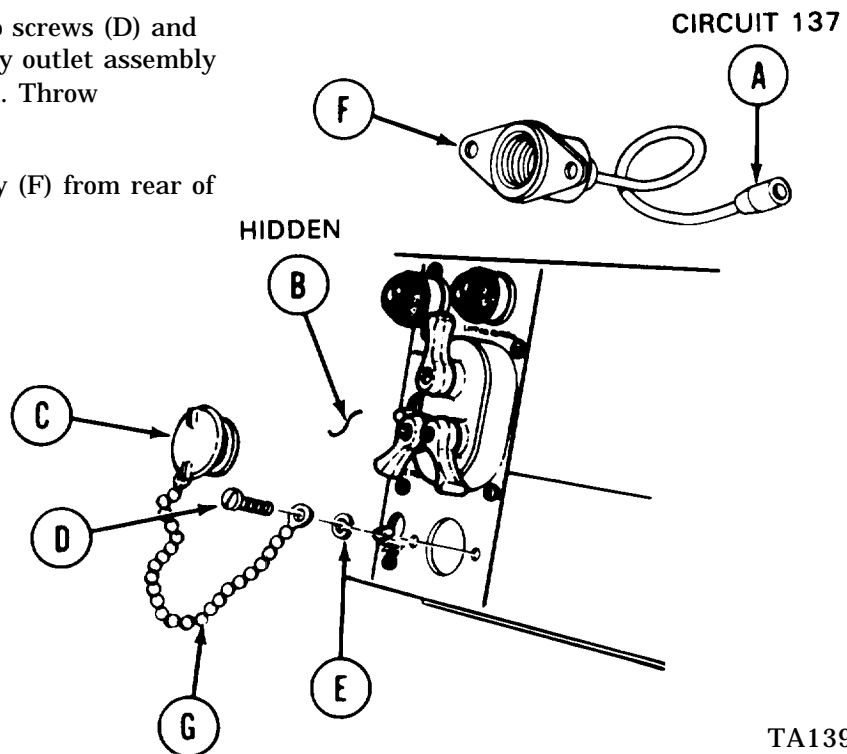
TOOLS: 4 in. cross-tip screwdriver

SUPPLIES: Silicone compound (Item 32, Appendix D)
 Lockwasher (MS35338-41) (2 required)

PRELIMINARY PROCEDURE: Remove panel from vehicle (page 10-48)

REMOVAL:

1. Using fingers, disconnect electrical connector (A) from utility outlet circuit breaker (B).
2. Using fingers, remove cap (C) by turning counterclockwise.
3. Using screwdriver, remove two screws (D) and lockwashers (E) securing utility outlet assembly (F) and cap chain (G) to panel. Throw lockwashers away.
4. Remove utility outlet assembly (F) from rear of panel.

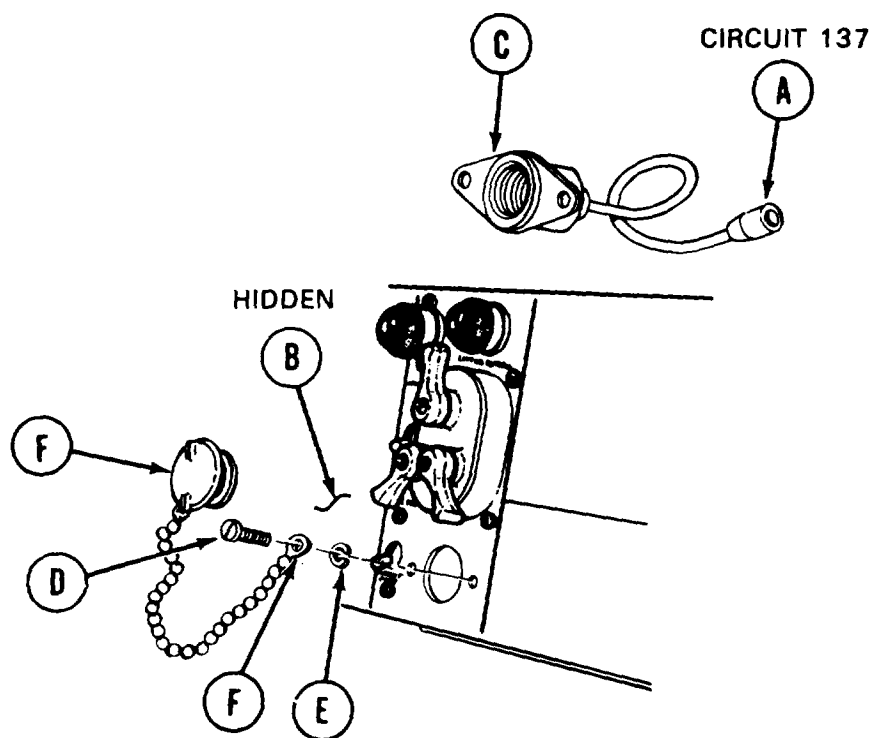


Go on to Sheet 2

TA139630

MASTER CONTROL PANEL REPAIR (Sheet 21 of 65)**Utility Outlet Replacement (Sheet 2 of 2)****INSTALLATION:**

1. Apply silicone compound (Item 32, Appendix D) to electrical connector (A).
2. Connect electrical connector (A) to utility outlet circuit breaker (B).
3. Place utility outlet (C) in position on panel.
4. Using screwdriver, install two screws (D) and new lockwashers (E) securing cap chain (F) and utility outlet (C) to panel.
5. Using fingers, install cap (F) onto utility outlet (C).
6. Install panel in vehicle (page 10-50).



End of Task

TA139631

10-75

MASTER CONTROL PANEL REPAIR (Sheet 22 of 65)
 Gas Particulate Switch and Indicator Light Replacement (Sheet 1 of 4)

PROCEDURE INDEX

PROCEDURE	PAGE
Removal	10-76
Installation	10-78

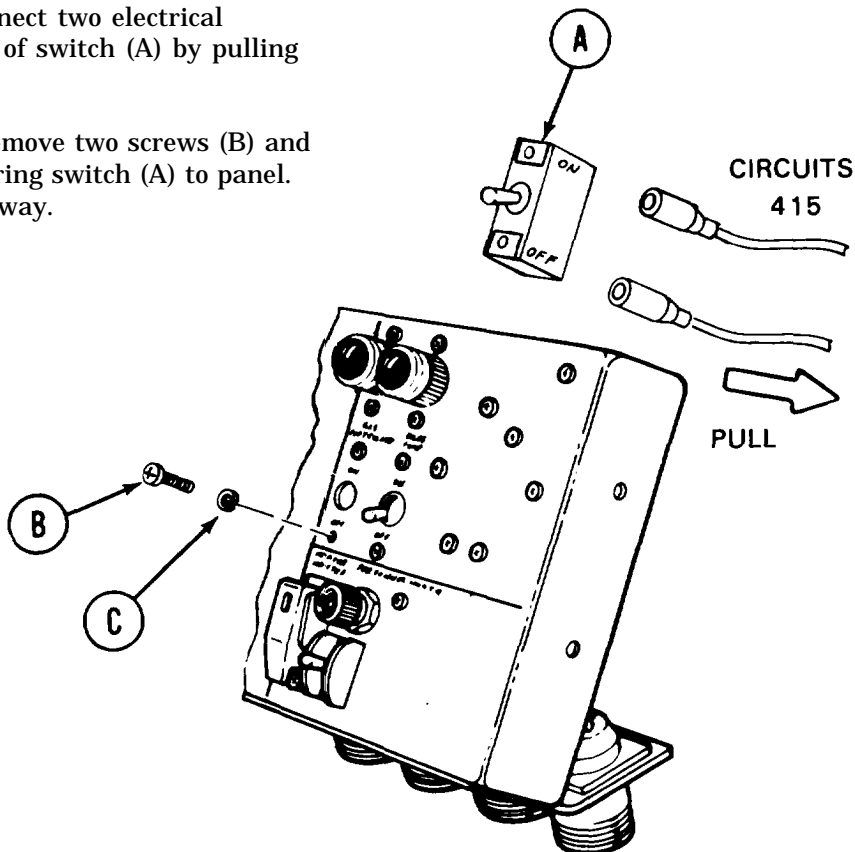
TOOLS: 4 in. cross-tip screwdriver
 10 in. adjustable wrench
 1 in. combination box and open end wrench

SUPPLIES: Silicone compound (Item 32, Appendix D)
 Preformed packing
 Lockwasher (MS35338-41 (4 required))

PRELIMINARY PROCEDURE: Remove panel from vehicle (page 10-48)

REMOVAL:

- Using fingers, disconnect two electrical connectors from rear of switch (A) by pulling out.
- Using screwdriver, remove two screws (B) and lockwashers (C) securing switch (A) to panel. Throw lockwashers away.
- Remove switch (A).



Go on to Sheet 2

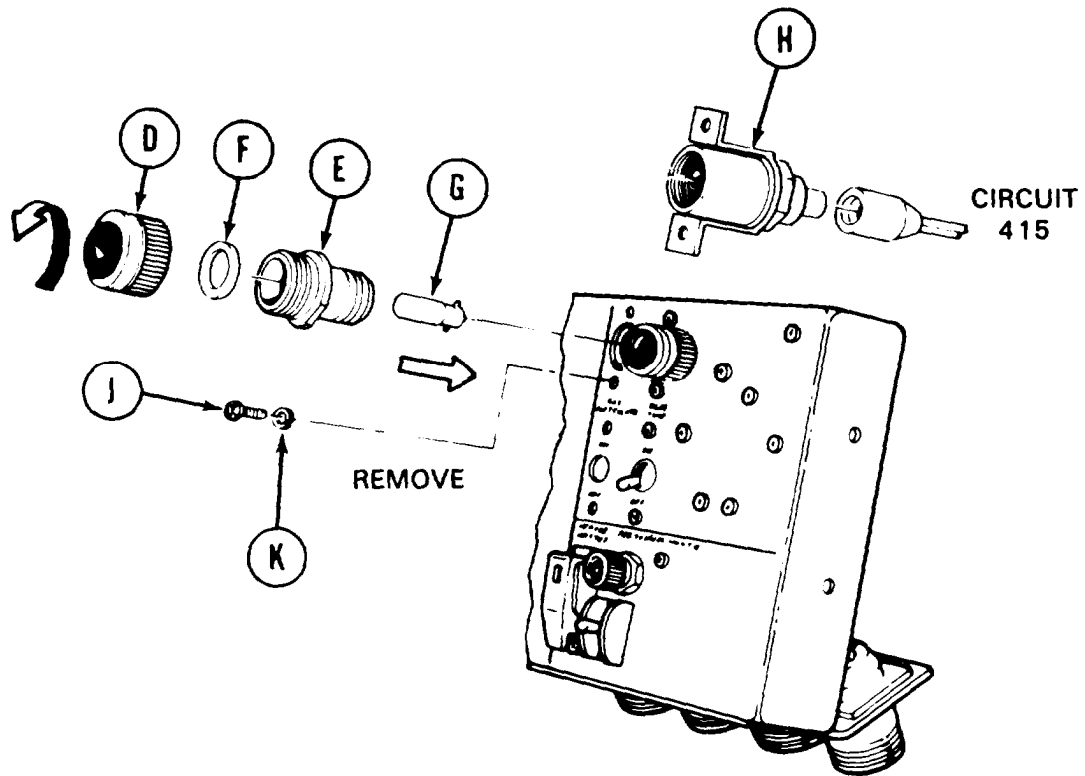
TA139632

MASTER CONTROL PANEL REPAIR (Sheet 23 of 65)
Gas Particulate Switch and Indicator Light Replacement (Sheet 2 of 4)

NOTE

If necessary, use adjustable wrench to remove adapter (E).

4. Using fingers, remove lens (D) and adapter (E) by turning counterclockwise.
5. Using fingers, remove preformed packing (F) from adapter (E). Throw preformed packing (F) away.
6. Using fingers, remove lamp (G) by pushing in and turning counterclockwise.
7. Using fingers, disconnect electrical connector from rear of base assembly (H).
8. Using screwdriver, remove two screws (J) and lockwashers (K) securing base assembly to panel. Throw lockwashers away.
9. Remove base assembly (H).



Go on to Sheet 3

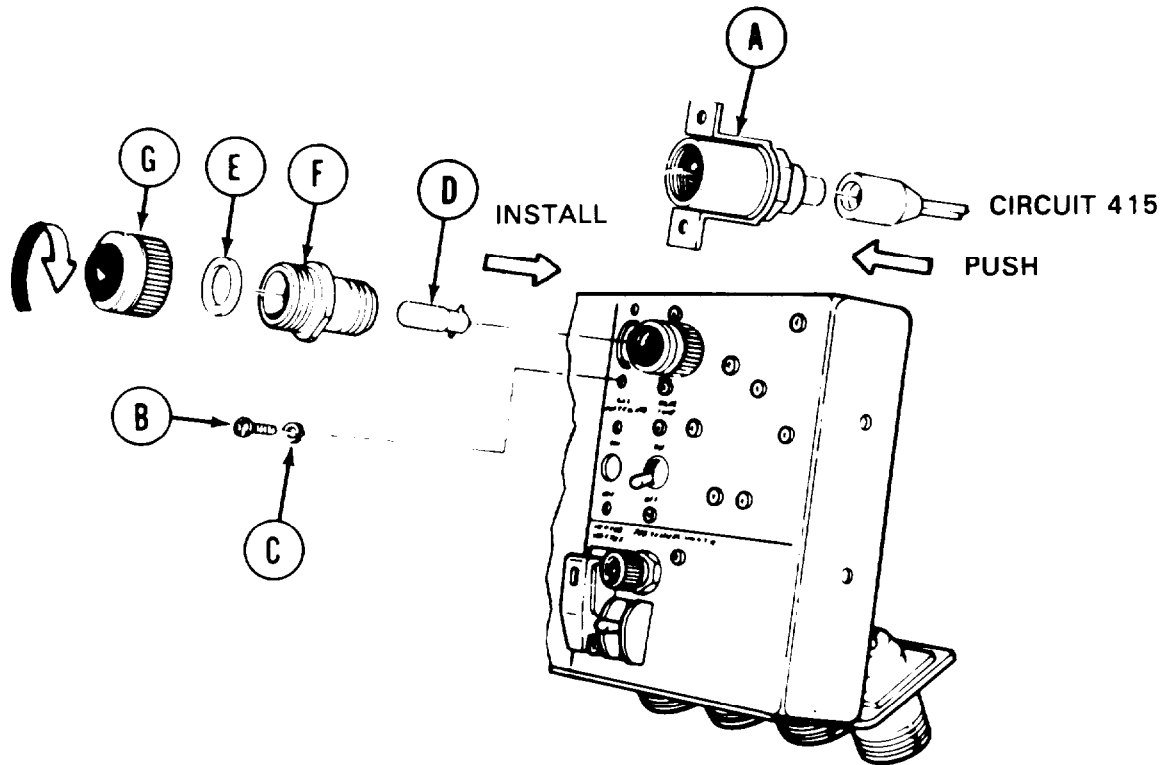
TA139633

10-77

MASTER CONTROL PANEL REPAIR (Sheet 24 of 65)
Gas Particulate Switch and Indicator Light Replacement (Sheet 3 of 4)

INSTALLATION:

1. Apply silicone compound (Item 32, Appendix D) to electrical connector on base assembly (A).
2. Using fingers, connect electrical connector (circuit 415) to rear of base assembly (A) by pushing in.
3. Place base assembly (A) in position on panel.
4. Using screwdriver, install two screws (B) and new lockwashers (C) securing base assembly (A) to panel.
5. Using fingers, install lamp (D) by pushing in and turning clockwise.
6. Install new preformed packing (F) on adapter (G).
7. Using fingers, install adapter (F) and lens (G) in panel.



Go on to Sheet 4

TA139634

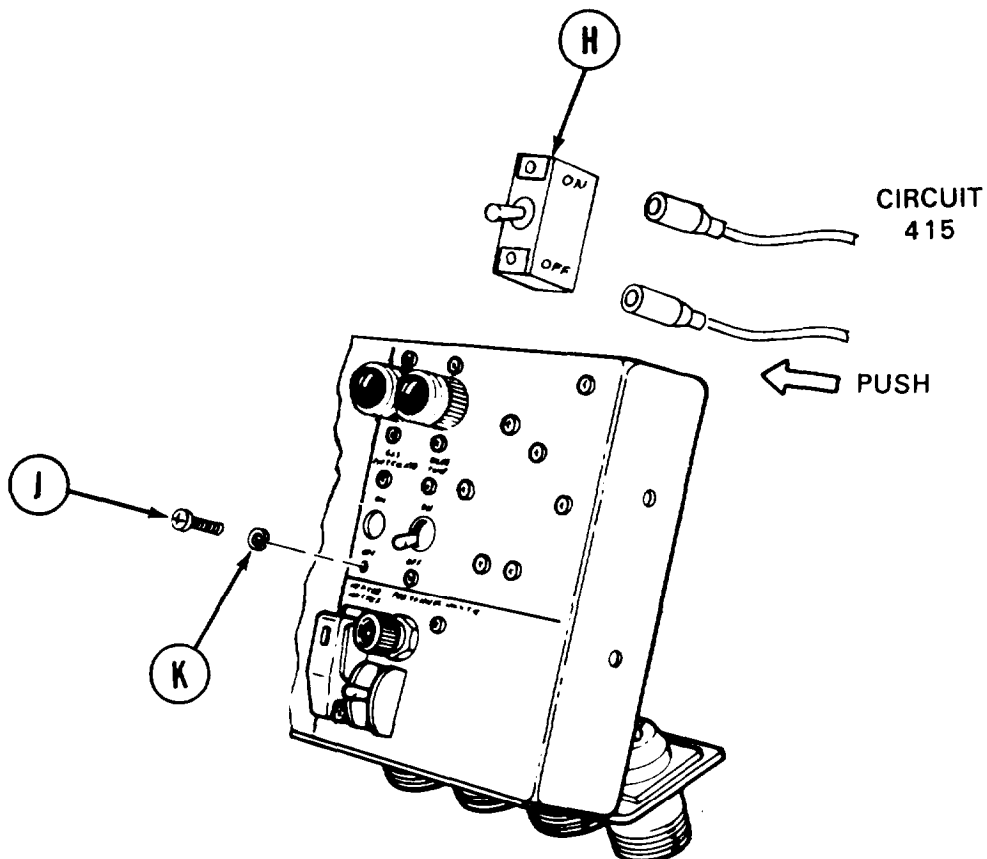
MASTER CONTROL PANEL REPAIR (Sheet 25 of 65)
Gas Particulate Switch and Indicator Light Replacement (Sheet 4 of 4)

8. Apply silicone compound (Item 32, Appendix D) to two male connectors for switch (H).
9. Using fingers, connect two electrical connectors to switch (H) by pushing in.

NOTE

Before installing switch (H), make sure switch (H) is in OFF position. If off position is not marked on switch (H), use multimeter to make sure switch (H) is on OFF position.

10. Place switch (H) in position on panel.
11. Using screwdriver, install two screws (J) and new lockwashers (K) securing switch (H) to panel.
12. Install panel in vehicle (page 10-50).



End of Task

TA139635

MASTER CONTROL PANEL REPAIR (Sheet 26 of 65)
 Bilge Pump Switch and Indicator Light Replacement (Sheet 1 of 4)

PROCEDURE INDEX

PROCEDURE	PAGE
Removal	10-80
Installation	10-82

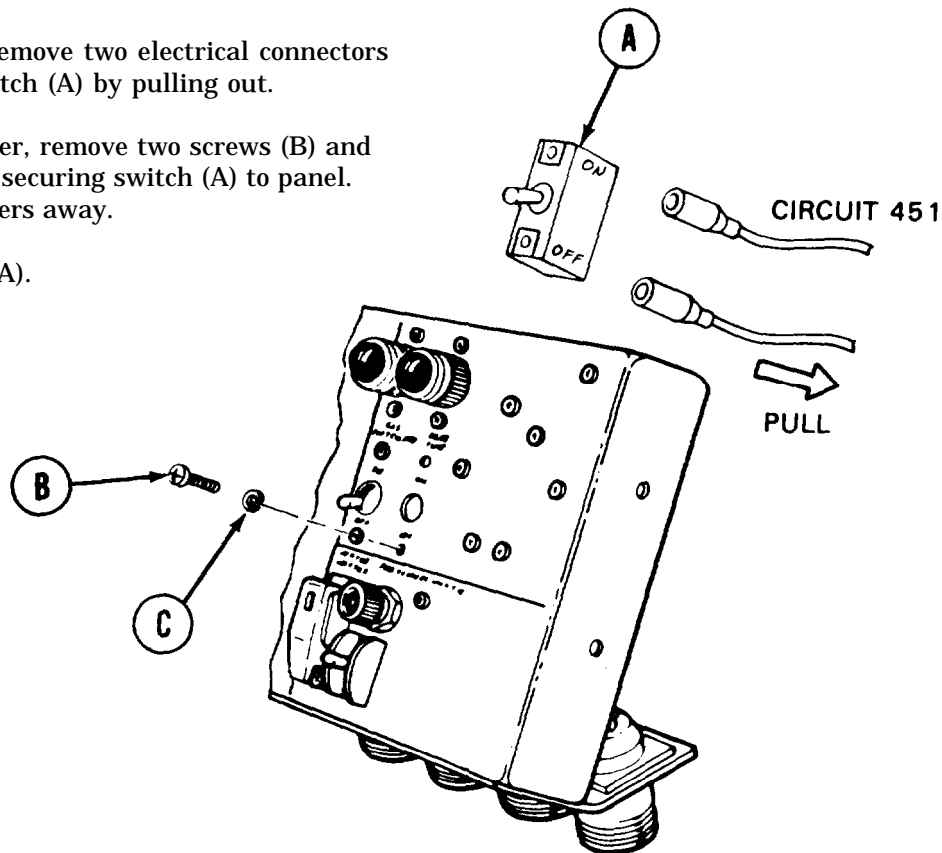
TOOLS: 4 in. cross-tip screwdriver
 10 in. adjustable wrench
 1 in. combination box and open end wrench

SUPPLIES: Silicone compound (Item 32, Appendix D)
 Preformed packing (MS28775-119)
 Lockwasher (MS35338-42) (4 required)

PRELIMINARY PROCEDURE: Remove panel from vehicle (page 10-48)

REMOVAL:

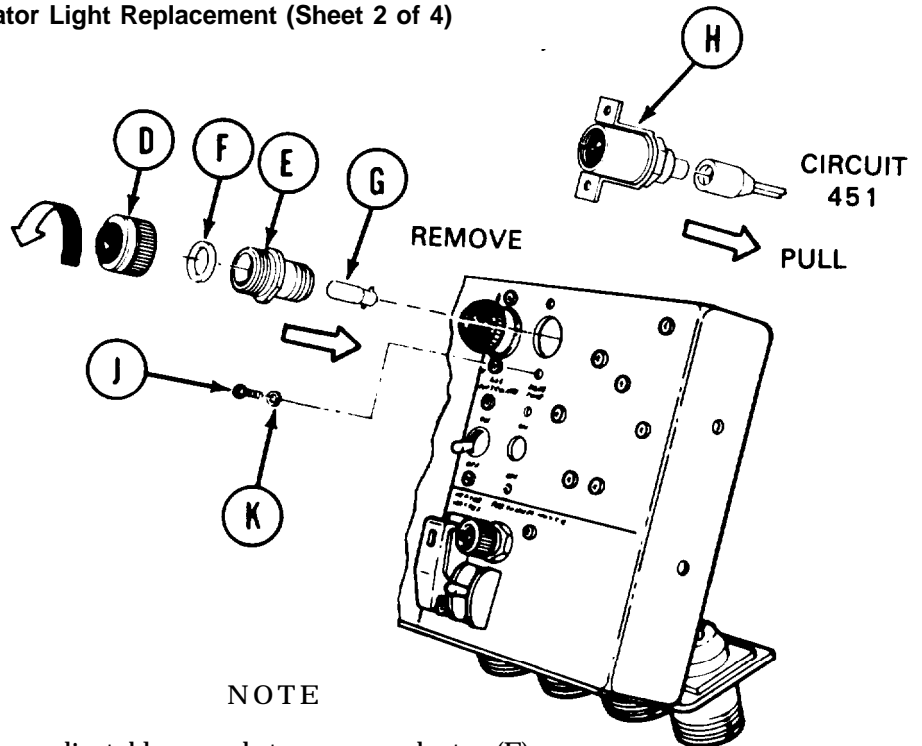
- Using fingers, remove two electrical connectors from rear of switch (A) by pulling out.
- Using screwdriver, remove two screws (B) and lockwashers (C) securing switch (A) to panel. Throw lockwashers away.
- Remove switch (A).



Go on to Sheet 2

TA139636

MASTER CONTROL PANEL REPAIR (Sheet 27 of 65)
 Bilge Pump Switch and Indicator Light Replacement (Sheet 2 of 4)



NOTE

If necessary, use adjustable wrench to remove adapter (E).

4. Using fingers, remove lens (D) and adapter (E) by turning counterclockwise.
5. Using fingers, remove preformed packing (F) from adapter (E). Throw preformed packing (F) away,
6. Using fingers, remove lamp (G) by pushing in and turning counterclockwise.
7. Using fingers, remove electrical connector from rear of base assembly (H) by pulling out.
8. Using screwdriver, remove two screws (J) and lockwashers (K) securing base assembly (H) to panel. Throw lockwashers away.
9. Remove base assembly (H).

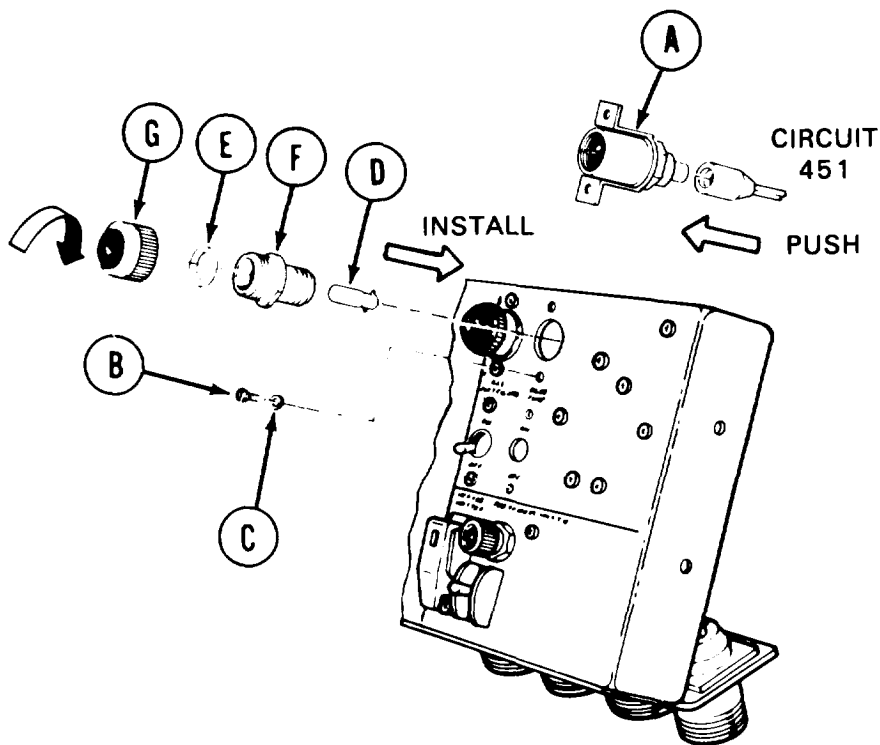
Go on to Sheet 3

TA139637

MASTER CONTROL PANEL REPAIR (Sheet 28 of 65)

INSTALLATION:

1. Apply silicone compound (Item 32, Appendix D) to circuit 451 electrical connector.
2. Using fingers, connect electrical connector (circuit 451) to rear of base assembly (A) by pushing in.
3. Place base assembly (A) in position on panel.
4. Using screwdriver, install two screws (B) and new lockwashers (C) securing base assembly (A) to panel.
5. Using fingers, install lamp (D) by pushing in and turning clockwise.
6. Place new preformed packing (E) in position on adapter (F).
7. Using fingers, install adapter (F) and lens (G) in position on panel.



Go on to Sheet 4

TA139638

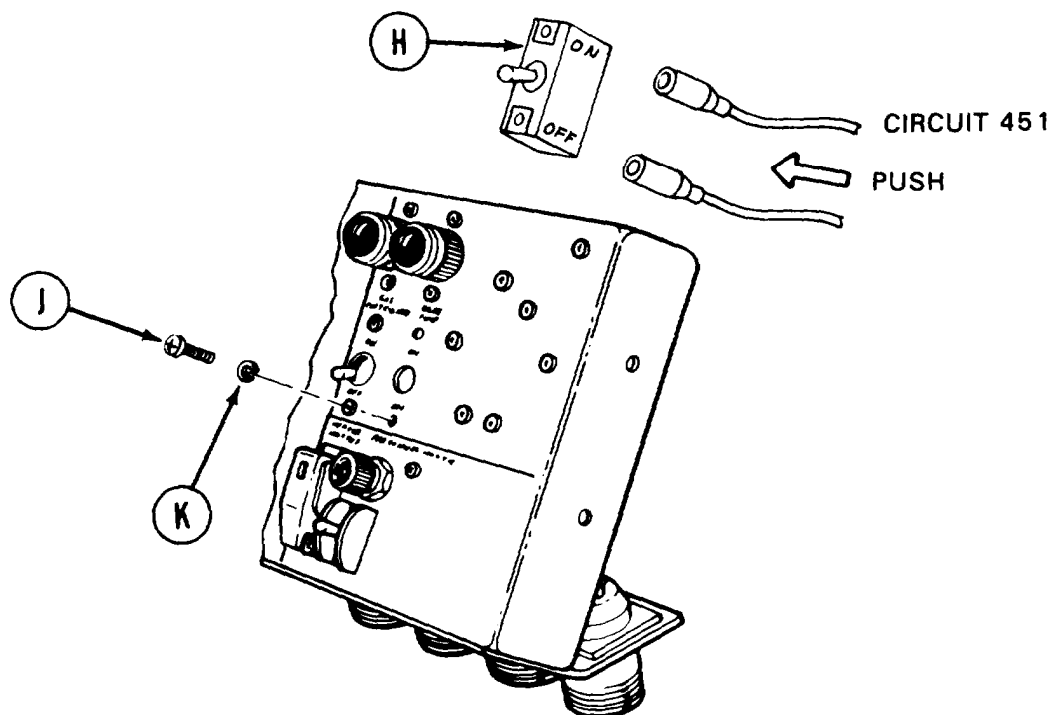
MASTER CONTROL PANEL REPAIR (Sheet 29 of 65)
Bilge Pump Switch and Indicator Light Replacement (Sheet 4 of 4)

8. Apply silicone compound (Item 32, Appendix D) to two male electrical connectors.
9. Using fingers, connect two electrical connectors to rear of switch (H) by pushing in

NOTE

Before installing switch (H), make sure switch (H) is in OFF position. If OFF position is not marked on switch (H), use multimeter to make sure switch (H) is in OFF position.

10. Place switch (H) in position on panel.
11. Using screwdriver, install two screws (J) and new lockwashers (K) securing switch (H) to panel.
12. Install panel in vehicle (page 10-50).



End of Task

TA139639

10-83

MASTER CONTROL PANEL REPAIR (Sheet 30 of 65)
Circuit Breaker Replacement (Sheet 1 of 7)

PROCEDURE INDEX

PROCEDURE	PAGE
Removal (bilge pump and gas particulate, IR power/Night Vision, fuel shutoff, and utility outlet circuit breakers)	10-85
Installation (bilge pump and gas particulate, IR power /Night Vision fuel shutoff, and utility outlet circuit breakers)	10-85
Removal (fuel pump circuit breaker)	10-86
Installation (fuel pump circuit breaker)	10-87
Removal (gage circuit breaker)	10-88
Installation (gage circuit breaker)	10-89
Removal (manifold preheat circuit breaker)	10-90
Installation (manifold preheat circuit breaker)	10-90

TOOLS: 3/8 in. socket with 1/2 in. drive
Ratchet with 1/2 in. drive
Long round nose pliers
6 in. cross-tip screwdriver
11/32 in. combination box and open end wrench

SUPPLIES: Silicone compound (Item 32, Appendix D)
Lockwasher (MS35338-42) (13 required)

PRELIMINARY PROCEDURE: Remove panel from vehicle (page 10-48)

Go on to Sheet 2

TA253223

MASTER CONTROL PANEL REPAIR (Sheet 31 of 65)
Circuit Breaker Replacement (Sheet 2 of 7)

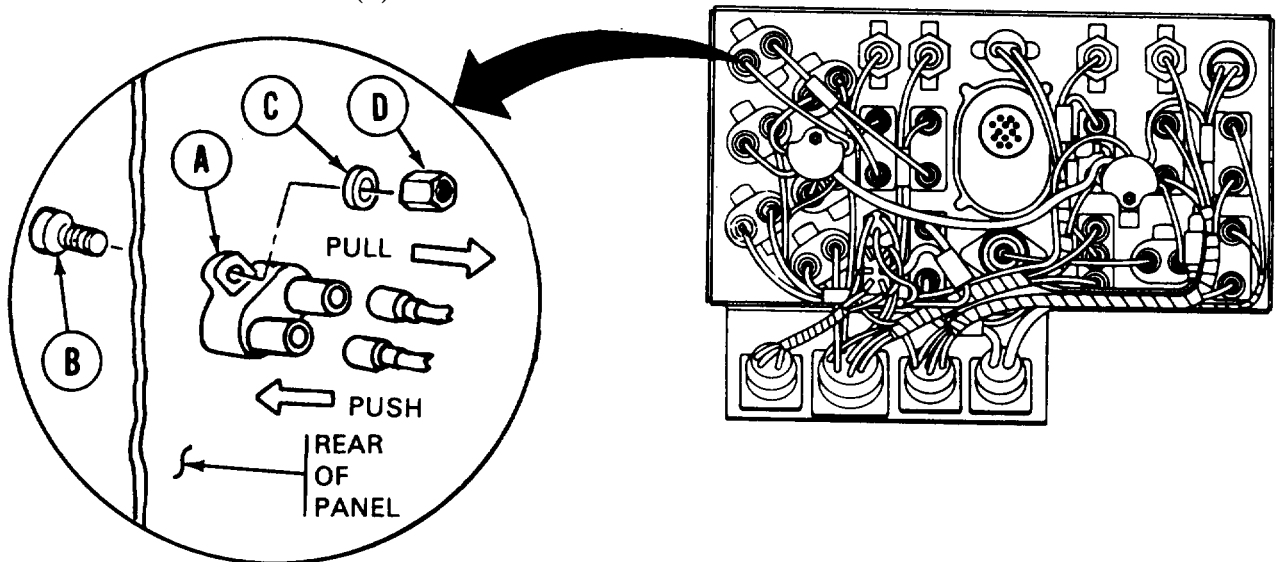
REMOVAL OF BILGE PUMP AND GAS PARTICULATE, IR POWER, FUEL SHUTOFF, AND UTILITY OUTLET CIRCUIT BREAKERS:

- Using fingers, remove two electrical connectors from rear of circuit breaker (A) by pulling out,

NOTE

If necessary, use wrench to hold nuts (D) while removing screws (B).

- Using cross-tip screwdriver, remove two screws (B), lockwashers (C), and nuts (D) securing circuit breaker (A) to panel. Throw lockwashers away.
- Remove circuit breaker (A).



INSTALLATION OF BILGE PUMP AND GAS PARTICULATE, IR POWER, FUEL SHUTOFF, AND UTILITY OUTLET CIRCUIT BREAKERS:

- Place circuit breaker (A) in position on panel.

NOTE

If necessary, use wrench to hold nuts (D) while installing screw (B).

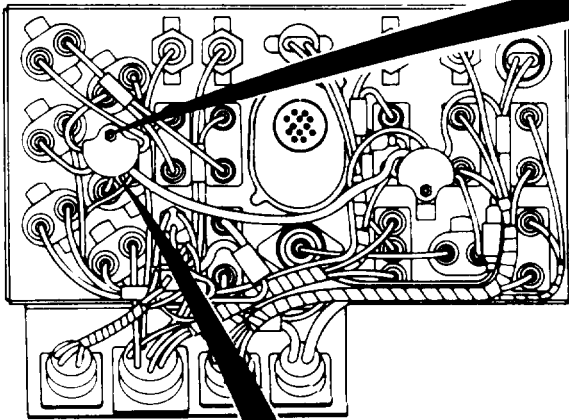
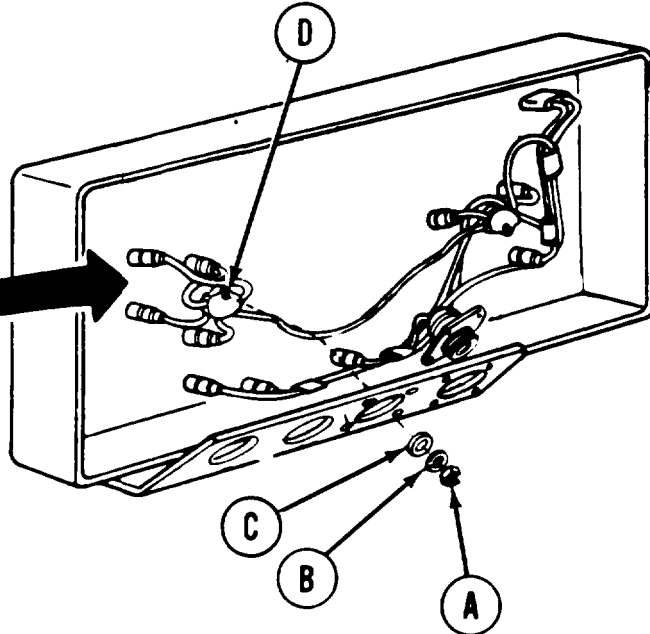
- Using screwdriver, install two screws (B), new lockwashers (C), and nuts (D).
- Apply silicone compound (Item 32, Appendix D) to two male electrical connectors for circuit breaker (A).
- Using fingers, connect two electrical connectors in rear of circuit breaker (A) by pushing in, Goon to Sheet 3

TA139641

MASTER CONTROL PANEL REPAIR (Sheet 32 of 65)
 Circuit Breaker Replacement (Sheet 3 of 7)

REMOVAL OF FUEL PUMP CIRCUIT BREAKER:

1. Using socket, remove nut (A), lockwasher (B), and flat washer (C) securing harness junction (D) to panel. Throw lockwasher away.
2. Lift harness junction (D) off stud and position aside.

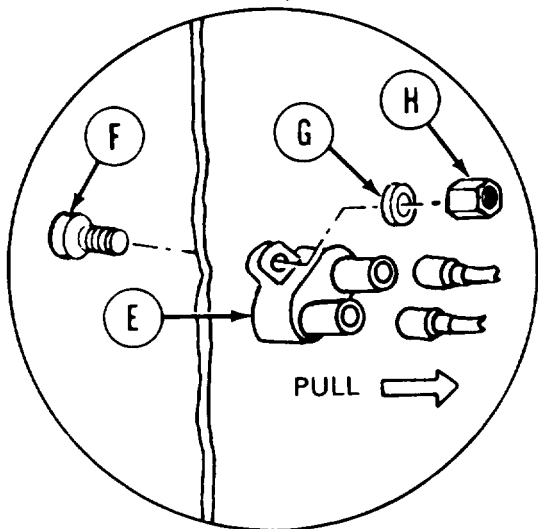


3. Using fingers, remove two electrical connectors from rear of circuit breaker (E) by pulling out.

NOTE

If necessary, use wrench to hold nuts (H) while removing screws (F).

4. Using screwdriver, remove two screws (F), lockwashers (G), and nuts (H) securing circuit breaker (E) to panel. Throw lockwashers away.
5. Remove fuel pump circuit breaker (E).



Go on to Sheet 4

TA139642

**MASTER CONTROL PANEL REPAIR (Sheet 33 of 65)
Circuit Breaker Replacement (Sheet 4 of 7)**

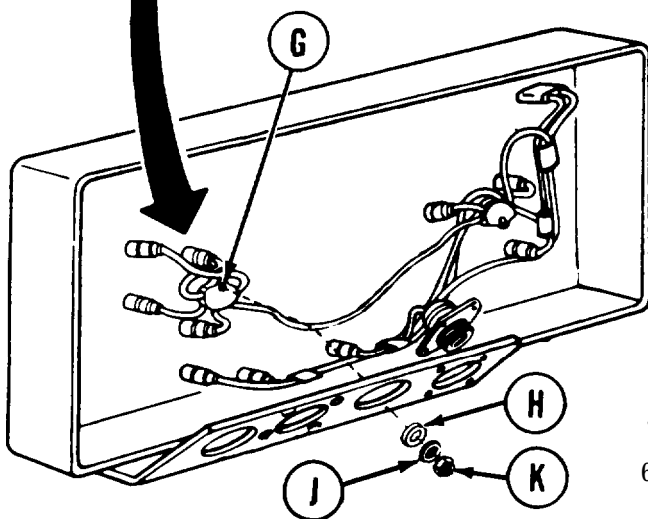
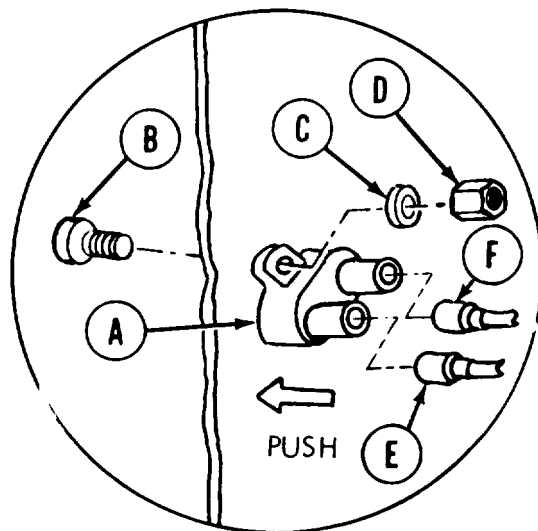
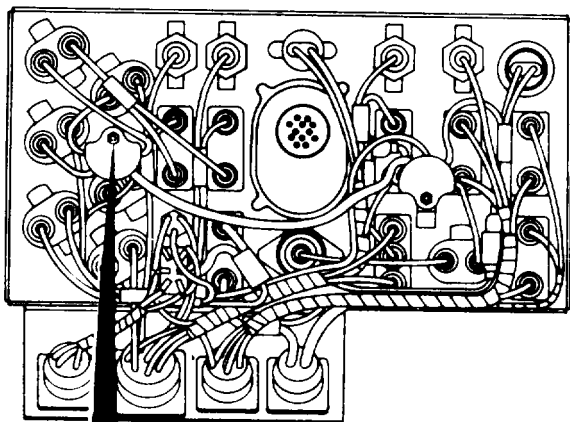
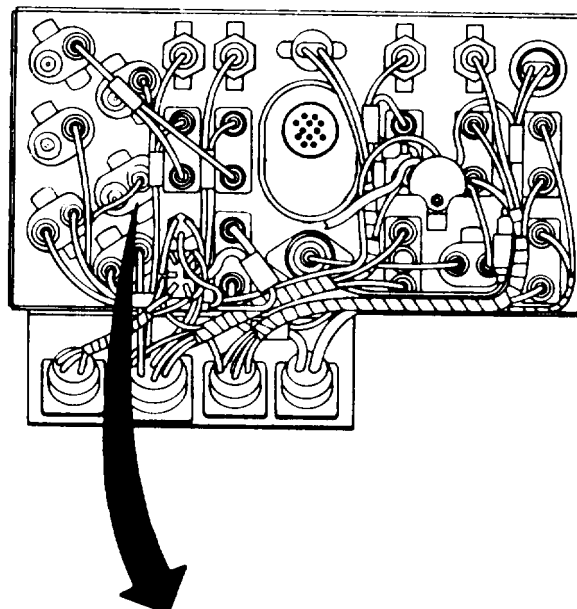
INSTALLATION OF FUEL PUMP CIRCUIT BREAKER:

1. Place circuit breaker (A) in position on panel.

NOTE

If necessary, use pliers to hold nuts (D) while installing screws (B).

2. Using screwdriver, install two screws (B), new lockwashers (C), and nut (D).
3. Apply silicone compound (Item 32, Appendix D) to two male electrical connectors for circuit breaker (A).
4. Using fingers, connect two electrical connectors (E) and (F) in rear of circuit breaker (A) by pushing in.



5. Position harness junction (G) onto stud.
6. Using socket, install flatwashers (H), new lockwashers (J), and nuts (K) securing harness junction (G) to panel

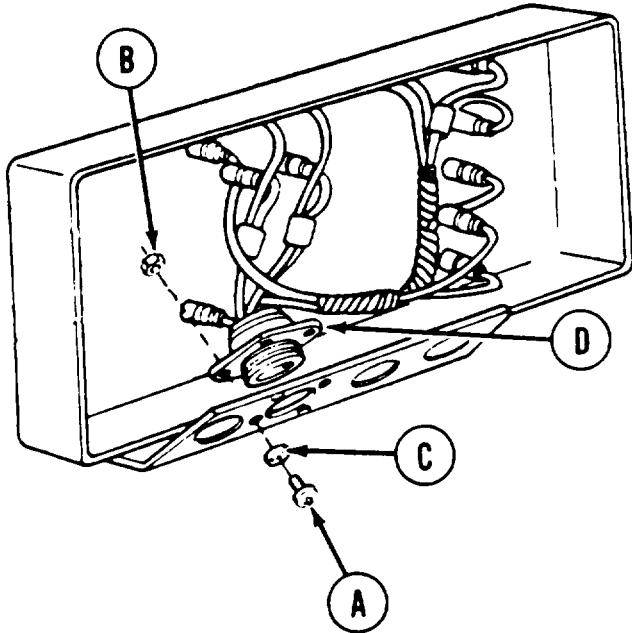
Go on to Sheet 5

TA139643

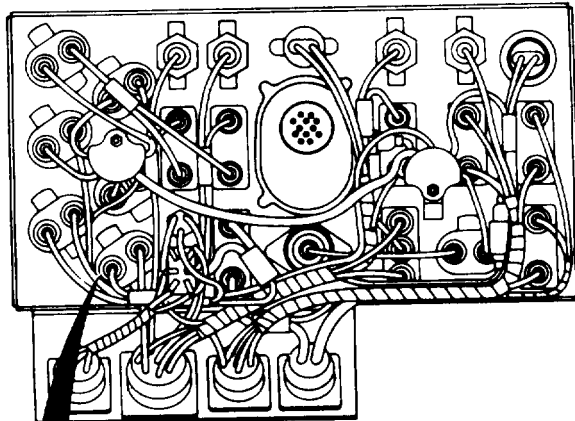
MASTER CONTROL PANEL REPAIR (Sheet 34 of 65)
 Circuit Breaker Replacement (Sheet 5 of 7)

REMOVAL OF GAGE CIRCUIT BREAKER:

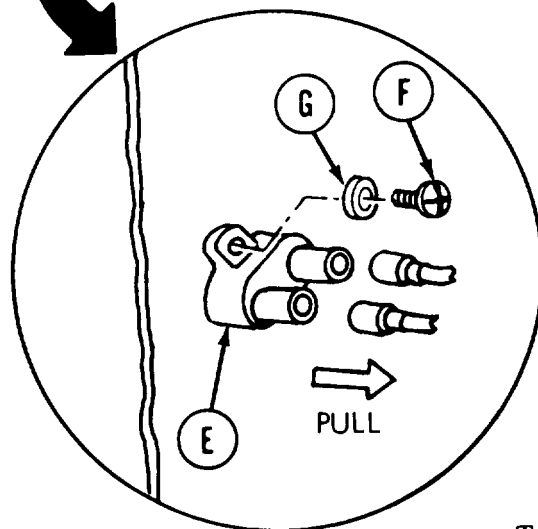
- Using screwdriver on screw (A) and wrench on nut (B), remove four screws (A), lockwashers (C), and nuts (B) securing connector (D) to panel. Throw lockwashers away.



- Remove connector (D) from panel and position aside.



- Using fingers, remove two electrical connectors from rear of circuit breaker (E) by pulling out.
- Using screwdriver, remove two screws (F) and lockwashers (G) securing circuit breaker to panel. Throw lockwashers away.
- Remove gage circuit breaker (E).

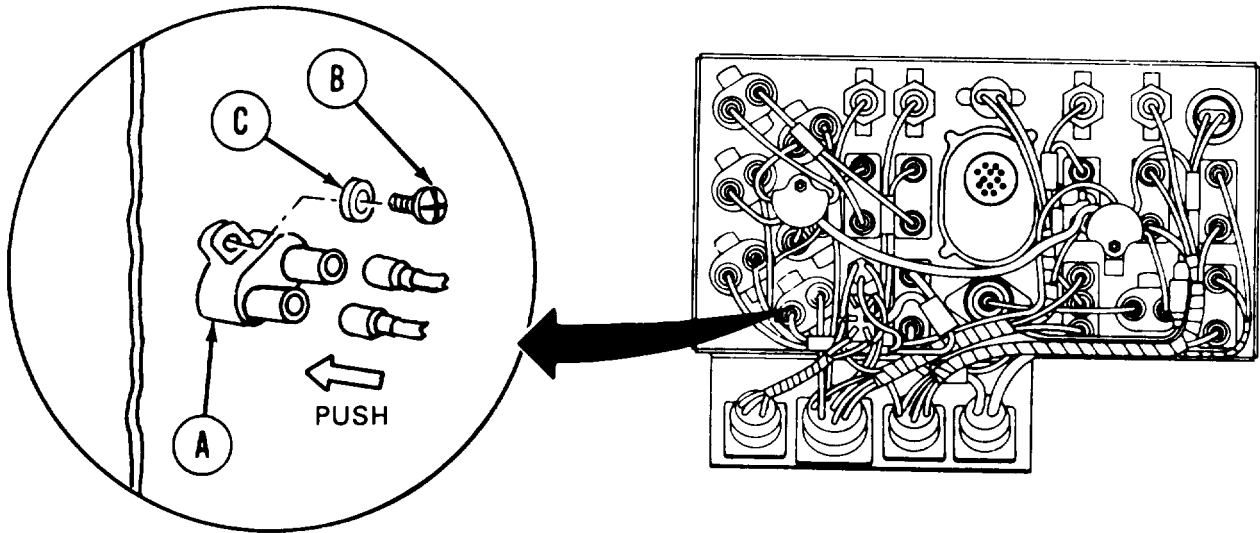


Go on to Sheet 6

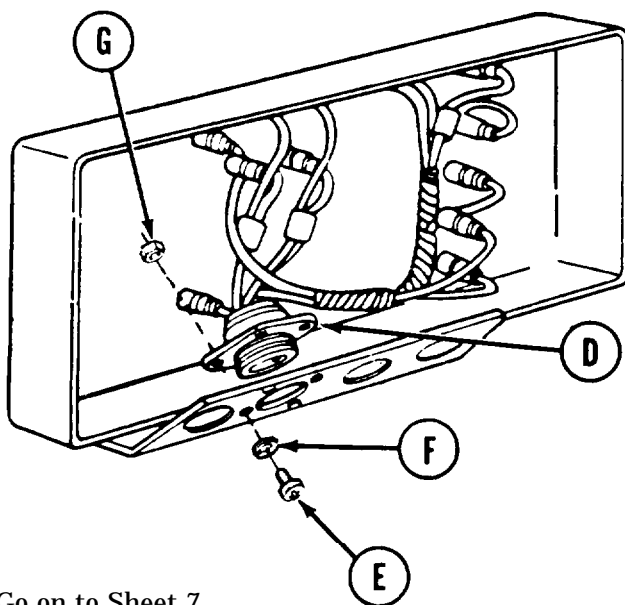
TA139644

MASTER CONTROL PANEL REPAIR (Sheet 35 of 65)
 Circuit Breaker Replacement (Sheet 6 of 7)

INSTALLATION OF GAGE CIRCUIT BREAKER:



1. Place circuit breaker (A) in position on panel.
2. Using cross-tip screwdriver, install two screws (B) and new lockwashers (C).
3. Apply silicone compound (Item 32, Appendix D) to two male electrical connectors on circuit breaker (A).
4. Using fingers, connect two electrical connectors in rear of circuit breaker (A) by pushing in.



5. Position connector (F) to panel.
6. Using cross-tip screwdriver on screw and wrench on nut, install and secure four screws (E), new lockwashers (F), and nuts (G).

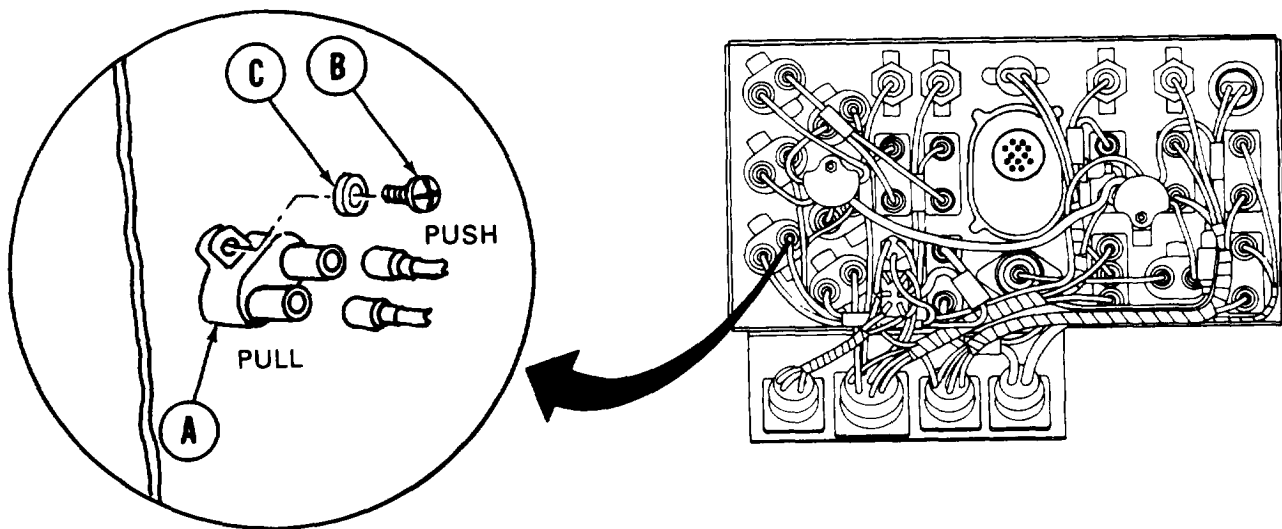
Go on to Sheet 7

TA139645

MASTER CONTROL PANEL REPAIR (Sheet 36 of 65)
Circuit Breaker Replacement (Sheet 7 of 7)

REMOVAL OF MANIFOLD PREHEAT CIRCUIT BREAKER:

1. Using fingers, disconnect two electrical connectors from rear of circuit breaker (A) by pulling out.
2. Using cross-tip screwdriver, remove two screws (B) and lockwashers (C) securing circuit breaker (A) to panel. Throw lockwashers away.
3. Remove circuit breaker (A).



INSTALLATION OF MANIFOLD PREHEAT CIRCUIT BREAKER:

1. Place circuit breaker (A) in position on panel.
2. Using cross-tip screwdriver, install two screws (B) and new lockwashers (C) securing circuit breaker (A) to panel.
3. Apply silicone compound (Item 32, Appendix D) to two male connectors for circuit breaker (A).
4. Using fingers, connect two electrical connectors in rear of circuit breaker (A).
5. Install panel in vehicle (page 10-50).

End of Task

TA139646

MASTER CONTROL PANEL REPAIR (Sheet 37 of 65)
Master Heater Circuit Breaker, Hi-Lo Switch, and Indicator Light
Replacement (Sheet 1 of 7)

PROCEDURE INDEX

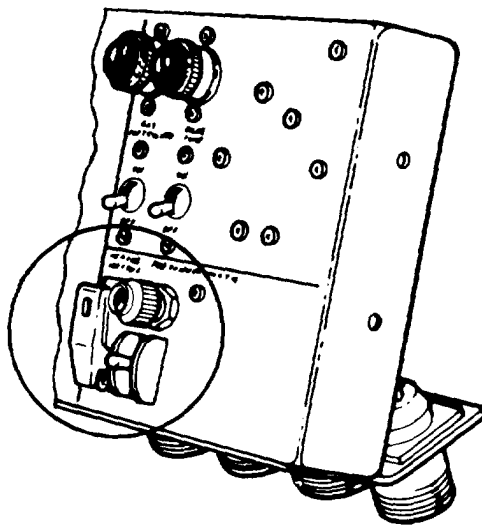
PROCEDURE	PAGE
Removal	10-92
Installation	10-95

TOOLS: 11/32 in. combination box and open end wrench
 Slip joint pliers
 4 in. cross-tip screwdriver
 4 in. flat-tip screwdriver

TEST EQUIPMENT: Multimeter

SUPPLIES: Silicone compound (Item 32, Appendix D)
 Lockwasher (MS35338-57) (7 required)
 Lockwasher (MS35338-42) (8 required)

PRELIMINARY PROCEDURE: Remove master control panel from vehicle (page 10-48)



Go on to Sheet 2

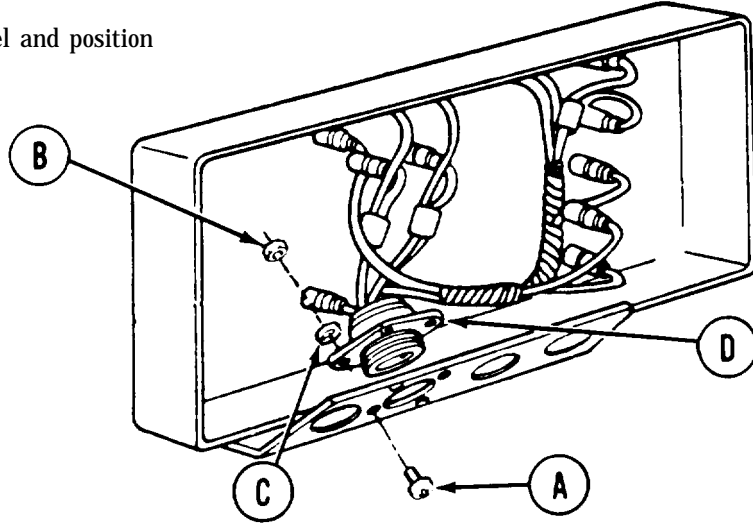
TA139647

MASTER CONTROL PANEL REPAIR (Sheet 38 of 65)
Master Heater Circuit Breaker, Hi-Lo Switch, and Indicator Light
Replacement (Sheet 2 of 7)

REMOVAL:

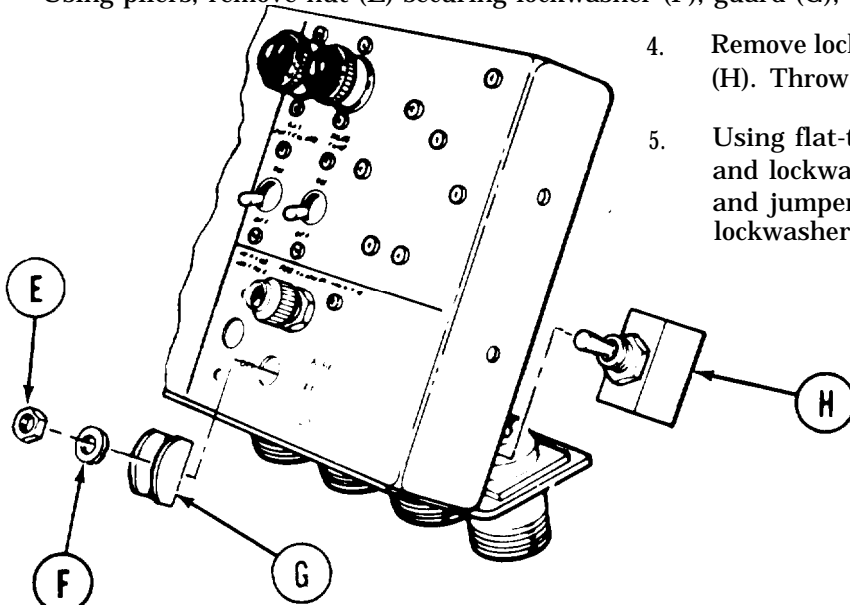
1. Using cross-tip screwdriver on screw (A) and wrench on nut (B), remove four screws (A), lockwashers (C), and nuts (B) securing connector (D) to panel. Throw lockwashers away.

2. Remove connector (D) from panel and position aside.



3. Using pliers, remove nut (E) securing lockwasher (F), guard (G), and switch (H) to panel.

4. Remove lockwasher (F), guard (G), and switch (H). Throw lockwasher away.
5. Using flat-tip screwdriver, remove five screws and lockwashers securing six electrical leads and jumper wire to switch (H). Throw lockwashers away.

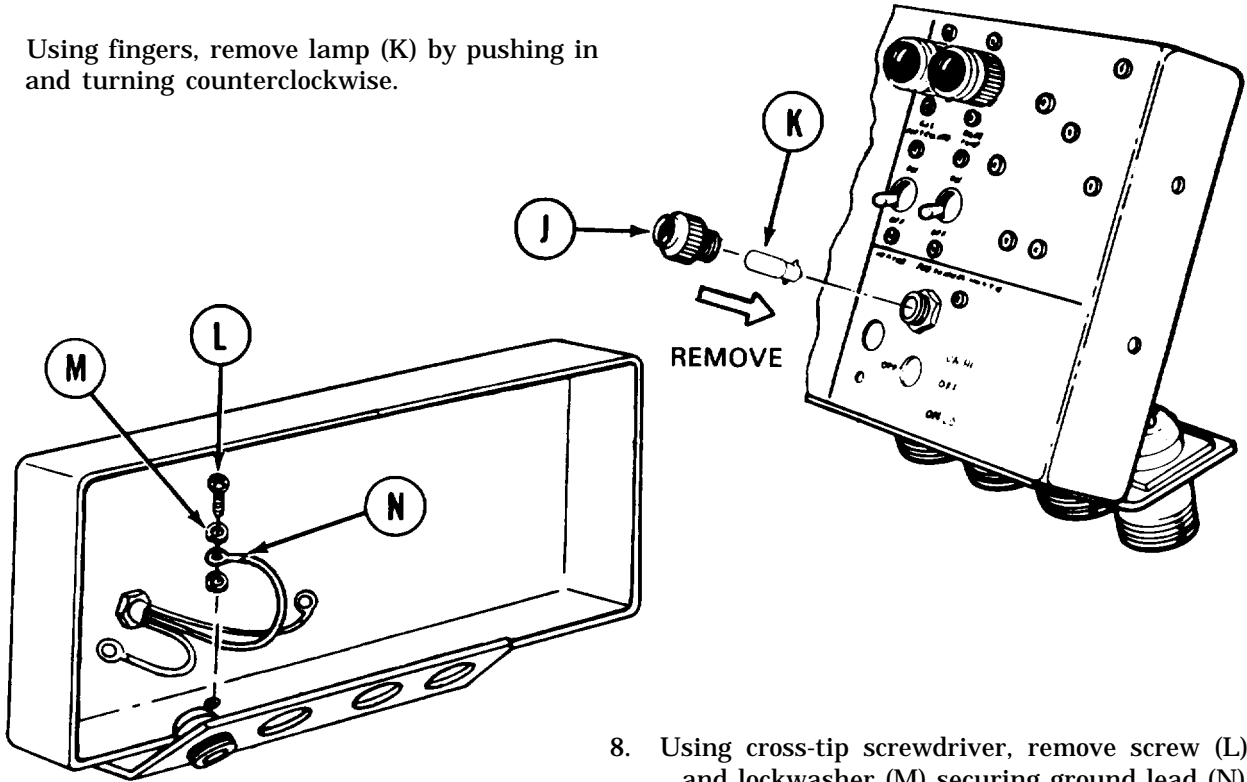


Go 0%0 Sheet 3

TA139648

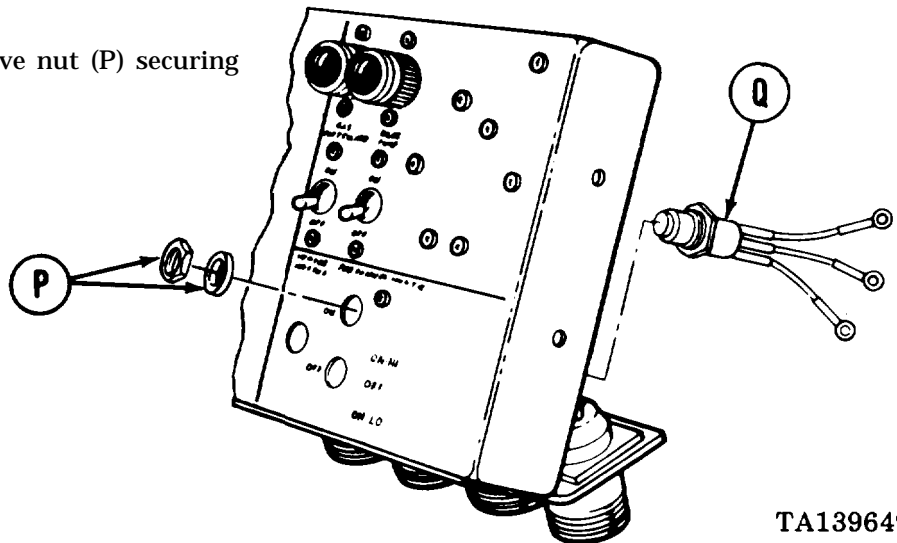
MASTER CONTROL PANEL REPAIR (Sheet 39 of 65)
Master Heater Circuit Breaker, Hi-Lo Switch, and Indicator Light
Replacement (Sheet 3 of 7)

6. Using fingers, remove lens (J) by turning counterclockwise.
7. Using fingers, remove lamp (K) by pushing in and turning counterclockwise.



8. Using cross-tip screwdriver, remove screw (L) and lockwasher (M) securing ground lead (N) to rear of panel. Throw lockwasher away.

9. Using 3/4 inch socket, remove nut (P) securing indicator light (Q) to panel.
10. Remove indicator light (Q).

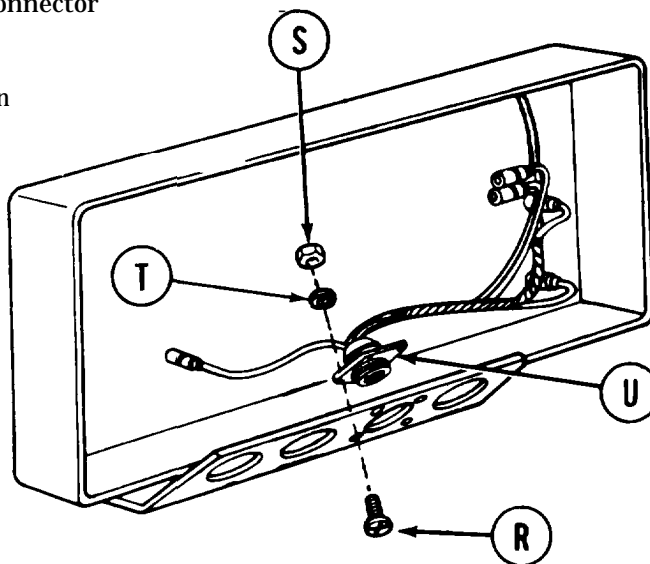


Go on to Sheet 4

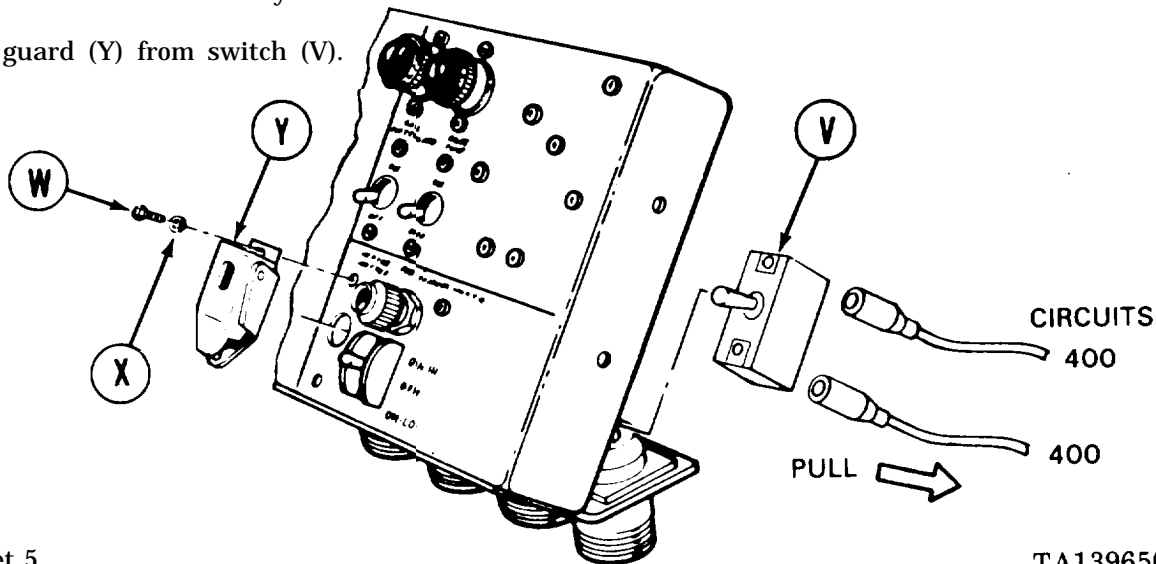
TA139649

MASTER CONTROL PANEL REPAIR (Sheet 40 of 65)
Master Heater Circuit Breaker, Hi-Lo Switch, and Indicator Light
Replacement (Sheet 4 of 7)

11. Using cross-tip screwdriver on screw (R) and wrench on nut (S), remove four screws (R), lockwashers (T), and nuts (S) securing connector (U) to panel. Throw lockwashers
12. Remove connector (U) from panel and position aside.



13. Using fingers, disconnect two circuit 400 leads from switch (V).
14. Using cross-tip screwdriver, remove two screws (W) and lockwashers (X) securing switch (V) to panel. Throw lockwashers away.
15. Remove guard (Y) from switch (V).



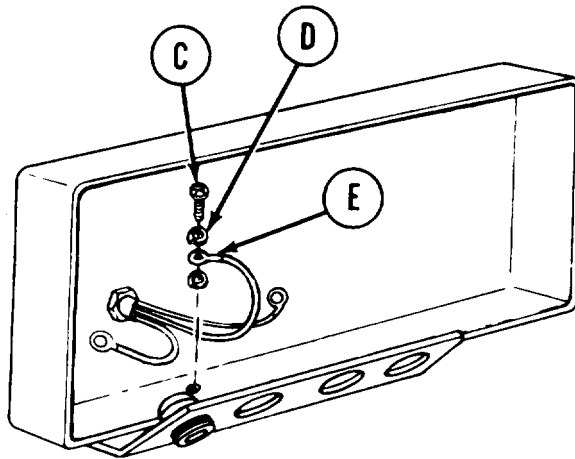
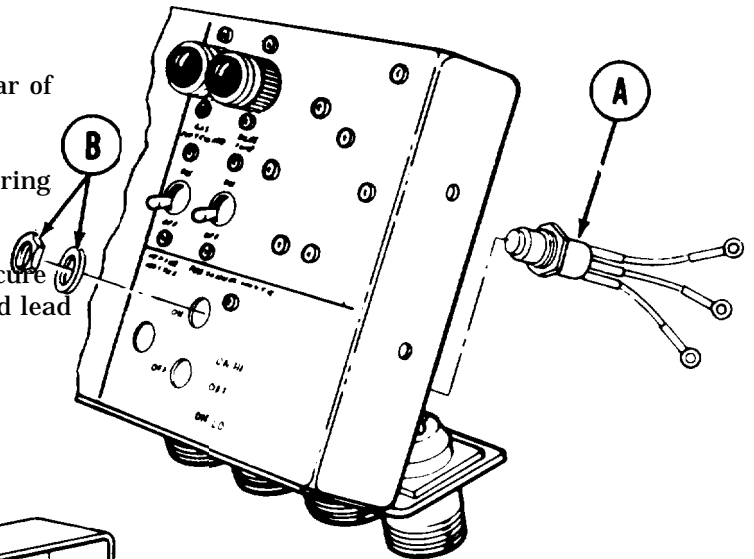
Go on to Sheet 5

TA139650

MASTER CONTROL PANEL REPAIR (Sheet 41 of 65)
Master Heater Circuit Breaker, Hi-Lo Switch, and Indicator Light
Replacement (Sheet 5 of 7)

INSTALLATION:

1. Place indicator light (A) in position on rear of panel.
2. Using 3/4 inch socket, install nut (B) securing indicator light (A) to panel.
3. Using cross-tip screwdriver, install and secure screw (C), new lockwashers (D), and ground lead (E) to panel.



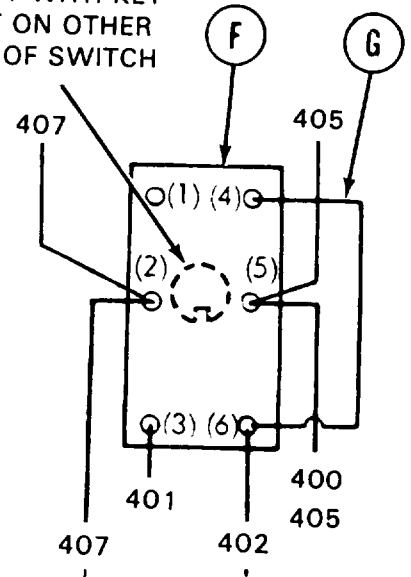
4. Using flat-tip screwdriver, remove screws and washers from terminals 2 through 6 of replacement hi-lo switch (F). Retain screws and washers for installation.
5. Position electrical leads and jumper wire (G) to switch (F) as shown,

NOTE

Electrical leads (circuits 407 and 405) are part of indicator light (A).

6. Using flat-tip screwdriver, secure leads to terminals with screws and washers removed in step 4.

SHAFT WITH KEY SLOT ON OTHER SIDE OF SWITCH

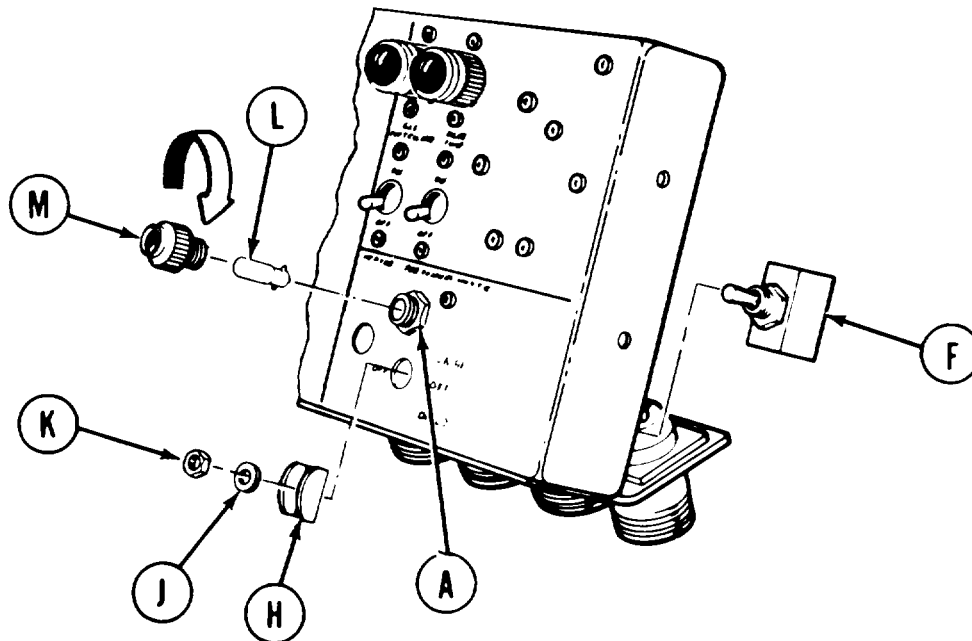


Go on to Sheet 6

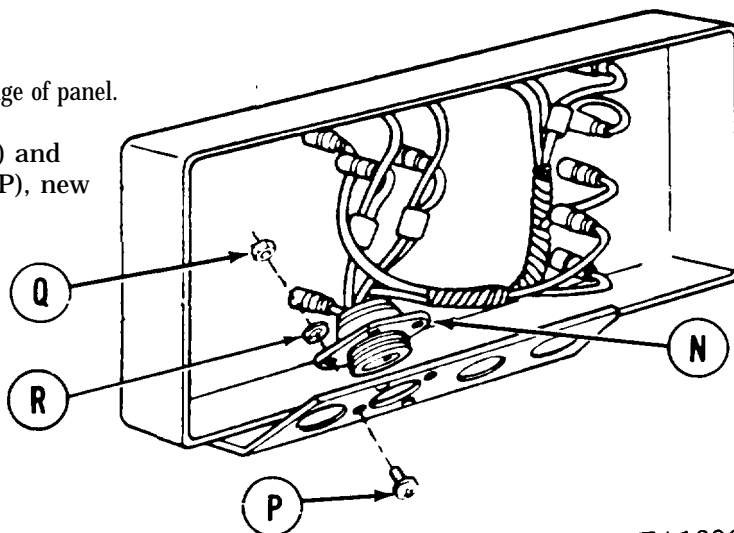
TA139651

MASTER CONTROL PANEL REPAIR (Sheet 42 of 65)
Master Heater Circuit Breaker, Hi-Lo Switch, and Indicator Light
Replacement (Sheet 6 of 7)

7. Place switch (F) in position on panel.
8. Place guard (H) and new lockwasher (J) on panel over switch (F).
9. Using pliers, install nut (K) securing lockwasher (J), guard (H) and switch (F) to panel.
10. Install lamp (L) in indicator light (A) by pushing in and turning clockwise.
11. Install lens (M) on indicator light (A).



12. Position connector (N) onto panel with key to edge of panel.
13. Using cross-tip screwdriver on screw (P) and wrench on nut (Q), install four screws (P), new lockwashers (R), & nuts (Q) to secure connector (N) to panel.

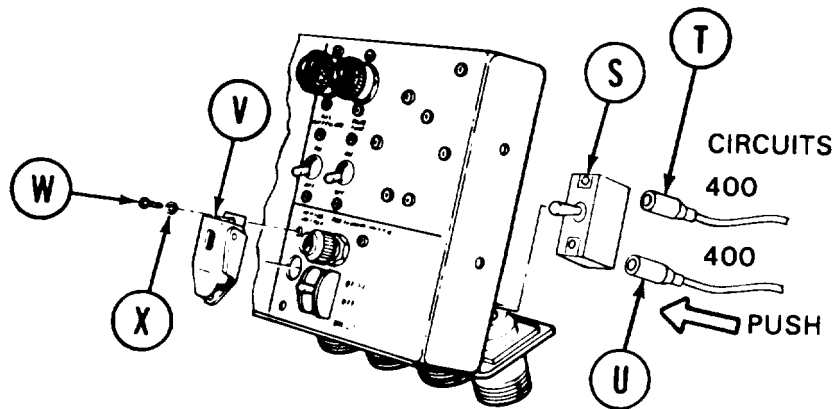


Go on to Sheet 7

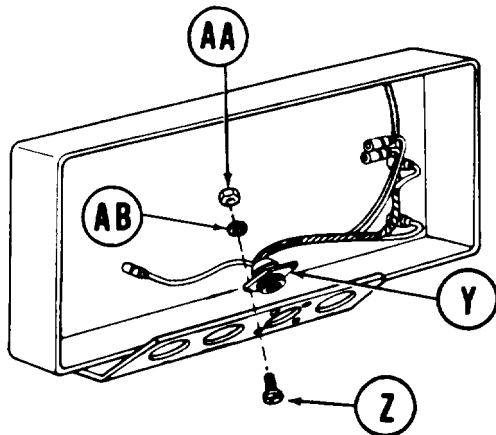
TA139652

MASTER CONTROL PANEL REPAIR (Sheet 43 of 65)
Master Heater Circuit Breaker, Hi-Lo Switch, and Indicator Light
Replacement (Sheet 7 of 7)

14. Apply silicone compound (Item 32, Appendix D) to two circuit 400 male electrical connectors.
15. Using multimeter, make sure switch (S) is in off position.
16. Using fingers, connect two connectors (T) and (U) to switch (S).
17. Place switch (S) and guard (V) in position on panel.



18. Using screwdriver, install two screws (W) and new lockwashers (X).



19. Position connector (Y) onto panel with key to edge of panel
20. Using screwdriver on screw (Z) and wrench on nut (AA), install four screws (Z), new lockwashers (AB), and nuts (AA) to secure connector (Y) to panel
21. Install panel in vehicle (page 10-50).

End of Task

TA139653

MASTER CONTROL PANEL REPAIR (Sheet 44 of 65)
Personnel Heater Wiring Harness Replacement (Sheet 1 of 5)

PROCEDURE INDEX

PROCEDURE	PAGE
Removal	10-98
Installation	10-101

TOOLS: Slip joint pliers
11/32 in. combination box and open end wrench
4 in. flat-tip screwdriver
4 in. cross-tip screwdriver

SUPPLIES: Silicone compound (Item 32, Appendix D)
Lockwasher (MS35338-57)
Lockwasher (MS35338-42) (8 required)

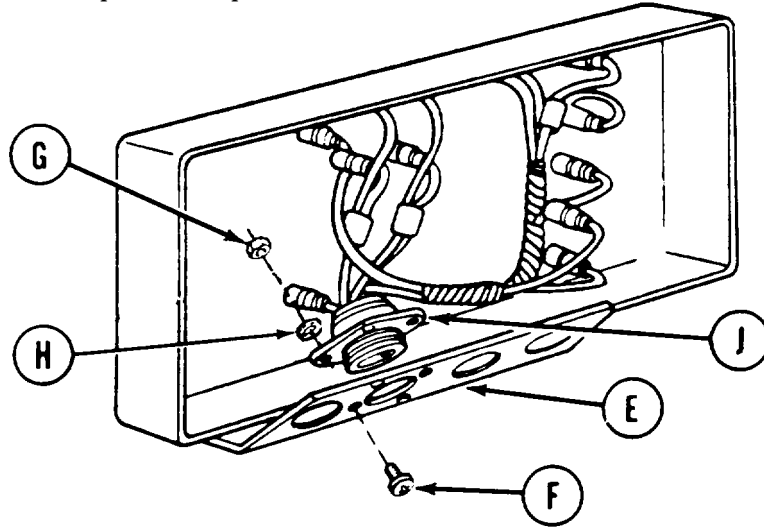
PRELIMINARY PROCEDURE: Remove panel from vehicle (page 10-48)

REMOVAL:

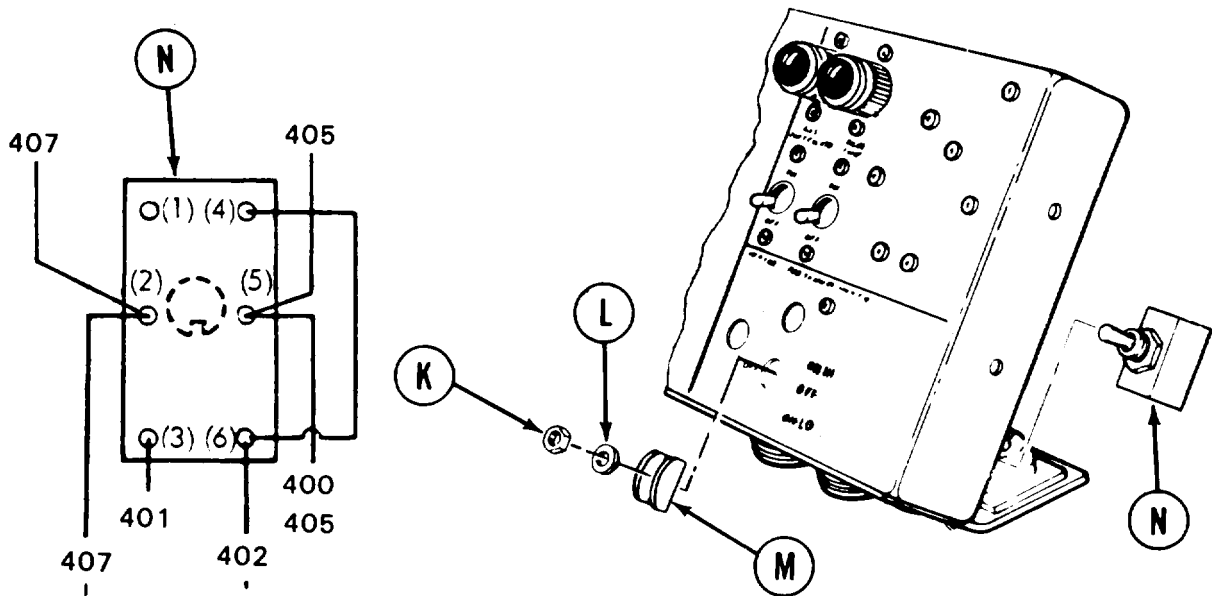
1. Using cross-tip screwdriver on screw (A) and wrench on nut (B), remove four screws (A), lockwashers (C), and nuts (B) securing connector (D) to panel (E). Throw lockwashers away.
2. Remove connector (D) from panel and position aside.

MASTER CONTROL PANEL REPAIR (Sheet 45 of 65)
Personnel Heater Wiring Harness Replacement (Sheet 2 of 5)

3. Using cross-tip screwdriver on screw (F) and wrench on nut (G), remove four screws (F), lockwashers (H), and nuts (G) securing connector (J) to panel (E). Throw lockwashers away.
4. Remove connector (J) from panel and position aside.



5. Using pliers, remove nut (K) and lockwasher (L) securing guard (M) and switch (N) to panel. Throw lockwasher away.
6. Remove guard (M) and switch (N).

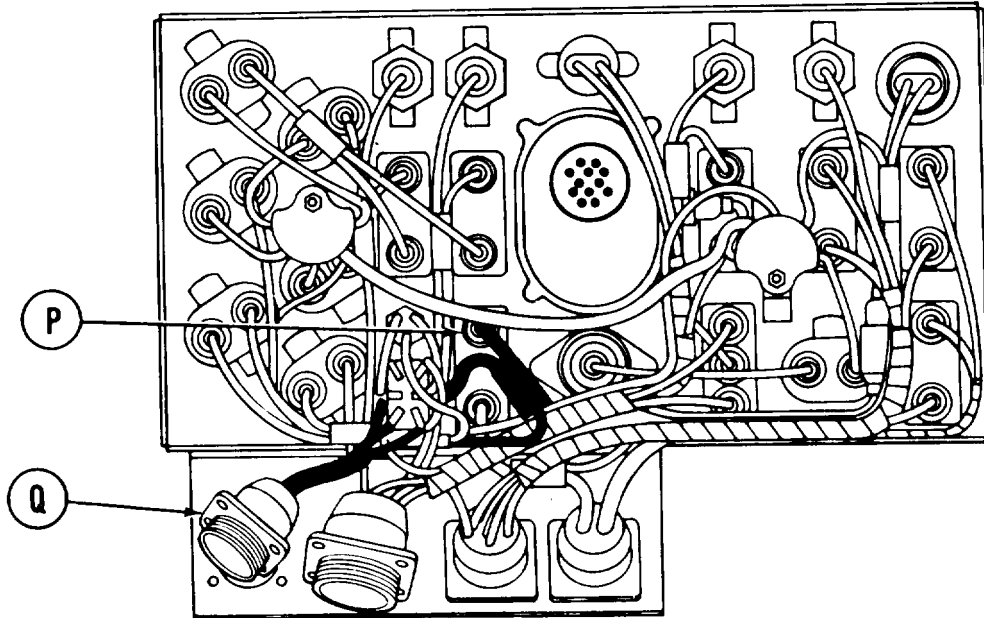


7. Using flat-tip screwdriver, remove screws and washers securing circuits 400/405, 405, 401, 402, and 407 to switch (N).

TA139655

MASTER CONTROL PANEL REPAIR (Sheet 46 of 65)
Personnel Heater Wiring Harness Replacement (Sheet 3 of 5)

8. Disconnect connector (P) to separate circuit 400
9. Remove harness assembly (Q).

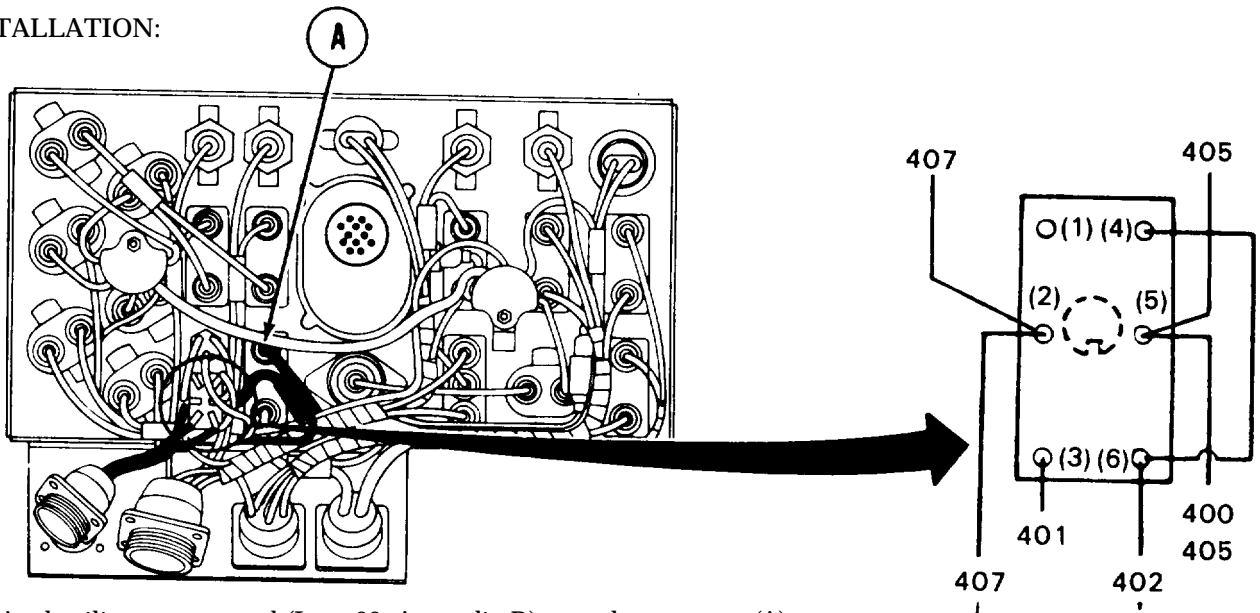


Go on to Sheet 4

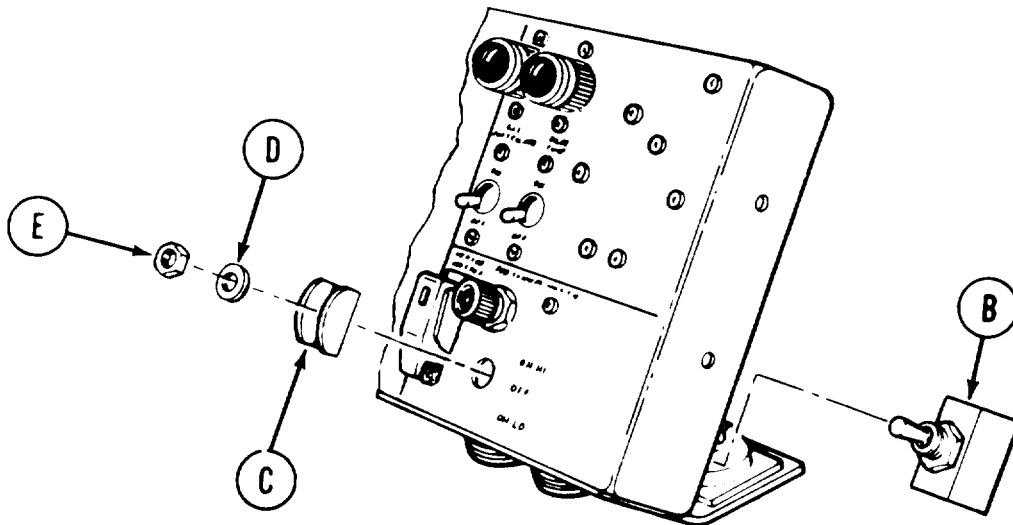
TA139656

MASTER CONTROL PANEL REPAIR (Sheet 47 of 65)
Personnel Heater Wiring Harness Replacement (Sheet 4 of 5)

INSTALLATION:



1. Apply silicone compound (Item 32, Appendix D) to male connector (A).
2. Connect connector (A) to join circuit 400.
3. Using flat-tip screwdriver, secure electrical leads (circuits 400/405, 405, 401, 402, and two 407) with screws and washers to their respective terminals of switch, as shown.
4. Place switch (B) in position on panel.
5. Place guard (C) and new lockwasher (D) over switch (B).
6. Using pliers, install nut (E) securing switch (B), guard (C), and new lockwasher (D) to panel.

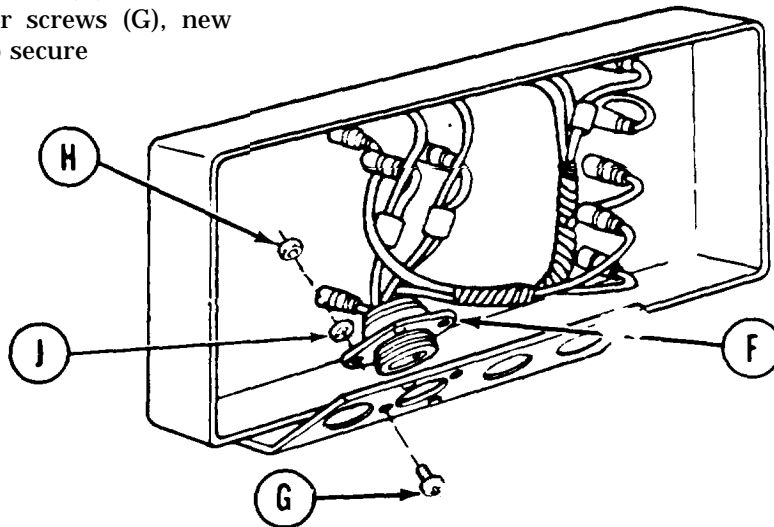


Go on to Sheet 5

TA139657

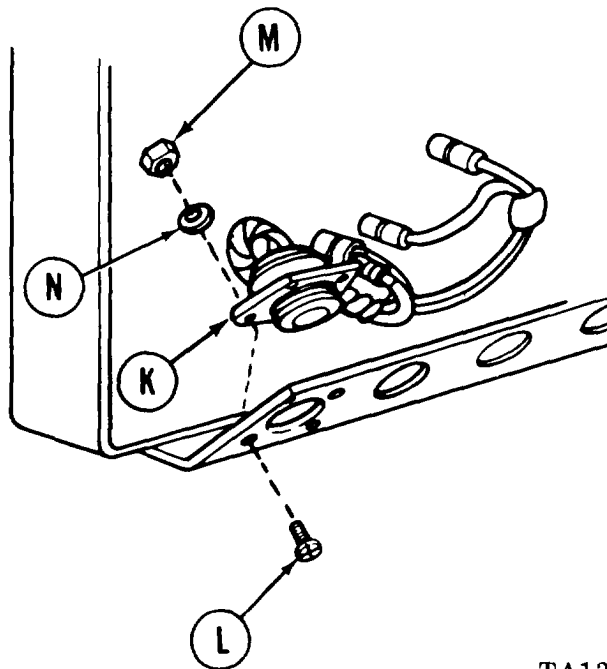
MASTER CONTROL PANEL REPAIR (Sheet 48 of 65)
Personnel Heater Wiring Harness Replacement (Sheet 5 of 5)

7. Position connector (F) onto panel with key to edge of panel.
8. Using cross-tip screwdriver on screw (G) and wrench on nut (H), install four screws (G), new lockwashers (J), and nuts (H) to secure connector (F) to panel.



9. Position connector (K) onto panel with key to edge of panel.
10. Using cross-tip screwdriver on screw (L) and wrench on nut (M), install four screws (L), new lockwashers (N), and nuts (M) to secure connector (K) to panel.

11. Install panel in vehicle (page 10-50),



End of Task

TA139658

MASTER CONTROL PANEL REPAIR (Sheet 49 of 65)
 Accessories Wiring Harness Replacement (Sheet 1 of 4)

PROCEDURE INDEX

PROCEDURE	PAGE
Removal	10-103
Installation	10-105

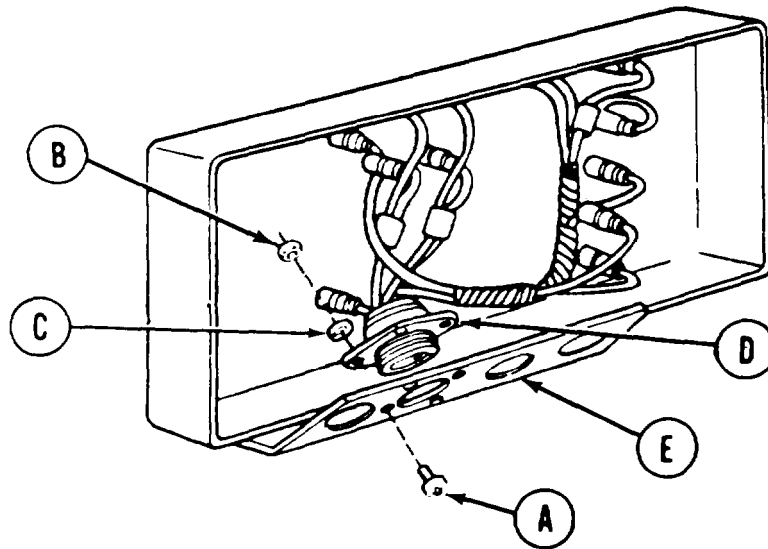
TOOLS: 6 in. cross-tip screwdriver
 11/32 in. combination box and open end wrench

SUPPLIES: Silicone compound (Item 32, Appendix D)
 Lockwasher (MS35338-40) (4 required)

PRELIMINARY PROCEDURE: Remove panel from vehicle (page 10-48)

REMOVAL:

- Using cross-tip screwdriver on screw (A) and wrench on nut (B), remove four screws (A), lockwashers (C), and nuts (B) securing connector (D) to panel (E). Throw lockwashers away.
- Remove connector (D) from panel and position aside.

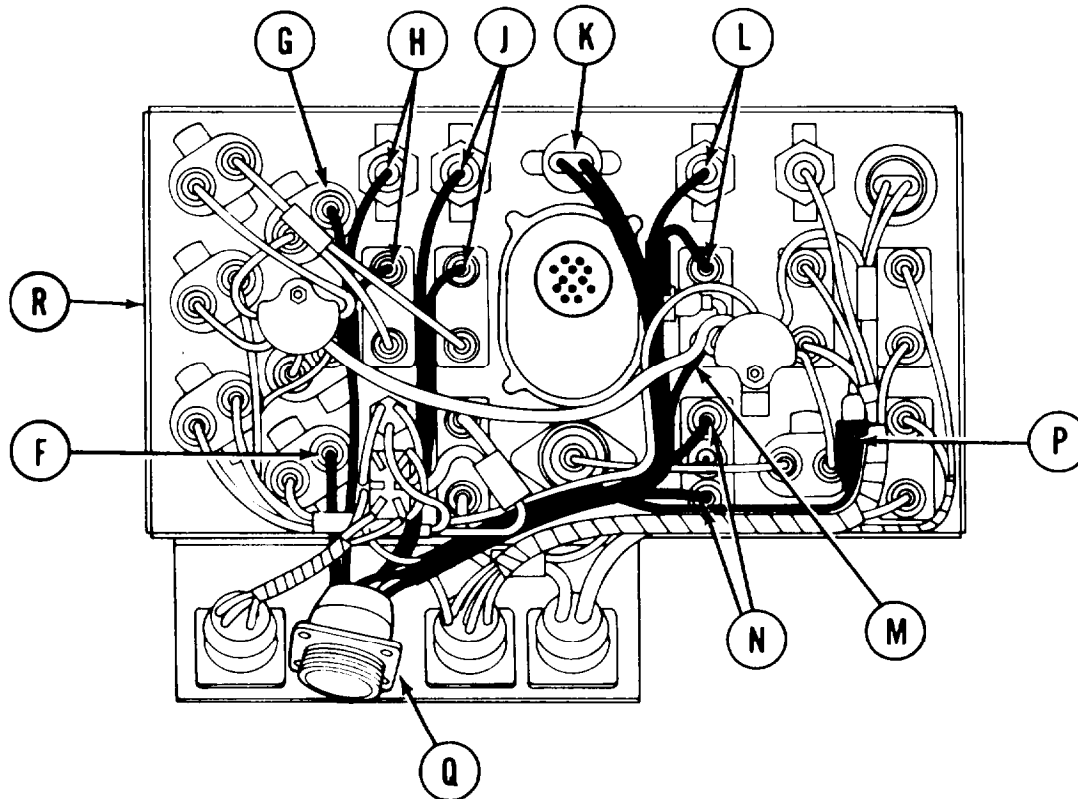


Go on to Sheet 2

TA139659

MASTER CONTROL PANEL REPAIR (Sheet 50 of 65)
Accessories Wiring Harness Replacement (Sheet 2 of 4)

3. Remove lead (circuit 27) from gage circuit breaker (F).
4. Remove lead (circuit 38/516) from IR power circuit breaker (G).
5. Remove two leads (circuit 451) from bilge pump switch and bilge pump indicator light (H).
6. Remove two leads (circuit 415) from gas particulate switch and gas particulate indicator light (J).



7. Remove two leads (circuit 519) from hi-beam indicator light (K).
8. Remove two leads (circuit 516) from IR power switch and indicator light (L).
9. Remove lead (circuit 516) from IR power switch (M).
10. Remove two leads (circuits 19 and 514/515) from blackout selector switch (N).
11. Disconnect electrical connector (circuit 14) (P) by pulling apart.
12. Remove harness assembly (Q) from control panel (R).

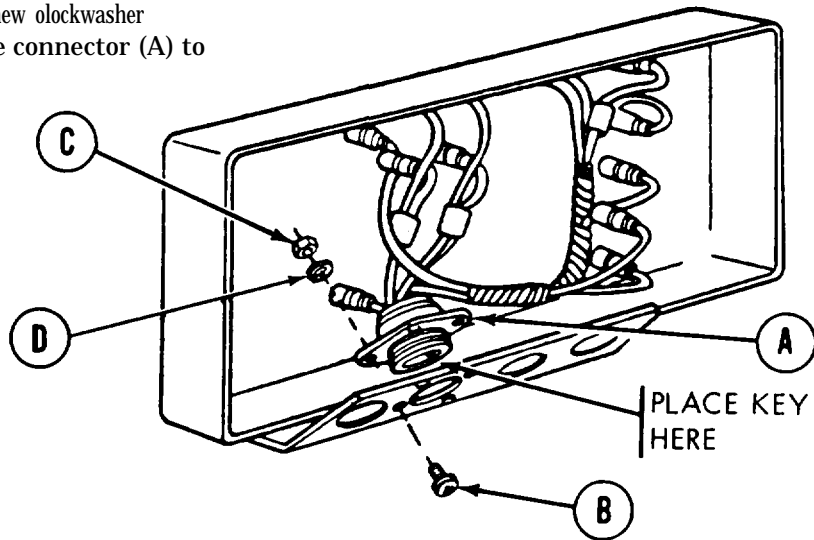
Go on to Sheet 3

TA139660

MASTER CONTROL PANEL REPAIR (Sheet 51 of 65)
Accessories Wiring Harness Replacement (Sheet 3 of 4)

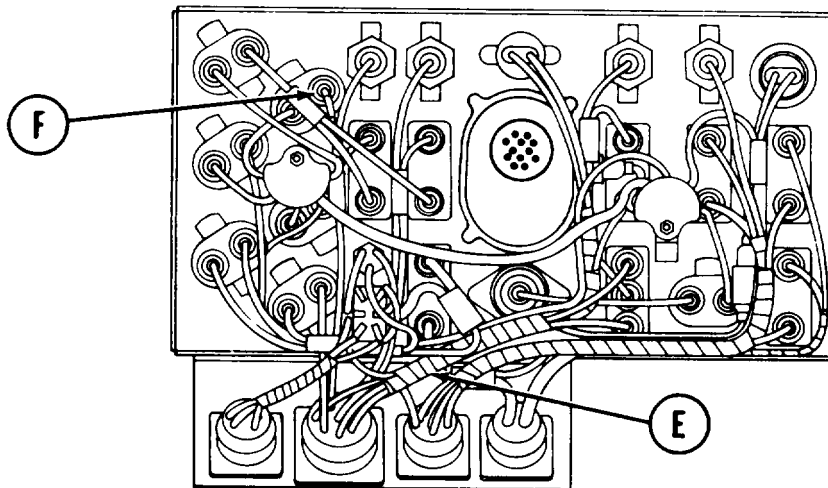
INSTALLATION:

1. Position connector (A) onto panel with key to edge of panel.
2. Using screwdriver on screw (B) and wrench on nut (C), install four screws (B), new olockwasher (D), and nuts (C) to secure connector (A) to panel.



3. Apply silicone compound (Item 32, Appendix D) to all male electrical connectors of wiring harness (E).

38/516) to IR power circuit breaker (F).

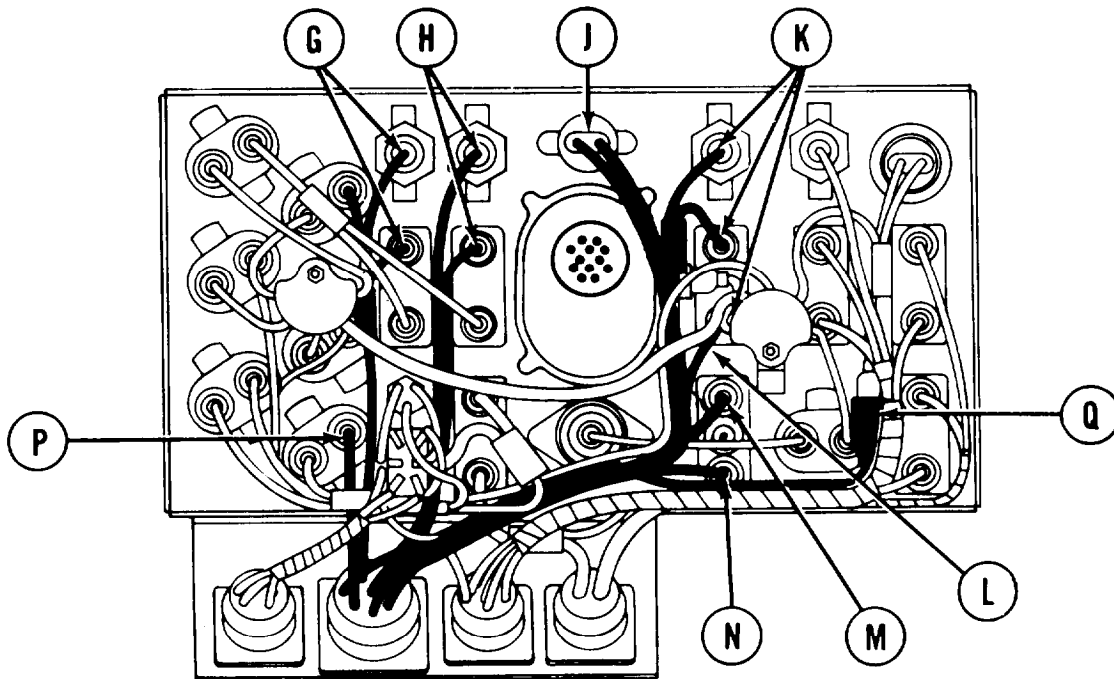


Go on to Sheet 4

TA139661

MASTER CONTROL PANEL REPAIR (Sheet 52 of 65)
Accessories Wiring Harness Replacement (Sheet 4 of 4)

5. Connect two leads (circuit 451) to bilge pump switch and indicator light (G).
6. Connect two leads (circuit 415) to gas particulate switch and indicator light (H).
7. Connect two leads (circuits 519) to hi-beam indicator light (J).
8. Connect two leads (K) (circuit 516) to IR power switch and indicator lights.
9. Connect lead (L) (circuit 516A) to IR power switch.



10. Connect lead (M) (circuit 19) to blackout selector switch.
11. Connect lead (N) (circuit 514/515) to blackout selector switch.
12. Connect lead (P) (circuit 27) to gage circuit breaker .
13. Connect electrical connector (circuit 14) (Q) by pushing together.
14. Install panel in vehicle (page 10-50).

End of Task

TA139662

MASTER CONTROL PANEL REPAIR (Sheet 53 of 65)
Master Battery Wiring Harness Replacement (Sheet 1 of 4)

PROCEDURE INDEX

PROCEDURE	PAGE
Removal	10-107
Installation	10-109

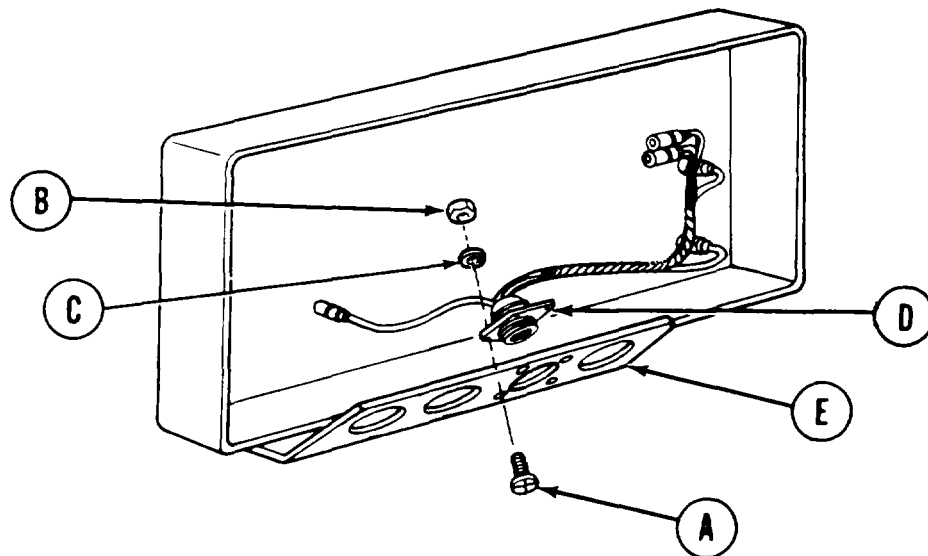
TOOLS: 6 in. cross-tip screwdriver
 11/32 in. combination box and open end wrench

SUPPLIES: Silicone compound (Item 32, Appendix D)
 Lockwashers (MS35338-42) (4 required)

PRELIMINARY PROCEDURE: Remove panel from vehicle (page 10-48)

REMOVAL

- Using screwdriver on screw (A) and wrench on nut (B), remove four screws (A), lockwashers (C), and nuts (B) securing connector (D) to panel (E). Throw lockwashers away.
- Remove connector (D) from panel and position aside.

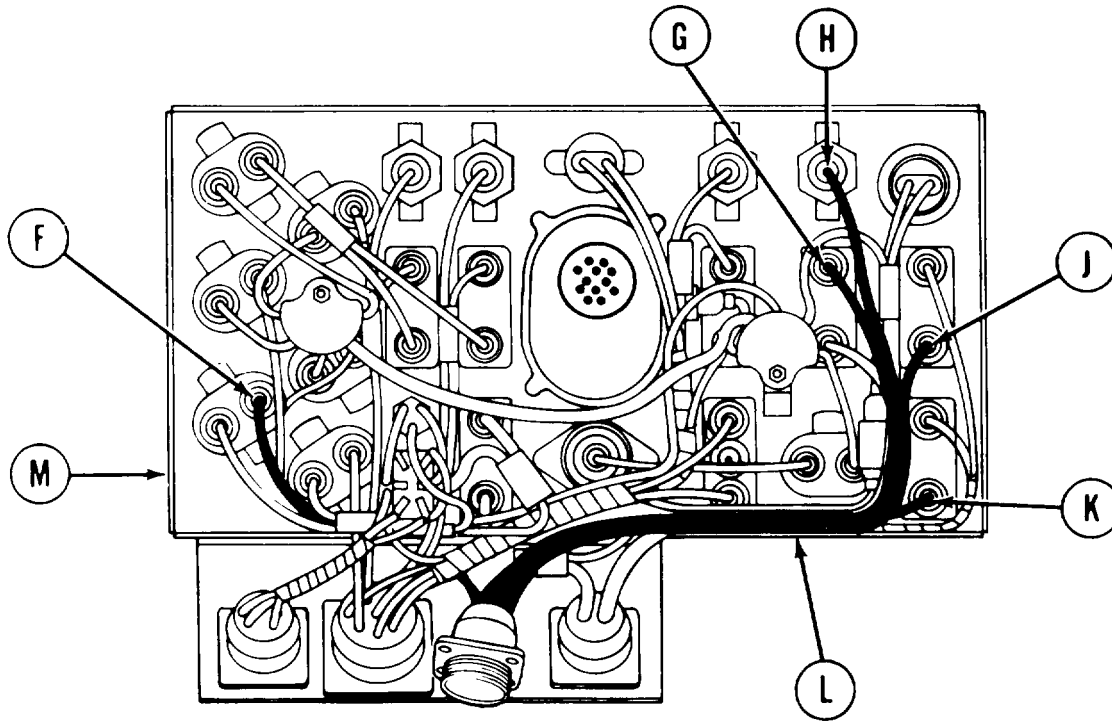


Go on to Sheet 2

TA139663

MASTER CONTROL PANEL REPAIR (Sheet 54 of 65)
Master Battery Wiring Harness Replacement (Sheet 2 of 4)

3. Remove lead (circuit 486) from manifold preheat circuit breaker (F).
4. Remove lead (circuit 459A) from master battery switch (G).
5. Remove lead (circuit 459A) from master battery indicator light (H).



6. Remove lead (54A) from fuel shutoff switch (J).
7. Remove lead (circuit 76) from fuel pump switch (K).
8. Remove wiring harness (L) from panel (M).

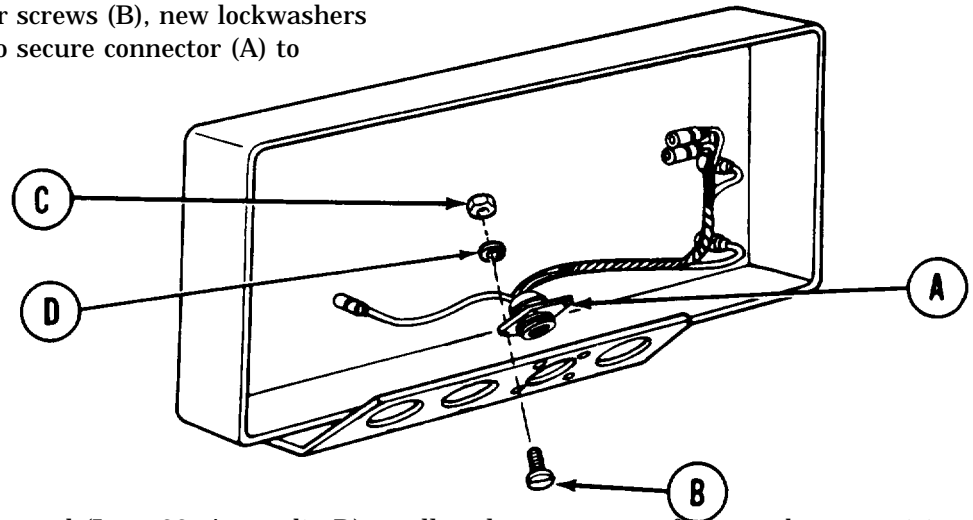
Go on to Sheet 3

TA139664

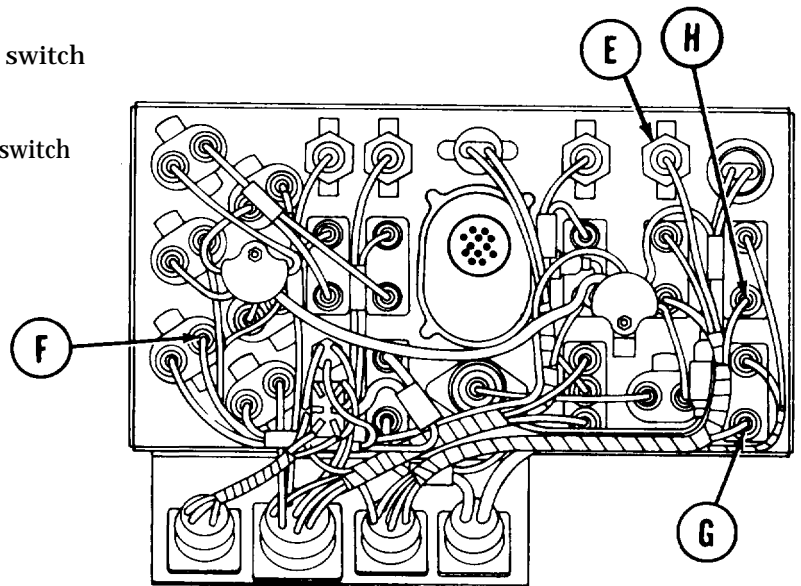
MASTER CONTROL PANEL REPAIR (Sheet 55 of 65)
Master Battery Wiring Harness Replacement (Sheet 3 of 4)

INSTALLATION:

1. Position connector (A) onto panel with key to edge of panel.
2. Using screwdriver on screw (B) and wrench on nut (C), install four screws (B), new lockwashers (D), end nuts (C) to secure connector (A) to



3. Apply silicone compound (Item 32, Appendix D) to all male connectors of master battery wiring harness and connector on master battery indicator light (E).
4. Connect lead (circuit 486) to manifold preheat circuit breaker (F).
5. Connect lead (circuit 76) to fuel pump switch (G).
6. Connect lead (circuit 54A) to fuel shutoff switch (H).

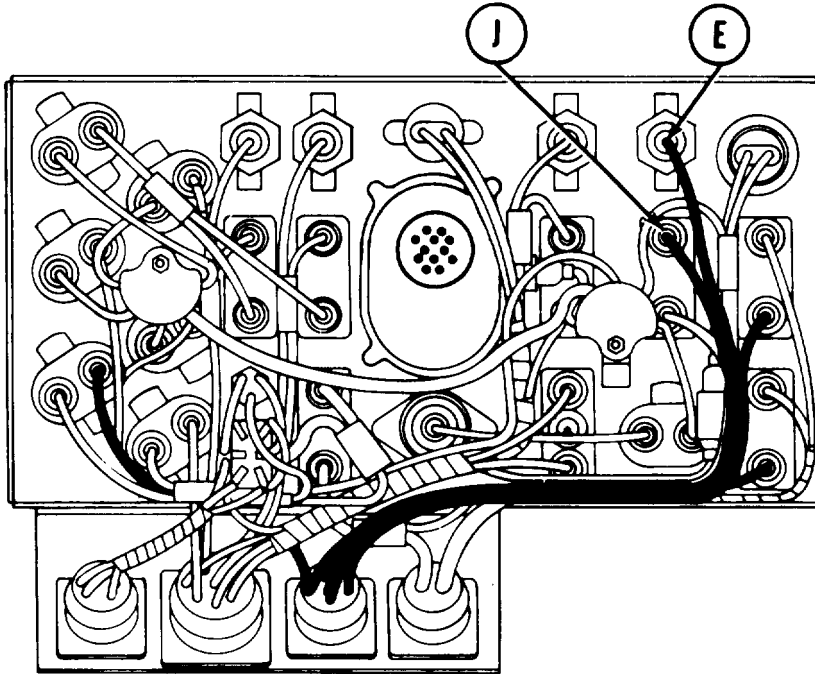


Go on to Sheet 4

TA139665

MASTER CONTROL PANEL REPAIR (Sheet 56 of 65)
Master Battery Wiring Harness Replacement (Sheet 4 of 4)

7. Connect lead (circuit 459) to master battery switch (J).
8. Connect lead (circuit 459A) to master battery indicator light (E).



9. Install panel in vehicle (page 10-50).

End of Task

TA13966

MASTER CONTROL PANEL REPAIR (Sheet 57 of 65)
Master Control Panel Wiring Harness Replacement (Sheet 1 of 5)

PROCEDURE INDEX

PROCEDURE	PAGE
Removal	10-111
Installation	10-114

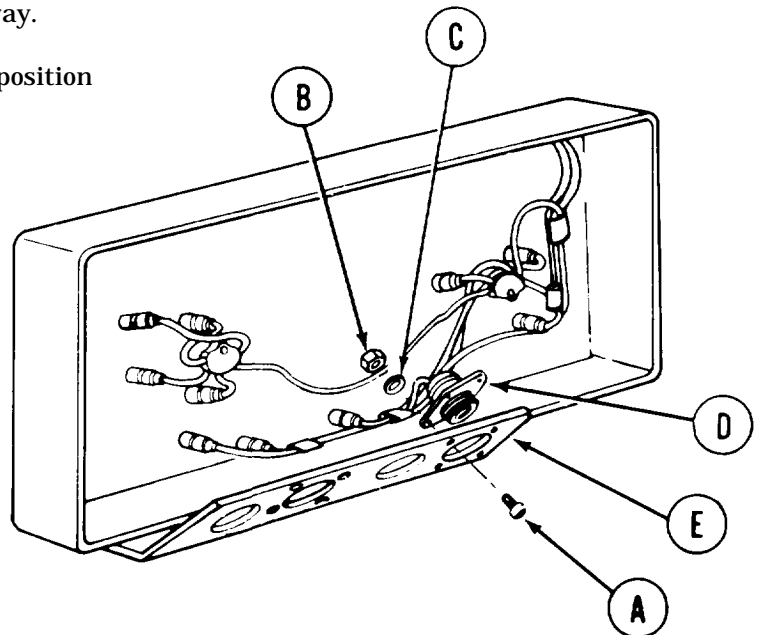
TOOLS: 3/8 in. combination box and open end wrench
 6 in. cross-tip screwdriver
 3/8 in. socket with 1/2 in. drive
 Ratchet with 1/2 in. drive
 11/32 in. combination box and open end wrench
 5/16 in. combination box and open end wrench

SUPPLIES: Silicone compound (Item 32, Appendix D)
 Lockwasher (MS35338-43) (2 required)
 Lockwasher (MS35338-42) (4 required)

PRELIMINARY PROCEDURE: Remove panel from vehicle (page 10-48)

REMOVAL:

- Using screwdriver on screw (A) and 11/32 inch wrench on nut (B), remove four screws (A), lockwashers (C), and nuts (B) securing connector (D) to panel (E). Throw lockwashers away.
- Remove connector (D) from panel and position aside.



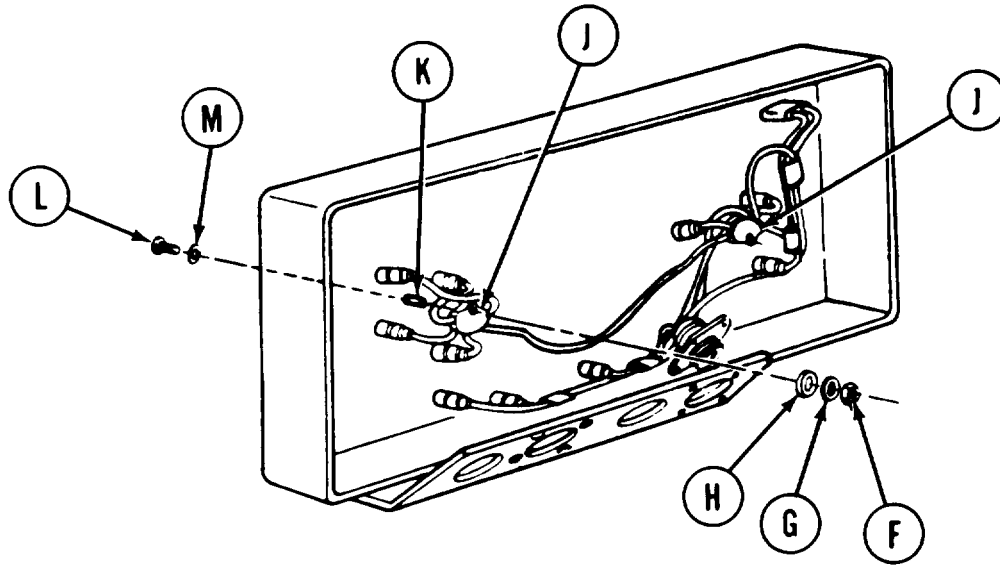
Go on to Sheet 2

TA139667

MASTER CONTROL PANEL REPAIR (Sheet 58 of 65)

Master Control Panel Wiring Harness Replacement (Sheet 2 of 5)

- Using socket, remove two nuts (F), lockwashers (G), and flat washers (H) securing two harness junctions (J) to panel]. Throw lockwashers away.



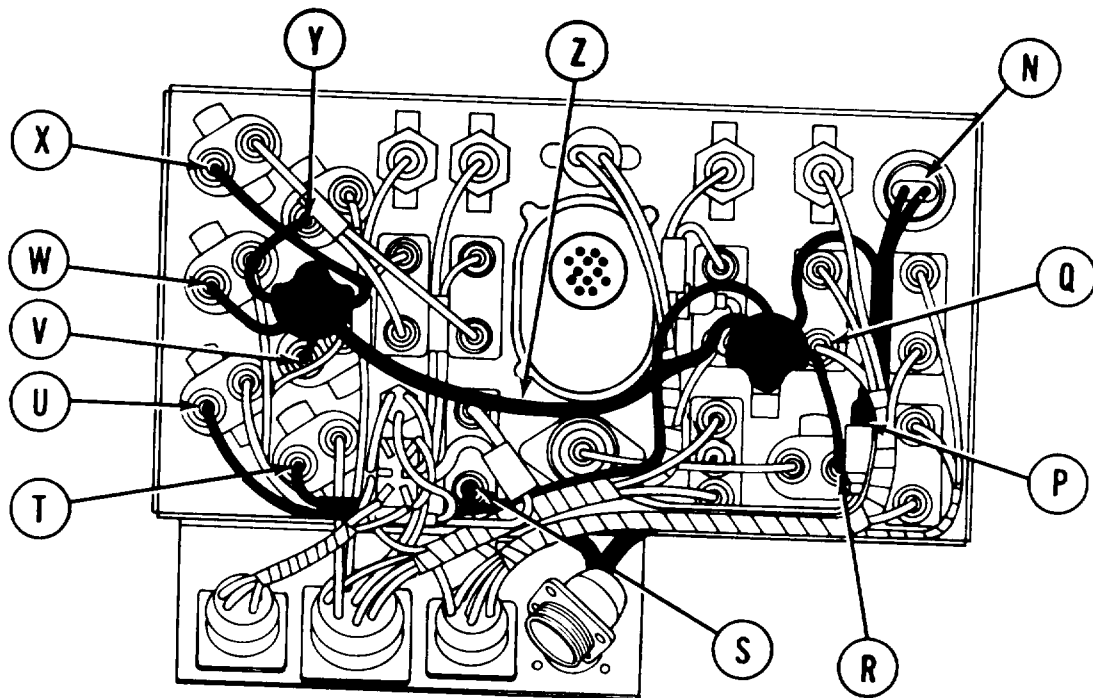
- Inspect stud (K) for stripped or damaged threads. If any defects are found, replace.
- If necessary to replace stud (K), use 5/16 inch wrench on screw (L) and 3/8 inch wrench on stud (K) and replace stud (K), washer (M), and/or screw (L).

Go on to Sheet 3

TA139668

MASTER CONTROL PANEL REPAIR (Sheet 59 of 65)
Master Control Panel Wiring Harness Replacement (Sheet 3 of 5)

6. Disconnect electrical connector (circuit 14) from starter switch (N).
7. Disconnect electrical connector (circuit 14) (P) by pulling apart.
8. Remove lead (circuit 459) from master battery switch (Q).
9. Remove lead (circuit 37) from utility outlet circuit breaker (R).
10. Remove lead (circuit 400) from master heater switch (S).
11. Remove lead (circuit 27) from gage circuit breaker (T).



12. Remove lead (circuit 486) from manifold preheat circuit breaker (U).
13. Remove lead (circuit 76A) from fuel pump circuit breaker (V).
14. Remove lead (circuit 54) from fuel shutoff circuit breaker (W).
15. Remove leads (circuit 54) from bilge pump and gas particulate circuit breaker (X).
16. Remove lead (circuit 38/516A) from IR power circuit breaker (Y).
17. Remove wiring harness (Z).

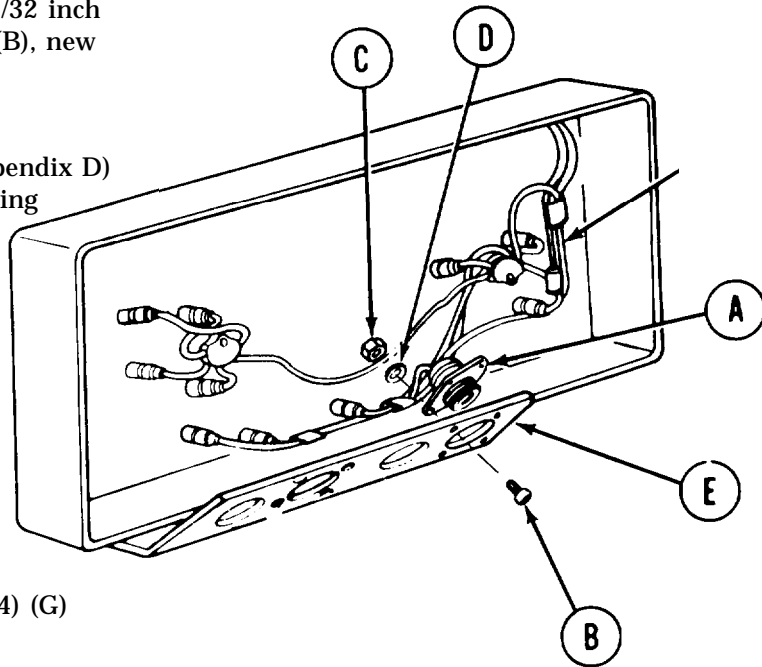
Go on to Sheet 4

TA139669

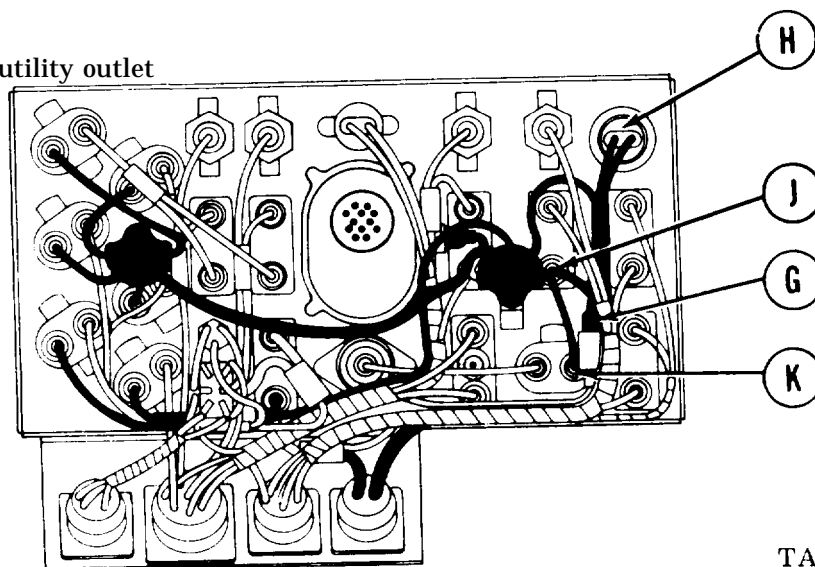
MASTER CONTROL PANEL REPAIR (Sheet 60 of 65)
Master Control Panel Wiring Harness Replacement (Sheet 4 of 5)

INSTALLATION:

1. Position connector (A) onto panel with key to edge of panel.
2. Using screwdriver on screw (B) and 11/32 inch wrench on nut (C), install four screws (B), new lockwashers (D), and nuts (C) to secure connector (A) to panel (E).
3. Apply silicone compound (Item 32, Appendix D) to all male electrical connectors of wiring harness (F).



4. Connect electrical connector (circuit 14) (G) by pushing together.
5. Connect electrical connector (circuit 14) to starter switch (H).
6. Connect lead (circuit 459) to master battery switch (J).
7. Connect lead (circuit 37) to utility outlet circuit breaker (K).

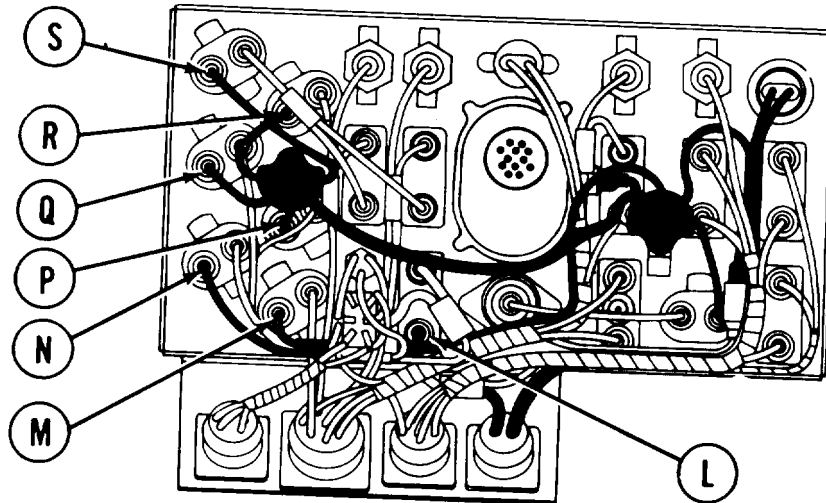


Go on to Sheet 5

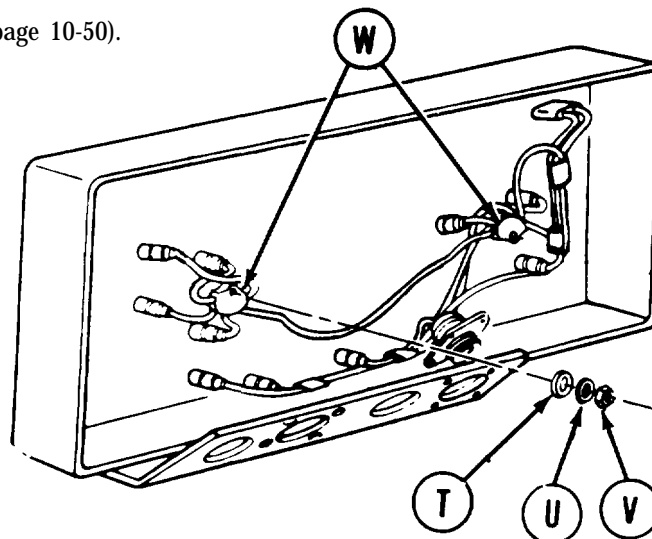
TA139670

MASTER CONTROL PANEL REPAIR (Sheet 61 of 65)
Master Control Panel Wiring Harness Replacement (Sheet 5 of 5)

8. Connect lead (circuit 400) to master heater switch (L).
9. Connect lead (circuit 27) to gage circuit breaker (M).
10. Connect lead (circuit 486) to manifold preheat circuit breaker (N).
11. Connect lead (circuit 76A) to fuel pump circuit breaker (P).



12. Connect lead (circuit 54) to fuel shutoff circuit breaker (Q).
13. Connect lead (circuit 38/516A) to IR power circuit breaker (R).
14. Connect leads (circuit 920) to bilge pump and gas particulate circuit breaker (S).
15. Using socket, install two flat washers (T), new lockwashers (U), and nuts (V) securing two harness junctions (W) to panel.
16. Install panel in vehicle (page 10-50).



End of Task

TA139671

MASTER CONTROL PANEL REPAIR (Sheet 62 of 65)

Bilge Pump/Gas Particulate Switch Cable Assembly Replacement (Sheet 1 of 2)

PROCEDURE INDEX

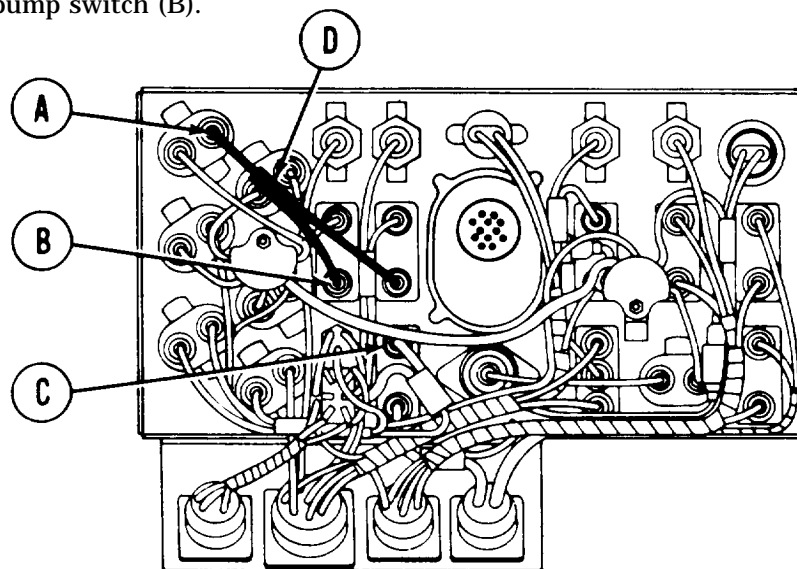
PROCEDURE	PAGE
Removal	10-116
Installation	10-117

SUPPLIES: Silicone compound (Item 32, Appendix D)

PRELIMINARY PROCEDURE: Remove panel from vehicle (page 10-48)

REMOVAL:

1. Remove lead from bilge pump and gas particulate circuit breaker (A).
2. Remove lead from bilge pump switch (B).



3. Remove lead from gas particulate switch (C).
4. Remove cable assembly (D).

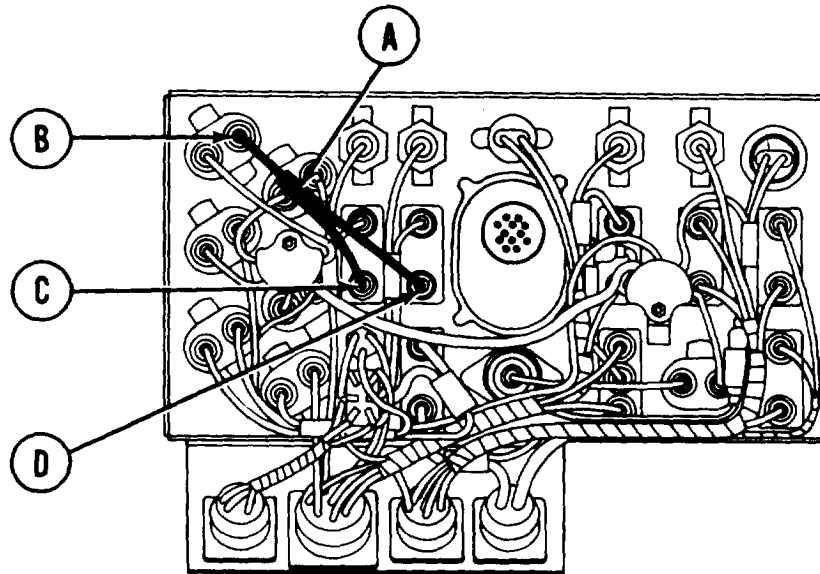
Go on to Sheet 2

TA139672

MASTER CONTROL PANEL REPAIR (Sheet 63 of 65)
Bilge Pump/Gas Particulate Switch Cable Assembly Replacement (Sheet 2 of 2)

INSTALLATION:

1. Apply silicone compound (Item 32, Appendix D) to three end connectors on cable (A).
2. Connect lead to bilge pump and gas particulate circuit breaker (B).
3. Connect lead to bilge pump switch (C).
4. Connect lead to gas particulate switch (D).



5. Install panel in vehicle (page 10-50).

End of Task

TA139673

MASTER CONTROL PANEL REPAIR (Sheet 64 of 65)
 Fuel Shutoff/Fuel Pump Wiring Harness Replacement (Sheet 1 of 2)

PROCEDURE INDEX

PROCEDURE	PAGE
Removal	10-118
Installation	10-119

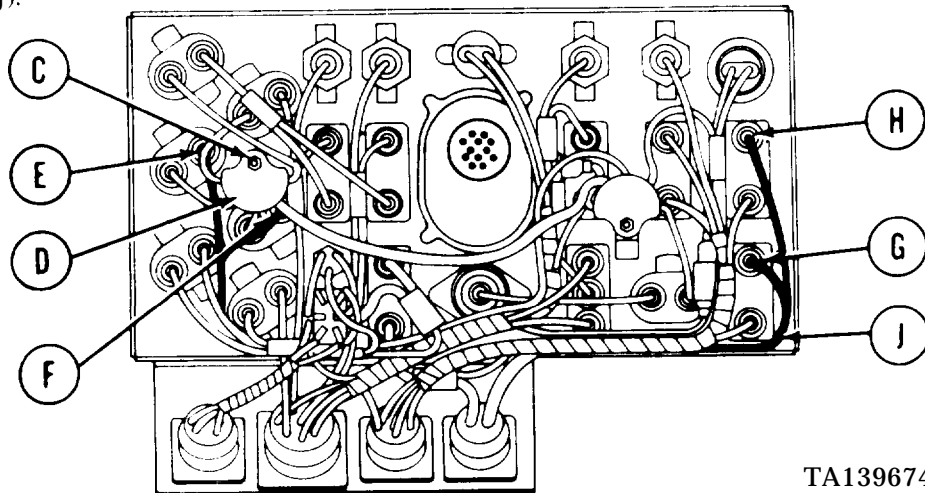
TOOLS: Ratchet with 1/2 in. drive
 3/8 in. socket with 1/2 in. drive

SUPPLIES: Silicone compound (Item 32, Appendix D)
 Lockwasher (MS35338-43)

PRELIMINARY PROCEDURE: Remove panel from vehicle (page 10-48)

REMOVAL:

- Using socket, remove nut (A), lockwasher (B), and flat washer (C) securing harness junction (D) to panel. Throw lockwasher away.
- Remove harness junction (D) and position aside.
- Remove circuit 54 connector from fuel shutoff circuit breaker (E).
- Remove circuit 76 connector from fuel pump circuit breaker (F).
- Disconnect circuit 76 connector from fuel pump switch (G).
- Remove circuit 54 connector fuel shutoff switch (H).
- Remove wiring harness (J).



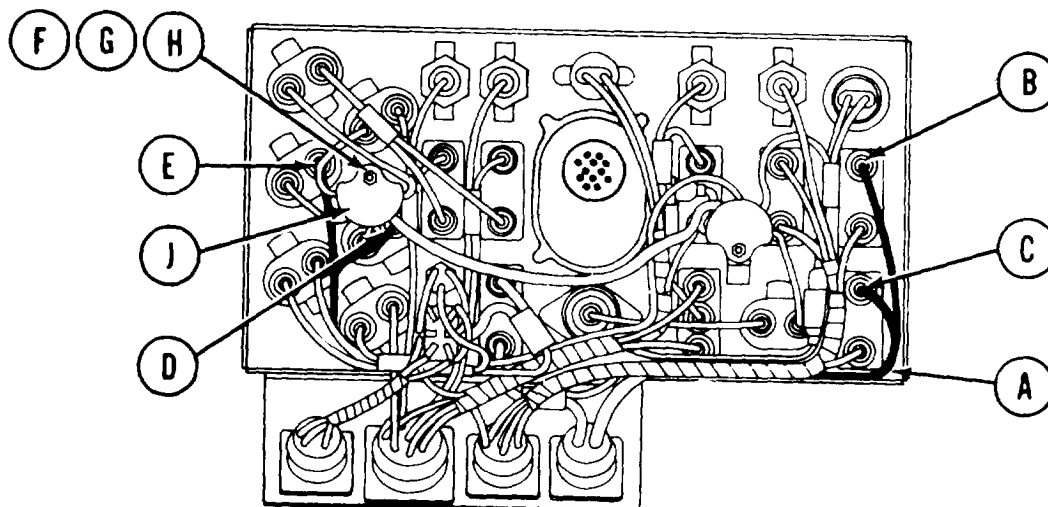
Go on to Sheet 2

TA139674

MASTER CONTROL PANEL REPAIR (Sheet 65 of 65)
Fuel Shutoff/Fuel Pump Wiring Harness Replacement (Sheet 2 of 2)

INSTALLATION:

1. Place wiring harness (A) in position in master control panel.
2. Apply silicone compound (Item 32, Appendix D) to four electrical connectors of wiring harness (A).
3. Connect circuit 54 connector to fuel shutoff switch (B).
4. Connect circuit 76 connector to fuel pump switch (C).
5. Connect circuit 76 connector to fuel pump circuit breaker (D).
6. Connect circuit 54 connector to fuel shutoff circuit breaker (E).



7. Using socket, install flat washer (F), new lockwasher (G), and nut (H) securing harness junction (J) to panel.
8. Install panel in vehicle (page 10-50).

End of Task

TA139675

INDICATOR LIGHT BASE ASSEMBLY REPAIR (Sheet 1 of 1)

TOOLS: 1 in. combination box and open end wrench

REFERENCE: TM 9-2350-222-10

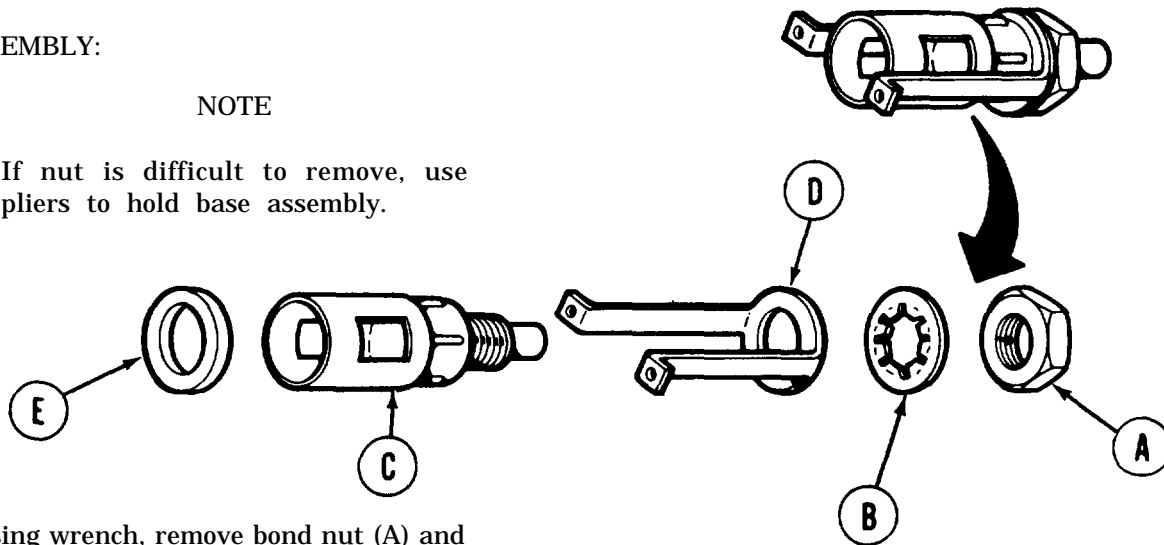
SUPPLIES: Lockwasher (7358624)

PRELIMINARY PROCEDURE: Remove base assembly from master control panel (page 10-52)

DISASSEMBLY:

NOTE

If nut is difficult to remove, use pliers to hold base assembly.



1. Using wrench, remove bond nut (A) and lockwasher (B) from lampholder (C). Throw lockwasher away.
2. Remove retaining strap (D) and preformed packing (E) from lampholder (C).

CLEANING AND INSPECTION:

1. Clean all component parts as required.
2. Inspect base assembly for broken or damaged parts. Replace as required.

ASSEMBLY:

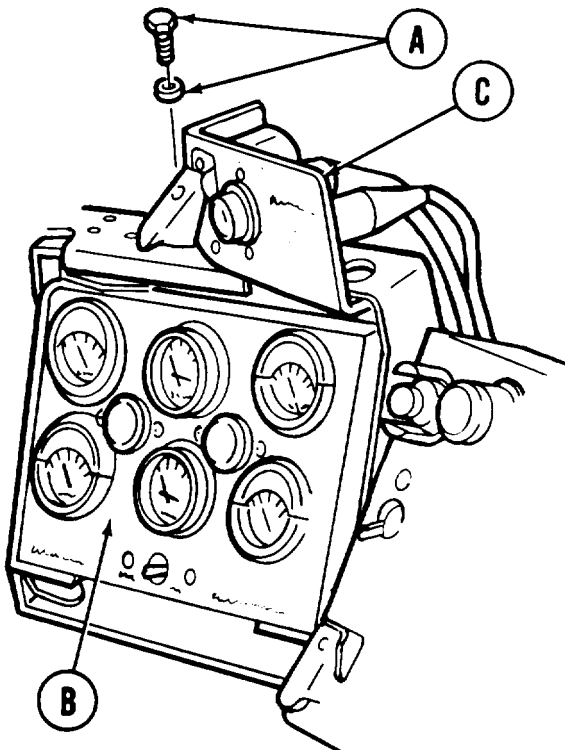
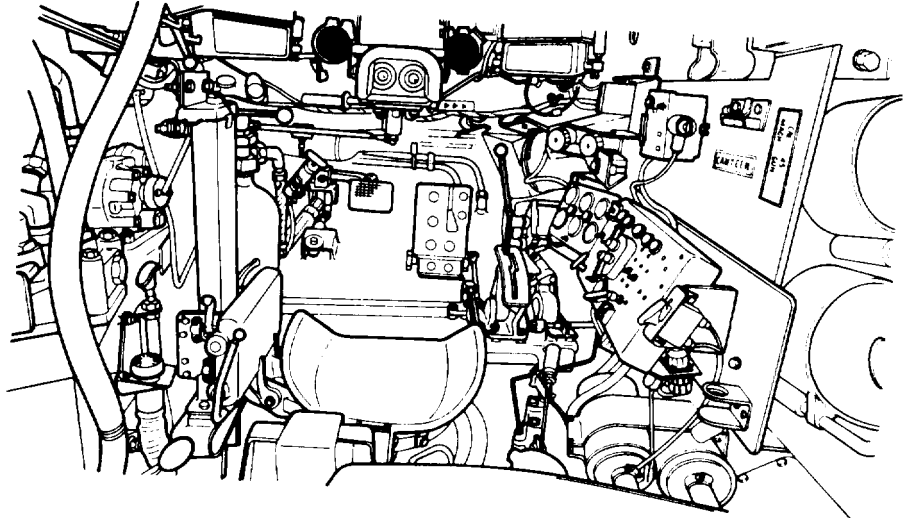
1. Place lampholder (C) in position in retaining strap (D).
2. Using wrench, install bond nut (A) and new lockwasher (B).
3. Place preformed packing (E) in position on lampholder (C).
4. Install base assembly in master control panel (See Master Control Panel Repair Index - page 10-52). TA139676

End of Task

INSTRUMENT PANEL CLUSTER ASSEMBLY DISPLACEMENT (Sheet 1 of 2)

TOOLS: 7/16 in. socket with 1/2 in. drive
 Ratchet with 1/2 in. drive

SUPPLIES: Lockwasher (MS35338-44) (4 required)



REMOVAL:

1. Using socket, remove four screws and lockwashers (A) securing instrument panel cluster assembly (B) and hydraulic switch bracket (C). Throw lockwashers away.
2. Position hydraulic switch bracket (C) aside.
3. Move instrument panel cluster assembly (B) to gain access to its back,

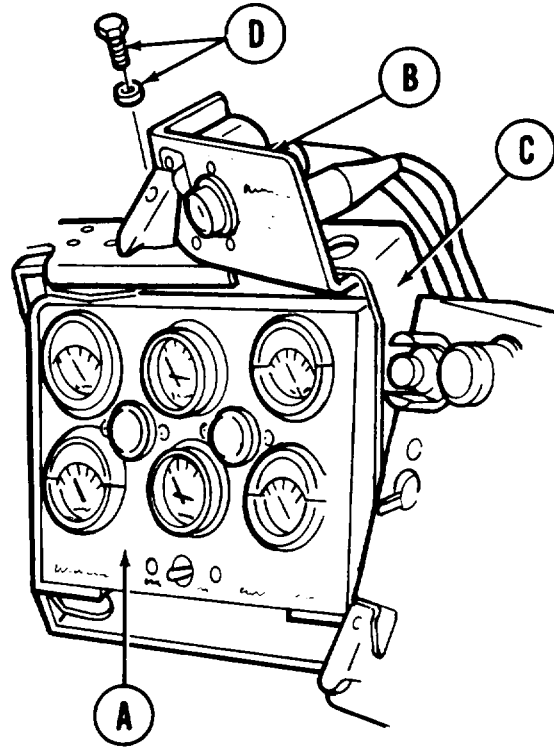
Go on to Sheet 2

TA139677

INSTRUMENT PANEL CLUSTER ASSEMBLY DISPLACEMENT (Sheet 2 of 2)

INSTALLATION:

1. Position instrument panel cluster assembly (A) and hydraulic switch bracket (B) to mounting plate (C).
2. Using socket, install and tighten four screws and new lockwashers (D) securing instrument panel cluster assembly (A) and hydraulic switch bracket (B).



End of Task

TA139678

INSTRUMENT PANEL CLUSTER ASSEMBLY OR SUPPORT REPLACEMENT (Sheet 1 of 4)

PROCEDURE INDEX

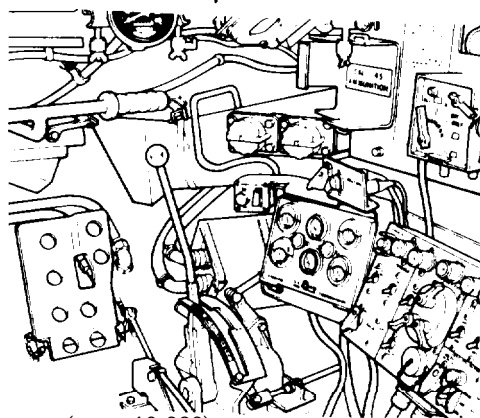
PROCEDURE	PAGE
Removal	10-123
Installation	10-125

TOOLS: 11/32 in. combination box and open end wrench

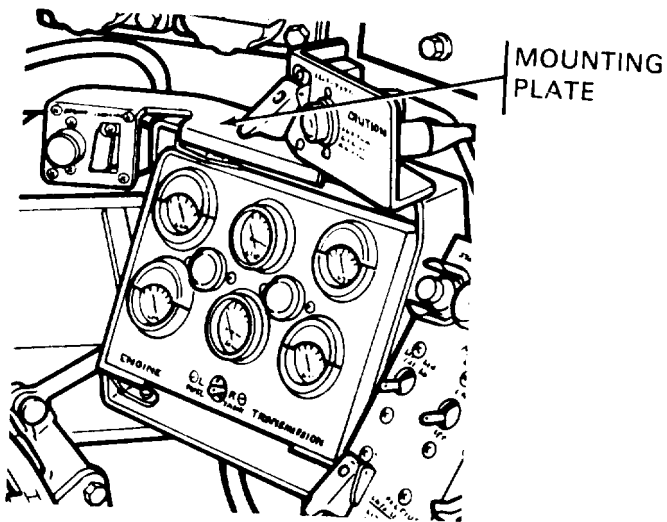
- Ratchet with 1/2 in. drive
- 7/16 in. socket with 1/2 in. drive
- Cross-tip screwdriver
- Spanner wrench

SUPPLIES: Lockwasher (MS35335-33) (2 required)
 Lockwasher (MS35333-40) (4 required)
 Lockwasher (MS35333-38)

REFERENCE: TM 9-2350-222-10



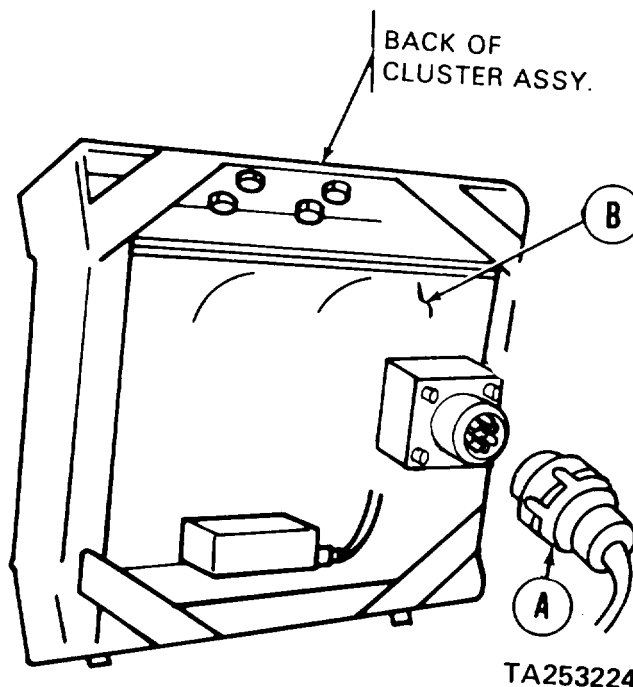
PRELIMINARY PROCEDURE: Disconnect three battery ground straps (page 10-283)



REMOVAL:

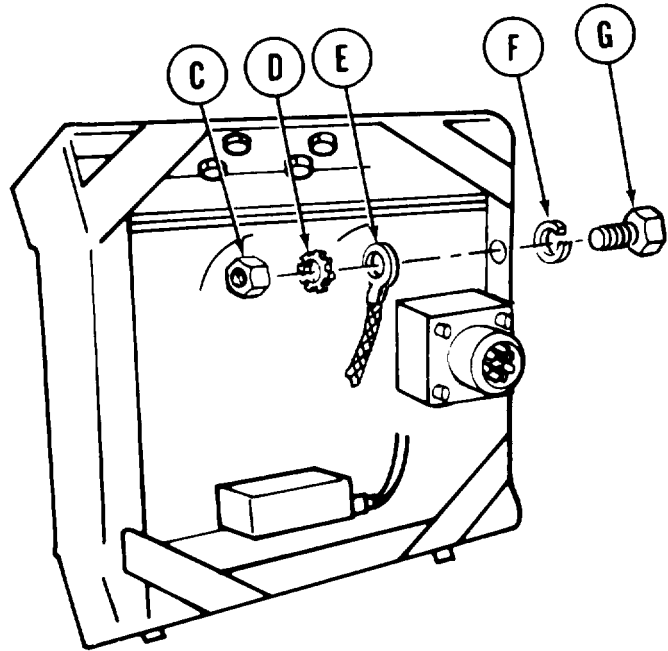
1. Using spanner wrench and fingers, remove electrical connector (A) from panel (B).

Go on to Sheet 2

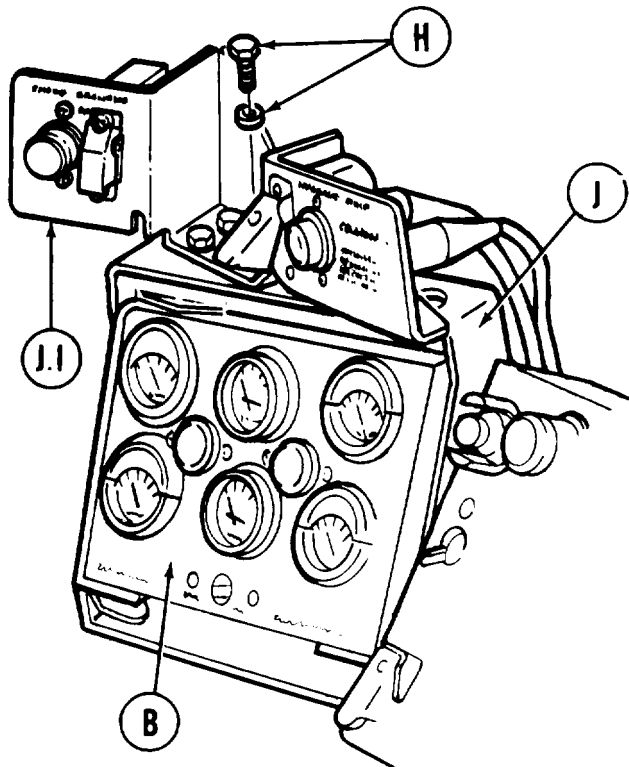


INSTRUMENT PANEL CLUSTER ASSEMBLY OR SUPPORT REPLACEMENT (Sheet 2 of 4)

2. Using socket, remove nut (C) and lockwasher (D). Throw lockwasher (D) away.
3. Remove ground strap (E), lockwasher (F), and screw (G). Throw lockwasher (F) away.

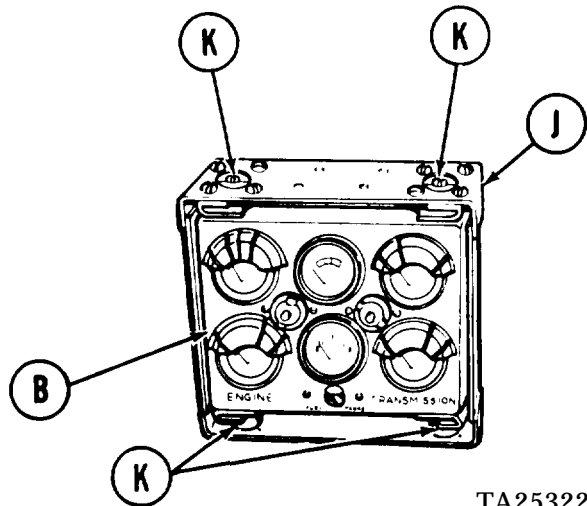


NOTE
Your vehicle may not have
bracket (J. 1).



4. Using socket, remove four screws (H) with lockwashers securing support (J) and switch bracket (J. 1) to mounting bracket. Throw lockwashers away.
5. Remove panel (B) and support (J).

6. Using screwdriver and 11/32 inch wrench, remove four screws (K) with lockwashers and nuts from support (J). Throw lockwashers away.
7. Remove panel (B) from support (J).



Go on to Sheet 3

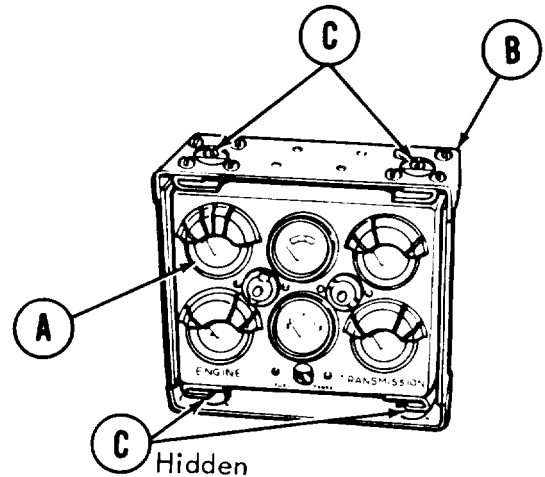
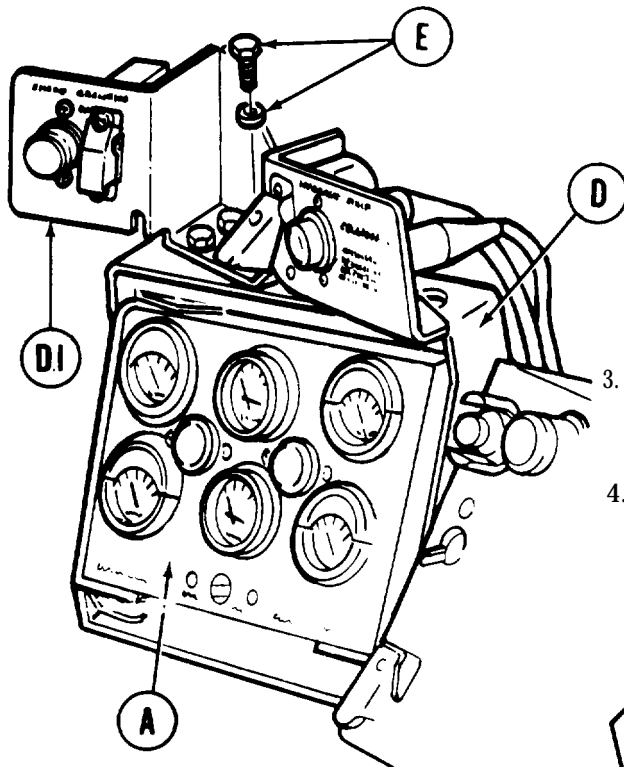
TA253225

INSTRUMENT PANEL CLUSTER ASSEMBLY OR SUPPORT REPLACEMENT (Sheet 3 of 4)

INSTALLATION:

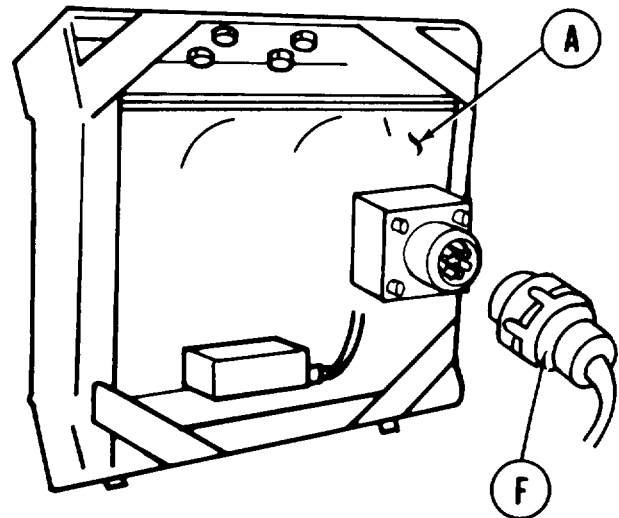
1. Place panel (A) in position on support (B).
2. Using screwdriver and 11/32 inch wrench, install four screws (C) with new lockwashers and nuts to hold panel (A) to support(B).

NOTE
Your vehicle may not have
bracket (D.1).



3. Place panel and support (A) and (B) and switch bracket (D. 1) into position on mounting bracket (D).
4. Using socket, install four screws (E) with new lockwashers.

5. Using fingers and spanner wrench, connect electrical connector (F) to rear of panel (A).

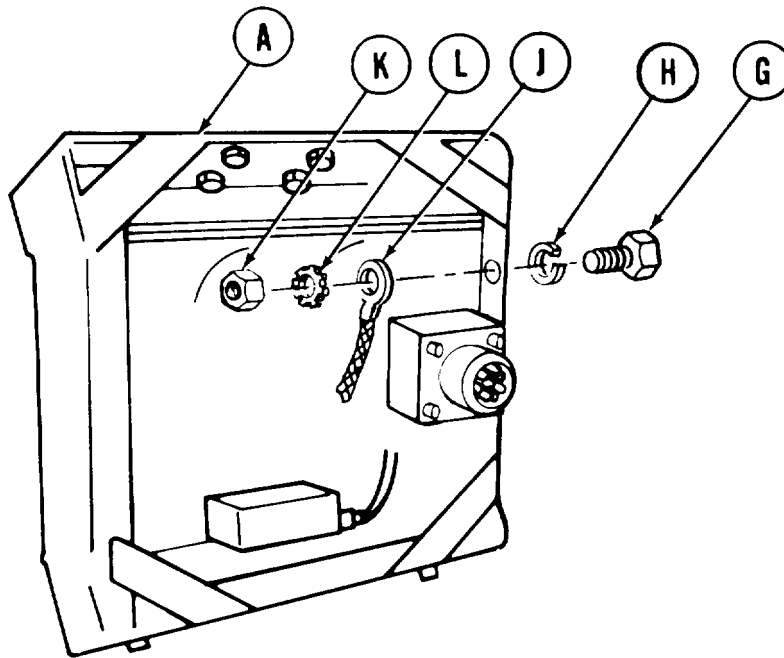


Go on to Sheet 4

TA253226

INSTRUMENT PANEL CLUSTER ASSEMBLY OR SUPPORT REPLACEMENT (Sheet 4 of 4)

6. Place screw (G) and new lockwasher (H) in position.
7. Install ground strap (J), lockwasher (L) and nut (K), to panel (A).
8. Using socket, tighten nut (K).
9. Connect three battery ground straps (page 10-283).



End of Task

TA139682

INSTRUMENT PANEL CLUSTER ASSEMBLY MAINTENANCE INDEX (Sheet 1 of 1)

PROCEDURE INDEX

PROCEDURE	PAGE
(A) Engine Oil Pressure Indicator Replacement	10-128
(B) Battery Generator Indicator Replacement	10-130
(c) Transmission Oil Pressure Indicator Replacement	10-132
(D) Gage Illumination Indicator Light Replacement	10-134
(E) Engine Oil Temperature Indicator Replacement	10-136
(F) Fuel Tank Liquid Quantity Indicator Replacement	10-138
(G) Transmission Oil Temperature Indicator Replacement	10-141
(H) Fuel Tank Selector Switch Replacement	10-143
(J) Instrument Panel Wiring Harness Replacement	10-145
(K) Fuel Tank Selector Switch Cable Assembly Replacement	10-149

TA139683

INSTRUMENT PANEL CLUSTER ASSEMBLY REPAIR (Sheet 1 of 22)
Engine Oil Pressure Indicator Replacement (Sheet 1 of 2)

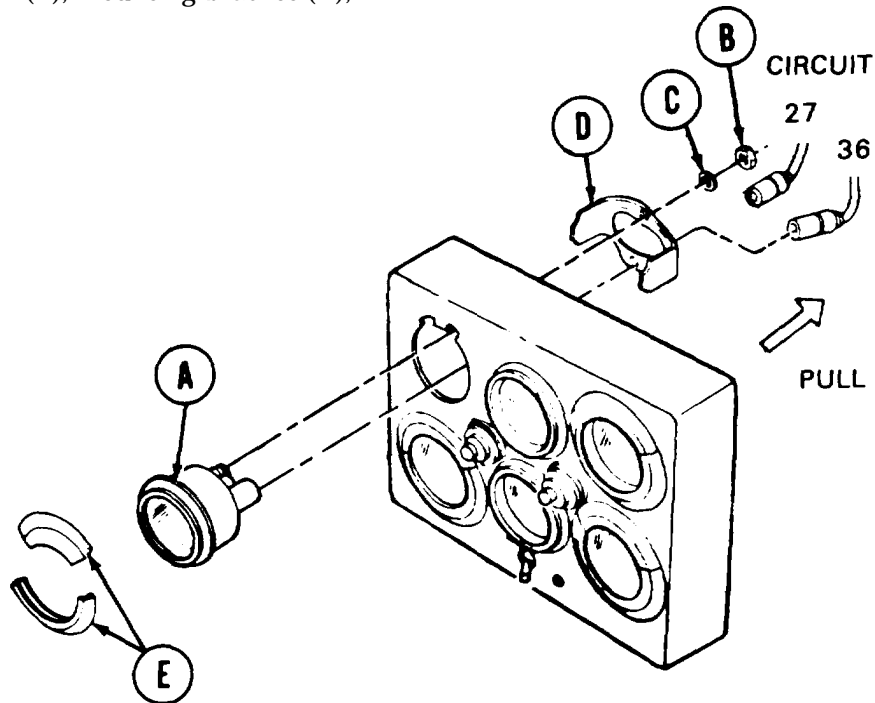
TOOLS: 3/8 in. combination box and open end wrench

SUPPLIES: Silicone compound (Item 32, Appendix D)
Lockwasher (MS35338-43) (2 required)

PRELIMINARY PROCEDURE: Remove instrument panel from vehicle (page 10-123)

REMOVAL:

1. Remove two leads (circuits 27 and 36) from rear of indicator (A) by pulling out,
2. Using wrench, remove two nuts (B) and lockwashers (C) securing indicator (A) and mounting bracket (D) to panel. Throw lockwashers away.
3. Remove indicator (A), mounting bracket (D), and bezel (E).



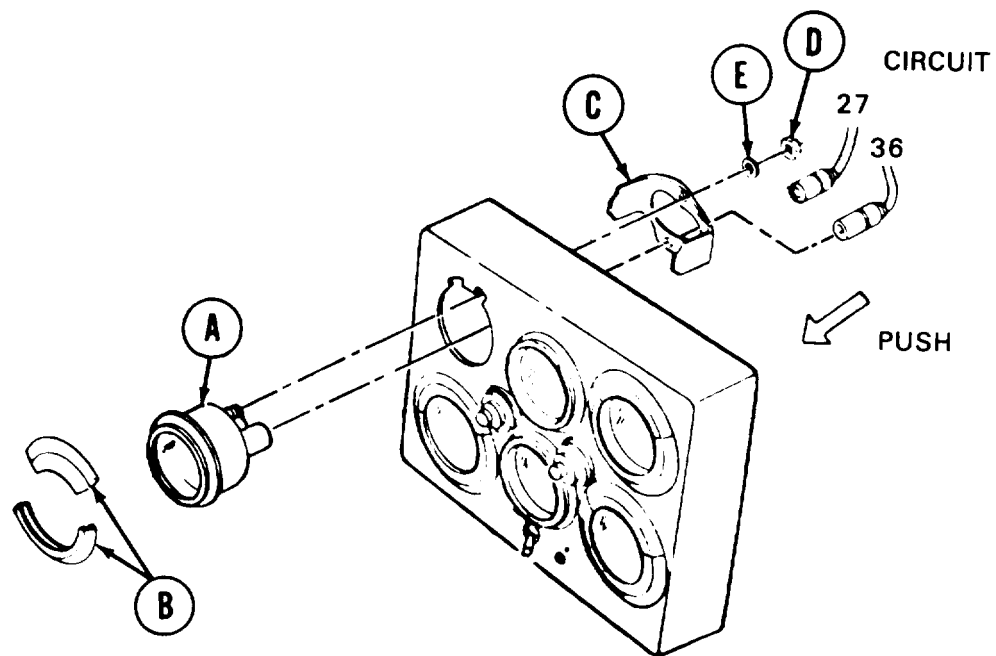
Go on to Sheet 2

TA139684

INSTRUMENT PANEL CLUSTER ASSEMBLY REPAIR (Sheet 2 of 22)
Engine Oil Pressure Indicator Replacement (Sheet 2 of 2)

INSTALLATION:

1. Apply silicone compound (Item 32, Appendix D) to two indicator (A) electrical connectors.
2. Place bezel (B) on indicator (A) and place in position on panel.
3. Place mounting bracket (C) in position on rear of indicator (A).
4. Using wrench, install two nuts (D) and new lockwashers (E).



5. Connect two leads (circuits 27 and 36) to rear of indicator (A) by pushing in.
6. Install instrument panel in vehicle (page 10-125).

End of Task

TA139685

INSTRUMENT PANEL CLUSTER ASSEMBLY REPAIR (Sheet 3 of 22)
Battery Generator Indicator Replacement (Sheet 1 of 2)

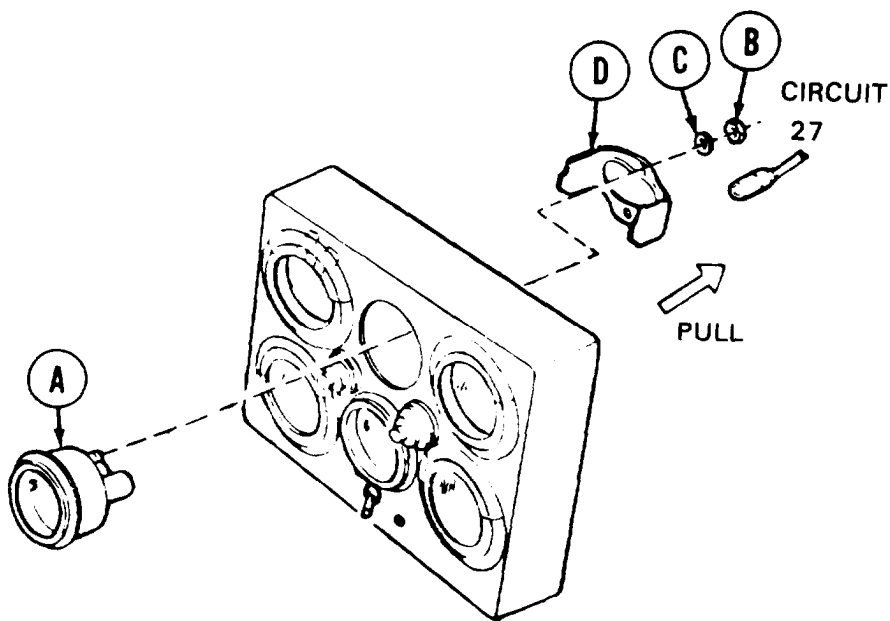
TOOLS: 3/8 in. combination box and open end wrench

SUPPLIES: Silicone compound (Item 32, Appendix D)
Lockwasher (MS35338-43) (2 required)

PRELIMINARY PROCEDURE: Remove instrument panel from vehicle (page 10-123)

REMOVAL:

1. Remove lead (circuit 27) from rear of indicator (A) by pulling out.
2. Using wrench, remove two nuts (B) and lockwashers (C) securing indicator (A) and mounting bracket (D) to panel. Throw lockwashers away.
3. Remove indicator (A) and mounting bracket (D).



INSTALLATION:

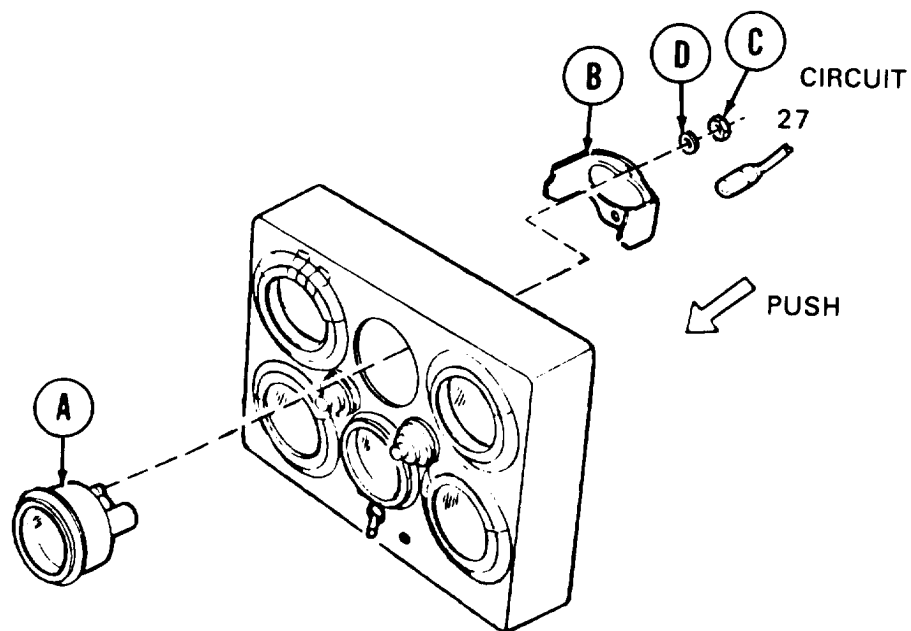
1. Apply silicone compound (Item 32, Appendix D) to indicator (A) electrical connector.

Go on to Sheet 2

TA139686

INSTRUMENT PANEL CLUSTER ASSEMBLY REPAIR (Sheet 4 of 22)
Battery Generator Indicator Replacement (Sheet 2 of 2)

2. Place indicator (A) in position in panel.
3. Place mounting bracket (B) in position on indicator (A).
4. Using wrench, install two nuts (C) and new lockwashers (D) securing indicator (A) and mounting bracket (B) on panel.



5. Connect lead (circuit 27) to rear of indicator (A) by pushing in.
6. Install instrument panel in vehicle (page 10-125).

End of Task

TA139687

INSTRUMENT PANEL CLUSTER ASSEMBLY REPAIR (Sheet 5 of 22)
Transmission Oil Pressure Indicator Replacement (Sheet 1 of 2)

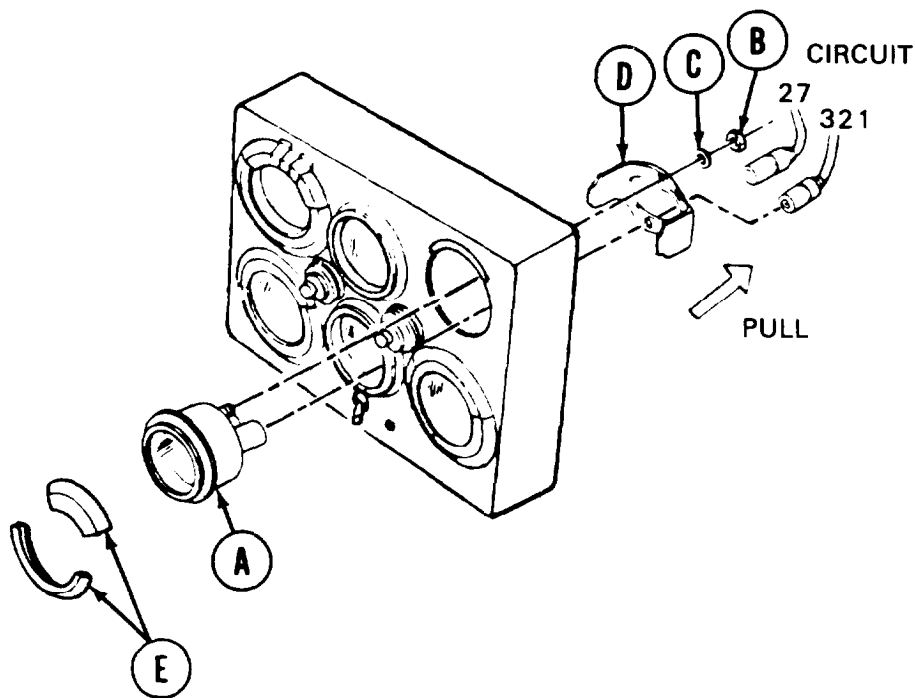
TOOLS: 3/8 in. combination box and open end wrench

SUPPLIES: Silicone compound (Item 32, Appendix D)
Lockwasher (MS35338-43) (2 required)

PRELIMINARY PROCEDURE: Remove instrument panel from vehicle (page 10-123)

REMOVAL:

1. Remove two leads (circuits 27 and 321) from rear of indicator (A) by pulling out.
2. Using wrench, remove two nuts (B) and lockwashers (C) securing indicator (A) and mounting bracket (D) to panel. Throw lockwashers away.
3. Remove indicator (A), bezel (E), and mounting bracket (D).



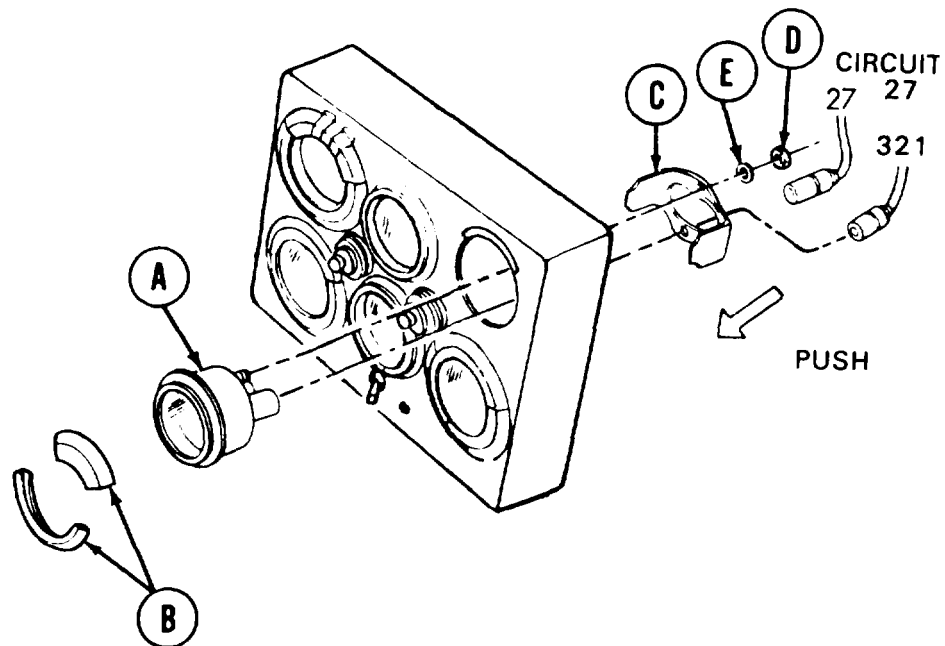
Go on to Sheet 2

TA139688

INSTRUMENT PANEL CLUSTER ASSEMBLY REPAIR (Sheet 6 of 22)
Transmission Oil Pressure Indicator Replacement (Sheet 2 of 2)

INSTALLATION:

1. Apply silicone compound (Item 32, Appendix D) to two indicator (A) electrical connectors.
2. Place bezel (B) in position on indicator (A).
3. Place indicator (A) and bezel (B) in position in panel.
4. Place mounting bracket (C) in position on indicator (A).
5. Using wrench, install two nuts (D) and new lockwashers (E) securing indicator (A) and mounting bracket (C) to panel.



6. Connect two leads (27 and 321) to rear of indicator (A) by pushing in.
7. Install instrument panel in vehicle (page 10-125).

End of Task

TA139689

INSTRUMENT PANEL CLUSTER ASSEMBLY REPAIR (Sheet 7 of 22)
Gage Illumination Indicator Light Replacement (Sheet 1 of 2)

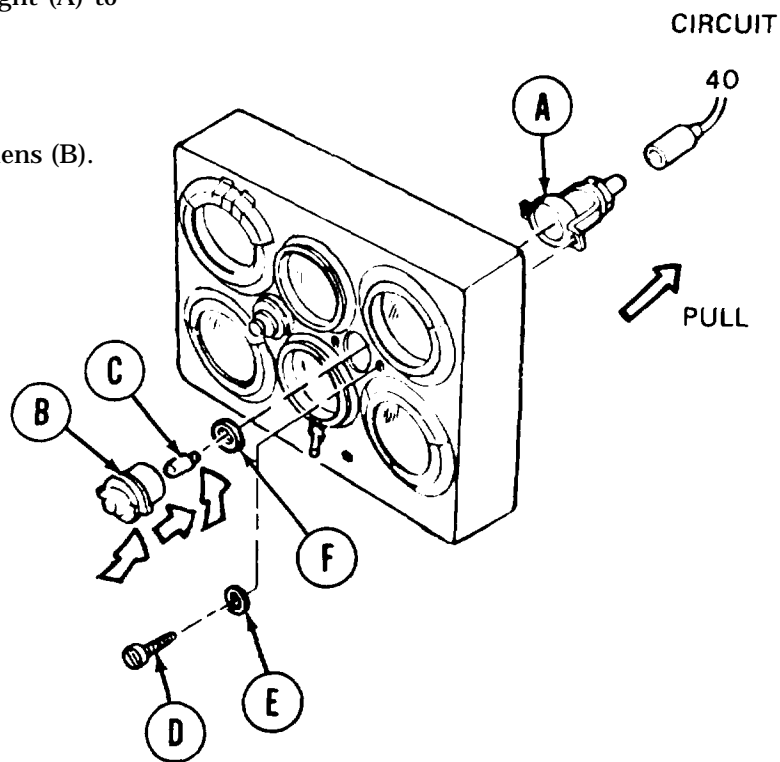
TOOLS: Flat-tip screwdriver

SUPPLIES: Silicone compound (Item 32, Appendix D)
Preformed packing (7358626)
Lockwasher (MS35338-57)

PRELIMINARY PROCEDURE: Remove instrument panel from vehicle (page 10-123)

REMOVAL:

1. Remove lead (circuit 40) from rear of indicator light (A) by pulling out.
2. Remove lens (B) by turning counterclockwise
3. Remove lamp (C) by pushing in and turning counterclockwise.
4. Using screwdriver, remove two screws (D) and lockwashers (E) securing indicator light (A) to panel. Throw lockwashers away.
5. Remove indicator light (A).
6. Remove preformed packing (F) from lens (B). Throw preformed packing away.



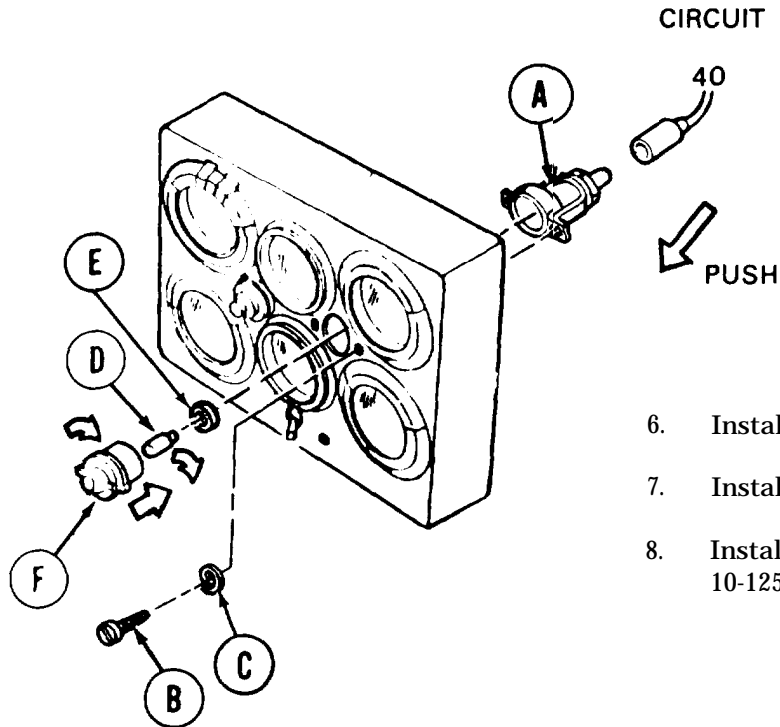
Go on to Sheet 2

TA139690

INSTRUMENT PANEL CLUSTER ASSEMBLY REPAIR (Sheet 8 of 22)
Gage Illumination Indicator Light Replacement (Sheet 2 of 2)

INSTALLATION:

1. Apply silicone compound (Item 32, Appendix D) to indicator light (A) lead No. 40.
2. Connect lead (circuit 40) to rear of indicator light (A) by pushing in.
3. Place indicator light (A) in position in panel.
4. Using screwdriver, install two screws (B) and new lockwashers (C) securing indicator light (A) to panel.
5. Install lamp (D) by pushing in and turning clockwise.



6. Install preformed packing (E) on lens (F).
7. Install lens (F) by turning clockwise.
8. Install instrument panel in vehicle (page 10-125).

End of Task

TA139691

INSTRUMENT PANEL CLUSTER ASSEMBLY REPAIR (Sheet 9 of 22)
Engine Oil Temperature Indicator Replacement (Sheet 1 of 2)

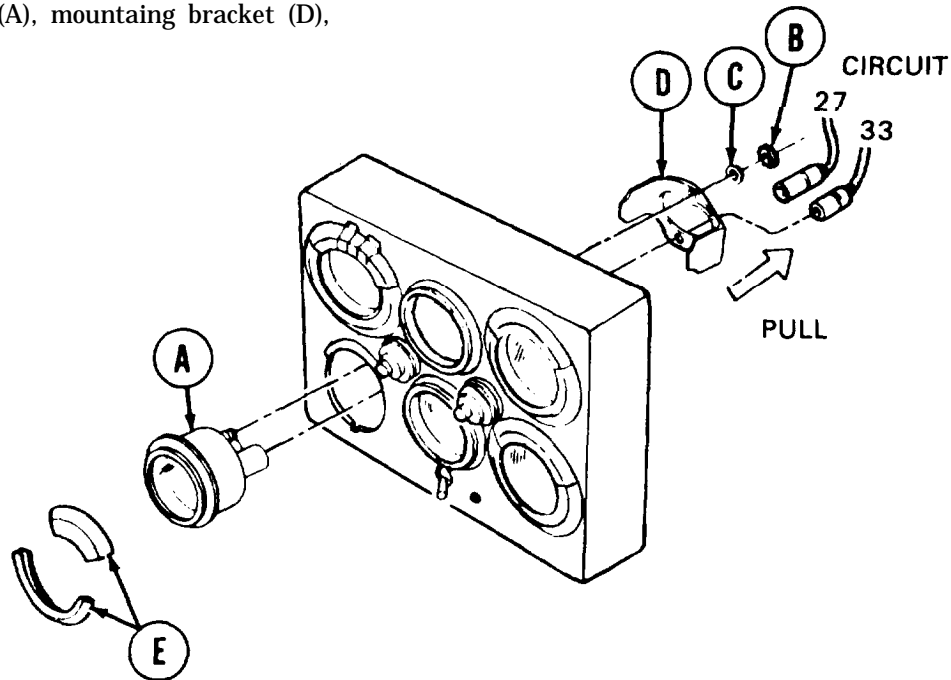
TOOLS: 3/8 in. combination box and open end wrench

SUPPLIES: Silicone compound (Item 32, Appendix D)
Lockwashers (MS35338-43) (2 required)

PRELIMINARY PROCEDURE: Remove instrument panel from vehicle (page 10-123)

REMOVAL:

1. Remove two leads (circuits 33 and 27) from indicator (A) by pulling out.
2. Using wrench, remove two nuts (B) and lockwashers (C) securing indicator (A) and mounting bracket (D) to panel. Throw lockwashers away.
3. Remove indicator (A), mounting bracket (D), and bezel (E).



INSTALLATION:

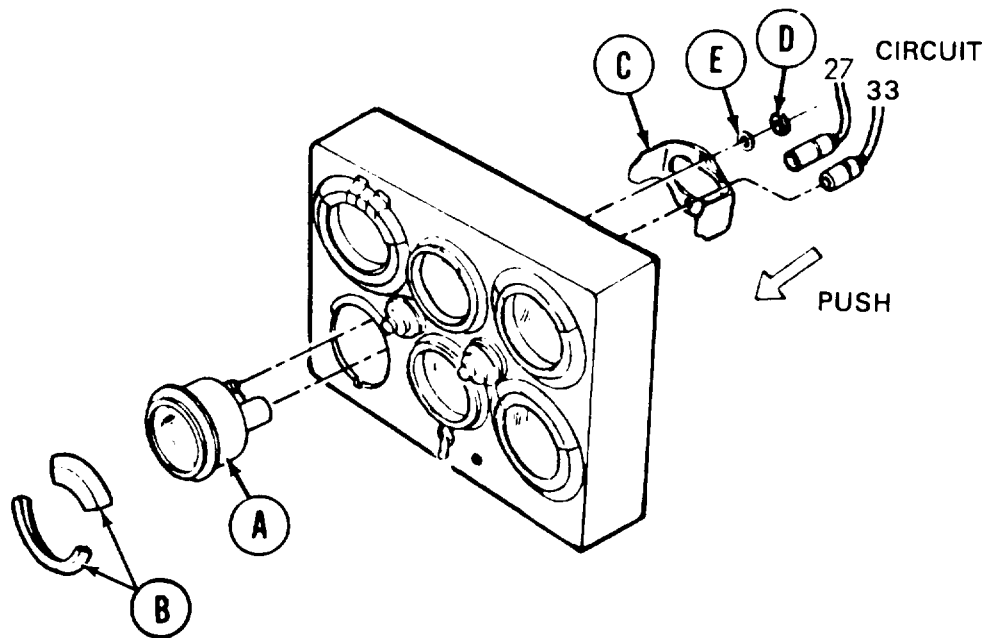
1. Apply silicone compound (Item 32, Appendix D) to two indicator (A) electrical connectors.

Go on to Sheet 2

TA139692

INSTRUMENT PANEL CLUSTER ASSEMBLY REPAIR (Sheet 10 of 22)
Engine Oil Temperature Indicator Replacement (Sheet 2 of 2)

2. Place bezel (B) on indicator (A).
3. Place indicator with bezel (A) and (B) in position in panel
4. Place mounting bracket (C) in position on indicator (A).
5. Using wrench, install two nuts (D) and new lockwashers (E) securing indicator (A) to panel.
6. Connect two leads (circuits 27 and 33) to indicator (A) by pushing in.



7. Install instrument panel in vehicle (page 10-125).

End of Task

TA139693

INSTRUMENT PANEL CLUSTER ASSEMBLY REPAIR (Sheet 11 of 22)
Fuel Tank Liquid Quantity Indicator Replacement (Sheet 1 of 3)

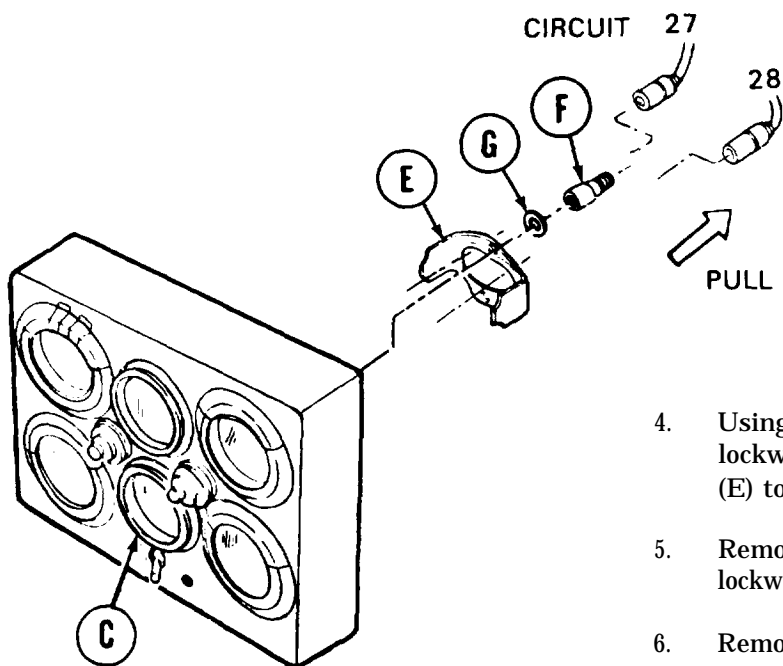
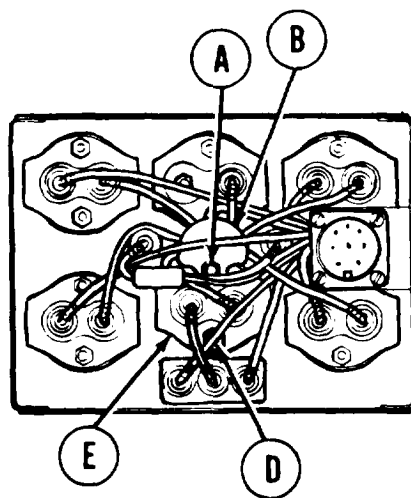
TOOLS: 3/8 in. combination box and open end wrench

SUPPLIES: Silicone compound (Item 32, Appendix D)
Lockwasher (MS35338-42)
Lockwasher (MS35338-43) (2 required)

PRELIMINARY PROCEDURE: Remove instrument panel from vehicle (page 10-123)

REMOVAL:

1. Using wrench, remove nut and lockwasher (A) securing harness junction (B) to panel. Throw lockwasher away.
2. Displace harness junction (B).
3. Disconnect two leads (circuits 27 and 28) from rear of indicator (C).



4. Using wrench, remove two nuts and lockwashers (D) securing mounting bracket (E) to panel. Throw lockwashers away.
5. Remove mounting bracket (E), stud (F), and lockwasher (G).
6. Remove indicator (C) from panel.

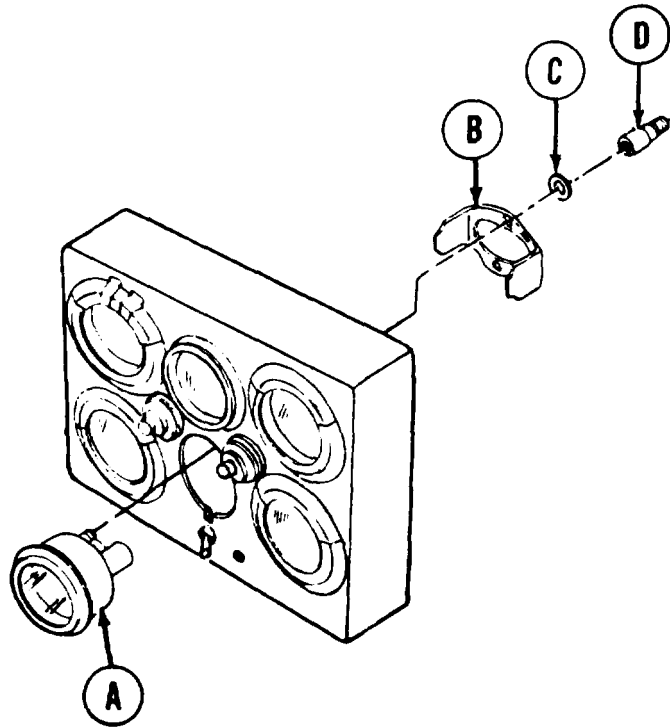
Go on to Sheet 2

TA139694

INSTRUMENT PANEL CLUSTER ASSEMBLY REPAIR (Sheet 12 of 22)
Fuel Tank Liquid Quantity Indicator Replacement (Sheet 2 of 3)

INSTALLATION:

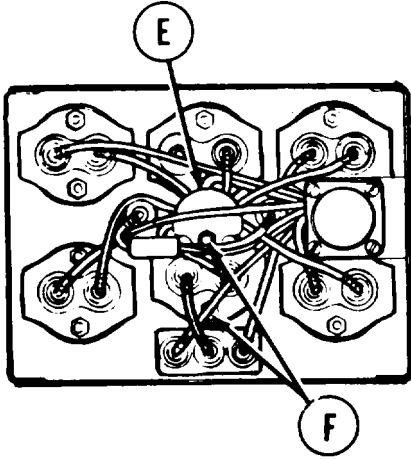
1. Apply silicone compound (Item 32, Appendix D) to two indicator (A) electrical connectors.
2. Place indicator (A) in position on panel.
3. Place mounting bracket (B), new lockwasher (C), and stud (D) in position on indicator (A).



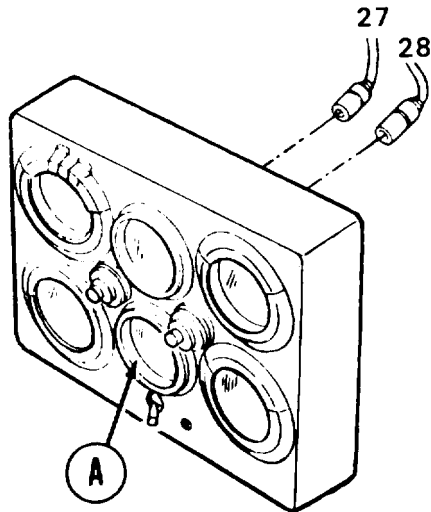
Go on to Sheet 3

TA139695

INSTRUMENT PANEL CLUSTER ASSEMBLY REPAIR (Sheet 13 of 22)
Fuel Tank Liquid Quantity Indicator Replacement (Sheet 3 of 3)



4. Place flat washer and harness junction (E) in position on panel.
5. Using wrench, install two nuts and new lockwashers (F) securing harness junction (E) and indicator (A) to panel.
6. Connect two leads (circuits 27 and 28) to rear of indicator (A).
7. Install instrument panel in vehicle (page 10-125).



End of Task

TA139696

INSTRUMENT PANEL CLUSTER ASSEMBLY REPAIR (Sheet 14 of 22)
Transmission Oil Temperature Indicator Replacement (Sheet 1 of 2)

TOOLS: 3/8 in. combination box and open end wrench

SUPPLIES: Silicone compound (Item 32, Appendix D)
 Lockwasher (MS35338-43) (2 required)

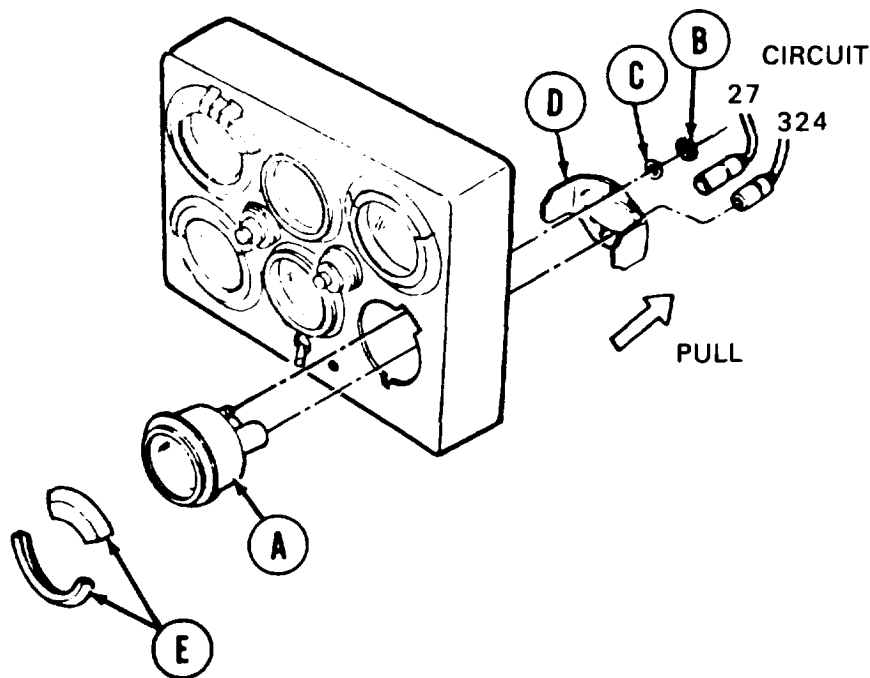
PRELIMINARY PROCEDURE: Remove instrument panel from vehicle (page 10-123)

REMOVAL:

1. Remove two leads (circuits 324 and 27) from rear of indicator (A) by pulling out.
2. Using wrench, remove two nuts (B) and lockwashers (C) securing indicator (A) and mounting bracket (D) to panel. Throw lockwashers away.
3. Remove indicator (A), mounting bracket (D), and bezel (E).

INSTALLATION:

1. Apply silicone compound (Item 32, Appendix D) to two indicator (A) electrical connectors.

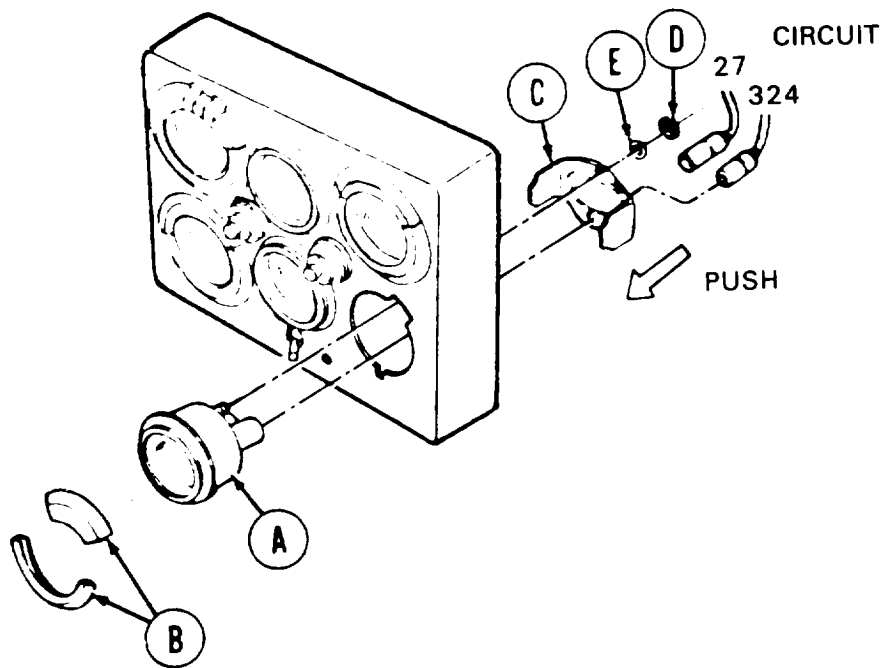


Go on to Sheet 2

TA139697

INSTRUMENT PANEL CLUSTER ASSEMBLY REPAIR (Sheet 15 of 22)
Transmission Oil Temperature Indicator Replacement (Sheet 2 of 2)

2. Place bezel (B) in position on indicator (A).
3. Place indicator with bezel (A) and (B) in position in panel.
4. Place mounting bracket (C) in position on indicator (A).



5. Using wrench, install two nuts (D) and new lockwashers (E) securing indicator (A) and mounting bracket (C) in position on panel.
6. Connect two leads (circuits 324 and 27) to rear of indicator (A) by pushing in.
7. Install instrument panel in vehicle (page 10-125).

End of Task

TA139698

INSTRUMENT PANEL CLUSTER ASSEMBLY REPAIR (Sheet 16 of 22)
Fuel Tank Selector Switch Replacement (Sheet 1 of 2)

TOOLS: Flat-tip screwdriver

SUPPLIES: Silicone compound (Item 32, Appendix D)
 Lockwasher (MS35333-38) (2 required)

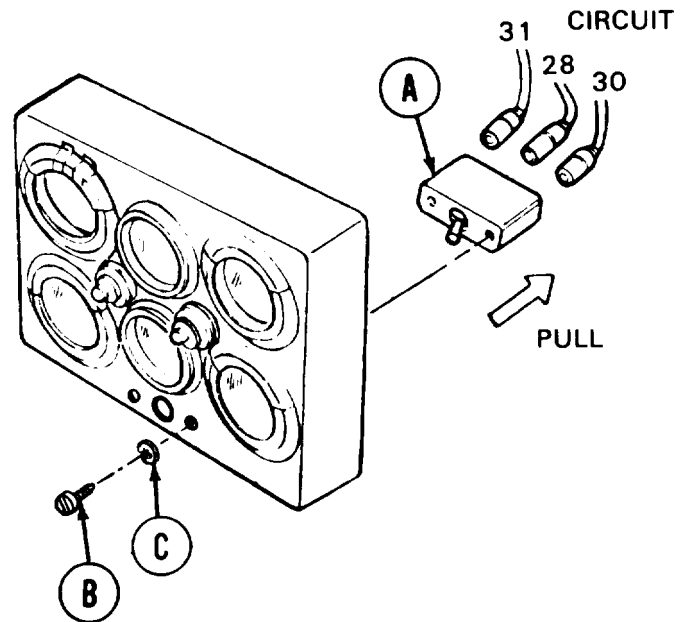
PRELIMINARY PROCEDURE: Remove instrument panel from vehicle (page 10-123)

REMOVAL:

1. Remove three leads (circuits 30, 28, and 31) from rear of switch (A) by pulling out.
2. Using screwdriver, remove two screws (B) and two lockwashers (C) securing switch (A) to panel. Throw lockwashers away.
3. Remove switch (A).

INSTALLATION:

1. Apply silicone compound (Item 32, Appendix D) to three switch (A) leads (circuits 30, 28, and 31).
2. Place switch (A) in position in panel.
3. Using screwdriver, install two screws (B) and new lockwashers (C) securing switch (A) to panel.

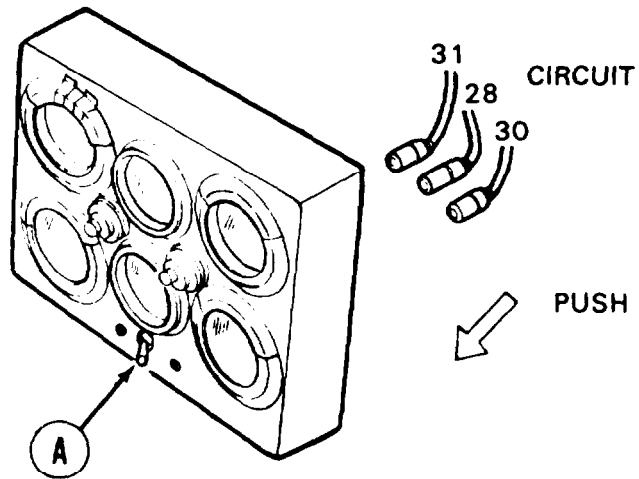


Go on to Sheet 2

TA139699

INSTRUMENT PANEL CLUSTER ASSEMBLY REPAIR (Sheet 17 of 22)
Fuel Tank Selector Switch Replacement (Sheet 2 of 2)

4. Connect three leads (circuits 30, 28, and 31) to rear of switch (A),
5. Install instrument panel in vehicle (page 10-125).



End of Task

TA139700

INSTRUMENT PANEL CLUSTER ASSEMBLY REPAIR (Sheet 18 of 22)
Instrument Panel Wiring Harness Replacement (Sheet 1 of 4)

PROCEDURE INDEX

PROCEDURE	PAGE
Removal	10-145
Installation	10-147

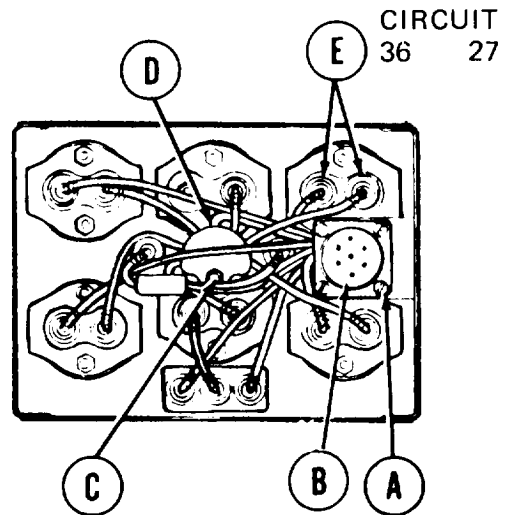
TOOLS: 3/8 in. combination box and open end wrench
 Flat-tip screwdriver

SUPPLIES: Silicone compound (Item 32, Appendix D)
 Lockwasher (MS35338-43)
 Lockwasher (MS35336-42) (4 required)

PRELIMINARY PROCEDURE: Remove instrument panel from vehicle (page 10-123)

REMOVAL:

1. Using screwdriver, remove four screws and lockwashers (A) securing receptacle connector (B) to panel. Throw lockwashers away.
2. Using wrench, remove nut and lockwasher (C) securing harness junction (D) to panel. Throw lockwasher away.
3. Disconnect two leads (circuits 27 and 36) from engine oil pressure gage (E) by pulling out.

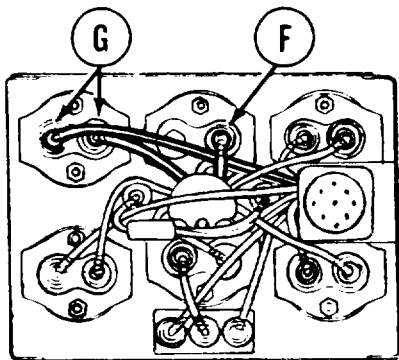


Go on to Sheet 2

TA139701

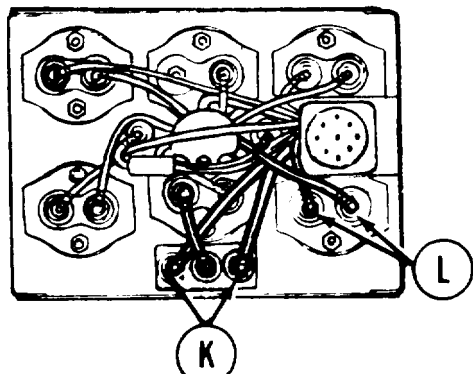
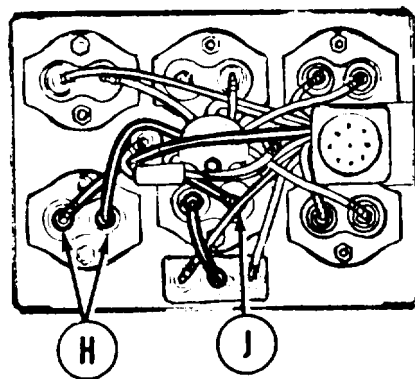
INSTRUMENT PANEL CLUSTER ASSEMBLY REPAIR (Sheet 19 of 22)

Instrument Panel Wiring Harness Replacement (Sheet 2 of 4)



4. Disconnect one lead (circuit 27) from battery indicator gage (F).
5. Disconnect two leads (circuits 27 and 321) from transmission oil pressure indicator (G).

6. Disconnect two leads (circuits 27 and 324) from transmission oil temperature indicator (H).
7. Disconnect lead (circuit 27) from fuel gage indicator (J).



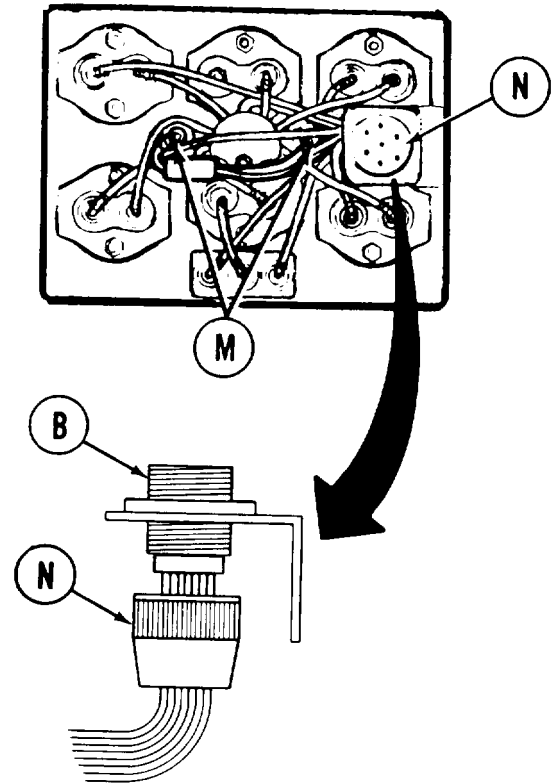
8. Disconnect two leads (circuits 30 and 31) from fuel switch (K).
9. Disconnect two leads (circuits 33 and 27) from engine oil temperature indicator (L).

Go on to Sheet 3

TA139702

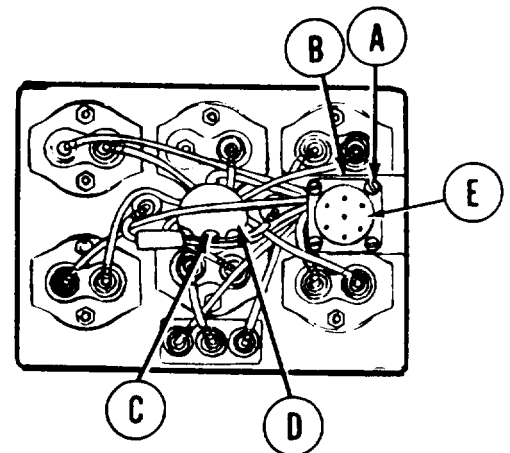
INSTRUMENT PANEL CLUSTER ASSEMBLY REPAIR (Sheet 20 of 22)
Instrument Panel Wiring Harness Replacement (Sheet 3 of 4)

10. Disconnect two leads (circuit 40) from two panel lights (M).
11. Loosen receptacle connector retainer nut (N) and slide back on leads.
12. Remove wiring harness from panel.



INSTALLATION:

1. Apply silicone compound (Item 32, Appendix D) to 16 lead connectors of instrument panel wiring harness.
2. Place wiring harness in position in panel.
3. Using fingers, tighten receptacle connector retainer nut (E) to receptacle connector (B).
4. Using screwdriver, install four screws and new lockwashers (A) securing receptacle connector (B) to panel.
5. Using wrench, install nut and new lockwasher (C) securing harness junction (D) to panel.

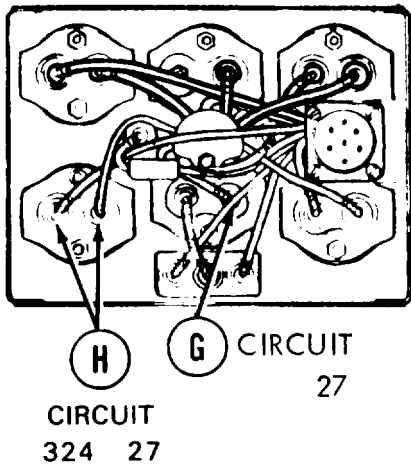
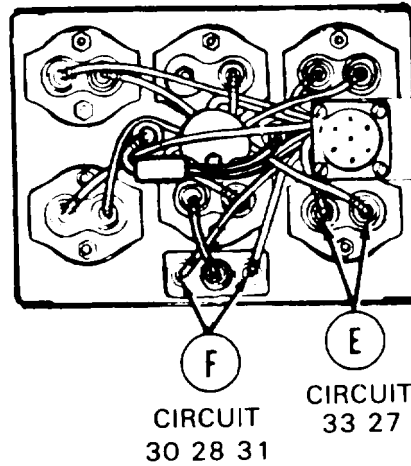


Go on to Sheet 4

TA139703

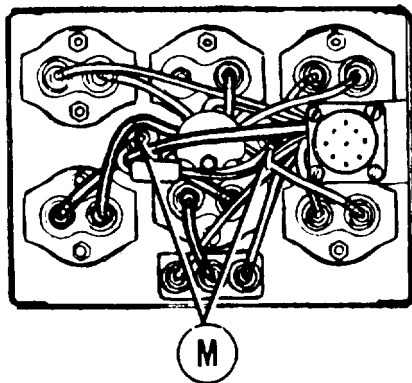
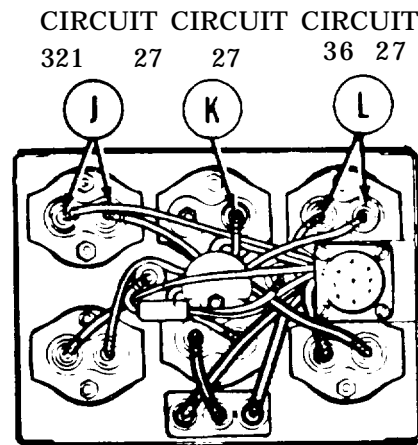
INSTRUMENT PANEL CLUSTER ASSEMBLY REPAIR (Sheet 21 of 22)
Instrument Panel Wiring Harness Replacement (Sheet 4 of 4)

6. Connect two leads (circuits 27 and 33) to engine oil temperature indicator (E).
7. Connect two leads (circuits 30 and 31) to fuel switch (F).



8. Connect lead (circuit 27) to fuel gage indicator (G).
9. Connect two leads (circuits 27 and 324) to transmission oil temperature indicator (H).

10. Connect two leads (circuits 27 and 321) to transmission oil pressure indicator (J).
11. Connect lead (circuit 27) to battery indicator (K).
12. Connect two leads (circuits 27 and 36) to engine oil pressure indicator (L).



13. Connect two leads (circuit 40) to two panel lights (M).
14. Install instrument panel in vehicle (page 10-125).

End of Task

TA139704

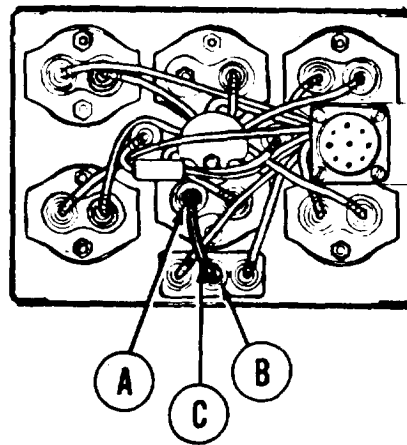
INSTRUMENT PANEL CLUSTER ASSEMBLY REPAIR (Sheet 22 of 22)
Fuel Tank Selector Switch Cable Assembly Replacement (Sheet 1 of 1)

SUPPLIES: Silicone compound (Item 32, Appendix D)

PRELIMINARY PROCEDURE: Remove instrument panel from vehicle (page 10-123)

REMOVAL:

1. Remove connector (circuit 28) from fuel tank indicator (A) by pulling out.
2. Remove other connector (circuit 28) from fuel tank selector switch (B).
3. Remove lead (C).



INSTALLATION:

1. Apply silicone compound (Item 32, Appendix D) to each connector (A) and (B) of cable assembly (c).
2. Connect one connector (circuit 28) to fuel tank indicator (A).
3. Connect other connector (circuit 28) to fuel tank selector switch (B).
4. Install instrument panel in vehicle (page 10-125).

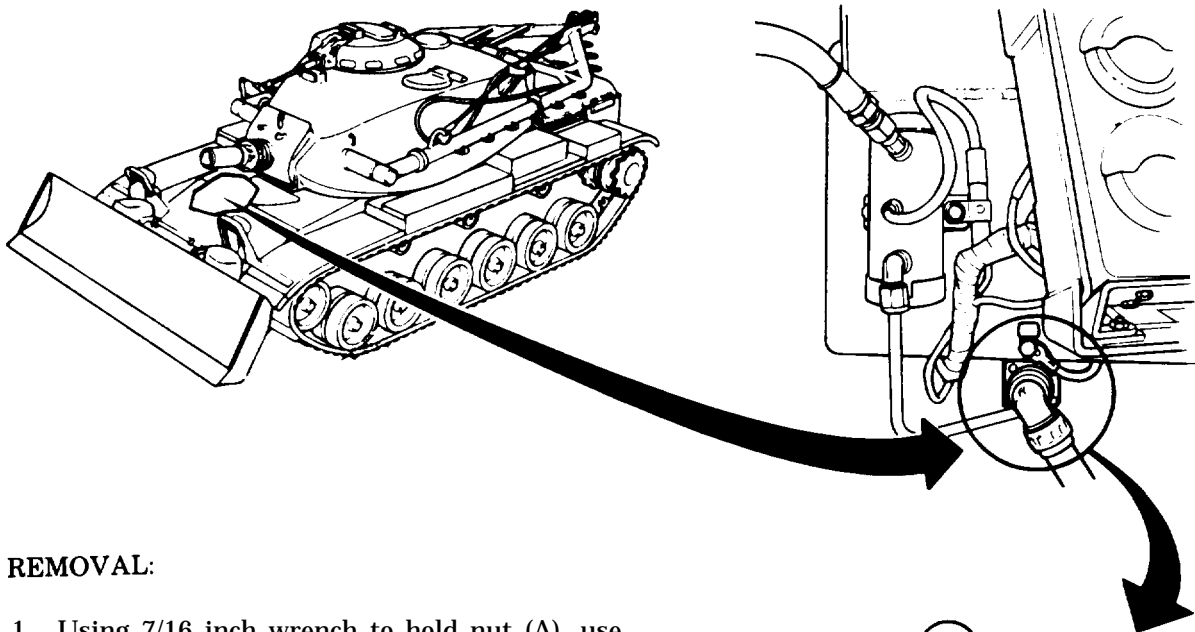
End of Task

TA139705

BILGE PUMP STOWAGE RECEPTACLE PLATE REPLACEMENT (Sheet 1 of 2)

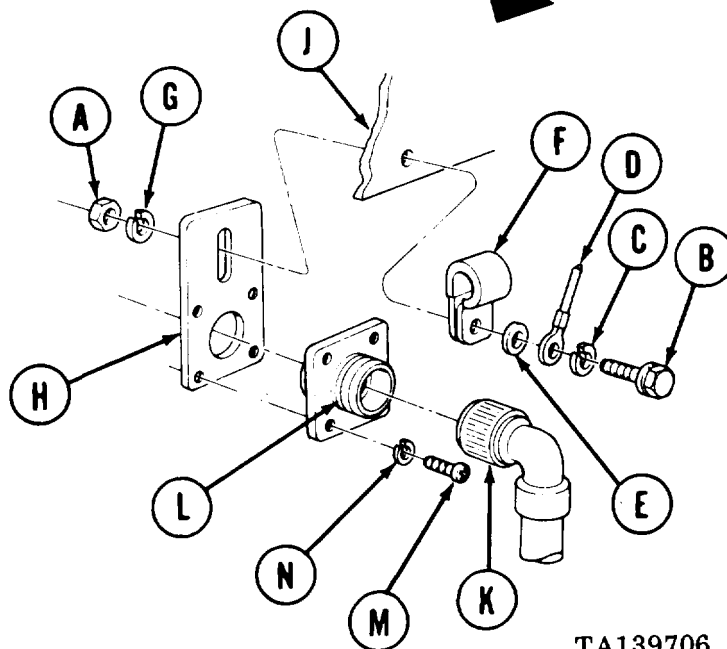
TOOLS: Ratchet with 1/2 in. drive
 7/16 in. socket with 1/2 in. drive
 7/16 in. combination box and open end wrench
 11/32 in. open end wrench
 Flat-tip screwdriver
 6 in. extension with 1/2 in. drive

SUPPLIES: Lockwashers (MS35330-40) (4 required)
 Lockwashers (MS35338-40) (2 required)



REMOVAL:

1. Using 7/16 inch wrench to hold nut (A), use socket to remove screw (B), lockwasher (C), ground strap from fuel pump (D), washer (E), clamp (F), and lockwasher (G). Throw lockwashers (C) and (G) away.
2. Remove plate (H) from plate assembly (J).
3. Remove connector (K) from shell (L).
4. Using screwdriver, remove four screws (M) and lockwashers (N). Throw lockwashers away.
5. Remove shell (L) from plate (H).



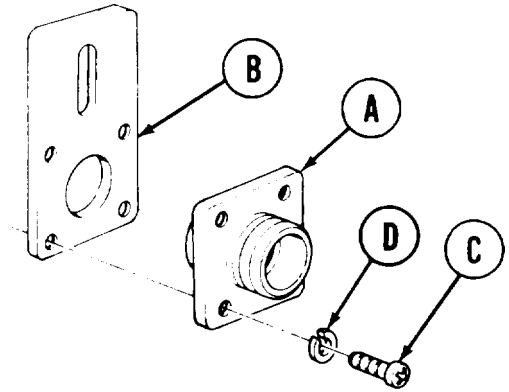
Go on to Sheet 2

TA139706

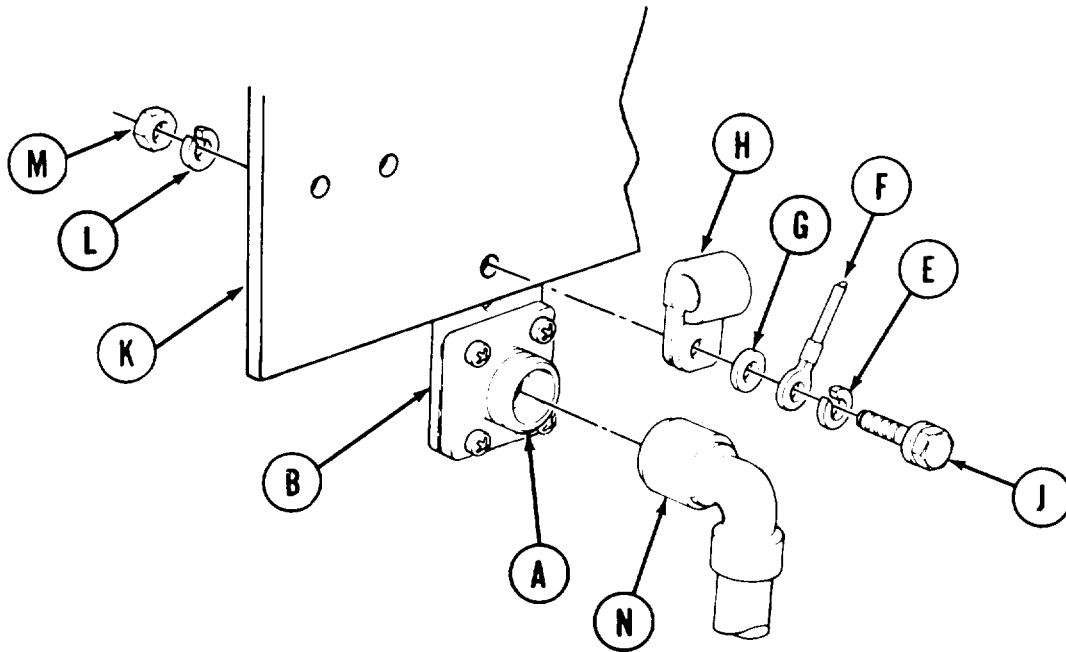
BILGE PUMP STOWAGE RECEPTACLE PLATE REPLACEMENT (Sheet 2 of 2)

INSTALLATION:

1. Place shell (A) onto plate (B).
2. Using screwdriver, install four screws (C) and new lockwashers (D), securing shell (A) to plate (B).



3. Place new lockwasher (E), ground cable (F), washer (G), and clamp (H) onto screw (J).
4. Place plate (B) onto plate assembly (K).



5. Install screw (J) with assembled items (E), (F), (G), and (H) through plate (B) and plate assembly (K).
6. Place new lockwasher (L) and nut (M) onto screw (J).
7. Using 7/16 inch wrench to hold nut (M), use socket to tighten screw (J).
8. Install connector (N) to shell (A).

End of Task

TA139707

MASTER CONTROL PANEL PLATE ASSEMBLY REPLACEMENT (Sheet 1 of 4)

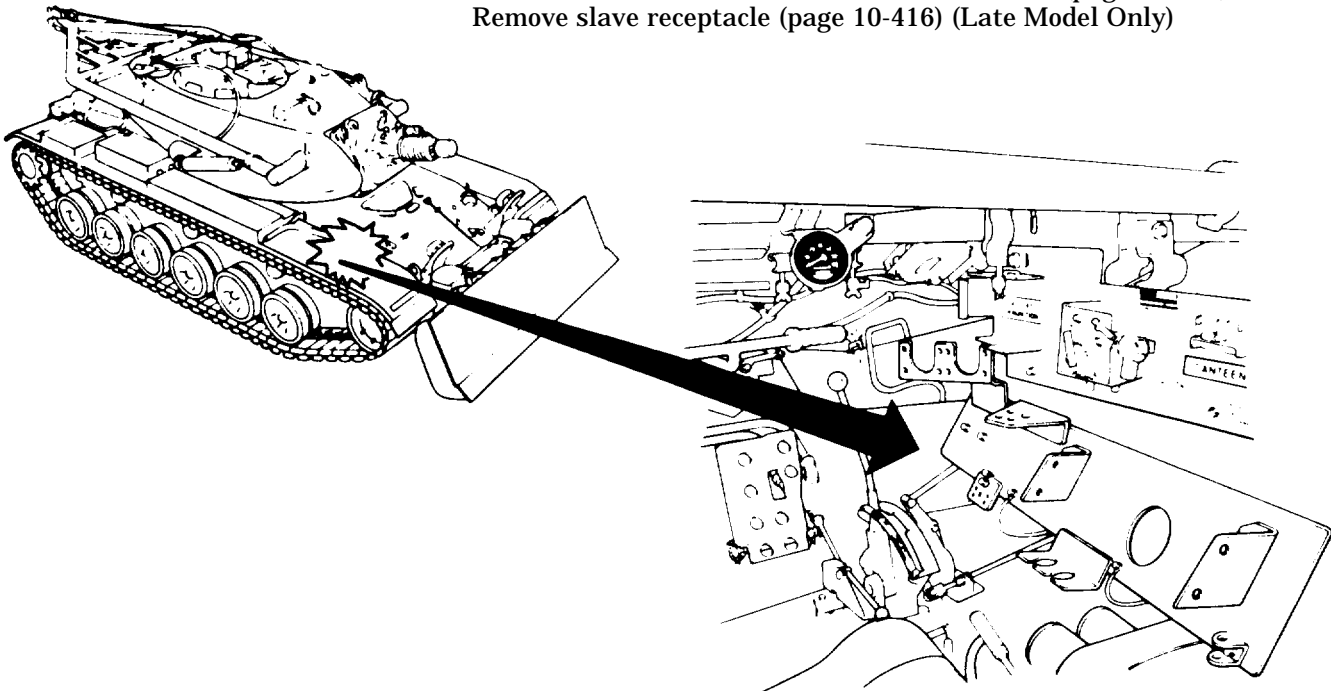
PROCEDURE INDEX

PROCEDURE	PAGE
Removal	10-153
Installation	10-154

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
 7/16 in. combination box and open end wrench
 Cross-tip screwdriver

SUPPLIES: Lockwasher (MS35338-46) (7 required)
 Lockwasher (MS35338-44) (2 required)

- PRELIMINARY PROCEDURES:
- Remove master control panel (page 10-48)
 - Remove gage indicator panel (page 10-123)
 - Remove bilge pump stowage receptacle (page 10-150) (if equipped)
 - Remove machine gun stowage bracket assembly (page 17-5)
 - Remove personnel heater fuel pump (page 7-67)
 - Remove driver intercommunications connectors (page 10-351)
 - Remove slave receptacle (page 10-416) (Late Model Only)



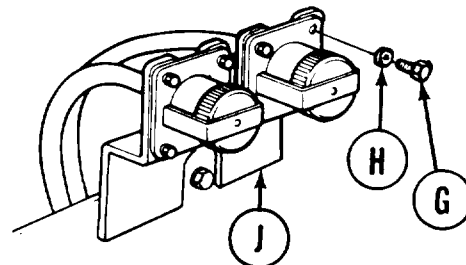
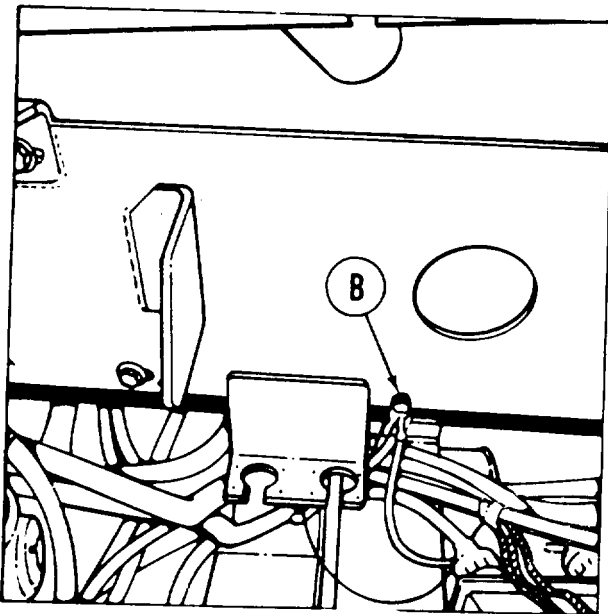
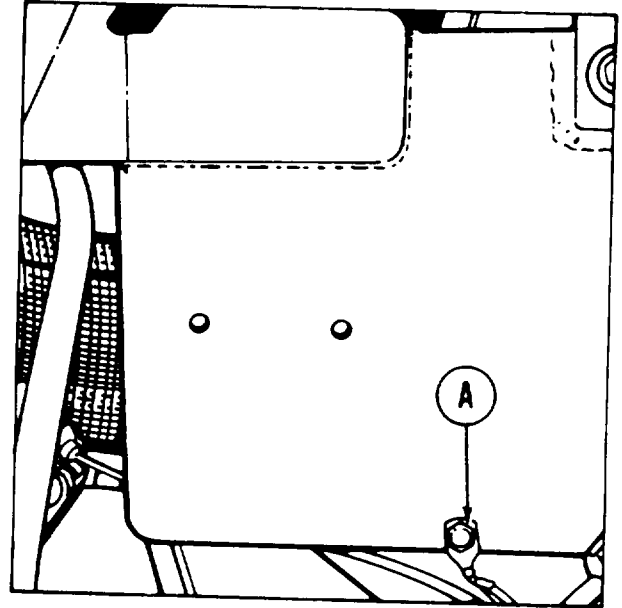
Go on to Sheet 2

TA253327

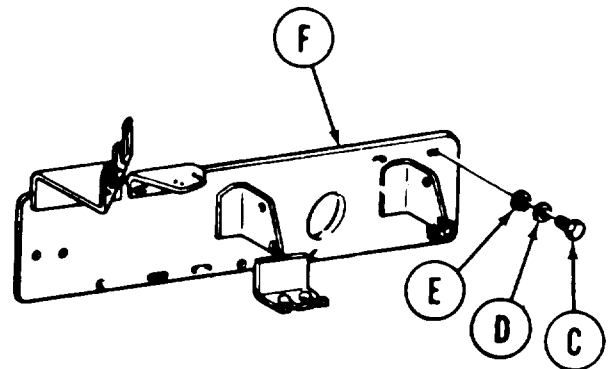
MASTER CONTROL PANEL PLATE ASSEMBLY REPLACEMENT (Sheet 2 of 4)

REMOVAL:

- 1 Using wrench to hold nut, use 7/16 inch wrench to remove screw (A) holding ground lead, Throw lockwasher away.
2. Using wrench to hold nut, use 7/16 inch wrench to remove screw (B) holding ground lead. Throw lockwasher away



3. Using 9/16 inch socket, remove seven screws (C), lockwashers (D), washers (E) holding plate (F). Throw lockwashers away.
4. Using socket, remove eight screws (G) and washers (H).
5. Lift two slave receptacles (J) upward and out of mounting bracket.
6. Remove plate (F) from vehicle.



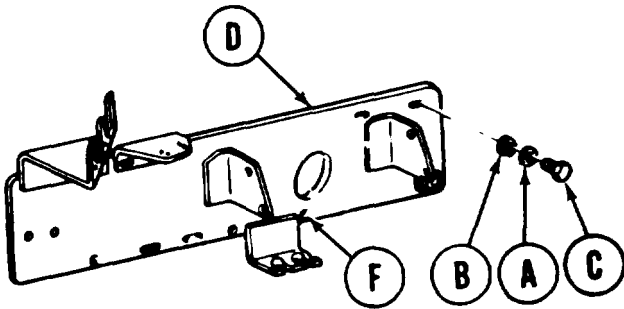
Go on to Sheet 3

TA139709

MASTER CONTROL PANEL PLATE ASSEMBLY REPLACEMENT (Sheet 3 of 4)

INSTALLATION:

1. Position new lockwashers (A) and washers (B) onto seven new screws (C).



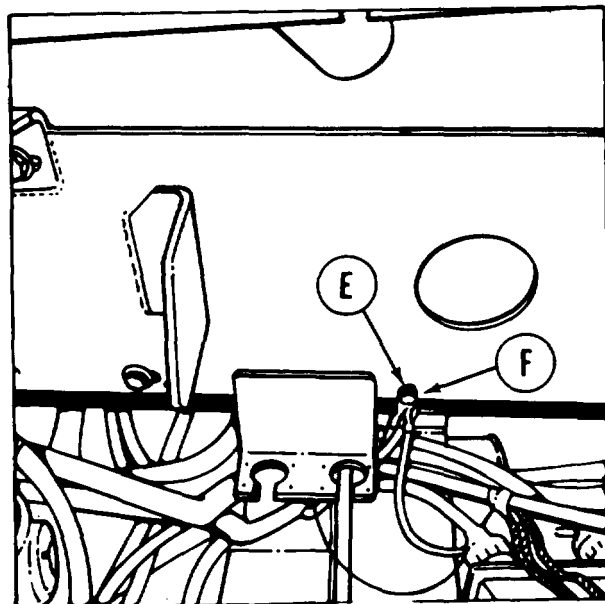
2. Manually position new plate (D).

3. Manually start seven screws (C) with new lockwashers (A) and washers (B) through plate (D) and into mounting holes.

4. Using socket, install seven screws (C).

5. Placing ground lead onto screw (D), insert screw (E) into mounting hole (F) in plate (D).

6. Place new lockwasher onto screw (E).



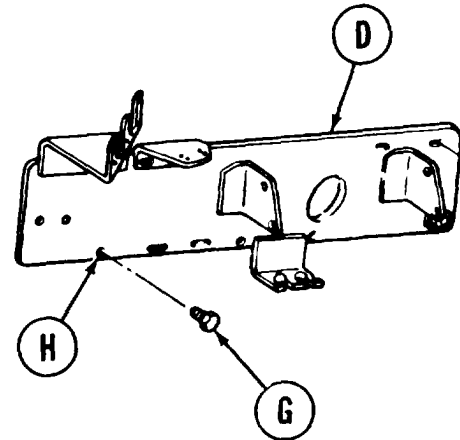
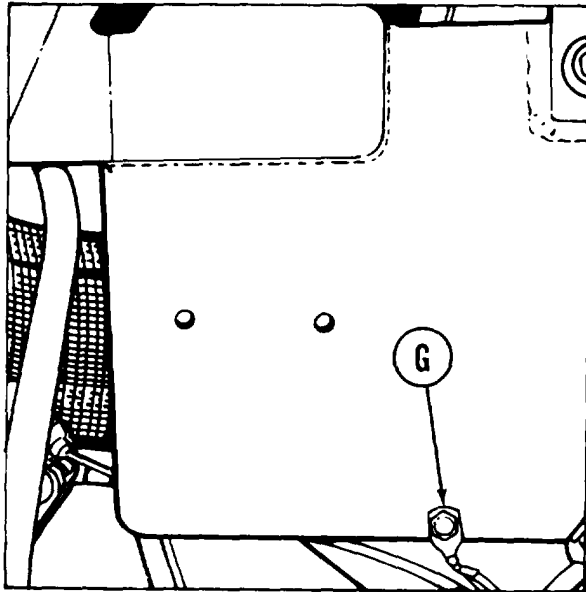
7. Using wrench to hold nut, use 7/16 inch socket to install screw (E).

Go on to Sheet 4

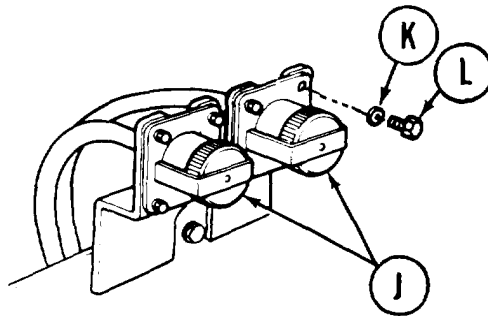
TA13971O

MASTER CONTROL PANEL PLATE ASSEMBLY REPLACEMENT (Sheet 4 of 4)

8. Placing ground lead onto screw (G), insert screw (G) into mounting hole (H) in plate (D).
9. Place new lockwasher onto screw (G).



10. Using wrench to hold nut, use 7/16 inch socket to install screw (G).
11. Place two slave receptacles (J) into cutouts in mounting bracket.
12. Install eight washers (K) and screws (L). Using socket, tighten screws.
11. Install driver intercommunications connectors (page 10-354).
12. Install personnel heater fuel pump (page 7-69).



13. Install machine gun stowage bracket assembly (page 17-5).
14. Install bilge pump stowage receptacle (page 10-151). (if required),
15. Install gage indicator panel (page 10-122).
16. Install master control panel (page 10-50).
17. Install slave receptacle (page 10-416) (Late Model Only).

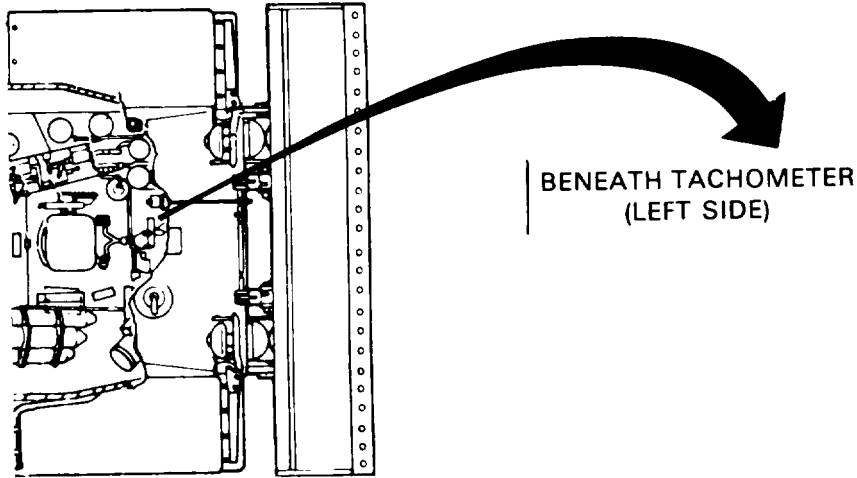
End of Task

TA253328

INFRA-RED RECEPTACLE/PASSIVE HARNESS STOWAGE ASSEMBLY REPLACEMENT
(Sheet 1 of 1)

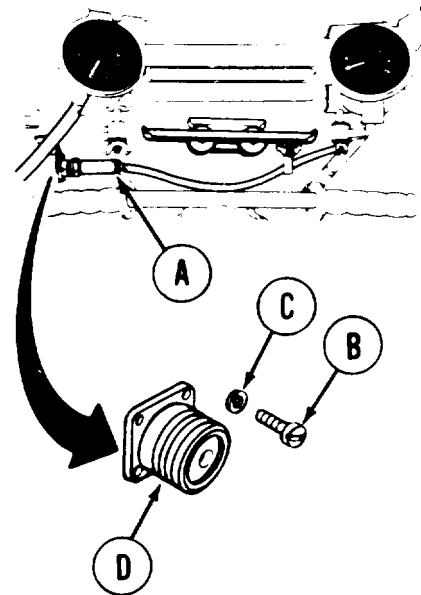
TOOLS: Flat-tip screwdriver

SUPPLIES: Lockwasher (MS35338-40) (4 required)



NOTE

Be sure MASTER BATTERY switch is OFF.



REMOVAL:

1. Remove electrical connector (A).
2. Using screwdriver, remove four screws (B) and lockwashers (C). Throw lockwashers away.
3. Remove receptacle (D).

INSTALLATION:

1. Place receptacle (D) in position.
2. Using screwdriver, install four screws (B) and new lockwashers (C).
3. Install electrical connector (A).

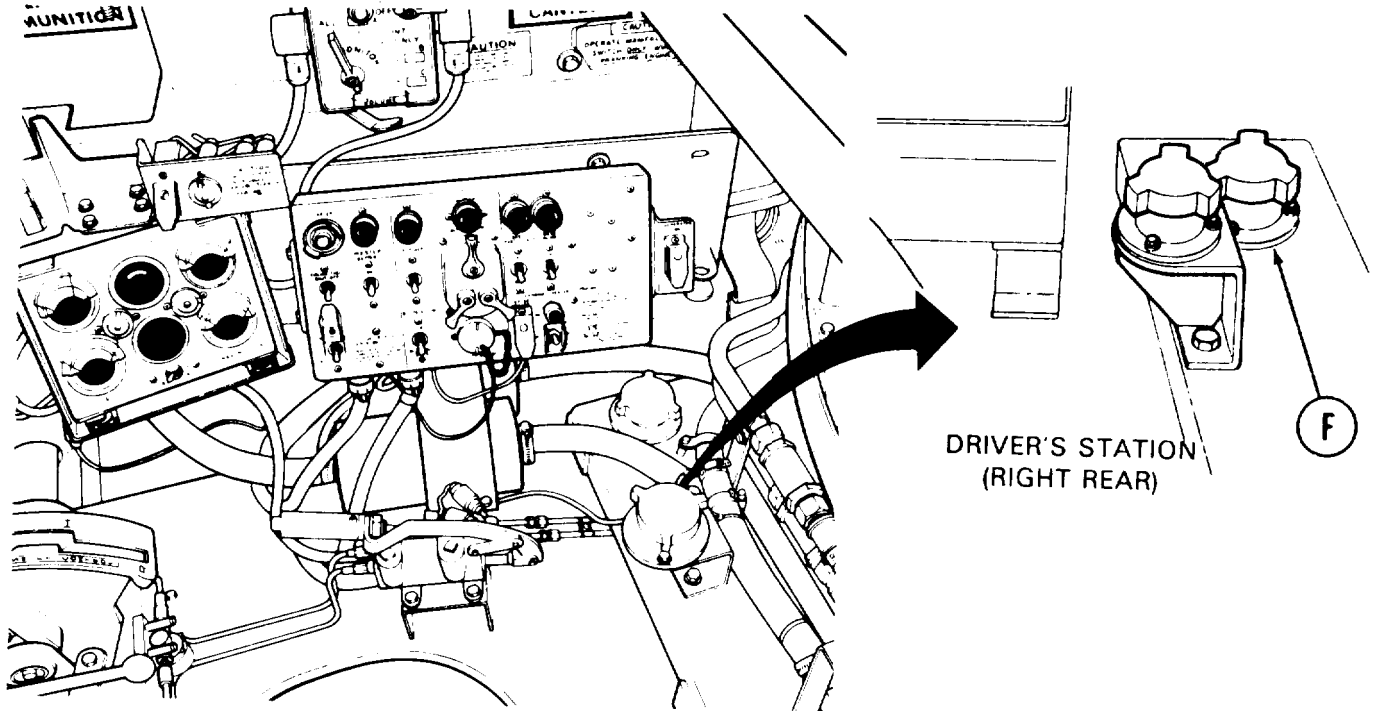
End of Task

TA253329

HEADLIGHT STOWAGE LAMPHOLDER REPAIR AND REPLACEMENT (Sheet 1 of 2)

TOOLS: Flat-tip screwdriver
 3/8 in. combination box and open end wrench

SUPPLIES: Spring clip (7739925)
 Lockwasher (MS35338-44) (3 required)

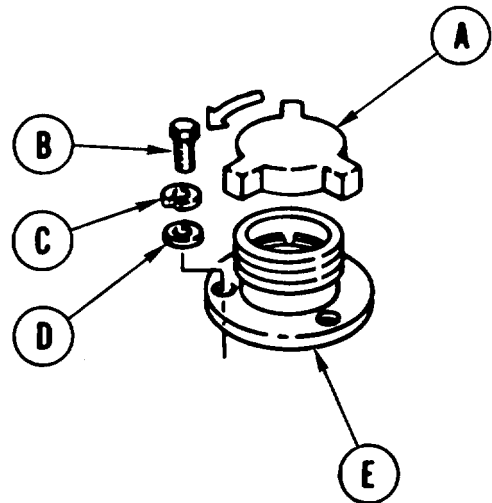


NOTE

There are two lampholders at driver's station. Removal and installation are the same for each lampholder.

REMOVAL:

1. Using hand, remove dust cap (A) by turning counterclockwise.
2. Using wrench, remove three screws (B), lockwashers (C), and flat washers (D). Throw lockwashers away.
3. Remove lampholder (E).



Go on to Sheet 2

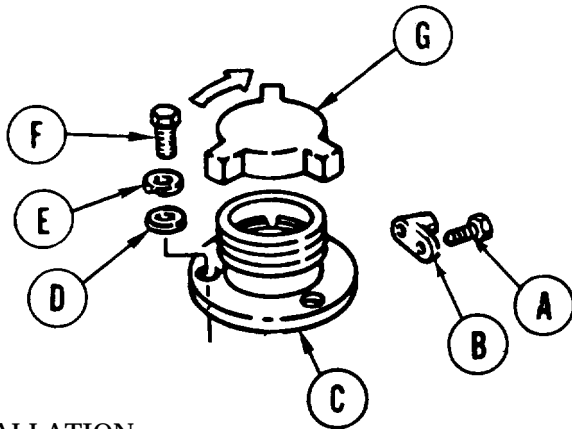
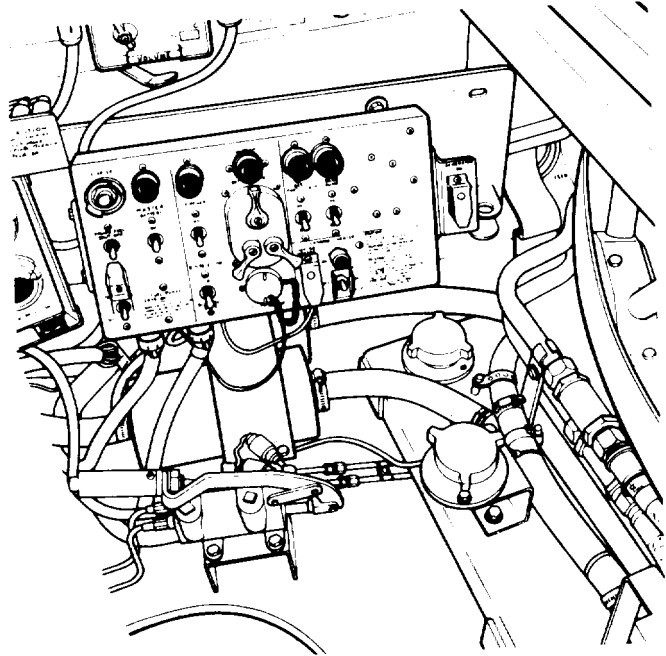
HEADLIGHT STOWAGE LAMPHOLDER REPAIR AND REPLACEMENT (Sheet 2 of 2)

DISASSEMBLY:

1. Using screwdriver, remove two screws (A) with assembled lockwashers.
2. Remove defective spring clip (B) from lampholder (C) and throw it away.

ASSEMBLY:

1. Place new spring clip (B) in position on lampholder (C).
2. Using screwdriver, install two screws (A) with assembled lockwashers.



INSTALLATION:

1. Place lampholder (C) in position at mounting location.
2. Using wrench, install three flat washers (D), new lockwashers (E), and screws (F).
3. Manually install dust cap (G) by turning clockwise.

End of Task

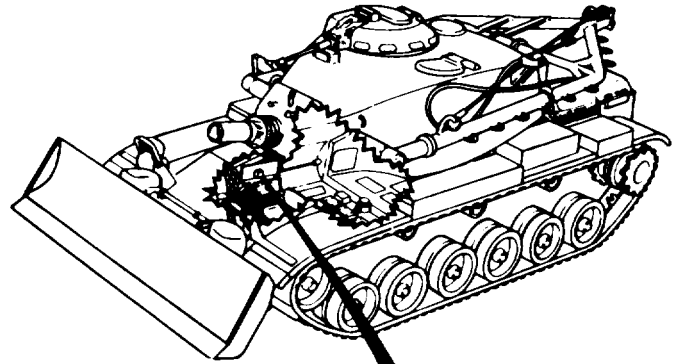
TA139714

HYDRAULIC PUMP SWITCH REPLACEMENT (Sheet 1 of 1)

TOOLS: Flat-tip screwdriver

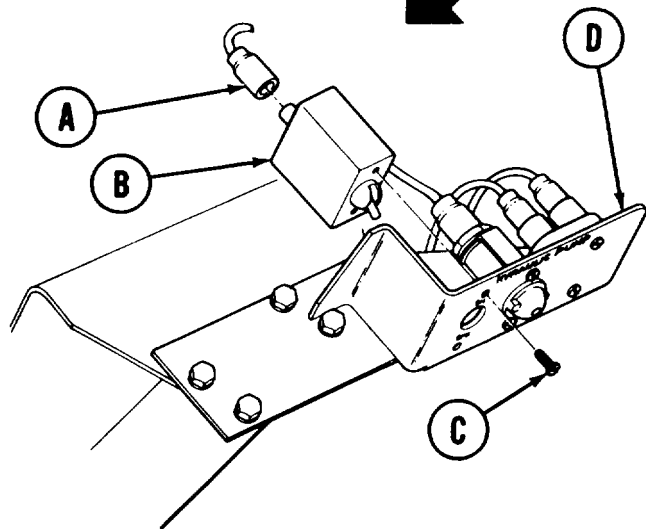
REMOVAL:

1. Disconnect connector (A) from switch (B).
2. Using screwdriver, remove two screws (C).
3. Remove switch (B) from bracket (D).



INSTALLATION:

1. Position switch (B) in bracket (D) and start two screws (C),
2. Using screwdriver, tighten two screws (C).
3. Install connector (A) on switch (B).



End of Task

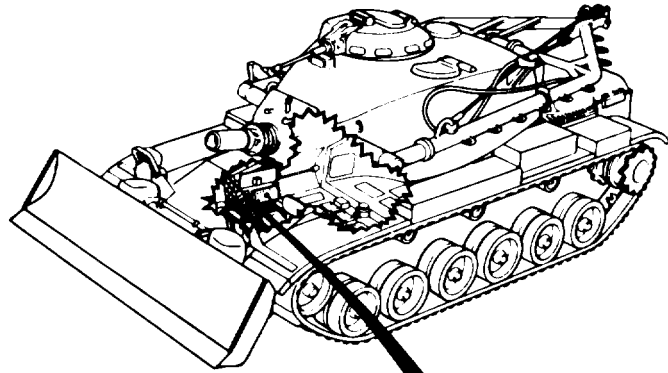
TA139715

HYDRAULIC PUMP CIRCUIT BREAKER REPLACEMENT (Sheet 1 of 1)

TOOLS: Flat-tip screwdriver

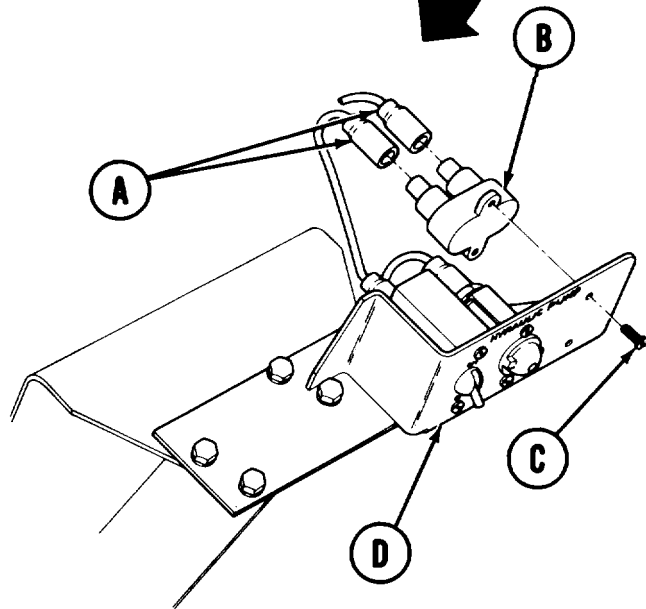
REMOVAL:

1. Disconnect two connectors (A) from circuit breaker (B).
2. Using screwdriver, remove two screws (C).
3. Remove circuit breaker (B) from bracket (D).



INSTALLATION:

1. Position circuit breaker on bracket (D), and start two screws (C).
2. Using screwdriver, tighten two screws (C).
3. Install two connectors (A) on circuit breaker (B).



End of Task

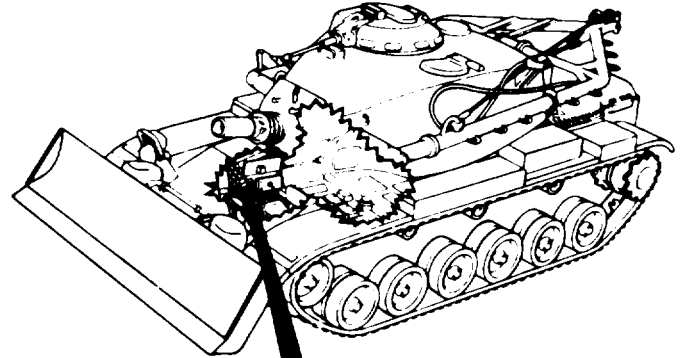
TA139716

HYDRAULIC PUMP INDICATOR LIGHT REPLACEMENT (Sheet 1 of 1)

TOOLS: Flat-tip screwdriver

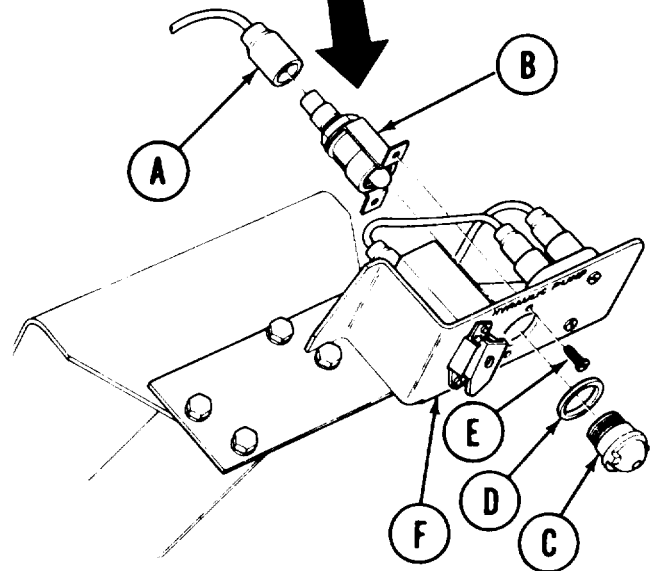
REMOVAL:

1. Disconnect connector (A) from indicator light (B).
2. Turn lens (C) counterclockwise. Remove lens (C) and gasket (D).
3. Using screwdriver, remove two screws (E).
4. Remove indicator light (B) from bracket (F).



INSTALLATION:

1. Position indicator light (B) in bracket (F), and start two screws (E).
2. Using screwdriver, start two screws (E).
3. Install gasket (D) and lens (C) on indicator light. Turn lens clockwise until tight.
4. Install connector (A) on indicator light (B).



End of Task

TA139717

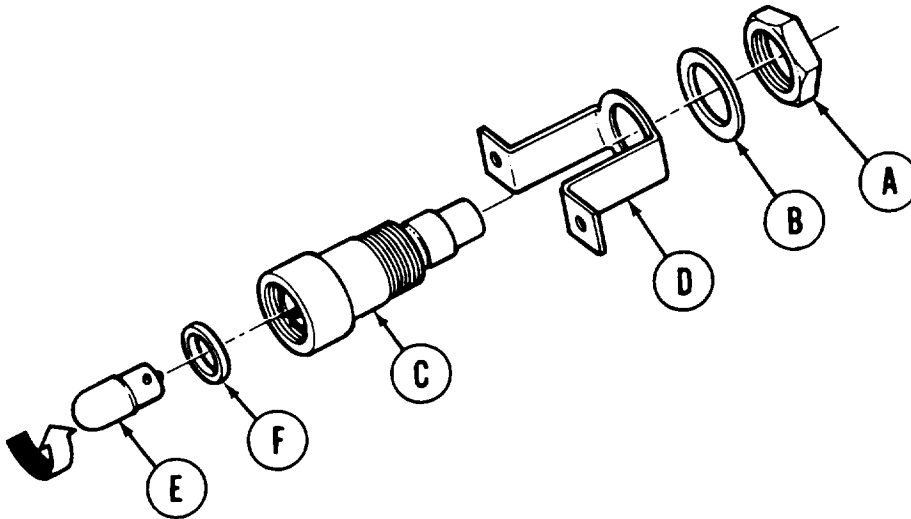
HYDRAULIC PUMP INDICATOR LIGHT REPAIR (Sheet 1 of 2)

TOOLS: 7/16 in. combination box and open end wrench

PRELIMINARY PROCEDURE: Remove indicator light from vehicle (page 10-161)

DISASSEMBLY:

1. Using wrench, remove nut (A) and lockwasher (B) from light assembly (C).
2. Remove bracket (D) from light assembly (C).
3. Push in lightly on lamp (E), turn counterclockwise, and remove.
4. Jar light assembly (C) against palm of hand to remove gasket (F).



Go on to Sheet 2

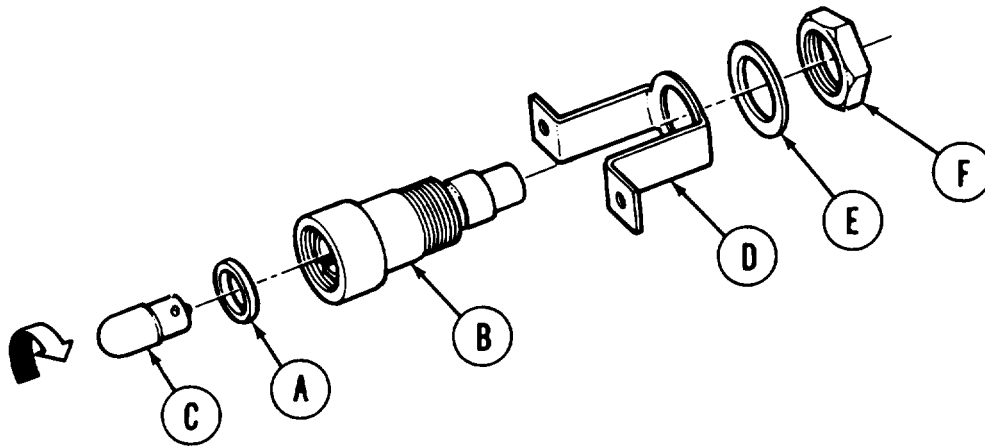
TA139718

HYDRAULIC PUMP INDICATOR LIGHT REPAIR (Sheet 2 of 2)

INSPECTION:

Inspect all parts for damage or corrosion. Replace any damaged or corroded part.

ASSEMBLY:



1. Insert gasket (A) in light assembly (B).
2. Install lamp (C) in light assembly (B), push lamp (C) lightly, and turn clockwise.
3. Install bracket (D) and lockwasher (E) on light assembly (B).
4. Using wrench, install and tighten nut (F).
5. Install indicator light in vehicle (page 10-161).

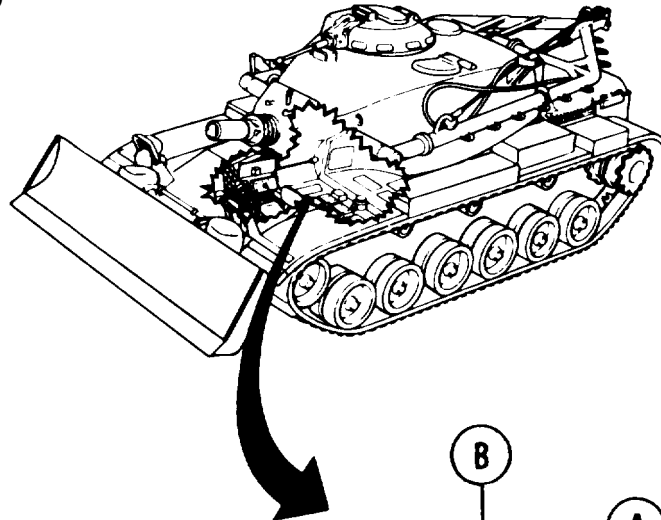
End of Task

TA139719

HYDRAULIC PUMP SWITCH BRACKET REPLACEMENT (EARLY MODEL) (Sheet 1 of 2)

TOOLS: Flat-tip screwdriver
7/16 in. socket with 3/8 in. drive
Ratchet with 3/8 in. drive

SUPPLIES: lockwashers (MS35333-40) (4 required)



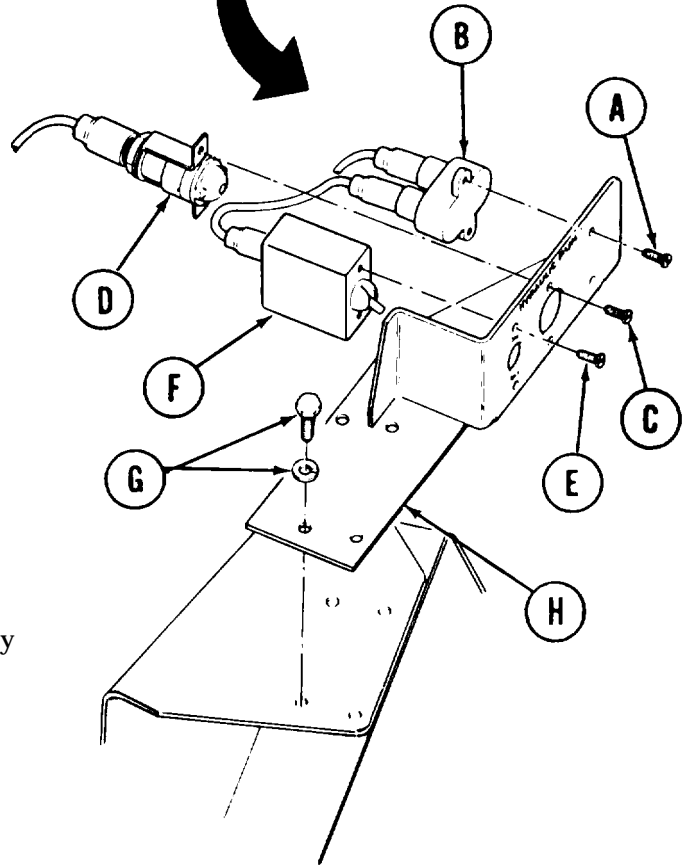
REMOVAL:

1. Using screwdriver, remove two screws (A) to release circuit breaker (B).
2. Using screwdriver, remove two screws (C) to release indicator light (D).
3. Using screwdriver, remove two screws (E) to release switch (F).

CAUTION

Support instrument panel cluster assembly before removing screws. Screws are common attaching hardware.

4. Using socket and ratchet, remove four screws and lockwashers (G). Throw lockwashers away
5. Remove bracket (H).

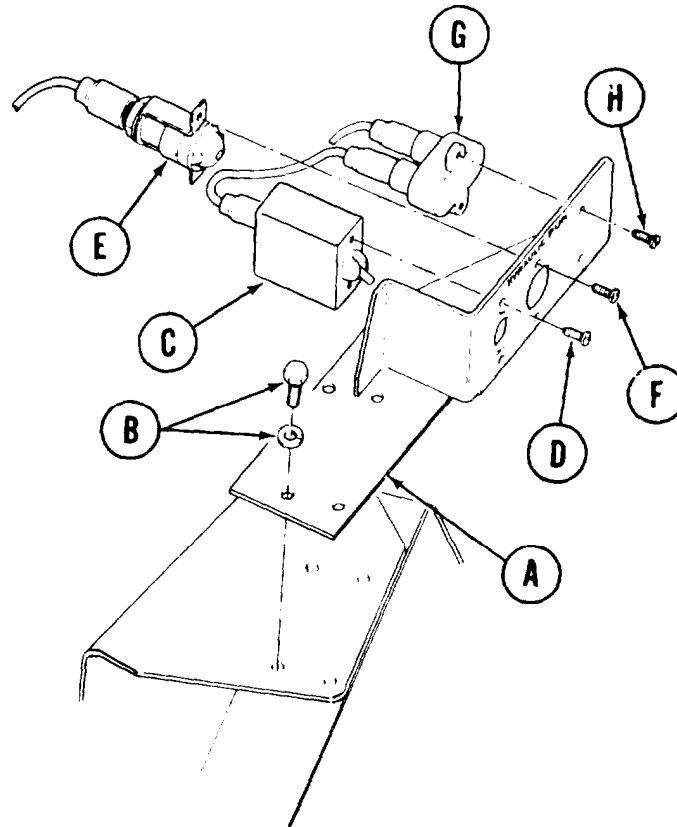


Go on to Sheet 2

TA253330

HYDRAULIC PUMP SWITCH BRACKET REPLACEMENT (EARLY MODEL) (Sheet 2 of 2)

INSTALLATION:



1. Position bracket (A) and start four screws and new lockwashers (B).
2. Using socket and ratchet, tighten four screws and lockwashers (B).
3. Place switch (C) in position and start two screws (D).
4. Using screwdriver, tighten two screws (D).
5. Place indicator light (E) in position and start two screws (F).
6. Using screwdriver, tighten two screws (F).
7. Place circuit breaker (G) in position and start two screws (H).
8. Using screwdriver, tighten two screws (H).

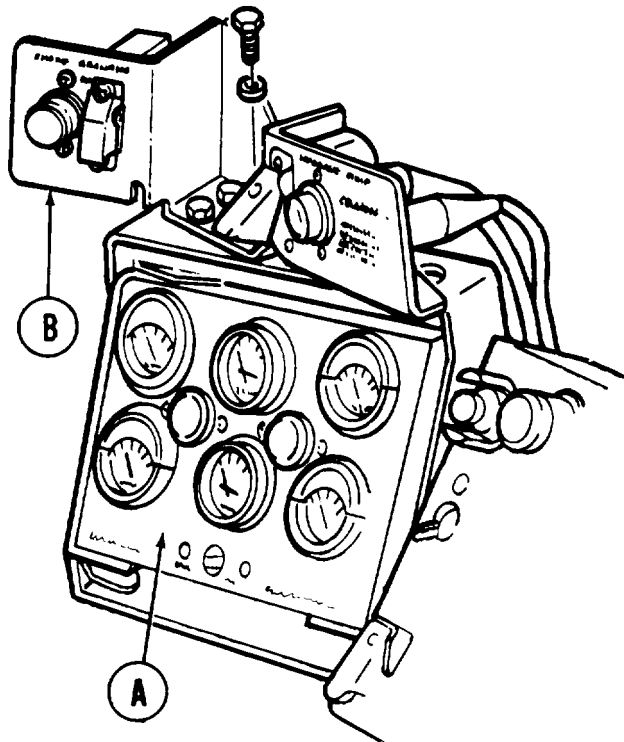
End of Task

TA253331

Change 1

10-165

SMOKE GENERATOR/HYDRAULIC PUMP SWITCH BRACKET REPLACEMENT (Sheet 1 of 1)



REMOVAL:

1. Remove hydraulic pump switch (page 10-159).
2. Remove hydraulic pump circuit breaker (page 10-160).
3. Remove hydraulic pump indicator light (page 10-161).
4. Remove smoke generator switch and guard (page 23-2).
5. Remove smoke generator indicator light (page 23-5).
6. Displace instrument panel cluster assembly (A) (page 10-121).
7. Discard switch bracket (B).

INSTALLATION:

1. Install instrument panel cluster assembly (A) and new switch bracket (B) (page 10-122).
2. Install smoke generator indicator light (page 23-7).
3. Install smoke generator switch and guard (page 23-3).
4. Install hydraulic pump indicator light (page 10-161).
5. Install hydraulic pump circuit breaker (page 10-160).
6. Install hydraulic pump switch (page 10-159).

End of Task

TA253332

Change 1

10-166

TM 9-2350-222-20-1-4

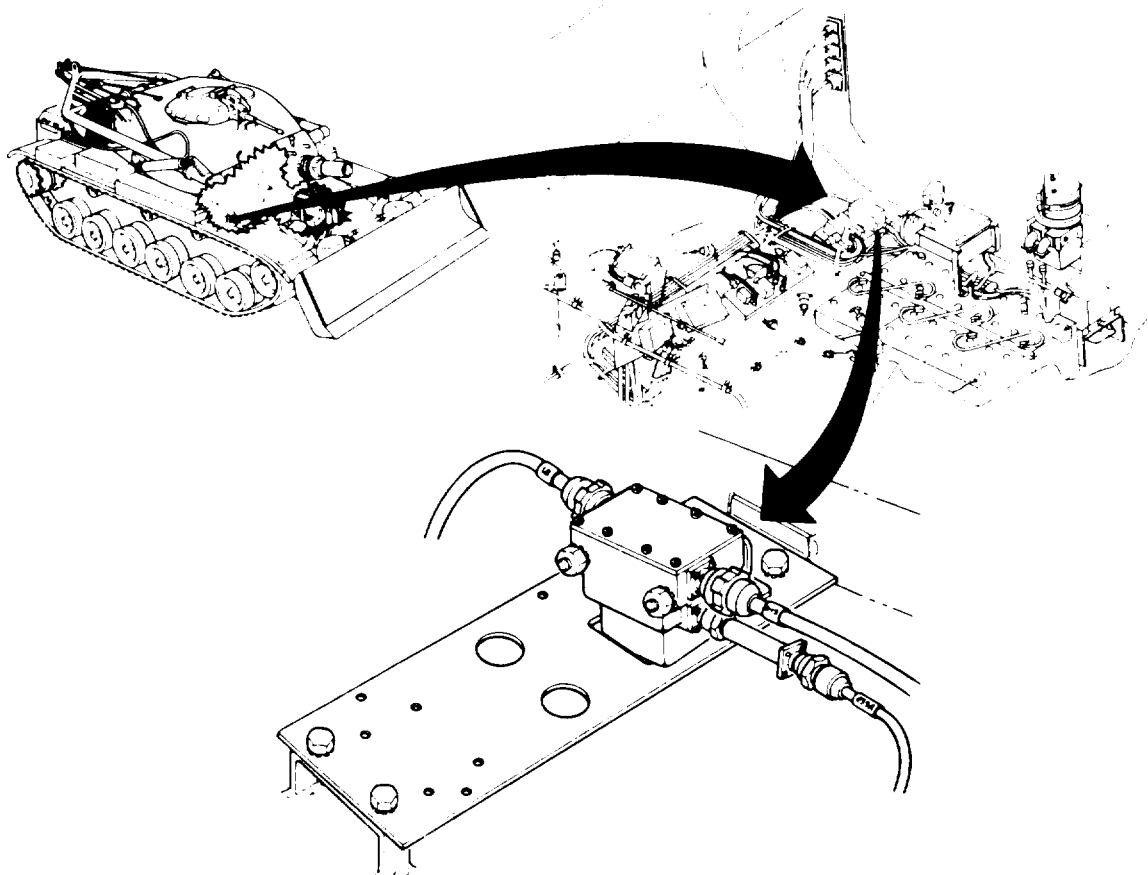
MASTER RELAY REPLACEMENT (Sheet 1 of 3)

TOOLS: Ratchet with 1/2 in. drive
1/2 in. socket with 1/2 in. drive
3/4 in. combination box and open end wrench
7/8 in. combination box and open end wrench
Spanner wrench
1/2 in. combination box and open end wrench

SUPPLIES: Lockwasher (MS45904-72) (4 required)

REFERENCE: TM 9-2350-222-10

PRELIMINARY PROCEDURE: Disconnect three battery ground cable assemblies from battery terminals (page 10-284)
Manually traverse turret to expose master relay (TM 9-2350-222-10)



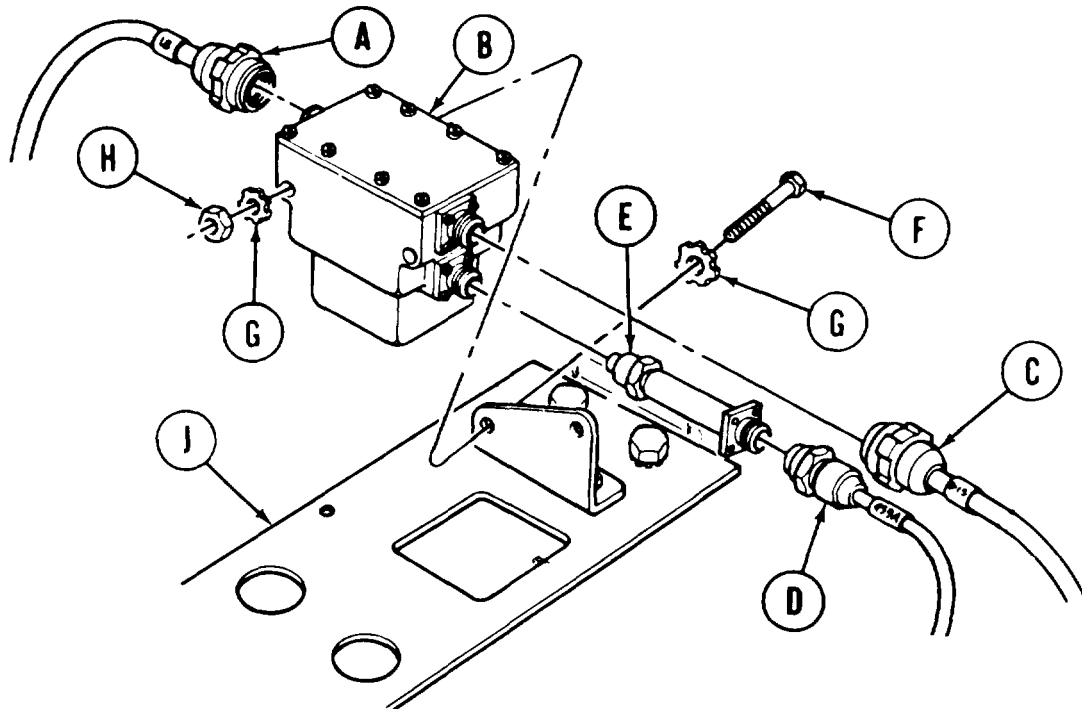
Go on to Sheet 2

TA253333

MASTER RELAY REPLACEMENT (Sheet 2 of 3)

REMOVAL:

1. Using spanner wrench, remove connector (A) from master relay (B).
2. Using spanner wrench, remove connector (C) from master relay (B).



3. Using 7/8 inch wrench, remove connector (D),

NOTE

Some vehicles do not have protection device (E). **If your vehicle does not have protection device (E), skip step 4 and go on to steps 5 and 6. If your vehicle does have protection device (E), continue with steps 4 through 6.**

4. Using 3/4 inch wrench, remove protection device (E) from master relay (B).
5. Using socket and 1/2 inch wrench, remove two bolts (F), four lockwashers (G), and two nuts (H). Throw lockwashers (G) away.
6. Remove master relay (B) from plate (J) and from vehicle.

Go on to Sheet 3

TA139723

MASTER RELAY REPLACEMENT (Sheet 3 of 3)

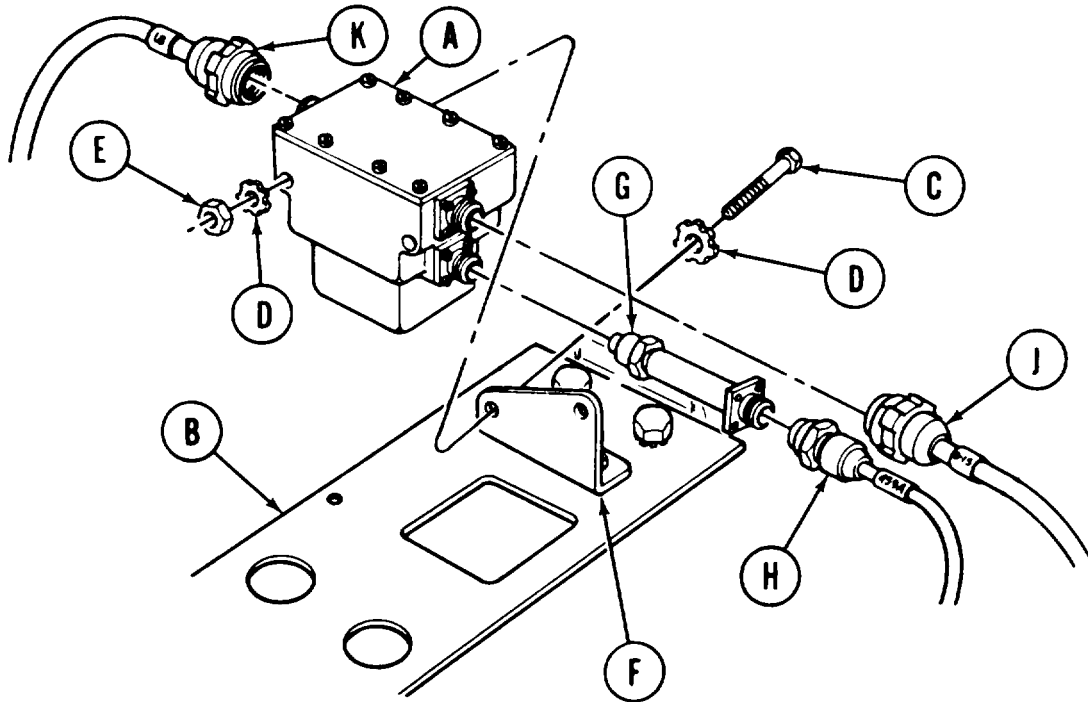
INSTALLATION:

1. Traverse turret to expose master relay. Position master relay (A) into plate (B).
2. Using socket, install two bolts (C), four new lockwashers (D), and two nuts (E) to hold master relay (A) to bracket (F).

NOTE

If your vehicle has protection device (G), continue with steps 3 through 7. If your vehicle does not have protection device (G), skip step 3 and continue with steps 4 through 7.

3. Using 3/4 inch wrench, install protection device (G) to master relay (A).
4. Using 7/8 inch wrench, install connector (H).



5. Using spanner wrench, install connector (J) to master relay (A).
6. Using spanner wrench, install connector (K) to master relay (A).
7. Connect three battery ground cable assemblies to battery terminals (page 10-285).

