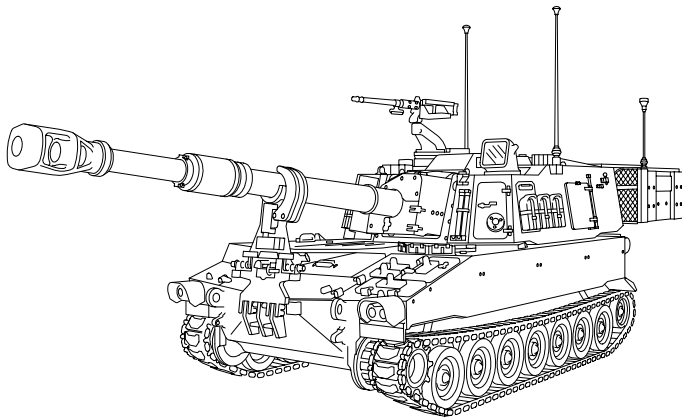


**UNIT MAINTENANCE MANUAL  
FOR  
HULL SYSTEMS  
AND  
COMPONENTS**



**HOWITZER, MEDIUM,  
SELF-PROPELLED:  
155MM, M109A6  
(NSN 2350-01-305-0028)  
(EIC:3FC)**

Distribution Statement A: Approved for public release;  
distribution is unlimited.

© 1997 United Defense, L.P. All rights reserved  
under the copyright laws.

This material may be reproduced for U.S. Government  
purposes only, pursuant to the copyright license under  
the clause at (DFARS 52.227-7013) dated October 1988.

TABLE OF CONTENTS	i
ELECTRICAL SYSTEMS	8-1
TRANSMISSION	9-1
TRANSFER AND FINAL DRIVE ASSEMBLIES	10-1
BRAKES	11-1
WHEELS AND TRACKS	12-1
STEERING	13-1
TOWING ATTACHMENTS	14-1
SHOCK ABSORBERS	15-1
BODY, CAB, HOOD, AND HULL	16-1
SPADE ASSEMBLIES	17-1
BODY, CHASSIS, OR HULL ACCESSORY ITEM	18-1
SPECIAL PURPOSE KITS	19-1
GAGES	20-1
FIRE FIGHTING EQUIPMENT	21-1
NUCLEAR, BIOLOGICAL, AND CHEMICAL (NBC) EQUIPMENT	22-1
ADMINISTRATIVE STORAGE	23-1
ALPHABETICAL INDEX	INDEX-1
ELECTRICAL SCHEMATICS	FP-1

CHANGE  
NO.1

**TECHNICAL MANUAL  
UNIT MAINTENANCE MANUAL  
FOR  
HULL SYSTEMS AND COMPONENTS  
HOWITZER, MEDIUM,  
SELF-PROPELLED: 155MM M109A6  
(NSN 2350-01-305-0028) (EIC: 3FC)**

TM 9-2350-314-20-1-2, February 1999, is changed as follows:

1. The purpose of this change is to update TM 9-2350-314-20-1-2.
2. New or changed material is indicated by a vertical bar in the outside margin of text changes and by a hand symbol beside illustration changes.
3. Remove the old page and insert the new page as indicated below:

Remove Pages

Insert Pages

none

A and B

i and ii

i and ii

8-37 through 8-44

8-37 through 8-44

8-49 and 8-50

8-49 and 8-50

8-53 and 8-54

8-53 and 8-54

8-61 and 8-62

8-61 and 8-62

8-239 and 8-240

8-239 and 8-240

8-243 and 8-244

8-243 and 8-244

8-269 and 8-270

8-269 and 8-270

8-273 through 8-278

8-273 through 8-278

8-283 through 8-286

8-283 through 8-286

8-289 and 8-290

8-289 and 8-290

15-5 and 15-6

15-5 and 15-6

16-65 and 16-66

16-65 and 16-66

16-89 and 16-90

16-89 and 16-90

16-97 through 16-102

16-97 through 16-102

16-117 through 16-120

16-117 through 16-120

16-127 through 16-130

16-127 through 16-130

16-139 and 16-140

16-139 and 16-140

16-147 and 16-148

16-147 and 16-148

18-7 through 18-12

18-7 through 18-12

Distribution Statement A: Approved for public release; distribution is unlimited.



**TM 9-2350-314-20-1-2**

Remove Pages

18-15 through 18-30

22-1 through 22-4

B-11 and B-12

B-17 and B-18

E-1 and E-2

E-7 through E-10

DA2028-2 sample form

DA2028-2 form (4)

FP-1 through FP-10/(blank)

Cover/blank

4. File this change in front of the publication.

Insert Pages

18-15 through 18-30

22-1 through 22-4

B-11 and B-12

B-17 and B-18

E-1 and E-2

E-7 through E-10

DA2028-2 sample form

DA2028-2 form (4)

FP-1 through FP-11/(FP-12 blank)

Cover/blank

By Order of the Secretary of the Army:

Official:



JOEL B. HUDSON

*Administrative Assistant to the  
Secretary of the Army*

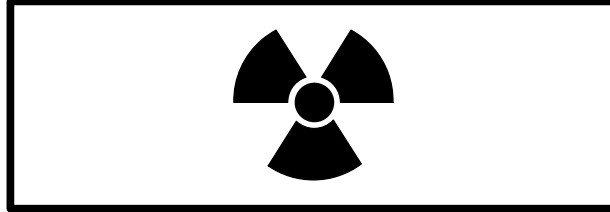
0105104

ERIC K. SHINSEKI  
*General, United States Army  
Chief of Staff*

DISTRIBUTION: To be distributed in accordance with the initial distribution requirements for IDN: 371933  
TM 9-2350-314-20-1-2.

**WARNING**

## RADIOACTIVE MATERIAL(S)



### TRITIUM (HYDROGEN-3) GAS

This item contains radioactive material. Control of this radioactive material is mandated by federal law. Immediately report any suspected lost or damaged items to your Radiation Protection Officer (RPO). If your RPO cannot be reached, contact the TACOM-ACALA safety office.

Handle with care. In the event the radioluminous source is broken, cracked, or there is no illumination, immediately wrap device in plastic bag (item 5, Appendix D) and notify the local RPO. Contact the base safety office for the name and telephone number of your local RPO:

LOCAL RPO: \_\_\_\_\_ TELEPHONE: \_\_\_\_\_

#### SAFETY PROCEDURES FOR NUCLEAR REGULATORY COMMISSION (NRC) TRITIUM FIRE CONTROL DEVICES

1. Purpose: To implement mandatory license requirements for use and maintenance of tritium radioluminous fire control devices used on howitzers, mortars, tanks, and rifles.
2. Scope: This procedure is applicable to all personnel working with tritium devices, including unit, direct support, general support maintenance, and operator's levels.
3. Radiological hazard: The beta radiation emitted by tritium presents no external radiation hazard. However, if taken internally, it can damage soft tissue. If a capsule is broken, the tritium gas will dissipate into the surrounding air, and surfaces near the vicinity of the break may become contaminated. Tritium can be taken into the body by inhalation, ingestion, or skin absorption/injection.
4. Safety precautions:
  - a. Check for illumination prior to use or service in low light or darkroom. If not illuminated, do not repair. Wrap the entire device in plastic bag (item 11, Appendix C) and notify the local RPO.
  - b. No eating, drinking, or smoking will be allowed in tritium device work areas.
5. Emergency procedures: If a tritium source breaks, inform other personnel to vacate the area or move upwind. If skin contact is made with any area contaminated with tritium, wash immediately with nonabrasive soap and water. Report the incident to the local RPO. Actions below will be taken under supervision or direction of the local RPO.

- a. Personnel handling the device should wear rubber or latex gloves (item 20, Appendix C). Device must be immediately double wrapped in plastic (item 11, Appendix C), sealed (item 63, Appendix C), and marked as "Broken Tritium Device — Do Not Open" per RPO direction. Package (item 12, Appendix C) item and return to depot for disposal. Dispose of used gloves as radioactive waste, per instructions from local RPO and wash hands well.
  - b. Personnel who may have handled the broken tritium should report to health clinic for tritium bioassay. Optimum bioassay sample is at least 4 hours after exposure.
  - c. Broken tritium sources indoors may result in tritium contamination in the area, such as work bench or table. The area must be cordoned off, restricted until wipe tests indicate no contamination.
6. Further information:
- a. Requirements for safe handling and maintenance are located in TM 9-254, General Maintenance Procedures for Fire Control Materiel.
  - b. If assistance is needed, contact your local or major command (MACOM) safety office(s) for information on safe handling, shipping, storage, maintenance, or disposal of radioactive devices.
  - c. The ACALA RPO/licensee may be contacted by calling: DSN 793-2965/2969/2995, Commercial (309) 782-2965/2969/2995. After duty hours, contact the Staff Duty Office through the operator at DSN 793-6001, Commercial (309) 782-6001. The following rules and regulations are available from ACALA, ATTN: AMSMC-SFS, Rock Island, IL 61299-7630. Copies may be requested, or further information obtained by contacting the ACALA Radiation Protection Office (RPO).
    - (1) Title 10 CFR Part 19 – Notices, Instructions, and Reports to Workers.
    - (2) Title 10 CFR Part 20 – Standards for Protection Against Radiation.
    - (3) Title 10 CFR Part 21 – Reporting of Defects and Noncompliance.
    - (4) NRC License, License Conditions, and License Application.
7. Safety, Care, and Handling:



Nuclear, Biological, and Chemical (NBC) agents can kill you. If NBC exposure is suspected, all air filter media must be handled by personnel wearing full NBC protective equipment (FM 21-11).

**WARNING**



## **RADIATION HAZARD**

Fire control instruments containing Tritium are used as a part of a backup system for manual firing. Loss of illumination may indicate that leakage has occurred. Do not attempt to repair a non-illuminated device.

### **Pre-Maintenance Check:**

- a. Prior to taking any maintenance action on fire control devices (e.g., purging or charging M1A1 Collimator), check for broken/cracked reticle or loss of illumination as follows:
  - (1) Place device in the dark for at least four hours to prevent exterior light from activating the phosphor.
  - (2) Check for cracks/illumination in a low light environment after allowing sufficient time to accustom eyes to the dark.
- b. If illumination is not observed, or illuminated but cracks are observed, take following actions:
  - (1) Personnel handling the device should wear rubber or plastic gloves (item 20, Appendix C).
  - (2) Seal entire device in two plastic bags (item 11, Appendix C).
  - (3) Mark the outer bag as "Broken Tritium Device – Do Not Open."
  - (4) Dispose of used gloves as radioactive waste as per instructions from local Radiation Protection Officer (RPO). Wash hands well with nonabrasive soap and water.
  - (5) Per RPO direction, place bag in a strong, tight container, such as fiberboard box (item 12, Appendix C) with all seams sealed using tape (item 63, Appendix C) (masking tape is not authorized).
  - (6) Send package to depot level maintenance for repair/disposal.
- c. If illumination is observed, maintenance actions may proceed.



**WARNING**

### **CARBON MONOXIDE POISONING IS DEADLY**

Carbon monoxide is a colorless, odorless, deadly poisonous gas, which, when breathed, deprives the body of oxygen and causes suffocation. Exposure to carbon monoxide produces headache, dizziness, loss of muscular control, drowsiness, and coma. Permanent brain damage or death can result from severe exposure.

Carbon monoxide occurs in the exhaust of fuel-burning heaters and internal-combustion engines and becomes dangerously concentrated under conditions of inadequate ventilation. The following precautions must be observed to insure the safety of personnel whenever the personnel heater, main, or auxiliary engine of any vehicle is operated for maintenance purposes or tactical use.

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

1. DO NOT operate heater or engine of vehicle in an enclosed area unless it is ADEQUATELY VENTILATED.
2. DO NOT idle engine for long periods without 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; if necessary, administer artificial respiration. For detailed first aid instruction consult FM 21-11, First Aid for Soldiers.

<b>WARNING</b>
----------------

**EXHAUST SYSTEM HAZARDS****EXHAUST GASES CAN KILL**

Brain damage or death can result from heavy exposure. Precautions must be followed to ensure crew safety when personnel heater, main, or auxiliary engine of any vehicle is operated for any purpose.

1. Do not operate vehicle engine in enclosed areas.
2. Do not idle vehicle engine with vehicle windows closed.
3. Be alert at all times for exhaust odors.
4. Be alert for exhaust poisoning symptoms. They are:
  - Headache
  - Dizziness
  - Sleepiness
  - Loss of muscular control
5. If you see another person with exhaust poisoning symptoms:
  - Remove person from area
  - Expose to open air
  - Keep person warm
  - Do not permit physical exercise
  - Administer artificial respiration, if necessary\*
  - Seek immediate medical attention

\*For artificial respiration, refer to FM 21-11.

6. BE AWARE, the field protective mask for nuclear-biological-chemical (NBC) protection will not protect you from carbon monoxide poisoning.

**THE BEST DEFENSE AGAINST EXHAUST POISONING IS ADEQUATE VENTILATION.**

- Allow engine to cool before performing maintenance on the muffler, exhaust pipe, exhaust manifold, or turbocharger. If necessary, use insulated pads and gloves.
- Do not touch hot exhaust system with bare hands; injury to personnel will result.

**WARNING**

**ENGINE OIL HAZARD**

Do not drain engine oil while engine is hot. Severe injury to personnel may result.

**WARNING**

**NOISE HAZARDS**

- Excessive noise levels are present any time the equipment is operating. Wear hearing protection while operating or working around equipment while it is running. Failure to do so could result in damage to your hearing. Seek medical aid should you suspect a hearing problem (ref. FM 21-11).
- Hearing protection is required for operator and for all personnel working in and around this vehicle while engine is running.
- Personnel hearing can be PERMANENTLY DAMAGED if exposed to constant high noise levels of 85 dB (A) or greater. Wear approved hearing protection devices when working in high noise level areas. Personnel exposed to high noise levels shall participate in a hearing conservation program in accordance with TB MED 501. Hearing loss occurs gradually, but becomes permanent over time.

**WARNING**

**FALLING EQUIPMENT HAZARDS**

- Never crawl under equipment when performing maintenance unless equipment is securely blocked. Equipment may fall and cause serious injury or death to personnel.
- Keep clear of equipment when it is being raised or lowered. Equipment may fall and cause serious injury or death to personnel.
- Do not work on any item supported only by lift jacks or hoist. Always use blocks or proper stands to support the item prior to any work. Equipment may fall and cause serious injury or death to personnel.
- Do not allow heavy components to swing while suspended by lifting device. Equipment may strike personnel and cause injury.
- Exercise extreme caution when working near a cable or chain under tension. A snapped cable or a shifting or swinging load may result in injury or death to personnel.
- All personnel must stand clear during lifting operations. A swinging or shifting load may cause injury or death to personnel.



**WARNING****FIRE HAZARD**

Diesel fuel and combustible materials are used in operation and maintenance of this equipment. Do not smoke or allow open flames or sparks in areas where diesel fuel and combustible materials are used or stored. DEATH or severe injury may result if personnel fail to observe this precaution. If you are burned, seek medical aid immediately (ref. FM 21-11).

**WARNING****STEAM UNDER PRESSURE**

- Do not remove the radiator cap when the engine is hot; steam and hot coolant can escape and burn personnel.
- Use extreme care when removing the radiator pressure cap. Sudden release of pressure can cause a steam flash which could seriously injure personnel. Slowly loosen cap to the first stop to relieve pressure before removing cap completely. After use, securely tighten cap.
- Use a clean, thick waste cloth or like material to remove the cap. Avoid using gloves. If hot water soaks through gloves, personnel could be burned.
- Extreme care should be taken when removing radiator filler cap if temperature gage reads above 180° F (82° C). Contact by steam or hot coolant may result in injury or death to personnel.

**WARNING****DO NOT USE MINERAL SPIRITS OR PAINT  
THINNER TO CLEAN THE HOWITZER**

Mineral spirits and paint thinners are highly toxic and combustible. Prolonged breathing can cause dizziness, nausea, and even death (ref. FM 21-11).

**DO NOT USE THESE MATERIALS**

**WARNING**

**DRY-CLEANING SOLVENT**

Dry-cleaning solvent (P-D-680), used to clean parts, is toxic and flammable. Wear protective goggles and gloves and use only in a well-ventilated area. Avoid contact with skin, eyes, and clothes. Do not breathe vapors. Do not use near open flame or excessive heat. Do not smoke when using solvent. Failure to do so could cause SERIOUS INJURY. If you become dizzy while using cleaning solvent, get fresh air immediately, and if necessary, get medical attention. If contact with skin or clothes is made, flush thoroughly with water. If the solvent contacts your eyes, wash with water immediately, and obtain medical aid (ref. FM 21-11).

**WARNING**

**BATTERY HAZARDS**

- Batteries contain sulfuric acid which can cause severe burns. Avoid contact with skin, eyes, or clothing, and remove all metal or jewelry. If battery electrolyte is spilled, stop its burning effects immediately (ref. FM 21-11).
- Lead-acid battery gases can explode. Do not smoke, have open flames, or make sparks around a battery, especially if caps are off. If a battery is gassing, it can explode and cause injury to personnel.
  - a. Ventilate when charging or using in an enclosed space.
  - b. Wear safety goggles and acid-proof gloves when battery cover must be removed or when adding electrolyte.
  - c. Avoid electrolyte contact with skin, eyes, or clothing. If battery electrolyte spills, take immediate action to stop burning effects:
    - External: Immediately flush with cold running water to remove all acid.
    - Eyes: Flush with cold water for at least 15 minutes. Seek immediate medical attention.
    - Internal: Drink large amounts of water or milk. Follow with milk of magnesia, beaten egg, or vegetable oil. Seek immediate medical attention.
    - Clothing or Vehicle: Wash at once with cold water. Neutralize with baking soda or household ammonia solution.
- Wear safety glasses or goggles when checking batteries. Always check electrolyte level with engine stopped. Do not smoke or use exposed flame when checking battery; explosive gases are present and severe injury to personnel can result.
- Remove or disconnect batteries and turn vehicle MASTER switch OFF prior to performing maintenance in immediate battery area or working on electrical system. Such disconnections prevent electrical shock to personnel or equipment.

<b>WARNING</b>
----------------

### **BATTERY HAZARDS – CONTINUED**

- Battery acid (electrolyte) is extremely harmful. Always wear safety goggles and rubber gloves, and do not smoke when performing maintenance on batteries. Injury will result if acid contacts skin or eyes. Wear rubber apron to prevent clothing being damaged.
- Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry contacts battery terminal, a direct short may result in instant heating of tools, damage to equipment, and injury or death to personnel.

<b>WARNING</b>
----------------

### **ELECTRICAL HAZARD**

Be certain vehicle MASTER switch is OFF when working on hull electrical system to prevent injury due to electrical shock (ref. FM 21-11).

<b>WARNING</b>
----------------

### **NBC EXPOSURE AND VEHICLE AIR FILTER HAZARDS**

- NBC-contaminated air filters must be handled and disposed of only by authorized and trained personnel. The unit commander or senior officer in charge of maintenance personnel must ensure that prescribed protective clothing (FM 3-4) is used, and prescribed safety measures and decontamination procedures (FM 3-5) are followed. The local unit SOP is responsible for final disposal of contaminated air filters. Failure to comply may cause severe injury or death to personnel.
- The NBC protection filters use a type of carbon that contains Chromium VI. This is a known carcinogen if inhaled or swallowed. Damaged or unusable filters are classified as hazardous waste.
  - a. Do not throw away damaged or unusable filters as trash.
  - b. Turn in damaged or unusable filters to your Hazardous Waste Management Office or Defense Reutilization and Marketing Office (DRMO).

Filters are completely safe to handle and use if they are not damaged in such a way that carbon leaks from them. If carbon does leak, use protection such as a dust respirator to cover nose and mouth and put carbon in container such as a self-sealing plastic bag; turn in to Hazardous Waste Management Office or DRMO.

Disposal of hazardous waste is restricted by law. Violation is subject to criminal penalties.

**WARNING**

**FIRE EXTINGUISHING SYSTEM HAZARDS**

- Fire extinguisher bottles can discharge and injure personnel. Insert antirecoil plugs, lock pins, and cotter pins before working on or near bottles.
- CO<sup>2</sup> can cause frostbite or eye injury. Wear protective clothing and goggles to avoid contact. If CO<sup>2</sup> contacts hands, hold hands under armpits or in warm water until warmed. If CO<sup>2</sup> contacts eyes, flush with large amounts of water and get medical attention immediately.

**WARNING**

**FAN SCREEN HAZARD**

Installed or removed, the rotation of the radiator cooling fans creates a hazard during maintenance on a running engine. A fan screen (12268262, NSN 2510-01-247-2976) must be installed prior to maintenance on a running engine (ref. FM 21-11).

**WARNING**

**ROTATION HAZARD**

- When working on a running engine, provide shielding for exposed rotating parts. Tools, clothing, or hands can get caught and cause serious injury to personnel.
- With engine running and driver's engine compartment access cover removed for maintenance, keep hands, clothing and tools clear of generator pulley and belt. Injury or death could result.

**WARNING**

**WASTE HAZARD**

When servicing this vehicle, performing maintenance, or disposing of materials such as engine coolant, transmission fluid, lubricants, battery acids or batteries, and CARC paint, consult your unit/local regulatory guidance. If further informatios is needed, please contact the U.S. Army Environmental Hotline at 1-800-872-3845.

**WARNING****FALLING EQUIPMENT/ROLLING VEHICLE HAZARD**

Unless otherwise specified, perform all maintenance procedures with all equipment lowered to the ground, transmission in neutral, parking/emergency brake applied, and the engine stopped to prevent possible injury to personnel due to falling equipment or rolling vehicle (ref. FM 21-11).

**WARNING****PARKING HAZARD**

Do not park vehicles head to head. Personnel injury or damage to the vehicles could occur if one vehicle jumps (ref. FM 21-11).

**WARNING****EXPLOSION HAZARD**

Cylinders containing compressed gases must not be dropped, struck, or subjected to any temperature above +140°F (+60°C). This could result in an explosion and injury to personnel (ref. FM 21-11).

**WARNING****COMPRESSED AIR HAZARD**

Compressed air used for cleaning purposes will not exceed 30 psi (207 kPa). Use only with effective chip guarding and personal protective equipment (goggles/shield, gloves, etc.).

**WARNING****SNAP AND RETAINING RING HAZARD**

Use care when removing snap and retaining rings. Snap and retaining rings are under spring tension and can act as projectiles when released and could cause severe eye injury.

**WARNING**

**TURRET HAZARD**

The turret can kill or injure personnel as it turns. Do not enter or exit turret unless turret traverse lock is locked and turret power is off.

**WARNING**

**FASTENERS AND ATTACHING HARDWARE HAZARD**

Always use the same fastener part number (or equivalent) when replacing fasteners. Do not risk using a fastener of less quality; do not mix metric and inch (customary) fasteners. Mismatched or incorrect fasteners can result in damage, malfunction, or injury.

**WARNING**

**ADHESIVE HAZARDS**

- Adhesive causes immediate bonding on contact with eyes, skin, or clothing and also gives off harmful vapors. Wear protective goggles and use it in a well-ventilated area. If adhesive gets in eyes, try to keep eyes open; flush eyes with water for 15 minutes and get immediate medical attention.
- Adhesive sealant MIL-S-46163 can damage your eyes. Wear safety goggles/glasses when using; avoid contact with eyes. If sealant contacts eyes, flush eyes with water and get immediate medical attention.

INSERT LATEST CHANGED PAGES.  
DESTROY SUPERSEDED PAGES

**LIST OF EFFECTIVE PAGES**

Note: The portion of the text affected by the changes is indicated by a vertical line in the outer margin of the page. Changes to illustrations are indicated by miniature pointing hands. Changes to wiring diagrams are indicated by shaded areas.

Date of issue for original and changed pages are:

Original ..... 0 ..... 8 February 1999  
Change ..... 1 ..... 1 May 2001

TOTAL NUMBER OF PAGES IN THIS PUBLICATION IS 928 CONSISTING OF THE FOLLOWING:

Page No.	*Change No.	Page No.	*Change No.	Page No.	*Change No.
Cover	1	8-285 - 8-286	1	16-121 - 16-126	0
Blank	0	8-287 - 8-288	0	16-127	0
Change 1 Errata Added (4)	1	8-289	1	16-128	1
a - I	0	8-290	0	16-129	1
A - B Added	1	8-291 - 8-344	0	16-130	0
i - ii	1	9-1 - 9-40	0	16-131 - 16-138	0
iii	0	9-41	0	16-139	0
iv Blank	0	9-42 Blank	0	16-140	1
8-1 - 8-36	0	10-1 - 10-16	0	16-141 - 16-146	0
8-37 - 8-42	1	10-17	0	16-147	0
8-43	1	10-18 Blank	0	16-148	1
8-44	0	11-1 - 11-20	0	16-149 - 16-204	0
8-45 - 8-48	0	11-21	0	17-1 - 17-10	0
8-49	1	11-22 Blank	0	17-11	0
8-50	0	12-1 - 12-54	0	17-12 Blank	0
8-51 - 8-52	0	13-1 - 13-14	0	18-1 - 18-6	0
8-53	0	14-1 - 14-6	0	18-7	0
8-54	1	15-1 - 15-4	0	18-8	1
8-55 - 8-60	0	15-5	1	18-9	1
8-61	0	15-6	0	18-10	0
8-62	1	15-7 - 15-8	0	18-11 - 18-12	1
8-63 - 8-238	0	15-9	0	18-13 - 18-14	0
8-239	0	15-10 Blank	0	18-15 - 18-28	1
8-240	1	16-1 - 16-64	0	18-29	1
8-241 - 8-242	0	16-65	0	18-30	0
8-243	0	16-66	1	18-31 - 18-38	0
8-244	1	16-67 - 16-88	0	19-1 - 19-38	0
8-245 - 8-268	0	16-89	0	20-1 - 20-10	0
8-269	0	16-90	1	20-11	0
8-270	1	16-91 - 16-96	0	20-12 Blank	0
8-271 - 8-272	0	16-97	0	21-1 - 21-26	0
8-273	0	16-98	1	21-27	0
8-274	1	16-99 - 16-100	1	21-28 Blank	0
8-275	0	16-101	1	22-1	0
8-276	1	16-102	0	22-2	1
8-277	0	16-103 - 16-116	0	22-3	1
8-278	1	16-117	1	22-4	0
8-279 - 8-282	0	16-118	0	22-5 - 22-10	0
8-283	0	16-119	1	23-1 - 23-4	0
8-284	1	16-120	0	23-5	0

\*Zero in this column indicates an original page

**TM 9-2350-314-20-1-2**

Page No.	*Change No.	Page No.	*Change No.	Page No.	*Change No.
23 – 6 Blank .....	0	E-7 – E-8 .....	1	DA Form 2028-2 .....	1
A-1 – A-4 .....	0	E-9 .....	0	DA Form 2028-2 Address ...	1
B-1 – B-10 .....	0	E-10 .....	1	FP-1 .....	1
B-11 .....	0	F-1 – F-2 .....	0	FP-2 Blank .....	0
B-12 .....	1	F-3 .....	0	FP-3 .....	1
B-13 – B-16 .....	0	F-4 Blank .....	0	FP-4 Blank .....	0
B-17 .....	1	G-1 – G-2 .....	0	FP-5 .....	1
B-18 .....	0	Index-1 – Index-6 .....	0	FP-6 Blank .....	0
C-1 – C-4 .....	0	DA Form 2028-2 Sample ...	1	FP-7 .....	1
C-5 .....	0	Blank .....	0	FP-8 Blank .....	0
C-6 Blank .....	0	DA Form 2028-2 .....	1	FP-9 .....	1
D-1 – D-4 .....	0	DA Form 2028-2 Address ...	1	FP-10 Blank .....	0
D-5 .....	0	DA Form 2028-2 .....	1	FP-11 Added .....	1
D-6 Blank .....	0	DA Form 2028-2 Address ...	1	FP-12 Blank .....	1
E-1 .....	0	DA Form 2028-2 .....	1	Measurement Page .....	0
E-2 .....	1	DA Form 2028-2 Address ...	1	Blank .....	0
E-3 – E-6 .....	0				

\*Zero in this column indicates an original page



**UNIT MAINTENANCE MANUAL  
FOR  
HULL SYSTEMS AND COMPONENTS  
HOWITZER, MEDIUM, SELF-PROPELLED:  
155MM, M109A6  
(NSN 2350-01-305-0028)(EIC: 3FC)**

**REPORTING ERRORS AND RECOMMENDING IMPROVEMENTS**

You can help improve this publication. If you find any mistakes or if you know of a way to improve the procedures, please let us know. Submit your DA Form 2028-2 (Recommended Changes to Equipment Technical Publications), through the Internet, on the Army Electronic Product Support (AEPS) website. The Internet address is <http://aeps.ria.army.mil>. If you need a password, scroll down and click on "ACCESS REQUEST FORM". The DA Form 2028 is located in the ONLINE FORMS PROCESSING section of the AEPS. Fill out the form and click on SUBMIT. Using this form on the AEPS will enable us to respond quicker to your comments and better manage the DA Form 2028 program. You may also mail, fax or email your letter, DA Form 2028, or DA Form 2028-2 direct to: Technical Publication Information Office, TACOM-RI, 1 Rock Island Arsenal, Rock Island, IL 61299-7630. The email address is [TACOM-TECH-PUBS@ria.army.mil](mailto:TACOM-TECH-PUBS@ria.army.mil). The fax number is DSN 793-0726 or Commercial (309) 782-0726.

Distribution Statement A: Approved for public release; distribution is unlimited.

**TABLE OF CONTENTS  
VOLUME 2**

<u>CONTENTS</u>	<u>PAGE</u>
<b>CHAPTER 8 – ELECTRICAL SYSTEMS</b> .....	<b>8-1</b>
Section I. Generator .....	8-5
Section II. Voltage Regulator .....	8-32
Section III. Starting Motor .....	8-33
Section IV. Instrument or Engine Control Panels .....	8-37
Section V. Miscellaneous Items .....	8-70
Section VI. Lights .....	8-96
Section VII. Sending Units and Warning Switches .....	8-124
Section VIII. Batteries .....	8-146
Section IX. Hull Wiring Harness .....	8-162
Section X. Ventilating Equipment .....	8-336
<b>CHAPTER 9 – TRANSMISSION</b> .....	<b>9-1</b>
Section I. Gear Shift and Controls .....	9-2
Section II. Transmission Assembly and Associated Parts .....	9-14
<b>CHAPTER 10 – TRANSFER AND FINAL DRIVE ASSEMBLIES</b> .....	<b>10-1</b>
<b>CHAPTER 11 – BRAKES</b> .....	<b>11-1</b>
Section I. Hand Brake .....	11-2
Section II. Mechanical Brake System .....	11-10

\*This manual supersedes TM 9-2350-314-20-1-2 dated 25 October 1993, including all changes.

TABLE OF CONTENTS – CONTINUED

<u>CONTENTS</u>	<u>PAGE</u>
CHAPTER 12 – WHEELS AND TRACKS .....	12-1
Section I. Suspension Assembly .....	12-2
Section II. Track Idlers and Brackets .....	12-28
Section III. Track Drive Sprocket .....	12-40
Section IV. Track Assembly .....	12-42
CHAPTER 13 – STEERING .....	13-1
CHAPTER 14 – TOWING ATTACHMENTS .....	14-1
CHAPTER 15 – SHOCK ABSORBERS .....	15-1
CHAPTER 16 – BODY, CAB, HOOD, AND HULL .....	16-1
Section I. Body, Cab, Hood, and Hull Assemblies .....	16-4
Section II. Fenders .....	16-109
Section III. Driver’s Hatch and Periscopes .....	16-111
Section IV. Drain Plugs .....	16-128
Section V. Floor, Subfloor, and Related Components .....	16-130
Section VI. Driver’s Seat .....	16-139
Section VII. Stowage Racks, Boxes, Straps, Carrying Cases, and Cable Reels .....	16-151
CHAPTER 17 – SPADE ASSEMBLIES .....	17-1
CHAPTER 18 – BODY, CHASSIS, OR HULL ACCESSORY ITEMS .....	18-1
Section I. Accessory Items .....	18-2
Section II. Bilge Pump .....	18-8
Section III. Winterization Equipment .....	18-12
Section IV. Data Plates and Instruction Holders .....	18-34
CHAPTER 19 – SPECIAL PURPOSE KITS .....	19-1
CHAPTER 20 – GAGES .....	20-1
CHAPTER 21 – FIRE FIGHTING EQUIPMENT .....	21-1
CHAPTER 22 – NUCLEAR, BIOLOGICAL, AND CHEMICAL (NBC) EQUIPMENT .....	22-1
CHAPTER 23 – ADMINISTRATIVE STORAGE .....	23-1
APPENDIX A – REFERENCES .....	A-1
APPENDIX B – MAINTENANCE ALLOCATION CHART .....	B-1
APPENDIX C – EXPENDABLE AND DURABLE ITEMS LIST .....	C-1
APPENDIX D – TORQUE LIMITS .....	D-1
APPENDIX E – MANDATORY REPLACEMENT PARTS LIST .....	E-1
APPENDIX F – TOOL IDENTIFICATION LIST .....	F-1
APPENDIX G – CORROSION PREVENTION AND CONTROL .....	G-1
ALPHABETICAL INDEX .....	Index-1
ELECTRICAL SCHEMATICS .....	FP-1

## HOW TO USE THIS MANUAL

### Indexing

Five major indexing procedures are used in this manual to help the technician locate information rapidly.

1. Cover index: Lists sections of text and page number. Includes Index Mark ( ) which lines up with Index Marks on the actual page of reference.

Example: Troubleshooting. 3–1

2. Table of Contents – pages i through iii.
3. Chapter indexes listing data/information covered within the chapter and section.
4. Troubleshooting symptoms index identifies system malfunction and provides page reference for specific troubleshooting procedures.
5. Index, pages Index–1 through Index–2. Alphabetical listing of information.

### Maintenance Text and Illustrations (Chapter 4 through 23)

1. Maintenance procedures are to be performed in the sequence shown in the text and illustrations. Step 1 must be performed before Step 2. Procedure a must be performed before Procedure b, and so on.
2. Equipment illustrations use numbers to identify parts of the system/components.

Example:

1. Remove both wiring harnesses (1) and (2).
2. Remove four screws (3), four flat washers (4), four lockwashers (5) and four nuts (6).

## CHAPTER 8

### ELECTRICAL SYSTEMS

---

#### GENERAL

This chapter contains maintenance procedures for hull electrical systems authorized by the MAC for unit level.

Instructions for repair of individual wiring harnesses are contained in this chapter.

Each electrical cable is marked with a wire numbered metal tag attached to the junction of terminal of the cable. All electrical circuits shown in schematics and wiring diagrams are identified by wire numbers listed in each area.

<u>CONTENTS</u>	<u>Page</u>
Section I. GENERATOR	
8-1 GENERATOR DRIVE BELT .....	8-5
8-2 GENERATOR DRIVE BELT TENSIONER AND BRACKET .....	8-7
8-3 GENERATOR PULLEY ASSEMBLY .....	8-9
8-4 GENERATOR .....	8-11
8-5 GENERATOR ALIGNMENT .....	8-20
8-6 GENERATOR DRIVE SHAFT AND SHAFT SCREW .....	8-23
8-7 CRADLE ASSEMBLY .....	8-25
8-8 CRADLE MOUNTING BRACKET .....	8-28
8-9 GENERATOR OIL COOLING MANIFOLD, HOSES, VALVES AND FITTINGS .....	8-29
Section II. VOLTAGE REGULATOR	
8-10 VOLTAGE REGULATOR .....	8-32
Section III. STARTING MOTOR	
8-11 ENGINE STARTER .....	8-33
Section IV. INSTRUMENT OR ENGINE CONTROL PANELS	
8-12 DRIVER'S INSTRUMENT PANEL .....	8-37
8-13 DRIVER'S INSTRUMENT PANEL SUPPORT ASSEMBLY .....	8-44
8-14 DRIVER'S PORTABLE INSTRUMENT PANEL .....	8-49
8-15 DRIVER'S PORTABLE INSTRUMENT PANEL BRACKET (OUTSIDE DRIVER'S HATCH AND CREW COMPARTMENT) .....	8-55
8-16 GUN TUBE TRAVEL LOCK CONTROL BOX ASSEMBLY .....	8-57
8-17 VOLTAGE REGULATOR CONTROL BOX ASSEMBLY .....	8-59
8-18 GUN TUBE TRAVEL LOCK CONTROL BOX AND VOLTAGE REGULATOR CONTROL BOX BRACKET .....	8-61
8-19 ACCESSORY CONTROL BOX AND BRACKETS .....	8-62
8-20 CIRCUIT BREAKERS AND CIRCUIT BREAKER PANELS .....	8-65
8-21 ENCLOSURE ASSEMBLY AND BRACKET - CREW COMPARTMENT WARNING LIGHT. ....	8-68
Section V. MISCELLANEOUS ITEMS	
8-22 MASTER RELAY AND BRACKET .....	8-70
8-23 STARTER PROTECTION RELAY, BILGE PUMP RELAY, BILGE PUMP CIRCUIT BREAKER, AND MOUNT .....	8-72
8-24 GENERATOR/FUEL PUMP RELAY AND MOUNTING BRACKET .....	8-78
8-25 AIR CLEANER BLOWER RELAY AND MOUNTING BRACKET .....	8-80

CONTENTS

Page

Section V. MISCELLANEOUS ITEMS – CONTINUED

8-26	COMBAT OVERRIDE SWITCH AND BRACKET .....	8-82
8-27	HEADLIGHT DIMMER SWITCH .....	8-84
8-28	RESISTOR MODULE BLOCK AND BRACKET .....	8-86
8-29	DRIVER'S FULL FUNCTION CREW STATION MOUNTING PLATE .....	8-88
8-30	DRIVER'S INTERCOM BRACKET .....	8-89
8-31	STE BRACKET .....	8-90
8-32	DRIVER'S BULKHEAD HARNESS COVER .....	8-91
8-33	CURRENT SHUNT AND GROUND BUS .....	8-92

Section VI. LIGHTS

8-34	HEADLIGHT SEALED-BEAM AND INCANDESCENT LAMPS .....	8-96
8-35	HEADLIGHT ASSEMBLY .....	8-98
8-36	HEADLIGHT MOUNT .....	8-108
8-37	SERVICE AND BLACKOUT TAILLIGHTS, STOPLIGHTS, AND LAMPS .....	8-110
8-38	DOME LIGHT .....	8-113
8-39	DOME LIGHT MOUNTING BRACKET .....	8-120
8-40	WARNING LIGHT ASSEMBLY (STEERING SHAFT) .....	8-122

Section VII. SENDING UNITS AND WARNING SWITCHES

8-41	AIR CLEANER PRESSURE TRANSDUCER .....	8-124
8-42	FUEL PRESSURE DIFFERENTIAL TRANSDUCER .....	8-125
8-43	FUEL SUPPLY PRESSURE TRANSDUCER .....	8-127
8-44	AIR BOX PRESSURE TRANSDUCER .....	8-129
8-45	TRANSMISSION OIL TEMPERATURE TRANSMITTER AND TRANSMISSION OIL HIGH TEMPERATURE SWITCH .....	8-130
8-46	TRANSMISSION OIL PRESSURE TRANSMITTER AND TRANSMISSION OIL LOW PRESSURE SWITCH .....	8-132
8-47	ENGINE OIL PRESSURE SWITCH .....	8-134
8-48	AIR CLEANER AND GENERATOR SYSTEM RELAY SWITCH .....	8-136
8-49	ENGINE OIL PRESSURE TRANSMITTER .....	8-138
8-50	PROTECTIVE COVER (FRONT AND REAR) .....	8-140
8-51	COOLANT TEMPERATURE TRANSMITTER .....	8-142
8-52	COOLANT TEMPERATURE SWITCH .....	8-144

Section VIII. BATTERIES

8-53	BATTERY TERMINAL LUGS .....	8-146
8-54	BATTERIES .....	8-148
8-55	BATTERY SUPPORTS .....	8-150
8-56	LEAD, BATTERY POSITIVE TERMINAL TO MASTER RELAY TERMINAL A1 .....	8-151
8-57	LEADS, NEGATIVE TERMINAL TO GROUND BUS AND BATTERY POSITIVE TERMINAL TO BATTERY NEGATIVE TERMINAL .....	8-154
8-58	LEAD, BATTERY POSITIVE TERMINAL TO MASTER RELAY TERMINAL A1 AND WIRING HARNESS W105 .....	8-159

Section IX. HULL WIRING HARNESS

8-59	WIRING HARNESS AND CABLE REPAIR .....	8-162
8-60	WIRING HARNESS W100 .....	8-166
8-61	WIRING HARNESS W101 .....	8-172
8-62	WIRING HARNESS W102 .....	8-182
8-63	WIRING HARNESS W104 .....	8-187

CONTENTS

Page

Section IX. HULL WIRING HARNESS – CONTINUED

8-64	WIRING HARNESS W105 .....	8-194
8-65	WIRING HARNESS W106 .....	8-200
8-66	WIRING HARNESS W107 .....	8-206
8-67	WIRING HARNESS W108 .....	8-211
8-68	WIRING HARNESS W109 .....	8-213
8-69	WIRING HARNESS W110 .....	8-217
8-70	WIRING HARNESS W111A .....	8-221
8-71	WIRING HARNESS W112 .....	8-225
8-72	WIRING HARNESS W113 .....	8-230
8-73	WIRING HARNESS W114 .....	8-238
8-74	WIRING HARNESS W115 .....	8-246
8-75	WIRING HARNESS W116 .....	8-254
8-76	WIRING HARNESS W117 .....	8-260
8-77	WIRING HARNESS W118 .....	8-266
8-78	WIRING HARNESS W119 .....	8-269
8-79	WIRING HARNESS W120 .....	8-276
8-80	WIRING HARNESS W122 .....	8-280
8-81	WIRING HARNESS W123 .....	8-284
8-82	WIRING HARNESS W124 .....	8-286
8-83	WIRING HARNESS W125 .....	8-290
8-84	WIRING HARNESS W126 .....	8-295
8-85	LEAD ASSEMBLY, SLIP RING SEGMENT FRONT POSITIVE TERMINAL TO SLIP RING SEGMENT REAR POSITIVE TERMINAL .....	8-296
8-86	LEAD ASSEMBLY, SLIP RING SEGMENT FRONT NEGATIVE TERMINAL TO SLIP RING SEGMENT REAR NEGATIVE TERMINAL .....	8-298
8-87	LEAD ASSEMBLY, RIGHT SLIP RING SEGMENT REAR POSITIVE TERMINAL TO REAR POWER RECEPTACLE, POSITIVE BUS BAR .....	8-300
8-88	LEAD ASSEMBLY, LEFT SLIP RING SEGMENT REAR NEGATIVE TERMINAL TO REAR POWER RECEPTACLE, NEGATIVE BUS BAR .....	8-302
8-89	LEAD ASSEMBLY, RIGHT SLIP RING SEGMENT REAR NEGATIVE TERMINAL TO REAR POWER RECEPTACLE, NEGATIVE BUS BAR .....	8-304
8-90	LEAD ASSEMBLY, LEFT SLIP RING SEGMENT REAR POSITIVE TERMINAL TO REAR POWER RECEPTACLE, POSITIVE BUS BAR .....	8-306
8-91	SLAVE RECEPTACLE ASSEMBLY AND MOUNTING BRACKET (FRONT) .....	8-308
8-92	POWER RECEPTACLE GUARD .....	8-310
8-93	BUS BAR (POSITIVE OR NEGATIVE) AND POWER RECEPTACLE ASSEMBLY (REAR) .....	8-311
8-94	LEAD ASSEMBLY CIRCUIT BREAKER TO DRIVER'S MCS HEATER .....	8-314
8-95	POWERPACK GROUND LEAD .....	8-316
8-96	STARTER GROUND STRAP .....	8-318
8-97	LEAD ASSEMBLY, GENERATOR TO ENGINE BLOCK GROUND .....	8-320
8-98	LEAD ASSEMBLY, ACCESSORY CONTROL BOX TO LEAD FILTER FAN .....	8-322
8-99	LEAD ASSEMBLY, LEAD FILTER FAN TO GROUND .....	8-324
8-100	WIRING HARNESS REAR ACCESS GUARD .....	8-326
8-101	WIRING HARNESS W114 ACCESS GUARD .....	8-327
8-102	WIRING HARNESS HULL REAR ACCESS COVERS .....	8-328
8-103	GUN TUBE TRAVEL LOCK WIRING HARNESS CONNECTORS AND SHIELD .....	8-329

CONTENTS

Page

Section IX. HULL WIRING HARNESS – CONTINUED

8-104 BATTERY COMPARTMENT ACCESS PORT COVER AND GASKET ..... 8-332

8-105 ENGINE WIRING HARNESS MOUNTING BRACKET ..... 8-334

Section X. VENTILATING EQUIPMENT

8-106 LEAD FILTER FAN ..... 8-336

## Section I. GENERATOR

### 8-1 GENERATOR DRIVE BELT.

This task covers:

a. Removal

b. Installation

#### INITIAL SETUP

##### Tools

General mechanic's tool kit  
(SC 5180-90-N26)

##### Equipment Conditions

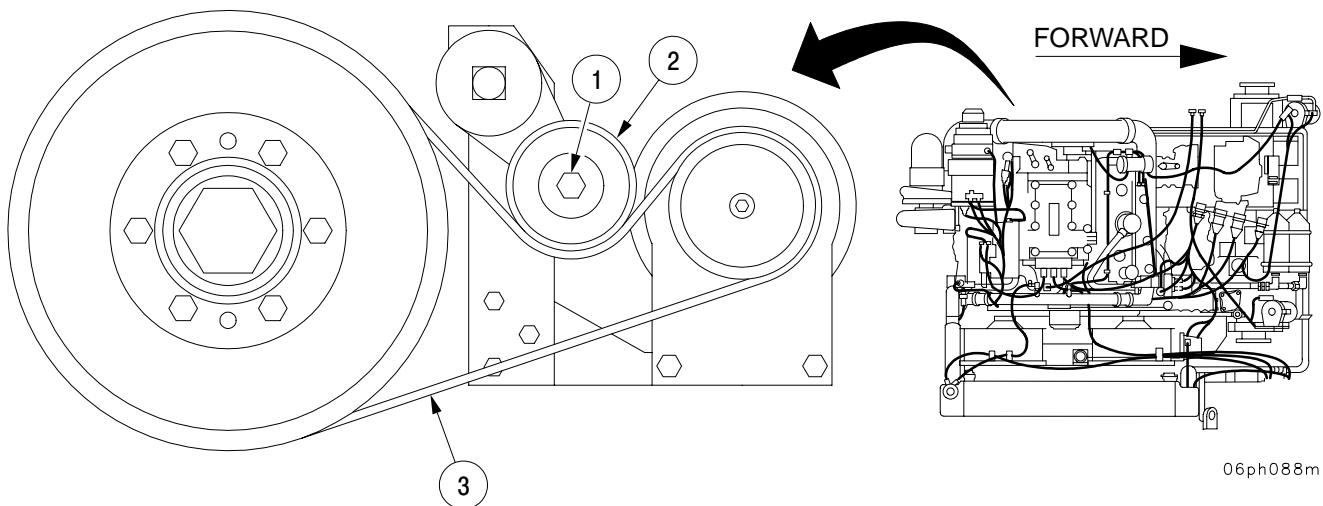
Powerpack removed (para 4-1)

#### a. Removal.

#### WARNING

Tensioner applies 150 lb-ft (203 N-m) of torque to drive belt. To avoid serious personnel injury, use extreme care when releasing tension on drive belt.

- 1 Using wrench on pulley screw (1), move tensioner assembly (2) counterclockwise to release tension on drive belt (3), and hold in this position.
- 2 Remove drive belt (3) and slowly release pressure on wrench to allow tensioner assembly (2) to go to relaxed position.



06ph088m



---

**Section I. GENERATOR – CONTINUED**

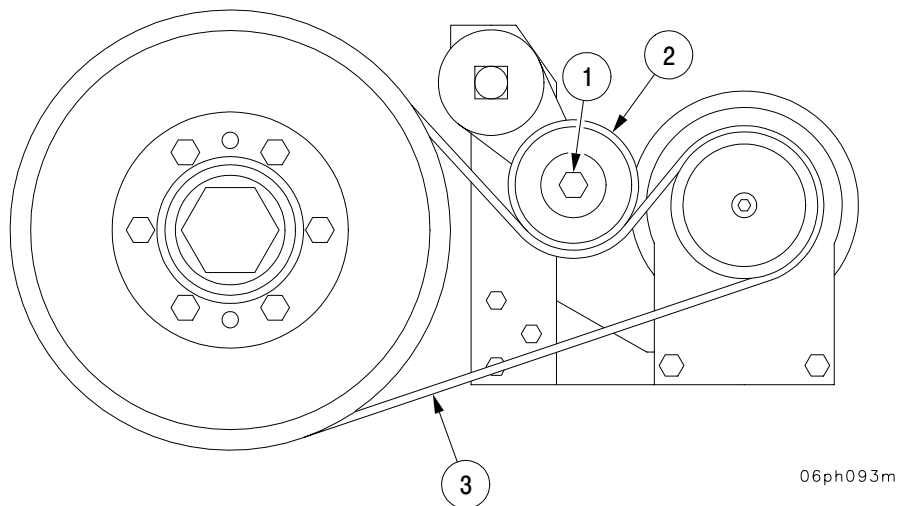
---

**8-1 GENERATOR DRIVE BELT – CONTINUED**

---

**b. Installation.**

- 1 Using wrench on pulley screw (1), move tensioner assembly (2) counterclockwise.
- 2 Install drive belt (3) and slowly release pressure on wrench, allowing tensioner assembly to tighten drive belt.



**NOTE**

**FOLLOW-ON MAINTENANCE:**  
Install powerpack (para 4-1)

**Section I. GENERATOR – CONTINUED**

**8-2 GENERATOR DRIVE BELT TENSIONER AND BRACKET.**

This task covers: a. Removal b. Installation

**INITIAL SETUP**

Tools

General mechanic's tool kit  
(SC 5180-90-N26)  
Torque wrench (item 86, Appx F)

Equipment Conditions

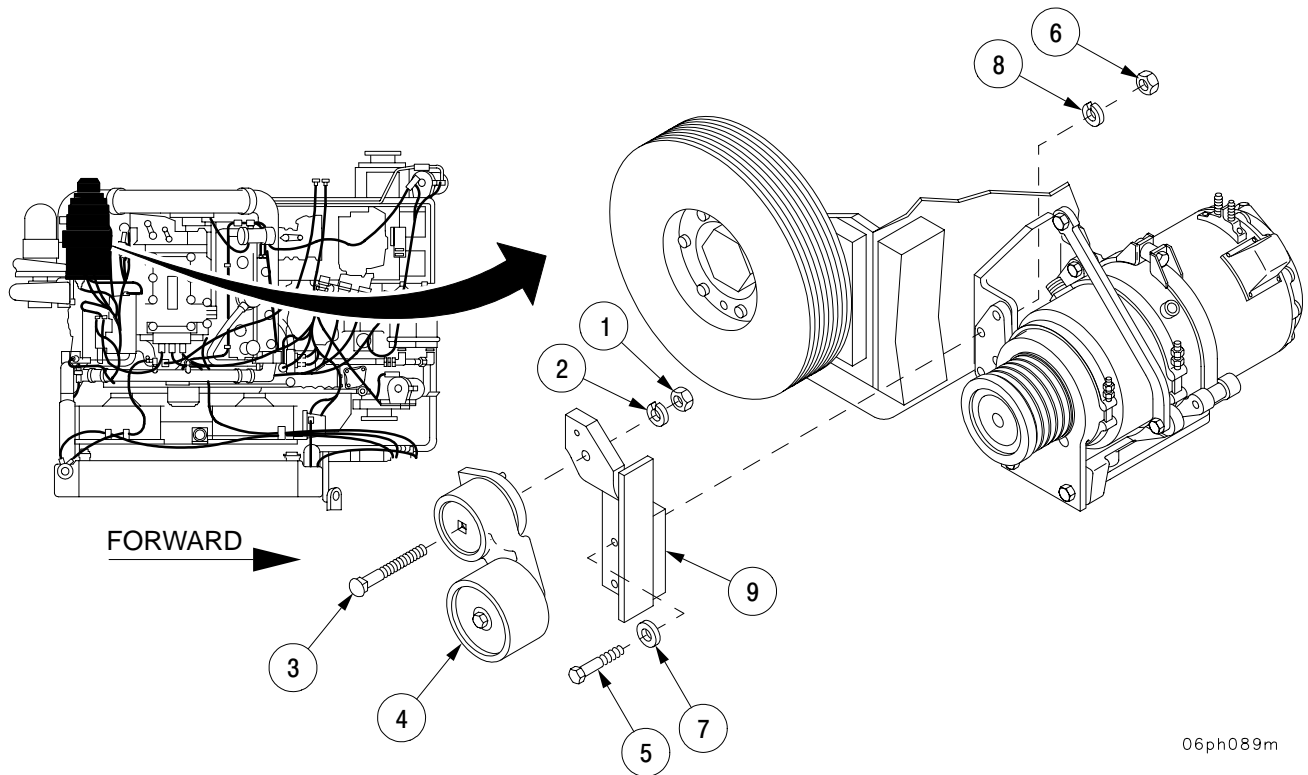
Generator drive belt removed  
(para 8-1)

Materials/Parts

Lockwasher (item 47, Appx E)  
Lockwashers (4) (item 5, Appx E)

**a. Removal.**

- 1 Remove nut (1), lockwasher (2), screw (3), and tensioner (4). Discard lockwasher.
- 2 Remove four screws (5), four nuts (6), four flat washers (7), four lockwashers (8), and bracket (9). Discard lockwashers.



06ph089m

---

## Section I. GENERATOR – CONTINUED

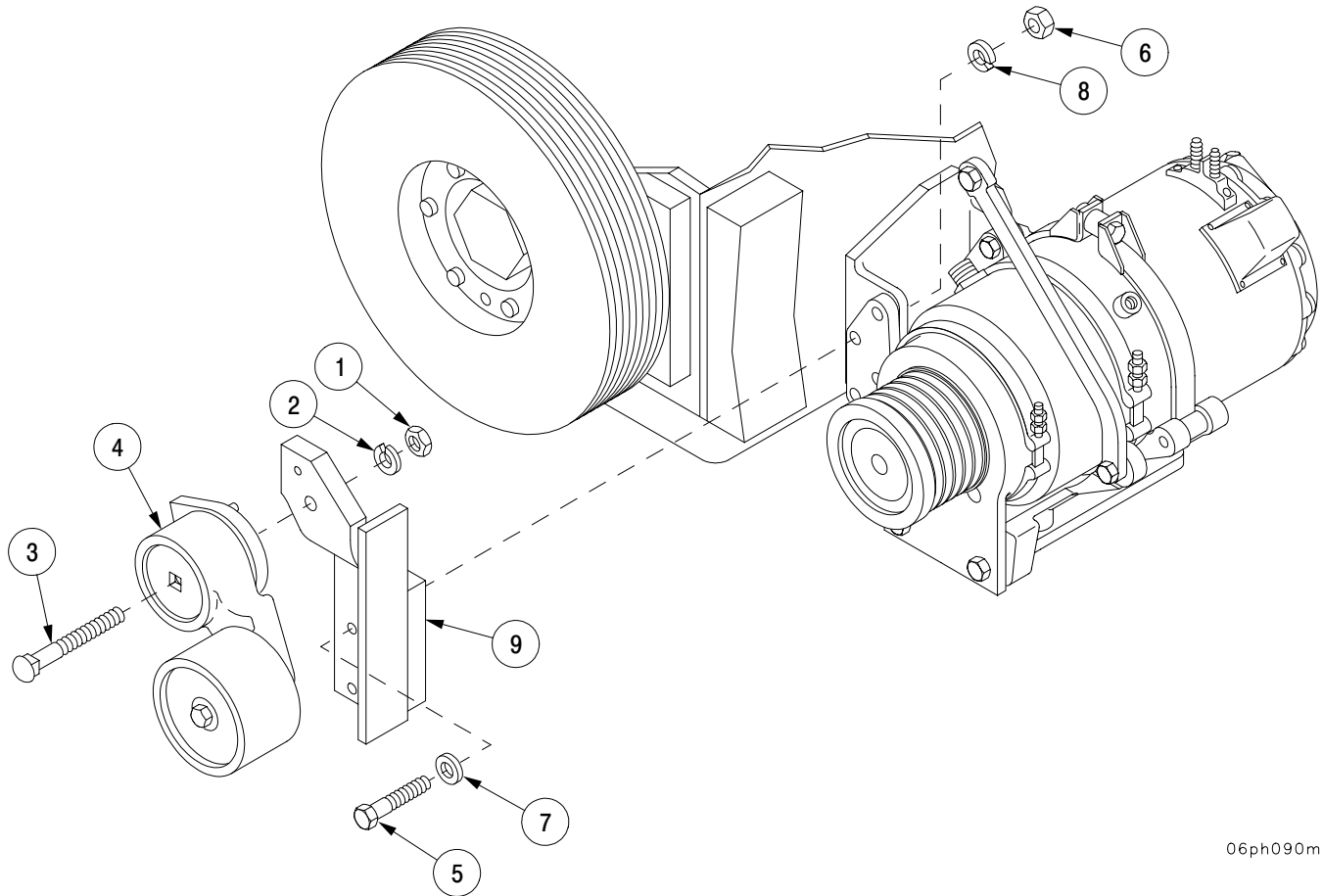
---

### 8-2 GENERATOR DRIVE BELT TENSIONER AND BRACKET – CONTINUED

---

#### b. Installation.

- 1 Install bracket (9) with four screws (5), four flat washers (7), four new lockwashers (8) and four nuts (6). Torque screws to 35–41 lb–ft (47–55 N·m)
- 2 Install tensioner (4) with screw (3), new lockwasher (2), and nut (1).



#### NOTE

**FOLLOW-ON MAINTENANCE:**  
Install generator drive belt (para 8-1)



---

## Section I. GENERATOR – CONTINUED

---

### 8-3 GENERATOR PULLEY ASSEMBLY – CONTINUED

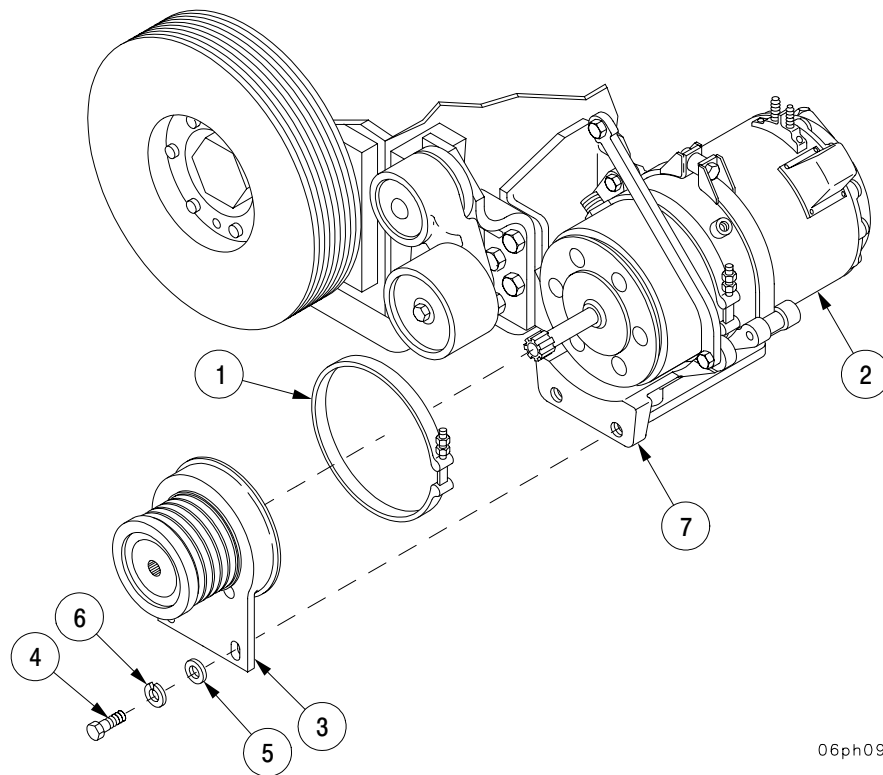
---

#### b. Installation.

#### NOTE

Apply lubricant to generator drive spline.

- 1 Install pulley assembly (3) on generator cradle (7) with two screws (4), two new lockwashers (6), and two flat washers (5). Torque screws to 71–76 lb–ft (96–103 N·m).
- 2 Connect pulley assembly (3) to generator (2) with clamp (1).



06ph092m

#### NOTE

#### FOLLOW-ON MAINTENANCE:

- Install generator drive belt (para 8-1)
- Perform generator alignment (para 8-5)



## Section I. GENERATOR – CONTINUED

---

### 8-4 GENERATOR – CONTINUED

---

a. Removal.



Move electrical leads out of the way to avoid damaging leads during generator removal.

- 1 Disconnect wiring harness W106 connector P2 (1) from receptacle (2) at front of generator (3).
- 2 Disconnect wiring harness W106 connector P3 (4) from receptacle (5) at rear of generator (3).

#### NOTE

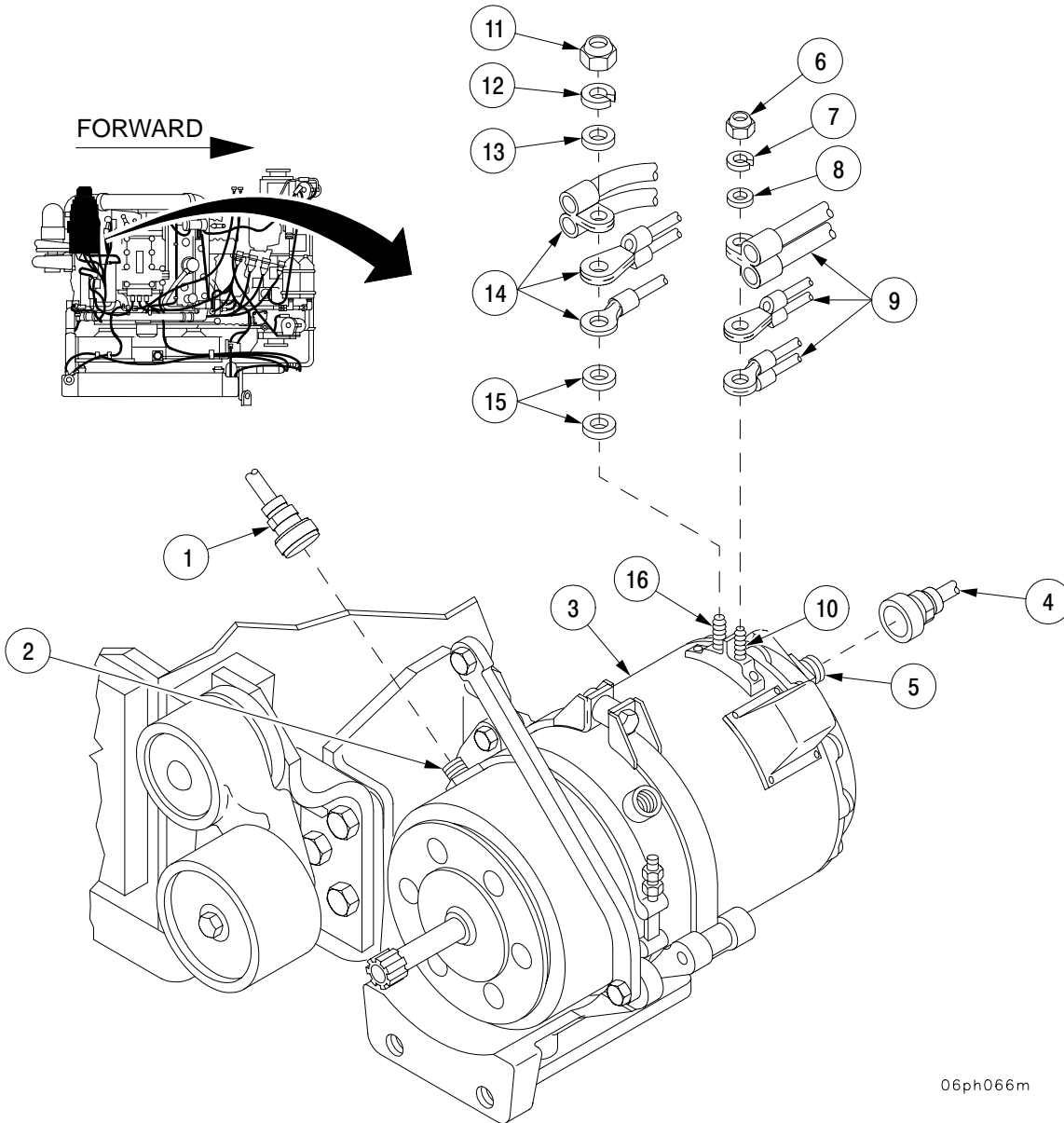
Tag electrical connections and electrical leads prior to removal to aid in installation.

- 3 Remove nut (6), lockwasher (7), flat washer (8), and six leads (9) from negative terminal (10) (small). Discard lockwasher.
- 4 Remove nut (11), lockwasher (12), flat washer (13), five leads (14) and two flat washers (15) from positive terminal (16) (large). Discard lockwasher.

Section I. GENERATOR – CONTINUED

8-4 GENERATOR – CONTINUED

a. Removal – Continued



06ph066m



## Section I. GENERATOR – CONTINUED

---

### 8-4 GENERATOR – CONTINUED

---

#### a. Removal – Continued

- 5 Remove two screws (17), two lockwashers (18), flat washer (19), two flat washers (20), and arm (21). Discard lockwashers.
- 6 Remove screw (22), lockwasher (23), and nut (24) from clamps (25 and 26). Separate clamps (25 and 26) and secure out of the way. Discard lockwasher.

**WARNING**

Generator weighs 85 lb (39 kg). Use extreme caution and a helper when removing generator to avoid serious injury or damage.

**CAUTION**

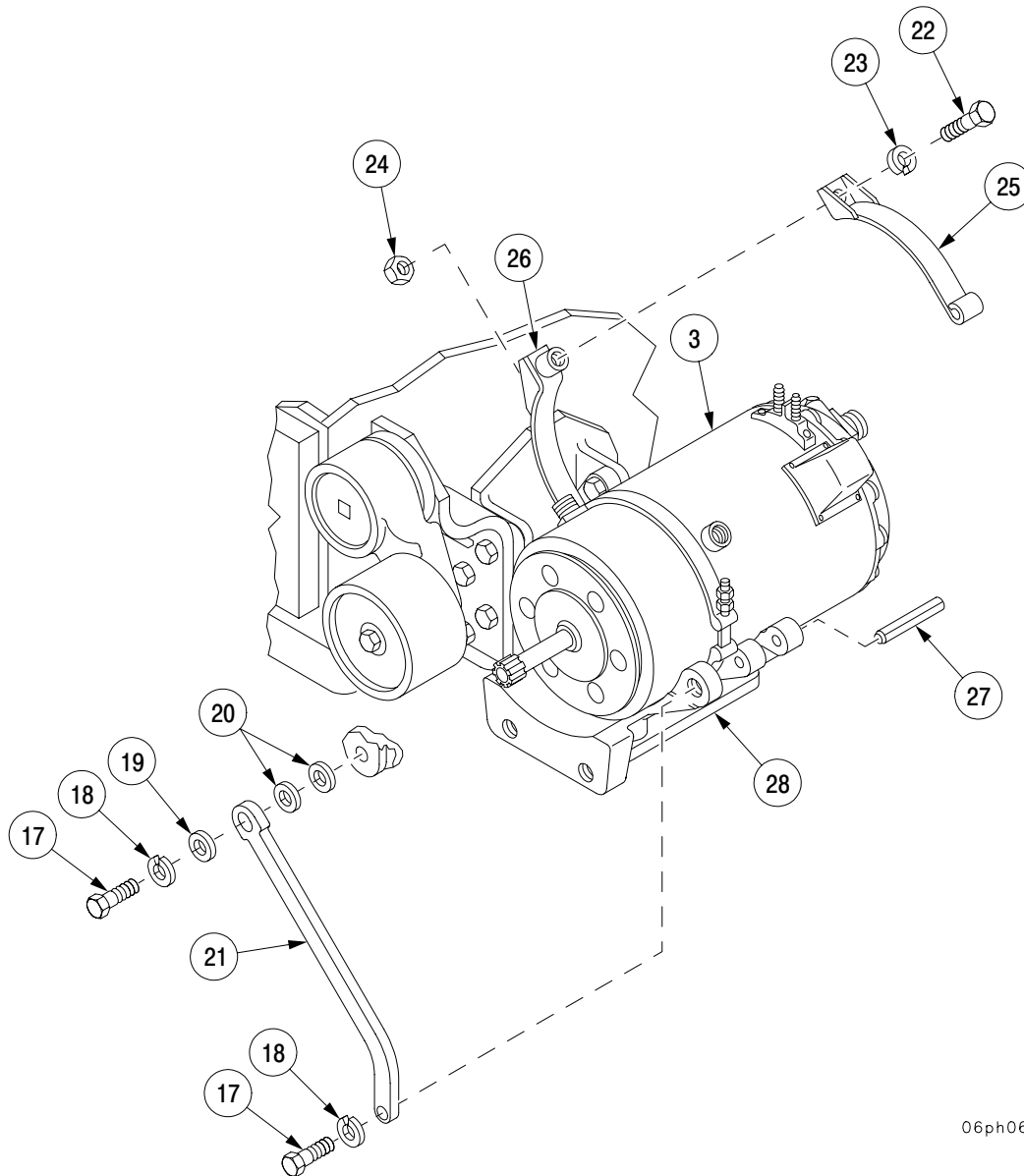
To avoid damage to clamps, electrical leads, and oil lines, make sure these items are out of the way before removing generator.

- 7 Remove spring pin (27) securing clamp (25) to cradle assembly (28). Discard spring pin.
- 8 Remove clamp (25) from cradle assembly (28).
- 9 Remove generator (13) from cradle assembly (28).

Section I. GENERATOR – CONTINUED

8-4 GENERATOR – CONTINUED

a. Removal – Continued



06ph067m

## Section I. GENERATOR – CONTINUED

---

### 8-4 GENERATOR – CONTINUED

---

#### b. Installation.

**WARNING**

Generator weighs 85 lb (39 kg). Use extreme caution and a helper when installing generator to avoid injury or damage.

**CAUTION**

To avoid damage to clamps, electrical leads, and oil lines, make sure that these items are out of the way before installing generator.

- 1 Position generator (3) in cradle assembly (28).
- 2 Install clamp (25) on cradle assembly (28) with new spring pin (27).
- 3 Position clamps (25 and 26) around generator (3) and loosely install screw (22), new lockwasher (23), and nut (24). Torque screw to 30–36 lb–ft (41–49 N·m).
- 4 Position arm (21) and two washers (20), and secure with two screws (17), two new lockwashers (18), and flat washer (19).

---

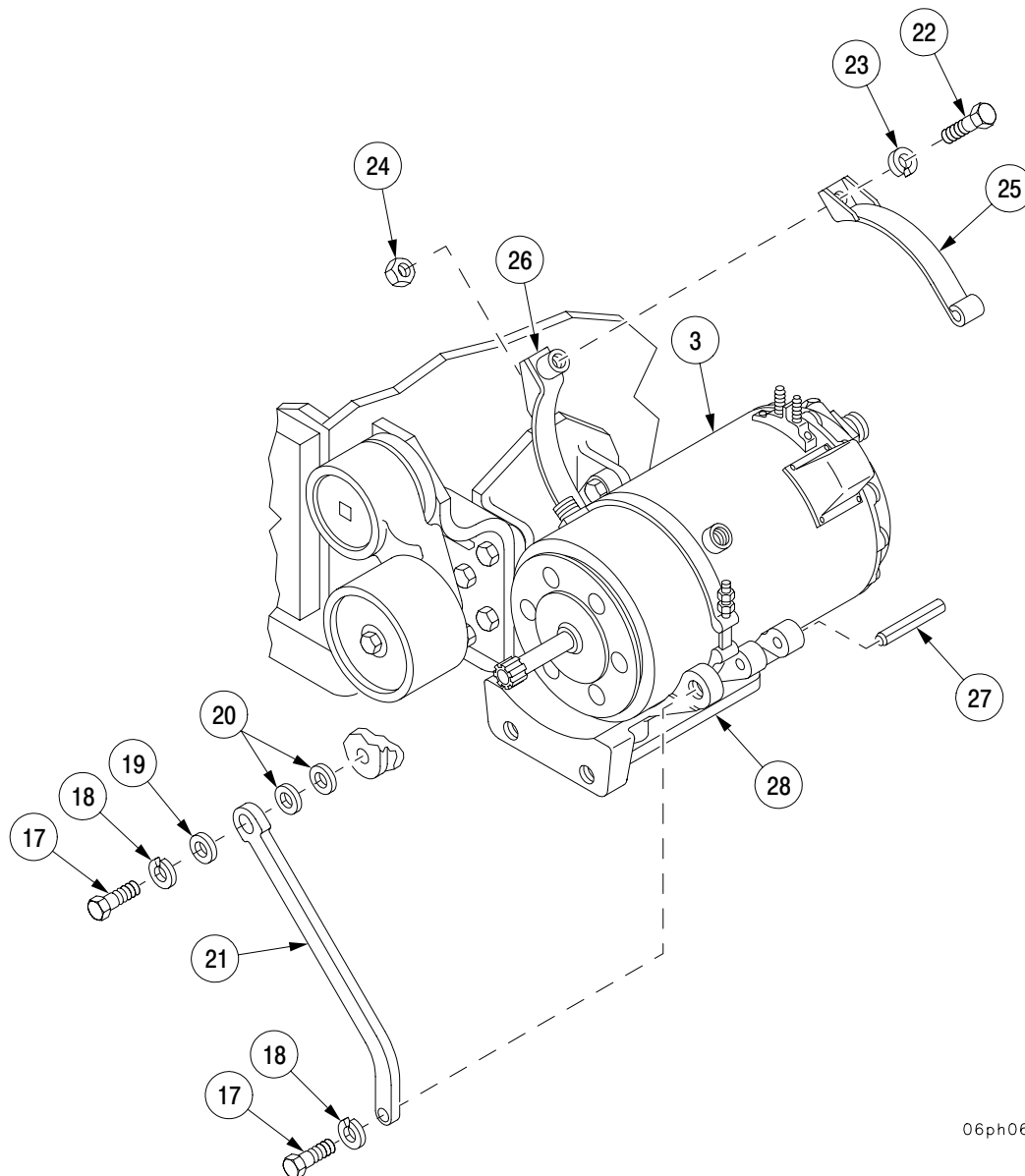
**Section I. GENERATOR – CONTINUED**

---

**8-4 GENERATOR – CONTINUED**

---

**b. Installation – Continued**



06ph067m

## Section I. GENERATOR – CONTINUED

---

### 8-4 GENERATOR – CONTINUED

---

#### b. Installation – Continued

- 5 Connect wiring harness W106 connectors P3 (4) to receptacle (5) at rear of generator (3).
- 6 Connect wiring harness W106 connector P2 (1) to receptacle (2) at front of generator (3).

#### **NOTE**

If installing new generator, remove attaching hardware on output terminals.

- 7 Install two flat washers (15) and five leads (14) to positive terminal (16) (large) and secure with flat washer (13), new lockwasher (12), and nut (11).
- 8 Install six leads (9) to negative terminal (10) (small) and secure with flat washer (8), new lockwasher (7), and nut (6).
- 9 Apply adhesive to positive terminal (16) (large) and negative terminal (10) (small) after assembly.

#### **NOTE**

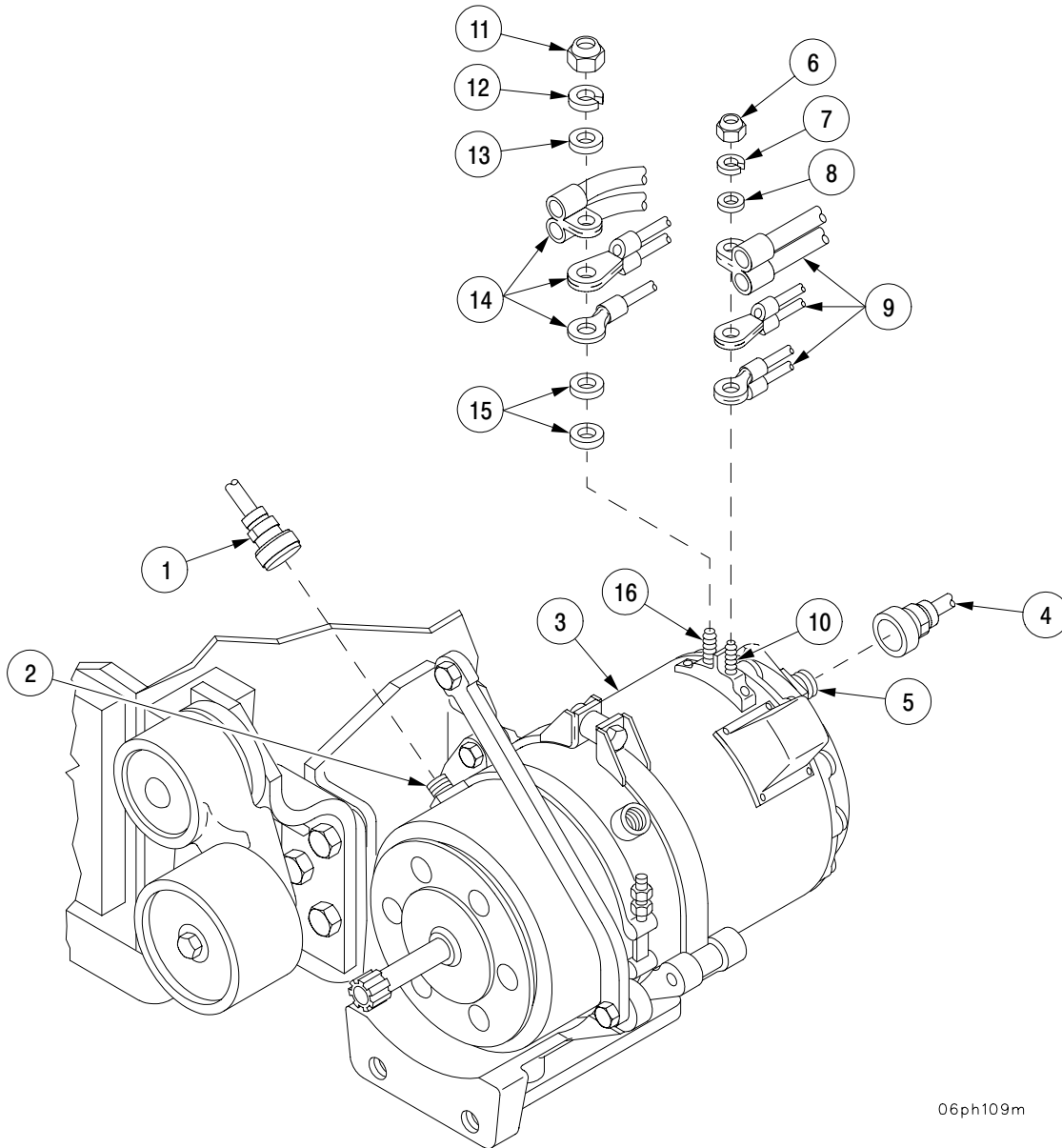
Clamps securing generator to cradle will be tightened during pulley assembly installation.

- 10 Check all connections and mounting hardware to make sure installation is correct.

**Section I. GENERATOR – CONTINUED**

**8-4 GENERATOR – CONTINUED**

**b. Installation – Continued**



06ph109m

**NOTE**

**FOLLOW-ON MAINTENANCE:**

- Install generator pulley assembly (para 8-3)
- Install powerpack (para 4-1)
- Install generator oil cooling system lines and fittings to generator (para 8-9)

## Section I. GENERATOR – CONTINUED

---

### 8-5 GENERATOR ALIGNMENT.

---

- This task covers:
- a. Generator/dampener fixture assembly installation
  - b. Generator alignment
- 

<b>INITIAL SETUP</b>
----------------------

Tools

General mechanic's tool kit  
(SC 5180-90-N26)  
Torque wrench (item 86, Appx F)  
Generator alignment tool  
(item 4, Appx F)

Materials/Parts

Lockwashers (3) (item 47, Appx E)  
Lockwashers (4) (item 5, Appx E)

Equipment Conditions

Powerpack removed and placed on level  
surface (para 4-1)  
Generator drive belt removed (para 8-1)

---

**a. Generator/dampener fixture assembly installation.**

**NOTE**

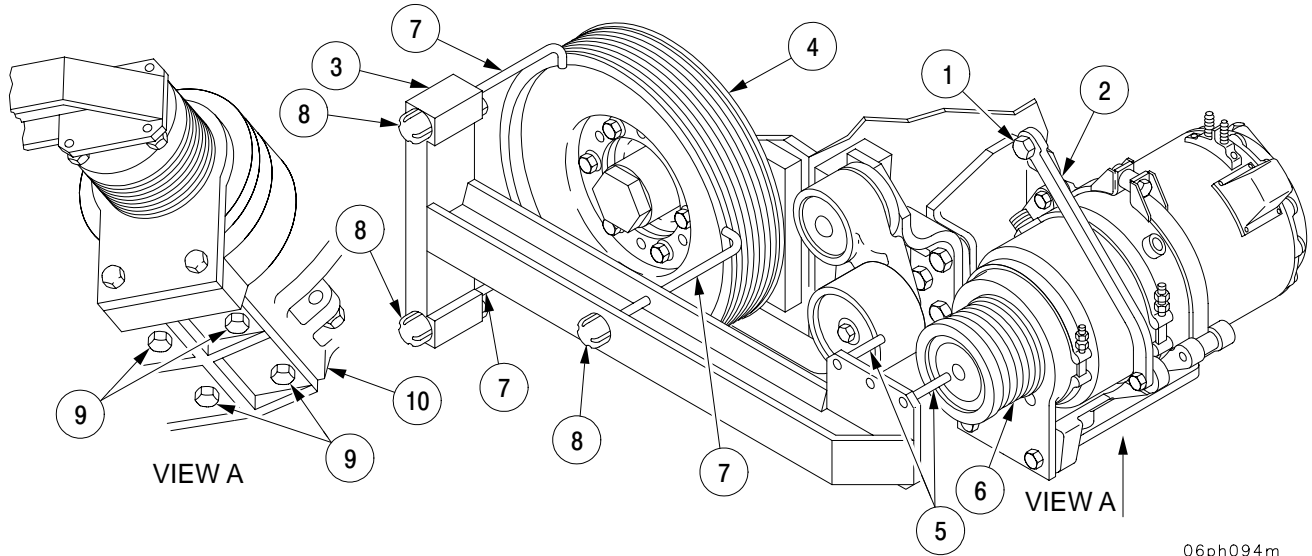
- Adjustment of generator is accomplished with generator, cradle, and pulley assembly assembled as a unit.
- Each and every time a screw is loosened during this alignment procedure, it must be completely removed and the lockwasher discarded. A new lockwasher must replace the discarded lockwasher.

- 1 Loosen screw (1) securing generator support arm (2).
- 2 Place alignment fixture (3) against engine dampener pulley (4). Use pins (5) to support end of fixture (3) on generator pulley (6).
- 3 Hook three clamp rods (7) behind engine dampener pulley (4) and tighten three knobs (8) to attach alignment fixture (3) to engine dampener pulley (4).
- 4 Loosen four screws (9) securing generator cradle assembly (10).

**Section I. GENERATOR – CONTINUED**

**8-5 GENERATOR ALIGNMENT – CONTINUED**

**a. Generator/dampener fixture assembly installation – Continued**



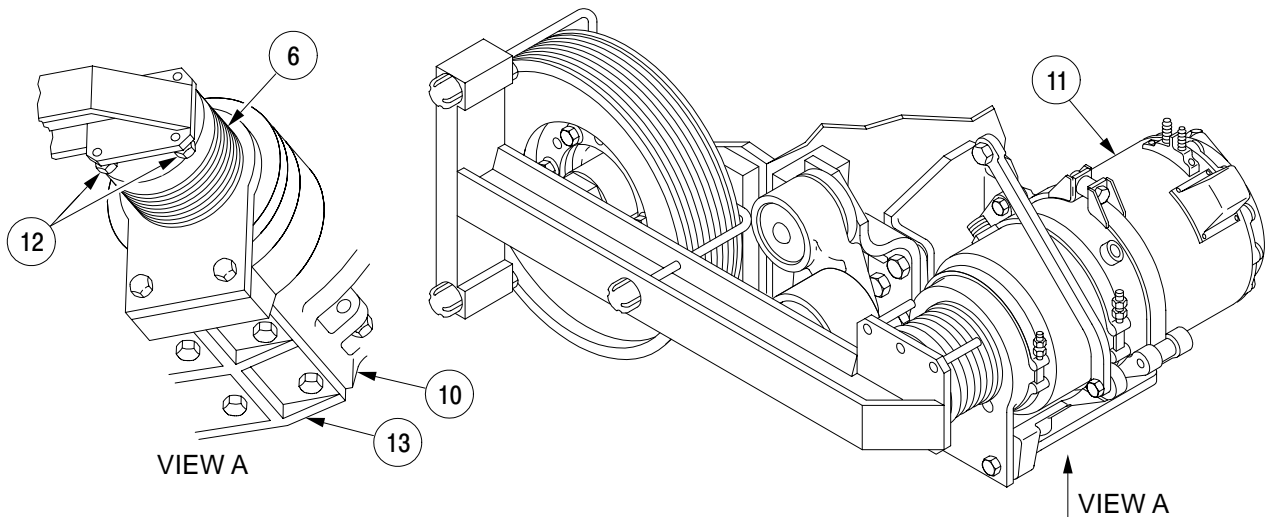
06ph094m

**b. Generator alignment.**

**CAUTION**

When sliding generator forward, do not force pulley against fixture.

- 1 Slide generator cradle assembly (10) with generator (11) forward until the generator pulley (6) touches one or more of the three fixture locator studs (12).
- 2 Pivot the generator cradle assembly (10) in the screw slots of cradle bracket (13) until generator pulley (6) touches both bottom studs (12).



06ph095m

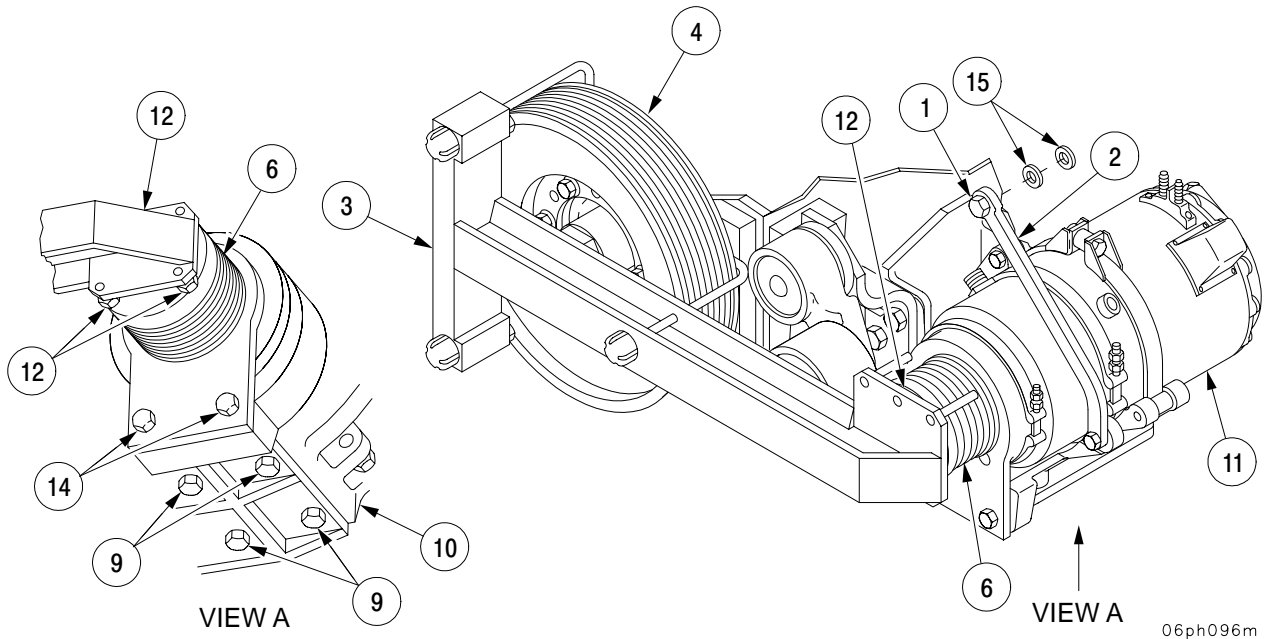


**Section I. GENERATOR – CONTINUED**

**8-5 GENERATOR ALIGNMENT – CONTINUED**

**b. Generator alignment – Continued**

- 3 If the generator pulley (6) does not touch or is more than the thickness of a piece of paper (0.003 inch) from the top or bottom studs (12) loosen two bolts (14).
- 4 Move the generator pulley (6) up or down and slide generator (11) forward or back until generator pulley (6) touches all three locator studs (12) or there is no more than 0.003 inch gap between studs (12) and generator pulley (6). Check gap with a feeler gage or piece of paper.
- 5 Torque two screws (14) to 71–76 lb–ft (96–103 N·m).
- 6 Torque four screws (9) located under generator cradle assembly (10) to 35–41 lb–ft (47–56 N·m).
- 7 Verify that gap between generator pulley (6) and the three studs (12) is no more than 0.003 inch. If the generator (11) moved during tightening, repeat adjustment steps 4 through 7.
- 8 Add flat washers (15) as required to take up space between the generator support arm (2) and engine. Tighten screw (1) on generator support arm (2).
- 9 Remove generator alignment fixture (3) from engine dampener pulley (4) and generator pulley (6).



06ph096m

**NOTE**

**FOLLOW-ON MAINTENANCE:**  
 Install generator drive belt (para 8-1)  
 Install powerpack (para 4-1)



---

## Section I. GENERATOR – CONTINUED

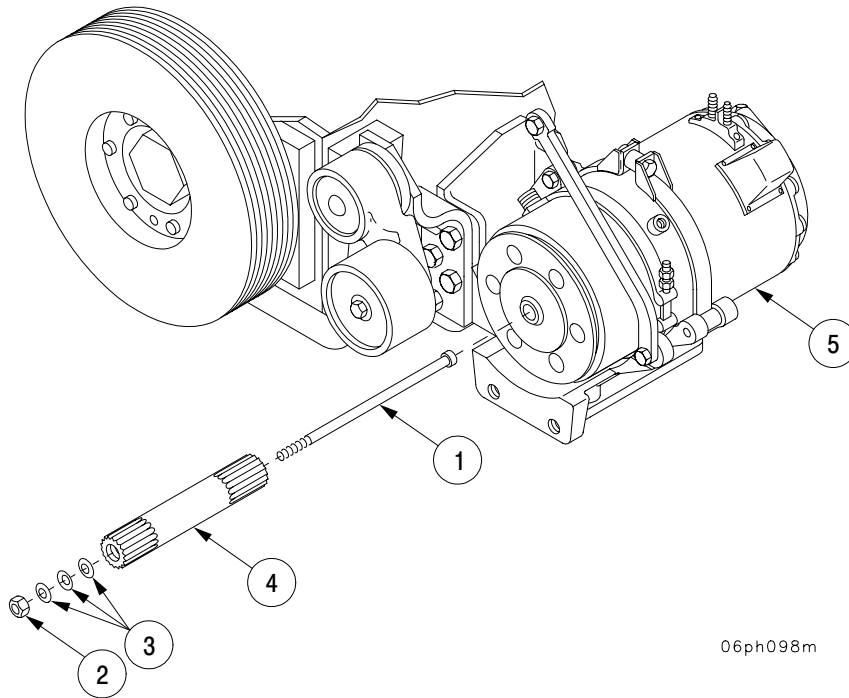
---

### 8-6 GENERATOR DRIVE SHAFT AND SHAFT SCREW – CONTINUED

---

**b. Installation:**

- 1 Install generator shaft screw (1) in generator (5).
- 2 Apply grease to inner end of drive shaft (4). Install drive shaft (4) over generator shaft screw (1) and secure drive shaft (4) with three washers (3) and new self-locking nut (2).
- 3 Hold generator shaft screw (1) stationary using screwdriver and tighten new self-locking nut (2) until there is no end play of drive shaft (4). Torque self-locking nut (2) to  $17.5 \pm 2.5$  in.-lb ( $1.98 \pm 0.3$  N·m).
- 4 Apply grease to splines of drive shaft (4).



06ph098m

**NOTE**

**FOLLOW-ON MAINTENANCE:**

Install generator pulley assembly (para 8-3)

**Section I. GENERATOR – CONTINUED**

**8-7 CRADLE ASSEMBLY.**

This task covers: a. Removal b. Disassembly c. Assembly d. Installation

**INITIAL SETUP**

Tools

- General mechanic’s tool kit (SC 5180-90-N26)
- Wire brush (item 7, Appx F)
- Torque wrench (item 86, Appx F)

Equipment Conditions

Generator removed (para 8-4)

Materials/Parts

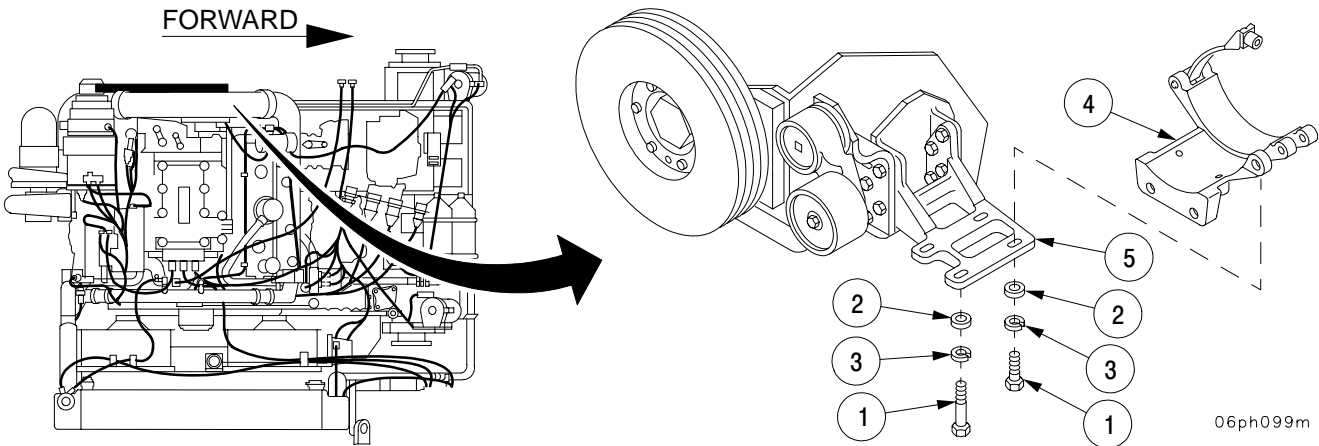
- Lockwashers (4) (item 5, Appx E)
- Dry-cleaning solvent (item 59, Appx C)
- Adhesive (item 1, Appx C)
- Cushioning pad (item 166, Appx E)
- Acid swabbing brush (item 13, Appx C)
- Spring pin (item 300, Appx E)

**a. Removal.**

**NOTE**

One screw is shorter than the other three. Note location of screws for ease of installation.

- 1 Remove four screws (1), four flat washers (2), and four lockwashers (3) securing cradle assembly (4) to cradle mounting bracket (5). Discard lockwashers.
- 2 Remove cradle assembly (4) from cradle mounting bracket (5).



---

## Section I. GENERATOR – CONTINUED

---

### 8-7 CRADLE ASSEMBLY – CONTINUED

---

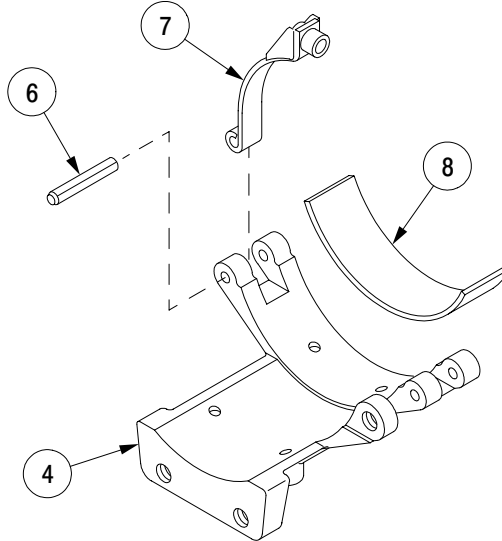
#### b. Disassembly.

- 1 Remove spring pin (6) and retaining strap (7) from cradle assembly (4). Discard spring pin.
- 2 Remove liner (8) from cradle assembly (4) with putty knife. Discard liner.

**WARNING**

Dry-cleaning solvent (P-D-680) is toxic and flammable. To avoid injury, wear protective goggles and gloves and use only in a well-ventilated area. Avoid contact with skin, eyes, and clothes. Do not breathe vapors. Do not use near open flame or excessive heat. Do not smoke when using solvent. Failure to do so could cause **SERIOUS INJURY**. If you become dizzy while using dry-cleaning solvent, get fresh air immediately, and if necessary, get medical attention. If contact with skin or clothes is made, flush thoroughly with water. If the solvent contacts your eyes, wash them with water immediately and obtain medical aid (FM 21-11).

- 3 Clean all adhesive from cradle assembly (4) using dry-cleaning solvent and wire brush.



06ph100m

**Section I. GENERATOR – CONTINUED**

**8-7 CRADLE ASSEMBLY – CONTINUED**

**c. Assembly.**

- 1 Apply thin, even coat of adhesive in cavity of cradle assembly (4) with acid brush.
- 2 Install new liner (8) in cavity of cradle assembly (4). Wait one hour for adhesive to dry.
- 3 Install retainer strap (7) on cradle assembly (4) with new spring pin (6).

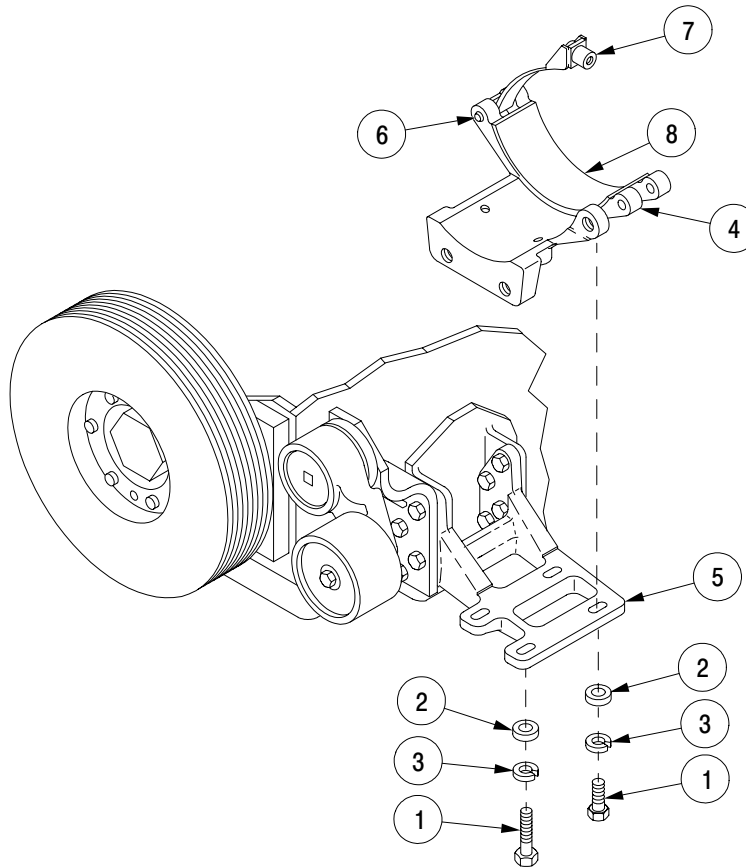
**d. Installation.**

- 1 Position cradle assembly (4) on cradle mounting bracket (5).

**NOTE**

One screw is shorter than the other three and must be installed in correct hole.

- 2 Secure cradle assembly (4) with four screws (1), four new lockwashers (3), and four flat washers (2). Torque screws to 35–41 lb–ft (47–56 N·m).



**NOTE**

**FOLLOW-ON MAINTENANCE:**  
Install generator (para 8-4)

06ph101m

**Section I. GENERATOR – CONTINUED**

**8-8 CRADLE MOUNTING BRACKET.**

This task covers:                    a. Removal    b. Installation

**INITIAL SETUP**

Tools

General mechanic's tool kit  
(SC 5180-90-N26)  
Torque wrench (item 86, Appx F)

Equipment Conditions

Generator drive belt tensioner  
bracket removed (para 8-2)  
Cradle assembly removed (para 8-7)

Materials/Parts

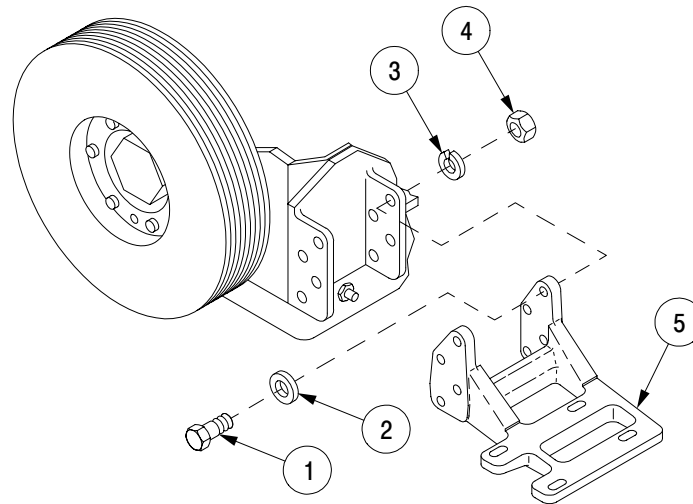
Lockwashers (4) (item 5, Appx E)

**a. Removal.**

Remove four screws (1), four flat washers (2), four lockwashers (3), four nuts (4), and bracket (5). Discard lockwashers.

**b. Installation.**

Install bracket (5) with four screws (1), four flat washers (2), four new lockwashers (3), and four nuts (4). Torque screws to 35-41 lb-ft (47-56 N·m).



06ph102m

**NOTE**

**FOLLOW-ON MAINTENANCE:**

Install generator drive belt  
tensioner bracket (para 8-2)  
Install cradle assembly (para 8-7)



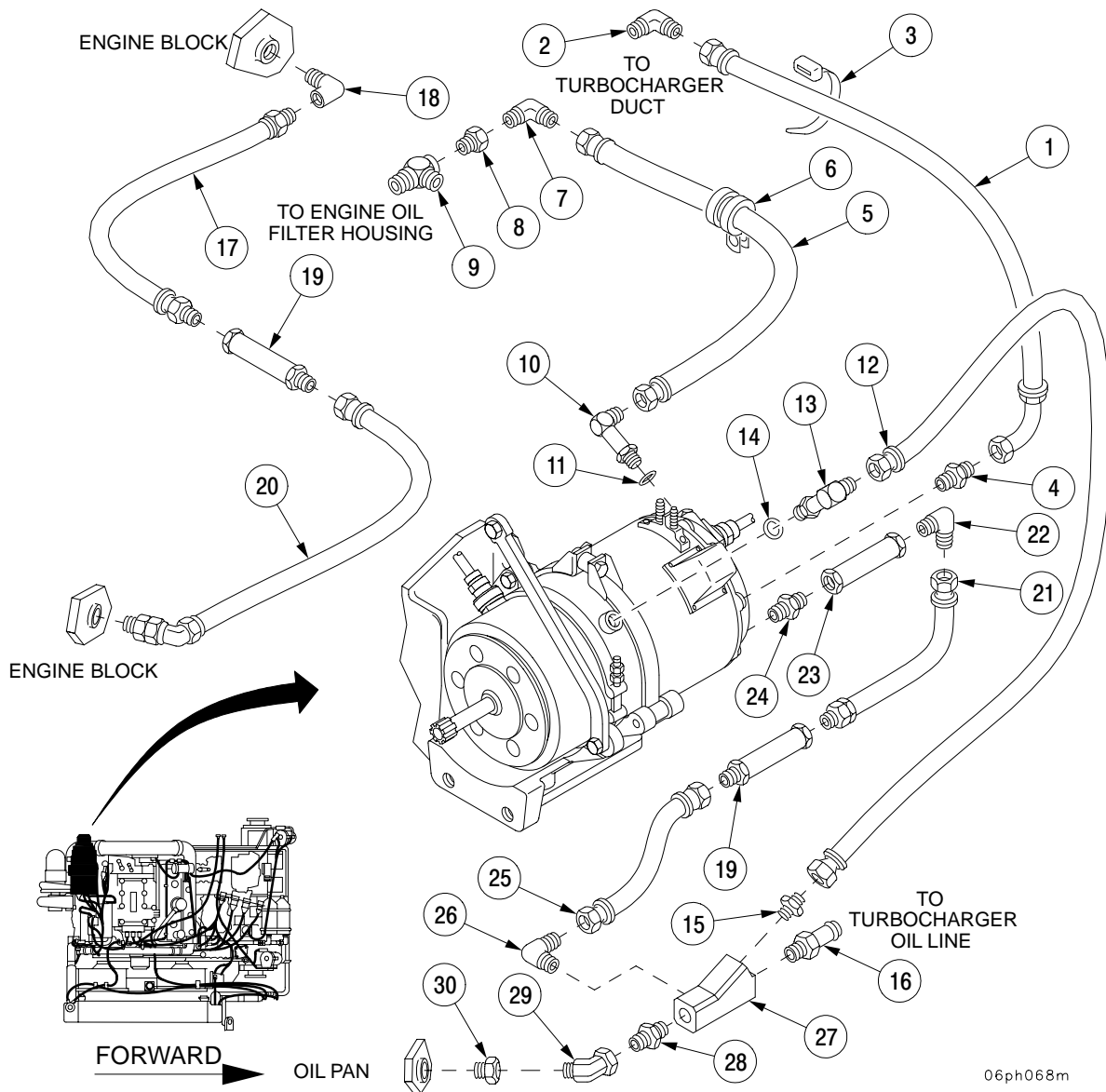


**Section I. GENERATOR – CONTINUED**

**8-9 GENERATOR OIL COOLING MANIFOLD, HOSES, VALVES, AND FITTING – CONTINUED**

**b. Installation – Continued**

- |                   |                       |                   |
|-------------------|-----------------------|-------------------|
| 1. Hose Assembly  | 11. Preformed Packing | 21. Hose Assembly |
| 2. Elbow          | 12. Hose Assembly     | 22. Elbow         |
| 3. Tie Straps (3) | 13. Adapter           | 23. Valve         |
| 4. Adapter        | 14. Preformed Packing | 24. Nipple        |
| 5. Hose Assembly  | 15. Adapter           | 25. Hose Assembly |
| 6. Clamp          | 16. Insert            | 26. Elbow         |
| 7. Elbow          | 17. Hose Assembly     | 27. Manifold      |
| 8. Reducer        | 18. Elbow             | 28. Pipe Fitting  |
| 9. Tee            | 19. Valves (2)        | 29. Elbow         |
| 10. Adapter       | 20. Hose Assembly     | 30. Adapter       |



06ph068m

---

**Section I. GENERATOR – CONTINUED**

---

**8-9 GENERATOR OIL COOLING MANIFOLD, HOSES, VALVES, AND FITTING – CONTINUED**

---

**b. Installation – Continued**

**NOTE**

**FOLLOW-ON MAINTENANCE:**

Connect W110 to generator (para 8-69)

Connect W107 to generator (para 8-66)

Connect W106 to generator (para 8-65)

Connect turbocharger oil  
line to manifold (para 5-9)

Connect engine oil pressure line to tee on top of  
oil filter (para 4-6)

Install powerpack (para 4-1)





---

### Section III. STARTING MOTOR – CONTINUED

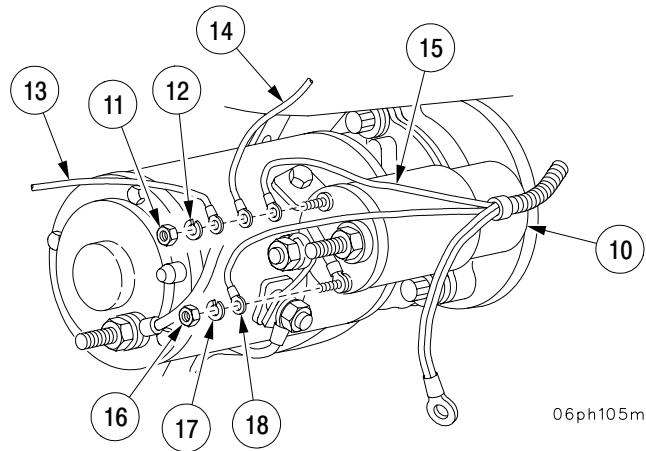
---

#### 8-11 ENGINE STARTER – CONTINUED

---

**a. Removal – Continued**

- 3 Remove nut (11), lockwasher (12), solenoid W104 lead 14B (13), W102 lead AX (14), and orange lead (15) from left post of starter solenoid (10). Discard lockwasher.
- 4 Remove nut (16), lockwasher (17), and gray lead (18) from right post of solenoid (10). Discard lockwasher.

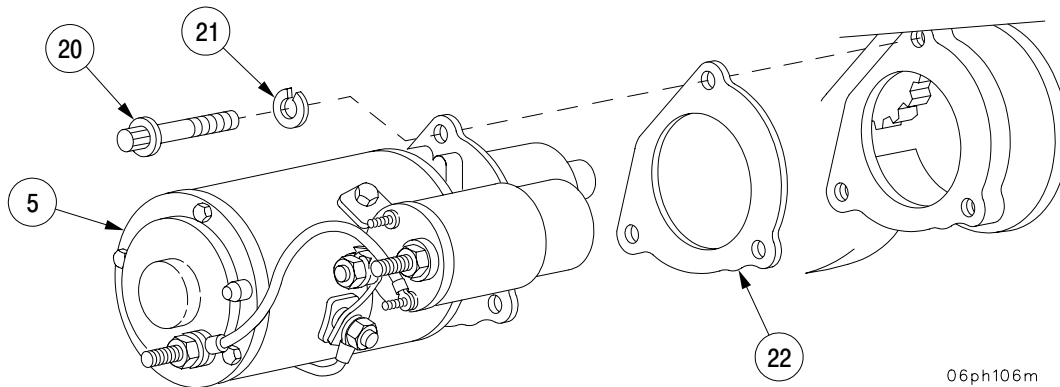


- 5 Remove three screws (20) and lockwashers (21) from starter (5). Discard lockwashers.

**WARNING**

Starter motor weighs 80 pounds (36 kg). To avoid serious injury to personnel, use an assistant when removing starter.

- 6 With the aid of an assistant, remove starter (5) and gasket (22) from engine. Discard gasket.



Section III. STARTING MOTOR – CONTINUED

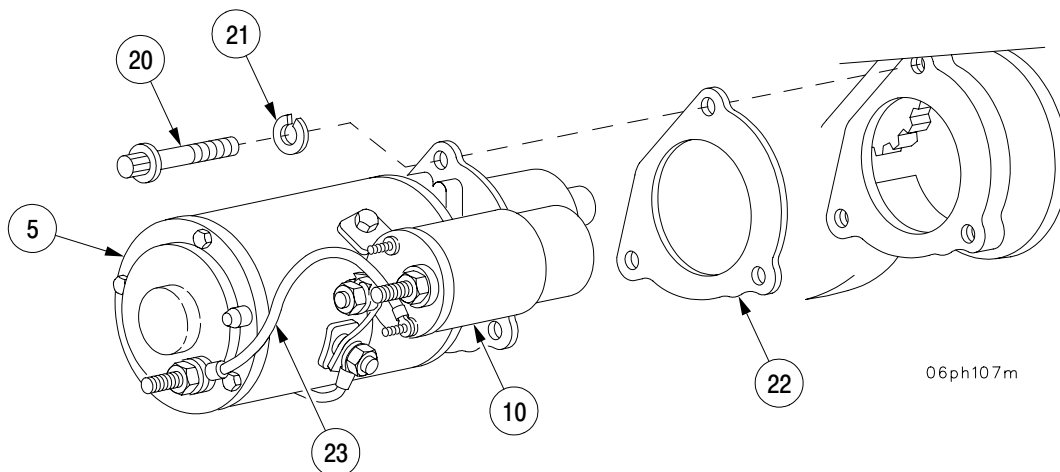
8-11 ENGINE STARTER – CONTINUED

b. Installation.

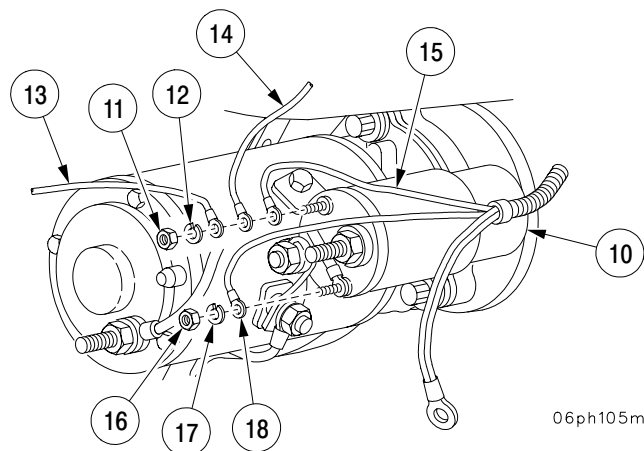
**WARNING**

Starter motor weighs 80 pounds (36 kg). To avoid serious injury to personnel, use an assistant when installing starter.

- 1 With the aid of an assistant, install new gasket (22) and starter (5) on engine.
- 2 Secure starter (5) in engine with three new lockwashers (21) and three screws (20). Torque screws to 95 to 105 lb-ft (129 – 142 N•m).
- 3 Ensure ground lead (23) is installed on right post of starter solenoid (10).



- 4 Install gray lead (18) on right post of starter solenoid (10) with new lockwasher (17) and nut (16).
- 5 Install orange lead (15), W102 lead AX (14), and solenoid W104 lead 14B (13) on left post of starter solenoid (10) with new lockwasher (12) and nut (11).



---

## Section III. STARTING MOTOR – CONTINUED

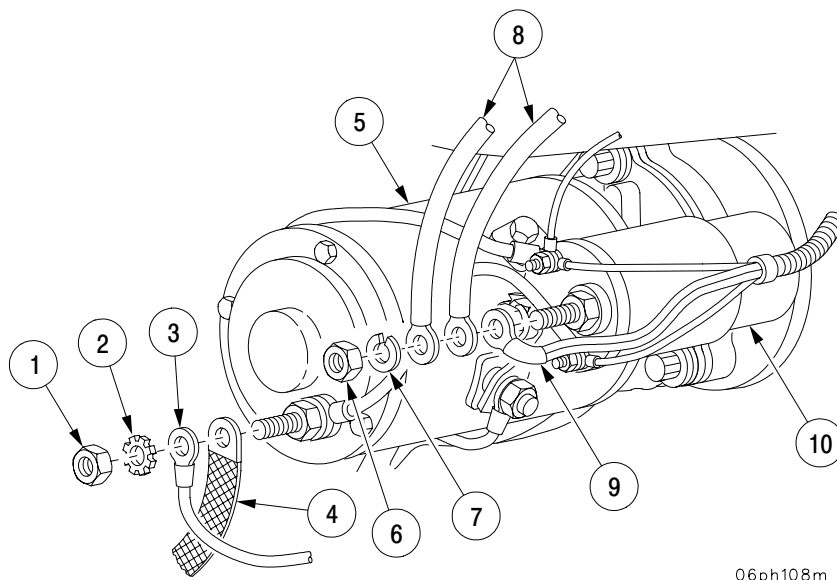
---

### 8-11 ENGINE STARTER – CONTINUED

---

#### b. Installation – Continued

- 6 Install two starter cable W104 leads 82 (8) and two red leads (9) on center terminal of starter solenoid (10) with new lockwasher (7) and nut (6).
- 7 Install ground strap (4) and ground W102 lead N (3) on starter (5) with new lockwasher (2) and nut (1).
- 8 After assembly, apply adhesive to starter terminals.



06ph108m

#### NOTE

##### FOLLOW-ON MAINTENANCE:

Install generator oil cooling manifold and oil inlet line  
(para 8-9)

Install powerpack (para 4-1)

**Section IV. INSTRUMENT OR ENGINE CONTROL PANELS**

**8-12 DRIVER'S INSTRUMENT PANEL.**

This task covers: a. Removal b. Disassembly c. Assembly d. Installation

**INITIAL SETUP**

Tools

General mechanic's tool kit  
(SC 5180-90-N26)

Materials/Parts

- Lockwashers (14) (item 39, Appx E)
- Lockwashers (8) (item 38, Appx E)
- Lockwashers (2) (item 41, Appx E)
- Lockwashers (4) (item 40, Appx E)
- Nuts, self-locking (2) (item 318, Appx E)
- Silicone compound (item 58, Appx C)

Equipment Conditions

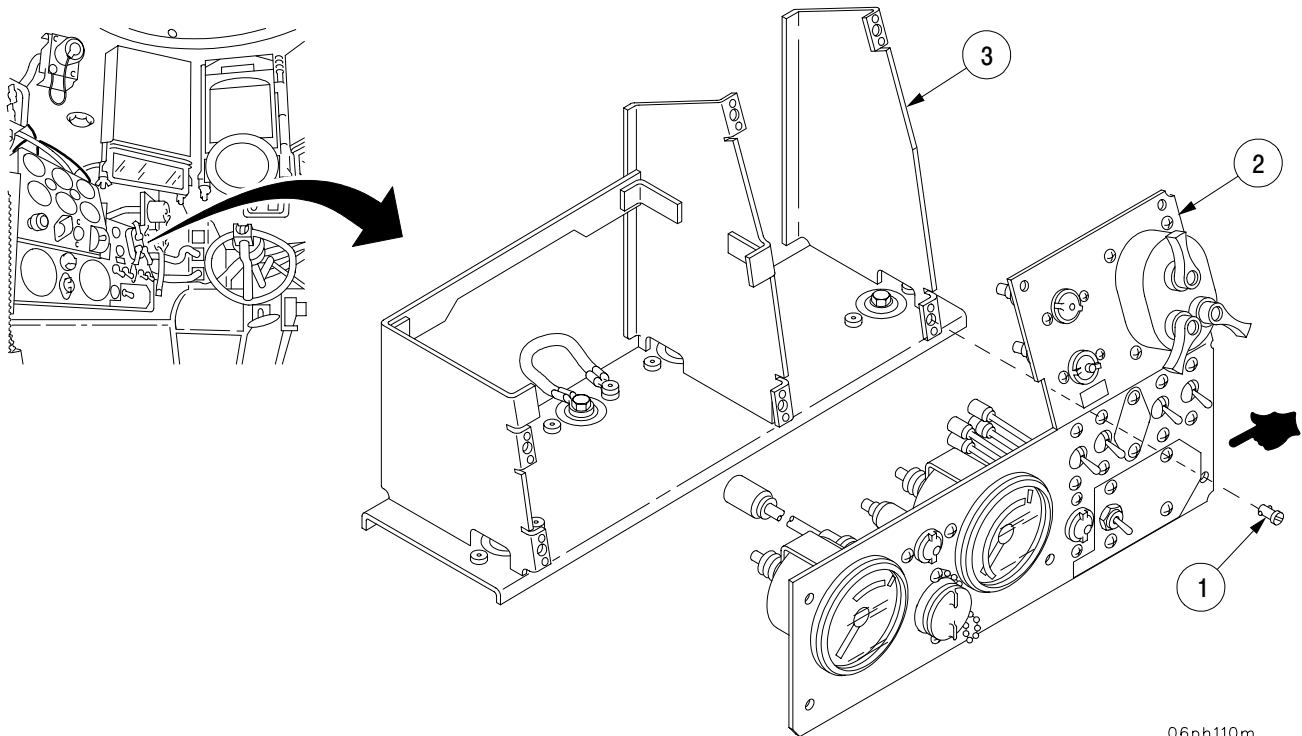
- Vehicle MASTER switch OFF  
(TM 9-2350-314-10)
- Battery ground leads disconnected  
(para 8-33)
- Portable instrument panel removed  
(TM 9-2350-314-10)
- Speedometer cable disconnected  
(para 20-1)
- Tachometer cable disconnected  
(para 20-2)

References

TM 9-2350-314-10

**a. Removal.**

- 1 Disconnect six stud fasteners (1) securing instrument panel (2) to mounting support (3).



06ph110m



---

**Section IV. INSTRUMENT OR ENGINE CONTROL PANELS – CONTINUED**

---

**8-12 DRIVER'S INSTRUMENT PANEL – CONTINUED**

---

**a. Removal – Continued**

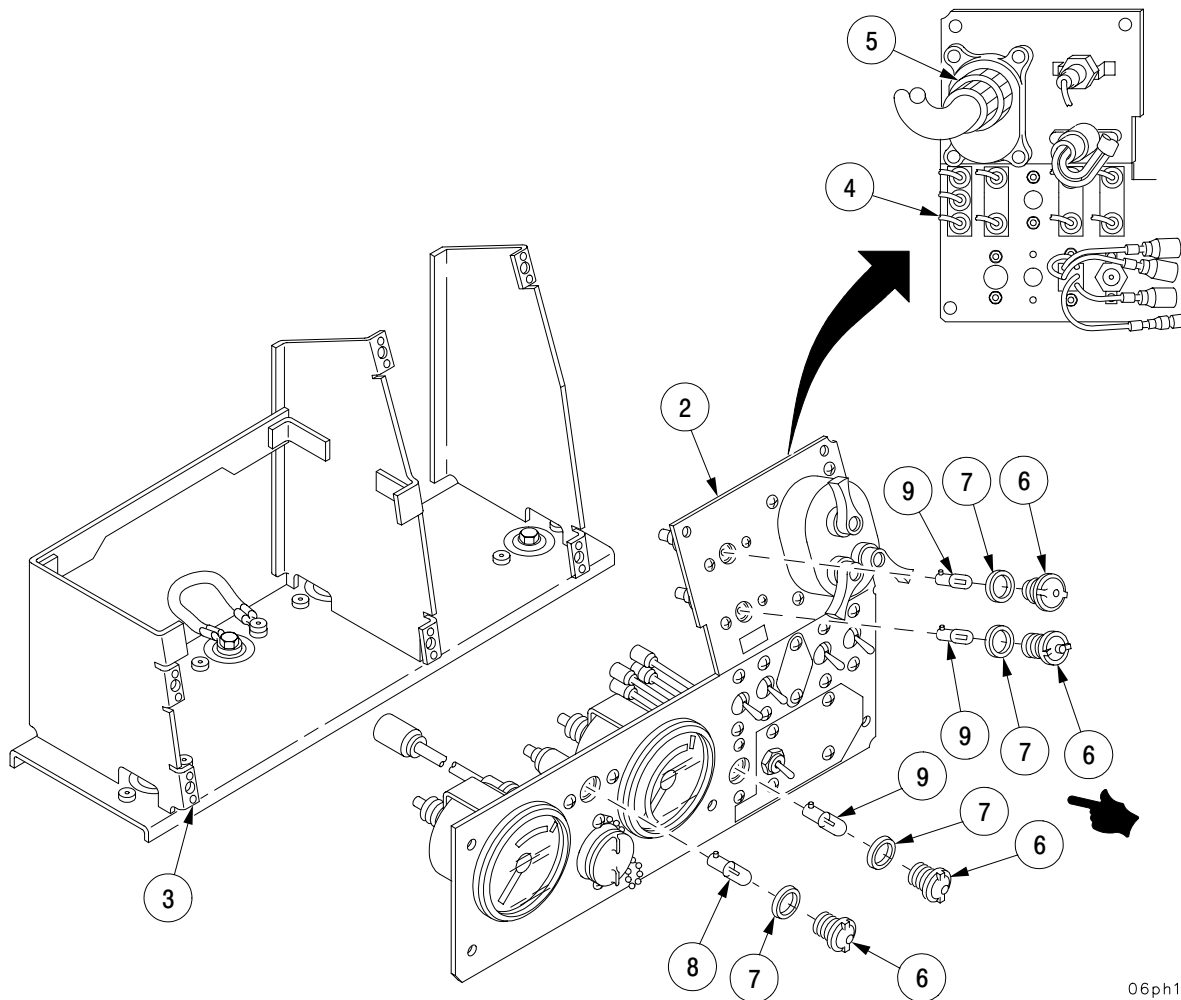
**NOTE**

Tag all electrical connections and electrical leads prior to removal to aid in installation.

- 2 Disconnect 21 instrument panel connectors (4) and light switch cannon plug (5) from back of instrument panel (2).
- 3 Remove instrument panel (2) from mounting support (3).

**b. Disassembly.**

- 1 Remove four lenses (6) with gasket (7), one lamp (8) and three LEDs (9) from instrument panel (2).
- 2 Remove gasket (7) from each of four lenses (6).