End of Task

TA139724

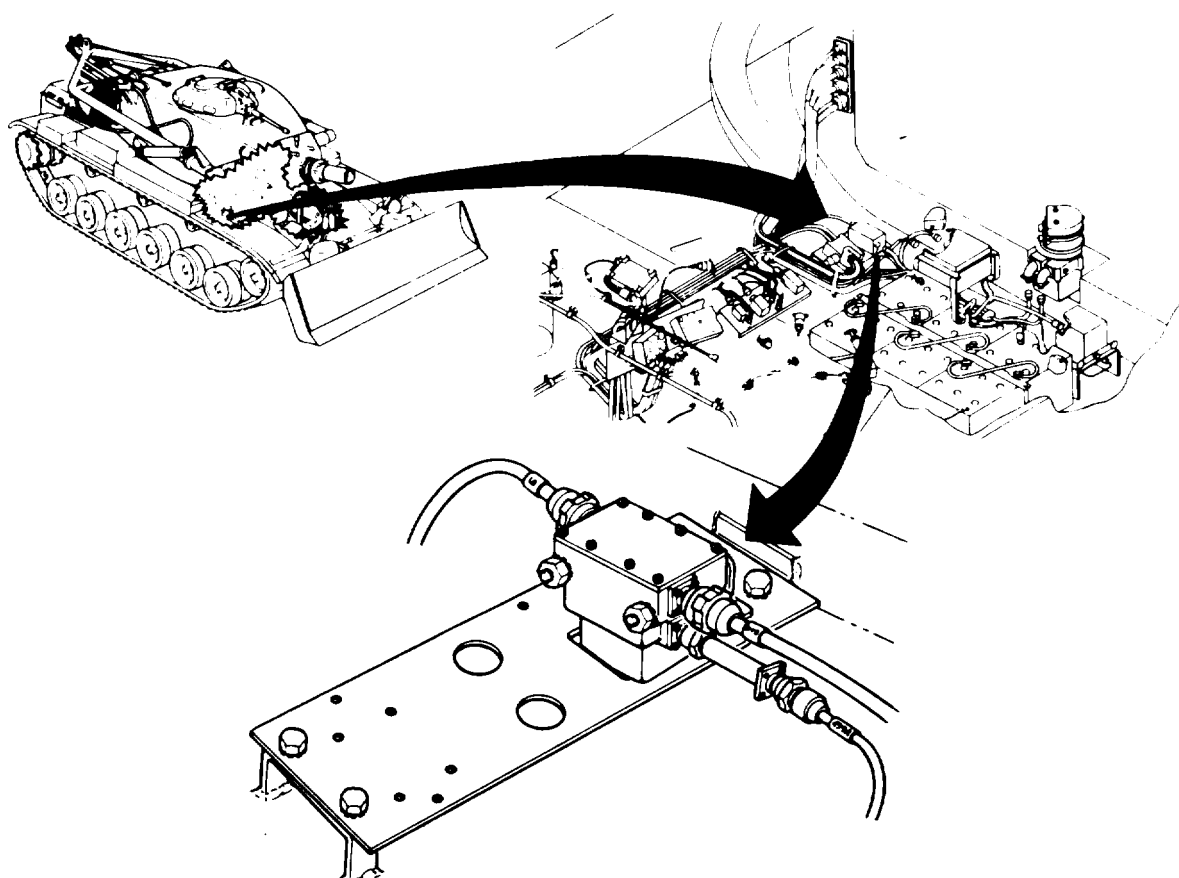
PROTECTION DEVICE REPLACEMENT (Sheet 1 of 3)

TOOLS: Spanner wrench

3/4 in. combination box and open end wrench

7/8 in. combination box and open end wrench

REFERENCE: TM 9-2350-222-10

PRELIMINARY PROCEDURES: Traverse turret for access to master relay (TM 9-2350-222-10)
Open turret platform access door (TM 9-2350-222-10)

Go on to Sheet 2

TA139725

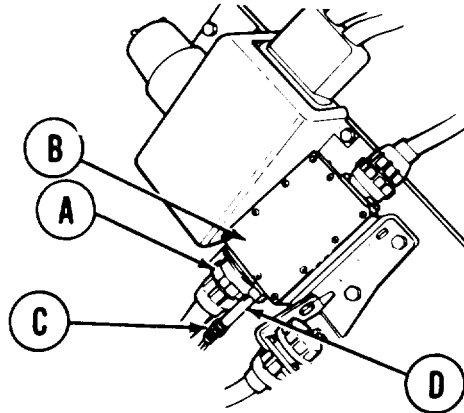
PROTECTION DEVICE REPLACEMENT (Sheet 2 of 3)

REMOVAL:

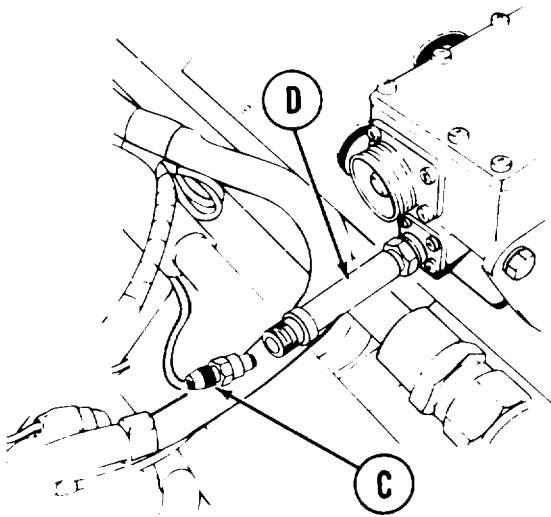
CAUTION

Make sure MASTER BATTERY switch is set to OFF before replacing protection device.

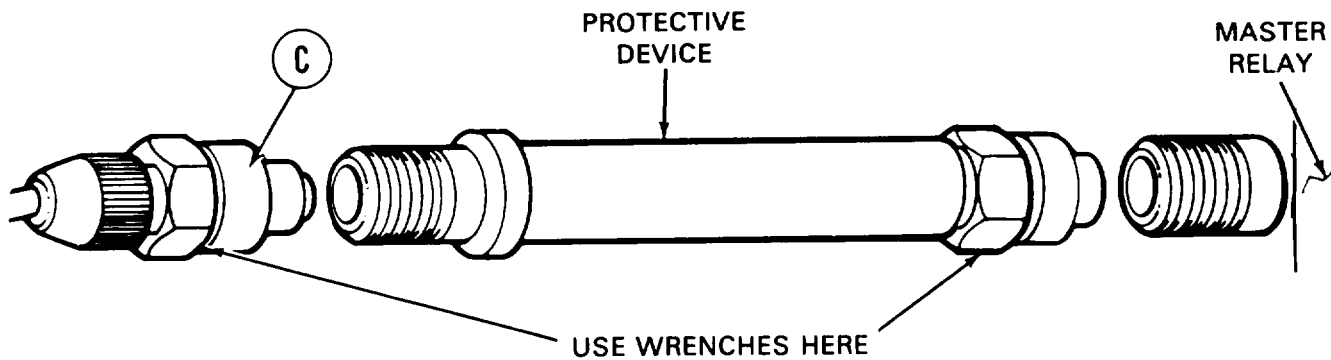
1. Using spanner wrench, loosen connector (A).
2. Manually remove connector (A) from master relay (B).



3. Using 7/8 inch wrench, loosen connector (C).
4. Manually remove connector (C) from protection device (D).



5. Using 3/4 inch wrench, remove protection device (D) from master relay (B).



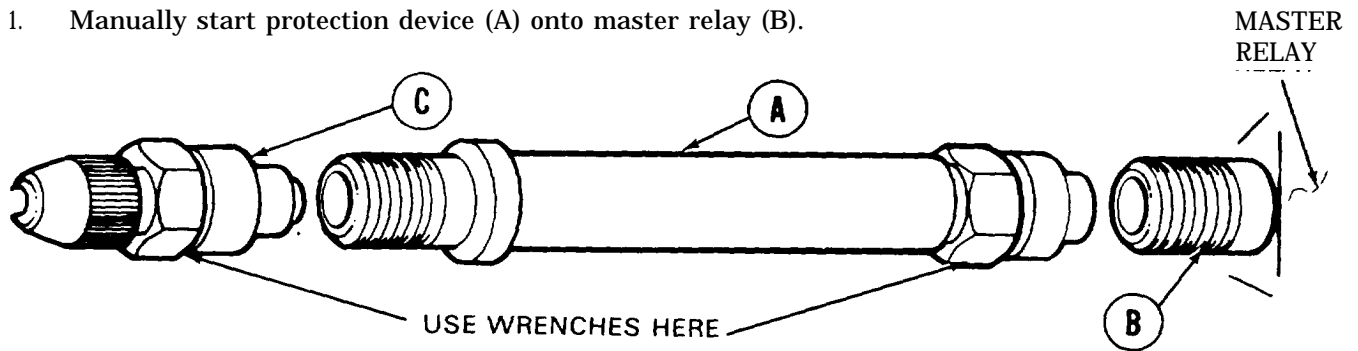
Go on to Sheet 3

TA139726

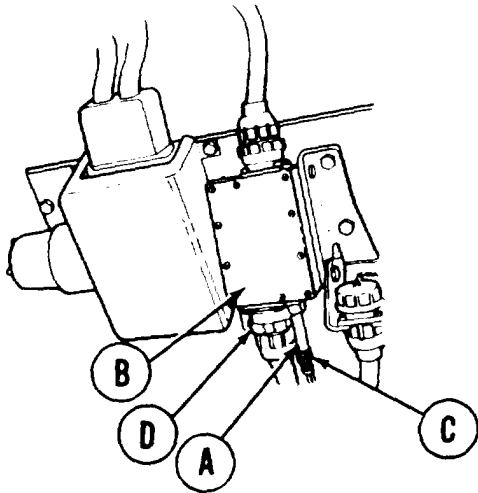
PROTECTION DEVICE REPLACEMENT (Sheet 3 of 3)

INSTALLATION:

1. Manually start protection device (A) onto master relay (B).



2. Using 3/4 inch wrench, install protection device (A) onto master relay (B).



3. Manually start connector (C) onto protection device (A).
4. Using 7/8 inch wrench, install connector (C).

5. Manually start connector (D) onto master relay (B).
6. Using spanner wrench, install connector (D).
7. Check out vehicle electrical system (TM 9-2350-222-10).
8. Close turret platform access door (TM 9-2350-222-10).

End of Task

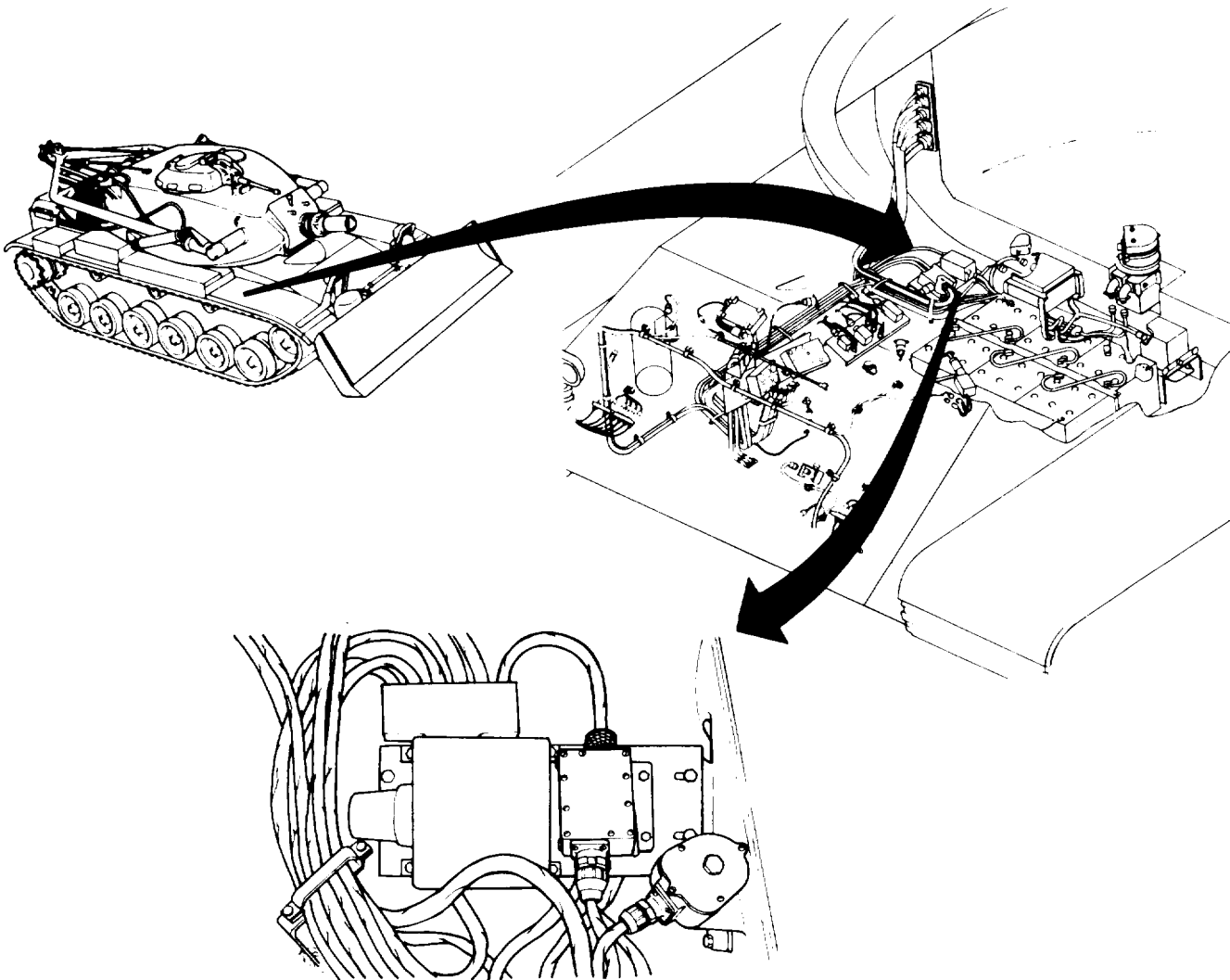
TA139727

STARTER RELAY ASSEMBLY REPLACEMENT (Sheet 1 of 3)

TOOLS: 7/16 in. socket with 1/2 in. drive
10 in. extension with 1/2 in. drive
Ratchet with 1/2 in. drive
3/4 in. socket with 1/2 in. drive
Torque wrench with 1/2 in. drive (0-175 lb-ft) (0-237 N-m)

REFERENCE: TM 9-2350-222-10

PRELIMINARY PROCEDURES: Disconnect three battery ground cable assemblies from battery terminals (page 10-284)
Manually traverse turret to expose starter relay (TM 9-2350-222-10)



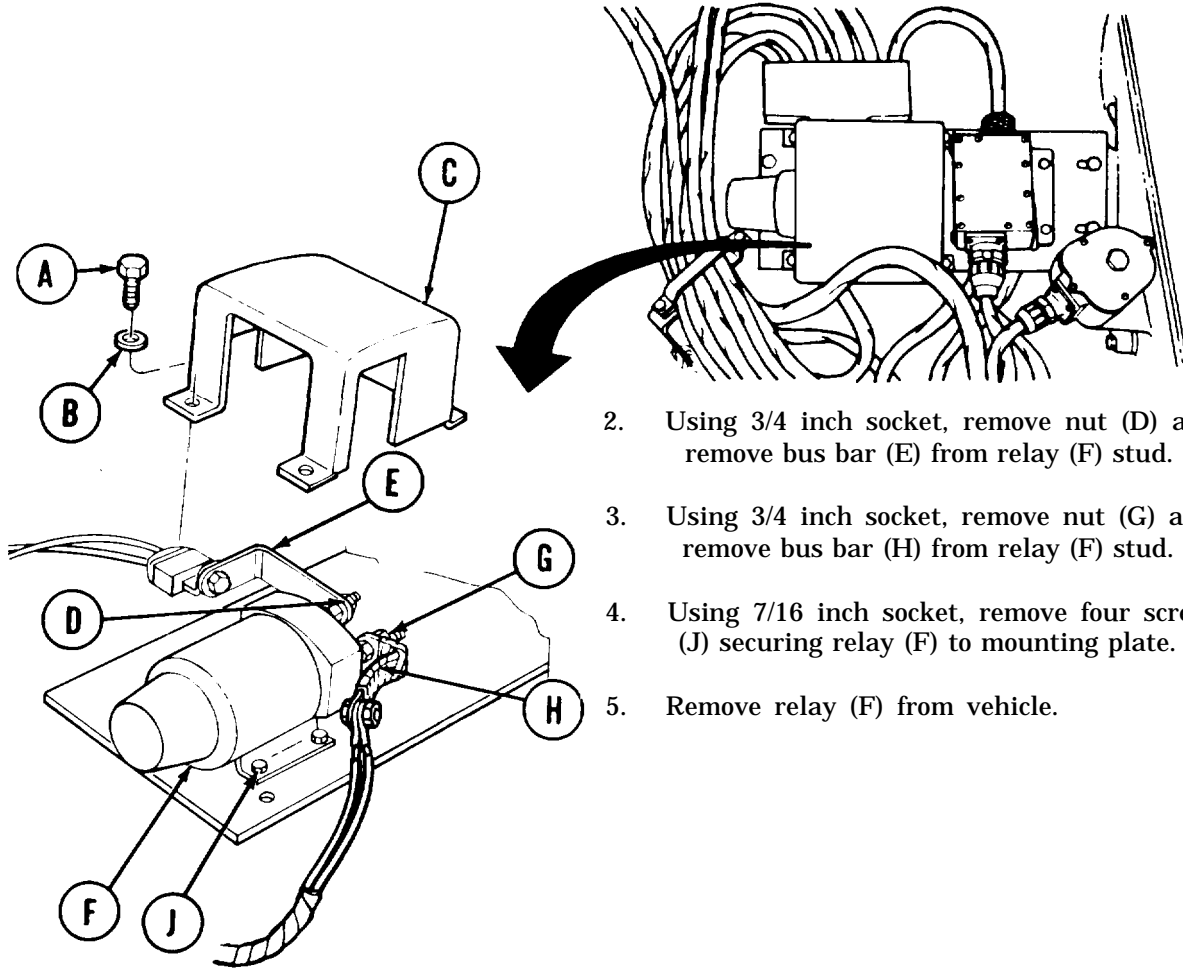
Go on to Sheet 2

TA139728

STARTER RELAY ASSEMBLY REPLACEMENT (Sheet 2 of 3)

REMOVAL:

1. Using 7/16 inch socket, remove three screws (A) and washers (B). Remove cover (C).



2. Using 3/4 inch socket, remove nut (D) and remove bus bar (E) from relay (F) stud.
3. Using 3/4 inch socket, remove nut (G) and remove bus bar (H) from relay (F) stud.
4. Using 7/16 inch socket, remove four screws (J) securing relay (F) to mounting plate.
5. Remove relay (F) from vehicle.

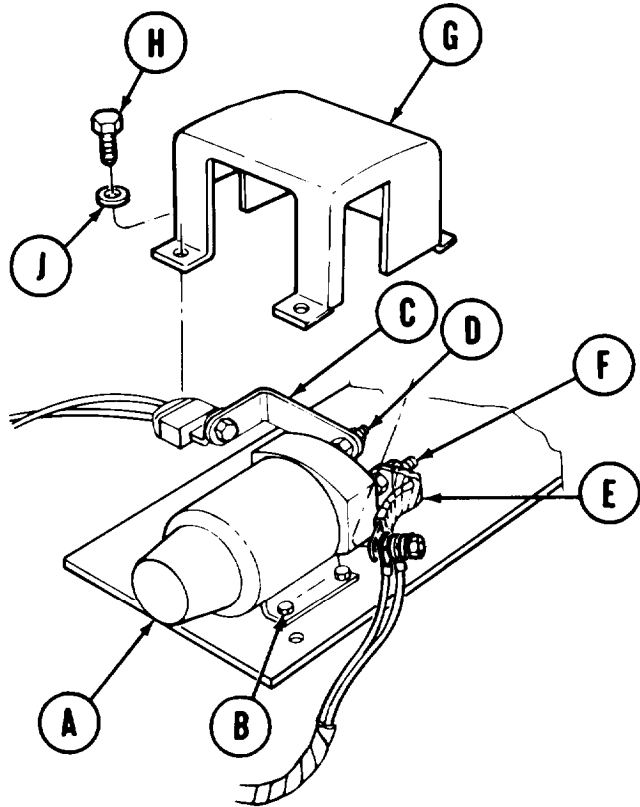
Go on to Sheet 3

TA139729

STARTER RELAY ASSEMBLY REPLACEMENT (Sheet 3 of 3)

INSTALLATION:

1. Position relay (A) onto mounting plate.
2. Using 7/16 inch socket, install and tighten four screws (B) securing relay (A) to mounting plate.
3. Install bus bar (C) onto relay (A) stud and install nut (D).
4. Install bus bar (E) onto relay (A) stud and install nut (F).
5. Using torque wrench and 3/4 inch socket, tighten nuts (D) and (F) 14 to 16 lb-ft. (18-20 N.m)
6. Position cover (G) over relay (A).



7. Using 7/16 inch socket, install and tighten three screws (H) and washers (J) securing cover (G) to mounting plate.
8. Connect three battery ground cable assemblies onto battery terminals (page 10-285).
9. Start engine (TM 9-2350-222-10).
10. Stop engine (TM 9-2350-222-10).

End of Task

TA139730

MASTER RELAY/STARTER RELAY MOUNTING PLATE REPLACEMENT (Sheet 1 of 2)

TOOLS: 9/16 in. socket with 1/2 in. drive
10 in. extension with 1/2 in. drive
Ratchet with 1/2 in. drive

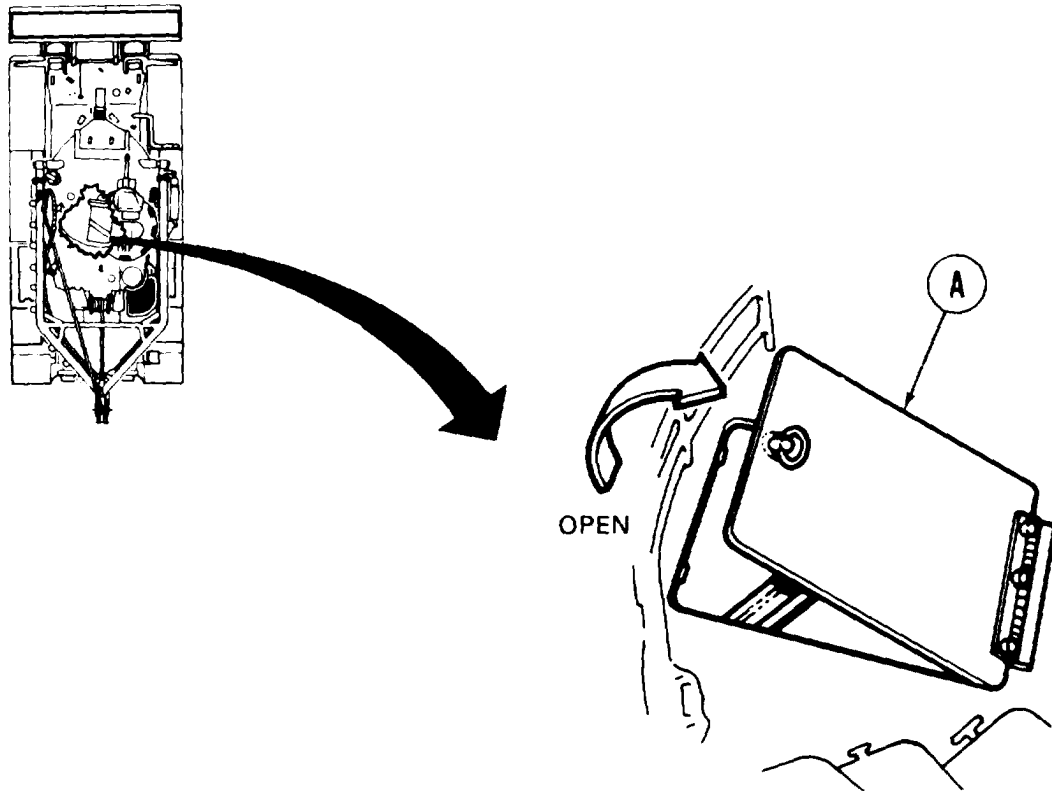
SUPPLIES: Lockwasher (MS35335-34) (4 required)

REFERENCE: TM 9-2350-222-10

PRELIMINARY PROCEDURES: Remove master relay (page 10-166)
Remove starter relay (page 10-172)

REMOVAL:

1. Open turret platform access cover (A) (TM 9-2350-222-10,.



Go on to Sheet 2

TA139731

10-175

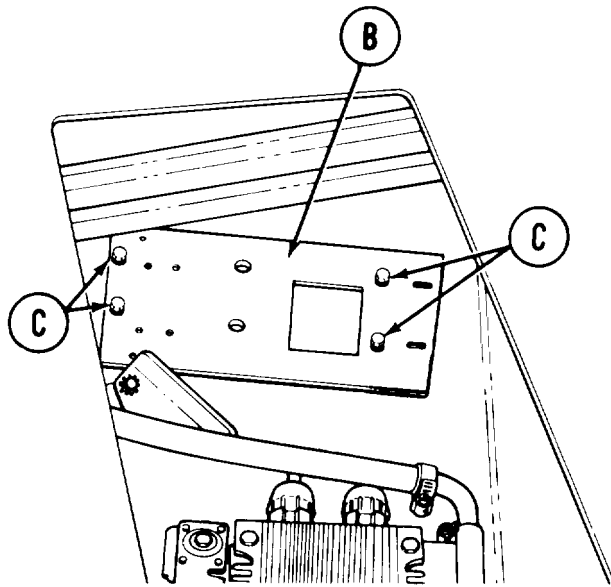
MASTER RELAY/STARTER RELAY MOUNTING PLATE REPLACEMENT (Sheet 2 of 2)

2. Manually traverse turret to gain access to plate (B).

NOTE

Manually traverse turret, as necessary, to gain access to screws (C).

3. Using socket, remove four screws and lockwashers (C) securing plate (B) to hull. Throw lockwashers away.
4. Remove plate (B) from vehicle.

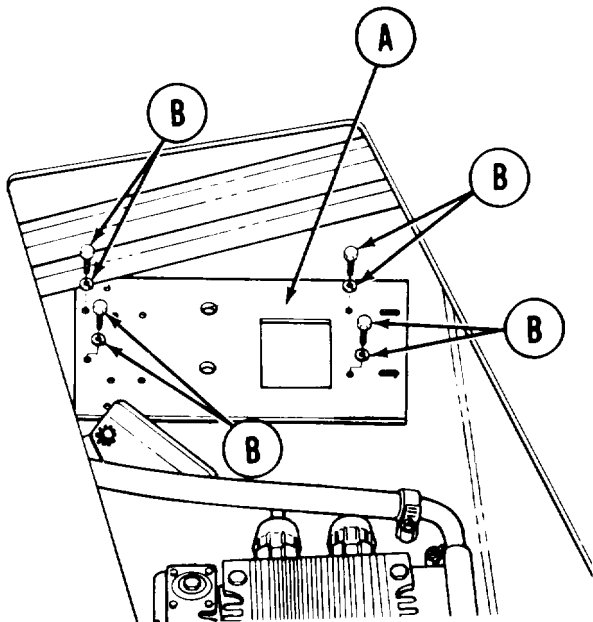


INSTALLATION:

1. Place plate (A) in position in vehicle.
2. Install four screws and new lockwashers (B) securing plate (A) to hull.

NOTE

Manually traverse turret, as necessary, to gain access to four screws (B).



3. Using socket, tighten four screws (B).
4. Install master relay (page 10-168).
5. Install starter relay (page 10-174).
6. Close turret platform access cover (TM 9-2350-222-10).

End of Task

TA139732

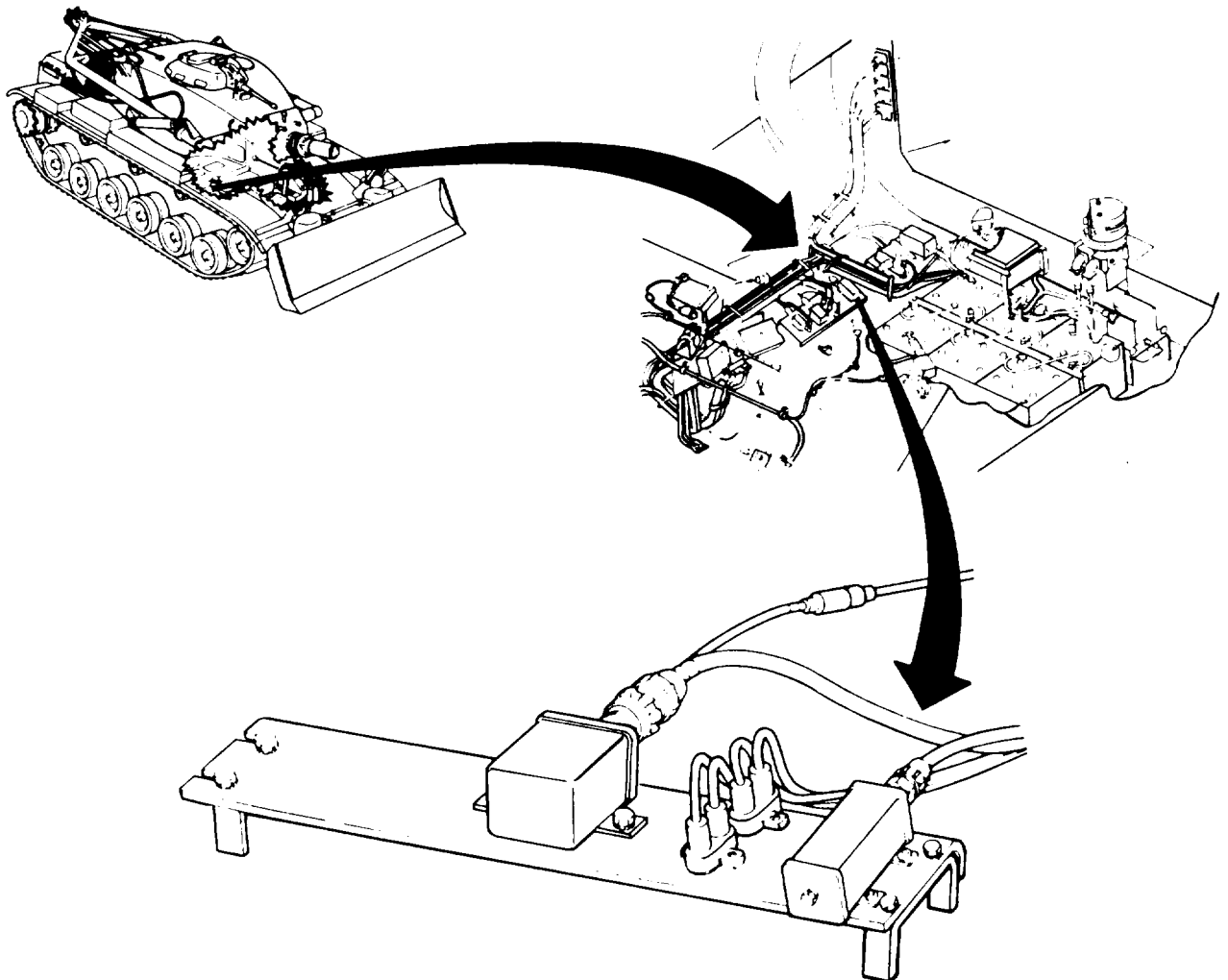
FIRE EXTINGUISHER RELAY REPLACEMENT (Sheet 1 of 3)

TOOLS: 12 in. adjustable wrench
Cross-tip screwdriver

SUPPLIES: Lockwashers (MS35335-31) (4 required)

REFERENCE: TM 9-2350-222-10

PRELIMINARY PROCEDURE: Disconnect three battery ground cable assemblies from battery terminals (page 10-284)
Manually traverse turret to expose fire extinguisher relay (TM 9-2350-222-10)



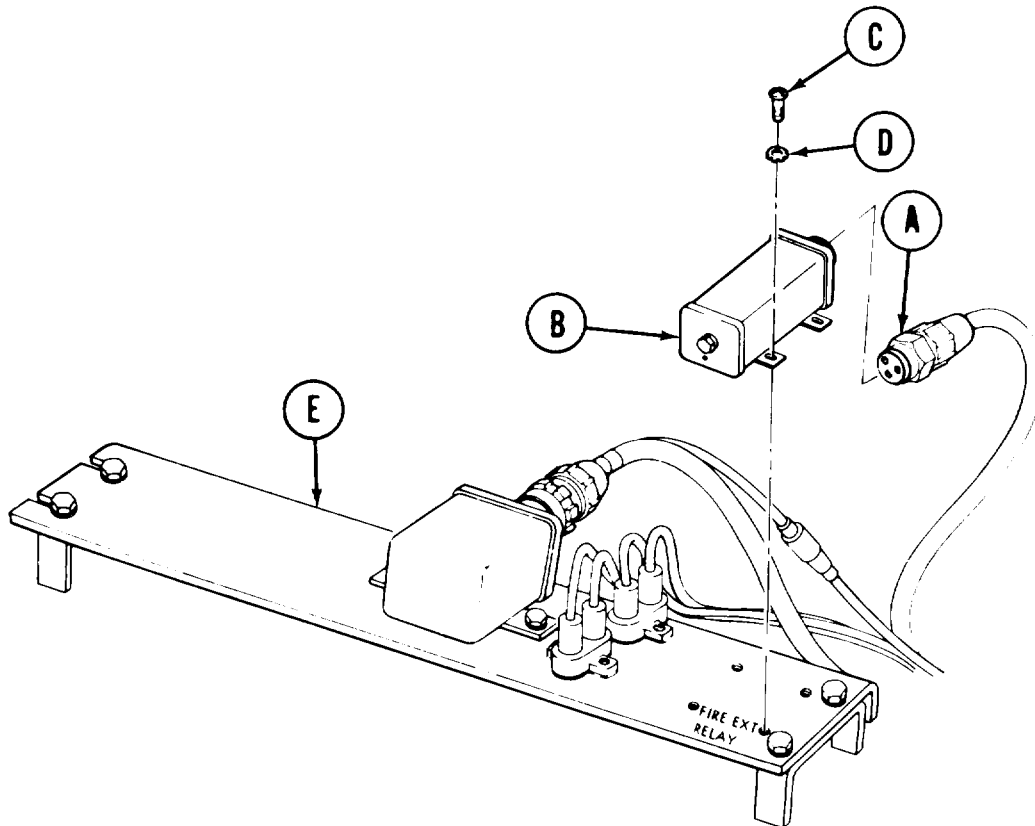
Go on to Sheet 2

TA139733

FIRE EXTINGUISHER RELAY REPLACEMENT (Sheet 2 of 3)

REMOVAL:

1. Using wrench, remove electrical connector (A) from fire extinguisher relay (B).
2. Using screwdriver, remove four screws (C) and lockwashers (D) holding fire extinguisher relay (B) to plate (E). Throw lockwashers away.



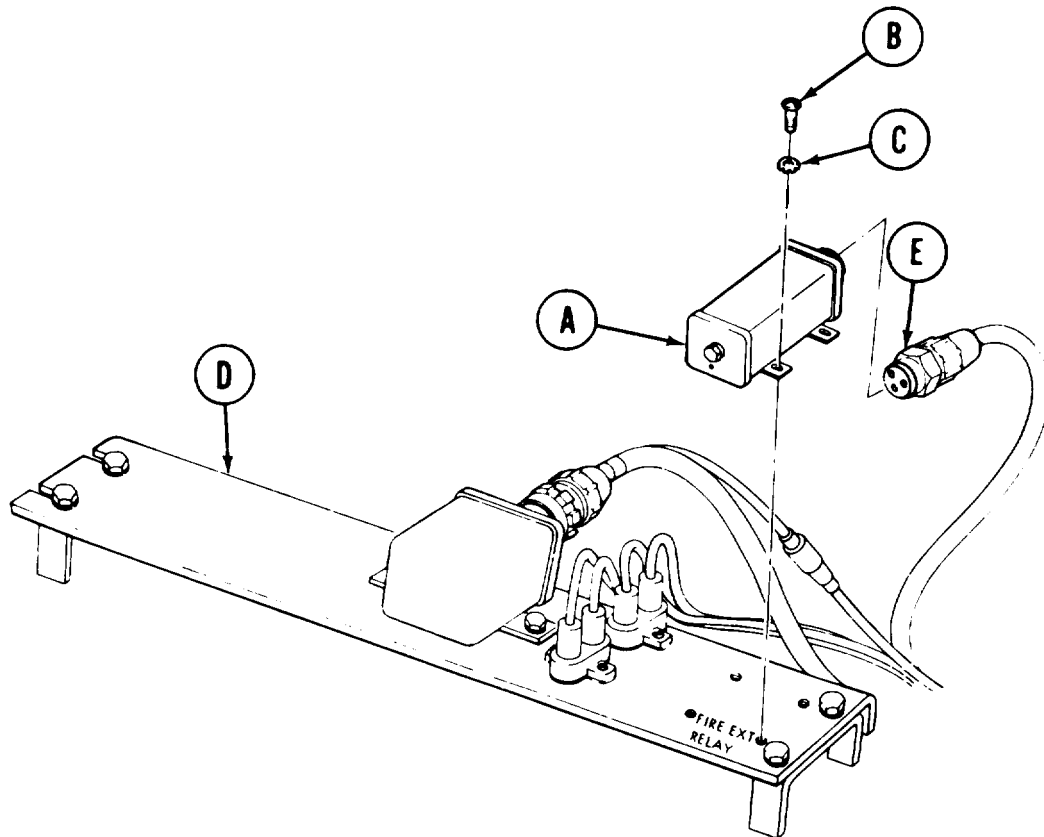
3. Remove fire extinguisher relay (B) from vehicle.

Go on to Sheet 3

TA139734

INSTALLATION:

1. Position fire extinguisher relay (A) into vehicle.
2. Using screwdriver, install four screws (B) and new lockwashers (C) to hold fire extinguisher relay (A) to plate (D).
3. Using wrench, install electrical connector (E) to fire extinguisher relay (A).



4. Connect three battery ground straps (page 10-285).

End of Task

TA139735

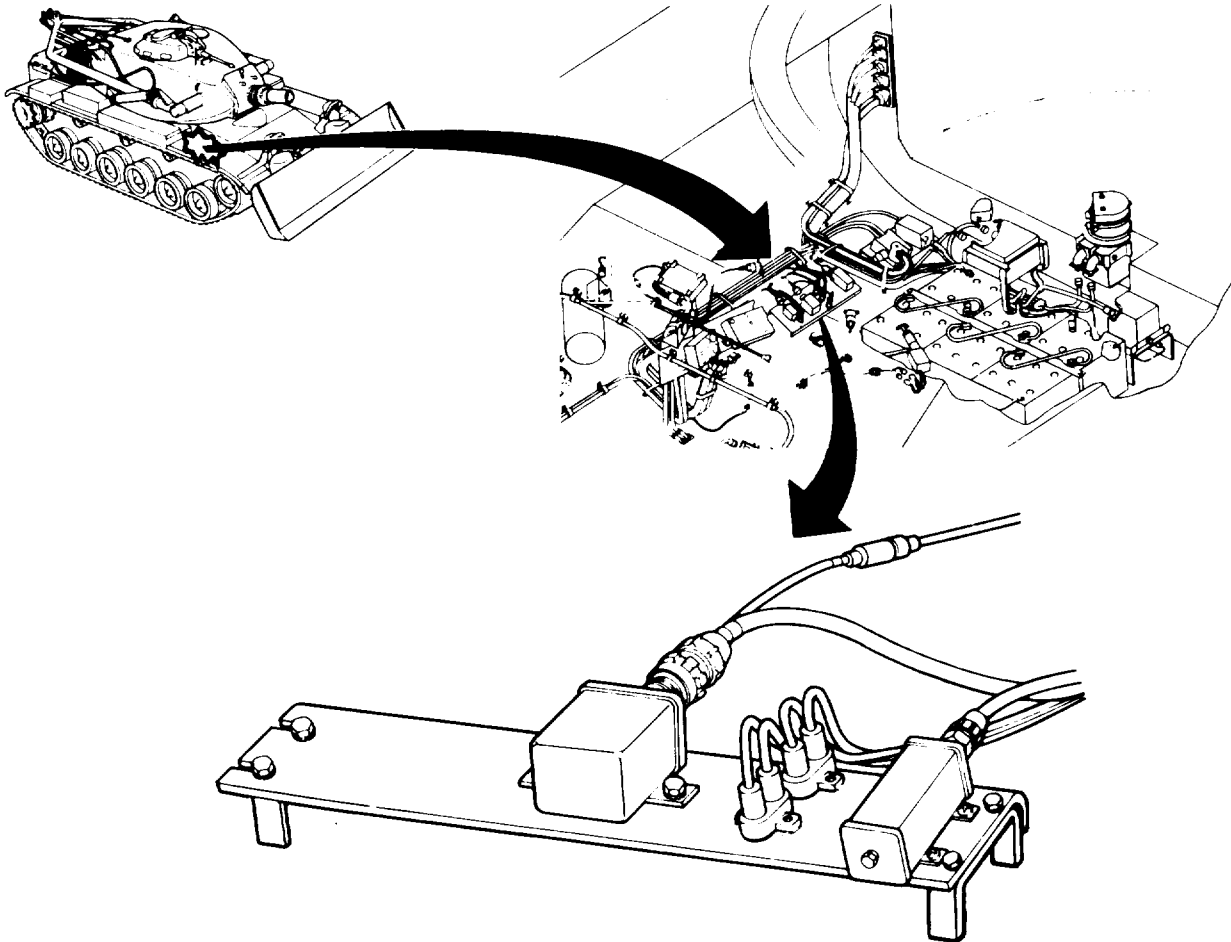
AIR CLEANER BLOWER MOTOR RELAY REPLACEMENT (Sheet 1 of 2)

TOOLS: Ratchet with 1/2 in. drive
7/16 in. socket with 1/2 in. drive
Spanner wrench
5 in. extension with 1/2 in. drive

SUPPLIES: Lockwasher (MS35335-31) (4 required)

REFERENCE: TM 9-2350-222-10

PRELIMINARY PROCEDURES: Disconnect three battery ground cable assemblies from battery terminals (page 10-284)
Manually traverse turret to expose air cleaner blower motor relay (TM 9-2350-222-10)

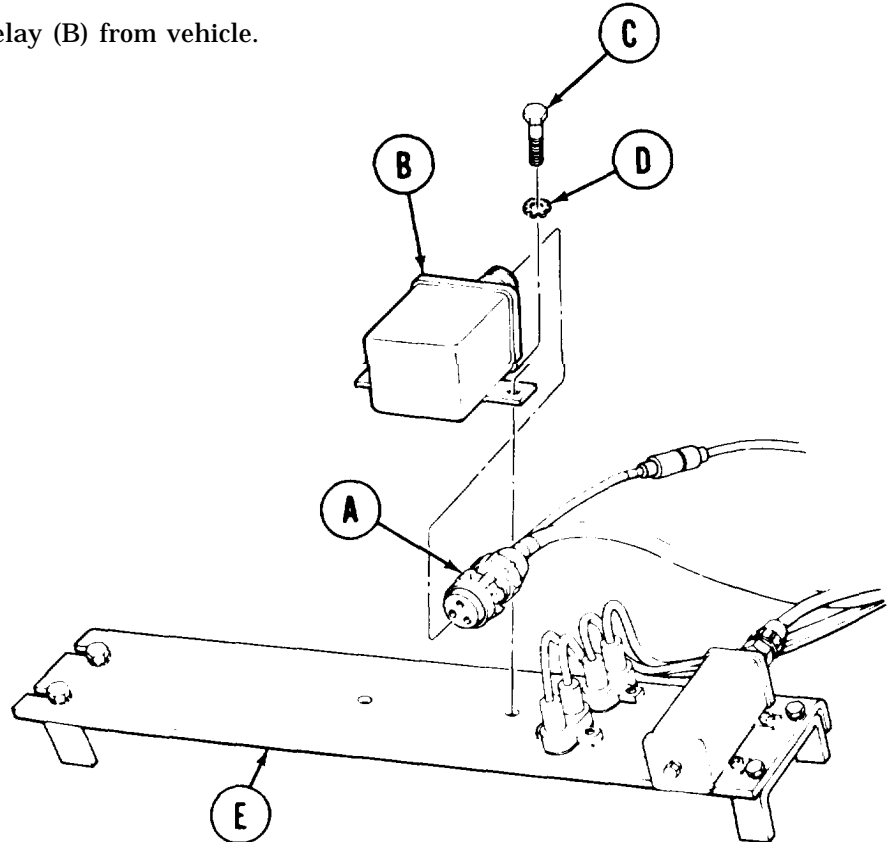


Go on to Sheet 2

TA139736

AIR CLEANER BLOWER MOTOR RELAY REPLACEMENT (Sheet 2 of 2)**REMOVAL:**

1. Using spanner wrench, remove electrical connector (A) from air cleaner blower relay (B).
2. Using socket, remove two screws (C) and lockwashers (D) holding air cleaner blower relay (B) to plate (E). Throw lockwashers away.
3. Remove air cleaner blower relay (B) from vehicle.

**INSTALLATION:**

1. Position air cleaner blower relay (B) in vehicle.
2. Using socket, install two screws (C) and new lockwashers (D) to hold air cleaner blower relay (B) to plate (E).
3. Using spanner wrench, install electrical connector (A) to air cleaner blower relay (B).
4. Connect three battery ground straps (page 10-285).

End of Task

TA139737

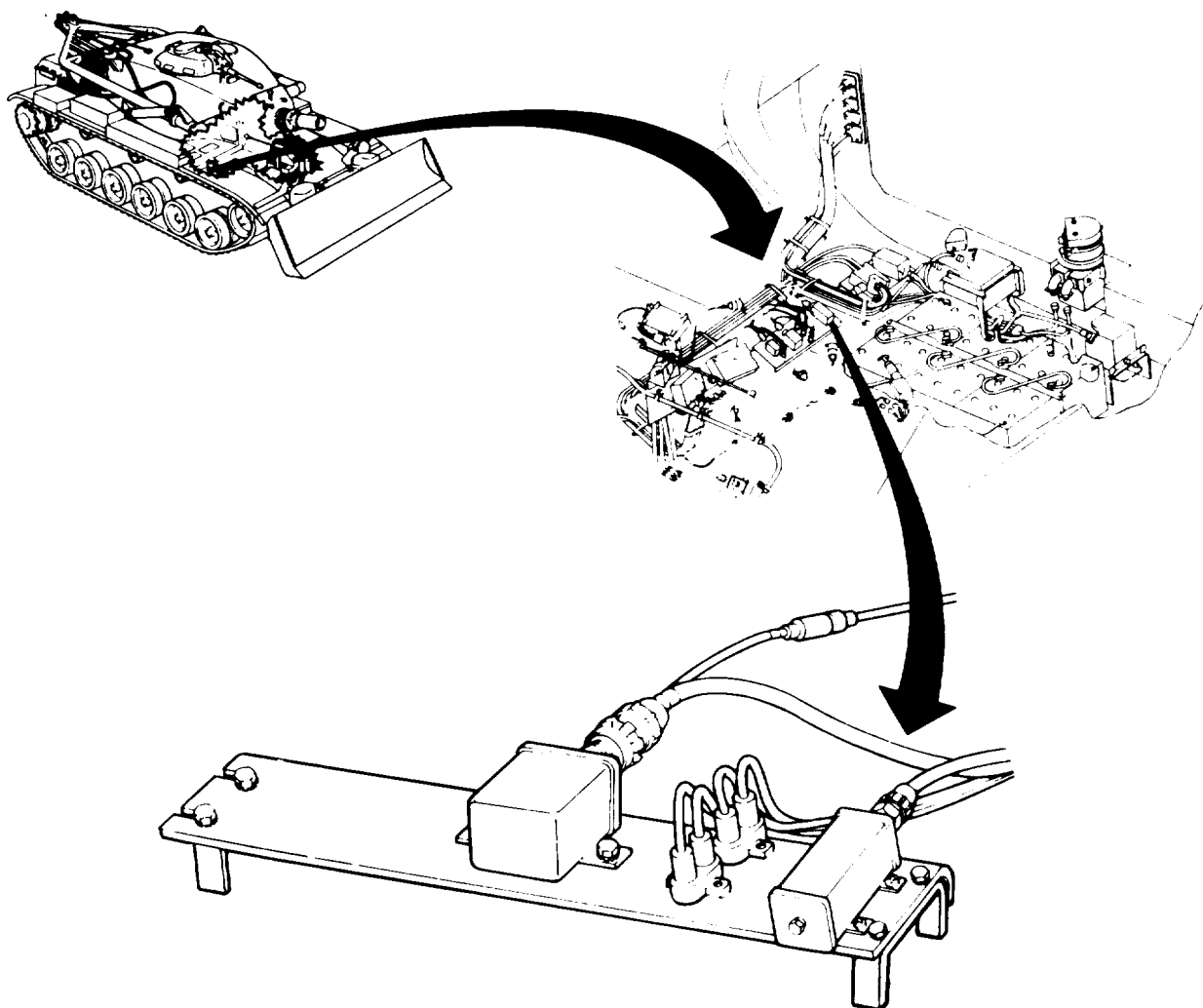
FIRE EXTINGUISHER AND PERSONNEL HEATER CIRCUIT BREAKERS REPLACEMENT
(Sheet 1 of 3)

TOOLS: Cross-tip screwdriver

SUPPLIES: Tags
Lockwashers (MS35335-31) (4 required)

REFERENCE: TM 9-2350-222-10

PRELIMINARY PROCEDURE: Disconnect three battery ground assemblies from battery terminals (page 10-284)
Manually traverse turret to expose fire extinguisher and personnel heater circuit breakers (TM 9-2350-222-10)



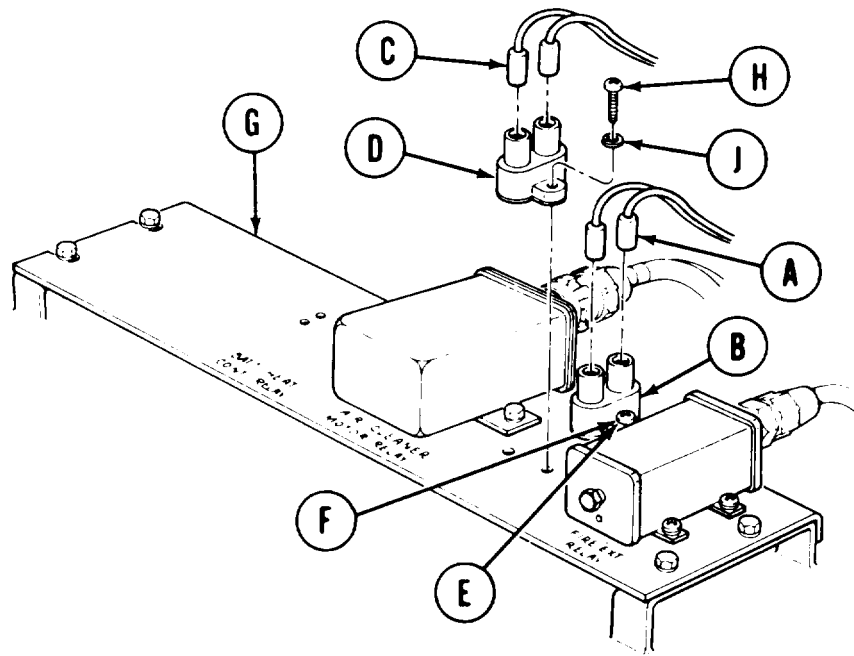
Go on to Sheet 2

TA139738

FIRE EXTINGUISHER AND PERSONNEL HEATER CIRCUIT BREAKERS REPLACEMENT (Sheet 2 of 3)

REMOVAL:

1. Tag and disconnect two cable connectors (A) from fire extinguisher circuit breaker (B) and two cable connectors (C) from personnel heater circuit breaker (D).
2. Using screwdriver, remove two screws (E) and lockwashers (F) holding fire extinguisher circuit breaker (B) to plate (G). Throw lockwashers (F) away,



3. Using screwdriver, remove two screws (H) and lockwashers (J), holding personnel heater circuit breaker (D), from plate (G). Throw lockwashers (J) away.
4. Remove fire extinguisher circuit breaker (B) and personnel heater circuit breaker (D) from vehicle.

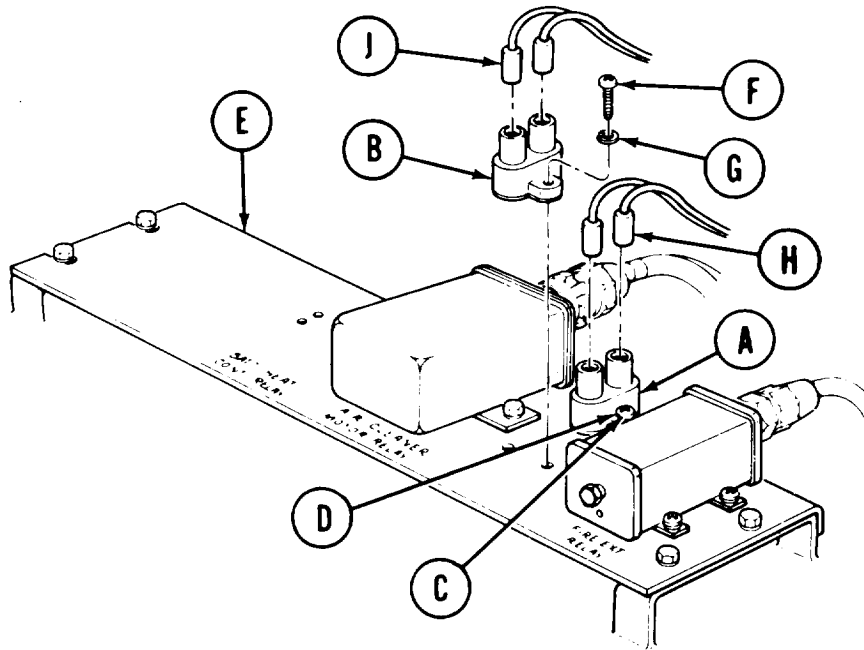
Go on to Sheet 3

TA139739

FIRE EXTINGUISHER AND PERSONNEL HEATER CIRCUIT BREAKERS REPLACEMENT (Sheet 3 of 3)

INSTALLATION:

1. Position fire extinguisher circuit breaker (A) and personnel heater circuit breaker (B) in vehicle.
2. Using screwdriver, install two screws (C) and new lockwashers (D) to hold fire extinguisher circuit breaker (A) to plate (E).



3. Using screwdriver, install two screws (F) and new lockwashers (G) to hold personnel heater circuit breaker (B) to plate.
4. Connect two cable connectors (H) to fire extinguisher circuit breaker (A) and two cable connectors (J) to personnel heater circuit breaker (B).
5. Connect three battery ground straps (page 10-285).

End of Task

TA139740

RELAYS AND CIRCUIT BREAKERS MOUNTING PLATE REPLACEMENT (Sheet 1 of 3)

TOOLS: 3 in. extension with 1/2 in. drive
9/16 in. socket with 1/2 in. drive
10 in. extension with 1/2 in. drive
Ratchet with 1/2 in. drive
Flat-tip screwdriver, 3/8 in. blade

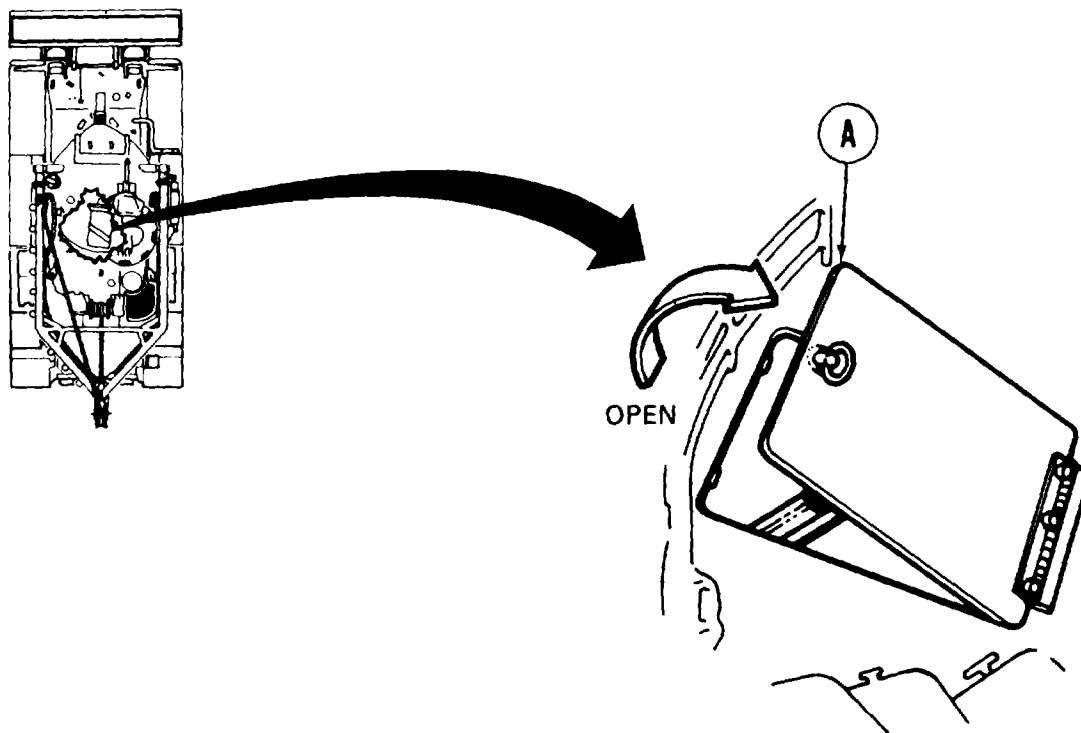
SUPPLIES: Lockwasher (MS35338-42) (2 required)
Lockwasher (MS35333-40) (2 required)

REFERENCE: TM 9-2350-222-10

PRELIMINARY PROCEDURES: Remove fire extinguisher circuit breaker (page 10-183)
Remove personnel heater circuit breaker (page 10-183)
Remove fire extinguisher relay (page 10-178)
Remove air cleaner blower motor relay (page 10-181)

REMOVAL:

1. Open turret platform access cover (A) (TM 9-2350-222-10).



Go on to Sheet 2

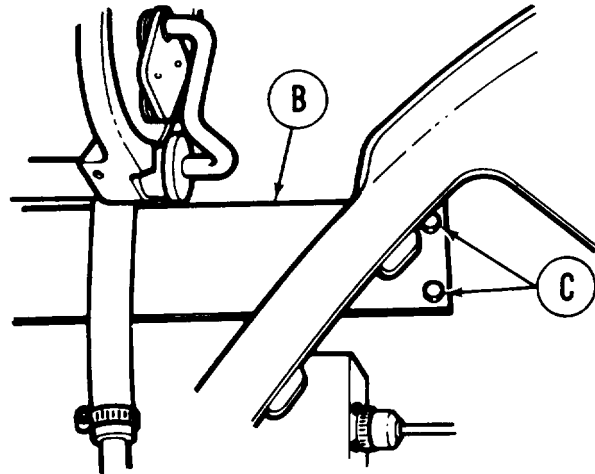
TA139741

RELAYS AND CIRCUIT BREAKERS MOUNTING PLATE REPLACEMENT (Sheet 2 of 3)

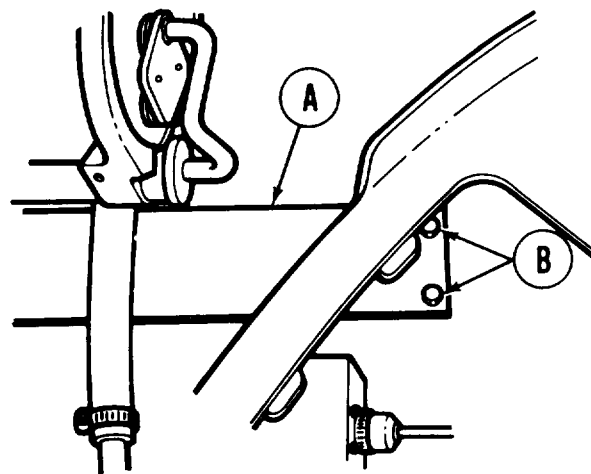
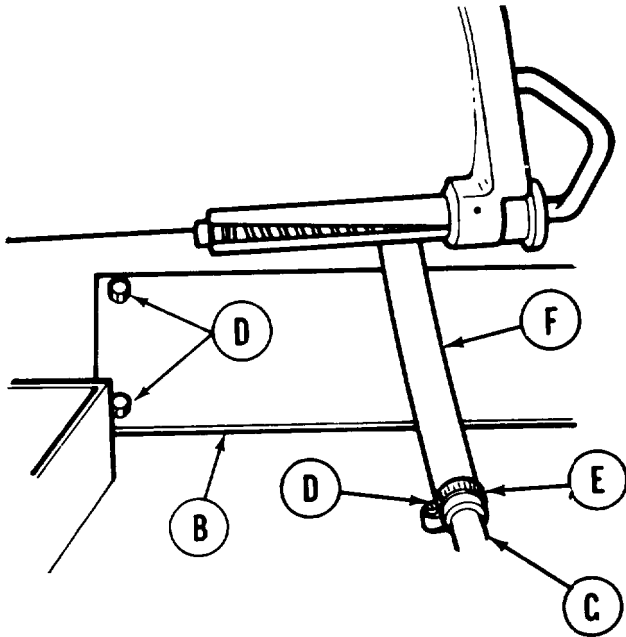
2. Manually traverse turret, as necessary, to gain access to plate (B) (TM 9-2350-222-10)
3. Using socket, remove two screws and lockwashers (C).

NOTE

Following steps performed in driver's compartment.



4. Using socket, 3 inch extension, and ratchet, remove two screws and lockwashers (C).
5. Using screwdriver, loosen screw (D), on hose clamp (E).
6. Slide clamp (E) back on hose (G).
7. Disconnect hose (F) from tee (G) by pulling apart.
8. Remove plate (B) from vehicle.



INSTALLATION:

1. Position plate (A) in vehicle.
2. Manually install two screws and new lockwashers (B).
3. Using socket, 10 inch extension, and ratchet, tighten screws (B).

Go on to Sheet 3

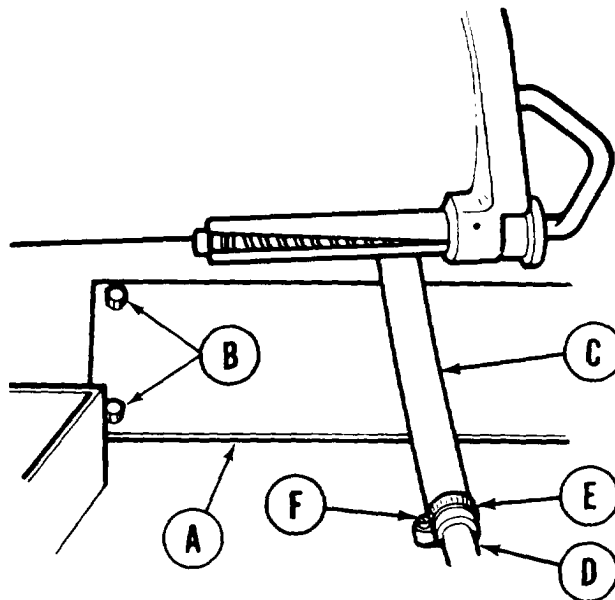
TA139742

RELAYS AND CIRCUIT BREAKERS MOUNTING PLATE REPLACEMENT (Sheet 3 of 3)

NOTE

Following steps performed in driver's compartment.

4. Install two screws and new lockwashers (B).
5. Using socket, 3 inch extension, and ratchet, tighten screws (B).
6. Connect hose (C) to tee (D) by pushing together.
7. Slide hose clamp (E) into position, near end of hose (C).
8. Using screwdriver, tighten screw (F) on hose clamp (E).
9. Install air cleaner blower motor relay (page 10-181).
10. Install fire extinguisher relay (page 10-179).
11. Install personnel heater circuit breaker (page 10-184).
12. Install fire extinguisher circuit breaker (page 10-184).
13. Close turret platform access cover (TM 9-2350-222-10).



End of Task

TA139743

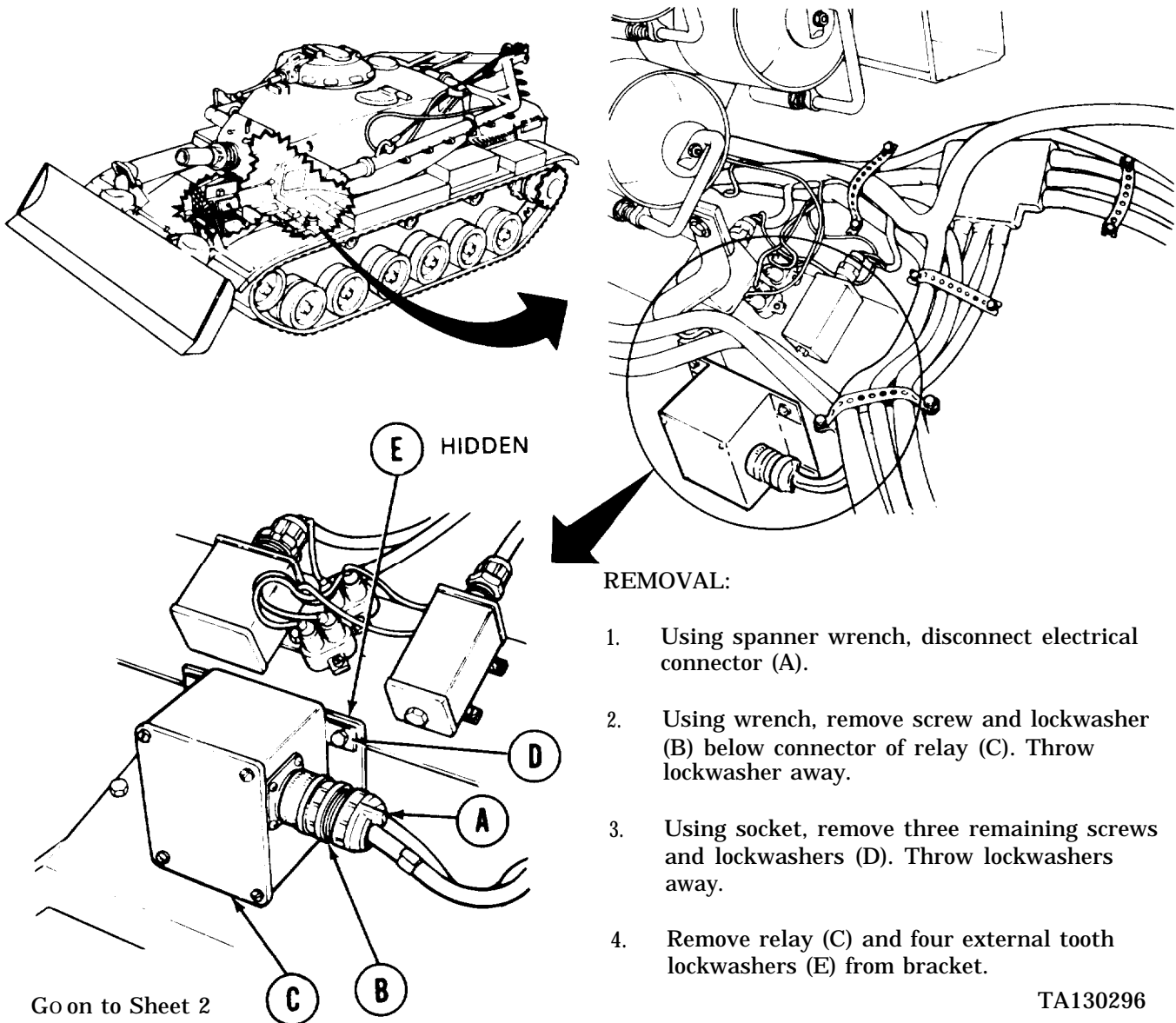
BILGE PUMP RELAY ENCLOSURE ASSEMBLY REPLACEMENT (Sheet 1 of 2)

TOOLS: 7/16 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
Spanner wrench

SUPPLIES: Lockwasher (MS35338-44) (4 required)

REFERENCE: TM 9-2350-222-10

PRELIMINARY PROCEDURE: Disconnect three battery ground straps (page 10-283)
Open turret platform access door and manually traverse turret to expose relay (TM 9-2350-222-10)



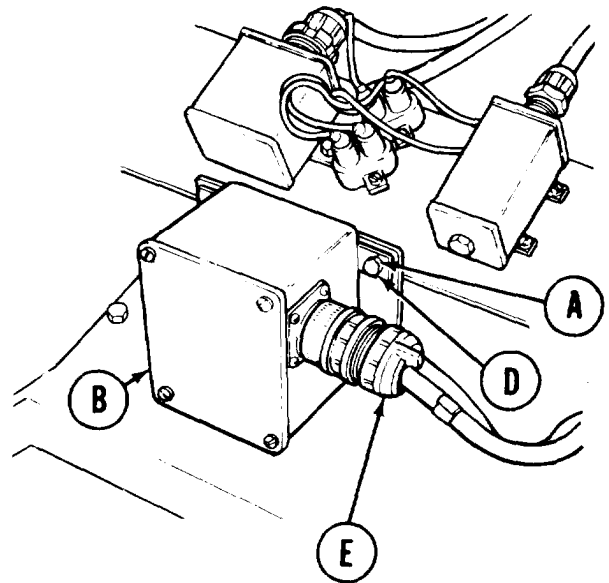
REMOVAL:

1. Using spanner wrench, disconnect electrical connector (A).
2. Using wrench, remove screw and lockwasher (B) below connector of relay (C). Throw lockwasher away.
3. Using socket, remove three remaining screws and lockwashers (D). Throw lockwashers away.
4. Remove relay (C) and four external tooth lockwashers (E) from bracket.

TA130296

BILGE PUMP RELAY ENCLOSURE ASSEMBLY REPLACEMENT (Sheet 2 of 2)**INSTALLATION:**

1. Place four external tooth lockwashers (A) over screw holes on mounting bracket.
2. Place relay (B) over external tooth lockwashers (A).
3. Insert four screws and new lockwashers by hand to align relay (B) with bracket.
4. Using wrench, tighten screw (D) below connector of relay (B).
5. Using socket, tighten other three screws (D).
6. Connect electrical connector (E). Using spanner wrench, tighten.
7. Connect three battery ground straps (page 10-283).
8. Close turret platform access door (TM 9-2350-222-10).



End of Task

TA139744

BILGE PUMP RELAY ENCLOSURE ASSEMBLY REPAIR (Sheet 1 of 12)

PROCEDURE INDEX

PROCEDURE	PAGE
Circuit Breaker Replacement	10-190
Cable Assembly Replacement	10-193
Solenoid Relay Replacement	10-197

Circuit Breaker Replacement (Sheet 1 of 3)

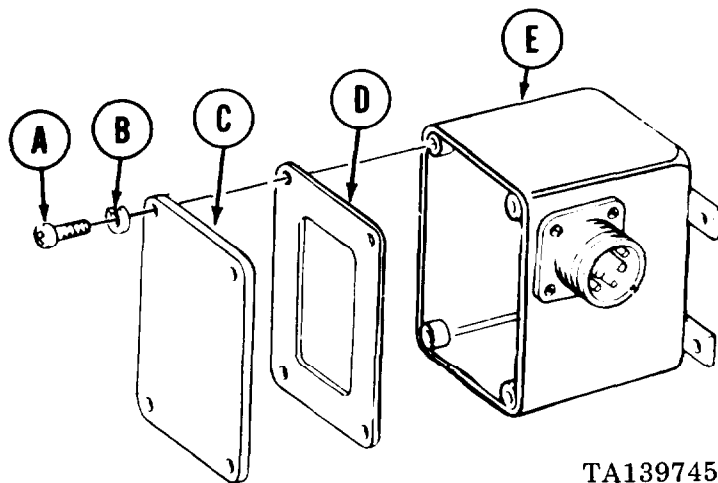
TOOLS: Cross-tip screwdriver (Phillips)
 7/16 in. socket with 1/2 in. drive
 Ratchet with 1/2 in. drive
 5 in. extension with 1/2 in. drive

SUPPLIES: Crocus cloth (Item 14, Appendix D)
 Steel wool (Item 55, Appendix D)
 Gasket (10951769)
 Lockwasher (MS35338-43) (6 required)
 Lockwasher (MS35338-44) (4 required)
 Lockwasher (MS35338-101) (2 required)

PRELIMINARY PROCEDURE: Remove enclosure assembly from vehicle (page 10-188)

REMOVAL:

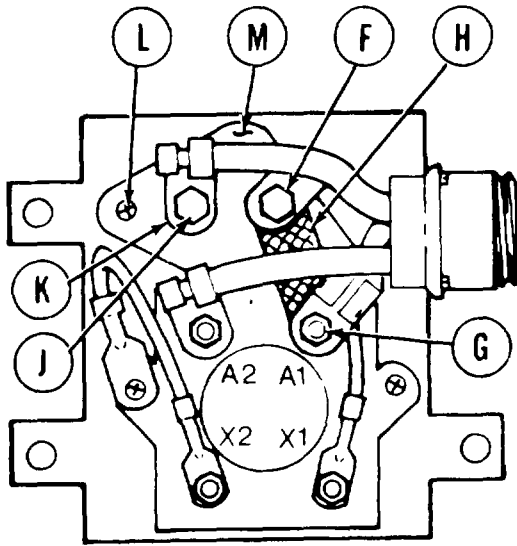
- Using screwdriver, remove four screws (A) and lockwashers (B). Throw lockwashers (B) away.
- Remove cover (C) and gasket (D) from enclosure assembly (E). Throw gasket (D) away.



Go on to Sheet 2

TA139745

BILGE PUMP RELAY ENCLOSURE ASSEMBLY REPAIR (Sheet 2 of 12)
Circuit Breaker Replacement (Sheet 2 of 3)



3. Using socket, remove screw (F) with two lockwashers. Throw lockwashers away.
4. Using socket, remove nut (G) with lockwasher holding bus bar (H). Throw lockwasher away.
5. Remove bus bar (H).
6. Using socket, remove screw (J) with lockwasher. Throw lockwasher away.

7. Remove lead (K).
8. Using screwdriver, remove two screws (L) with flat washers and lockwashers. Throw lockwashers away.
9. Remove circuit breaker (M).

CLEANING AND INSPECTION:

1. Inspect circuit breaker for corrosion. If corroded areas cannot be cleaned using crocus cloth (Item 14, Appendix D) or steel wool (Item 55, Appendix D), replace circuit breaker.
2. Inspect for mechanical damage or wear. If damaged or worn, replace circuit breaker,

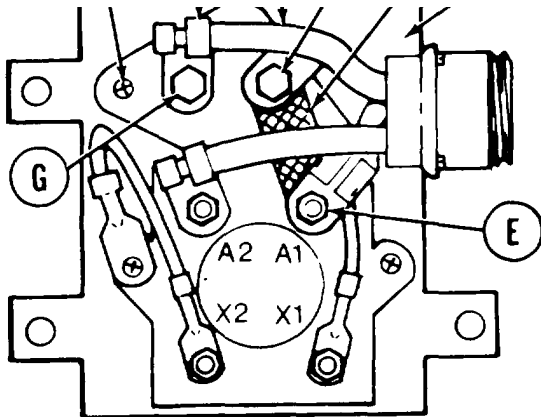
Go on to Sheet 3

TA139746

BILGE PUMP RELAY ENCLOSURE ASSEMBLY REPAIR (Sheet 3 of 12)
Circuit Breaker Replacement (Sheet 3 of 3)

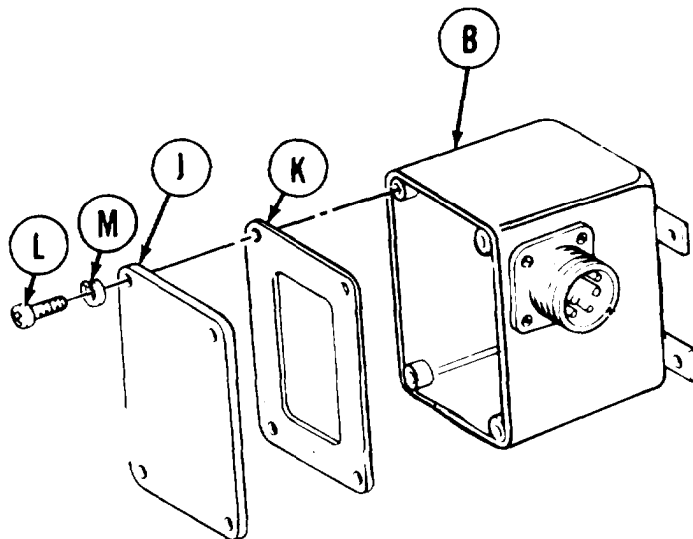
INSTALLATION:

1. Position circuit breaker (A) into position in enclosure assembly (B).
2. Using screwdriver, install two screws (C) with flat washers and new lockwashers.



3. Place two lockwashers at position (D) on circuit breaker and one flat washer at position (E) of relay. Position bus bar (F) over lockwasher at (D) and (E).
4. Using socket, install screw and two flat washers through bus bar on circuit breaker at position (D).
5. Using socket, install nut and flat washer to hold bus bar at position (E).
6. Using socket, install screw, flat washer, and new lockwasher (G) to secure lead (H).

7. Place cover (J) and new gasket (K) into installation position on enclosure assembly (B).
8. Using screwdriver, install four screws (L) and new lockwashers (M).
9. Install enclosure assembly (B) in vehicle (page 10-189).



End of Task

TA139747

BILGE PUMP RELAY ENCLOSURE ASSEMBLY REPAIR (Sheet 4 of 12)
Cable Assembly Replacement (Sheet 1 of 4)

PROCEDURE INDEX

PROCEDURE	PAGE
Removal	10-193
Cleaning and Inspection	10-195
Installation	10-195

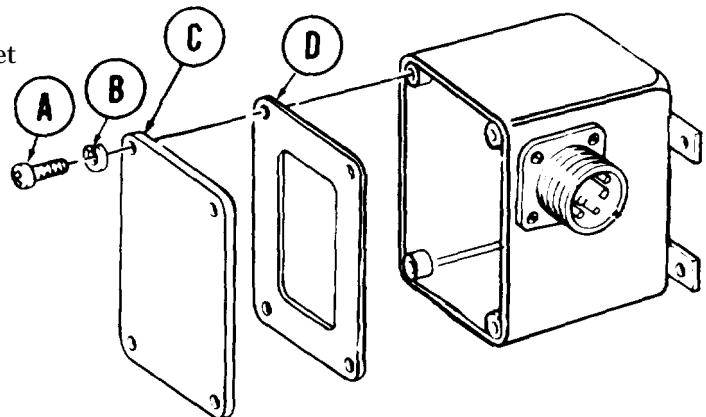
TOOLS: Cross-tip screwdriver
 5/16 in. socket with 1/2 in. drive
 7/16 in. socket with 1/2 in. drive
 5 in. extension with 1/2 in. drive
 Ratchet with 1/2 in. drive
 Flat-tip screwdriver

SUPPLIES: Gasket (10951769)
 Crocus cloth (Item 14, Appendix D)
 Steel wool (Item 55, Appendix D)
 Lockwasher (MS35338-43) (4 required)
 Lockwasher (MS35338-44) (2 required)
 Lockwasher (MS35338-101)
 Lockwasher (MS35338-98)

PRELIMINARY PROCEDURE: Remove enclosure assembly from vehicle (page 10-188)

REMOVAL:

- Using cross-tip screwdriver, remove four screws (A) and lockwashers (B) holding cover (C). Throw lockwashers (B) away.
- Remove cover (C) and gasket (D). Throw gasket (D) away.

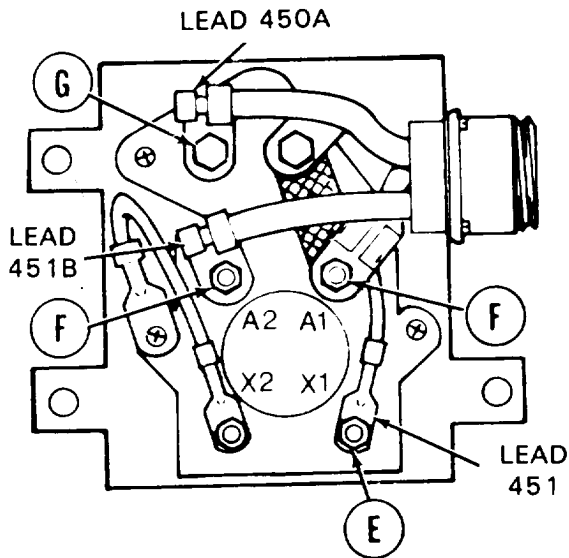


Go on to Sheet 2

TA139748

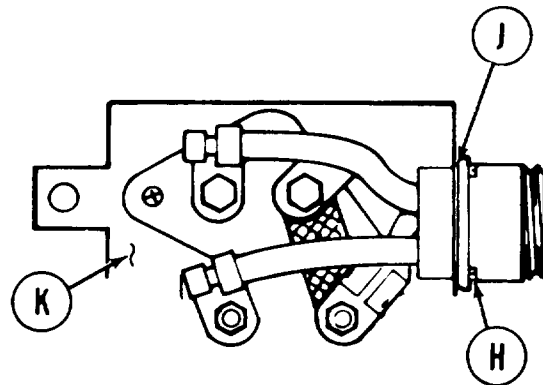
BILGE PUMP RELAY ENCLOSURE ASSEMBLY REPAIR (Sheet 5 of 12)
Cable Assembly Replacement (Sheet 2 of 4)

3. Using 5/16 inch socket, remove nut (E) with lockwasher. Throw lockwasher away.
4. Remove lead 451 and flat washer.
5. Using 7/16 inch socket, remove nut (F) with lockwasher and flat washer. Throw lockwasher away.



6. Remove lead 451B
7. Using 7/16 inch socket, remove screw (G) with flat washer and lockwasher. Throw lockwasher away.
8. Remove lead 450A.

9. Using flat-tip screwdriver, remove four screws (H) with lockwashers and nuts. Throw lockwashers away.
10. Remove cable assembly and gasket (J) from enclosure assembly (K).
11. Throw gasket away if damaged.



Go on to Sheet 3

TA139749

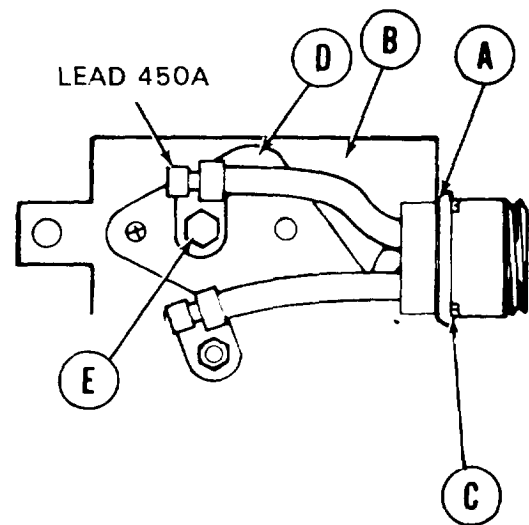
BILGE PUMP RELAY ENCLOSURE ASSEMBLY REPAIR (Sheet 6 of 12) Cable Assembly Replacement (Sheet 3 of 4)

CLEANING AND INSPECTION:

1. Inspect all parts for corrosion. If corroded parts cannot be cleaned using crocus cloth (Item 14, Appendix D) or steel wool (Item 55, Appendix D), replace parts.
2. Inspect all parts for mechanical damage and wear. If damaged or worn, replace parts.

INSTALLATION:

1. Position gasket and cable assembly (A) into place on enclosure assembly (B) with notch of cable assembly facing 9 o'clock position as you face it.
2. Using screwdriver, install four screws (C) with new lockwashers and nuts.
3. Place lead 450A onto terminal of circuit breaker (D).
4. Using 7/16 inch socket, install screw (E) with new lockwasher and flat washer.

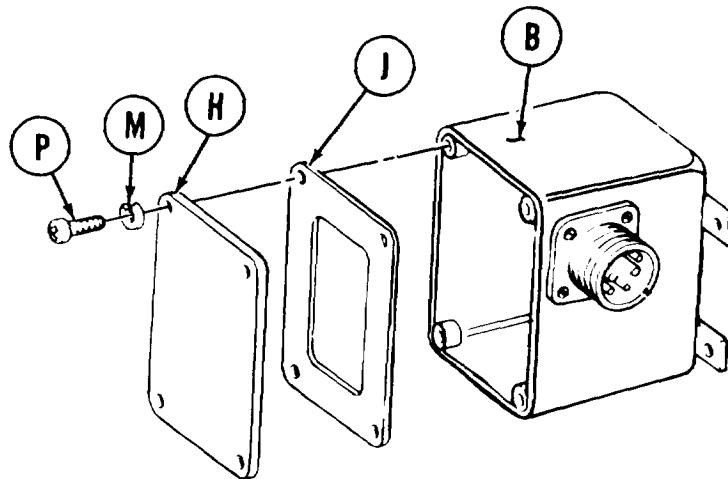
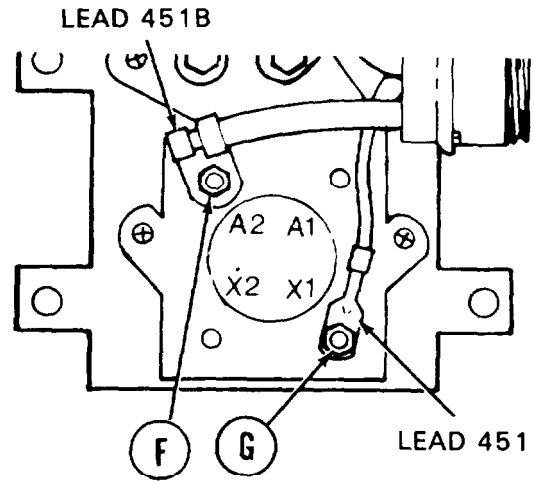


Go on to Sheet 4

TA139750

BILGE PUMP RELAY ENCLOSURE ASSEMBLY REPAIR (Sheet 7 of 12)
Cable Assembly Replacement (Sheet 4 of 4)

5. Place lead 451B with flat washer and new lockwasher onto terminal.
6. Using 7/16 inch socket, install nut (F) to terminal A2.
7. Place flat washer and lead 451 on terminal X1.
8. Using 5/16 inch socket, install nut (G) with new lockwasher.
9. Place cover (H) and new gasket (J) onto enclosure assembly (B).
10. Using cross-tip screwdriver, install four screws (L) with new lockwashers (M).
11. Install enclosure assembly (B) in vehicle (page 10-189).



End of Task

TA139751

BILGE PUMP RELAY ENCLOSURE ASSEMBLY REPAIR (Sheet 8 of 12)
Solenoid Relay Replacement (Sheet 1 of 5)

PROCEDURE INDEX

PROCEDURE	PAGE
Removal	10-197
Cleaning and Inspection	10-199
Installation	10-199

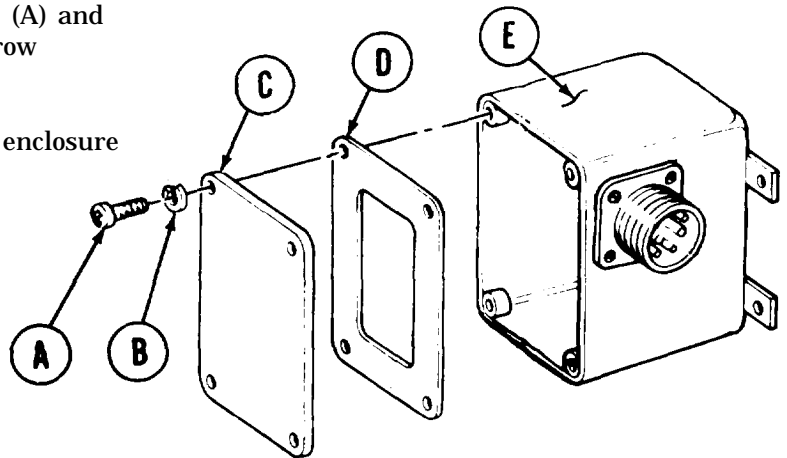
TOOLS: Cross-tip screwdriver
 5/16 in. socket with 1/2 in. drive
 7/16 in. socket with 1/2 in. drive
 Ratchet with 1/2 in. drive
 5 in. extension with 1/2 in. drive

SUPPLIES: Gasket (10951769)
 Crocus cloth (Item 14, Appendix D)
 Steel wool (Item 55, Appendix D)
 Lockwasher (MS35338-43) (4 required)
 Lockwasher (MS35338-44) (2 required)
 Lockwasher (MS35338-101)
 Lockwasher (MS35338-98) (2 required)
 Lockwasher (MS35338-39) (2 required)

PRELIMINARY PROCEDURE: Remove enclosure assembly from vehicle (10-188)

REMOVAL:

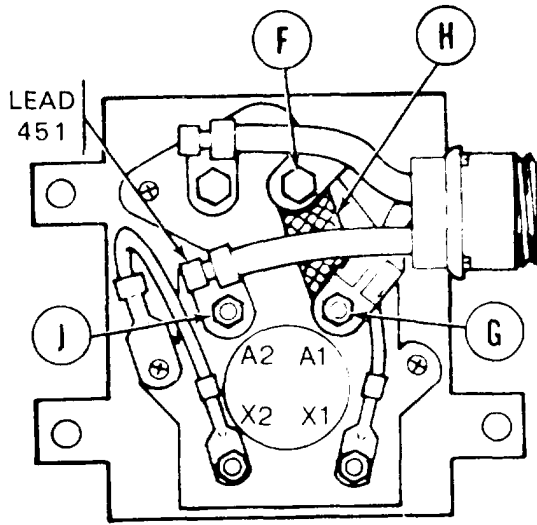
- Using screwdriver, remove four screws (A) and lockwashers (B) holding cover (C). Throw lockwashers (B) away.
- Remove cover (C) and gasket (D) from enclosure assembly (E). Throw gasket away.



Go on to Sheet 2

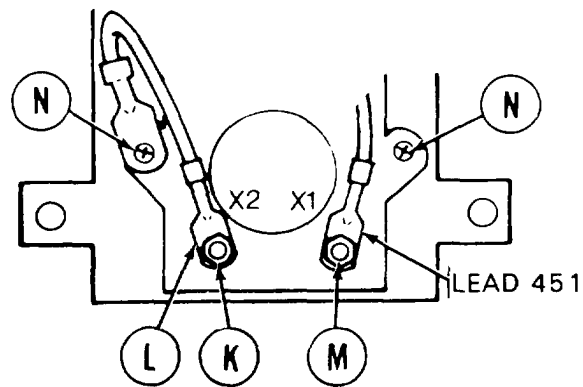
TA139752

BILGE PUMP RELAY ENCLOSURE ASSEMBLY REPAIR (Sheet 9 of 12)
Solenoid Relay Replacement (Sheet 2 of 5)



3. Using 7/16 inch socket, remove screw (F) with two flat washers.
4. Using 7/16 inch socket. Remove nut (G) with lockwasher. Throw lockwasher away.
5. Remove bus bar (H).

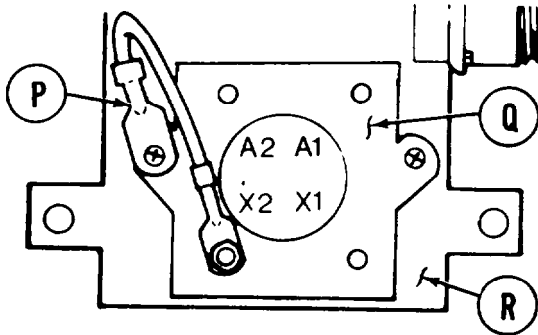
6. Using 7/16 inch socket, remove nut (J) with lockwasher. Throw lockwasher away.
7. Remove lead 451 from terminal A2.
8. Using 5/16 inch socket, remove nut (K) with lockwasher and flat washer. Throw lockwasher away.
9. Remove ground lead (L) from terminal X2.
10. Using 5/16 inch socket, remove nut (M) with lockwasher and flat washer. Throw lockwasher away.
11. Remove lead 451 from terminal X1.
12. Using screwdriver, remove two screws (N) with lockwashers. Throw lockwashers away.



Go on to Sheet 3

TA139753

BILGE PUMP RELAY ENCLOSURE ASSEMBLY REPAIR (Sheet 10 of 12)
Solenoid Relay Replacement (Sheet 3 of 5)



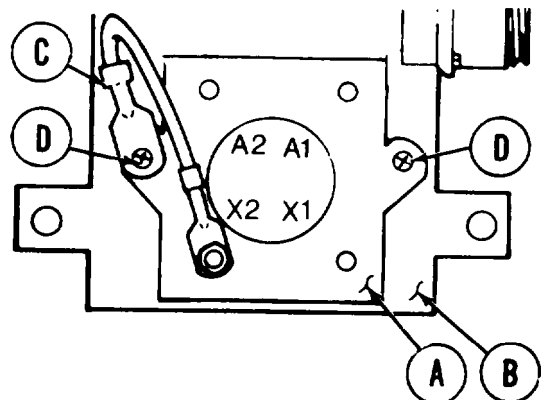
13. Using fingers, remove ground lead (P) from solenoid relay (Q).
14. Remove solenoid relay (Q) from relay enclosure assembly (R).

CLEANING AND INSPECTION:

1. Visually inspect all parts for corrosion. If corroded parts cannot be cleaned with crocus cloth (Item 14, Appendix D) or steel wool (Item 55, Appendix D), replace parts.
2. Visually inspect for mechanical damage and wear. If damaged or worn, replace parts.

INSTALLATION:

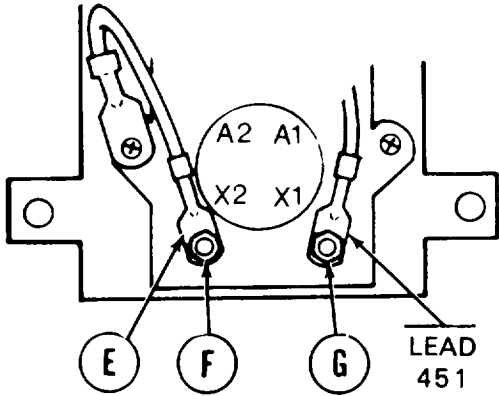
1. Position solenoid relay (A) into place in enclosure assembly (B).
2. Place ground lead (C) into position as shown.
3. Using screwdriver, install two screws (D) with two new lockwashers.



Go on to Sheet 4

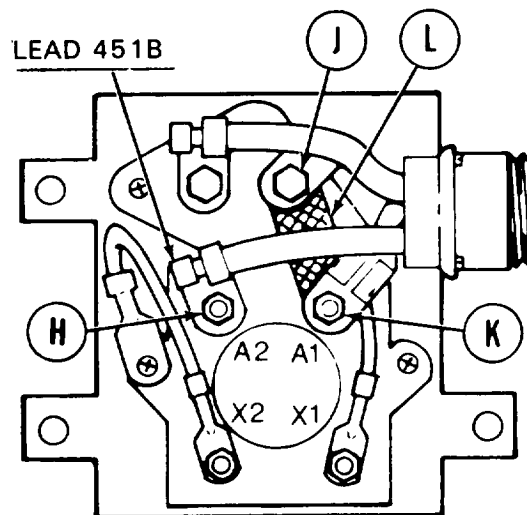
TA139754

BILGE PUMP RELAY ENCLOSURE ASSEMBLY REPAIR (Sheet 11 of 12)
Solenoid Relay Replacement (Sheet 4 of 5)



4. Place ground lead (E) with flat washer into position on X2 terminal.
5. Using 5/16 inch socket, install nut (F) with new lockwasher.
6. Place lead 451 with flat washer into position on terminal X1.

7. Using 5/16 inch socket, install nut (G) with new lockwasher.
8. Place lead 451B with flat washer into position on terminal A2.
9. Using 7/16 inch socket, install nut (H) with new lockwasher.
10. Place two flat washers at position (J) on circuit breaker and one flat washer at position (K) of relay.
11. Position bus bar (L) over flat washers at (J) and (K).
12. Using 7/16 inch socket, install screw and two flat washers (J) through bus bar on circuit breaker at position (J).
13. Using 7/16 inch socket, install nut and flat washer to hold bus bar at position (K).

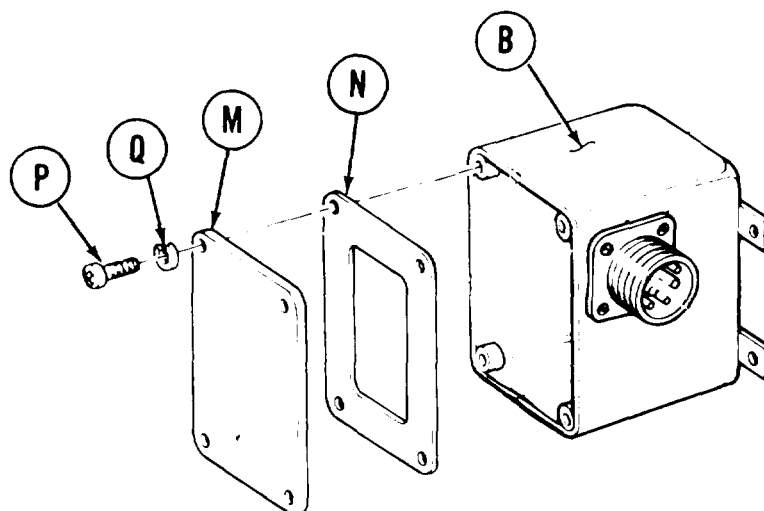


Go on to Sheet 5

TA139755

**BILGE PUMP RELAY ENCLOSURE ASSEMBLY REPAIR (Sheet 12 of 12)
Solenoid Relay Replacement (Sheet 5 of 5)**

14. Place cover (M) and new gasket (N) on enclosure assembly (B).
15. Using screwdriver, install four screws (P) and new lockwashers (Q).
16. Install enclosure assembly (B) in vehicle (page 10-189).



End of Task

TA139756

INFRARED POWER SUPPLY AND SHOCK MOUNT ASSEMBLY REPLACEMENT
 (Sheet 1 of 5)

PROCEDURE INDEX

PROCEDURE	PAGE
Removal	10-202
Inspection	10-204
Installation	10-205

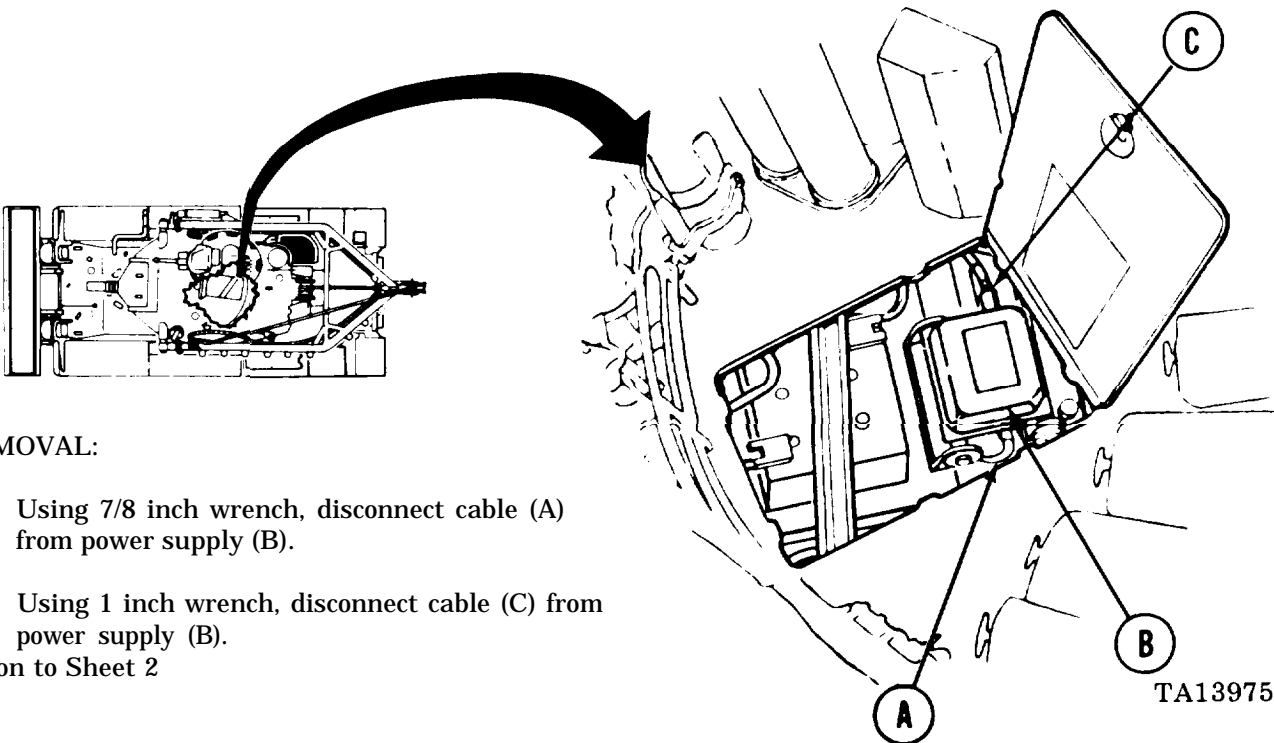
TOOLS: 1/4 in. combination box and open end wrench
 7/16 in. socket with 1/2 in. drive
 1/2 in. socket with 1/2 in. drive
 5 in. extension with 1/2 in. drive
 Ratchet with 1/2 in. drive

7/16 in. combination box and open end wrench
 7/8 in. combination box and open end wrench
 1 in. combination box and open end wrench
 Flat-tip screwdriver

SUPPLIES: Lockwasher (MS35338-26) (4 required)
 Lockwasher (MS45904-72) (4 required)

REFERENCE: TM 9-2350-222-10

PRELIMINARY PROCEDURES: Open turret platform access door (TM 9-2350-222-10)
 Traverse turret to expose infrared power supply, located directly behind left battery (TM 9-2350-222-10)



REMOVAL:

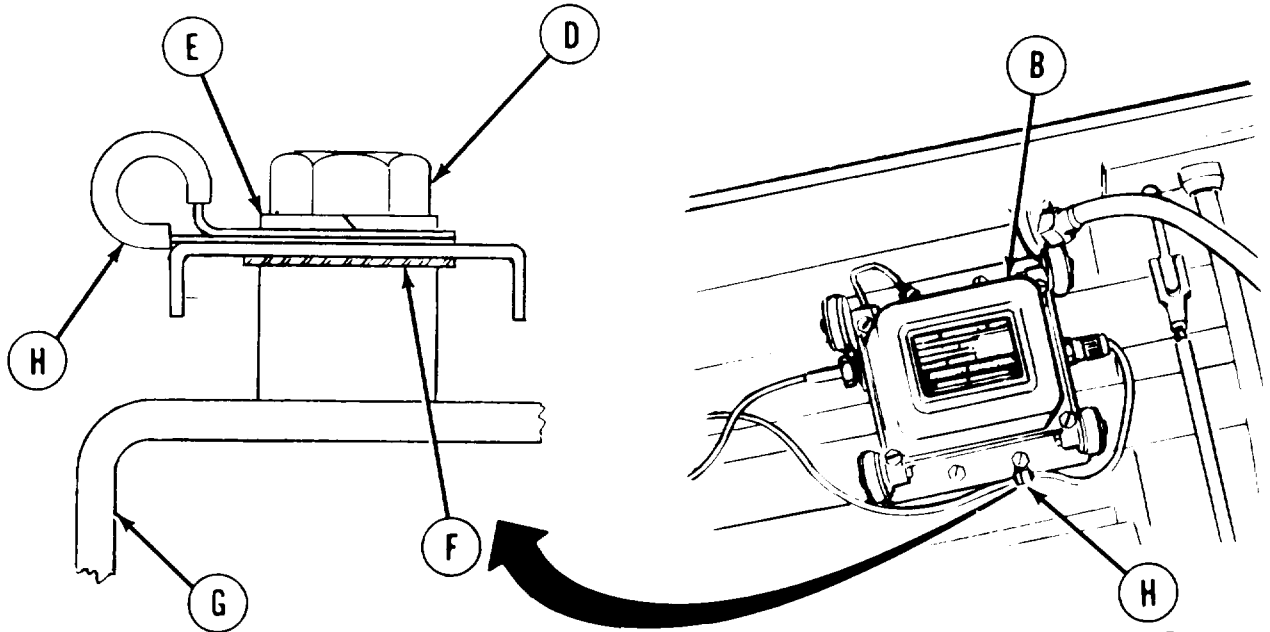
1. Using 7/8 inch wrench, disconnect cable (A) from power supply (B).
2. Using 1 inch wrench, disconnect cable (C) from power supply (B).

Go on to Sheet 2

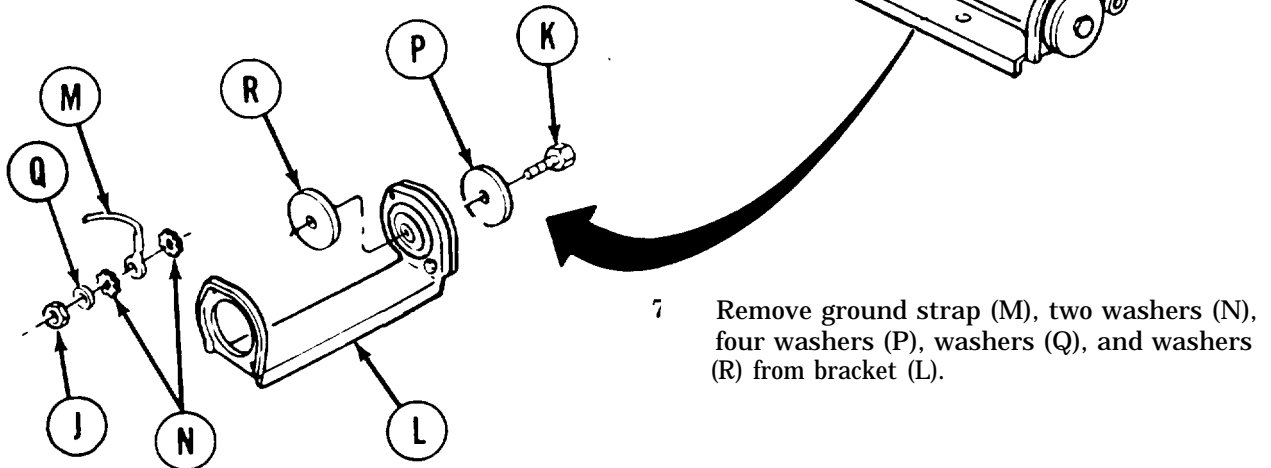
TA139757

INFRARED POWER SUPPLY AND SHOCK MOUNT ASSEMBLY REPLACEMENT
 (Sheet 2 of 5)

- Using 1/2 inch socket, remove four screws (D), lockwashers (E), and lockwashers (F) securing power supply (B) to mounting pad (G). Throw lockwashers (E) and (F) away.



- Remove clamp (H).
- Move power supply (B) from vehicle to bench.
- Using 7/16 inch wrench to hold nut (J), use 7/16 inch socket and remove four screws (K) and nuts (J) securing power supply (B) to bracket (L).



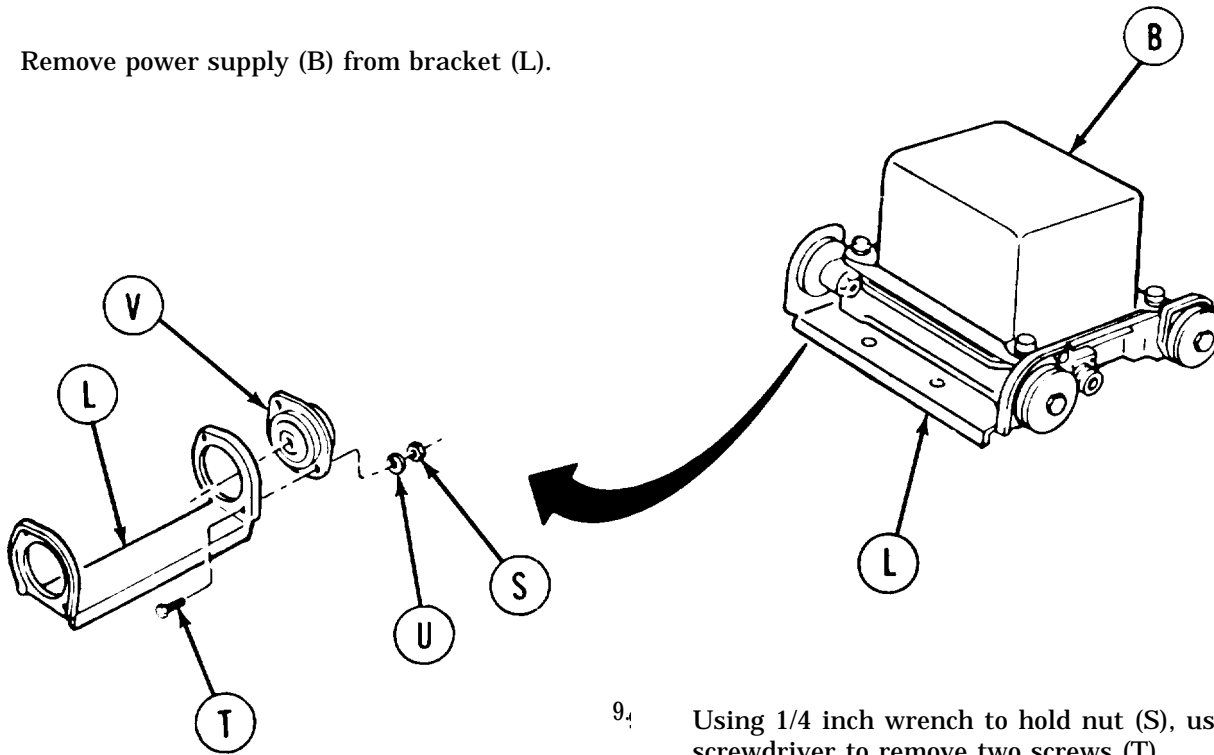
- Remove ground strap (M), two washers (N), four washers (P), washers (Q), and washers (R) from bracket (L).

Go on to Sheet 3

TA139758

INFRARED POWER SUPPLY AND SHOCK MOUNT ASSEMBLY REPLACEMENT (Sheet 3 of 5)

8. Remove power supply (B) from bracket (L).



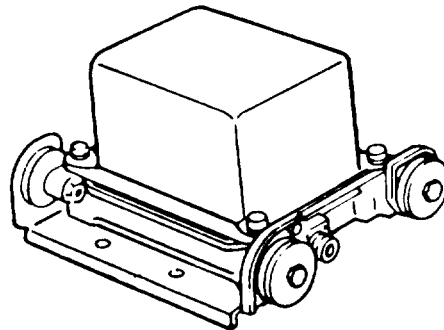
9. Using 1/4 inch wrench to hold nut (S), use screwdriver to remove two screws (T), washers (U), and mount (V) from each end of both brackets (L).

INSPECTION:

Inspect all parts for defects. Replace any defective parts.

NOTE

Mounting hardware used to mount power supply to brackets is same for both ends of each bracket, except for end of bracket not shown on illustration. Mounting hardware for hidden bracket is described in step 4 below.



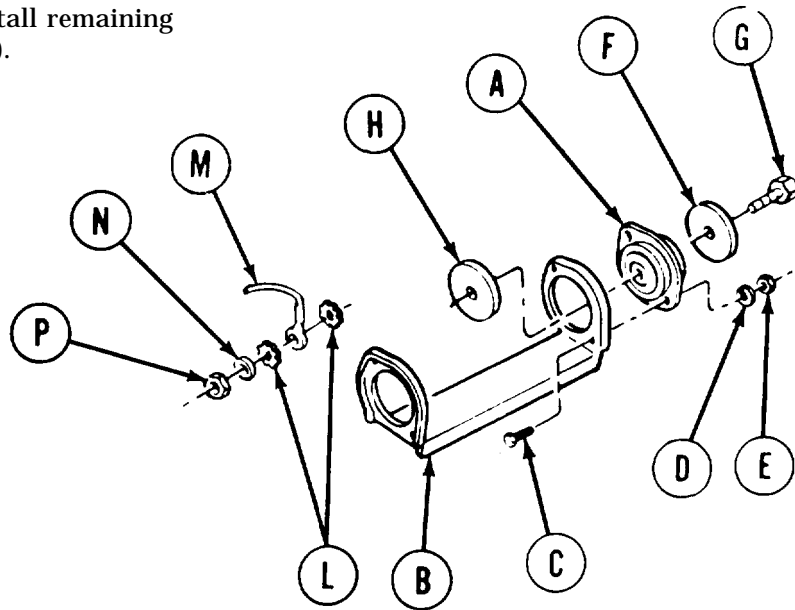
Go on to Sheet 4

TA139759

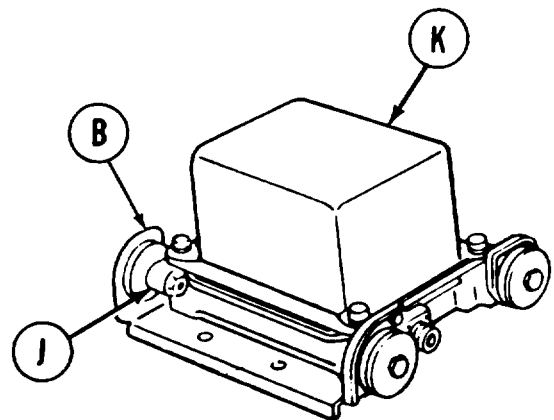
INFRARED POWER SUPPLY AND SHOCK MOUNT ASSEMBLY REPLACEMENT
 (Sheet 4 of 5)

INSTALLATION:

1. Position mount (A) on outside of bracket (B). Insert screw (C) through inside of bracket (B). Install mount (A), washer (D), and nut (E) onto screw (C).
2. Using 1/4 inch wrench to hold nut (E), use screwdriver to tighten screw (C).
3. Repeat steps 1 and 2 to install remaining mounts (A) into brackets (B).



4. Position washer (F) on screw (G). Install screw (G) through mount (A), washer (H), hole (J) in power supply (K), washer (L), ground strap (M), washer (L), and washer (N). Using 7/16 inch wrench to hold screw (G), use 7/16 inch socket to tighten nut (P).
5. Using same procedure described in step 4, except omitting washers (L) and ground strap (M), install power supply (K) onto brackets (B).

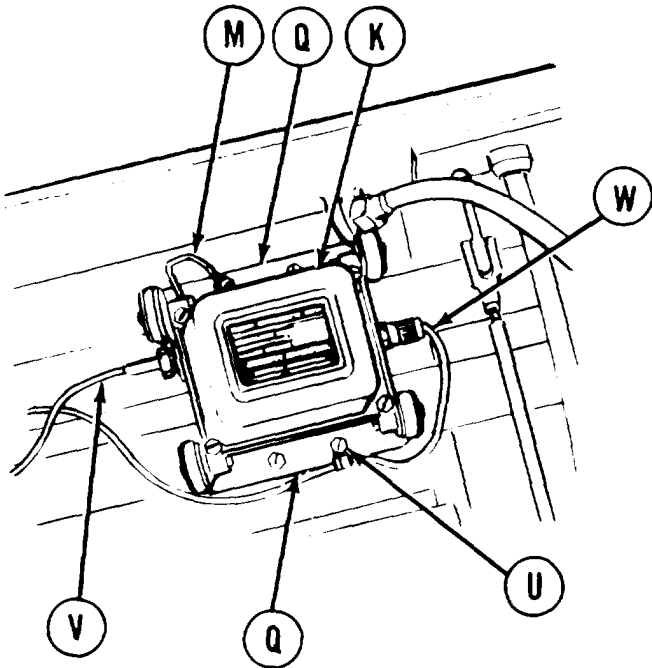


Go on to Sheet 5

TA139760

INFRARED POWER SUPPLY AND SHOCK MOUNT ASSEMBLY REPLACEMENT (Sheet 5 of 5)

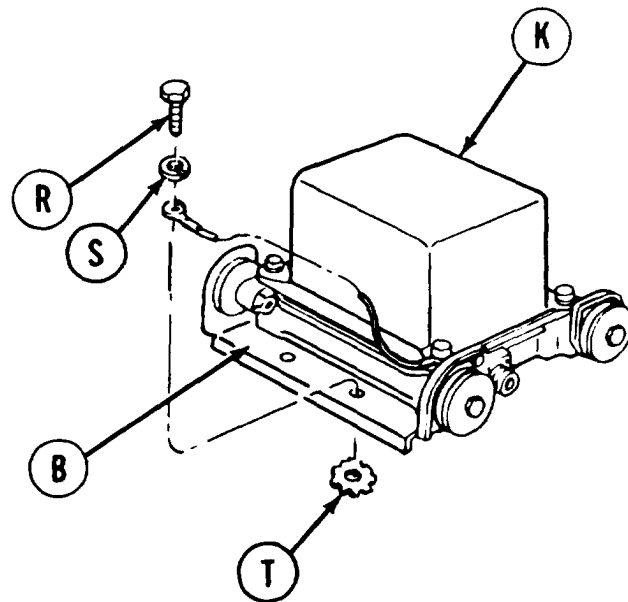
6. Position assembled power supply (K) onto mounting pad (Q) inside turret.



- 7.. Install screw (R) through new washer (S), ground strap (M), bracket (B), and new washer (T). Using 1/2 inch socket, tighten screw (R) into mounting pad (Q).

8. Install screw (R) through new washer (S), clamp (U), bracket (B), and new washer (T). Using 1/2 inch socket, tighten screw (R) into mounting pad (Q).

9. Using same procedure as described in step 8, except omitting clamp (U), install two screws (R), new lockwashers (S), and new lockwashers (T) and secure bracket (B) to mounting pad (Q).



10. Using 1 inch wrench, install connector on cable (V) to power supply (K).
11. Using 7/8 inch wrench, install connector on cable (W) to power supply (K).
12. Close turret platform access door (TM 9-2350-222-10).

End of Task

TA139761

HEADLIGHT BEAM SELECTOR SWITCH ASSEMBLY REPLACEMENT Sheet 1 of 1)

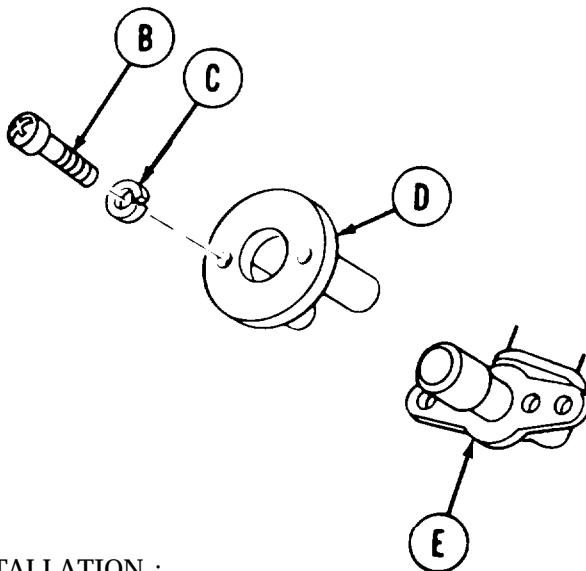
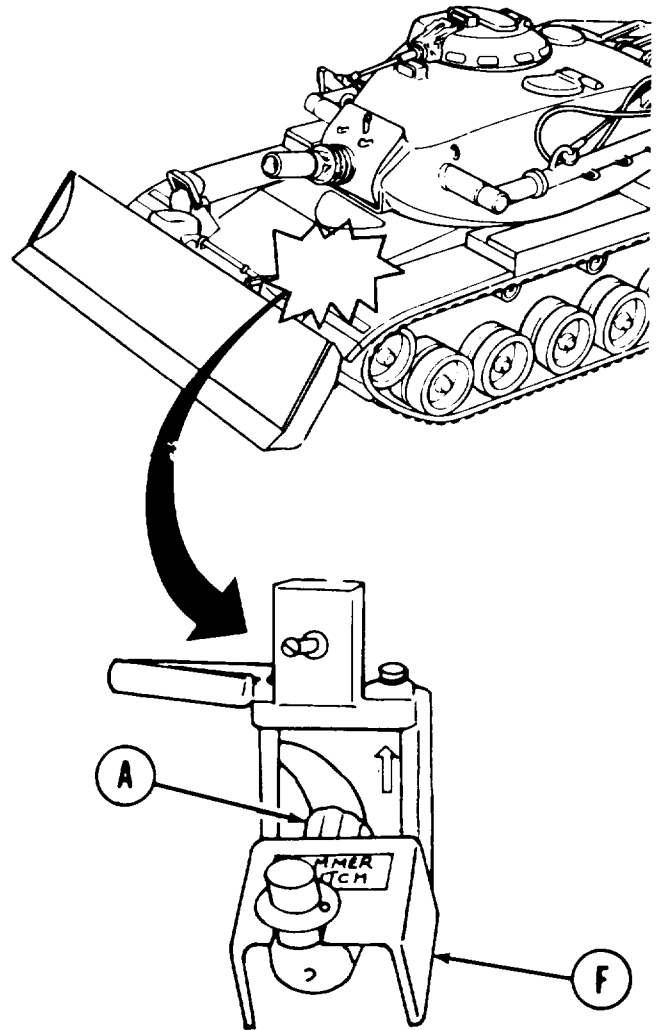
TOOLS: Cross-tip screwdriver
Spanner wrench

SUPPLIES: Lockwasher (MS35336-27) (2 required)

REFERENCE: TM 9-2350-222-10

REMOVAL:

1. Using wrench, disconnect electrical connector (A).
2. Using screwdriver, remove two screws (B) and lockwashers (C). Throw lockwashers (C) away.
3. Remove guard (D).
4. Pull selector switch (E) toward driver's seat.



INSTALLATION :

1. Place selector switch (E) in position on mounting bracket (F).
2. Using wrench, connect electrical connector (A).
3. Place guard (D) on selector switch (E),
4. Using screwdriver, install two screws (B) and new lockwashers (C).

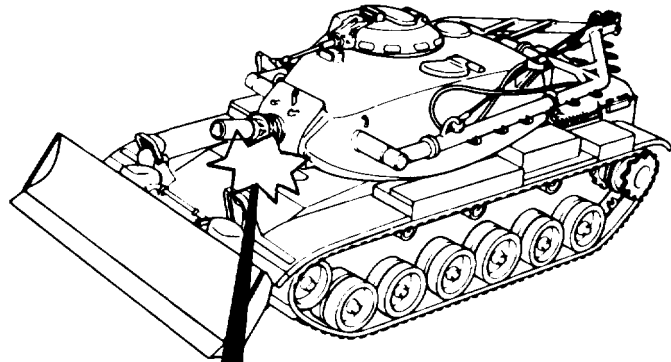
End of Task

TA139762

POWERPLANT WARNING LIGHT REPAIR (Sheet 1 of 2)

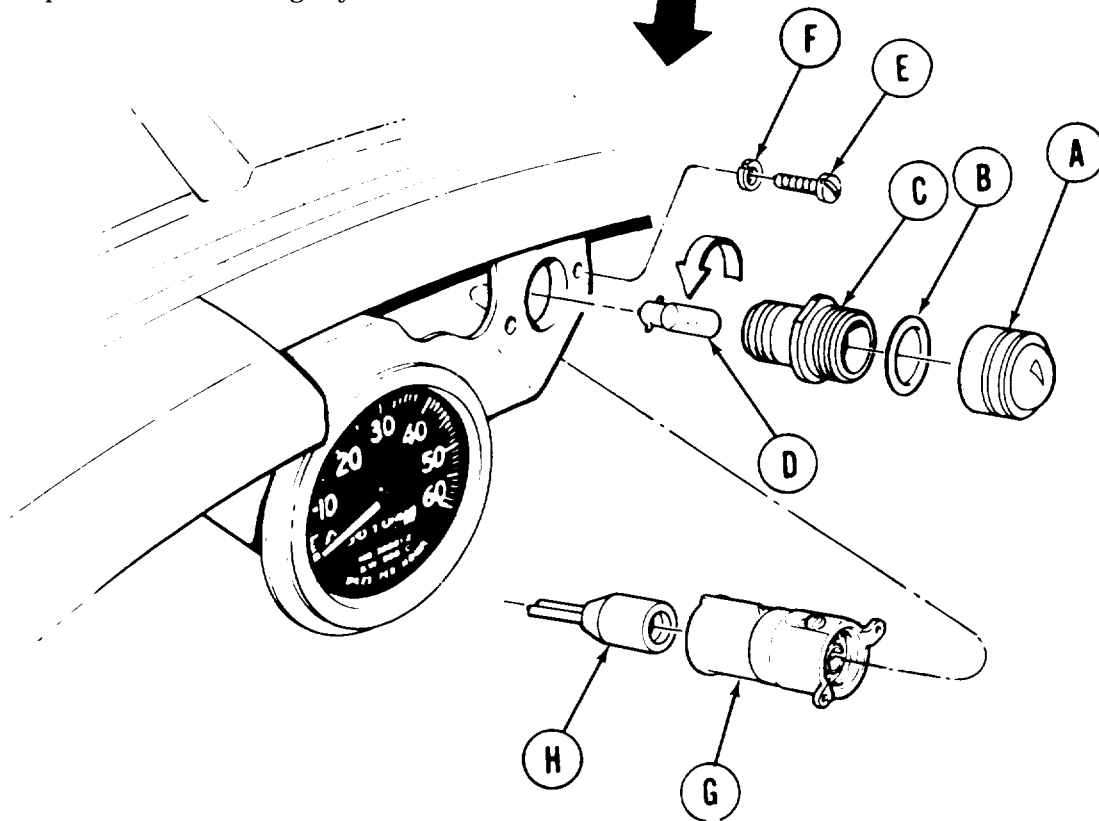
TOOLS: Adjustable wrench
Flat-tip screwdriver

SUPPLIES: Lint-free cloth (Item 12, Appendix D)
Packing (MS28775-021)
Steel wool (Item 55, Appendix D)
Silicone compound (Item 32, Appendix D)
Lockwasher (MS35338-42) (2 required)



DISASSEMBLY:

1. Unscrew lens (A) and remove packing (B) from adapter (C).
2. Using wrench, remove adapter (C).
3. Press in on lamp (D), turn it left slightly, and remove.



4. Using screwdriver, remove two screws (E), lockwashers (F), and light assembly (G). Throw lockwashers (F) away.
5. With fingers, pull electrical connector (H) loose from light assembly (G).

Go on to Sheet 2

TA139763

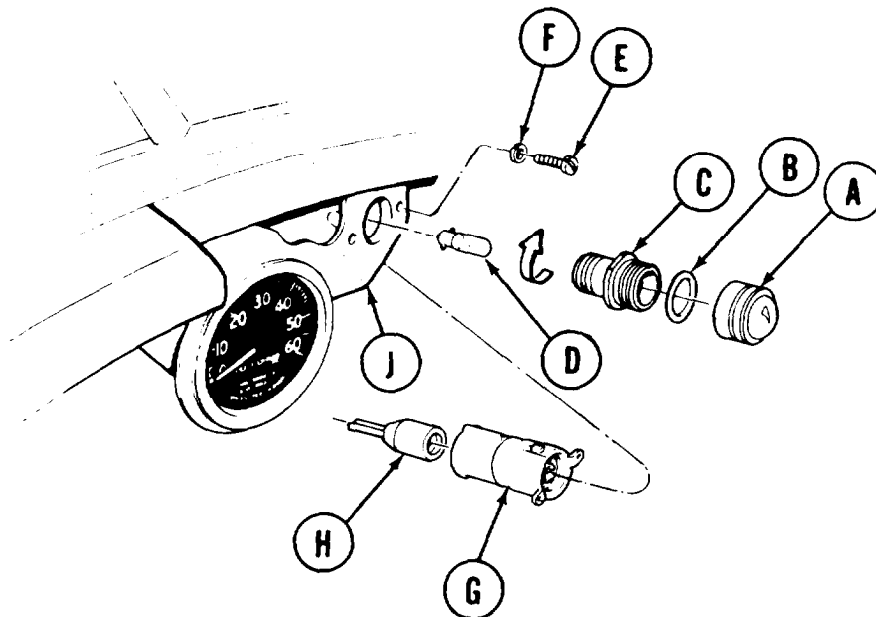
POWER PLANT WARNING LIGHT REPAIR (Sheet 2 of 2)**CLEANING AND INSPECTION:**

1. Clean lens (A) with moist, lint-free cloth (Item 12, Appendix D).
2. Using steel wool (Item 55, Appendix D), remove any corrosion from connector terminal (K) of lamp assembly (G).
3. Inspect lens for cracks or deep scratches. Replace if any are found.

INSTALLATION:**NOTE**

Apply silicone compound (Item 32, Appendix D) to mating surfaces of light assembly (G) and connector (H).

1. Using fingers, connect electrical connector (H) to light assembly (G).
2. Using screwdriver, secure light assembly (G) to bracket (J) with two screws (E) and new lockwashers (F).
3. Insert lamp (D) in socket. Press in and turn slightly right, and release to secure.
4. Using wrench, install adapter (C).
5. Place new packing (B) on adapter (C) and install lens (A) finger tight.
6. Place MASTER BATTERY switch to ON and check that lamp (D) lights.



End of Task

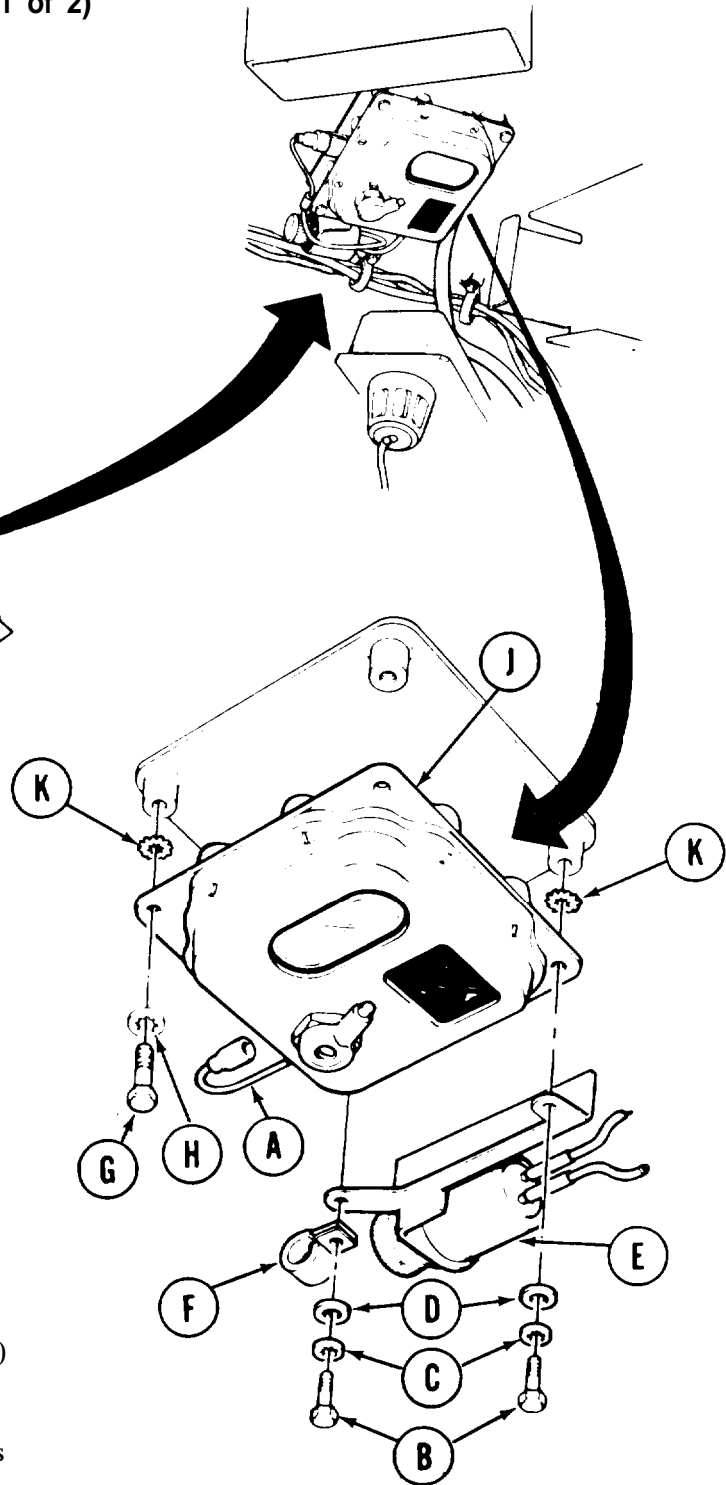
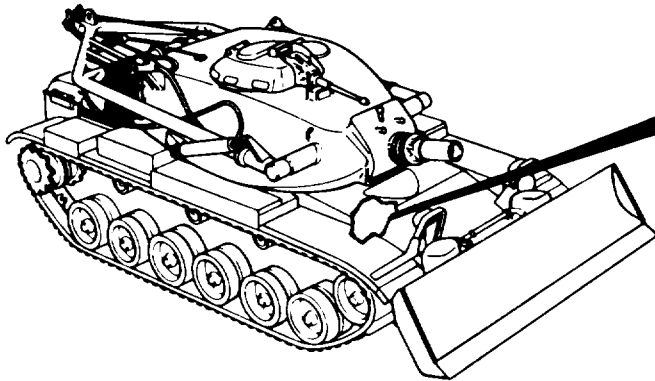
TA139764

DOMELIGHT ASSEMBLY REPLACEMENT (Sheet 1 of 2)

TOOLS: Ratchet with 1/2 in. drive
7/16 in. socket with 1/2 in. drive
5 in. extension with 1/2 in. drive

SUPPLIES: Lockwashers (MS35338-44) (4 required)
Lockwasher (MS35335-33) 4 required)

REFERENCE: TM 9-2350-222-10



REMOVAL:

Using fingers, disconnect electrical connectors (A).

- Using socket, remove two screws (B), lockwashers (C), and flat washers (D). Throw lockwashers (C) away.
- Remove variable resistor assembly (E) and clamp (F).
- Using socket, remove two remaining screws (G) and lockwashers (H). Throw lockwashers (H) away.
- Remove domelight assembly (J) and four lockwashers

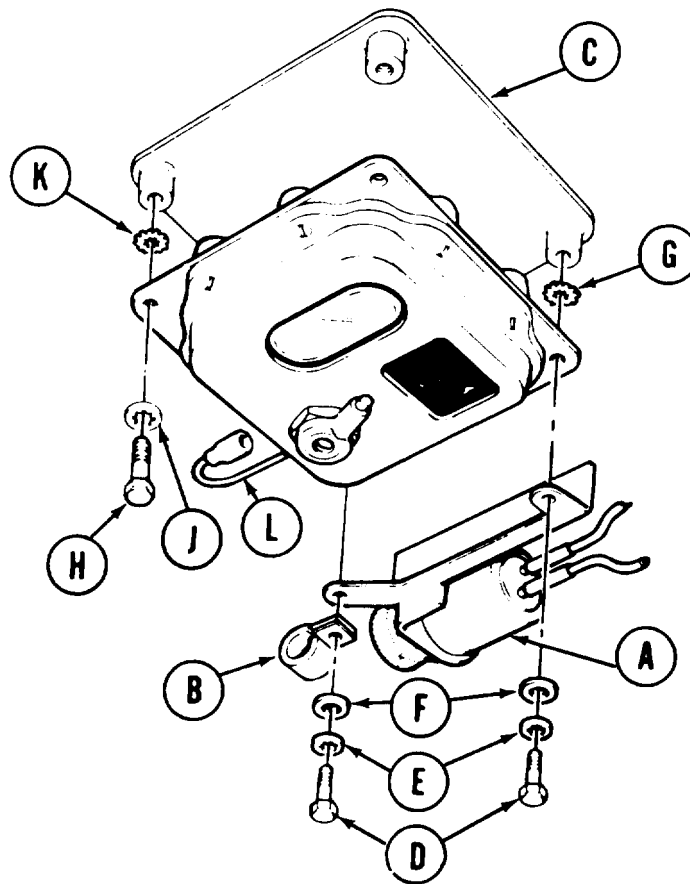
Go on to Sheet 2

TA139765

DOMELIGHT ASSEMBLY REPLACEMENT (Sheet 2 of 2)

INSTALLATION:

1. Place resistor assembly (A) and clamp (B) in position on domelight assembly (C).
2. Insert two screws (D), new lockwashers (E), and flat washers (F) in screw holes of domelight assembly.
3. Place two new lockwashers (G) over screws (D).
4. Aline domelight (C) on mounting bracket of vehicle.
5. Tighten screws (D) with fingers.
6. Using socket, install two remaining screws (H), new lockwashers (J), and new lockwashers (K).
7. Using socket, tighten two screws (H).
8. Using fingers, connect electrical connectors (L).



End of Task

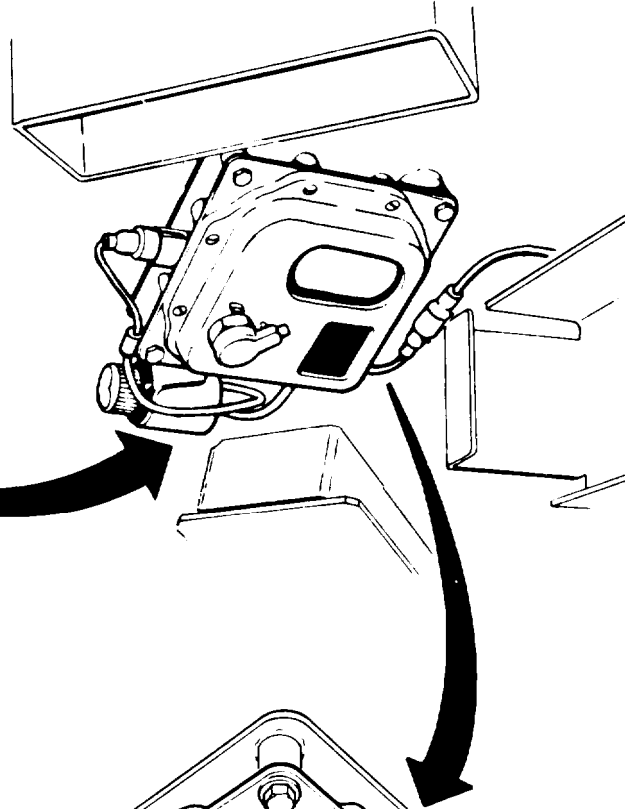
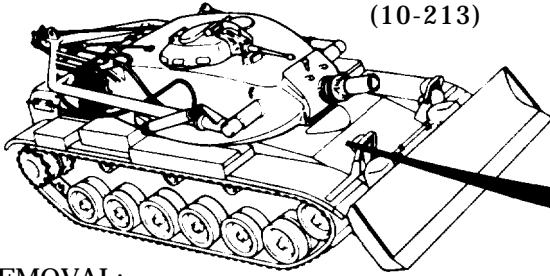
TA139766

DOMELIGHT RESISTOR ASSEMBLY BRACKET REPLACEMENT (Sheet 1 of 1)

TOOLS: 7/16 in. socket with 1/2 in. drive
extension with 1/2 in. drive
Ratchet with 1/2 in. drive

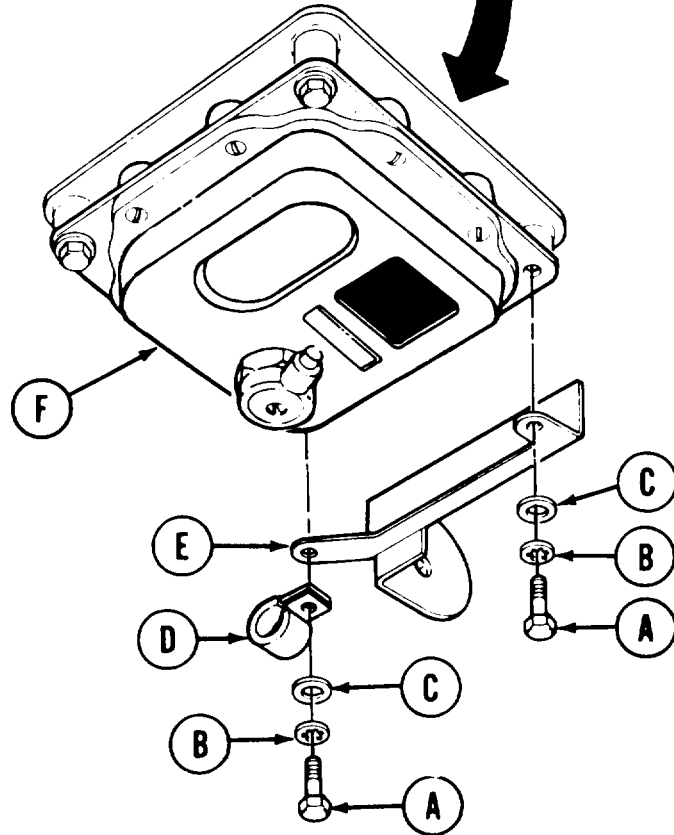
SUPPLIES: Lockwasher (MS35338-33) 2 required)

PRELIMINARY PROCEDURE: Remove resistor
assembly (page
(10-213)



REMOVAL:

1. Using socket, remove two screws (A), lockwashers (B), and washers (C). Throw lockwashers (B) away.
2. Remove clamp (D) and bracket (E).



INSTALLATION:

1. Position bracket holes and clamp (D) with holes in domelight assembly (F).
2. Place new lockwasher (B) and washer (C) on two screws (A).
3. Insert screws (A) through holes in positioned parts of step 1.
4. Using socket, tighten screws (A).
5. Install resistor assembly (page 10-214).

End of Task

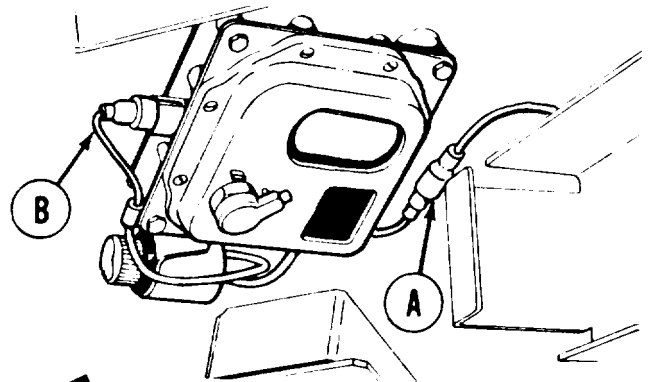
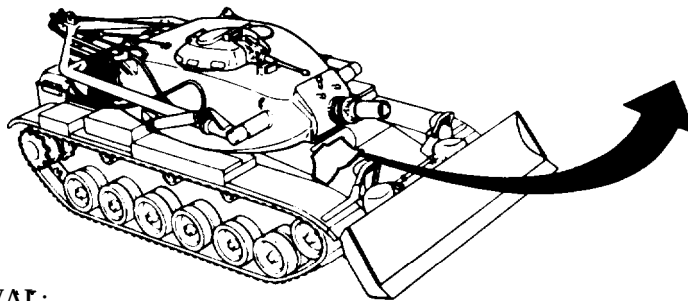
TA139767

DOMELIGHT RESISTOR ASSEMBLY REPLACEMENT (Sheet 1 of 2)

TOOLS: Ratchet with 1/2 in. drive
 3 in. extension with 1/2 in. drive
 7/16 in. socket with 1/2 in. drive
 9/16 in. combination box and open end wrench
 Hose clamp pliers
 3/32 in. socket head screw key (allen wrench)

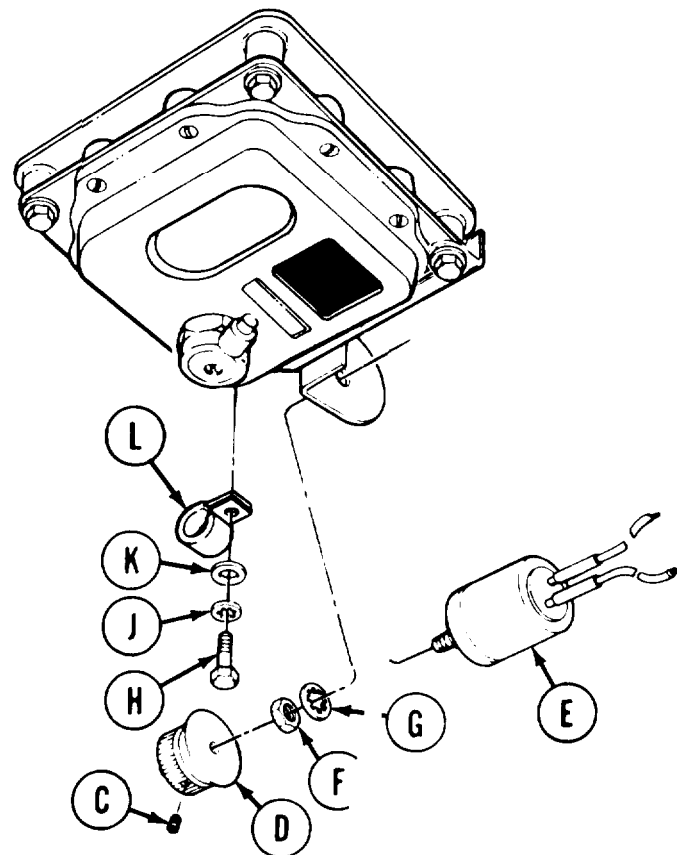
SUPPLIES: Lockwasher (MS35338-33)
 Lockwasher (MS35333-42)

REFERENCE: TM 9-2350-222-10



REMOVAL:

1. Disconnect electrical connectors (A) and (B).
2. Using allen wrench, loosen two setscrews (C).
3. Slide knob (D) off shaft of resistor assembly (E).
4. Using wrench on nut (F) and pliers on resistor assembly (E), remove nut (F) and lockwasher (G). Throw lockwasher away.
5. Using socket, remove screw (H), lockwasher (J), washer (K), and clamp (L). Throw lockwasher away.
6. Open clamp (L) to release resistor assembly wires.
7. Remove resistor assembly (E).



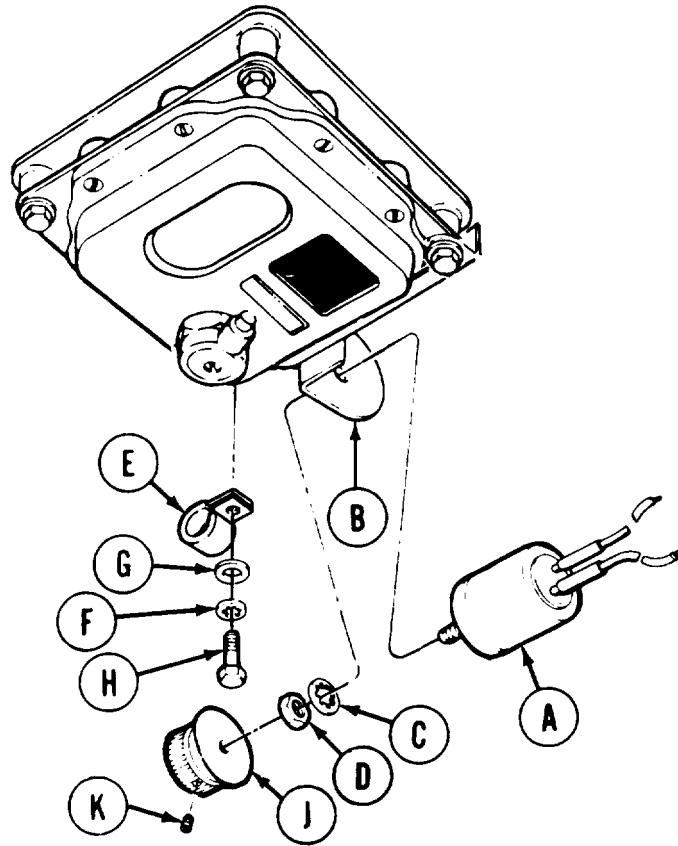
Go on to Sheet 2

TA139768

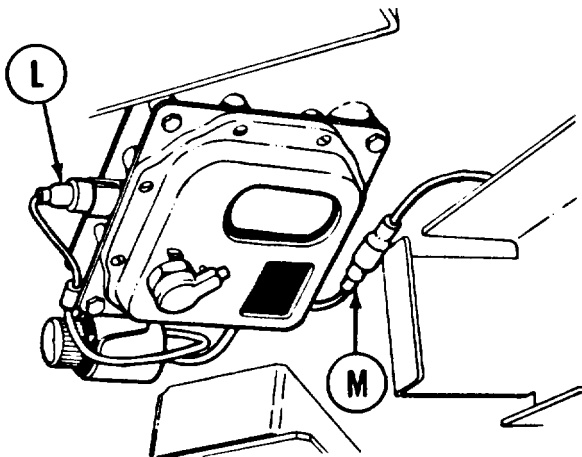
DOMELIGHT RESISTOR ASSEMBLY REPLACEMENT (Sheet 2 of 2)

INSTALLATION:

1. Position resistor assembly (A) in domelight resistor assembly bracket (B).
2. Place new lockwasher (C) and nut (D) on resistor assembly (A).
3. Using wrench on nut (D) and Pliers On resistor assembly (A), tighten nut (D).
4. Open clamp (E) enough to insert wires of resistor assembly (A).
5. Place new lockwasher (F), flat washer (G), and clamp (E) on screw (H).
6. Using socket, tighten screw (H).



7. Slide knob (J) on resistor assembly (A).
8. Using allen wrench, tighten two setscrews (K)



9. Connect electrical connectors (L) and (M).
10. Perform function test (TM 9-2350-222-10).

End of Task

TA139769

DOMELIGHT ASSEMBLY REPAIR (Sheet 1 of 8)

PROCEDURE INDEX

PROCEDURE	PAGE
Disassembly	10-215
Cleaning and Inspection	10-219
Assembly	10-219

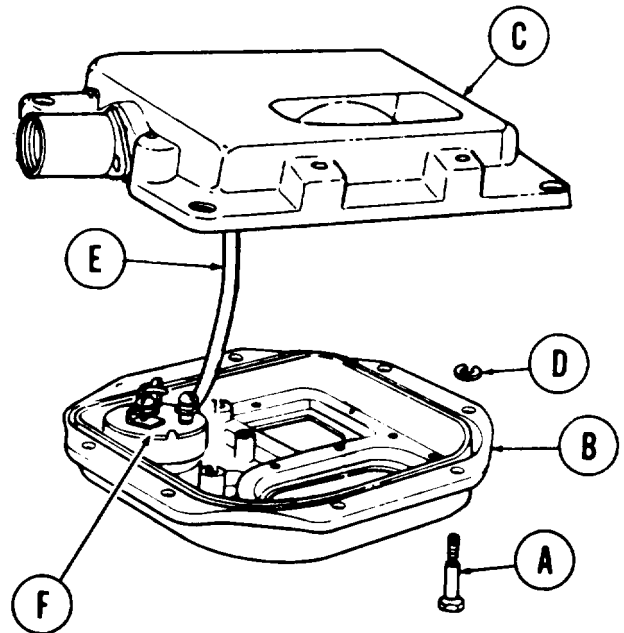
TOOLS: Flat-tip screwdriver
 Cross-tip screwdriver
 8 in. adjustable wrench (crescent)
 Long round nose pliers (needle nose)

SUPPLIES: Lockwashers (MS35335-30) (5 required)

PRELIMINARY PROCEDURE: Remove domelight (page 10-210)

DISASSEMBLY:

1. Using flat-tip screwdriver, unscrew eight captive screws (A).
2. Separate door assembly (B) from body assembly (C).
3. Using flat-tip screwdriver, remove electrical lead (E) from rotary switch (F).
4. Using needle nose pliers, remove eight rings (D) from captive screws (A). Remove captive screws (A).

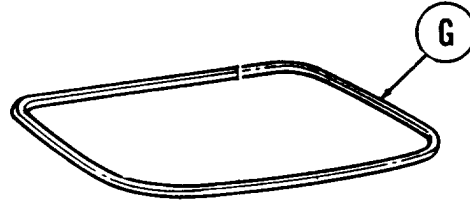


Go on to Sheet 2

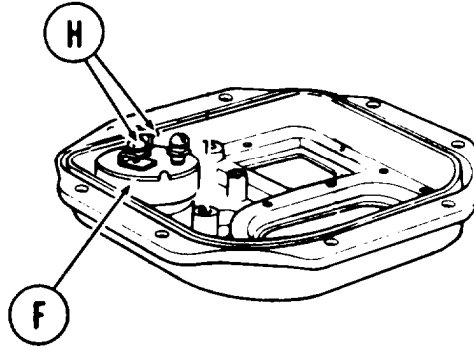
TA139770

DOMELIGHT ASSEMBLY REPAIR (Sheet 2 of 8)

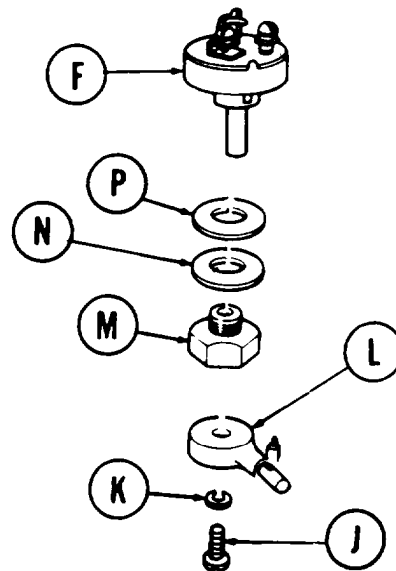
5. Using flat-tip screwdriver, remove door gasket (G) by inserting under gasket and lifting up.



6. Using flat-tip screwdriver, remove two remaining electrical leads (H) from switch (F).



7. Using flat-tip screwdriver, remove screw (J) and lockwasher (K) securing knob (L). Remove knob (L). Throw lockwasher (K) away.



8. Using crescent wrench, remove nut assembly (M), washer (N), and gasket (P).

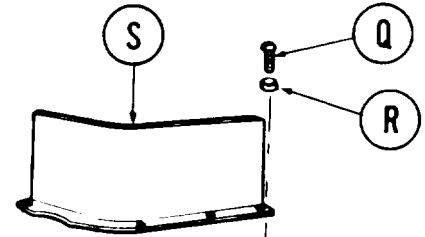
9. Remove rotary switch (F).

Go on to Sheet 3

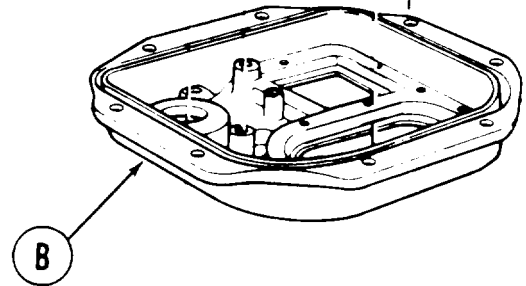
TA139771

DOMELIGHT ASSEMBLY REPAIR (Sheet 3 of 8)

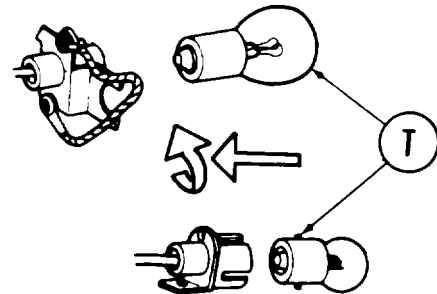
10. Using cross-tip screwdriver, remove four screws (Q) and lockwashers (R) from partition (S).



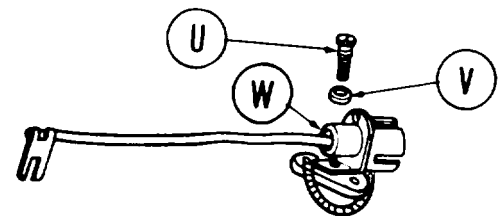
11. Remove partition (S) from door assembly (B).



12. Remove two lamps (T) by pushing in and turning counterclockwise.

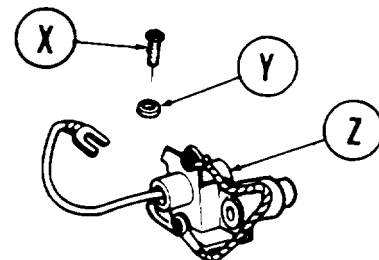


13. Using flat-tip screwdriver, remove two screws (U) and flat washers (V) holding socket assembly (W) in place.



14. Remove socket assembly (W).

15. Using cross-tip screwdriver, remove two screws (X) and flat washers (Y) holding socket assembly (Z) in place.

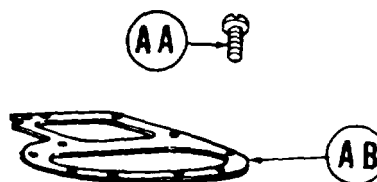


16. Remove socket assembly (Z).

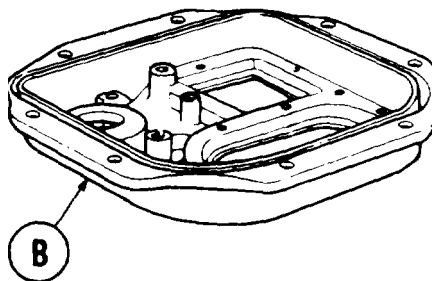
Go on to Sheet 4

DOMELIGHT ASSEMBLY REPAIR (Sheet 4 of 8)

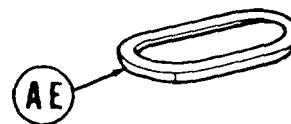
17. Using cross-tip screwdriver, remove seven screws (AA) from retaining plate (AB).



18. Remove retaining plate (AB) from door assembly (B).



19. Remove blue lens (AC) and gasket (AD) by pushing up from outside of door assembly (B).



20. Remove white lens (AE) and gasket (AF) by pushing up from outside of door assembly (B).

Go on to Sheet 5

DOMELIGHT ASSEMBLY REPAIR (Sheet 5 of 8)

CLEANING AND INSPECTION:

1. Inspect domelight and components for cleanliness and corrosion. Replace any components that cannot be cleaned.

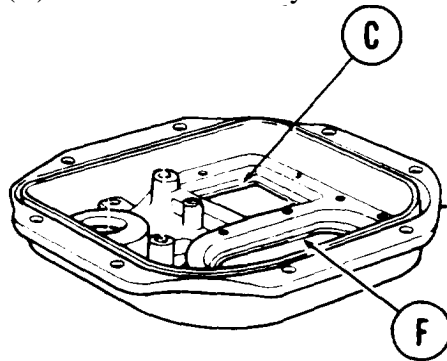
2. Inspect for mechanical damage and wear. If worn or damaged, replace.

3. Inspect domelight components for cracks. If any items are cracked, replace them.

4. Inspect all gaskets for damage. If damaged, replace.

ASSEMBLY:

1. Place blue lens (A) and gasket (B) in position (C) on door assembly.



2. Place white lens (D) and gasket (E) in position (F) on door assembly.



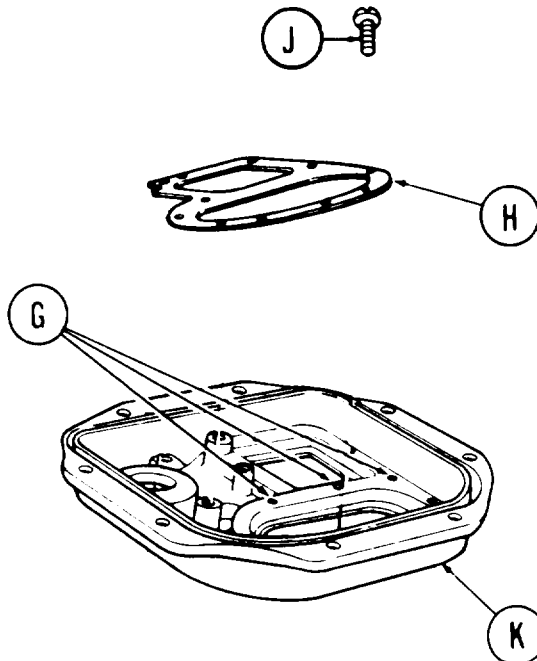
Go on to Sheet 6

DOMELIGHT ASSEMBLY REPAIR (Sheet 6 of 8)

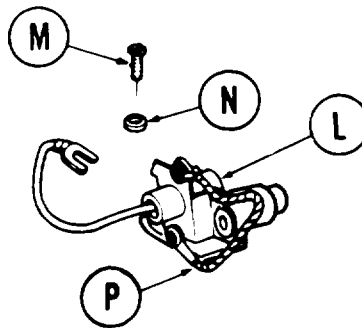
NOTE

Do not place screws in three holes (G) shown.

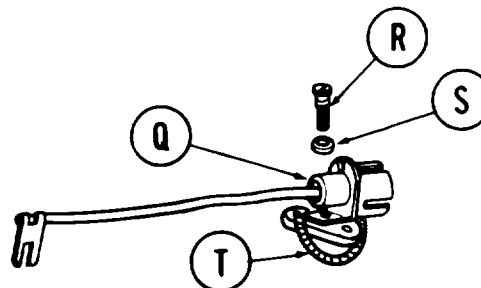
- Using cross-tip screwdriver, install retaining plate (H) and seven screws (J) to door assembly (K).



- Using cross-tip screwdriver, install socket assembly (L), two screws (M), washers (N), and ground strap (P).



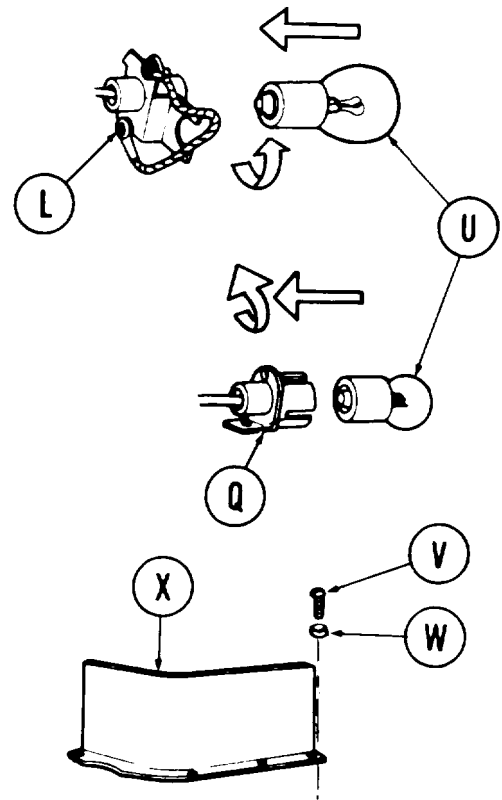
- Using flat-tip screwdriver, install socket assembly (Q), two screws (R), new lock-washers (S), and ground cable (T).



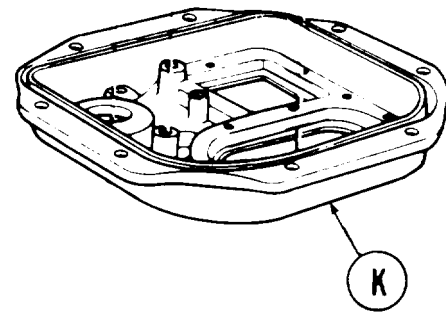
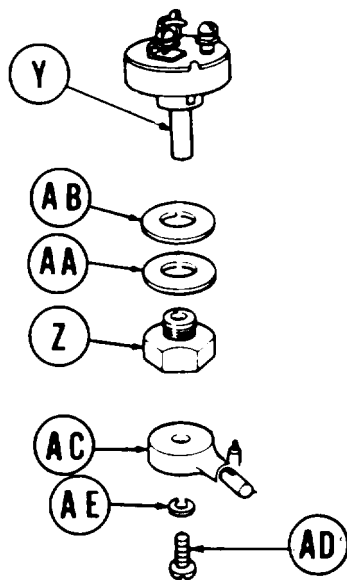
Go on to Sheet 7

DOMELIGHT ASSEMBLY REPAIR (Sheet 7 of 8)

6. Install two lamps (U) in position: large lamp in socket assembly (L), small lamp in socket assembly (Q).



7. Using cross-tip screwdriver, install four screws (V) and new lockwashers (W) to secure partition (X) to door assembly (K).



Place rotary switch (Y) in position on door

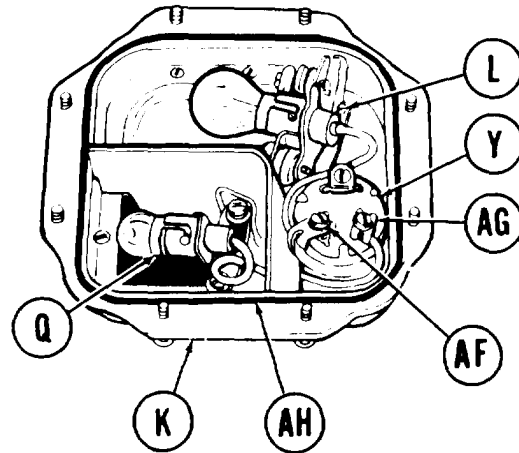
Using crescent wrench, install nut (Z), washer (AA), and gasket (AB).

10. Using flat-tip screwdriver, install knob (AC), screw (AD), and new lockwasher (AE).

Go on to Sheet 8

DOMELIGHT ASSEMBLY REPAIR (Sheet 8 of 8)

11. Using flat-tip screwdriver, install lead from socket assembly (L) to connector (AF), which is marked 'W' on switch (Y).



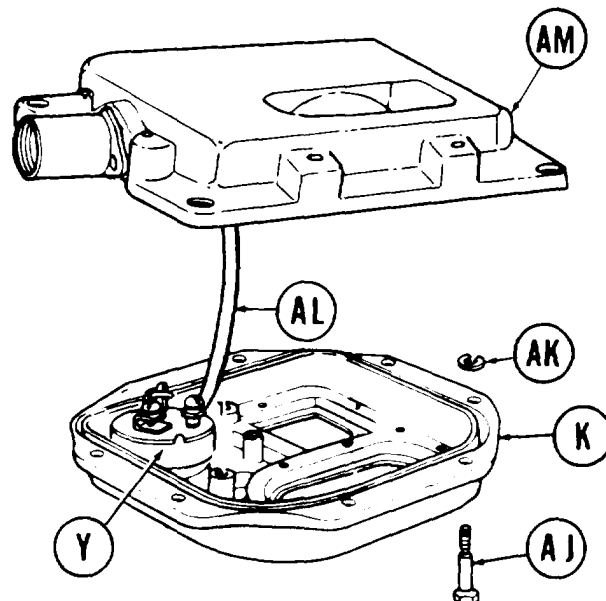
12. Using flat-tip screwdriver, install lead from socket assembly (Q) to connector (AG), which is marked 'R' on switch (Y).

13. Using fingers, install door gasket (AH) in gasket groove of door assembly (K).

14. Using fingers, install eight captive screws (AJ) in door assembly (K).

15. Using needle nose pliers, install eight rings (AK) on captive screws (AJ).

16. Using flat-tip screwdriver, install lead (AL) on remaining connector of switch (Y).



17. Using flat-tip screwdriver, tighten eight captive screws (AJ) securing door assembly (K) to body assembly (AM).

18. Install domelight (page 10-211).

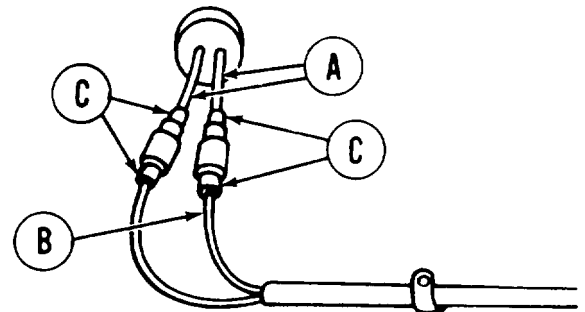
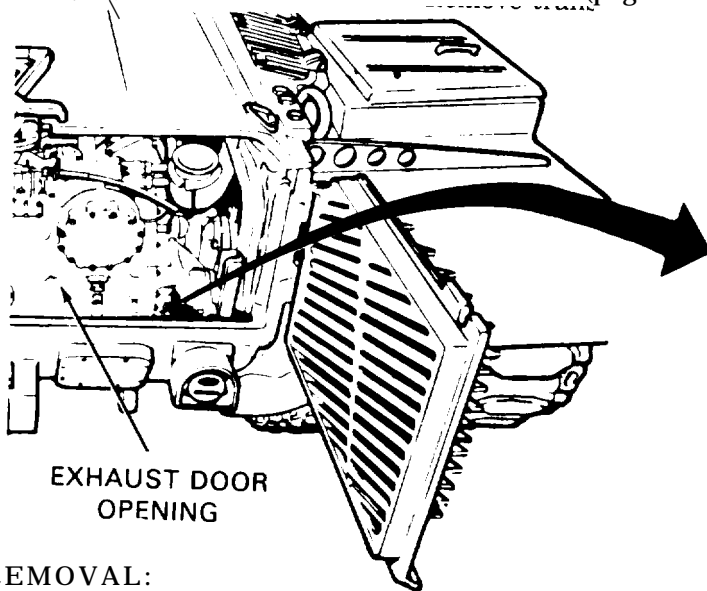
End of Task

RIGHT TAILLIGHT - STOPLIGHT ASSEMBLY REPLACEMENT (Sheet 1 of 3)

TOOLS: 9/16 in. combination box and open end wrench

SUPPLIES: Silicone compound (Item 32, Appendix D)
 Masking tape (Item 57, Appendix D)
 Pencil
 Lockwasher (MS35338-46) (2 required)

PRELIMINARY Remove transmission shroud (page 9-19)



CONNECTIONS FOR RIGHT
 TAILLIGHT-STOPLIGHT ASSEMBLY

REMOVAL:

NOTE

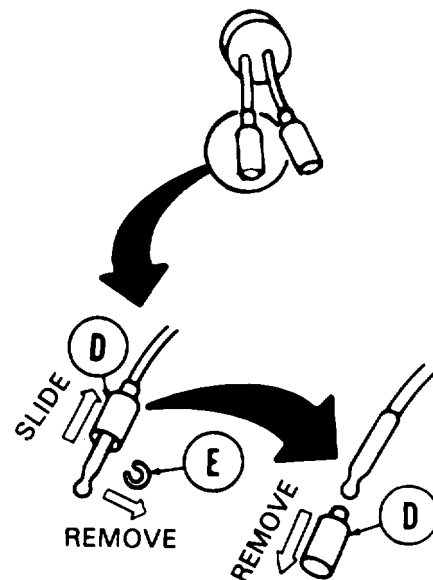
Inspect leads (A) and leads (B) for numbered tags (C) 23 and 24. If leads do not have tags, use masking tape (Item 57, Appendix D) and pencil to number leads.

- 1 Reach through exhaust door opening and disconnect two leads (A) from hull connectors (B).
- 2 Slide two connector shells (D) back on taillight leads to expose two slotted washers (E).

NOTE

Lubricant may be needed on leads (A) to remove shells (D).

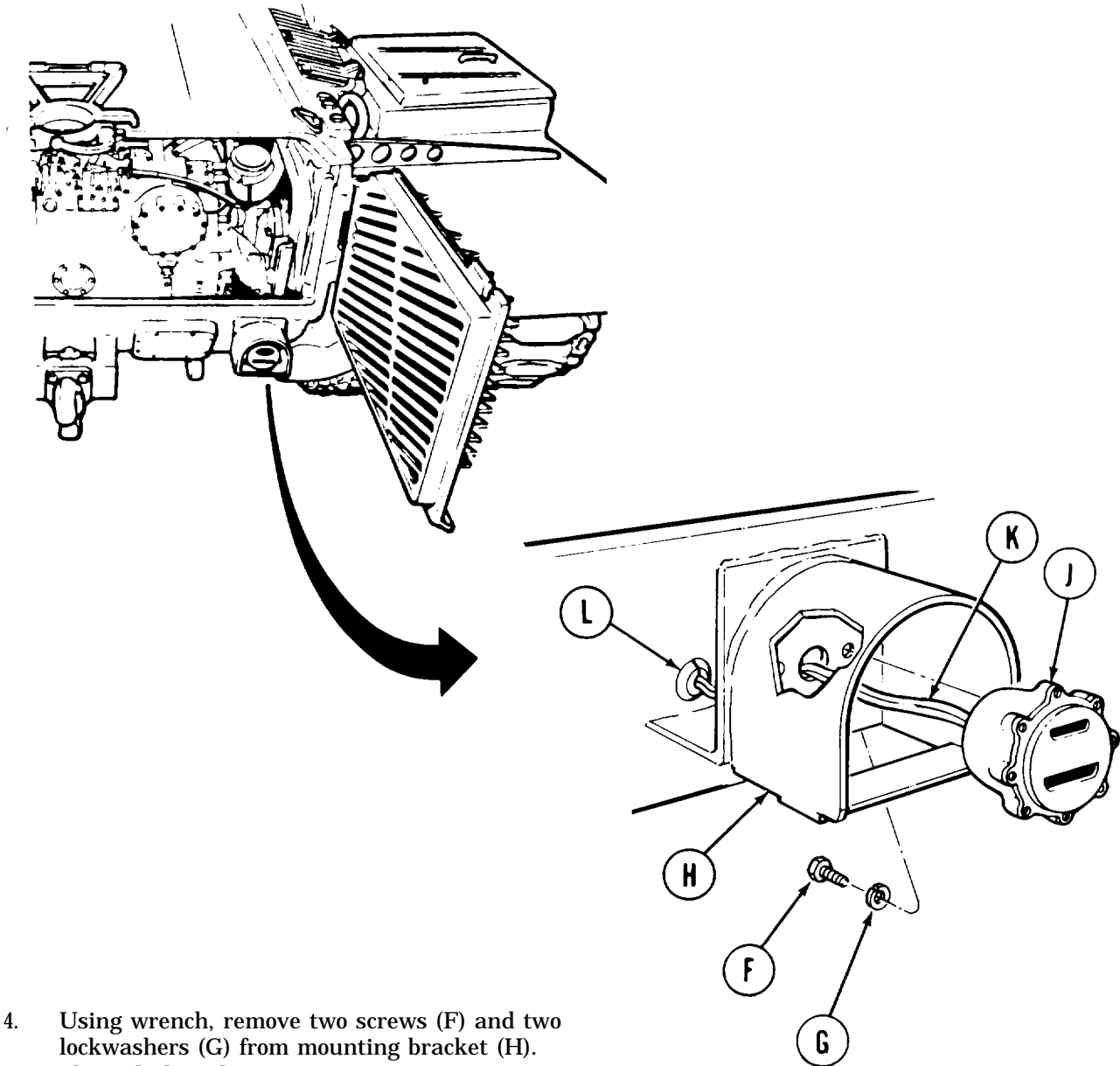
- 3 Remove two slotted washers (E) and two shells (D).



Go on to Sheet 2

TA139778

RIGHT TAILLIGHT - STOPLIGHT ASSEMBLY REPLACEMENT (Sheet 2 of 3)



4. Using wrench, remove two screws (F) and two lockwashers (G) from mounting bracket (H). Throw lockwashers away.
5. Remove taillight (J), pulling two taillight leads (K) through rubber grommet (L).

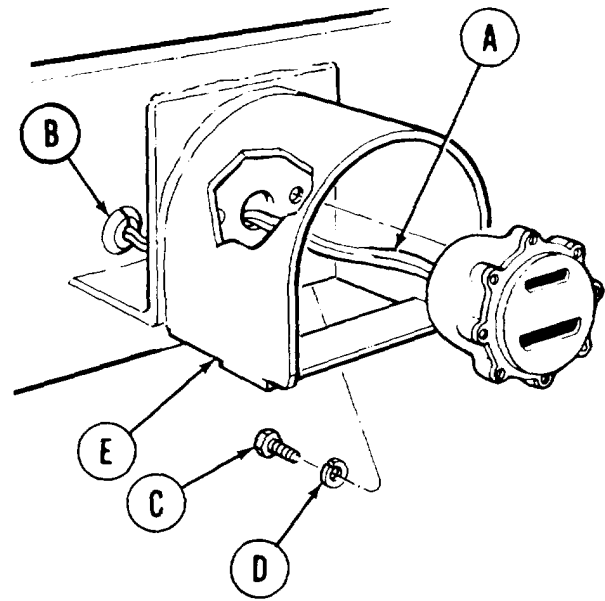
Go on to Sheet 3

TA139779

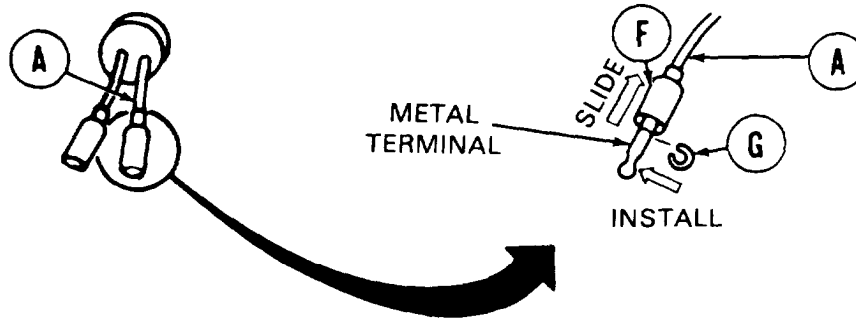
RIGHT TAILLIGHT - STOPLIGHT ASSEMBLY REPLACEMENT Sheet 3 of 3)

INSTALLATION:

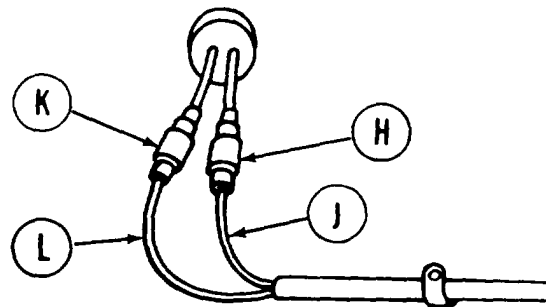
- 1 Using silicone compound (Item 32, Appendix D) on taillight leads (A), insert two leads through rubber grommet (B).
- 2 Using wrench, install two screws (C) and two new lockwashers (D) on mounting bracket (E).



- 3 Slide two shells (F) on taillight leads (A),
- 4 Install two slotted washers (G) on leads (A) behind metal terminal.



5. Connect tagged or taped taillight lead (H) to hull connector number 24 (J).
6. Connect remaining lead (K) to hull connector number 23 (L).
7. Install transmission shroud (page 9-23).
8. Check for proper taillight operation (TM 9-2350-222-10).



End of Task

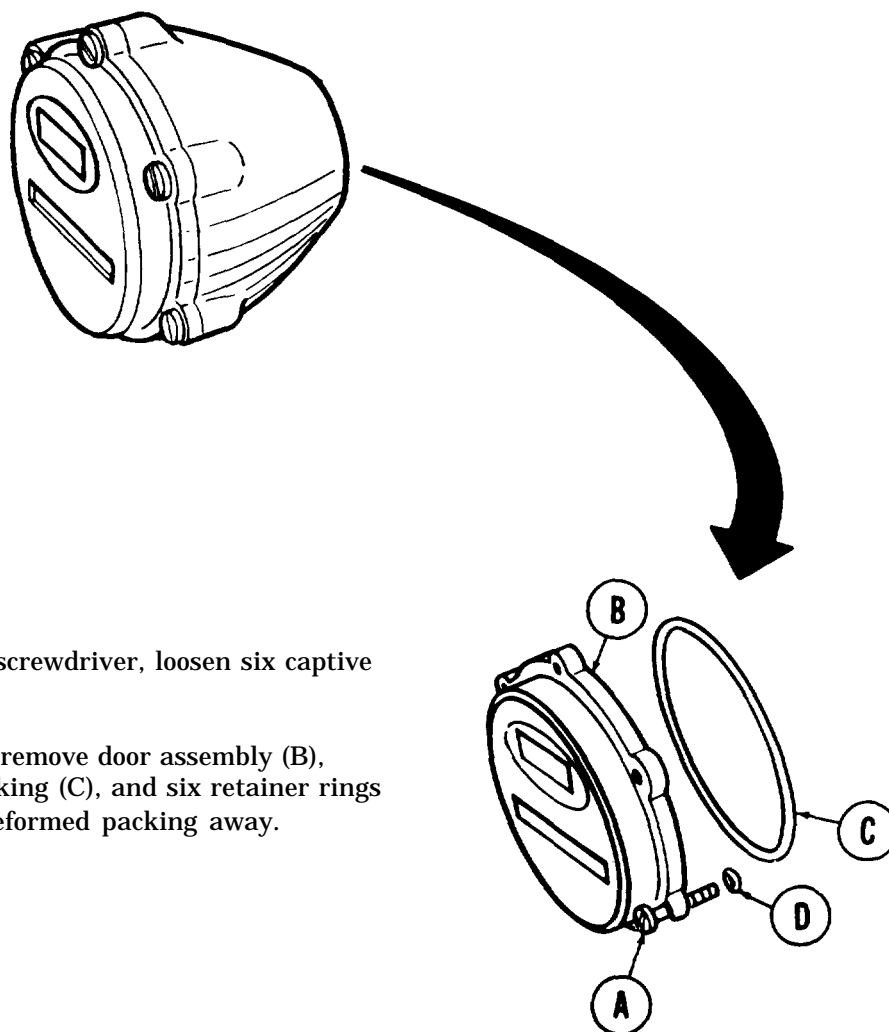
TA139780

RIGHT TAILLIGHT - STOPLIGHT ASSEMBLY REPAIR (Sheet 1 of 3)

TOOLS: Flat-tip screwdriver
Cross-tip screwdriver

SUPPLIES: Crocus cloth (Item 14, Appendix D) or steel wool (Item 55, Appendix D)
Silicone compound (Item 32, Appendix D)
Preformed packing (7320658)
Lockwasher (MS35338-42) (2 required)

PRELIMINARY PROCEDURE: Remove taillight from vehicle for complete repair (page 10-223).
Lamp replacement (steps 1 thru 4) can be accomplished with taillight on vehicle.



DISASSEMBLY:

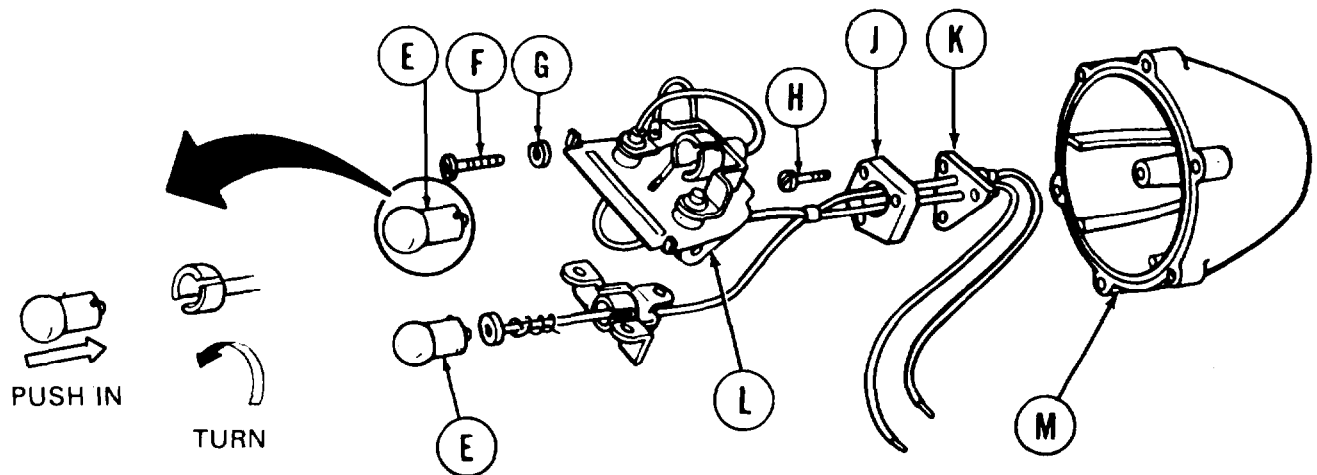
1. Using flat-tip screwdriver, loosen six captive screws (A).
2. Using fingers, remove door assembly (B), preformed packing (C), and six retainer rings (D). Throw preformed packing away.

Go on to Sheet 2

TA139781

RIGHT TAILLIGHT - STOPLIGHT ASSEMBLY REPAIR (Sheet 2 of 3)

3. Remove two stoplight and taillight lamps (E).
4. Using cross-tip screwdriver, remove two screws (F) and two lockwashers (G).
Throw lockwashers away.



5. Using Phillips screwdriver, remove three screws (H) from plate (J) and grommet (K).
6. Remove socket and wiring harness assembly (L) with fingers by pressing out grommet (K) from body assembly (M).

CLEANING AND INSPECTION:

1. Inspect taillight assembly for corrosion. Corroded areas which cannot be cleaned with crocus cloth (Item 14, Appendix D) or steel wool (Item 55, Appendix D) are cause for replacement of that item,
2. Inspect taillight and components for cracks. If any items are cracked, replace.
3. Inspect for mechanical damage and wear. If damaged or worn, replace.

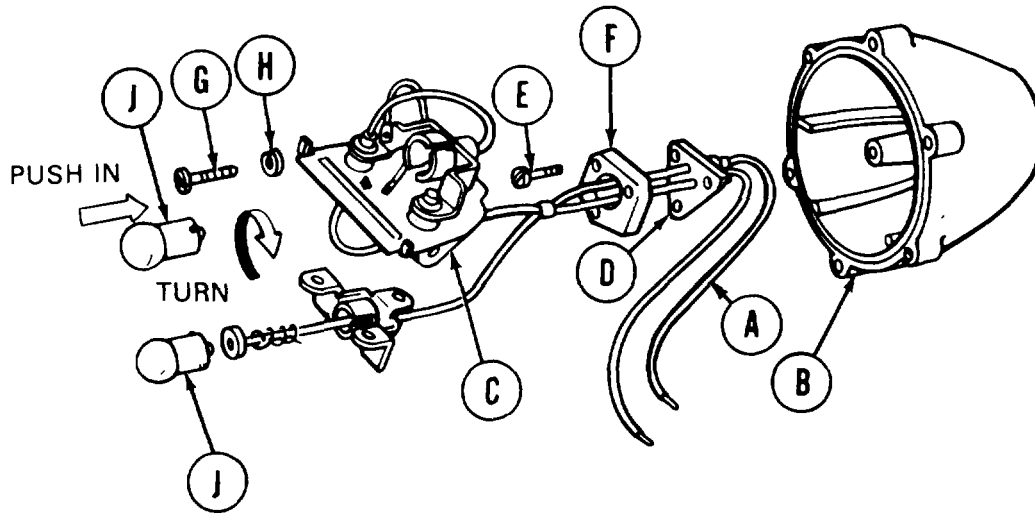
Go on to Sheet 3

TA139782

RIGHT TAILLIGHT - STOPLIGHT ASSEMBLY REPAIR (Sheet 3 of 3)

ASSEMBLY:

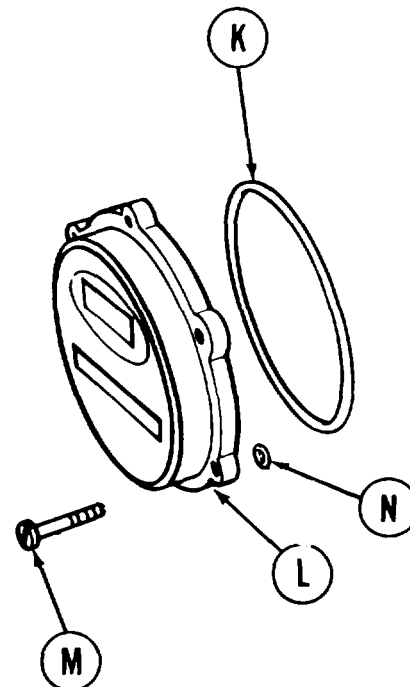
1. Insert two leads (A) through body assembly (B).
2. Install socket and wiring assembly (C) by pressing in grommet (D).
3. Using cross-tip screwdriver, install three screws (E) through plate (F) and grommet (D).
4. Using cross-tip screwdriver, install two screws (G) and two new lockwashers (H).



5. Install two lamps (J).
6. Coat new preformed packing gasket (K) with silicone compound (Item 32, Appendix D) before installation.
7. Place new preformed packing (K) in door assembly (L).

NOTE

Wires are located at bottom of body assembly (B) for positioning of door assembly (L) as shown.



8. Using flat-tip screwdriver, install six screws (M) door assembly (L), and six retaining rings (N).
9. Install lamp assembly (page 10-225).
10. Perform test on taillight assembly (TM 9-2350-222-10).

End of Task

TA139783

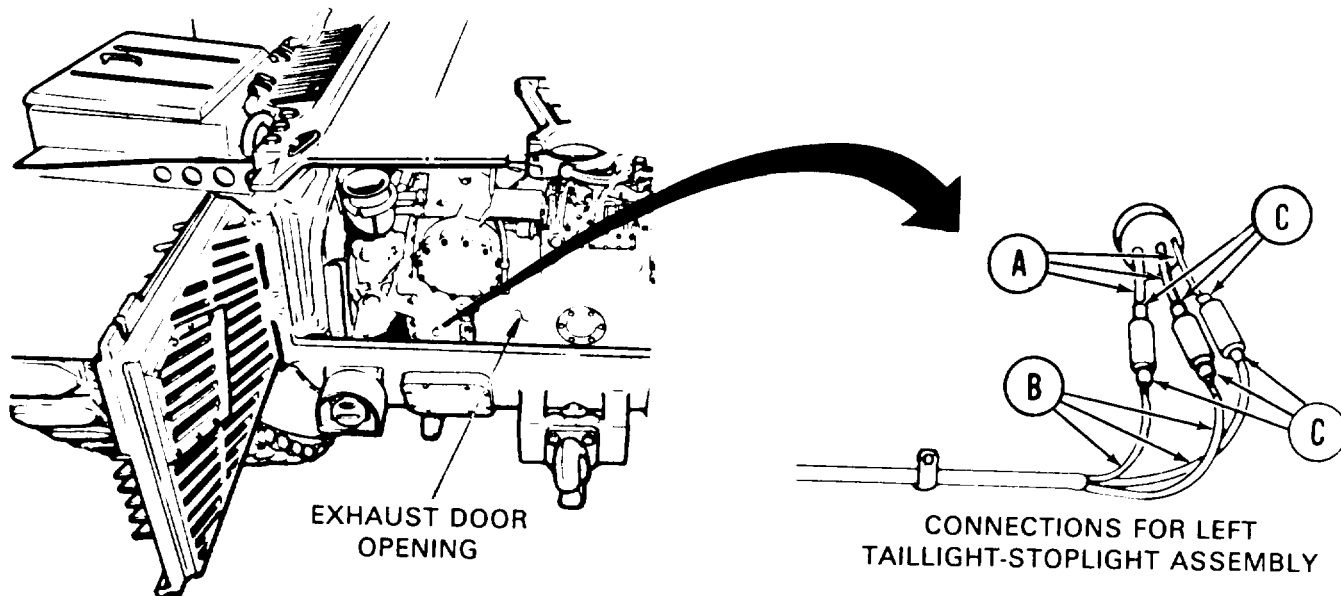
LEFT TAILLIGHT - STOPLIGHT ASSEMBLY REPLACEMENT (Sheet 1 of 3)

TOOLS: 9/16 in. combination box and open end wrench

SUPPLIES: Silicone compound (Item 32, Appendix D)
 Masking tape (Item 57, Appendix D)
 Pencil
 Lockwasher (MS35338-42) (2 required)

REFERENCE: TM 9-2350-222-10

PRELIMINARY PROCEDURE: Remove transmission shroud (page 9-19)



REMOVAL:

NOTE

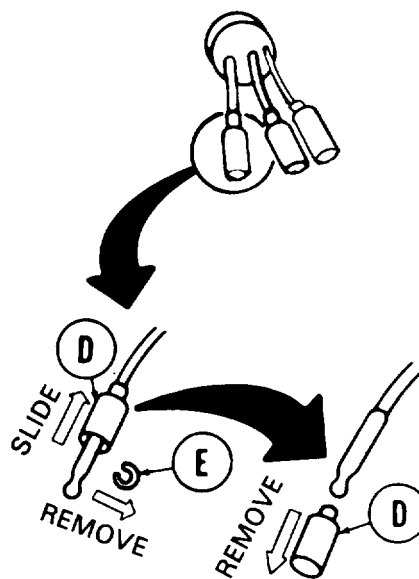
Inspect leads (A) and leads (B) for numbered tags (C). If leads do not have tags, use masking tape (Item 57, Appendix D) and pencil to number leads 21, 22, and 24.

1. Reach through exhaust door opening and disconnect three leads (A) from hull connectors (B).
2. Slide three connector shells (D) back on taillight leads to expose three slotted washers (E).

NOTE

Lubricant may be needed on leads (A) to remove shells (D).

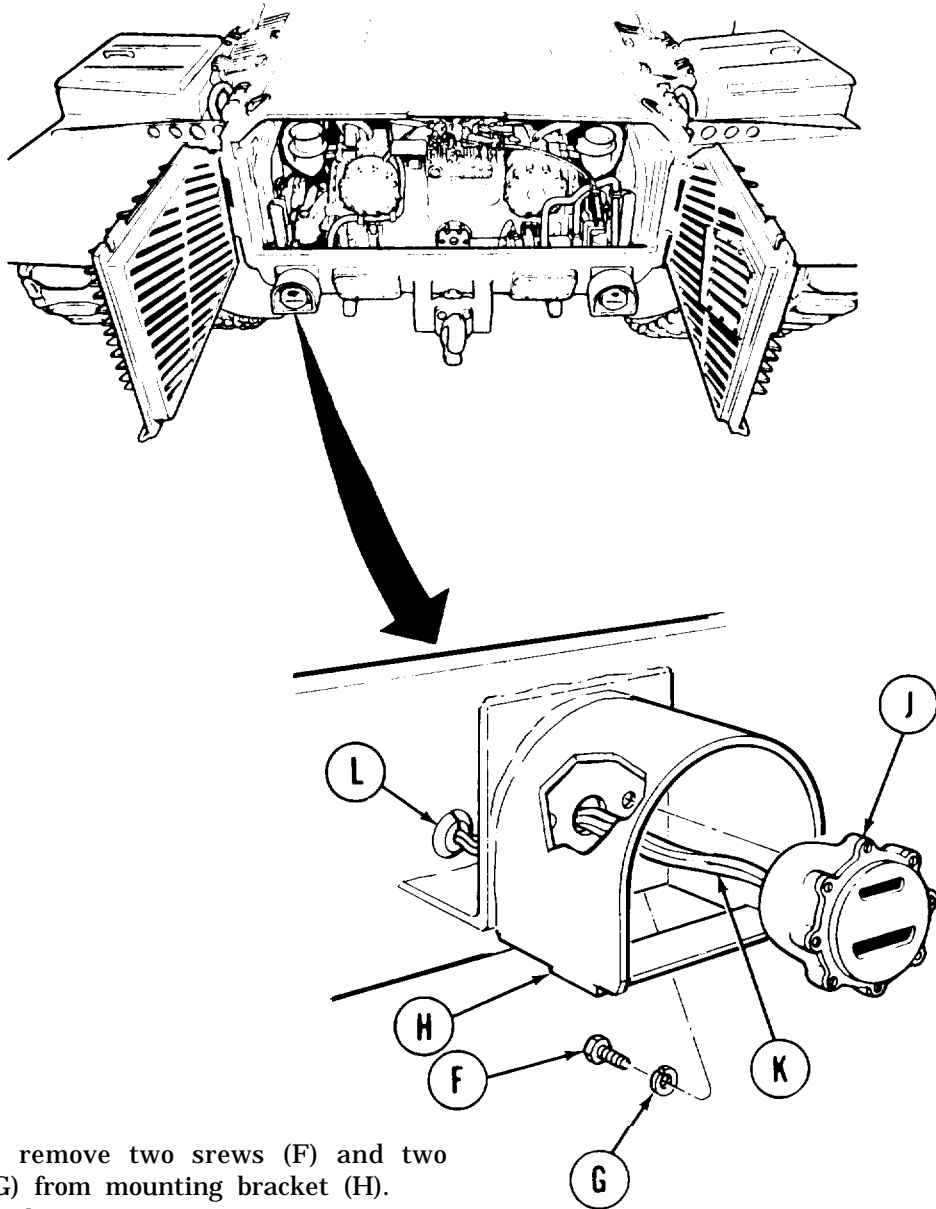
3. Remove three slotted washers (E) and three shells (D).



Go on to Sheet 2

TA139784

LEFT TAILLIGHT - STOPLIGHT ASSEMBLY REPLACEMENT (Sheet 2 of 3)



4. using wrench, remove two screws (F) and two lockwashers (G) from mounting bracket (H).
Throw lockwashers away.
5. Remove taillight (J), pulling three taillight leads (K) through grommet (L).

Go on to Sheet 3

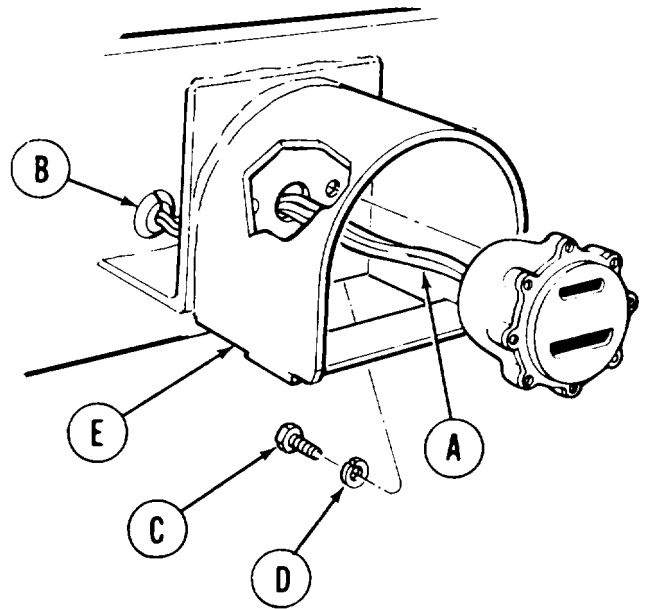
TA139785

LEFT TAILLIGHT - STOPLIGHT ASSEMBLY REPLACEMENT (Sheet 3 of 3)

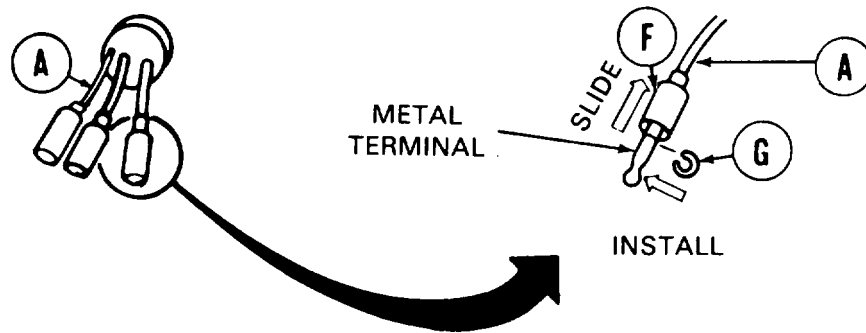
INSTALLATION:

- Using silicone compound (Item 32, Appendix D) on taillight leads (A), insert three leads through rubber grommet (B).

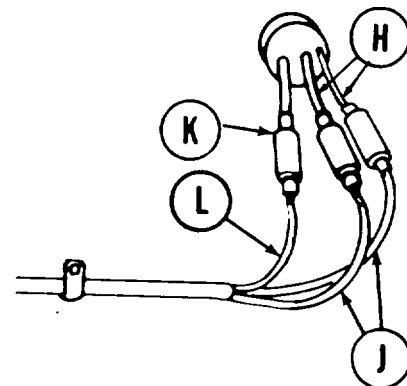
Using wrench, install two screws (C) and two new lockwashers (D) on mounting bracket (E)



- Slide three shells (F) on taillight leads (A).
- Install three slotted washers (G) on leads (A) behind metal terminal.



- Connect two tagged or taped taillight leads (H) to hull connectors number 22 and 24 (J).
- Connect remaining lead (K) to hull connector number 21 (L).
- Install transmission shroud (page 9-23).
- Check for proper taillight operation (TM 9-2350-222-10).



End of Task

TA139558

TM 9-2350-222-20-1-4

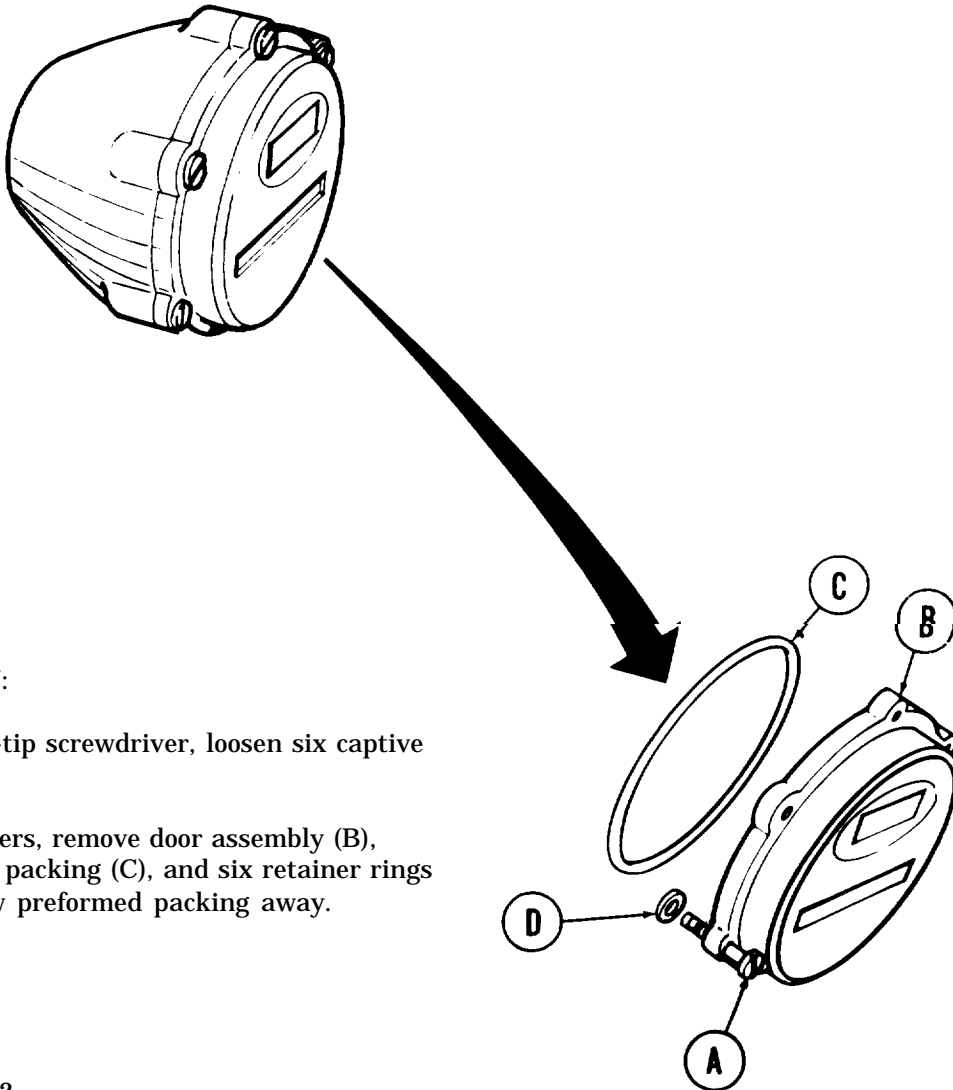
LEFT TAILLIGHT - STOPLIGHT ASSEMBLY REPAIR (Sheet 1 of 3)

TOOLS: Flat-tip screwdriver
Cross-tip screwdriver (Phillips)

SUPPLIES: Preformed packing (7320658)
Crocus cloth (Item 14, Appendix D) or steel wool (Item 55, Appendix D)
Silicone compound (Item 32, Appendix D)
Lockwasher (MS35338-42) (2 required)

REFERENCE: TM 9-2350-222-10

PRELIMINARY PROCEDURE: Remove taillight from vehicle for complete repair (page 10-229). Lamp replacement (steps 1 thru 4) can be done with taillight on vehicle.



DISASSEMBLY:

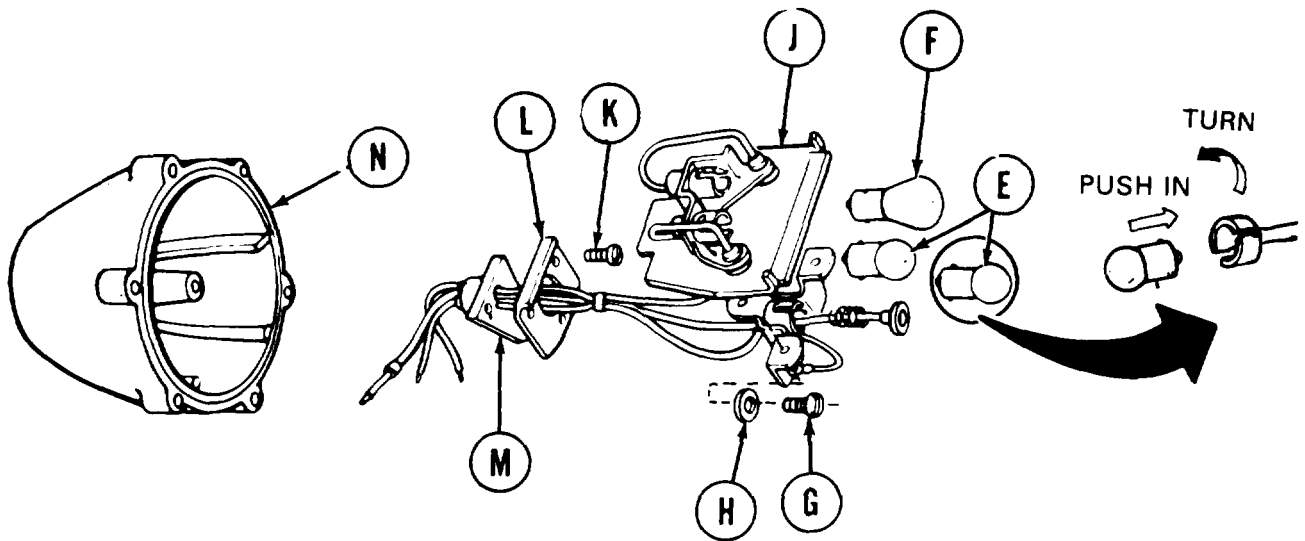
1. Using flat-tip screwdriver, loosen six captive screws (A).
2. Using fingers, remove door assembly (B), preformed packing (C), and six retainer rings (D). Throw preformed packing away.

Go on to Sheet 2

TA140102

LEFT TAILLIGHT - STOPLIGHT ASSEMBLY REPAIR (Sheet 2 of 3)

3. Remove two small stoplight and taillight lamps (E).
4. Remove large blackout drive lamp (F).
5. Using Phillips screwdriver, remove two screws (G) and lockwashers (H) from socket and wiring assembly (J). Throw lockwashers (H) away.



6. Using Phillips screwdriver, remove three screws (K) from plate (L) and grommet (M).
7. Remove socket and wiring assembly (J) with fingers by pressing out grommet (M), from body assembly (N).

CLEANING AND INSPECTION:

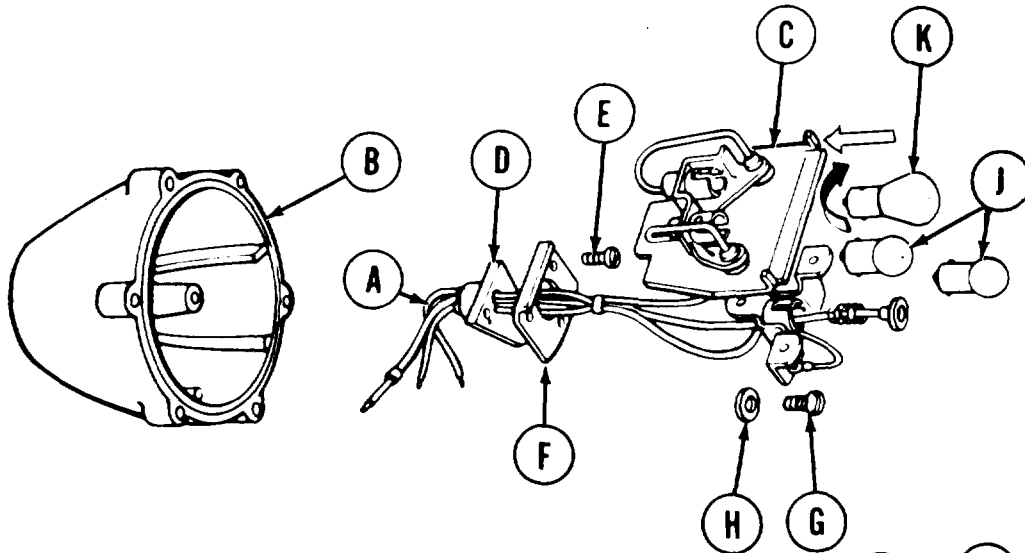
1. Inspect taillight and components for cracks. Replace any cracked items
2. Inspect for mechanical damage and wear. If damaged or worn, replace.
3. Inspect taillight assembly for corrosion. Corroded area which cannot be cleaned with crocus cloth (Item 14, Appendix D) or steel wool (Item 55, Appendix D) is cause for replacement of that item.

Go on to Sheet 3

TA140190

ASSEMBLY:

1. Insert three leads (A) through body assembly (B).
2. Install socket and wiring assembly (C) by pressing in grommet (D).
3. Using Phillips screwdriver, install three screws (E) through plate (F) and grommet (D)
4. Using Phillips screwdriver, install two screws (G) and new lockwashers (H).

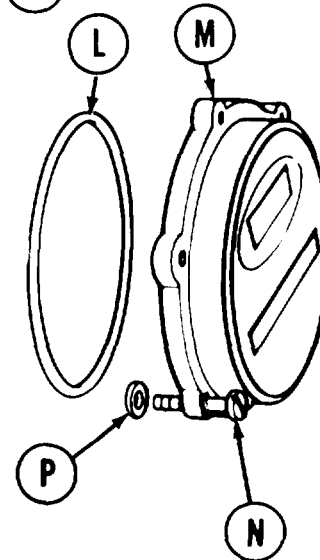


5. Install three lamps (J) and (K).
6. Coat preformed packing gasket (L) with silicone compound (Item 32, Appendix D) before installation.
7. Place new preformed packing (L) on door assembly (M).

NOTE

Wires are located at bottom of housing (B) for positioning of door assembly (M).

8. Using flat-tip screwdriver, install six screws (N), door assembly (M) and six retaining rings (P) on body assembly (B).
9. Install lamp assembly (page 10-231).
10. Check taillight operation (TM 9-2350-222-10).



End of Task

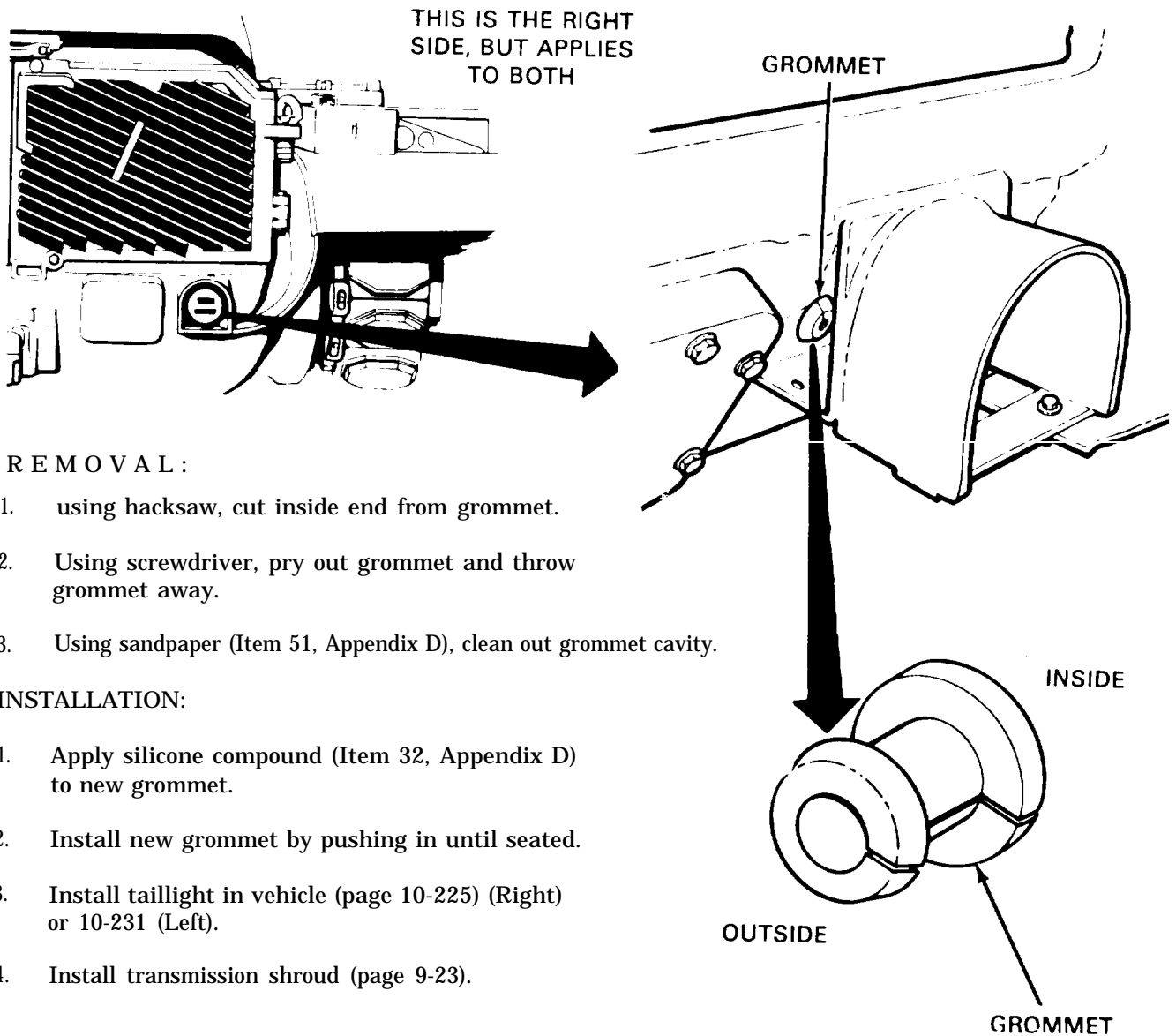
TA140530

TAILLIGHT GROMMET REPLACEMENT (Sheet 1 of 1)

TOOLS: Flat-tip screwdriver
Hand hacksaw

SUPPLIES: Silicone compound (Item 32, Appendix D)
Grommet (10905012)
Sandpaper (Item 51, Appendix D)

PRELIMINARY PROCEDURES: Remove transmission shroud (page 9-19)
Remove taillight from vehicle (page 10-223)
(Right) or 10-229 (Left)



REMOVAL:

1. using hacksaw, cut inside end from grommet.
2. Using screwdriver, pry out grommet and throw grommet away.
3. Using sandpaper (Item 51, Appendix D), clean out grommet cavity.

INSTALLATION:

1. Apply silicone compound (Item 32, Appendix D) to new grommet.
2. Install new grommet by pushing in until seated.
3. Install taillight in vehicle (page 10-225) (Right) or 10-231 (Left).
4. Install transmission shroud (page 9-23).

End of Task

TA139786

TM 9-2350-222-20-1-4

HEADLIGHT ADJUSTMENT (Sheet 1 of 2)

TOOLS: 7/16 in. combination box and open end wrench
9/16 in. combination box and open end wrench
50 ft. measuring tape

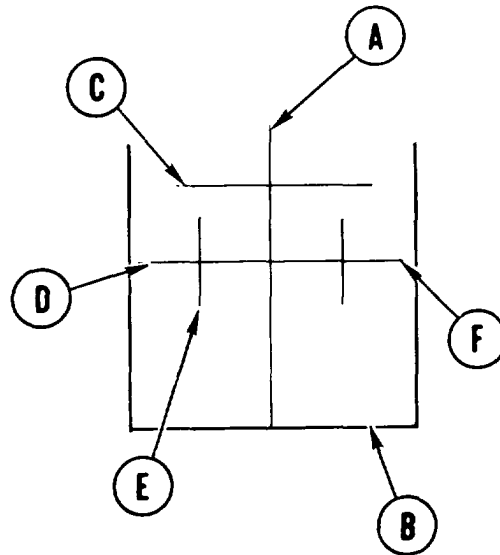
SUPPLIES: Chalk (Item 11, Appendix D)

REFERENCE: TM 9-2350-222-10

PRELIMINARY PROCEDURE: Park vehicle on flat ground 25 feet from flat vertical wall

ADJUSTMENT:

1. Using measuring tape, locate center of vehicle.
2. Using chalk (Item 11, Appendix D), draw line (A) on ground and UP vertical wall (B).
3. Using measuring tape, measure distance from ground to center of headlight.
4. Using chalk, draw line (C) on wall (B) of the distance found in step 3.
5. Using measuring tape, measure down 27-1/4 inches from line (C). Using chalk, draw line (D) on wall (B).
6. Using measuring tape, measure distance from center of vehicle to center of clear lens on left headlight.
7. Using chalk, draw line (F) that distance found in step 6 on wall (B).
8. Perform steps 6 and 7 for right side. Using chalk, draw line (F) on wall (B).



Go on to Sheet 2

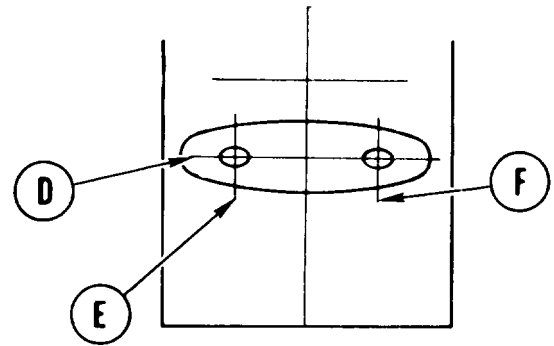
TA139787

HEADLIGHT ADJUSTMENT (Sheet 2 of 2)

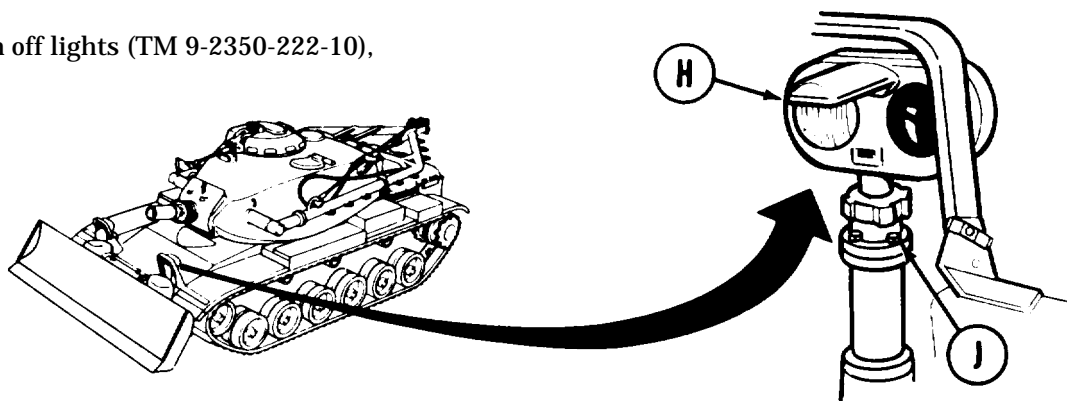
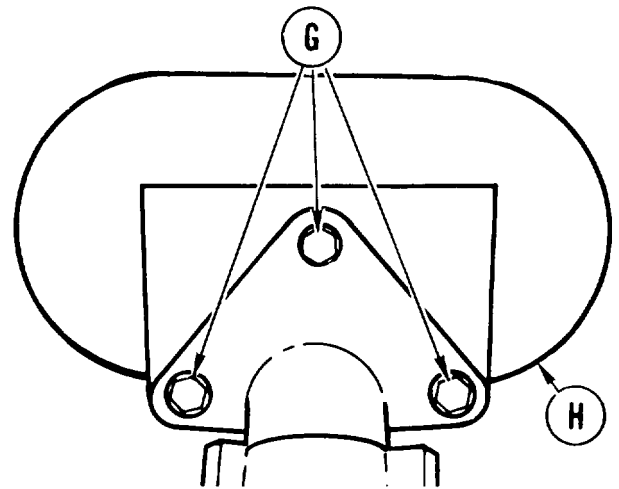
9. Turn on service drive headlights, low beam (TM 9-2350-222-10).
10. Center of maximum light intensity should be centered on line (D).
11. If not, using 9/16 inch wrench, loosen three screws (G) and adjust by tilting headlight (H) to desired angle.

NOTE

Adjust both left and right headlights in same manner.



12. Using 9/16 inch wrench, tighten three screws (G).
13. Check to see if light intensity for left headlight is centered on intersection of lines (D) and (E).
14. If not, using 7/16 inch wrench, loosen three screws (J) at base of headlight.
15. Turn headlight (H) until in proper position.
16. Using 7/16 inch wrench, tighten three screws (J) when adjusted.
17. Repeat steps 13 through 16 for right headlight, using lines (D) and (F).
18. Turn off lights (TM 9-2350-222-10),



End of Task

TA139788

TM 9-2350-222-20-1-4

HEADLIGHT ASSEMBLY (LEFT AND RIGHT) REPLACEMENT (Sheet 1 of 1)

TOOLS: Hammer

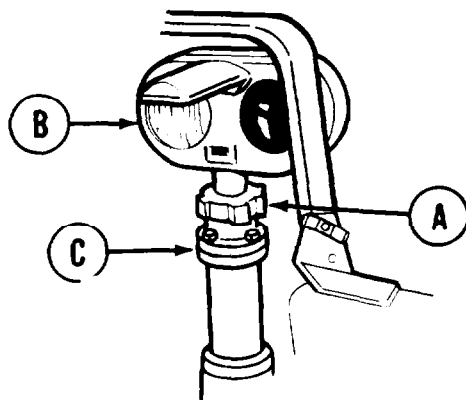
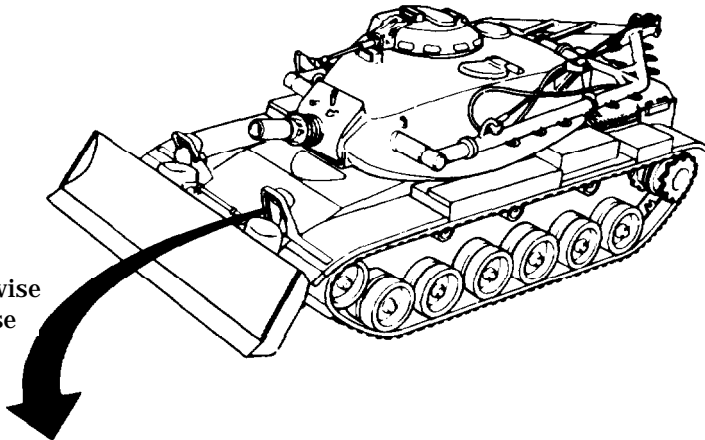
REFERENCE: TM 9-2350-222-10

NOTE

Some rings may be too tight to loosen with fingers. Tap with hammer until loose. Then do steps 1 and 2.

REMOVAL:

1. Using fingers, turn ring (A) counterclockwise while lifting headlight (B) away from base assembly (C).
2. Remove headlamp (B).



INSTALLATION:

1. Place headlight (B) in position on base assembly (C).
2. Using fingers, turn ring (A) clockwise while pressing down on headlight (B). Tighten ring.
3. Check operation of headlight (TM 9-2350-222-10).

End of Task

TA139789

HEADLIGHT ASSEMBLY REPAIR (LEFT AND RIGHT) (Sheet 1 of 8)

PROCEDURE INDEX

PROCEDURE	PAGE
Disassembly	10-239
Cleaning and Inspection	10-243
Assembly	10-243

TOOLS: Flat-tip screwdriver
 Cross-tip screwdriver (Phillips)

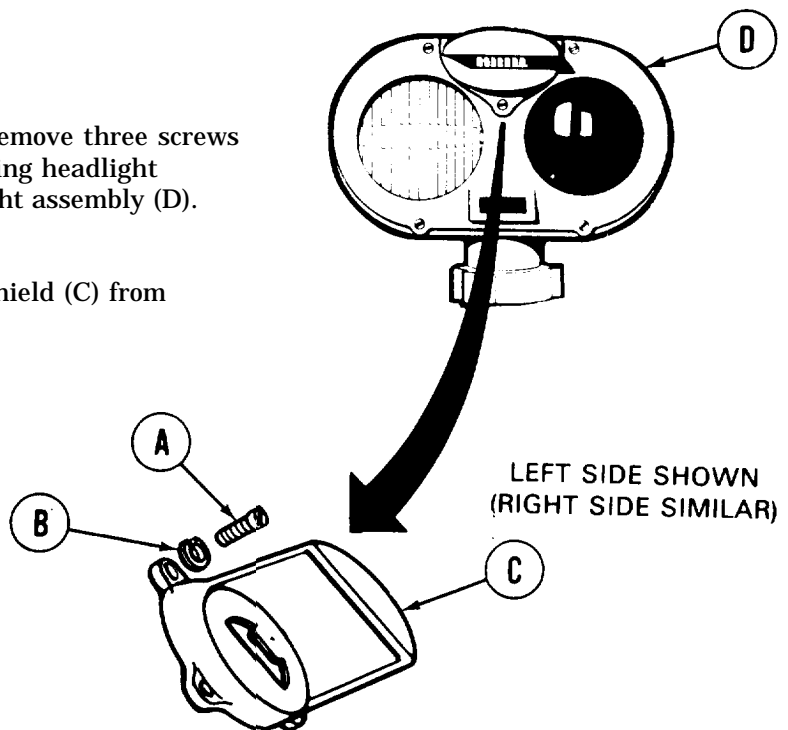
SUPPLIES: Adhesive (Item 2, Appendix D)
 Crocus cloth (Item 14, Appendix D)
 Steel wool (Item 55, Appendix D)
 Soft cloth (for cleaning lens) (Item 13, Appendix D)
 Lockwasher (MS35338-31) (3 required)

REFERENCE: TM 9-2350-222-10

PRELIMINARY PROCEDURE: Remove headlight assembly (page 10-238)

DISASSEMBLY:

1. Using Phillips screwdriver, remove three screws (A) and lockwashers (B) holding headlight blackout shield (C) to headlight assembly (D). Throw lockwashers away.
2. Remove headlight blackout shield (C) from headlight assembly (D).

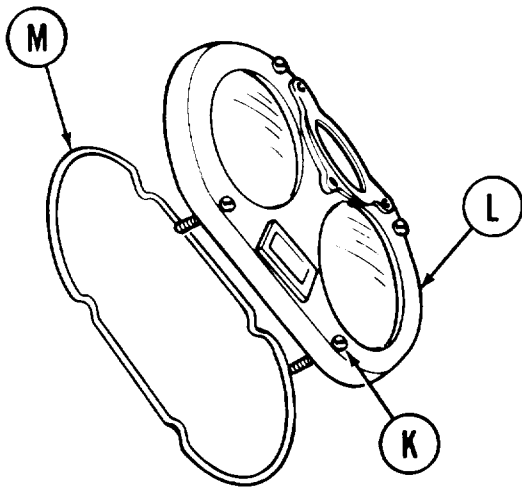
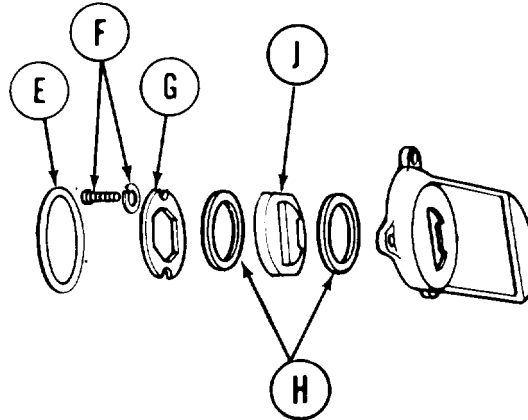


Go on to Sheet 2

TA139790

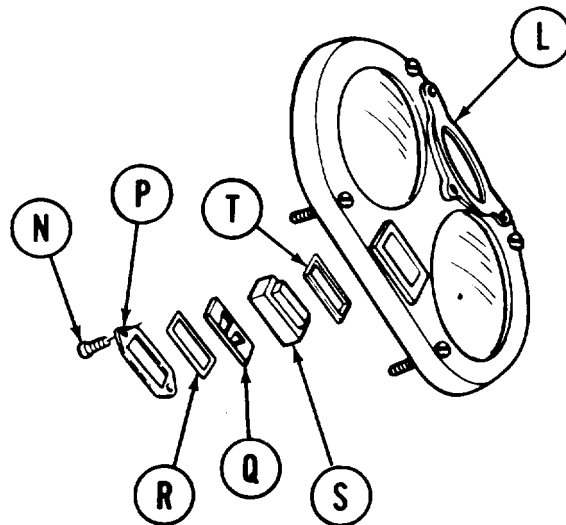
HEADLIGHT ASSEMBLY REPAIR (LEFT AND RIGHT) (Sheet 2 of 8)

3. Remove round rubber seal (E).
4. Using Phillips screwdriver, remove two screws (F).
5. Using fingers, remove retainer (G), two rubber seals (H), and lens (J).



6. Using flat-tip screwdriver, loosen four captive screws (K).
7. Remove headlight cover (L).
8. Using fingers, remove seal (M).

9. Using Phillips screwdriver, remove two screws (N) with assembled washers. Remove retainer (P).
10. Using fingers, remove filter (Q), rubber seal (R), lens (S), and seal (T).

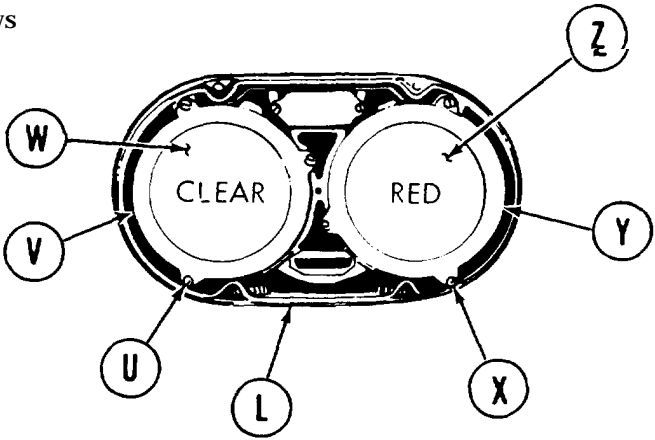
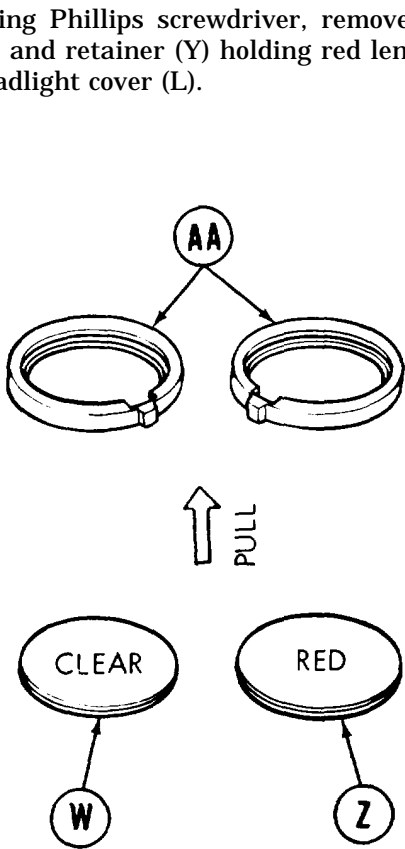


Go on to Sheet 3

TA139791

HEADLIGHT ASSEMBLY REPAIR (LEFT AND RIGHT) (Sheet 3 of 8)

- 11. Using Phillips screwdriver, remove three screws (U) and retainer (V) holding clear headlight lens (W) in headlight cover (L).
- 12. Push out clear lens and seal (W) from headlight cover (L).
- 13. Using Phillips screwdriver, remove three screws (X) and retainer (Y) holding red lens (Z) in headlight cover (L).

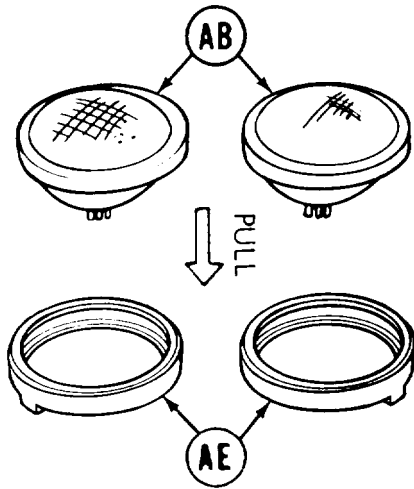
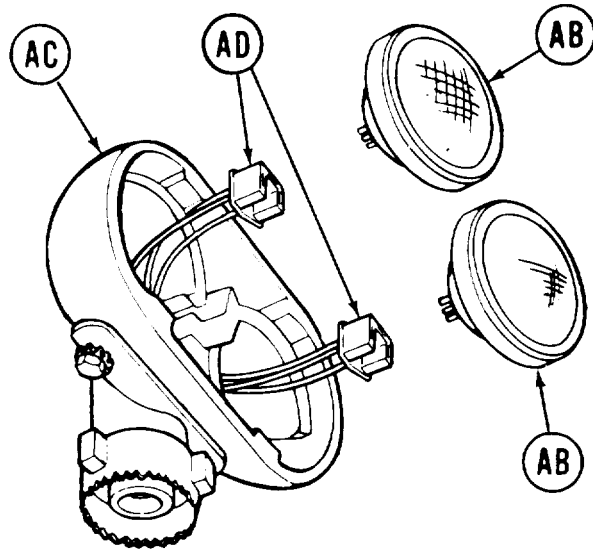


- 14. Push out red lens and seal (Z) in same manner as clear lens.
- 15. Using fingers, remove two seals (AA) from clear lens (W) and red lens (Z).

Go on to Sheet 4

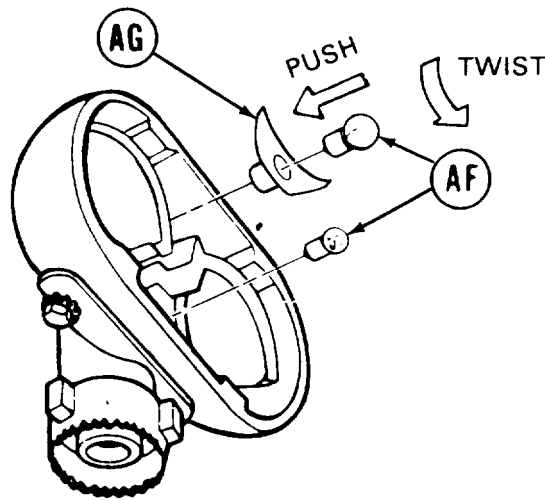
TA139792

16. Using fingers, lift out two headlights and gaskets (AB) from headlight body (AC).
17. Unplug two headlights (AB) from electrical connectors (AD).



18. Using fingers, remove two seals (AE) from headlights (AB).

19. Remove two bulbs (AF) by pushing in and twisting them counterclockwise. Remove reflector (AG) with fingers.



Go on to Sheet 5

TA139793

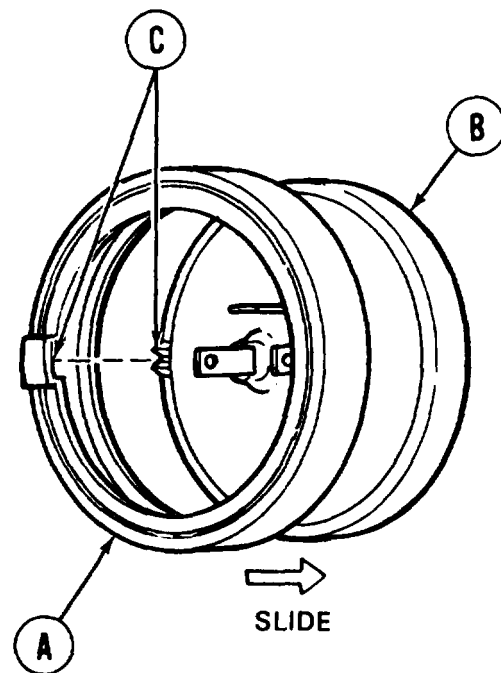
HEADLIGHT ASSEMBLY REPAIR (LEFT AND RIGHT) (Sheet 5 of 8)

CLEANING AND INSPECTION:

1. Inspect headlight components for corrosion. Any item that cannot be cleaned with crocus cloth (Item 14, Appendix D) or steel wool (Item 55, Appendix D) is cause for replacement.
2. Inspect seals and gaskets for wear, cuts, and/or deterioration. Replace damaged seals and gaskets.
3. Using soft cloth (Item 13, Appendix D), clean lens glass.
4. Inspect lens glass for chipping, scratches, or cracks. Replace damaged lens glass.
5. Using cloth, remove any dust or moisture from parts.

ASSEMBLY:

1. Slide two seals (A) over two headlights (B), aligning notches (C) on both.



Go on to Sheet 6

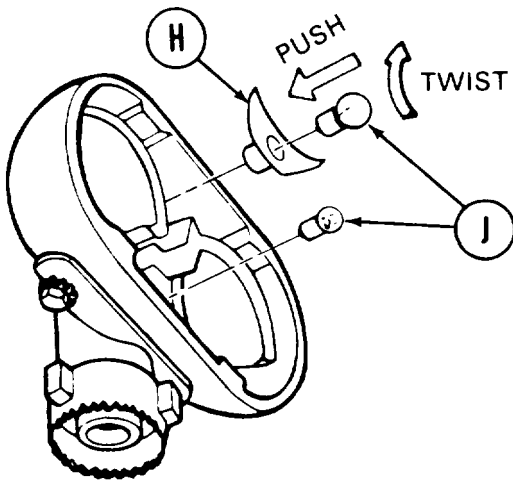
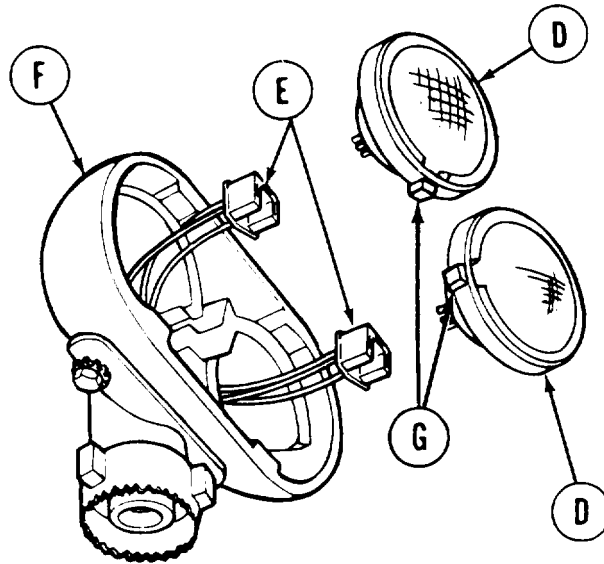
TA139794

HEADLIGHT ASSEMBLY REPAIR (LEFT AND RIGHT) (Sheet 6 of 8)

2. Connect two headlights (D) to two electrical connectors (E) on headlight body (F).
3. Place two headlights (D) in headlight body (F); aligning notches (G) on both.

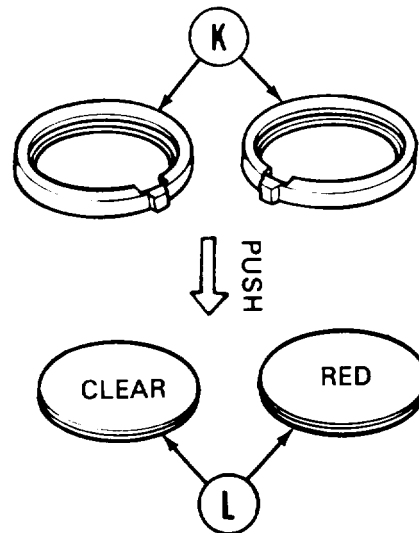
NOTE

Install reflector (H) with larger bulb (J).



4. Using fingers, install reflector (H), and install two bulbs (J) by pushing in and twisting them clockwise. Large bulb with reflector (H) goes on top.

5. Using fingers, install two seals (K) around two headlight lenses (L). Make sure notches of seals are to inside.



Go on to Sheet 7

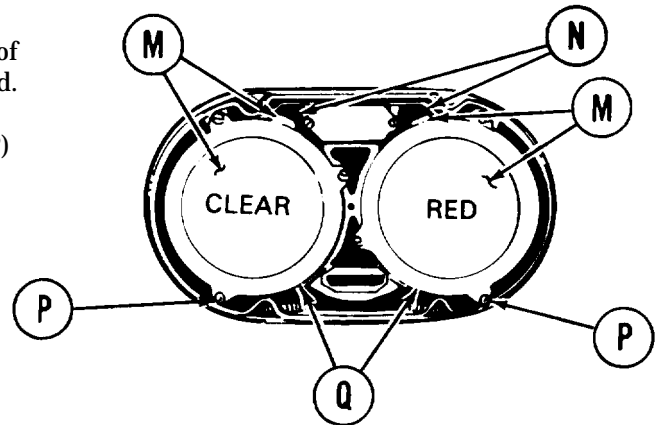
TA139795

HEADLIGHT ASSEMBLY REPAIR (LEFT AND RIGHT) (Sheet 7 of 8)

NOTE

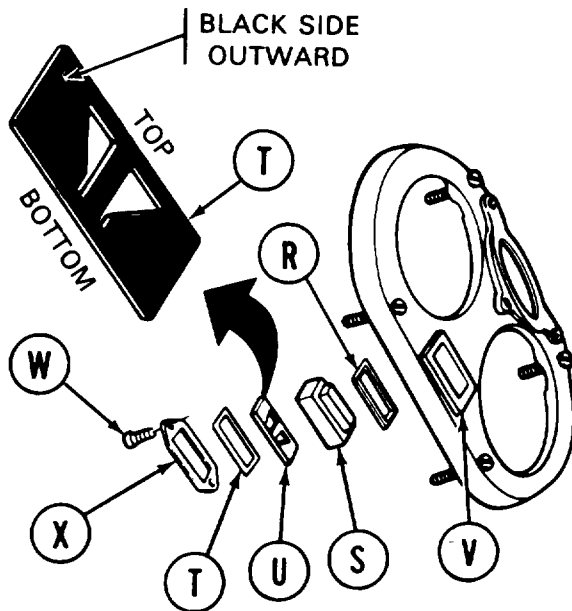
Make sure red and clear lenses (M) are positioned as shown.

6. headlight lens and seals (M) in notches of headlight cover (N) with rounded sides outward.
7. Using Phillips screwdriver, install six screws (P) and two retainers (Q) in position over two lenses (M) and tighten.



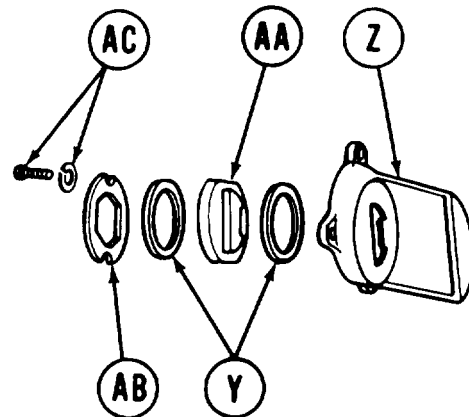
NOTE

Make sure filter (T) is positioned properly in blackout marker cavity (V) properly.



8. Using fingers, install seal (R), lens (S), seal (U), and filter (T) in blackout marker cavity (V).
9. Using Phillips screwdriver, install two screws (W) with assembled washers to secure retainer (X).

10. Using fingers, install one seal (Y) in blackout headlight shield (Z).
11. Using fingers, install blackout headlight lens (AA) in position on blackout headlight shield (Z).
12. Using Phillips screwdriver, install other seal (Y) and retainer (AB) into headlight shield (Z) with two screws (AC)

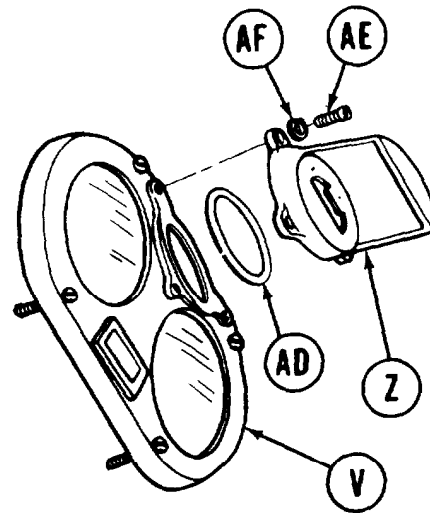


Go onto Sheet 8

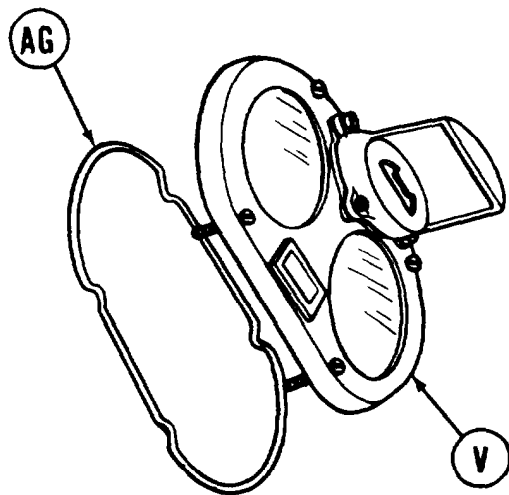
TA139796

HEADLIGHT ASSEMBLY REPAIR (LEFT AND RIGHT) (Sheet 8 of 8)

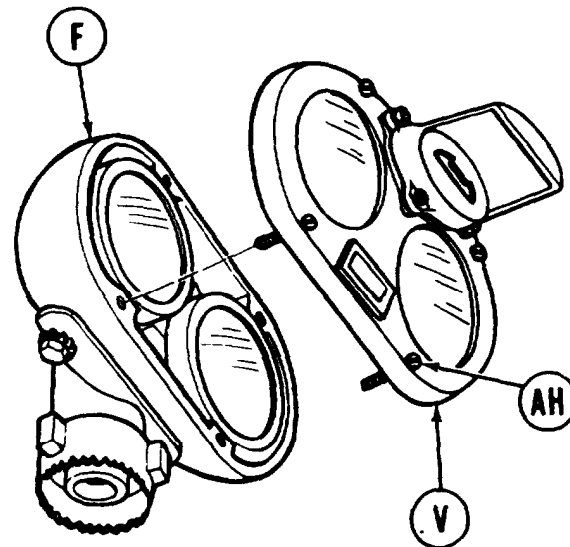
13. Apply adhesive (Item 2, Appendix D) to round seal (AD) and place on blackout headlight shield (Z).
14. Using Phillips screwdriver, install three screws (AE), new lockwashers (AF), and shield (Z) to headlight cover (V).



15. Apply adhesive (Item 2, Appendix D) to headlight cover seal (AG) and insert on headlight cover (V).



16. Using flat-tip screwdriver, tighten four captive screws (AH) securing headlight cover (V) to headlight body (F).
17. Install headlight assembly (page 10-238).



End of Task

TA139797

HEADLIGHT HARNESS BASE ASSEMBLY REPLACEMENT (Sheet 1 of 4)

PROCEDURE INDEX

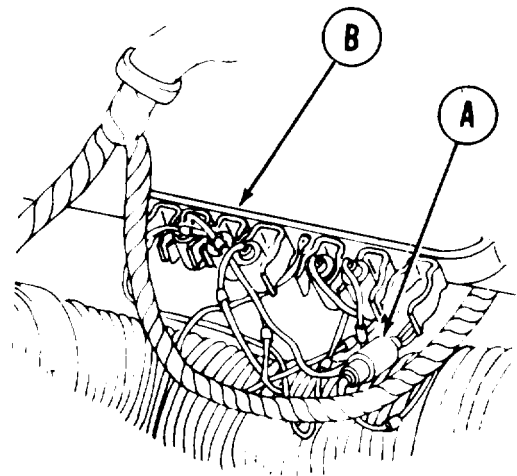
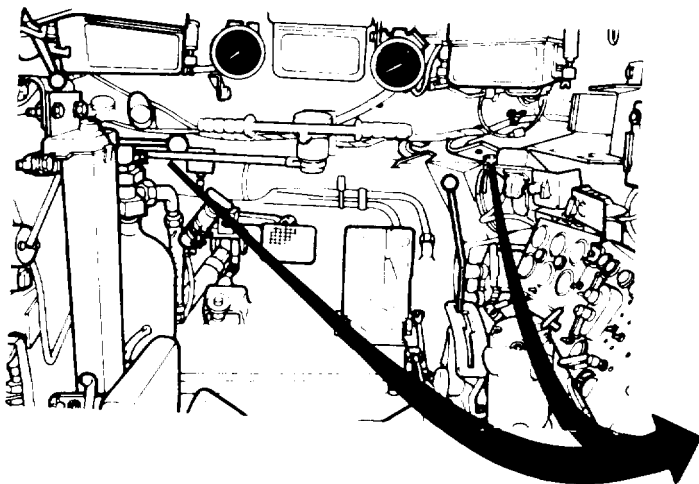
PROCEDURE	PAGE
Removal	10-247
Installation	10-249

TOOLS: Cross-tip screwdriver (phillips)
7/16 in. combination box and open end wrench

SUPPLIES: Silicone compound (Item 32, Appendix D)
Lockwasher (MS45904-60)
Lockwasher (MS35335-32)
Lockwasher (MS35338-44) (3 required)
Gasket (7970024)

PRELIMINARY PROCEDURE: Remove headlight (page 10-238)

NOTE
For replacement of right headlight harness base assembly,
personnel heater must be removed (page 19-1 9).



REMOVAL:

1. From inside vehicle, remove six connectors (A) from bracket assembly (B).

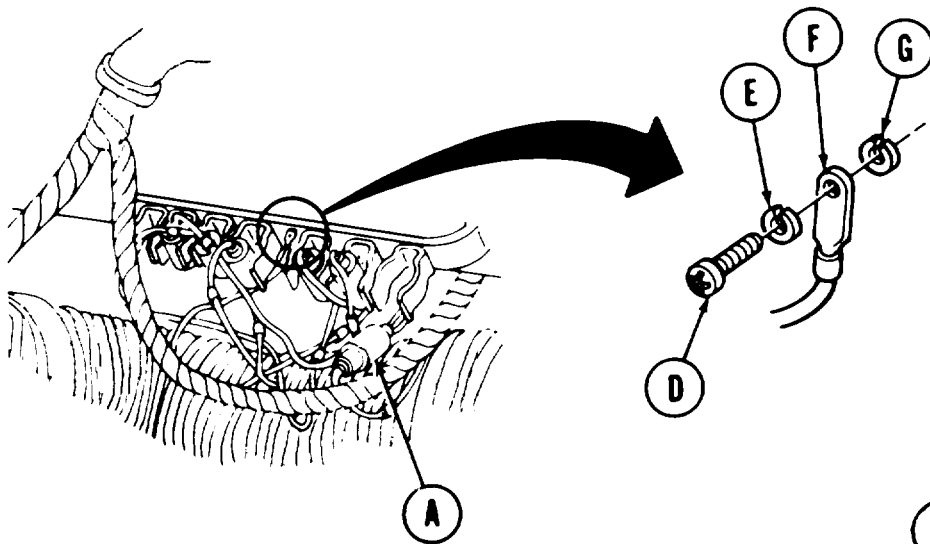
Go on to Sheet 2

TA253334

Change 1 10-247

HEADLIGHT HARNESS BASE ASSEMBLY REPLACEMENT (Sheet 2 of 4)

2. Disconnect six electrical connectors (A) by pulling apart.
3. Using screwdriver, remove screw (D), lockwasher (E), ground lead (F), and lockwasher (G) from hull. Throw lockwashers away.

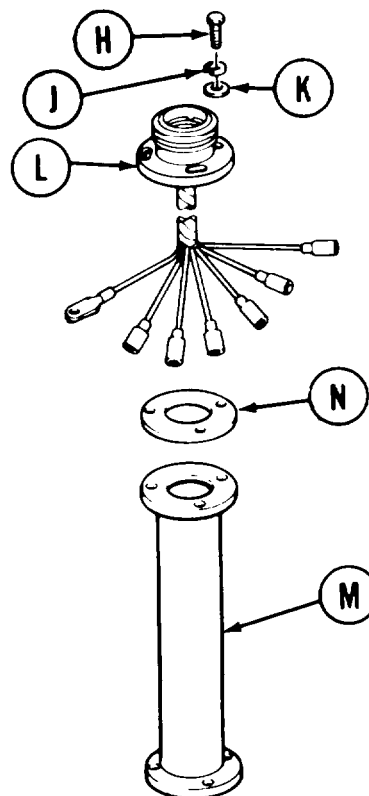


Outside of vehicle, using wrench, remove three screws (H), lockwashers (J), and flat washers (K) securing base assembly (L) to tube assembly (M). Throw lockwashers away.

NOTE

Remove connectors and leads one at a time.

Remove base assembly (L) and gasket (N). Throw gasket away.



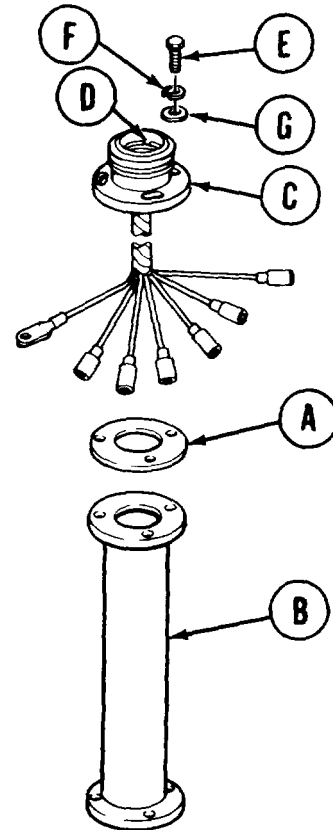
Go on sheet 3

TA253335

HEADLIGHT HARNESS BASE ASSEMBLY REPLACEMENT (Sheet 3 of 4)

INSTALLATION:

1. Place new gasket (A) in position on tube assembly (B).
2. Insert six electrical connectors of base assembly (C) through gasket (A) and tube assembly (B).
3. Place base assembly (C) in position on gasket (A) with slot (D) to rear.
4. Using wrench, install three screws (E), new lockwashers (F), and flat washers (G) securing base assembly (C) to tube assembly (B).



Go on to Sheet 4

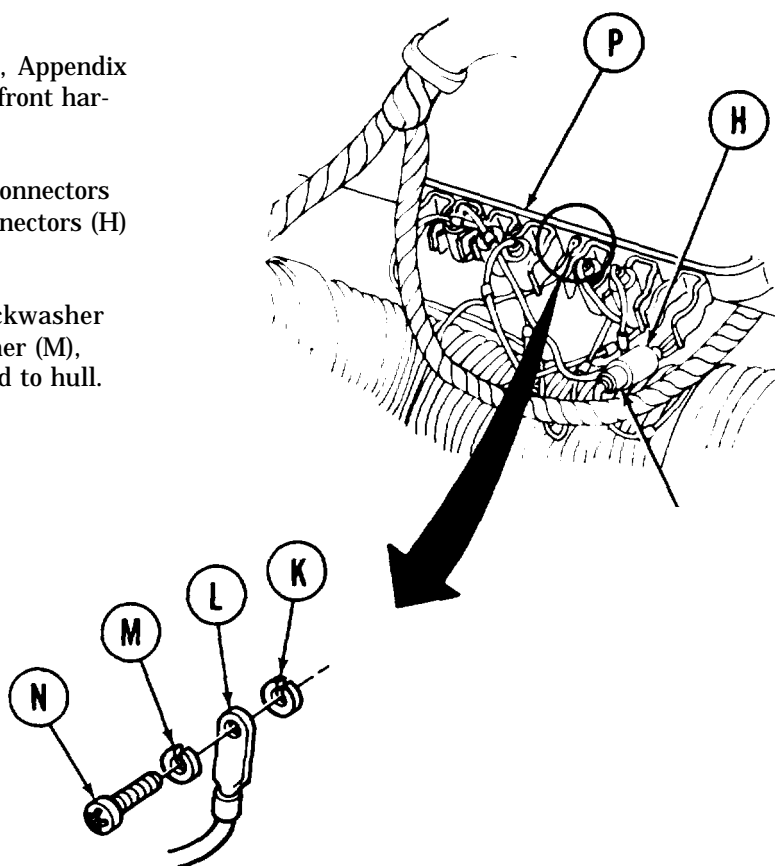
TA253336

Change 1 10-249

NOTE

Make sure to connect connectors properly. Use metal tags for identifying proper connections.

5. Apply silicone compound (Item 32, Appendix D) to six mating connectors (H) of front harness inside vehicle.
6. From inside vehicle, connect six connectors (J) of base assembly to mating connectors (H) of front harness.
7. Using screwdriver, install *new* lockwasher (K), ground lead (L), new lockwasher (M), and screw (N) securing ground lead to hull.



8. Place six mated connectors (H and J) in position in bracket assembly (P) by pushing up .
9. Install headlight on vehicle (page 10-238).
10. Install personnel heater (page 19-22), if right headlight base assembly was replaced.

End of Task

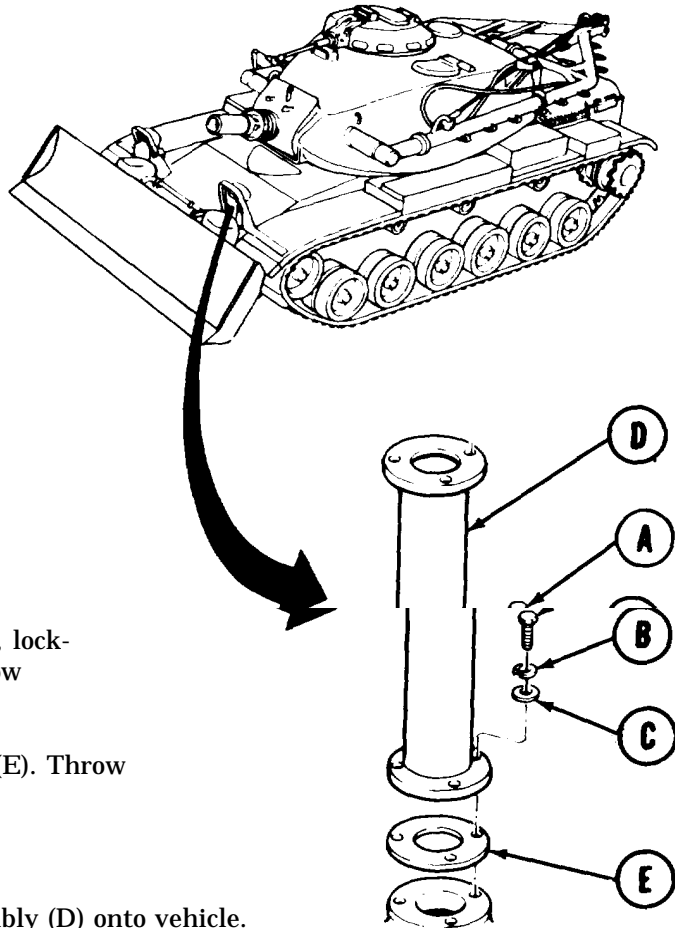
TA253337

HEADLIGHT TUBE ASSEMBLY REPLACEMENT {Sheet 1 of 1}

TOOLS: 7/16 in. combination box and open end wrench

SUPPLIES: Gasket (7970024)
Lockwasher (MS35338-44) (3 required)

PRELIMINARY PROCEDURES: Remove headlight (page 10-238)
Remove headlight harness base assembly (page 10-247)



REMOVAL:

1. Using wrench, remove three screws (A), lockwashers (B), and flat washers (C). Throw lockwashers away.
2. Remove tube assembly (D) and gasket (E). Throw gasket away.

INSTALLATION:

1. Position new gasket (E) and tube assembly (D) onto vehicle.
2. Using wrench, install and tighten three screws (A), new lockwashers (B), and flatwashers (C) to secure tube assembly (D).
3. Install headlight harness base assembly (page 10-249).
4. Install headlight (page 10-238).

End of Task

TA253338

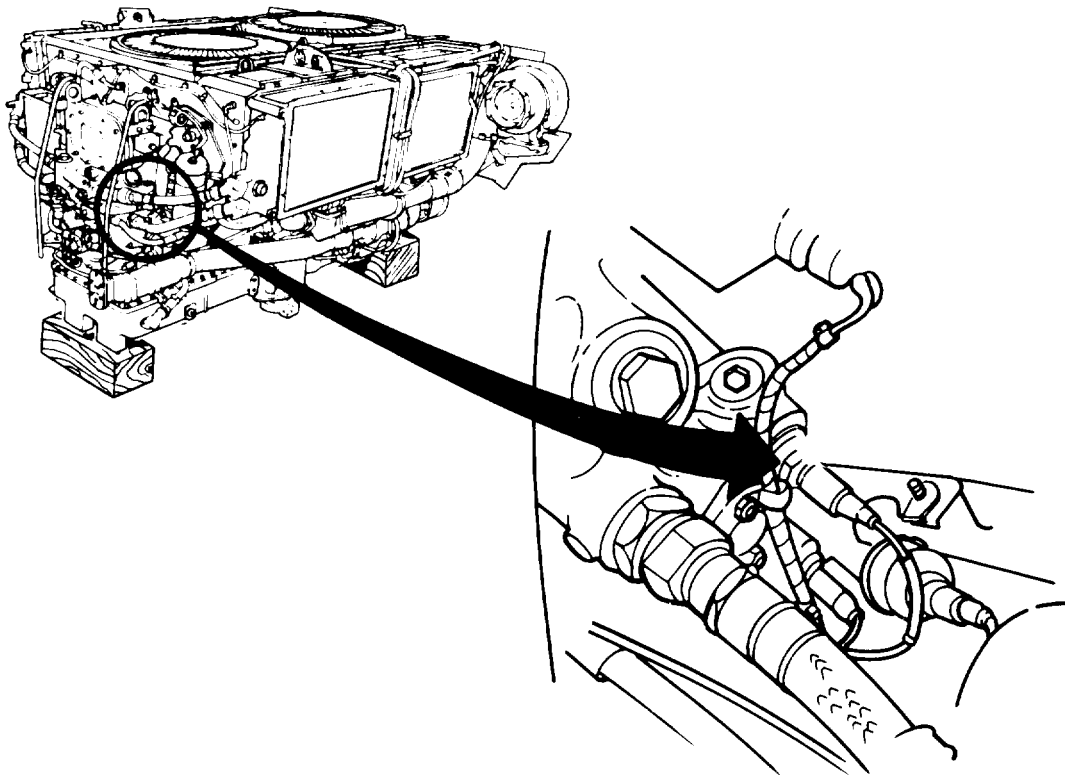
ENGINE OIL TEMPERATURE TRANSMITTER REPLACEMENT (2D ENGINE) (Sheet 1 of 3)

TOOLS: 1/2 in. combination box and open end wrench
15/16 in. combination box and open end wrench

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

SUPPLIES: Rags (Item 65, Appendix D)
Sealing compound (Item 20, Appendix D)
Self-locking nut

PRELIMINARY PROCEDURE: Remove powerplant (page 5-26)



Go on to Sheet 2

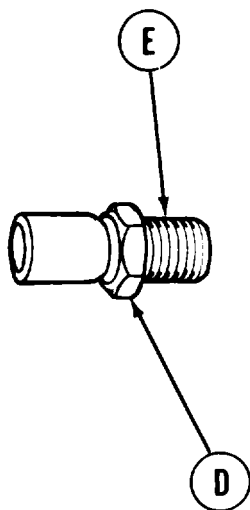
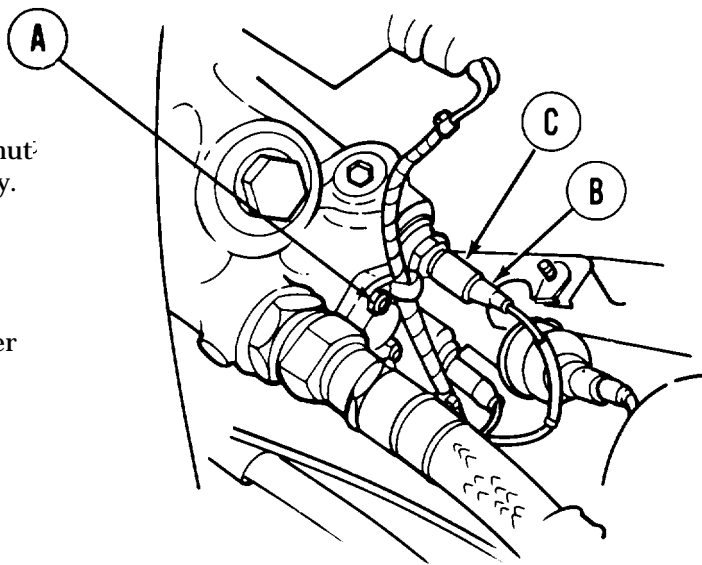
All data on pages 10-251 thru 10-258 deleted.

Change 5 **10-259**

ENGINE OIL TEMPERATURE TRANSMITTER REPLACEMENT (2D ENGINE) (Sheet 2 of 3)

REMOVAL:

1. place rags under trasmitter:
2. Using 1/2 inch wrench, remove self-locking nut and clamp (A). Throw self-locking nut away.
3. pull socket of rubber insulated connector (B) from switch cap (C).
4. Using 15/ 16 inch wrench, remove transmitter (D) from engine.



5. Check interior and protruding part of transmitter socket (E) for cracks and crossed threads. Replace if necessary.

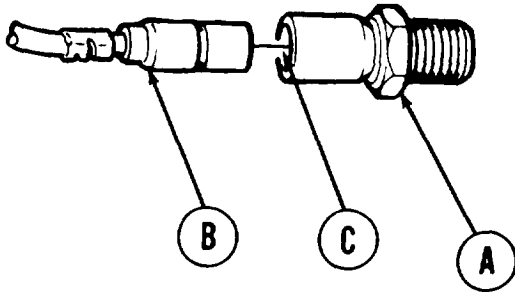
INSTALLATION:

1. Lightly coat threads of transmitter with sealing compound (Item 20, Appendix D).

Go on to Sheet 3

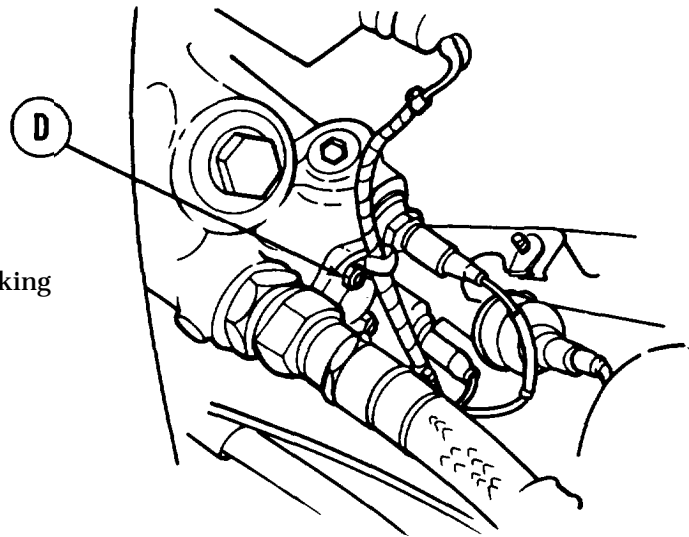
TA139811

ENGINE OIL TEMPERATURE TRANSMITTER REPLACEMENT (2D ENGINE) (Sheet 3 of 3)



- 2 . Using 15/16 inch wrench, install transmitter (A) into engine.
- 3 . Push socket of rubber insulated connector (B) into transmitter cap (C).

4. Remove rags from under transmitter.
5. Using 1/2 inch wrench, install new self-locking nut and clamp (D).
6. Connect engine for powerplant ground hop (page 5-48).
7. Start and run engine (TM 9-2350-222-10)
Observe oil temperature indicator for normal oil temperature
8. Shut down engine, Disconnect engine from powerplant ground hop (page 5-62).
9. Install powerplant (page 5-37).



End of Task

TA139812

TM 9-2350-222-20- 1-4

ENGINE OIL HIGH TEMPERATURE SWITCH REPLACEMENT (2D ENGINE) (Sheet 1 of 2)

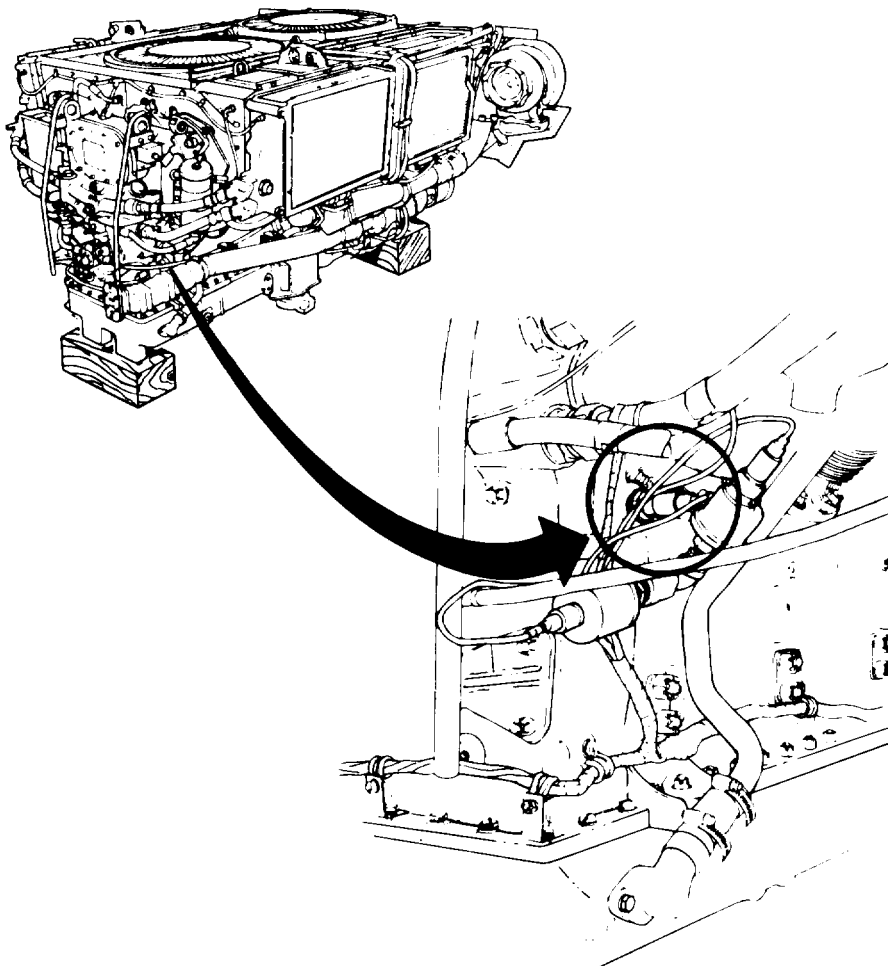
TOOLS: 6 in. extension with 1/2 in. drive
15/16 in. deep well socket with 1/2 in. drive
Ratchet with 1/2 in. drive

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

SUPPLIES: Rags (Item 65, Appendix D)
sealing compound (Item 20, Appendix D)

REFERENCE: TM 9-2350-222-10

PRELIMINARY PROCEDURE: Remove powerplant (page 5-26)



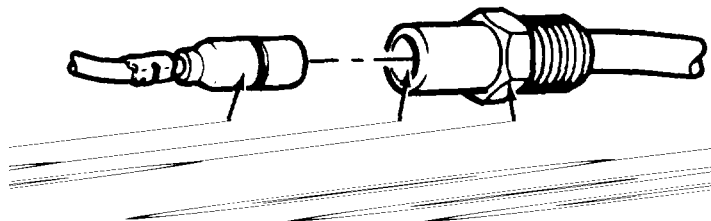
Go on to Sheet 2

TA139813

ENGINE OIL HIGH TEMPERATURE SWITCH REPLACEMENT (2D ENGINE) (Sheet 2 of 2)

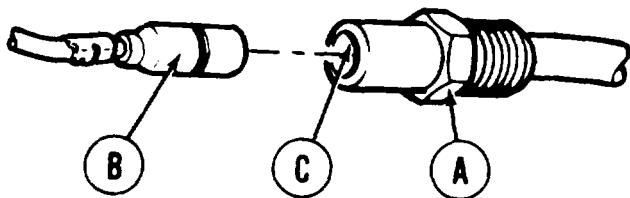
REMOVAL:

1. Place rags under switch.
2. Pull socket of rubber insulated connector (A) from switch cap (B).
3. Using socket, remove switch (C) from engine.



INSTALLATION:

1. Lightly coat threads of switch with sealing compound (Item 20, Appendix D).
2. Using socket, install switch (A) into engine.
3. Push socket of rubber insulated connector (B) into switch cap (C).
4. Remove rags from under switch



5. Connect engine for powerplant ground hop (page 5-48).
6. Start and run engine. Observe temperature indicator for normal oil temperature(TM 9) 2350-222-10).
7. Shut down engine. Disconnect engine from powerplant ground hop (page 5-62).
8. Install powerplant (page 5-37).

End of Task

TA139814

TM 9-2350-222-20-1 -4

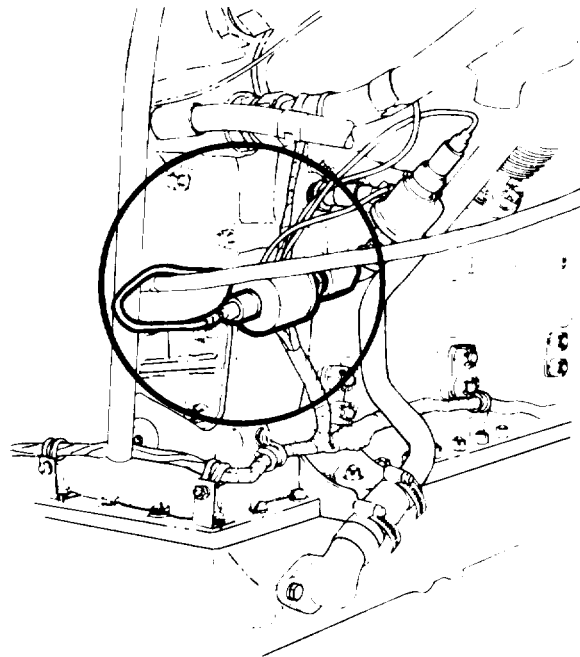
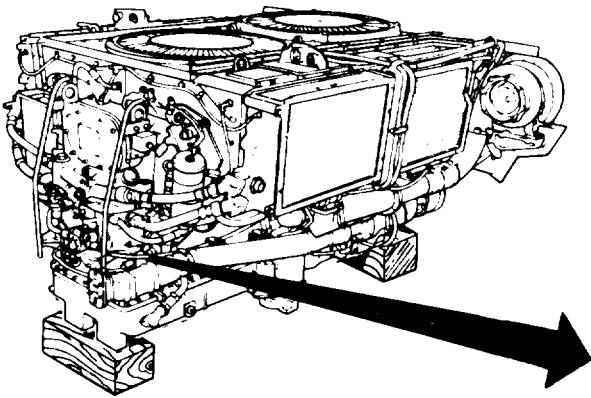
ENGINE LOW OIL PRESSURE SWITCH REPLACEMENT (2D ENGINE) (Sheet 1 of 3)

TOOLS: 7/8 in. combination box and open end wrench
12 in. adjustable wrench (crescent)

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

SUPPLIES: Rags (Item 65, Appendix D)
Sealing compound (Item 20, Appendix D)

PRELIMINARY PROCEDURES: Remove powerplant (page 5-26)
Remove engine oil high temperature switch (page 10-262)



Go on to Sheet 2

TA139815

ENGINE LOW OIL PRESSURE SWITCH REPLACEMENT (2D ENGINE) (Sheet 2 of 3)

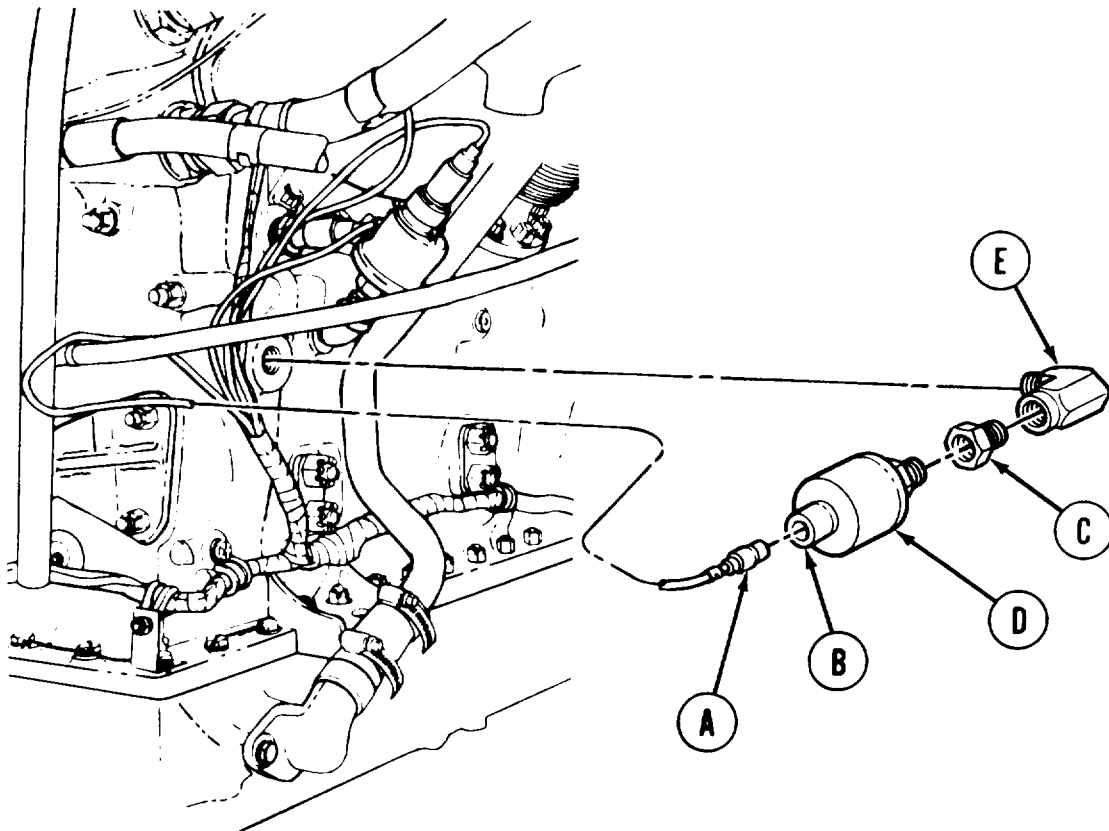
REMOVAL:

1. Place rags under engine oil low pressure switch.
2. Pull socket of rubber insulated connector (A) from switch cap (B).
3. Using 7/8 inch wrench to hold adapter (C), use adjustable wrench and remove switch (D) from adapter (C).
4. Using 7/8 inch wrench, remove adapter (C) from elbow (E).
5. Using crescent wrench, remove elbow (E) from engine.

INSTALLATION:

NOTE

Prior to installation, lightly coat male threads of all components with sealing compound (Item 20, Appendix D).



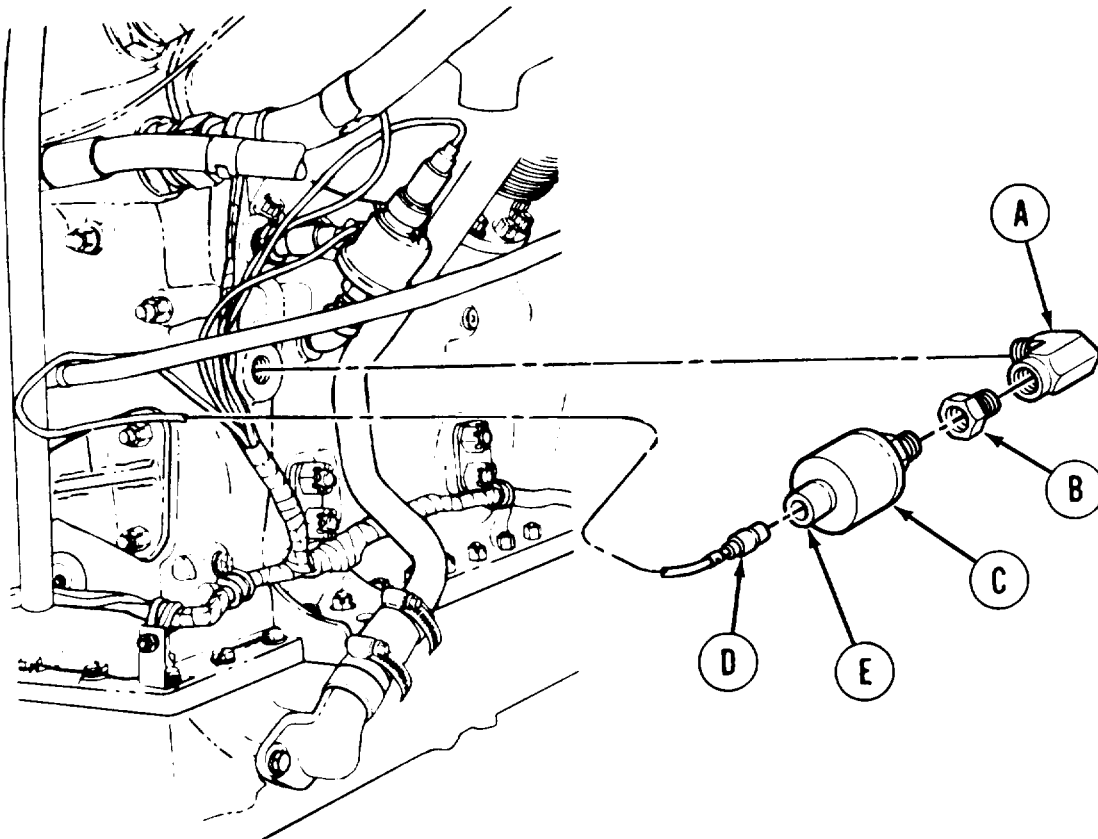
Go on to Sheet 3

TA139816

TM 9-2350-222-20-1-4

ENGINE LOW OIL. PRESSURE SWITCH REPLACEMENT (2D ENGINE) (Sheet 3 of 3)

1. Using adjustable wrench, install elbow (A) to engine.
2. Using 7/8 inch wrench, install adapter (B) to elbow (A).
3. Using crescent wrench, install new switch (C) into adapter (B).
4. Push socket of rubber insulated connector (D) into switch cap (E).
5. Remove rags from under engine oil low pressure switch.
6. Install engine oil high temperature switch (page 10-262).
7. Connect engine for powerplant ground hop (page 5-48).
8. Start and run engine (TM 9-2350-222-10). Observe low oil pressure indicator for normal oil pressure.
9. Shut down engine. Disconnect engine from powerplant ground hop (Page 5-62).
10. Install powerplant (page 5-37).



End of Task

TA139817

ENGINE OIL PRESSURE TRANSMITTER REPLACEMENT (2D ENGINE) (Sheet 1 of 3)

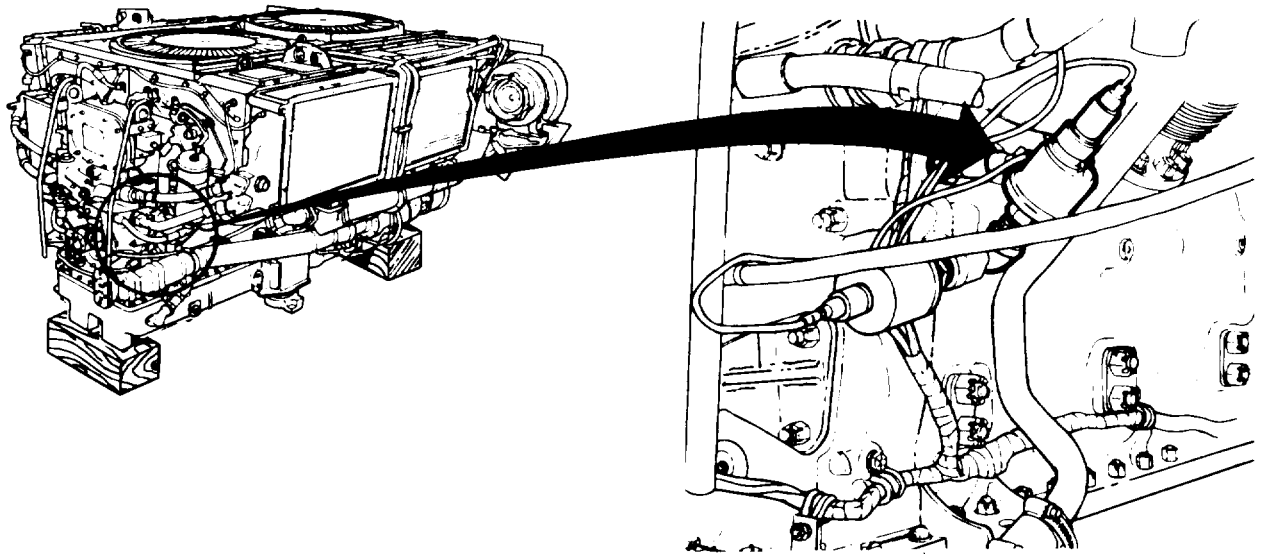
TOOLS: 7/8 in. combination box and open end wrench
3/4 in. combination box and open end wrench
10 in. pipe wrench

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

SUPPLIES: Rags (Item 65, Appendix D)
Sealing compound (Item 20, Appendix D)

REFERENCE: TM 9-2350-222-10

PRELIMINARY PROCEDURE: Remove powerplant (page 5-26)



Go on to Sheet 2

TA139818

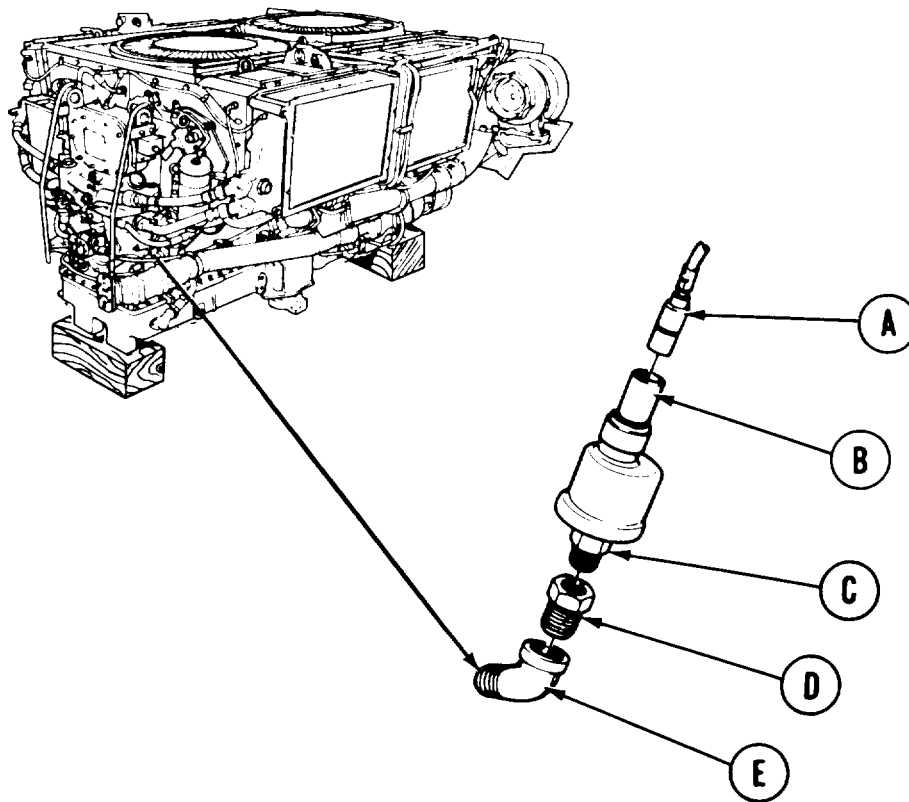
ENGINE OIL PRESSURE TRANSMITTER REPLACEMENT (2D ENGINE) (Sheet 2 of 3)

REMOVAL:

1. Place rags under engine oil high pressure transmitter.
2. Pull socket of rubber insulated connector (A) from transmitter cap (B).
3. Using 7/8 inch wrench, remove transmitter (C) from pipe bushing (D).
4. Using 3/4 inch wrench, remove pipe bushing (D) from elbow (E).
5. Using pipe wrench, remove elbow (E) from engine.

INSPECTION:

1. Check pipe bushing (D) and elbow (E) for cracks and crossed threads. Replace as required.
2. Replace faulty parts.



Go on to Sheet 3

TA139819

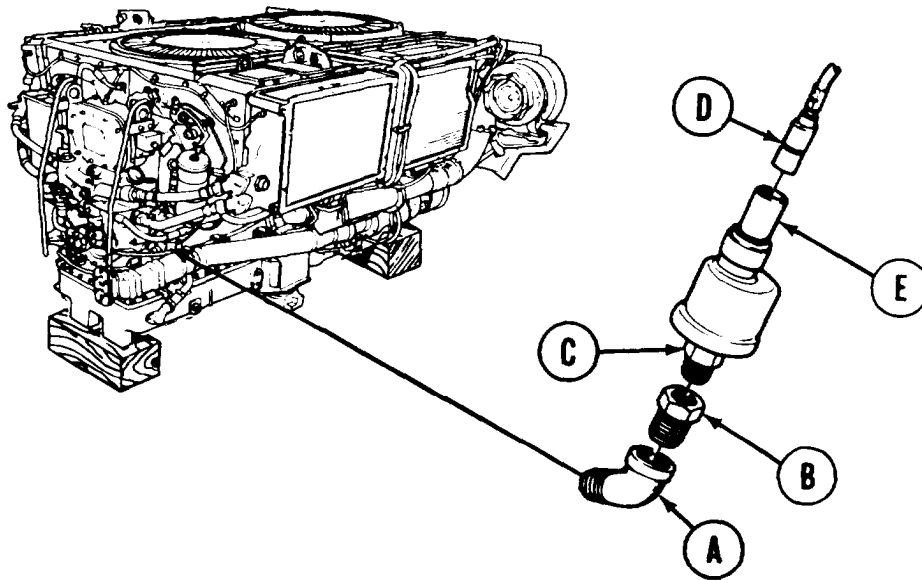
ENGINE OIL PRESSURE TRANSMITTER REPLACEMENT (2D ENGINE) (Sheet 1 of 3)

INSTALLATION:

NOTE

Prior to installation, lightly coat male threads of all components with sealing compound (Item 20, Appendix D).

1. Using pipe wrench, install elbow (A) to engine.
2. Using 3/4 inch wrench, install pipe bushing (B) to elbow (A).
3. Using 7/8 inch wrench, install new transmitter (C) to pipe bushing (B).
4. Push socket of rubber insulated connector (D) into transmitter cap (E).
5. Remove rags from under engine oil high pressure transmitter.
6. Connect engine for powerplant ground hop (page 5-48).



7. Start and run engine. Observe oil pressure indicator for normal oil pressure (TM 9-2350- 222-10).
8. Shut down engine. Disconnect engine from powerplant ground hop (page 5-62).
9. Install powerplant (page 5-37).

End of Task

TA139820

TM 9-2350-222-20-1-4

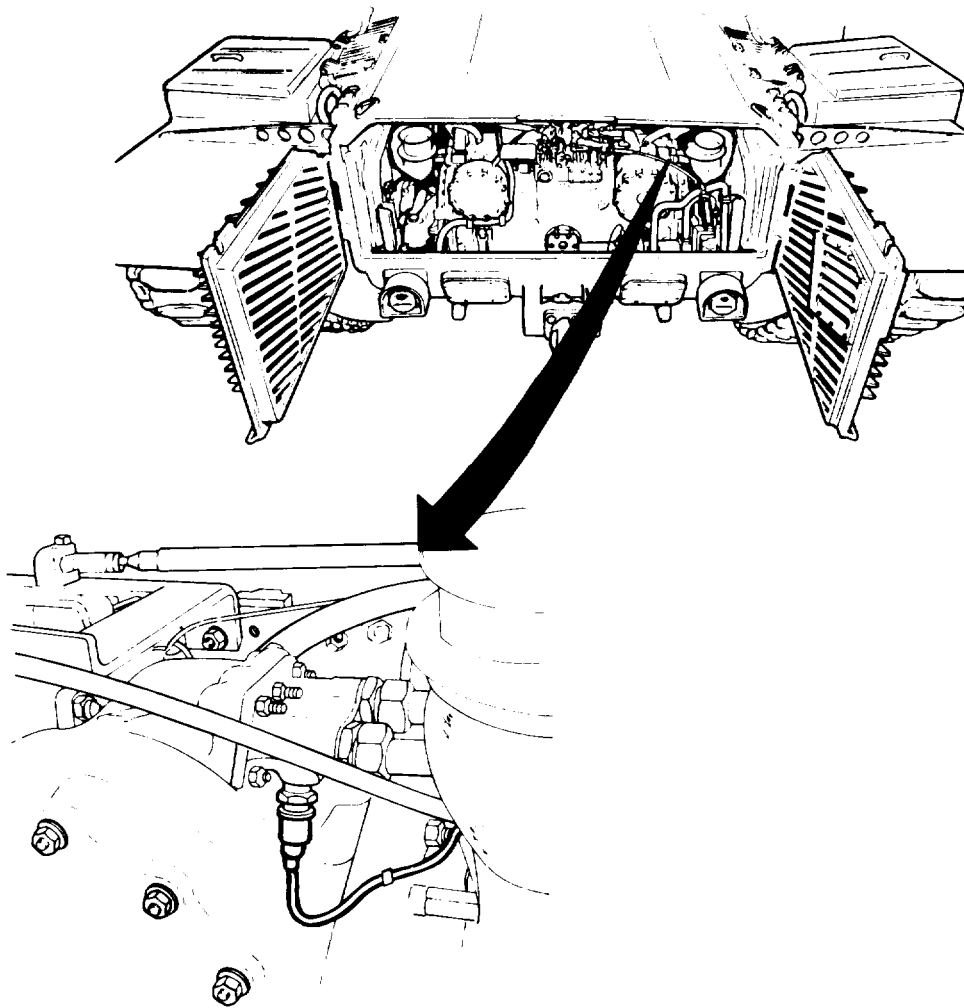
TRANSMISSION OIL HIGH TEMPERATURE SWITCH REPLACEMENT (Sheet 1 of 2)

TOOLS: 15/ 16 in. combination box and open end wrench

SUPPLIES: Rags (Item 65, Appendix D)
Sealing compound (Item 20, Appendix D)

REFERENCE: TM 9-2350-222-10

PRELIMINARY PROCEDURE: Remove transmission shroud (page 9-20)



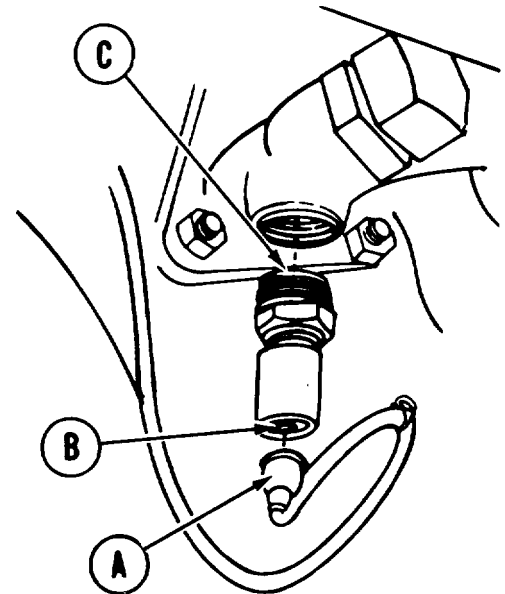
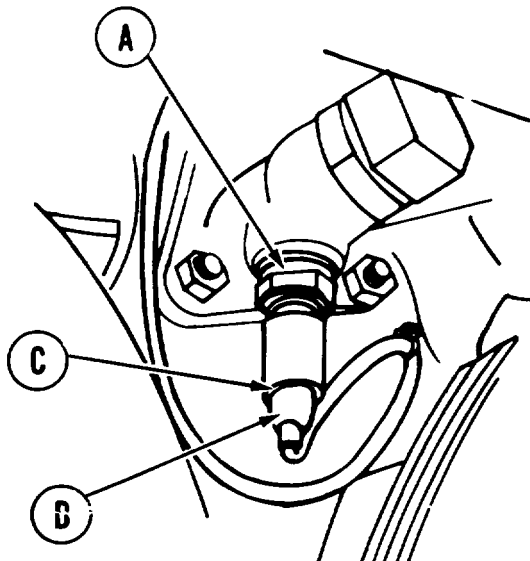
Go on to Sheet 2

TA139821

TRANSMISSION OIL HIGH TEMPERATURE SWITCH REPLACEMENT (Sheet 2 of 2)

REMOVAL:

1. Place rags under switch.
2. Pull socket of rubber insulated connector (A) from switch cap (B).
3. Using wrench, remove switch (C) from transmission.



INSTALLATION:

1. Lightly coat threads of switch with sealing compound (Item 20, Appendix D).
 2. Using wrench, install switch (A) into transmission.
 3. Push socket of rubber insulated connector (B) into switch cap (C).
 4. Remove rags from under switch.
5. Start and run engine. Observe oil temperature indicator for normal oil temperature (TM 9-2350-222-10).
 6. Shut down engine (TM 9-2350-222-10).
 7. Install transmission shroud (page 9-23).

End of Task

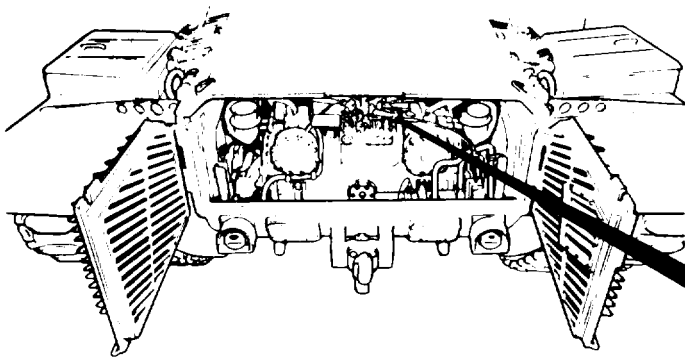
TA139822

NEUTRAL SHIFT SWITCH ASSEMBLY REPLACEMENT (Sheet 1 of 2)

TOOLS: Adjustable wrench
Flat-tip screwdriver with 2 in, blade

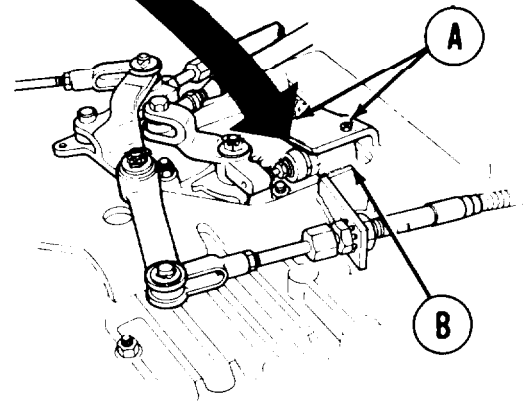
SUPPLIES: Silicone compound (Item 32, Appendix D)
Lockwasher (MS35338-42) (2 required)

PRELIMINARY PROCEDURE: Remove transmission shroud (page 9-20)



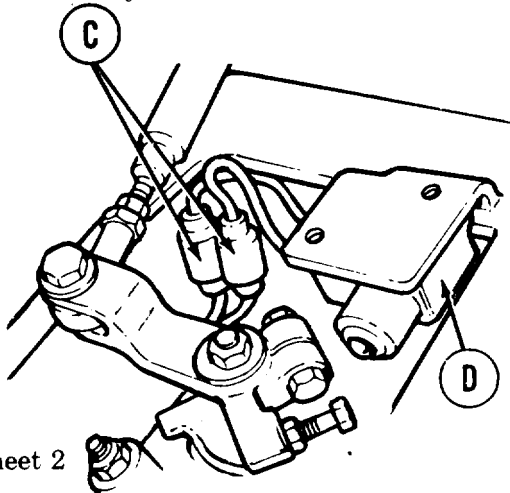
NOTE

Screws holding switch may be reversed.



REMOVAL:

1. Using adjustable wrench on nuts (A) and screwdriver on screws (B) (hidden), remove two screws, lockwashers, and nuts. Throw lockwashers away.



2. Disconnect two electrical connectors (C) from neutral shift switch (D).
3. Remove neutral shift switch (D).

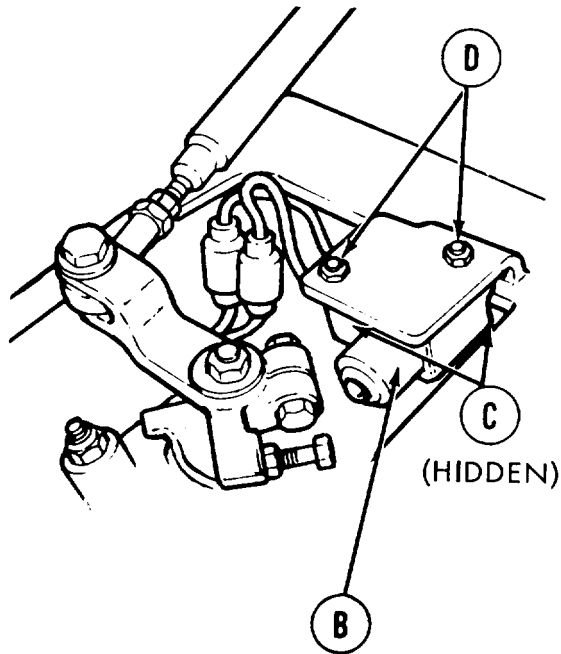
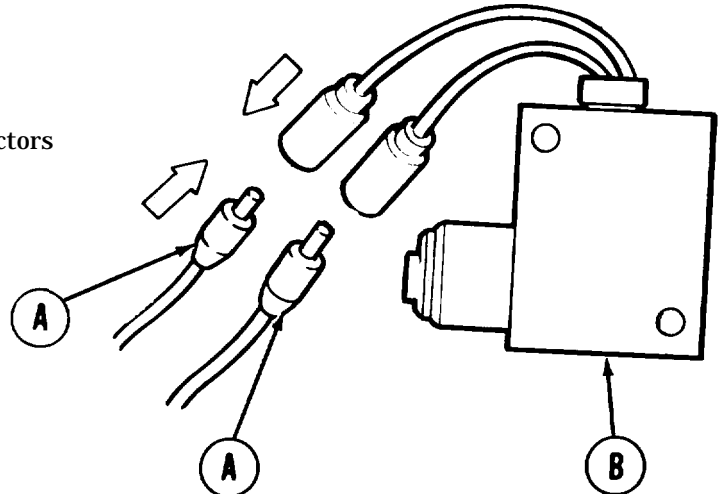
Go on to Sheet 2

TA139823

NEUTRAL SHIFT SWITCH ASSEMBLY REPLACEMENT (Sheet 2 of 2)

INSTALLATION:

1. Apply silicone compound (Item 32, Appendix D) to two male electrical connectors (A).
2. Connect two connectors (A) to connectors of neutral shift switch (B).



3. Place neutral shift switch (B) in position on vehicle.
4. Using adjustable wrench and screwdriver, install two screws (C) (hidden), new lockwashers, and nuts (D).

5. Attempt to start engine in all transmission lever positions. Engine should start only in neutral (N) and park (P) positions. If not, perform adjustment procedure (page 11-22).
6. Install transmission shroud (page 9-23).

End of Task

TA139824

TM 9-2350-222-20-1-4

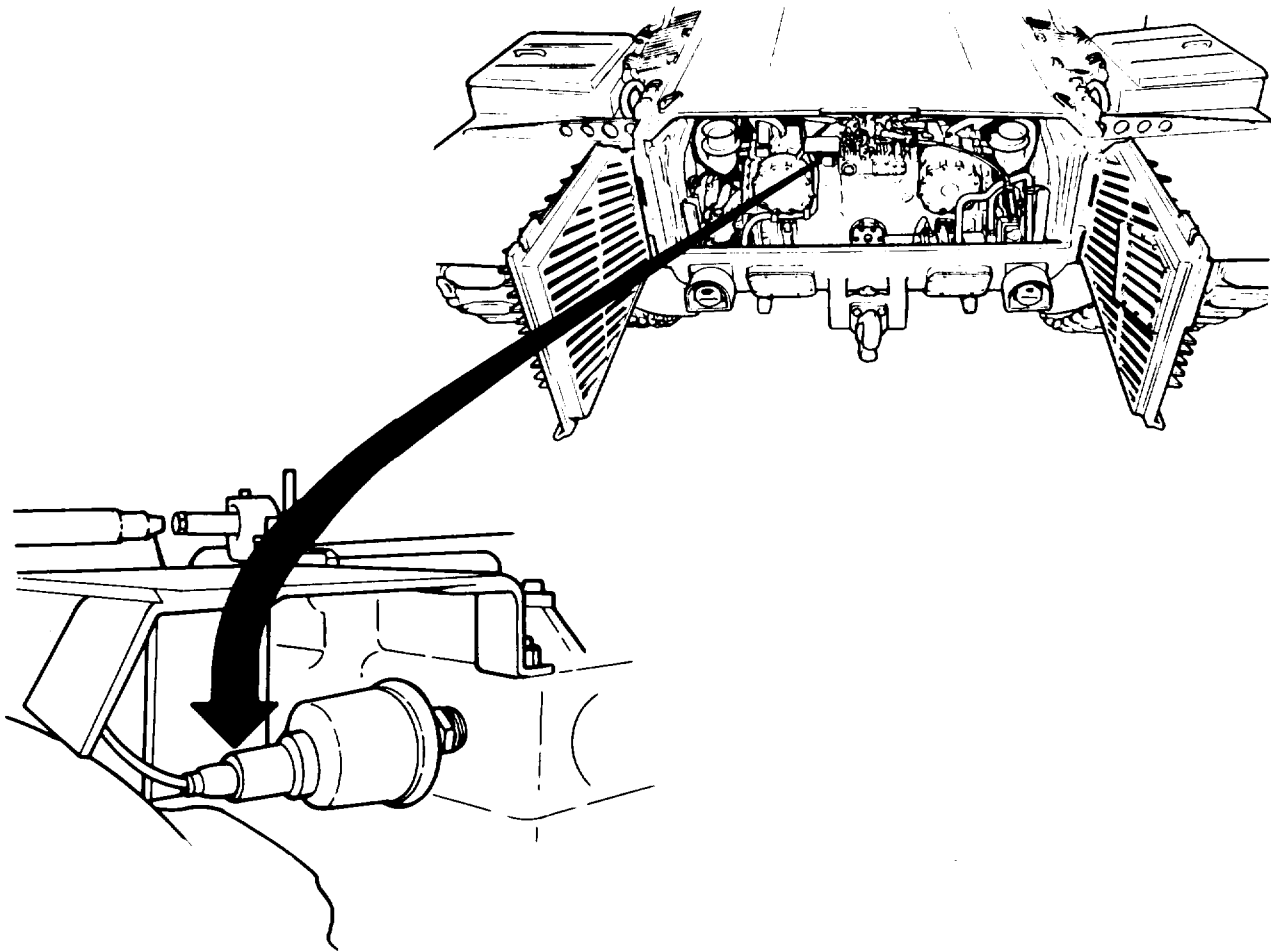
TRANSMISSION OIL PRESSURE TRANSMITTER REPLACEMENT (Sheet 1 of 3)

TOOLS: 3/4 in. combination box and open end wrench
7/8 in. combination box and open end wrench

SUPPLIES: Rags (Item 65, Appendix D)
Sealing compound (Item 20, Appendix D)

REFERENCE: TM 9-2350-222-10

PRELIMINARY PROCEDURE: Remove transmission shroud (page 9-20)



Go on to Sheet 2

TA139825

TRANSMISSION OIL PRESSURE TRANSMITTER REPLACEMENT (Sheet 2 of 3)

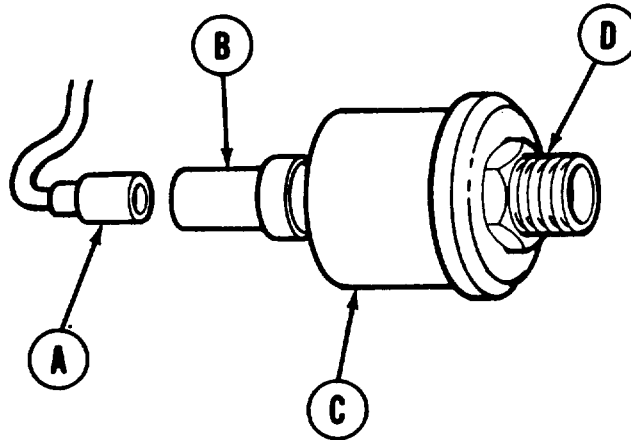
REMOVAL:

1. Place rags under transmitter.
2. Pull socket of rubber insulated connector (A) from transmitter cap (B).
3. Using 7/8 inch wrench, remove transmitter (C) from bushing (D).
4. Using 3/4 inch wrench, remove bushing (D) from transmission socket.
5. Check bushing (D) for cracks and crossed threads. Replace if necessary.

INSTALLATION:

NOTE

Prior to installation, lightly coat male threads of all components with sealing compound (Item 20, Appendix D).



Go on to Sheet 3

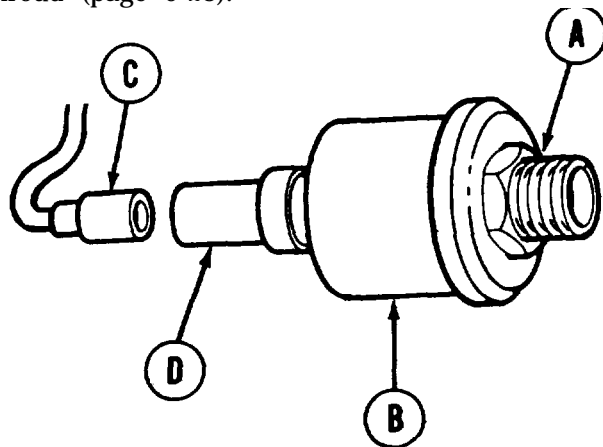
TA139827

10-275

TM 9-2350-222-20-14

TRANSMISSION OIL PRESSURE TRANSMITTER REPLACEMENT (Sheet 3 of 3)

1. Using 3/4 inch wrench, install bushing (A) to transmission socket.
2. Using 7/8 inch wrench, install transmitter (B) to bushing (A).
3. Push socket of rubber insulated connector (C) into transmitter cap (D).
4. Remove rags from under transmitter.
5. Start and run engine. Observe oil pressure indicator for normal oil pressure (TM 9-2350- 222-10).
6. Shut down engine (TM 9-2350-222-10).
7. Install transmission shroud (page 9-23).



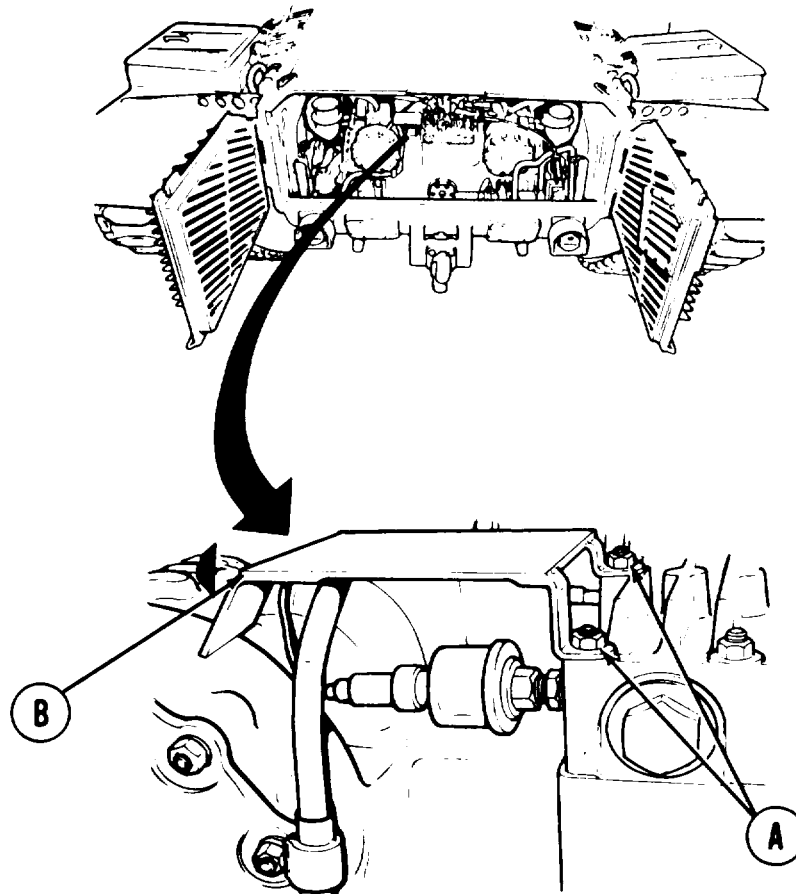
End of Task

TA139828

TRANSMISSION OIL PRESSURE TRANSMITTER GUARD PLATE REPLACEMENT
(Sheet 1 of 2)

TOOLS: Ratchet with 1/2 in. drive
9/16 in. socket with 1/2 in. drive

PRELIMINARY PROCEDURE: Remove transmission shroud (page 9-20)



REMOVAL;

1. Using socket, remove two nuts (A) holding oil pressure transmitter guard plate (B) to transmission,
2. Manually lift oil pressure transmitter guard plate (B) up and away from transmission.

Go on to Sheet 2

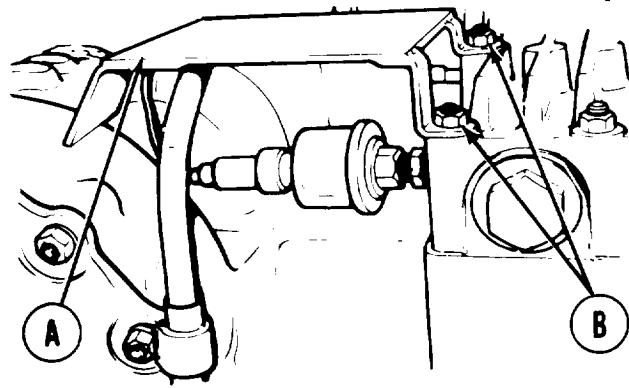
TA139830

TM 9-2350-222-20-1-4

TRANSMISSION OIL PRESSURE TRANSMITTER GUARD PLATE REPLACEMENT (Sheet 2 of 2)

INSTALLATION:

1. Position oil pressure transmitter guard plate (A) onto transmission.
2. Manually start two nuts (B) to hold oil pressure transmitter guard plate (A) in place.
3. Using socket, tighten two nuts (B).
4. Install transmission shroud (page 9-23).



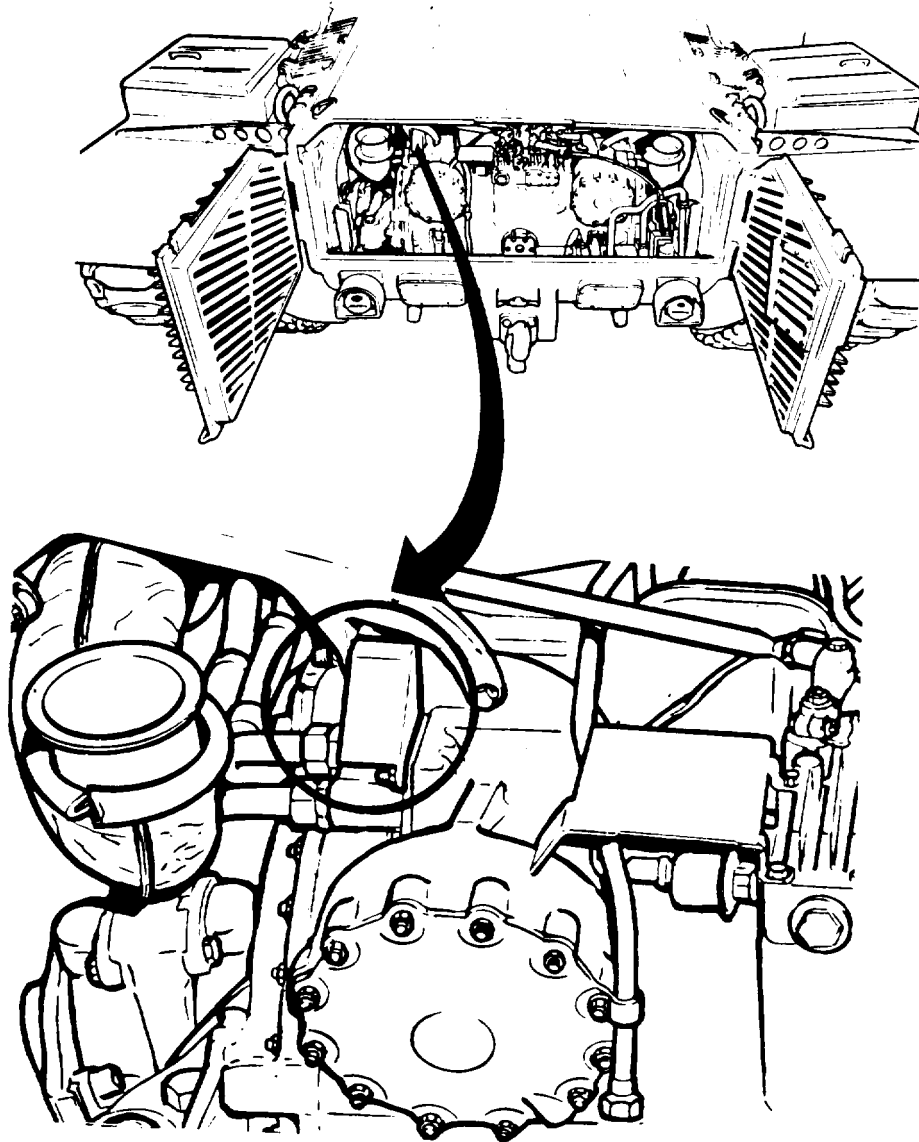
End of Task

TA139829

TRANSMISSION OIL TEMPERATURE TRANSMITTER PROTECTOR REPLACEMENT
(Sheet 1 of 2)

TOOLS: Ratchet with 1/2 in. drive
10 in. extension with 1/2 in. drive
9/16 in. socket with 1/2 in. drive

PRELIMINARY PROCEDURE: Remove transmission shroud (page 9-20)



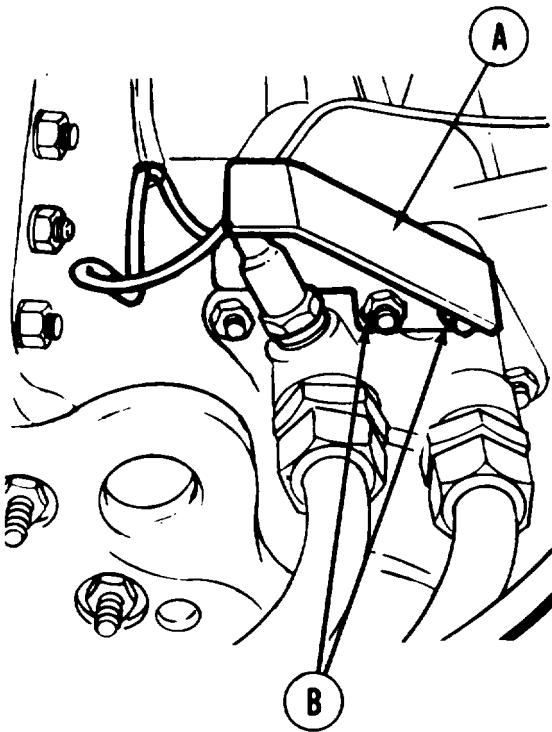
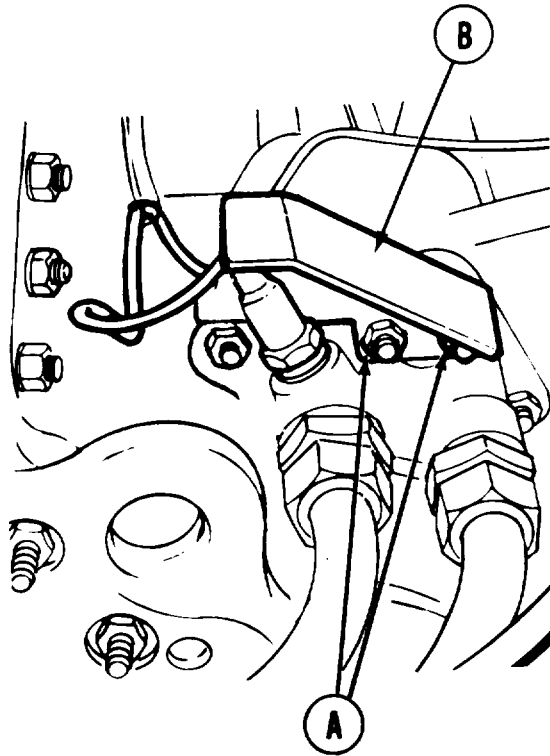
Go on to Sheet 2

TA139832

TRANSMISSION OIL TEMPERATURE TRANSMITTER PROTECTOR REPLACEMENT
(Sheet 2 of 2)

REMOVAL:

1. Using socket and extension or wrench, remove two nuts (A) holding transmission oil temperature transmitter protector (B) to transmission.
2. Manually lift transmission oil temperature transmitter protector (B) away from transmission.



INSTALLATION:

1. Position transmission oil temperature transmitter protector (A) onto transmission.
2. Manually start two nuts (B) to hold oil temperature transmitter protector (A) in place.
3. Using socket and extension or wrench, install two nuts (B).
4. Install transmission shroud (page 9-23).

End of Task

TA139831

TOOLS: 15/16 in. combination box and open end wrench

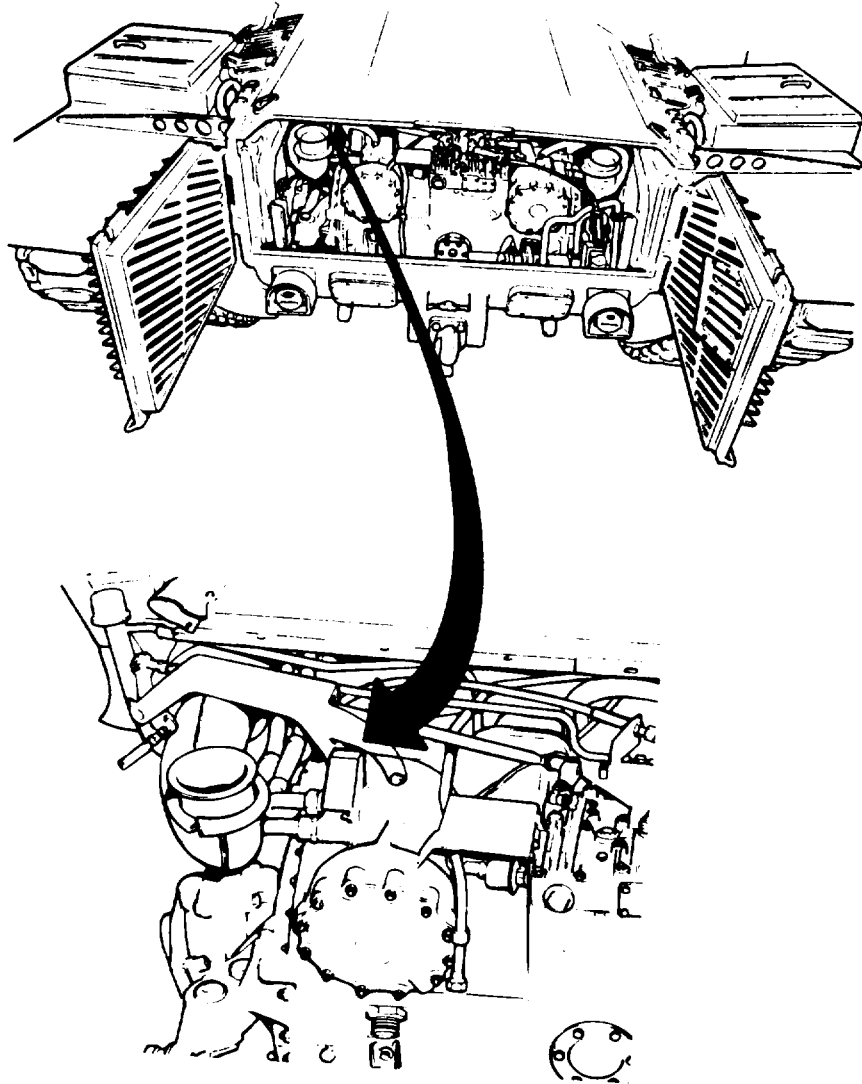
SUPPLIES: Rags (*Item 65, Appendix D*)

Sealing compound (*Item 20, Appendix D*)

REFERENCE: TM 9-2350-222-10

PRELIMINARY PROCEDURE:

Remove transmission shroud (page 9-20)



Go on to Sheet 2

TA149233

10-281

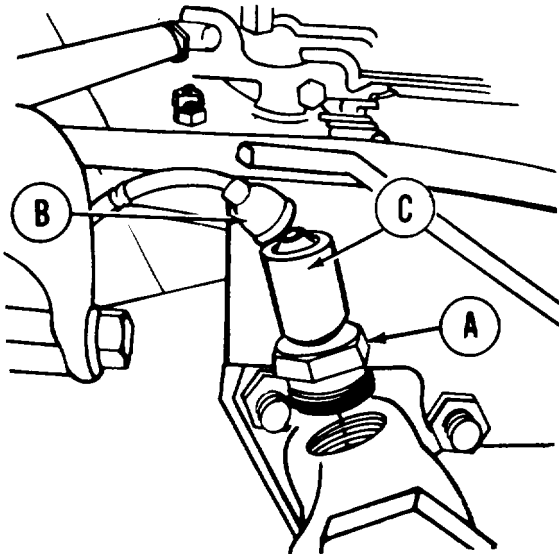
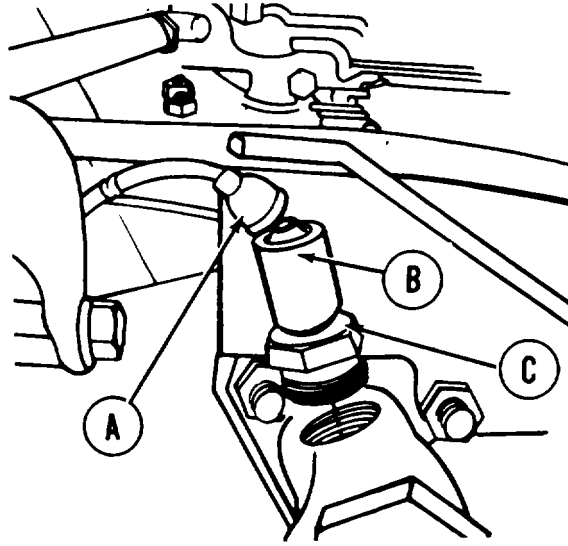
TRANSMISSION OIL TEMPERATURE TRANSMITTER REPLACEMENT (Sheet 2 of

REMOVAL:

1. Place rags under transmitter.
2. Pull socket of rubber insulated connector (A) from switch cap (B).
3. Using wrench, remove transmitter (C) from transmission.

INSTALLATION:

1. Lightly coat threads of transmitter with sealing compound (Item 20, Appendix D).



2. Using wrench, install transmitter (A) into transmission.
3. Push socket of rubber insulated connector (B) into switch cap (C).
4. Remove rags from under transmitter.

5. Start and run engine. Observe oil temperature indicator for normal oil temperature (TM 9-2350-222-10).
6. Shut down engine (TM 9-2350-222-10).
7. Install transmission shroud (page 9-23).

End of Task

TA139833

DISCONNECT BATTERY GROUND STRAPS (Sheet 1 of 1)

TOOLS: 9/16 in. socket with 1/2 in. drive
 Ratchet with 1/2 in. drive,
 5 in. extension with 1/2 in. drive

SUPPLIES: Rag, wiping (Item 65, Appendix D)
 Rubber gloves (Item 73, Appendix D)
 Goggles (Item 74, Appendix D)

WARNING

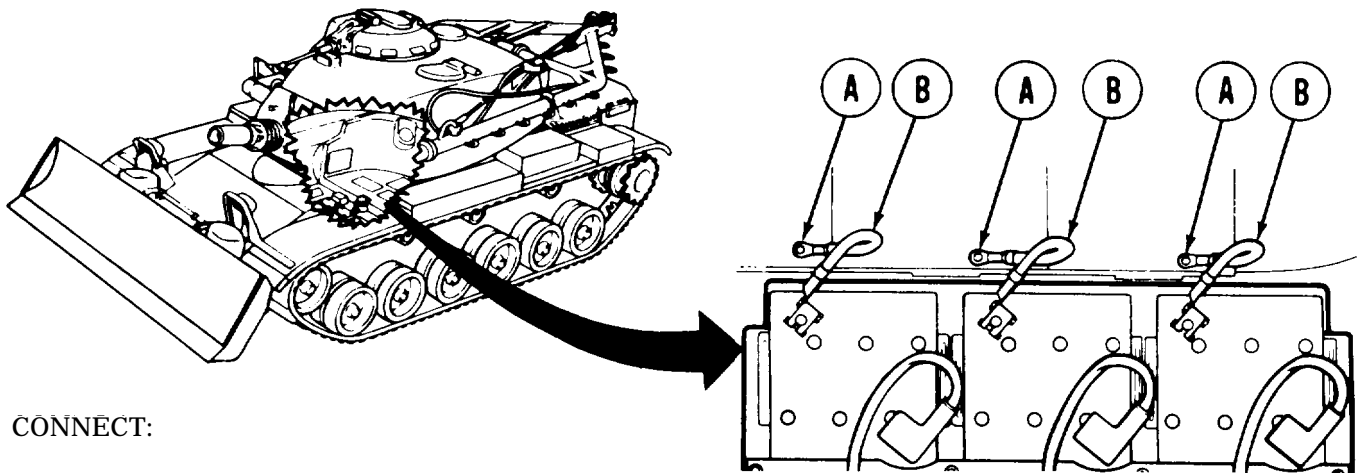
- Remove all jewelry such as rings, watches, dog tags, bracelets, etc. If jewelry or disconnected battery ground cable contacts battery terminal, a direct short can result, causing instant heating of jewelry and tools, causing severe injury to personnel or damage to equipment.
- Battery acid (electrolyte) is extremely harmful. Always wear safety goggles and rubber gloves, and don't smoke while servicing batteries. Severe injury will result if acid contacts eyes or skin.

CAUTION

As each cable is removed, cover cable with rags to prevent contact with floor or battery box which may cause arcing.

DISCONNECT:

Using socket with extension, remove three screws and washers (A) securing three ground straps (B) to hull floor.

**CONNECT:**

1. Remove cloth from each cable (B) and place in position.
2. Using socket, install three screws and washers (A) securing cables (B) to hull floor.

End of Task

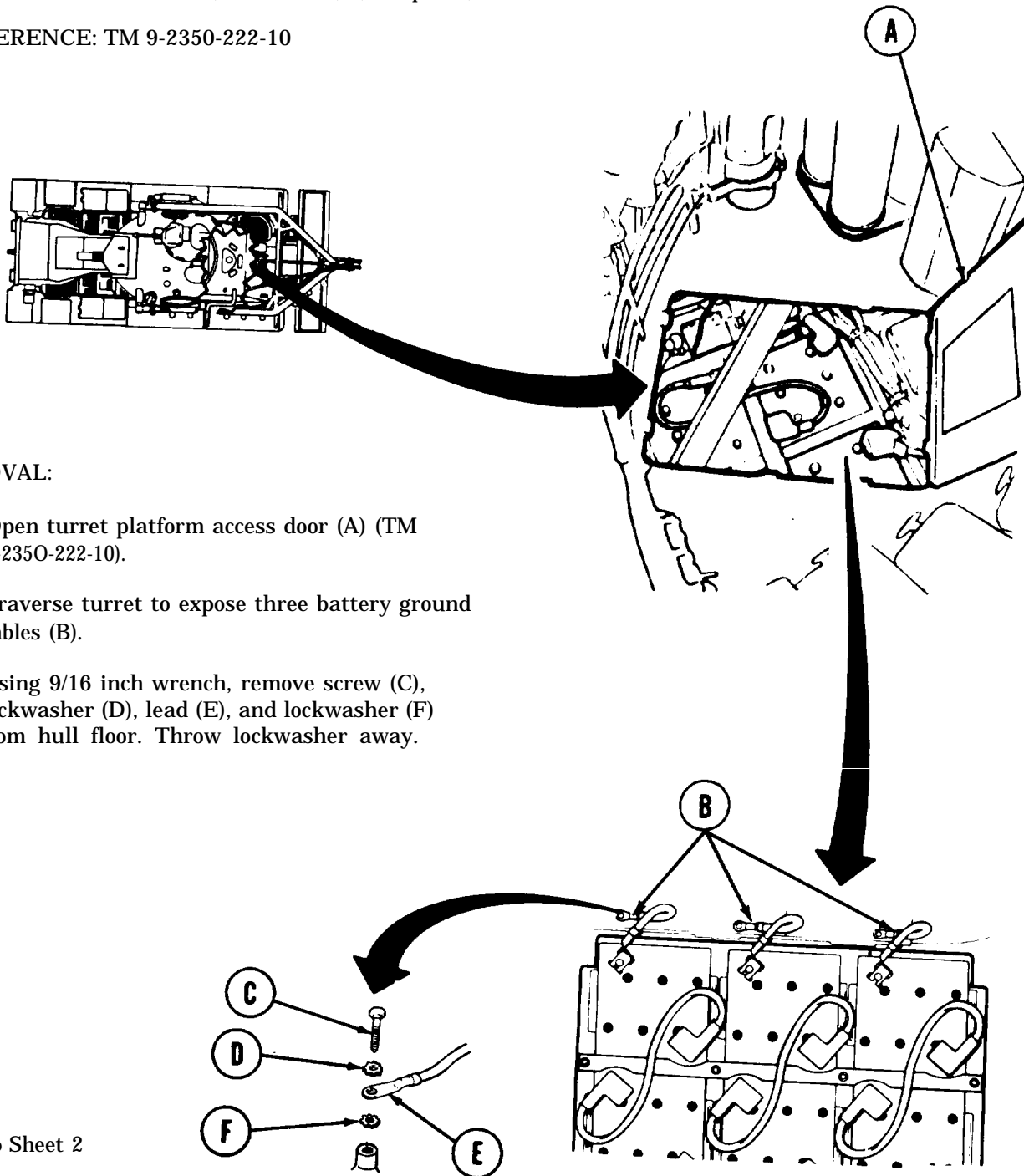
TA249116

BATTERY GROUND CABLE REPLACEMENT (Sheet 1 of 3)

TOOLS: 1/2 in. combination box and open end wrench
9/16 in. combination box and open end wrench
Battery terminal lifter-scraper

SUPPLIES: Grease (Item 36, Appendix D)
Lockwasher (MS35335-35) (6 required)

REFERENCE: TM 9-2350-222-10



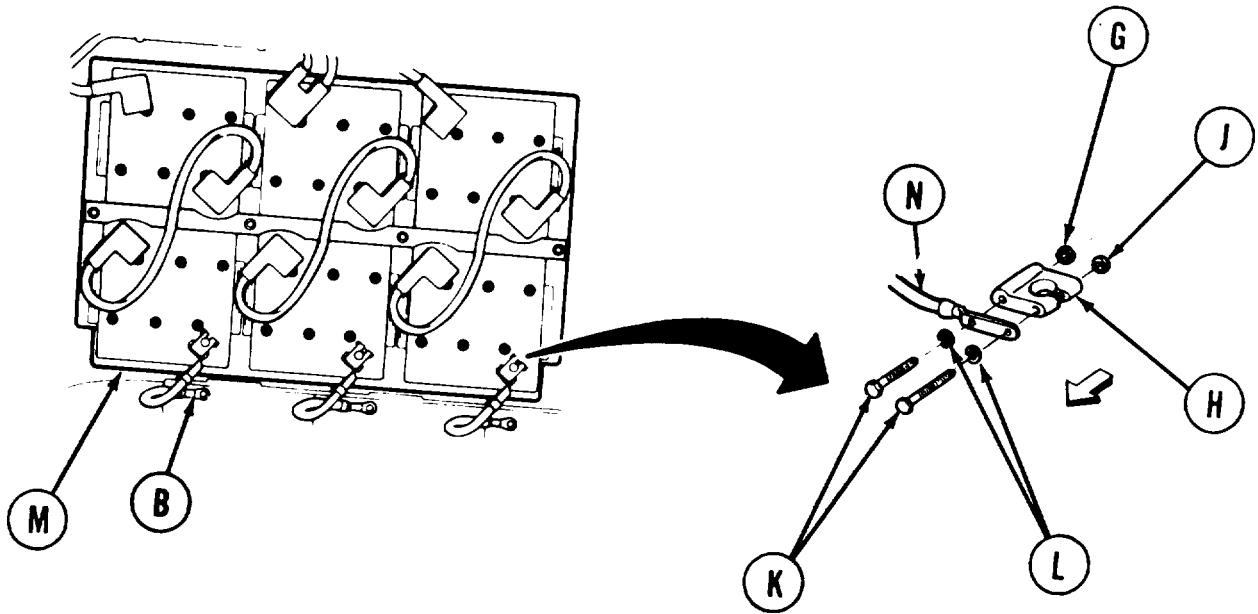
REMOVAL:

1. Open turret platform access door (A) (TM 9-2350-222-10).
2. Traverse turret to expose three battery ground cables (B).
3. Using 9/16 inch wrench, remove screw (C), lockwasher (D), lead (E), and lockwasher (F) from hull floor. Throw lockwasher away.

Go on to Sheet 2

TA139835

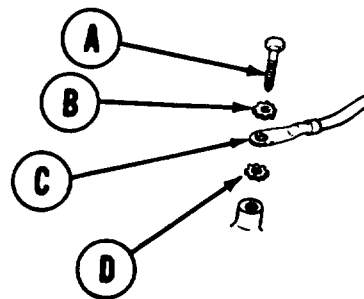
4. Using 9/16 inch wrench, remove nut (G) from terminal (H).
5. Using 1/2 inch wrench, remove nut (J) from terminal (H).
6. Remove two screws (K) and washers (L) from terminal (H).
7. Using lifter-scraper, remove terminal (H) from battery (M).



8. Remove battery ground cables (B).

INSTALLATION:

1. Using 9/16 inch wrench, install screw (A), new lockwasher (B), lead (C), and lockwasher (D) to hull floor.



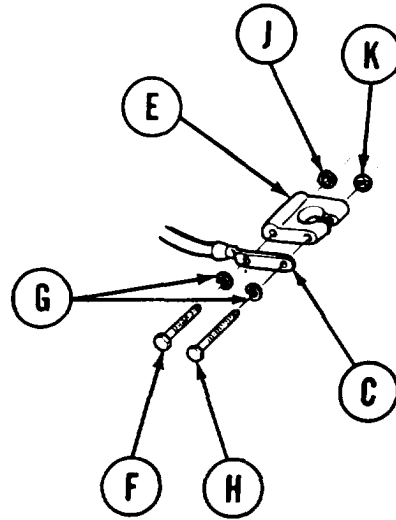
Go on to Sheet 3

TA139836

TM 9-2350-222-20-1-4

BATTERY GROUND CABLE REPLACEMENT (Sheet 3 of 3)

2. Place lead (C) in position on terminal (E).
3. Place screw (F) and washer (J) in position in terminal (G).
4. Place screw (H) and washer (G) in position in terminal (E).
5. Install terminal (E) on battery.
6. Using 9/16 inch wrench, install nut (J) on screw (F).
7. Using 1/2 inch wrench, install nut (K) on screw (H).
8. Apply small amount of grease (Item 36, Appendix D) to terminal (E) to stop possible corrosion.
9. Close turret platform access door.



End of Task

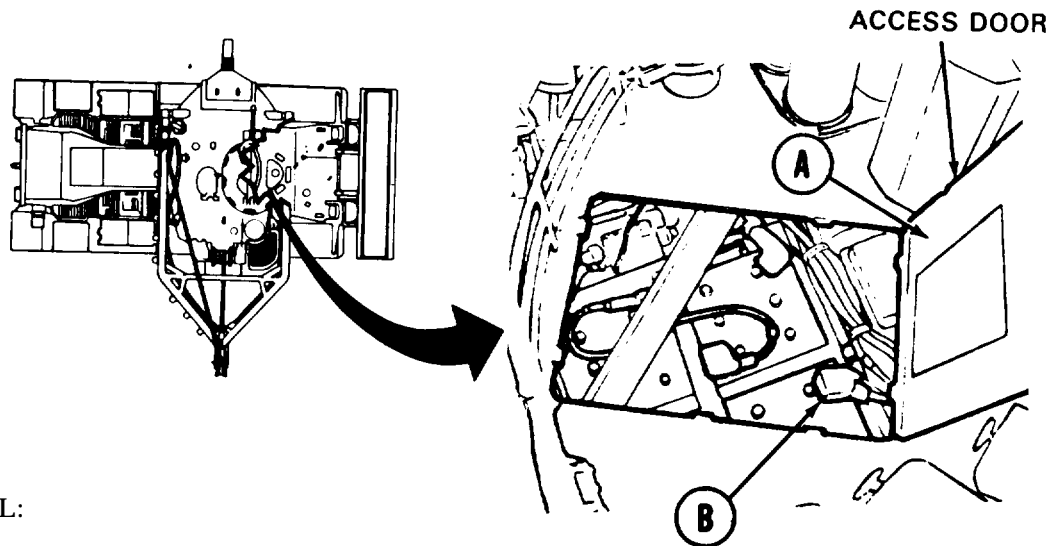
TA139837

BATTERY TERMINAL BOOT REPLACEMENT (Sheet 1 of 2)

TOOLS: 1/2 in. combination box and open end wrench
 9/16 in. combination box and open end wrench
 Slip joint pliers

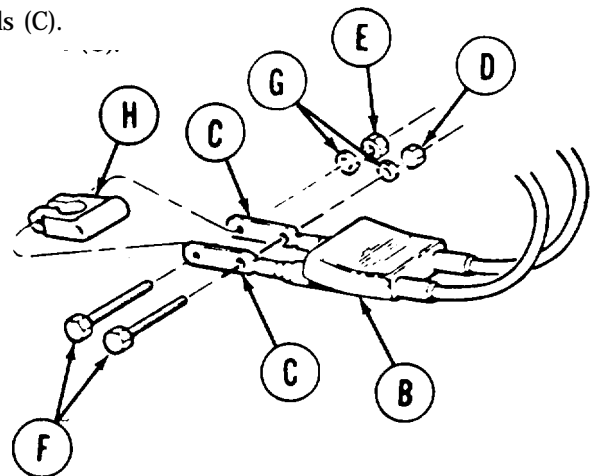
REFERENCE: TM 9-2350-222-10

PRELIMINARY PROCEDURE: Disconnect three battery ground straps (page 10-283)



REMOVAL:

1. Open turret platform access door (A).
2. Displace boot (B) back on two leads (C).
3. Using 9/16 inch wrench, remove nut (D).
4. Using 1/2 inch wrench, remove nut (E).
5. Using pliers, pull two leads (C), screws (F), and washers (G) away from terminal (H).
6. Separate two screws (F) and washers (G) from two leads (C).
7. Slide boot (B) down and off two leads (C).



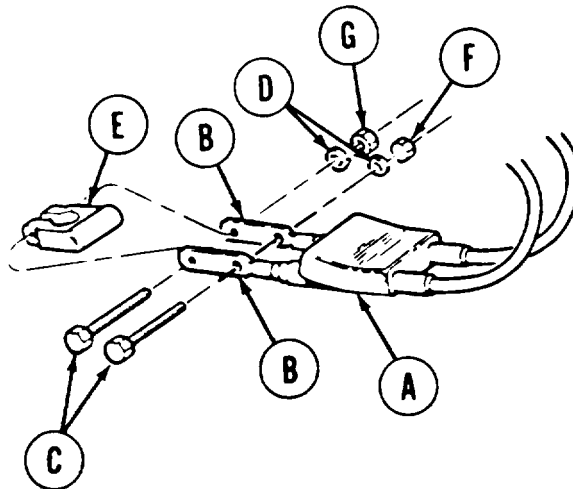
Go on to Sheet 2

TA139838

BATTERY TERMINAL BOOT REPLACEMENT (Sheet 2 of 2)

INSTALLATION:

1. Place boot (A) in position by sliding onto two leads (B).
2. Place two screws (C), washers (D), and leads (B) in position on terminal (E).
3. Using 9/16 inch wrench, install nut (F).
4. Using 1/2 inch wrench, install nut (G).
5. Slide boot (A) over assembled terminal (E).
6. Connect three battery ground straps (page 10-283).
7. Close turret platform access door.



End of Task

TA139839

BATTERY TESTING AND REPLACEMENT (Sheet 1 of 13)

PROCEDURE INDEX

PROCEDURE	PAGE
Test	10-290
Removal	10-293
Cleaning and Inspection	10-297
Installation	10-298

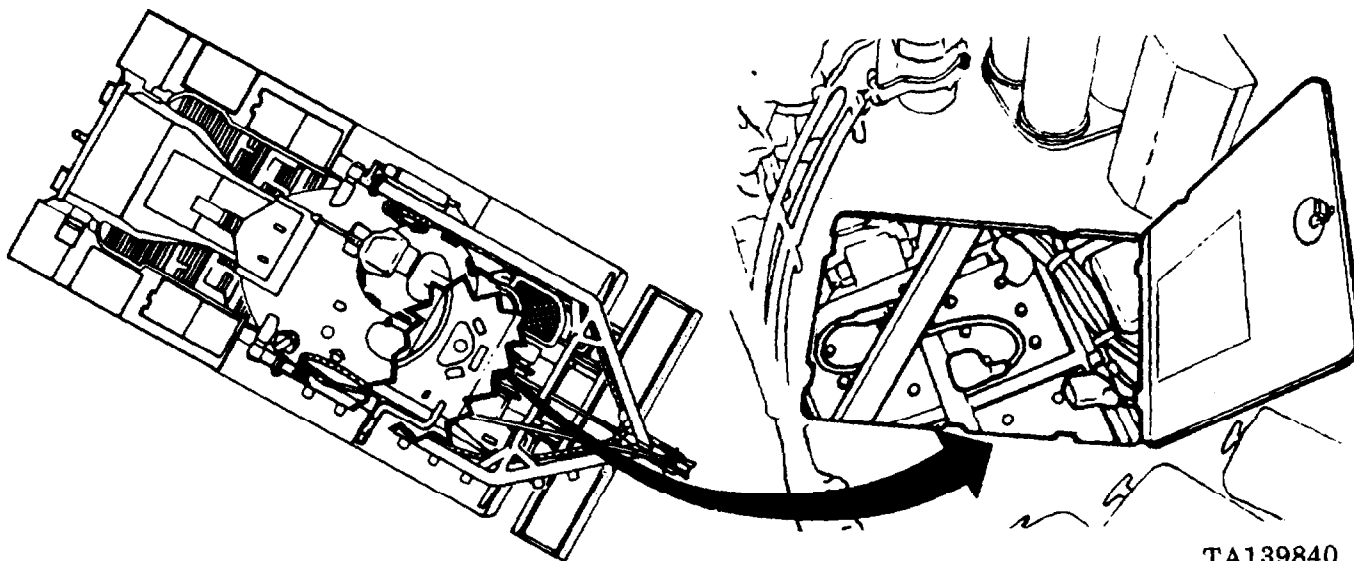
TOOLS 9/16 in. combination box and open end wrench
 1/2 in. combination box and open end wrench
 Wire brush
 Storage battery carrier
 Brush
 Antifreeze and battery tester
 Battery terminal puller
 Battery post and terminal cleaner

SUPPLIES: Bicarbonate of soda
 Rags (Item 65, Appendix D)

Pencil and paper
 Black paint (Item 44, Appendix D)
 Grease (Item 36, Appendix D)

REFERENCES: TM 9-2350-222-10
 TM 9-6140-22-14

PRELIMINARY PROCEDURES: Traverse turret to expose batteries (TM 9-2350-222-10)
 Set MASTER BATTERY switch to OFF (TM 9-2350-222-10)



Go on to Sheet 2

TA139840

TEST

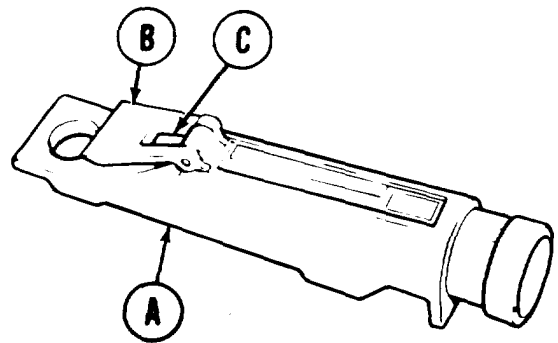
WARNING

Acid fumes and copper sulphate particles are injurious to eyes and skin. Upon contact, immediately flush Contacted area with water and immediately obtain medical attention.

NOTE

If using STE/ICE to test batteries, refer to test no. 77 for Internal Battery Resistance (page 4-83), test no. 74 for Starter Circuit Resistance (page 4-80), and test no. 72 for Starter Circuit First Peak (page 4-77).

1. Before each use of battery tester (A), open plastic cover (B). Clean measuring window (C) and cover with clean, soft cloth and dry thoroughly



Go on to Sheet 3

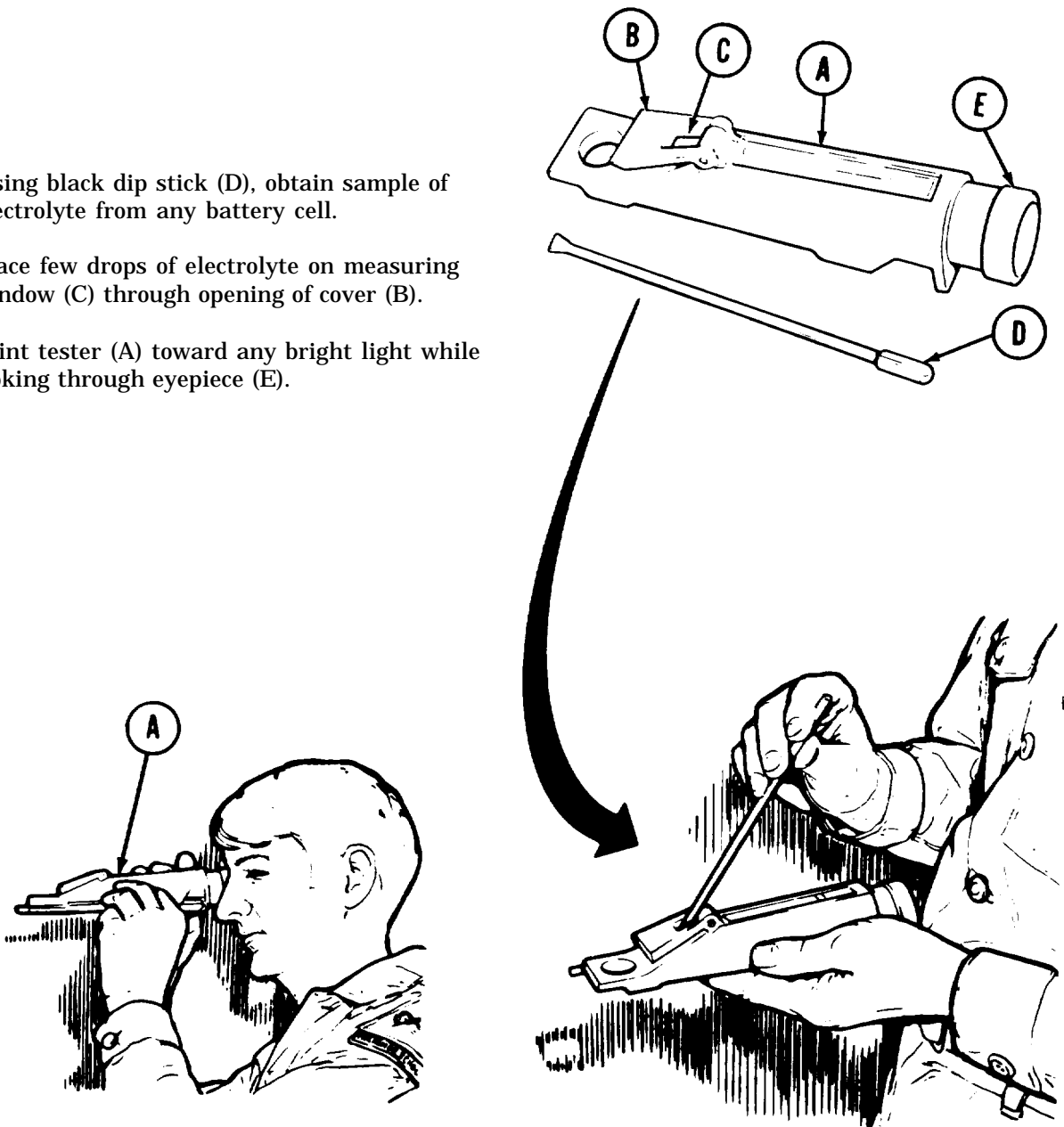
TA139841

BATTERY TESTING AND REPLACEMENT (Sheet 3 of 13)

NOTE

Measuring surface must be clean before each reading. Do not add water to battery before test.

2. Using black dip stick (D), obtain sample of electrolyte from any battery cell.
3. Place few drops of electrolyte on measuring window (C) through opening of cover (B).
4. Point tester (A) toward any bright light while looking through eyepiece (E).



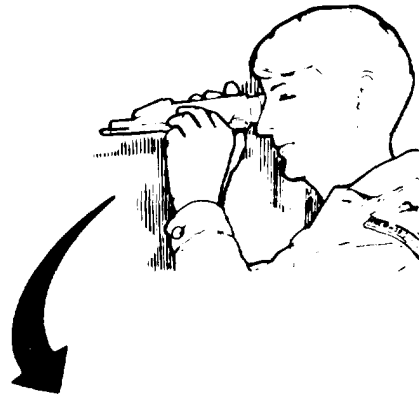
Go on to Sheet 4

TA139842

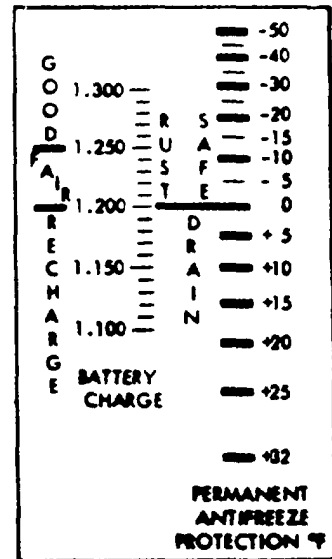
5. Read battery charge (specific gravity) on left scale at point where dividing line between light and dark (edge of shadow) crosses scale.

NOTE

If shadow edge is not sharp, measuring surfaces were not sufficiently cleaned or dried. Clean measuring surfaces and make new test.



6. Using pencil and paper, record reading.
7. Repeat steps 1 thru 6 for each battery cell.



8. Check your recorded readings for all six cells of each battery against the following table. Readings should be approximately the same.

Specific Gravity	Charge on Battery
1.280	Fully charged
1.250	Three-fourths charged
1.220	One-half charged
1.190	One-fourth charged
1.160	Little useful charge
1.130	Discharged

9. If readings are approximately the same but are below 1.225 for any one battery, charge battery and recheck.

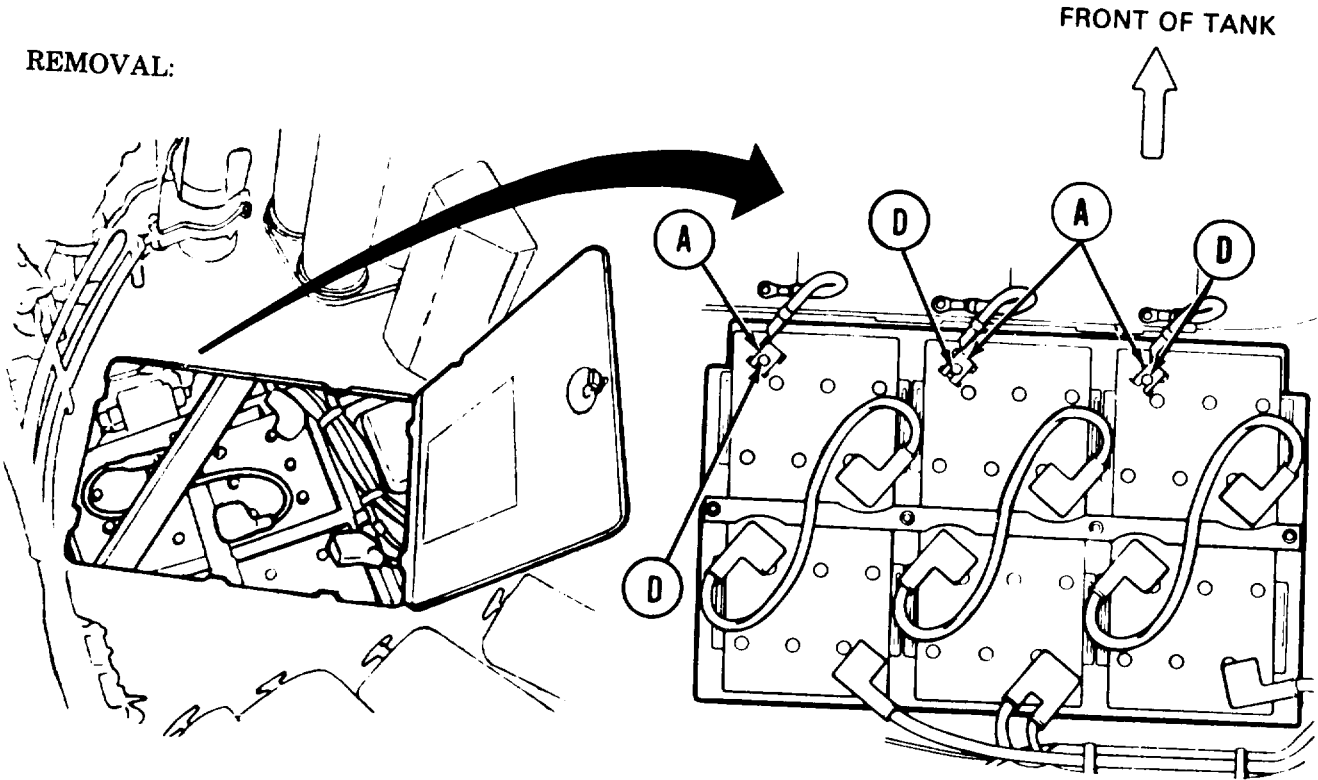
Go on to Sheet 5

TA139843

BATTERY TESTING AND REPLACEMENT (Sheet 5 of 13)

10. Readings between cells of any one battery must be within 0.025 of each other. If they are not, replace battery,

REMOVAL:

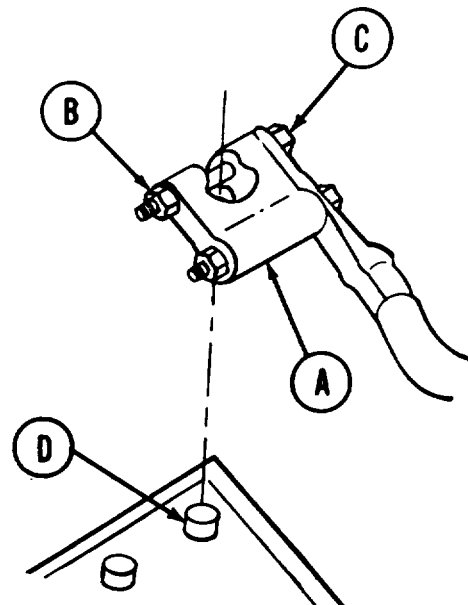


1. Locate three battery ground cable terminals (A).
2. Using 1/2 inch box wrench on nut (B) and 1/2 inch open end wrench on bolt (C), loosen nut (B) and bolt (C) on three battery ground cable terminals (A).

CAUTION

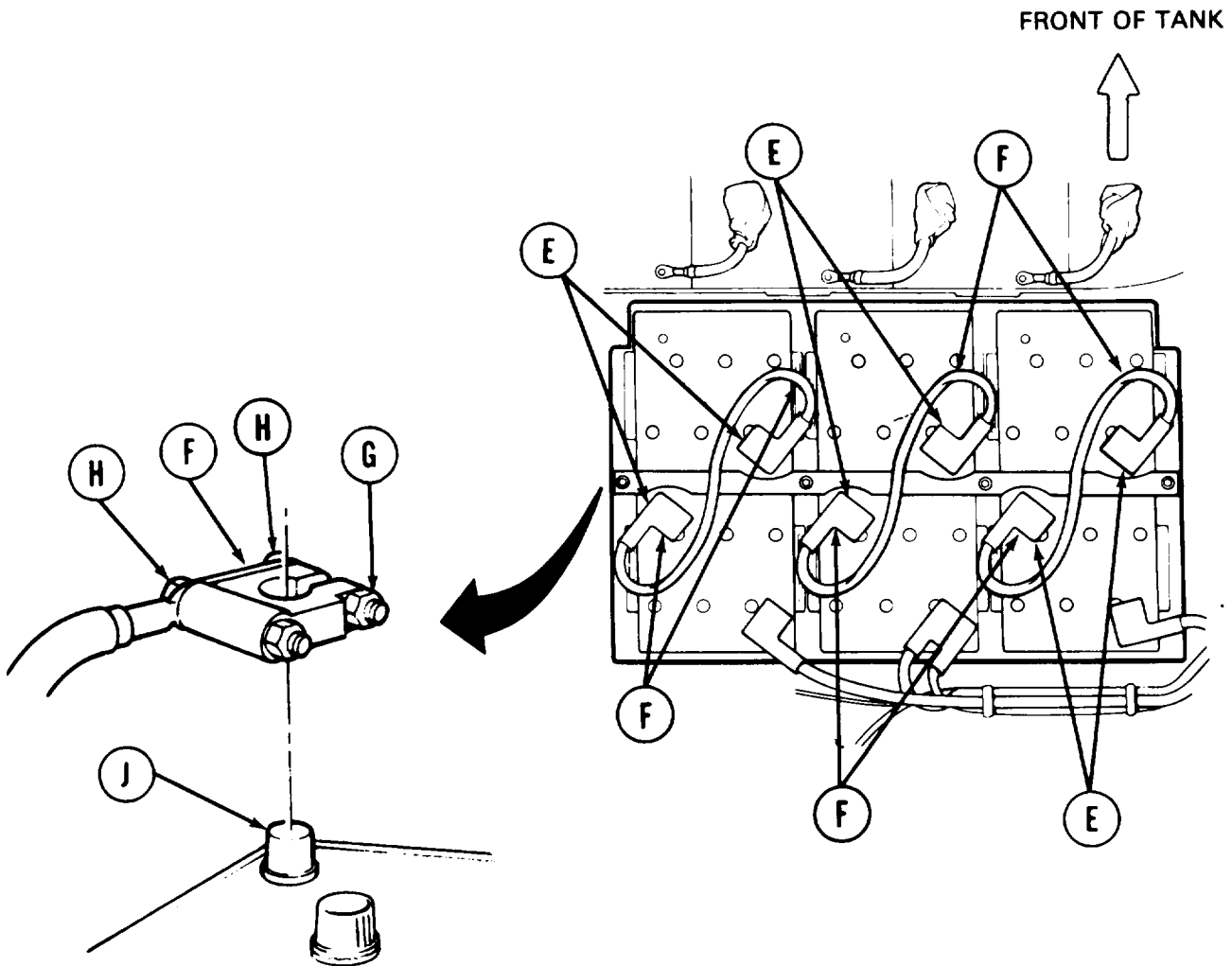
As each cable is removed, cover battery ground cable with rags and position cable to prevent contact with battery box or batteries to prevent arcing.

3. Using battery terminal puller, remove three battery ground terminals (A) from battery post (D). Lay terminals and cables aside.



TA139844

- Lift up and slide back six protective boots (E) from six terminals (F).



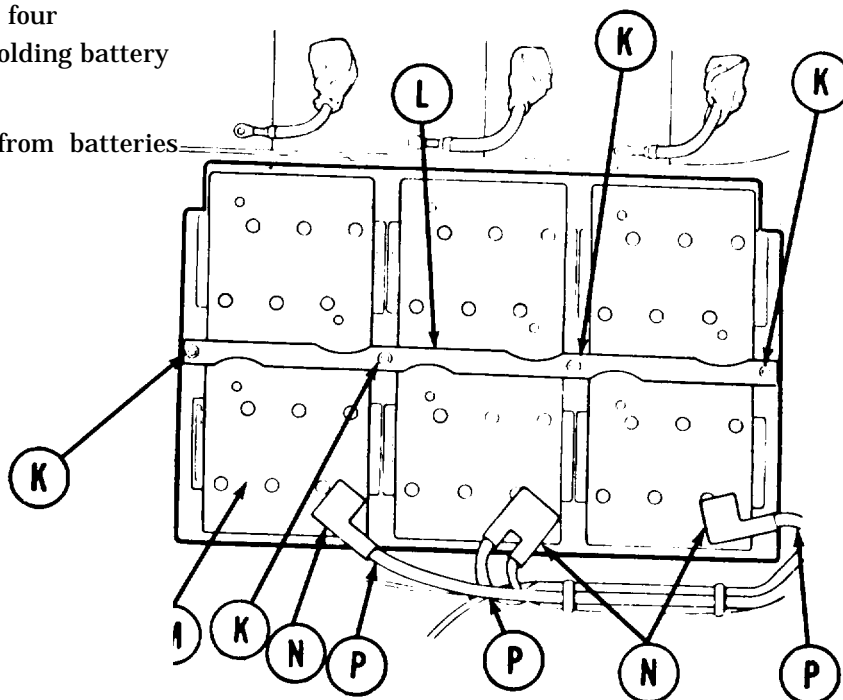
- Using 1/2 inch box wrench on nuts (G) and 1/2 inch open end wrench on bolts (H), loosen nuts (G) and bolts (H) **on six** battery lead assemblies (F).
- Using battery terminal puller, remove six battery terminals (F) from battery post (J).

Go on to Sheet 7

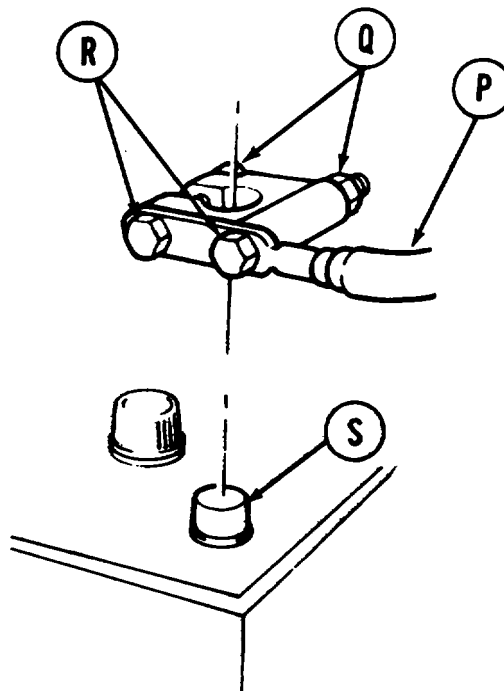
TA139845

BATTERY TESTING AND REPLACEMENT (Sheet 7 of 13)

7. Using 9/16 inch wrench, remove four retainer bolts and washers (k) (holding battery holddown retainer (L)).
8. Remove holddown retainer (L) from batteries (M).



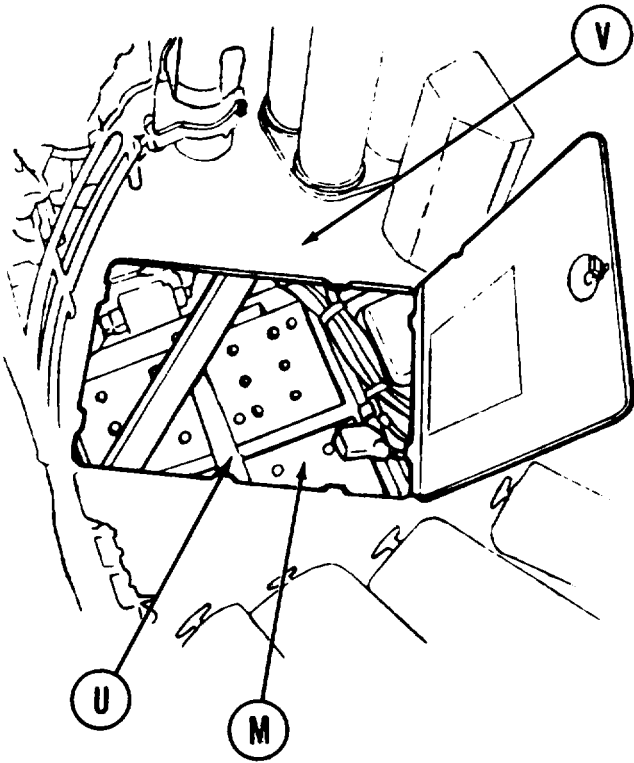
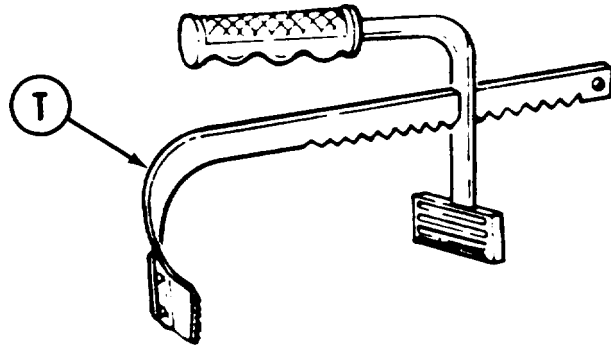
9. Lift up and slide back three protective boots (N) on three positive terminals (P).
10. Using 1/2 inch wrench on nuts (Q) and 1/2 inch wrench on bolts (R), loosen nuts (Q) and bolts (R) on three positive terminals (P).
11. Using battery terminal puller, remove three positive terminals (P) from battery post (S). Cover positive terminals with rags and position away from battery box and batteries.



Go on to Sheet 8

TA139846

- Using two handles on battery (M), lift battery from compartment (U) to turret floor (V). Using battery carrier (T), remove batteries from vehicle.



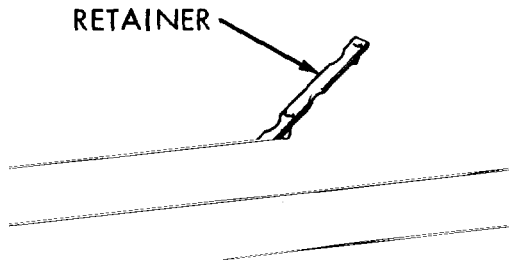
Go on to Sheet 9

TA139847

BATTERY TESTING AND REPLACEMENT (Sheet 9 of 13)

CLEANING AND INSPECTION:

1. Using stiff wire brush, clean retainer with bicarbonate of soda and water.
2. Using brush, coat retainer with black acid-resistant paint (Item 44, Appendix D).



3. Using terminal and post cleaner, clean battery posts and terminals.
4. Inspect bolts, nuts, washers, and retainer for bent or stripped threads or rounding-off bolt heads.
5. Inspect rubber boots for cracks or deterioration.
6. Replace parts found unserviceable.

NOTE

For detailed instructions in proper care and maintenance of batteries, see TM 9-6140-200-14.

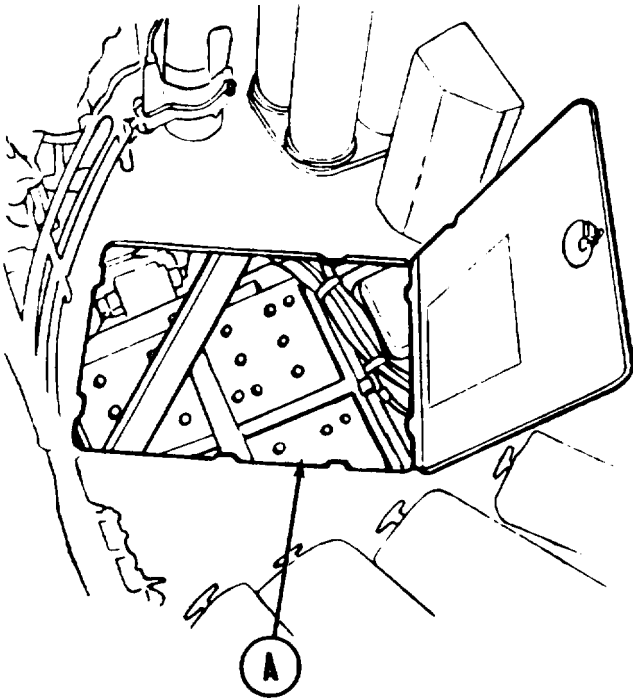
Go on to Sheet 10

TA139648

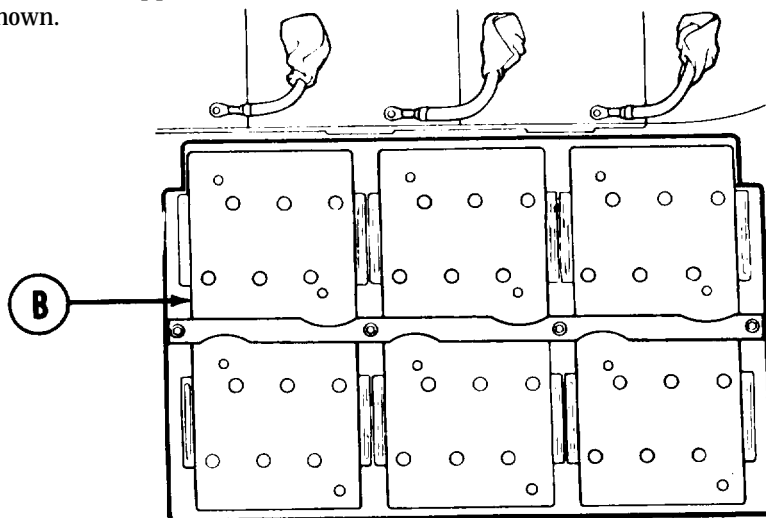
10-297

BATTERY TESTING AND REPLACEMENT (Sheet 10 of 13)

INSTALLATION:



1. Using battery handles, install batteries through turret floor (A).
2. Position six batteries (B) on support. Terminals must be oriented as shown.



Go on to Sheet 11

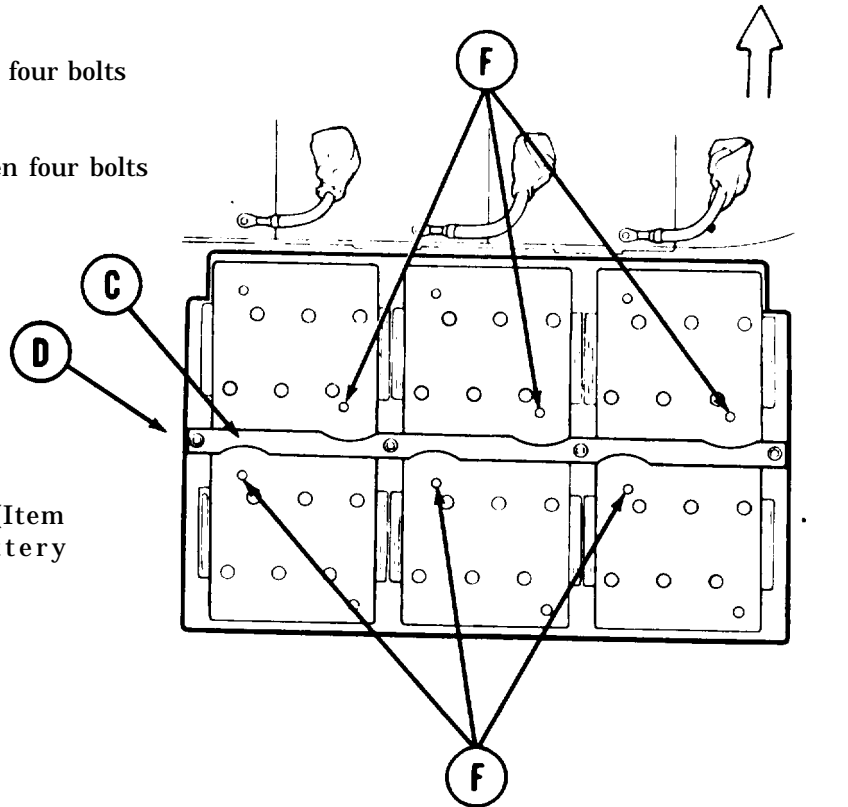
TA139849

BATTERY TESTING AND REPLACEMENT (Sheet 11 of 13)

FRONT OF TANK

3. Install holddown retainer (C) using four bolts and eight washers.

Using 9/16 inch box wrench, tighten four bolts (D).



NOTE

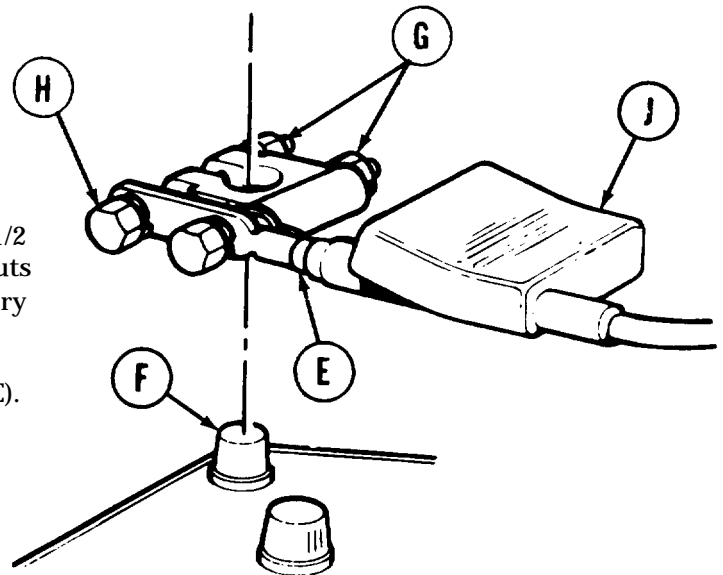
Apply light coat of grease (Item 36, Appendix D) to battery terminals.

5. Install six terminals (E) to battery posts (F).

NOTE

Do not force terminals onto battery posts.

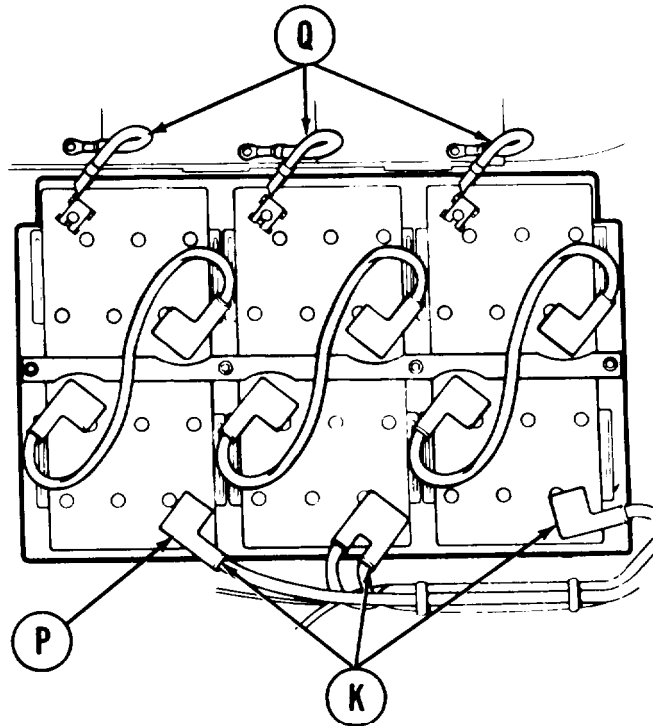
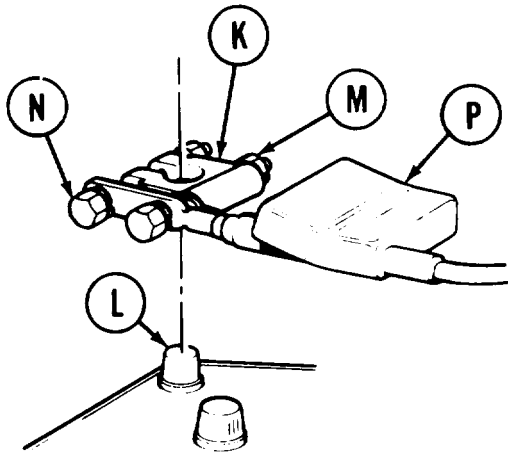
6. Using 1/2 inch box wrench on nuts (G) and 1/2 inch open end wrench on bolts (H), tighten nuts (G) and bolts (H) on six terminals (E) to battery posts (F).
7. Position six rubber boots (J) over terminals (E).



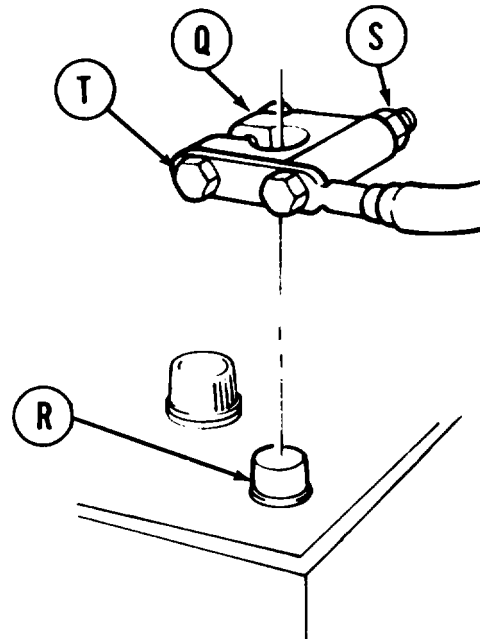
Go on to Sheet 12

TA139850

8. Install three positive terminals (K) to battery posts (L).



9. Using 1/2 inch box wrench on nuts (M) and 1/2 inch open end wrench on bolts (N), tighten nuts (M) and bolts (N) on three terminals (K).
10. Position three rubber boots (P) over three terminals (K).
11. Install three negative terminals (Q) to battery posts (R).
12. Using 1/2 inch box wrench on nuts (S) and 1/2 inch open end wrench on bolts (T), tighten nuts (S) and bolts (T) on three terminals (Q) securing terminals (Q) to battery posts (R).



Go on to Sheet 13

TA139851

BATTERY TESTING AND REPLACEMENT (Sheet 13 of 13)

13. Close turret access door (TM 9-2350-222-10).
14. Set MASTER BATTERY switch to ON (TM 9-2350-222-10).
15. Check battery generator indicator for condition of batteries (TM 9-2350-222-10).

End of Task

TA139852

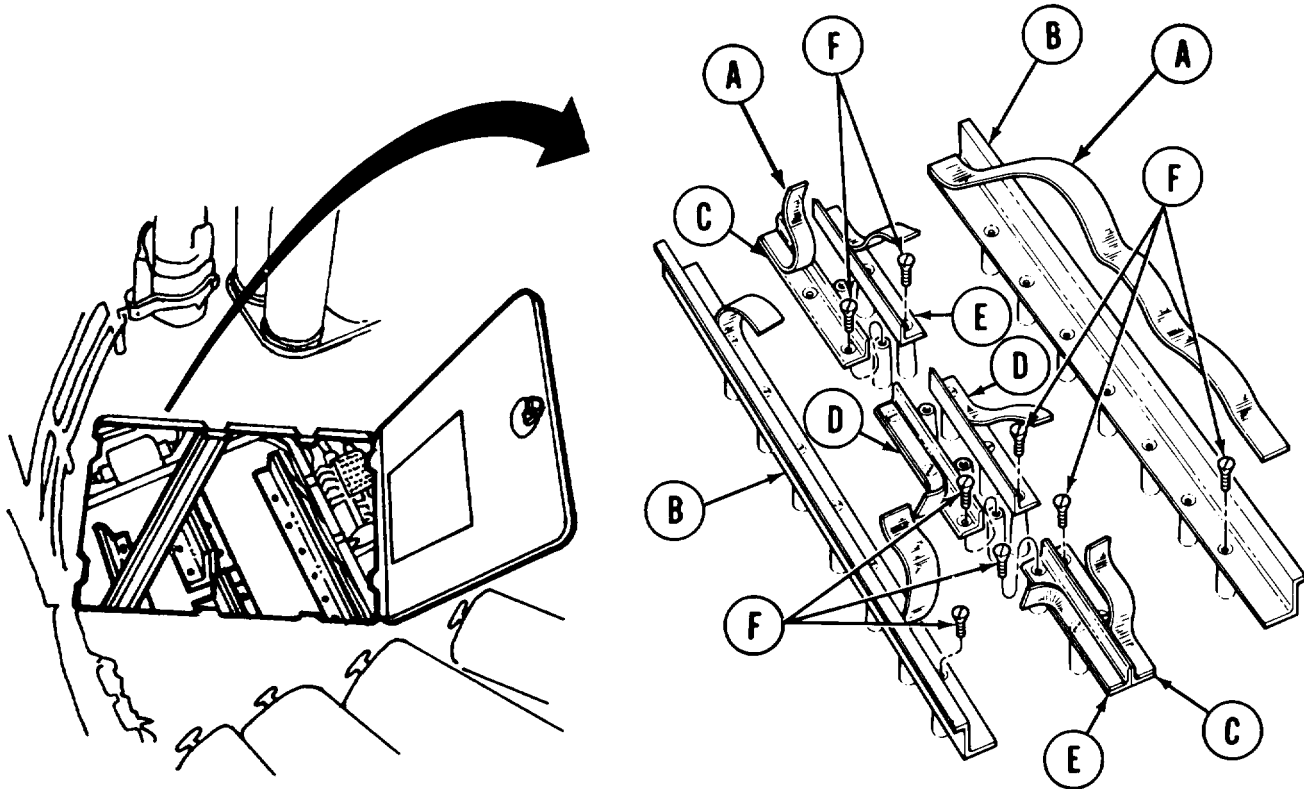
BATTERY SUPPORTS REPLACEMENT (Sheet 1 of 2)

TOOLS: Cross-tip screwdriver
Putty knife

SUPPLIES: Dry cleaning solvent (Item 54, Appendix D)
Adhesive (Item 2, Appendix D)

PRELIMINARY PROCEDURE: Remove batteries (page 10-293)

REMOVAL:



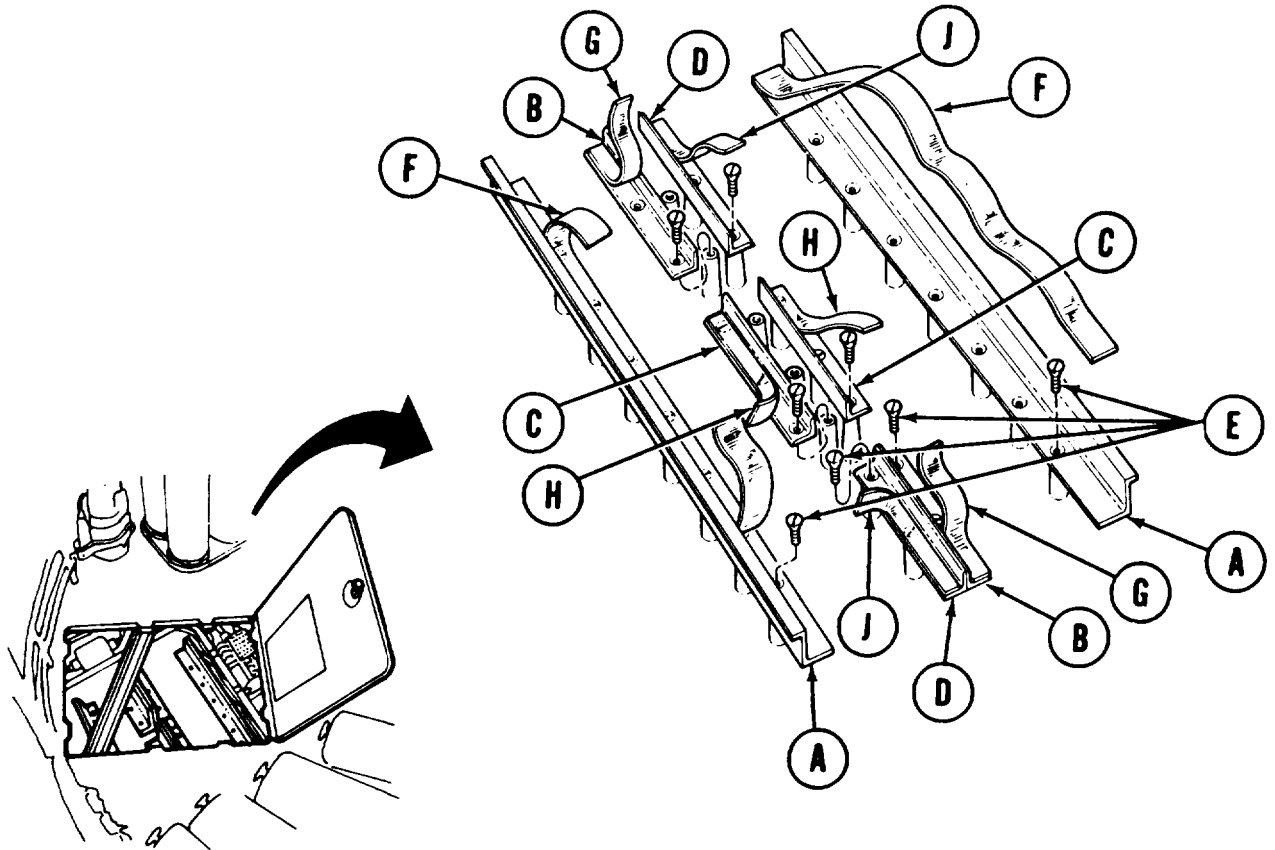
1. Using putty knife and dry cleaning solvent (Item 54, Appendix D), remove rubber pad (A) from defective support (B), (C), (D), or (E).
2. Using screwdriver, remove screws (F) securing defective support.
3. Remove defective support.

Go on to Sheet 2

TA139853

BATTERY SUPPORTS REPLACEMENT (Sheet 2 of 2)

INSTALLATION:



1. Position support (A), (B), (C), or (D) onto hull floor.
2. Using screwdriver, install and tighten screws (E) securing support.
3. Apply adhesive (Item 2, Appendix D) to rubber pad (F), (G), (H), or (J) and position pad onto support.
4. Install batteries (page 10-298).

End of Task

TA130310

TM 9-2350-222-20-1-4

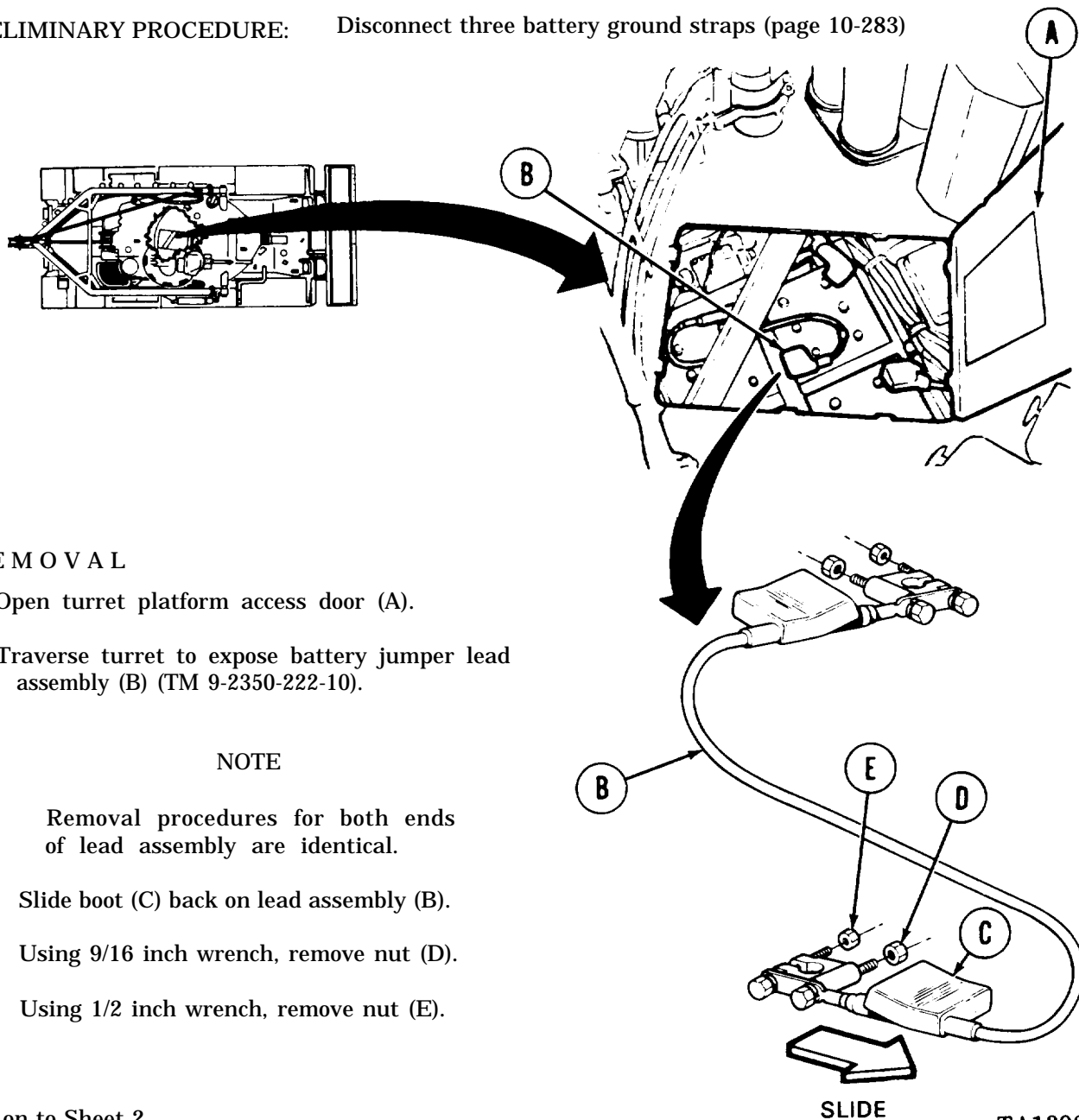
BATTERY JUMPER LEAD ASSEMBLY REPLACEMENT (Sheet 1 of 3)

TOOLS: 1/2 in. combination box and open end wrench
9/16 in. combination box and open end wrench
Lifter-scraper, battery terminal
Slip joint pliers

SUPPLIES: Grease (Item 36, Appendix D)

REFERENCE: TM 9-2350-222-10

PRELIMINARY PROCEDURE: Disconnect three battery ground straps (page 10-283)



REMOVAL

1. Open turret platform access door (A).
2. Traverse turret to expose battery jumper lead assembly (B) (TM 9-2350-222-10).

NOTE

Removal procedures for both ends of lead assembly are identical.

3. Slide boot (C) back on lead assembly (B).
4. Using 9/16 inch wrench, remove nut (D).
5. Using 1/2 inch wrench, remove nut (E).

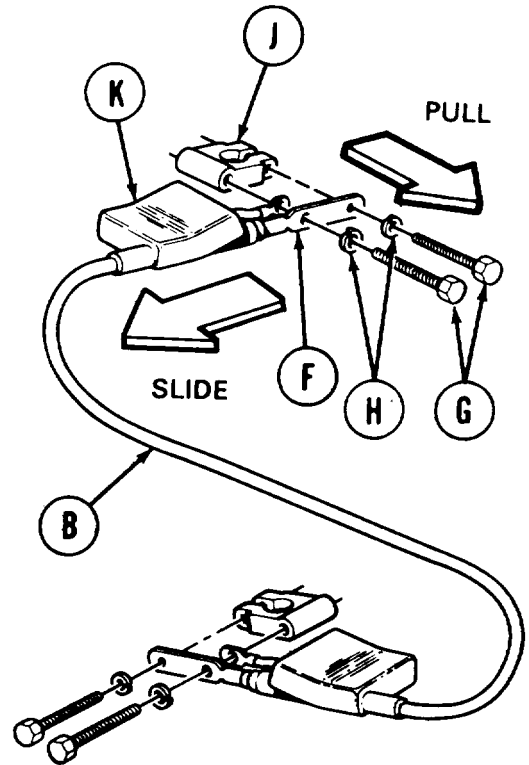
Go on to Sheet 2

SLIDE

TA139855

BATTERY JUMPER LEAD ASSEMBLY REPLACEMENT (Sheet 2 of 3)

6. Using pliers, pull lead (F) along with two screws (G) and washers (H) away from terminal (J).
7. Remove two screws (G) and washers (H) from lead (F).
8. Using lifter, remove terminal (J) from battery.
9. Slide boot (K) down and off lead (F).
10. Remove other end of lead assembly (B) (steps 3 through 9).

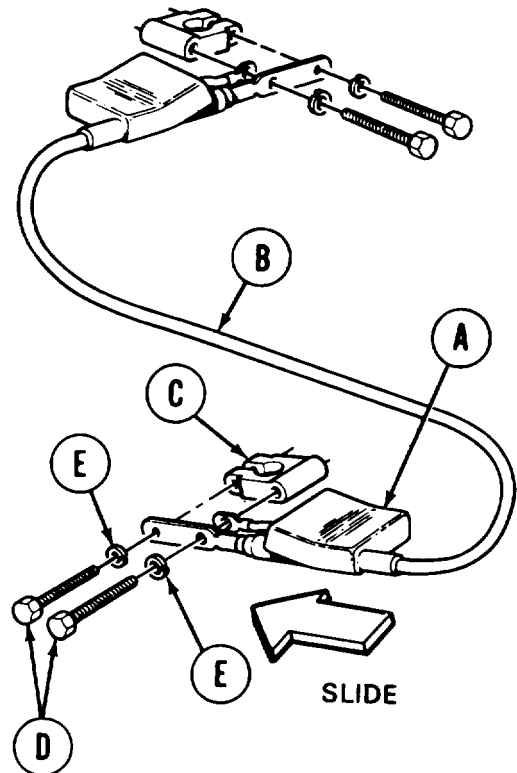


INSTALLATION:

NOTE

Installation is identical for both ends of lead assembly.

1. Slide boot (A) on lead (B).
2. Place terminal (C) on battery.
3. Place lead (B) in position on terminal (C).
4. Place two screws (D) and washers (E) through lead (B) and terminal (C).



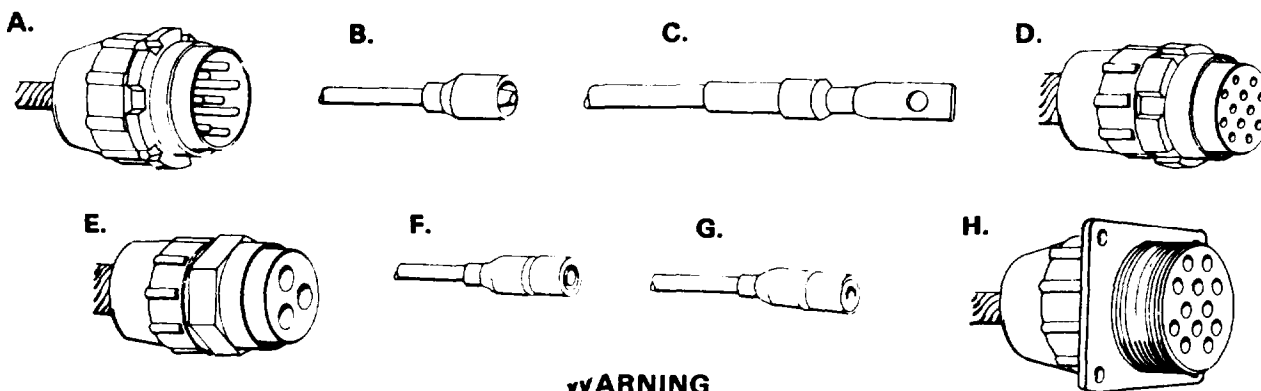
Go on to Sheet 3

TA139856

ELECTRICAL WIRING HARNESS AND CABLE CONNECTOR REPAIR (Sheet 1 of 2)

PROCEDURE INDEX

PROCEDURE	PAGE
A. Male Plug Repair	10-309
B. Male Connector Repair	10-312
C. Terminal Connector Repair	10-313
D. Female Plug Repair	10-315
E. Female Plug Repair	10318
F. Female Connector with Washer (12 Gage Cable) Repair	10-321
G. Female Connector with Sleeve (14 and 16 Gage Cable) Repair	10-322
H. Female Receptacle Repair	10-323



WARNING

Some wiring harnesses and cables are hot even if MASTER BATTERY switch is set to OFF. Make sure the three battery ground cable assemblies are disconnected before disconnecting any wiring harness or cable (page 10-283).

NOTE

When replacing a bad pin or contact, the opposite pin or contact at the other end of the cable must also be replaced. Do not disassemble the harness. Use a jumper wire of the same gage wire being replaced, cut to the length of the affected cable. When repairs to both connectors are complete, tape the jumper wire to the outside of the cable with friction tape. The jumper wire should be taped at least every six to eight inches, but in no case should any part of the wire be allowed to hang loose.

NOTE

After a plug, receptacle, or connector in the engine compartment has been repaired and the cable or jumper wire has been installed, brush or spray the cable or jumper wire with electrical insulating compound. Allow the compound to dry for about 24 hours before handling. The compound is an insulator of electricity, so care must be taken to keep from overspraying the compound on contacting surfaces of wire terminals, connector pins or contacts, or similar parts where it

Go on to Sheet 2 will prevent the flow of electricity.

TA139858

TOOLS: Electrical connector repair tool kit
Soldering gun
Slip joint pliers with plastic jaw inserts
Diagonal cutting pliers
Heat gun
Pocketknife

SUPPLIES: Silicone compound (Item 32, Appendix D)
Electrical tape (Item 58, Appendix D)
Jumper wire
Heat-shrink tubing

NOTE

Identify the cable or harness connector which you are to repair, then go to that page for repair procedures.

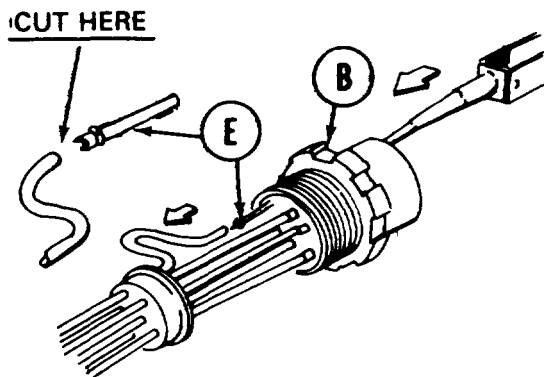
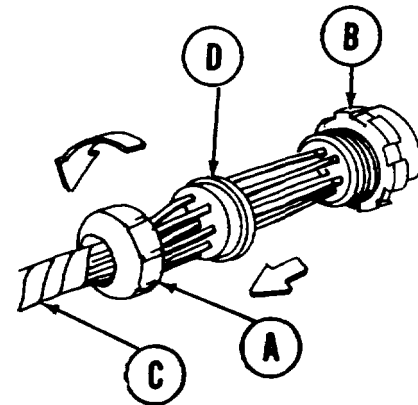
ELECTRICAL WIRING HARNESS AND CABLE CONNECTOR REPAIR
 MALE PLUG REPAIR (Sheet 1 of 3)

TOOLS: Electrical connector repair tool kit
 Soldering gun
 Slip joint pliers with plastic jaw inserts
 Diagonal cutting pliers
 Pocketknife

SUPPLIES: Silicone compound (Item 32, Appendix D)
 Electrical tape (Item 58, Appendix D)
 Jumper wire

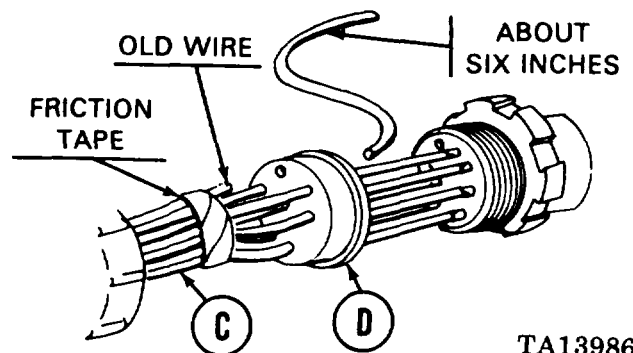
PRELIMINARY PROCEDURES: Disconnect three battery ground straps (page 10-283)
 Loosen or remove cable clamps as required
 Disconnect connectors at each end of affected cable

1. Manually thread grommet retaining nut (A) from plug assembly (B).
2. Slide grommet retaining nut (A) back along cable (C).



3. Using slip joint pliers, work grommet (D) back and forth and out of plug assembly (B).
4. Using remover, push contact (E) with damaged wire out of back of plug assembly (B).

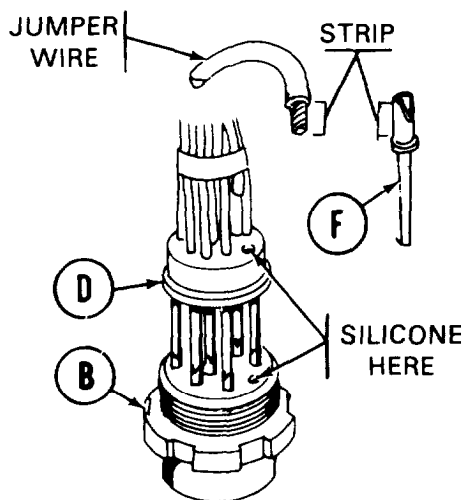
5. Using diagonal cutting pliers, cut wire from contact (E). Throw away contact (E).
6. Pulling cut wire out of grommet (D), use diagonal cutting pliers to shorten wire about 6 inches. Fasten new end of cut wire to cable (C) with electrical tape (Item 58, Appendix D).



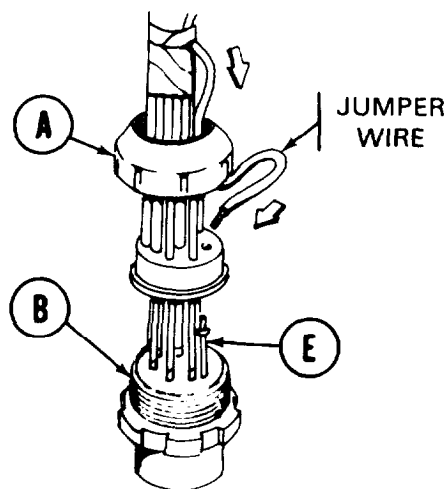
Go on to Sheet 2

TA139860

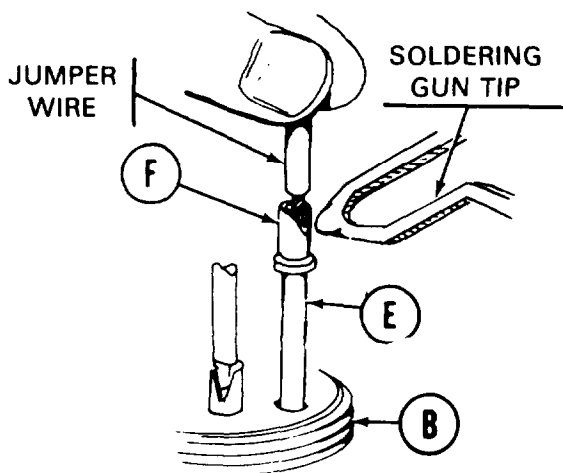
ELECTRICAL WIRING HARNESS AND CABLE CONNECTOR REPAIR
MALE PLUG REPAIR (Sheet 2 of 3)



7. Using hand wire stripper, strip insulation from jumper wire equal to depth of contact solder well (F).
8. Placing connector face down on flat surface, apply a small amount of silicone (Item 32, Appendix D) to empty holes on back of plug assembly (B) and on front of grommet (D).



9. Push new contact (E) into hole in back of plug assembly (B) far enough so it will remain standing.
10. Push jumper wire end, first through grommet retaining nut (A) and then through hole in grommet (D).



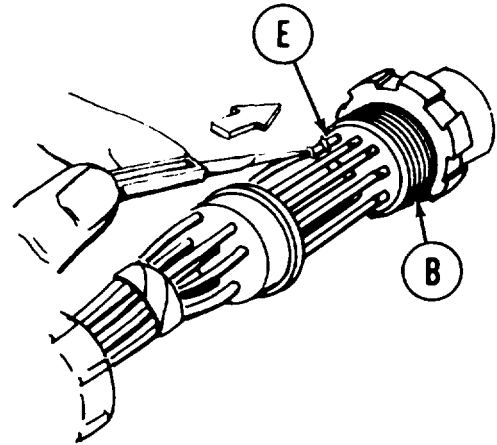
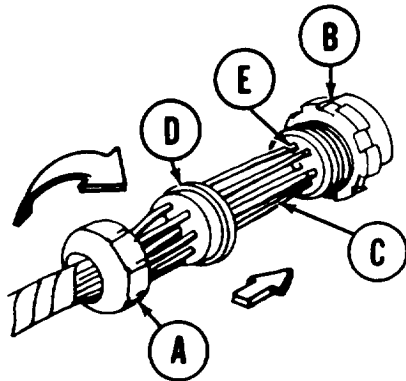
11. Hold jumper wire so wire end is pushing down onto solder in contact solder well (F).
12. Hold soldering gun tip against side of contact (E) until solder begins to melt and wire slips into contact solder well (F).
13. Removing soldering gun from side of contact (E), continue holding wire until solder has cooled and set.

Go on to Sheet 3

TA139861

ELECTRICAL WIRING HARNESS AND CABLE CONNECTOR REPAIR
 MALE PLUG REPAIR (Sheet 3 of 3)

14. Using remover, push contact (E) into plug assembly (B).



15. Sliding grommet (D) forward along cable (C), set grommet (D) firmly against contacts (E).
16. Manually thread grommet retaining nut (A) onto plug assembly (B).

17. Using multimeter, check continuity of repaired circuit.
18. Tighten or install cable clamps as required.
19. Connect connectors at each end of affected cable.
20. Connect three battery ground straps (page 10-283)

End of Task

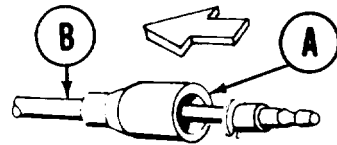
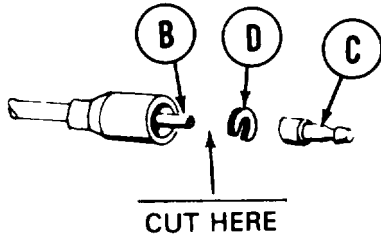
TA139862

ELECTRICAL WIRING HARNESS AND CABLE CONNECTOR REPAIR
MALE CONNECTOR REPAIR (Sheet 1 of 1)

TOOLS: Electrical connector repair tool kit
Diagonal cutting pliers

PRELIMINARY PROCEDURE: Disconnect three battery ground straps (page 10-283)

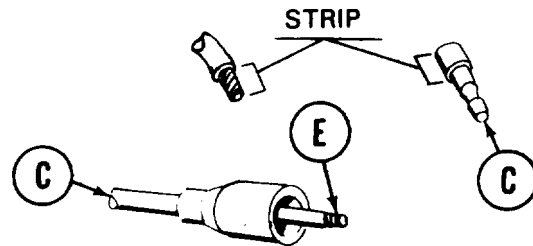
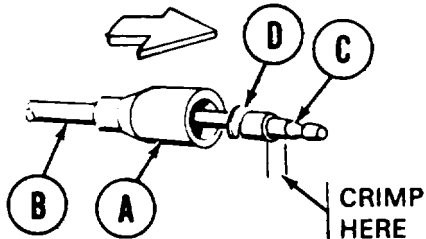
1. Slide shell (A) back along cable (B).



2. Using diagonal cutting pliers, cut terminal (C) and C-washer (D) from cable (B). Throw terminal (C) and C-washer (D) away.

3. Using hand wire stripper, strip insulation from cable (B) equal to well depth in terminal (C).

4. Insert stripped cable end (E) into well in terminal (C).



5. Using crimping tool, crimp terminal (C).

6. Push new C-washer (D) onto cable (B) at rear of terminal.

7. Slide shell (A) forward along cable (B) until tight against C-washer (D).

8. Using multimeter, check continuity of repaired circuit.

9. Connect three battery ground straps (page 10-283).

End of Task

TA139863

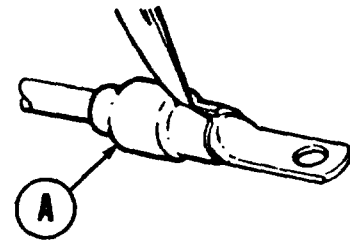
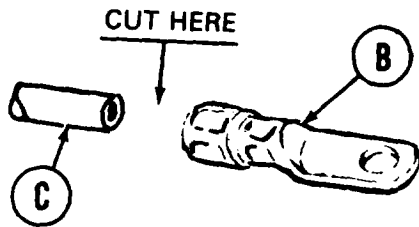
ELECTRICAL WIRING HARNESS AND CABLE CONNECTOR REPAIR
 TERMINAL CONNECTOR REPAIR (Sheet 1 of 2)

TOOLS: Electrical connector repair tool kit
 Diagonal cutting pliers
 Heat gun
 Pocketknife

SUPPLIES: Heat-shrink tubing

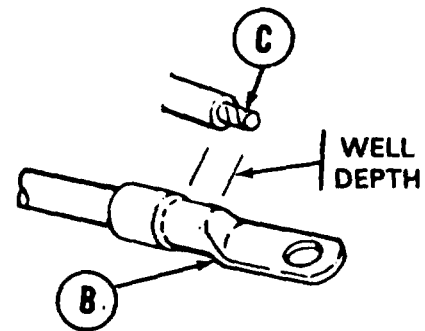
PRELIMINARY PROCEDURES: Disconnect three battery ground straps (page 10-283)
 Loosen or remove cable clamps as required

1. Using knife, slit heat-shrink tubing (A) along its entire length. Throw heat-shrink tubing (A) away.



2. Using diagonal cutting pliers, cut terminal (B) from cable (C). Throw terminal (B) away.

3. Using hand wire stripper, strip insulation from cable (C) equal to well depth in terminal (B).

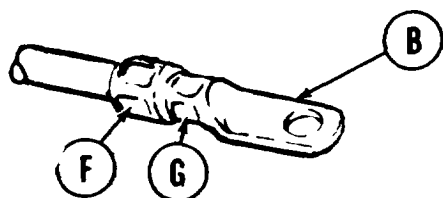
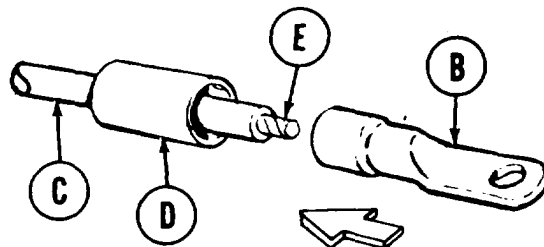


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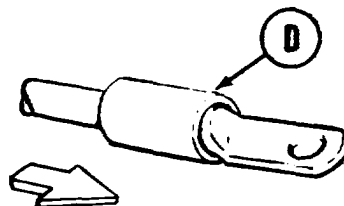
TA139864

ELECTRICAL WIRING HARNESS AND CABLE CONNECTOR REPAIR
TERMINAL CONNECTOR REPAIR (Sheet 2 of 2)

- Slide new heat-shrink tubing (D) onto and back along cable (C).
- Slide new terminal (B) over stripped cable end (E) and onto cable (C).



- Using crimping tool, crimp terminal (B) at (F) and (G).



- Slide heat-shrink tubing (D) over crimps (F) and (G).
- Using heat gun, shrink tubing (D).
- Using multimeter, check continuity of repaired circuit.
- Tighten or install cable clamps as required.
- Connect three battery ground straps (page 10-283).

End of Task

TA139865

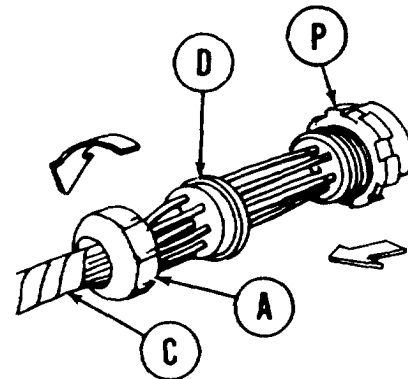
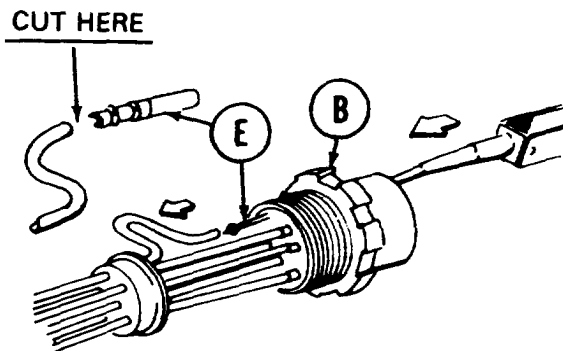
ELECTRICAL WIRING HARNESS AND CABLE CONNECTOR REPAIR
 FEMALE PLUG REPAIR (Sheet 1 of 3)

TOOLS: Electrical connector repair tool kit
 Soldering gun
 Slip joint pliers with plastic jaw inserts
 Diagonal cutting pliers

SUPPLIES: Silicone compound (Item 32, Appendix D)
 Electrical tape (Item 58, Appendix D)
 Jumper wire

PRELIMINARY PROCEDURES: Disconnect three battery ground straps (page 10-283)
 Loosen or remove cable clamps as required
 Disconnect connectors at each end of affected cable

1. Manually thread grommet retaining nut (A) from plug assembly (B).
2. Slide grommet retaining nut (A) back along cable (C).



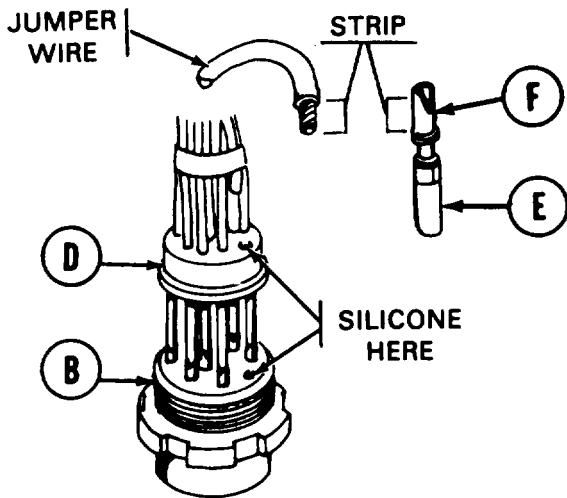
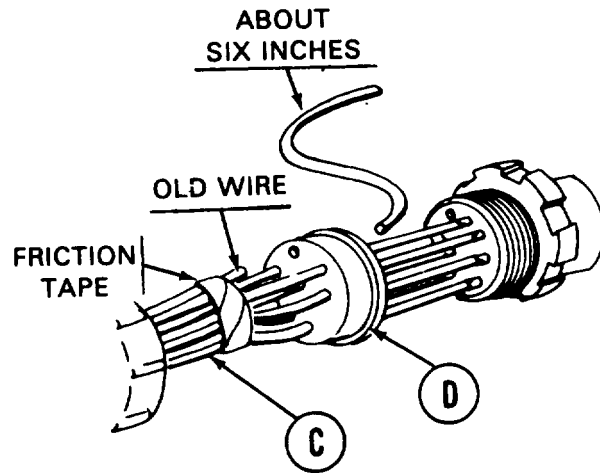
3. Using slip joint pliers, work grommet (D) back and forth and out of plug assembly (B).
4. Using remover, push contact (E) with damaged wire out of back of plug assembly (B).

Go on to Sheet 2

TA139866

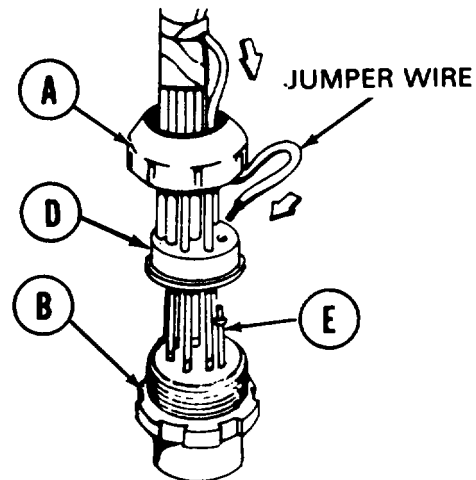
ELECTRICAL WIRING HARNESS AND CABLE CONNECTOR REPAIR
 FEMALE PLUG REPAIR (Sheet 2 of 3)

5. Using diagonal cutting pliers, cut wire from contact (E). Throw away contact (E).
6. Pulling cut wire out of grommet (D), use diagonal cutting pliers to shorten wire about 6 inches. Fasten new end of cut wire to cable (C) with electrical tape (Item 58, Appendix D).



7. Using hand wire stripper, strip insulation from jumper wire equal to depth of contact solder well (F).
8. Placing connector face down on flat surface, apply a small amount of silicone (Item 32, Appendix D) to empty holes on back of plug assembly (B) and on front of grommet (D).

9. Push new contact (E) into hole in back of plug assembly (B) far enough so it will remain standing.
10. Push jumper wire end through grommet retaining nut (A) and then through hole in grommet (D).

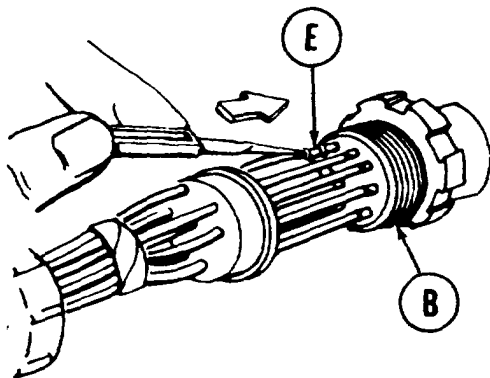
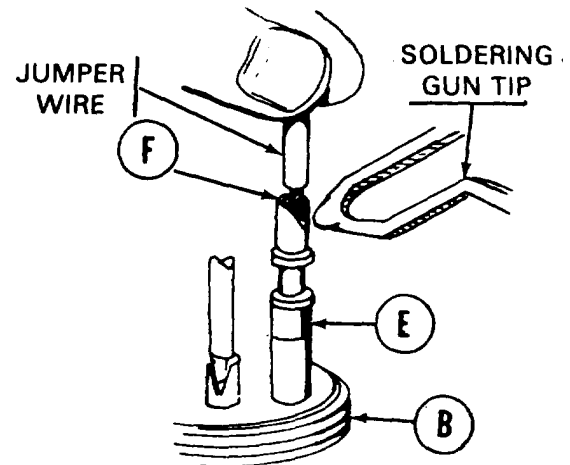


Go on to Sheet 3

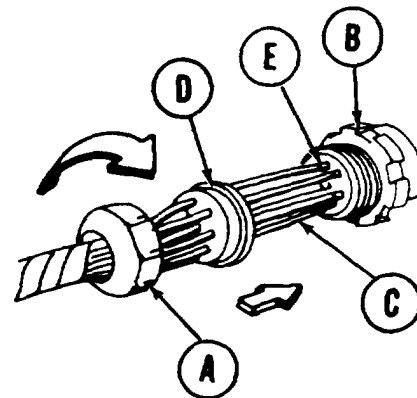
TA139867

ELECTRICAL WIRING HARNESS AND CABLE CONNECTOR REPAIR
 FEMALE PLUG REPAIR (Sheet 3 of 3)

11. Hold jumper wire so wire end is pushing down onto solder in contact solder well (F).
12. Hold soldering gun tip against side of contact (E) until solder begins to melt and wire slips into contact solder well (F).
13. Removing soldering gun from side of contact (E), continue holding wire until solder has cooled and set.



14. Using remover, push contact (E) into plug assembly (B).



15. Sliding grommet (D) forward along cable (C), set grommet (D) firmly against contacts (E).
16. Manually thread grommet retaining nut (A) onto plug assembly (B).
17. Using multimeter, check continuity of repaired circuit.
18. Tighten or install cable clamps as required.
19. Connect connectors at each end of affected cable.
20. Connect three battery ground straps (page 10-283),

End of Task

TA139868

TM 9-2350-222-20-1-4

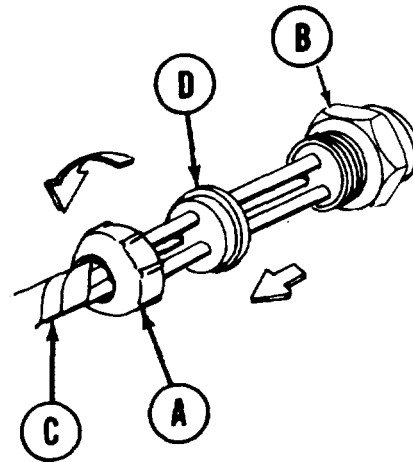
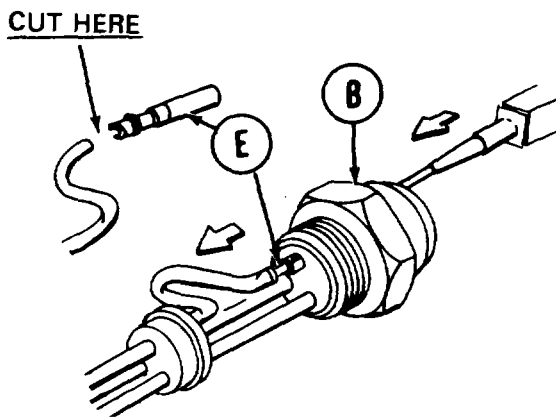
ELECTRICAL WIRING HARNESS AND CABLE CONNECTOR REPAIR FEMALE PLUG REPAIR (Sheet 1 of 3)

TOOLS: Electrical connector repair tool kit
Soldering gun
Slip joint pliers with plastic jaw inserts
Diagonal cutting pliers

SUPPLIES: Silicone compound (Item 32, Appendix D)
Electrical tape (Item 58, Appendix D)
Jumper wire

PRELIMINARY PROCEDURES: Disconnect three battery ground straps (page 10-283)
Loosen or remove cable clamps as required
Disconnect connectors at each end of affected cable

1. Manually thread grommet retaining nut (A) from plug assembly (B).
2. Slide grommet retaining nut (A) back along cable (C).



3. Using slip joint pliers, work grommet (D) back and forth and out of plug assembly (B).
4. Using remover, push contact (E) with damaged wire out of back of plug assembly (B).

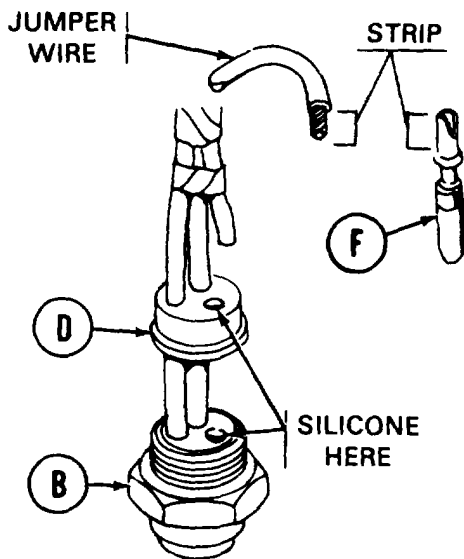
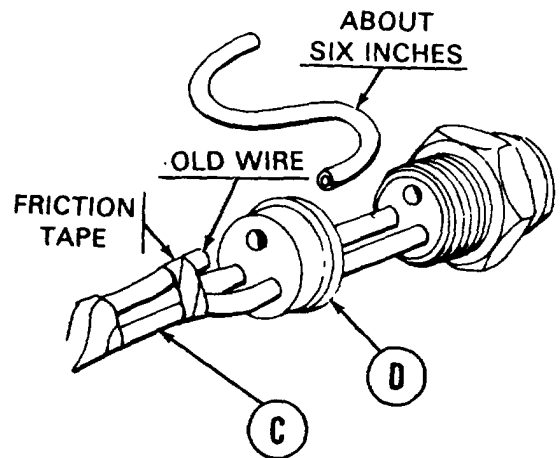
Using diagonal cutting pliers, cut wire from contact (E). Throw away contact (E).

Go on to Sheet 2

TA139869

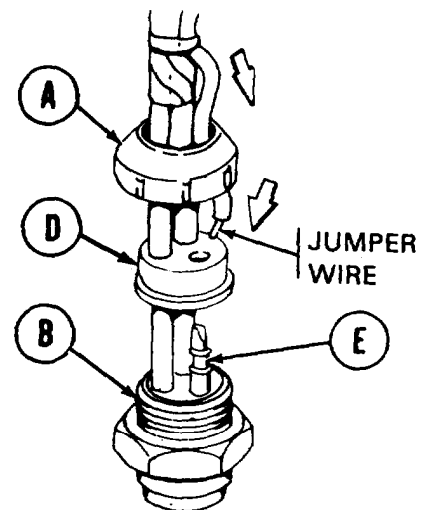
ELECTRICAL WIRING HARNESS AND CABLE CONNECTOR REPAIR
 FEMALE PLUG REPAIR (Sheet 2 of 3)

- Pulling cut wire out of grommet (D), use diagonal cutting pliers to shorten wire about 6 inches. Fasten new end of cut wire to cable (C) with electrical tape (Item 58, Appendix D).



- Using hand wire stripper, strip insulation from jumper wire equal to depth of contact solder well (F)
- Placing connector face down on flat surface, apply a small amount of silicone (Item 32, Appendix D) to empty holes on back of plug assembly (B) and on front of grommet (D).

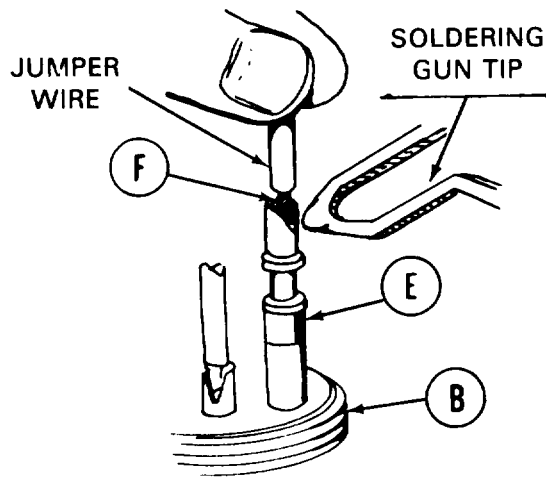
- Push new contact (E) into hole in back of plug assembly (B) far enough so it will remain standing.
- Push jumper wire end through grommet retaining nut (A) and then through hole in grommet (D).



Go on to Sheet 3

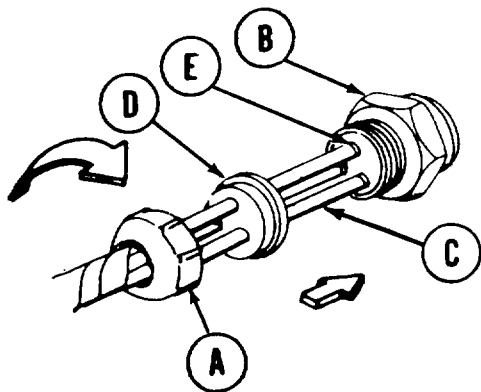
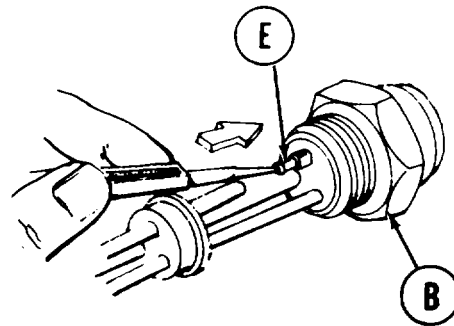
TA139870

ELECTRICAL WIRING HARNESS AND CABLE CONNECTOR REPAIR
 FEMALE PLUG REPAIR (Sheet 3 of 3)



11. Hold jumper wire so wire end is pushing down onto solder in contact solder well (F).
12. Hold soldering gun tip against side of contact (E) until solder begins to melt and wire slips into contact solder well (F).
13. Removing soldering gun from side of contact (E), continue holding wire until solder has cooled and set.

14. Using remover, push contact (E) into plug assembly (B).



15. Sliding grommet (D) forward along cable (C), set grommet (D) firmly against contacts (E).
16. Manually thread grommet retaining nut (A) onto plug assembly (B).

17. Using multimeter, check continuity of repaired circuit.
18. Tighten or install cable clamps as required.
19. Connect connectors at each end of affected cable.
20. Connect three battery ground straps (page 10-283).

End of Task

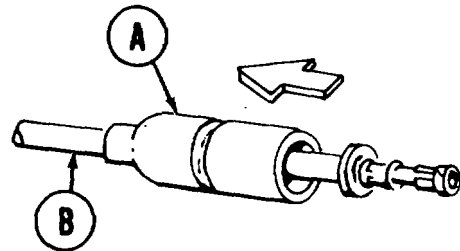
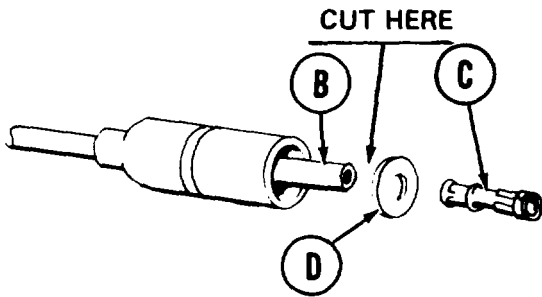
TA139871

ELECTRICAL WIRING HARNESS AND CABLE CONNECTOR REPAIR
 FEMALE CONNECTOR WITH WASHER (12 GAGE CABLE) REPAIR (Sheet 1 of 1)

TOOLS: Electrical connector repair tool kit
 Diagonal cutting pliers

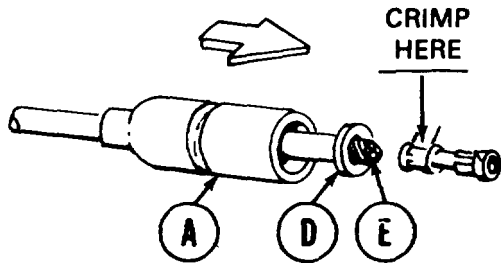
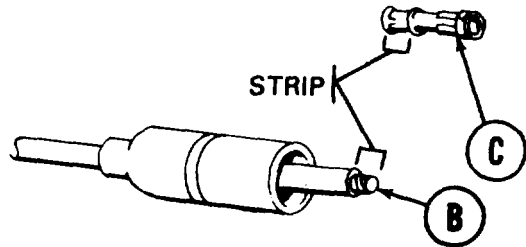
PRELIMINARY PROCEDURES: Disconnect three battery ground straps (page 10-283)
 Loosen or remove cable clamps as required

1. Slide shell (A) back along cable (B).



2. Using diagonal cutting pliers, cut terminal (C) and washer (D) from cable (B). Throw terminal (C) and washer (B) away.

3. Using hand wire stripper, strip insulation from cable (B) equal to well depth in terminal (C).
4. Slide new washer (D) onto stripped cable end (E) back to cable insulation.



5. Insert stripped cable end (E) into well in terminal (C).
6. Using crimping tool, crimp terminal (C).

7. Slide shell (A) forward until tight against washer (D).
8. Using multimeter, check continuity of repaired circuit.
9. Tighten or install cable clamps as required.
10. Connect three battery ground straps (page 10-283).

End of Task

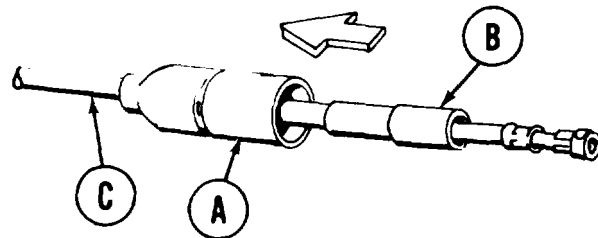
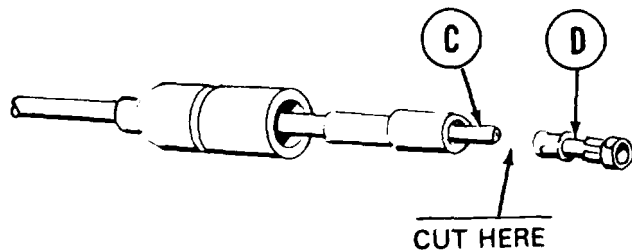
TA139872

ELECTRICAL WIRING HARNESS AND CABLE CONNECTOR REPAIR
 FEMALE CONNECTOR WITH SLEEVE (14 AND 16 GAGE CABLE) REPAIR (Sheet 1 of 1)

TOOLS: Electrical connector repair tool kit
 Diagonal cutting pliers

PRELIMINARY PROCEDURES: Disconnect three battery ground straps (page 10-283)
 Loosen or remove cable clamps as required

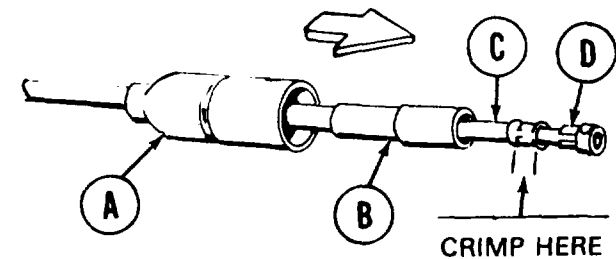
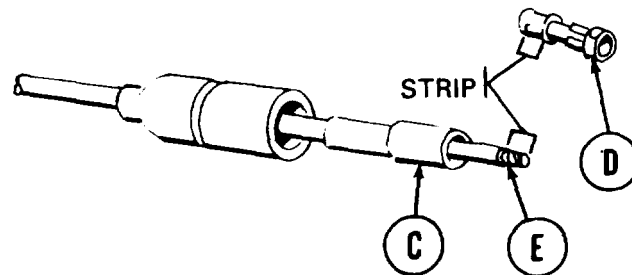
- Slide shell (A) and sleeve (B) back along cable (c).



- Using diagonal cutting pliers, cut terminal (D) from cable (C). Throw terminal (D) away.

- Using hand wire stripper, strip insulation from cable (C) equal to well depth in terminal (D).

- Insert stripped cable end (E) into well in terminal (D).



- Using crimping tool, crimp terminal (D).
- Slide sleeve (B) forward along cable (C) until tight against terminal (D).

- Slide shell (A) forward along cable (C) until tight against sleeve (B).
- Using multimeter, check continuity of repaired circuit.
- Tighten or install cable clamps as required.
- Connect three battery ground straps (page 10-283).

End of Task

TA139873

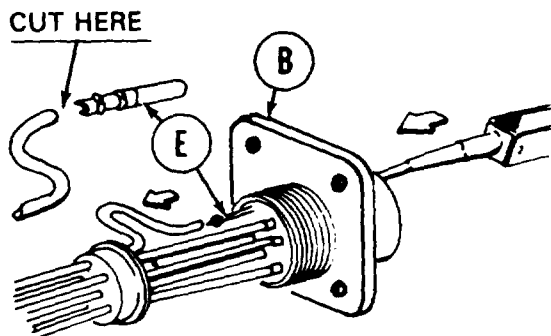
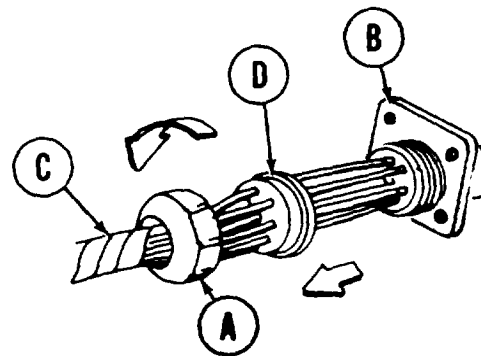
ELECTRICAL WIRING HARNESS AND CABLE CONNECTOR REPAIR
 FEMALE RECEPTACLE REPAIR (Sheet 1 of 3)

TOOLS: Electrical connector repair tool kit
 Soldering gun
 Slip joint pliers with plastic jaw inserts
 Diagonal cutting pliers
 Pocketknife

SUPPLIES Silicone compound (Item 32, Appendix D)
 Electrical tape (Item 58, Appendix D)
 Jumper wire
 Heat-shrink tubing

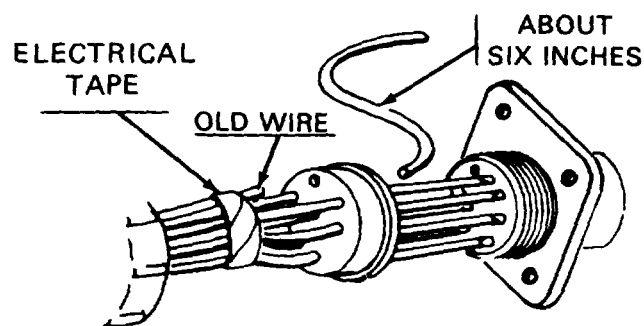
PRELIMINARY PROCEDURES Disconnect three battery ground straps (page 10-283)
 Loosen or remove cable clamps as required
 Disconnect connectors at each end of affected cable

1. Manually thread grommet retaining nut (A) from plug assembly (B).
2. Slide grommet retaining nut (A) back along cable (C).



3. Using slip joint pliers, work grommet (D) back and forth and out of plug assembly (B).
4. Using remover, push contact (E) with damaged wire out of back of plug assembly (B).

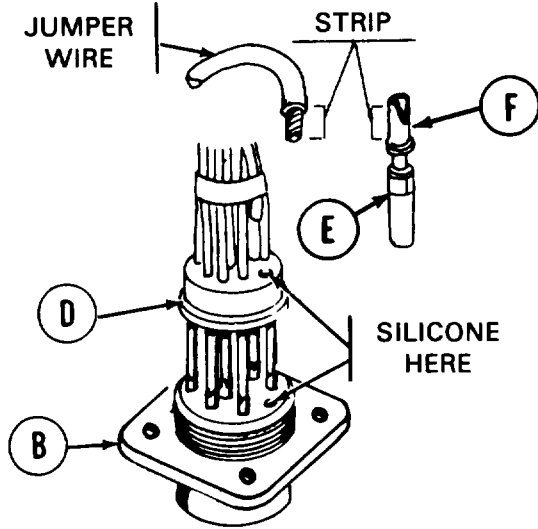
5. Using diagonal cutting pliers, cut wire from contact (E). Throw away contact (E).
6. Pulling cut wire out of grommet (D), use diagonal cutting pliers to shorten wire about 6 inches. Fasten new end of cut wire to cable (C) with electrical tape (Item 58, Appendix D).



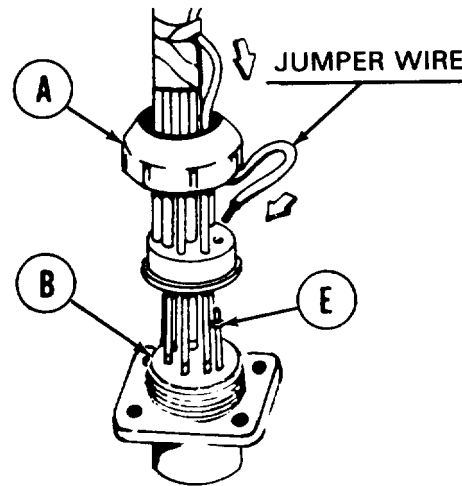
Go on to Sheet 2

TA139874

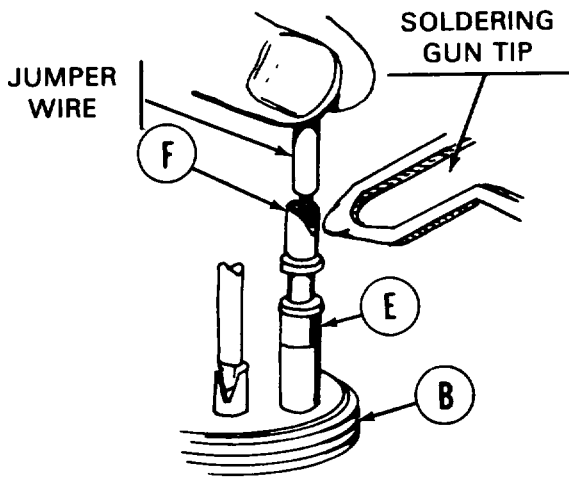
ELECTRICAL WIRING HARNESS AND CABLE CONNECTOR REPAIR
 FEMALE RECEPTACLE REPAIR (Sheet 2 of 3)



7. Using hand wire stripper, strip insulation from jumper wire equal to depth of contact solder well (F).
8. Placing connector face down on flat surface, apply a small amount of silicone (Item 32, Appendix D) to empty holes on back of plug assembly (B) and on front of grommet (D).



9. Push new contact (E) into hole in back of plug assembly (B) far enough so it will remain standing.
10. Push jumper wire end through grommet retaining nut (A) and then through hole in grommet (D).



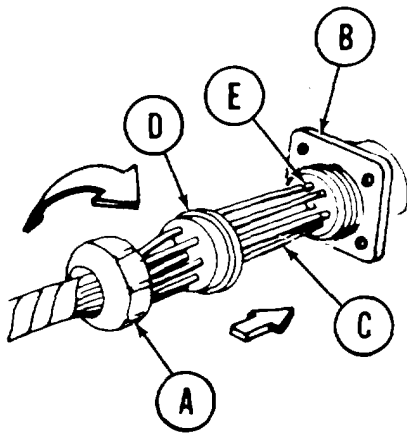
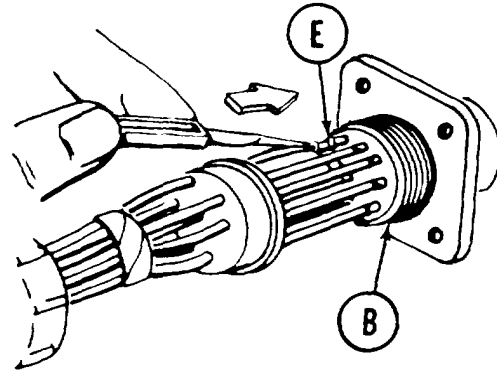
11. Hold jumper wire so wire end is pushing down into solder in contact solder well (F).
12. Hold soldering gun tip against side of contact (E) until solder begins to melt and wire slips into contact solder well (F).
13. Removing soldering gun from side of contact (E), continue holding wire until solder has cooled and set.

Go on to Sheet 3

TA139875

ELECTRICAL WIRING HARNESS AND CABLE CONNECTOR REPAIR
 FEMALE RECEPTACLE REPAIR (Sheet 3 of 3)

14. Using remover, push contact (E) into plug assembly (B).



15. Sliding grommet (D) forward along cable (C), set grommet (D) firmly against contacts (E).
16. Manually thread grommet retaining nut (A) onto plug assembly (B).

17. Using multimeter, check continuity of repaired circuit.
18. Tighten or install cable clamps as required.
19. Connect connectors at each end of affected cable.
20. Connect three battery ground straps (page 10-283).

End of Task

ENGINE WIRING HARNESS REPLACEMENT (2D ENGINE) (Sheet 1 of 12)

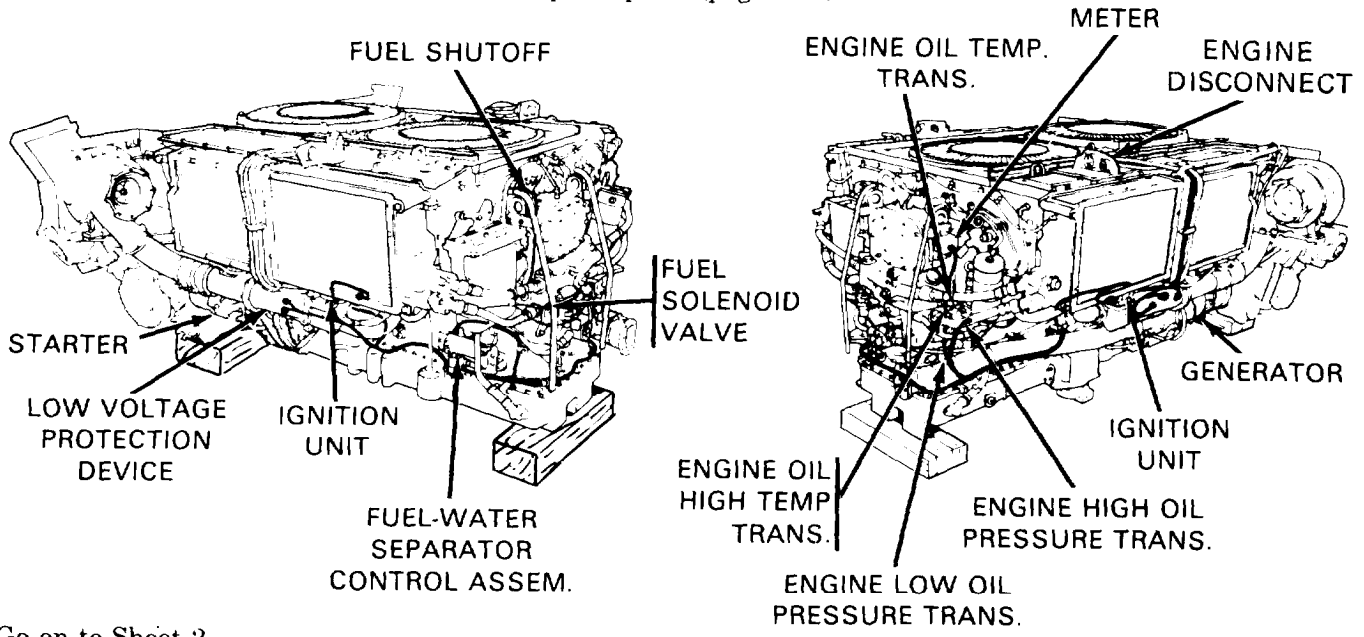
PROCEDURE INDEX

PROCEDURE	PAGE
Removal	10-340
Installation	10-345

TOOLS: Spanner wrench
 3/8 in. combination box and open end wrench
 3/4 in. combination box and open end wrench
 7/8 in. combination box and open end wrench
 1 in. open end wrench
 1-1/8 in. combination box and open end wrench
 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
 Cross-tip screwdriver
 Flat-tip screwdriver
 Slip joint pliers
 Diagonal cutting pliers
 8 in. adjustable wrench
 9/16 in. combination box and

SUPPLIES: Silicone compound (Item 32. Appendix D)
 Lockwasher (4 required)
 Lockwasher (11 required)
 Lockwasher (5 required)
 Lockwasher (2 required)
 Lockwasher (2 required)
 Lockwasher

PRELIMINARY PROCEDURE: Remove powerplant (page 5-26)

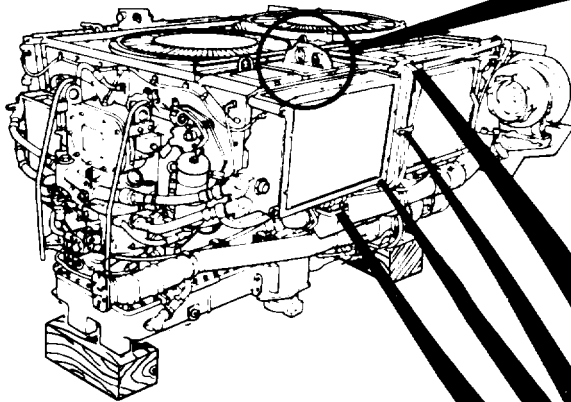
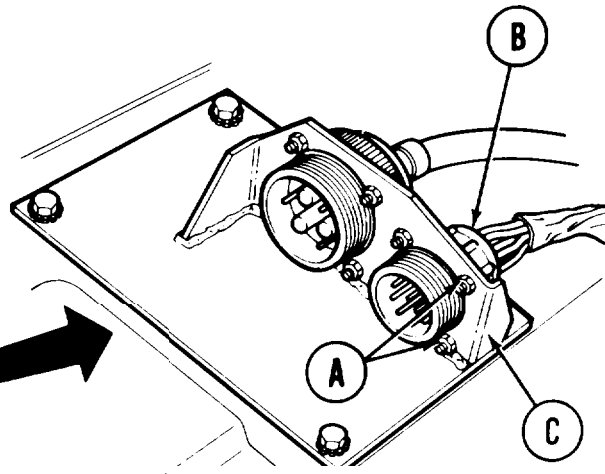


Go on to Sheet 2

All data on pages 10-326 thru 10-338 deleted.
changes 5 10-339

REMOVAL:

1. Using flat-tip screwdriver and 3/8 inch wrench, remove four screws, lockwashers, and nuts (A). Throw lockwashers away.
2. Remove engine harness (B) from mounting bracket (C).

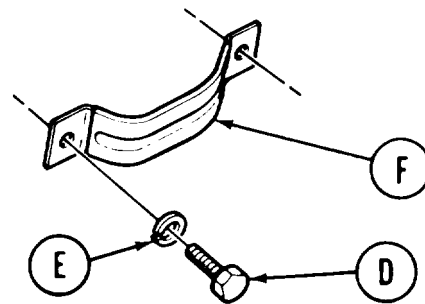


3. using 7/16 inch socket, remove eight screws (D) and lockwashers (E) securing four clamps (F). Throw lockwashers away.
4. Remove four clamps (G) from engine.

NOTE

Engine wiring harness is wrapped, while other two harness leads are covered with insulation.

5. Separate and remove engine wiring harness (B) from top of engine.

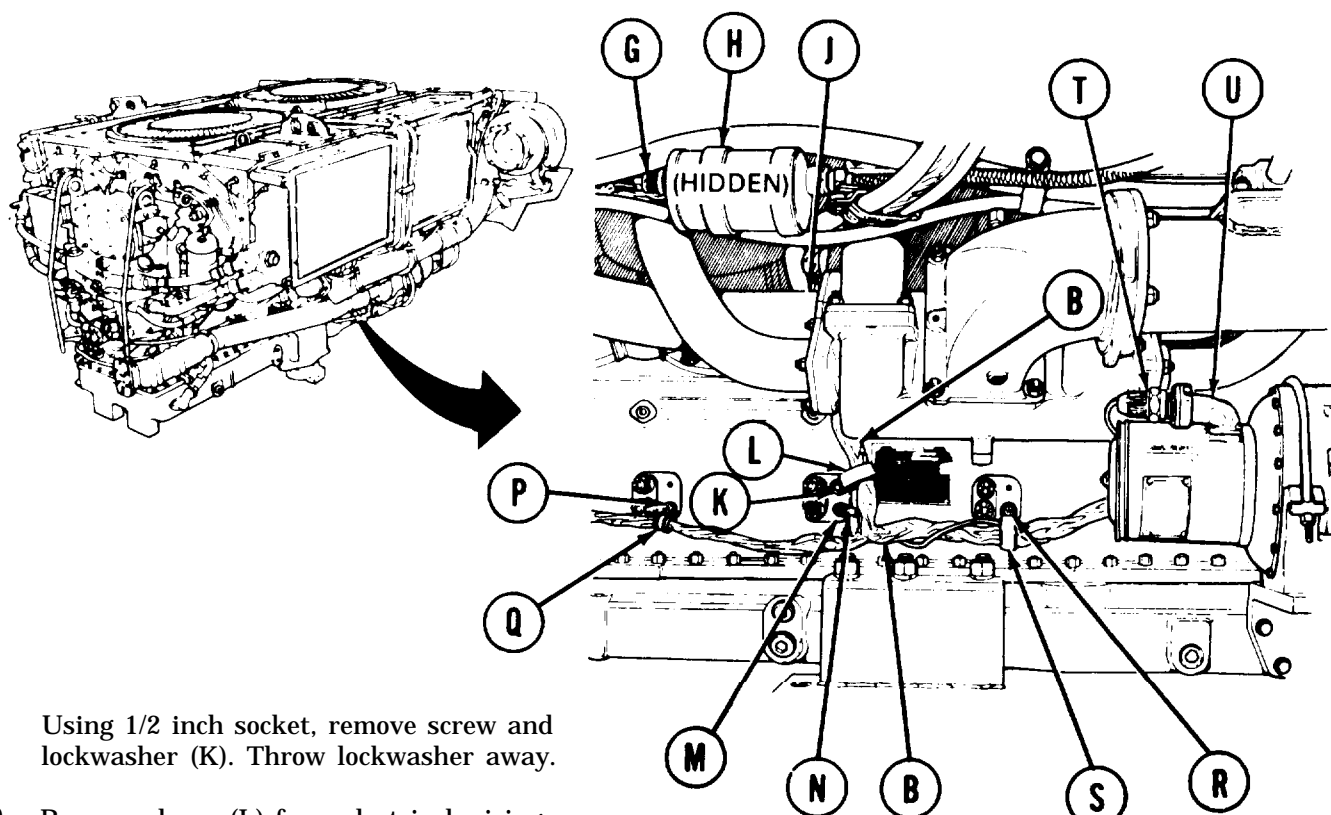


Go on to Sheet 3

TA139891

ENGINE WIRING HARNESS REPLACEMENT (2D ENGINE) (Sheet 3 of 12)

6. Using slip joint pliers and hands to loosen, disconnect electrical lead (CKT 86/GND) (G) from ignition unit (H).
7. Using 1/2 inch socket, remove nut and lockwasher(J) securing clamp (hidden). Throw lockwasher away.
8. Remove clamp from wiring harness (B).



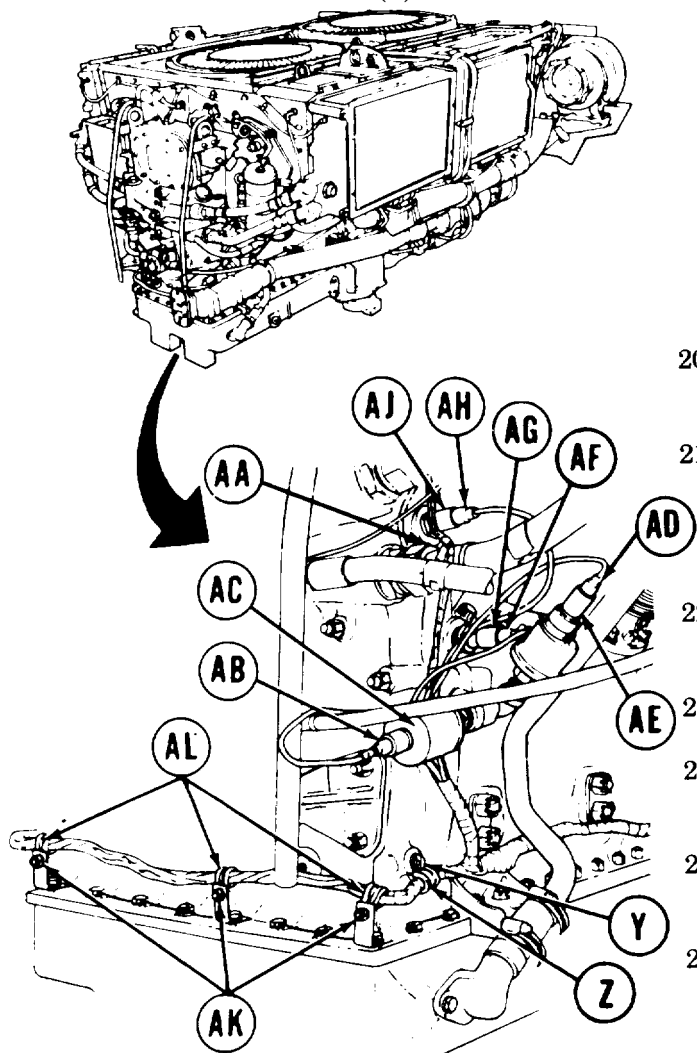
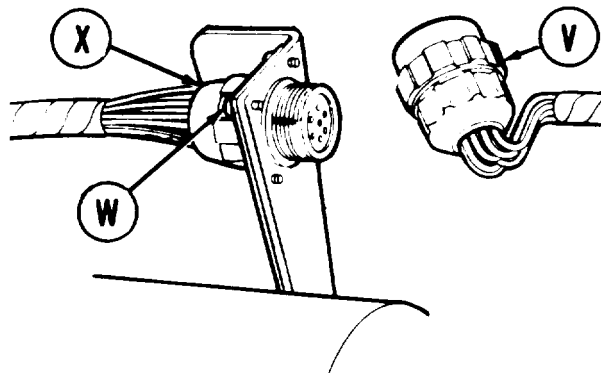
9. Using 1/2 inch socket, remove screw and lockwasher (K). Throw lockwasher away.
10. Remove clamp (L) from electrical wiring harness (B).
11. Using 1/2 inch socket, remove screw and lockwasher (M) securing ground lead (N). Throw lockwasher away.
12. Using 1/2 inch socket, remove screw and lockwasher (P). Throw lockwasher away.
13. Remove clamp (Q) from wiring harness (B).
14. Using 1/2 inch socket, remove screw and lockwasher (R). Throw lockwasher away.
15. Remove clamp (S) from engine wiring harness (B).
16. Using 1 inch wrench, disconnect electrical connector (T) from generator (U).

Go on to Sheet 4

TA139892

ENGINE WIRING HARNESS REPLACEMENT (2D ENGINE) (Sheet 4 of 12)

17. Using spanner wrench, disconnect electrical connector (V).
18. Using cross-tip screwdriver and adjustable wrench, remove four screws, lockwashers, and nuts (W). Throw lockwashers away.
19. Remove cable connector (X) from bracket.



20. Using 1/2 inch socket, remove screw and lockwasher (Y). Throw lockwasher away.
21. Remove clamp (Z).
22. Using 1/2 inch socket with extension, remove nut (AA) securing clamp (hidden).
23. Remove clamp.
24. Disconnect electrical connector (AB) from engine oil pressure switch (AC).
25. Disconnect electrical connector (AD) from engine oil pressure transmitter (AE).
26. Disconnect electrical connector (AF) from engine oil temperature thermostatic switch (AG).

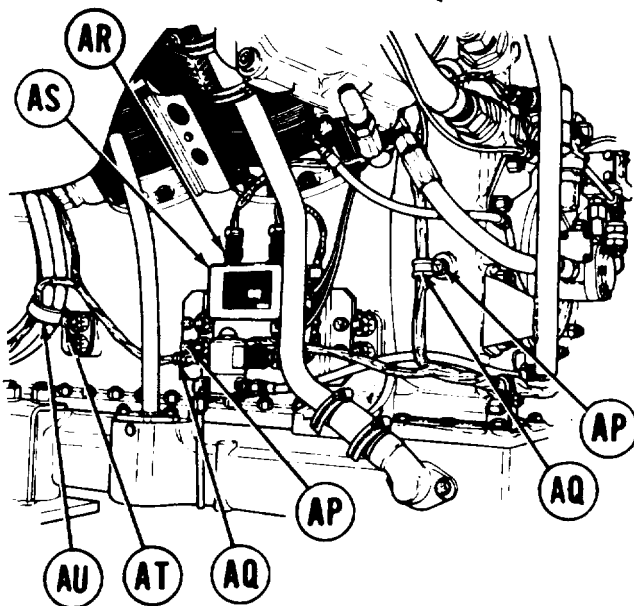
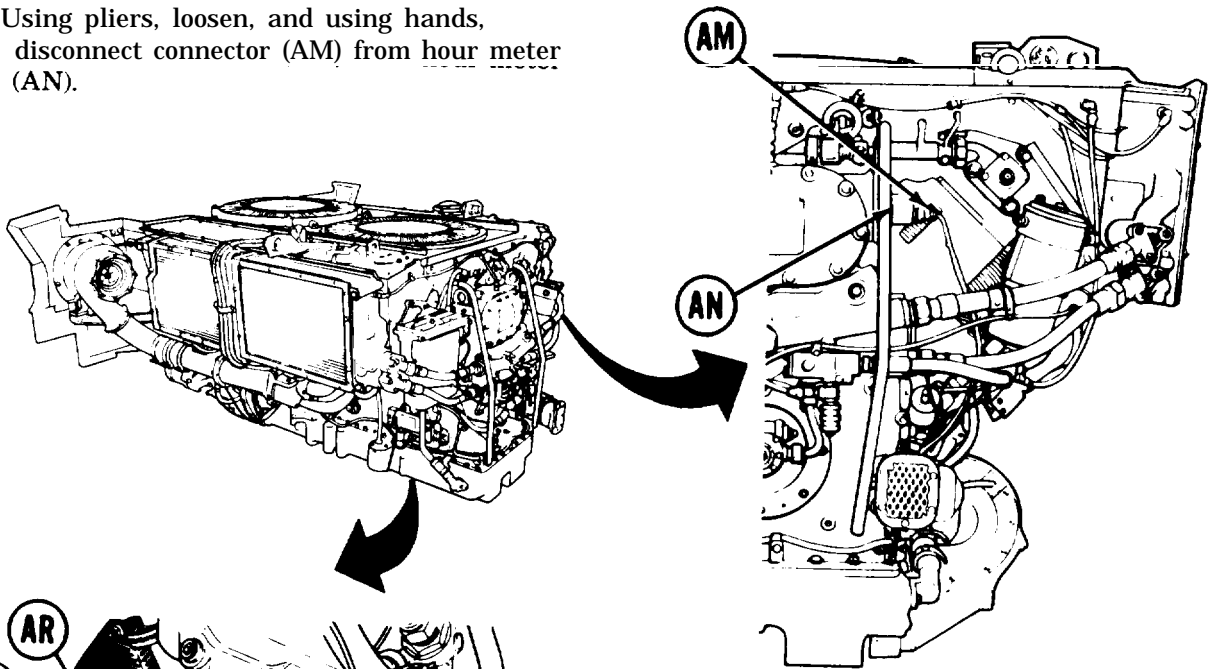
27. Disconnect electrical connector (AH) from engine oil temperature transmitter (AJ).
28. Using 7/16 inch socket and wrench, remove three screws, lockwashers, and nuts (AK). Throw lockwashers away.
29. Remove three clamps (AL).

Go on to Sheet 5

TA139893

ENGINE WIRING HARNESS REPLACEMENT (2D ENGINE) (Sheet 5 of 12)

30. Using pliers, loosen, and using hands, disconnect connector (AM) from hour meter (AN).



31. Using 1/2 inch socket with extension, remove two screws and lockwashers (AP). Throw lockwashers away.
32. Remove two clamps (AQ).
33. Using slip joint pliers, loosen, and using hands, disconnect connector (AR) from fuel-water separator control (AS).
34. Using 1/2 inch socket with extension, remove screw and lockwasher (AT) securing clamp (AU). Throw lockwasher away.
35. Remove clamp (AU).

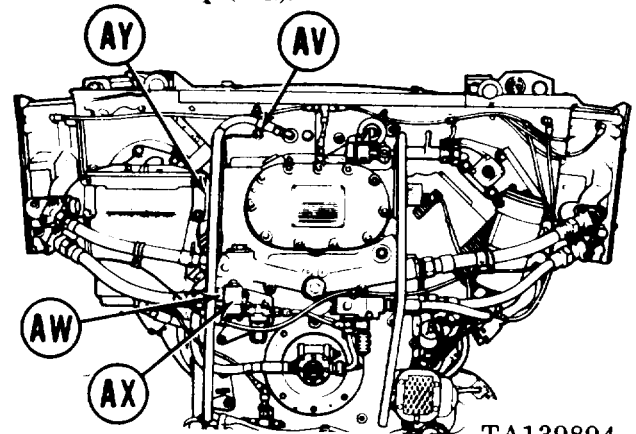
36. Using 7/8 inch wrench, disconnect electrical lead (AV) from front of engine.

37. Using slip joint pliers, loosen, and using hands, disconnect electrical connector (AW) from solenoid valve (AX).

38. Using 9/16 inch wrench, remove nut (AY) securing clamp (hidden).

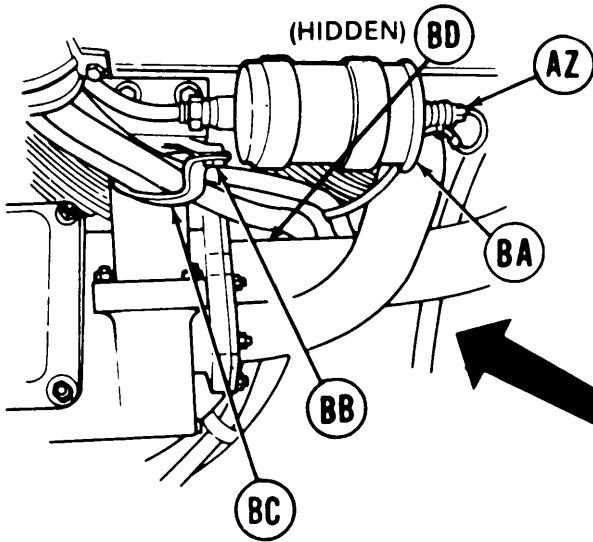
39. Remove clamp.

Go on to Sheet 6

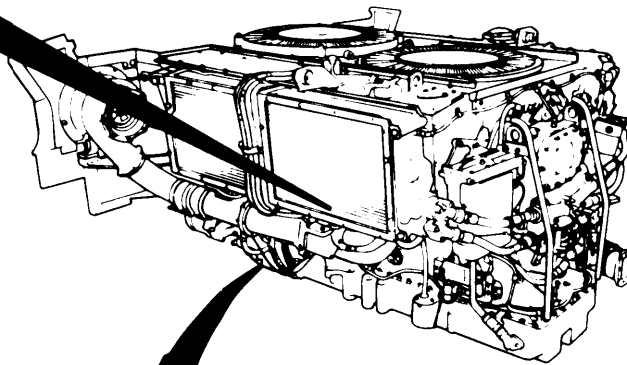


TA139894

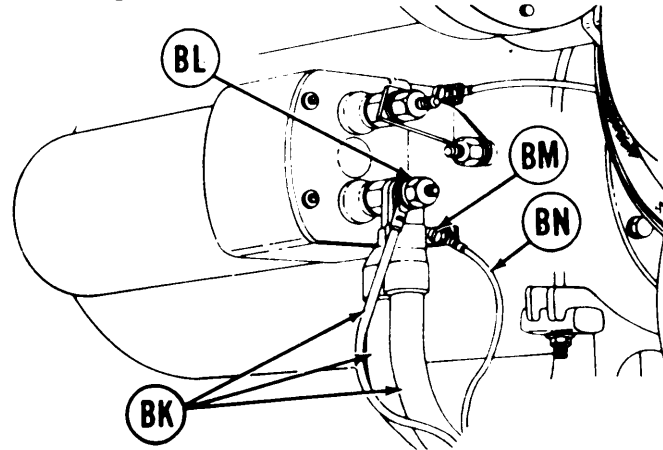
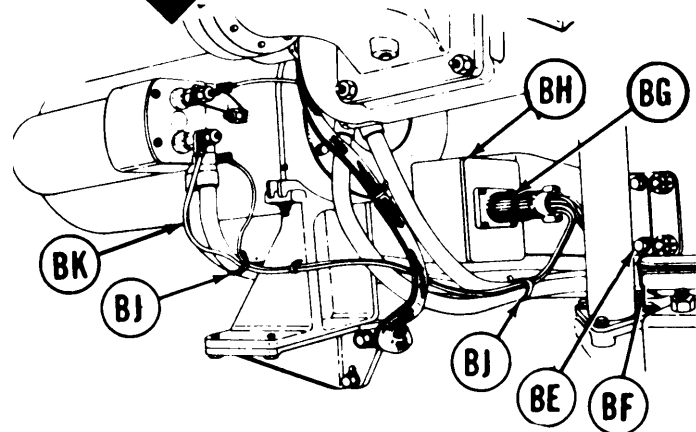
ENGINE WIRING HARNESS REPLACEMENT (2.D ENGINE) (Sheet 6 of 12)



40. Using slip joint pliers, remove electrical connector (AZ) from ignition unit (BA).
41. Using 7/16 inch socket, remove two screws and lockwashers (BB) securing clamp (BC). Throw lockwashers away.
42. Remove clamp.



43. Using 1/2 inch socket, remove nut (BD) securing clamp (hidden).
44. Remove clamp.
45. Using 1/2 inch socket with extension, remove screw and lockwasher (BE) securing clamp (BF). Throw lockwasher away.
46. Remove clamp (BF).
47. Using spanner wrench, disconnect electrical connector (BG) from low voltage protection relay (BH).
48. Using cutting pliers, cut and remove two plastic straps (BJ) from cables (BK).



49. Using 3/4 inch wrench, remove nut and lockwasher (BL). Throw lockwasher away.
50. Remove three cables (BK).
51. Using flat-tip screwdriver, remove screw (BM).
52. Remove electrical cable (BN).
53. Remove engine wiring harness from engine.

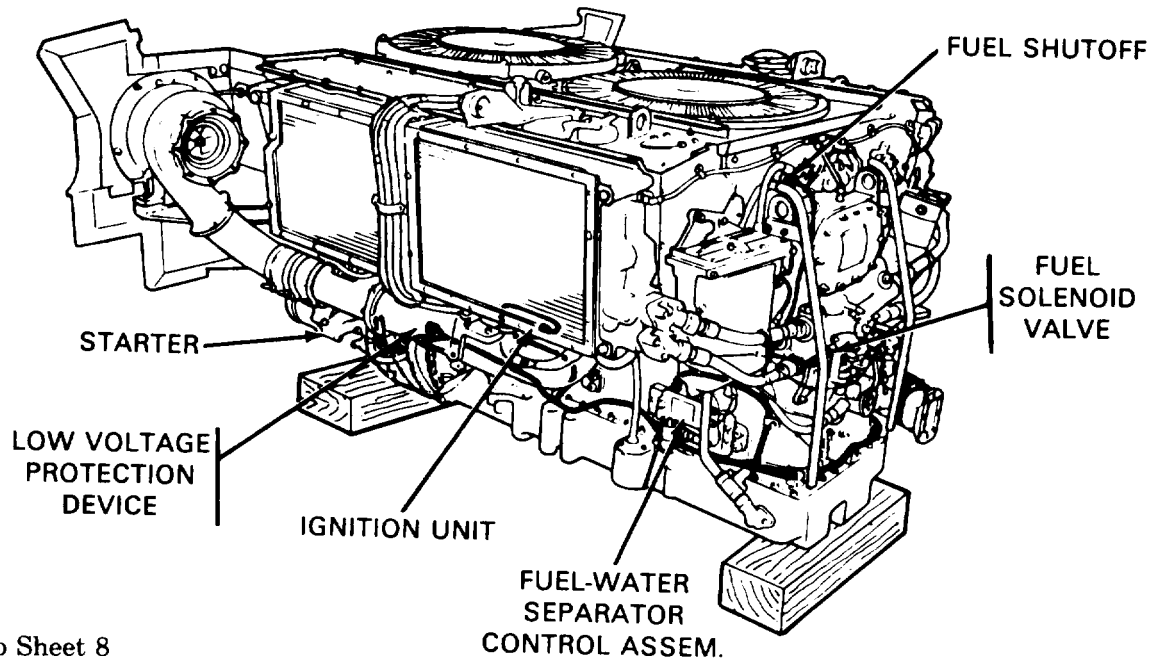
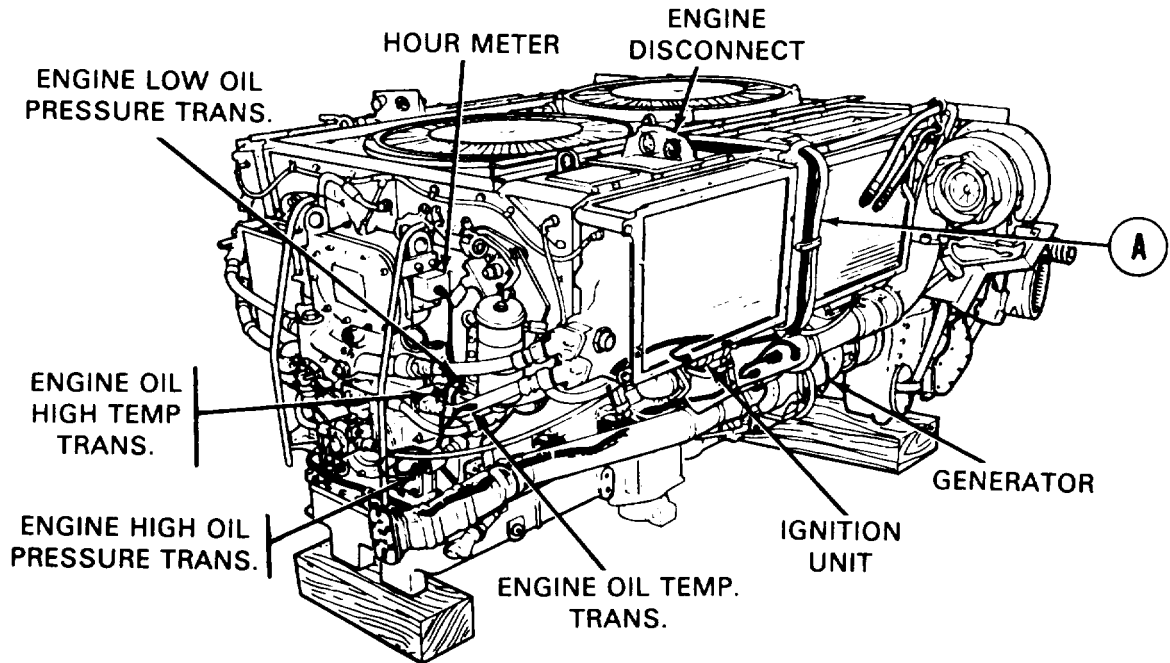
Go on to Sheet 7

TA139895

ENGINE WIRING HARNESS REPLACEMENT (2D ENGINE) (Sheet 7 of 12)

INSTALLATION:

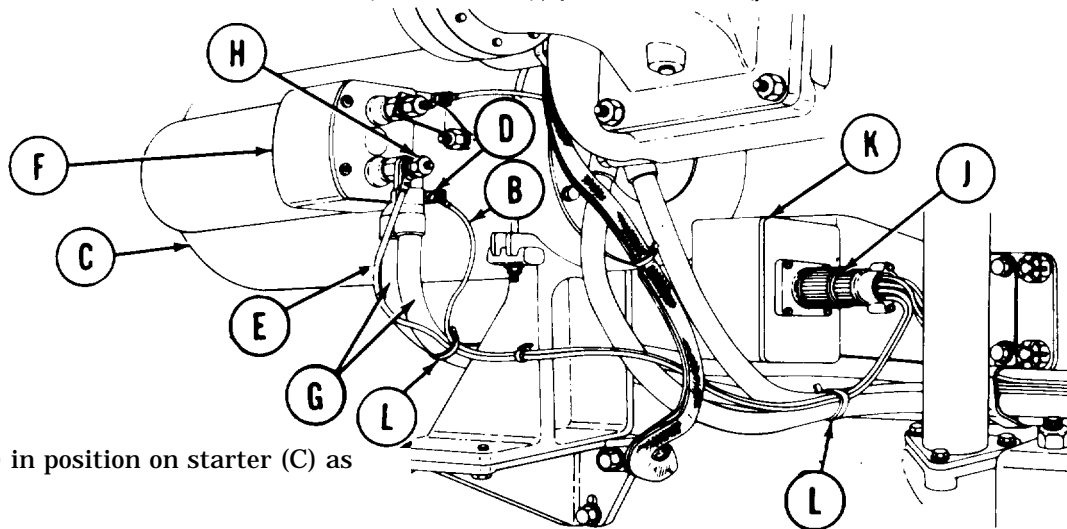
1. Place engine wiring harness (A) in position on engine.



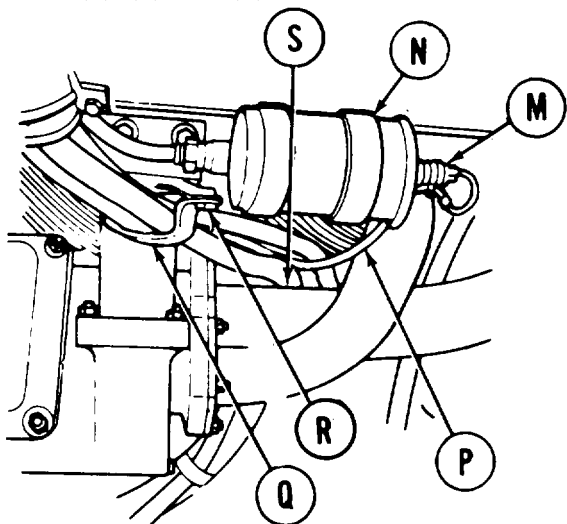
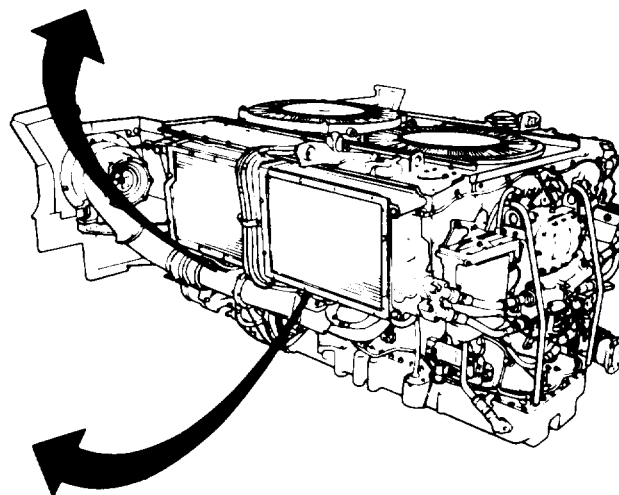
Go on to Sheet 8

TA139896

ENGINE WIRING HARNESS REPLACEMENT (2D ENGINE). (Sheet 8 of 12)



2. place cable (B) in position on starter (C) as shown .
3. Using flat-tip screwdriver, install screw (D) securing cable (B) to starter (C).
4. Place cable (E) in position on starter solenoid (F).
5. Place two other cables (G) on starter solenoid (F).
6. Using 3/4 inch wrench, install nut and new lockwasher (H).
7. Using spanner wrench, connect connector (J) to low voltage protection device (K).
8. Install two new plastic straps (L) around cables (B), (E), and (G).



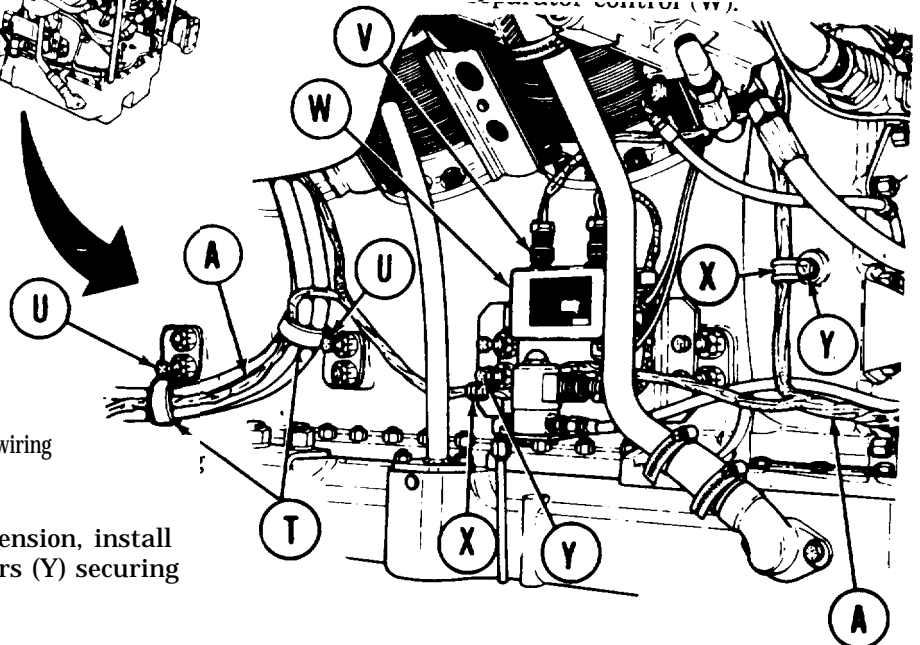
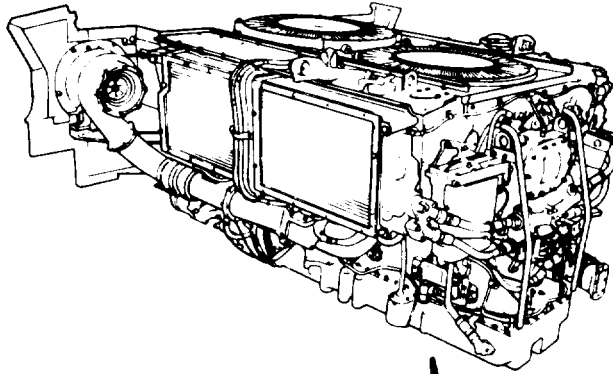
9. Place connector (M) to ignition unit (N).
10. Place cable (P) and clamp (Q) in position.
11. Using 7/16 inch socket, install two screws and new lockwashers (R) securing cable (P) and clamp (Q).
12. Place clamp (S) (hidden) in position over cables.
13. Using 1/2 inch socket, install nut securing cables and clamp (S).

Go on to Sheet 9

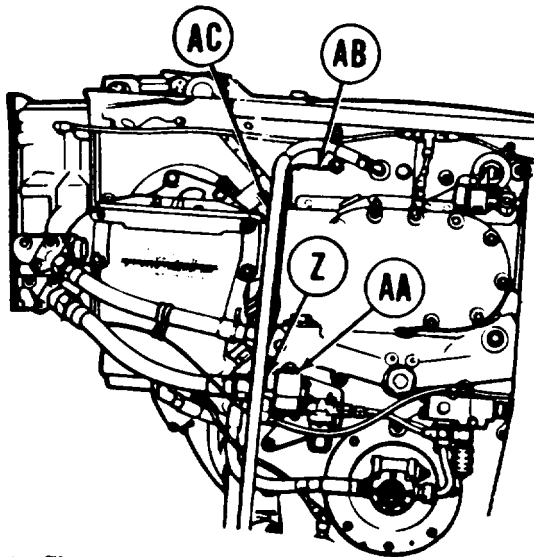
TA139897

ENGINE WIRING HARNESS REPLACEMENT (2D ENGINE) (Sheet 9 of 12)

14. Place wiring harness (A) in position.
15. Place two clamps (T) in position around wiring harness (A).
16. Using 1/2 inch socket with extension, install two screws and new lockwashers (U) securing two clamps (T) to engine.
17. Using slip joint pliers, install connector (V) to fuel-water separator control (W).



18. Place two clamps (X) in position around wiring harness (A).
19. Using 1/2 inch socket with extension, install two screws and new lockwashers (Y) securing clamps (X) to engine.



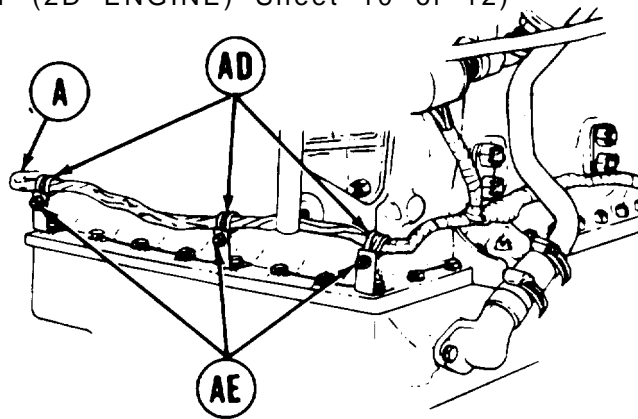
20. Using slip joint pliers, install connector (Z) to fuel solenoid valve (AA).
21. Using 7/8 inch wrench, install fuel shutoff lead (AB) to front of engine.
22. Place clamp (AC) (hidden) in position on cable.
23. Using 9/16 inch wrench, install nut securing cable and clamp (AC).

Go on to Sheet 10

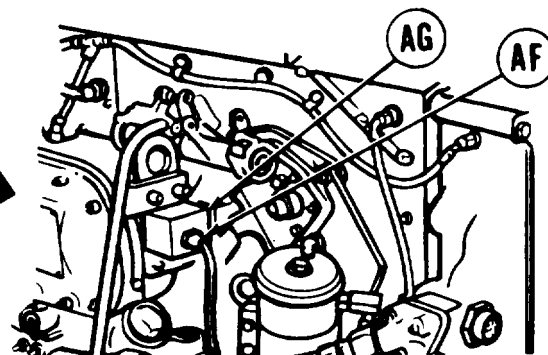
TA139898

ENGINE WIRING HARNESS REPLACEMENT (2D ENGINE) Sheet 10 of 12)

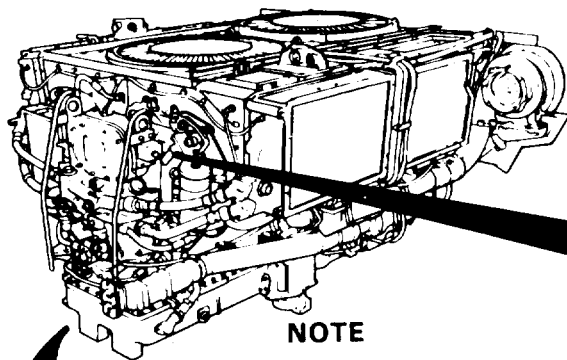
24. Place wiring harness (A) in position along bottom of engine.
25. place three clamps (AD) in position around wiring harness (A).
26. Using 7/16 inch socket and wrench, install three screws, new lockwashers, and nuts (AE) securing three clamps (AD) and wiring harness to engine.



27. Using slip joint pliers, install connector (AF) to hour meter (AG)

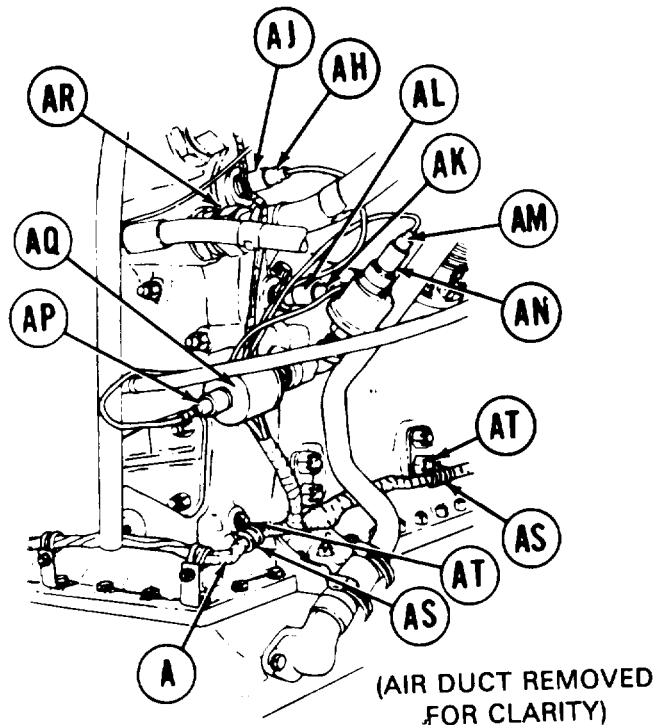


28. Connect electrical lead (AH) (CKT 33) to engine oil temperature transmitter (AJ).
29. Connect electrical lead (AK) (CKT 509L) to engine oil temperature thermostatic switch (AL).
30. Connect electrical lead (AM) (CKT 36) to engine oil pressure transmitter (AN).
31. Connect electrical lead (AP) (CKT 509L) to engine oil pressure transmitter (AQ).
32. Place clamp (AR) (hidden) in position on wiring harness (A).
33. Using 1/2 inch socket with extension, install nut securing wiring harness (A) and clamp (AR).
34. Place two clamps (AS) in position on wiring harness (A).
35. Using 1/2 inch socket, install two screws and new lockwashers (AT).



NOTE

Apply silicone compound (Item 32, Appendix D) to all male connectors in steps 28 thru 31.

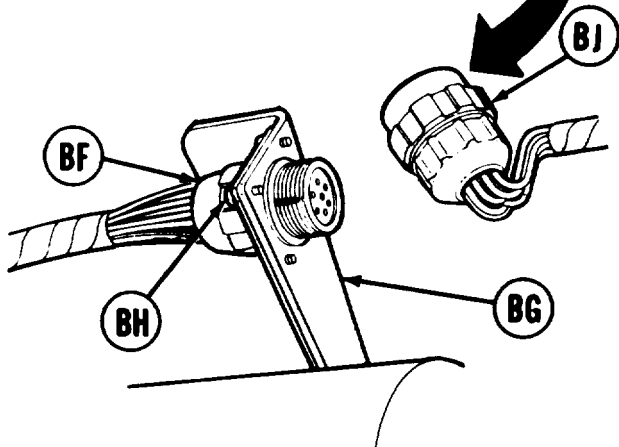
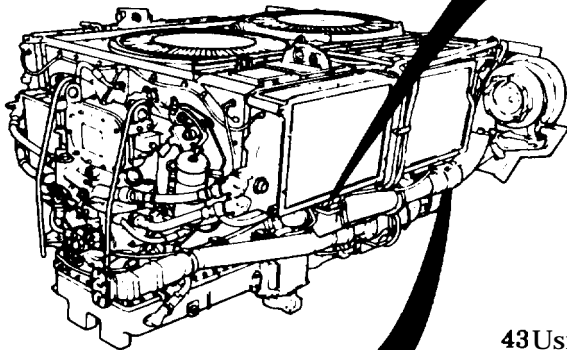
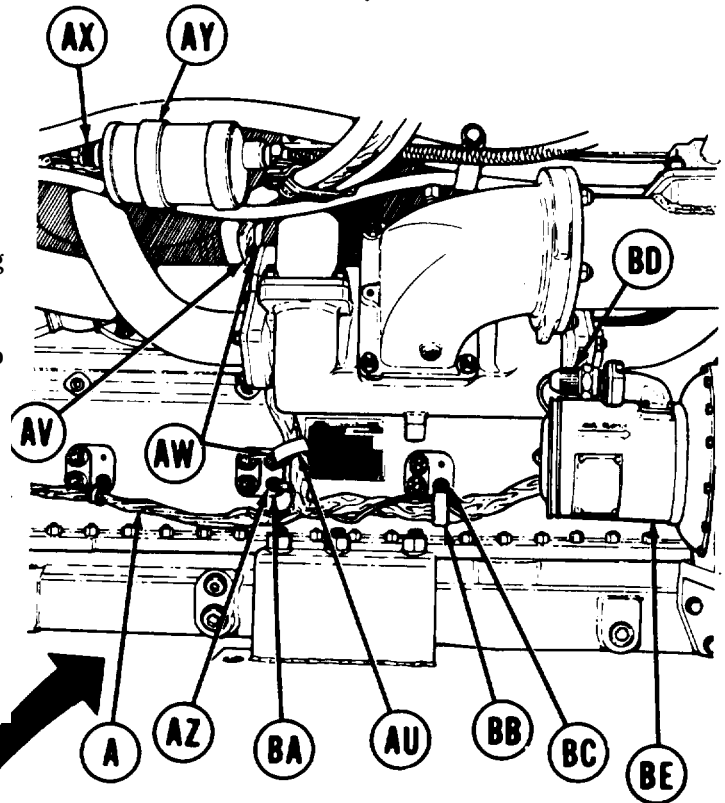


Go on to Sheet 11

A139899

ENGINE WIRING HARNESS REPLACEMENT (2D ENGINE) (Sheet 11 of 12)

36. Place wiring harness (A) in position.
37. Place clamp (AU) and clamp (AV), which is hidden, in position around wiring harness (A).
38. Using 1/2 inch socket with extension, install two screws and new lockwashers (AW) securing two clamps (AU) and (AV).
39. Using slip joint pliers, install connector (AX) to ignition unit (AY).
40. Using 1/2 inch socket with extension, install screw and new lockwasher (AZ) securing ground strap (BA) to engine.
41. Place clamp (BB) in position around wiring harness (A).
42. Using 1/2 inch socket with extension, install screw and new lockwasher (BC) securing clamp (BB).



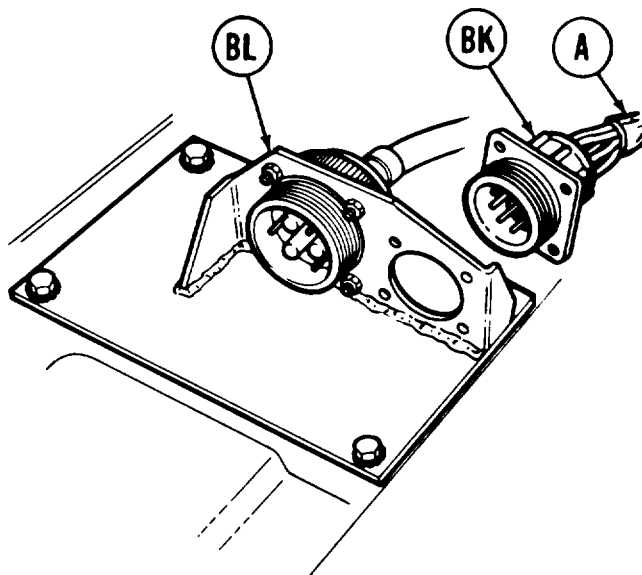
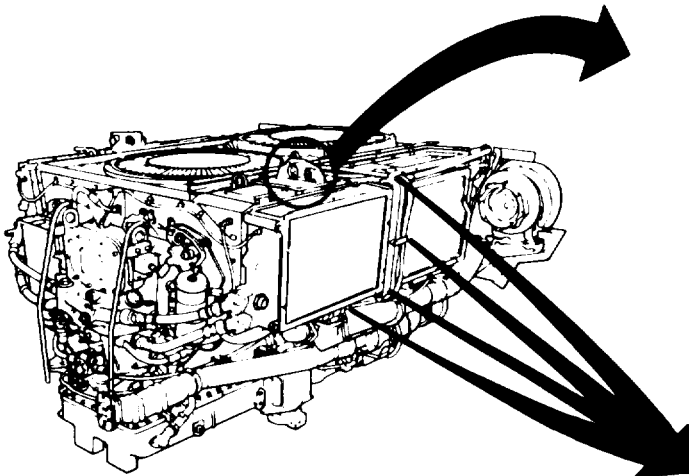
- 43 Using 1 inch wrench, connect connector (BD) to end of generator (BE).
- 44 Position connector (BF) in bracket (BG).
- 45 Using cross-tip screwdriver and adjustable wrench, install four screws, new lockwashers, and nuts (BH).
46. Using spanner wrench, install connector (BJ).

Go on to Sheet 12

TA139900

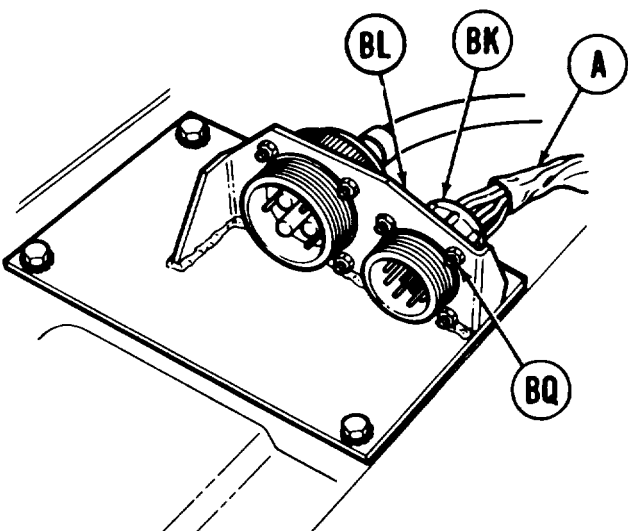
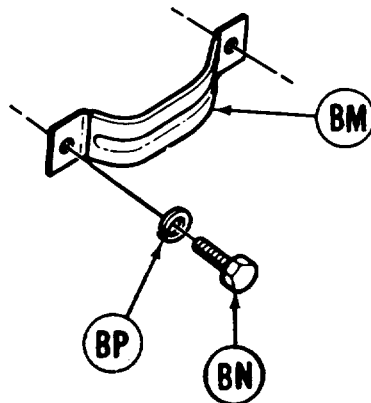
ENGINE WIRING HARNESS REPLACEMENT (2D ENGINE). (Sheet 12 of 12)

47. Place wiring harness (A) alongside of engine and place electrical connector (BK) in position in engine disconnect bracket (BL).



48. Place four clamps (BM) over wiring harness (A).

49. Using 7/8 inch wrench, install eight screws (BN) and new lockwashers (BP).



50. Make sure wiring harness (A) and electrical connector (BK) are in position in engine disconnect mounting bracket (BL).

51. Using screwdriver and 3/8 inch wrench, install four screws, new lockwashers, and nuts (BQ).

52. Install powerplant (page 5-37).

End of Task

TA139901

ENGINE WIRING HARNESS (DUST DETECTOR) REPLACEMENT (Sheet 1 of 8)

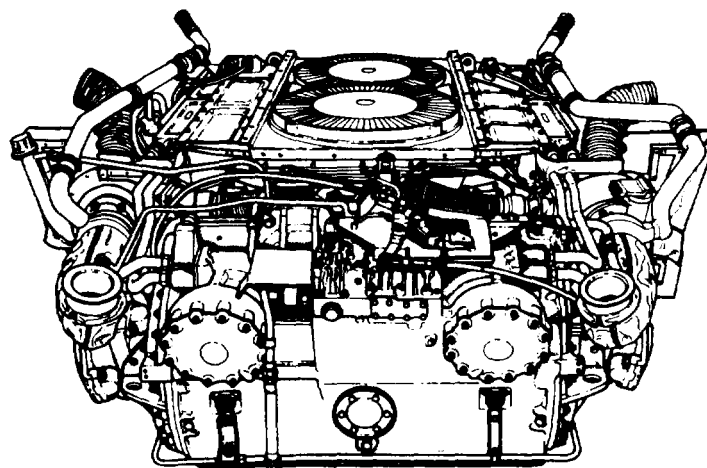
PROCEDURE INDEX

PROCEDURE	P A G E
Removal	10-350.2
Installation	10-350.5

TOOLS: 1/2 in. combination box and open end wrench
 7/16 in. combination box and open end wrench
 1/2 in. socket with 1/2 in. drive
 7/16 in. socket with 1/2 in. drive.
 Ratchet with 1/2 in. drive
 5 in. extension with 1/2 in. drive
 Slip joint pliers with plastic jaw inserts

SUPPLIES: Lockwashers (11657469-3) (2 required)
 Self-locking nuts (MS21045-5) (2 required)
 Silicone compound (Item 32, Appendix D)

PRELIMINARY PROCEDURES: Disconnect battery ground straps (page 10-283)
 Remove top deck (page 16-21)
 Remove transmission shroud (page 9-19)
 Remove engine shroud (page 9-2)



POWERPACK REMOVED
 FOR CLARITY

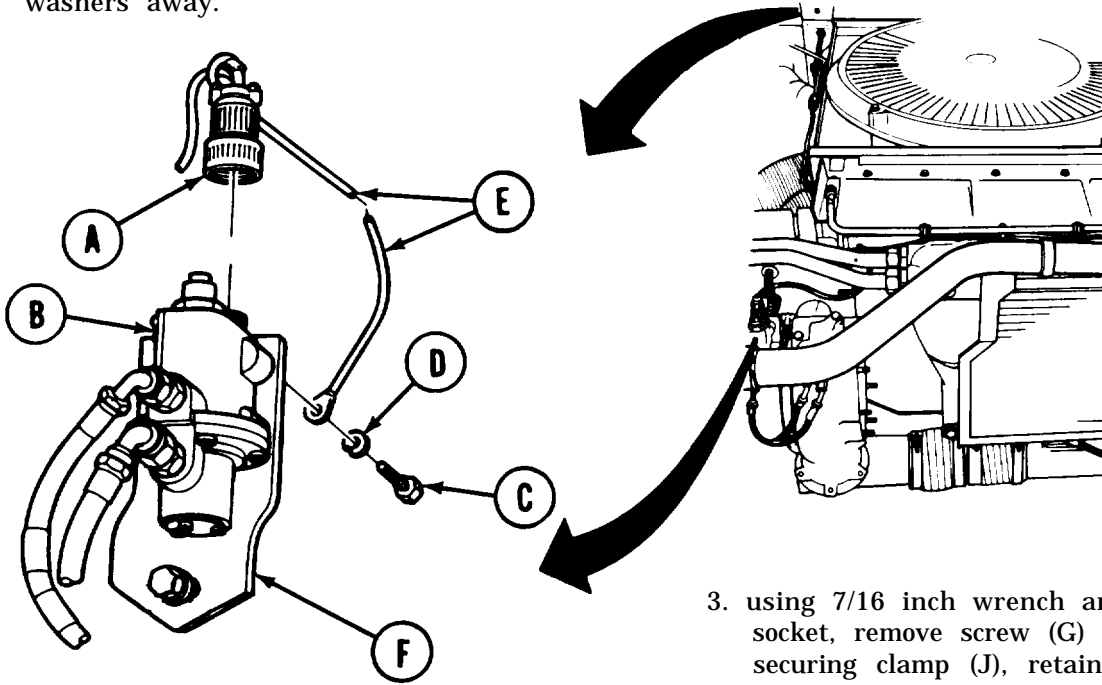
Go on to Sheet 2

TA249117

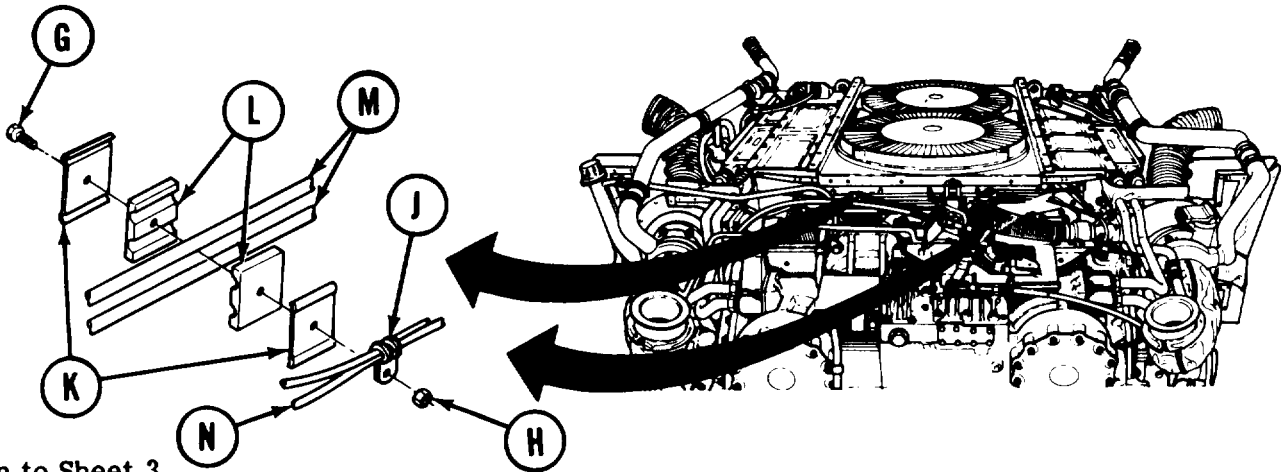
ENGINE WIRING HARNESS (DUST DETECTOR) REPLACEMENT (Sheet 2 of 8)

REMOVAL:

1. Disconnect connectors (A) from right and left bank pressure switches (B).
2. Using 7/16 inch socket, remove screws (C) and lockwashers (D) securing ground leads (E) to brackets (F). Throw lockwashers away.



3. using 7/16 inch wrench and 7/16 inch socket, remove screw (G) and nut (H) securing clamp (J), retaining strap (K), and pads (L) to tube assemblies (M). Throw nut away.
4. Remove clamps (J) from wiring (N).



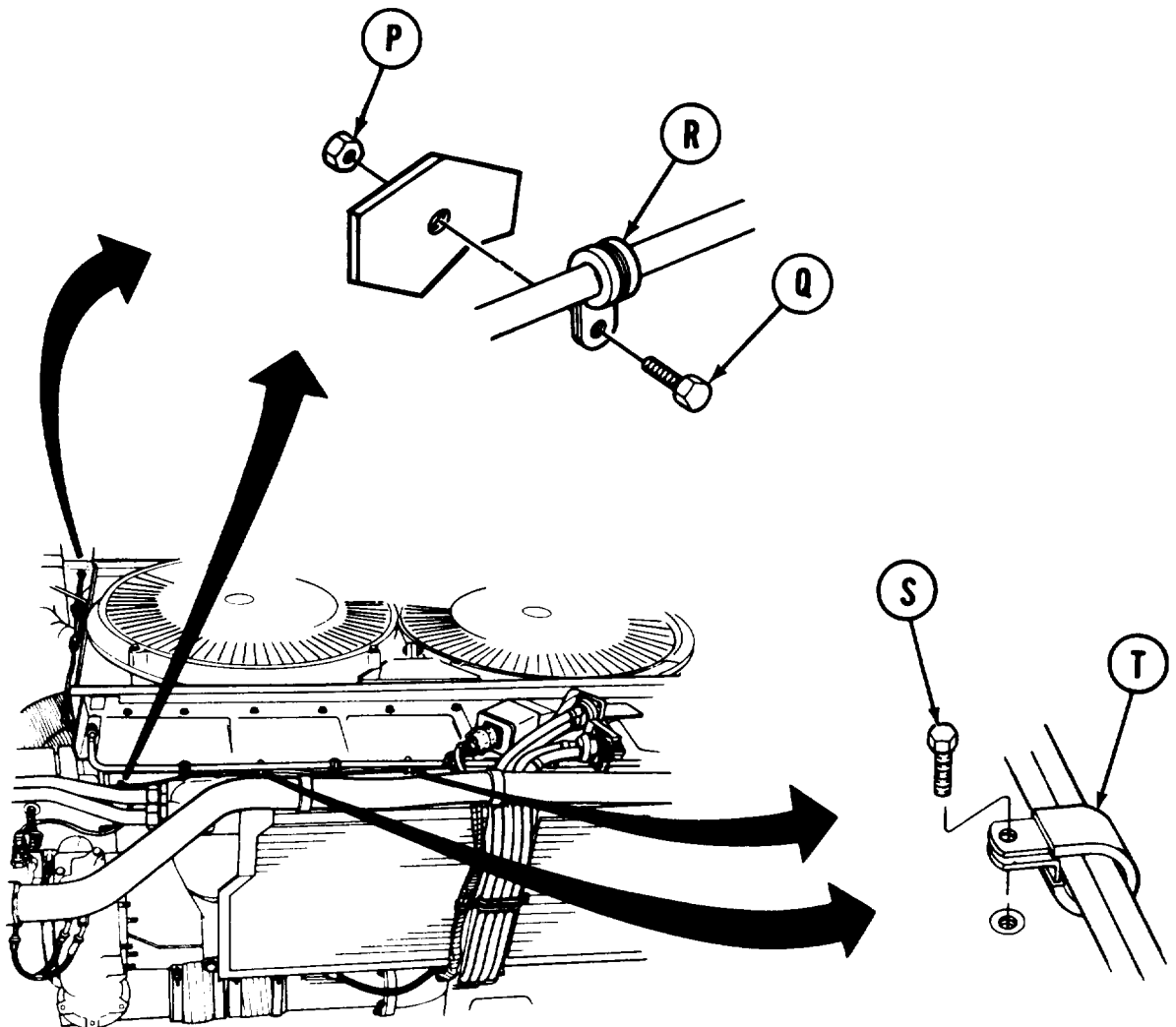
Go on to Sheet 3

Go on to sheet 3

TA249118

ENGINE WIRING HARNESS (DUST DETECTOR) REPLACEMENT (Sheet 3 of 8)

5. Using 1/2 inch wrench to hold nut (P), use 1/2 inch socket and remove screw (Q) securing clamp (R) (two places). Throw nuts away.
6. Remove clamps (R) from wiring.
7. Using 1/2 inch socket remove screws (S) securing clamps (T). Remove clamps (T) from wiring (two places).



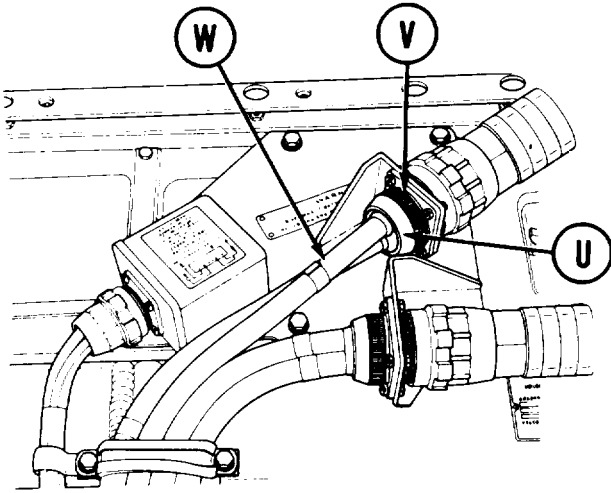
Go on to Sheet 4

TA249119

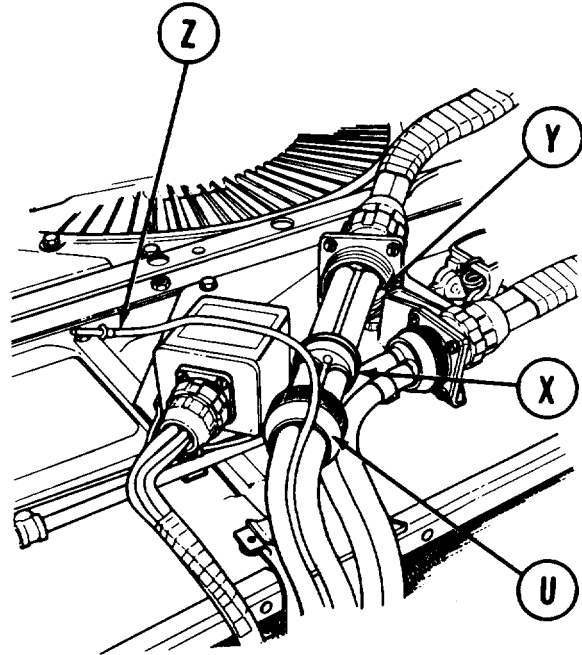
Change 3

10-350.3

ENGINE WIRING HARNESS (DUST DETECTOR) REPLACEMENT (Sheet 4 of 8)



8. Using slip joint pliers, unscrew retainer nut (U) from shell (V). Slide retainer nut (U) back along cable assembly (W).



9. Pull bushing (X) back from insert (Y).
10. Remove wiring lead 510L (Z) from position "C" of insert (Y). Pull wiring lead 510L (Z) from bushing (X) and retainer nut (U).
11. Remove dust detector wiring harness from engine.

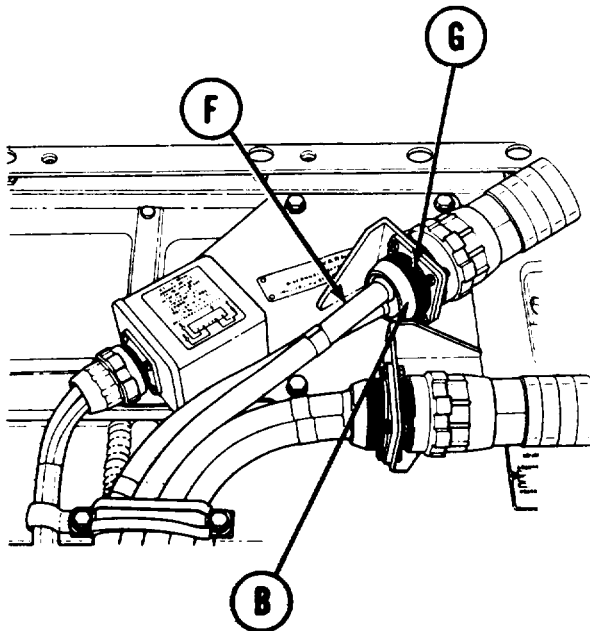
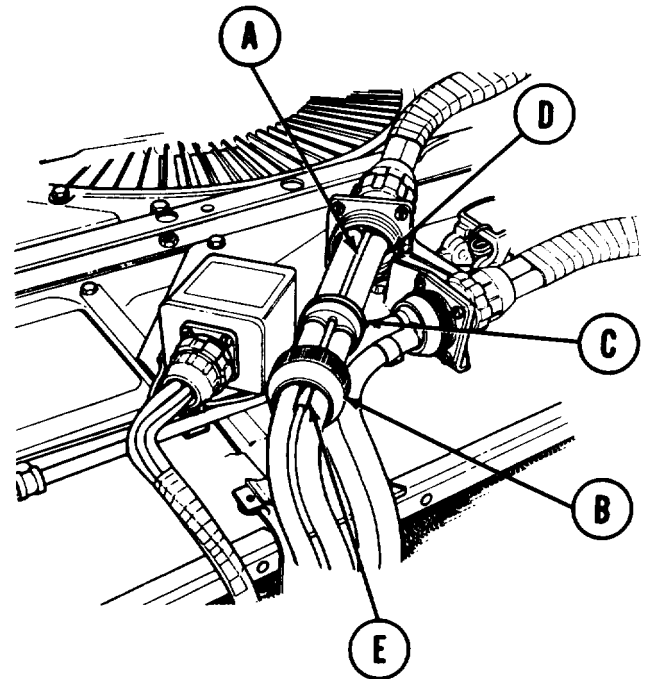
Go on to Sheet 5

TA249120

ENGINE WIRING HARNESS (DUST DETECTOR) REPLACEMENT (Sheet 5 of 8)

INSTALLATION:

1. Apply silicone compound (Item 32, appendix D) to wiring lead 510L (A) and thread lead through retainer nut (B) and bushing (C),
2. Insert pin of wiring lead 510L (A) in position "C" of insert (D).
3. Slide bushing (C) against insert (D).
4. Slide sleeving (E) up against bushing (C).



5. Slide retainer nut (B) up cable assembly (F) and connect to shell (G).
6. Using slip joint pliers, tighten retainer nut (B) onto shell (G).

Go on to Sheet 6

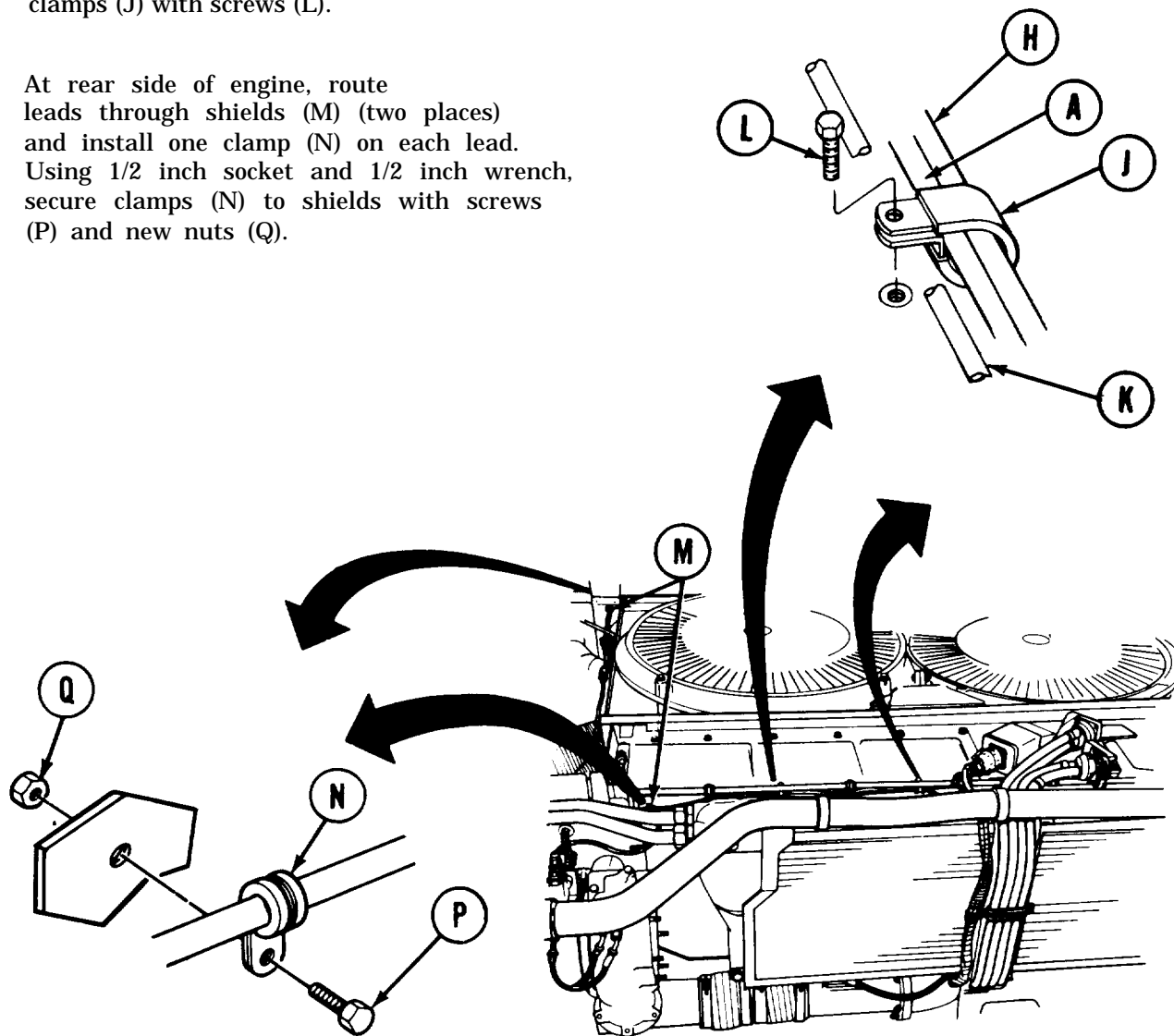
TA249121

Change 3

10-350.5

7. At two locations along top left side of engine, route wiring lead 510L (A) along with smoke generator wiring harness (H). Install clamps (J) under smoke generator tube (K) and, using 1/2 inch socket, secure clamps (J) with screws (L).

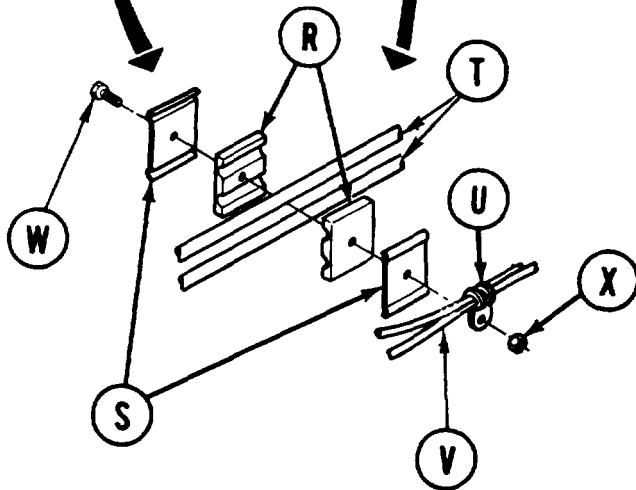
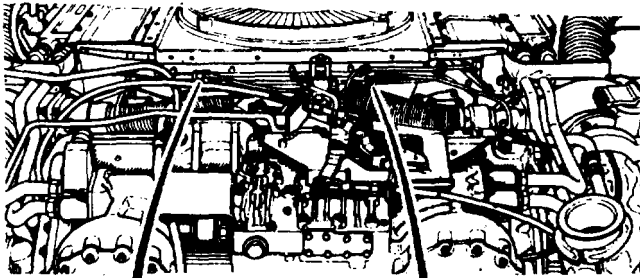
8. At rear side of engine, route leads through shields (M) (two places) and install one clamp (N) on each lead. Using 1/2 inch socket and 1/2 inch wrench, secure clamps (N) to shields with screws (P) and new nuts (Q).



Go on to Sheet 7

TA249122

ENGINE WIRING HARNESS (DUST DETECTOR) REPLACEMENT (Sheet 7 of 8)



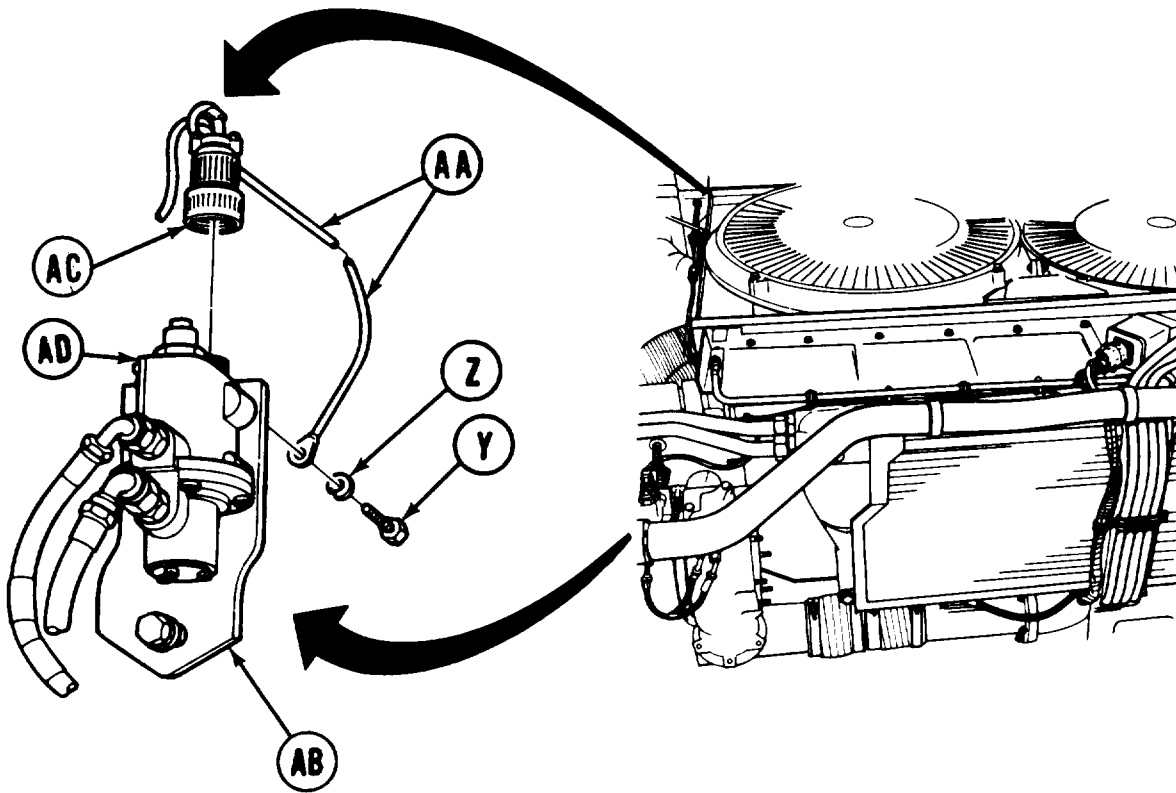
9. At two locations at rear of engine, assemble pads (R) and retaining straps (S) around tube assemblies (T).
10. Install two clamps (U) onto wiring harnesses (V). Pull slack out of wiring harnesses.
11. Using 7/16 inch wrench and 7/16 inch socket, install screw (W) and new self-locking nut (X) to secure clamps (U), retaining straps (S), and pads (R) to two tube assemblies (T).

Go on to Sheet 8

TA249123

ENGINE WIRING HARNESS (DUST DETECTOR) REPLACEMENT (Sheet 8 of 8)

12. Using 7/16 inch socket, install screws (y) and new lockwashers (Z) to secure ground leads (AA) to left and right pressure switch bracket (AB).
13. Connect harness connector (AC) to left and right pressure switches (AD).



14. Connect battery ground straps (page 10-283).
15. perform dust detector operational test (page 10-350.19).
16. Install engine shroud (page 9-3).
17. Install transmission shroud (page 9-23).
18. Install top deck (page 16-23).

TA249124

End of Task

REPLACEMENT OF HULL INTERMEDIATE LEAD ASSEMBLY (Sheet 1 of 4)

PROCEDURE INDEX

PROCEDURE	PAGE
Removal	10-350.9
Installation	10-350.11

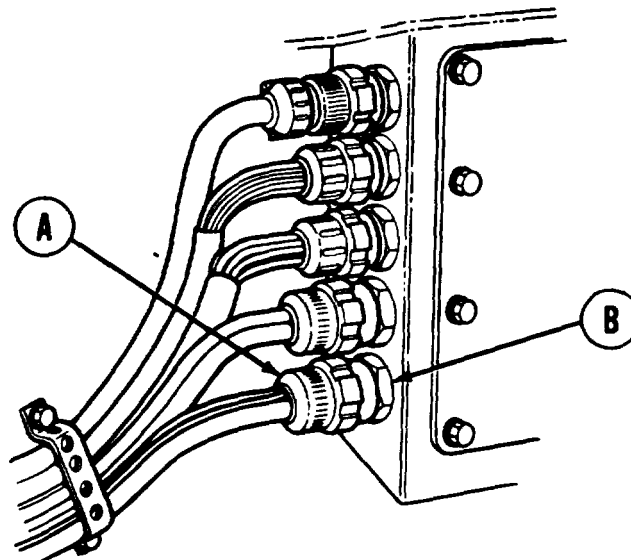
TOOLS: 1/2 in. combination box and open end wrench
 Pliers, diagonal cutting
 Pliers, slip joint with plastic jaw inserts

SUPPLIES: Strap, tie down (MS3367-1) (as required)

PRELIMINARY PROCEDURE Disconnect three battery ground straps (page 10-283)

REMOVAL:

1. Using slip joint pliers, disconnect starter cable (A) at bulkhead connector (B).



Go on to Sheet 2

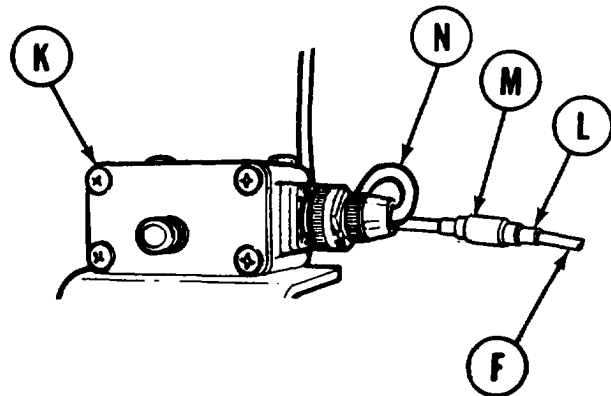
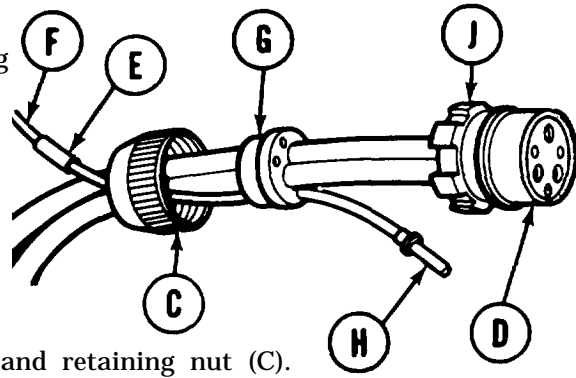
TA250640

Change 3

10-350.9

REPLACEMENT OF HULL INTERMEDIATE LEAD ASSEMBLY (Sheet 2 of 4)

2. Using slip joint pliers, unthread retaining nut (C) from shell (D). Slide retaining nut (C) back along cable.
3. Slide sleeving (E) back along lead assembly (F)
4. Slide bushing (G) back along cable.
5. Remove pin (H) from position "C" of insert (J)
6. pull lead assembly (F) back through bushing (G) and retaining nut (C).
7. Using diagonal cutting pliers, cut tie downs securing lead assembly (F) to harness bundle end working back toward driver's compartment, pull lead assembly (F) from beneath retaining straps.
8. At dust detector warning light box (K) in driver's compartment, disconnect lead assembly connector (L) from short lead (M) on dust detector warning light wiring harness (N).
9. Remove hull intermediate lead assembly (F) from vehicle.

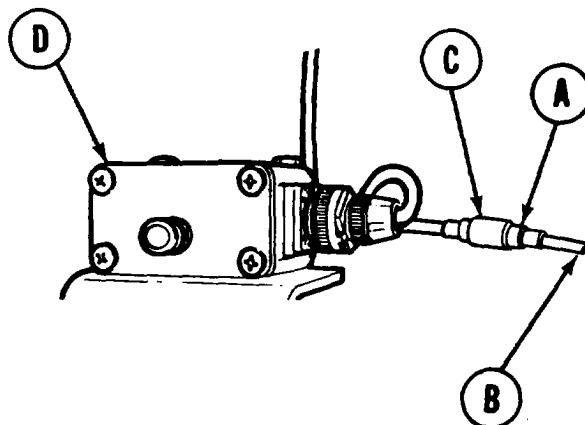


Go on to Sheet 3

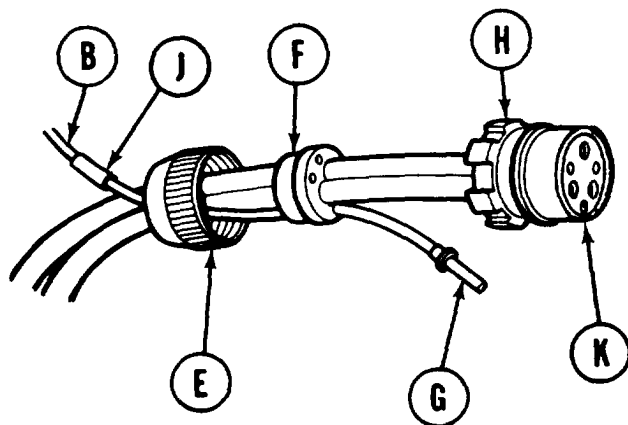
REPLACEMENT OF HULL INTERMEDIATE LEAD ASSEMBLY {Sheet 3 of 4}

INSTALLATION:

1. Connect connector (A) of replacement hull intermediate lead assembly (B) to short lead (C) of dust detector warning light harness assembly.
2. Route replacement hull intermediate lead assembly (B) beneath cable retaining straps from dust detector warning light box (D) to starter cable bulkhead connector.



3. Insert lead assembly (B) through retaining nut (E) and bushing (F).
4. Install pin (G) into position "C" of insert (H).
5. Slide bushing (F) against insert (H).



6. Slide sleeving against bushing (F).
7. Install retaining nut (E) on shell (K).

Go on to Sheet 4

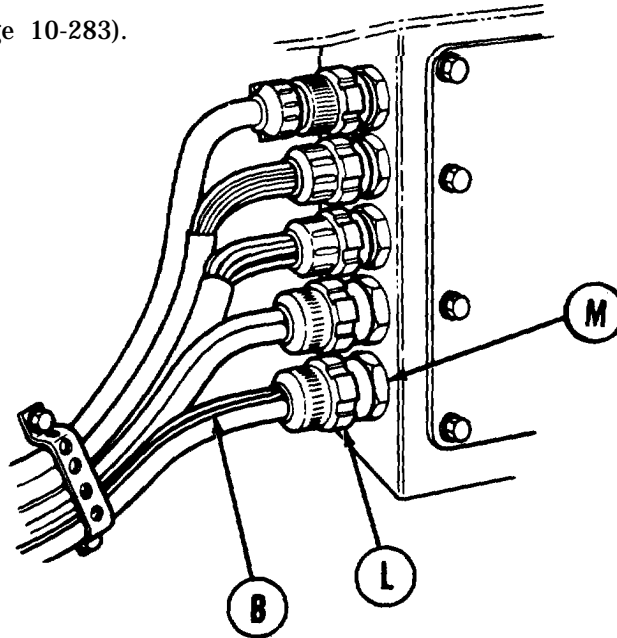
TA250642

Change 3

10-350.11

REPLACEMENT OF HULL INTERMEDIATE LEAD ASSEMBLY (Sheet 4 of 4)

8. Using slip joint pliers, connect starter cable connector (L) to bulkhead connector (M).
9. Secure lead assembly (B) to harness bundle with new tie downs, as required.
10. Connect three battery ground straps (page 10-283).



TA 250643

End of Task

10-350.12 Change 3

DUST DETECTOR WARNING LIGHT HARNESS ASSEMBLY REPLACEMENT (Sheet 1 of 3)

NOTE

. Replacement of the dust detector warning light harness assembly is the same whether the dust detector warning light box is mounted with the NATO slave connector or with conventional slave connectors. NATO slave connector mounting is shown.

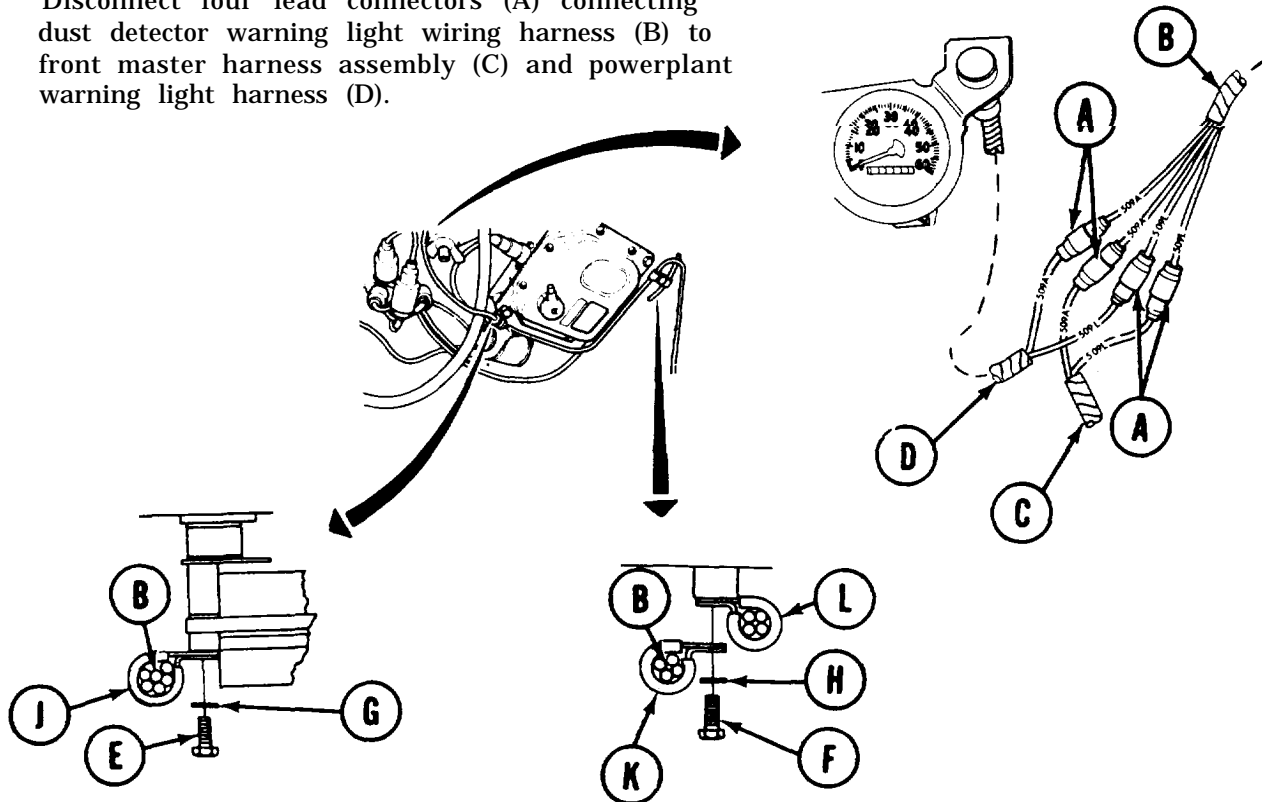
TOOLS: 7/16 in. socket with 1/2 in. drive
 6 in. extension with 1/2 in. drive
 Pliers, slip joint, plastic jaw insert
 Ratchet with 1/2 in. drive

SUPPLIES: Lockwasher (M S35333-40) (4 required)

PRELIMINARY PROCEDURE: Disconnect three battery ground straps (page 10-283)

REMOVAL:

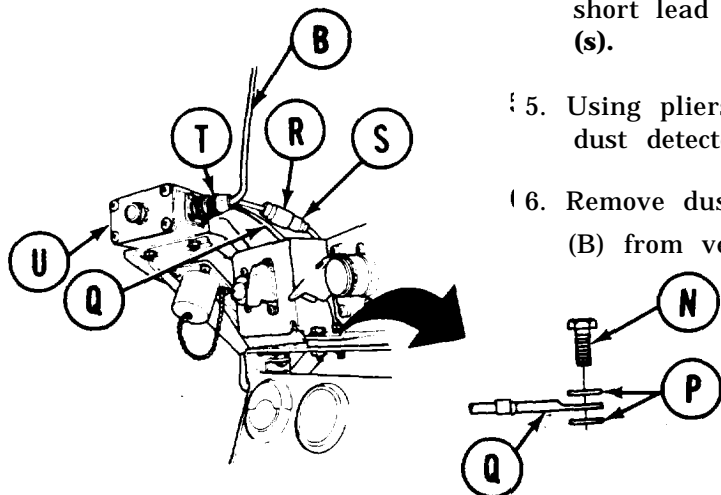
1. Disconnect four lead connectors (A) connecting dust detector warning light wiring harness (B) to front master harness assembly (C) and powerplant warning light harness (D).



2. Using socket, extension, and ratchet, remove two screws (E and F) and lockwashers (G and H) securing three clamps (J, K, and L) to domelight (M) and to ceiling. Discard lockwashers. Take dust detector warning light harness (B) out of clamps (J and K).

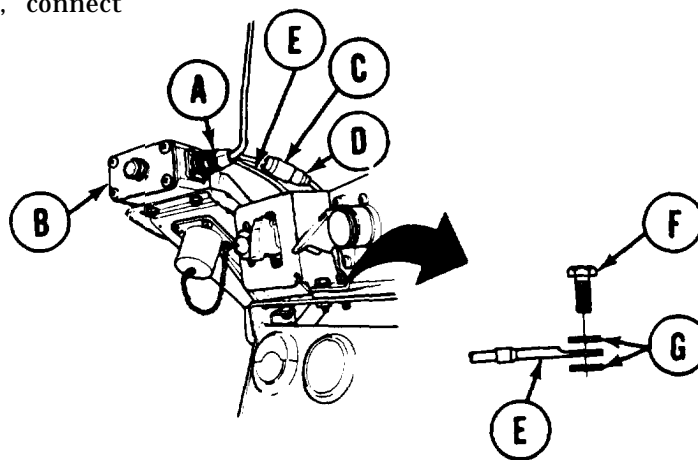
TA250688

3. Using socket, extension, and ratchet, remove screw (N) and two lockwashers (P) securing ground lead (Q) to equipment mounting bracket on indicator panel. Discard lockwashers.
4. Disconnect dust detector warning light harness short lead (R) from hull intermediate lead assembly (S).
5. Using pliers, disconnect harness connector (T) from dust detector warning light box (U).
6. Remove dust detector warning light wiring harness (B) from vehicle.



INSTALLATION:

1. Connect harness connector (A) to dust detector warning light box (B).
2. Connect dust detector warning light short lead (C) to hull intermediate lead assembly (D).
3. Using socket, extension, and ratchet, connect ground lead (E) to equipment mounting bracket on indicator panel with screw two new lockwashers (G).



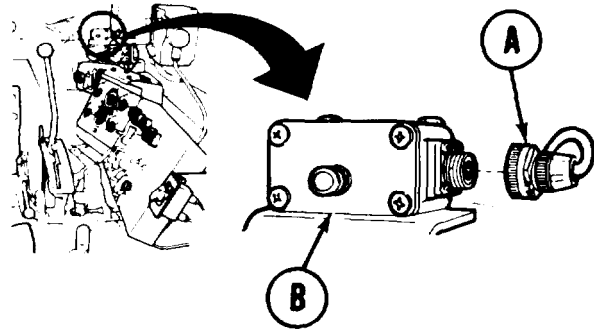
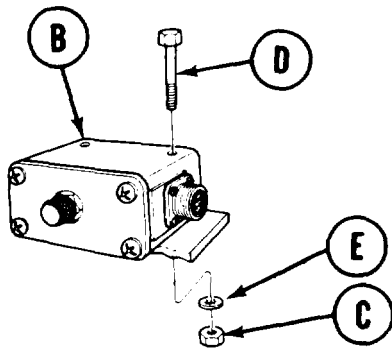
TA250689

TOOLS: Pliers, slip joint, plastic jaw insert
Screwdriver, cross tip
3/8 in. combination box and open end wrench
7/16 in. combination box and open end wrench (2 required)

SUPPLIES: Lockwasher (MS35333-40) (6 required)
Lockwasher (MS35338-42) (4 required)

REMOVAL:

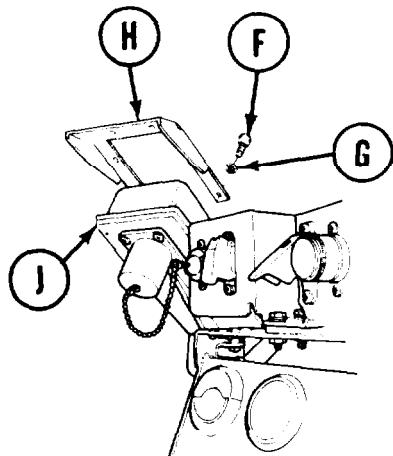
1. Using pliers, disconnect harness connector (A) from dust detector warning light box (B).



2. Using one 7/16 inch wrench to hold nuts (C), use other 7/16 inch wrench to remove two screws (D), lockwashers (E), and nuts (C). Remove box (B). Throw lockwashers away.

NOTE

If the dust detector warning light box in your vehicle has the NATO slave connector type mounting, do step 3 and skip step 4. If you have the conventional slave connector type mounting, skip step 3 and do step 4.



NATO SLAVE
CONNECTOR
MOUNTING

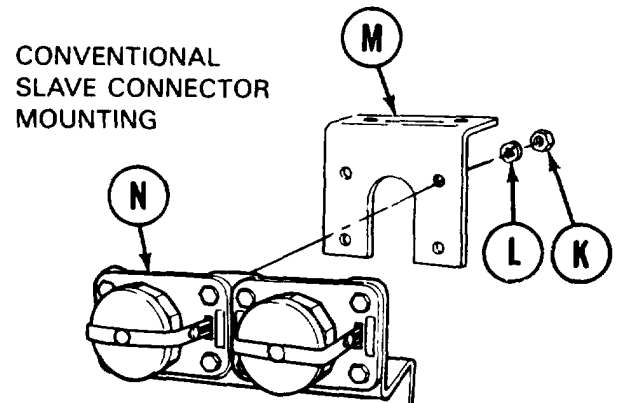
3. Using screwdriver, remove four screws (F) and lockwashers (G) securing bracket (H) to NATO slave connector mount (J). Remove bracket (H). Throw lockwashers away.

Go on to Sheet 2

TA250691

DUST DETECTOR WARNING LIGHT BOX ASSEMBLY AND BRACKET REPLACEMENT (Sheet 2 of 3)

- Using 7/16 inch wrench, remove four nuts (K) and lockwashers (L) securing bracket (M) to conventional slave connector mount (N). Remove bracket (M). Throw lockwashers away.

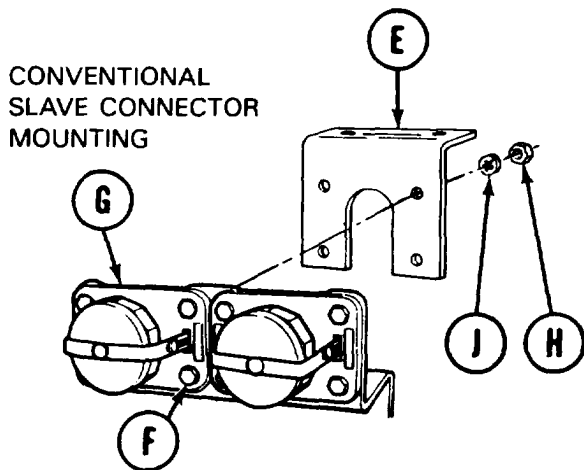
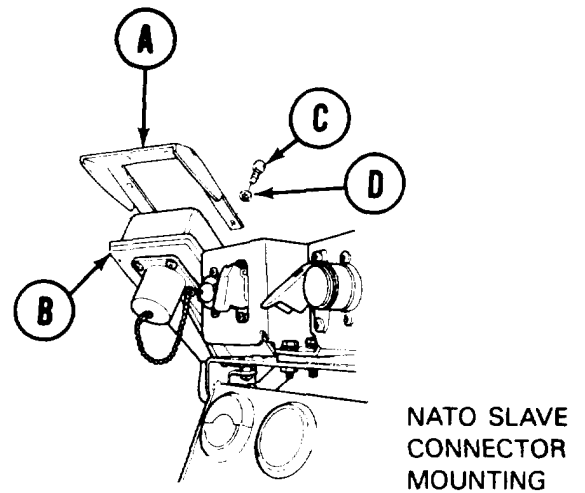


INSTALLTIONN:

NOTE

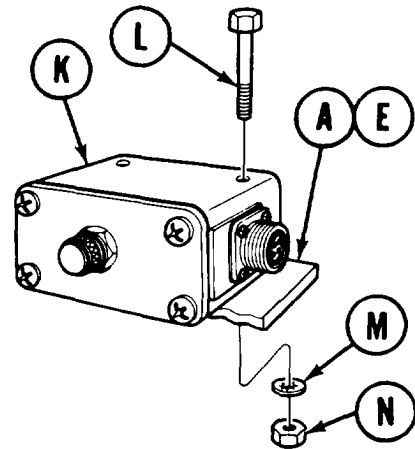
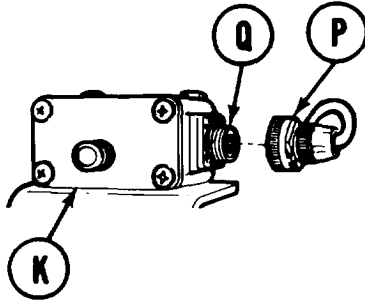
If the dust detector warning light box in your vehicle has the NATO slave connector type mounting, do step 1, and skip step 2. If you have the conventional slave connector type mounting, stab at step 2.

- Put bracket (A) in position on NATO slave connector mount (B) and secure with four screws (C) and lockwashers (D), using screw-driver.



- Position bracket (E) on mounting screw (F) at rear of conventional slave connector mount (G). Using 7/16 inch wrench, secure bracket (E) with four nuts (H) and new internal tooth lockwashers (J).

- Put dust detector warning light box (K) in position on bracket (A or E) and secure with two screws (L), new internal tooth Lock-washers (M), and nuts (N), using one 7/16 inch wrench to tighten screws (L) while holding nuts (N) with other 7/16 inch wrench.



- Connect harness connector (P) to connector (Q) on dust detector warning light box (K).

End of Task

TA250693

DUST DETECTOR OPERATIONAL TEST (Sheet 1 of 3)

TOOL: 1/2 in. combination box and open end wrench

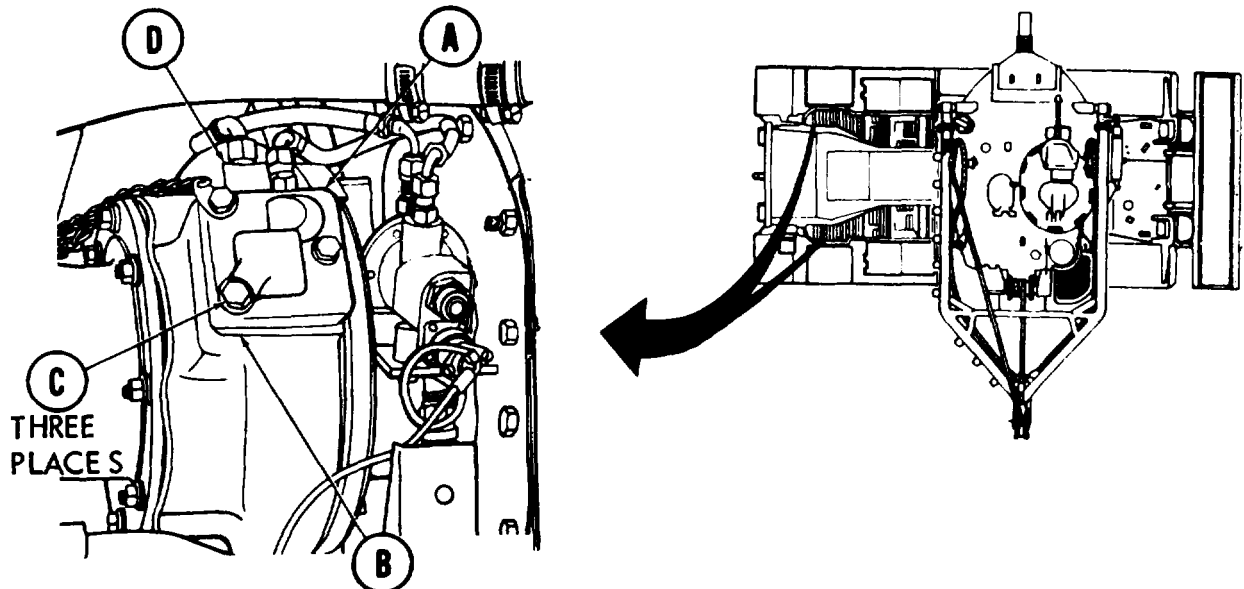
SPECIAL TOOLS: Ground hop kit (Item 30, Chapter 3, Section I) if powerplant is out of tank

REFERENCE TM 9-2350-222-10

PRELIMINARY PROCEDURE Open top deck grille doors (TM 9-2350-222-10)

NOTE

- Operational test may be performed with powerplant out of vehicle if ground hop kit has starter cable modified to accommodate improved clean air system. If powerplant is out of vehicle, connect ground hop kit according to procedure on page 5-48.
- Operational test is the same for both right and left sides.



1. Remove dust and dirt from filter strip cover (A) and compressor housing (B).
2. Using wrench, loosen three screws (C) securing filter strip cover (A) to compressor housing (B), but do not remove cover (A).
3. Insert 1-inch wide strip of nonporous material (plastic, celluloid, etc.) over filter strip (D).
4. Using wrench, tighten three screws (C).

Go on to Sheet 2

TA250648

DUST DETECTOR OPERATIONAL TEST (sheet 2 of 3)

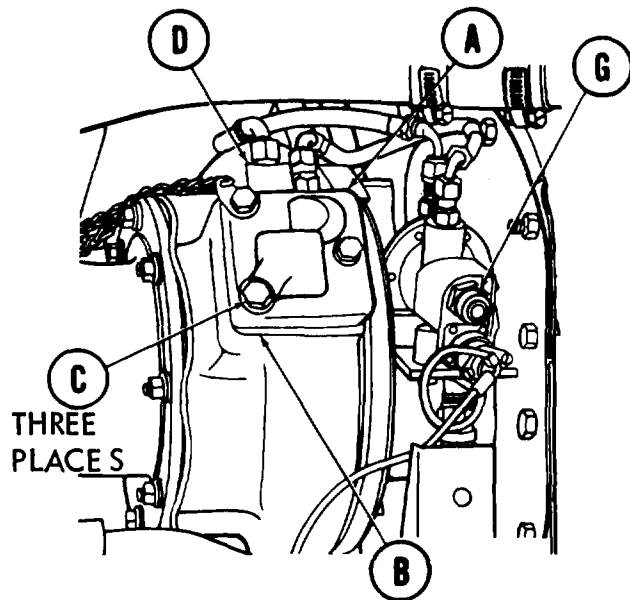
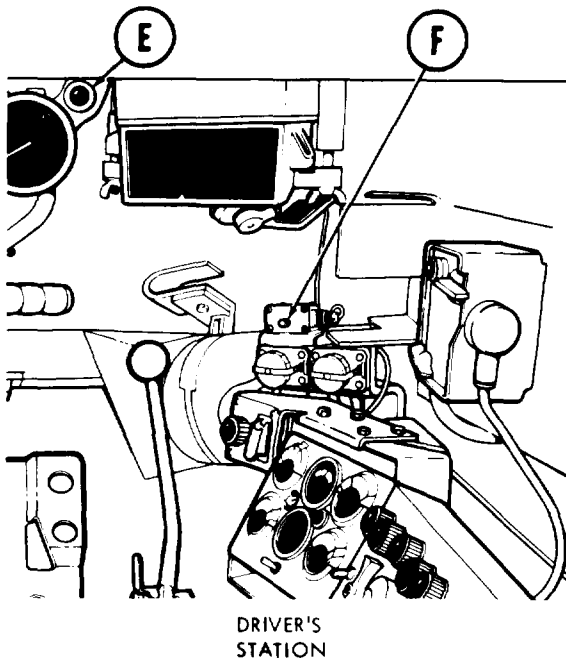
WARNING

Make sure area around vehicle is clear of personnel and equipment before performing step 5.

5. Start engine. apply vehicle brakes. Put transmission lever in high gear. Operate engine at 1800-1900 rpm for no more than 30 seconds. Observe powerplant warning light (E) and dust detector warning light (F).

- A. If powerplant and dust detector warning lights (E, F) light, system is operational; go to step 6.
- B. If powerplant and dust detector warning lights (E, F) do not light, check to see if dust detector switch (G) is tripped. A red plunger, visible through plastic cover on switch (G), indicates switch (G) has tripped. If switch (G) is tripped, go to troubleshooting symptom 17.11.

If switch (G) did not trip, repeat step 5 to verify. If switch (G) still does not trip, replace dust detector pressure switch (page 7-148 .8).



6. Stop engine.

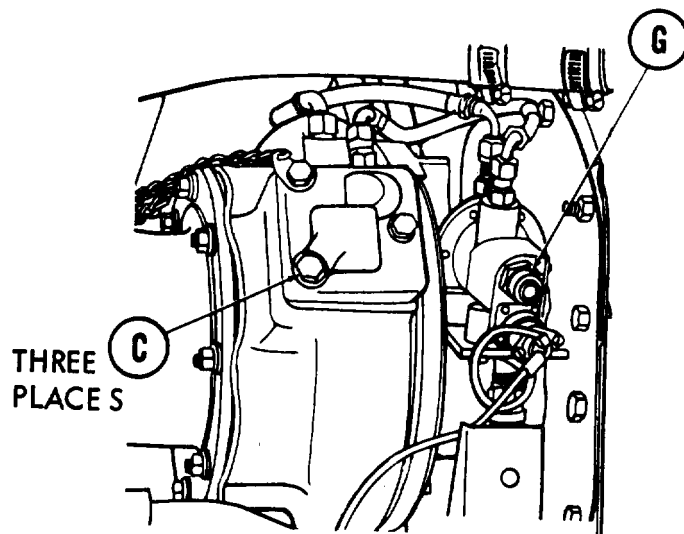
7. Using wrench, loosen three screws (C) securing filter strip cover (A) to housing (B) and remove non-porous material from filter strip (D) and cover (A).

Go on to Sheet 3

TA250649

DUST DETECTOR OPERATIONAL TEST (Sheet 3 of 3)

8. Using wrench, tighten three screws (C).
9. Press plunger to reset pressure switch (G).
10. Close top deck grille doors (TM 9-2350-222-10).



End of Task

TA250650

DRIVER-TO-TURRET INTERPHONE CABLE ASSEMBLY REPLACEMENT (Sheet 1 of 5)

PROCEDURE INDEX

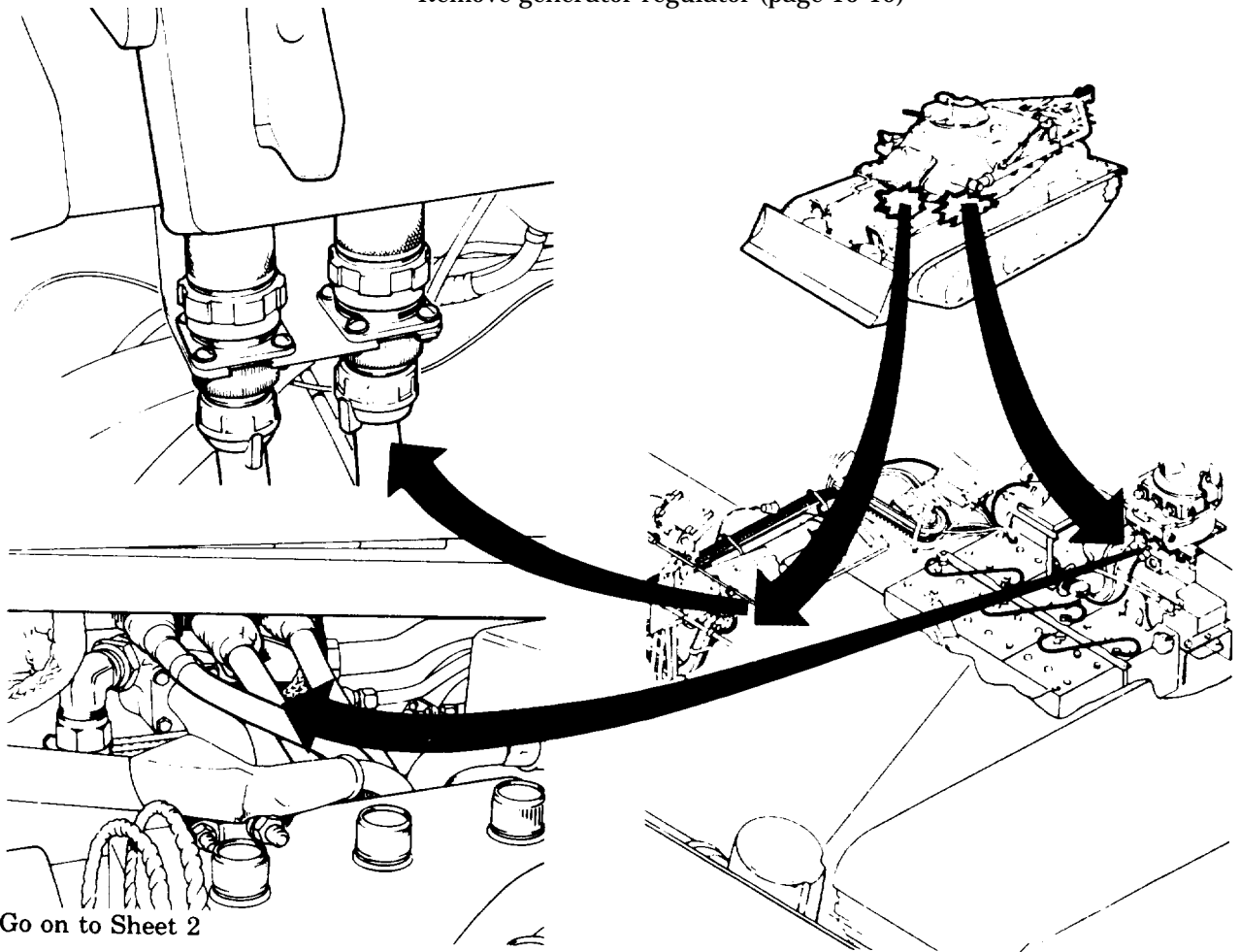
PROCEDURE	PAGE
Removal	10-352
Installation	10-354

TOOLS: Flat-tip screwdriver
 Ratchet with 1/2 in. drive
 7/16 in. socket with 1/2 in. drive
 5 in. extension with 1/2 in. drive
 Spanner wrench

SUPPLIES: Lockwashers (MS35338-42) (4 required)

REFERENCE: TM 9-2350-222-10

PRELIMINARY PROCEDURE: Set MASTER BATTERY switch to OFF (TM 9-2350-222-10)
 Traverse turret for access to slipring (TM 9-2350-222-10)
 Remove generator regulator (page 10-19)



Go on to Sheet 2

TA253339

Change 1 10-351

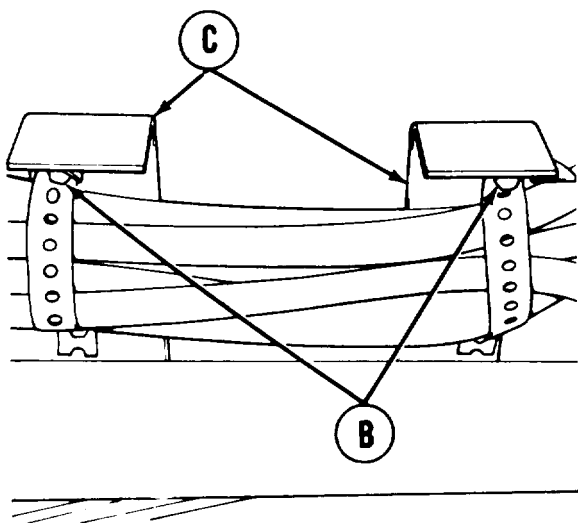
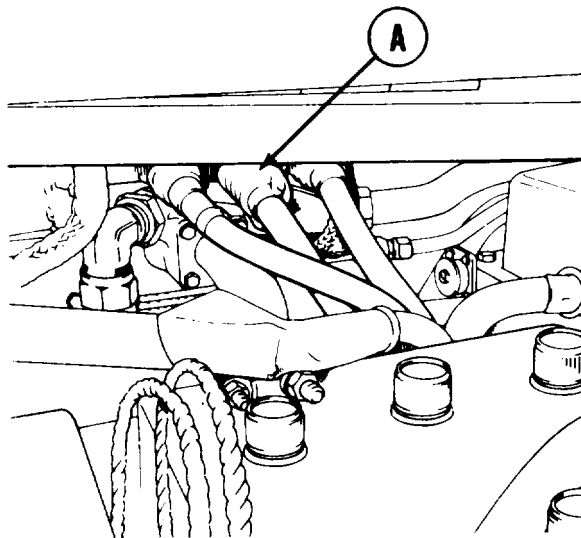
DRIVER-TO-TURRET INTERPHONE CABLE ASSEMBLY REPLACEMENT (Sheet 2 of 5)

REMOVAL:

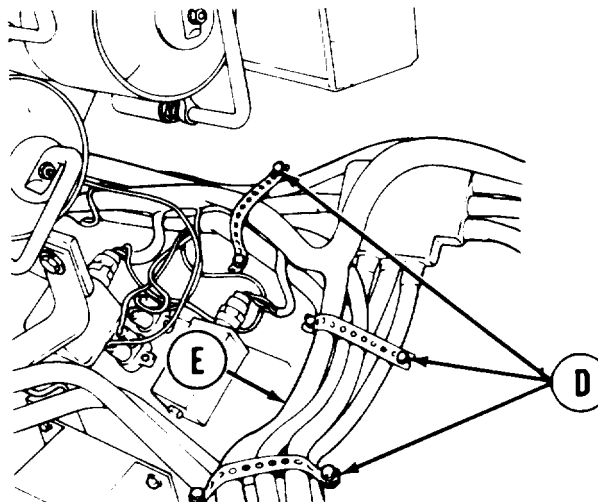
NOTE

Traverse turret as required to remove cable assembly.

1. Using spanner wrench, loosen connector (A) from slipping.
2. Manually remove connector (A) from slipping.



3. Using socket, remove two screws (B) from brackets (C). Move cable to top of brackets (c).

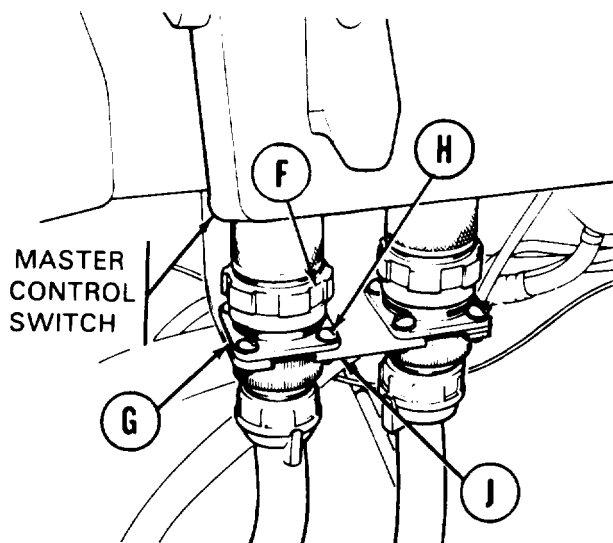


4. Using socket, remove three screws (D). Displace cable from harness assembly (E).

Go on to Sheet 3

TA139903

DRIVER-TO-TURRET INTER PHONE CABLE ASSEMBLY REPLACEMENT (Sheet 3 of 5)

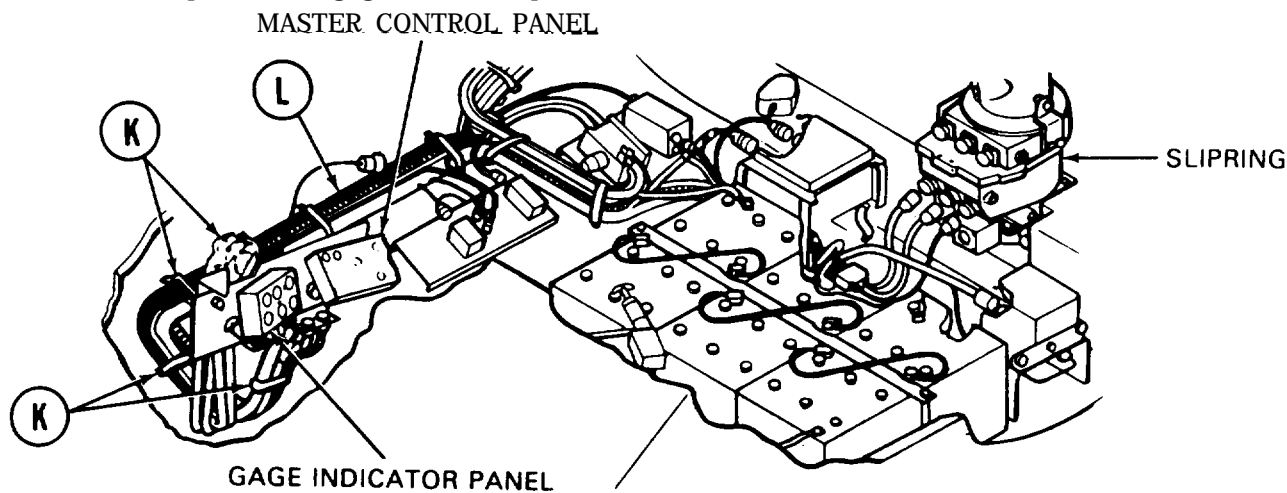


5. Using spanner wrench, loosen connector (F) from connector (G).
6. Manually remove connector (F) from connector (G).
7. Using screwdriver, remove four screws (H) and washers. Throw lockwashers away,

8. Manually remove connector (G) from bracket (J) by lifting up and pulling out.

NOTE

Four cable straps (K) are reached from under master control panel and gage indicator panel.



9. Using socket, remove one screw from each of four straps (K).
10. Remove cable assembly (L) from installed position and from vehicle,

Go on to Sheet 4

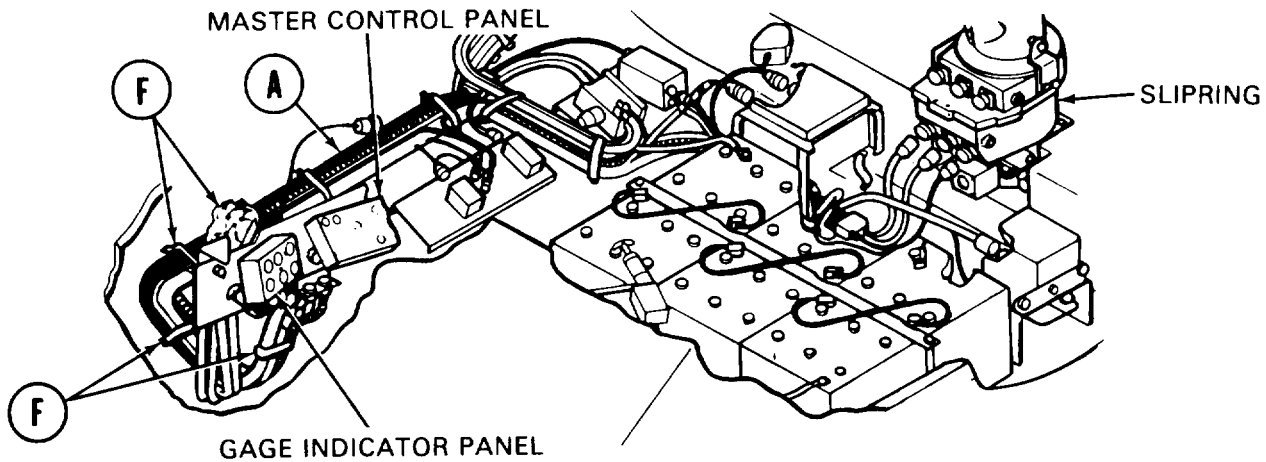
TA253446

INSTALLATION:

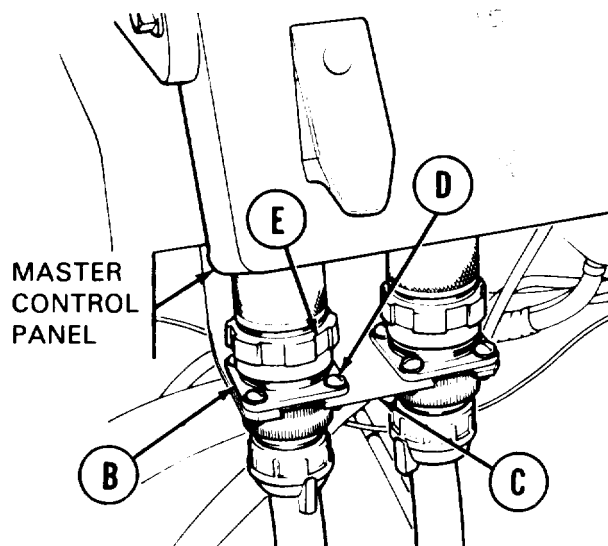
NOTE

Traverse turret as required to install cable assembly (A).

1. Position new cable assembly (A) into vehicle.



2. Position connector (B) into bracket (C).
3. Using screwdriver, install four screws and new lockwashers (D).
4. Manually start connector (E) onto connector (B).
5. Using spanner wrench, install connector (E) to connector (B).



NOTE

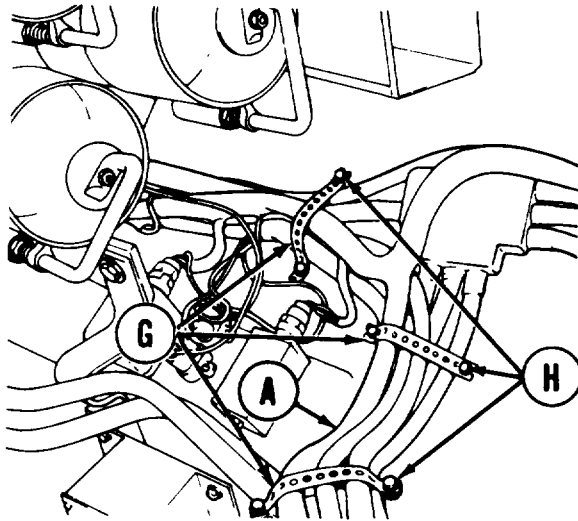
Four cable straps (F) are reached from under master control panel and gage indicator panel.

6. Positioning new cable assembly (A) under four straps (F), use socket to install one screw through each of the four straps (F).

Go on to Sheet 5

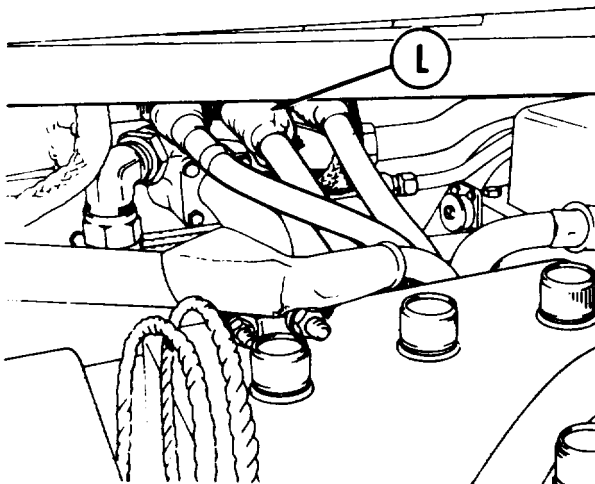
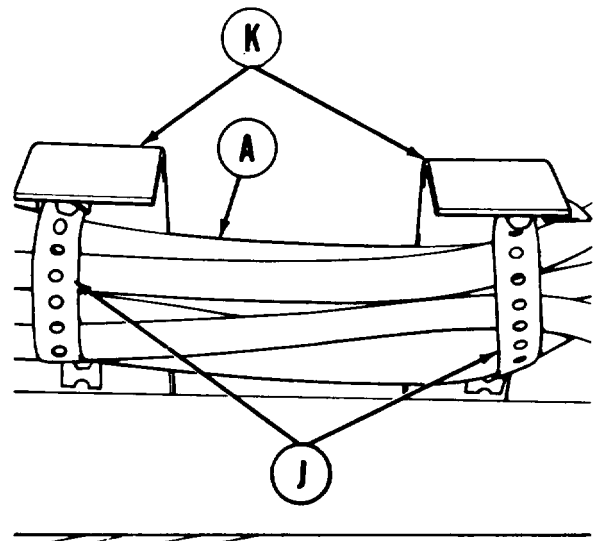
TA253447

DRIVER-TO-TURRET INTERPHONE CABLE ASSEMBLY REPLACEMENT (Sheet 5 of 5)



7. Positioning new cable assembly (A) under three straps (G), use socket to install one screw (H) through each of the three straps (9)

8. Positioning new cable assembly (A) behind two straps (J), use socket to install one screw (K) through both straps (J).