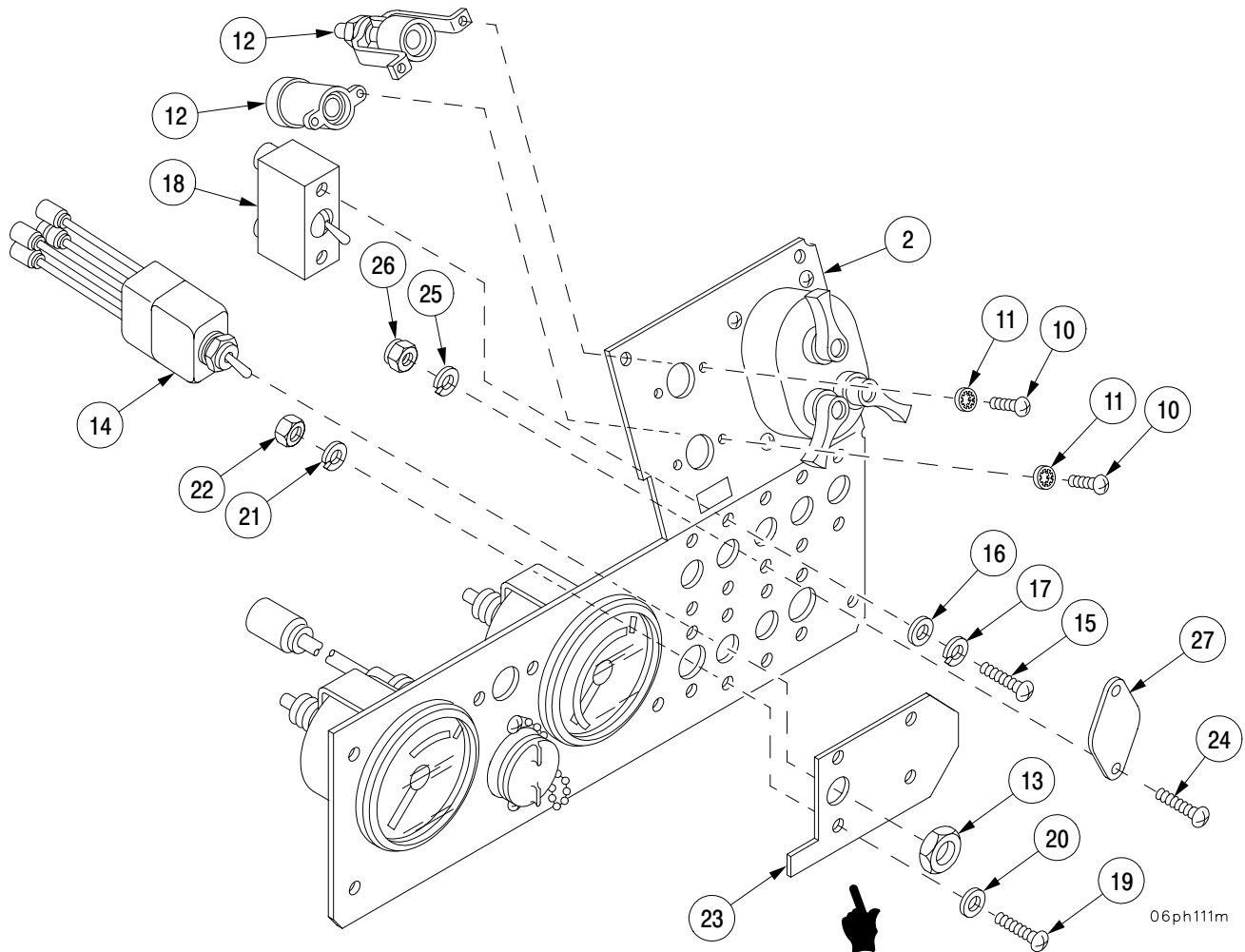
06ph112ma

**Section IV. INSTRUMENT OR ENGINE CONTROL PANELS – CONTINUED**

**8-12 DRIVER'S INSTRUMENT PANEL – CONTINUED**

**b. Disassembly – Continued**

- 3 Remove eight screws (10), eight lockwashers (11), and four light brackets (12) from instrument panel (2). Discard lockwashers.
- 4 Remove nut (13) and switch (14) from instrument panel (2).
- 5 Remove eight screws (15), eight flat washers (16), eight lockwashers (17), and four switches (18) from instrument panel (2). Discard lockwashers.
- 6 Remove four screws (19), four flat washers (20), four lockwashers (21), four nuts (22), and plate (23) from instrument panel (2). Discard lockwashers.
- 7 Remove two screws (24), two lockwashers (25), two self-locking nuts (26), and plate (27) from instrument panel (2). Discard lockwashers and self-locking nuts.

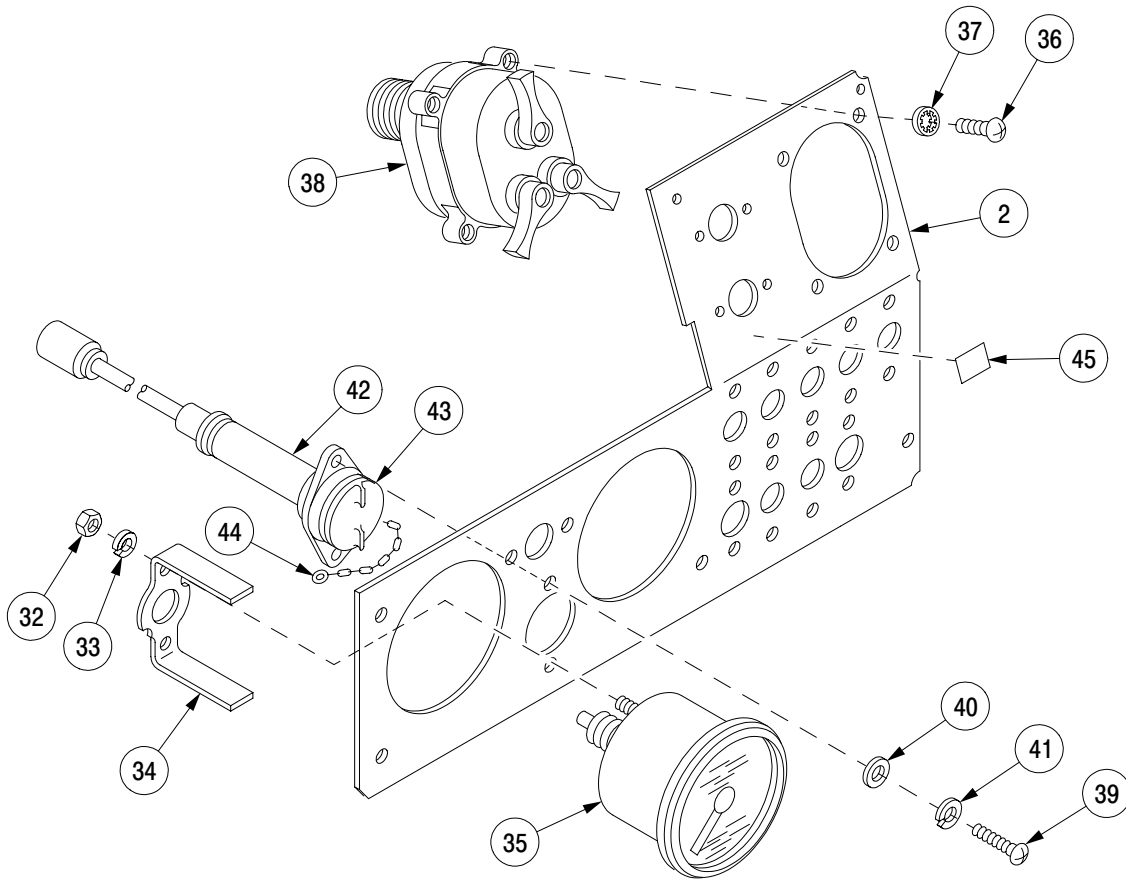


**Section IV. INSTRUMENT OR ENGINE CONTROL PANELS – CONTINUED**

**8-12 DRIVER'S INSTRUMENT PANEL – CONTINUED**

**b. Disassembly – Continued**

- 8 Step deleted.
- 9 Remove four nuts (32), four lockwashers (33), two mounting clamps (34), and two indicators (35) from instrument panel (2).
- 10 Remove four screws (36), four lockwashers (37), and light switch (38) from instrument panel (2). Discard lockwashers.
- 11 Remove two screws (39), two flat washers (40), two lockwashers (41), and auxiliary outlet (42) with cover (43) and chain (44) from instrument panel (2). Discard lockwashers.
- 12 Remove decal (45) from instrument panel (2) if illegible.



06ph111ma

---

**Section IV. INSTRUMENT OR ENGINE CONTROL PANELS – CONTINUED**

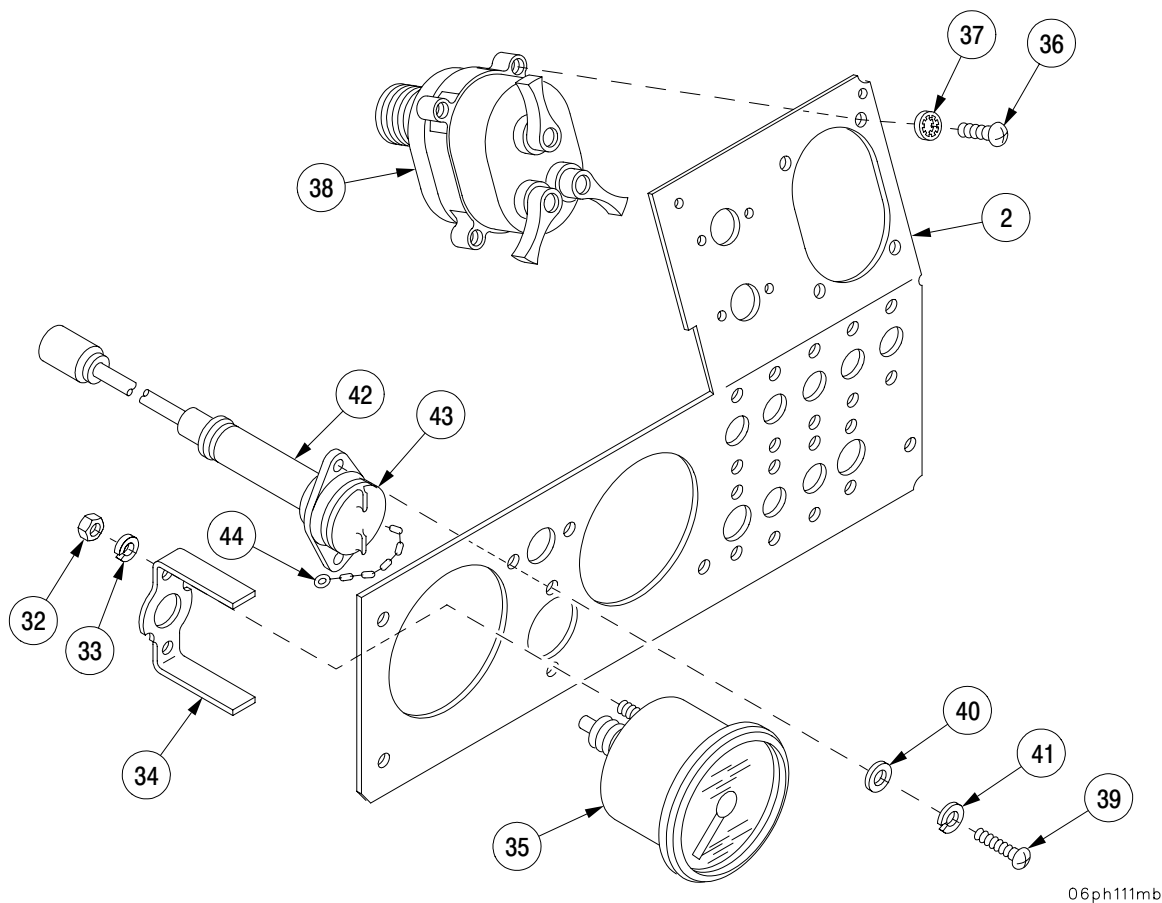

---

**8-12 DRIVER'S INSTRUMENT PANEL – CONTINUED**


---

**c. Assembly.**

- 1 Install auxiliary outlet (42), cover (43), and chain (44) in instrument panel (2) with two screws (39), two new lockwashers (41), and two flat washers (40).
- 2 Install light switch (38) in instrument panel (2) with four screws (36) and four new lockwashers (37).
- 3 Install two indicators (35) in instrument panel (2) with two mounting clamps (34), four nuts (32), and four new lockwashers (33).
- 4 Step deleted. ■

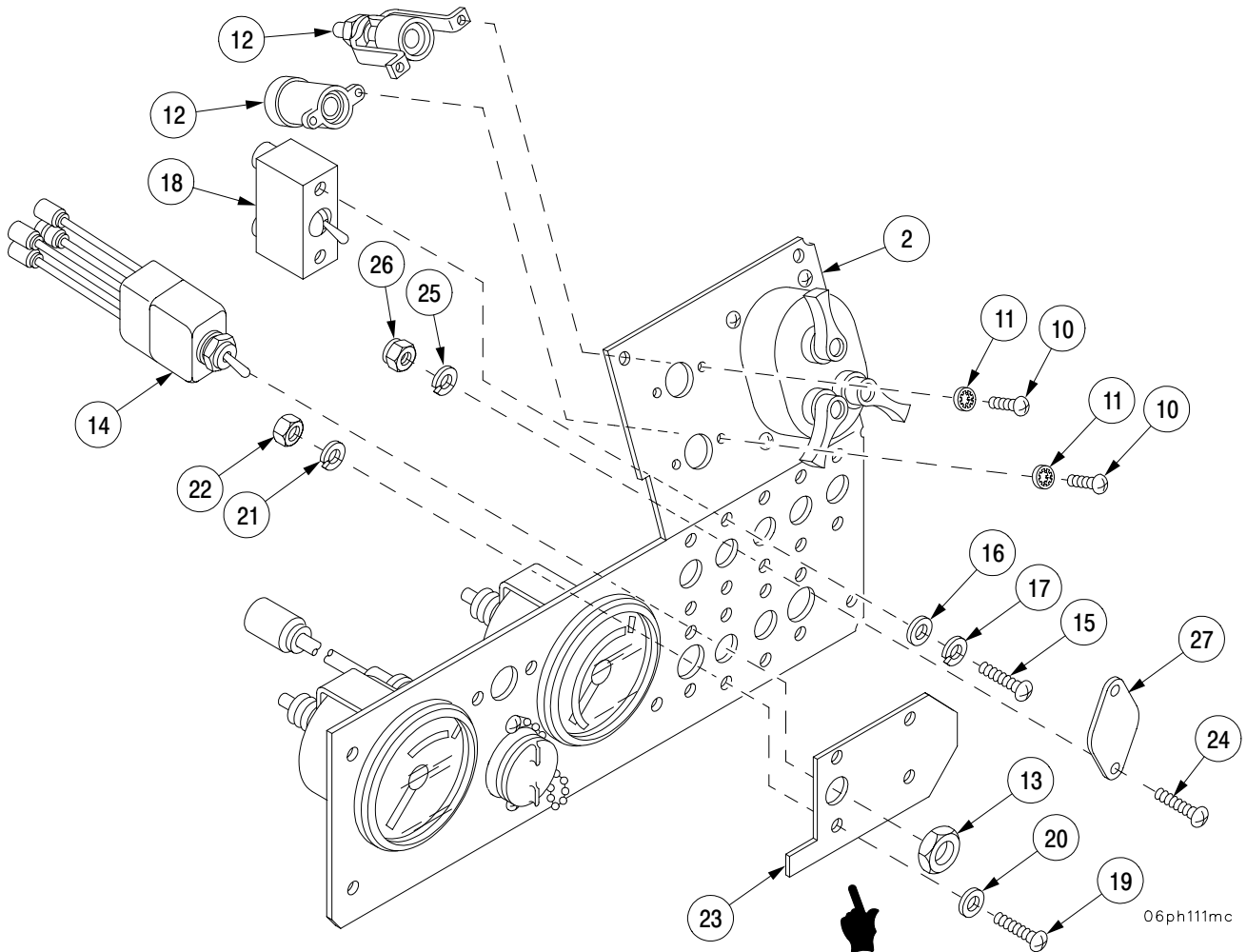


**Section IV. INSTRUMENT OR ENGINE CONTROL PANELS – CONTINUED**

**8-12 DRIVER'S INSTRUMENT PANEL – CONTINUED**

**c. Assembly – Continued**

- 5 Install plate (27) on instrument panel (2) with two screws (24), two new lockwashers (25) and two new self-locking nuts (26).
- 6 Install plate (23), four nuts (22), four new lockwashers (21), four flat washers (20), and four screws (19).
- 7 Install four switches (18) in instrument panel (2) with eight screws (15), eight new lockwashers (17), and eight flat washers (16).
- 8 Install switch (14) in instrument panel (2) with nut (13).
- 9 Install four light brackets (12) on instrument panel (2) with eight screws (10) and eight new lockwashers (11).



06ph111mc

**Section IV. INSTRUMENT OR ENGINE CONTROL PANELS – CONTINUED**

**8-12 DRIVER'S INSTRUMENT PANEL – CONTINUED**

**c. Assembly – Continued**

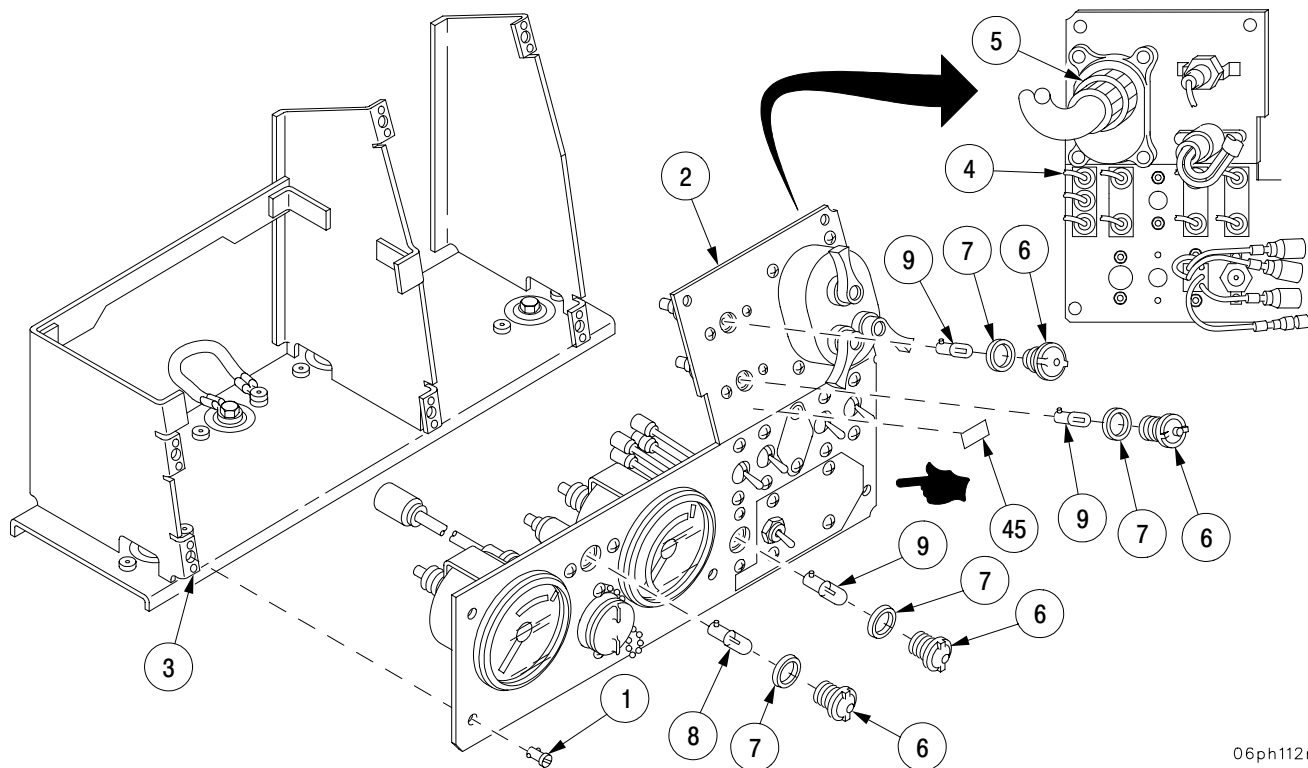
**NOTE**

Apply a light coat of anti-corrosion silicone compound to socket before installing new lamp.

- 10 Install one lamp (8) and three LEDs (9) in instrument panel (2).
- 11 Install gasket (7) on each of four lenses (6).
- 12 Install four lenses (6) with gasket (7) in instrument panel (2).
- 13 Install decal (45) on instrument panel (2), if removed.

**d. Installation.**

- 1 Connect 21 connectors (4) and light switch cannon plug (5) to instrument panel (2).
- 2 Secure instrument panel (2) to mounting support (3) with six stud fasteners (1).



06ph112m

**NOTE**

**FOLLOW-ON MAINTENANCE:**  
 Connect tachometer cable (para 20-2)  
 Connect speedometer cable (para 20-1)  
 Install portable instrument panel  
 (TM 9-2350-314-10)  
 Connect battery ground cables (para 8-33)

**Section IV. INSTRUMENT OR ENGINE CONTROL PANELS – CONTINUED**

---

**8-13 DRIVER'S INSTRUMENT PANEL SUPPORT ASSEMBLY.**

---

This task covers    a. Removal                      b. Disassembly                      c. Assembly                      b. Installation

---

**INITIAL SETUP**

Tools

General mechanic's tool kit  
(SC 5180-90-N26)  
Hand riveter (item 55, Appx F)  
Wire brush (item 7, Appx F)

Materials/Parts

Dry-cleaning solvent (item 59, Appx C)  
Adhesive (item 2, Appx C)  
Rivets (12) (item 61, Appx E)  
Rivets (8) (item 62, Appx E)  
Lockwashers (3) (item 3, Appx E)  
Lockwasher (item 44, Appx E)  
Cushions (4) (item 64, Appx F)  
Acid swabbing brush (item 13, Appx C)

Equipment Conditions

Vehicle MASTER switch OFF  
(TM 9-2350-314-10)  
Driver's instrument panel removed  
(para 8-12)

References

TM 9-2350-314-10

---

---

**Section IV. INSTRUMENT OR ENGINE CONTROL PANELS – CONTINUED**


---

**8-13 DRIVER'S INSTRUMENT PANEL SUPPORT ASSEMBLY – CONTINUED**

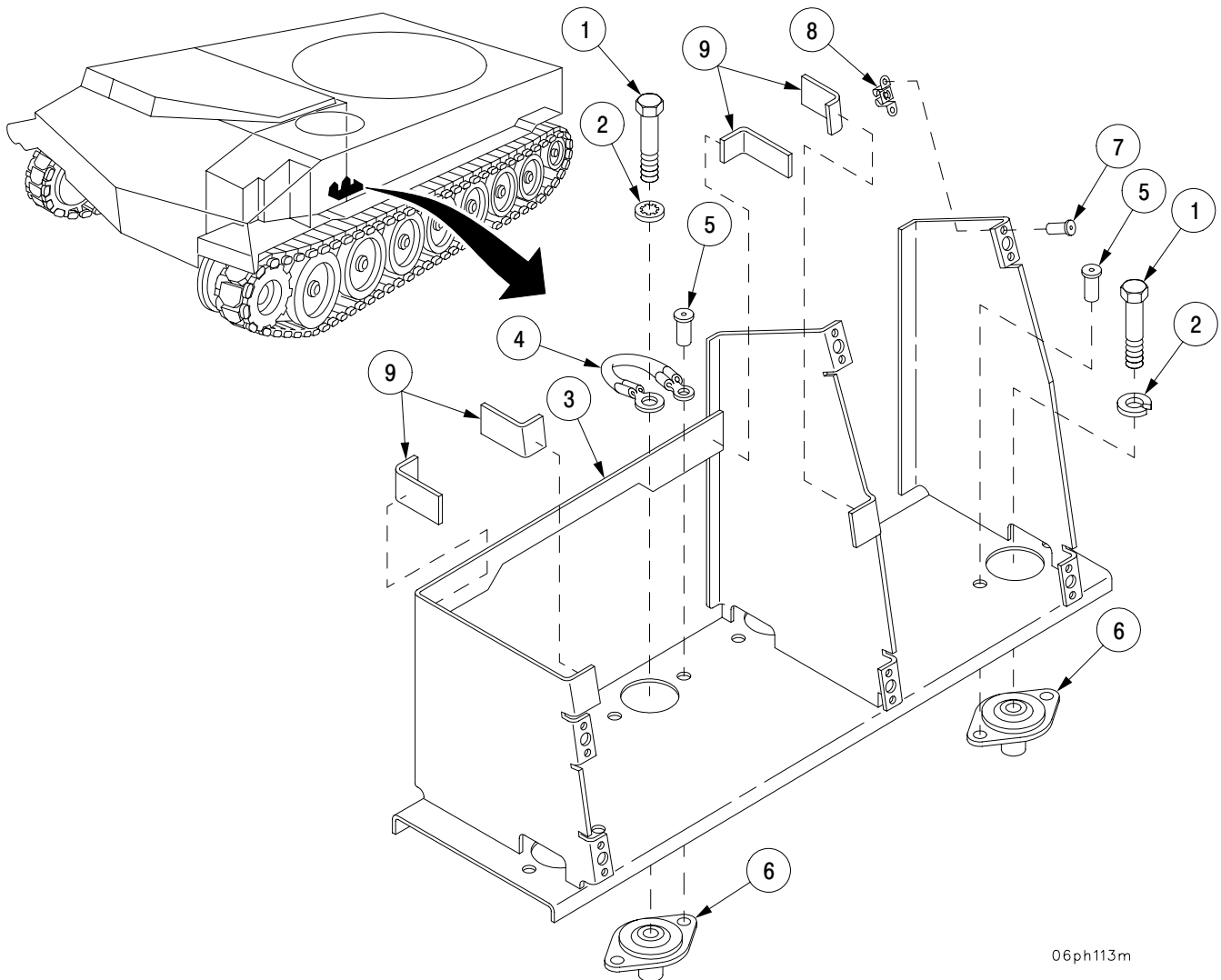

---

**a. Removal.**

Remove four screws (1), four lockwashers (2), and support (3) with ground lead (4). Discard lockwashers.

**b. Disassembly.**

- 1 Remove eight rivets (5), four cushions (6), and ground lead (4) from support (3). Discard rivets.
- 2 Remove 12 rivets (7) and six receptacles (8) from support (3). Discard rivets.
- 3 Remove four cushions (9) from support (3). Discard cushions.



06ph113m



**Section IV. INSTRUMENT OR ENGINE CONTROL PANELS – CONTINUED**

---

**8-13 DRIVER'S INSTRUMENT PANEL SUPPORT ASSEMBLY – CONTINUED**

---

c. Assembly.

**WARNING**

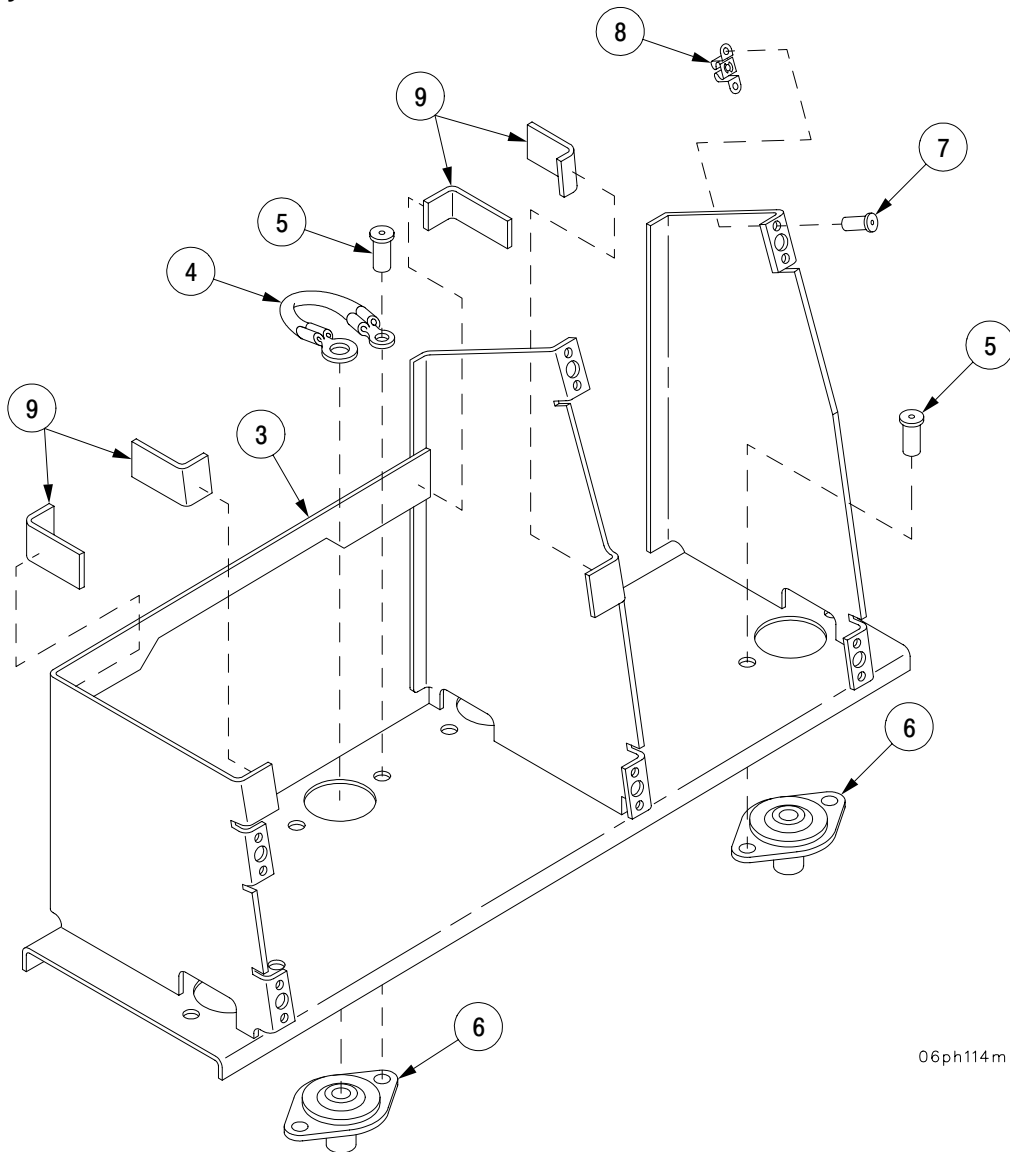
Dry-cleaning solvent (P-D-680) is toxic and flammable. To avoid injury, wear protective goggles and gloves and use only in a well-ventilated area. Avoid contact with skin, eyes, and clothes. Do not breathe vapors. Do not use near open flame or excessive heat. Do not smoke when using solvent. Failure to do so could cause **SERIOUS INJURY**. If you become dizzy while using dry-cleaning solvent, get fresh air immediately, and if necessary, get medical attention. If contact with skin or clothes is made, flush thoroughly with water. If the solvent contacts your eyes, wash them with water immediately and obtain medical aid (FM 21-11).

- 1 Remove adhesive from corners of support (7) using dry-cleaning solvent and wire brush.
- 2 Apply adhesive to four new cushions (10) using acid brush.
- 3 Install four new cushions (10) on support (7).
- 4 Install six receptacles (9) on support (7) with 12 new rivets (8) using hand riveter.
- 5 Install four cushions (6) and ground lead (4) on support (7) with eight new rivets (5) using hand riveter.

Section IV. INSTRUMENT OR ENGINE CONTROL PANELS – CONTINUED

8-13 DRIVER'S INSTRUMENT PANEL SUPPORT ASSEMBLY – CONTINUED

c. Assembly – Continued



06ph114m

---

**Section IV. INSTRUMENT OR ENGINE CONTROL PANELS – CONTINUED**

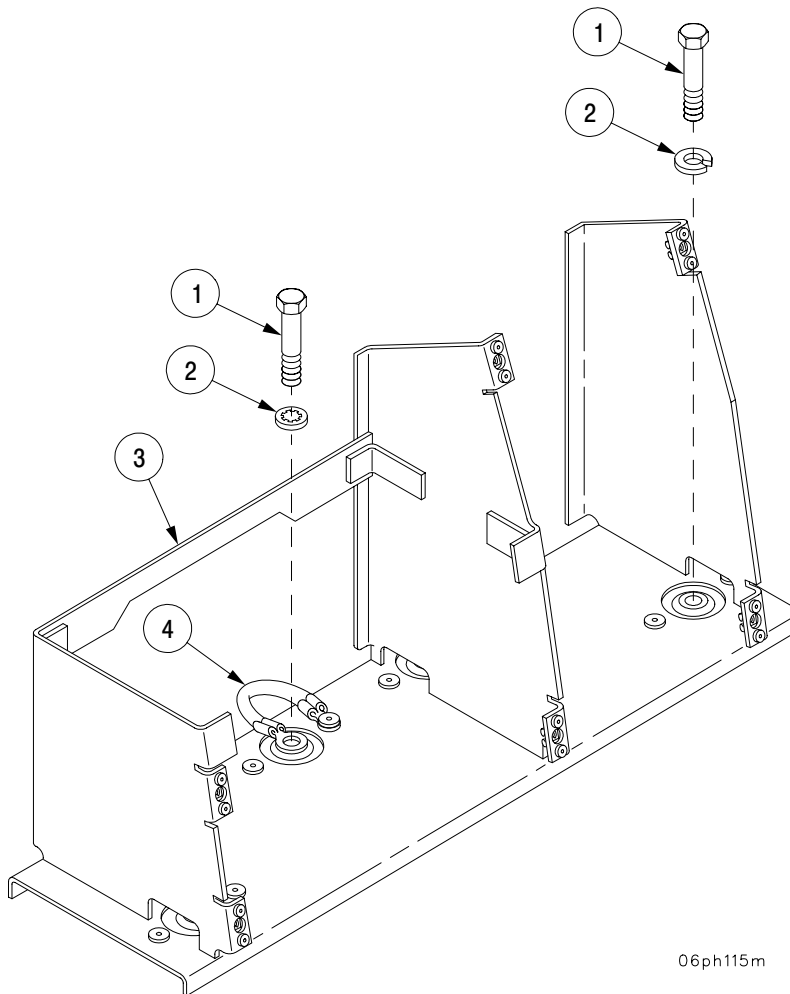
---

**8-13 DRIVER'S INSTRUMENT PANEL SUPPORT ASSEMBLY – CONTINUED**

---

**d. Installation.**

Install support assembly (3) and ground lead (4) in vehicle with four screws (1) and four new lockwashers (2).



**NOTE**

**FOLLOW-ON MAINTENANCE:**

Install driver's instrument panel (para 8-12)

**Section IV. INSTRUMENT OR ENGINE CONTROL PANELS – CONTINUED**

**8-14 DRIVER'S PORTABLE INSTRUMENT PANEL.**

This task covers      a. Removal      b. Disassembly      c. Assembly      d. Installation

**INITIAL SETUP**

Tools

General mechanic's tool kit  
(SC 5180-90-N26)

Materials/Parts

Lockwashers (9) (item 38, Appx E)  
Lockwashers (2) (item 39, Appx E)  
Silicone compound (item 58, Appx C)

Equipment Conditions

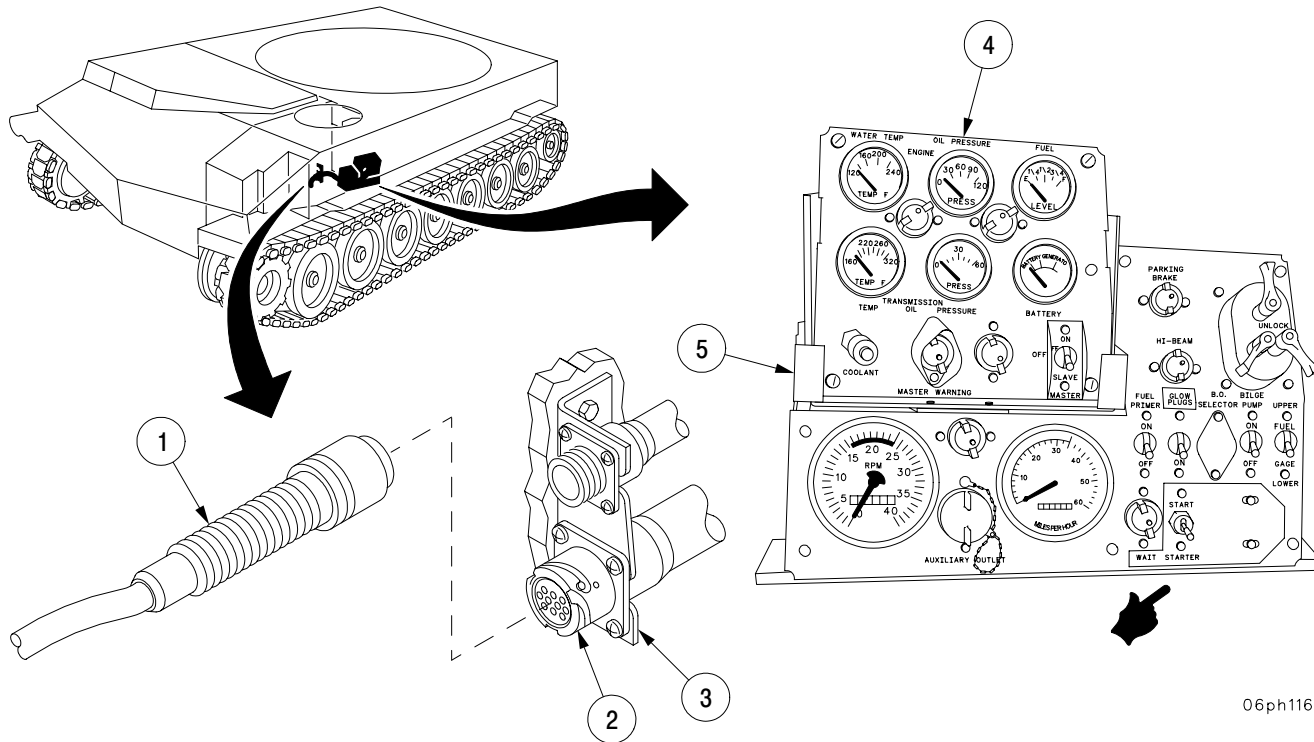
Vehicle MASTER switch OFF  
(TM 9-2350-314-10)  
Battery ground leads disconnected  
(para 8-33)

References

TM 9-2350-314-10

**a. Removal.**

- 1 Disconnect wiring harness W112 connector P1 (1) from wiring harness W114 connector P2 (2) at driver's intercom bracket (3).
- 2 Lift off portable instrument panel (4) from driver's instrument panel bracket (5).



06ph116m

## Section IV. INSTRUMENT OR ENGINE CONTROL PANELS – CONTINUED

---

### 8-14 DRIVER'S PORTABLE INSTRUMENT PANEL – CONTINUED

---

#### b. Disassembly.

- 1 Remove four screws (6) securing panel cover (7) to bracket assembly (8).
- 2 Disconnect the four stud fasteners (9) securing indicator panel (10) to panel cover (7).
- 3 Slide grommet (11) back on wiring harness W112 (12) to allow for slack to disassemble indicator panel (10). Remove grommet (11).

#### NOTE

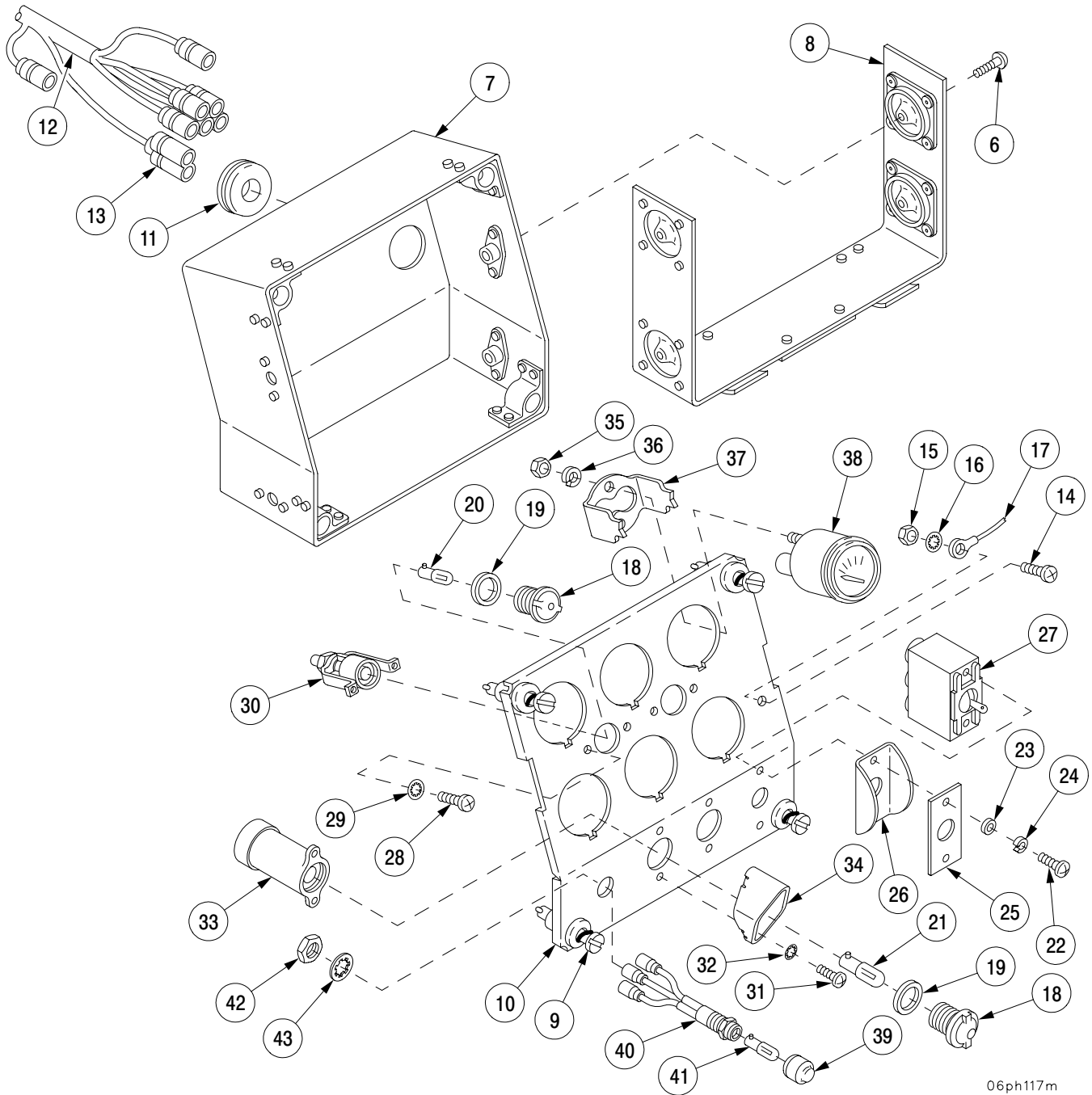
Tag all electrical connections and electrical leads prior to removal to aid in installation.

- 4 Disconnect all electrical connectors (13) from the back of indicator panel (10).
- 5 Remove screw (14), nut (15), lockwasher (16), and wiring harness W112 ground lead (17) from indicator panel (10). Discard lockwasher.
- 6 Remove wiring harness W112 (12) from panel cover (7).
- 7 Remove four lenses (18) with gasket (19), two lamps (20), and two LEDs (21) from indicator panel (10).
- 8 Remove gasket (19) from each of four lenses (18).
- 9 Remove two screws (22), two flat washers (23), two lockwashers (24), plate (25), guard (26) and MASTER switch (27) from indicator panel (10). Discard lockwashers.
- 10 Remove six screws (28), six lockwashers (29), and three light brackets (30) from indicator panel (10). Discard lockwashers.
- 11 Remove two screws (31), two lockwashers (32), light bracket (33), and shield light assembly (34) from indicator panel (10). Discard lockwashers.
- 12 Remove 12 nuts (35), 12 lockwashers (36), six mounting clamps (37), and six indicators (38) from indicator panel (10).
- 13 Remove lens (39) from low coolant indicator light socket (40).
- 14 Remove LED (41) from lens (39) or low coolant indicator light socket (40).
- 15 Remove nut (42), lockwasher (43), and low coolant indicator light socket (40) from indicator panel (10).

Section IV. INSTRUMENT OR ENGINE CONTROL PANELS – CONTINUED

8-14 DRIVER'S PORTABLE INSTRUMENT PANEL – CONTINUED

b. Disassembly – Continued



06ph117m

## Section IV. INSTRUMENT OR ENGINE CONTROL PANELS – CONTINUED

---

### 8-14 DRIVER'S PORTABLE INSTRUMENT PANEL – CONTINUED

---

#### c. Assembly.

#### NOTE

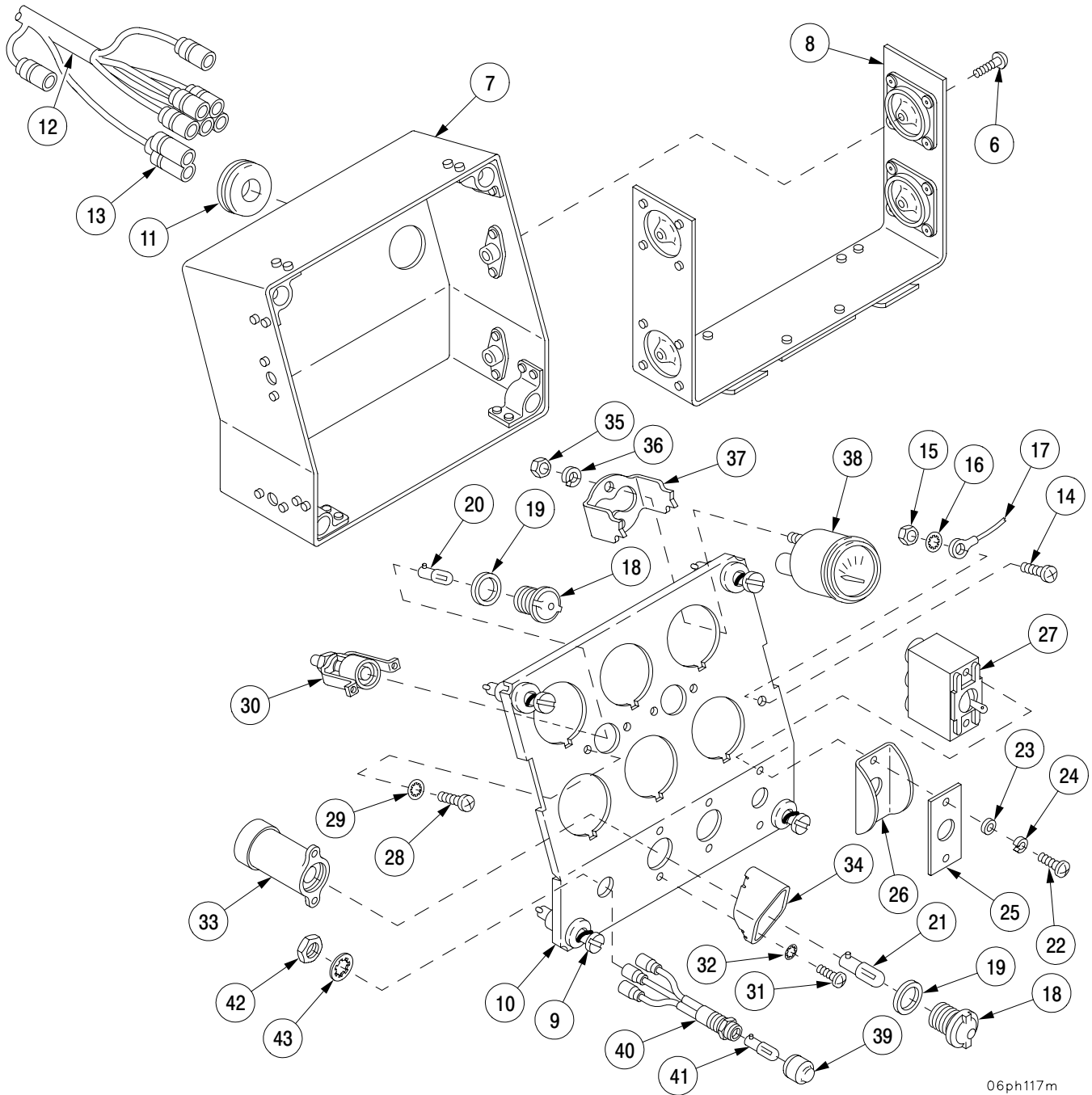
Apply a light coat of anti-corrosion silicone compound to socket before installing new lamp.

- 1 Install low coolant indicator light socket (40) with nut (42) and lockwasher (43) in indicator panel (10).
- 2 Install LED (41) in coolant indicator light socket (40).
- 3 Install lens (39) on coolant indicator light socket (40).
- 4 Install six indicators (38) and six mounting clamps (37) with 12 lockwashers (36) and 12 nuts (35) in indicator panel (10).
- 5 Install shield light assembly (34) and light bracket (33) with two screws (31) and two new lockwashers (32) in indicator panel (10).
- 6 Install three light brackets (30) with six screws (28) and six new lockwashers (29) in indicator panel (10).
- 7 Install plate (25), guard (26) and master switch (27) with two screws (22), two new lockwashers (24), and two flat washers (23) in indicator panel (10).
- 8 Install two lamps (20) and two LEDs (21) in indicator panel (10).
- 9 Install gasket (19) on each of four lenses (18).
- 10 Install four lenses (18) in indicator panel (10).
- 11 Install grommet (11) over wiring harness W112 (12).
- 12 Install wiring harness W112 (12) in panel cover (7).
- 13 Connect wiring harness W112 ground lead (17) to indicator panel (10) with screw (14), new lockwasher (16), and nut (15).
- 14 Connect all electrical connectors (13) to the back of indicator panel (10).
- 15 Install grommet (11) in panel cover (7) and remove slack from wiring harness W112 (12).
- 16 Position indicator panel (10) to panel cover (7) and secure with four stud fasteners (9).
- 17 Position portable instrument panel cover (7) inside bracket assembly (8) and secure with four screws (6).

Section IV. INSTRUMENT OR ENGINE CONTROL PANELS – CONTINUED

8-14 DRIVER'S PORTABLE INSTRUMENT PANEL – CONTINUED

c. Assembly – Continued



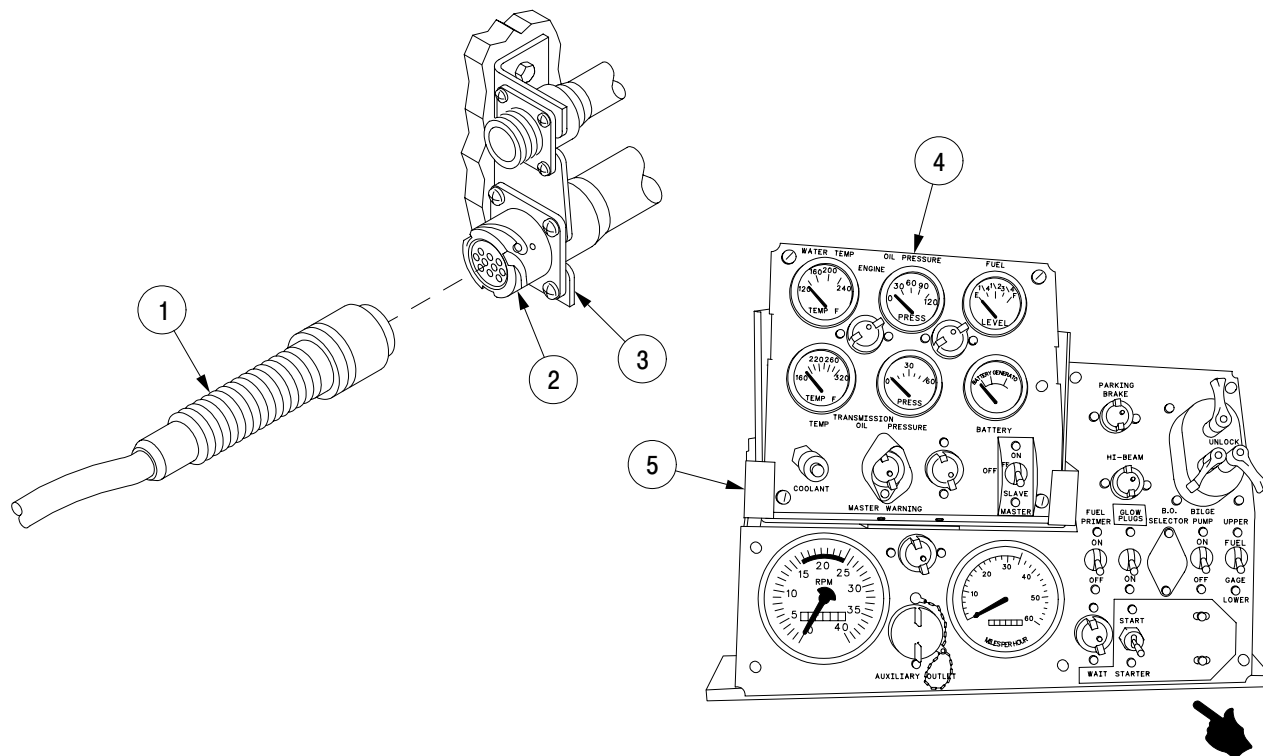


**Section IV. INSTRUMENT OR ENGINE CONTROL PANELS – CONTINUED**

**8-14 DRIVER'S PORTABLE INSTRUMENT PANEL – CONTINUED**

**d. Installation.**

- 1 Position portable instrument panel (4) into driver's instrument panel bracket (5).
- 2 Connect wiring harness W112 connector P1 (1) to wiring harness W114 connector P2 (2) at driver's intercom bracket (3).



06ph118m

**NOTE**

**FOLLOW-ON MAINTENANCE:**  
Connect battery ground leads (para 8-33).

---

**Section IV. INSTRUMENT OR ENGINE CONTROL PANELS – CONTINUED**

---

**8-15 DRIVER'S PORTABLE INSTRUMENT PANEL BRACKET (OUTSIDE DRIVER'S HATCH AND CREW COMPARTMENT).**

---

This task covers:      a. Removal                                      b. Installation

---

**INITIAL SETUP**Tools

General mechanic's tool kit  
(SC 5180-90-N26)

Materials/Parts

Lockwashers (2) (item 9, Appx E)  
Lockwashers (2) (item 22, Appx E)

---

**NOTE**

- Perform Removal step 1 and Installation step 2 for replacement of bracket located outside driver's hatch.
- Perform Removal step 2 and Installation step 1 for replacement of bracket located in crew compartment.

---

**Section IV. INSTRUMENT OR ENGINE CONTROL PANELS – CONTINUED**

---

**8-15 DRIVER'S PORTABLE INSTRUMENT PANEL BRACKET (OUTSIDE DRIVER'S HATCH AND CREW COMPARTMENT) – CONTINUED**

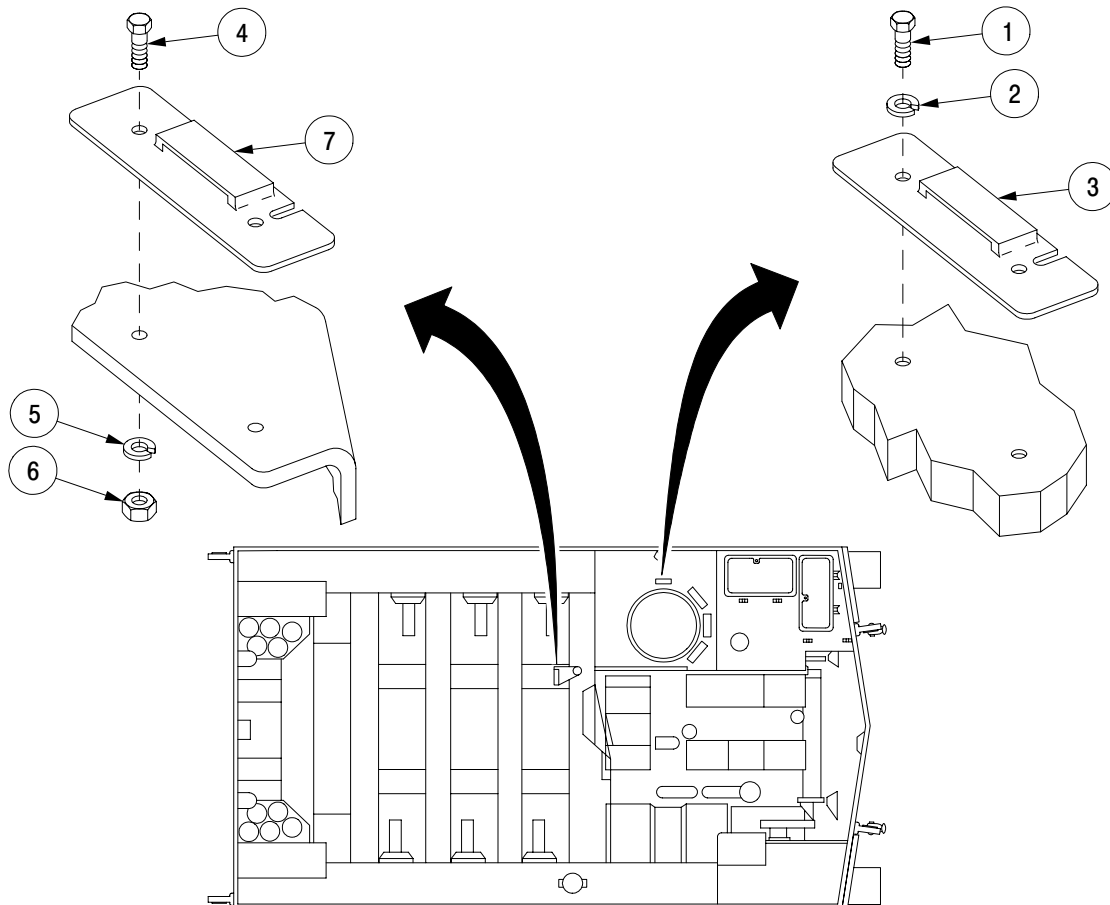
---

**a. Removal.**

- 1 Remove two screws (1), two lockwashers (2), and bracket (3) from outside of hull. Discard lockwashers.
- 2 Remove two screws (4), two lockwashers (5), two nuts (6), and bracket (7) in crew compartment. Discard lockwashers.

**b. Installation.**

- 1 Install bracket (7) in crew compartment with two screws (4), two new lockwashers (5), and two nuts (6).
- 2 Install bracket (3) on outside of hull with two screws (1) and two new lockwashers (2).



06ph130m

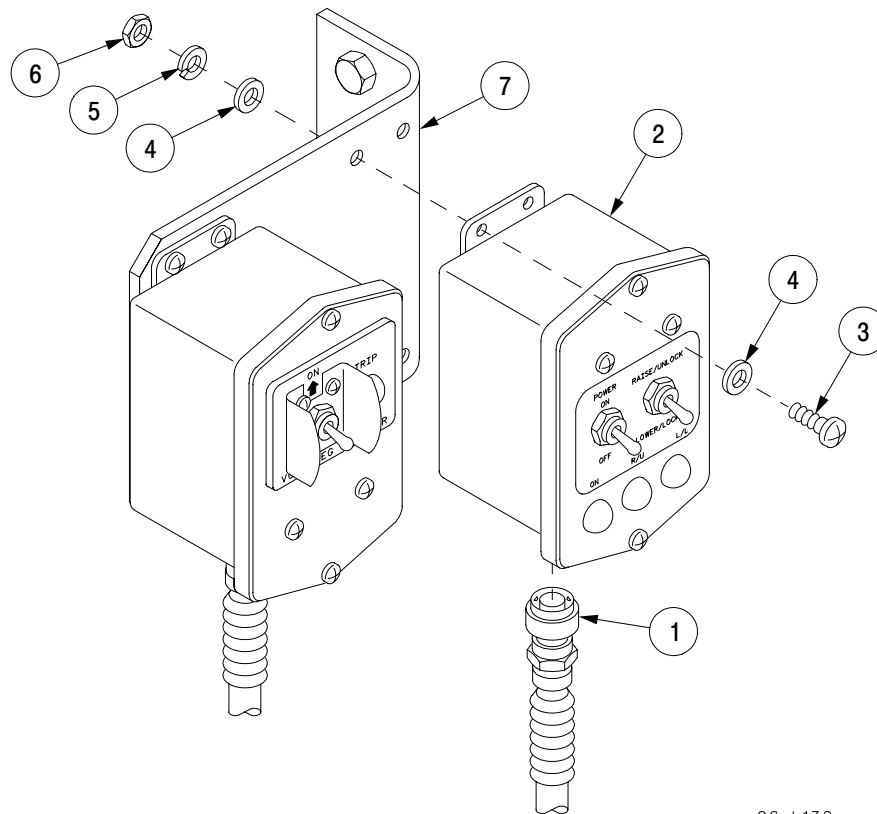


**Section IV. INSTRUMENT OR ENGINE CONTROL PANELS – CONTINUED**

**8-16 GUN TUBE TRAVEL LOCK CONTROL BOX ASSEMBLY – CONTINUED**

**b. Installation.**

- 1 Install travel lock control box assembly (2) on mounting bracket (7) with four screws (3), eight flat washers (4), four new lockwashers (5), and four nuts (6).
- 2 Connect wiring harness W115 connector P2 (1) to travel lock control box assembly (2).



06ph132m

**NOTE**

**FOLLOW-ON MAINTENANCE:**  
Connect battery ground leads (para 8-33)

**Section IV. INSTRUMENT OR ENGINE CONTROL PANELS – CONTINUED**

**8-17 VOLTAGE REGULATOR CONTROL BOX ASSEMBLY.**

This task covers:      a. Removal                                      b. Installation

**INITIAL SETUP**

Tools

General mechanic's tool kit  
(SC 5180-90-N26)

Materials/Parts

Lockwashers (4) (item 48, Appx E)

Equipment Conditions

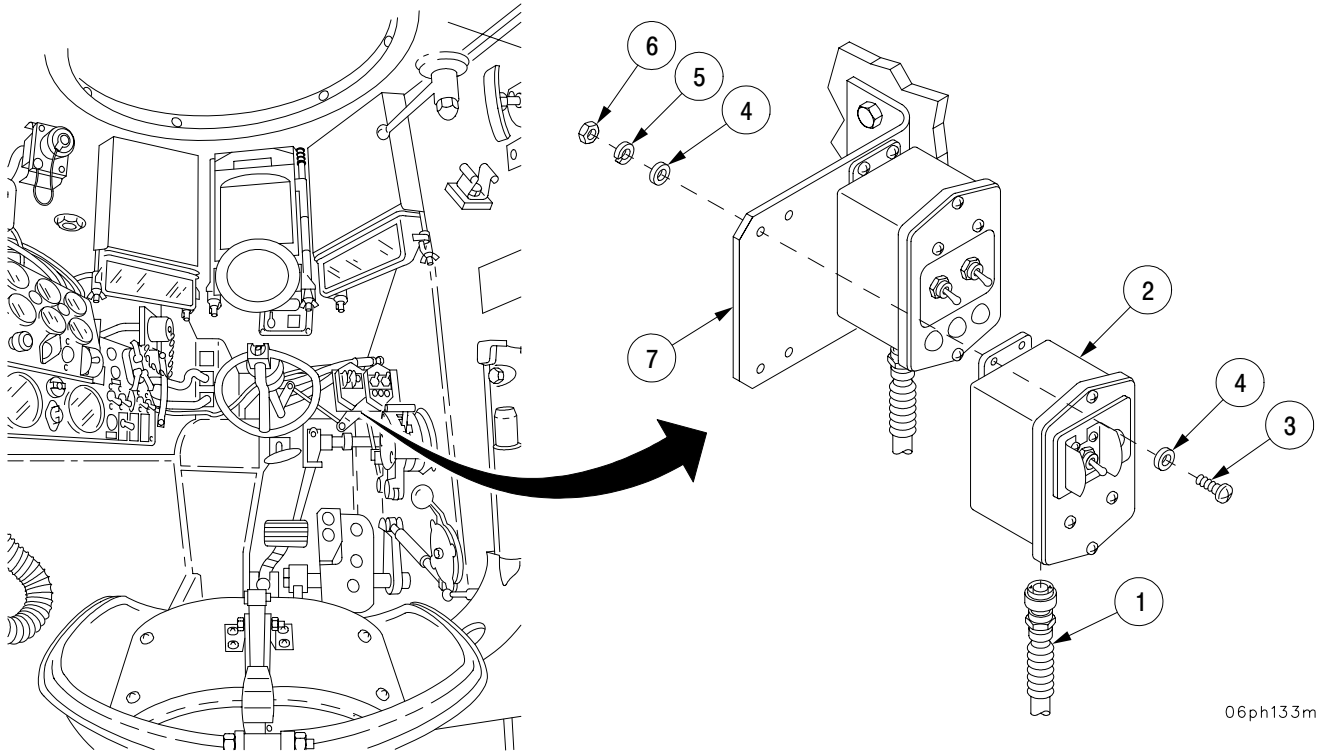
Vehicle MASTER switch OFF  
(TM 9-2350-314-10)  
Battery ground leads disconnected  
(para 8-33)

References

TM 9-2350-314-10

**a. Removal.**

- 1 Disconnect wiring harness W114 connector P3 (1) from voltage regulator control box assembly (2) in driver's compartment.
- 2 Remove four screws (3), eight flat washers (4), four lockwashers (5), four nuts (6), and voltage regulator control box assembly (2) from bracket (7). Discard lockwashers.



06ph133m

---

**Section IV. INSTRUMENT OR ENGINE CONTROL PANELS – CONTINUED**

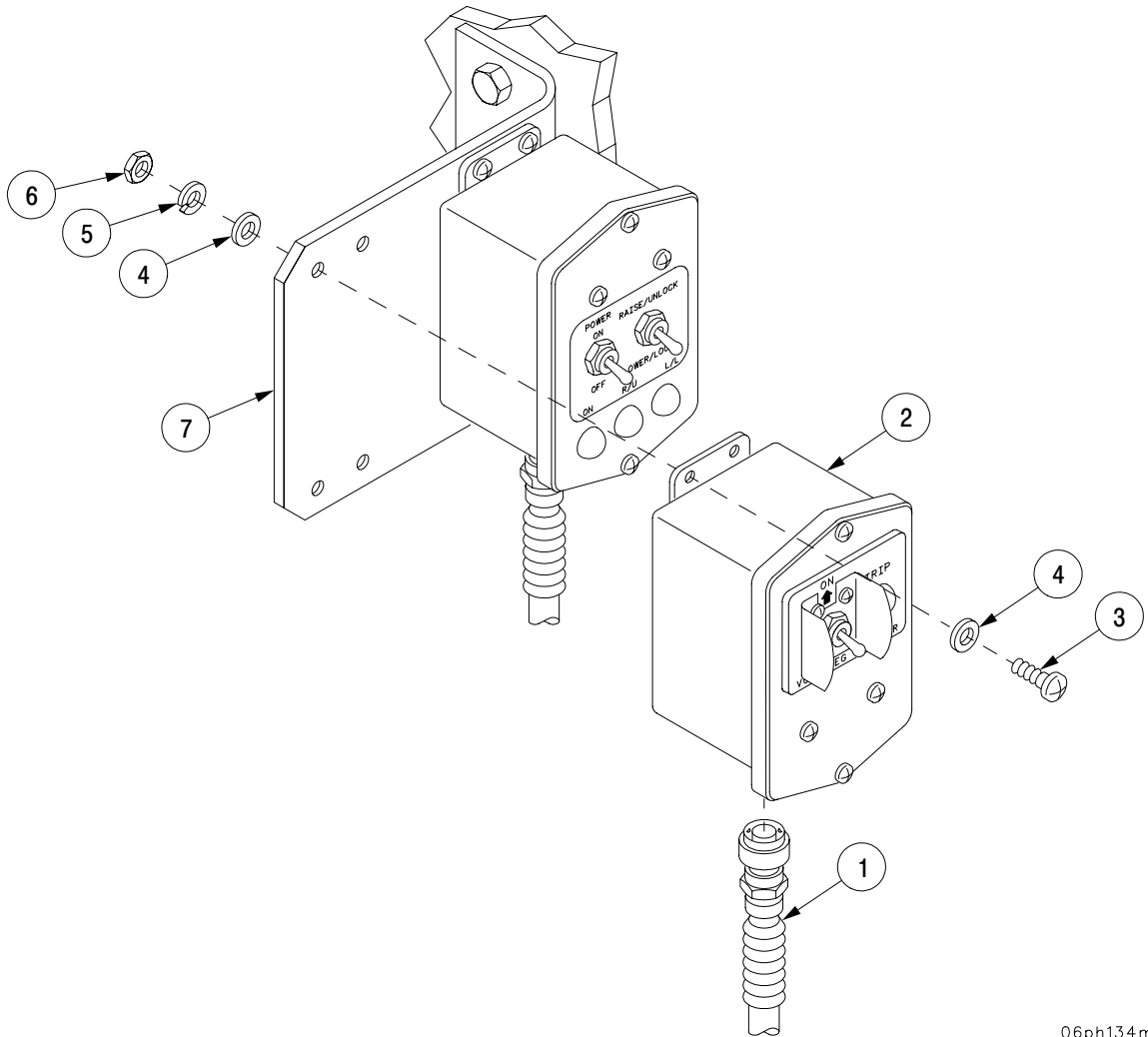
---

**8-17 VOLTAGE REGULATOR CONTROL BOX ASSEMBLY – CONTINUED**

---

**b. Installation.**

- 1 Install voltage regulator control box assembly (2) on mounting bracket (7) with four screws (3), eight flat washers (4), four new lockwashers (5), and four nuts (6).
- 2 Connect wiring harness W114 connector P3 (1) to voltage regulator control box assembly (2).



06ph134m

**NOTE**

**FOLLOW-ON MAINTENANCE:**  
Connect battery ground leads (para 8-33)

**Section IV. INSTRUMENT OR ENGINE CONTROL PANELS – CONTINUED**

**8-18 GUN TUBE TRAVEL LOCK CONTROL BOX AND VOLTAGE REGULATOR CONTROL BOX BRACKET.**

This task covers:                      a. Removal                                      b. Installation

**INITIAL SETUP**

Tools

General mechanic's tool kit  
(SC 5180-90-N26)

Materials/Parts

Lockwashers (2) (item 5, Appx E)

Equipment Conditions

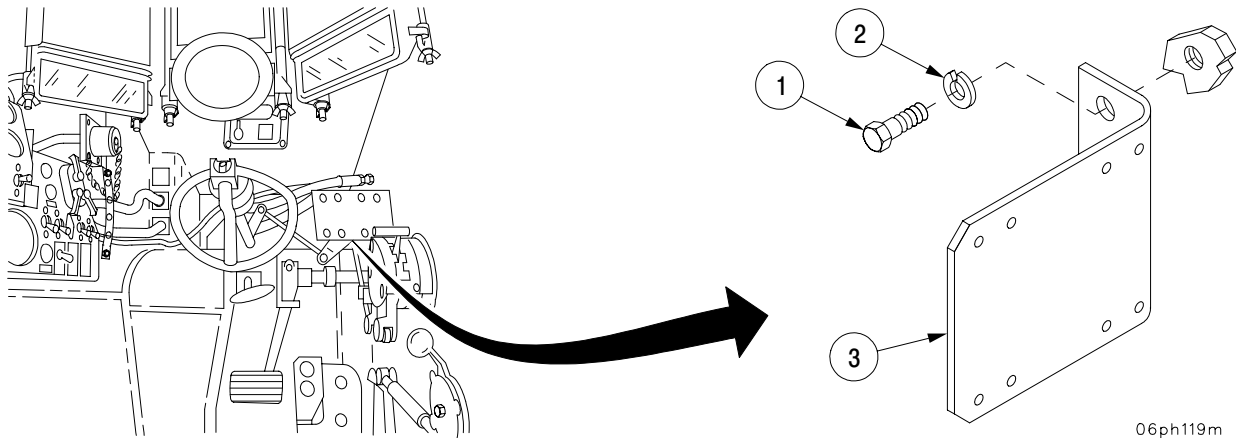
Gun tube travel lock control box assembly removed (para 8-16)  
Voltage regulator control box assembly removed (para 8-17)

**a. Removal.**

Remove two screws (1), two lockwashers (2), and mounting bracket (3) from engine compartment bulkhead. Discard lockwashers.

**b. Installation.**

Install mounting bracket (3) on engine compartment bulkhead with two new lockwashers (2) and two screws (1).



**NOTE**

**FOLLOW-ON MAINTENANCE:**

- Install voltage regulator control box assembly (para 8-17)
- Install gun tube travel lock control box assembly (para 8-16)

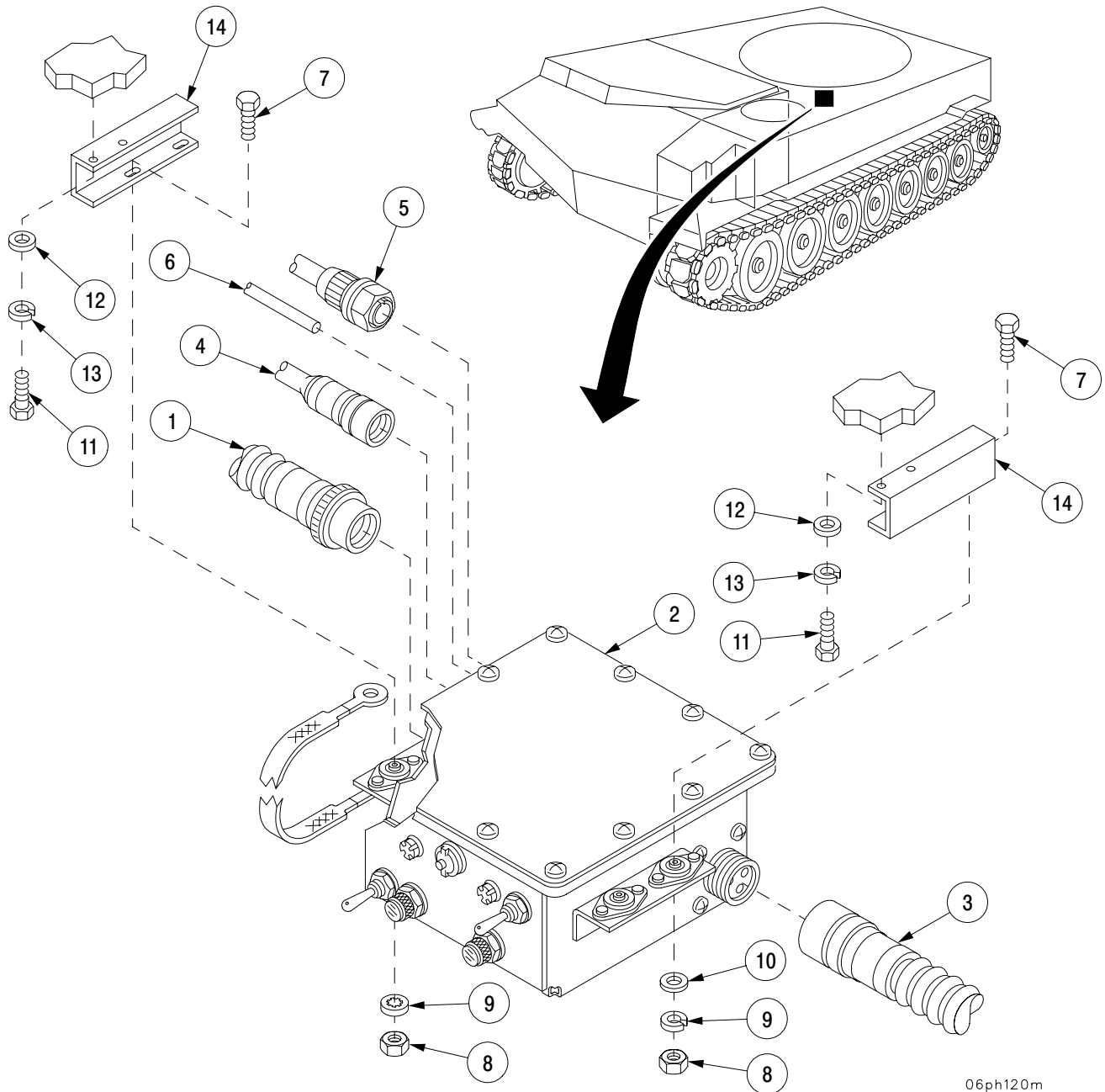




Section IV. INSTRUMENT OR ENGINE CONTROL PANELS – CONTINUED

8-19 ACCESSORY CONTROL BOX AND BRACKETS – CONTINUED

a. Removal – Continued



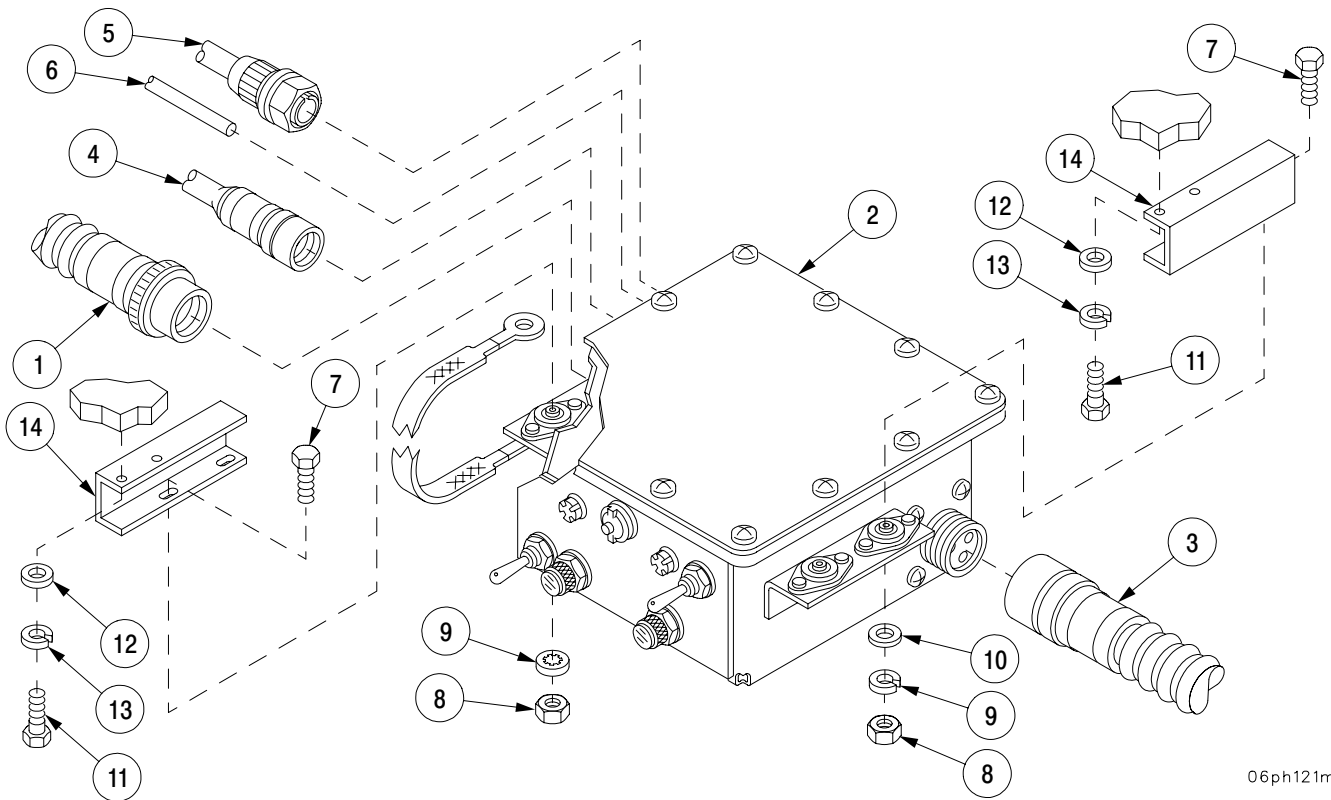
06ph120m

**Section IV. INSTRUMENT OR ENGINE CONTROL PANELS – CONTINUED**

**8-19 ACCESSORY CONTROL BOX AND BRACKET – CONTINUED**

**b. Installation.**

- 1 Install two mounting brackets (14) in hull with four screws (11), four new lockwashers (13), and four flat washers (12).
- 2 Install accessory control box assembly (2) with ground lead on two mounting brackets (14) with four screws (7), three flat washers (10), four new lockwashers (9), and four nuts (8).
- 3 Connect vent tube (6) to accessory control box assembly (2).
- 4 Connect lead 657 electrical connector (5) to accessory control box assembly (2).
- 5 Connect W125 electrical connector P1 (4) to accessory control box assembly (2).
- 6 Connect W119 electrical connector P2 (3) to accessory control box assembly (2).
- 7 Connect W119 electrical connector P1 (1) to accessory control box assembly (2).



06ph121m

**NOTE**

**FOLLOW-ON MAINTENANCE:**  
Connect battery ground leads (para 8-33)



**Section IV. INSTRUMENT OR ENGINE CONTROL PANELS – CONTINUED**

---

**8-20 CIRCUIT BREAKERS AND CIRCUIT BREAKER PANELS – CONTINUED**

---

**a. Removal.**

**NOTE**

Tag all electrical connections and electrical leads prior to removal to aid in installation.

- 1 Disconnect electrical leads (1) from circuit breaker (2).
- 2 Remove two screws (3), two flat washers (4), two lockwashers (5), and CB panel (6). Discard lockwashers.
- 3 Remove two screws (7), two nuts (8), two lockwashers (9), two flat washers (10), and circuit breaker (2) from CB panel (6). Discard lockwashers.

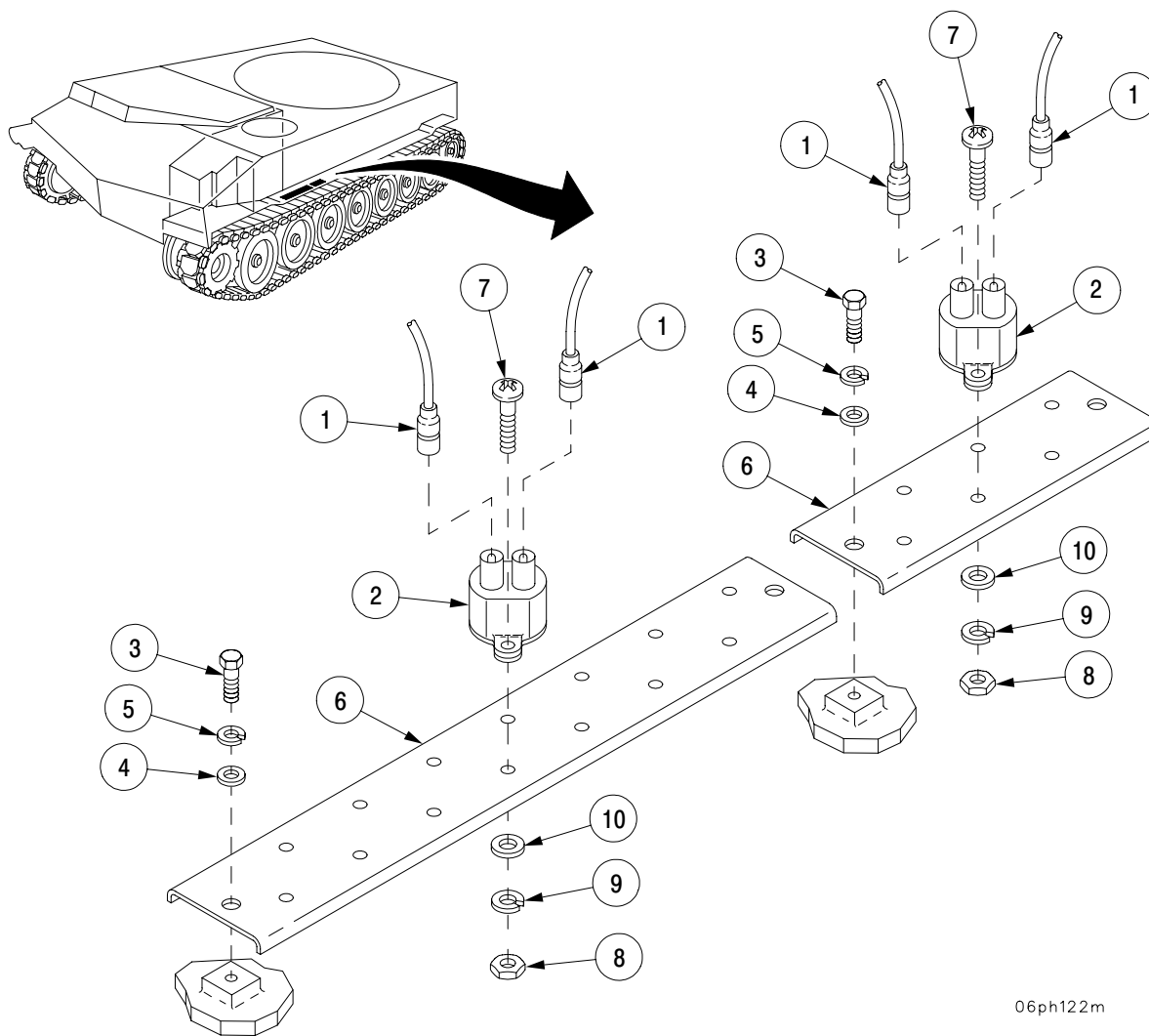
**b. Installation.**

- 1 Install circuit breaker (2) on CB panel (6) with two screws (7), two flat washers (10), two new lockwashers (9), and two nuts (8).
- 2 Install CB panel (6) with two screws (3), two new lockwashers (5), and two flat washers (4).
- 3 Connect electrical leads (1) to circuit breaker (2).

**Section IV. INSTRUMENT OR ENGINE CONTROL PANELS – CONTINUED**

**8-20 CIRCUIT BREAKERS AND CIRCUIT BREAKER PANELS – CONTINUED**

**b. Installation – Continued**



06ph122m

**NOTE**

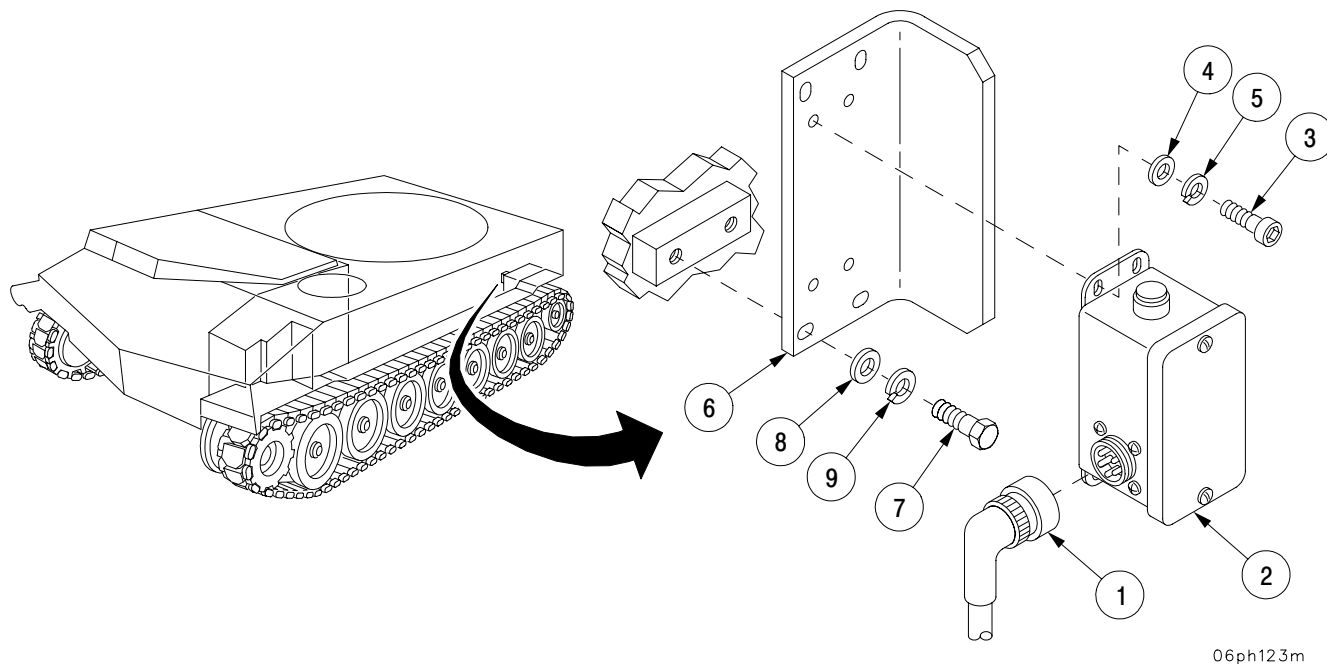
**FOLLOW-ON MAINTENANCE:**  
 Install driver's portable instrument panel  
 (TM 9-2350-314-10)  
 Connect battery ground leads  
 (para 8-33)



**Section IV. INSTRUMENT OR ENGINE CONTROL PANELS – CONTINUED**

**8-21 ENCLOSURE ASSEMBLY AND BRACKET – CREW COMPARTMENT WARNING LIGHT – CONTINUED**

**b. Installation – Continued**



**NOTE**

**FOLLOW-ON MAINTENANCE:**  
 Connect battery ground leads (para 8-33)



---

## Section V. MISCELLANEOUS ITEMS

---

### 8-22 MASTER RELAY AND BRACKET.

---

This task covers:      a. Removal                              b. Installation

---

#### **INITIAL SETUP**

##### Tools

General mechanic's tool kit  
(SC 5180-90-N26)

##### Materials/Parts

Lockwashers (2) (item 47, Appx E)  
Lockwashers (4) (item 22, Appx E)  
Insulation tape (item 61, Appx C)  
Adhesive sealant (item 7, Appx C)

##### Equipment Conditions

Vehicle MASTER switch OFF  
(TM 9-2350-314-10)  
Battery ground leads disconnected  
(para 8-33)

##### References

TM 9-2350-314-10

---

#### **a. Removal.**

#### **WARNING**

When battery ground leads are disconnected, it is necessary to discharge generator capacitor by shorting any battery positive lead to ground. Generator capacitor could discharge when touched, causing electrical shock.

#### **NOTE**

Tag all electrical connections and electrical leads prior to removal to aid in installation.

- 1 Remove screw (1), two flat washers (2), lockwasher (3), and nut (4) securing lead assemblies (5 and 6) to relay (7). Discard lockwasher. Tape ends of lead assemblies.
- 2 Remove screw (8), two flat washers (9), lockwasher (10), and nut (11) securing cables (12, 13, and 14) to relay (7). Discard lockwasher.
- 3 Loosen two screws (15) securing plate (16).
- 4 Pivot plate (16) and remove two screws (17) securing wiring harness W113 lead 7 (18) and lead 459 (19) to relay (7).
- 5 Remove four screws (20) and four lockwashers (21) securing cover (22) and relay (7) to bracket (23).
- 6 Remove four screws (24), four flat washers (25), four lockwashers (26), and bracket (23). Discard lockwashers.

#### **b. Installation.**

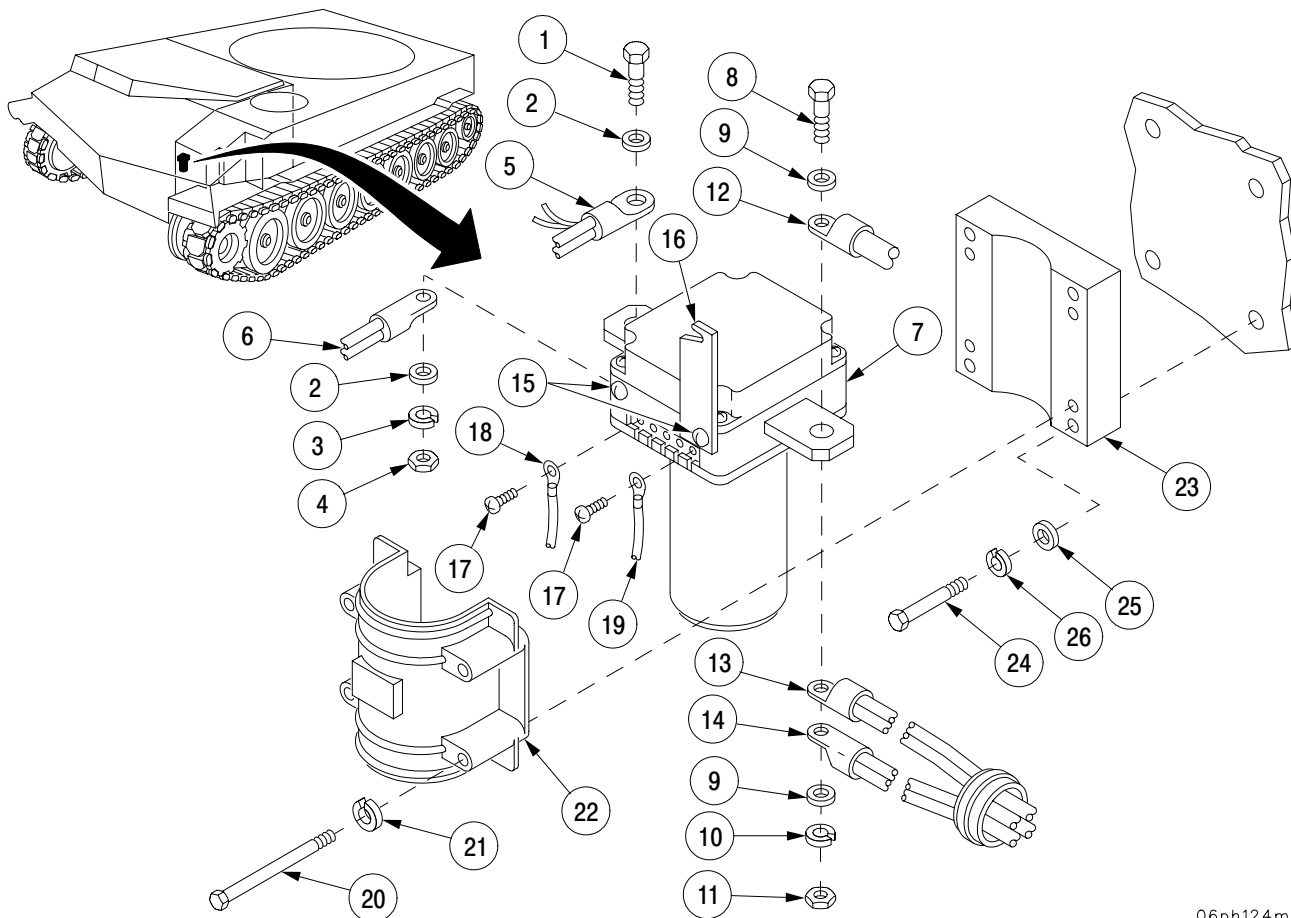
- 1 Install bracket (23) with four screws (24), four new lockwashers (26), and four flat washers (25).
- 2 Install relay (7) and cover (22) on bracket (23) with four screws (20) and four lockwashers (21).
- 3 Secure wiring harness W113 lead 7 (18) and lead 459 (19) to relay (7) with two screws (17).

**Section V. MISCELLANEOUS ITEMS – CONTINUED**

**8-22 MASTER RELAY AND BRACKET – CONTINUED**

**b. Installation – Continued**

- 4 Position plate (16) over two electrical leads (18 and 19) and secure plate (16) with two screws (15).
- 5 Install cables (12, 13, and 14) on relay (7) with screw (8), two flat washers (9), new lockwasher (10), and nut (11).
- 6 Install lead assemblies (5 and 6) on relay (7) with screw (1), two flat washers (2), new lockwasher (3), and nut (4).
- 7 Apply adhesive to terminals after assembly.



06ph124m

**NOTE**

**FOLLOW-ON MAINTENANCE:**  
Connect battery ground leads (para 8-33)





**Section V. MISCELLANEOUS ITEMS – CONTINUED**

---

**8-23 STARTER PROTECTION RELAY, BILGE PUMP RELAY, BILGE PUMP CIRCUIT BREAKER, AND MOUNT – CONTINUED**

---

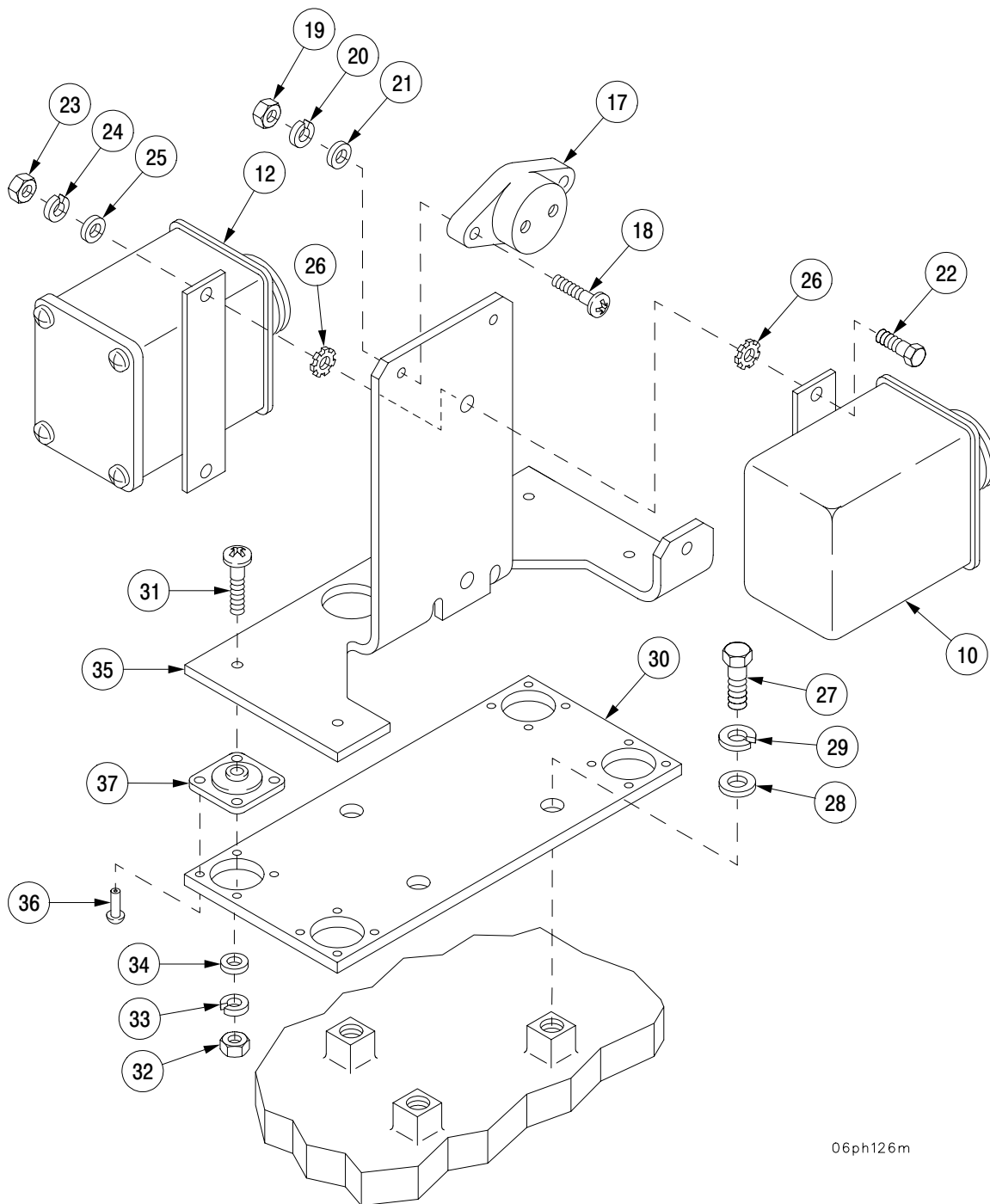
**a. Removal – Continued**

- 5 Remove two screws (18), two nuts (19), two lockwashers (20), and two flat washers (21) securing bilge pump circuit breaker (17). Discard lockwashers.
- 6 Remove two screws (22), two nuts (23), two lockwashers (24), two flat washers (25), and four lockwashers (26) securing bilge pump relay (12) and starter protection device (10). Discard lockwashers.
- 7 Remove three screws (27), three flat washers (28), and three lockwashers (29) securing support (30) to bulkhead. Discard lockwashers.
- 8 Remove four screws (31), four nuts (32), four lockwashers (33), and four flat washers (34) securing bracket (35) to support (30). Discard lockwashers.
- 9 Remove 16 rivets (36) securing four resilient mounts (37) to support (30). Discard rivets.
- 10 Remove four resilient mounts (37) from support (30). Discard resilient mounts.

**Section V. MISCELLANEOUS ITEMS – CONTINUED**

**8-23 STARTER PROTECTION RELAY, BILGE PUMP RELAY, BILGE PUMP CIRCUIT BREAKER, AND MOUNT – CONTINUED**

**a. Removal – Continued**



06ph126m

## Section V. MISCELLANEOUS ITEMS – CONTINUED

---

### 8-23 STARTER PROTECTION RELAY, BILGE PUMP RELAY, BILGE PUMP CIRCUIT BREAKER, AND MOUNT – CONTINUED

---

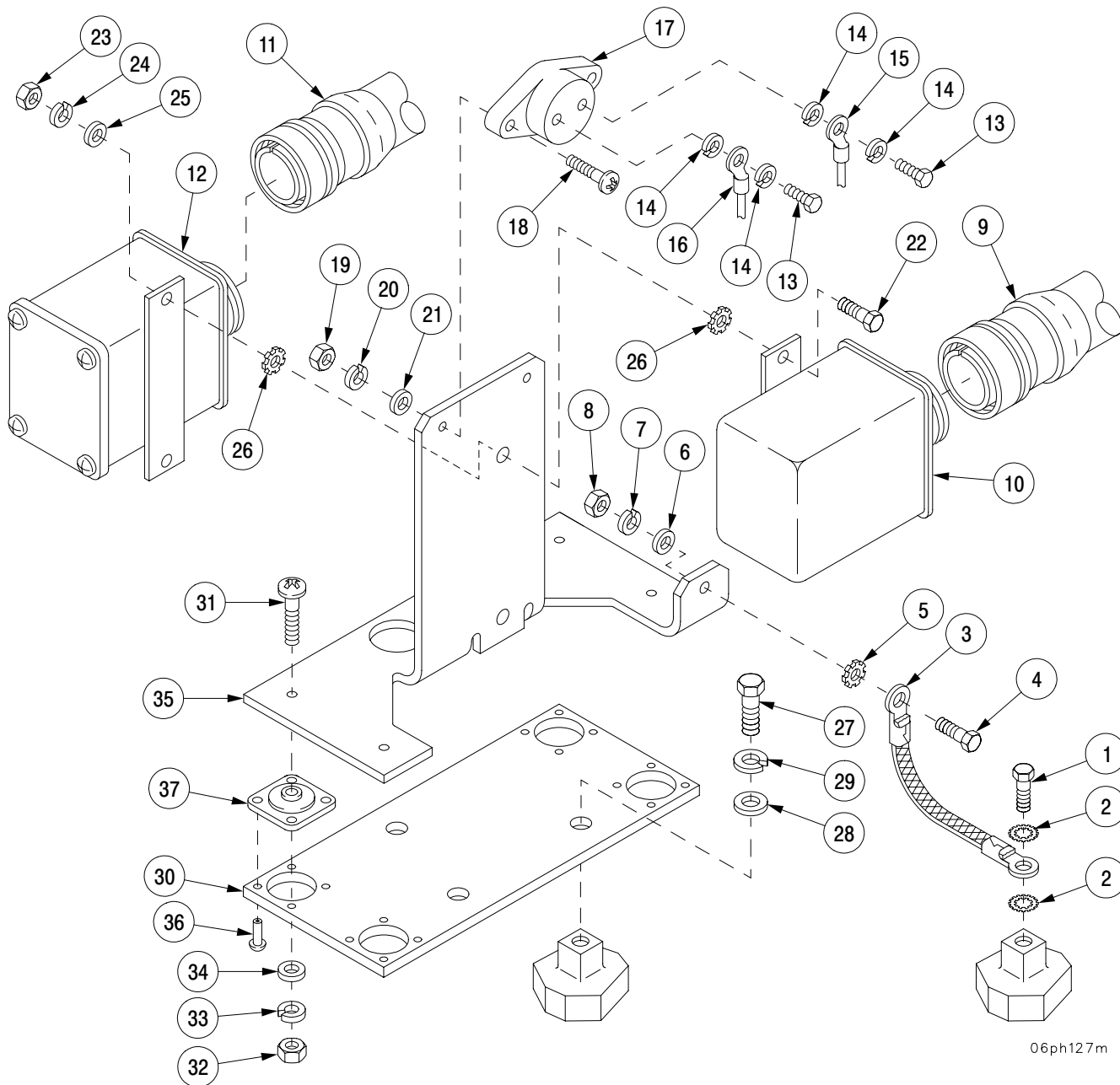
#### b. Installation.

- 1 Install four new resilient mounts (37) on support (30) with 16 new rivets (36).
- 2 Secure bracket (35) to support (30) with four screws (31), four flat washers (34), four new lockwashers (33), and four nuts (32).
- 3 Secure support (30) to bulkhead with three screws (27), three new lockwashers (29), and three flat washers (28).
- 4 Secure bilge pump relay (12) and starter protection device (10) to bracket (35) with two screws (22), four new lockwashers (26), two flat washers (25), two new lockwashers (24), and two nuts (23).
- 5 Secure bilge pump circuit breaker (17) to bracket (35) with two screws (18), two flat washers (21), two new lockwashers (20), and two nuts (19).
- 6 Secure wiring harness W113 lead 452B (16) and wiring harness W105 lead 452A (15) to bilge pump circuit breaker (17) with two screws (13) and four lockwashers (14).
- 7 Apply adhesive to circuit breaker (17) terminals after assembly.
- 8 Connect wiring harness W105 connector P3 (9) to starter protection device (10), and wiring harness W113 connector P3 (11) to bilge pump relay (12).
- 9 Secure ground strap (3) to bracket (35) with screw (4), new lockwasher (5), flat washer (6), new lockwasher (7), and nut (8).
- 10 Secure ground strap (3) to vehicle with screw (1) and two new lockwashers (2).

**Section V. MISCELLANEOUS ITEMS – CONTINUED**

**8-23 STARTER PROTECTION RELAY, BILGE PUMP RELAY, BILGE PUMP CIRCUIT BREAKER, AND MOUNT – CONTINUED**

**b. Installation – Continued**



06ph127m

**NOTE**  
**FOLLOW-ON MAINTENANCE:**  
 Install batteries (para 8-54)

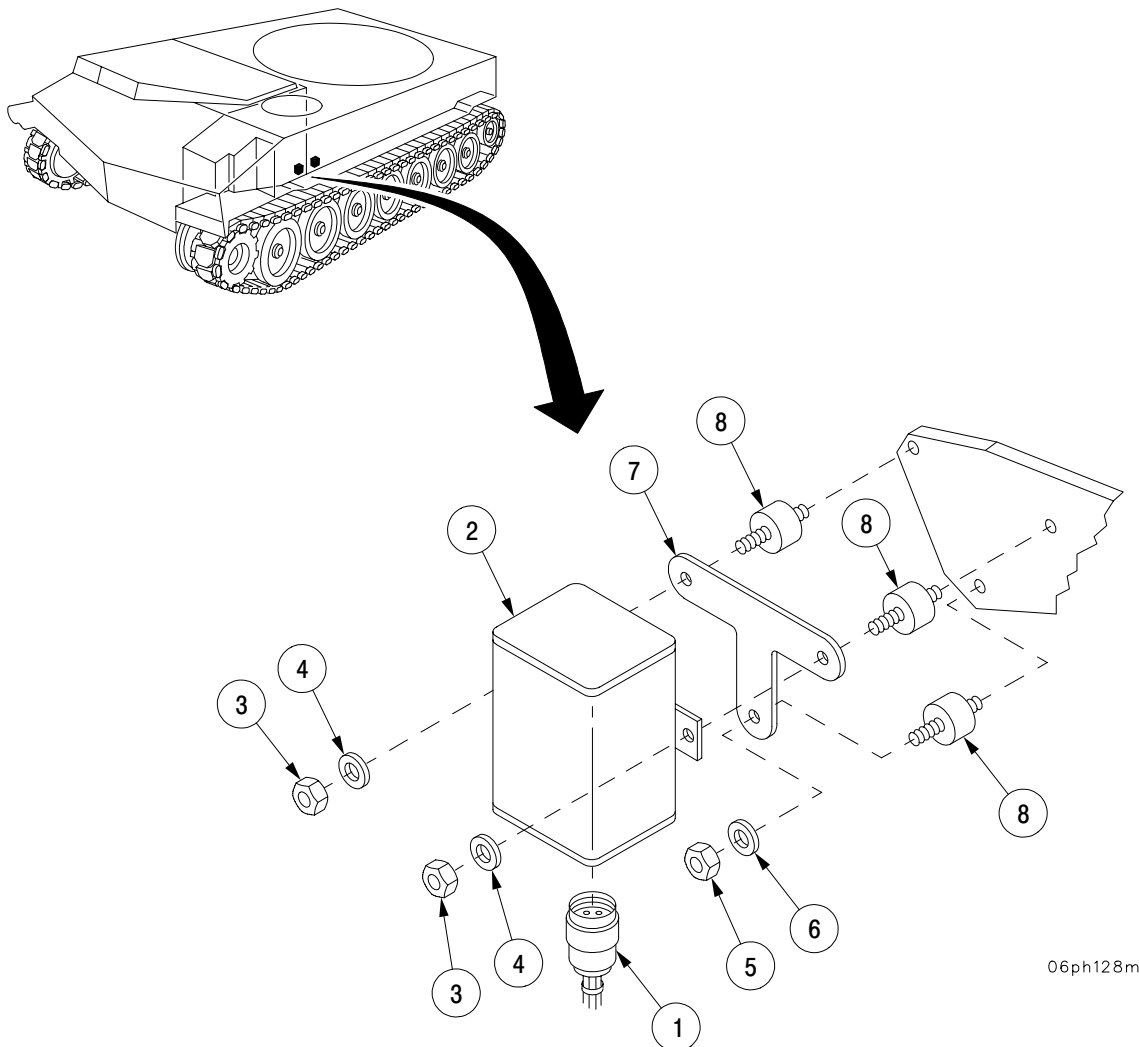




**Section V. MISCELLANEOUS ITEMS – CONTINUED**

**8-24 GENERATOR/FUEL PUMP RELAY AND MOUNTING BRACKET – CONTINUED**

**b. Installation – Continued**



06ph128m

**NOTE**

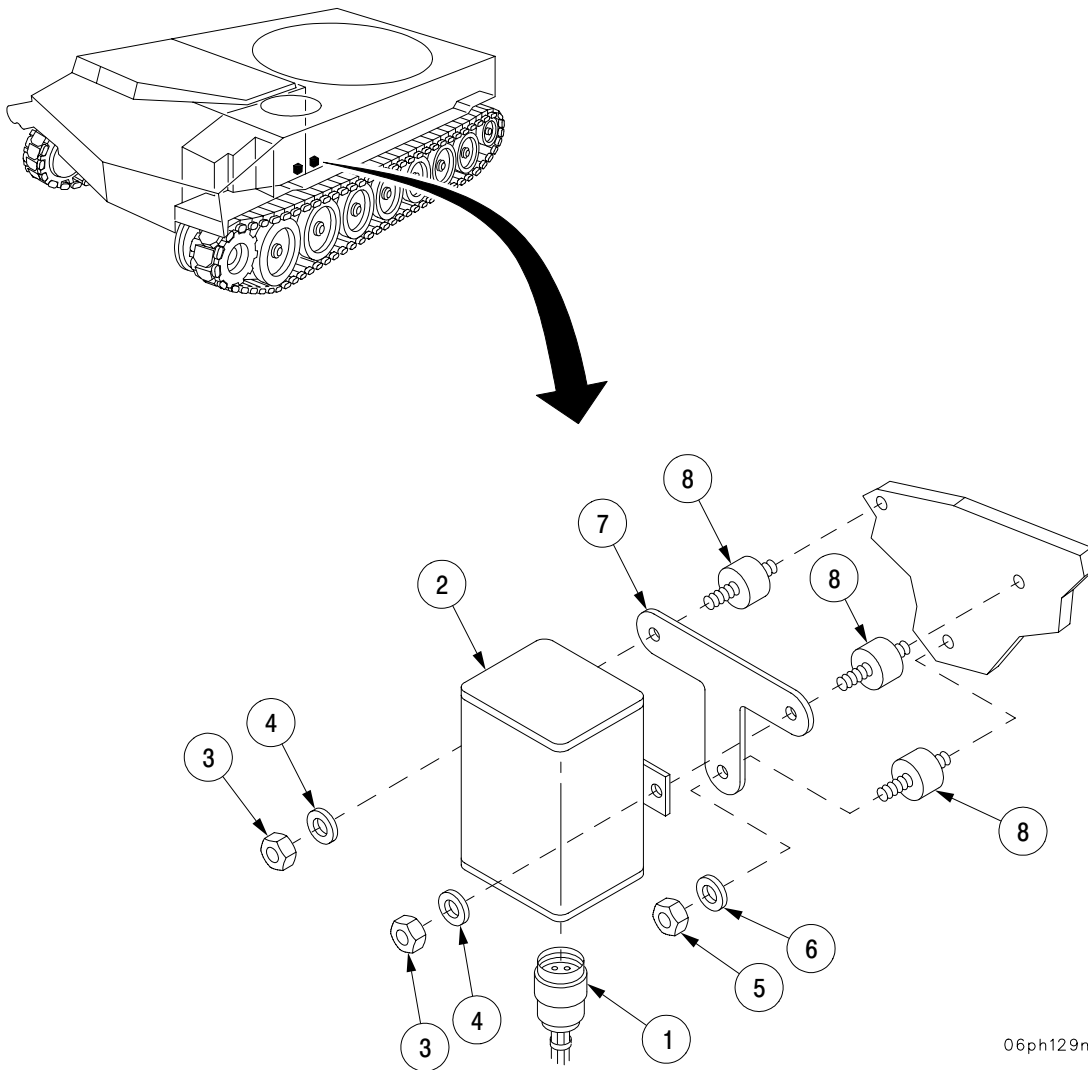
**FOLLOW-ON MAINTENANCE:**  
 Install driver's portable instrument panel  
 (TM 9-2350-314-10)  
 Connect battery ground leads (para 8-33)



**Section V. MISCELLANEOUS ITEMS – CONTINUED**

**8-25 AIR CLEANER BLOWER RELAY AND MOUNTING BRACKET – CONTINUED**

**b. Installation – Continued**



06ph129m

**NOTE**

**FOLLOW-ON MAINTENANCE:**  
 Install driver's portable instrument panel  
 (TM 9-2350-314-10)  
 Connect battery ground leads (para 8-33)

## Section V. MISCELLANEOUS ITEMS – CONTINUED

---

### 8-26 COMBAT OVERRIDE SWITCH AND BRACKET.

---

This task covers:    a. Removal                    b. Disassembly                    c. Assembly                    d. Installation

---

#### **INITIAL SETUP**

##### Tools

General mechanic's tool kit  
(SC 5180-90-N26)

##### Materials/Parts

Lockwashers (2) (item 70, Appx E)  
Lockwashers (2) (item 22, Appx E)

##### Equipment Conditions

Vehicle MASTER switch OFF  
(TM 9-2350-314-10)  
Battery ground leads disconnected  
(para 8-33)

##### References

TM 9-2350-314-10

---

#### **a. Removal.**

- 1 Disconnect wiring harness W114 lead 7 (1) and lead 611 (2) from switch (3).
- 2 Remove two screws (4), two flat washers (5), two lockwashers (6), and bracket (7) with switch (3). Discard lockwashers.

#### **b. Disassembly.**

Remove two screws (8), two flat washers (9), two lockwashers (10), and switch (3) from bracket (7). Discard lockwashers.

#### **c. Assembly.**

Install switch (3) on bracket (7) with two screws (8), two new lockwashers (10), and two flat washers (9).

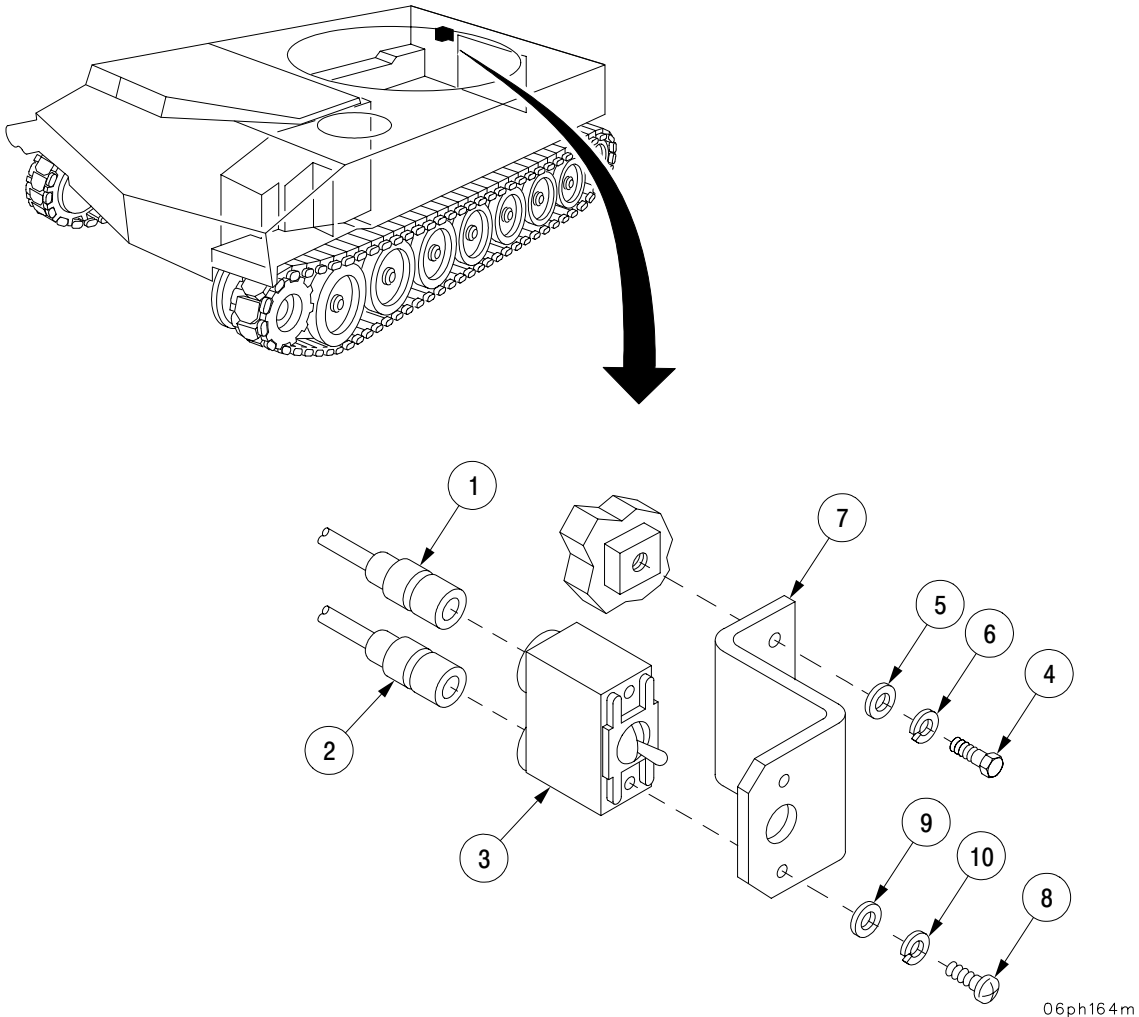
#### **d. Installation.**

- 1 Install bracket (7) and switch (3) with two screws (4), two new lockwashers (6), and two flat washers (5).
- 2 Connect wiring harness W114 lead 7 (1) and lead 611 (2) to switch (3).

Section V. MISCELLANEOUS ITEMS – CONTINUED

8-26 COMBAT OVERRIDE SWITCH AND BRACKET – CONTINUED

d. Installation – Continued



**NOTE**

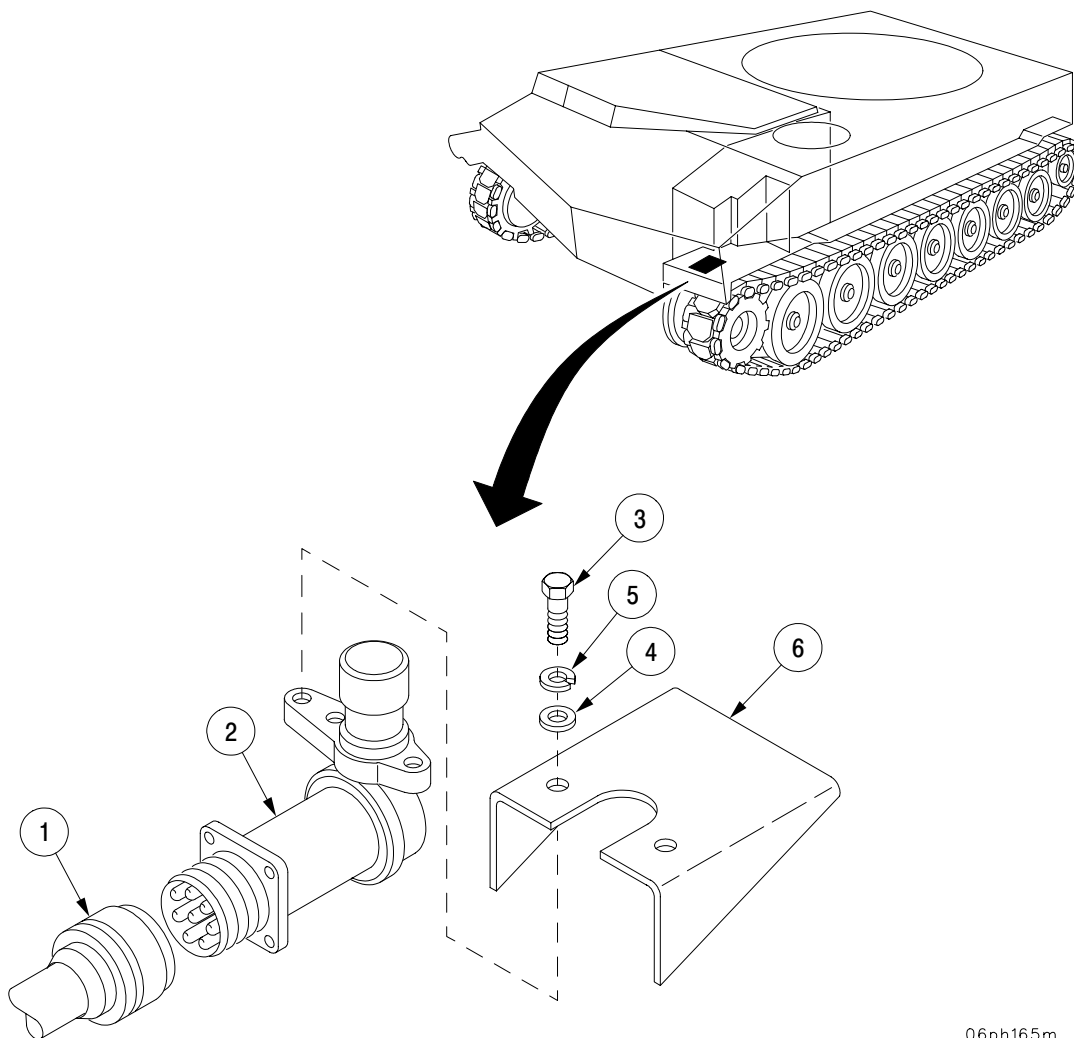
**FOLLOW-ON MAINTENANCE:**  
 Connect battery ground leads (para 8-33)



Section V. MISCELLANEOUS ITEMS – CONTINUED

8-27 HEADLIGHT DIMMER SWITCH – CONTINUED

b. Installation – Continued



06ph165m

**NOTE**

**FOLLOW-ON MAINTENANCE:**  
 Connect battery ground leads (para 8-33)



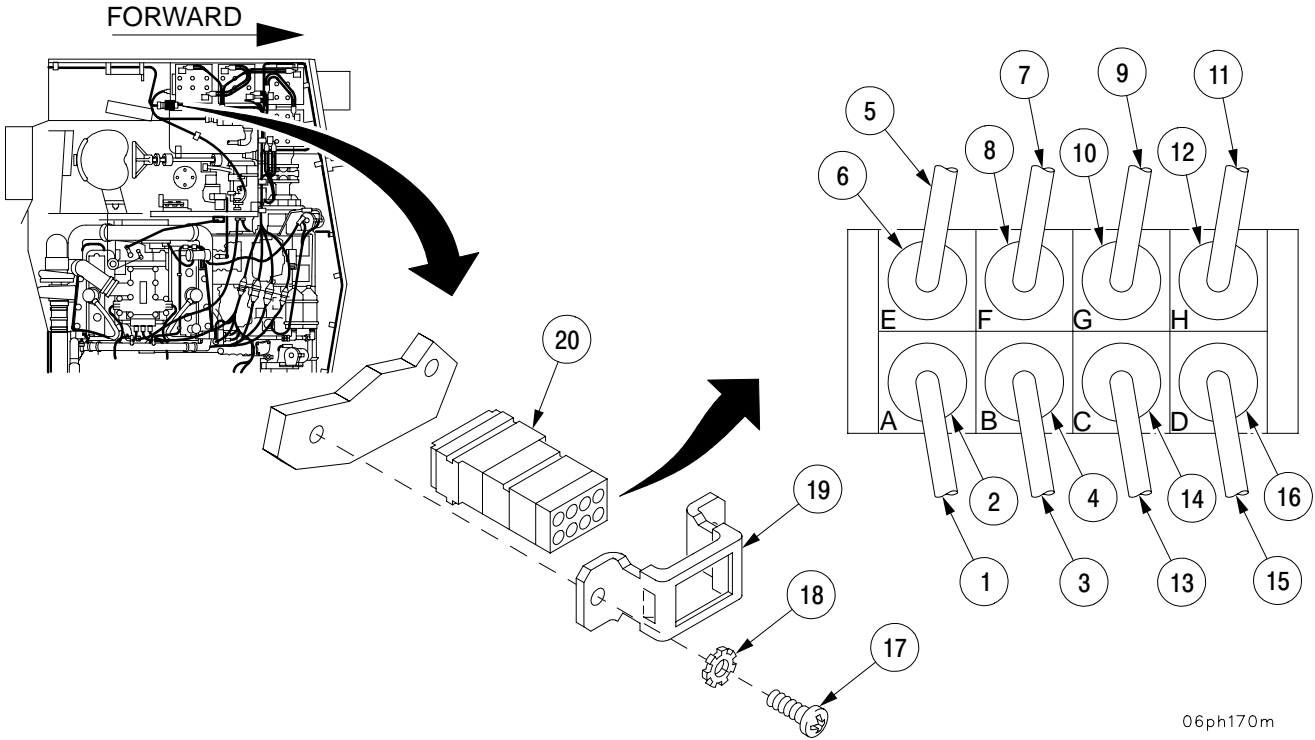


**Section V. MISCELLANEOUS ITEMS – CONTINUED**

**8-28 RESISTOR MODULE BLOCK AND BRACKET – CONTINUED**

**b. Installation – Continued**

- 2 Connect wiring harness W100 circuit AP (15) to terminal D (16).
- 3 Connect wiring harness W100 circuit AM (13) to terminal C (14).
- 4 Connect wiring harness W100 circuit AF (11) to terminal H (12).
- 5 Connect wiring harness W100 circuit AJ (9) to terminal G (10).
- 6 Connect wiring harness W100 circuit BE (7) to terminal F (8).
- 7 Connect wiring harness W100 circuit CB (5) to terminal E (6).
- 8 Connect wiring harness W100 circuit AK (3) to terminal B (4).
- 9 Connect wiring harness W100 circuit CA (1) to terminal A (2).