9. Manually start connector (L) onto slipping.
10. Using spanner wrench, tighten connector (L).

11. Install generator regulator (page 10-21).
12. Close turret platform access door (TM 9-2350-222-10).

End of Task

TA139906

TM 9-2350-222-20-1-4

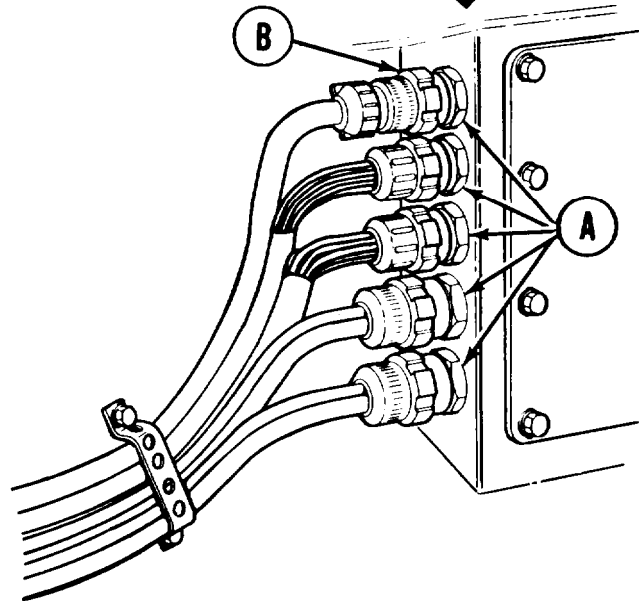
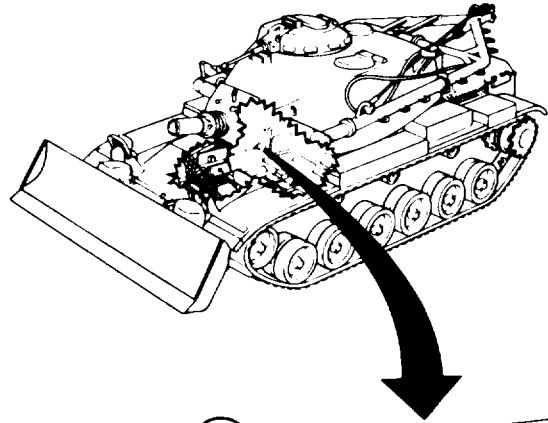
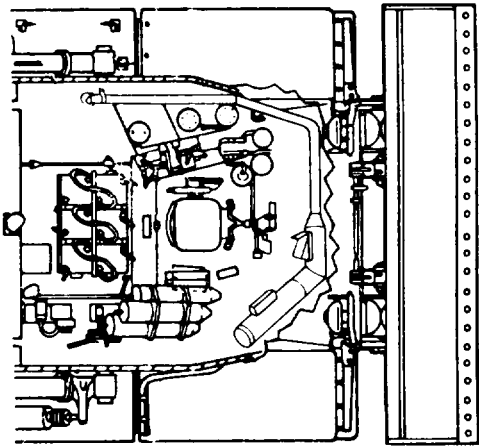
FRONT INTERPHONE CABLE ASSEMBLY REPLACEMENT (Sheet 1 of 3)

TOOLS: 7/16 in. socket with 1/2 in. drive
Cross-tip screwdriver
Spanner wrench
Ratchet with 1/2 in. drive
5 in. extension with 1/2 in. drive

SUPPLIES: Lockwasher (MS35335-33) (7 required)
Lockwasher (MS35338-42) (4 required)

REFERENCE: TM 9-2350-222-10

PRELIMINARY PROCEDURE: Remove interphone connectors from interphone cables
(page 10-353, step 6)



REMOVAL:

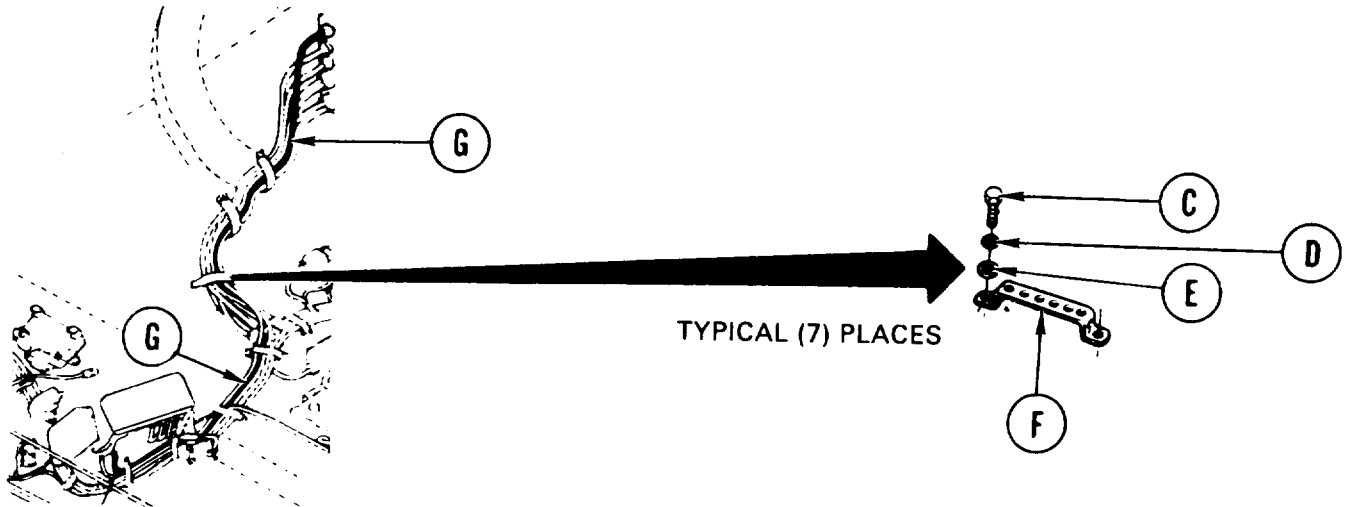
1. Traverse turret to expose five bulkhead connectors (A).
2. Using spanner wrench, remove top connector (B).

Go on to Sheet 2

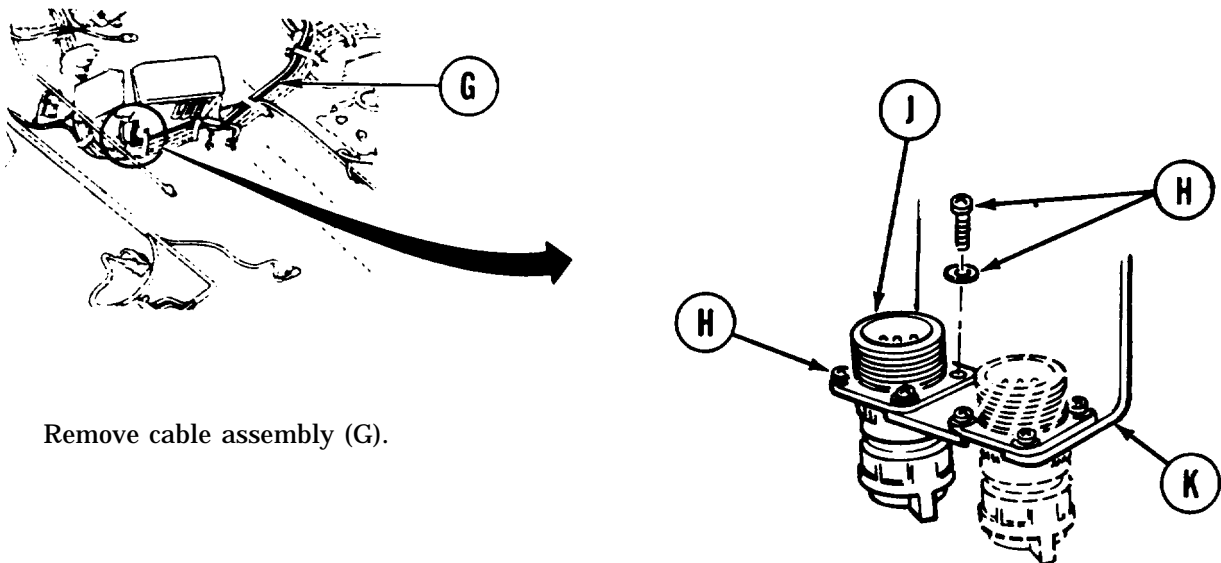
TA139907

FRONT INTERPHONE CABLE ASSEMBLY REPLACEMENT (Sheet 2 of 3)

3. Using wrench, remove seven screws (C), lockwashers (D), and flat washers (E) securing one side of seven straps (F) to hull. Throw lockwashers away.



4. Free cable assembly (G) from seven straps (F).
5. Using screwdriver, remove four screws and lockwashers (H) securing receptacle (J) to plate assembly (K). Throw lockwashers away.



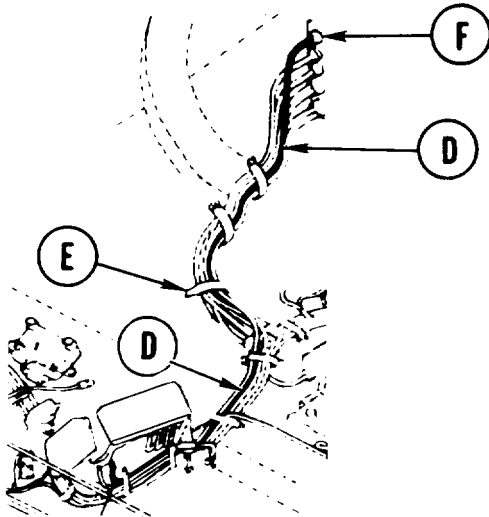
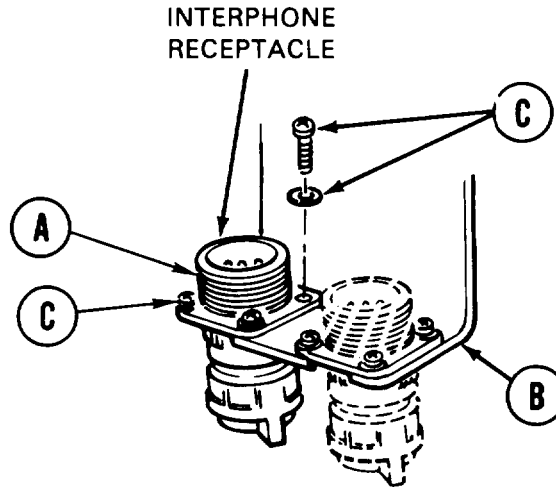
6. Remove cable assembly (G).

Go onto Sheet 3

TA139908

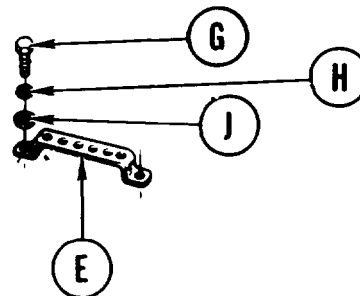
INSTALLATION:

1. Place receptacle (A) in position on plate assembly (B).
2. Using screwdriver, install four screws and new lockwashers (C) securing receptacle (A) to plate assembly (B).



3. Place cable assembly (D) in position inside seven clamps (E).
4. Using spanner wrench, connect electrical connector (F).

5. Using socket, install seven screws (G), new lockwashers (H), and flat washers (J) securing seven straps (E) to hull.
6. Connect interphone connectors to interphone cables (page 10-354, steps 2 thru 5).
7. Perform functional test of interphone cable assembly (TM 9-2350-222-10).



End of Task

TA139909

PROCEDURE INDEX

PROCEDURE	PAGE
Removal	10-364
Installation	10-366

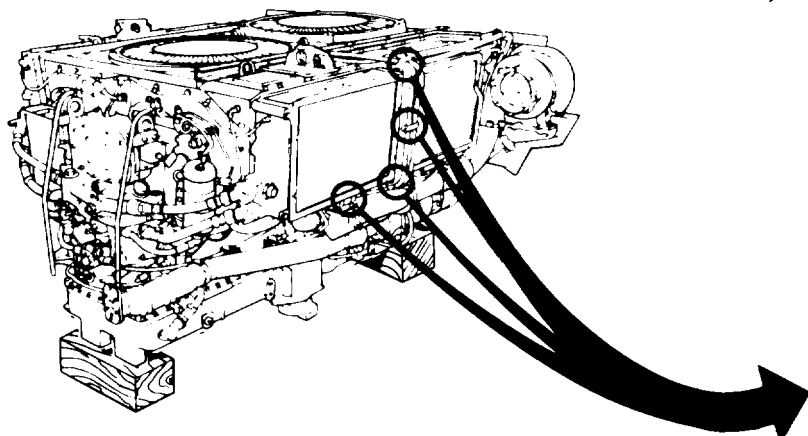
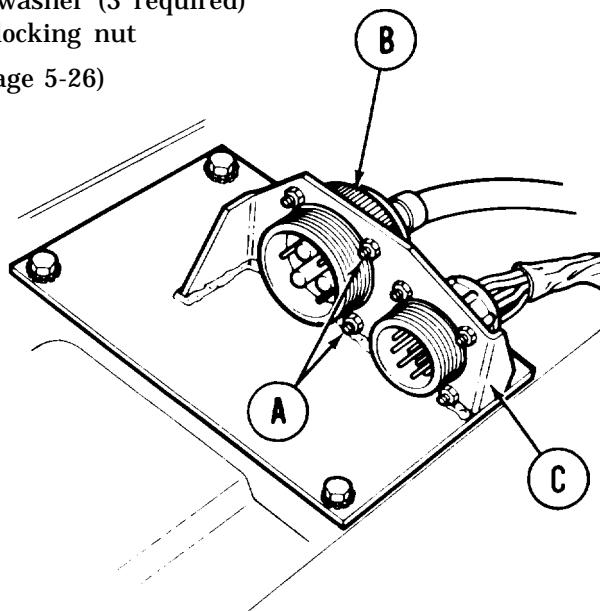
TOOLS: Flat-tip screwdriver
 3/8 in. combination box and open end wrench
 9/16 in. combination box and open end wrench
 7/16 in. socket with 1/2 in. drive
 Ratchet with 1/2 in. drive
 5 in. extension with 1/2 in. drive
 1/2 in. socket with 1/2 in. drive
 9/16 in. socket with 1/2 in. drive
 Pocketknife

SUPPLIES: Lockwasher (4 required)
 Lockwasher
 Lockwasher (3 required)
 Lockwasher (4 required)
 Lockwasher (3 required)
 Self-locking nut

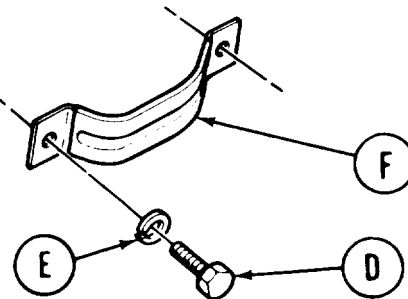
PRELIMINARY PROCEDURE: Remove powerplant (page 5-26)

REMOVAL:

- Using flat-tip screwdriver and 3/8 inch wrench, remove four screws, lockwashers, and nuts (A). Throw lockwashers away.
- Remove electrical lead (B) from mounting bracket (C).



- Using 7/16 inch socket, remove eight screws (D) and lockwasher (E) securing four clamps (F). Throw lockwashers away.
- Remove four clamps (F) from engine.

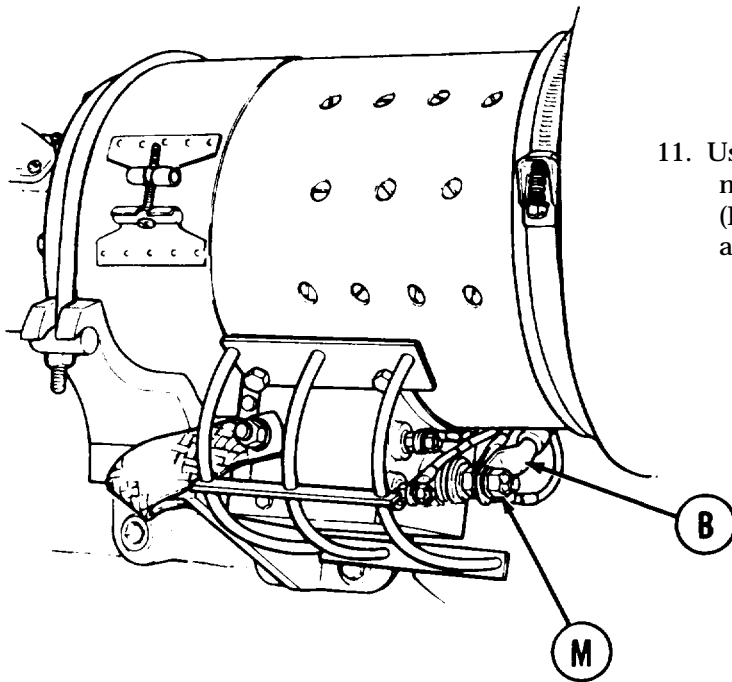
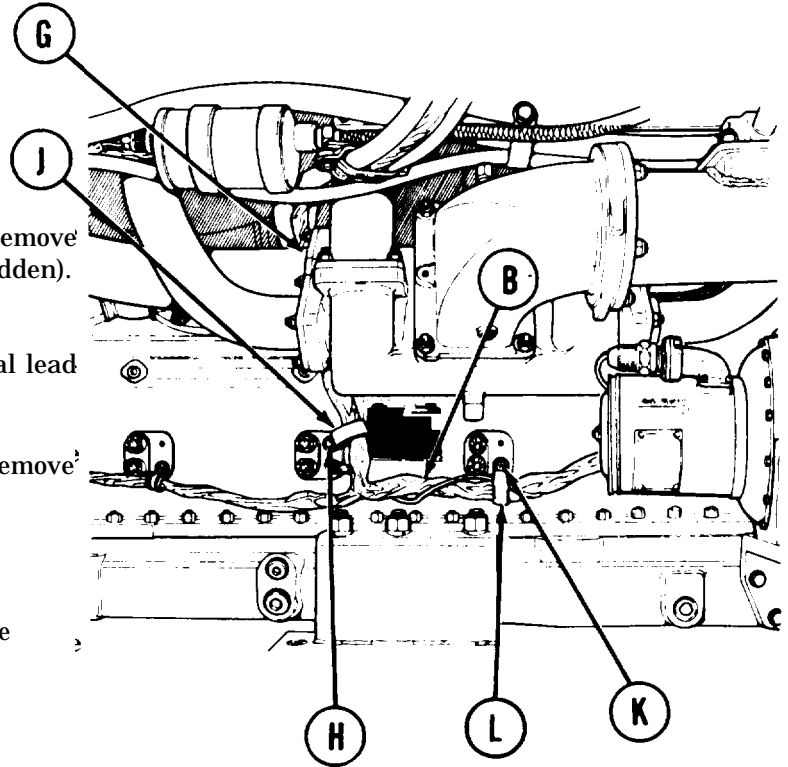


Go on to Sheet 2

All data on pages 10-359 thru 10-363 deleted.

GENERAL ELECTRICAL LEADS REPLACEMENT (2D ENGINE) (Sheet 2 of 4)

- (HIDDEN) G
5. Using 1/2 inch socket with extension, remove screw and lockwasher from clamp (G-hidden). Throw lockwasher away.
 6. Remove clamp (G-hidden) from electrical lead (B).
 7. using 1/2 inch socket with extension, remove screw and lockwasher (H) from clamp (J).
 8. Remove clamp (J) from electrical lead (B).
 9. Using 1/2 inch socket with extension, remove screw and lockwasher (K) from clamp (L).
 10. Remove clamp (L) from electrical lead (B).



11. Using 9/16 inch wrench, remove self-locking nut and washer (M) securing electrical lead (B) to generator. Throw self-locking nut away.

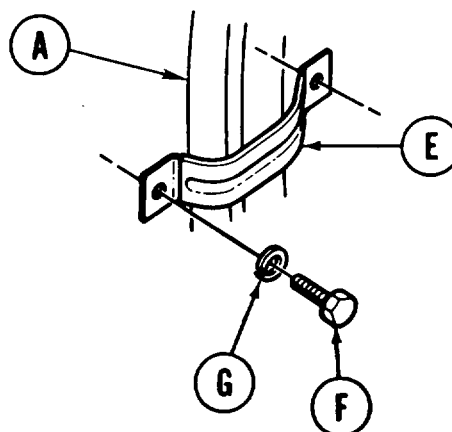
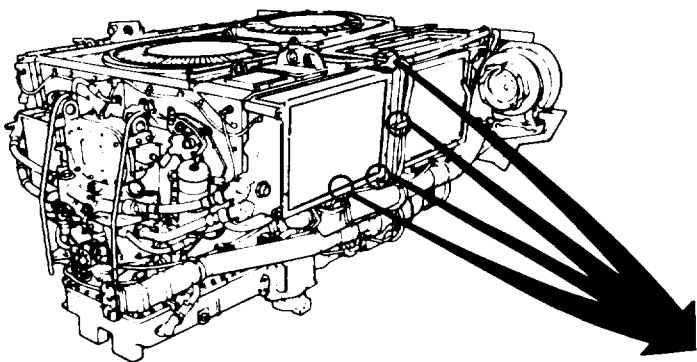
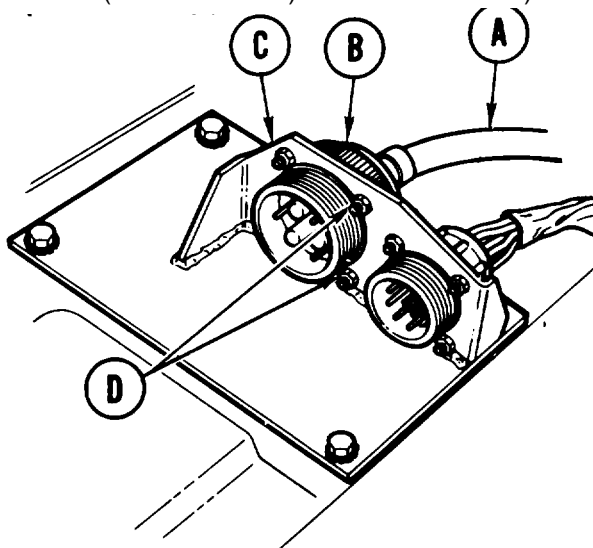
Remove electrical lead (B) from powerplant.

Go on to Sheet 3

TA139916

INSTALLATION:

1. Position electrical lead (A) on powerplant,
2. Position electrical connector (B) in engine disconnect bracket (C).
3. Using screwdriver and 3/8 inch wrench, install four screws, new lockwashers, and nuts (D).



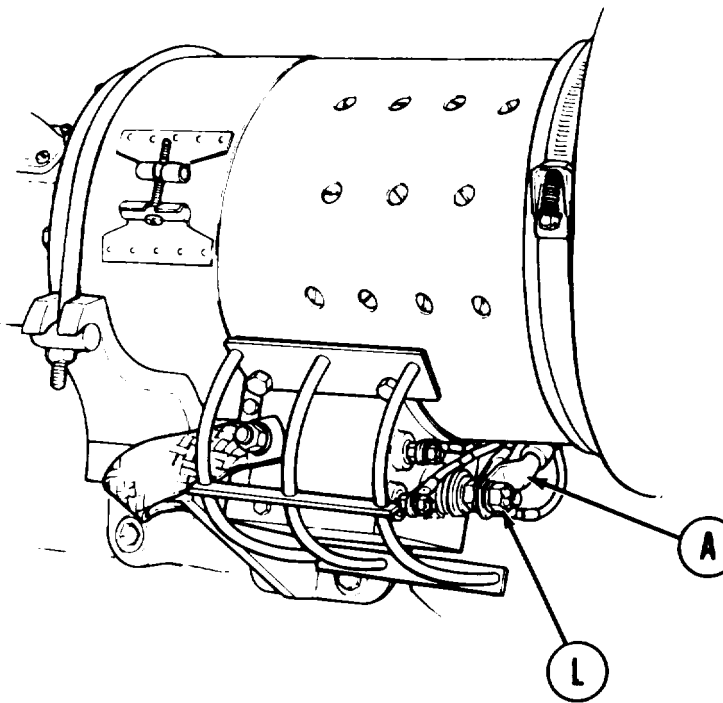
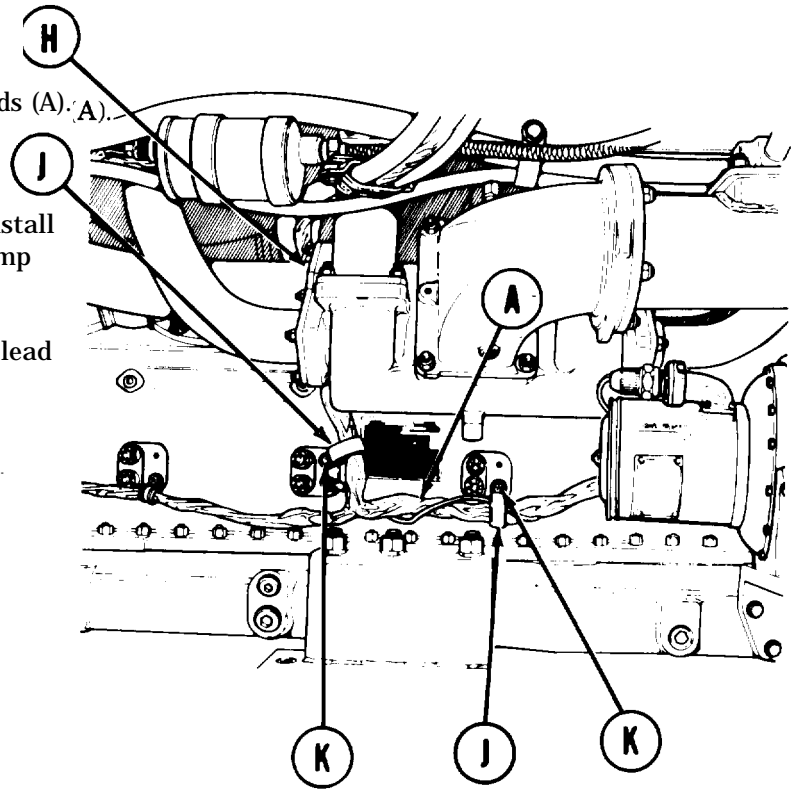
4. Place four clamps (E) over electrical leads (A).
5. Using 7/16 inch socket, install eight screws (F) and new lockwashers (G).

Go on to Sheet 4

TA139917

GENERAL ELECTRICAL LEADS REPLACEMENT (2D ENGINE) (Sheet 4 of 4)

6. place clamp (H-hidden) over electrical Leads (A).
7. Using 1/2 inch socket with extension, install screw and new lockwasher to secure clamp (H-hidden).
8. Position two clamps (J) around electrical lead (A).
9. Using 1/2 inch socket with extension, install two screws and new lockwashers (K) securing clamps (J) to engine.



10. Position electrical lead (A) and any other lead that may have been removed onto generator stud.
11. Using 9/16 inch wrench, install new self-locking nut and washer (L) to secure electrical lead (A).
12. Install powerplant (page 5-37),

End of Task

TA139918

All data on pages 10-368 thru 10-371 deleted.

Change 5 10-367

PROCEDURE INDEX

PROCEDURE	PAGE
Removal	10-373
Installation	10-374

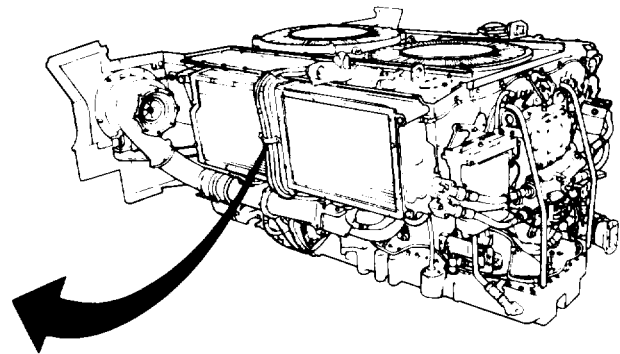
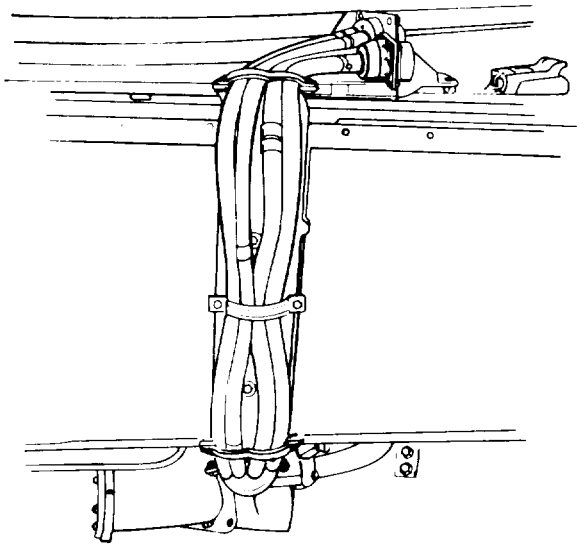
TOOLS: Ratchet with 1/2 in. drive
1/2 in. socket with 1/2 in. drive
5 in. extension with 1/2 in. drive
7/16 in. socket with 1/2 in. drive
3/4 in. combination box and open end wrench
3/8 in. combination box and open end wrench
Diagonal cutting pliers
Flat-tip screwdriver

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

SUPPLIES: Glyptol (Item 38, Appendix D)
Cable ties
Lockwashers (MS35338-43 (4 required)
Lockwasher (MS35338-44) (8 required)
Lockwasher (MS35338-45) (2 required)

REFERENCE: TM 9-2350-222-10

PRELIMINARY PROCEDURE: Remove powerplant (page 5-26)



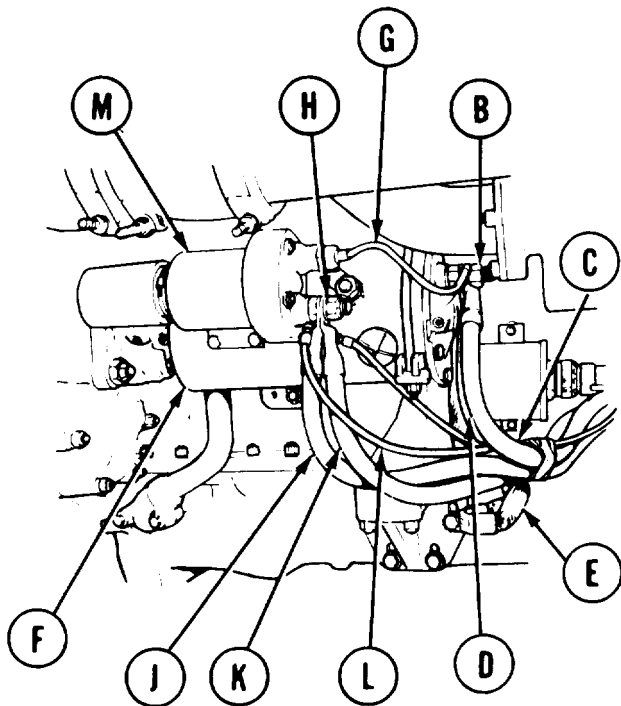
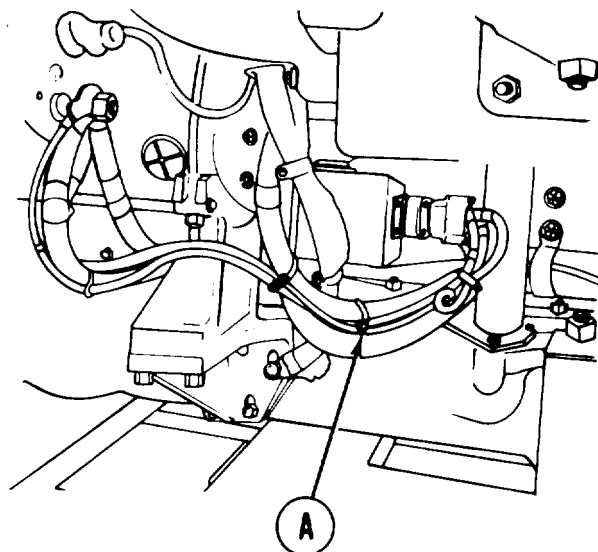
Go on to Sheet 2

TA139923

ENGINE STARTER WIRING HARNESS REPLACEMENT (2D ENGINE) (Sheet 2 of 6)

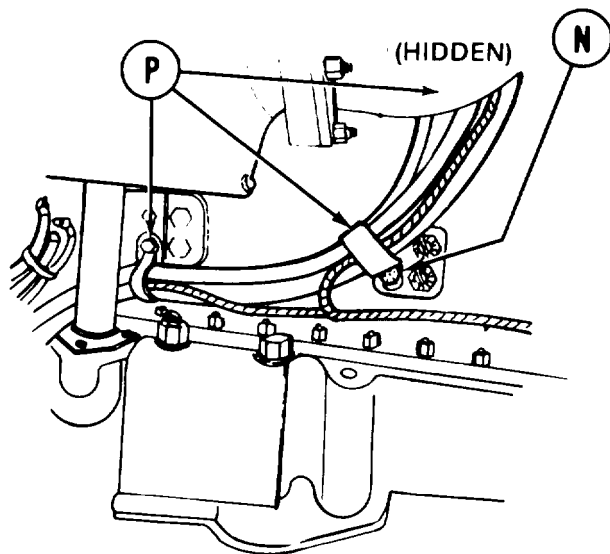
REMOVAL:

- Using cutting pliers, cut all cable ties (A).



- Using 3/4 inch wrench, remove nut and lockwasher (B). Remove heavy cables (C) and (D) and ground strap (E) from starter (F). Do not remove small cable (G). Throw lockwasher away.
- Using 3/4 inch wrench, remove nut and lockwasher (H). Remove heavy cables (J) and (K) and light cable (L) from solenoid relay (M). Throw lockwasher away.

- Using 1/2 inch socket, remove screws and lockwashers (N) from cable clamps (P); throw lockwashers away. Remove cable clamps.



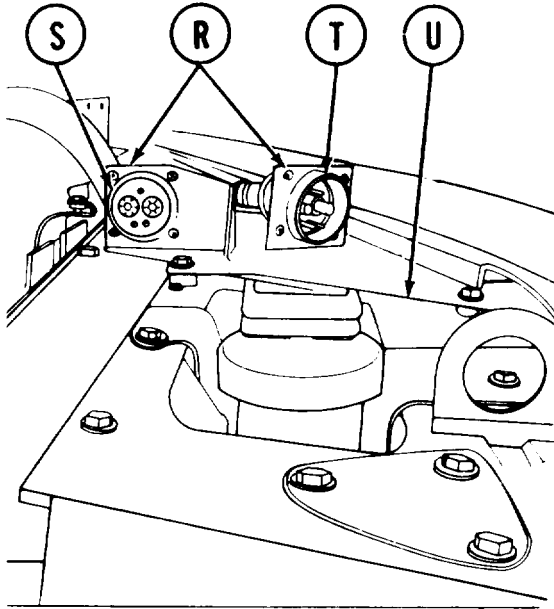
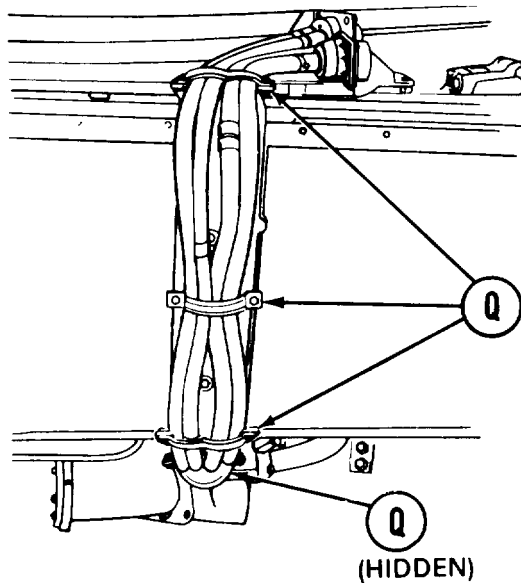
Go on to Sheet 3

TA139924

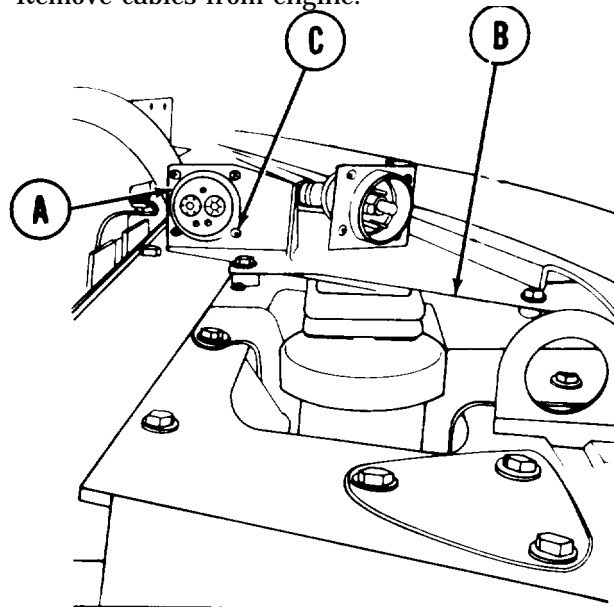
ENGINE STARTER WIRING HARNESS REPLACEMENT (2D ENGINE)

(Sheet 3 of 6)

- Using 7/16 inch socket, remove eight screws, eight lockwashers, and four clamps (Q). Throw lockwashers away.



- Using screwdriver and 3/8 inch wrench, remove eight screws, lockwashers, and nuts (R). Throw lockwashers away. Remove electrical connectors (S) and (T) from connector bracket (U).
- Remove cables from engine.



INSTALLATION:

NOTE

Note position. Two small holes go on bottom.

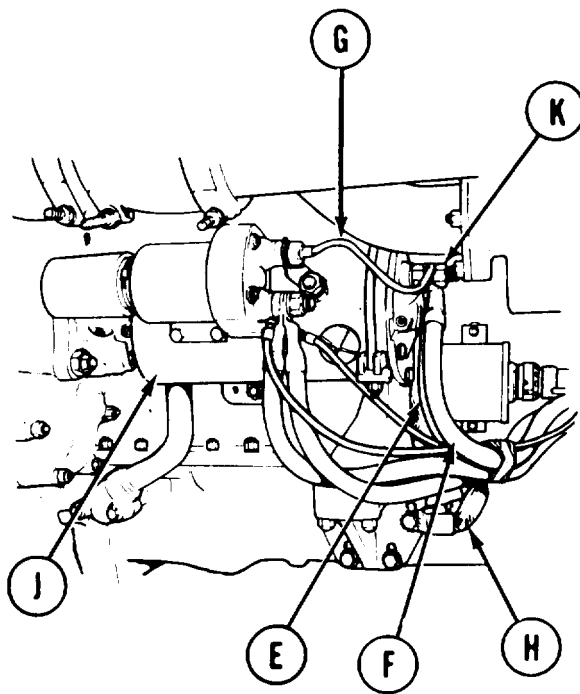
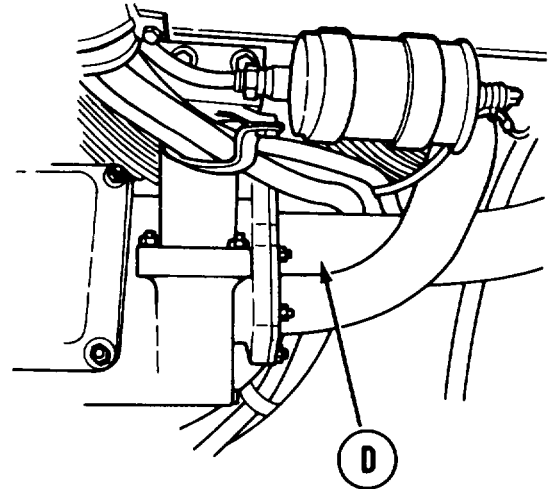
- Using screwdriver and 3/8 inch wrench, secure female connector (A) to bracket (B) with four screws, new lockwashers, and nuts (C).

Go on to Sheet 7

TA139925

ENGINE STARTER WIRING HARNESS REPLACEMENT (2D ENGINE) (Sheet 4 of 6)

2. Feed female connector cables between exhaust manifold (D) and engine.

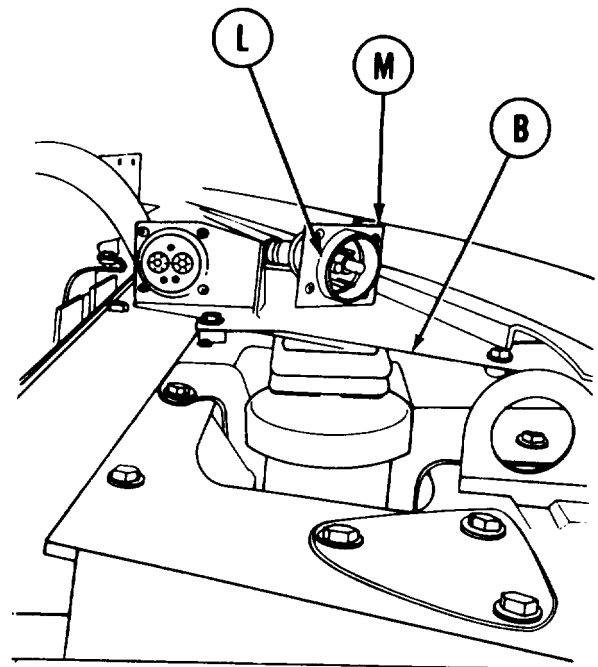


3. Using 3/4 inch wrench, secure female connector cables (E) and (F), light cable (G), and ground cables (H) to starter (J) with nut and new lockwasher (K).

NOTE

Note position. Single male prong goes on top.

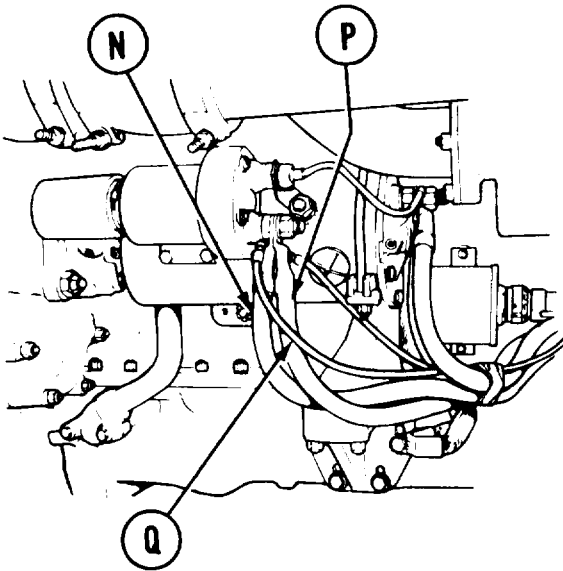
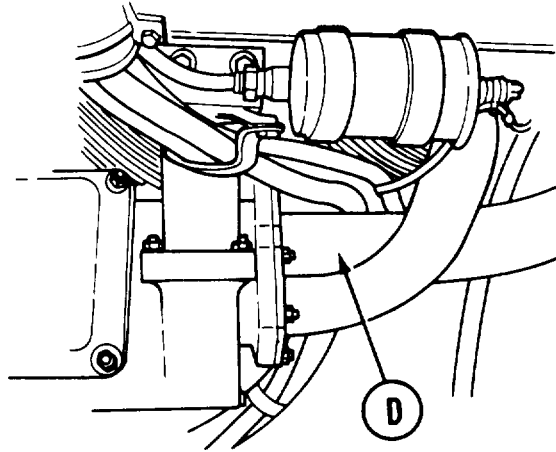
4. Using screwdriver and 3/8 inch wrench, secure male connector (L) to bracket (B) with four screws, new lockwashers, and nuts (M).



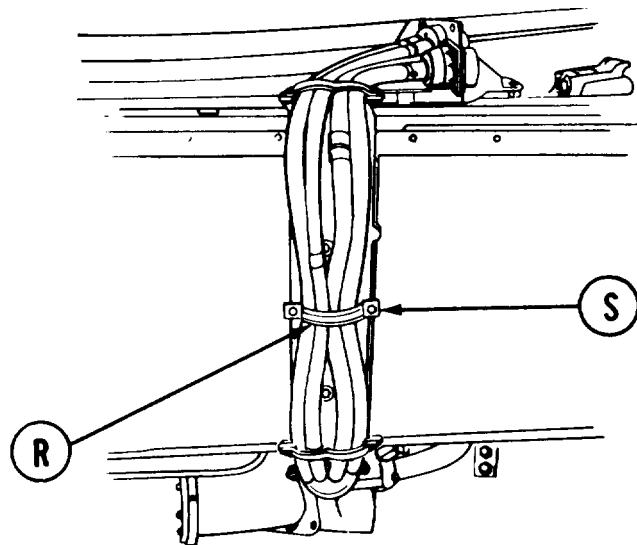
Go on to Sheet 5

TA139926

5. Feed male connector cables between exhaust manifold (D) and engine.



6. Using 3/4 inch wrench, secure male connector cables (N) and (P) and light cable (Q) with new lockwasher and nut.



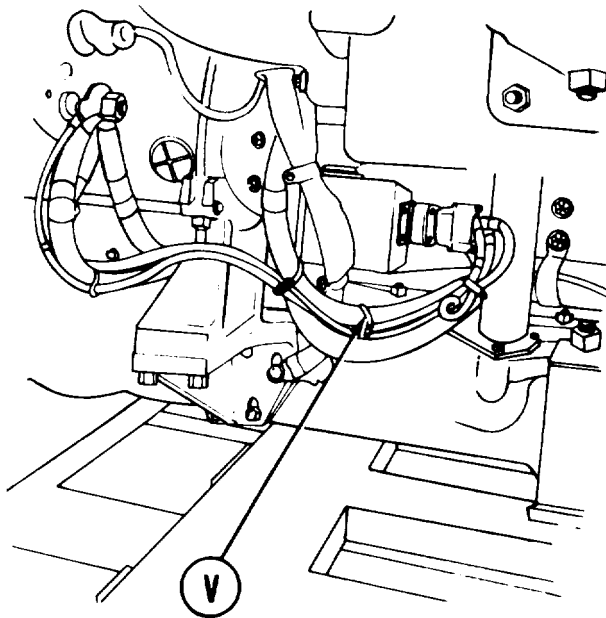
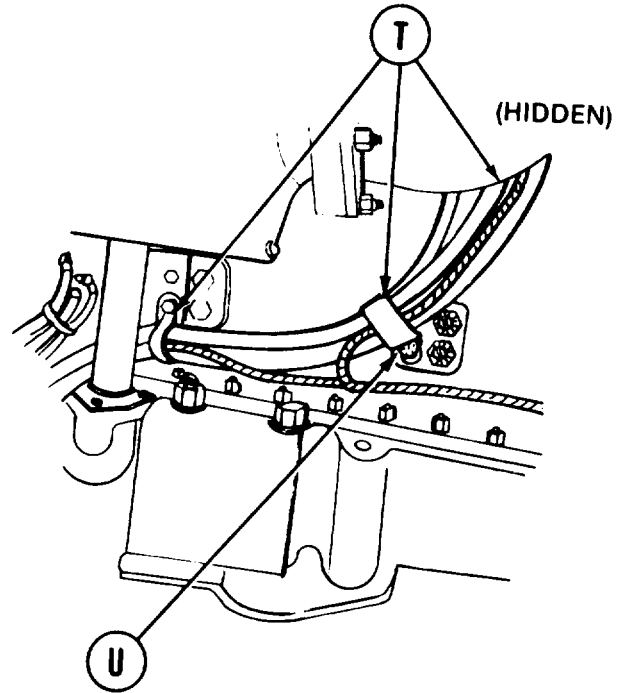
7. Using 7/16 inch socket, secure cables with four clamps (R) and eight new lockwashers and screws (S).

Go on to Sheet 6

TA139927

ENGINE STARTER WIRING HARNESS REPLACEMENT (2D ENGINE) (Sheet 6 of 6)

8. Using 1/2 inch socket, extension and ratchet secure cable clamps (T) with screws (U).
9. Secure cables with cable ties (V).
10. Connect powerplant for ground hop (page 5-48).
11. Start engine (TM 9-2350-222-10).
12. Stop engine (TM 9-2350-222-10).



13. Coat all exposed terminal fittings with glyptol (Item 38, Appendix D).
14. Disconnect powerplant from test set-up (page 5-62).
15. Install powerplant (page 5-37).

End of Task

TRANSMISSION WIRING HARNESS REPLACEMENT (Sheet 1 of 7)
 PROCEDURE INDEX

PROCEDURE	PAGE
Removal	10-378
Installation	10-361

TOOLS: 3/4 in. combination box and open end wrench
 7/16 in. combination box and open end wrench (2 required)
 Slip joint pliers
 9 /16-in. socket with 1/2 in. drive
 Ratchet with 1/2 in. drive
 Flat-tip screwdriver
 Spanner wrench
 3/4 in. socket with 1/2 in. drive

SUPPLIES: Identification tags
 Grommet (11662707)
 Lockwasher (MS35338-44)

PRELIMINARY PROCEDURE: Remove powerplant (page 5-1)

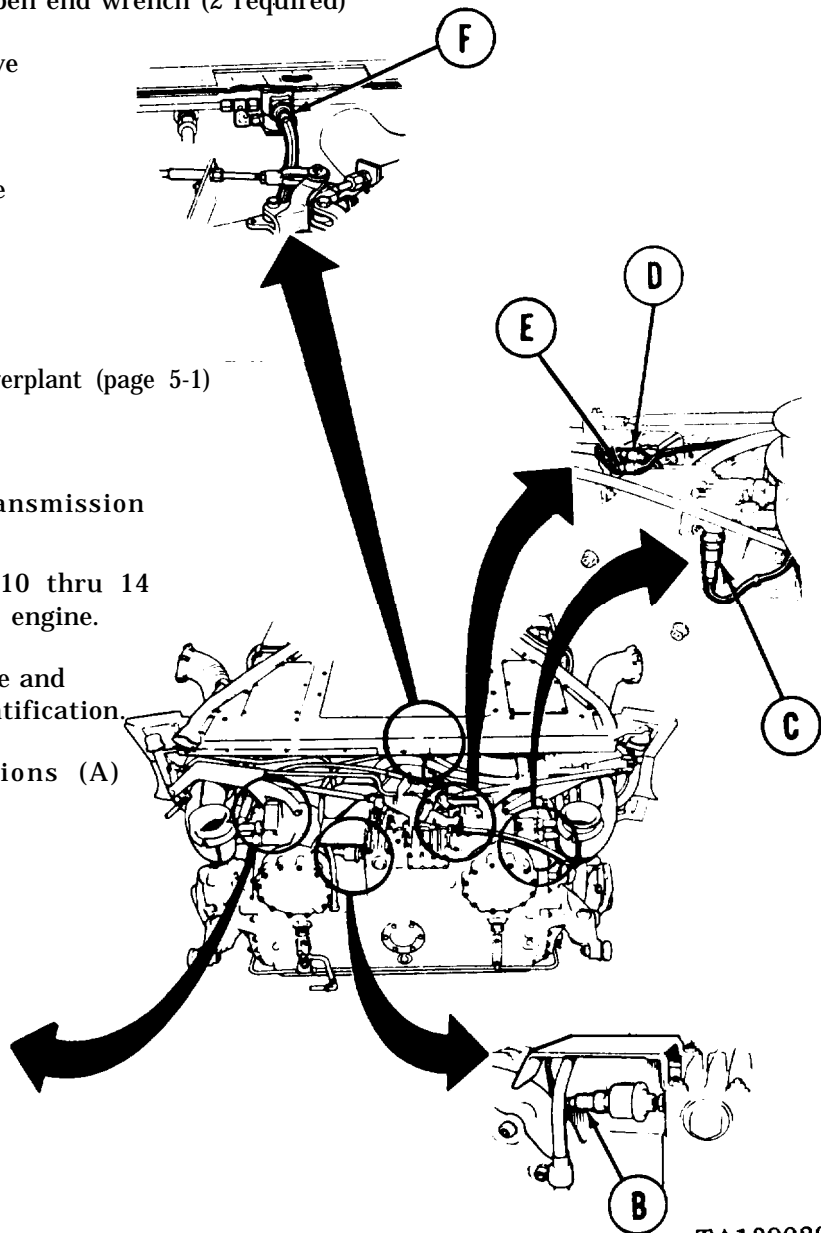
REMOVAL:

NOTE

Perform steps 1 thru 9 if transmission is mated to a 2D engine.

perform steps 1, 2, and 3, and 10 thru 14 if transmission is mated to a 2A engine.

1. Locate and tag six connections (male and female) (A) through (F) for identification.
2. Using hands, unplug connections (A) (E).
3. Using pliers, disconnect connector (F).

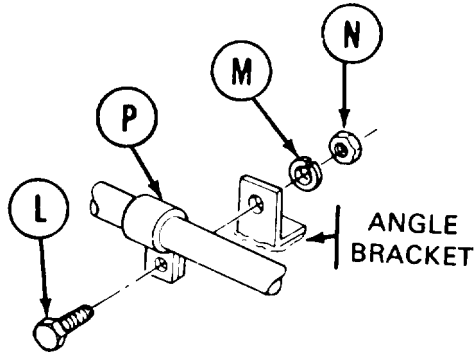
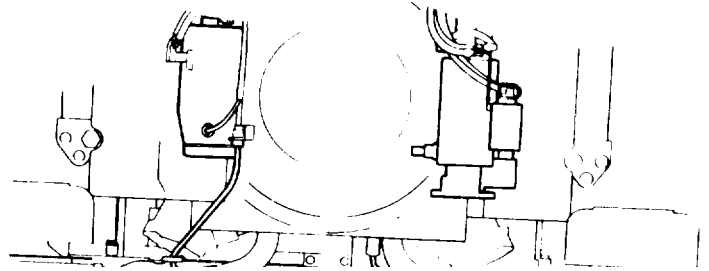


Go on to Sheet 2

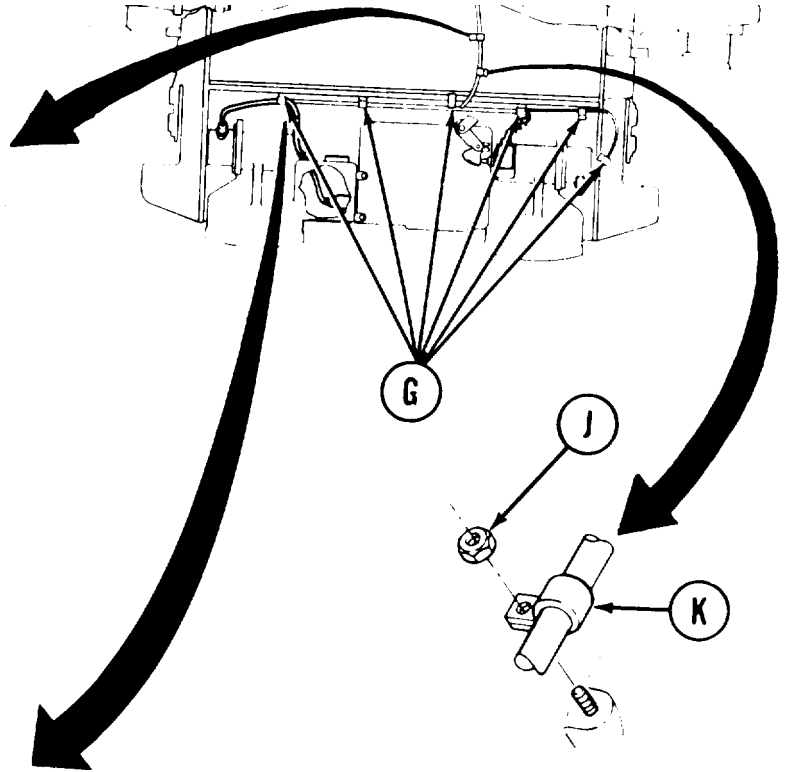
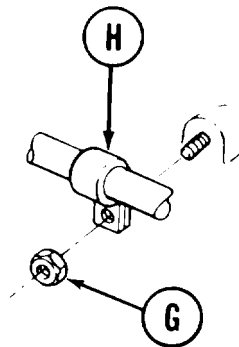
TA139929

TRANSMISSION WIRING HARNESS REPLACEMENT (Sheet 2 of 7)

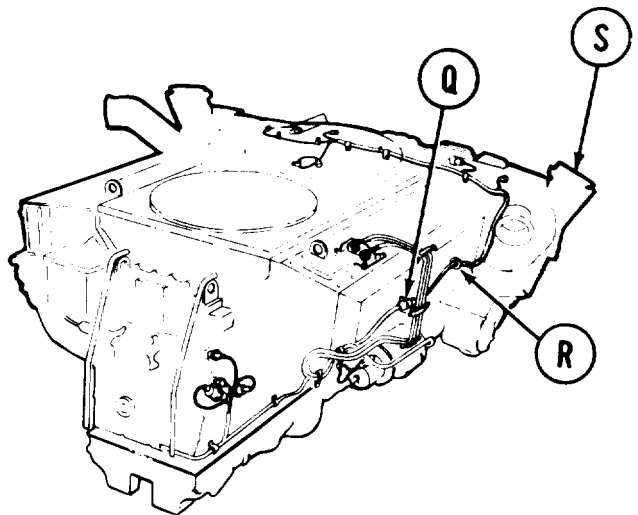
4. Using 3/4 inch wrench, remove six nuts (G) and clamps (H) securing wiring harness to transmission.
5. Using socket, remove nut (J) and clamp (K).
6. Using two 7/16 inch wrenches, remove screw (L), lockwasher (M), nut (N), and clamp (P).



7. Using spanner wrench, disconnect wiring harness connector (Q).

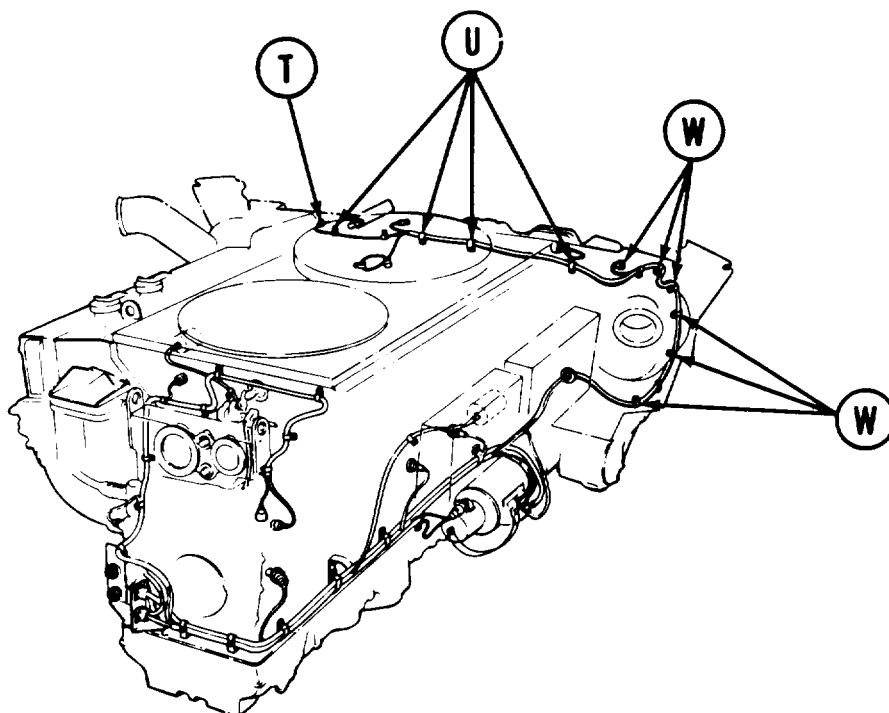


8. Using screwdriver, remove grommet (R) from rear engine shroud (S). Throw grommet away.
9. Pull wiring harness connector (Q) through shroud (S) and remove wiring harness from transmission.



Go on to Sheet 3

TA139930



10. Using 3/4 inch socket, remove nut securing clamp (T).
11. Using 3/4 inch wrench, remove nuts securing clamp (U).
12. Using 7/16 inch wrench, remove screw securing clamp (V).
13. Using 3/4 inch socket, remove nuts securing clamps (W).
14. Remove wiring harness from transmission and position aside.

Go on to Sheet 4

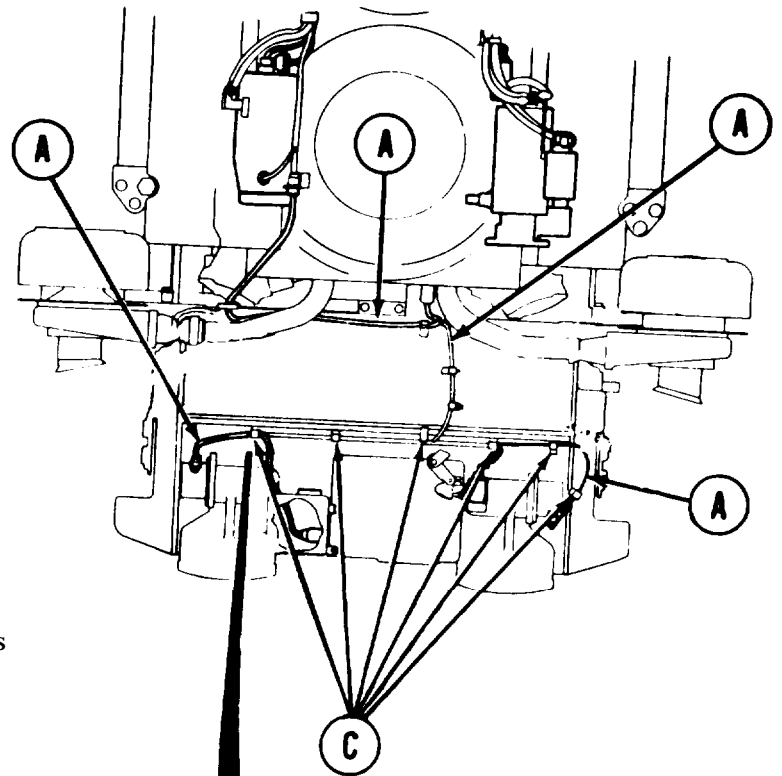
TA139931

INSTALLATION:

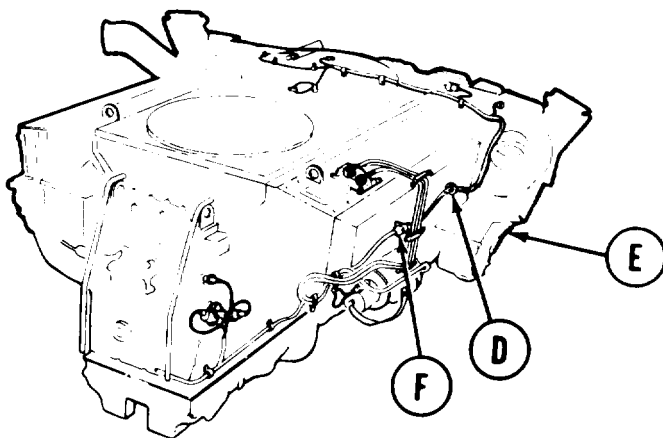
NOTE

Perform steps 1 through 9 and 15 through 18 when transmission is mated to 2D engine.

Perform steps 10 through 18 when transmission is mated to 2A engine.



1. Position wiring harness (A) onto powerplant as shown.
2. Place six clamps (B) onto wiring harness at Positions (C).
3. Using hands, install new grommet (D) into rear engine shroud (E).
4. using spanner wrench, connect wiring harness connector (F)



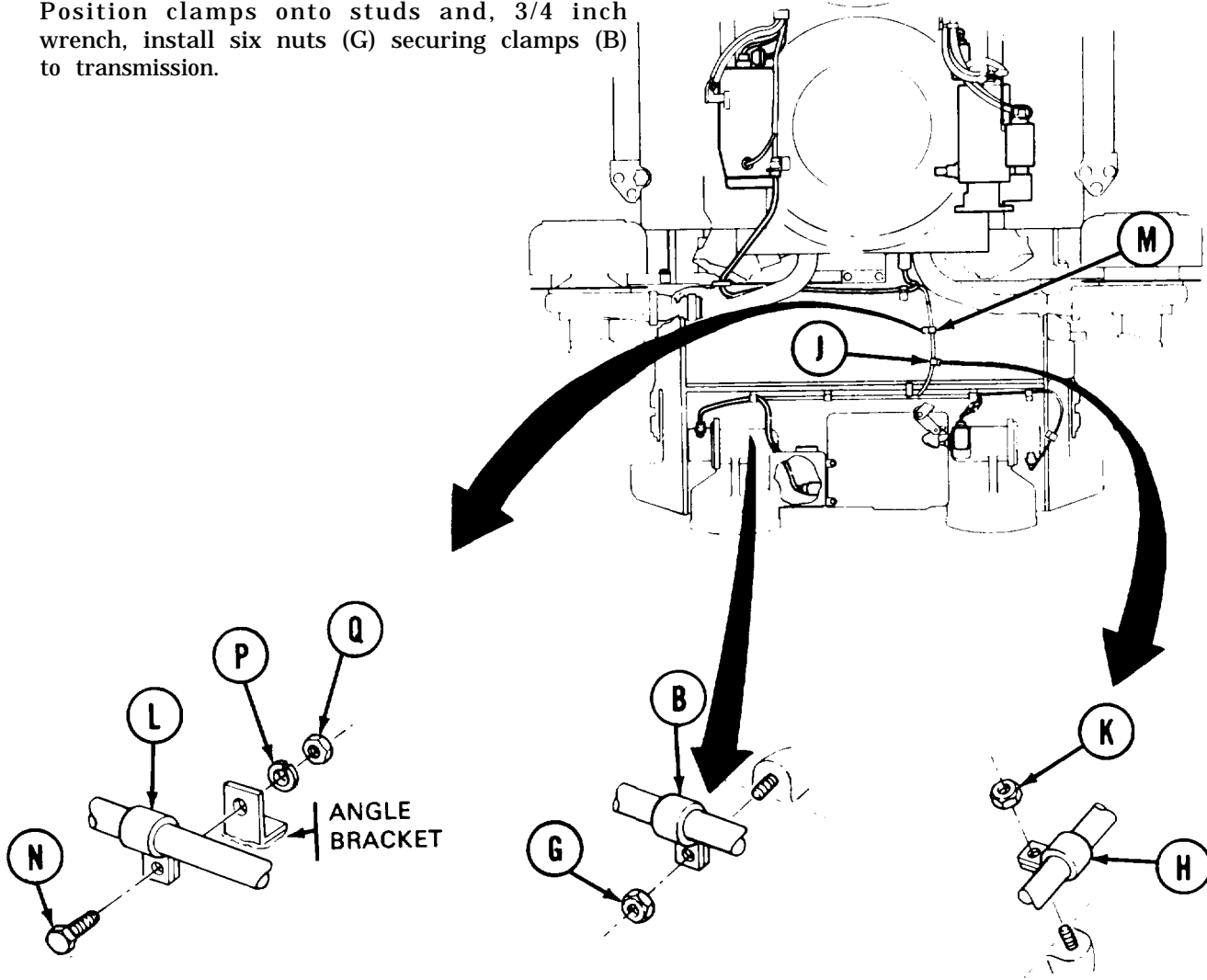
Go on to Sheet 5

TA139932

10-381

TRANSMISSION WIRING HARNESS REPLACEMENT (Sheet 5 of 7)

5. Position clamps onto studs and, 3/4 inch wrench, install six nuts (G) securing clamps (B) to transmission.

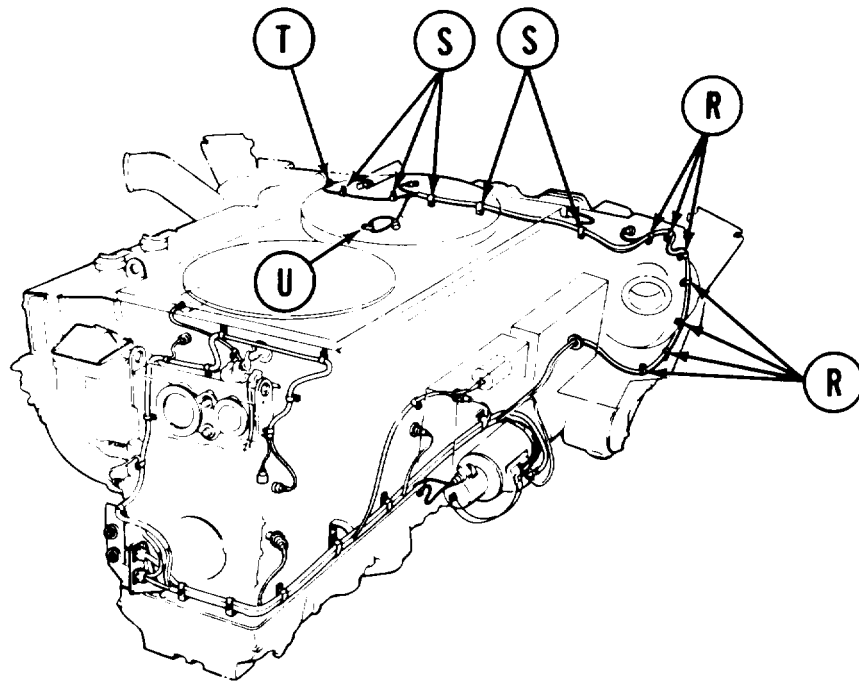


6. Place clamp (H) onto wiring harness at position (J).
7. Position clamp onto stud and, using socket, install nut (K) securing clamp (H) to transmission.
8. Place clamp (L) onto wiring harness at position (M).
9. Position clamp onto bracket and, using two 7/16 inch wrenches, install screw (N), new lockwasher (P), and nut (Q) securing clamp (L) to bracket.

Go on to Sheet 6

TA139933

TRANSMISSION WIRING HARNESS REPLACEMENT (Sheet 6 of 7)



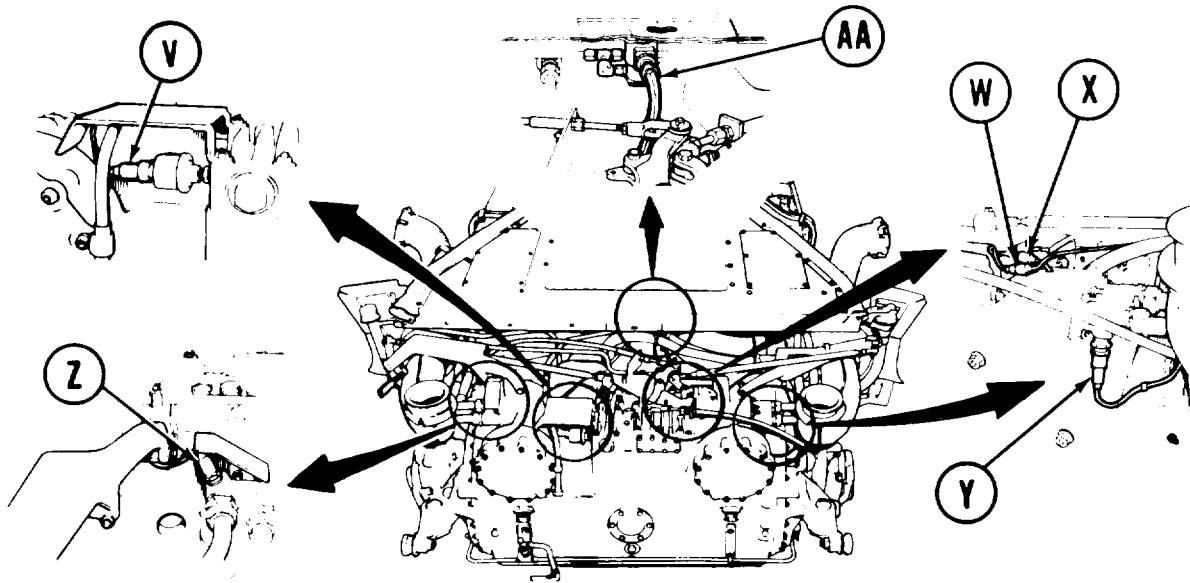
10. Position wiring harness onto transmission as shown.
11. Position clamps (R) onto studs and using 3/4 inch socket, install nuts to secure clamps.
12. Position clamps (S) onto studs and using 3/4 inch wrench, install nuts to secure clamps.
13. Position clamp (T) onto studs and using 3/4 inch socket, install nut to secure clamp.
14. Using 7/16 inch wrench, install screw to secure clamp (U).

Go on to Sheet 6

TA 139934

TRANSMISSION WIRING HARNESS REPLACEMENT (Sheet 7 of 7)

15. Using hands, connect five leads (V) thru (Z) to their mating connections according to tags.
16. Using pliers, connect lead (AA) to its mating connection according to tags.
17. Remove all tags.



18. Install powerplant (page 5-37).

End of Task

TM 9-2350-222-20-1-4

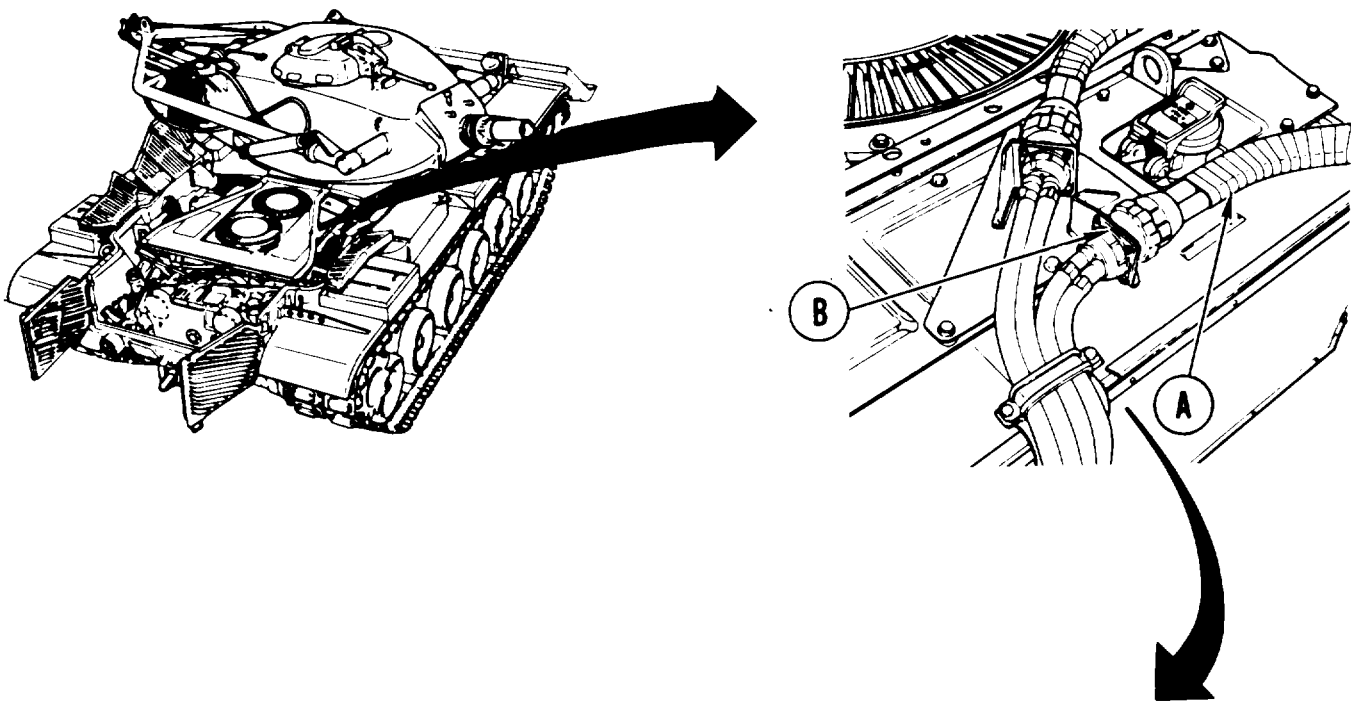
ENGINE GROUND LEAD ASSEMBLY REPLACEMENT (sheet 1 of 2)

TOOLS: Spanner wrench
9/16 in. socket with 1/2 in. drive.
Ratchet with 1/2 in. drive

SUPPLIES: Lockwashers (4 required)

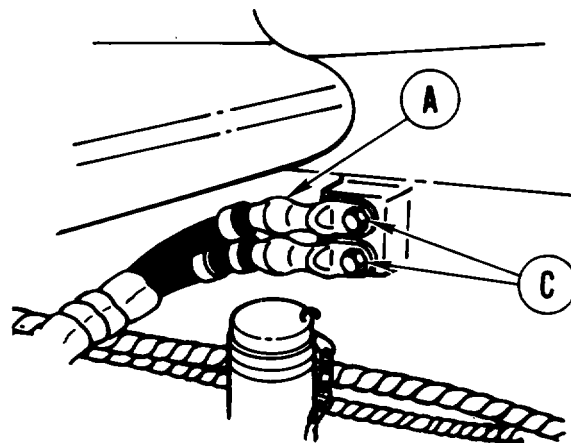
REFERENCE: TM 9-2350-222-10

PRELIMINARY PROCEDURES: Disconnect three battery ground straps (page 10-283)
Open right grille doors (TM 9-2350-222-10)
Traverse gun over right or left fender (TM 9-2350 -222-10)



REMOVAL:

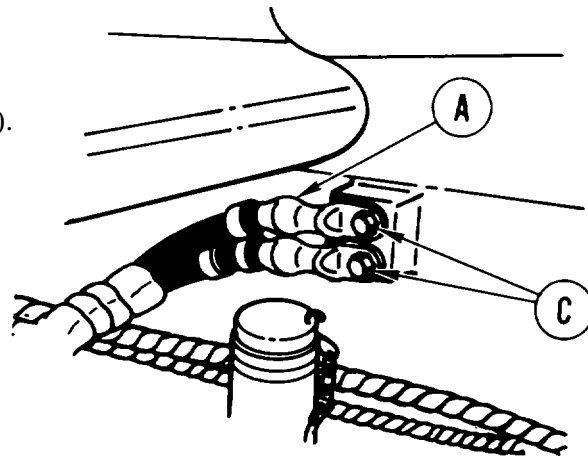
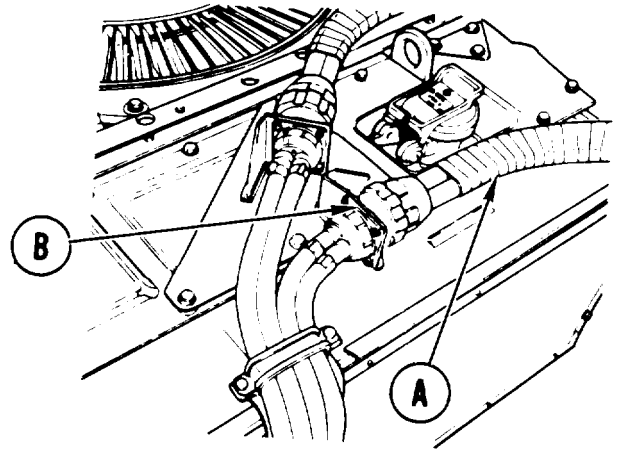
1. Using spanner wrench, disconnect ground lead (A) from engine disconnect (B).
2. Using socket and ratchet, remove two screws and lockwashers (C) securing ground lead (A) to hull. Throw lockwashers away.
3. Remove ground lead assembly (A).



Go on to Sheet 2

INSTALLATION:

1. Using spanner wrench, connect ground lead (A) to engine disconnect (B).
2. Place ground leads (A) in position on hull.
3. Using socket and ratchet, install two screws and new lockwashers (C) securing ground lead (A) to hull.
4. Close right grille doors (TM 9-2350 -222-10).
5. Connect three battery ground straps (page 10-283).



End of Task

TM 9-2350-222-20-1-4

CAPACITOR AND HOUSING ASSEMBLY REPLACEMENT, LEFT FUEL TANK
(Sheet 1 of 6)

PROCEDURE INDEX

PROCEDURE	PAGE
Removal	10-396
Cleaning and Inspection	10-399
Installation	10-399

TOOLS: Flat-tip screwdriver
Diagonal cutting pliers
Putty knife
Slip joint pliers
1/2 in. socket with 3/8 in. drive
1/2 in. socket with 1/2 in. drive
Ratchet with 1/2 in. drive
Torque wrench with 3/8 in. drive
(0-200 lb-in) (0-22 N.m)

SUPPLIES: Dry cleaning solvent (Item 54, Appendix D)
Rags (Item 65, Appendix D)
Lockwire (Item 60, Appendix D)
Gasket (2 required)
Gasket
Lockwasher (4 required)
Lockwasher (4 required)

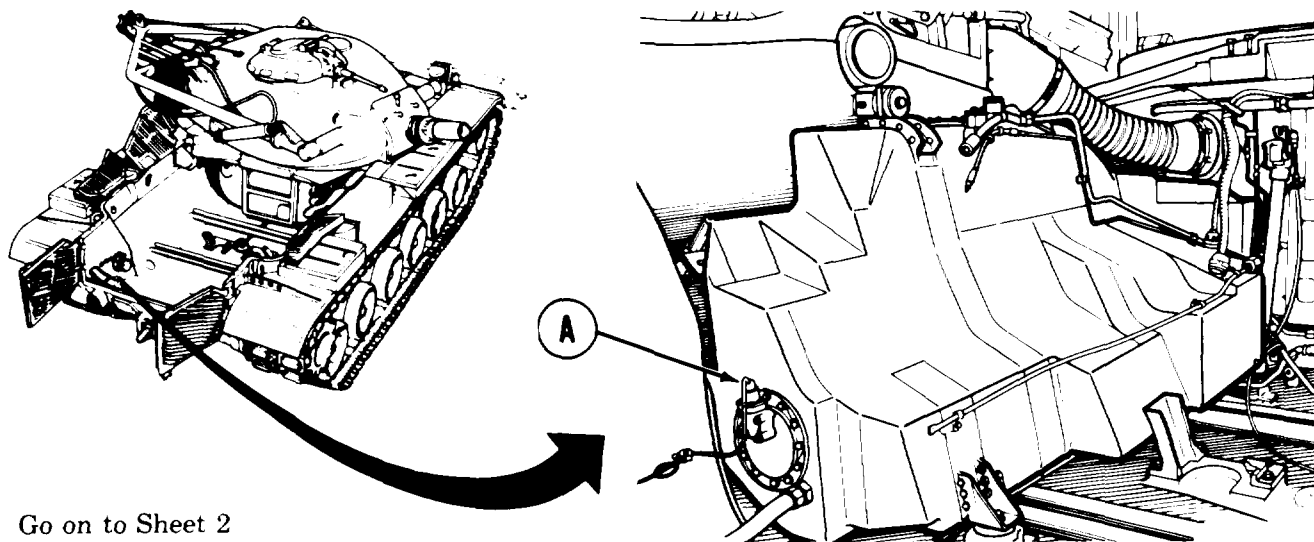
PRELIMINARY PROCEDURES: Remove powerplant (page 5-1)
Isolate left fuel tank (TM 9-2350-222-10)
Drain left fuel tank (page 7-125)

NOTE

Your vehicle may have the capacitor and housing assembly mounted with connector facing up. When installing the capacitor and housing assembly, be sure to install it so the connector faces down.

REMOVAL:

1. Using hands, remove electrical connector (A) from mating connector.



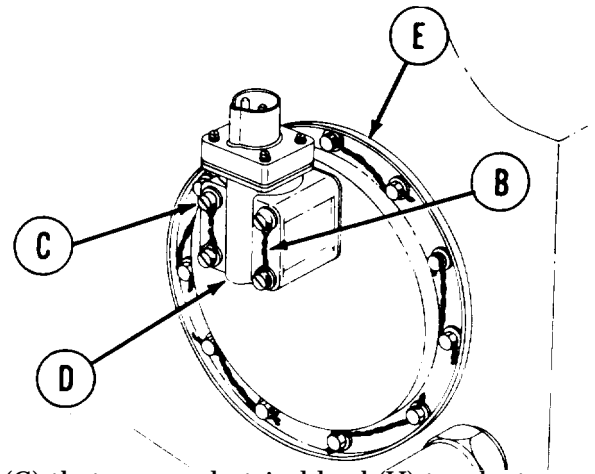
Go on to Sheet 2

CAPACITOR AND HOUSING ASSEMBLY REPLACEMENT, LEFT FUEL TANK

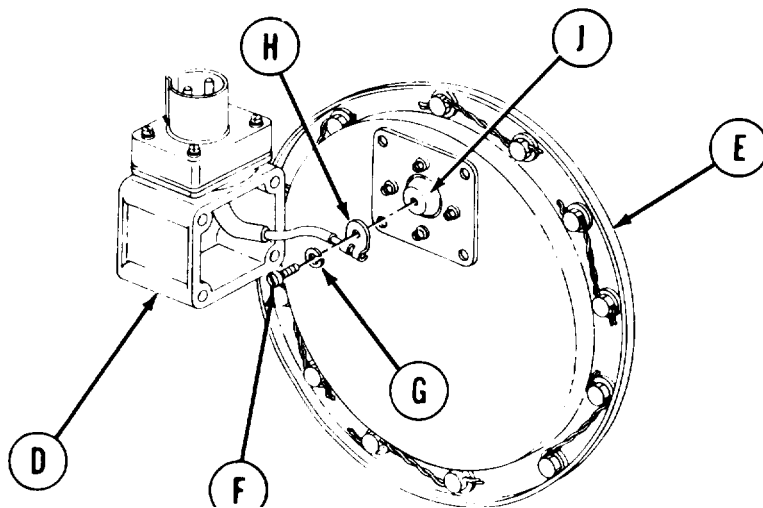
(Sheet 2 of 6)

2. Using diagonal cutting pliers, remove lockwire (B) securing four screws (C) on capacitor and housing (D).

3. Using screwdriver, remove four screws, lockwashers, and flat washers (C) securing capacitor and housing (D). Slowly separate capacitor and housing (D) from cover (E). Capacitor and housing (D) is connected to cover (E) with an electrical lead. Throw lockwashers away.

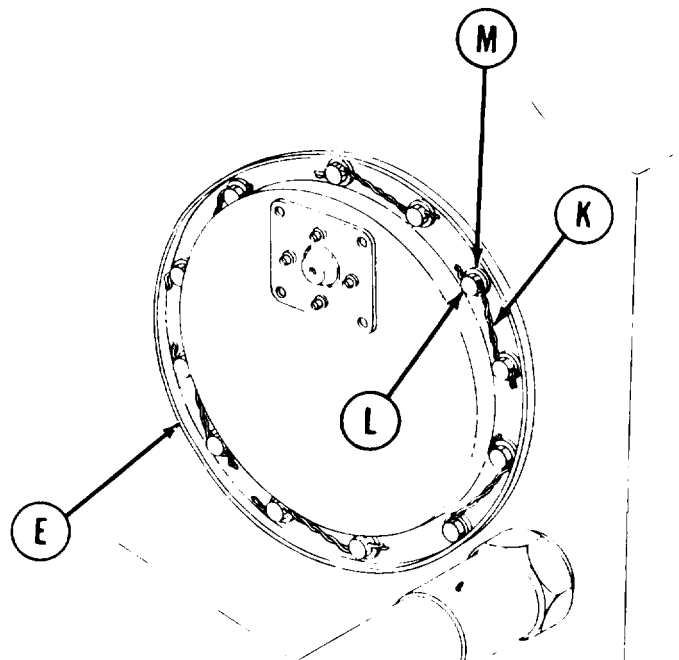


4. Using screwdriver, remove screw (F) and lockwasher (G) that secure electrical lead (H) to adapter (J). Remove capacitor and housing (D) from cover (E). Throw lockwasher (G) away.



5. Using diagonal cutting pliers, remove lockwire (K) securing 12 screws (L) on access cover (E).

6. Using 1/2 inch socket, remove 12 screws (L) and washers (M).



Go on to Sheet 3

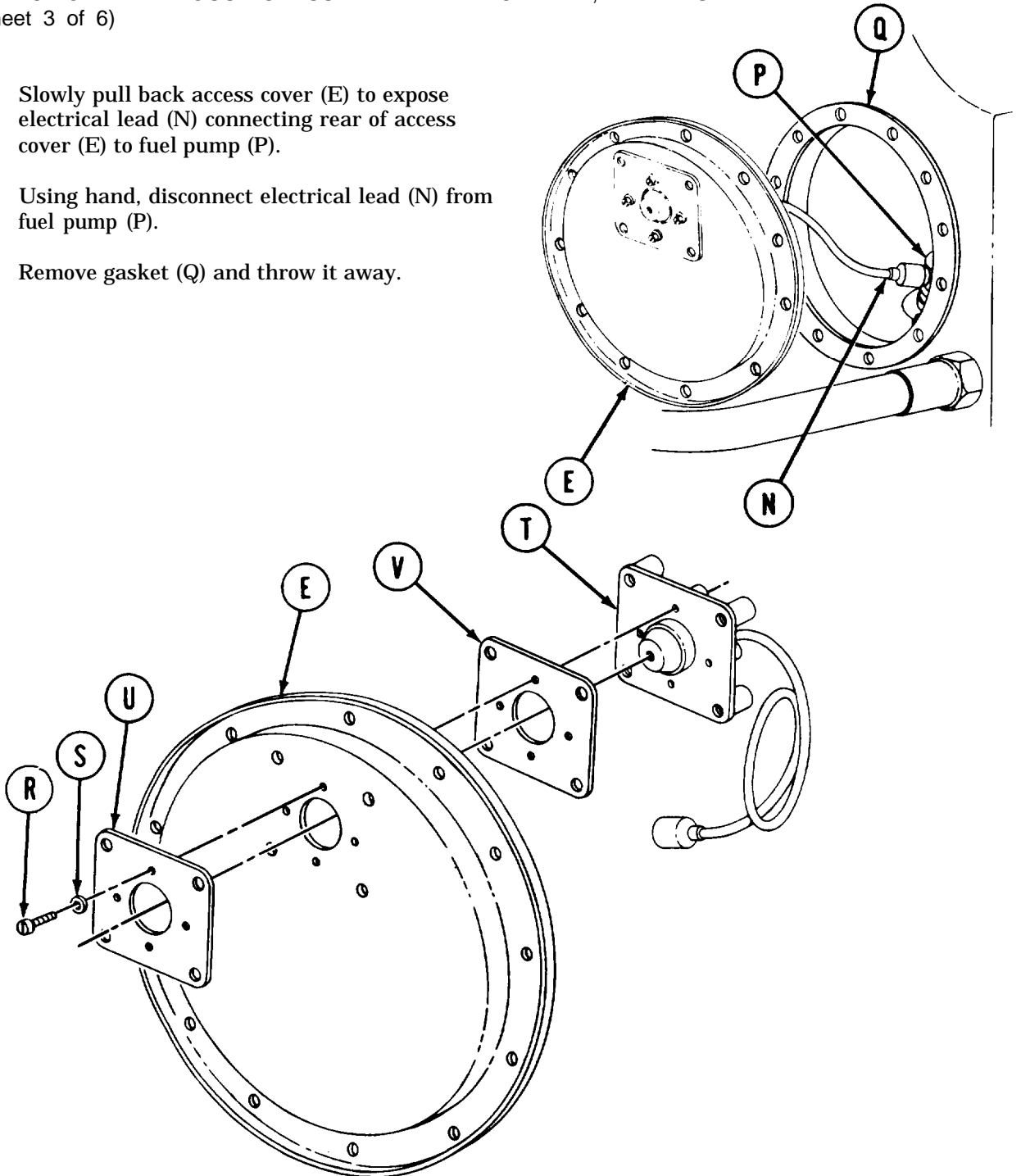
TA253350

Change 1 10-397

TiM 9-2350-222-20-1-4

CAPACITOR AND HOUSING ASSEMBLY REPLACEMENT, LEFT FUEL TANK
(Sheet 3 of 6)

7. Slowly pull back access cover (E) to expose electrical lead (N) connecting rear of access cover (E) to fuel pump (P).
8. Using hand, disconnect electrical lead (N) from fuel pump (P).
9. Remove gasket (Q) and throw it away.



10. Using screwdriver, remove four screws (R) and lockwashers (S) from cover (E) and adapter (T). Throw lockwashers away.
11. Separate gasket (U), cover (E), gasket (V), and adapter (T). Throw gaskets (U) and (V) away.

Go on to Sheet 4

TA139854

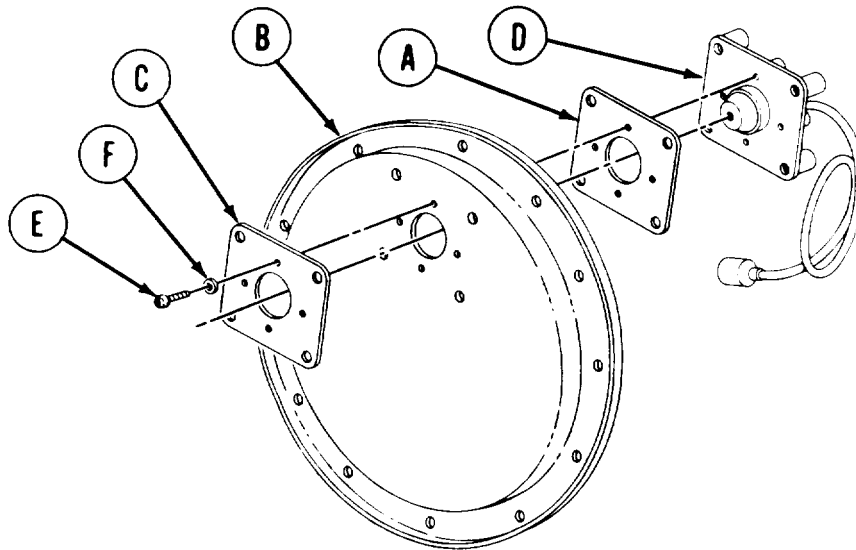
CAPACITOR AND HOUSING ASSEMBLY REPLACEMENT, LEFT FUEL TANK
(Sheet 4 of 6)

CLEANING AND INSPECTION:

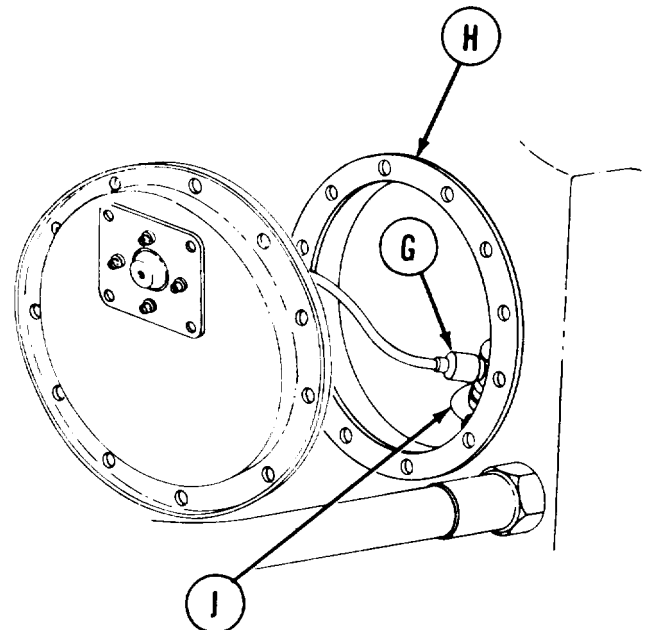
1. Using putty knife, clean all areas where gaskets were mounted.
2. Using dry cleaning solvent (Item 54, Appendix D) and rag, wipe gasket surfaces clean.
3. Inspect cable and adapter and cover for damages. Replace damaged parts.

INSTALLATION:

1. Position new gasket (A), cover (B), and new gasket (C) onto adapter (D). Align screw holes. Using screwdriver, install four screws (E) and new lockwashers (F) securing cover and gaskets to adapter (D).



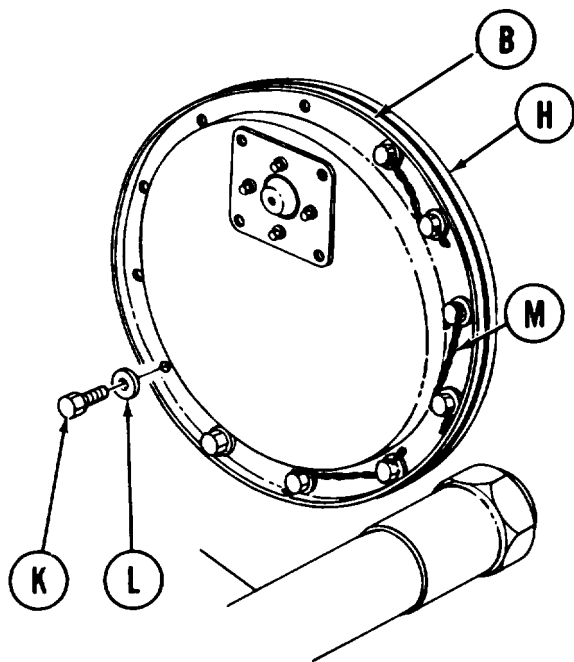
2. Position electrical lead (G) through gasket (H) and, with hand, connect electrical lead (G) to fuel pump (J).



Go on to Sheet 5

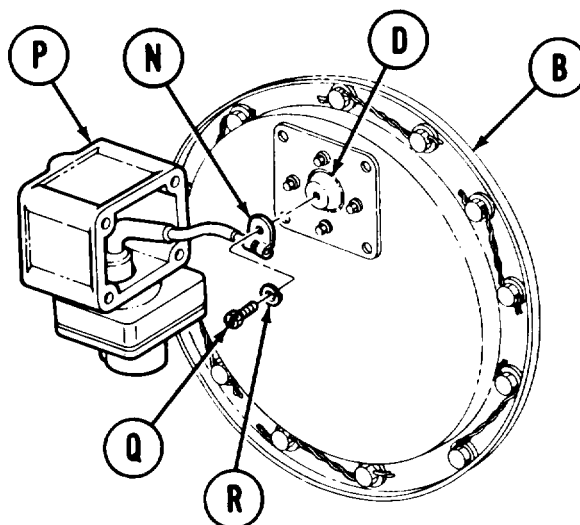
TA130295

CAPACITOR AND HOUSING ASSEMBLY REPLACEMENT, LEFT FUEL TANK
(Sheet 5 of 6)



Position gasket (H) and cover (B) onto fuel tank and install 12 screws (K) and washers (L) securing cover (B) to fuel tank.

4. Using 1/2 inch socket and torque wrench, tighten screws (K) to 50-60 lb-in (6-7 N.m).
5. Using slip joint pliers, install lockwire (M) into screws (K).

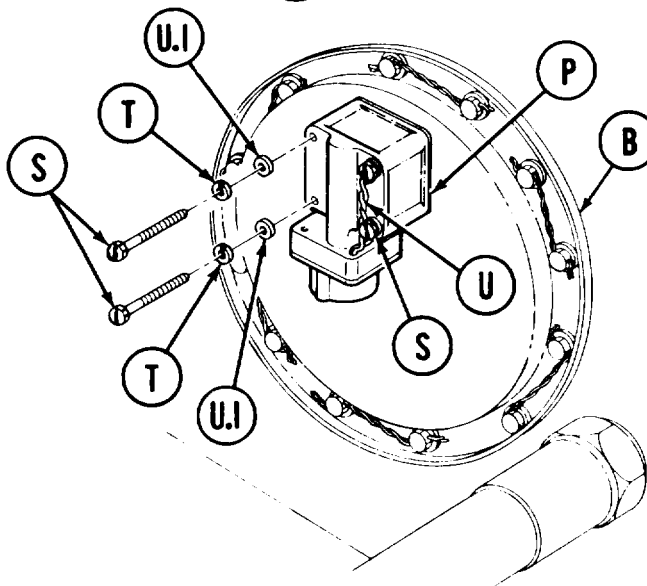


6. Using screwdriver, secure electrical lead (N) of capacitor and housing (P) to adapter (D) with screw (Q) and new lockwasher (R).

NOTE

Be sure to install capacitor and housing with the connector facing down.

7. Position capacitor and housing (P) onto cover (B) and, using screwdriver, install four screws (S), new lockwasher (U.1) and washers (U) securing capacitor and housing (P) to cover (B).
8. Using slip joint pliers, install lockwire (V) into screws (S).

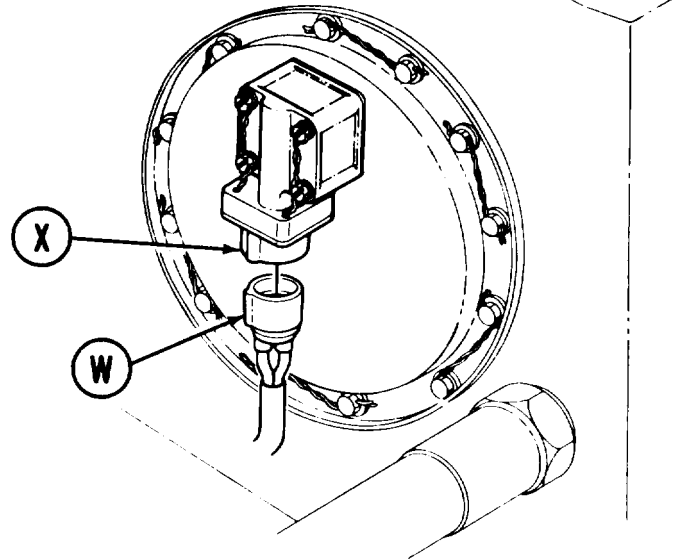


Go on to Sheet 6

TA253351

CAPACITOR AND HOUSING ASSEMBLY REPLACEMENT, LEFT FUEL TANK
(Sheet 6 of 6)

9. With hand, connect electrical lead (W) to capacitor and housing electrical connector (X).
10. Refill fuel tank.
11. Turn isolate valves back to original position (TM 9-2350-222-10).
12. Install 2A powerplant (page 5-14) or 2D powerplant (page 5-37).



End of Task

TA253352

Change 1 10-401

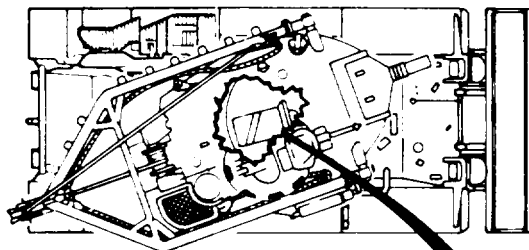
TM 9-2350-222-20-1-4

CAPACITOR AND HOUSING ASSEMBLY REPLACEMENT, RIGHT FUEL TANK
(Sheet) 1 of 9)

PROCEDURE INDEX

PROCEDURE	PAGE
Removal	10-402
Cleaning and Inspection	10-406
Installation	10-407

TOOLS: Offset flat-tip screwdriver with 2 in. blade
Flat-tip screwdriver with 6 in. blade
Diagonal cutting pliers
Slip joint pliers
Putty knife
1/2 in. socket with 1/2 in. drive
Ratchet with 1/2 in. drive
9/16 in. socket with 1/2 in. drive



SUPPLIES: Lockwire (Item 60, Appendix D)
Rags (Item 65, Appendix D)
Dry cleaning solvent (Item 54, Appendix D)
Sealing compound (Item 28, Appendix D)
Silicone compound (Item 32, Appendix D)

Gasket (10864181)
Gasket (10870952)
Gasket (10864012)
(2 required)
Lockwasher (MS35333-38)
Lockwasher (MS35338-43)
(4 required)
Lockwasher (MS35388-44)
(4 required)

REFERENCE: TM 9-2350-222-10

PRELIMINARY PROCEDURES: Isolate right fuel tank (TM 9-23510-222-10)
Drain right fue tank (page 7-125)
Remove bulkhead floor access covers (page 16-37)

REMOVAL:

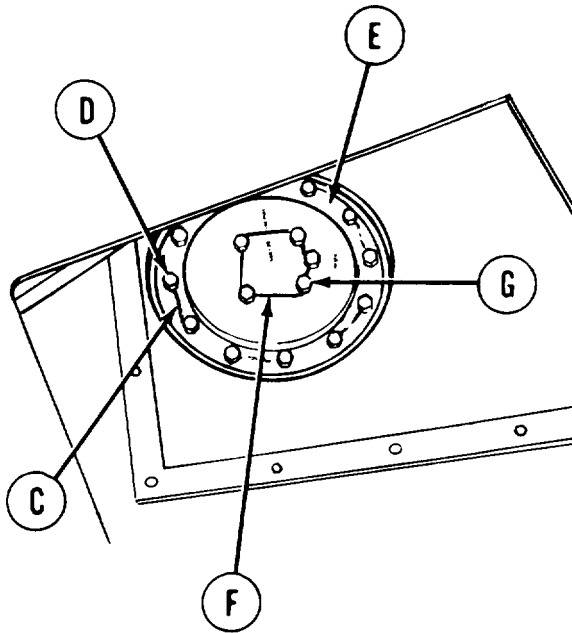
NOTE

Steps 1, 2, and 3 deleted. Callouts A and B deleted.

Go on to Sheet 2

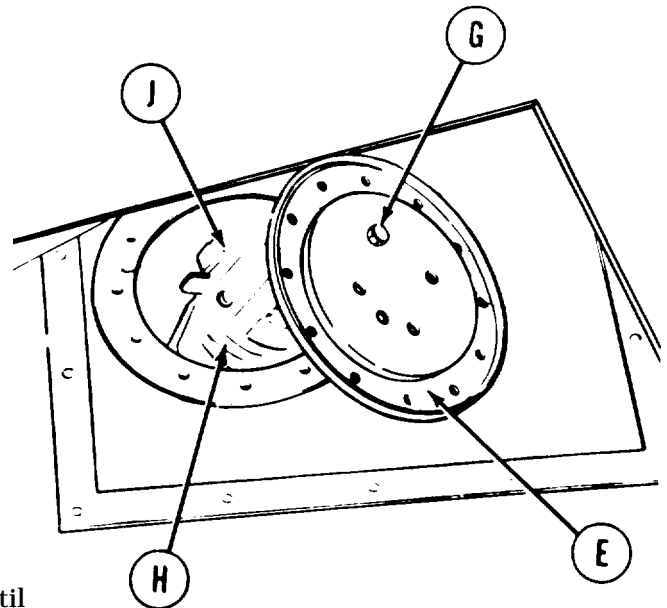
TA253353

CAPACITOR AND HOUSING ASSEMBLY REPLACEMENT, RIGHT FUEL TANK
 (Sheet 2 of 9)



4. Using diagonal cutting pliers, cut lockwire (C). Using 1/2 inch socket and ratchet, remove 12 screws and washers (D) securing fuel pump access cover (E).

5. Using diagonal cutting pliers, cut lockwire (F). Using 9/16 inch socket and ratchet, remove four of five screws (G) securing access cover (E) to fuel pump mounting bracket (H) (underneath cover). Loosen, but do not remove, fifth screw.



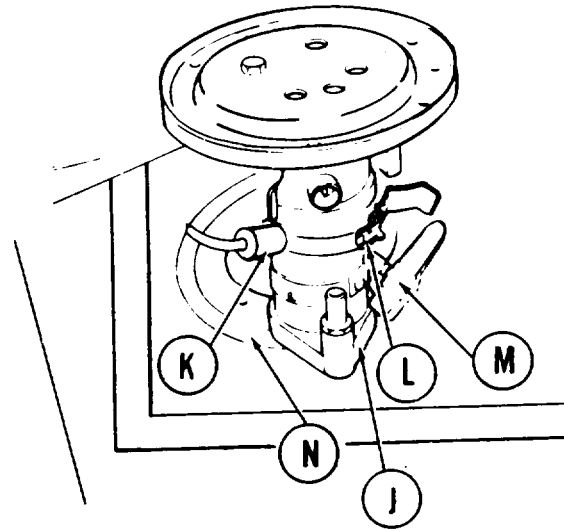
6. Swivel access cover (E) on fifth screw (G) until you can withdraw mounting bracket (H) with fuel pump (J) attached part way out of fuel tank.

Go on to Sheet 3

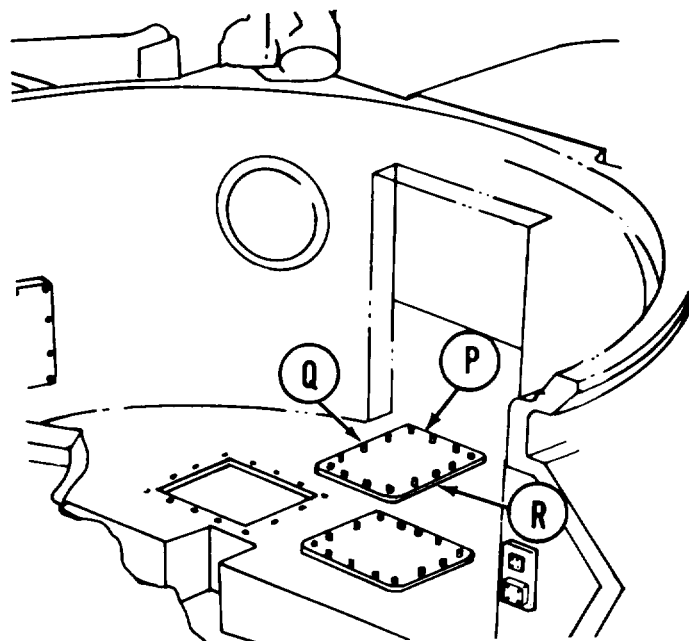
TA130300

CAPACITOR AND HOUSING ASSEMBLY REPLACEMENT, RIGHT FUEL TANK
(Sheet 3 of 9)

7. Disconnect electrical connector (K).
8. Using flat-tip screwdriver, loosen hose clamp (L). Remove hose (M) from fuel pump (J).
9. Remove fuel pump (J) and gasket (N) from fuel opening in fuel tank. Throw gasket away.



10. Manually traverse turret to gain access to fuel crossover access cover (P).
11. Using flat-tip screwdriver, remove 14 screws (Q). Remove cover (P) and gasket (R). Throw gasket (R) away.

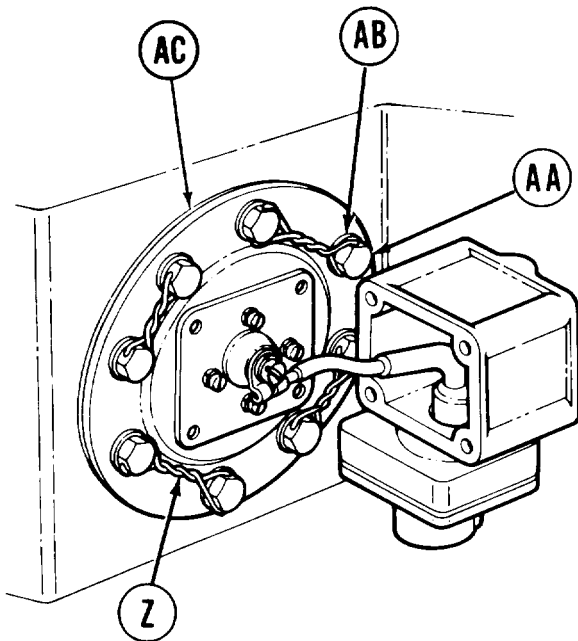
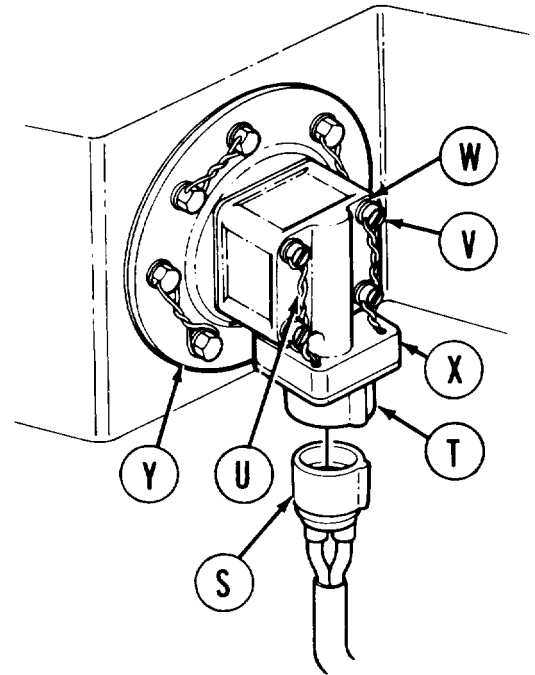


Go on to Sheet 4

TA130301

CAPACITOR AND HOUSING ASSEMBLY REPLACEMENT, RIGHT FUEL TANK
(Sheet 4 of 9)

12. Using hands, disconnect cable (S) from electrical connector (T).
13. Using diagonal cutting pliers, remove lockwire (U) from four screws (V).
14. Using flat-tip screwdriver, remove four screws (V), lockwashers and flat washers (W) holding housing (X) to cover (Y). Throw lockwashers away.
15. Slowly separate capacitor and housing (X) from cover (Y). Capacitor and housing (X) are connected to cover (Y) with an electrical lead.



16. Using diagonal cutting pliers, remove lockwire (Z) from eight screws (AA).
17. Using 1/2 inch socket, remove eight screws (AA) and washers (AB).
18. Remove cover (Y) and gasket (AC) from fuel tank. Throw gasket away.

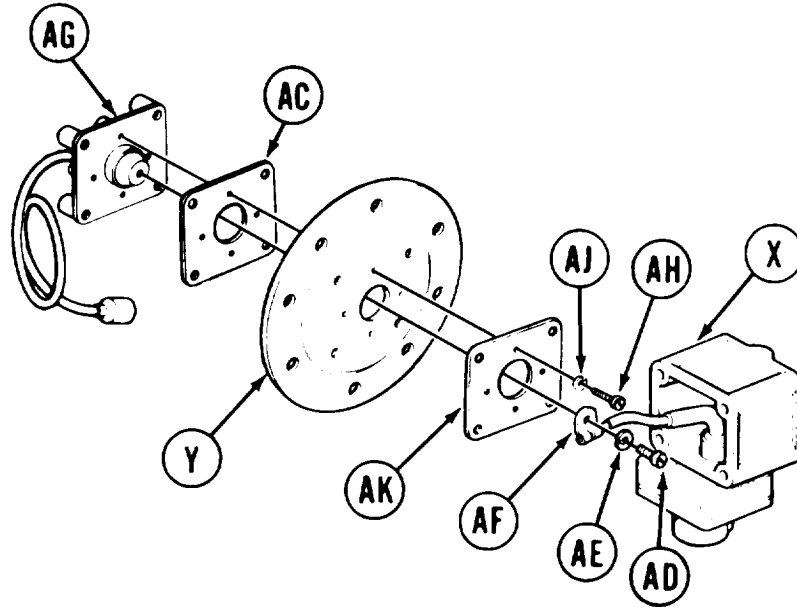
Go on to Sheet 5

TA253354

Change 1 10-405

CAPACITOR AND HOUSING ASSEMBLY REPLACEMENT, RIGHT FUEL TANK
(Sheet 5 of 9)

19. Using flat-tip screwdriver, remove screw (AD) and lockwasher (AE) that secure electrical lead (AF) to adapter (AG); throw lockwasher (AE) away. Remove capacitor and housing (X) from cover (Y).
20. Using screwdriver, remove four screws (AH) and lockwashers (AJ) from cover (Y) and adapter (AG); throw lockwashers (AJ) away. Separate gasket (AK), cover (Y), gasket (AC), and adapter (AG). Throw gaskets (AK) and (AC) away.



CLEANING AND INSPECTION:

1. Using putty knife, clean all areas where gaskets were mounted,
2. Using dry cleaning solvent and rag, wipe gasket surfaces clean
3. Inspect cable, adapter, and cover for damages. Replace damaged parts,

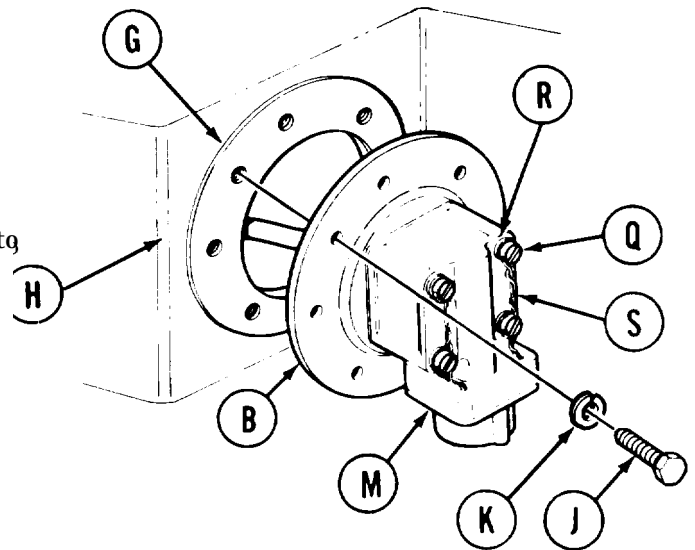
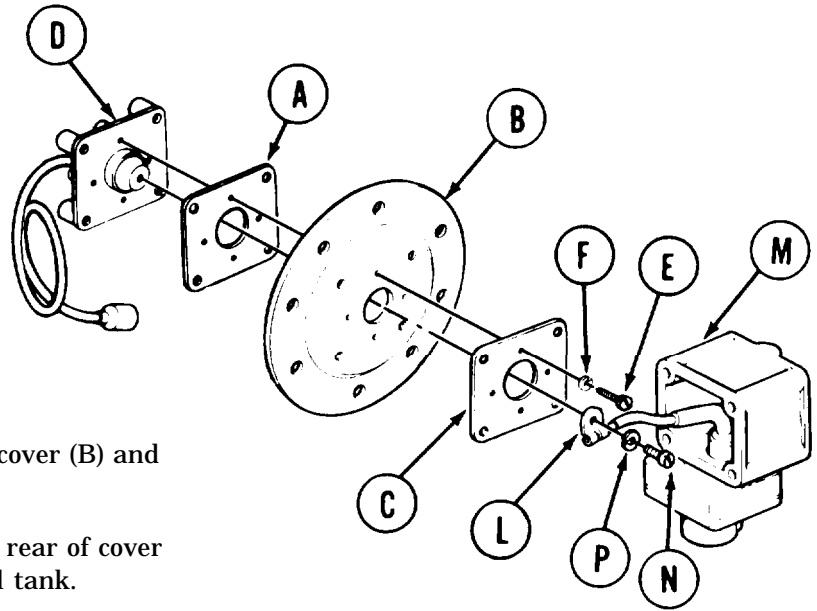
Go on to Sheet 6

TA130303

CAPACITOR AND HOUSING ASSEMBLY REPLACEMENT, RIGHT FUEL TANK
(Sheet 6 of 9)

INSTALLATION:

1. Position new gasket (A), cover (B), and new gasket (C) onto cable and adapter (D). Aline screw holes.
2. Using flat-tip screwdriver, install four screws (E) and new lockwashers (F) securing cover and gaskets to adapter (D).
3. Position new gasket (G) between cover (B) and fuel tank (H).
4. Position cable that is attached to rear of cover (B) through gasket and lay in fuel tank.
5. Using 1/2 inch socket, install eight screws (J) and washers (K) securing cover (B) to fuel tank (H).
6. Using torque wrench, tighten screws (J) to 5-10 lb-ft (6-13 N.m).
7. Using flat-tip screwdriver, secure electrical lead (L) of housing and capacitor (M) to adapter (D), with screw (N) and new lockwasher (P).
8. Position capacitor and housing (M) onto cover (B). Using flat-tip screwdriver, install four screws (Q), new lockwashers and flat washers (R) securing capacitor and housing (M) to cover (B).
9. Using slip joint pliers, install lockwire (S) onto screws (Q).



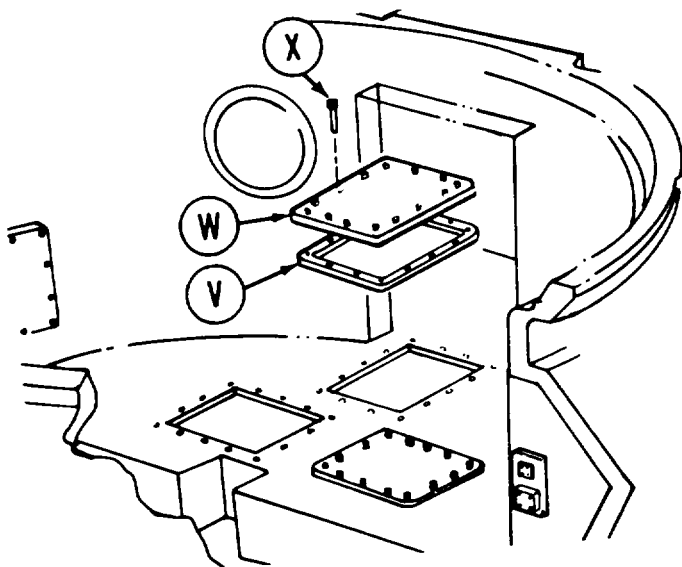
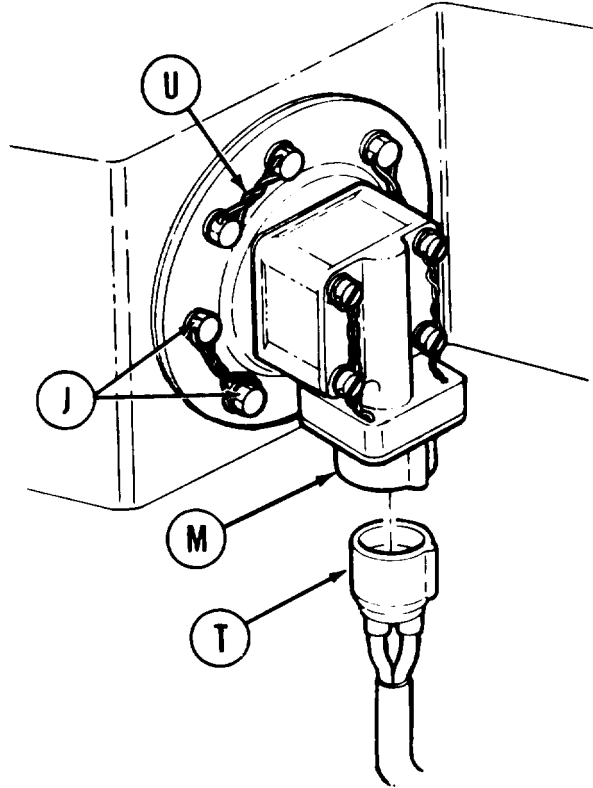
Go on to Sheet 7

TA253355

Change 1 10-407

CAPACITOR AND HOUSING ASSEMBLY REPLACEMENT, RIGHT FUEL TANK
(Sheet 7 of 9)

10. Using hand, install cable (T) into electrical connection on capacitor and housing (M).

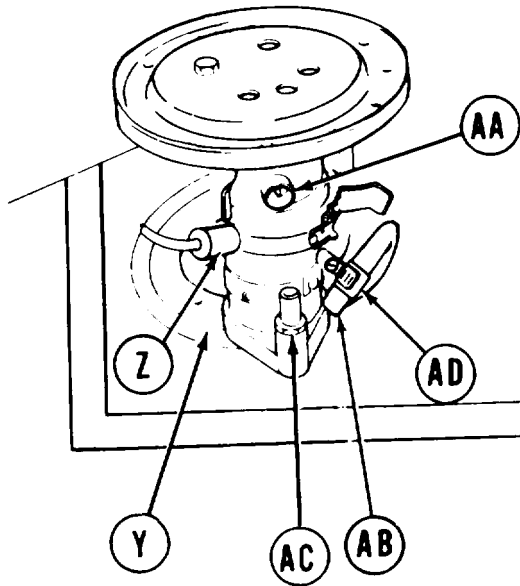


11. Using slip joint pliers, install lockwire (U) through screws (J).
12. Position new gasket (V) and cover (W) onto hull and, using screwdriver, install 14 screws (X) securing cover (W) to hull.

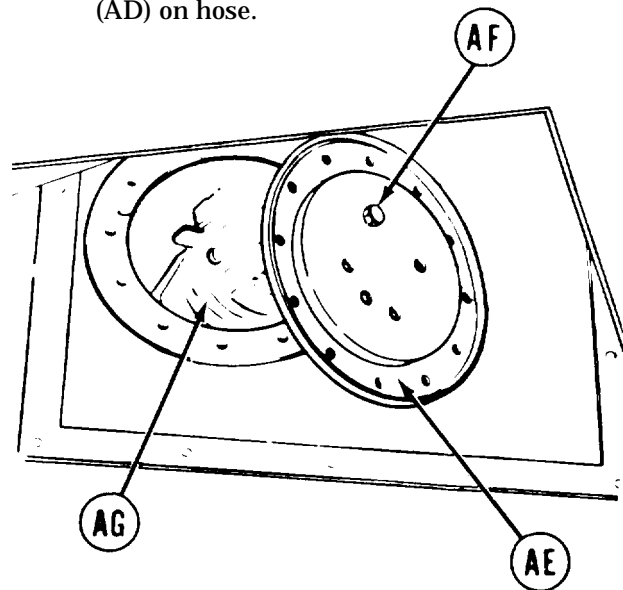
Go on to Sheet 8

TA253356

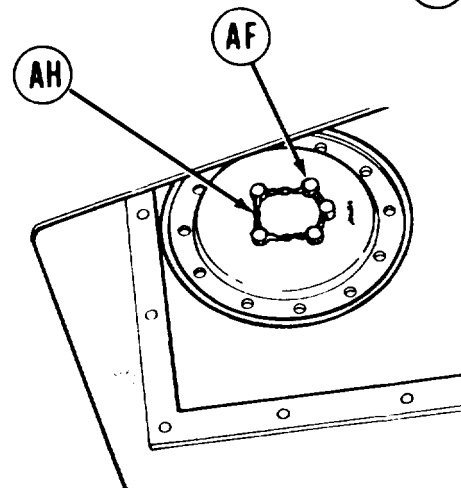
CAPACITOR AND HOUSING ASSEMBLY REPLACEMENT, RIGHT FUEL TANK
(Sheet 8 of 9)



13. Place new gasket (Y) over opening in fuel tank.
14. Place silicone compound on electrical lead (z).
15. Place fuel pump close to opening of fuel tank. Connect electrical lead (Z) to electrical connector (AA).
16. Place hose (AB) on pump outlet port (AC). Using flat-tip screwdriver, tighten clamp (AD) on hose.



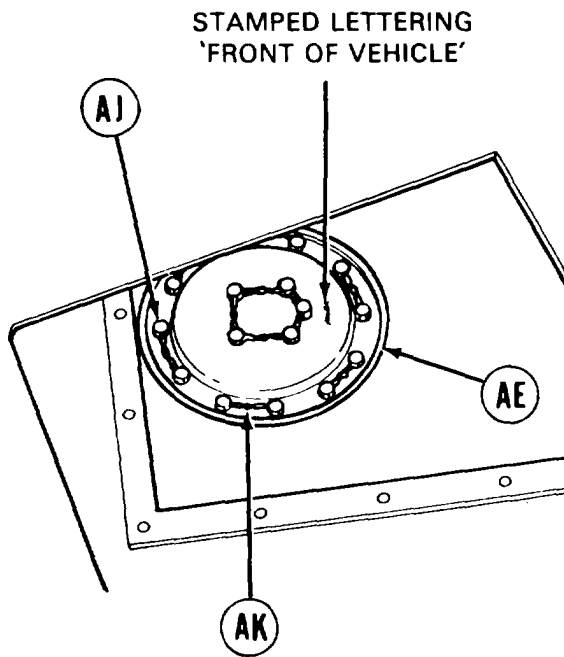
17. Swivel access cover (AE) on single installed screw (AF) to work fuel pump into position in fuel tank.
18. Position access cover and gasket on mounting bracket (AG).
19. Apply sealing compound to threads of remaining four screws (AF). Using 9/16 inch socket and ratchet, install and tighten all five screws (AF). Using slip joint pliers, secure screws with lockwire (AH).



Go on to Sheet 9

TA253357

CAPACITOR AND HOUSING ASSEMBLY REPLACEMENT, RIGHT FUEL TANK
(Sheet 9 of 9)



20. Position access cover (AE) over fuel tank opening so that lettering 'FRONT OF VEHICLE' stamped on cover is facing toward front of vehicle.
21. Using 1/2 inch socket, install 12 screws and 12 washers (AJ) securing cover (AE).
22. Using torque wrench, tighten screws and lockwashers (AJ) to 10-15 lb-ft (14-20 N.m).
23. Using slip joint pliers, secure screws with lockwire (AK).
24. Install bulkhead floor access cover (Page 16-37).
25. Open fuel tank crossover valve (TM 9-2350-222-10),
26. Fill fuel tanks.

End of Task

TA130307

CAPACITOR AND HOUSING ASSEMBLY REPAIR (Sheet 1 of 2)

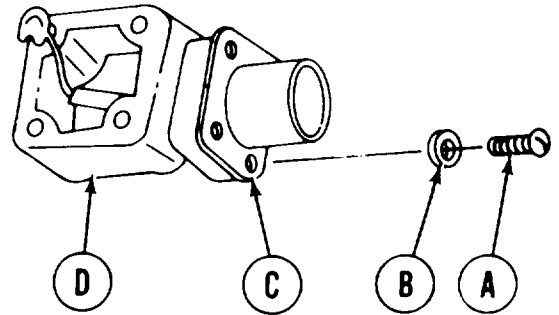
TOOLS: Flat-tip screwdriver
Round nose pliers

SUPPLIES: Lockwasher (MS35335-29) (2 required)
Gasket (7412721)

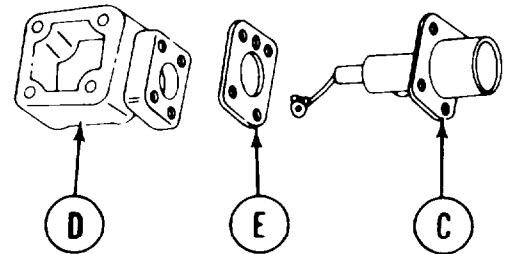
PRELIMINARY PROCEDURES: Remove fuel tank capacitor and housing assembly
(page 10-396 or 10-402)

DISASSEMBLY:

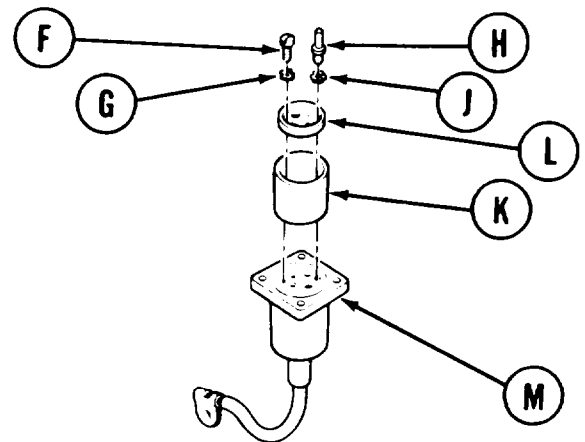
- Using screwdriver, remove four screws (A) and washers (B) holding capacitor and connector assembly (C) to housing (D).



- Separate capacitor and connector assembly (C) from housing (D).
- Remove gasket (E). Throw gasket (E) away,



- Using screwdriver, remove screw (F) and flat lockwasher (G). Throw lockwasher away,
- Using pliers, unscrew and remove polarizing pin (H) and lockwasher (J). Throw lockwasher away.
- Remove receptacle shell (K) and retaining plate (L) from base plate assembly (M).
- Remove retaining plate (L) from receptacle shell (K).



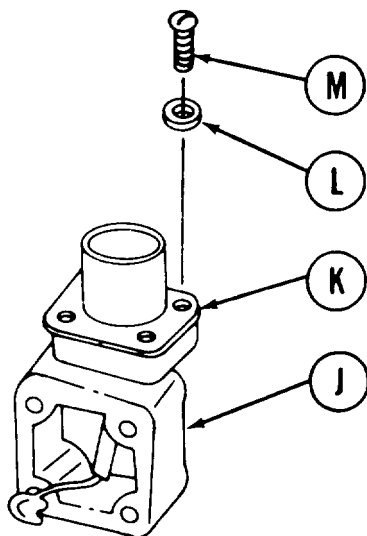
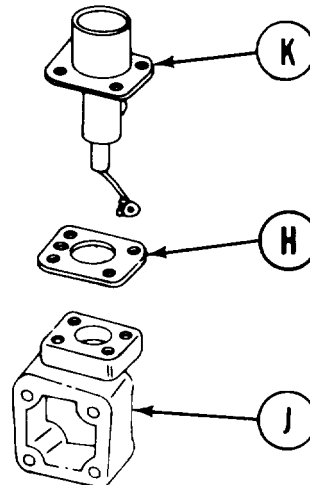
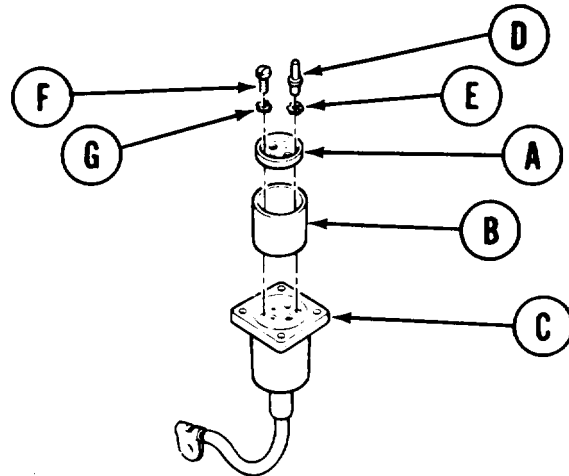
Go on to Sheet 2

TA130308

CAPACITOR AND HOUSING ASSEMBLY REPAIR (Sheet 2 of 2)

INSTALLATION:

1. Insert retaining plate (A) in receptacle shell (B).
2. Position retaining plate (A) and receptacle shell (B) on base plate assembly (C).
3. Using pliers, install and secure polarizing pin (D) and new lockwasher (E).
4. Using screwdriver, install and secure screw (F) and new lockwasher (G).
5. Position new gasket (H) onto housing (J).
6. Position capacitor and connector assembly (K) onto housing (J).



7. Using screwdriver, install and secure four washers (L) and screws (M) to secure capacitor and connector assembly (K) to housing (J).
8. Install capacitor and housing assembly onto fuel tank (page 10-397 or 10-407).

End of Task

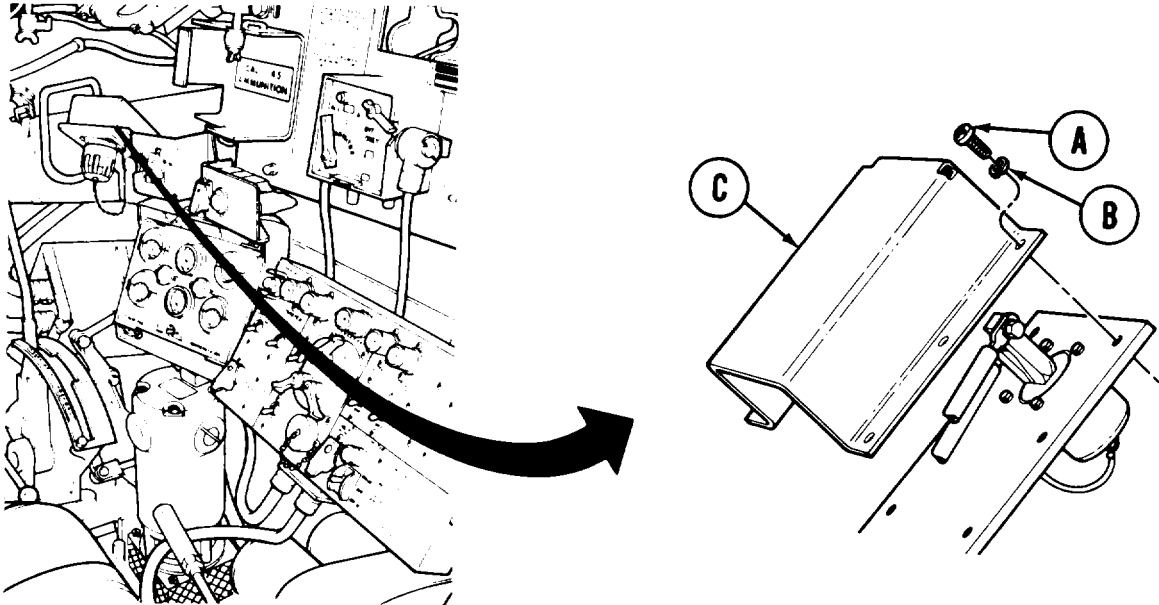
TA130309

SLAVE RECEPTACLE COVER REPLACEMENT (Sheet 1 of 1)

TOOLS: Offset cross-tip screwdriver

SUPPLIES: Lockwashers (MS35338-42) (6 required)

PRELIMINARY PROCEDURES: Disconnect battery ground cables (page 10-283).

**REMOVAL:**

1. Using screwdriver, remove six screws (A) and lockwashers (B) from cover (C). Throw lockwashers away.
2. Remove cover (C).

INSTALLATION:

1. Place cover (C) in position.
2. Using screwdriver, install six screws (A) and new lockwashers (B).
3. Connect battery ground cables (page 10-283).

End of Task

TA253358

Change 1 10-413

TM 9-2350-222-20-1-4

SLAVE RECEPTACLE GROUND CABLE REPLACEMENT (Sheet 1 of 2)

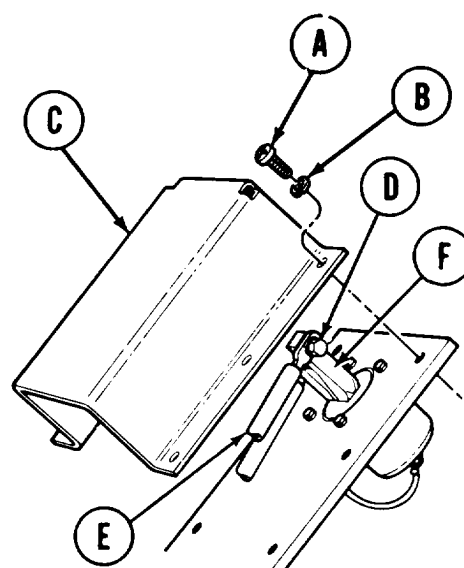
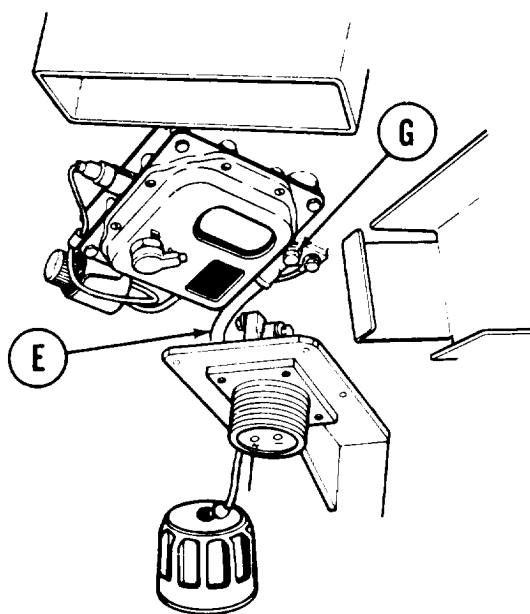
TOOLS: Offset cross-tip screwdriver
9/16 in. socket with 1/2 in. drive
5 in. extension with 1/2 in. drive
Ratchet with 1/2 in. drive

SUPPLIES: Lockwashers (MS35338-42) (6 required)
Lockwashers (MS35338-46)
Lockwashers (MS35335-35) (2 required)

PRELIMINARY PROCEDURE: Disconnect battery ground cables (page 10-283).

REMOVAL:

1. Using screwdriver, remove six screws (A) and lockwashers (B) from cover (C). Throw lockwashers away.
2. Remove cover (C).
3. Using 9/16 inch socket, remove bolt and lockwasher (D) securing ground cable (E) to receptacle (F).



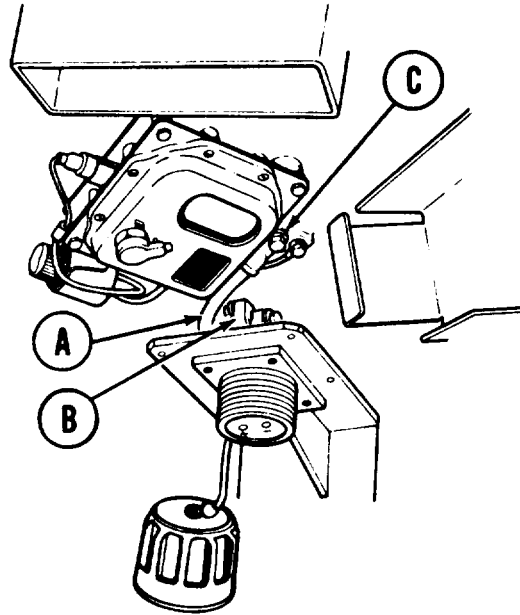
4. Using 9/16 inch socket, remove screw and two lockwashers (G) securing ground lead (E) to hull. Throw lockwashers away.
5. Remove ground lead (E) from vehicle.

Go on to Sheet 2

TA253359

SLAVE RECEPTACLE GROUND CABLE REPLACEMENT (SHEET 2 OF 2)

INSTALLATION:

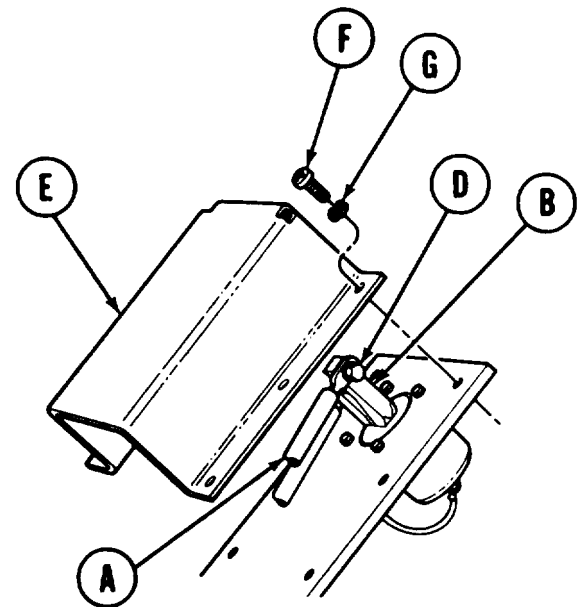


1. Position ground cable (A) to receptacle (B) and hull.
2. Using 9/16 inch socket, install and tighten screw and two new lockwashers (C), place lockwashers on each side of terminal lug of cable, to secure ground cable (A) to hull.

3. Using 9/16 inch socket, install and tighten bolt and new lockwasher (D) securing ground cable (A) to negative terminal of receptacle (B).

4. Place cover (E) in position.

5. Using screwdriver, install six screws (F) and new lockwashers (G).



6. Connect battery ground cable (page 10-283).

End of Task

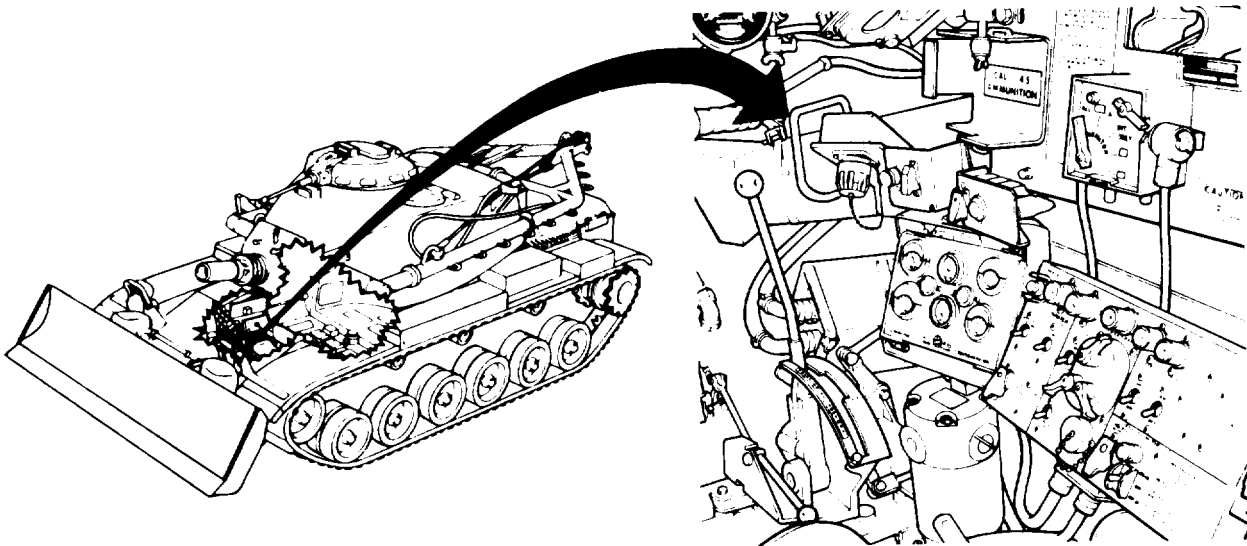
PROCEDURE INDEX

PROCEDURE	P A G E
Removal	10-417
Installation	10-418

TOOLS: Offset cross-tip screwdriver
3/8 in. combination box and open end wrench
Ratchet with 1/2 in. drive
Cross-tip screwdriver
9/16 in. socket with 1/2 in. drive

SUPPLIES: Lockwasher (MS35338-42) (6 required)
Lockwasher (MS35338-43) (4 required)
Lockwasher (MS35338-46) (2 required)

PRELIMINARY PROCEDURE: Disconnect battery ground cables (page 10-283).



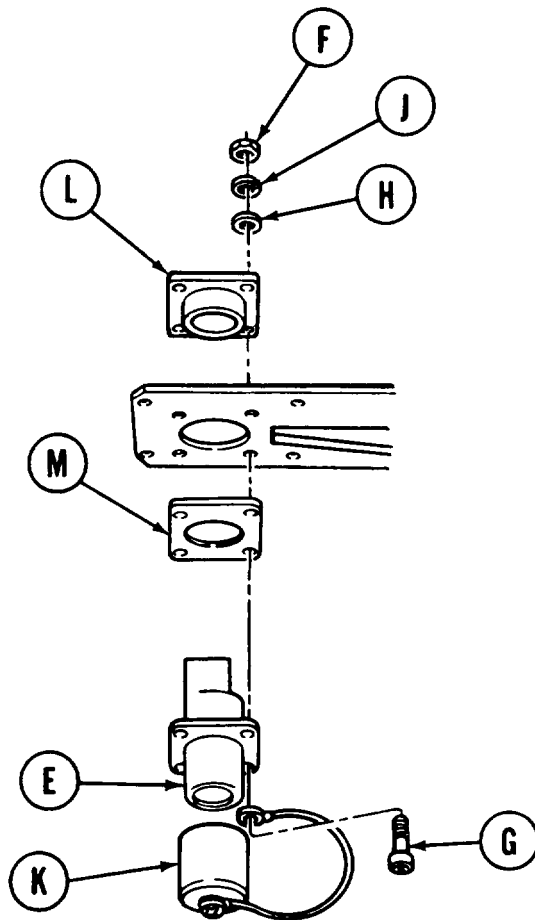
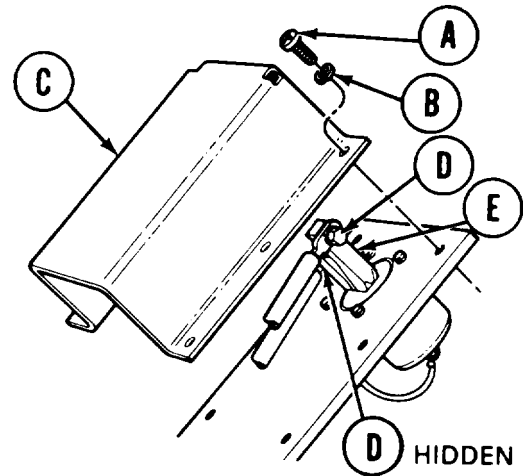
Go on to Sheet 2

TA253361

SLAVE RECEPTACLE REPLACEMENT (Sheet 2 of 3)

REMOVAL:

1. Using offset cross-tip screwdriver, remove six screws (A) and lockwashers (B) securing cover (C). Throw lockwashers away.
2. Remove cover (C).
3. Using 9/16 inch socket, remove two screws and lockwashers (D) securing cables to receptacle (E). Throw lockwashers away.



4. Using 3/8 inch wrench to hold nut (F), use cross-tip screwdriver and remove four screws (G), flat washers (H), lockwashers (J) and nuts (F) securing receptacle (E) and cover (K) lead to bracket. Throw lockwashers away.
5. Remove cover (K), receptacle (E), gasket (M), and insulator (L) from bracket.

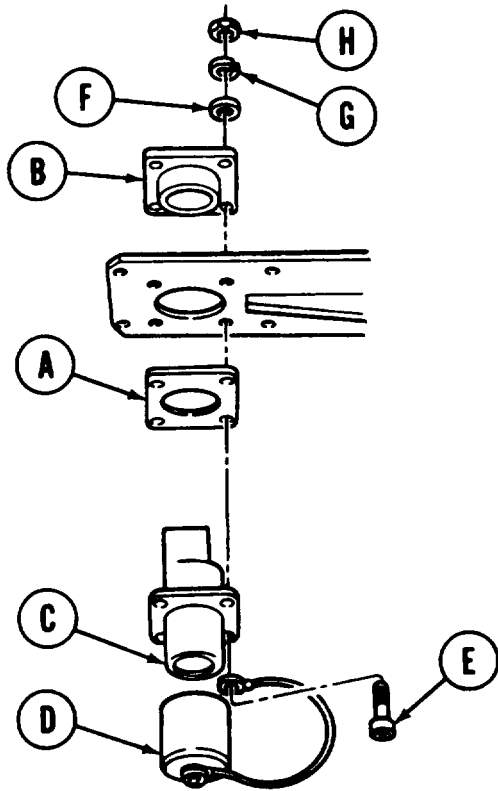
Go on to Sheet 3

TA253362

Change 1 10-417

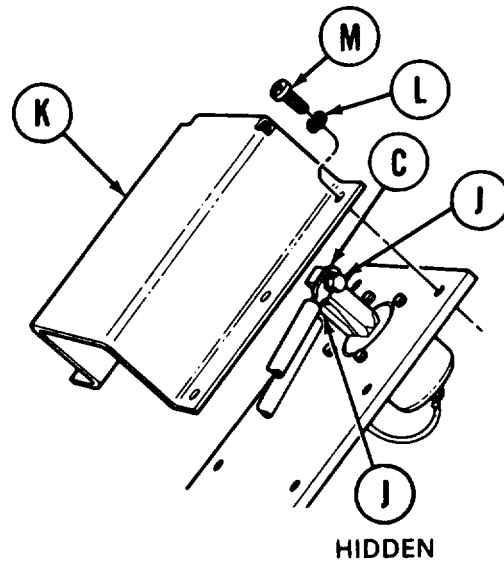
SLAVE RECEPTACLE REPLACEMENT (Sheet 3 of 3)

INSTALLATION:



1. position insulator (B), gasket (A) receptacle (C) and cover (D) to bracket.
2. Using fingers, install four screws (E), flat washers (F), new lockwashers (G) and nuts (H) to secure receptacle (C) and cover (D) lead to bracket.
3. Using 7/16 inch wrench to hold nuts (H), use cross-tip screwdriver and tighten screws (E).

4. Using fingers, install two screws and new lockwashers (J) to secure cables to receptacle (C).
5. Using 9/16 inch socket, tighten screws (J).
6. Position cover (K) over receptacle (C).
7. Using offset screwdriver, install six new lockwashers (L) and screws (M) to secure cover (K).
8. Connect battery ground cables (page 10-283).



End of Task

TA253363

CHAPTER 11

TRANSMISSION AND SHIFTING MAINTENANCE INDEX

PROCEDURE	PAGE
Shift Linkage Adjustment	11-2
Neutral Shift Switch Adjustment	11-22
Shifting Control and Related Parts Repair and Replacement	11-25
Shifting Control Connecting Link Replacement	11-40
Shifting Control Bracket Assembly and Connecting Link Replacement	11-42
Shifting Control Bracket Assembly Repair	11-44.1
Shifting Control Rod and Levers Replacement	11-45
Shifting Control Shaft Assembly Replacement	11-49
Shifting Control Gasket Replacement	11-50
Shifting Control Bracket and Connecting Link Assembly Repair and Replacement	11-52
Shifting Control Seal Assembly Repair and Replacement	11-61
Servobands Adjustment	11-63
Transmission Main Oil Filter Element Replacement	11-67
Transmission Side Oil Strainer Assembly Repair and Replacement	11-74
Transmission Oil Breather Tube Replacement	11-82

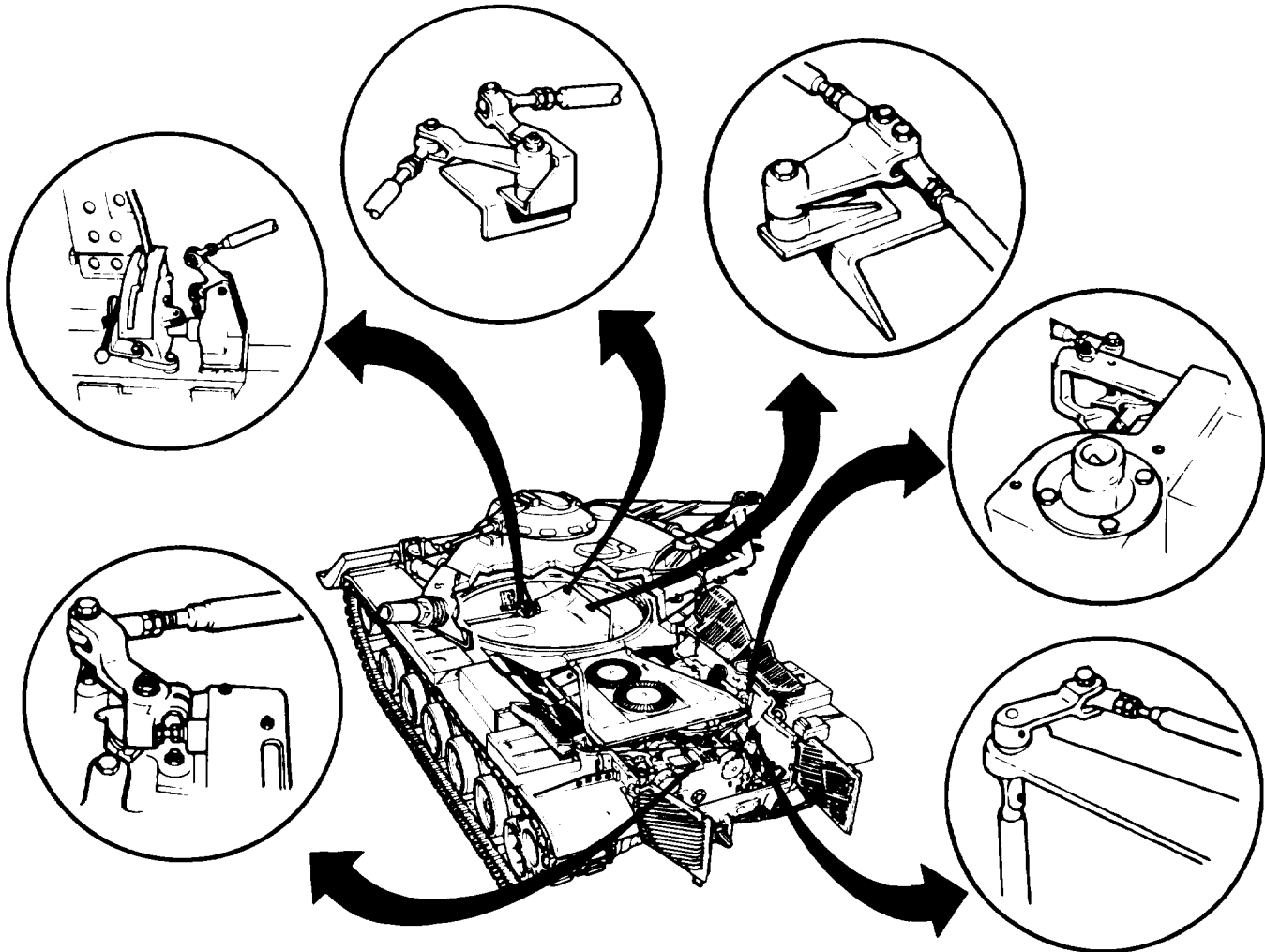
SHIFT LINKAGE ADJUSTMENT (Sheet 1 of 20)

- TOOLS:** Adapter, 1/2 in. to 3/8 in.
9/16 in. socket with 1/2 in. drive
7/16 in. socket with 1/12 in. drive
Ratchet with 1/12 in. drive
9/16 in. combination box and open end wrench (2 required)
Torque wrench with 1/2 in. drive (0-175 lb-ft) (0-237 N,m)
7/16 in. combination box and open end wrench
6 in. rule
9/16 in. crowfoot wrench with 3/8 in. drive

- SUPPLIES:** Locating pin (1/8 in. diameter by 2-1/2 in. long copper rod)
Wire (0.06 in. diameter by 2 in. long) (Item 59, Appendix D)

- REFERENCE:** TM 9-2350-222-10

- PRELIMINARY PROCEDURES:** Block tracks (TM 9-2350-222-10)
Remove transmission shroud (page 9-20)
Remove top deck (page 16-21)

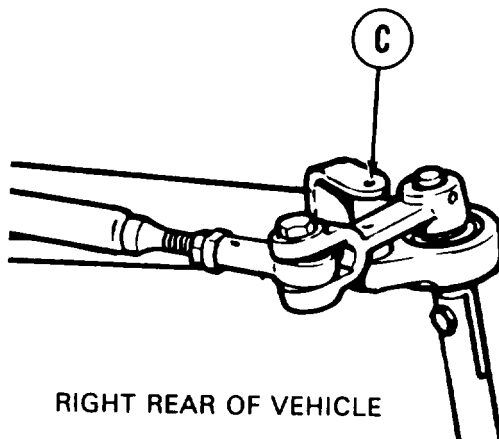
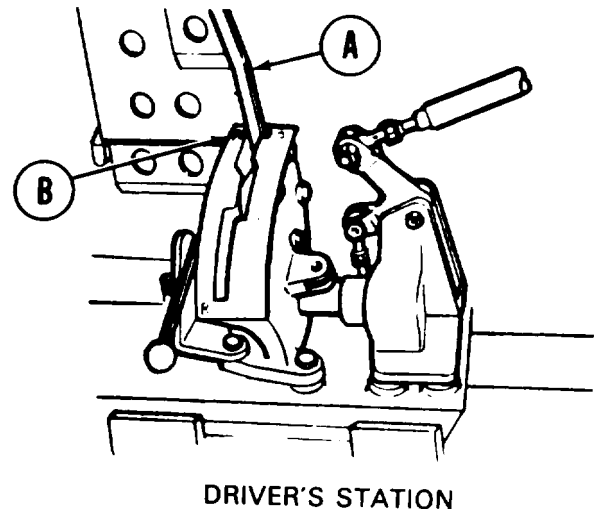


Go on to Sheet 2

SHIFT LINKAGE ADJUSTMENT (Sheet 2 of 20)

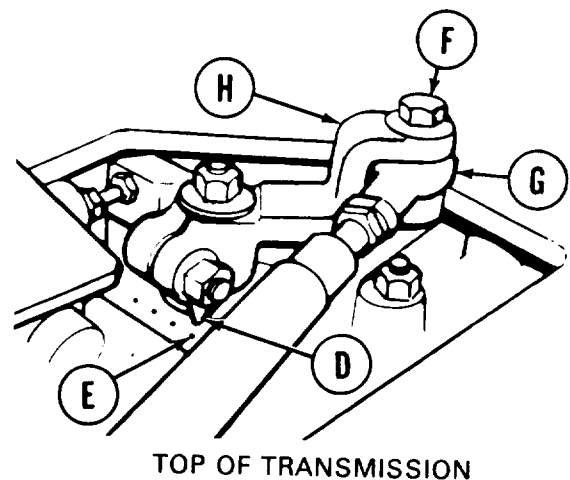
ADJUSTMENT:

1. Try to move transmission shift lever (A) to P position (B). If transmission shift lever cannot be moved to P position, go to step 4. If transmission shift lever can be moved to P position, go on to step 2.



2. Go to right rear of vehicle and try to insert locating pin into alignment hole (C). If locating pin cannot be inserted, go to step 7. If locating pin can be inserted, remove locating pin and go on to step 3.

3. At top of transmission, check position of shifting position indicator (D). If shifting position indicator (D) is pointing to most forward dot (E), notify support maintenance. If shifting position indicator (D) is not pointing to most forward dot, go to step 130.
4. At top of transmission, using 9/16 inch wrench, remove screw (F) and remove shifting rod bearing end (G) from clevis (H).
5. At driver's station, move transmission shift lever (A) to P position.

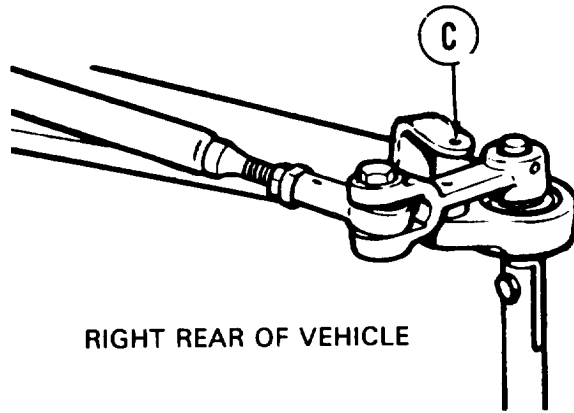


Go on to Sheet 3

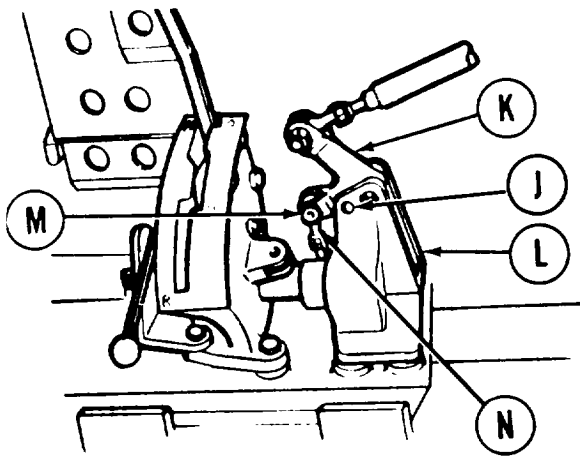
TA139256

SHIFT LINKAGE ADJUSTMENT (Sheet 3 of 20)

6. Go to right rear of vehicle and try to insert locating pin into alignment hole (C). If locating pin cannot be inserted, go to step 7. If locating pin can be inserted, go to step 130.



RIGHT REAR OF VEHICLE



DRIVER'S STATION

7. At driver's station, try to insert locating pin into alignment holes (J) in link (K) and bracket (L). If locating pin can be inserted, remove locating pin and go to step 13. If locating pin cannot be inserted, go on to step 8.
8. Using 9/16 inch wrench, remove screw (M).
9. Manually move link (K) and insert locating pin in alignment hole (J).

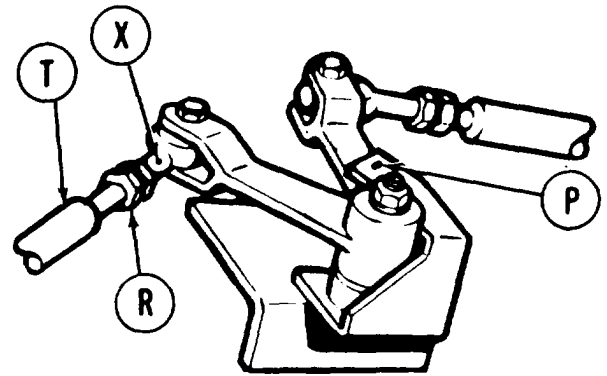
10. Using 9/16 inch wrench, adjust shifting rod bearing end (N) by turning clockwise or counterclockwise until screw (M) slips freely through link (K) and shifting rod bearing end (N).
11. Remove locating pin from alignment hole (J).
12. Using 9/16 inch wrench, install screw (M). Using 9/16 inch socket and torque wrench, tighten screw (M) to 15-20 lb-ft (2027 N.m).

Go on to Sheet 4

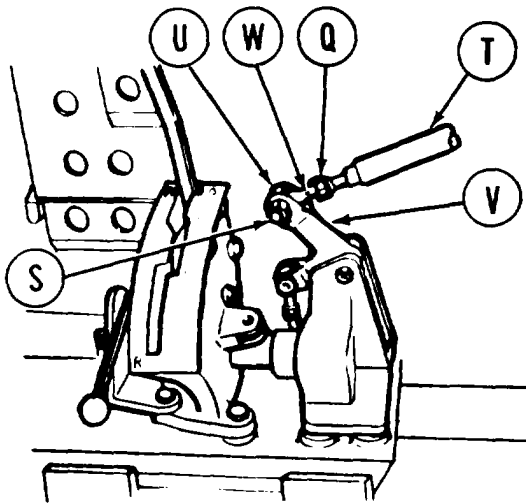
TA139257

SHIFT LINKAGE ADJUSTMENT (Sheet 4 of 20)

13. Forward of ammunition rack, try to insert locating pin into alignment hole (P). If locating pin can be inserted, remove locating pin and go to step 43. If locating pin cannot be inserted, go on to step 14.



FORWARD OF AMMO RACK



DRIVER'S STATION

14. Using 9/16 inch wrench, loosenn jamnuts (Q) and (R).
15. Using 9/16 inch wrench, remove screw (S).
16. Manually move shifting rod (T) and insert locating pin into alinement hole (P).
17. Using 9/16 inch wrench, adjust shifting rod bearing end (U) by turning clockwise or counterclockwise until screw (S) slips freely through link (V) and shifting rod bearing end (U).

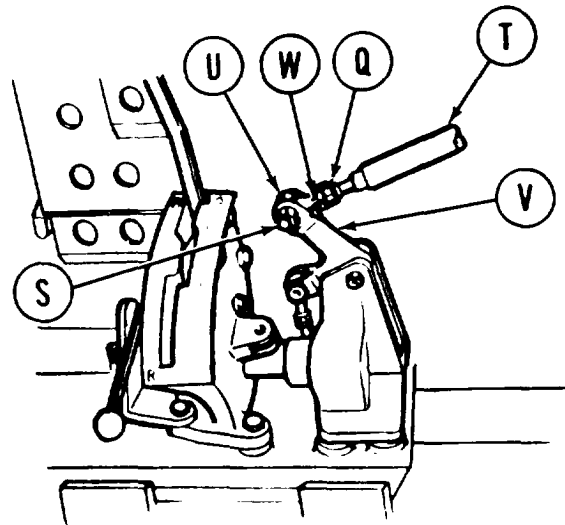
18. Using small diameter wire (Item 59, Appendix D), check to see if shifting rod (T) is past holes (W) and (X). If shifting rod (T) is past holes (W) and (X), do steps 19 thru 22. If shifting rod (T) is not past hole (W), do steps 23 thru 32. If shifting rod (T) is not past hole (X), go to step 33.

Go on to Sheet 5

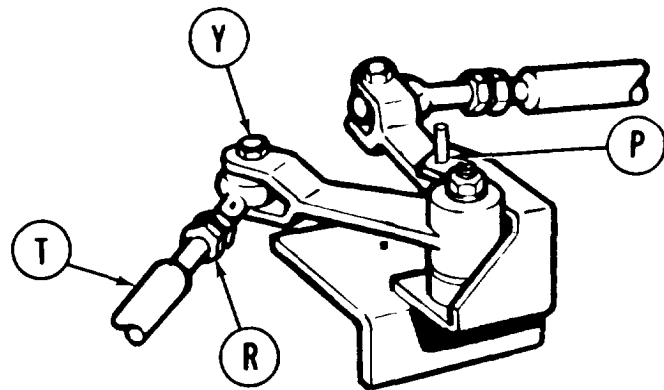
TA 139258

SHIFT LINKAGE ADJUSTMENT (Sheet 5 of 20)

19. Using 9/16 inch wrench, install screw (S) through link (V) and shifting rod bearing end (u).
20. Using torque wrench and crowfoot wrench, tighten jamnuts (Q) and (R) to 15-20 lb-ft (20-27 N l m).
21. Remove locating pin from alinement hole (P).
22. Using 9/16 inch socket and torque wrench, tighten screw (S) to 15-20 lb-ft (20-27 N.m) and go to step 43.
23. Using 9/16 inch wrench, adjust shifting rod bearing end (U) clockwise until shifting rod (T) is past hole (W).
24. Using 9/16 inch wrench, remove screw (Y).
25. Using 9/16 inch wrench, install screw (S) through link (V) and shifting rod bearing end (u).
26. Using crowfoot and torque wrenches, tighten jamnut (Q) to 15-20 lb-ft (20-27 N l m).
27. Using 9/16 inch socket and torque wrench, tighten screw (S) to 15-20 lb-ft (20-27 N.m).



DRIVER'S STATION



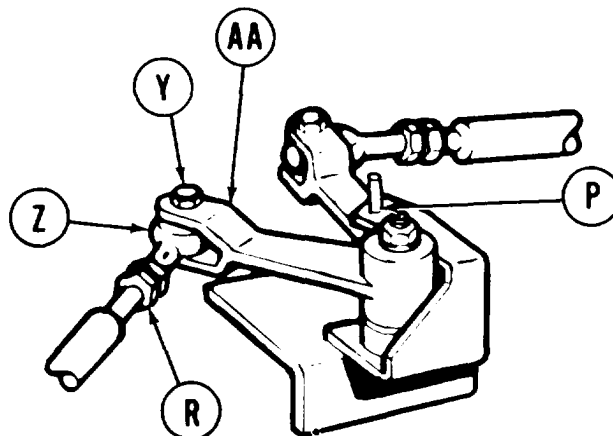
FORWARD OF
AMMO RACK

Go on to Sheet 6

TA253365

SHIFT LINKAGE ADJUSTMENT (Sheet 6 of 20)

28. Using 9/16 inch wrench, adjust shifting rod bearing end (Z) by turning clockwise or counterclockwise until screw (Y) drops freely through clevis (AA) and shifting rod bearing end (Z).
29. Using 9/16 inch wrench, install screw (Y) through clevis (AA) and shifting rod bearing end (Z).
30. Using crowfoot and torque wrenches, tighten jamnut (R) to 15-20 lb-ft (20-27 N.m).
31. Remove locating pin from alinement hole (P).
32. Using 9/16 inch socket and torque wrench, tighten screw (Y) to 15-20 lb-ft (20-27 N.m) and go to step 43.

FORWARD OF
AMMO RACK

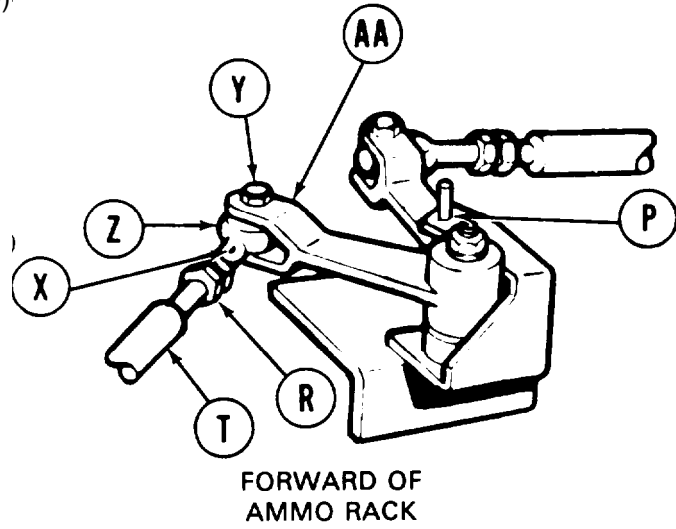
Go on to Sheet i'

TA253366

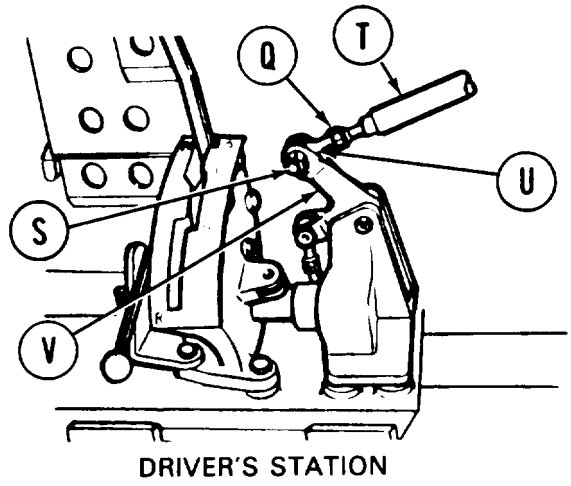
Change 1 11-7

SHIFT LINKAGE ADJUSTMENT (Sheet 7 of 20)

- 33. Using 9/16 inch wrench, remove screw (Y) and shifting rod bearing end (Z) from clevis (AA).
- 34. Using 9/16 inch wrench, adjust shifting rod bearing end (Z) clockwise until shifting rod (T) is past hole (X).



- 35. Using 9/16 inch wrench, install screw (Y) through clevis (AA) and shifting rod bearing end (Z).
- 36. Using crowfoot and torque wrenches, tighten jamnut (R) to 15-20 Ib-ft (20-27 N.m).
- 37. Using 9/16 inch socket and torque wrench, tighten screw (Y) to 15-20 Ib-ft (20-27 N.m).

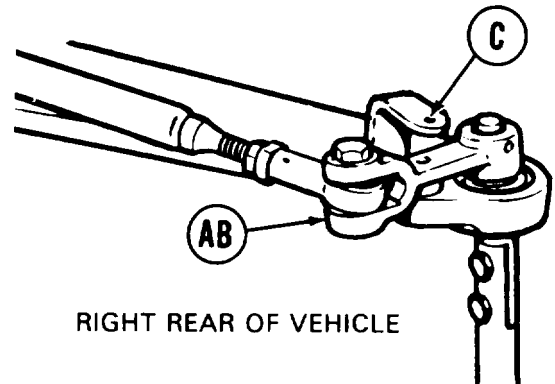


- 38. Using 9/16 inch wrench, adjust shifting rod bearing end (U) by turning clockwise or counterclockwise until screw (S) slides freely through clevis (V) and shifting rod bearing end (U).

- 39. Using 9/16 inch wrench, install screw (S) through clevis (V) and shifting rod bearing end (U).
- 40. Using crowfoot and torque wrenches, tighten jamnut (Q) to 15-20 Ib-ft (20-27 N.m).
- 41. Remove locating pin from alignment hole (P).
- 42. Using 9/16 inch socket and torque wrench, tighten screw (S) to 15-20 Ib-ft (20-27 N.m).

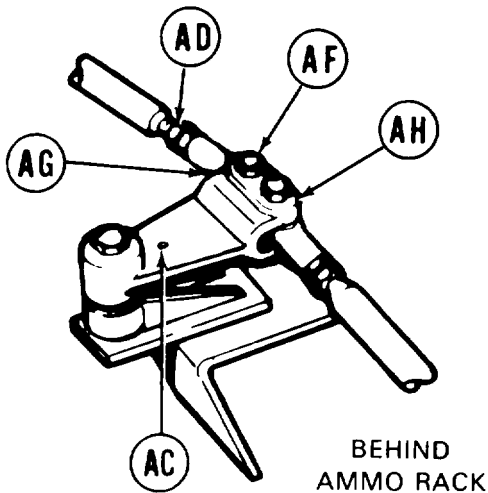
SHIFT LINKAGE ADJUSTMENT (Sheet 8 of 20)

43. Go to right rear of vehicle and try to insert locating pin into alignment hole (C) and through clevis (AB). If locating pin can be inserted, shift linkage is in adjustment. Remove locating pin and go to step 129. If locating pin cannot be inserted, go on to step 44.



RIGHT REAR OF VEHICLE

44. Displace ammo rack (page 17-7).



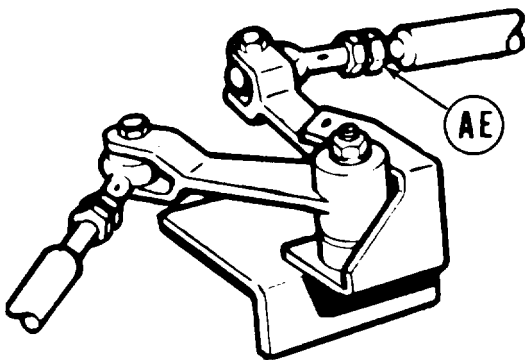
BEHIND AMMO RACK

45. Try to insert locating pin into alignment hole (AC). If locating pin can be inserted, remove locating pin and go to step 73. If locating pin cannot be inserted, go on to step 46.

46. Using 9/16 inch wrench, loosen jamnuts (AD) and (AE).

47. Using 9/16 inch wrench, remove screw (AF) and remove shifting rod bearing end (AG) from clevis (AH).

48. Manually move clevis (AH) and insert locating pin into alignment hole (AC).



FORWARD OF AMMO RACK

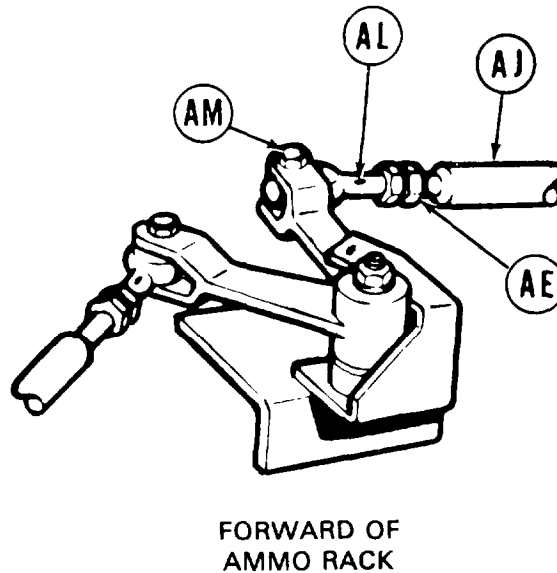
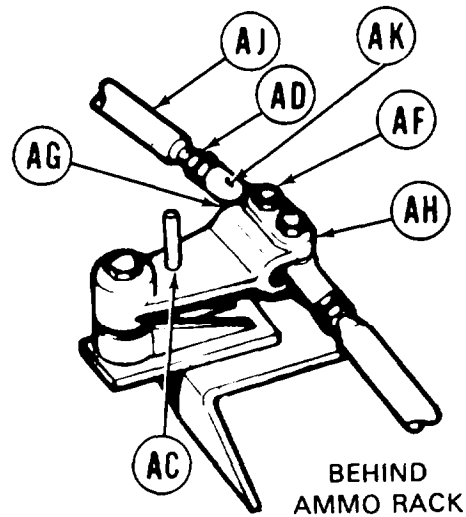
Go on to Sheet 9

TA139262

TM 9-2350-222-20-1-4

SHIFT LINKAGE ADJUSTMENT (Sheet 9 of 20)

49. Using 9/16 inch wrench, adjust shifting rod bearing end (AG) by turning clockwise or counterclockwise until screw (AF) drops freely through clevis (AH) and shifting rod bearing end (AG).
50. Using small diameter wire (Item 59, Appendix D), check to see if shifting rod (AJ) is past holes (AK) and (AL). If shifting rod (AJ) is past holes (AK) and (AL), do steps 51 thru 53. If shifting rod (AJ) is not past hole (AK), do steps 54 thru 62. If shifting rod (AJ) is not past hole (AL), go to step 63.
51. Using 9/16 inch wrench, install screw (AF) through clevis (AH) and shifting rod bearing end (AG).
52. Using crowfoot and torque wrenches, tighten jamnuts (AD) and (AE) to 15-20 Ib-ft (20-27 N.m). Remove locating pin from alinement hole (AC).
53. Using 9/16 inch socket and torque wrench, tighten screw (AF) to 15-20 Ib-ft (20-27 N.m) and go to step 73.
54. Using 9/16 inch wrench, adjust shifting rod bearing end (AG) clockwise until shifting rod (AJ) is past hole (AK).



55. Using 9/16 inch wrench, remove screw (AM).
56. Using 9/16 inch wrench, install screw (AF) through clevis (AH) and shifting rod bearing end (AG).
57. Using crowfoot and torque wrenches, tighten jamnut (AD) to 15-20 Ib-ft (20-27 N-m).
58. Using 9/16 inch socket and torque wrench, tighten screw (AF) to 15-20 Ib-ft (20-27 N.m).

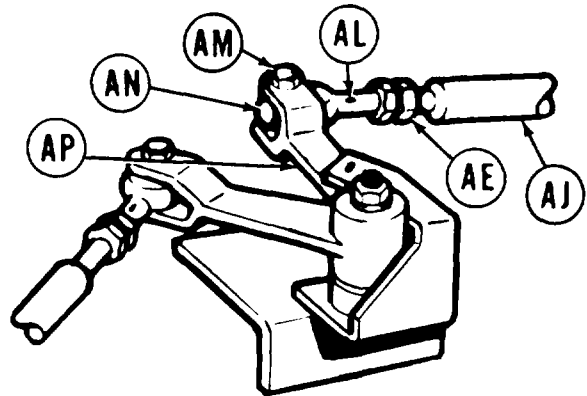
Go on to Sheet 10

TA253368

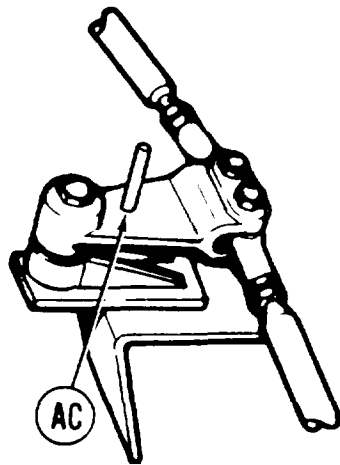
11-10 Change 1

SHIFT LINKAGE ADJUSTMENT (Sheet 10 of 20)

59. Using 9/16 inch wrench, adjust shifting rod bearing end (AN) by turning clockwise or counterclockwise until screw (AM) drops freely through clevis (AP) and shifting rod bearing end (AN).
60. Using 9/16 inch wrench, install screw (AM).
61. Using crowfoot and torque wrenches, tighten jamnut (AE) to 15-20 lb-ft (20-27 N.m). Remove locating pin from alignment hole (AC).



FORWARD OF AMMO RACK



BEHIND AMMO RACK

62. Using 9/16 inch socket and torque wrench, tighten screw (AM) to 15-20 lb-ft (20-27 N.m) and go to step 73.
63. Using 9/16 inch wrench, remove screw (AM).
64. Using 9/16 inch wrench, adjust shifting rod bearing end (AN) by turning clockwise until shifting rod (AJ) is past hole (AL).
65. Using 9/16 inch wrench, install screw (AM).
66. Using crowfoot and torque wrenches, tighten jamnut (AE) to 15-20 lb-ft (20-27 N.m).
67. Using 9/16 inch socket and torque wrench, tighten screw (AM) to 15-20 lb-ft (20-27 N.m).

Go on to Sheet 11

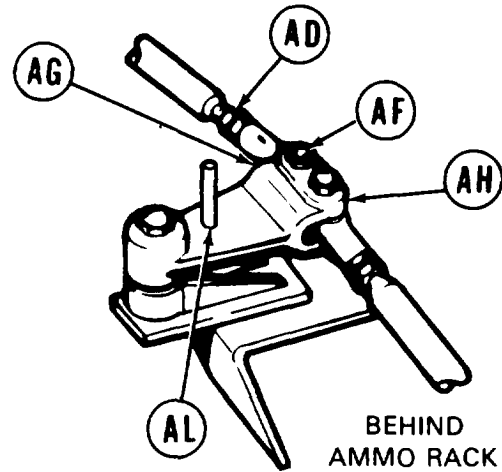
TA253369

Change 1 11-11

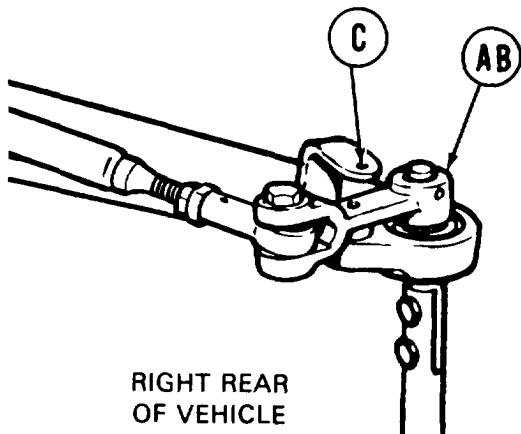
TM 9-2350-222-20-1-4

SHIFT LINKAGE ADJUSTMENT (Sheet 11 of 20)

68. Using 9/16 inch wrench, adjust shifting rod bearing end (AG) by turning clockwise or counterclockwise until screw (AF) drops freely through clevis (AH) and shifting rod bearing end (AG).
69. Using 9/16 inch wrench, install screw (AF).
70. Using crowfoot and torque wrenches, tighten jamnut (AD) to 15-20 lb-ft (20-27 N.m).
71. Remove locating pin from alignment hole (AC).
72. Using 9/16 inch socket and torque wrench, tighten screw (AF) to 15-20 lb-ft (20-27 N.m).



73. Go to right rear of vehicle and try to insert locating pin into alignment hole (C and through Clevis (AB). If locating pin can be inserted, shift linkage is in adjustment. Remove locating pin and go to step 129. If locating pin cannot be inserted, go on to step 74.



74. Remove powerplant (page 5-1).

Go on to Sheet 12

TA253370

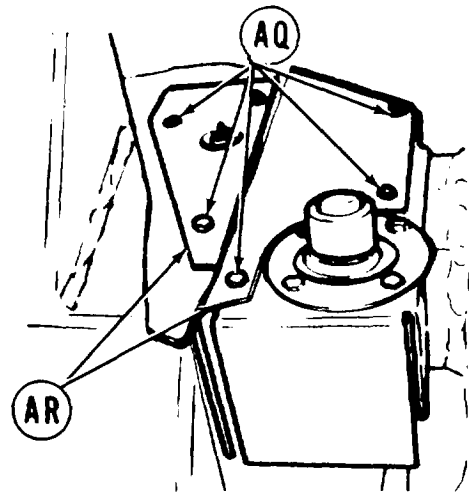
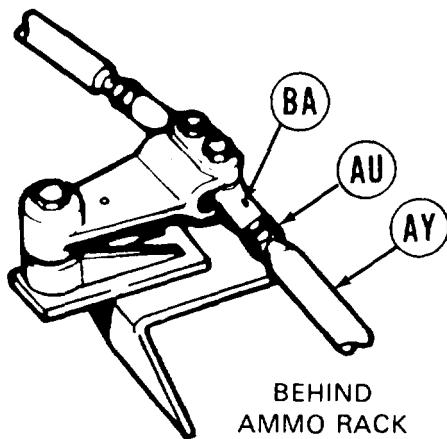
SHIFT LINKAGE ADJUSTMENT (Sheet 12 of 20)

75. Using 9/16 inch wrench, remove 5 screws and 10 washers (AQ).
76. Using hands, remove two shift linkage control cover plates (AR).
77. Try to insert locating pin in alinement hole (AS). If locating pin can be inserted, go to step 106. If locating pin cannot be inserted, go on to step 78.
78. Using 9/16 inch wrench, loosen jamnuts (AT) and (AU).
79. Using 9/16 inch wrench, remove screw (AV). Manually move clevis (AW).
80. Insert locating pin into alinement hole (AS).

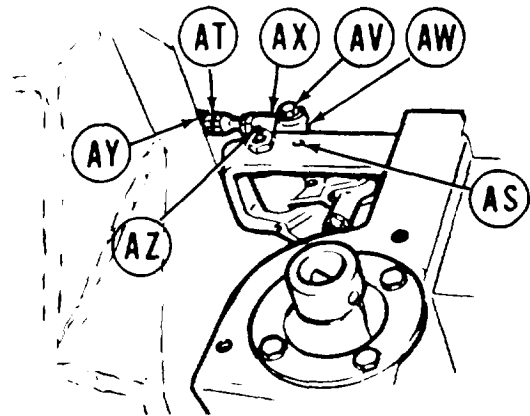
NOTE

Do not allow shift rod (AY) to turn while doing step 81. Shift rod (AY) is made up of more than one piece and may come apart if allowed to turn.

81. Using 9/16 inch wrench, adjust shifting rod bearing end (AX) by turning clockwise-or counterclockwise until screw (AV) drops freely through clevis (AW) and shifting rod bearing end (AX).



RIGHT REAR OF ENGINE COMPARTMENT

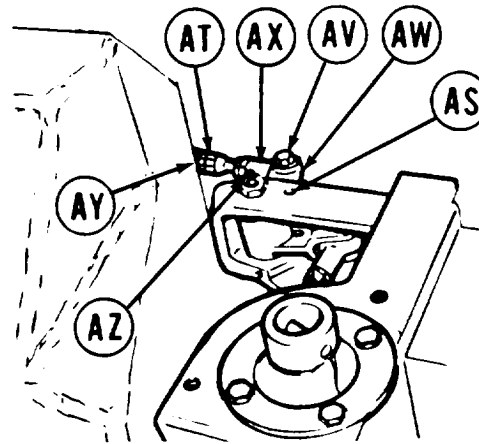


82. Using small diameter wire (Item 59, Appendix D), check to see if shift rod (AY) is past holes (AZ) and (BA). If shifting rod (AY) is past holes (AZ) and (BA), do steps 83 thru 86. If shifting rod (AY) is not past hole (AZ), do steps 87 thru 95. If shifting rod (AY) is not past hole (BA), go to step 96.
83. Using 9/16 inch wrench, install screw (AV).
84. Using crowfoot and torque wrenches, tighten jamnuts (AT) and (AU) to 15-20 ll-ft (20- 27 N.m).
85. Remove locating pin from alinement hole (AS).
86. Using 9/16 inch socket and torque wrench, tighten screw (AV) to 15-20 lb-ft (20-27 N.m) and go to step 106.

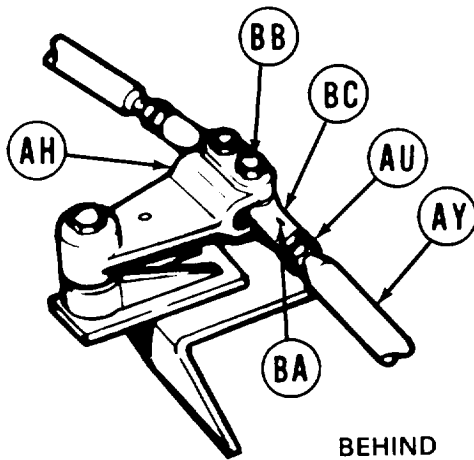
Go on to Sheet 13

TA253371

87. Using 9/16 inch wrench, adjust shifting rod bearing end (AX) by turning clockwise until shifting rod (AY) is past hole (AZ).
88. Using 9/16 inch wrench, remove screw (BB).
89. Using 9/16 inch wrench, install screw (AV) through clevis (AW) and shifting rod bearing end (AX).
90. Using crowfoot and torque wrenches, tighten jamnut (AT) to 15-20 lb-ft (20-27 N.m).



RIGHT REAR OF
ENGINE COMPARTMENT



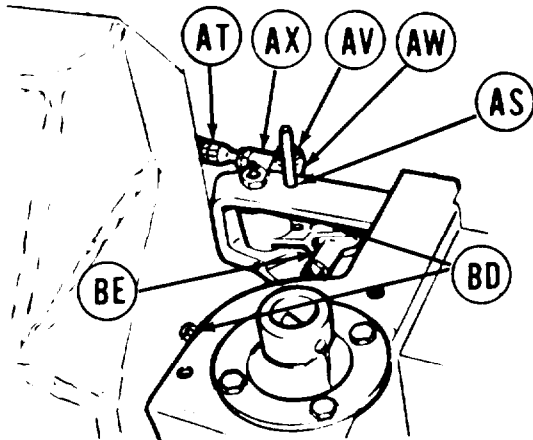
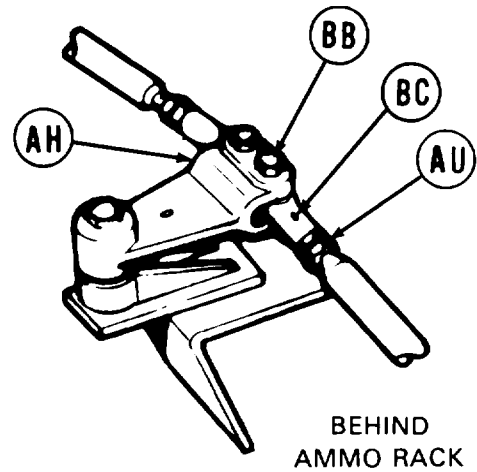
BEHIND
AMMO RACK

91. Using 9/16 inch socket and torque wrench, tighten screw (AV) to 15-20 lb-ft (20-27 N.m).
92. Using 9/16 inch wrench, adjust shifting rod bearing end (BC) by turning clockwise or counterclockwise until screw (BB) drops freely through clevis (AH) and shifting rod bearing end (BC).
93. Using 9/16 inch wrench, install screw (BB).

94. Using crowfoot and torque wrenches, tighten jamnut (AU) to 15-20 lb-ft (20-27 N.m). Remove locating pin from alignment hole (AS).
95. Using 9/16 inch socket and torque wrench, tighten screw (BB) to 15-20 lb-ft (20-27 N.m) and go on to step 106.
96. Using 9/16 inch wrench, remove screw (BB).
97. Using 9/16 inch wrench, adjust shifting rod bearing end (BC) by turning clockwise until shifting rod (AY) is past hole (BA).

SHIFT LINKAGE ADJUSTMENT (Sheet 14 of 20)

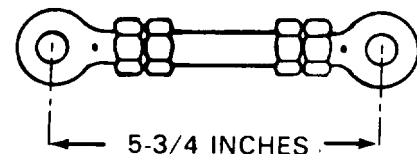
98. Using 9/16 inch wrench, install screw (BB) through clevis (AH) and shifting rod bearing end (BC).
99. Using crowfoot and torque wrenches, tighten jamnut (AU) to 15-20 lb-ft (20-27 N.m).
100. Using 9/16 inch socket and torque wrench, tighten screw (BB) to 15-20 lb-ft (20-27 N.m).



RIGHT REAR OF
ENGINE COMPARTMENT

101. Using 9/16 inch wrench, adjust shifting rod bearing end (AX) by turning clockwise or counterclockwise until screw (AV) drops freely through clevis (AW) and shifting rod bearing end (AX).
102. Using 9/16 inch wrench, install screw (AV) through clevis (AW) and shifting rod bearing end (AX).

103. Using crowfoot and torque wrenches, tighten jamnut (AT) to 15-20 lb-ft (20-27 N.m).
104. Remove locating pin from alignment hole (AS).
105. Using 9/16 inch socket and torque wrench, tighten screw (AV) to 15-20 lb-ft (20-27 N.m).
106. Using 9/16 inch wrench, remove two screws (BD).
107. Using hands, remove stud and rod end bearing assembly (BE).
108. Using rule, measure between center-to-center of rod end holes. If measurement is 5-3/4 inches, assembly is in adjustment. Go to step 123. If measurement is not 5-3/4 inches, go on to step 109.



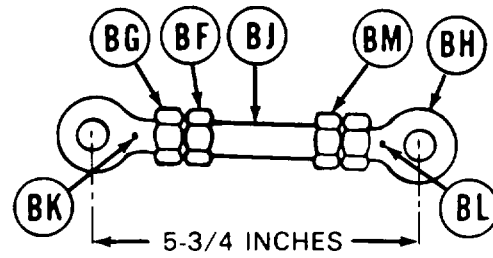
Go on to Sheet 15

TA253373

TM 9-2350-222-20-1-4

SHIFT LINKAGE ADJUSTMENT (Sheet 15 of 20)

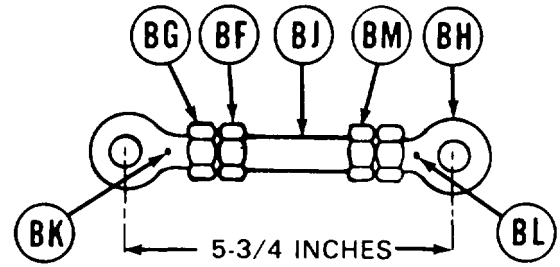
- 109. Using two 9/16 inch wrenches, loosen jamnut (BF).
- 110. Using 9/16 inch wrench, adjust stud and rod end bearing assembly by turning rod bearing end (BG) clockwise or counterclockwise until distance between centers of rod bearing (BG) and (BH) measures 5-3/4 inches.



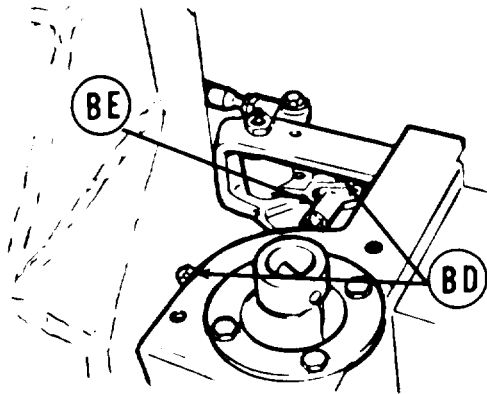
- 111. Using small diameter wire (Item 59, Appendix D), check to see if rod (BJ) is past holes (BK) and (BL). If rod (BJ) is past holes (BK) and (BL), go on to step 112. If rod (BJ) is not past hole (BK), do steps 113 thru 117. If rod (BJ) is not past hole (BL), go on to step 118
- 112. Using 9/16 inch wrench, crowfoot wrench, and torque wrench, tighten jamnut (BF) to 15-20 lb-ft (20-27 N.m) while maintaining 5-3/4 inch measurement and go to step 123.
- 113. Using 9/16 inch wrench, turn rod bearing end (BG) clockwise until rod (BJ) is past hole (BK).
- 114. Using 9/16 inch wrench, crowfoot wrench, and torque wrench, tighten jamnut (BF) to 15-20 lb-ft (20-27 N.m).
- 115. Using two 9/16 inch wrenches, loosen jamnut (BM).
- 116. Using 9/16 inch wrench, adjust stud and rod end bearing assembly by turning rod bearing end (BH) clockwise or counterclockwise until distance between centers of rod bearing ends (BG) and (BH) measures 5-3/4 inches.
- 117. Using 9/16 inch wrench, crowfoot wrench, and torque wrench, tighten jamnut (BM) to 15-20 lb-ft (20-27 N.m) while maintaining 5-3/4 inch measurement and go to step 123.

SHIFT LINKAGE ADJUSTMENT (Sheet 16 of 20)

- 118. Using two 9/16 inch wrenches, loosen jamnut (BM).
- 119. Using 9/16 inch wrench, turn rod bearing end (BH) clockwise until rod (BJ) is past hole (BL).



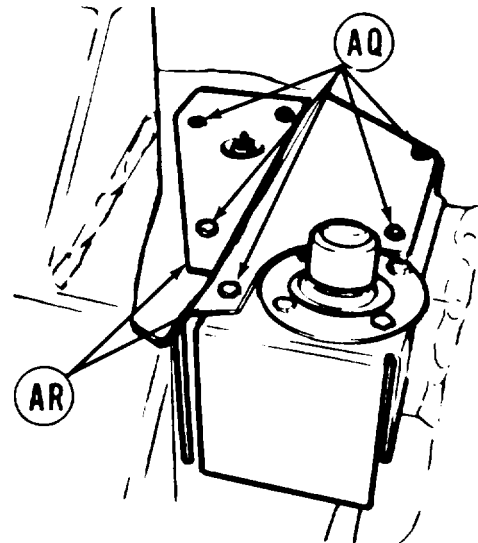
- 120. Using 9/16 inch wrench, crowfoot wrench, and torque wrench, tighten jamnut (BM) to 15-20 lb-ft (20-27 N.m).
- 121. Using 9/16 inch wrench, adjust stud and rod end bearing assembly by turning rod bearing end (BG) clockwise or counterclockwise until distance between centers of rod bearing ends (BG) and (BH) measures 5-3/4 inches.
- 122. Using 9/16 inch wrench, crowfoot wrench, and torque wrench, tighten jamnut (BF) to 15-20 lb-ft (20-27 N.m).



RIGHT REAR OF ENGINE COMPARTMENT

- 123. Using hands, install stud and rod bearing assembly (BE).
- 124. Using 9/16 inch wrench, install two screws

- 125. Using hands, install two shift linkage control cover plates (AR).
- 126. Using 7/16 inch wrench, install 5 screws and 10 washers (AQ).



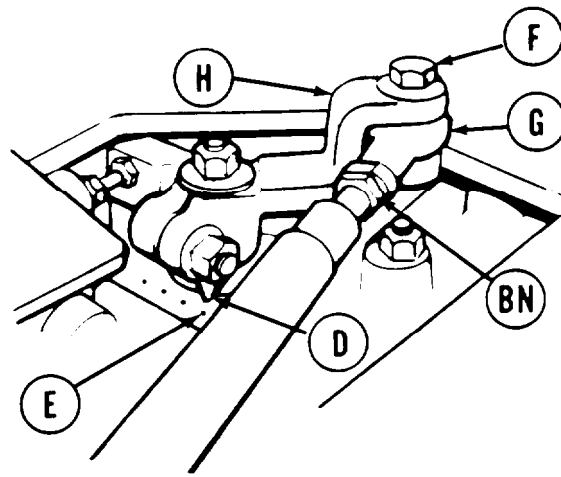
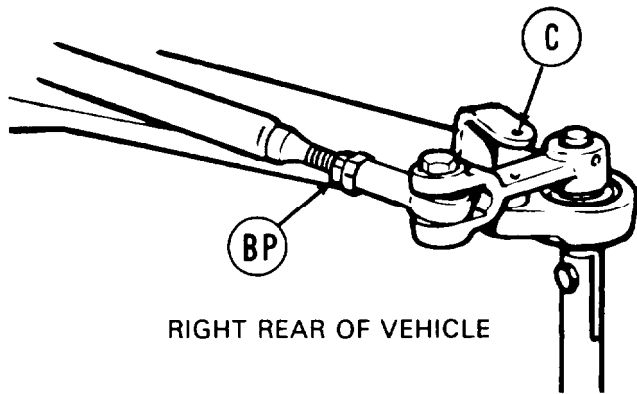
Go on to Sheet 17

TA253375

SHIFT LINKAGE ADJUSTMENT (Sheet 17 of 20)

127. Install 2A powerplant (page 5-14) or 2D powerplant (page 5-37).

128. At top of transmission, try to insert locating pin in alinement hole (C). If locating pin can be inserted, go on to step 129. If locating pin cannot be inserted, go to step 130.



TOP OF TRANSMISSION

129. At top of transmission, check position of shifting position indicator (D). If shifting position indicator (D) is pointing to most forward dot (E), linkage is in adjustment. Go to step 160. If shifting position indicator (D) is not pointing to most forward dot (E), go on to step 130.

130. Using 9/16 inch wrench, loosen jamnuts (BN) and (BP).

131. Using 9/16 inch wrench, remove screw (F) (if not removed in step 4).

132. Using hands, move shifting position indicator (D) to most forward dot (E).

133. Insert locating pin in alinement hole (C) (if not inserted in step 128).

NOTE

It may be necessary to move shifting position indicator (D) to most rear dot to adjust shifting rod bearing end (G) and then back to most forward dot (E) to check adjustment in step 134.

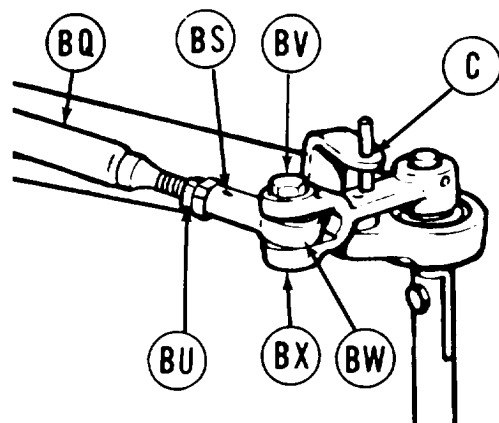
134. Using 9/16 inch wrench, adjust shifting rod bearing end (G) by turning clockwise or counterclockwise until screw (F) drops freely through shifting rod bearing end (G) and clevis (H).

Go on to Sheet 18

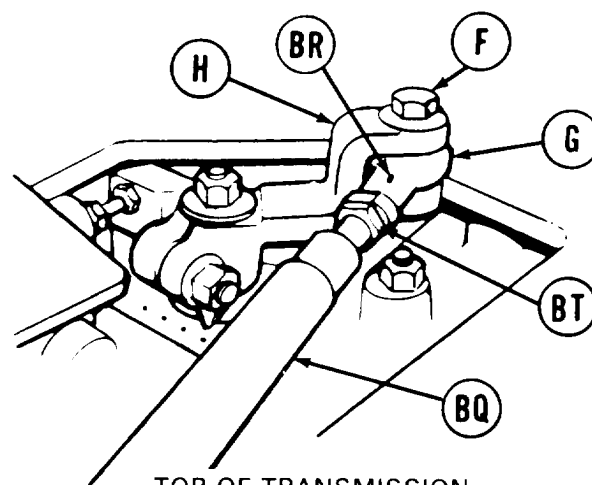
TA139271

SHIFT LINKAGE ADJUSTMENT (Sheet 18 of 20)

135. Using small diameter wire (Item 59, Appendix D), check to see if shifting rod (BQ) is past holes (BR) and (BS). If shifting rod (BQ) is past holes (BR) and (BS), do steps 136 thru 139. If shifting rod (BQ) is not past hole (BR), do steps 140 thru 149. If shifting rod (BQ) is not past hole (BS), go to step 150.



RIGHT REAR OF VEHICLE



TOP OF TRANSMISSION

136. Using 9/16 inch wrench, install screw (F) through clevis (H) and shifting rod bearing end (G).
137. Using crowfoot and torque wrenches, tighten jamnuts (BT) and (BU) to 15-20 lb-ft (20- 27 N.m).
138. Remove locating pin from alinement hole (C).
139. Using 9/16 inch socket and torque wrench, tighten screw (F) to 15-20 lb-ft (20-27 N.m) and go to step 160,
140. Using 9/16 inch wrench, adjust shifting rod bearing end (G) by turning clockwise until shifting rod (BQ) is past hole (BR).
141. Using 9/16 inch wrench, remove screw (BV) and remove shifting rod bearing end (BW) from clevis (BX).
142. Using 9/16 inch wrench, install screw (F) through clevis (H) and shifting rod bearing end (G).
143. Using crowfoot and torque wrenches, tighten jamnut (BT) to 15-20 lb-ft (20-27 N.m).
144. Using 9/16 inch socket and torque wrench, tighten screw (F) to 15-20 lb-ft (20-27 N.m).

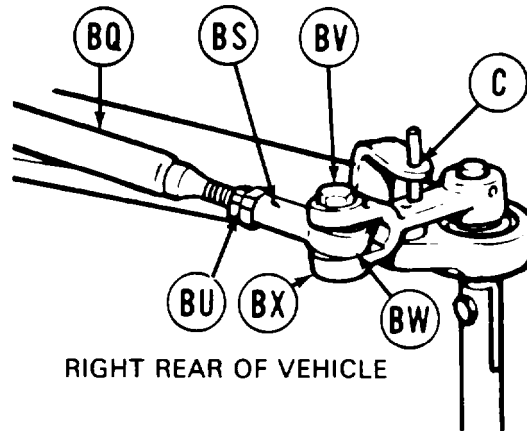
Go on to Sheet 19

TA253376

TM 9-2350-222-20-1-4

SHIFT LINKAGE ADJUSTMENT (Sheet 19 of 20)

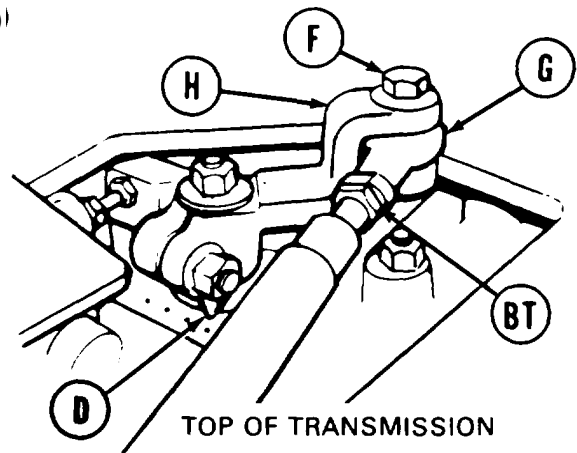
145. Using 9/16 inch wrench, adjust shifting rod bearing end (BW) by turning clockwise or counterclockwise until screw (BV) drops freely through clevis (BX) and shifting rod bearing end (BW).
146. Using 9/16 inch wrench, install screw (BV) through clevis (BX) and shifting rod bearing end (BW).
147. Using crowfoot and torque wrenches, tighten jamnut (BU) to 15-20 lb-ft (20-27 N.m).
148. Remove locating pin from alignment hole (C).
149. Using 9/16 inch socket and torque wrench, tighten screw (BV) to 15-20 lb-ft (20-27 N.m) and go to step 160.
150. Using 9/16 inch wrench, remove screw (BV) and shifting rod bearing end (BW) from clevis (BX).
151. Using 9/16 inch wrench, adjust shifting rod bearing end (BW) by turning clockwise until shifting rod (BQ) is past hole (BS).
152. Using 9/16 inch wrench, install screw (BV) through clevis (BX) and shifting rod bearing end (BW).
153. Using crowfoot and torque wrenches, tighten jamnut (BU) to 15-20 lb-ft (20-27 N.m).
154. Using 9/16 inch socket and torque wrench, tighten screw (BV) to 15-20 lb-ft (20-27 N.m).



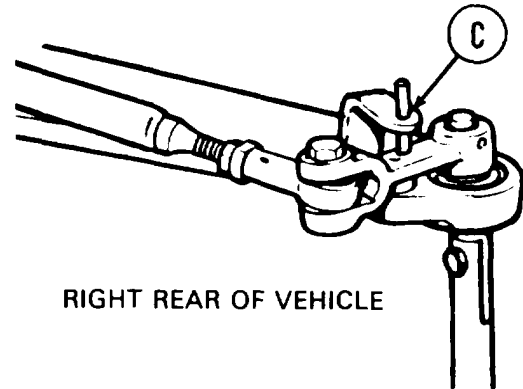
SHIFT LINKAGE ADJUSTMENT (Sheet 20 of 20)

NOTE

It may be necessary to move position indicator (D) to most rear positioned dot to adjust rod end, and then back to most forward positioned dot to check adjustment in step 155.



155. Using 9/16 inch wrench, adjust shifting rod bearing end (G) by turning clockwise or counterclockwise until screw (F) drops freely through clevis (H) and shifting rod bearing end (G).
156. Using 9/16 inch wrench, install screw (F) through clevis (H) and shifting rod bearing end (G).
157. Using crowfoot and torque wrenches, tighten jamnut (BT) to 15-20 lb-ft (20-27 N-m).
158. Remove locating pin from alinement hole (C).



159. Using 9/16 inch socket and torque wrench, tighten screw (F) to 15-20 lb-ft (20-27 N.m).
160. Install ammunition rack (page 17-9).
161. Check shifting pattern response (TM 9-2350-222-10). If transmission still does not shift correctly, notify support maintenance. If transmission does shift correctly, go on to step 162.
162. Install top deck (page 16-23).
163. Install transmission shroud (page 9-23).

End of Task

TA253378

Change 1 11-21

TM 9-2350-222-20-1-4

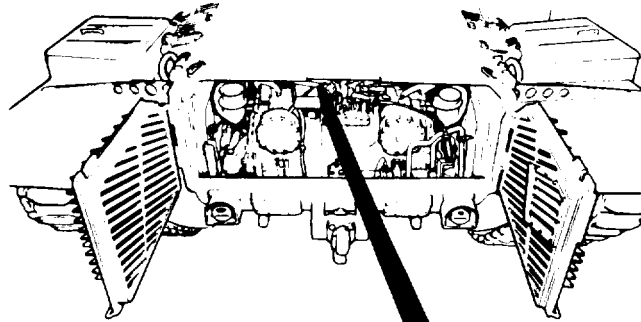
NEUTRAL SHIFT SWITCH ADJUSTMENT (Sheet 1 of 3)

TOOLS: 7/16 in. combination box and open end wrench (2 required)

TEST EQUIPMENT: Multimeter

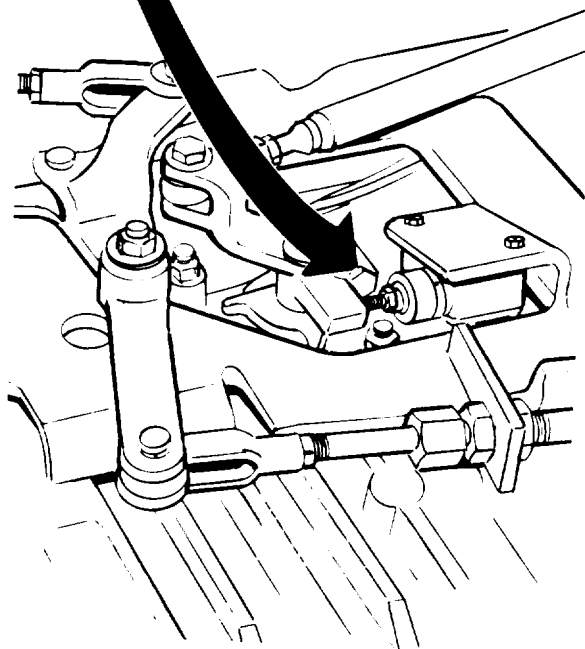
REFERENCE: TM 9-2350-222-10

PRELIMINARY PROCEDURES: Remove transmission shroud (page 9-20)
Adjust transmission shift linkage (page 11-2)



ADJUSTMENT:

1. Set transmission lever (neutral) (TM 9-2350-222-10).

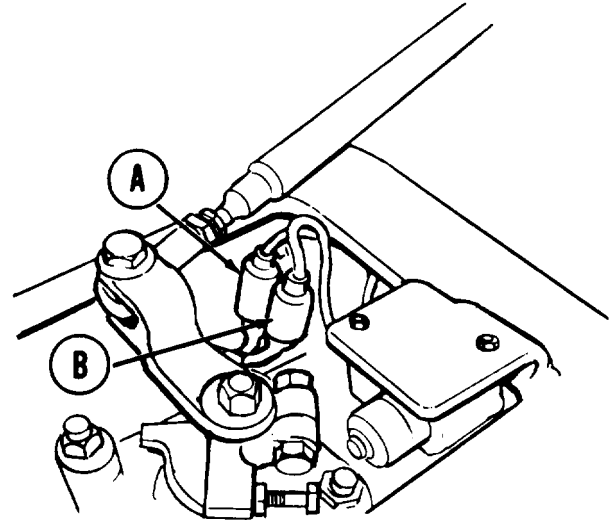
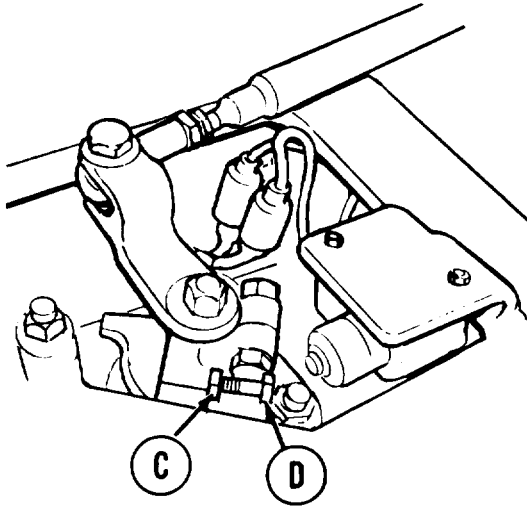


Go on to Sheet 2

TA139275

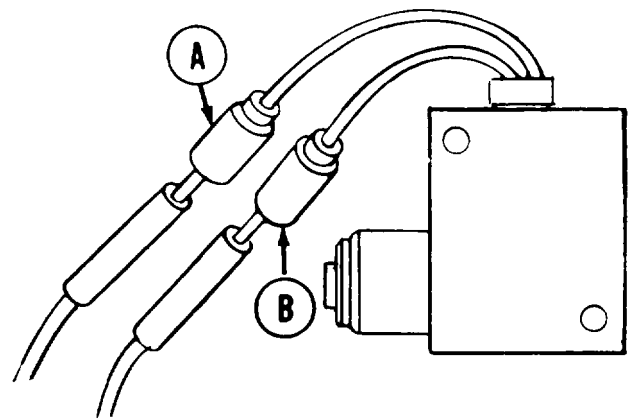
NEUTRAL SHIFT SWITCH ADJUSTMENT (Sheet 2 of 3)

2. Disconnect electrical connectors (A) and (B).
3. Set up multimeter for continuity test.



4. Using two wrenches, loosen jamnut (C) while holding screw (D),

5. Connect multimeter leads to connectors (A) and (B). If meter needle does not move, go to step 7. If meter needle goes to zero, go on to step 6.
6. Using wrench, shorten screw (D) until meter shows high resistance.

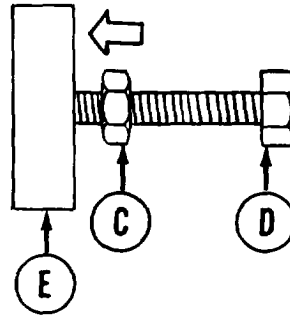


Go on to Sheet 3

TA139276

NEUTRAL SHIFT SWITCH ADJUSTMENT (Sheet 3 of 3)

7. Lengthen screw (D) until meter just reads zero.
8. Lengthen screw (D) by three complete turns.
9. Using two wrenches, tighten jamnut (C) toward bracket (E) while holding screw (D).



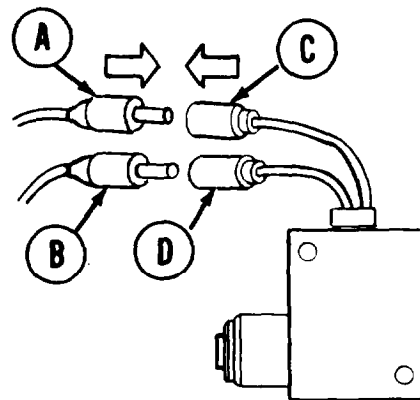
10. Set transmission lever to other positions, meter should read zero in neutral (N) and park (P) only. Replace neutral shift switch (page 10-252) if any other readings are found.

11. Disconnect meter probes from electrical connectors.

12. Connect connectors (A) and (B) to (C) and (D).

13. Test adjustment by attempting to start engine in all transmission lever positions. Engine should start only in neutral (N) and park (P) positions only.

14. Install transmission shroud (page 9-23).



End of Task

TA139277

**SHIFTING CONTROL AND RELATED PARTS REPAIR AND REPLACEMENT
(Sheet 1 of 15)**

PROCEDURE INDEX

PROCEDURE	PAGE
Removal	11-26
Disassembly	11-28
Inspection	11-33
Assembly	11-33
Installation	11-38

TOOLS:

- 7/16 in. combination box and open end wrench
- 9/16 in. combination box and open end wrench
- 3/4 in. combination box and open end wrench
- 7/16 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)
- 9/16 in. socket with 1/2 in. drive
- 10 in. extension with 1/2 in. drive
- 2 lb hammer
- 1/8 in. drive punch
- 3/8 in. drive punch
- 1/4 in. drive punch
- 3/4 in. brass drift
- Slip joint pliers
- Flat-tip screwdriver
- Vise
- 6 in. machinist's rule
- 1/4 in. electric drill
- 5/64 in. drill bit
- 1/8 in. drill bit
- Alining punch

PRELIMINARY PROCEDURE: Block tracks (TM 9-2350-222-10)

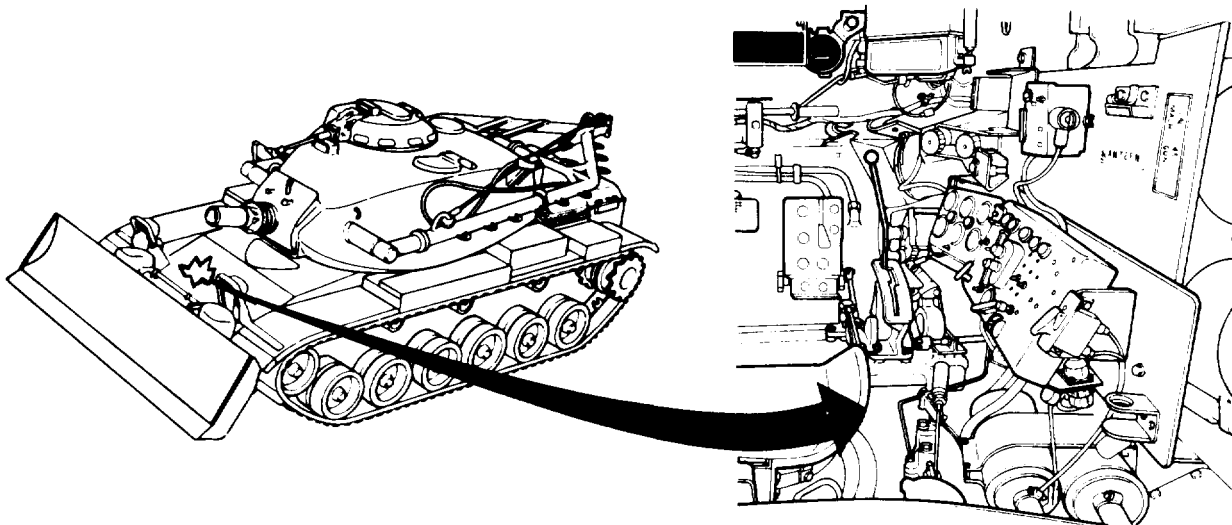
Go on to Sheet 2

TA253379

Change 1 11-25

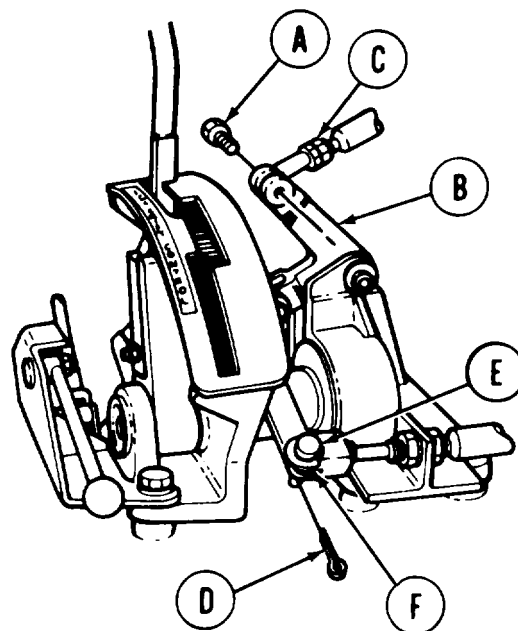
SHIFTING CONTROL AND RELATED PARTS REPAIR AND REPLACEMENT (Sheet 2 of 15)

SUPPLIES: Cotter pin (MS24665-283) (3 required)
Pencil
Paper
Masking tape (Item 56, Appendix D)
Tags (4 required)
Bearing (713937)
Lockwasher (MS35337-27) (8 required)
Lockwasher (MS35338-63) (1 required)



REMOVAL:

1. Using 9/16 inch wrench, remove bolt (A) from upper clevis of link assembly (B).
2. Move connecting link (C) aside
3. Using pliers, remove cotter pin (D) and straight pin (E) from parking brake clevis (F). Throw cotter pin away.

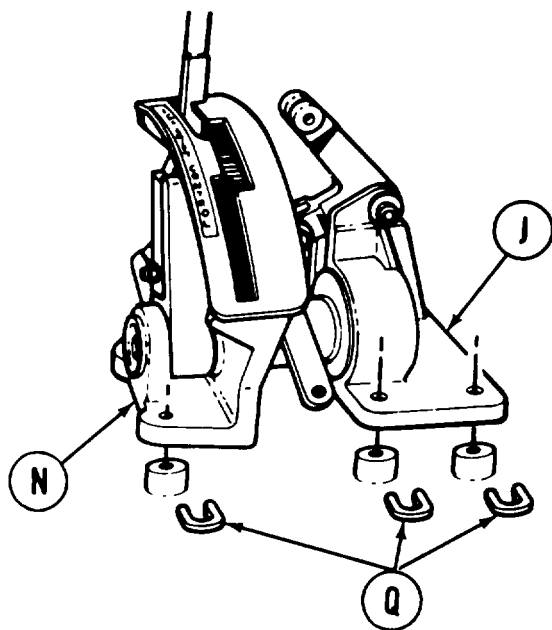
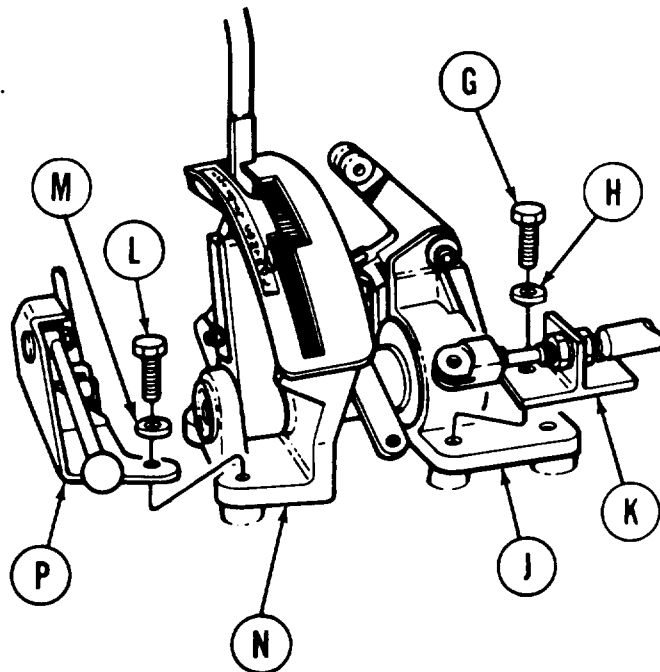


Go on to Sheet 3

TA 139279

SHIFTING CONTROL AND RELATED PARTS REPAIR AND REPLACEMENT
(Sheet 3 of 15)

4. Using 9/16 inch socket with extension, remove four screws (G) and lockwashers (H) from bracket assembly base (J). Throw lockwashers away.
5. Move parking brake control assembly (K) aside.
6. Using 9/16 inch socket with extension, remove three screws (L) and lockwashers (M) from hand lever base assembly (N). Throw lockwashers away.
7. Move throttle locking lever (P) aside.



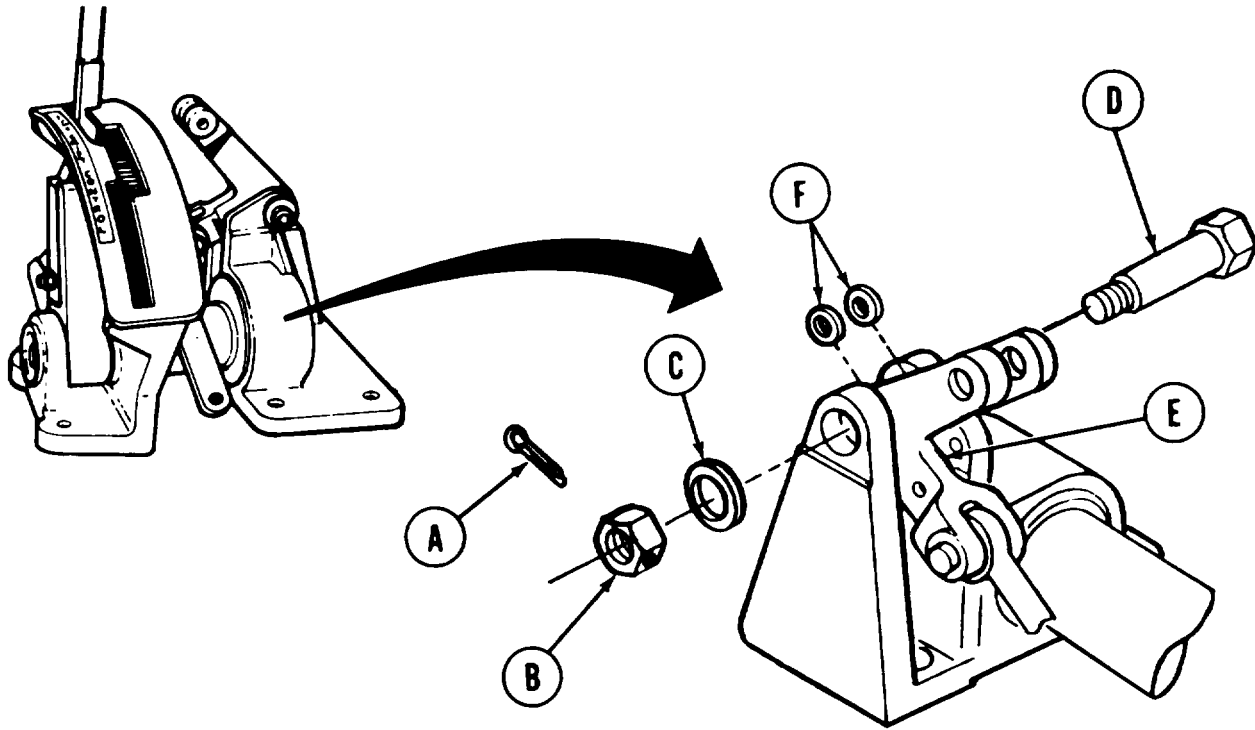
8. Remove base assembly (N) and bracket assembly (J) as a single unit from vehicle.
9. Using pencil and masking tape, tag all shims (Q) found under bases (N) and (J).

Go on to Sheet 4

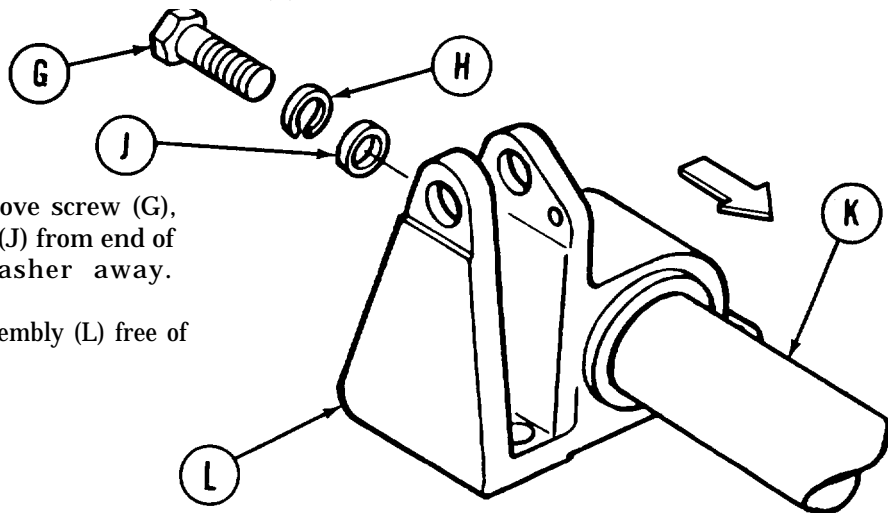
SHIFTING CONTROL AND RELATED PARTS REPAIR AND REPLACEMENT

(Sheet 4 of 15)

DISASSEMBLY:



1. Using pliers, remove cotter pin (A). Throw cotter pin away.
2. Using 9/16 inch and 3/4 inch wrenches, remove nut (B), washer (C), and bolt (D).
3. Move link (E) aside and remove two flat washers (F).



4. Using 9/16 inch socket, remove screw (G), lockwasher (H), and washer (J) from end of shaft (K). Throw lockwasher away.
5. Using hands, slide bracket assembly (L) free of shaft (K).

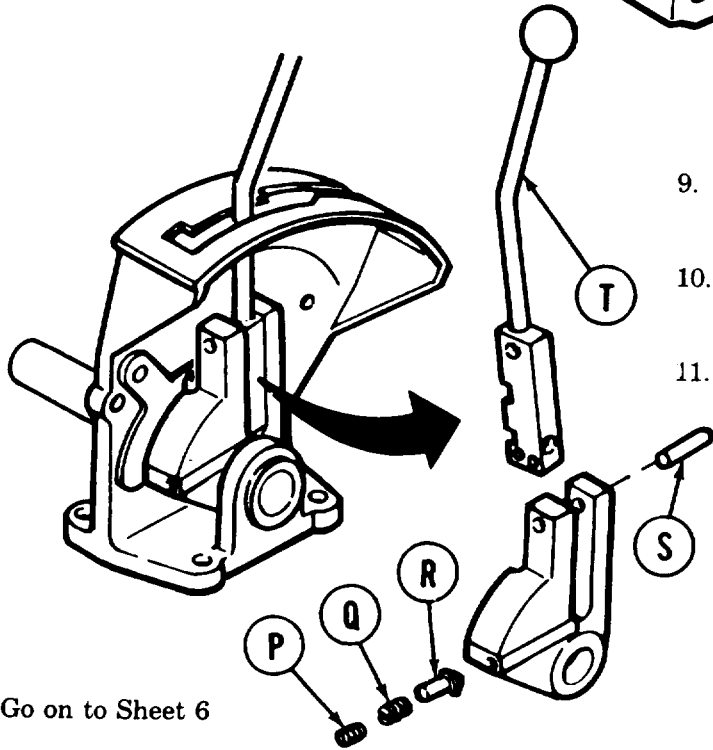
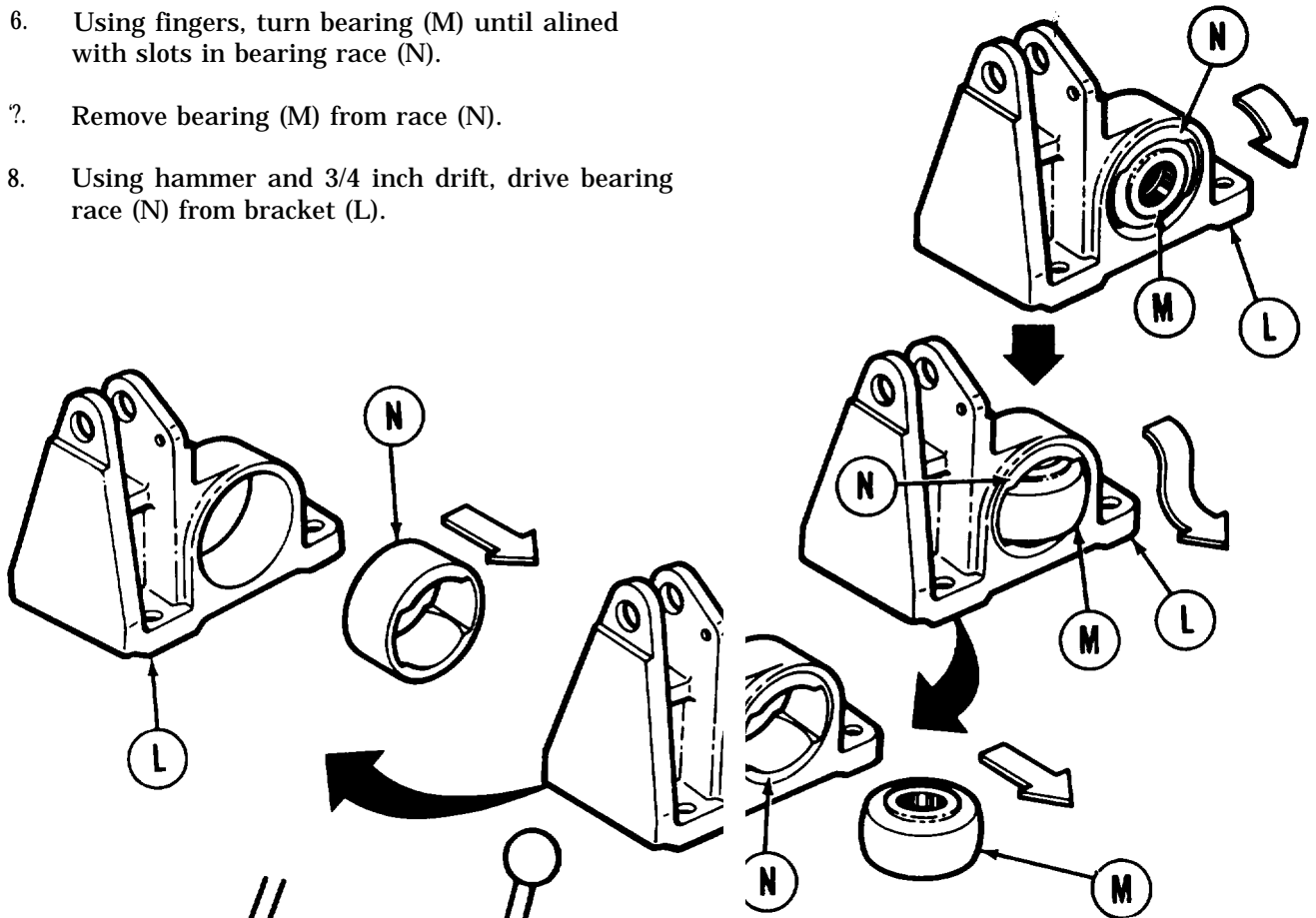
Go on to Sheet 5

TA139281

SHIFTING CONTROL AND RELATED
(Sheet 5 of 15)

AND REPLACEMENT

6. Using fingers, turn bearing (M) until aligned with slots in bearing race (N).
7. Remove bearing (M) from race (N).
8. Using hammer and 3/4 inch drift, drive bearing race (N) from bracket (L).



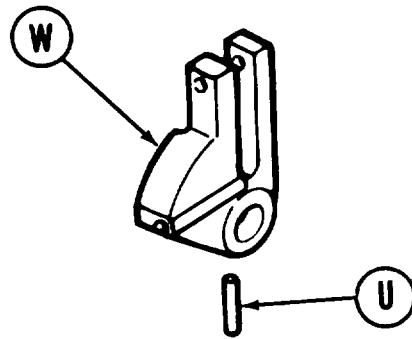
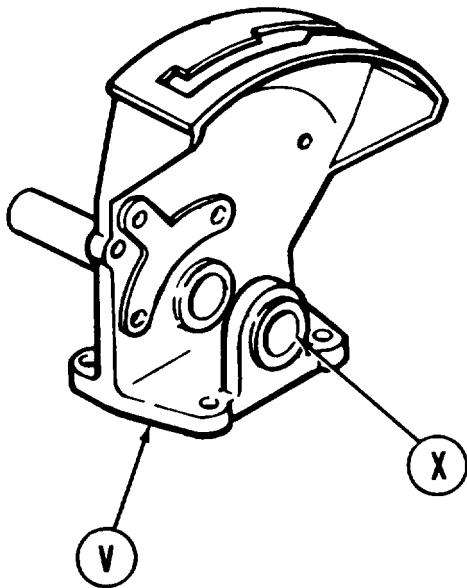
9. Using screwdriver, remove adjuster (P), spring (Q), and plunger (R).
10. Using hammer and 1/4 inch. drive punch, remove pin (S).
11. Move control rod (T) to L and remove control rod (T).

Go on to Sheet 6

TA139282

SHIFTING CONTROL AND RELATED PARTS REPAIR AND REPLACEMENT
(Sheet 6 of 15)

12. Using hammer and alining punch, remove pin (U).
13. Remove shaft (V) and pivot (W) from base assembly (X).



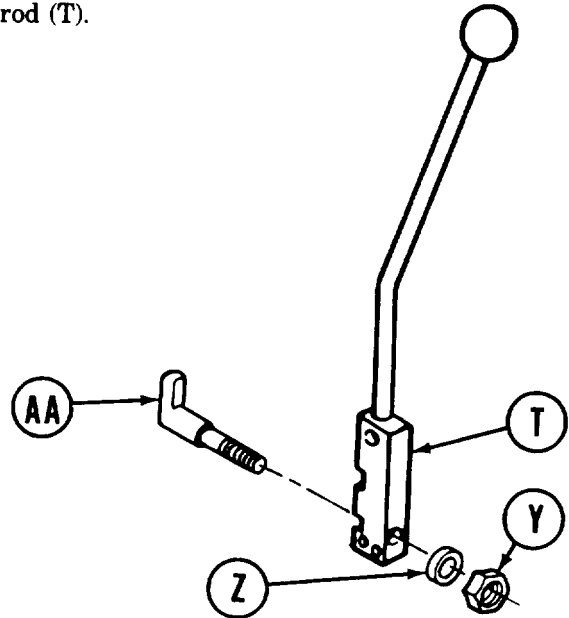
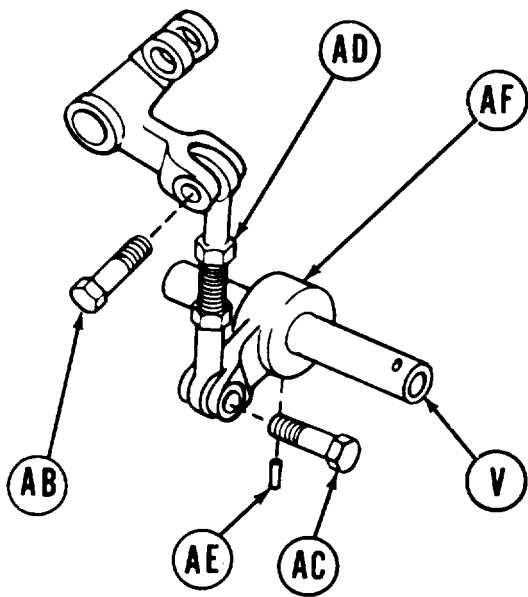
Go on to Sheet 7

TA139283

SHIFTING CONTROL AND RELATED PARTS REPAIR AND REPLACEMENT
(Sheet 7 of 15)

14. Using 7/16 inch wrench, remove nut (Y) and lockwasher (Z). Throw lockwasher away.

i. Using pliers, remove fastener (AA) from control rod (T).



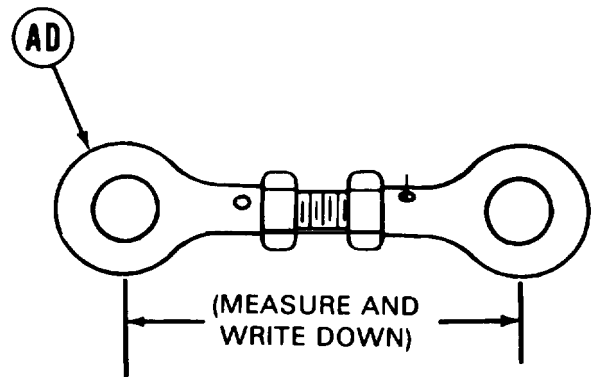
16. Using 9/16 inch wrench, remove bolts (AB) and (AC).

17. Remove rod end assembly (AD).

18. Using hammer and punch, remove pin (AE) from connecting link (AF).

19. Using hammer, tap lightly and remove connecting link (AF) from shaft (V).

20. Using ruler, pencil, and paper, measure and write down distance between centers of rod end holes.

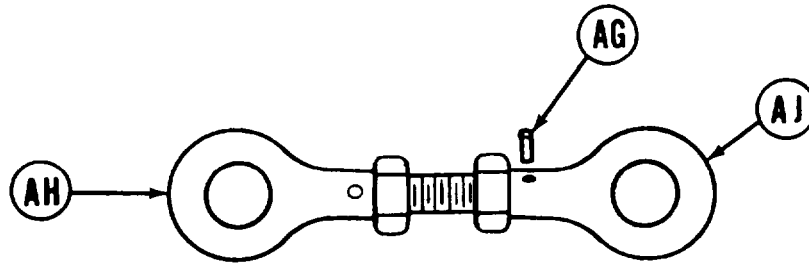


Go on to Sheet 8

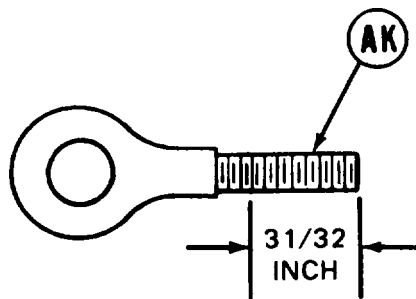
TA139284

SHIFTING CONTROL AND RELATED PARTS REPAIR AND REPLACEMENT
(Sheet 8 of 15)

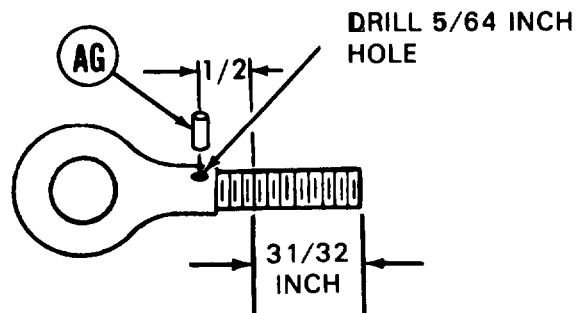
21. Using hammer and 1/8 inch punch, remove pin (AG).
22. Using 9/16 inch wrench, remove rod ends (AH) and (AJ).



23. If stud (AK) is to be replaced, thread stud (AK) into rod end until 31/32 inch of stud (AK) can be measured outside of rod end.



24. Using drill and vise, drill a 1/8 inch hole through rod end and stud, 1/2 inch from bolt end of rod.
25. Using hammer and punch, install new pin (AG) in drilled hole.
26. Using 9/16 inch wrench, install new rod end on other end of stud.

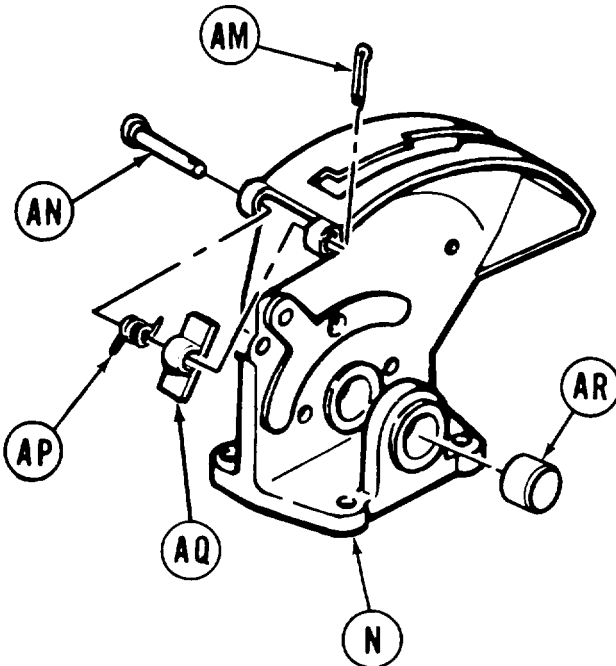
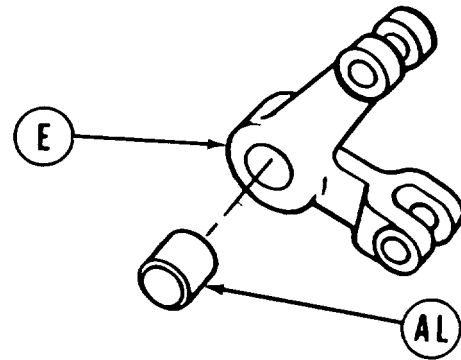


Go on to Sheet 9

TA139285

SHIFTING CONTROL AND RELATED PARTS REPAIR AND REPLACEMENT
 (Sheet 9 of 15)

27. Using hammer and 3/8 inch punch, remove bearing (AL) from connecting link (E). Throw bearing away.



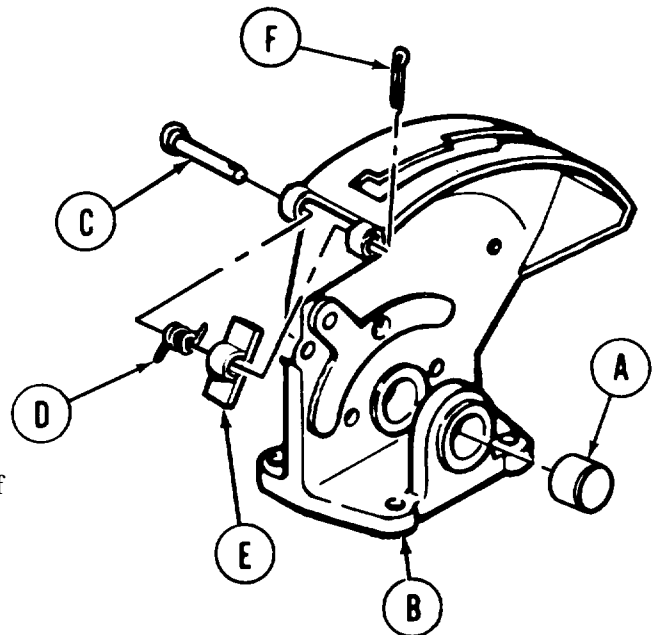
- 28. Using pliers, remove cotter pin (AM). Throw cotter pin away.
- 29. Using pliers, remove pin (AN), spring (AP), and hasp (AQ).
- 30. Secure base assembly (N) in vise.
- 31. Using brass drift and hammer, tap out bearing (AR). Throw bearing away.

INSPECTION:

- 1. Inspect all parts for damage and wear.
- 2. Replace any damaged or worn part.

ASSEMBLY:

- 1. Using vise with jaw guards, press new bearing (A) in base assembly (B).
- 2. Install pin (C) through spring (D) and hasp (E).
- 3. Using pliers, install new cotter pin (F) in end of pin (C).

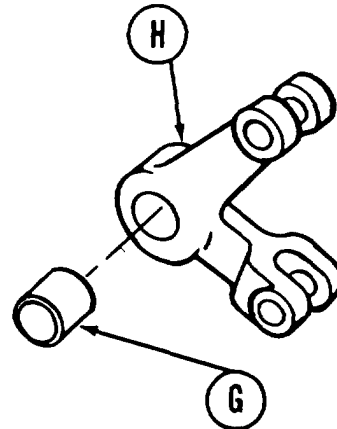


Go on to Sheet 10

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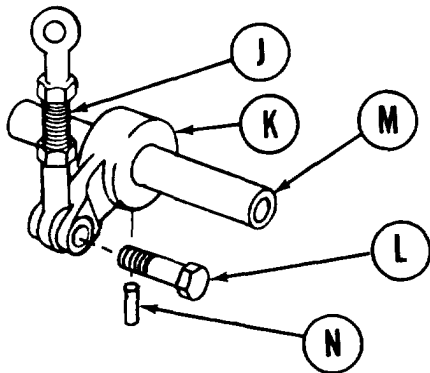
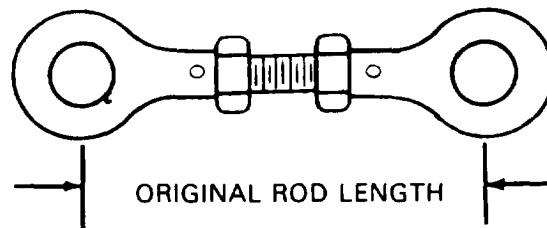
SHIFTING CONTROL AND RELATED PARTS REPAIR AND REPLACEMENT
 (Sheet 10 of 15)

4. Using vise, press new bearing (G) in link (H) until flush with outer surfaces of link.



NOTE

Adjust rod (J) to measure same length as original rod (see page 11-31, step 20).



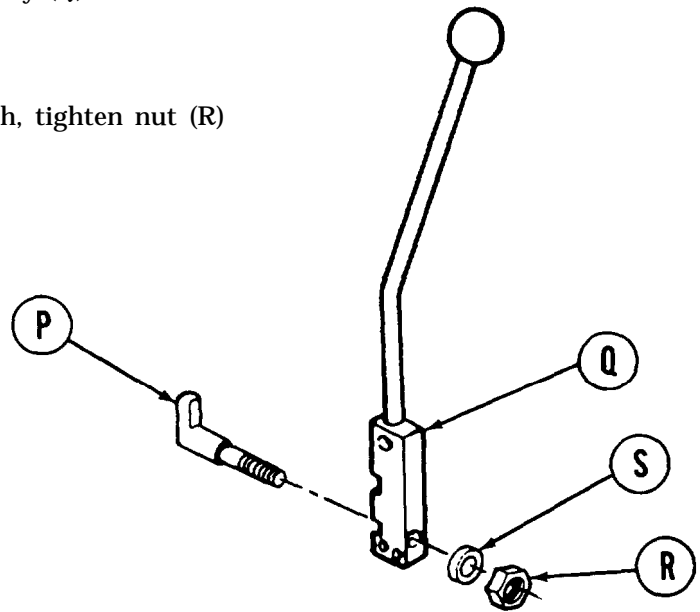
5. Position rod (J) into intermediate link (K).
6. Install bolt (L) through intermediate link (K) and rod (J).
7. Install link (K) in vise.
8. Using 9/16 inch socket and torque wrench, tighten bolt (L) to 15-20 lb-ft (20-27 N-m).
9. Remove intermediate link (K) from vise.
10. Position intermediate link (K) in place on shaft (M) with holes aligned.
11. Using hammer, install pin (N).

Go on to Sheet 11

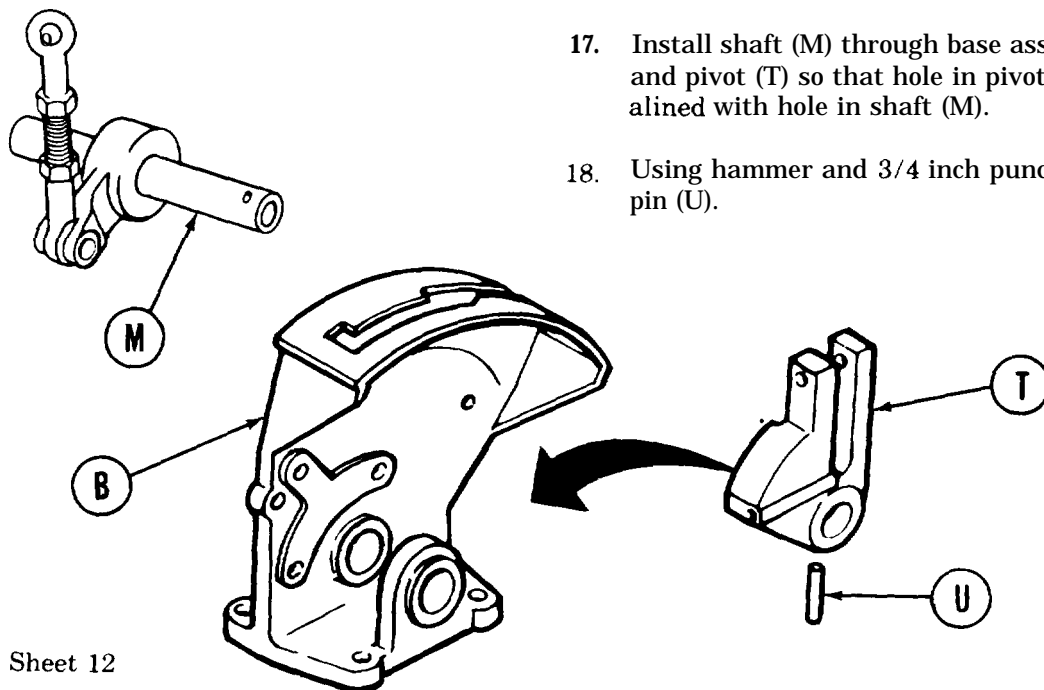
TA253381

SHIFTING CONTROL AND RELATED PARTS REPAIR AND REPLACEMENT
(Sheet 11 of 15)

12. Position fastener (P) through lever assembly (Q).
13. Install nut (R) and new lockwasher (S).
14. Using 7/16 inch socket and torque wrench, tighten nut (R) to 6-10 lb-ft (10-13 N·m).



15. Position pivot (T) on base assembly (B).
16. Aline hole in pivot (T) with hole in base assembly (B).
17. Install shaft (M) through base assembly (B) and pivot (T) so that hole in pivot (T) is alined with hole in shaft (M).
18. Using hammer and 3/4 inch punch, install pin (U).



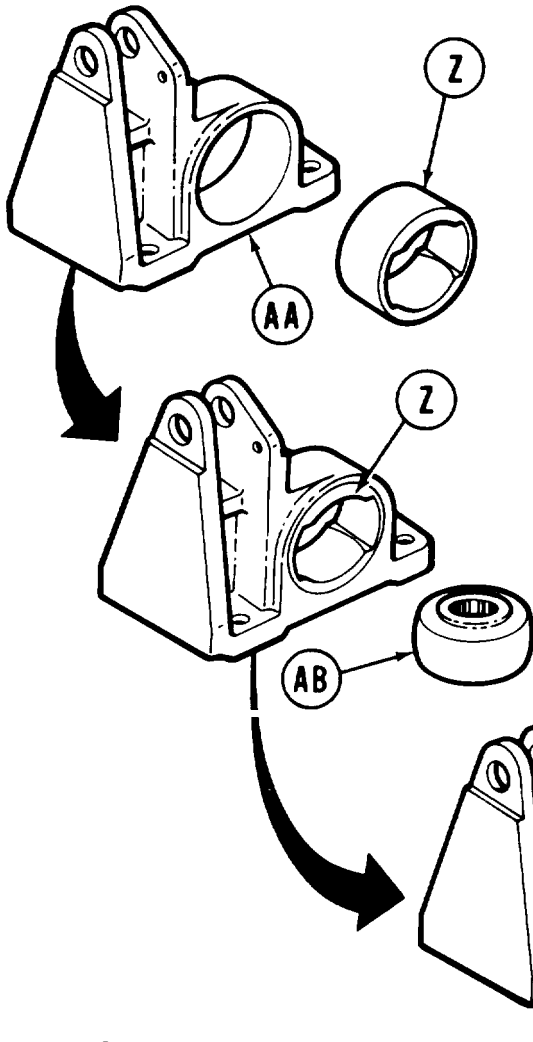
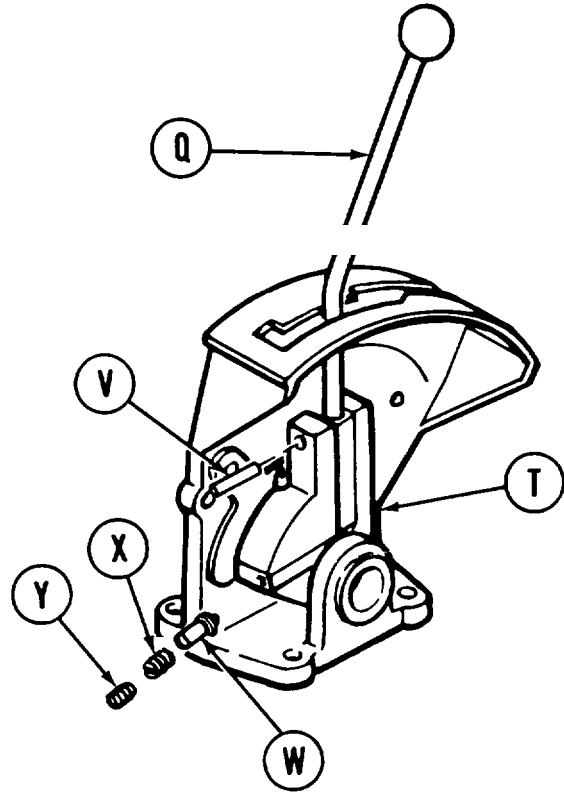
Go on to Sheet 12

TA253382

Change 111-35

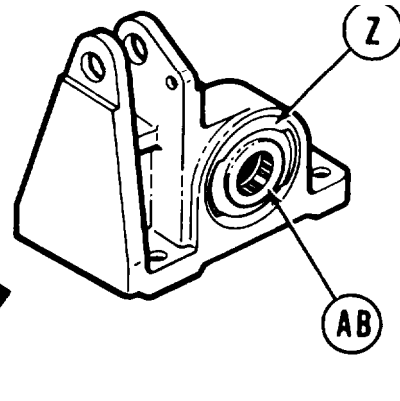
SHIFTING CONTROL AND RELATED PARTS REPAIR AND REPLACEMENT
(Sheet 12 of 15)

- 19. Position control rod lever (Q) through pivot (T).
- 20. Using hammer, install pin (V).
- 21. Using screwdriver, install plunger (W), spring (X), and adjuster (Y).



22. Using vise, press bearing race (Z) in bracket (AA) flush with outer surface of bracket (AA).

23. Using fingers, place bearing (AB) into slots of race (Z) position as shown in illustration.

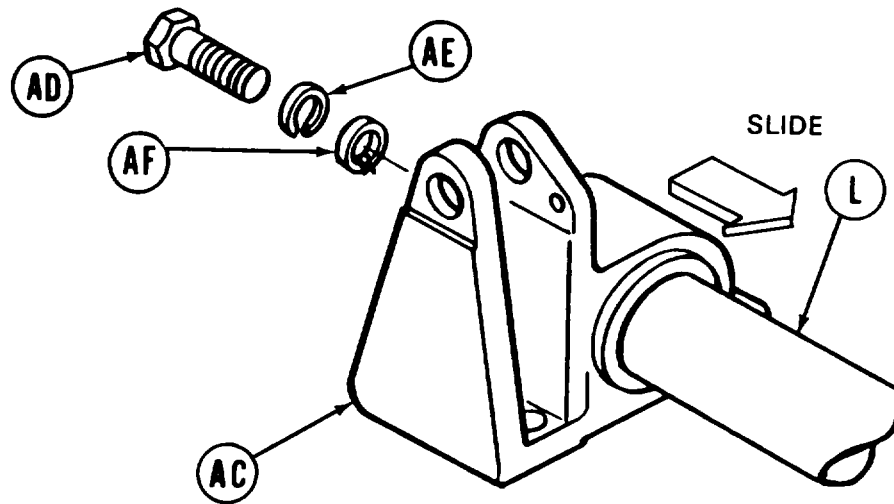


Go on to Sheet 13

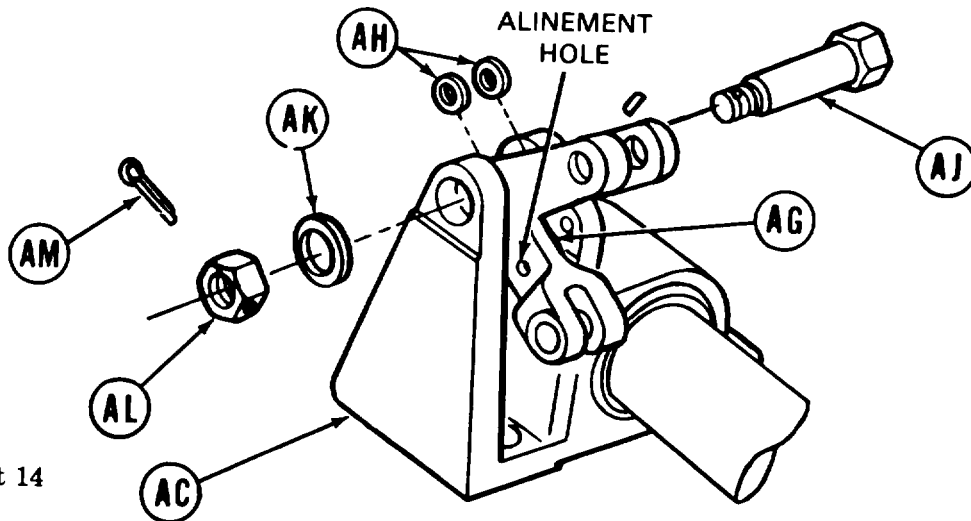
TA139289

SHIFTING CONTROL AND RELATED PARTS REPAIR AND REPLACEMENT
(Sheet 13 of 15)

24. Using hands, slide bracket assembly (AC) over shaft (L).
25. Using 9/16 inch socket, install screw (AD), new lockwasher (AE), and washer (AF) on end of shaft (L).



26. Position link (AG) and flat washers (AH) in bracket assembly (AC).
27. Using 9/16 inch and 3/4 inch wrenches, install bolt (AJ), washer (AK), and nut (AL).
28. Using pliers, install new cotter pin (AM).



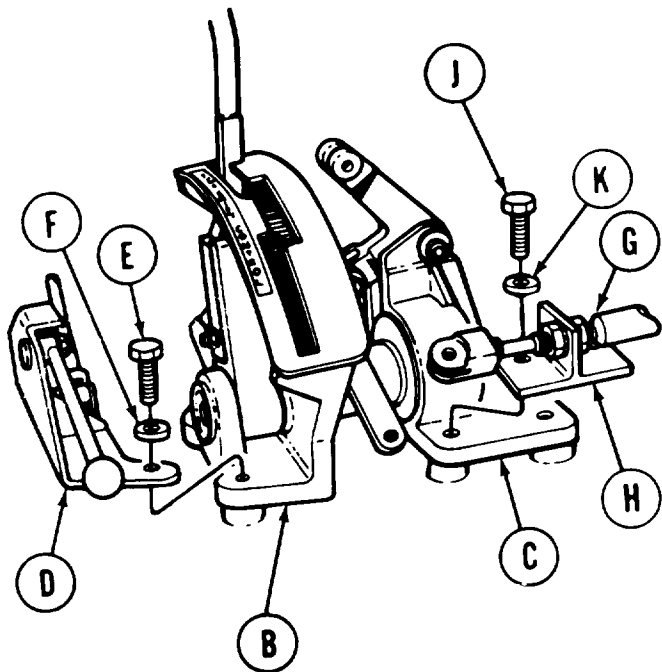
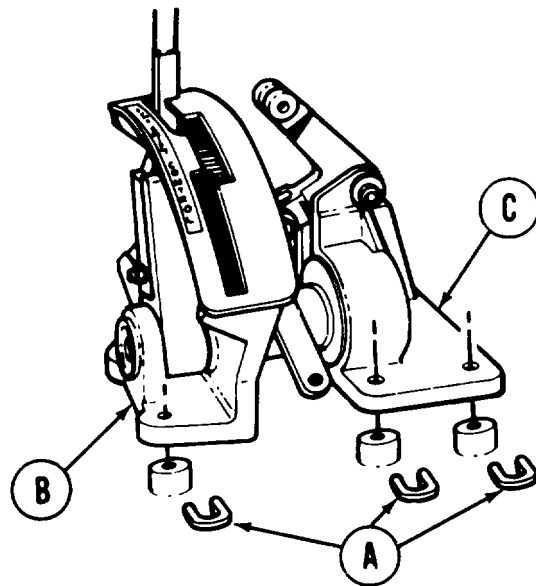
Go on to Sheet 14

TA139290

SHIFTING CONTROL AND RELATED PARTS REPAIR AND REPLACEMENT
(Sheet 14 of 15)

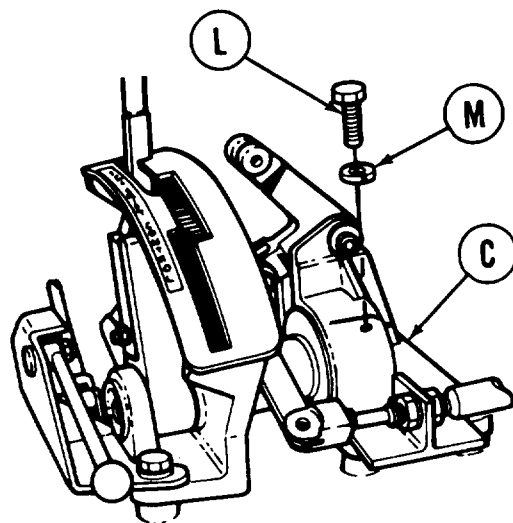
INSTALLATION:

1. Position all shims (A) on hull mounting surfaces exactly as tagged during removal.
2. Position base assembly (B) and bracket assembly (C) on shims (A).
3. Position throttle locking lever (D) on base assembly (B).



4. Install three screws (E) and new lockwashers (F) finger tight through throttle locking lever (D) and base assembly (B).
5. Position parking brake control assembly (G) and mounting bracket (H) on bracket assembly (C).
6. Install two screws (J) and new lockwashers (K) finger tight through parking brake control assembly (G) and mounting bracket (C).

7. Install two more screws (L) and new lockwashers (M) finger tight in mounting bracket (C).



Go on to Sheet 15

TA139291

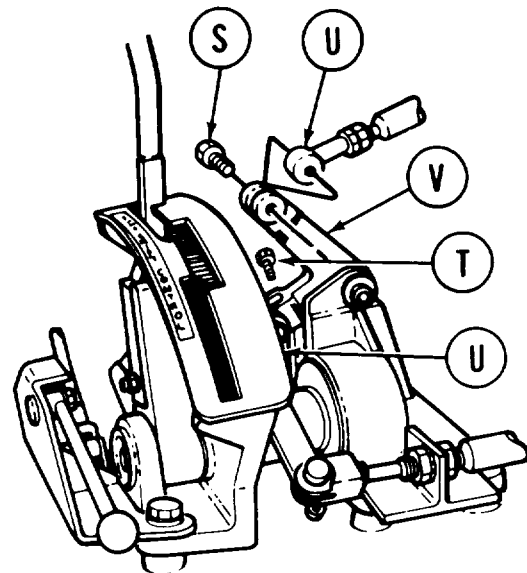
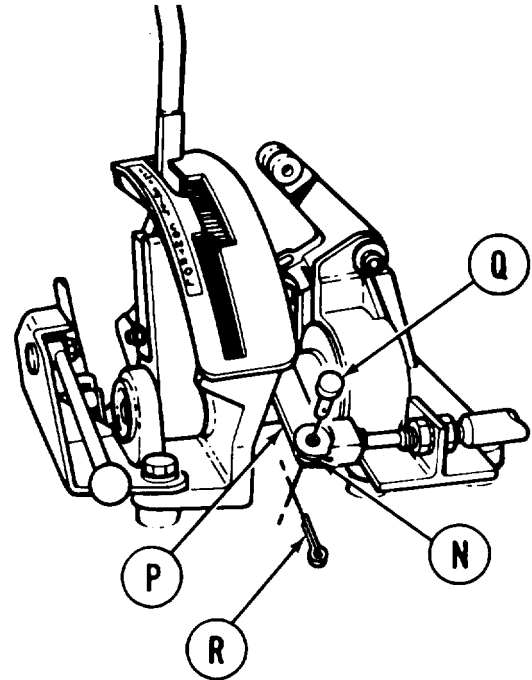
SHIFTING CONTROL AND RELATED PARTS REPAIR AND REPLACEMENT (Sheet 15 of 15)

8. Using 9/16 inch socket with extension, tighten screws installed in steps 4 and 6, alternately.

NOTE

Make sure that components are properly aligned. If components bind, use shims as required to make sure of proper alignment and freedom of movement.

9. Position brake control clevis (N) over brake lever (P).
10. Using pliers, install straight pin (Q) through clevis (N) and lever (P).
11. Using pliers, install cotter pin (R) in straight pin.



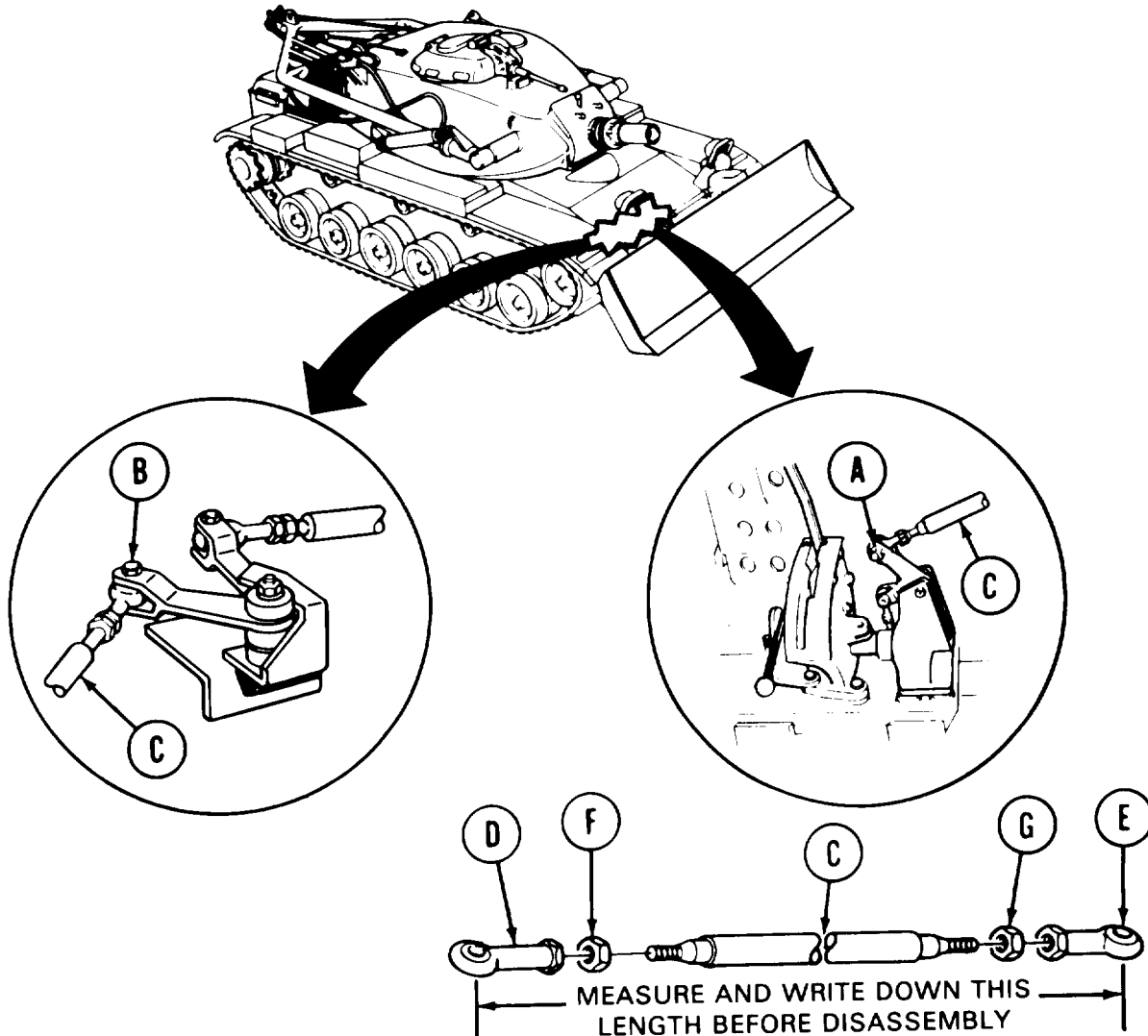
12. Install bolts (S) and (T) through connecting links (U) and link assembly (V).
13. Using 9/16 inch socket and torque wrench, tighten bolts (S) and (T) to 15-20 lb-ft (20- 27 N-m).
14. Adjust shifting linkage (page 11-2).

TA253383

SHIFTING CONTROL CONNECTING LINK REPLACEMENT (Sheet 1 of 2)

TOOLS: Adapter, 1/2 in. to 3/8 in.
5 in. Extension with 3/8 in. drive
12 in. Extension with 3/8 in. drive
9/16 in. socket with 1/2 in. drive
9/16 in. combination box and open end wrench (2 required)
Ratchet with 1/2 in. drive
Torque wrench with 1/2 in. drive (0-175 lb-ft) (0-237 N.m)
Rule
9/16 in. crowfoot wrench with 3/8 in. drive

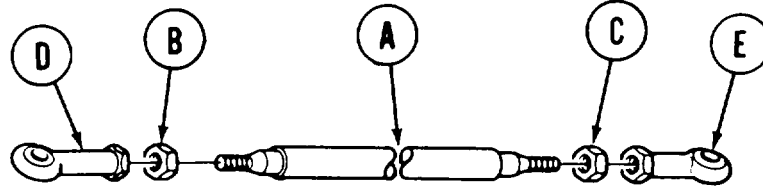
PRELIMINARY PROCEDURE: Block tracks (TM 9-2350-222-10)



REMOVAL:

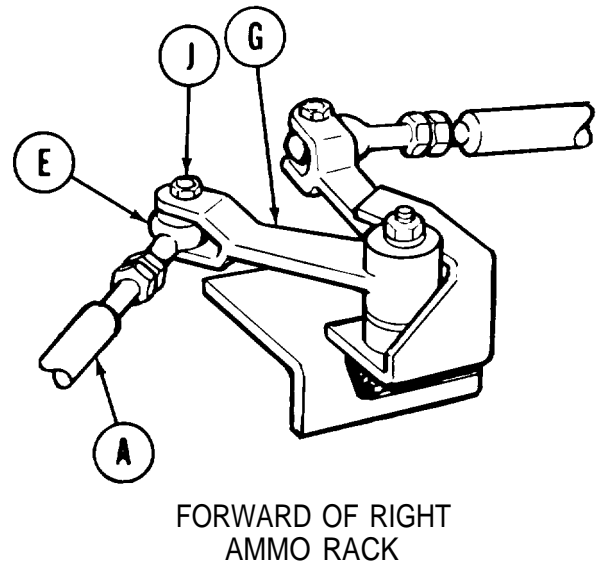
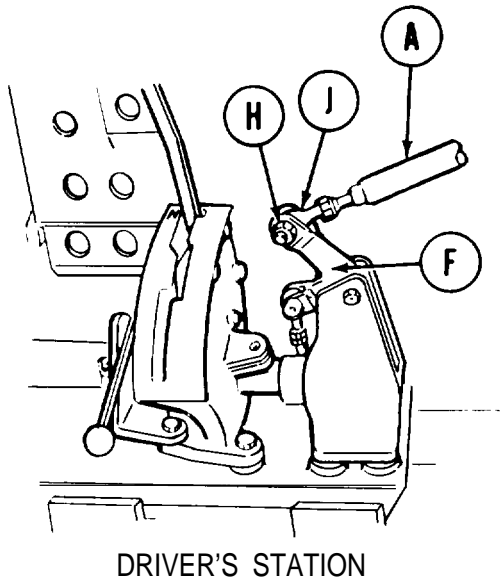
1. Using 9/16 inch socket, remove screws (A) and (B). Remove link assembly (C) from vehicle.
2. Record length of link. Using one 9/16 inch wrench to hold rod ends (D) and (E) and other 9/16 inch wrench on nuts (F) and (G), loosen nuts (F) and (G) from rod ends (D) and (E).
3. Using 9/16 inch wrench, remove rod ends (D) and (E) and nuts (F) and (G) from link (C).

SHIFTING CONTROL CONNECTING LINK REPLACEMENT (Sheet 2 of 2)



INSTALLATION:

1. Using 9/16 inch wrench, install nuts (B) and (C) onto link (A),
2. Using 9/16 inch wrench, install rod ends (D) and (E) onto link (A). Adjust link assembly to obtain same distance between holes as previously recorded.
3. Using 9/16 inch wrench to hold rod ends (D) and (E), and crowfoot wrench, adapter, and torque wrench on jam nuts (B) and (C), tighten jamnuts (B) and (C) to 15-20 lb-ft (20-27 N. m).



4. Position link assembly (A) into brackets (F) and (G) and, using 9/16 inch socket, install screws (H) and (J) through brackets (F) and (G) and rod ends (D) and (E).
5. Using 9/16 inch socket and torque wrench, tighten screws (H) and (J) to 15-20 lb-ft (20- 27 N.m).
6. Adjust shifting linkage (page 11-2).

End of Task

SHIFTING CONTROL BRACKET ASSEMBLY AND CONNECTING LINK REPLACEMENT (Sheet 1 of 3)

- TOOLS:** Torque wrench with 1/2 in. drive (0-175 lb-ft) (0-237 N.m)
 7/16 in. socket with 1/2 in. drive
 Ratchet with 1/2 in. drive
 3/4 in. socket with 1/2 in. drive
 2 in. extension with 1/2 in. drive
 3/4 in. combination box and open end wrench (2 required)
 7/16 in. combination box and open end wrench
 3/4 in. crowfoot wrench with 3/8 in. drive
 Adapter, 1/2 in. to 3/8 in.
- SUPPLIES:** Lockwasher (2 required)
 Lockwasher (2 required)
 Lockwasher

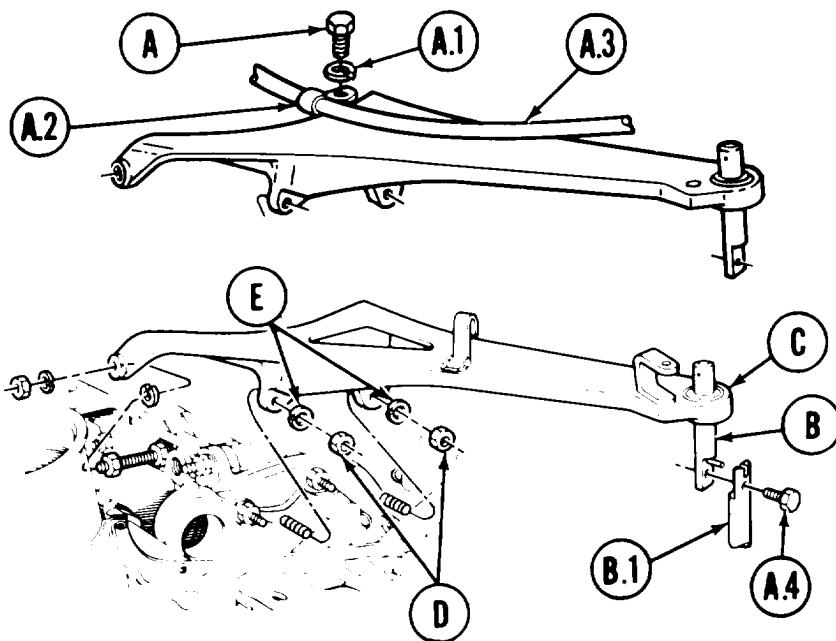
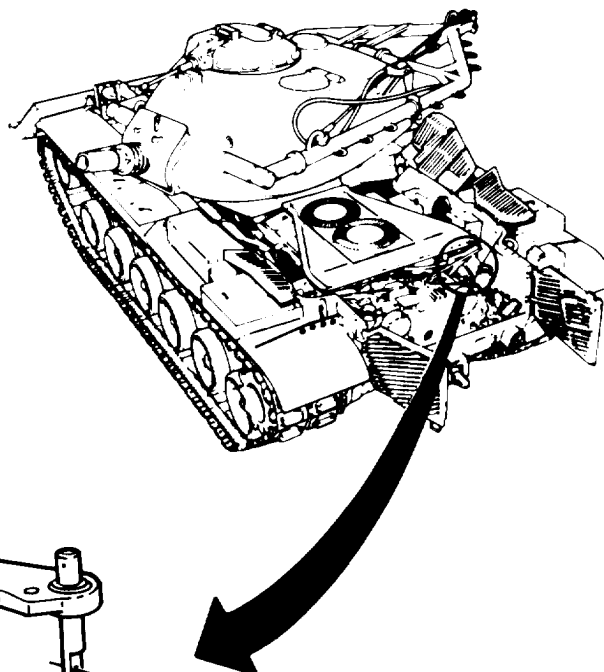
PRELIMINARY PROCEDURE: Remove shifting control lever (page 11-45)

REMOVAL:

NOTE

Replacement of shifting control bracket assembly and connecting link for the early or late model are similar, except as noted.

1. On late model only. Using 7/16 inch wrench remove screw (A) and lockwasher (A.1) securing clip (A.2) to bracket. Throw lockwasher away. Position parking brake control assembly (A.3) aside.
- 1.1. Using 7/16 inch wrench, remove screw (A.4) securing link (B) and shaft (B.1).
2. Remove link (B) from bracket (C) by pulling down from bottom.
3. Using 3/4 inch socket with extension, remove two nuts (D) and lockwashers (E). Throw lockwashers away.



Go on to Sheet 2

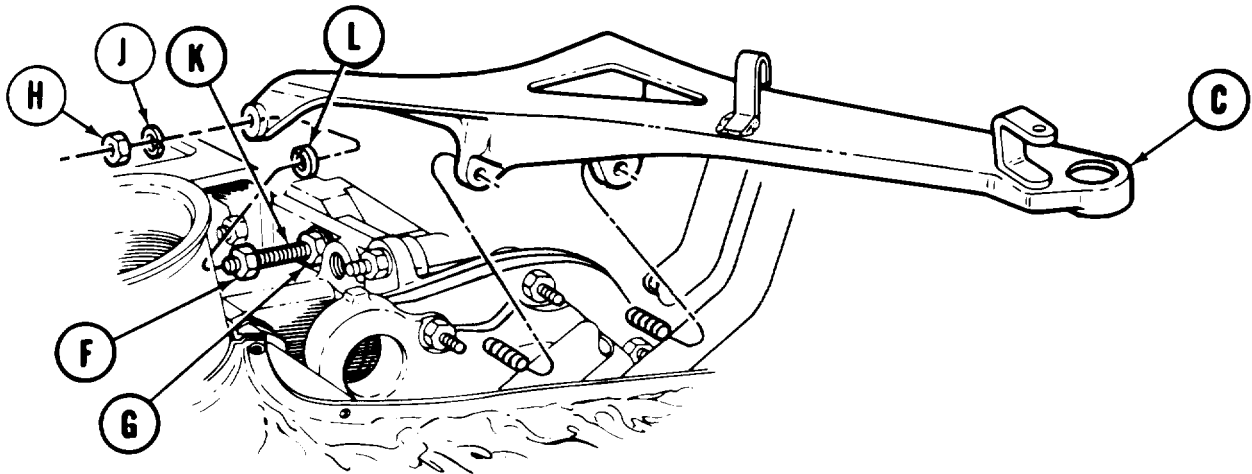
SHIFTING CONTROL BRACKET ASSEMBLY AND CONNECTING LINK REPLACEMENT (Sheet 2 of 3)

- Using 3/4 inch wrench, tighten nut (G) against nut (F).
- Using 3/4 inch wrench, remove nut (H) and lockwasher (J). Throw lockwasher away.

NOTE

If stud (K) cannot be screwed in far enough in step 6, back off nuts (G) and (F) on stud (K) and repeat step 6.

- Using 3/4 inch wrench, tighten nut (F) and screw stud (K) into transmission housing until stud (K) is out of hole in bracket assembly (C).
- Remove bracket assembly (C) and lockwashers (L) from transmission. Throw lockwashers away.

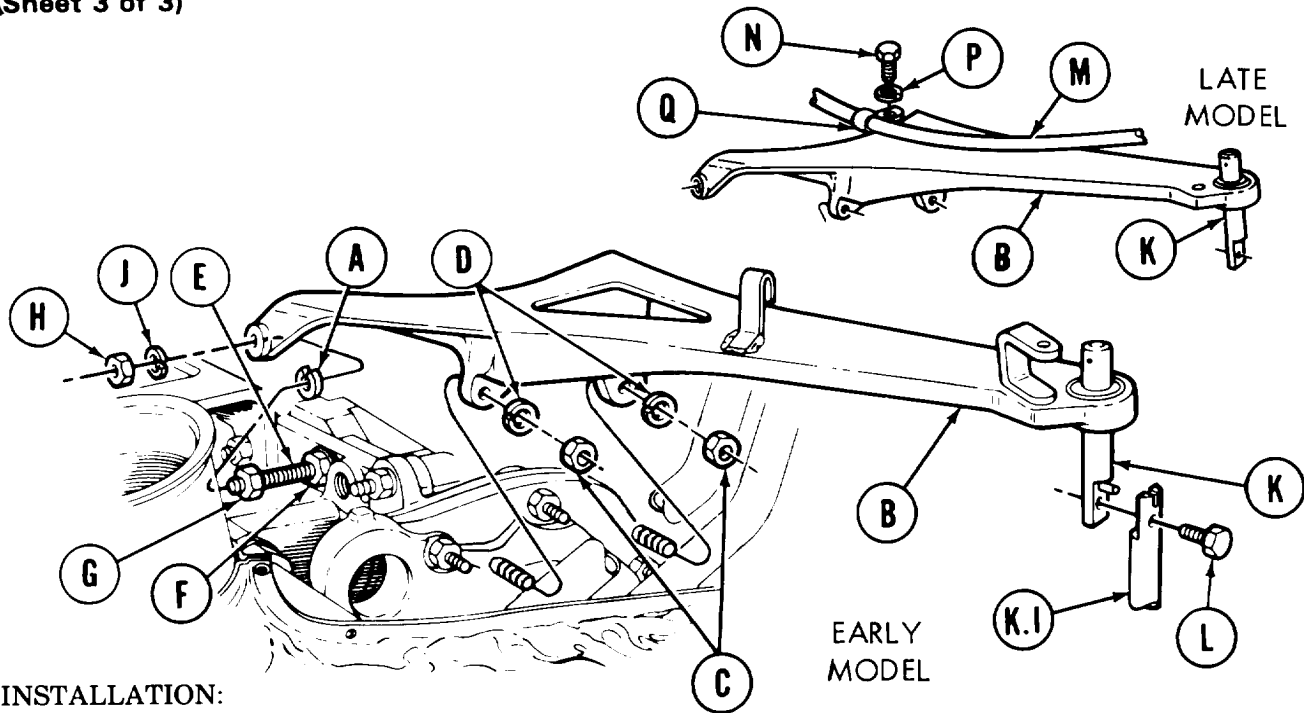


Go on to Sheet 3

TA253387

Change 1 11-43

SHIFTING CONTROL BRACKET ASSEMBLY AND CONNECTING LINK REPLACEMENT
(Sheet 3 of 3)



INSTALLATION:

1. Position new lockwasher (A) and bracket assembly (B) on transmission.
2. Using 3/4 inch socket with extension, install two nuts (C) and new lockwashers (D).
3. Loosen stud (E) until stud (E) extends approximately 1/2 inch out from bracket (B).
4. Using torque wrench, adapter, and crowfoot wrench, tighten nut (F) against transmission housing to 67-80 lb-ft (90-108 N·m).
5. Loosen nut (G) until nut (G) is against bracket assembly (B).
6. Using 3/4 inch wrench, install nut (H) and new lockwasher (J).
7. Using 3/4 inch wrench to hold nut (G) and 3/4 inch socket and torque wrench on nut (H), tighten nut (H) to 67-80 lb-ft (90-108 N·m).
8. Using 3/4 inch socket and torque wrench, tighten nuts (C) to 67-80 lb-ft (90-108 N·m).
9. Install link (K) in bracket (B).
10. Using 7/16 inch wrench, install screw (L) to secure shaft (K.1) to link (K).
11. Using 7/16 inch socket and torque wrench, tighten screw (L) to 10-15 lb-ft (13-20 N·m).
12. On late model only. Position parking brake control assembly (M) on bracket (B). Using 7/16 inch wrench, install screw (N) and new lockwasher (P) to secure clip (Q) to bracket.
13. Install shifting control lever (page 11-47).