06ph170m

**NOTE**

**FOLLOW-ON MAINTENANCE:**  
Connect battery ground leads (para 8-33)

---

**Section V. MISCELLANEOUS ITEMS – CONTINUED**

---

**8-29 DRIVER'S FULL FUNCTION CREW STATION MOUNTING PLATE.**

---

This task covers:      a. Removal                                      b. Installation

---

**INITIAL SETUP**

Tools

General mechanic's tool kit  
(SC 5180-90-N26)

Materials/Parts

Lockwashers (4) (item 44, Appx E)

Equipment Conditions

Vehicle MASTER switch OFF  
(TM 9-2350-314-10)  
Full function crew station removed  
(para 18-2)

References

TM 9-2350-314-10

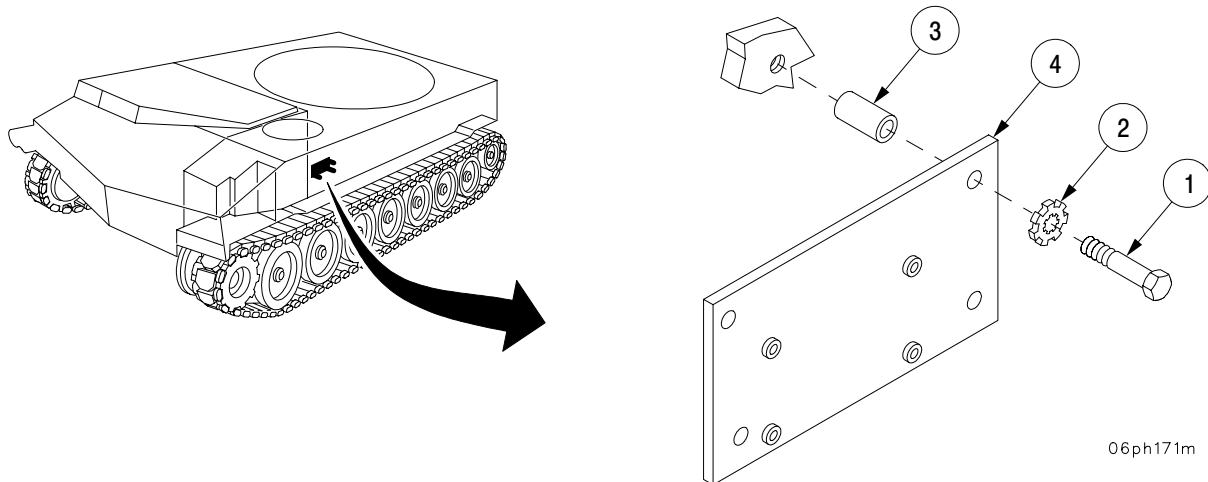
---

**a. Removal.**

Remove four screws (1), four lockwashers (2), four spacers (3), and plate (4). Discard lockwashers.

**b. Installation.**

Install plate (4) with four screws (1), four new lockwashers (2), and four spacers (3).



**NOTE**

**FOLLOW-ON MAINTENANCE:**  
Install full function crew station (para 18-2)







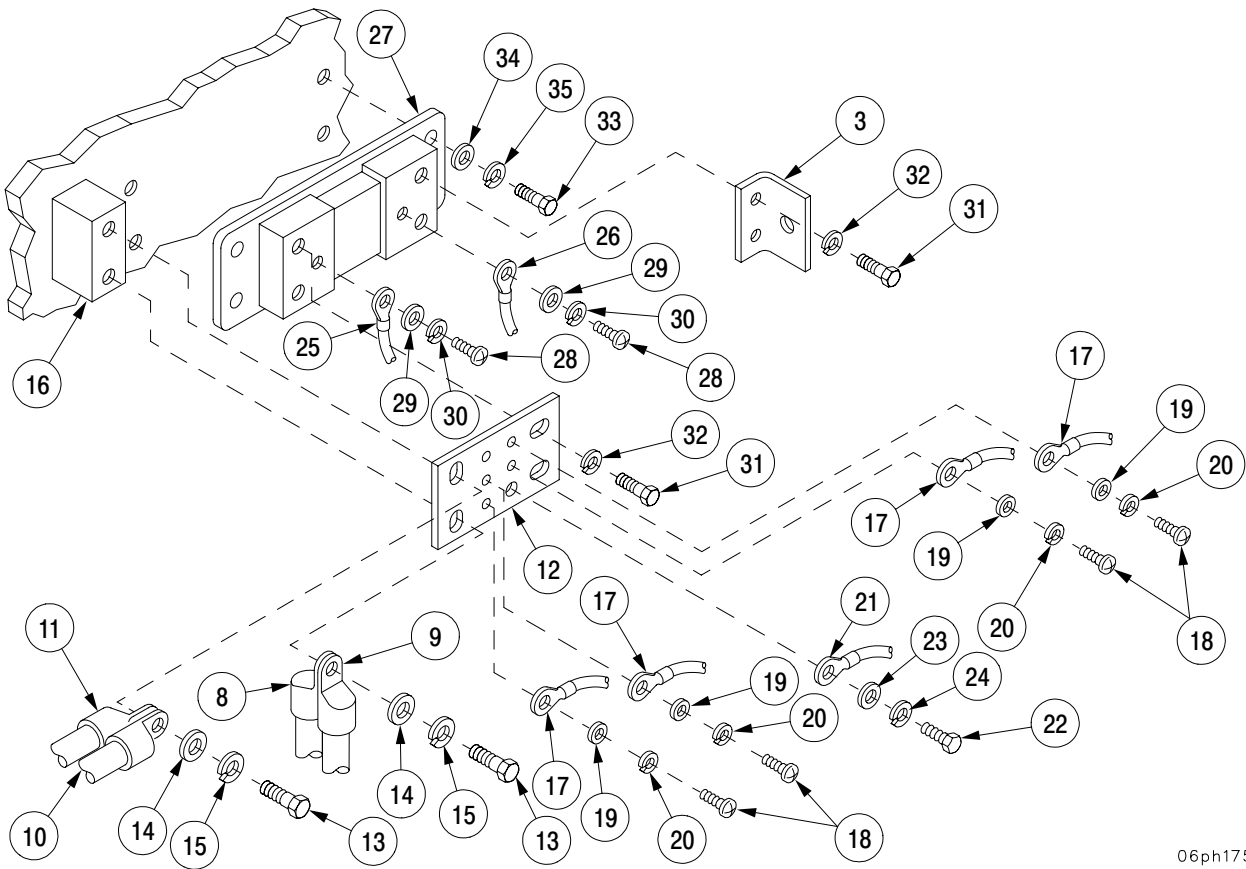


**Section V. MISCELLANEOUS ITEMS – CONTINUED**

**8-33 CURRENT SHUNT AND GROUND BUS – CONTINUED**

**a. Removal – Continued**

- 2 Disconnect four leads (8, 9, 10, and 11) from bus bar (12) by removing two screws (13), two flat washers (14), and two lockwashers (15) from block (16). Discard lockwashers.
- 3 Disconnect four wires (17) from bus bar (12) by removing four screws (18), four flat washers (19), and four lockwashers (20). Discard lockwashers.
- 4 Disconnect wire (21) from bus bar (12) by removing screw (22), flat washer (23), and lockwasher (24). Discard lockwasher.
- 5 Disconnect leads BA (25) and BB (26) from shunt (27) by removing two screws (28), two flat washers (29), and two lockwashers (30). Discard lockwashers.
- 6 Remove four screws (31), four lockwashers (32), and two bus bars (3 and 12) from shunt (27). Discard lockwashers.
- 7 Remove four screws (33), four flat washers (34), four lockwashers (35), and shunt (27). Discard lockwashers.



06ph175m



## Section V. MISCELLANEOUS ITEMS – CONTINUED

---

### 8-33 CURRENT SHUNT AND GROUND BUS – CONTINUED

---

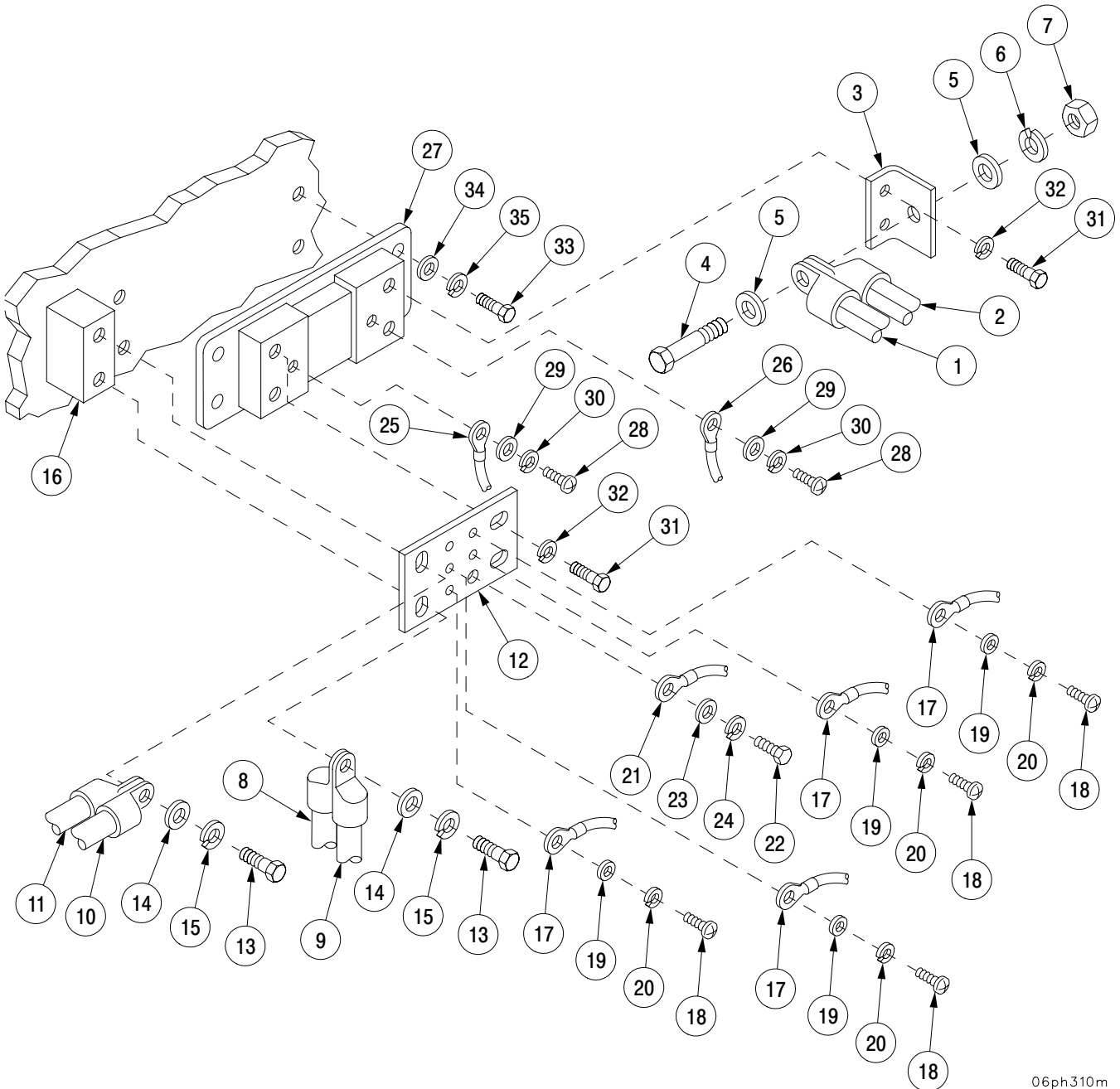
#### b. Installation.

- 1 Install shunt (27) on bulkhead with four screws (33), four new lockwashers (35), and four flat washers (34).
- 2 Install two bus bars (3 and 12) on shunt (27) with four screws (31) and four new lockwashers (32).
- 3 Connect two leads BA (25) and BB (26) to shunt (27) with two screws (28), two new lockwashers (30), and two flat washers (29).
- 4 Connect wire (21) to bus bar (12) with screw (22), new lockwasher (24), and flat washer (23).
- 5 Connect four wires (17) to bus bar (12) with four screws (18), four new lockwashers (20), and four flat washers (19).
- 6 Connect four leads (8, 9, 10, and 11) to bus bar (12) with two screws (13), two new lockwashers (15), and two flat washers (14). Screws thread into block (16).
- 7 Connect two battery ground leads (1 and 2) to bus bar (3) with screw (4), two flat washers (5), new lockwasher (6), and nut (7).

Section V. MISCELLANEOUS ITEMS – CONTINUED

8-33 CURRENT SHUNT AND GROUND BUS – CONTINUED

b. Installation – Continued



06ph310m

**NOTE**  
**FOLLOW-ON MAINTENANCE:**  
 Close and secure battery access doors  
 (TM 9-2350-314-10)

## Section VI. LIGHTS

---

### 8-34 HEADLIGHT SEALED-BEAM AND INCANDESCENT LAMPS.

---

This task covers:      a. Removal                                      b. Installation

---

<b>INITIAL SETUP</b>
----------------------

Tools

General mechanic's tool kit  
(SC 5180-90-N26)

Materials/Parts

Lockwashers (4) (item 317, Appx E)

Equipment Conditions

Vehicle MASTER switch OFF  
(TM 9-2350-314-10)  
Main light switch OFF  
(TM 9-2350-314-10)

References

TM 9-2350-314-10

---

#### a. Removal.

- 1 Remove four screws (1), four lockwashers (2), and cover (3) from headlight body (4). Discard lockwashers.
- 2 Remove two sealed-beam units (5) from headlight body (4).
- 3 Disconnect two electrical connectors (6) from two sealed-beam units (5).
- 4 Remove two gaskets (7) from two sealed-beam units (5).
- 5 Remove lamp (8) and LED (9) from headlight body (4).

#### b. Installation.

- 1 Install LED (9) and lamp (8) in headlight body (4).
- 2 Install two gaskets (7) on two sealed-beam units (5).
- 3 Connect two electrical connectors (6) to two sealed-beam units (5) and install two sealed-beam units (5) in headlight body (4).
- 4 Install cover (3) on headlight body (4) and secure with four screws (1) and four new lockwashers (2).

---

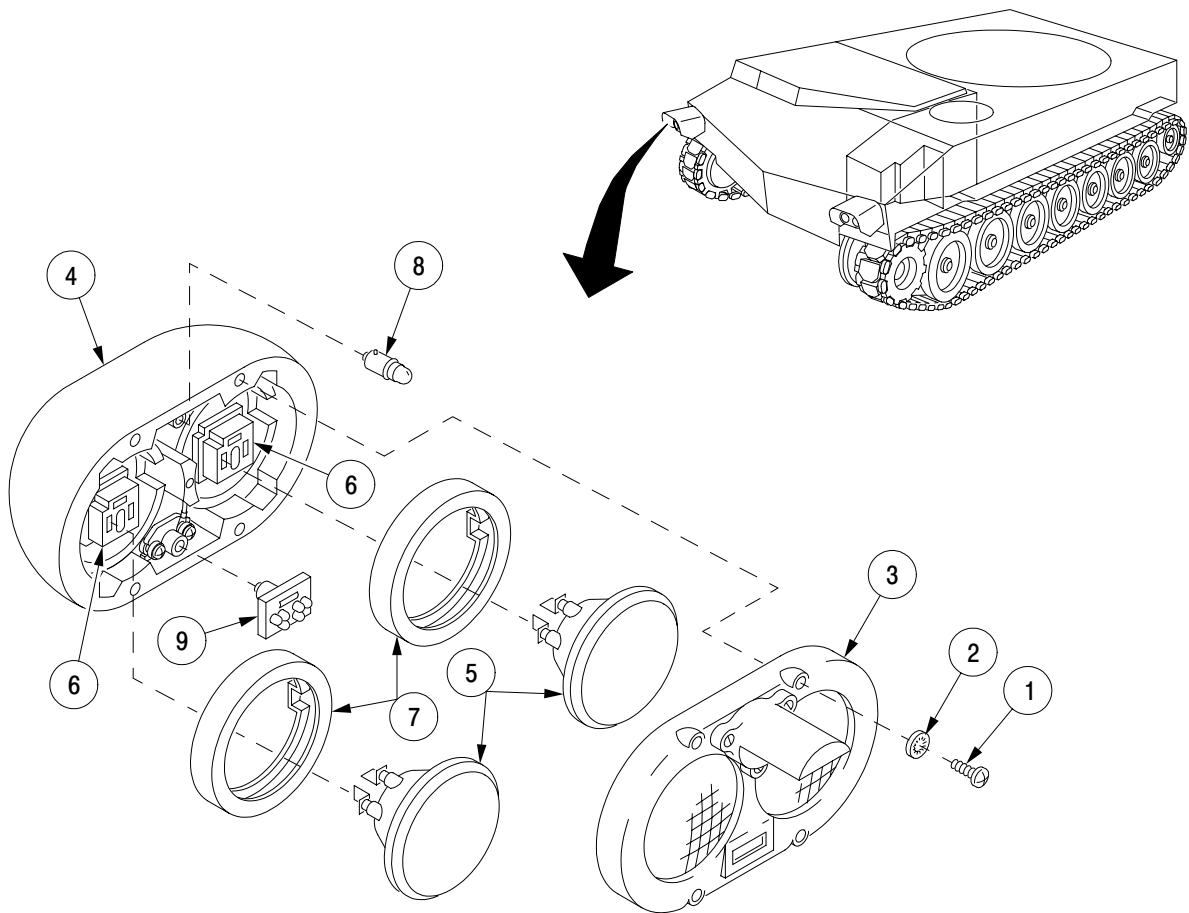
**Section VI. LIGHTS – CONTINUED**

---

**8-34 HEADLIGHT SEALED-BEAM AND INCANDESCENT LAMPS – CONTINUED**

---

**b. Installation – Continued**



06ph135m

## Section VI. LIGHTS – CONTINUED

---

### 8-35 HEADLIGHT ASSEMBLY.

---

This task covers:    a. Removal                    b. Disassembly                    c. Assembly  
                              d. Installation                    e. Alignment                        f. Adjustment

---

#### **INITIAL SETUP**

##### Tools

General mechanic's tool kit  
(SC 5180-90-N26)

##### Materials/Parts

Lockwashers (2) (item 74, Appx E)  
Lockwashers (15) (item 38, Appx E)  
Lockwashers (4) (item 73, Appx E)  
Lockwashers (4) (item 83, Appx E)  
Spring pin (item 82, Appx E)  
Gaskets (2) (item 75, Appx E)  
Gaskets (2) (item 81, Appx E)  
Nonmetallic seal (item 77, Appx E)  
Nonmetallic seal (item 78, Appx E)  
Nonmetallic seal (item 79, Appx E)  
Nonmetallic seal (item 80, Appx E)  
Adhesive (item 2, Appx C)  
Sealing compound (item 49, Appx C)  
Gaskets (2) (item 306, Appx E)

##### Equipment Conditions

Vehicle parked on level surface  
25 feet from wall (alignment and  
adjustment)  
Main light switch OFF  
(TM 9-2350-314-10)  
Vehicle MASTER switch OFF  
(TM 9-2350-314-10)

##### References

TM 9-2350-314-10

---

---

**Section VI. LIGHTS – CONTINUED**

---

**8-35 HEADLIGHT ASSEMBLY – CONTINUED**

---

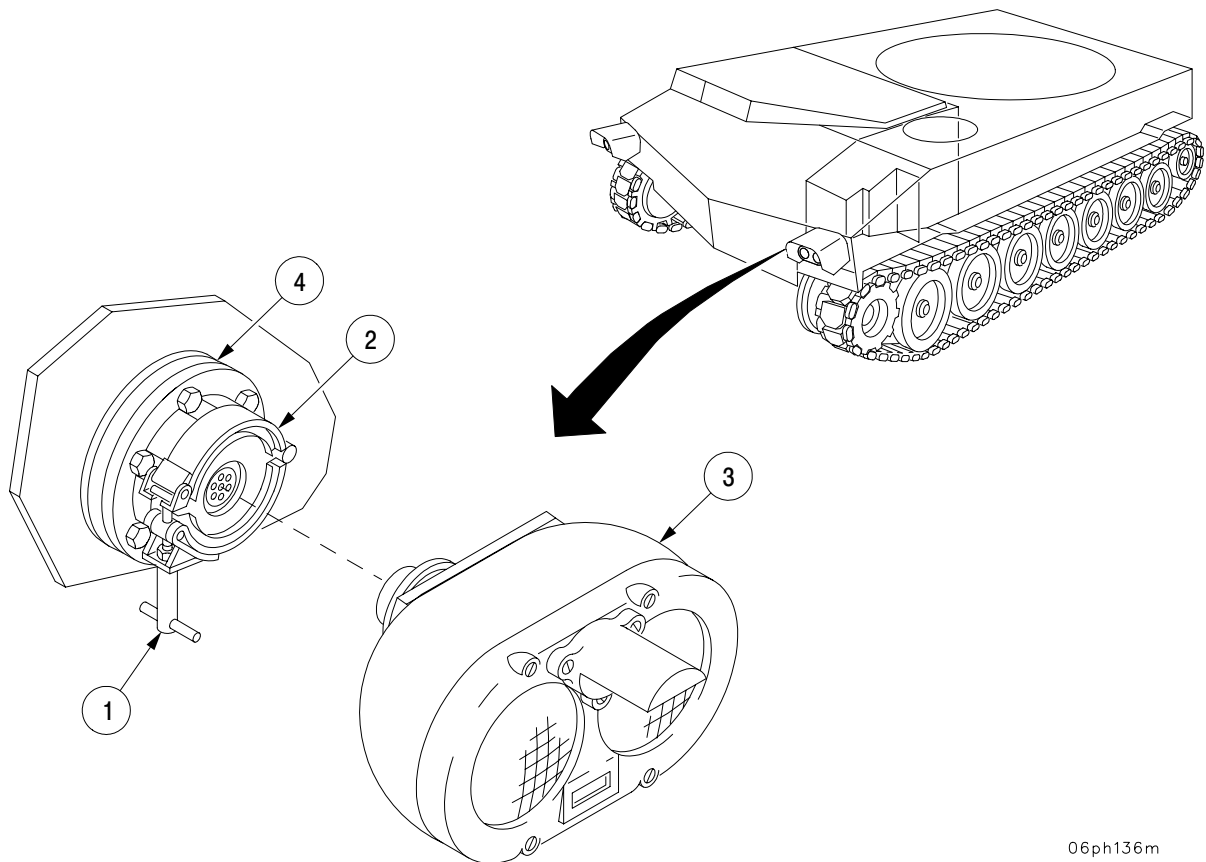
**a. Removal.**

- 1 Turn T-handle (1) and loosen retaining clamp (2).

**CAUTION**

Do not twist headlight assembly during removal or installation. Damage to connectors may result.

- 2 Remove retaining clamp (2) and headlight assembly (3) from mount (4).



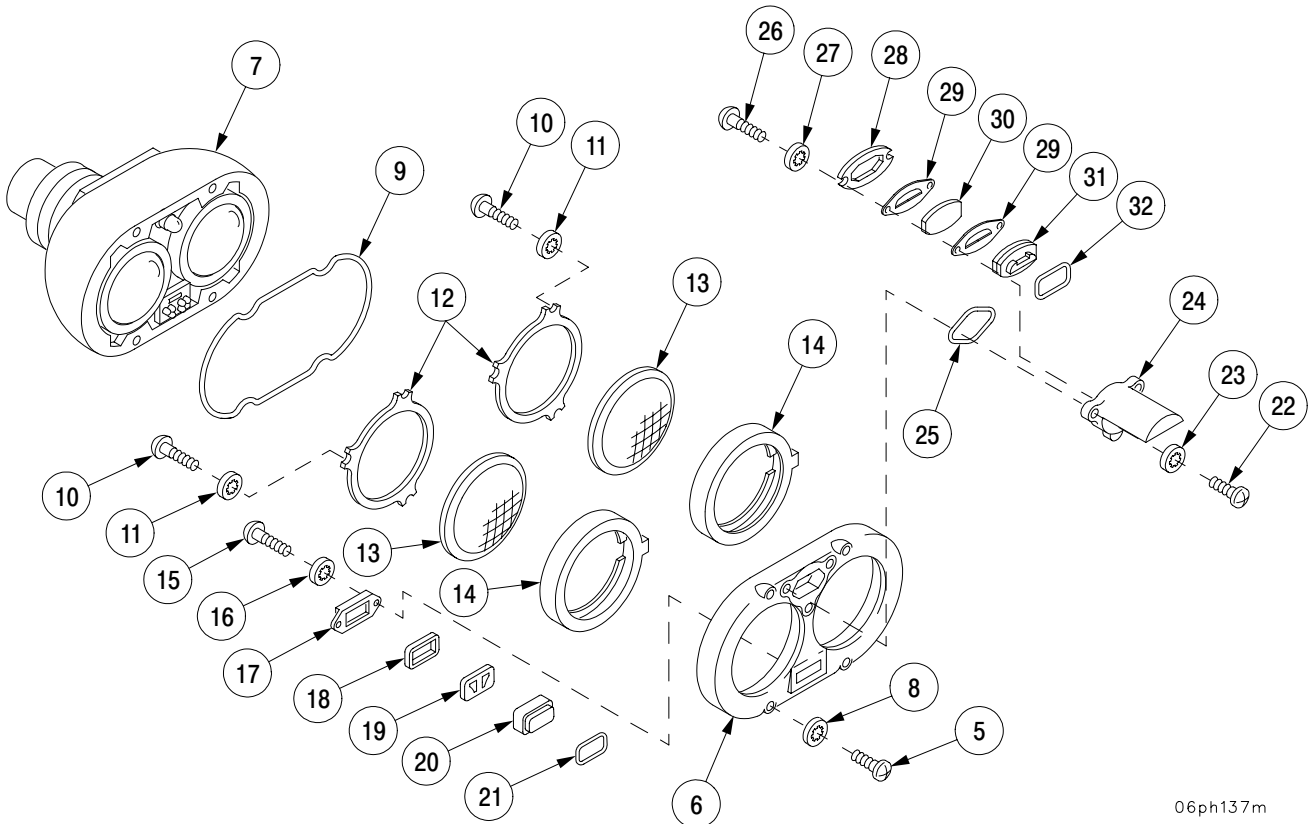
06ph136m

**Section VI. LIGHTS – CONTINUED**

**8-35 HEADLIGHT ASSEMBLY – CONTINUED**

**b. Disassembly.**

- 1 Loosen four screws (5) and remove cover (6) from headlight body (7).
- 2 Remove four screws (5) and four lockwashers (8) from cover (6). Discard lockwashers.
- 3 Remove seal (9) from cover (6). Discard seal.
- 4 Remove six screws (10), six lockwashers (11), two lens retainers (12), two lenses (13), and two gaskets (14) from cover (6). Discard lockwashers and gaskets.
- 5 Remove two screws (15), two lockwashers (16), bezel (17), seal (18), filter (19), lens (20), and seal (21) from cover (6). Discard lockwashers and seals.
- 6 Remove three screws (22), three lockwashers (23), guard (24), and seal (25) from cover (6). Discard lockwashers and seal.
- 7 Remove two screws (26), two lockwashers (27), lens retainer (28), two gaskets (29), filter (30), lens (31), and seal (32) from guard (24). Discard lockwashers, gaskets, and seal.



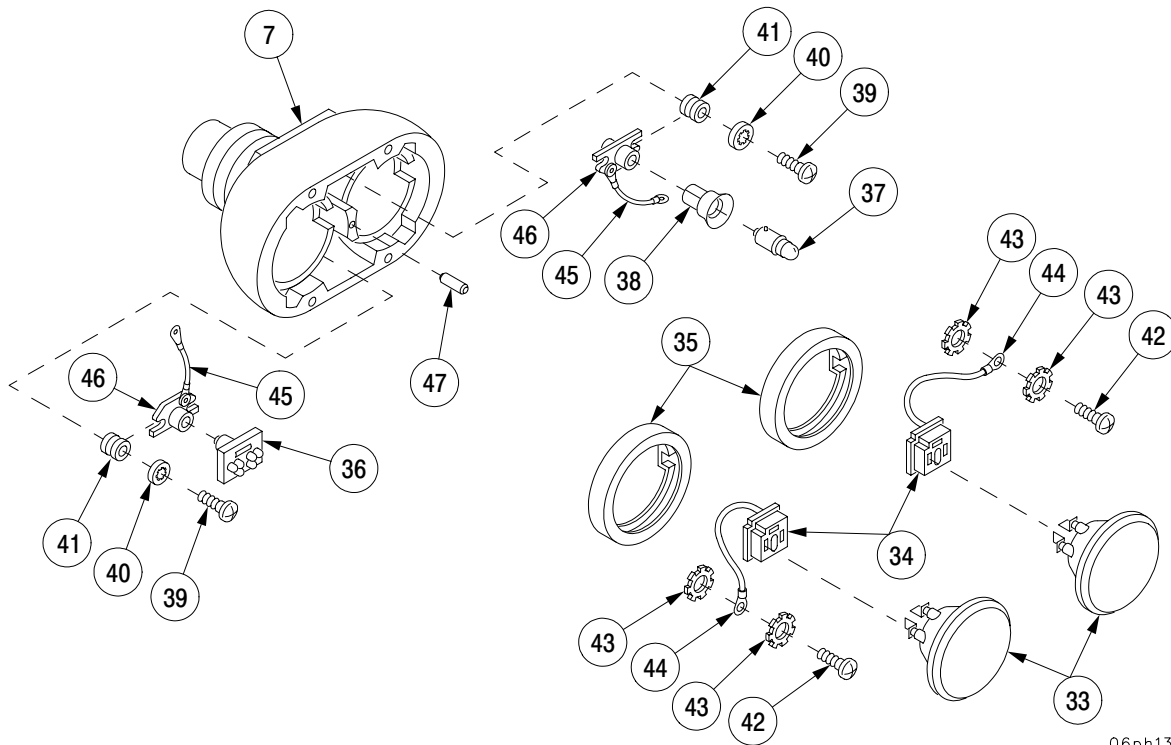
06ph137m

**Section VI. LIGHTS – CONTINUED**

**8-35 HEADLIGHT ASSEMBLY – CONTINUED**

**b. Disassembly – Continued**

- 8 Remove two sealed-beam units (33) from headlight body (7) and disconnect two electrical connectors (34) from sealed-beam units (33).
- 9 Remove two gaskets (35) from sealed-beam units (33). Discard gaskets.
- 10 Remove LED (36) and lamp (37) from headlight body (7).
- 11 Remove reflector (38) from headlight body (7).
- 12 Remove four screws (39), four lockwashers (40), and four eyelets (41). Discard lockwashers.
- 13 Remove two screws (42) and four lockwashers (43) attaching two electrical leads (44) and two electrical leads (45) to headlight body (7). Discard lockwashers.
- 14 Remove two electrical connectors (34) and two sockets (46) from headlight body (7).
- 15 Remove spring pin (47) from headlight body (7). Discard spring pin.



06ph138m

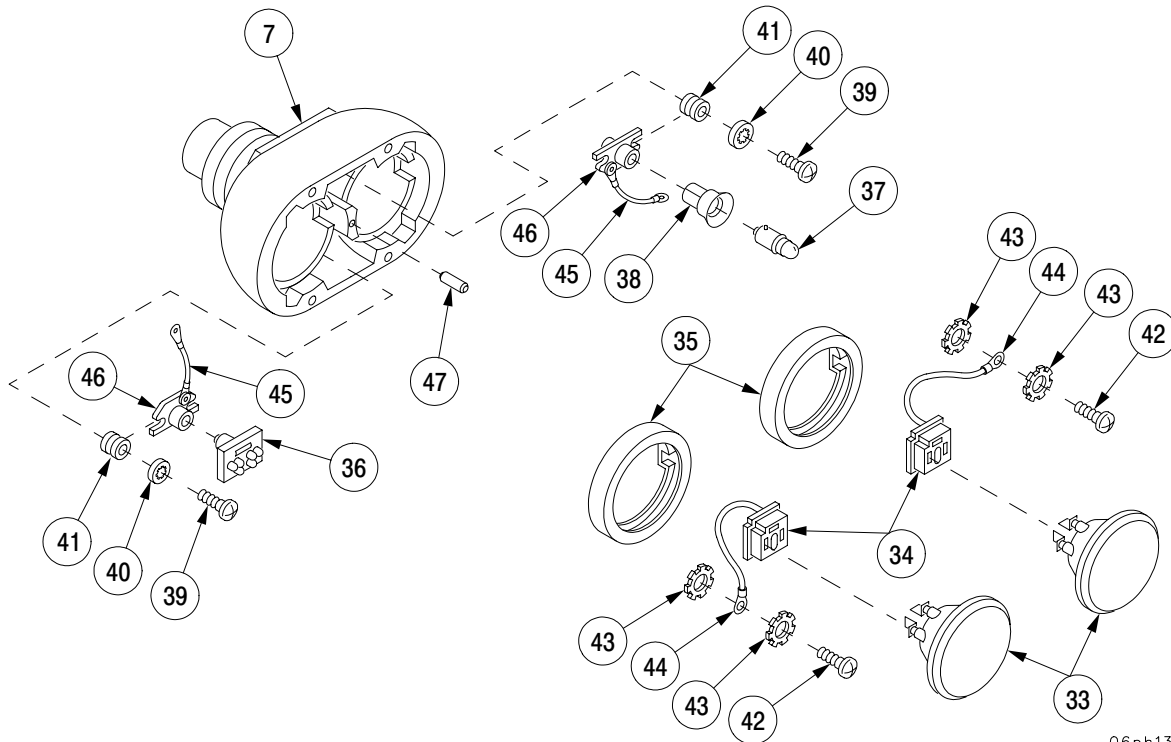


Section VI. LIGHTS – CONTINUED

8-35 HEADLIGHT ASSEMBLY – CONTINUED

c. Assembly.

- 1 Install new spring pin (47) in headlight body (7).
- 2 Attach two electrical leads (45) and two electrical leads (44) to headlight body (7) with four new lockwashers (43), and two screws (42).
- 3 Install two sockets (46) in headlight body (7) with four eyelets (41), four new lockwashers (40), and four screws (39).
- 4 Install reflector (38) in headlight body (7).
- 5 Install lamp (37) and LED (36) in headlight body (7).
- 6 Install two new gaskets (35) on sealed-beam units (33).
- 7 Connect two electrical connectors (34) to sealed-beam units (33) and install in headlight body (7).



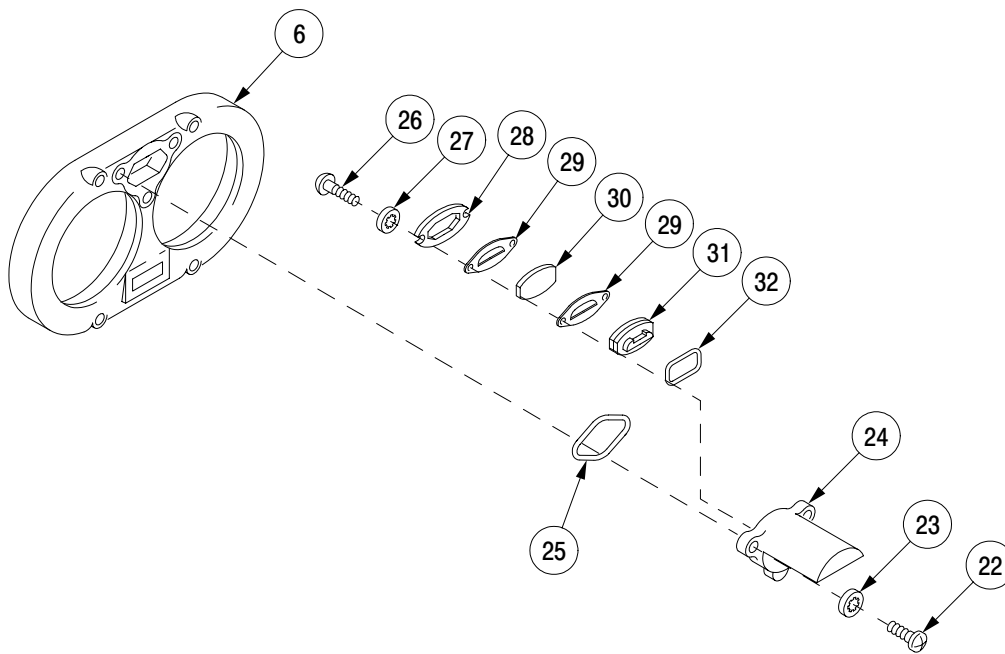
06ph138m

**Section VI. LIGHTS – CONTINUED**

**8-35 HEADLIGHT ASSEMBLY – CONTINUED**

**c. Assembly – Continued**

- 8 Apply sealing compound to new seal (32).
- 9 Install new seal (32) on guard (24).
- 10 Install lens (31), two new gaskets (29), filter (30) and lens retainer (28) on guard (24) with two screws (26) and two new lockwashers (27).
- 11 Install guard (24) with seal (25) on cover (6) with three screws (22) and three new lockwashers (23).



06ph139m

---

## Section VI. LIGHTS – CONTINUED

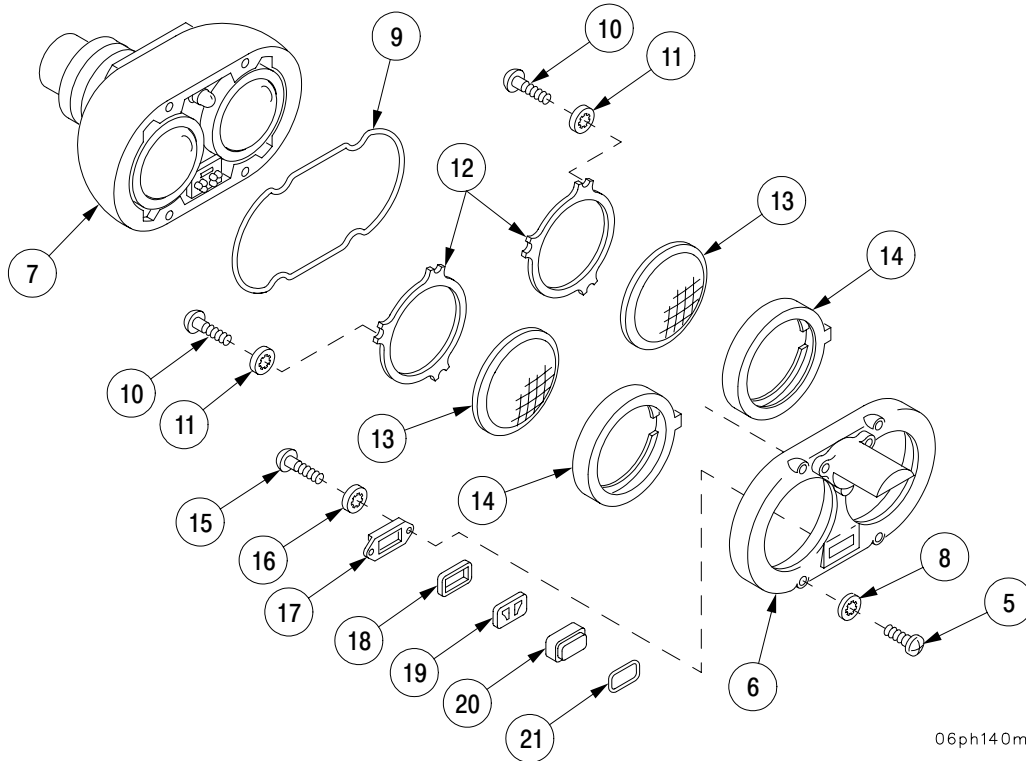
---

### 8-35 HEADLIGHT ASSEMBLY – CONTINUED

---

#### c. Assembly – Continued

- 12 Apply sealing compound to new seal (21).
- 13 Install new seal (21) on cover (6).
- 14 Install bezel (17), new seal (18), filter (19), and lens (20) on cover (6) with two screws (15) and two new lockwashers (16).
- 15 Install two new gaskets (14), two lenses (13), and two retainers (12) on cover (6) with six screws (10) and six new lockwashers (11).
- 16 Apply adhesive to new seal (9).
- 17 Install new seal (9) in groove of cover (6).
- 18 Install four screws (5) and four new lockwashers (8) in cover (6).
- 19 Install cover (6) on headlight body (7) with four screws (5).



---

**Section VI. LIGHTS – CONTINUED**

---

**8-35 HEADLIGHT ASSEMBLY – CONTINUED**

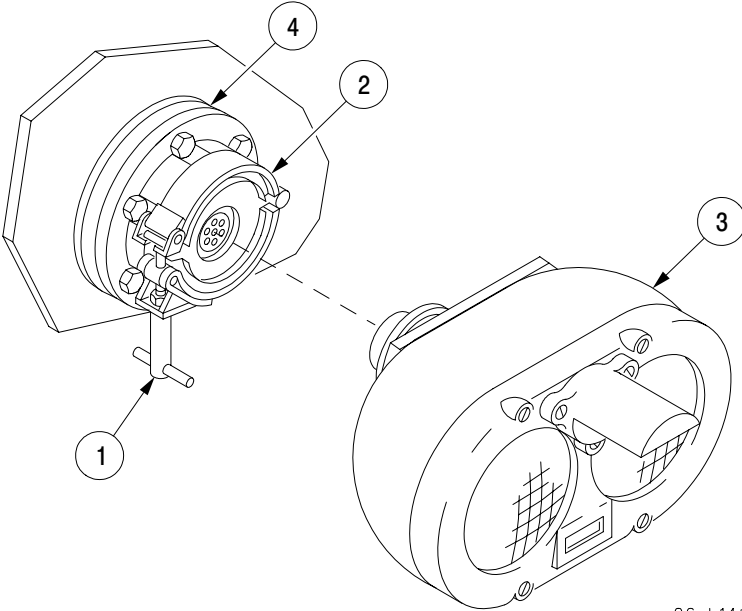
---

**d. Installation.**

**CAUTION**

Do not twist headlight assembly during installation.  
Damage to connectors may result.

- 1 Position headlight assembly (3) in mount (4) and install retaining clamp (2).
- 2 Turn T-handle (1) and tighten retaining clamp (2).



06ph141m

---

**Section VI. LIGHTS – CONTINUED**

---

**8-35 HEADLIGHT ASSEMBLY – CONTINUED**

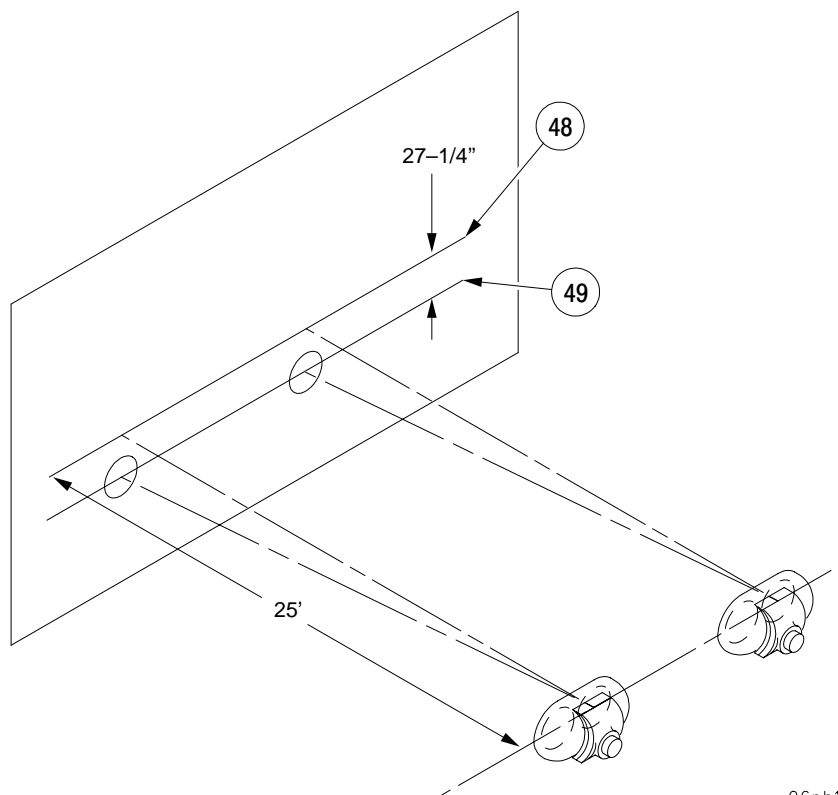
---

**e. Alignment.**

**NOTE**

Alignment of lights should be performed in shaded or dimly lit areas.

- 1 Measure the distance from the center of the sealed lamp unit (service side, clear) to the ground. Duplicate this measurement on the wall, drawing a horizontal centerline (48) of lamp unit.
- 2 Draw a line (49) parallel to, and 27-1/4 inches (69.2cm) below, line (48).
- 3 Turn lights on low beam. Center of right and left beam should be on line (49). Adjust, if necessary.



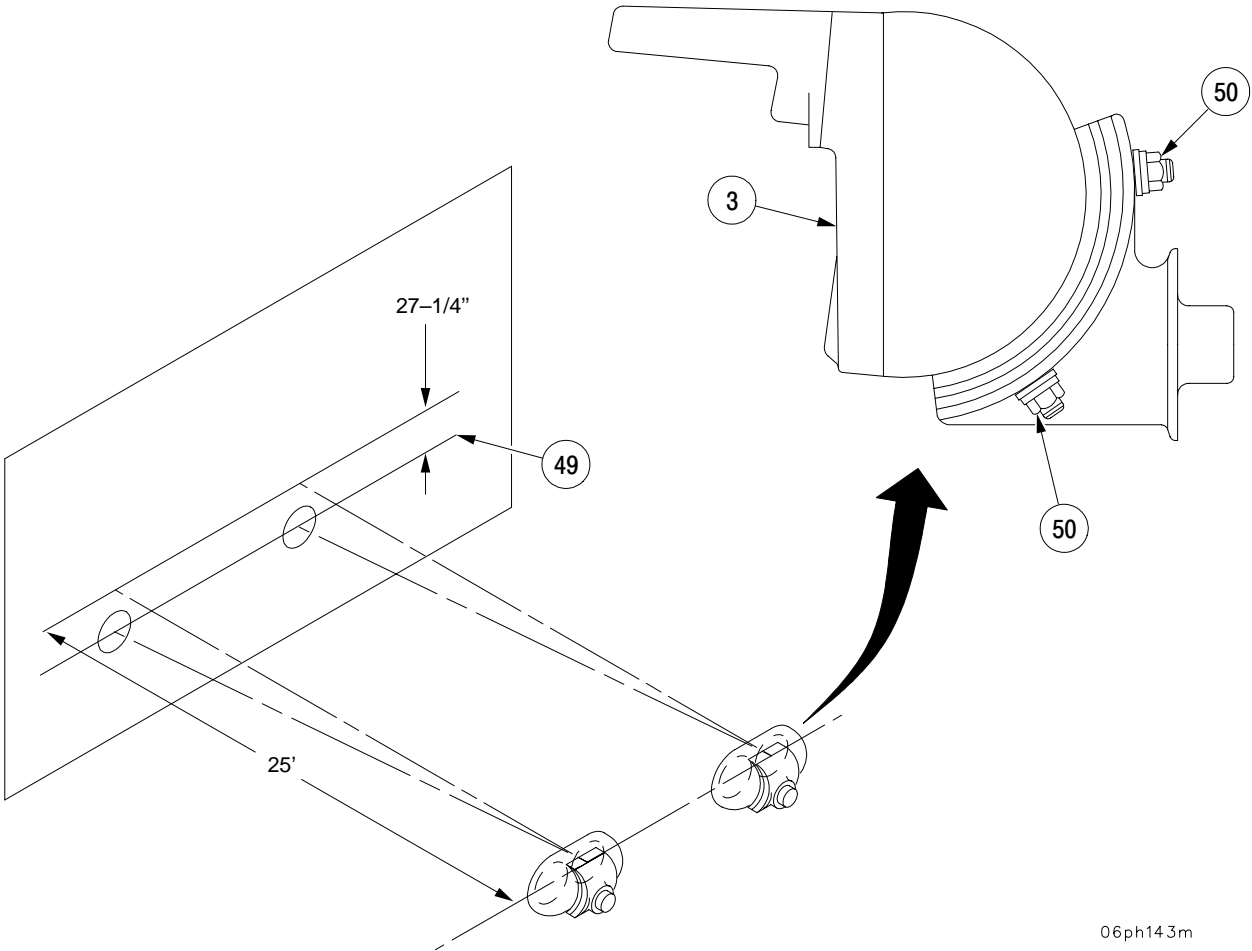
06ph142m

**Section VI. LIGHTS – CONTINUED**

**8-35 HEADLIGHT ASSEMBLY – CONTINUED**

**f. Adjustment.**

- 1 Remove headlight assembly (3).
- 2 Loosen four nuts (50).
- 3 Install headlight assembly (3).
- 4 Manually adjust headlight assembly (3) so that center of low beam is on line (49).
- 5 Remove headlight assembly (3).
- 6 Tighten four nuts (50).
- 7 Install headlight assembly (3).



06ph143m



**Section VI. LIGHTS – CONTINUED**

**8-36 HEADLIGHT MOUNT – CONTINUED**

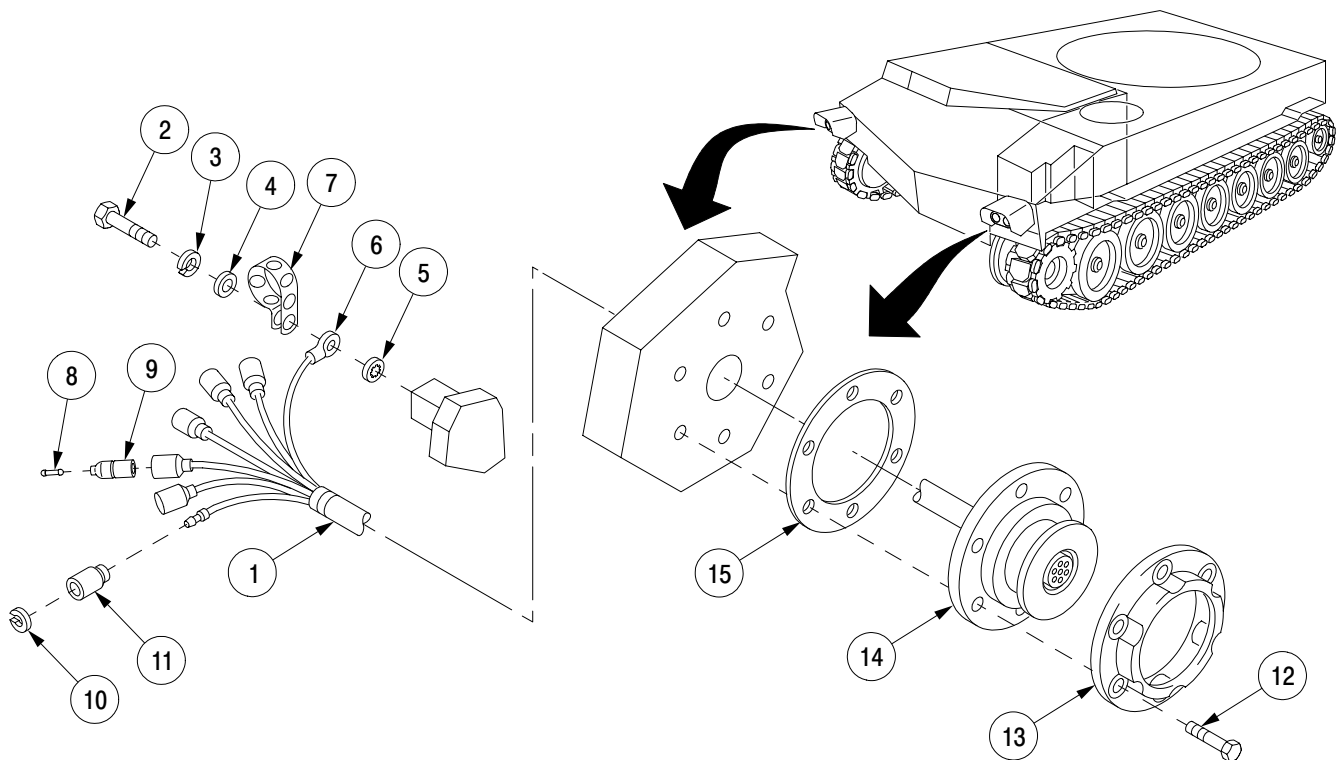
**b. Installation.**

- 1 Install new gasket (15), mount (14), retainer (13), and six screws (12).
- 2 Install shells (11) and C-washers (10) on harness leads (1).

**NOTE**

- Step 3 applies to right headlight assembly only.
- Wire 19 on right side only, is not used.

- 3 Install shell (9) and plug (8) to harness lead wire 19.
- 4 Install ground lead (6) and strap (7) with screw (2), new lockwashers (3 and 5), and flat washer (4).
- 5 Connect headlight mount harness terminals (1) to wiring harness W113 in vehicle.



06ph144m

**NOTE**

**FOLLOW-ON MAINTENANCE:**  
 Install radiator surge tank (right headlight mount)  
 (para 7-3)  
 Install headlight assembly (para 8-35)  
 Connect battery ground leads (para 8-33)



## Section VI. LIGHTS – CONTINUED

---

### 8-37 SERVICE AND BLACKOUT TAILLIGHTS, STOPLIGHTS, AND LAMPS.

---

This task covers:

a. Removal

b. Installation

---

#### INITIAL SETUP

##### Tools

General mechanic's tool kit  
(SC 5180-90-N26)

##### Materials/Parts

Lockwashers (2) (item 3, Appx E)  
Silicone compound (item 58, Appx C)

##### Equipment Conditions

Vehicle MASTER switch OFF  
(TM 9-2350-314-10)  
Battery ground leads disconnected  
(para 8-33)  
Power receptacle guard removed  
(right taillight) (para 8-92)  
Wiring harness hull rear access covers  
removed (para 8-102)

##### References

TM 9-2350-314-10

---

#### a. Removal.

#### NOTE

- Service taillight assembly has three electrical leads and three lamps. Blackout taillight assembly has two electrical leads and two lamps.
- Taillight need not be removed from vehicle to replace lamps.
- Tag all electrical connections and electrical leads prior to removal to aid in installation.
- Perform Removal steps 1, 3, and 4 and Installation steps 3 and 5 for replacement of service taillight.
- Perform Removal steps 2 thru 4 and Installation steps 3 and 4 for replacement of blackout taillight.
- Perform Removal steps 5 and 6 and Installation steps 1 and 2 for replacement of lamps.

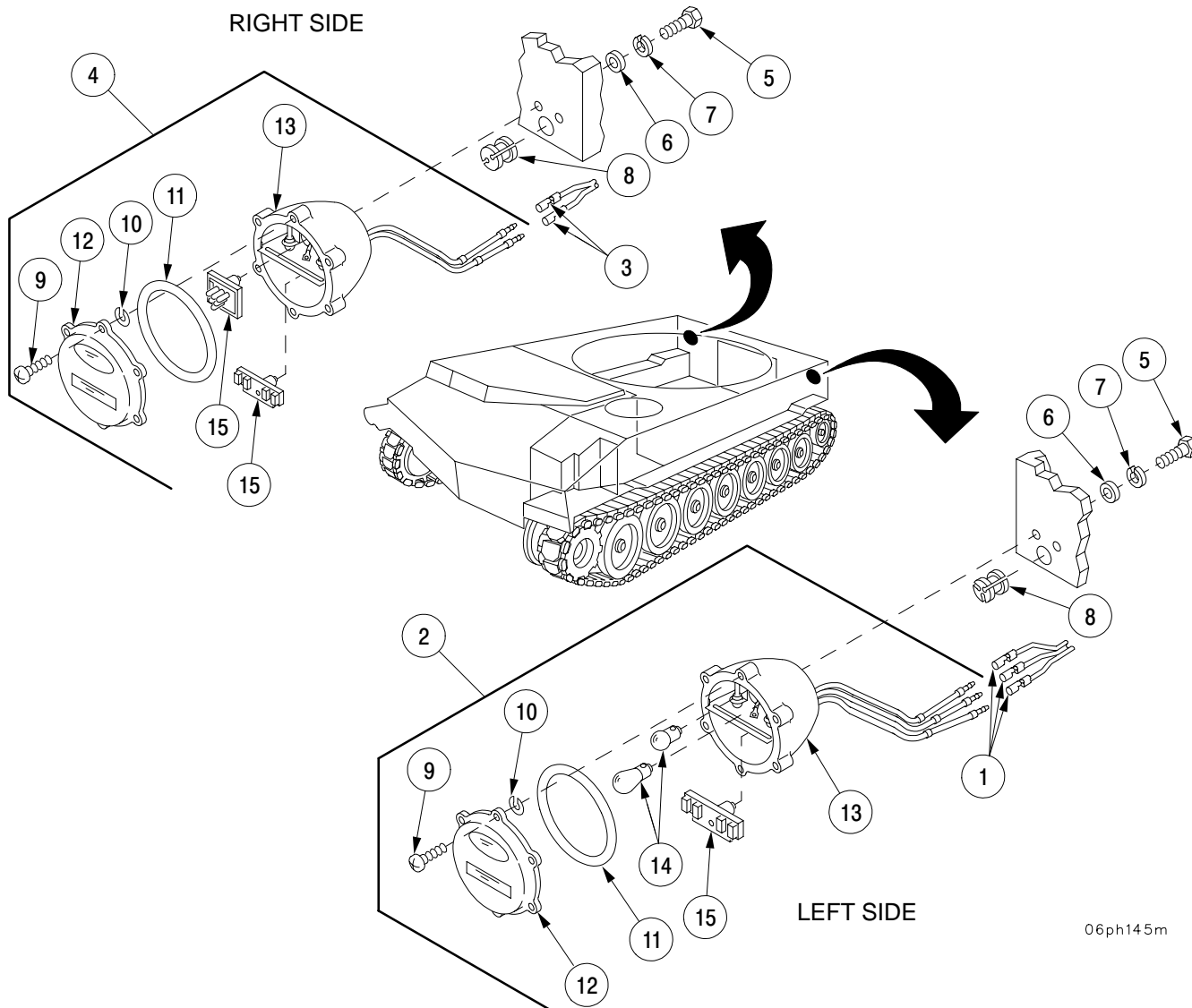
- 1 Disconnect wiring harness W115 wires 21/22/24 (1) from service taillight (2).
- 2 Disconnect wiring harness W115 wires 23/24 (3) from blackout taillight (4).

**Section VI. LIGHTS – CONTINUED**

**8-37 SERVICE AND BLACKOUT TAILLIGHTS, STOPLIGHTS, AND LAMPS – CONTINUED**

**a. Removal – Continued**

- 3 Remove two screws (5), two flat washers (6), and two lockwashers (7) from inside hull. Discard lockwashers.
- 4 Remove taillight assembly (2 or 4) with grommet (8) and electrical leads (1 or 3) from outside hull.
- 5 Remove six screws (9), six retaining rings (10), gasket (11), and door (12) from taillight body (13).
- 6 Remove lamps (14 or 15) from taillight body (13).



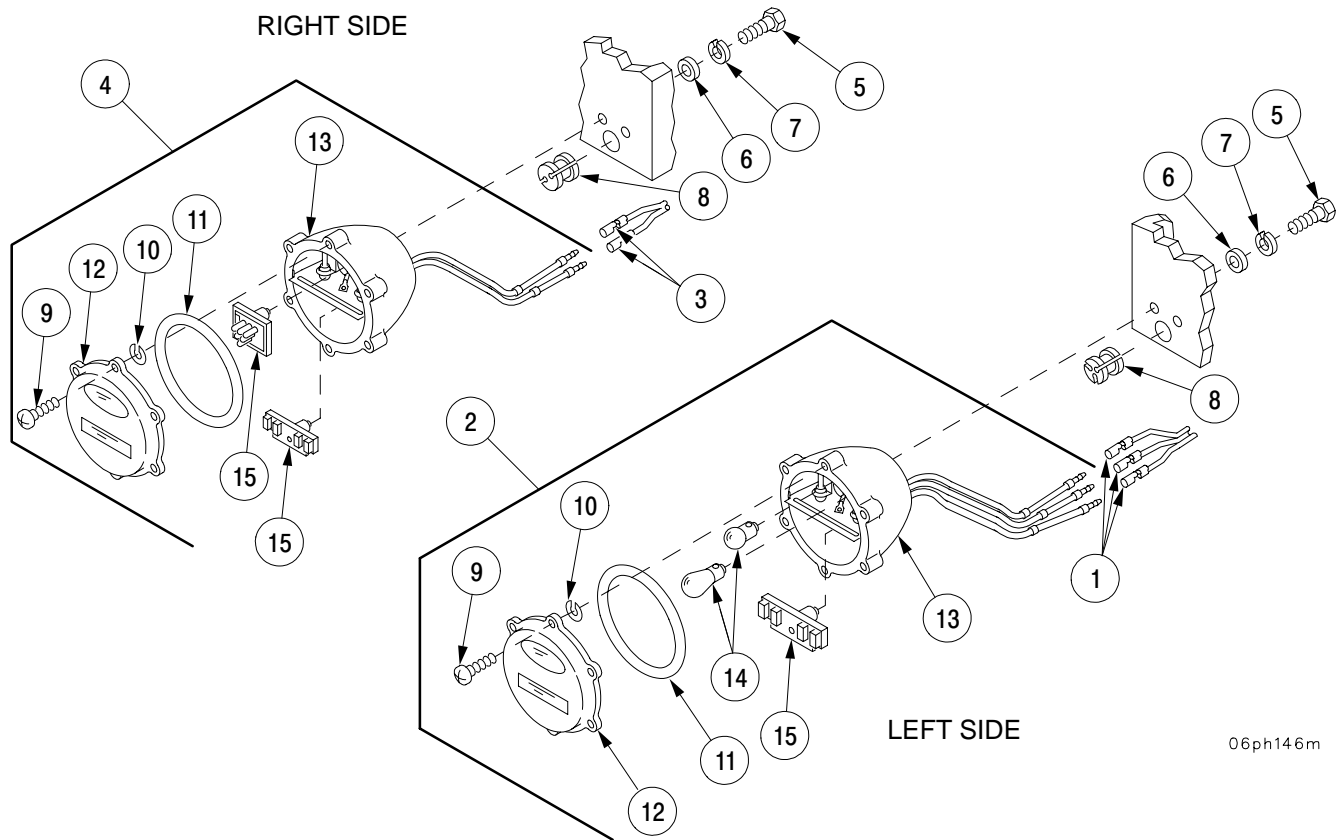
06ph145m

**Section VI. LIGHTS – CONTINUED**

**8-37 SERVICE AND BLACKOUT TAILLIGHTS, STOPLIGHTS, AND LAMPS – CONTINUED**

**b. Installation.**

- 1 Install lamps (14 or 15) in taillight body (13).
- 2 Install door (12) on taillight body (13) with six screws (9), six retaining rings (10), and gasket (11).
- 3 Install taillight assembly (2 or 4) with grommet (8) and electrical leads (1 or 3) on outside of hull with two screws (5), two new lockwashers (7), and two flat washers (6).
- 4 Connect wiring harness W115 wires 23/24 (3) to blackout taillight (4).
- 5 Connect wiring harness W115 wires 21/22/24 (1) to service taillight (2).



06ph146m

**NOTE**

**FOLLOW-ON MAINTENANCE:**  
 Install wiring harness hull rear access covers  
 (para 8-102)  
 Install power receptacle guard  
 (right taillight) (para 8-92)  
 Connect battery ground leads (para 8-33)

---

**Section VI. LIGHTS – CONTINUED**

---

**8-38 DOME LIGHT.**

---

This task covers:    a. Removal                    b. Disassembly                    c. Assembly                    d. Installation

---

**INITIAL SETUP**Tools

General mechanic's tool kit  
(SC 5180-90-N26)

Materials/Parts

Lockwashers (2) (item 172, Appx E)  
Lockwashers (4) (item 159, Appx E)  
Gasket (item 175, Appx E)  
Gasket (item 177, Appx E)  
Lockwashers (4) (item 180, Appx E)  
Lockwashers (3) (item 83, Appx E)  
Nonmetallic seal (item 176, Appx E)  
Nonmetallic seal (item 178, Appx E)  
Preformed packing (item 179, Appx E)  
Sealing compound (item 56, Appx C)

Equipment Conditions

Vehicle MASTER switch OFF  
(TM 9-2350-314-10)  
Battery ground leads disconnected  
(para 8-33)

References

TM 9-2350-314-10

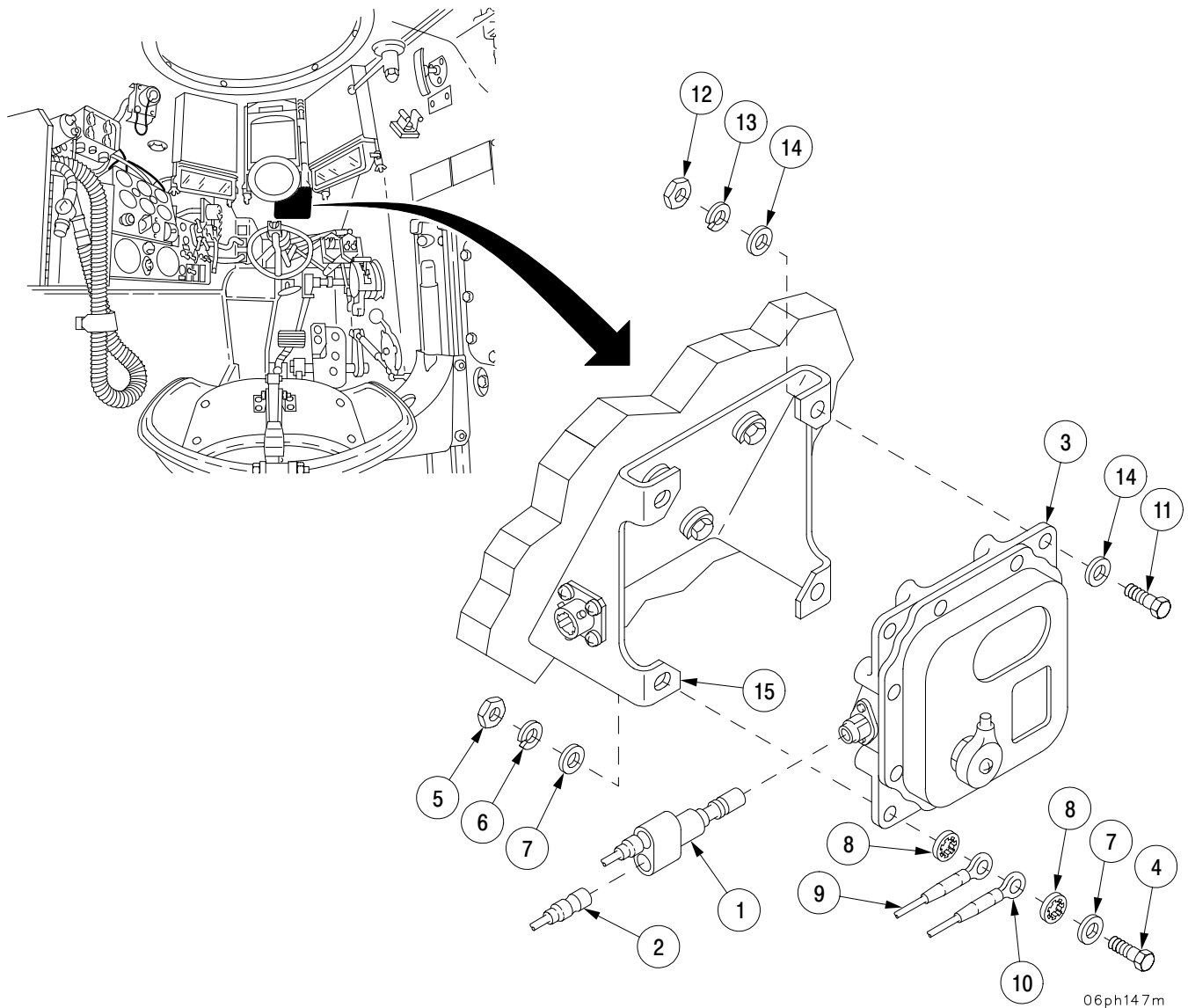
---

Section VI. LIGHTS – CONTINUED

8-38 DOME LIGHT – CONTINUED

a. Removal.

- 1 Disconnect wiring harness W118 lead 628 (1) and W115 lead 38 (2) from dome light (3).
- 2 Remove screw (4), nut (5), lockwasher (6), two flat washers (7), two lockwashers (8), wiring harness W118 lead 7 (9), and W125 lead 7 (10). Discard lockwashers.
- 3 Remove three screws (11), three nuts (12), three lockwashers (13), six flat washers (14), and dome light (3) from bracket (15). Discard lockwashers.



---

**Section VI. LIGHTS – CONTINUED**

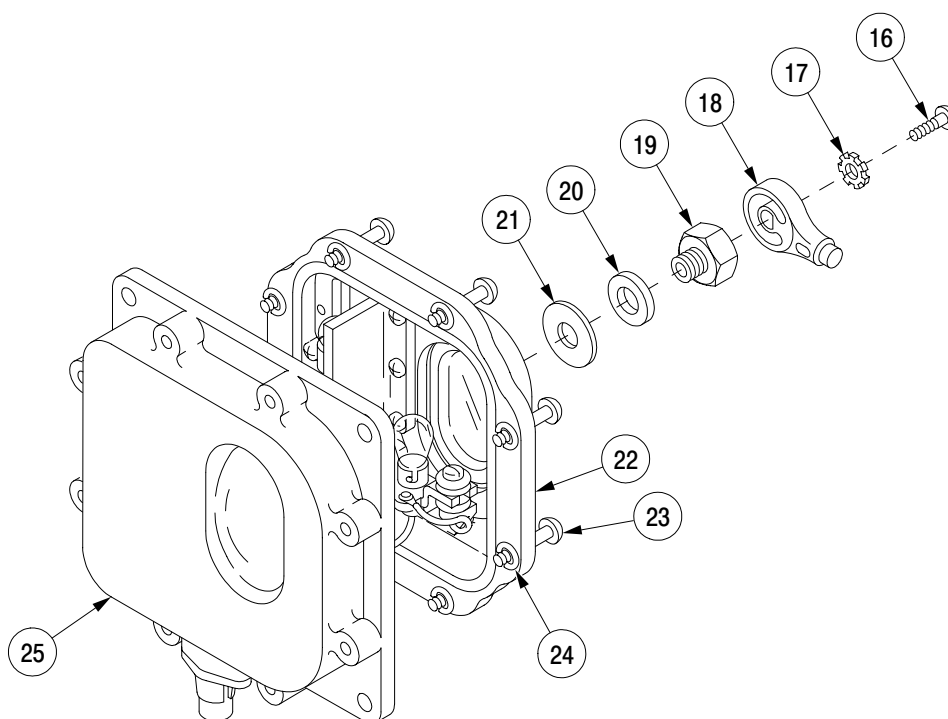
---

**8-38 DOME LIGHT – CONTINUED**

---

**b. Disassembly.**

- 1 Remove screw (16), lockwasher (17), switch knob (18), nut (19), flat washer (20), and gasket (21) from dome light door (22). Discard lockwasher and gasket.
- 2 Loosen eight screws (23) with retaining rings (24).
- 3 Separate dome light door (22) from light body (25).



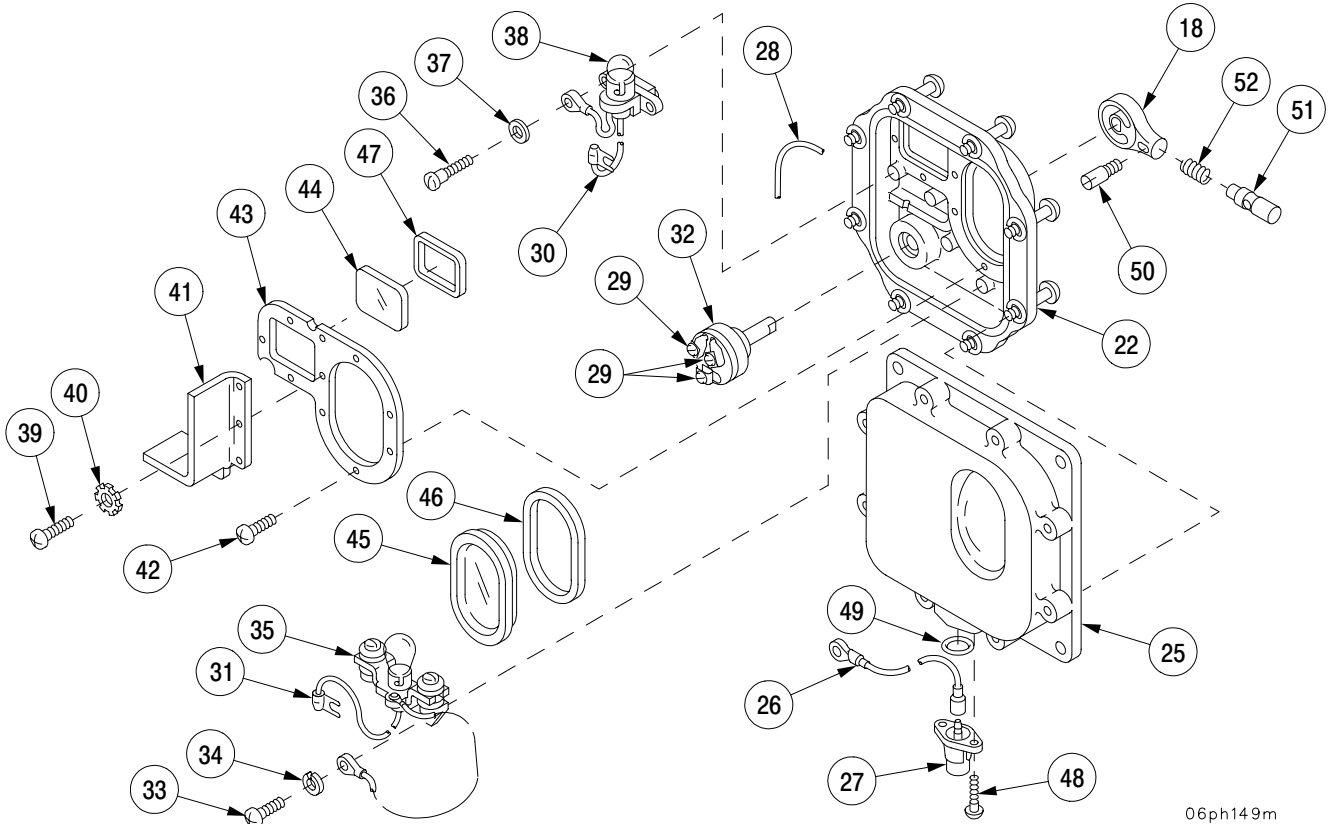
06ph148m

**Section VI. LIGHTS – CONTINUED**

**8-38 DOME LIGHT – CONTINUED**

**b. Disassembly – Continued**

- 4 Disconnect electrical lead (26) at connector (27). Remove dome light door (22) from dome light body (25).
- 5 Remove nonmetallic seal (28) from dome light door (22). Discard seal.
- 6 Loosen three screws (29) and remove three electrical leads (26, 30, and 31) at switch (32). Remove switch (32) from dome light door (22).
- 7 Remove two screws (33), two lockwashers (34), and lamp assembly (35) from dome light door (22).
- 8 Remove two screws (36), two flat washers (37), and lamp assembly (38) from dome light door (22).
- 9 Remove four screws (39), four lockwashers (40), and partition (41) from dome light door (22). Discard lockwashers.
- 10 Remove seven screws (42), plate (43), two lenses (44 and 45), nonmetallic seal (46), and gasket (47) from dome light door (22). Discard seal and gasket.
- 11 Remove two screws (48), connector (27), and preformed packing (49) from dome light body (25). Discard preformed packing.
- 12 Remove setscrew (50), plunger (51), and spring (52) from switch knob (18).



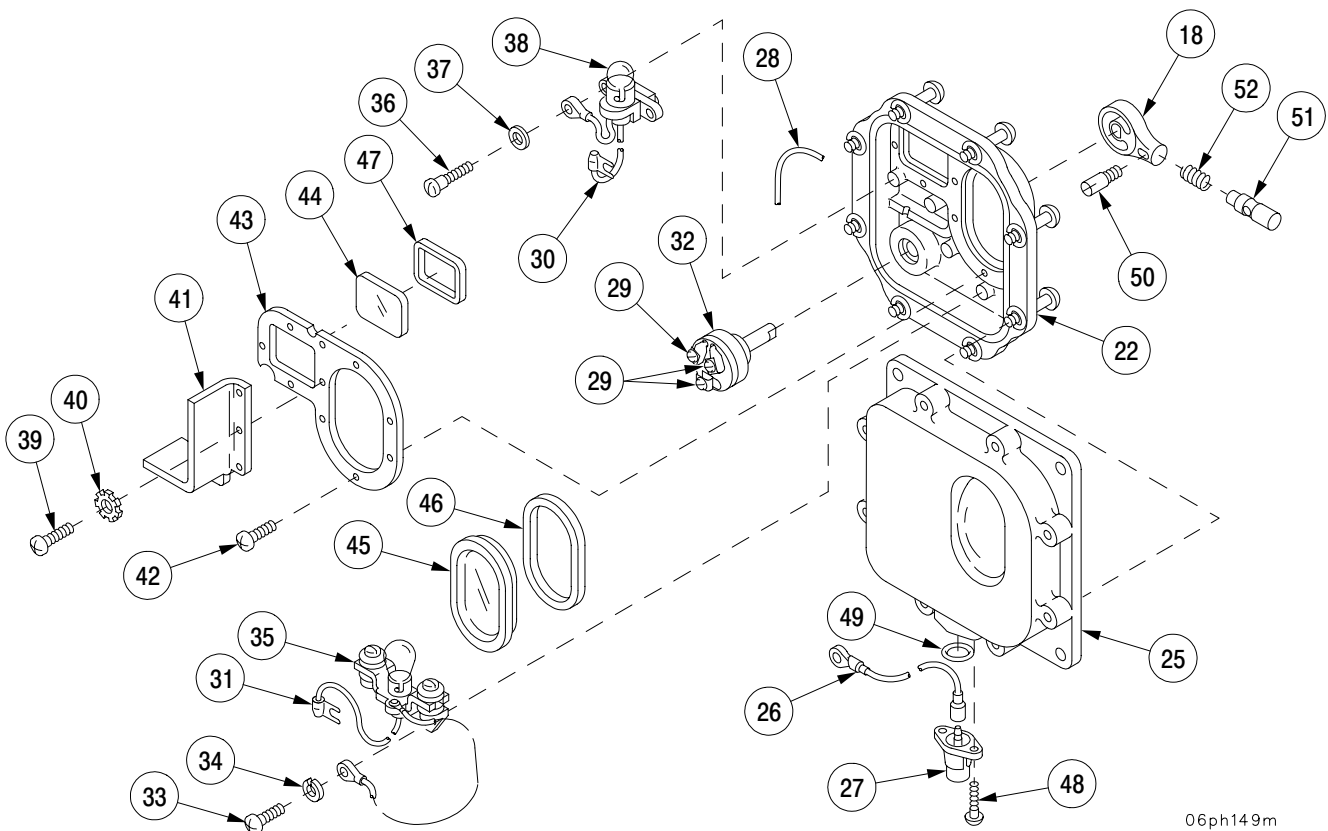
06ph149m

**Section VI. LIGHTS – CONTINUED**

**8-38 DOME LIGHT – CONTINUED**

**c. Assembly.**

- 1 Install spring (52), plunger (51), and setscrew (50) in switch knob (18).
- 2 Install connector (27) in dome light body (25) with new preformed packing (49), and two screws (48).
- 3 Install new gasket (47), new nonmetallic seal (46), two lenses (45 and 44), and plate (43) in dome light door (22) with seven screws (42).
- 4 Install partition (41) in dome light door (22) with four new lockwashers (40) and four screws (39).
- 5 Install lamp assembly (38) in dome light door (22) with two flat washers (37) and two screws (36).
- 6 Install lamp assembly (35) in dome light door (22) with two lockwashers (34) and two screws (33).
- 7 Connect three electrical leads (31, 30, and 26) to switch (32) with three screws (29).
- 8 Connect lead (26) to connector (27) in dome light body (25).
- 9 Install new nonmetallic seal (28) in groove of dome light door (22).



06ph149m



---

## Section VI. LIGHTS – CONTINUED

---

### 8-38 DOME LIGHT – CONTINUED

---

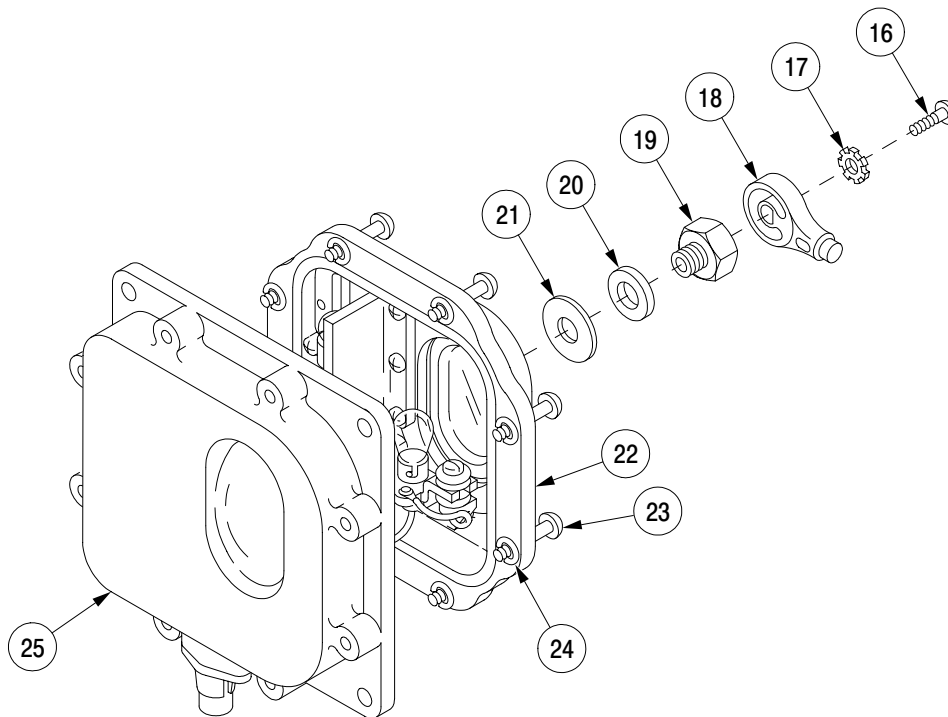
#### c. Assembly – Continued

- 10 Install dome light door (22) on dome light body (25) with eight screws (23) and retaining rings (24).

**WARNING**

Adhesive sealant MIL-S-46163 can damage your eyes. Wear safety goggles/glasses when using; avoid contact with eyes. If sealant contacts eyes, flush eyes with water and get immediate medical attention.

- 11 Apply sealing compound to threads of screw (16).
- 12 Install new gasket (21), flat washer (20), nut (19), switch knob (18), new lockwasher (17), and screw (16) on dome light door (22).



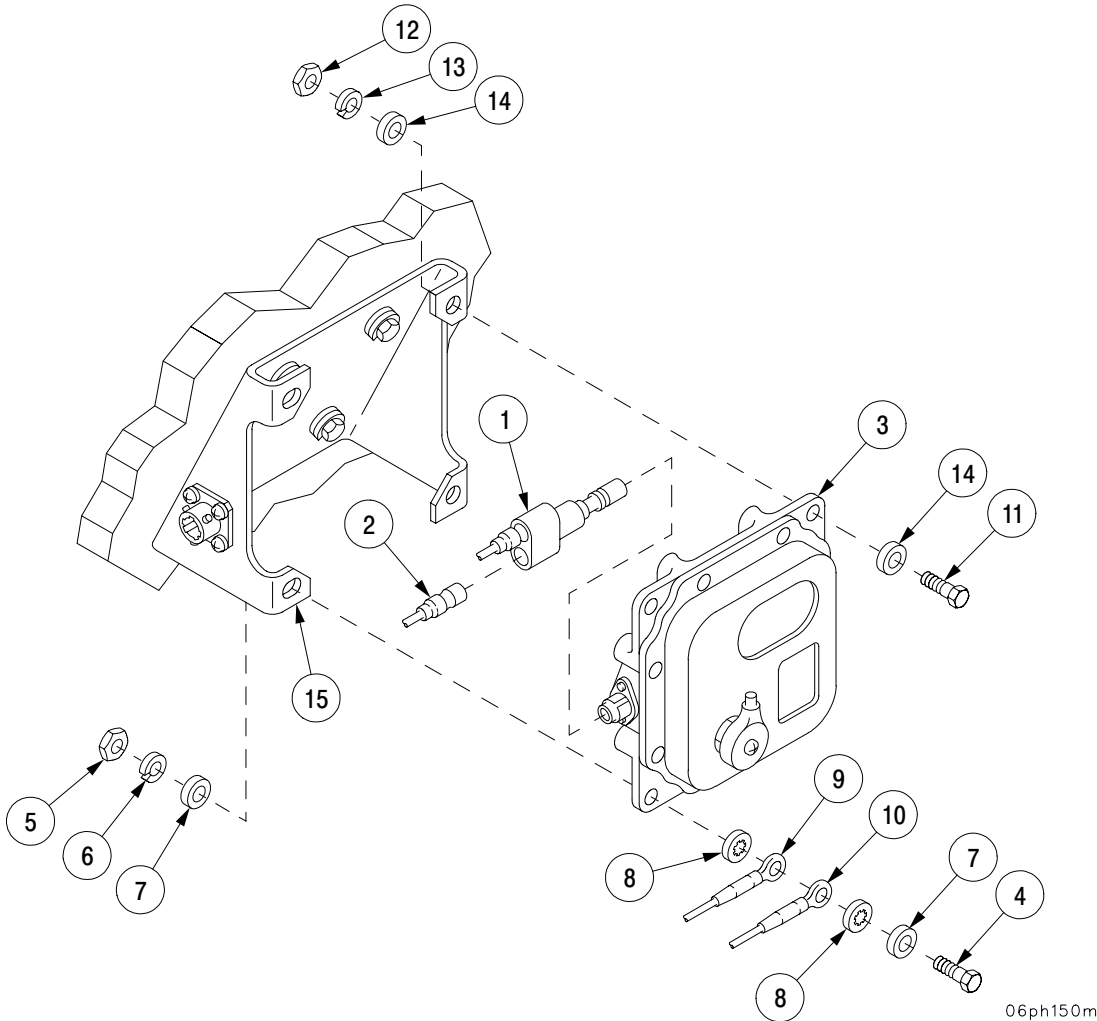
06ph148m

**Section VI. LIGHTS – CONTINUED**

**8-38 DOME LIGHT – CONTINUED**

**d. Installation.**

- 1 Install dome light (3) on bracket (15) with three screws (11), six flat washers (14), three new lockwashers (13), and three nuts (12).
- 2 Install wiring harness W125 lead E27 (10) and W118 lead 7 (9) on dome light (3) with screw (4), two flat washers (7), two new lockwashers (8), new lockwasher (6), and nut (5).
- 3 Connect wiring harness W115 lead 38 (2) and W118 lead 628 (1) to dome light (3).



**NOTE**

**FOLLOW-ON MAINTENANCE:**  
Connect battery ground leads (para 8-33)



---

**Section VI. LIGHTS – CONTINUED**

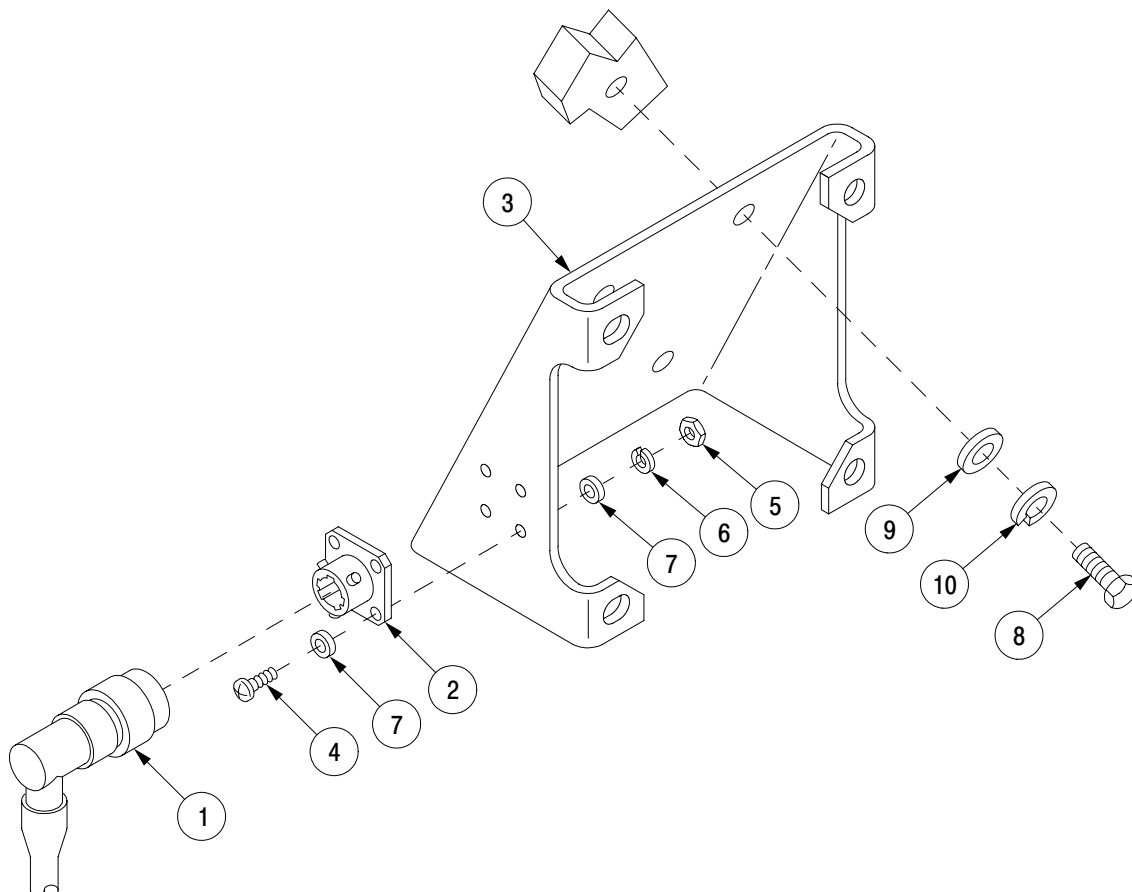
---

**8-39 DOME LIGHT MOUNTING BRACKET – CONTINUED**

---

**b. Installation.**

- 1 Install bracket (3) with four screws (8), four new lockwashers (10), and four flat washers (9).
- 2 Install stowage connector (2) with four screws (4), eight flat washers (7), four new lockwashers (6), and four nuts (5).
- 3 Connect wiring harness W118 connector P1 (1) to stowage connector (2) on bracket (3).



06ph152m

**NOTE**

**FOLLOW-ON MAINTENANCE:**  
Install dome light (para 8-38)



---

**Section VI. LIGHTS – CONTINUED**


---

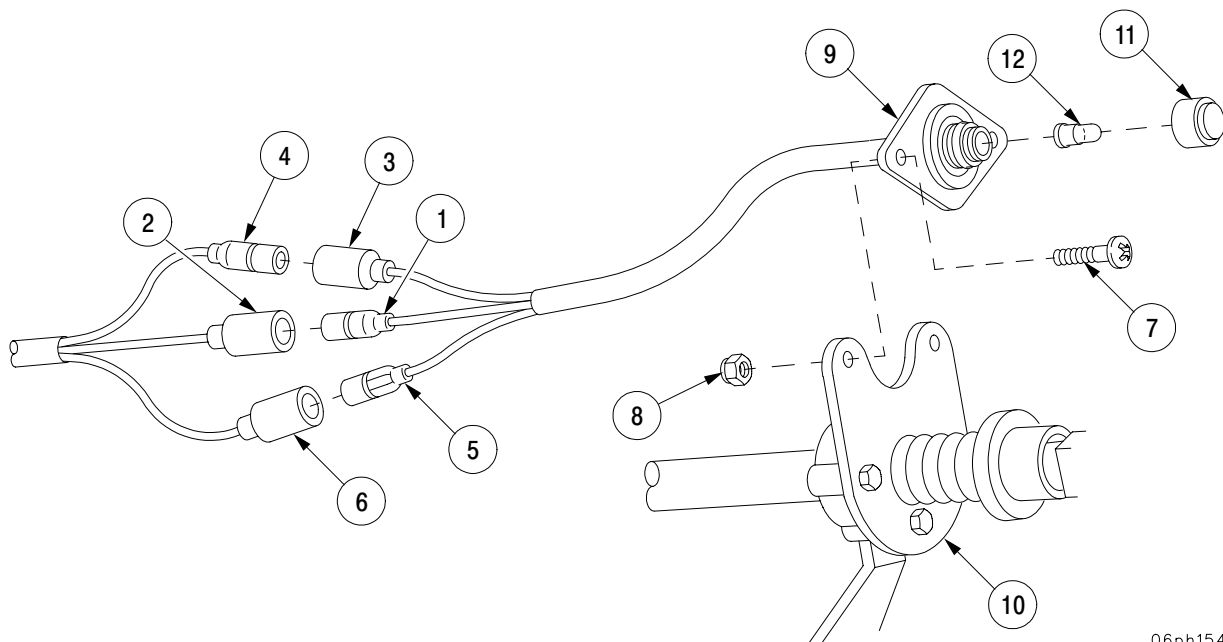
**8-40 WARNING LIGHT ASSEMBLY (STEERING SHAFT) – CONTINUED**


---

**b. Installation.**
**NOTE**

Apply a light coat of anti-corrosion silicone compound to socket before installing new lamp.

- 1 Install warning light lamp (12).
- 2 Install warning light lens cap (11).
- 3 Install warning light assembly (9) in mounting bracket (10) with two screws (7), and two new self-locking nuts (8).
- 4 Connect warning light wire 7 (5) to wiring harness W114 wire 7 (6).
- 5 Connect warning light wire 509 (3) to wiring harness W114 wire 509 (4).
- 6 Connect warning light wire 27 (1) to wiring harness W114 wire 27 (2).



06ph154m

**NOTE**
**FOLLOW-ON MAINTENANCE:**

Connect battery ground leads (para 8-33)

---

## Section VII. SENDING UNITS AND WARNING SWITCHES

---

### 8-41 AIR CLEANER PRESSURE TRANSDUCER.

---

This task covers:      a. Removal                                      b. Installation

---

#### INITIAL SETUP

##### Tools

General mechanic's tool kit  
(SC 5180-90-N26)

##### Equipment Conditions

Vehicle MASTER switch OFF  
(TM 9-2350-314-10)  
Battery ground leads disconnected  
(para 8-33)

##### References

TM 9-2350-314-10

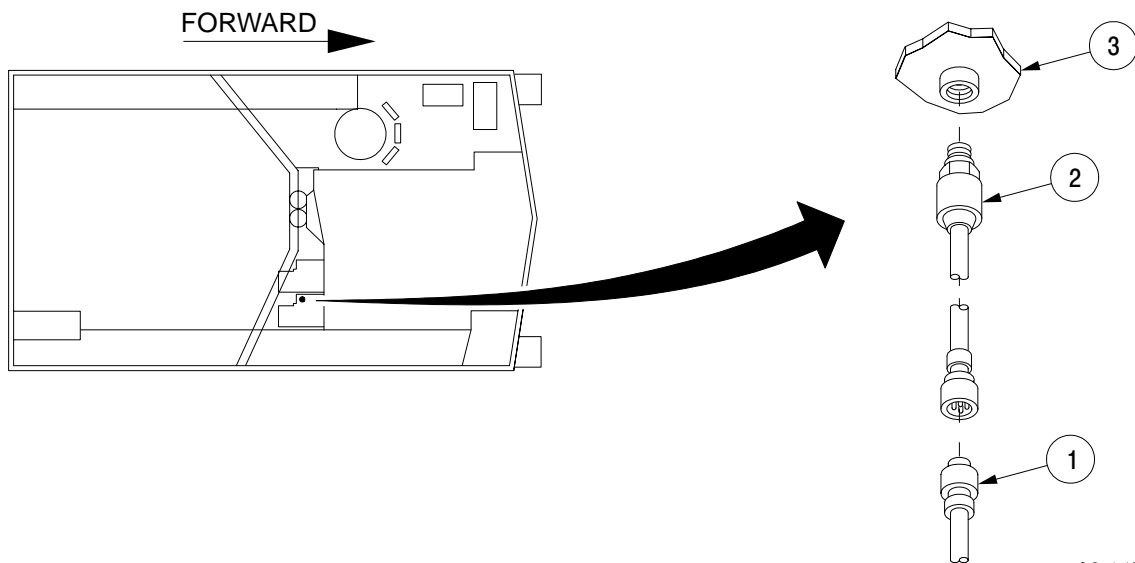
---

#### a. Removal.

- 1 Disconnect wiring harness W100 connector P2 (1) from air cleaner pressure transducer (2).
- 2 Remove air cleaner pressure transducer (2) from air cleaner duct (3).

#### b. Installation.

- 1 Install air cleaner pressure transducer (2) in air cleaner duct (3).
- 2 Connect wiring harness W100 connector P2 (1) to air cleaner pressure transducer (2).



06ph155m

#### NOTE

FOLLOW-ON MAINTENANCE:  
Connect battery ground leads (para 8-33)





---

**Section VII. SENDING UNITS AND WARNING SWITCHES – CONTINUED**

---

**8-42 FUEL PRESSURE DIFFERENTIAL TRANSDUCER – CONTINUED**

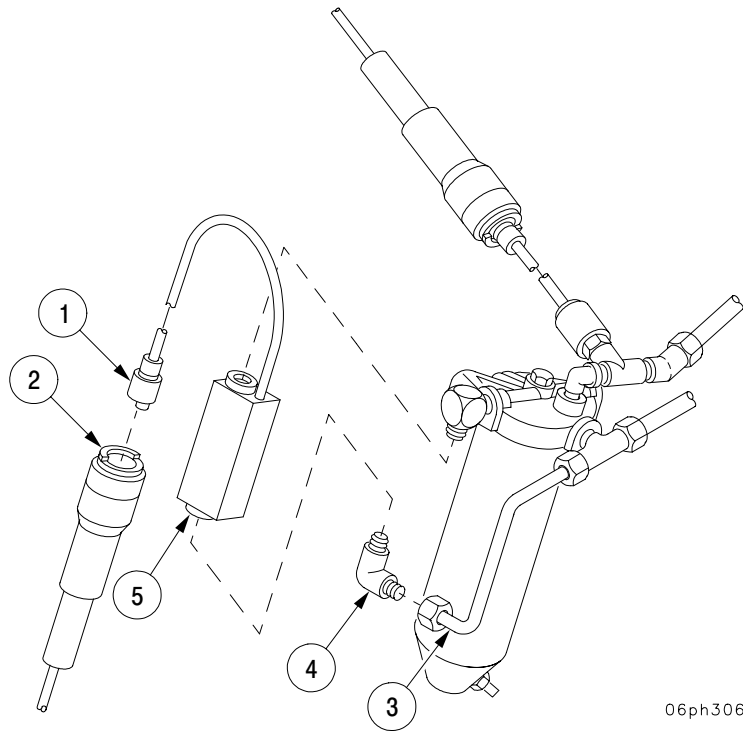
---

**a. Removal – Continued**

- 3 Remove fuel pressure differential transducer (5) with elbow (4) attached.
- 4 Remove elbow (4) from fuel pressure differential transducer (5).

**b. Installation.**

- 1 Install elbow (4) on fuel pressure differential transducer (5).
- 2 Install fuel pressure differential transducer (5) and elbow (4).
- 3 Connect tube (3) to elbow (4).
- 4 Connect connector (1) to harness W102 connector P4 (2).



**NOTE**

**FOLLOW-ON MAINTENANCE:**

- Close and secure transmission access doors (TM 9-2350-314-10)
- Connect battery ground leads (para 8-33)

---

**Section VII. SENDING UNITS AND WARNING SWITCHES – CONTINUED**

---

**8-43 FUEL SUPPLY PRESSURE TRANSDUCER.**

---

This task covers: a. Removal

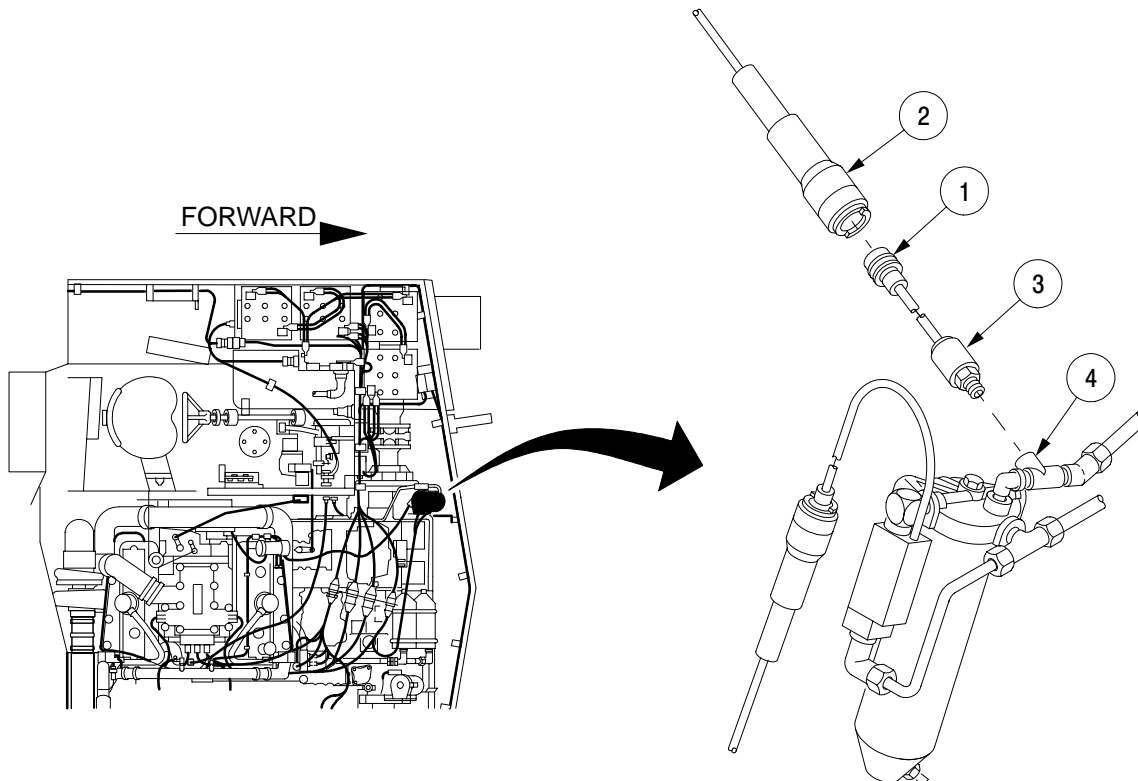
b. Installation

**INITIAL SETUP**ToolsGeneral mechanic's tool kit  
(SC 5180-90-N26)Equipment ConditionsVehicle MASTER switch OFF  
(TM 9-2350-314-10)  
Battery ground leads disconnected  
(para 8-33)  
Transmission access doors open  
(TM 9-2350-314-10)References

TM 9-2350-314-10

**a. Removal.**

- 1 Disconnect connector (1) from harness W102 connector P2 (2).
- 2 Remove fuel supply pressure transducer (3) from tee connector (4).



06ph307m

---

**Section VII. SENDING UNITS AND WARNING SWITCHES – CONTINUED**

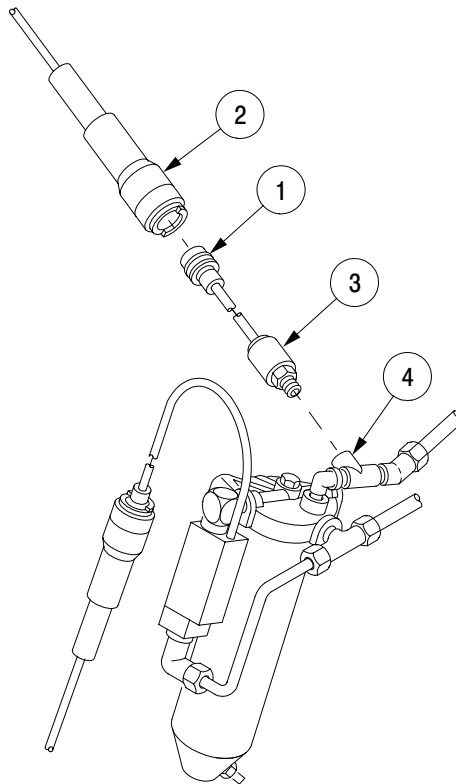
---

**8-43 FUEL SUPPLY PRESSURE TRANSDUCER – CONTINUED**

---

**b. Installation.**

- 1 Install fuel supply pressure transducer (3) on tee connector (4).
- 2 Connect connector (1) to harness W102 connector P2 (2).



06ph308m

**NOTE**

**FOLLOW-ON MAINTENANCE:**

- Close and secure transmission access doors (TM 9-2350-314-10)
- Connect battery ground leads (para 8-33)

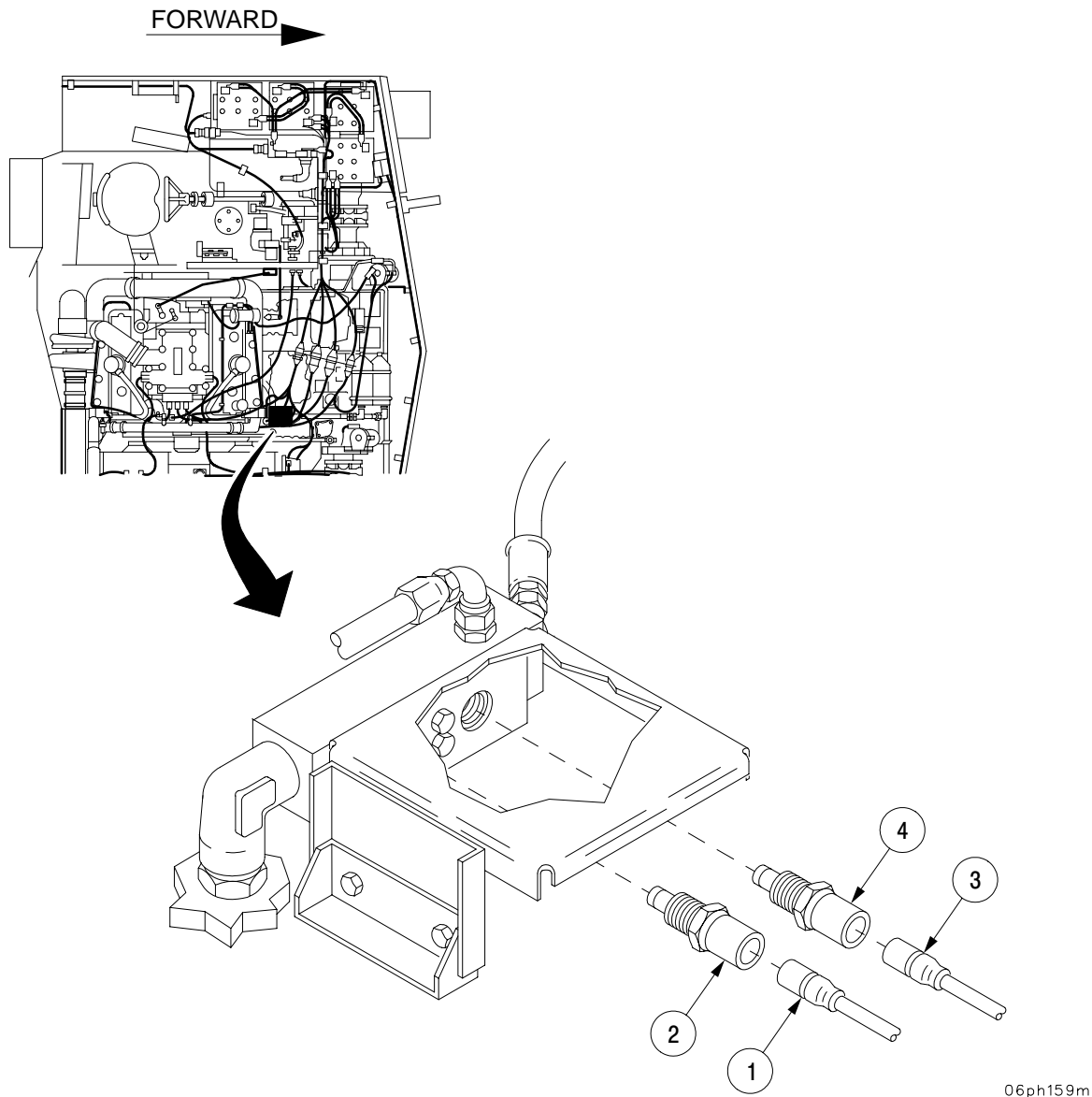




**Section VII. SENDING UNITS AND WARNING SWITCHES – CONTINUED**

**8-45 TRANSMISSION OIL TEMPERATURE TRANSMITTER AND TRANSMISSION OIL HIGH TEMPERATURE SWITCH – CONTINUED**

**b. Installation – Continued**



**NOTE**

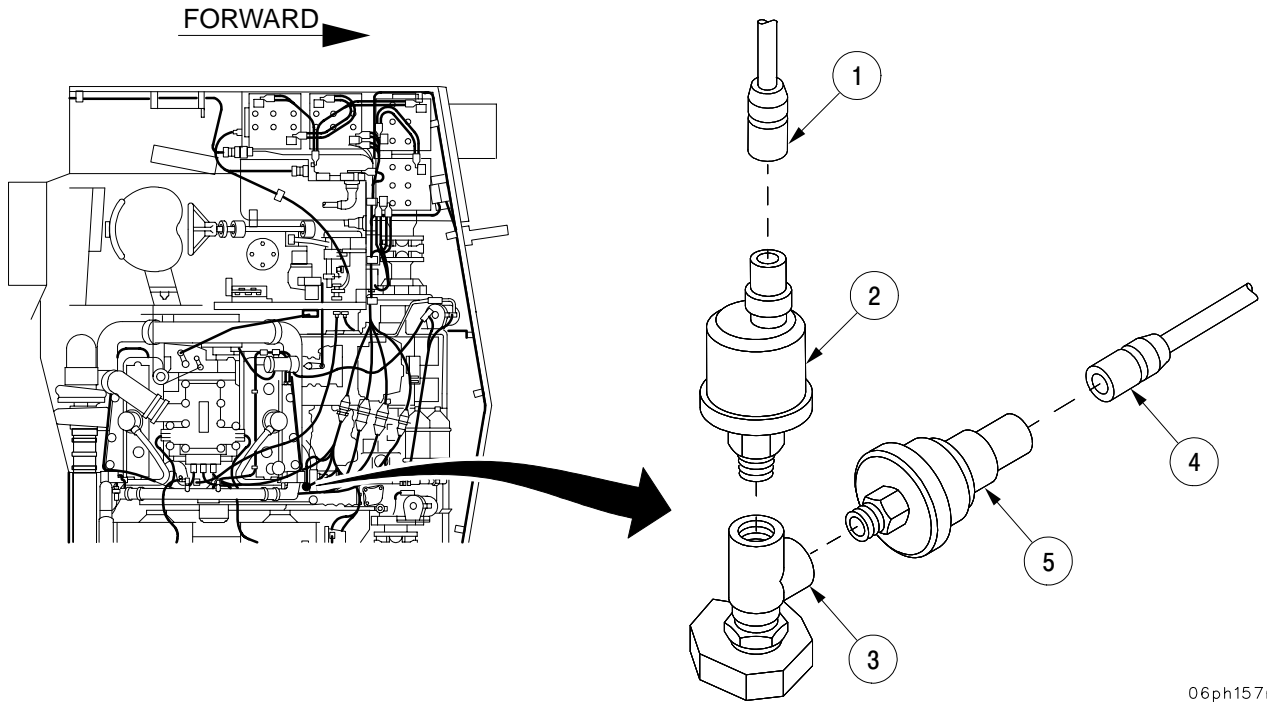
**FOLLOW-ON MAINTENANCE:**  
 Connect battery ground leads (para 8-33)  
 Close and secure air intake grille  
 (TM 9-2350-314-10)



**Section VII. SENDING UNITS AND WARNING SWITCHES – CONTINUED**

**8-46 TRANSMISSION OIL PRESSURE TRANSMITTER AND TRANSMISSION OIL LOW PRESSURE SWITCH – CONTINUED**

**b. Installation – Continued**



06ph157m

**NOTE**

**FOLLOW-ON MAINTENANCE:**  
 Connect battery ground leads (para 8-33)  
 Close and secure air intake grille  
 (TM 9-2350-314-10)



---

## Section VII. SENDING UNITS AND WARNING SWITCHES – CONTINUED

---

### 8-47 ENGINE OIL PRESSURE SWITCH.

---

This task covers:      a. Removal                                      b. Installation

---

#### INITIAL SETUP

Tools

General mechanic's tool kit  
(SC 5180-90-N26)

Equipment Conditions

Vehicle MASTER switch OFF  
(TM 9-2350-314-10)  
Battery ground leads disconnected  
(para 8-33)  
Engine compartment access cover  
removed (para 16-7)

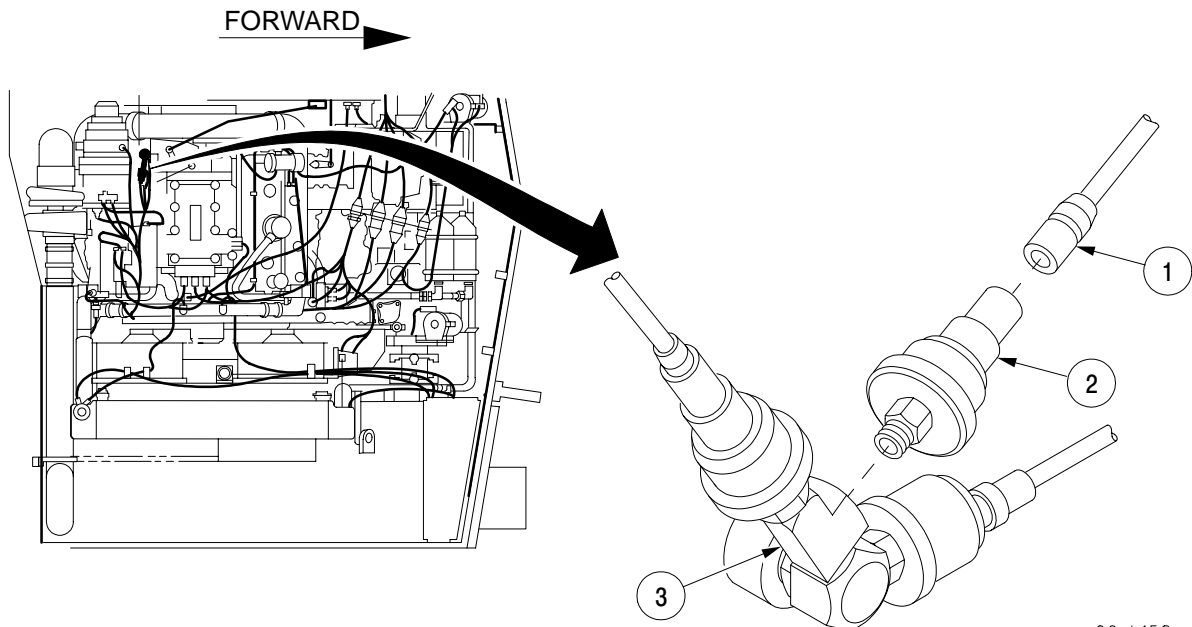
References

TM 9-2350-314-10

---

#### a. Removal.

- 1 Disconnect wiring harness W104 wire 509B (1) from engine oil pressure switch (2).
- 2 Remove switch (2) from tee (3).



---

**Section VII. SENDING UNITS AND WARNING SWITCHES – CONTINUED**

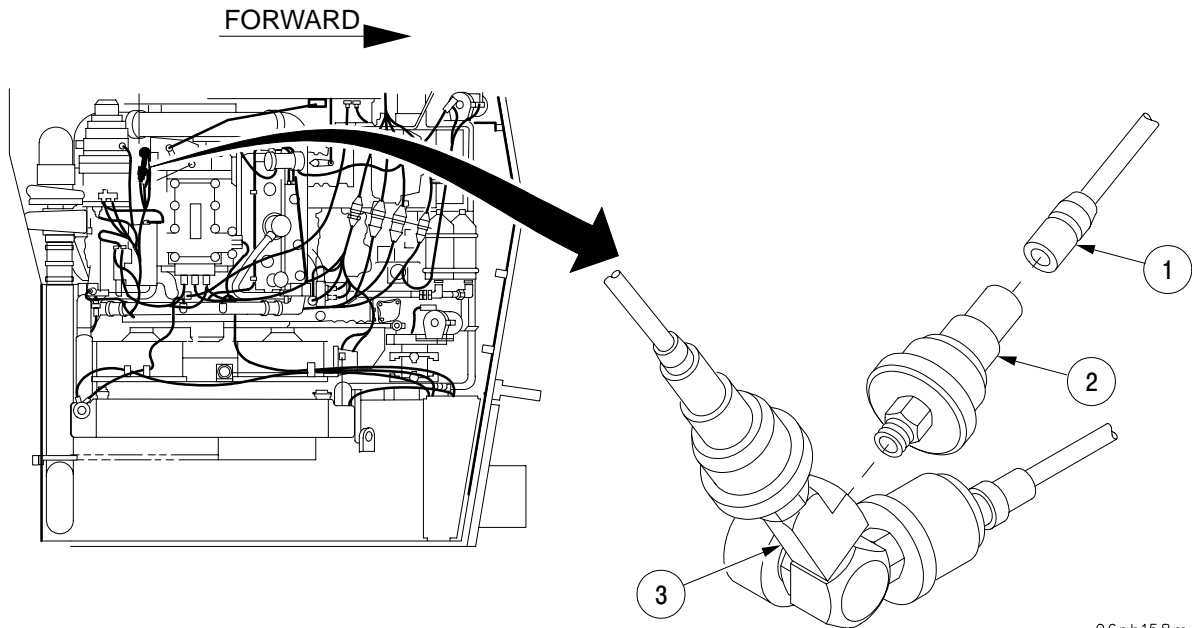
---

**8-47 ENGINE OIL PRESSURE SWITCH – CONTINUED**

---

**b. Installation.**

- 1 Install switch (2) on tee (3).
- 2 Connect wiring harness W104 wire 509B (1) to engine oil pressure switch (2).

**NOTE****FOLLOW-ON MAINTENANCE:**

- Install engine compartment access cover (para 16-7)
- Connect battery ground leads (para 8-33)

---

## Section VII. SENDING UNITS AND WARNING SWITCHES – CONTINUED

---

### 8-48 AIR CLEANER AND GENERATOR SYSTEM RELAY SWITCH.

---

This task covers:

a. Removal

b. Installation

---

#### INITIAL SETUP

##### Tools

General mechanic's tool kit  
(SC 5180-90-N26)

##### Equipment Conditions

Vehicle MASTER switch OFF  
(TM 9-2350-314-10)  
Battery ground leads disconnected  
(para 8-33)  
Engine compartment access cover  
removed (para 16-7)

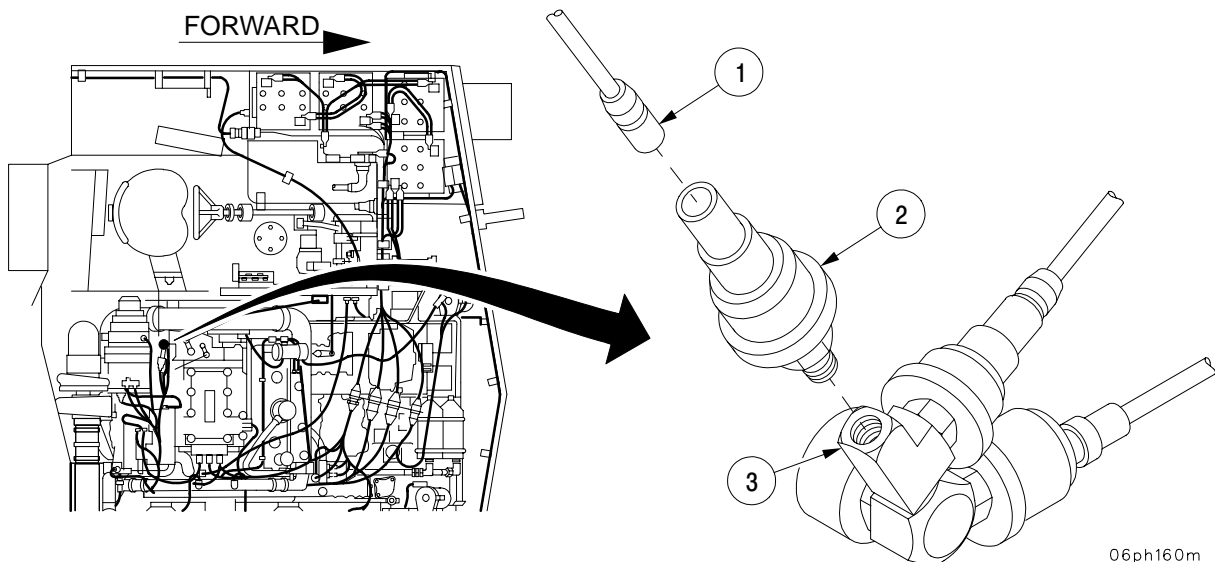
##### References

TM 9-2350-314-10

---

#### a. Removal.

- 1 Disconnect wiring harness W104 wire 415B (1) from air cleaner and generator system relay switch (2).
- 2 Remove switch (2) from tee (3).



---

**Section VII. SENDING UNITS AND WARNING SWITCHES – CONTINUED**

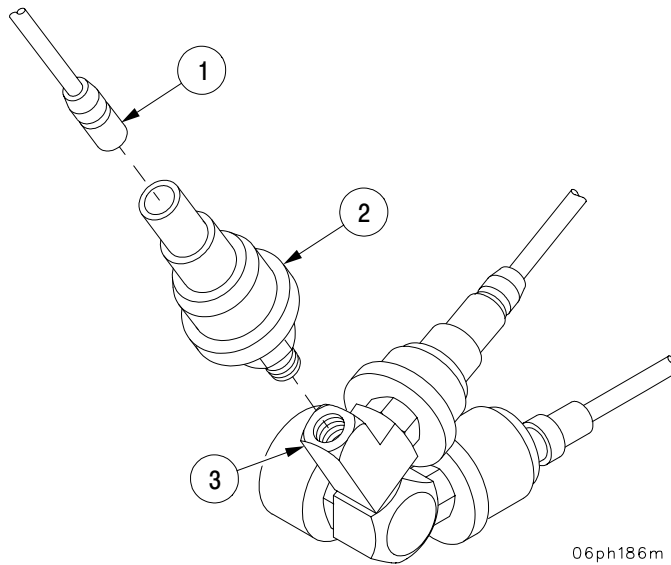
---

**8-48 AIR CLEANER AND GENERATOR SYSTEM RELAY SWITCH – CONTINUED**

---

**b. Installation.**

- 1 Install switch (2) on tee (3).
- 2 Connect wiring harness W104 wire 415B (1) to switch (2).

**NOTE****FOLLOW-ON MAINTENANCE:**

- Install engine compartment access cover (para 16-7)
- Connect battery ground leads (para 8-33)



---

**Section VII. SENDING UNITS AND WARNING SWITCHES – CONTINUED**

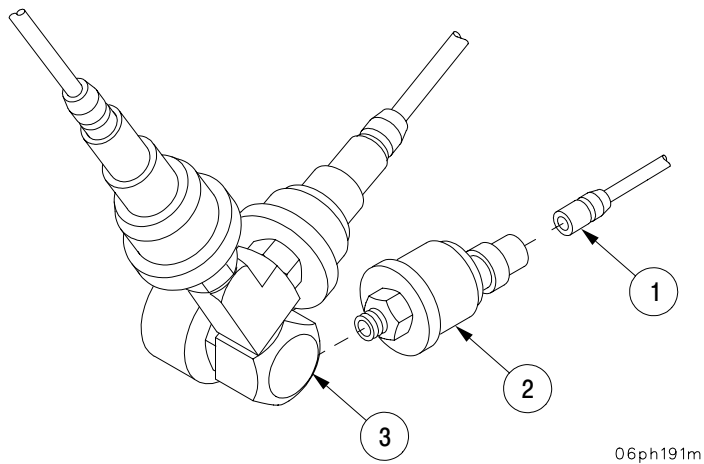
---

**8-49 ENGINE OIL PRESSURE TRANSMITTER – CONTINUED**

---

**b. Installation.**

- 1 Install engine oil pressure transmitter (2) on tee (3).
- 2 Connect wiring harness W104 wire 36 (1) to engine oil pressure transmitter (2).

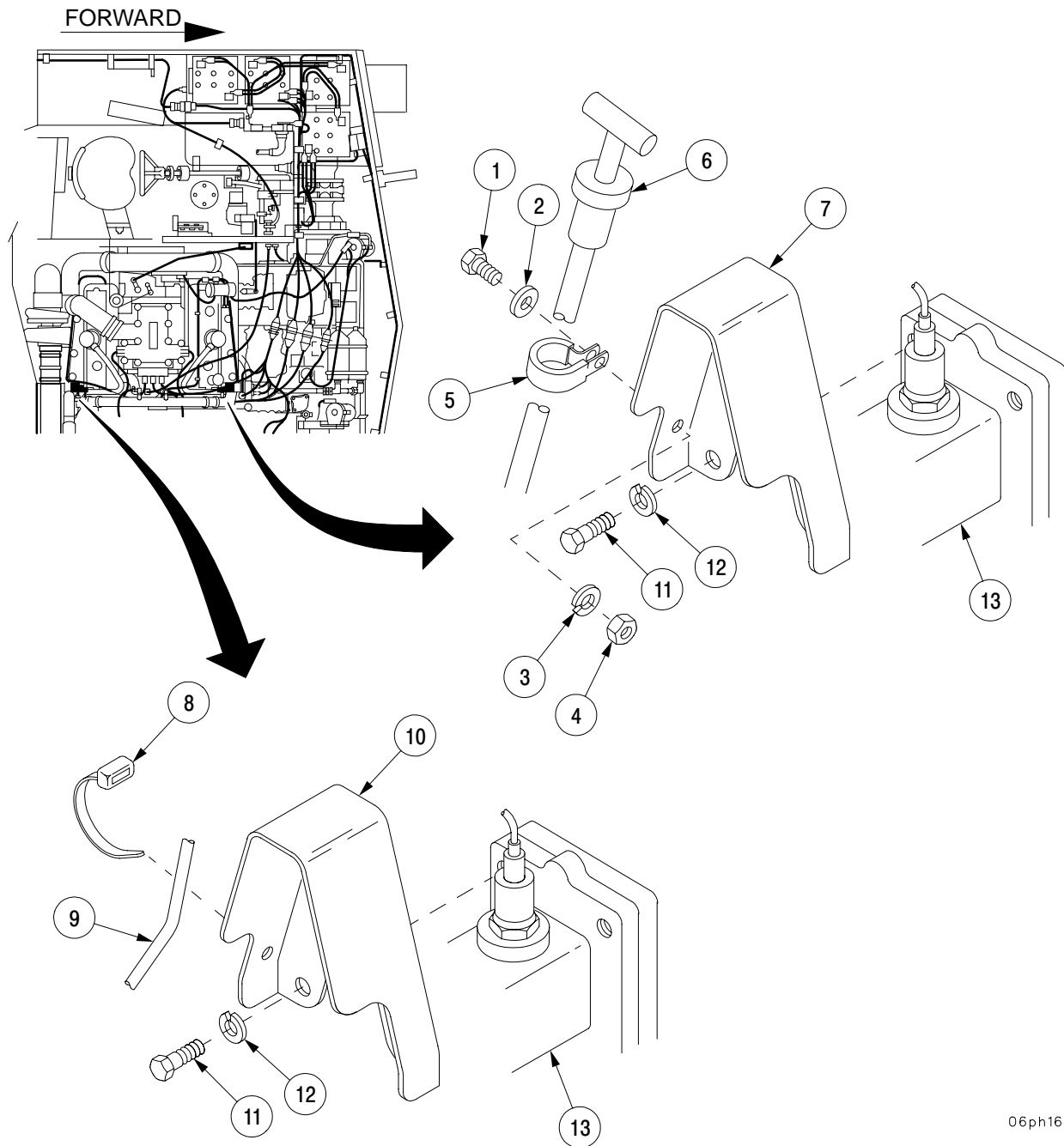
**NOTE****FOLLOW-ON MAINTENANCE:**

- Install engine compartment access cover (para 16-7)
- Connect battery ground leads (para 8-33)



Section VII. SENDING UNITS AND WARNING SWITCHES – CONTINUED

8-50 PROTECTIVE COVER (FRONT AND REAR) – CONTINUED



06ph162m

**NOTE**

**FOLLOW-ON MAINTENANCE:**

- Close and secure air intake grille  
(TM 9-2350-314-10)
- Connect battery ground leads (para 8-33)





---

**Section VII. SENDING UNITS AND WARNING SWITCHES – CONTINUED**

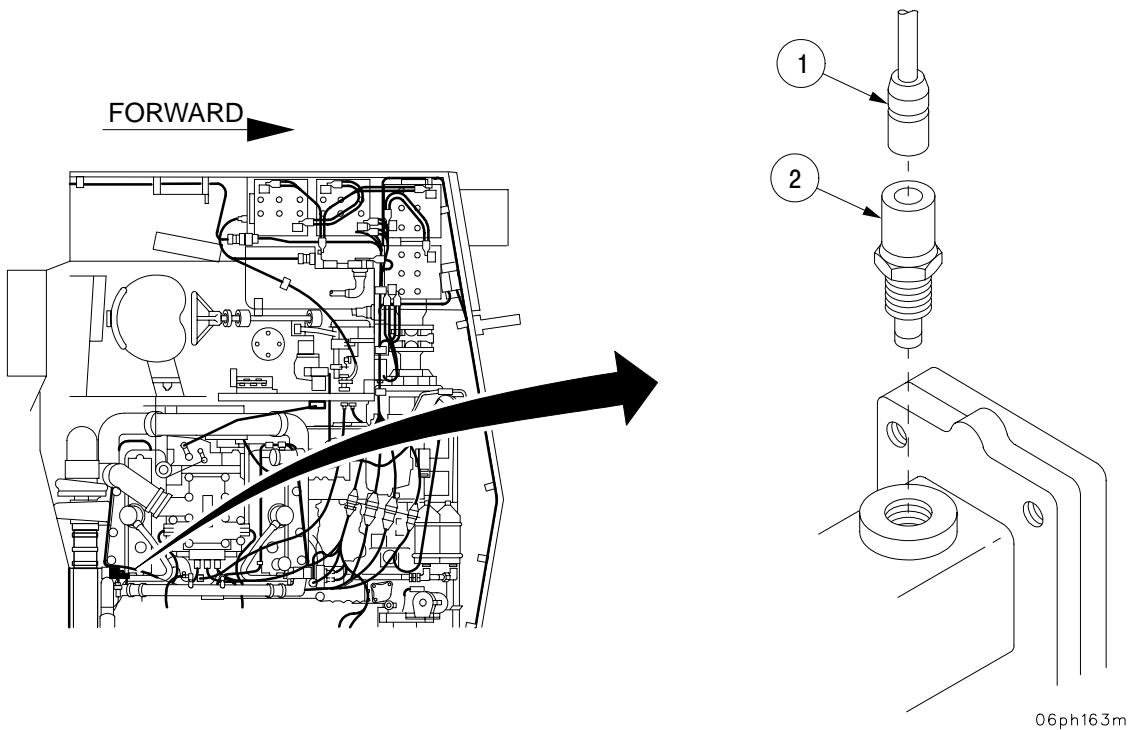
---

**8-51 COOLANT TEMPERATURE TRANSMITTER – CONTINUED**

---

**b. Installation.**

- 1 Install coolant temperature transmitter (2).
- 2 Connect wiring harness W104 wire 33A (1) to coolant temperature transmitter (2).

**NOTE****FOLLOW-ON MAINTENANCE:**

- Fill cooling system (TM 9-2350-314-10)
- Install rear protective cover (para 8-50)
- Close and secure air intake grille (TM 9-2350-314-10)
- Connect battery ground leads (para 8-33)



---

**Section VII. SENDING UNITS AND WARNING SWITCHES – CONTINUED**

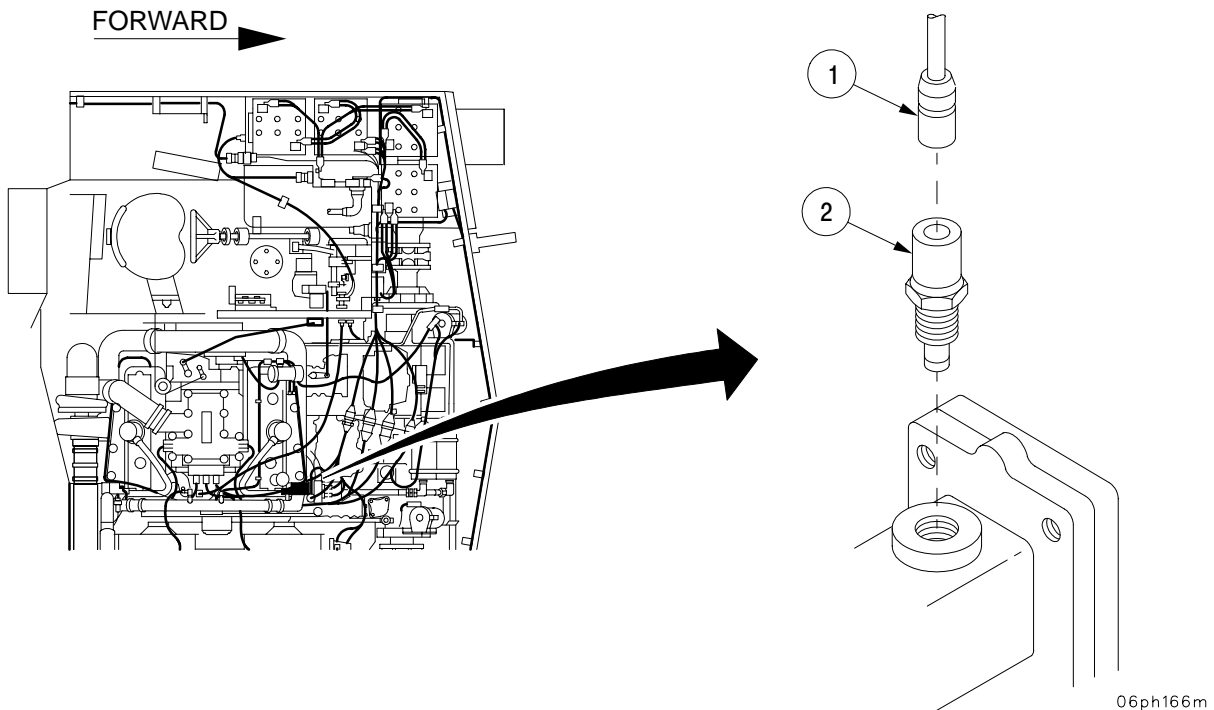
---

**8-52 COOLANT TEMPERATURE SWITCH – CONTINUED**

---

**b. Installation.**

- 1 Install coolant temperature switch (2).
- 2 Connect wiring harness W104 wire 509A (1) on coolant temperature switch (2).

**NOTE****FOLLOW-ON MAINTENANCE:**

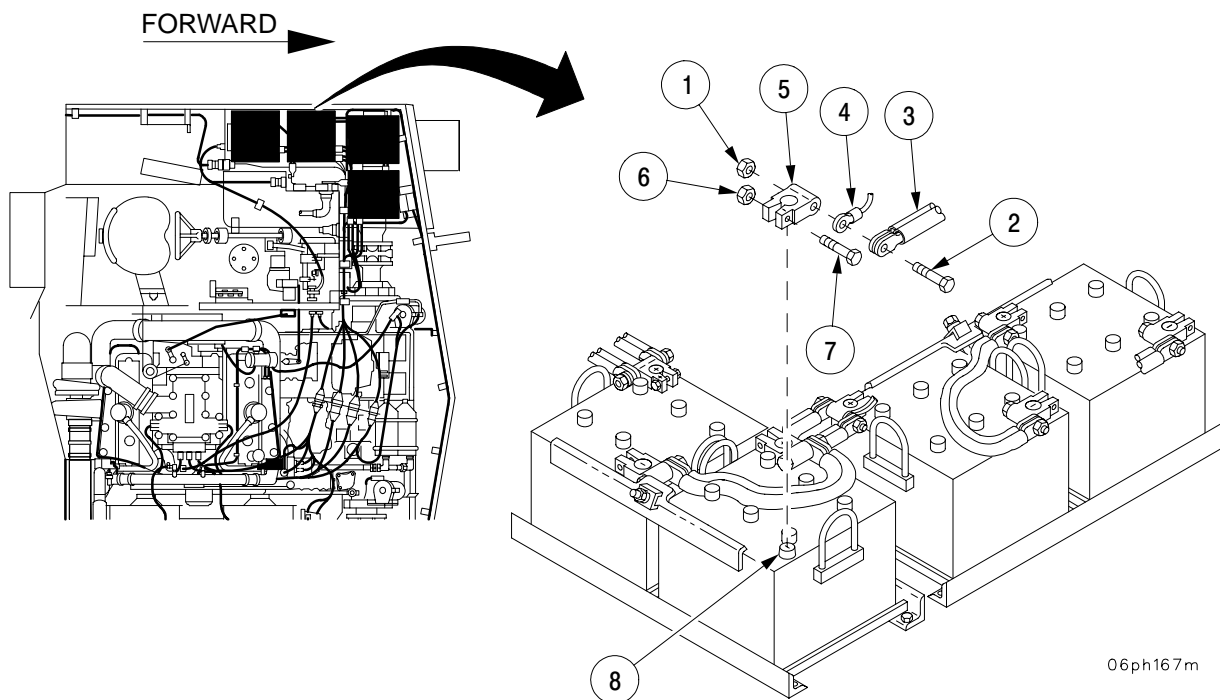
- Fill cooling system (TM 9-2350-314-10)
- Install front protective cover (para 8-50)
- Close and secure air intake grille (TM 9-2350-314-10)
- Connect battery ground leads (para 8-33)



**Section VIII. BATTERIES – CONTINUED**

**8-53 BATTERY TERMINAL LUGS – CONTINUED**

**b. Installation – Continued**



06ph167m

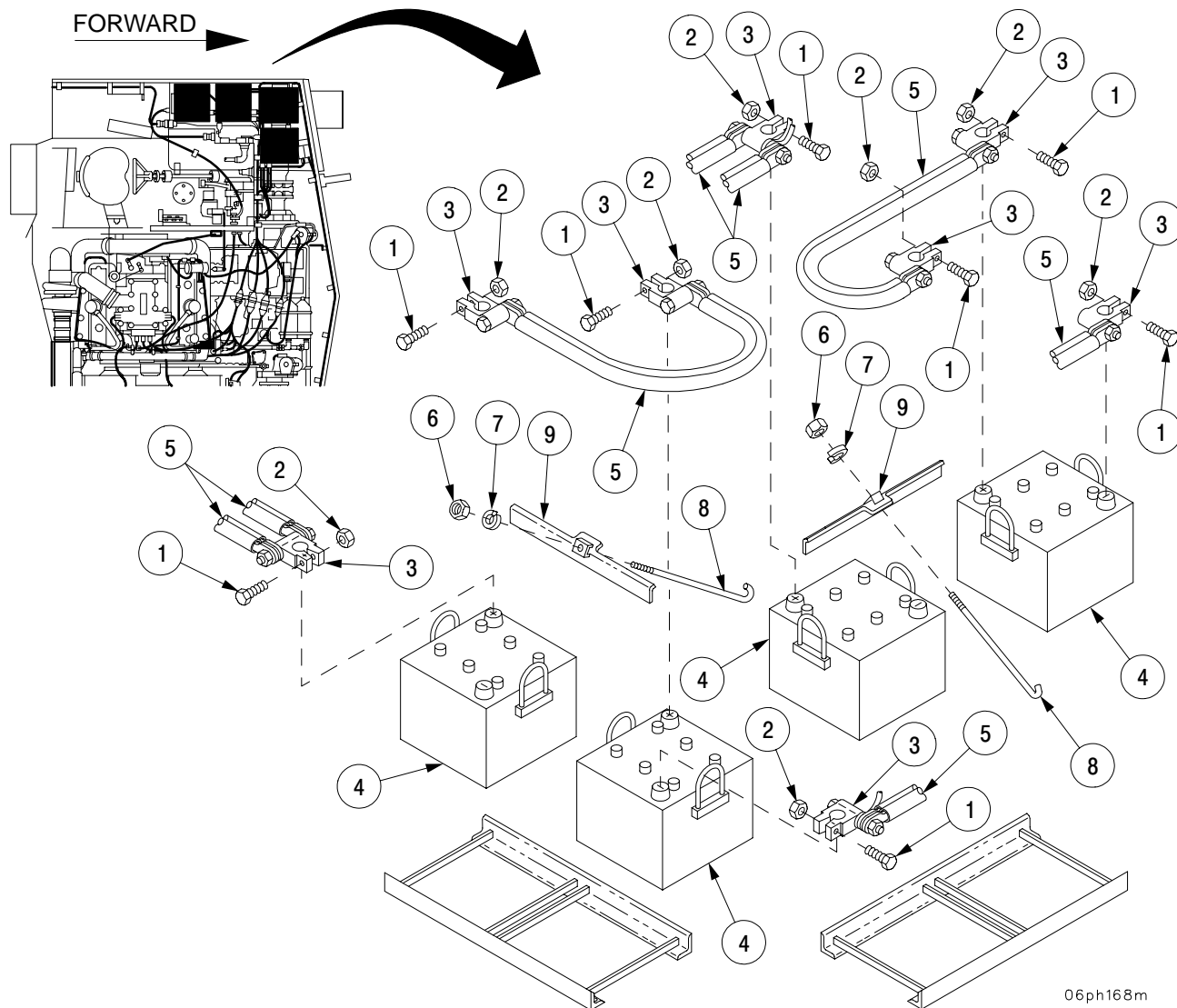
**NOTE**  
**FOLLOW-ON MAINTENANCE:**  
 Connect battery ground leads (para 8-33)



Section VIII. BATTERIES – CONTINUED

8-54 BATTERIES – CONTINUED

b. Installation – Continued



06ph168m

**NOTE**

**FOLLOW-ON MAINTENANCE:**  
Connect battery ground leads (para 8-33)





**Section VIII. BATTERIES – CONTINUED**

**8-56 LEAD, BATTERY POSITIVE TERMINAL TO MASTER RELAY TERMINAL A1.**

This task covers: a. Removal b. Installation

**INITIAL SETUP**

Tools

General mechanic's tool kit  
(SC 5180-90-N26)

Materials/Parts

Lockwasher (item 5, Appx E)  
Lockwasher (item 47, Appx E)  
Adhesive (item 7, Appx C)

Equipment Conditions

Vehicle MASTER switch OFF  
(TM 9-2350-314-10)  
Battery ground leads disconnected  
(para 8-33)  
Transmission access doors open  
(TM 9-2350-314-10)

References

TM 9-2350-314-10

**a. Removal.**

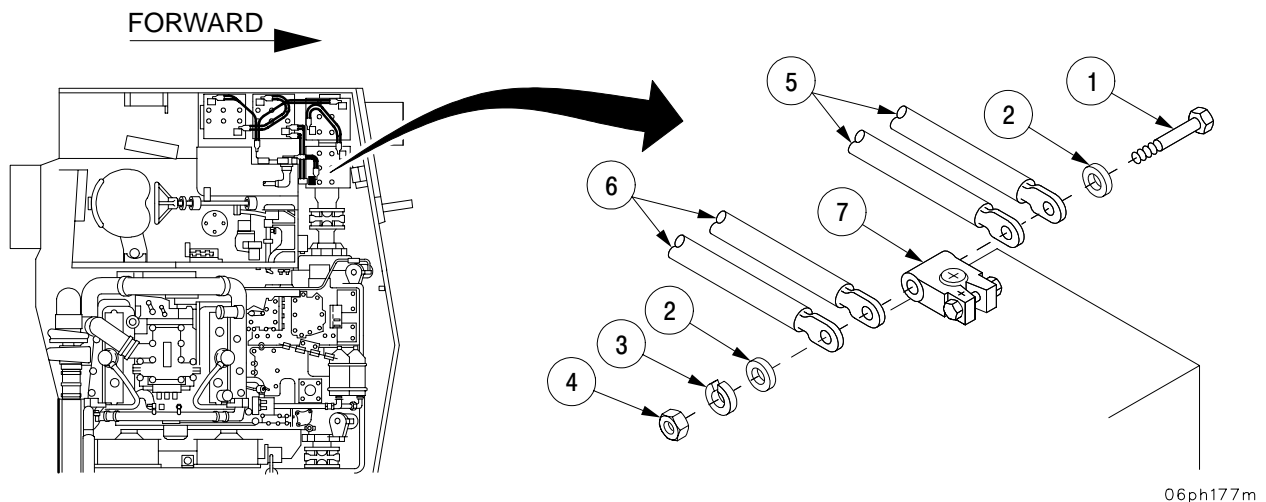
**WARNING**

When working on batteries, wear eye protection and remove all jewelry, dog tags, and metal items to avoid electrical shock and burns.

**NOTE**

Tag all electrical connections and electrical leads prior to removal to aid in installation.

- 1 Remove screw (1), two flat washers (2), lockwasher (3), nut (4), two leads E2 81A and E3 81A (5), and two leads 81 (6) from terminal lug (7). Discard lockwasher.



06ph177m

---

## Section VIII. BATTERIES – CONTINUED

---

### 8-56 LEAD, BATTERY POSITIVE TERMINAL TO MASTER RELAY TERMINAL A1 – CONTINUED

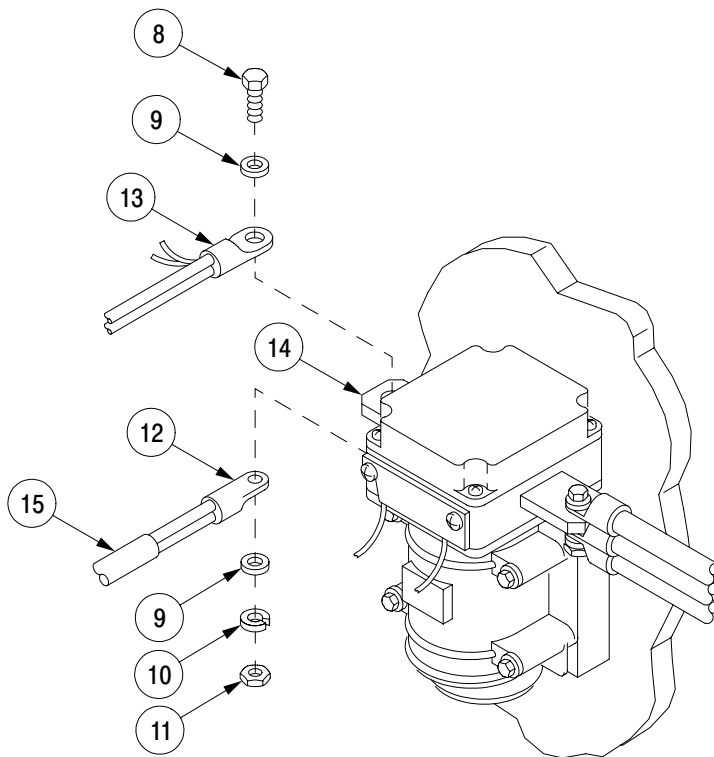
---

#### a. Removal – Continued

- 2 Remove screw (8), two flat washers (9), lockwasher (10), nut (11), lead E1 81A (12), and leads 81B, 452A, and 459W (13) from master relay terminal A1 (14) and remove lead assembly (15) from vehicle. Discard lockwasher.

#### b. Installation.

- 1 Position lead assembly (15) in vehicle.
- 2 Connect leads 81B, 452A, 459W (13) and lead E1 81A (12) to master relay terminal A1 (14) with screw (8), two flat washers (9), new lockwasher (10), and nut (11).
- 3 Apply adhesive to master relay terminal A1 (14) after assembly.



06ph178m

---

**Section VIII. BATTERIES – CONTINUED**

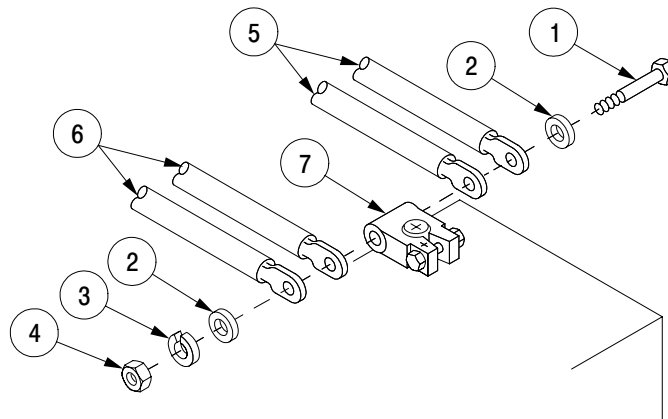
---

**8-56 LEAD, BATTERY POSITIVE TERMINAL TO MASTER RELAY TERMINAL A1 – CONTINUED**

---

**b. Installation – Continued**

- 4 Connect two leads 81 (6) and two leads E3 81A and E2 81A (5) to terminal lug (7) with screw (1), two flat washers (2), new lockwasher (3), and nut (4).



06ph179m

**NOTE****FOLLOW-ON MAINTENANCE:**

Install positive terminal (para 8-54)  
Connect battery ground leads (para 8-33)  
Close and secure transmission access doors  
(TM 9-2350-314-10)

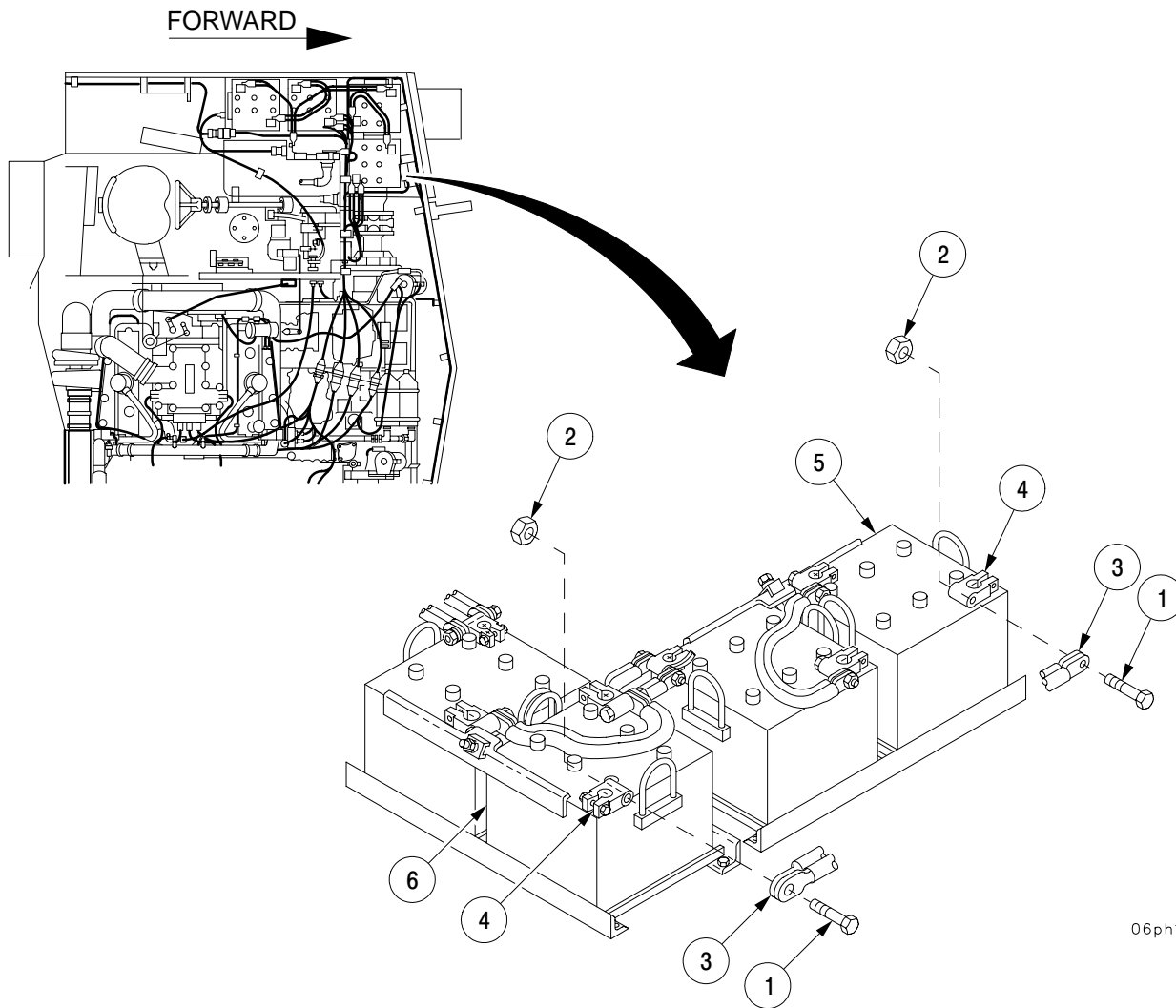


**Section VIII. BATTERIES – CONTINUED**

**8-57 LEADS, NEGATIVE TERMINAL TO GROUND BUS AND BATTERY POSITIVE TERMINAL TO BATTERY NEGATIVE TERMINAL – CONTINUED**

**a. Removal – Continued**

- 1 Remove screw (1), nut (2), and two ground lead terminals E2 and E3 (3) from terminal lugs (4) on battery (5 or 6).



06ph180m

---

## Section VIII. BATTERIES – CONTINUED

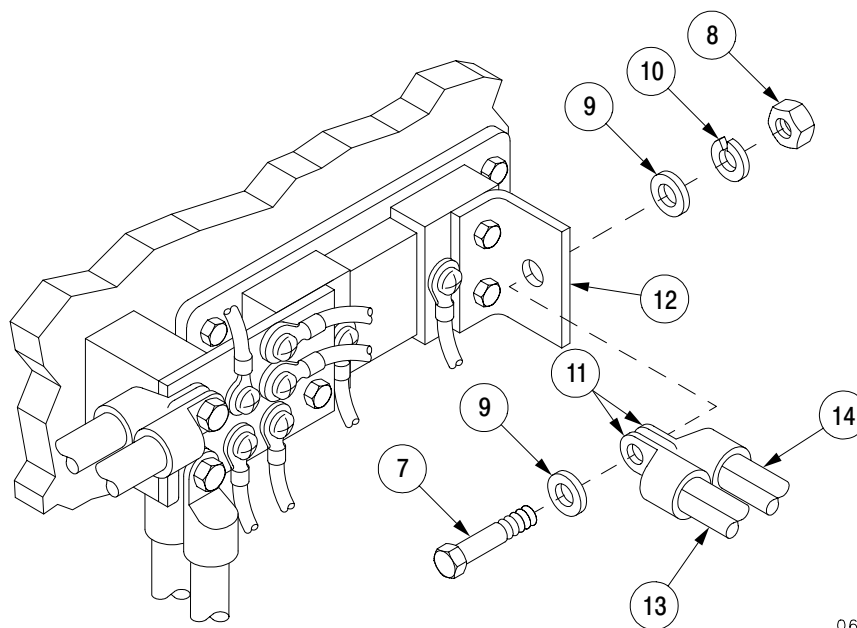
---

### 8-57 LEADS, NEGATIVE TERMINAL TO GROUND BUS AND BATTERY POSITIVE TERMINAL TO BATTERY NEGATIVE TERMINAL – CONTINUED

---

#### a. Removal – Continued

- 2 Remove screw (7), nut (8), two flat washers (9), lockwasher (10), and two ground lead terminals E1 (11) from bus bar (12).
- 3 Remove lead assembly (13 or 14) from battery compartment.



06ph181m

**Section VIII. BATTERIES – CONTINUED**

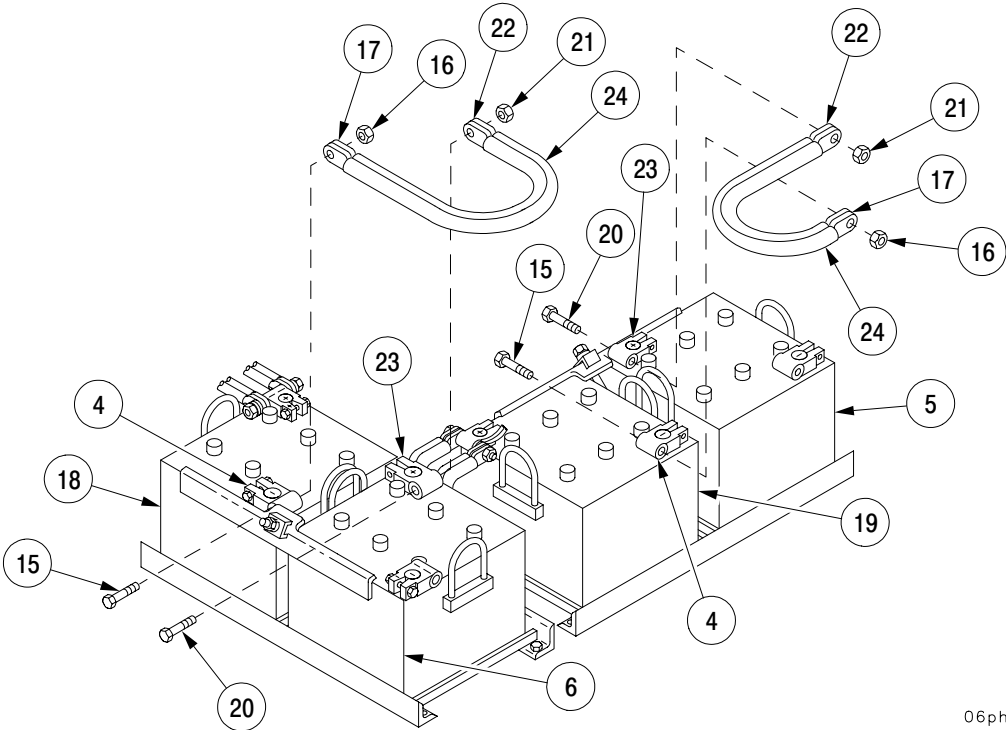
**8-57 LEADS, NEGATIVE TERMINAL TO GROUND BUS AND BATTERY POSITIVE TERMINAL TO BATTERY NEGATIVE TERMINAL – CONTINUED**

**a. Removal – Continued**

- 4 Remove screw (15), nut (16), and two lead terminals 68 (17) from terminal lug (4) on battery (18 or 19).
- 5 Remove screw (20), nut (21), and two lead terminals 68 (22) from terminal lug (23) on battery (5 or 6).
- 6 Remove two lead assemblies (24) from battery compartment.

**b. Installation.**

- 1 Position two lead assemblies (24) in battery compartment.
- 2 Connect two lead terminals 68 (22) to terminal lug (23) on battery (5 or 6) with screw (20) and nut (21).
- 3 Connect two lead terminals 68 (17) to terminal lug (4) on battery (18 or 19) with screw (15) and nut (16).



06ph182m



---

**Section VIII. BATTERIES – CONTINUED**

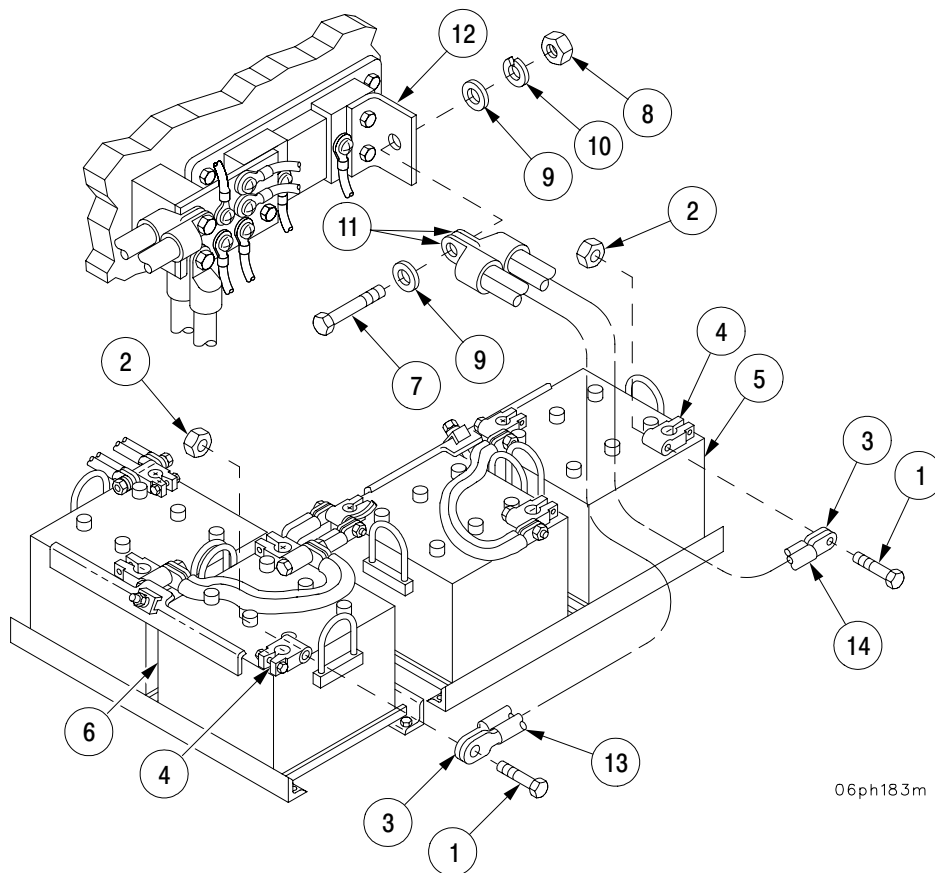
---

**8-57 LEADS, NEGATIVE TERMINAL TO GROUND BUS AND BATTERY POSITIVE TERMINAL TO BATTERY NEGATIVE TERMINAL – CONTINUED**

---

**b. Installation – Continued**

- 4 Position lead assembly (13 or 14) in battery compartment.
- 5 Connect two ground lead terminals E1 (11) to bus bar (12) with screw (7), two flat washers (9), new lockwasher (10), and nut (8).
- 6 Connect two ground lead terminals E2 and E3 (3) to terminal lug (4) on battery (5 or 6) with screw (1) and nut (2).



06ph183m

**NOTE**

**FOLLOW-ON MAINTENANCE:**  
Close and secure battery access doors  
(TM 9-2350-314-10)

---

**Section VIII. BATTERIES – CONTINUED**

---

**8-58 LEAD, BATTERY POSITIVE TERMINAL TO MASTER RELAY TERMINAL A1 AND WIRING HARNESS W105.**

---

This task covers:      a. Removal                                      b. Installation

---

**INITIAL SETUP**Tools

General mechanic's tool kit  
(SC 5180-90-N26)

Materials/Parts

Lockwasher (item 5, Appx E)  
Lockwasher (item 47, Appx E)  
Insulation tape (item 61, Appx C)

Equipment Conditions

Vehicle MASTER switch OFF  
(TM 9-2350-314-10)  
Battery ground leads disconnected  
(para 8-33)  
Transmission access doors open  
(TM 9-2350-314-10)

References

TM 9-2350-314-10

---

**a. Removal.****WARNING**

When working on batteries, wear eye protection and remove all jewelry, dog tags, and metal items to avoid electrical shock and burns.

**NOTE**

Tag all electrical connections and electrical leads prior to removal to aid in installation.

## Section VIII. BATTERIES – CONTINUED

---

### 8-58 LEAD, BATTERY POSITIVE TERMINAL TO MASTER RELAY TERMINAL A1 AND WIRING HARNESS W105 – CONTINUED

---

#### a. Removal – Continued

- 1 Remove nut (1), screw (2), lockwasher (3), two flat washers (4), two leads 81B (5), and two leads 81 (6) from battery terminal lug (7). Discard lockwasher. Tape ends of leads.
- 2 Remove screw (8), two flat washers (9), lockwasher (10), nut (11), lead 81B (12), and lead 81A (13) from relay terminal A1 (14). Discard lockwasher.
- 3 Disconnect wires 459M (15) and 452A (16) from wiring harness W105.
- 4 Remove lead assembly (17) from vehicle.

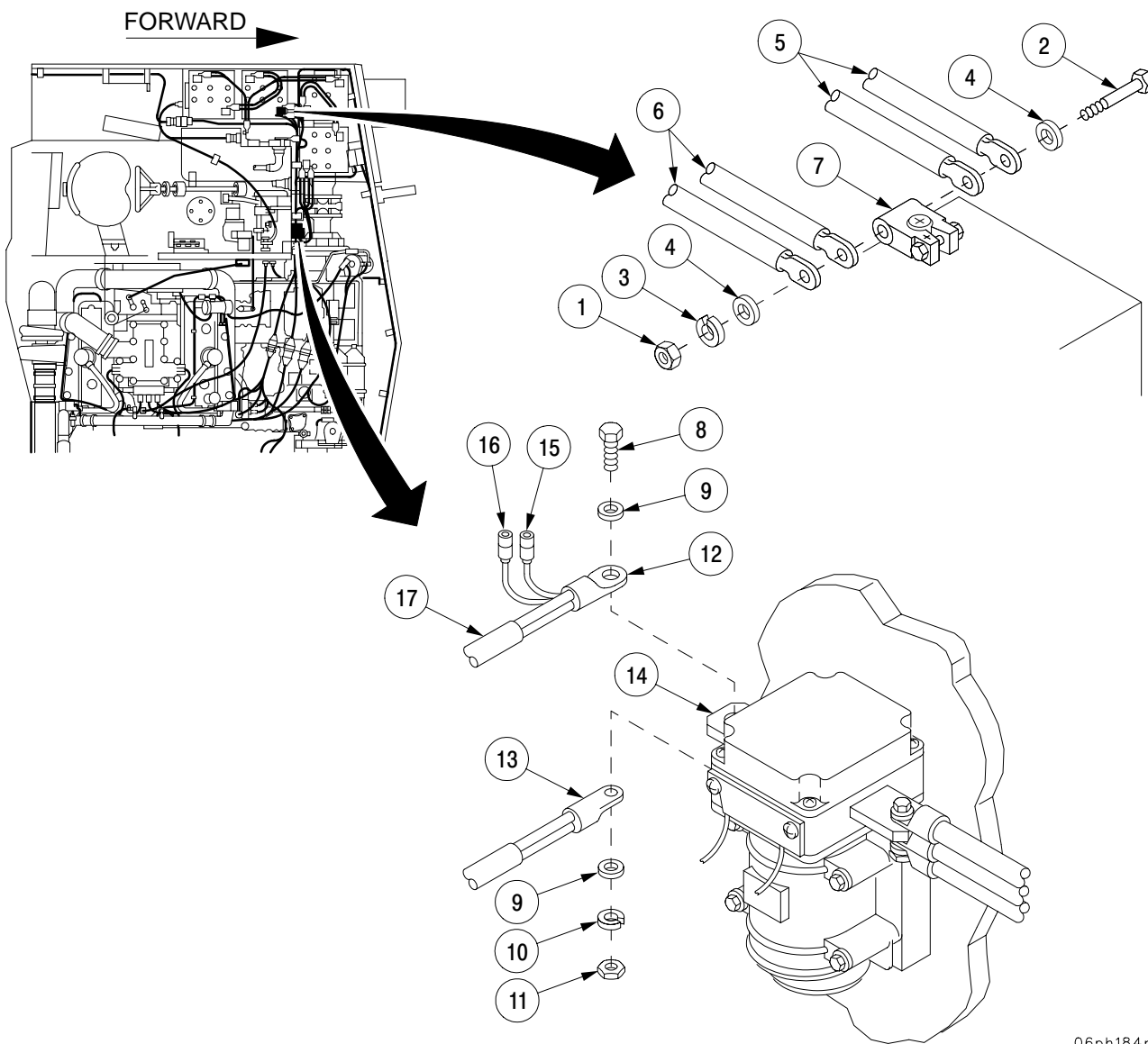
#### b. Installation.

- 1 Install lead assembly (17) in vehicle.
- 2 Connect wires 459M (15) and 452A (16) to wiring harness W105.
- 3 Connect lead 81A (13) and lead 81B (12) to relay terminal A1 (14) with nut (11), new lockwasher (10), two flat washers (9), and screw (8).
- 4 Connect two leads 81 (6) and two leads 81B (5) to battery terminal lug (7) with screw (2), two flat washers (4), new lockwasher (3), and nut (1).

**Section VIII. BATTERIES – CONTINUED**

**8-58 LEAD, BATTERY POSITIVE TERMINAL TO MASTER RELAY TERMINAL A1 AND WIRING HARNESS W105 – CONTINUED**

**b. Installation – Continued**



06ph184m

**NOTE**

**FOLLOW-ON MAINTENANCE:**  
 Close and secure transmission access doors  
 (TM 9-2350-314-10)  
 Connect battery ground leads (para 8-33)

## Section IX. HULL WIRING HARNESS

---

### 8-59 WIRING HARNESS AND CABLE REPAIR.

---

This task covers:      a. Disassembly                      b. Assembly

---

#### **INITIAL SETUP**

##### Tools

Electrical contact tool kit (item 73, Appx F)  
Electrical heat gun (item 29, Appx F)  
Heat shrink insulation tubing (item 89, Appx F)

##### References

TB SIG 222

##### Materials/Parts

Insulation tape (item 61, Appx C)

---

#### **NOTE**

- When removing more than one wire from a multiple wire receptacle, record which line was removed from which pin hole.
- Before proceeding, see detailed instructions on soldering and solder (TB SIG 222).
- Cable identifiers are attached to cables. These tags are embossed with the cable identification number. Cable identifier numbers are shown on the systems wiring diagram.
- Wire identifiers are embossed with the same individual wire number. Wire identifier numbers are also shown on systems wiring diagram.
- If cables or wires are replaced, remove tags from old wire and place them on new wire.

---

**Section IX. HULL WIRING HARNESS – CONTINUED**

---

**8-59 WIRING HARNESS AND CABLE REPAIR – CONTINUED**

---

**a. Disassembly – Heat Shrink Insulation Sleeving**

Cut and discard insulation sleeving.

**b. Assembly – Heat Shrink Insulation Sleeving****NOTE**

Insulation sleeving tubing should be twice the diameter of the part over which it will be shrunk.

- 1 Slide sleeving over wire and terminal.

**NOTE**

Remove thermal heat gun from sleeving as soon as sleeving forms to shape of wire and terminal.

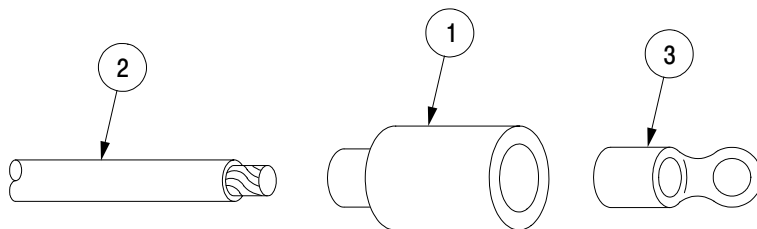
- 2 Hold thermal heat gun 4 or 5 inches away from sleeving and apply heat for about 30 seconds.
- 3 Let sleeving cool 30 seconds before handling.

**a. Disassembly – Terminal-Type Cable Connectors**

Cut and discard connector.

**b. Assembly – Terminal-Type Cable Connectors**

- 1 Strip cable insulation equal to depth of terminal well.
- 2 Slide insulator (1) over cable (2).
- 3 Insert cable (2) into terminal well (3) and crimp.
- 4 Slide insulator (1) over crimped end of terminal (3).



06ph034m

---

**Section IX. HULL WIRING HARNESS – CONTINUED**

---

**8-59 WIRING HARNESS AND CABLE REPAIR – CONTINUED**

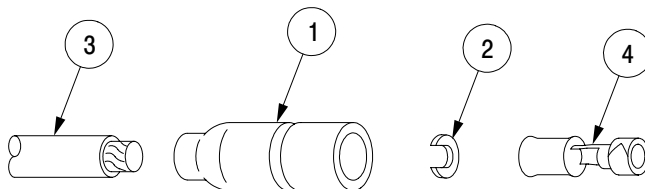
---

**a. Disassembly – Female Cable Connector with Washer**

Cut and discard connector.

**b. Assembly – Female Cable Connector with Washer**

- 1 Strip cable insulation approximately 1/8 inch (3.2 mm).
- 2 Slide shell (1) and washer (2) over cable (3).
- 3 Place cable (3) in cylinder end of terminal (4) and crimp.
- 4 Slide shell (1) and washer (2) over terminal (4).



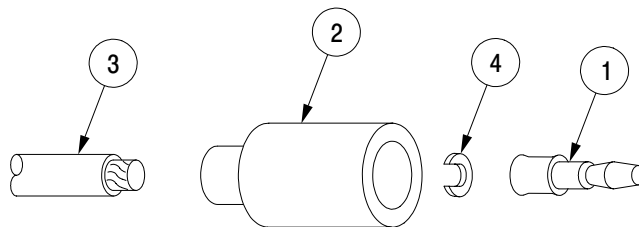
06ph035m

**a. Disassembly – Male Cable Connector with Washer**

Cut and discard connector.

**b. Assembly – Male Cable Connector with Washer**

- 1 Strip cable insulation equal to depth of terminal (1) well.
- 2 Slide shell (2) over cable (3).
- 3 Insert cable (3) into terminal (1) well and crimp.
- 4 Place washer (4) over cable (3) at crimped junction and slide shell (2) over washer (4) and terminal (1).



06ph033m

---

**Section IX. HULL WIRING HARNESS – CONTINUED**

---

**8-59 WIRING HARNESS AND CABLE REPAIR – CONTINUED**

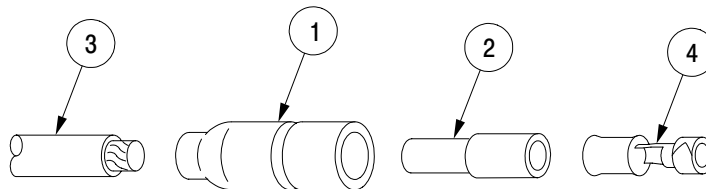
---

**a. Disassembly – Female Cable Connector with Sleeve.**

Cut and discard connector.

**b. Assembly – Female Cable Connector with Sleeve**

- 1 Strip cable insulation approximately 1/8 inch (3.2 mm).
- 2 Slide shell (1) and sleeve (2) over cable (3).
- 3 Place cable (3) in cylinder end of terminal (4) and crimp.
- 4 Slide shell (1) and sleeve (2) over terminal (4).



06ph036m





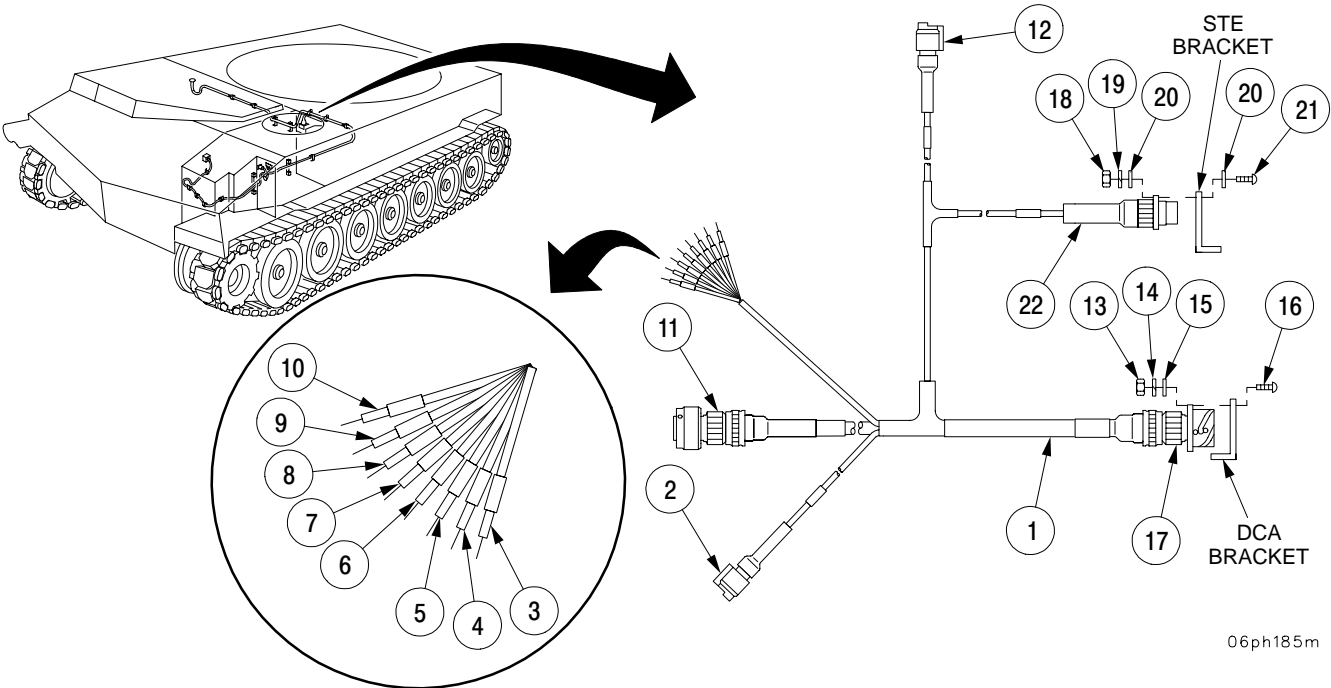
**Section IX. HULL WIRING HARNESS – CONTINUED**

**8-60 WIRING HARNESS W100 – CONTINUED**

**a. Removal – Continued**

Item No.	W100 Connector/Lead/Wire	From Connector/Lead/Wire/Component	Location
2	W100 P3	Pulse Tachometer	Engine Compartment Bulkhead (Driver's Compartment)
3	Wire CA	Resistor Module Block Terminal A	Driver's Bulkhead
4	Wire AK	Resistor Module Block Terminal B	Driver's Bulkhead
5	Wire CB	Resistor Module Block Terminal E	Driver's Bulkhead
6	Wire BE	Resistor Module Block Terminal F	Driver's Bulkhead
7	Wire AJ	Resistor Module Block Terminal G	Driver's Bulkhead
8	Wire AF	Resistor Module Block Terminal H	Driver's Bulkhead
9	Wire AM	Resistor Module Block Terminal C	Driver's Bulkhead
10	Wire AP	Resistor Module Block Terminal D	Driver's Bulkhead
11	W100 P1	Driver's Bulkhead	Forward Driver's Compartment
12	W100 P2	Air Cleaner Pressure Transducer	Crew Compartment (Forward)

- 2 Remove four nuts (13), four lockwashers (14), four flat washers (15), four screws (16), and connector W100 J1 (17) from DCA bracket. Discard lockwashers.
- 3 Remove four nuts (18), four lockwashers (19), eight flat washers (20), four screws (21), and connector W100 J2 (22) from STE bracket. Discard lockwashers.



06ph185m

**Section IX. HULL WIRING HARNESS – CONTINUED**

---

**8-60 WIRING HARNESS W100 – CONTINUED**

---

**a. Removal – Continued**

- 4 Remove straps, clamps, attaching hardware and lockwashers (A thru G) securing wiring harness (1) to vehicle, as shown in illustration. Discard lockwashers.
- 5 Remove wiring harness (1).

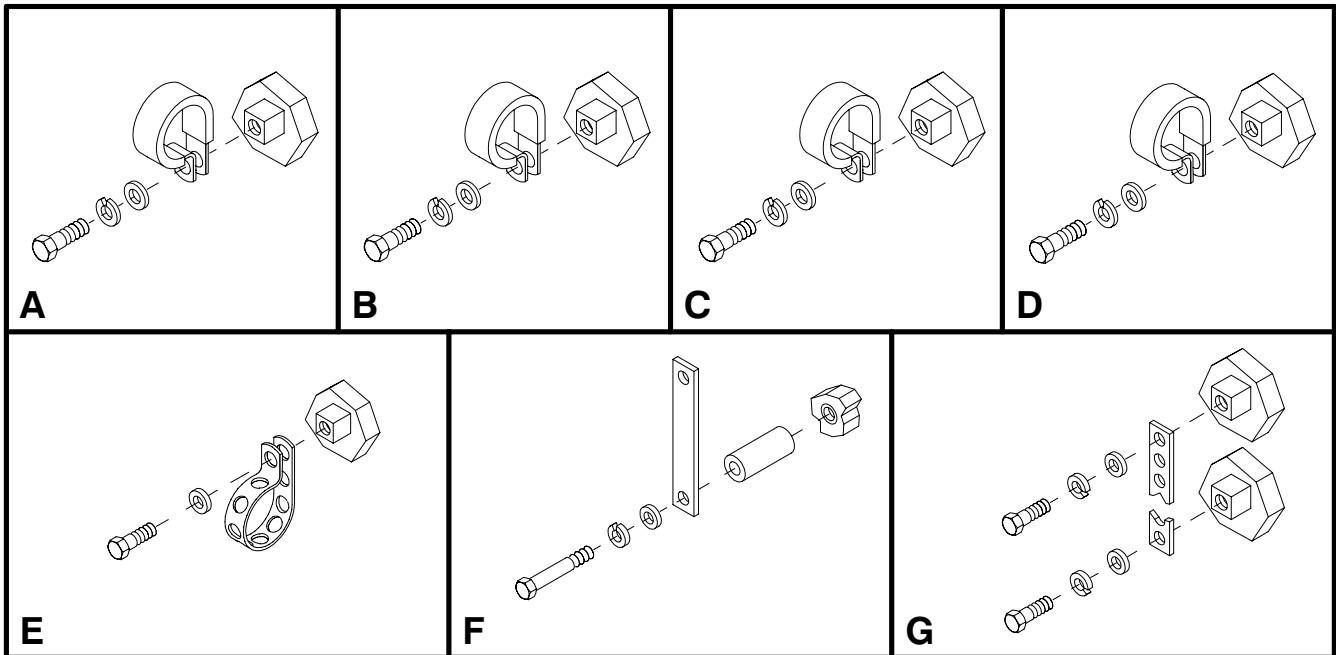
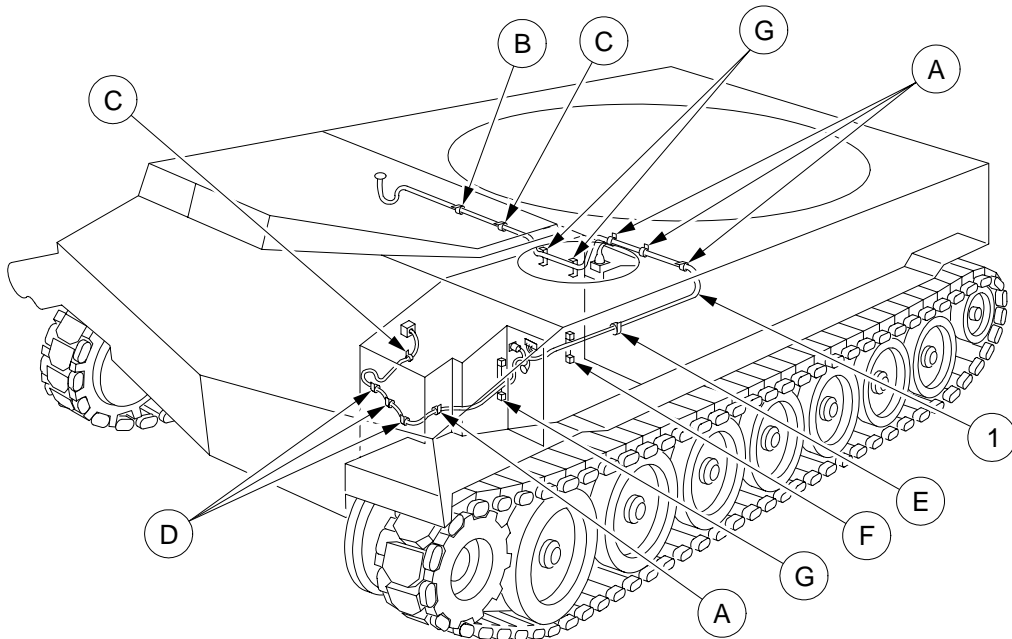
**b. Installation.**

- 1 Install wiring harness (1) in vehicle, with straps, clamps, attaching hardware, and new lockwashers (A thru G), as shown in illustration.

**Section IX. HULL WIRING HARNESS – CONTINUED**

**8-60 WIRING HARNESS W100 – CONTINUED**

**b. Installation – Continued**



06ph224m

**Section IX. HULL WIRING HARNESS – CONTINUED**

**8-60 WIRING HARNESS W100 – CONTINUED**

**b. Installation – Continued**

- 2 Connect connector W100 J2 (22) to STE bracket and install four screws (21), eight flat washers (20), four new lockwashers (19), and four nuts (18).
- 3 Connect connector W100 J1 (17) to DCA bracket and install four screws (16), four flat washers (15), four new lockwashers (14), and four nuts (13).

**NOTE**

The following legend identifies attachment points for each connection.

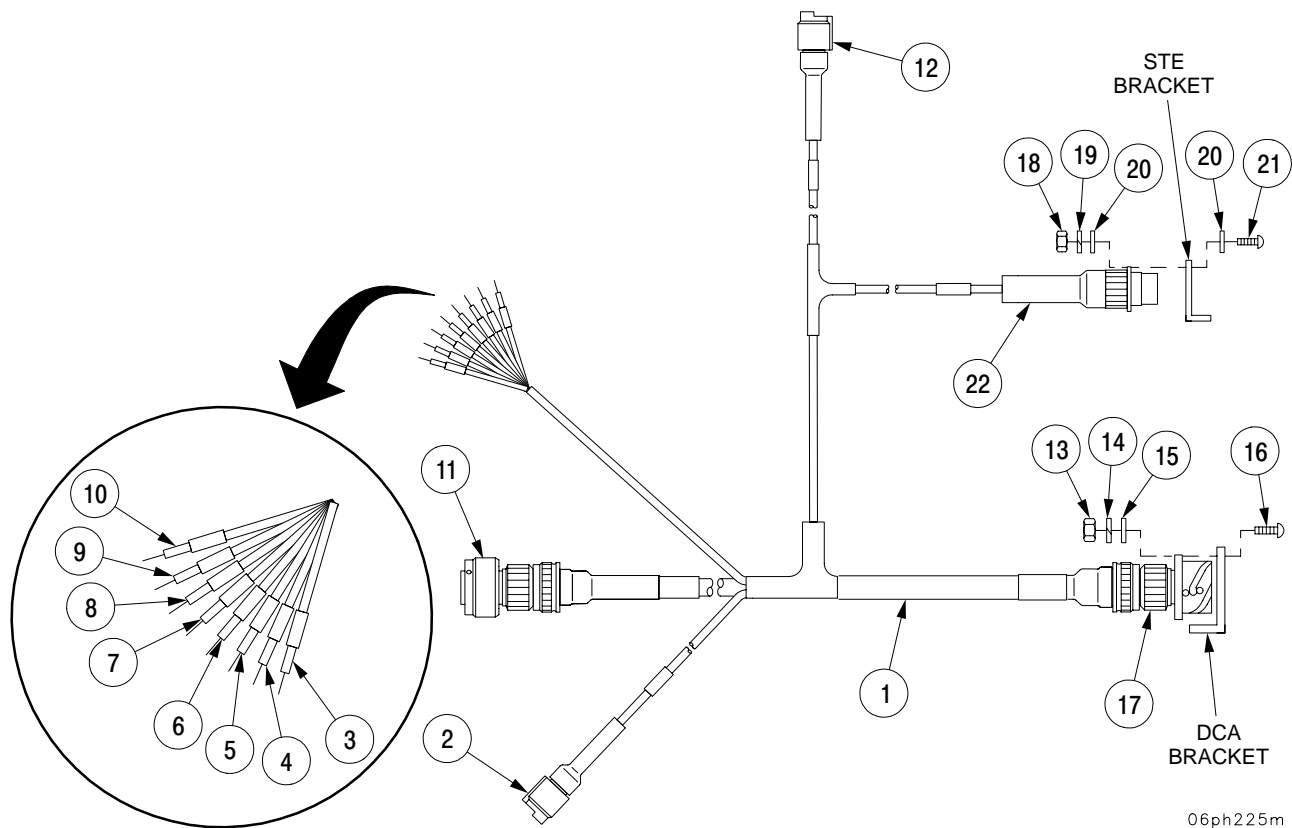
- 4 Install wiring harness (1) with attaching hardware at the following attachment points:

<b>Item No.</b>	<b>W100 Connector/Lead/Wire</b>	<b>To Connector/Lead/Wire/Component</b>	<b>Location</b>
12	W100 P2	Air Cleaner Pressure Transducer	Crew Compartment (Forward)
11	W100 P1	Driver's Bulkhead	Forward Driver's Compartment
10	Wire AP	Resistor Module Block Terminal D	Driver's Bulkhead
9	Wire AM	Resistor Module Block Terminal C	Driver's Bulkhead
8	Wire AF	Resistor Module Block Terminal H	Driver's Bulkhead
7	Wire AJ	Resistor Module Block Terminal G	Driver's Bulkhead
6	Wire BE	Resistor Module Block Terminal F	Driver's Bulkhead
5	Wire CB	Resistor Module Block Terminal E	Driver's Bulkhead
4	Wire AK	Resistor Module Block Terminal B	Driver's Bulkhead
3	Wire CA	Resistor Module Block Terminal A	Driver's Bulkhead
2	W100 P3	Pulse Tachometer	Engine Compartment Bulkhead (Driver's Compartment)

**Section IX. HULL WIRING HARNESS – CONTINUED**

**8-60 WIRING HARNESS W100 – CONTINUED**

**b. Installation – Continued**



**NOTE**

**FOLLOW-ON MAINTENANCE:**  
 Install driver's intercom box mounting plate  
 (para 8-29)  
 Connect wiring harness W101 J1 at  
 driver's bulkhead (para 8-61)

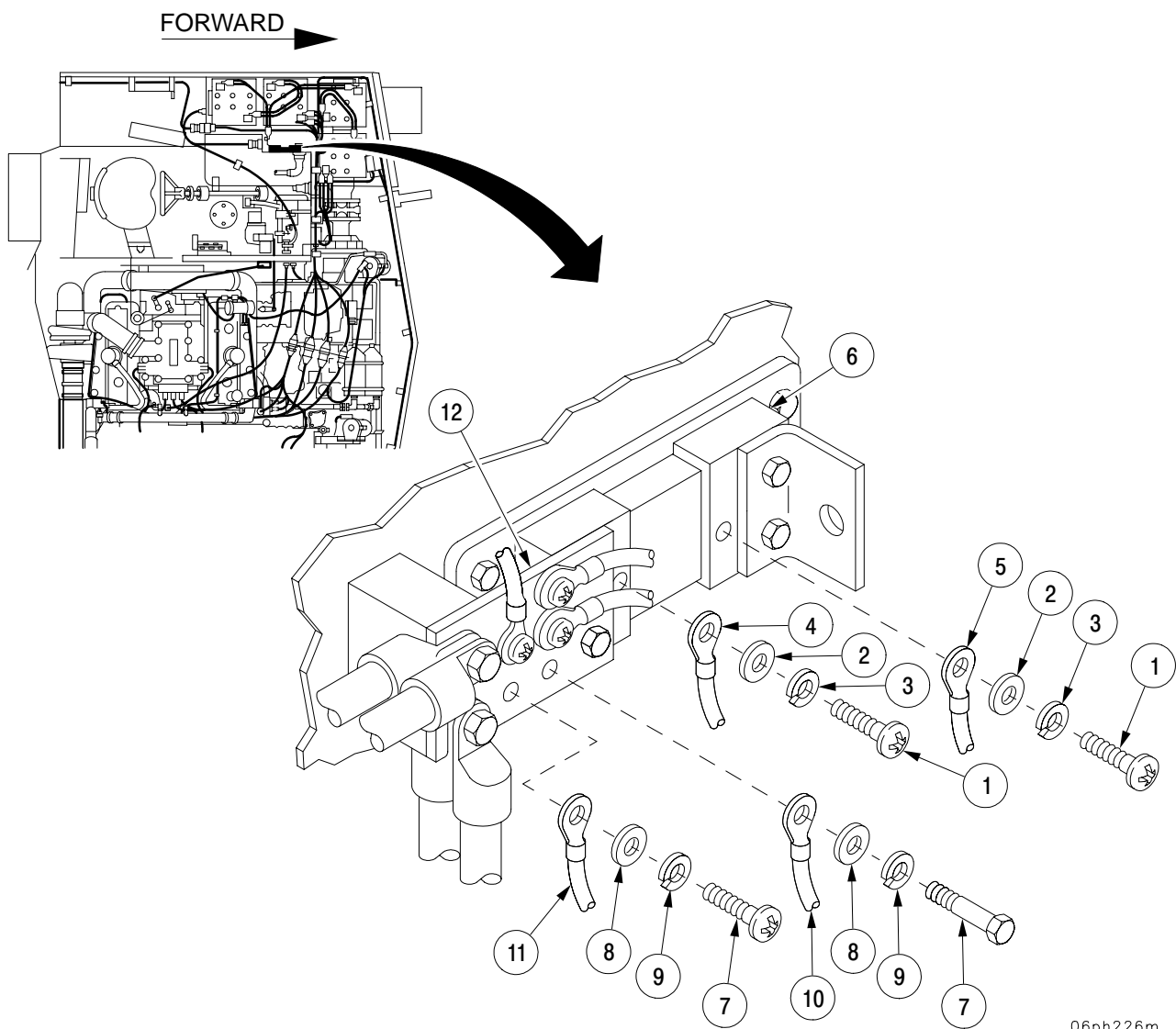


**Section IX. HULL WIRING HARNESS – CONTINUED**

**8-61 WIRING HARNESS W101 – CONTINUED**

**a. Removal – Continued**

- 1 Remove two screws (1), two flat washers (2), two lockwashers (3), and wiring harness W101 leads BA (4) and BB (5) from shunt (6). Discard lockwashers.
- 2 Remove two screws (7), two flat washers (8), two lockwashers (9), wiring harness W101 lead 7 (10), and wiring harness W101 lead GNDW (11) from bus bar (12). Discard lockwashers.



06ph226m

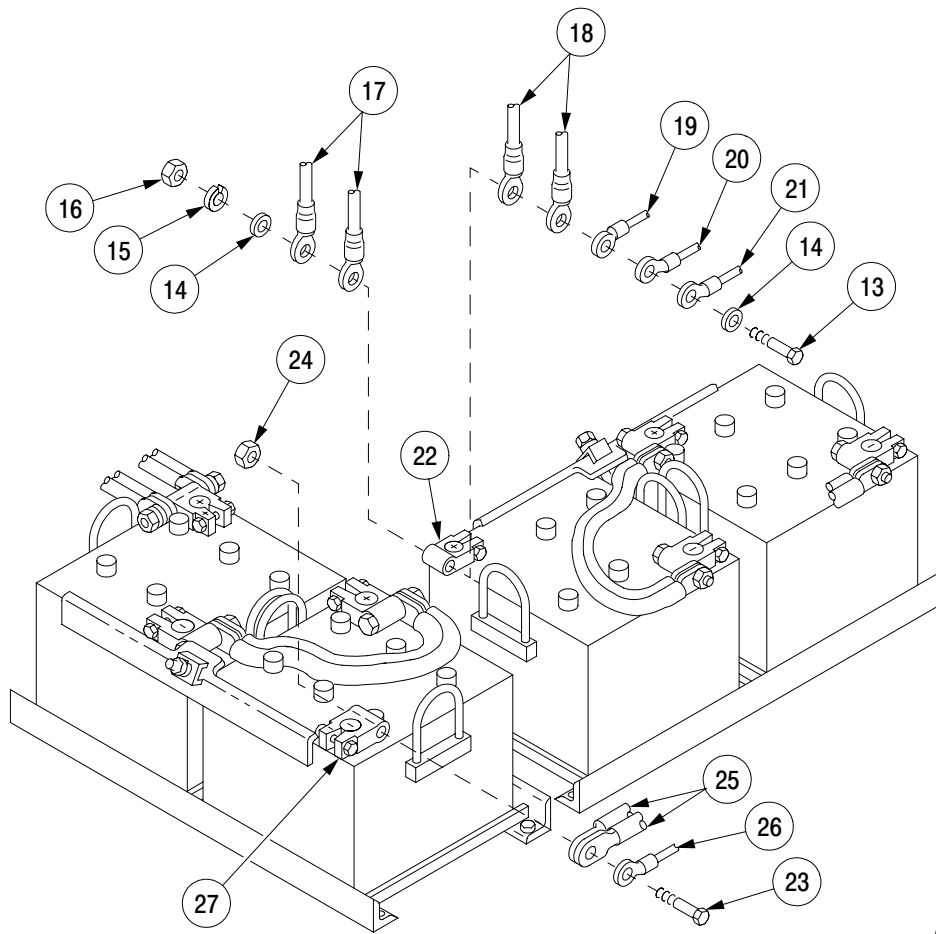


**Section IX. HULL WIRING HARNESS – CONTINUED**

**8-61 WIRING HARNESS W101 – CONTINUED**

**a. Removal – Continued**

- 3 Remove bolt (13), two flat washers (14), lockwasher (15), nut (16), wiring harness leads 81 (17), 81B (18), wiring harness lead 10V (19), wiring harness lead 10R (20), and wiring harness lead 81 (21) at positive battery terminal lug (22). Discard lockwasher.
- 4 Remove bolt (23), nut (24), lead 7A (25), and wiring harness W101 lead AZ (26) from negative battery terminal lug (27).



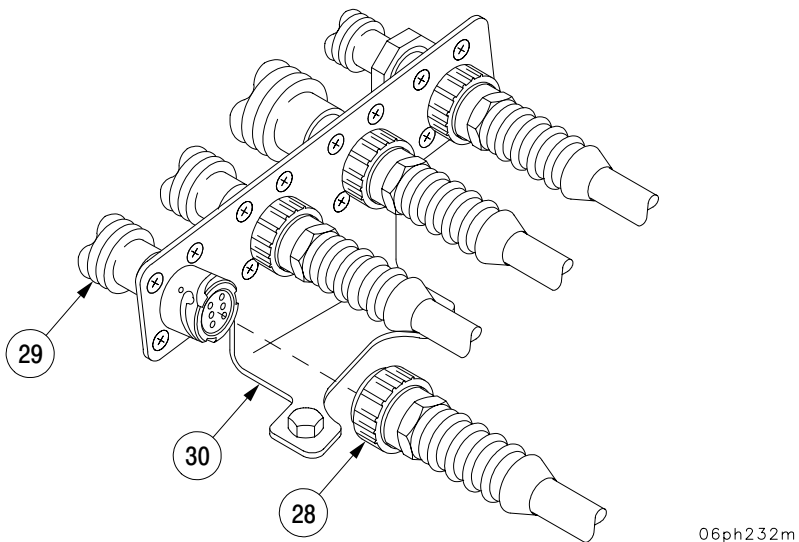
06ph231m

**Section IX. HULL WIRING HARNESS – CONTINUED**

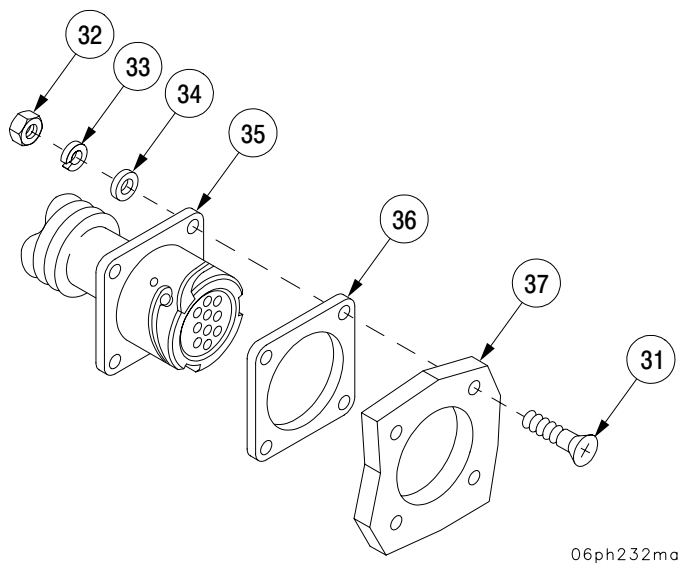
**8-61 WIRING HARNESS W101 – CONTINUED**

**a. Removal – Continued**

- 5 Remove wiring harness W101 connector P1 (28) from wiring harness W102 connector J1 (29) on engine wiring harness mounting bracket (30).



- 6 Remove four screws (31), four nuts (32), four lockwashers (33), four flat washers (34), wiring harness W101 connector J1 (35), and gasket (36) at driver's bulkhead (37). Discard lockwashers and gasket.



---

## Section IX. HULL WIRING HARNESS – CONTINUED

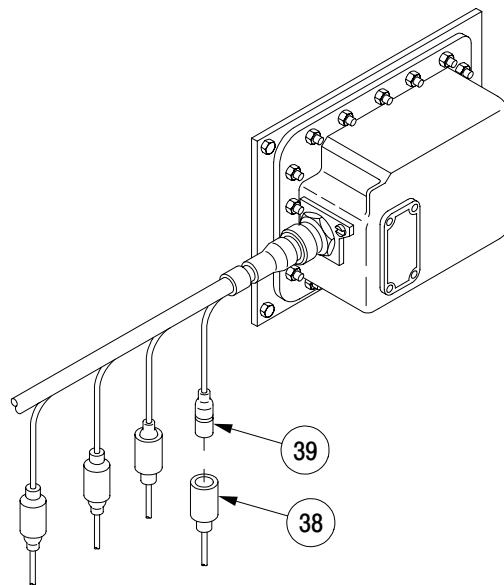
---

### 8-61 WIRING HARNESS W101 – CONTINUED

---

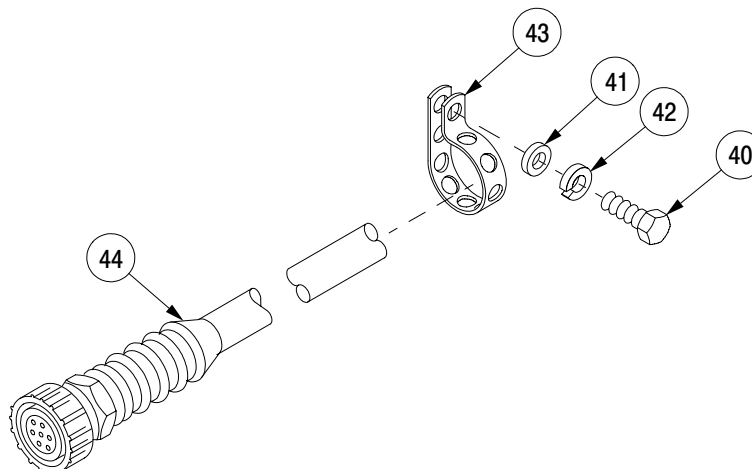
#### a. Removal – Continued

- 7 Disconnect wiring harness W101 lead AV (38) from wiring harness W106 lead AV-F+ (39).



06ph233m

- 8 Remove three screws (40), three flat washers (41), three lockwashers (42), and three straps (43) securing harness W101 (44). Discard lockwashers.
- 9 Remove wiring harness W101 (44) from vehicle.



06ph233ma

---

**Section IX. HULL WIRING HARNESS – CONTINUED**

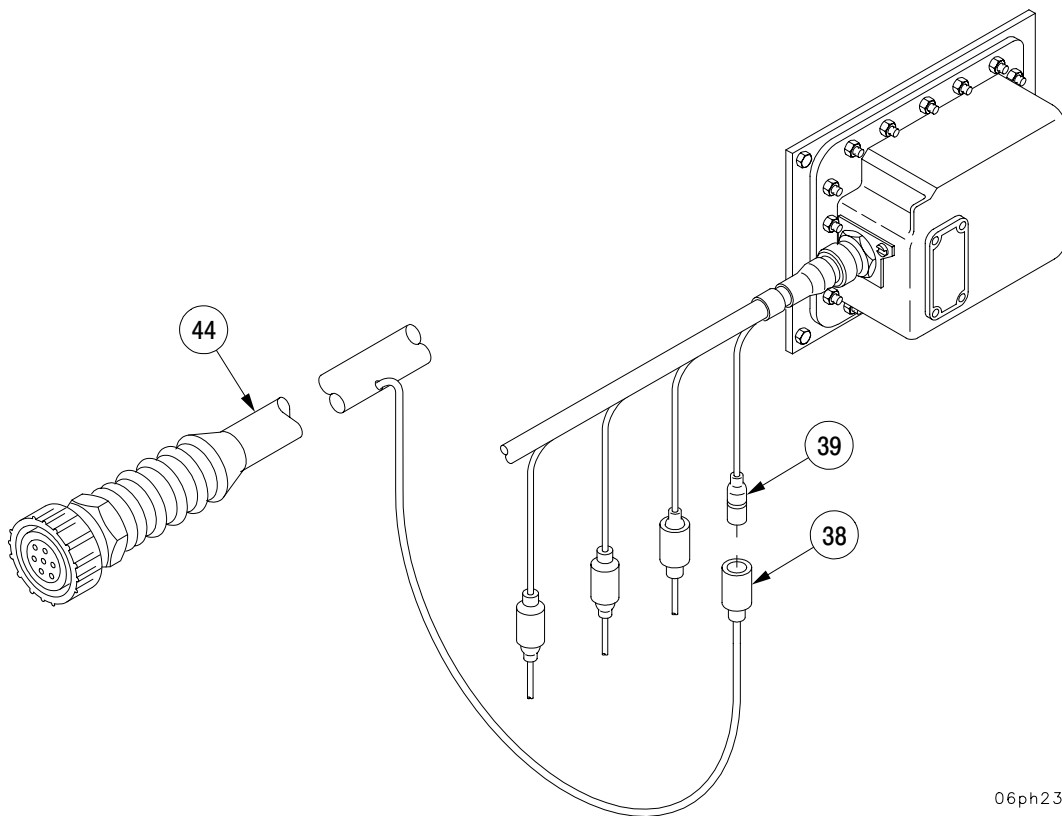
---

**8-61 WIRING HARNESS W101 – CONTINUED**

---

**b. Installation.**

- 1 Position wiring harness W101 (44) in vehicle.
- 2 Connect wiring harness W101 lead AV (38) to wiring harness W106 lead AV-F+ (39).



06ph234m

---

## Section IX. HULL WIRING HARNESS – CONTINUED

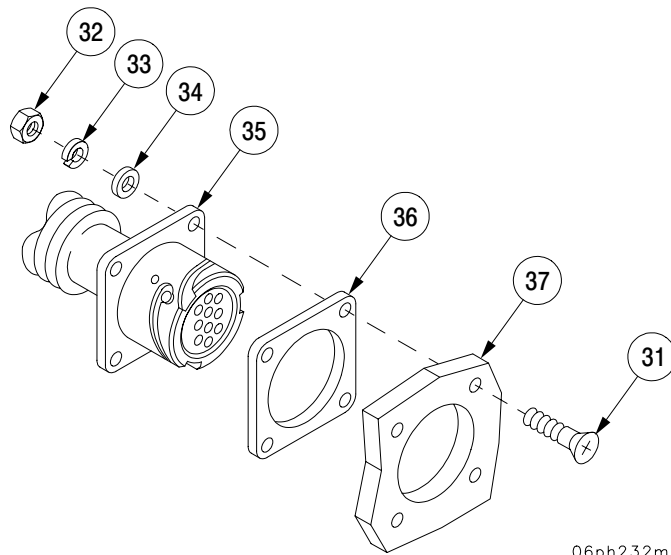
---

### 8-61 WIRING HARNESS W101 – CONTINUED

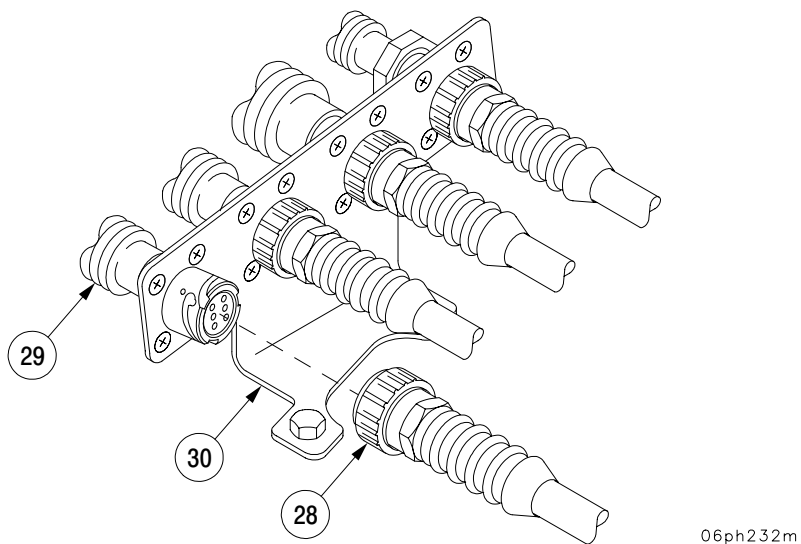
---

#### b. Installation – Continued

- 3 Install wiring harness W101 connector J1 (35) and new gasket (36) with four screws (31), four flat washers (34), four new lockwashers (33), and four nuts (32) to driver's bulkhead (37).



- 4 Connect wiring harness W101 connector P1 (28) to wiring harness W102 connector J1 (29) at engine wiring harness mounting bracket (30).

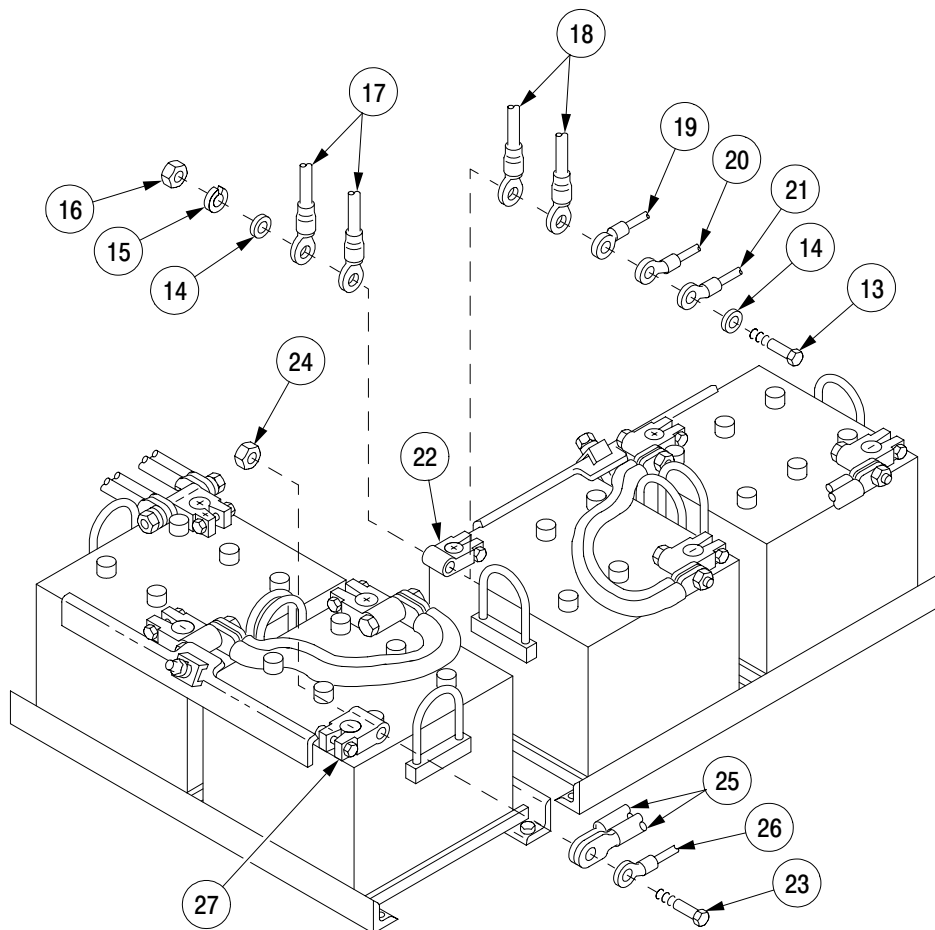


**Section IX. HULL WIRING HARNESS – CONTINUED**

**8-61 WIRING HARNESS W101 – CONTINUED**

**b. Installation – Continued**

- 5 Install wiring harness W101 lead AZ (26) and lead 7A (25) with bolt (23) and nut (24) on negative battery terminal lug (27).
- 6 Install wiring harness lead 81 (21), wiring harness W101 lead 10R (20), wiring harness lead 10V (19), wiring harness lead 81 (17) and 81B (18) with bolt (13), two flat washers (14), new lockwasher (15), and nut (16) on positive battery terminal lug (22).



06ph231m

---

**Section IX. HULL WIRING HARNESS – CONTINUED**

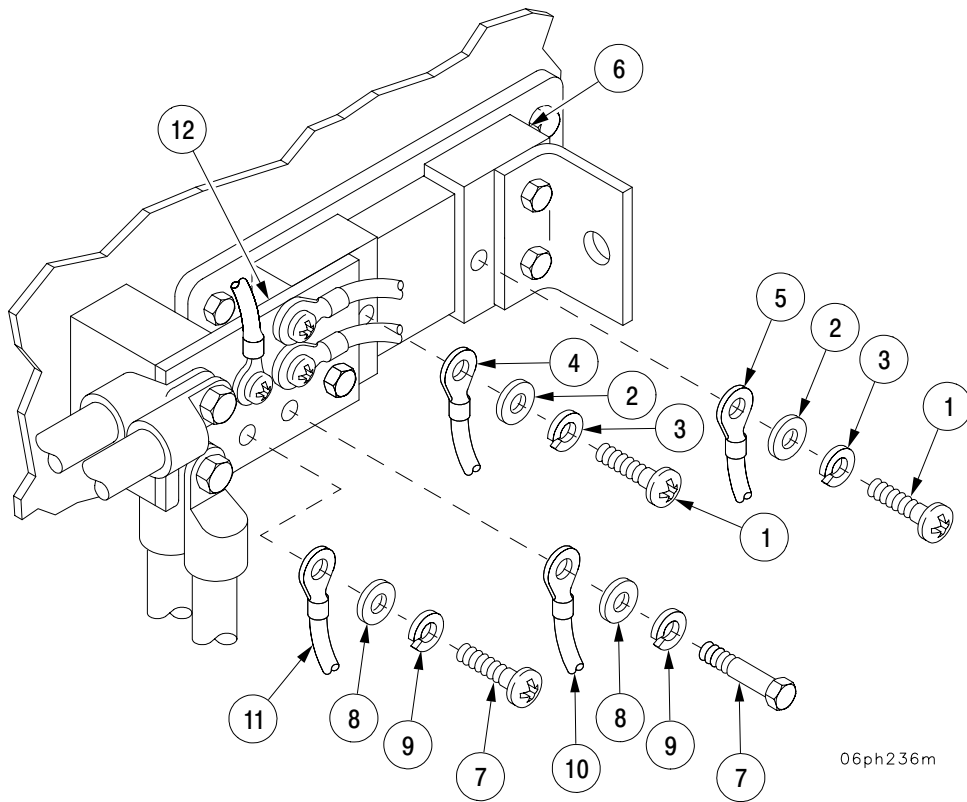
---

**8-61 WIRING HARNESS W101 – CONTINUED**

---

**b. Installation – Continued**

- 7 Install wiring harness W101 lead GNDW (11) and wiring harness W101 lead 7 (10) with two screws (7), two flat washers (8), and two new lockwashers (9) on bus bar (12).
- 8 Install wiring harness W101 lead BB (5) and wiring harness W101 lead BA (4) with two screws (1), two flat washers (2), and two new lockwashers (3) on shunt (6).



06ph236m

---

**Section IX. HULL WIRING HARNESS – CONTINUED**

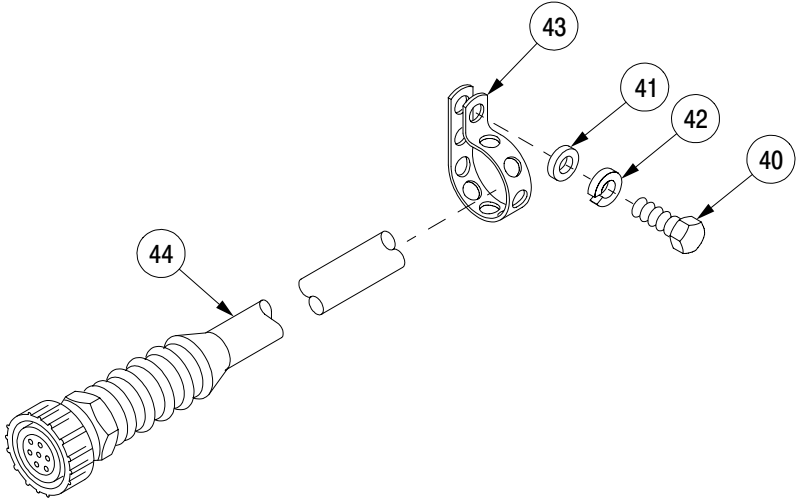
---

**8-61 WIRING HARNESS W101 – CONTINUED**

---

**b. Installation – Continued**

- 9 Secure wiring harness W101 (44) to bulkhead with three straps (43), three screws (40), three new lockwashers (42), and three flat washers (41).



06ph237m

**NOTE**

**FOLLOW-ON MAINTENANCE:**  
Connect wiring harness W100 P1 at driver's bulkhead (para 8-60)  
Connect battery ground leads (para 8-33)





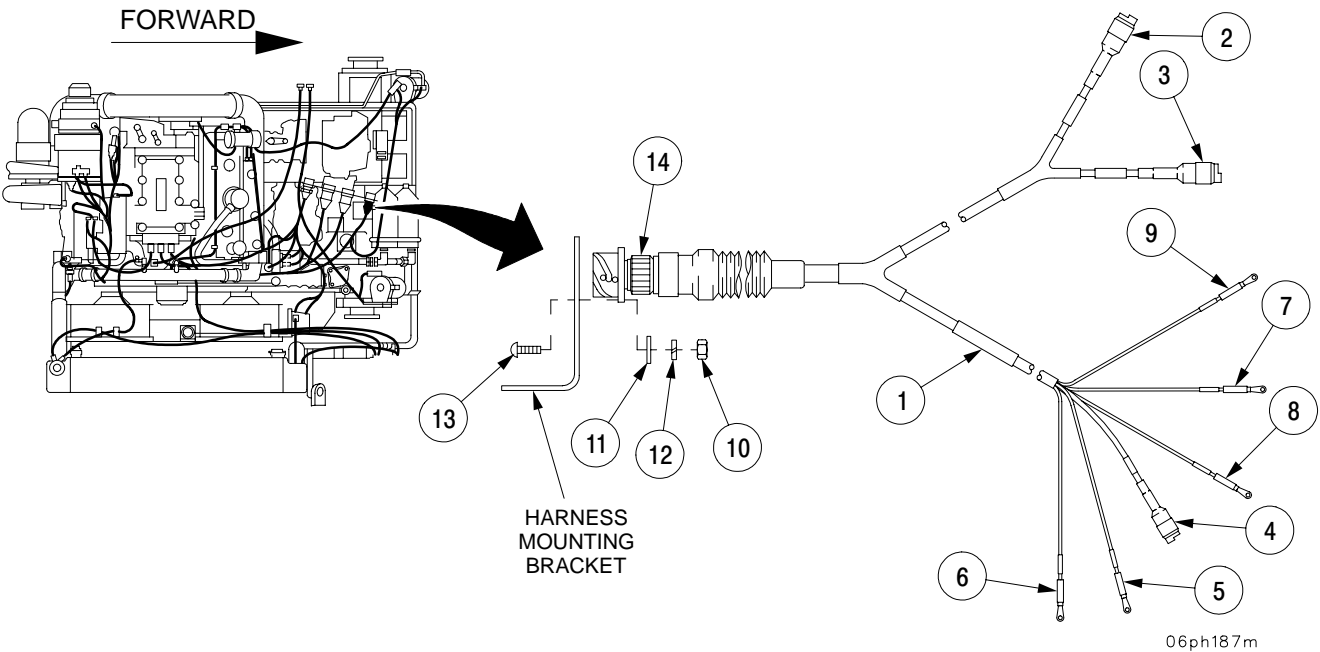
**Section IX. HULL WIRING HARNESS – CONTINUED**

**8-62 WIRING HARNESS W102 – CONTINUED**

**a. Removal – Continued**

Item No.	W102 Connector/Lead/Wire	From Connector/Lead/Wire/Component	Location
2	W102 P2	Fuel Supply Pressure Transducer	Engine Compartment (Forward)
3	W102 P4	Fuel Pressure Differential Transducer	Engine Compartment (Forward)
4	W102 P3	Air Box Pressure Transducer	Engine Compartment (Rear)
5	Wire GNDZ	Generator Negative Terminal (Small)	Generator – Engine Compartment (Rear)
6	Wire AW	Generator Positive Terminal (Large)	Generator – Engine Compartment (Rear)
7	Wire AY	Starter Solenoid	Starter – Engine Compartment (Rear)
8	Wire GNDN	Starter Terminal	Starter – Engine Compartment (Rear)
9	Wire AX	Starter Solenoid Positive Terminal	Starter – Engine Compartment (Rear)

- Remove four nuts (10), four flat washers (11), four lockwashers (12), four screws (13), and connector W102 J1 (14) from harness mounting bracket. Discard lockwashers.



---

## Section IX. HULL WIRING HARNESS – CONTINUED

---

### 8-62 WIRING HARNESS W102 – CONTINUED

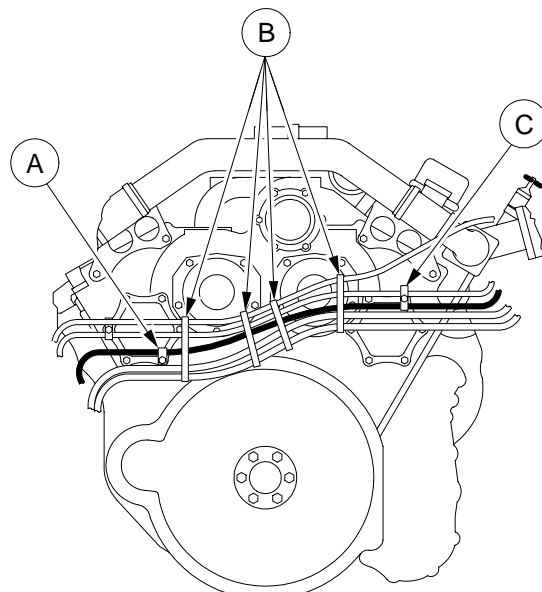
---

#### a. Removal – Continued

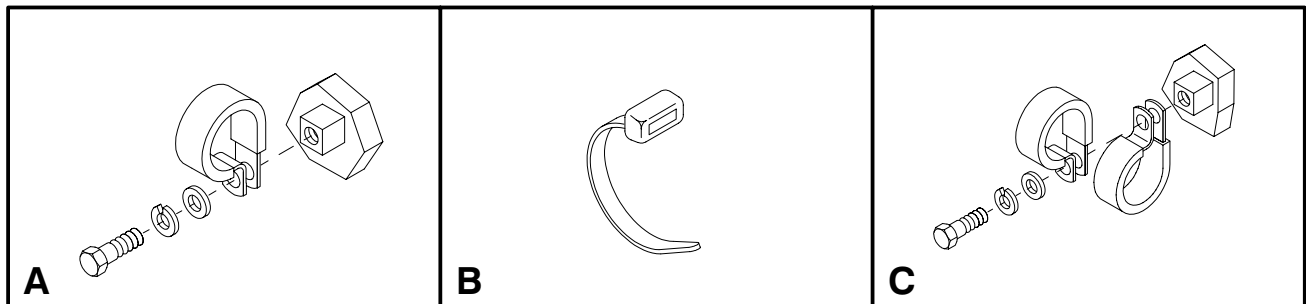
- 3 Remove straps, clamps, attaching hardware, and lockwashers (A thru C) securing wiring harness (1) to vehicle, as shown in illustration. Discard lockwashers.
- 4 Remove wiring harness (1).

#### b. Installation.

- 1 Install wiring harness (1) in vehicle, with straps, clamps, attaching hardware, and new lockwashers (A thru C), as shown in illustration.



RIGHT SIDE VIEW



06ph188m

**Section IX. HULL WIRING HARNESS – CONTINUED**

**8-62 WIRING HARNESS W102 – CONTINUED**

**b. Installation – Continued**

- 2 Install connector W102 J1 (14) to harness mounting bracket with four screws (13), four new lockwashers (12), four flat washers (11), and four nuts (10).

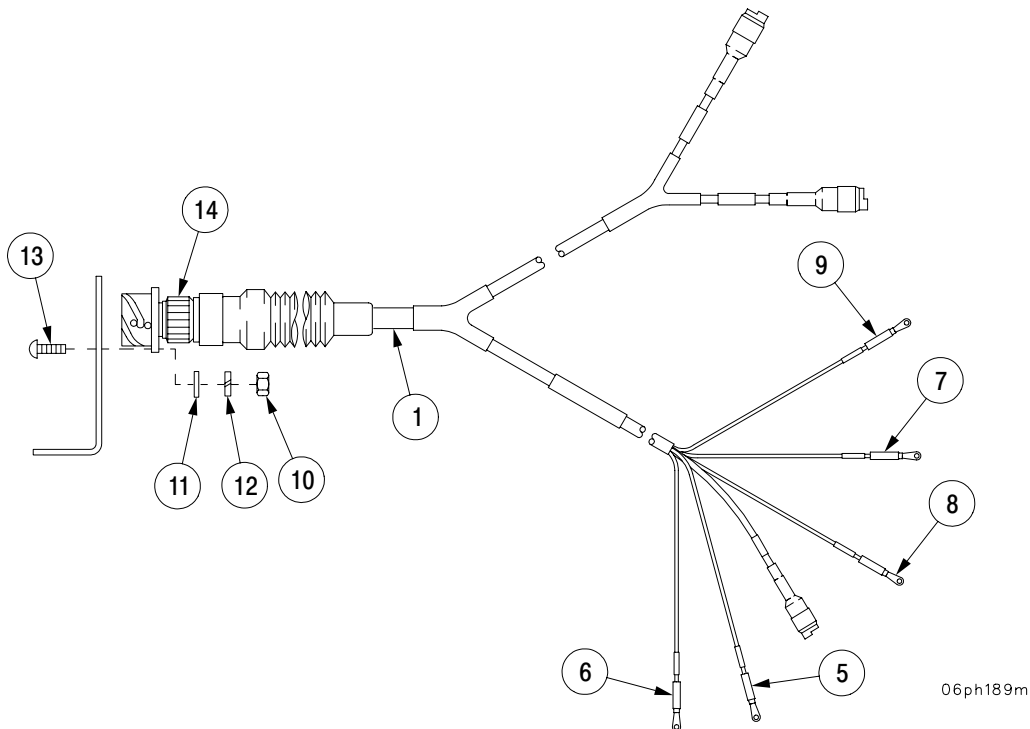
**NOTE**

The following legend identifies attachment points for each connection.

- 3 Install wiring harness (1) with attaching hardware at the following attachment points:

Item No.	W102 Connector/Lead/Wire	To Connector/Lead/Wire/Component	Location
9	Wire AX	Starter Solenoid Positive Terminal	Starter – Engine Compartment (Rear)
8	Wire GNDN	Starter Terminal	Starter – Engine Compartment (Rear)
7	Wire AY	Starter Solenoid	Starter – Engine Compartment (Rear)
6	Wire AW	Generator Positive Terminal (Large)	Generator – Engine Compartment (Rear)
5	Wire GNDZ	Generator Negative Terminal (Small)	Generator – Engine Compartment (Rear)

- 4 Apply adhesive to all starter and generator terminals after assembly.

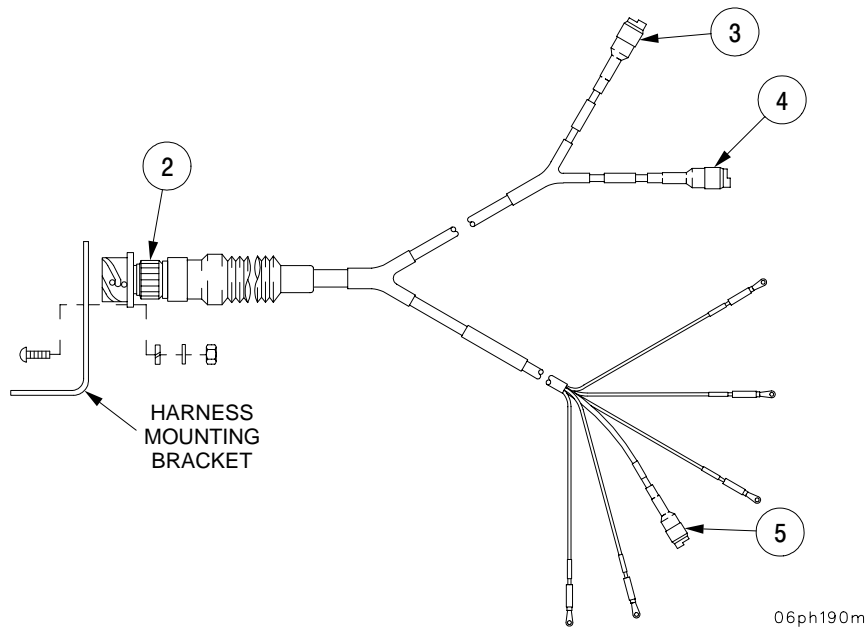


**Section IX. HULL WIRING HARNESS – CONTINUED**

**8-62 WIRING HARNESS W102 – CONTINUED**

**b. Installation – Continued**

Item No.	W102 Connector/Lead/Wire	To Connector/Lead/Wire/Component	Location
4	W102 P3	Air Box Pressure Transducer	Engine Compartment (Rear)
3	W102 P4	Fuel Pressure Differential Transducer	Engine Compartment (Forward)
2	W102 P2	Fuel Supply Pressure Transducer	Engine Compartment (Forward)



**NOTE**

**FOLLOW-ON MAINTENANCE:**

- Install powerpack (para 4-1)
- Connect wiring harness W101 P1 at engine disconnect bracket (para 8-61)



**Section IX. HULL WIRING HARNESS – CONTINUED**

**8-63 WIRING HARNESS W104 – CONTINUED**

**a. Removal – Continued**

- 1 Remove wiring harness (1) and attaching hardware at the following attachment points:

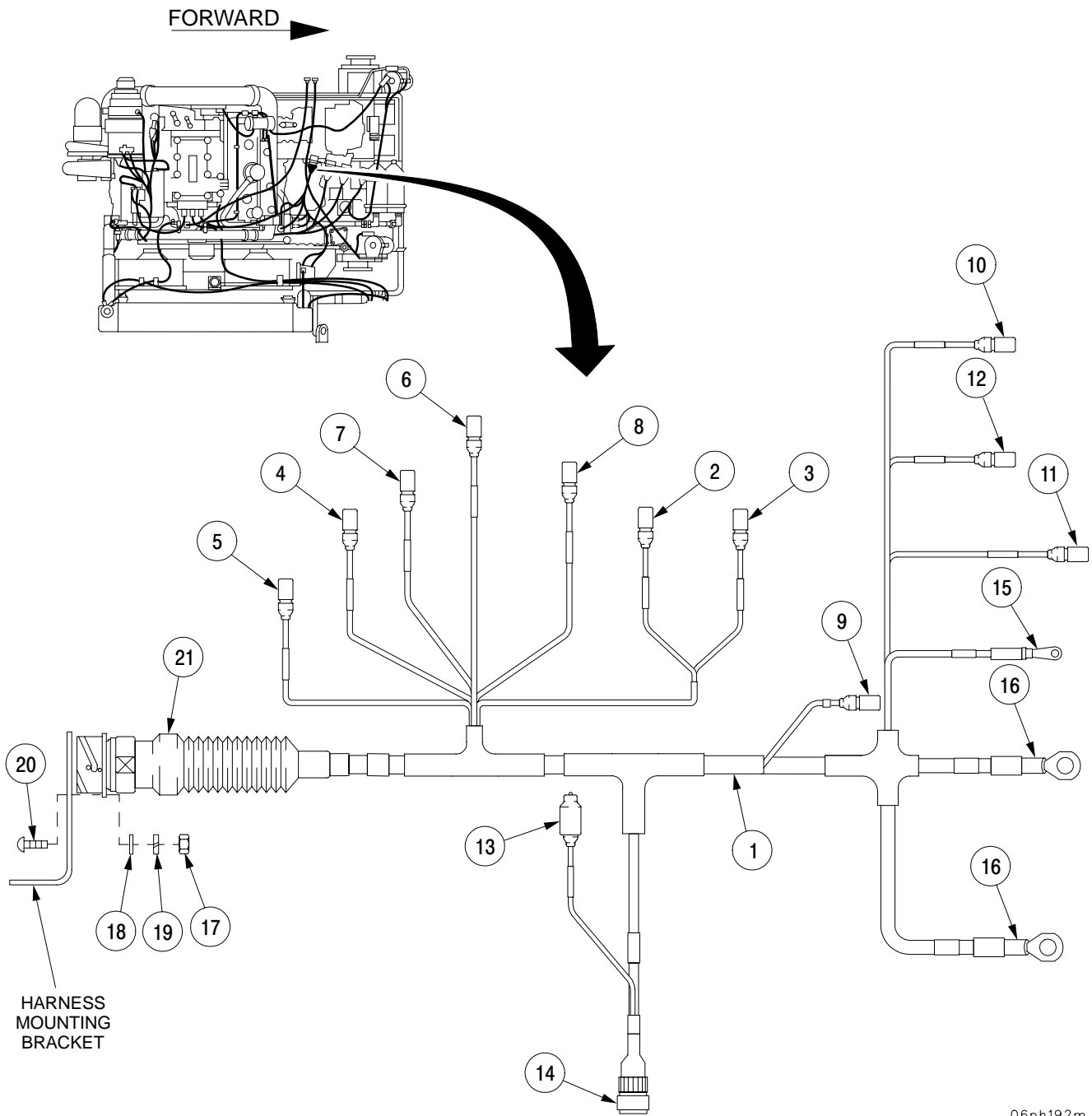
<b>Item No.</b>	<b>W104 Connector/Lead/Wire</b>	<b>From Connector/Lead/Wire/Component</b>	<b>Location</b>
2	Wire 352A	Low Level Coolant Detector	Engine Compartment (Right Side)
3	Wire 352B	Low Level Coolant Detector	Engine Compartment (Right Side)
4	Wire 324	Transmission Oil Temperature Transmitter	Engine Compartment (Right Side)
5	Wire 509D	Transmission Oil High Temperature Switch	Engine Compartment (Right Side)
6	Wire 509C	Transmission Oil Pressure Switch	Engine Compartment (Right Side)
7	Wire 321	Transmission Oil Pressure Transmitter	Engine Compartment (Right Side)
8	Wire 509A	Engine Coolant Temperature Switch	Engine Compartment (Right Side)
9	Wire 33A	Engine Coolant Temperature Transmitter	Engine Compartment (Right Rear)
10	Wire 509B	Engine Oil Pressure Switch	Engine Compartment (Left Rear)
11	Wire 36	Engine Oil Pressure Transmitter	Engine Compartment (Left Rear)
12	Wire 415B	Generator Oil Pressure Switch	Engine Compartment (Left Rear)
13	Wire 588	Fuel Prime Pump	Engine Compartment (Left Side)
14	W104 P2	Glow Plug Controller	Engine Compartment (Left Side)
15	Wire 14B	Starter Solenoid	Engine Compartment (Rear)
16	Wire 82 (2)	Starter Solenoid (Positive Terminal)	Engine Compartment (Rear)

- 2 Remove four nuts (17), four flat washers (18), four lockwashers (19), four screws (20), and connector W104 J1 (21) from harness mounting bracket. Discard lockwashers.

**Section IX. HULL WIRING HARNESS – CONTINUED**

**8-63 WIRING HARNESS W104 – CONTINUED**

**a. Removal – Continued**



06ph192m



**Section IX. HULL WIRING HARNESS – CONTINUED**

---

**8-63 WIRING HARNESS W104 – CONTINUED**

---

**a. Removal – Continued**

- 3 Remove straps, clamps, attaching hardware and lockwashers (A thru F) securing wiring harness (1) to vehicle, as shown in illustration. Discard lockwashers.
- 4 Remove wiring harness (1).

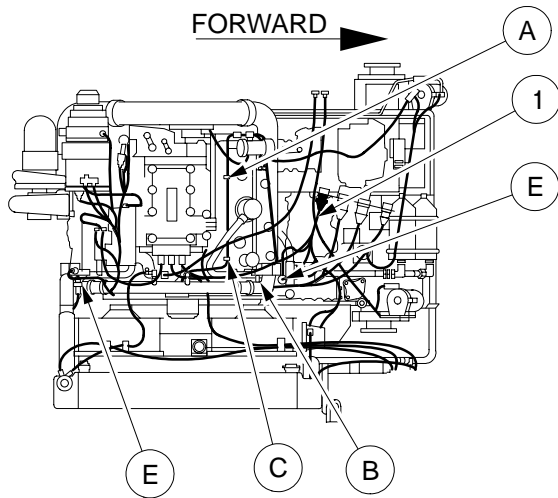
**b. Installation.**

- 1 Install wiring harness (1) in vehicle, with straps, clamps, attaching hardware, and new lockwashers (A thru F), as shown in illustration.

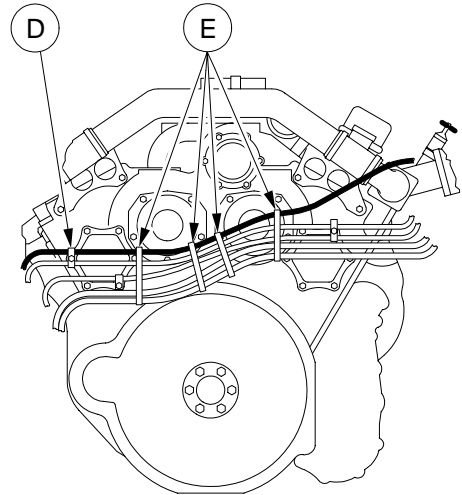
**Section IX. HULL WIRING HARNESS – CONTINUED**

**8-63 WIRING HARNESS W104 – CONTINUED**

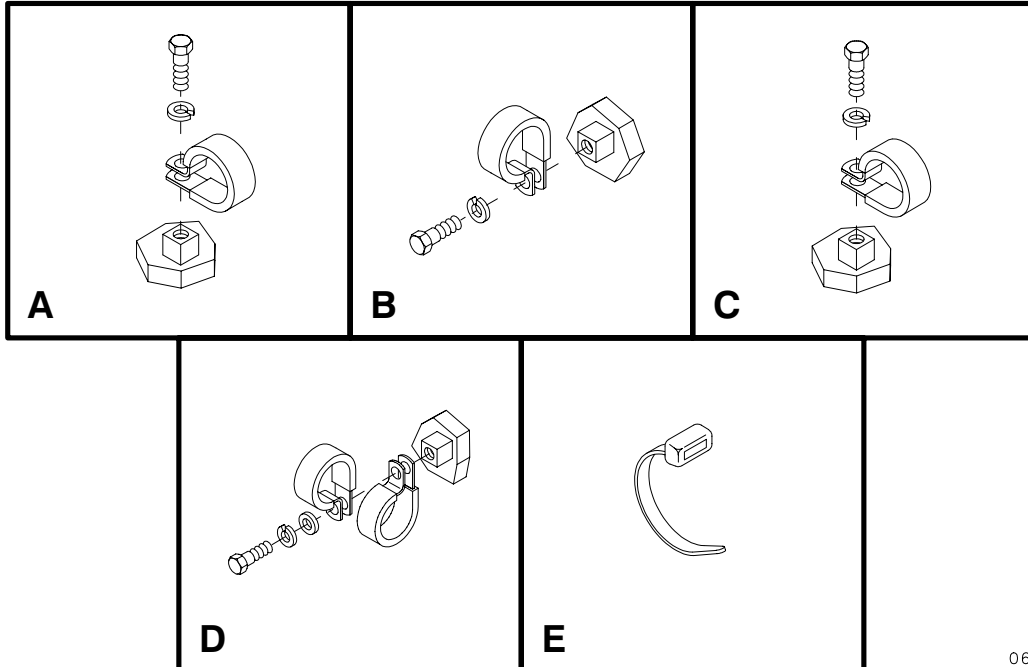
**b. Installation – Continued**



TOP VIEW



RIGHT SIDE VIEW



06ph193m

**Section IX. HULL WIRING HARNESS – CONTINUED**

**8-63 WIRING HARNESS W104 – CONTINUED**

**b. Installation – Continued**

- 2 Connect connector W104 J1 (21) to harness mounting bracket and install four screws (20), four new lockwashers (19), four flat washers (18), and four nuts (17).

**NOTE**

The following legend identifies attachment points for each connection.

- 3 Install wiring harness (1) with attaching hardware at the following attachment points:

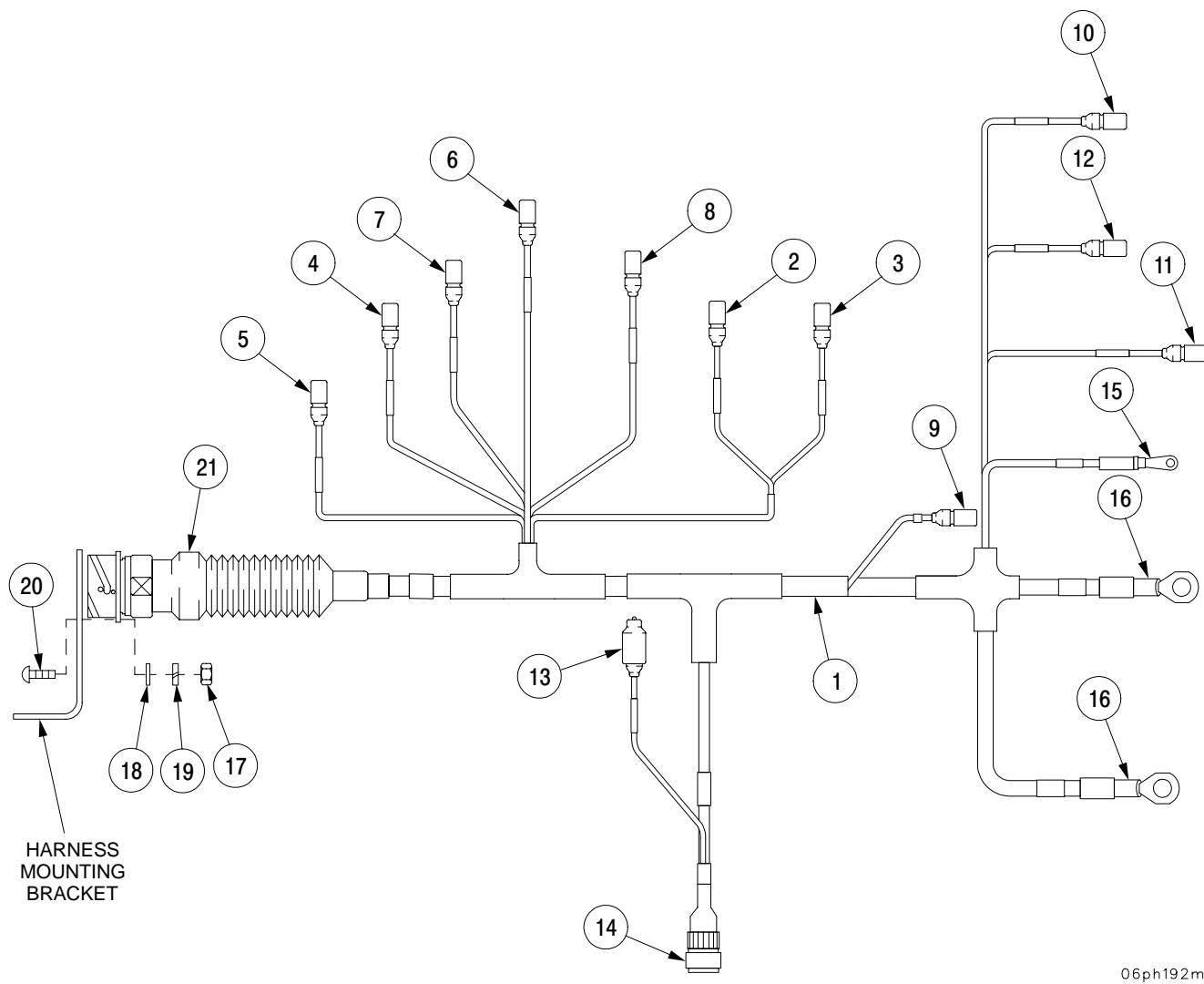
<b>Item No.</b>	<b>W104 Connector/Lead/Wire</b>	<b>To Connector/Lead/Wire/Component</b>	<b>Location</b>
16	Wire 82 (2)	Starter Solenoid (Positive Terminal)	Engine Compartment (Rear)
15	Wire 14B	Starter Solenoid	Engine Compartment (Rear)
14	W104 P2	Glow Plug Controller	Engine Compartment (Left Side)
13	Wire 588	Fuel Prime Pump	Engine Compartment (Left Side)
12	Wire 415B	Generator Oil Pressure Switch	Engine Compartment (Left Rear)
11	Wire 36	Engine Oil Pressure Transmitter	Engine Compartment (Left Rear)
10	Wire 509B	Engine Oil Pressure Switch	Engine Compartment (Left Rear)
9	Wire 33A	Engine Coolant Temperature Transmitter	Engine Compartment (Right Rear)
8	Wire 509A	Engine Coolant Temperature Switch	Engine Compartment (Right Side)
7	Wire 321	Transmission Oil Pressure Transmitter	Engine Compartment (Right Side)
6	Wire 509C	Transmission Oil Pressure Switch	Engine Compartment (Right Side)
5	Wire 509D	Transmission Oil High Temperature Switch	Engine Compartment (Right Side)
4	Wire 324	Transmission Oil Temperature Transmitter	Engine Compartment (Right Side)
3	Wire 352B	Low Level Coolant Detector	Engine Compartment (Right Side)
2	Wire 352A	Low Level Coolant Detector	Engine Compartment (Right Side)

- 4 Apply adhesive to starter solenoid terminals after assembly.