End of Task

SHIFTING CONTROL BRACKET ASSEMBLY REPAIR (Sheet 1 of 1)

TOOLS: 2 lb hammer
3/4 in. drive pin punch
Vise

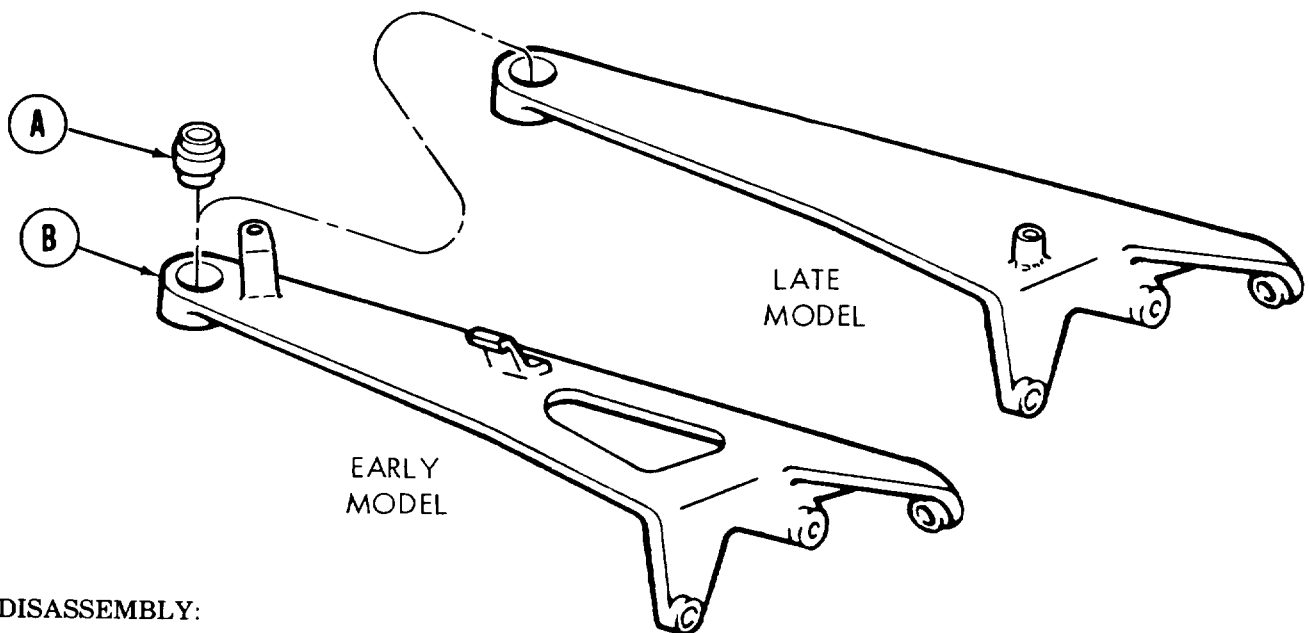
SUPPLIES: Bearing (7954792)

REFERENCES: LO 9-2350-222-12
TM 9-214

PRELIMINARY PROCEDURE: Remove bracket from vehicle (page 11-42)

INSPECTION:

Inspect bearing (A) for damage or wear (TM 9-214).

**DISASSEMBLY:**

Using hammer and punch, remove bearing (A). Throw bearing away.

ASSEMBLY:

1. Using vise, press new bearing (A), if required, in bracket (B).
2. Install bracket in vehicle (page 11-44).
3. Lubricate (LO 9-2350-222-12).

End of Task

TA253389

Change 1 11-44.1 (11-44.2 blank)

SHIFTING CONTROL ROD AND LEVERS REPLACEMENT (Sheet 1 of 4)

PROCEDURE INDEX

PROCEDURE	PAGE
Removal	11- 45
Installation	11-47

TOOLS: Hammer

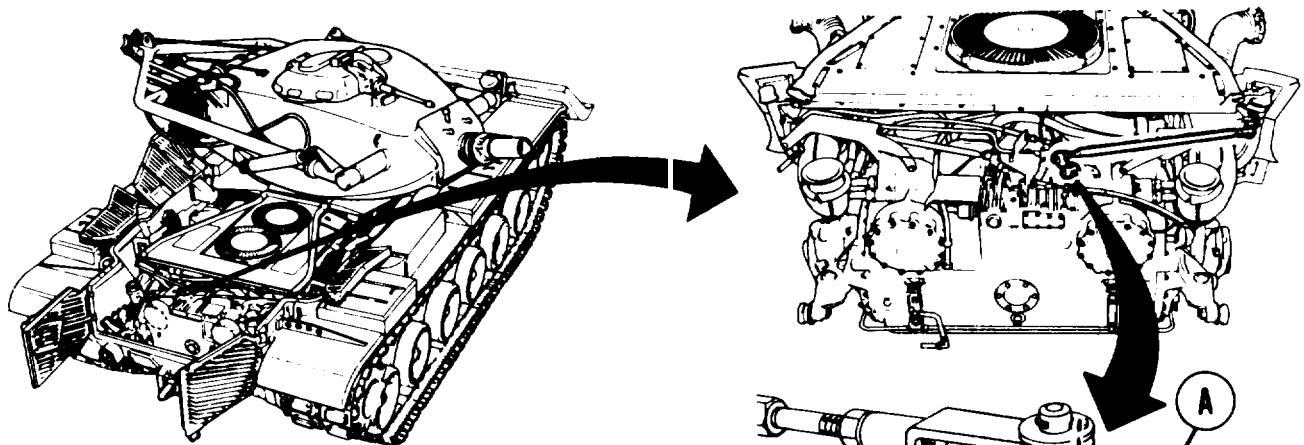
- 1/8 in. drive punch
- Slip joint pliers
- 7/16 in. combination box and open end wrench
- 9/16 in. combination box and open end wrench
- Flat-tip screwdriver

SUPPLIES: Spring pin (MS39086-161)

- Cotter pin (MS24665-283)
- Lockwasher (MS35338-65)

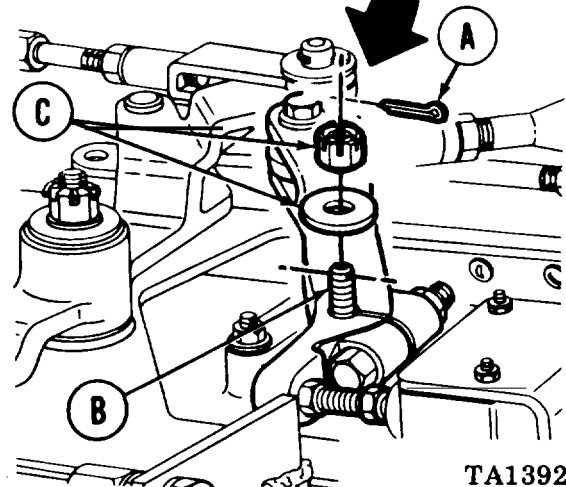
REFERENCE: TM 9-2350-222-10

PRELIMINARY PROCEDURES: Block track and place shift lever in reverse (TM 9-2350-222-10)
 Remove top deck (page 16-21)
 Remove transmission shroud (page 9-20)



REMOVAL:

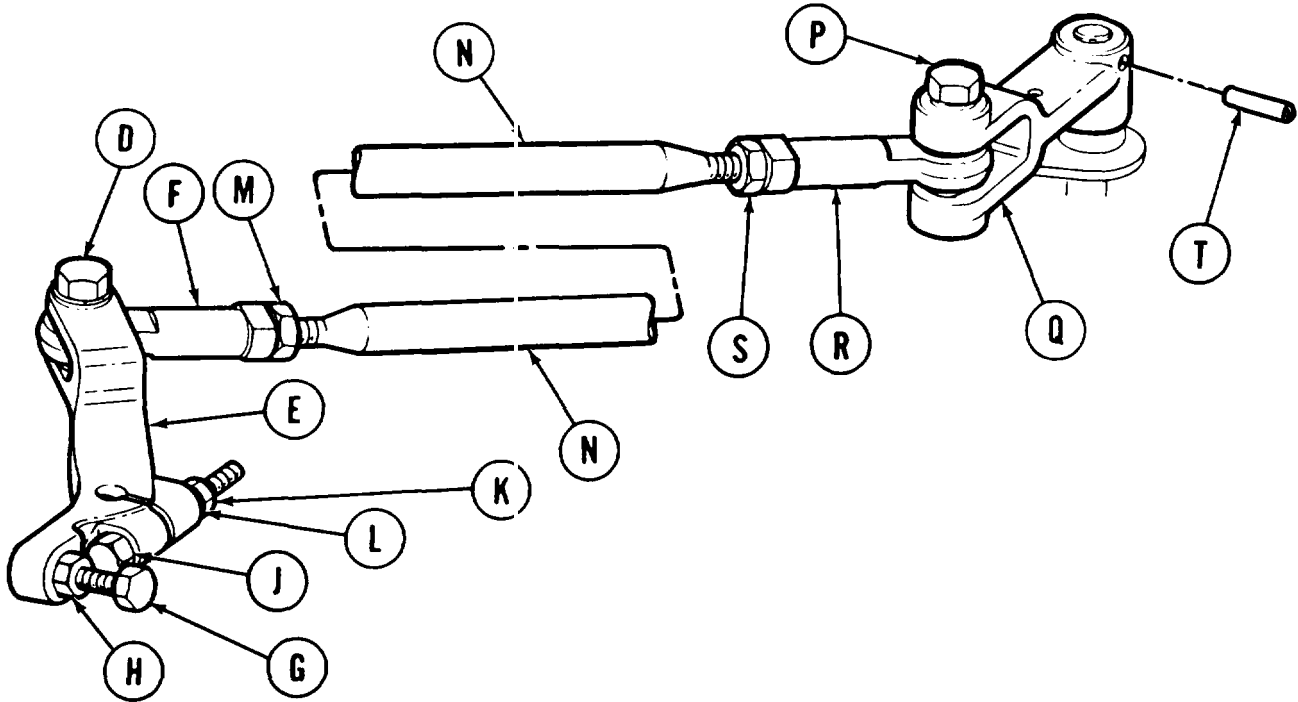
1. Using pliers, remove cotter pin (A) from transmission shaft stud (B).
2. Using 9/16 inch wrench, remove nut and washer (C) from transmission shaft stud (B).



Go on to Sheet 2

TA139298

SHIFTING CONTROL ROD AND LEVERS REPLACEMENT (Sheet 2 of 4)

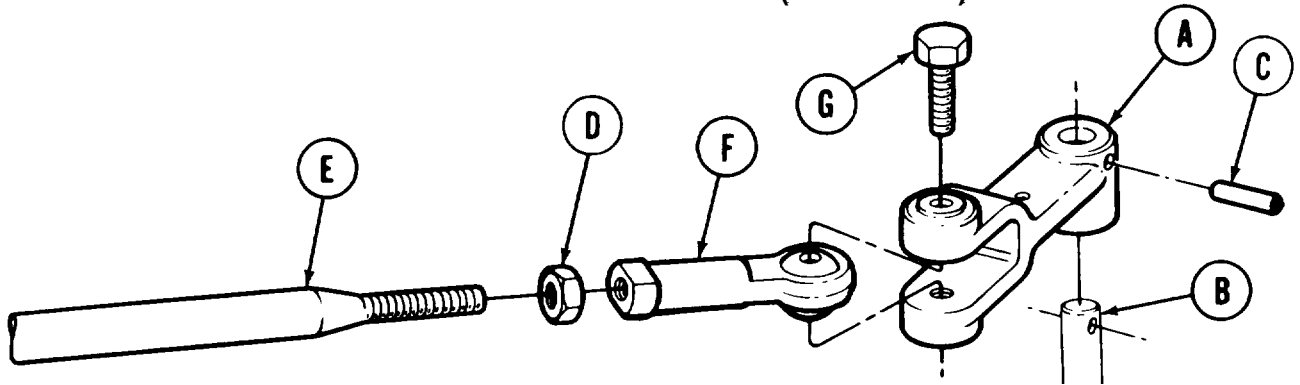


3. Using 9/16 inch wrench, remove bolt (D) from lever (E) and rod end (F) and separate rod end from clevis of lever (E).
4. Using 7/16 inch wrench, remove screw (G) and nut (H) from lever (E).
5. Using 9/16 inch wrench, hold screw (J). Using other 9/16 inch wrench, remove nut (K) and lockwasher (L) from screw (J). Remove screw (J) and lever (E) from transmission shaft. It may be necessary to use hammer and screwdriver to remove lever (E). Throw lockwasher away.
6. Using 9/16 inch wrench on flats of rod end (F) and 9/16 inch wrench on jam nut (M), loosen jamnut (M) and remove rod end (F) from rod (N).
7. Using 9/16 inch wrench, remove jamnut (M) from rod (N).
8. Using 9/16 inch wrench, remove bolt (P) from lever (Q).
9. Using 9/16 inch wrench on flats of rod end (R) and 9/16 inch wrench on jamnut (S), loosen jam nut (S) and remove rod end (R) from rod (N).
10. Using 9/16 inch wrench, remove jamnut (S) from rod (N).
11. Using hammer and punch, drive spring pin (T) from lever (Q). Remove lever (Q) and throw pin (T) away.

Go on to Sheet 3

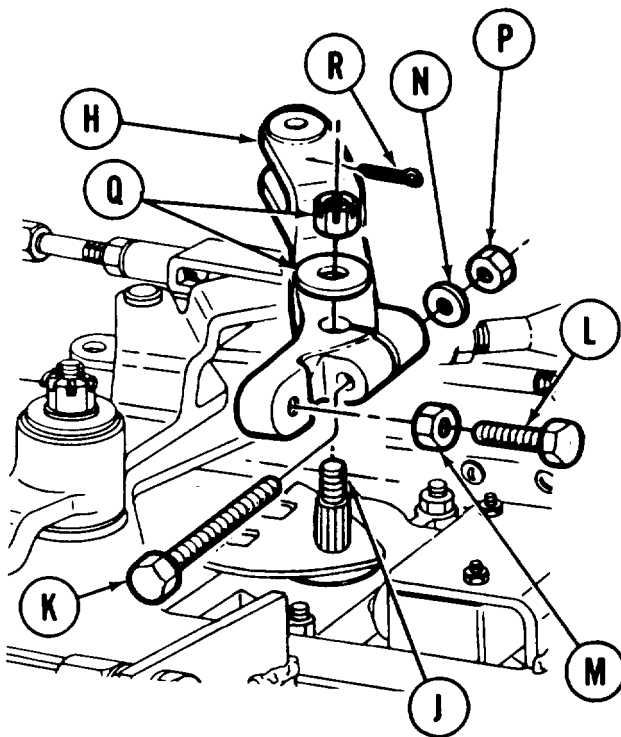
TA139299

SHIFTING CONTROL ROD AND LEVERS REPLACEMENT (Sheet 3 of 4)



INSTALLATION:

1. Position lever (A) on connecting shaft (B). Using hammer and punch, install new spring pin (C) through lever (A) and shaft (B).
2. Using 9/16 inch wrench, install jamnut (D) onto rod (E).
3. Install rod end (F) onto rod (E) past witness holes.
4. Position rod end (F) into clevis of lever (A). Using 9/16 inch wrench, install bolt (G) through clevis of lever (A) and rod end (F),



NOTE

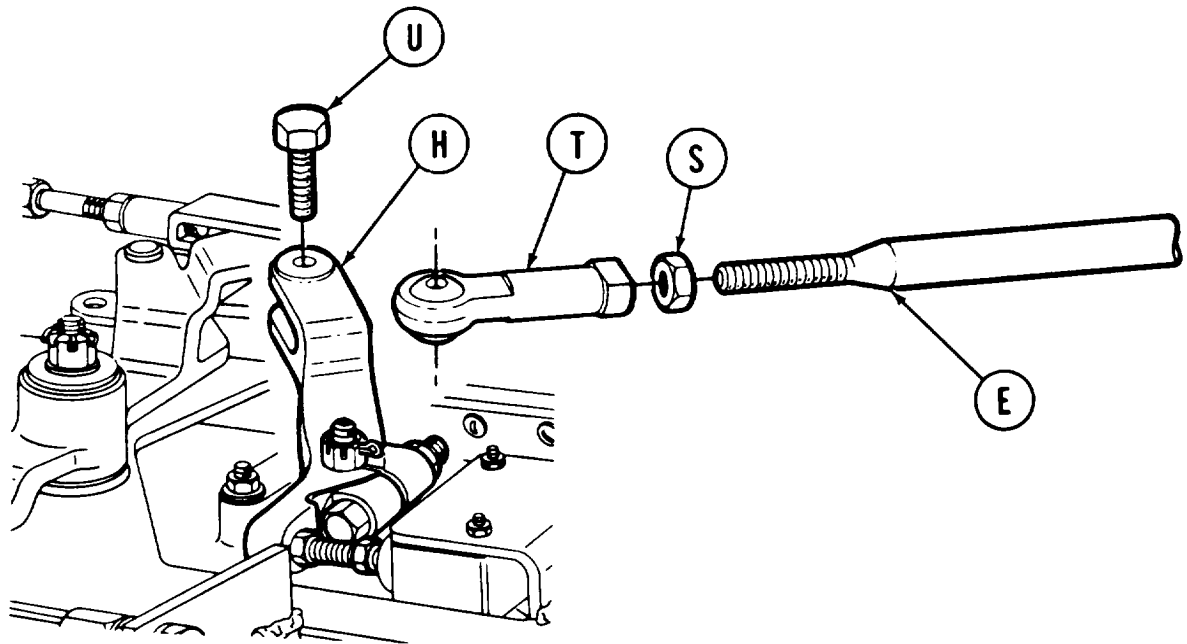
Make sure that clevis opening on lever (H) is alined with spline on transmission stud (J) before installing lever (H).

5. Install lever (H) onto transmission shaft stud (J). Using hand, install screw (K) through lever (H).
6. Using 7/16 inch wrench, install screw (L) and jamnut (M) into lever (H).
7. Install new lockwasher (N) and nut (P) onto screw (K). Using 9/16 inch wrench, tighten nut (P).
8. Using 9/16 inch wrench, install washer and nut (Q) onto transmission shaft stud (J).
9. Using pliers, install new cotter pin (R) through nut (Q) and transmission shaft stud (J).

Go on to Sheet 4

TA139300

SHIFTING CONTROL ROD AND LEVERS REPLACEMENT (Sheet 4 of 4)



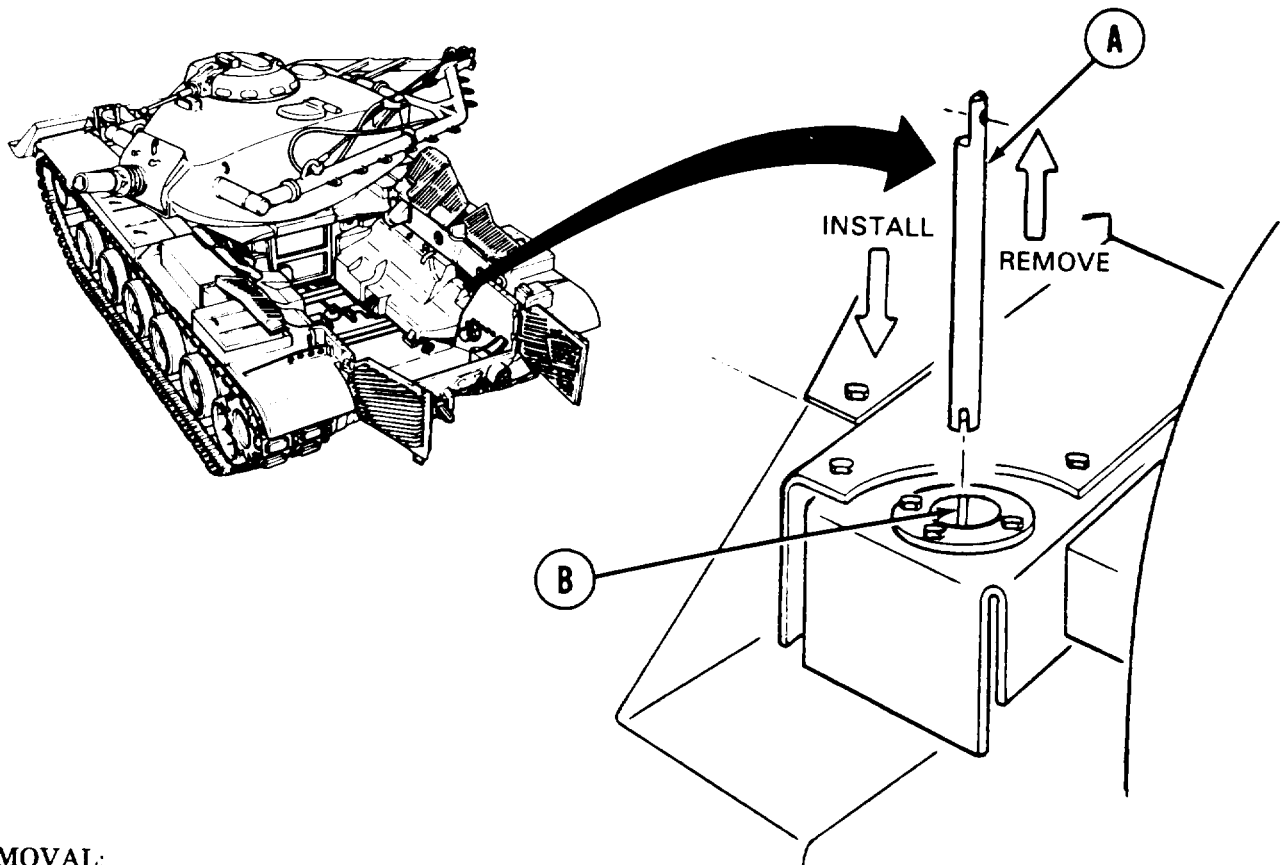
10. Using 9/16 inch wrench, install jamnut (S) onto rod (E).
11. Using 9/16 inch wrench, install rod end (T) onto rod (E).
12. Adjust and position rod end (T) into clevis of lever (H). Using 9/16 inch wrench, install bolt (U) through clevis of lever (H) and rod end (T).
13. Adjust shifting linkage (page 11-2).
14. Install transmission shroud (page 9-23).
15. Install top deck (page 16-23).
16. Adjust neutral shift switch (page 11-22).
17. Unblock track.

End of Task

TA139301

SHIFTING CONTROL SHAFT ASSEMBLY REPLACEMENT (Sheet 1 of 1)

PRELIMINARY PROCEDURE: Remove powerplant (page 5-1)

**REMOVAL:**

Grasp shaft (A) in both hands and lift up.

INSPECTION:

1. Inspect shaft for damage or wear.
2. Replace if required.

INSTALLATION:

1. Position slot in shaft (A) over pin (B) and push down.
2. Install powerplant (2A, page 5-14 or 2D, page 5-37).

End of Task

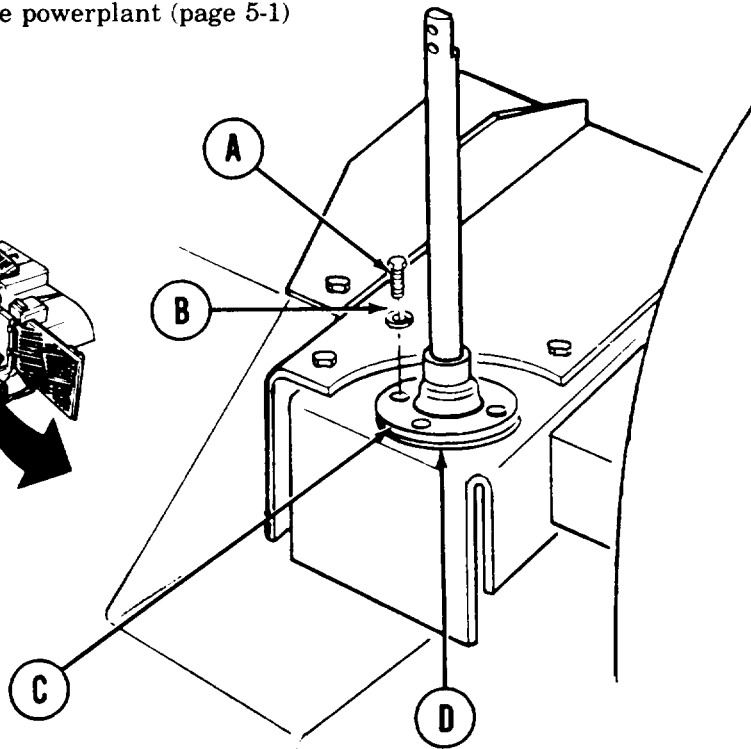
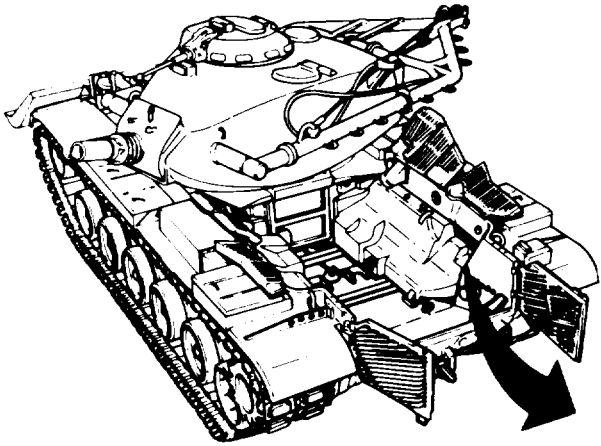
TA139302

SHIFTING CONTROL GASKET REPLACEMENT (Sheet 1 of 2)

TOOLS: 7/16 in. socket with 1/2 in. drive
Ratchet with 1/2 in. drive
Putty knife

SUPPLIES: Gasket (10911621)
Lockwasher (MS35338-63) (4 required)

PRELIMINARY PROCEDURE: Remove powerplant (page 5-1)



REMOVAL:

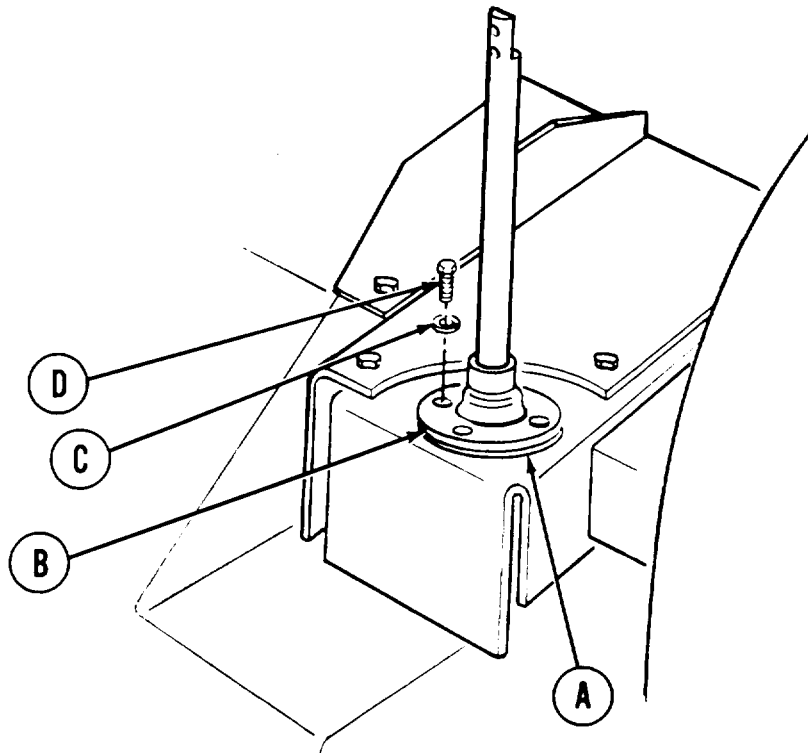
1. Using socket, remove four screws (A) and lockwashers (B). Throw lockwashers away.
2. Remove spacer (C) and gasket (D), use putty knife if necessary. Throw gasket away.

Go on to Sheet 2

TA139303

SHIFTING CONTROL GASKET REPLACEMENT (Sheet 2 of 2)**INSTALLATION:**

1. Position new gasket (A) and spacer (B) over mounting holes.
2. Using socket, install four new lockwashers (C) and screws (D).
3. Install 2A powerplant (page 5-14) or 2D powerplant (page 5-37).



End of Task

TA139304

SHIFTING CONTROL BRACKET AND CONNECTING LINK ASSEMBLY REPAIR AND REPLACEMENT (Sheet 1 of 9)

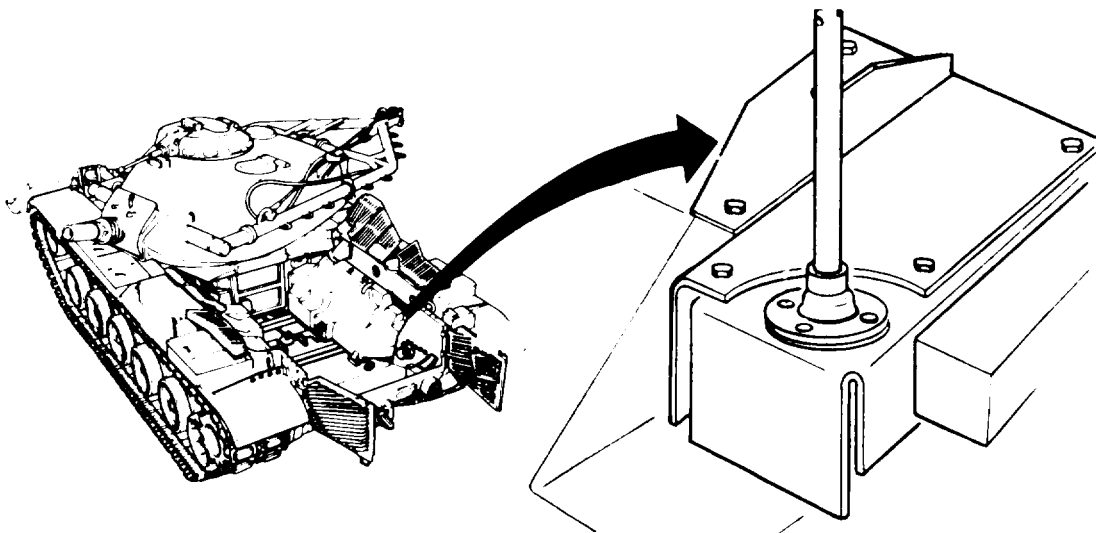
PROCEDURE INDEX

PROCEDURE	PAGE
Removal	11-53
Disassembly	11-55
Assembly	11-58
Installation	11-59

- TOOLS:**
- | | |
|--|--|
| 7/16 in. socket with 1/2 in. drive | 5 in. extension with 1/2 in. drive |
| 9/16 in. socket with 1/2 in. drive | Torque wrench with 1/2 in. drive
(0-175 lb-ft) (0-237 N.m) |
| Ratchet with 1/2 in. drive | 3/4 in. pin punch |
| 1/8 in. pin punch | 6 in. rule |
| 1/2 in. pin punch | Grease gun |
| 9/16 in. combination box and
open end wrench (2 required) | Vise |
| 3/4 in. combination box and
open end wrench | Hammer |
| 7/16 in. combination box and
open end wrench | 5/16 in. combination box and
open end wrench |
| | 9/16 in. crowfoot wrench with 3/8 in. drive
Adapter, 1/2 in. to 3/8 in. |

- SUPPLIES:**
- | | |
|--------------------------------|----------------------------|
| Steel welding rod 1/8 in. dia. | Imckwasher (9 required) |
| Gasket | Lockwasher (3 required) |
| Grease (Item 36, Appendix D) | Rags (Item 65, Appendix D) |

PRELIMINARY PROCEDURE: Remove powerplant (page 5-1)



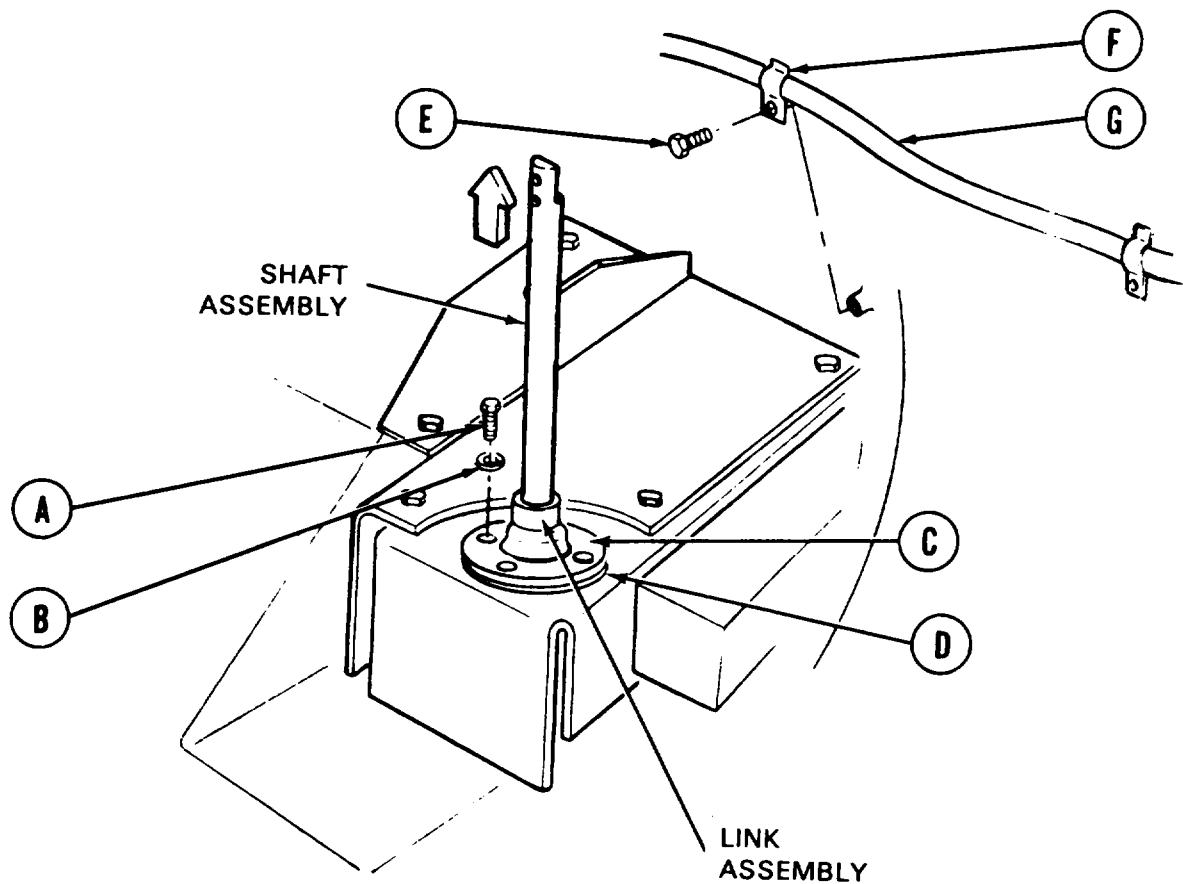
Go on to Sheet 2

SHIFTING CONTROL BRACKET AND CONNECTING LINK ASSEMBLY REPAIR AND REPLACEMENT

(Sheet 2 of 9)

REMOVAL:

1. Lift shaft assembly from link assembly.
2. Using 7/16 inch socket, remove four screws (A) and lockwashers (B) securing spacer (C) and gasket (D). Throw lockwashers away.
3. Remove spacer (C) and gasket (D). Throw gasket (D) away.
4. Using 7/16 inch socket, remove screw (E) from clamp (F).
5. Remove clamp (F).
6. Push cable (G) aside.

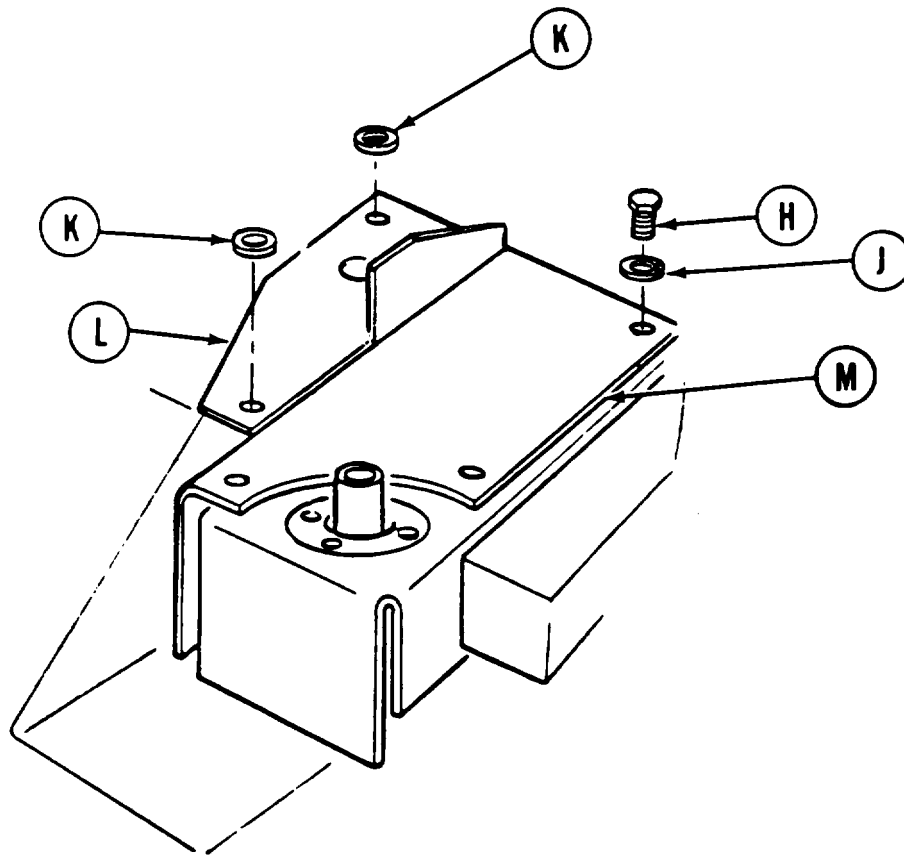


Go on to Sheet 3

TA139306

SHIFTING CONTROL BRACKET AND CONNECTING LINK ASSEMBLY REPAIR AND REPLACEMENT (Sheet 3 of 9)

7. Using 7/16 inch socket, remove five screws (H), five lockwashers (J), and two flat washers (K).
Throw lockwashers away.
8. Remove seal assembly (L).
9. Remove shield (M).



Go on to Sheet 4

TA139307

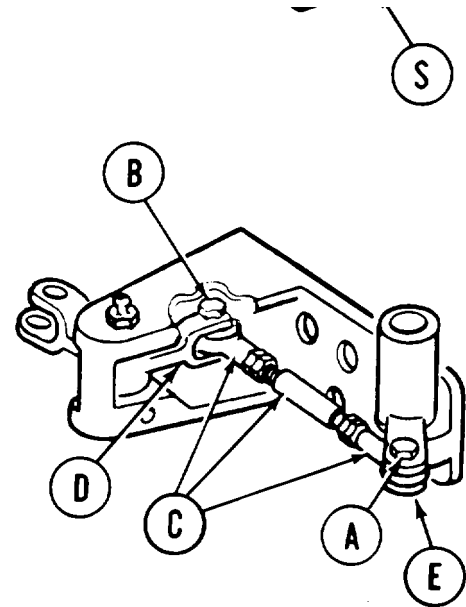
SHIFTING CONTROL BRACKET AND CONNECTING LINK ASSEMBLY REPAIR AND REPLACEMENT (Sheet 4 of 9)

10. Using 9/16 inch wrench, remove bolt (N).
11. Using 9/16 inch socket, extension, and 9/16 inch wrench, remove three screws (P) and lockwashers (Q) securing bracket assembly (R) to hull. Throw lockwashers away.
12. Remove bracket assembly (R) and shield (S) from hull wall.



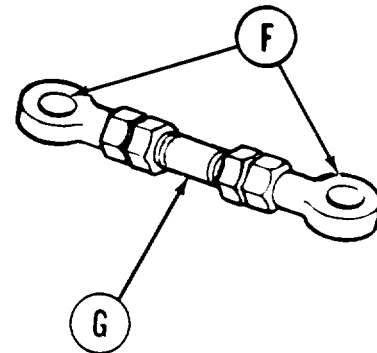
DISASSEMBLY:

1. Using 9/16 inch socket, remove bolts (A) and (B).
2. Remove stud and rod end bearing assembly (C) from clevises (D) and (E).
3. Inspect rod end bearings (F). Replace if required.
4. Inspect stud (G) for cracks or bends. Replace if required.



NOTE

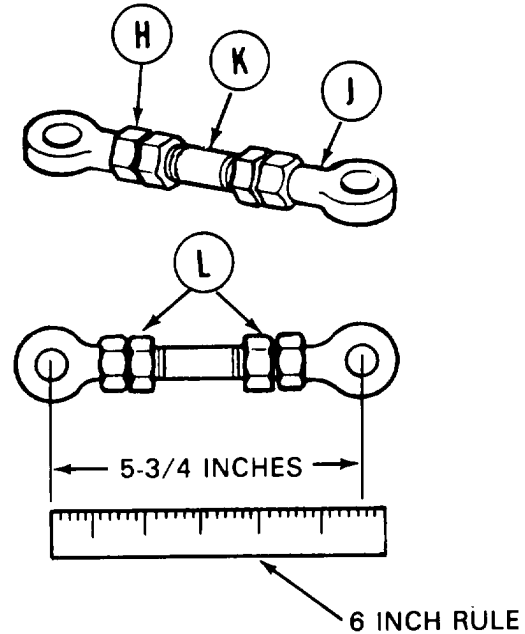
If replacement of parts on stud and rod end bearing assembly (C) is required, perform steps 5 thru 7.



Go on to Sheet 5

SHIFTING CONTROL BRACKET AND CONNECTING LINK ASSEMBLY REPAIR AND REPLACEMENT (Sheet 5 of 9)

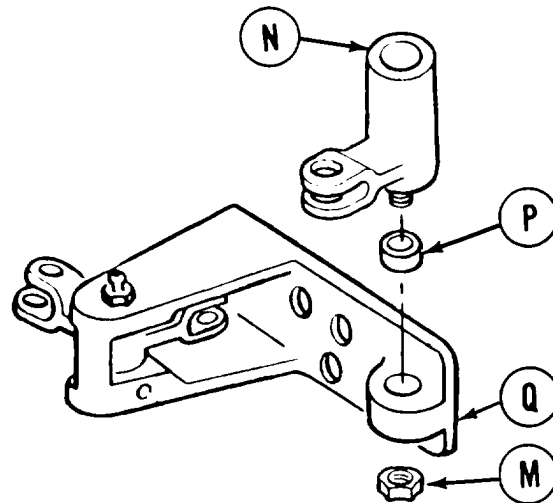
5. Using two 9/16 inch wrenches, remove rod ends (H) and (J) from stud (K) if necessary.
6. Using two 9/16 inch wrenches, install new rod ends (H) and (J) on stud (K) as required.
7. Using 6 inch rule, adjust length of rod assembly to 5-3/4 inches center-to-center of rod end holes.
8. Using 9/16 inch wrench to hold rod ends (H) and (J), and crowfoot wrench, adapter, and torque wrench on jamnuts (L), tighten jamnuts (L) to 15-20 lb-ft (20-27 N.m) while maintaining 5-3/4 inch measurement.
9. Using 3/4 inch wrench, remove self-locking nut (M). Throw nut away.
10. Remove link assembly (N).
11. Inspect bearing (P) and link (N). Replace if required.



NOTE

If bearing (P) is to be replaced, perform steps 12 and 13. If not, proceed to step 14.

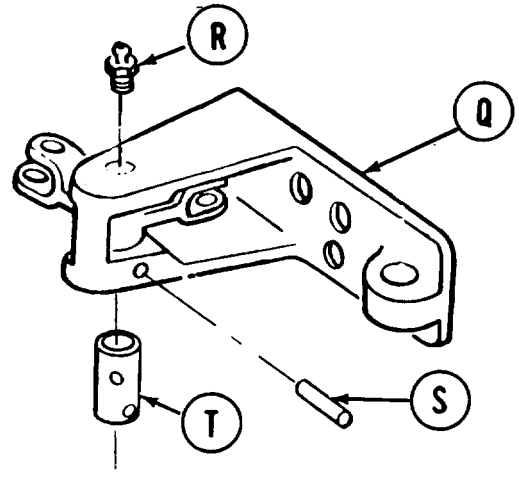
12. Using 3/4 inch punch and hammer, remove bearing (P) from bracket (Q). Throw bearing away.
13. Using vise, press new bearing (P) in bracket (Q).



Go on to Sheet 6

SHIFTING CONTROL BRACKET AND CONNECTING LINK ASSEMBLY REPAIR AND REPLACEMENT AND
(Sheet 6 of 9)

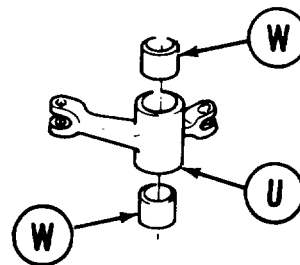
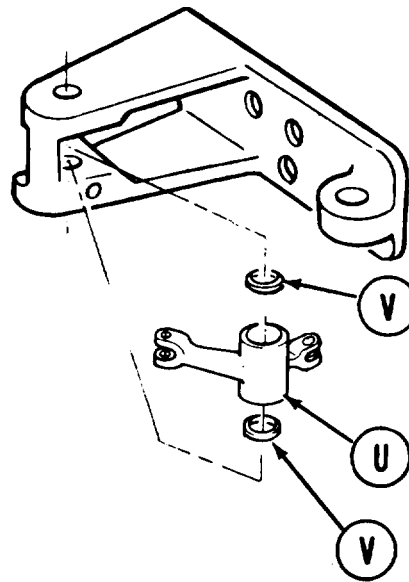
14. Place bracket (Q) into vise.
15. Using 5/16 inch wrench, remove grease fitting (R).
16. Inspect grease fitting (R) for blockage or damaged threads. Throw away if damaged.
17. Using hammer, 1/8 inch punch, and welding rod, remove pin (S). Throw pin away.
18. Using hammer and 1/2 inch punch, remove shaft (T).
19. Remove connecting link (U) and two washers (V).
20. Inspect washers (V) and connecting link bearings (W).



NOTE

If bearings (W) are to be replaced, perform steps 21 and 22.

21. Using 1/2 inch punch and hammer, remove bearings (W). Throw bearings away.
22. Using vise, press new bearings (W) one at a time into connecting link (U), flush with outer surface of connecting link (U).



Go on to Sheet 7

TA139310

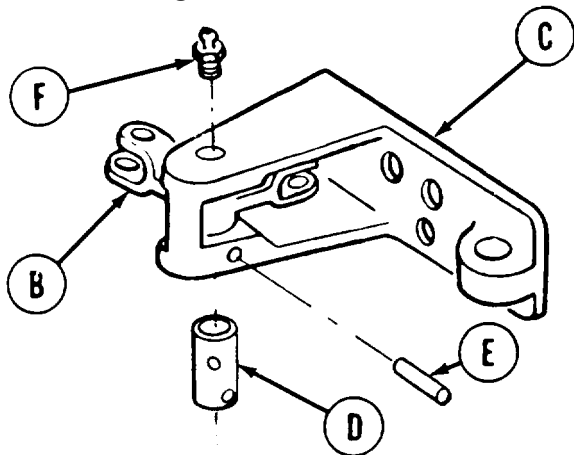
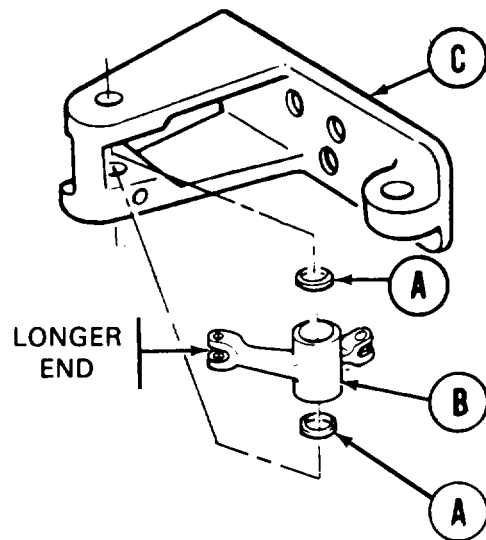
SHIFTING CONTROL BRACKET AND CONNECTING LINK ASSEMBLY REPAIR AND REPLACEMENT
 (Sheet 7 of 9)

ASSEMBLY:

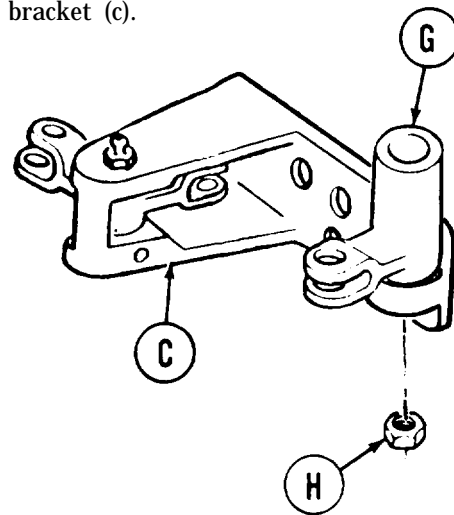
NOTE

Position bracket (C) into vise as necessary to accomplish assembly.

1. Position two washers (A) on connecting link (B).
2. Carefully position washers (A) and connecting link (B) in bracket (C) with all holes aligned. Make sure longer end of connecting link is inserted through bracket.

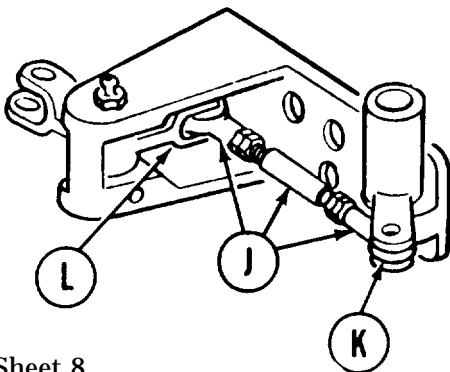


3. Position shaft (D) through bracket (C), washers (A), and connecting link (B) with pin hole in shaft (D) aligned with pin hole in bracket (C).



4. Using hammer, install new pin (E) through pin hole in bracket (C) and shaft (D).
5. Using 5/16 inch wrench, install grease fitting (F).
6. Position link assembly (G) on bracket (C).

7. Using 3/4 inch wrench, install new self-locking nut (H) on link assembly (G).
8. Position stud and rod end bearing assembly (J) with rod end holes aligned with holes in clevises (K) and (L).

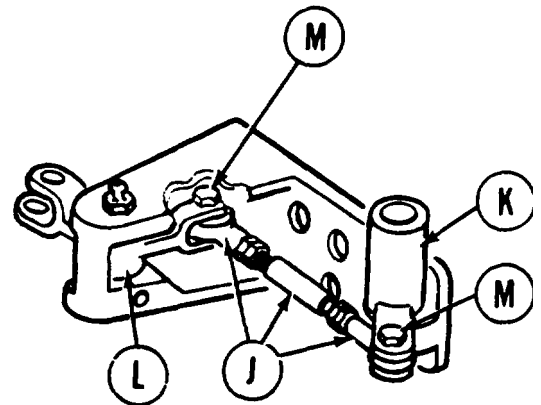


Go on to Sheet 8

TA139311

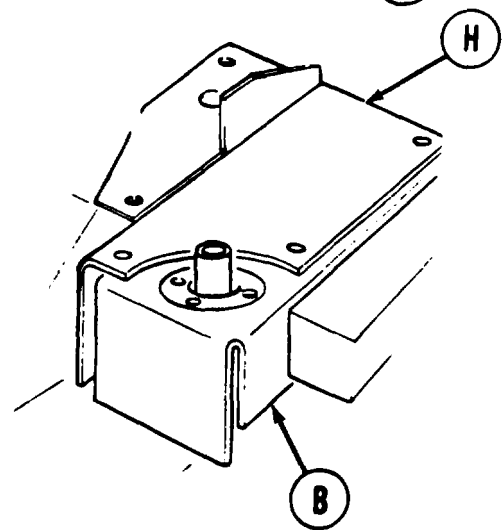
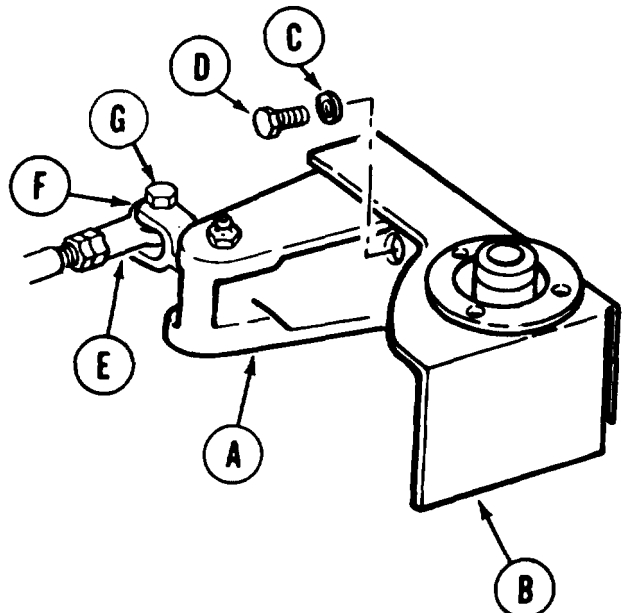
SHIFTING CONTROL BRACKET AND CONNECTING LINK ASSEMBLY REPAIR AND REPLACEMENT (Sheet 8 of 9)

9. Using 9/16 inch socket, install two bolts (M) through link assemblies (K) and (L) and stud and rod end bearing assembly (J).
10. Using torque wrench and 9/16 inch socket, tighten two bolts (M) to 15-20 lb-ft (20-27 N•m).



INSTALLATION:

1. Position bracket assembly (A) and shield (B) against hull wall with mounting holes aligned.
2. Using 9/16 inch socket and 9/16 inch wrench, install three new lockwashers (C) and screws (D) through bracket (A).
3. Using torque wrench, extension, and 9/16 inch socket, tighten three screws (D) to 15-20 lb-ft (20-27 N.m).
4. Position rod end (E) in clevis (F).
5. Using 9/16 inch wrench, install bolt (G) through clevis (F) and rod end (E).
6. Using torque wrench and 9/16 inch socket, tighten bolt (G) to 15-20 lb ft (20-27 N.m).
7. Install shield (H) over shield (B) with holes aligned.

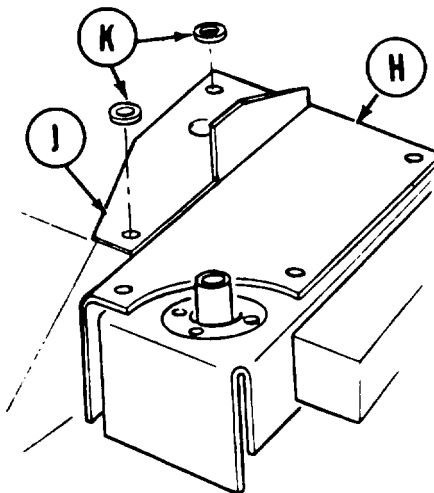


Go to Sheet 9

TA253392

Change 1 11-59

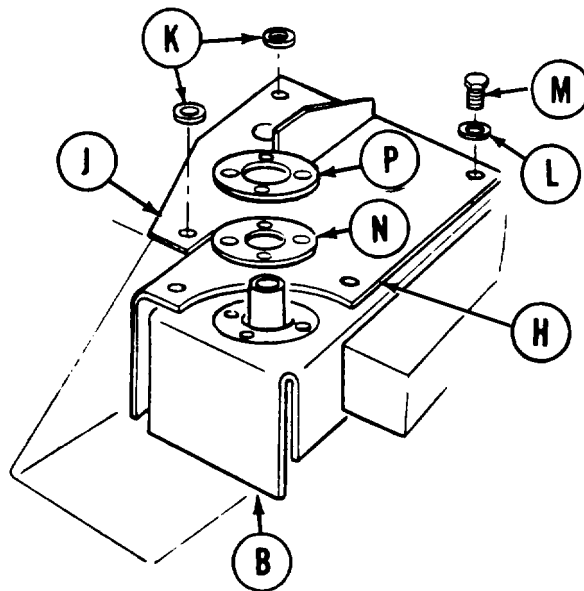
SHIFTING CONTROL BRACKET AND CONNECTING LINK ASSEMBLY REPAIR AND REPLACEMENT



8. Position seal assembly (J) over shield (H) with holes aligned.
9. Position two flat washers (K) on seal assembly with holes aligned.

10. Using 7/16 inch socket, install five new lockwashers (L) and screws (M) and secure seal assembly (J) and shield (H) to shield (B).

11. Position new gasket (N) and spacer (P) on shield (B) with holes aligned.



12. Using 7/16 inch socket, install four new lockwashers (Q) and screws (R) through spacer (P) and gasket (N).

13. Lubricate connecting link at grease fitting (S) using grease (Item 36, Appendix D).

14. Position clamp (T) on cable (U)

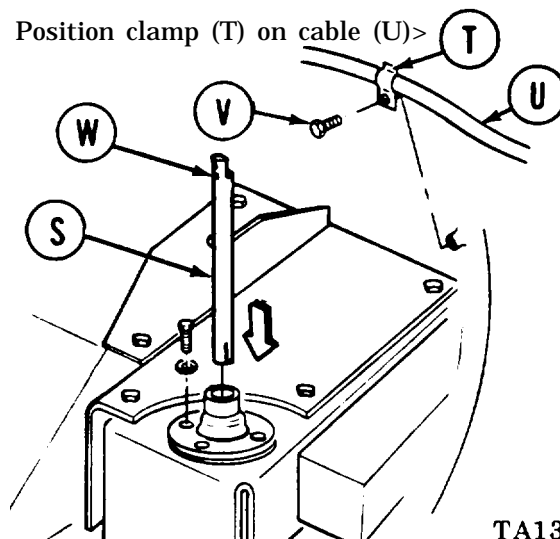
15. Position cable (U) and clamp (T) on hull wall.

16. Using 7/16 inch wrench, install screw (V) through clamp (T).

17. Insert shaft assembly (W) into link assembly.

18. Install 2A powerplant (page 5-14) or 2D powerplant (page 5-37).

19. Check shifting pattern response (TM 9-2350-222-10). If transmission does not shift correctly, adjust shifting linkage (page 11 -2).



End of Task

TA139313

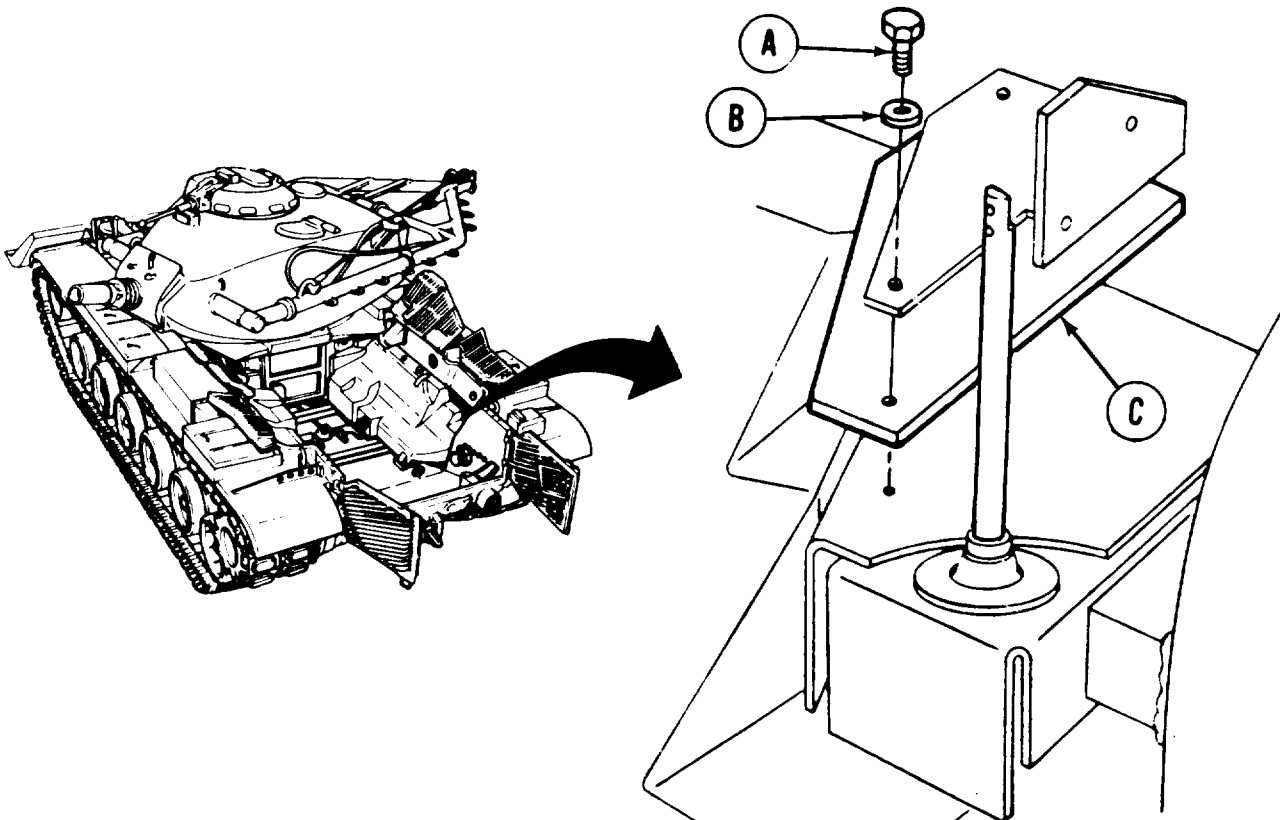
SHIFTING CONTROL SEAL ASSEMBLY REPAIR AND REPLACEMENT (Sheet 1 of 2)

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

SUPPLIES: Seal (10870478)

Lockwashers (MS35338-63) (2 required)

PRELIMINARY PROCEDURE: Remove powerplant (page 5-1)

**REMOVAL:**

1. Using socket and 7/16 inch wrench, remove two screws (A) and lockwashers (B).
2. Remove seal (c).

INSPECTION:

Inspect seal for damage and wear. Replace as required.

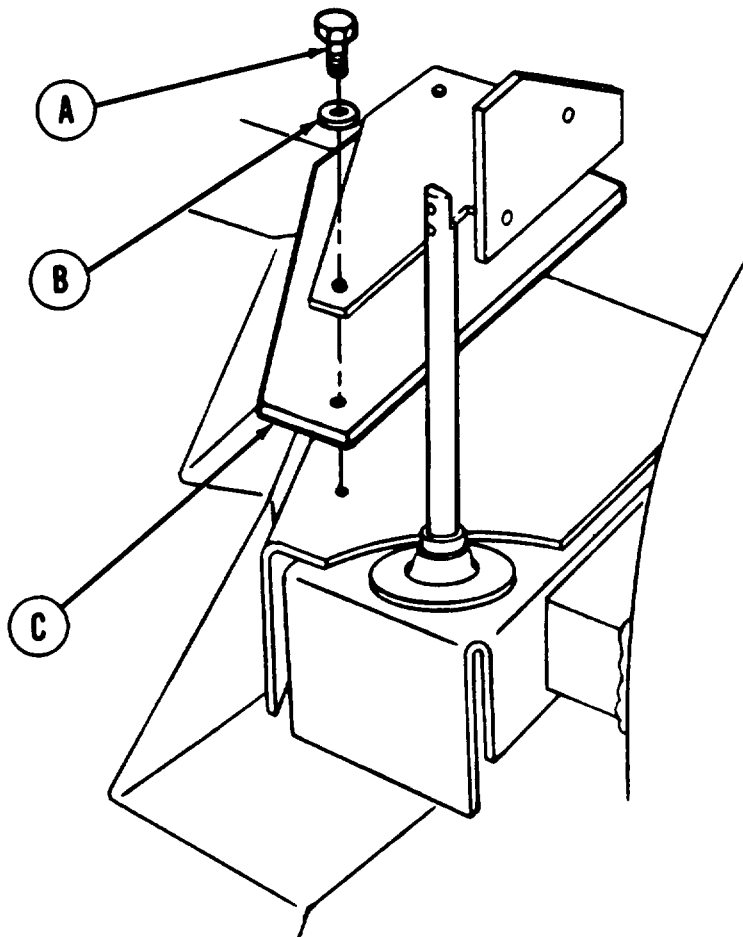
INSTALLATION:

1. Position seal (C).

Go on to Sheet 2

TA139314

- Using socket and 7/16 inch wrench, install two screws (A) and new lockwashers (B) through seal assembly (C).



- Install 2A powerplant (page 5-14) or 2D powerplant (page 5-37).

End of Task

TA139315

SEROVBANDS ADJUSTMENT (Sheet 1 of 3)

TOOLS: Torque wrench with 1/2 in. drive (0 to 175 lb-ft) (0 to 237 N.m)
 9/16 in. socket with 1/2 in. drive
 Ratchet with 1/2 in. drive
 1-1/16 in. socket with 1/2 in. drive
 1-1/16 in. open end wrench

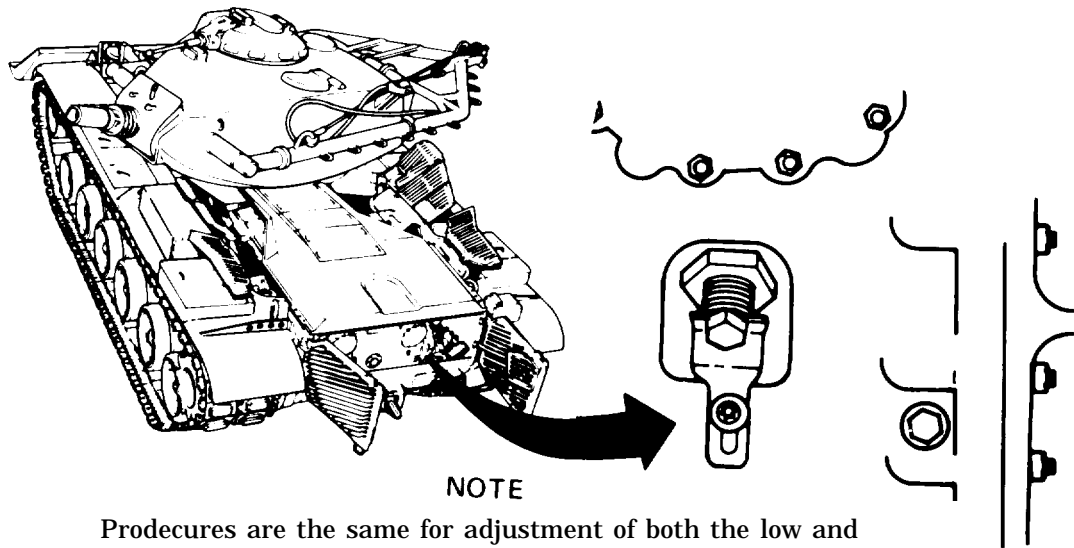
SPECIAL TOOLS: Socket wrench socket (Item 5, Chapter 3, Section I)

SUPPLIES: Self-locking bolt

REFERENCE: TM 9-2350-222-10

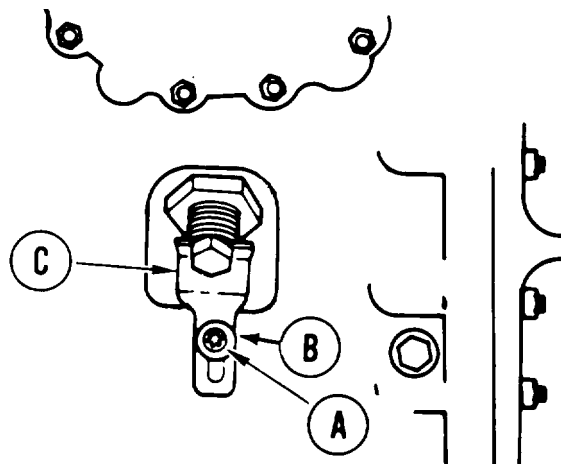
PRELIMINARY PROCEDURES:

Set shift lever in P (park) position (TM 9-2350-222-10)
 Remove transmission shroud (page 9-20)



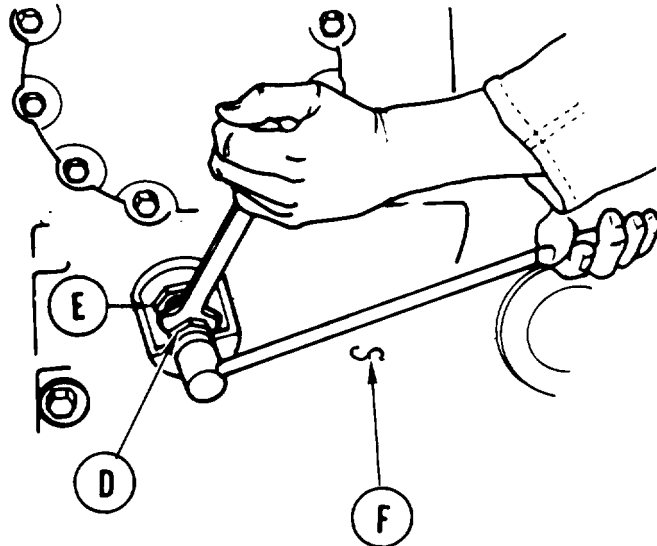
- Using 9/16 inch socket, remove self-locking bolt (A) and washer (B) holding lock plate (C). Remove lock plate (C). Throw self-locking bolt (A) away.

Go on to Sheet 2

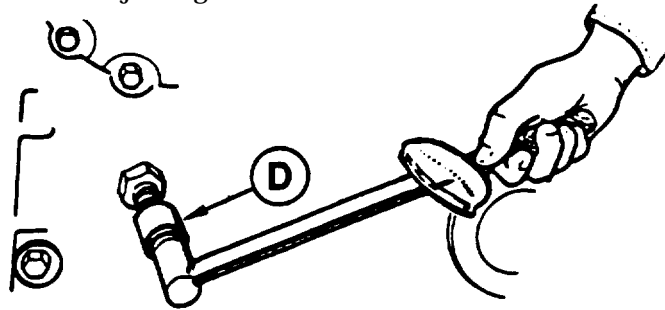


SERVOBANDS ADJUSTMENT (Sheet 2 of 3)

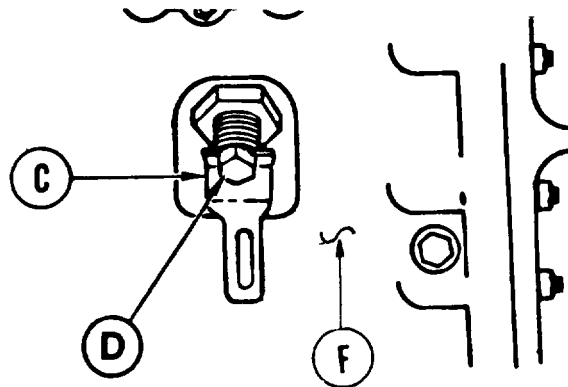
2. Using 1-1/16 inch wrench to hold adjusting screw (D) and socket wrench socket on locknut (E), loosen locknut (E) enough to allow adjustment of adjusting screw (D) without locknut (E) coming in contact with transmission case (F).



3. Using torque wrench and 1-1/16 inch socket on adjusting screw (D), torque adjusting screw (D) 2530 lb-ft (34-41 N.m).

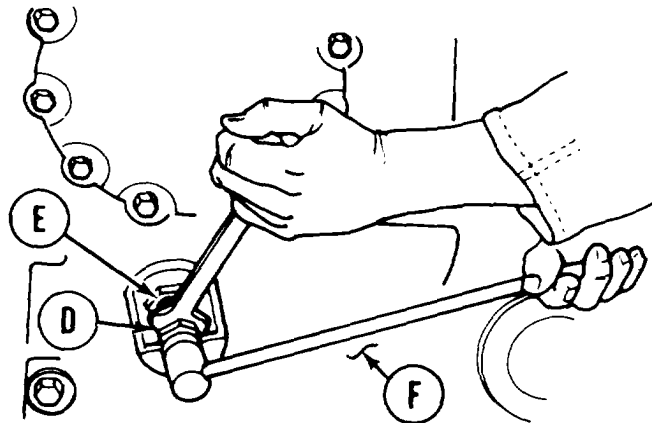


4. Back off adjusting screw (D) approximately one full turn to the nearest flat that will align with lock plate (C) when lock plate (C) is installed.
5. Scribe mark on adjusting screw (D) and transmission case (F) to record aligned position.



Go on to Sheet 3

SERVOBANDS ADJUSTMENT (Sheet 3 of 3)



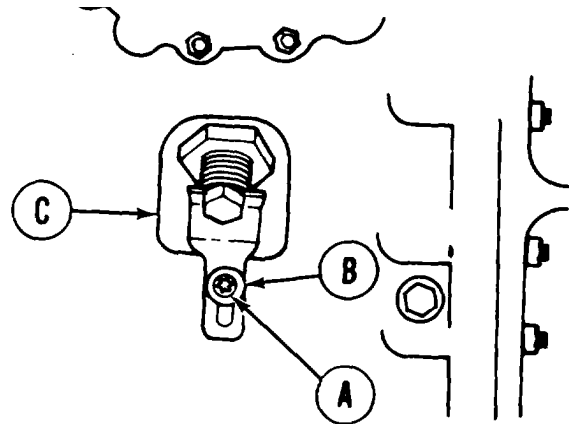
6. Use 1-1/16 inch wrench to hold adjusting screw (D), while using torque wrench and socket wrench socket to torque locknut (E) to 145-155 lb-ft (197-210 N.m).

7. Check scribe mark on adjusting screw (D) and transmission case (F) for alinement. If not in alinement, repeat complete adjustment procedure.

8. Position lock plate (C) over adjusting screw (D) and secure using new self-locking bolt (A) and washer (B). I

9. Using 9/16 inch socket, and torque wrench, tighten self-locking bolt (A) to 18-22 lb-ft (25-29 N.m).

10. Install transmission shroud (page 9-23).



End of Task

All data on page 11-66 deleted.

Change 5 11-65/ (11-66 blank)

TRANSMISSION MAIN OIL FILTER ELEMENT REPLACEMENT (Sheet 1 of 7)

PROCEDURE INDEX

PROCEDURE	PAGE
Removal	11-67
Cleaning and Inspection	11-70
Installation	11-71

<p>TOOLS: 9/16 in. socket with 1/2 in. drive 7/16 in. socket with 1/2 in. drive 5 in. extension with 1/2 in. drive 1 in. combination box and open end wrench Torque wrench with 1/2 in. drive</p>	<p>Diagonal cutting pliers Putty knife Slip joint pliers Retaining ring pliers Ratchet with 1/2 in. drive Flat-tip screwdriver</p>
--	---

SUPPLIES: Transmission oil (Item 43, Appendix D)
 Filter cover gasket
 Rags (Item 65, Appendix D)
 Dry cleaning solvent (Item 54, Appendix D)
 Lockwire (Item 59, Appendix D)
 1/4 in. x 20 NF x 3 in. long bolts (2 required)
 Lockwashers (10 required)
 Goggles (Item 74, Appendix D)
 Rubber gloves (Item 73, Appendix D)

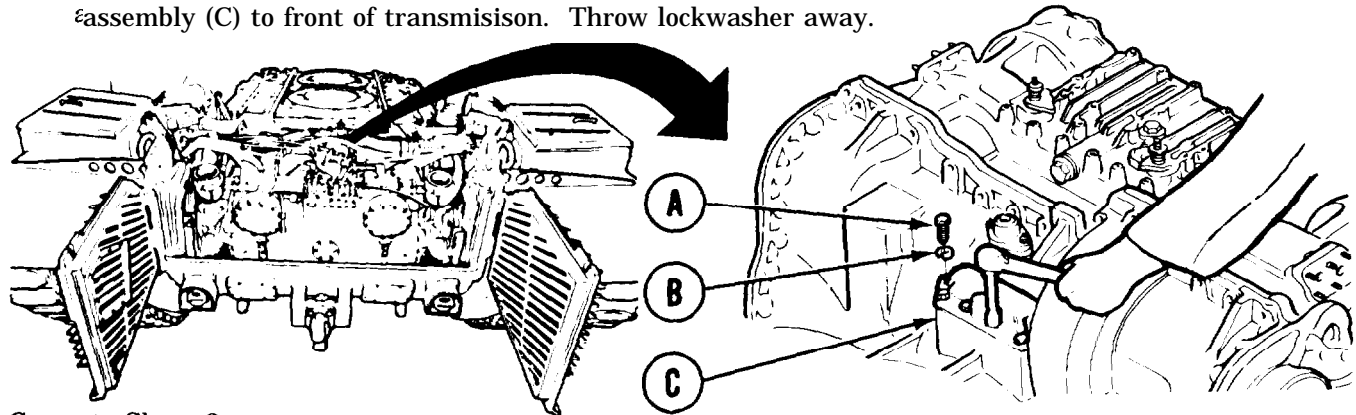
PRELIMINARY PROCEDURES: Remove top deck (page 16-21)
 Remove transmission shroud (page 9-20)

REMOVAL:

NOTE

Some filter assemblies are secured with nuts and threaded studs instead of bolts and lockwashers.

- Using 9/16 inch socket with extension, remove 10 bolts (A) and lockwashers (B) holding filter assembly (C) to front of transmission. Throw lockwasher away.



Go on to Sheet 2

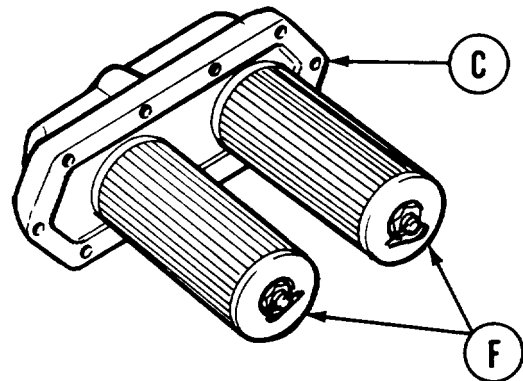
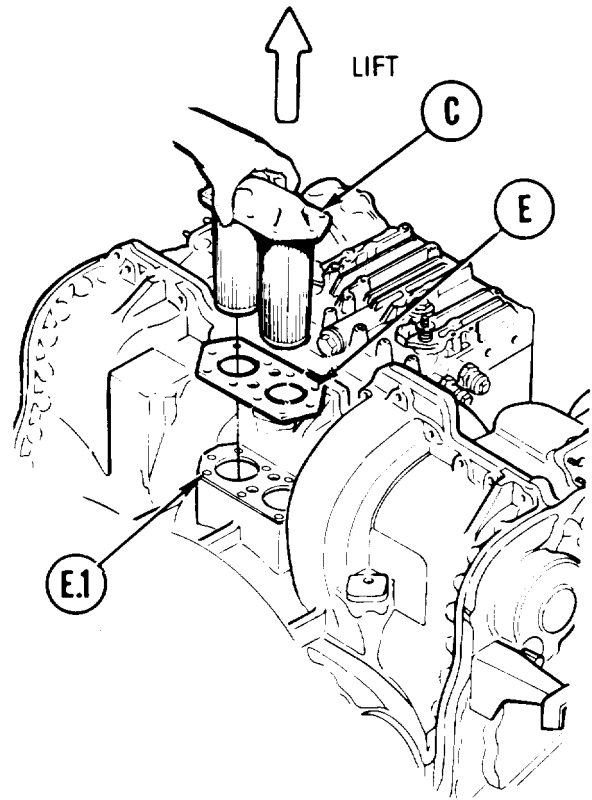
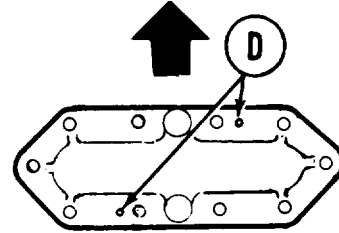
TRANSMISSION MAIN OIL FILTER ELEMENT REPLACEMENT (Sheet 2 of 7)

2. Using 1/4 inch x 20 NF x 3 inch long bolts 7/16 inch socket, loosen filter assembly by installing bolts in holes (D) and tightening evenly to withdraw filter assembly.
3. Using 7/16 inch socket, remove two 1/4 inch x 20 NF x 3 inch long bolts (D) from filters.
4. Lift filter assembly (C) slowly out of transmission to reduce possibility of oil entering bolt holes (E. 1). Remove and throw gasket (E) away.

NOTE

Some filters are secured with self-locking nuts and do not require lockwiring.

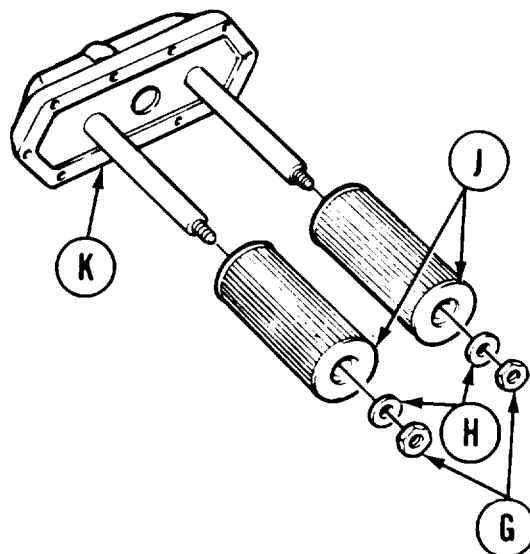
5. Using diagonal cutting pliers, remove lockwire (F), if present, securing nuts on bottom of filter assembly (C). Throw lockwire away.



Go on to Sheet 3

TRANSMISSION MAIN OIL FILTER ELEMENT REPLACEMENT (Sheet 3 of 7)

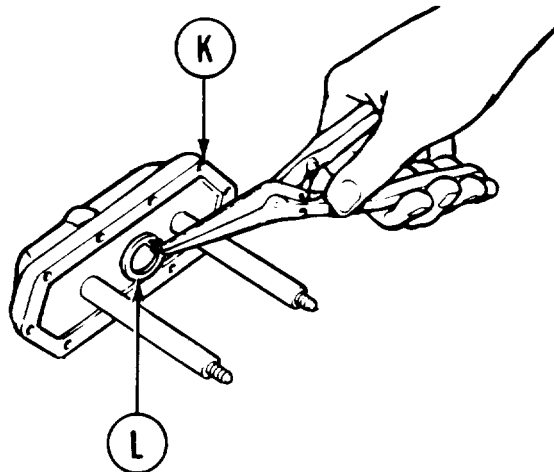
6. Using 1 inch wrench, remove two nuts (G) and two washers (H) holding filter elements (J) to filter assembly head (K).
7. Remove two filter elements (J) from filter assembly head (K).



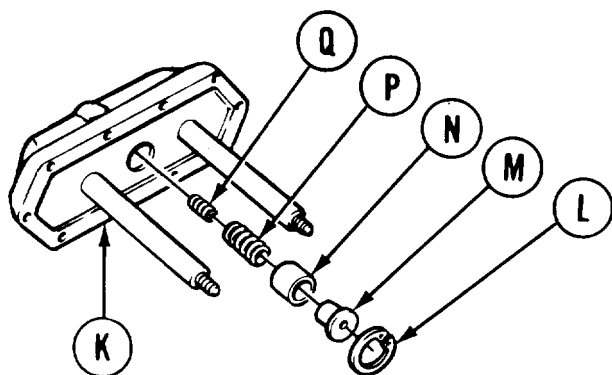
CAUTION

Bypass valve has spring tension. Hold hand over bypass valve while removing.

8. Using retaining ring pliers, remove retaining ring (L) holding bypass valve in bottom of filter assembly head (K).



9. Remove washer (M), sleeve (N), outer spring (P), and inner spring (Q) from filter assembly head (K).



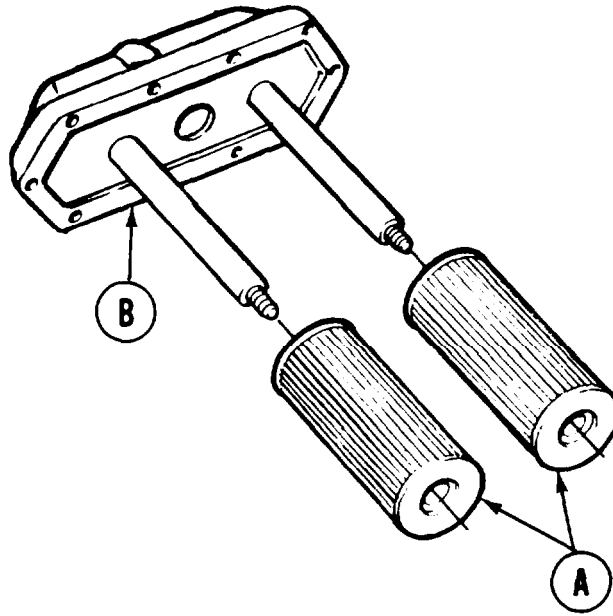
Go on to Sheet 4

TA139322

TRANSMISSION MAIN OIL FILTER ELEMENT REPLACEMENT (Sheet 4 Of 7)

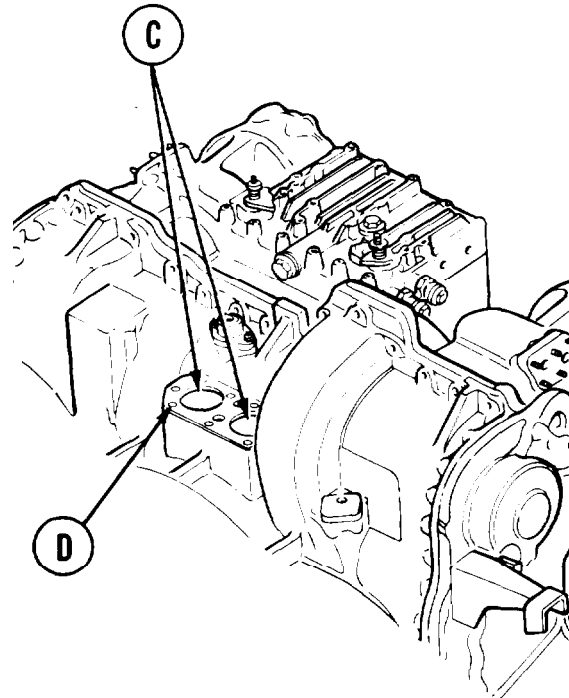
WARNING

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



CLEANING AND INSPECTION:

1. Clean filter elements (A) using dry cleaning solvent. If filter elements are damaged, throw them away.
2. Using putty knife, clean old gasket off filter assembly head (B) mounting surface.
3. Clean dirt and oil off filter assembly head (B).
4. Inspect bypass valve springs for damage, Replace if defective.
5. Stuff clean rags into filter assembly holes (C) on transmission.
6. Using putty knife, clean off gasket mounting surface on transmission.
7. Ensure 10 bolt holes (D) are clean and free of oil.

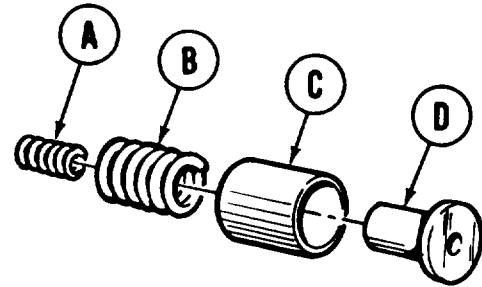


Go on to Sheet 5

TRANSMISSION MAIN OIL FILTER ELEMENT REPLACEMENT (Sheet 5 of 7)

INSTALLATION:

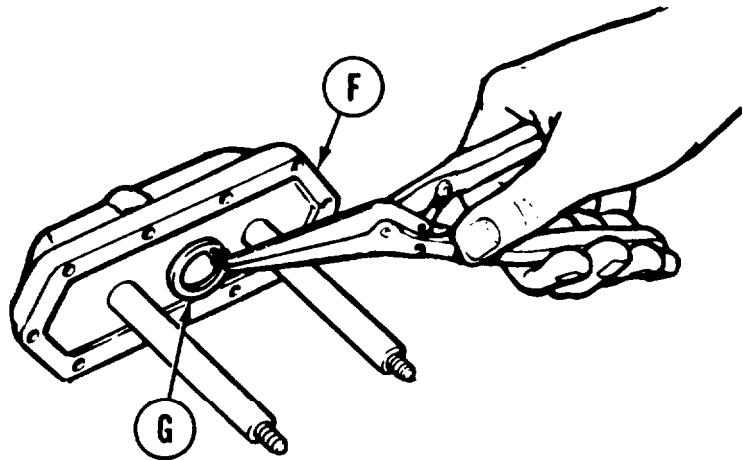
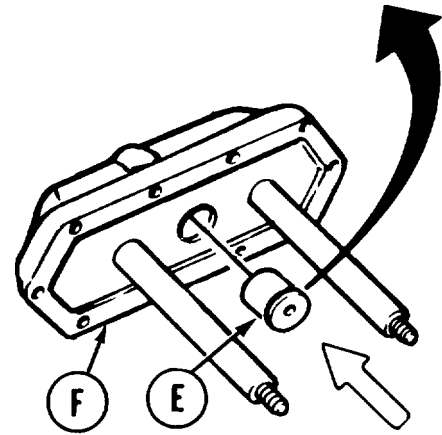
1. Assemble inner spring (A), outer spring (B), sleeve (C), and washer (D).
2. Install assembled bypass valve (E) into bottom of filter assembly head (F).



NOTE

It may be necessary to maintain pressure on bypass valve with screwdriver to perform step 3.

3. Using retaining ring pliers, install retaining ring (G) into filter assembly head (F) to hold bypass valve in place.

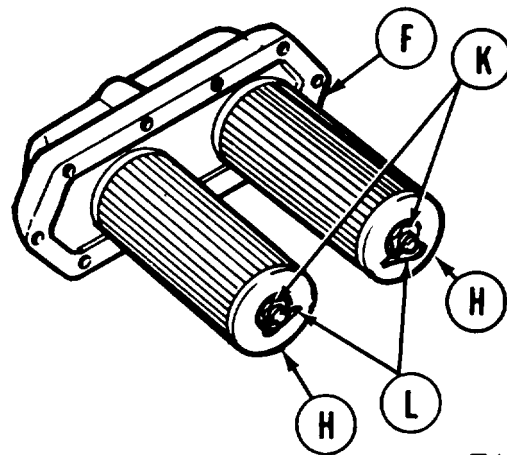
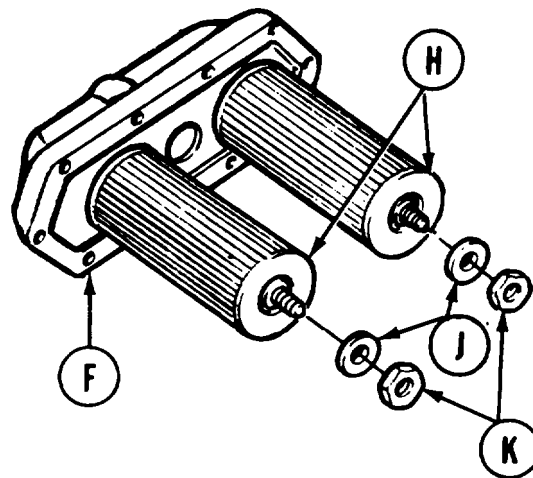
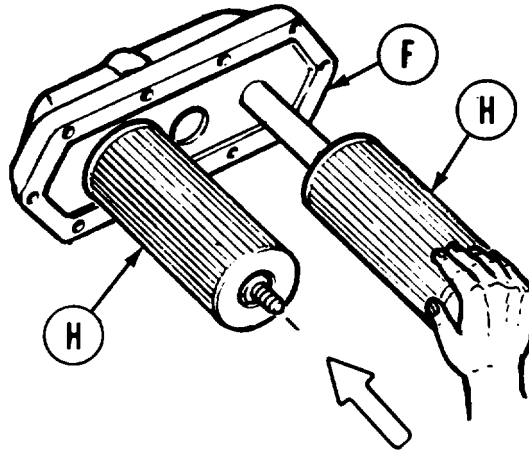


Go on to Sheet 6

TA139324

TRANSMISSION MAIN OIL FILTER ELEMENT REPLACEMENT (Sheet 6 of 7)

4. Place filter elements (H) on filter assembly head (F).
5. Using 1 inch wrench, secure filter elements (H) with two washers (J) and two nuts (K).
6. Using lockwire (L) (Item 59, Appendix D), secure nuts (K) to filter assembly (H).

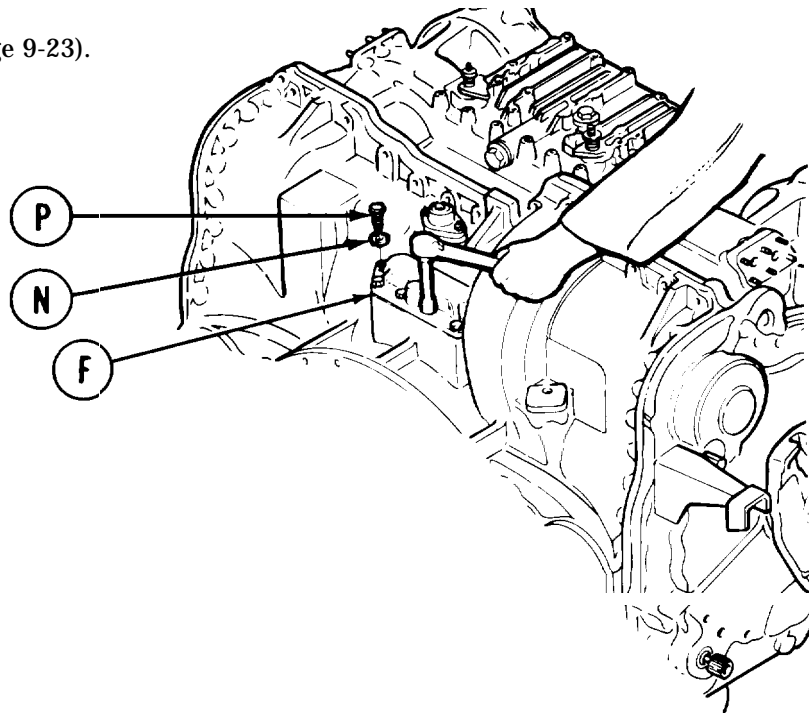
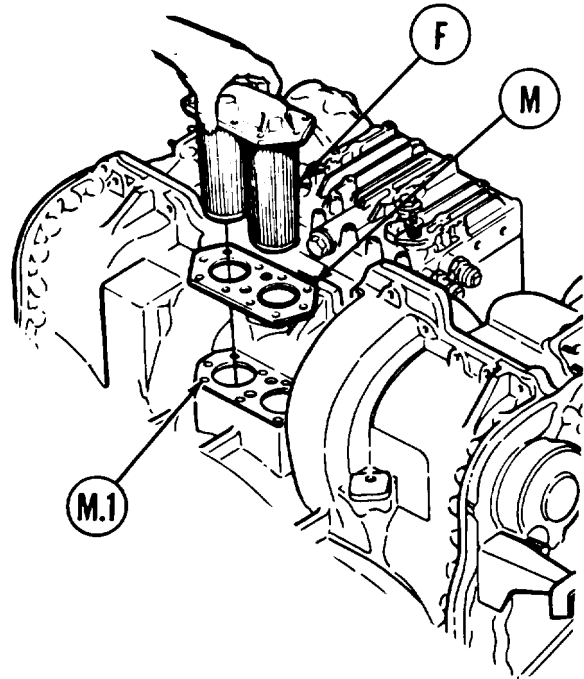


Go on to Sheet 7

TA139325

TRANSMISSION MAIN OIL FILTER ELEMENT REPLACEMENT (Sheet 7 of 7)

7. Remove rags from filter assembly holes.
8. Place new gasket (M) on transmission and install filter assembly (F).
- 8.1. Ensure 10 bolt holes (M1) are clean and free of oil.
9. Install 10 new lockwashers (N) and bolts (P) to hold filter assembly (F) to transmission.
10. Using a 9/16 inch socket wrench and torque wrench, alternately tighten 10 bolts (P) to 26-32 lb-ft (35-43 N.m).
11. Operate engine and transmission and check for leaks at gasket.
12. Install top deck (page 16-23).
13. Install transmission shroud (page 9-23).



End of Task

TRANSMISSION SIDE OIL STRAINER ASSEMBLY REPAIR AND REPLACEMENT (Sheet 1 of 8)

PROCEDURE INDEX

PROCEDURE	PAGE
Removal	11-75
Disassembly	11-77
Cleaning and Inspection	11 - 77
Assembly	11-78
Installation	11-79

TOOLS: Slip joint pliers
 1/2 in. socket with 1/2 in. drive
 10 in. extension with 1/2 in. drive
 Ratchet with 1/2 in. drive
 12 in. adjustable wrench
 Torque wrench with 3/8 in. drive
 (0-200 lb-in) (0-22 N.m)

Hose clamp pliers
 Diagonal cutting pliers
 7/16 in. socket with 3/8 in. drive
 Putty knife
 3/4 in. socket with 1/2 in. drive
 Tube bender
 9/16 in. socket with 1/2 in. drive

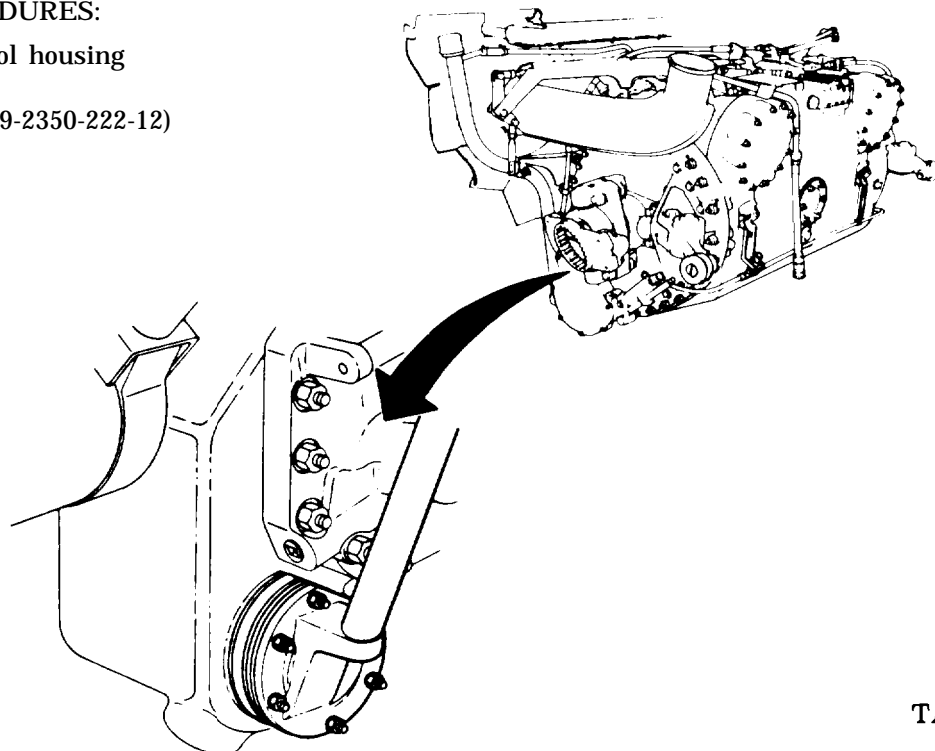
SUPPLIES: 5/16-18 jackscrew (2 required)
 Gasket
 Preformed packing (3 required)
 Washer seal (6 required)
 Dry cleaning solvent (Item 54, Appendix D)

Rags (Item 65, Appendix D)
 Lockwire (Item 59, Appendix D)
 Lockwashers (6 required)
 Lockwashers (2 required)

REFERENCE: LO 9-2350-222-12

PRELIMINARY PROCEDURES:

- Remove left brake control housing
 (page 13-70)
- Drain transmission (LO 9-2350-222-12)

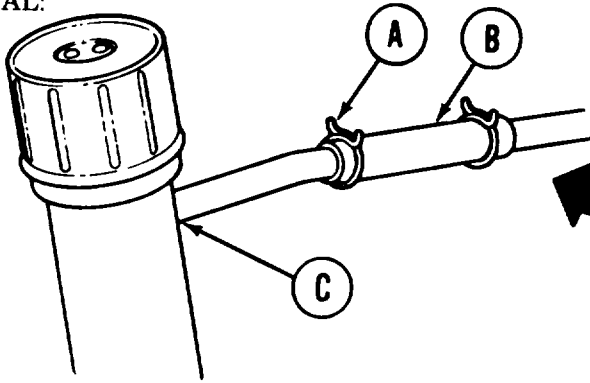


Go on to Sheet 2

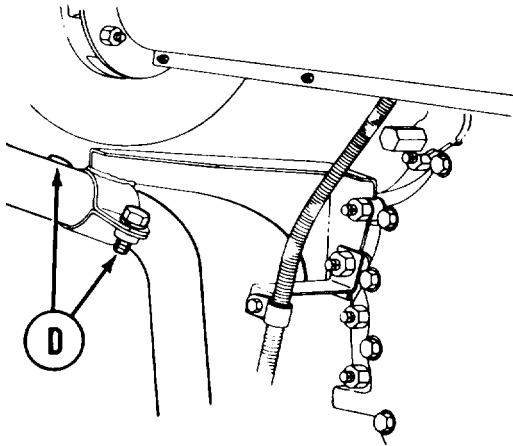
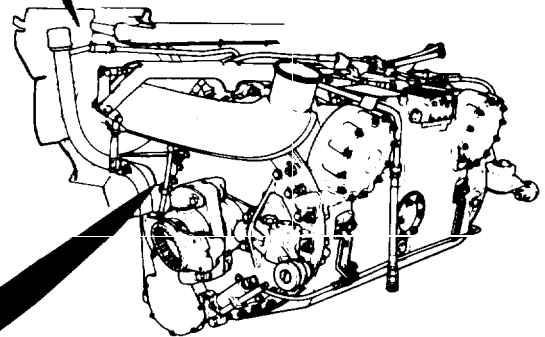
TA139327

TRANSMISSION SIDE OIL STRAINER ASSEMBLY REPAIR AND REPLACEMENT (Sheet 2 of 8)

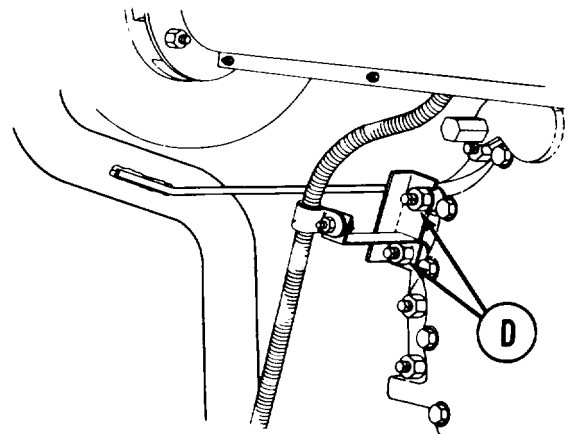
REMOVAL:



1. Using hose clamp pliers, loosen clamp (A).
2. Disconnect rubber tubing (B) from oil filler tube (C).



3. On earlier model transmissions, use 9/16 inch socket to remove two screws and lockwashers (D) securing bracket. Throw lockwashers away.

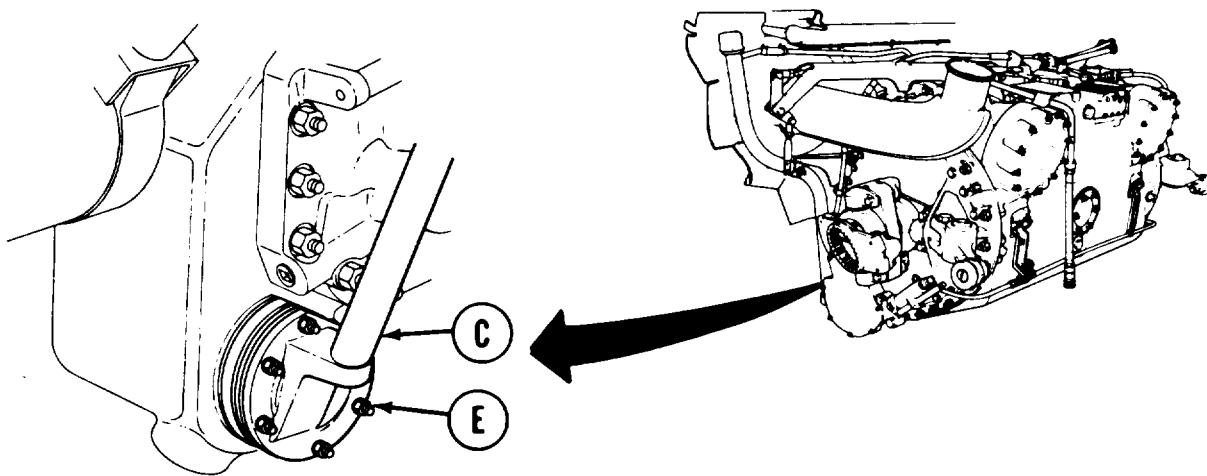


4. On later model transmissions, use 3/4 inch socket and extension to remove two nuts (D) securing bracket to transmission.

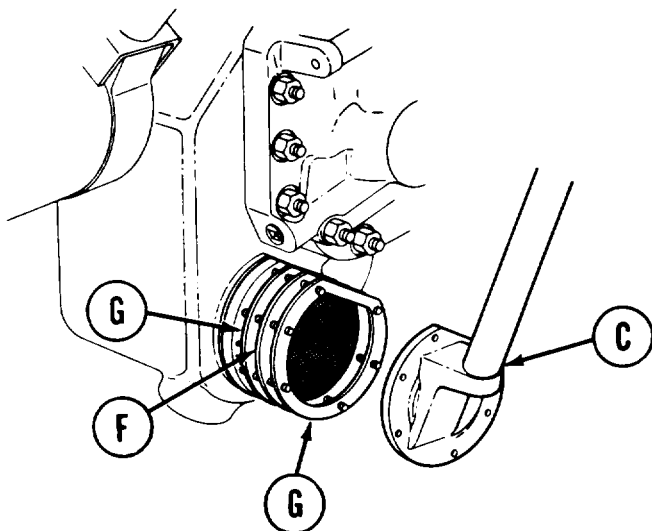
Go on to Sheet 3

TA139328

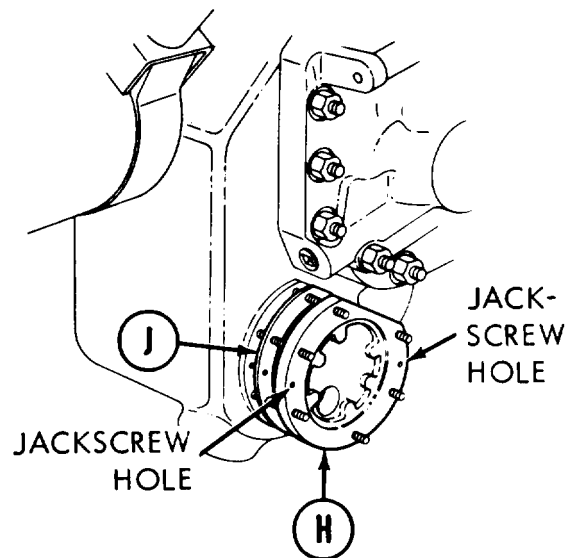
TRANSMISSION SIDE OIL STRAINER ASSEMBLY REPAIR AND REPLACEMENT (Sheet 3 of 8)



5. Using 1/2 inch socket, extension, and 1/2 inch wrench, remove six nuts and lockwashers (E) securing oil filler tube (C) to transmission. Throw lockwashers away.
6. Remove oil filler tube (C) from transmission"
7. Using putty knife, remove strainer (F) and two gaskets (G) from mounting studs. Throw gaskets away.



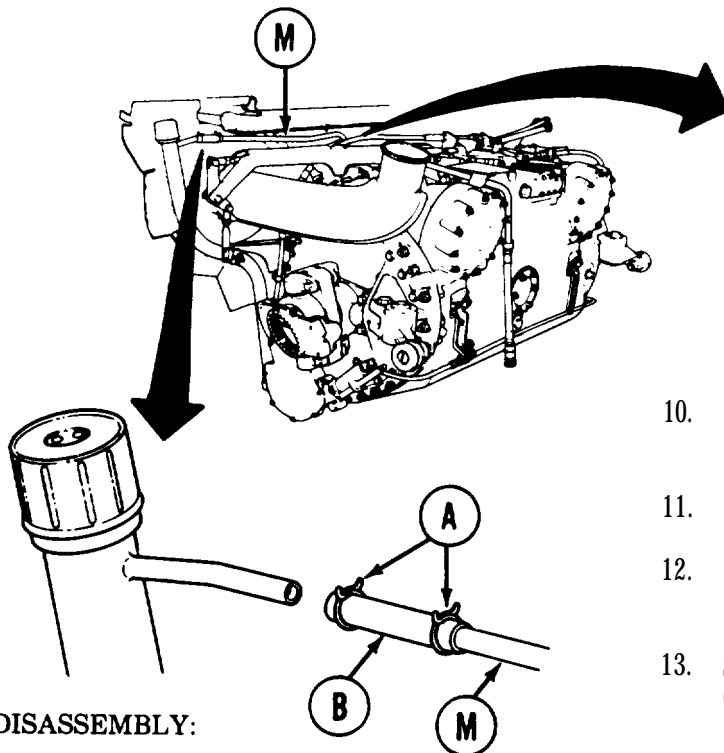
8. Using two 5/16-18 jackscrews and 1/2 inch socket, tighten jackscrews alternately and remove side oil strainer assembly (H).
9. Using putty knife, remove gasket (J). Throw gasket away.



Go on to Sheet 4

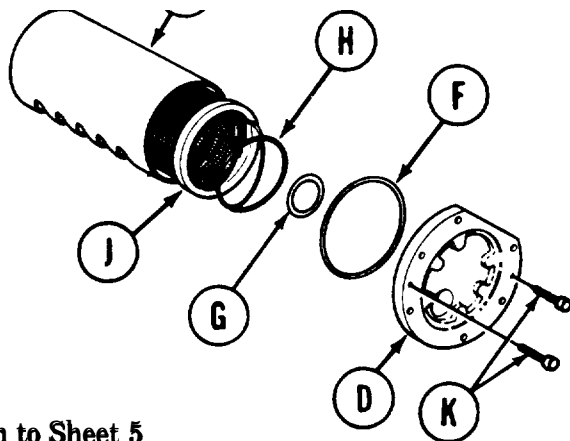
TA139329

TRANSMISSION SIDE OIL STRAINER ASSEMBLY REPAIR AND REPLACEMENT
(Sheet 4 of 8)

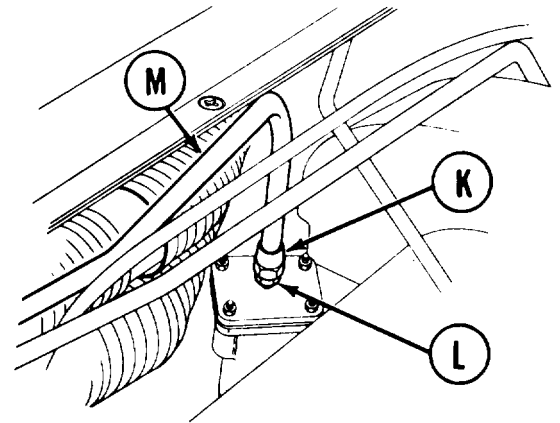


DISASSEMBLY:

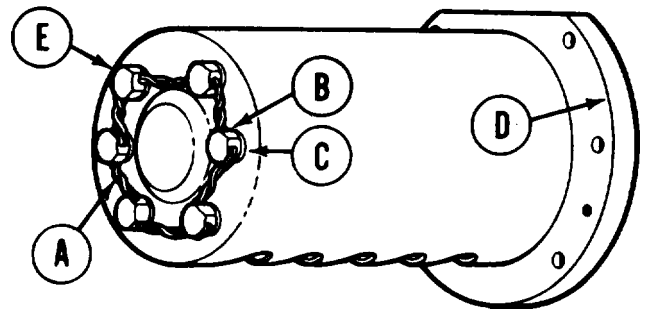
1. Using diagonal pliers, cut lockwire (A) from six screws (B).
2. Using 7/16 inch socket, remove six screws (B) and washer seals (C) securing element cover (D) to oil screen shell (E). Throw washer seals away.
3. Using putty knife, remove cover (D) and gasket (F). Throw gasket away.



Go on to Sheet 5



10. Using adjustable wrench, remove nut (K) and nipple adapter (L) from transmission,
11. Remove vent tube (M) from transmission.
12. Using hose clamp pliers, remove both clamps (A) and rubber tubing (B) from vent tube (M).
13. Slide nut (K) off opposite end of vent tube (M).



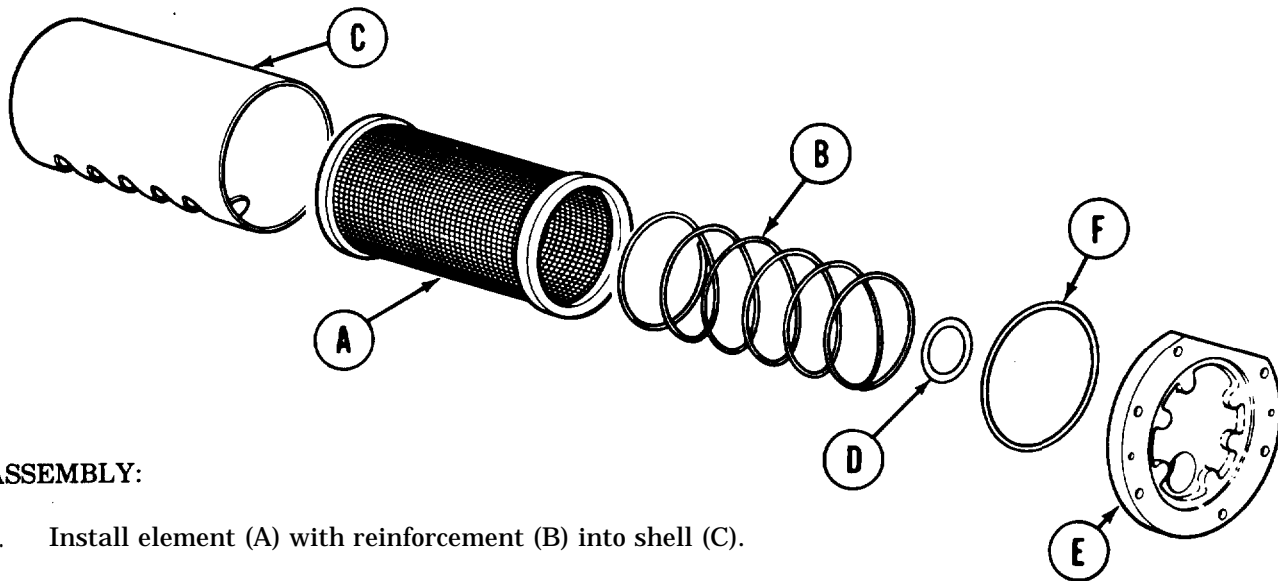
4. Remove preformed packing (G), reinforcement (H), and element (J) from shell (E). Separate reinforcement (H) from element (J). Throw packing away.
5. Using 1/2 inch socket, remove two jackscrews (K).

CLEANING AND INSPECTION:

1. Using dry cleaning solvent (Item 54, Appendix D) and rags, clean all parts.
2. Inspect all parts for defects.
3. Replace parts found defective.

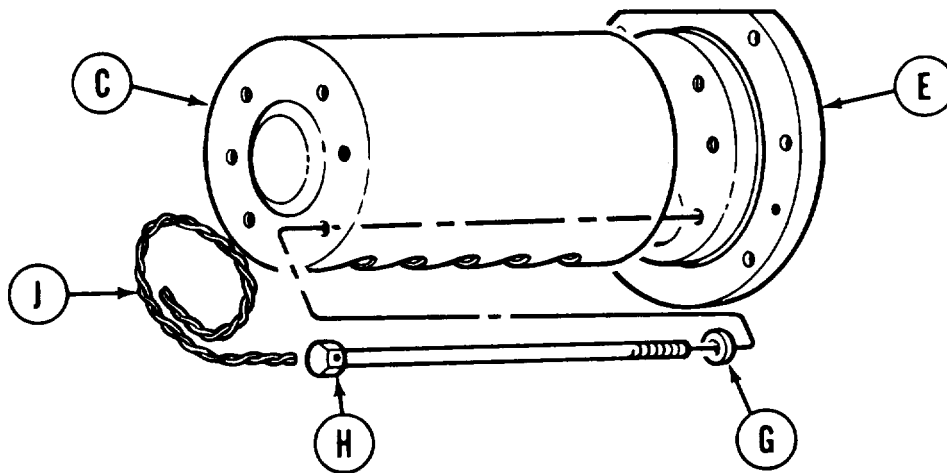
TA139330

TRANSMISSION SIDE OIL STRAINER ASSEMBLY REPAIR AND REPLACEMENT (Sheet 5 of 8)



ASSEMBLY:

1. Install element (A) with reinforcement (B) into shell (C).
2. Put new preformed packing (D) into groove of shell (C).
3. Position cover (E) with new gasket (F) to shell (C).



4. Install six new washer seals (G) and new screws (H) securing cover (E) to shell (C).
5. Using torque wrench with 7/16 inch socket, tighten six screws (H) to 20-25 lb-in (2-3 N.m).
6. Secure screws (H) in sets of three (or in pairs) with lockwire (J).

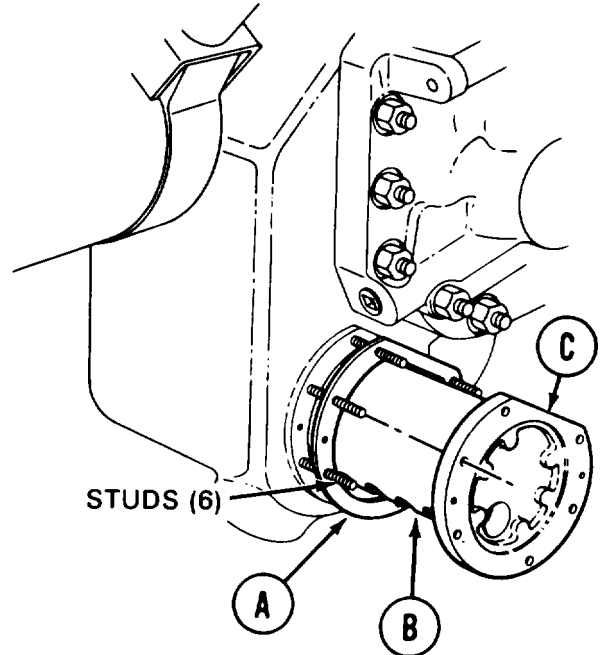
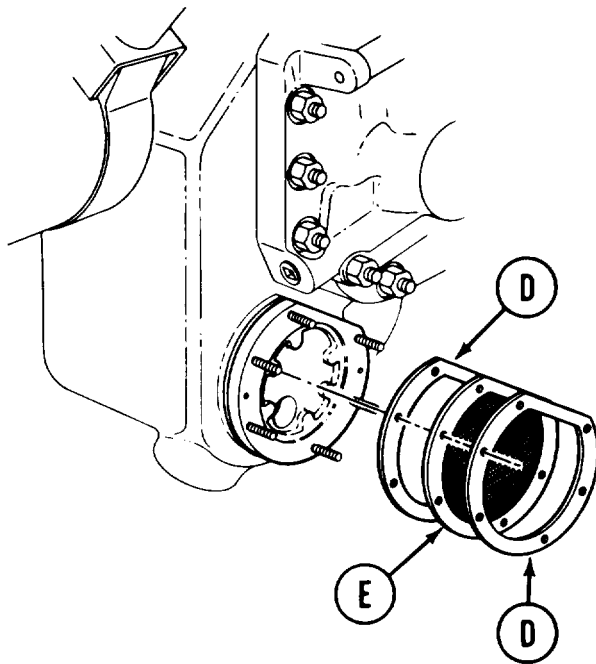
Go on to Sheet 6

TA139331

TRANSMISSION SIDE OIL STRAINER ASSEMBLY REPAIR AND REPLACEMENT (Sheet 6 of 8)

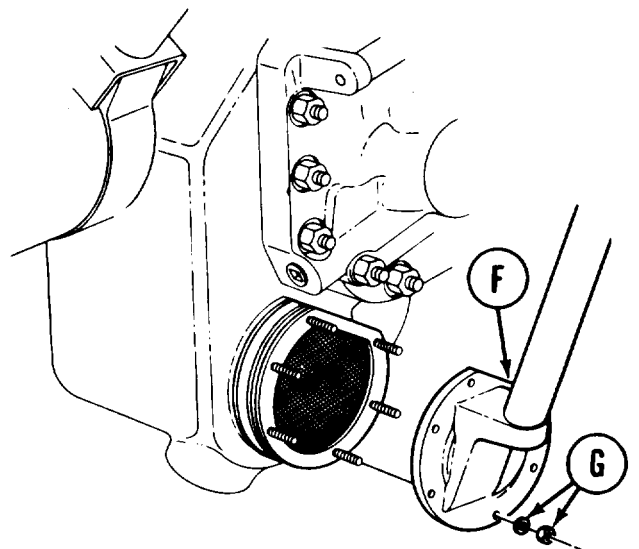
INSTALLATION:

1. Install new gasket (A) to mounting studs.
2. Install side oil strainer assembly (B) into transmission opening with cover (C) flange mounted to studs.



3. Mount new gaskets (D), strainer (E), and another new gasket (D) onto studs.

4. Mount oil filler tube (F) onto transmission studs and secure tube (F) with six new lockwashers and nuts (G).
5. Using 1/2 inch socket, tighten six nuts (G).
6. Install brake control housing (page 13-76), except wait to install powerplant after step 16.

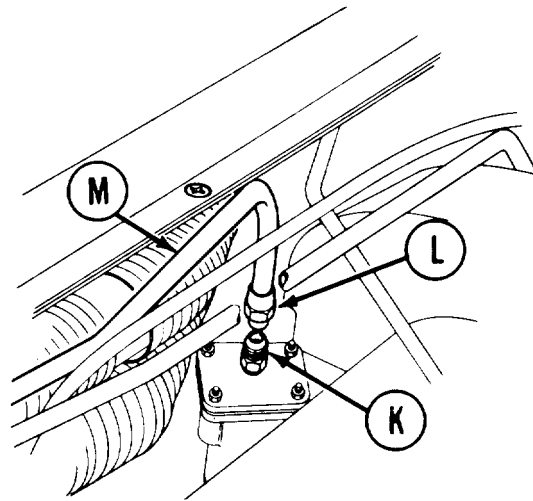
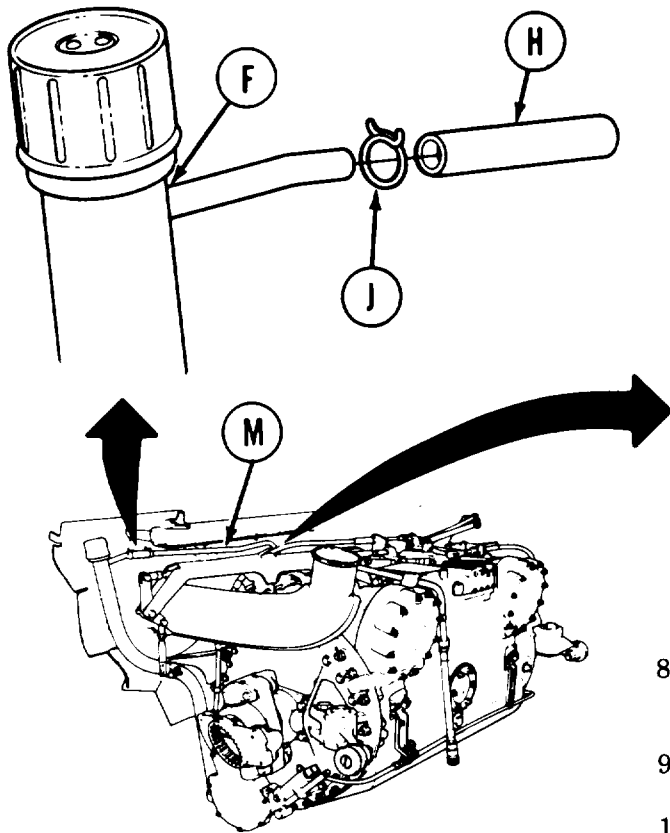


Go on to Sheet 7

TA139332

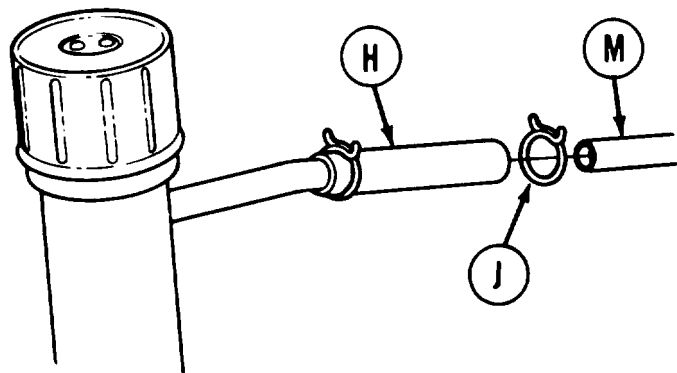
TRANSMISSION SIDE OIL STRAINER ASSEMBLY REPAIR AND REPLACEMENT (Sheet 7 of 8)

7. Using hose clamp pliers, install rubber tubing (H) with clamp (J) onto oil filler tube (F).



8. Using adjustable wrench, install nipple adapter (K) into transmission.
9. Slide nut (L) onto new vent tube (M).
10. Using tube bender, bend new vent tube (M) of same length as old tube into same shape as old tube.
11. Install nut (L) end of vent tube (M) onto nipple adapter (K). Using wrench, tighten nut (L).

12. Using hose clamp pliers, secure vent tube (M) into rubber tubing (H) with clamp (J).



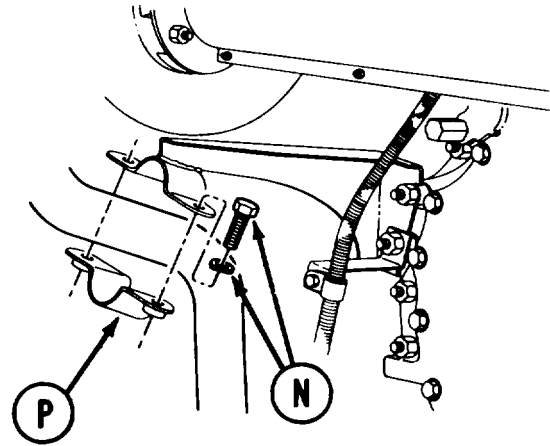
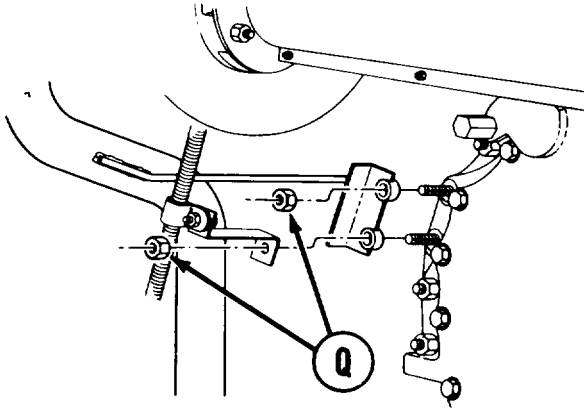
Go on to Sheet 8

TA139333

TRANSMISSION SIDE OIL STRAINER ASSEMBLY REPAIR AND REPLACEMENT (Sheet 8 of 8)

13. Position oil filler tube bracket (P). Secure bracket with two lockwashers and screws (N) or two nuts (Q) on later transmission models.

14. Using 9/16 inch socket, tighten screws (N).



15. On later models, use 3/4 inch socket to tighten two nuts (Q).

16. Fill transmission with oil (LO 9-2350222-12).

17. Install 2A powerplant (page 5-14) or 2D powerplant (page 5-37).

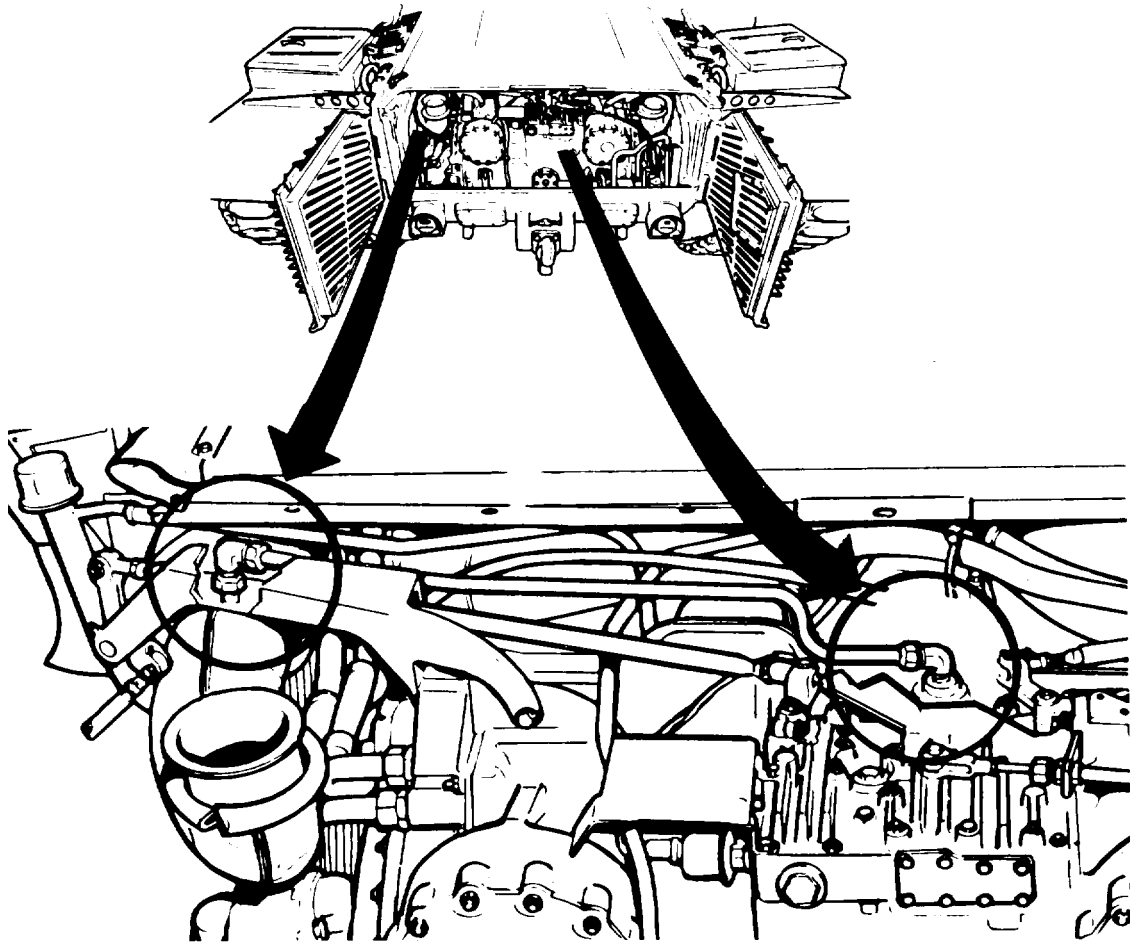
End of Task

TA139334

TRANSMISSION OIL BREATHER TUBE REPLACEMENT (Sheet 1 of 3)

TOOLS: 3/4 in. combination box and open end wrench
7/8 in. combination box and open end wrench

PRELIMINARY PROCEDURE: Remove transmission shroud (page 9-20)

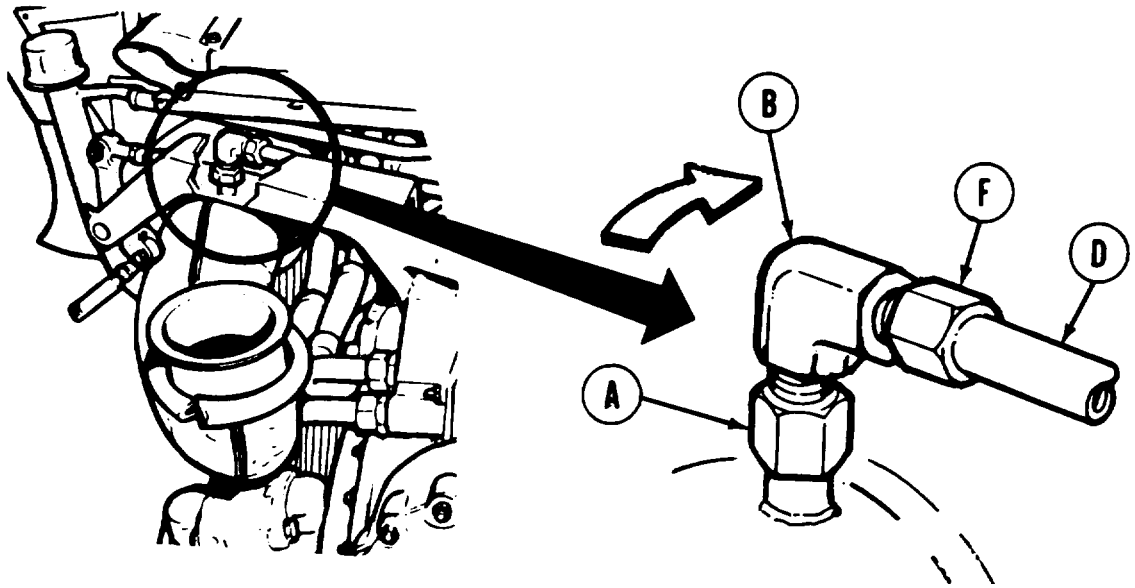


Go on to Sheet 2

TA139335

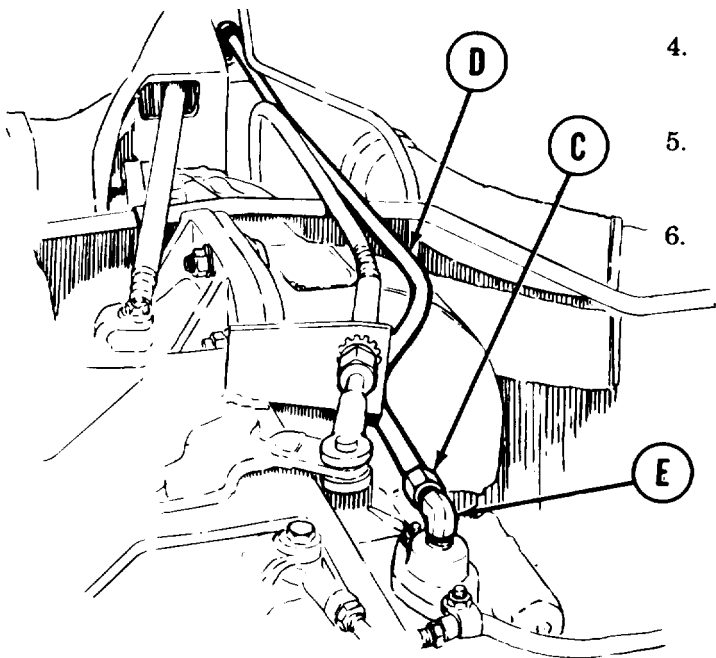
TRANSMISSION OIL BREATHER TUBE REPLACEMENT

(Sheet 2 of 3)



REMOVAL:

1. Using 7/8 inch wrench, turn nut (A) clockwise until it falls free.
2. Lift elbow (B) off nut (A).
3. Using 7/8 inch wrench, remove coupling nut (C) and transmission oil breather tube (D) from elbow (E).



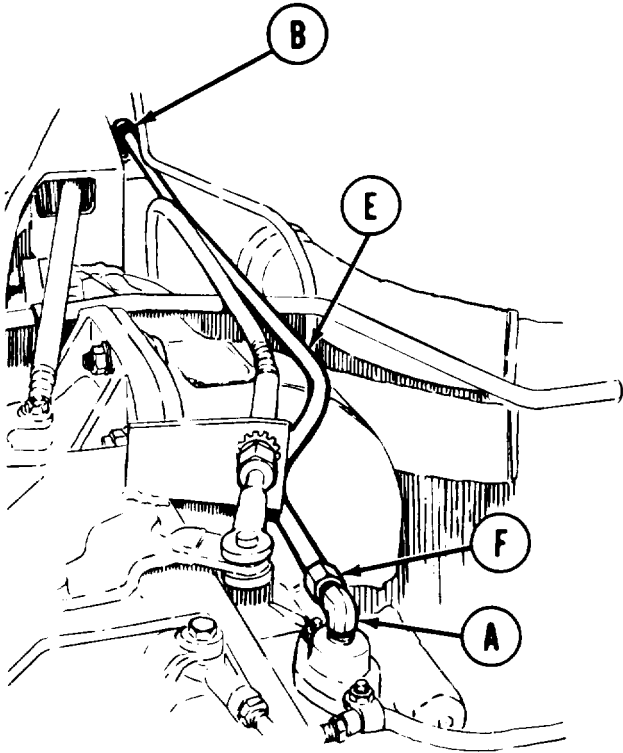
4. Remove transmission oil breather tube (D) from vehicle.
5. Using 7/8 inch wrench on nut (F) and 3/4 inch wrench on elbow (B), remove elbow (B).
6. Using 3/4 inch wrench, remove elbow (E) from transmission.

Go on to Sheet 3

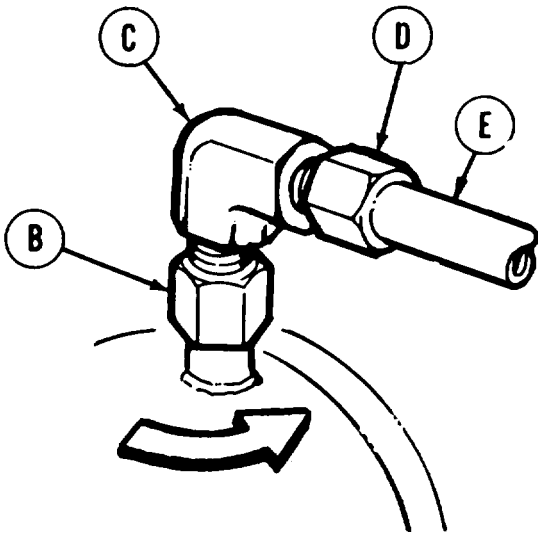
TA139336

TRANSMISSION OIL BREATHER TUBE REPLACEMENT (Sheet 3 of 3)

INSTALLATION:



1. Manually start elbow (A) into transmission.
2. Using 3/4 inch wrench, install elbow (A). Make sure hole in elbow (A) is pointing toward nut (B).
3. Manually install elbow (C) into nut (D).
4. Using 7/8 inch wrench on nut (D) and 3/4 inch wrench on elbow (C), tighten nut (D).
5. Position tube (E) between elbow (A) and nut (B). If necessary, use 3/4 inch wrench to aline elbow (A) with nut (F).
6. Manually start nut (F) onto elbow (A) and tighten with 7/8 inch wrench.
7. Manually start nut (B) onto elbow (C).
8. Using 7/8 inch wrench, install coupling nut (B) onto elbow (C).
9. Start engine. Check for exhaust leaks at transmission oil breather tube (E) connections.
10. Install transmission shroud (page 9-23).



End of Task

TA139337

CHAPTER 12

FINAL DRIVE AND UNIVERSAL JOINTS MAINTENANCE INDEX

PROCEDURE	PAGE
Final Drive (Left and Right) Replacement	12-2
Final Drive Stud Replacement	12-6
Final Drive Air Pressure Relief Valve (Left and Right) Replacement	12-8
Final Drive Adapter Assembly and Oil Seal Replacement	12-9
Universal Joint Replacement	12-11
Universal Joint Repair	12-18
Final Drive Venting System Replacement	12-20

FINAL DRIVE (LEFT AND RIGHT) REPLACEMENT (Sheet 1 of 6)

PROCEDURE INDEX

PROCEDURE	PAGE
Removal	12-3
Installation	12-4

- TOOLS:
- 6 in. adjustable wrench
 - 8 in. extension with 3/4 in. drive
 - Universal joint with 3/4 in. drive
 - Hoist (capable of 1100 lbs minimum capacity)
 - Pinch bar
 - Socket wrench handle 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)
 - Torque wrench with 3/8 in. drive (0-200 lb-in) (0-23 N.m)
 - 36 in. extension bar (cheater bar)
 - Knife, putty
 - 9/16 in. combination box and open end wrench
 - 9/16 in. crowfoot wrench with 3/8 in. drive

- SUPPLIES:
- Sealing compound (Item 27, Appendix D)
 - Oil (Item 43, Appendix D)
 - 1-1/2 in. locknuts (34 required)
 - Small brush (Item 10, Appendix D)
 - Dry cleaning solvent (Item 54, Appendix D)
 - Rags (Item 65, Appendix D)

PERSONNEL: TWO

- REFERENCES:
- TM 9-2350-222-10
 - LO 9-2350-222-12

- PRELIMINARY PROCEDURES:
- Remove powerplant guides (page 6-4)
 - Remove adapter assembly (page 12-9)
 - Remove track drive sprocket (page 14-73)
 - Drain oil from final drive (LO 9-2350-222-12)

Go on to Sheet 2

FINAL DRIVE (LEFT AND RIGHT) REPLACEMENT (Sheet 2 of 6)

REMOVAL:

NOTE

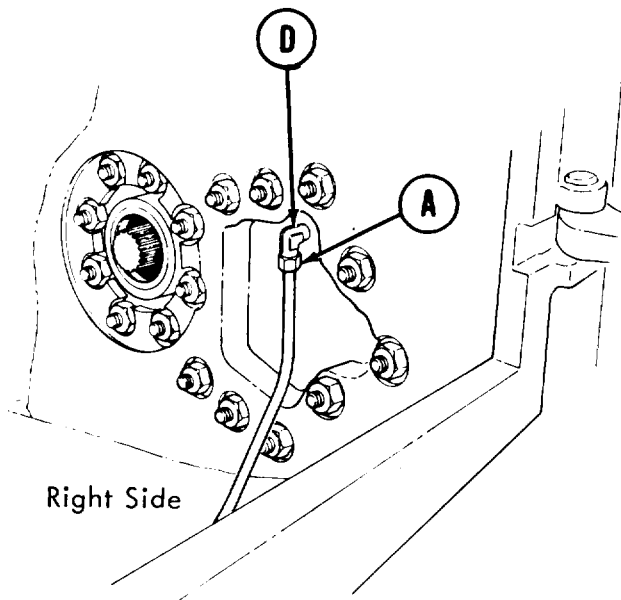
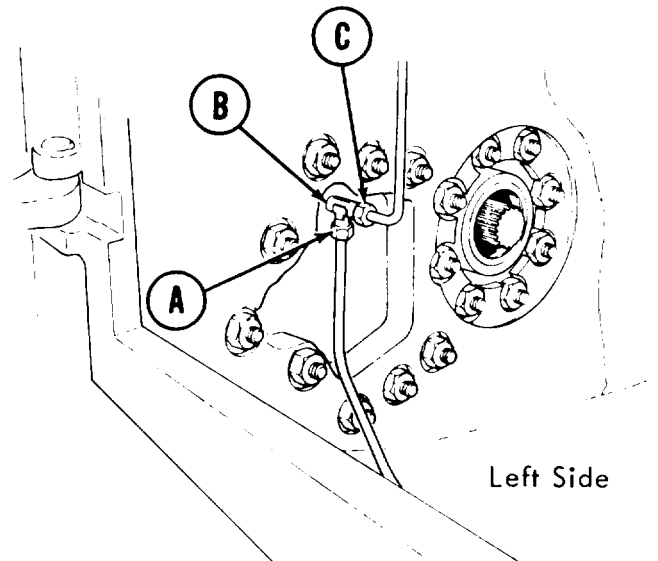
If your final drive is equipped with a final drive venting system, start with step 1.

If your final drive is equipped with an air pressure relief valve, start with step 1.5.

If replacing left final drive, perform steps 1 thru 1.2 and continue with step 1.5.

If replacing right final drive, perform steps 1.3 and 1.4 and continue with step 1.5.

1. Using 9/16 inch wrench, disconnect tubing (A) from tee (B).
- 1.1 Using 9/16 inch wrench, disconnect tube assembly (C) and tee (B),
- 1.2 Using adjustable wrench, remove tee (B) from left final drive.



- 1.3 Using 9/16 inch wrench, disconnect tubing (A) from elbow (D).
- 1.4 Using adjustable wrench, remove elbow (D) from right final drive.

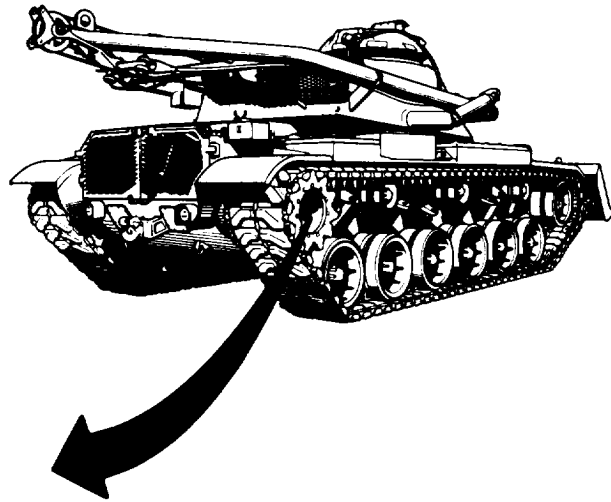
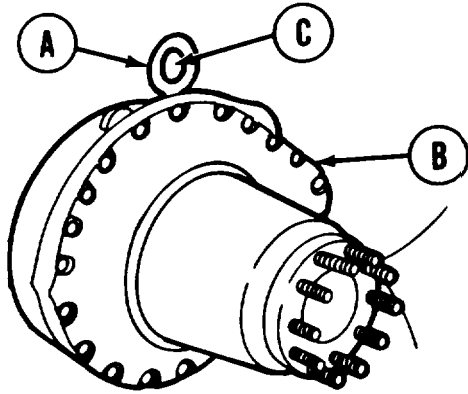
Go on to Sheet 3

TA253394

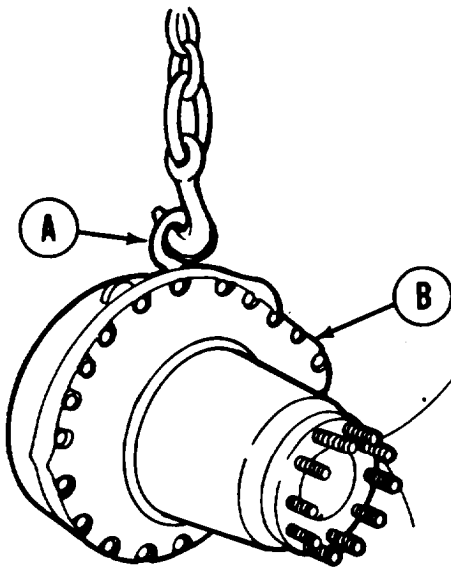
Change 1 12-3

FINAL DRIVE (LEFT AND RIGHT) REPLACEMENT (Sheet 3 of 6)

- 1.5 Check if lifting eye (A) is installed in final drive (B).
2. If lifting eye (A) is installed in final drive (B), check it for distortion or cracks.



3. If lifting eye (A) is distorted or cracked, using pinch bar through eyehole (C), turn and remove lifting eye (A) from final drive (B).
4. Start threads of new lifting eye (A) into final drive (B).



5. Using pinch bar, turn and tighten lifting eye (A).
6. If lifting eye (A) is not installed in final drive (B), using socket wrench handle, remove plug from lifting eyehole in final drive (B).
7. Install new lifting eye (A) as in steps 4 and 5 above.

CAUTION

Use hoist with 1100 pounds minimum capacity.

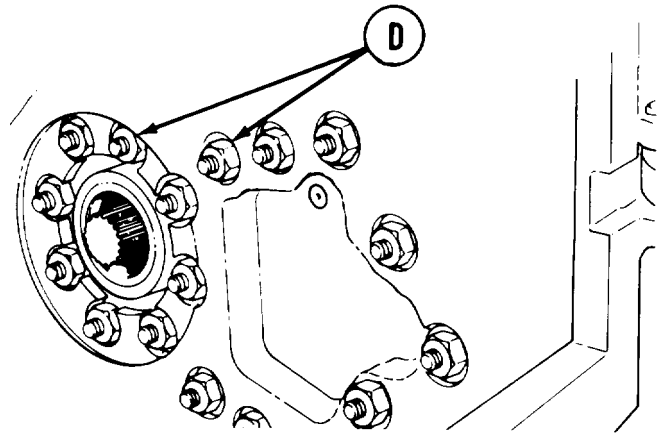
8. Connect hoist to lifting eye (A) on final drive (B).

Go on to Sheet 4

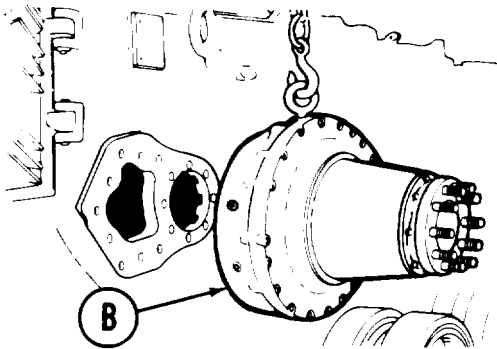
TA253395

FINAL DRIVE (LEFT AND RIGHT) REPLACEMENT (Sheet 4 of 6)

9. Using hand impact wrench set, remove 17 self-locking nuts (D) holding final drive (B) to hull. Throw self-locking nuts (D) away.



WARNING
Do not place hands under final drive (B) or between final drive (B) and hull (C). Injury to personnel may occur if final drive (B) inadvertently shifts.



10. Keeping hoist chain tight, slowly pull final drive (B) from hull.

NOTE

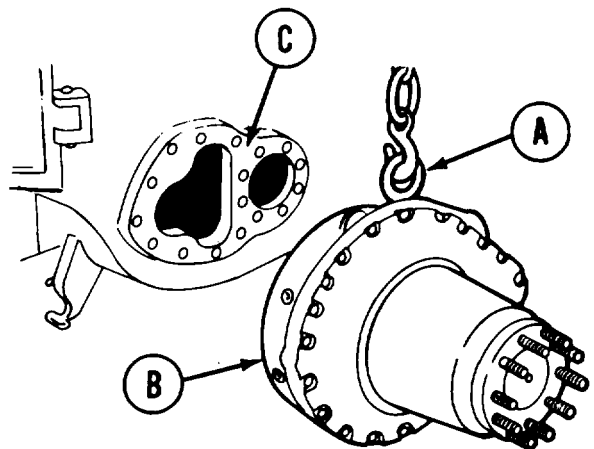
If final drive cannot be pulled free from hull, do step 10.1.

- 10.1. Using pinch bar, pry final drive (B) away from hull and slowly pull final drive (B) from hull

INSTALLATION:

1. If lifting eye (A) is not installed in final drive (B), use socket handle wrench and remove plug from eyehole in final drive (B).
2. Using hoist, attach hook to lifting eye (A) on final drive (B). Using pinch bar, through lifting eye, tighten lifting eye (A).
3. Using hoist, attach hook to lifting eye (A) on final drive (B). Take slack out of hoist chain.
4. Using brush and sealing compound, coat final drive mating surface on hull (C).
5. Using hoist, lift final drive (B) and position it so that studs are in alignment with mating surface on hull (C).
11. Using hoist, slowly lower final drive (B) to a solid surface.

WARNING
Do not place hands under final drive (B) or between final drive (B) and hull (C). Injury to personnel may occur if final drive (B) inadvertently shifts.



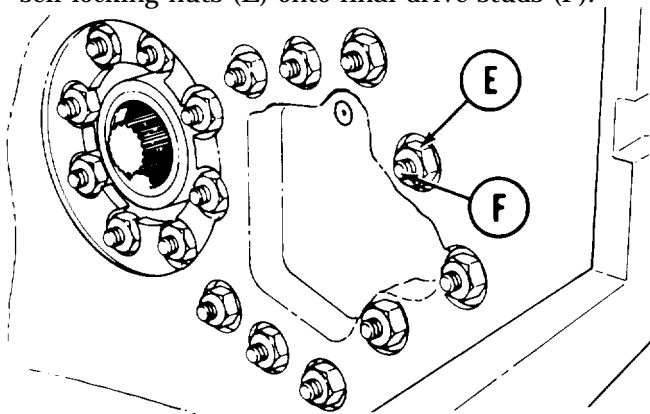
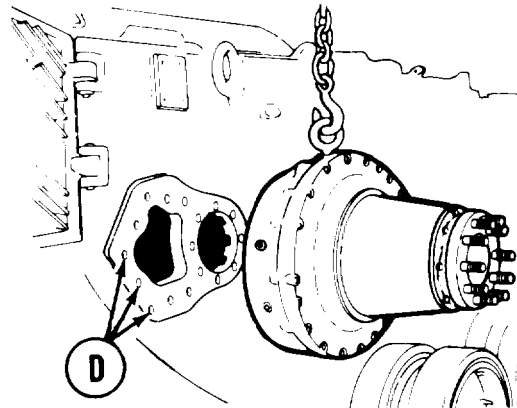
Go on to Sheet 5

FINAL DRIVE (LEFT AND RIGHT) REPLACEMENT (Sheet 5 of 6)

CAUTION

Do not damage threads on mounting studs when installing studs through mounting holes.

6. Carefully guide mounting studs through mounting holes (D) in side of hull.
7. Using lubricating oil (Item 44, Appendix D), oil 17 new self-locking nuts (E).
8. Using fingers, start threads of 17 new self-locking nuts (E) onto final drive studs (F).



Using socket or offset link, install 17 new self-locking nuts (E).

NOTE

Use hand impact wrench offset link with torque wrench where torque wrench cannot be used due to lack of space.

Using torque wrench, tighten 17 new self-locking nuts (E) to 460-500 lb-ft (625-680 N m).

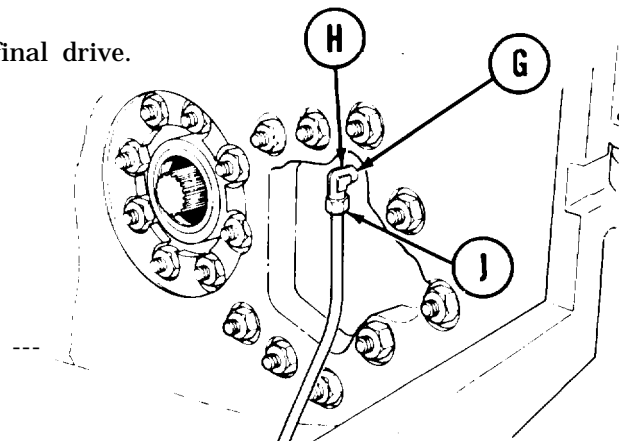
11. Remove hoist hook from final drive lifting eye.

NOTE

If your final drive is to be equipped with final drive venting system, perform steps 12 through 26 skipping step 21.

If your final drive is to be equipped with an air pressure relief valve, skip steps 12 through 20.

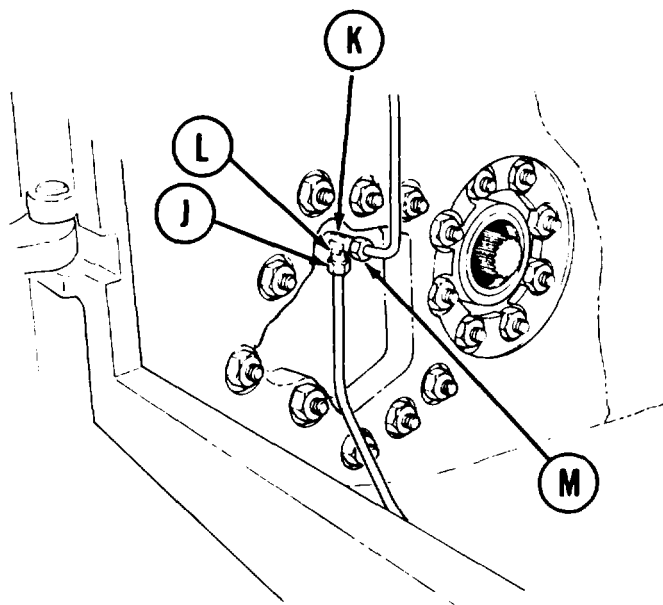
12. Using 3/16 inch allen wrench, remove plug (G) from final drive.
13. Using adjustable wrench, install elbow (H) onto right final drive where plug (G) was.
14. Using fingers, connect tubing (J) to elbow (H).
15. using torque wrench and crowfoot wrench, tighten tubing (J) nut 75-85 lb-in (8.4-9.5 N.m).



RIGHT SIDE

Go on to Sheet 6

FINAL DRIVE (LEFT AND RIGHT) REPLACEMENT (Sheet 6 of 6)



Left Side

16. Using 3/16 inch allen wrench, remove plug (K) from left final drive.
17. Using adjustable wrench, install tee (L) into left final drive where plug (K) was.

18. Using fingers connect tube assembly (M) and tubing (J) to tee (L).
19. Using torque wrench and 9/16 inch crowfoot (Item 37, Chapter 3, Section 1), tighten tubing(J) 75-85 lb-in (8.4-9.5 N m).
20. Using torque wrench and 9/16 inch crowfoot, tighten tube assembly (M) 75-85 lb-in (8.4-9.5 N m).
21. Install final drive air pressure valve (page 12-8).
22. Install track drive sprocket (page 14-79).
23. Install adapter assembly (page 12-10).
24. Install powerplant guides (page 6-5).
25. Fill final drive with oil (LO 9-2350-222-12).
26. Drive vehicle to perform operational check (TM 9-2350-22210).

End of Task

TA253398

Change 1 12-5

FINAL DRIVE STUD REPLACEMENT (Sheet 1 of 2)

TOOLS: 1-1/2 in. open end wrench (2 required)
Pipe wrench (2 in. opening)
Ruler
Hammer

SUPPLIES: primer (Item 48, Appendix D)
Sealing compound (Item 26, Appendix D)
Small brushes (Item 10, Appendix D) (2 required)
Penetrating oil (Item 42, Appendix D)

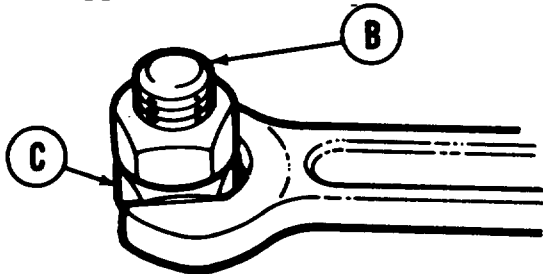
PRELIMINARY PROCEDURE: Remove final drive (page 12-2)

REMOVAL:

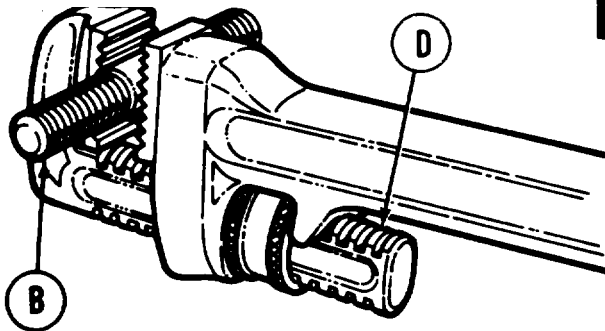
NOTE

If stud is bent or cracked, go to step 1. If stud has damaged threads or is broken off below threads, go to step 2.

If stud is broken off flush with final drive housing notify support maintenance.

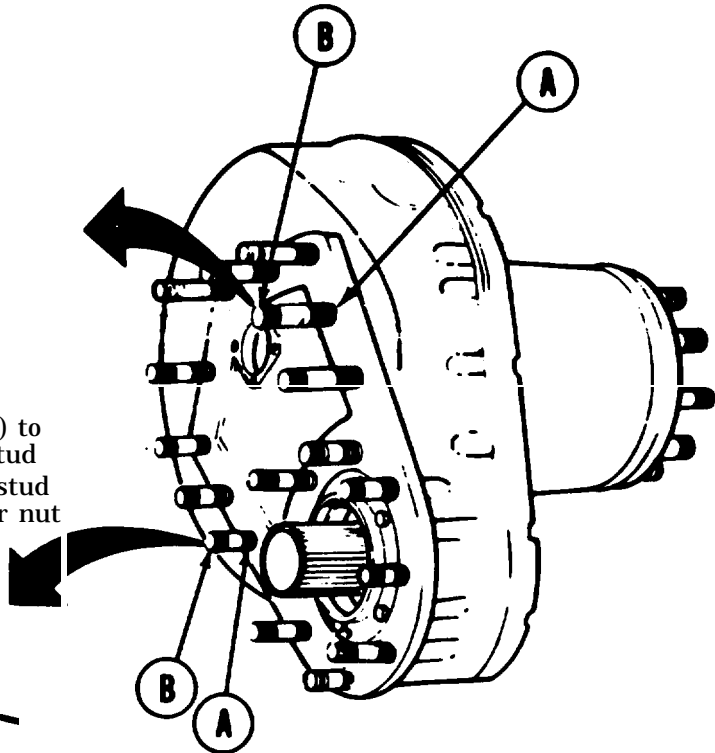


1. Apply penetrating oil (Item 42, Appendix D) to base of stud (A). Thread two hex nuts on stud (B) and jam the nuts. Sharply tap head of stud (R) several times with hammer. Turn lower nut (C) to remove stud.



NOTE

Studs come in three different lengths. Make sure you order right size.



2. Apply penetrating oil to base of stud (A). Sharply tap head of stud (B) with hammer. Using pipe wrench (D), remove broken stud.

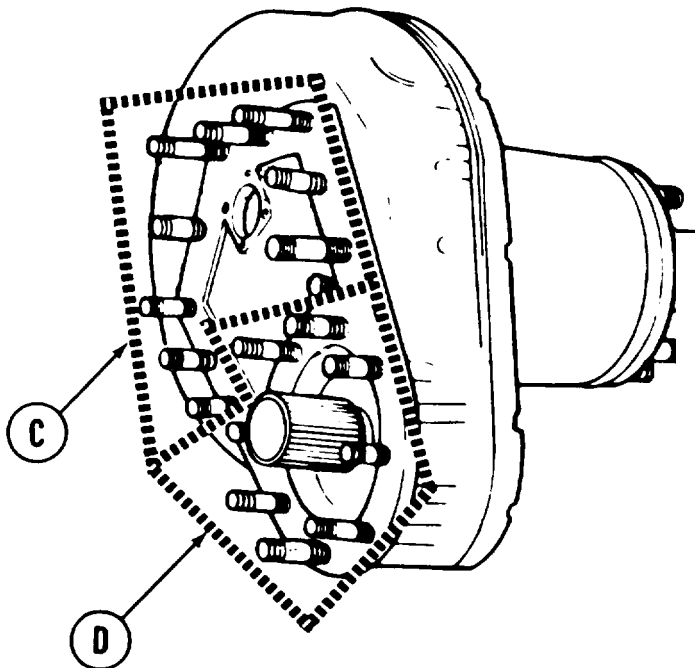
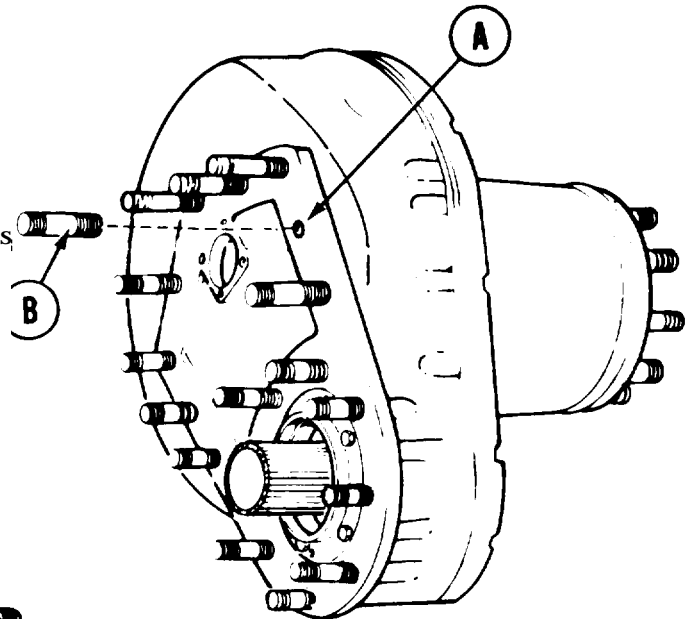
Go on to Sheet 2

TA140299

FINAL DRIVE STUD REPLACEMENT (Sheet 2 of 2)

INSTALLATION:

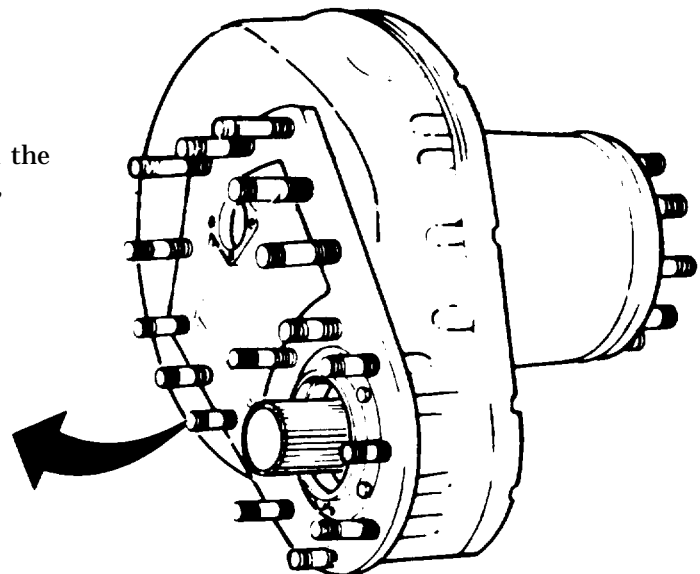
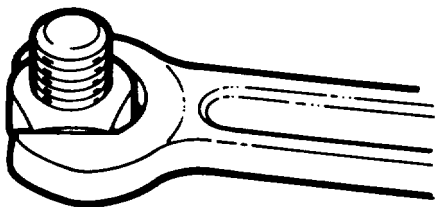
1. Using clean brush (Item 10, Appendix D), lightly coat tapped stud holes (A) with primer (Item 48, Appendix D).
2. Using clean brush, lightly coat threads of studs (B) with sealing compound (Item 26, Appendix D).



NOTE

Any stud installed in area (C) must protrude 2-1 5/16 inches out of tapped stud hole. Any stud installed in area (D) must protrude 2-1/4 inches out of tapped stud hole.

3. Thread two hex nuts on new stud and jam the nuts. Using 1-1/2 inch wrench on top nut, install new stud.
4. Install final drive (page 12-4),



End of Task

TA140300

FINAL DRIVE AIR PRESSURE RELIEF VALVE (LEFT AND RIGHT) REPLACEMENT (Sheet 1 of 1)

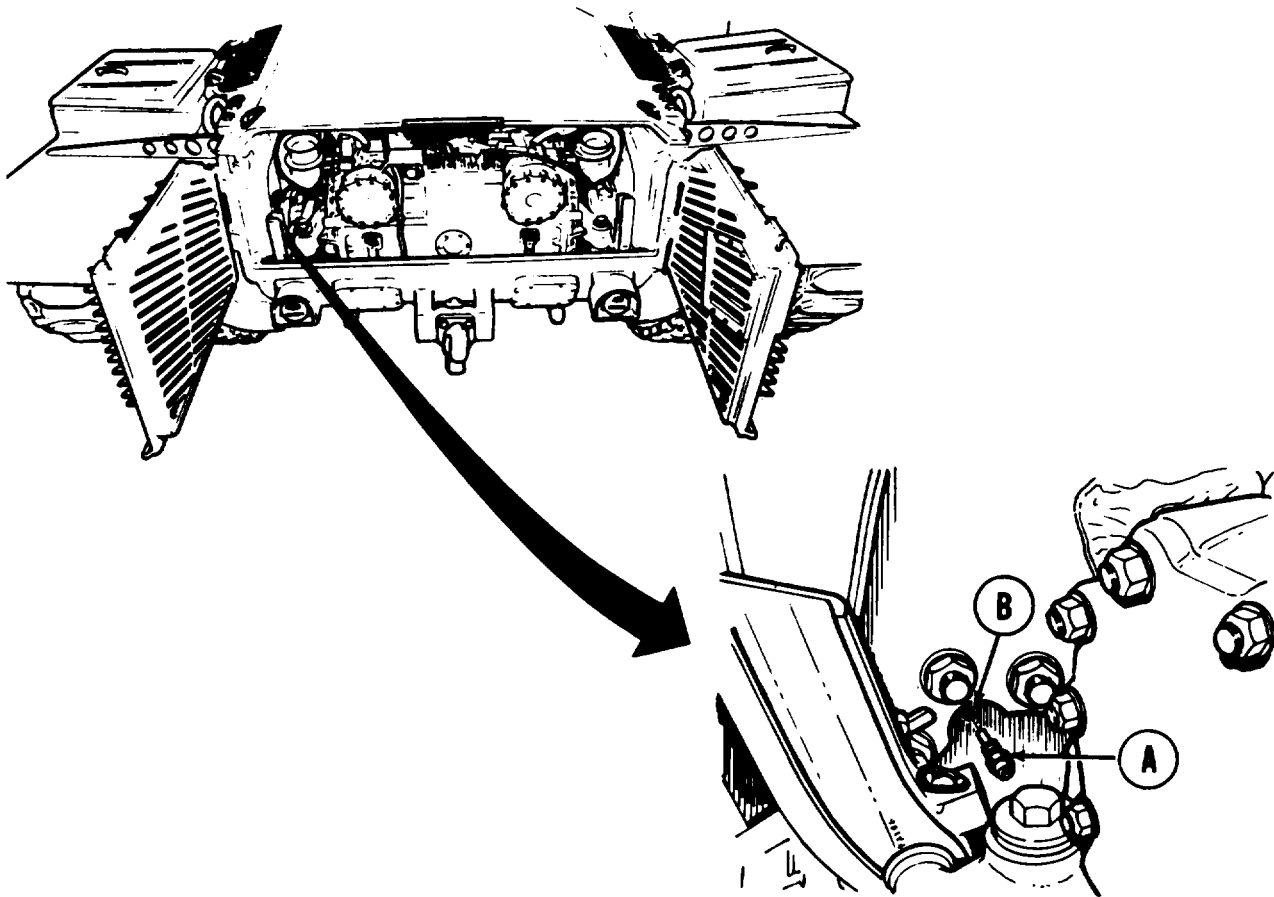
TOOLS: 7/16 in. combination box and open end wrench

SUPPLIES: Rags (Item 65, Appendix D)

PRELIMINARY PROCEDURE: Remove transmission shroud (page 9-20)

REMOVAL

1. Using wrench, remove air pressure valve (A) from installation hole (B) in drive housing.



2. Inspect air pressure valve to insure that vent cap is free to move on the valve. Replace as required.

INSTALLATION:

1. Using wrench, install air pressure valve (A) into installation hole (B).
2. Install transmission shroud (page 9-23).

End of Task

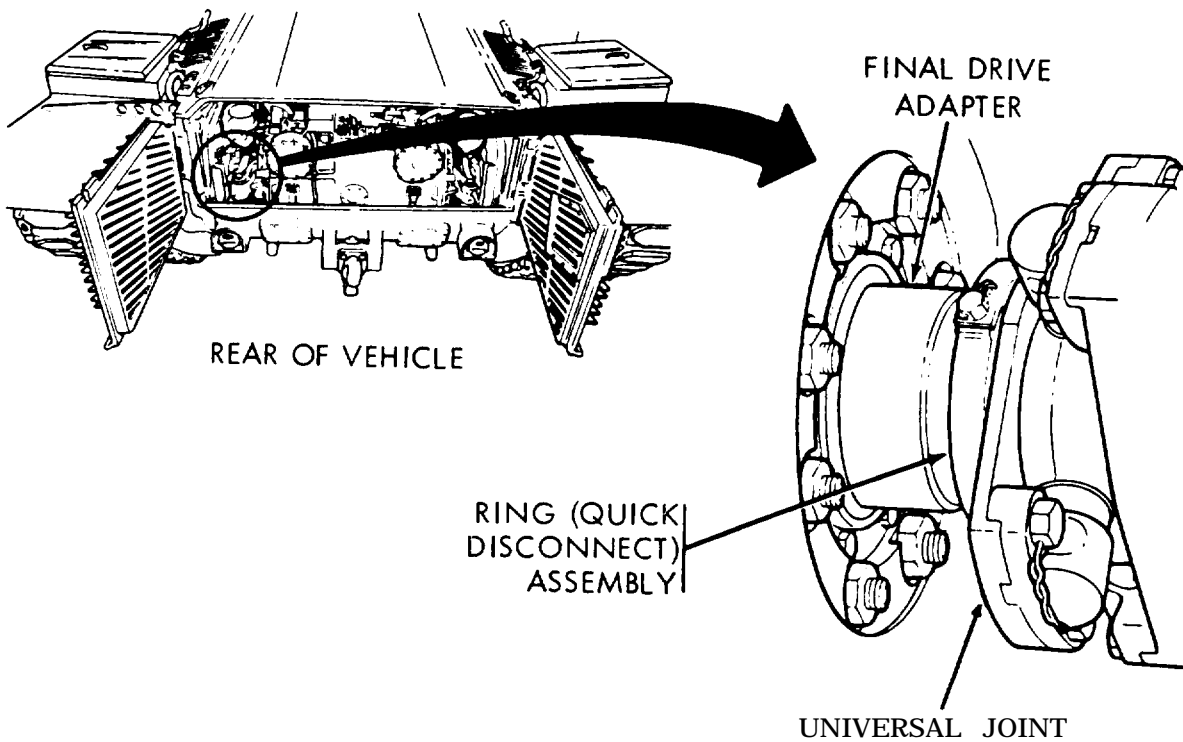
TA140301

RING (QUICK-DISCONNECT) ASSEMBLY REPLACEMENT (Sheet 1 of 3)

TOOLS: Wire cutter
 Ratchet with 1/2 in. drive
 3/4 in. socket with 1/2 in. drive
 5 in. extension with 1/2 in. drive

SUPPLIES: Lockwire (Item 59, Appendix D)

PRELIMINARY PROCEDURE: Remove transmission shroud (page 9-20)



Go on to Sheet 2

RING (QUICK-DISCONNECT) ASSEMBLY REPLACEMENT (Sheet 2 of 3)

NOTE

Do the following procedure for both sides of powerplant.

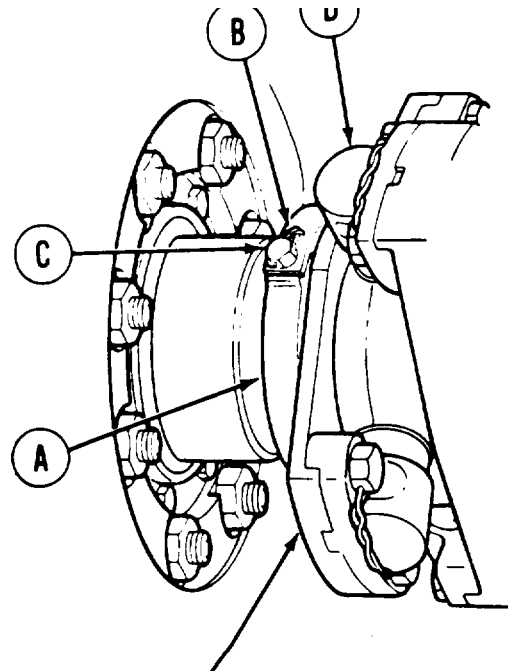
REMOVAL:

1. Rotate ring (quick-disconnect) assembly (A) to a workable position.
2. Using wire cutter, cut lockwire (B).

NOTE

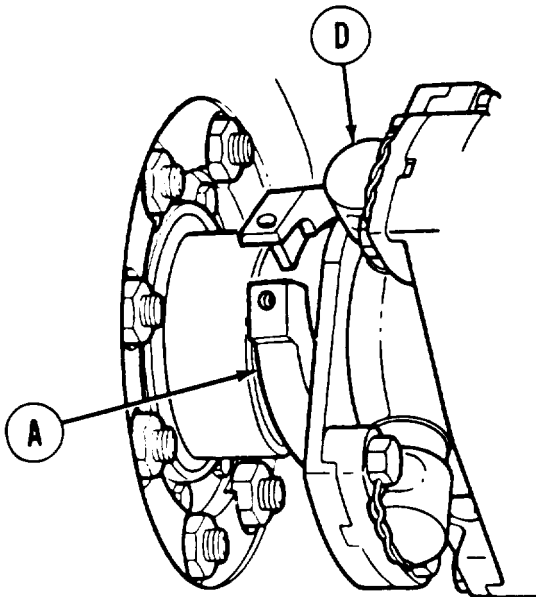
When removing screw (C), hold onto quick-disconnect ring (A) or it will snap open and fall down into engine compartment.

3. Using socket and extension, remove screw (C).



UNIVERSAL-JOINT

4. Remove ring (quick-disconnect) assembly (A) from universal joint (D).

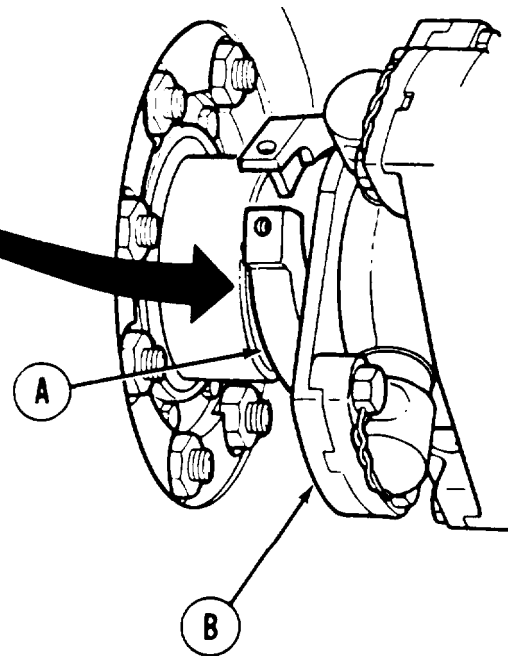
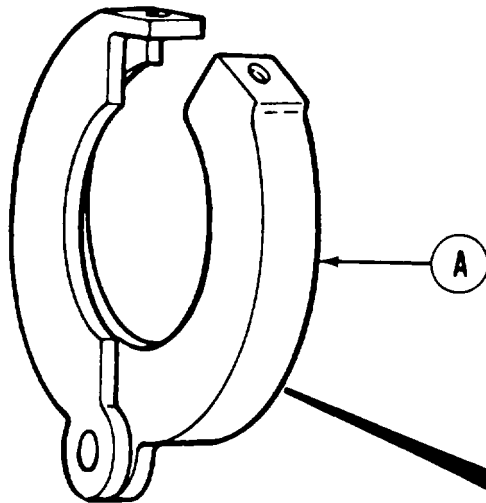


Go on to Sheet 3

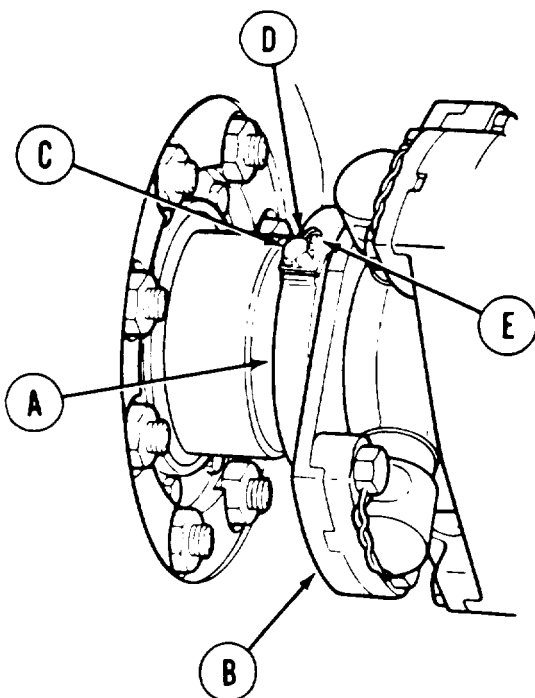
RING (QUICK-DISCONNECT) ASSEMBLY REPLACEMENT (Sheet 3 of 3)

INSTALLATION:

1. Install ring (quick-disconnect) assembly (A) around universal joint (B).
2. Install screw (C) to ring (quick-disconnect) assembly (A).



3. Using socket and extension, tighten screw (C).



4. String new lockwire (D) through screw (C) and opening in ring (E).
5. Install transmission shroud (page 9-6).

End of Task

FINAL DRIVE QUICK-DISCONNECT COUPLING REPAIR (Sheet 1 of 3)

PROCEDURE INDEX

Cleaning and Initial Inspection	12-6.4
Inspection and Repair of Coupling Stop	12-6.5
Inspection and Repair of Pivot Pin	12-6.6
Installation	12-8.6

TOOLS: Feeler gauge
 8 in. brazing rod
 10 in. flat file
 Hammer, 3 lb cross peen

 Center punch
 1/2 in. drive ratchet
 3/4 in. socket, 1/2 in. drive
 1/2 in. drive torque wrench, 0–1 75 lb-ft

SUPPLIES:

 Dry cleaning solvent (Item 54, Appendix D) Cleaning brush (Item 77, Appendix D)
 Wire (Item 59, Appendix D) Flux (Item 78, Appendix D)

PRELIMINARY PROCEDURE: Remove ring (quick-disconnect) assembly (page 12–8.1)

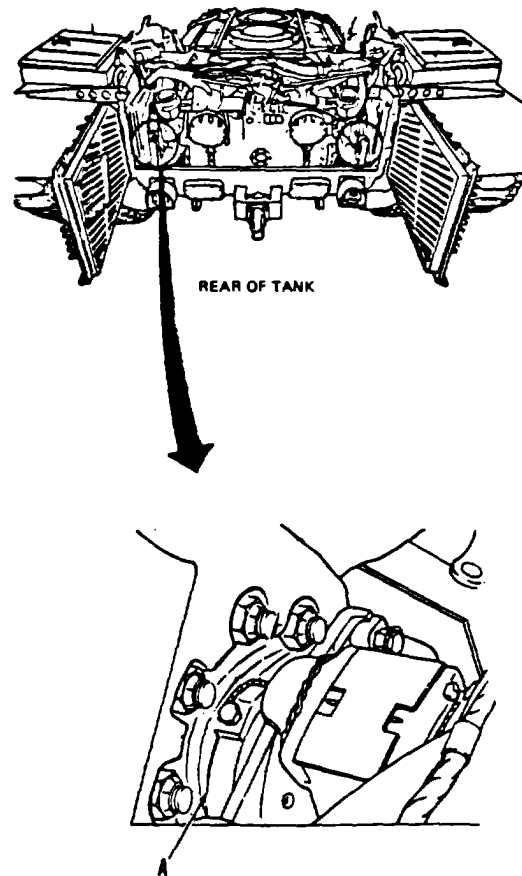
CLEANING AND INITIAL INSPECTION

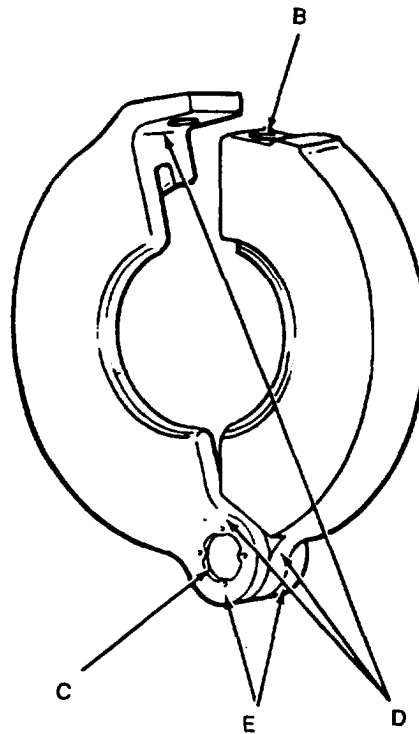
1. Clean ring assembly (A) thoroughly. Make sure tapped hole (B) is free of grease and dirt.

NOTE

Dispose of ring assembly in accordance with AR-755-2 or as directed by local authority.

2. Inspect tapped hole (B) for cross-threaded or stripped threads. If threads are damaged, discard ring assembly (A).
3. Check for looseness of pivot pin (C). If pin is loose, discard ring assembly (A).
4. Visually inspect coupling (D) for cracks. If cracks are evident, discard ring assembly (A).
5. Inspect for bent pivot bosses (E). If bosses are bent, discard ring assembly (A).





INSPECTION AND REPAIR OF COUPLING STOP

NOTE

Ring assembly is made up of lock ring and clasp ring.

1. Install screw (A) in ring assembly (B) and finger tighten.

NOTE

Metal to metal contact is preferred for a serviceable ring.

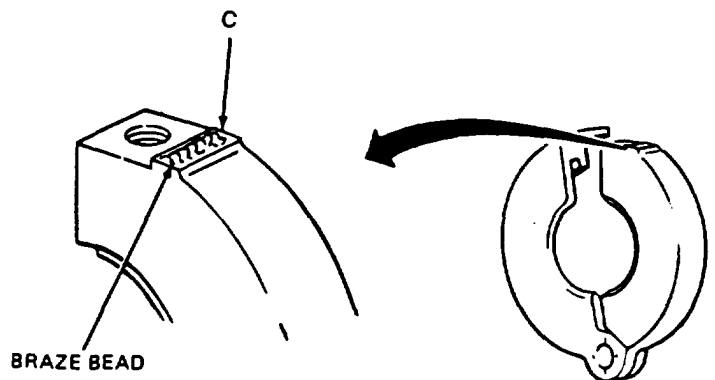
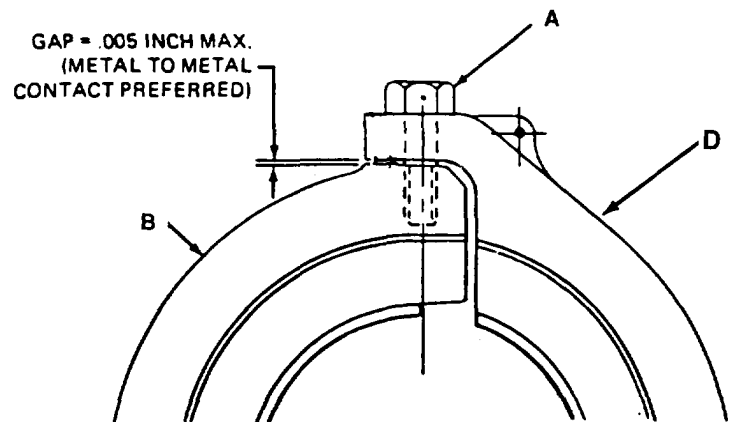
2. Check clearance of stop (C). If clearance is .005 in. or less, ring assembly (B) is serviceable. If clearance is greater than .005 inch, remove screw from (A) from ring assembly (B) and continue to step 3.

3. Braze a bead across top of stop (C) surface.

NOTE

Metal to metal contact should exist across most of the length of the brazed bead.

4. File brazed bead down until metal to metal contact exists between stop (C) and lock ring (D).



INSPECTION AND REPAIR OF PIVOT PIN

NOTE

A modified center punch with a rounded point must be used to properly stake pin in place.

Stake marks should be on the brass and deep and wide enough to move brass over the pin.

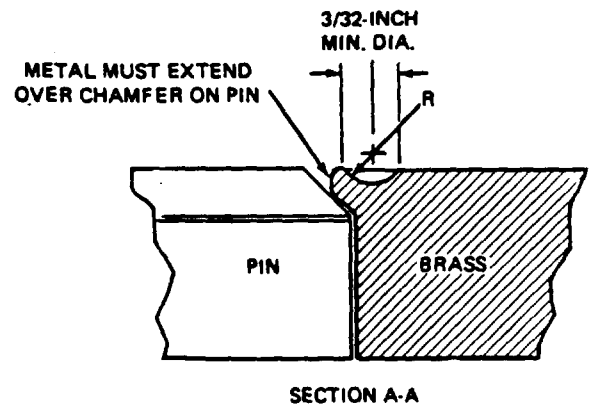
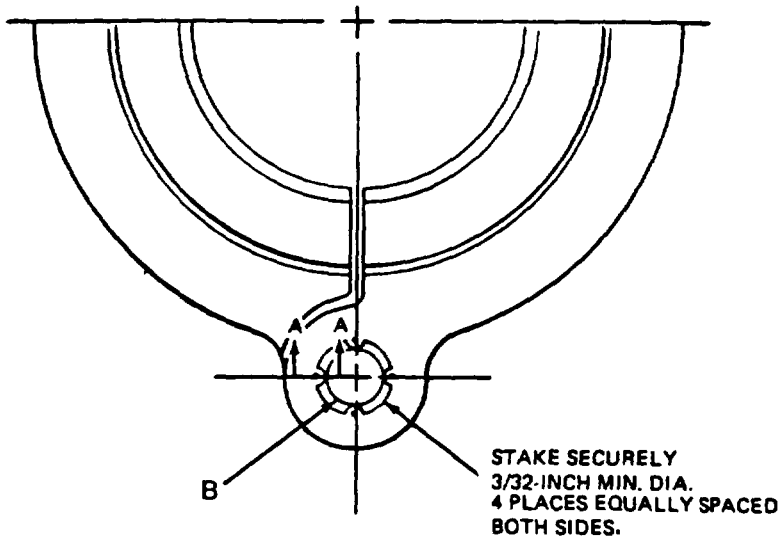
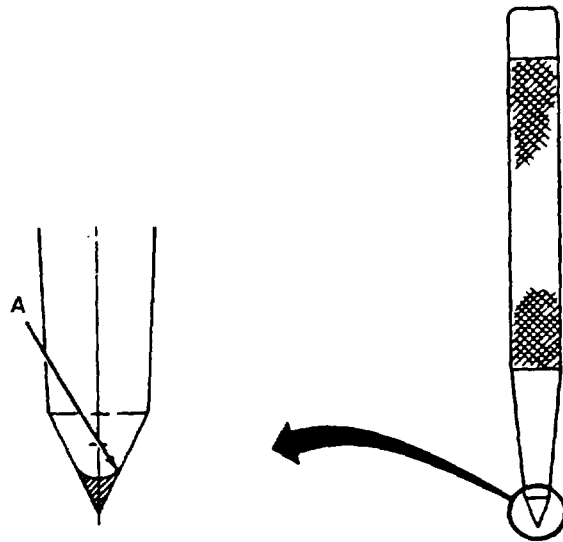
Dispose of ring assembly in accordance with AR 756-2 or as directed by local authority.

1. Grind sharp point of center punch (A) to 1/16 radius.

NOTE

Stake marks must be on brass.

2. Make sure pin(B) is securely staked in place 3/32 inch minimum diameter, four places equally spaced both sides. If staked on pin (B), restake on brass in four places between stake marks on pin (B). If chamfer on brass is so large that metal does not "mushroom" out over pin when staked, discard ring assembly.



INSTALLATION OF COUPLING BOTH SIDES

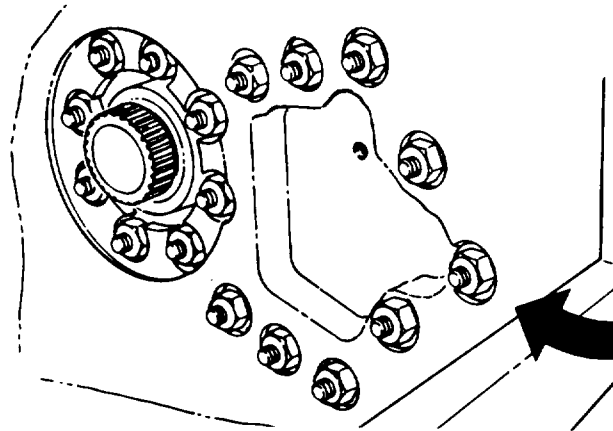
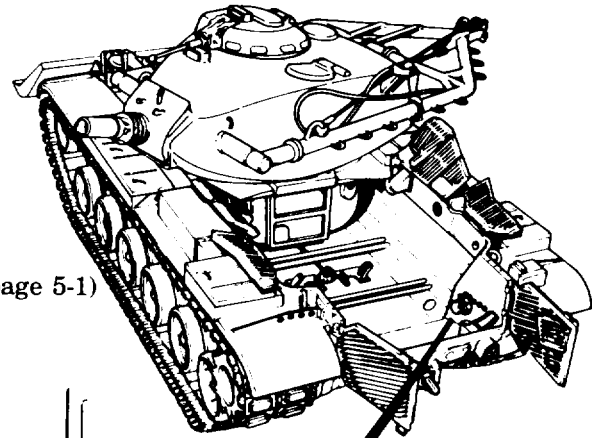
1. Install ring (quick-disconnect) assembly (page 12-8.3).

FINAL DRIVE ADAPTER ASSEMBLY AND OIL SEAL REPLACEMENT (Sheet 1 of 2)

TOOLS: Pinch bar
Hammer

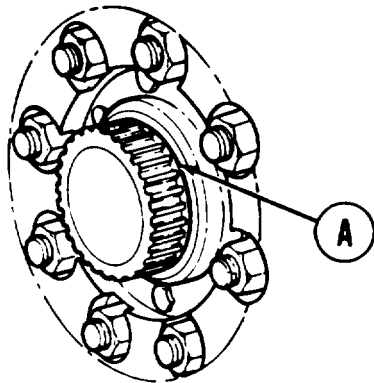
SUPPLIES: Oil (Item 43, Appendix D)
Grease (Item 37, Appendix D)
Block of wood

PRELIMINARY PROCEDURE: Remove powerplant page 5-1)

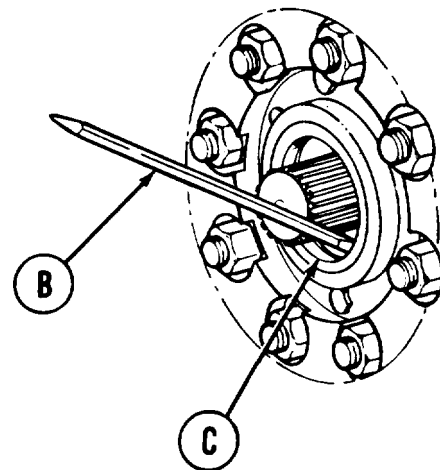


REMOVAL:

1. Remove final drive adapter assembly (A) from final drive assembly input shaft by manually pulling final drive adapter assembly (A) straight out.



2. Using pinch bar (B), remove seal (C) by prying around entire seal (C).



Go on to Sheet 2

TA140302

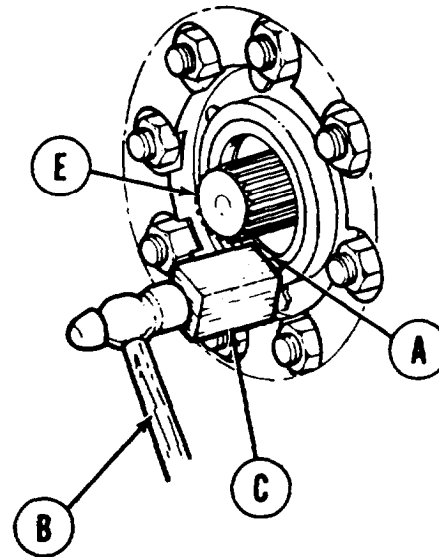
FINAL DRIVE ADAPTER ASSEMBLY AND OIL SEAL REPLACEMENT (Sheet 2 of 2)

INSTALLATION:

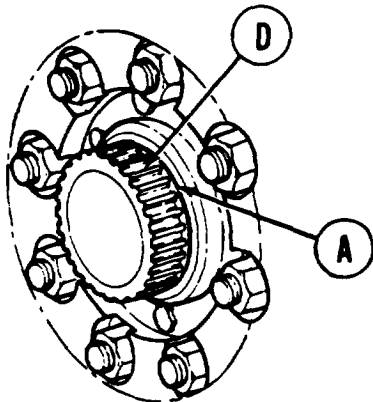
1. Position seal (A) in vehicle.
2. Make sure rubber lip of seal (A) is toward inside of hull.
3. Using hammer (B) and block of wood (C), tap seal (A) into place.

NOTE

Seal is seated when tapped in as far as it will go.



4. Make sure all sand, grit, and accumulated debris has been removed from the final drive adapter assembly (D).



5. Apply grease (Item 37, Appendix D) inside final drive adapter assembly (D) and on final drive assembly spline (E).
6. Using oil (Item 43, Appendix D), lightly coat outside surface of final drive adapter assembly (D).
7. Alining internal splines in final drive adapter assembly (D) with splines on input shaft, slide final drive adapter assembly (D) onto input shaft and into seal (A).
8. Install 2A powerplant (page 5-14) or 2D powerplant (page 5-37).

End of Task

TA140303

UNIVERSAL JOINT REPLACEMENT (Sheet 1 of 7)

PROCEDURE INDEX

PROCEDURE	PAGE
Removal	12-12
Inspection	12-14
Installation	12-14.2

TOOLS: 13/16 in. socket with 1/2 in. drive
 2 in. extension with 1/2 in. drive
 Ratchet with 1/2 in. drive
 Socket wrench handle with 1/2 in. drive
 Torque wrench with 1/2 in. drive
 (0-175 lb-ft capacity) (0-237 N. m)
 Diagonal cutting pliers
 Slip joint pliers
 Alining punch
 Pinch bar
 Crowbar
 Hammer
 Screwdriver
 92 lb. minimum capacity hoist
 92 lb. minimum capacity rope

Thickness gage
 Oxy-acetylene welding equipment
 10 in. flat file
 3/4 in. socket with 1/2 in. drive
 1-1/2 in. open end wrench

SPECIAL TOOLS: Center punch (Figure F-9, Appendix F)

SUPPLIES: Lockwire (Item 59, Appendix D)
 Dry cleaning solvent (Item 54, Appendix D)
 Rags (Item 65, Appendix D)
 Rubber gloves (Item 73, Appendix D)
 Paint brush (Item 10, Appendix D)
 Rope (Item 64, Appendix D)

Paint brush (Item 77, Appendix D)
 Brazing alloy (Item 78, Appendix D)
 Welding flux (Item 79, Appendix D)
 Industrial goggles (Item 74,
 Appendix D)

PERSONNEL: Two

REFERENCES: TM 9-2350-222-10
 LO 9-2350-222-12

PRELIMINARY PROCEDURES: Remove top deck (page 16-21)
 Remove transmission shroud support (page 9-38)
 Remove exhaust pipe (page 8-5 or 8-9)
 Block both tracks front and rear, place transmission selector lever
 in neutral (N), and make sure brake is released so transmission
 output flange can be turned to loosen all four screws
 (TM 9-2350-222-10)
 Pull transmission mounting guide toward rear (page 6-10)

Go on to Sheet 2

UNIVERSAL JOINT REPLACEMENT (Sheet 2 of 7)

REMOVAL:

NOTE

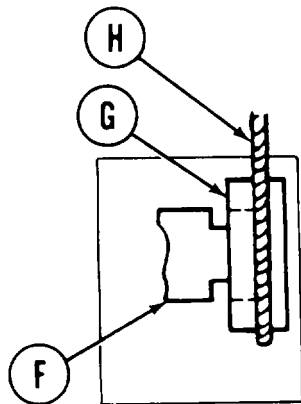
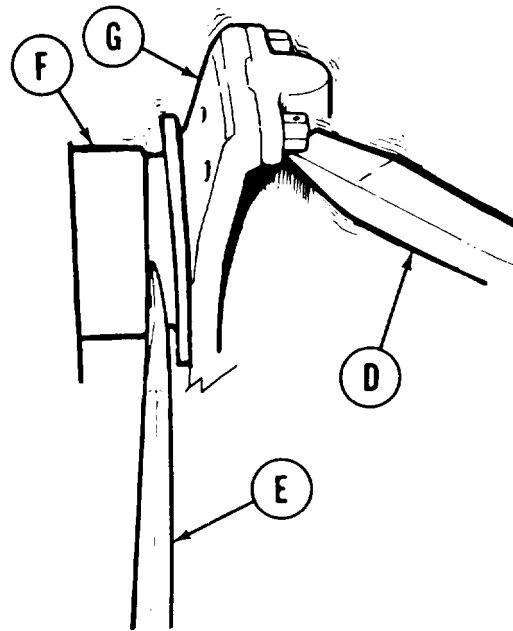
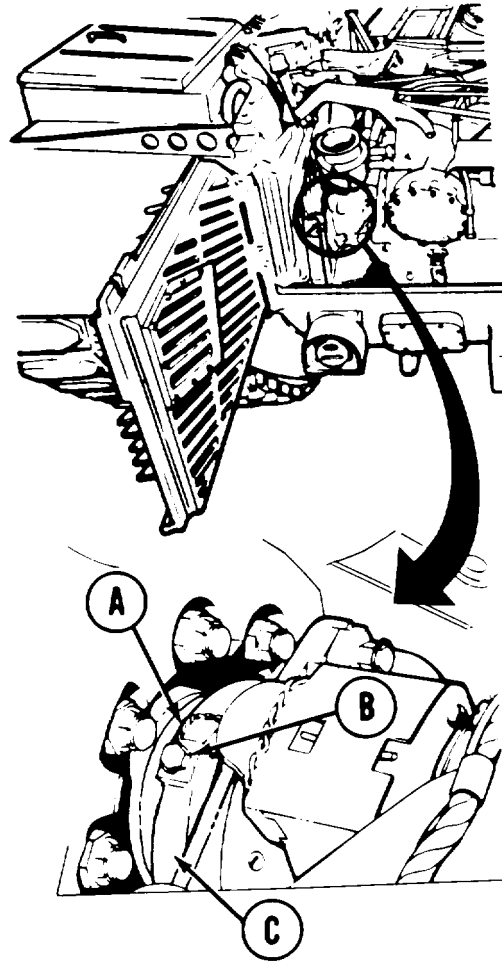
Turn quick-disconnect clamp until it is in working position.

1. Using cutting pliers, cut lockwire (A).
2. Using ratchet, extension, and 3/4 inch socket, remove screw (B).
3. Open quick-disconnect clamp (C).
4. Remove quick-disconnect clamp (C).
5. Deleted
6. Place large crowbar (D) in position to support final drive.
7. While holding down on large crowbar (D), use small pinch bar (E) to pry final drive adapter assembly (F) until it comes loose from final drive flange (G).

CAUTION

Use rope capable of picking up and holding at least 92 pounds.

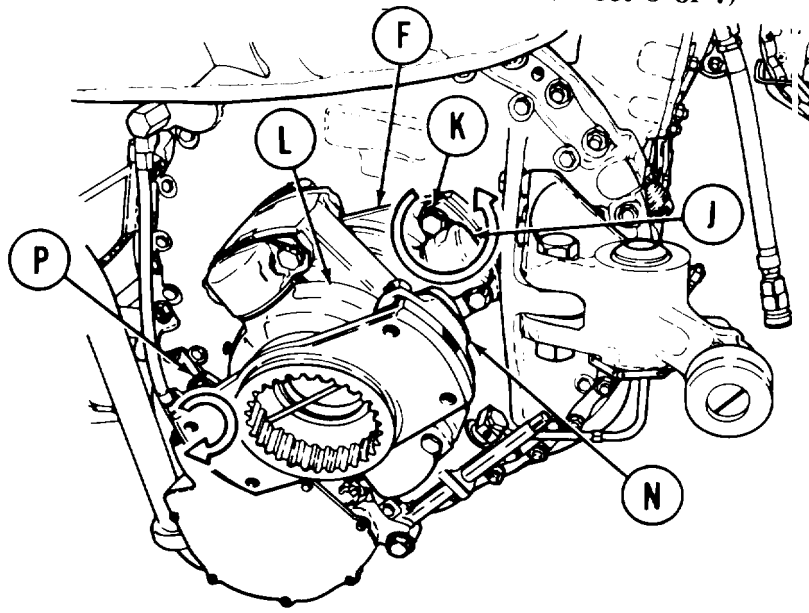
8. Attach rope (H) loosely to universal joint.



Go on to Sheet 3

TA253400

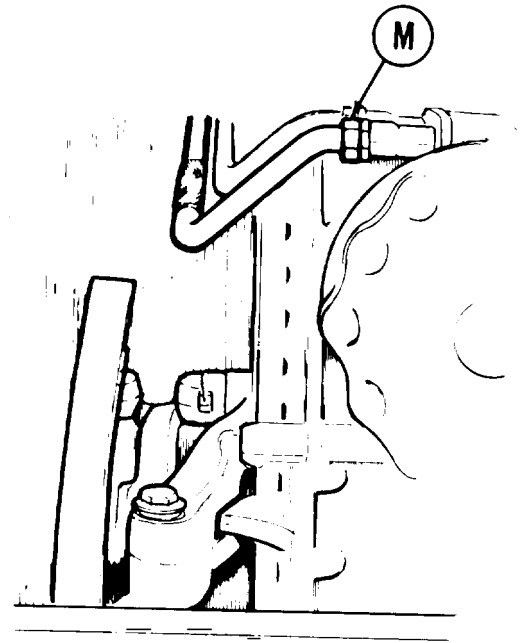
UNIVERSAL JOINT REPLACEMENT (Sheet 3 of 7)



9. Using cutting pliers, cut two lockwires (J),
Remove lockwires.

NOTE

Turn final drive adapter assembly (F) left or right to remove all four screws (K). It may be necessary to use crowbar to wedge universal joint to prevent it from turning while removing screws (K).



10. Using hinged handle, 13/16 inch socket, extension, and ratchet, remove three of four screws (K).
11. Tighten rope to universal joint (L).
12. Using hinged handle, socket, extension, and ratchet, remove fourth screw (K).
13. Using 1-1/2 inch wrench, loosen connector (M). Move oil cooler tube to one side.
14. Using rope and crowbar, lift universal joint from vehicle and place in work area.
15. Remove rope from universal joint.
16. Using cutting pliers, cut lockwire (N). Remove lockwire.
17. Using socket wrench handle and hammer, if required, loosen four screws (P).
18. Using ratchet and 13/16 inch socket, remove four screws (P).

Go on to Sheet 4

TA140305

UNIVERSAL JOINT REPLACEMENT (Sheet 4 of 7)

19. Using hammer, tap final drive flange (Q) loose from universal joint (J).
20. Remove final drive flange (Q) from universal joint (J).

WARNING

Dry cleaning solvent P-D-680 is toxic and flammable. To prevent personal injury, wear protective goggles and gloves and use only in a well-ventilated area. Avoid contact with skin, eyes, and clothes and don't breathe vapors. Do not use near open flame or excessive heat. The flash point for Type #1 Dry Cleaning Solvent is 100° F (38 °C) and for type #2 is 140° F (60 °C). If you become dizzy while using cleaning solvent, get fresh air immediately and get medical aid. If contact with eyes is made, wash your eyes with water and get medical aid immediately.

21. **Wearing rubber gloves (Item 73, Appendix D) and using rags (Item 65, Appendix D) and dry cleaning solvent (Item 54, Appendix D), clean final drive flange (Q).**
22. **Check final drive flange (Q) for cracks and breaks. Replace if necessary.**

INSPECTION:

1. Using brush (Item 77, Appendix D) and solvent (Item 54, Appendix D), clean quick-disconnect clamp (A). Be sure tapped hole (B) is free of grease and dirt.
2. Inspect tapped hole (B) for cross-threaded or stripped threads. If threads are damaged, replace quick-disconnect clamp (A).
3. Check for looseness of pin (C). If pin (C) is loose, proceed to step 4.

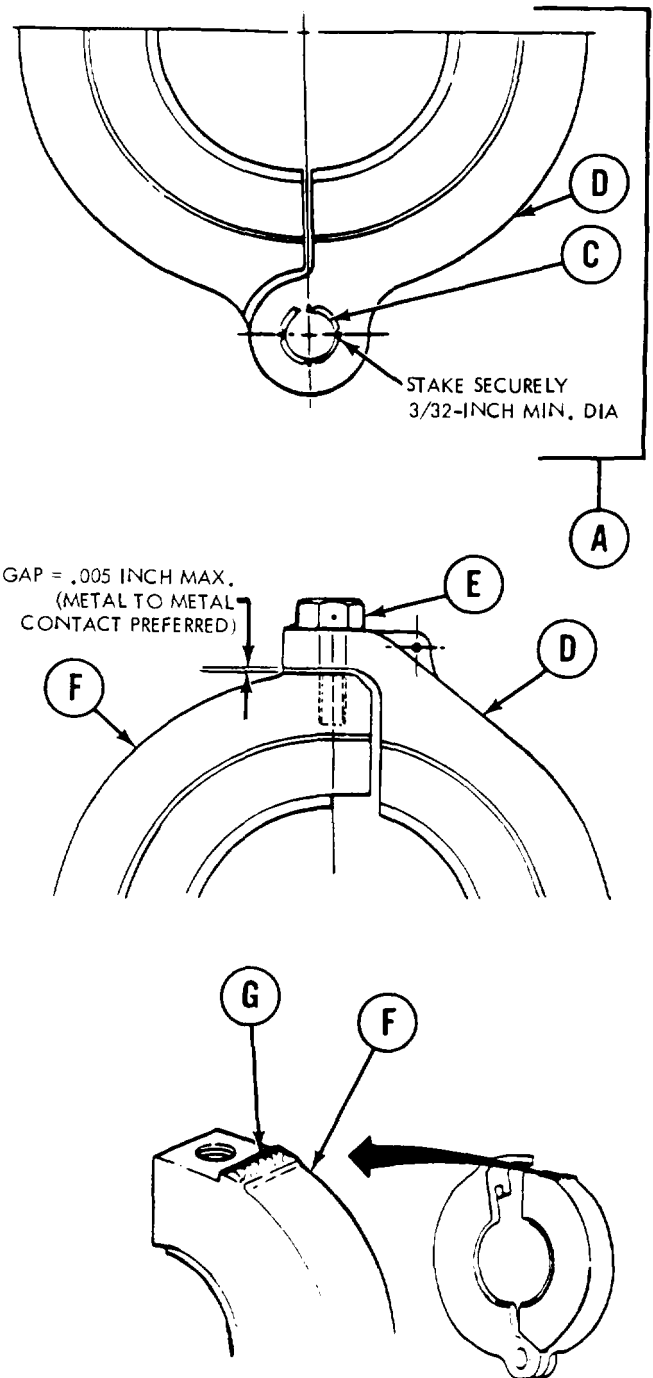
Go on to Sheet 4.1

UNIVERSAL JOINT REPLACEMENT (Sheet 4.1 of 7)

NOTE

Stake marks should be on flange (D) so that mark on flange (D) is overlapping pin (C) on four sides.

- If chamfer on flange (D) is so large that metal does not “mushroom” out over pin when staked, replace quick-disconnect clamp (A).
4. Using center punch, stake pin (C) four places equally spaced on flange (D).
 5. Inspect quick-disconnect clamp (A) for cracks, breaks, or sprung hinge. If damaged, replace quick-disconnect clamp (A).
 6. Close quick-disconnect clamp (A) and install screw (E) finger tight.
 7. Using thickness gage, check clearance between flange (F) and flange (D). Clearance must be 0.000 to 0.005 inch. If more than 0.005 inch, proceed to step 8.
 8. Using oxy-acetylene welding equipment, brazing alloy (Item 78, Appendix D) and welding flux (Item 79, Appendix D), braze a bead (G) across top of flange (F).
 9. Using file, file bead (G) down until metal to metal contact exists between flange (F) and flange (D).



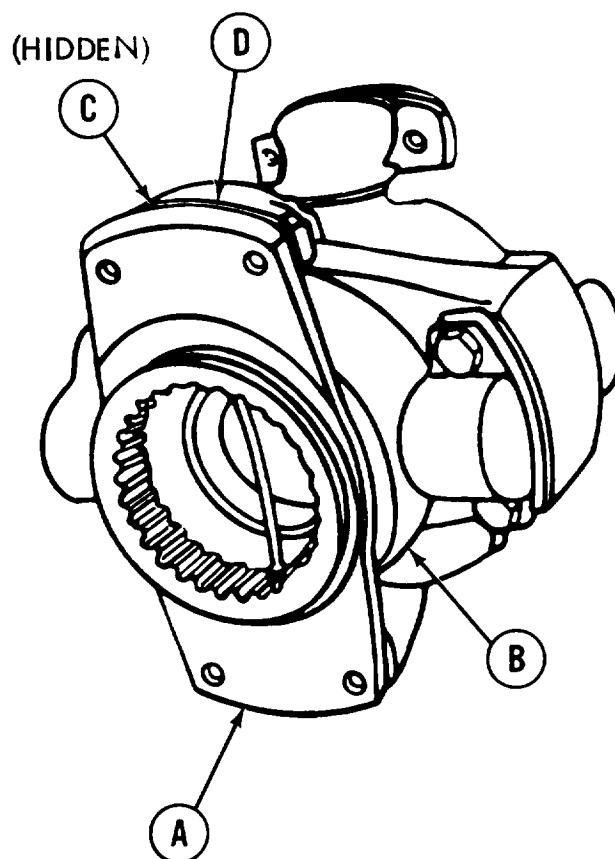
Go on to Sheet 4.2

UNIVERSAL JOINT REPLACEMENT (Sheet 4.2 of 7)

INSTALLATION:

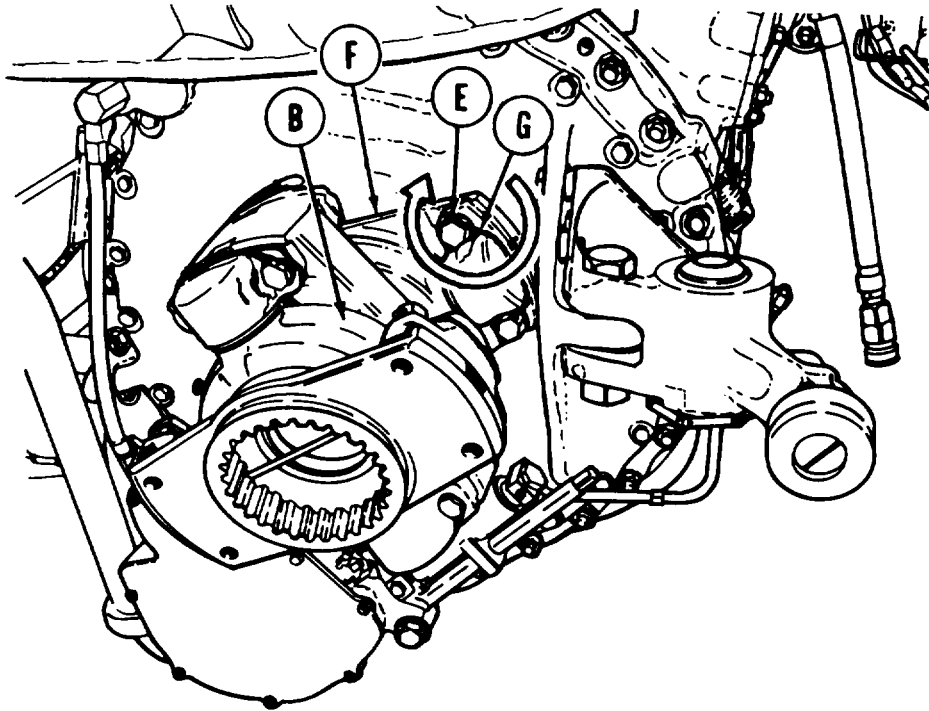
Position final drive flange (A) to universal joint (B).

2. Using 13/16 inch socket, install four screws (C).
3. Using torque wrench, tighten four screws (C) to 110-130 lb-ft (146-173 N. m).
4. Using slip joint pliers, install lockwires (D) to each two adjacent screws (C) (page C-39).



Go on to Sheet 5

UNIVERSAL JOINT REPLACEMENT (Sheet 5 of 7)

**CAUTION**

Use rope capable of picking up and holding at least 92 pounds.

5. Using rope and crowbar, position universal joint (B) into general position in vehicle.
6. Insert alining punch through one screw hole (E) and into corresponding final drive adapter assembly screw hole to aline universal joint.

NOTE

Turn final drive adapter assembly (F) left or right to install four straws (E) and two new lockwires (G) (Item 59, Appendix D).

- i. Aline three remaining screw holes (E) with final drive adapter assembly (F).
8. Start threads of three screws (E) by hand.
9. Remove alining punch from fourth screw hole.
10. Start threads of fourth screw (E) by hand.

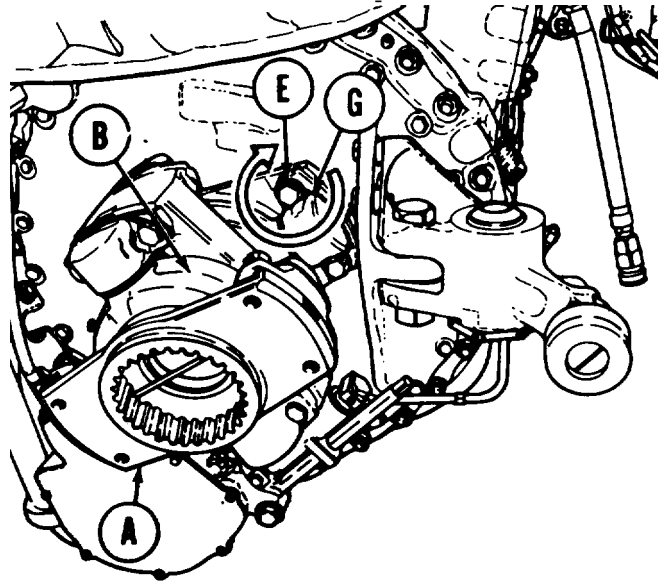
Go on to Sheet 6

TA140307

UNIVERSAL JOINT REPLACEMENT (Sheet 6 of 7)

NOTE

It may be necessary to use crowbar to wedge universal joint to prevent it from turning while tightening screws (E).

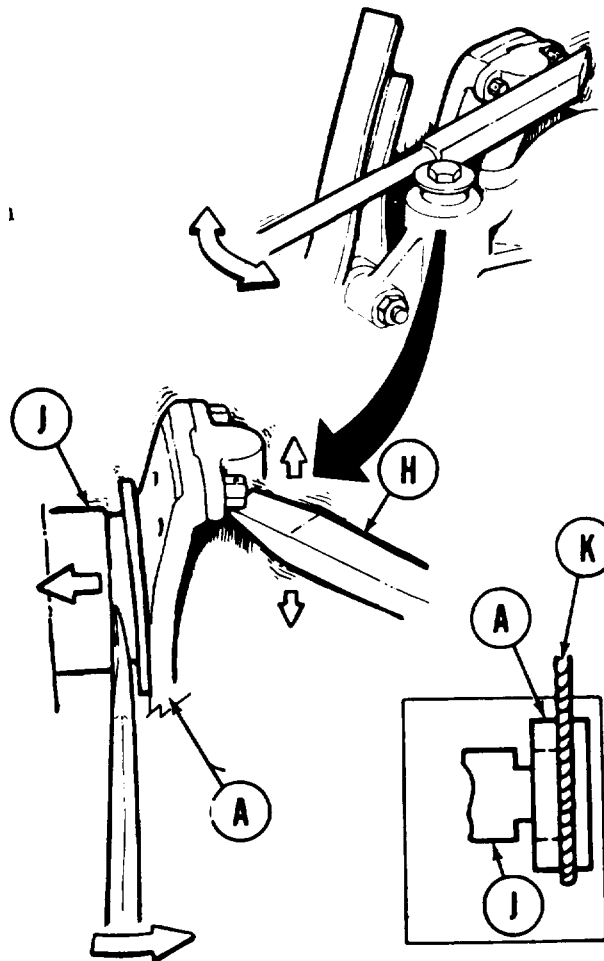


11. Using 13/16 inch socket, tighten four screw (E).
12. Using 13/16 inch socket and torque wrench, tighten four screws (E) to 110-130 lb-ft (146-173 N.m).
13. Using slip joint pliers, install new lockwire (G) (Item 59, Appendix D) to each two adjacent screws (E).

NOTE

Two persons are needed to perform steps 14 and 15. After splines are lined up (in step 14), person using crowbar (H) will have to move handle of crowbar (H) repeatedly, left and right, striking flange (A) to engage final drive flange (A) with final drive adapter (J).

14. Position universal joint (B) so final drive flange (A) splines match up with final drive adapter assembly (J) splines. Manually turn universal joint (B) left or right to match up splines.
15. Using rope (K) and crowbar (H), slide final drive adapter assembly (J) away from final drive to engage final drive flange (A).

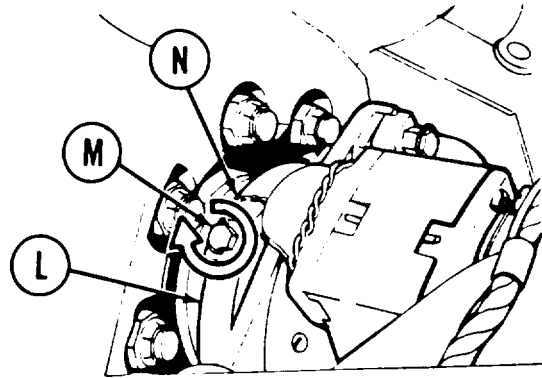


Go on to Sheet 7

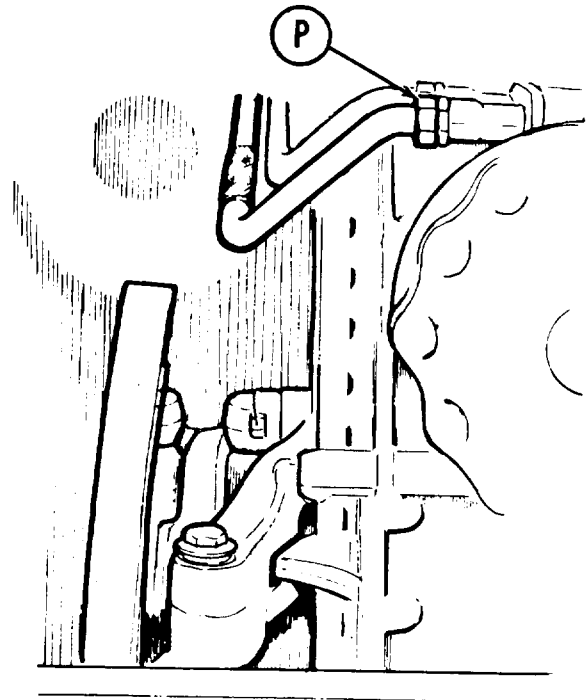
TA140308

UNIVERSAL JOINT REPLACEMENT (Sheet 7 of 7)

16. Remove rope from universal joint.
17. Fit quick-disconnect ring (L) over grooves in final drive flange and final drive adapter assembly.
18. Hold quick-disconnect ring (L) over grooves in final drive flange and final drive adapter assembly.
19. Close quick-disconnect ring (L).
20. Using ratchet and 3/4 inch socket, install one screw (M). Torque screw to 5-10 lb-ft (15 N.m).
21. Using slip joint pliers, install new lockwire (N) (Item 59, Appendix D) to screw (M) and quick-disconnect ring (L).



22. Using 1-1/2 inch wrench, install tube (P) to transmission.
23. Install exhaust pipes (page 8-7 or 8-11).
24. Lubricate (LO 9-2350-222-12).
25. Install transmission shroud support (page 9-38).
26. Push transmission mounting guide towards transmission and lock into place (page 6-11).
27. Install top deck (page 16-23).
28. Remove track blocks.



End of Task

UNIVERSAL JOINT REPAIR (Sheet 1 of 2)

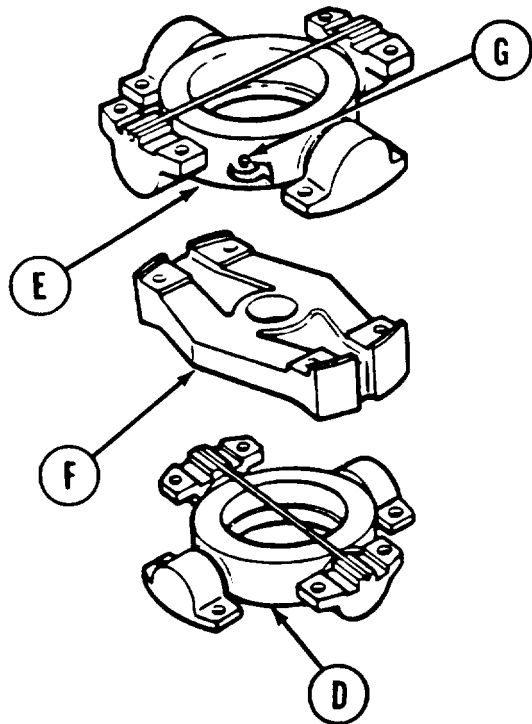
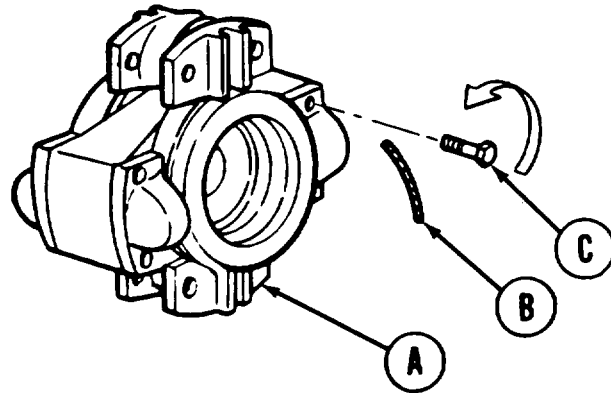
TOOLS: Torque wrench with 1/2 in. drive (0-175 lb-ft) (0-237 N.m)
13/16 in. socket with 1/2 in. drive
18 in. hinge handle with 1/2 in. drive
3/8 in. combination box and open end wrench
Diagonal cutting pliers
Slip joint pliers
Hammer
26 in. pinch bar

SUPPLIES: Lockwire (Item 59, Appendix D)
Oil (Item 43, Appendix D)

PRELIMINARY PROCEDURE: Remove universal joint (page 12-11)

DISASSEMBLY:

1. Place universal joint on end (A).
2. Using cutting pliers, cut four lockwires (B). Remove lockwires.
3. Using socket and hinge handle, loosen eight screws (C). Using hammer, gently tap hinge handle to loosen screws, if necessary.



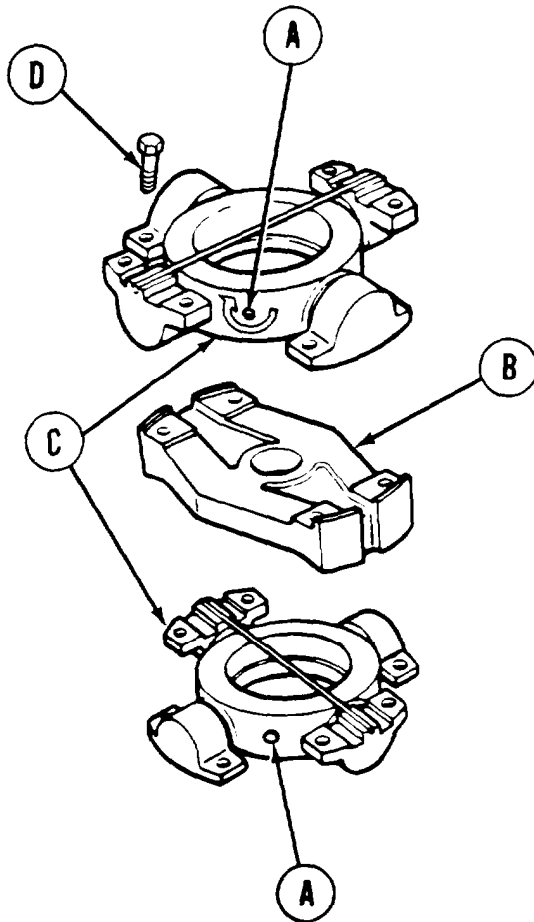
4. Place universal joint on side (D).
6. Using socket and hinge handle, remove four screws (C).
6. Using pinch bar, pry loose spider assembly (E) from coupling plate (F).
7. Lift spider assembly (E) from coupling plate (F).
8. Using wrench, remove two lubrication fittings (G) if damaged or broken.

Go on to Sheet 2

TA140310

UNIVERSAL JOINT REPAIR (Sheet 2 of 2)

9. Turn universal joint over. Repeat steps 5 thru 8 to remove second spider assembly from coupling plate.
10. Replace coupling plate and each spider in its entirety if any component within an assembly is cracked or broken.

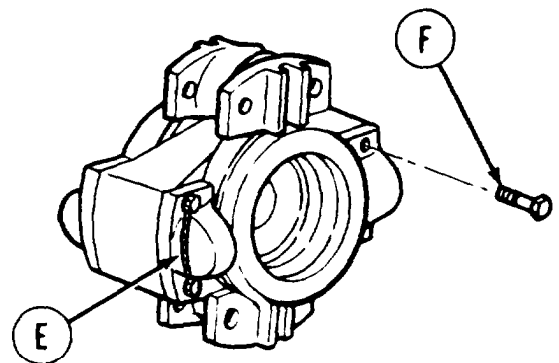


ASSEMBLY:

1. Using wrench, replace lubrication fittings (A), if removed.
2. Place coupling plate (B) and either spider assembly (C) on side.
3. Place spider assembly (C) into position on coupling plate (B).
4. Using hammer, gently tap spider assembly (C) and coupling plate (B) into snug fit.
5. Using hinge handle, install four screws (D).
6. Using socket and torque wrench, tighten screws (D) to 115-130 lb-ft (155-175 N-m).
7. Turn universal joint over. Repeat steps 1 through 6.
8. Place universal joint on end.
9. Using slip joint pliers, attach new lockwire (E) (Item 59, Appendix D) to each two adjacent screws (F).

10. Using lubricating oil (Item 43, Appendix D), oil universal joint assembly.

11. Install universal joint (page 12-14).



End of Task

TA253404

Change 1 12-19

FINAL DRIVE VENTING SYSTEM REPLACEMENT (Sheet 1 of 10)

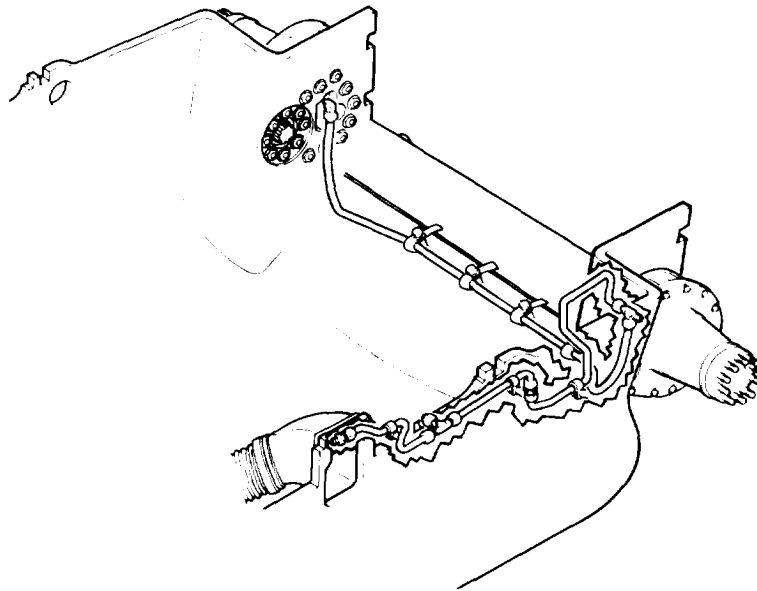
PROCEDURE INDEX

PROCEDURE	PAGE
Removal	12-21
Installation	12-25

- TOOLS:
- 7/16 in. Combination box and open end wrench
 - 9/16 in. Combination box and open end wrench
 - 9/16 in. Crowfoot wrench with 3/8 in. drive (NSN 5120-00-184-8397)
 - 5/8 in. Combination box and open end wrench
 - 11/16 in. Combination box and open end wrench
 - 11/16 in. Crowfoot wrench with 3/8 in. drive (NSN 5120-00-189-7896)
 - 13/16 in. Combination box and open end wrench
 - 10 in. Adjustable wrench
 - Torque wrench with 3/8 in. drive, 0-200 lb-in (0-23 N.m)

- SUPPLIES:
- Lockwashers (8 required)
 - Nuts (2 required)
 - Sleeves (2 required)

PRELIMINARY PROCEDURE: Remove powerplant (page 5-1)

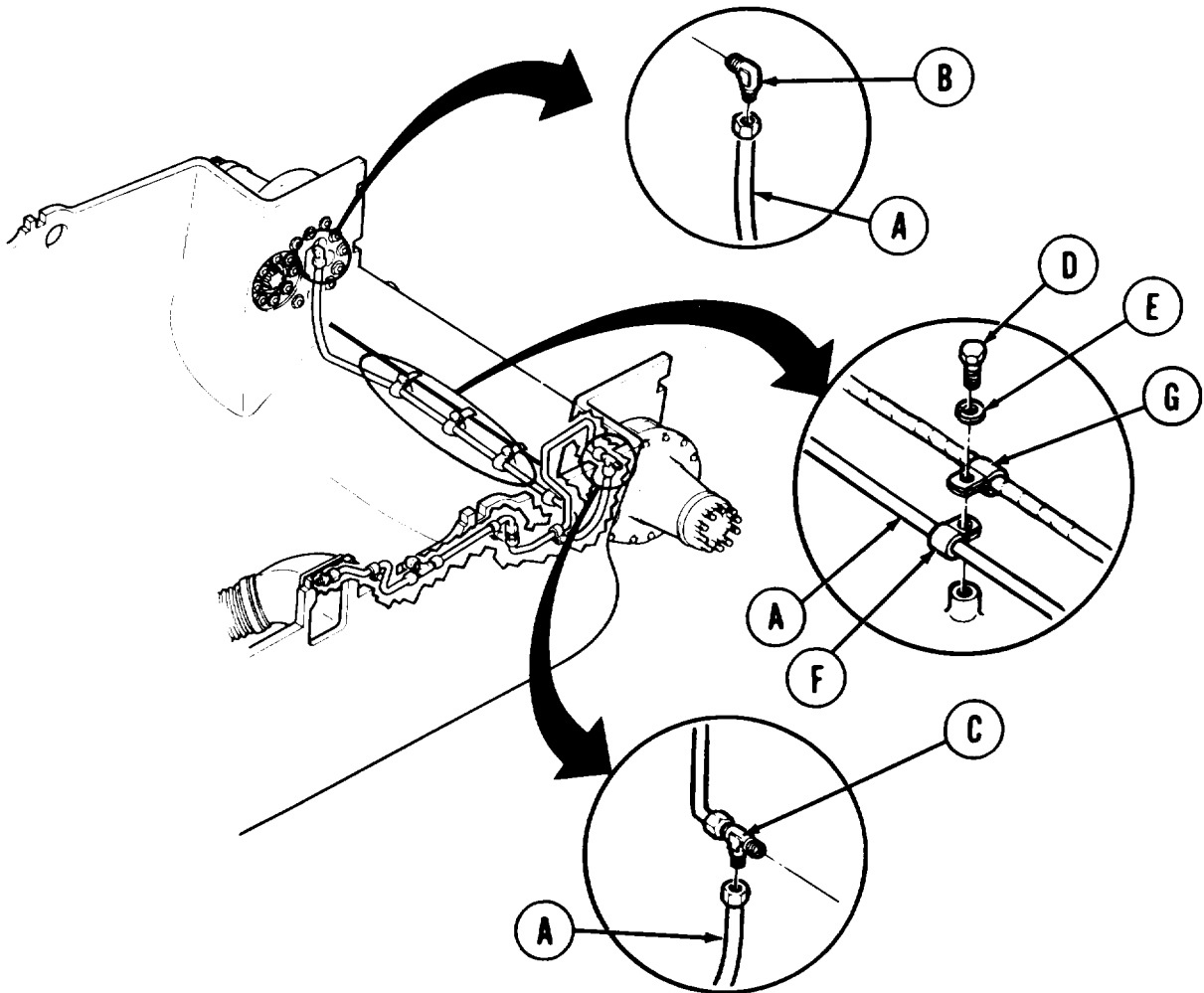


Go on to Sheet 2

FINAL DRIVE VENTING SYSTEM REPLACEMENT (Sheet 2 of 10)

REMOVAL:

1. Using 9/16 inch wrench, disconnect tubing (A) from elbow (B) in right final drive.
2. Using 9/16 inch wrench, disconnect tubing (A) from tee (C) on left final drive.
3. Using 7/16 inch wrench, remove four screws (D) and lockwashers (E) securing clamps (F and G).



4. Remove tubing (A) and clamps (F) from vehicle.
5. Remove clamps (F) from tubing (A).
6. Using adjustable wrench, remove elbow (B) from right final drive.

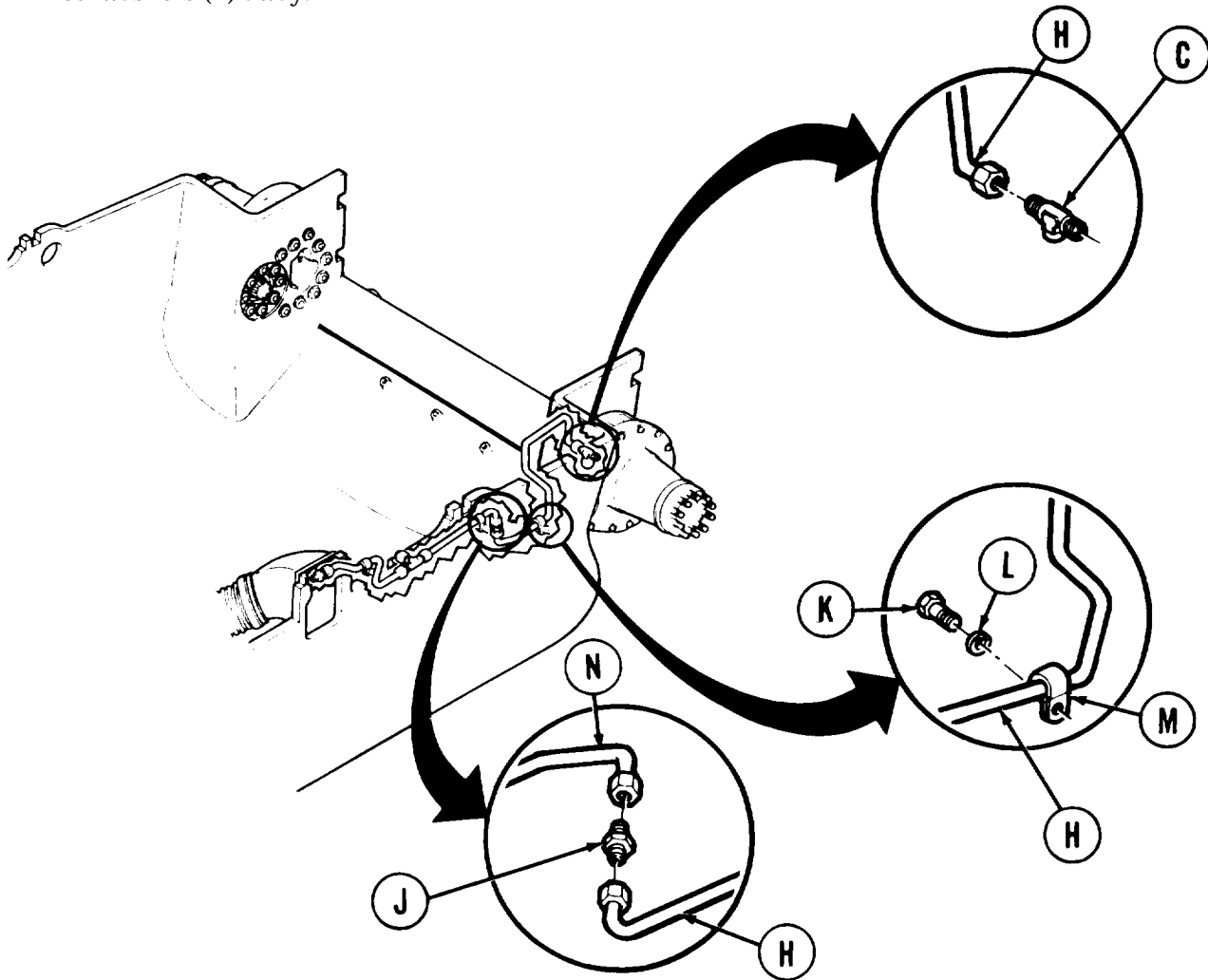
Go on to Sheet 3

TA253406

Change 1 12-21

FINAL DRIVE VENTING SYSTEM REPLACEMENT (Sheet 3 of 10)

7. Using 9/16 inch wrench, disconnect tube assembly (H) from tee (C).
8. Using 13/16 inch wrench to hold adapter (J), use 9/16 inch wrench and disconnect tube assembly (H) from-adapter (J).
9. Using 7/16 inch wrench, remove two screws (K) and lockwashers (L) securing clamps (M). Throw lockwashers (L) away.



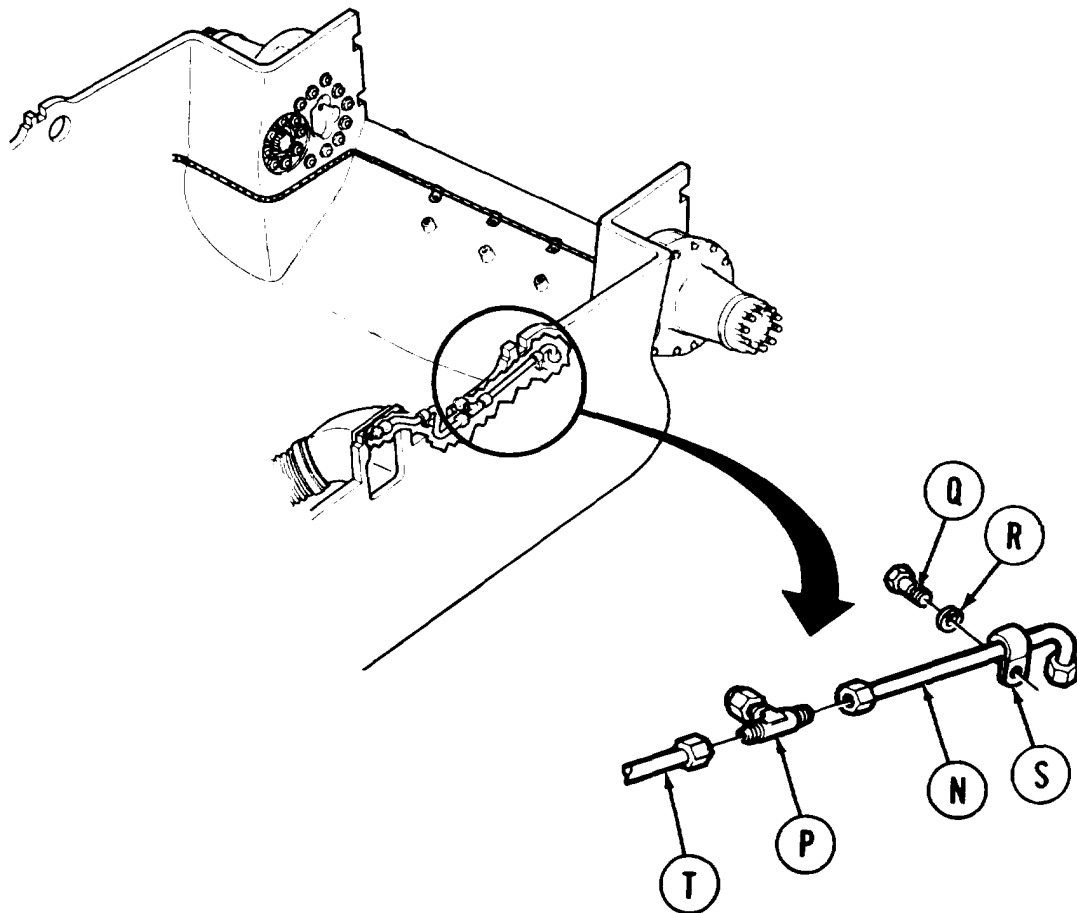
10. Remove tube assembly (H) and clamps (M) from vehicle.
11. Remove clamps (M) from tube assembly (H).
12. Using adjustable wrench, remove tee (C) from left final drive.
13. Using 11/16 inch wrench to hold tube assembly (N), use 13/16 inch wrench and remove adapter (J).

Go on to Sheet 4

TA253407

FINAL DRIVE VENTING SYSTEM REPLACEMENT (Sheet 4 of 10)

14. Using adjustable wrench to hold tee (P), use 11/16 inch wrench and disconnect tube assembly (N) from tee (P).
15. Using 7/16 inch wrench, remove screw (Q) and lockwashers (R) securing clamp (S). Throw lockwashers (R) away.
16. Remove tube assembly (N) and clamp (S) from vehicle.
17. Remove clamp (S) from tube assembly (N).



18. Using adjustable wrench to hold tee (P), use 11/16 inch wrench and disconnect tube assembly (T) from tee (P).
19. Remove tee (P).

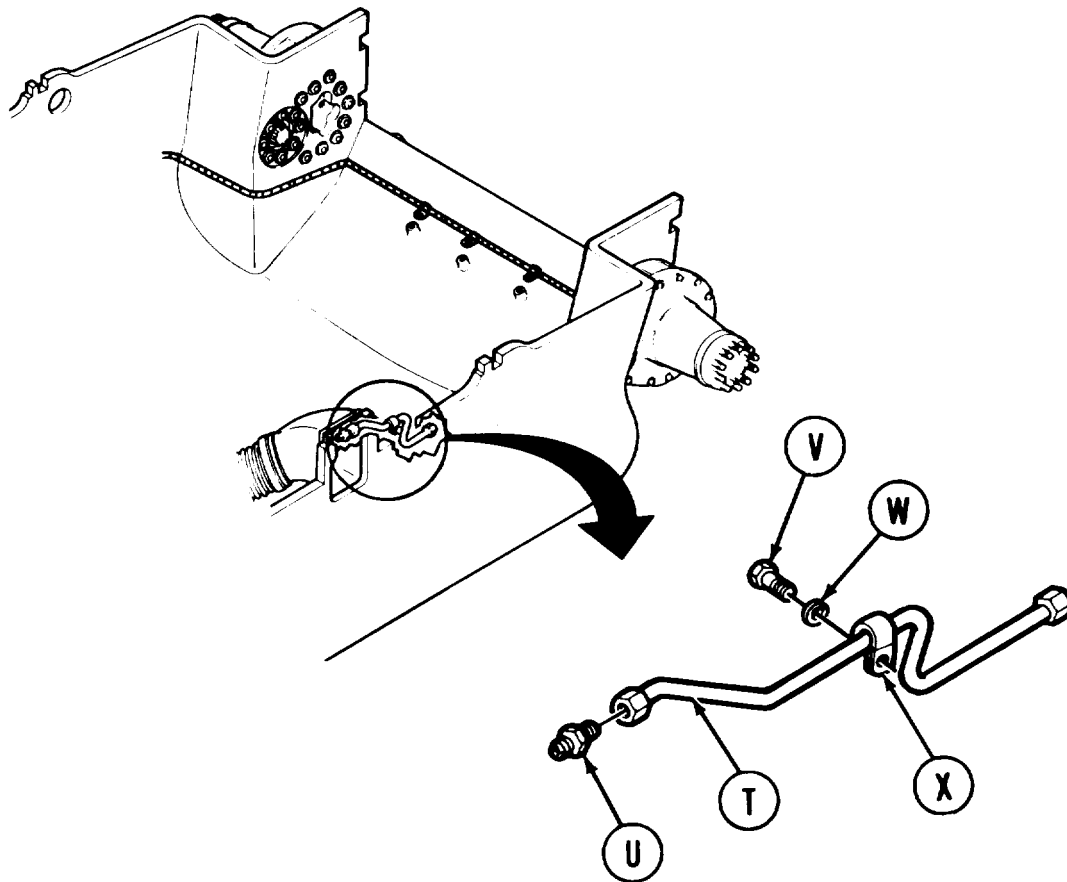
Go on to Sheet 5

TA253408

Change 1 12-23

FINAL DRIVE VENTING SYSTEM REPLACEMENT (SHEET 5 of 10)

20. Using 5/8 inch wrench to hold adapter (U), use 11/16 inch wrench and disconnect tube assembly (T) from adapter (U).
21. Using 7/16 inch wrench, remove screw (V) and lockwasher (W) securing clamp (X). Throw lockwasher (W) away.
22. Remove tube assembly (T) and clamp (x) from vehicle.

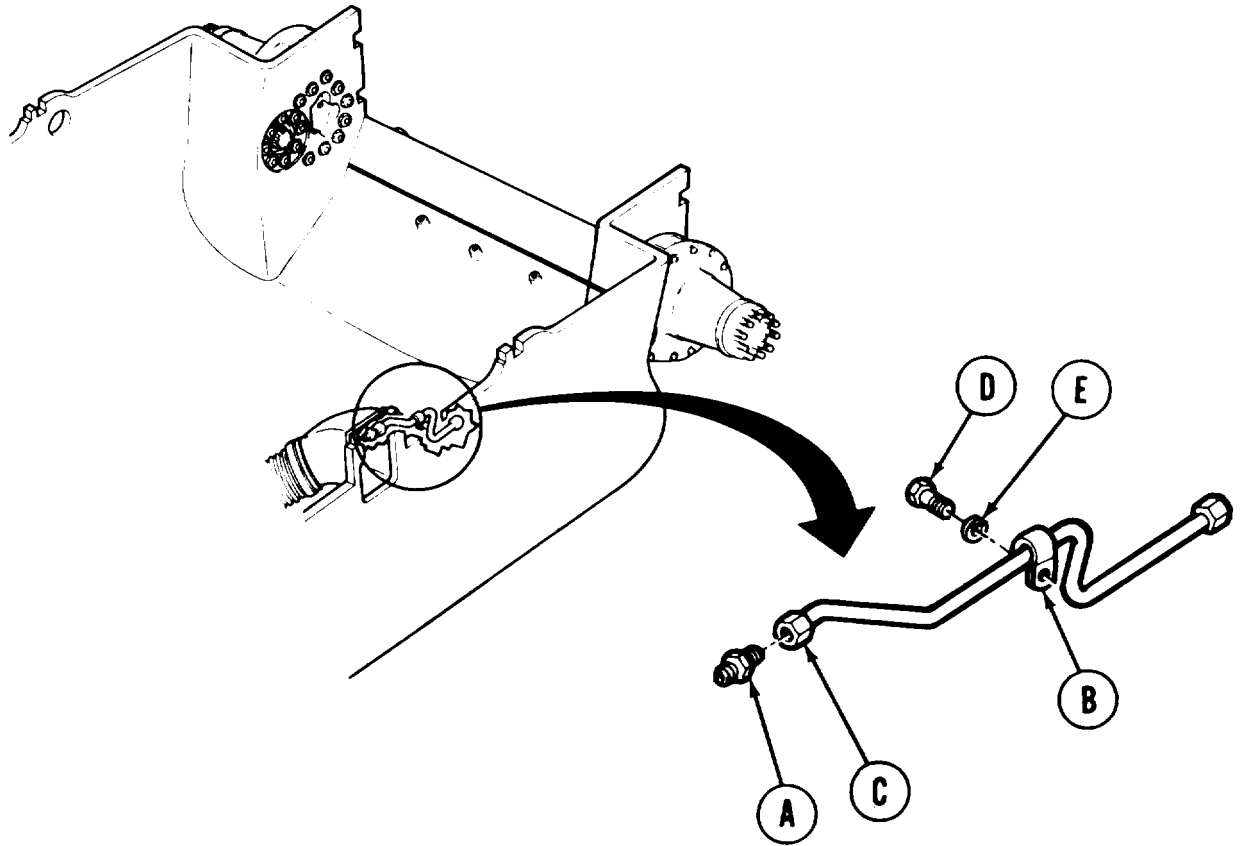


23. Remove clamp (X) from tube assembly (T).
24. Using 5/8 inch wrench remove adapter (U) from elbow of left air cleaner.

Go on to Sheet 6

TA253409

FINAL DRIVE VENTING SYSTEM REPLACEMENT (Sheet 6 of 10)



INSTALLATION:

1. Using 5/8 inch wrench, install adapter (A) into elbow of left air cleaner.
2. Install clamp (B) onto tube assembly (C) and position tube assembly (C) onto hull.
3. Using fingers, connect tube assembly (C) to adapter (A).
4. Using torque wrench with 11/16 inch crowfoot and 5/8 inch wrench to hold adapter (A), tighten tube assembly (C) fitting 75-85 lb-in (8.4-9.5 N m).
5. Using 7/16 inch wrench, install and tighten screw (D) and new lockwasher (E) securing clamp (B) to hull.

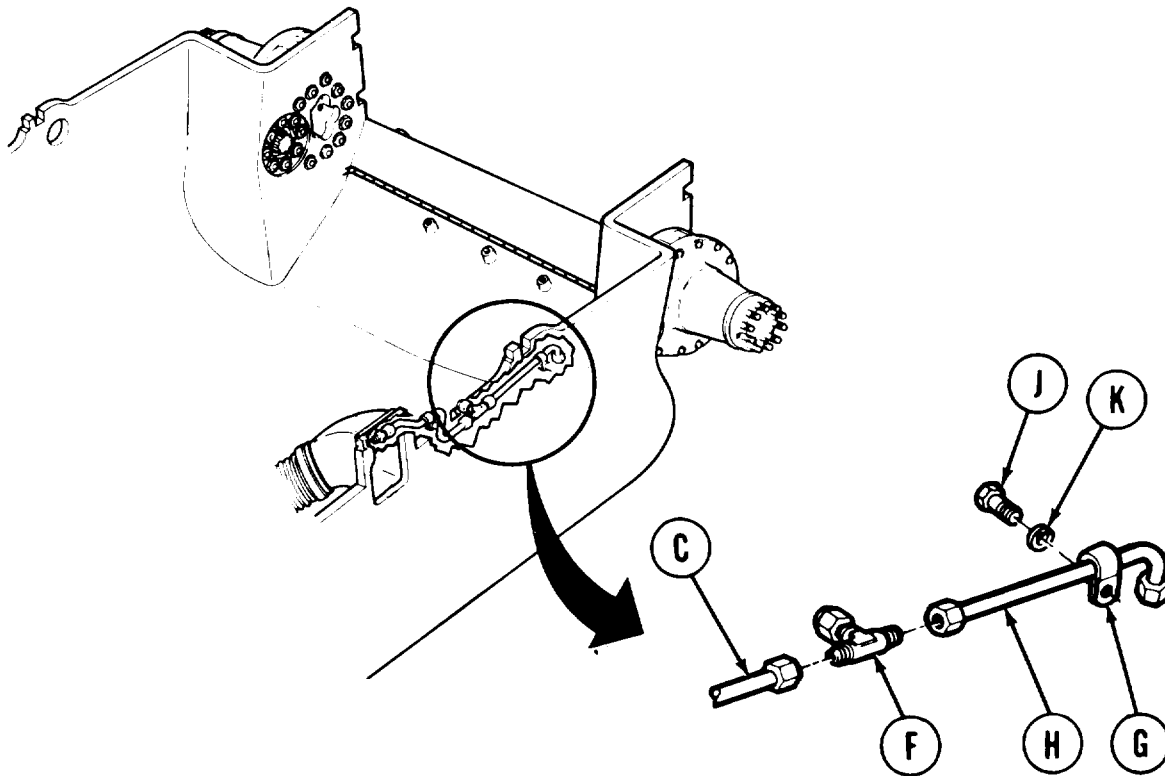
Go on to Sheet 7

TA253410

Change 1 12-25

FINAL DRIVE VENTING SYSTEM REPLACEMENT (Sheet 7 of 10)

6. Using fingers, connect tube assembly (C) to tee (F).
7. Install clamp (G) onto tube assembly (H) and position tube assembly (H) onto hull.
8. Using fingers, connect tube assembly (H) to tee (F).



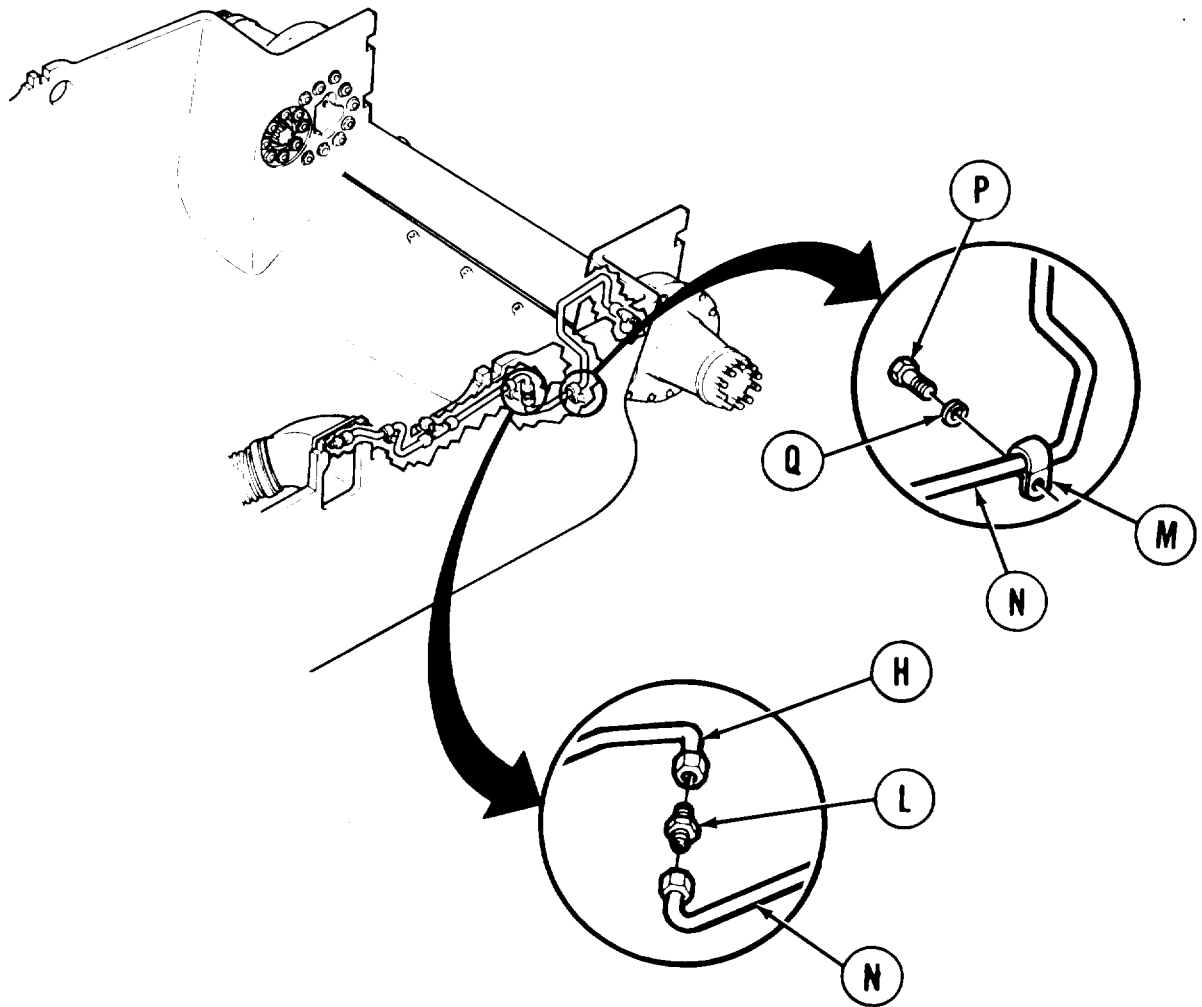
9. Using adjustable wrench to hold tee (F), and using torque wrench with 11/16 inch crowfoot tighten assemblies (C and H) 75-85 lb-in (8.4-9.5 N m).
10. Using 7/16 inch wrench, install and tighten screw (J), and new lockwasher (K) securing clamp (G) to hull.

Go on to Sheet 8

TA253411

FINAL DRIVE VENTING SYSTEM REPLACEMENT (Sheet 8 of 10)

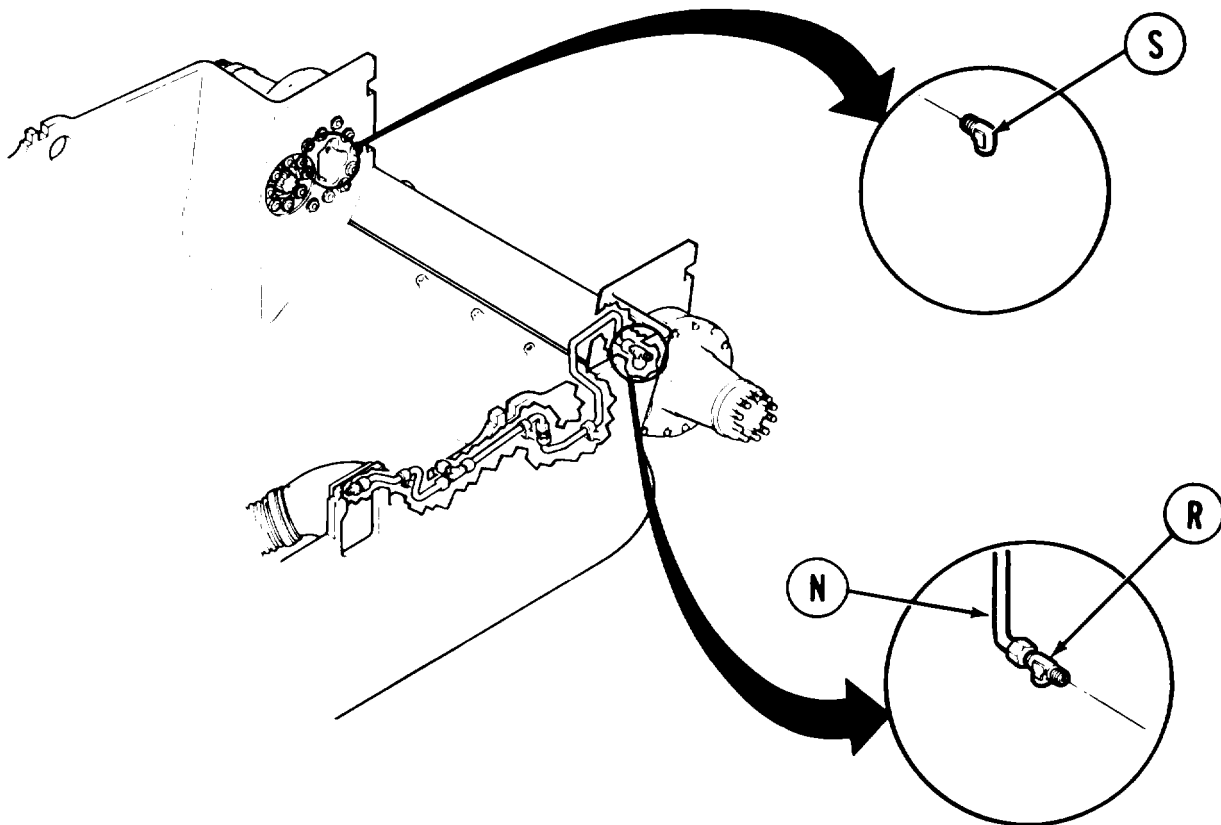
11. Using fingers, connect adapter (L) to tube assembly (H).
12. Install two clamps (M) on tube assembly (N) and position tube assembly to hull.
13. Using fingers, connect tube assembly (N) to adapter (L).
14. Using 13/16 inch wrench to hold adapter (L), and using torque wrench with 11/16 inch crowfoot, tighten tube assembly (H) 75-85 lb-in (8.4-9.5 N^m). Using torque wrench with 9/16 inch crowfoot, tighten tube assembly (N).



15. Using 7/16 inch wrench, install and tighten screws (P) and new lockwashers (Q) securing clamps (M) to hull.

Go on to Sheet 9

16. Using adjustable wrench, install tee (R) onto left final drive.
17. Using fingers, connect tube assembly (N) to tee (R).
18. Using torque wrench and 9/16 inch crowfoot, tighten tubing assembly (N) nut 75-85 lb-in (8.4 - 9.5 N.m).



19. Using adjustable wrench, install elbow (S) into right final drive.

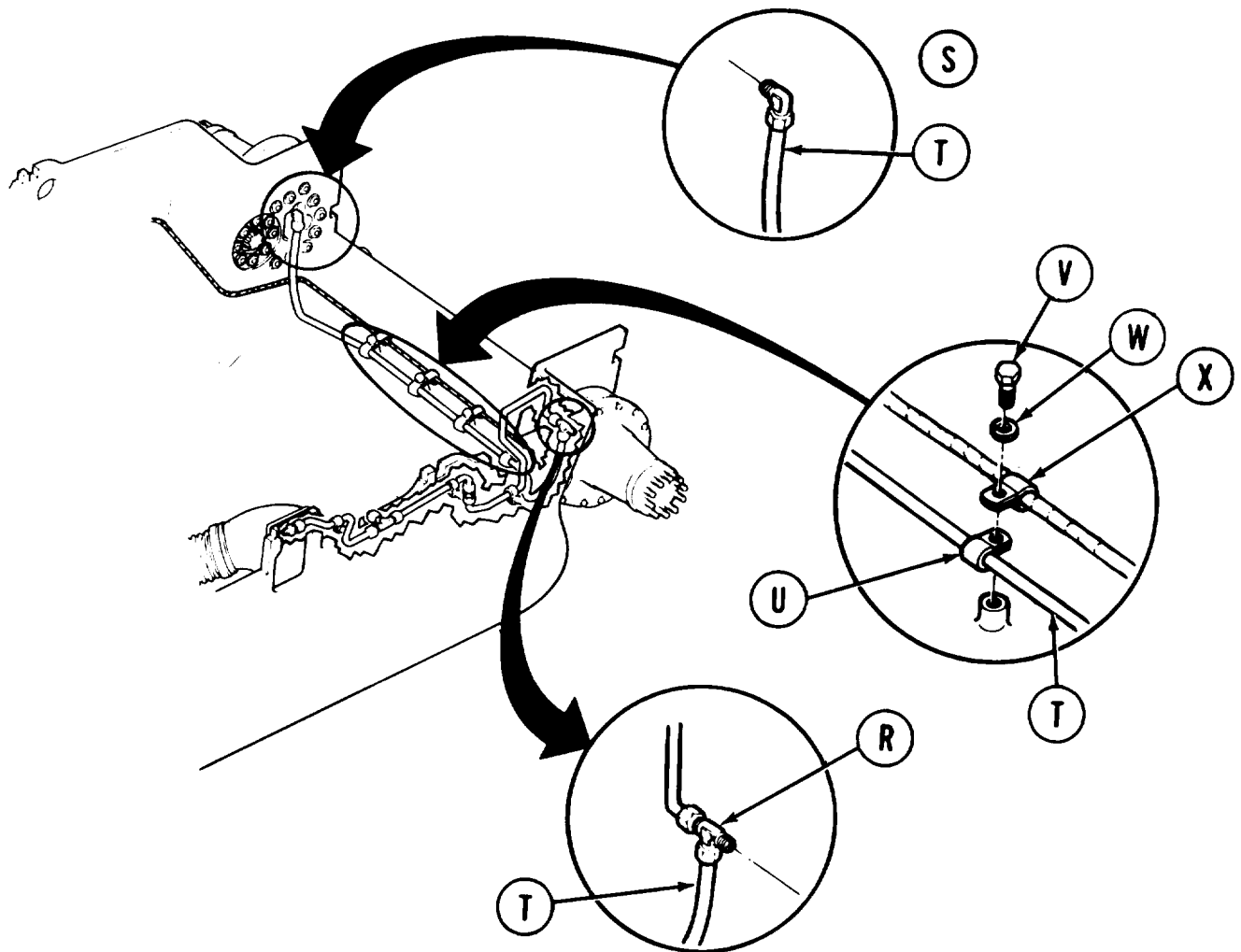
Go on to Sheet 10

FINAL DRIVE VENTING SYSTEM REPLACEMENT (Sheet 10 of 10)

NOTE

If new tubing is being replaced, obtain from supply two tube nuts (MS51823) and two sleeves (MS51825) and install onto new tubing (T).

20. Using fingers, connect tubing (T) to elbow (S) and tee (R).
21. Using torque wrench and 9/16 inch crowfoot, tighten tubing (T) nuts to elbow (S) and tee (R) 75-85 lb-in (8.4-9.5 N.m).



22. Install four clamps (U) onto tubing (T).
23. Using 7/16 inch wrench, install and tighten screws (V) and new lockwashers (W) securing clamps (U) and (X).
24. Install powerplant (page 5-37).

End of Task

CHAPTER 13

BRAKE SYSTEM MAINTENANCE INDEX

PROCEDURE	PAGE
Brakes Adjustment	13-2
Brake Pedal Adjustment	13-10
Hydraulic Brake System Bleeding	13-12
Parking Brake Pawl and Bellcrank Adjustment	13-16
Parking Brake Cable Adjustment	13-20
Brake Control Pedal and Bracket Repair and Replacement	13-24
Brake Master Cylinder Mounting Bracket and Push Rod Replacement	13-29
Brake Pressure Gage and Related Parts Replacement	13-36
Brake Master Cylinder Replacement	13-40
Brake Switch (Stoptlight) Replacement	13-45
Brake Quick-Disconnect and Hose Assembly Replacement	13-47
Brake Nipple and Hose Assembly Replacement	13-54
Brake Left Hand Slave Cylinder and Tube Assembly Replacement	13-60
Brake Right Hand Slave Cylinder and Tube Assembly Replacement	13-64
Brake Control Housing Repair	13-70
Parking Brake Control Assembly Replacement (Engine Compartment)	13-84
Parking Brake Control Assembly Replacement (Engine Mounted)	13-98.1
Parking Brake Bellcrank Repair and Replacement	13-99
Brake Control Bracket Replacement	13-103
Parking Brake Control Assembly and Linkage Replacement (Driver's Station)	13-105

BRAKES ADJUSTMENT (Sheet 1 of 8)

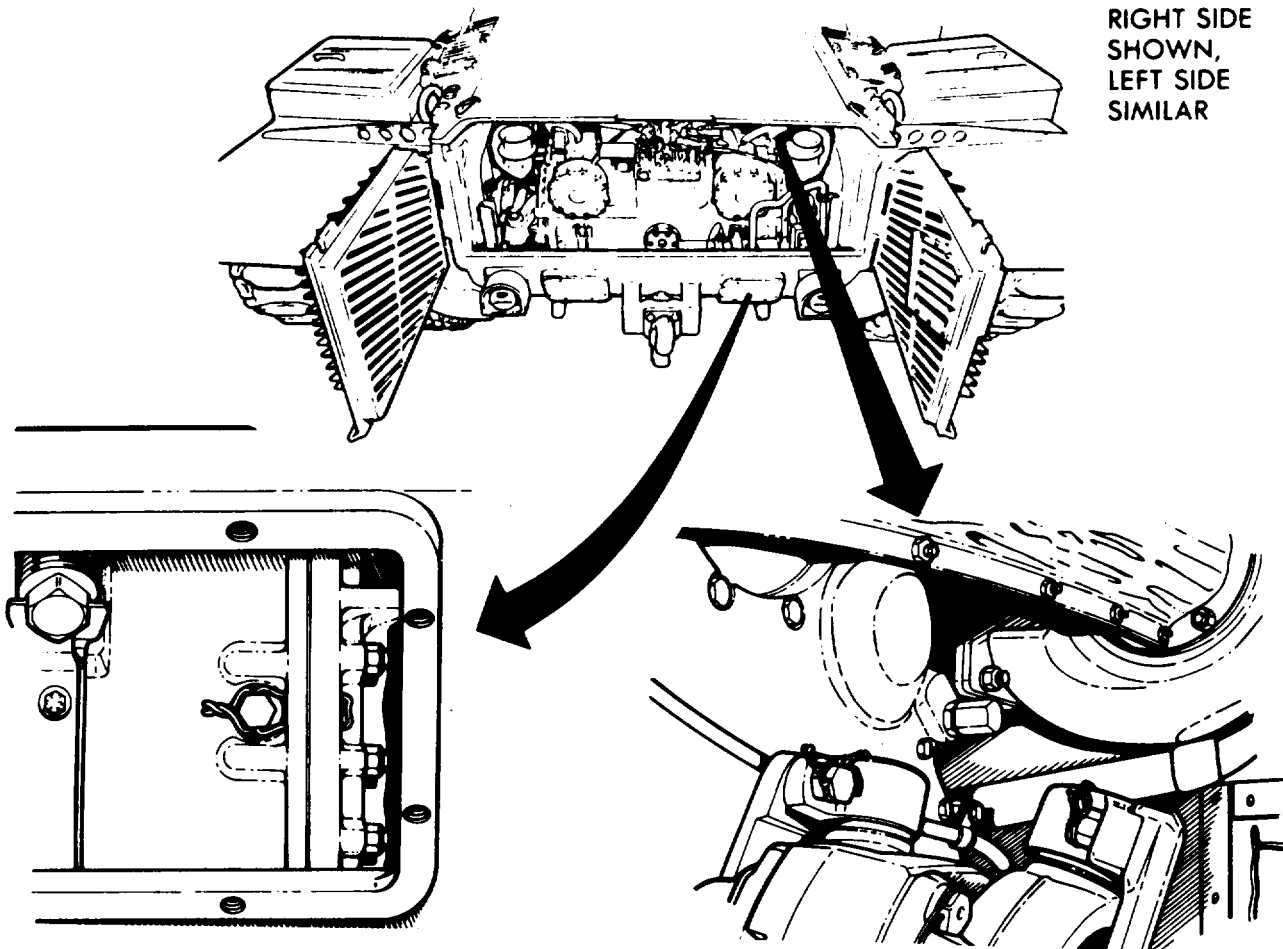
TOOLS: 7/16 in. combination box and open end wrench
15/16 in. combination box and open end wrench
7/8 in. combination box and open end wrench
Diagonal cutting pliers
1 in. combination box and open end wrench
Slip joint pliers

SUPPLIES: Lockwire (Item 60, Appendix A)
Gaskets (MS35769-2) (2 required)

PERSONNEL: Two

REFERENCE: TM 9-2350-222-10

PRELIMINARY PROCEDURES: Block tracks (TM 9-2350-222-10)
Place transmission in (N) neutral (TM 9-2350-222-10)
Remove transmission shroud (page 9-20)
Remove rear transmission access covers (page 16-38)



Go on to Sheet 2

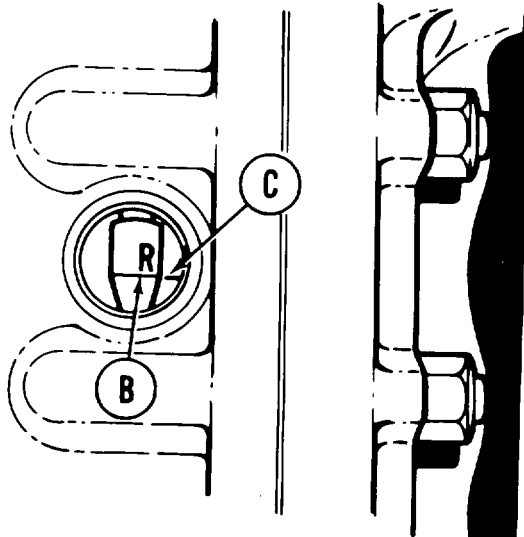
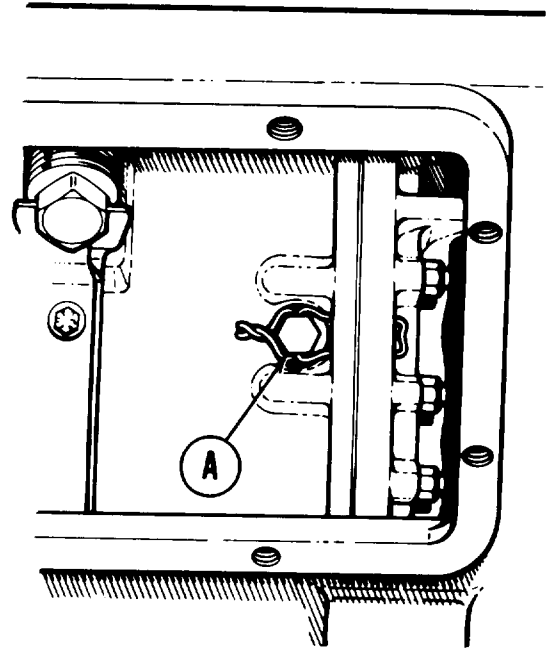
TA140312

BRAKES ADJUSTMENT (Sheet 2 of 8)

NOTE

Both right and left brakes must be adjusted. Left brake adjustment is located equally opposite right brake adjustment on transmission.

1. Using pliers, cut two lockwires holding two brake inspection hole plugs (A). Remove lockwires.
2. Using 7/8 inch wrench, remove two brake inspection hole plugs and gaskets (A). Throw gaskets away.



NOTE

You must look directly into brake, inspection hole to see the index marks.

3. Check whether index line (B) marked R and index mark (C) are lined up.

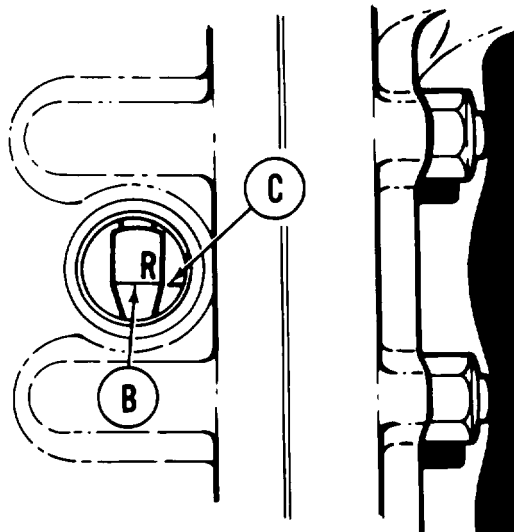
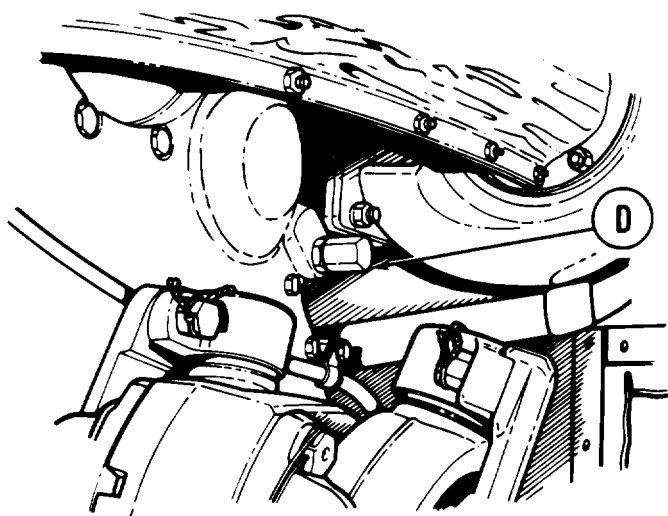
Go on to Sheet 3

TA140313

BRAKES ADJUSTMENT (Sheet 3 of 8)

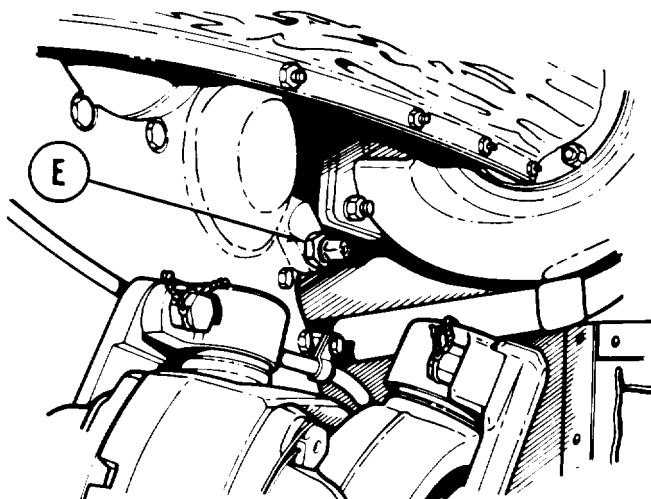
NOTE

If index line (B) marked R, and index mark (C) are lined up, skip step 4 and go to step 10. If they are not lined up, go to step 4.



4. Using 1 inch wrench, remove brake adjustment worm cap (D).

5. Using 15/16 inch wrench, loosen locknut (E).



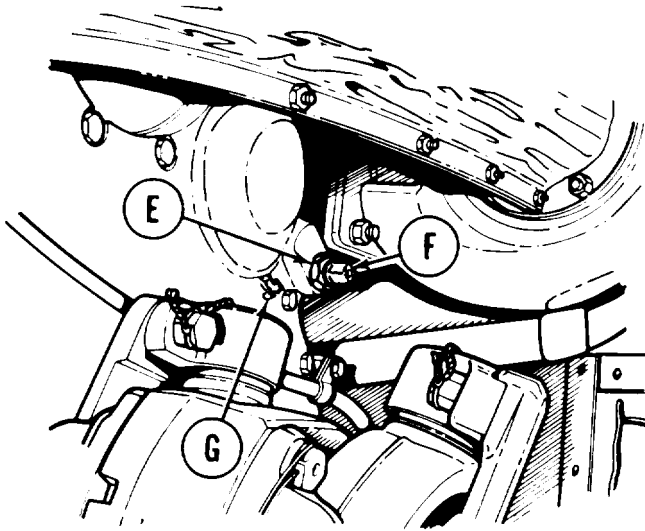
Go on to Sheet 4

TA140314

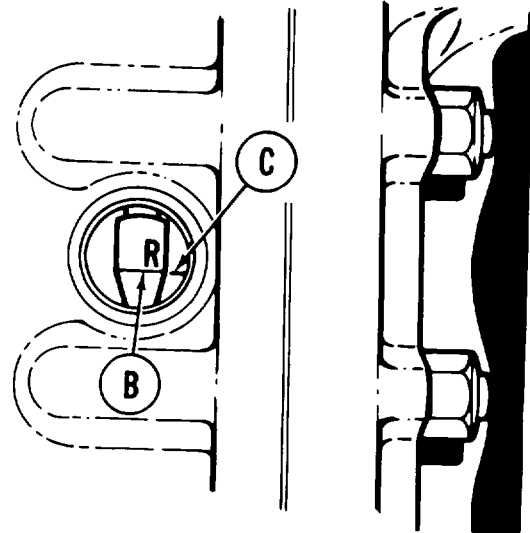
BRAKES ADJUSTMENT (Sheet 4 of 8)

CAUTION

Make sure brakes are fully released before making brake adjustment. Failure to fully release brakes can cause internal damage to cross-drive transmission.



6. Using 7/16 inch wrench, turn brake adjusting worm (F) about 25 turns toward rear of vehicle.
7. Using 7/16 inch wrench, attempt to line up index line (B) marked R with index mark (C) by turning brake adjustment worm toward front of vehicle.
8. If index line (B) marked R and index mark (C) are lined up, using 7/16 inch wrench, hold brake adjusting worm (F). Using 15/16 inch wrench, tighten locknut (E).



NOTE

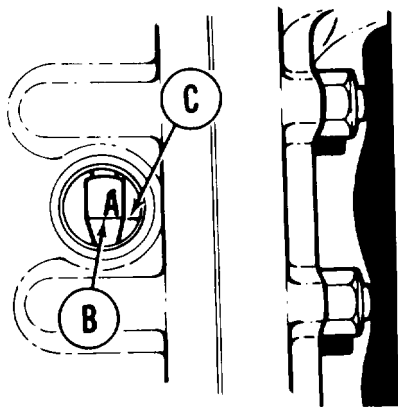
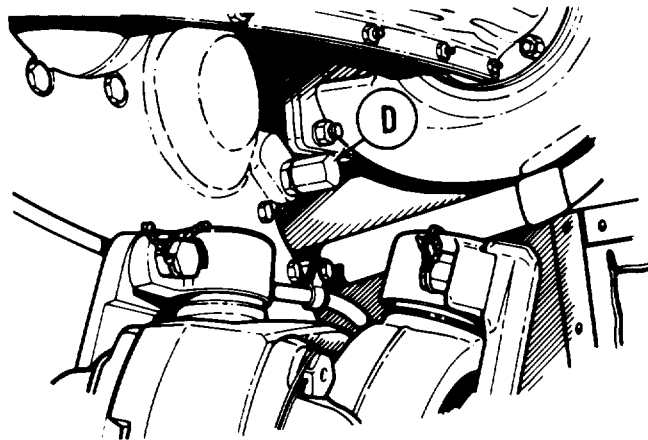
If index line (B) marked R, and index mark (C) are not lined up, notify supervisor that brakes require higher level maintenance.

Go on to Sheet 5

TA140315

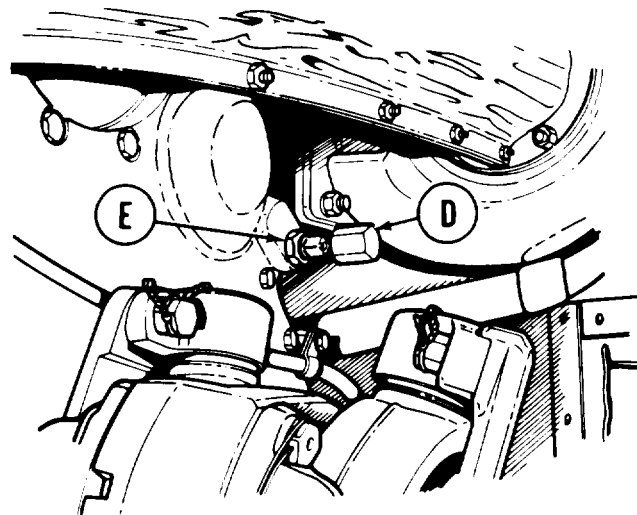
BRAKES ADJUSTMENT (Sheet 5 of 8)

- 9 . Using 1 inch wrench, install brake adjusting worm cap (D).
10. Fully apply brakes (TM 9-2350-222-10).
11. Check whether index line (B) marked A and index mark (C) are lined up.
12. If index line (B) marked A and index mark (C) are lined up, brakes are adjusted. Release brakes and go to step 24.



13. If index line (B) marked A and index mark (C) are not lined up, release brakes and go on to step 14.

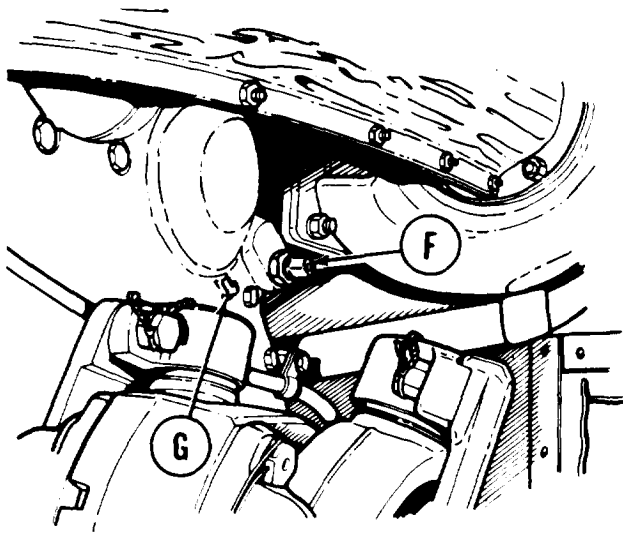
14. Using 1 inch wrench, remove brake adjusting worm cap (D).
15. Using 15/16 inch wrench, loosen locknut (E).
16. Fully apply brakes (TM 9-2350-222-10). If index line (B) marked A moves past index mark (C), brake is too loose.



Go on to Sheet 6

TA140316

BRAKES ADJUSTMENT (Sheet 6 of 8)

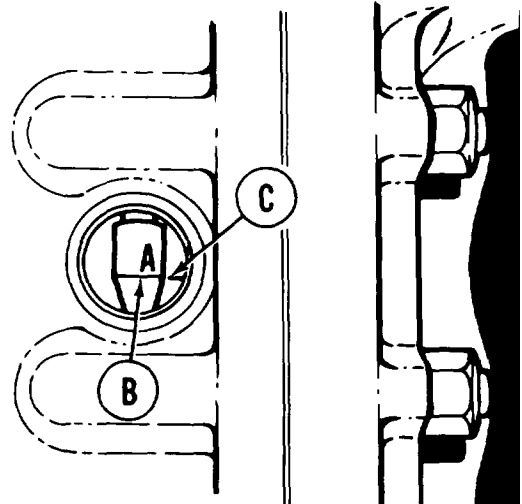


17. Release brakes.

18. Using 7/16 inch wrench, turn brake adjusting worm (F) in direction of arrow (G) until index line (B) lines up with index mark

19. If index line (B) marked A does not move back to index mark (C), brake is too tight.

20. Using 7/16 inch wrench, turn brake adjusting worm (F) about 25 turns toward rear of vehicle.



NOTE

Always try to bring index line (B) marked A and index mark (C) into line by turning brake adjusting worm (F) counterclockwise.

CAUTION

Always release brakes before making adjustments.

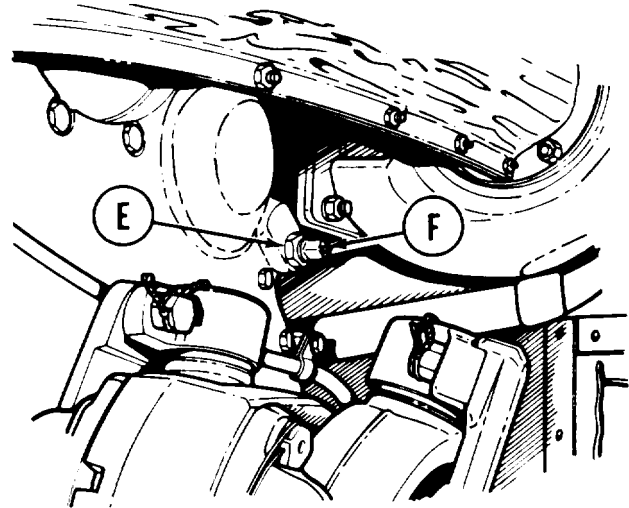
21. Using 7/16 inch wrench, turn brake adjusting worm (F) in direction of arrow (G) until index line (B) marked A lines up with index mark (C) when brakes are applied.

Go on to Sheet 7

TA140317

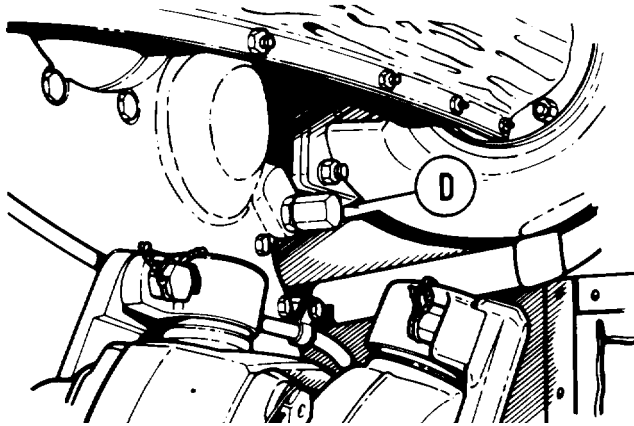
BRAKES ADJUSTMENT (Sheet 7 of 8)

22. When brakes have been adjusted, using 7/16 inch wrench, hold adjusting worm (F). Using 15/16 inch wrench, tighten locknut (E).

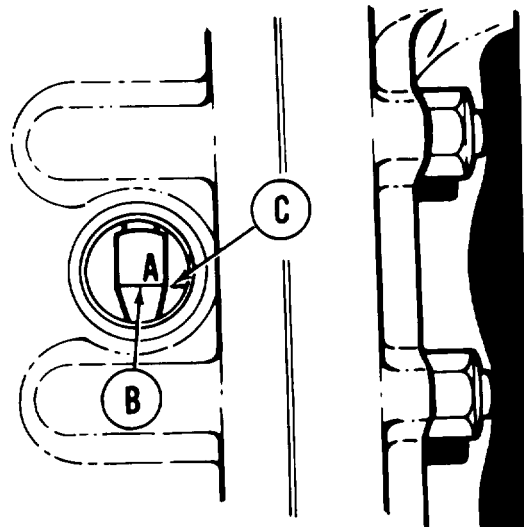


NOTE

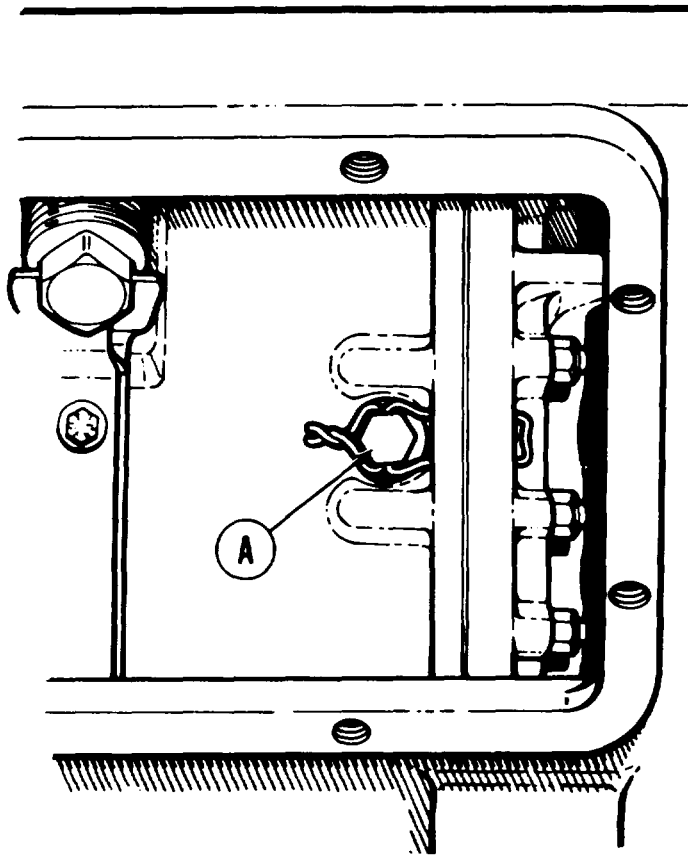
If index line (B) marked A cannot be lined up with index mark (C) notify supervisor that brakes require higher level maintenance.



23. Using 1 inch wrench, install brake adjusting worm cap (D).



BRAKES ADJUSTMENT (Sheet 8 of 8)



24. Using 7/8 inch wrench, install two brake inspection hole plugs and new gaskets (A).
25. Using pliers, install lockwire (Item 60, Appendix D) to two brake inspection hole plugs.

26. Install rear transmission access covers (page 16-38).

27. Install transmission shroud (page 9-23).

28. Road test vehicle to check brakes adjustment (TM 9-2350-222-10).

End of Task

TA140319

BRAKE PEDAL ADJUSTMENT (Sheet 1 of 2)

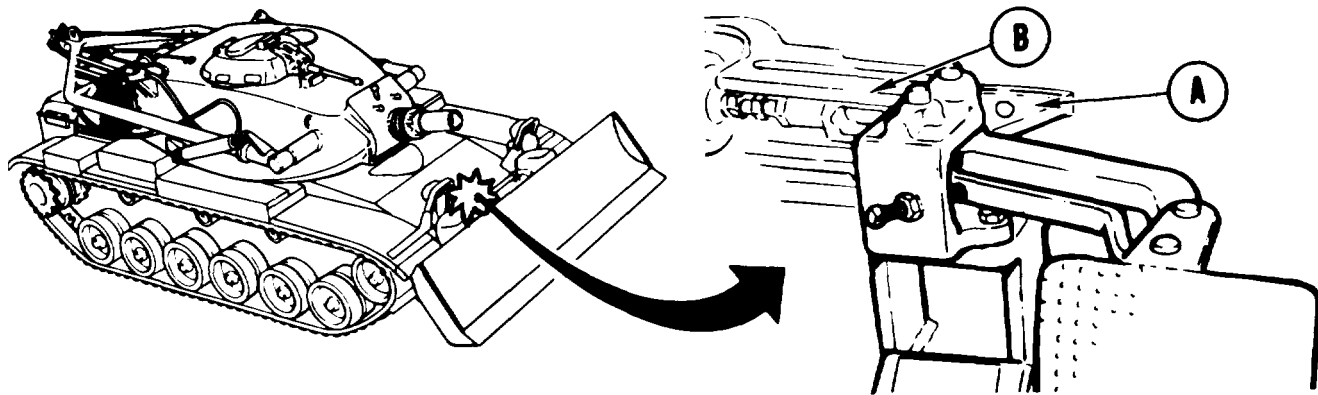
TOOLS: Pin, locating (1/2 in. dia., 7-1/2 in. long)
11/16 in. combination box and open end wrench (2 required)
9/16 in. combination box and open end wrench
7/16 in. combination box and open end wrench
5/8 in. combination box and open end wrench

REFERENCE: TM 9-2350-222-10

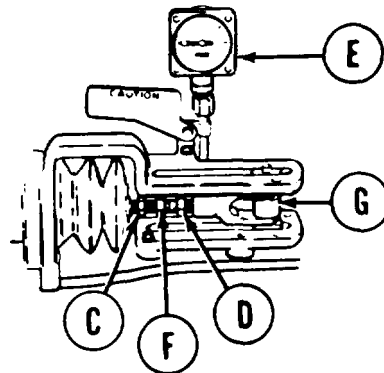
PRELIMINARY PROCEDURES: Block tracks (TM 9-2350-222-10)
Set transmission shift lever to (N) neutral position
(TM 9-2350-222-10)

BRAKE PEDAL ADJUSTMENT:

1. Depress brake pedal until hole in cam (A) is aligned with hole in master cylinder bracket (B). Insert locating pin through alignment holes in cam (A) and bracket (B).



2. Using 11/16 inch wrench, loosen jamnuts (C) and (D). Using 5/8 inch wrench, adjust tie-rod (F) for a reading of 175 to 250 psi on pressure gage (E).
3. Tighten jamnuts (C) and (D).
4. Remove locating pin installed in step 1.
5. Depress brake pedal until brake pedal cam face just contacts roller surface (G).
6. Check pressure gage (F) for 0 psi reading.

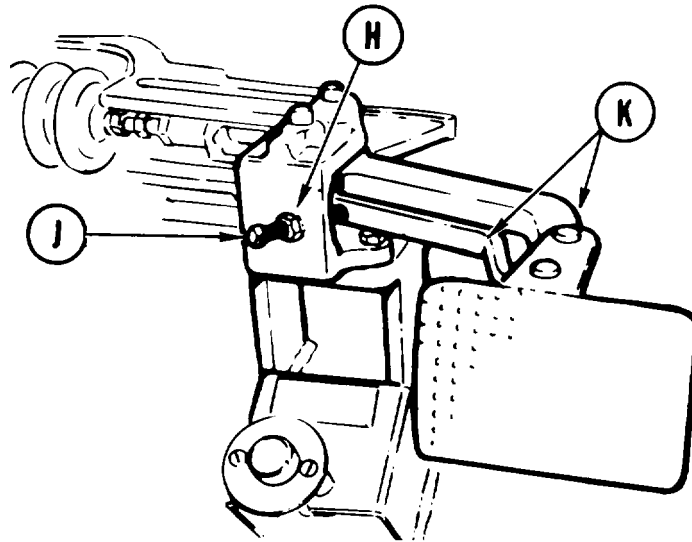


Go on to Sheet 2

TA140420

BRAKE PEDAL ADJUSTMENT (Sheet 2 of 2)

7. Using 9/16 inch wrench, loosen jamnut (H).
8. Using 7/16 inch wrench, adjust screw (J) until screw (J) just makes contact with brake lever (K).
9. Tighten jamnut (H).



10. Set transmission shift lever to (P) park position (TM 9-2350-222-10).

End of Task

TA140320

HYDRAULIC BRAKE SYSTEM BLEEDING (Sheet 1 of 4)

TOOLS: 1-1/8 in. open end wrench
1 1/16 in. combination box and open end wrench
3/8 in. combination box and open end wrench
3/4 in. combination box and open end wrench
Filler and bleeder

SUPPLIES: Brake fluid (Item 34, Appendix D)

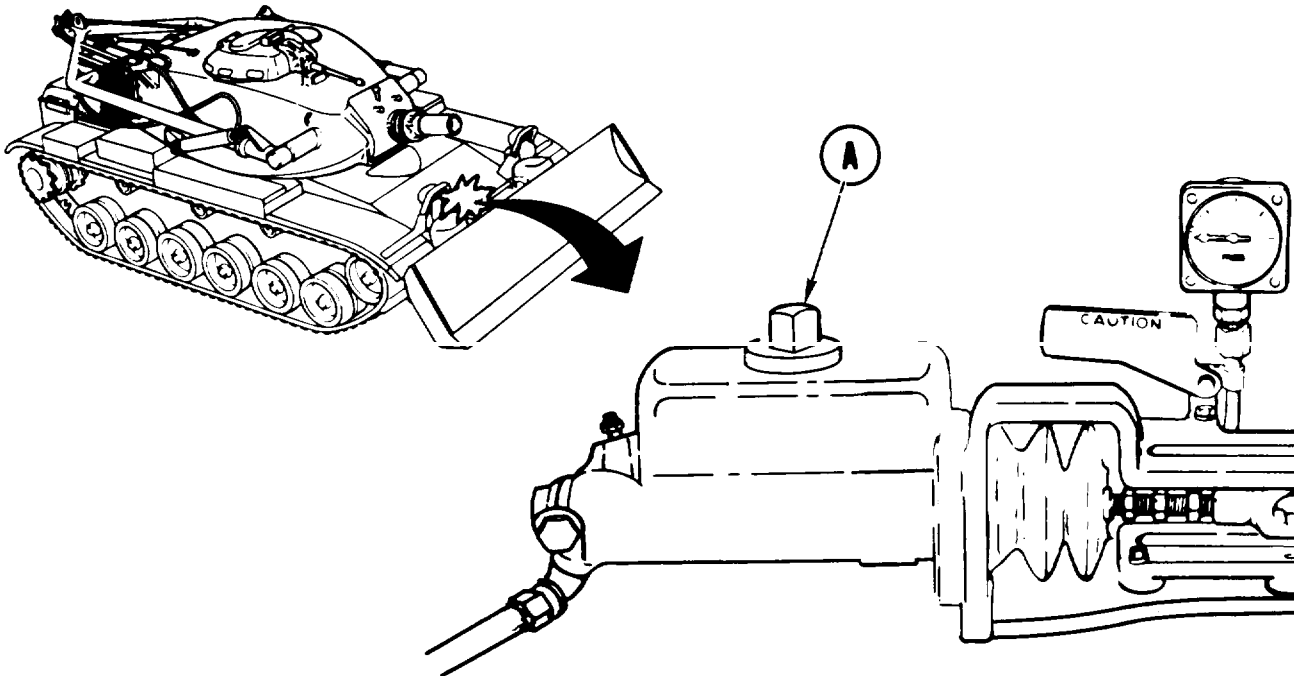
PERSONNEL: Two

REFERENCE: TM 9-2350-222-10

PRELIMINARY PROCEDURE: Remove transmission shroud (page 9-20)

BRAKE BLEEDING:

1. Block tracks (TM 9-2350-222-10).
2. Place transmission lever to neutral (N) (TM 9-2350-222-10).
3. Using 1-1/8 inch wrench, remove master cylinder filler port cap (A).

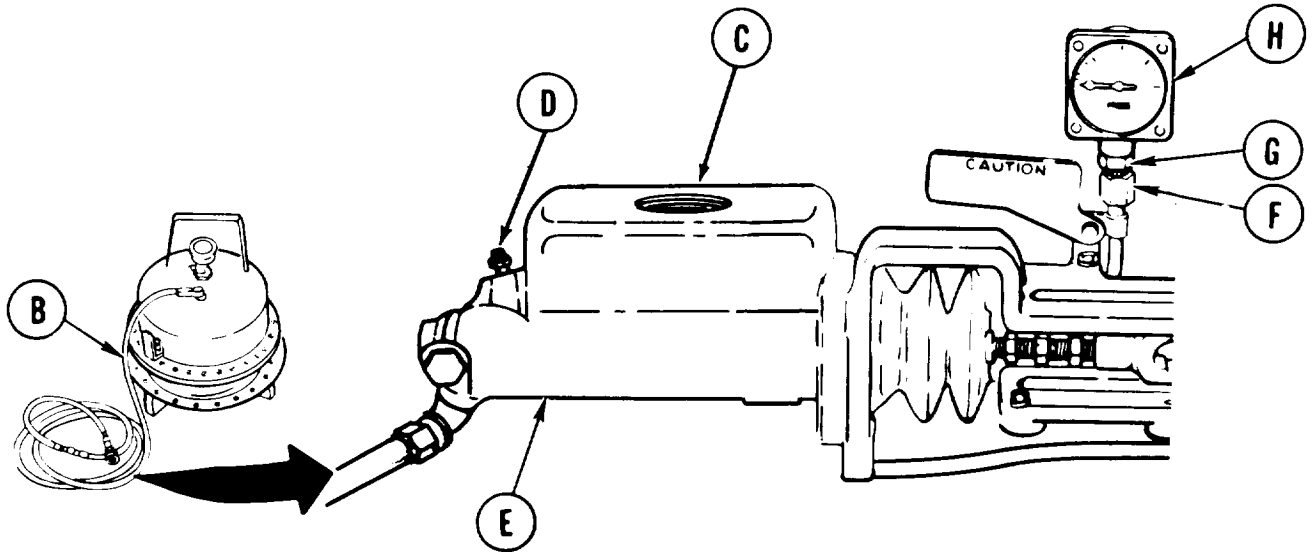


Go on to Sheet 2

TA140421

HYDRAULIC BRAKE SYSTEM BLEEDING (Sheet 2 of 4)

4. Connect filler and bleeder (B) to master cylinder filler port (C).



NOTE

Filler and bleeder will maintain pressure. Fill master cylinder with fluid.

5. Using 3/8 inch wrench, open bleeder valve (D) on master cylinder (E). Let hydraulic fluid run until no air bubbles are detected in hydraulic fluid. Close bleeder valve (D).
6. Using 11/16 inch wrench on nut (F) and 3/4 inch wrench on adapter (G), loosen nut (F) and bleed gage (H) until no air bubbles are observed in hydraulic fluid. Tighten nut (F) holding adapter (G).

NOTE

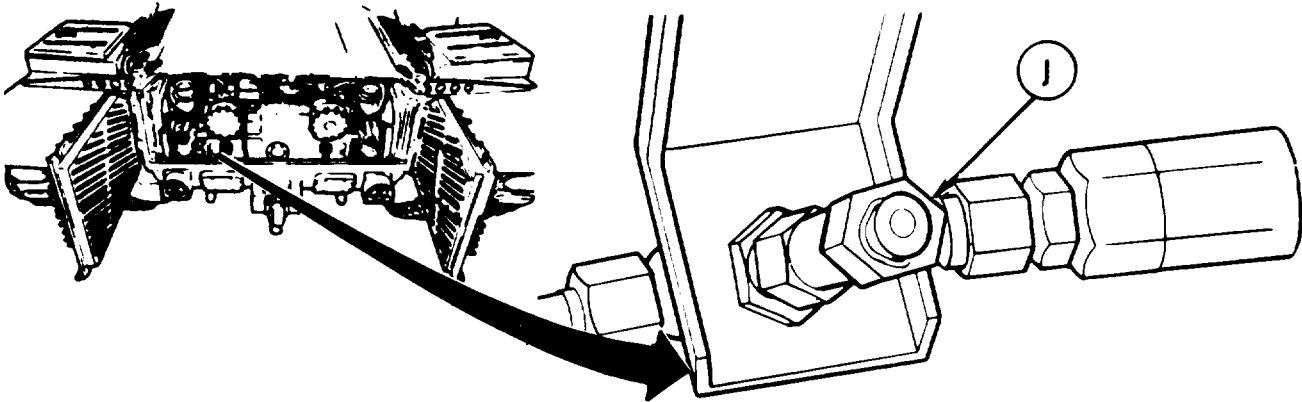
Steps 7 thru 9 require one person at driver's station and one person at rear of vehicle.

Go on to Sheet 3

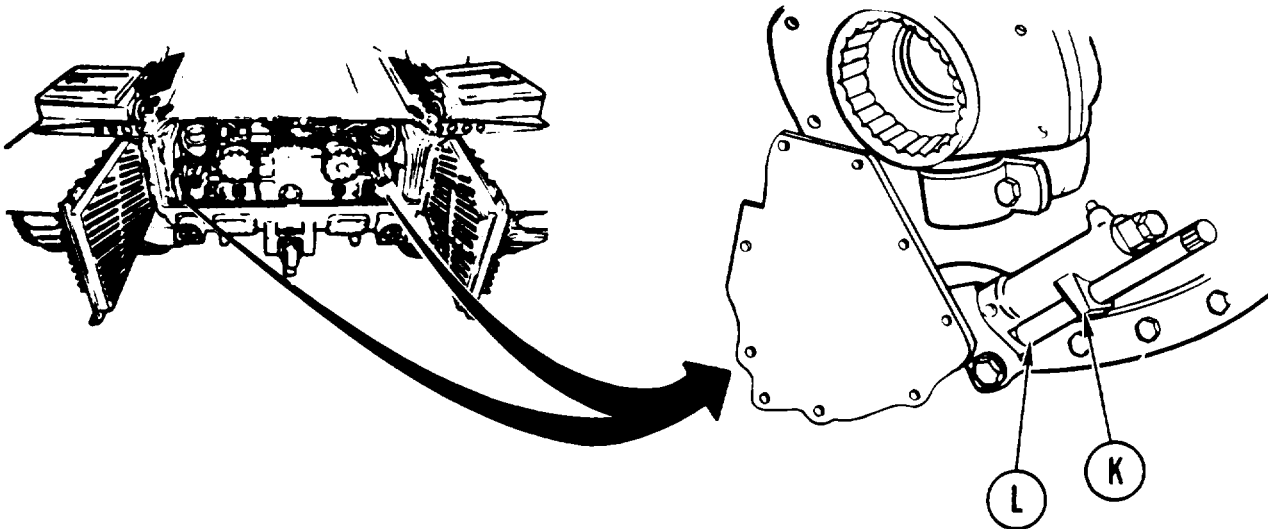
TA140321

HYDRAULIC BRAKE SYSTEM BLEEDING (Sheet 3 of 4)

- Using 11/16 inch wrench, open bleed cap or nut (J) and observe hydraulic fluid until air bubbles are no longer present. Close bleed nut (J).



- Using 3/8 inch wrench, open bleed nut (K) on slave cylinder (L) until no air bubbles are observed in hydraulic fluid. Close bleed nut (K).
- Repeat step 8 for opposite slave cylinder



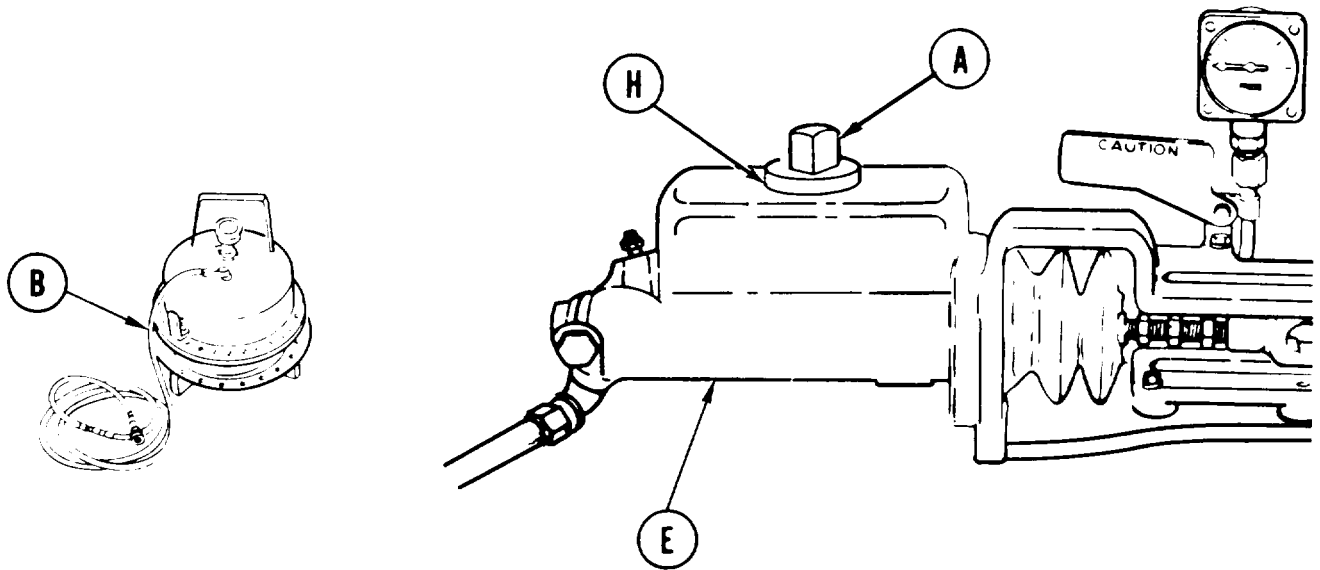
POWERPLANT REMOVED FOR CLARITY

Go on to Sheet 4

TA253415

HYDRAULIC BRAKE SYSTEM BLEEDING (Sheet 4 of 4)

10. Remove filler and bleeder (B) from filler port (H).



11. Using 1-1/8 inch wrench, install filler port cap (A) to master cylinder (E).

12. Place transmission lever in park position (TM 9-2350-222-10).

13. Install transmission shroud (page 9-23).

14. Remove blocks from tracks (TM 9-2350-222-10).

End of Task

TA140323

PARKING BRAKE PAWL AND BELLCRANK ADJUSTMENT (Sheet 1 of 9)

TOOLS: 15/16 in. combination box and open end wrench (2 required)
9/16 in. combination box and open end wrench (2 required)
1/2 in. combination box and open end wrench
Ratchet with 1/2 in. drive
7/16 in. socket with 1/2 in. drive
Pry bar
Slip joint pliers
Thickness gage

FABRICATED TOOLS: Gage block, 3/16 inch (Figure 5, Appendix F)
Gage block, 15/16 inch (Figure 5, Appendix F)
Gage block, 1-1/8 inch (Figure 5, Appendix F)

SUPPLIES: Locating pin (1/8 in. drill or welding rod 4 in. long)
Cotter pin (MS24665-283) (4 required)
Gasket (10910888) (2 required)
Lockwasher (MS35338-44) (8 required)

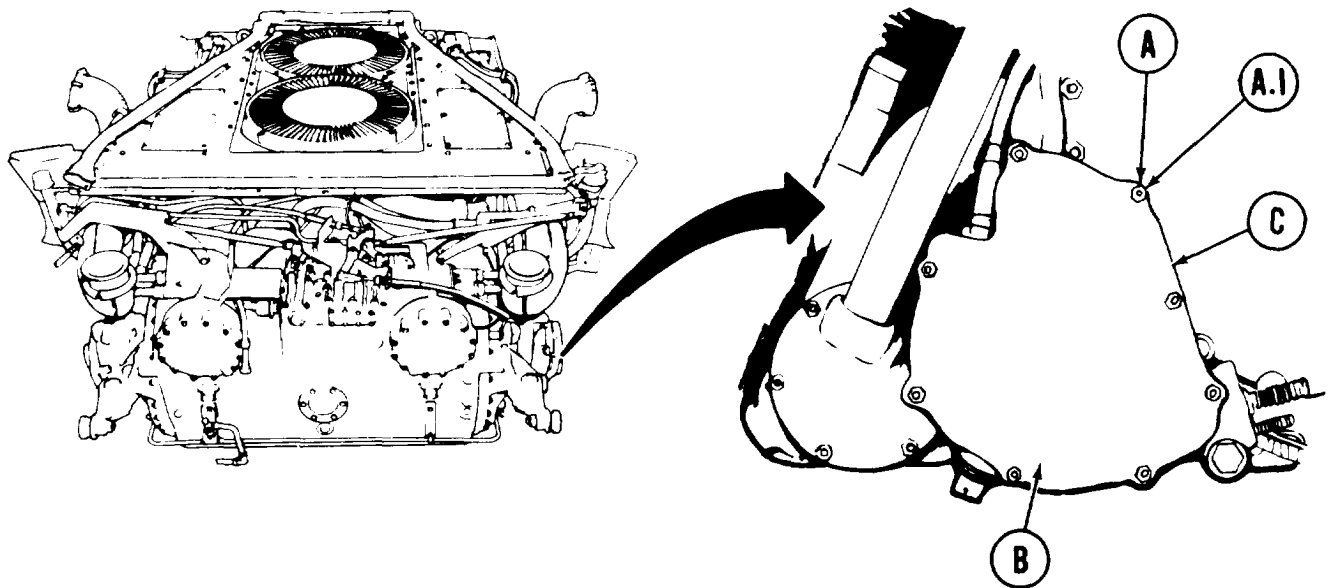
PRELIMINARY PROCEDURE: Remove powerplant (page 5-1)

NOTE

If your vehicle is equipped with the two-piece control assembly, it must be separated at the disconnect.

ADJUSTMENT:

1. Using socket, remove eight nuts (A) and lockwashers (A1) securing cover and gasket (B) to brake housing assembly (C). Remove cover and gasket. Throw gaskets and lockwashers away.



Go on to Sheet 2

TA253416

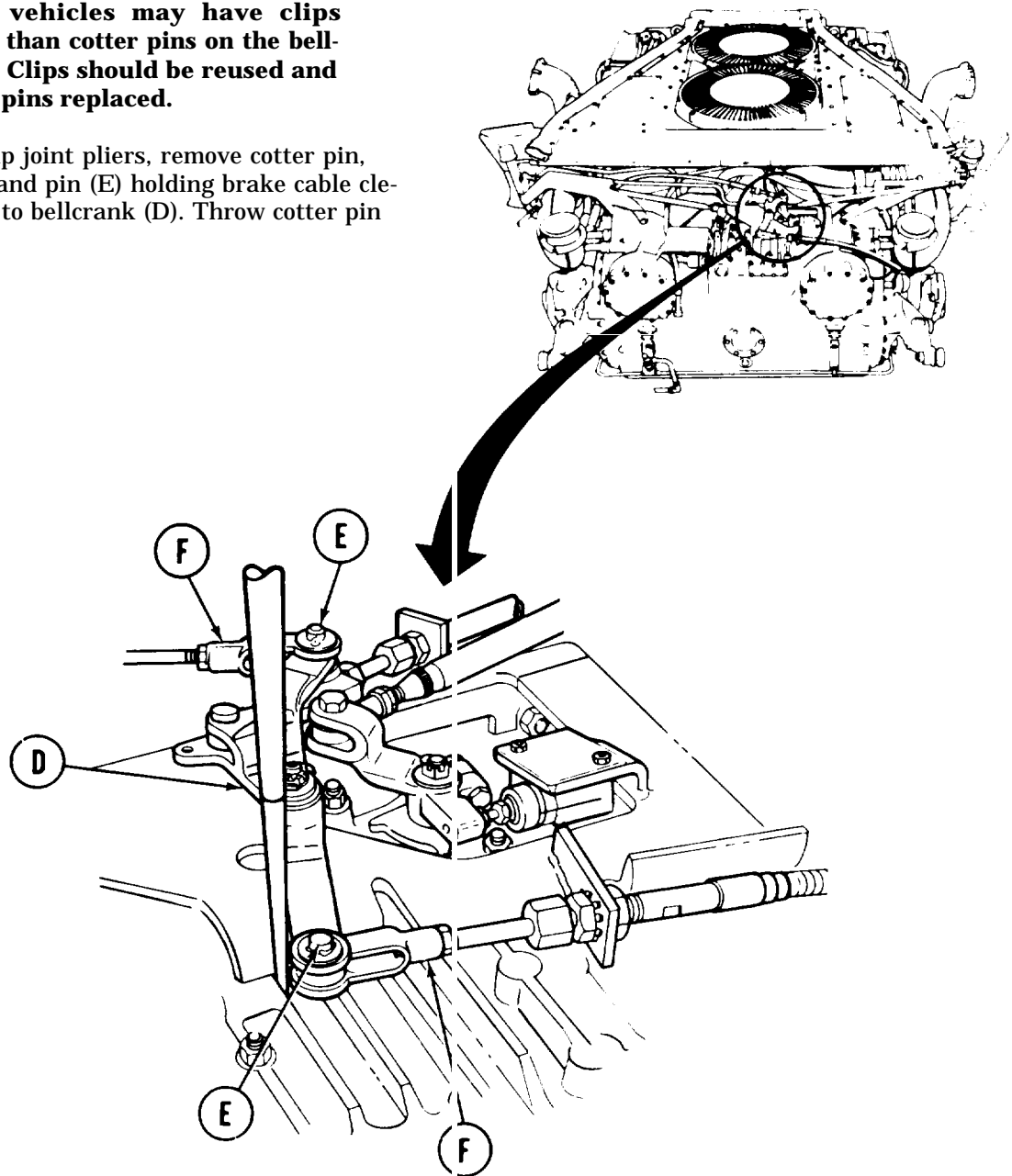
PARKING BRAKE PAWL AND BELLCRANK ADJUSTMENT (Sheet 2 of 9)

- Using pry bar, rotate bellcrank (D) counterclockwise to park position.

NOTE

Some vehicles may have clips rather than cotter pins on the bellcrank. Clips should be reused and cotter pins replaced.

- Using slip joint pliers, remove cotter pin, washer, and pin (E) holding brake cable clevises (F) to bellcrank (D). Throw cotter pin away.



Go on to Sheet 3

TA253417

Change 1 13-17

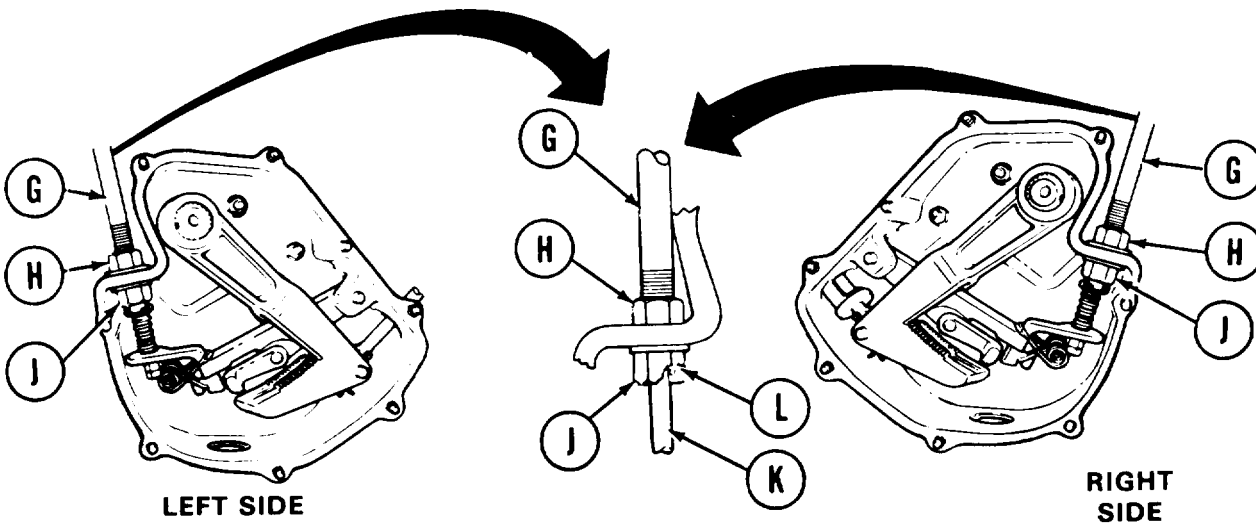
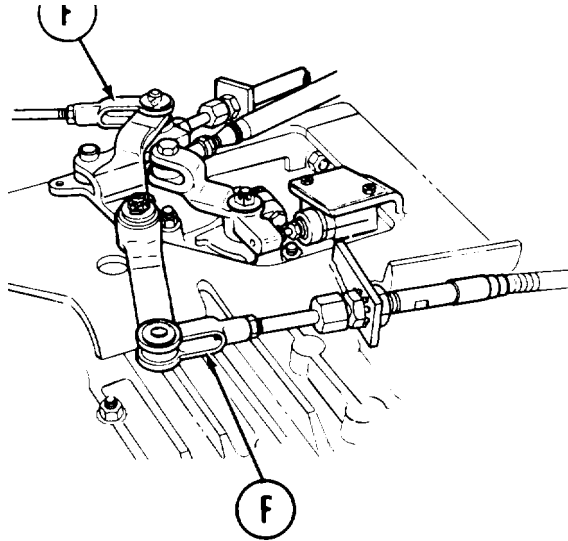
PARKING BRAKE PAWL AND BELLCRANK ADJUSTMENT (Sheet 3 of 9)

- At side housing assembly, hold control (G) at flats using open end of 9/16 inch wrench and loosen jamnut (H) with a 15/16 inch wrench. Continue holding control (G), finger tighten nut (J) until nut bottoms on control (G). Tighten nut (H) with a 15/16 inch wrench.

CAUTION

Do not tighten nut (J) with wrench, shaft (K) will bind on control (G). Finger tighten nut (J) only.

- Push and pull on clevis (F). Be sure shaft (K) does not bind. If free movement occurs, go to next step. If binding occurs, back off sleeve nut (J). Visibly inspect packing (L) for damage. Refer to page 3-70 for removal. Do not replace packing. When complete repeat step 5.

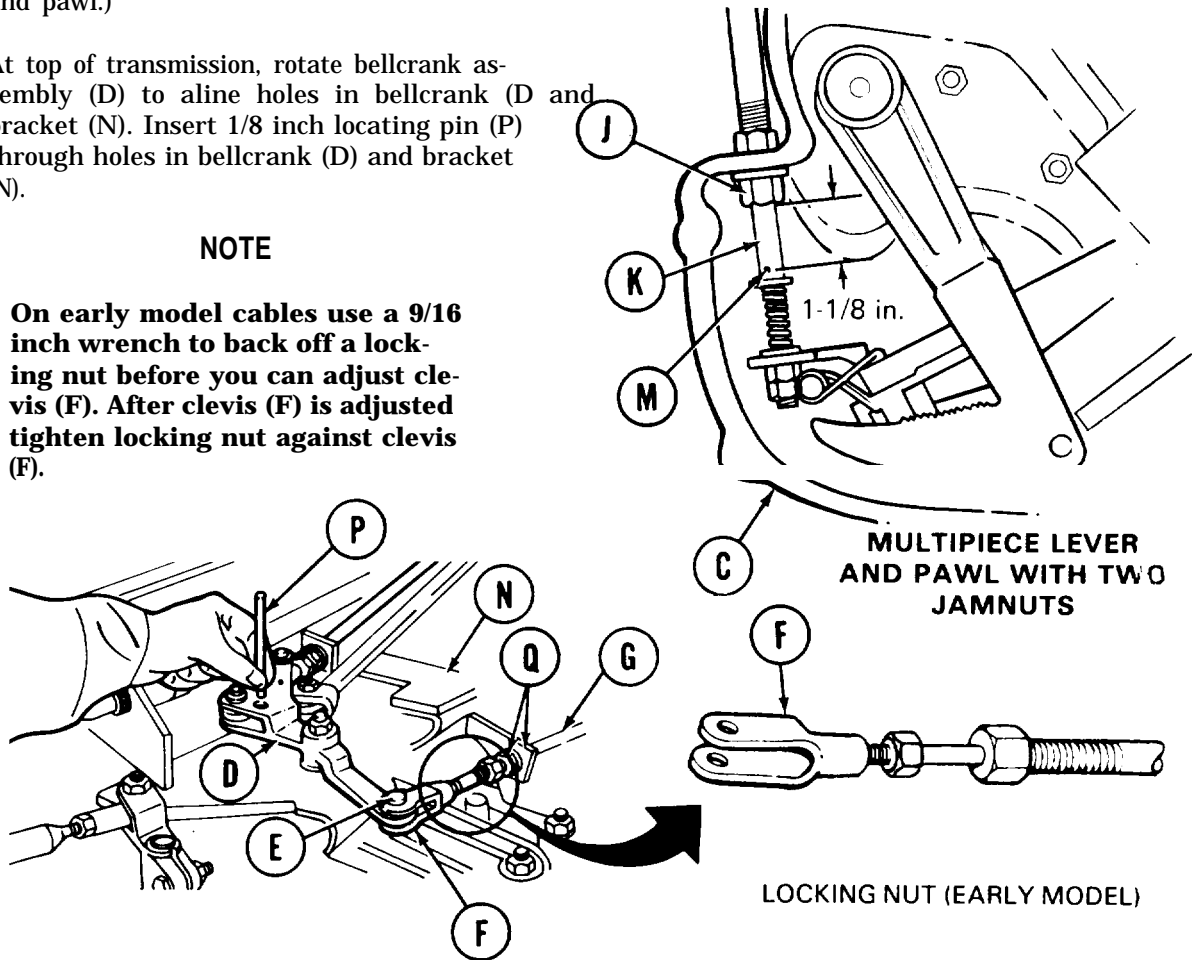


PARKING BRAKE PAWL AND BELLCRANK ADJUSTMENT (Sheet 4 of 9)

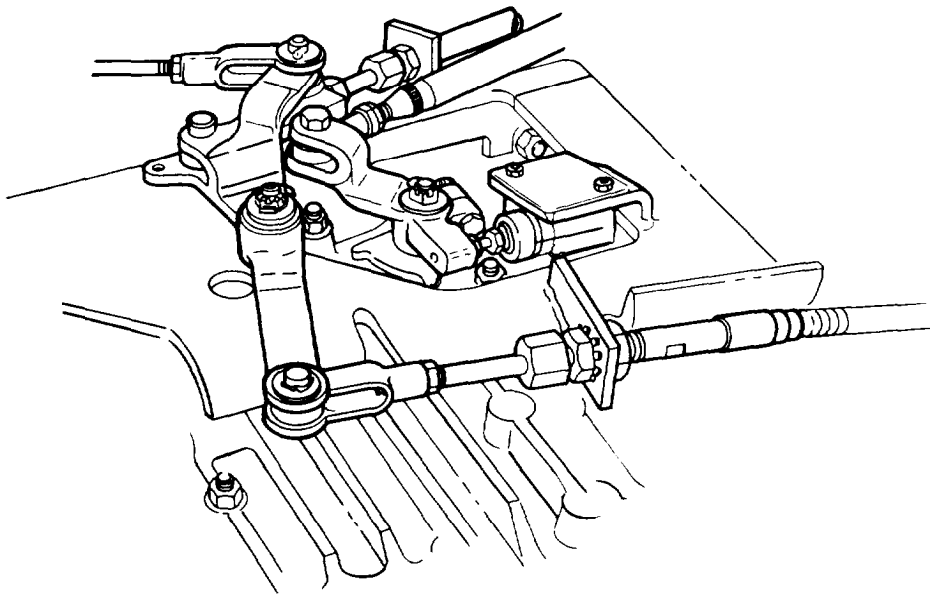
6. Push/pull cable (K) until 1-1/8 inch gage block fits between cotter pin (M) and sleeve nut (J). (15/16 gage block for one-piece lever and pawl.)
7. At top of transmission, rotate bellcrank assembly (D) to align holes in bellcrank (D) and bracket (N). Insert 1/8 inch locating pin (P) through holes in bellcrank (D) and bracket (N).

NOTE

On early model cables use a 9/16 inch wrench to back off a locking nut before you can adjust clevis (F). After clevis (F) is adjusted tighten locking nut against clevis (F).



8. Using two 15/16 inch wrenches, loosen two nuts (Q) and adjust control assembly (G) until clevis pin (E) slides freely in the respective holes. If clevis pin (E) binds at bellcrank, adjust clevis (F) until bind no longer occurs.
9. Using two 15/16 inch wrenches, tighten nuts (Q), install clevis pin (E) and using pliers, install washer and new cotter pin on clevis pin (E).
10. Remove gage block from side housing assembly (C).
11. Remove locating pin (P). Rotate bellcrank (D) left and right to check for free movement . If bellcrank moves freely continue adjustment, refer to page 13-18.2. If bellcrank binds, replace control cable assembly (Page 13-84).



NOTE

For vehicles equipped with the one-piece lever and pawl with two jamnuts, do steps 12 thru 16, refer to page 13-18.3

For vehicles equipped with the multipiece lever and pawl with two jamnuts, do steps 17 thru 22, refer to page 13-18.4

For vehicles equipped with the multipiece lever end pawl with interlocking jamnut do steps 23 thru 28, refer to page 13-18.5

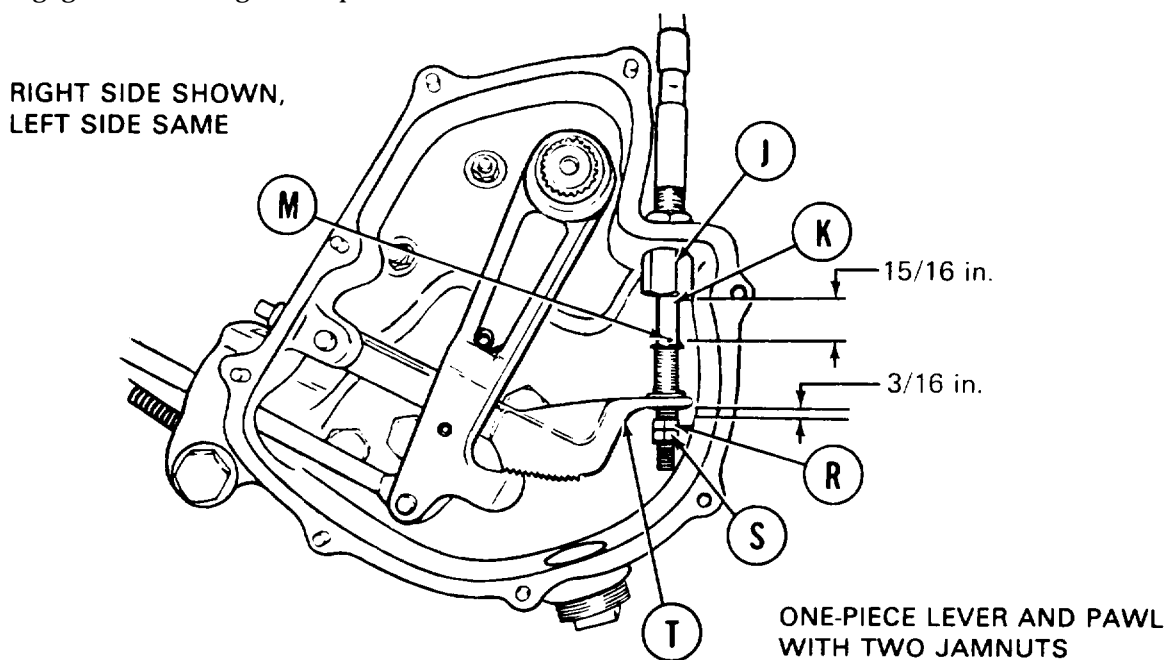
Insert 1/8 inch diameter locating pin (P) in bellcrank assembly for steps 12, 17, and 23.

PARKING BRAKE PAWL AND BELLCRANK ADJUSTMENT (Sheet 6 of 9)

CAUTION

Do not allow shaft to turn or damage to control will result.

12. Using two 9/16 inch wrenches, loosen two nuts (R) and (S) on end of shaft (K).
13. Push or pull shaft (K) until a 15/16 inch gage block fits between cotter pin (M) and bottom face of sleeve nut (J).
14. Adjust upper nut (R) to allow a 3/16 inch gage block to be placed between the lower face of lever (T) and upper nut (R).
15. Using two 9/16 inch wrenches, hold nut (R) and lock lower nut (S) securely against upper nut (R).
16. Remove gage blocks and go to step 31.



Go on to Sheet 7

TA253421

Change 1 13-18.3

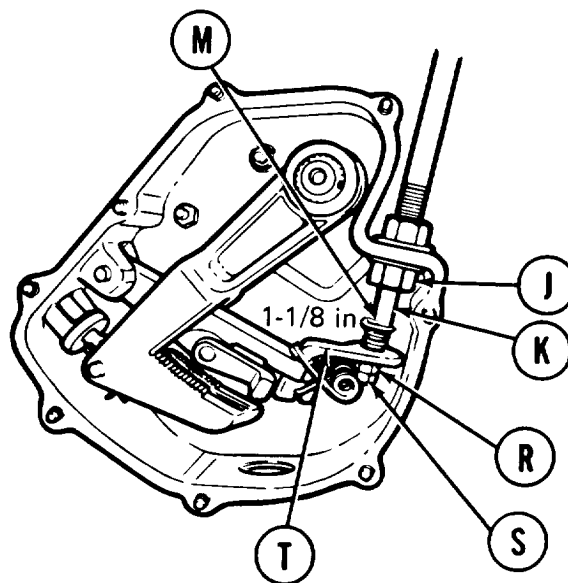
PARKING BRAKE PAWL AND BELLCRANK ADJUSTMENT (Sheet 7 of 9)

CAUTION

Do not allow shaft to turn or damage to control will result.

17. Remove spring from pawl, using two 9/16 inch wrenches, loosen two nuts (R) and (S) on end of shaft (K).
18. Push or pull shaft (K) until 1-1/8 inch gage block just fits between cotter pin (M) and sleeve nut (J).
19. With gage block in place, rotate upper nut (R) until there is metal to metal contact between upper nut (R) and lever assembly (T).
20. Using 9/16 inch wrench, back off upper nut (R) 1-1/2 turns.
21. Using two 9/16 inch wrenches, hold nut (R) and lock lower nut (S) securely against upper nut (R) and install spring on pawl.
22. Remove gage block and go to step 31.

RIGHT SIDE SHOWN,
LEFT SIDE SAME

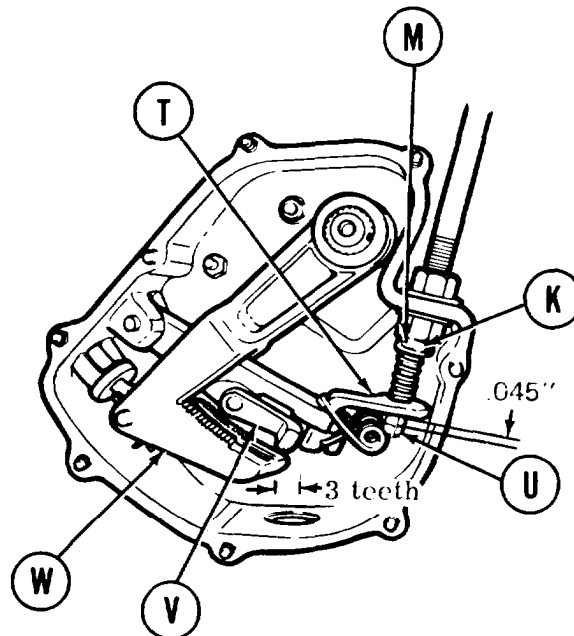


**MULTIPIECE LEVER AND PAWL
WITH INTERLOCKING JAMNUT**

PARKING BRAKE PAWL AND BELLCRANK ADJUSTMENT (Sheet 8 of 9)

23. Remove cotter pin (M).
24. Lift lever assembly (T) up enough to disengage the lever (T) from the vertical flats on nut (U). Turn nut (U) on shaft (K) until it just makes contact with lever assembly (T) when lever is let fully down and is in contact with pawl (V) and pawl is in contact with nonserrated portion of brake lever (W). When properly adjusted, pawl (V) will touch top of brake lever (W).
25. Using pry bar between housing and brake lever (W), move brake lever until the first three teeth on the brake lever (W) are fully engaged with the first three teeth on pawl (V).
26. Using feeler gage, measure distance between lever assembly (T) and nut (U). Measurement should be 0.045 ± 0.005 inches.
27. If measurement is within tolerance, go to step 28. If measurement is not within tolerance. Repeat steps 24, 25, and 26.
28. Install cotter pin (M).

RIGHT SIDE SHOWN,
LEFT SIDE SAME



MULTIPIECE LEVER AND PAWL
WITH INTERLOCKING JAMNUT

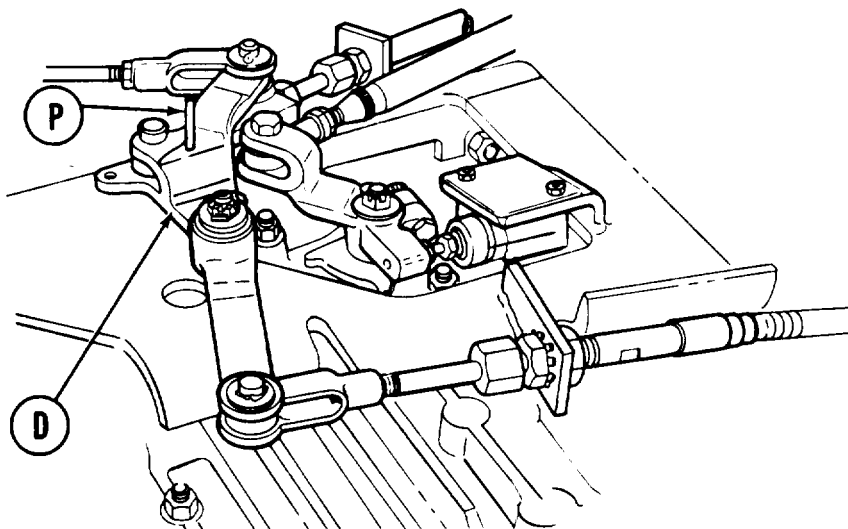
Go on to Sheet 9

TA253423

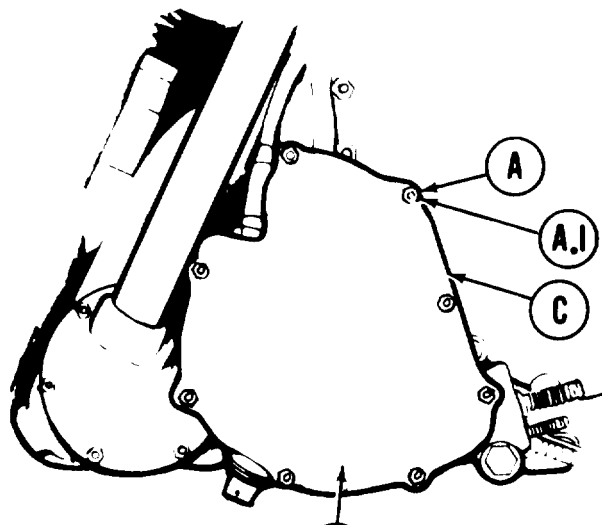
Change 1 13-18.5

PARKING BRAKE PAWL AND BELLCRANK ADJUSTMENT (Sheet 9 of 9)

29. Remove locating pin (P) and using pry bar, rotate bellcrank (D) clockwise to release brakes.



30. Position cover and new gasket (B) on brake housing (C).
31. Install eight new lockwashers (A.1) on to studs of brake housing (C).
32. Using socket, install and tighten eight nuts (A) to secure lockwashers (A.1), cover and gasket (C).
33. Install 2A power plant (page 5-14) or 2D power plant (page 5-37).



End of Task

TA253424

PARKING BRAKE CABLE ADJUSTMENT (Sheet 1 of 4)

TOOLS: 9/16 in. combination box and open end wrench
15/16 in. combination box and open end wrench (2 required)
9/16 in. socket with 1/2 in. drive
Ratchet with 1/2 in. drive
6 in. ruler
Grinder
Long round nose pliers
Drop light

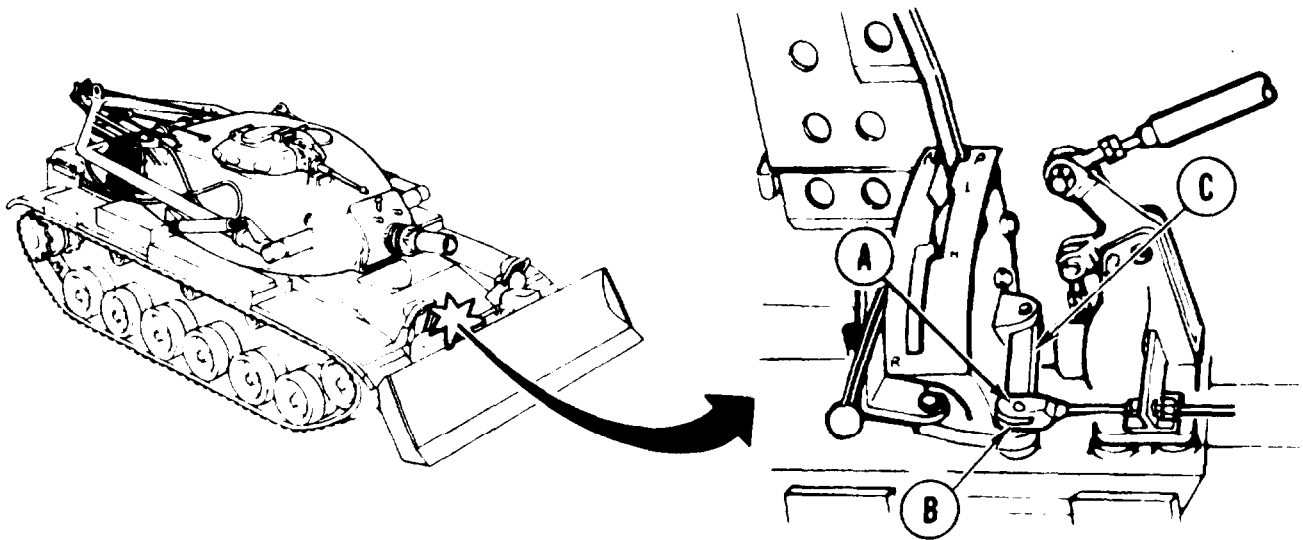
SUPPLIES: Cotter pins (MS24665-283)
Pencil
Locating pin (1/8 in. drill or welding rod 4 in. long)

REFERENCE: TM 9-2350-222-10

PRELIMINARY PROCEDURES: Remove transmission shroud (page 9-20)
Block tracks (TM 9-2350-222-10)

CABLE ADJUSTMENT:

1. Set transmission shift lever to N (neutral) position.
2. Using pliers, remove cotter pin, washer, and pin (A) holding brake cable clevis (B) to parking brake lever (C). Throw cotter pin away.



Go on to Sheet 2

TA253425

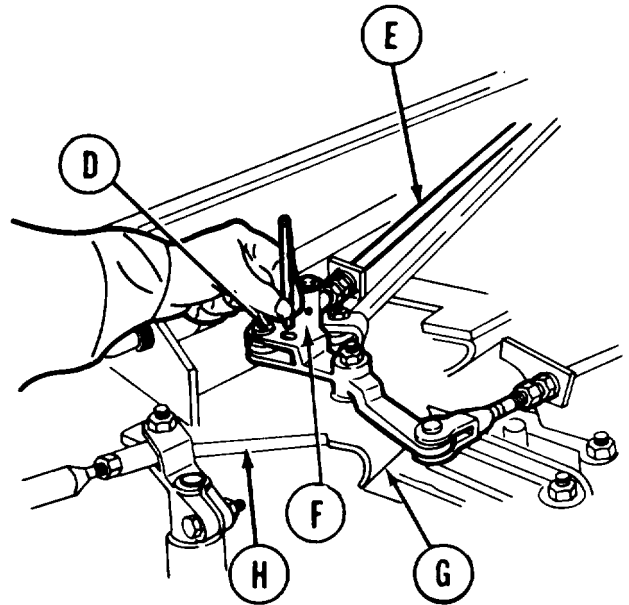
PARKING BRAKE CABLE ADJUSTMENT (Sheet 2 of 4)

- Using pliers, remove cotter pin washer and pin (D) holding brake cable (E) to bellcrank (F) at transmission (G). Throw cotter pins away.

- Rotate bellcrank (F) to align holes in bellcrank (F) with hole in bracket (H). Insert 1/8 inch locating pin through bellcrank (F) and bracket (H).

NOTE

Locating pin must slide up and down freely while performing remaining adjustments.



- Push parking brake cable (E) inward until it stops.
- Check forward end of cable at driver's station for free movement.

Go on to Sheet 3

TA253426

Change 1 13-21

PARKING BRAKE CABLE ADJUSTMENT (Sheet 3 of 4)

7. Using ruler, measure distance between nut (J) and clevis (K) after brake cable (E) is pushed inward as far as possible. Record reading.

8. Pull brake cable (E) outward 3/4 inch farther than reading taken in step 7.

NOTE

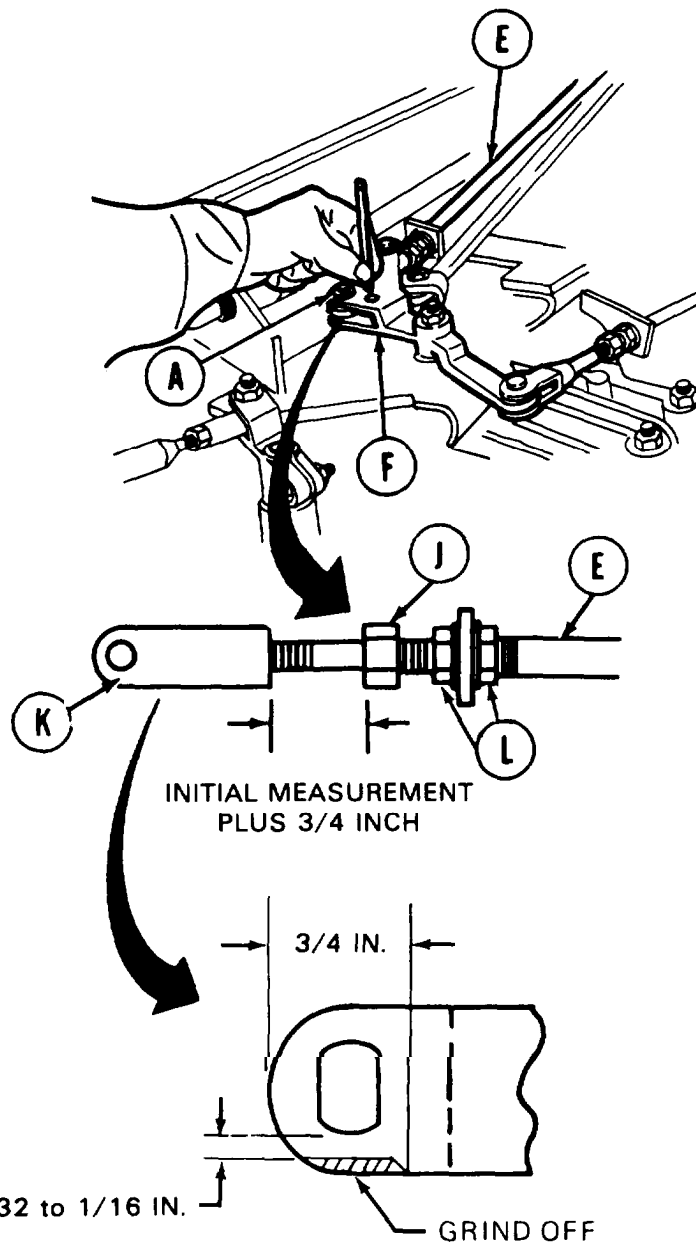
Do not change 3/4 inch position when performing steps 9 and 10.

9. Position clevis (K) in bellcrank (F). Insert pin, washer, and new cotter pin (D). Do not allow cable (E) to turn, or damage will result. Nuts and clevis must thread freely on cable (see step 10).

10. If pin cannot be freely inserted in clevis (K), using 15/16 inch wrench, loosen two nuts (L) and adjust cable travel maintaining distance in step 8 until clevis (K) and bellcrank (F) will aline. Tighten two nuts (L) after inserting pin, washer, and new cotter pin.

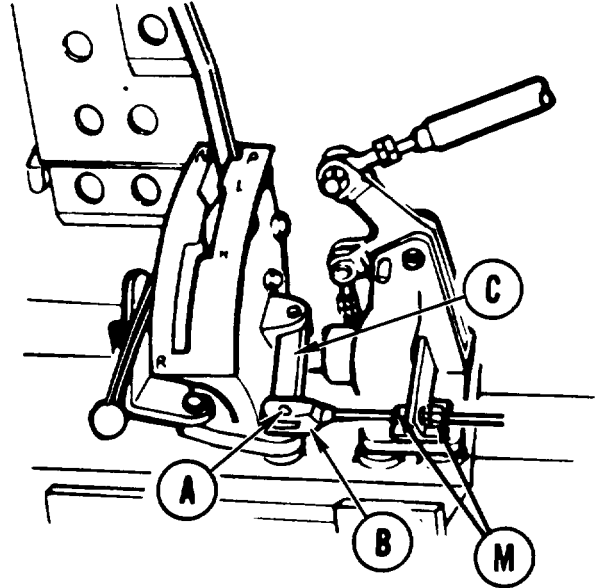
NOTE

An interference may exist between clevis and locating pin during this adjusting procedure. It may be necessary to grind clevis as shown to eliminate this interference.



PARKING BRAKE CABLE ADJUSTMENT (Sheet 4 of 4)

11. Place shift lever in P (park) position. Install parking brake cable clevis (B) to parking brake lever (C), using pin, washer, and new cotter pin (A).
12. If clevis (B) will not align with parking brake lever (C), using 15/ 16 inch wrench, loosen two nuts (M) and adjust cable until clevis (B) aligns with lever (C). Install pin, washer, and new cotter pin (A).
13. Remove locating pin installed in step 4.
14. Install transmission shroud (page 9-23).
15. Unblock tracks (TM 9-2350-222-10).



End of Task

TA140331

BRAKE CONTROL PEDAL AND BRACKET REPAIR AND REPLACEMENT (Sheet 1 of 5)

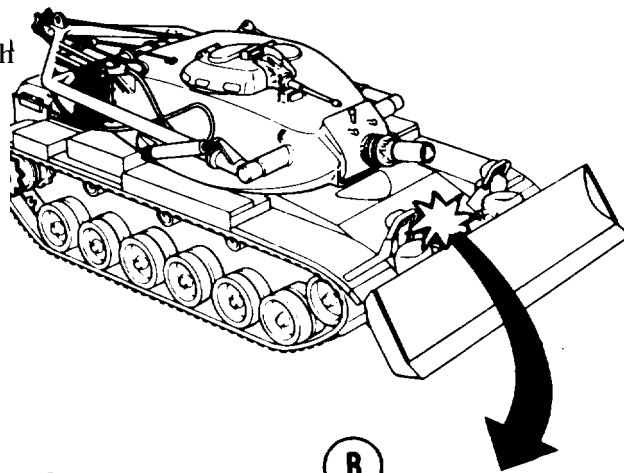
PROCEDURE INDEX

PROCEDURE	PAGE
Removal	13-24
Disassembly	13-26
Assembly	13-26
Installation	

TOOLS:

- Hammer
- 3/16 in. drive punch
- 9/16 in. combination box and open end wrench
- 3/8 in. combination box and open end wrench
- Vise
- Alining punch
- Slip joint pliers

- SUPPLIES: Spring pins (MS39086-47) (2 required)
 Bearing (70417-A742-2) (5 required)

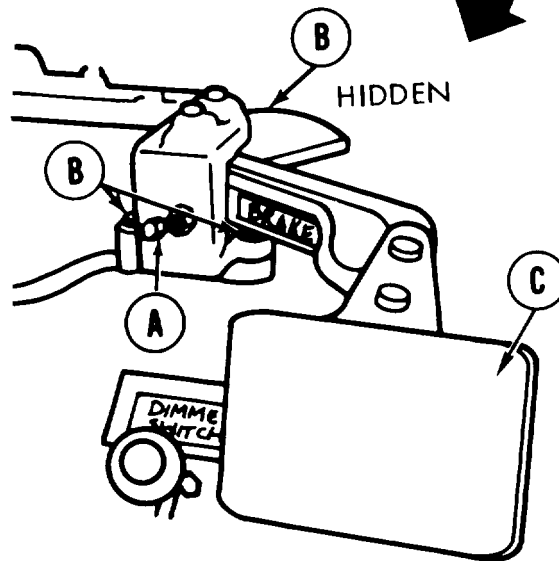


REMOVAL:

1. Using 3/8 inch wrench, remove screw (A).

NOTE

Screw and washer (B) in rear mounting hole may not come out of bracket until later in disassembly.



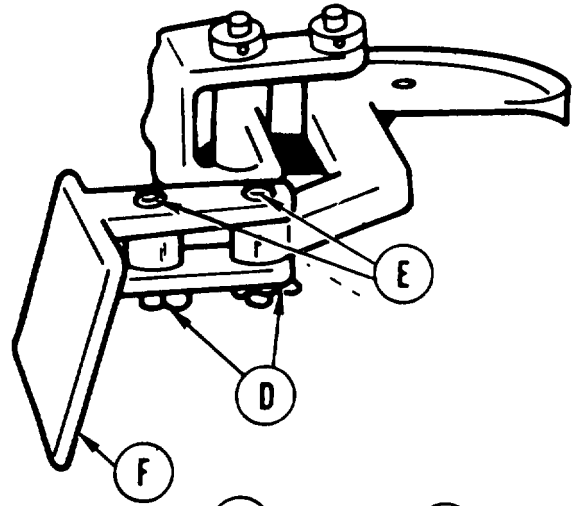
2. Using 9/16 inch wrench, remove three mounting screws and lockwashers (B).
3. Raise and remove control pedal (C) and related parts as an assembly.

Go on to Sheet 2

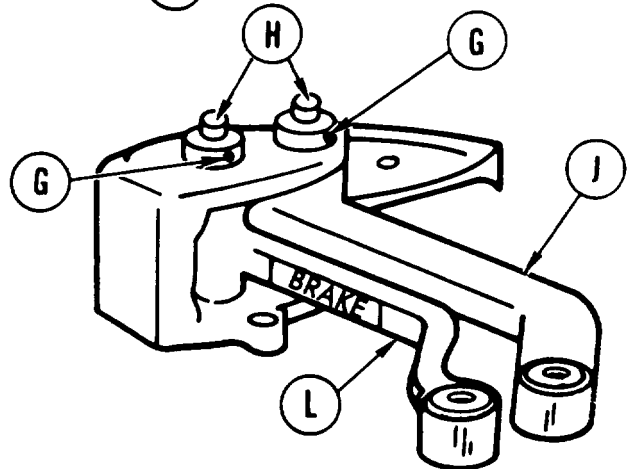
TA140332

BRAKE CONTROL PEDAL AND BRACKET REPAIR AND REPLACEMENT (Sheet 2 of 5)

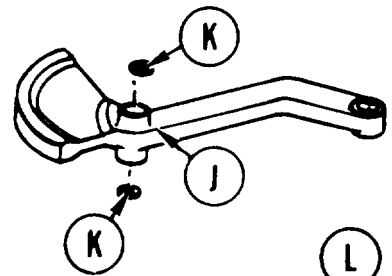
4. Using pliers, remove two lockpins (D).
5. Remove two pins (E) and control pedal (F).



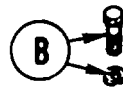
6. Using hammer and punch, drive out two spring pins (G). Throw spring pins away.
7. Using hammer and punch, drive out two pins (H).



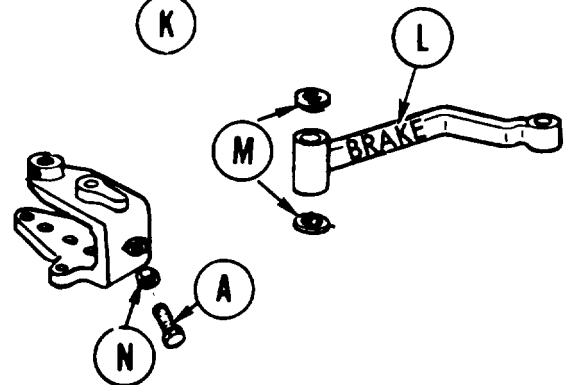
8. Remove lever assembly (J) and two washers (K).
9. Remove lever assembly (L) and two washers (M).



10. Remove remaining mounting screw and lockwasher (B). Throw lockwasher away.



11. Using 3/8 inch wrench and 9/16 inch wrench, remove nut (N) from screw (A).



Go on to Sheet 3

TA140333

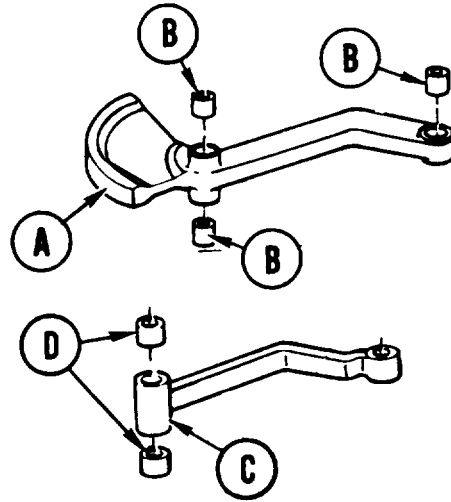
BRAKE CONTROL PEDAL AND BRACKET REPAIR AND REPLACEMENT (Sheet 3 of 5)

DISASSEMBLY:

NOTE

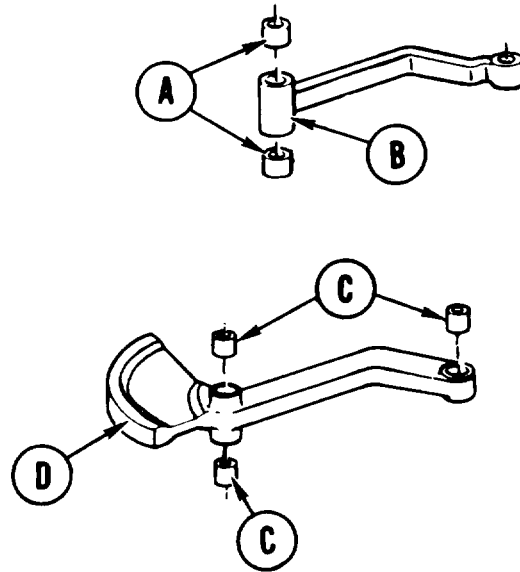
Portion of lever assemblies with two bearings have a shoulder in the middle between bearings.

1. Place lever (A) in vise. Using alining punch and hammer, carefully drive three bearings (B) from lever (A).
2. Place lever (C) in vise. Using alining punch and hammer, carefully drive two bearings (D) from lever (C). Throw bearings away.



ASSEMBLY:

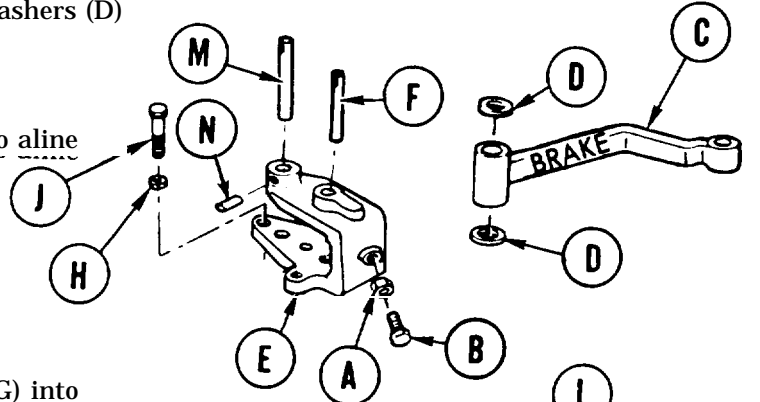
1. Using vise, carefully press two new bearings (A) into lever (B).
2. Using vise, carefully press three new bearings (c) into lever (D).



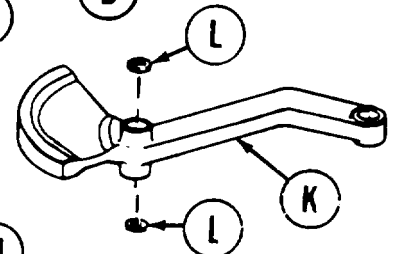
BRAKE CONTROL PEDAL AND BRACKET REPAIR AND REPLACEMENT (Sheet 4 of 5)

INSTALLATION:

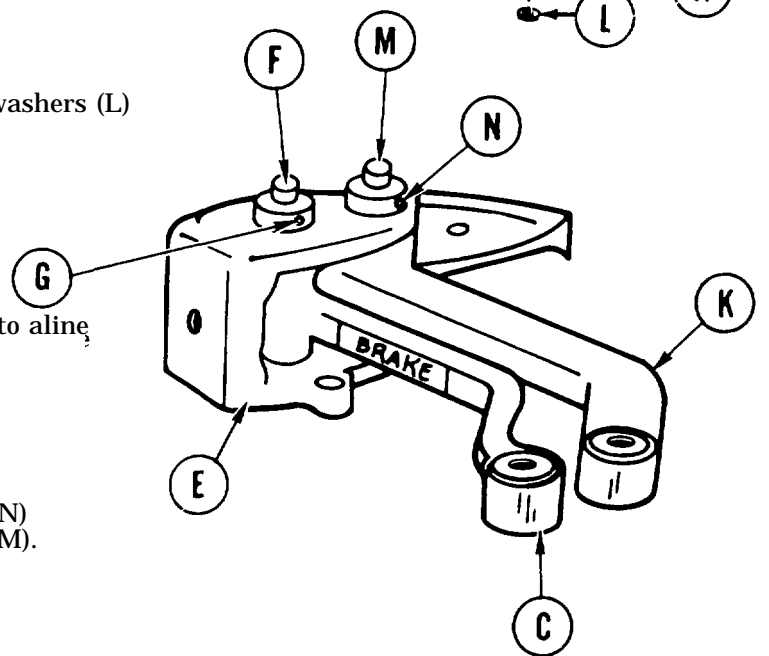
1. Thread nut (A) onto screw (B).
2. Position lever assembly (C) and two washers (D) in bracket (E). Insert pin (F).



3. Using slip joint pliers, rotate pin (F) to align hole with hole in bracket (E).
4. Using hammer, drive new spring pin (G) into holes of bracket (E) and pin (F).
5. Place washer (H) on screw (J). Insert screw in rear mounting hole of bracket (E).



6. Position lever assembly (K) and two washers (L) in bracket (E). Insert pin (M).



7. Using slip joint pliers, rotate pin (M) to align hole with hole in bracket (E).
8. Using hammer, drive new spring pin (N) through holes of bracket (E) and pin (M).

Go on to Sheet 5

TA14033521

**BRAKE CONTROL PEDAL AND BRACKET REPAIR AND REPLACEMENT
(Sheet 5 of 5)**

9. Position control pedal (P) on levers (C) and

10. Insert two pins (Q).

11. Using pliers, install two lockpins (R) through holes in pins (Q).

12. Place new lockwasher (S) on each of two screws (T).

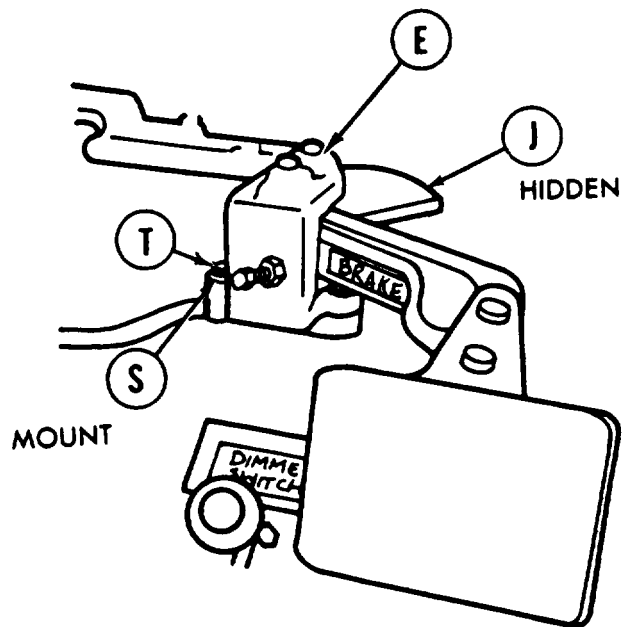
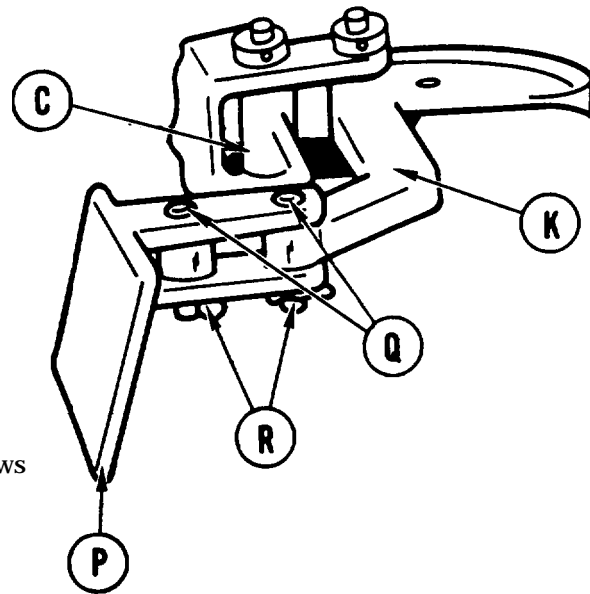
13. Position bracket (E) over locating pin of mount and aline mounting holes.

14. Holding bracket (E) slightly raised, tighten rear screw (J) finger tight.

15. Insert two screws (T) in front mounting holes and tighten finger tight.

16. Using 9/16 inch wrench, tighten screw (J) and two screws (T).

17. Perform brake pedal adjustment (page 13-10).



End of Task

TA140336

**BRAKE MASTER CYLINDER MOUNTING BRACKET AND PUSH ROD REPLACEMENT
(Sheet 1 of 7)**

PROCEDURE INDEX

PROCEDURE	PAGE
Removal	13-29
Cleaning and Inspection	13-32
	13-32

<p>TOOLS: 5/8 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 11/16 in. combination box and open end wrench 6 in. steel rule</p>	<p>13/16 in. combination box and open end wrench 9/16 in. socket with 1/2 in. drive 7/16 in. socket with 1/2 in. drive 10 in. extension with 1/2 in. drive 1/8 in. drive punch Long round nose pliers Hammer Ratchet with 1/2 in. drive</p>
---	--

- SUPPLIES: Webbed strap or twine (2-1/2 ft.long)
 Adhesive (Item 2, Appendix D)
 Steel wool (Item 55, Appendix D)
 Dry cleaning solvent (Item 54, Appendix D)
 Alcohol (Item 8, Appendix D)
 Lint-free cloth (Item 12, Appendix D)
 Boot (10915256)
 Lockwasher (MS35338-46) (8 required)
 Lockwasher (MS35338-44)
 Lockwasher (MS45904-80) (2 required)

REFERENCE: TM 9-2350-222-10

- PRELIMINARY PROCEDURES: Place shift lever in N (neutral) position (TM 9-2350-222- 10)
 Block tracks to prevent vehicle movement (TM 9-2350-222-10)
 Remove brake control pedal and bracket (page 13-24)
 Remove personnel heater duct (page 19-10)

REMOVAL:

NOTE

For ease of access, you may drop driver's escape hatch (TM 9-2350-222-10) and remove three fire extinguisher cylinders (page 21-49).

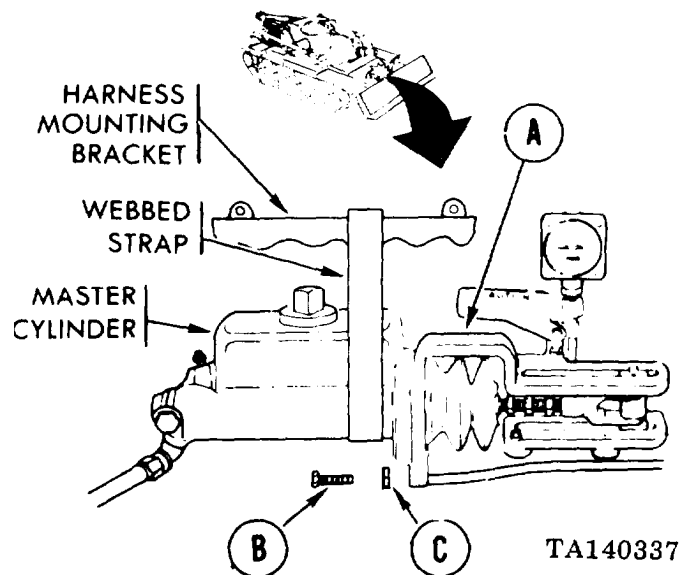
1. Install webbed strap firmly to support master cylinder when bracket (A) has been removed.

NOTE

For easier removal, remove two screws (B) at back side first,

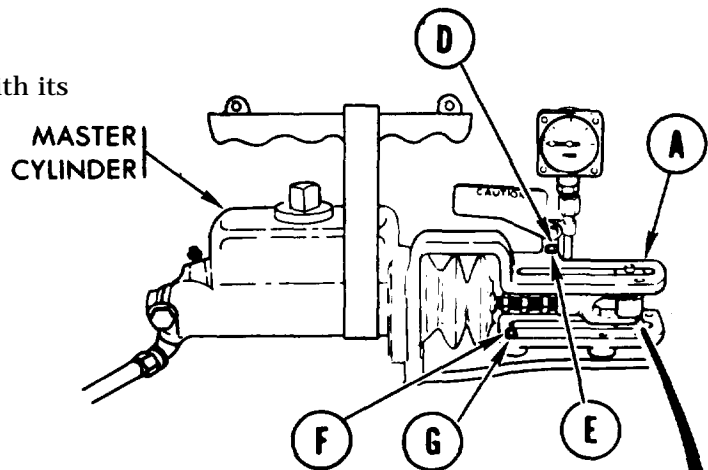
2. Using 9/16 inch socket or 9/16 inch wrench, remove five screws (B) and lockwashers (C) from bracket (A), Throw lockwashers away.

Go on to Sheet 2

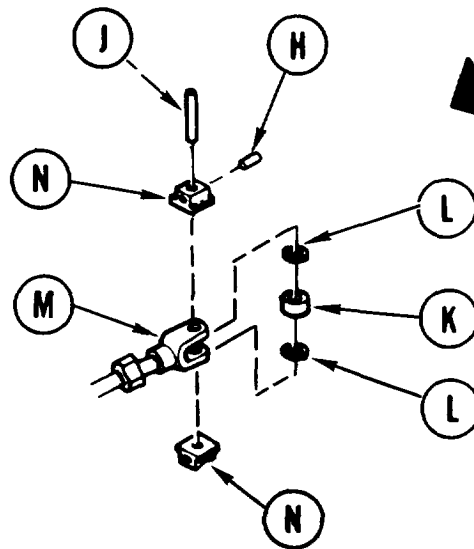


**BRAKE MASTER CYLINDER MOUNTING BRACKET AND PUSH ROD REPLACEMENT
(Sheet 2 of 7)**

3. Using 7/16 inch socket, remove screw (D) and lockwasher (E). Throw lockwasher away.
4. Using 9/16 inch wrench, remove three screws (F) and lockwashers (G). Throw lockwashers away.
5. Carefully raise and remove bracket (A) with its assembled parts from master cylinder.



6. Using hammer and punch, drive out pin (H).
7. Using hammer and punch, drive out pin (J).
8. Remove roller assembly (K) and two washers (L) from clevis (M).
9. Move clevis (M) from between two bearings (N), and remove bearings.

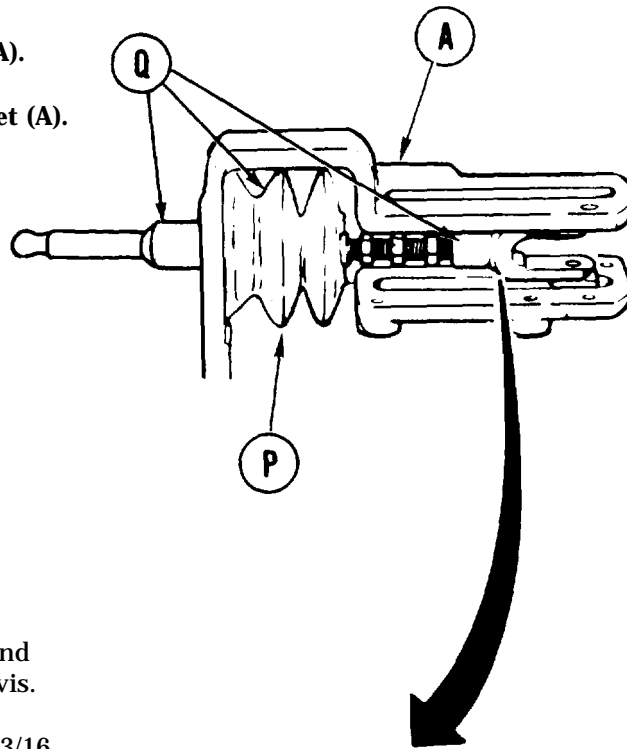


Go on to Sheet 3

TA140338

**BRAKE MASTER CYLINDER MOUNTING BRACKET AND PUSH ROD REPLACEMENT
(Sheet 3 of 7)**

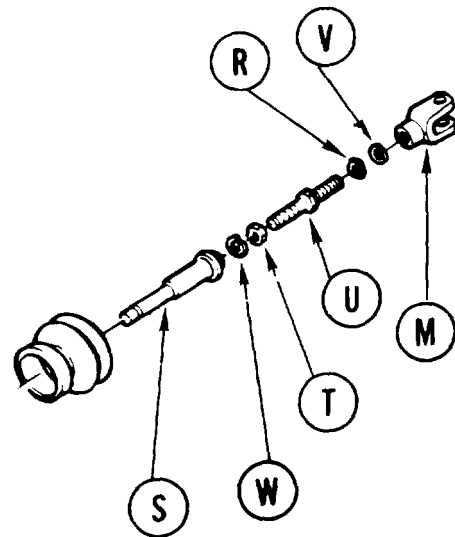
10. Push lip of boot (P) loose from bracket (A).
11. Remove assembled items (Q) from bracket (A).



NOTE

Clevis (M) and nut (R) have left hand threads. Push rod (S) and nut (T) have right hand threads.

12. Using 13/16 inch wrench on clevis (M) and 11/16 inch wrench on nut (R), loosen clevis.
13. Using 5/8 inch wrench on rod (U) and 13/16 inch wrench on clevis (M), remove clevis. If washer (V) is present, remove and throw away.
14. Using 5/8 inch wrench on rod (U) and 11/16 inch wrench on nut (T), loosen nut.
15. Using one 5/8 inch wrench on rod (U) and other 5/8 inch wrench on push rod (S), loosen push rod.
16. Using one 5/8 inch wrench on rod (U) and other 5/8 inch wrench on push rod (S), remove push rod. If washer (W) is present, remove and throw it away.

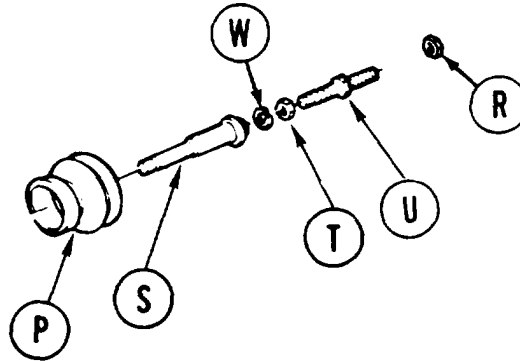


Go on to Sheet 4

TA140339

**BRAKE MASTER CYLINDER MOUNTING BRACKET AND PUSH ROD REPLACEMENT
(Sheet 4 of 7)**

17. Using 5/8 inch wrench on rod (U) and 11/16 inch wrench on nut (T), remove nut.
18. Using 5/8 inch wrench on rod (U) and 11/16 inch wrench on nut (R), remove nut.
19. Using hands, pull boot (P) from groove in push rod (S). Throw boot away.

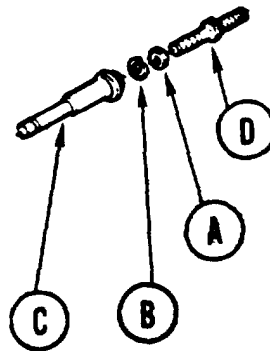


CLEANING AND INSPECTION:

1. Using steel wool (Item 55, Appendix D), remove old adhesive from groove in push rod (S).
2. Clean all parts in dry cleaning solvent (Item 54, Appendix D).
3. Inspect all parts for damage or wear. Replace all unserviceable parts.

INSTALLATION:

1. Thread nut (A), new lockwasher (B), and push rod (C) on rod (D).



Go on to Sheet 5

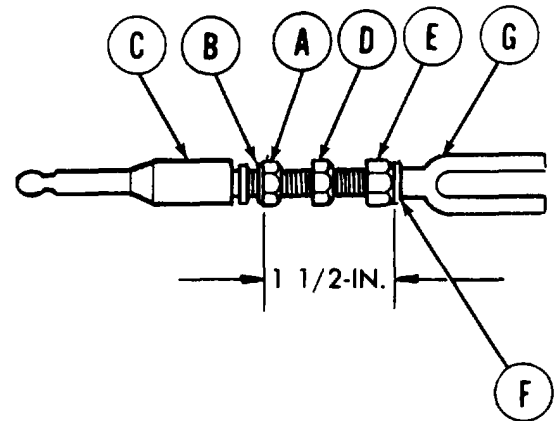
TA140340

BRAKE MASTER CYLINDER MOUNTING BRACKET AND PUSH ROD REPLACEMENT
 (Sheet 5 of 7)

NOTE

Nut (E) and clevis (G) have left hand threads.

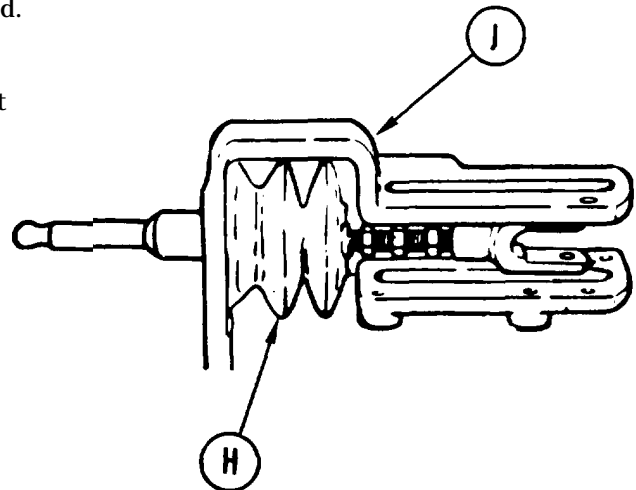
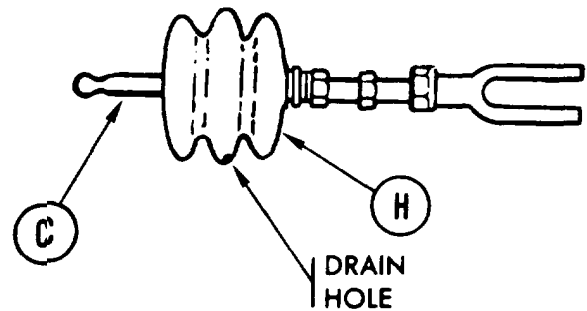
2. Thread nut (E), new lockwasher (F), and clevis (G) on rod (D),
3. Snug up nuts (A) and (E) on push rod (C) and clevis (G) with ends of push rod and clevis about 1-1/2 inches apart and hex of rod (D) about centered.



NOTE

Nuts (A) and (E) will be tightened during adjustment procedure.

4. Apply adhesive (Item 2, Appendix D) to groove of push rod (C) and edge of smaller hole of new boot (H).
5. Slide boot (H) over push rod (C) with drain hole down and seat lip of boot in groove of push rod.
6. Insert assembled items (A) thru (H) in bracket (J).

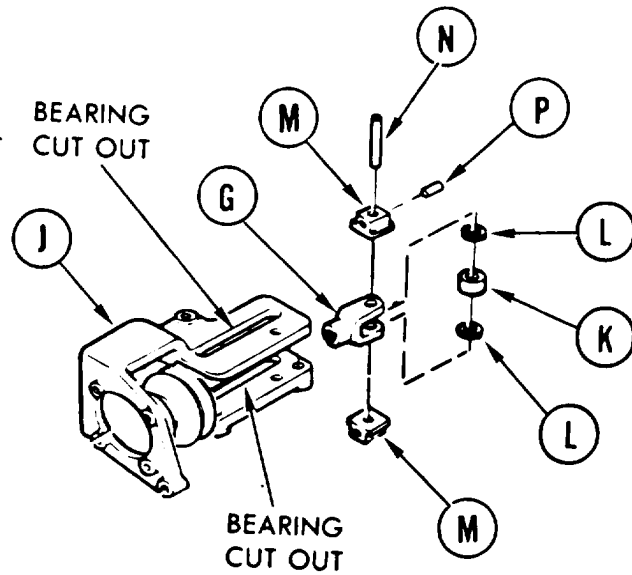


Go on to Sheet 6

TA140341

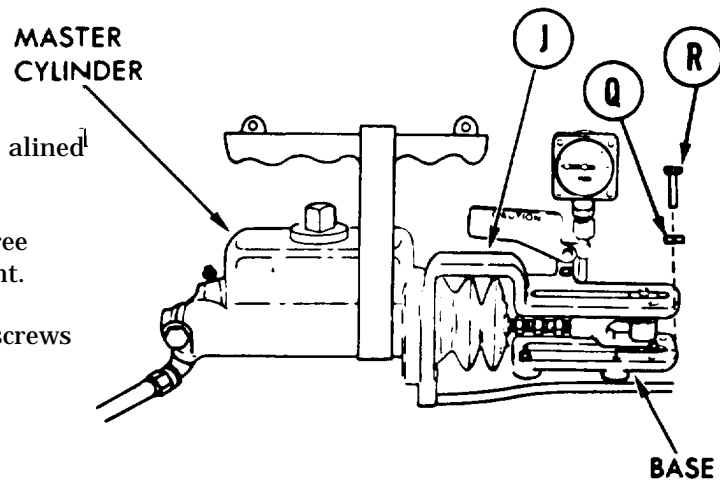
**BRAKE MASTER CYLINDER MOUNTING BRACKET AND PUSH ROD REPLACEMENT
(Sheet 6 of 7)**

7. Position roller assembly (K) and two washers (L) in clevis (G).
8. Slide two bearings (M) along bearing cutouts of bracket (J) above and below clevis (G).
9. Aline holes in items (K) thru (M) and insert new pin (N) with its hole alined with the hole in top bearing (M).
10. Using hammer and punch, drive pin (P) through top bearing (M) and pin (N).



11. Using lint-free cloth (Item 12, Appendix D) and alcohol (Item 8, Appendix D), clean face and flange of master cylinder of all dirt and grease.

12. Carefully position bracket (J) with holes alined with base.
13. Place new lockwasher (Q) on each of three screws (R) and tighten screws finger tight.
14. Using 9/16 inch wrench, tighten three screws (R).



Go on to Sheet 7

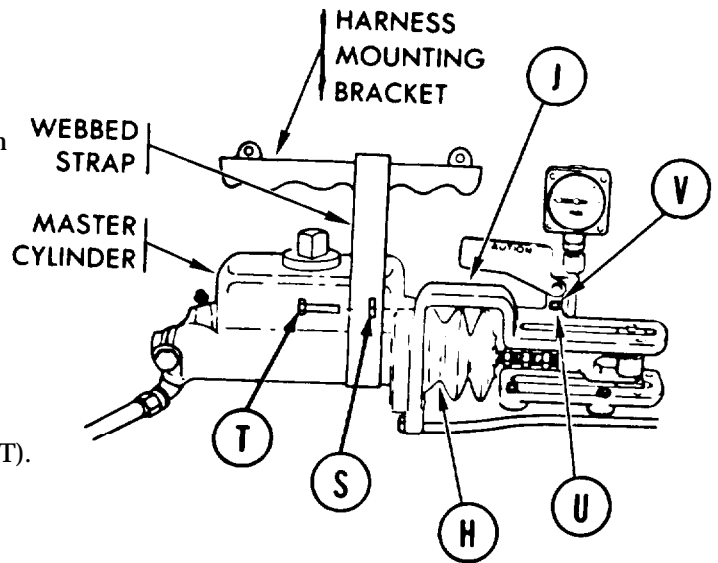
TA140342

**BRAKE MASTER CYLINDER MOUNTING BRACKET AND PUSH ROD REPLACEMENT
(Sheet 7 of 7)**

15. Aline holes in master cylinder with those in bracket (J).

16. Place new lockwasher (S) on five screws (T), insert screws, and tighten finger tight.

17. Using 9/16 inch socket, tighten five screws (T).



18. Place new lockwasher (U) on screw (V), insert screw, and tighten finger tight.

19. Using 7/16 inch socket, tighten screw (V).

20. Slip boot (H) over lip of master cylinder.

21. Remove webbed strap from master cylinder and harness mounting bracket.

22. Install personnel heater duct (page 19-1 1).

23. Install brake control pedal and mount (page 13-26).

24. Adjust brake pedal (page 13-10).

25. Place shift lever in P (park) position and remove blocks from track (TM 9-2350-222-10).

End of Task

TA140343

PROCEDURE INDEX

PROCEDURE	PAGE
Removal	13-36
Installation	13-38

TOOLS: Ratchet with 1/2 in. drive
 Slip joint pliers
 3/4 in. combination box and open end wrench
 13/16 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
 7/16 in. socket with 1/2 in. drive
 5 in. extension with 1/2 in. drive

SUPPLIES: Container (to catch brake fluid)
 3/4 in. plastic cap
 Silicone brake fluid (Item 34, Appendix D)
 Lockwasher (MS35338-44 (2 required))

REFERENCE: TM 9-2350-222-10

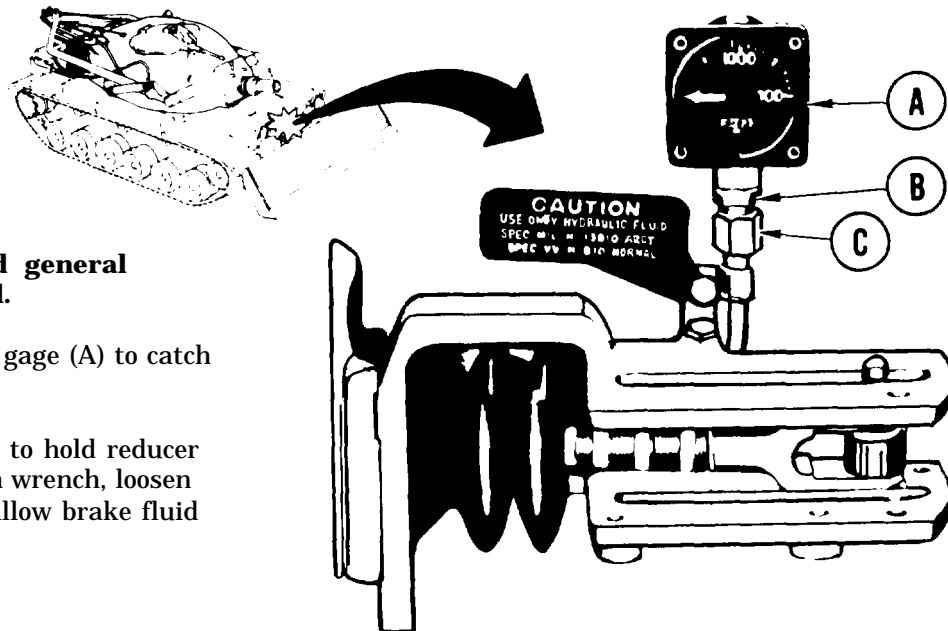
PRELIMINARY PROCEDURES: Place shift lever in N (neutral) position (TM 9-2350-222- 10)
 Block tracks (TM 9-2350-222-10)

REMOVAL:

NOTE

Clean all parts and general area prior to removal.

1. Position container under gage (A) to catch brake fluid.
2. Using 13/16 inch wrench to hold reducer (B) and, using 11/ 16 inch wrench, loosen tube assembly nut (C). Allow brake fluid to drain into container.

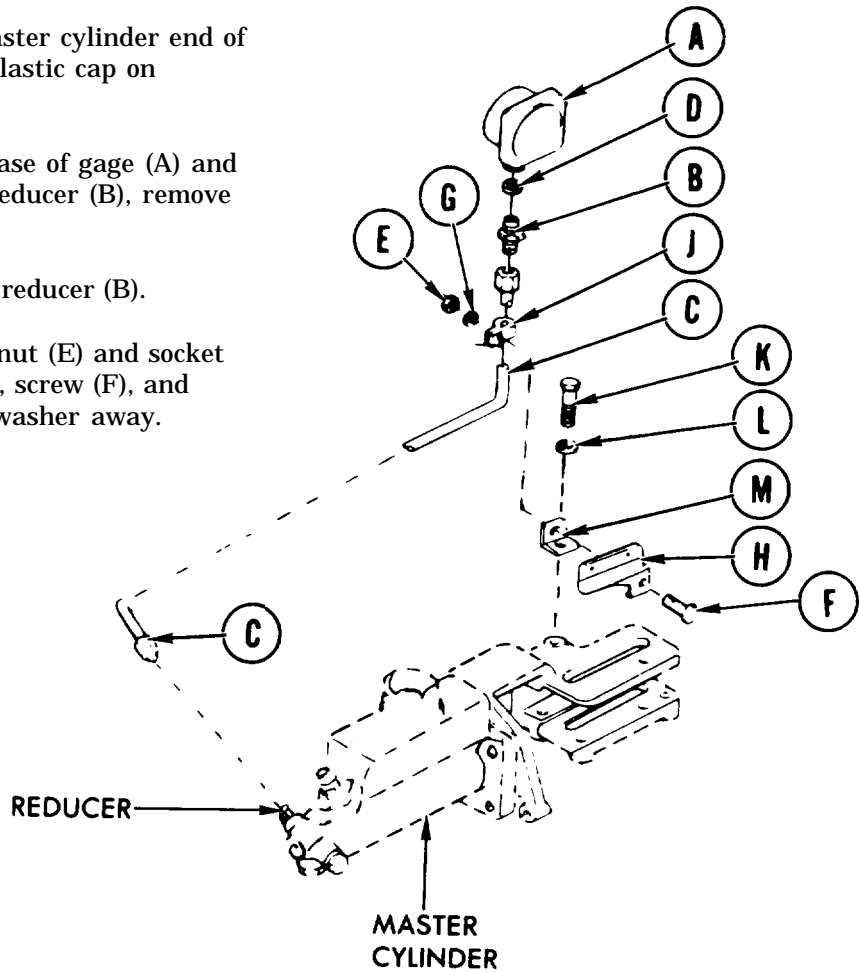


Go on to Sheet 2

TA253428

BRAKE PRESSURE GAGE AND RELATED PARTS REPLACEMENT (Sheet 2 of 4)

3. Repeat step 2 for nut at master cylinder end of tube assembly (C). Install plastic cap on reducer.
4. Using 3/4 inch wrench on base of gage (A) and 13/16 inch wrench to hold reducer (B), remove gage.
5. Remove flat washer (D) and reducer (B).
6. Using 7/16, inch wrench on nut (E) and socket on screw (F), remove nut (E), screw (F), and lockwasher (G). Throw lockwasher away.



7. Remove caution plate (H) and clamp (J).
8. Remove tube assembly (C).
9. Using socket, remove screw (K), lockwasher (L), and bracket (M). Throw lockwasher away.
10. Inspect all threaded parts for damage. Replace as necessary.
11. Inspect nuts of tube assembly (C) for cracks. Replace tube assembly if damage is found.

Go on to Sheet 3

TA140345

BRAKE PRESSURE GAGE AND RELATED PARTS REPLACEMENT (Sheet 3 of 4)

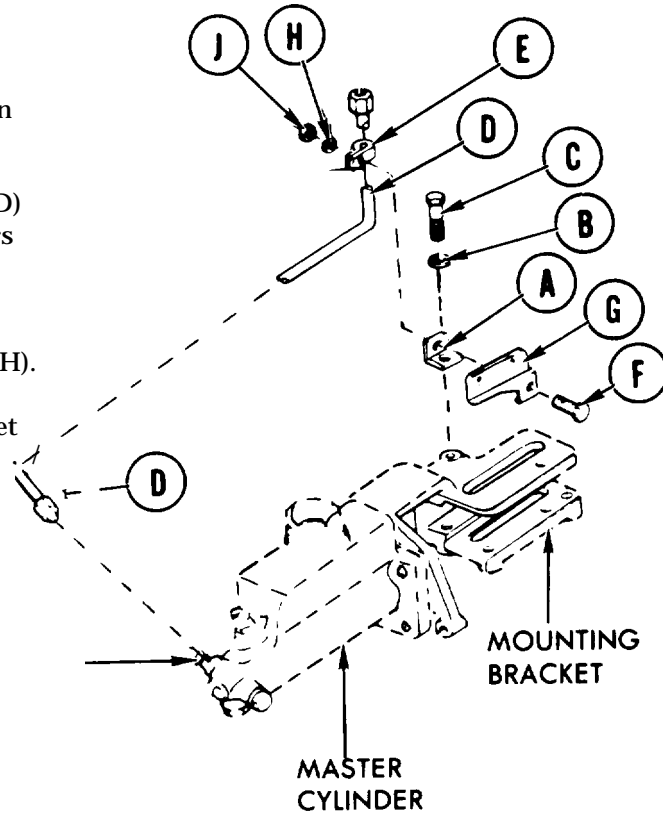
INSTALLATION:

1. Position bracket (A) on mounting bracket.
2. Place new lockwasher (B) on screw (C).
3. Using socket, install screw (C).

NOTE

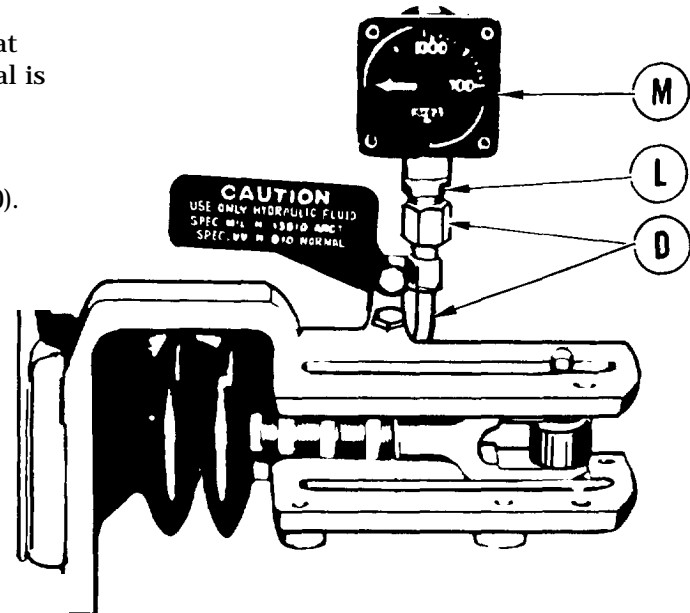
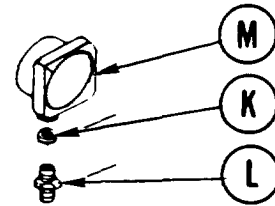
Remove plastic cap from reducer.

4. Position tube assembly (D) and tighten nut on master cylinder end finger tight.
5. Open clamp (E) and slip over tube assembly (D) and, with tube assembly positioned, use pliers to close clamp.
6. Insert screw (F) through caution Plate (G) bracket (A), clamp (E), and new lockwasher (H).
7. Using 7/16 inch wrench on nut (J) and socket on screw (F), tighten screw.



BRAKE PRESSURE GAGE AND RELATED PARTS REPLACEMENT (Sheet 4 of 4)

8. Place washer (K) on reducer (L).
9. Using 3/4 inch wrench on base of gage (M) and 13/ 16 inch wrench on reducer (L), tighten reducer to gage.
10. Using 11/16 inch wrench, tighten nut on master cylinder end of tube assembly (D).
11. Tighten nut at gage end of tube assembly (D) finger tight.
12. Fill master cylinder with hydraulic brake fluid (Item 34, Appendix D).
13. Position 13/ 16 inch wrench on reducer (L) and 11/16 inch wrench on tube assembly nut (D) with gage (M) facing driver's position.
14. Push brake pedal until fluid flows at tube assembly nut (D), then tighten nut.
15. Bleed master cylinder (page 13-12).
16. Press (do not pump) brake pedal. Check that gage indicates 800 to 1000 psi and that pedal is firm, not spongy,
17. Place shift lever in P (park) position and remove blocks from track (TM 9-2350-222-10).



End of Task

TA140347

BRAKE MASTER CYLINDER REPLACEMENT (Sheet 1 of 5)

PROCEDURE INDEX

PROCEDURE	I	PAGE
Removal		13-40
Inspection		13-42
Installation		13-42

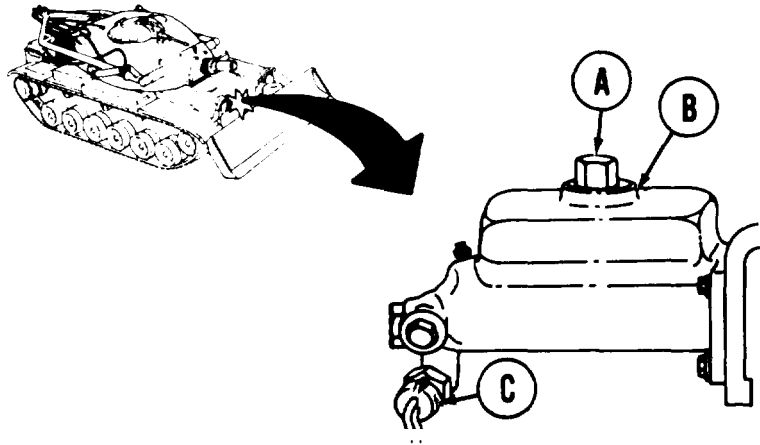
- TOOLS:
- 1-1 /8 in. box end wrench
 - 1 in. combination box and open end wrench
 - 13/16 in. combination box and open end wrench
 - 11/16 in. combination box and open end wrench
 - 3/8 in. combination box and open end wrench
 - 9/32 in. combination box and open end wrench
 - 9/16 in. socket with 1/2 in. drive
 - 5 in. extension with 1/2 in. drive
 - Ratchet with 1/2 in. drive
 - 3/4 in. combination box and open end wrench
 - 10 in. pipe wrench
 - Screwdriver

- SUPPLIES:
- Container (to catch brake fluid)
 - Silicone brake fluid (Item 34, Appendix D)
 - Silicone compound (Item 32, Appendix D)
 - 3/4 in. plastic plugs (2 required)
 - Gasket (5276834)
 - Lockwasher (MS35338-65) (4 required)
 - Gasket (AN901-5C (2 required)

REFERENCE: TM 9-2350-222-10

PRELIMINARY PROCEDURES: Place shift lever in N (neutral) position (TM 9-2350-222- 10)
Block tracks (TM 9-2350-222-10)

NOTE
Clean all parts and general area prior to removal.



REMOVAL:

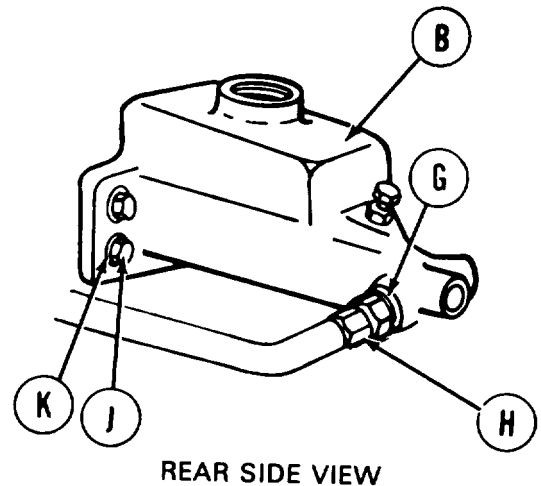
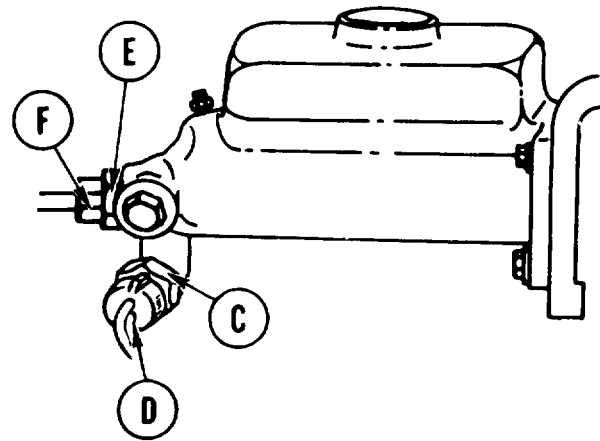
1. Using 1-1 /8 inch wrench, remove cap and gasket (A) from master cylinder (B).
Throw gasket away.
2. Position container under brake switch (C) to catch brake fluid.

Go on to Sheet 2

TA253429

BRAKE MASTER CYLINDER REPLACEMENT (Sheet 2 of 5)

3. Pull loose electrical connector (D) from brake switch (C).
4. Using 1 inch wrench, remove brake switch (C) and drain master cylinder.
5. Press brake pedal lightly to empty master cylinder completely. Dispose of brake fluid.
6. Using 13/16 inch wrench to hold reducer (E), use 11/16 inch wrench and disconnect tube assembly nut (F).
7. Using 13/16 inch wrench to hold reducer (G), use 11/16 inch wrench and disconnect tube assembly nut (H).
8. Insert plastic plugs in tube nuts (H) and (F).
9. Using 9/16 inch socket, remove four bolts (J) and lockwashers (K). Throw lockwashers away.
10. Remove master cylinder (B).



Go on to Sheet 3

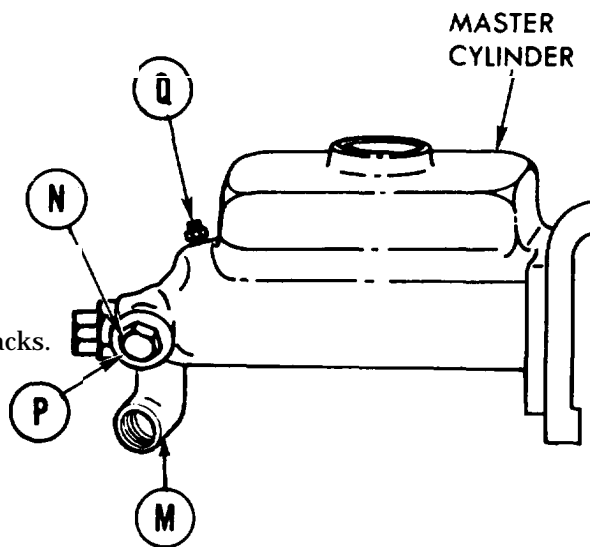
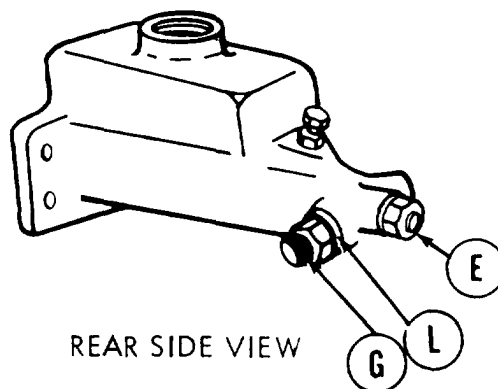
TA140349

BRAKE MASTER CYLINDER REPLACEMENT (Sheet 3 of 5)

- 11. Using 13/16 inch wrench, remove reducers (E) and (G) and two gaskets (L). Throw gaskets away.
- 12. Using pipe wrench, remove elbow (M).

NOTE

Do not remove plug (N), gasket (P), or bleeder valve (Q). Replacement master cylinder is supplied with these parts.



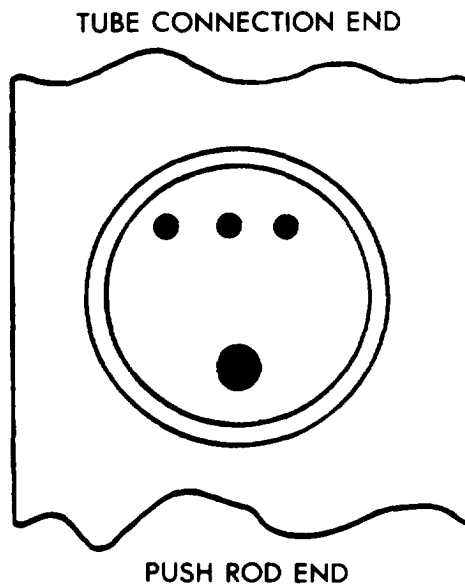
INSPECTION:

- 1. Inspect all threaded parts for damage or cracks.

INSTALLATION:

NOTE

Before installing replacement master cylinder, remove cap and gasket and look inside filler port. Correct master cylinder has four ports as shown. If it does not, get correct master cylinder.



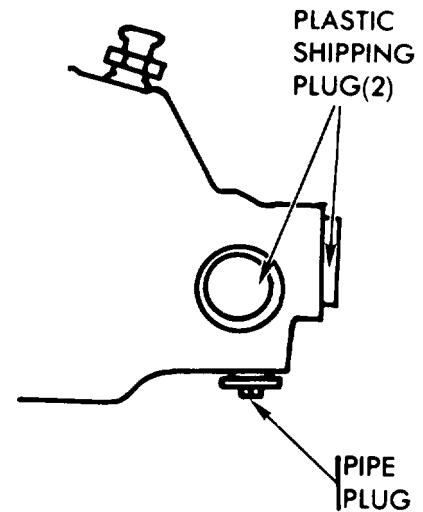
Go on to Sheet 4

TA140350

BRAKE MASTER CYLINDER REPLACEMENT (Sheet 4 of 5)

NOTE

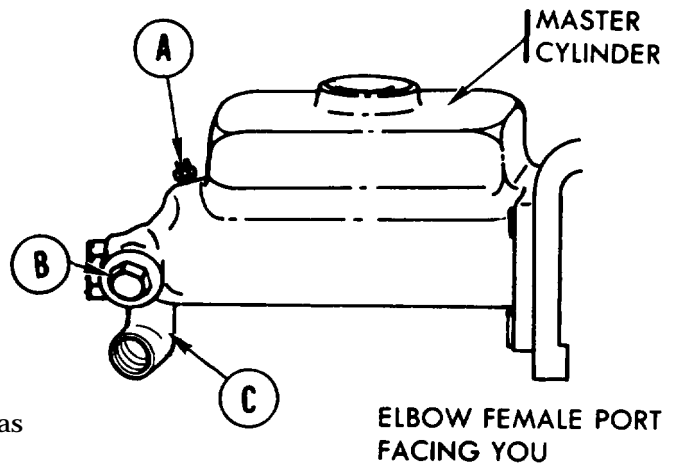
Replacement master cylinders are supplied with plugs in the four ports. Using screwdriver, remove two plastic plugs. Using 9/32 inch wrench, remove pipe plug. Install three plugs in old master cylinder and turn in to support maintenance.



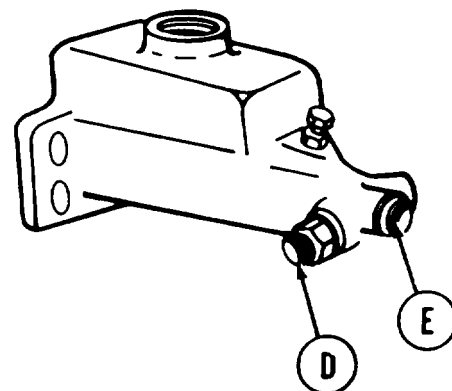
1. Using 3/8 inch wrench, make sure bleeder valve (A) is tight.

NOTE

Visually inspect to make sure there is a gasket under plug (B).



2. Using 3/4 inch wrench, make sure plug (B) tight.
3. Using pipe wrench, install elbow (C) facing as shown.
4. Place new gasket on each reducer (D) and (E).
5. Using 13/16 inch wrench, install reducers (D) and (E).



Go on to Sheet 5

TA140351

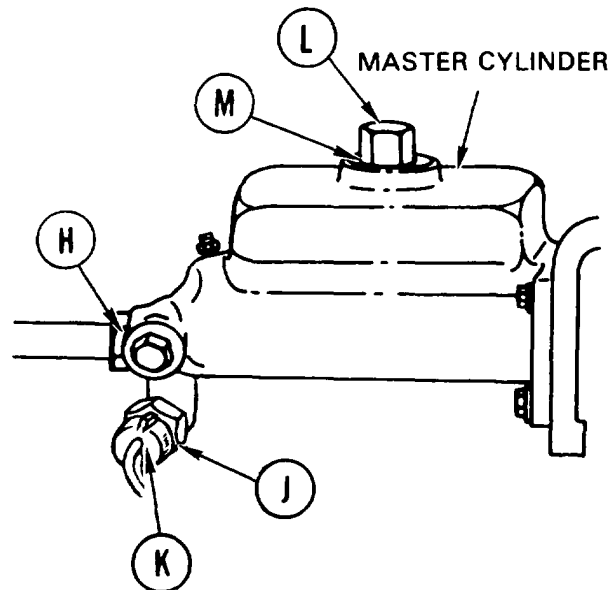
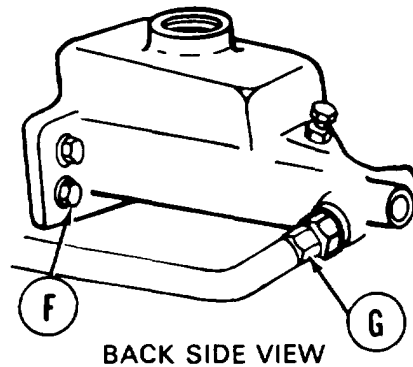
BRAKE MASTER CYLINDER REPLACEMENT (Sheet 5 of 5)

- 6. Place new lockwashers on four bolts (F).
- 7. Position master cylinder. Using 9/16 inch socket, install four screws (F).

NOTE

Remove two plastic plugs from tube nuts.

- 8. Start tube assembly nut (G) finger tight. Using 11/16 inch wrench, tighten nut.
- 9. Start tube assembly nut (H) finger tight. Using 11/16 inch wrench, tighten nut.
- 10. Apply silicone compound (Item 32, Appendix D) to electrical connector (K). Push connector on brake switch (J).
- 11. Fill master cylinder with silicone brake fluid (Item 34, Appendix D). Using 1-1/8 inch wrench, install cap (L) with new gasket (M).
- 12. Perform brake bleed procedure (page 13-12, steps 3 thru 11).
- 13. Place shift lever in P (park) position and remove blocks from track (TM 9-2350-222-10).



End of Task

TA253430

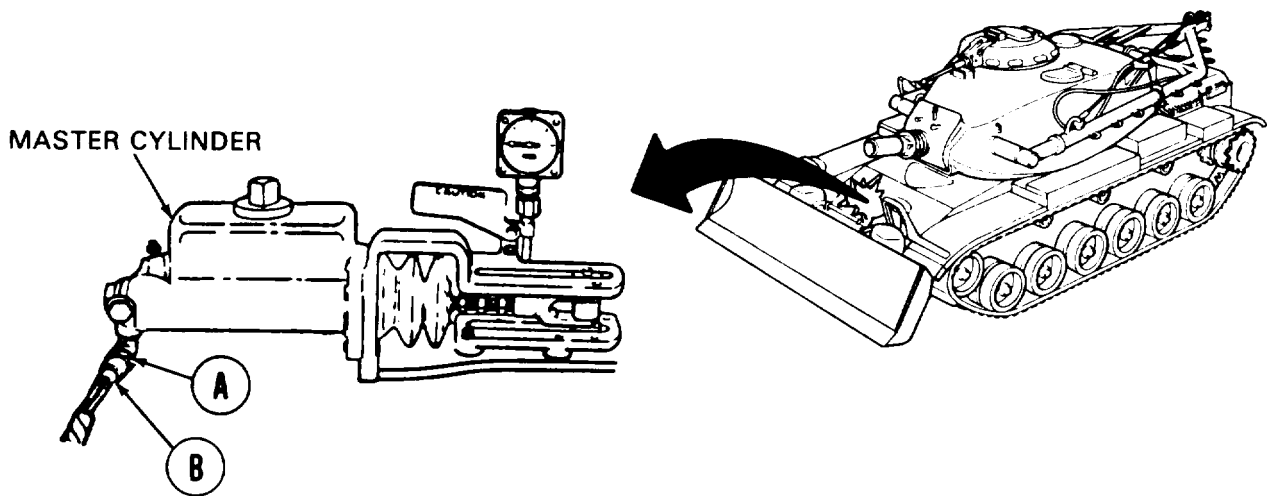
BRAKE SWITCH (STOPLIGHT) REPLACEMENT (Sheet 1 of 2)

TOOLS: 1 in. combination box and open end wrench
1-1/8 in. open end wrench

SUPPLIES: Container (to catch brake fluid)
Silicone brake fluid (Item 34, Appendix D)
Silicone compound (Item 32, Appendix D)

REFERENCE: TM 9-2350-222-10

PRELIMINARY PROCEDURES: Place shift lever in N (neutral) position (TM 9-2350-222- 10)
Block tracks (TM 9-2350-222-10)

**REMOVAL:**

1. Position container under brake switch (A) to catch brake fluid,
2. Pull electrical connector (B) loose from switch (A).

NOTE

Have new brake switch ready to install immediately after removal of old switch to prevent loss of too much brake fluid.

3. Using 1 inch wrench, remove brake switch (A).

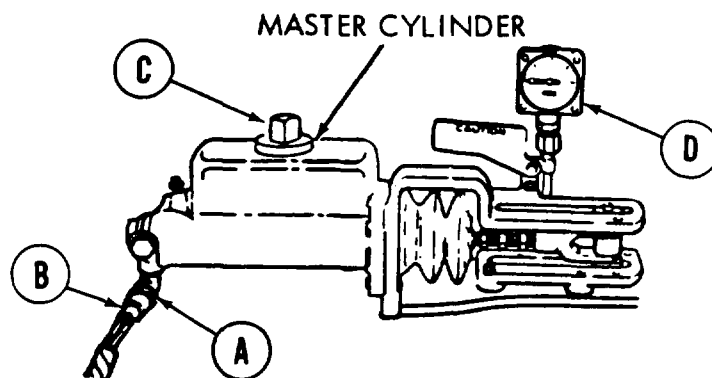
Go on to Sheet 2

TA253431

BRAKE SWITCH (STOPLIGHT) REPLACEMENT (Sheet 2 of 2)

INSTALLATION:

1. Using 1 inch wrench, install brake switch (A).
2. Apply silicone compound (Item 32, Appendix D) to connector (B) and plug into brake switch (A).
3. Using 1-1/8 inch wrench, remove cap (C) and check brake fluid level. Fill as necessary and install cap (C).
4. Perform brake bleeding procedure (page 13-12, steps 3 thru 11).
5. Press (not pump) brake pedal. Check that gage (D) indicates 800 to 1000 psi and pedal movement is firm, not spongy.



6. Check that brake lights work properly (TM 9-2350-222-10).
7. Place shift lever in P (park) position (TM 9-2350-222-10).
8. Remove blocks from tracks (TM 9-2350-222-10).

End of Task

TA140354

BRAKE QUICK-DISCONNECT AND HOSE ASSEMBLY REPLACEMENT (Sheet 1 of 7)

PROCEDURE INDEX

PROCEDURE	PAGE
Removal	13-48
Cleaning and Inspection	13-50
Installation	13-50

TOOLS: 11/16 in. combination box and open end wrench
 3/4 in. combination box and open end wrench
 7/8 in. combination box and open end wrench

9/16 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
 Adjustable wrench (crescent)

SUPPLIES: 1/2 in. plastic plugs (5 required)
 Dry cleaning solvent (Item 54, Appendix D)
 Rags (Item 65, Appendix D)
 Lockwasher (MS35338-46)

REFERENCE: TM 9-2350-222-10

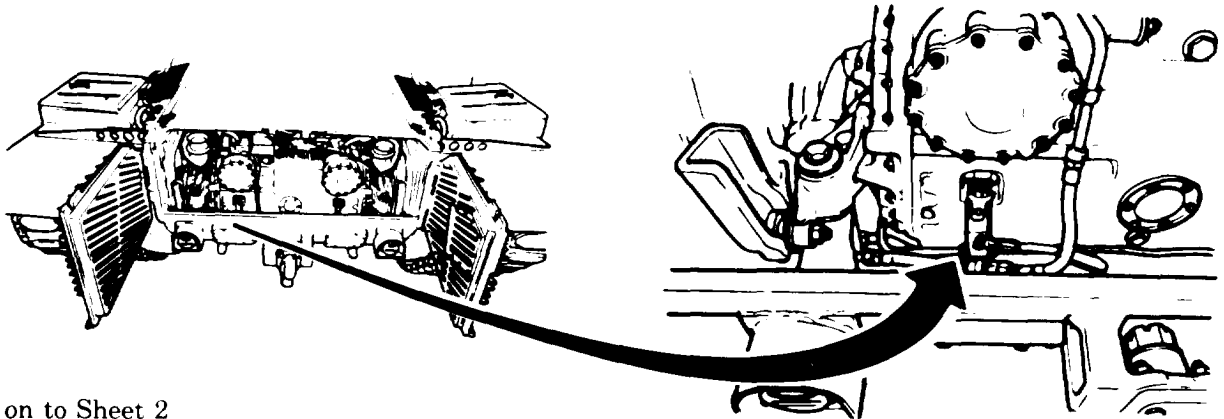
PRELIMINARY PROCEDURES: Place shift lever in P (park) position (TM 9-2350-222-10)
 Remove transmission shroud (page 9-20)

NOTE

Some Models do not have quick-disconnect, refer to page 13-54.

NOTE

Clean all parts and general area prior to removal.



Go on to Sheet 2

TA140355

BRAKE QUICK-DISCONNECT AND HOSE ASSEMBLY REPLACEMENT (Sheet 2 of 7)

REMOVAL:

1. Place rags under hose assembly (A) to absorb brake fluid.
2. Using hand, turn brake quick-disconnect (B) off coupling half (C).
3. Using adjustable wrench to hold elbow (D) and 11/16 inch wrench on nut of hose assembly (A), disconnect hose (A) from elbow (D).

4. Using adjustable wrench to hold elbow (D) and 11/16 inch wrench on nut of tube assembly (E), disconnect tube assembly (E) from elbow.

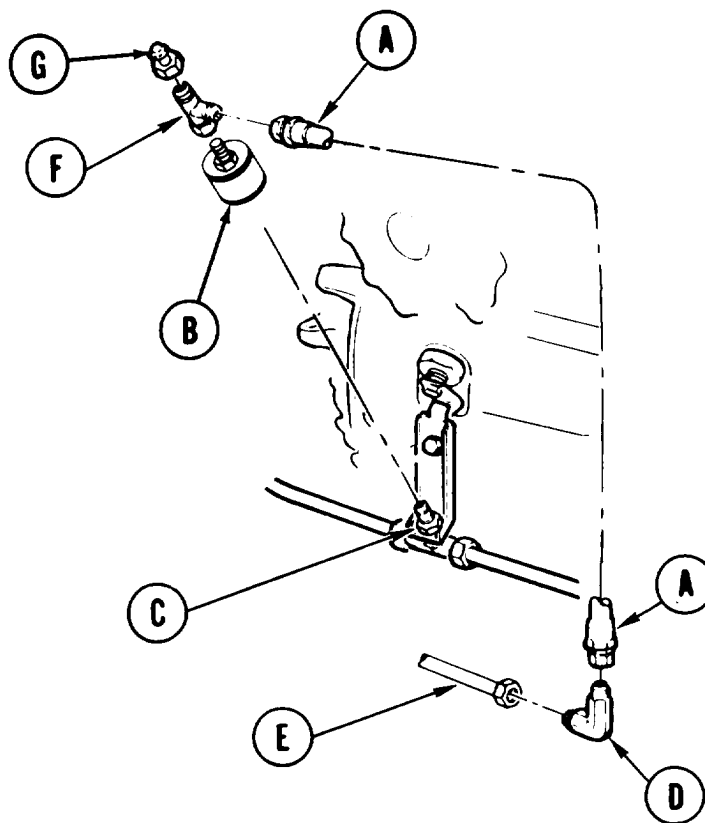
NOTE

Insert plastic plug in nut of tube assembly (E).

5. Using 11/ 16 inch wrench, disconnect hose assembly (A) from tee (F).

NOTE

If hose assembly (A) is not defective, insert plastic Plugs in end fittings.



6. Using adjustable wrench to hold tee (F) use 11/16 inch wrench and remove cap or valve (G).
7. Using 3/4 inch wrench to hold top of disconnect (B) and 11/16 inch wrench on nut of tee (F), remove tee.

BRAKE QUICK-DISCONNECT AND HOSE ASSEMBLY REPLACEMENT (Sheet 3 of 7)

8. Using 11/16 inch wrench on nuts of tube assemblies (H) and (J), disconnect nuts.
9. Using 9/16 inch socket, remove screw (K) and lockwasher (L).

NOTE

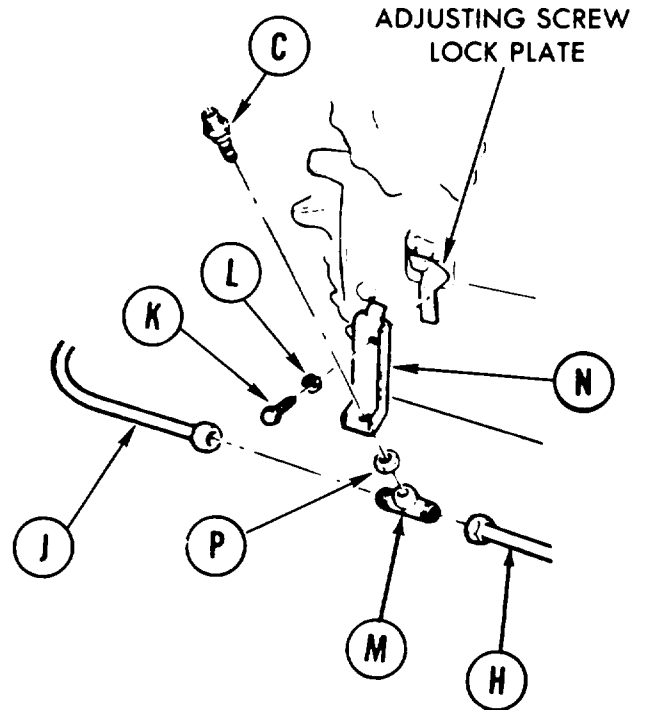
Replace screw (K) and lockwasher (L) after step 10 finger tight to hold adjusting screw lock plate.

10. Remove parts (C), (M), (N), and (P) as an assembly.

NOTE

It may be necessary to wiggle or pull tube assemblies (H) or (J) slightly to clear tee (M).

11. Insert plastic plug in nuts of both tube assemblies (H) and (J).
12. Using adjustable wrench to hold coupling half (C) and 11/16 inch wrench on nut of tee (M), disconnect and remove tee (M) from bracket (N).
13. Using adjustable wrench to hold coupling half (C) and 7/8 inch wrench on nut (P), remove nut (P) from coupling half (C) and bracket (N).



Go on to Sheet 4

TA140357

BRAKE QUICK-DISCONNECT AND HOSE ASSEMBLY REPLACEMENT (Sheet 4 of 7)

CLEANING AND INSPECTION:

1. Clean all metallic parts in dry cleaning solvent (Item 54, Appendix D).
2. Inspect all parts for damage or wear. Replace all unserviceable parts.
3. Inspect tube and hose assembly nuts for cracks. Replace tube or hose assembly if cracks are found.

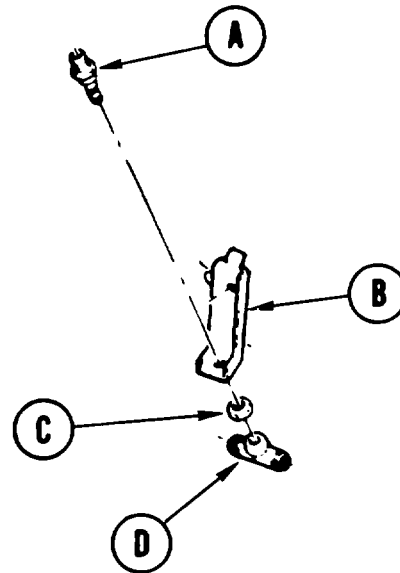
INSTALLATION:

1. Insert coupling half (A) through hole in bracket (B).
2. Thread nut (C) onto coupling half (A) finger tight.
3. Using adjustable wrench to hold coupling (A) and 7/8 inch wrench on nut (C), tighten nut.

NOTE

Do not tighten nut of tee (D) at this time. It will have to be aligned later.

4. Thread nut of tee (D) on coupling half (A) finger tight.

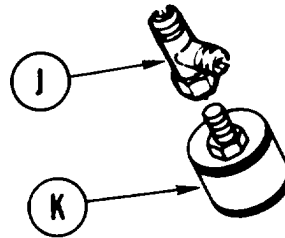
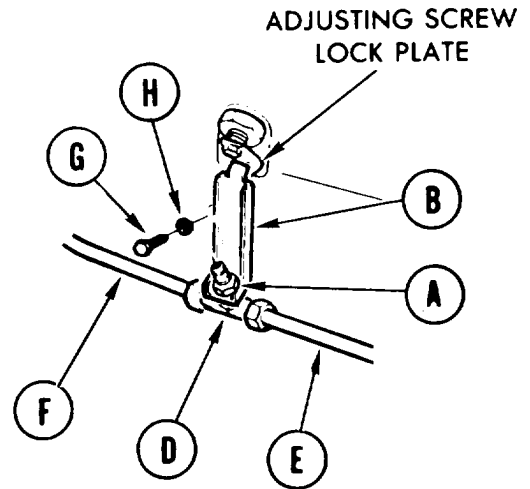


Go on to Sheet 5

TA140358

BRAKE QUICK-DISCONNECT AND HOSE ASSEMBLY REPLACEMENT (Sheet 5 of 7)

5. Remove plastic plugs from tube assemblies (E) and (F) and position assembled parts (A) thru (D) with tee (D) between tube assemblies (E) and (F).
6. Tighten nuts of tube assemblies (E) and (F) to tee (D) finger tight.
7. Remove screw (G) and lockwasher (H) holding adjusting screw lock plate. Throw lockwasher away.
8. Position bracket (B) over adjusting screw lock plate and insert screw (G) and new lockwasher (H). Tighten finger tight.
9. Using 9/16 inch socket, tighten screw (G).
10. Using 11/16 inch wrench, tighten nuts of tube assemblies (E) and (F).
11. Using 11/16 inch wrench, tighten nut of tee (D).
12. Thread nut of tee (J) on coupling half (K) finger tight.
13. Using 3/4 inch wrench to hold coupling half (K) and 11/ 16 inch wrench on nut of tee (J), tighten nut.

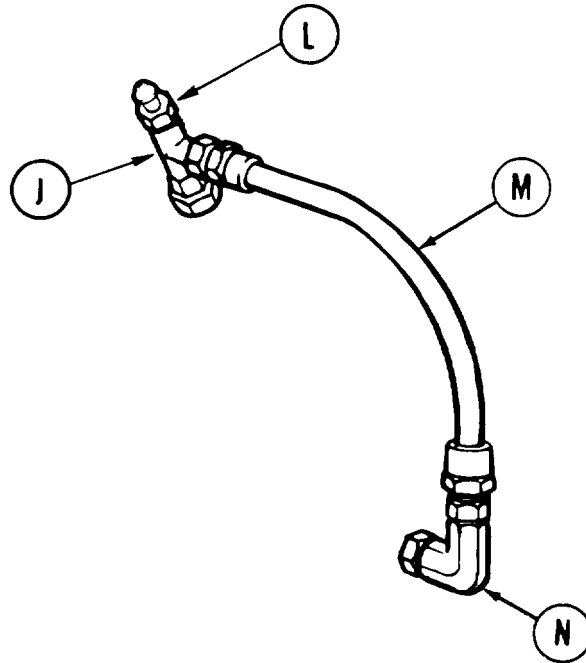


Go on to Sheet 6

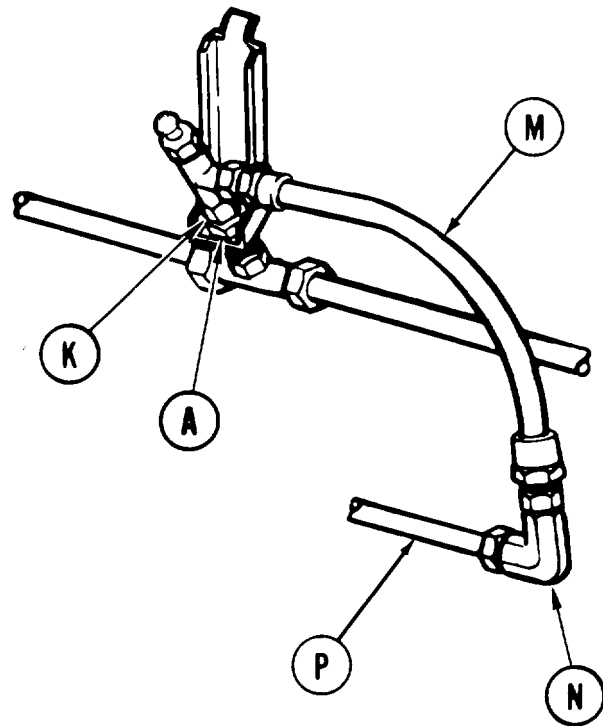
TA140359

BRAKE QUICK-DISCONNECT AND HOSE ASSEMBLY REPLACEMENT (Sheet 6 of 7)

14. Thread valve or cap (L) on tee (J).
15. Using adjustable wrench to hold tee (J), use 11/16 inch wrench and tighten valve (L) valve (L).
16. Thread nuts of hose assembly (M) on tee (J) and elbow (N).
17. With elbow (N) facing as shown, using adjustable wrench to hold elbow (N) and 11/16 inch wrench on nut of hose assembly (M), tighten nut.



18. Using adjustable wrench to hold tee (J) and 11/16 inch wrench on nut of hose assembly (M), tighten nut.
19. position assembled parts (J) thru (N) in vehicle with elbow (N) positioned at nut of tube assembly (P) and tighten nut finger tight.
20. Using adjustable wrench to hold elbow (N) and 11/16 inch wrench on nut of tube assembly (P), tighten nut.
21. Use hand to connect brake quick-disconnect to coupling half (A).



Go on to Sheet 7

TA253433

BRAKE QUICK-DISCONNECT AND HOSE ASSEMBLY REPLACEMENT (Sheet 7 of 7)

22. Perform brake bleeding procedures (page 13-12).
23. Install transmission shroud (page 9-23).

End of Task

BRAKE NIPPLE AND HOSE ASSEMBLY REPLACEMENT (Sheet 1 of 6)

PROCEDURE INDEX

PROCEDURE	PAGE
Removal	13-55
Cleaning and Inspection	13-57
Installation	13-57

TOOLS: Ratchet with 1/2 in. drive
 5 in. extension with 1/2 in. drive
 9/16 in. socket with 1/2 in. drive
 11/ 16 in. socket with 1/2 in. drive
 11/16 in. combination box and open end wrench
 3/4 in. combination box and open end wrench
 8 in. adjustable wrench
 13/ 16 in. combination box and open end wrench
 7/8 in. combination box and open end wrench

SUPPLIES: Rags (Item 65, Appendix D)
 1/2 in. plastic plugs (5 required)
 Dry cleaning solvent (Item 54, Appendix D)
 Lockwasher (MS35338-46)

REFERENCE: TM 9-2350-222-10

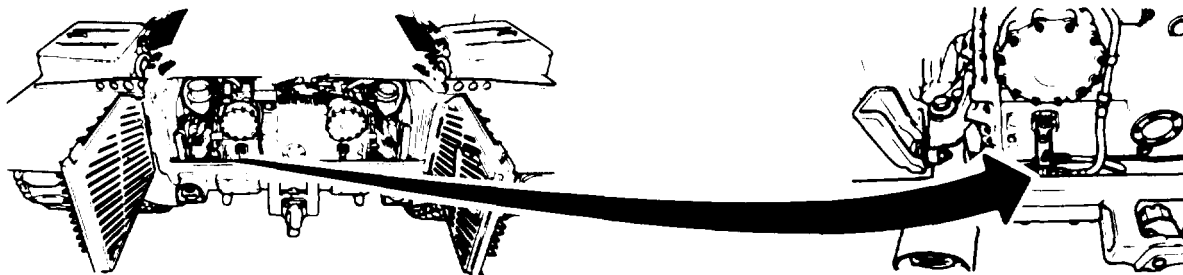
PRELIMINARY PROCEDURES: Place shift lever in N (neutral) position (TM 9-2350-222-10)
 Block tracks (TM 9-2350-222-10)
 Remove transmission shroud (page 9-20)

NOTE

Some models have a quick-disconnect, refer to page 13-47.

NOTE

Clean all parts and general area prior to removal.

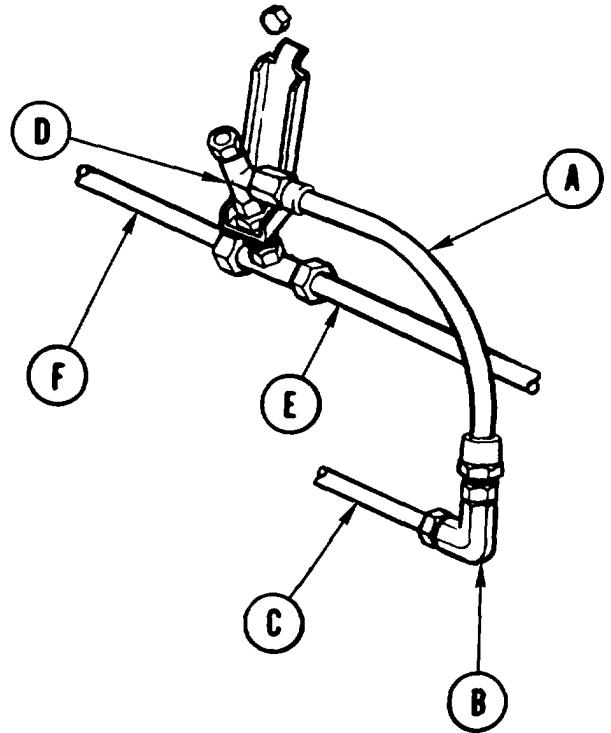


Go on to Sheet 2

TA140361

BRAKE NIPPLE AND HOSE ASSEMBLY REPLACEMENT (Sheet 2 of 6)**REMOVAL:**

1. Place rags under hose assembly (A) to absorb brake fluid.
2. Using adjustable wrench to hold elbow (B) and 11/16 inch wrench on nut of tube assembly (C), disconnect nut.
3. Insert plastic plug in nut of tube assembly (C).
4. Using 11/16 inch wrench' on nut of hose assembly (A) at tee (D), disconnect nut and remove hose assembly (A) and elbow (B).
5. Using adjustable wrench to hold elbow (B) and 11/16 inch wrench on nut of hose assembly (A), disconnect nut and remove elbow (B).

**NOTE**

If hose assembly (A) is not defective, insert plastic plugs in end fittings.

6. Using 11/16 inch wrench on nuts of tube assemblies (E) and (F), disconnect nuts.

Go on to Sheet 3

TA140362

BRAKE NIPPLE AND HOSE ASSEMBLY REPLACEMENT (Sheet 3 of 6)

- Using 9/16 inch socket, remove screw (G) and lockwasher (H).

NOTE

Replace screw (G) and lockwasher (H) after step 8 finger tight to hold adjusting screw lock plate.

- Remove parts (J) thru (P) as an assembly.

NOTE

It will be necessary to pull tube assemblies (E) or (F) slightly to clear tee (N).

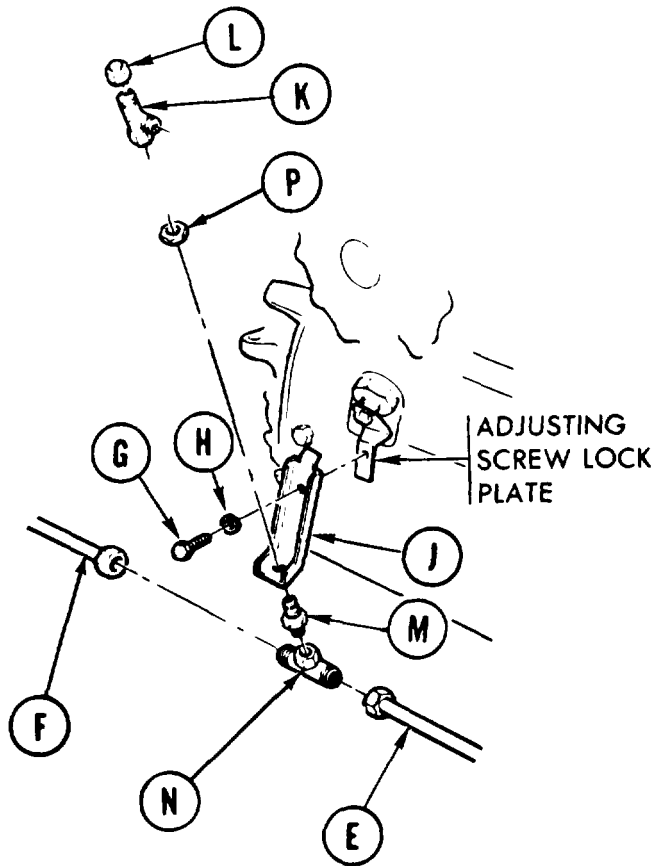
- Insert plastic plug in nuts of both tube assemblies (E) and (F).

- Using adjustable wrench to hold tee (K) and 11/16 inch socket on cap (L), remove cap (L).

- Using 13/16 inch wrench to hold nipple (M) and 11/16 inch wrench on nut of tee (K), remove tee (K).

- Using 13/16 inch wrench to hold nipple (M) and 11/16 inch wrench on nut of tee (N), disconnect nut and remove tee (N).

- Using 13/16 inch wrench to hold nipple (M) and 7/8 inch wrench on nut (P), remove nut and nipple from bracket (J).



Go on to Sheet 4

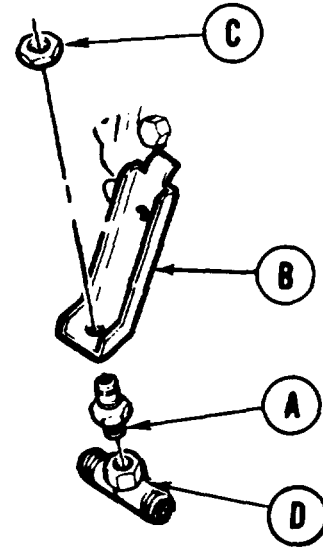
TA140363

BRAKE NIPPLE AND HOSE ASSEMBLY REPLACEMENT [Sheet 4 of 6]**CLEANING AND INSPECTION:**

1. Clean all metallic parts in dry cleaning solvent (Item 54, Appendix D).
2. Inspect all parts for damage or wear. Replace all unserviceable parts.
3. Inspect tube and hose assembly nuts for cracks. Replace tube or hose assembly if any are found.

INSTALLATION:

1. Insert nipple (A) through hole in bracket (B).
2. Thread nut (C) onto nipple (A) finger tight.
3. Using 7/8 inch wrench to hold nipple (A) and 13/16 inch wrench on nut (C), tighten nut.
4. Thread nut of tee (D) on nipple (A) finger tight.

**NOTE**

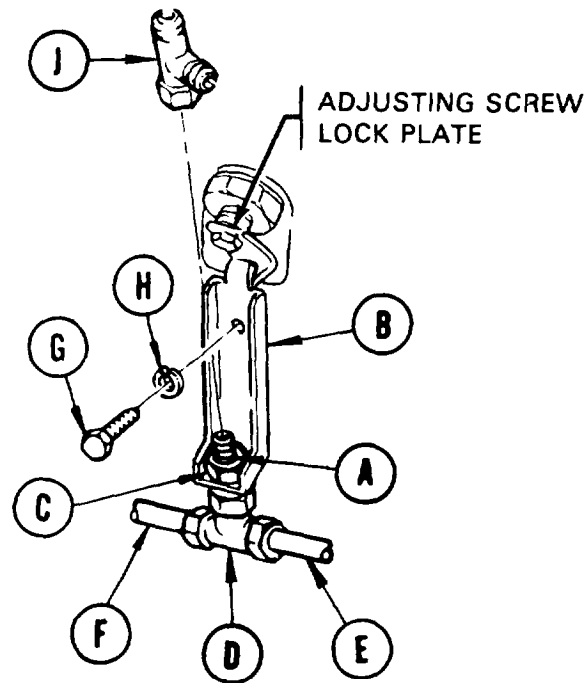
Do not tighten nut of tee (D) at this time. It will have to be aligned later.

Go on to Sheet 5

TA140364

BRAKE NIPPLE AND HOSE ASSEMBLY REPLACEMENT (Sheet 5 of 6)

5. Remove plastic Plugs from tube assemblies (E) and (F) and position assembled parts (A) thru (D) with tee (D) between tube assemblies (E) and (F).
6. Tighten nuts of tube assemblies (E) and (F) to tee (D) finger tight.
7. Remove screw (G) and lockwasher (H) holding adjusting screw lock plate. Throw lockwasher away.
8. Position bracket (B) over adjusting screw lock plate and insert screw (G) and new lockwasher (H). Tighten finger tight.
9. Using 9/16 inch socket, tighten screw (G).
10. Using 11/16 inch wrench, tighten nuts of tube assemblies (E) and (F).
11. Using 11/16 inch wrench, tighten nut of tee (D).
12. Thread nut of tee (J) on nipple (A) finger tight.
13. With tee (J) facing as shown, use 13/16 inch wrench to hold nipple (A) and 11/16 inch wrench to tighten nut of tee (J). Tighten nut.



Go on to Sheet 6

TA140365

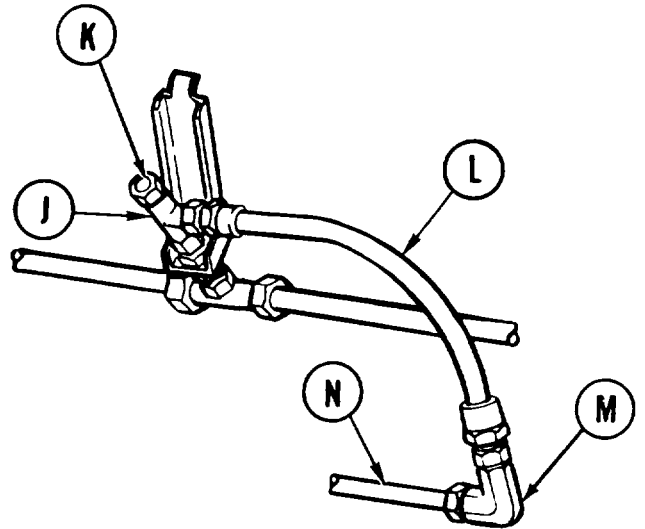
BRAKE NIPPLE AND HOSE ASSEMBLY REPLACEMENT (Sheet 6 of 6)

14. Thread cap (K) on tee (J) and tighten.

NOTE

Perform steps 15 and 16 out of vehicle.

15. Thread nuts of hose assembly (L) on elbow (M) finger tight.
16. Using adjustable wrench to hold elbow (M) and 11/16 inch wrench on nut of hose assembly (L), tighten nut.
17. Position elbow (M) and nut of tube assembly (N) and tighten nut finger tight,
18. Using adjustable wrench to hold elbow (M) and 11/16 inch wrench on nut of tube assembly (N), tighten nut.
19. Thread nut of hose assembly (L) on tee (J) finger tight.
20. Using adjustable wrench to hold tee (J) and 11/16 inch wrench on nut of hose assembly (L), tighten nut.
21. Perform brake bleeding procedure (page 13-12).
22. Install transmission shroud (page 9-23).
23. Place shift lever in P (park) position and remove blocks from track.



End of Task

TA140366

BRAKE LEFT HAND SLAVE CYLINDER AND TUBE ASSEMBLY REPLACEMENT
 (Sheet 1 of 4)

PROCEDURE INDEX

PROCEDURE	PAGE
Removal	13-60
Cleaning and Inspection	13-62
Installation	13-62

TOOLS: 9/16 in. socket with 1/2 in. drive
 Putty knife
 11/ 16 in. combination box and open end wrench
 13/16 in. combination box and open end wrench
 5 in. extension with 1/2 in. drive
 Ratchet with 1/2 in. drive

SUPPLIES: Container
 1/2 in. plastic cap
 Gasket (AN901-6C) (2 required)
 Lint-free cloth (Item 12, Appendix D)
 1/2 in. plastic plug
 Masking tape (Item 57, Appendix D)
 Dry cleaning solvent (Item 54, Appendix D)
 Preformed packing (MS28775-222)

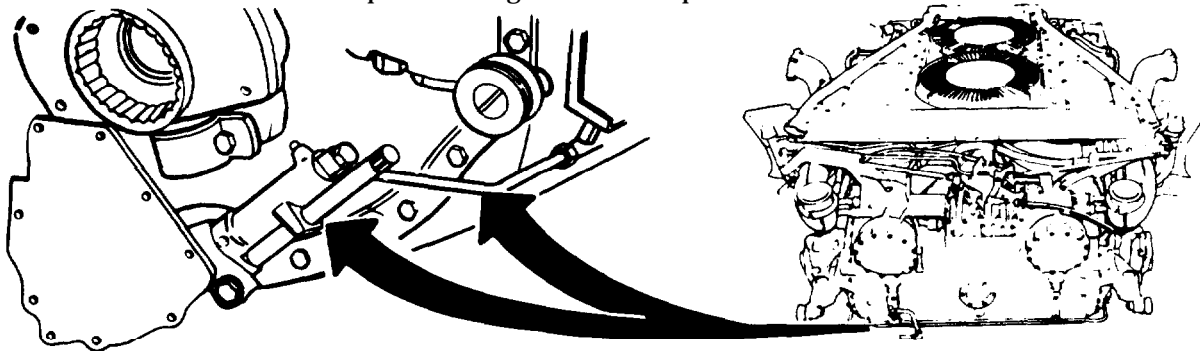
REFERENCE: TM 9-2350-222-10

PRELIMINARY PROCEDURE: Remove powerplant (page 5-1)

REMOVAL:

NOTE

Clean all parts and general area prior to removal.



Go on to Sheet 2

TA140367

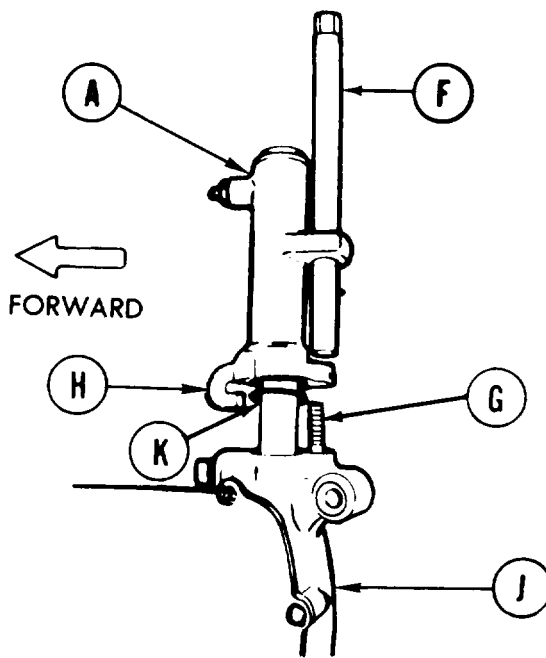
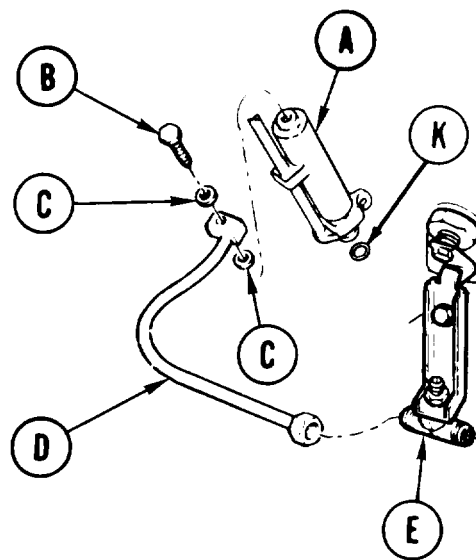
**BRAKE LEFT HAND SLAVE CYLINDER AND TUBE ASSEMBLY REPLACEMENT
(Sheet 2 of 4)**

1. Position container under slave cylinder (A) to catch brake fluid.
2. Using 13/16 inch wrench, remove bolt (B) and two gaskets (C). Throw gaskets away.

NOTE

Allow brake fluid to drain, then throw fluid away. Check bolt (B) to make sure internal passages are open and clean.

3. Using 11/16 inch wrench, disconnect nut on tube assembly (D) from tee (E) and install Plastic cap on tee.
4. Install plastic plug in nut of tube assembly (D) and masking tape (Item 57, Appendix D) over Parts in other end.
5. Using socket, disconnect mounting nut (F) from stud (G).
6. Move slave cylinder (A) forward and wiggle it side to side while pulling up until catch (H) clears housing assembly. Continue this procedure until it comes loose from housing assembly (J).
7. Using putty knife, remove packing (K) from groove of slave cylinder (A) and throw away.



Go on to Sheet 3

TA140368

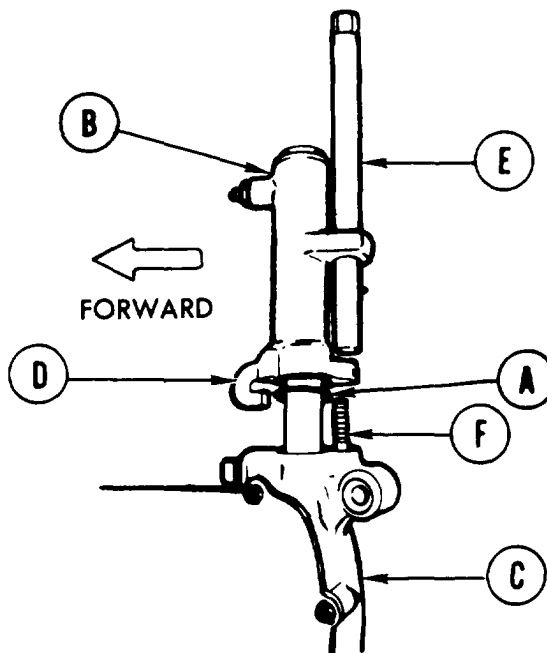
BRAKE LEFT HAND SLAVE CYLINDER AND TUBE ASSEMBLY REPLACEMENT (Sheet 3 of 4)

CLEANING AND INSPECTION:

1. Clean all metallic parts in dry cleaning solvent (Item 54, Appendix D).
2. Inspect all parts for damage or wear. Replace all unserviceable parts.
3. Inspect tube assembly nut for cracks. Replace tube assembly if any are found.

INSTALLATION:

1. Insert new packing (A) in groove of slave cylinder (B).
2. Position and slide slave cylinder (B) down over housing assembly push rod. Wiggle it back and forth while pushing down. Push slave cylinder (B) forward when on housing assembly (C), then pull back to make sure catch (D) engages in housing assembly.
3. Tighten mounting nut (E) to stud (F) finger tight.
4. Using socket, tighten mounting nut (E).

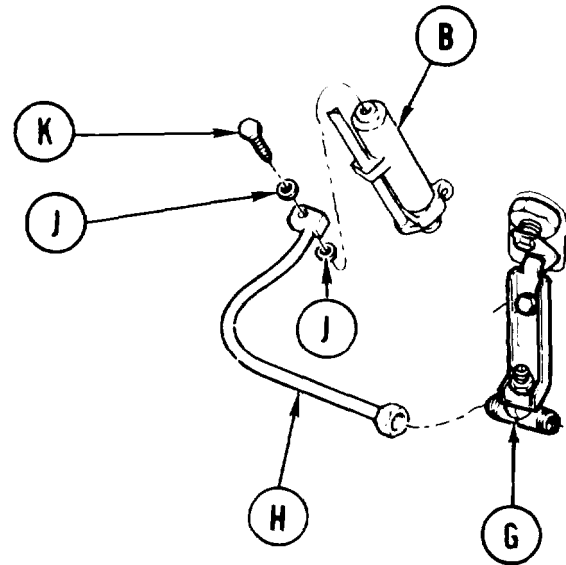


Go on to Sheet 4

TA140369

**BRAKE LEFT HAND SLAVE CYLINDER AND TUBE ASSEMBLY REPLACEMENT
(Sheet 4 of 4)**

5. Remove plastic cap from tee (G) and plastic plug and masking tape from tube assembly (H).
6. Thread nut of tube assembly (H) on tee (G) finger tight.
7. Position two new gaskets (J) and end of tube assembly (H) over part in slave cylinder (B).
8. Insert bolt (K) and tighten finger tight.
9. Using 13/16 inch wrench, tighten bolt (K).
10. Using 11/16 inch wrench, tighten nut of tube assembly (H) to tee (G).
11. Install 2A powerplant (page 5-14) or 2D powerplant (page 5-37).
12. Perform brake bleeding procedure (page 13-12)



End of Task

TA140370

BRAKE RIGHT HAND SLAVE CYLINDER AND TUBE ASSEMBLY REPLACEMENT
 (Sheet 1 of 6)

PROCEDURE INDEX

PROCEDURE	PAGE
Removal	13-64
Cleaning and Inspection	13-66
Installation	13-67

- TOOLS:** Ratchet with 1/2 in. drive
 5 in. extension with 1/2 in. drive
 9/16 in. socket with 1/2 in. drive
 7/16 in. socket with 1/2 in. drive
 11/16 in. combination box and open end wrench
 Putty knife
 Torque wrench with 1/2 in. drive
 13/16 in. combination box and open end wrench

- SUPPLIES:** Container
 Gasket (AN901-6C) (2 required)
 Preformed packing (MS28775-222)
 1/2 in. plastic cap
 1/2 in. plastic plug
 Masking tape (Item 57, Appendix D)
 Dry cleaning solvent (Item 54, Appendix D)
 Rags
 Lockwasher (MS35338-44)
 Lockwasher (MS35338-46)

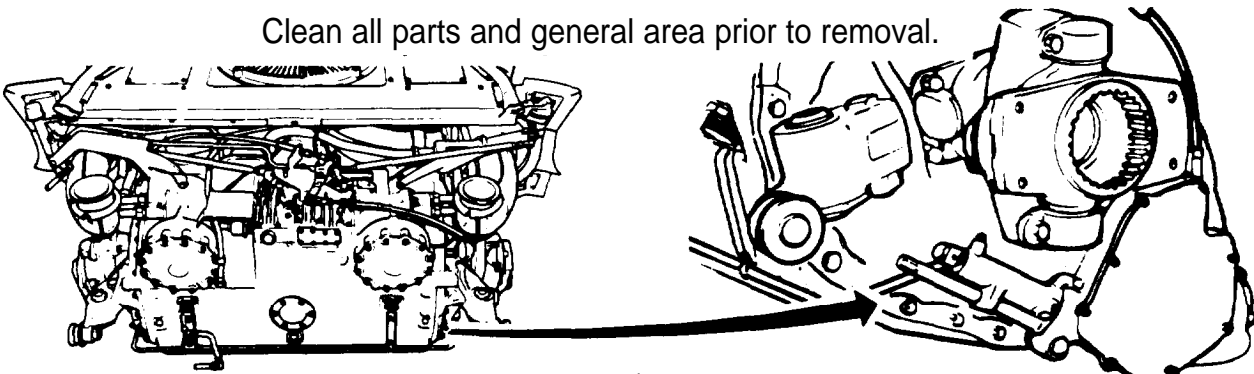
REFERENCE: TM 9-2350-222-10

PRELIMINARY PROCEDURE: Remove powerplant (page 5-1)

REMOVAL:

NOTE

Clean all parts and general area prior to removal.



Go on to Sheet 2

TA140371

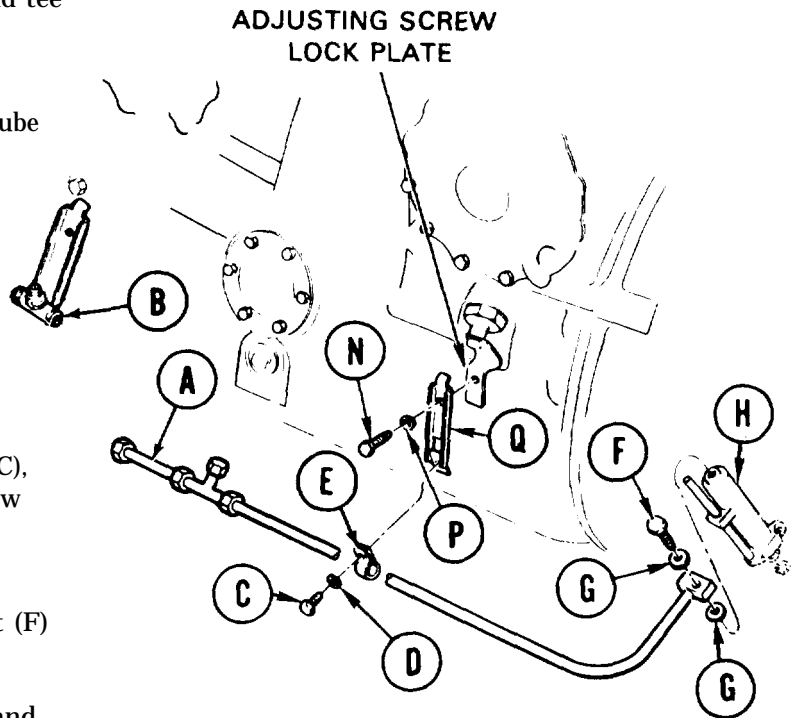
**BRAKE RIGHT HAND SLAVE CYLINDER AND TUBE ASSEMBLY REPLACEMENT
(Sheet 2 of 6)**

1. Position container under tube (A) and tee (B) to catch brake fluid.
2. Using 11/16 inch wrench, disconnect tube assembly (A) from tee (B).

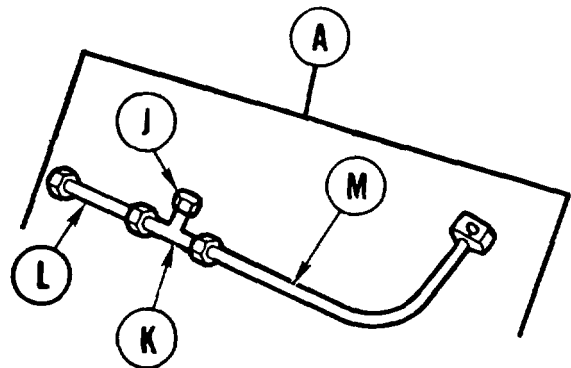
NOTE

Allow brake fluid to drain, then throw fluid away.

3. Using 7/16 inch socket, remove screw (C), lockwasher (D), and clamp (E). Throw lockwasher away.
4. Using 13/16 inch wrench, loosen bolt (F) from slave cylinder.
5. Remove bolt (F), tube assembly (A), and two gaskets (G) as an assembly from slave cylinder (H). Throw gaskets (G) away.



6. Install plastic cap on tee (B).
7. Using 11/16 inch wrench, remove cap (J).
- 7.1 Using adjustable wrench to hold tee (K), use 11/16 inch wrench and remove tube assembly (L) and (M) from tee (K).
8. Using 9/16 inch socket, remove screw (N), lockwasher (P), and bracket (Q). Throw lockwasher away.



NOTE

Replace screw (N) and new lockwasher (P) to hold adjusting screw lock plate in place until installation of bracket (Q).

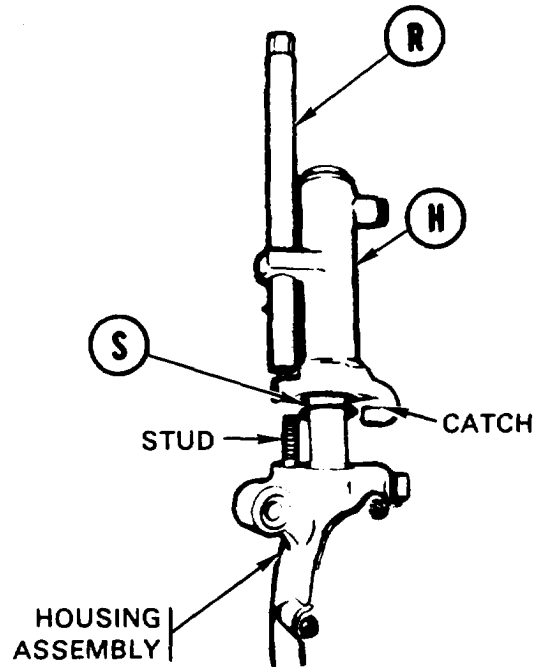
Go on to Sheet 3

TA253434

Change 1 13-65

**BRAKE RIGHT HAND SLAVE CYLINDER AND TUBE ASSEMBLY REPLACEMENT
(Sheet 3 of 6)**

9. Using 9/16 inch socket, disconnect mounting nut (R) from stud.
10. Move slave cylinder (H) forward and wiggle it side to side while pulling up until catch clears housing assembly. Continue this procedure until slave cylinder comes loose from housing assembly.
11. Remove slave cylinder (H).
12. Using putty knife, remove packing (S) from groove of slave cylinder (H) and throw packing away.



CLEANING AND INSPECTION:

1. Clean all metallic parts in dry cleaning solvent (Item 54, Appendix D).
2. Inspect all parts for damage or wear. Replace all unserviceable parts.
3. Inspect tube assembly nut for cracks. Replace tube assembly if any are found.
4. Check bolt (F) for open and clean internal passages.

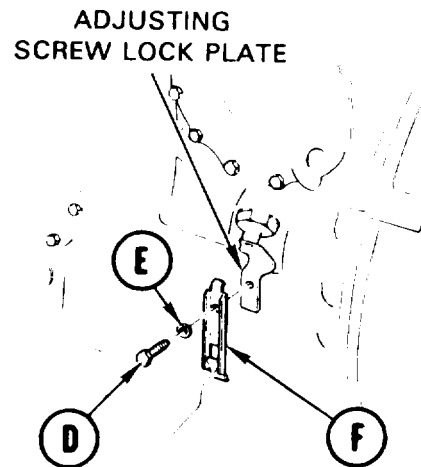
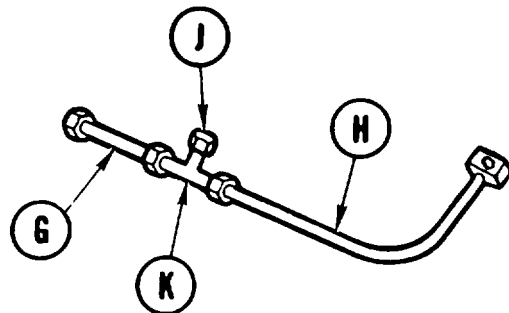
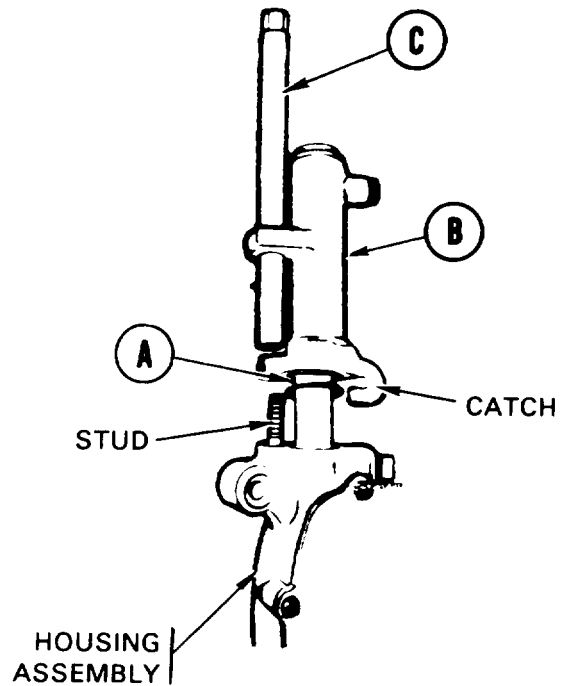
Go on to Sheet 4

TA253435

BRAKE RIGHT HAND SLAVE CYLINDER AND TUBE ASSEMBLY
(Sheet 4 of 6)

INSTALLATION:

1. Insert new packing (A) in groove of slave cylinder (B).
2. Position and slide slave cylinder (B) down over housing assembly push rod, Wiggle slave cylinder back and forth while pushing down. Push slave cylinder forward when on housing assembly, then pull back to make sure catch engages in housing assembly,
3. Tighten mounting nut (C) to stud, finger tight.
4. Using 9/16 inch socket, tighten mounting nut (C).
5. Using 9/16 inch socket, remove screw (D) and lockwasher (E) from adjusting screw lock plate. Throw lockwasher away.
6. Position and align adjusting screw lock plate and bracket (F), Insert screw (D) and new lockwasher (E) finger tight.
7. Using 9/16 inch socket, tighten screw (D).
8. Using fingers, connect tube assemblies (G) and (H) and cap (J) to tee (K).

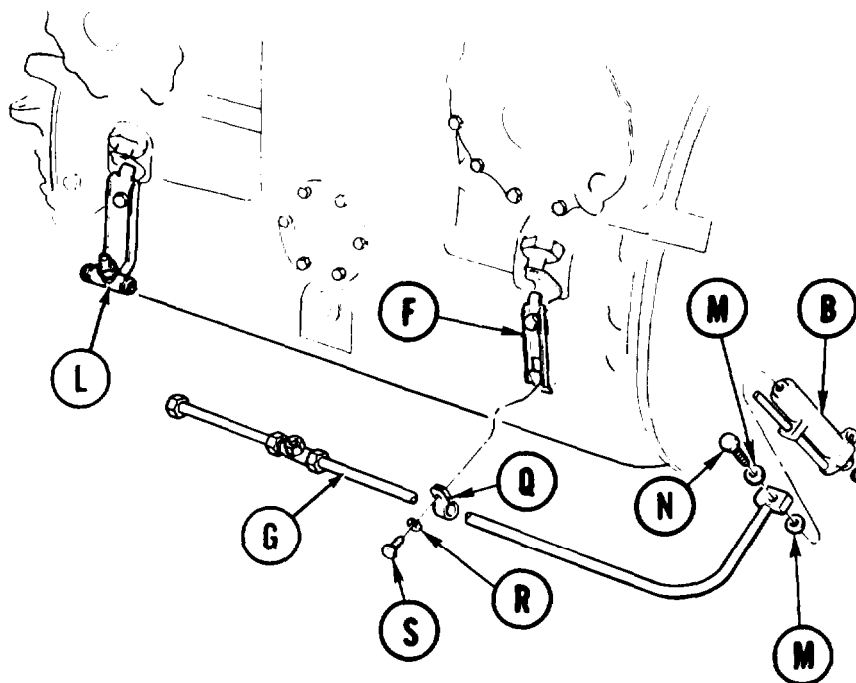


Go on to Sheet 5

TA253436

BRAKE RIGHT HAND SLAVE CYLINDER AND TUBE ASSEMBLY REPLACEMENT
 (Sheet 5 of 6)

9. Using fingers, position tube assembly (assembled in step 8) to tee (L) and slave cylinder (B).
10. Remove plastic cap from tee (L) and loosely connect tube assembly (G) to tee (L).
11. Position two new gaskets (M), bolt (N), and end of tube assembly (H) as an assembly over hole in slave cylinder (B).
12. Insert bolt (N) and tighten finger tight.



13. Using torque wrench, tighten bolt (N) to 25-30 lb-ft (34-40 N·m).
14. Using adjustable wrench to hold tees (K) and (L), use 11/16 inch wrench and tighten nuts of tube assemblies (G) and (H) to tees (K) and (L).
15. Using 11/16 inch wrench, tighten cap (J) onto tee (K).
16. Place clamp (Q) over tube assembly (H) and position clamp on bracket (F).
17. Place new lockwasher (R) on screw (S) and insert through clamp (Q) and bracket (F). Tighten finger tight.
18. Using 7/16 inch socket, tighten screw (S).

Go on to Sheet 6

TA253437

**BRAKE RIGHT HAND SLAVE CYLINDER AND TUBE ASSEMBLY REPLACEMENT
(Sheet 6 of 6)**

19. Install 2A powerplant (page 5-14) or 2D powerplant (page 5-37).

20. Perform brake bleeding procedure (page 13-12).

End of Task

BRAKE CONTROL HOUSING REPAIR (Sheet 1 of 14)
PROCEDURE INDEX

PROCEDURE	PAGE
Removal	13-70
Cleaning and Inspection	13-76
Installation	13-76

TOOLS: Retaining ring pliers (external)
 6 in. steel rule
 1/4 in. drive punch
 1/2 in. drive punch
 Hammer
 15/16 in. combination box and open end wrench
 9/16 in. combination box and open end wrench (2 required)
 Vise

SUPPLIES: Cotter pin (MS24665-283)
 (2 required)
 Gasket (10911888)
 Preformed packing (MS28775-110)
 Dry cleaning solvent (Item 54, Appendix D)
 Shims (8674484)
 Rags (Item 65, Appendix D)
 Preformed packing (11659173-2)

Lockwasher (MS35338-44)
 (10 required)
 Preformed packing (11602168-1)
 Lockwasher (MS35338-63)
 (2 required)
 Lockwasher (MS35338-65)
 (2 required)
 Preformed packing (MS28775-112)
 (3 required)
 Gasket (10911851)

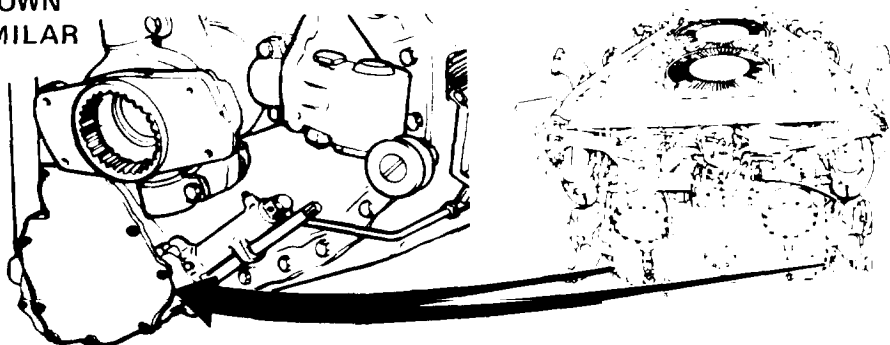
PRELIMINARY PROCEDURES: Remove slave cylinders (pages 13-60, 13-64) (as applicable)

REMOVAL:

NOTE

Clean all parts and general area prior to disassembly.

**LEFT SIDE SHOWN
 RIGHT SIDE SIMILAR**



Go on to Sheet 2

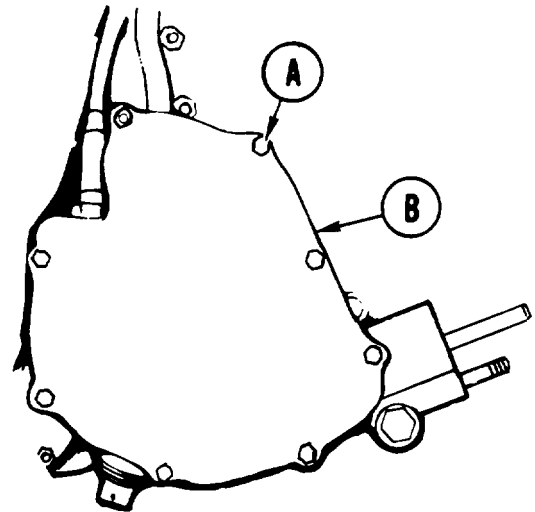
TA140376

BRAKE CONTROL HOUSING REPAIR (Sheet 2 of 14)

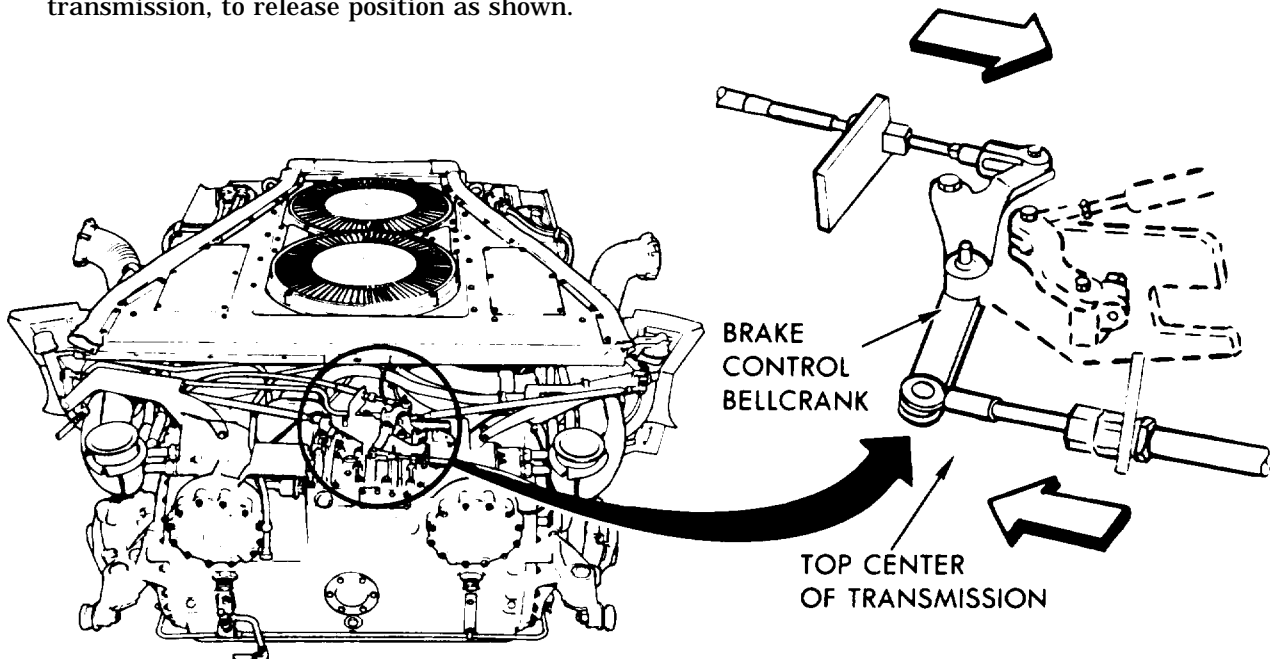
NOTE

This task is for left hand brake control housing. Procedure for right hand housing is exactly the same.

1. Using 7/16 inch socket, remove eight nuts and lockwashers (A). Throw lockwashers away.
2. Remove cover and gasket (B). Throw gasket away.



3. Move brake control bellcrank, at top center of transmission, to release position as shown.

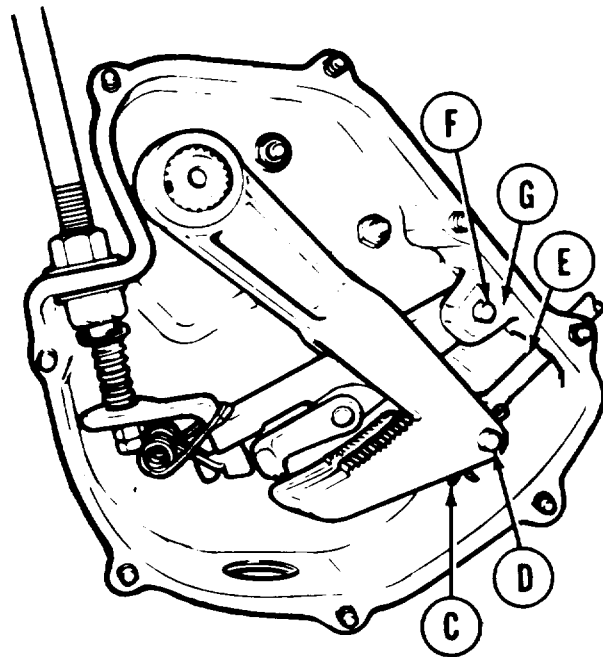


Go on to Sheet 3

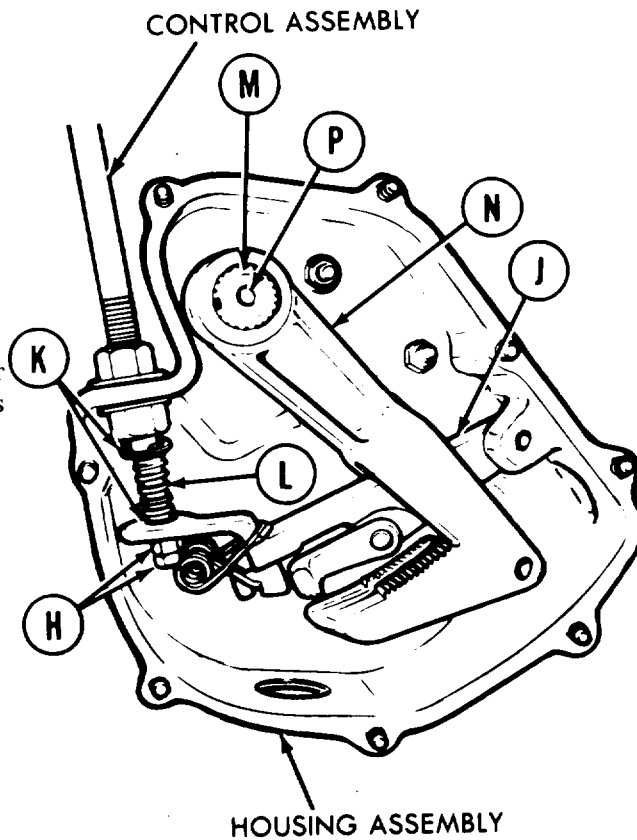
TA140377

BRAKE CONTROL HOUSING REPAIR (Sheet 3 of 14)

4. Using pliers, remove cotter pin (C). Throw cotter pin away.
5. Remove pin (D) by pulling out. Remove push rod (E).
6. Using pliers, pull pin (F) from housing clevis (G).
7. Using two 9/16 inch wrenches, remove two nuts (H) by removing lower nut first while holding upper one.
8. Move lever assembly (J) clear of control assembly and remove two washers (K) and spring (L).



9. Using retaining ring pliers, remove snapping (M).
10. Slide lever (N) off shaft (P) and remove lever (N) and lever assembly (J) with attached parts from control housing.



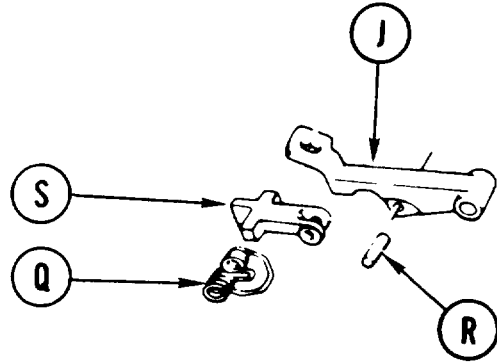
Go on to Sheet 4

TA140378

BRAKE CONTROL HOUSING REPAIR (Sheet 4 of 14)

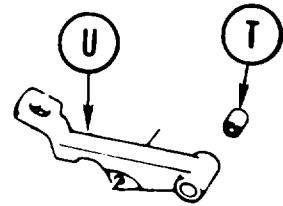
11. Remove spring (Q) from lever assembly (J).

12. Place lever assembly (J) in vise.

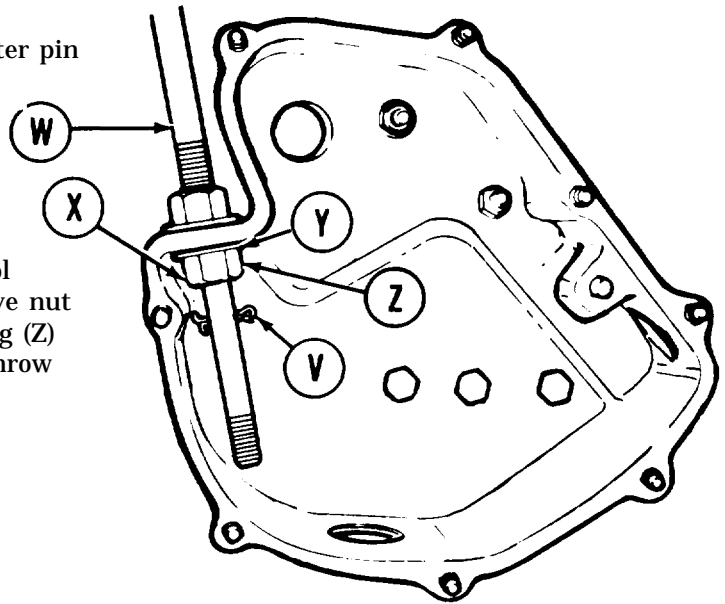


13. Using 1/4 inch punch and hammer, drive out pin (R) and remove pawl (S).

14. Using 1/2 inch punch and hammer, drive bearing (T) out of lever (U).



15. Using long round nose pliers, remove cotter pin (V). Throw cotter pin away.



16. Using 9/16 inch wrench on flats of control assembly (W) and 7/8 inch wrench, remove nut (X), packing with retainer (Y), and packing (Z) (inside nut) from control assembly (W). Throw packings away.

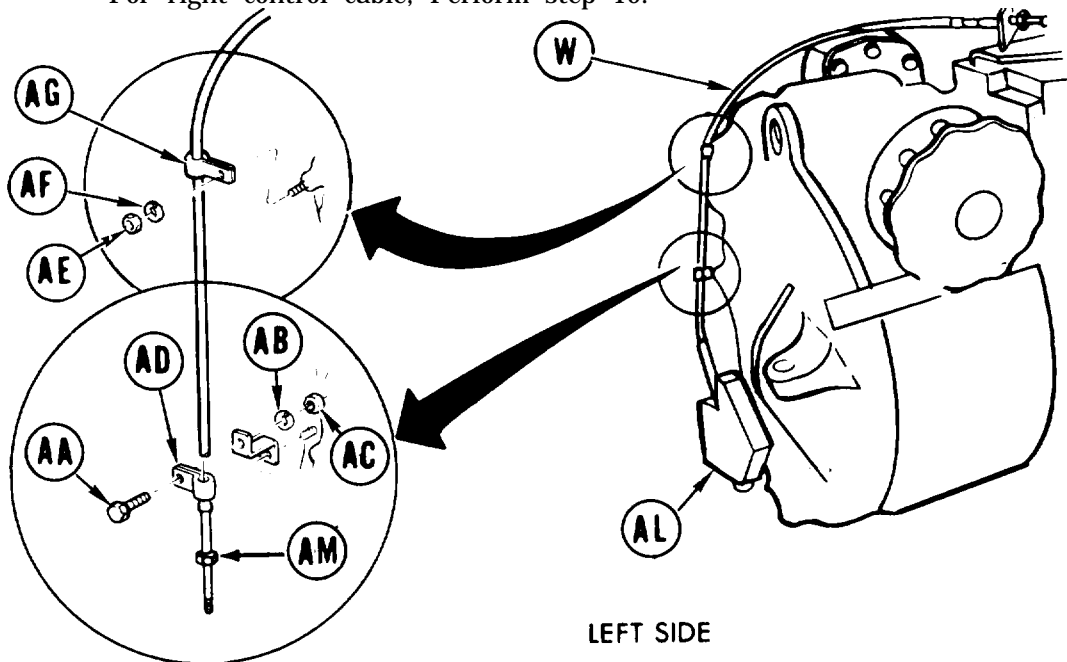
Go on to Sheet 5

TA140379

BRAKE CONTROL HOUSING REPAIR (Sheet 5 of 14)

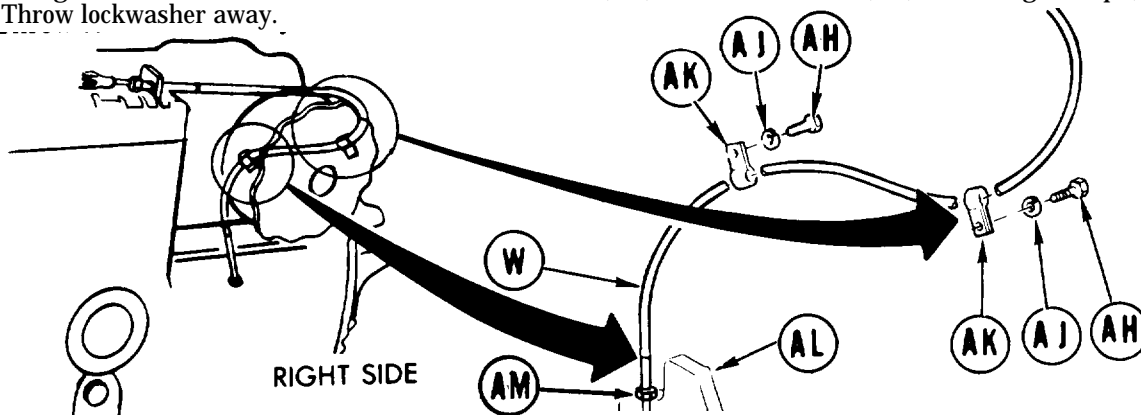
NOTE

If left control cable is to be removed, perform steps 17 and 18.
For right control cable, Perform step 19.



17. Using 7/16 inch socket, remove screw (AA), lockwasher (AB), and nut (AC) releasing clamp (AD).
Throw lockwasher away.

18. Using 3/4 inch socket and extension, remove nut (AE) and lockwasher (AF) releasing clamp (AG).
Throw lockwasher away.



19. Using 3/4 inch socket, remove two screws (AH) and lockwashers (AJ) releasing clamps (AK).
Throw lockwashers away.

20. Pull control assembly (W) from housing assembly (AL).

21. Using 9/16 inch wrench on flats of control assembly (W), use 15/16 inch wrench and remove nut (AM).

Go on to Sheet 6

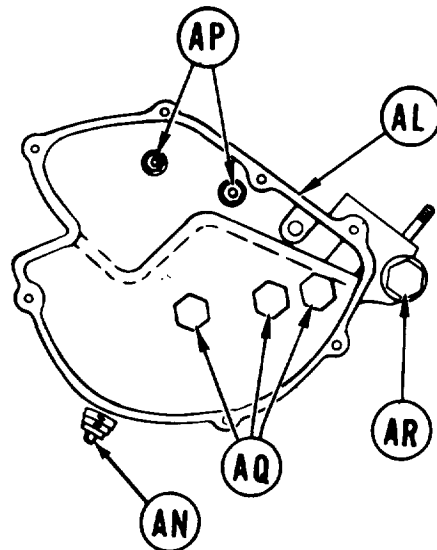
TA140380

BRAKE CONTROL HOUSING REPAIR (Sheet 6 of 14)

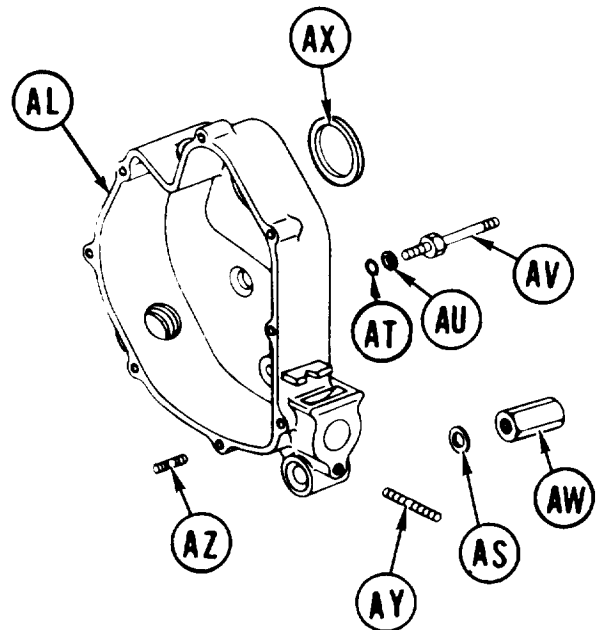
22. Using 15/16 inch wrench, remove plug (AN).
23. Using 9/16 inch wrench, remove two nuts and lockwashers (AP). Throw lockwashers away.

NOTE

Shims are located between housing assembly (AL) and transmission on bolts (AQ) and (AR). Be careful when removing control housing so as not to lose shims.



24. Using 15/16 inch socket, remove three bolts and packings (AQ) (under head) and bolt (AR). Throw packings away.
25. Remove housing assembly (AL) and shims (AS).
26. Remove two packings (AT) and shims (AU).
27. Using 9/16 inch wrench, remove two studs (AV).
28. Using 3/4 inch socket, remove four spacer nuts (AW).
29. Remove gasket (AX). Throw gasket away.
30. Remove stud (AY) and eight studs (AZ).



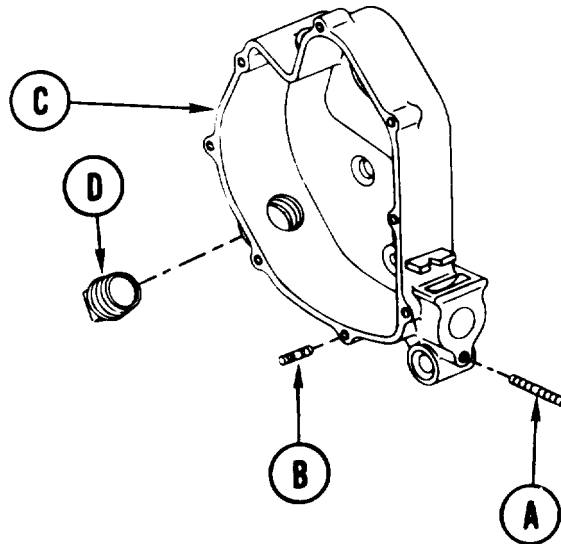
Go on to Sheet 7

TA140381

BRAKE CONTROL HOUSING REPAIR (Sheet 7 of 14)

CLEANING AND INSPECTION:

1. Clean all metallic parts in dry cleaning solvent (Item 54, Appendix D).
2. Inspect all parts for damage or wear.
3. Replace all unserviceable parts.

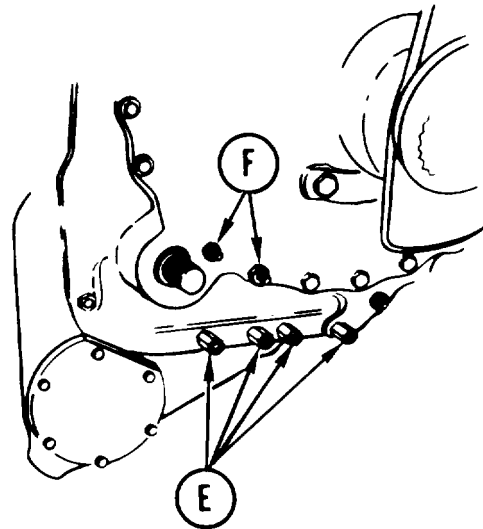


INSTALLATION:

1. Install stud (A) and eight studs (B) in housing assembly (C).
2. Using 15/16 inch wrench, install plug (D) in housing assembly (C).

NOTE

If new transmission has been installed, remove four nuts and lockwashers from spacer nut (E) locations, and two screws and lockwashers from stud (F) locations.



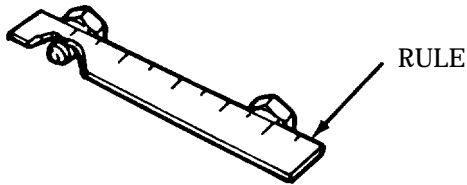
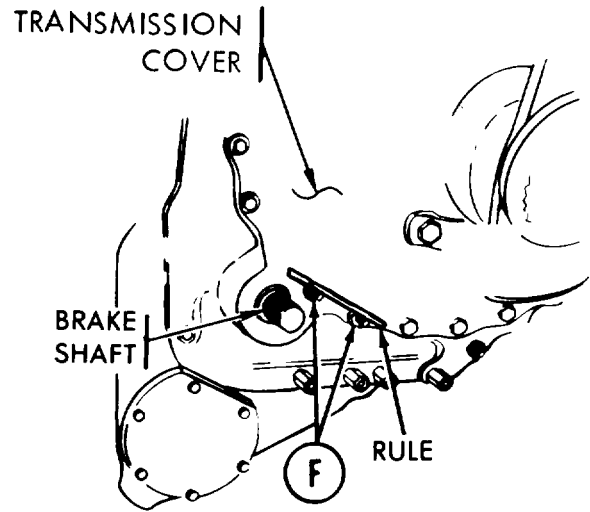
3. Using 9/16 inch wrench, install two studs (F). Using 9/16 inch socket and torque wrench, tighten to 20-25 lb-ft (27-34 N.m).
4. Using 3/4 inch socket, install four spacer nuts (E). Using 3/4 inch socket and torque wrench, tighten to 55-60 lb-ft (74-81 N.m).

Go on to Sheet 8

TA140382

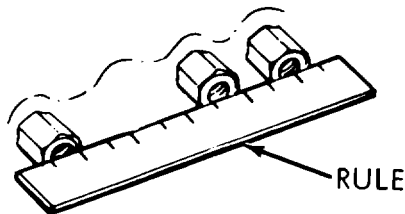
BRAKE CONTROL HOUSING REPAIR (Sheet 8 of 14)

- Using rule, check that top surface of hex on stud (F) (the one closest to brake shaft) stands out beyond transmission cover surface.

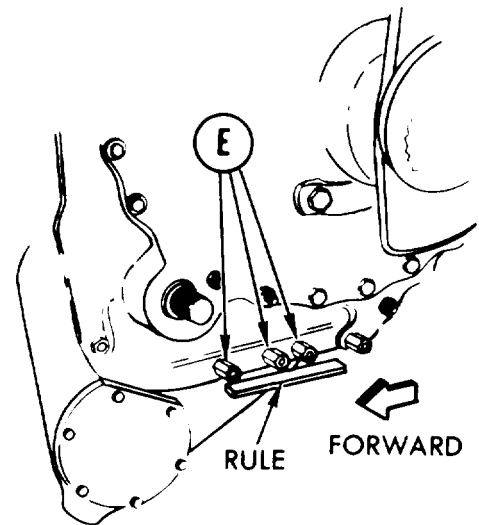


NOTE

If hex of stud (F) (the one closest to brake shaft) does not stand out beyond transmission cover surface, add shims (G). If shims are added, an equal number should be added to the other stud (F) (the one farthest from brake shaft).

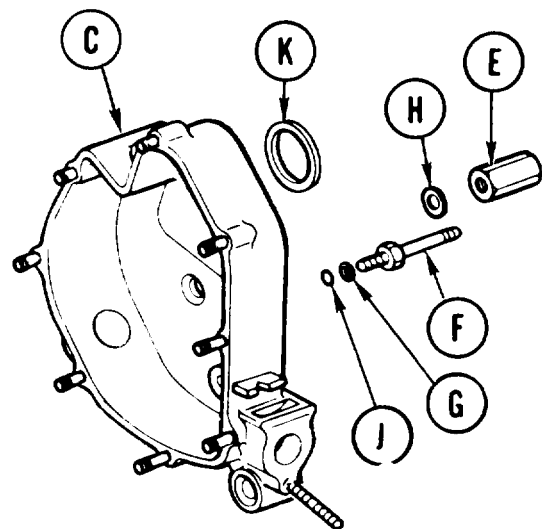


- Using rule, check that end surfaces of three forward spacer nuts (E) are equal in height. If they are not, add shims (H) as necessary between spacer nuts (E) and housing assembly (c).



- Place shim (G) and new packing (J) on each stud (F).

- Position new gasket (K) in groove of housing assembly (C).

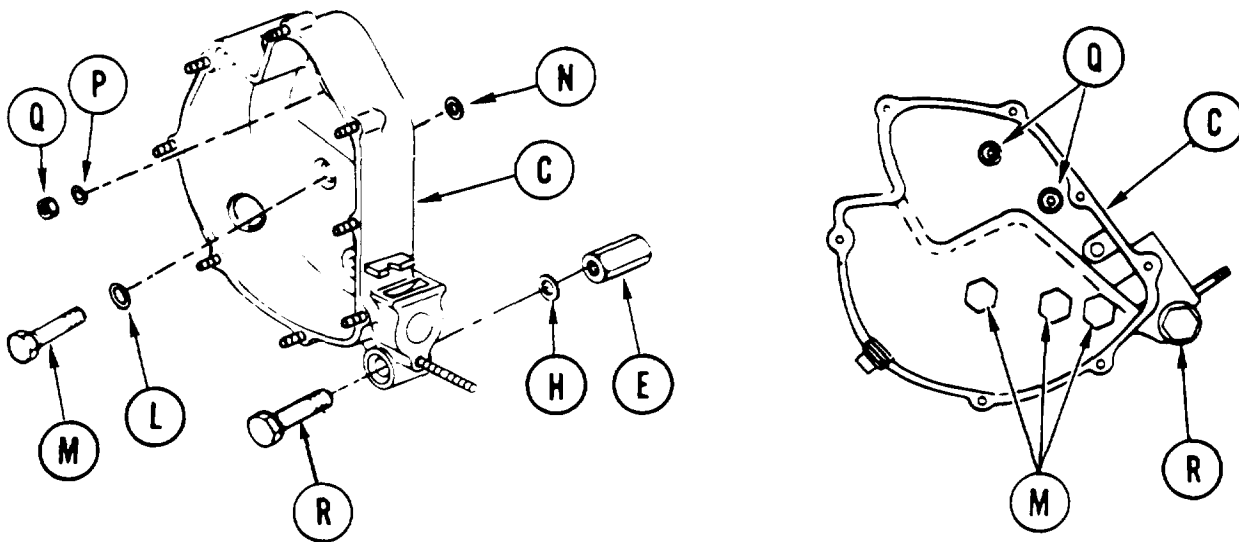


Go on to Sheet 9

TA140383

BRAKE CONTROL HOUSING REPAIR (Sheet 9 of 14)

9. Place new packings (L) on three bolts (M) and insert bolts in housing assembly (C).
10. Place three shims (N) on each bolt (M) on back side of brake housing (C) in addition to any shims added in step 6.
11. Carefully position housing assembly (C) on transmission and start each bolt (M). Tighten finger tight.
12. Place new lockwasher (P) and nut (Q) on each of two studs. Tighten finger tight.



13. With housing assembly (C) firmly positioned, insert as many shims (H) as necessary to fill gap between brake housing and spacer nut (E).
14. Insert bolt (R) (no packing under head) and tighten finger tight,
15. Using torque wrench, extension, and 9/16 inch socket, tighten two nuts (Q) to 20-25 lb-ft (27-34 N.m).
16. Using torque wrench and 15/16 inch socket, tighten three bolts (M) to 55-60 lb-ft (74-81 N.m). Tighten bolt (R) to 20-25 lb-ft (27-34 N.m).

Go on to Sheet 10

TA140384

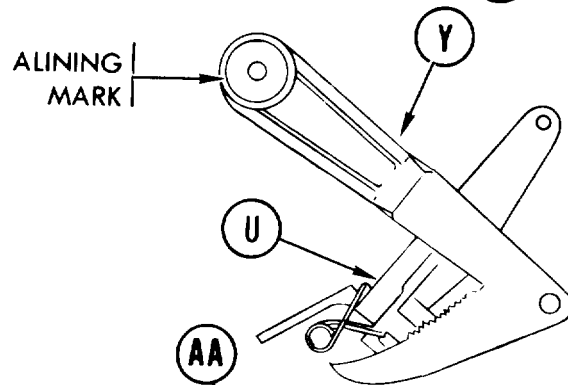
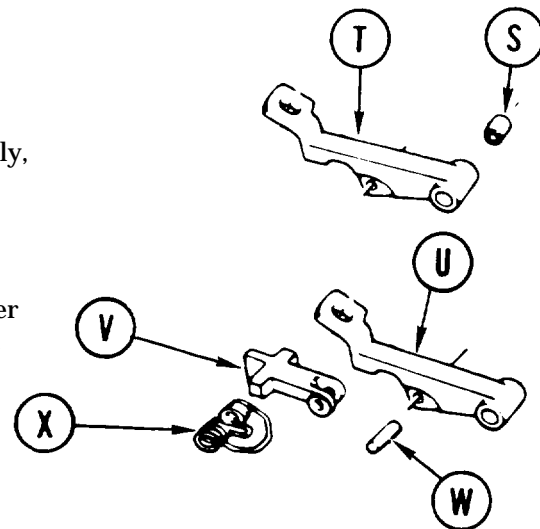
BRAKE CONTROL HOUSING REPAIR (Sheet 10 of 14)

17. Using vise, press bearing (S) into lever (T).

18. Position lever assembly (U) on pawl (V) and start pin (W) through pawl and lever assembly. Position in vise and press pin through.

19. Place large loop of spring (X) over end of lever assembly (U) and other loop over end of pawl (v).

20. Insert lever assembly (U) with its attached parts through cutout in lever (Y).

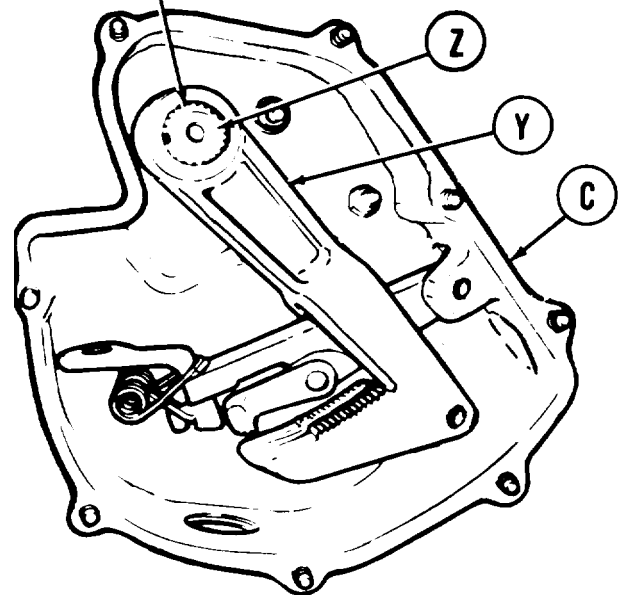


NOTE

When installing lever (Y) in housing assembly (C), make sure alining mark (dot) on lever (Y) is in line with wide slot in shaft (Z).

21. Slide lever (Y) with its assembled parts on shaft (z).

22. Using retaining ring pliers, install snapping (AA) in groove of shaft (Z)



Go on to Sheet 11

TA253438

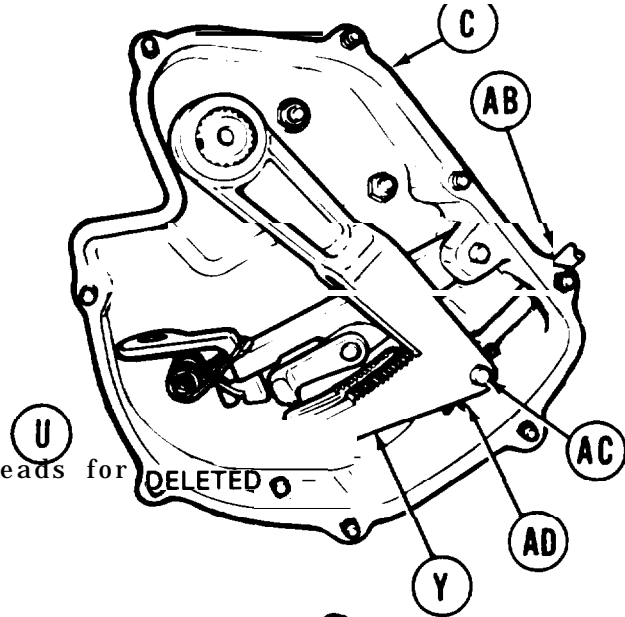
Change 1 13.79

BRAKE CONTROL HOUSING REPAIR (Sheet 11 of 14)

23. Insert push rod (AB) through hole in housing and position in clevis of lever (Y).

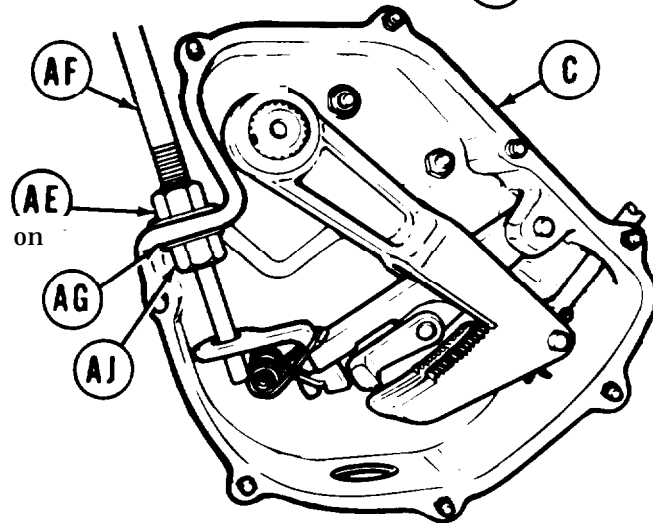
24. Insert pin (AC) and, using pliers, install new cotter pin (AD).

25. Thread nut (AE) all the way on control assembly (AF) to provide enough threads for parts (AG) thru (AJ).



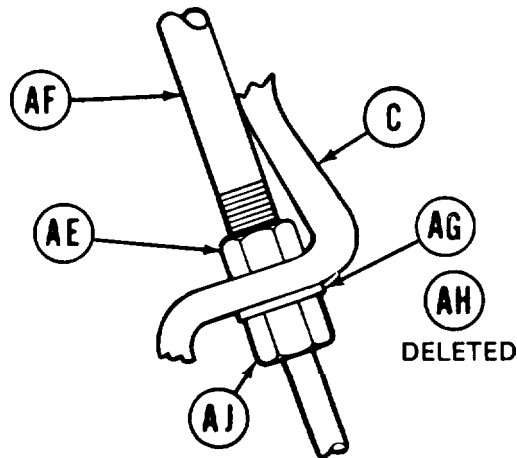
26. Insert end of control assembly (AF) through hole of housing assembly (C).

27. Place new packing with retainer (AG) on control assembly (AF).



28. Deleted.

29. Thread nut (AJ) on control assembly (AF) and tighten finger tight. Do not over-tighten.



30. Deleted.

Go on to Sheet 12

TA253439

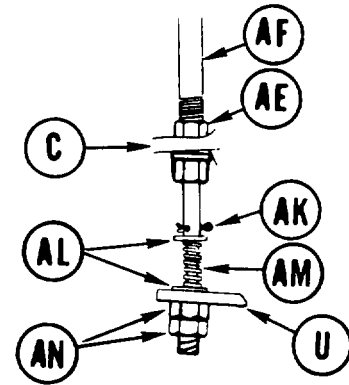
BRAKE CONTROL HOUSING REPAIR (Sheet 12 of 14)

31. Using 9/16 inch wrench on flats of control assembly (AF) and 15/16 inch wrench on nut (AE), tighten nut.

32. Using pliers, install new cotter pin (AK),

33. Position two washers (AL) and spring (AM) on control assembly (AF).

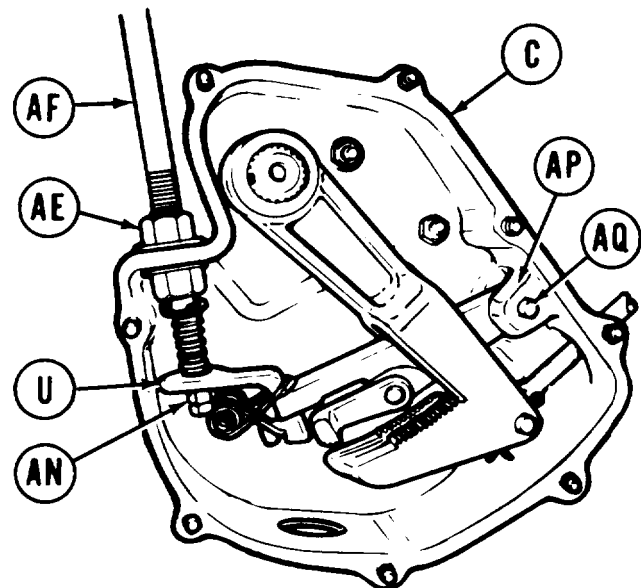
34. Position lever assembly (U) on control assembly (AF) and thread two nuts (AN) on control assembly finger tight.



NOTE

Do not tighten nuts (AN), They will be tightened during adjustment procedure.

35. Position lever assembly (U) in housing clevis (AP) and, using pliers, insert pin (AQ).



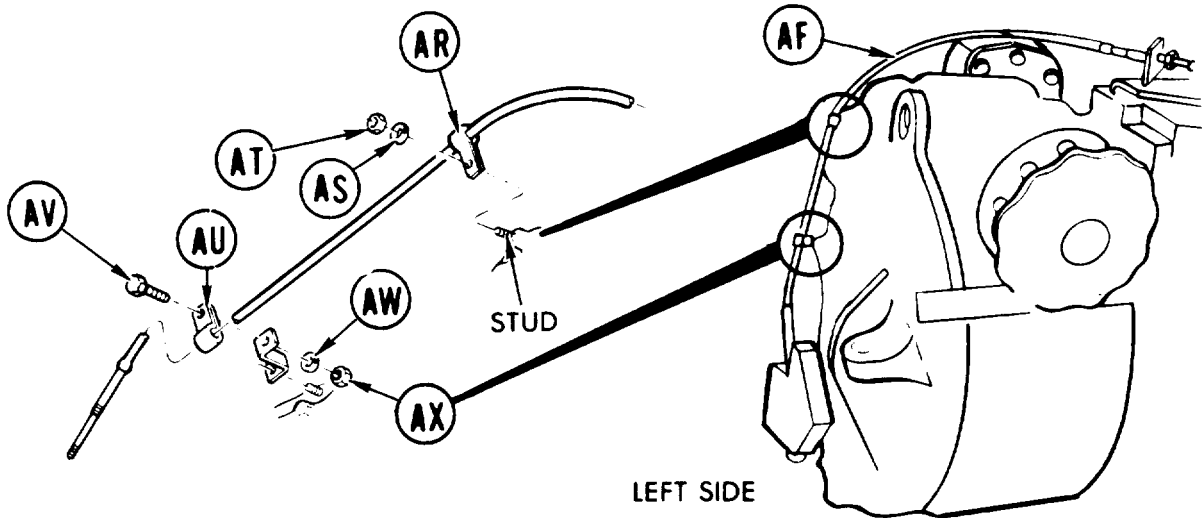
Go on to Sheet 13

TA140387

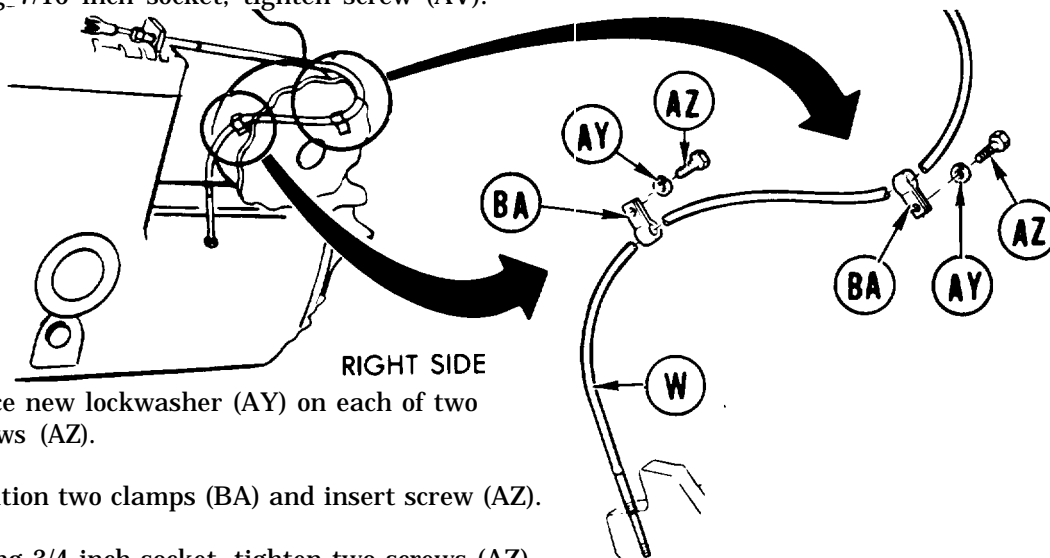
BRAKE CONTROL HOUSING REPAIR (Sheet 13 of 14)

NOTE

If left control cable was removed, perform steps 36 thru 40.
 For right control cable, perform steps 41 thru 43.



36. Position clamp (AR) on stud, add new lockwasher (AS) and nut (AT), and tighten finger tight.
37. Using 3/4 inch socket, universal joint, and extension, tighten nut (AT).
38. Position clamp (AU) and insert screw (AV).
39. Place new lockwasher (AW) and nut (AX) on screw (AV) finger tight.
40. Using 7/16 inch socket, tighten screw (AV).



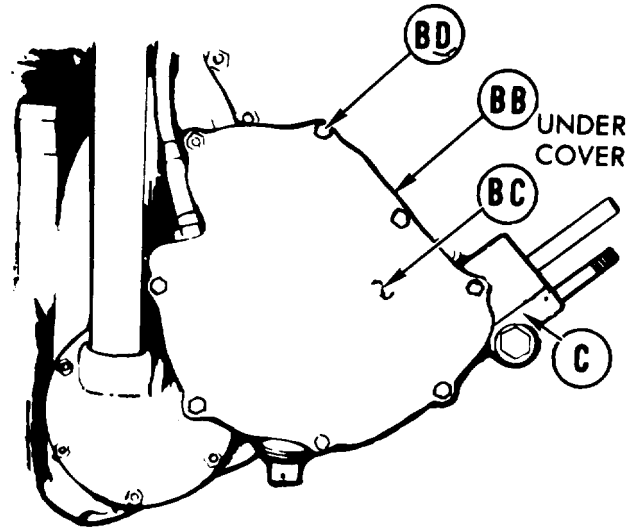
41. Place new lockwasher (AY) on each of two screws (AZ).
42. Position two clamps (BA) and insert screw (AZ).
43. Using 3/4 inch socket, tighten two screws (AZ).

Go on to Sheet 14

TA140388

BRAKE CONTROL HOUSING REPAIR (Sheet 14 of 14)

44. Perform parking brake pawl and bellcrank adjustment (page 13-16).
45. Position new gasket (BB) and install cover (BC) on studs of housing assembly (C).
46. Install eight new lockwashers and nuts (BD).
47. Install slave cylinder (pages 13-62, 13-67).



End of Task

TA140389

PARKING BRAKE CONTROL ASSEMBLY REPLACEMENT (ENGINE COMPARTMENT)
 (Sheet 1 of 15)

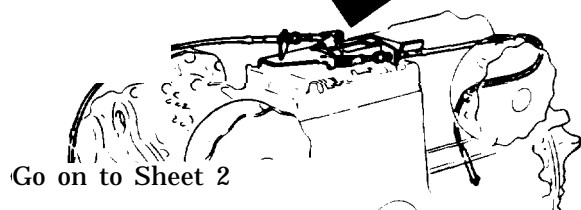
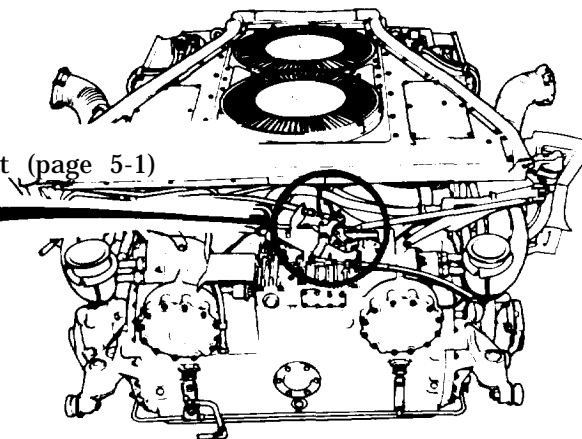
PROCEDURE INDEX

PROCEDURE	PAGE
Removal	13-85
Inspection	13-91
Installation	13-91

TOOLS: 9/16 in. combination box and open end wrench (2 required)
 7/16 in. socket with 1/2 in. drive
 3/4 in. socket with 1/2 in. drive
 Ratchet with 1/2 in. drive
 10 in. extension with 1/2 in. drive
 Long round nose pliers
 Torque wrench with 1/2 in. drive (0-175 lb-ft) (0-237 N.m)
 7/16 in. combination box and open end wrench
 8 in. adjustable wrench
 15/ 16 in. combination box and open end wrench (2 required)
 7/8 in. combination box and open end wrench
 6 in. steel rule

SUPPLIES: Cotter pin (MS24665-283 (3 required)
 Gasket (10911888)
 Preformed packing (MS28775-110)
 Packing with retainer (11659173-2)
 Pencil
 Writing paper
 Lockwasher (MS35338-63) (3 required)
 Lockwasher (MS35338-44) (10 required)
 Cotter pin (MS24665-138)
 Preformed packing (11602168-1)

PRELIMINARY PROCEDURE: Remove powerplant (page 5-1)



Go on to Sheet 2

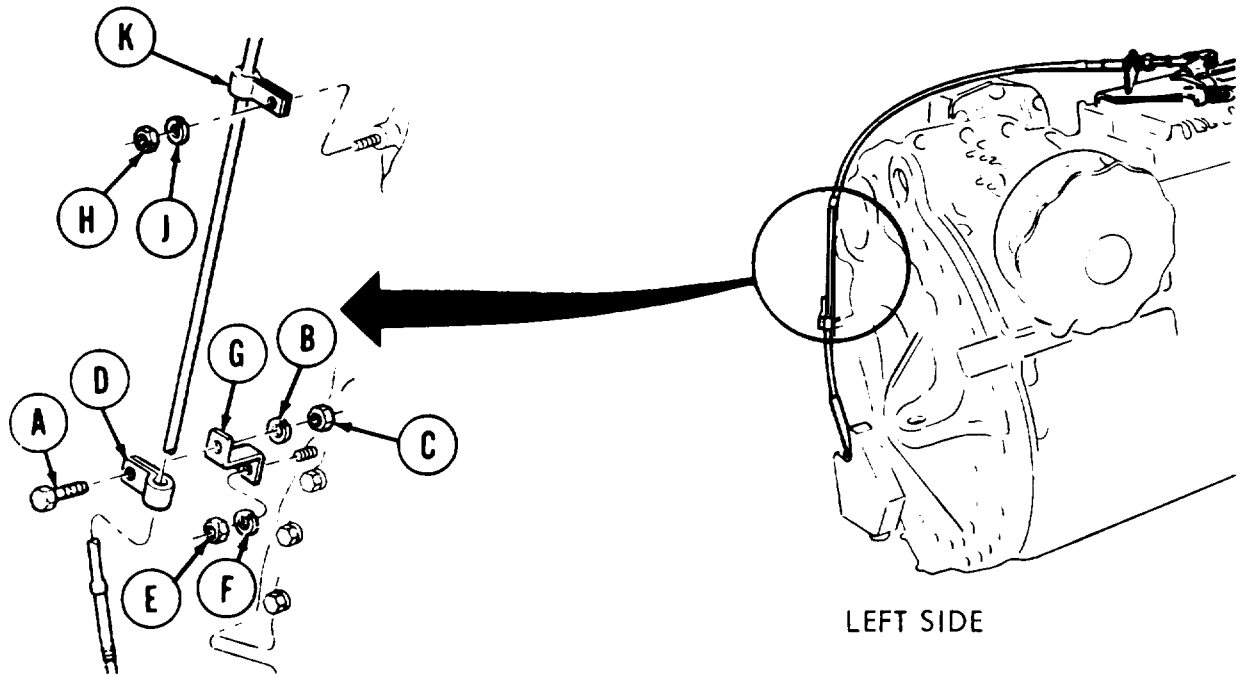
TA140390

PARKING BRAKE CONTROL ASSEMBLY REPLACEMENT (ENGINE COMPARTMENT) (Sheet 2 of 15)

REMOVAL:

NOTE

Except as noted, replacement of left or right control assembly is same.



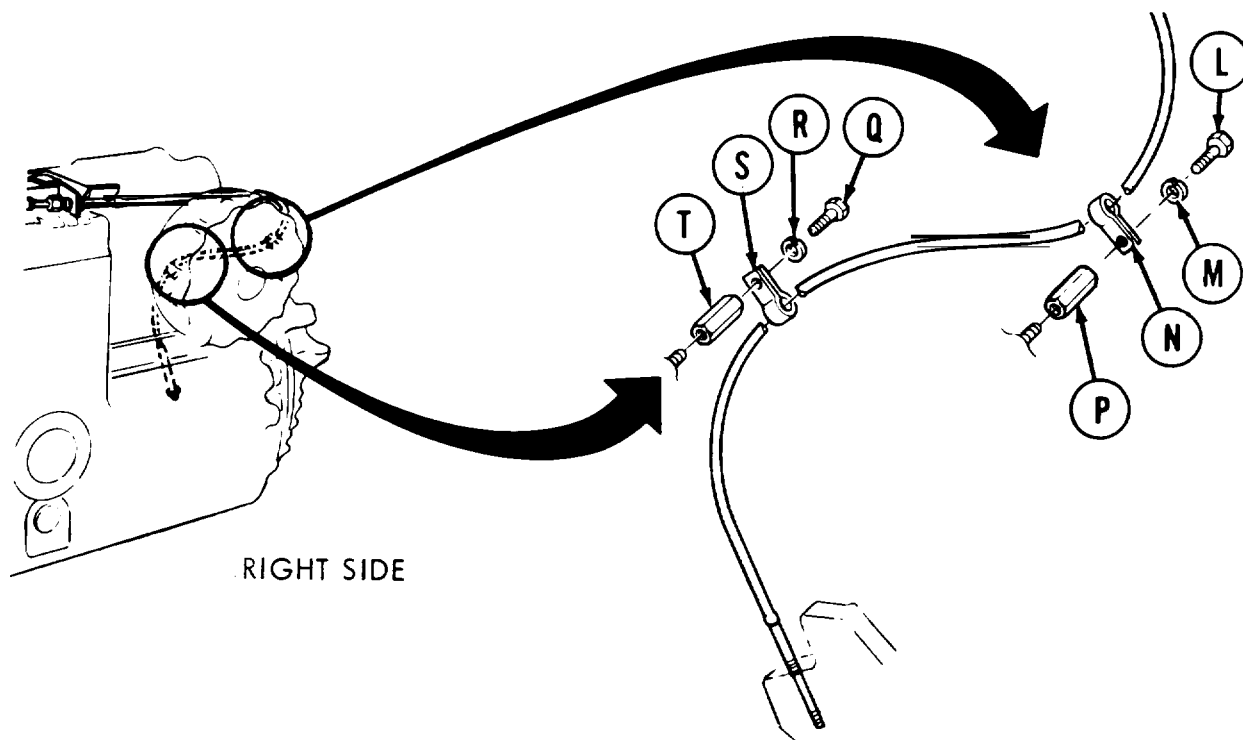
LEFT SIDE

1. Using 7/16 inch socket and 7/16 inch wrench, remove screw (A), lockwasher (B), and nut (C). Throw lockwasher away.
2. Remove clamp (D) from control assembly.
3. Using 3/4 inch socket, remove nut (E) and lockwasher (F). Throw lockwasher away.
4. Remove bracket (G).
5. Using 3/4 inch socket and extension, remove nut (H) and lockwasher (J). Throw lockwasher away.
6. Remove clamp (K) from stud and control assembly.

Go on to Sheet 3

TA140391

PARKING BRAKE CONTROL ASSEMBLY REPLACEMENT (ENGINE COMPARTMENT)
(Sheet 3 of 15)

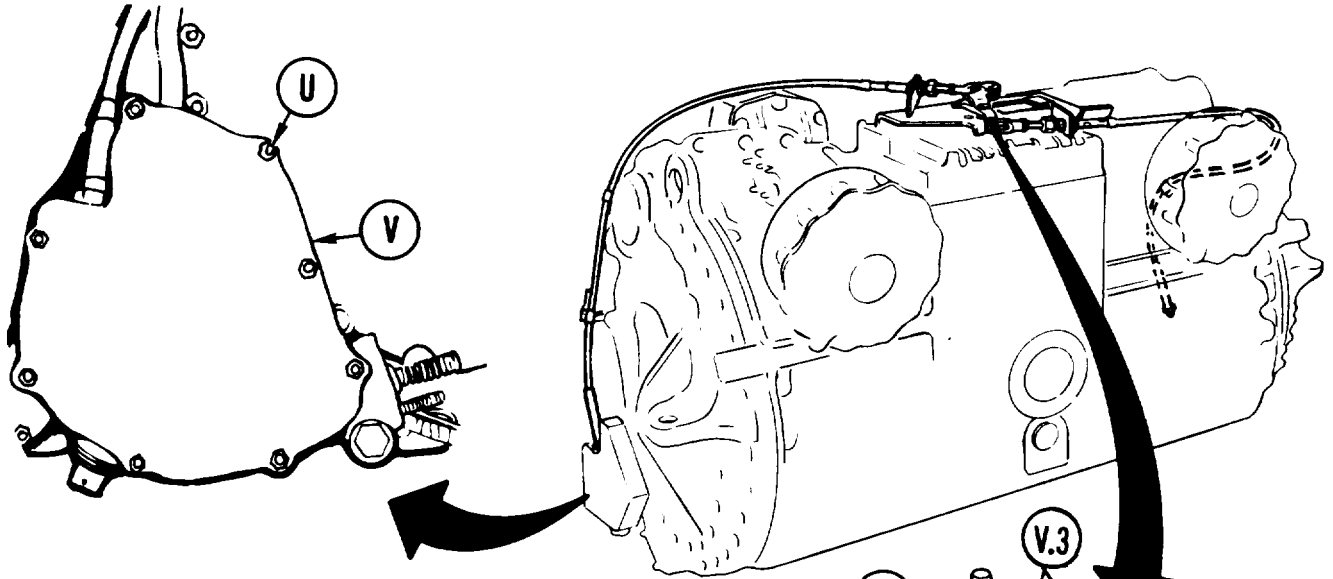


7. Using 3/4 inch socket, remove screw (L) and lockwasher (M). Throw lockwasher away.
8. Remove clamp (N) from control assembly.
9. Using 3/4 inch socket, remove nut (P).
10. Using 3/4 inch socket, remove screw (Q) and lockwasher (R). Throw lockwasher away.
11. Remove clamp (S) from control assembly.
12. Using 3/4 inch socket, remove nut (T).

Go on to Sheet 4

TA140392

PARKING BRAKE CONTROL ASSEMBLY REPLACEMENT (ENGINE COMPARTMENT)
(Sheet 4 of 15)



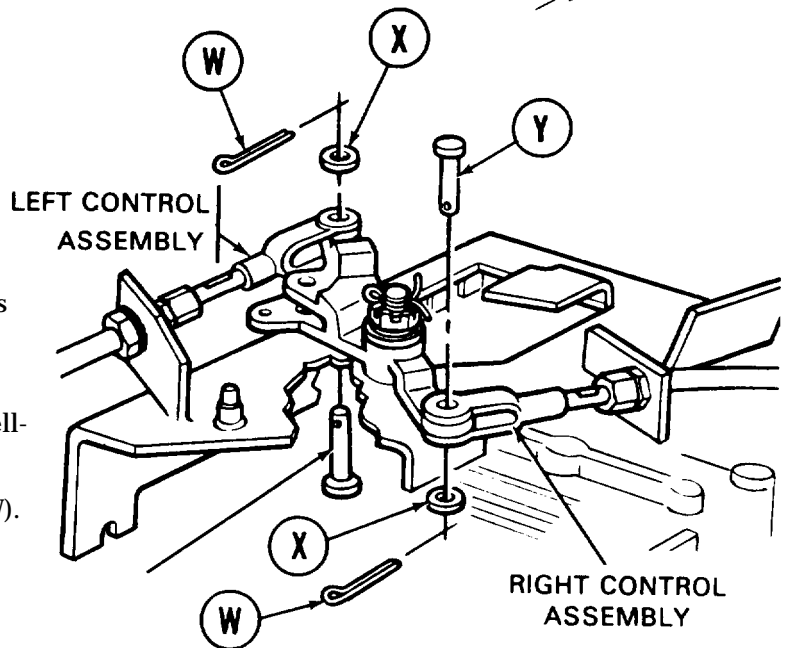
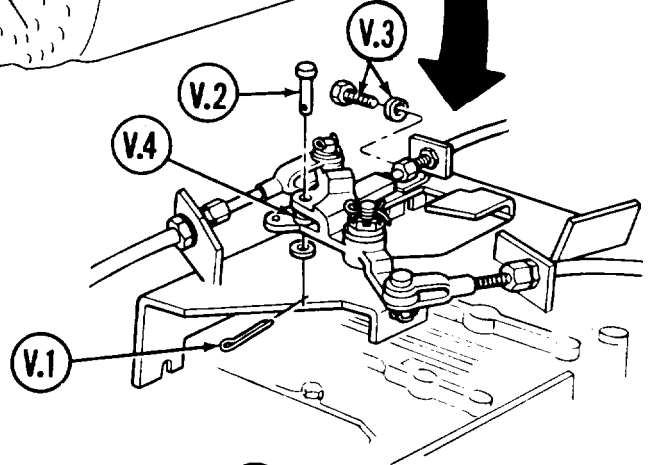
13. Using 7/16 inch socket, remove eight nuts and lockwashers (U) from cover (V) on left or right sides. Throw lockwashers away.
14. Remove cover and gasket (V) on left or right sides. Throw gasket away.

NOTE

If your vehicle is equipped with two-piece brake control cable, perform steps 14.1 thru 14.4 and go to step 17.

If your vehicle is equipped with one-piece brake control cable, go to step 15.

- 14.1 Using pliers, remove cotter pin (V.1).
- 14.2 Remove pin (V.2).
- 14.3 Using 9/16 inch socket, remove two bolts and lockwashers (V.3) securing bracket. Throw lockwashers away.
- 14.4 Remove control assembly (V.4) from bell-crank and position aside.
15. Using pliers, remove two cotter pins (W). Throw cotter pins away.
16. Remove two washers (X) and pins (Y).

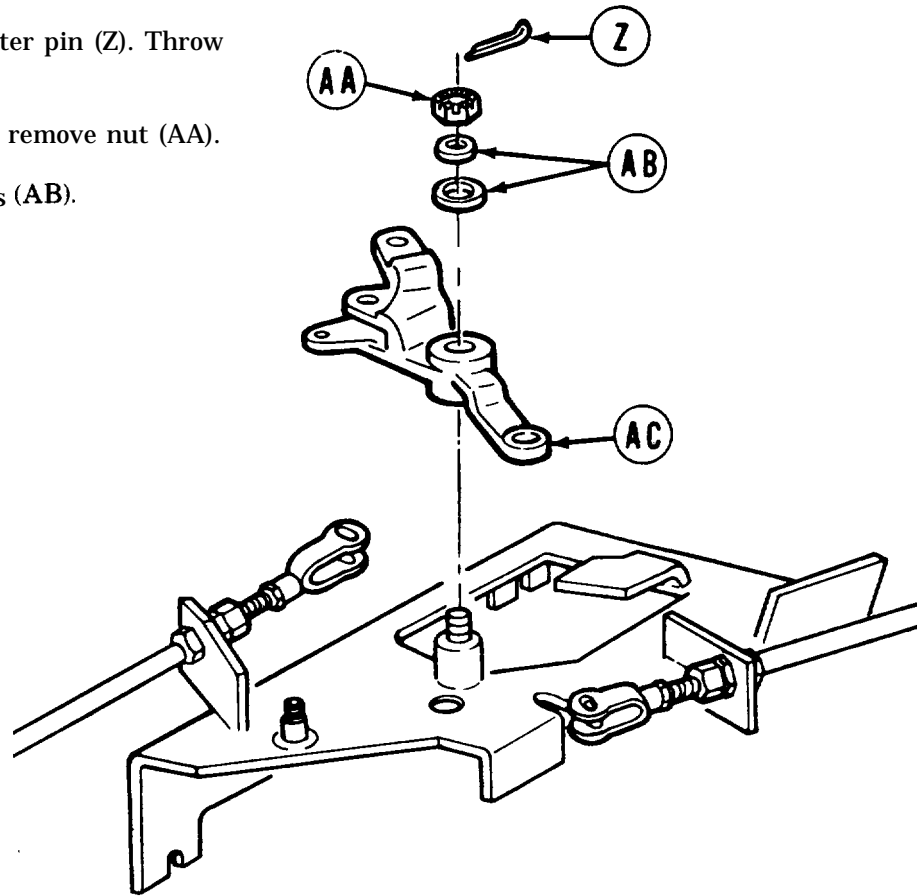


Go on to Sheet 5

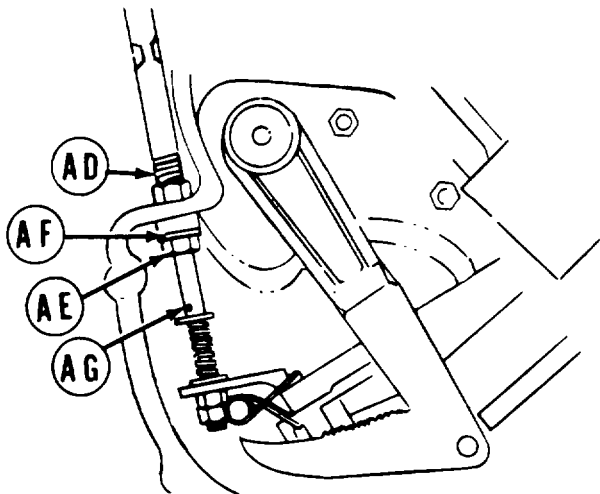
TA253440

PARKING BRAKE CONTROL ASSEMBLY REPLACEMENT (ENGINE COMPARTMENT)
(Sheet 5 of 15)

17. Using pliers, remove cotter pin (Z). Throw cotter pin away.
18. Using 9/16 inch wrench, remove nut (AA).
19. Remove two flat washers (AB).
20. Remove bellcrank (AC).



21. Using 9/16 inch wrench on flats (AD) of control assembly and 15/16 inch wrench on nut (AE), back off nut (AE) until it falls.
22. Pull or pry packing with retainer (AF) off control assembly.
23. Using pliers, remove cotter pin (AG). Throw cotter pin away.

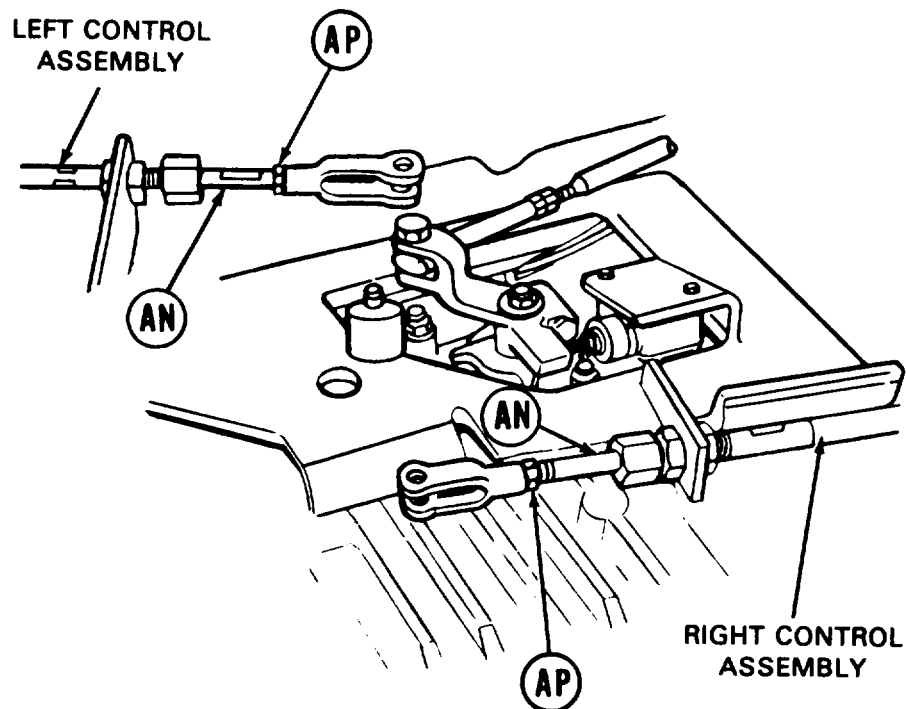
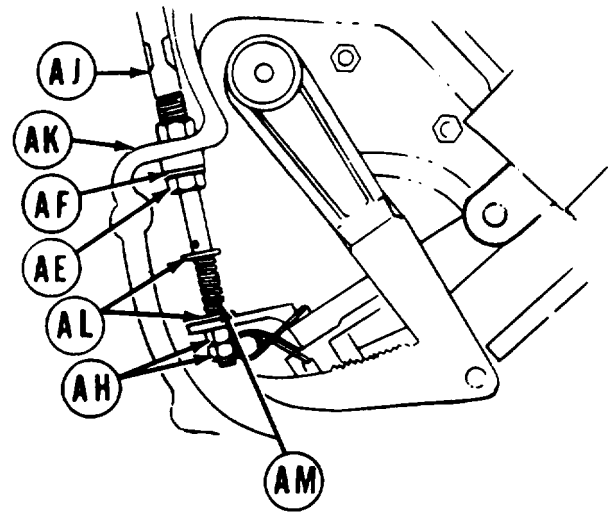


Go on to Sheet 6

TA140394

PARKING BRAKE CONTROL ASSEMBLY REPLACEMENT (ENGINE COMPARTMENT)
 (Sheet 6 of 15)

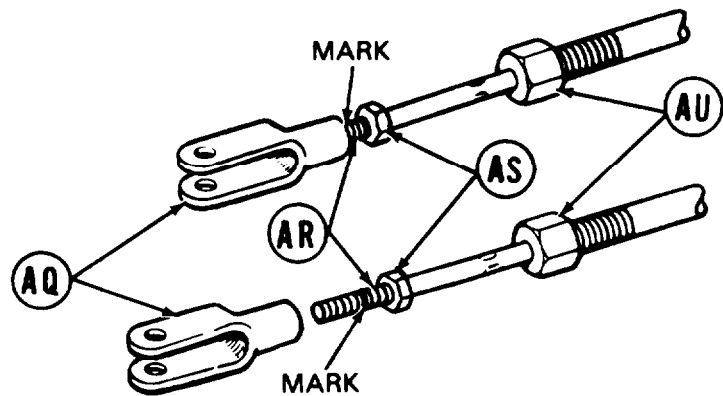
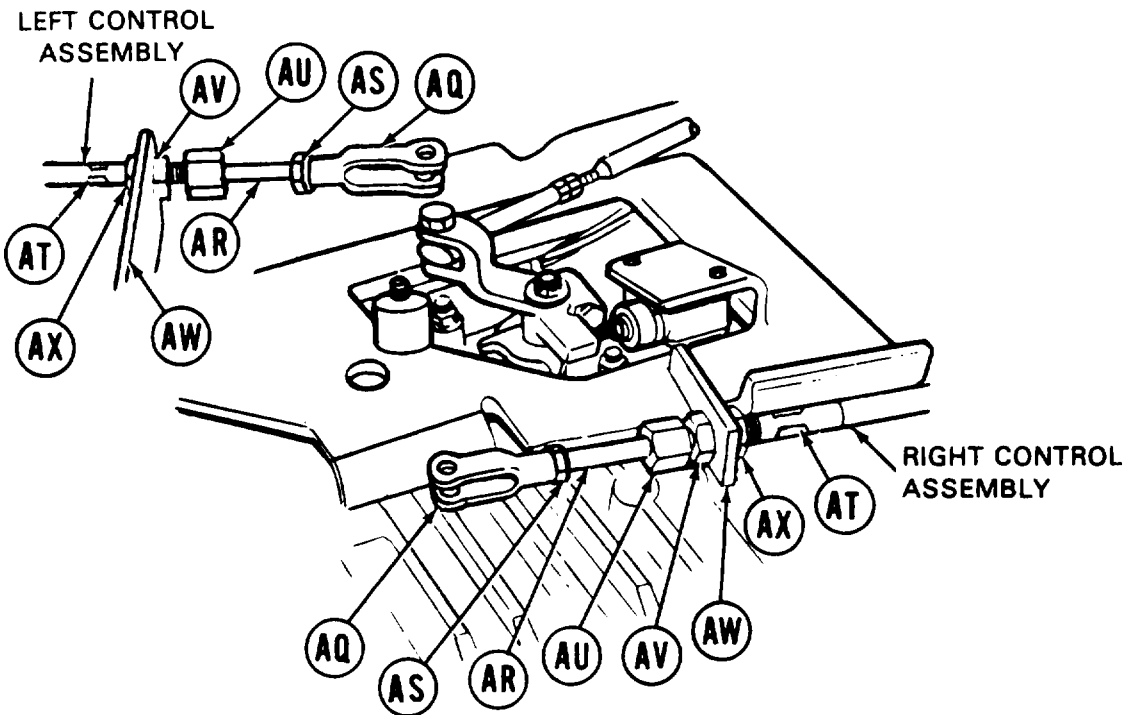
- 24 Using two 9/16 inch wrenches, remove two nuts (AH) by removing lower nut first while holding upper nut. (Note - your system may only have one nut).
25. Pull control assembly (AJ) out of housing (AK). When control assembly is pulled out, washers (AL), spring (AM), packing with retainer (AF), and nut (AE) will fall free.
26. Throw packing with retainer (AF) away.
27. Remove and throw away preformed packing from inside of nut (AE).
28. On early model only, using adjustable wrench on flats of inner rod (AN) and 9/16 inch wrench, back off nut (AP) on left or right side.



Go on to Sheet 7

TA253441

PARKING BRAKE CONTROL ASSEMBLY REPLACEMENT (ENGINE COMPARTMENT)
 (Sheet 7 of 15)



29. Measure and record distance that clevis (AQ) is threaded onto control assembly rod (AR).
30. Using fingers, remove clevis (AQ).
31. On early model only, using 9/16 inch wrench, remove nut (AS).
32. Using 9/16 inch wrench to hold flata (AT) of control assembly and, using 15/16 inch wrench, remove nut (AU).
33. Using 9/16 inch wrench to hold flab (AT) of control assembly and using 15/16 inch wrench, remove nut and washer (AV).
34. Pull control assembly out of bracket (AW).
35. Using 9/16 inch wrench to hold flats (AT) of control assembly and, using 15/16 inch wrench, remove nut and washer (AX).

Go on to Sheet 8

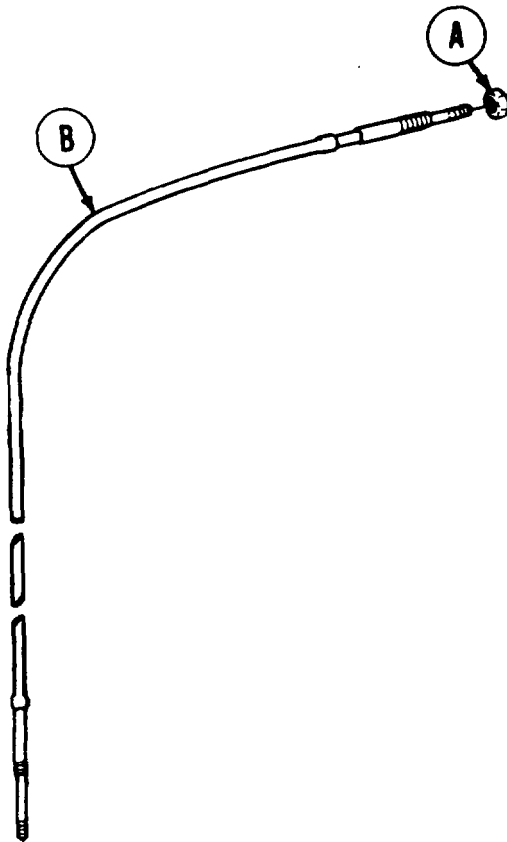
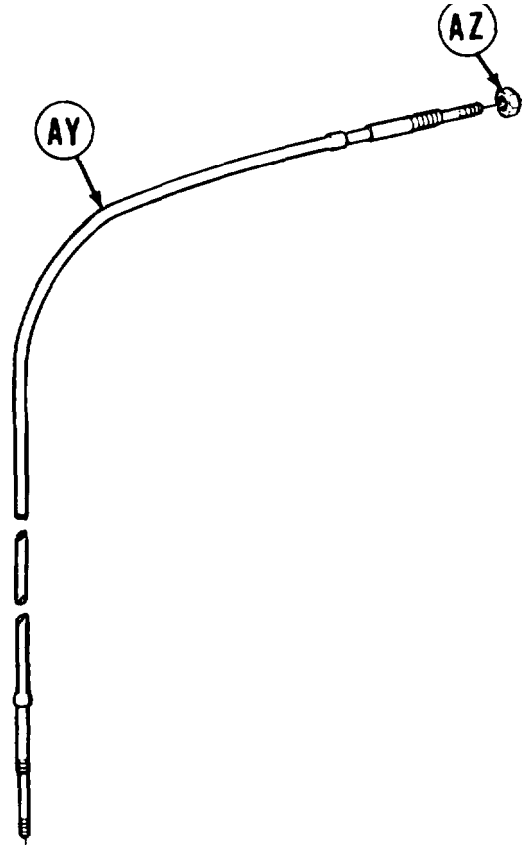
TA253442

PARKING BRAKE CONTROL ASSEMBLY REPLACEMENT (ENGINE COMPARTMENT) (Sheet 8 of 15)

36. Remove control assembly (AY).
37. Using 9/16 inch wrench on flats of control assembly (AY), use 15/16 inch wrench and remove nut (AZ).

INSPECTION:

1. Inspect all items removed for damage or wear.
2. Replace parts as necessary.



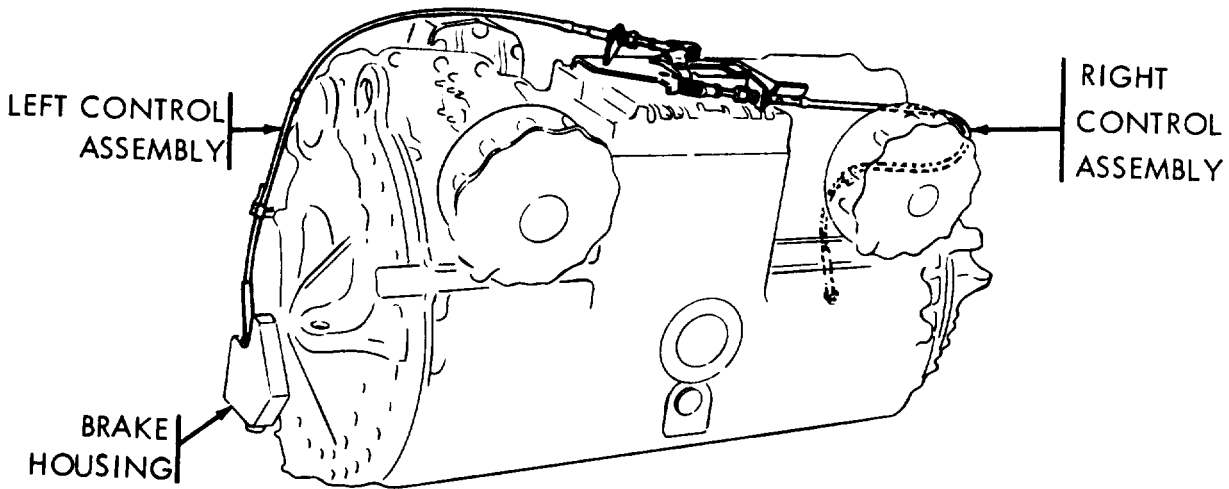
INSTALLATION:

1. Check control assembly moveable section for end containing cotter pin hole through threaded end section.
2. Using 9/16 inch wrench on flats of control assembly and, using 15/16 inch wrench, install nut (A) onto control assembly (B).

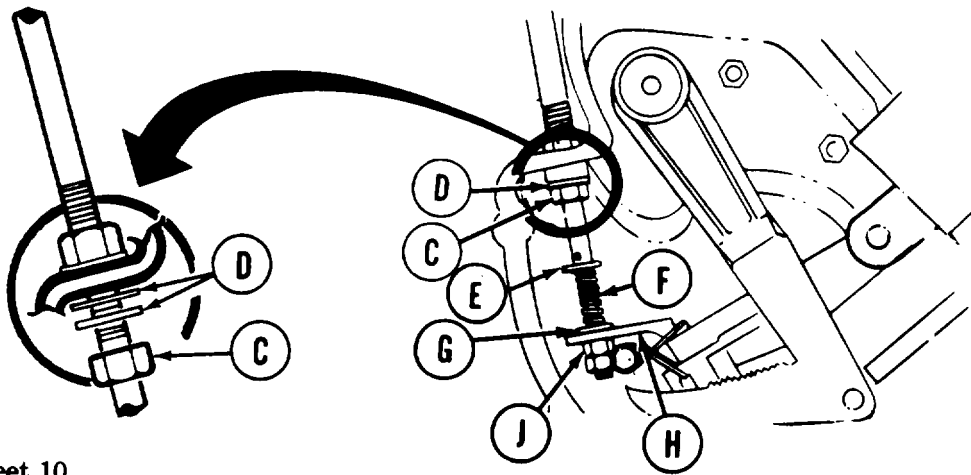
Go on to Sheet 9

TA140397

PARKING BRAKE CONTROL ASSEMBLY REPLACEMENT (ENGINE COMPARTMENT)
(Sheet 9 of 16)



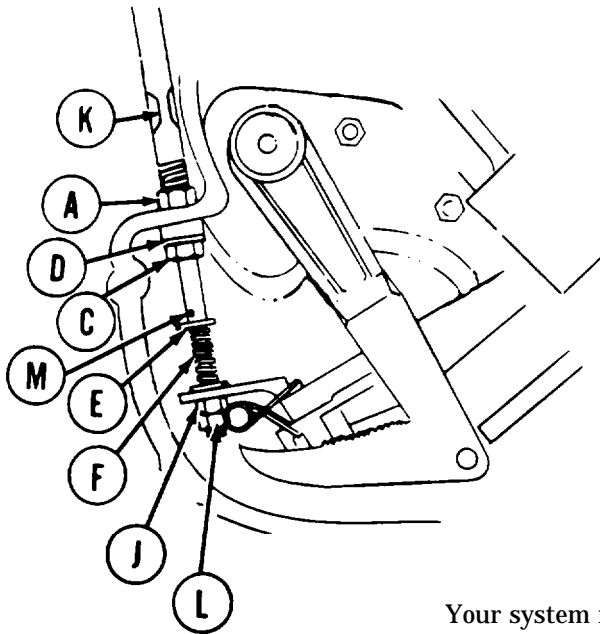
3. Position control assembly to transmission. Place end with nut installed at brake housing.
4. Position control assembly end rod through hole in brake housing.
5. Deleted.
6. As you are inserting control assembly end rod, install the following parts in the following order: new packing with new retainer (D), nut (C), washer (E), spring (F), and washer (G).
7. Continue inserting control assembly and guide end of rod through brake lever (H) and install one nut (J) onto rod end. It may be necessary to compress spring (F) to permit rod end to pass through brake lever (H).



Go on to Sheet 10

TA253443

PARKING BRAKE CONTROL ASSEMBLY REPLACEMENT (ENGINE COMPARTMENT)
 (Sheet 10 of 15)

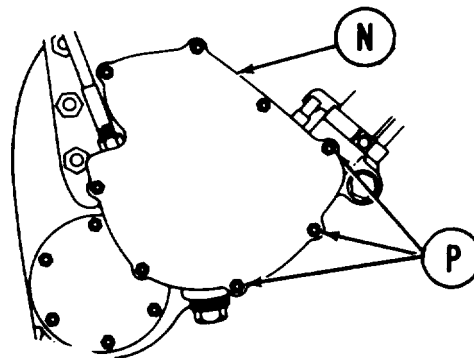


8. Push packing with retainer (D) onto threaded sleeve of control assembly.
9. Thread nut (C) onto sleeve and finger tighten on shaft.
10. Using 9/16 inch wrench on flats (K) of control assembly, use 15/16 inch wrench to tighten nut (A) securely against housing.

NOTE

Your system may not have nut (L). If not skip step 12.

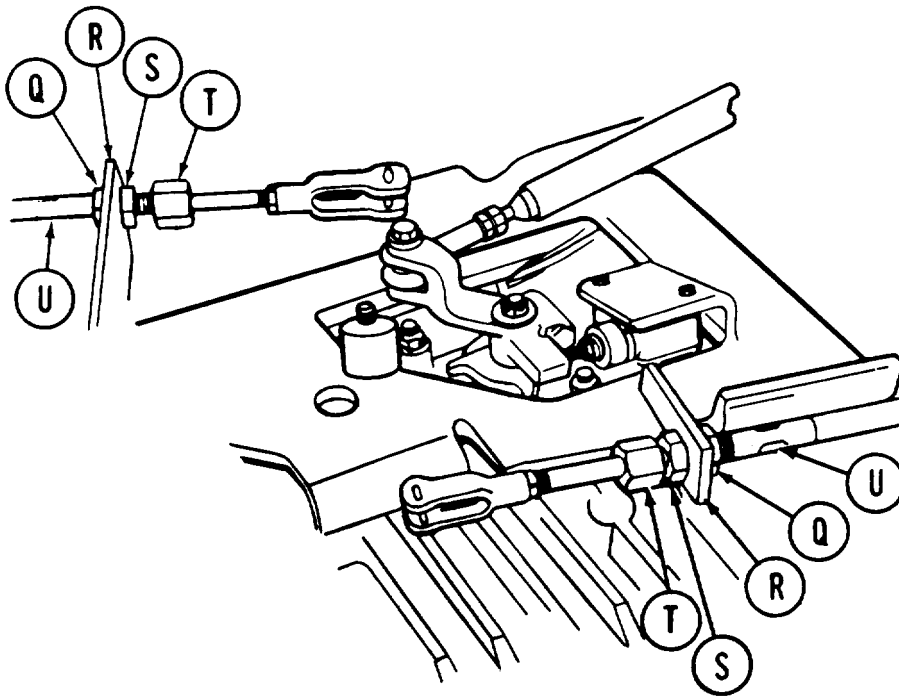
11. Using 9/16 inch wrench, thread nut (J) onto rod end to allow installation of another nut.
12. Using fingers, install and tighten second nut (L) onto rod end.
13. Push washer (E) and spring (F) downward and install new cotter pin (M) through hole in rod end.
14. Using pliers, bend cotter pin (M) to prevent it from falling out.
15. Install cover and new gasket (N).
16. Using 7/16 inch socket, install eight nuts and new lockwashers (P).



Go on to Sheet 11

TA253444

PARKING BRAKE CONTROL ASSEMBLY REPLACEMENT (ENGINE COMPARTMENT)
(Sheet 11 of 15)



17. Install nut and washer (Q) over end of control assembly. Thread nut to end of threaded sleeve.
18. Insert end of control assembly through bracket (R).
19. Install washer and nut (S) onto control assembly. Thread nut onto threaded sleeve.
20. Using two 15/16 inch wrenches, tighten nuts (Q) and (S).
21. Install new preformed packing into nut (T) and install nut onto control assembly.
22. Using 9/16 inch wrench on flats (U) of control assembly and 15/16 inch wrench on nut (T), thread nut onto control assembly sleeve until it bottoms. Tighten nut securely.

Go on to Sheet 12

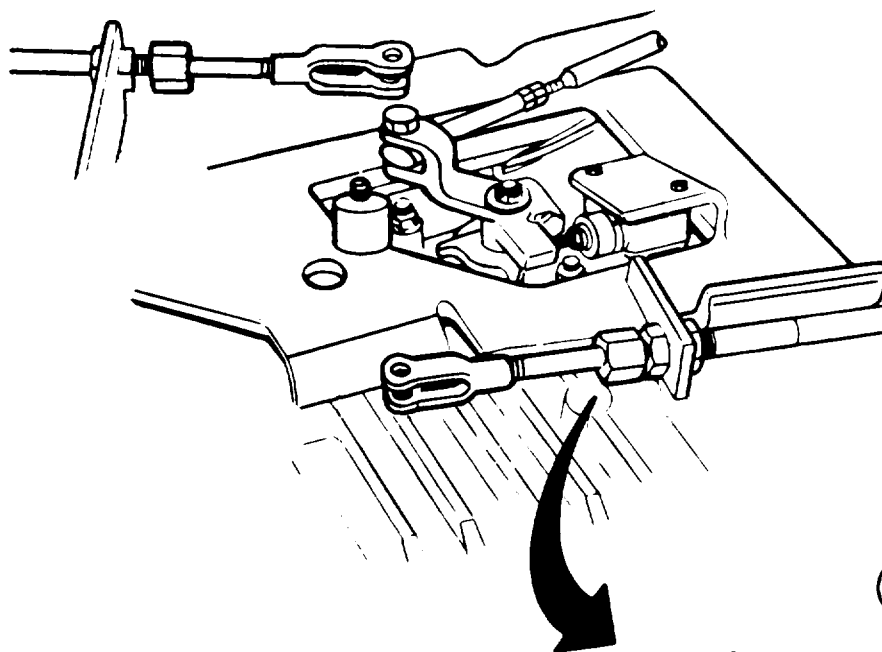
TA140400

PARKING BRAKE CONTROL ASSEMBLY REPLACEMENT (ENGINE COMPARTMENT)
 (Sheet 12 of 15)

23. Deleted.

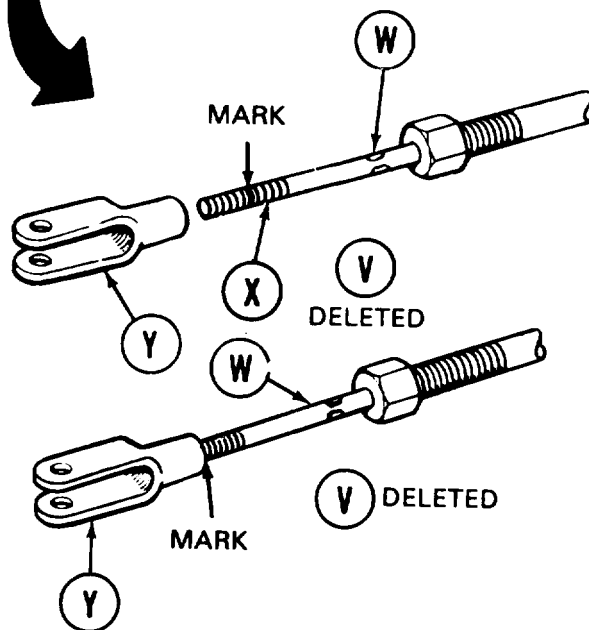
24. Deleted.

25. Measure and mark on control assembly rod end (X) distance clevis (Y) is to be threaded on.
 (Distance was measured and recorded during removal of clevis.)



26. Using adjustable wrench on flats (W) (if present) of control assembly, install clevis on rod. Thread clevis (Y) up to measured mark.

27. Deleted.

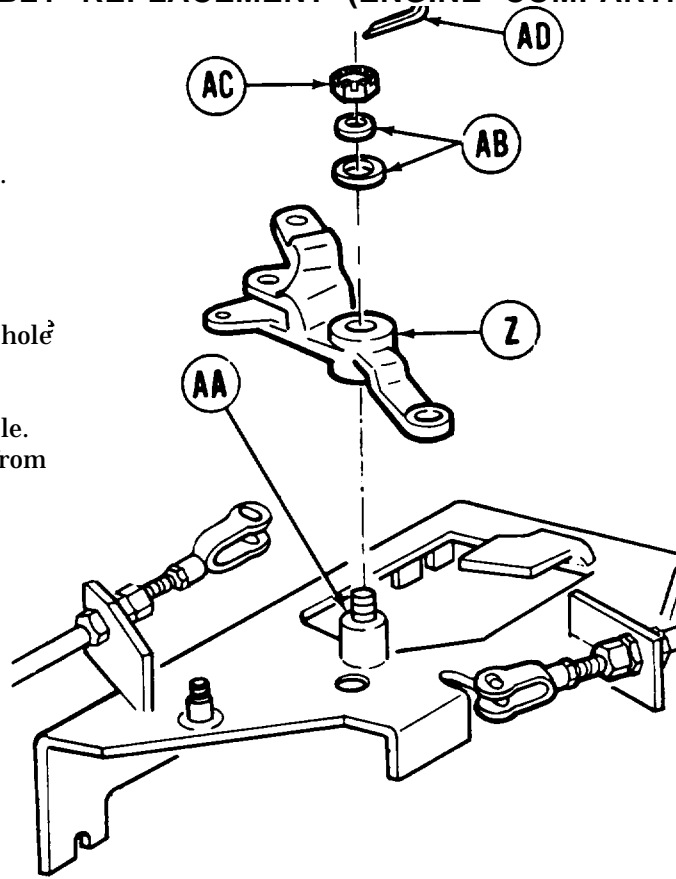


Go on to Sheet 13

TA253445

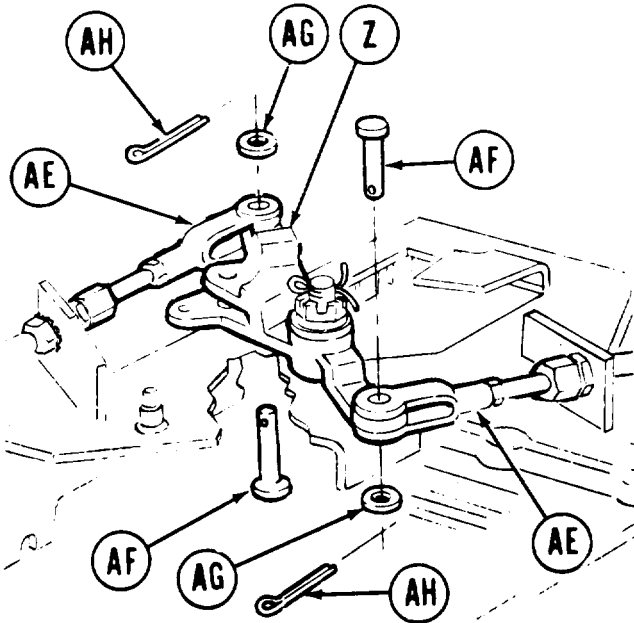
PARKING BRAKE CONTROL ASSEMBLY REPLACEMENT (ENGINE COMPARTMENT)
(Sheet 13 of 15)

28. Install bellcrank (Z) onto stud (AA).
29. Install two flat washers (AB) onto stud (AA).
30. Install nut (AC) onto stud. Using 9/16 inch wrench, tighten nut.
31. Back off nut (AC) to aline slots in nut with hole in stud.
32. Install new cotter pin (AD) through stud hole. Using pliers, bend cotter pin to prevent it from falling out.
33. Position clevis (AE) to bellcrank (Z).



NOTE

If your vehicle is equipped with the two-piece brake control cable perform steps 36.1 thru 36.3 and proceed to step 37. If your vehicle is equipped with the one-piece brake control cable proceed to step 34.

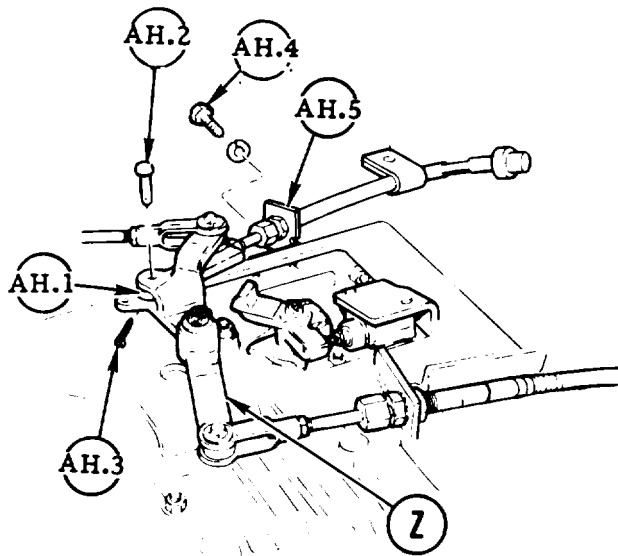


34. Install pin (AF) and washer (AG) to secure clevis to bellcrank.
35. Install new cotter pin (AH) through hole in pin (AF).
36. Using pliers, bend cotter pin (AH) to prevent it from falling out.

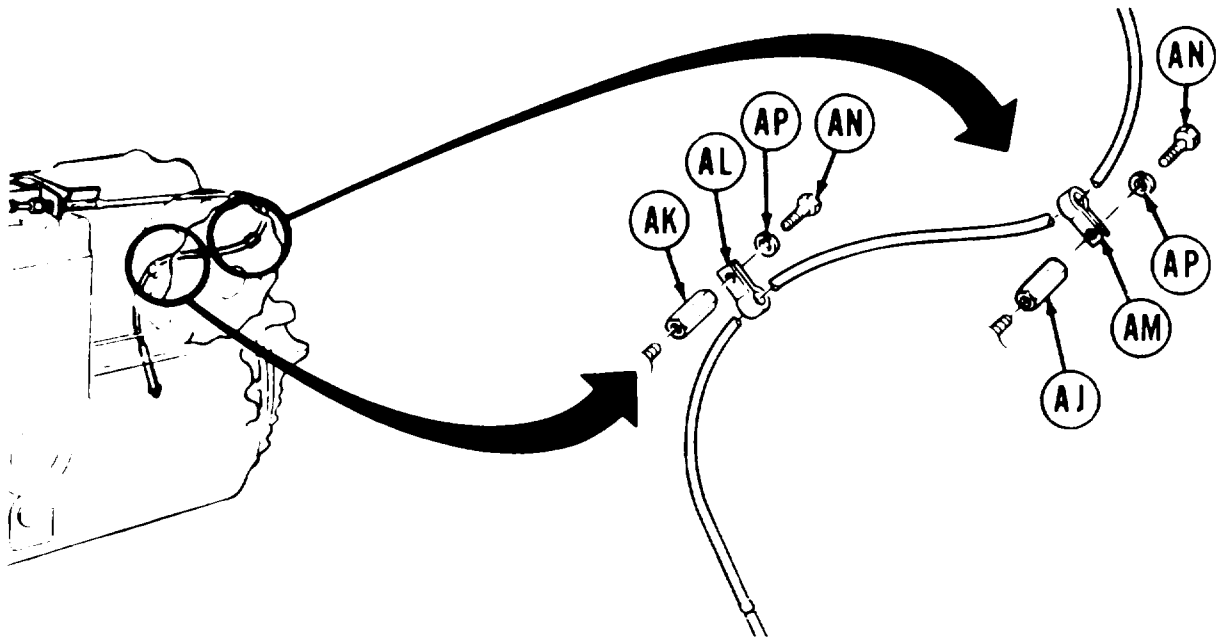
Go on to Sheet 14

TA253448

PARKING BRAKE CONTROL ASSEMBLY REPLACEMENT (ENGINE COMPARTMENT)
 (Sheet 14 of 15)



- 36.1 Position control assembly (AH.1) to bellcrank (Z) and install pin (AH.2),
- 36.2 Using pliers, install cotter pin (AH.3) on pin (AH.2).
- 36.3 Using 9/16 inch socket, install two screws (AH.4) securing control assembly bracket (AH.5).

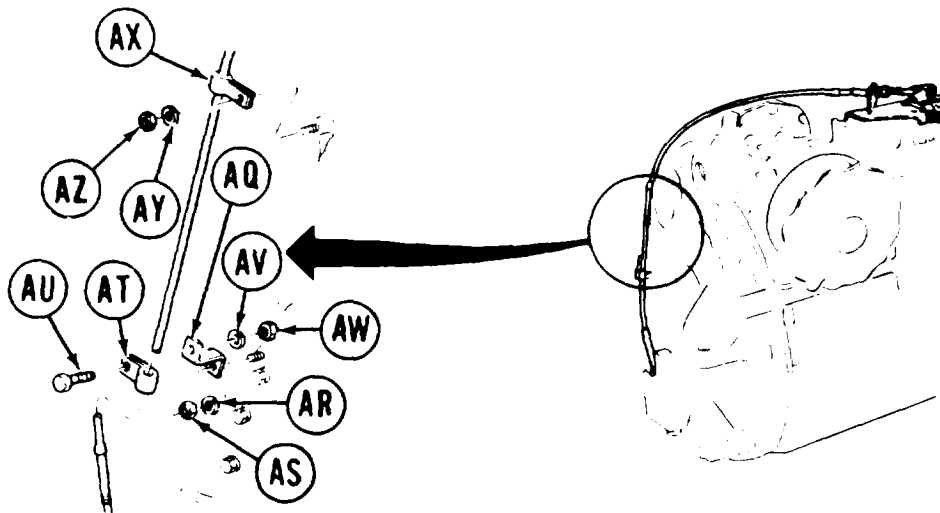


- 37. Using 3/4 inch socket, install nuts (AJ) and (AK). Using 3/4 inch socket and torque wrench, tighten nuts to 55-60 lb-ft (74-81 N.m).
- 38. Position clamps (AL) and (AM) on control assembly.
- 39. Install screws (AN) and new lockwashers (AP) to secure clamps (AL) and (AM). Using 3/4 inch socket, tighten screws.
- 40. Adjust clamp (AM) to maintain minimum 3/4 inch clearance between control assembly and turbocharger.

Go on to Sheet 15

TA253449

PARKING BRAKE CONTROL ASSEMBLY REPLACEMENT (ENGINE COMPARTMENT)
 (Sheet 15 of 15)



41. Position bracket (AQ) on transmission stud.
42. Install washer (AR) and nut (AS) to secure bracket (AQ). Using 3/4 inch socket, tighten nut.
43. Using 3/4 inch socket and torque wrench, tighten nut (AS) to 55-60 lb-ft (74-81 N-m).
44. Install clamp (AT) on control assembly,
45. Install screw (AU), new lockwasher (AV), and nut (AW) to secure clamp (AT) to bracket (AQ)
 Using 7/16 inch wrench to hold nut (AW) and 7/16 inch socket on screw (AU), tighten screw (AU).
46. Adjust clamp (AT) to allow clearance between control assembly and transmission oil filler tube bracket.
47. Install clamp (AX) on control assembly
48. Install new lockwasher (AY) and nut (AZ) to secure clamp.
49. Using 3/4 inch socket and extension, tighten nut (AZ).
50. Using 3/4 inch socket and torque wrench, tighten nut (AZ) to 55-60 lb-ft (74-81 N.m).
51. Adjust clamp to maintain minimum 3/4 inch clearance between control assembly and turbocharger.
52. Adjust parking brake pawl and bellcrank (page 13-16).
53. Install 2A powerplant (page 5-14) or 2D powerplant (page 5-37).

End of Task

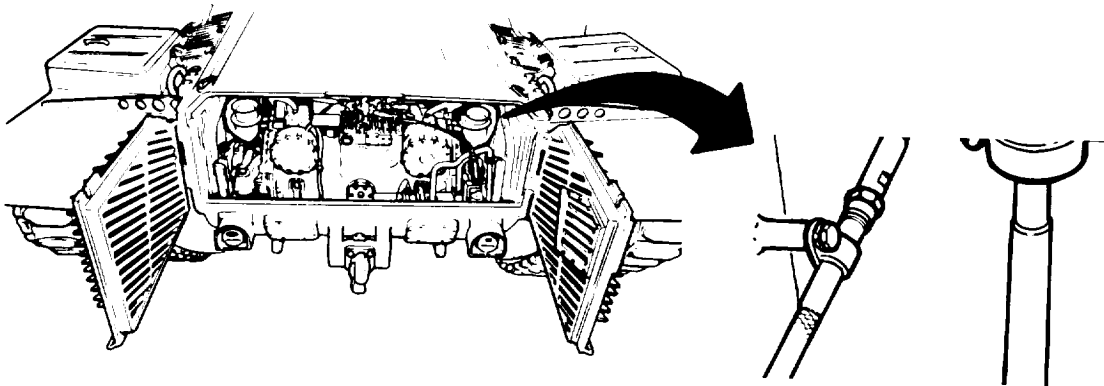
TA140404

PARKING BRAKE CONTROL ASSEMBLY REPLACEMENT (ENGINE MOUNTED) (Sheet 1 of 7)

TOOLS: 7/8 in. combination box and open end wrench
 9/16 in. socket with 3/8 in. drive
 Ratchet with 3/8 in. drive
 7/16 in. combination box and open end wrench
 9/16 in. combination box and open end wrench
 15/16 in. combination box and open end wrench
 Adjustable wrench
 Long round nose pliers
 Slip joint pliers
 5 in. extension with 3/8 in. drive
 6 in. rule
 7/8 in. crowfoot wrench with 3/8 in. drive

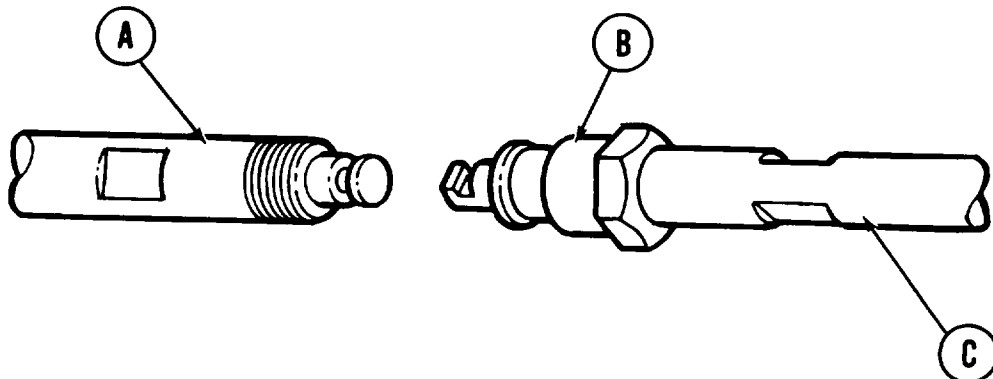
SUPPLIES: Lockwasher (2 required)
 Lock washer
 Preformed packing

PRELIMINARY PROCEDURES: Remove transmission shroud (page 9-20)
 Block tracks (TM 9-2350 -222-1 O)



REMOVAL:

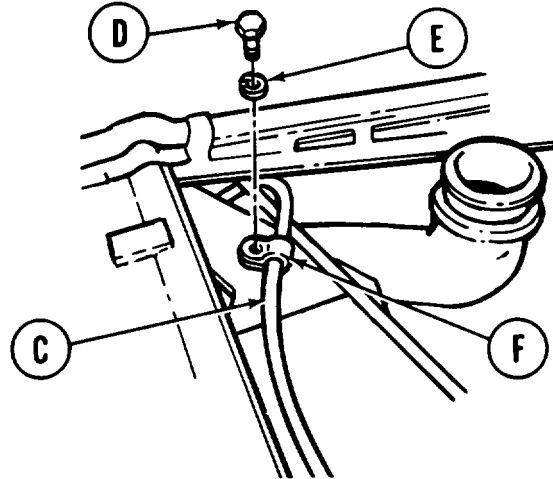
1. At flats, use an adjustable wrench to hold control assembly (A), use 7/8 inch wrench to loosen disconnect nut (B) on control assembly (C). separate control assemblies (A and C).