**Section IX. HULL WIRING HARNESS – CONTINUED**

**8-63 WIRING HARNESS W104 – CONTINUED**

**b. Installation – Continued**



06ph192m

**NOTE**

**FOLLOW-ON MAINTENANCE:**

- Install powerpack (para 4-1)
- Connect wiring harness W105 P1 at engine disconnect bracket (para 8-64)



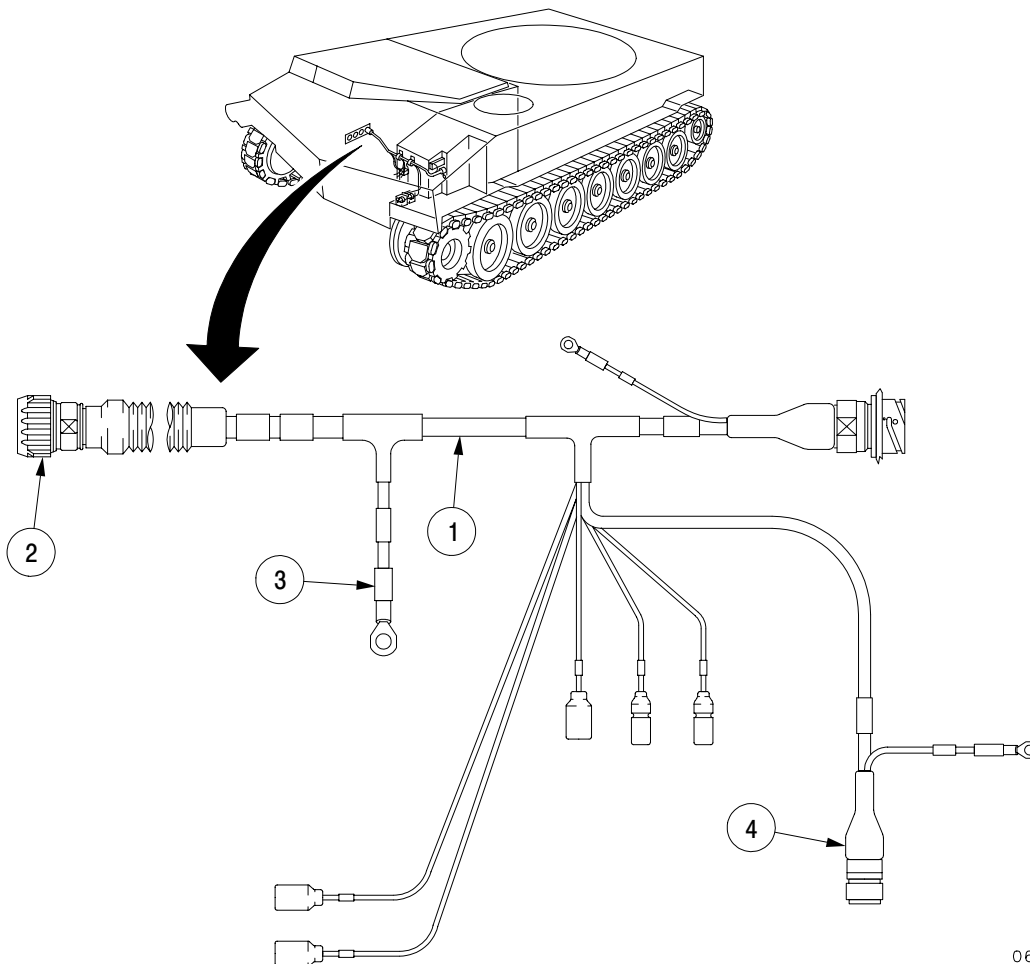
**Section IX. HULL WIRING HARNESS – CONTINUED**

**8-64 WIRING HARNESS W105 – CONTINUED**

**a. Removal – Continued**

1 Remove wiring harness (1) and attaching hardware at the following attachment points:

Item No.	W105 Connector/Lead/Wire	From Connector/Lead/Wire/Component	Location
2	W105 P1	Harness Mounting Bracket	Engine Compartment (Forward)
3	Wire 82	Master Relay Terminal A2	Master Relay (Forward Battery Compartment)
4	W105 P3	Starter Protection Device	Battery Compartment (Forward)



06ph203m

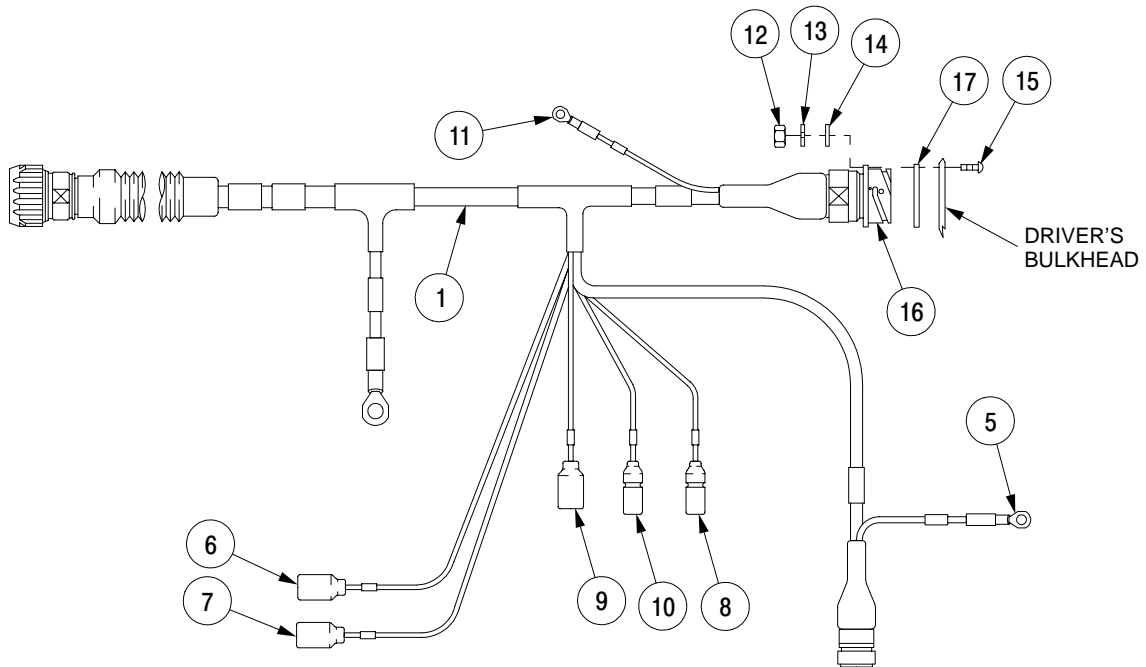
**Section IX. HULL WIRING HARNESS – CONTINUED**

**8-64 WIRING HARNESS W105 – CONTINUED**

**a. Removal – Continued**

Item No.	W105 Connector/Lead/Wire	From Connector/Lead/Wire/Component	Location
5	Wire 452A	Bilge Pump Circuit Breaker	Battery Compartment (Forward)
6	Wire 452A	Lead 12370823 Wire 452A	Battery Compartment (Forward)
7	Wire 459M	Lead 12370823 Wire 459M	Battery Compartment (Forward)
8	Wire 605	W106 Wire 605	Battery Compartment (Forward)
9	Wire OVS	W106 Wire OVS	Battery Compartment (Forward)
10	Wire L+	W106 Wire L+	Battery Compartment (Forward)
11	Wire 7	Bus Bar	Battery Compartment (Rear)

- Remove four nuts (12), four lockwashers (13), four flat washers (14), four screws (15), connector W105 J1 (16) and gasket (17) from driver's bulkhead. Discard lockwashers and gasket.



06ph204m

---

**Section IX. HULL WIRING HARNESS – CONTINUED**

---

**8-64 WIRING HARNESS W105 – CONTINUED**

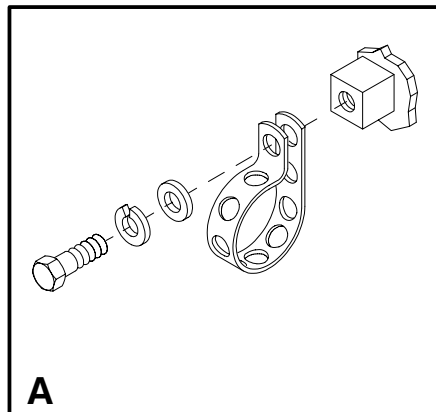
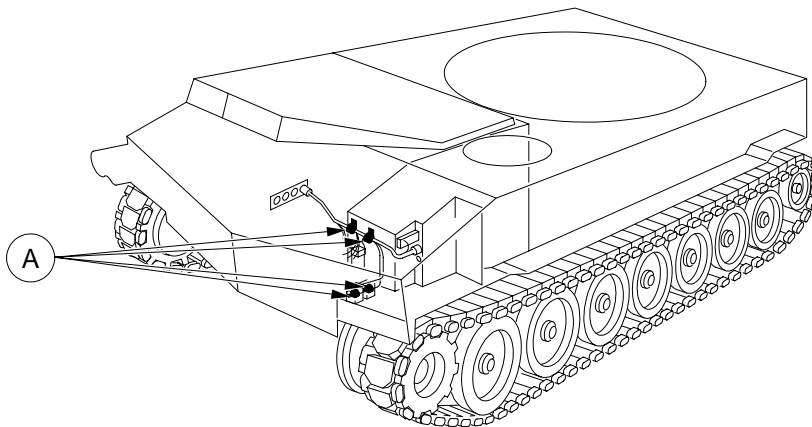
---

**a. Removal – Continued**

- 3 Remove straps, clamps, attaching hardware, and lockwashers (A) securing wiring harness (1) to vehicle, as shown in illustration. Discard lockwashers.
- 4 Remove wiring harness (1).

**b. Installation.**

- 1 Install wiring harness (1) in vehicle, with straps, clamps, attaching hardware, and new lockwashers (A), as shown in illustration.



06ph205m



**Section IX. HULL WIRING HARNESS – CONTINUED**

**8-64 WIRING HARNESS W105 – CONTINUED**

**b. Installation – Continued**

- 2 Install new gasket (17) and connector W105 J1 (16) to driver’s bulkhead with four screws (15), four flat washers (14), four new lockwashers (13), and four nuts (12).

**NOTE**

The following legend identifies attachment points for each connection.

- 3 Install wiring harness (1) with attaching hardware at the following attachment points:

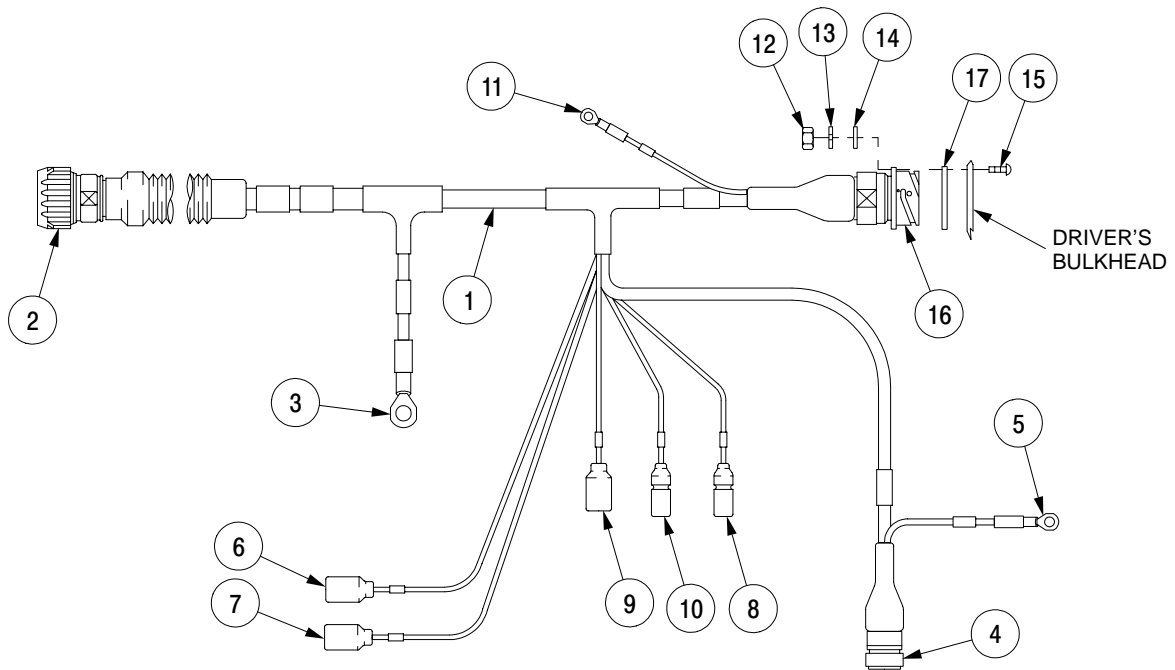
<b>Item No.</b>	<b>W105 Connector/Lead/Wire</b>	<b>To Connector/Lead/Wire/ Component</b>	<b>Location</b>
11	Wire 7	Bus Bar	Battery Compartment (Rear)
10	Wire L+	W106 Wire L+	Battery Compartment (Forward)
9	Wire OVS	W106 Wire OVS	Battery Compartment (Forward)
8	Wire 605	W106 Wire 605	Battery Compartment (Forward)
7	Wire 459M	Lead 12370823 Wire 459M	Battery Compartment (Forward)
6	Wire 452A	Lead 12370823 Wire 452A	Battery Compartment (Forward)
5	Wire 452A	Bilge Pump Circuit Breaker	Battery Compartment (Forward)
4	W105 P3	Starter Protection Device	Battery Compartment (Forward)
3	Wire 82	Master Relay Terminal A2	Master Relay (Forward Battery Compartment)
2	W105 P1	Harness Mounting Bracket	Engine Compartment (Forward)

- 4 Apply adhesive to master relay terminal A2 after assembly.

**Section IX. HULL WIRING HARNESS – CONTINUED**

**8-64 WIRING HARNESS W105 – CONTINUED**

**b. Installation – Continued**



06ph206m

**NOTE**

**FOLLOW-ON MAINTENANCE:**

- Connect W104 J1 at engine disconnect bracket (para 8-63)
- Connect W114 P1 to driver's bulkhead (para 8-73)
- Connect battery ground leads (para 8-33)
- Close and secure transmission access doors (TM 9-2350-314-10)



---

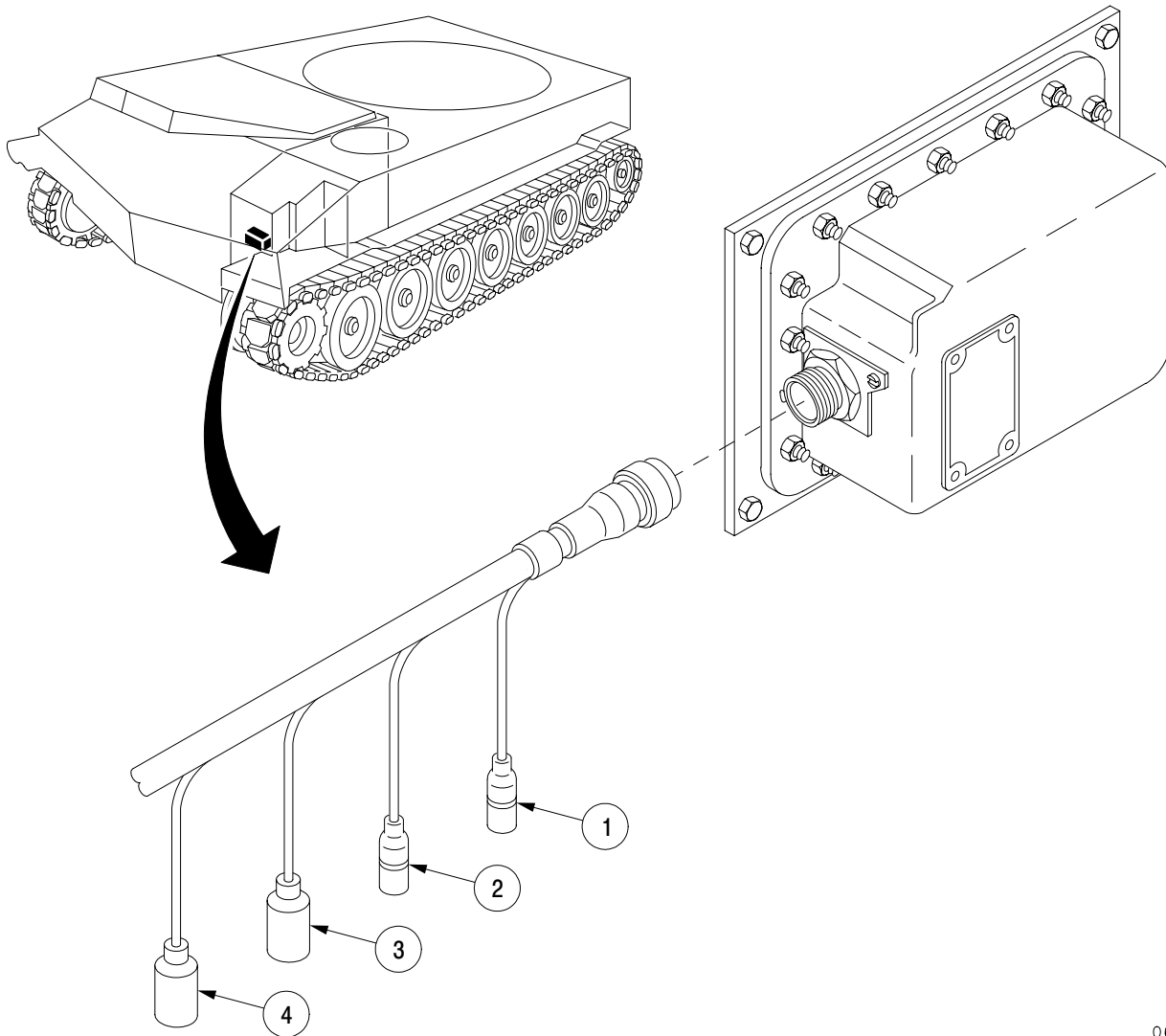
**Section IX. HULL WIRING HARNESS – CONTINUED**

---

**8-65 WIRING HARNESS W106 – CONTINUED**

---

**a. Removal – Continued**



06ph194m

---

**Section IX. HULL WIRING HARNESS – CONTINUED**

---

**8-65 WIRING HARNESS W106 – CONTINUED**

---

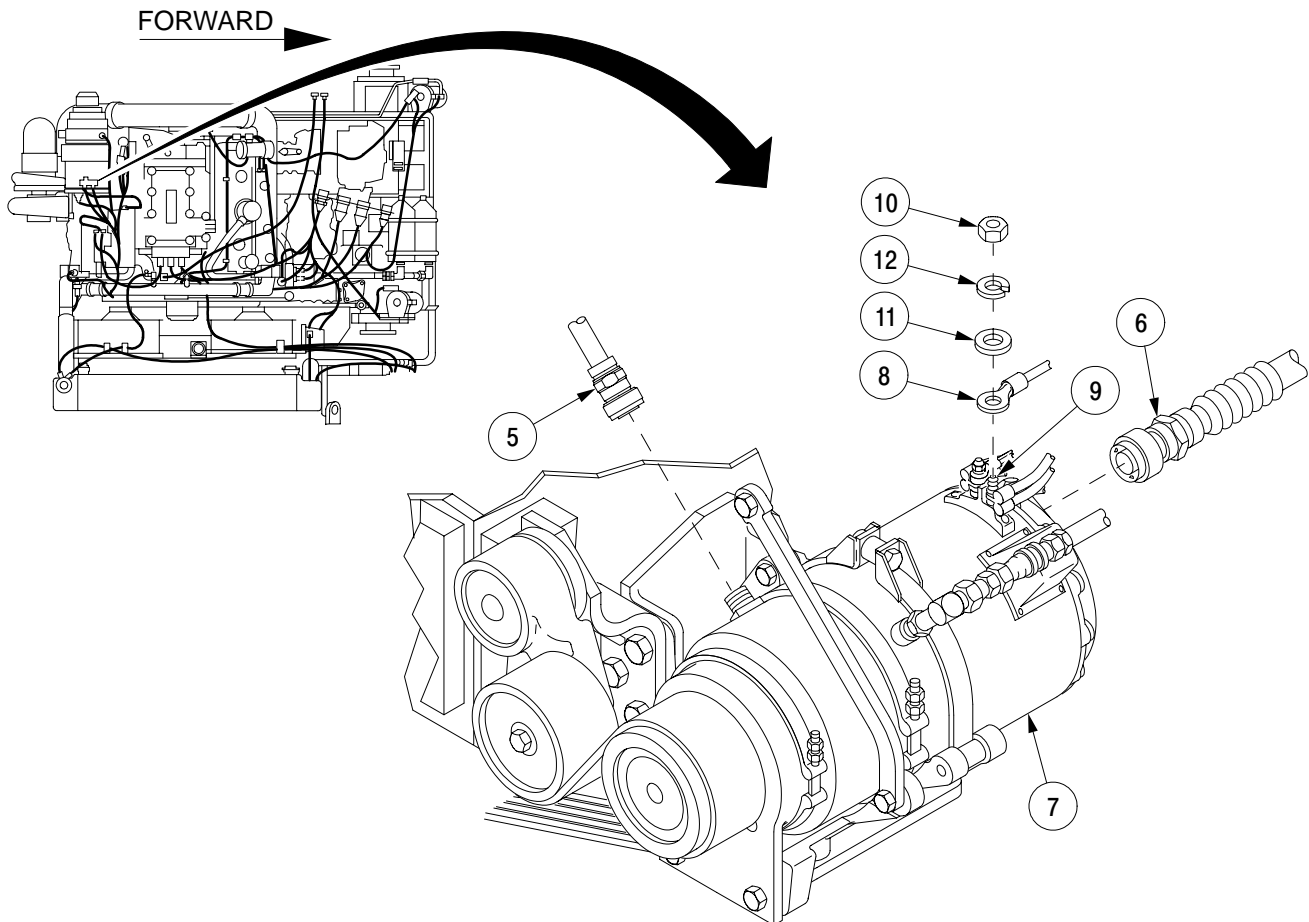
**a. Removal – Continued**

- 5 Disconnect wiring harness W106 connector P2 (5) from generator receptacle J2 and W106 connector P3 (6) from generator receptacle J1 on generator (7).

**NOTE**

Additional wires may be removed as necessary from terminal to access W106 lead L-.

- 6 Disconnect wiring harness W106 lead L- (8) from negative (small) terminal (9) of generator (7) by removing nut (10), flat washer (11), and lockwasher (12). Discard lockwasher.



06ph195m

---

**Section IX. HULL WIRING HARNESS – CONTINUED**

---

**8-65 WIRING HARNESS W106 – CONTINUED**

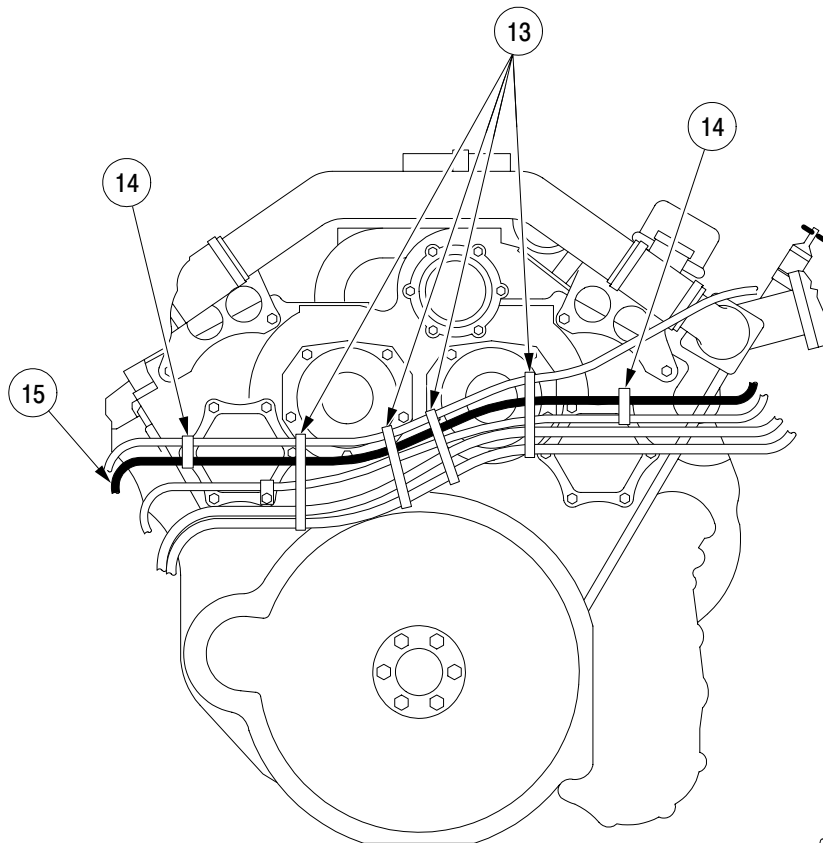
---

**a. Removal – Continued**

- 7 Remove four tiedown straps (13) and two clamps (14) securing wiring harness W106 (15) to front of engine. Discard tiedown straps.
- 8 Remove wiring harness W106 (15) from vehicle.

**b. Installation.**

- 1 Position wiring harness W106 (15) in vehicle.
- 2 Secure wiring harness W106 (15) to front of engine with four new tiedown straps (13) and two clamps (14).



06ph196m

---

## Section IX. HULL WIRING HARNESS – CONTINUED

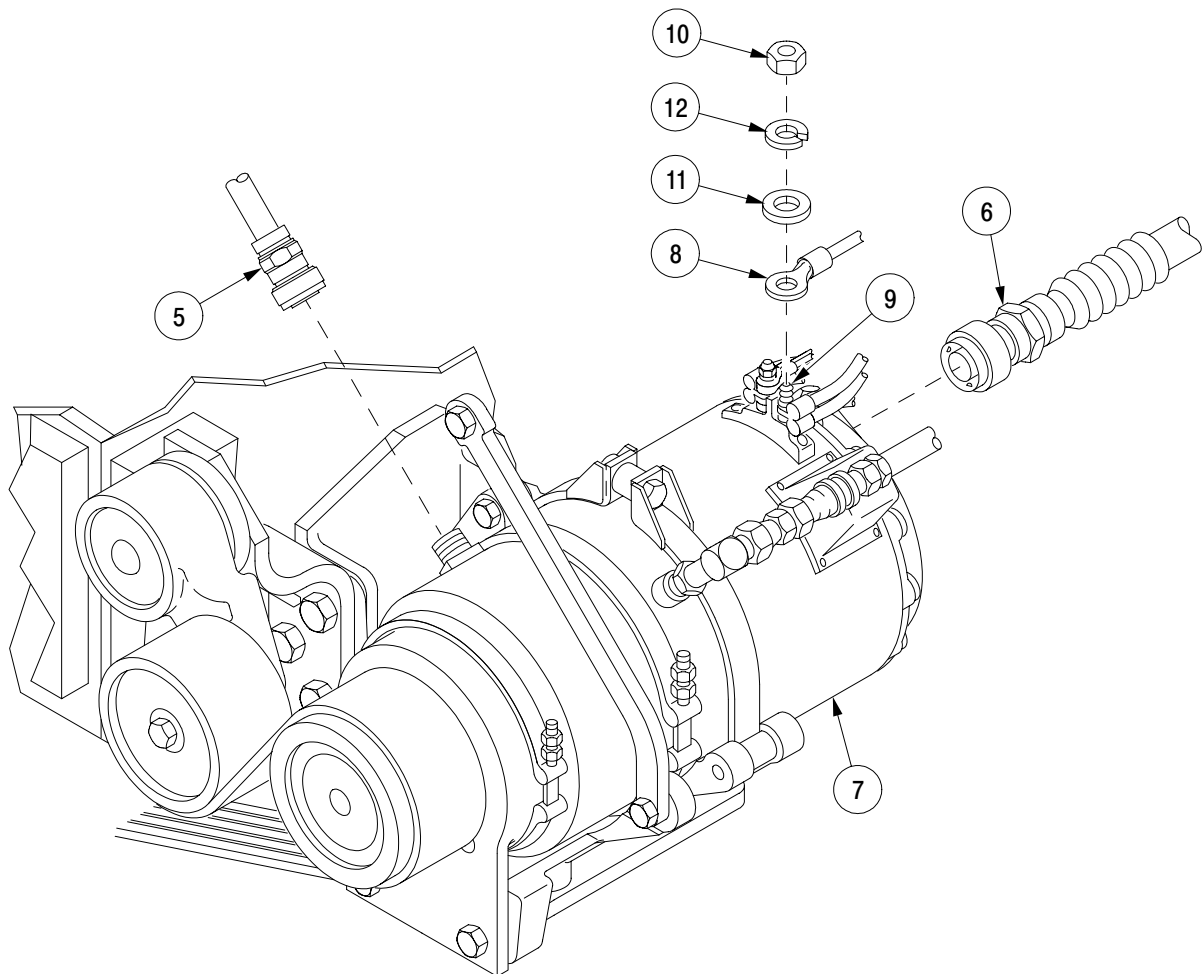
---

### 8-65 WIRING HARNESS W106 – CONTINUED

---

#### b. Installation – Continued

- 3 Connect wiring harness W106 lead L- (8) to negative small terminal (9) of generator (7) with nut (10), new lockwasher (12), and flat washer (11).
- 4 Apply adhesive to negative small terminal (9) after assembly.
- 5 Connect wiring harness W106 connector P3 (6) to generator receptacle J1 and wiring harness W106 connector P2 (5) to generator receptacle J2. Tighten connectors 1/4–1/2 turn past finger-tight.



06ph197m

---

**Section IX. HULL WIRING HARNESS – CONTINUED**

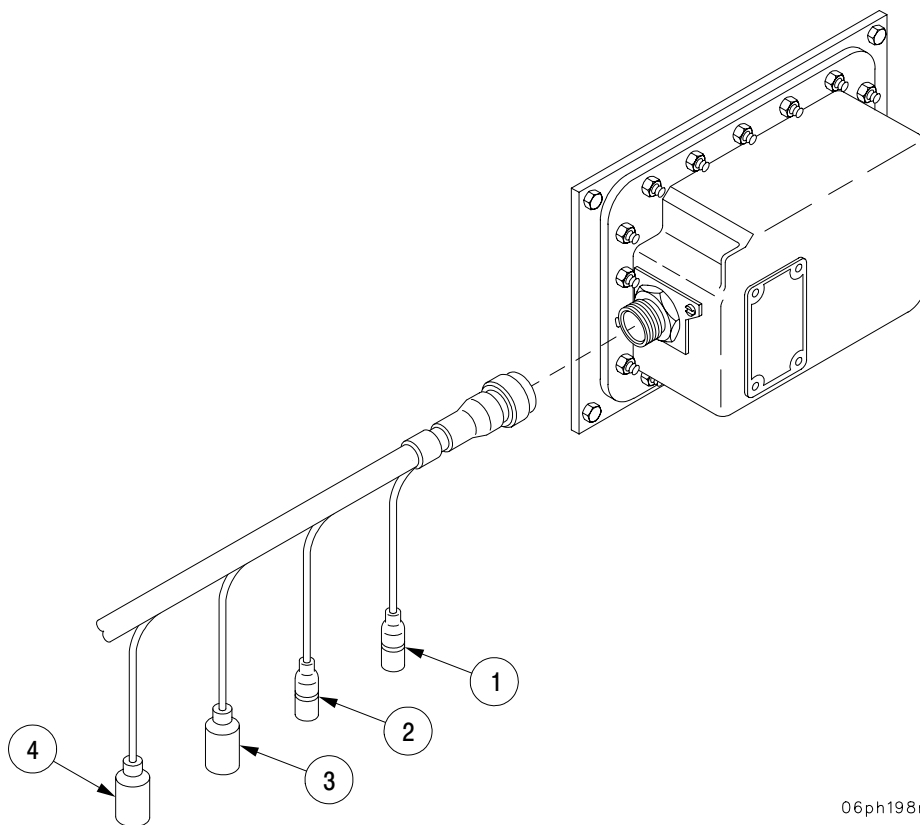
---

**8-65 WIRING HARNESS W106 – CONTINUED**

---

**b. Installation – Continued**

- 6 Connect wiring harness W106 wire AVF+ (4) to wiring harness W101 wire AV.
- 7 Connect wiring harness W106 wire L+ (3) to wiring harness W105 wire L+.
- 8 Connect wiring harness W106 wire 605-AC (2) to wiring harness W105 wire 605.
- 9 Connect wiring harness W106 wire OVS (1) to wiring harness W105 wire OVS.



06ph198m

**NOTE****FOLLOW-ON MAINTENANCE:**

Install powerpack (para 4-1)

Connect battery ground leads (para 8-33)





---

**Section IX. HULL WIRING HARNESS – CONTINUED**

---

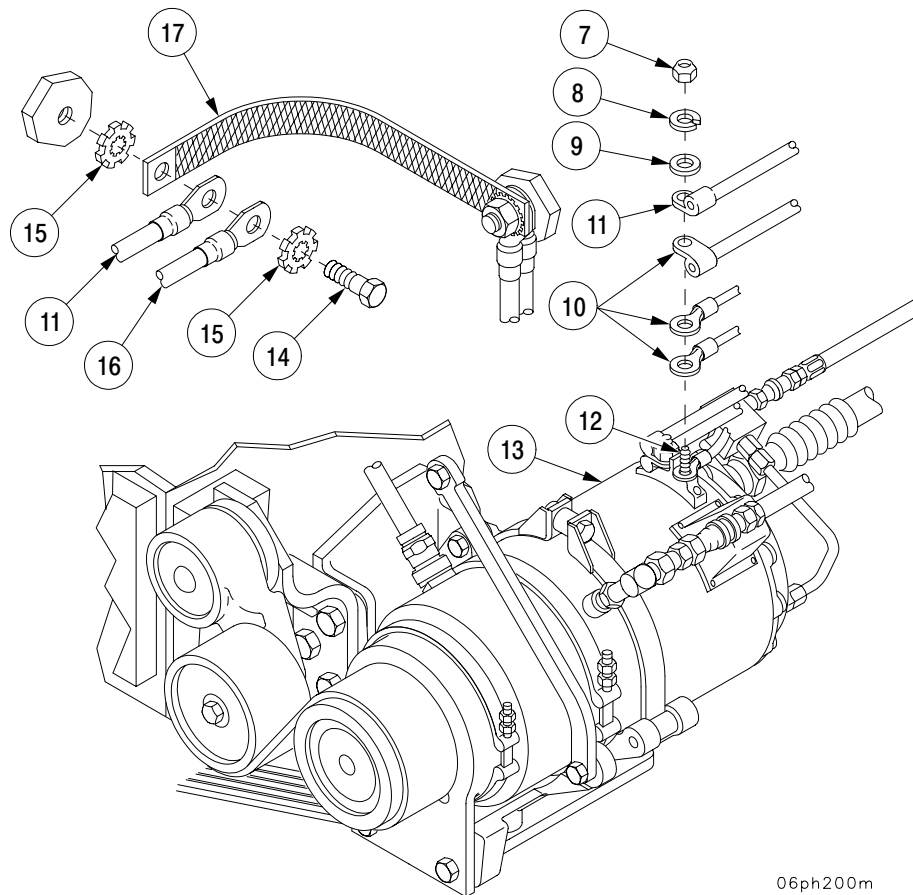
**8-66 WIRING HARNESS W107 – CONTINUED**

---

**a. Removal – Continued****NOTE**

Additional wires may be removed as necessary from terminals to access wiring harness W107 leads E2 7, E3 7, E4 7, and E1 7.

- 2 Remove nut (7), lockwasher (8), flat washer (9), and three wiring harness W107 leads E2 7, E3 7, and E4 7 (10), and ground lead 3 (11) from negative (small) terminal (12) on generator (13). Discard lockwasher.
- 3 Remove screw (14), two lockwashers (15), wiring harness W107 lead E1 7 (16), ground lead 3 (11), and ground strap (17) from engine block. Discard lockwashers.



06ph200m

---

## Section IX. HULL WIRING HARNESS – CONTINUED

---

### 8-66 WIRING HARNESS W107 – CONTINUED

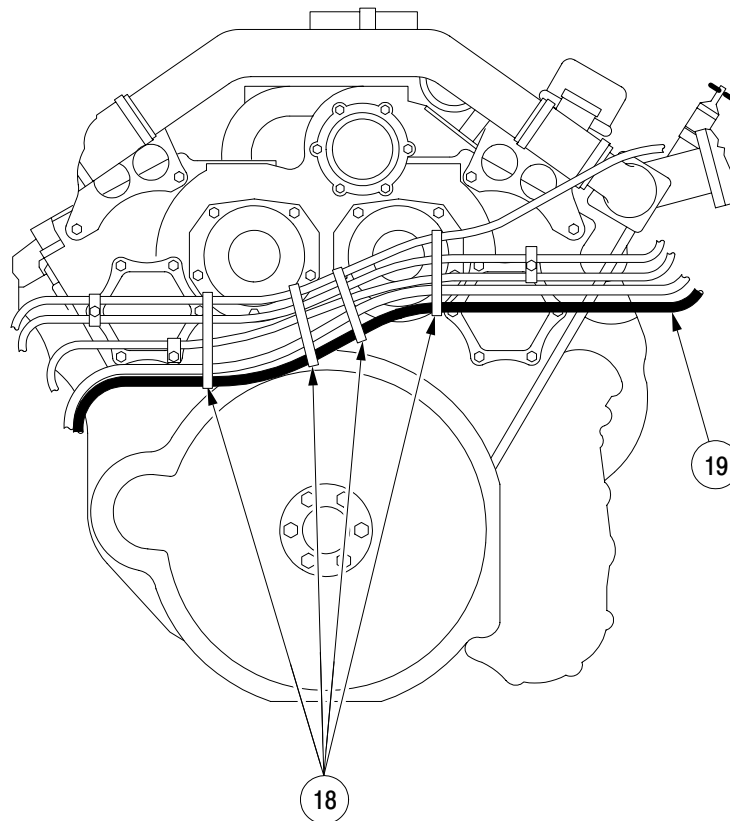
---

#### a. Removal – Continued

- 4 Remove four tiedown straps (18) securing wiring harness W107 (19) to front of engine.
- 5 Remove wiring harness W107 (19) from vehicle.

#### b. Installation.

- 1 Position wiring harness W107 (19) in vehicle.
- 2 Secure wiring harness W107 (19) to front of engine with four new tiedown straps (18).



06ph201m

---

**Section IX. HULL WIRING HARNESS – CONTINUED**

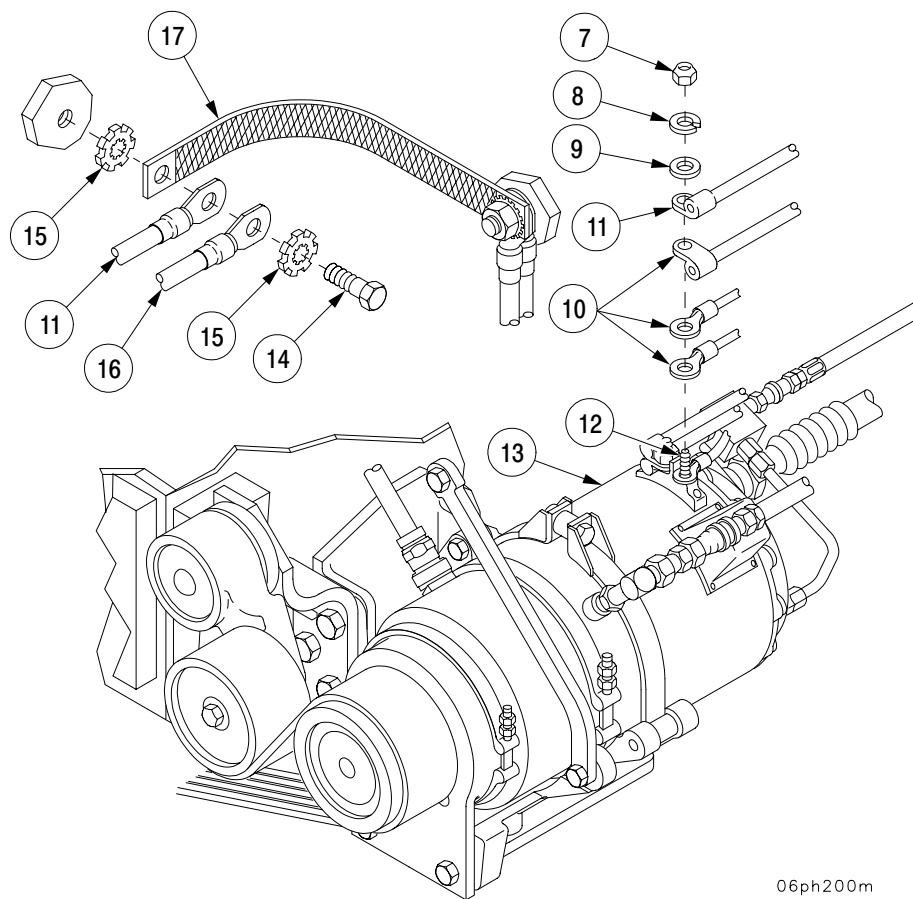
---

**8-66 WIRING HARNESS W107 – CONTINUED**

---

**b. Installation – Continued**

- 3 Connect ground strap (17), ground lead 3 (11), and wiring harness W107 lead E1 7 (16) to engine block with screw (14) and two new lockwashers (15).
- 4 Connect three wiring harness W107 leads E4 7, E3 7, and E2 7 (10) and ground lead 3 (11) to negative (small) terminal (12) on generator (13) with flat washer (9), new lockwasher (8), and nut (7).
- 5 Apply adhesive to negative (small) terminal (11) after assembly.



06ph200m

---

**Section IX. HULL WIRING HARNESS – CONTINUED**

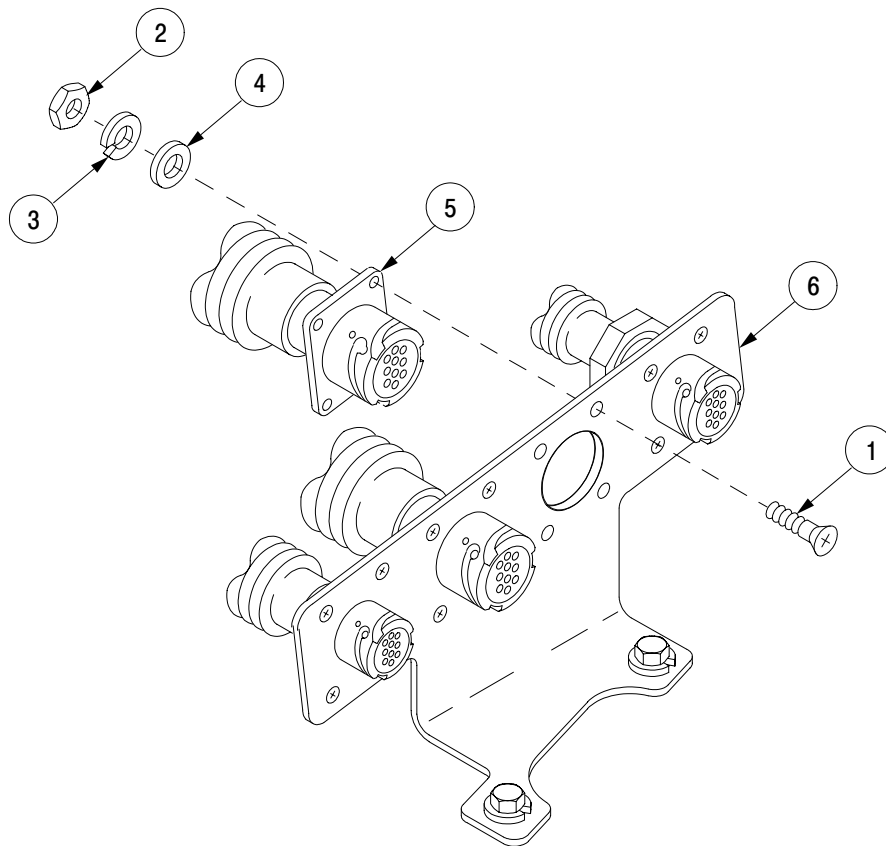
---

**8-66 WIRING HARNESS W107 – CONTINUED**

---

**b. Installation – Continued**

- 6 Secure wiring harness W107 connector J1 (5) to mounting bracket (6) with four screws (1), four flat washers (4), four new lockwashers (3), and four nuts (2).



06ph202m

**NOTE**

**FOLLOW-ON MAINTENANCE:**

Install powerpack (para 4-1)

Connect battery ground leads (para 8-33)



**Section IX. HULL WIRING HARNESS – CONTINUED**

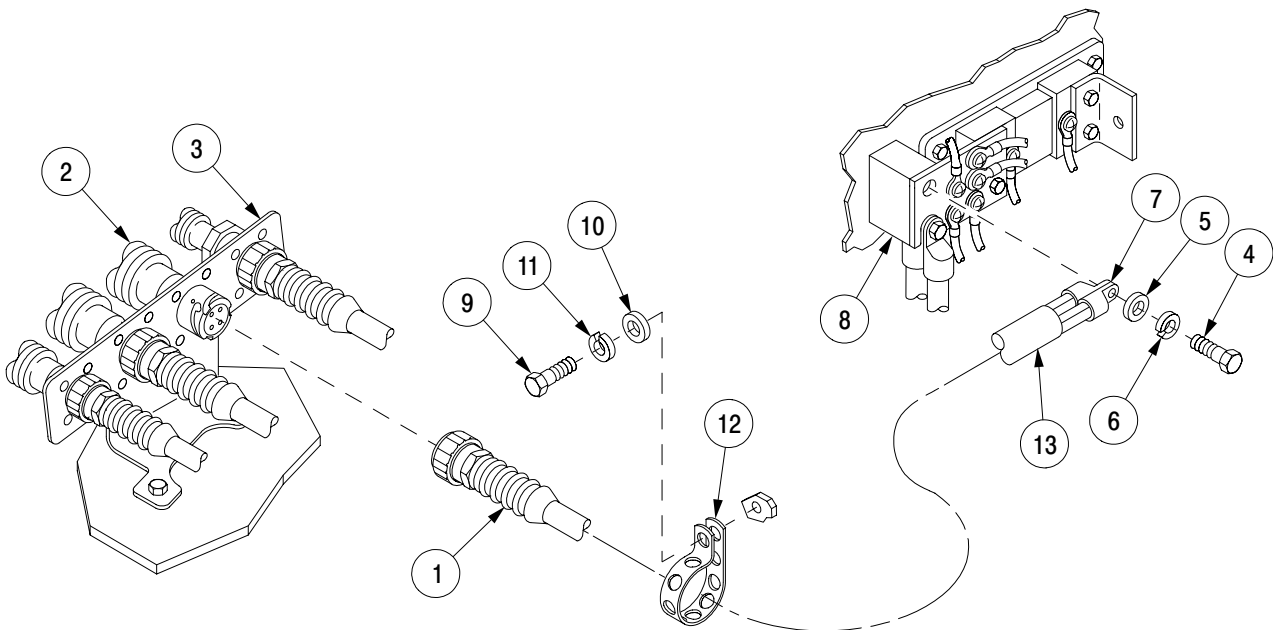
**8-67 WIRING HARNESS W108 – CONTINUED**

**a. Removal – Continued**

- 3 Remove three screws (9), three flat washers (10), three lockwashers (11), and three straps (12) securing wiring harness W108 (13) to vehicle. Discard lockwashers.
- 4 Remove wiring harness W108 (13) from vehicle.

**b. Installation.**

- 1 Position wiring harness W108 (13) in vehicle.
- 2 Install two wiring harness W108 leads E1 7 and E2 7 (7) to ground bus (8) with screw (4), new lockwasher (6), and flat washer (5).
- 3 Connect wiring harness W108 connector P1 (1) to wiring harness W107 connector J1 (2) at harness mounting bracket (3).
- 4 Secure wiring harness W108 (13) to vehicle with three straps (12), three screws (9), three new lockwashers (11), and three flat washers (10).



06ph208m

**NOTE**

**FOLLOW-ON MAINTENANCE:**  
Connect battery ground leads (para 8-33)



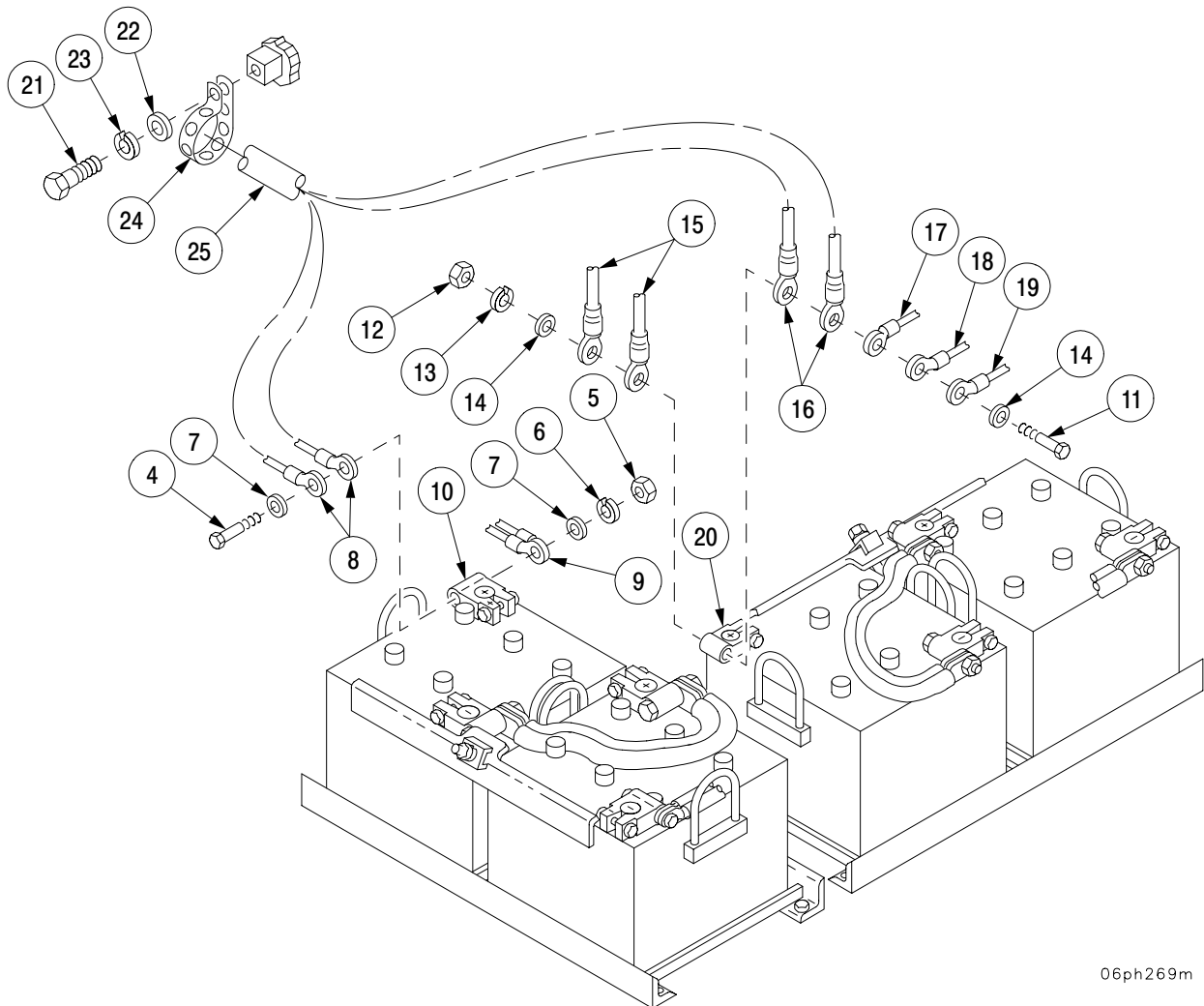


**Section IX. HULL WIRING HARNESS – CONTINUED**

**8-68 WIRING HARNESS W109 – CONTINUED**

**a. Removal – Continued**

- 2 Remove screw (4), nut (5), lockwasher (6), two flat washers (7), two wiring harness W109 leads E1 81 and E2 81 (8), and wiring harness lead 81A (9) from battery terminal lug (10). Discard lockwasher.
- 3 Remove screw (11), nut (12), lockwasher (13), two flat washers (14), two wiring harness leads 81B (15), two wiring harness W109 leads E3 81 and E4 81 (16), and leads 81 (17), 10V (18), and 10R (19) from battery terminal lug (20). Discard lockwasher.
- 4 Remove two screws (21), two flat washers (22), two lockwashers (23), and two straps (24). Discard lockwashers.
- 5 Remove wiring harness W109 (25) from vehicle.



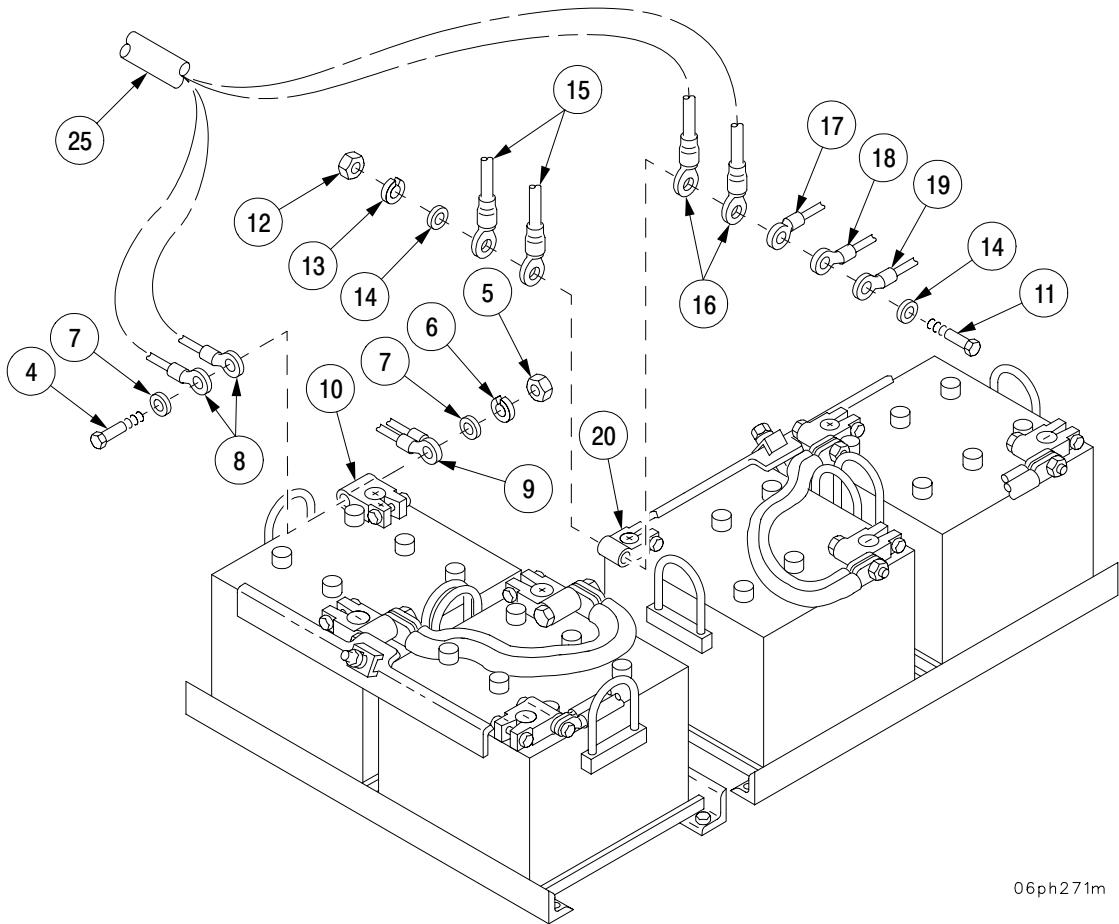
06ph269m

**Section IX. HULL WIRING HARNESS – CONTINUED**

**8-68 WIRING HARNESS W109 – CONTINUED**

**b. Installation.**

- 1 Position wiring harness W109 (25) in vehicle.
- 2 Install leads 10R (19), 10V (18), 81 (17), two wiring harness W109 leads E4 81 and E3 81 (16), and two wiring harness leads 81B (15) on battery terminal lug (20) with screw (11), two flat washers (14), new lockwasher (13), and nut (12).
- 3 Install wiring harness lead 81A (9) and two wiring harness W109 leads E2 81 and E1 81 (10) on battery terminal lug (9) with screw (4), two flat washers (7), new lockwasher (6), and nut (5).



06ph271m

---

## Section IX. HULL WIRING HARNESS – CONTINUED

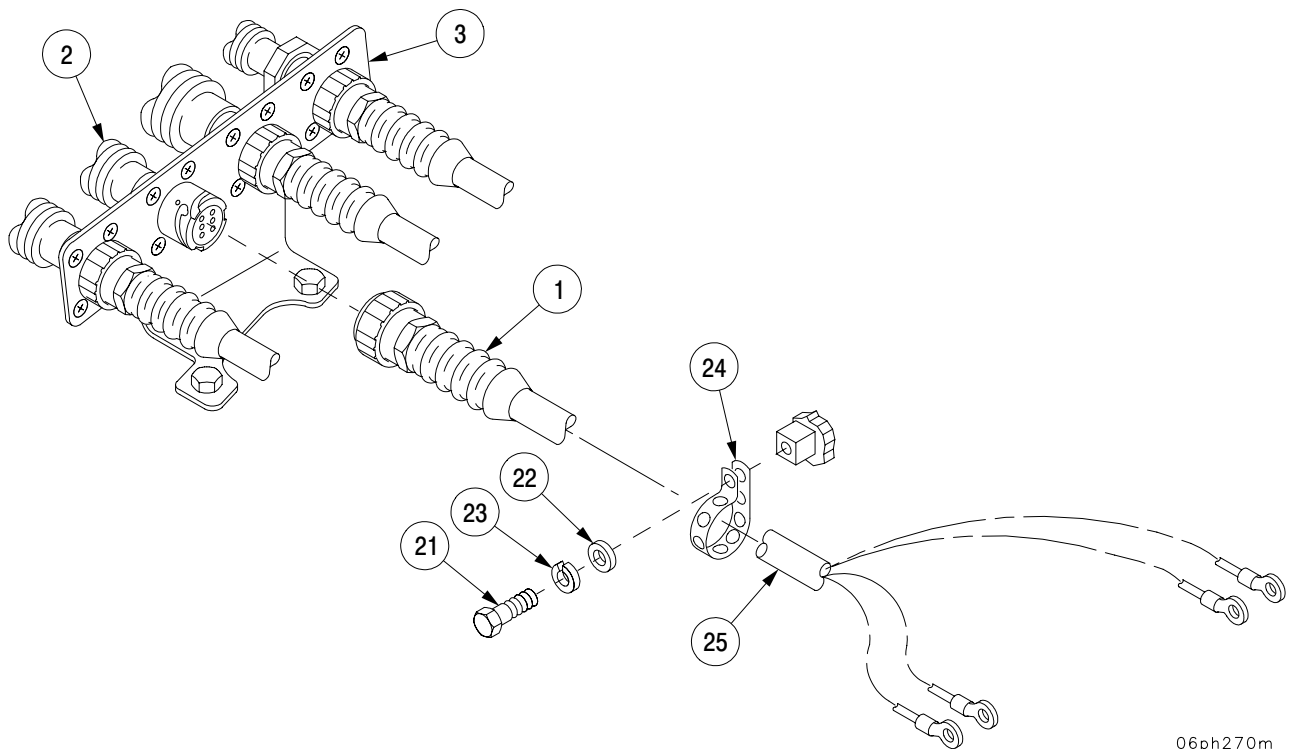
---

### 8-68 WIRING HARNESS W109 – CONTINUED

---

#### b. Installation – Continued

- 4 Connect wiring harness W109 connector P1 (1) to harness W110 connector J1 (2) at wiring harness mounting bracket (3).
- 5 Secure wiring harness W109 (25) to vehicle with two straps (24), two screws (21), two new lockwashers (23), and two flat washers (22).



06ph270m

#### NOTE

#### FOLLOW-ON MAINTENANCE:

Connect battery ground leads  
(para 8-33)



---

## Section IX. HULL WIRING HARNESS – CONTINUED

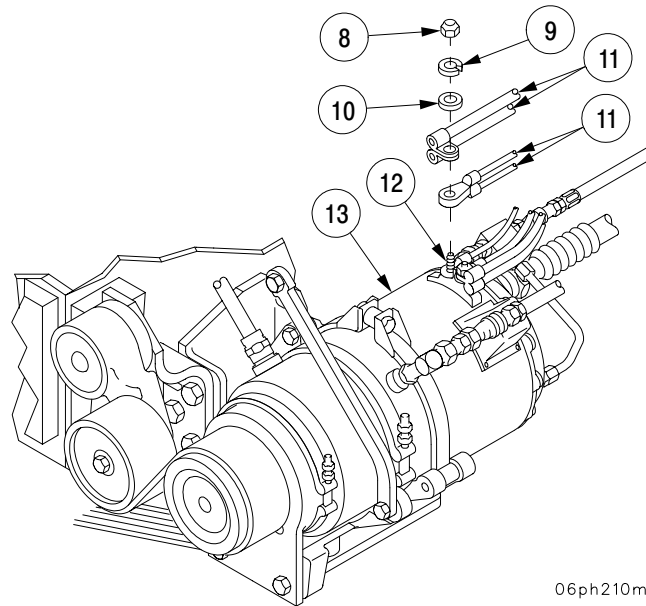
---

### 8-69 WIRING HARNESS W110 – CONTINUED

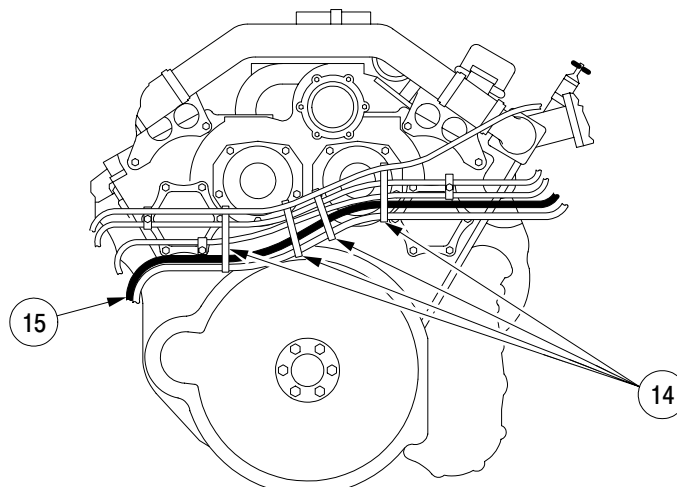
---

#### a. Removal – Continued

- 3 Remove nut (8), lockwasher (9), flat washer (10), and four wiring harness W110 leads E1 81, E2 81, E3 81, and E4 81 (11) from positive (large) terminal (12) on generator (13). Discard lockwasher.



- 4 Remove four tiedown straps (14), securing wiring harness W110 (15) to front of engine. Discard tiedown straps.
- 5 Remove wiring harness W110 (15) from vehicle.

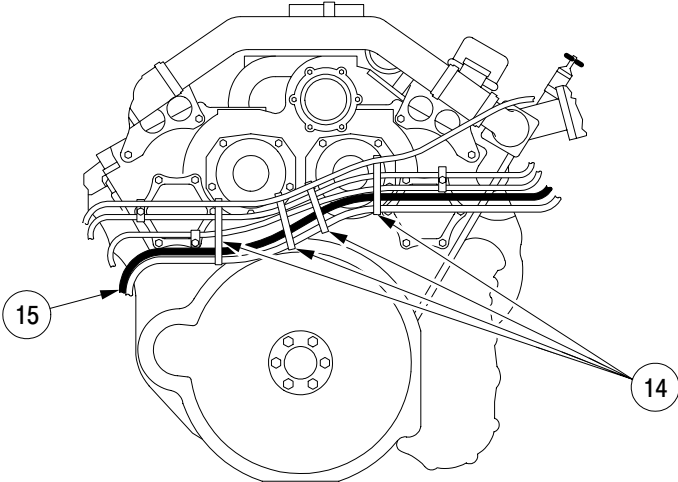


**Section IX. HULL WIRING HARNESS – CONTINUED**

**8-69 WIRING HARNESS W110 – CONTINUED**

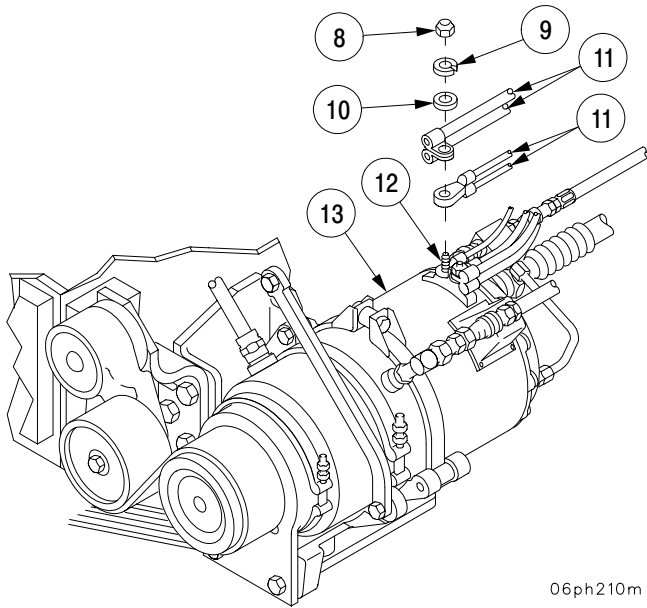
**b. Installation.**

- 1 Position wiring harness W110 (15) in vehicle.
- 2 Secure wiring harness W110 (15) to front of engine with four new tiedown straps (14).



06ph211m

- 3 Connect four wiring harness W110 leads E1 81, E2 81, E3 81, and E4 81 (11) to positive (large) terminal (12) on generator (13) with flat washer (10), new lockwasher (9), and nut (8).
- 4 Apply adhesive to large positive terminal (12) after assembly.



06ph210m

---

**Section IX. HULL WIRING HARNESS – CONTINUED**

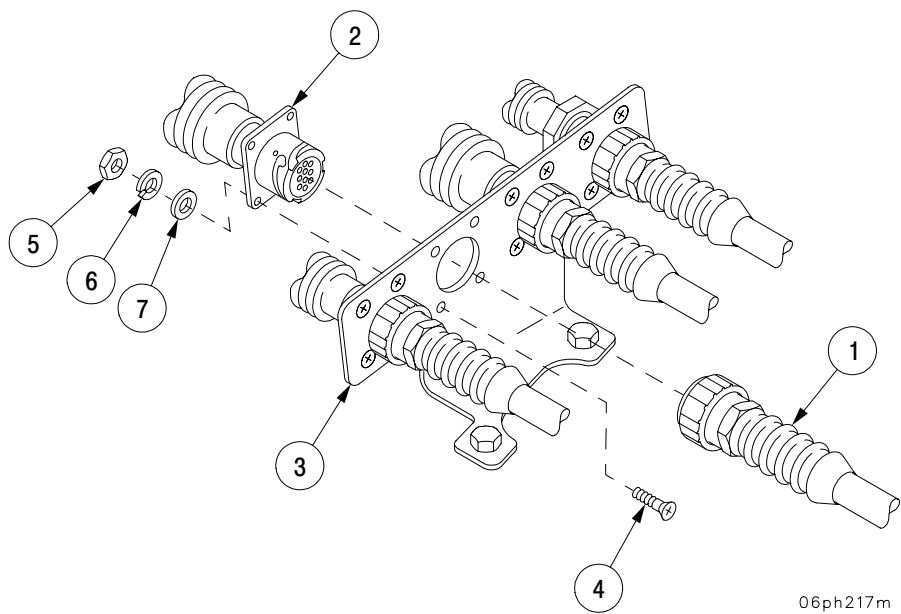
---

**8-69 WIRING HARNESS W110 – CONTINUED**

---

**b. Installation – Continued**

- 5 Secure wiring harness W110 connector J1 (2) to harness mounting bracket (3) with four screws (4), four flat washers (7), four new lockwashers (6), and four nuts (5).
- 6 Connect wiring harness W109 connector P1 (1) to wiring harness W110 connector J1 (2) on wiring harness mounting bracket (3).



**NOTE**

**FOLLOW-ON MAINTENANCE:**  
Connect battery ground leads (para 8-33)  
Install engine compartment access cover  
(para 16-7)





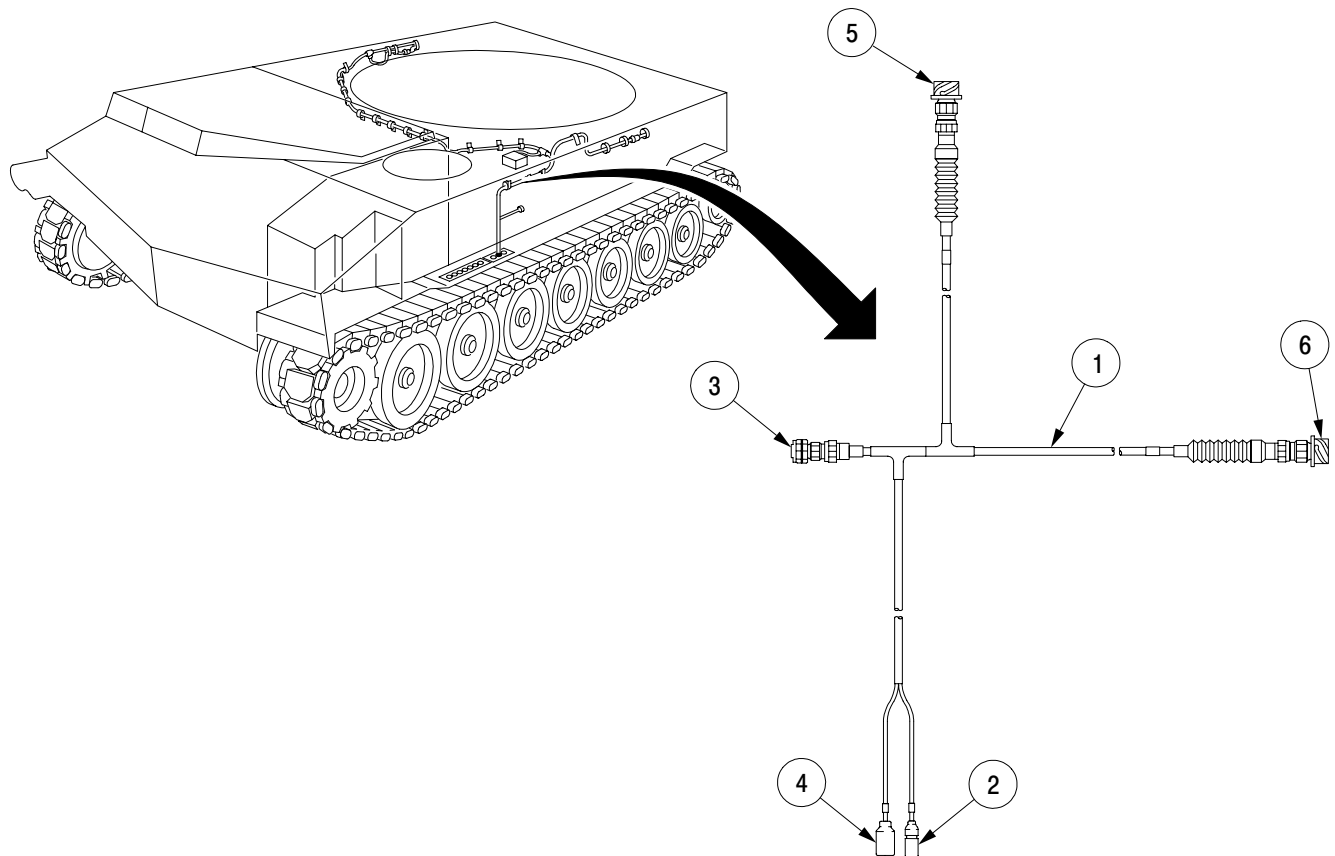
**Section IX. HULL WIRING HARNESS – CONTINUED**

**8-70 WIRING HARNESS W111A – CONTINUED**

**a. Removal – Continued**

- 1 Remove wiring harness (1) and attaching hardware, at the following attachment points:

Item No.	W111A Connector/Lead/Wire	From Connector/Lead/Wire/Component	Location
2	Wire 48	CB9	Circuit Breaker Panel
3	W111A P1	VMS Modem J2	Crew Compartment
4	Wire 7	W125 Wire 7	Rear of Portable Instrument Panel
5	W111A J3	Right Side Slip Ring Connector	Crew Compartment (Right Side)
6	W111A J2	A3206130-10 Cable Connector P3	Crew Compartment (Left Side)



06ph212m

**Section IX. HULL WIRING HARNESS – CONTINUED**

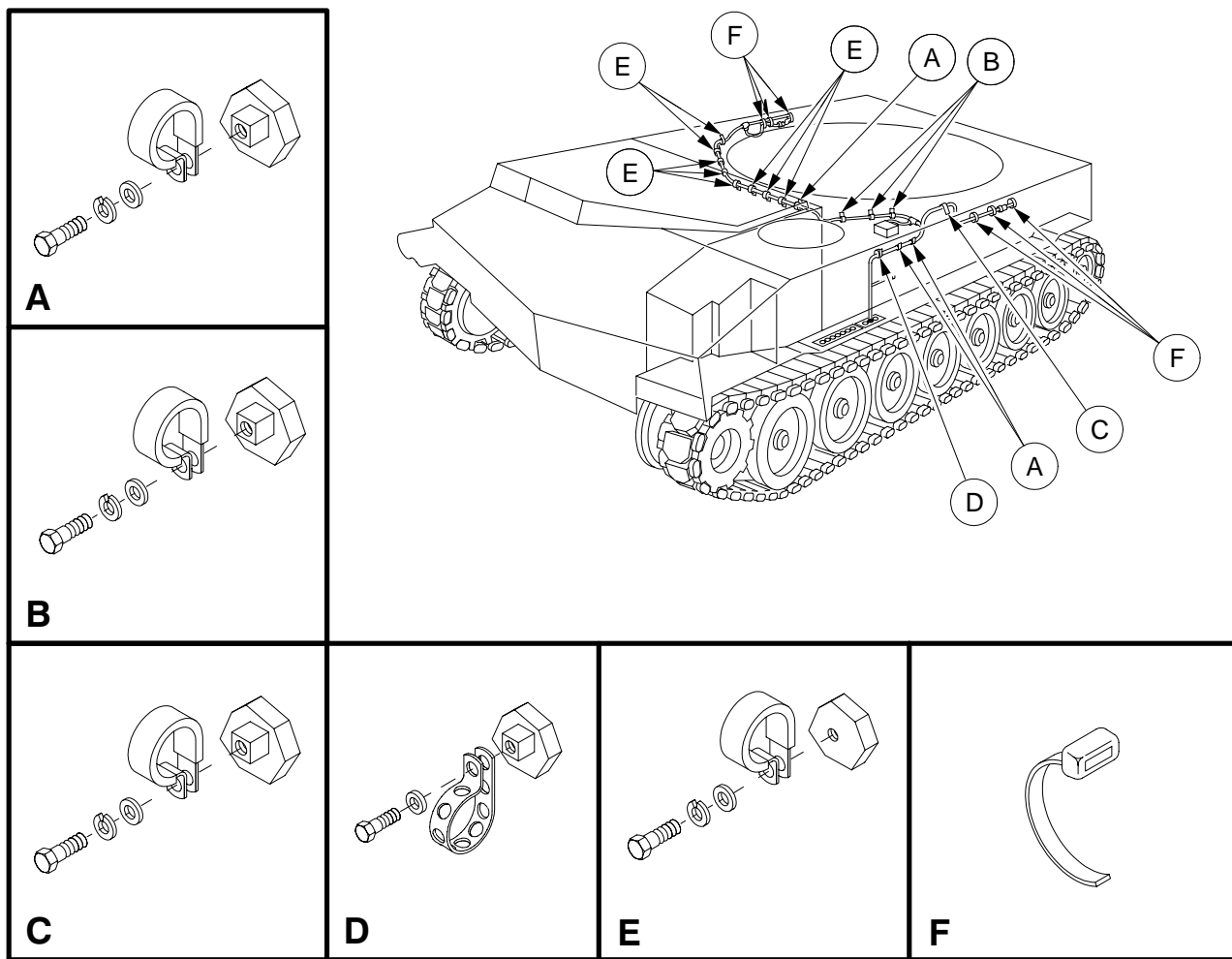
**8-70 WIRING HARNESS W111A – CONTINUED**

**a. Removal – Continued**

- 2 Remove straps, clamps, attaching hardware, and lockwashers (A thru F), securing wiring harness (1) to vehicle, as shown in illustration. Discard lockwashers.
- 3 Remove wiring harness (1).

**b. Installation.**

- 1 Install wiring harness (1) in vehicle, with straps, clamps, attaching hardware, and new lockwashers (A thru F) as shown in illustration.



06ph213m

**Section IX. HULL WIRING HARNESS – CONTINUED**

**8-70 WIRING HARNESS W111A – CONTINUED**

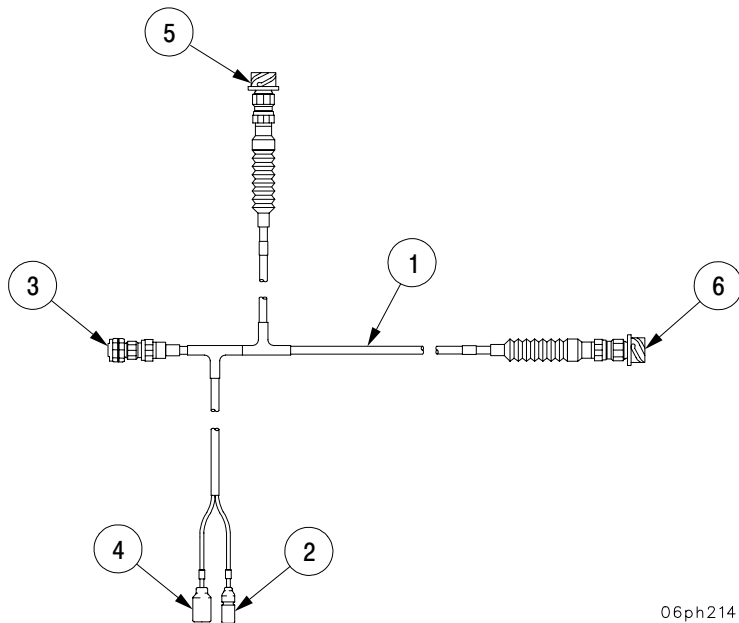
**b. Installation – Continued**

**NOTE**

The following legend identifies attachment points for each connection.

2 Install wiring harness (1) with attaching hardware, at the following attachment points.

Item No.	W111A Connector/Lead/Wire	To Connector/Lead/Wire/Component	Location
6	W111A J2	A3206130-10 Cable Connector P3	Crew Compartment (Left Side)
5	W111A J3	Right Side Slip Ring Connector	Crew Compartment (Right Side)
4	Wire 7	W125 Wire 7	Rear of Portable Instrument Panel
3	W111A P1	VMS Modem J2	Crew Compartment
2	Wire 48	CB9	Circuit Breaker Panel



06ph214m

**NOTE**

**FOLLOW-ON MAINTENANCE:**

Install turret slip ring cover under gun mount  
(TM 9-2350-314-20-2)

Install driver's full function crew station mounting  
plate (para 8-29)



**Section IX. HULL WIRING HARNESS – CONTINUED**

**8-71 WIRING HARNESS W112 – CONTINUED**

**a. Removal – Continued**

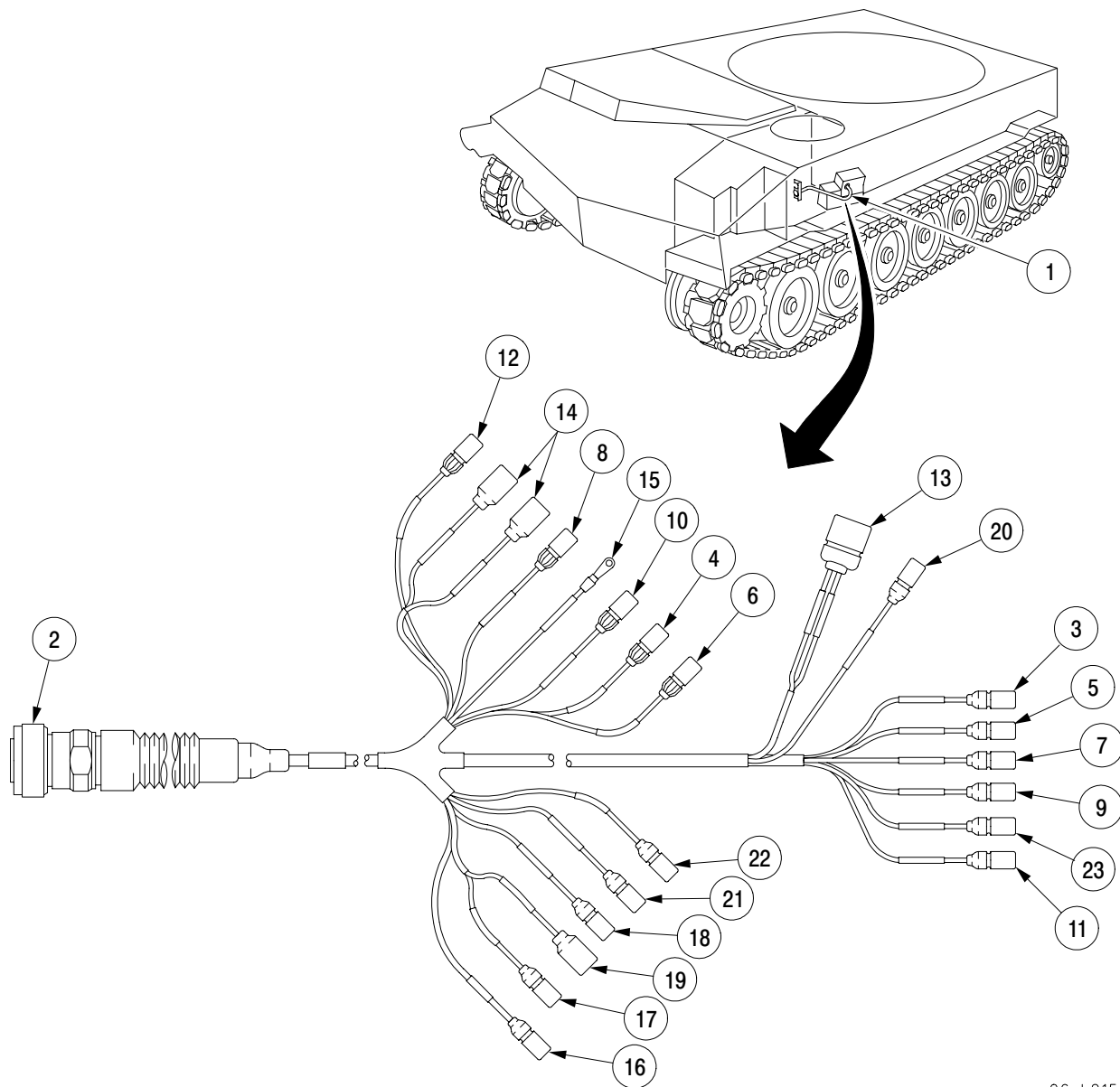
- 1 Disconnect wiring harness (1) at the following attachment points:

<b>Item No.</b>	<b>W112 Connector/Lead/Wire</b>	<b>From Connector/Lead/Wire/Component</b>	<b>Location</b>
2	W112 P1	W114 J1	Driver's Intercom Bracket – Behind Instrument Panel
3	Wire 27	Engine Water Temperature Gage	Rear of Portable Instrument Panel
4	Wire 33A	Engine Water Temperature Gage	Rear of Portable Instrument Panel
5	Wire 27	Transmission Oil Temperature Gage	Rear of Portable Instrument Panel
6	Wire 324	Transmission Oil Temperature Gage	Rear of Portable Instrument Panel
7	Wire 27	Engine Oil Pressure Gage	Rear of Portable Instrument Panel
8	Wire 36	Engine Oil Pressure Gage	Rear of Portable Instrument Panel
9	Wire 27	Transmission Oil Pressure Gage	Rear of Portable Instrument Panel
10	Wire 321	Transmission Oil Pressure Gage	Rear of Portable Instrument Panel
11	Wire 27	Fuel Gage	Rear of Portable Instrument Panel
12	Wire 29-31	Fuel Gage	Rear of Portable Instrument Panel
13	Wire 27/509	Warning Lamp	Rear of Portable Instrument Panel
14	Wire 40 (2)	Panel Lights	Rear of Portable Instrument Panel
15	GND	Portable Instrument Panel Cover	Rear of Portable Instrument Panel
16	Wire 459B	Master Switch	Rear of Portable Instrument Panel
17	Wire 459	Master Switch	Rear of Portable Instrument Panel
18	Wire 459A	Master Switch	Rear of Portable Instrument Panel
19	Wire 459L	Master Switch Warning Lamp	Rear of Portable Instrument Panel
20	Wire 27	Low Level Coolant Indicator	Rear of Portable Instrument Panel
21	Wire 352A	Low Level Coolant Indicator	Rear of Portable Instrument Panel
22	Wire 352B	Low Level Coolant Indicator	Rear of Portable Instrument Panel
23	Wire 27	Battery Indicator	Rear of Portable Instrument Panel

Section IX. HULL WIRING HARNESS – CONTINUED

8-71 WIRING HARNESS W112 – CONTINUED

a. Removal – Continued



06ph215m

2 Remove wiring harness (1).

**Section IX. HULL WIRING HARNESS – CONTINUED**

**8-71 WIRING HARNESS W112 – CONTINUED**

**b. Installation.**

**NOTE**

The following legend identifies attachment points for each connection.

Connect wiring harness (1) at the following attachment points:

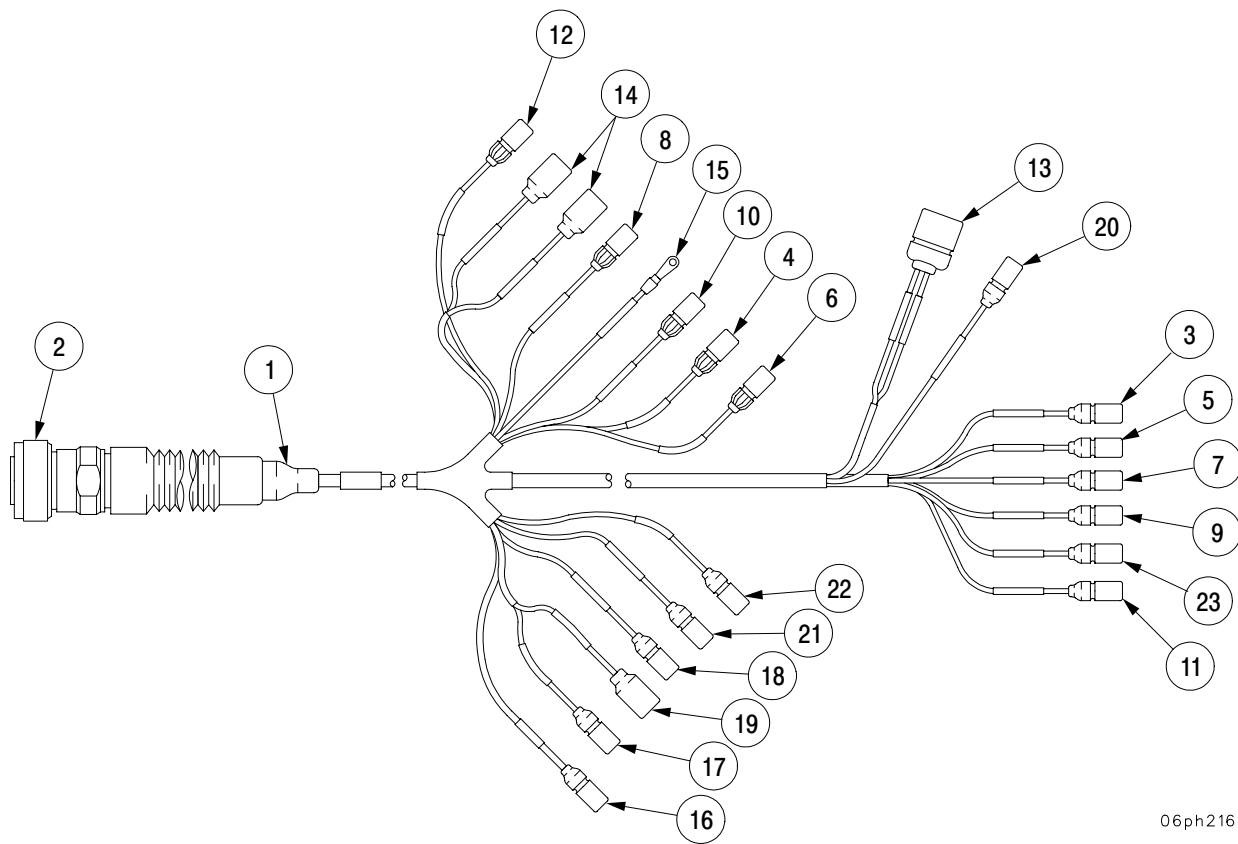
<b>Item No.</b>	<b>W112 Connector/Lead/Wire</b>	<b>To Connector/Lead/Wire/Component</b>	<b>Location</b>
23	Wire 27	Battery Indicator	Rear of Portable Instrument Panel
22	Wire 352B	Low Level Coolant Indicator	Rear of Portable Instrument Panel
21	Wire 352A	Low Level Coolant Indicator	Rear of Portable Instrument Panel
20	Wire 27	Low Level Coolant Indicator	Rear of Portable Instrument Panel
19	Wire 459L	Master Switch Warning Lamp	Rear of Portable Instrument Panel
18	Wire 459A	Master Switch	Rear of Portable Instrument Panel
17	Wire 459	Master Switch	Rear of Portable Instrument Panel
16	Wire 459B	Master Switch	Rear of Portable Instrument Panel
15	GND	Portable Instrument Panel Cover	Rear of Portable Instrument Panel
14	Wire 40 (2)	Panel Lights	Rear of Portable Instrument Panel
13	Wire 27/509	Warning Lamp	Rear of Portable Instrument Panel
12	Wire 29-31	Fuel Gage	Rear of Portable Instrument Panel
11	Wire 27	Fuel Gage	Rear of Portable Instrument Panel
10	Wire 321	Transmission Oil Pressure Gage	Rear of Portable Instrument Panel
9	Wire 27	Transmission Oil Pressure Gage	Rear of Portable Instrument Panel
8	Wire 36	Engine Oil Pressure Gage	Rear of Portable Instrument Panel
7	Wire 27	Engine Oil Pressure Gage	Rear of Portable Instrument Panel
6	Wire 324	Transmission Oil Temperature Gage	Rear of Portable Instrument Panel
5	Wire 27	Transmission Oil Temperature Gage	Rear of Portable Instrument Panel

**Section IX. HULL WIRING HARNESS – CONTINUED**

**8-71 WIRING HARNESS W112 – CONTINUED**

**b. Installation – Continued**

Item No.	W112 Connector/Lead/Wire	To Connector/Lead/Wire/Component	Location
4	Wire 33A	Engine Water Temperature Gage	Rear of Portable Instrument Panel
3	Wire 27	Engine Water Temperature Gage	Rear of Portable Instrument Panel
2	W112 P1	W114 J1	Driver's Intercom Bracket–Behind Instrument Panel



06ph216m

**NOTE**

**FOLLOW-ON MAINTENANCE:**  
 Install driver's portable instrument panel  
 (TM 9-2350-314-10)  
 Connect battery ground leads  
 (para 8-33)





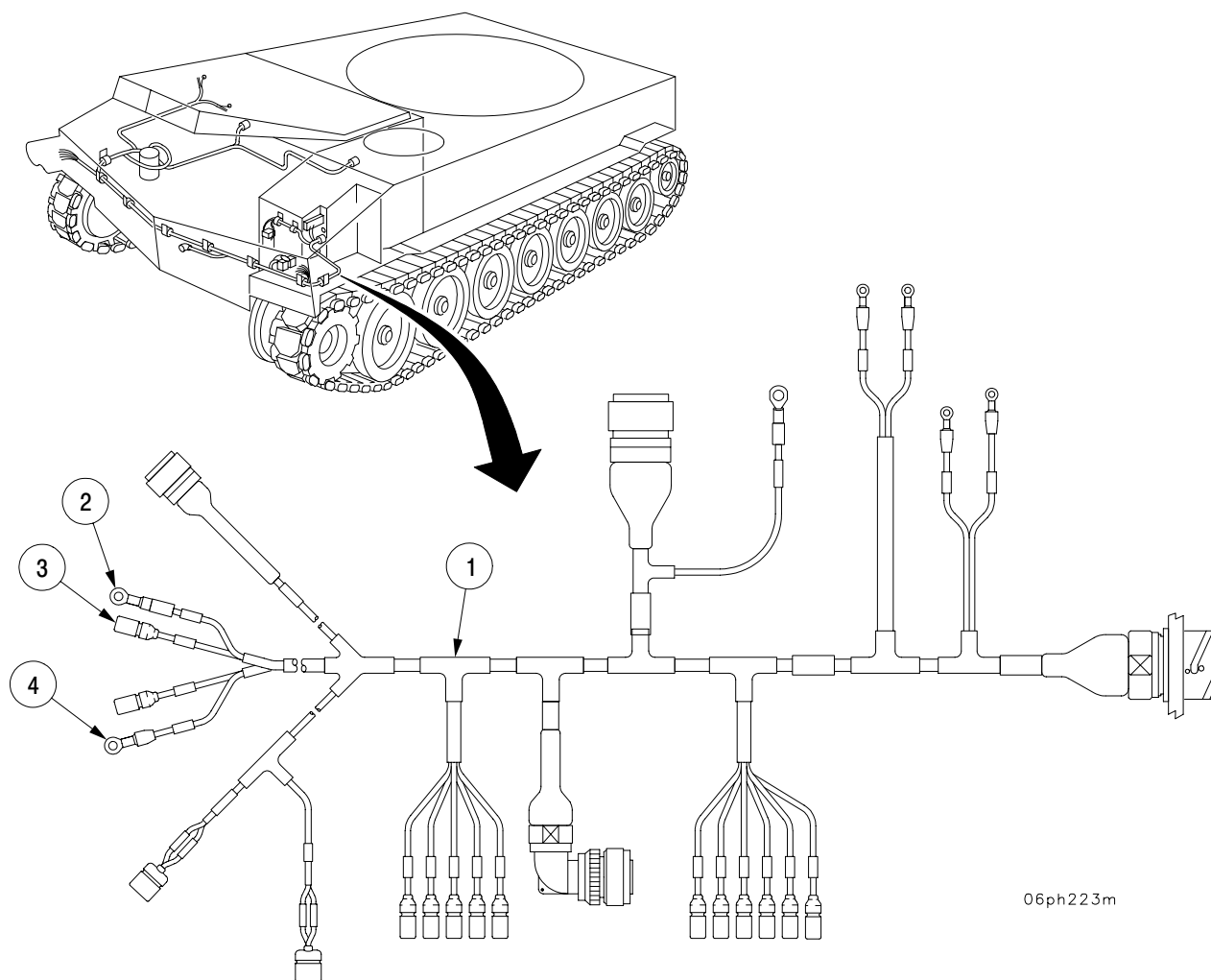
**Section IX. HULL WIRING HARNESS – CONTINUED**

**8-72 WIRING HARNESS W113 – CONTINUED**

**a. Removal – Continued**

1 Remove wiring harness (1) and attaching hardware at the following attachment points:

Item No.	W113 Connector/Lead/Wire	From Connector/Lead/Wire/Component	Location
2	Wire GND	Upper Fuel Level Transmitter	Upper Fuel Tank
3	Wire 31	Upper Fuel Level Transmitter	Upper Fuel Tank
4	Wire GND	Lower Fuel Level Transmitter	Lower Fuel Tank



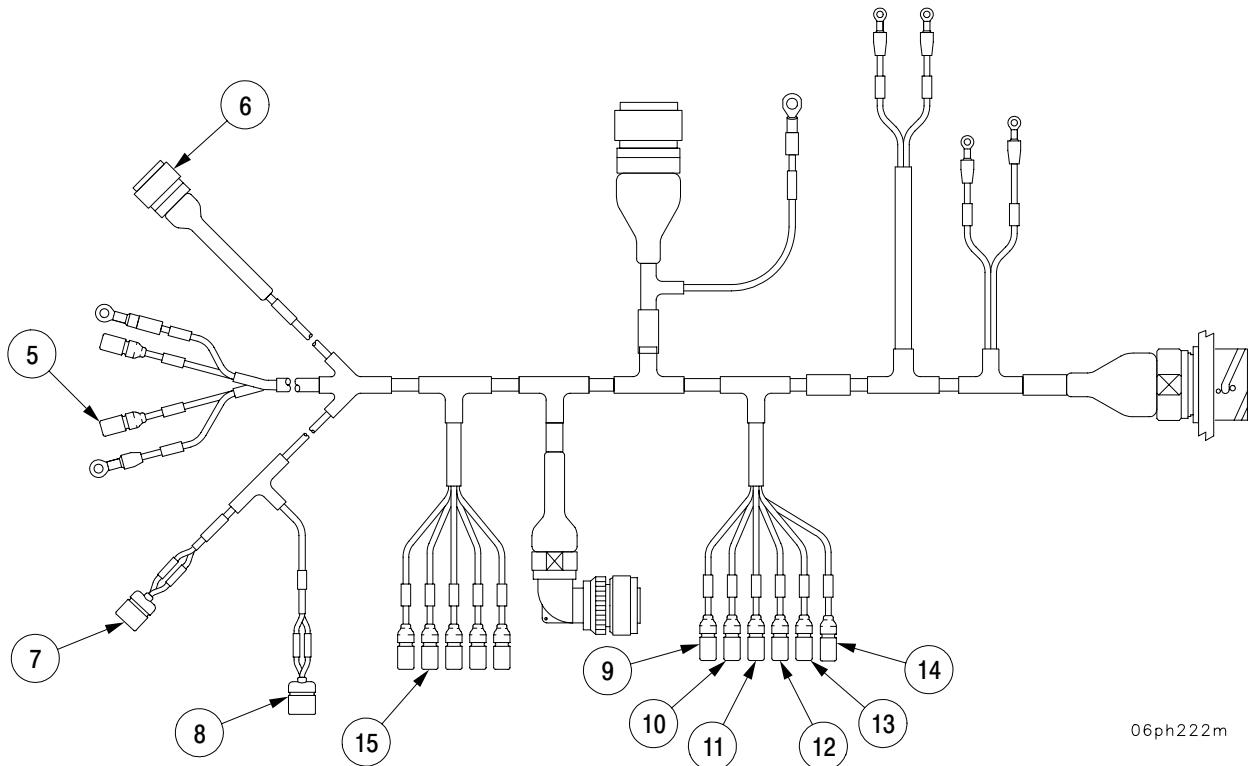
06ph223m

**Section IX. HULL WIRING HARNESS – CONTINUED**

**8-72 WIRING HARNESS W113 – CONTINUED**

**a. Removal – Continued**

Item No.	W113 Connector/Lead/Wire	From Connector/Lead/Wire/Component	Location
5	Wire 29	Lower Fuel Level Transmitter	Lower Fuel Tank
6	Wire 452	Bilge Pump	Engine Compartment (Right Side)
7	W113 P5	Right Fuel Pump	Engine Compartment (Right Rear)
8	W113 P4	Left Fuel Pump	Engine Compartment (Left Rear)
9	Wire 515	Headlight Wire 515	Left Headlight (Inside Hull)
10	Wire 514	Headlight Wire 514	Left Headlight (Inside Hull)
11	Wire 20	Headlight Wire 20	Left Headlight (Inside Hull)
12	Wire 18	Headlight Wire 18	Left Headlight (Inside Hull)
13	Wire 17	Headlight Wire 17	Left Headlight (Inside Hull)
14	Wire 19	Headlight Wire 19	Left Headlight (Inside Hull)
15	Wire 515	Headlight Wire 515	Right Headlight (Inside Hull)



06ph222m

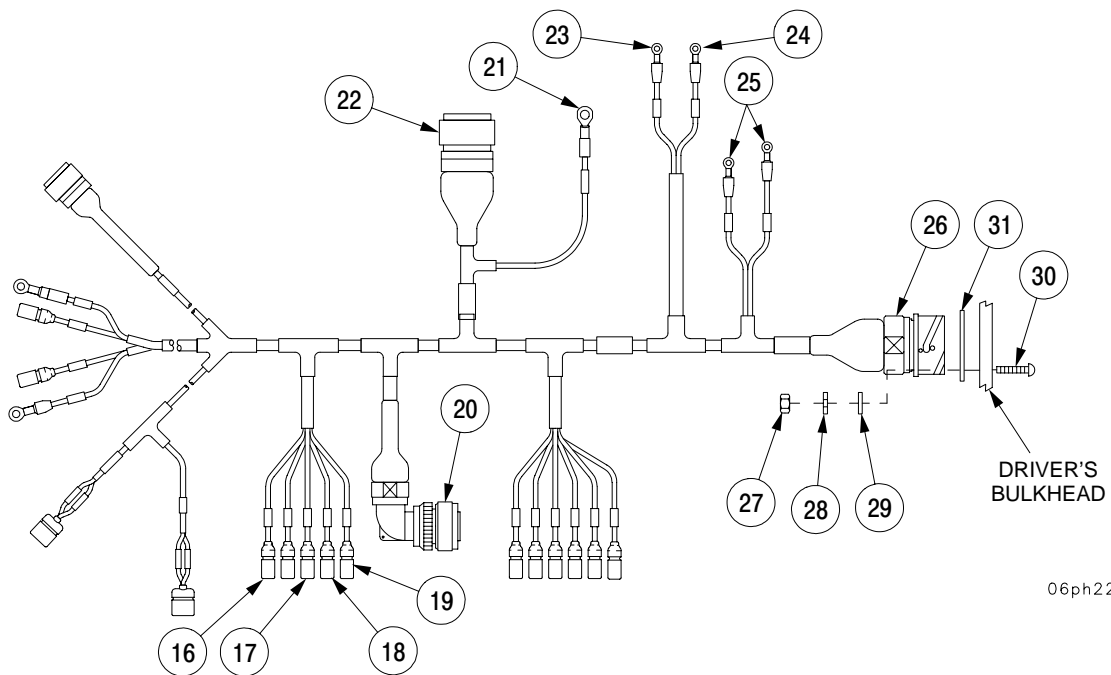
**Section IX. HULL WIRING HARNESS – CONTINUED**

**8-72 WIRING HARNESS W113 – CONTINUED**

**a. Removal – Continued**

Item No.	W113 Connector/Lead/Wire	From Connector/Lead/Wire/Component	Location
16	Wire 514	Headlight Wire 514	Right Headlight (Inside Hull)
17	Wire 20	Headlight Wire 20	Right Headlight (Inside Hull)
18	Wire 18	Headlight Wire 18	Right Headlight (Inside Hull)
19	Wire 17	Headlight Wire 17	Right Headlight (Inside Hull)
20	W113 P2	W126 P1	Engine Compartment (Forward)
21	Wire 452B	Bilge Pump Circuit Breaker	Battery Compartment (Forward)
22	W113 P3	Bilge Pump Relay	Battery Compartment (Forward)
23	Wire 459	Master Relay X1	Battery Compartment (Forward)
24	Wire 7	Master Relay X2	Battery Compartment (Forward)
25	Wire 7 (2)	Bus Bar	Battery Compartment (Rear)

- Remove four nuts (27), four lockwashers (28), four flat washers (29), four screws (30), and gasket (31) from driver's bulkhead. Discard lockwashers and gasket.



06ph221m

---

## Section IX. HULL WIRING HARNESS – CONTINUED

---

### 8-72 WIRING HARNESS W113 – CONTINUED

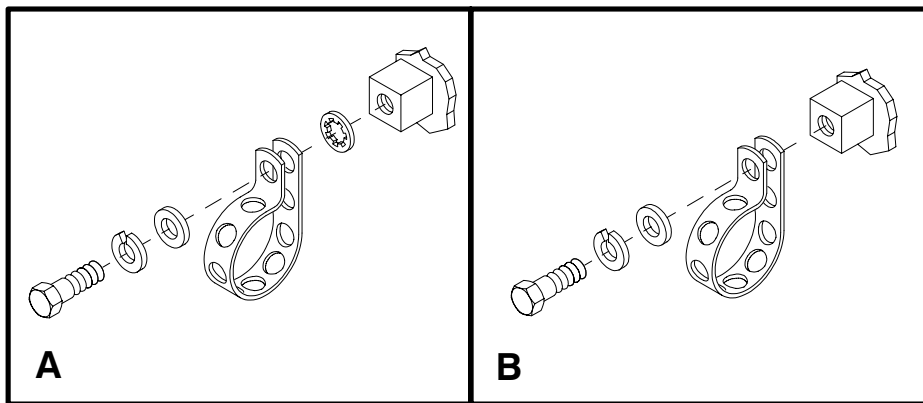
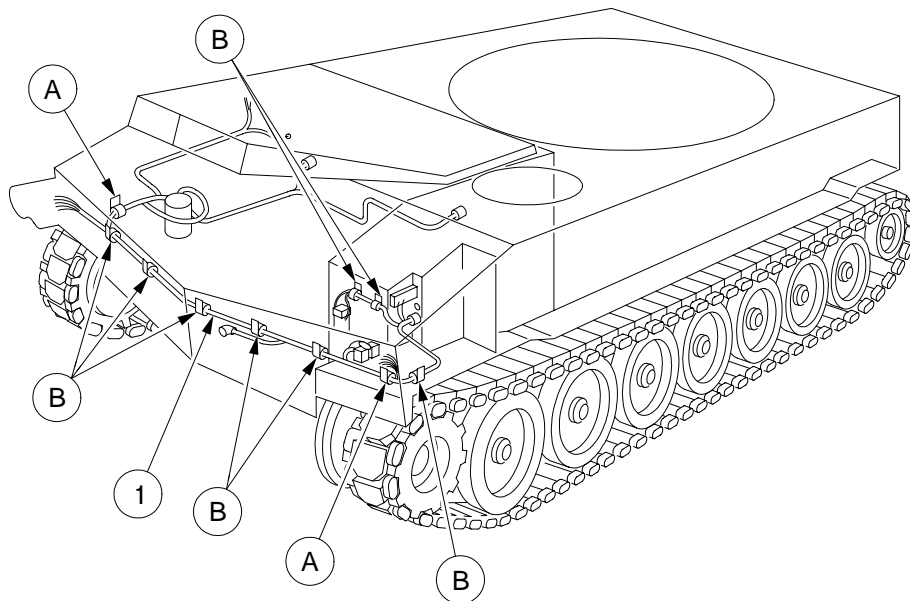
---

#### a. Removal – Continued

- 3 Remove straps, clamps, attaching hardware, and lockwashers (A and B) securing wiring harness (1) to vehicle, as shown in illustration. Discard lockwashers.
- 4 Remove wiring harness (1).

#### b. Installation.

- 1 Install wiring harness (1) in vehicle with straps, clamps, attaching hardware, and new lockwashers (A and B), as shown in illustration.



06ph220m

**Section IX. HULL WIRING HARNESS – CONTINUED**

**8-72 WIRING HARNESS W113 – CONTINUED**

**b. Installation – Continued**

- 2 Install new gasket (31) and connector W113 J1 (26) to driver's bulkhead with four screws (30), four flat washers (29), four new lockwashers (28), and four nuts (27).

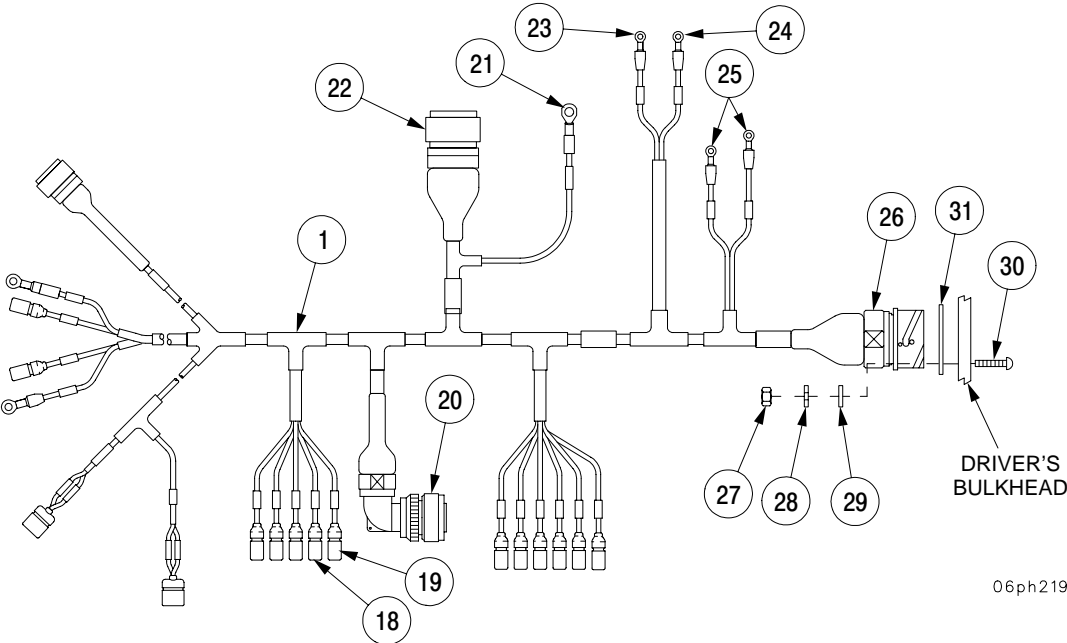
**NOTE**

The following legend identifies attachment points for each connection.

- 3 Install wiring harness (1) with attaching hardware at the following attachment points:

Item No.	W113 Connector/Lead/Wire	To Connector/Lead/Wire/Component	Location
25	Wire 7 (2)	Bus Bar	Battery Compartment (Rear)
24	Wire 7	Master Relay X2	Battery Compartment (Forward)
23	Wire 459	Master Relay X1	Battery Compartment (Forward)
22	W113 P3	Bilge Pump Relay	Battery Compartment (Forward)
21	Wire 452B	Bilge Pump Circuit Breaker	Battery Compartment (Forward)
20	W113 P2	W126 P1	Engine Compartment (Forward)
19	Wire 17	Headlight Wire 17	Right Headlight (Inside Hull)
18	Wire 18	Headlight Wire 18	Right Headlight (Inside Hull)

- 4 Apply adhesive to terminals (24, 23, and 21) after assembly.



06ph219m

**Section IX. HULL WIRING HARNESS – CONTINUED**

**8-72 WIRING HARNESS W113 – CONTINUED**

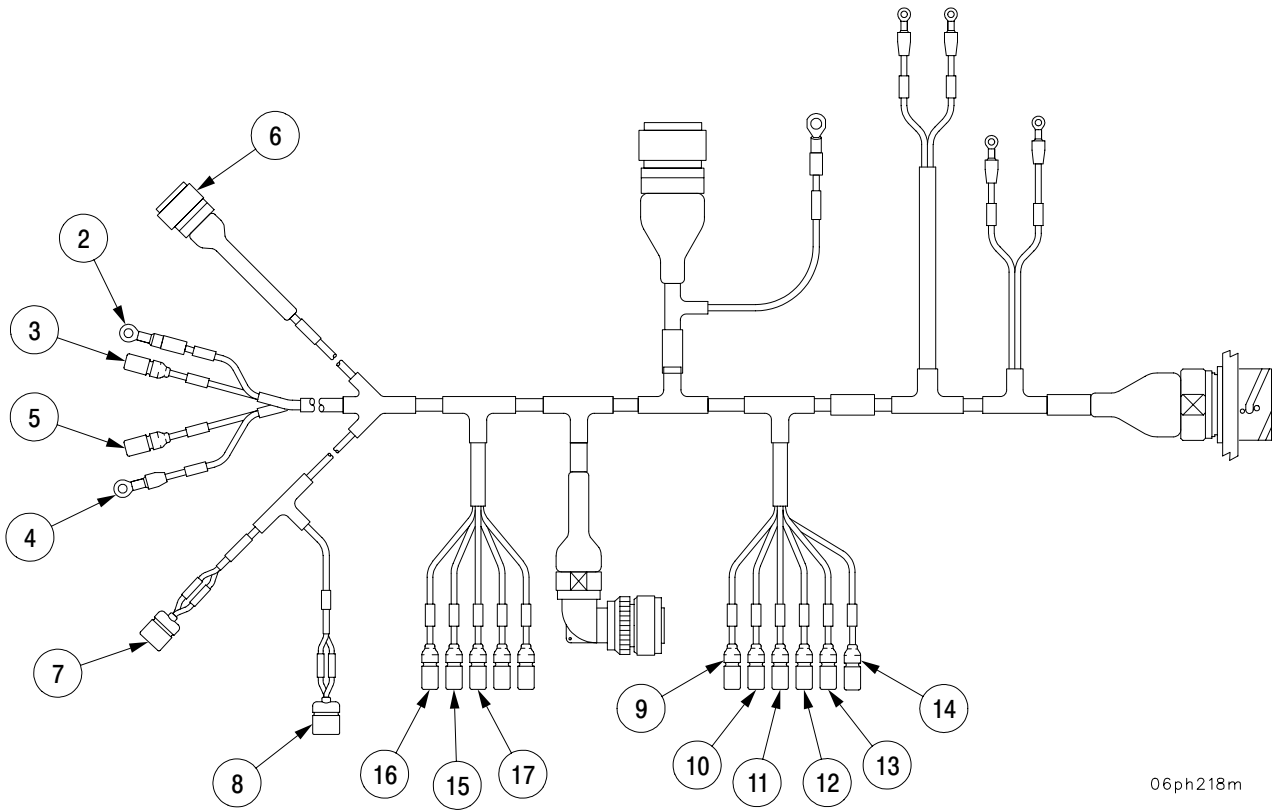
**b. Installation – Continued**

<b>Item No.</b>	<b>W113 Connector/Lead/Wire</b>	<b>To Connector/Lead/Wire/Component</b>	<b>Location</b>
17	Wire 20	Headlight Wire 20	Right Headlight (Inside Hull)
16	Wire 514	Headlight Wire 514	Right Headlight (Inside Hull)
15	Wire 515	Headlight Wire 515	Right Headlight (Inside Hull)
14	Wire 19	Headlight Wire 19	Left Headlight (Inside Hull)
13	Wire 17	Headlight Wire 17	Left Headlight (Inside Hull)
12	Wire 18	Headlight Wire 18	Left Headlight (Inside Hull)
11	Wire 20	Headlight Wire 20	Left Headlight (Inside Hull)
10	Wire 514	Headlight Wire 514	Left Headlight (Inside Hull)
9	Wire 515	Headlight Wire 515	Left Headlight (Inside Hull)
8	W113 P4	Left Fuel Pump	Engine Compartment (Left Rear)
7	W113 P5	Right Fuel Pump	Engine Compartment (Right Rear)
6	Wire 452	Bilge Pump	Engine Compartment (Right Side)
5	Wire 29	Lower Fuel Level Transmitter	Lower Fuel Tank
4	Wire GND	Lower Fuel Level Transmitter	Lower Fuel Tank
3	Wire 31	Upper Fuel Level Transmitter	Upper Fuel Tank
2	Wire GND	Upper Fuel Level Transmitter	Upper Fuel Tank

**Section IX. HULL WIRING HARNESS – CONTINUED**

**8-72 WIRING HARNESS W113 – CONTINUED**

**b. Installation – Continued**



**NOTE**

**FOLLOW-ON MAINTENANCE:**

- Install transmitter covers (para 5-12)
- Install powerpack (para 4-1)



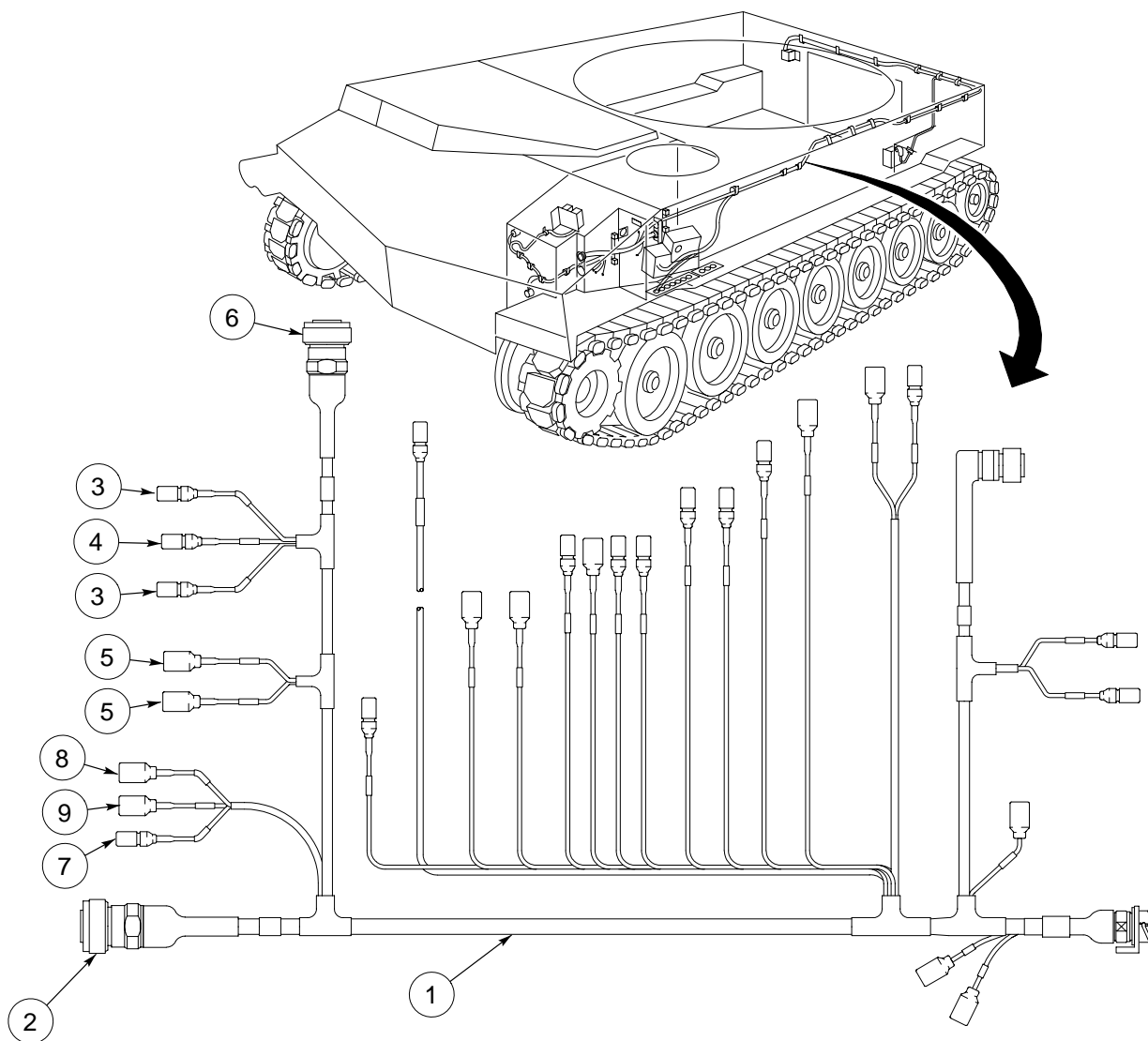


**Section IX. HULL WIRING HARNESS – CONTINUED**

**8-73 WIRING HARNESS W114 – CONTINUED**

**a. Removal – Continued**

Item No.	W114 Connector/Lead/Wire	From Connector/Lead/Wire/Component	Location
8	Wire 509	Master Warning Light Wire 509	Master Warning Light (Driver's Compartment)
9	Wire 7	Master Warning Light Wire 7	Master Warning Light (Driver's Compartment)



HIPH077B

**Section IX. HULL WIRING HARNESS – CONTINUED**

**8-73 WIRING HARNESS W114 – CONTINUED**

**a. Removal – Continued**

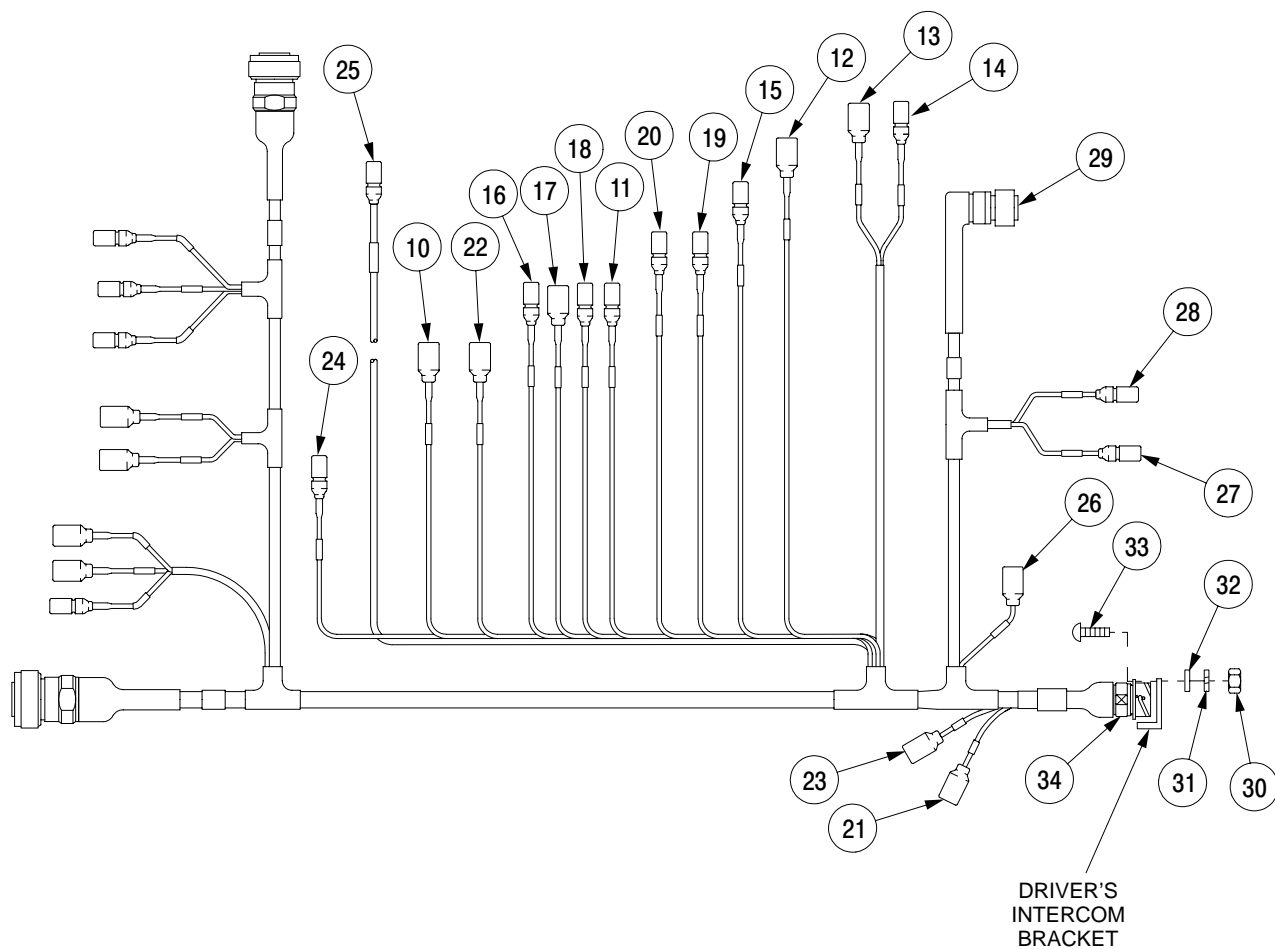
<b>Item No.</b>	<b>W114 Connector/Lead/Wire</b>	<b>From Connector/Lead/Wire/Component</b>	<b>Location</b>
10	Wire 415B	W123 P1 Wire 415B	Behind Driver's Instrument Panel
11	Wire 415C	W123 P1 Wire 415	Behind Driver's Instrument Panel
12	Wire 509E	Parking Brake Warning Light	Driver's Instrument Panel
13	Wire 486	Wait Indicator Light	Driver's Instrument Panel
14	Wire 588	Fuel Prime Switch	Driver's Instrument Panel
15	Wire 486A	Glow Plug Switch	Driver's Instrument Panel
16	Wire 14	Starter Switch	Driver's Instrument Panel
17	Wire 27B	Starter Switch	Driver's Instrument Panel
18	Wire 415C	Starter Switch	Driver's Instrument Panel
19	Wire 29-31	Fuel Level Switch	Driver's Instrument Panel
20	Wire 27	CB 1	Circuit Breaker Panel
21	Wire 459	W115 Wire 459	Behind Driver's Instrument Panel
22	Wire 459A	W120 Wire 459A	Behind Driver's Instrument Panel
23	Wire 509E	W120 Wire 509E	Behind Driver's Instrument Panel
24	Wire 40	W115 Wire 40/W119 Wire 40	Behind Driver's Instrument Panel
25	Wire 400	Circuit Breaker 5	Circuit Breaker Panel
26	Wire 7	W125 Wire E37	Behind Driver's Instrument Panel
27	Wire 611	Combat Override Switch	Rear of Hull (Right Side)
28	Wire 7	Combat Override Switch	Rear of Hull (Right Side)
29	W114 P2	Crew Compartment Warning Light	Left Side of Hull

- 2 Remove four nuts (30), four lockwashers (31), four flat washers (32), four screws (33), and connector W114 J1 (34) from driver's intercom bracket. Discard lockwashers.

Section IX. HULL WIRING HARNESS – CONTINUED

8-73 WIRING HARNESS W114 – CONTINUED

a. Removal- Continued



06ph228m

**Section IX. HULL WIRING HARNESS – CONTINUED**

---

**8-73 WIRING HARNESS W114 – CONTINUED**

---

**a. Removal – Continued**

- 3 Remove straps, clamps, attaching hardware, and lockwashers (A thru H) securing wiring harness (1) to vehicle, as shown in illustration. Discard lockwashers.
- 4 Remove wiring harness (1).

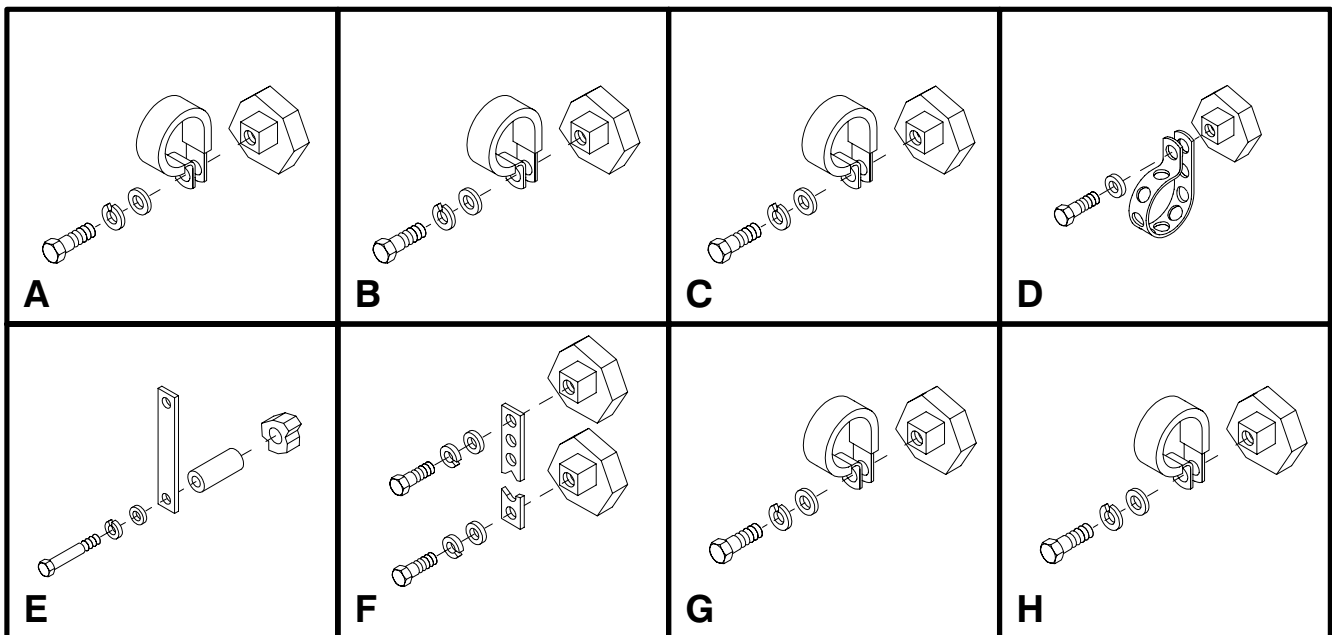
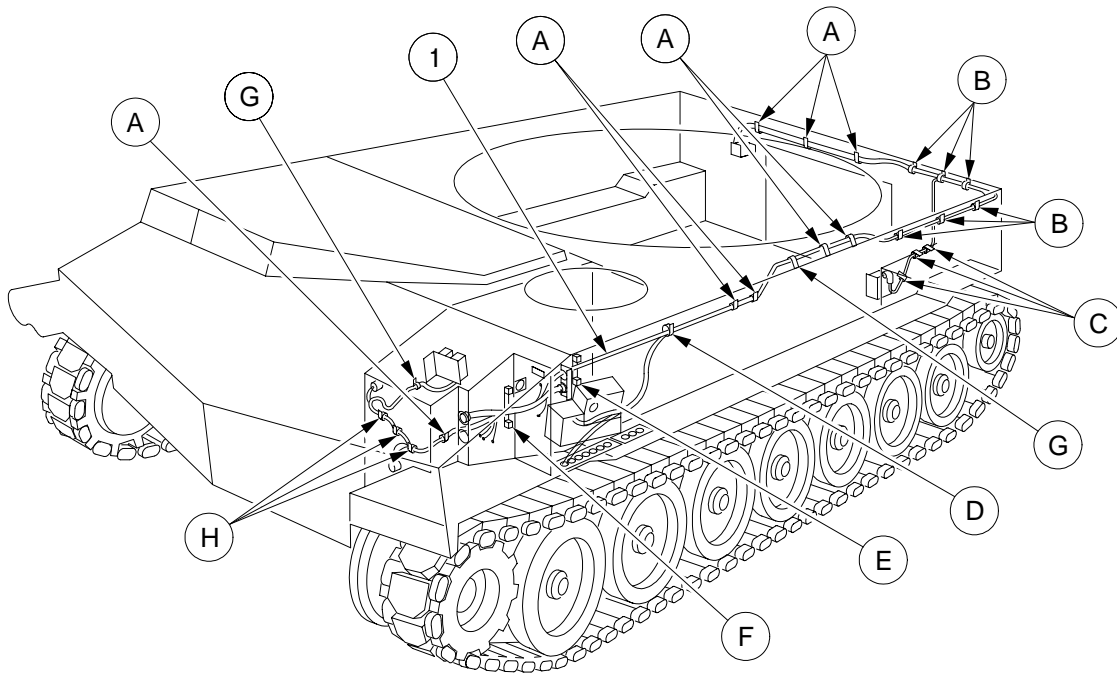
**b. Installation.**

- 1 Install wiring harness (1) in vehicle with straps, clamps, attaching hardware, and new lockwashers (A thru H), as shown in illustration.

**Section IX. HULL WIRING HARNESS – CONTINUED**

**8-73 WIRING HARNESS W114 – CONTINUED**

**b. Installation – Continued**



06ph229m

**Section IX. HULL WIRING HARNESS – CONTINUED**

**8-73 WIRING HARNESS W114 – CONTINUED**

**b. Installation – Continued**

- 2 Install connector W114 J1 (34) to driver's intercom bracket with four screws (33), four flat washers (32), four new lockwashers (31), and four nuts (30).

**NOTE**

The following legend identifies attachment points for each connection.

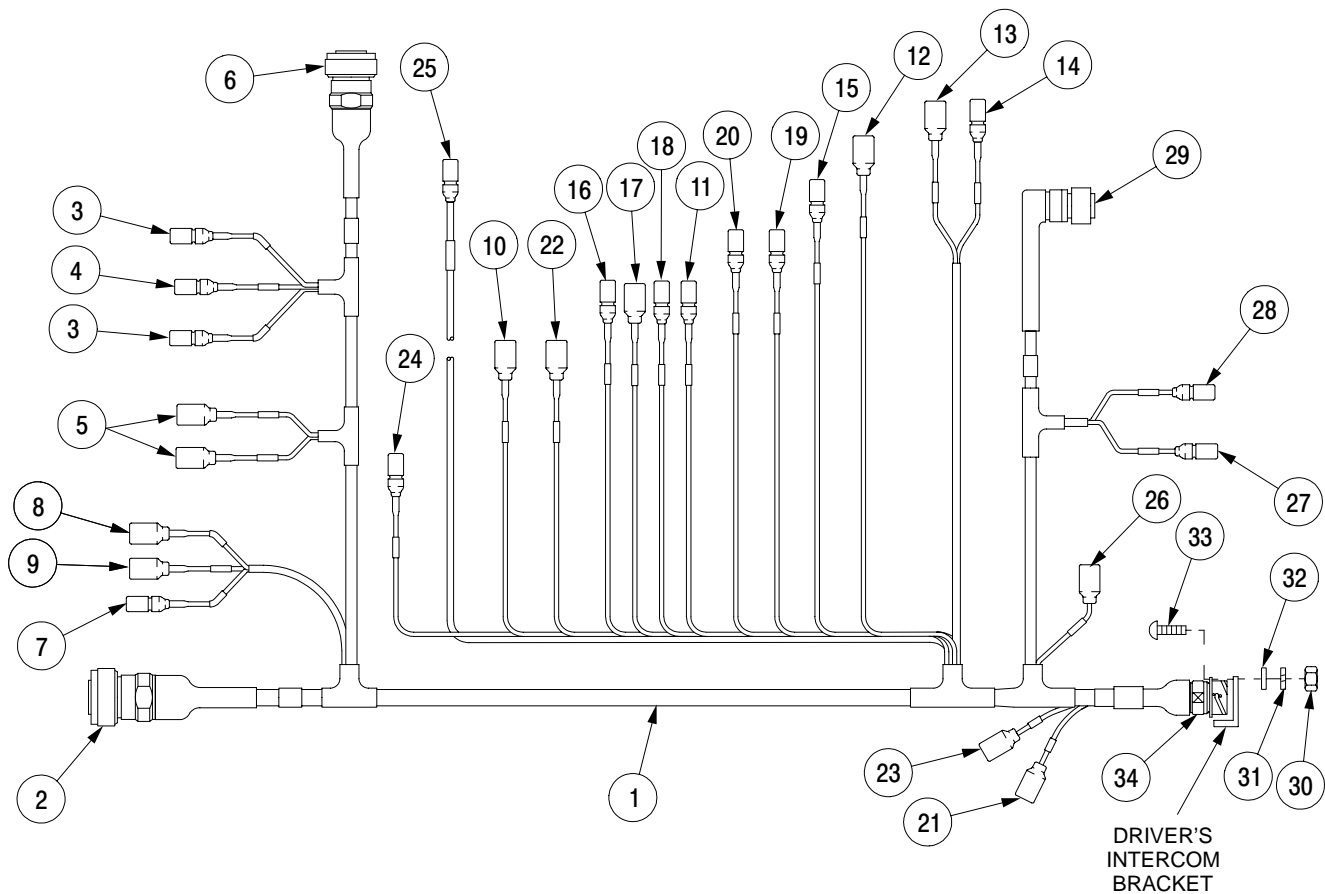
- 3 Install wiring harness (1) with attaching hardware at the following attachment points:

Item No.	W114 Connector/Lead/Wire	To Connector/Lead/Wire/Component	Location
29	W114 P2	Crew Compartment Warning Light	Left Side of Hull
28	Wire 7	Combat Override Switch	Rear of Hull (Right Side)
27	Wire 611	Combat Override Switch	Rear of Hull (Right Side)
26	Wire 7	W125 Wire E37	Behind Driver's Instrument Panel
25	Wire 400	Circuit Breaker 5	Circuit Breaker Panel
24	Wire 40	W115 Wire 40/W119 Wire 40	Behind Driver's Instrument Panel
23	Wire 509E	W120 Wire 509E	Behind Driver's Instrument Panel
21	Wire 459A	W120 Wire 459A	Behind Driver's Instrument Panel
21	Wire 459	W115 Wire 459	Behind Driver's Instrument Panel
20	Wire 27	CB 1	Circuit Breaker Panel
19	Wire 29-31	Fuel Level Switch	Driver's Instrument Panel
18	Wire 415C	Starter Switch	Driver's Instrument Panel
17	Wire 27B	Starter Switch	Driver's Instrument Panel
16	Wire 14	Starter Switch	Driver's Instrument Panel
15	Wire 486A	Glow Plug Switch	Driver's Instrument Panel
14	Wire 588	Fuel Prime Switch	Driver's Instrument Panel
13	Wire 486	Wait Indicator Light	Driver's Instrument Panel
12	Wire 509E	Parking Brake Warning Light	Driver's Instrument Panel
11	Wire 415C	W123 P1 Wire 415	Behind Driver's Instrument Panel
10	Wire 415B	W123 P1 Wire 415B	Behind Driver's Instrument Panel
9	Wire 7	Master Warning Light Wire 7	Master Warning Light (Driver's Compartment)
8	Wire 509	Master Warning Light Wire 509	Master Warning Light (Driver's Compartment)
7	Wire 27	Master Warning Light Wire 27	Master Warning Light (Driver's Compartment)
6	W114 P3	Voltage Regulator Control Box	Driver's Compartment
5	Wire 509E (2)	Parking Brake Switch Wire 509E	Brake Pedal
4	Wire 415C	Neutral Safety Switch Wire 415A	Engine Compartment Bulkhead (Driver's Compartment)
3	Wire 14 (2)	Neutral Safety Switch Wire 14	Engine Compartment Bulkhead (Driver's Compartment)
2	W114 P1	W105 J1	Driver's Bulkhead

**Section IX. HULL WIRING HARNESS – CONTINUED**

**8-73 WIRING HARNESS W114 – CONTINUED**

**b. Installation – Continued**



06ph230m

**NOTE**

**FOLLOW-ON MAINTENANCE:**

- Install wiring harness W114 access guard (para 8-101)
- Install wiring harness rear access guard (para 8-100)
- Connect W112 P1 at driver's intercom bracket (para 8-71)
- Install driver's full function crew station mounting plate (para 8-29)
- Install driver's instrument panel (para 8-12)





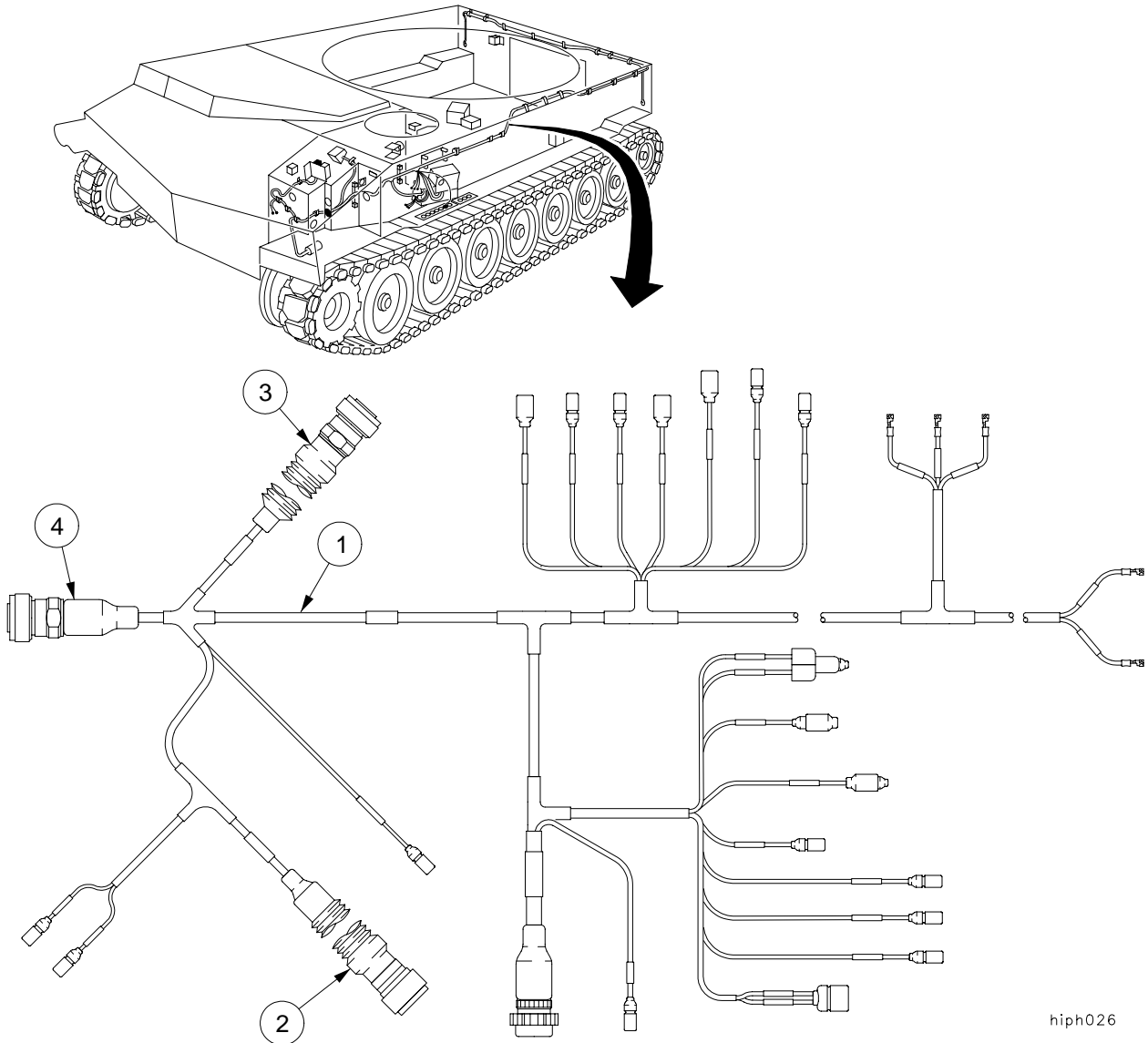
**Section IX. HULL WIRING HARNESS – CONTINUED**

**8-74 WIRING HARNESS W115 – CONTINUED**

**a. Removal – Continued**

1 Disconnect wiring harness (1) at the following attachment points:

Item No.	W115 Connector/Lead/Wire	From Connector/Lead/Wire/Component/	Location
2	W115 P4	Dimmer Switch	Driver's Compartment Floor
3	W115 P2	J1	Travel Lock Control Box
4	W115 P1	W113 P1	Driver's Bulkhead



hiph026

**Section IX. HULL WIRING HARNESS – CONTINUED**

**8-74 WIRING HARNESS W115 – CONTINUED**

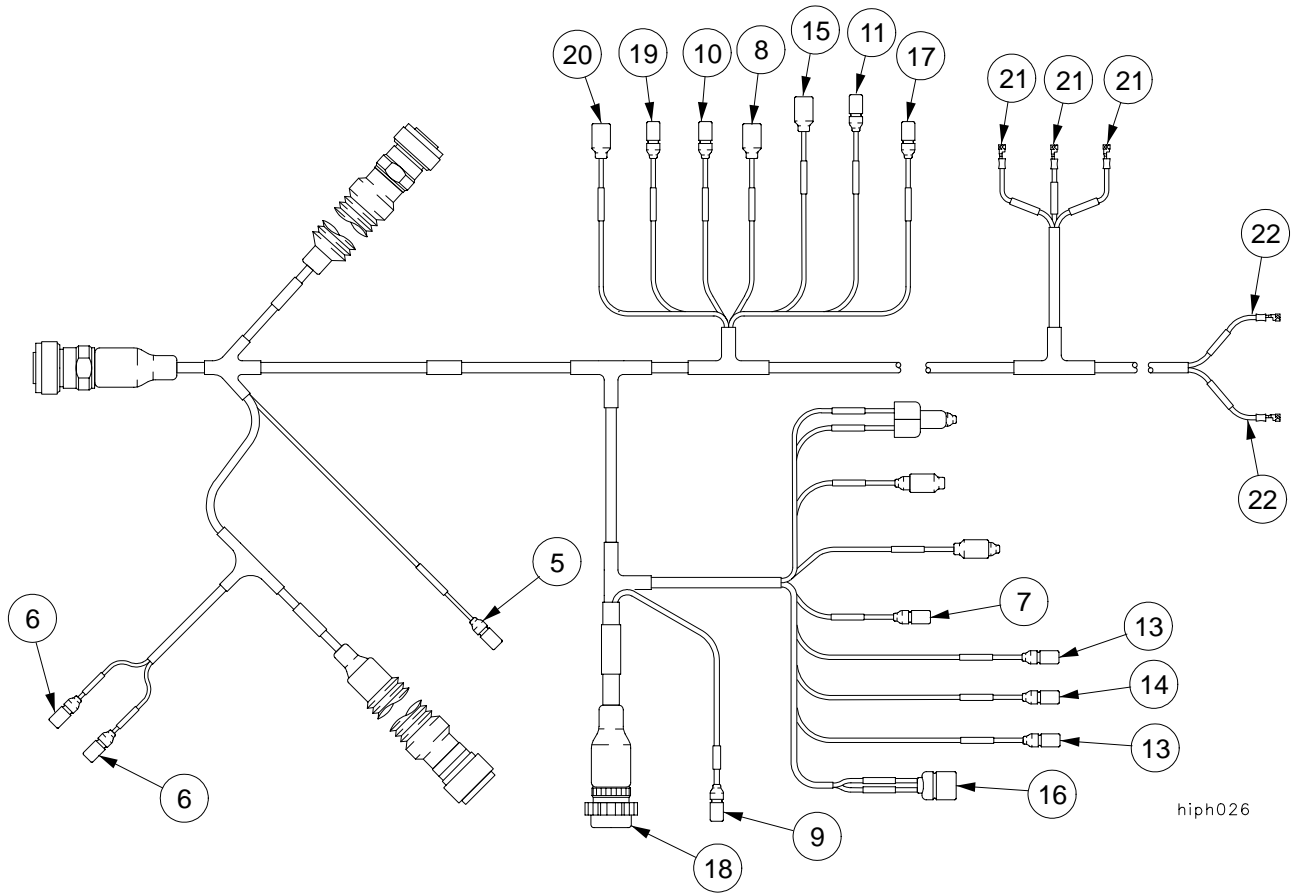
**a. Removal – Continued**

<b>Item No.</b>	<b>W115 Connector/Lead/Wire</b>	<b>From Connector/Lead/Wire/Component/</b>	<b>Location</b>
5	Wire 38	Dome Light/Driver's Night Vision	Driver's Compartment
6	Wire 75 (2)	Brake Pedal	Driver's Compartment
7	Wire 459	W114 Wire 459	Between Instrument Panel and C/B Panel
8	Wire 15	W124 Wire 10	Between Instrument Panel and C/B Panel
9	Wire 40	W119/W114 Wire 40	Between Instrument Panel and C/B Panel
10	Wire 76	W123 P1 Wire 415	Behind Driver's Instrument Panel
11	Wire 37/38	CB6	Circuit Breaker Panel
12	Wire 19/5114-515/520	Plugged	
13	Wire 29/31	Fuel Level Switch	Driver's Instrument Panel
14	Wire 450	Bilge Pump Switch	Driver's Instrument Panel
15	Wire 40	Panel Light	Driver's Instrument Panel
16	Wire 519	High Beam Ind Light	Driver's Instrument Panel
17	Wire 37	Auxiliary Outlet	Driver's Instrument Panel
18	W115 P3	Lighting Switch	Driver's Instrument Panel
19	Wire TL2	W125 Wire E47	Behind Driver's Instrument Panel
20	Wire TL1	W120 Wire 10S	Behind Driver's Instrument Panel
21	Wires 21/22/24	Left Rear Taillight	Left Rear Stoplight Assembly (Inside Hull)
22	Wires 23/24	Right Rear Taillight	Right Rear Stoplight Assembly (Inside Hull)

Section IX. HULL WIRING HARNESS – CONTINUED

8-74 WIRING HARNESS W115 – CONTINUED

a. Removal – Continued



## Section IX. HULL WIRING HARNESS – CONTINUED

---

### 8-74 WIRING HARNESS W115 – CONTINUED

---

#### a. Removal – Continued

- 2 Remove straps, clamps, attaching hardware, and lockwashers (A thru J) securing wiring harness (1) to vehicle, as shown in illustration. Discard lockwashers.
- 3 Remove wiring harness (1).

#### b. Installation.

#### NOTE

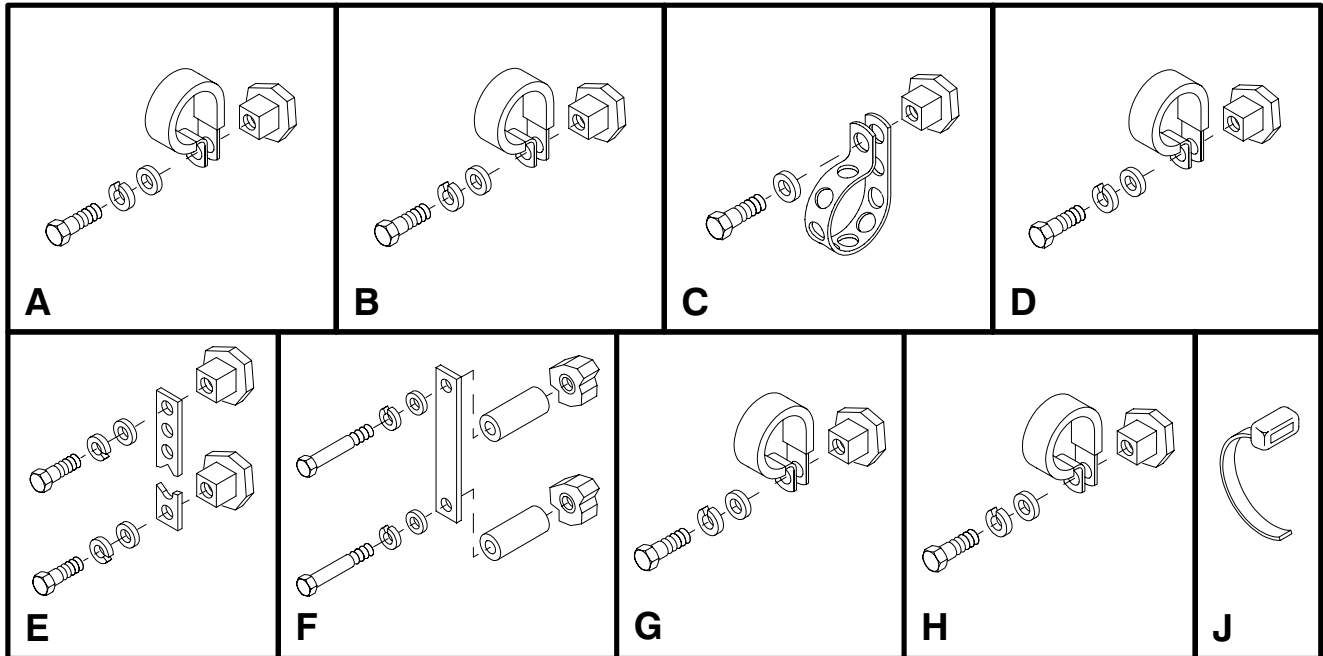
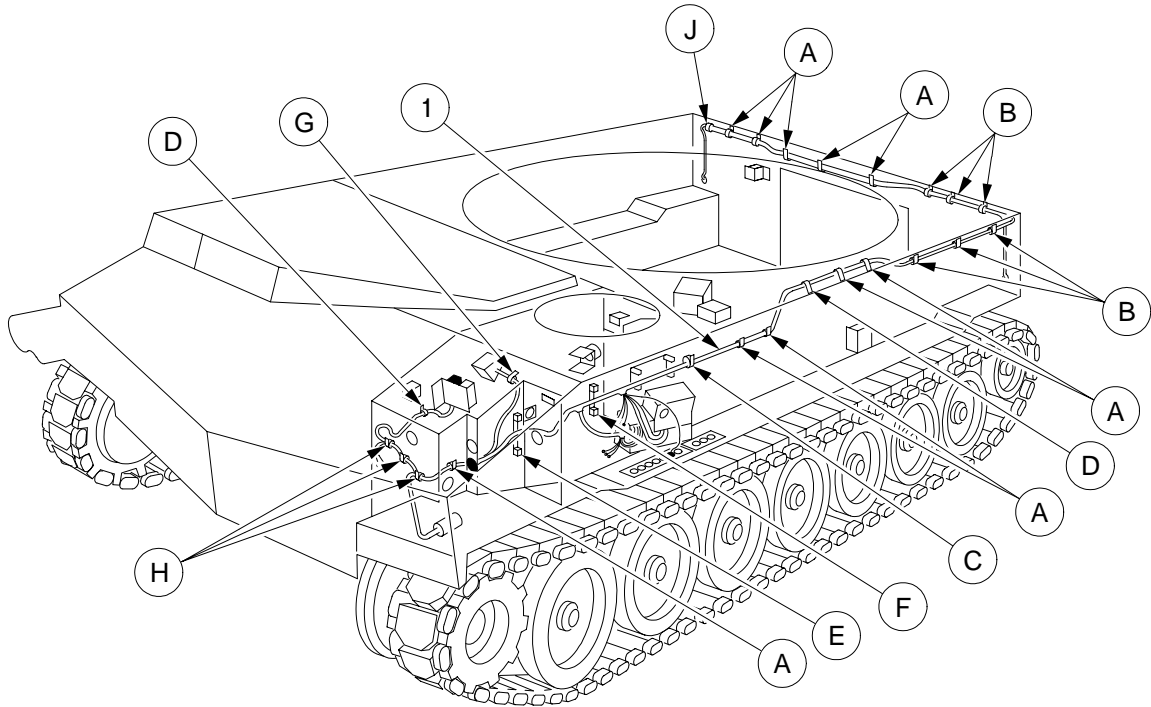
Tape and sleeving must be applied to wiring harness W115 wires 21, 22, 23, 24 and wiring harness W115 at left and right rear stoplight assemblies.

- 1 Install wiring harness (1) in vehicle with straps, clamps, attaching hardware, and new lockwashers (A thru J), as shown in illustration.

**Section IX. HULL WIRING HARNESS – CONTINUED**

**8-74 WIRING HARNESS W115 – CONTINUED**

**b. Installation – Continued**



06ph247m

**Section IX. HULL WIRING HARNESS – CONTINUED**

**8-74 WIRING HARNESS W115 – CONTINUED**

**b. Installation – Continued**

**NOTE**

The following legend identifies attachment points for each connection.

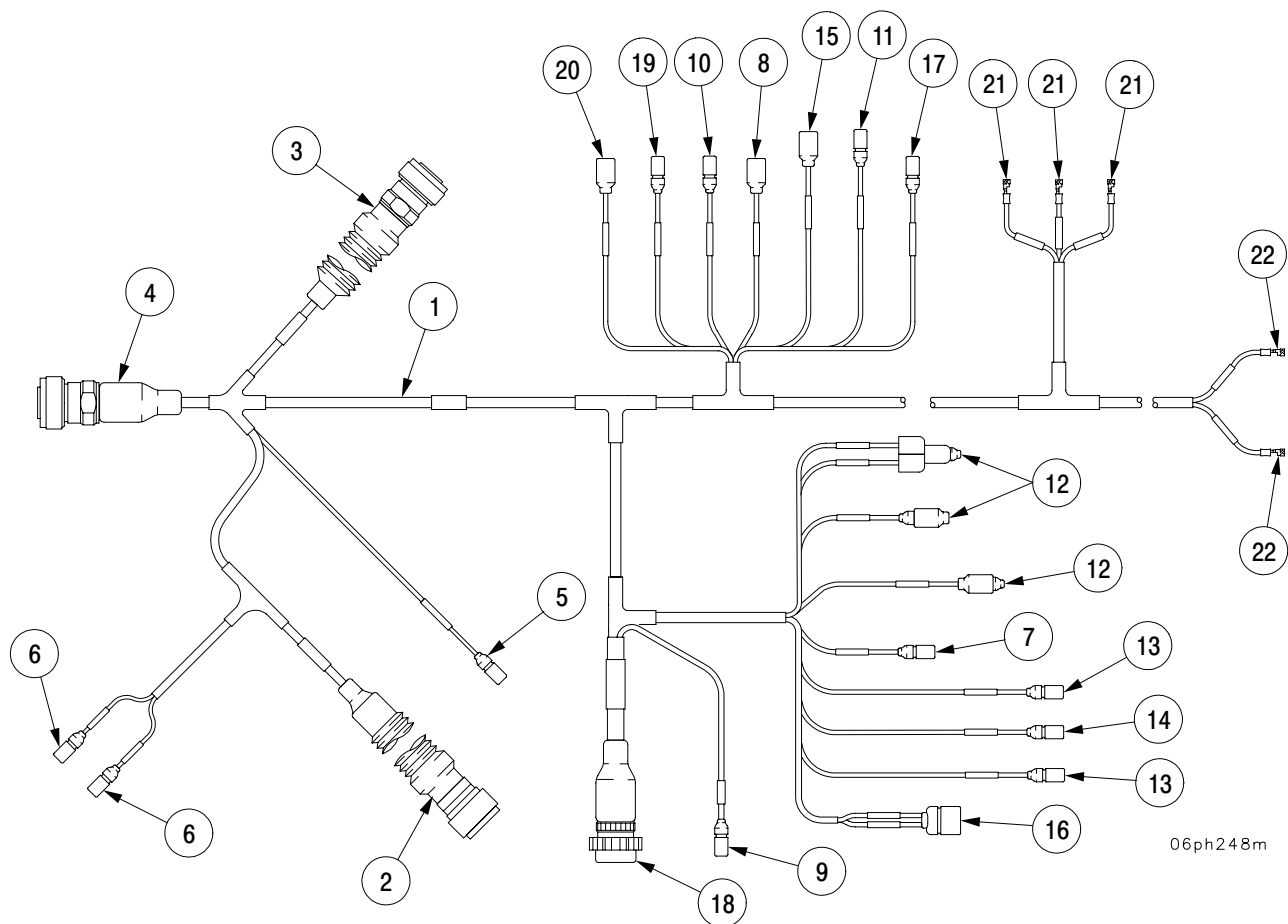
- 2 Connect wiring harness (1) at the following attachment points:

<b>Item No.</b>	<b>W115 Connector/Lead/Wire</b>	<b>To Connector/Lead/Wire/Component</b>	<b>Location</b>
22	Wires 23/24	Right Rear Taillight	Right Rear Stoplight Assembly (Inside Hull)
21	Wires 21/22/24	Left Rear Taillight	Left Rear Stoplight Assembly (Inside Hull)
20	Wire TL1	W120 Wire 10S	Behind Driver's Instrument Panel
19	Wire TL2	W125 Wire E47	Behind Driver's Instrument Panel
18	W115 P3	Lighting Switch	Driver's Instrument Panel
17	Wire 37	Auxiliary Outlet	Driver's Instrument Panel
16	Wire 519	High Beam Ind Light	Driver's Instrument Panel
15	Wire 40	Panel Light	Driver's Instrument Panel
14	Wire 450	Bilge Pump Switch	Driver's Instrument Panel
13	Wire 29/31	Fuel Level Switch	Driver's Instrument Panel
12	Wire 19/514-515/520	Plugged	
11	Wire 37/38	CB6	Circuit Breaker Panel
10	Wire 76	W123 P1 Wire 415	Behind Driver's Instrument Panel
9	Wire 40	W119/W114 Wire 40	Between instrument Panel and Circuit Breaker Panel
8	Wire 15	W124 Wire 10	Between Instrument Panel and Circuit Breaker Panel
7	Wire 459	W114 Wire 459	Between Instrument Panel and Circuit Breaker Panel
6	Wire 75 (2)	Brake Pedal	Driver's Compartment
5	Wire 38	Dome Light/Driver's Night Vision	Driver's Compartment
4	W115 P1	W113 P1	Driver's Bulkhead
3	W115 P2	J1	Travel Lock Control Box
2	W115 P4	Dimmer Switch	Driver's Compartment Floor

**Section IX. HULL WIRING HARNESS – CONTINUED**

**8-74 WIRING HARNESS W115 – CONTINUED**

**b. Installation – Continued**



**NOTE**

**FOLLOW-ON MAINTENANCE:**

- Install wiring harness rear access cover (para 8-102)
- Install slave receptacle guard (para 8-92)
- Install wiring harness rear access guard (para 8-100)
- Install driver's portable instrument panel (para 8-12)
- Install driver's full function crew station mounting plate (para 8-29)



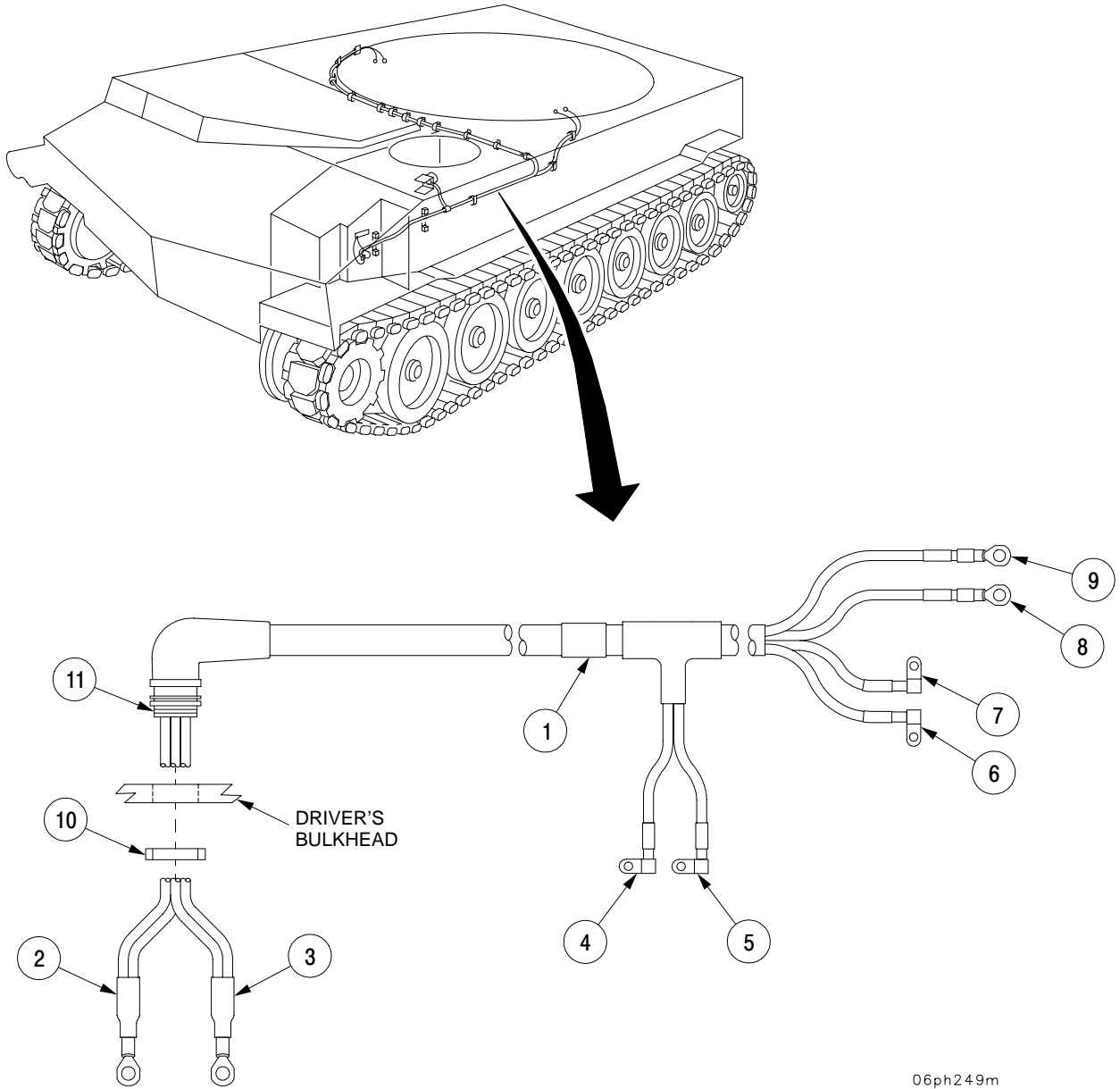


**Section IX. HULL WIRING HARNESS – CONTINUED**

**8-75 WIRING HARNESS W116 – CONTINUED**

**a. Removal – Continued**

- 2 Remove nut (10) from feed-through seal (11).



---

## Section IX. HULL WIRING HARNESS – CONTINUED

---

### 8-75 WIRING HARNESS W116 – CONTINUED

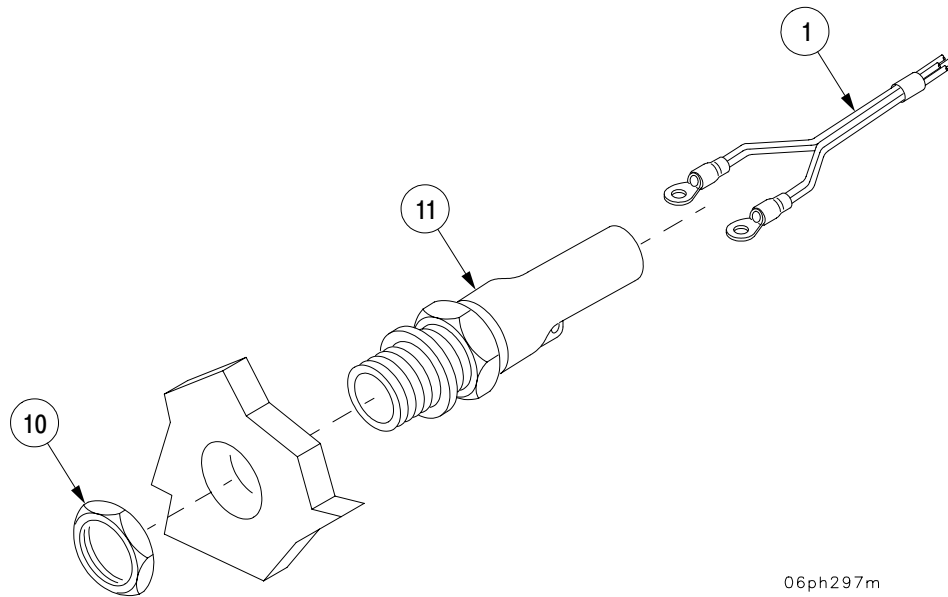
---

#### a. Removal – Continued

- 3 Remove straps, clamps, attaching hardware and lockwashers (A thru E), securing wiring harness (1) to vehicle, as shown in illustration. Discard lockwashers.
- 4 Remove wiring harness (1). Separate feed-through seal (11) from wiring harness (1).

#### b. Installation.

- 1 Install wiring harness (1) in vehicle with straps, clamps, attaching hardware, and new lockwashers (A thru E), as shown in illustration.
- 2 Install feed-through seal (11) over wiring harness (1) and secure feed-through seal (11) to driver's bulkhead with nut (10).

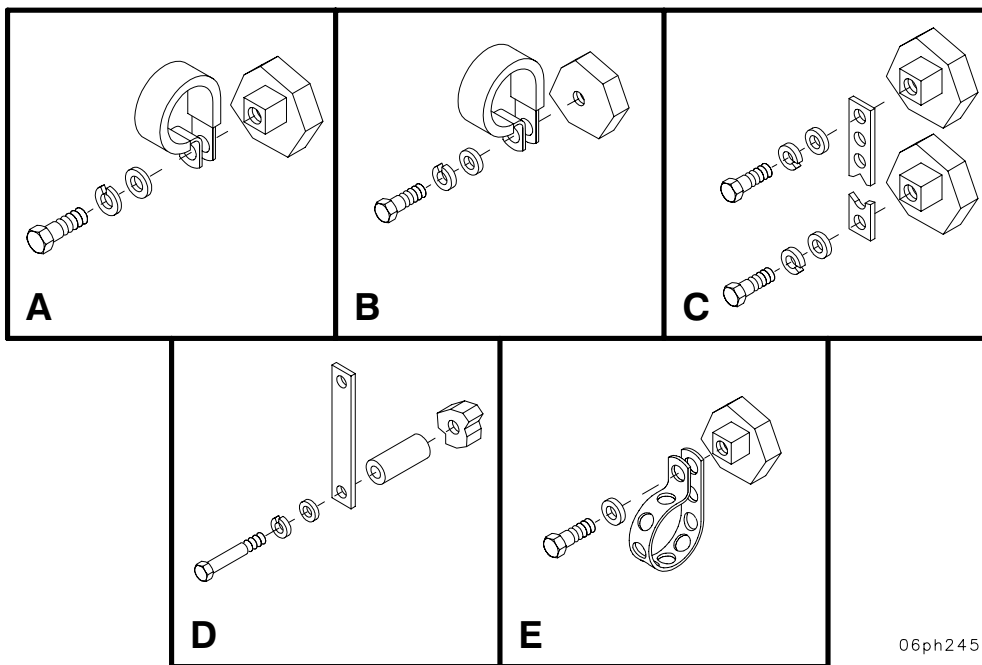
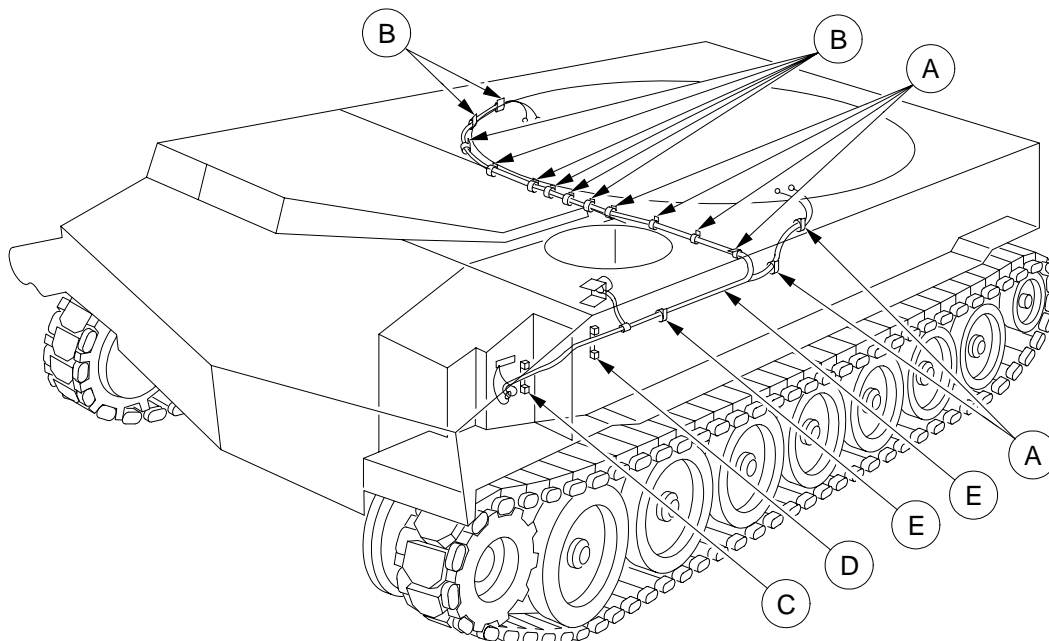


06ph297m

**Section IX. HULL WIRING HARNESS – CONTINUED**

**8-75 WIRING HARNESS W116 – CONTINUED**

**b. Installation – Continued**



06ph245m

**Section IX. HULL WIRING HARNESS – CONTINUED**

**8-75 WIRING HARNESS W116 – CONTINUED**

**b. Installation – Continued**

**NOTE**

- Torque negative slip ring terminal connections to 25–35 lb–ft (34–47 N.m).
- The following legend identifies attachment points for each connection.

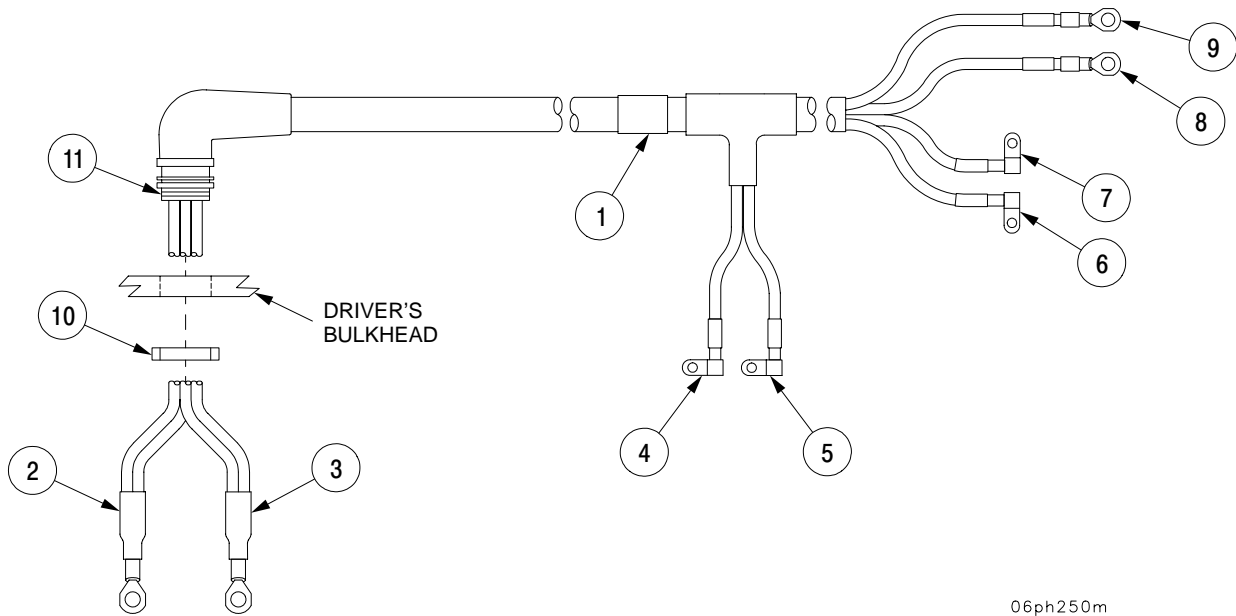
3 Install wiring harness (1) with attaching hardware at the following attachment points:

<b>Item No.</b>	<b>W116 Connector/Lead/Wire</b>	<b>To Connector/Lead/Wire/Component</b>	<b>Location</b>
9	Lead E8 7	Right Negative Slip Ring Terminal	Crew Compartment (Right Side)
8	Lead E7 7	Right Negative Slip Ring Terminal	Crew Compartment (Right Side)
7	Lead E6 7	Left Negative Slip Ring Terminal	Crew Compartment (Left Side)
6	Lead E5 7	Left Negative Slip Ring Terminal	Crew Compartment (Left Side)
5	Lead E4 7	Front NATO Slave Receptacle	Driver's Compartment
4	Lead E3 7	Front NATO Slave Receptacle	Driver's Compartment
3	Lead E2 7	Ground Bus	Battery Compartment (Rear)
2	Lead E1 7	Ground Bus	Battery Compartment (Rear)

**Section IX. HULL WIRING HARNESS – CONTINUED**

**8-75 WIRING HARNESS W116 – CONTINUED**

**b. Installation – Continued**



06ph250m

**NOTE**

**FOLLOW-ON MAINTENANCE:**

- Install driver's full function crew station mounting plate (para 8-29)
- Install batteries (para 8-54)

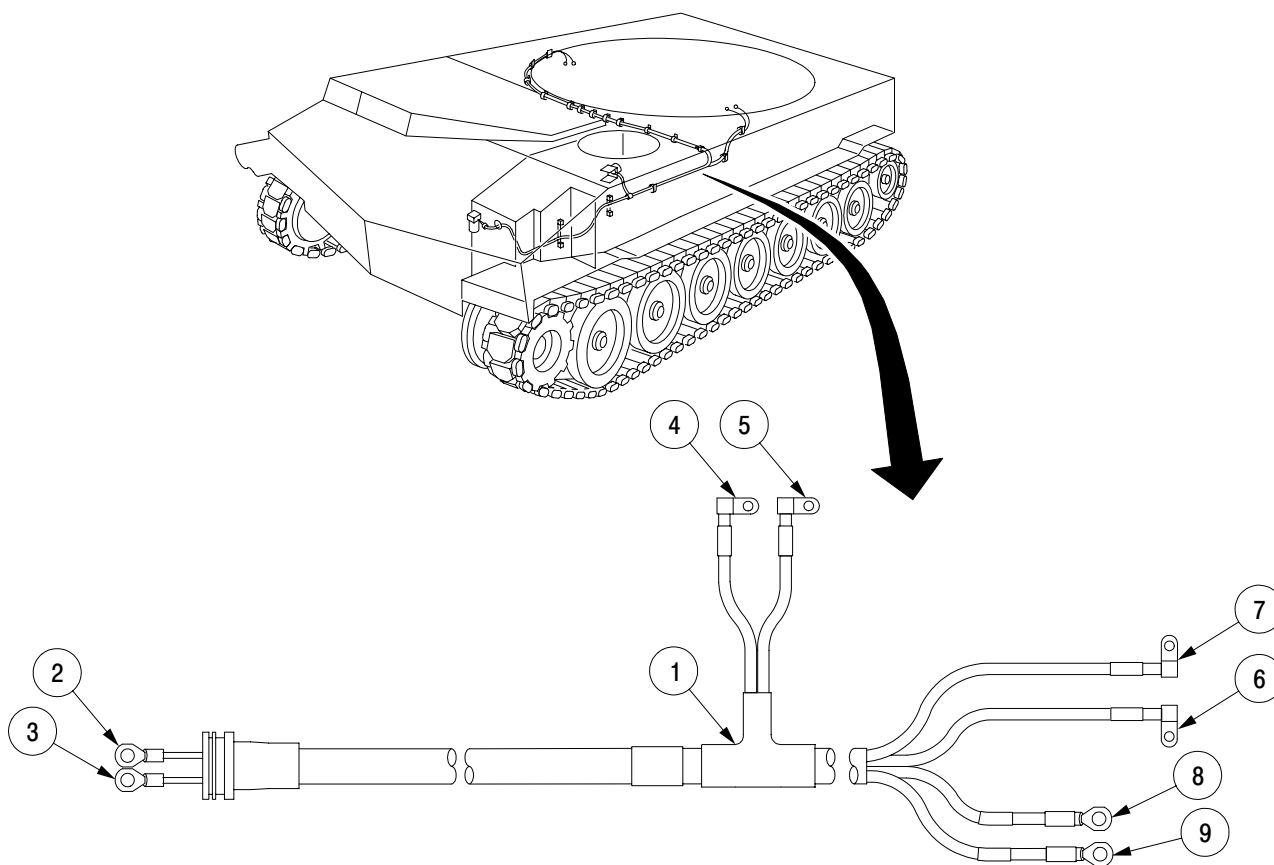


**Section IX. HULL WIRING HARNESS – CONTINUED**

**8-76 WIRING HARNESS W117 – CONTINUED**

**a. Removal – Continued**

Item No.	W117 Connector/Lead/Wire	From Connector/Lead/Wire/Component	Location
6	Lead E7 10	Right Slip Ring Segment Positive Terminal	Right Slip Ring (Crew Compartment)
7	Lead E8 10	Right Slip Ring Segment Positive Terminal	Right Slip Ring (Crew Compartment)
8	Lead E5 10	Left Slip Ring Segment Positive Terminal	Left Slip Ring (Crew Compartment)
9	Lead E6 10	Left Slip Ring Segment Positive Terminal	Left Slip Ring (Crew Compartment)



06ph238m



**Section IX. HULL WIRING HARNESS – CONTINUED**

---

**8-76 WIRING HARNESS W117 – CONTINUED**

---

**a. Removal – Continued**

- 2 Remove straps, clamps, attaching hardware and lockwashers (A thru E) securing wiring harness (1) to vehicle, as shown in illustration. Discard lockwashers.
- 3 Remove wiring harness (1).

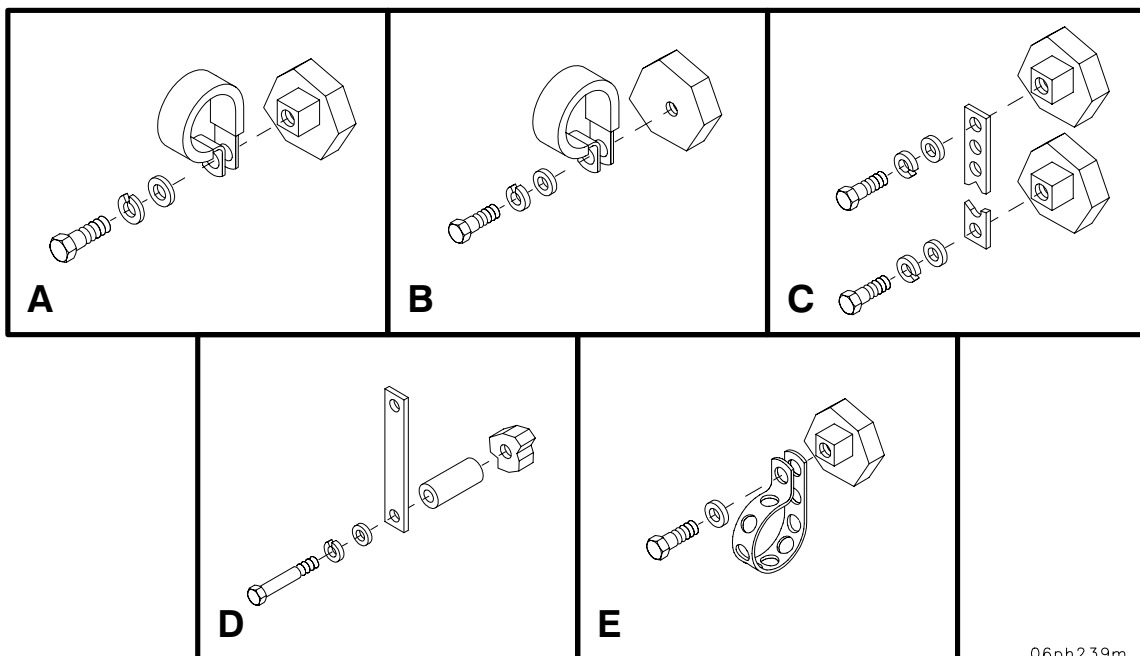
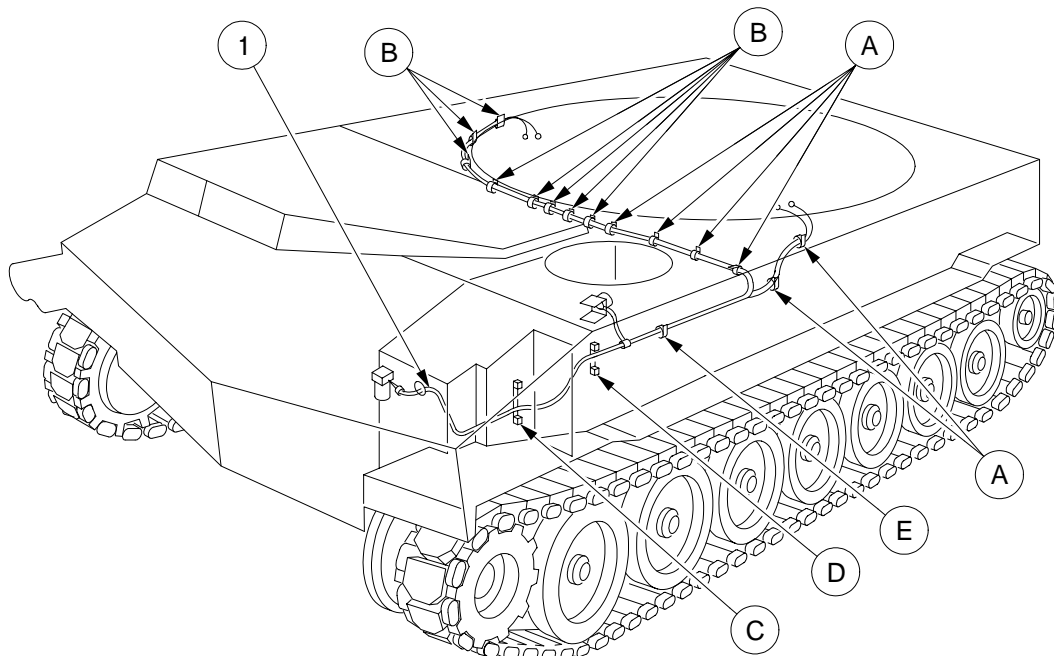
**b. Installation.**

- 1 Install wiring harness (1) in vehicle with straps, clamps, attaching hardware, and new lockwashers (A thru E), as shown in illustration.

Section IX. HULL WIRING HARNESS – CONTINUED

8-76 WIRING HARNESS W117 – CONTINUED

b. Installation – Continued



06ph239m

**Section IX. HULL WIRING HARNESS – CONTINUED**

**8-76 WIRING HARNESS W117 – CONTINUED**

**b. Installation – Continued**

**NOTE**

- Torque attaching hardware for leads E6 10, E5 10, E8 10, and E7 10 to 30–35 lb–ft (41–47 N·m).
- The following legend identifies attachment points for each connection.

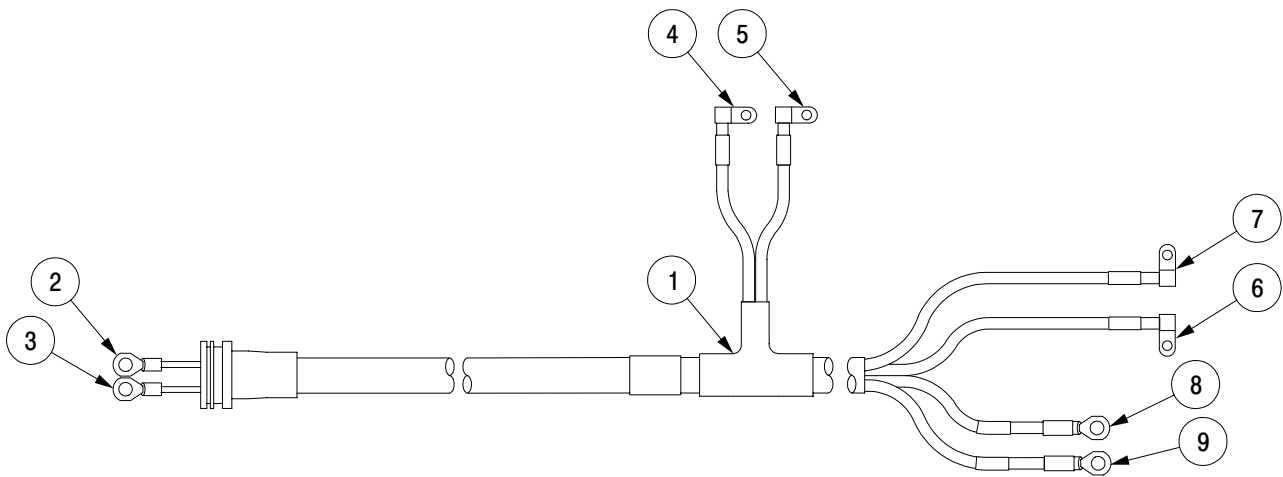
2 Install wiring harness (1) with attaching hardware at the following attachment points:

<b>Item No.</b>	<b>W117 Connector/Lead/Wire</b>	<b>To Connector/Lead/Wire/Component</b>	<b>Location</b>
9	Lead E6 10	Left Slip Ring Segment Positive Terminal	Left Slip Ring (Crew Compartment)
8	Lead E5 10	Left Slip Ring Segment Positive Terminal	Left Slip Ring (Crew Compartment)
7	Lead E8 10	Right Slip Ring Segment Positive Terminal	Right Slip Ring (Crew Compartment)
6	Lead E7 10	Right Slip Ring Segment Positive Terminal	Right Slip Ring (Crew Compartment)
5	Lead E4 10	NATO Slave Receptacle Positive Terminal	NATO Slave Receptacle (Driver's Compartment)
4	Lead E3 10	NATO Slave Receptacle Positive Terminal	NATO Slave Receptacle (Driver's Compartment)
3	Lead E2 10	Master Relay Terminal A2	Master Relay (Engine Compartment)
2	Lead E1 10	Master Relay Terminal A2	Master Relay (Engine Compartment)

**Section IX. HULL WIRING HARNESS – CONTINUED**

**8-76 WIRING HARNESS W117 – CONTINUED**

**b. Installation – Continued**



06ph295m

**NOTE**

**FOLLOW-ON MAINTENANCE:**

Install turret ring shields under gun mount

(TM 9-2350-314-20-2)

Close transmission access door

(TM 9-2350-314-10)

Install driver's full function crew station mounting plate

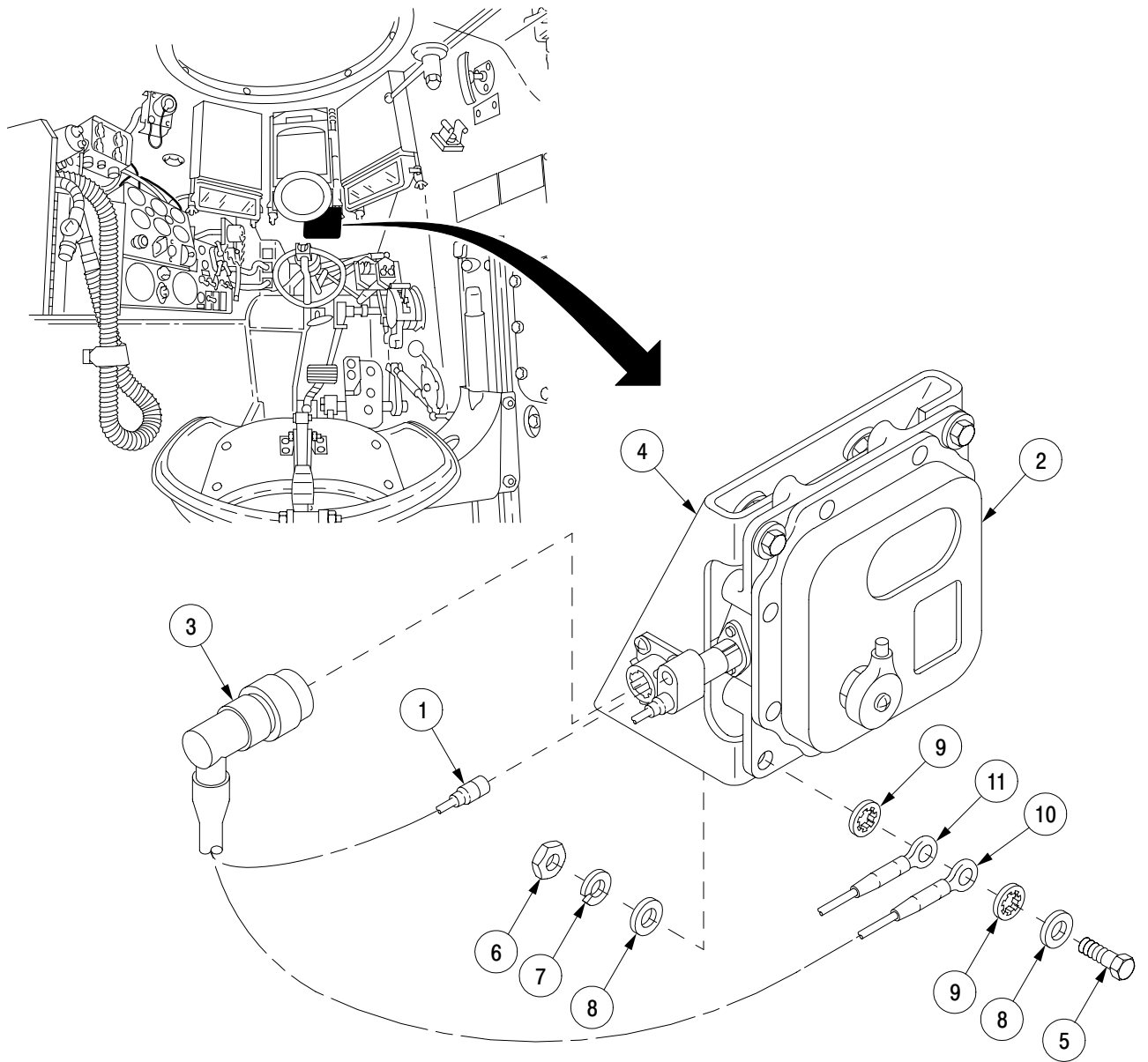
(para 8-29)



Section IX. HULL WIRING HARNESS – CONTINUED

8-77 WIRING HARNESS W118 – CONTINUED

a. Removal – Continued



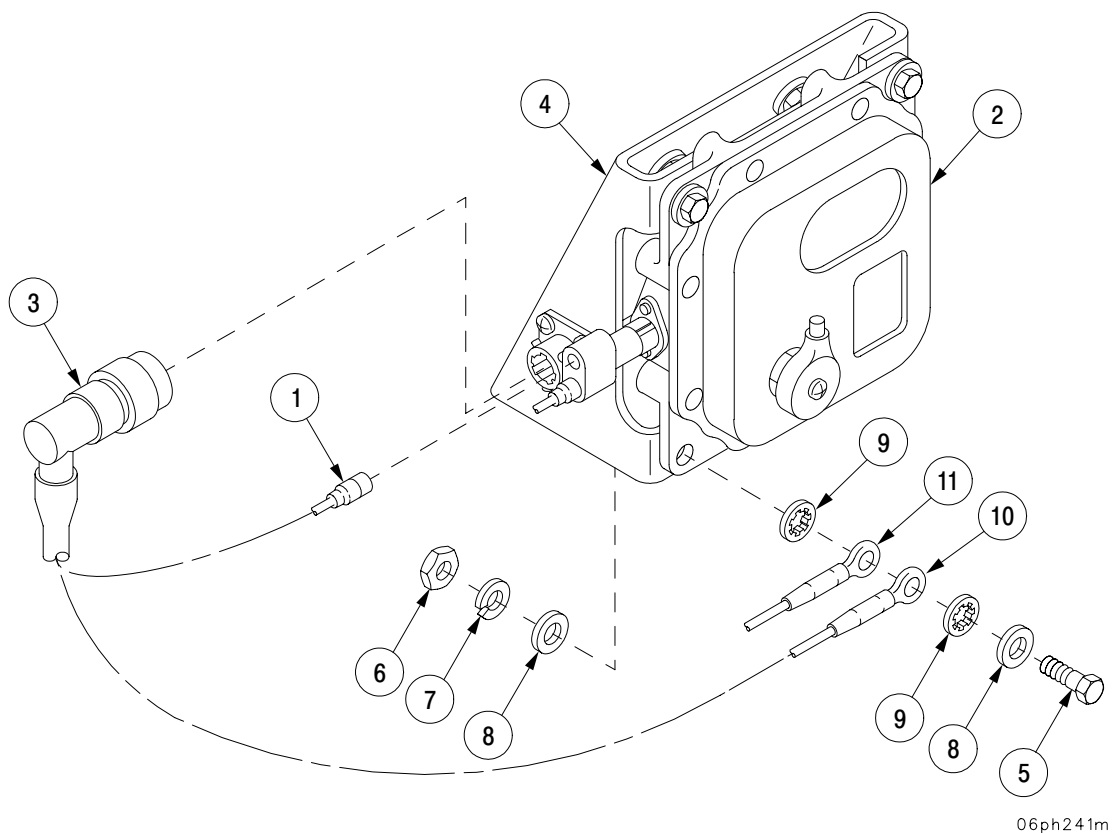
06ph240m

**Section IX. HULL WIRING HARNESS – CONTINUED**

**8-77 WIRING HARNESS W118 – CONTINUED**

**b. Installation.**

- 1 Secure wiring harness W125 wire E2 7 (11) and wiring harness W118 wire 7 (10) to dome light bracket (4) with screw (5), two flat washers (8), two new lockwashers (9), new lockwasher (7), and nut (6).
- 2 Connect wiring harness W118 connector P1 (3) to dome light bracket (4).
- 3 Connect wiring harness W118 wire 628 (1) to dome light (2).



**NOTE**

**FOLLOW-ON MAINTENANCE:**  
 Connect battery ground leads (para 8-33)





**Section IX. HULL WIRING HARNESS – CONTINUED**

**8-78 WIRING HARNESS W119 – CONTINUED**

**a. Removal – Continued**

- 1 Remove wiring harness (1) and attaching hardware, at the following attachment points:

<b>Item No.</b>	<b>W119 Connector/Lead/Wire</b>	<b>From Connector/Lead/Wire/Component</b>	<b>Location</b>
2	W119 P1	Accessory Control Box	Forward Crew Compartment
3	W119 P2	Accessory Control Box	Forward Crew Compartment
4	W119 P3	Personnel Vent Fan	Forward Crew Compartment
5	W119 P4	Personnel Heater	Forward Crew Compartment
6	Wire 402A	Heater Fuel Pump	Forward Crew Compartment
7	Wire 415 (2)	Right and Left Air Cleaner Blower Motors	Forward Crew Compartment
8	Wire 7	Accessory Control Box/Bracket	Forward Crew Compartment
9	Wire 40	W114 Wire 40	Behind Driver's Instrument Panel
10	Wire 400	Circuit Breaker 5	Circuit Breaker Panel
11	Wire 415	W122 Wire 415	Behind Driver's Instrument Panel Blower Motor Relay

---

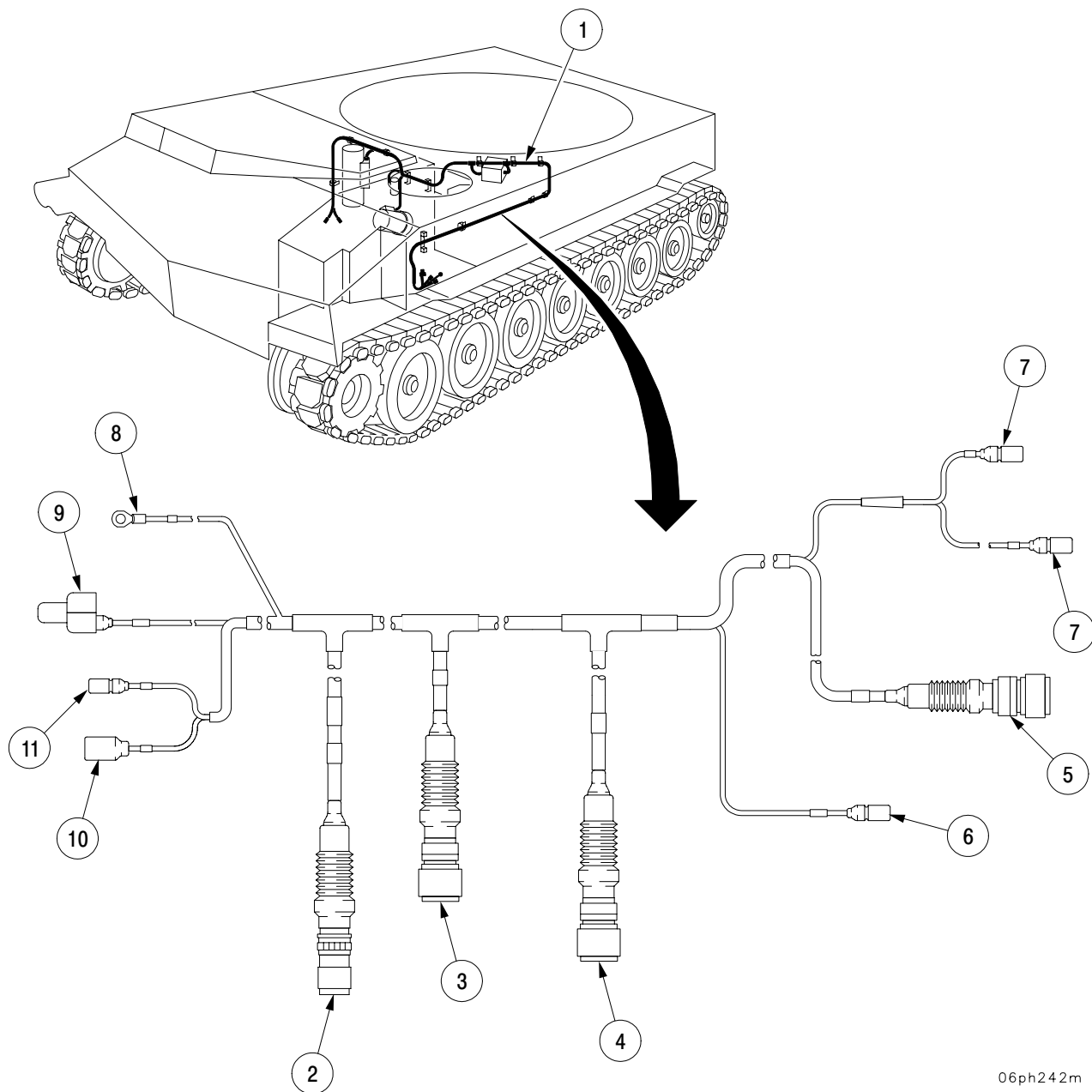
**Section IX. HULL WIRING HARNESS – CONTINUED**

---

**8-78 WIRING HARNESS W119 – CONTINUED**

---

**a. Removal – Continued**



06ph242m

**Section IX. HULL WIRING HARNESS – CONTINUED**

---

**8-78 WIRING HARNESS W119 – CONTINUED**

---

**a. Removal – Continued**

- 2 Remove straps, clamps, attaching hardware, and lockwashers (A thru H) securing wiring harness (1) to vehicle, as shown in illustration. Discard lockwashers.
- 3 Remove wiring harness (1).

**b. Installation.**

**NOTE**

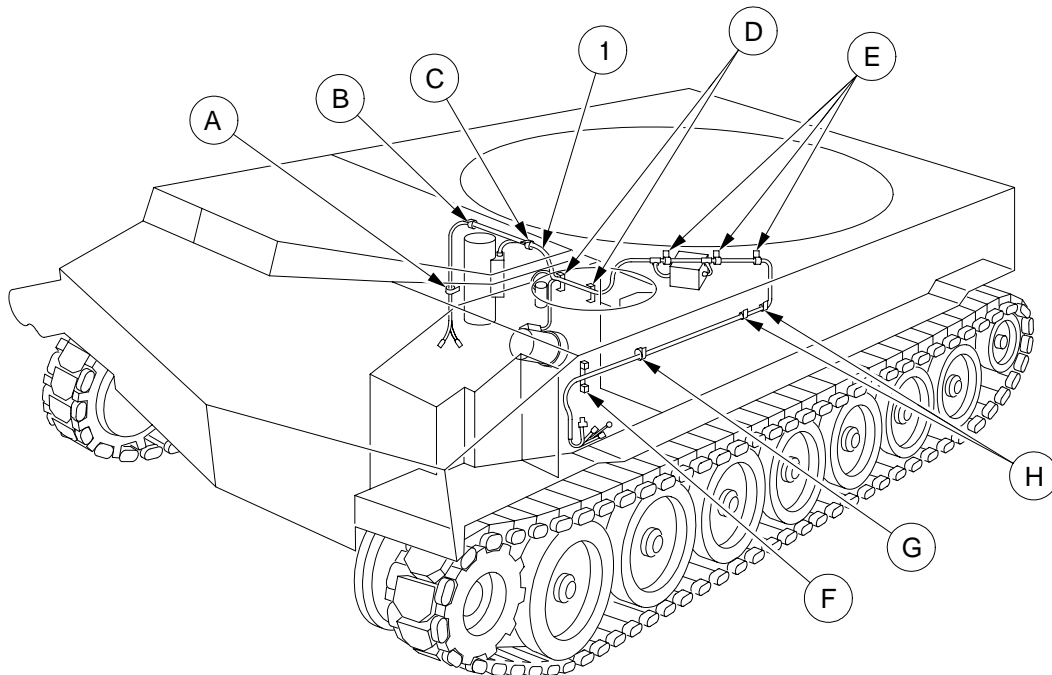
Electrical tape can be applied to wiring harness as necessary during installation.

- 1 Install wiring harness (1) in vehicle with straps, clamps, attaching hardware, and new lockwashers (A thru H), as shown in illustration.

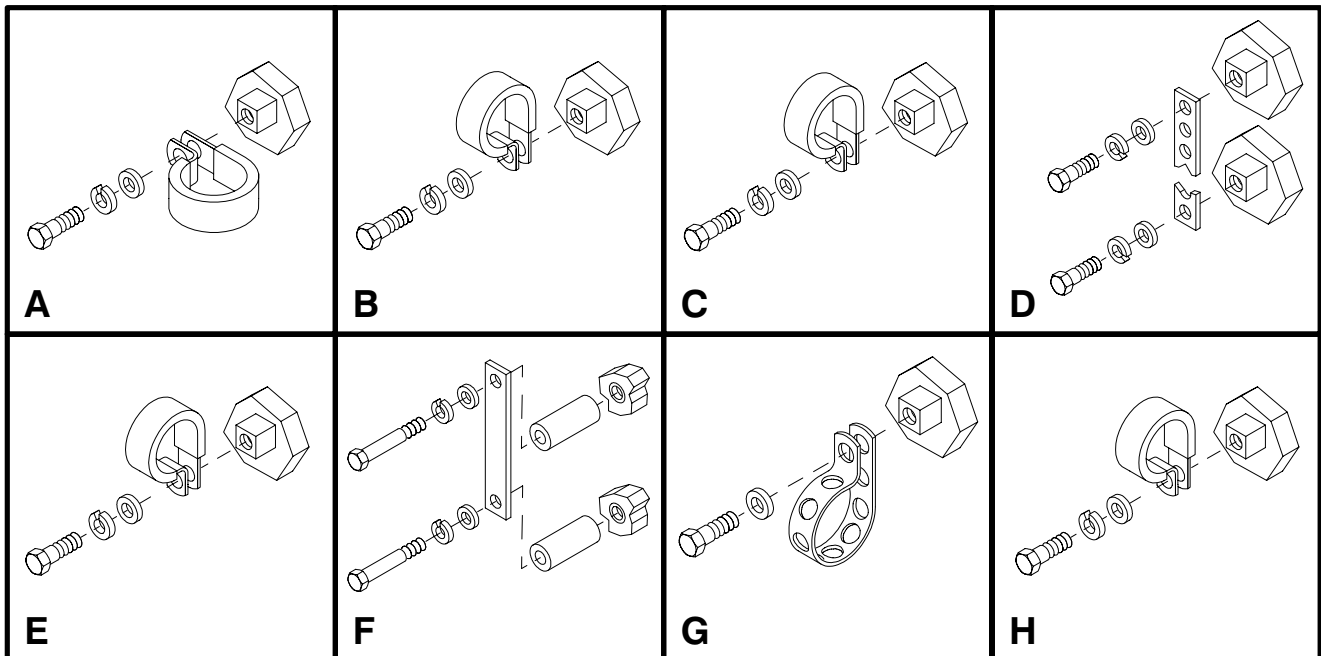
**Section IX. HULL WIRING HARNESS – CONTINUED**

**8-78 WIRING HARNESS W119 – CONTINUED**

**b. Installation – Continued**



06ph243m



**Section IX. HULL WIRING HARNESS – CONTINUED**

**8-78 WIRING HARNESS W119 – CONTINUED**

**b. Installation – Continued**

**NOTE**

The following legend identifies attachment points for each connection.

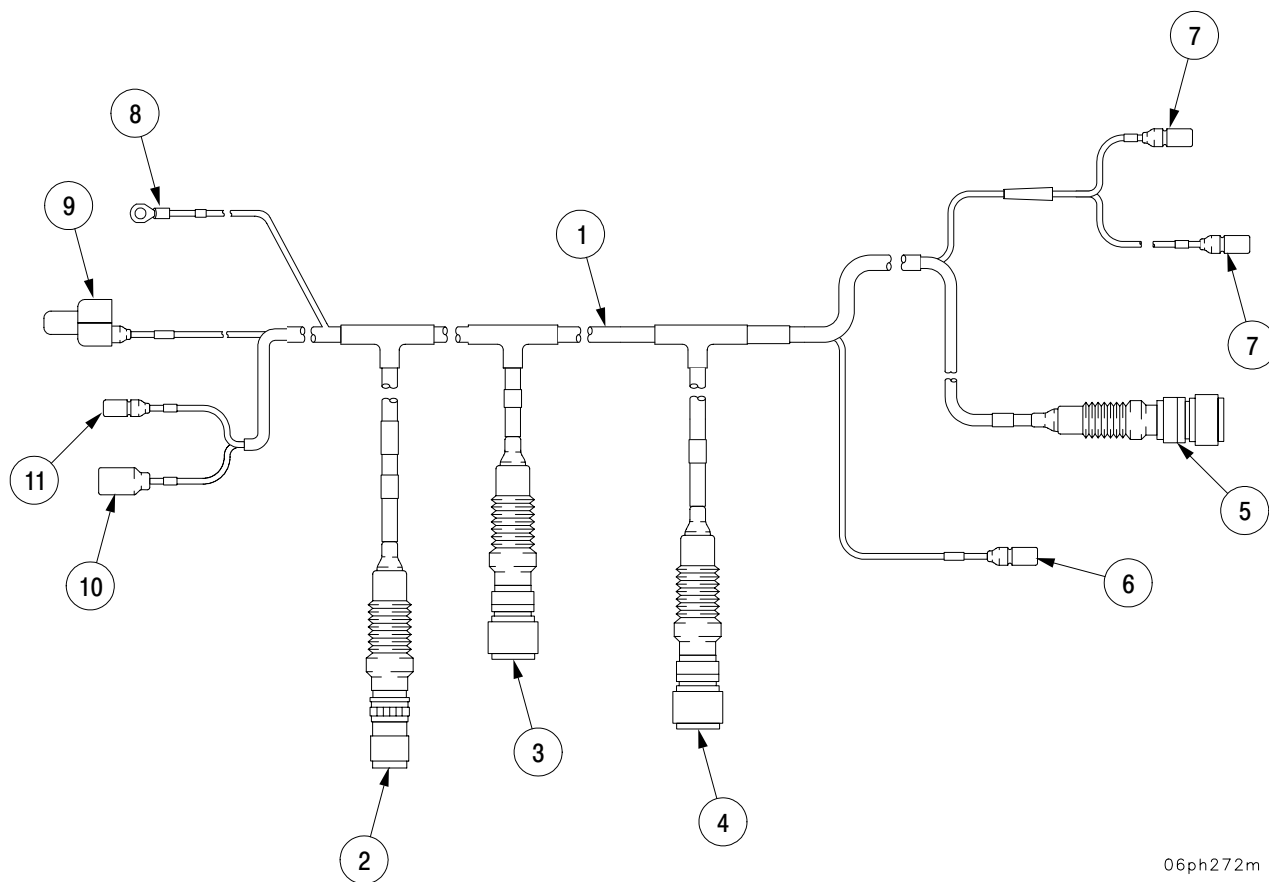
- 2 Install wiring harness (1) with attaching hardware at the following attachment points:

<b>Item No.</b>	<b>W119 Connector/Lead/Wire</b>	<b>To Connector/Lead/Wire/Component</b>	<b>Location</b>
11	Wire 415	W122 Wire 415	Behind Driver's Instrument Panel Blower Motor Relay
10	Wire 400	Circuit Breaker 5	Circuit Breaker Panel
9	Wire 40	W114 Wire 40	Behind Driver's Instrument Panel
8	Wire 7	Accessory Control Box/Bracket	Forward Crew Compartment
7	Wire 415(2)	Right and Left Air Cleaner Blower Motors	Forward Crew Compartment
6	Wire 402A	Heater Fuel Pump	Forward Crew Compartment
5	W119 P4	Personnel Heater	Forward Crew Compartment
4	W119 P3	Personnel Vent Fan	Forward Crew Compartment
3	W119 P2	Accessory Control Box	Forward Crew Compartment
2	W119 P1	Accessory Control Box	Forward Crew Compartment

**Section IX. HULL WIRING HARNESS – CONTINUED**

**8-78 WIRING HARNESS W119 – CONTINUED**

**b. Installation – Continued**



06ph272m

**NOTE**

**FOLLOW-ON MAINTENANCE:**

Install driver's portable instrument panel  
(TM 9-2350-314-10)

Install driver's full function crew station mounting  
plate (para 8-29)

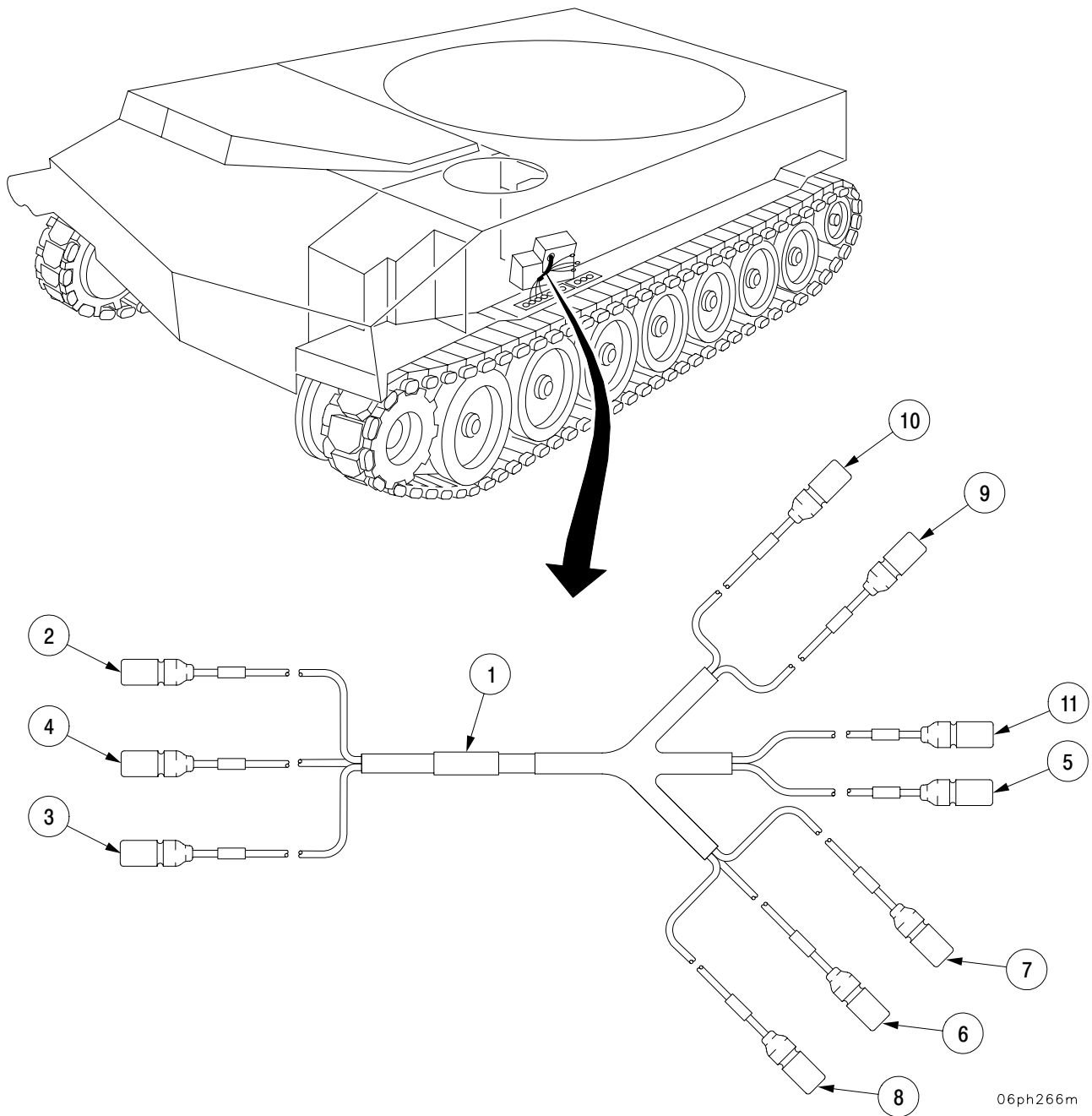


**Section IX. HULL WIRING HARNESS – CONTINUED**

**8-79 WIRING HARNESS W120 – CONTINUED**

**a. Removal – Continued**

- 2 Remove wiring harness (1).





**Section IX. HULL WIRING HARNESS – CONTINUED**

**8-79 WIRING HARNESS W120 – CONTINUED**

**b. Installation.**

**NOTE**

The following legend identifies attachment points for each connection.

Install wiring harness. Connect at the following attachment points:

<b>Item No.</b>	<b>W120 Connector/Lead/Wire</b>	<b>To Connector/Lead/Wire/Component</b>	<b>Location</b>
11	Wire 459A	W114 Wire 459A	Behind Driver's Instrument Panel
10	Wire 509E	W114 Wire 509E	Behind Driver's Instrument Panel
9	Wire 450	Bilge Pump Switch	Driver's Instrument Panel
8	Wire 10S	W115 Wire TL1	Driver's Instrument Panel
7	Wire 10S	Glow Plugs Switch	Driver's Instrument Panel
6	Wire 10S	Starter Switch Wire 10S	Behind Driver's Instrument Panel
5	Wire 588	Fuel Prime Pump Switch	Driver's Instrument Panel
4	Wire 588	CB3	Circuit Breaker Panel
3	Wire 10S	CB4	Circuit Breaker Panel
2	Wire 450	CB2	Circuit Breaker Panel

---

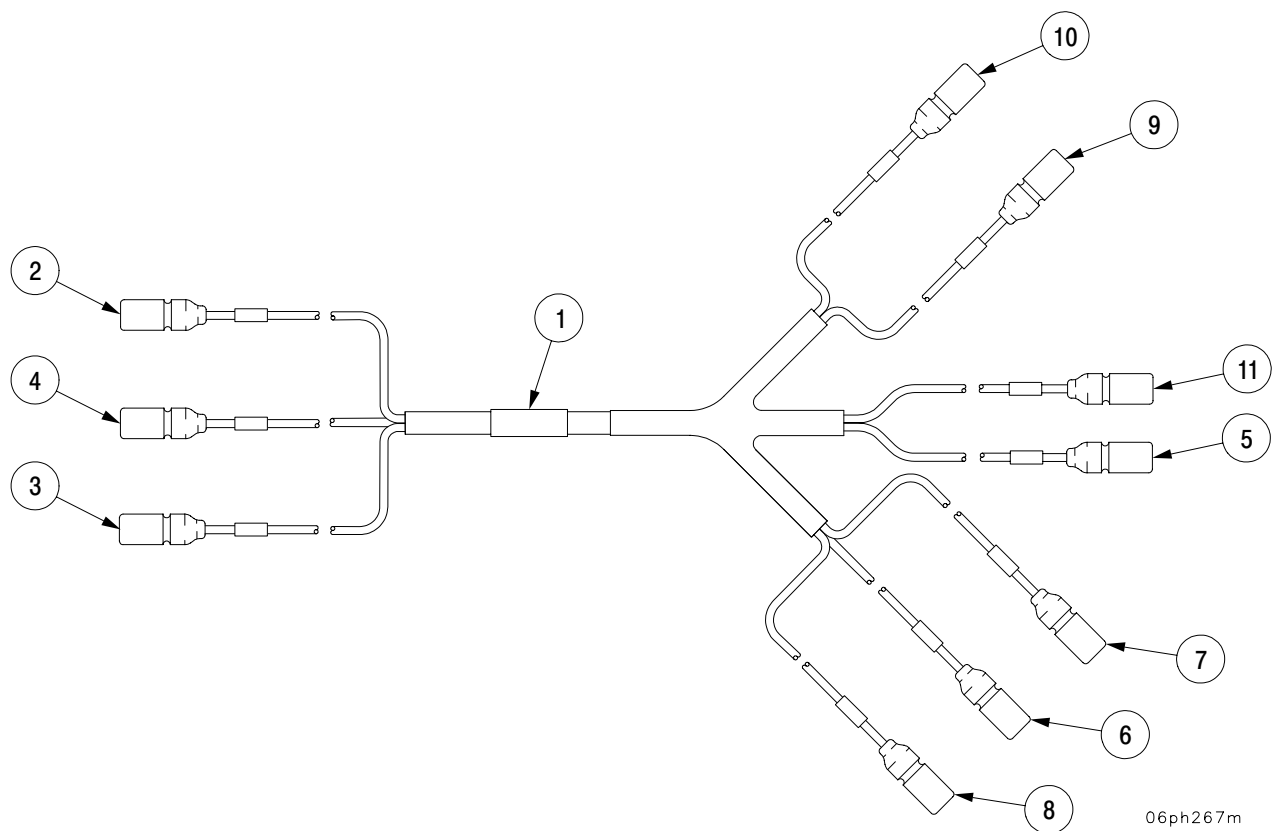
**Section IX. HULL WIRING HARNESS – CONTINUED**

---

**8-79 WIRING HARNESS W120 – CONTINUED**

---

**b. Installation – Continued**



06ph267m

**NOTE**

**FOLLOW-ON MAINTENANCE:**  
Connect battery ground leads (para 8-33)



---

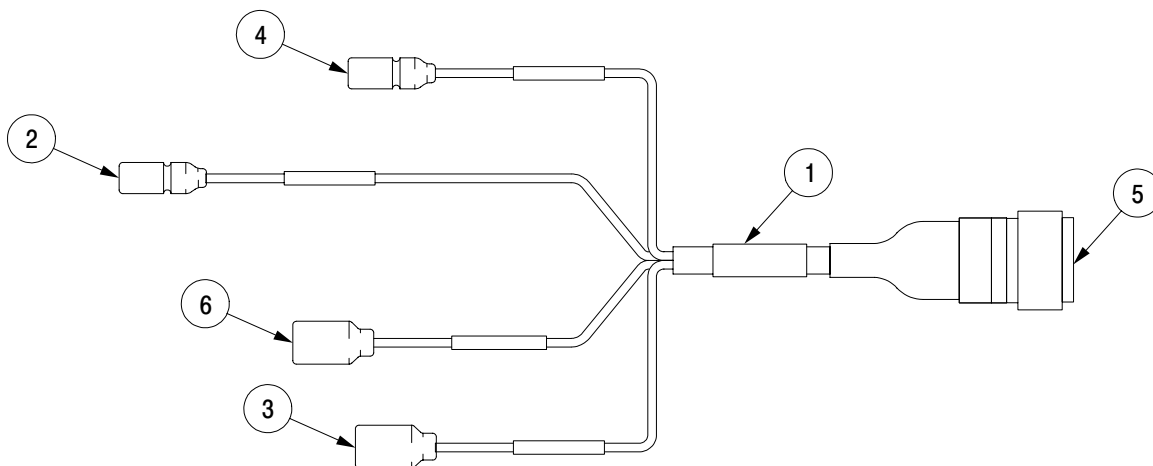
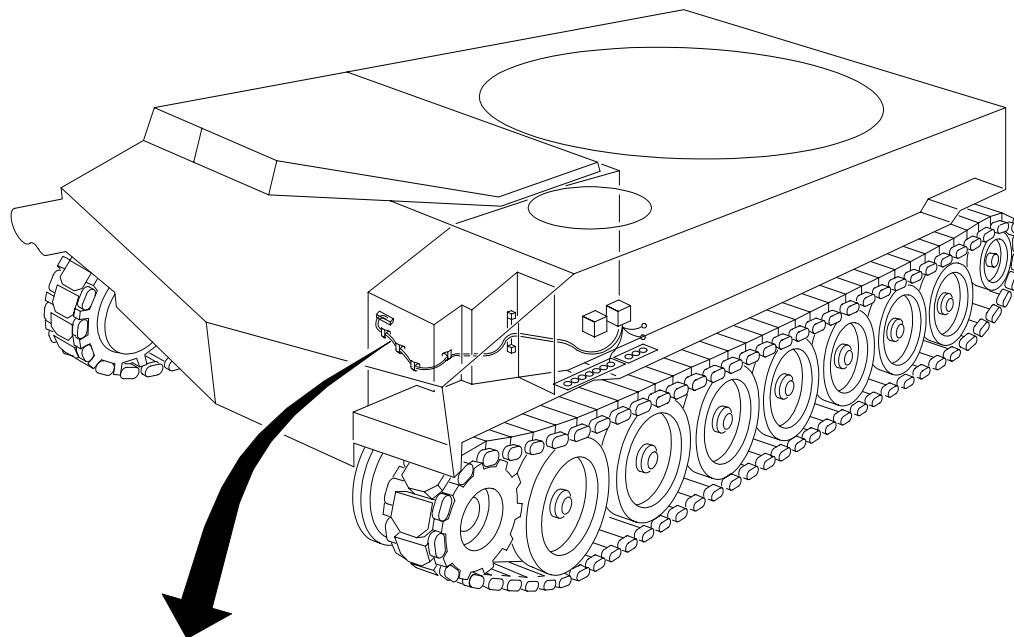
**Section IX. HULL WIRING HARNESS – CONTINUED**

---

**8-80 WIRING HARNESS W122 – CONTINUED**

---

**a. Removal – Continued**



06ph251m

---

## Section IX. HULL WIRING HARNESS – CONTINUED

---

### 8-80 WIRING HARNESS W122 – CONTINUED

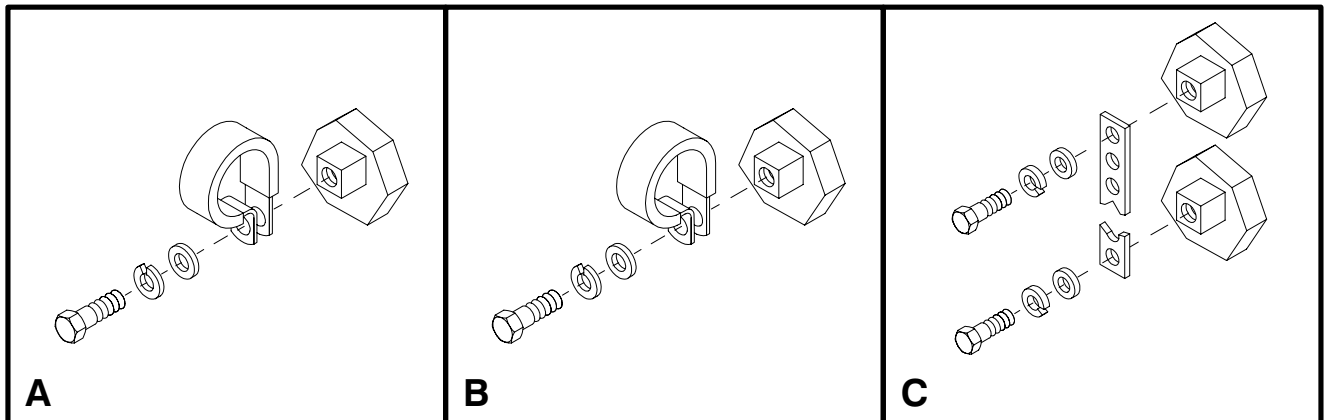
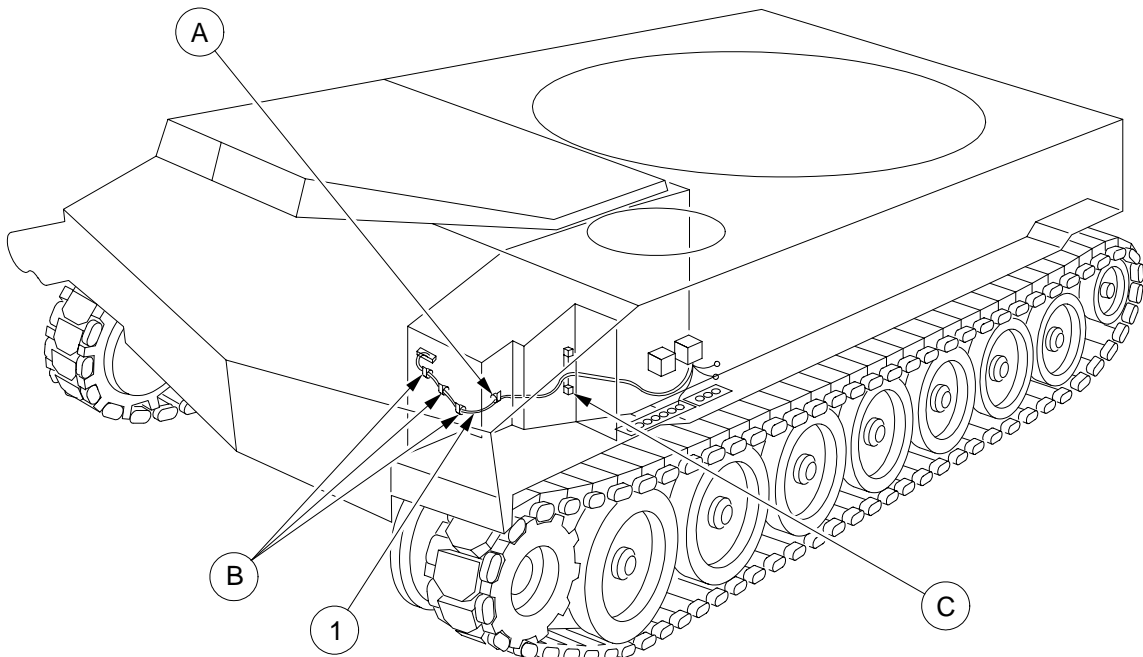
---

#### a. Removal – Continued

- 2 Remove straps, clamps, attaching hardware, and lockwashers (A thru C) securing wiring harness (1) to vehicle, as shown in illustration. Discard lockwashers.
- 3 Remove wiring harness (1).

#### b. Installation.

- 1 Install wiring harness (1) in vehicle with straps, clamps, attaching hardware, and new lockwashers (A thru C), as shown in illustration.



06ph252m

**Section IX. HULL WIRING HARNESS – CONTINUED**

**8-80 WIRING HARNESS W122 – CONTINUED**

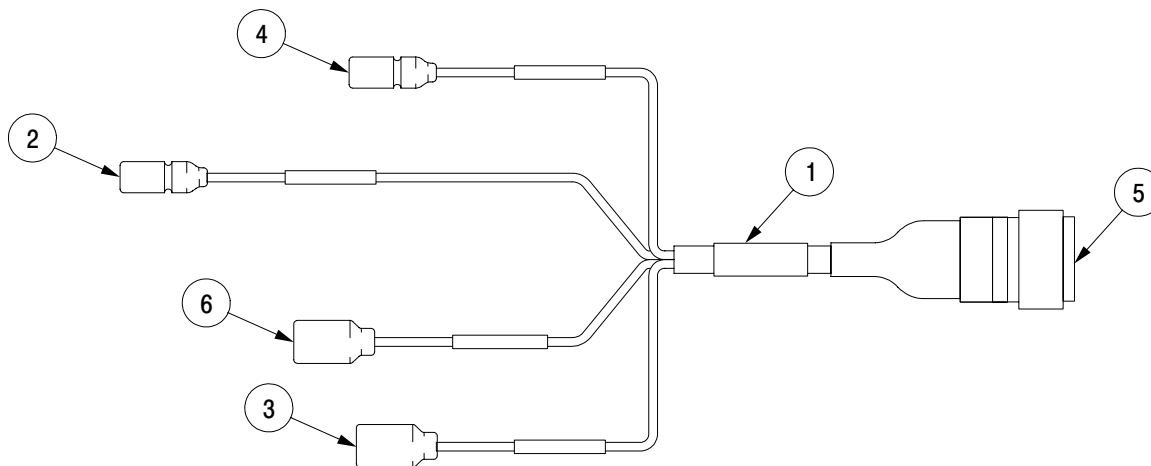
**b. Installation – Continued**

**NOTE**

The following legend identifies attachment points for each connection.

2 Connect wiring harness (1) at the following attachment points:

Item No.	W122 Connector/Lead/Wire	To Connector/Lead/Wire/Component	Location
6	Wire 7	W125 E5 7	Behind Driver's Instrument Panel
5	W122 P1	Air Cleaner Blower Motor Relay	Behind Driver's Instrument Panel
4	Wire 415A	CB7	Circuit Breaker Panel
3	Wire 415	W119 Wire 415	Behind Driver's Instrument Panel
2	Wire 415F	Neutral Safety Switch Wire 415B	Engine Compartment Bulkhead (Driver's Compartment)



06ph251m

**NOTE**

**FOLLOW-ON MAINTENANCE:**  
 Install driver's portable instrument panel (TM 9-2350-314-10)  
 Connect battery ground leads (para 8-33)

## Section IX. HULL WIRING HARNESS – CONTINUED

---

### 8-81 WIRING HARNESS W123.

---

This task covers:      a. Removal                                      b. Installation

---

<b>INITIAL SETUP</b>
----------------------

Tools

General mechanic's tool kit  
(SC 5180-90-N26)

Equipment Conditions

Vehicle MASTER switch OFF  
(TM 9-2350-314-10)  
Battery ground leads disconnected  
(para 8-33)  
Driver's portable instrument panel removed  
(TM 9-2350-314-10)

References

TM 9-2350-314-10

---

#### a. Removal.

#### NOTE

Tag all electrical connections and electrical leads prior to removal to aid in installation.

- 1 Disconnect wiring harness W123 connector P1 (1) from fuel pump relay (2).
- 2 Disconnect wiring harness W123 wire 415 connector (3) from wiring harness W114 wire 415C/W115 wire 76 connector (4).
- 3 Disconnect wiring harness W123 wire 415B connector (5) from wiring harness W114 wire 415B connector (6).
- 4 Disconnect wiring harness W123 wire 76 connector (7) from CB3 (8).
- 5 Remove wiring harness W123 (9) from vehicle.

#### b. Installation.

- 1 Position wiring harness W123 (9) in vehicle.
- 2 Connect wiring harness W123 wire 76 connector (7) to CB3 (8).

---

**Section IX. HULL WIRING HARNESS – CONTINUED**

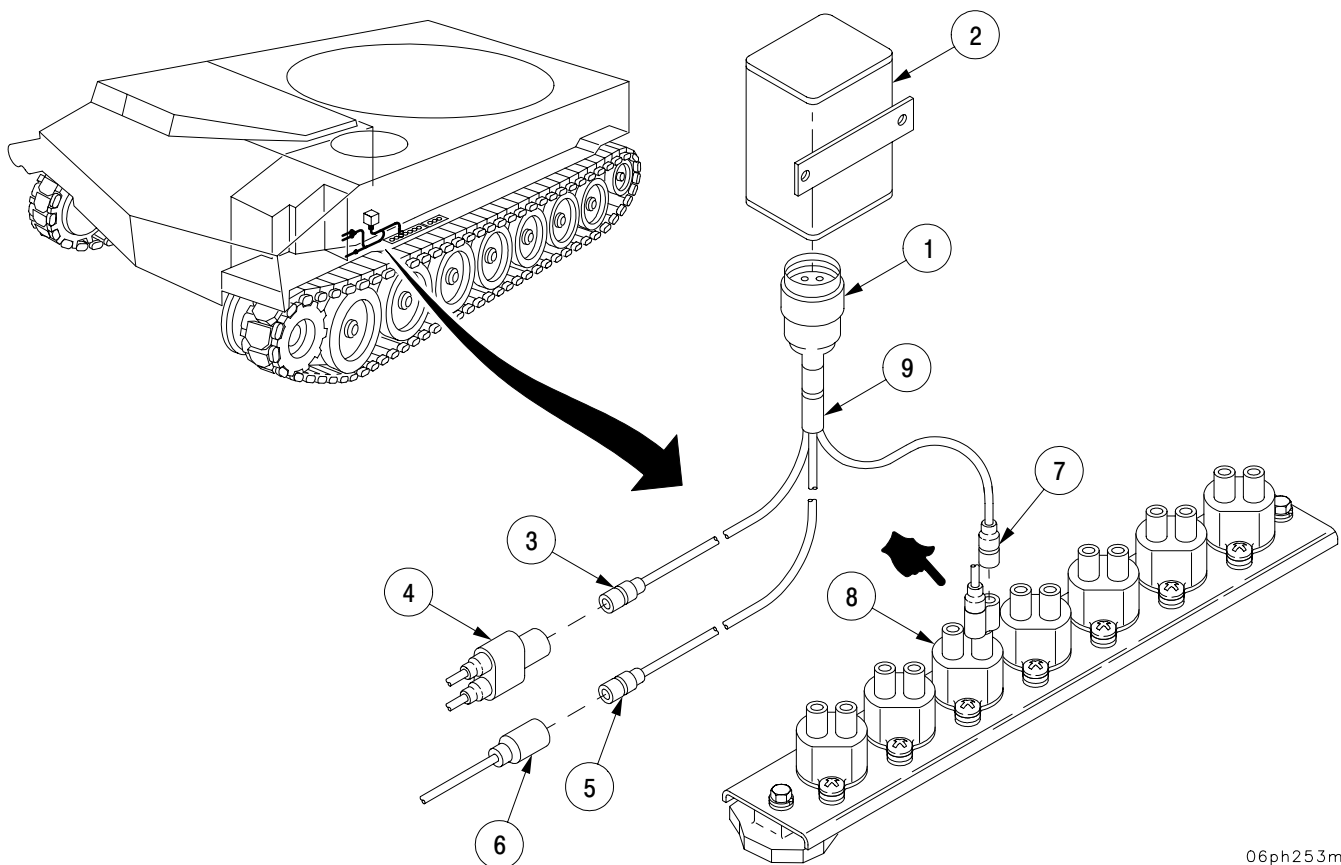

---

**8-81 WIRING HARNESS W123 – CONTINUED**


---

**a. Installation – Continued**

- 3 Connect wiring harness W123 wire 415B connector (5) to wiring harness W114 wire 415B connector (6).
- 4 Connect wiring harness W123 wire 415 connector (3) to wiring harness W114 wire 415C/W115 wire 76 connector (4).
- 5 Connect wiring harness W123 connector P1 (1) to fuel pump relay (2).



06ph253m

**NOTE**

**FOLLOW-ON MAINTENANCE:**  
 Install driver's portable instrument panel  
 (TM 9-2350-314-10)  
 Connect battery ground leads (para 8-33)



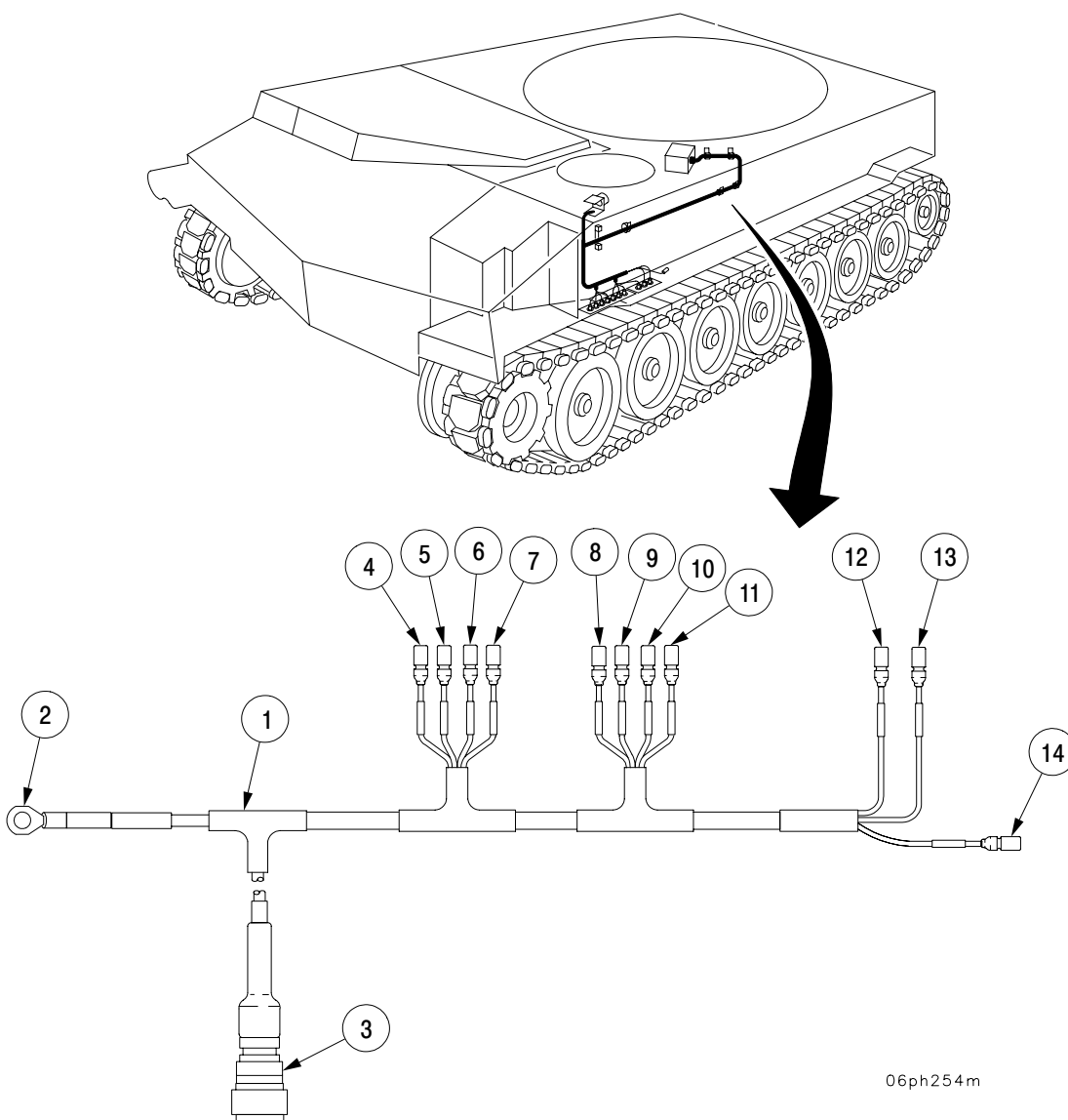


**Section IX. HULL WIRING HARNESS – CONTINUED**

**8-82 WIRING HARNESS W124 – CONTINUED**

**a. Removal – Continued**

Item No.	W124 Connector/Lead/Wire	From Connector/Lead/Wire/Component	Location
13	Wire E10 10	CB10	Circuit Breaker Panel
14	Wire E11 10	W115 Wire 15	Behind Driver's Instrument Panel



**Section IX. HULL WIRING HARNESS – CONTINUED**

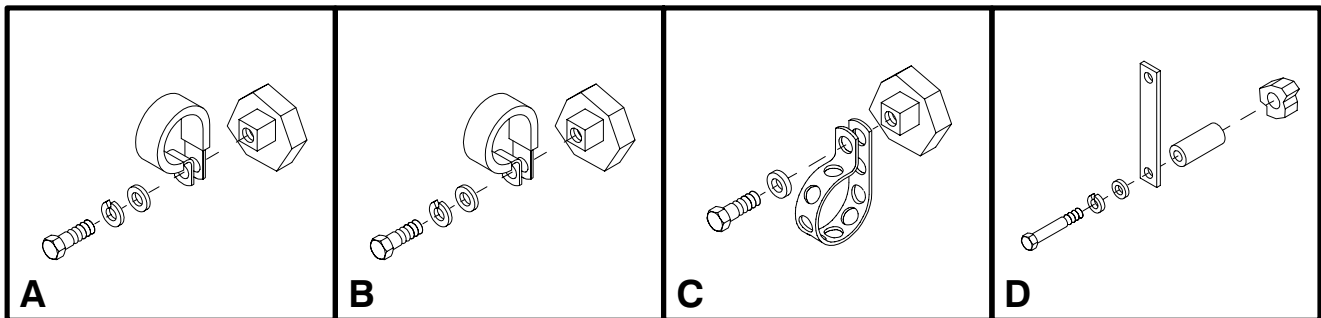
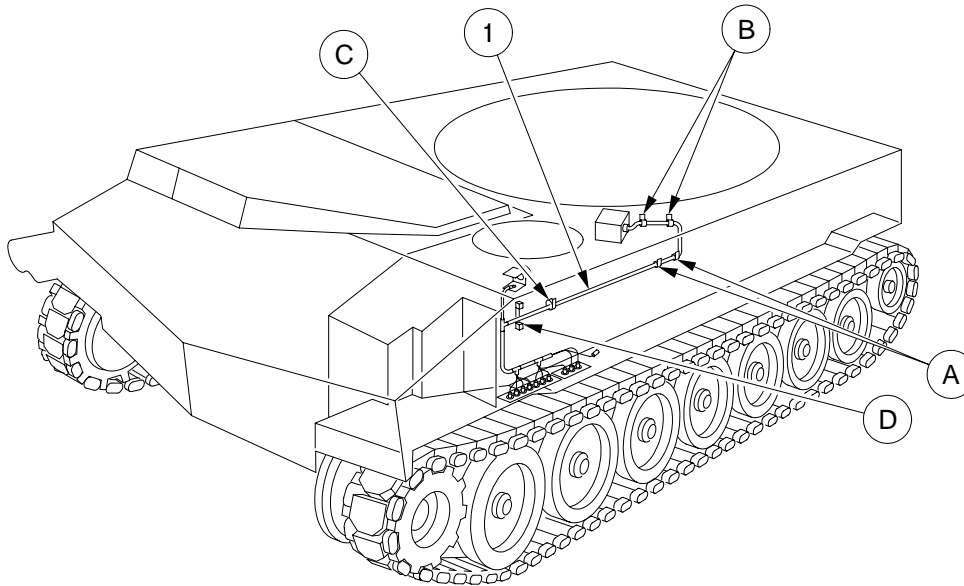
**8-82 WIRING HARNESS W124 – CONTINUED**

**a. Removal – Continued**

- 2 Remove straps, clamps, attaching hardware, and lockwashers (A thru D), securing wiring harness (1) to vehicle, as shown in illustration. Discard lockwashers.
- 3 Remove wiring harness (1).

**b. Installation.**

- 1 Install wiring harness (1) in vehicle with straps, clamps, attaching hardware, and new lockwashers (A thru D), as shown in illustration.



06ph255m

**NOTE**

The following legend identifies attachment points for each connection.