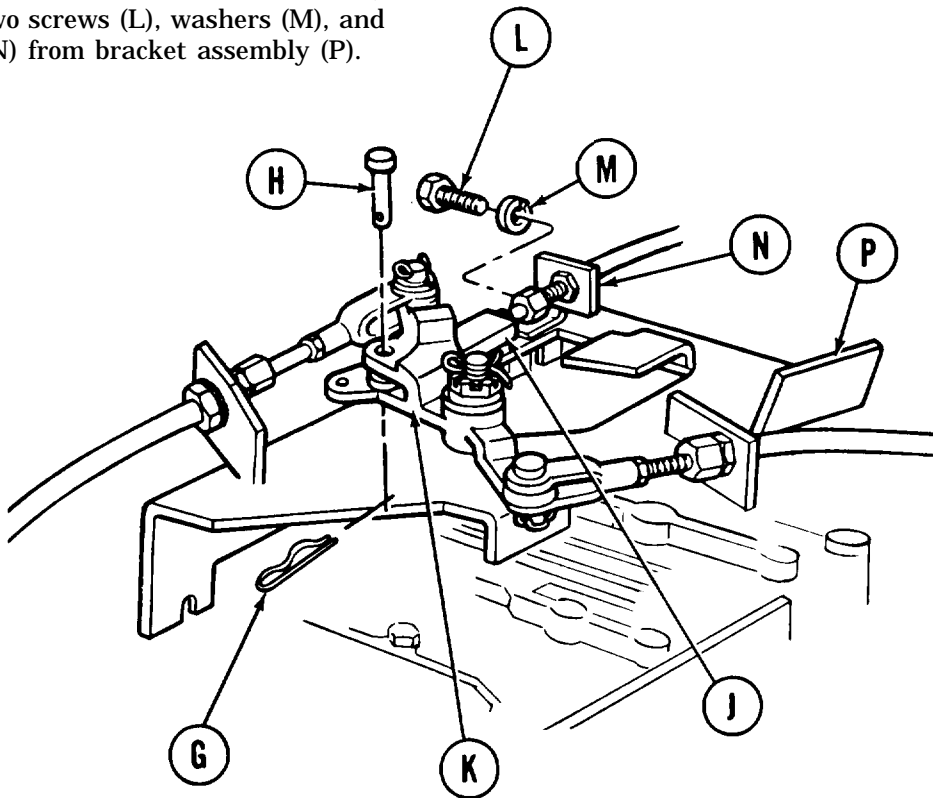
Go on to Sheet 2

PARKING BRAKE CONTROL ASSEMBLY REPLACEMENT (ENGINE MOUNTED)
sheet 2 of 7)

- Using 7/16 inch wrench, remove screw (D), lockwasher (E), and clamp (F) securing control assembly (C) to the boss on top of transmission. Throw lockwasher away.



- At transmission bellcrank assembly using pliers, remove clip (G) and pin (H) securing connector (J) to bellcrank (K).
- Using a 9/16 inch socket and extension, remove two screws (L), washers (M), and bracket (N) from bracket assembly (P).

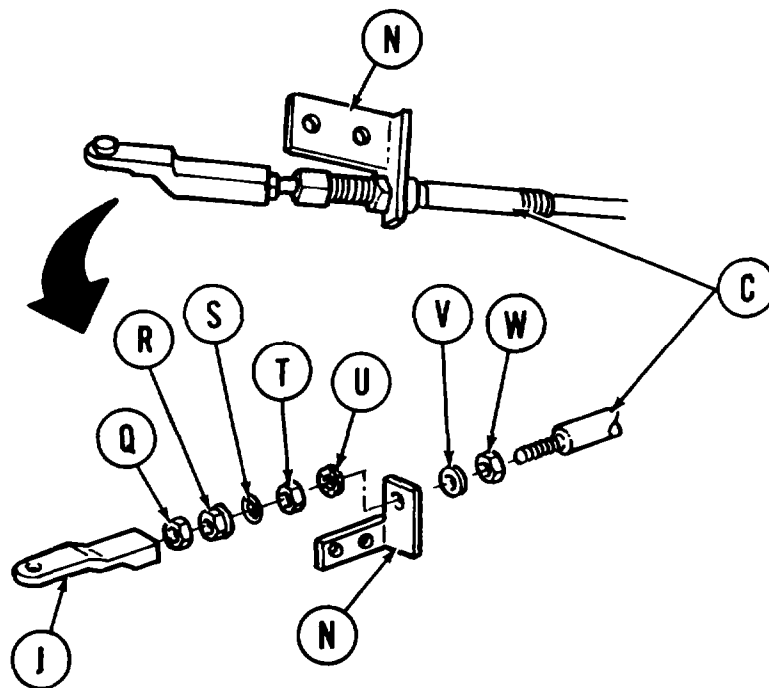


Go on to Sheet 3

TA253451

**PARKING BRAKE CONTROL ASSEMBLY REPLACEMENT (ENGINE MOUNTED)
(Sheet 3 of 7)**

5. Using 9/16 inch wrench on nut (Q) and adjustable wrench, remove connector (J) and nut (Q).
6. Use an adjustable wrench to hold support bracket(N). Using a 15/16 inch wrench, remove nut (R) and preformed packing (S). Throw preformed packing away.
7. Using a 15/16 inch wrench, remove nut (T) and lockwasher (U) from control assembly (C). Remove support bracket (N) and lockwasher (V). Throw lockwashers away.
8. Using a 15/16 inch wrench, remove nut (W) from control assembly (C).



Go on to Sheet 4

TA253452

Change 1 13-98.3

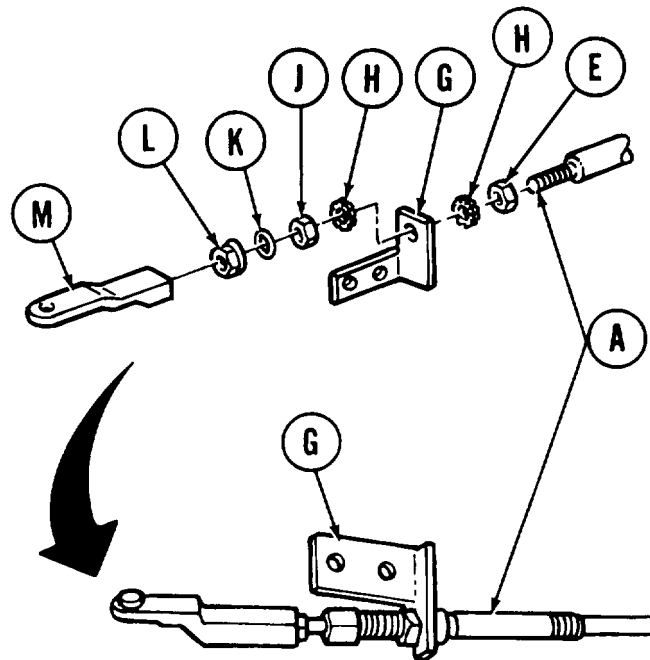
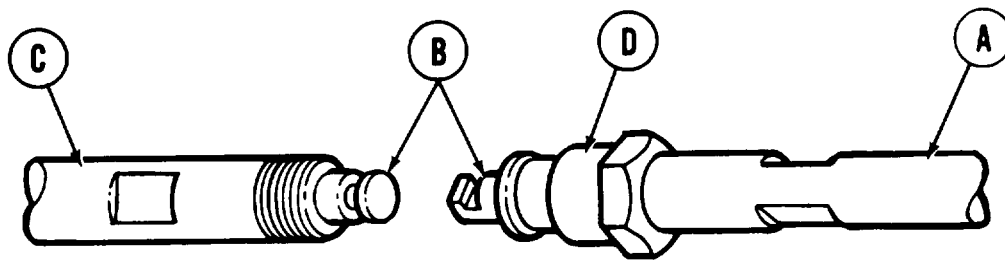
PARKING BRAKE CONTROL ASSEMBLY REPLACEMENT (ENTINE MOUNTED)

INSTALLATION:

CAUTION

Make sure the metal casing of control assembly (A) is free to rotate at both ends so as not to cause binding of the inner pushrod.

1. Connect the inner pushrods (B) of control assemblies (A) and (C) and slide nut (D) over connection, Manually tighten disconnect nut (D) on control assembly (C) finger tight.



2. Using a 15/16 inch wrench, install nut (E),
3. Install new lockwasher (F), bracket (G), and new lockwasher (H) on control assembly (A).
4. Using 15/ 16 inch wrench, install nut (J).
5. Install new packing (K) in nut (L).
6. Using a 15/16 inch wrench, install new nut (L).
7. Using an adjustable wrench, install connector (M) on end of control assembly (A).

Go on to Sheet 5

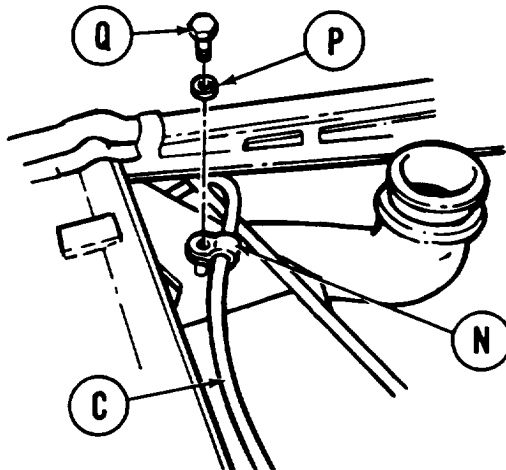
TA253453

PARKING BRAKE CONTROL ASSEMBLY REPLACEMENT (ENGINE MOUNTED) (Sheet 5 of 7)

CAUTION

Do not force rear control (C) to rotate on top of transmission. Gently twist control at metal casing until it lays smoothly on transmission. Forcing rear control will cause damage.

8. Position rear control assembly (C) on top of transmission.
9. Position clamp (N) on control assembly (C). Attach clamp to boss with washer (P) and screw (Q).
10. Do not tighten screw (Q).



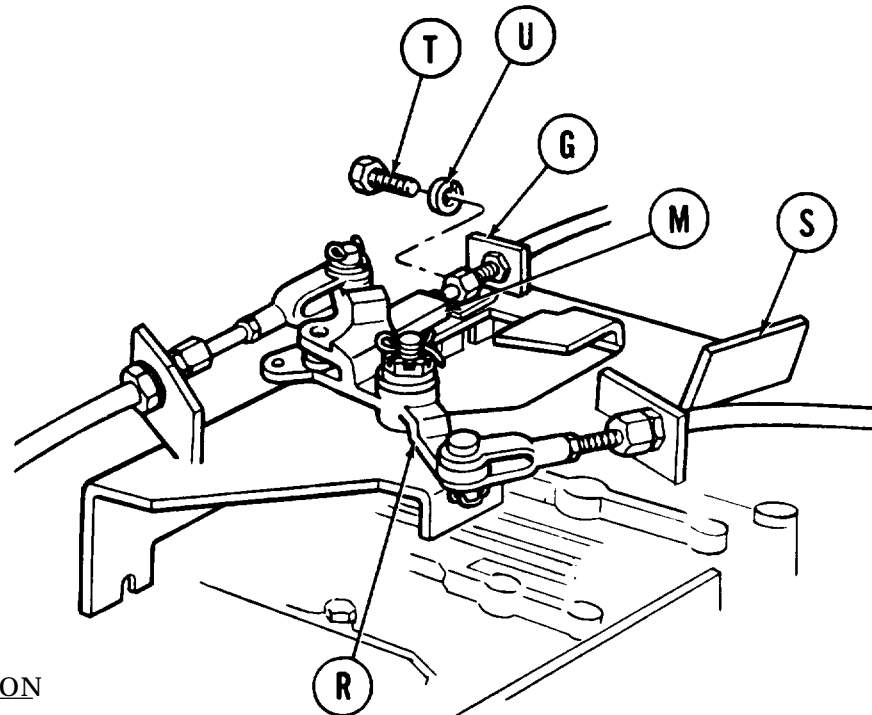
Go on to Sheet 6

TA253454

Change 1 13-98.5

PARKING BRAKE CONTROL ASSEMBLY REPLACEMENT (ENGINE MOUNTED) (Sheet 6 of 7)

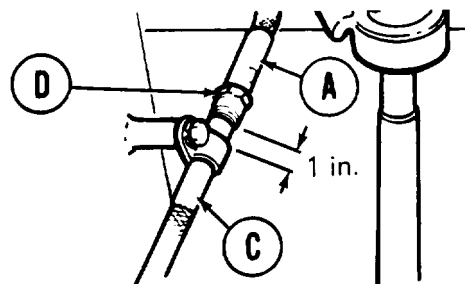
11. Position connector (M) in bellcrank assembly (R). Using a 9/16 inch socket and extension, install bracket (G) to bracket assembly (S) with two screws (T) and new lockwashers (U).



!CAUTION

Make sure control assembly (C) is secured to hull wall with clamp located on metal casing, one inch below disconnect nut (D).

12. Using adjustable wrench on flats of control assembly (A), and torque wrench with 7/8 inch crowfoot, tighten disconnect nut (D) to 35-50 lb-in (8.9 to 12.7 N.m).

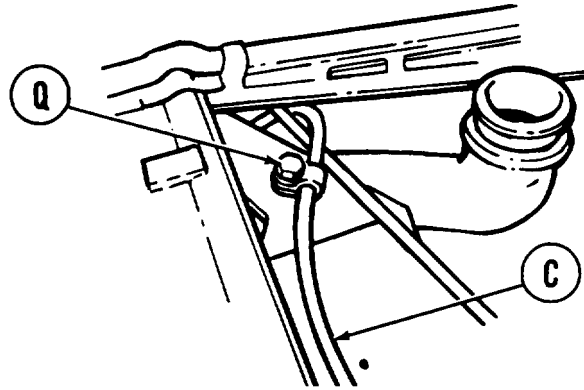


Go on to Sheet 7

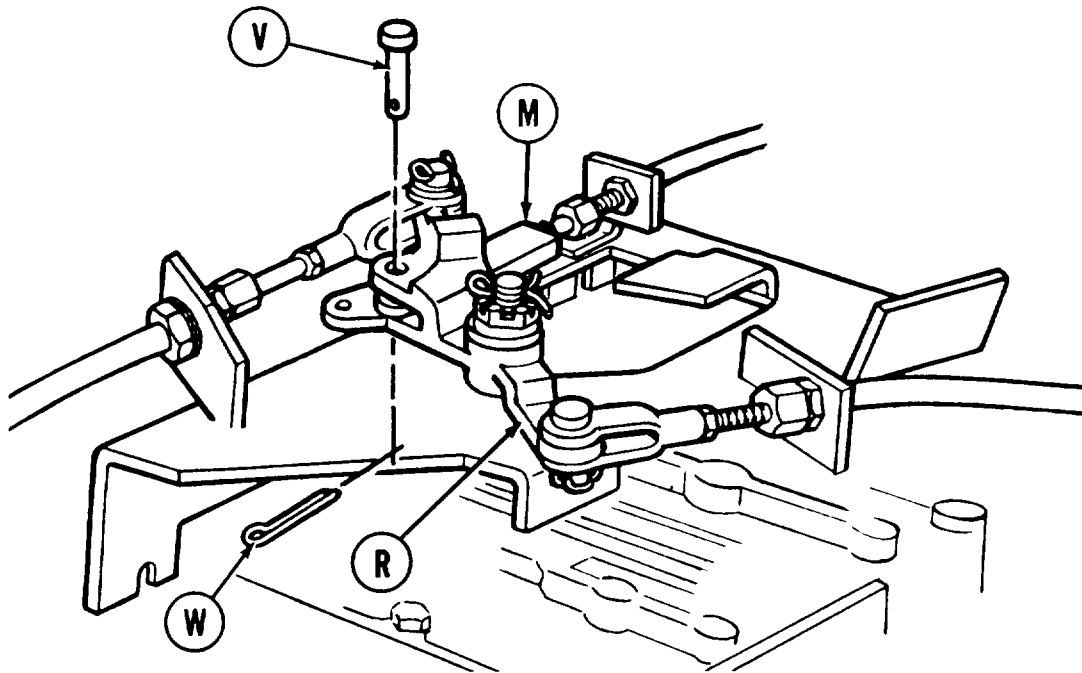
TA253455

PARKING BRAKE CONTROL ASSEMBLY REPLACEMENT (ENGINE MOUNTED)
 (Sheet 7 of 7)

13. Tighten screw (Q) securing rear control assembly (C) to transmission boss.



14. At bellcrank, install pin (V) and clip (W) securing connector (M) to bellcrank assembly (R).



End of Task

TA253456

PARKING BRAKE BELLCRANK REPAIR AND REPLACEMENT (Sheet 1 of 4)

PROCEDURE INDEX

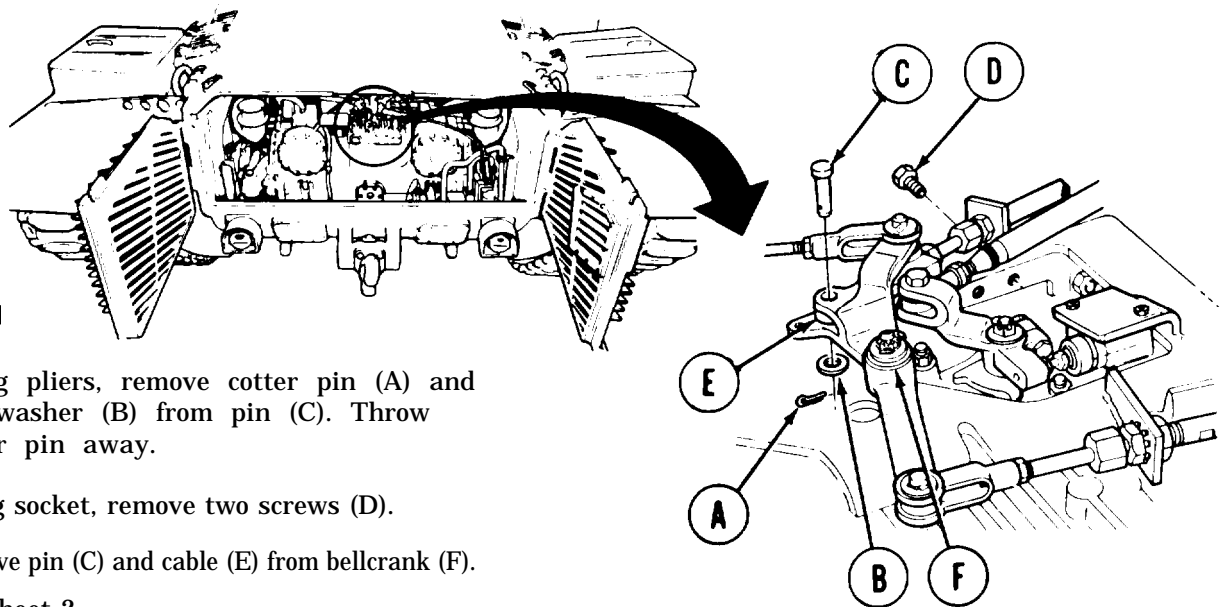
PROCEDURE	PAGE
Removal	13-99
Cleaning and Inspection	13-101
Installation	13-101

TOOLS: 9/16 in. socket with 1/2 in. drive
 9/16 in. combination box and open end wrench
 Long round nose pliers (needle nose)
 Bench vise
 Drift pin
 12 oz. hammer
 Ratchet with 1/2 in. drive

SUPPLIES: Cotter pin (3 required)
 Dry cleaning solvent (Item 54, Appendix D)
 Rags (Item 65, Appendix D)
 Bushing
 Cotter pin

REFERENCE: TM 9-2350-222-10

PRELIMINARY PROCEDURES: Block tracks (TM 9-2350-222-10)
 Place transmission in neutral (TM 9-2350-222-10)
 Remove transmission shroud (page 9-20)



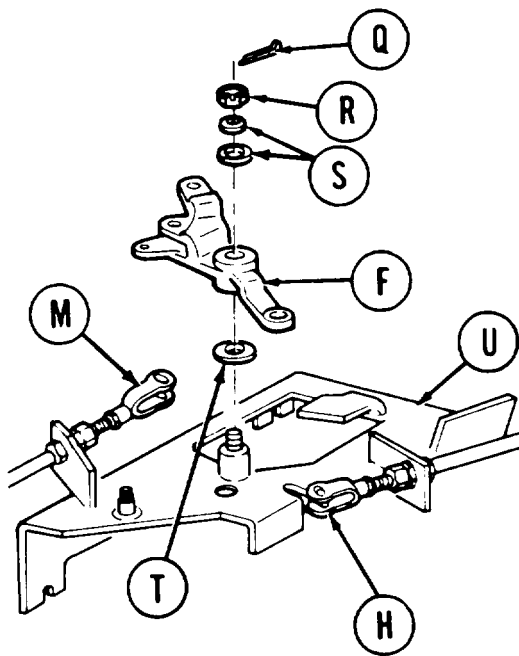
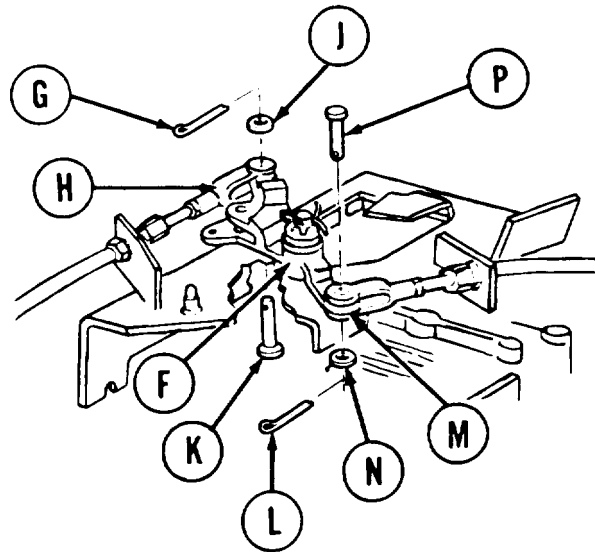
REMOVAL:

1. Using pliers, remove cotter pin (A) and flat washer (B) from pin (C). Throw cotter pin away.
2. Using socket, remove two screws (D).
3. Remove pin (C) and cable (E) from bellcrank (F).

Go on to Sheet 2

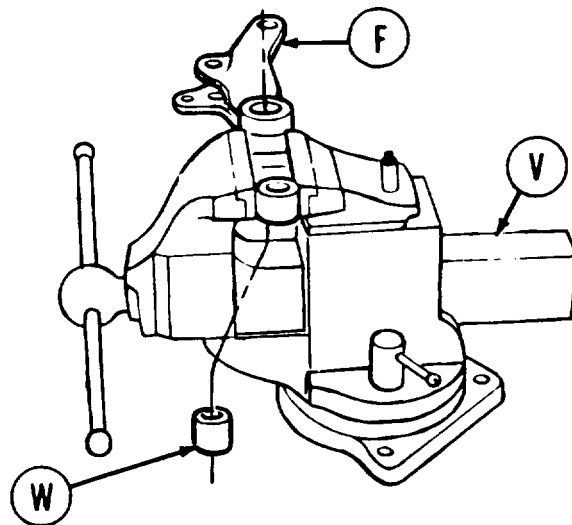
PARKING BRAKE BELLCRANK REPAIR AND REPLACEMENT (Sheet 2 of 4)

4. Using pliers, remove cotter pin (G) securing clevis (H) to bellcrank (F). Throw cotter pin away.
5. Remove flat washer (J) and pin (K) from clevis (H).
6. Using pliers, remove cotter pin (L) securing clevis (M) to bellcrank (F). Throw cotter pin away.
7. Remove flat washer (N) and pin (P) from clevis (M).



8. Using pliers, remove cotter pin (Q). Throw cotter pin away.
9. Using 9/16 inch wrench, remove nut (R) and two flat washers (S).
10. Displace clevises (H) and (M).
11. Remove bellcrank (F) and flat washer (T) from brake control bracket (U).

12. Place bellcrank (F) in bench vise (V).
13. Using driftpin and hammer, drive out bushing (W) from bellcrank (F). Throw bushing away.



Go on to Sheet 3

TA140406

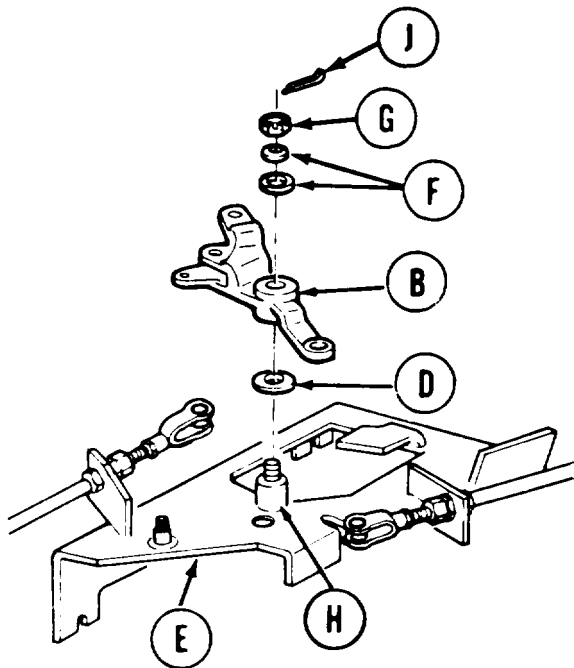
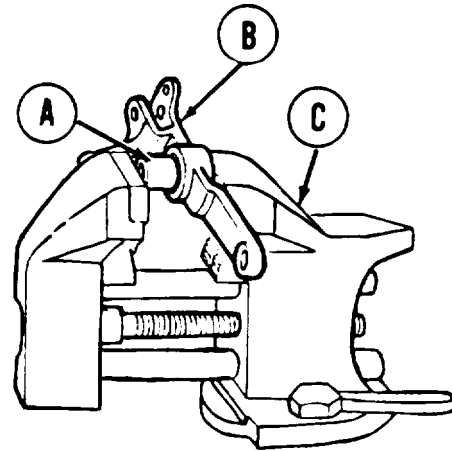
PARKING BRAKE BELLCRANK REPAIR AND REPLACEMENT Sheet 3 of 4)

CLEANING AND INSPECTION:

1. Inspect bellcrank for cracks, damage, and wear.
2. Clean bellcrank and bushing cavity with dry cleaning solvent (Item 54, Appendix D).

INSTALLATION:

1. Place new bushing (A) in position in bellcrank (B).
2. Using vise (C), press bushing (A) into bellcrank (B).



3. Place flat washer (D) and bellcrank (B) in position on mounting bracket (E).
4. Place two flat washers (F) and nut (G) in position on bellcrank (B).
5. Using 9/16 inch wrench, tighten nut (G).

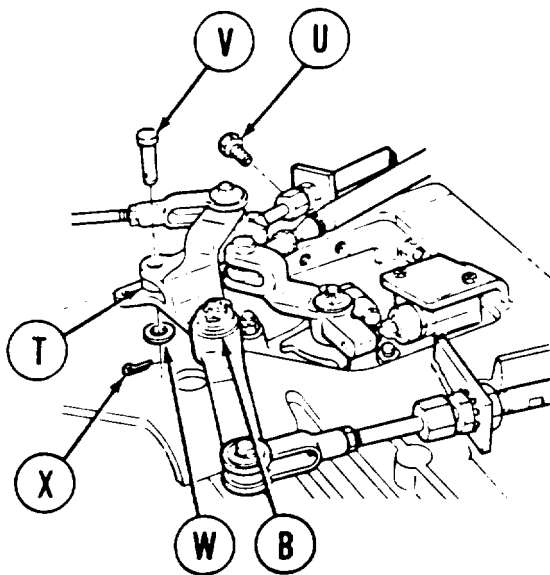
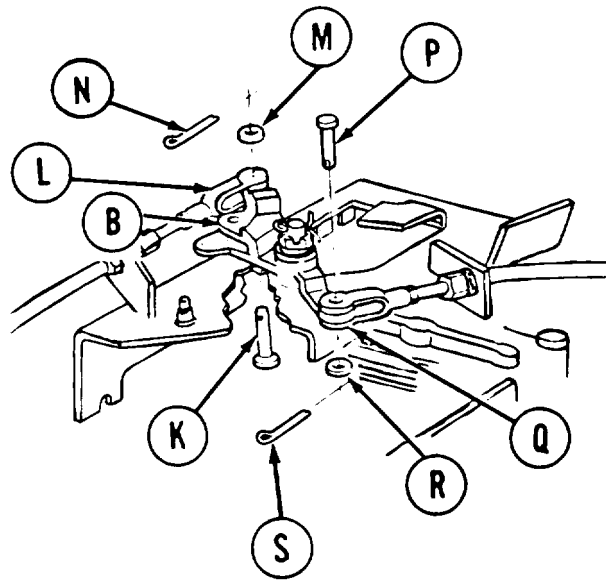
6. Aline slot of nut (G) with hole of mounting bracket stud (H).
7. Using needle nose pliers, install new cotter pin (J).

Go on to Sheet 4

TA140407

PARKING BRAKE BELLCRANK REPAIR AND REPLACEMENT (Sheet 4 of 4)

8. Place pin (K) through clevis (L) and bellcrank (B).
9. Using pliers, install flat washer (M) and new cotter pin (N).
10. Place pin (P) through clevis (Q) and bellcrank (B).
11. Using pliers, install flat washer (R) and new cotter pin (S).



12. Place main parking brake cable (T) in position on bellcrank (B).
13. Using socket, install two screws (U). Place pin (V) through cable (T) and bellcrank (B).
14. Using pliers, install flat washer (W) and new cotter pin (X) into Pin (V).
15. Install transmission shroud (page 9-23)

16. Apply parking brake (TM 9-2350-222-10).
17. Remove blocks from tracks (TM 9-2350-222-10).

End of Task

BRAKE CONTROL BRACKET REPLACEMENT (Sheet 1 of 2)

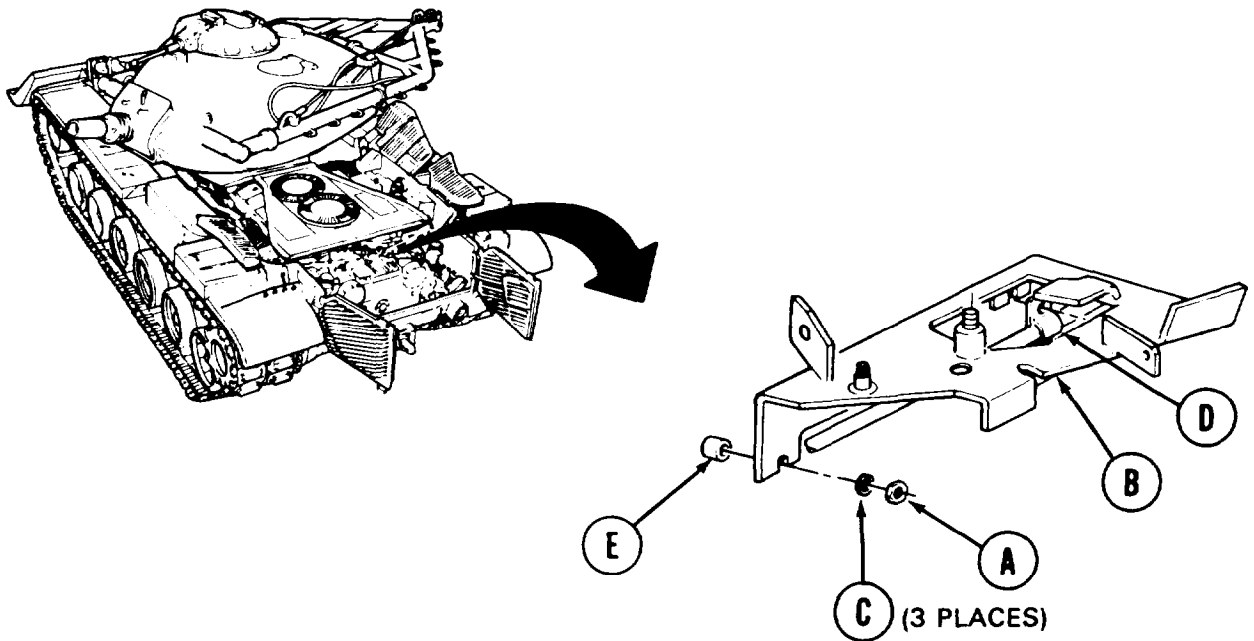
TOOLS 3/4 in. combination box and open end wrench

PRELIMINARY PROCEDURES:

- Remove top deck (page 18-21)
- Remove transmission shroud (page 9-20)
- Disconnect shifting rod at control lever (page 11-45)
- Remove parking brake control assemblies from bracket (page 13-85)
- Remove neutral shift switch from bracket (page 10272)
- Remove parking brake bellcrank (page 13-99)
- Remove parking brake control assembly (page 13-98.1) (late model)

REMOVAL:

1. Using wrench, loosen three nuts (A) from bracket mounting studs.
2. Using hands, remove bracket (B).
3. Using wrench, remove three nuts (A), three washers (C), one cable clamp (D), and three spacers (E).



Go on to Sheet 2

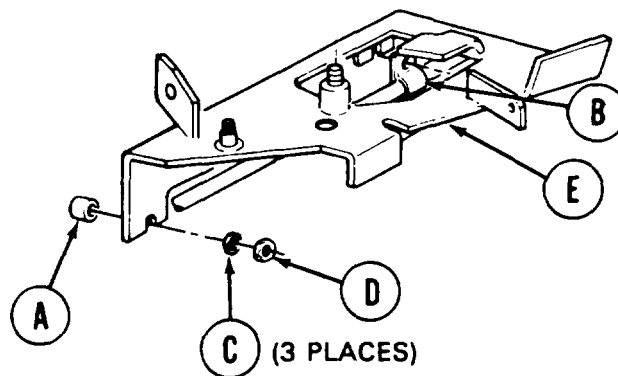
TA253457

Change 1 13-103

BRAKE CONTROL BRACKET REPLACEMENT (Sheet 2 of 2)

INSTALLATION:

1. Using hands, loosely install three spacers (A), one cable clamp (B), three washers (C), and three nuts (D) to three bracket mounting studs.
2. Position bracket (E) onto three transmission mounting studs.
3. Using wrench, tighten three nuts (D).
4. Install parking brake bellcrank (page 13-101).
5. Install neutral shift switch (page 10-273).
6. Install parking brake control assemblies to bracket (page 13-91).
- 6.1 Install parking brake control assembly (page 13-98.4) (late model).
7. Install shifting rod to control lever (page 11-47).
8. Install transmission shroud (page 9-23).
9. Install top deck (page 16-23).



End of Task

TA253458

**PARKING BRAKE CONTROL ASSEMBLY AND LINKAGE REPLACEMENT
(DRIVER'S STATION) (Sheet 1 of 10)**

PROCEDURE INDEX

PROCEDURE	P A G E
Removal	13-106
Cleaning and Inspection	13-110
Installation	13-110

- 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
 - 3/4 in. combination box and open end wrench
 - 7/8 in. combination box and open end wrench
 - 15/ 16 in. combination box and open end wrench
 - 8 in. adjustable wrench
 - 1/2 in. socket with 1/2 in. drive
 - 9/16 in. socket with 1/2 in. drive
 - 5 in. extension with 1/2 in. drive
 - Ratchet with 1/2 in. drive
 - 7/8 in. crowfoot wrench with 3/8 in. drive
 - 1/8 in. punch
 - 1-1/4 lb hammer
 - Slip joint pliers
 - Torque wrench with 3/8 in. drive (0-200 lb-in) (0-22 N.m)
 - Flat-tip screwdriver

- SUPPLIES:
- | | |
|---------------------------------|--|
| Cotter pin (MS24665-283) | Cotter pin (MS24665-281) |
| Spring pin (MS39086-47) | Spring pin (MS39086-157) |
| Preformed packing (MS28775-110) | Lockwasher (MS35335-39) |
| Dry cleaning solvent | (4 required) |
| (Item 54, Appendix D) | Lockwasher (186491) |
| Black grease pencil | Lockwasher (MS35338-46) |
| Sealing compound | (2 required) |
| (Item 23, Appendix D) | Safety wire (Item 61, Appendix D) |
| | Bushing - brake control nut (10915816) |

PERSONNEL: Two

PRELIMINARY PROCEDURES: Remove powerplant (page 5-1)
Remove right bulkhead access cover (page 16-33)

Go on to Sheet 2

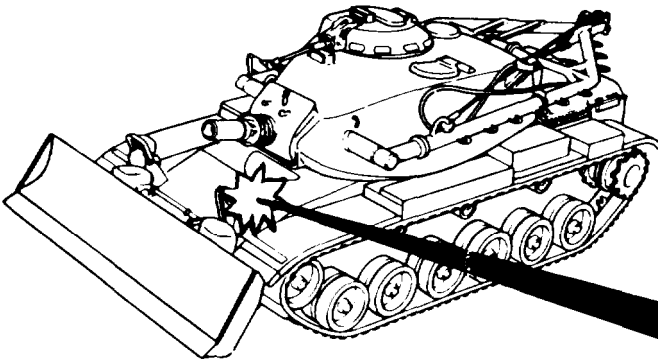
**PARKING BRAKE CONTROL ASSEMBLY AND LINKAGE REPLACEMENT
(DRIVER'S STATION) (Sheet 2 of 10)**

NOTE

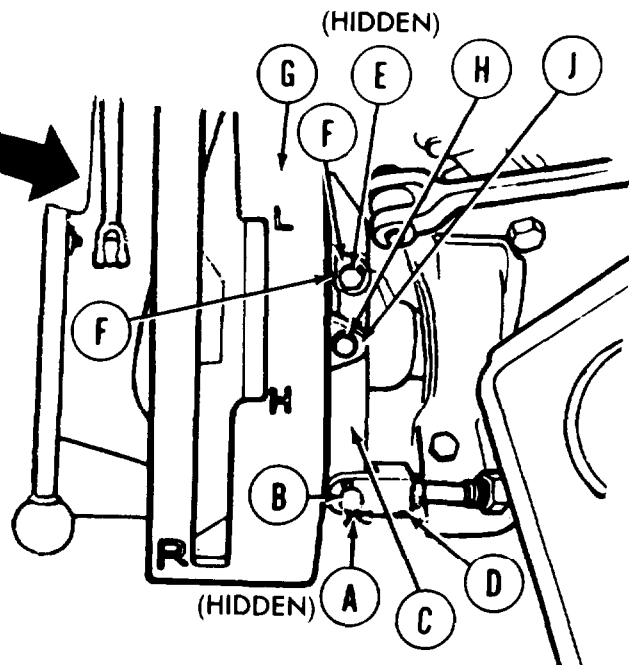
Although the parking brake control assembly on the newer model vehicles is a two-piece cable and the older model vehicles (not yet modified) have a one-piece cable, both are removed exactly the same way. However, if only the transmission end of the two-piece cable needs replacing, go to steps 16 thru 21 and step 25. If complete two-piece cable is to be removed and replaced, use steps 1 thru 25.

REMOVAL:

1. In driver's station, using pliers, remove cotter pin (A) and straighthead pin (B) securing lever (C) to clevis (D). Throw cotter pin (A) away.



2. Using pliers, remove cotter pin (E) and straighthead pin (F) securing lever (C) to base (G). Throw cotter pin (E) away.
3. Using hammer and punch, remove spring pin (H) from straight pin (J) and remove straight pin (J) from lever (C) and base (G). Throw spring pin (H) away.

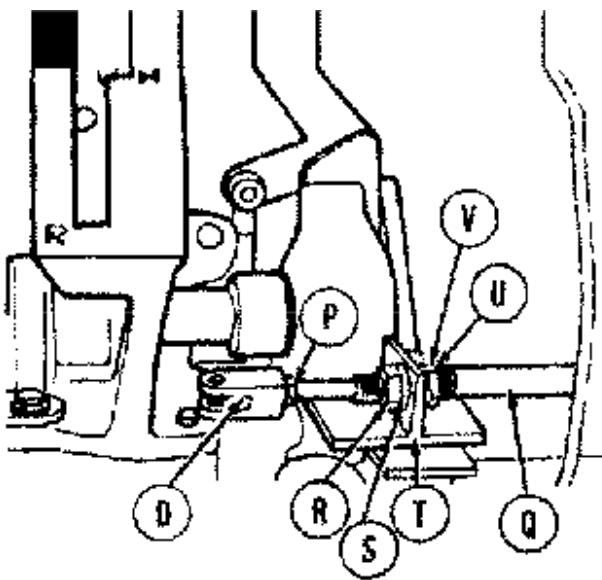
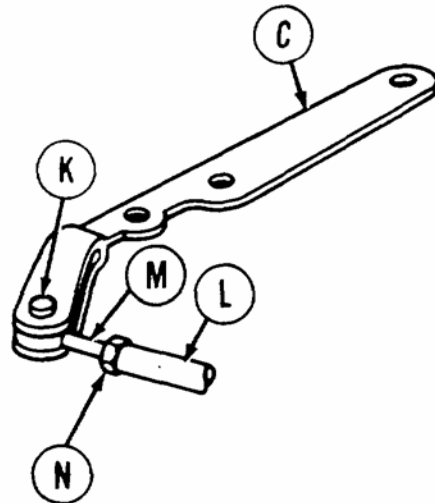


Go on to Sheet 3

TA140411

**PARKING BRAKE CONTROL ASSEMBLY AND LINKAGE REPLACEMENT
(DRIVER'S STATION) (Sheet 3 of 10)**

4. Remove lever (C), spring pin (K), straight pin (L), rod end connector (M), and nut (N) as a unit.
5. Using 7/16 inch wrench to hold nut (N), use pliers and remove straight pin (L) from rod end connector (M). Remove nut (N) from rod end connector (M).
6. Using hammer and punch, remove spring pin (K) from lever (C) and rod end connector (M). Throw pin (K) away.



7. Using 9/16 inch wrench to hold nut (P), use 8 inch adjustable wrench to remove clevis (D) from control assembly (Q).
8. Using 9/16 inch wrench, remove nut (P) from control assembly (Q).
9. Using 15/16 inch wrench, remove nut (R) and lockwasher (S) from control assembly (Q). Throw lockwasher away.

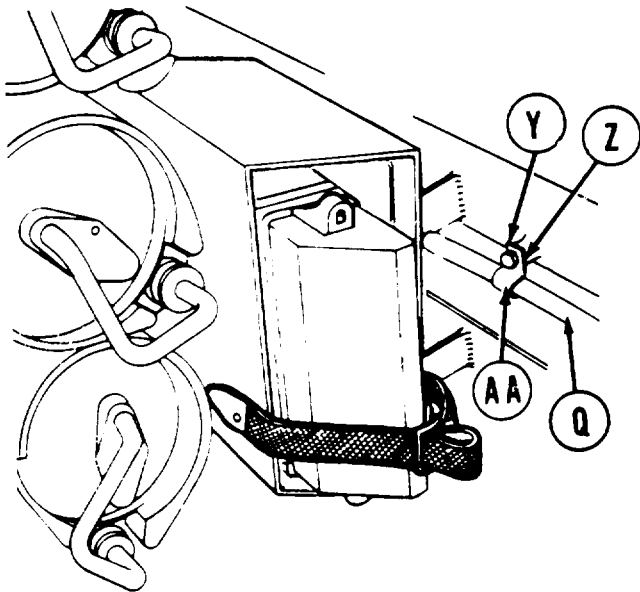
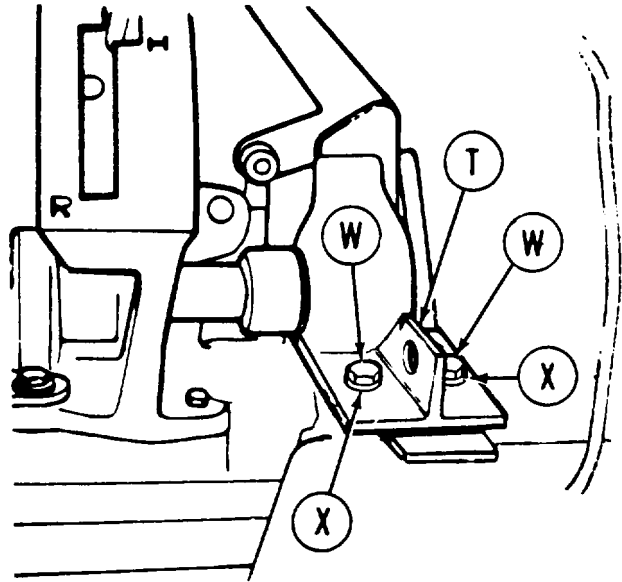
10. Pull control assembly (Q) through support bracket (T) and use 15/16 inch wrench to remove nut (U) and lockwasher (V) from control assembly (Q). Hold control assembly (Q) with adjustable wrench. Throw lockwasher away.

Go on to Sheet 4

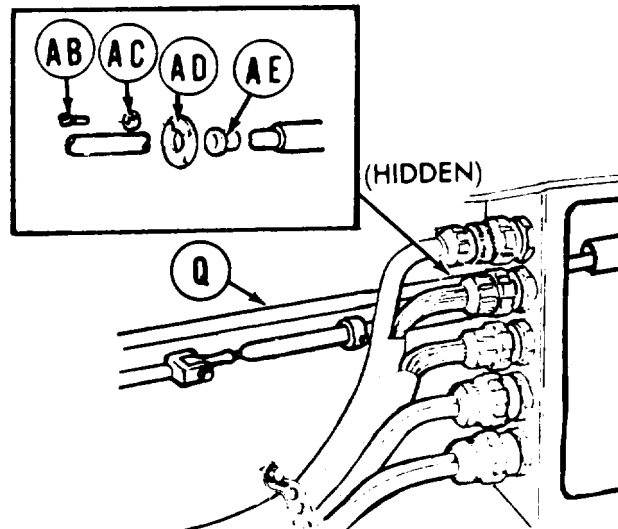
TA140412

**PARKING BRAKE CONTROL ASSEMBLY AND LINKAGE REPLACEMENT
(DRIVER'S STATION) (Sheet 4 of 10)**

11. Using 9/16 inch socket and extension, remove two screws (W), lockwashers and washers (X), and bracket from bearing support bracket. Throw lockwashers away.
12. Using 1/2 inch socket, remove screw (Y), washer (Z), and clamp (AA) securing control assembly (Q) to hull wall.



13. Using black grease pencil, mark control assembly (Q) at bulkhead wall.
14. Using screwdriver, remove four screws (AB) and four washers (AC) securing retainer (AD) and control assembly (Q) to bulkhead.



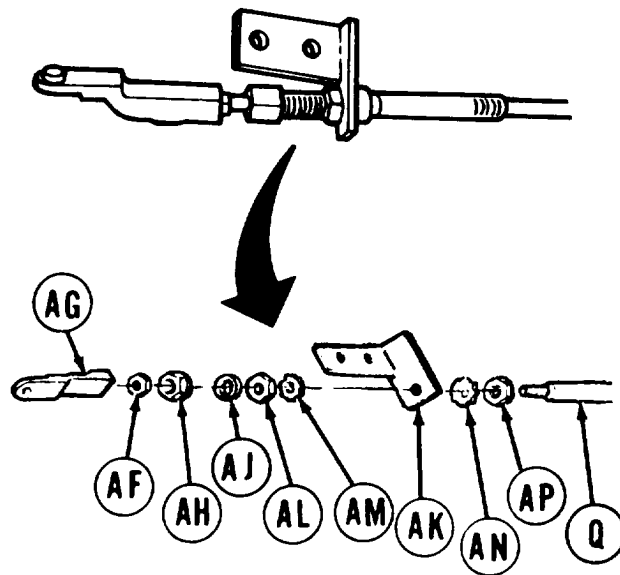
15. Grasp control (Q) with both hands and move about one inch toward front of vehicle. Remove split bushing (AE) and throw it away. Remove retainer (AD) from bulkhead.

Go on to Sheet 5

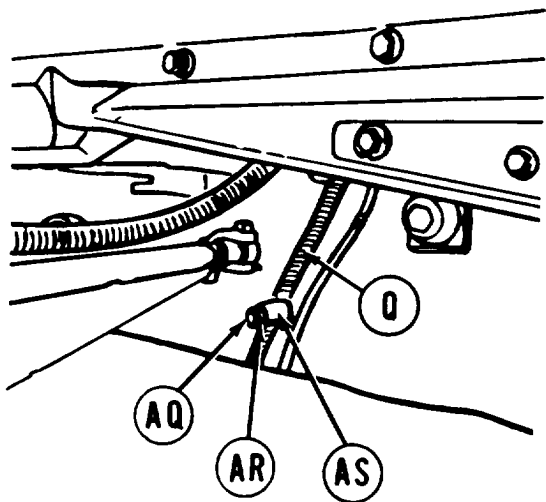
TA140413

**PARKING BRAKE CONTROL ASSEMBLY AND LINKAGE REPLACEMENT
(DRIVER'S STATION) (Sheet 5 of 10)**

16. From engine compartment, using 9/16 inch wrench to hold nut (AF), use adjustable wrench and remove rod end connector (AG) from control assembly (Q).
17. Using 9/16 inch wrench, remove nut (AF) from control assembly (Q).



18. Using 15/16 inch wrench, remove brake control nut (AH) and preformed packing (AJ) from control assembly (Q). Throw packing (AJ) away. Use adjustable wrench to hold support bracket (AK).
19. Using 15/16 inch wrench, remove nut (AL) and lockwasher (AM) from control assembly (Q). Remove support bracket (AK) and lockwasher (AN) from control assembly (Q). Throw lockwashers away.



20. Using 15/16 inch wrench, remove nut (AP) from control assembly (Q).
21. Using 7/16 inch wrench, remove capscrew (AQ), lockwasher (AR), and clamp (AS) securing control assembly (Q) to hull. Throw lockwasher away.

Go on to Sheet 6

TA140414

PARKING BRAKE CONTROL ASSEMBLY AND LINKAGE REPLACEMENT (DRIVER'S STATION) (Sheet 6 of 10)

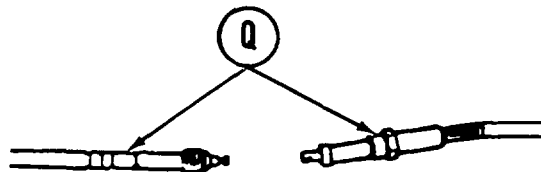
22. Attach 15 foot piece of safety wire (Item 61, Appendix D) to end of control assembly located inside driver's station. Make sure one end of wire is wrapped tight several times around end of control assembly, and other end is secured to a wrench or other moveable object which will not allow free end of wire to pass through bulkhead opening.

NOTE

Two persons are required to remove control assembly from vehicle; one person inside turret and one person inside engine compartment.

23. Person in engine compartment grasps control assembly with both hands and pulls toward rear of vehicle, while person inside turret makes sure control assembly and wire feed through hole in bulkhead and tube. Insure that retainer is removed from control assembly as control assembly is being pulled through bulkhead.
24. When control assembly is clear of tube located behind fuel tank, person in engine compartment disconnects wire from control assembly and removes control assembly from vehicle. Make sure wire is secured to a wrench or other moveable object so that wire will remain in tube for installation of new control assembly.

25. Using adjustable wrench to hold control assembly (Q), use 7/8 inch wrench to loosen connector on control assembly (Q). Separate control assembly (Q) into two pieces.



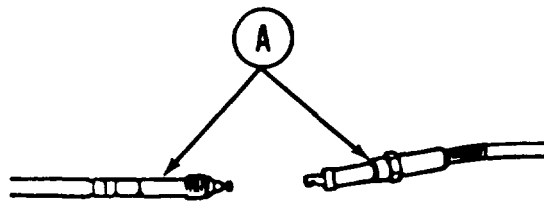
CLEANING AND INSPECTION:

1. Clean all parts, using dry cleaning solvent (Item 54, Appendix D).
2. Inspect all mounting hardware for cracks in brackets, worn pivot pins, and damaged threads on screws and nuts. Replace any damaged parts.

INSTALLATION:

NOTE

Step 1 applies only to two-piece cable.



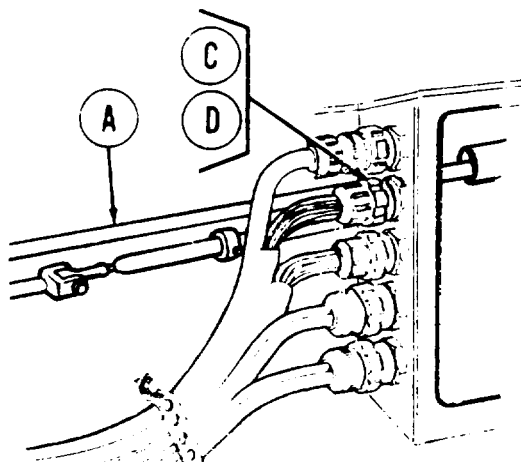
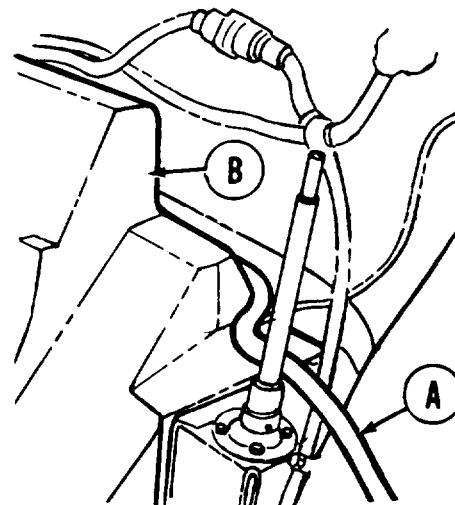
1. Using adjustable wrench and 7/8 inch wrench, connect the two pieces of control assembly (A) together. Using torque wrench and 7/8 inch crow foot, tighten connector on control assembly (A) to 35-50 lb-in (9-13 N.m).

Go on to Sheet 7

TA140415

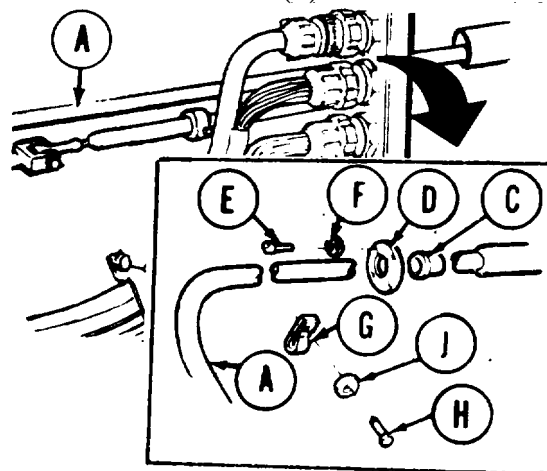
**PARKING BRAKE CONTROL ASSEMBLY AND LINKAGE REPLACEMENT
(DRIVER'S STATION) (Sheet 7 of 10)**

2. Lay out removed and replacement control assemblies side by side. Make sure length of end fittings match. Mark replacement control assembly at same location as mark on removed control assembly.
3. Go to engine compartment. Using safety wire (Item 61, Appendix D) extending from behind fuel tank, wrap threads of forward (short) end of control assembly several times. Make sure safety wire is tight around control assembly.
4. With one person inside turret pulling safety wire extending from bulkhead, second person carefully threads control assembly (A) through tube located behind fuel tank (B) until control assembly end is visible at bulkhead inside turret.



5. Carefully pull control assembly (A) through tube until reference mark on control assembly is at bushing (C) and retainer (D) location.
6. Apply sealing compound (Item 23, Appendix D) to new split bushing (C). Position bushing (C) over control assembly (A). Allow 20 minutes for compound to dry, then install bushing (C) into bulkhead.
7. Position retainer (D) in place. Using screwdriver, secure retainer (D) to bulkhead with four screws (E) and four washers (F).

8. Route control assembly (A) along right side of hull behind periscope box and ammunition rack and down into driver's station to base of transmission shift control.
9. Position clamp (G) over control assembly (A). Using 1/2 inch socket, secure control to hull with screw (H) and washer (J).
10. Make sure transmission lever is in neutral position.

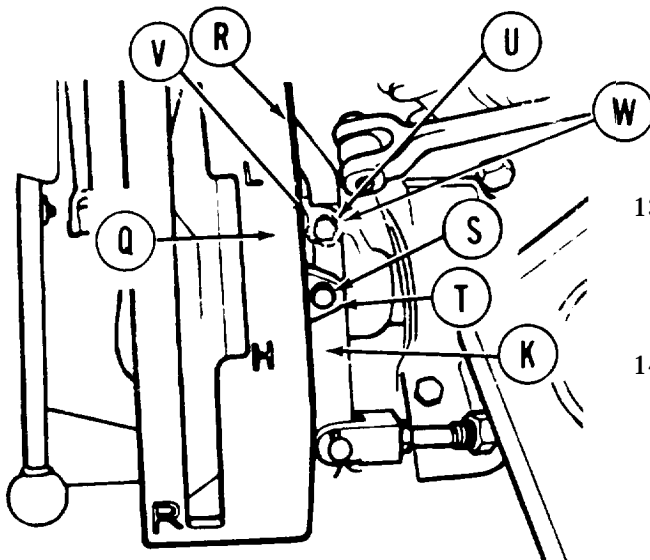
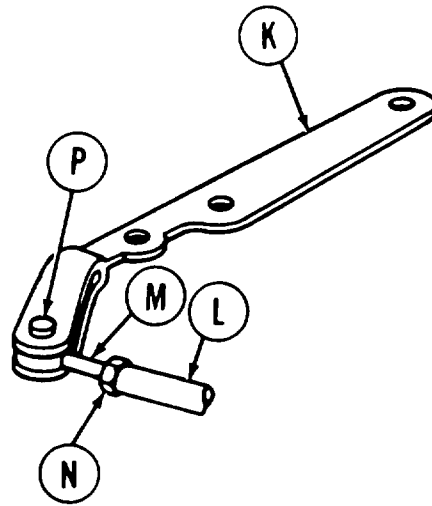


Go on to Sheet 8

TA140416

PARKING BRAKE CONTROL ASSEMBLY AND LINKAGE REPLACEMENT (DRIVER'S STATION) (Sheet 8 of 10)

11. Locate lever (K), pin (L), rod end (M), nut (N), and new spring pin (P). Using 7/16 inch wrench, install nut (N) onto rod end connector (M).
12. Using pliers to hold pin (L), use adjustable wrench to install rod end connector onto pin (L).



13. Position split end of lever (K) over rod end connector (M). Using pliers, install new spring pin (P) through level (K) and rod end connector (M).
14. Position assembled lever (K) so pin (L) fits into hole in base (Q) at (R) (hidden).

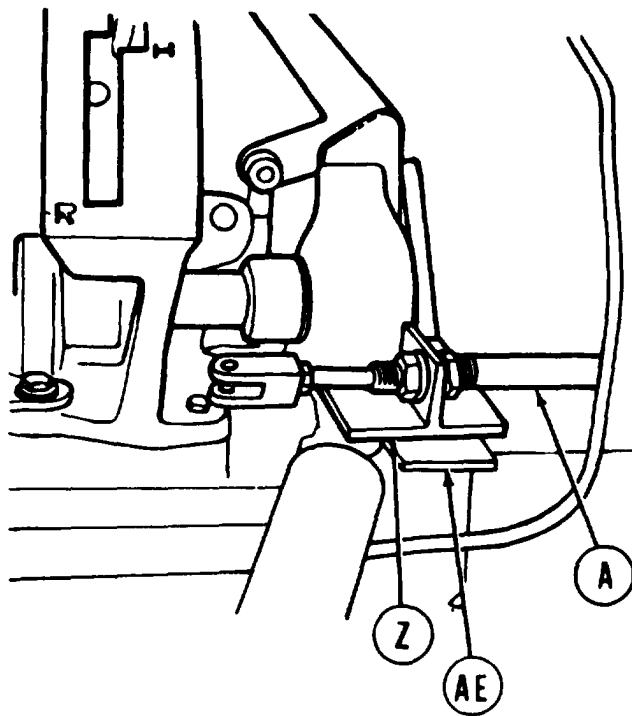
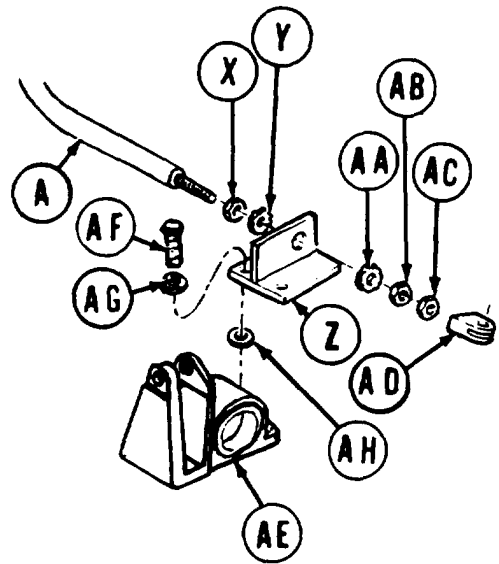
15. Position lever (K) onto base (Q) and secure with pin (S). Using pliers and hammer, install new spring pin (T) into pin (S).
16. Using pliers, install straight pin (U) through straight head pin clevis (V) and secure Pin (U) with new cotter pin (W).

Go on to Sheet 9

TA140417

**PARKING BRAKE CONTROL ASSEMBLY AND LINKAGE REPLACEMENT
(DRIVER'S STATION) (Sheet 9 of 10)**

17. Locate control assembly (A). Using 15/16 inch wrench, install nut (X) onto control assembly (A).
18. Position new lockwasher (Y), bracket (Z), and new lockwasher (AA) onto control assembly (A). Using 15/16 inch wrench, install nut (AB) onto control assembly (A). If necessary, hold control assembly (A) with adjustable wrench.



19. Using 9/16 inch wrench, install nut (AC) onto control assembly (A). If necessary, hold control assembly (A) with adjustable wrench.
20. Using adjustable wrench, install clevis (AD) onto control assembly (A).

21. Using 9/16 inch socket and extension, install bracket (Z) to bearing support bracket (AE) with two screws (AF), two washers (AG), and two new lockwashers (AH). Washers (AH) are installed between bracket (Z) and bearing support bracket (AE).

Go on to Sheet 10

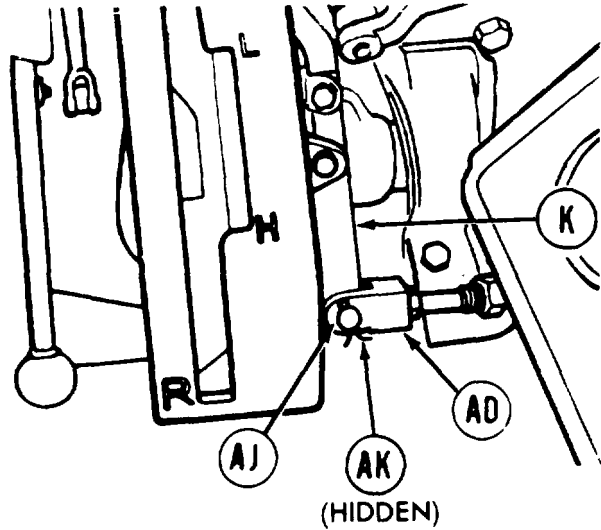
TA140418

PARKING BRAKE CONTROL ASSEMBLY AND LINKAGE REPLACEMENT (DRIVER'S STATION) (Sheet 10 of 10)

22. Position clevis (AD) over lever (K) and install pin (AJ) through clevis (AD) and lever (K). Using pliers, install new cotter pin (AK) through pin (AJ).

23. Go to engine compartment. Route control assembly along right wall of engine compartment.

24. Position clamp (AL) over control assembly (A). Using 7/16 inch wrench, install screw (AM) and washer (AN) into mount on engine compartment hull.

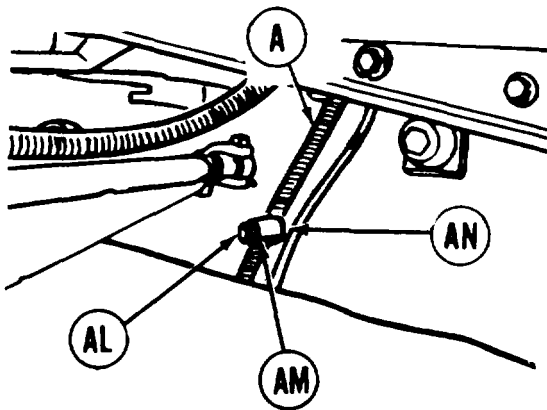


25. Using 15/16 inch wrench, install nut (AP) onto control assembly (A).

26. Install new lockwasher (AQ), bracket (AR), and new lockwasher (AS) onto control assembly (A).

27. Using 15/16 inch wrench, install nut (AT) onto control assembly (A).

28. Install new packing (AU) onto brake control nut (AV).



29. Using 15/16 inch wrench, install new brake control nut (AV) onto control assembly (A).

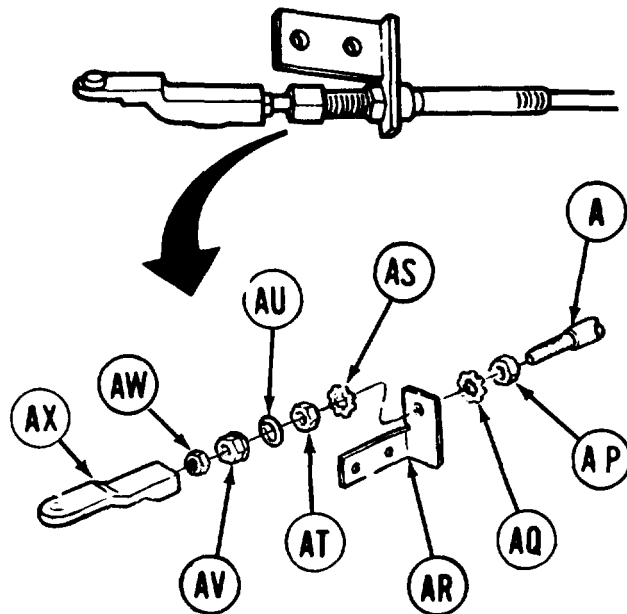
30. Using 9/16 inch wrench, install nut (AW) onto control assembly (A).

31. Using 9/16 inch wrench to hold nut (AW), use adjustable wrench and install connector (AX) onto control assembly (A).

32. Install 2A powerplant (page 5-14) or 2D powerplant (page 5-37).

33. Perform parking brake adjustment (page 13-20).

34. Install right bulkhead access cover (page 16-34).



End of Task

TA140419

CHAPTER 14
TRACK AND SUSPENSION SYSTEM MAINTENANCE INDEX

PROCEDURE	PAGE
Roadwheel Arm Replacement	14-2
Roadwheel Arm Repair	14-9
Hub Assembly Replacement	14-15
Roadwheel Support Housing Assembly Repair and Replacement	14-22
Suspension Torsion Bar Replacement	14-24
Torsion Bar Anchor Replacement	14-31
Track Support Roller Replacement	14-34
Track Support Roller Wheel and Hub Repair	14-45
Compensating Idler Wheel and Roadwheel Replacement	14-50
Mechanical Track Adjusting Link Replacement	14-56
Mechanical Track Adjusting Link Repair	14-61
Grease Actuated Track Adjusting Link Replacement	14-62.2
Grease Actuated Track Adjusting Link Repair	14-62.9
Compensating Idler Hub and Arm Replacement	14-64
Compensating Idler Arm Assembly Repair	14-67
Track Drive Sprocket Repair and Replacement	14-72
Track Assembly Replacement	14-81
Track Shoe Pad Replacement	14-90.4 ■
T142 Track Link Replacement	14-92
Shock Absorber Replacement	14-95
Shock Absorber Bearing Repair	14-97
Shock Absorber Mounting Yoke Bushing Replacement	14-98.1 ■
Volute Spring Replacement	14-99

ROADWHEEL ARM REPLACEMENT (Sheet 1 of 7)

PROCEDURE INDEX

PROCEDURE	PAGE
Removal	14-4
Installation	14-6

- TOOLS:
- Punch
 - Hammer
 - 3/4 in. socket with 1/2 in. drive
 - Ratchet with 1/2 in. drive
 - Torque wrench with 1/2 in. drive (0-600 lb-ft) (0-814 N.m)
 - Internal puller
 - 3/4 in. crowfoot wrench with 3/8 in. drive
 - 3/4 in. combination box and open end wrench
 - Automotive wrench
 - Crowbar
 - 5/8 in. socket with 1/2 in. drive
 - Adapter
 - Slide hammer puller
 - Handle
 - Adapter, 1/2 in. to 3/8 in.

SPECIAL TOOLS: Oil seal replacer (Item 20, Chapter 3, Section I)

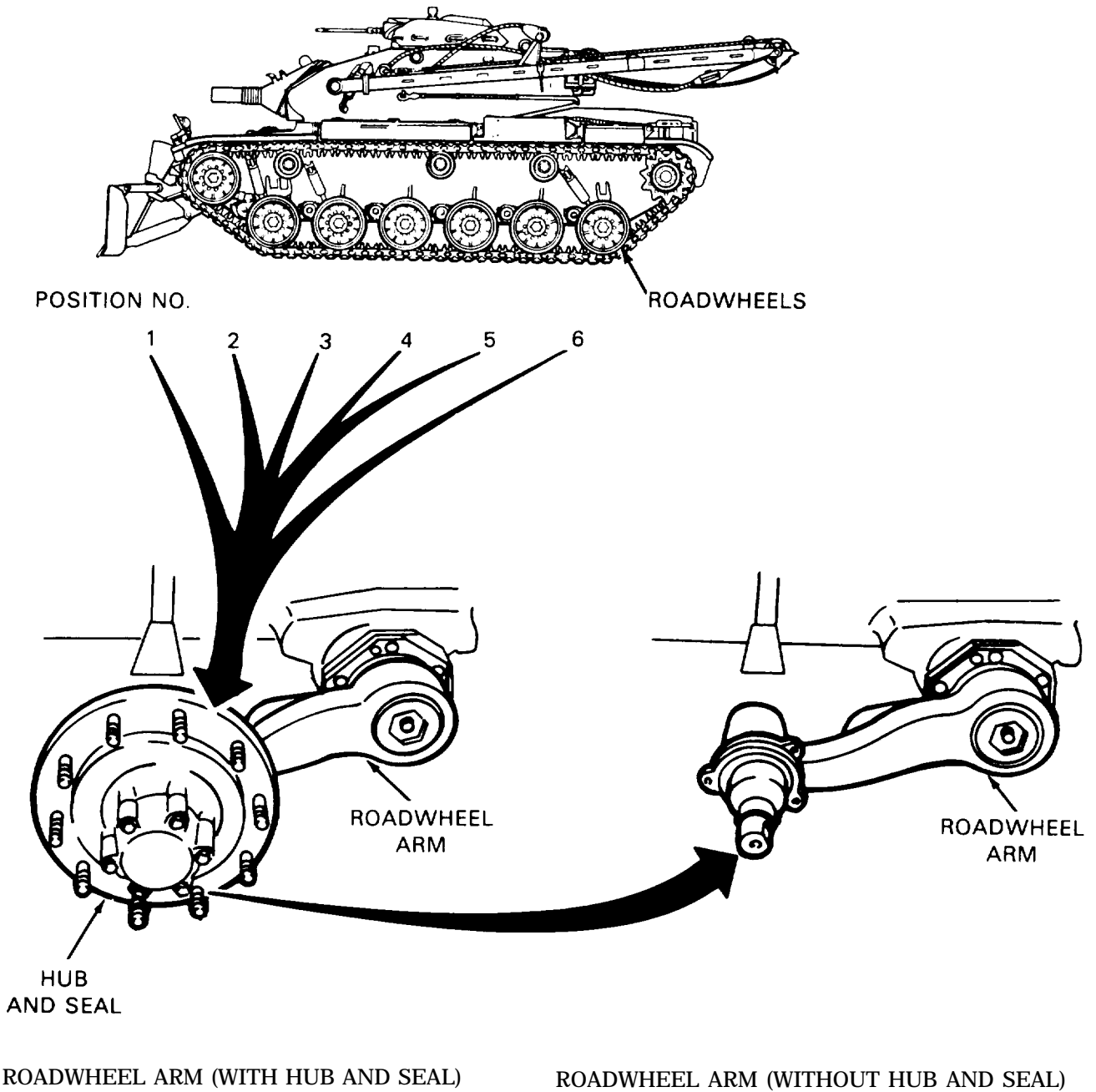
- SUPPLIES:
- Gasket
 - Seal
 - Grease (Item 37, Appendix D)
 - 5/8-13 UNC threaded screws (2 required)
 - Lockwashers (6 required)

PERSONNEL: Three

- PRELIMINARY PROCEDURES:
- Remove roadwheels (page 14-51)
 - Remove wheel hub if necessary (page 14-15)
 - Remove torsion bar (page 14-24)
 - Remove shock absorbers when removing arms at roadwheel positions No. 1, 2, and 6 (page 14-95)
 - Disconnect track adjusting link at No. 1 roadwheel position (page 14-57 or 14-62.2)

Go on to Sheet 2

ROADWHEEL ARM REPLACEMENT (Sheet 2 of 7)



NOTE

Hub and seal assemblies are on all left and right roadwheels at position No. 1 thru 6. They may or may not be removed from roadwheel arm before removing arm itself. It is easier to remove arm with hub and seal off.

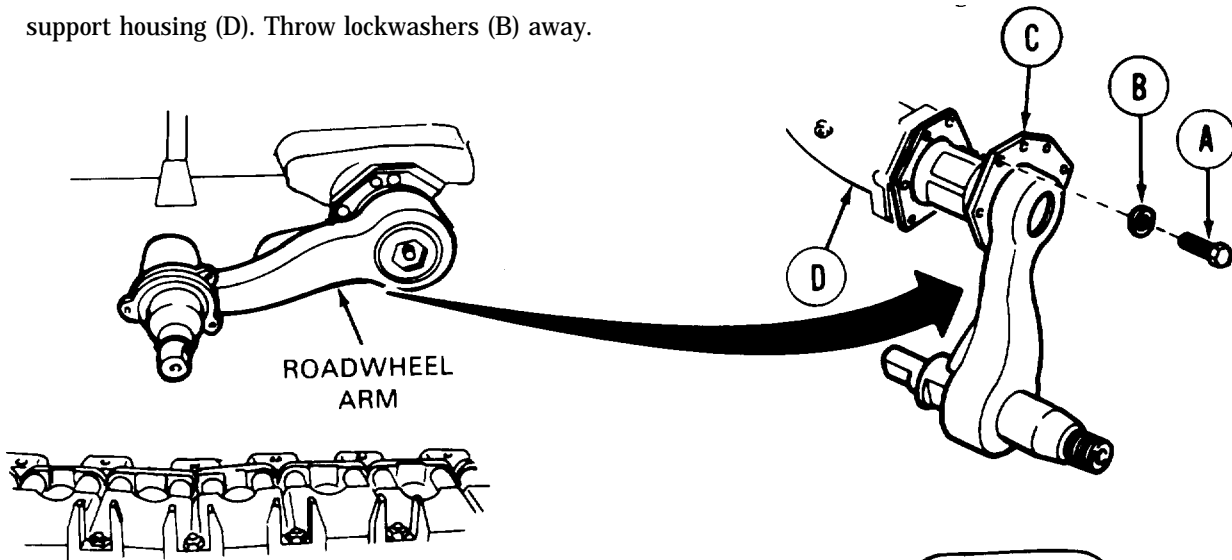
Go on to Sheet 3

TA135944

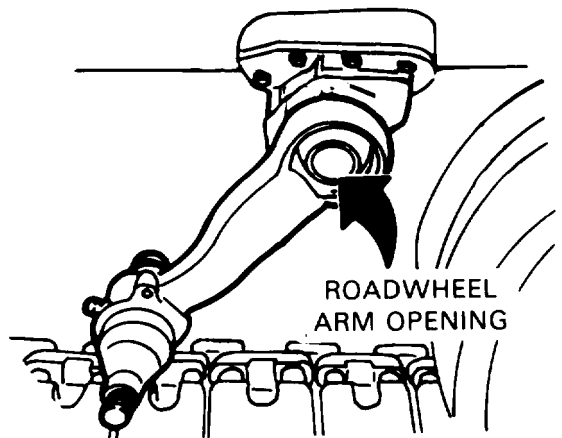
ROADWHEEL ARM REPLACEMENT (Sheet 3 of 7)

REMOVAL:

- 1 Using 3/4 inch wrench, remove six screws (A) and lockwashers (B) securing arm retainer (C) to support housing (D). Throw lockwashers (B) away.



- 2 Using automotive wrench, screw adapter (E) all the way into roadwheel arm opening.

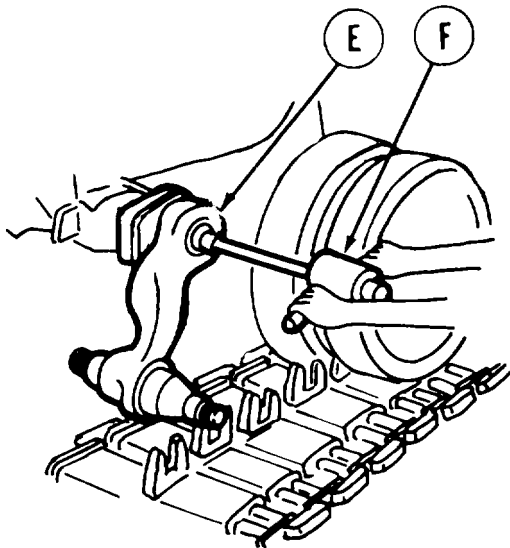


- 3 Install slide hammer (F) to adapter (E).

NOTE

There should be no side-to-side movement of slide hammer. If there is, remove and reinstall adapter and slide hammer.

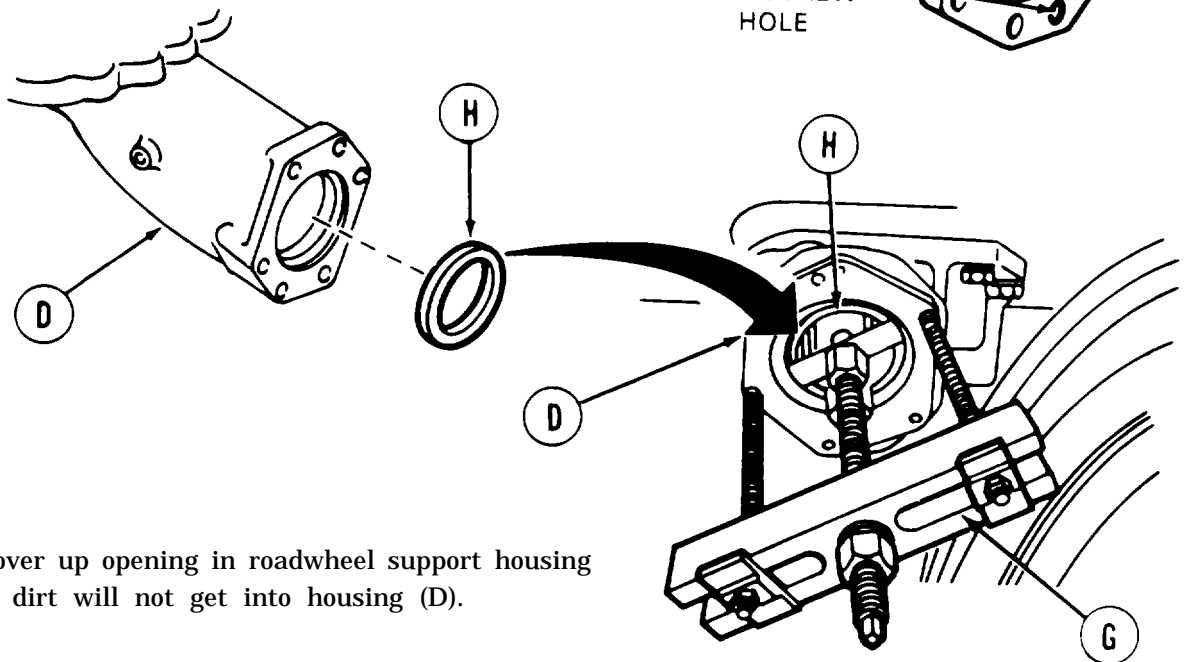
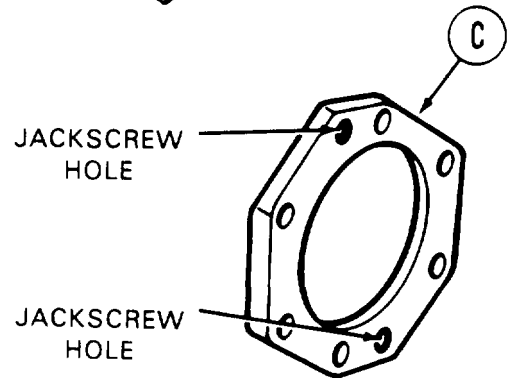
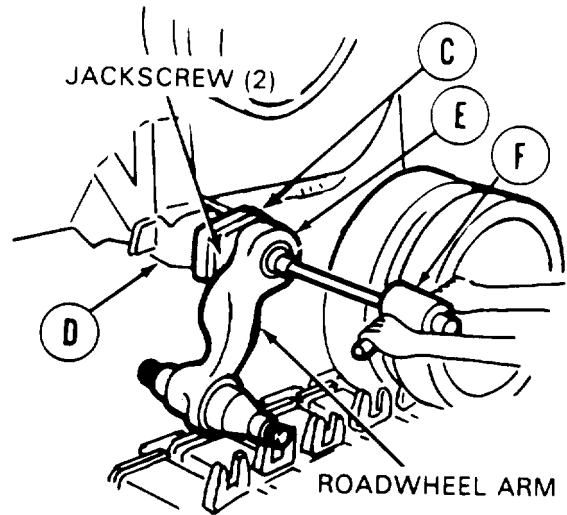
- 4 Have second person use crowbar and support roadwheel arm.
- 5 Using both hands, operate slide hammer on puller from adapter end with force (away from hull).



Go on to Sheet 4

ROADWHEEL ARM REPLACEMENT (Sheet 4 of 7)

6. If roadwheel arm does not come out of support housing (D) after repeated hits with slide hammer. perform steps 7, 8, and 9.
7. Screw two 5/8-13 UNC threaded screws into two retaining jackscrew holes,
8. Using 5/8 inch socket, alternately and evenly tighten jackscrews.
9. Use slide hammer (F) while tightening jackscrews, if used, to free arm from support housing (D).
10. When arm is loose in support housing (D), remove slide hammer (F) and adapter (E).
11. Using another person, remove roadwheel arm and gasket to clean working area, Throw gasket away.
12. Using internal puller (G), remove inner grease seal (H) from support housing (D). Throw seal away.



13. Cover up opening in roadwheel support housing so dirt will not get into housing (D).

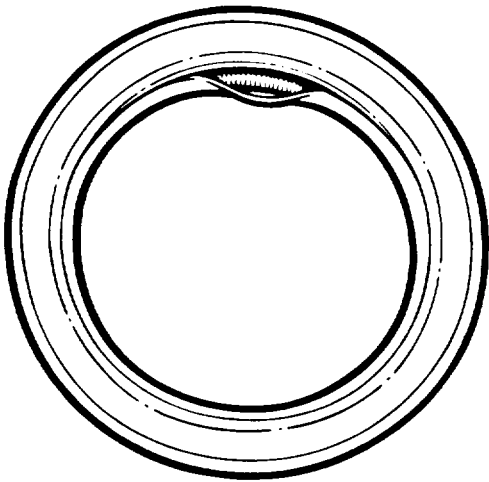
Go on to Sheet 5

TA141287

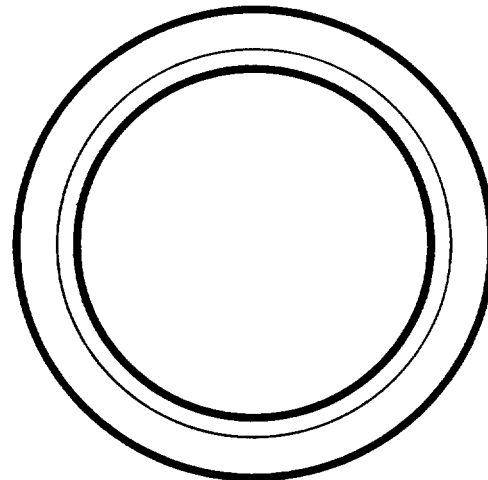
INSTALLATION:

NOTE

Identify FRONT and BACK of inner grease seal. Rubber grease seal retaining lip can be pulled away from metal inner edge on FRONT of seal. Pull back retaining lip on seal and expose garter spring. BACK of seal has rubber grease retainer bonded to metal case and cannot be pulled away.



FRONT VIEW



BACK VIEW

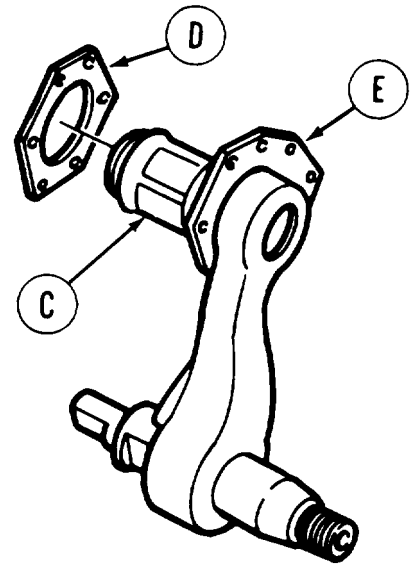
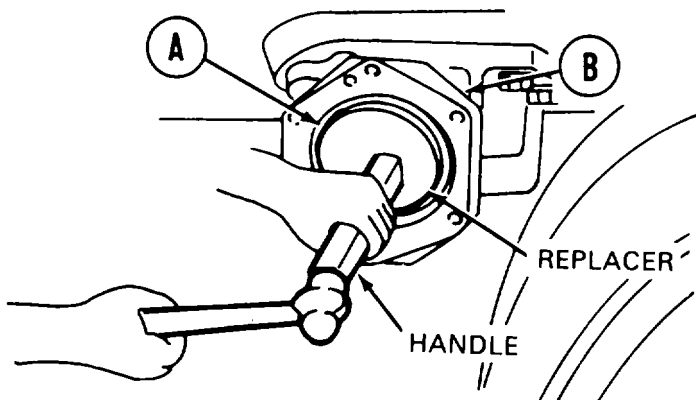
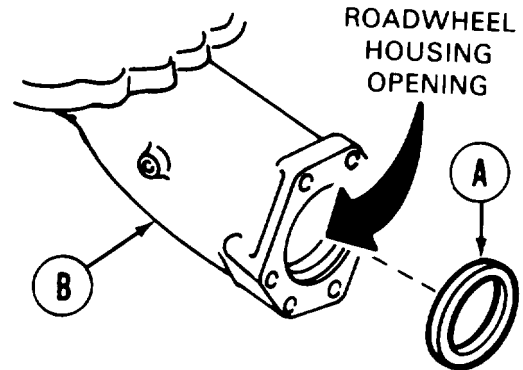
INNER GREASE SEAL

Go on to Sheet 6

TA141288

ROADWHEEL ARM REPLACEMENT (Sheet 6 of 7)

1. Remove covering from roadwheel support housing opening.
2. Apply a light coat of grease to outer edge of new inner grease seal.
3. Position inner grease seal (A) into roadwheel housing (B) opening so BACK of seal (A) goes in towards hull. You should be able to see FRONT of seal (A) as you look into housing.
4. Using oil seal replacer and handle, tap lightly on handle with hammer until inner seal has bottomed in housing (B).
5. Coat all parts on upper spindle (C) with grease.



6. Install new gasket (D) to mounting face of retainer (E).

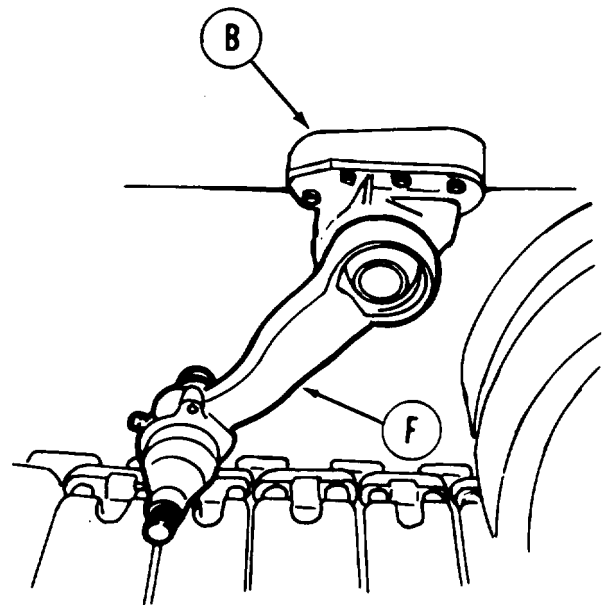
NOTE

Upper spindle (C) must be properly aligned with support housing (B) while roadwheel arm (F) is being installed.

CAUTION

Do not use excessive force while installing roadwheel arm; damage to seal may result.

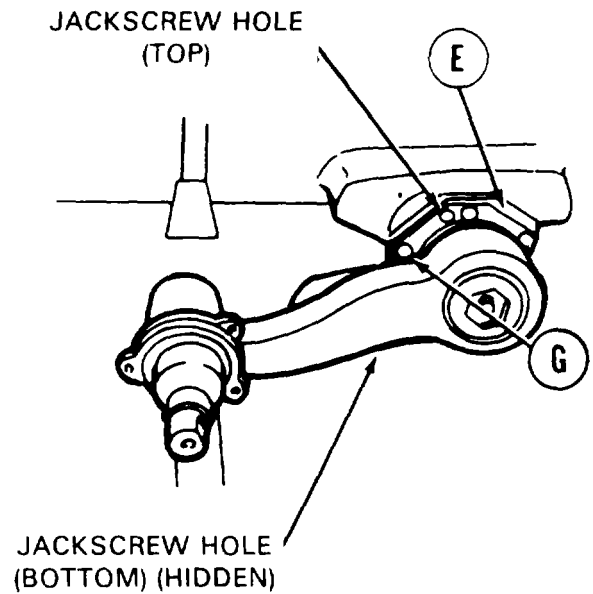
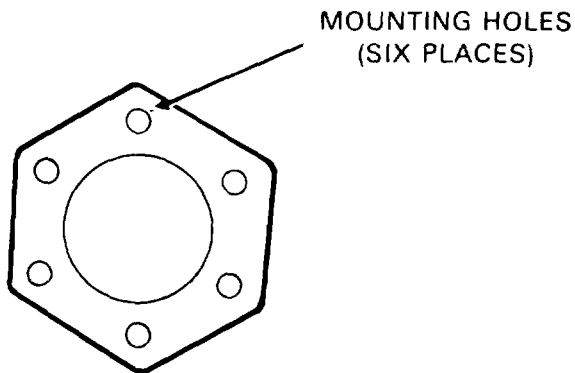
7. Using two persons, install upper spindle (C) completely into support housing (B).



Go on to Sheet 7

ROADWHEEL ARM REPLACEMENT (Sheet 7 of 7)

8. Position retainer (E) so that its jackscrew holes are at top and bottom of upper spindle.
9. Using pin punch, align six mounting holes in retainer (E) to holes in housing.
10. Put six new lockwashers and screws (G) into mounting holes.



11. Using crowfoot wrench and torque wrench, tighten six screws (G) alternately and evenly to 95-125 lb-ft (129-169 N.m).
12. Connect adjusting link at No. 1 roadwheel position, if necessary (page 14-59).
13. Install shock absorbers if roadwheel arms were removed from positions No. 1, 2, and 6 (page 14-96).
14. Install suspension torsion bar (page 14-27)

End of Task

TA141291

ROADWHEEL ARM REPAIR (Sheet 1 of 9)

PROCEDURE INDEX

PROCEDURE	PAGE
Disassembly	14-10
Cleaning and Inspection	14-13
Assembly	14-14

TOOLS: Pry bar
 Hammer
 Long round nose pliers
 File
 Handle
 Handle, socket wrench, hinged, with 1/2 in. drive
 Chisel

SPECIAL TOOLS: Oil seal replacer (Item 20, Chapter 3, Section I)
 Spanner wrench (Item 29.2, Chapter 3, Section I)
 Bearing tool assembly (Item 17, Chapter 3, Section I)
 Replacer (Item 24, Chapter 3, Section I)
 Bearing driver (Item 29.1, Chapter 3, Section I)

SUPPLIES: Seals
 Key washer
 Dry cleaning solvent (Item 54, Appendix D)
 Grease (Item 36, Appendix D)
 Washer
 Goggles (Item 74, Appendix D)
 Rubber gloves (Item 73, Appendix D)

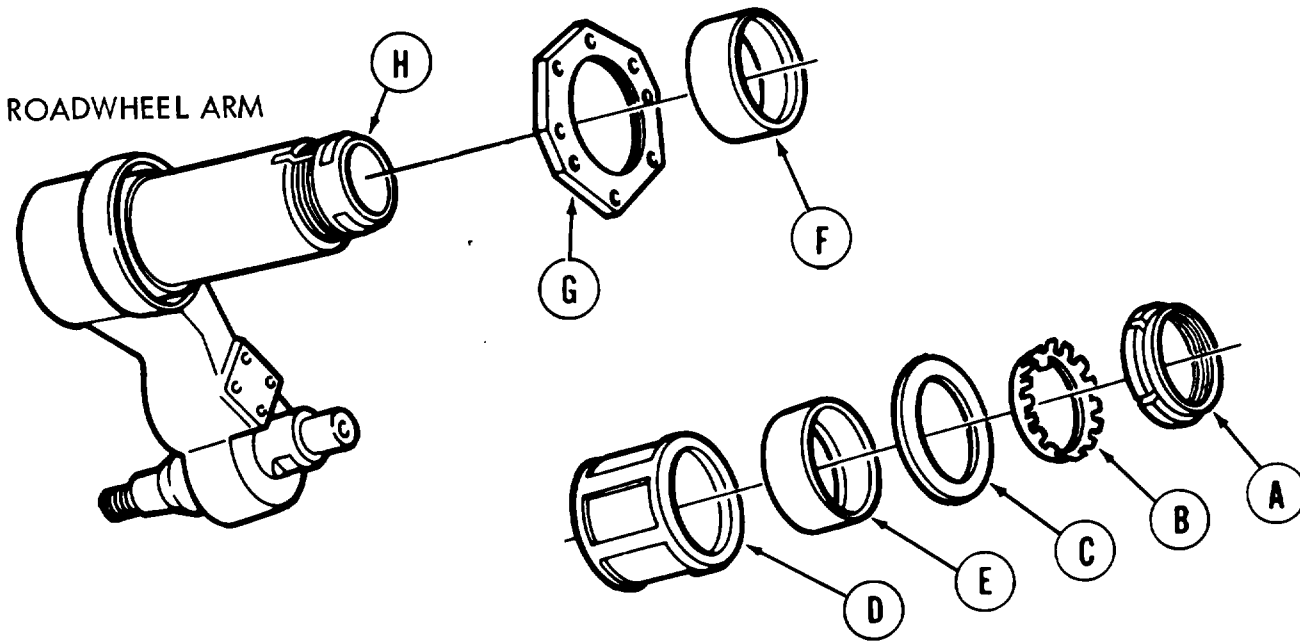
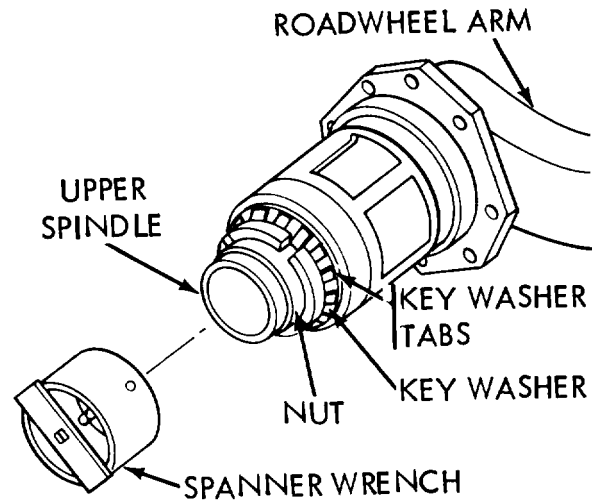
PRELIMINARY PROCEDURE: Remove roadwheel arm (page 14-2)

Go on to Sheet 2

ROADWHEEL ARM REPAIR (Sheet 2 of 9)

DISASSEMBLY:

1. Using pliers, bend key washer tabs back out of slot in nut.
2. Using spanner wrench (Item 29.2, Chapter 3, Section I), loosen nut (A). Remove nut (A).
3. Remove key washer (B) and bearing washer (C). Throw bearing washer (B) away.



NOTE

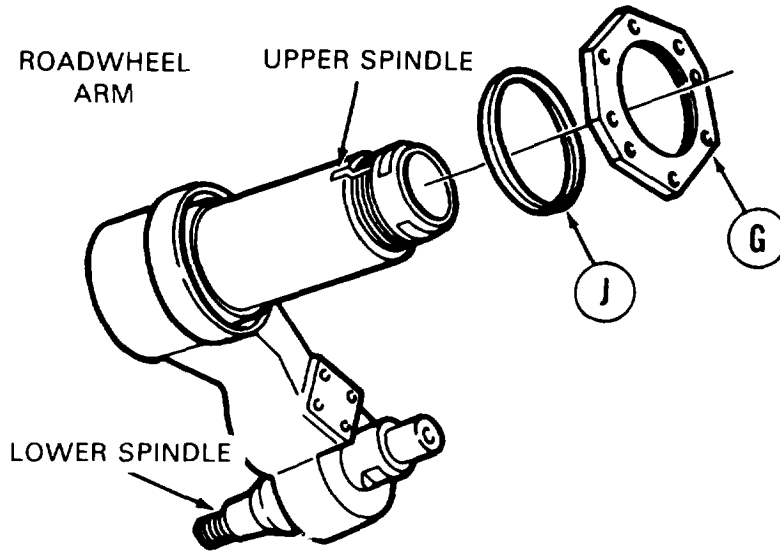
Keep inner and outer races of bearings together as matched set. If you throw away one race, throw away other one.

4. Use sleeve spacer (D) like a slide hammer to loosen inboard bearing (E). Remove bearing.
5. Remove sleeve spacer (D) and outboard bearing (F).
6. Pull oil seal retainer (G) off upper spindle (H).

Go on to Sheet 3

ROADWHEEL ARM REPAIR (Sheet 3 of 9)

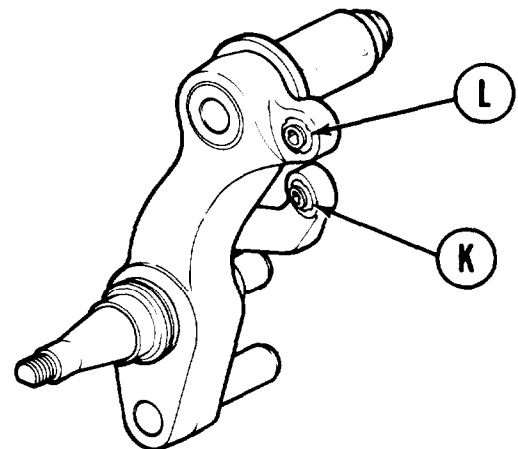
- Using pry bar, remove seal (J) from retainer (G) with care. Do not damage retainer. Throw seal away.



NOTE

Roadwheel arm numbers 1, 2, and 6 require bearing replacement. For roadwheel number 1, if your vehicle is equipped with mechanical track adjusting link, perform steps 8, 9, and 10; if equipped with grease actuated track adjusting link, perform steps 8, 9, and 11. For roadwheel numbers 2 and 6, perform steps 8 and 10. For roadwheel numbers 3, 4, and 5, go to cleaning and inspection, page 14-13.

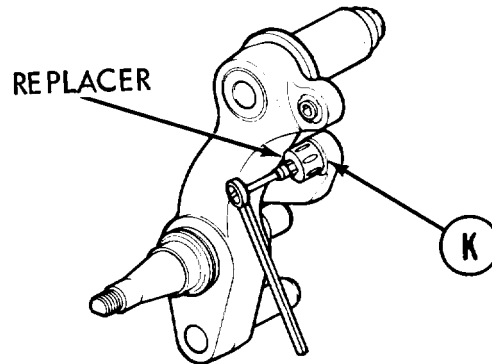
- Using hammer and chisel, cut off stakes on three places each side of shock absorber bearing (K) and track adjusting link bearing (L).



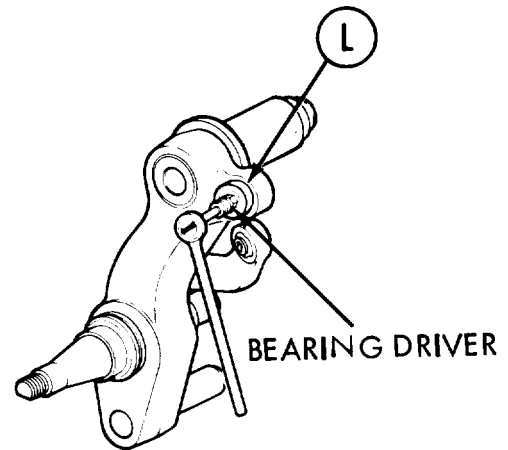
Go on to Sheet 4

ROADWHEEL ARM REPAIR (Sheet 4 of 9)

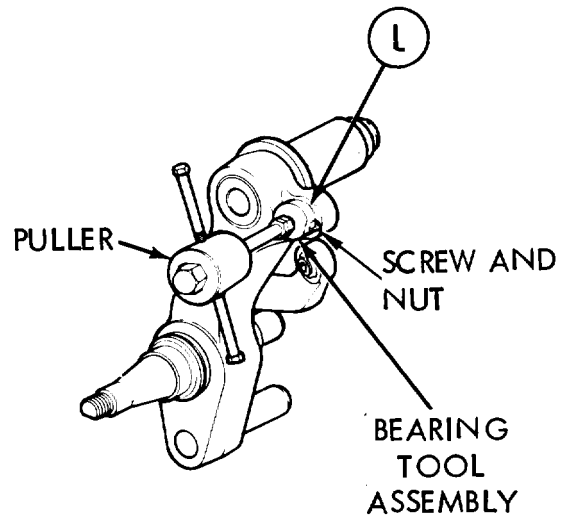
9. Install replacer on bearing (K). Turn replacer nut until bearing (K) is removed. Discard bearing (K).



10. Install bearing driver on bearing (L). Turn nut of bearing driver until bearing (L) is removed. Discard bearing (L).



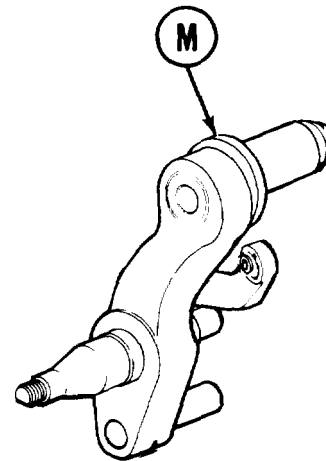
11. Secure bearing tool assembly to bearing (L) with screw and nut. Install puller to bearing tool assembly and remove bearing (L). Discard bearing (L).



Go on to Sheet 5

ROADWHEEL ARM REPAIR (Sheet 5 of 9)

12. Inspect deflector (M) for bending, cracking, or wear. If damaged, carefully remove deflector (M) by tapping around its outer face with hammer and chisel.



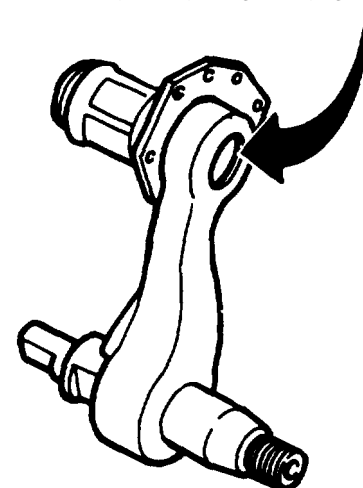
CLEANING AND INSPECTION:

WARNING

Dry cleaning solvent P-D-680 is toxic and flammable, To avoid injury, wear protective goggles and gloves and use in a well-ventilated area. Avoid contact with skin, eyes, and clothes, and do not breathe vapors. Do not use near open fire or excessive heat. The flash point for Type I dry cleaning solvent is 100°F (38°C), and for Type 11 is 140°F (60°C). If you become dizzy while using dry Cleaning solvent, get fresh air immediately and get medical aid. If contact with eyes is made, wash your eyes with water and get medical aid immediately.

1. Using dry cleaning solvent, clean all parts, especially bearings.
2. Check arm for cracks. If arm is cracked or bad, turn in to support maintenance and replace with new arm.
3. Inspect both upper and lower spindles of arm, especially threads.
4. Check internal splines of arm for broken, cracked, or deformed splines. If bad, replace arm.
5. Using file, smooth out any rust spots, pits, or other damaged places on arm. Do not file spindle.
6. Inspect bearings for missing needle rollers and scuffs or scratches, especially on inner races.
7. Replace defective parts as required.

INTERNAL SPLINES



Go on to Sheet 6

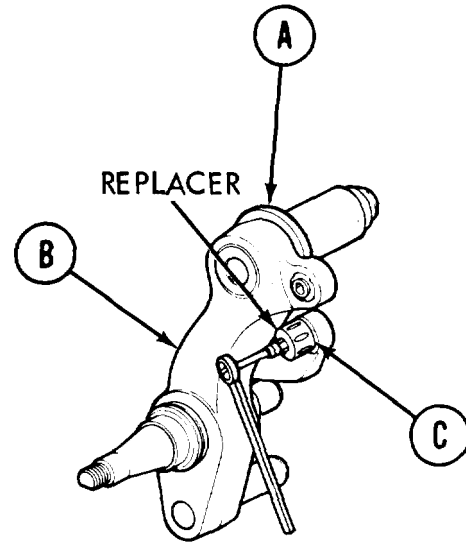
ROADWHEEL ARM REPAIR (Sheet 6 of 9)

ASSEMBLY:

If deflector (A) was removed, carefully position new deflector in place over upper spindle against machined ridge in arm (B). Assure base of U-shaped deflector (A) is towards arm and open end towards threaded end of spindle. Tap deflector (A) lightly with hammer to assure it seats fully against arm (B).

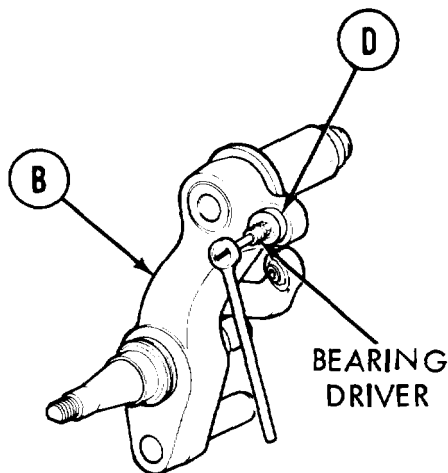
Position shock absorber bearing (C) on arm. Install replacer (Item 24, Chapter 3, Section I) over bearing (C) and arm (B). Turn replacer nut until bearing (C) is centered in arm (B). Remove replacer.

Stake bearing (C) to arm (B) at three equally spaced locations on each side of bearing (C).



NOTE

If replacing bearing for mechanical track adjusting link, perform steps 4 and 5. If replacing bearing for grease actuated track adjusting link, perform steps 6 and 7.

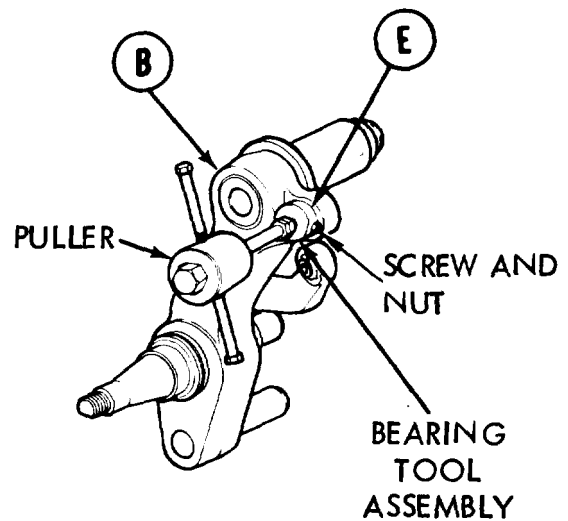


4. Position bearing (D) on arm (B). Install bearing driver (Item 29.1, Chapter 3, Section I) over bearing (D). Turn nut of bearing driver until bearing (D) is centered in arm (B). Remove bearing driver.
5. Stake bearing (D) to arm (B) at three equally spaced locations on each side of bearing (D). Go to step 8.

Go on to Sheet 7

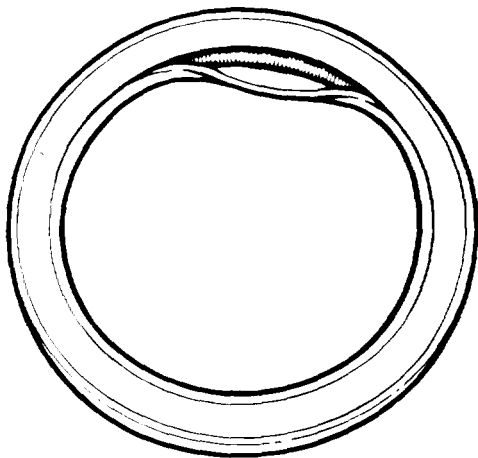
ROADWHEEL ARM REPAIR (Sheet 7 of 9)

6. Position bearing (E) on arm (B). Secure bearing tool assembly (Item 17, Chapter 3, Section I) to bearing (E) with screw and nut. Install puller to bearing tool assembly and drive bearing (E) in arm until centered. Remove bearing tool assembly and puller.
7. Stake bearing (E) to arm (B) at three equally spaced locations on each side of bearing (E). Go on to step 8.

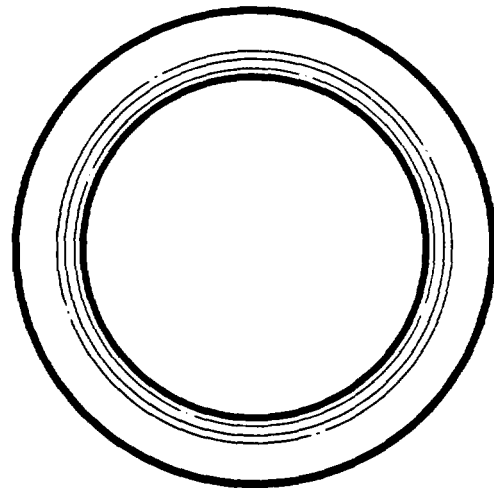


NOTE

Identify FRONT and BACK of outer grease seal. Rubber grease seal retaining lip can be pulled away from metal inner edge on FRONT of seal. pull back retaining lip on seal and expose garter spring. BACK of seal has rubber grease retainer bonded to metal ease and cannot be pulled away.



FRONT VIEW



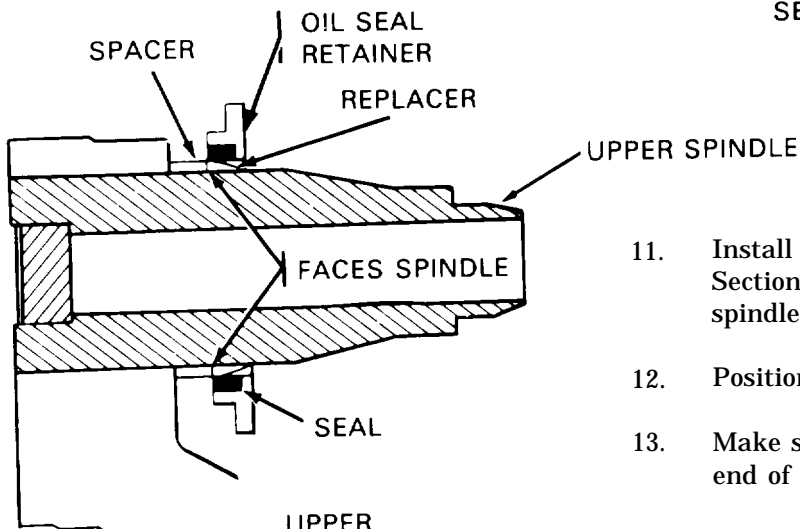
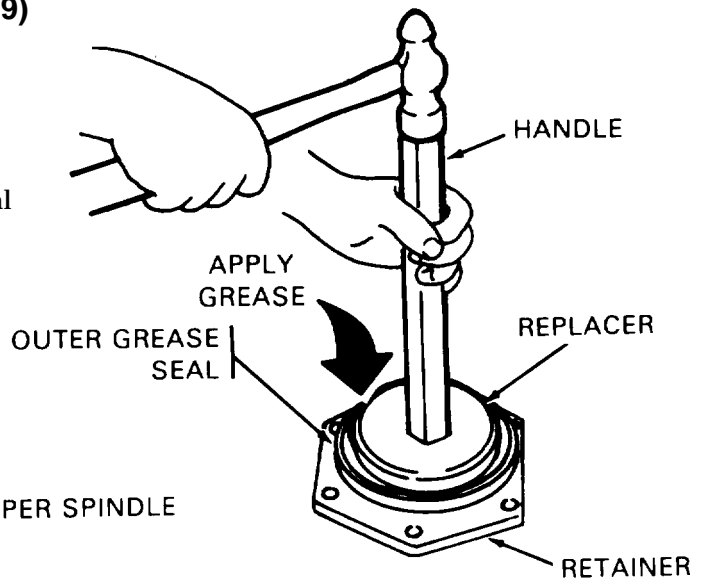
BACK VIEW

OUTER GREASE SEAL

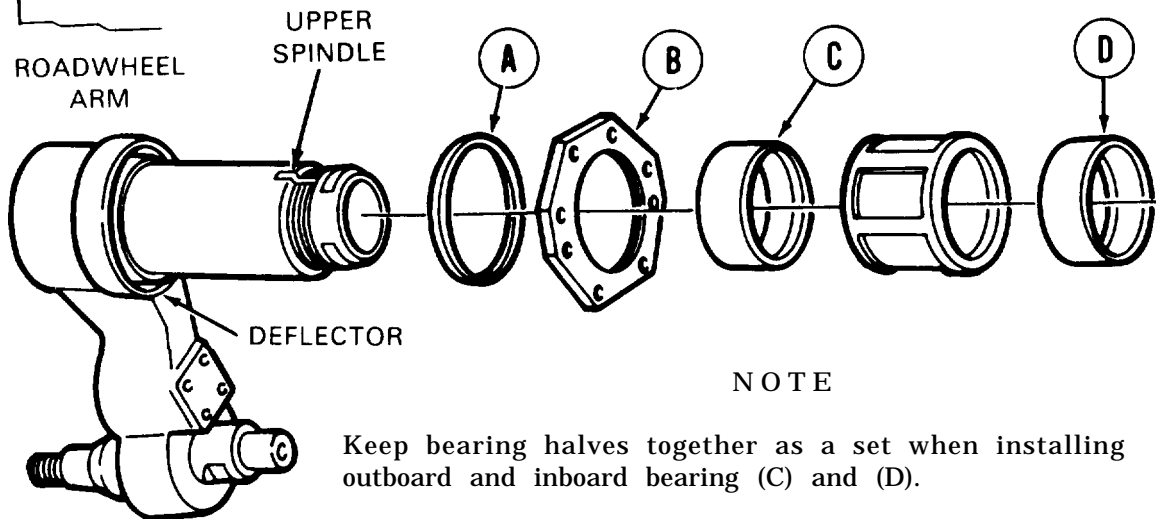
Go on to Sheet 8

ROADWHEEL ARM REPAIR (Sheet 8 of 9)

8. Coat outer edge of seal with grease.
9. Position seal (A) into retainer with front of seal facing upward.
10. Using replacer and handle, tap handle with hammer to install seal (A).



11. Install oil seal replacer (Item 20, Chapter 3, Section I) to face with spacer on upper spindle of arm.
12. Position retainer (B) onto upper spindle
13. Make sure seal in retainer (B) fits into open end of deflector on roadwheel arm.



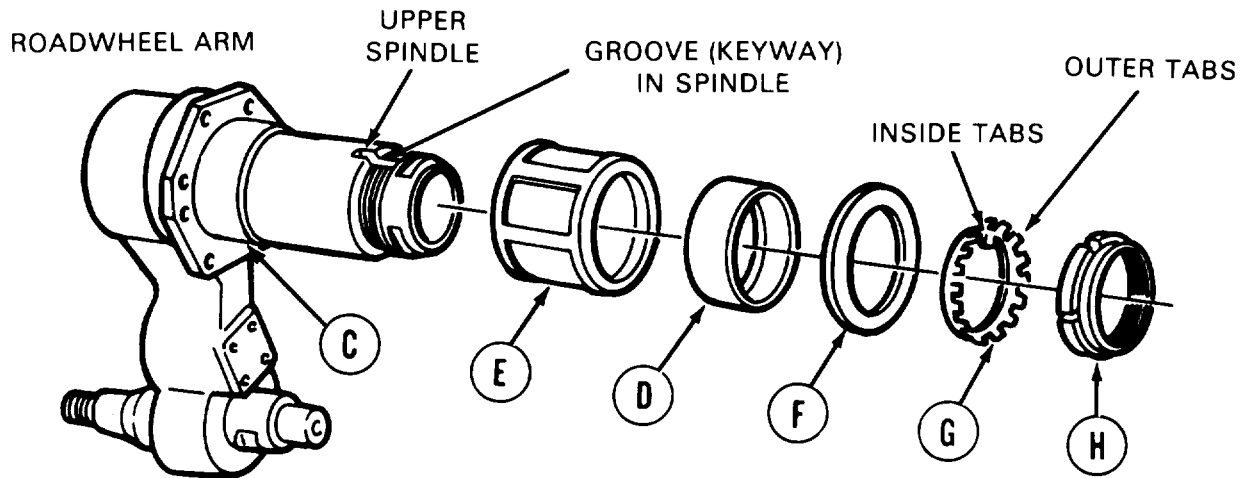
NOTE

Keep bearing halves together as a set when installing outboard and inboard bearing (C) and (D).

14. Coat inner and outer races of outboard bearings (C) with grease. Install inner race on spindle. Install outer race over it.

Go on to Sheet 9

ROADWHEEL ARM REPAIR (Sheet 9 of 9)

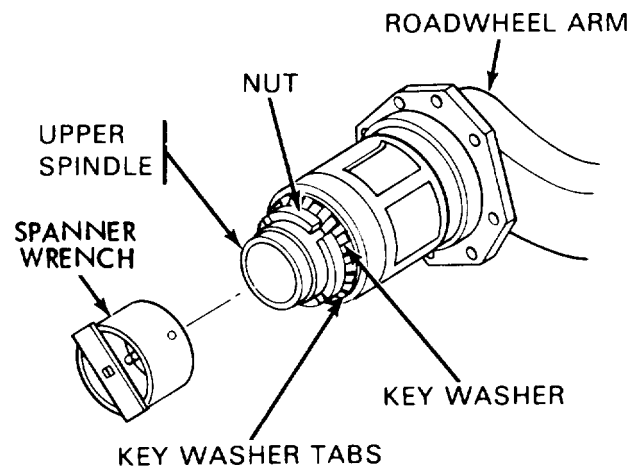


15. Apply grease to bearing spacer (E) and bearing washer (F).
16. Install bearing spacer (E) onto spindle up against outboard bearing (C),.
17. Repeat step 14 to install inboard bearings (D).
18. Install key washer (G) on spindle of arm so that inside tab fits into groove

NOTE

Make sure outer tabs of key washer are pointing towards nut (H).

19. Screw nut (H) onto threaded end of spindle.
20. Using spanner wrench (Item 29.2, Chapter 3, Section I), tighten nut (H) until parts on spindle cannot be turned by hand.
21. Back off nut (H) just enough so parts can be turned by hand through one complete turn on spindle.
22. Using pliers, bend tab on key washer (G) into aligning slot on nut (H).
23. Install roadwheel arm (page 14-6).
End of Task



HUB ASSEMBLY REPLACEMENT (Sheet 1 of 7)

PROCEDURE INDEX

PROCEDURE	PAGE
Disassembly	14-15
Cleaning and Inspection	14-17
Assembly	14-18

TOOLS: 9/16 in. socket with 1/2 in. drive
 Drift punch
 Ratchet with 1/2 in. drive
 Hammer
 Hinged handle with 1/2 in. drive
 Long round nose pliers
 2-1/2 in. socket with 3/4 in. drive
 Ratchet with 3/4 in. drive
 Pinch bar
 Torque wrench with 3/4 in. drive (0-600 lb-ft) (0-814 N.m)

SPECIAL TOOLS: Replacer (Item 20, Chapter 3, Section I)
 Spanner wrench (Item 27, Chapter 3, Section I)
 Handle (item 10, Chapter 3, Section 1)
 Remover-replacer (Item 16, Chapter 3, Section 1)
 Remover-replacer (Item 15, Chapter. 3, Section I)

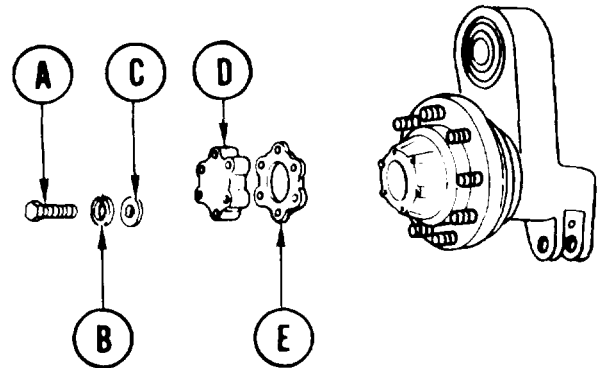
SUPPLIES: Grease (Item 37, Appendix D)
 Gaskets
 Seal
 Preformed packing
 Bearing nut lock
 Lockwashers (MS35338-65) (12 required)

REFERENCE: LO 9-2350-222-12

PRELIMINARY PROCEDURE: Remove roadwheels (page 14-51)

DISASSEMBLY:

- Using 9/16 inch socket, remove six screws (A), lockwashers (B), and washers (C). Throw lockwashers (B) away.
- Remove cover plate (D) and gasket (E). Throw gasket away.

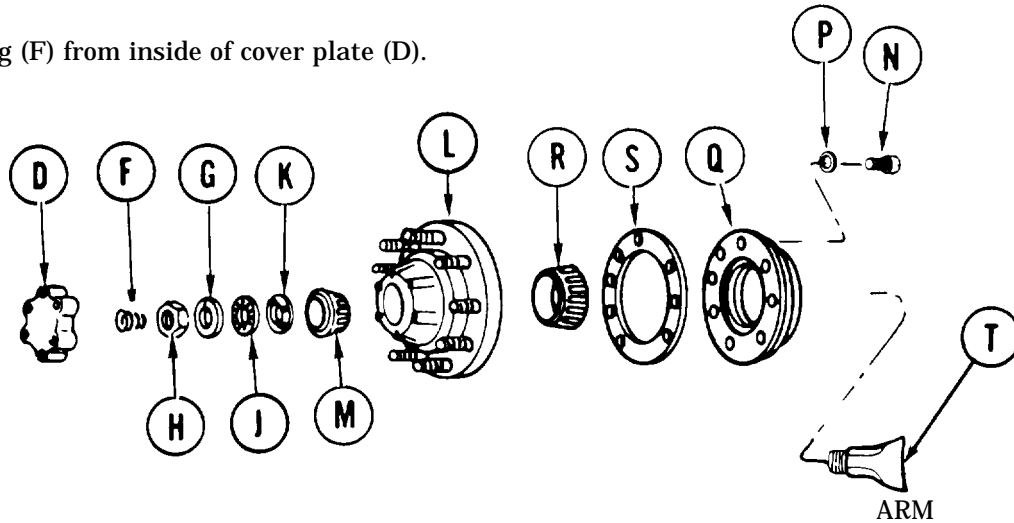


Go on to Sheet 2

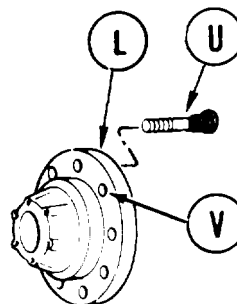
TA253462

HUB ASSEMBLY REPLACEMENT (Sheet 2 of 7)

3. Remove spring (F) from inside of cover plate (D).



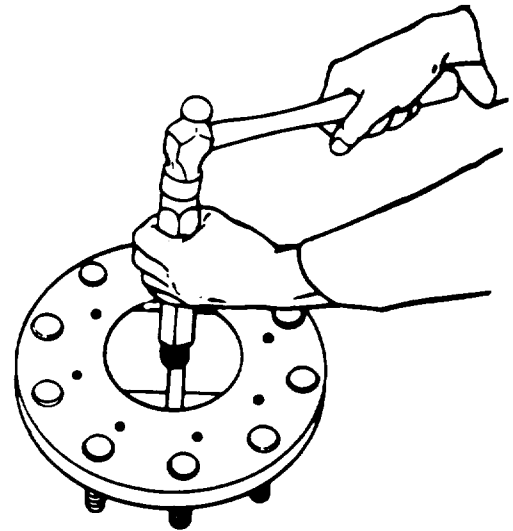
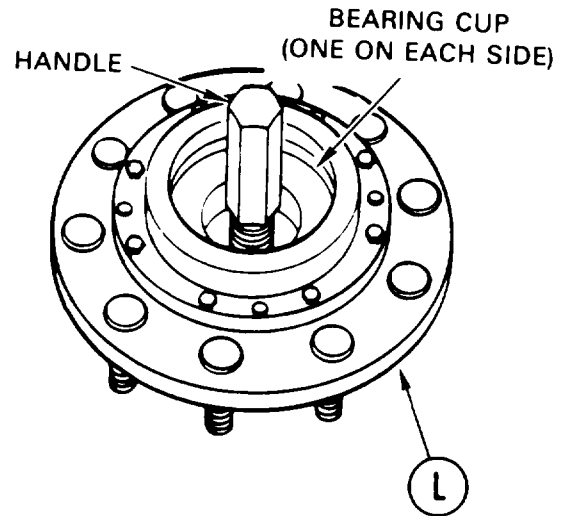
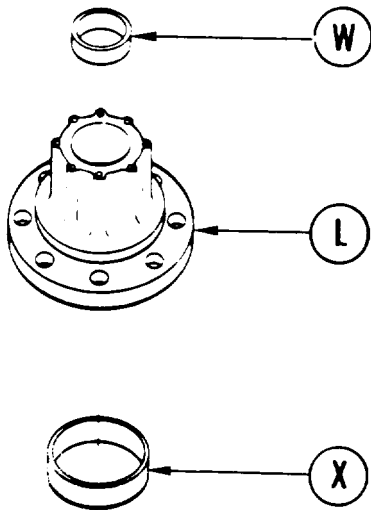
4. Using hammer and drift punch, bend back tab of bearing nut lock (G).
5. Using 2-1/2 inch socket, loosen nut (H). Remove nut (H), bearing nut lock (G), and lock (J). Throw bearing nut lock (G) away if used more than four times.
6. Using spanner wrench (Item 27, Chapter 3, Section I) with 3/4 inch ratchet, remove nut (K).
7. Using pinch bar on hub, if necessary, remove hub (L) and bearing (M).
8. Using 9/16 inch socket with hinged handle, remove eight screws (N) and lockwashers (P) securing seal assembly (Q) to hub (L). Throw lockwasher (P) away.
9. Remove inner bearing (R), gasket (S), and seal assembly (Q). Throw gasket away.
10. Separate preformed packing (T) from arm assembly. Throw packing away.
11. Using hammer and drift punch, drive out any bolts (U) with stripped threads or other damage. Throw bolts away.
12. If inserts (V) are stripped or damaged, turn hub into support maintenance for repair.



Go on to Sheet 3

TA141298

13. Position remover-replacer (Item 15, Chapter 3, Section 1) onto inner edge of outer bearing cup (W) in hub (L).
14. Using hammer, tap handle to drive outer bearing cup (W) from hub (L).
15. Repeat steps 13 thru 14 to remove inner bearing cup (X) from hub (L), using other remover-replacer tool (Item 16, Chapter 3, Section I).



CLEANING AND INSPECTION:

1. Clean all parts including bearings.
2. Inspect hub and cover plate for cracks or damage. There should be no cracks.
3. Minor nicks, scratches, gouges, and pitting are okay if they are not on machined surfaces.

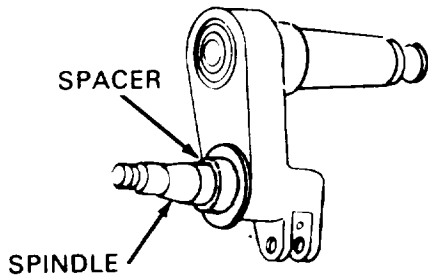
Go on to Sheet 4

TA141299

Change 1 14-17

HUB ASSEMBLY REPLACEMENT (Sheet 4 of 7)

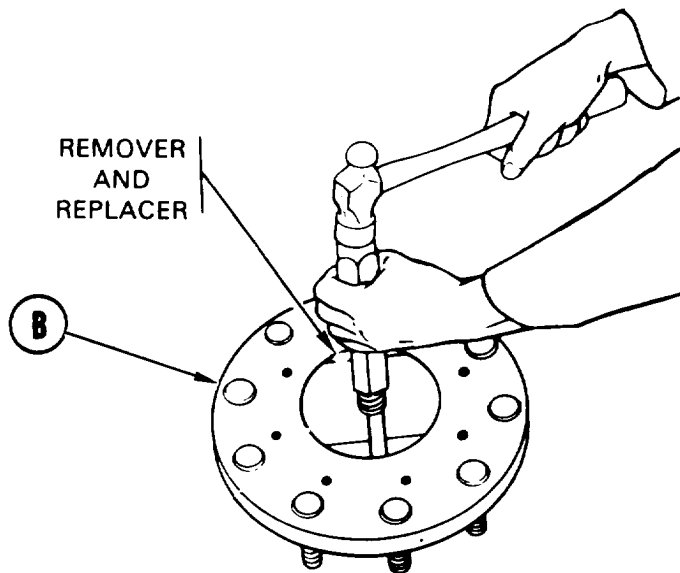
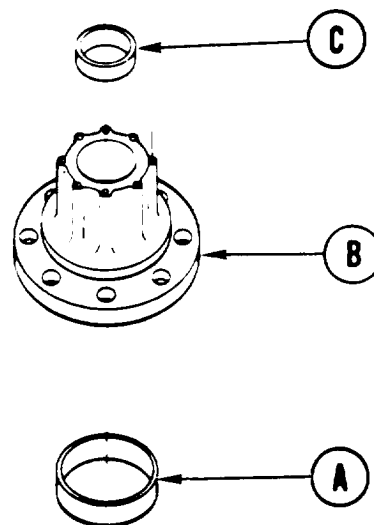
4. Inspect bearings and cups for damage. Replace as necessary.
5. Check seal assembly for rust, missing rivets, or other damage. Replace seal as required.



6. Inspect all nuts, washers, and screws for wear and damaged threads.
7. Inspect spacer on spindle for scratches, nicks, or dents. If damaged, notify support maintenance.

ASSEMBLY:

1. Grease (Item 36, Appendix D) both bearing cups. Position remover-replacer tool (Item 16, Chapter 3, Section I) to inner cup (A) in hub (B).
2. Using hammer, tap remover-replacer to seat inner cup (A) into place in hub (B).
3. Using other remover-replacer tool (Item 15, Chapter 3, Section I) with hammer, repeat steps 1 and 2 to seat outer cup (C) in hub (B).

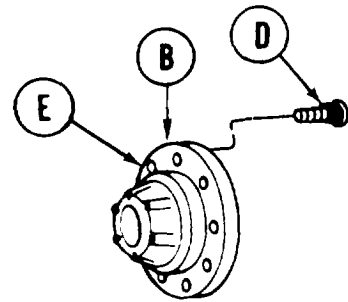


Go on to Sheet 5

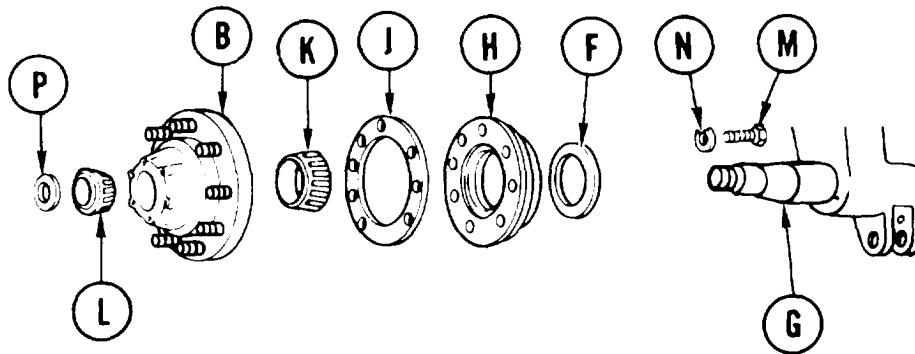
TA141300

HUB ASSEMBLY REPLACEMENT (Sheet 5 of 7)

4. Using hammer and drift punch, install new (if required) bolts (D) into hole (E) of hub (B).



5. Grease (Item 36, Appendix D) new preformed packing (F). Install packing into groove on arm assembly (G).
6. Install seal assembly (H) with new gasket (J) onto arm (G) lower spindle.
7. Pack both inner (K) and outer bearings (L) with grease (Item 36, Appendix D)
8. Position inner bearing (K) on arm (G) lower spindle
9. Install hub (B) onto arm spindle (G), making sure seal assembly (H) aligns to five pins on interface of arm assembly (G).



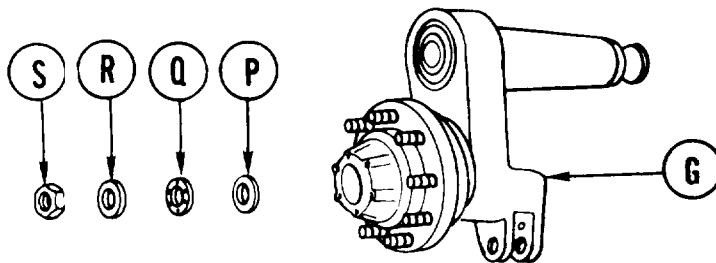
10. Install eight screws (M) and new lockwashers (N) to secure seal assembly (H) to hub (B).
11. Using 9/16 inch socket, tighten screws (M) alternately.
12. Install outer bearing (L) onto spindle. Push hub (B) onto spindle and bearing until bearing seats.
13. Install round nut (P) with dowel. Using spanner wrench (Item 27, Chapter 3, Section 1) with 3/4 inch drive ratchet, tighten nut (P) while rotating hub one way, then opposite.

Go on to Sheet 6

TA253463

HUB ASSEMBLY REPLACEMENT (Sheet 6 of 7)

14. When nut (P) is tight and parts seem to be seated, back off nut and, using torque wrench, tighten nut (P) to 50-70 lb-ft (68-95 N.m)



15. Back off round nut (P) 1/4 turn.
16. Install lock (Q) so that hole of lock fits over nut (P) dowel.

NOTE

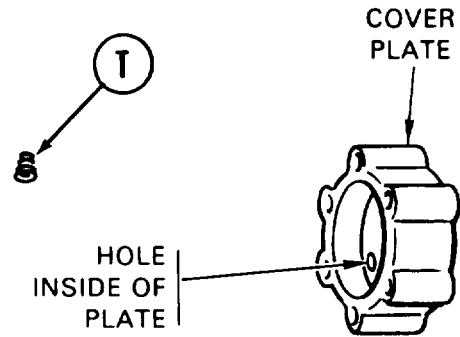
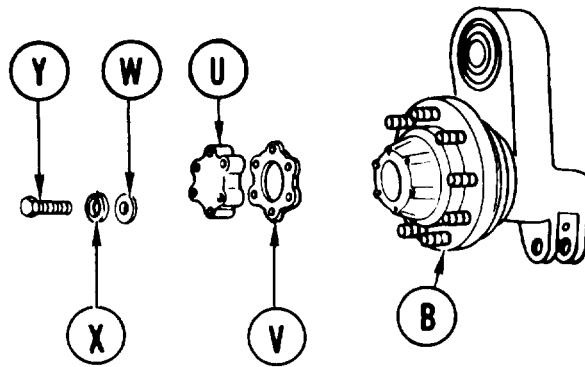
If lock hole does not line up to dowel of nut, turn lock over and try other side.

17. Position new bearing nut lock (R) to one of holes in lock (Q).
18. Screw nut (S) onto arm (G) lower spindle. Tighten nut up against bearing nut lock (R).
19. Using 2-1 /2 inch socket and torque wrench, tighten nut (S) 150-300 lb-ft (202-406 N.m).
20. Using hammer and drift punch, bend one end of bearing nut lock (R) back over nut (S).

Go on to Sheet 7

TA253464

HUB ASSEMBLY REPLACEMENT (Sheet 7 of 7)



21. Install spring (T) into cover plate (U). Tang of large end of spring goes into hole inside of cover plate.
22. Install cover plate (U) with new gasket (V) to hub (B).
23. Install six washers (W), new lockwashers (X), and screws (Y) to secure cover plate (U) to hub (B).
24. Using 9/16 inch socket, tighten six screws (Y).
25. Service hub and arm assembly (LO 9-2350-222-12).
26. Install roadwheels (page 14-53).

End of Task

TA253465

Change 1 14-21

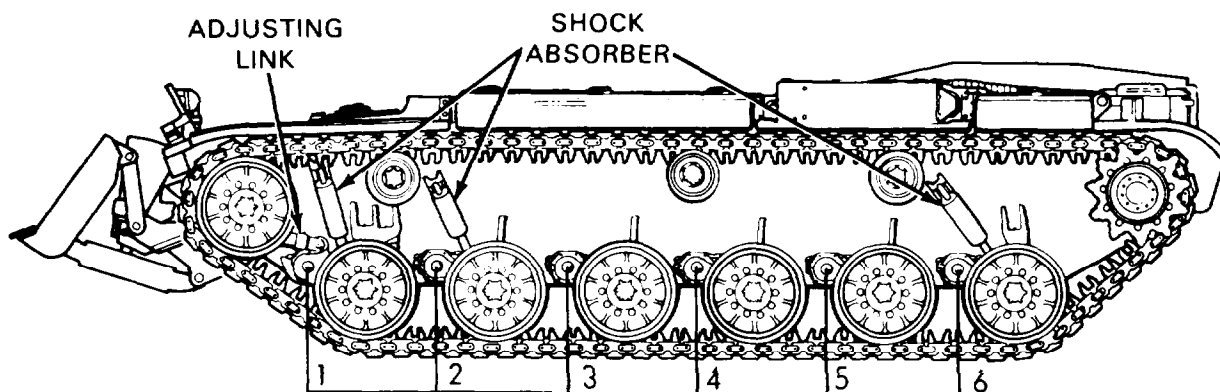
ROADWHEEL SUPPORT HOUSING ASSEMBLY REPAIR AND REPLACEMENT (Sheet 1 of 2)

TOOLS: 1-5/16 in. socket with 3/4 in. drive
 Ratchet with 3/4 in. drive
 Hammer
 36 in. extension bar
 Drift pin punch
 10 in. adjustable wrench
 Slip joint pliers
 Torque wrench with 3/4 in. drive (0-600 lb-ft)
 (0-814 N.m)

SUPPLIES: Gasket (10911460)
 Grease (Item 37, Appendix D)
 Sealing compound (Item 25, Appendix D)
 Lockwashers (MS35340-52) (9 required)

PERSONNEL: Two

PRELIMINARY PROCEDURES: Remove roadwheel arm (page 14-2)
 Remove torsion bar anchor (page 14-31)

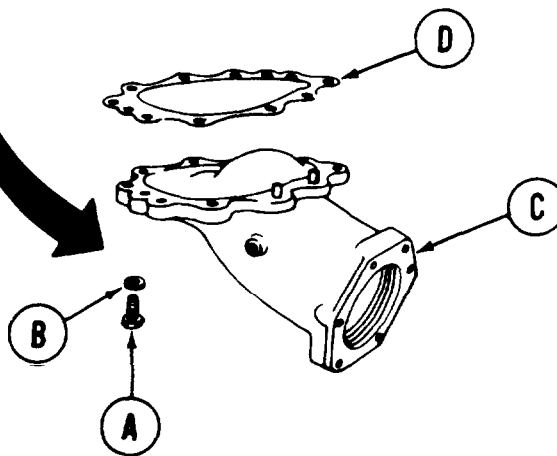


NOTE

There are six support housings on each side of tank. The procedures for all six are identical except that no. 1 housing is not interchangeable.

NOTE

Use jack to support housing during removal and installation.



REMOVAL:

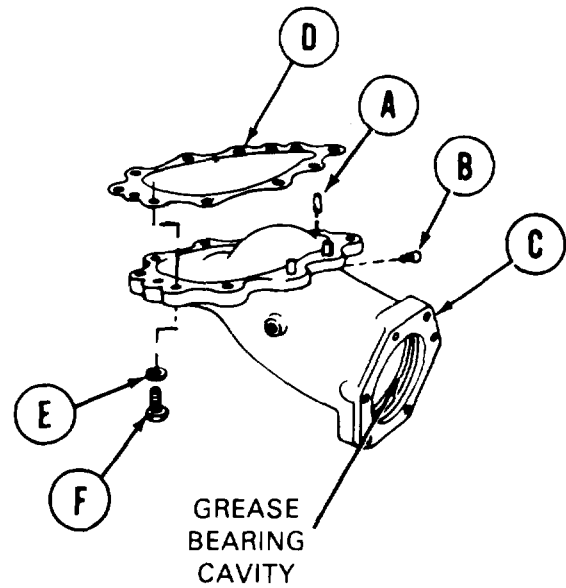
1. Using socket with ratchet, remove nine screws (A) and lockwashers (B) securing roadwheel support housing (C) to hull. Throw lockwashers (B) away.
2. Remove housing (C) and gasket (D) from hull mounting place. Throw gasket (D) away.

Go on to Sheet 2

TA141304

ROADWHEEL SUPPORT HOUSING ASSEMBLY REPAIR AND REPLACEMENT (Sheet 2 of 2)**REPAIR:**

1. Using hammer, tap two straight pins (A) to loosen them. Using pliers, pull pins out.
2. Using adjustable wrench, remove plug (B) from housing.
3. Inspect housing (C). Replace if necessary.
4. Coat support housing bearing cavity with grease (Item 37, Appendix D).
5. Using adjustable wrench, install plug (B).
6. Inspect grease fitting. Replace if necessary.

**INSTALLATION:**

1. Using hammer and drift punch, drive two pins (A) into place.
2. Apply sealing compound (Item 25, Appendix D) to mating surfaces of hull and housing (C).
3. Lift housing (C) and new gasket (D) and position to mounting place.
4. Aline holes in gasket, and housing with holes in hull mounting place,
5. Install nine new lockwashers (E) and screws (F) securing housing (C) to hull.
6. Using socket, alternately tighten nine screws (F).
7. Using torque wrench, socket, and extension bar, tighten screws (F) to 450-475 lb-ft (610- 644 N.m).
8. Install torsion bars (page 14-27).
9. Install roadwheel arm (page 14-6).

End of Task

TA141305

Change 1 14-23

SUSPENSION TORSION BAR REPLACEMENT (Sheet 1 of 7)

PROCEDURE INDEX

PROCEDURE	PAGE
Removal	14-24
Installation	14-27

TOOLS: 3/4 in. deep socket with 1/2 in. drive Automotive wrench
Ratchet with 1/2 in. drive Slide hammer puller
Mallet Mechanical puller adapter
Crowbar (or pinch bar)
Rod (or drift pin)
Blocks
15 in. adjustable wrench
36 in. extension bar

SPECIAL TOOLS: Plug wrench (Item 26, Chapter 3, Section I)
Roadwheel arm lifter (Item 11, Chapter 3, Section I)

SUPPLIES: Grease (Item 36, Appendix D) Corrosion preventive (Item 80, Appendix D)
Blocks Solid film lubricant (Item 81, Appendix D)
Lockwasher

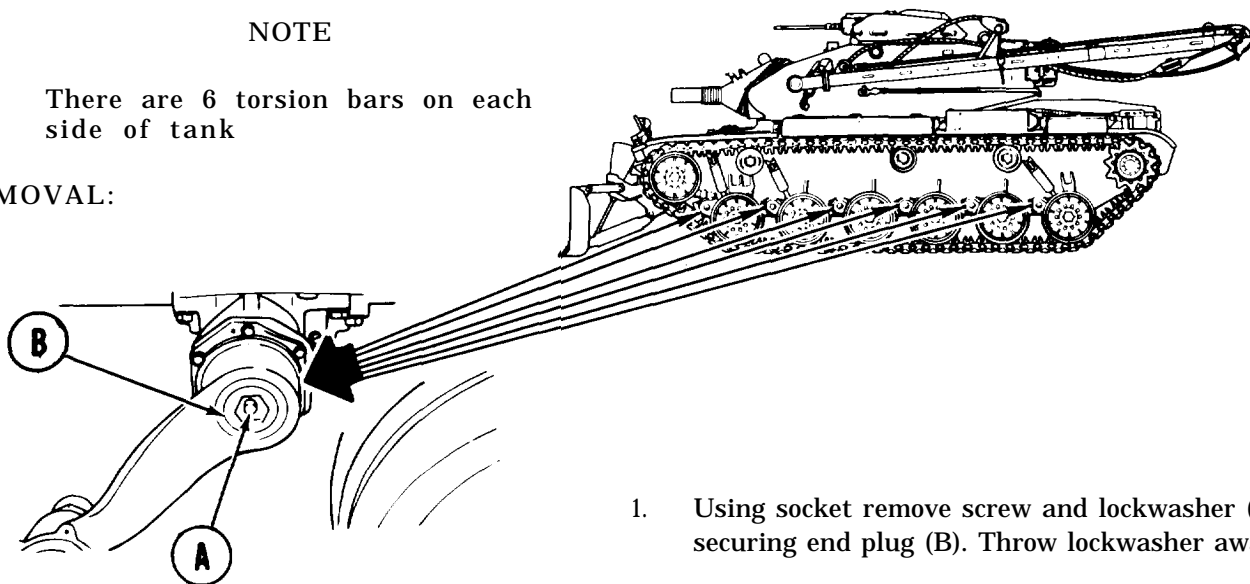
PERSONNEL: Two

PRELIMINARY PROCEDURES: Remove hub (page 14-15)

NOTE

There are 6 torsion bars on each side of tank

REMOVAL:



1. Using socket remove screw and lockwasher (A) securing end plug (B). Throw lockwasher away.

Go on to Sheet 2

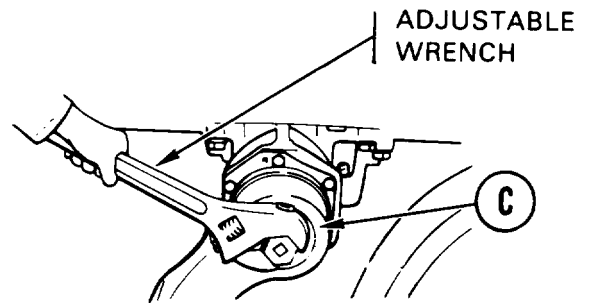
SUSPENSION TORSION BAR REPLACEMENT (Sheet 2 of 7)

2. Install plug wrench (Item 26, Chapter 3, Section I) into end plug (C).

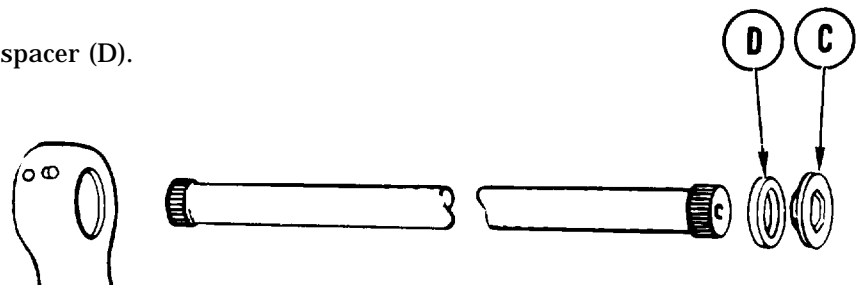
NOTE

It may be necessary to use 36 inch bar extension.

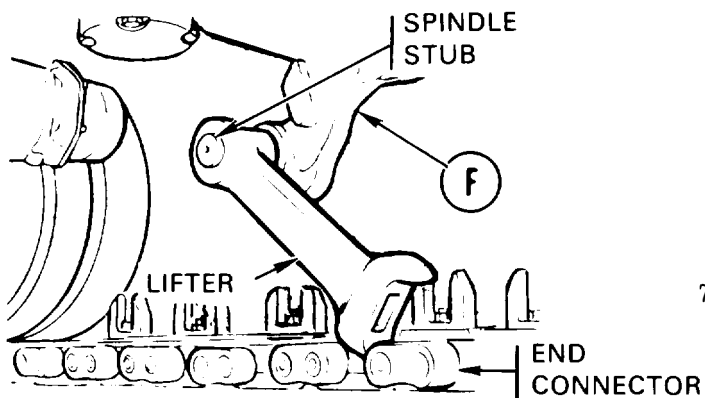
3. Using adjustable wrench on plug wrench, loosen end plug (C).



4. Remove end plug (C) and spacer (D).



5. Have second person start engine. Then shift transmission into reverse and slowly back tank up.
6. Direct second person to stop tank when support arm (F) is in down position.



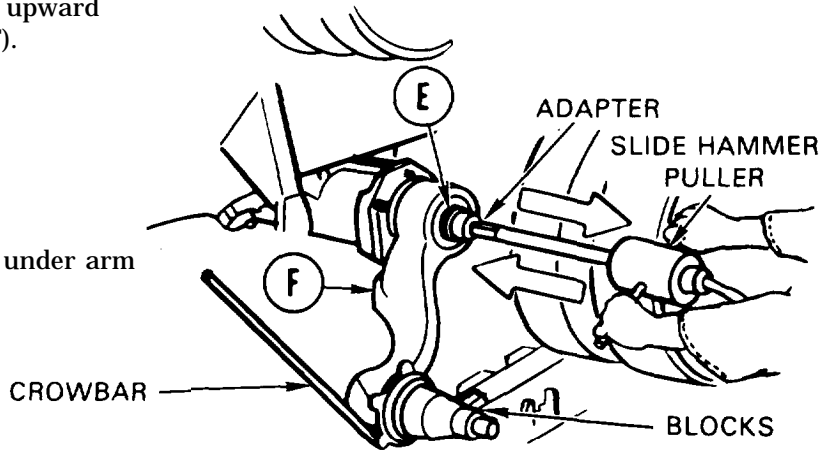
7. Using mallet, tap special roadwheel lifter off spindle stub. Remove lifter.

Go on to Sheet 3

SUSPENSION TORSION BAR REPLACEMENT (Sheet 3 of 7)

8. Using crowbar (or pinch bar), apply upward force to bottom of roadwheel arm (F).

9. Have second person position blocks under arm (F) while force is being applied.



10. Remove crowbar.

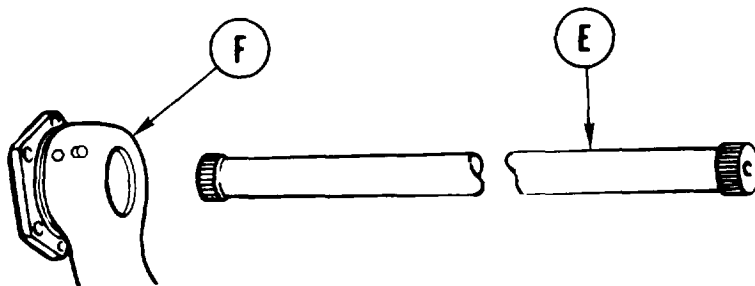
11. Using automotive wrench, screw adapter into threaded hole of torsion bar (E).

NOTE

Adapter must be tightened after each striking movement.

12. Using slide hammer puller with adapter, strike torsion bar (E) with slide hammer by sliding slide hammer puller along slide hammer rod.
13. Keep on striking torsion bar (E) with slide hammer. Hammer with some force until torsion bar (E) spline is free from side of hull.

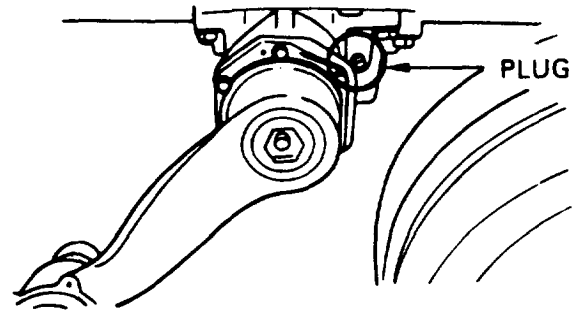
14. Pull bar (E) out of support arm (F).



Go on to Sheet 4

SUSPENSION TORSION BAR REPLACEMENT (Sheet 4 of 7)

15. If torsion bar is broken, use adjustable wrench to remove plug at opposite side of tank.



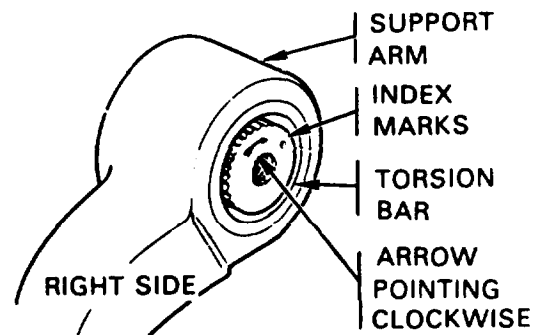
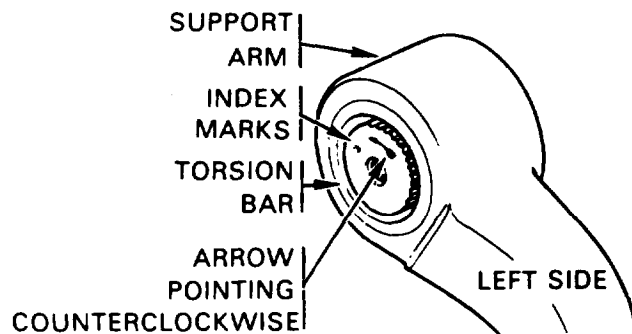
16. Stick rod through plug hole. Using mallet, tap rod to drive torsion bar out from other end.

17. Replace torsion bar or other parts found defective.

INSTALLATION:

CAUTION

Six torsion bare (E) on one side of tank are different from six bare on other side. Left aide bars have arrow pointing counter clockwise. Right aide bare have arrows pointing clockwise. Alignment for No. 1 and 2 torsion bar index marks is at 1130 hrs.

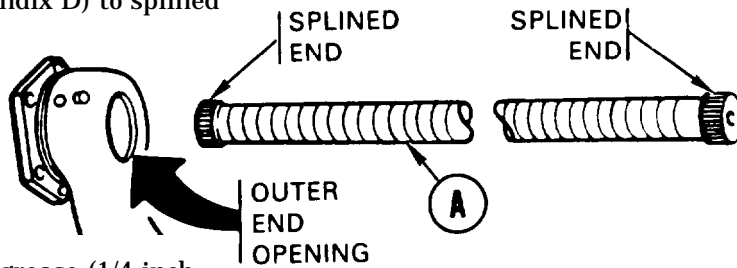


Go on to Sheet 5

TA141309

SUSPENSION TORSION BAR REPLACEMENT (Sheet 5 of 7)

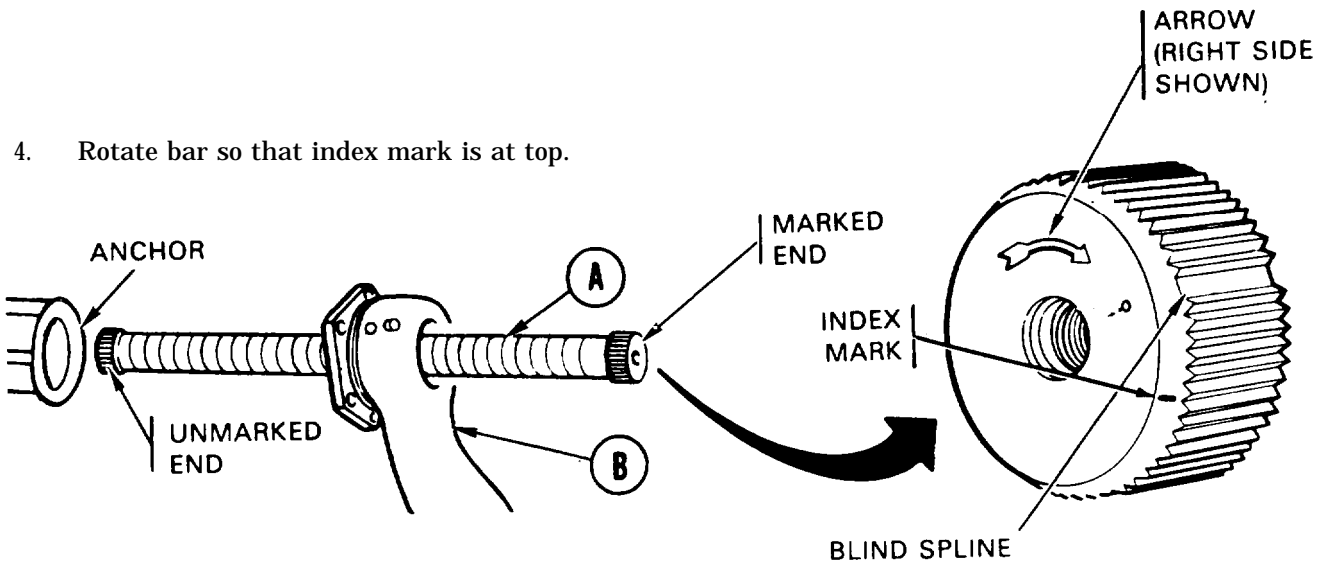
1. Apply grease (Item 36, Appendix D) to splined ends of torsion bar (A).



2. Fill outer end opening with grease (1/4-inch deep).

3. Insert unmarked end of bar (A) into roadwheel support arm (B) housing.

4. Rotate bar so that index mark is at top.



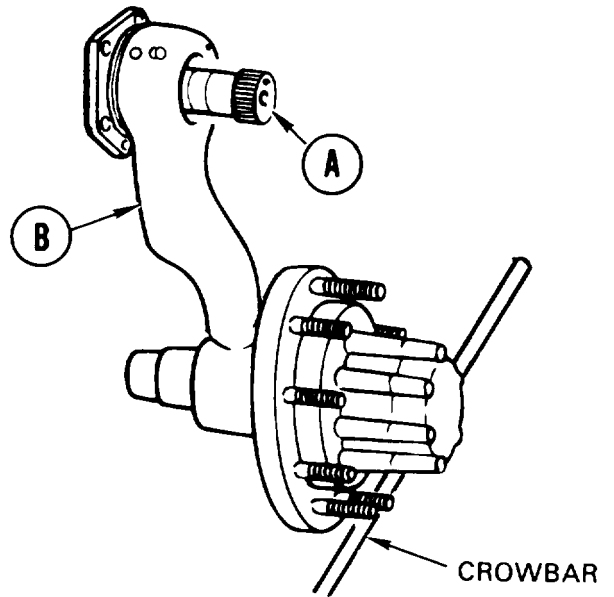
5. Push bar (A) through housing until inside end enters anchor on other side of tank. When this is done, about 1/2 inch of bar will be out of housing.

Go on to Sheet 6

TA141310

SUSPENSION TORSION BAR REPLACEMENT (Sheet 6 of 7)

6. Using crowbar (or pinch bar), apply upward pressure to support arm (B) until blind spline on bar (A) and index marks on support arm (B) are alined.

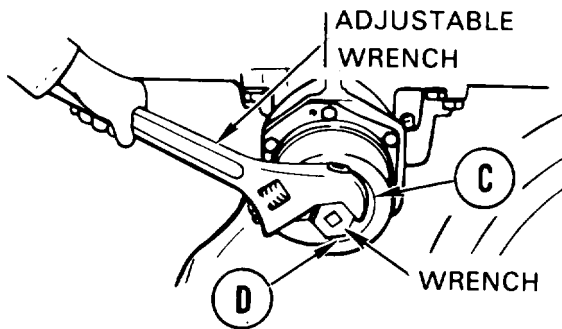


7. Using slide hammer puller and adapter, push end of bar (A) in as far as it will go. Remove blocks and crowbar.

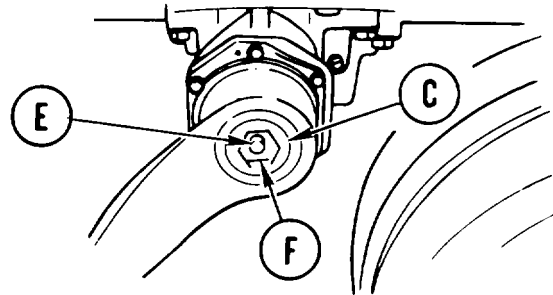
8. Remove slide hammer and adapter.

9. Apply grease to end of bar (A).

10. Using adjustable wrench with plug wrench, screw end plug (C) and spacer (D) into place. Remove plug wrench.



11. Secure spacer (D) and end plug (C) with new lockwasher (E) and screw (F).



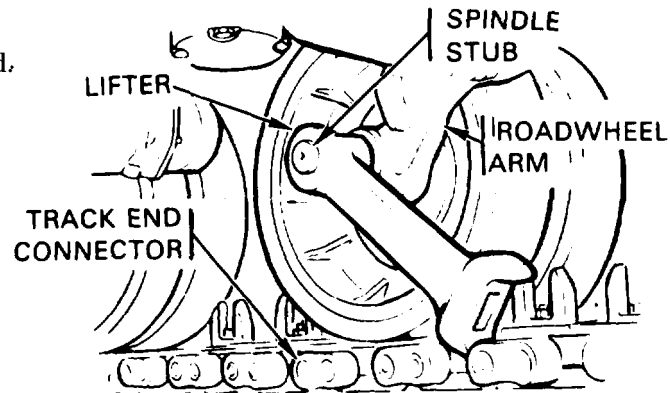
12. Using deep socket with ratchet, tighten screw (F).

Go on to Sheet 7

SUSPENSION TORSION BAR REPLACEMENT (Sheet 7 of 7)

13. Position lifter (Item 11, Chapter 3, Section 1) to inside of roadwheel over spindle stub and onto track end connector.

14. Make sure that lifter is correctly placed.



15. Have second person get into driver's seat and start tank.

16. Direct person to drive tank forward slowly.

17. When lifter is straight up and down, tell second person to stop tank.

18. Install hub assembly (page 14-18)

End of Task

TA141312

TORSION BAR ANCHOR REPLACEMENT (Sheet 1 of 3)

TOOLS: 3/4 in. socket with 1/2 in. drive
 Ratchet with 1/2 in. drive
 Putty knife
 Extractor tool set
 Portable drill and drill set
 Crowbar
 Pry bar

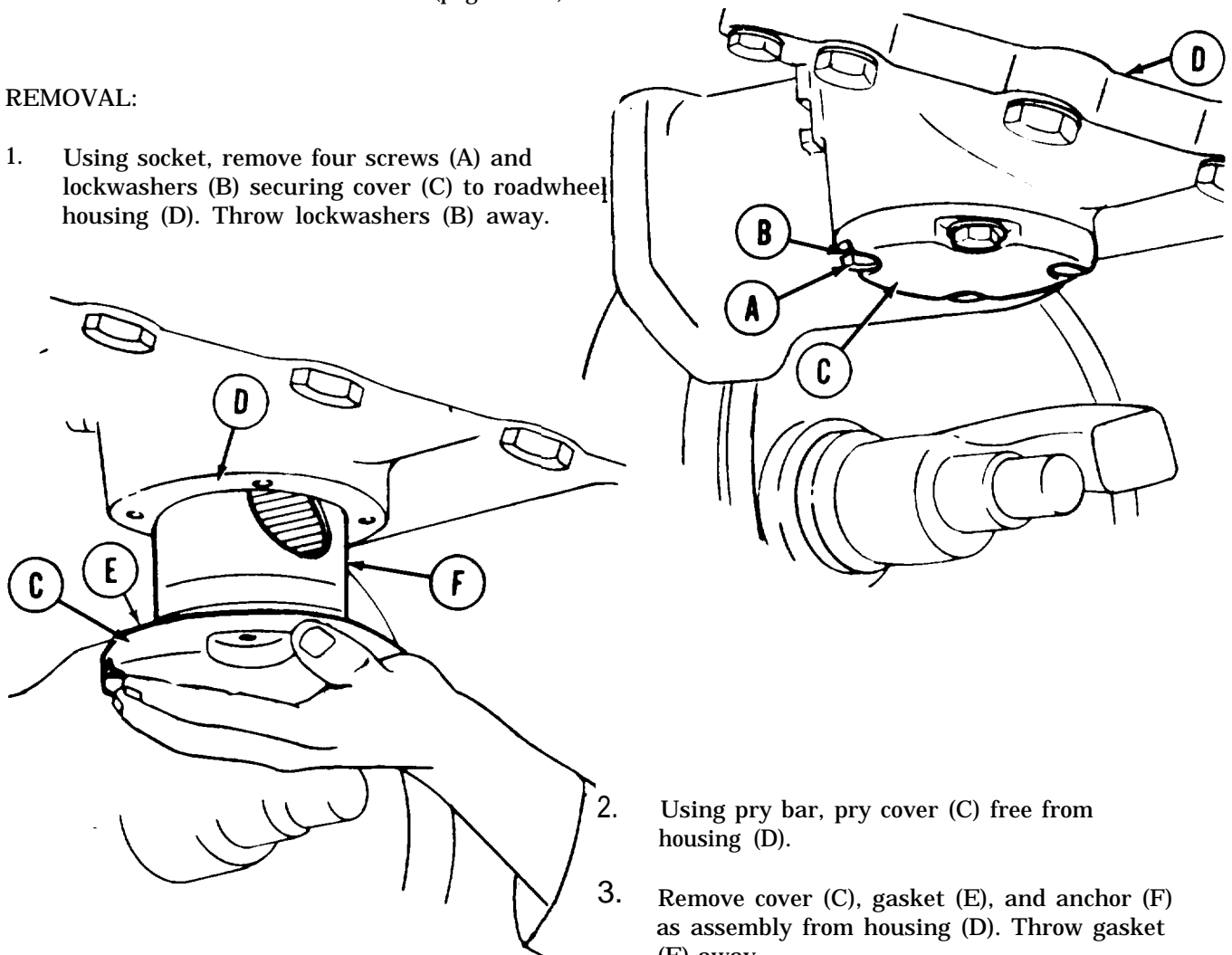
SUPPLIES: Gasket
 Pins (2 required)
 Lockwashers (4 required)

Corrosion preventive (Item 80, Appendix D)
 Solid film lubricant (Item 81, Appendix D)

PRELIMINARY PROCEDURE: remove torsion bar from exact opposite side of tank
 (page 14-24)

REMOVAL:

1. Using socket, remove four screws (A) and lockwashers (B) securing cover (C) to roadwheel housing (D). Throw lockwashers (B) away.



2. Using pry bar, pry cover (C) free from housing (D).
3. Remove cover (C), gasket (E), and anchor (F) as assembly from housing (D). Throw gasket (E) away.

Go on to Sheet 2

TORSION BAR ANCHOR REPLACEMENT (Sheet 2 of 3)

NOTE

If anchor cannot be removed, perform steps 4 thru 9. If anchor was removed, go to step 10.

Using socket head screw key, remove two plugs (G) from cover (C).

Reverse cover (C) and secure to anchor [~\ using two previously removed screws

NOTE

Cover (C) will rest against road-wheel housing (H).

6. Using socket, alternately tighten screws (A) until snug.

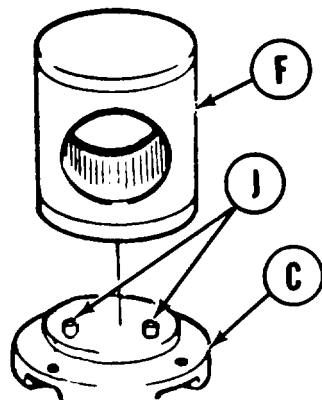
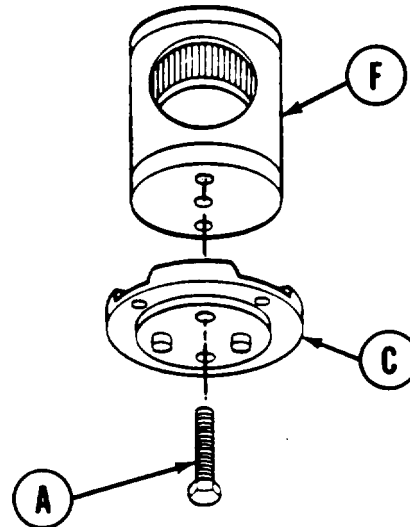
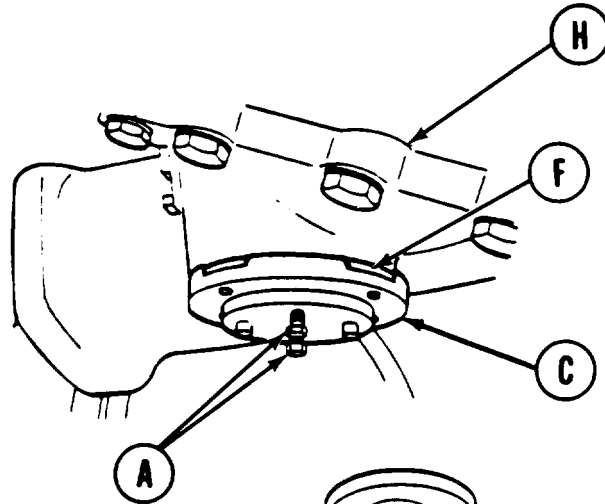
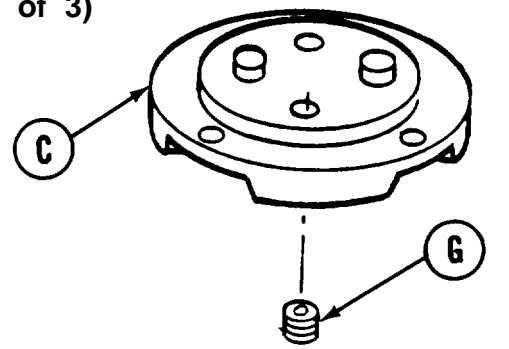
WARNING

Hold cover (C) in place while performing step 7. Cover (C) and anchor (F) could fall free from vehicle, causing injury.

7. Alternately tighten screws (A) to pull anchor (F) from vehicle evenly.

8. Remove cover (C) and anchor (F) from vehicle.

9. Remove two screws (A) securing cover (C) to anchor (F).



10. Separate anchor (F) from cover (C).
11. If pins (J) must be removed from cover, using drill, make 1/4 inch hole in top of pin.
12. Using extractor tool, remove pins (J) from cover.

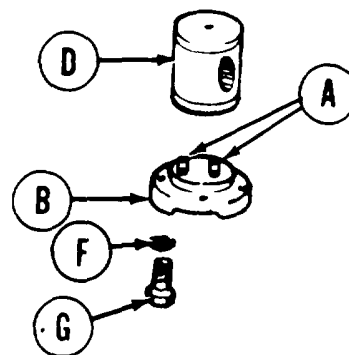
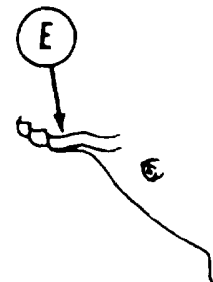
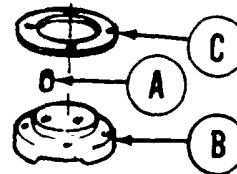
Go on to Sheet 3

TORSION BAR ANCHOR REPLACEMENT (Sheet 3 of 3)

13. Apply corrosion preventive to the inside of the torsion bar anchor housing and solid film lubricant to the torsion bar anchor.
14. Remove them, as necessary, to repair suspension system.

INSTALLATION:

1. Press two pins (A) into cover (B), if they were removed.
2. Install gasket (C) to cover (B).
3. Position anchor (D) onto cover (B) so that two pins (A) fit into holes in anchor.
4. Lift cover (B) and anchor (D) as an assembly. Mount in roadwheel housing (E) opening.
5. Install four new lockwashers (F) and screws (G) to secure cover (B) to housing (E).
6. Using socket wrench, tighten four screws (G).
7. Install torsion bar at opposite side of tank (page 14-27).



End of Task

TRACK SUPPORT ROLLER REPLACEMENT (Sheet 1 of 11)

PROCEDURE INDEX

PROCEDURE	PAGE
Removal	14-35
Installation	14-40

TOOLS: Ratchet with 1/2 in. drive
 9/16 in. socket with 1/2 in. drive
 2-1/2 in. socket with 3/4 in. drive
 Hydraulic jack
 Hammer
 Flat-tip screwdriver

Ratchet with 3/4 in. drive
 Pliers
 3/16 in. alining punch
 3/8 in. punch
 1/2 in. rod
 Straight punch 3/4 in. dia. 10 in. long

SPECIAL TOOLS: Slide hammer puller (Item 12, Chapter 3, Section I)
 Spanner wrench (Item 27, Chapter 3, Section I)
 Oil seal replacer (Item 21, Chapter 3, Section I)

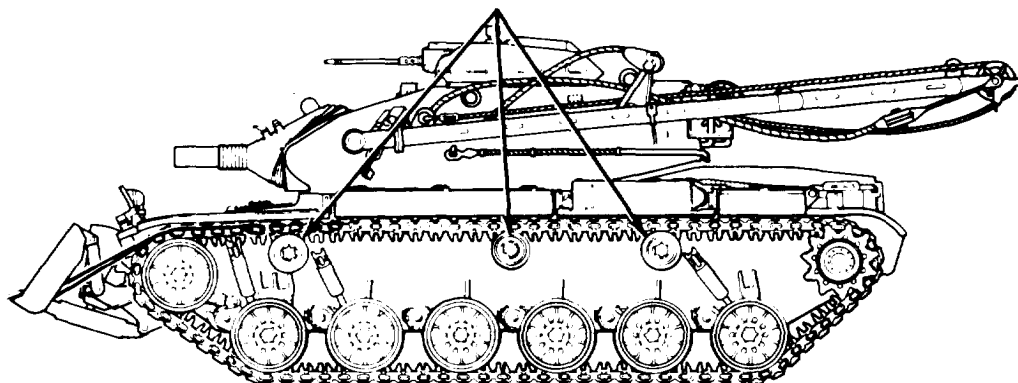
FABRICATED TOOLS: Mechanical puller (Figure F-6, Appendix F)

SUPPLIES: Gaskets (73641 15) (2 required)
 Grease (Item 36, Appendix D)
 Rags (Item 65, Appendix D)
 Spring pins
 Seals
 Nut lock
 Cotter pin
 Wooden planks 2 in. by 6 in. by 4 ft. (or metal plates) (2 required).
 Wooden safety block 2 in. by 6 in. by 2 ft.
 Lockwashers (6 required)

PERSONNEL: Two

REFERENCES: TM 9-2350-222-10
 LO 9-2350-222-12

TRACK SUPPORT ROLLERS

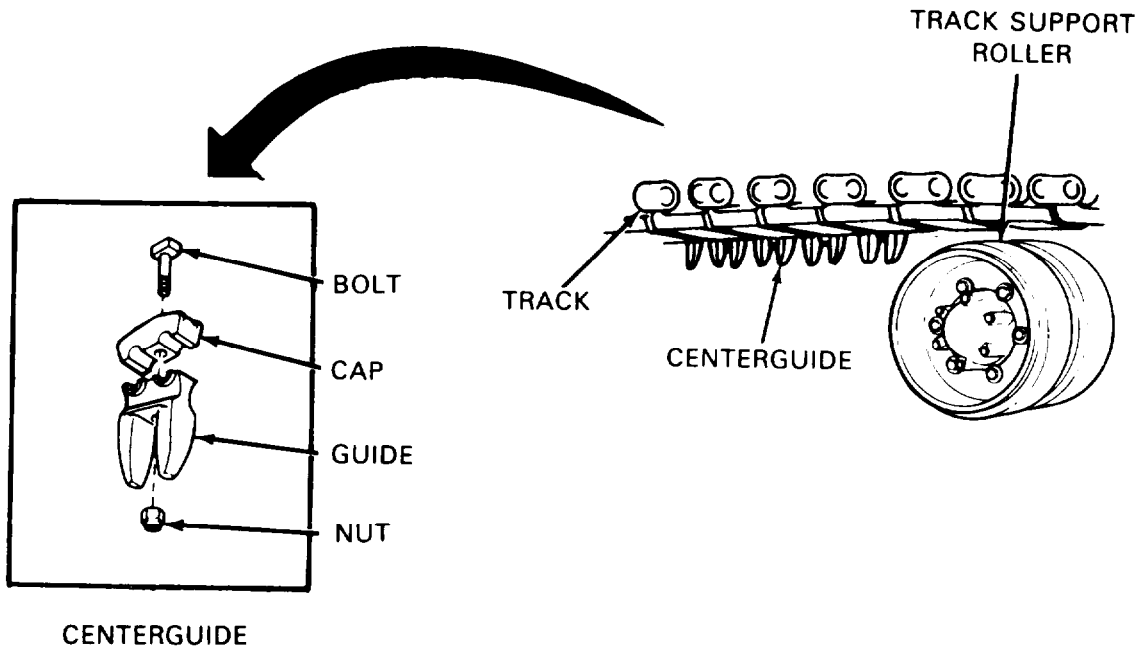


Go on to Sheet 2

TA253471

REMOVAL:

- 1 Remove two track centerguides (TM 9-2350-222-10) just in front of support roller to be removed.



2. Have second person start engine (TM 9-2350-222-10).
3. Have second person drive tank slowly until area where centerguides were removed is over track support roller.
4. Have second person stop tank and shut engine off (TM 9-2350-222-10).
5. Loosen track tension (TM 9-2350-222-10).
6. Apply parking brake (TM 9-2350-222-10).

Go on to Sheet 3

TA253472

TRACK SUPPORT ROLLER REPLACEMENT (Sheet 3 of 11)

NOTE

If plank or base plate is not available, position jack on roadwheel near roller and raise track.

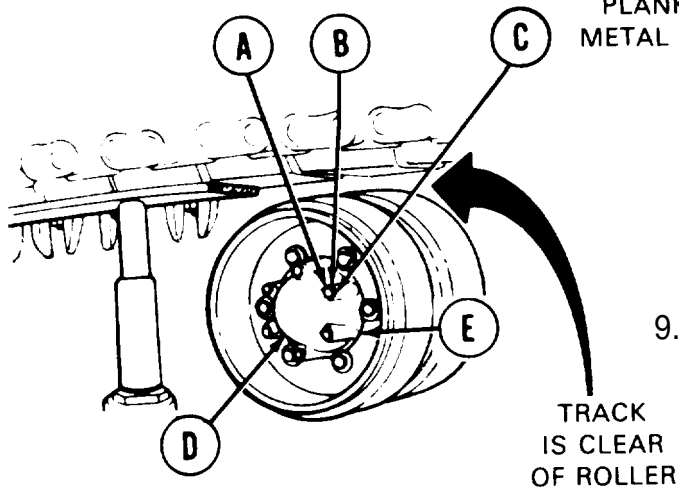
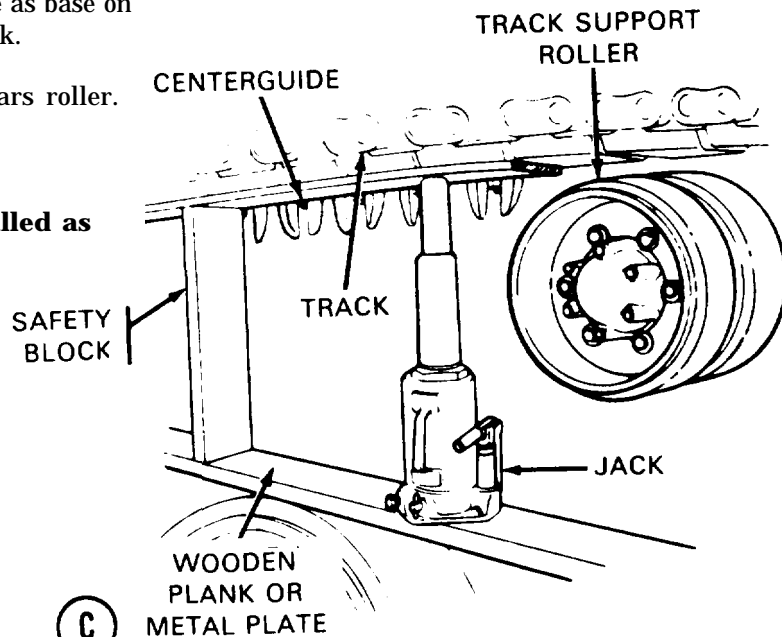
NOTE

If hydraulic jack is not available, disconnect track (TM 9-2350-222-10). Then move tank in reverse until track is off roller.

7. Using wooden plank or metal plate as base on roadwheel, position hydraulic jack.
8. Using jack, raise track so it clears roller.

NOTE

Safety block must be installed as shown.



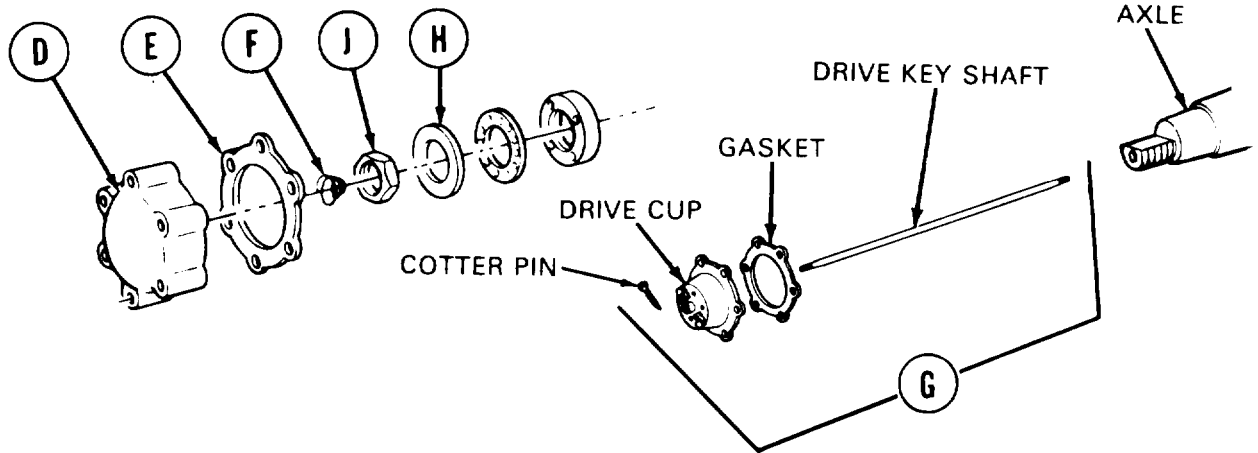
9. Using 9/16 inch socket, remove six screws (A), lockwashers (B), and flat washers (C) securing access cover plate (D) and gasket (E). Throw lockwashers (B) and gasket (E) away.

Go on to Sheet 4

TA141318

TRACK SUPPORT ROLLER REPLACEMENT (Sheet 4 of 11)

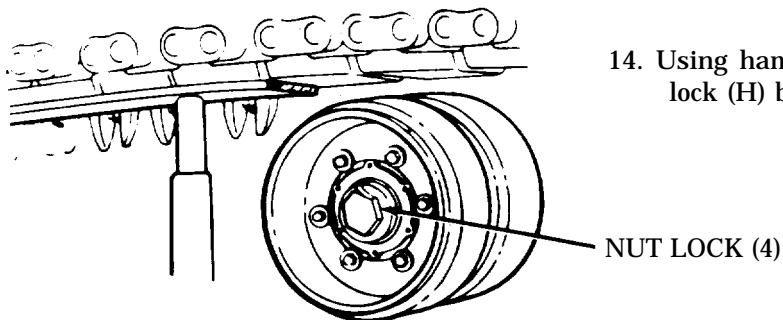
10. Remove access cover plate (D) and gasket (E). Throw gasket away



11. On all support rollers except left front, remove static ground spring (F) from cover plate (D),

12. On left front support roller ONLY, pull speedometer drive assembly (G) from support axle.

13. Using pliers, remove cotter pin from speedometer drive assembly (G). Throw cotter pin away.



14. Using hammer and straight punch, bend nut lock (H) back from hex nut (J).

Go on to Sheet 5

TA141319

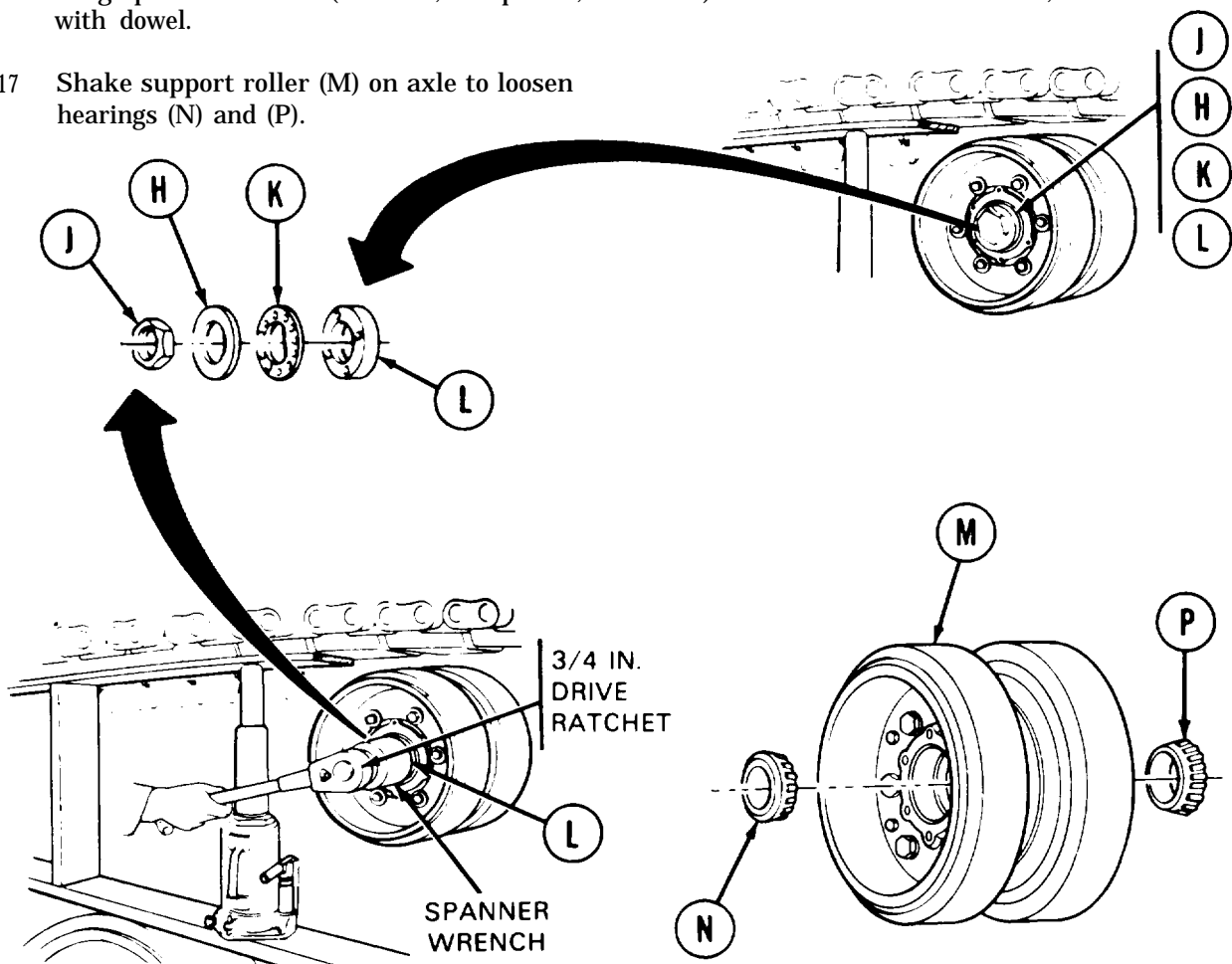
Change 1 14-37

TRACK SUPPORT ROLLER REPLACEMENT (Sheet 5 of 11)

NOTE

It may be necessary to start nut lock (H) with screwdriver.

15. Using 2-1/2 inch socket, remove nut (J), nut lock (H), and lock (K). Throw nut lock (H) away.
16. Using spanner wrench (Item 27, Chapter 3, Section I) and 3/4 inch drive ratchet, remove locknut with dowel.
17. Shake support roller (M) on axle to loosen bearings (N) and (P).



CAUTION

Do not damage axle when removing support roller parts.

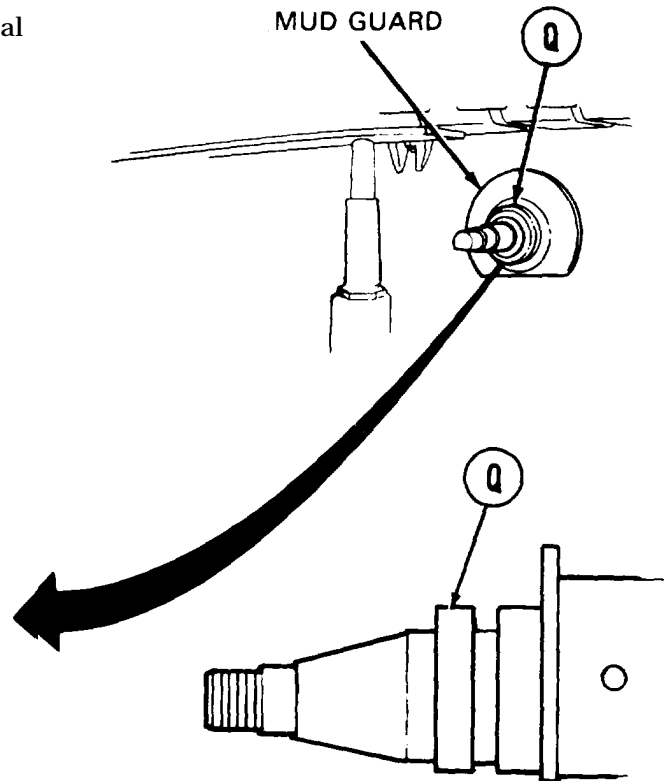
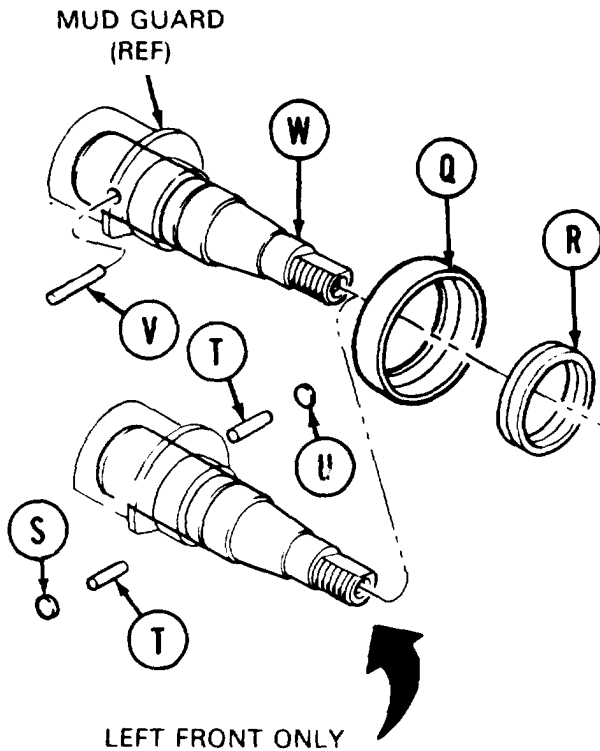
18. Pull outer bearing (N) and roller (M) off axle.

19. Pull inner bearing (P) off axle.
Go on to Sheet 6

TA141320

TRACK SUPPORT ROLLER REPLACEMENT (Sheet 6 of 11)

20. Using hammer, tap around deflector (Q) to free it and seal (R).
21. Using screwdriver, pry deflector (Q) and seal from axle as shown.
22. Remove deflector (Q) and seal (R) from axle. Throw seal away.



23. On left front support roller ONLY, using 3/16 inch alining punch and hammer, tap around edges of plug (S) until plug can be pried free with screwdriver

NOTE

If plugs in steps 23 and 24 cannot be removed as written, drill a hole in one or the other plug and use a 1/2 inch rod to punch out plug, Replace plug which has been drilled.

24. Using hammer and 3/8 inch punch, drive two spring pins (T) and other plug (U) out of axle. Throw pins away.
25. Using hammer and 3/8 inch punch, drive pin (V) out of other axles. Throw pins away.
26. Using mechanical puller (Figure F-6, Appendix F) and slide hammer puller (Item 12, Chapter 3, Section I), remove axle (W).

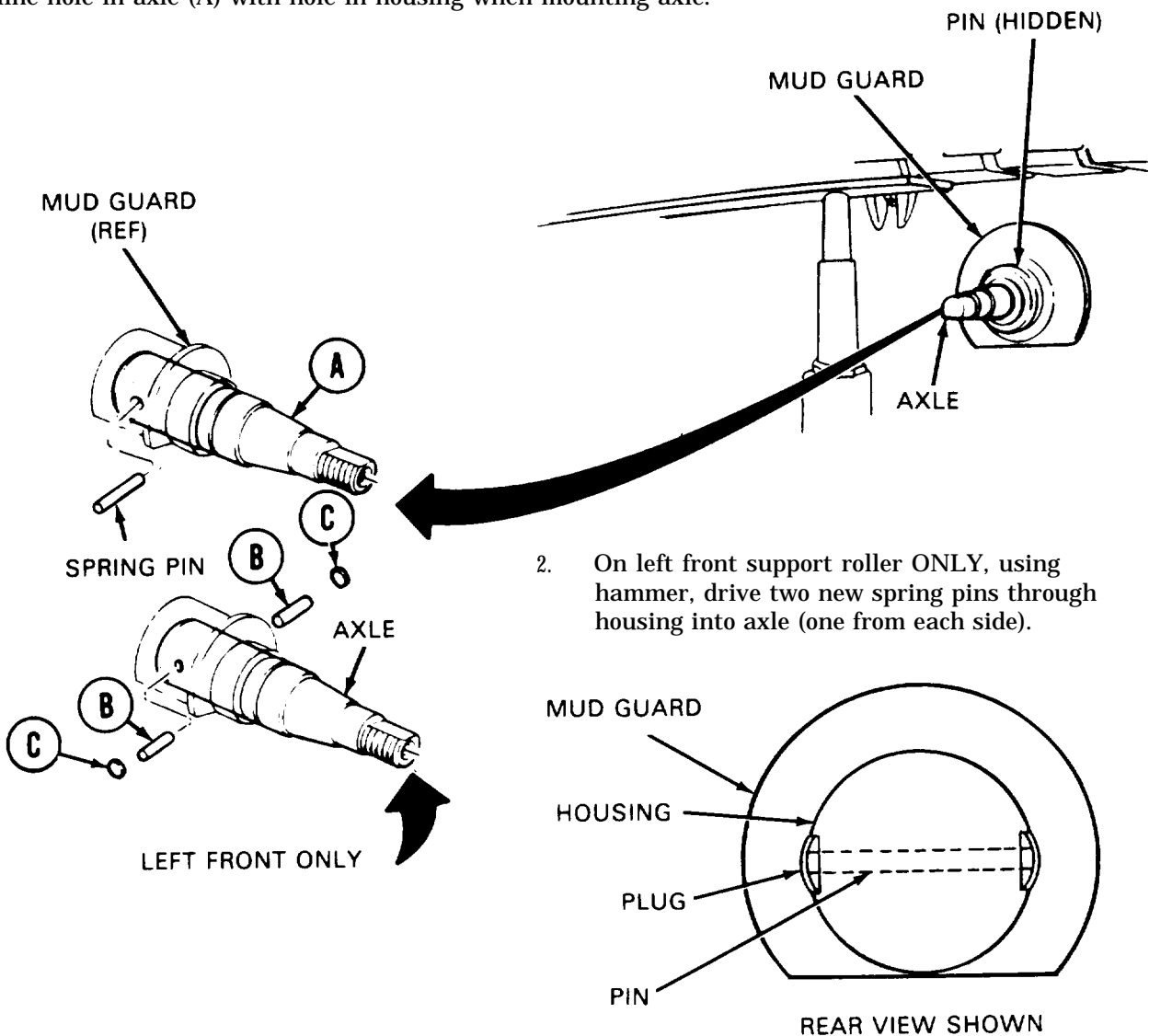
Go on to Sheet 7

TA253473

TRACK SUPPORT ROLLER REPLACEMENT (Sheet 7 of 11)

INSTALLATION:

1. Aline hole in axle (A) with hole in housing when mounting axle.



2. On left front support roller ONLY, using hammer, drive two new spring pins through housing into axle (one from each side).

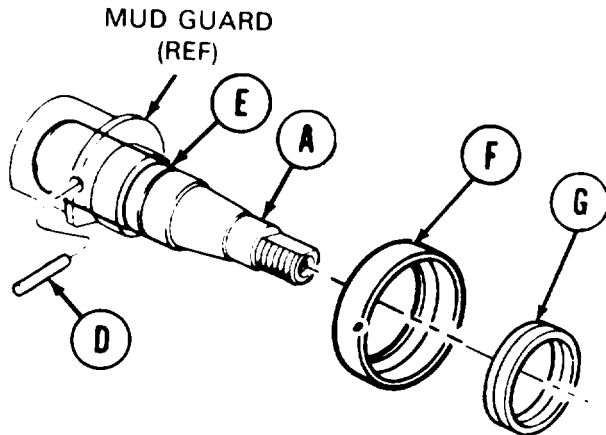
3. Continue driving spring pins (B) in until they are both flush (even) with housing surface, as shown.
4. Position dome of both plugs (C) to outside. Using hammer and 3/4 inch punch, drive plugs into place (both sides).
5. When plugs are fully seated, using hammer and 3/16 inch alining punch, force edges of dome into hull housing (this is called 'dimpling').

Go on to Sheet 8

TA141322

TRACK SUPPORT ROLLER REPLACEMENT (Sheet 8 of 11)

6. On other support rollers, using hammer, tap new spring pin (D) through hole in housing and axle (A).
7. Make sure space (E) is correctly installed on axle (A),

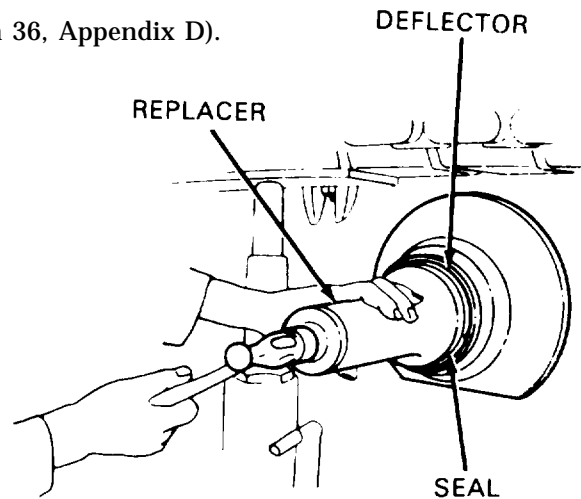
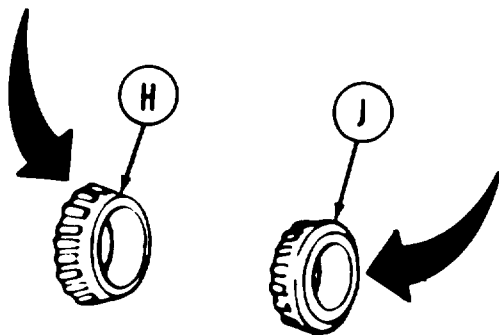


NOTE

Open groove of deflector (F) and lip seal (G) must face outward.

8. Mount deflector (F) and new seal (G) over axle (A).
9. Using hammer and oil seal replacer (Item 21, Chapter 3, Section I), tap deflector and seal into place.

10. Pack inner bearing cone (H) with grease (Item 36, Appendix D).
11. Pack outer bearing cone (J) with grease (Item 36, Appendix D).



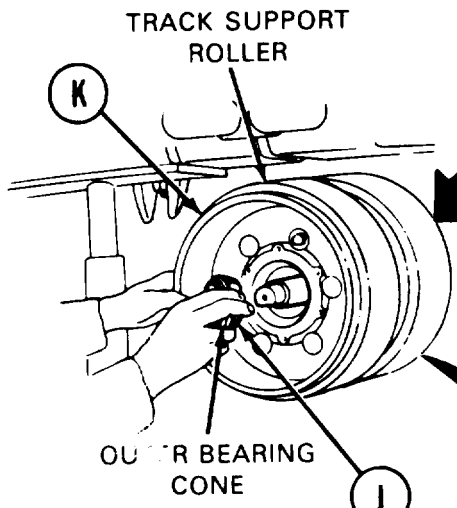
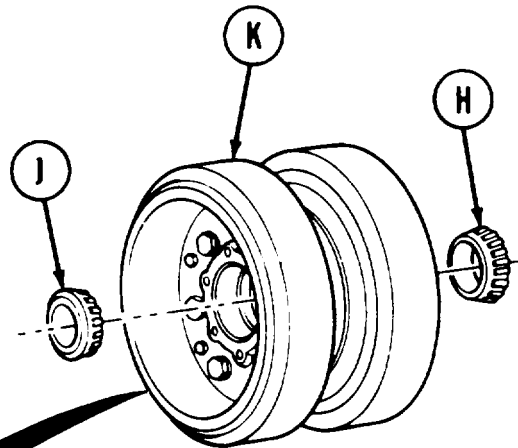
Go on to Sheet 9

TA141323

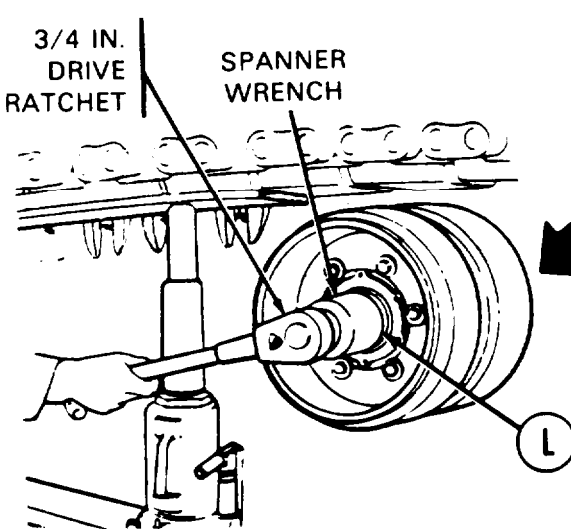
Change 1 14-41

TRACK SUPPORT ROLLER REPLACEMENT (Sheet 9 of 11)

12. Position inner bearing (H) to support roller assembly (K).
13. Have second person position support roller (K) and inner bearing (H) on support axle.



14. Install outer bearing cone (J) into position on axle.
15. Screw round nut (L) onto shaft. Using special spanner wrench (Item 27, Chapter 3, Section I), tighten round nut (L).



16. Loosen round nut (L) about 1/2 turn so support roller (K) turns easily.
17. Rotate support roller (K) while retightening nut (L) until bearings bind. Back nut off 1/4 turn.

Go on to Sheet 10

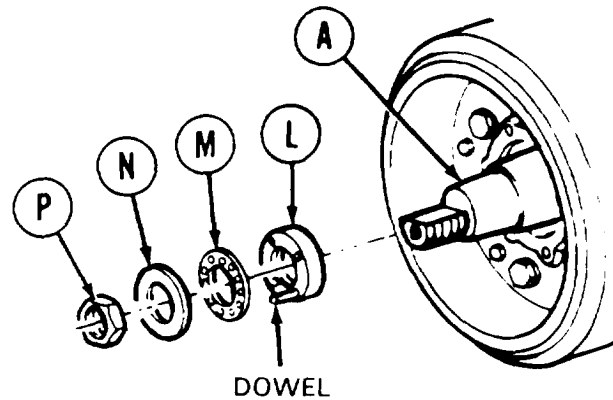
TA141324

TRACK SUPPORT ROLLER REPLACEMENT (Sheet 10 of 11)

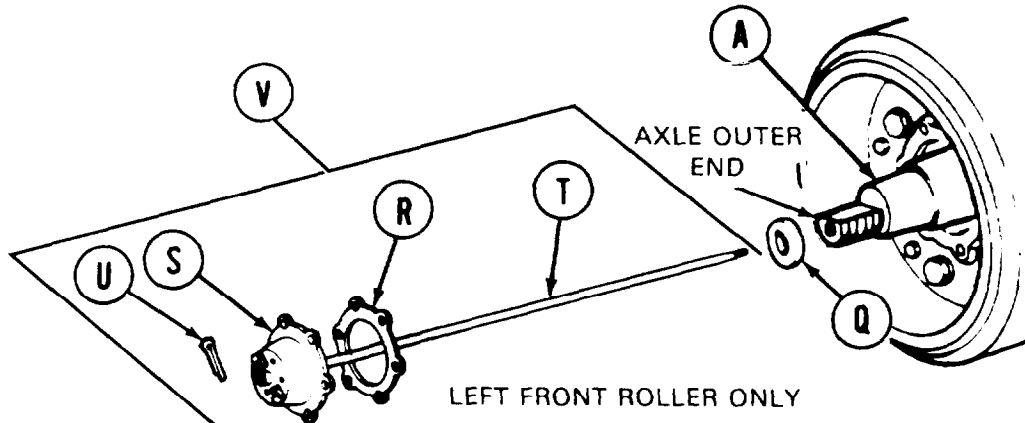
18. Install lock (M) and align hole in lock (M) to dowel of nut (L).

NOTE

If hole in lock (M) does not line up to dowel of nut (L), turn lock over for closer alignment.



19. Install new nut lock (N) onto axle (A)
20. Make sure detent of nut lock (N) seats in hole of lock (M).
21. Install hex nut (P). Using 2-1/2 inch socket, tighten nut.
22. Using hammer and screwdriver, bend nut lock (N) around hex nut (P).
23. Crease seal (Q) with grease (Item 36, Appendix D).
24. Install seal (Q) to axle outer end with lip facing out,



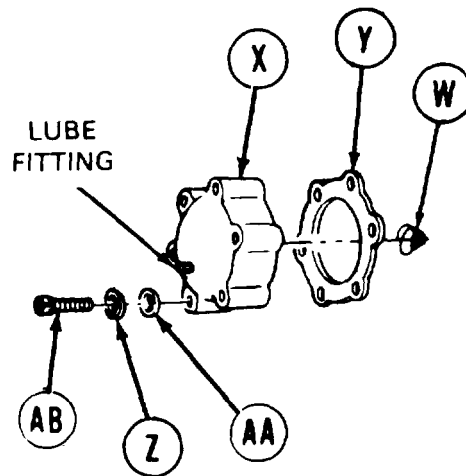
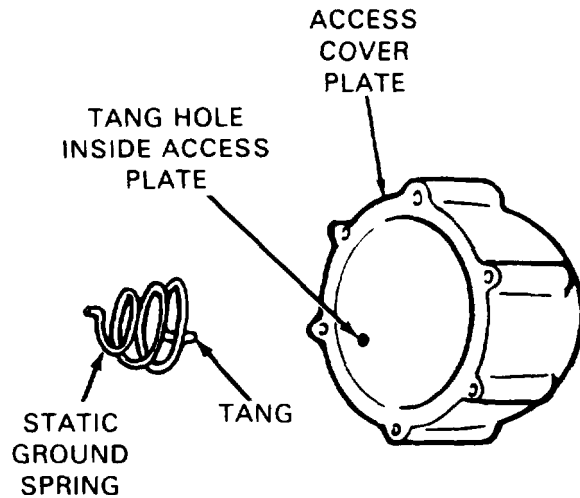
25. Install new gasket (R) to drive cup (S),
26. Push drive key shaft (T) through cup (S) and install new cotter pin (U) with pliers.
27. Install speedometer drive assembly (V) through seal (Q) and into axle (A). Rotate shaft (T) until splines on its end mate to keyway in hull mounted adapter.

Go on to Sheet 11

TA141325

TRACK SUPPORT ROLLER REPLACEMENT (Sheet 11 of 11)

- 28. Place static ground spring (W) into access cover plate (X) so tang is in hole inside cover plate.
- 29. Twist spring (W) into place.
- 30. Position new gasket (Y) and cover (X) to hub and secure to hub with six new lockwashers (Z), flat washers (AA), and screw (AB).
- 31. Using 9/16 inch socket, tighten screws alternately.
- 32. Using grease gun to lube fitting on cover plate, lube roadwheel (LO 9-2350-222-12).
- 33. If jack was used, lower it. Remove jack and planks (or plates).
- 34. Have second person start engine and move tank so two centerguides can be installed (TM 9-2350-222-12).
- 35. Install centerguides (TM 9-2350-222-10).
- 36. Test drive tank a short way (TM 9-2350-222-10).
- 37. Adjust track tension (TM 9-2350-222-10).



End of Task

TA141326

TRACK SUPPORT ROLLER WHEEL AND HUB REPAIR (Sheet 1 of 5)

PROCEDURE INDEX

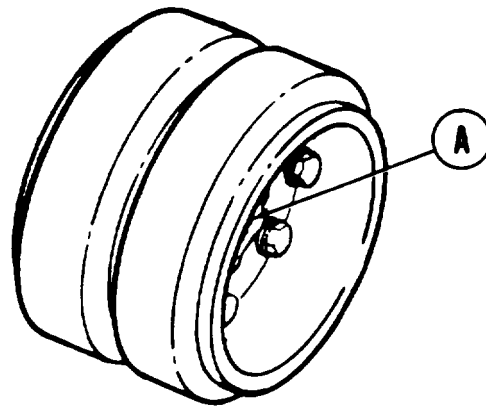
PROCEDURE	PAGE
Disassembly	14-45
Assembly	14-48
<p>TOOLS: 13/16 in. socket with 1/2 in. drive 10 in. extension with 1/2 in. drive Ball peen hammer Torque wrench with 1/2 in. drive (0-175 lb-ft) (0-237 N.m)</p>	
<p>SPECIAL TOOLS: Remover-replacer (Item 17, Chapter 3, Section I) Remover-replacer (Item 15, Chapter 3, Section I) Handle (Item 10, Chapter 3, Section I)</p>	
<p>SUPPLIES: Grease (Item 36, Appendix D) Dry cleaning solvent (Item 54, Appendix D) Rags (Item 65, Appendix D)</p>	
<p>PRELIMINARY PROCEDURE: Remove track support roller (page 14-35).</p>	

DISASSEMBLY:

NOTE

Do not use dry cleaning solvent on rubber.

- Using rags (Item 65, Appendix D) and dry cleaning solvent (Item 54, Appendix D), wipe wheel and hub assembly (A) clean,



Go on to Sheet 2

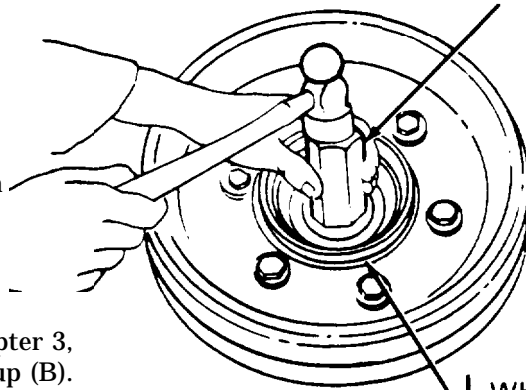
TA253474

TRACK SUPPORT ROLLER WHEEL AND HUB REPAIR (Sheet 2 of 5)

HANDLE (THREADED TO REMOVER-REPLACER)

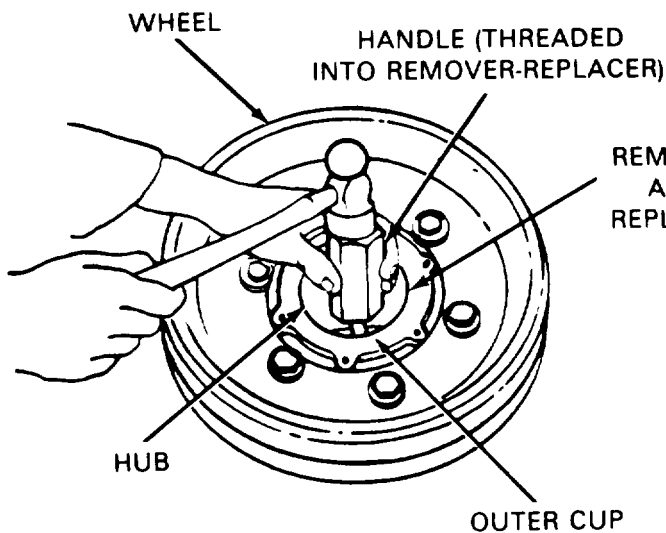
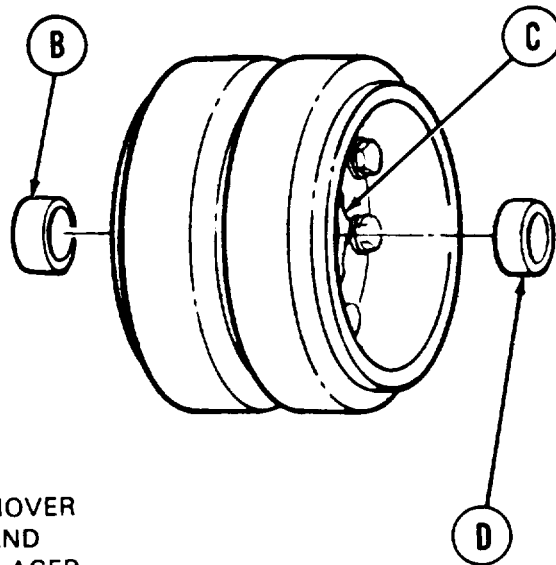
NOTE

If special tools do not fit into hub, stop work and order a complete new support roller assembly, then install support roller on tank (page 1 4-45).



WHEEL HUB CUP (ONE ON EACH SIDE)

2. Position remover-replacer (Item 15, Chapter 3, Section I) to inside of inner wheel hub cup (B).
3. Screw handle (Item 10, Chapter 3, Section I) into remover-replacer from other side of hub (c).
4. Using hammer, tap handle to drive inner bearing cup (B) out of hub. Remove cup.
5. Position other remover-replacer (Item 17, Chapter 3, Section I) to inner edge of outer bearing cup (D).

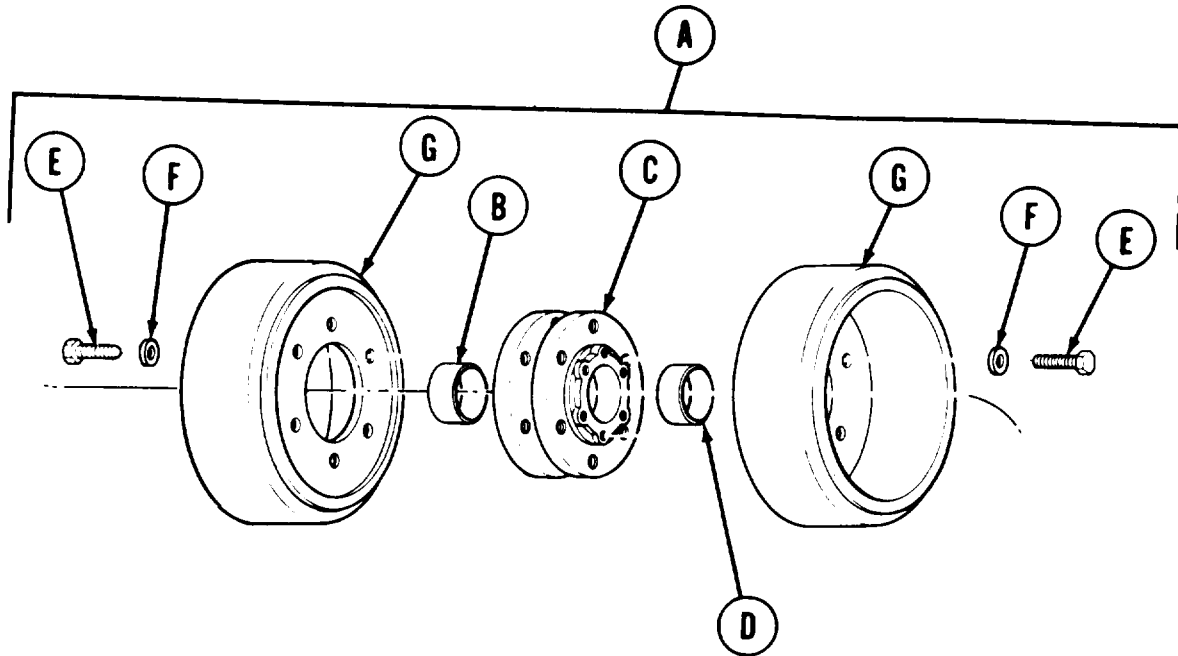


6. Screw handle into remover-replacer from other side of hub (C).
7. Using hammer, tap handle to drive outer bearing cup (D) from hub (C). Remove cup.

Go on to Sheet 3

TA141328

TRACK SUPPORT ROLLER WHEEL AND HUB REPAIR (Sheet 3 of 5)



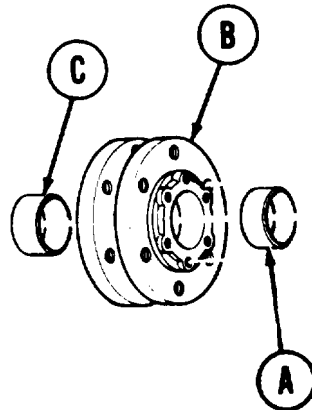
8. Using socket with ratchet and 10 inch extension, remove six screws (E) and flat washer (F) securing wheel (G) on one side of hub (C).
9. Repeat step 8 to wheel (G) on other side of hub (C).

Go on to Sheet 4

TA141329

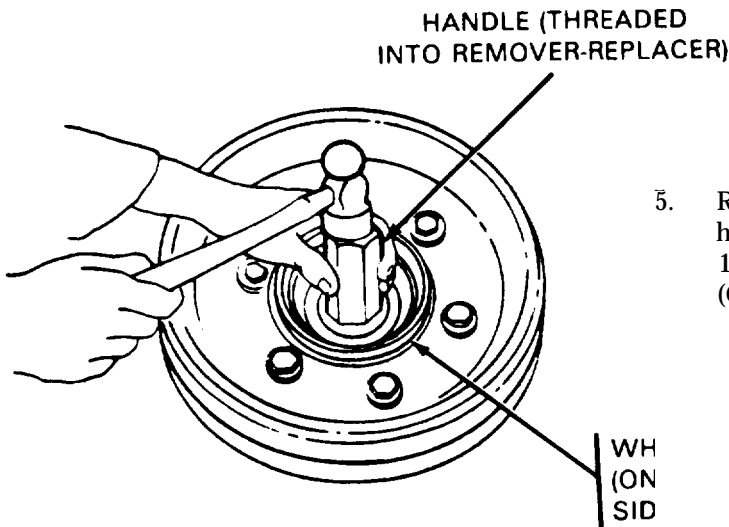
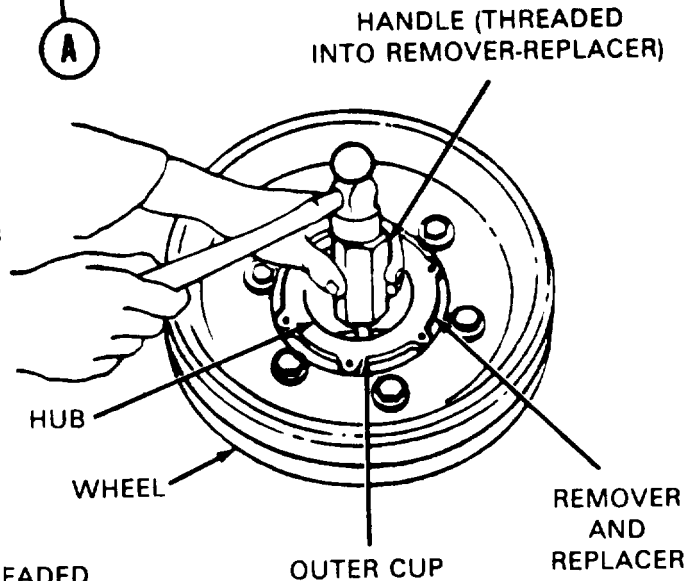
Change 1 14-47

TRACK SUPPORT ROLLER WHEEL AND HUB REPAIR (Sheet 4 of 5)



ASSEMBLY

1. Position outer wheel bearing cup (A) with its smallest end toward center of hub (B).
2. Install remover-replacer (Item 17, Chapter 3, Section I) over edge of cup (A).
3. Screw handle (Item 10, Chapter 3, Section I) into remover-replacer.
4. Tap handle to seat outer cup (A) in hub (B).

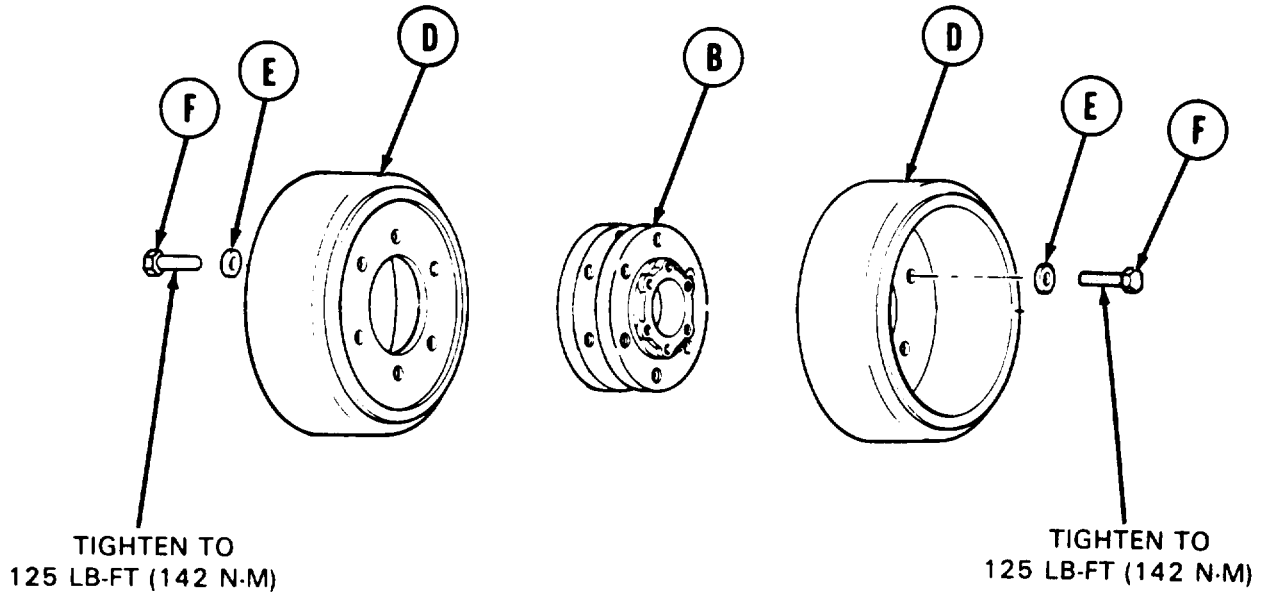


5. Repeat steps 1 thru 4 using hammer with handle and remover-replacer (Items 10 and 15, Chapter 3, Section 1) to seat inner cup (C) in hub (B).

Go on to Sheet 5

TA141330

TRACK SUPPORT ROLLER WHEEL AND HUB REPAIR (Sheet 5 of 5)



6. Position wheels (D) to hub (B).
7. Install six washers (E) and screws (F) to secure one wheel (D) to hub (B).
8. Install six washers (E) and screws (F) to secure second wheel (D) to other side of hub (B).
9. Using torque wrench with socket and extension, tighten all 12 screws (F) alternately to 125 lb-ft (142 N m).
10. Install track support roller to tank (page 14-40).

End of Task

TA141331

Change 1 14-49

COMPENSATING IDLER WHEEL AND ROADWHEEL REPLACEMENT (Sheet 1 of 4)

PROCEDURE INDEX

PROCEDURE	PAGE
Removal	14-51
Cleaning and Inspection	14-53
Installation	14-53

- TOOLS:** 1-1/2 in. socket with 3/4 in. drive
Ratchet with 3/4 in. drive
16 in. extension with 3/4 in. drive
Hinged handle with 3/4 in. drive
Torque wrench with 3/4 in. drive (0-600 lb-ft) (0-814 N.m)
Wire brush

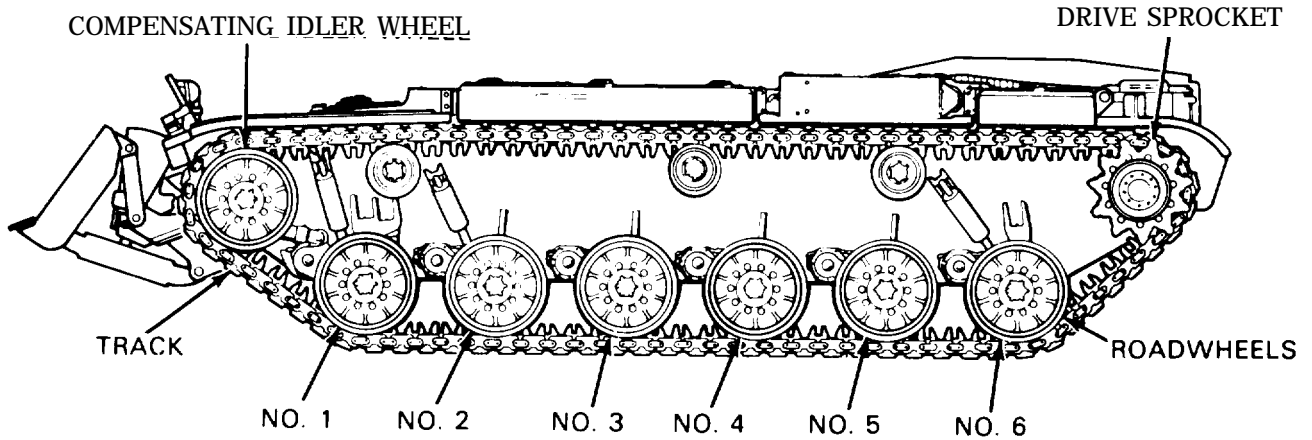
SPECIAL TOOL: Roadwheel arm lifter (Item 11, Chapter 3, Section I)

PERSONNEL: Two

SUPPLIES: Rags (Item 65, Appendix D)

REFERENCE: TM 9-2350-222-10

COMPENSATING IDLER WHEEL AND ROADWHEEL REPLACEMENT (Sheet 2 of 4)

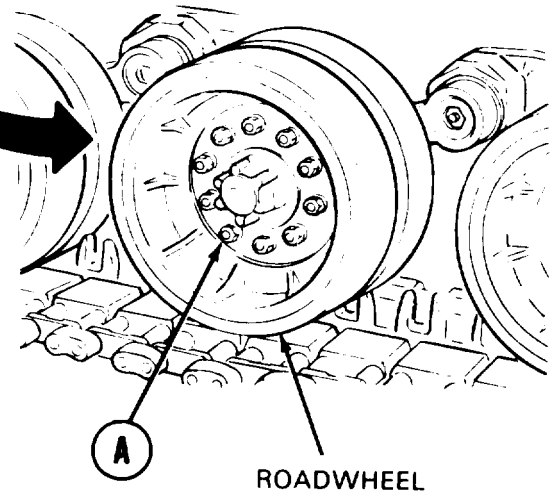


REMOVAL:

NOTE

There are six roadwheel positions - No. 1 thru No. 6 - on each side of tank.

There are two roadwheels at each of these 12 positions for 24 roadwheels at ground level. In addition, there is a compensating idler wheel at front top on each side of tank. Each compensating idler consists of two roadwheels. Thus, there are four roadwheels in addition to 24 at ground level - 28 roadwheels in all.



1. Using 1-1/2 inch socket wrench, loosen 10 nuts (1). Do not remove.

NOTE

On compensating idler wheel only, disconnect track (TM 9-2350-222-10) and proceed to step 9.

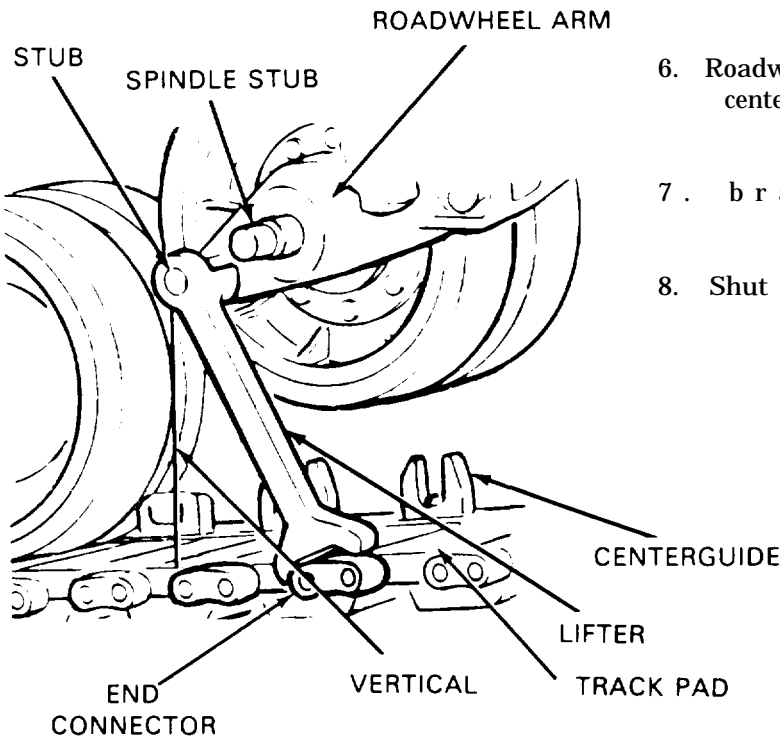
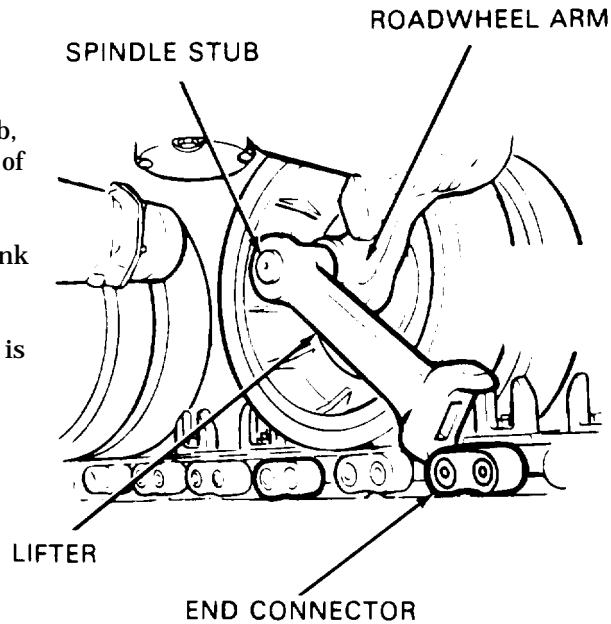
Go on to Sheet 3

TA253476

Change 1 14-51

COMPENSATING IDLER WHEEL AND ROADWHEEL REPLACEMENT (Sheet 3 of 4)

2. Get roadwheel arm lifter (Item 11, Chapter 3, Section I).
3. Place lifter to inside of track over spindle stub, track pad, and end connector that is forward of roadwheel.
4. Have second person start engine and drive tank forward slowly.
5. Direct second person to stop tank when lifter is straight up and down.



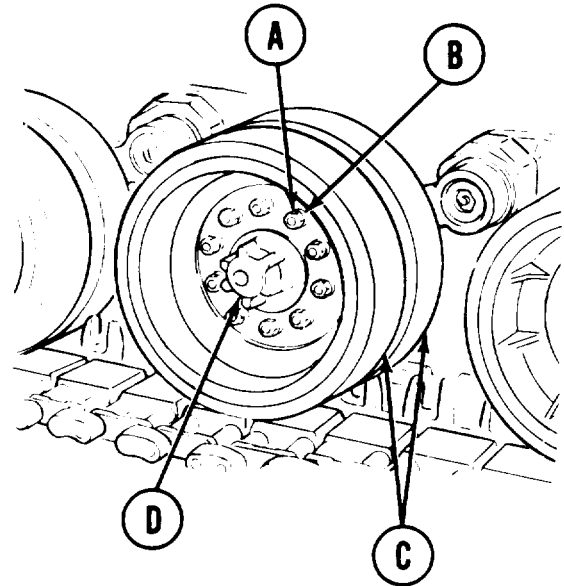
6. Roadwheel should be up off track centerguides.
7. b r a k e s (T M 9-2350-222-10).
8. Shut engine off (TM 9-2350-222-10).

Go on to Sheet 4

TA253477

COMPENSATING IDLER WHEEL AND ROADWHEEL REPLACEMENT (Sheet 4 of 4)

9. Using 1-9/16 inch socket with extension and hinged handle, remove 10 self-locking nuts (A) and 20 flat washers (B) securing roadwheel (C) to wheel hub (D). Throw 10 self-locking nuts (A) away.
10. Using second person for help, pull one roadwheel, then the other, off mounting studs. Do not damage studs.



CLEANING AND INSPECTION:

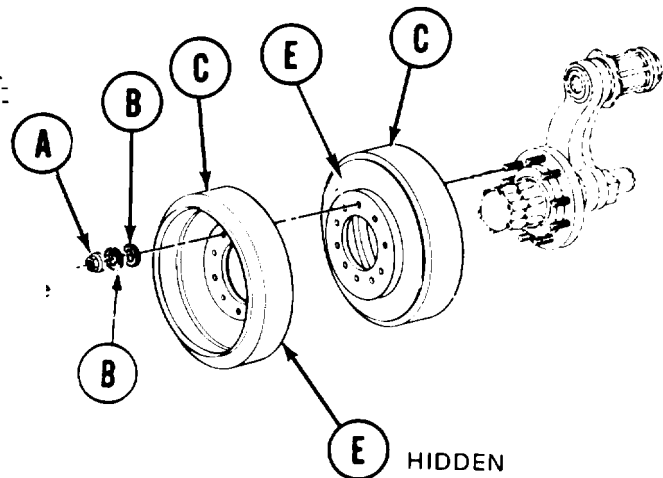
Inspect and clean mounting hub surface with wire brush and rag prior to mounting roadwheels.

INSTALLATION:

NOTE

Do not damage hub mounting studs when installing roadwheel.

1. Position inside roadwheel (C) with wear surface (E) facing out.
2. Position outside roadwheel (C) with wear surface (E) facing in.
3. Install 20 flat washers (B) and 10 new self-locking nuts (A).
4. Have second person back vehicle up so lifting arm can be removed.
5. If track was removed or disconnected, replace or reconnect (TM 9-2350-222-10).
6. Using 1-5/16 inch socket with extension and torque wrench, tighten nuts (A) to 320-350 lb-ft (434-475 N. m) lubricated.



End of Task

MECHANICAL TRACK ADJUSTING LINK REPLACEMENT (Sheet 1 of 5)

PROCEDURE INDEX

PROCEDURE	PAGE
Removal	14-57
Installation	14-59

- TOOLS: Slip joint pliers
Ratchet with 3/4 in. drive
3/4 in. socket with 3/4 in. drive
1-1/8 in. socket with 3/4 in. drive
Pry bar
Wire brush
Soft mallet hammer
Slide hammer puller

SPECIAL TOOLS: Adapter (Item 7, Chapter 3, Section I),

- SUPPLIES: Cotter pins (2 required)
Rags (Item 65, Appendix D)
Lockwashers (2 required)

PERSONNEL: Three

REFERENCE: (TM 9-2350-222-10)

PRELIMINARY PROCEDURES: Disconnect track (TM 9-2350-222-10)
Remove front fender (page 16-64)

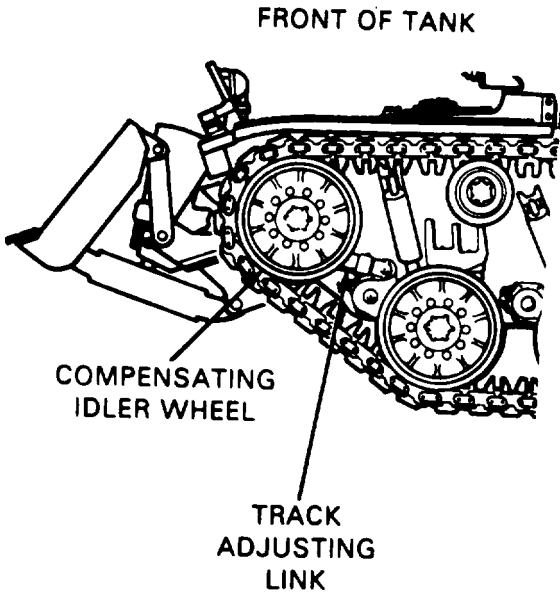
NOTE

This adjusting link replacement procedure is for left side of tank. Right side adjusting link procedure is similar.

Go on to Sheet 2

All data on pages 14-54 and 14-55 deleted.

MECHANICAL TRACK ADJUSTING LINK REPLACEMENT (Sheet 2 of 5)



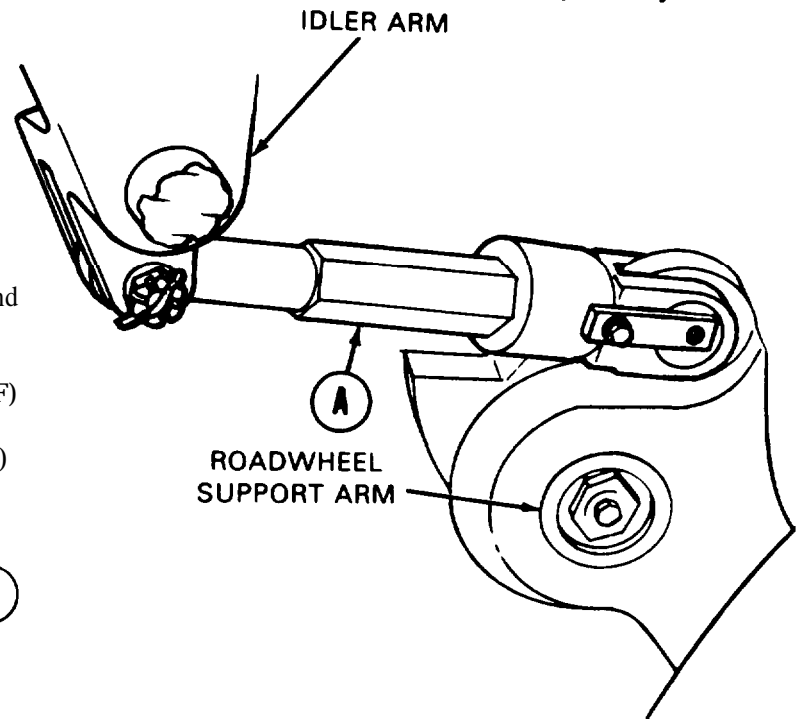
REMOVAL:

1. Using wire brush and rag, clean off both ends of adjusting link (A).

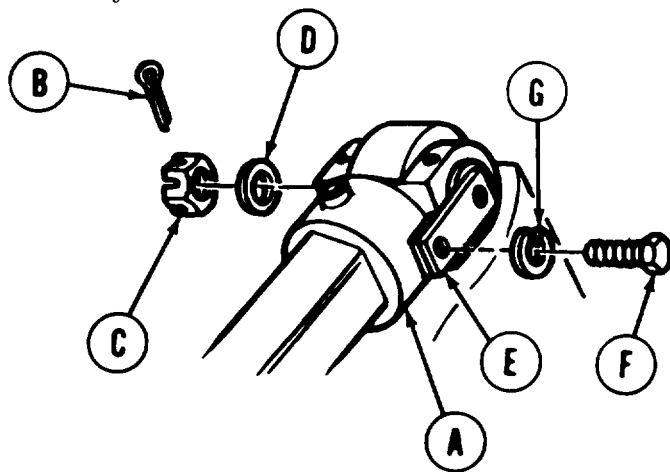
NOTE

Due to a configuration change, link pin that secures adjusting link to roadwheel arm was reversed and is now installed with threaded end toward hull of tank.

2. Using pliers, straighten cotter pin (B) and remove it from slotted nut (C) at roadwheel support arm. Throw cotter pin away,



3. Using 1-1/8 inch socket, remove nut (C) and washer (D) from pin (E).
4. Using 3/4 inch socket, remove screw (F) securing pin (E) to link (A). Remove lockwasher (G). Throw lockwasher (G) away.



Go on to Sheet 3

TA249126

MECHANICAL TRACK ADJUSTING LINK REPLACEMENT (Sheet 3 of 5)

5. Go to other end of adjusting link (A).
6. Using pliers, straighten cotter pin (H) and remove it from slotted nut (J). Throw cotter pin away.
7. Using 1-1/8 inch socket with ratchet, loosen nut (J).
8. Remove nut (J) and washer (K).
9. Using 3/4 inch socket, remove screw (L). Remove lockwasher (M). Throw lockwasher (M) away.
10. Pick up nut (J) and screw it a couple of turns onto pin (N).
11. Using hammer, tap nut (J) on pin (N) to loosen pin (N).
12. Screw adapter into end of pin (E). Screw end of slide hammer puller (Item 12, Chapter 3, Section 1) into adapter (Item 7, Chapter 3, Section I) and, using slide hammer puller, remove pin (E) and shim (P) from link (A).
13. Using second person to hold link (A), rotate arm so that pin (N) will be over front slope of tank.
14. Remove nut (J) from pin (N).

NOTE

Have third person hold link when pin (N) is removed.

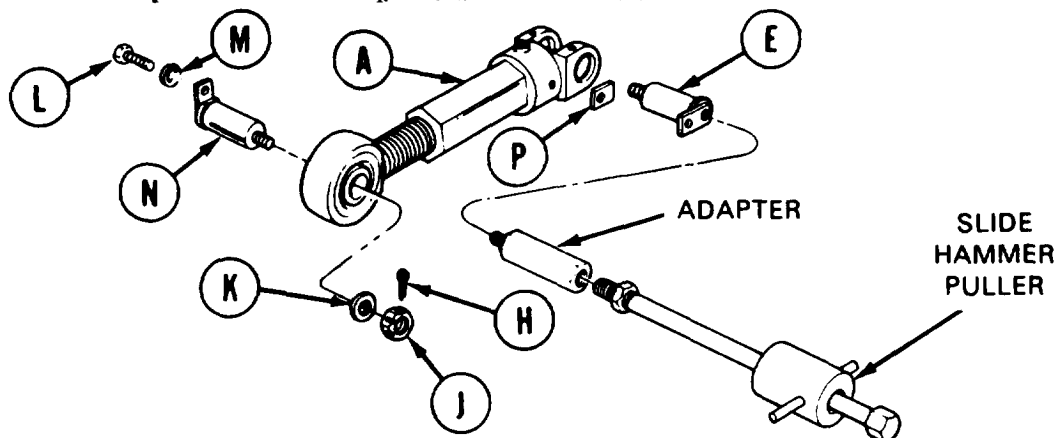
NOTE

Use caution when removing pin (N) because link (A) may fall away.

15. Using pry bar, remove pin (N) from link (A).
16. Remove link (A) from tank. Lower idler arm to normal position.

NOTE

If pin (N) is hard to remove, screw adapter onto pin (N). Screw end of slide hammer puller into adapter and use slide hammer puller to remove pin (N) from link (A).



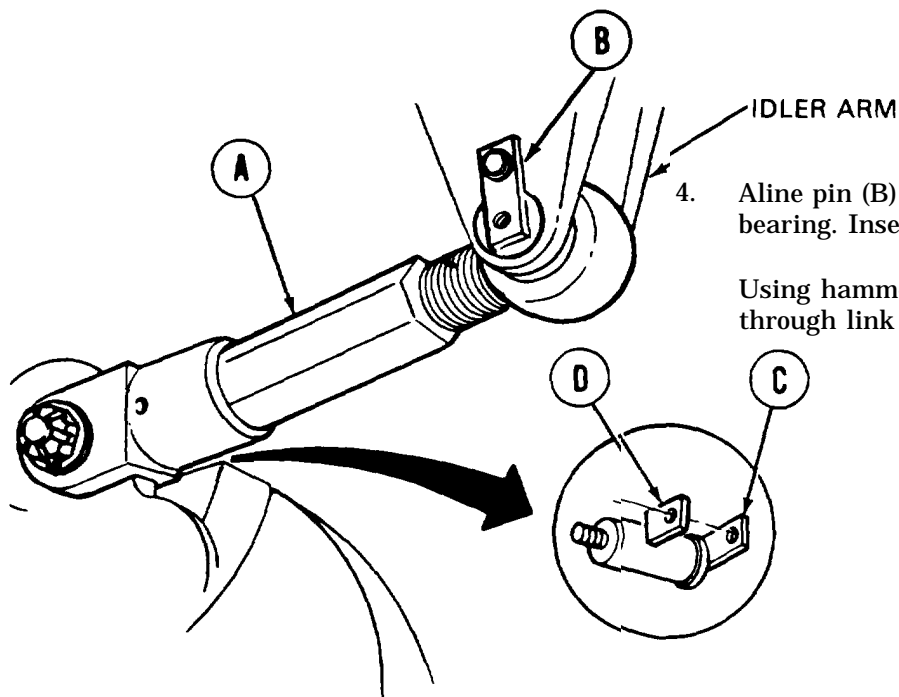
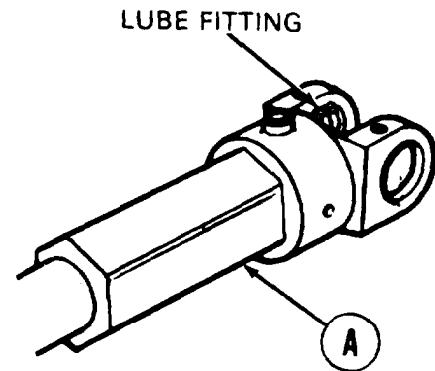
Go on to Sheet 4

TA249127

MECHANICAL TRACT ADJUSTING LINK REPLACEMENT (Sheet 4 of 5)

INSTALLATION:

1. Before mounting link (A), position it so lube fitting is on top (pointing outward).
2. Rotate arm until link mount is above slope at front of tank.
3. With help of second person, lift link (A) into mounted position on tank,



4. Aline pin (B) grooves with two splines in bearing. Insert pin (B) toward hull side.

Using hammer, drive pin (B) into place through link (A).

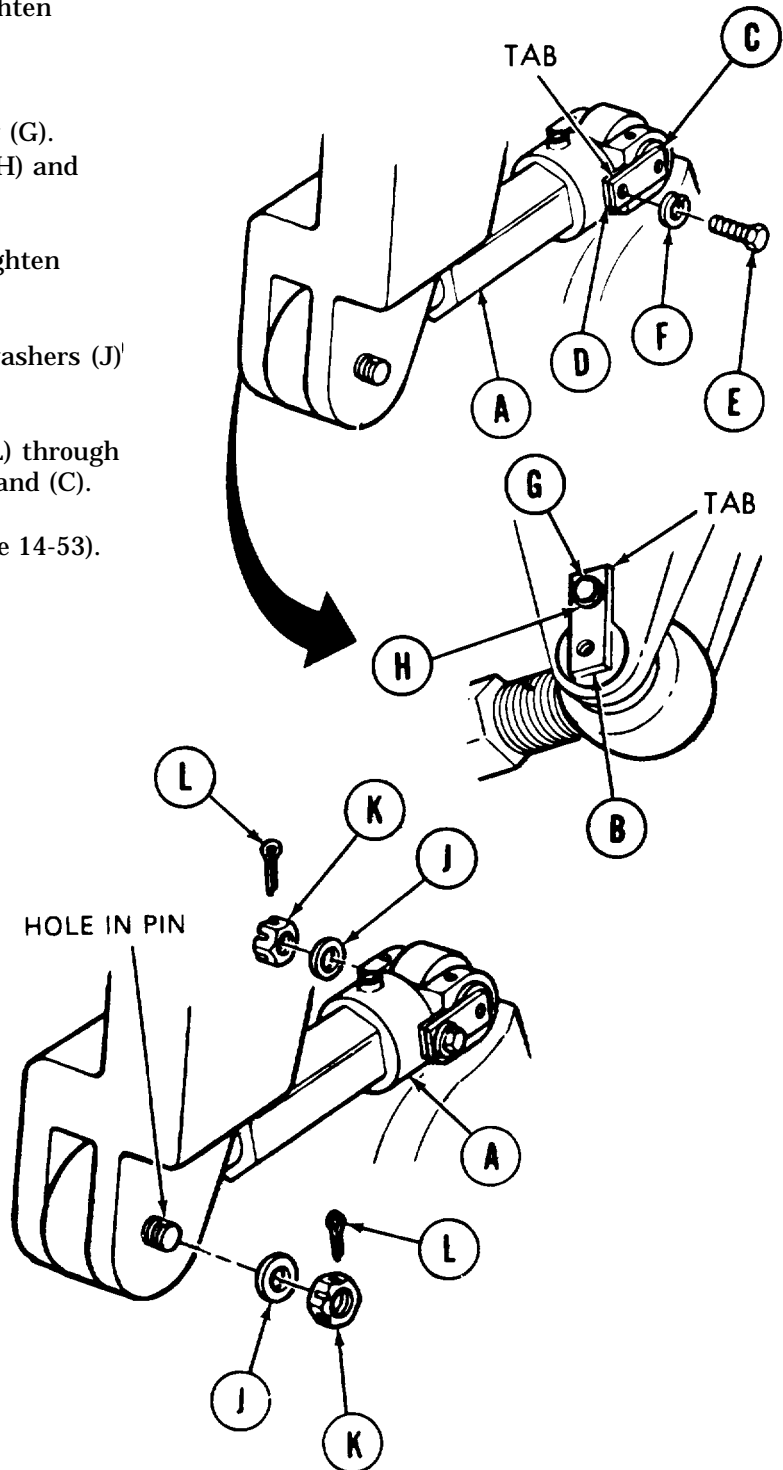
6. Lower arm and position other end of link (A) on mount at roadwheel.
7. Aline pin (C) with two splines in bearing. Insert pin (C) from outside.
8. Using hand to hold shim (D) in place between mount and pin (C), use hammer and drive pin (C) through link (A).

Go on to Sheet 5

TA249128

MECHANICAL TRACK ADJUSTING LINK REPLACEMENT (Sheet 5 of 5)

9. Aline tab of pin (C) with hole for screw (E).
Insert screw (E) through new washer (F), tab of pin (C), and shim (D).
10. Using 3/4 inch socket with ratchet, tighten screw (E).
11. Aline tab of pin (B) with hole for screw (G).
Insert screw (G) through new washer (H) and tab of pin (B).
12. Using 3/4 inch socket with ratchet, tighten screw (G).
13. Using 1-1/8 inch socket, install both washers (J) and nuts (K) onto pins (B) and (C).
14. Using pliers, install new cotter pins (L) through slots in nuts (K) and holes in pins (B) and (C).
15. Install compensating idler wheels (page 14-53).
16. Install front fender (page 16-68).
17. Connect track (TM 9-2350-222-10).
18. Adjust track (TM 9-2350-222-10).



End of Task

TA249129

MECHANICAL TRACK ADJUSTING LINK REPAIR (Sheet 1 of 3)

TOOLS: 3/4 in. sliding tee
7/16 in. combination box and open end wrench
9/16 in. combination box and open end wrench
Hammer
Center punch
Chisel
Grease gun
Mounted vise

SPECIAL TOOL: Remover-replacer (Item 14, Chapter 3, Section I)

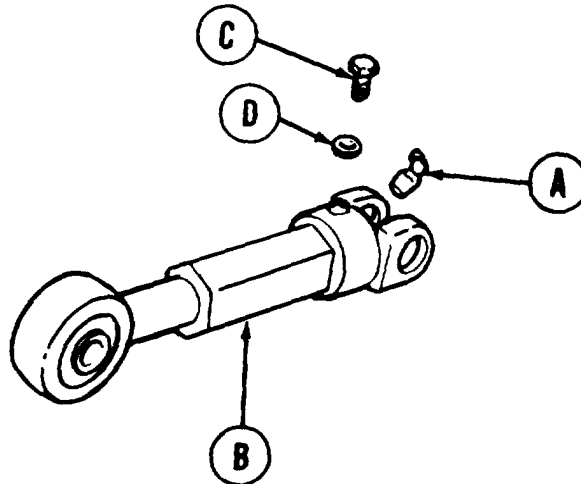
SUPPLIES: Lube fitting (MS15003-4)
Rags (Item 65, Appendix D)
Grease (Item 36, Appendix D)
Lockwasher (MS35338-46)

REFERENCE: TM 9-2350-222-10

PRELIMINARY PROCEDURES: Disconnect track (TM 9-2350-222-10)
Remove compensating idler wheel (page 14-51)
Remove mechanical track adjusting link assembly (page 14-56)

DISASSEMBLY:

1. Using 7/16 inch wrench, remove grease fitting (A) from link (B).
2. Using 9/16 inch wrench, remove bolt (C) and lockwasher (D). Throw lockwasher (D) away.

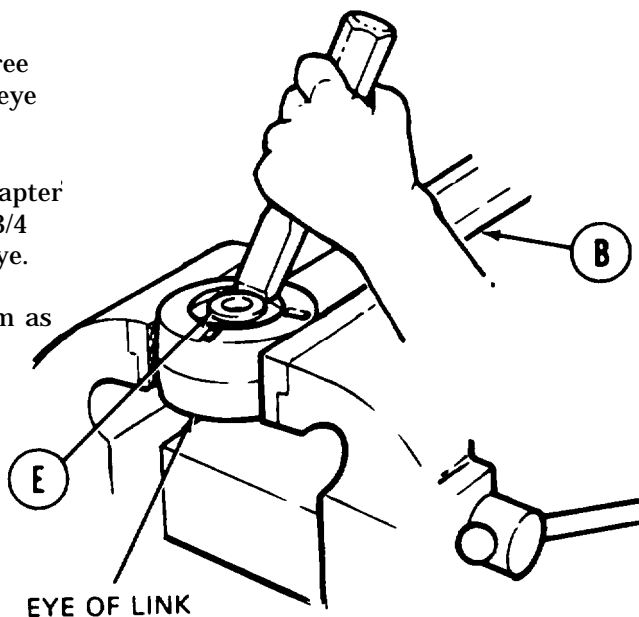


Go on to Sheet '2

TA249130

MECHANICAL TRACK ADJUSTING LINK REPAIR (Sheet 2 of 3)

3. Using hammer and chisel, cut stakes at three places (both sides) that hold bearing (E) in eye end of link (B).
4. Position remover-replacer tool (Item 14, Chapter 3, Section I) to bearing in link (B). Using 3/4 inch sliding tee, press bearing out of link eye.
5. Inspect parts (A) through (E). Replace them as necessary.



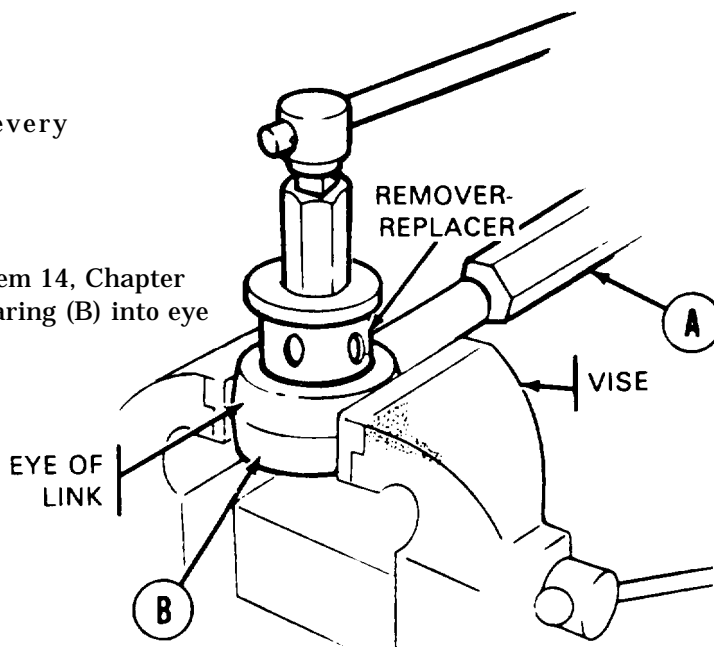
ASSEMBLY:

1. Position link (A) so eye end is facing upward.

NOTE

Make sure bearing is every mounted in link eye.

2. Using remover-replacer tool (Item 14, Chapter 3, Section I), carefully press bearing (B) into eye of link (A).

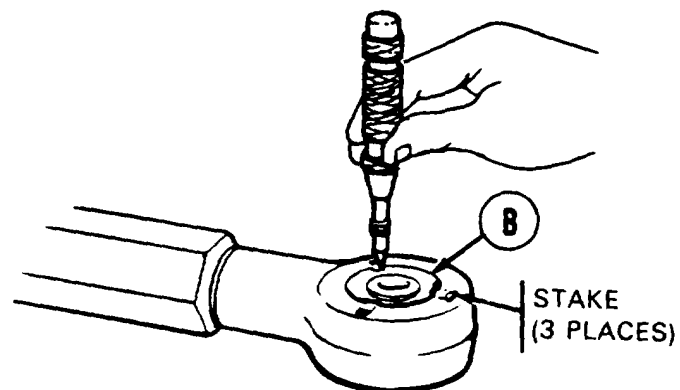
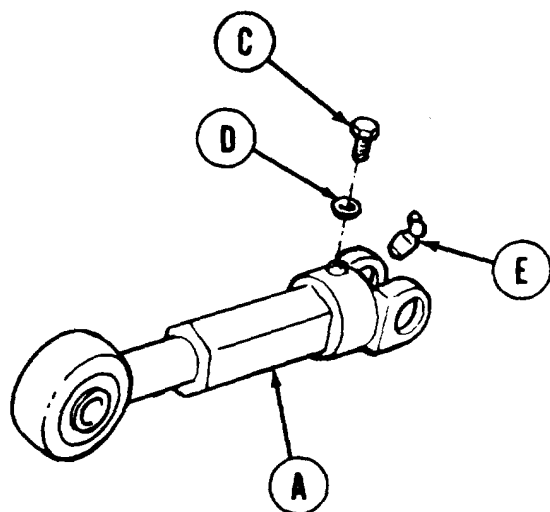


Go on to Sheet 3

TA249131

MECHANICAL TRACK ADJUSTING LINK REPAIR (Sheet 3 of 3)

3. Using hammer and center punch, stake bearing (B) into link (A) in three places (both sides).
4. Install bolt (C) and new lockwasher (D) at other end of link.



5. Using 9/16 inch wrench, tighten bolt (C) in place.
6. Using 7/16 inch wrench, tighten new grease fitting (E) into position in link (A).

NOTE

For easy access with grease gun, fitting (E) should be pointing outward when link (A) is installed to tank.

7. Using grease gun, squirt grease (Item 36, Appendix D) through fitting (E) to make sure it is not plugged.
8. Install mechanical track adjusting link assembly (page 14-59).

End of Task

TA249132

Change 3 14-62.1

GREASE ACTUATED TRACK ADJUSTING LINK REPLACEMENT (Sheet 1 of 7)

PROCEDURE INDEX

PROCEDURE	PAGE
Removal	14-62.3
Installation	14-62.6

TOOLS: 15/16 in. socket with 1/2 in. drive
 15/16 in. socket with 3/4 in. drive
 1-1/8 in. socket with 1/2 in. drive
 Ratchet with 1/2 in. drive
 Ratchet with 3/4 in. drive
 5 in. extension with 1/2 in. drive
 5 in. extension with 3/4 in. drive
 12 in. adjustable wrench

Slip joint pliers
 3/8 in. combination box and open end wrench
 3/4 in. combination box and open end wrench
 Torque wrench with 3/4 in. drive (0-600 ft-lb) (0-813 N.m)
 Lifting device (2,000 lbs. capacity)

SPECIAL TOOLS: Slide hammer puller (Item 12, Chapter 3, Sect
 Remover and replacer tool (Item 18, Chapter 3, Section I)
 Sling assembly (Item 23, Chapter 3, Section 1)

SUPPLIES: Grease (Item 36, Appendix D)
 Lockwasher (MS35338-67)
 Pin, cotter (MS24665-497)

REFERENCE: TM 9-2350-222-10

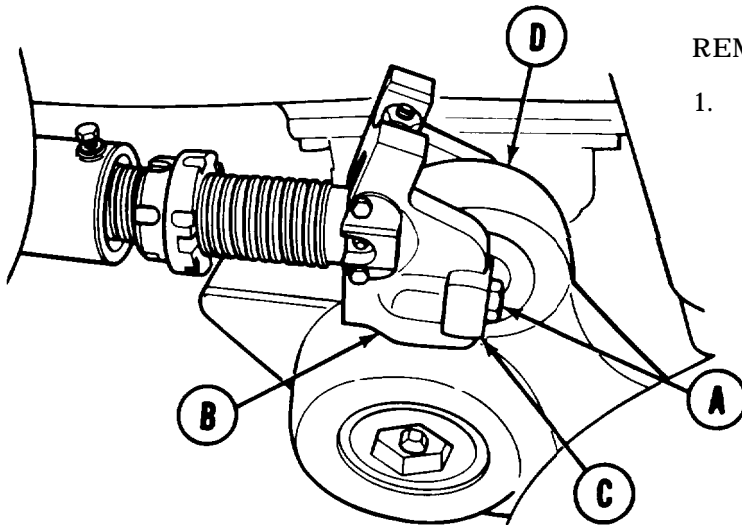
PERSONNEL: Two

PRELIMINARY PROCEDURES: Release track tension (TM 9-2350-222-10)
 Disconnect track between compensating idler wheel and number 1 roadwheel (TM 9-2350-222-10)
 Remove front fender (page 16-65)
 Remove shock absorber (page 14-95)
 Remove compensating idler wheel (page 14-50)

Go on to Sheet 2

TA249133

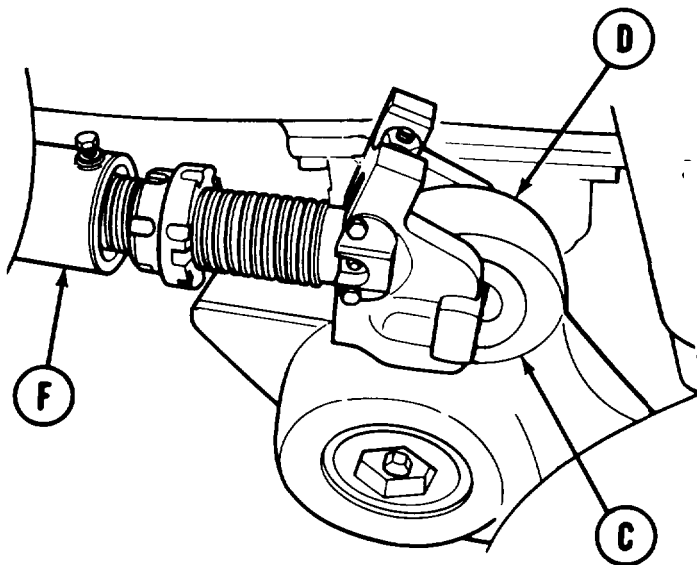
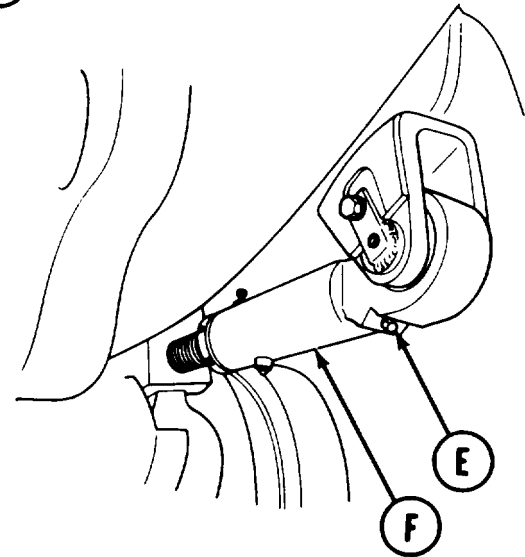
GREASE ACTUATED TRACK ADJUSTING LINK REPLACEMENT (Sheet 2 of 7)



REMOVAL:

1. Using 15/16 inch socket, remove two cap screws (A) that secure shaft yoke (B) to roadwheel bearing (C) in number 1 road wheel support arm (D).

2. Using 3/8 inch wrench, remove pipe plug (E) and collapse grease actuated adjusting link (F).



3. Remove adjusting link (F) from bearing (C) in number 1 roadwheel support arm (D).

Go on to Sheet 3

TA249134

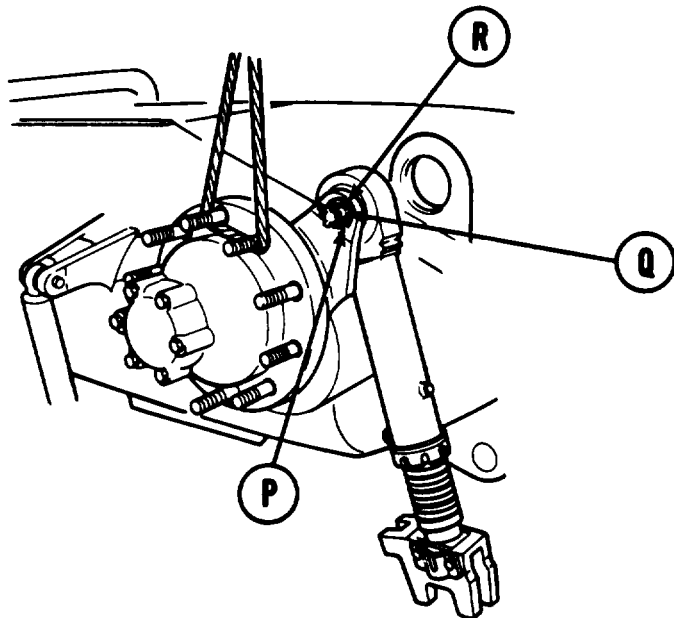
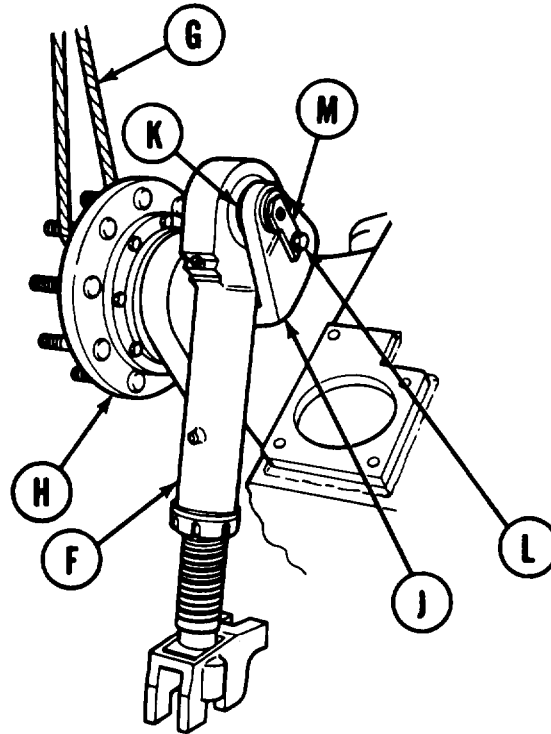
Change 3 14-62.3

GREASE ACTUATED TRACK ADJUSTING LINK REPLACEMENT (Sheet 3 of 7)

WARNING

Be careful when lifting compensating idler wheel hub (H). Serious injury to personnel can result from careless handling.

4. Attach sling assembly (G) to compensating idler wheel hub (H). Using lifting device, raise compensating idler arm (J) until adjusting link mounting eye (K) is positioned above the front slope
5. Position adjusting link (F) as shown.
6. Using 3/4 inch wrench, remove cap-screw (L) and lockwasher securing tab on pin assembly (M) to inner face of compensating idler arm (J). Throw lock-washer away.
7. Using slip joint pliers, straighten and remove cotter pin (p). Throw pin away.
8. Using 1-1/8 in. socket, remove nut (Q) and Washer (R).

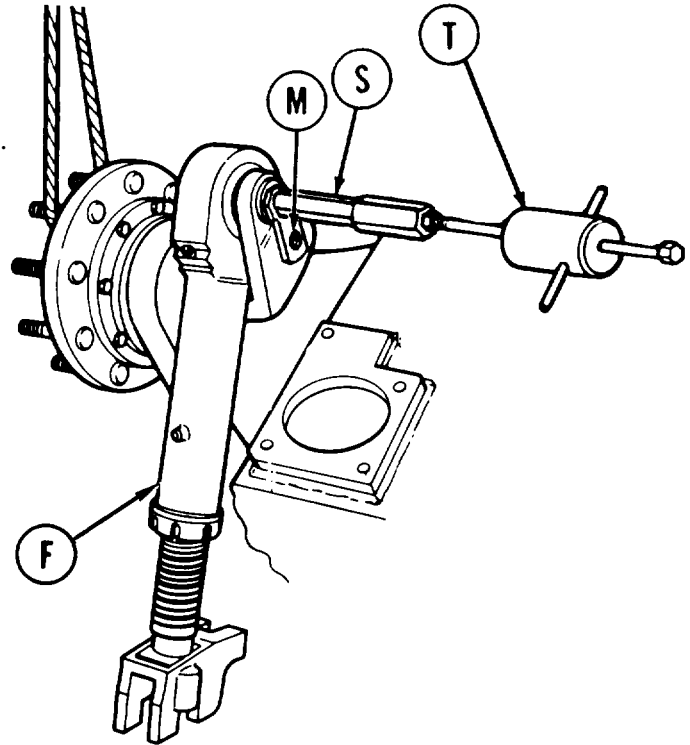


Go on to Sheet 4

TA249135

GREASE ACTUATED TRACK ADJUSTING LINK REPLACEMENT (Sheet 4 of 7)

9. Using adjustable wrench, screw remover and replacer tool (S) (Item 18, Chapter 3, Section I) on pin assembly (M).
10. Secure slide hammer puller (T) (Item 12, Chapter 3, Section I) on remover and replacer tool (S) (Item 18, Chapter 3, Section I).
11. Have second person hold and support track adjusting link (F).
12. Using slide hammer puller (T), tap pin assembly (M) from adjusting link (F).



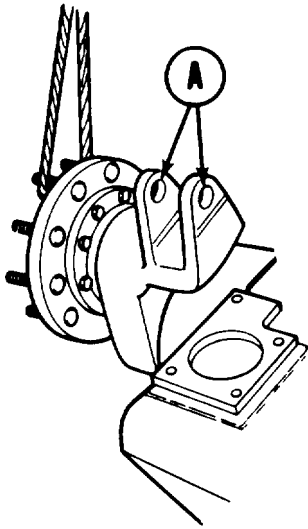
13. Remove slide hammer puller (T) from remover and replacer tool (S) using adjustable wrench.
14. Remove pin assembly (M) from remover and replacer tool (S).
15. Remove grease actuated track adjusting link (F) from vehicle.

Go on to Sheet 5

TA249130

Change 3 14-62.5

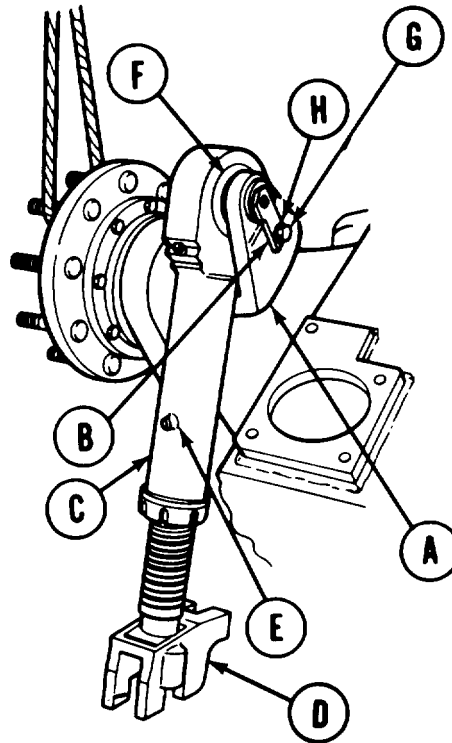
GREASE ACTUATED TRACK ADJUSTING LINK REPLACEMENT (Sheet 5 of 7)



INSTALLATION:

1. Put a light coat of grease (Item 36, Appendix D) on two mounting eyes of compensating idler arm (A).

2. Put a light coat of grease on pin assembly (B).
3. Using second person, position grease actuated track adjusting link (C) with yoke (D) facing down and safety relief valve (E) facing up as shown.
4. Using second person, put adjusting link (C) between two eyes of compensating idler arm (A).
5. Aline keyways in pin assembly (B) with splines in adjusting link bearing (F) and install pin assembly (B) from hull side to secure adjusting link (C) to compensating idler arm (A).



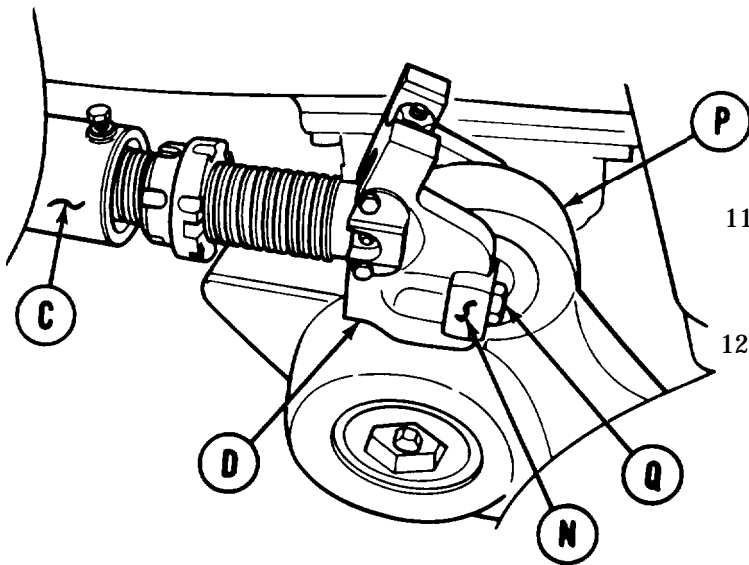
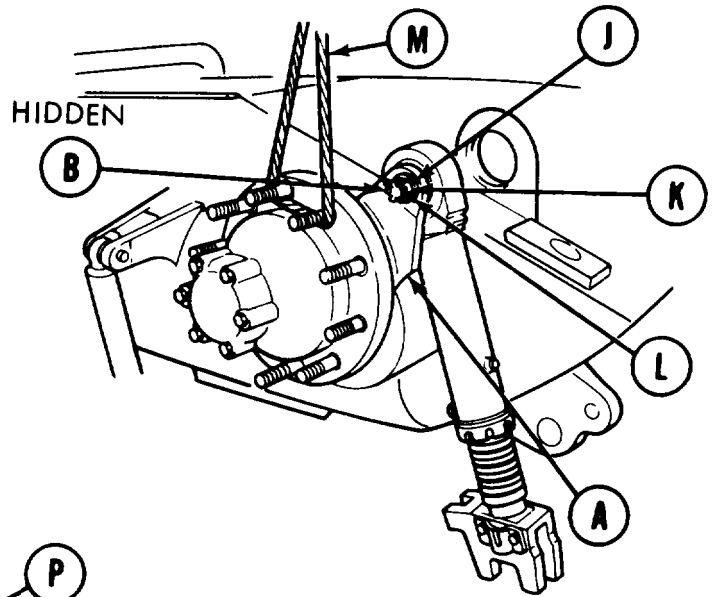
6. Aline tab on pin assembly (B) with threaded hole in compensating idler arm (A) and install capscrew (G) and new lockwasher (H). Using 3/4 inch wrench, tighten capscrew (G).

Go on to Sheet 6

TA249137

GREASE ACTUATED TRACK ADJUSTING LINK REPLACEMENT (Sheet 6 of 7)

7. Install flat washer (J) and nut (K) on threaded end of pin assembly (B).
8. Using 1-1/8 inch socket, tighten nut (K) and align slot in nut (K) with hole in pin assembly (B).
9. Using pliers, install new cotter pin (L).
10. Using wire rope assembly (M) and lifting device, lower compensation idler arm (A).



11. Align slots of yoke (D) on adjusting link (C) with bearing (N) on number 1 roadwheel support arm (P).
12. Using 15/16 inch socket and extension, install and tighten two cap screws (Q) to secure adjusting link (C) to bearing (N).

13. Using torque wrench, tighten cap screws (Q) 150-200 lb.ft. (203-271) (N•m).
14. Remove sling assembly (M) and lifting device.

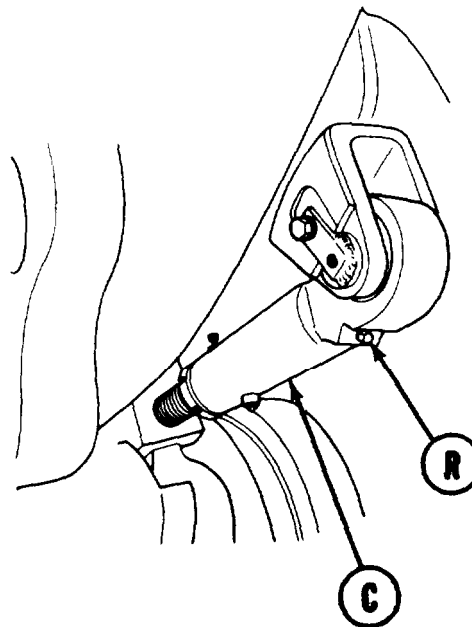
Go on to Sheet 7

TA249138

Change 3 14-62.7

GREASE ACTUATED TRACK ADJUSTING LINK REPLACEMENT (Sheet 7 of 7)

15. Using 3/8 inch wrench, install pipe plug (R) in adjusting link (C).
16. Install compensating idler wheel (page 14-53).
17. Install shock absorber (page 14-96).
18. Install front fender (page 16-69).
19. Connect track (TM 9-2350-222-10).
20. Adjust track tension (TM 9-2350-222-10).



End of Task

TA249141

GREASE ACTUATED TRACK ADJUSTING LINK REPAIR (Sheet 1 of 4)

PROCEDURE INDEX

PROCEDURE	PAGE
	I
Disassembly	14-62.10
Inspection	14-62.11
Assembly	14-62.11
TOOLS:	7/16 in. socket with 1/2 in. drive 3/4 in. socket with 1/2 in. drive 15/16 in. socket with 1/2 in. drive Ratchet with 1/2 in. drive Torque wrench with 1/2 in. drive (0-175 lb-ft) (0-236 N.m) 10 in. adjustable wrench
SPECIAL TOOLS:	Bearing driver (Item 29.1, Chapter 3, Section I)
SUPPLIES:	Grease (Item 36, Appendix D) Brush (Item 10, Appendix D) Rag, wiping (Item 65, Appendix D) Dry cleaning solvent (Item 54, Appendix D) Packing (NAS1523C-10B) Lockwasher (MS35338-44) (2 required) Goggles (Item 74, Appendix D) Rubber gloves (Item 73, Appendix D)
REFERENCES:	None
PRELIMINARY PROCEDURE:	Remove grease actuated track adjusting link from vehicle (page 14-62.2)

NOTE

Repair procedure is the same for both right end left side adjusting links.

Go on to Sheet 2

TA249139

Change 3

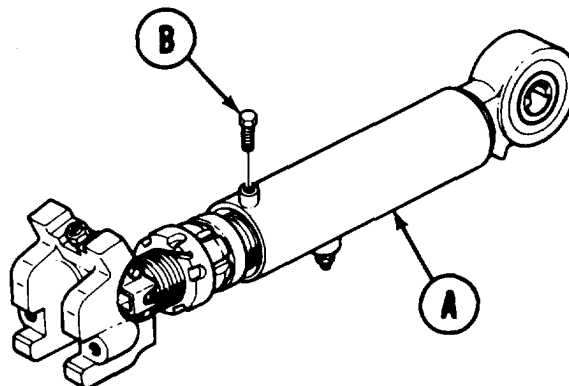
14-62.9

DISASSEMBLY:

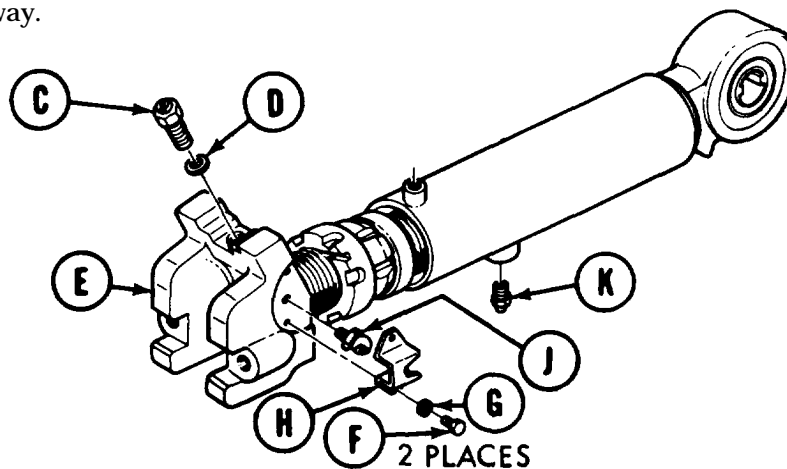
WARNING

Dry cleaning solvent P-D-880 is toxic and flammable. Wear protective goggles and gloves and use only in a well-ventilated area. Avoid contact with skin, eyes, and clothes and don't breathe vapors. Do not use near open flame or excessive heat. The flash point for Type #1 Dry Cleaning Solvent is 100°F (38°C) and for Type #2 is 138°F (50°C). If you become dizzy while using cleaning solvent, get fresh air immediately and get medical aid. If contact with eyes is made, wash your eyes with water and get medical aid immediately.

1. Clean grease actuated adjusting link (A) with solvent (Item 54, Appendix D), brush (Item 10, Appendix D), and rag (Item 65, Appendix D).
2. Using 3/4 inch socket, remove collar locking screw (B).



3. Using 15/16 inch socket, remove pressure relief valve (C) and packing (D) from yoke (E). Throw packing (D) away.
4. Using 7/16 inch socket, remove two screws (F) and lockwashers (G) from support link assembly (H). Throw lockwashers (G) away.



5. Using 7/16 inch socket, remove grease fitting (J). Throw fitting (J) away.
6. Using 7/16 inch socket, remove safety relief valve (K).

Go on to Sheet 3

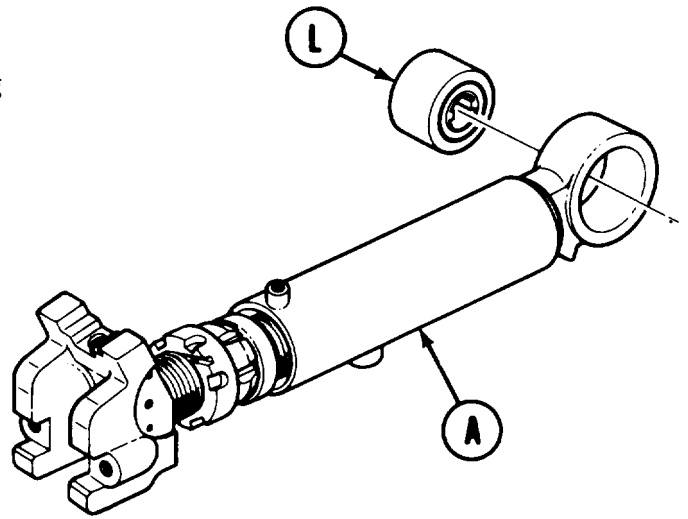
TA249140

GREASE ACTUATED TRACK ADJUSTING LINK REPAIR (Sheet 3 of 4)

- Using bearing driver tool (Item 29.1, Chapter 3, Section I) and adjustable wrench, remove bearing (L) from adjusting link (A). Throw bearing (L) away.

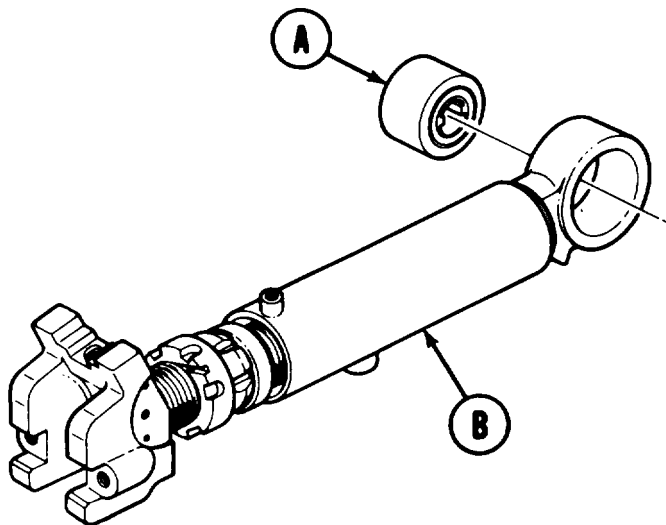
INSPECTION:

- Inspect all parts removed for cracks, breaks, crossed or stripped threads, or missing items. Replace damaged or missing parts as necessary.
- Inspect adjusting link (A) for cracks, mechanical damage or corrosion. Cracks are not permissible. Turn damaged adjusting link in to next higher level maintenance.



ASSEMBLY:

- Using bearing driver tool (Item 29.1, Chapter 3, Section I) and adjustable wrench, install new bearing (A) in adjusting link (B).

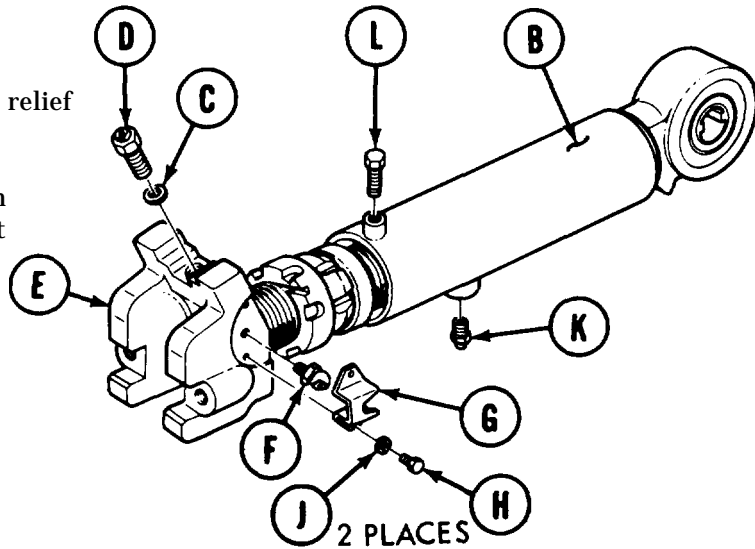


Go on to Sheet 4

TA249142

GREASE ACTUATED TRACK ADJUSTING LINK REPAIR (Sheet 4 of 4)

2. Put thin coat of grease (Item 36, Appendix D) on new packing (C).
3. Install new packing (C) and pressure relief valve (D) in yoke (E).
4. Using torque wrench and 15/16 inch socket tighten valve (D) 40-60 lb-ft (54-81 N.m).
5. Using 7/16 inch socket, install grease fitting (F) in yoke (E).



6. Position support link assembly (G) on yoke (E). Using 7/16 inch socket, install two screws (H) and new lockwashers (J).
7. Using 7/16 inch socket, install safety relief valve (K) in adjusting link (B).
8. Install locking collar screw (L) in adjusting link (B), but do not tighten.
9. Install grease actuated track adjusting link (page 14-62.6).