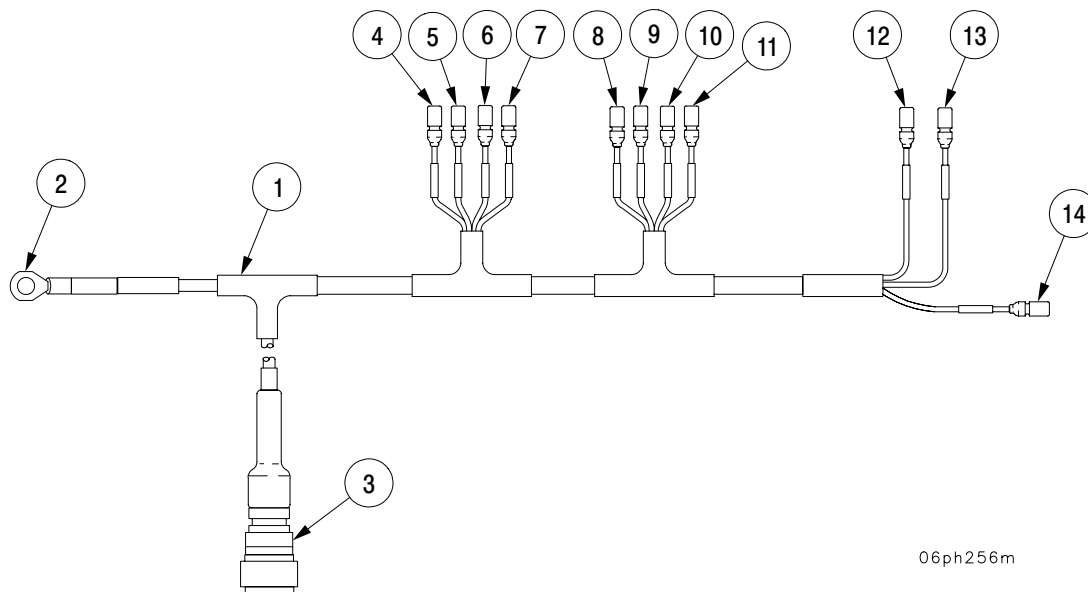
- 2 Install wiring harness (1) at the following attachment points:

**Section IX. HULL WIRING HARNESS – CONTINUED**

**8-82 WIRING HARNESS W124 – CONTINUED**

**b. Installation – Continued**

Item No.	W124 Connector/Lead/Wire	To Connector/Lead/Wire/Component	Location
14	Wire E11 10	W115 Wire 15	Behind Driver's Instrument Panel
13	Wire E10 10	CB10	Circuit Breaker Panel
12	Wire E9 10	CB9	Circuit Breaker Panel
11	Wire E8 10	CB8	Circuit Breaker Panel
10	Wire E7 10	CB7	Circuit Breaker Panel
9	Wire E6 10	CB6	Circuit Breaker Panel
8	Wire E5 10	Plugged	Circuit Breaker Panel
7	Wire E4 10	CB4	Circuit Breaker Panel
6	Wire E3 10	CB3	Circuit Breaker Panel
5	Wire E2 10	CB2	Circuit Breaker Panel
4	Wire E1 10	CB1	Circuit Breaker Panel
3	W124 P1 10	Accessory Control Box	Forward Crew Compartment
2	Wire E12 10	NATO Slave Receptacle Positive Terminal	NATO Slave Receptacle (Driver's Compartment)



**NOTE**

**FOLLOW-ON MAINTENANCE:**

- Install driver's instrument panel (para 8-12)
- Install driver's full function crew station mounting plate (para 8-29)

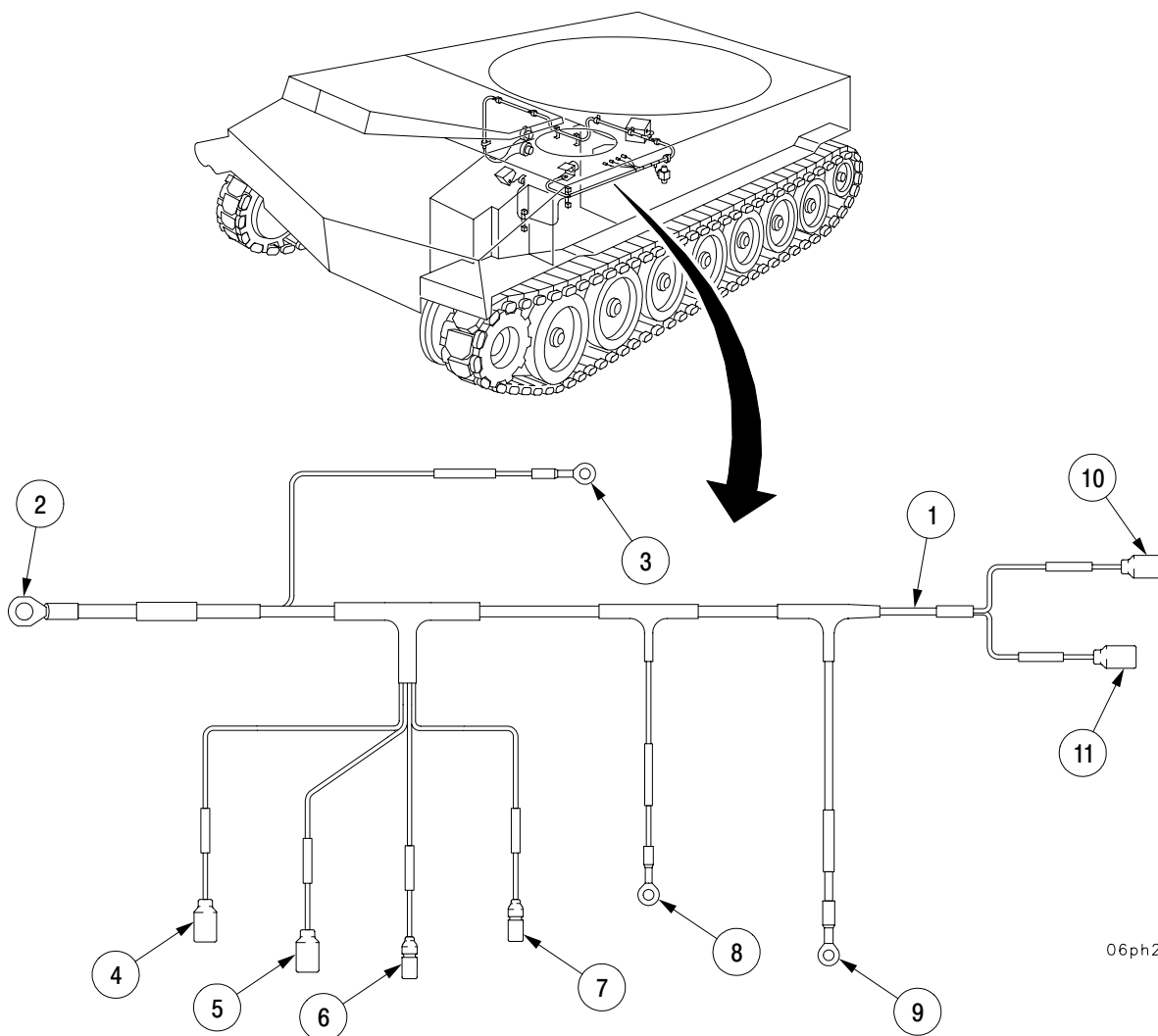


**Section IX. HULL WIRING HARNESS – CONTINUED**

**8-83 WIRING HARNESS W125 – CONTINUED**

**a. Removal – Continued**

Item No.	W125 Connector/Lead/Wire	From Connector/Lead/Wire/Component	Location
8	Wire E7 7	MCS Electrical Air Heater	MCS Heater (Driver's Compartment)
9	Wire E8 7	Accessory Control Box	Forward Crew Compartment
10	Wire E9 7	Air Cleaner Blower Motor	Forward Crew Compartment
11	Wire E10 7	Air Cleaner Blower Motor	Forward Crew Compartment



06ph257m

**Section IX. HULL WIRING HARNESS – CONTINUED**

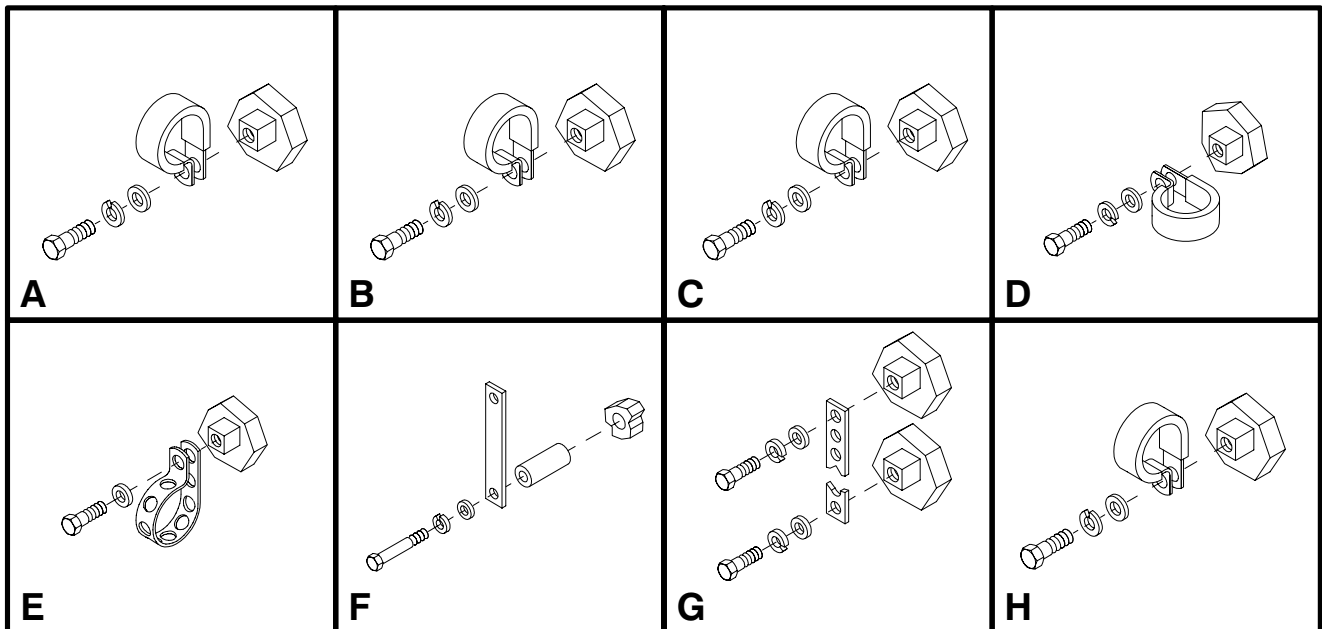
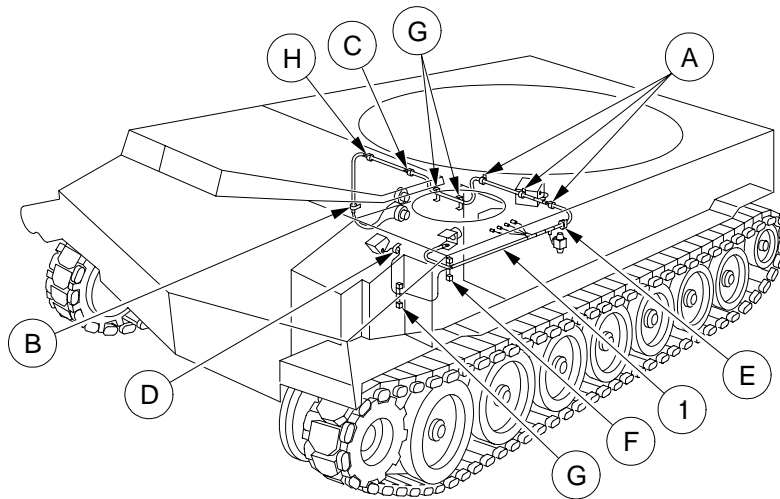
**8-83 WIRING HARNESS W125 – CONTINUED**

**a. Removal – Continued**

- 2 Remove straps, clamps, attaching hardware, and lockwashers (A thru H) securing wiring harness (1) to vehicle, as shown in illustration. Discard lockwashers.
- 3 Remove wiring harness (1) from vehicle.

**b. Installation.**

- 1 Install wiring harness (1) in vehicle with straps, clamps, attaching hardware, and new lockwashers (A thru H), as shown in illustration.



06ph258m

**Section IX. HULL WIRING HARNESS – CONTINUED**

**8-83 WIRING HARNESS W125 – CONTINUED**

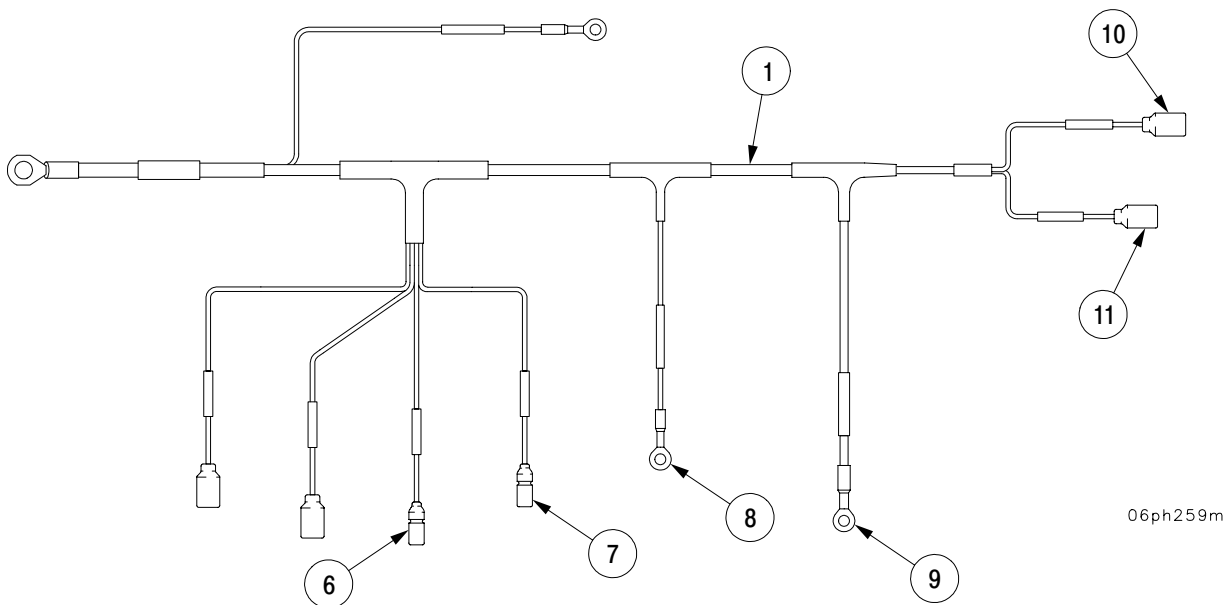
**b. Installation – Continued**

**NOTE**

The following legend identifies attachment points for each connection.

- 2 Install wiring harness (1) with attaching hardware, at the following attachment points:

Item No.	W125 Connector/Lead/Wire	To Connector/Lead/Wire/Component	Location
11	Wire E10 7	Air Cleaner Blower Motor	Forward Crew Compartment
10	Wire E9 7	Air Cleaner Blower Motor	Forward Crew Compartment
9	Wire E8 7	Accessory Control Box	Forward Crew Compartment
8	Wire E7 7	MCS Electrical Air Heater	MCS Electrical Air Heater (Driver's Compartment)
7	Wire E6 7	W111 Wire 7	Behind Driver's Instrument Panel
6	Wire E5 7	W122 Wire 7	Behind Driver's Instrument Panel



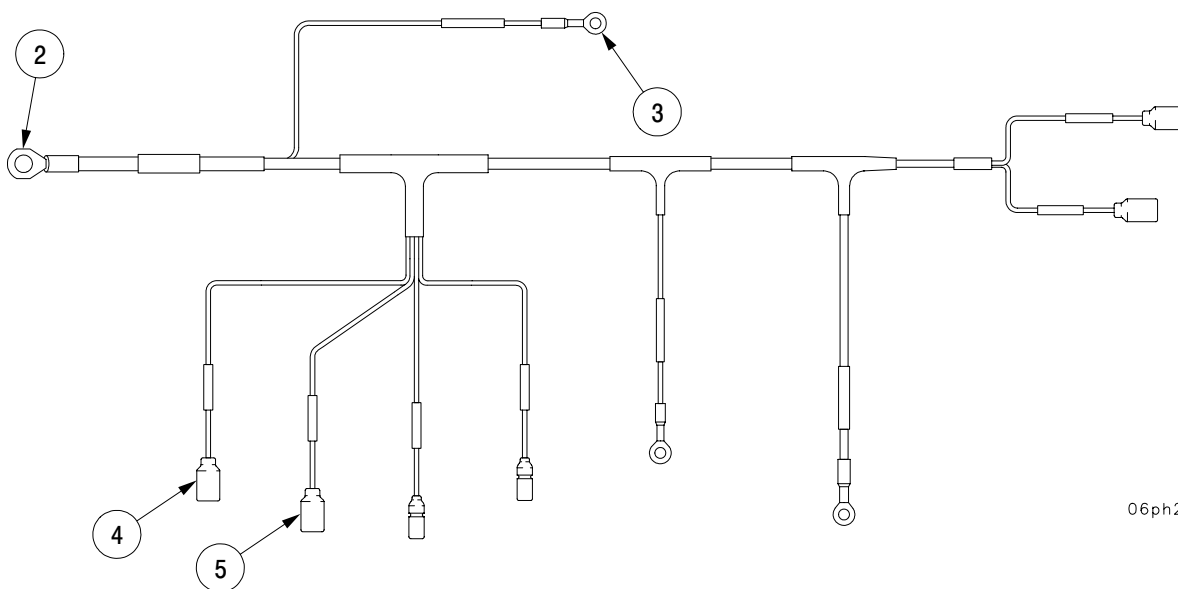


**Section IX. HULL WIRING HARNESS – CONTINUED**

**8-83 WIRING HARNESS W125 – CONTINUED**

**b. Installation – Continued**

Item No.	W125 Connector/Lead/Wire	To Connector/Lead/Wire/Component	Location
5	Wire E4 7	W115 TL2	Behind Driver's Instrument Panel
4	Wire E3 7	W114 Wire 7	Behind Driver's Instrument Panel
3	Wire E2 7	Dome Light (Driver's)	Forward Driver's Compartment
2	Wire E1 7	NATO Slave Receptacle Negative Terminal	NATO Slave Receptacle (Driver's Compartment)



06ph260m

**NOTE**

**FOLLOW-ON MAINTENANCE:**

- Install driver's instrument panel  
(para 8-12)
- Install driver's full function crew station plate  
(para 8-29)

**Section IX. HULL WIRING HARNESS – CONTINUED**

**8-84 WIRING HARNESS W126.**

This task covers:      a. Removal                                      b. Installation

**INITIAL SETUP**

Tools

General mechanic's tool kit  
(SC 5180-90-N26)

Equipment Conditions

Vehicle MASTER switch OFF  
(TM 9-2350-314-10)  
Battery ground leads disconnected  
(para 8-33)

References

TM 9-2350-314-10

**NOTE**

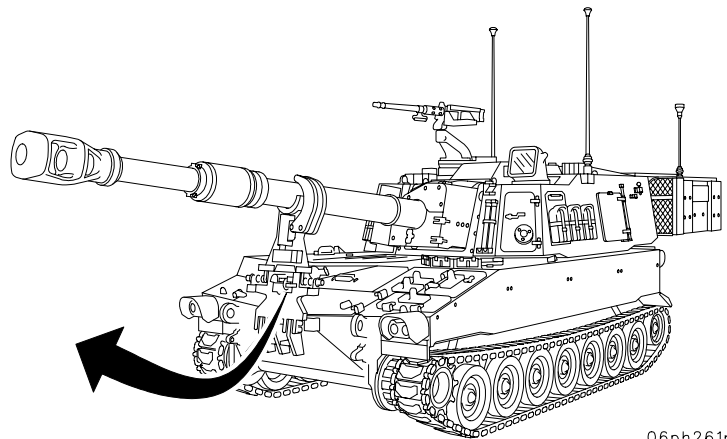
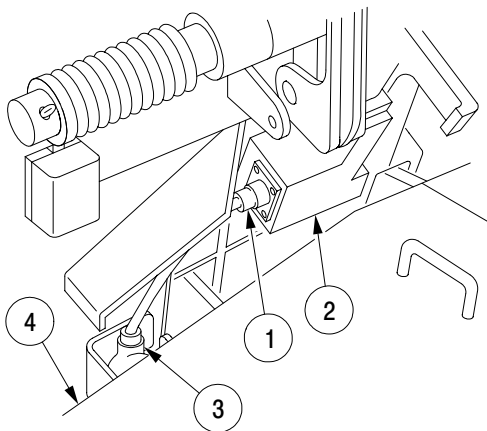
Tag all electrical connections and electrical leads prior to removal to aid in installation.

**a. Removal.**

- 1 Disconnect wiring harness W126 connector P2 (1) from actuator (2).
- 2 Disconnect wiring harness W126 connector P1 (3) from hull (4).

**b. Installation.**

- 1 Connect wiring harness W126 connector P1 (3) to hull (4).
- 2 Connect wiring harness W126 connector P2 (1) to actuator (2).



06ph261m

**NOTE**

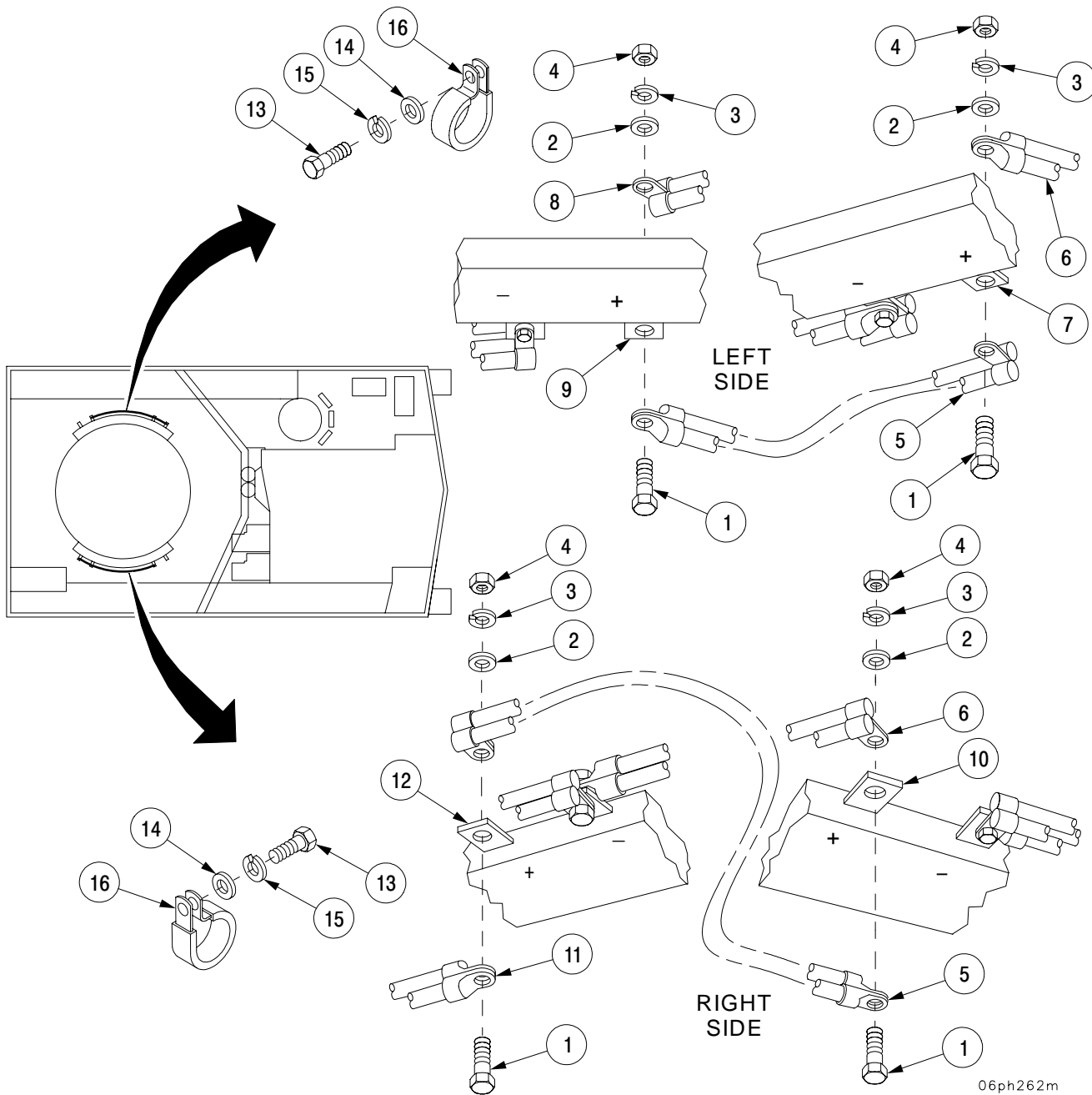
**FOLLOW-ON MAINTENANCE:**  
Connect battery ground leads (para 8-33)



**Section IX. HULL WIRING HARNESS – CONTINUED**

**8-85 LEAD ASSEMBLY, SLIP RING SEGMENT FRONT POSITIVE TERMINAL TO SLIP RING SEGMENT REAR POSITIVE TERMINAL – CONTINUED**

**b. Installation – Continued**



06ph262m

**NOTE**

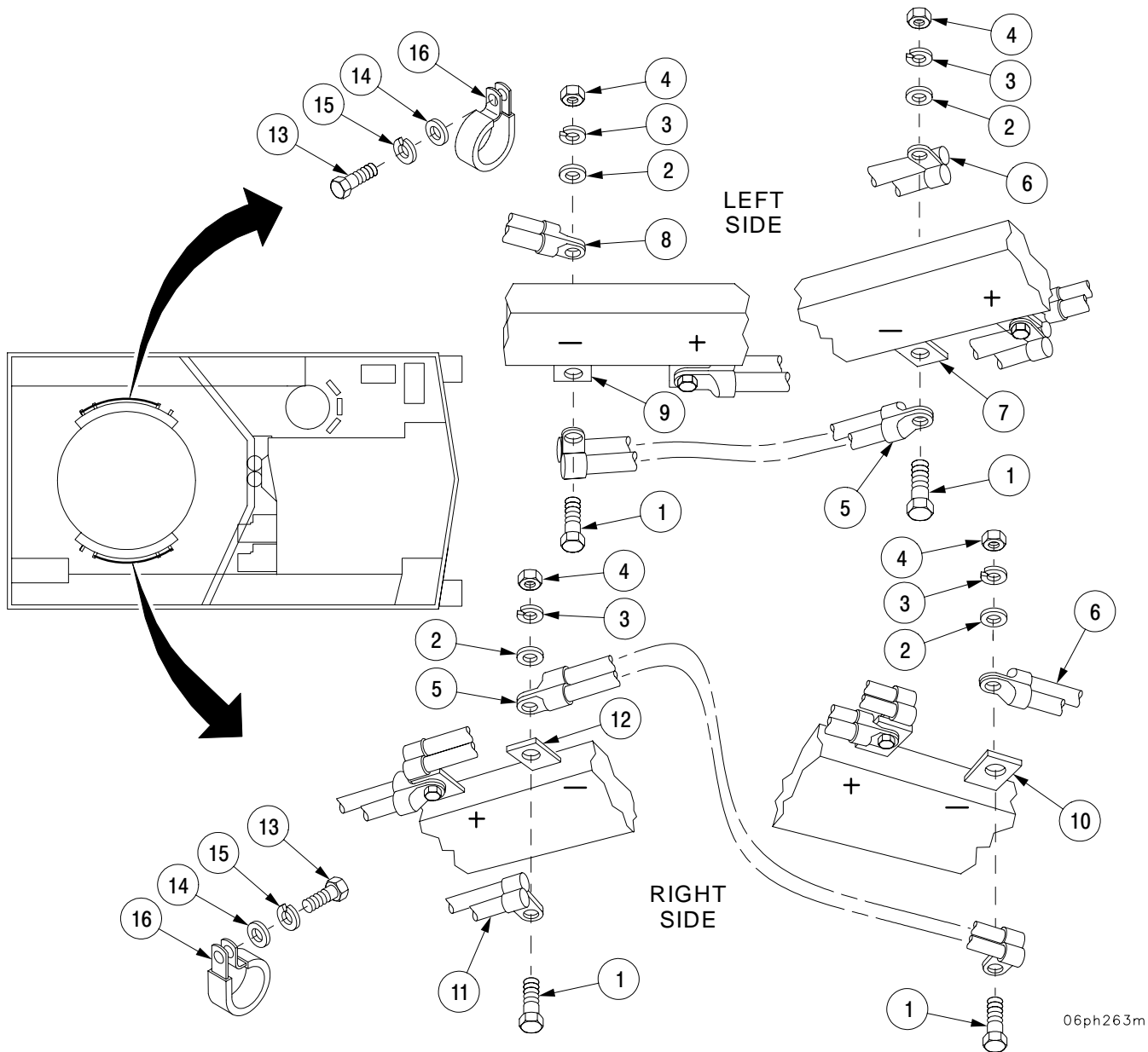
**FOLLOW-ON MAINTENANCE:**  
Connect battery ground leads (para 8-33)



**Section IX. HULL WIRING HARNESS – CONTINUED**

**8-86 LEAD ASSEMBLY, SLIP RING SEGMENT FRONT NEGATIVE TERMINAL TO SLIP RING SEGMENT REAR NEGATIVE TERMINAL – CONTINUED**

**b. Installation – Continued**



**NOTE**

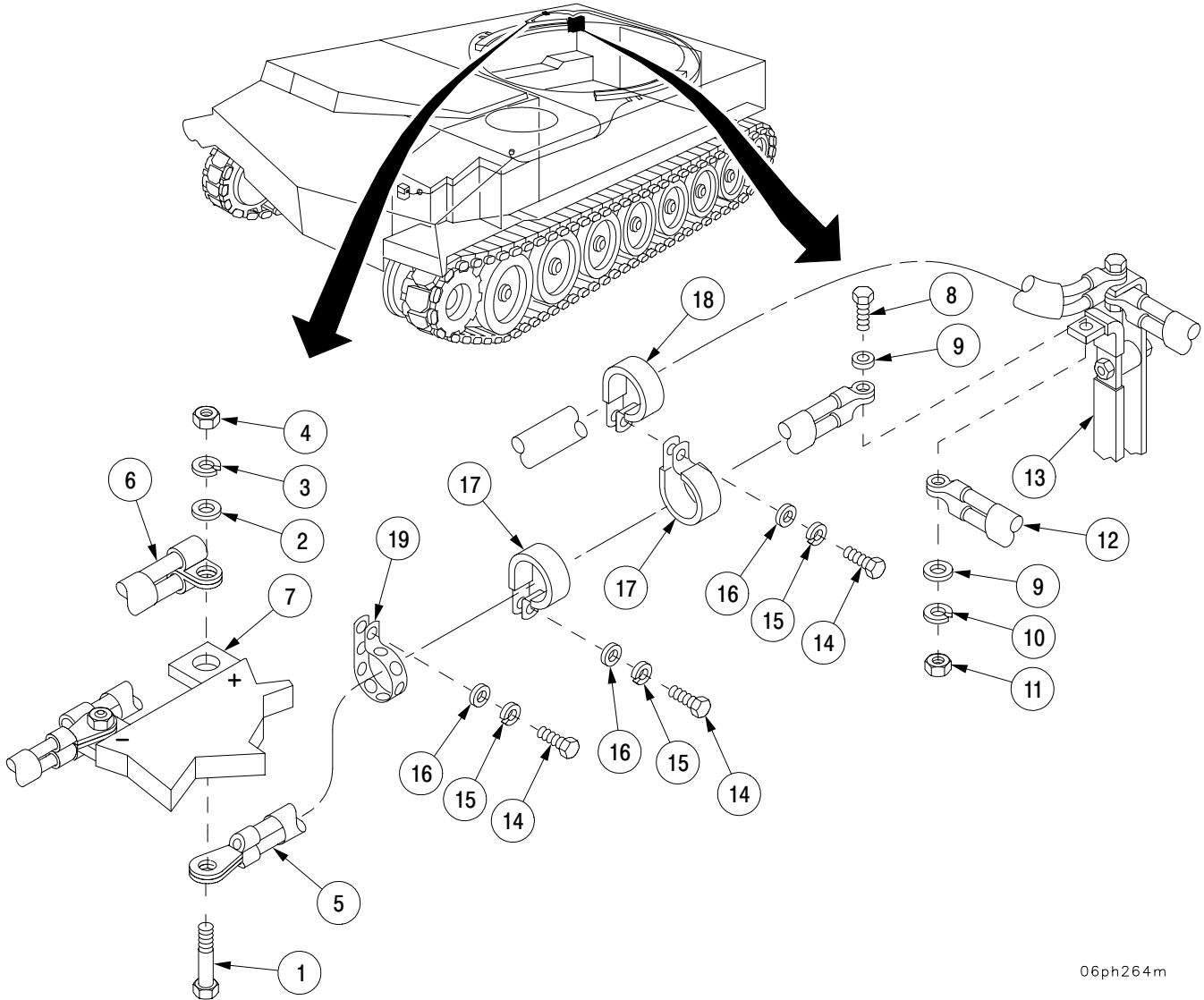
**FOLLOW-ON MAINTENANCE:**  
 Connect battery ground leads (para 8-33)



**Section IX. HULL WIRING HARNESS – CONTINUED**

**8-87 LEAD ASSEMBLY, RIGHT SLIP RING SEGMENT REAR POSITIVE TERMINAL TO REAR POWER RECEPTACLE, POSITIVE BUS BAR – CONTINUED**

**b. Installation – Continued**



06ph264m

**NOTE**

**FOLLOW-ON MAINTENANCE:**  
Install power receptacle guard (para 8-92)

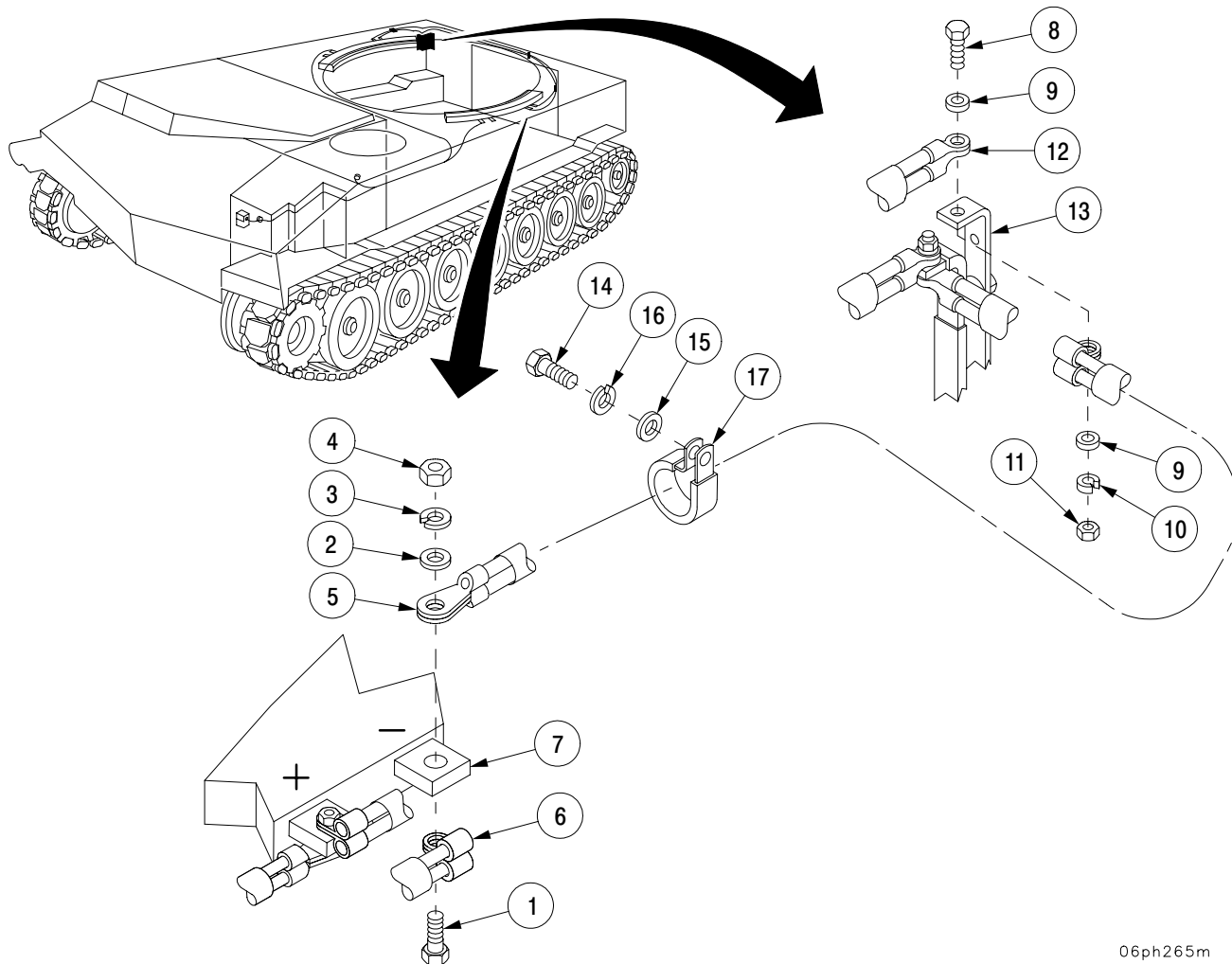




**Section IX. HULL WIRING HARNESS – CONTINUED**

**8-88 LEAD ASSEMBLY, LEFT SLIP RING SEGMENT REAR NEGATIVE TERMINAL TO REAR POWER RECEPTACLE, NEGATIVE BUS BAR – CONTINUED**

**b. Installation – Continued**



06ph265m

**NOTE**

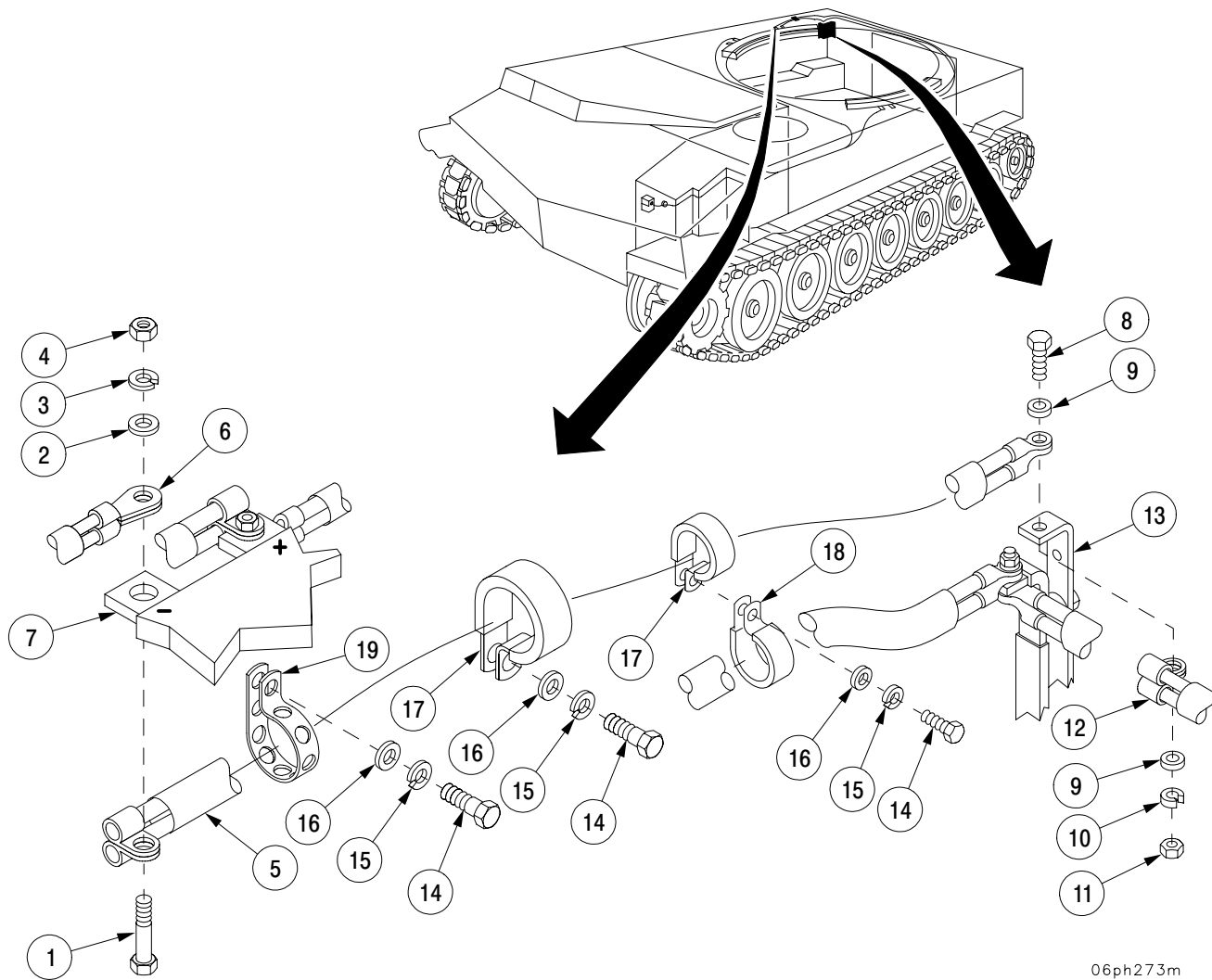
**FOLLOW-ON MAINTENANCE:**  
 Install power receptacle guard (para 8-92)  
 Install wiring harness rear access guard  
 (para 8-100)



**Section IX. HULL WIRING HARNESS – CONTINUED**

**8-89 LEAD ASSEMBLY, RIGHT SLIP RING SEGMENT REAR NEGATIVE TERMINAL TO REAR POWER RECEPTACLE, NEGATIVE BUS BAR – CONTINUED**

**b. Installation – Continued**



06ph273m

**NOTE**

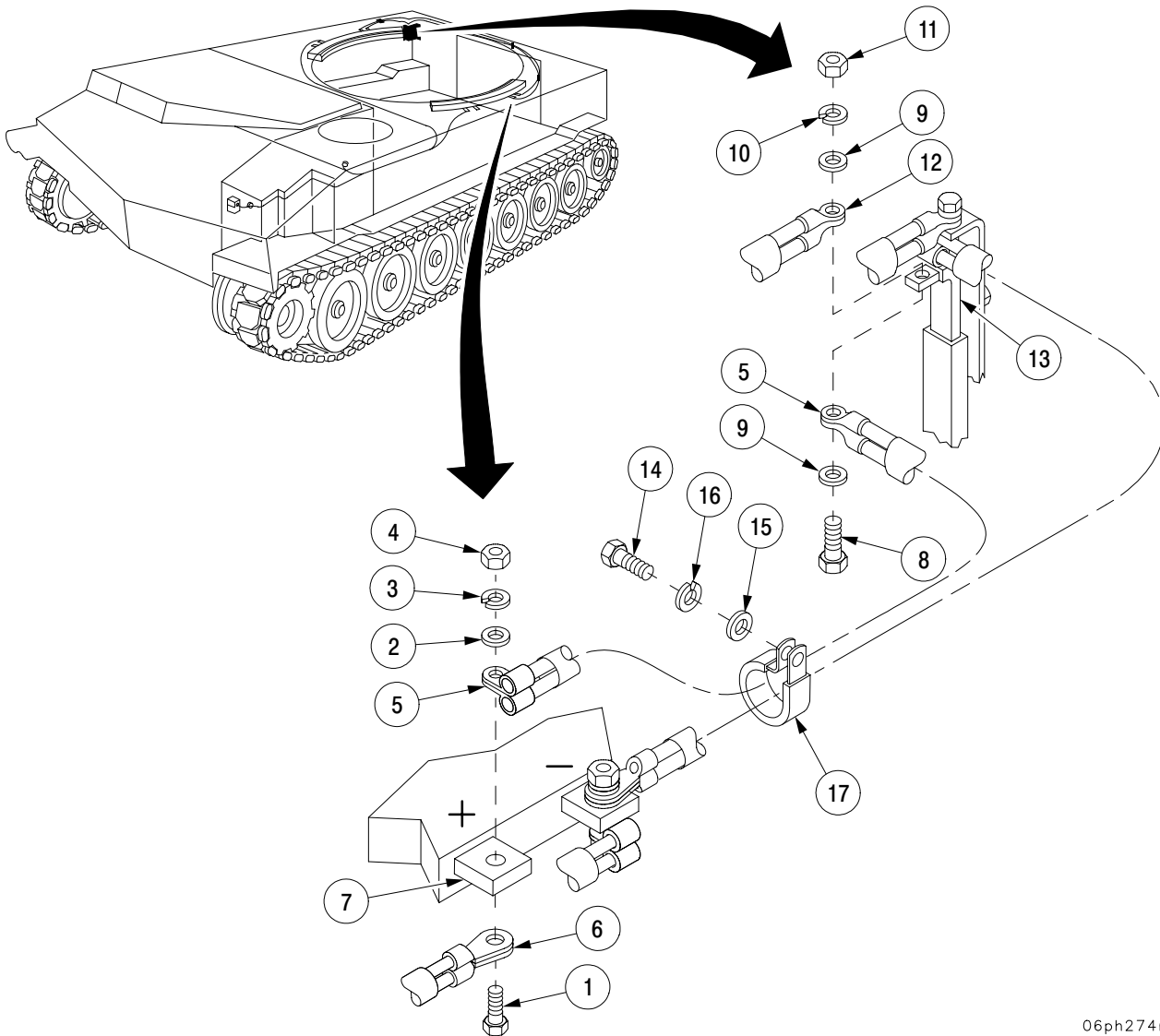
**FOLLOW-ON MAINTENANCE:**  
 Install power receptacle guard  
 (para 8-92)



**Section IX. HULL WIRING HARNESS – CONTINUED**

**8-90 LEAD ASSEMBLY, LEFT SLIP RING SEGMENT REAR POSITIVE TERMINAL TO REAR POWER RECEPTACLE, POSITIVE BUS BAR – CONTINUED**

**b. Installation – Continued**



06ph274m

**NOTE**

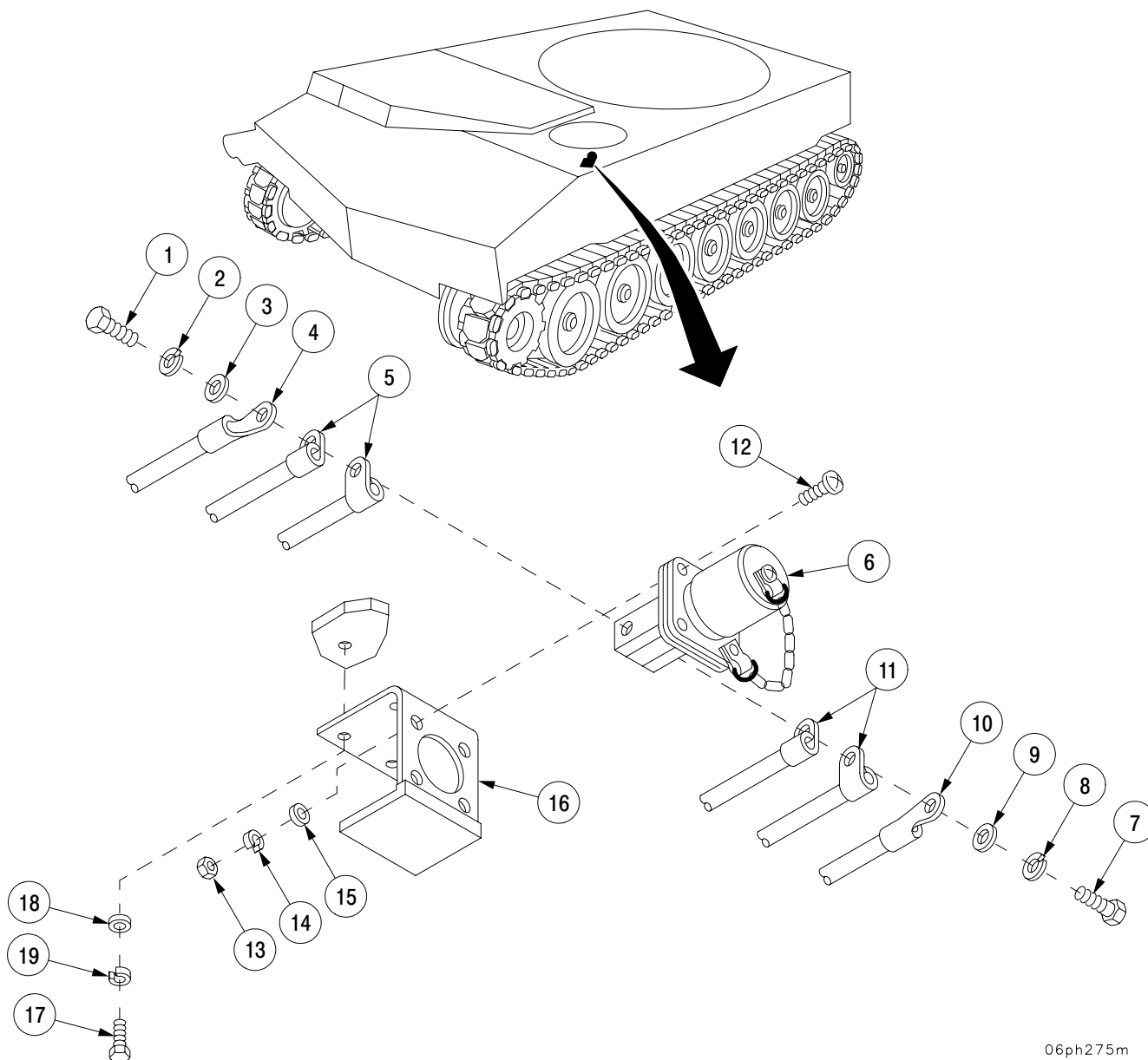
**FOLLOW-ON MAINTENANCE:**  
 Install wiring harness rear access guard  
 (para 8-100)  
 Install power receptacle guard  
 (para 8-92)



**Section IX. HULL WIRING HARNESS – CONTINUED**

**8-91 SLAVE RECEPTACLE ASSEMBLY AND MOUNTING BRACKET (FRONT) – CONTINUED**

**b. Installation – Continued**



06ph275m

**NOTE**

**FOLLOW-ON MAINTENANCE:**  
 Connect battery ground leads  
 (para 8-33)







## Section IX. HULL WIRING HARNESS – CONTINUED

---

### 8-93 BUS BAR (POSITIVE OR NEGATIVE) AND POWER RECEPTACLE ASSEMBLY (REAR) – CONTINUED

---

#### a. Removal.

#### NOTE

Tag all electrical connections and electrical leads prior to removal to aid in installation.

- 1 Remove screw (1), lockwasher (2), two flat washers (3), nut (4), lead assembly (5), and lead assembly (6) from negative bus bar (7). Discard lockwasher.
- 2 Remove screw (8), lockwasher (9), two flat washers (10), nut (11), lead assembly (12), and lead assembly (13) from positive bus bar (14). Discard lockwasher.
- 3 Remove two screws (15), two lockwashers (16), and two flat washers (17) securing negative and positive bus bars (7 and 14) to power receptacle (18). Discard lockwashers.
- 4 Remove nut (19), lockwasher (20), flat washer (21), mount (22), and negative and positive bus bars (7 and 14) from vehicle. Discard lockwasher.
- 5 Remove two nuts (23), two lockwashers (24), and two flat washers (25). Separate negative and positive bus bars (7 and 14) from mount (26). Discard lockwashers.
- 6 Remove four screws (27), four flat washers (28), and power receptacle (18).

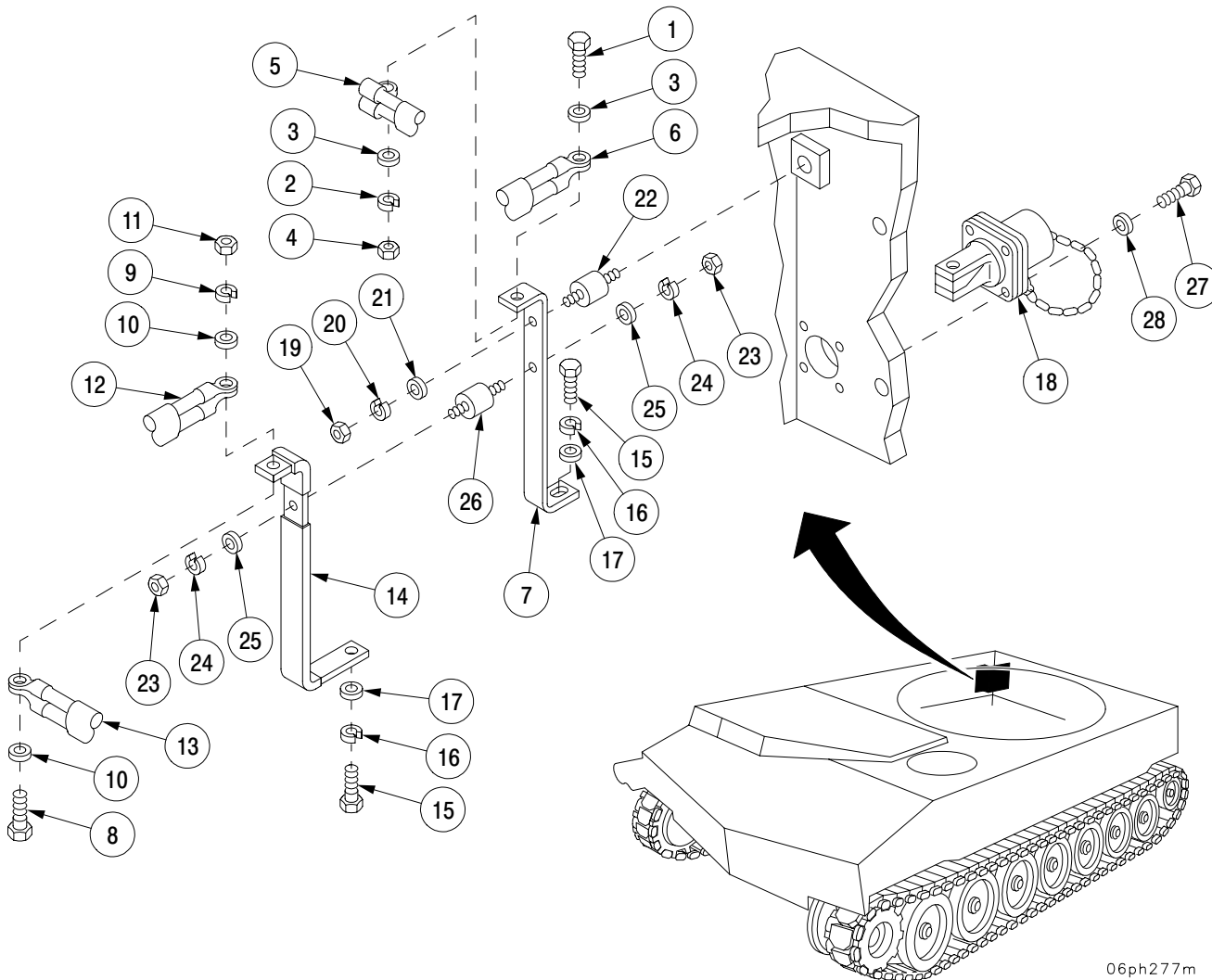
#### b. Installation.

- 1 Install power receptacle (18) with four flat washers (28), and four screws (27).
- 2 Install mount (26) on negative and positive bus bars (7 and 14) with two flat washers (25), two new lockwashers (24), and two nuts (23).
- 3 Install negative and positive bus bars (7 and 14) and mount (22) on vehicle with flat washer (21), new lockwasher (20), and nut (19).
- 4 Secure negative and positive bus bars (7 and 14) to power receptacle (18) terminals with two flat washers (17), two new lockwashers (16), and two screws (15).
- 5 Connect lead assembly (13) and lead assembly (12) to positive bus bar (14) with screw (8), two flat washers (10), new lockwasher (9), and nut (11).
- 6 Connect lead assembly (6) and lead assembly (5) to negative bus bar (7) with screw (1), two flat washers (3), new lockwasher (2), and nut (4).

**Section IX. HULL WIRING HARNESS – CONTINUED**

**8-93 BUS BAR (POSITIVE OR NEGATIVE) AND POWER RECEPTACLE ASSEMBLY (REAR) – CONTINUED**

**b. Installation – Continued**



06ph277m

**NOTE**

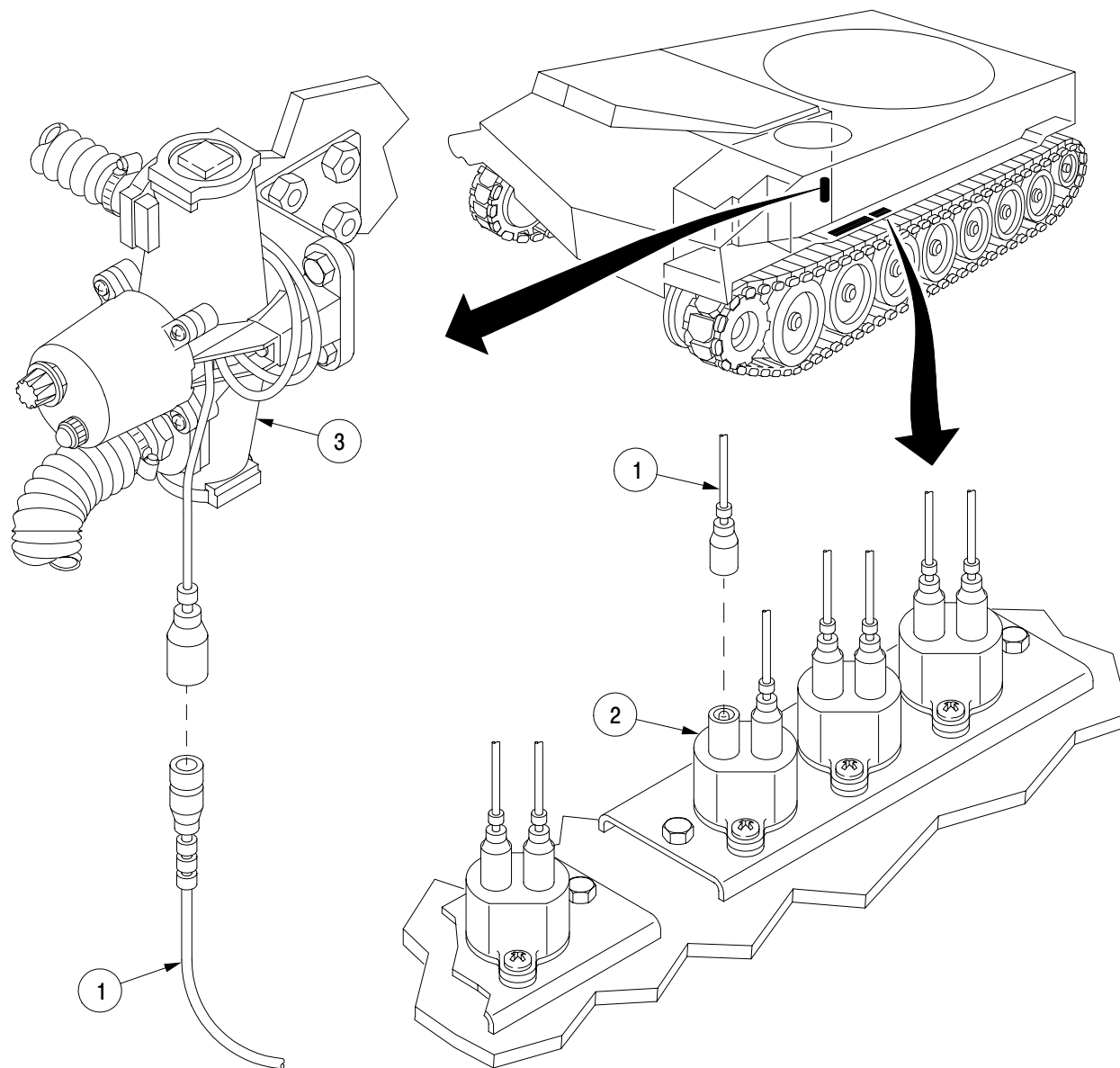
**FOLLOW-ON MAINTENANCE:**  
 Install power receptacle guard  
 (para 8-92)



**Section IX. HULL WIRING HARNESS – CONTINUED**

**8-94 LEAD ASSEMBLY CIRCUIT BREAKER TO DRIVER'S MCS HEATER – CONTINUED**

**b. Installation – Continued**



06ph278m

**NOTE**

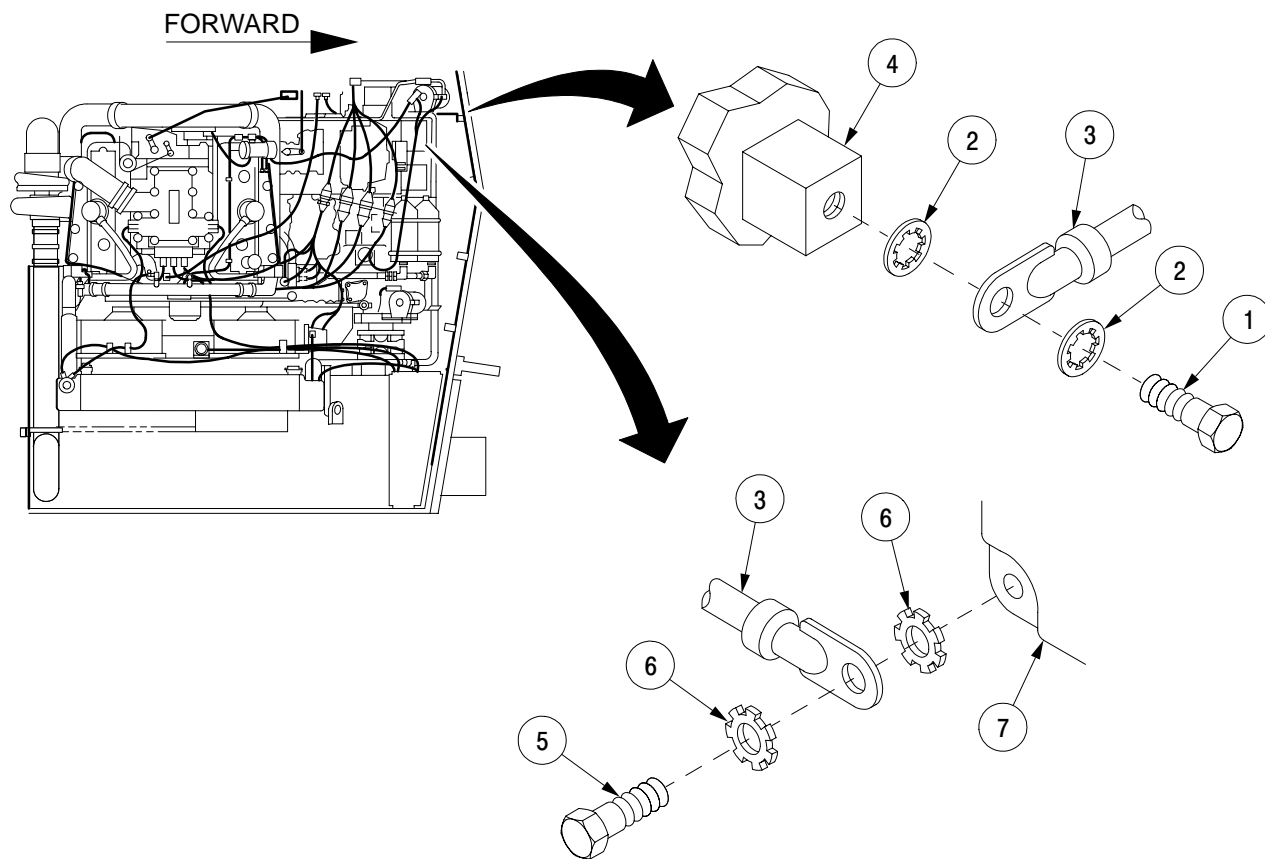
**FOLLOW-ON MAINTENANCE:**  
 Connect battery ground leads (para 8-33)



Section IX. HULL WIRING HARNESS – CONTINUED

8-95 POWERPACK GROUND LEAD – CONTINUED

b. Installation – Continued



06ph280m

**NOTE**

**FOLLOW-ON MAINTENANCE:**

- Close and secure transmission access doors (TM 9-2350-314-10)
- Connect battery ground leads (para 8-33)

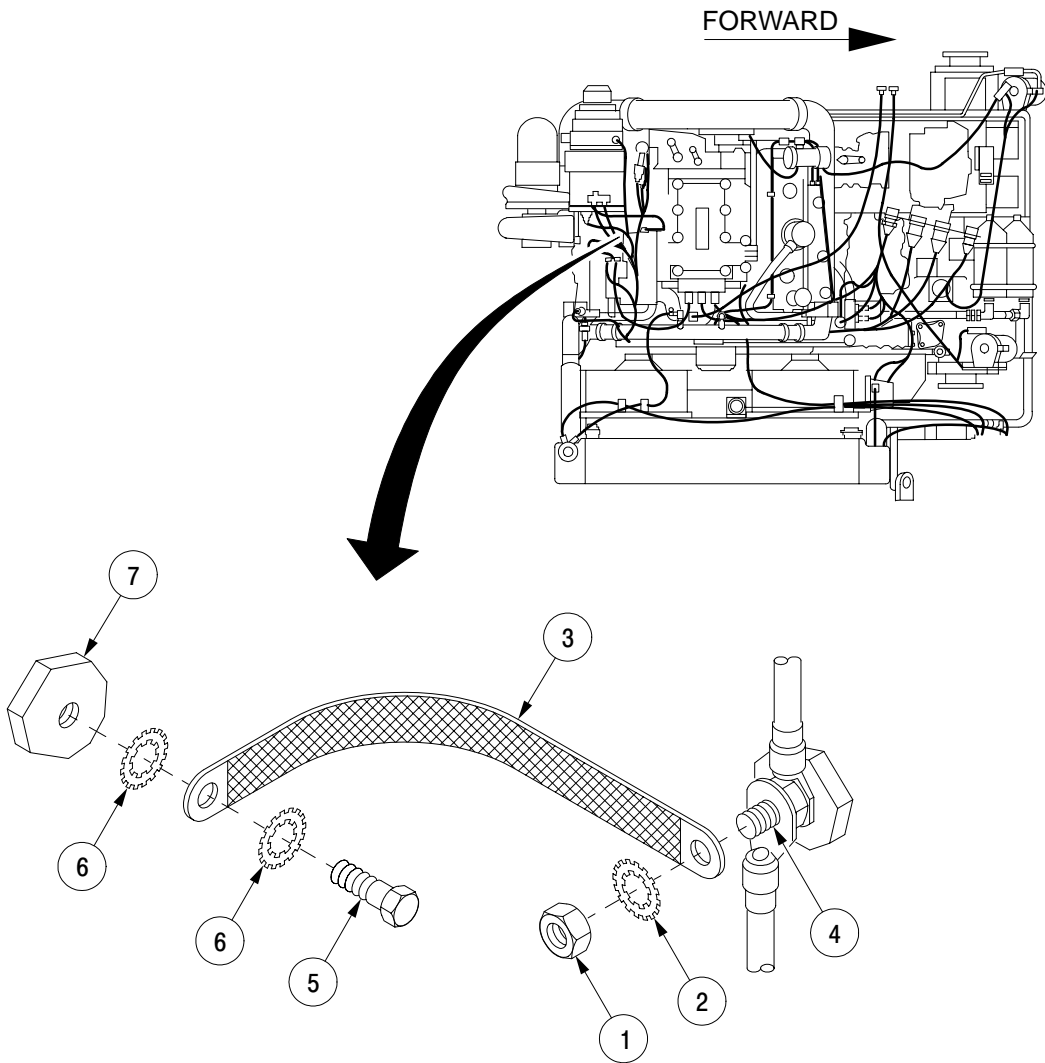




**Section IX. HULL WIRING HARNESS – CONTINUED**

**8-96 STARTER GROUND STRAP – CONTINUED**

**b. Installation – Continued**



06ph281m

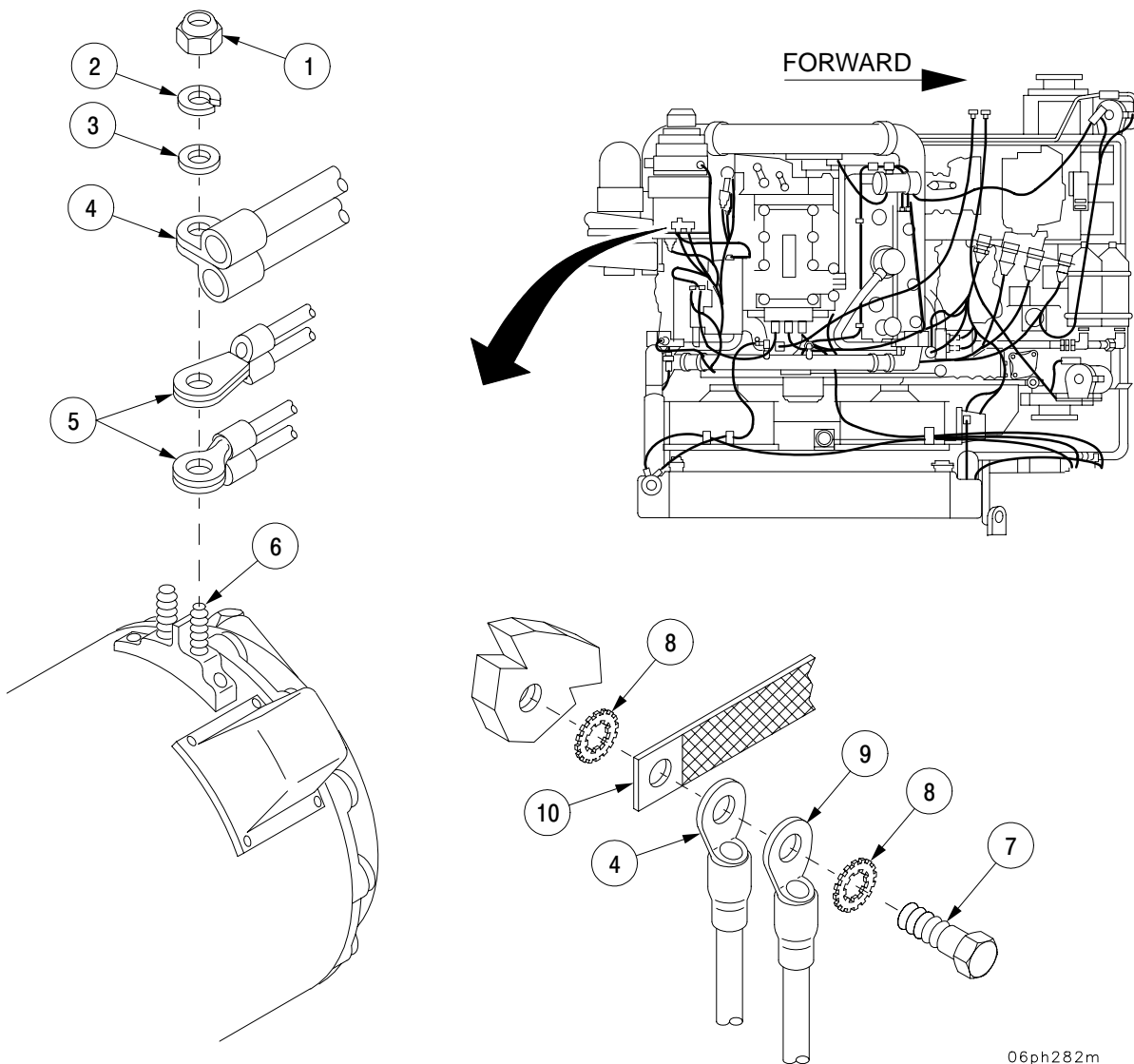
**NOTE**  
**FOLLOW-ON MAINTENANCE:**  
 Install powerpack (para 4-1)



**Section IX. HULL WIRING HARNESS – CONTINUED**

**8-97 LEAD ASSEMBLY, GENERATOR TO ENGINE BLOCK GROUND – CONTINUED**

**b. Installation – Continued**



06ph282m

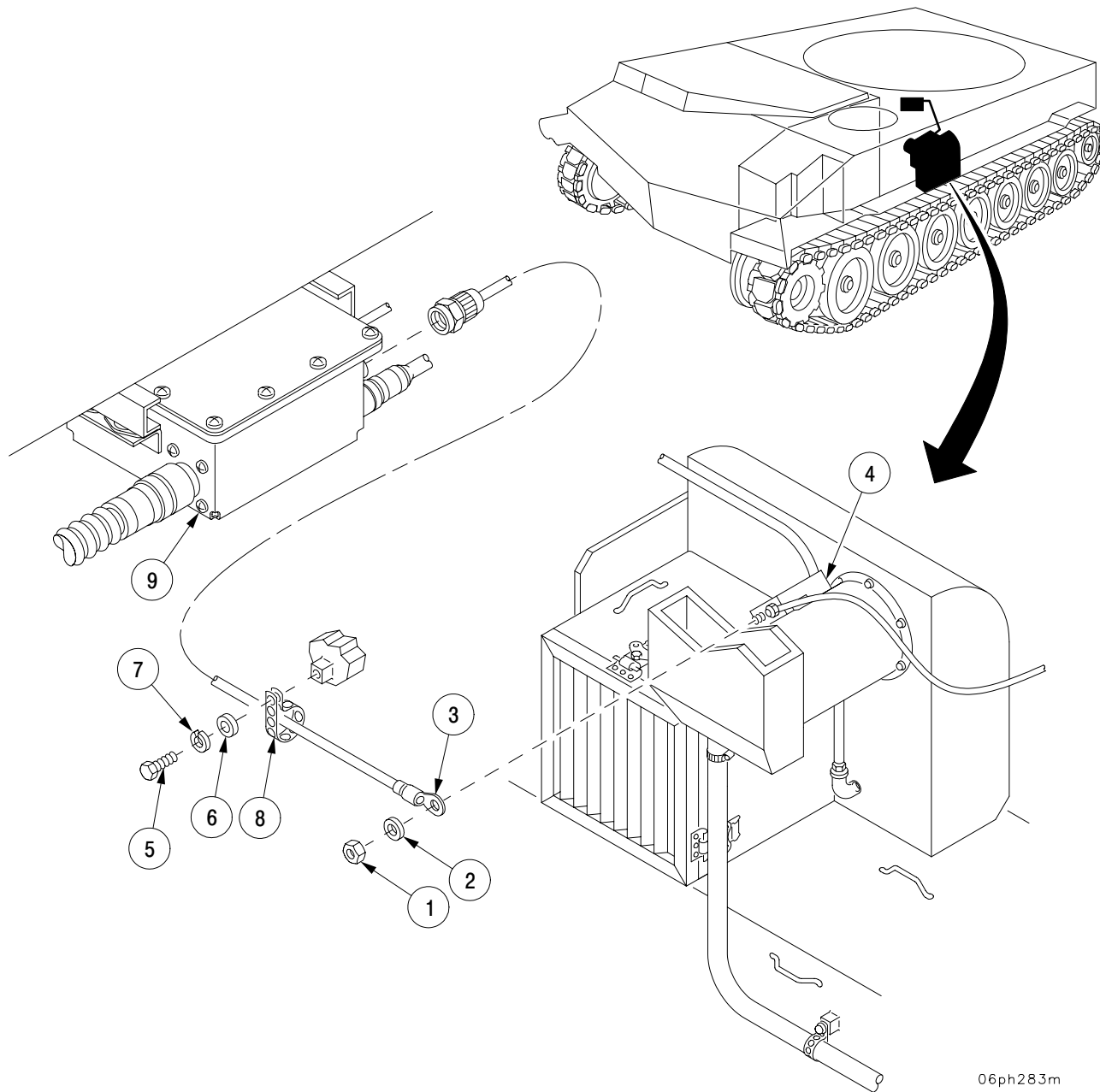
**NOTE**  
**FOLLOW-ON MAINTENANCE:**  
 Install powerpack (para 4-1)



**Section IX. HULL WIRING HARNESS – CONTINUED**

**8-98 LEAD ASSEMBLY, ACCESSORY CONTROL BOX TO LEAD FILTER FAN – CONTINUED**

**b. Installation – Continued**



06ph283m

**NOTE**

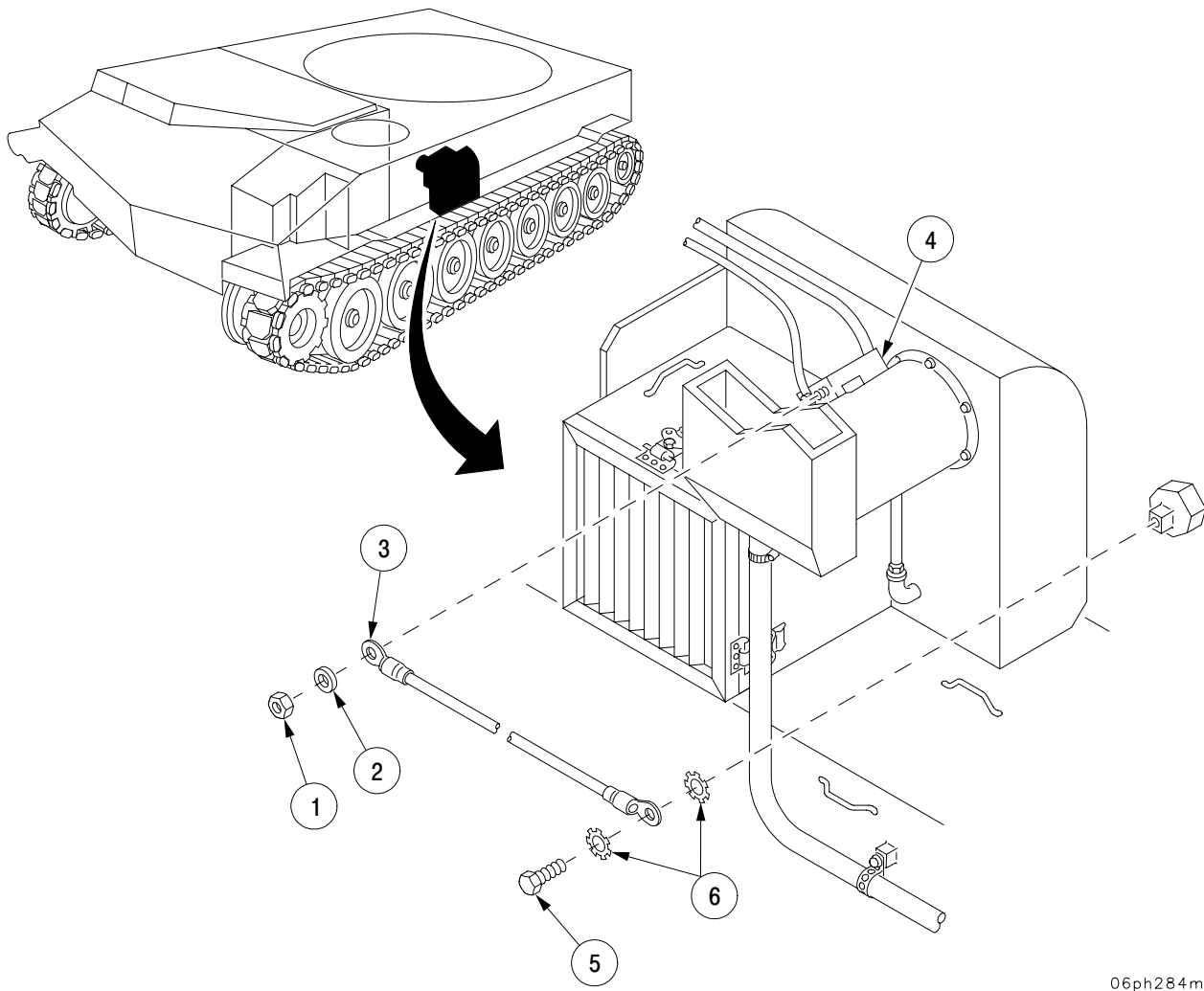
**FOLLOW-ON MAINTENANCE:**  
 Connect battery ground leads (para 8-33)



**Section IX. HULL WIRING HARNESS – CONTINUED**

**8-99 LEAD ASSEMBLY, LEAD FILTER FAN TO GROUND – CONTINUED**

**b. Installation – Continued**



06ph284m

**NOTE**

**FOLLOW-ON MAINTENANCE:**  
 Connect battery ground leads (para 8-33)





**Section IX. HULL WIRING HARNESS – CONTINUED**

**8-101 WIRING HARNESS W114 ACCESS GUARD.**

This task covers: a. Removal b. Installation

**INITIAL SETUP**

Tools

General mechanic's tool kit  
(SC 5180-90-N26)

Materials/Parts

Lockwashers (2) (item 22, Appx E)

Equipment Conditions

Vehicle MASTER switch OFF  
(TM 9-2350-314-10)  
Battery ground leads disconnected  
(para 8-33)

References

TM 9-2350-314-10

**a. Removal.**

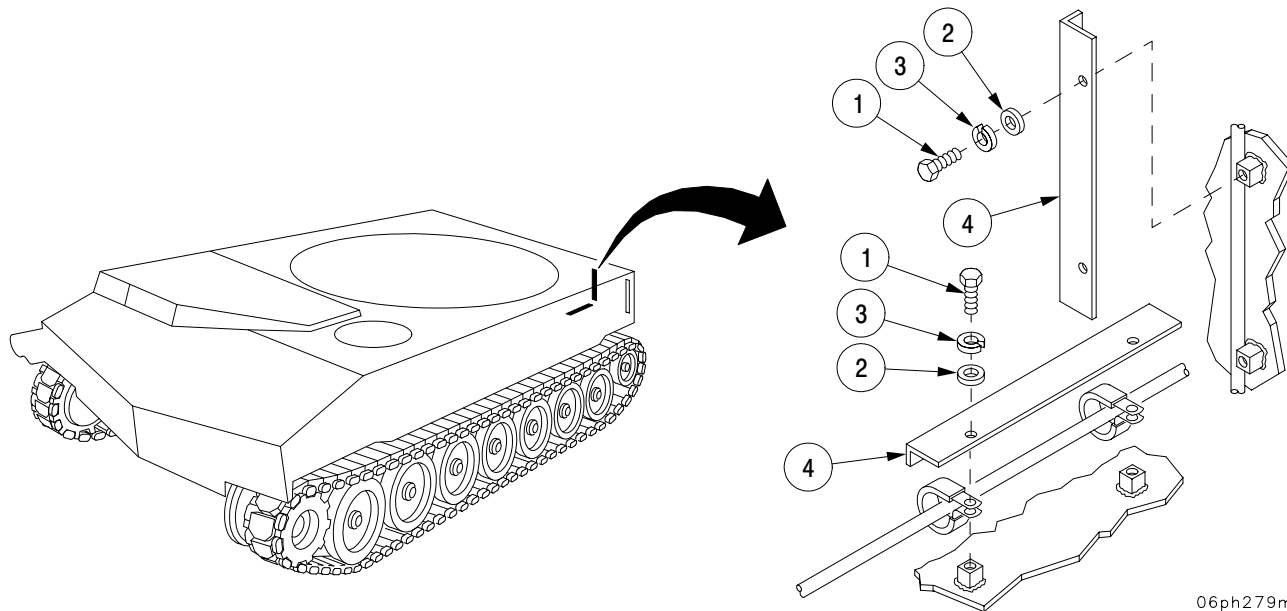
**NOTE**

Both guards are removed in the same manner.

Remove two screws (1), two flat washers (2), two lockwashers (3), and guard (4). Discard lockwashers.

**b. Installation.**

Install guard (4) on vehicle with two screws (1) and two new lockwashers (3) and two flat washers (2).



06ph279m

**NOTE**

**FOLLOW-ON MAINTENANCE:**  
Connect battery ground leads (para 8-33)





**Section IX. HULL WIRING HARNESS – CONTINUED**

---

**8-103 GUN TUBE TRAVEL LOCK WIRING HARNESS CONNECTORS AND SHIELD  
– CONTINUED**

---

**a. Removal.**

- 1 Remove four screws (1), four lockwashers (2), four flat washers (3) and bracket (4). Discard lockwashers.
- 2 Disconnect wiring harness W126 connector P1 (5) from outer connector (6).
- 3 Disconnect wiring harness W113 connector P2 (7) from inner connector (8).
- 4 Remove four screws (9), four flat washers (10), four lockwashers (11), connector (6 or 8), and gasket (12). Discard lockwashers.

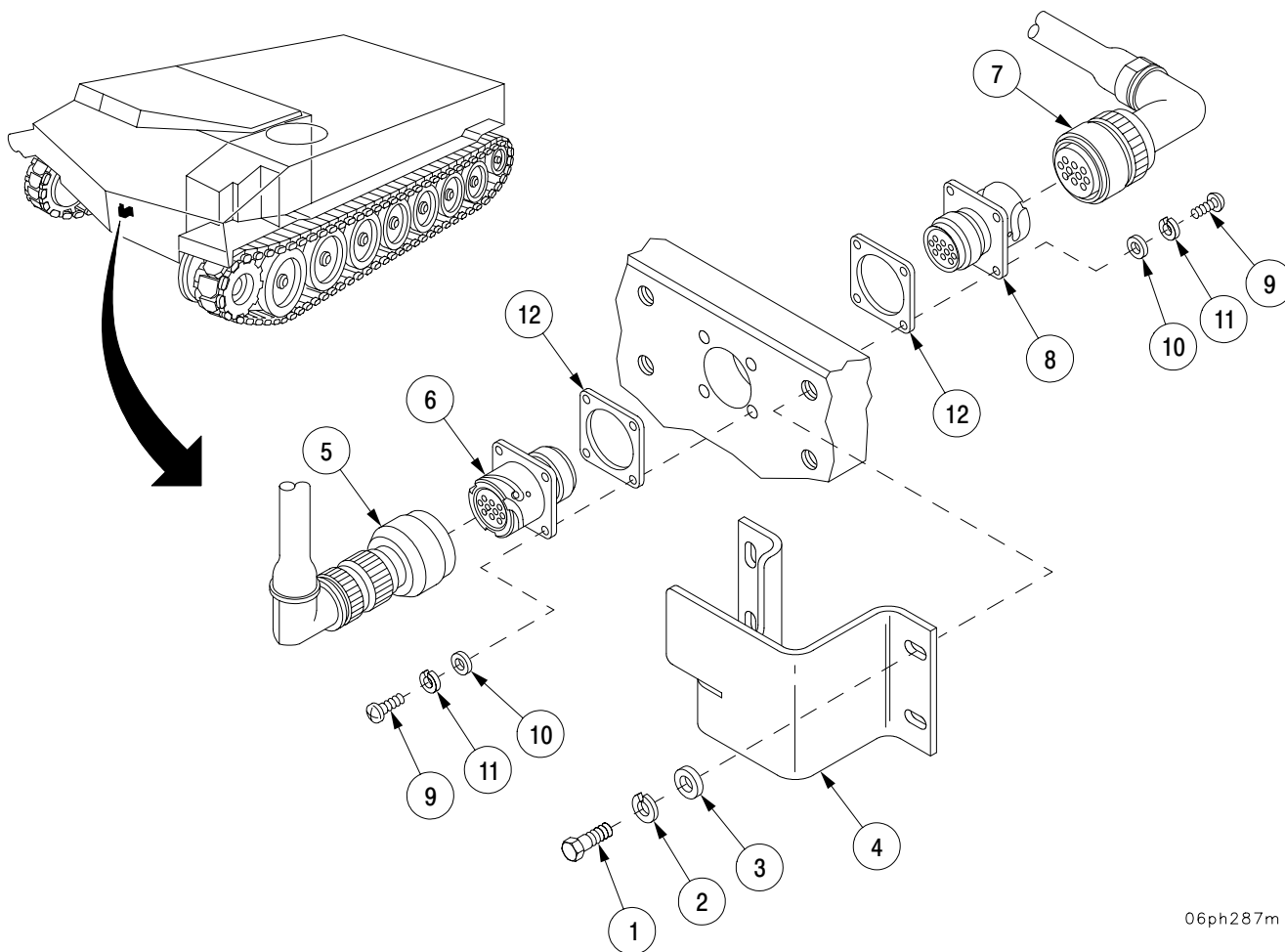
**b. Installation.**

- 1 Position connector (6 or 8) with gasket (12) on hull and secure with four screws (9), four flat washers (10), and four new lockwashers (11).
- 2 Connect wiring harness W113 connector P2 (7) to inner connector (8).
- 3 Connect wiring harness W126 lead connector P1 (5) to outer connector (6).
- 4 Install bracket (4) with four screws (1), four flat washers (3) and four new lockwashers (2).

**Section IX. HULL WIRING HARNESS – CONTINUED**

**8-103 GUN TUBE TRAVEL LOCK WIRING HARNESS CONNECTORS AND SHIELD  
– CONTINUED**

**b. Installation – Continued**



06ph287m

**NOTE**

**FOLLOW-ON MAINTENANCE:**

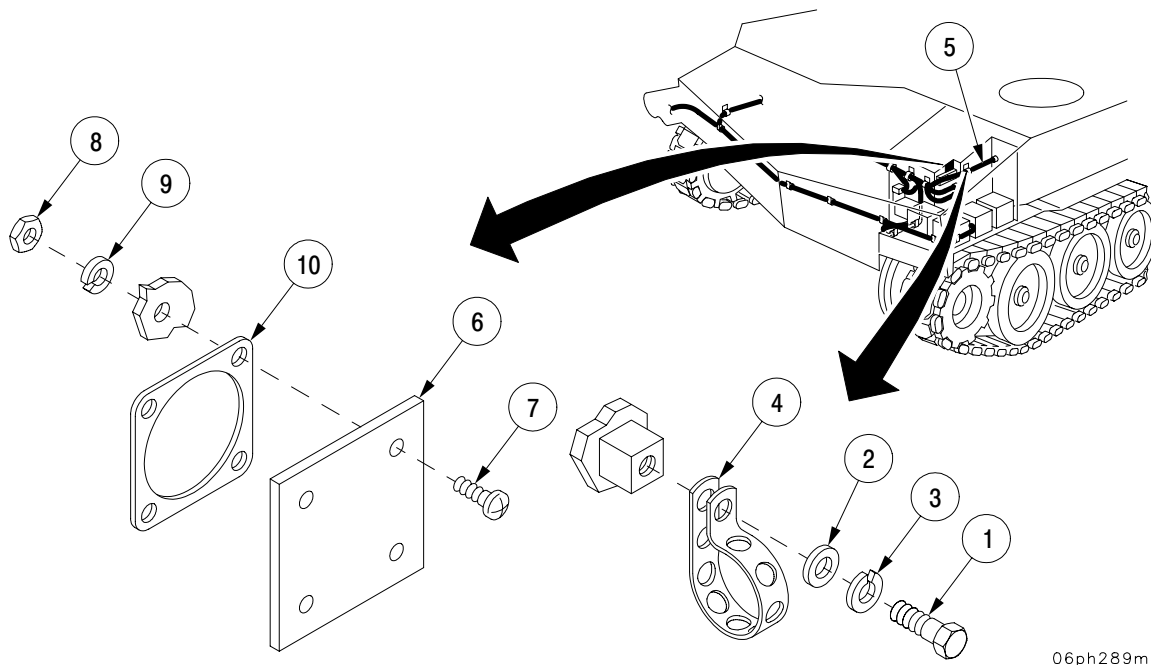
Close and secure transmission access door  
(TM 9-2350-314-10)  
Connect battery ground leads  
(para 8-33)



**Section IX. HULL WIRING HARNESS – CONTINUED**

**8-104 BATTERY COMPARTMENT ACCESS PORT COVER AND GASKET – CONTINUED**

**b. Installation – Continued**



06ph289m

**NOTE**

**FOLLOW-ON MAINTENANCE:**

Close and secure rear battery compartment door  
(TM 9-2350-314-10)

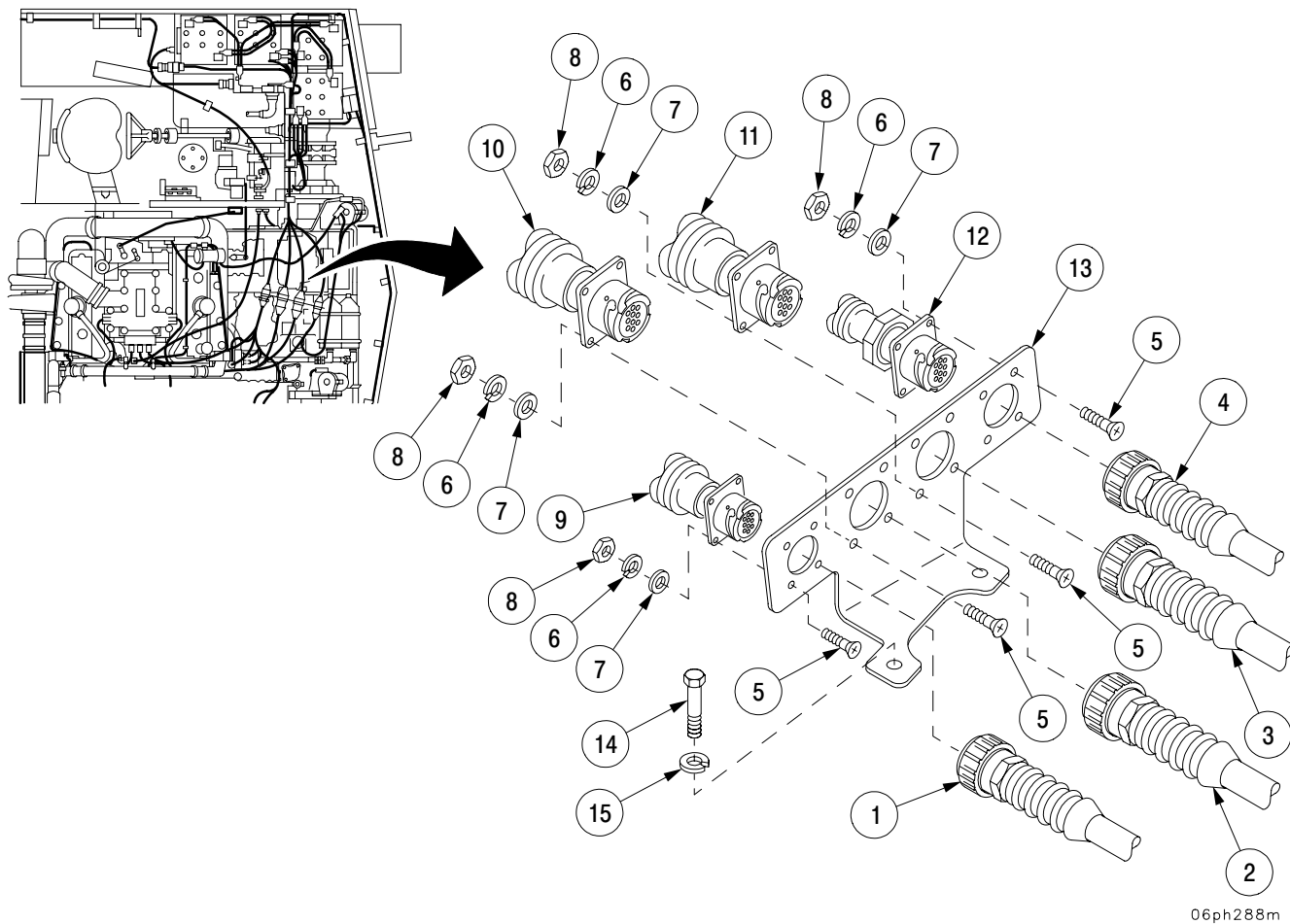




**Section IX. HULL WIRING HARNESS – CONTINUED**

**8-105 ENGINE WIRING HARNESS MOUNTING BRACKET – CONTINUED**

**b. Installation – Continued**



**NOTE**

**FOLLOW-ON MAINTENANCE:**

- Close transmission access doors  
(TM 9-2350-314-10)
- Connect battery ground leads (para 8-33)

## Section X. VENTILATING EQUIPMENT

---

### 8-106 LEAD FILTER FAN.

---

This task covers:    a. Removal                    b. Disassembly                    c. Assembly                    d. Installation

---

#### **INITIAL SETUP**

##### Tools

General mechanic's tool kit  
(SC 5180-90-N26)

##### Equipment Conditions

Lead filter removed (para 16-2)  
Battery ground leads disconnected (para 8-33)

##### Materials/Parts

Lockwashers (12) (item 48, Appx E)  
Lockwashers (2) (item 122, Appx E)  
Lockwashers (4) (item 294, Appx E)  
Cotter pins (2) (item 93, Appx E)  
Gasket (item 295, Appx E)  
Gasket (item 296, Appx E)  
Brush assemblies (4) (item 297, Appx E)  
Adhesive (item 6, Appx C)  
Sealing Compound (item 47, Appx C)  
Dry-cleaning solvent (item 59, Appx C)  
Lockwire (item 310, Appx E)  
Lockwire (item 76, Appx E)

---

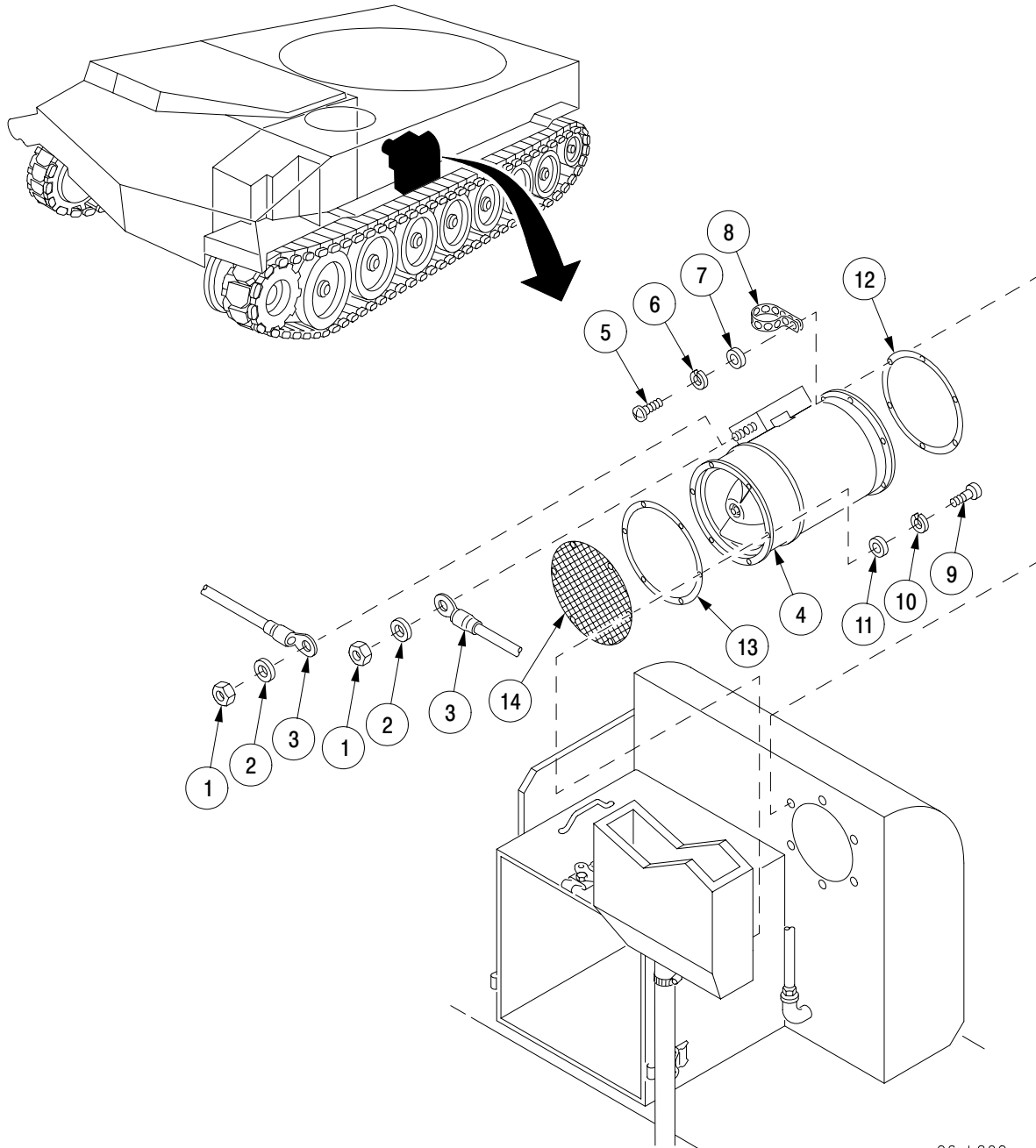
#### **a. Removal.**

- 1 Remove two nuts (1), two flat washers (2), and two leads (3) from fan (4).
- 2 Remove six screws (5), six lockwashers (6), six flat washers (7), and strap (8) from fan (4) rear flange. Discard lockwashers.
- 3 Remove six screws (9), six lockwashers (10), and six flat washers (11) from fan (4) front flange. Discard lockwashers.
- 4 Slide rear flange forward and remove fan (4), two gaskets (12 and 13), and screen (14). Discard gaskets.

Section X. VENTILATING EQUIPMENT – CONTINUED

8-106 LEAD FILTER FAN – CONTINUED

a. Removal – Continued



06ph290m

## Section X. VENTILATING EQUIPMENT – CONTINUED

---

### 8-106 LEAD FILTER FAN – CONTINUED

---

#### b. Disassembly.

- 1 Remove and discard cotter pin (15). Unscrew first stage propeller (16) from motor shaft.
- 2 Remove and discard cotter pin (17). Unscrew second stage propeller (18) from motor shaft.

**WARNING**

Dry-cleaning solvent (P-D-680) is toxic and flammable. To avoid injury, wear protective goggles and gloves and use only in a well-ventilated area. Avoid contact with skin, eyes, and clothes. Do not breathe vapors. Do not use near open flame or excessive heat. Do not smoke when using solvent. Failure to do so could cause **SERIOUS INJURY**. If you become dizzy while using dry-cleaning solvent, get fresh air immediately, and if necessary, get medical attention. If contact with skin or clothes is made, flush thoroughly with water. If the solvent contacts your eyes, wash them with water immediately and obtain medical aid (FM 21-11).

- 3 Remove and discard lockwire (19) from four screws (20). Remove four screws (20), and filter access cover (21). Remove sealant from mating surfaces of filter access cover (21), fan (4) and four screws (20) using dry-cleaning solvent.

**Section X. VENTILATING EQUIPMENT – CONTINUED**

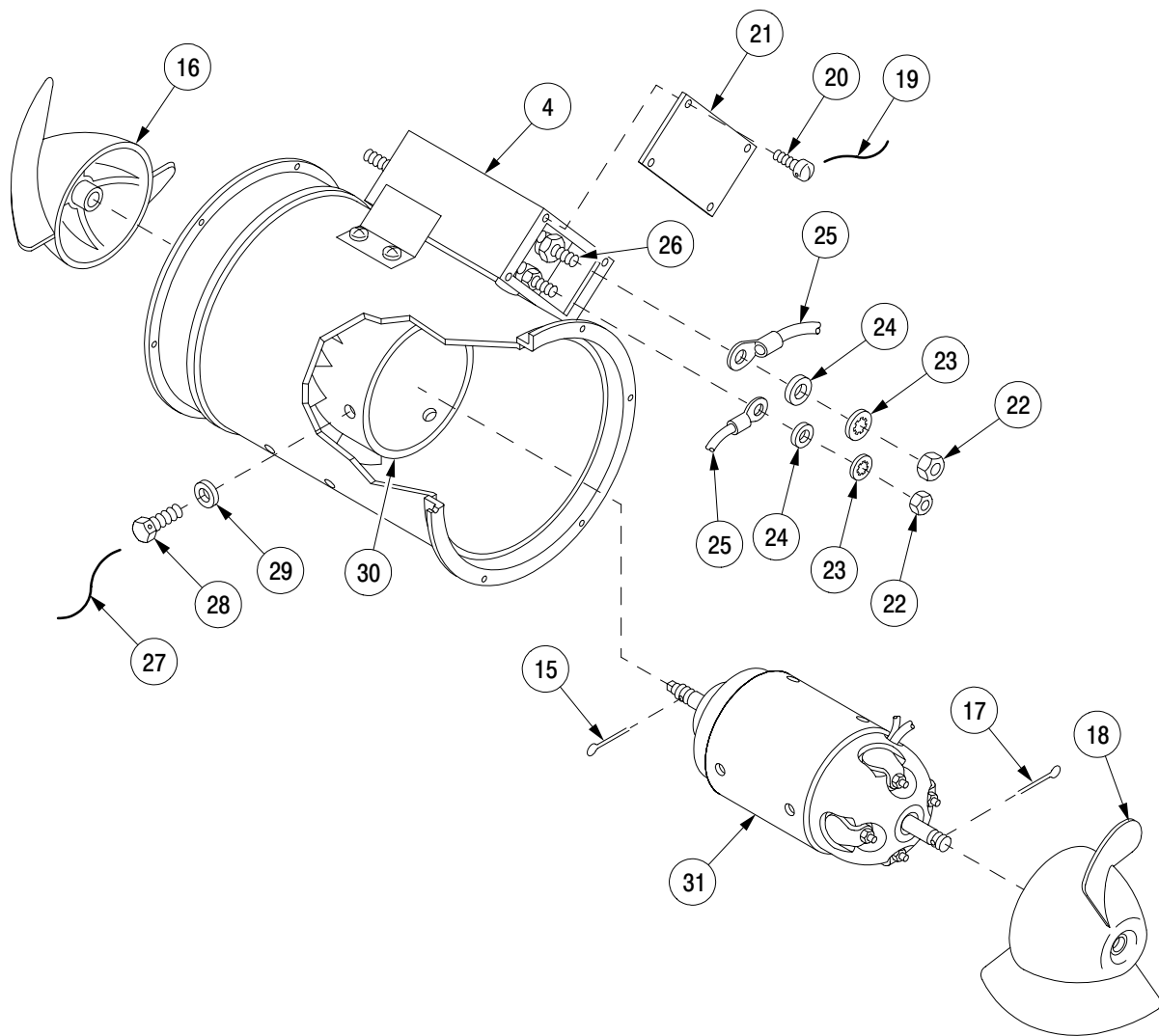
**8-106 LEAD FILTER FAN – CONTINUED**

**b. Disassembly – Continued**

**NOTE**

Tag all electrical leads before disconnecting to aid in installation.

- 4 Remove two nuts (22), two lockwashers (23), two flat washers (24), and two wires (25) from two terminal posts (26). Discard all lockwashers.
- 5 Remove lockwire (27), six screws (28), six flat washers (29), and fan housing (30) from fan motor (31).



06ph291m

**Section X. VENTILATING EQUIPMENT – CONTINUED**

**8-106 LEAD FILTER FAN – CONTINUED**

**b. Disassembly – Continued**

- 6 In each of four places, hold setscrew (32) and remove nut (33) and lockwasher (34). Discard lockwashers.
- 7 Remove four brush access caps (35) and four electrical contact brushes (36). Discard brushes.

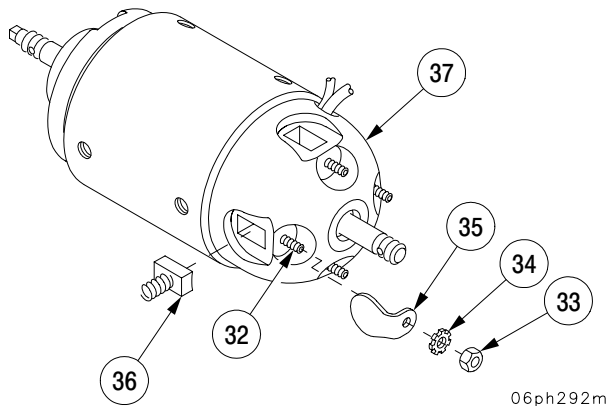
**c. Assembly.**

- 1 Install four new electrical contact brushes (36) into stator end bell (37).
- 2 Apply sealant to mating surfaces of four brush access caps (35), four new lockwashers (34), and four nuts (33).

**WARNING**

Dry-cleaning solvent (P-D-680) is toxic and flammable. To avoid injury, wear protective goggles and gloves and use only in a well-ventilated area. Avoid contact with skin, eyes, and clothes. Do not breathe vapors. Do not use near open flame or excessive heat. Do not smoke when using solvent. Failure to do so could cause **SERIOUS INJURY**. If you become dizzy while using dry-cleaning solvent, get fresh air immediately, and if necessary, get medical attention. If contact with skin or clothes is made, flush thoroughly with water. If the solvent contacts your eyes, wash them with water immediately and obtain medical aid (FM 21-11).

- 3 In each of four places, hold setscrew (32), and tighten nut (33). Remove excess sealant, using dry-cleaning solvent.



---

**Section X. VENTILATING EQUIPMENT – CONTINUED**

---

**8-106 LEAD FILTER FAN – CONTINUED**

---

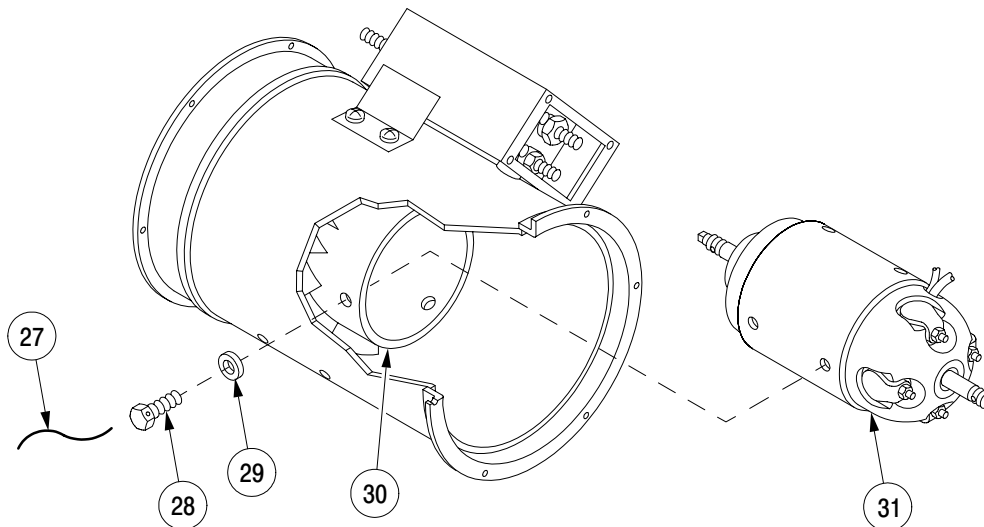
**c. Assembly – Continued**

- 4 Apply sealant to mating surfaces of fan motor (31) and fan housing (30), six flat washers (29), and under heads of six screws (28).
- 5 Install fan motor (31) into fan housing (30), and secure with six screws (28) and six flat washers (29).

**WARNING**

Dry-cleaning solvent (P-D-680) is toxic and flammable. To avoid injury, wear protective goggles and gloves and use only in a well-ventilated area. Avoid contact with skin, eyes, and clothes. Do not breathe vapors. Do not use near open flame or excessive heat. Do not smoke when using solvent. Failure to do so could cause **SERIOUS INJURY**. If you become dizzy while using dry-cleaning solvent, get fresh air immediately, and if necessary, get medical attention. If contact with skin or clothes is made, flush thoroughly with water. If the solvent contacts your eyes, wash them with water immediately and obtain medical aid (FM 21-11).

- 6 Remove excess sealant with dry-cleaning solvent and secure screws (28) with new lockwire (27).



06ph293m



## Section X. VENTILATING EQUIPMENT – CONTINUED

---

### 8-106 LEAD FILTER FAN – CONTINUED

---

#### c. Assembly – Continued

- 7 Install two wires (25) to two terminal posts (26), with two flat washers (24), two new lockwashers (23), and two nuts (22).

**WARNING**

Dry-cleaning solvent (P-D-680) is toxic and flammable. To avoid injury, wear protective goggles and gloves and use only in a well-ventilated area. Avoid contact with skin, eyes, and clothes. Do not breathe vapors. Do not use near open flame or excessive heat. Do not smoke when using solvent. Failure to do so could cause **SERIOUS INJURY**. If you become dizzy while using dry-cleaning solvent, get fresh air immediately, and if necessary, get medical attention. If contact with skin or clothes is made, flush thoroughly with water. If the solvent contacts your eyes, wash them with water immediately and obtain medical aid (FM 21-11).

- 8 Apply sealant to mating surfaces of filter access cover (21), fan (4) and under the heads of four screws (20). Install access cover (21) and four screws (20). Remove excess sealant with dry-cleaning solvent.
- 9 Secure screws (21) with new lockwire (19).
- 10 Install second stage propeller (18) onto motor shaft and install new cotter pin (17).
- 11 Install first stage propeller (16) onto motor shaft and install new cotter pin (15).

---

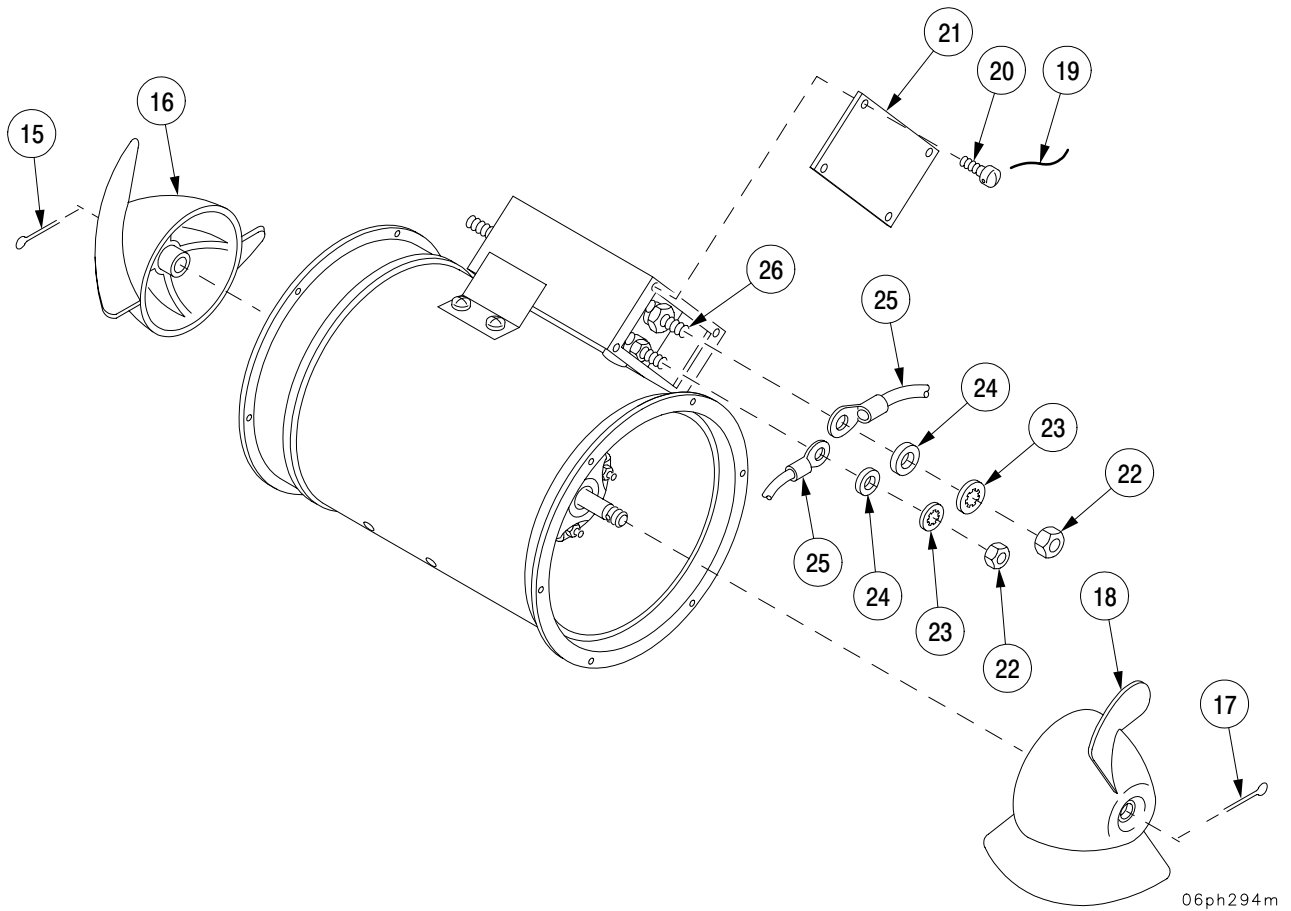
**Section X. VENTILATING EQUIPMENT – CONTINUED**

---

**8-106 LEAD FILTER FAN – CONTINUED**

---

**c. Assembly – Continued**



---

**Section X. VENTILATING EQUIPMENT – CONTINUED**

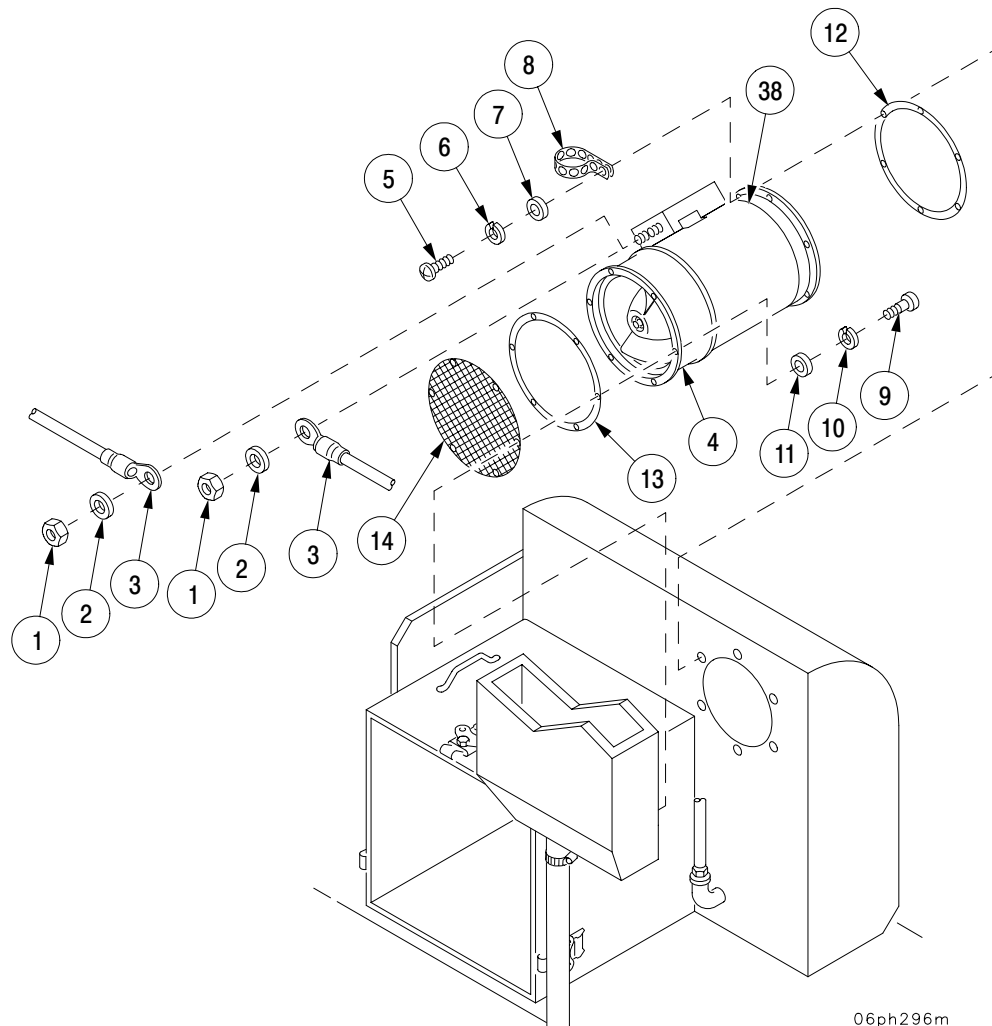
---

**8-106 LEAD FILTER FAN – CONTINUED**

---

**d. Installation.**

- 1 Install screen (14), two new gaskets (12 and 13), fan (4), and slide rear flange rearward.
- 2 Install six flat washers (11), six new lockwashers (10), and six screws (9) in fan (4) front flange.
- 3 Install strap (8), six flat washers (7), six new lockwashers (6), and six screws (5) in fan (4) rear flange.
- 4 Apply adhesive to joint (38) between fan housing and fan rear flange.
- 5 Install two leads (3), two flat washers (2), and two nuts (1) to fan (4).



**NOTE**

**FOLLOW-ON MAINTENANCE:**

- Install lead filter (para 16-2)
- Connect battery ground leads (para 8-33)

# CHAPTER 9 TRANSMISSION

---

## GENERAL

This chapter illustrates and defines procedures for removal, disassembly, assembly, installation, and adjustment of the gear shift controls and linkage, and transmission-related components.

---

<u>CONTENTS</u>		<u>Page</u>
Section I.	GEAR SHIFT AND CONTROLS	
9-1	GEAR SHIFT CONTROL LINKAGE .....	9-2
Section II.	TRANSMISSION ASSEMBLY AND ASSOCIATED PARTS	
9-2	TRANSMISSION PRESSURE CHECKS .....	9-14
9-3	TRANSMISSION OIL FILTER .....	9-21
9-4	TRANSMISSION INTERNAL BRAKE .....	9-23
9-5	TRANSMISSION GAGE ROD AND SEAL .....	9-26
9-6	BREATHER, TUBE, AND MOUNT .....	9-28
9-7	TRANSMISSION HUB ASSEMBLY .....	9-31
9-8	PROTECTIVE COVER FOR TRANSMISSION OIL TEMPERATURE TRANSMITTER AND TRANSMISSION OIL HIGH TEMPERATURE SWITCH .....	9-33
9-9	TRANSMISSION OIL LINES AND OIL SAMPLING VALVE .....	9-36

## Section I. GEAR SHIFT AND CONTROLS

---

### 9-1 GEAR SHIFT CONTROL LINKAGE.

---

This task covers:    a. Removal                    b. Disassembly                    c. Assembly                    d. Installation  
                                 e. Adjustment

---

#### **INITIAL SETUP**

##### Tools

General mechanic's tool kit  
(SC 5180-90-N26)  
Torque wrench (item 86, Appx F)  
Combination wrench (item 76, Appx F)

##### Materials/Parts

Cotter pins (5) (item 190, Appx E)  
Lockwashers (3) (item 3, Appx E)  
Lockwashers (15) (item 9, Appx E)  
Spring pin (item 191, Appx E)  
Spring pins (3) (item 193, Appx E)  
Spring pin (item 192, Appx E)  
Spring pin (item 134, Appx E)  
Lubricating compound (item 16, Appx C)  
Lubricant (item 34, Appx C)

##### Equipment Conditions

Vehicle parked on level ground  
(TM 9-2350-314-10)  
Tracks blocked  
(TM 9-2350-314-10)  
Vehicle parking brake set  
(TM 9-2350-314-10)  
Air intake grille open and  
secured (TM 9-2350-314-10)

##### References

TM 9-2350-314-10

---

#### a. Removal.

#### **WARNING**

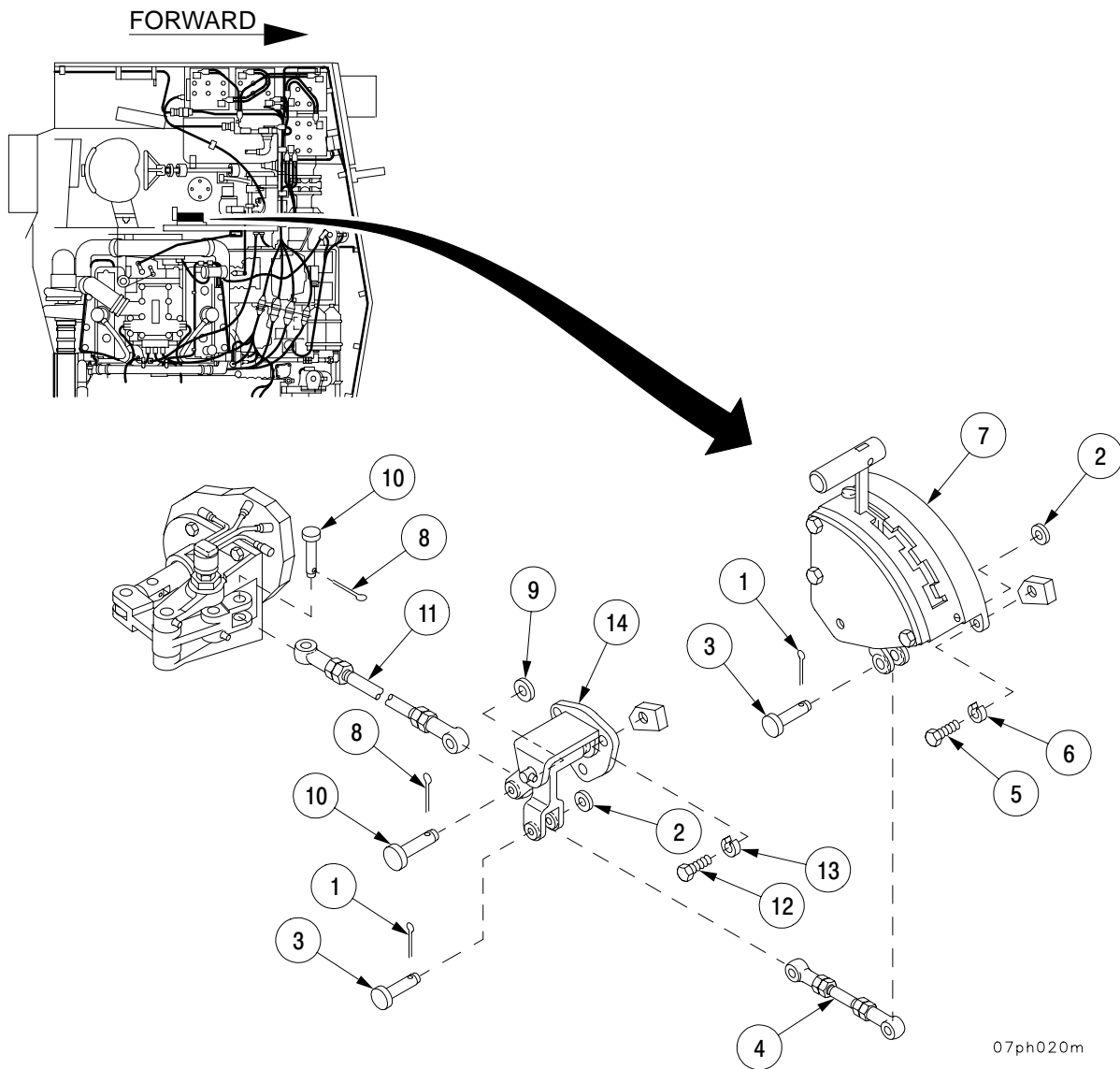
Track must be blocked so that the vehicle will not roll out of control when gear shift linkage is disconnected. Failure to securely block vehicle tracks may result in severe injury to personnel or equipment damage.

- 1 Remove two cotter pins (1), two flat washers (2), two pins (3), and shift control inner rod (4). Discard cotter pins.
- 2 Remove three screws (5), three lockwashers (6), and shift control (7). Discard lockwashers.
- 3 Remove two cotter pins (8), flat washer (9), two pins (10), and shift control inner rod (11). Discard cotter pins.
- 4 Remove three screws (12), three lockwashers (13), and support assembly (14). Discard lockwashers.

Section I. GEAR SHIFT AND CONTROLS – CONTINUED

9-1 GEAR SHIFT CONTROL LINKAGE – CONTINUED

a. Removal – Continued

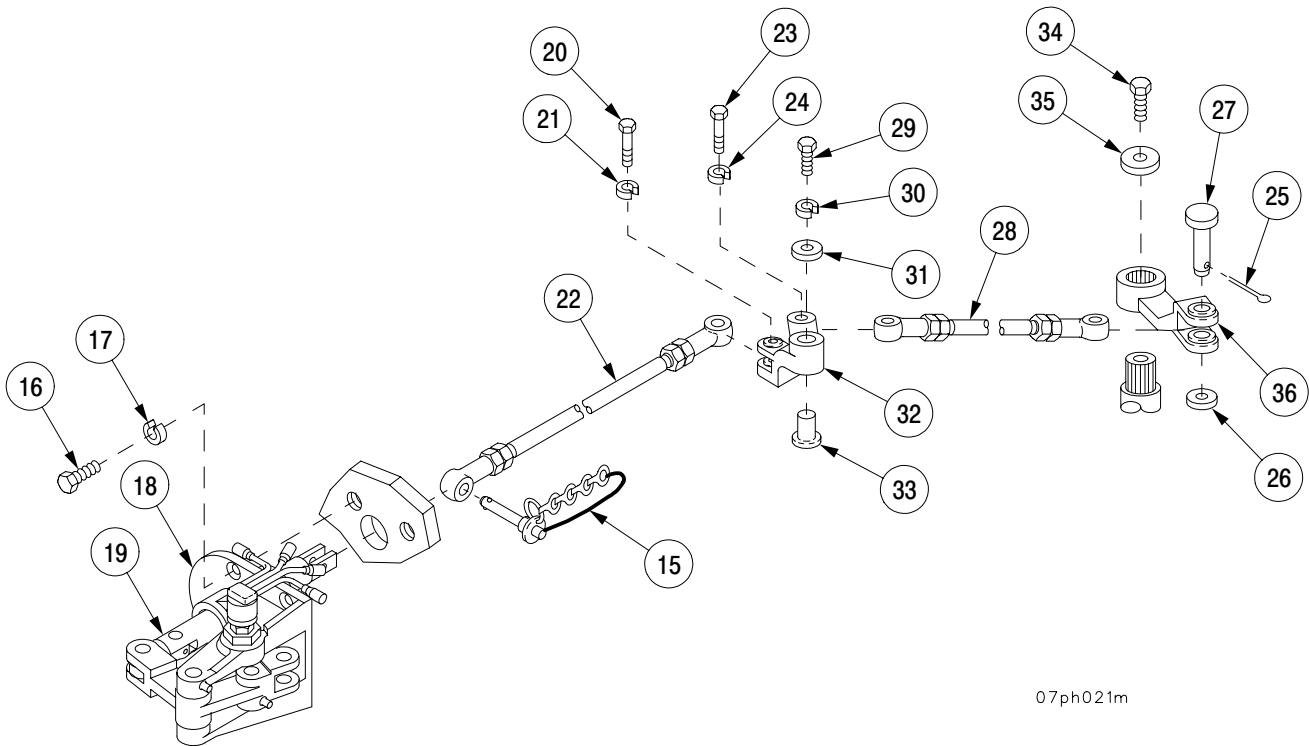


**Section I. GEAR SHIFT AND CONTROLS – CONTINUED**

**9-1 GEAR SHIFT CONTROL LINKAGE – CONTINUED**

**a. Removal – Continued**

- 5 Remove quick-release pin (15) (located in powerpack compartment at driver's bulkhead). Remove four screws (16), four lockwashers (17), and base assembly (18) with shaft (19) from bulkhead. Discard lockwashers.
- 6 Remove screw (20), lockwasher (21), and shift control outer rod (22). Discard lockwasher.
- 7 Remove screw (23), lockwasher (24), cotter pin (25), washer (26), pin (27), and shift control outer rod (28). Discard lockwasher and cotter pin.
- 8 Remove screw (29), lockwasher (30), flat washer (31), bellcrank (32), and spacer (33). Discard lockwasher.
- 9 Remove screw (34), flat washer (35), and lever (36).