End of Task

TA249143

COMPENSATING IDLER HUB AND ARM REPLACEMENT (Sheet 1 of 3)

TOOLS: 15/16 in. socket with 3/4 in. drive
Ratchet with 3/4 in. drive
Torque wrench with 3/4 in. drive
Universal joint with 3/4 in. drive
7/8 in. combination box and open end wrench
36 in. extension with 3/4 in. drive
T-bar with 3/4 in. drive

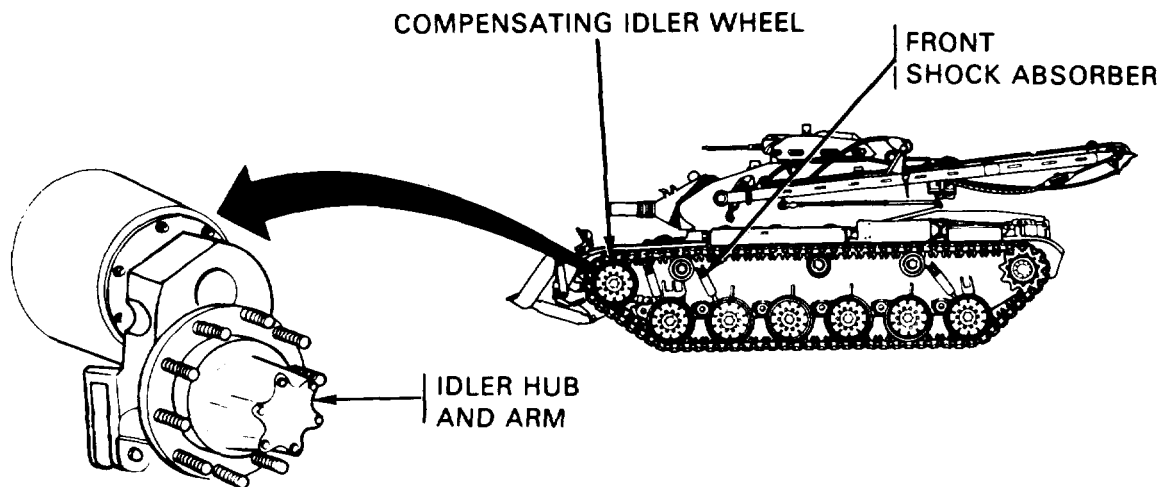
SUPPLIES: Preformed packing (8387481)
5/8-11 UNC capscrews, 2 in. long (2 required)
Grease (Item 36, Appendix D)
Lockwashers (MS35340-50) (6 required)

PERSONNEL: Three

REFERENCES: TM 9-2350-222-10
LO 9-2350-222-12

PRELIMINARY PROCEDURE: Remove track adjusting link (page 14-57)

REMOVAL:



N O T E

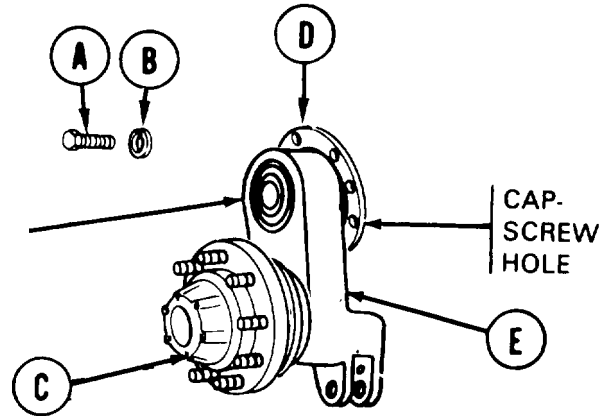
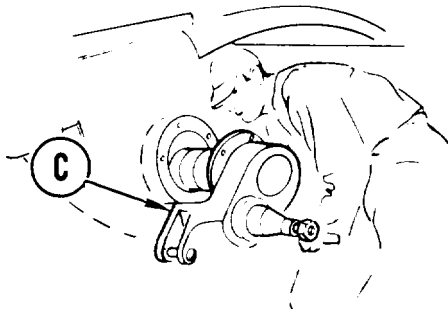
When removing screws in next step, have second person move hub to align screws with removal slots.

Go on to Sheet 2

TA249144

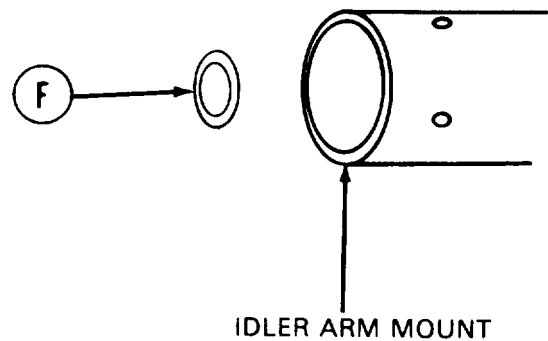
COMPENSATING IDLER HUB AND ARM REPLACEMENT (Sheet 2 of 3)

1. Using socket, remove six screws (A) and lockwashers (B) securing hub and arm assembly (C) to hull. Throw lockwashers (B) away.
2. Install two capscrews into holes in oil seal retainer (D) of idler arm (E).



3. Using two other persons, support hub and arm assembly.
4. Screw two capscrews alternately into retainer (D).

5. Using two persons, remove hub and arm assembly (C).
6. Remove preformed packing (F) from groove in idler arm mount. Throw packing away.
7. Remove capscrews from retainer (D).



Go on to Sheet 3

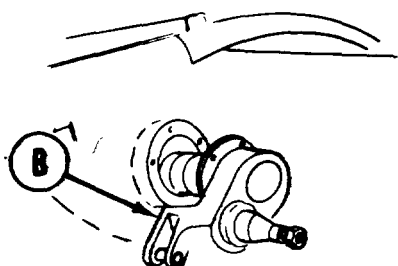
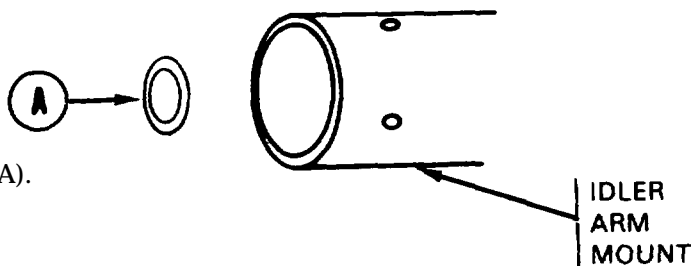
TA253484

Change 1 14-65

COMPENSATING IDLER HUB AND ARM REPLACEMENT (Sheet 3 of 3)

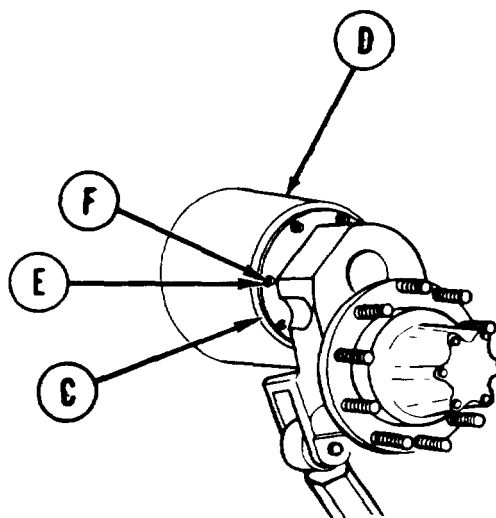
INSTALLATION:

1. Grease (Item 36, Appendix D) new packing (A). Install it to groove in idler arm mount.



2. Using three persons, lift hub and arm assembly (B) to mounting position.
3. Push arm of assembly (B) into mount opening.
4. Aline holes in grease seal retainer (C) with mounting holes on hub (D).

5. Install six new lockwashers (E) and screws (F).
6. Using socket with torque wrench, tighten screws (E) to 140-165 lb-ft (190-224 N m).
7. Using grease gun to fitting, shoot grease (Item 36, Appendix D) into idler arm mount housing (LO 9-2350-222-12).
8. Install adjusting link (page 14-59).
9. Test drive tank a short way (TM 9-2350-222-10).



End of Task

TA253485

COMPENSATING IDLER ARM ASSEMBLY REPAIR (Sheet 1 of 5)

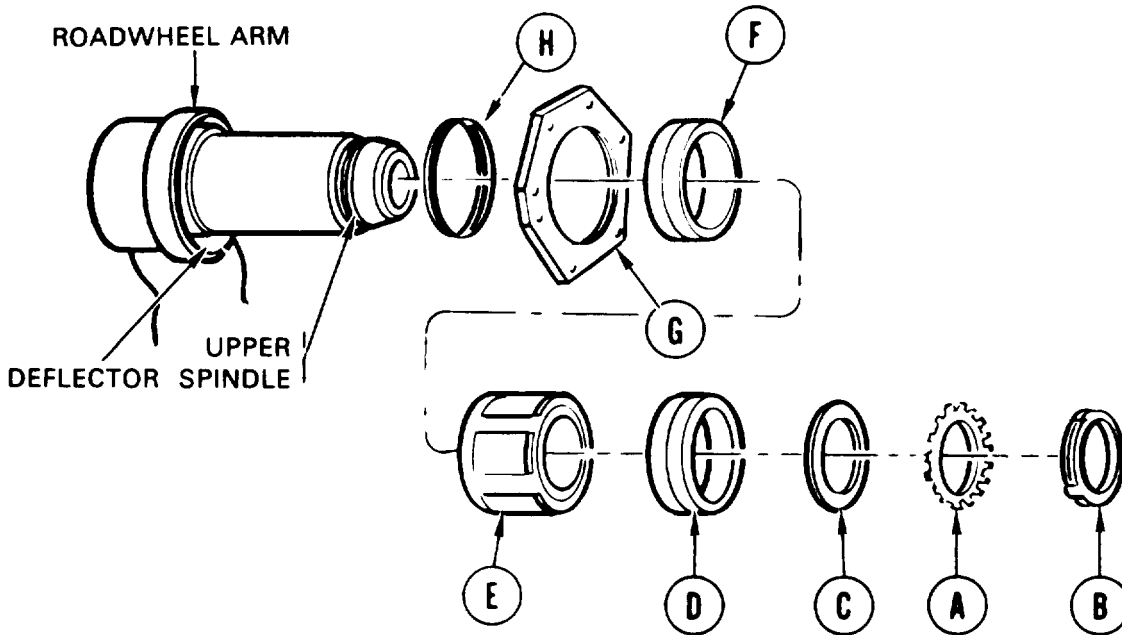
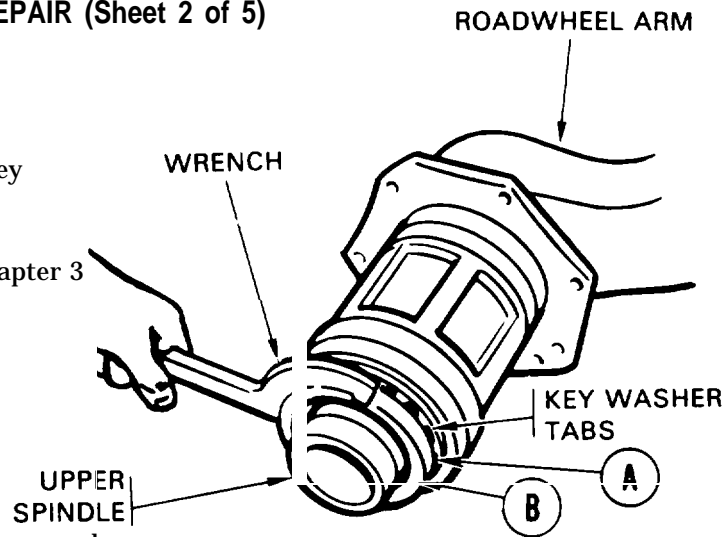
PROCEDURE INDEX

PROCEDURE	PAGE												
Disassembly	14-66												
Cleaning and Inspection	14-69												
Assembly	14-69												
<p>TOOLS:</p> <table border="0" style="width: 100%;"> <tr> <td style="width: 50%;">9/16 in. socket with 1/2 in. drive</td> <td style="width: 50%;">Pinch bar</td> </tr> <tr> <td>Drift punch</td> <td>Ratchet with 3/4 in. drive</td> </tr> <tr> <td>Ratchet with 1/2 in. drive</td> <td>Impact wrench with 1 in. drive</td> </tr> <tr> <td>Hammer</td> <td>Flat-tip screwdriver</td> </tr> <tr> <td>1/2 in. hinged handle</td> <td>Torque wrench with 3/4 in. drive (0-600 lb-ft) (0-814 N.m)</td> </tr> <tr> <td>Needle nose pliers</td> <td>2-1/2 in. socket with 1 in. drive</td> </tr> </table>		9/16 in. socket with 1/2 in. drive	Pinch bar	Drift punch	Ratchet with 3/4 in. drive	Ratchet with 1/2 in. drive	Impact wrench with 1 in. drive	Hammer	Flat-tip screwdriver	1/2 in. hinged handle	Torque wrench with 3/4 in. drive (0-600 lb-ft) (0-814 N.m)	Needle nose pliers	2-1/2 in. socket with 1 in. drive
9/16 in. socket with 1/2 in. drive	Pinch bar												
Drift punch	Ratchet with 3/4 in. drive												
Ratchet with 1/2 in. drive	Impact wrench with 1 in. drive												
Hammer	Flat-tip screwdriver												
1/2 in. hinged handle	Torque wrench with 3/4 in. drive (0-600 lb-ft) (0-814 N.m)												
Needle nose pliers	2-1/2 in. socket with 1 in. drive												
<p>SPECIAL TOOLS: Handle, remover and replacer (Item 9, Chapter 3, Section I) Replacer, oil seal (Item 19, Chapter 3, Section I) Replacer, oil seal and retainer (Item 22, Chapter 3, Section I) Wrench, hook spanner (Item 25, Chapter 3, Section I)</p>													
<p>SUPPLIES: Grease (Item 36, Appendix D) Seal (MS51912-2-9)</p>													
<p>REFERENCES: TM 9-2350-222-10 LO 9-2350-222-12</p>													
<p>PRELIMINARY PROCEDURE: Remove compensating idler arm assembly (page 14-64)</p>													

COMPENSATING IDLER ARM ASSEMBLY REPAIR (Sheet 2 of 5)

DISASSEMBLY:

1. Using hammer and punch, bend tabs of key washer (A) back from nut (B).
2. Using hook spanner wrench (Item 25, Chapter 3 Section I), loosen nut (B).
3. Remove nut (B), key washer (A), bearing washer (C), and inner bearing (D) from upper spindle of arm.



NOTE

It may be necessary to tap oil seal retainer (G) lightly with hammer to aid in removing outer bearing (F).

4. Remove spacer (E) and outer bearing (F) from upper spindle.
5. Slide oil seal retainer (G) off upper spindle.
6. Using screwdriver, pry seal (H) out of retainer (G). Throw seal away.

Go on to Sheet 3

TA141350

COMPENSATING IDLER ARM ASSEMBLY REPAIR (Sheet 3 of 5)

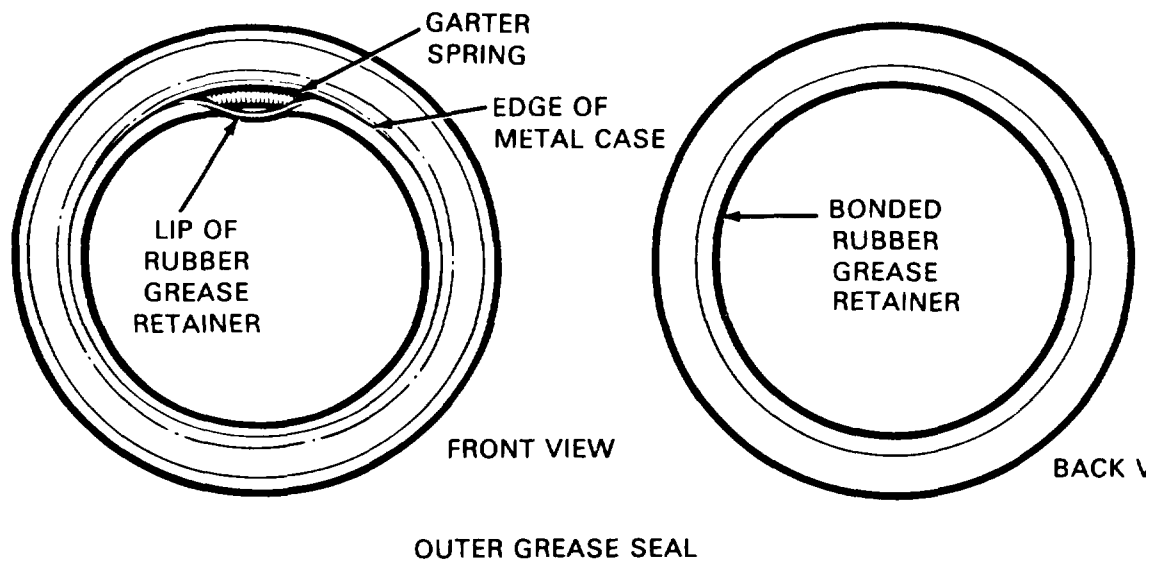
CLEANING AND INSPECTION:

1. Clean all parts including bearings.
2. Minor nicks, scratches, gouges, and pitting are okay if they are not on machined surfaces.
3. Inspect bearings and cups for damage. Replace as necessary.
4. Check seal assembly for rust, missing rivets, or other damage. Replace seal where required.
5. Inspect all nuts, washers, and screws for wear and damaged threads.
6. Inspect spacer and bearing sleeve on spindles for scratches, nicks, or dents. If damaged, notify support maintenance.

ASSEMBLY:

NOTE

Identify FRONT and BACK of outer grease seal. Rubber grease seal retaining lip can be pulled away from metal inner edge on FRONT of seal. Pull back retaining lip on seal and expose garter spring. BACK of seal has rubber grease retainer bonded to metal case and cannot be pulled away.



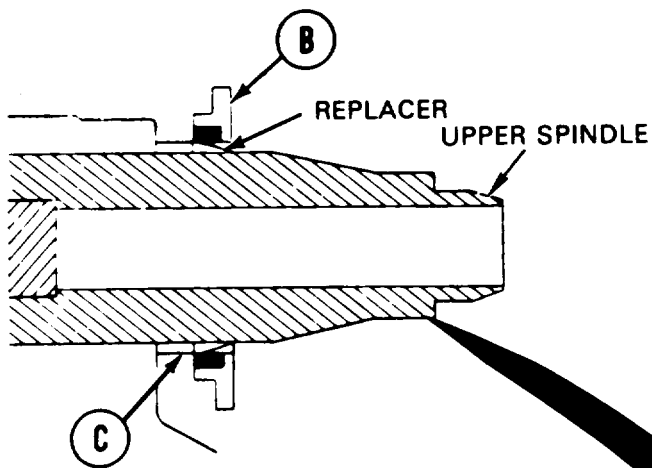
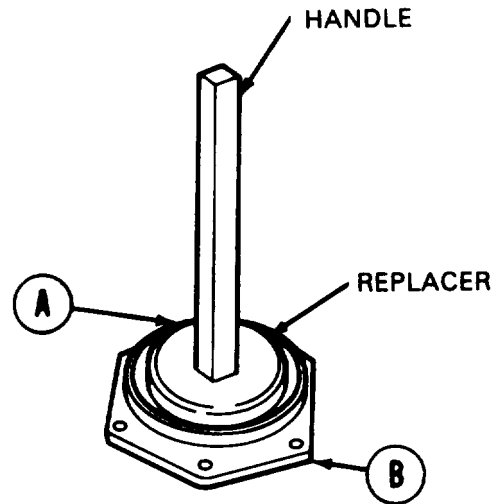
Go on to Sheet 4

TA141351

Change 1 14-69

COMPENSATING IDLER ARM ASSEMBLY REPAIR (Sheet 4 of 5)

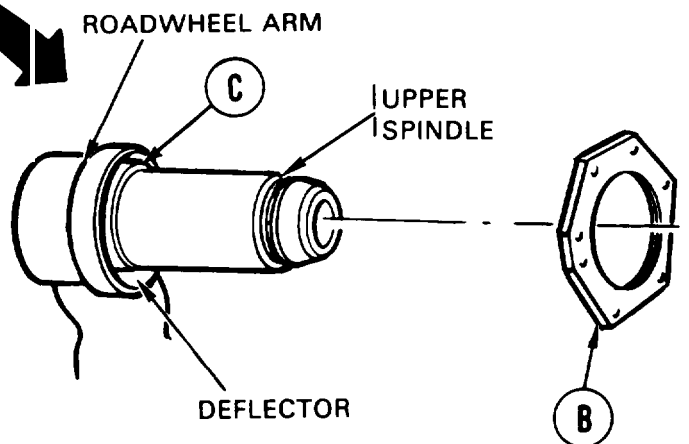
1. Apply a light coat of grease (Item 36, Appendix D) to outside of seal (A).
2. Position new outer grease seal (A) into retainer (B) so BACK of seal is into retainer and FRONT is facing away from retainer.



3. Using replacer and handle (Item 19 and 9, Chapter 3, Section I), tap seal (A) into place in seal retainer (B).
4. Coat upper spindle or arm, replacer, and seal retainer (B) with grease (Item 36, Appendix D).

Position replacer (Item 22, Chapter 3, Section I) on upper spindle, flush with spacer (C).

6. Slide seal retainer (B) over upper spindle and replace until it is sealed on spacer (C).

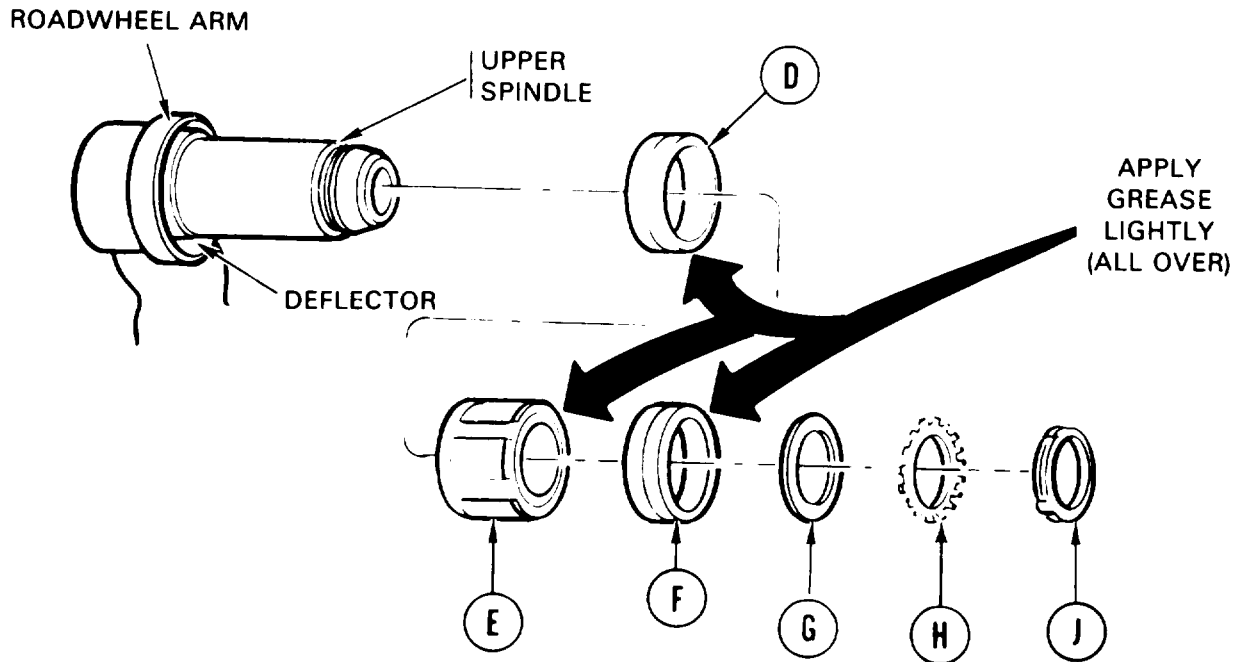


Go on to Sheet 5

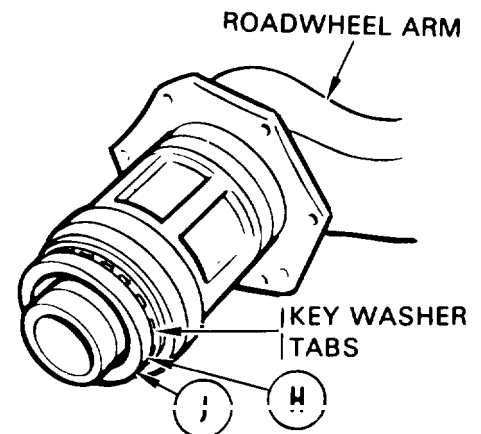
TA141352

COMPENSATING IDLER ARM ASSEMBLY REPAIR (Sheet 5 of 5)

- Remove replacer from upper spindle.



- Apply light coat of grease to outer bearing (D), bearing spacer (E), and inner bearing (F). Install them on arm upper spindle.
- Install bearing washer (G), key washer (H) with tabs toward nut (J), and screw nut (J) onto end of upper spindle.
- Using spanner wrench (Item 25, Chapter 3, Section I), tighten nut (J) until bearing assembly cannot be turned.
- Back nut (J) off just enough so bearing assembly can be turned by hand through one complete turn on spindle.
- Using hammer and punch, bend tab of key washer (H) so it fits in one of four slots in nut (J).
- Service hub and arm assembly (LO 9-2350-222-12).
- Install compensating idler arm assembly (page 14-16).



End of Task

TA141353

TRACK DRIVE SPROCKET REPAIR AND REPLACEMENT (Sheet 1 of 9)

PROCEDURE INDEX

PROCEDURE	PAGE
Removal	14-73
Disassembly	14-75
Inspection	14-77
Assembly	14-77
Installation	14-79

TOOLS: 1-1/2 in. socket with 3/4 in. drive
Impact wrench with 3/4 in. drive
16 in. extension with 3/4 in. drive
15/16 in. socket with 3/4 in. drive (2 required)
Ratchet with 3/4 in. drive
Sledge hammer
Pinchbar
Torque wrench with 3/4 in. drive (0-600 lb-ft) (0-814 N.m)
3/8 in. drift

SPECIAL TOOLS: Sling (Item 23, Chapter 3, Section I)
Remover (Item 13, Chapter 3, Section I)

SUPPLIES: Chalk (Item 11, Appendix D)
Lubricant (Item 40, Appendix D)
5/8-18 UNF bolt (3 in. long) (3 required)
Self-locking nuts (10870133) (10 required)
Wood block

PERSONNEL: Three

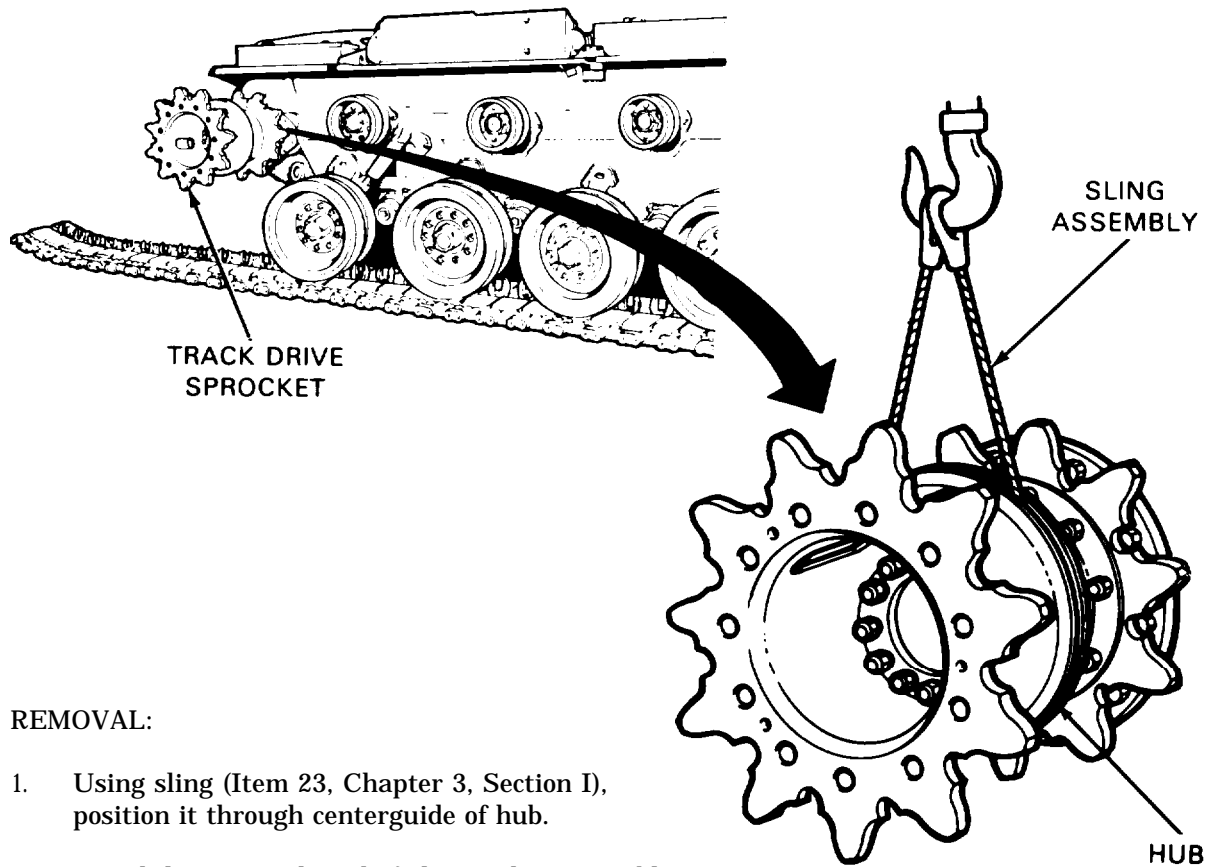
REFERENCE: TM 9-2350-222-10

PRELIMINARY PROCEDURE: Remove track from drive sprocket (page 14-81)

TA253486

Go on to Sheet 2

TRACK DRIVE SPROCKET REPAIR AND REPLACEMENT (Sheet 23 of 9)



REMOVAL:

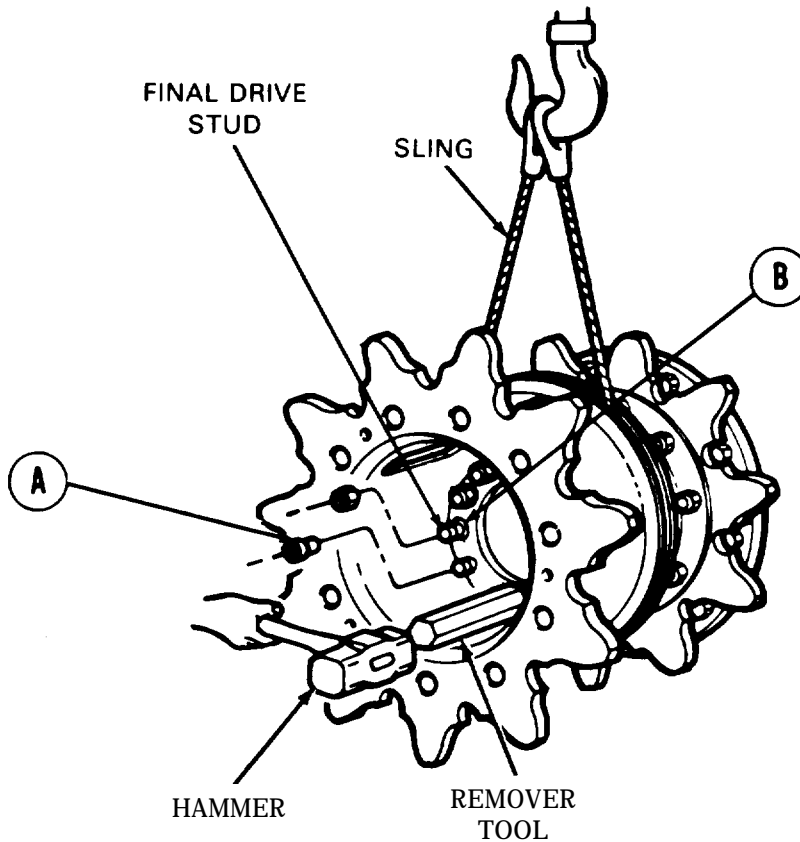
1. Using sling (Item 23, Chapter 3, Section I), position it through centerguide of hub.
2. Attach loop at each end of sling to hoist capable of lifting 600 pounds.
3. Use three persons, two on ground and one operating hoist.
4. Direct person operating hoist to take up slack of sling.
5. Check sling for tightness around sprocket. Make sure sling is tight and secure.

Go on to Sheet 3

TA253487

Change 1 14-73

TRACK DRIVE SPROCKET REPAIR AND REPLACEMENT (Sheet 3 of 9)



6. Using 1-1/2 inch socket with extension and handle, remove 10 nuts (A) securing sprocket and hub assembly to final drive hub.
7. Throw nuts (A) away.
8. Thread special remover tool (Item 13, Chapter 3, Section I) tightly onto stud. Using sledge hammer, strike remover tool to loosen tapered bushing (B) from final drive studs.
9. Remove tool. Remove bushing.
10. Do steps 8 and 9 to remove other nine hub tapered bushings (B). Replace bushings if needed.

NOTE

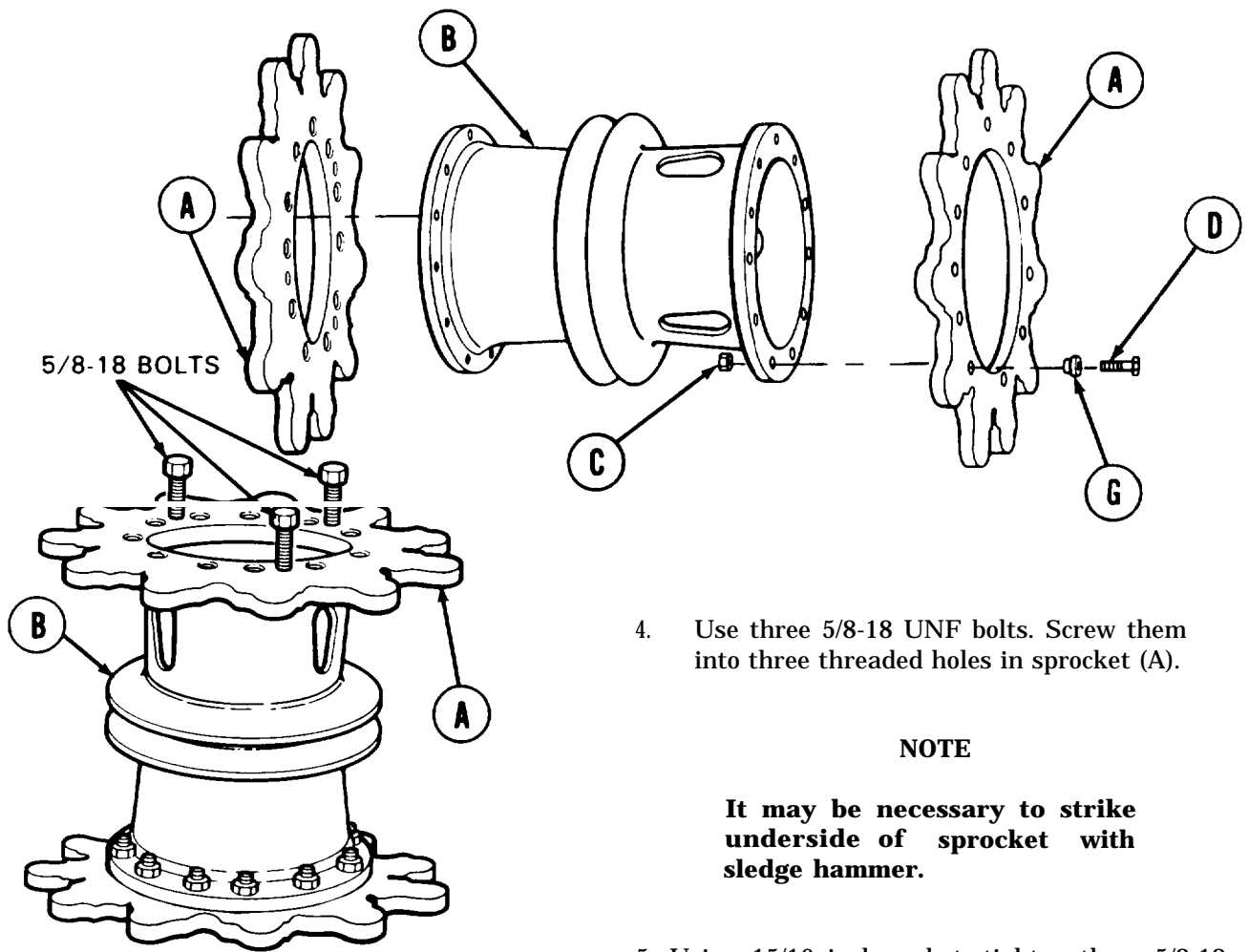
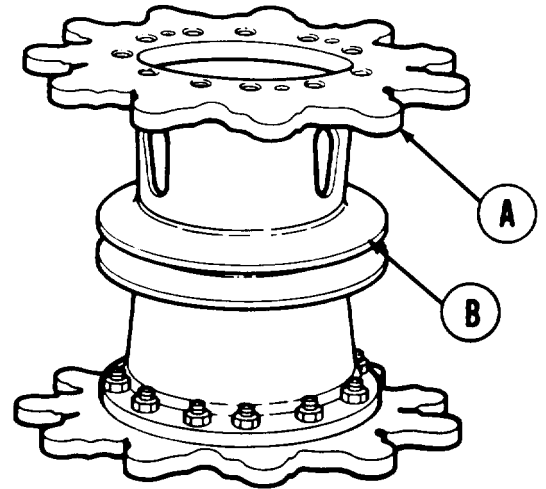
If sprocket has been on hub for long period of time, it may be necessary to strike it repeatedly with 20 pound sledge hammer until it becomes unsealed from hub.

11. Using second person to assist, pull sprocket and hub assembly free of mounting place on tank.
12. Using hoist and sling, move sprocket and hub assembly away from tank.

TRACK DRIVE SPROCKET REPAIR AND REPLACEMENT (Sheet 4 of 9)

DISASSEMBLY:

1. With help of other two persons, sit sprocket and hub assembly on end so sprocket (A) faces up.
2. Using 15/16 inch socket, remove 11 nuts (C).
3. Using 15/16 inch socket, remove 11 bolts (D).



4. Use three 5/8-18 UNF bolts. Screw them into three threaded holes in sprocket (A).

NOTE

It may be necessary to strike underside of sprocket with sledge hammer.

5. Using 15/16 inch socket, tighten three 5/8-18 UNF bolts evenly until sprocket is free of hub (B).

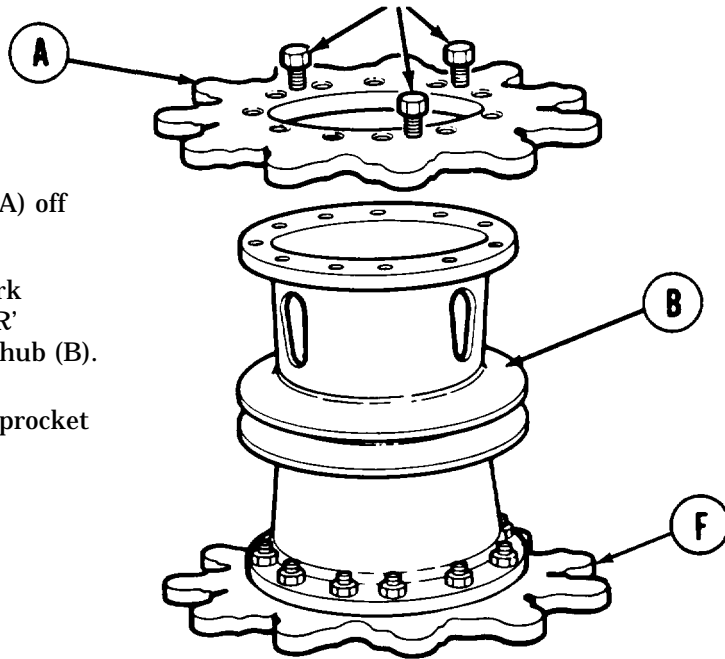
Go on to Sheet 5

TA141357

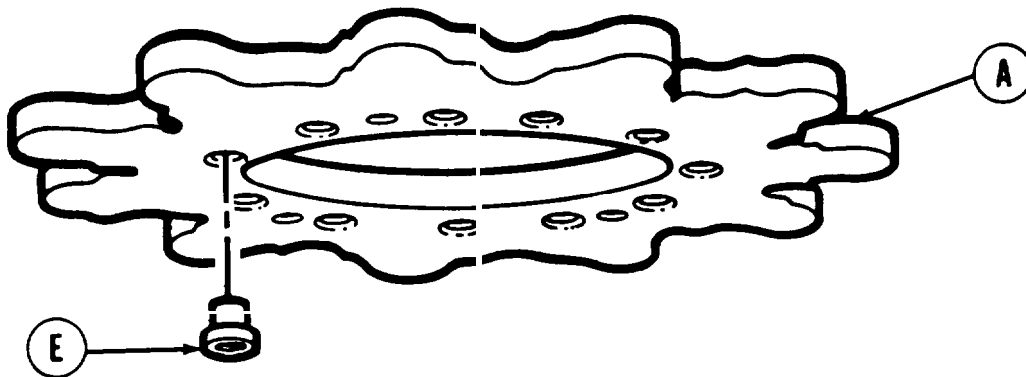
Change 1 14-75

TRACK DRIVE SPROCKTE REPAIR AND REPLACEMENT (Sheet 5 of 9)

5/8-18 BOLTS



6. Using two other persons, lift sprocket (A) off hub (B).
7. Using chalk (Item 11, Appendix D), mark sprocket (A) either 'INNER' or 'OUTER' depending on where it was mounted to hub (B).
8. Remove three 5/8-18 UNF bolts from sprocket (A).



9. Using hammer and punch to drive, drive 11 tapered bushings (E) out of sprocket (A). Replace bushings if needed.
10. With help from one other person, use pinchbar to set hub so other sprocket (F) faces up.
11. Repeat steps 2 thru 10 to remove other sprocket (F).

Go on to Sheet 6

TA141358

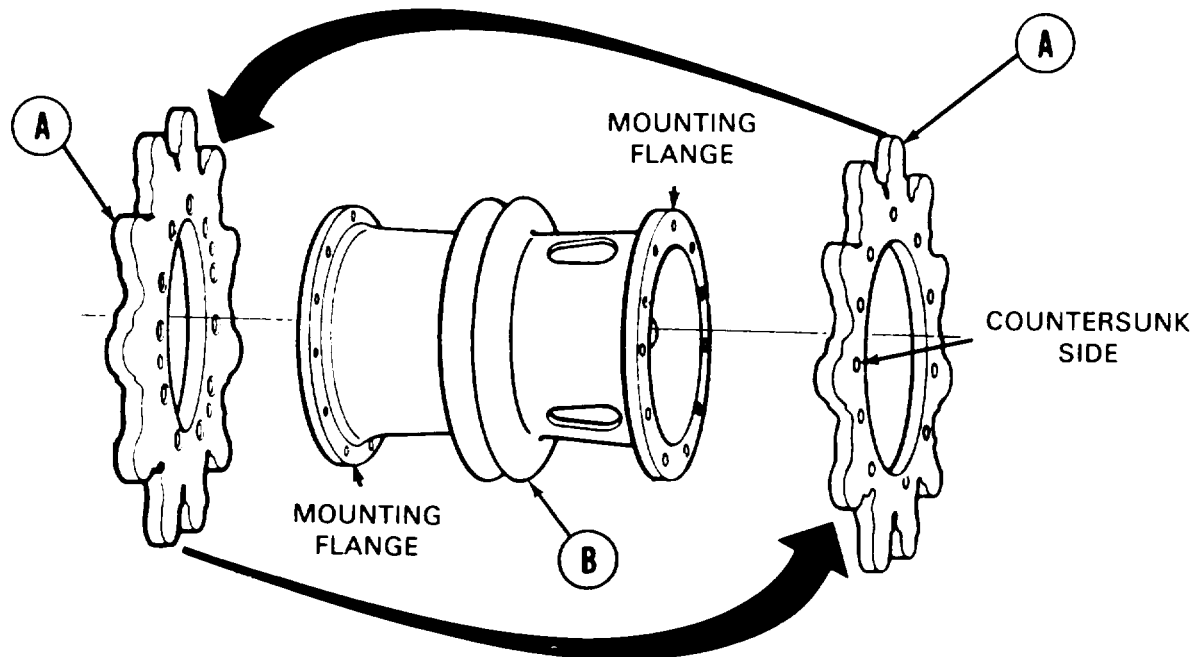
TRACK DRIVE SPROCKET REPAIR AND REPLACEMENT (Sheet 6 of 9)

INSPECTION:

1. Inspect sprockets for wear by checking wear marks or by using wear gage.
2. Inspect all parts for damage. Replace any damaged or worn parts.

ASSEMBLY:

1. If two sprockets (A) are not replaced, reverse them when reassembling.



NOTE

Sprocket marked 'OUTER' becomes inner one. Sprocket marked 'INNER' becomes outer one.

2. Mounting flange of hub (B) should be facing up.
3. Mount sprocket (A) into position to hub (B) with countersunk side of hole facing up.

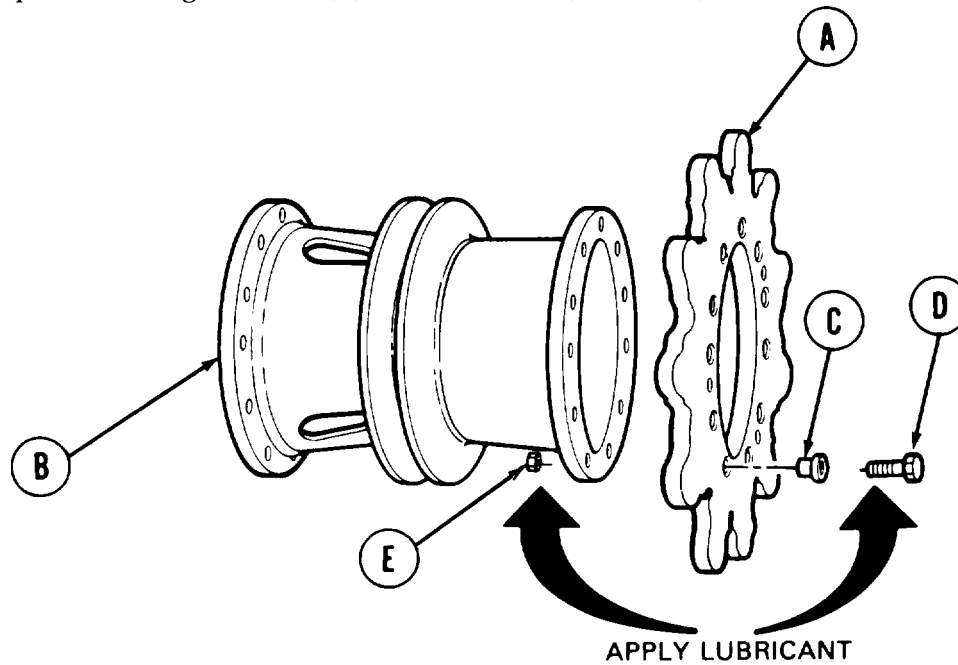
Go on to Sheet 7

TA141359

Change 1 14-77

TRACK DRIVE SPROCKET REPAIR AND REPLACEMENT (Sheet 7 of 9)

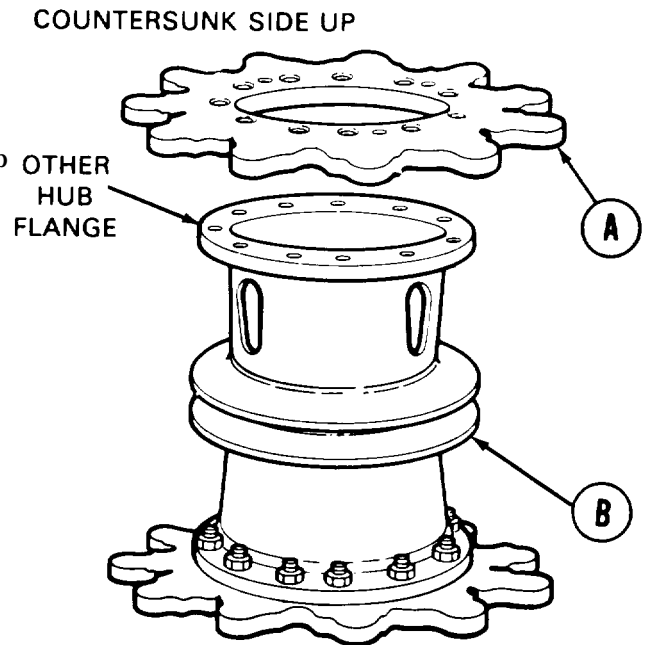
4. Using hammer and block, tap all 11 tapered bushings (C) into place in sprocket.
5. Apply light coat of lubricant (Item 40, Appendix D) to 11 new bolts (D) and nut (E) threads before installing them.
6. Using 15/16 inch socket, install 11 bolts (D) to secure sprocket (A) to hub (B). Using 15/16 socket and torque wrench, tighten bolts (D) to 450-500 ft-lb (51-56 N.m).



8. Install nuts (E) onto bolts (D).
9. Using 15/16 inch socket and torque wrench, tighten nuts (E) to 115-165 lb-ft (13-18 N.m).

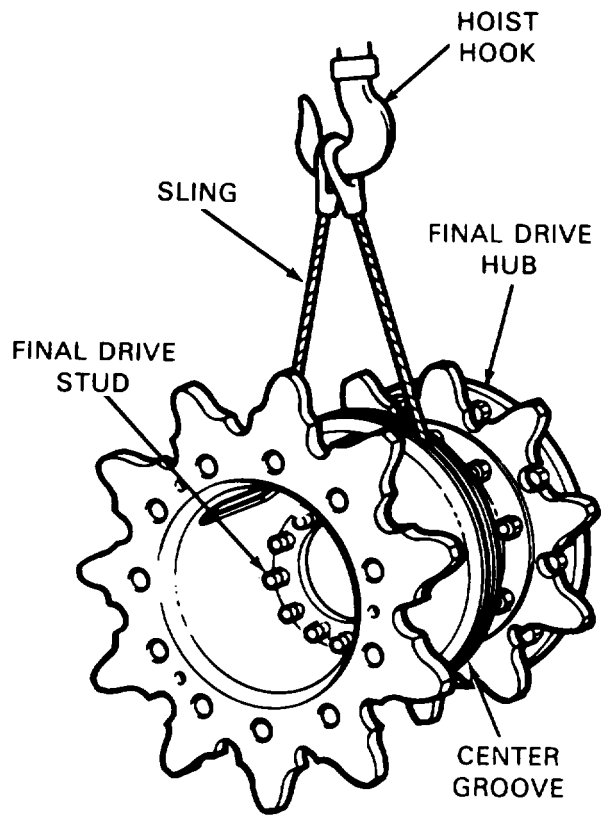
TRACK DRIVE SPROCKET REPAIR AND REPLACEMENT (Sheet 8 of 9)

10. Using pinchbar and two other persons for assistance, stand hub on end so other flange faces up.
11. Three persons lift other sprocket (A) onto hub (B) flange.
12. Repeat steps 4 through 9 to install other sprocket (A) to hub (B).



INSTALLATION:

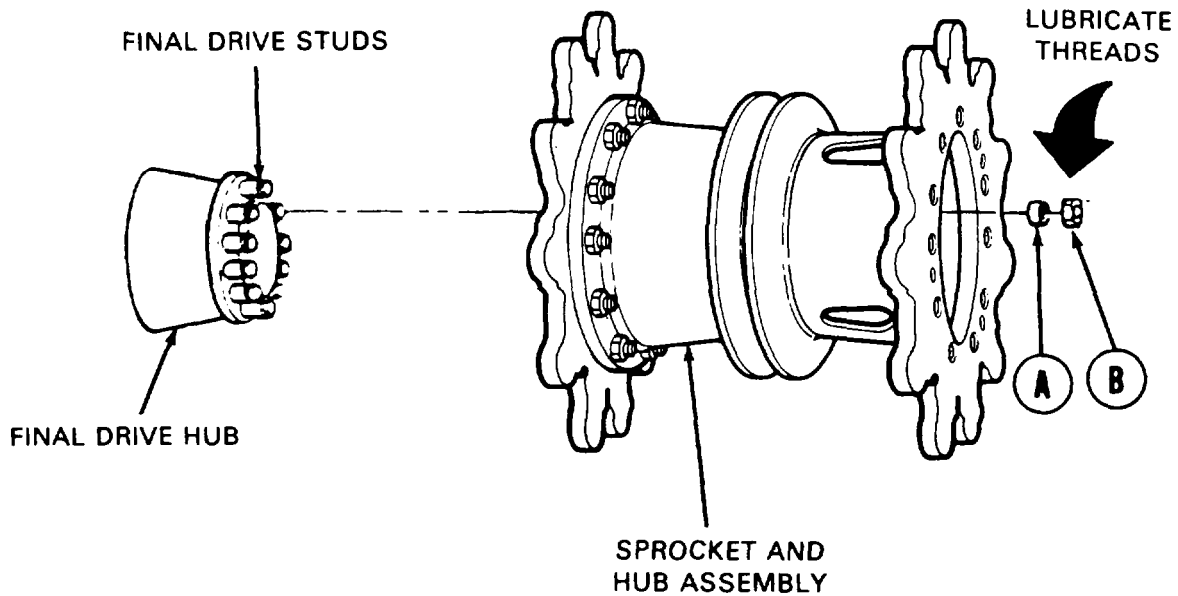
1. Position sling through center groove of hub.
2. Place loops at both ends of sling over hook of hoist.
3. Using second person to guide sprocket and hub assembly, carefully lift it into mounting position.



Go on to Sheet 9

TA141361

TRACK DRIVE SPROCKET REPAIR AND REPLACEMENT (Sheet 9 of 9)



4. Mount sprocket and hub assembly onto final drive studs.
5. Install 10 new tapered bushings(A) into hub mounting holes.
6. Apply lubricant (Item 40. Appendix D) to nuts (B).
7. Screw 10 new self-locking nuts (B) onto studs.
8. Using 1-1/2 inch socket with extension and impact wrench (or 3/4 inch drive handle if impact wrench cannot be found), tighten nuts alternately (in crisscross pattern).
9. Using torque wrench and extension, tighten nuts (B) to 450-470 lb-ft (610-637 N m).
10. Install track on rear sprocket.

End of Task

TA253490

TRACK ASSEMBLY REPLACEMENT (Sheet 1 of 10)

PROCEDURE INDEX

PROCEDURE	PAGE
Removal	14-82
Installation	14-84

TOOLS: Sledge hammer
 15/16 in. socket with 3/4 in. drive
 Hinged handle (breaker bar) with 3/4 in. drive
 Ratchet with 3/4 in. drive
 2 lb hammer
 Crowbar, pinch point
 1-5/16 in. socket 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) (0-814 N.m)
 10 in. extension with 3/4 in. drive

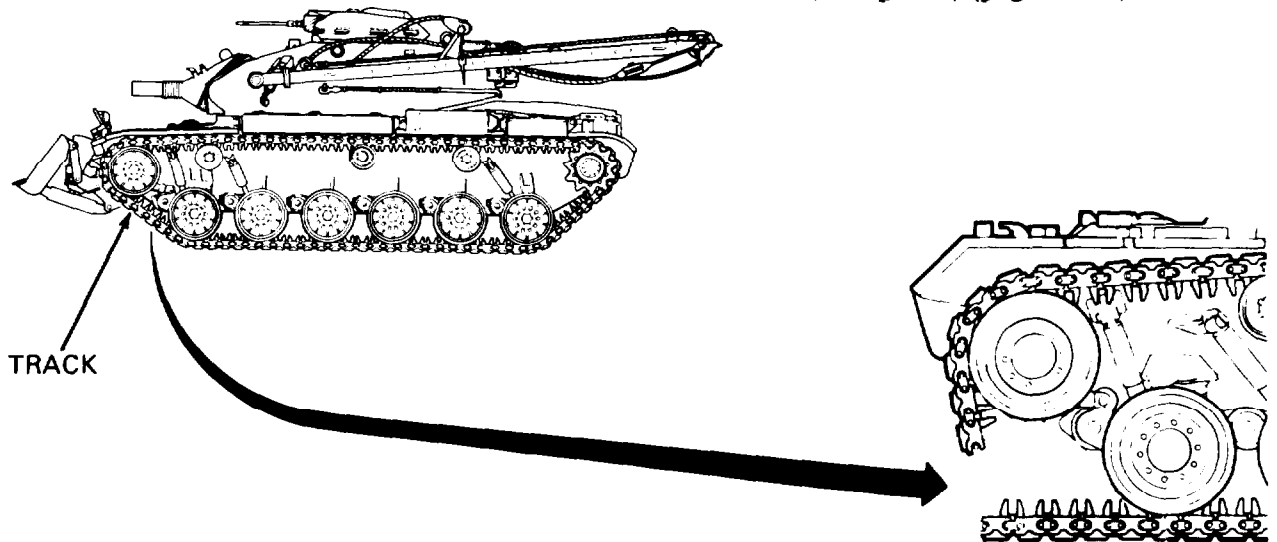
SPECIAL TOOLS: Puller and pump (Item 8, Chapter 3, Section I)
 Track components torquing tool kit (Item 16.3, Chapter 3, Section I)
 Track connecting fixture (Item 16.2, Chapter 3, Section I)

SUPPLIES: Heavy rope (50 ft)

PERSONNEL: Three

REFERENCE: TM 9-2350-222-10

PRELIMINARY PROCEDURES: Loosen track tension (TM 9-2350-222-10)
 Remove rear fender and shield (if required) (page 16-75)



Go on to Sheet 2

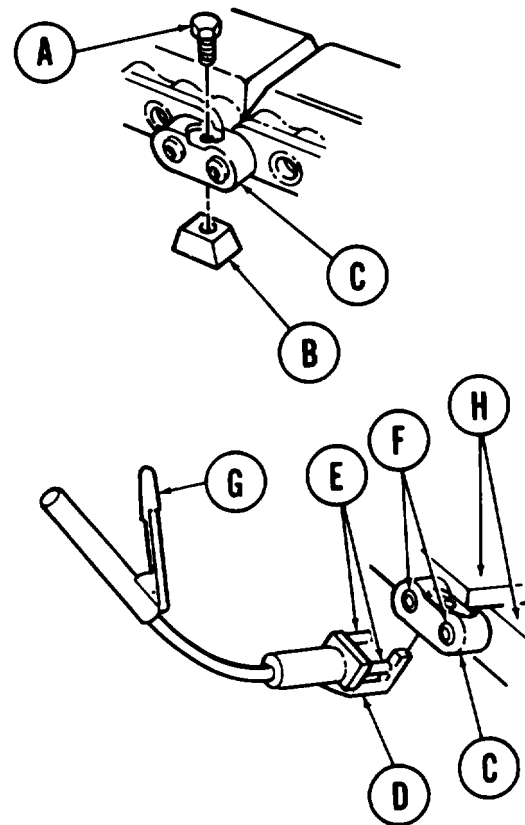
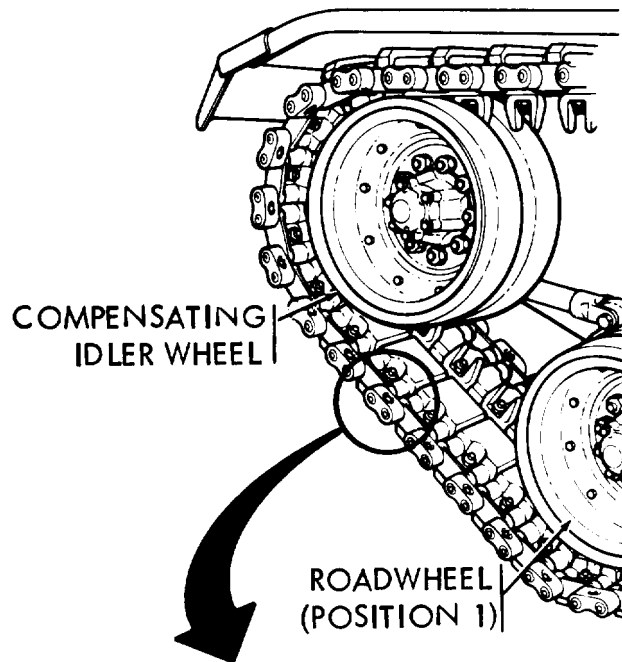
TRACK ASSEMBLY REPLACEMENT (Sheet 2 of 10)

NOTE

Disconnect track up front between compensating idler wheel and roadwheel at position No. 1 (on either side).

REMOVAL:

1. Using 15/16 inch socket with ratchet, loosen bolt (A) securing wedge (B) to end connector (C).
2. Using hammer, tap wedge (B) to loosen it.
3. Remove bolt and wedge. Throw both parts away.
4. Repeat steps 1 thru 3 to remove bolt and wedge at opposite side of track.
5. Put hook (D) of puller and pump behind end connector (C).
6. Aline studs (E) of puller with shoe pins (F).
7. Pump handle (G) until gap between end connector (C) and track shoes (H) is about one inch.



Go on to Sheet 3

TRACK ASSEMBLY REPLACEMENT (Sheet 3 of 10)

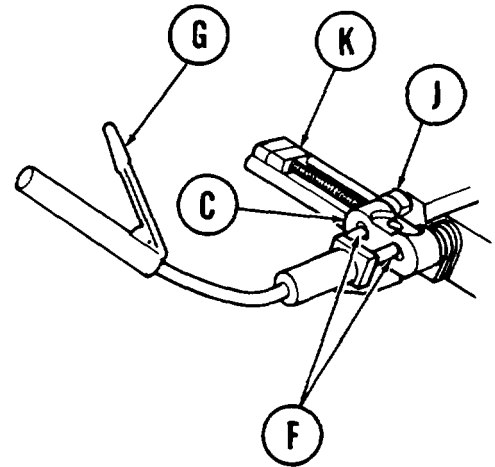
8. Hook and tighten jaws (J) of track connecting fixture (K) (Item 16.3, Chapter 3, Section I) around track shoe pins (F).

9. Pump handle (G) until end connector (C) comes off.

10. Repeat steps 5 thru 9 at opposite side of track.

11. Deleted

12. Deleted



Go on to Sheet 4

TRACK ASSEMBLY REPLACEMENT (Sheet 4 of 10)

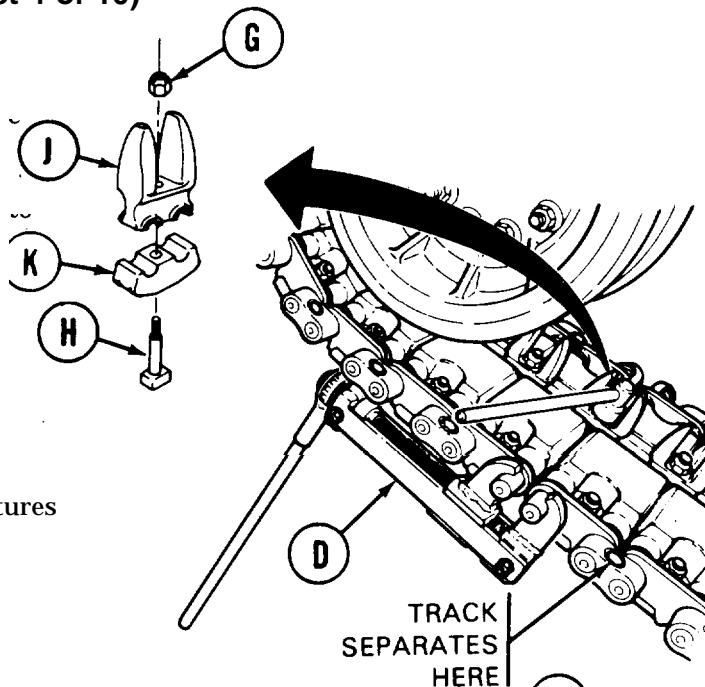
13. Using 1-5/16 inch socket with hinge handle and extension, loosen nut (G) securing centerguide bolt (H).

14. Using sledge hammer, strike centerguide (J) to loosen it.

15. Remove nut (G), centerguide (J), cap (K) and bolt (H).

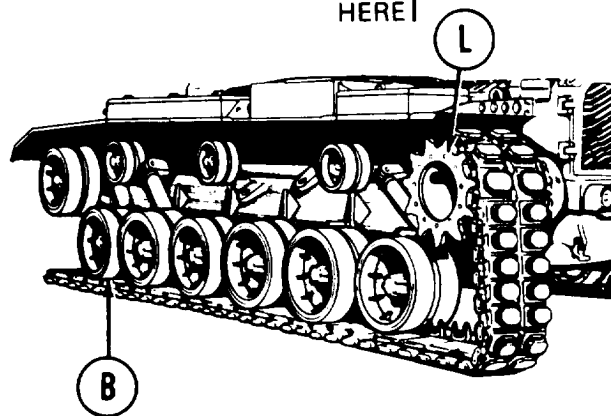
16. Using tool handle, loosen both track fixtures (D).

17. Using crowbar to support track, remove fixtures (D). Let track fall free to separate.



18. Start engine and put transmission in R (reverse) (TM 9-2350-222-10).

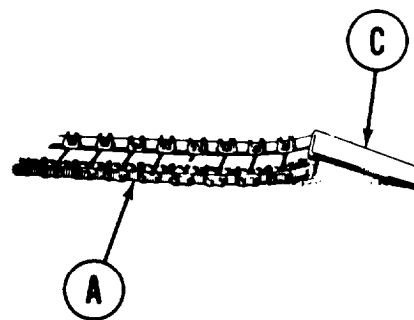
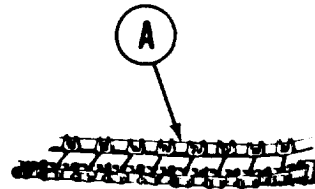
19. Move steering control handle away from track being removed. Use brake to control slow speed until track is off sprocket (L).



INSTALLATION:

1. If track is to be replaced and roadwheels are still on track, position new track (A) to mate with old track (B) as shown.

2. If roadwheels are on ground (old track (B) removed), use plank (C) as shown.



NOTE

If plank (C) or similar object is not available, dig a hole under first few links of new track.

3. Make sure new track (A) is in line with roadwheels (B).

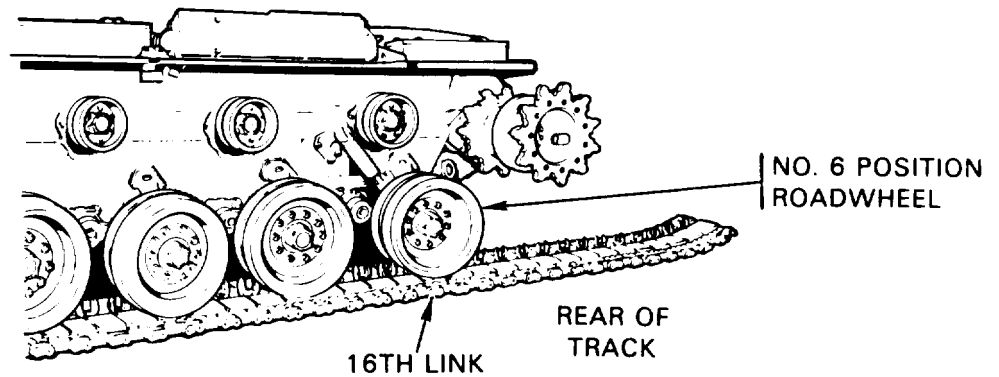
4. Start engine (TM 9-2350-222-10).

Go on to Sheet 5

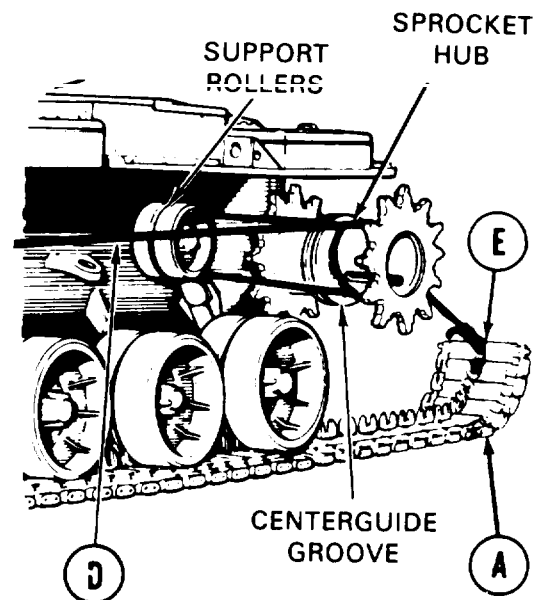
TA253493

TRACK ASSEMBLY REPLACEMENT (Sheet 5 of 10)

5. Drive tank onto new track (A). Keep moving tank until number 6 position roadwheel is on 16th link from rear of track.



6. Stop vehicle and shut off engine (TM 9-2350-222-10).
7. Apply parking brake (TM 9-2350-222-10).
8. Tie rope (D) to center of link pin (E) at rear of new track (A).
9. Place rope (D) over centerguide groove of sprocket hub.
10. String rope (D) through center groove between two rear support rollers.
11. Bring rope (D) back from support roller wheels to sprocket hub once again and wrap rope under and around sprocket hub (two turns).



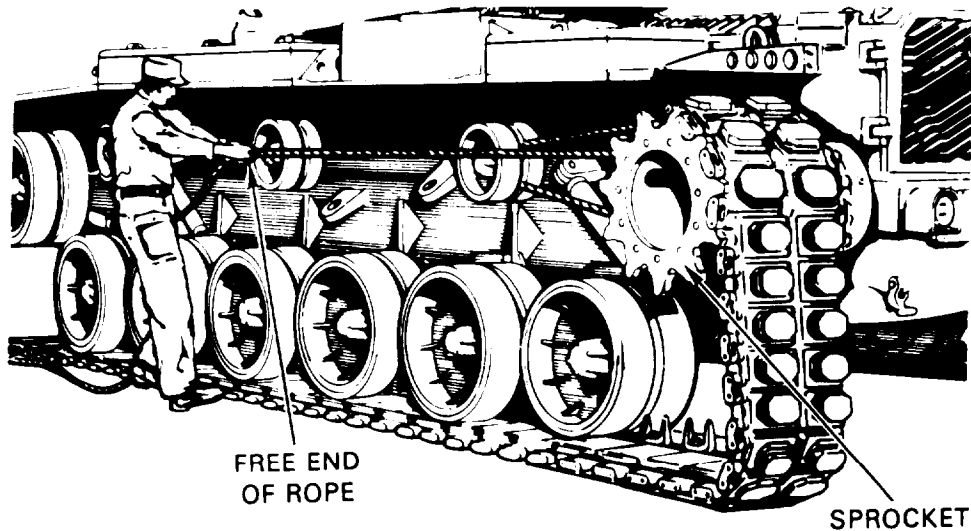
Go on to Sheet 6

TA253494

Change 1 14-85

TRACK ASSEMBLY REPLACEMENT (Sheet 6 of 10)

12. Have person pull on free end of rope.



13. Have another person start engine (TM 9-2350-222-10).

13. Have third person direct driver.

14. Run engine at idle speed. Release parking brake (TM 9-2350-222-10).

15. Place transmission shift lever in N (neutral) (TM 9-2350-222-10).

16. Position steering control to LEFT PIVOT STEER if track is being installed to right side.

17. Position steering control to RIGHT PIVOT STEER if track is being installed to left side.

18. While person pulls on free end of rope, driver in tank slowly speeds up engine to rotate sprocket.

19. When sprocket teeth have picked up three track links, have driver apply parking brakes.

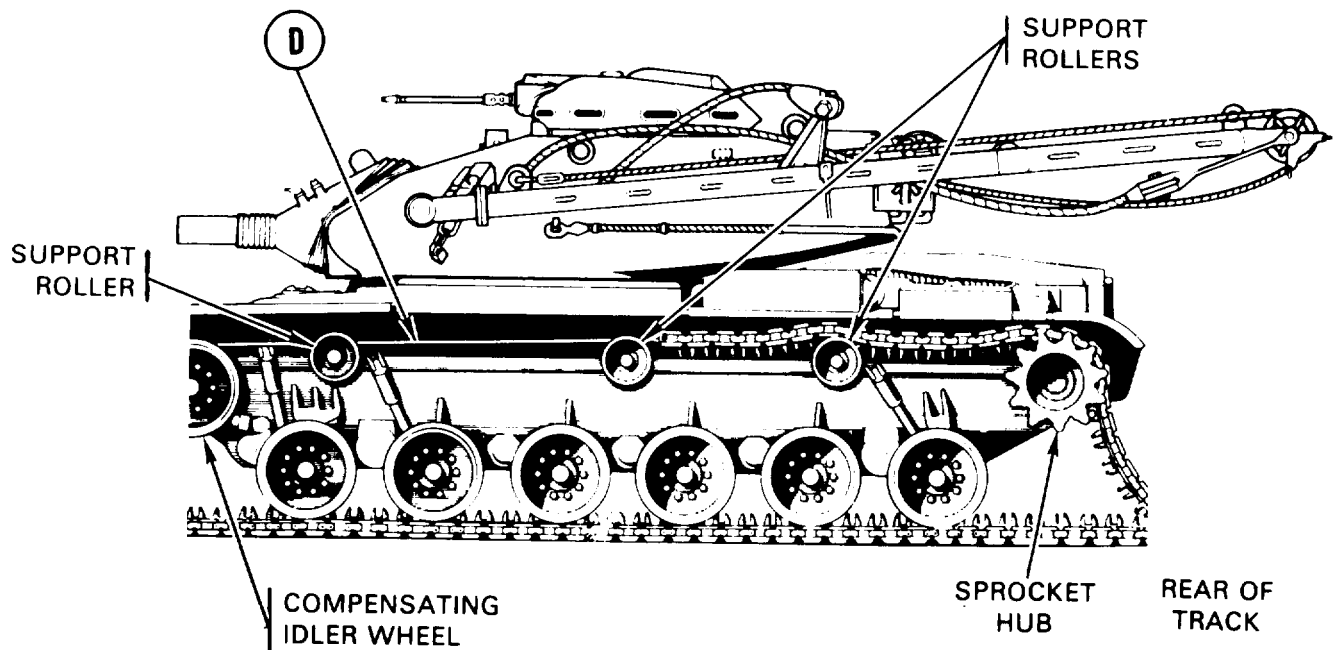
20. Have driver stop engine (TM 9-2350-222-10).

Go on to Sheet 7

TA253495

TRACK ASSEMBLY REPLACEMENT (Sheet 7 of 10)

21. Remove rope (D) from around sprocket hub and rear support roller.



22. With rope still attached to rear of track, pull rope forward over all three support rollers and compensating idler wheels.

NOTE

Make sure rope goes between groove in support roller and compensating idler wheels.

23. Have driver start engine and idle it (TM 9-2350-222-10).

24. Release parking brake (TM 9-2350-222-10),

25. Shift transmission lever to L (low) (TM 9-2350-222-10).

25.1 Have third person direct driver.

26. Have person pulling on rope walk in front of and to one side of tank as it moves forward slowly.

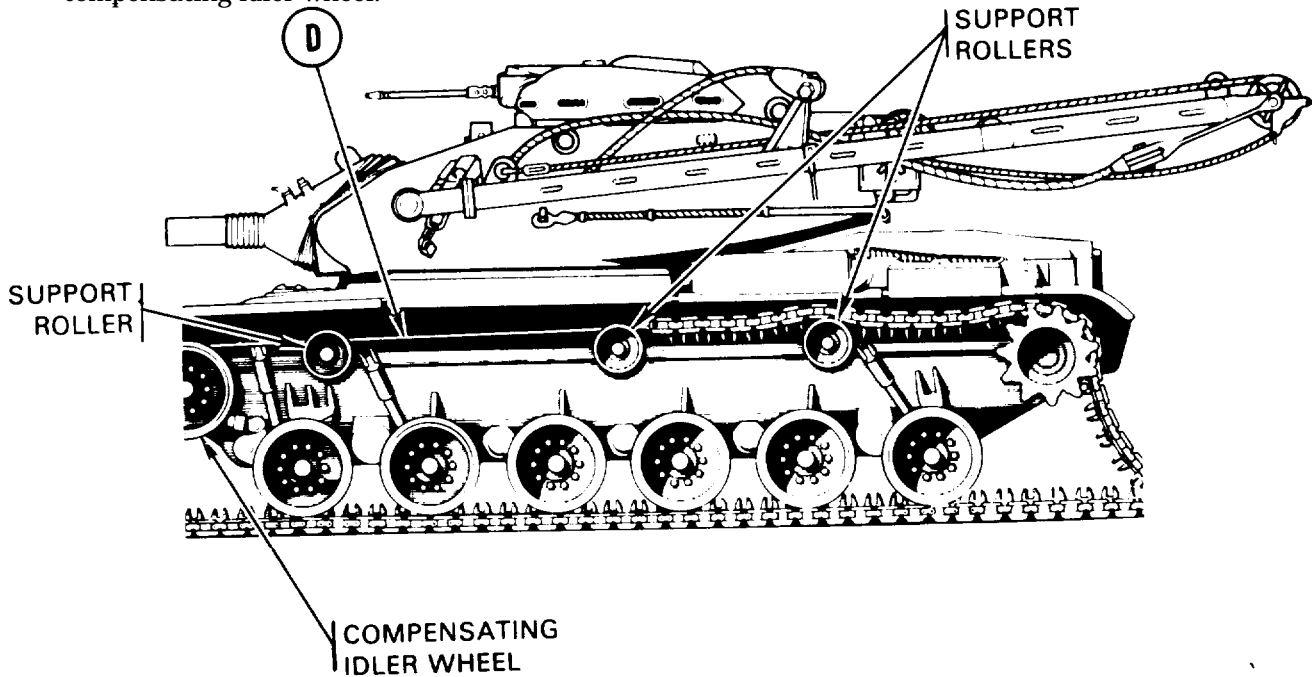
Go on to Sheet 8

TA253496

Change 1 14-87

TRACK ASSEMBLY REPLACEMENT (Sheet 8 of 10)

27. Speed engine just enough so person pulling on rope can steer track up over all support rollers and compensating idler wheel.



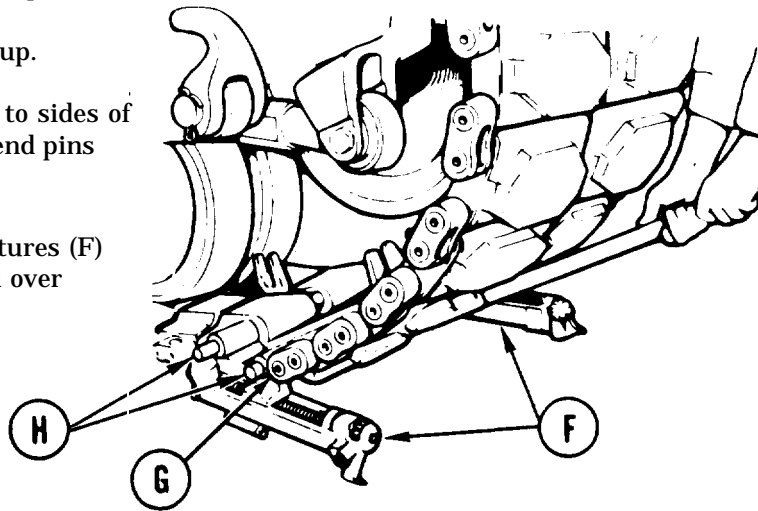
28. When track is over compensating idler wheel, is tight around sprocket, and is ready to be connected, shut down engine. Apply parking brake (TM 9-2350-222-10).

29. Shorten track adjusting link as much as possible (TM 9-2350-222-10).

30. Using crowbar lift lower end of track up.

31. Connect track connecting fixtures (F) to sides of track. Make sure fixtures are around end pins (H) and remove rope (D).

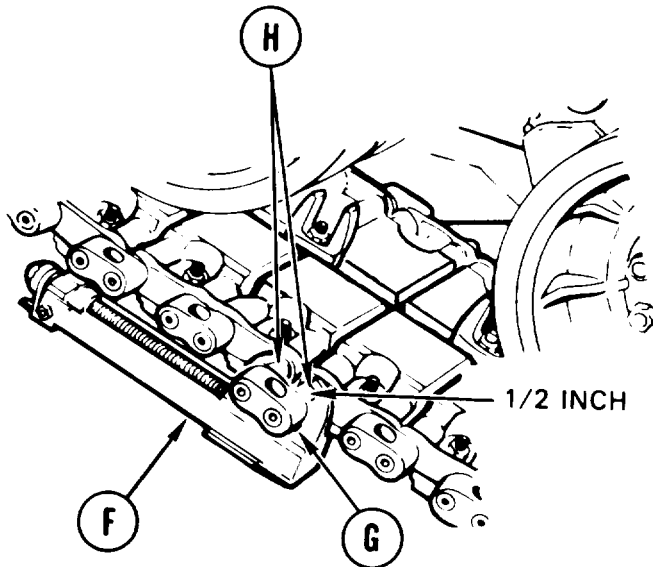
32. Using tool handle, tighten up both fixtures (F) until end connector (G) can be started over track end pins (H).



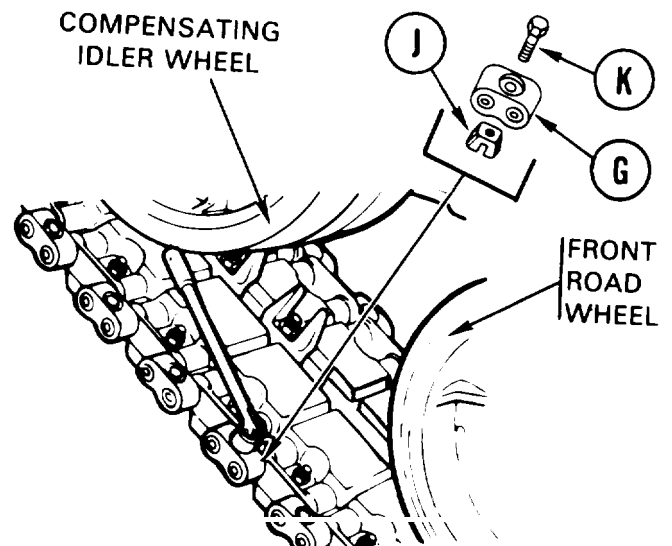
Go on to Sheet 9

TA253497

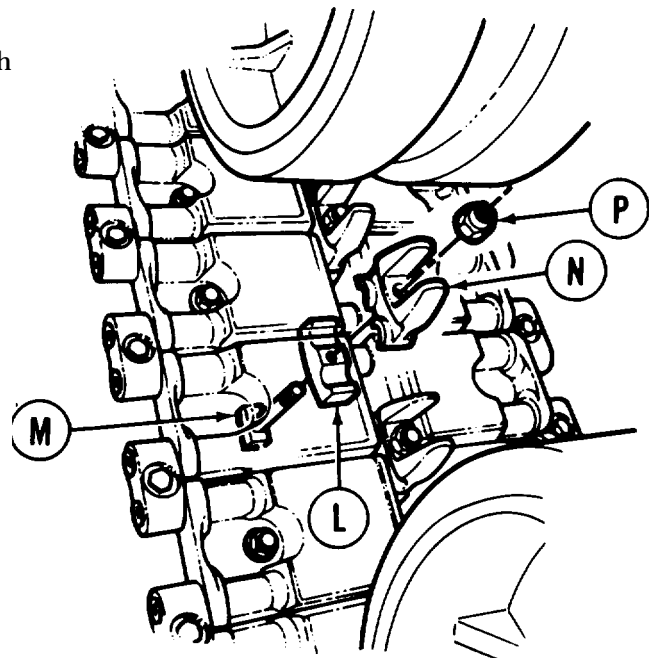
33. Using hammer, drive two end connectors (G) onto two pins (H) held together by fixture (F) clamps.
34. Leave 1/2 inch space between end connectors (G) and fixtures (F).



35. Remove track connecting fixtures (F).
36. Using hammer, drive both end connectors (G) all the way onto link pins (H).



37. Place wedge (J) to underside of end connector (G).
38. Using 15/16 inch socket, install bolt (K) through wedge (J). Tighten bolt snug.
39. Install cap (L), bolt (M), centerguide (N), and nut (P).
40. Using 1-5/16 inch socket and extension, tighten nut (P) to secure centerguide (N) in place.
41. Using 1-5/16 inch socket and torque wrench or torquing tool kit (Item 16.3, chapter 3, Section I), torque nut (P) to 15-20 lb-ft, (20-27 N-m).



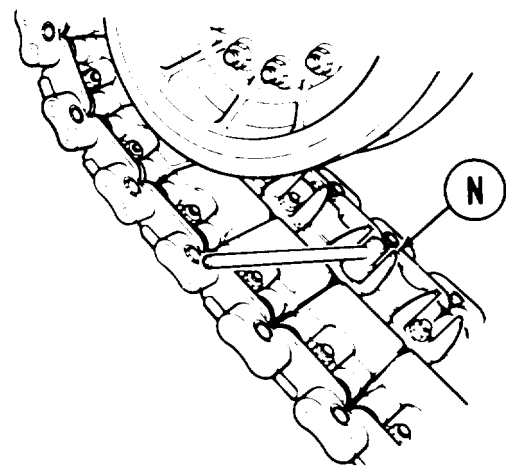
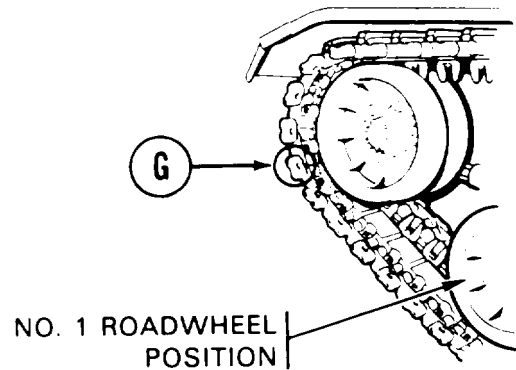
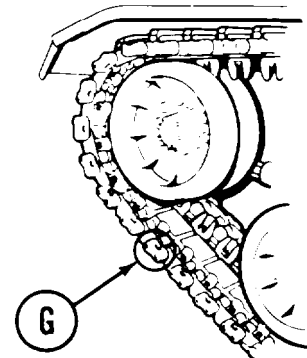
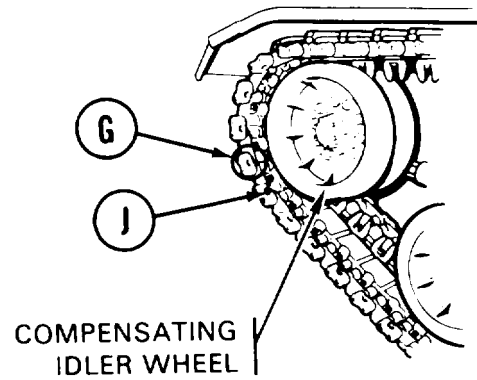
Go on to Sheet 9.1

TRACK ASSEMBLY REPLACEMENT (Sheet 9.1 of 10)

NOTE

If P.D. 704 torque wrench kit is available, go to step 49. If not available, go to step 42.

42. Have other person start engine (TM 9-2350-222-10). Slowly drive tank until the track link in front of the end connectors (G), just installed, is fully engaged over the compensating idler wheel and the track link after end connectors (G) is just touching the compensating idler wheel.
43. Using torque wrench with 15/16 inch socket, tighten end connector wedge (J) bolts to 180-200 lb-ft (244-271 N-m).
44. Move tank until end connector (G) is in lower position.
45. Move tank until end connector (G) is located in same position as step 42. Using torque wrench, tighten to 180-200 lb-ft (244-271 N-m).
46. Repeat steps 42 thru 44 until torque stays at 180-200 lb-ft (244-271 N-m).
47. Move tank until centerguide (N) is between compensating idler wheel and No. 1 roadwheel position.
48. Using torque wrench, tighten centerguide nut (p) to 350-380 lb-ft (474-515 N-m).



Go on to Sheet 9.2

TRACK ASSEMBLY REPLACEMENT (Sheet 9.2 of 10)

NOTE

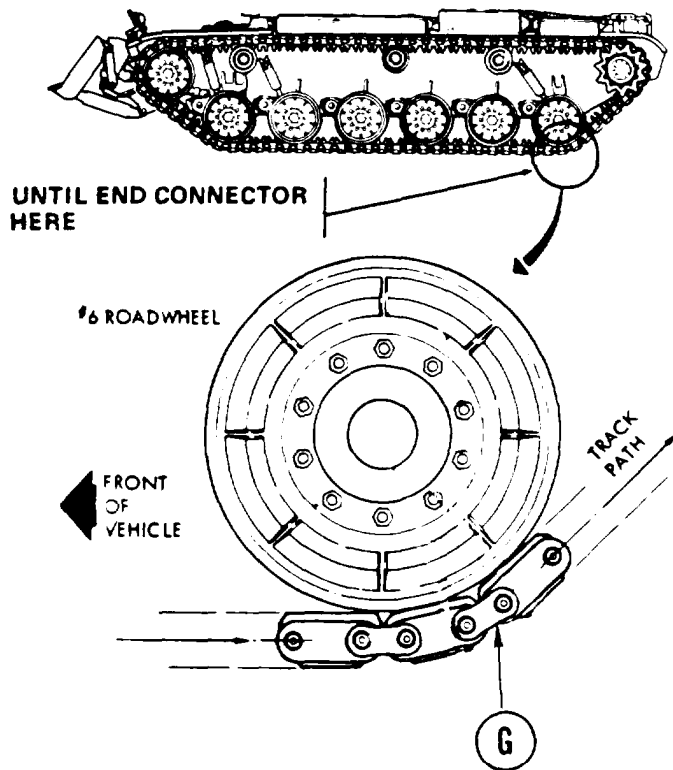
For ease of access, end connector to be tightened must be positioned at number 6 roadwheel.

49. Start engine (TM 9-2350-222-10). Slowly move vehicle until end connector (G) nut to be tightened is positioned at number 6 roadwheel.

WARNING

Tightening inboard end connector requires personnel to be under the vehicle. Perform steps 50 through 53 to prevent injury to personnel. (Refer to TM 9-2350-222-10).

50. Set transmission shift lever to park.
51. Set and lock brakes.
52. Block tracks to prevent vehicle movement.
53. Shut engine off (TM 9-2350-222-10).

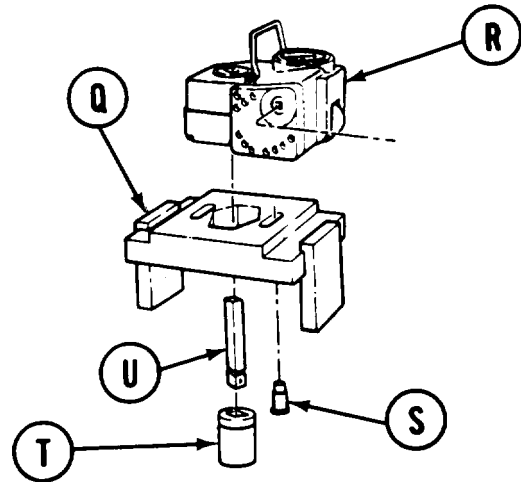


Go on to sheet 9.3

TRACK ASSEMBLY REPLACEMENT (Sheet 9.3 of 10)

54. Fasten adapter (Q) to torque pack (R) using shoulder screw (S).

55. Place 15/16 inch socket (T) on drive bar (U) and install drive bar (U) into torque pack (R).



56. Position torque pack (R) with adapter (Q) drive bar (U), and socket (T) over nut on end connector (G) to be tightened. Ensure adapter (Q) legs are seated firmly against shoe assemblies on either side.

57. Install ratchet (V) on torque pack (R) and rotate ratchet until socket (T) engages nut on end connector (G).

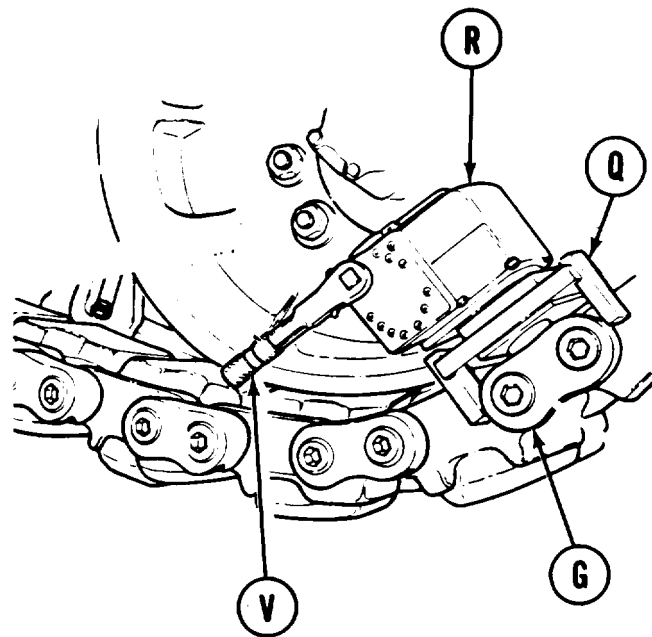
58. Rotate ratchet (V) clockwise until torque pack dial indicates 180-200 lb-ft (244-271 N-m).

59. Wait approximately 15 seconds, read dial, and repeat step 58 until dial reading stabilizes at 180-200 lb-ft (244-271 N-m).

60. Rotate ratchet (V) counterclockwise until dial reading indicates 0. Remove torque pack.

61. Repeat steps 56 thru 60 to tighten inboard end connector.

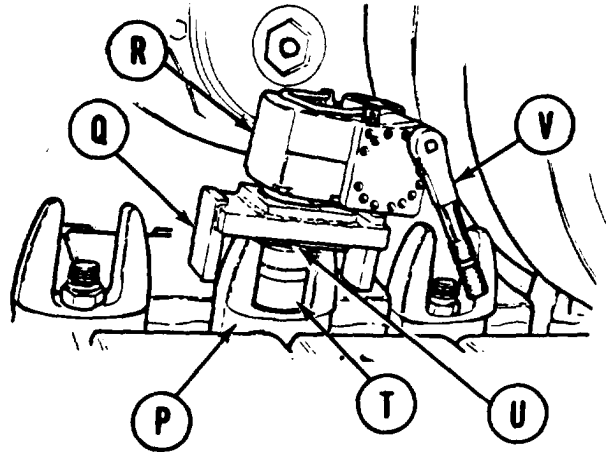
62. Remove 15/16 inch socket (T) from torque pack (R).



Go on to Sheet 10

TRACK ASSEMBLY REPLACEMENT (Sheet 10 of 10)

63. Place 1-5/16 inch socket (T) on drive bar (U).
64. Position torque pack (R) with adapter (Q), drive bar (U), and socket (T) over centerguide nut (P) to be tightened. Ensure adapter (Q) legs envelop top of centerguide ears.
65. Install ratchet (V) on torque pack (R) and rotate ratchet until socket (T) engages centerguide nut (P).
66. Rotate ratchet (V) clockwise until torque pack dial indicates 350-380 lb-ft (474-515 N-m).
67. Wait approximately 15 seconds, read dial, and repeat step 66 until dial reading stabilizes at 350-380 lb-ft (474-515 N-m).
68. Rotate ratchet (V) counterclockwise until dial reading indicates O. Remove torque pack.
69. Apply track tension (TM 9-2350-222-10).
70. Install rear fender and shield (if required) (page 16-78).



End of Task

TRACK SHOE PAD REPLACEMENT (Sheet 1 of 2)

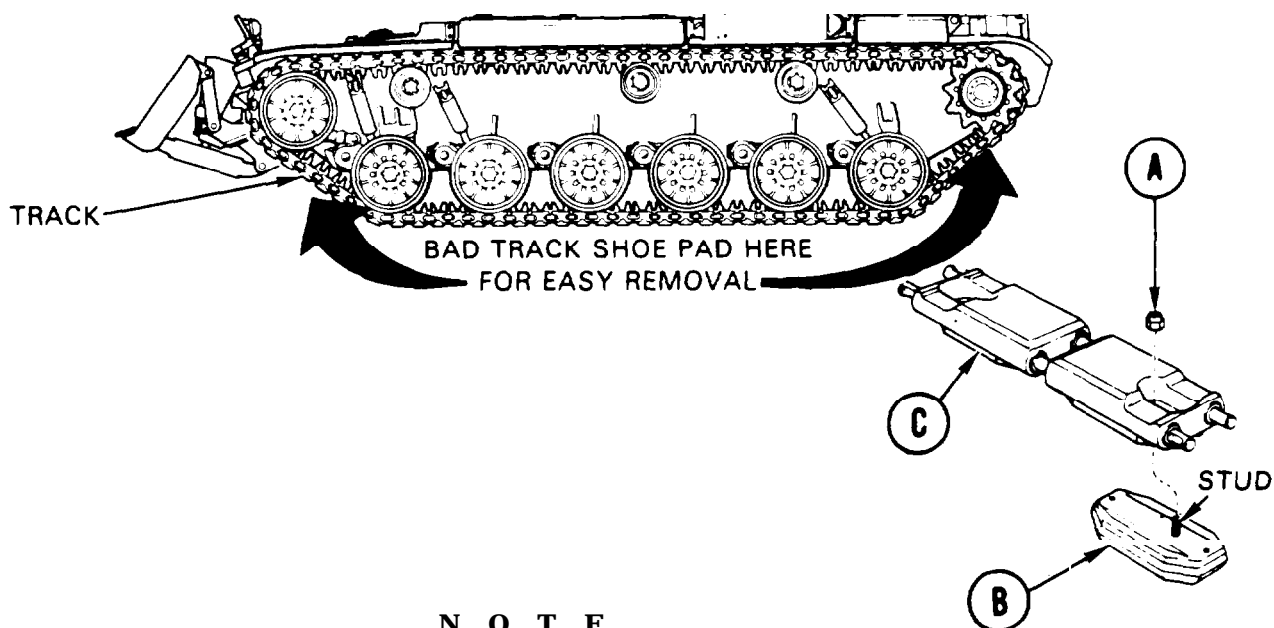
TOOLS: 1-1/8 in. socket with 3/4 in. drive
Ratchet with 3/4 in. drive
Ball peen hammer
T-handle with 3/4 in. drive
Torque wrench with 3/4 in. drive (0-600 lb-ft) (0-814 N-m.) or P.D. 704 torque wrench kit

SUPPLIES: Track pad parts kit (5704208)

SPECIAL TOOLS: Track components torquing tool kit (Item 16.3, Chapter 3, Section I)

REFERENCE: TM 9-2350-222-10

PRELIMINARY PROCEDURES: Position tank for easy removal and installation of track shoe pad (TM 9-2350-222-10)
Apply parking brake TM 9-2350-222-10



N O T E

Track shoe pads can be removed from T142 tracks. Pads can be removed with track installed on vehicle or from link (off vehicle).

REMOVAL:

1. Using socket with ratchet (or T-handle), remove nut (A). Throw nut away.
2. Using hammer, drive shoe pad (B) out of link (C). Throw pad away.

INSTALLATION:

1. Position pad (B) in link (C). Screw nut (A) onto pad (B) stud.

N O T E

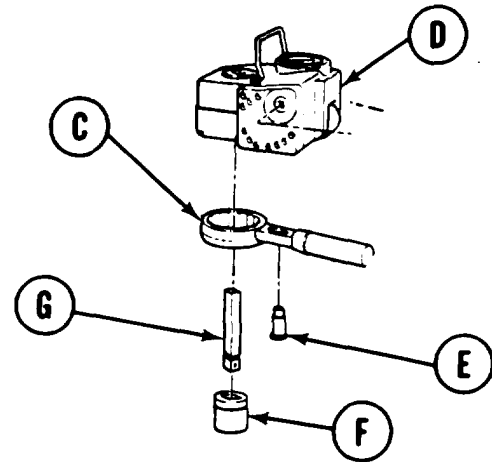
If P.D. 704 torque wrench kit is available, go to step 3. If not available, do step 2 only.

2. Using torque wrench or torquing tool kit, tighten nut (A) to 260-280 lb-ft (352-379 N-m).

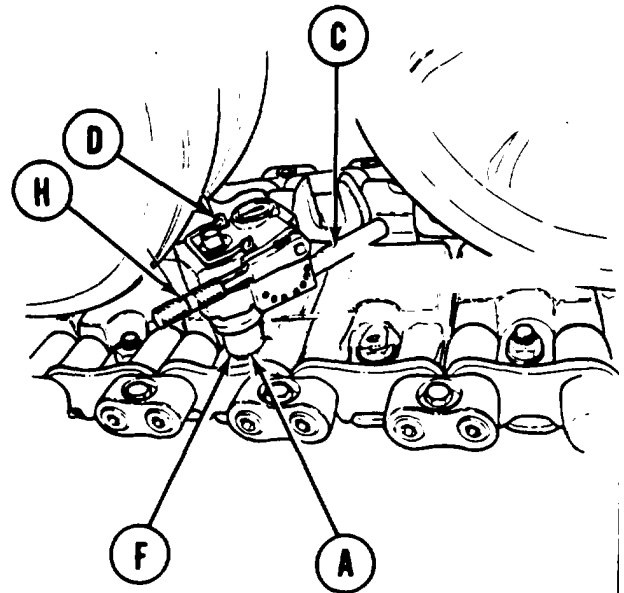
Go on to Sheet 2

TRACK SHOE PAD REPLACEMENT (Sheet 2 of 2)

3. Position reaction lever (C) on torque pack (D) and secure using shoulder screw (E).
4. Place 1-1/8 inch socket (F) on drive bar (G) and install drive bar (G) into torque pack (D).



5. Position torque pack (D) with drive bar (G) and socket (F) over center pad nut (A) to be tightened.
6. Install ratchet (H) on torque pack (D) and rotate ratchet until socket (F) engages center pad nut (A).
7. Rotate ratchet (H) clockwise until torque pack dial indicates 260-280 lb-ft (352-379 N-m).
8. Wait approximately 15 seconds, read dial, and repeat step 7 until dial reading stabilizes at 260-280 lb-ft (352-379 N-m).
9. Rotate ratchet (H) counterclockwise until dial reading indicates 0. Remove torque pack.



End of Task

T142 TRACK LINK REPLACEMENT (Sheet 1 of 3)

TOOLS: 15/16 in. socket with 3/4 in. drive
Ratchet with 3/4 in. drive
1-5/16 in. socket with 3/4 in. drive
Hammer
Hinged handle with 3/4 in. drive
1-1/2 in. socket with 3/4 in. drive
10 in. extension with 3/4 in. drive
T-Slide handle with 3/4 in. drive

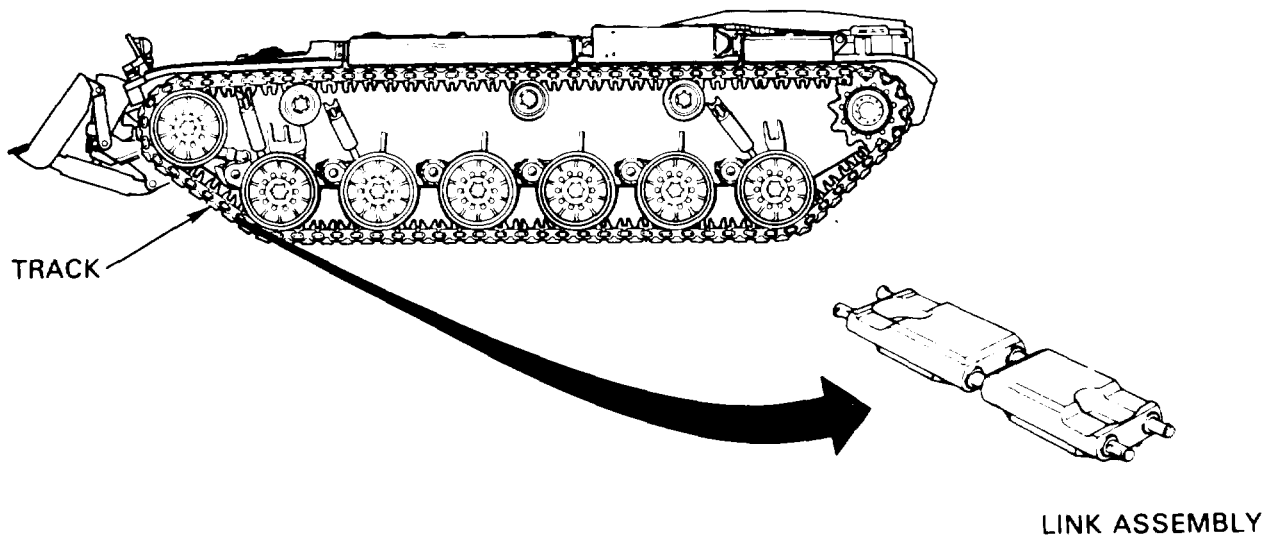
SPECIAL TOOLS: Puller and pump (Item 8, Chapter 3, Section I)

REFERENCE: TM 9-2350-222-10

PRELIMINARY PROCEDURE: Disconnect track (TM 9-2350-222-10)

NOTE

There are two track designs - T142 and T97. Do not mix tracks on same vehicle.



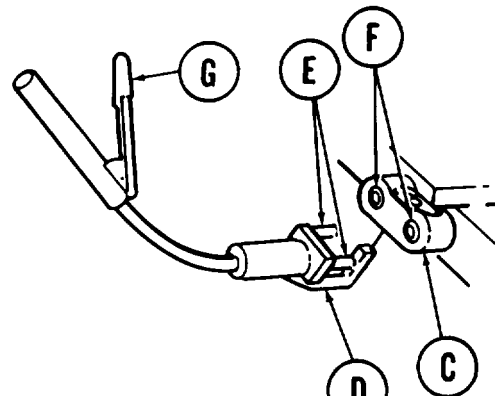
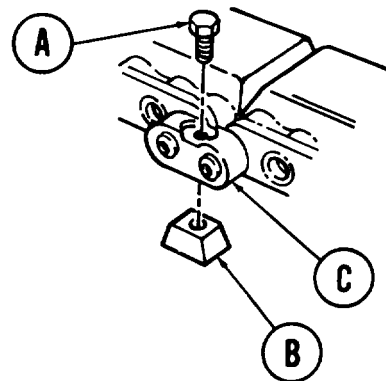
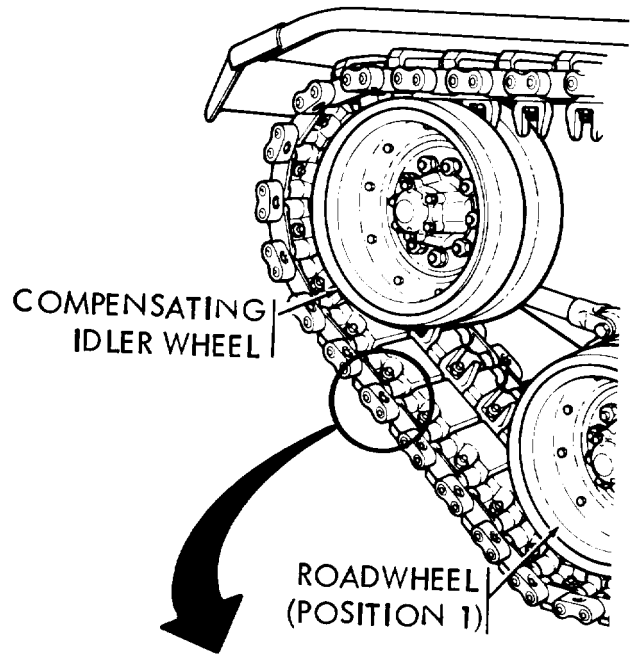
Go on to Sheet 2

NOTE

Position link to be replaced between compensating idler wheel and roadwheel No. 1. Disconnect track at link to be replaced. It will be necessary to remove end connectors and centerguide on both sides of link.

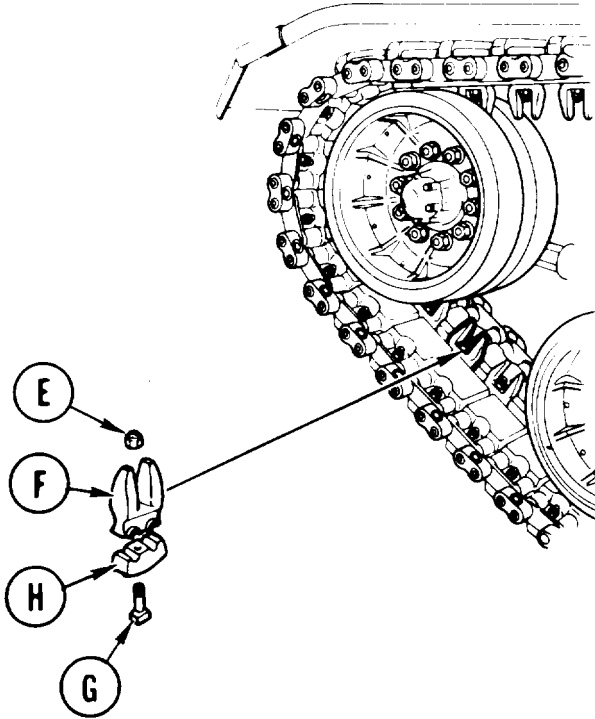
REMOVAL

1. Using 15/16 inch socket with ratchet, loosen bolt (A) securing wedge (B) to end connector (C).
2. Using hammer, tap wedge (B) to loosen it.
3. Remove bolt and wedge. Throw both Parts away.
4. Repeat steps 1 thru 3 to remove bolt and wedge at opposite side of track.
5. Put hook (D) of puller and pump behind end connector (C).
6. Aline studs (E) of puller with shoe pins (F).
7. Pump handle (G) until end connector (C) comes off.
8. Repeat steps 5, 6, and 7 to remove opposite end connector.



Go on to Sheet 3

T142 TRACK LINK REPLACEMENT (Sheet 3 of 3)



- Using 1-5/16 inch socket, T-slide handle, and extension, loosen nut (E).
10. Remove nut (E) and centerguide (F). Throw nut and centerguide away.
 11. Using hammer, tap bolt (G) loose.
 12. Remove bolt (G) and cap (H). Throw bolt and cap away.
 13. Remove link assembly from track. Throw link assembly away.

INSTALLATION:

CAUTION

Replace link with one that has same thickness as other links in track. Thicker link can cause vibration.

1. Connect track with new track link assembly (TM 9-2350-222-10).
2. Torque new end connector and centerguides (page 14-90).
3. Tighten track tension (TM 9-2350-222-10).

End of Task

SHOCK ABSORBER REPLACEMENT (Sheet 1 of 2)

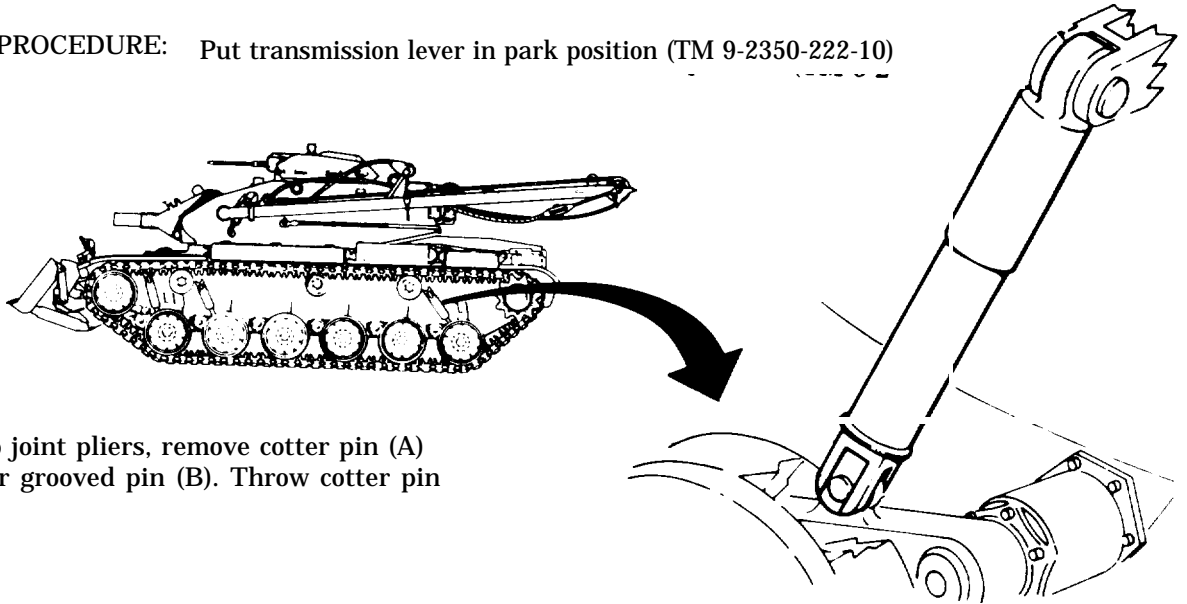
TOOLS: Slip joint pliers
Pinch bar, 26 in. long
12 lb. hammer
Long round nose pliers

PERSONNEL: Two

REFERENCE: TM 9-2350-222-10

SUPPLIES: Cotter pins (two)

PRELIMINARY PROCEDURE: Put transmission lever in park position (TM 9-2350-222-10)

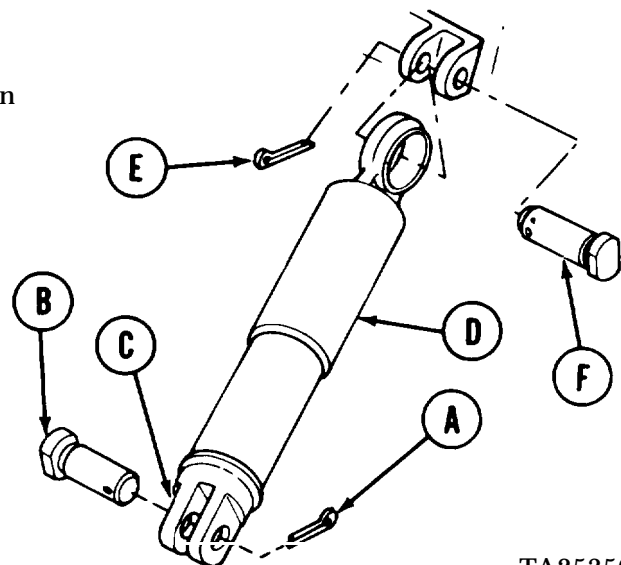


REMOVAL:

1. Using slip joint pliers, remove cotter pin (A) from lower grooved pin (B). Throw cotter pin away.

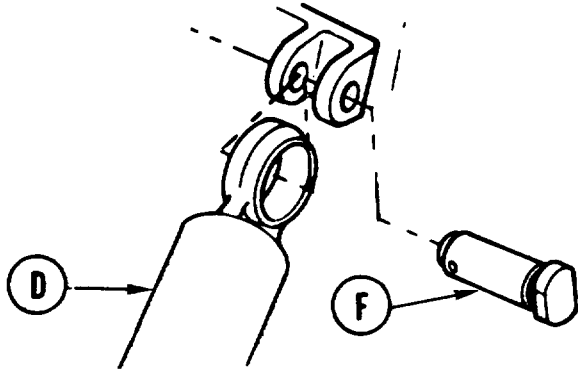
2. Using pinch bar, pry lower grooved pin (B) out of shock absorber yoke (C), while second person holds shock absorber (D).

3. Using long round nose pliers, remove cotter pin (E) from upper grooved pin (F). Throw cotter pin away.



Go on to Sheet 2

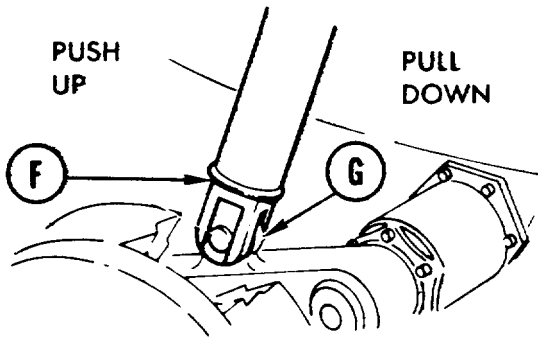
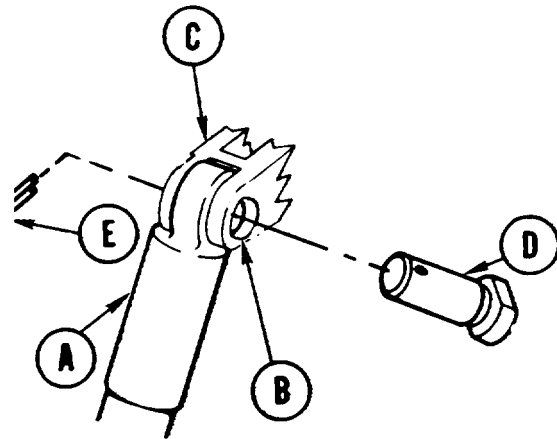
SHOCK ABSORBER REPLACEMENT (Sheet 2 of 2)



4. While one person holds shock absorber (D), second person, using hammer, drive out upper grooved pin (F).
5. Remove shock absorber (D).

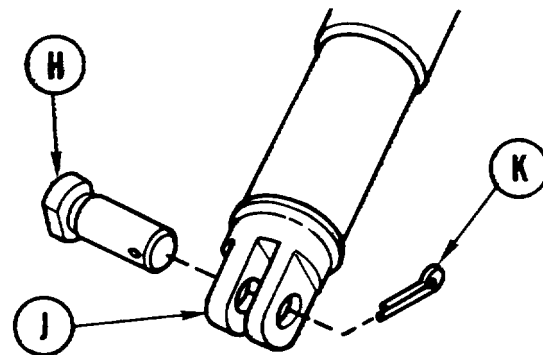
INSTALLATION:

1. With one person holding shock absorber (A), aline upper eye (B) with hull mounting yoke (C) and with keyways.
2. Using fingers, insert upper grooved pin (D) in position through yoke (C) and eye (B).
3. Using pliers, install new cotter pin (E).



4. Aline lower shock absorber yoke (F), with roadwheel support arm (G). Aline keyways by pushing up or pulling down on yoke.

5. Using fingers, install lower grooved pin (H) through shock absorber yoke (J), with cotter pin hole facing out.
6. Using pliers, install new cotter pin (K).



End of Task

TA253504

SHOCK ABSORBER BEARING REPAIR (Sheet 1 of 2)

TOOLS: Hammer
 Chisel
 1-1/2 in. socket with 3/4 in. drive
 Ratchet with 3/4 in. drive
 Vise
 Center punch

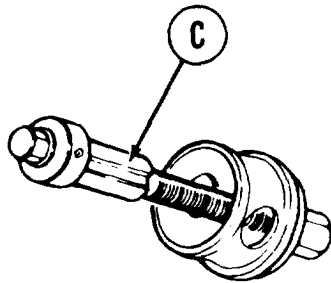
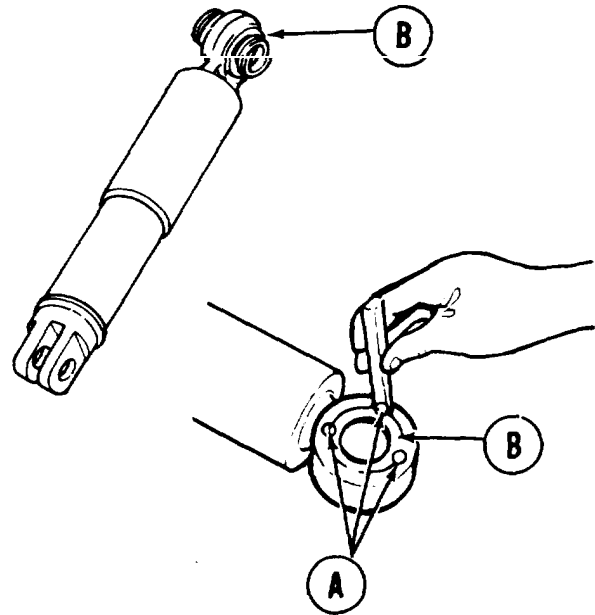
SPECIAL TOOLS: Shock absorber bearing tool assembly (Item 24, Chapter 3, Section I)

SUPPLIES: Bearing (7974760)

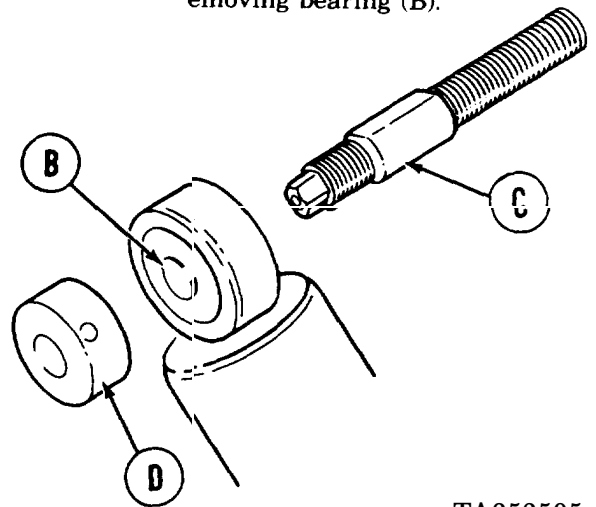
PRELIMINARY PROCEDURE: Remove shock absorber from tank (page 14-95)

DISASSEMBLY:

1. Using hammer and chisel, (three places, each side).



2. Get tool assembly (Item 24, Chapter 3, removing bearing (B)).



SPECIAL TOOL ASSEMBLY

3. Put shorter threaded end of screw (C) through bore of bearing (B).
4. Screw base (D) of special tool onto shorter end. Base should mate to one side of bearing bore.

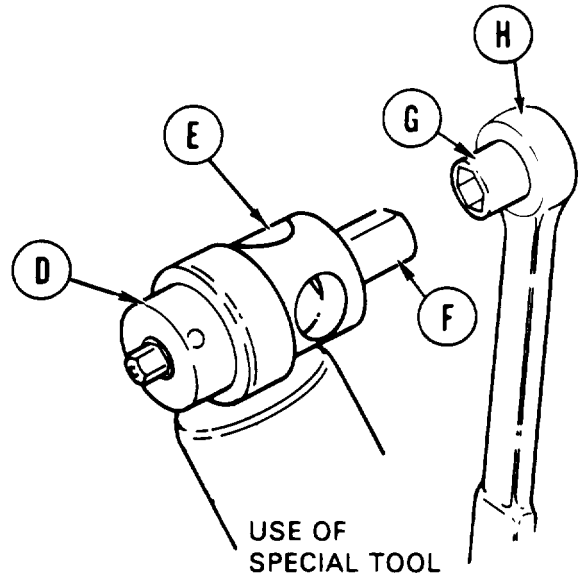
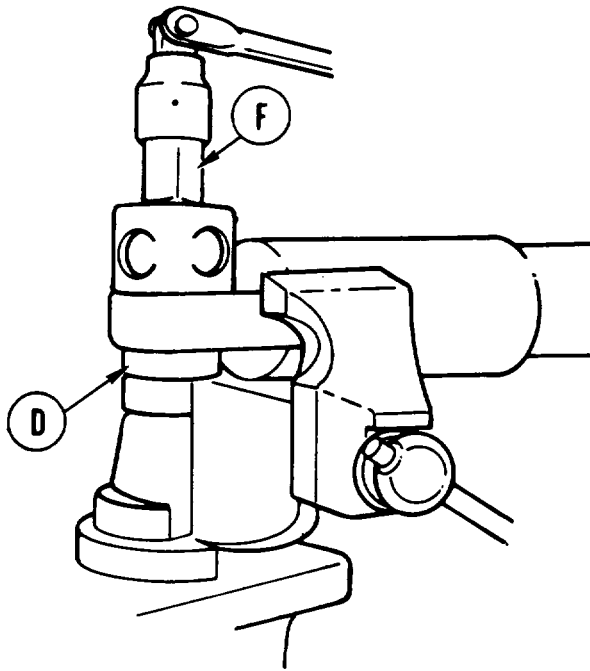
Go on to Sheet 2

TA253505

Change 1 14-97

SHOCK ABSORBER BEARING REPAIR (Sheet 2 of 2)

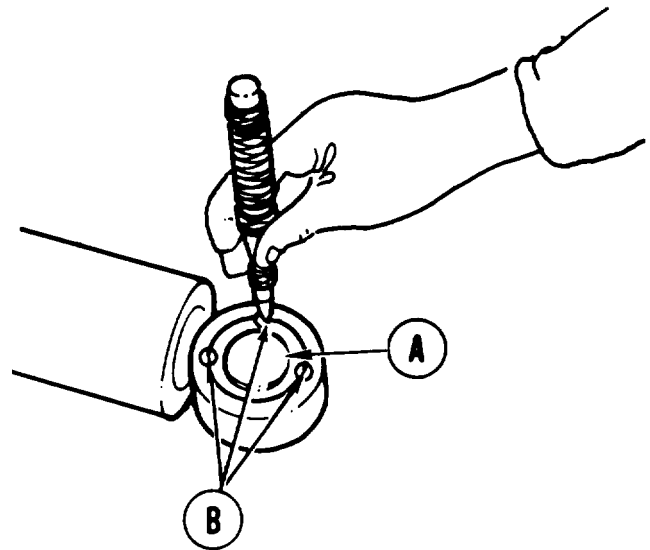
5. Position remover (E) onto longer threaded end of screw. Remover (E) should mate to surface of bearing (D) at other side.
6. Screw nut (F) onto longer end until it mates with remover.
7. Put shock absorber in vise.



8. Using socket (G) with ratchet (H), turn nut (F) of special tool to force bearing (D) out of shock absorber.
9. Throw bearing away.

ASSEMBLY:

1. Using special tool (Item 26, Chapter 3, Section I) as shown, install new bearing (A) in shock absorber.
2. Using hammer and center punch, stake bearing (B) (three places, each side) to hold bearing in place.
3. Install shock absorber (page 14-96).



End of Task

TA253506

SHOCK ABSORBER MOUNTING YOKE BUSHING REPLACEMENT (Sheet 1 of 4)

PROCEDURE INDEX

PROCEDURE	PAGE
Front and Middle Mounting Yoke Bushings Replacement	14-98.1
Rear Mounting Yoke Bushings Replacement	14-98.3

TOOLS: Hammer

SPECIAL TOOLS: Remover and replacer (Item 9, Chapter 3, Section I)
Handle (Rem 12, Chapter 3, Section I)

REFERENCE: TM 9-2350-222-10

PRELIMINARY PROCEDURE: Remove shock absorber (page 14-95)

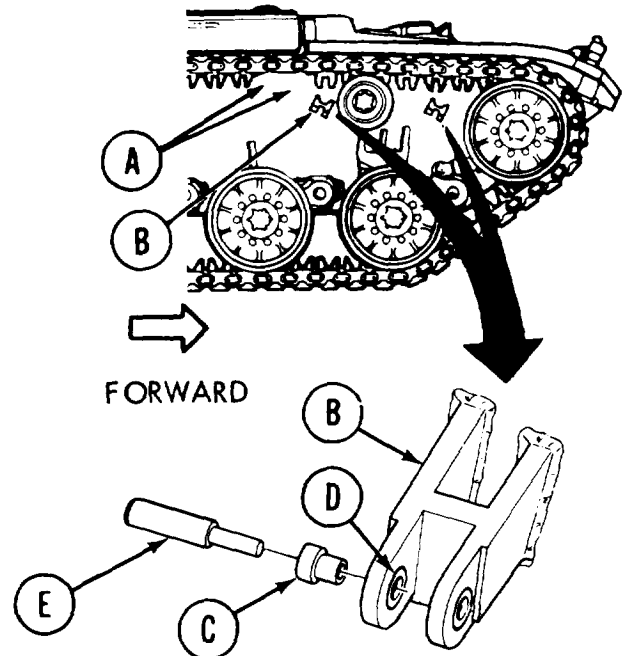
Front and Middle Mounting Yoke Bushings Replacement

REMOVAL:

NOTE

Replacement procedures are the same for the front and middle mounting yoke bushings except where noted.

1. For ease of removal of middle mounting yoke bushings, remove two track center guides at position (A) (to rear of middle mounting yoke (B)) (TM 9-2350-222-10).
2. Position remover and replacer (C) on rear bushing (D) of mounting yoke (B).
3. Position handle (E) on remover and replacer (C) and, using hammer, drive rear bushing (D) out of mounting yoke (B).
4. Remove handle (E) and remover and replacer (C).

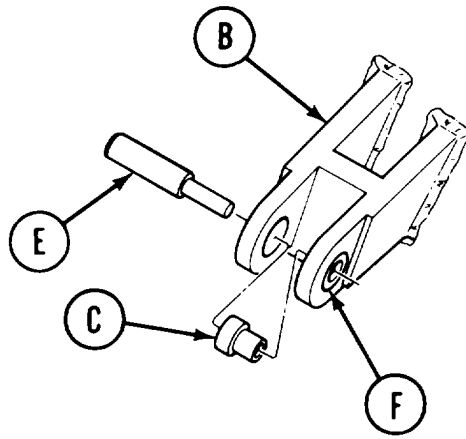


Go on to Sheet 2

SHOCK ABSORBER MOUNTING YOKE BUSHING REPLACEMENT (Sheet 2 of 4)

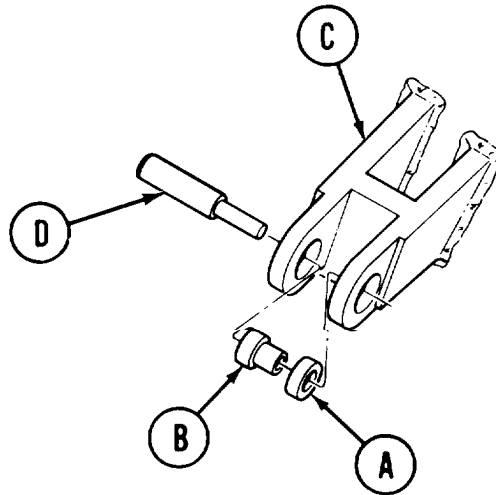
Front and Middle Mounting Yoke Bushings Replacement

5. Position remover and replacer (C) on forward bushing (F) of mounting yoke (B).
6. Position handle (E) through mounting yoke (B) on remover and replacer (C) and, using hammer, drive bushing (F) out of mounting yoke (B).



INSTALLATION:

1. Position forward bushing (A) on remover and replacer (B) and align bushing (A) in mounting yoke (C).
2. Position handle (D) through mounting yoke (C) on remover and replacer (B) and, using hammer, drive bushing (A) into mounting yoke (C) until flush with surface.
3. Remove handle (D) and remover and replacer (B).
4. Position rear bushing (E) on remover and replacer (B) and align bushing (E) with mounting yoke (C).
5. Position handle (D) on remover and replacer and, using hammer, drive bushing (E) into mounting yoke (C) until flush with surface.

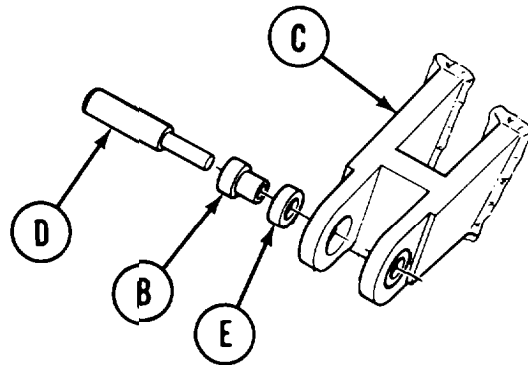


NOTE

If middle mounting yoke bushing was replaced, go to step

6. If not, go to step 7.

6. Install two track center guides (TM 9-2350-222-10).
7. Install shock absorber (page 14-96).



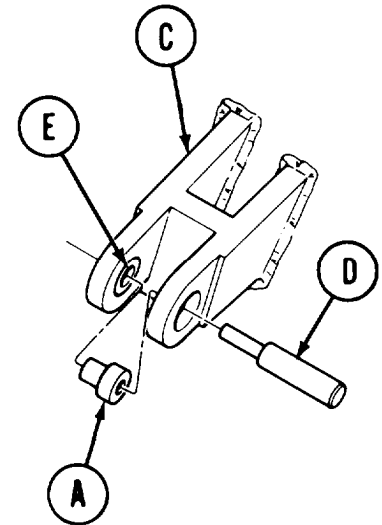
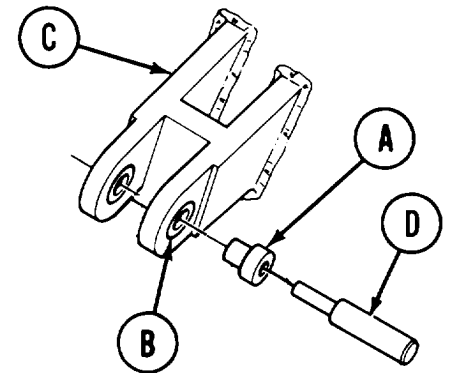
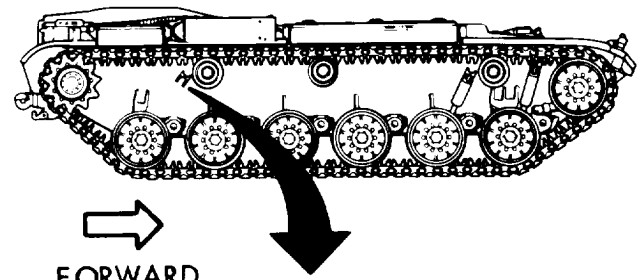
Go on to Sheet 3

SHOCK ABSORBER MOUNTING YOKE BUSHING REPLACEMENT (Sheet 3 of 4)

Rear Mounting Yoke Bushing Replacement

REMOVAL:

1. Position remover and replacer (A) on forward bushing (B) of rear mounting yoke (C).
2. Position handle (D) on remover and replacer (A) and, using hammer, drive bushing (B) out of mounting yoke (C).
3. Remove handle (D) and remover and replacer (A).
4. Position remover and replacer (A) on rear bushing (E).
5. Position handle (D) through mounting yoke (C) on remover and replacer (A) and, using hammer, drive bushing (E) out of mounting yoke (C).
6. Remove handle (D) and remover and replacer (A).

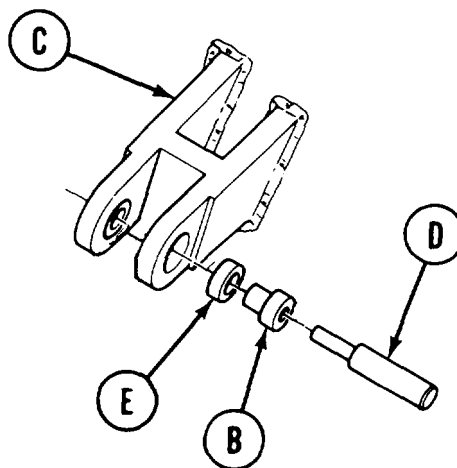
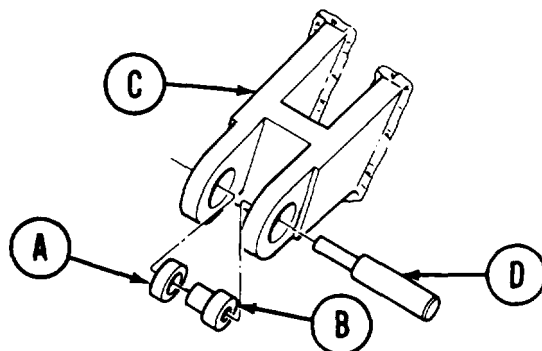


Go on to Sheet 4

Rear Mounting Yoke Bushing Replacement

INSTALLATION:

1. Position rear bushing (A) on remover and replacer (B) and align bushing (A) in mounting yoke (C).
2. Position handle (D) through mounting yoke (C) or remover and replacer (B) and, using hammer, drive bushing (A) into mounting yoke (C) until flush with surface.
3. Remove handle (D) and remover and replacer (B).
4. Position forward bushing (E) on remover and replacer (B) and align bushing (E) with mounting yoke (C).
5. Position handle (D) on remover and replacer (B) and, using hammer, drive bushing (E) into mounting yoke (C) until flush with surface.
6. Install shock absorber (page 14-96).

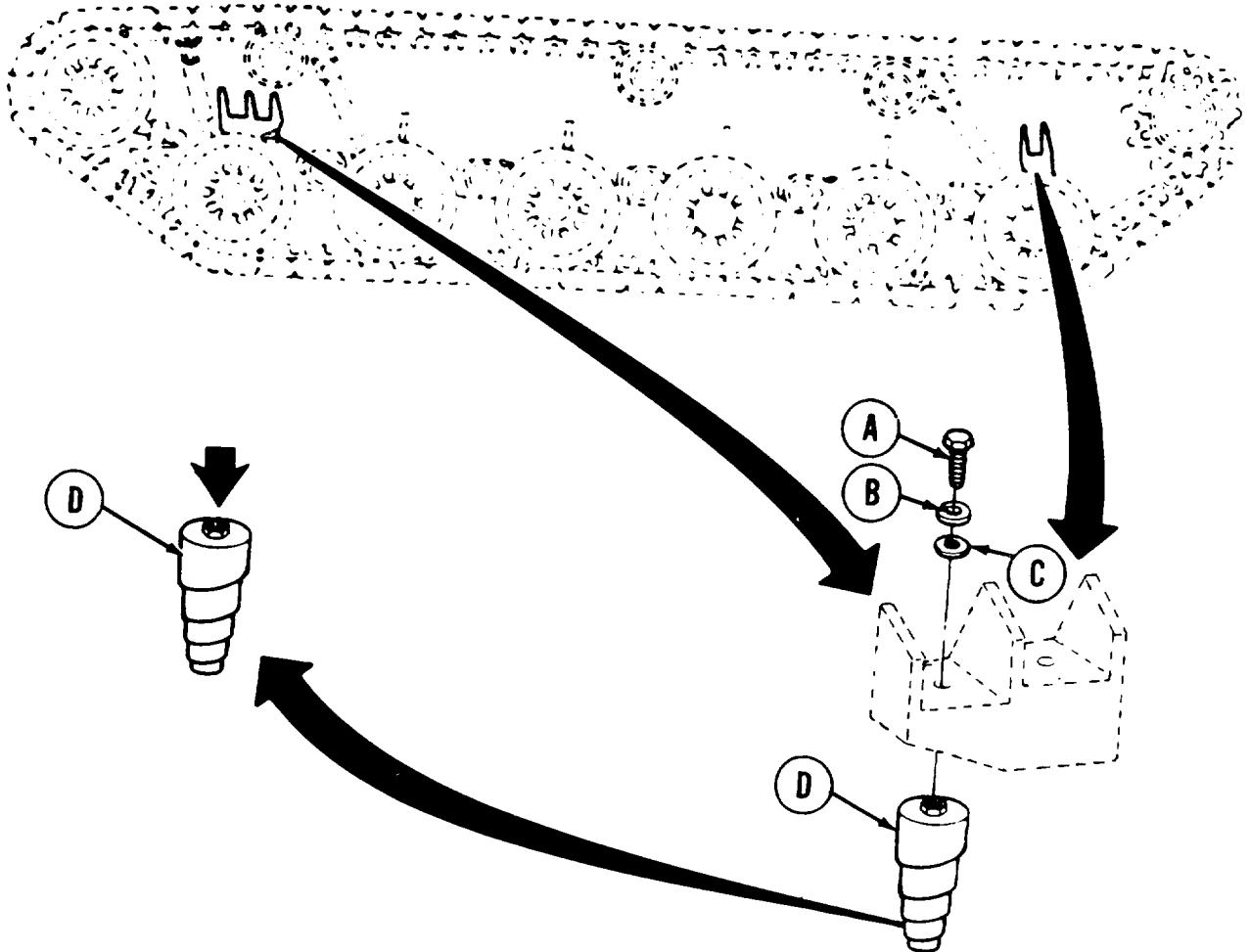


End of Task

VOLUTE SPRING REPLACEMENT (Sheet 1 of 2)

TOOLS: Ratchet with 1/2 in. drive
15/16 in. socket with 1/2 in. drive
Hammer
Hinged handle with 1/2 in. drive

SUPPLIES: Lockwasher (MS35340-50)

**REMOVAL:**

1. Using socket, remove screw (A), lockwasher (B), and washer (C) securing spring (D) to mounting bracket. Throw lockwasher away.
2. Remove spring from mounting bracket. Throw spring away.

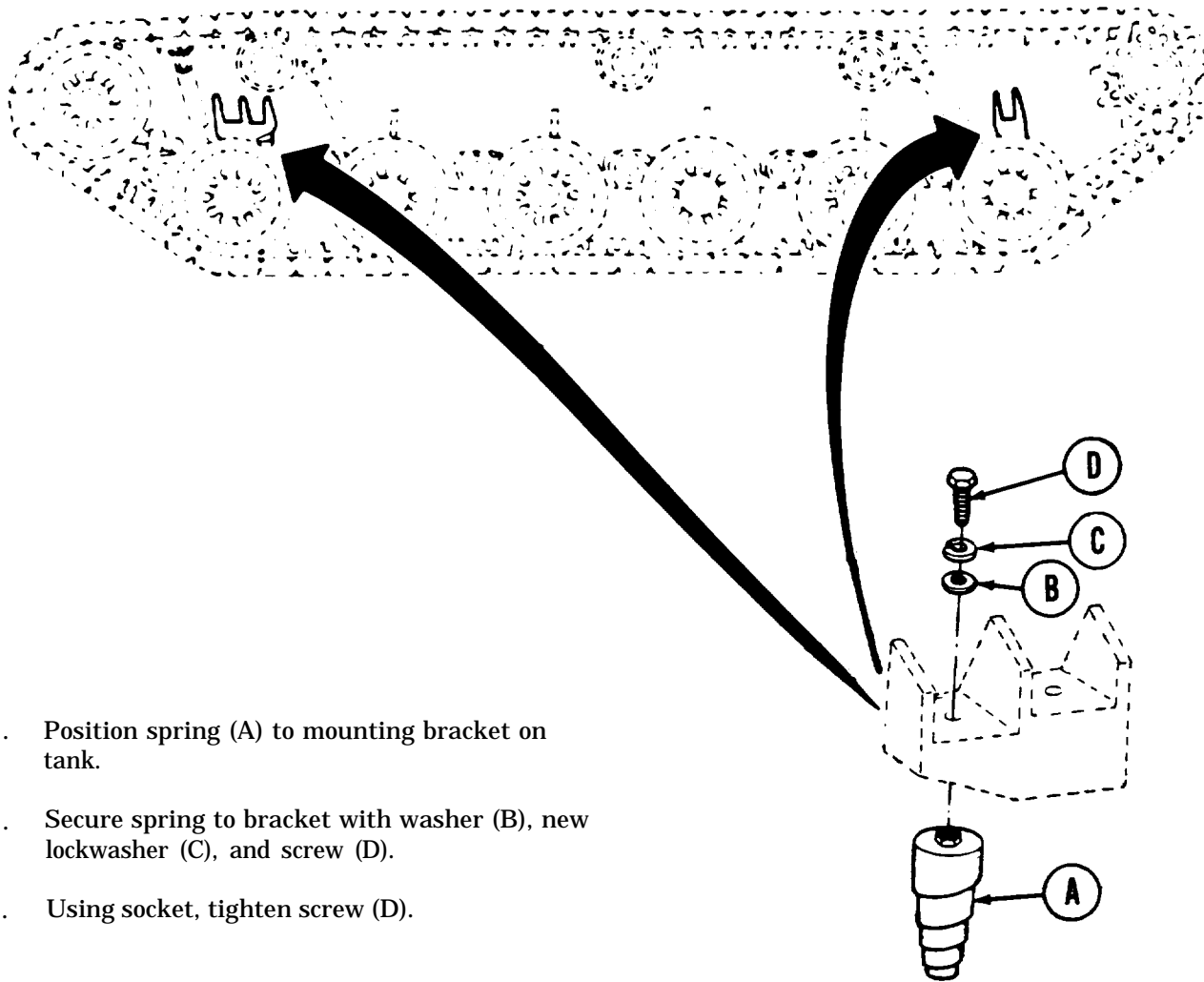
Go on to Sheet 2

TA149195

Change 1 14-99

VOLUTE SPRING REPLACEMENT (Sheet 2 of 2)

INSTALLATION:



1. Position spring (A) to mounting bracket on tank.
2. Secure spring to bracket with washer (B), new lockwasher (C), and screw (D).
3. Using socket, tighten screw (D).

End of Task

TA149196

CHAPTER 15

STEERING CONTROL MAINTENANCE INDEX

Procedure	Page
Steering Control Linkage Adjustment	15-2
Steering Control Handle and Sleeve Mount Replacement	15-15
Front Steering Control Rod Assembly Replacement	15-17
Front Steering Control Connecting Rod Replacement	15-20.1
Steering Control Intermediate Link Assembly Replacement	15-22
Steering Control Intermediate Link Assembly Repair	15-24
Steering Lever Assembly Repair	15-24.1
Steering Control Link to Bulkhead Shaft Rod Replacement	15-25
Steering Control Extension Stud Replacement	15-27
Connecting Link Replacement	15-28
Steering Control Connecting Link Repair	15-30
Steering Control Connecting Link (Riser Link to Transmission Shaft Link) Replacement	15-31
Steering Control Bracket Replacement	15-34
Steering Control to Transmission Shaft Connecting Link Replacement	15-36
Steering Control Link Assembly Replacement	15-38
Link Assembly Repair	15-41

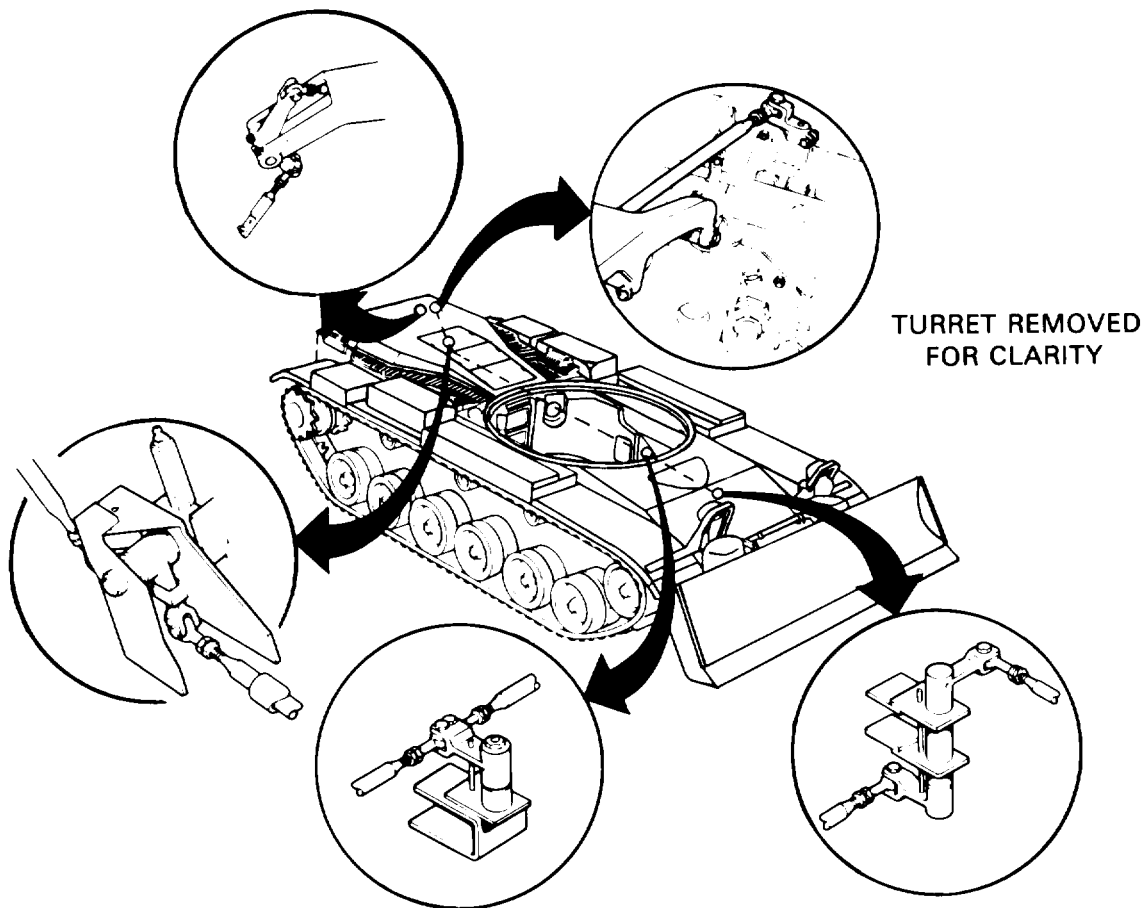
STEERING CONTROL LINKAGE ADJUSTMENT (Sheet 1 of 13)

TOOLS: Adapter, 1/2 in. to 3/8 in.
7/16 in. combination box and open end wrench
9/16 in. combination box and open end wrench
3/4 in. combination box and open end wrench
Torque wrench with 1/2 in. drive (0 to 175 lb-ft) (0-237 N m)
9/16 in. socket with 1/2 in. drive
Needle nose pliers
1/4 in. socket head screw key (Allen wrench)
9/16 in. crowfoot wrench with 3/8 in. drive (NSN 5120-00-184-8397)

SUPPLIES: Cotter pin
Metal locating pin (four required - 1/8 in. by 2-1/2 in. long)
Metal pin (1/16 in. by 2 in. long)

REFERENCE: TM 9-2350-222-10

PRELIMINARY PROCEDURES: Adjust track tension (TM 9-2350-222-10)
Block tracks (TM 9-2350-222-10)
Remove transmission shroud (page 9-20)



Go on to Sheet 2

STEERING CONTROL LINKAGE ADJUSTMENT (Sheet 2 of 13)

ADJUSTMENT:

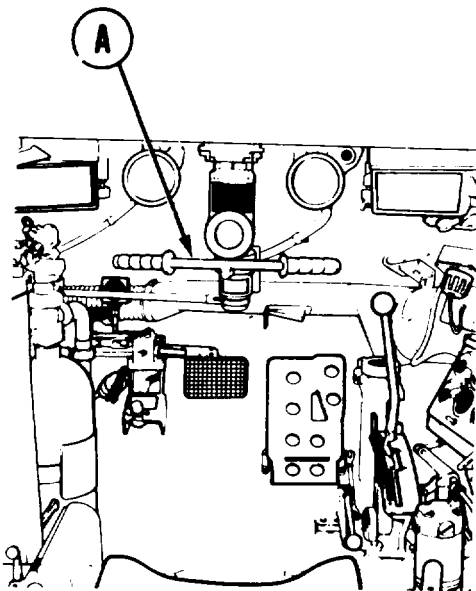
NOTE

When engine, transmission, or entire powerplant is exchanged in a vehicle, driver's steering control must be checked for centering and adjustment. Go to steps 1 and 2.

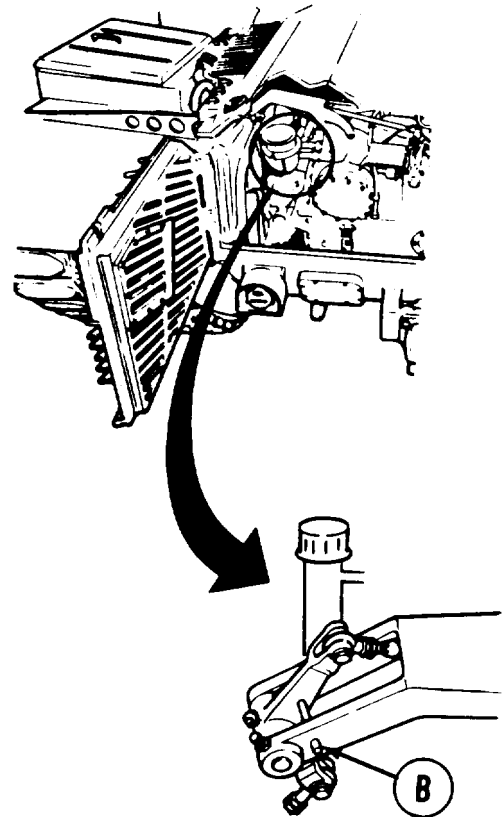
NOTE

Check to make sure rod end bearings are service before proceeding with any linkage adjustments.

1. While seated in driver's station, ove steering control (A), then release and check that it centers.



DRIVER'S STATION



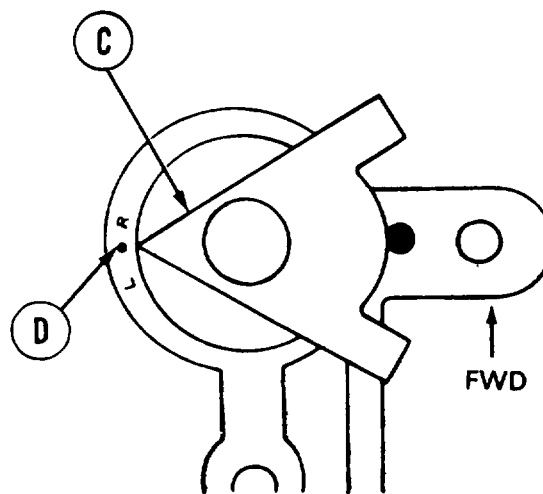
2. If driver's, steering control does not center, insert locating pin (B). If it does, go to step 20.

Go on to Sheet 3

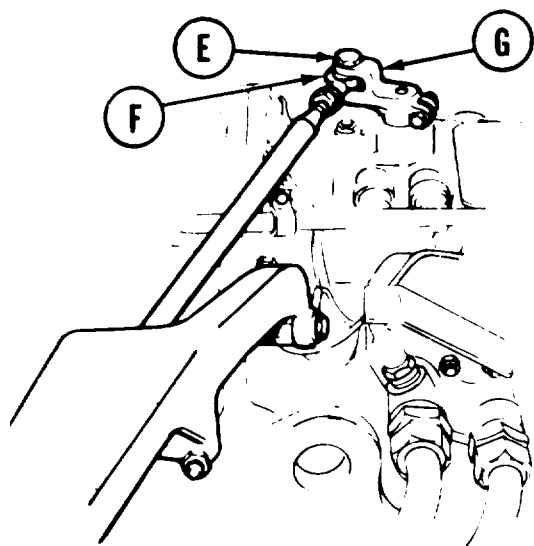
TA140518

STEERING CONTROL LINKAGE ADJUSTMENT (Sheet 3 of 13)

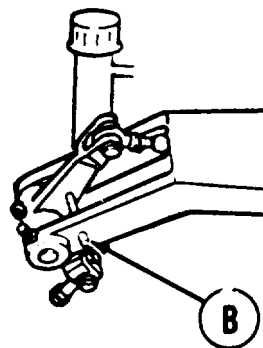
3. Check if indicator (C) on top of transmission is pointing to index mark (D). If it is, go to step 20. If it is not, go to step 4.
4. Remove locating pin (B).



TOP OF TRANSMISSION



TOP OF TRANSMISSION



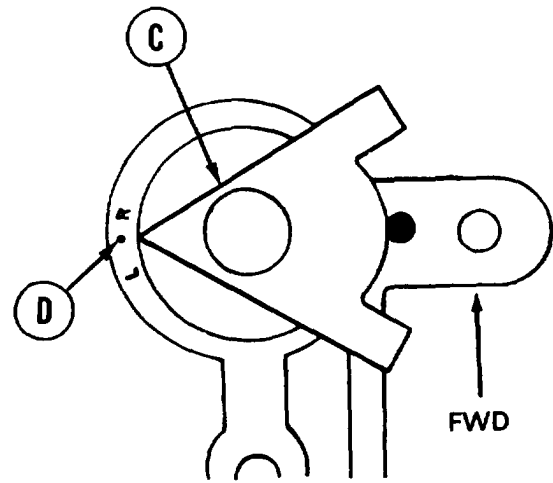
5. Using 9/16 inch wrench, remove screw (E).
6. Remove steering rod end bearing (F) from clevis (G).

Go on to Sheet 4

TA140562

STEERING CONTROL LINKAGE ADJUSTMENT (Sheet 4 of 13)

7. Make sure indicator (C) points to index mark (D). If indicator still does not point to index mark (D), notify support maintenance personnel.
8. If indicator (C) points to index mark (D), go on to step 9.



TOP OF TRANSMISSION

Go on to Sheet 5

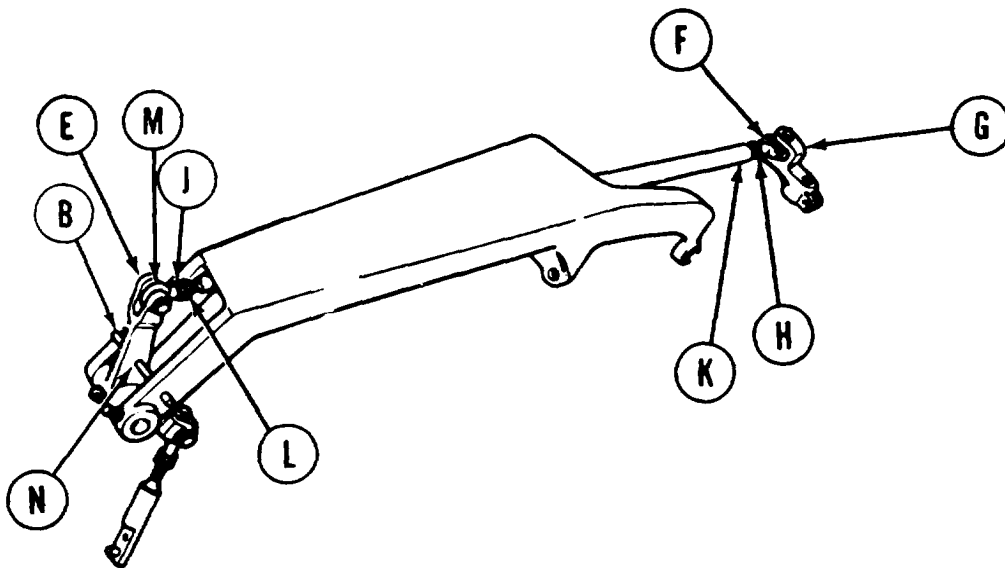
TA140474

STEERING CONTROL LINKAGE ADJUSTMENT (Sheet 5 of 13)

NOTE

When adjusting all steering rod end bearings, steering rods must go into steering rod and sleeves past check holes. When wire will not go through the check holes, there are sufficient threads remaining.

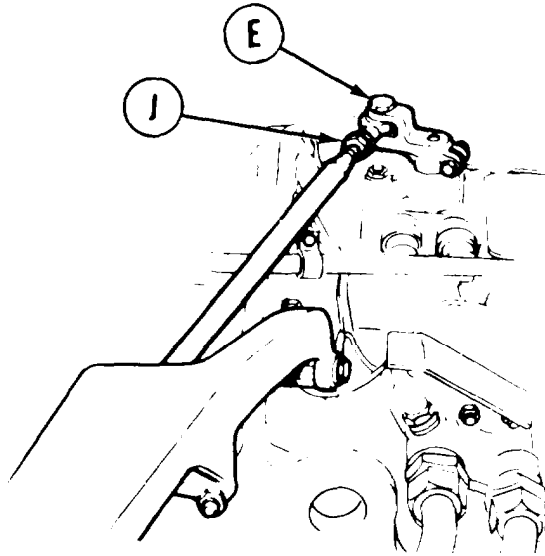
9. Using 9/16 inch wrench, loosen jamnuts (H) and (J).
10. Using 9/16 inch wrench, remove screw (E).



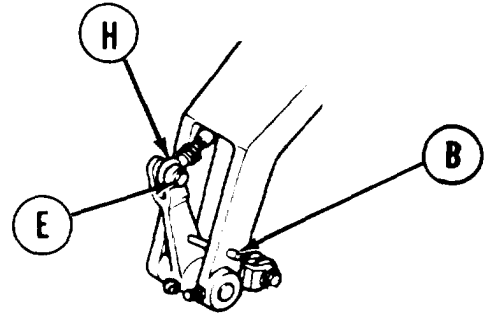
11. Remove steering rod end bearings from clevis. Insert locating pin (B).
12. Using 9/16 inch wrench on steering rod end bearings flats (K) and (L), turn clockwise or counterclockwise until steering rod end bearing (F) and clevis (G) holes line up and steering rod bearing (M) and clevis (N) holes line up (one end at a time).
13. Place steering rod end bearings (F) and (M) into clevis (G) and (N).

STEERING CONTROL LINKAGE ADJUSTMENT (Sheet 6 of 13)

14. Insert screws (E).
15. Remove locating pin (B).
16. Using 9/16 inch wrench, tighten screws (E).



TOP OF TRANSMISSION

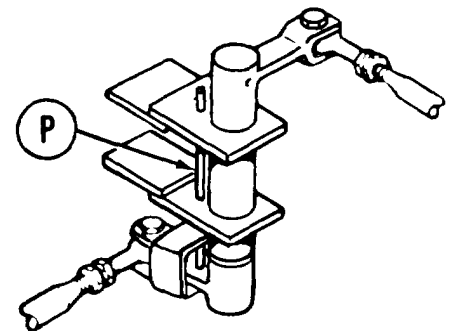


LEFT SIDE OF TRANSMISSION

17. Using crow foot wrench adapter, and torque wrench, tighten jamnuts (H) and

18. Using torque wrench with socket, tighten screws (E) to 15-20 lb-ft (20-27 N-m)

19. Remove fixed fire extinguisher control valve (page 21-48).
20. Remove fixed fire extinguisher cylinders (page 21-49).
21. Insert locating pin (B).
22. Attempt to insert locating pin (P).
23. If locating pin (P) can be inserted, go to step 35. If locating pin (P) cannot be inserted, go on to step 24.
24. Remove locating pin (B).

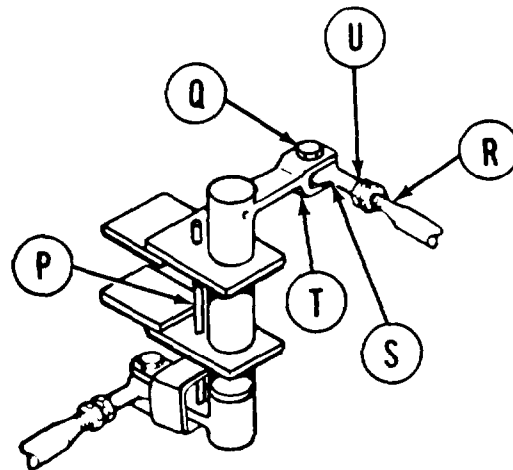


DRIVER'S STATION
LEFT FRONT

Go on to Sheet 7

STEERING CONTROL LINKAGE ADJUSTMENT (Sheet 7 of 13)

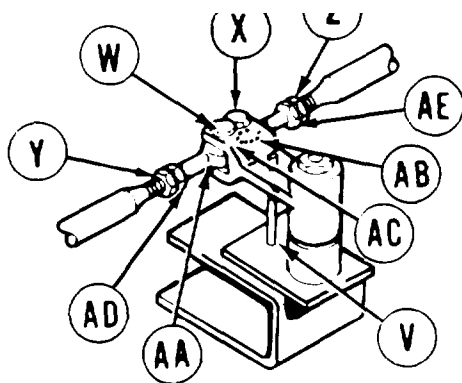
- 25. Using 9/16 inch wrench, remove screw (Q).
- 26. Using 9/16 inch wrench, loosen jamnut (R).
- 27. Remove steering rod end bearing (S) from clevis (T).
- 28. Insert locating pin (P).
- 29. Using 9/16 inch wrench on steering rod end bearing flat (U), turn clockwise or counterclockwise until steering control is centered when screw (Q) is installed through rod end bearing (S) and clevis (T).
- 30. Install screw (Q) finger tight through rod end bearing (S) and clevis (T).
- 31. Using crowfoot wrench, adapter, and torque wrench, tighten jamnut (R) to 15-20 lb-ft (20-27 N-m).
- 32. Remove locating pin (P).
- 33. Using torque wrench with socket, tighten screw (Q) to 15-20 lb-ft (20-27 N-m).
- 34. Insert locating pin (P).



DRIVER'S STATION

Go on to Sheet 8

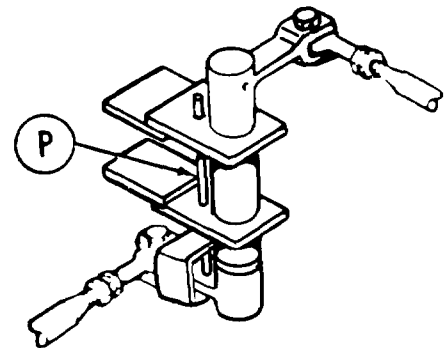
STEERING CONTROL LINKAGE ADJUSTMENT (Sheet 8 of 13)



DRIVER'S STATION
LEFT REAR

35. Attempt to insert locating pin (V).
36. If locating pin (V) can be inserted with locating pin (P) inserted, go to step 46.
37. If locating pin (V) cannot be inserted with locating pin (P) inserted, remove locating pin (P) and use 9/16 inch wrench to remove screws (W) and (X).
38. Using 9/16 inch wrench, loosen jamnuts (Y) and (Z).

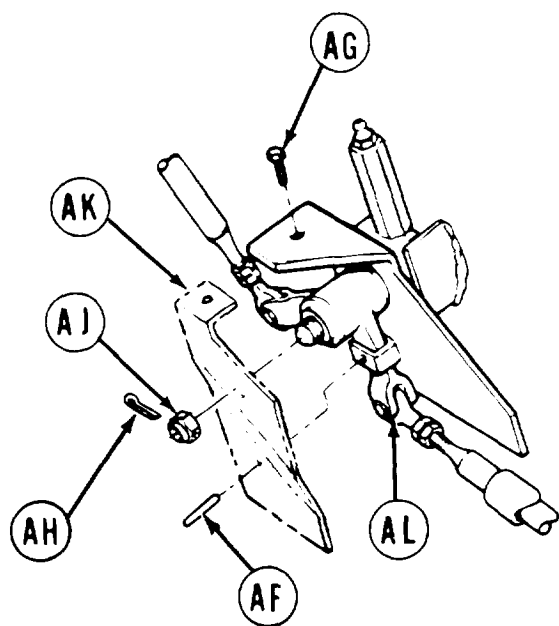
39. Remove steering rod end bearings (AA) and (AB) from clevis (AC).
40. Insert locating pins (P) and (V).
41. Using 9/16 inch wrench on steering rod end bearing flats (AD) and (AE), turn clockwise or counterclockwise until screws (W) and (X) will pass freely through steering rod end bearings (AA) and (AB) and holes in clevis (AC).
42. Insert screws (W) and (X) finger tight through rod end bearings (AA) and (AB) and clevis (AC).
43. Remove locating pins (P) and (V).
44. Using crowfoot wrench, adapter, and torque wrench, tighten jamnuts (Y) and (Z) to 15-20 lb-ft (20-27 N-m).
45. Using torque wrench with socket, torque screws (W) and (X) to 15-20 lb-ft (20-27 N-m).



DRIVER'S STATION-
LEFT FRONT

Go on to Sheet 9

STEERING CONTROL LINKAGE ADJUSTMENT (Sheet 9 of 13)



46. Remove powerplant (page 5-l).
47. Insert locating pin (V).
48. Attempt to insert locating pin (AF).
49. If locating pin (AF) can be inserted, go to step 69.
50. If locating pin (AF) cannot be inserted, use 7/16 inch wrench and remove screw (AG).
51. Using pliers, remove cotter pin (AH). Throw cotter pin away.

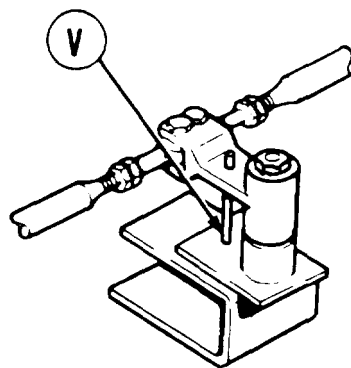
LEFT SIDE OF HULL (TO REAR OF FUEL TANK)

52. Using 3/4 inch wrench, remove nut (AJ).
53. Pull plate (AK) out and away from linkage assembly.
54. Install nut (AJ) finger tight.
55. Remove locating pin (V).

NOTE

If required, pull rod toward rear of vehicle while performing step 56.

56. Using 9/16 inch wrench, remove screw (AL).

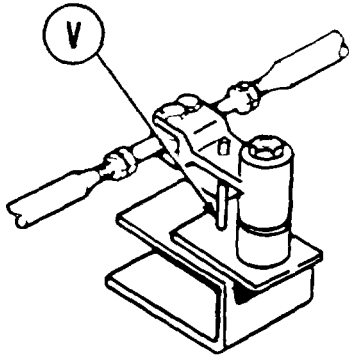


DRIVER'S STATION - LEFT REAR

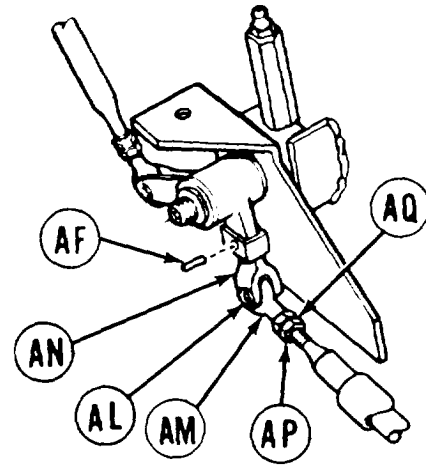
Go on to Sheet 10

STEERING CONTROL LINKAGE ADJUSTMENT (Sheet 10 of 13)

57. Remove steering rod end bearing (AM) from clevis (AN).
58. Using 9/16 inch wrench, loosen jamnut (AP).
59. Insert locating pins (V) and (AF).
60. Using 1/4 inch allen wrench through steering rod end bearing (AM), turn clockwise or counterclockwise until screw (AL) will pass freely through steering rod end bearing (AM) and clevis (AN).



DRIVER'S STATION--
LEFT REAR



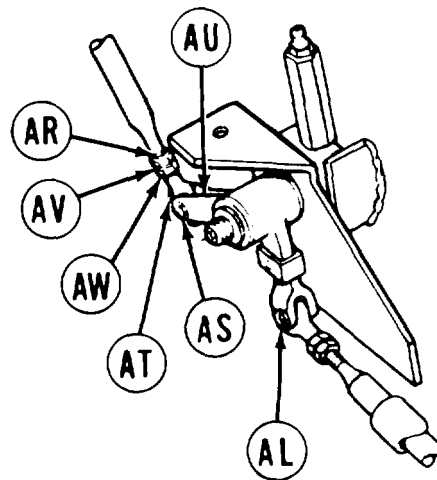
LEFT SIDE OF HULL
(TO REAR OF FUEL TANK)

61. Place steering rod end bearing (AM) into clevis (AN).
62. Remove locating pins (V) and (AF).
63. Using 9/16 inch wrench, install screw (AL).
64. Using crowfoot wrench, adapter, and torque wrench, tighten jamnut (AP) to 15-20 lb-ft (20-27 N-m).

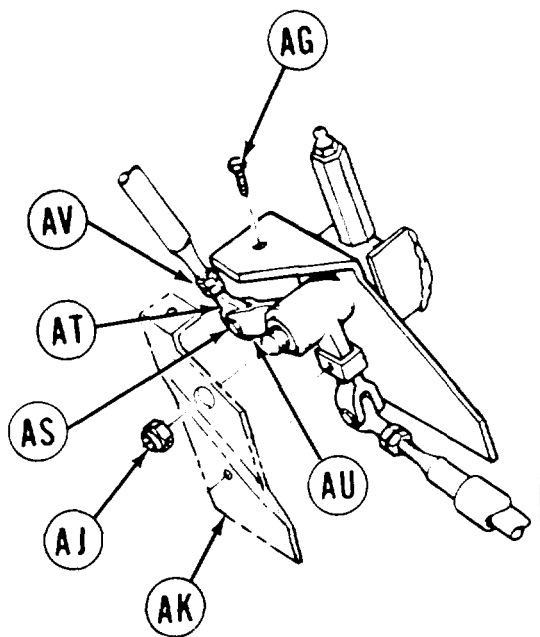
Go on to Sheet 11

STEERING CONTROL LINKAGE ADJUSTMENT (Sheet 11 of 13)

65. Using torque wrench with socket, tighten screw (AL) to 15-20 lb-ft (20-27 N-m).
66. Check threads at end of steering rod (AR) to make sure threads are past check hole.
67. If threads are not showing, using 9/16 inch wrench, remove screw (AS).
68. Remove steering rod end bearing (AT) from clevis (AU).
69. Using 9/16 inch wrench, loosen jamnut (AV).
70. Using 9/16 inch wrench on steering rod end bearing flats (AW), turn counterclockwise or clockwise until threads are showing past check hole.



LEFT SIDE OF HULL
(TO REAR OF FUEL TANK)

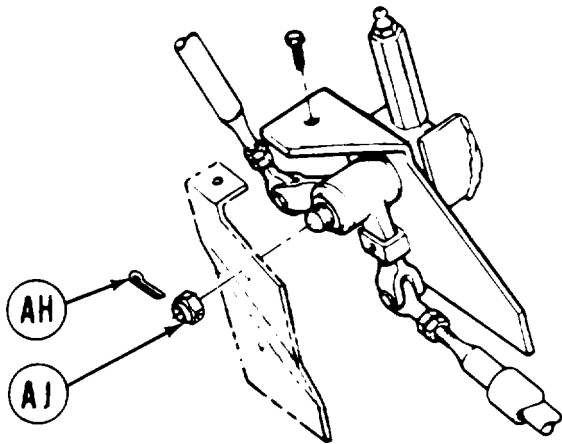


LEFT SIDE OF HULL (TO REAR OF FUEL TANK)

71. Place steering rod end bearing (AT) into clevis (AU).
72. Using 9/16 inch wrench, install screw (AS).
73. Using crowfoot wrench, adapter, and torque wrench, tighten jamnut (AV) to 15-20 lb-ft (20-27 N-m).
74. Using torque wrench with socket, tighten screw (AS) to 15-20 lb-ft (20-27 N-m).
75. Using fingers, remove nut (AJ).
76. Position plate (AK) to linkage assembly.
77. Using 7/16 inch wrench, install screw (AG).

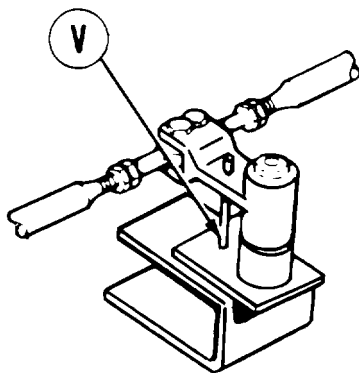
Go on to Sheet 12

STEERING CONTROL LINKAGE ADJUSTMENT (Sheet 12 of 13)

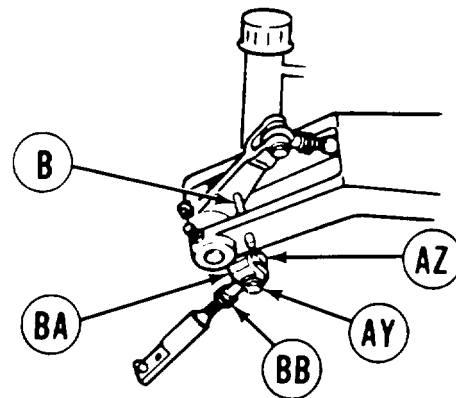


LEFT SIDE OF HULL
(TO REAR OF FUEL TANK)

78. Using 3/4 inch wrench, install nut (AJ).
79. Using pliers, install new cotter pin (AH).
80. Install 2A powerplant (page 5-14) or 2D powerplant (page 5-37).
81. Insert locating pin (V).



DRIVER'S STATION - LEFT REAR



LEFT SIDE OF VEHICLE

82. Attempt to insert locating pin (B).
83. If locating pin (B) can be inserted, remove locating pins (B) and (V) and go to step 93.
84. If locating pin (B) cannot be inserted, remove locating pin (B) and use 9/16 inch wrench to remove screw (AY).
85. Remove steering rod end and bearing (AZ) from clevis (BA).
86. Using 9/16 inch wrench, loosen jamnut (BB).
87. Insert locating pins (B) and (V).

1

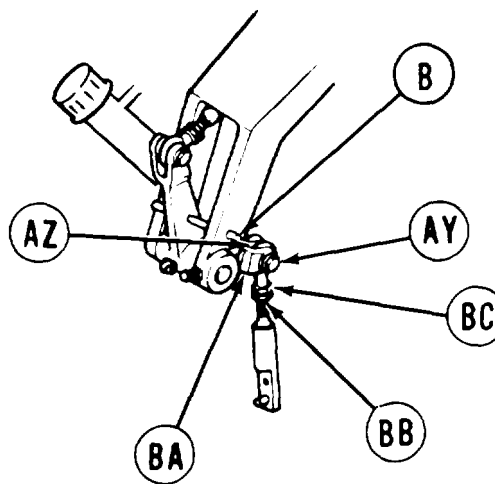
Go on to Sheet 13

TA253514

Change 1 15-13

STEERING CONTROL LINKAGE ADJUSTMENT (Sheet 13 of 13)

- 88. Using 9/16 inch wrench on steering rod end bearing flat (BC), turn clockwise or counterclockwise until screw (AY) will pass freely through steering rod end bearing (AZ) and clevis(BA).
- 89. Using fingers. install screw (AY) through steering rod end bearing (AZ) and clevis(BA).
- 90. Using crowfoot wrench, adapter, and torque wrench, tighten jamnut (BB) to 15-20 lb-ft (20-27 N·m).
- 91. Remove locating pins (B) and (V),
- 92. Using torque wrench with socket, tighten screw (AY) to 15-20 lb-ft (20-27 N·m).

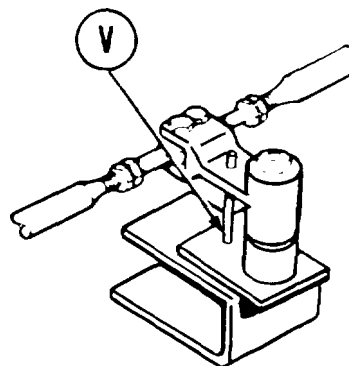


LEFT SIDE OF TRANSMISSION

NOTE

If steering is unacceptable, notify support maintenance personnel,

- 93. Check steering controls with vehicle moving (TM 9-2350-222-10).
- 94. Install transmission shroud (page 9-23).
- 95. Install fixed fire extinguisher control valve (page 21-48).
- 96. Install fixed fire extinguisher cylinders (page 21-51).
- 97. Unblock tracks (TM 9-2350-222-10)



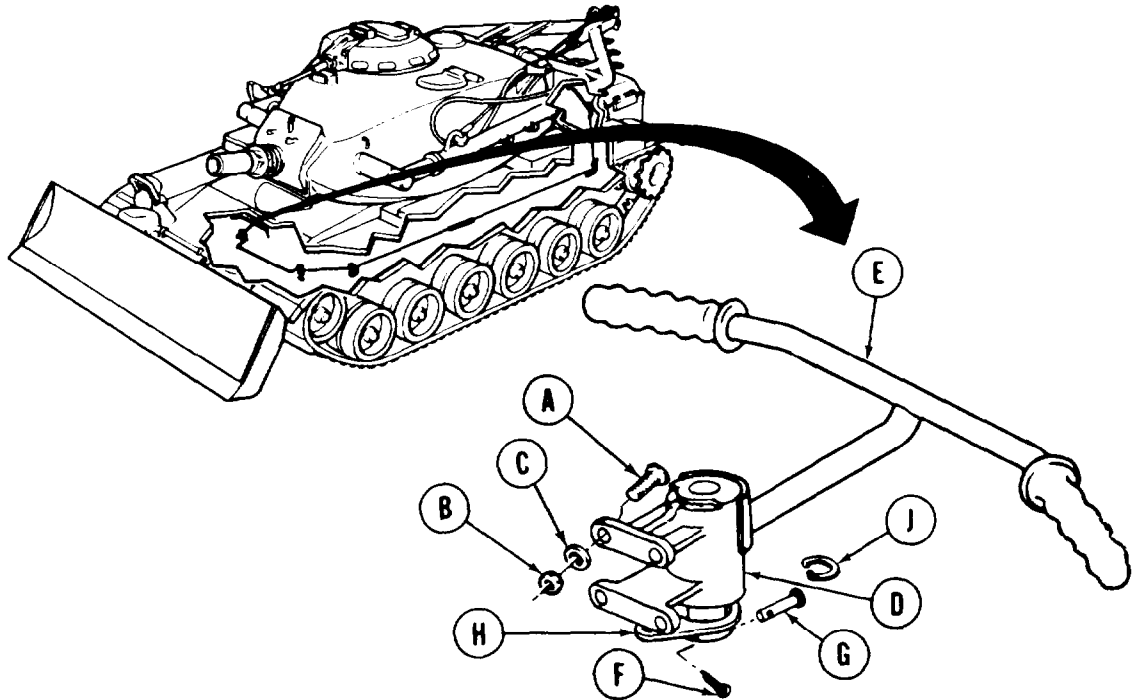
End of Task

STEERING CONTROL HANDLE AND SLEEVE MOUNT REPLACEMENT (Sheet 1 of 2)

TOOLS: 9/16 in. combination box and open end wrench (2 required)
 Slip joint pliers
 Retaining ring pliers
 Extension light

SUPPLIES: Cotter pin (MS24665-283)
 Lockwasher (MS35338-46) (4 required)

PRELIMINARY PROCEDURE: Disconnect front steering control rod assembly (page 15-17, steps 1 and 2)



REMOVAL:

1. Using wrenches on screw (A) and nut (B), remove four screws (A), nuts (B), and lockwashers (C) from mount (D). Throw lockwashers away.
2. Remove mount (D) and steering handle (E) from vehicle.
3. Using slip joint pliers, remove cotter pin (F) from pin (G). Throw cotter pin away.
4. Using slip joint pliers, remove pin (G) and lever (H).
5. Using retaining ring pliers, remove retaining ring (J) from handle (E).
6. Using hands, remove handle (E) from mount (D).

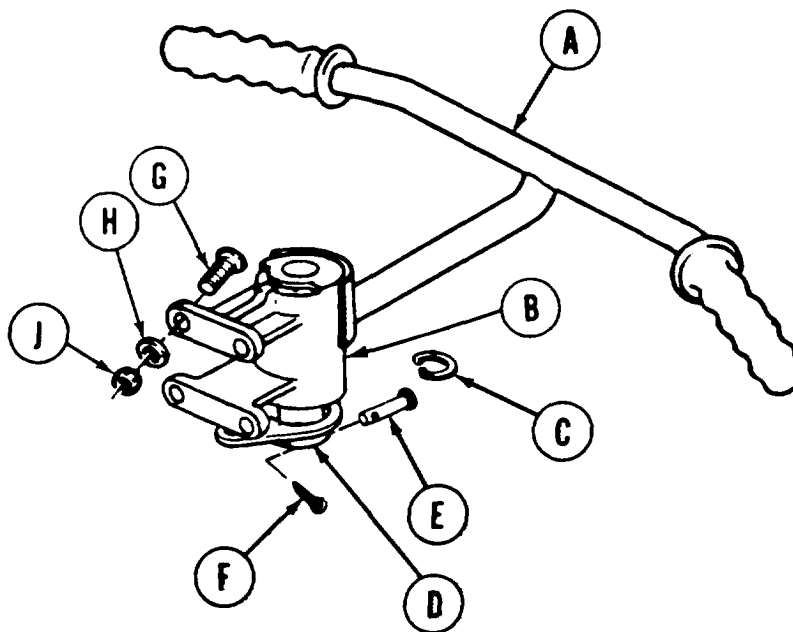
Go on to Sheet 2

TA253516

STEERING CONTROL HANDLE AND SLEEVE MOUNT REPLACEMENT (Sheet 2 of 2)

INSTALLATION:

1. Position steering handle (A) in mount (B).
2. Using retaining ring pliers, install retaining ring (C) in retaining ring groove of handle (A).
3. Line up holes in lever (D) and handle (A).
4. Install pin (E) through holes in lever (D) and handle (A).
5. Using slip joint pliers, install new cotter pin (F) through pin (E).
6. Take assembled handle and mount to driver's station and position mount (B) on mount inside of vehicle.
7. Using two wrenches, install four screws (G), new lockwashers (H), and nuts (J).
8. Connect front steering control rod assembly (page 15-19, steps 1, 3, and 4).



End of Task

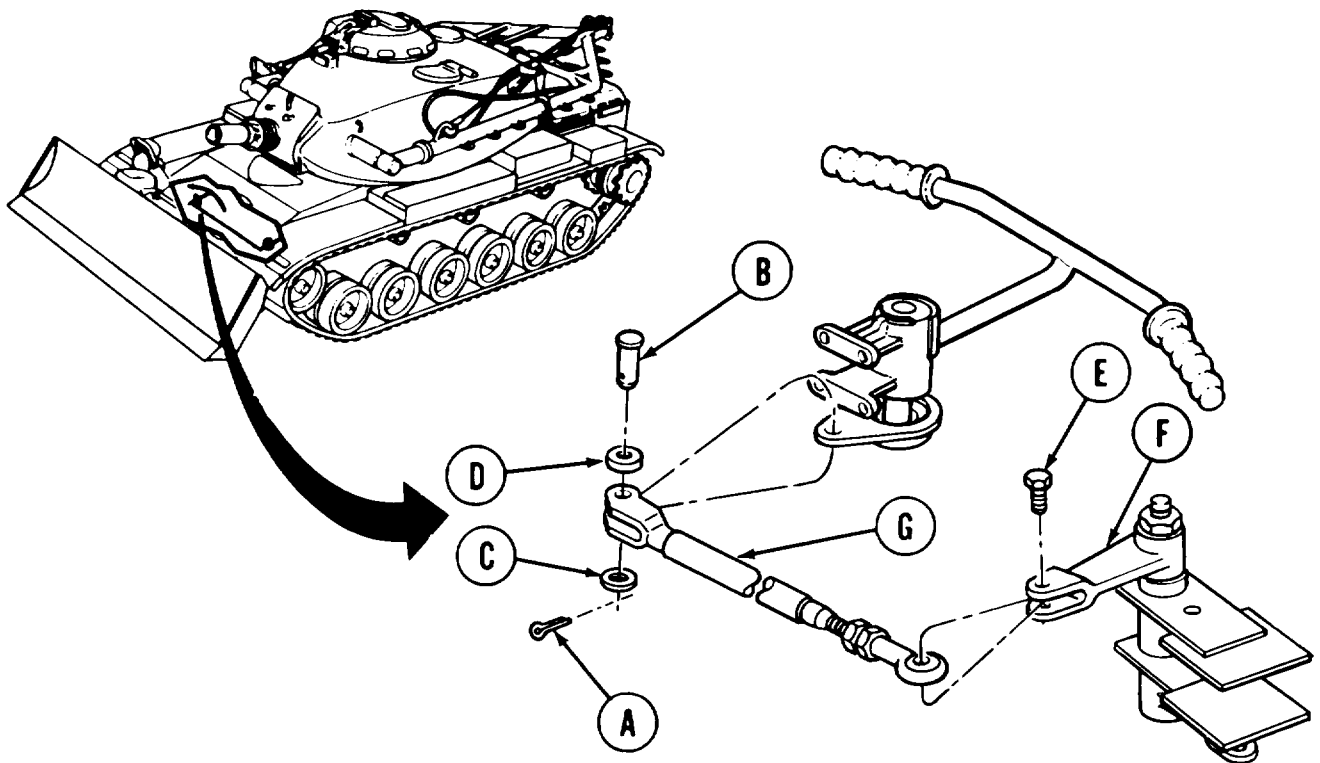
TA253527

FRONT STEERING CONTROL ROD ASSEMBLY REPLACEMENT (Sheet 1 of 3)

TOOLS: Adapter 3/8 in. to 1/2 in.
 Slip joint pliers
 Torque wrench with 1/2 in. drive (0-175 lb-ft) 0-237 N m
 9/16 in. combination box and open end wrench (2 required)
 12 in. extension with 3/8 in. drive
 5 in. extension with 3/8 in. drive
 9/16 in. crowfoot wrench

SUPPLIES: Cotter pin (MX24665-132)
 Metal locating pin (1/8 in. dia. by 2-1/2 in. long)

PRELIMINARY PROCEDURES: Block tracks (TM 9-2350-222-10)



REMOVAL:

1. Using pliers, remove cotter pin (A) from pin (B). Throw cotter pin away.
2. Using pliers, remove pin (B), washer (C), and washer (D).
3. Using wrench, remove bolt (E) from link (F).
4. Remove rod assembly (G).

Go on to Sheet 2

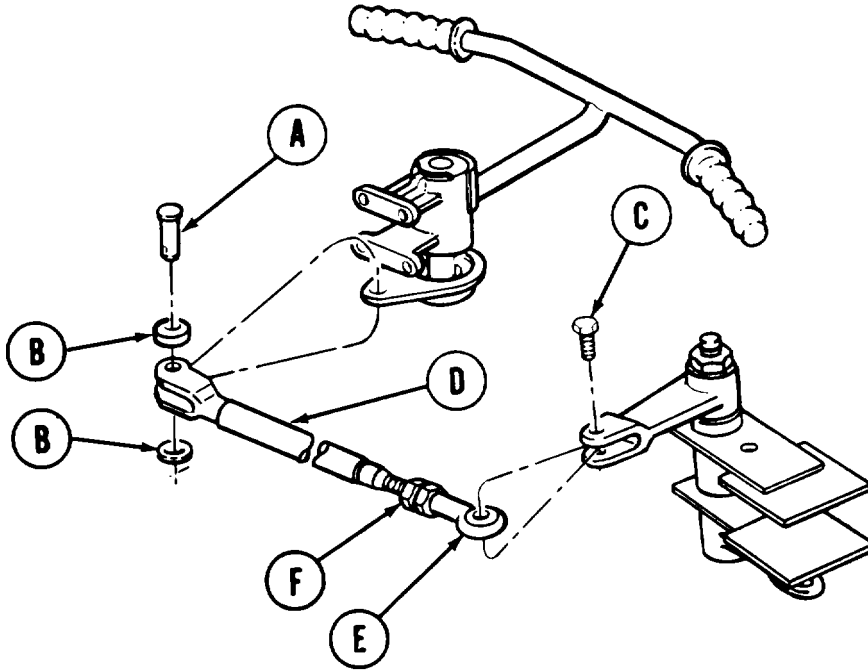
TA253517

Change 1 15-17

FRONT STEERING CONTROL ROD ASSEMBLY REPLACEMENT (Sheet 2 of 3)

INSPECTION AND REPAIR:

1. Inspect removed pin (A), washers (B), and bolt (C) for wear or damage. Replace as required.



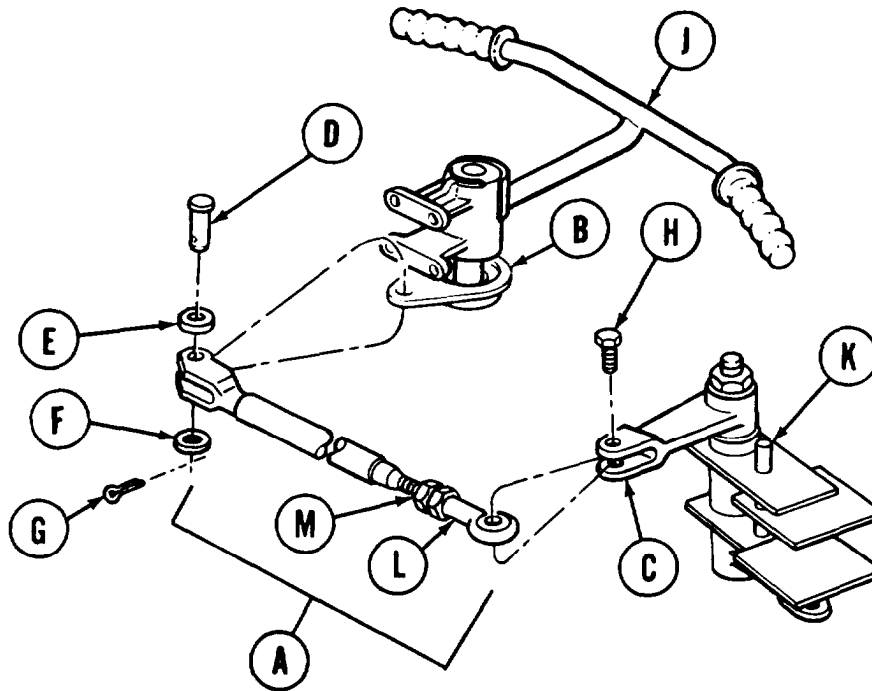
Inspect rod assembly (D), rod end bearing (E), and nut (F) for damage and wear. Replace as required.

NOTE

If rod assembly (D) or rod end bearing (E)

FRONT STEERING CONTROL ROD ASSEMBLY REPLACEMENT (Sheet 3 of 3)

INSTALLATION:



1. Position rod and bearing assembly (A) to steering control lever(B) and lever (C).
2. Install pin (D) and washer (E) to secure rod and bearing assembly (A) to steering control lever (B).
3. Install washer (F) on pin(D) and using pliers, install new cotter pin (G) through hole in pin (D).
4. Using wrench, install bolt (H) to secure rod and bearing assembly (A) to link (C).
5. Check if steering control (J) is centered. If centered, proceed to step 8. If not centered, proceed to step 6.
6. Insert locating pin (K) to lock lever (C).
7. Using wrench, remove bolt (H) and adjust rod end bearing (L) until steering control (J) is centered. When steering control is centered use wrench and install bolt (H) to secure rod and bearing assembly (A) to link(C). Remove locating pin(K).
8. Using wrench position nut (M) up against rod end bearing (J). Using 9/16 inch crowfoot and torque wrench, tighten nut (M) to 15-20 lb-ft (20-27 N- m).
9. Using 9/16 inch crowfoot and torque wrench, tighten bolt(H) to 15-20 lb-ft (20-27 N. m).

End of Task

TA253519

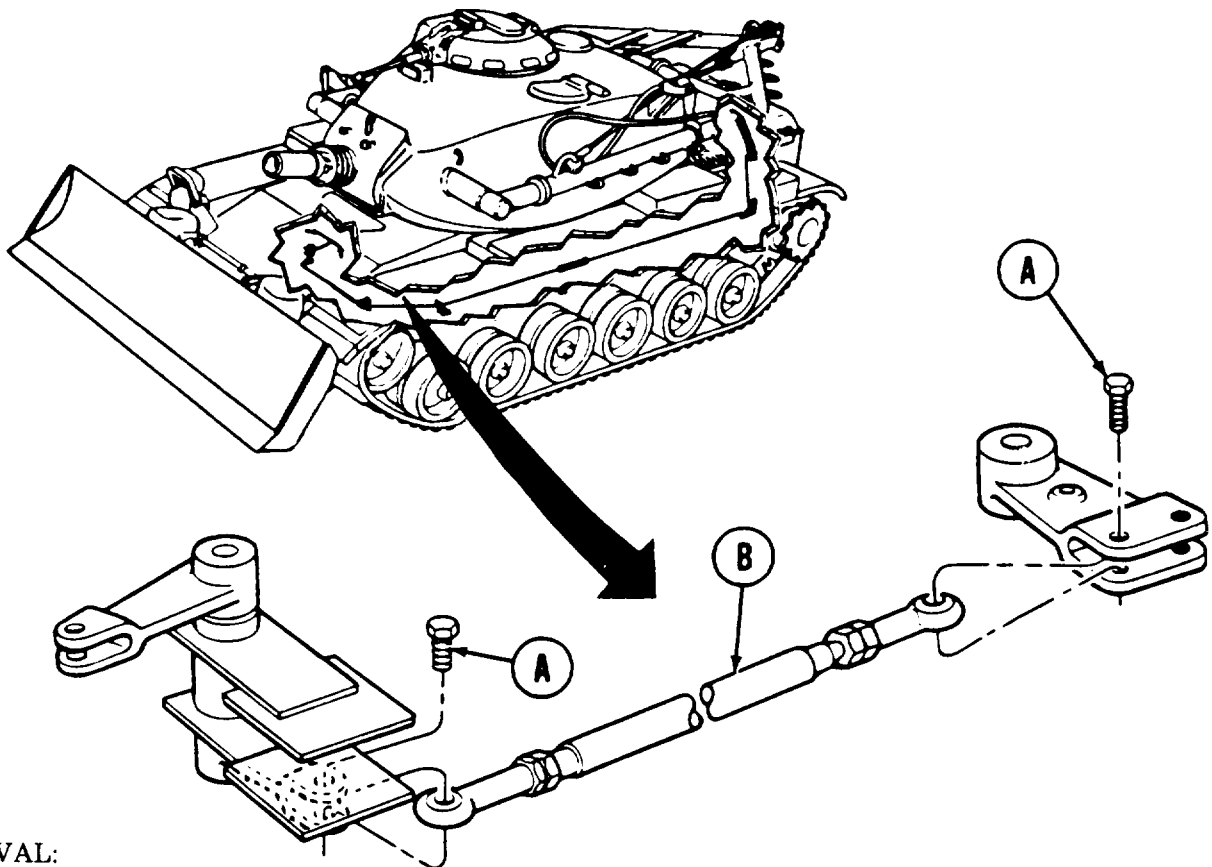
FRONT STEERING CONTROL CONNECTING ROD REPLACEMENT (Sheet 1 of 3)

TOOLS: Adapter 3/8 in. to 1/2 in.
 9/16 in. combination box and open end wrench (2 required)
 Torque wrench with 1/2 in. drive (0-175 ft-lb) (0-237 N m)
 9/16 in. socket with 1/2 in. drive
 12 in. extension with 3/8 in. drive
 5 in. extension with 3/8 in. drive
 9/16 in. crowfoot wrench

SUPPLIES: Metal locating pin (1/8 in. dia. by 2-1/2 in. long)

REFERENCE: TM 9-2350-222-10

PRELIMINARY PROCEDURES: Block tracks (TM 9-2350-222-10)

**REMOVAL:**

1. Using 9/16 inch wrench, remove two bolts (A).
2. Remove connecting link (B).

Go on to Sheet 2

TA253520

Change 1 15-20.1

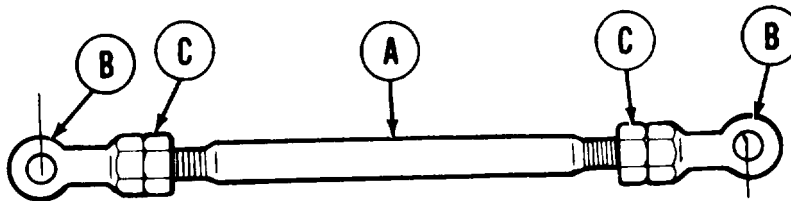
FRONT STEERING CONTROL CONNECTING ROD REPLACEMENT (Sheet 2 of 3)

INSPECTION AND REPAIR:

1. Inspect rod (A), rod end bearings (B), and nut (C) for damage and wear. Replace as required.

NOTE

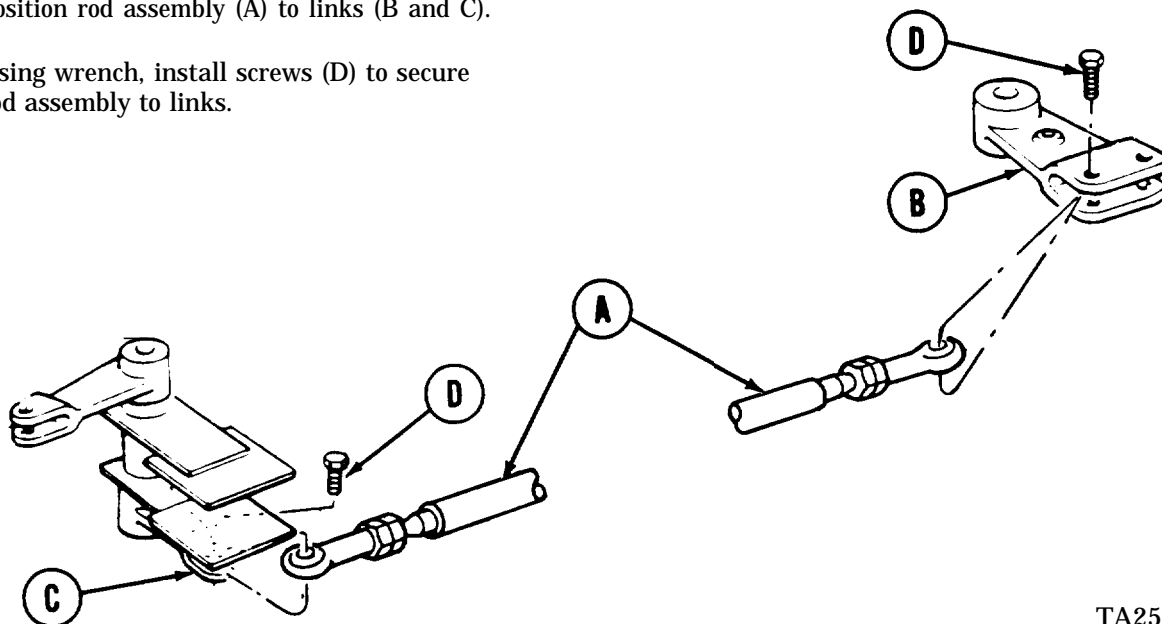
If rod (A) or rod end bearing (B) must be replaced proceed to step 2. If not proceed to installation.



2. Using two wrenches, remove rod end bearings (B) and nuts (C) from rod (A). Replace parts as required.
3. Install nuts (C) onto rod (A) until they bottom.
4. Install rod end bearings (B) onto rod (A) a minimum of four turns.

INSTALLATION:

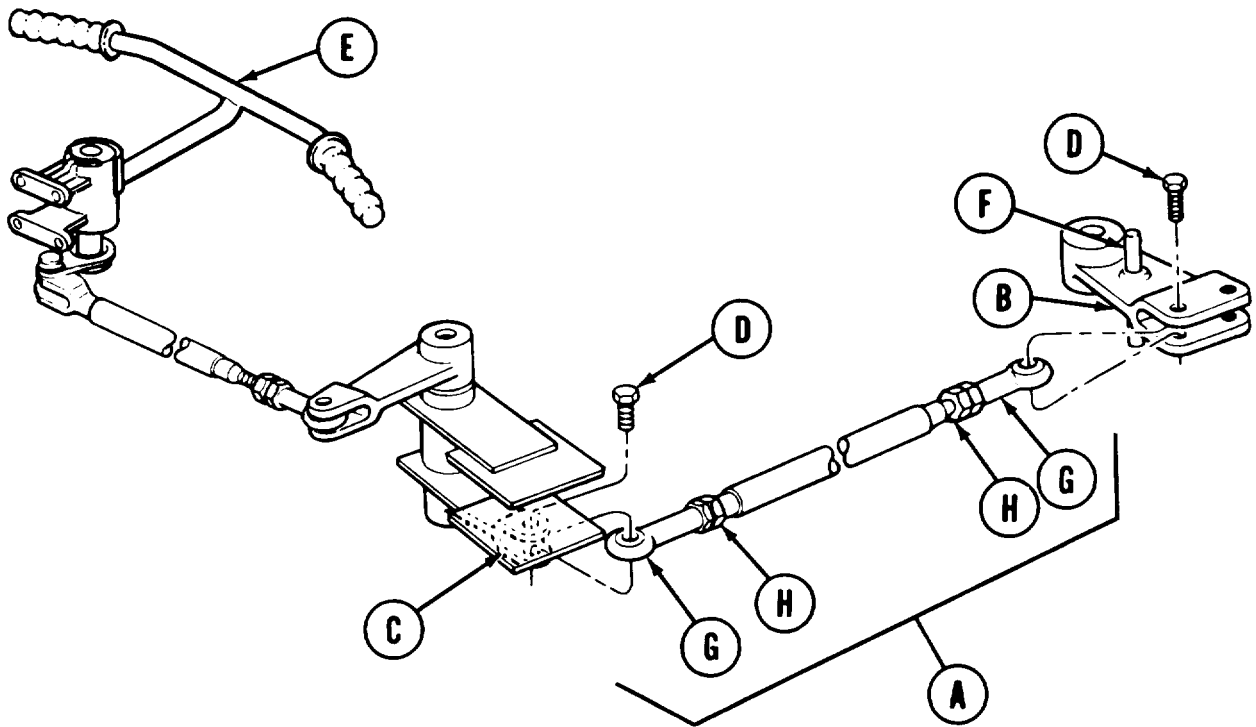
1. Position rod assembly (A) to links (B and C).
2. Using wrench, install screws (D) to secure rod assembly to links.



TA253521

FRONT STEERING CONTROL CONNECTING ROD REPLACEMENT (Sheet 3 of 3)

3. Check if steering control (E) is centered. If steering control is not centered, proceed to step 4. If centered, proceed to step (7).



4. Install locating pin (F) to lock link (B).
5. Using wrench, remove one screw (D) and remove rod assembly (A) from link. Adjust rod end bearing (G) until steering control (E) is centered.
6. Install rod assembly (A) to link and install screw (D) and remove locating pin (F).
7. Using 9/16 inch crowfoot and torque wrench, tighten screw (D) 15-20 lb-ft (20-27 N. m).
8. Using wrench, tighten nuts (H) up against rod end bearings (G).
9. Using 9/16 inch crowfoot and torque wrench, tighten nuts (H) 15-20 lb-ft (20-27 N. m).

End of Task

TA253522

Change 1 15-21

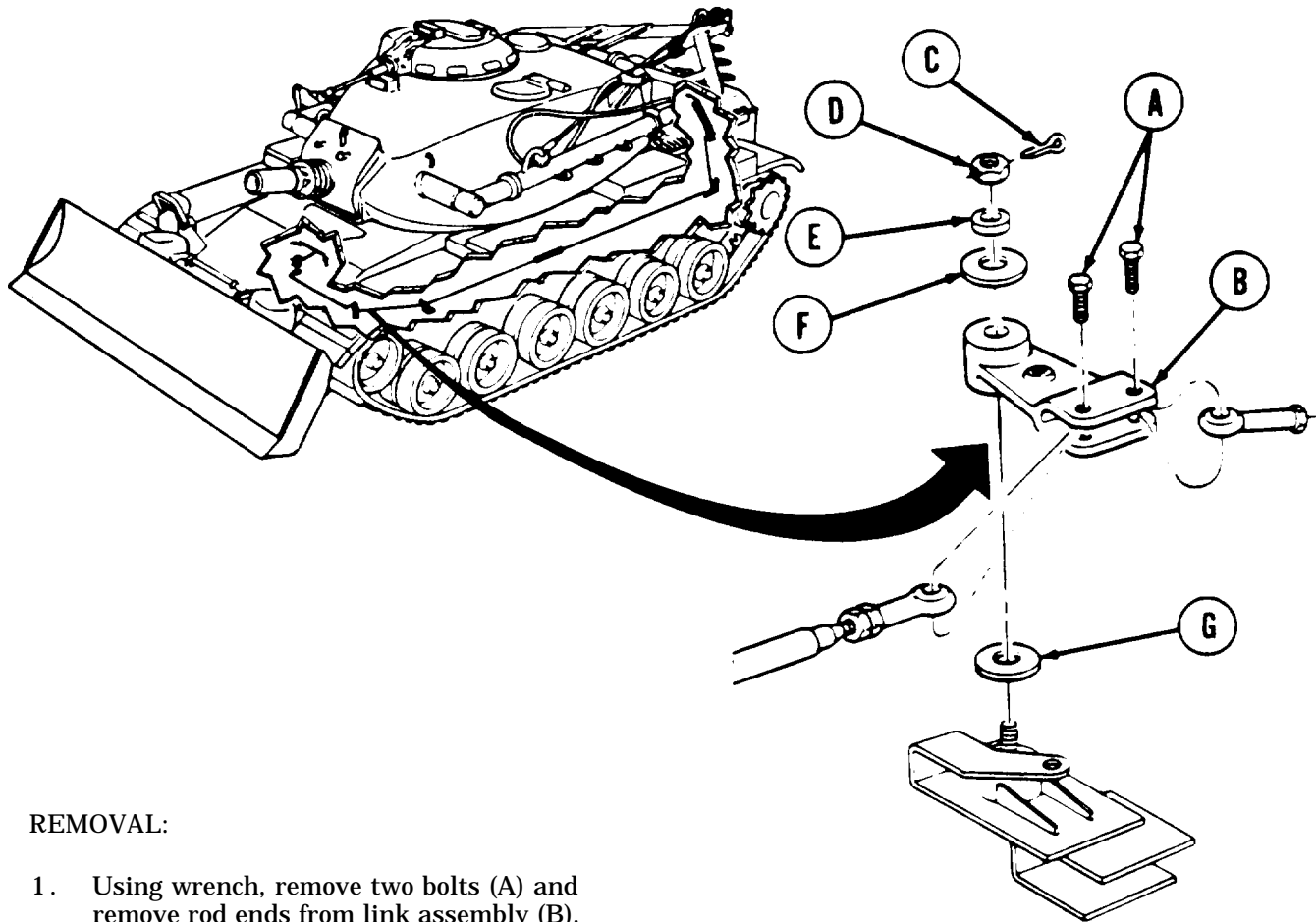
TM 9-2350-222-20-1-4

STEERING CONTROL INTERMEDIATE LINK ASSEMBLY REPLACEMENT (Sheet 1 of 2)

TOOLS: Slip joint pliers
9/16 in. open end wrench (2 required)
9/16 in. socket with 1/2 in. drive
Torque wrench with 1/2 in. drive (0-175 lb-ft) (0-237 N-m)

SUPPLIES: Cotter pin (MS24665-283)

REFERENCE: TM 9-214



REMOVAL:

1. Using wrench, remove two bolts (A) and remove rod ends from link assembly (B).
2. Using pliers, remove cotter pin (C). Throw cotter pin away
3. Using wrench, remove nut (D), washer (E), and washer (F).
4. Remove link assembly (B) and washer (G).

Go on to Sheet 2

TA253523

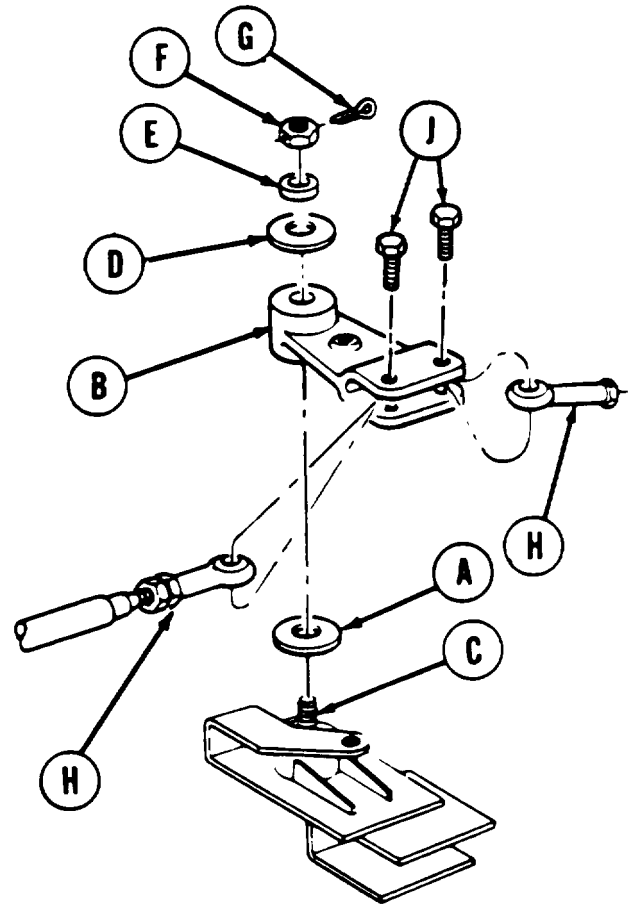
STEERING CONTROL INTERMEDIATE LINK ASSEMBLY REPLACEMENT (Sheet 2 of 2)

INSPECTION:

1. Inspect bearing of link assembly (B) (TM 9-214).
2. Replace bearing if required.

INSTALLATION:

1. Position washer (A) and link (B) on stud (C).
2. Position washers (D) and (E) on stud (C).
3. Using wrench, install nut (F).
4. Using pliers, install new cotter pin (G).
5. Position two rod ends (H) in link assembly (B).
6. Install two bolts (J) through link assembly (B) and rod ends (H).
7. Using torque wrench and socket, tighten bolts (J) to 15-20 lb-ft (20-27 N-m).



End of Task

TA253524

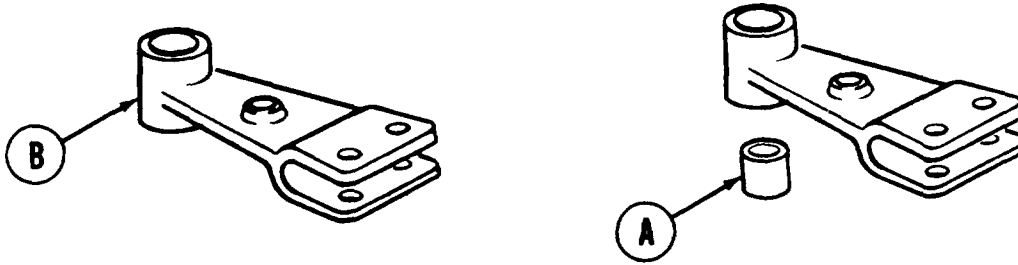
TM 9-2350-222-20-1-4

STEERING CONTROL INTERMEDIATE LINK ASSEMBLY REPAIR (Sheet 1 of 1)

TOOLS: Hand hammer
Brass bar 11/16 in. diameter
Vise

REFERENCE: TM 9-214

PRELIMINARY PROCEDURE: Remove intermediate link (page 15-22)



DISASSEMBLY:

1. Inspect bearing (A) (TM 9-214). Replace if required.

NOTE

If bearing is to be replaced, perform step 2.

2. Using hammer and brass bar, drive bearing from link from top or bottom of link.

ASSEMBLY:

1. Using vise, press bearing (A) in link (B) flush with both sides of link.
2. Install intermediate link (page 15-23).

End of Task

TA140524

STEERING LEVER ASSEMBLY REPAIR (Sheet 1 of 5)

PROCEDURE INDEX

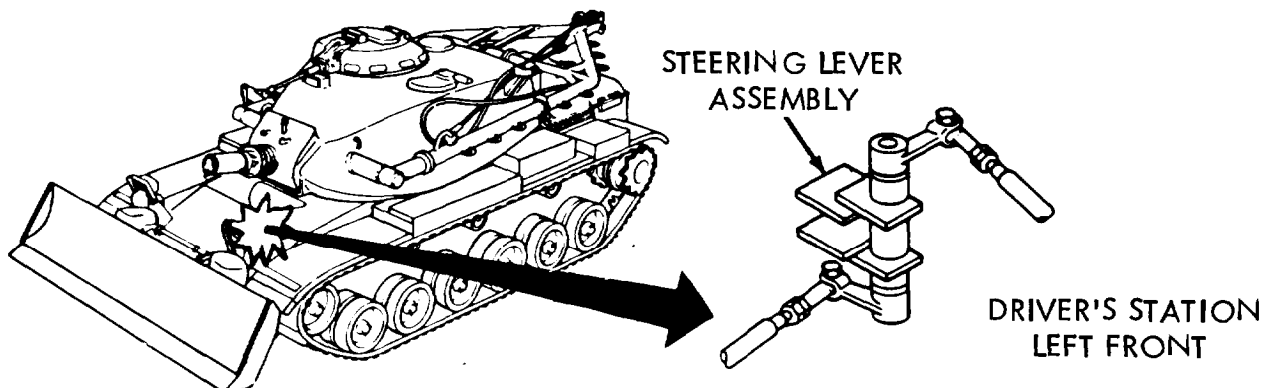
PROCEDURE	PAGE
Disassembly	15-24.2
Assembly	15-24.3

TOOLS: File, flat, 10 in.
 Grinder, portable
 Hammer, hand, 1 lb
 Punch, drive pin, 1/8 in.
 Torch Outfit, cutting and welding
 Welding Machine, arc
 9/16 in. combination box and open end wrench

SUPPLIES: Paint, white (Item 47, Appendix D)
 Rags (Item 65, Appendix D)
 Electrode, welding (Item 82, Appendix D)
 Shim (Item 83, Appendix D)
 Gloves, leather (Item 72, Appendix D)
 Shield, face (Item 76, Appendix D)
 Goggles, industrial (Item 74, Appendix D)

REFERENCES: TM 9-2350-222-10
 TM 43-0139
 TM 9-237

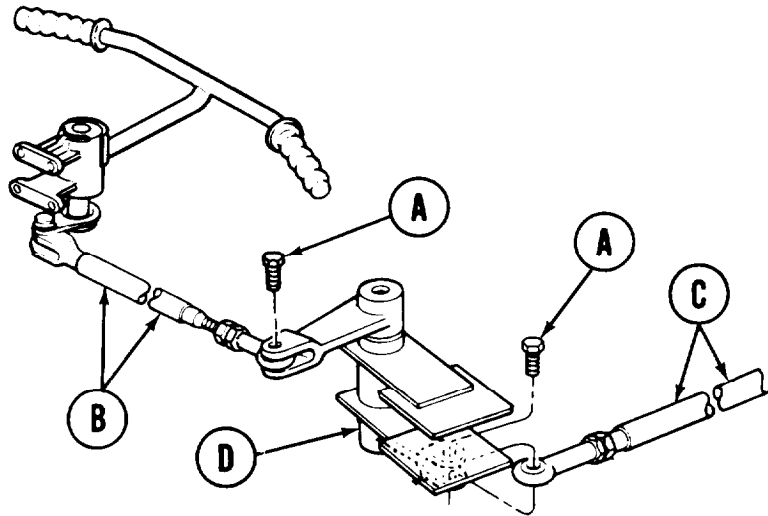
PRELIMINARY PROCEDURES: Remove all ammunition (TM 9-2350-222-10)
 Remove driver's escape hatch (TM 9-2350-222-10)
 Disconnect battery ground straps (page 10-283)
 Remove driver's seat assembly (page 17-42)
 Remove fixed fire extinguisher cylinders
 (page 21-49 or 21-52)
 Remove heater air duct hose (page 19-7)



Go on to Sheet 2

DISASSEMBLY:

1. Using 9/16 inch wrench, remove bolts (A) securing control rod (B) and connecting rod (C) to lever assembly (D).
2. Remove and position aside control rod (13) and connecting rod (C).

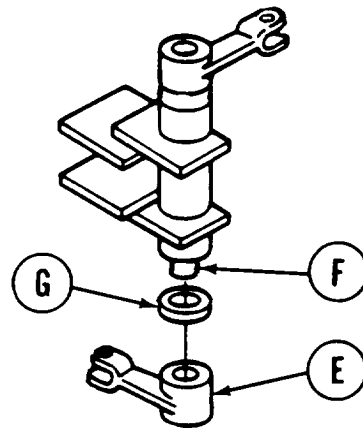


WARNING

Remove flammable materials, such as spilled fuel or oil, from hull. Place wet rags or nonflammable cloth under relay lever assembly. Follow safety procedures as listed in TM 9-237 "Operator's Manual for Welding Theory and Application." Station someone with a fire extinguisher in the immediate area.

Use effective chip guarding and personnel protective equipment (goggles/shield, gloves etc.) during cutting and welding operations. Failure to do so could result in personal injury.

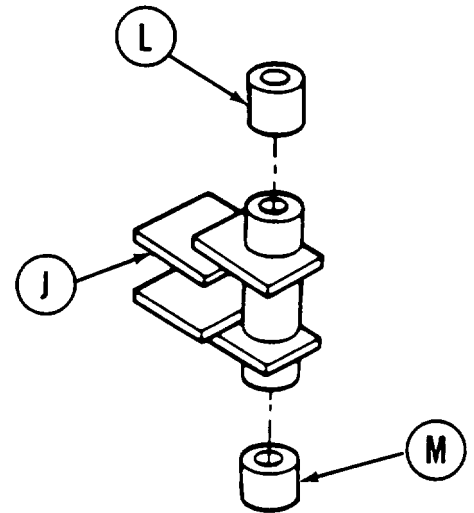
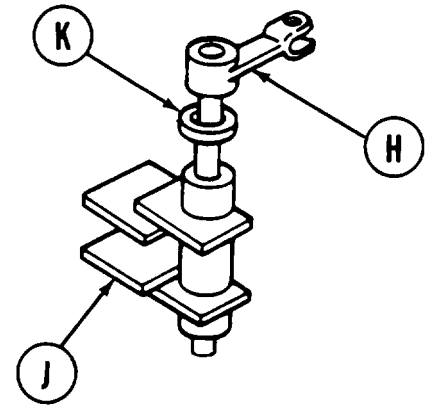
3. Using cutting torch, cut lower link (E) off pin (F). Discard lower link (E) and washer (G).
4. Using file or grinder, remove any burrs from end of pin (F).



Go on to Sheet 3

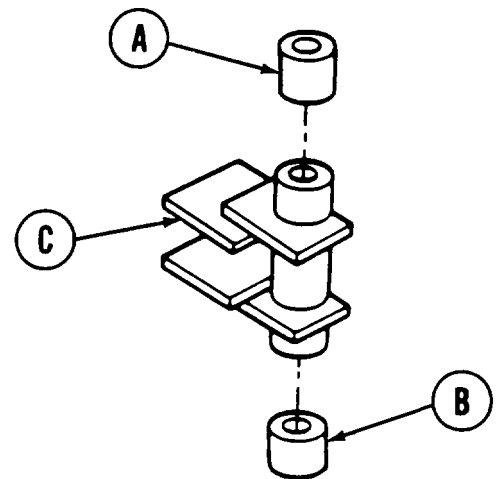
STEERING LEVER ASSEMBLY REPAIR (Sheet 3 of 5)

5. Using 1/8 inch punch and hammer, drive pin and link assembly (H) upward until clear of support (J).
6. Remove and discard pin and link assembly (H) and washer (K).
7. Using 1/8 inch punch and hammer, drive out top bearing (L) and bottom bearing (M) from support (J).
8. Retain removed bearings (L and M) to be used as an aid during installation.



ASSEMBLY:

1. Position new bearings (A) and (B) to support (C).
2. Using hammer and old bearings, drive bearings (A) and (B) into support (C). Be sure bearings are flush with support surfaces.

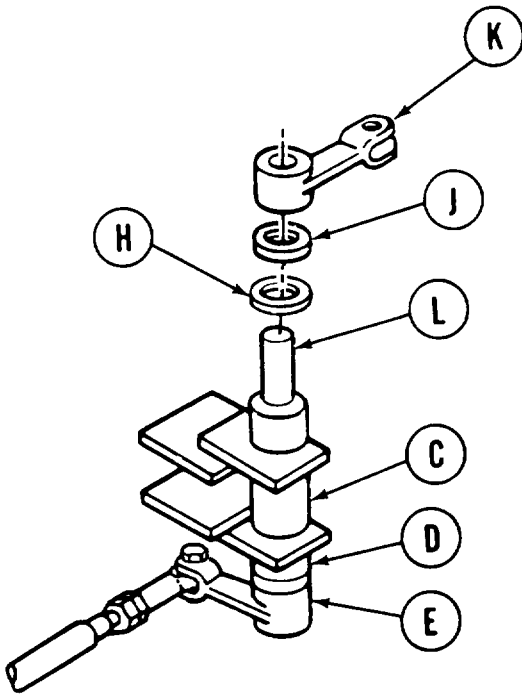
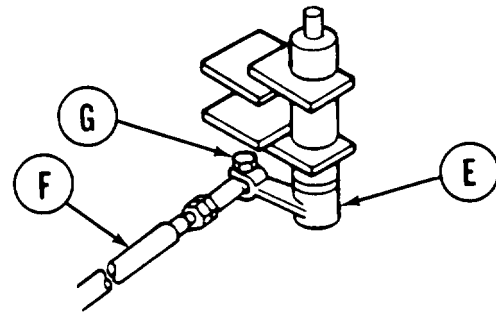
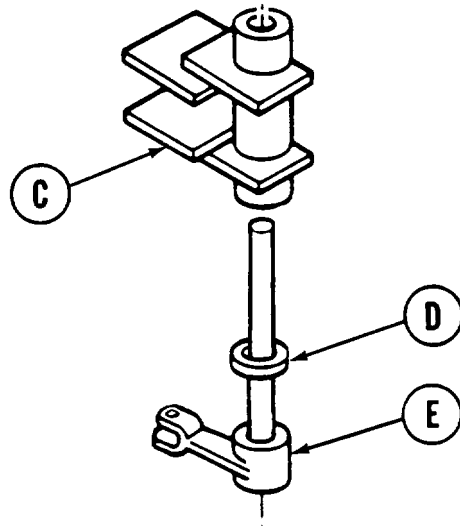


Go on to Sheet 4

STEERING LEVER ASSEMBLY REPAIR (Sheet 4 of 5)

3. Install new washer (D) on lower link and pin assembly (E) and insert in support (C).

4. Position rear connecting rod (F) to lower link and pin assembly (E) and secure with bolt (G).



5. Install new washer (H), .010 shim (J), and new upper link (K) on pin (L) of link and pin assembly (E).

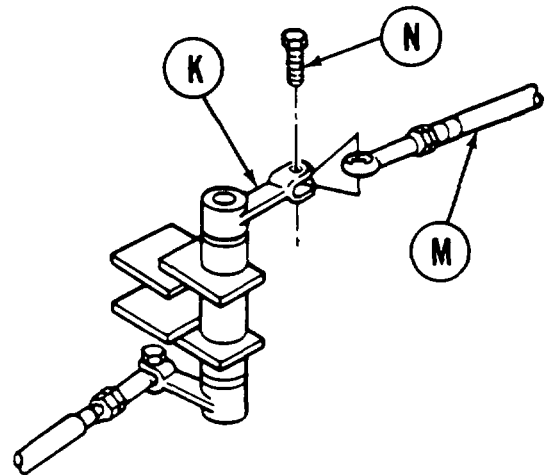
6. Align scribe marks on pin (L) and link (K). Be sure link and pin assembly (E) and washer (D) are flush with support (C). Weld link (K) to pin (L).

7. Remove and discard shim (J).

Go on to Sheet 5

STEERING LEVER ASSEMBLY REPAIR (Sheet 5 of 5)

8. Clean and paint welded areas according to TM 43-0139.
9. Position rear connecting rod (M) to link (K) and secure with bolt (N).
10. Perform step 3, page 15-21.
11. Install heater air duct hose (page 19-8).
12. Install fixed fire extinguisher cylinders (page 21-50 or 21-52.1).
13. Install driver's seat assembly (page 17-43).
14. Connect battery ground straps (page 10-283).
15. Install driver's escape hatch (TM 9-2350-222-10).
16. Install all ammunition (TM 9-2350-222-10).



End of Task

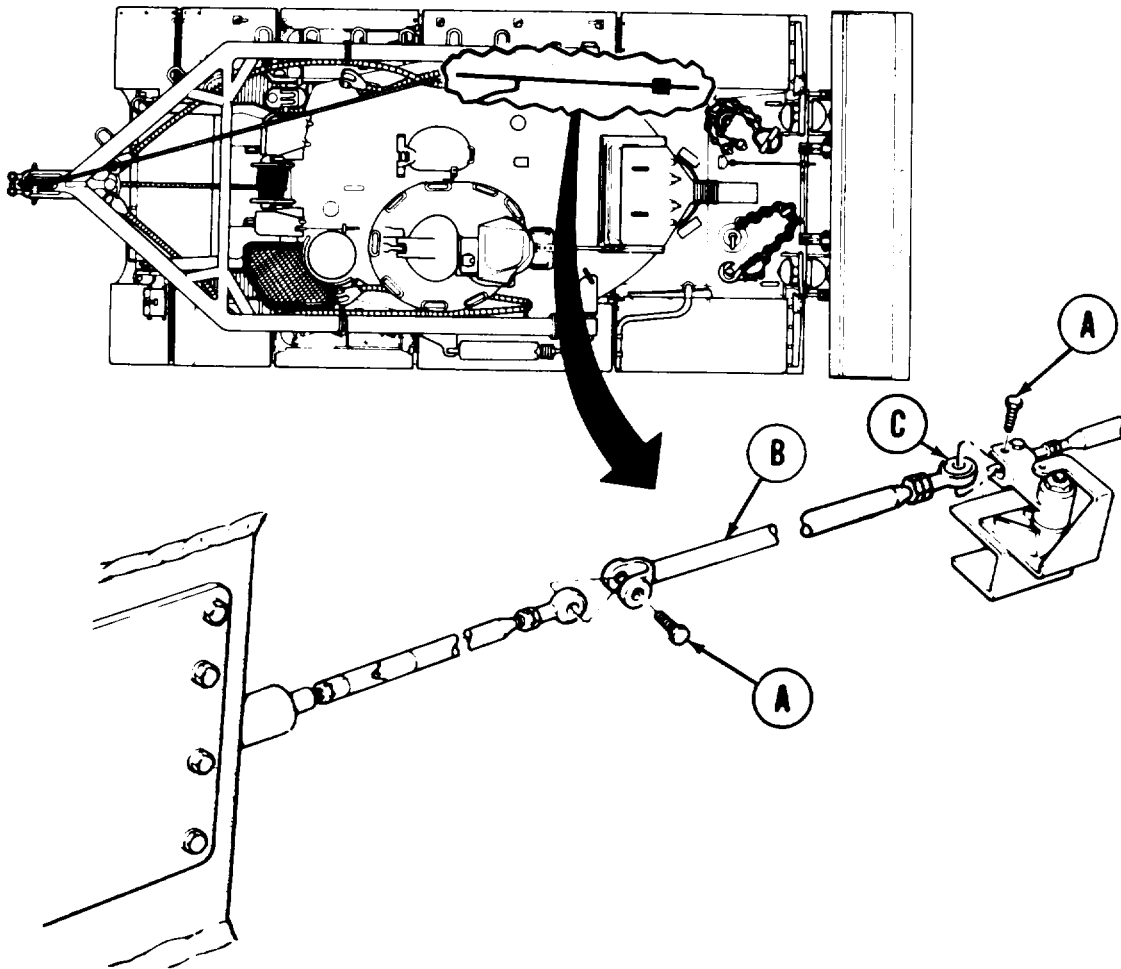
Change 5 15-24.5/(15-24.6 blank)

STEERING CONTROL LINK TO BULKHEAD SHAFT ROD REPLACEMENT (Sheet 1 of 2)

TOOLS: Torque wrench with 1/2 in. drive (0-175 lb-ft) (0237 N-m)
 9/16 in. combination box and open end wrench (2 required)
 9/16 in. socket with 1/2 in. drive

REFERENCE: TM 9-214

PRELIMINARY PROCEDURE: Block tracks (TM 9-2350-222-10)



REMOVAL

1. Using wrench, remove two bolts (A).
2. Remove rod assembly (B).
3. Inspect rod endbearing (C) (TM 9-214).
4. Inspect rod for bends, twists, or damaged threads.

Go on to Sheet 2

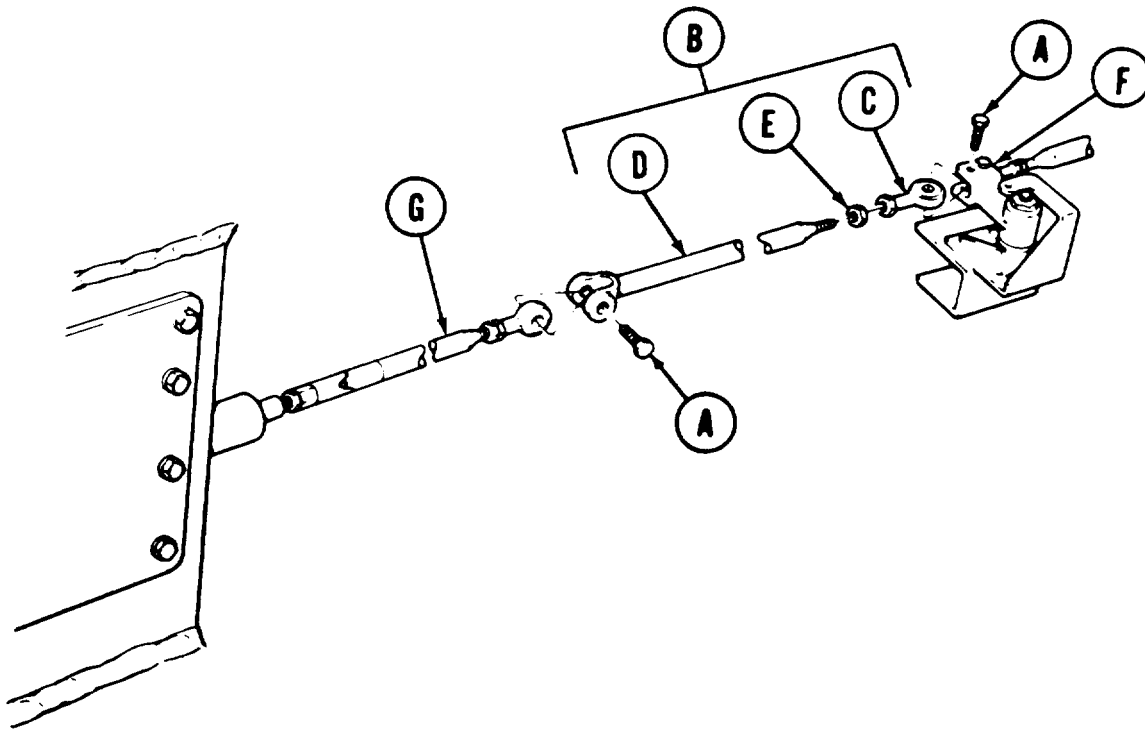
TA253525

STEERING CONTROL LINK TO BULKHEAD SHAFT ROD Replacement (Sheet 2 of 2)

NOTE

If rod (D) or rod end bearing (C) must be replaced, perform steps 5 thru 7.

- Using one wrench on nut (E) and one wrench on rod end (C), remove rod end (C).



- Replace rod (D) or rod end (C) as required.
- Using one wrench on nut (E) and one wrench on rod end (C), install rod end.

INSTALLATION:

- Install rod assembly (B) to link (F) and rod (G) as shown.
- Using wrench, install two bolts (A).
- Using socket and torque wrenches, tighten bolts (A) to 15-20 lb-ft (20-27 N.m).

End of Task

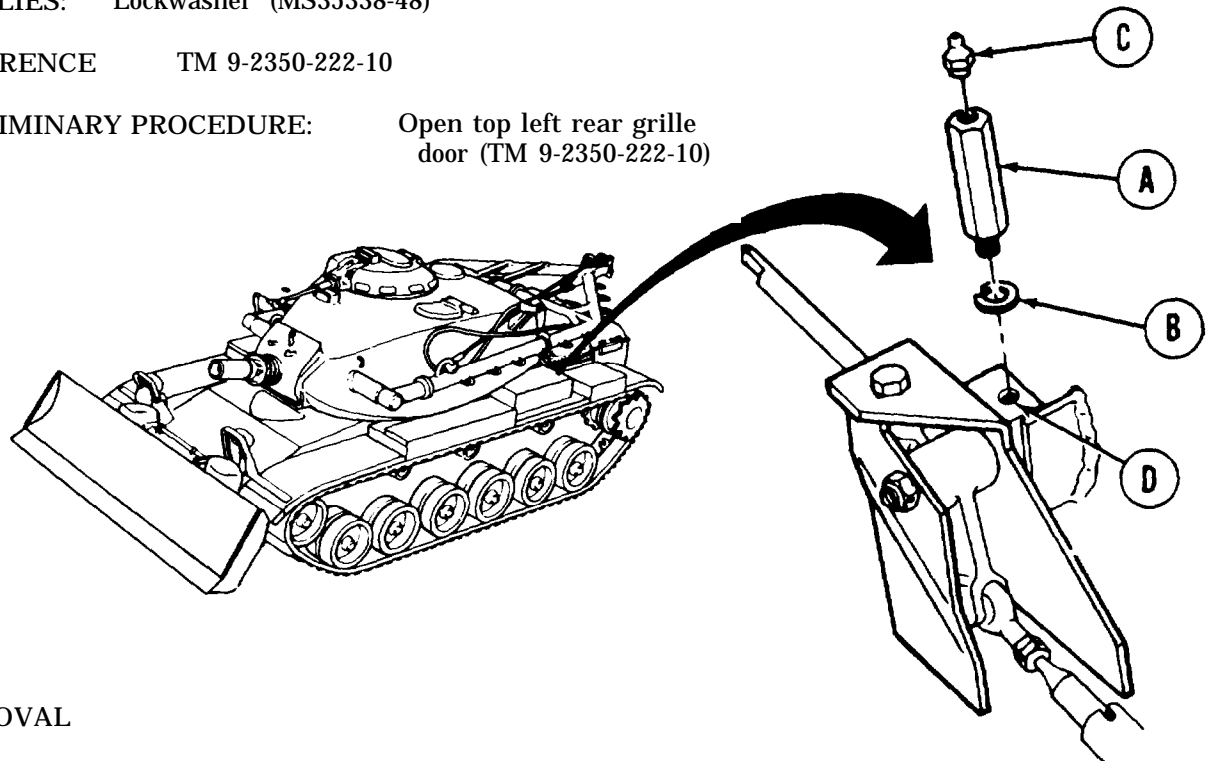
STEERING CONTROL EXTENSION STUD REPLACEMENT (Sheet 1 of 1)**TOOLS:** Droplight/flashlight

- 3/4 in. socket with 1/2 in. drive (deep well)
- 5/16 in. combination box and open end wrench
- Ratchet with 1/2 in. drive
- 10 in. extension with 1/2 in. drive
- 3/4 in. combination box and open end wrench

SUPPLIES: Lockwasher (MS35338-48)

REFERENCE TM 9-2350-222-10

PRELIMINARY PROCEDURE: Open top left rear grille door (TM 9-2350-222-10)



**BEHIND LEFT REAR
FUEL TANK ON HULL WALL.**

REMOVAL

1. Using socket, remove stud (A) and lockwasher (B). Throw lockwasher away.
2. Using 3/4 inch wrench to hold stud (A), use 5/16 inch wrench and remove fitting (C) from stud (A).

INSTALLATION:

1. Using 3/4 inch wrench to hold stud (A), use 5/16 inch wrench and install fitting (C) into stud (A).
2. Position new lockwasher (B) onto bracket (D). Using socket, install stud (A) into bracket (D).

End of Task

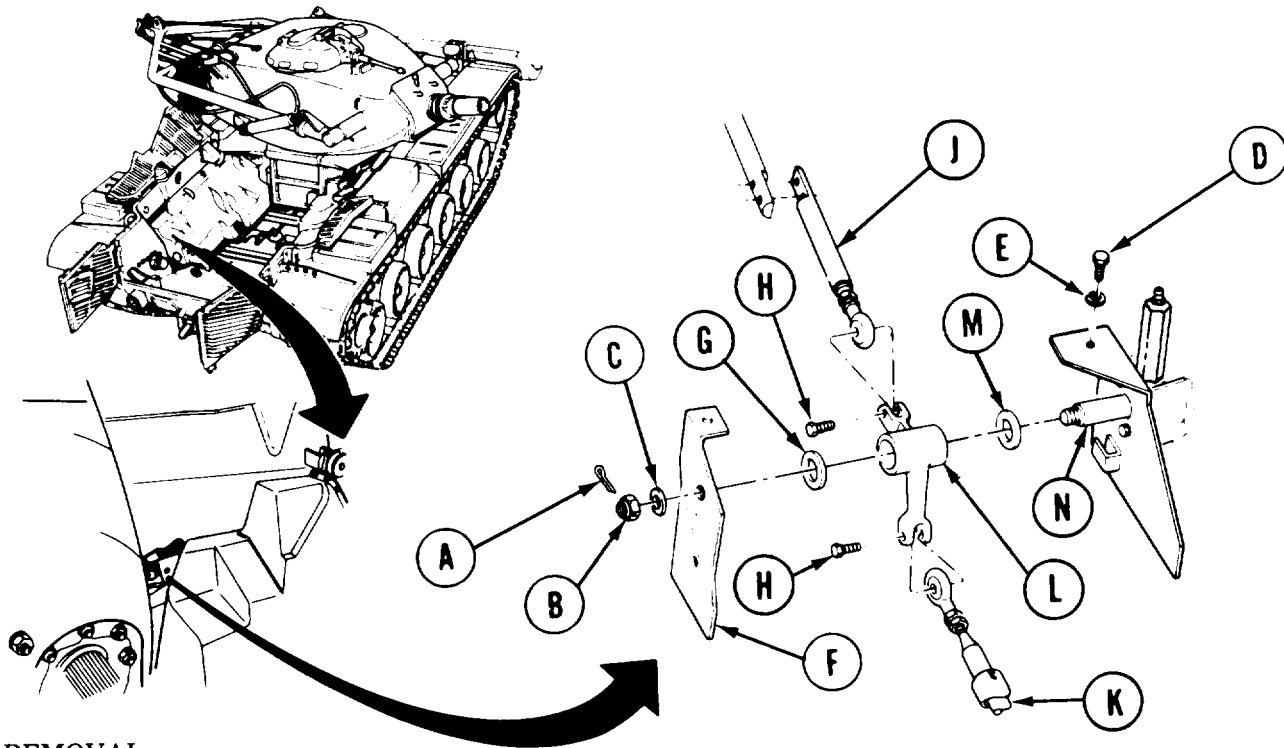
TA253528

CONNECTING LINK REPLACEMENT (Sheet 1 of 2)

TOOLS: Flashlight
5 in. extension with 1/2 in. drive
Slip joint pliers
7/16 in. socket with 1/2 in. drive
3/4 in. combination box and open end wrench
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)

SUPPLIES: Cotter pin (MS24665-287)

PRELIMINARY PROCEDURE: Remove powerplant (page 5-1)



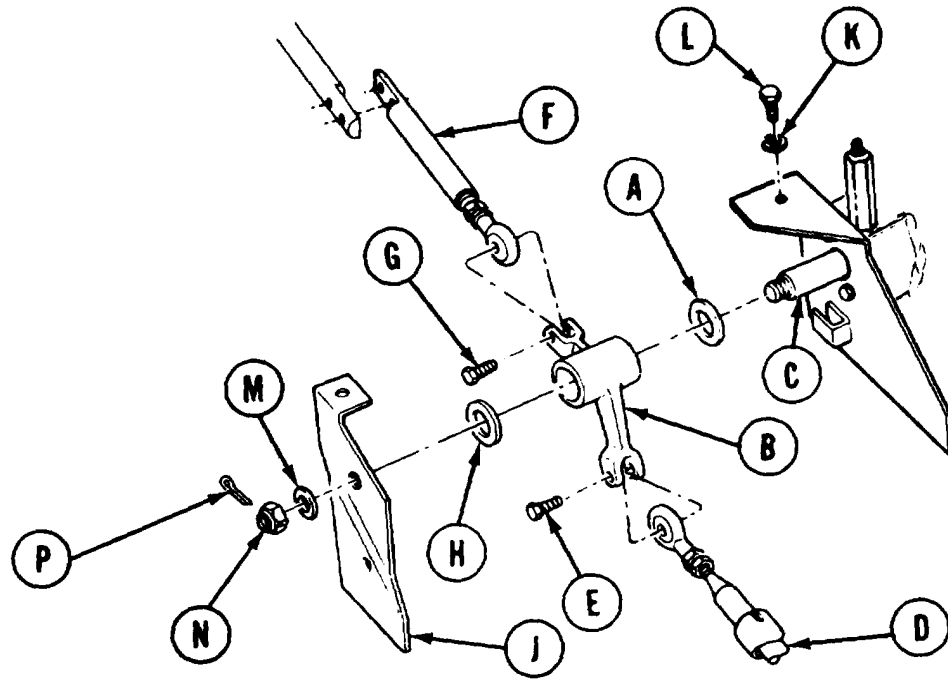
REMOVAL:

1. Using pliers, remove cotter pin (A). Throw pin (A) away.
2. Using wrench, remove nut (B) and washer (C).
3. Using 7/16 inch socket and extension, remove screw (D) and washer (E).
4. Remove shield (F) and washer (G).
5. Using 9/16 inch socket, remove two bolts (H) from connecting rods (J) and (K).
6. Remove connecting rods (J) and (K) from link (L).
7. Using hands, remove connecting link (L) and washer (M) from shaft (N).

TA253529

Go on to Sheet 2

CONNECTING LINK REPLACEMENT (Sheet 2 of 2)



INSTALLATION:

1. Position washer (A) and connecting link (B) onto shaft (C).
2. Position connecting rod (D) onto clevis of connecting link (B) and secure with bolt (E).
3. Install connecting rod (F) onto connecting link (B) and secure with bolt (G).
4. Using 9/16 inch socket and torque wrenches, tighten bolts (E) and (G) to 15-20 lb-ft (2027 N-m).
5. Install washer (H) and shield (J) onto shaft (C) and, using 7/16 inch socket and extension, install and secure washer (K) and screw (L) into shield (J).
6. Using wrench, install and secure washer (M) and nut (N).
7. Using pliers, install new cotter pin (P).
8. Install 2A powerplant (page 5-14) or 2D powerplant (page 5-37).

End of Task

TA253530

Change 1 15.29

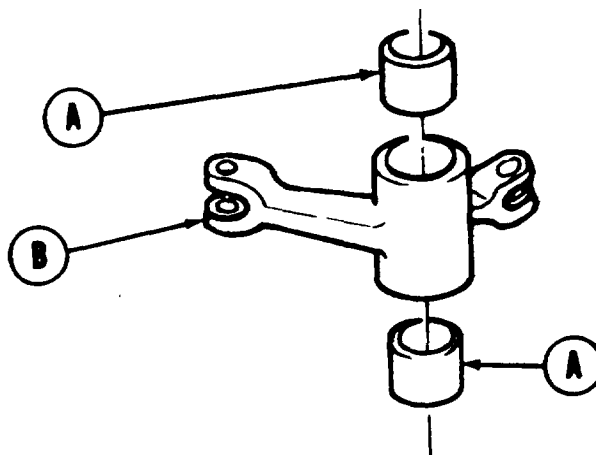
STEERING CONTROL CONNECTING LINK REPAIR (Sheet 1 of 1)

TOOLS: 2 lb hand hammer
3/8 in. drive pin punch
Vise

SUPPLIES: Bearing (8762130) (2 required)

REFERENCES: LO 9-2350-222-12
TM 9-214

PRELIMINARY PROCEDURE: Remove connecting link from vehicle (page 15-28)



INSPECTION:

Inspect bearings (TM 9-214).

DISASSEMBLY:

Using hammer and punch, drive bearings (A) out of link (B).

ASSEMBLY:

1. Position one new bearing (A) over connecting link (B).
2. Using vise, press bearing (A) flush with outer surface of link (B).
3. Turn link over. Repeat step 1 with other bearing.
4. Install link in vehicle (page 15-29).
5. Lubricate (LO 9-2350-222-12).

End of Task

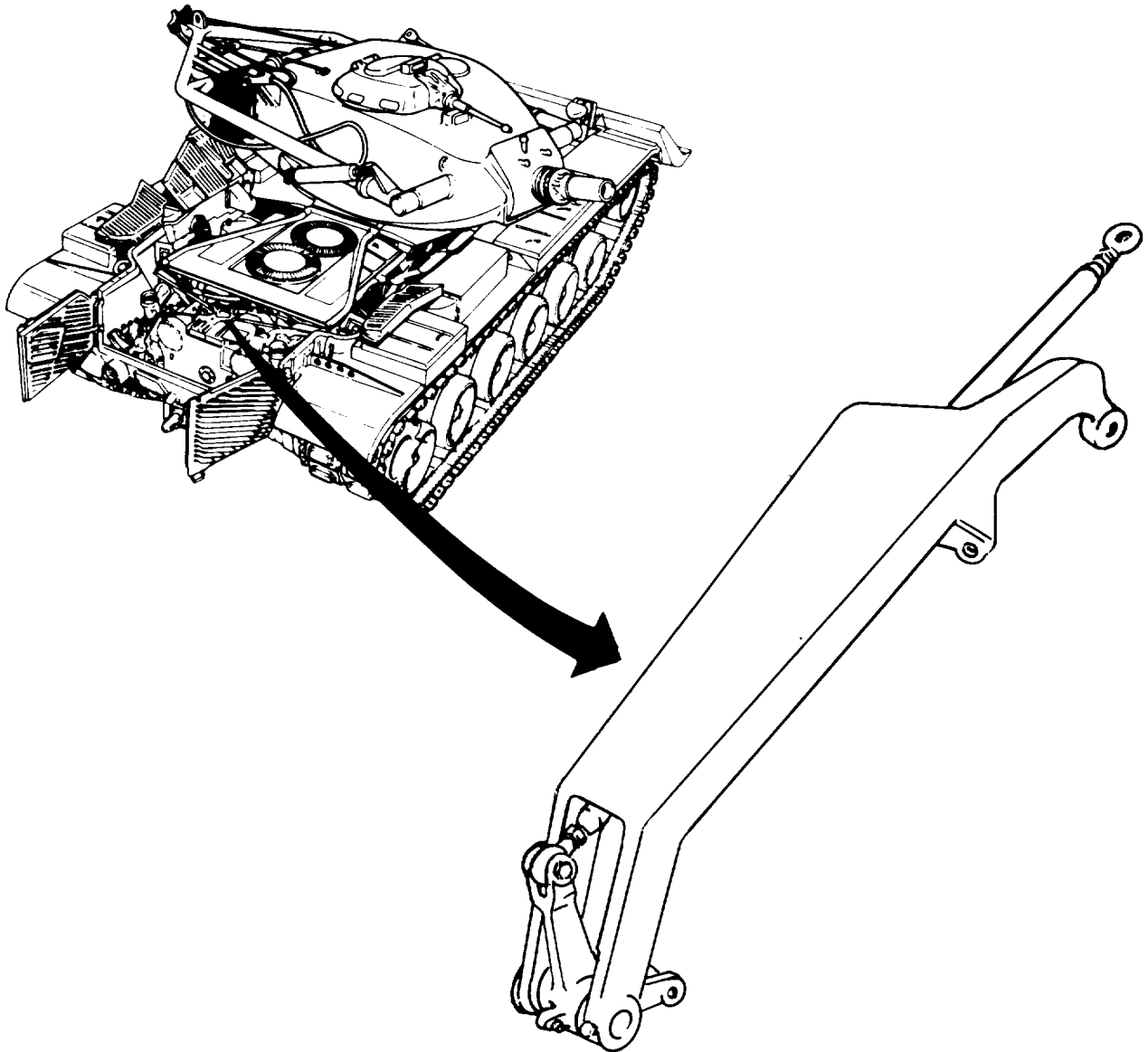
TA253531

STEERING CONTROL CONNECTING LINK (RISER LINK TO TRANSMISSION SHAFT LINK)
REPLACEMENT (Sheet 1 of 3)

TOOLS: 9/16 in. combination box and open end wrench (2 required)
Torque wrench with 1/2 in. drive (0-175 lb-ft) (0-237 N m)
9/16 in. socket with 1/2 in. drive
9/16 in. crowfoot wrench with 3/8 in. drive (NSN 5120-00-184-8397)
Adapter, 1/2 in. to 3/8 in.

REFERENcE: TM 9-214

PRELIMINARY PROCEDURES: Remove top deck (page 16-21)
Remove transmission shroud (page 9-20)



Go on to Sheet 2

**STEERING CONTROL CONNECTING LINK (RISER LINK TO TRANSMISSION SHAFT LINK)
REPLACEMENT (Sheet 2 of 3)**

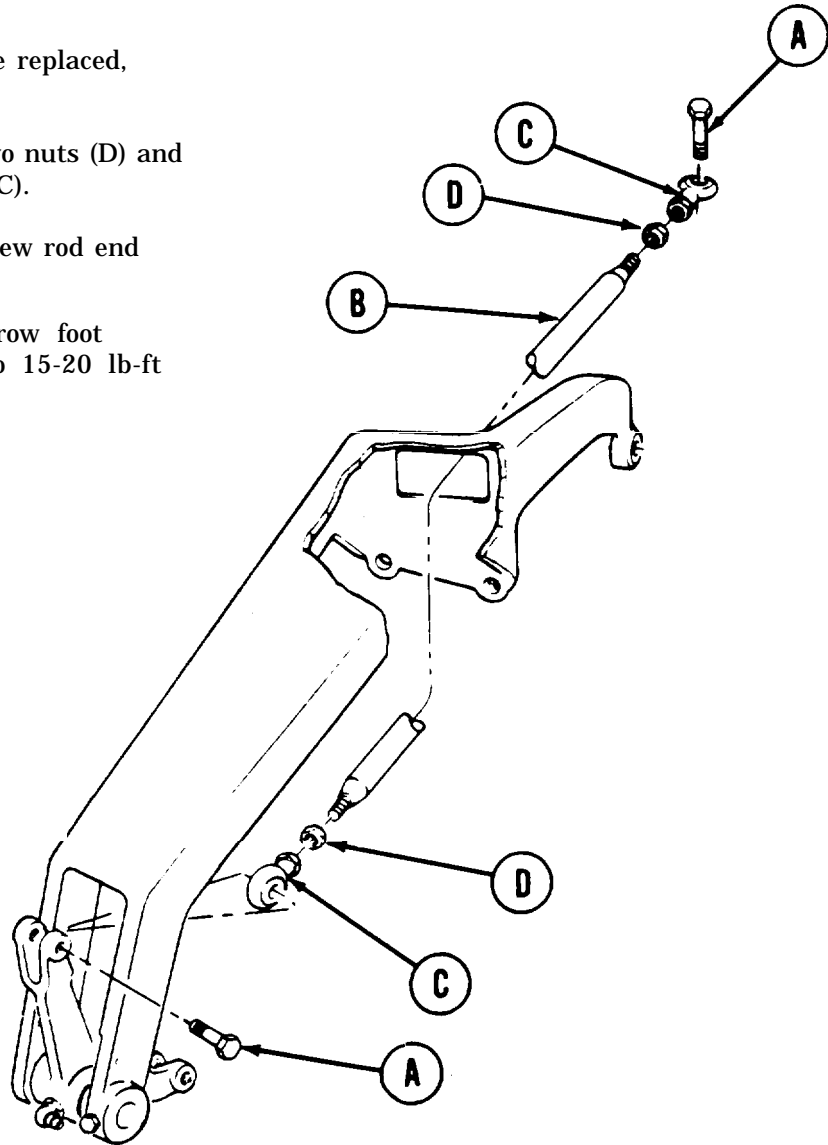
REMOVAL:

1. Using wrench, remove two bolts (A).
2. Remove connecting link (B).
3. Inspect rod end bearings (C) (TM 9-214).

NOTE

If rod end bearings must be replaced,
perform steps 4 thru 6.

4. Using two wrenches, loosen two nuts (D) and
remove two rod end bearings (C).
5. Using two wrenches, install new rod end
bearings (C).
6. Using torque wrench and crow foot
wrench, tighten nuts (D) to 15-20 lb-ft
(20-27 N-m).



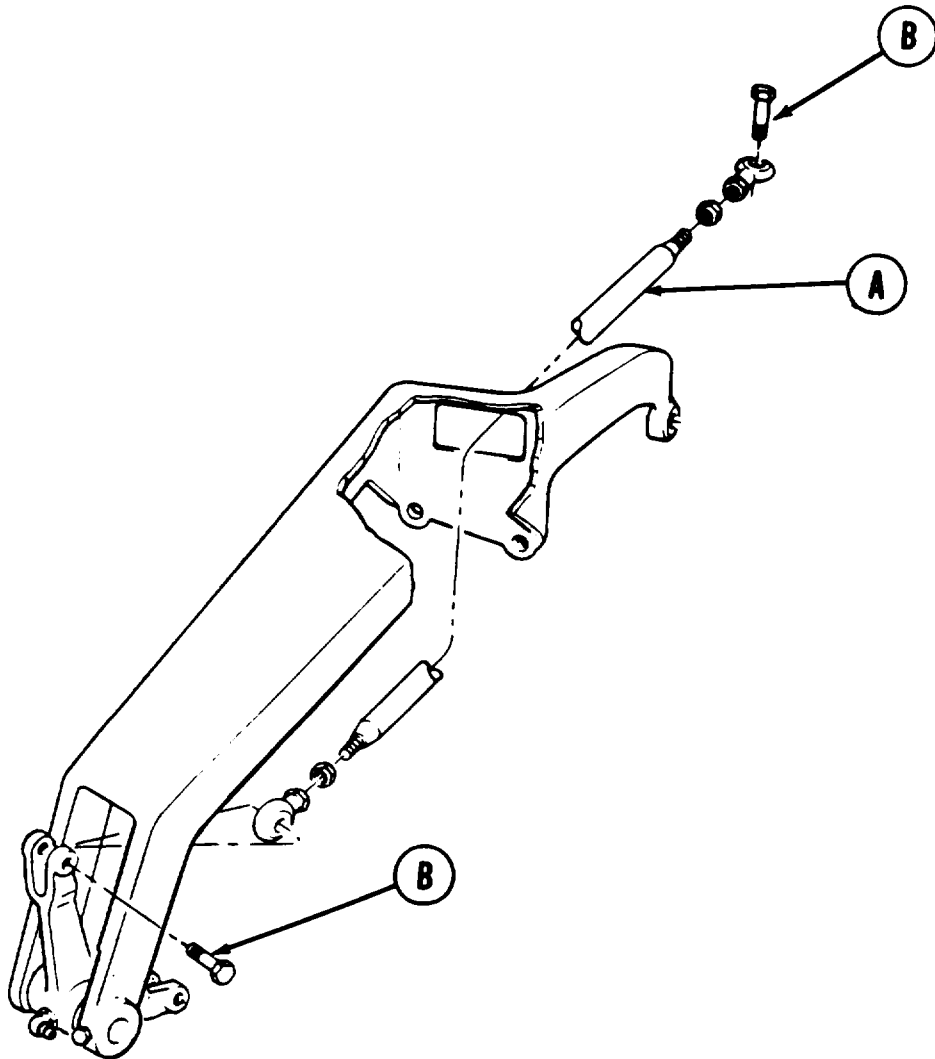
Go on to Sheet 3

TM 9-2350-222-20-1-4

**STEERING CONTROL CONNECTING LINK (RISER LINK TO TRANSMISSION SHAFT LINK)
REPLACEMENT (Sheet 3 of 3)**

INSTALLATION:

1. Position connecting link (A) on transmission.
2. Install two bolts (B) finger tight. Using socket and torque wrenches, tighten bolts (B) to 15-20 lb-ft (20-27 N-m).
3. Install transmission shroud (page 9-23).
4. Install top deck (page 16-23).



End of Task

TA253534

Change 1 15-33

STEERING CONTROL BRACKET REPLACEMENT (Sheet 1 of 2)

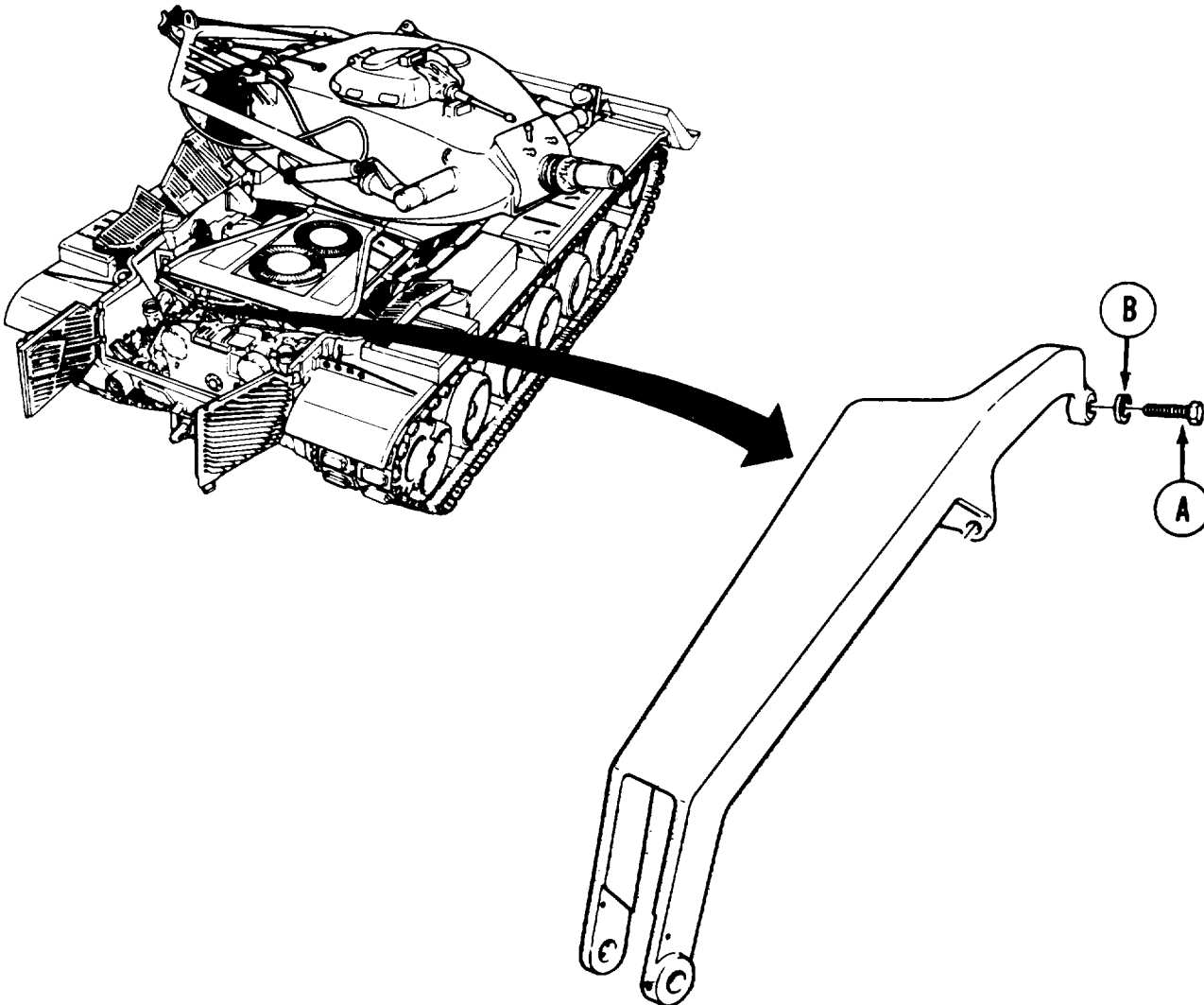
TOOLS: 13/16 in. socket with 1/2 in. drive
Ratchet with 1/2 in. drive
3/4 in. combination box and open end wrench
Hinged handle with 1/2 in. drive

SUPPLIES: Lockwasher (MS35338-67) (3 required)

PRELIMINARY PROCEDURE: Remove transmission shift linkage (pages 15-32, 15-38)

REMOVAL:

1. Using wrench, remove one screw (A) and lockwasher (B) holding bracket to transmission. Throw lockwasher away.

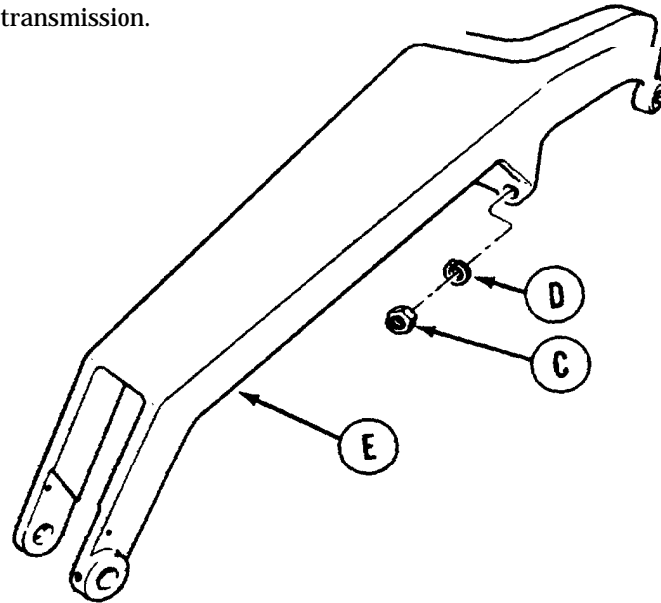


Go on to Sheet 2

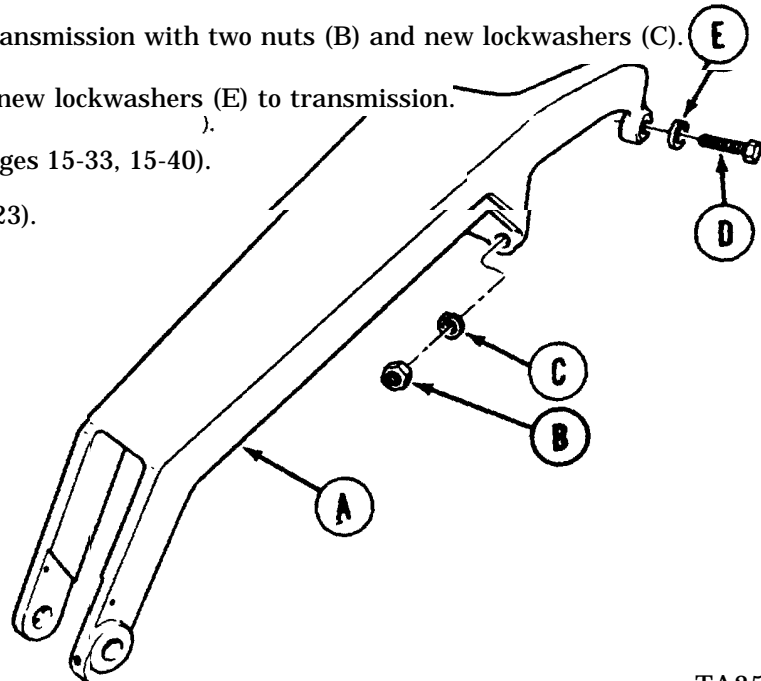
TA253535

STEERING CONTROL BRACKET REPLACEMENT (Sheet 2 of 2)

2. Using socket, remove two nuts (C) and lockwashers (D) holding bracket (E) to transmission. Throw lockwashers away.
3. Remove bracket (E) from transmission.

**INSTALLATION:**

1. Using socket, install bracket (A) to transmission with two nuts (B) and new lockwashers (C).
2. Using wrench, install screw (D) and new lockwashers (E) to transmission.
3. Install transmission shift linkage (pages 15-33, 15-40).
4. Install transmission shroud (page 9-23).



TA253536

End of Task

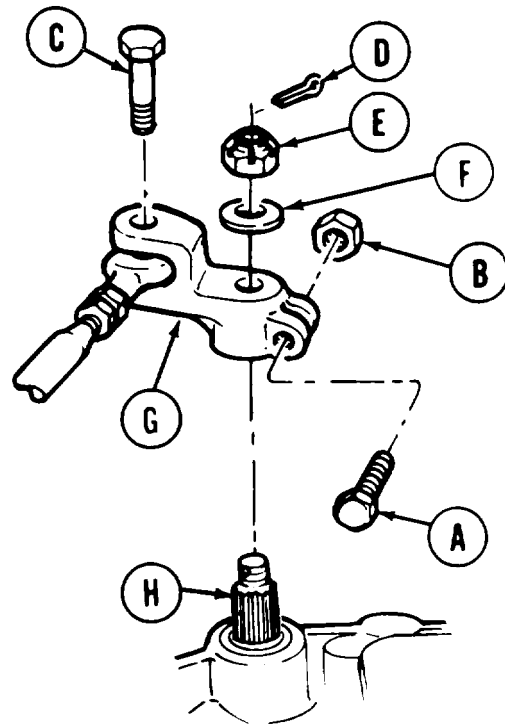
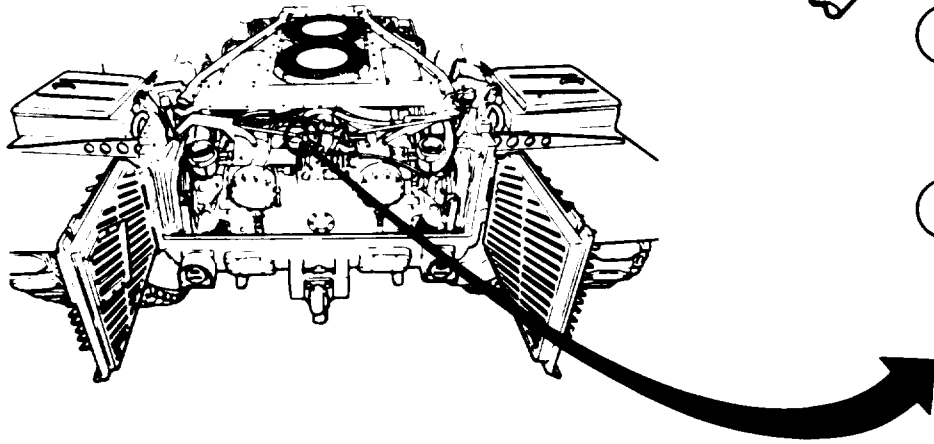
Change 1 15-35

**STEERING CONTROL TO TRANSMISSION SHAFT CONNECTING LINK REPLACEMENT
(Sheet 1 of 2)**

TOOLS: Torque wrench with 1/2 in. drive (0-175 lb-ft) (0-237 N-m)
Slip joint pliers
9/16. in. socket with 1/2 in. drive
9/16 in. combination box and open end wrench
Ratchet with 1/2 in. drive

SUPPLIES: Cotter pin (MS24665-283)

PRELIMINARY PROCEDURES: Remove transmission shroud (page 9-20)
Remove top deck (page 16-21)



REMOVAL:

1. Using socket and wrench on screw (A) and nut (B), remove nut and screw.
2. Using wrench on bolt (C), remove bolt.
3. Using pliers, remove cotter pin (D). Throw cotter pin away.
4. Using wrench on nut (E), remove nut (E) and washer (F).
5. Remove link (G) from transmission stud (H).

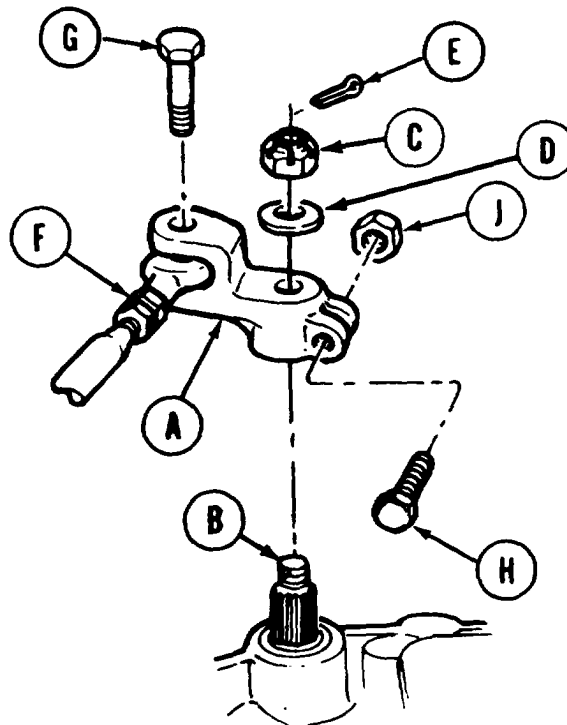
Go on to Sheet 2

TA253537

STEERING CONTROL TO TRANSMISSION SHAFT CONNECTING LINK REPLACEMENT (Sheet 2 of 2)

INSTALLATION:

1. Position link (A) over stud (B) with blind splines alined.
2. Using wrench, install nut and washer (C and D) on stud (B). Using socket and torque wrench, tighten nut (C) to 15-20 lb-ft (20-27 N-m).
3. Using pliers, install new cotter pin (E) through nut (C) and stud (D).
4. Position rod (F) in link (A).
5. Using wrench, install bolt (G). Using socket and torque wrench, tighten bolt (G) to 15-20 lb-ft (20-27 N-m).
6. Using socket and wrench on screw (H) and nut (J), install screw and nut on link (A).
7. Install transmission shroud (page 9-23).
8. Install top deck (page 16-23).



End of Task

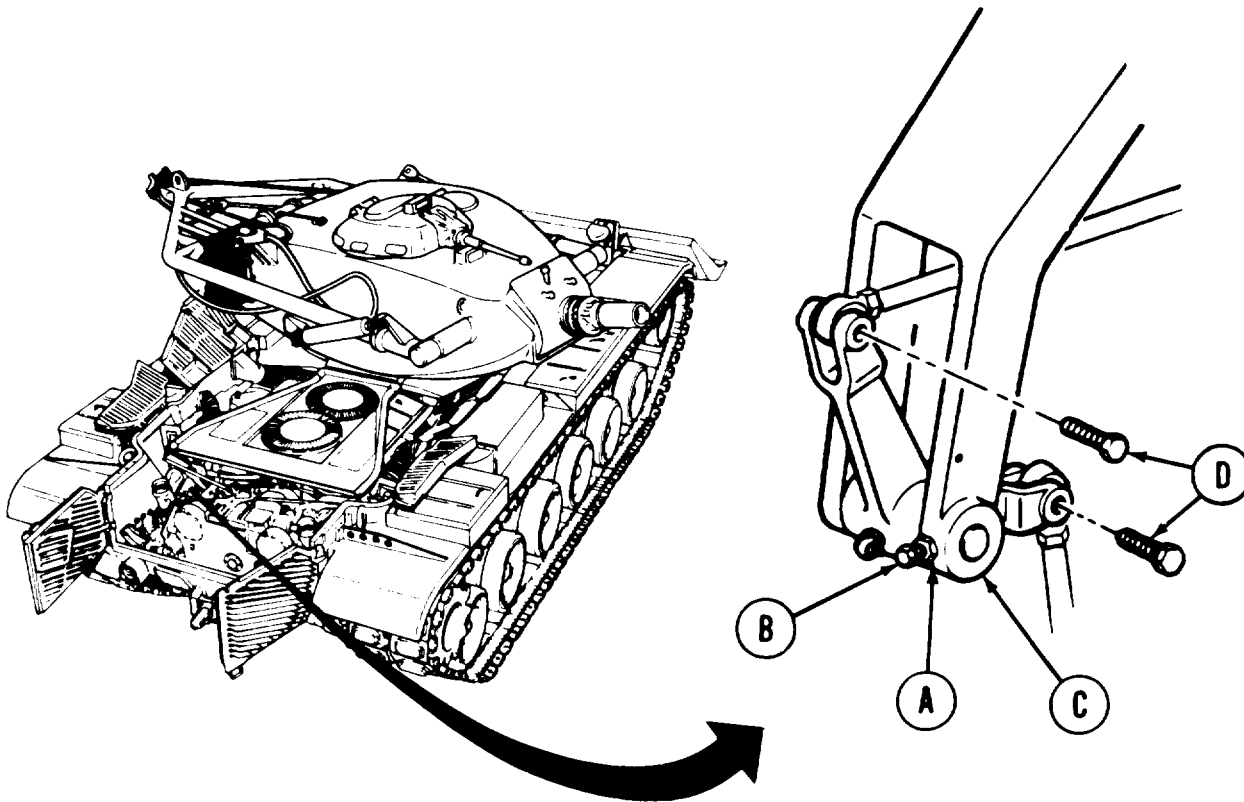
TA140573

TM 9-2350-222-20-1-4
STEERING CONTROL LINK ASSEMBLY REPLACEMENT (Sheet 1 of 3)

TOOLS: 1/4 in. pin punch
9/16 in. socket with 1/2 in. drive
7/16 in. combination box and open end wrench
8 in. adjustable wrench
Hammer
Ratchet with 1/2 in. drive
Torque wrench with 1/2 in. drive (0-175 lb-ft) (0-237 N-m)
5/16 in. combination box and open end wrench

REFERENCES: TM 9-2350-222-10
LO 9-2350-222-12

PRELIMINARY PROCEDURES: Remove transmission shroud (page 9-20).
Open number 5 top deck grille door (TM 9-2350-222-10)



REMOVAL:

1. Using 7/16 inch wrench, loosen locknut (A).
2. Using adjustable wrench, remove setscrew (B) and nut (A) from connecting link (C).
3. Using socket, remove two bolts (D).

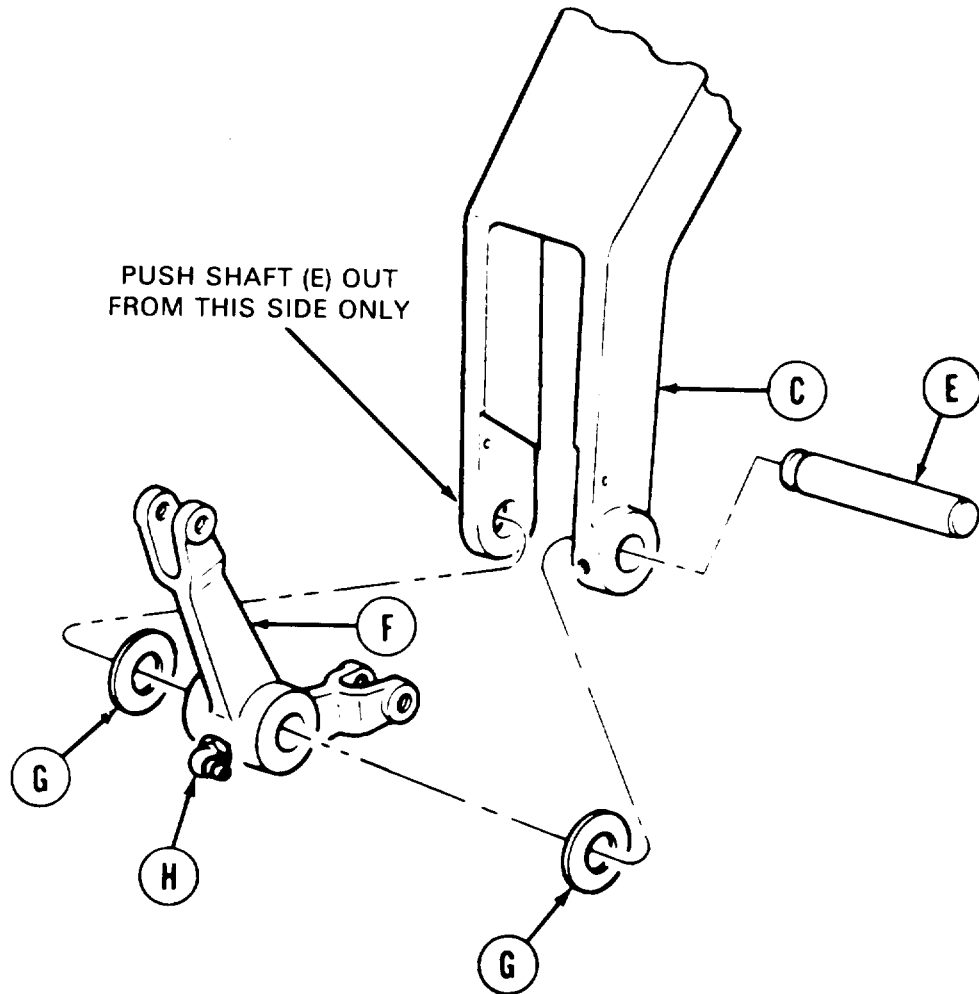
Go on to Sheet 2

TA253538

STEERING CONTROL LINK ASSEMBLY REPLACEMENT (Sheet 2 of 3)

NOTE

Support link (F) with free hand to prevent link from falling under transmission. If necessary, use pin punch and hammer on this side as indicated in step 4 to loosen shaft (E).



4. Remove shaft (E) from connecting link (C) and link (F).
5. Remove link (F) and washers (G) from link (C).
6. Using 5/16 inch wrench, remove grease fitting (H) from link (F).

Go on to Sheet 3

TA140529

STEERING CONTROL LINK ASSEMBLY REPLACEMENT (Sheet 3 of 3)

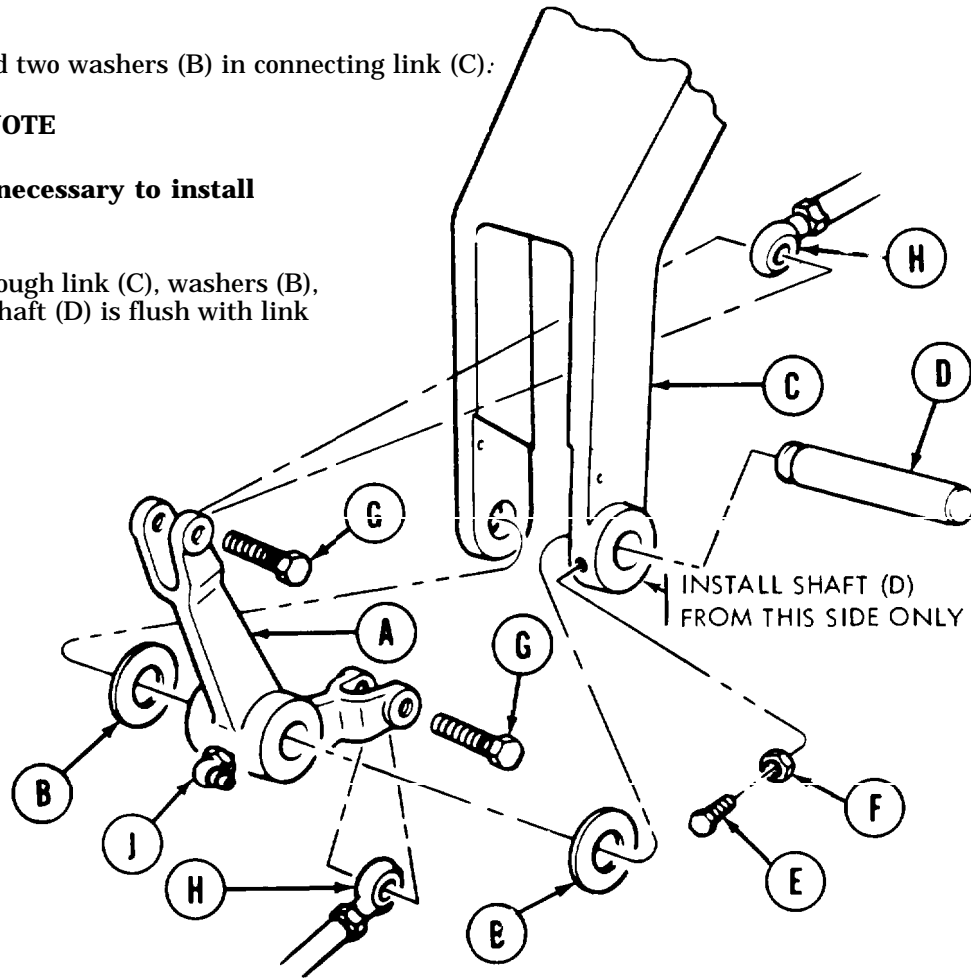
INSTALLATION:

1. Position link (A) and two washers (B) in connecting link (C):

NOTE

Use hammer if necessary to install shaft (D).

2. Install shaft (D) through link (C), washers (B), and link (A), until shaft (D) is flush with link (c).



3. Using adjustable wrench, install setscrew (E) and locknut (F) into link (C). Using 7/16 inch wrench to hold locknut (F), tighten setscrew (E) into groove of shaft (D). Tighten locknut (F) against link (C).
4. Using socket, install two bolts (G) through link (A) and two rod end bearings (H). Using torque wrench, tighten bolts (G) to 15-20 lb-ft (20-27 N-m).
5. Using 5/16 inch wrench, install grease fitting (J) into link (A).
6. Lubricate steering controls (LO 9-2350-222-12).
7. Close number 5 top deck grille door (TM 9-2350-222-10).
8. Install transmission shroud (page 9-23).

End of Task

TA253539

LINK ASSEMBLY REPAIR (Sheet 1 of 1)

TOOLS: Ball peen hammer
3/8 drive pin punch
Vise

SUPPLIES: Bearings (8762130) (2 required)

REFERENCE: LO 9-2350-222-12
TM 9-214

PRELIMINARY PROCEDURE: Remove steering control link (page 15-38)

INSPECTION:

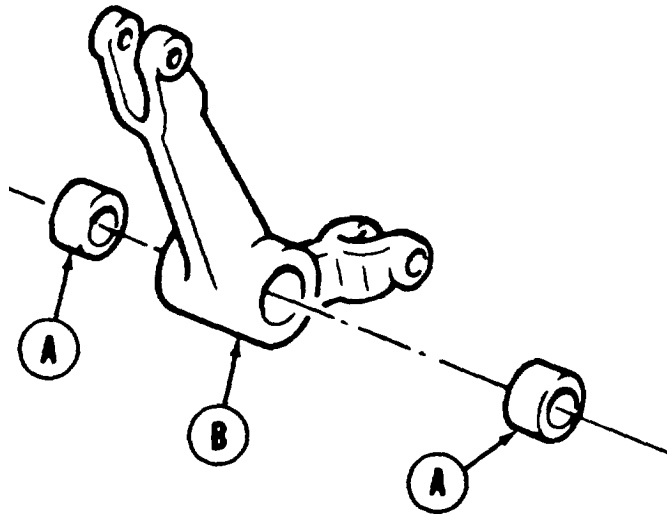
Inspect bearings (A) for damage or wear (TM 9-214).

DISASSEMBLY:

Using hammer and punch, remove bearings (A).

ASSEMBLY:

1. Using vise, press bearing (A) into link (B) flush with outer surface of link.
2. Turn link over. Repeat step 1 for other bearing.
3. Install steering control link (page 15-40).
4. Lubricate (LO 9-2350-222-12).



End of Task

TA140486

15-41/(15-42blank)

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TM 9-2350-222-20-1-4

PUBLICATION DATE

20 Feb 1981

PUBLICATION TITLE

M728 Combat Engineer Vehicle

BE EXACT PIN-POINT WHERE IT IS

PAGE NO	PARA-GRAPH	FIGURE NO	TABLE NO
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3

2

09

51

2-8

2-1

12

1-6a

IN THIS SPACE TELL WHAT IS WRONG AND WHAT SHOULD BE DONE ABOUT IT:

Item 10. Change illustration. Reason: Tube end shown assembled on wrong side of lever cam.

Item 3. The NSN and P/N are not listed on the AMDF nor the MCRL. Request correct NSN and P/N be furnished.

Preventive Maintenance Checks and Services. Item 7 under "Items to be inspected" should be changed to read as follows: Firing linkage and firing mechanism pawl.

Since there are both 20- and 30- round magazines for this rifle, data on both should be listed.

SAMPLE

PRINTED NAME GRADE OR TITLE AND TELEPHONE NUMBER

M. J. Smith, SP/5, 731-5316

SIGN HERE

M. J. Smith

DA FORM 2028-2
1 JUL 79

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PS--IF YOUR OUTFIT WANTS TO KNOW ABOUT YOUR RECOMMENDATION MAKE A CARBON COPY OF THIS AND GIVE IT TO YOUR HEADQUARTERS

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UNIT'S ADDRESS



DEPARTMENT OF THE ARMY

FOLD BACK

SAMPLE

TEAR ALONG PERFORATED LINE

OFFICIAL BUSINESS

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U.S. Army Tank-Automotive Command
ATTN: AMSTA-MBC
Warren, Michigan 48397-5000

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U.S. Army Tank-Automotive Command
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Warren, Michigan 48397-5000

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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 Track M728.

* U. S. GOVERNMENT PRINTING OFFICE : 1994 0 - 300-421 (3205)

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

SQUARE MEASURE

1 Sq Centimeter = 100 Sq Millimeters = 0.155 Sq Inches
 1 Sq Meter = 10000 Sq Centimeters = 1076 Sq Feet
 1 Sq Kilometer = 1,000,000 Sq Meters = 0.386 Sq 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

CUBIC MEASURE

1 Cu Centimeter = 1000 Cu Millimeters = 0.061 Cu Inches
 1 Cu Meter = 1,000,000 Cu Centimeters = 35.31 Cu Feet

LIQUID MEASURE

1 Milliliter = 0.001 Liters = 0.0338 Fluid Ounces
 1 Liter = 1000 Milliliters = 33.82 Fluid Ounces

TEMPERATURE

$^{\circ}\text{F} = 32 + 1.8^{\circ}\text{C}$
 212 Fahrenheit is equivalent to 100 Celsius
 90 Fahrenheit is equivalent to 32 Celsius
 32 Fahrenheit is equivalent to 0 Celsius
 $^{\circ}\text{C} = 32 + 0.55^{\circ}\text{F}$

APPROXIMATE CONVERSION FACTORS

TO CHANGE	TO	MULTIPLY BY
Inches	Centimeters	2.540
Feet	Meters	0.305
Yards	Meters	0.914
Miles	Kilometers	1.609
Square Inches	Square Centimeters	6.451
Square Feet	Square Meters	0.093
Square Yards	Square Meters	0.836
Square Miles	Square Kilometers	2.590
Acres	Square Hectometers	0.405
Cubic Feet	Cubic Meters	0.028
Cubic Yards	Cubic Meters	0.765
Fluid Ounces	Milliliters	29.573
Pints	Liters	0.473
Quarts	Liters	0.946
Gallons	Liters	3.785
Ounces	Grams	28.349
Pounds	Kilograms	0.454
Short Tons	Metric Tons	0.907
Pound-Feet	Newton-Meters	1.356
Pounds per Square Inch	Kilopascals	6.895
Miles per Gallon	Kilometers per Liter	0.425
Miles per Hour	Kilometers per Hour	1.609

TO CHANGE	TO	MULTIPLY BY
Centimeters	Inches	0.394
Meters	Feet	3.280
Meters	Yards	1.094
Kilometers	Miles	0.621
Square Centimeters	Square Inches	0.155
Square Meters	Square Feet	10.764
Square Meters	Square Yards	1.196
Square Kilometers	Square Miles	0.386
Square Hectometers	Acres	2.471
Cubic Meters	Cubic Feet	35.315
Cubic Meters	Cubic Yards	1.308
Milliliters	Fluid Ounces	0.034
Liters	Pints	2.113
Liters	Quarts	1.057
Liters	Gallons	0.264
Grams	Ounces	0.035
Kilograms	Pounds	2.205
Metric Tons	Short Tons	1.102
Newton-Meters	Pound-Feet	0.738
Kilopascals	Pounds per Square Inch	0.145
Kilometers per Liter	Miles per Gallon	2.354
Kilometers per Hour	Miles per Hour	0.621