**Section I. GEAR SHIFT AND CONTROLS – CONTINUED**

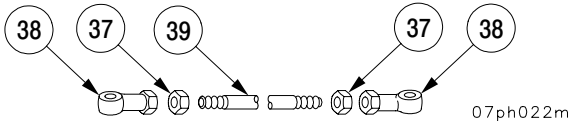
**9-1 GEAR SHIFT CONTROL LINKAGE – CONTINUED**

**b. Disassembly.**

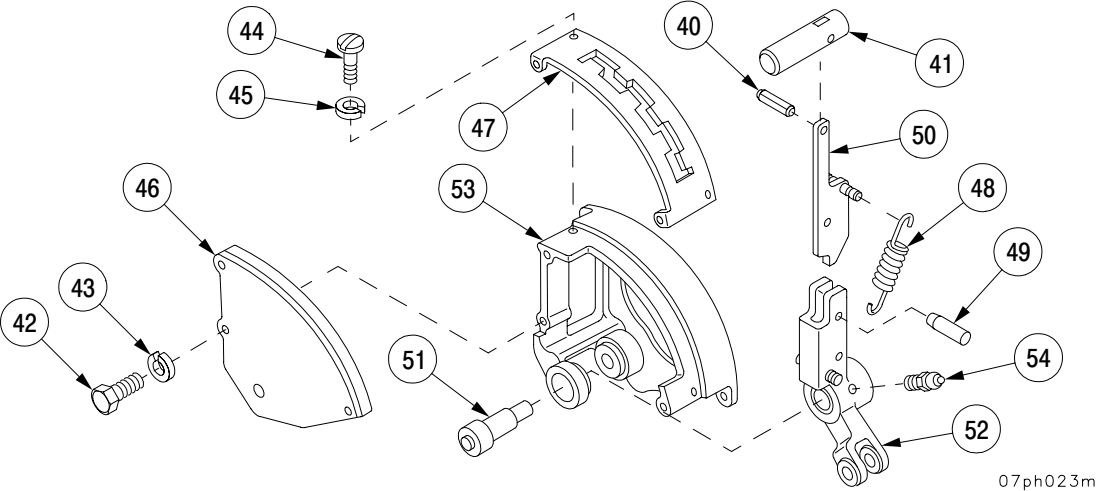
**NOTE**

- Perform steps 1 and 2 for disassembly of each rod assembly.
- All rod assemblies are disassembled in the same manner.
- Perform steps 3 thru 6 for disassembly of shift control assembly.
- Perform steps 7 thru 12 for disassembly of support and base assembly.

- 1 Loosen two locknuts (37).
- 2 Remove two rod ends (38) and two locknuts (37) from rod (39).



- 3 Remove spring pin (40) and knob (41). Remove three screws (42), three lockwashers (43), two screws (44), two lockwashers (45), cover (46), and shift guide (47). Discard lockwashers and spring pin.
- 4 Remove two springs (48), two pins (49), and manual lever (50).
- 5 Remove shaft (51) and lever (52) from bracket (53).
- 6 Remove grease fitting (54) from lever (52).



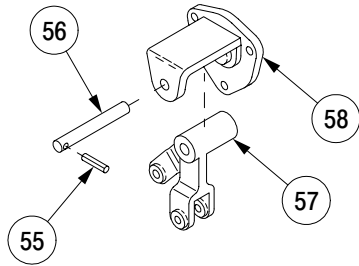


**Section I. GEAR SHIFT AND CONTROLS – CONTINUED**

**9-1 GEAR SHIFT CONTROL LINKAGE – CONTINUED**

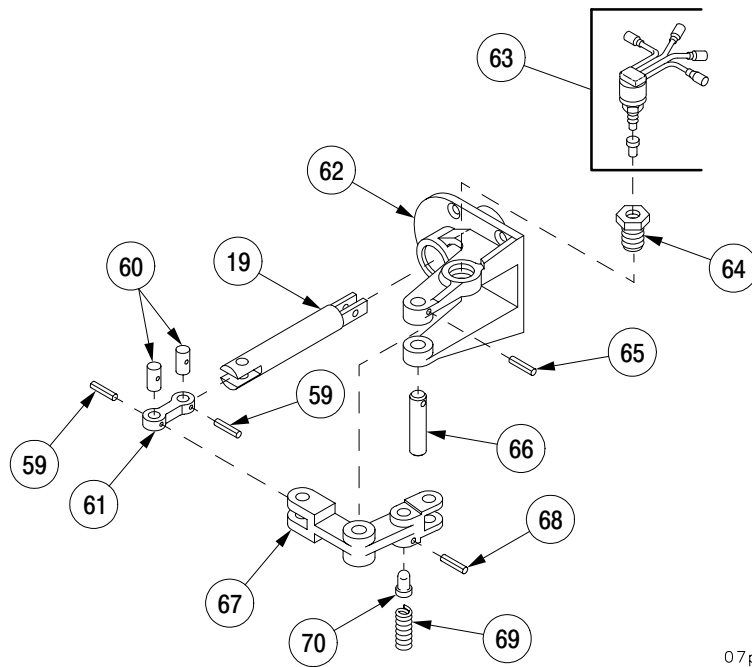
**b. Disassembly – Continued**

- 7 Remove spring pin (55), shaft (56), and bellcrank (57) from support (58). Discard spring pin.



07ph024m

- 8 Remove two spring pins (59), two shafts (60), shaft (19), and link (61) from base (62). Discard spring pins.
- 9 Remove neutral safety switch and pin (63) from adapter (64).
- 10 Remove adapter (64) from base (62).
- 11 Remove spring pin (65), straight pin (66), and lever (67) from base (62). Discard spring pin.
- 12 Remove spring pin (68), spring (69), and contact pin (70) from lever (67). Discard spring pin.



07ph025m

---

**Section I. GEAR SHIFT AND CONTROLS – CONTINUED**


---

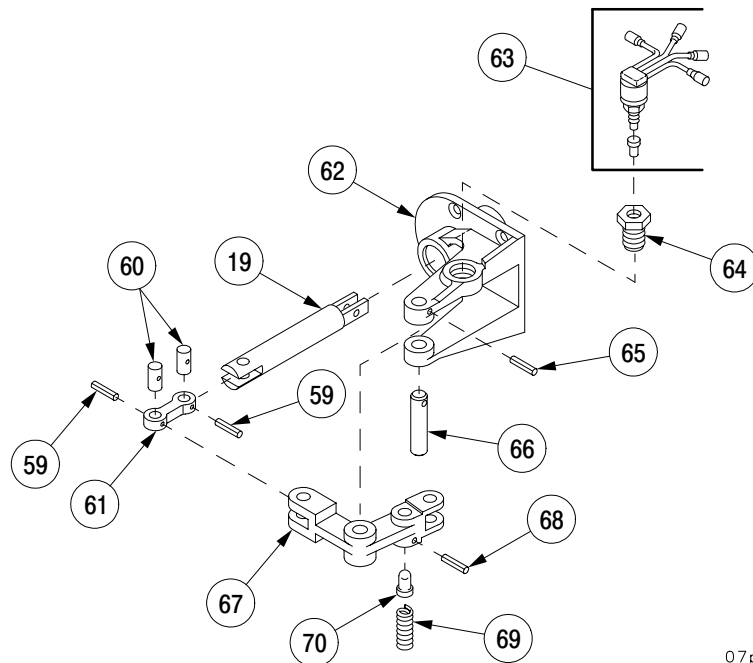
**9-1 GEAR SHIFT CONTROL LINKAGE – CONTINUED**


---

**c. Assembly.**
**NOTE**

- Perform steps 1 thru 9 for support and base assembly.
- Perform steps 10 thru 15 for shift control assembly.
- Perform steps 16 and 17 for rod assembly.
- All rod assemblies are assembled in the same manner.

- 1 Apply lubricant (item 34, Appx C) to contact surfaces of contact pin (70).
- 2 Install contact pin (70), spring (69), and new spring pin (68) in lever (67).
- 3 Install lever (67) in base (62) with straight pin (66) and new spring pin (65).
- 4 Install adapter (64) in base (62).
- 5 Apply lubricant (item 34, Appx C) to contact surfaces of adapter (64).
- 6 Install neutral safety switch and pin (63) in adapter (64).
- 7 Apply lubricating compound (item 16, Appx C) to shaft (19).
- 8 Install link (61), shaft (19), two shafts (60), and two new spring pins (59) in base (62).



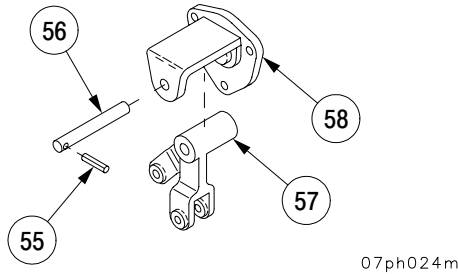
07ph025m

**Section I. GEAR SHIFT AND CONTROLS – CONTINUED**

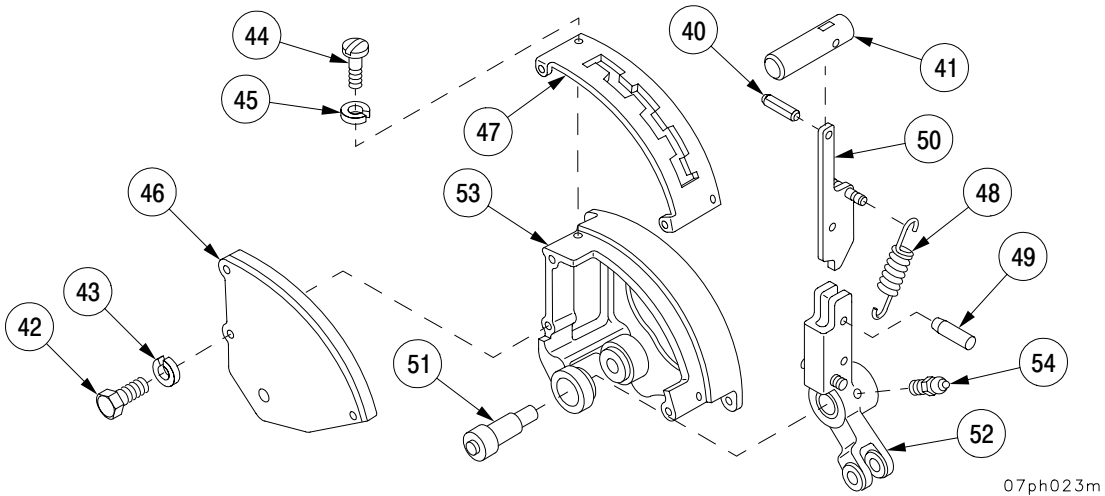
**9-1 GEAR SHIFT CONTROL LINKAGE – CONTINUED**

**c. Assembly – Continued**

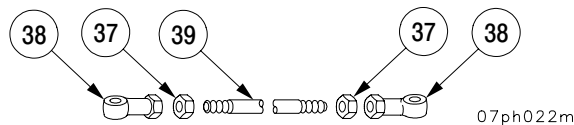
- 9 Install bellcrank (57) in support (58) with shaft (56) and new spring pin (55).



- 10 Install lever (52) in bracket (53) with shaft (51).
- 11 Install grease fitting (54) in lever (52).
- 12 Install manual lever (50) in lever (52) with two springs (48) and two pins (49).
- 13 Install cover (46) with three screws (42) and three new lockwashers (43).
- 14 Install shift guide (47) with two screws (44) and two new lockwashers (45).
- 15 Install knob (41) with new spring pin (40).



- 16 Install two locknuts (37) on rod (39).
- 17 Install two rod ends (38) on rod (39). Tighten two locknuts (37).

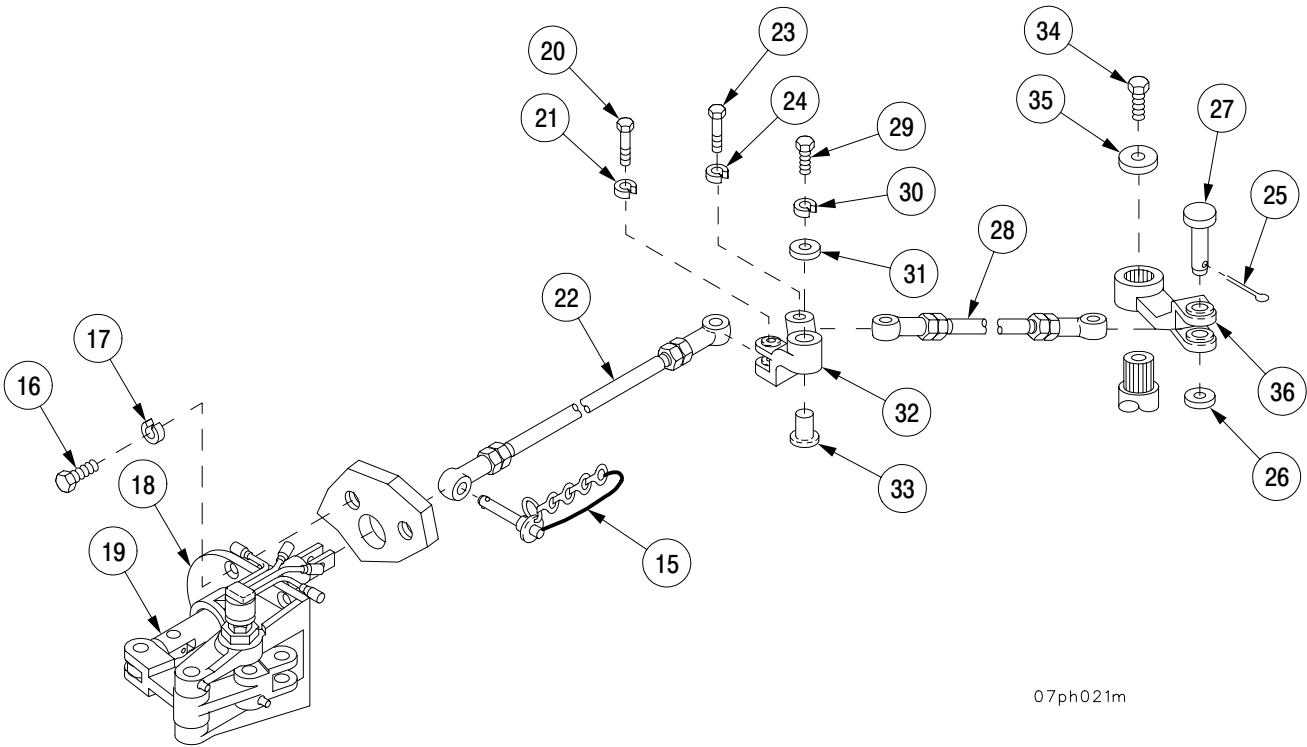


**Section I. GEAR SHIFT AND CONTROLS – CONTINUED**

**9-1 GEAR SHIFT CONTROL LINKAGE – CONTINUED**

**d. Installation.**

- 1 Install lever (36) with flat washer (35) and screw (34).
- 2 Install spacer (33) in bellcrank (32) with flat washer (31), new lockwasher (30), and screw (29). Torque screw to 15–19 lb–ft (20–26 N·m).
- 3 Install shift control outer rod (28) with pin (27), washer (26), new cotter pin (25), new lockwasher (24), and screw (23).
- 4 Install shift control outer rod (22) with new lockwasher (21) and screw (20).
- 5 Install base assembly (18) with shaft (19) on bulkhead with four new lockwashers (17), and four screws (16).
- 6 Connect shift control outer rod (22) to shaft (19) with quick-release pin (15) (located in powerpack compartment at driver’s bulkhead).



07ph021m

---

**Section I. GEAR SHIFT AND CONTROLS – CONTINUED**

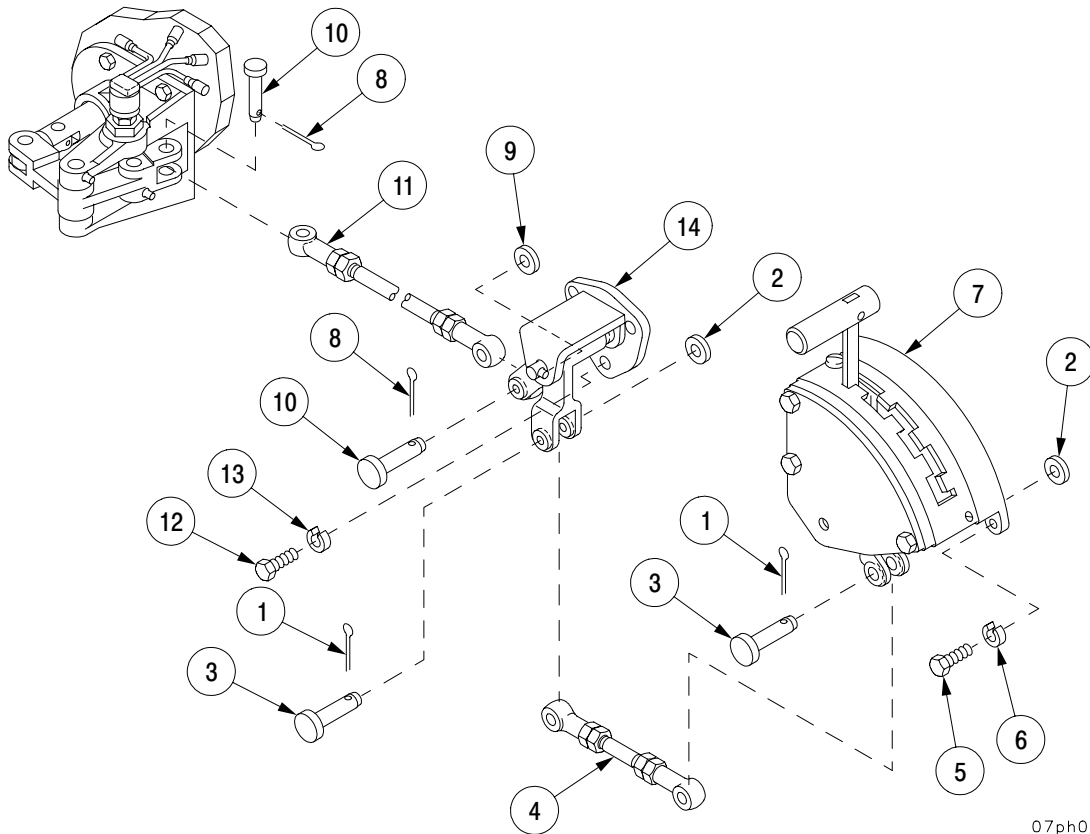
---

**9-1 GEAR SHIFT CONTROL LINKAGE – CONTINUED**

---

**d. Installation – Continued**

- 7 Install support assembly (14) with three new lockwashers (13) and three screws (12).
- 8 Install shift control inner rod (11) with two pins (10), flat washer (9), and two new cotter pins (8).
- 9 Install shift control (7) with three new lockwashers (6) and three screws (5).
- 10 Install shift control inner rod (4) with two pins (3), two flat washers (2), and two new cotter pins (1).



07ph026m

---

**Section I. GEAR SHIFT AND CONTROLS – CONTINUED**

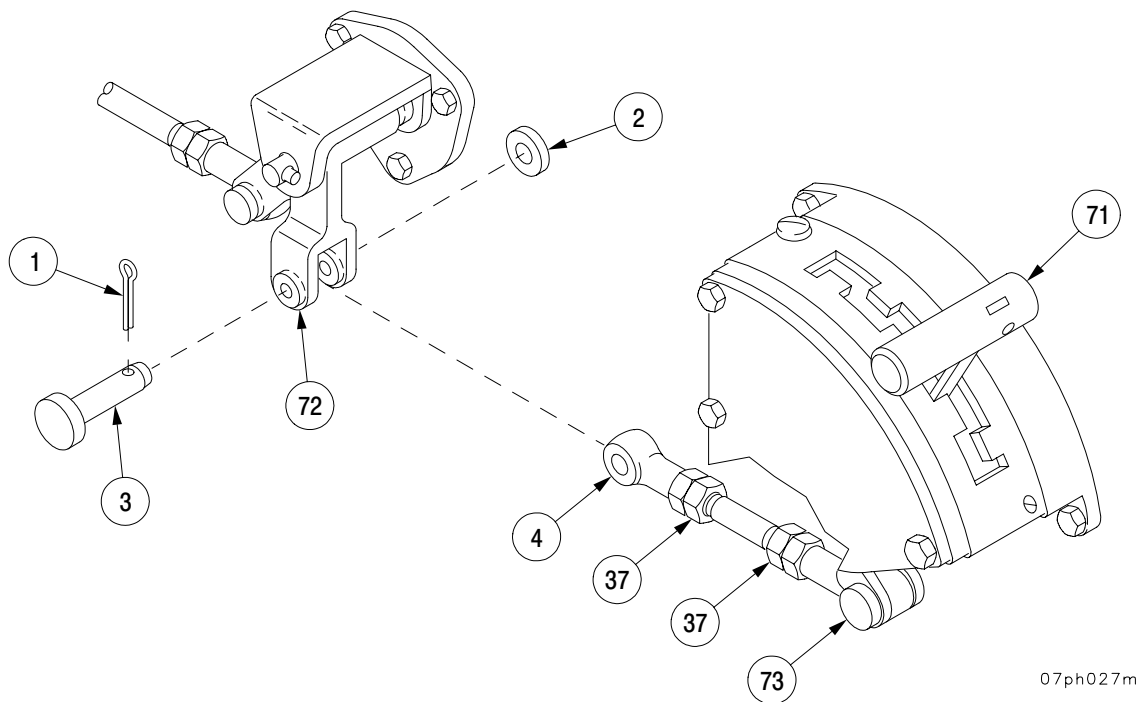
---

**9-1 GEAR SHIFT CONTROL LINKAGE – CONTINUED**

---

**e. Adjustment.**

- 1 Place shift control lever (71) in neutral (N) position. Disconnect shift control inner rod (4) by removing cotter pin (1), flat washer (2), and pin (3) from shift control inner bellcrank (72). Discard cotter pin.
- 2 Place bellcrank (72) parallel with shift control arm (73).
- 3 Loosen two locknuts (37) and adjust shift control inner rod (4) until pin (3) can be installed easily. Install flat washer (2) and new cotter pin (1). Tighten locknut (37).

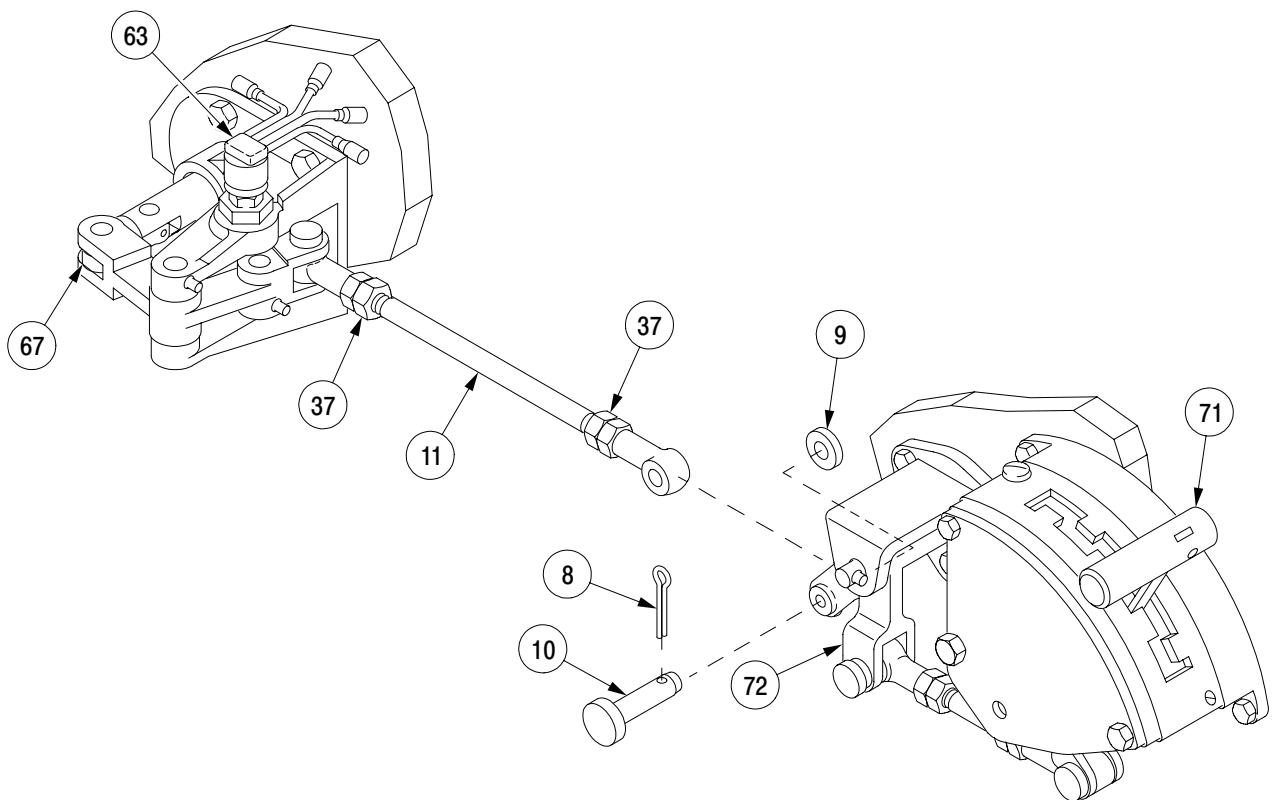


## Section I. GEAR SHIFT AND CONTROLS – CONTINUED

### 9-1 GEAR SHIFT CONTROL LINKAGE – CONTINUED

#### e. Adjustment – Continued

- 4 Disconnect shift control inner rod (11) by removing cotter pin (8), flat washer (9), and pin (10). Discard cotter pin.
- 5 With base lever (67) at neutral position on neutral safety switch (63) (verify by attempting to crank engine while fuel shutoff is pulled) and with shift lever (71) in neutral (N) position, loosen locknuts (37).
- 6 Adjust shift control inner rod (11) until pin (10) can be easily inserted into lever of inner bellcrank (72). Install flat washer (9) and new cotter pin (8). Tighten locknuts (37).



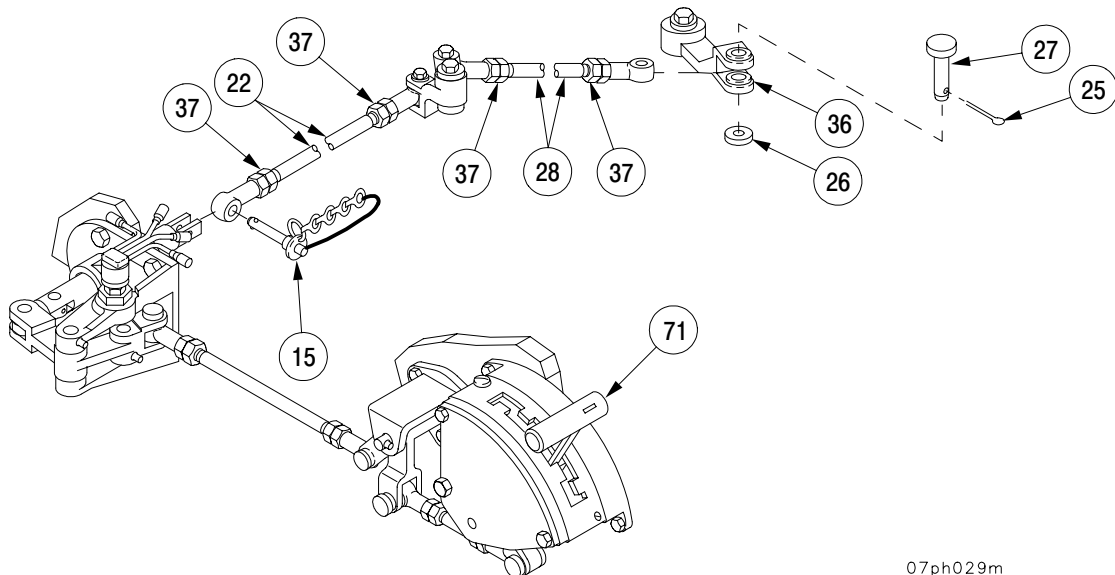
07ph028m

## Section I. GEAR SHIFT AND CONTROLS – CONTINUED

### 9-1 GEAR SHIFT CONTROL LINKAGE – CONTINUED

#### e. Adjustment – Continued

- 7 With shift control lever (71) in neutral (N) position, disconnect shift control outer rod (28) from transmission shift control lever (36) by removing cotter pin (25), flat washer (26), and clevis pin (27). Discard cotter pin.
- 8 Loosen locknuts (37) and adjust shift control outer rod (22) to approximately 8.25 inches (21 cm) (centerline of bearing bore to centerline of bearing bore). Tighten locknuts (37).
- 9 Disconnect shift control outer rod (22) by pulling quick-release pin (15). Make sure control lever (71) is in neutral (N) position and install shift control outer rod (28) in transmission shift control lever (36).
- 10 Install clevis pin (27), flat washer (26), and new cotter pin (25).
- 11 Loosen locknuts (37) and adjust shift control outer rod (22) until quick-release pin (15) can be easily inserted. Tighten locknuts (37) on shift control outer rod (22).
- 12 Move shift control lever (71) through all positions. In each position, check to see that transmission shift control lever index (located under shift control lever at transmission) indicates the same as the shift control lever (71) position.



07ph029m

#### NOTE

#### FOLLOW-ON MAINTENANCE:

- Lubricate shift control linkage  
(TM 9-2350-314-10)
- Close and secure air intake grille  
(TM 9-2350-314-10)
- Remove track blocks  
(TM 9-2350-314-10)





---

**Section II. TRANSMISSION ASSEMBLY AND ASSOCIATED PARTS – CONTINUED**

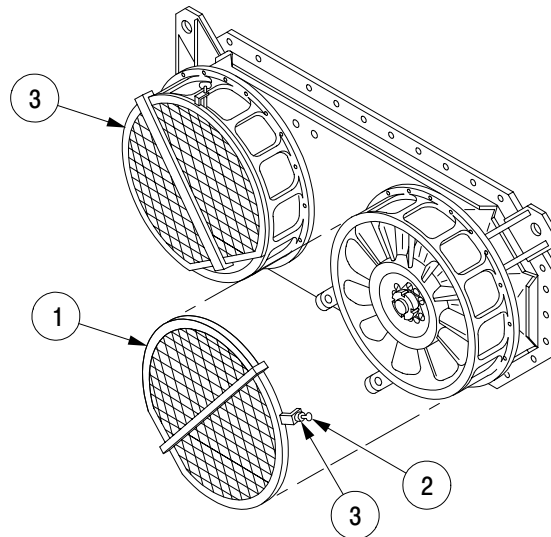
---

**9-2 TRANSMISSION PRESSURE CHECKS – CONTINUED**

---

**a. Preparation for Pressure Checks – Continued****NOTE**

Flat side of screen should align with two lower mounting bolts of fan housing.



05ph087m

- 2 Install two fan protective screens (1) with thumb or hex head screw (2) and locknut (3).

**WARNING**

- The rotation of the radiator cooling fan creates a hazard during maintenance on a running engine. Exercise care to prevent injury, especially to fingers and hands, during maintenance operations on a running engine.
  - Excessive noise levels are present any time the equipment is operating. Wear hearing protection while it is running. Failure to do so could result in damage to your hearing.
- 3 Apply brakes.
  - 4 Start engine and shift transmission into fourth gear and release brakes (TM 9-2350-314-10).

## Section II. TRANSMISSION ASSEMBLY AND ASSOCIATED PARTS – CONTINUED

---

### 9-2 TRANSMISSION PRESSURE CHECKS – CONTINUED

---

#### a. Preparation for Pressure Checks – Continued

**CAUTION**

If transmission oil temperature gets over 300°F (149°C) during any test, stop engine and troubleshoot transmission.

- 5 Run engine at 1200 to 1500 rpm for 3 to 8 minutes, or until transmission reaches about 220°F (104°C).
- 6 Shift transmission through all ranges several times.
- 7 Shift transmission to neutral (N).
- 8 Apply brakes.
- 9 Increase engine speed to 1350 rpm.
- 10 Check transmission oil level (TM 9-2350-314-10). Oil level must be at FULL mark on dipstick.
- 11 Add or drain oil as necessary (TM 9-2350-314-10).
- 12 During warmup period, check transmission for leaks.
- 13 Stop engine (TM 9-2350-314-10).
- 14 Tighten loose bolts, plugs, and hose fittings. Replace defective hoses. If leakage cannot be stopped, notify support maintenance and stop pressure tests.

#### b. Pressure Checks.

**WARNING**

Transmission contains hot oil under high pressure. Stop engine before removing or installing pipe plugs and gage adapter in pressure test points. Install pipe plug as soon as gage adapter is removed. Remove only pipe plug at test point.

- 1 Remove pipe plug from test point to be pressure tested (Table 9-1, Test Points).
- 2 Install pressure gage tester.

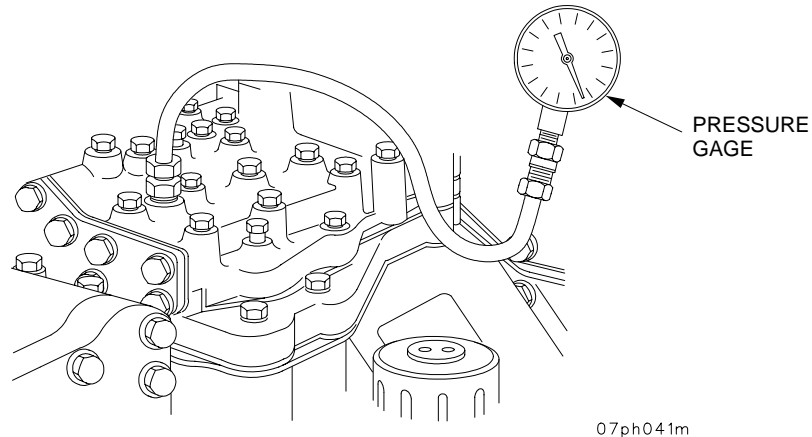
---

**Section II. TRANSMISSION ASSEMBLY AND ASSOCIATED PARTS – CONTINUED**

---

**9-2 TRANSMISSION PRESSURE CHECKS – CONTINUED**

---

**b. Pressure Checks – Continued**

- 3 Start engine (TM 9-2350-314-10).
- 4 Shift transmission to desired range (Table 9-2).
- 5 Slowly increase engine speed to desired rpm (Table 9-2).
- 6 Record readings for each test point (Tables 9-1 and 9-2).
- 7 Reduce engine speed to idle.

**NOTE**

- When making steer clutch pressure tests, move steering bar slowly from horizontal to full steer in desired direction while watching pressure gage. Note pressure rise to maximum as steering bar moves to full steer.
  - When making lockup engagement tests, increase engine speed slowly until lockup apply pressure is indicated on pressure gage. Record pressure and engine speed. Record governor pressure at lockup engagement.
  - When making lockup release tests, first increase engine speed higher than lockup engagement speed, then slowly reduce engine speed while watching pressure gage. When pressure drops quickly, record governor pressure and engine speed.
- 8 Stop engine (TM 9-2350-314-10).

---

**Section II. TRANSMISSION ASSEMBLY AND ASSOCIATED PARTS – CONTINUED**

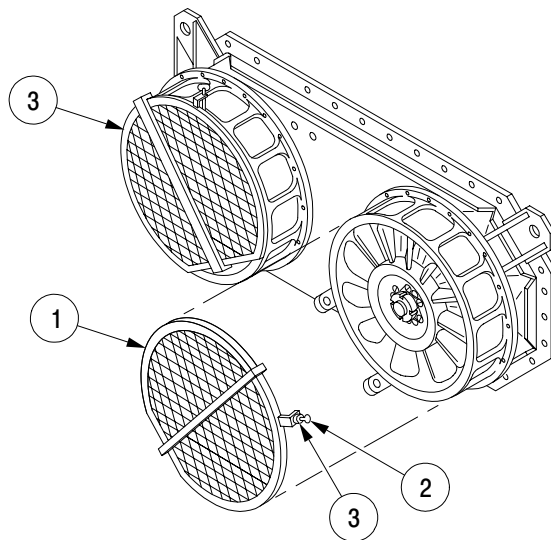
---

**9-2 TRANSMISSION PRESSURE CHECKS – CONTINUED**

---

**b. Pressure Checks – Continued**

- 9 Loosen locknut (3) and hex head thumb screw (2). Remove two fan protective screens (1).



05ph087m

**NOTE**

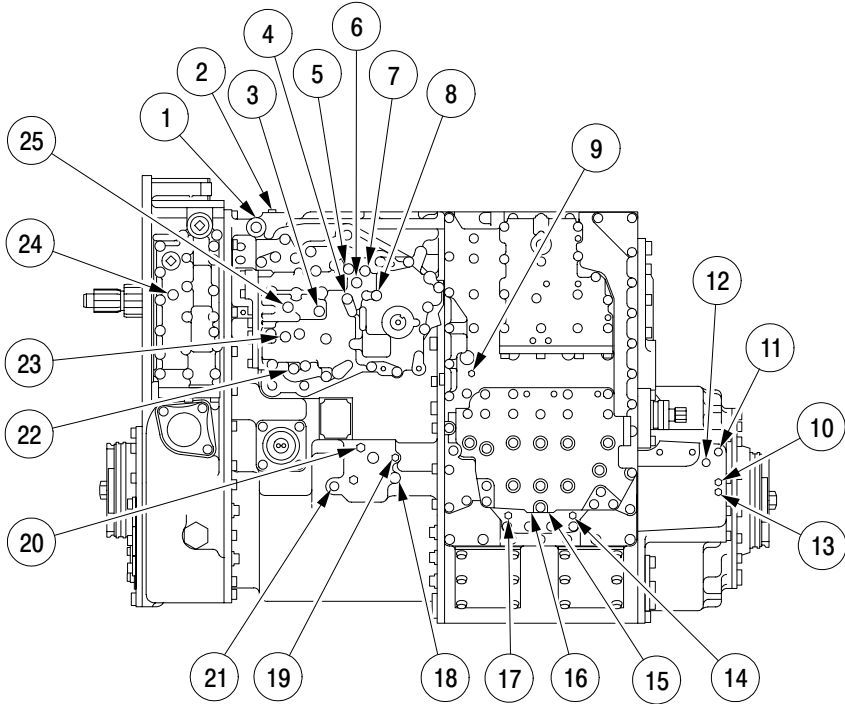
**FOLLOW-ON MAINTENANCE:**

- Install final drive quick-disconnects (para 10-3)
- Install front slope plate (para 16-30)
- Remove track blocks (TM 9-2350-314-10)

**Section II. TRANSMISSION ASSEMBLY AND ASSOCIATED PARTS – CONTINUED**

**9-2 TRANSMISSION PRESSURE CHECKS – CONTINUED**

**b. Pressure Checks – Continued**



07ph042m

**LEGEND**

- |  |                              |
|--|------------------------------|
| 1. Transmission lubrication                        | 14. Brake coolant            |
| 2. Transmission lubrication                        | 15. Brake                    |
| 3. Main  | 16. Brake                    |
| 4. Third gear                                      | 17. Brake coolant            |
| 5. Fourth gear                                     | 18. Geared steer clutch      |
| 6. First and second gear                           | 19. Geared steer coolant     |
| 7. First, neutral, and reverse one signal pressure | 20. Transmission lubrication |
| 8. Reverse   | 21. Output clutch            |
| 9. Third, fourth, and reverse two signal pressure  | 22. Throttle                 |
| 10. Geared steer clutch                            | 23. Throttle valve           |
| 11. Transmission lubrication                       | 24. Lockup                   |
| 12. Geared steer coolant                           | 25. Governor (pitot)         |
| 13. Output clutch                                  |                              |

**Table 9-1. TEST POINTS**

**Table 9-2. TRANSMISSION OIL PRESSURE TEST CHART**

Test	Test Point No.	RPM	Reading lb/in <sup>2</sup> (kPa)	Neutral 1	1st Gear	2nd Gear	3rd Gear	4th Gear	Reverse 1	Reverse 2	Right steer	Left steer	
Main pressure in converter	3	1000 to 1500	Normal	190 - 240 (1310 - 1655)	190 - 240 (1310 - 1655)	190 - 240 (1310 - 1655)	190 - 240 (1310 - 1655)	118 - 160 (814 - 1103)	300 - 350 (2069 - 2413)	300 - 350 (2069 - 2413)	Same as range reading		
			Actual										
Main pressure in lockup	3	1000 to 1500	Normal	118 - 160 (814 - 1103)	118 - 160 (814 - 1103)	118 - 160 (814 - 1103)	118 - 160 (814 - 1103)	160 - 190 (1103 - 1310)	160 - 190 (1103 - 1310)	160 - 190 (1103 - 1310)	Same as range reading		
			Actual										
Lockup and range clutch apply pressure	24	1000 to 1500	Normal	Same as main pressure for applicable gear									
			Actual										
1st, neutral, and reverse 1 signal pressure	7	1000 to 1500	Normal	Same as main pressure for applicable gear									
			Actual										
3rd, 4th, and reverse 2 signal pressure	9	1000 to 1500	Normal	Same as main pressure for applicable gear									
			Actual										
Geared steer apply pressure (no steer)	10, 18	1000 to 1500	Normal	160 - 210 (1103 - 1448)	160 - 210 (1103 - 1448)	0	0	0	160 - 210 (1103 - 1448)	0	0	0	0
			Actual										
Geared steer apply pressure (during steer)	10, 18	1000 to 1500	Normal	0	0	0	0	0	0	0	60 - 130 (414 - 896)	60 - 130 (414 - 896)	
			Actual										
Brake apply pressure	15, 16	1000 to 1500	Normal	0	0	0	0	0	0	0	74 - 127 (510 - 876)	74 - 127 (510 - 876)	
			Actual										
Geared steer and brake coolant pressure	12, 19 14, 17 9	1000 to 1500	Normal	0	0	0	0	0	0	0	8 - 12	8 - 12	
			Actual										
Output clutch pressure	13	1000 to 1500	Normal	0	0	165 - 210 (1138 - 1448)	165 - 210 (1138 - 1448)	118 - 160 (814 - 1103)	0	165 - 210 (1138 - 1448)	0*	0*	
			Actual										
Governor pressure (pitot) at lockup engagement	25	Full Throttle	Normal	75 - 89 (517 - 614)	75 - 89 (517 - 614)	75 - 89 (517 - 614)	75 - 89 (517 - 614)	75 - 89 (517 - 614)	75 - 89 (517 - 614)	75 - 89 (517 - 614)	75 - 89 (517 - 614)	75 - 89 (517 - 614)	
			Actual										
Lubrication pressure	1, 2, 11 20	1835 to 1900	Normal	18 - 45 (124 - 310)	18 - 45 (124 - 310)	18 - 45 (124 - 310)	18 - 45 (124 - 310)	18 - 45 (124 - 310)	18 - 45 (124 - 310)	18 - 45 (124 - 310)	15 - 35 (103 - 241)	15 - 35 (103 - 241)	
			Actual										
Throttle (T) pressure	22	Full Throttle	Normal	32 - 40 (221 - 276)	32 - 40 (221 - 276)	32 - 40 (221 - 276)	32 - 40 (221 - 276)	32 - 40 (221 - 276)	32 - 40 (221 - 276)	32 - 40 (221 - 276)	32 - 40 (221 - 276)	32 - 40 (221 - 276)	
			Actual										
Throttle valve (TV) pressure	23	Full Throttle	Normal	32 - 40 (221 - 276)	32 - 40 (221 - 276)	32 - 40 (221 - 276)	32 - 40 (221 - 276)	32 - 40 (221 - 276)	32 - 40 (221 - 276)	32 - 40 (221 - 276)	32 - 40 (221 - 276)	32 - 40 (221 - 276)	
			Actual										

\* Clutch pressure can be measured only when steering bar is turned toward side being tested.

**Section II. TRANSMISSION ASSEMBLY AND ASSOCIATED PARTS – CONTINUED**

**9-3 TRANSMISSION OIL FILTER.**

This task covers: a. Removal b. Disassembly c. Assembly d. Installation

**INITIAL SETUP**

Tools

General mechanic's tool kit  
(SC 5180-90-N26)  
Torque wrench (item 85, Appx F)

Materials/Parts

Transmission oil filter parts kit (item 196, Appx E)  
Preformed packing (item 195, Appx E)  
Lockwashers (3) (item 194, Appx E)

Equipment Conditions

Front slope plate removed (para 16-30)

Personnel Required

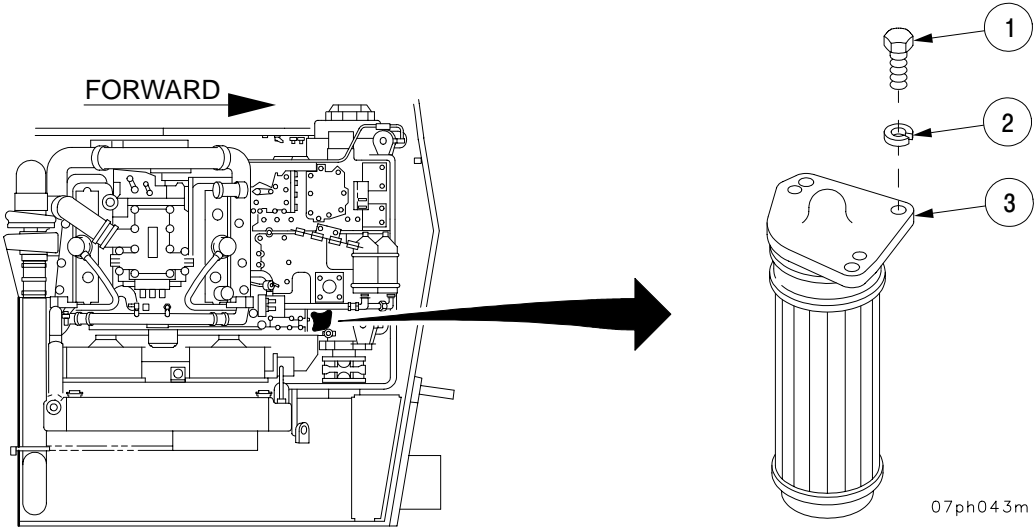
Two

**a. Removal.**

**NOTE**

Filter may be difficult to remove. If filter cannot be removed by hand, install two screws in puller screw holes to serve as jackscrews.

Remove three screws (1), three lockwashers (2), and oil filter assembly (3) from transmission. Discard lockwashers.





---

## Section II. TRANSMISSION ASSEMBLY AND ASSOCIATED PARTS – CONTINUED

---

### 9-3 TRANSMISSION OIL FILTER – CONTINUED

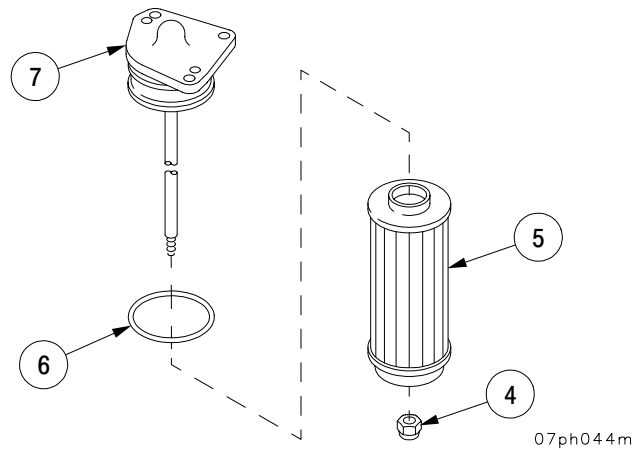
---

**b. Disassembly.**

Remove self-locking nut (4), filter (5), and preformed packing (6) from head assembly (7). Discard self-locking nut, preformed packing, and filter.

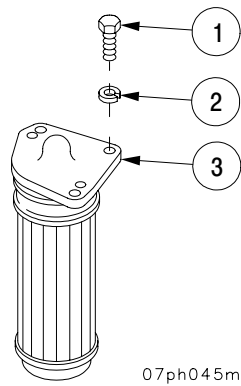
**c. Assembly.**

Install new preformed packing (6) and new filter (5) on head assembly (7) with new self-locking nut (4). Torque self-locking nut to 25–50 lb-in (2.8–5.6 N·m).



**d. Installation.**

Install oil filter assembly (3) in transmission with three screws (1) and three new lockwashers (2).



**NOTE**

**FOLLOW-ON MAINTENANCE:**  
Install front slope plate (para 16-30)

---

## Section II. TRANSMISSION ASSEMBLY AND ASSOCIATED PARTS – CONTINUED

---

### 9-4 TRANSMISSION INTERNAL BRAKE.

---

This task covers:        Adjustment

---

#### **INITIAL SETUP**

##### Tools

General mechanic's tool kit  
(SC 5180-90-N26)  
Brake splined wrenches (items 82 and 83, Appx F)  
Brake adjusting gage (item 21, Appx F)

##### Materials/Parts

Lockwashers (12) (item 194, Appx E)  
Gaskets (2) (item 197, Appx E)

##### Equipment Conditions

Transmission access doors open  
(TM 9-2350-314-10)  
Tracks blocked (TM 9-2350-314-10)

##### Personnel Required

Two

##### References

TM 9-2350-314-10

---

#### **Adjustment.**

#### **WARNING**

Track must be blocked so that the vehicle will not roll out of control when adjusting transmission internal brake. Failure to securely block vehicle tracks may result in severe injury to personnel or equipment damage.

#### **NOTE**

If the brake linkage is not installed, the brakes may be adjusted using the same procedures as outlined, except that special wrenches for brake adjustment may be used to apply the brakes. The brakes should be applied to approximately 90 lb-ft (122 N·m).

- 1 Check brake linkage adjustment (para 11-1).

---

## Section II. TRANSMISSION ASSEMBLY AND ASSOCIATED PARTS – CONTINUED

---

### 9-4 TRANSMISSION INTERNAL BRAKE – CONTINUED

---

#### Adjustment – Continued

- 2 Apply brakes fully and watch the index marks (1) on the brake levers (2). If the index marks (1) rotate to the APPLY mark (3) on the retainer (4) but not to the READJUST mark (5), the brakes are properly adjusted. If the index marks (1) do not rotate to the APPLY mark (3), or rotate past the READJUST mark (5), the brakes must be adjusted.
- 3 Remove 12 screws (6), 12 lockwashers (7), and two transmission covers (8) with two gaskets (9). Discard lockwashers and gaskets.
- 4 Insert screwdriver into adjustment nuts (10) and turn to adjust brakes. Clockwise rotation will tighten brakes; counterclockwise will loosen brakes.
- 5 Adjust both brakes uniformly so that both index marks (1) align with the APPLY mark (3) on the retainer (4) when brakes are applied, or use brake adjusting gage to check brake clearance.
- 6 Install two new gaskets (9) and two covers (8) with 12 screws (6) and 12 new lockwashers (7).

#### NOTE

The stall test is done to check the performance of the engine, transmission, and internal brake system.

- 7 Perform stall test:
  - (a) Check engine and transmission oil levels (TM 9-2350-314-10). Operate engine until normal operating temperature of approximately 170°F (77°C) is reached (TM 9-2350-314-10).

**CAUTION**

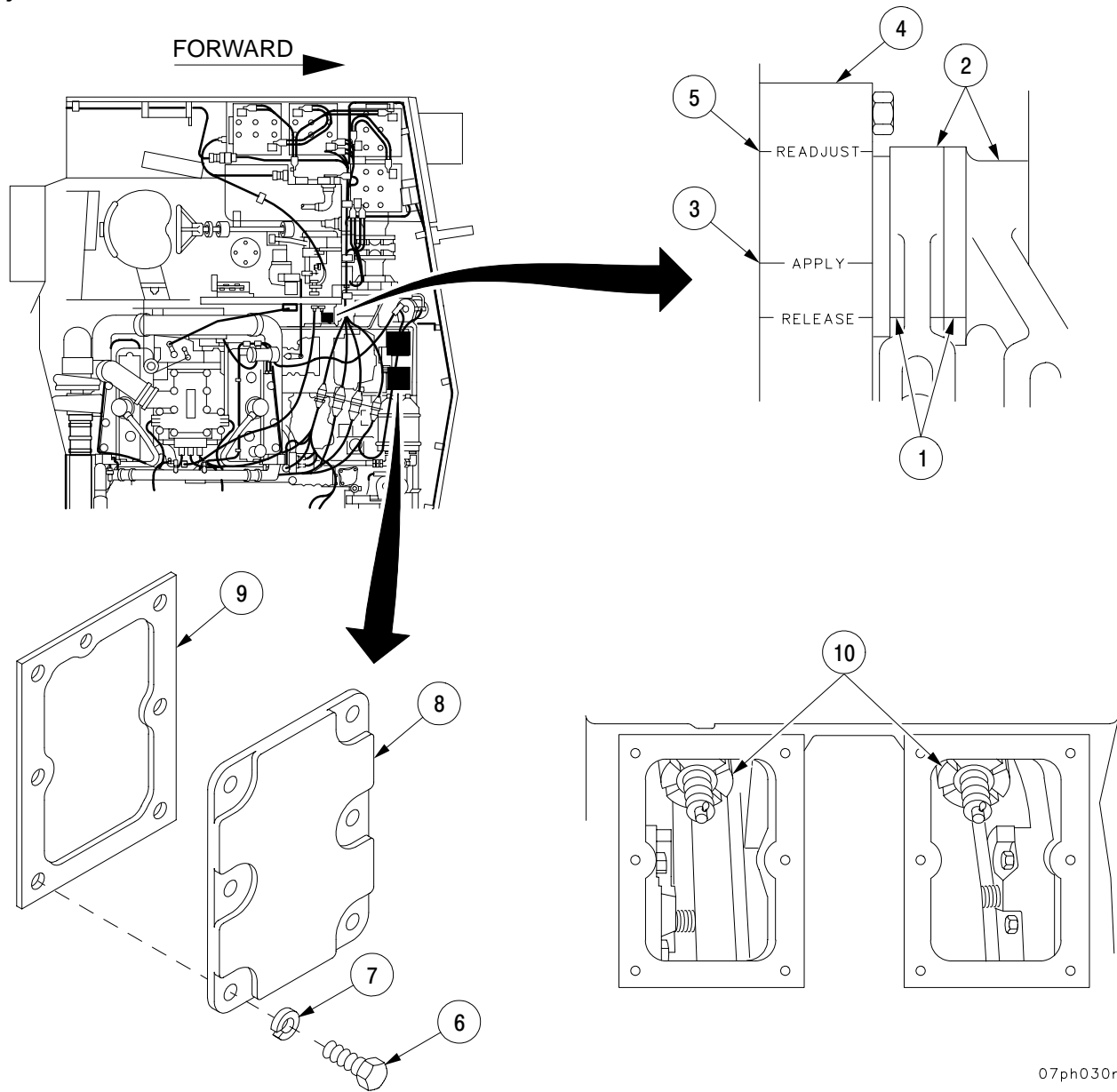
Do not stall engine for more than 10 seconds or the transmission oil temperature will go too high.

- (b) Lock brakes and place transmission in fourth gear. Run engine at full throttle for 5 seconds.
- 8 If brakes do not hold vehicle, readjust brakes.

**Section II. TRANSMISSION ASSEMBLY AND ASSOCIATED PARTS – CONTINUED**

**9-4 TRANSMISSION INTERNAL BRAKE – CONTINUED**

**Adjustment – Continued**



07ph030m

**NOTE**

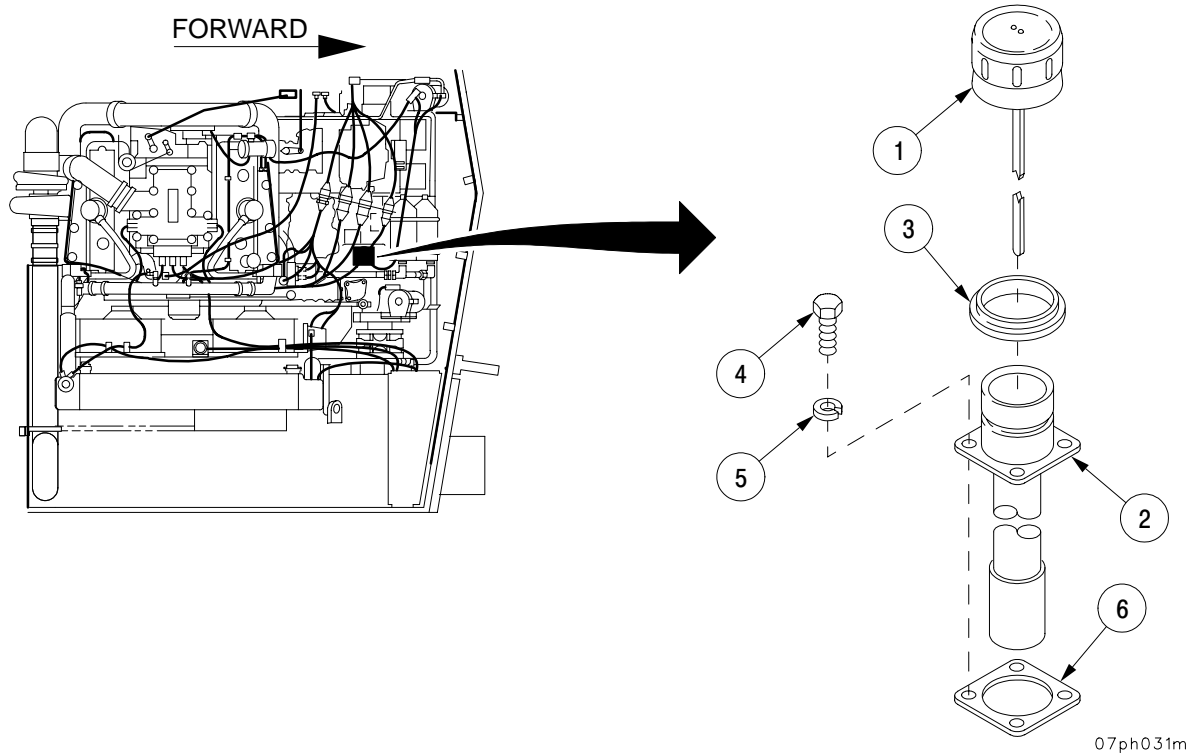
**FOLLOW-ON MAINTENANCE:**  
 Close and secure transmission access doors  
 (TM 9-2350-314-10)



**Section II. TRANSMISSION ASSEMBLY AND ASSOCIATED PARTS – CONTINUED**

**9-5 TRANSMISSION GAGE ROD AND SEAL – CONTINUED**

**b. Installation – Continued**



**NOTE**

**FOLLOW-ON MAINTENANCE:**  
 Close and secure transmission access doors  
 (TM 9-2350-314-10)



---

**Section II. TRANSMISSION ASSEMBLY AND ASSOCIATED PARTS – CONTINUED**

---

**9-6 BREATHER, TUBE, AND MOUNT – CONTINUED**

---

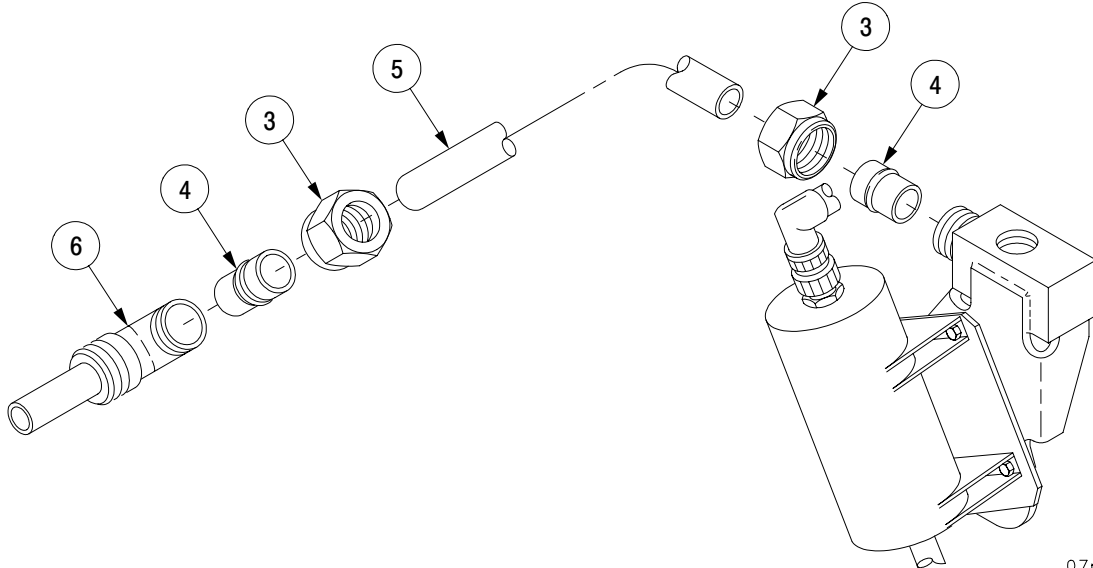
**a. Removal – Continued**

- 2 Remove two nuts (3), two sleeves (4), and tube (5).

**WARNING**

Dry-cleaning solvent (P-D-680) is toxic and flammable. To avoid injury, wear protective goggles and gloves and use only in a well-ventilated area. Avoid contact with skin, eyes, and clothes. Do not breathe vapors. Do not use near open flame or excessive heat. Do not smoke when using solvent. Failure to do so could cause **SERIOUS INJURY**. If you become dizzy while using dry-cleaning solvent, get fresh air immediately, and if necessary, get medical attention. If contact with skin or clothes is made, flush thoroughly with water. If the solvent contacts your eyes, wash them with water immediately and obtain medical aid (FM 21-11).

- 3 Clean tube (5) with dry-cleaning solvent.
- 4 Remove elbow (6) from transfer.



07ph033m



**Section II. TRANSMISSION ASSEMBLY AND ASSOCIATED PARTS – CONTINUED**

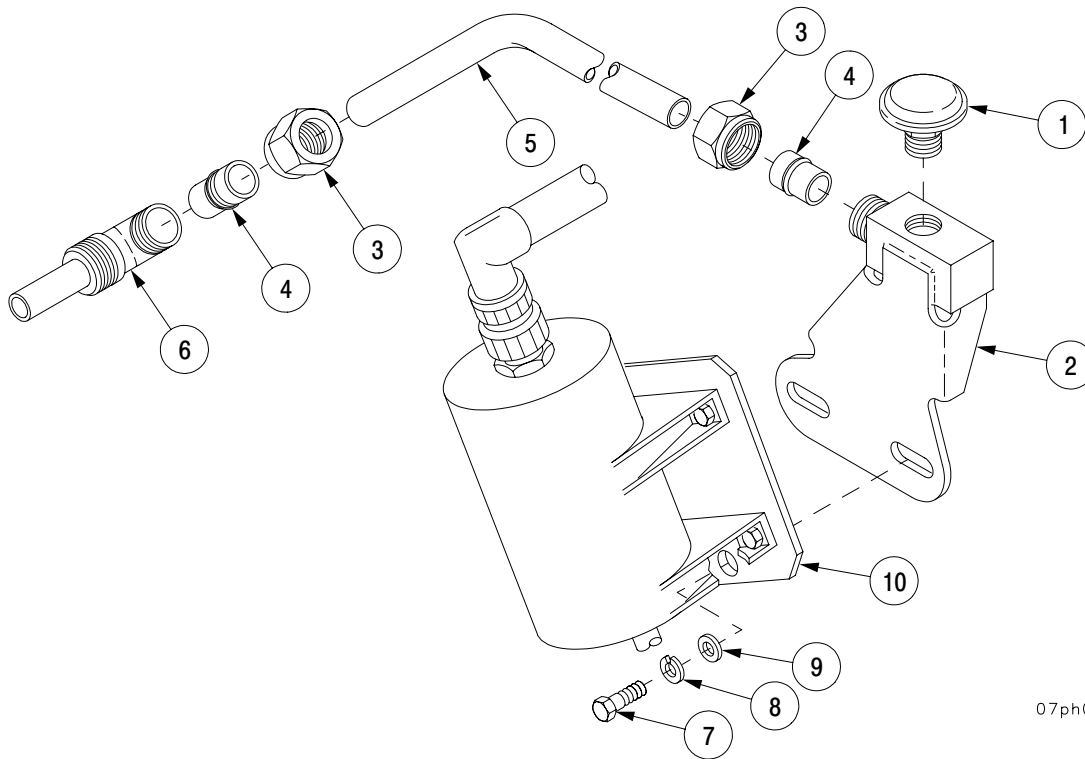
**9-6 BREATHER, TUBE, AND MOUNT – CONTINUED**

**a. Removal – Continued**

- 5 Remove two screws (7), two lockwashers (8), and two flat washers (9) securing VMS modem (10) and mount (2) to transmission. Discard lockwashers.

**b. Installation.**

- 1 Install mount (2) and VMS modem (10) on transmission with two screws (7), two new lockwashers (8), and two flat washers (9).
- 2 Install elbow (6) on transfer.
- 3 Install tube (5) to mount (2) and elbow (6) with two sleeves (4) and two nuts (3).
- 4 Install breather (1) on mount (2).



07ph034m

**NOTE**

**FOLLOW-ON MAINTENANCE:**

- Connect transmission oil cooling line at transmission (para 9-9)
- Install engine wiring harness mounting bracket (para 8-105)
- Close and secure transmission access doors (TM 9-2350-314-10)
- Close and secure air intake grille (TM 9-2350-314-10)



---

## Section II. TRANSMISSION ASSEMBLY AND ASSOCIATED PARTS – CONTINUED

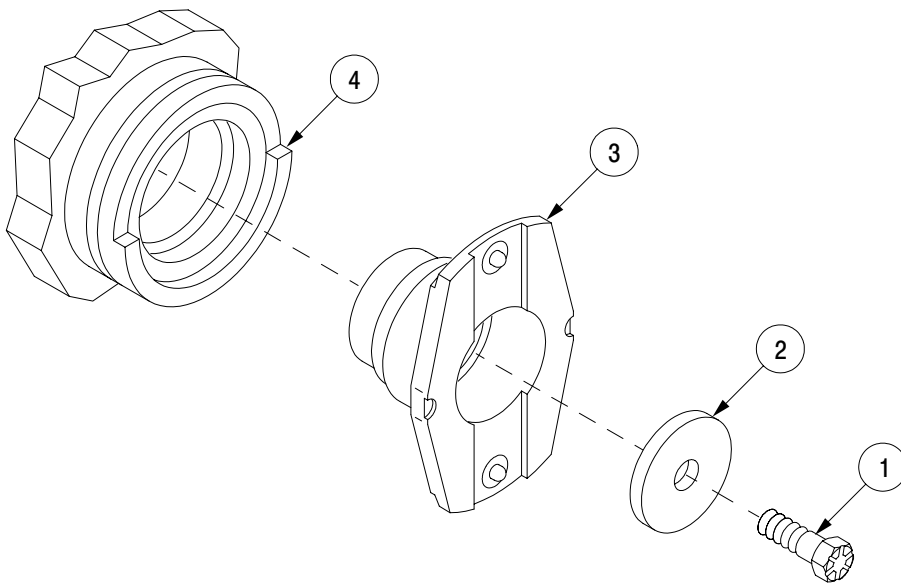
---

### 9-7 TRANSMISSION HUB ASSEMBLY – CONTINUED

---

#### b. Installation.

Install transmission hub (3) in transmission (4) with lock plate (2) and new self-locking bolt (1). Torque self-locking bolt to 299–330 lb-ft (405–447 N-m).



07ph036m

#### NOTE

**FOLLOW-ON MAINTENANCE:**  
Install coupling assembly (para 10-3)

**Section II. TRANSMISSION ASSEMBLY AND ASSOCIATED PARTS – CONTINUED**

**9-8 PROTECTIVE COVER FOR TRANSMISSION OIL TEMPERATURE TRANSMITTER AND TRANSMISSION OIL HIGH TEMPERATURE SWITCH.**

This task covers:    a. Removal                      b. Disassembly                      c. Assembly                      d. Installation  
                                  e. Adjustment

**INITIAL SETUP**

Tools

General mechanic's tool kit  
 (SC 5180-90-N26)

Materials/Parts

Lockwashers (4) (item 22, Appx E)

Equipment Conditions

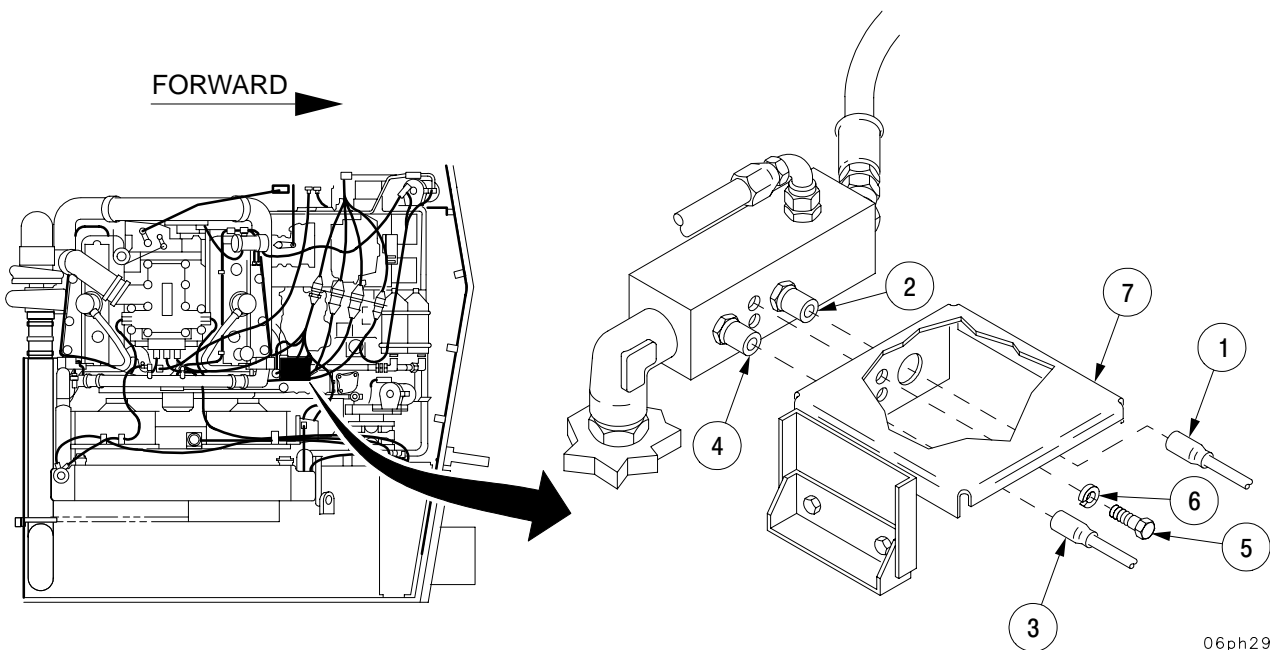
Vehicle MASTER switch OFF  
 (TM 9-2350-314-10)  
 Battery ground leads disconnected  
 (para 8-33)  
 Air intake grille open and secured  
 (TM 9-2350-314-10)

References

TM 9-2350-314-10

**a. Removal.**

- 1 Disconnect wiring harness W104 electrical connector 324 (1) from transmission oil temperature transmitter (2).
- 2 Disconnect wiring harness W104 electrical connector 509D (3) from transmission high oil temperature switch (4).
- 3 Remove two screws (5), two lockwashers (6), and protective cover (7). Discard lockwashers.



06ph298m

## Section II. TRANSMISSION ASSEMBLY AND ASSOCIATED PARTS – CONTINUED

---

### 9-8 PROTECTIVE COVER FOR TRANSMISSION OIL TEMPERATURE TRANSMITTER AND TRANSMISSION OIL HIGH TEMPERATURE SWITCH – CONTINUED

---

#### b. Disassembly.

Remove two screws (8), two lockwashers (9), four flat washers (10), and two nuts (11). Separate protective cover (7) from leg (12). Discard lockwashers.

#### c. Assembly.

Position leg (12) on protective cover (7). Loosely secure with two screws (8), two new lockwashers (9), four flat washers (10), and two nuts (11).

#### d. Installation.

- 1 Install cover (7) on manifold with two screws (5) and two new lockwashers (6).
- 2 Connect wiring harness W104 electrical connector 509D (3) to transmission high oil temperature switch (4).
- 3 Connect wiring harness W104 electrical connector 324 (1) to transmission oil temperature transmitter (2).

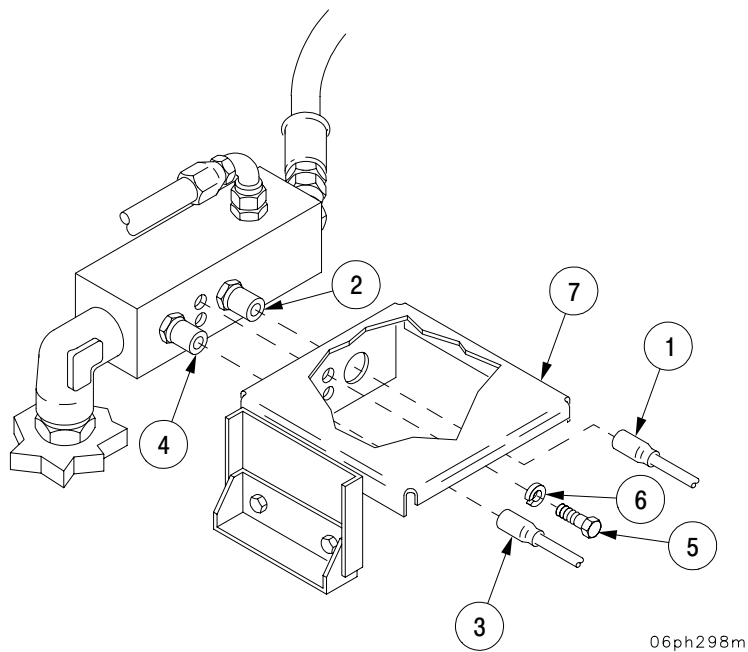
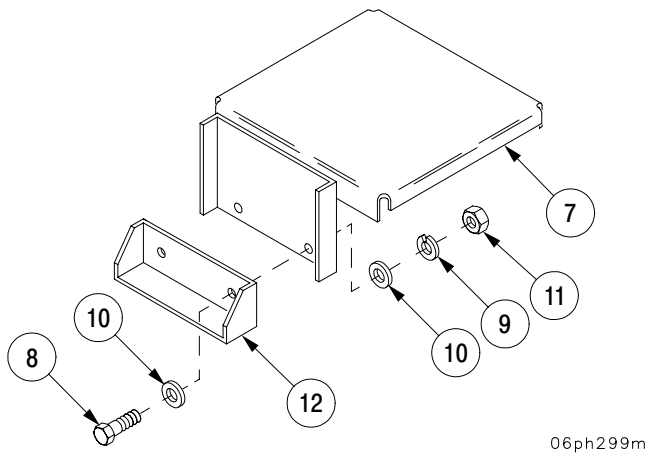
#### e. Adjustment.

- 1 Make sure that leg (12) attaching hardware (8, 9, 10, and 11) is loosely installed.
- 2 Push leg (12) against transmission.
- 3 Secure leg (12) by tightening two screws (8).

**Section II. TRANSMISSION ASSEMBLY AND ASSOCIATED PARTS – CONTINUED**

**9-8 PROTECTIVE COVER FOR TRANSMISSION OIL TEMPERATURE TRANSMITTER AND TRANSMISSION OIL HIGH TEMPERATURE SWITCH – CONTINUED**

**e. Adjustment – Continued**



**NOTE**

**FOLLOW-ON MAINTENANCE:**

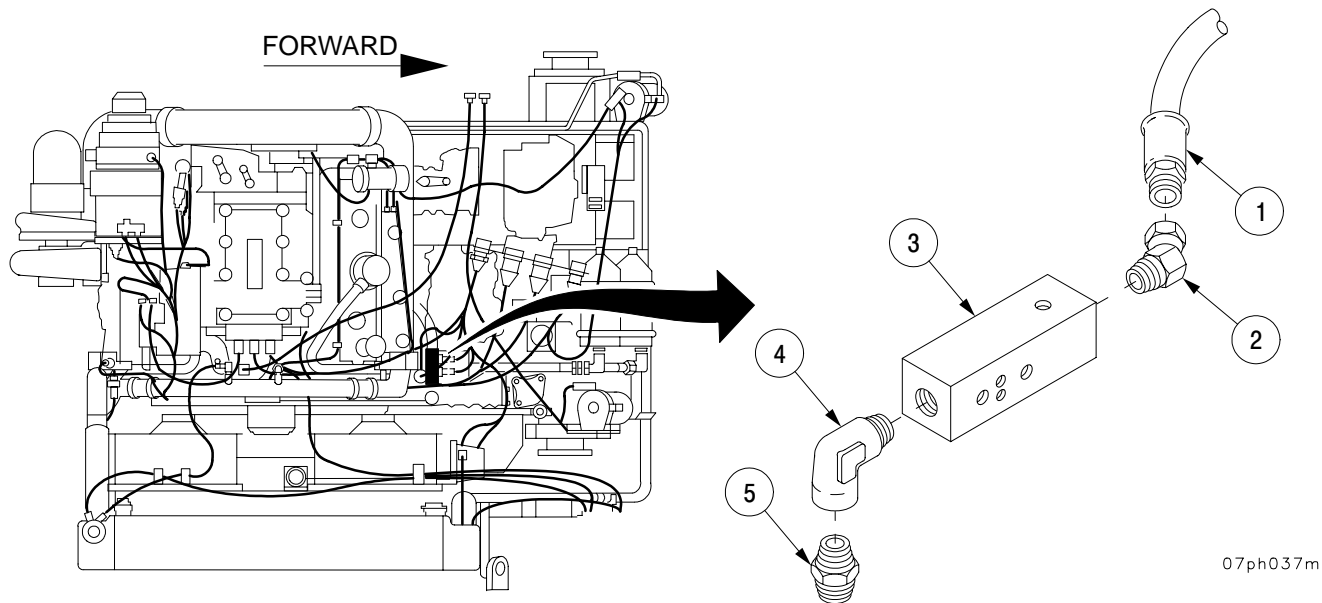
- Close and secure air intake grille  
(TM 9-2350-314-10)
- Connect battery ground leads (para 8-33)



**Section II. TRANSMISSION ASSEMBLY AND ASSOCIATED PARTS – CONTINUED**

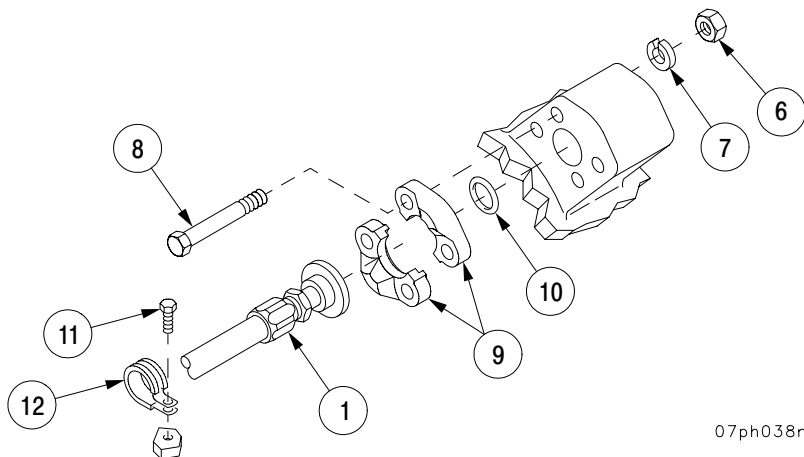
**9-9 TRANSMISSION OIL LINES AND OIL SAMPLING VALVE – CONTINUED**

**a. Removal – Continued**



07ph037m

- 5 Remove four nuts (6), four lockwashers (7), four screws (8), split flange (9), preformed packing (10), and hose assembly (1) from transmission oil cooler. Discard lockwashers and preformed packing.
- 6 Remove screw (11) and clamp (12) securing hose assembly (1) to transmission.



07ph038m

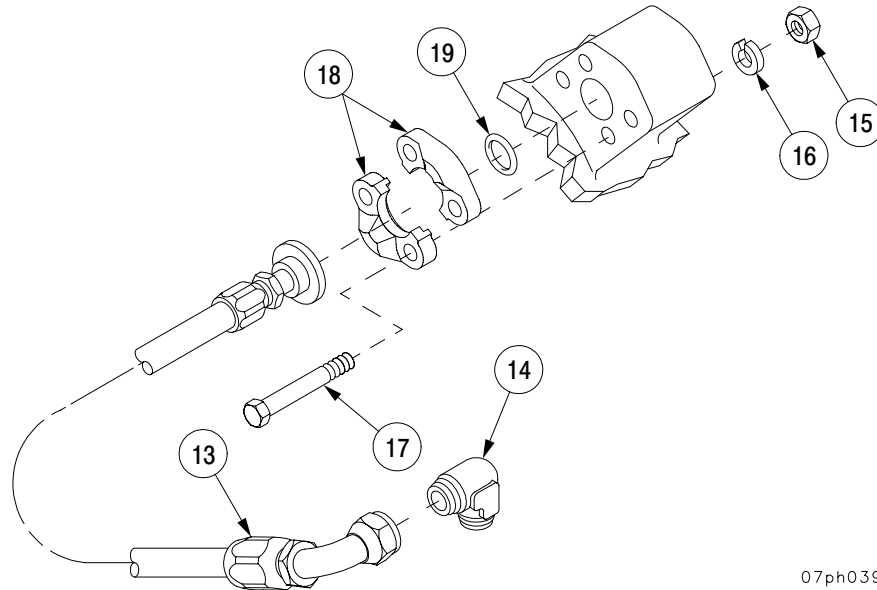


**Section II. TRANSMISSION ASSEMBLY AND ASSOCIATED PARTS – CONTINUED**

**9-9 TRANSMISSION OIL LINES AND OIL SAMPLING VALVE – CONTINUED**

**a. Removal – Continued**

- 7 Remove hose assembly (13) from elbow (14).
- 8 Remove elbow (14) from transmission.
- 9 Remove four nuts (15), four lockwashers (16), four screws (17), split flange (18), preformed packing (19), and hose assembly (13) from transmission oil cooler. Discard lockwashers and preformed packing.



07ph039m

- 10 Remove screw (20), lockwasher (21), and clamps (22 and 23) from hose assembly (24). Discard lockwasher.
- 11 Remove hose assembly (24) from adapter (25) and adapter (26).
- 12 Remove adapter (25) and bushing (27) from transmission.
- 13 Remove adapter (26) and transmission oil sampling valve (28) from bracket (29).
- 14 Remove two screws (30), two lockwashers (31), and bracket (29) from transmission. Discard lockwashers.
- 15 Remove transmission oil pressure transmitter (32) and transmission oil low pressure switch (33) (para 8-45).
- 16 Remove tee (34) and bushing (35) from transmission.

---

**Section II. TRANSMISSION ASSEMBLY AND ASSOCIATED PARTS – CONTINUED**

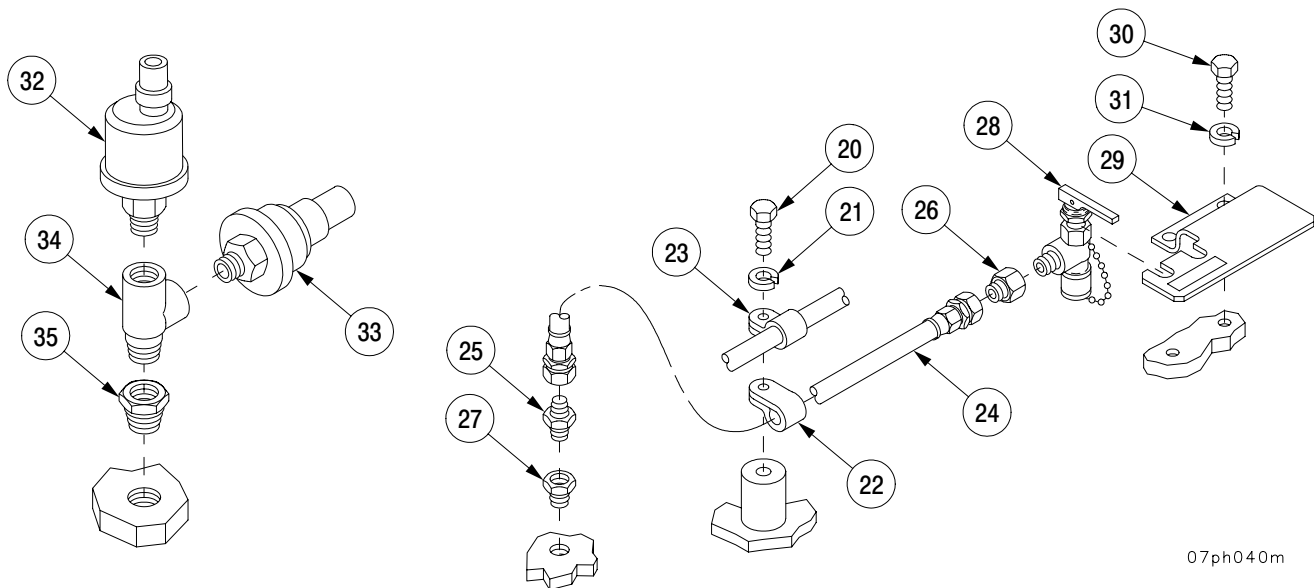

---

**9-9 TRANSMISSION OIL LINES AND OIL SAMPLING VALVE – CONTINUED**


---

**b. Installation.**

- 1 Install bushing (35) and tee (34) in transmission.
- 2 Install transmission oil low pressure switch (33) and transmission oil pressure transmitter (32) (para 8-45).
- 3 Install bracket (29) on transmission with two screws (30) and two new lockwashers (31).
- 4 Install transmission oil sampling valve (28) and adapter (26) on bracket (29).
- 5 Install bushing (27) and adapter (25) in transmission.
- 6 Install hose assembly (24) on adapters (26 and 25).
- 7 Install clamp (22) on hose assembly (24) and secure clamps (22 and 23) with screw (20) and new lockwasher (21).



---

## Section II. TRANSMISSION ASSEMBLY AND ASSOCIATED PARTS – CONTINUED

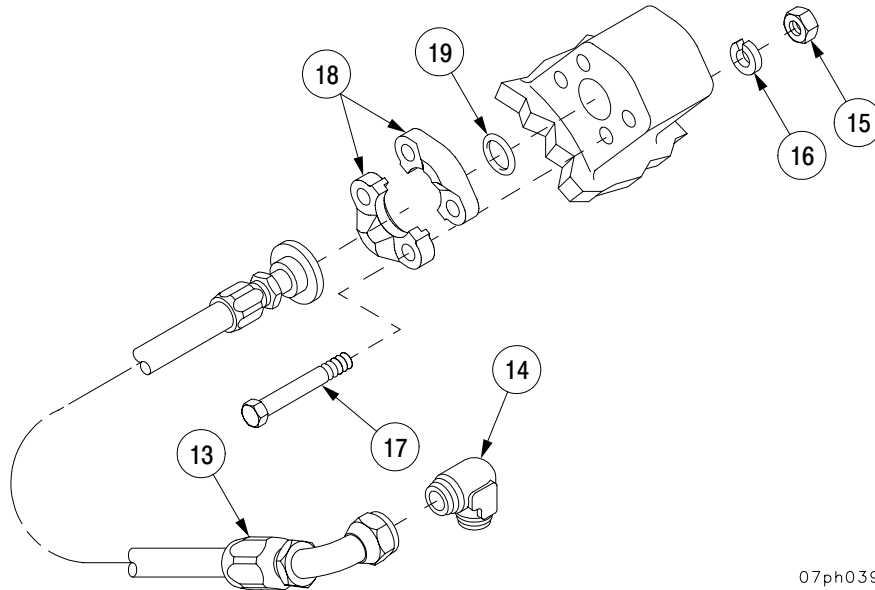
---

### 9-9 TRANSMISSION OIL LINES AND OIL SAMPLING VALVE – CONTINUED

---

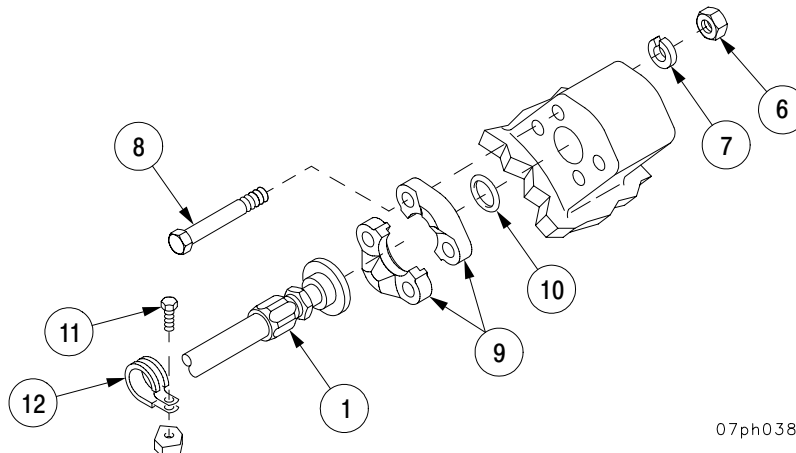
#### b. Installation – Continued

- 8 Install hose assembly (13) with new preformed packing (19), split flange (18), four screws (17), four new lockwashers (16), and four nuts (15) on transmission oil cooler.
- 9 Install elbow (14) in transmission.
- 10 Install hose assembly (13) on elbow (14).



07ph039m

- 11 Install hose assembly (1) with new preformed packing (10), split flange (9), four screws (8), four new lockwashers (7), and four nuts (6) on transmission oil cooler.
- 12 Secure hose assembly (1) to transmission with clamp (12) and screw (11).



07ph038m

---

**Section II. TRANSMISSION ASSEMBLY AND ASSOCIATED PARTS – CONTINUED**

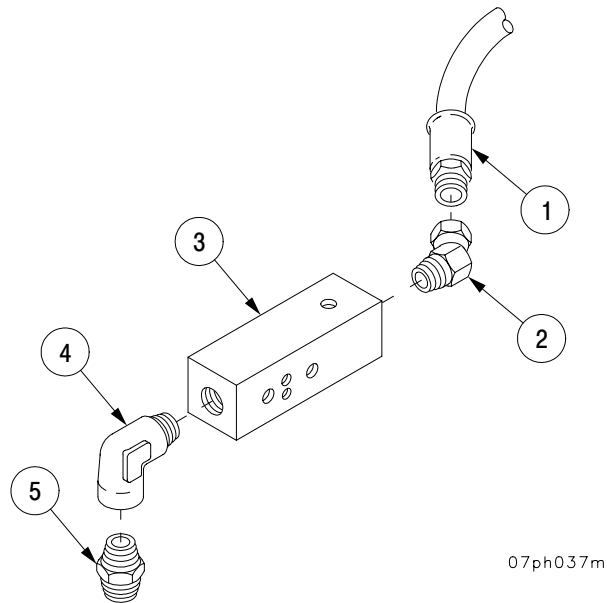
---

**9-9 TRANSMISSION OIL LINES AND OIL SAMPLING VALVE – CONTINUED**

---

**b. Installation – Continued**

- 13 Install nipple (5) and elbow (4) in transmission.
- 14 Install manifold (3) on elbow (4).
- 15 Install elbow (2) on manifold (3).
- 16 Install hose assembly (1) on elbow (2).

**NOTE****FOLLOW-ON MAINTENANCE:**

- Install generator oil cooling hose and fitting (para 8-10)
- Install engine oil sampling valve (para 4-6)
- Install transmission oil temperature transmitter and transmission oil high temperature switch (para 8-45)
- Install powerpack (required for transmission oil lines) (para 4-1)
- Install protective cover (para 9-8)
- Close and secure transmission access doors (TM 9-2350-314-10)

# CHAPTER 10

## TRANSFER AND FINAL DRIVE ASSEMBLIES

---

### GENERAL

This chapter illustrates and defines procedures for removal, disassembly, inspection, assembly, and installation of the final drive assemblies and related components.

---

### CONTENTS

	<u>Page</u>
10-1 FINAL DRIVE BREATHER TUBES AND BREATHER .....	10-2
10-2 FINAL DRIVE ASSEMBLY .....	10-4
10-3 FINAL DRIVE HUB, QUICK-DISCONNECT, AND COUPLING ASSEMBLY .....	10-9



## 10-1 FINAL DRIVE BREATHER TUBES AND BREATHER.

---

This task covers:

a. Removal

b. Installation

---

### INITIAL SETUP

#### Tools

General mechanic's tool kit  
(SC 5180-90-N26)

Hand tube flaring tool (item 20, Appx F)

#### Materials/Parts

Lockwasher (item 9, Appx E)

#### Equipment Conditions

Vehicle MASTER switch

OFF (TM 9-2350-314-10)

Transmission access doors  
open (TM 9-2350-314-10)

#### References

TM 9-2350-314-10

---

### a. Removal.

#### NOTE

- Task is applicable to either final drive assembly.
- Discard tube and fittings only if damaged.

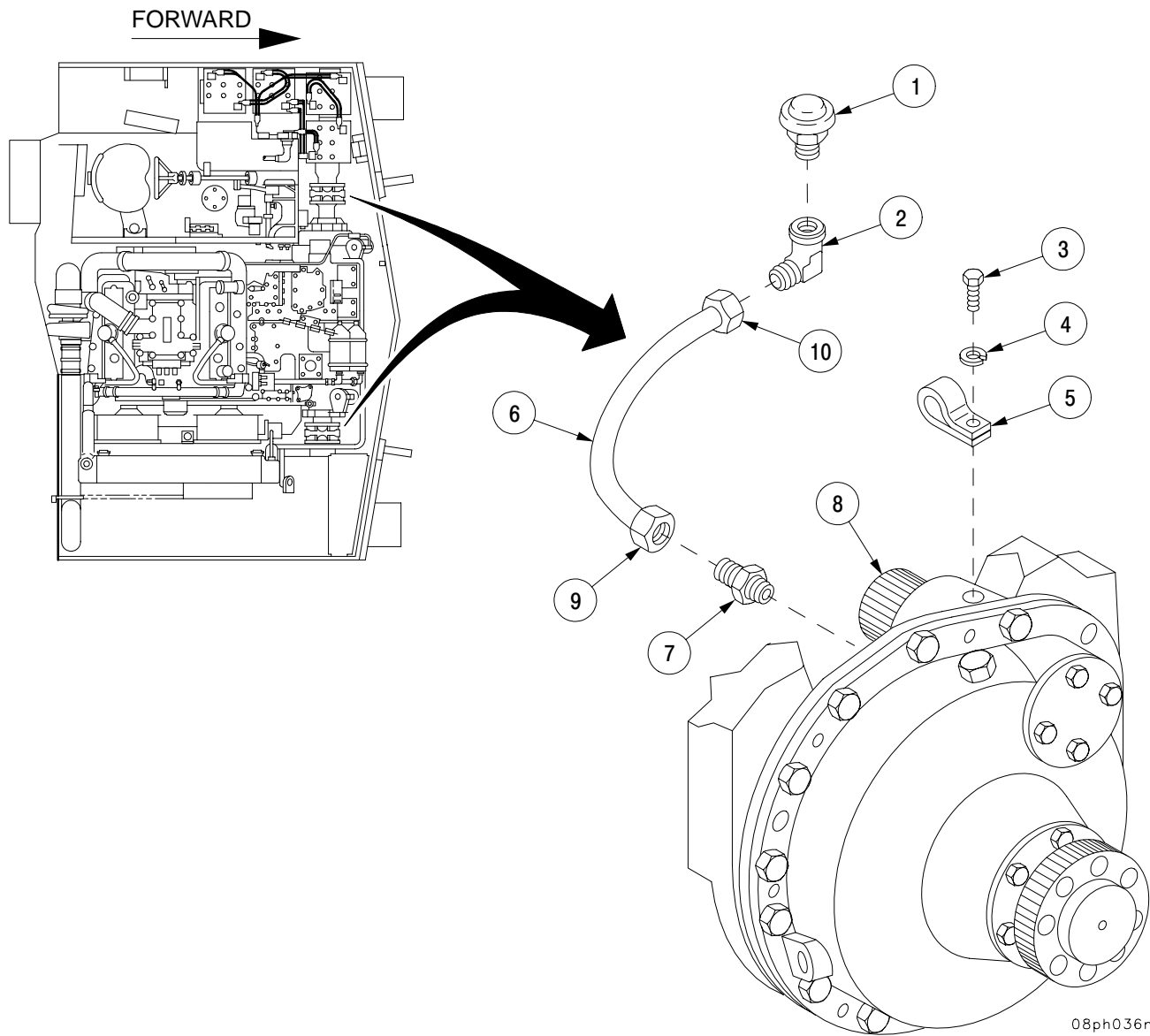
- 1 Remove breather (1) from elbow (2).
- 2 Remove screw (3), lockwasher (4), and clamp (5) securing breather tube (6). Discard lockwasher.
- 3 Remove breather tube (6) from adapter (7).
- 4 Remove adapter (7) from final drive assembly (8).

### b. Installation.

- 1 Install new adapter nut (9) on breather tube (6) using hand tube flaring tool.
- 2 Install new adapter (7) in final drive assembly (8).
- 3 Install new elbow nut (10) on breather tube (6) using hand tube flaring tool.
- 4 Install new elbow (2) and clamp (5) on breather tube (6).
- 5 Install breather tube (6) on adapter (7).
- 6 Secure clamp (5) with screw (3) and new lockwasher (4).
- 7 Install breather (1) on elbow (2).

10-1 FINAL DRIVE BREATHER TUBES AND BREATHER – CONTINUED

b. Installation – Continued



**NOTE**

**FOLLOW-ON MAINTENANCE:**

Close and secure transmission access doors  
(TM 9-2350-314-10)

## 10-2 FINAL DRIVE ASSEMBLY.

---

This task covers:    a. Removal                    b. Inspection                    c. Installation

---

### **INITIAL SETUP**

#### Tools

General mechanic's tool kit  
(SC 5180-90-N26)  
Eyebolt (item 6, Appx F)  
Final drive lifting sling (item 61, Appx F)  
Guide pins (2) (item 41, Appx F)  
Torque wrench (item 87, Appx F)

#### Materials/Parts

Primer coating (item 43, Appx C)  
Lockwashers (14) (item 31, Appx E)  
Lockwashers (12) (item 3, Appx E)  
Gasket (item 289, Appx E)  
Self-locking nuts (5) (item 92, Appx E)

#### Equipment Conditions

Vehicle MASTER switch OFF  
(TM 9-2350-314-10)  
Final drive sprocket and hub removed  
(para 12-12)  
Final drive breather tubes and breather  
removed (para 10-1)  
Final drive coupling disconnected  
(para 10-3)

#### Personnel Required

Two

#### References

TM 9-2350-314-10

---

### **a. Removal.**

#### **NOTE**

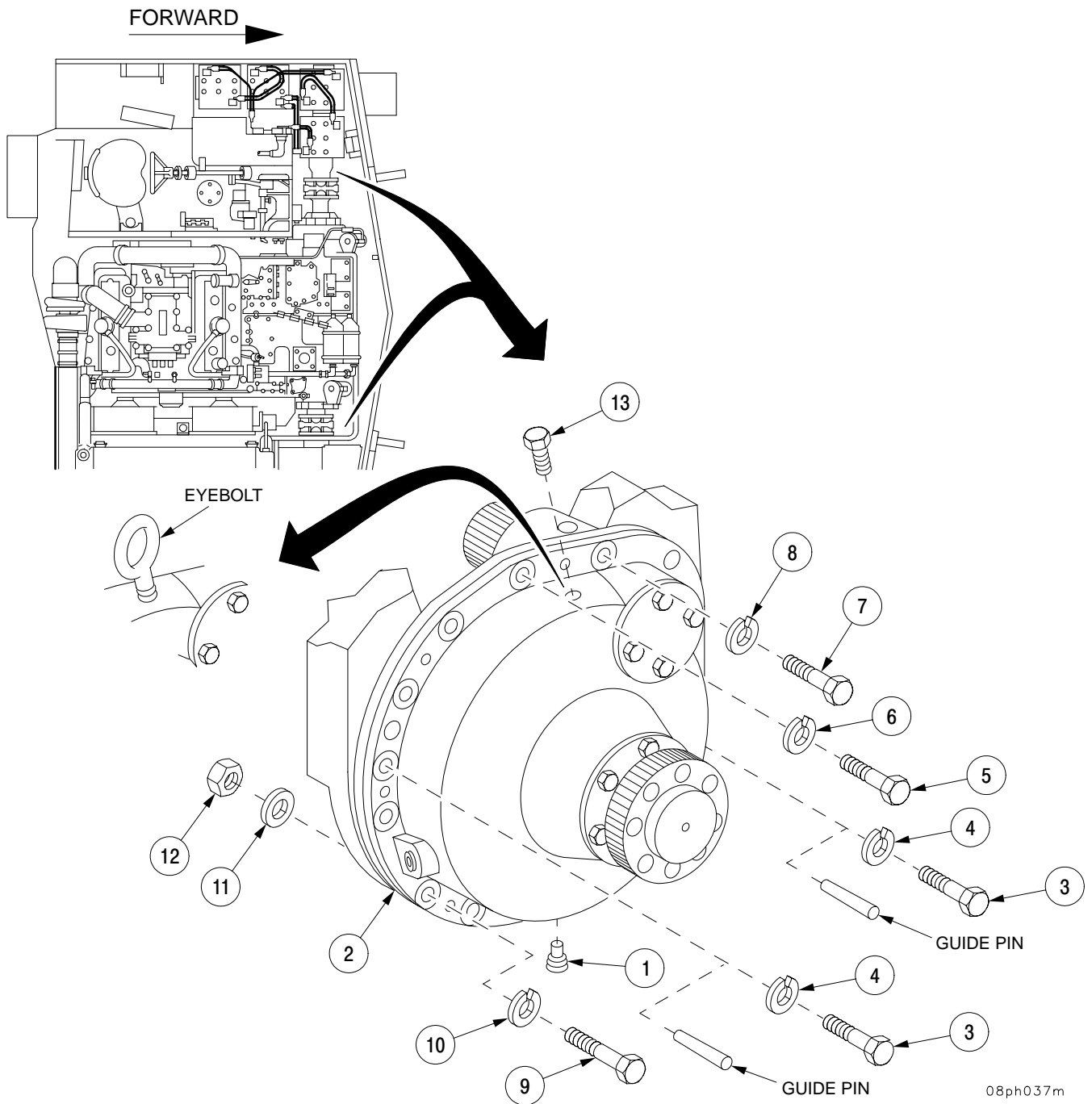
Final drive and bearing retaining nut may be inspected while installed in the vehicle. Refer to inspection procedure.

- 1 Remove drain plug (1) and drain oil from final drive assembly (2).
- 2 Remove two screws (3) and two lockwashers (4). Discard lockwashers.
- 3 Install two guide pins in screw (3) holes.
- 4 Remove six screws (5) and six lockwashers (6). Leave top screw (7) and lockwasher (8) in place. Discard lockwashers.
- 5 Remove five screws (9), five lockwashers (10), five flat washers (11), and five self-locking nuts (12). Discard lockwashers and self-locking nuts.
- 6 Remove capscrew (13) at top of final drive assembly (2) and install lifting eyebolt.
- 7 Attach lifting sling to eyebolt and to hoist.
- 8 Remove top screw (7) and lockwasher (8). Discard lockwasher.
- 9 Slide final drive assembly (2) away from vehicle using lifting sling.
- 10 Remove two guide pins, lifting sling, and eyebolt.



## 10-2 FINAL DRIVE ASSEMBLY – CONTINUED

### a. Removal – Continued



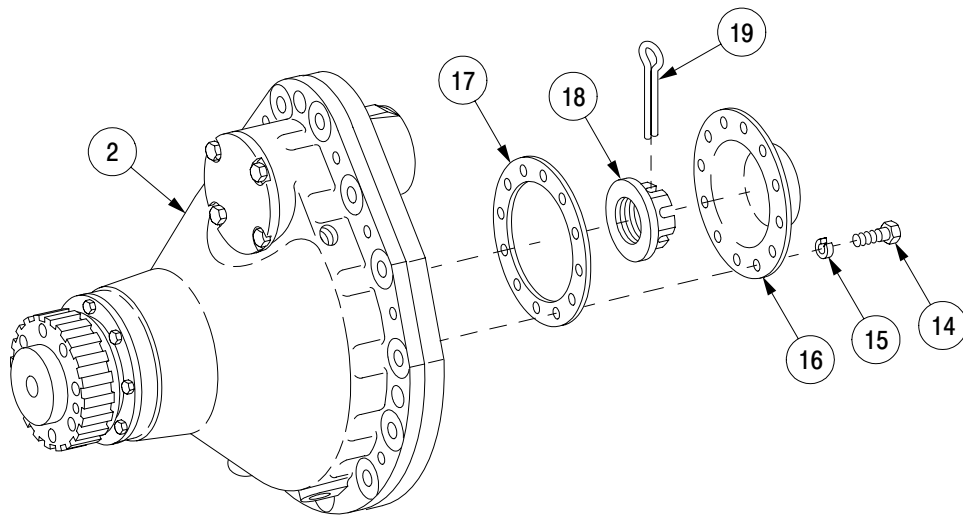
---

## 10-2 FINAL DRIVE ASSEMBLY – CONTINUED

---

### b. Inspection.

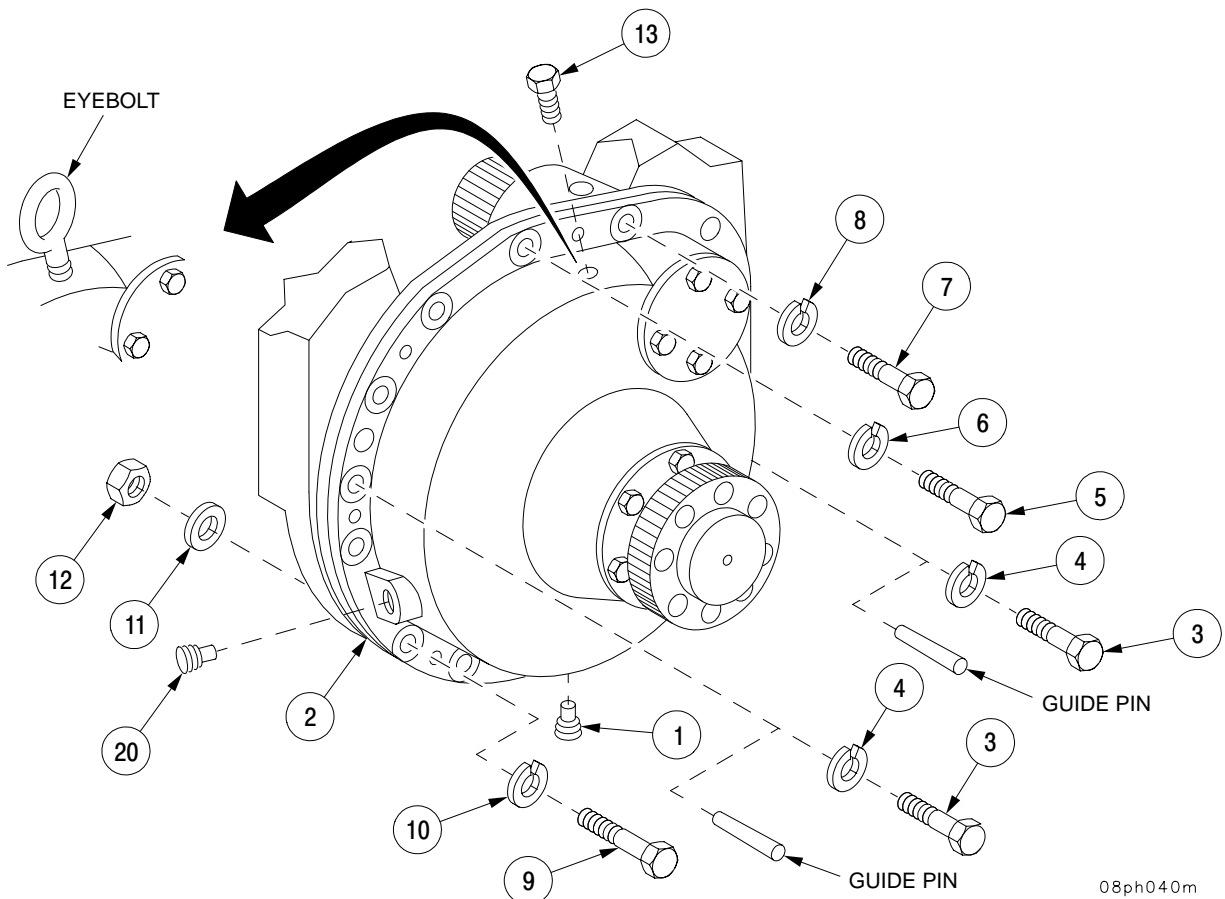
- 1 Remove 12 screws (14), 12 lockwashers (15), end cover (16), and gasket (17). Discard lockwashers and gasket.
- 2 Inspect retaining nut (18). If there are any visual signs of loose nut (18) or sheared cotter pin (19), remove and replace final drive assembly (2). Notify support maintenance.
- 3 Install new gasket (17) and end cover (16) with 12 new lockwashers (15) and 12 screws (14).



## 10-2 FINAL DRIVE ASSEMBLY – CONTINUED

### c. Installation.

- 1 Install guide pins.
- 2 Coat contact surfaces of hull and final drive assembly (2) with primer before installation.
- 3 Install eyebolt and lifting sling on final drive assembly (2). Slide final drive assembly (2) over guide pins.
- 4 Install top screw (7), new lockwasher (8), bottom screw (9), new lockwasher (10), flat washer (11), and new self-locking nut (12) near bottom of final drive assembly (2).
- 5 Remove guide pins, lifting eyebolt, and lifting sling.
- 6 Install remaining four screws (9), four new lockwashers (10), four flat washers (11), and four new self-locking nuts (12).
- 7 Torque five screws (9) to 290–300 ft-lb (393–407 N-m).
- 8 Install six screws (5) and six new lockwashers (6) in final drive assembly (2).
- 9 Install two screws (3) and two new lockwashers (4) in final drive assembly (2).
- 10 Torque screws (7, 5, and 3) to 290–300 ft-lb (393–407 N-m).
- 11 Install capscrew (13) in final drive assembly (2).
- 12 Install drain plug (1). Remove fill plug (20) and fill final drive assembly (2) with lubricant (TM 9-2350-314-10).



08ph040m

## 10-2 FINAL DRIVE ASSEMBLY – CONTINUED

---

### c. Installation – Continued

#### **NOTE**

##### **FOLLOW-ON MAINTENANCE:**

Connect final drive coupling (para 10-3)

Install final drive breather tubes and breather  
(para 10-1)

Install final drive sprocket and hub  
(para 12-12)

---

**10-3 FINAL DRIVE HUB, QUICK-DISCONNECT, AND COUPLING ASSEMBLY.**

---

This task covers:      a. Removal      b. Disassembly      c. Assembly      d. Installation

---

**INITIAL SETUP**Tools

General mechanic's tool kit  
(SC 5180-90-N26)  
Wire twisting pliers (item 43, Appx F)  
Torque wrench (item 86, Appx F)

Materials/Parts

Lockwire (item 310, Appx E)  
Lockwire (item 311, Appx E)  
Lockwire (item 312, Appx E)  
Sealing compound (item 53, Appx C)  
Lubricating oil (item 32, Appx C)

Equipment Conditions

Tracks blocked (TM 9-2350-314-10)  
Vehicle MASTER switch OFF  
(TM 9-2350-314-10)  
Transmission access doors opened  
(TM 9-2350-314-10)  
Speedometer angle drive and VMS drive cable  
removed (right coupling assembly only)  
(para 20-1)

Personnel Required

Two

References

TM 9-2350-314-10

**WARNING**

Track must be blocked so that the vehicle will not roll out of control. When coupling assembly is disconnected, vehicle is without brakes. Failure to securely block vehicle tracks may result in severe injury to personnel or equipment damage.

## 10-3 FINAL DRIVE HUB, QUICK-DISCONNECT, AND COUPLING ASSEMBLY – CONTINUED

---

### a. Removal.

#### NOTE

- If service to quick disconnect is not required, care must be taken not to turn clevis nuts while handling quick disconnect assembly.
- Procedure is the same for both right and left coupling assemblies.

- 1 Remove two lockwires (1) and two screws (2). Discard lockwires.

#### NOTE

- Do not remove clevis nuts.
- With only one disconnect screw removed, a clevis pair will swing open enough to enable removal.

- 2 Loosen clevis nuts (3) as required to swing open and remove two clevis (4) pairs with attached hardware.

#### WARNING

Coupling assembly weighs 60 pounds. Two soldiers are required to lift it to prevent serious injury to personnel.

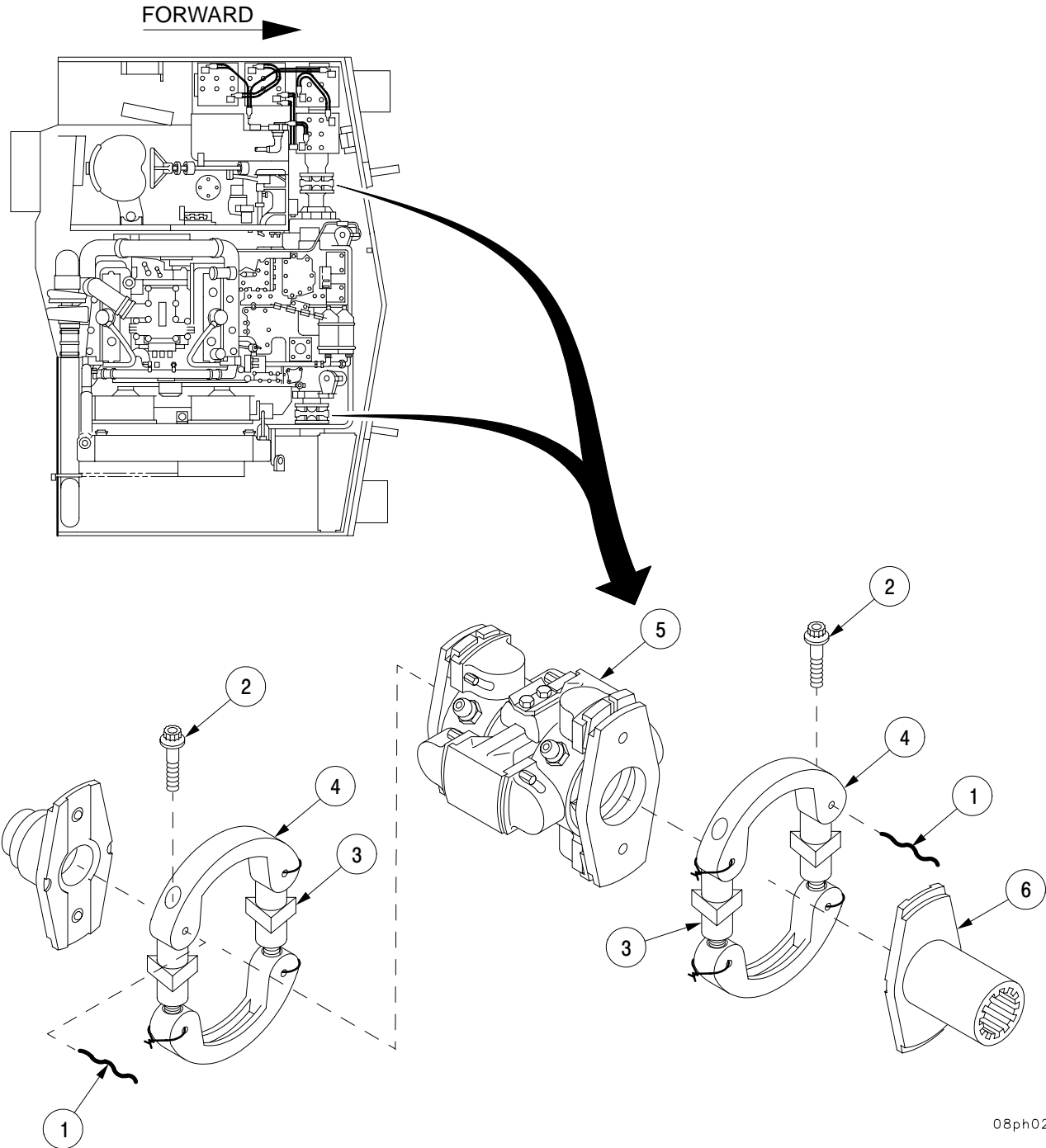
#### NOTE

If necessary, use pry bar to move final drive hub.

- 3 While supporting coupling assembly (5), slide final drive hub (6) toward final drive and remove coupling assembly (5).

**10-3 FINAL DRIVE HUB, QUICK-DISCONNECT, AND COUPLING ASSEMBLY – CONTINUED**

**a. Removal – Continued**



08ph029m

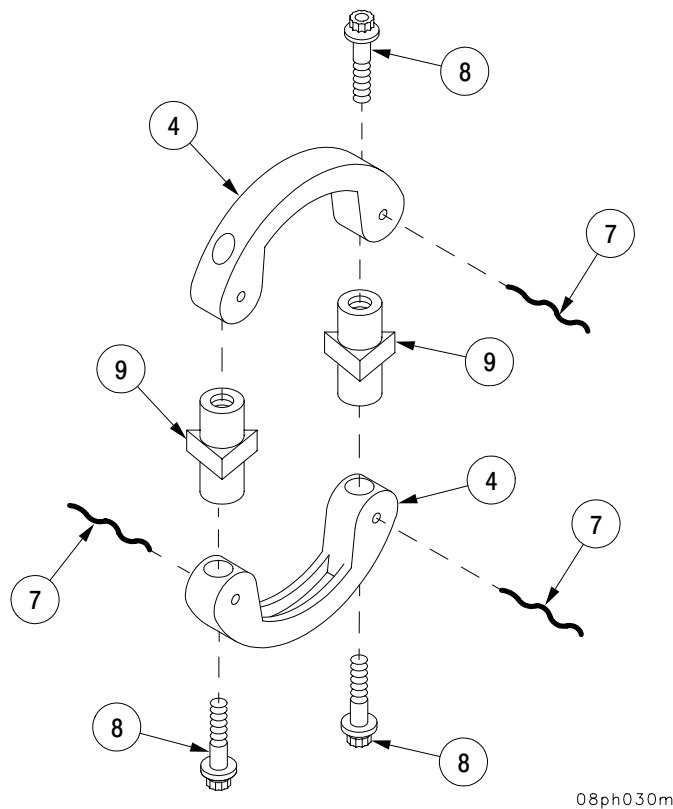
**10-3 FINAL DRIVE HUB, QUICK-DISCONNECT, AND COUPLING ASSEMBLY – CONTINUED**

**b. Disassembly.**

**NOTE**

- Perform step 1 for disassembly of each clevis pair.
- Perform steps 2 thru 6 for disassembly of coupling assembly.

1 Remove three lockwires (7), three screws (8), and two clevis nuts (9) from two clevises (4). Discard lockwires.



- 2 Remove four lockwires (10), eight machine bolts (11), and two hub adapters (12). Discard lockwires.
- 3 Remove four lockwires (13) and eight capscrews (14). Discard lockwires.
- 4 Separate two universal spider assemblies (15) from center plate (16).
- 5 Remove two lockwires (17), four screws (18), two bumper retainers (19) and two bumpers (20) from center plate (16). Discard lockwires.
- 6 Remove two grease fittings (21) from two spider assemblies (15).



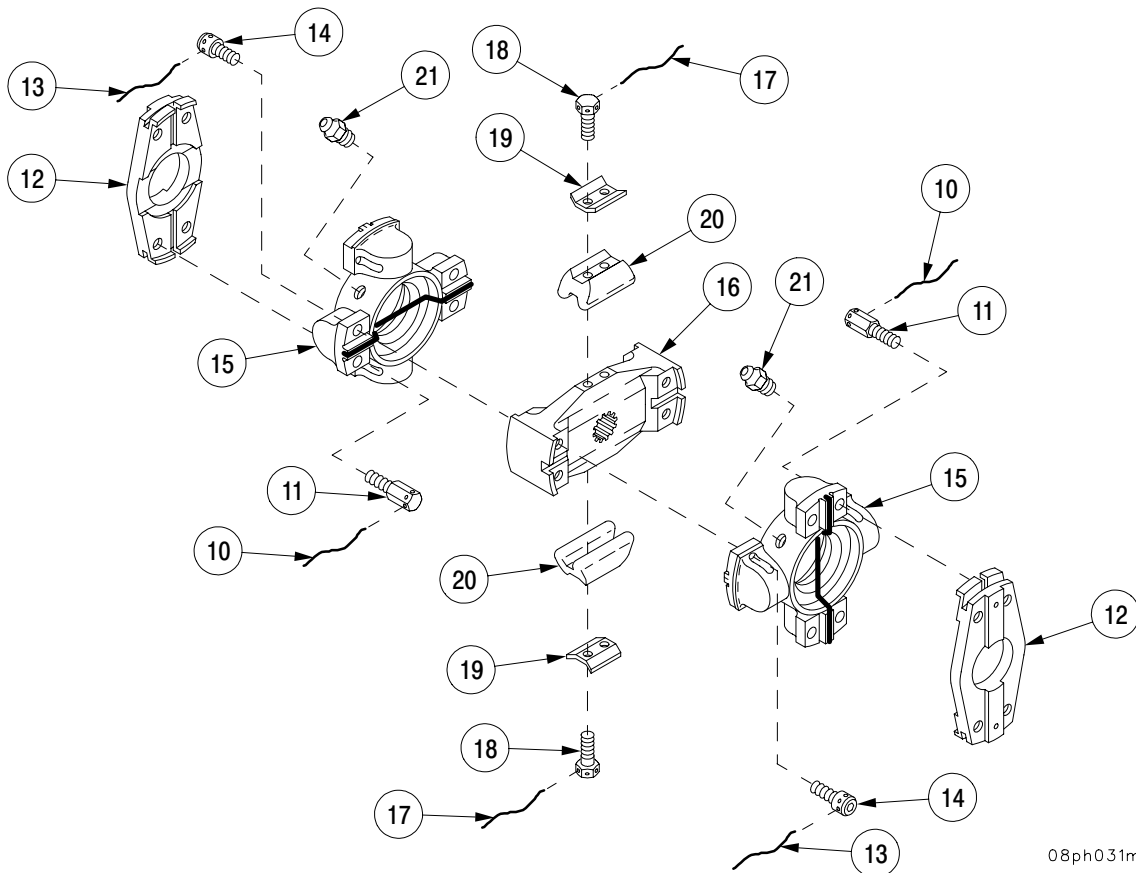
## 10-3 FINAL DRIVE HUB, QUICK-DISCONNECT, AND COUPLING ASSEMBLY – CONTINUED

### c. Assembly.

#### NOTE

- Perform steps 1 thru 5 for assembly of coupling assembly.
- Perform step 5 for assembly of each clevis pair.

- 1 Install two bumpers (20), two bumper retainers (19), four screws (18), and two new lockwires (17) onto center plate (16).
- 2 Connect two universal spider assemblies (15) to center plate (16).
- 3 Install eight capscrews (14). Torque screws to 85–95 lb–ft (115–129 N·m). Install four new lockwires (13).
- 4 Install two hub adapters (12) on two spider assemblies (15) with eight bolts (11). Torque bolts to 85–95 lb–ft (115–129 N·m). Secure with four new lockwires (10).
- 5 Install two grease fittings (21) in two spider assemblies (15).



### 10-3 FINAL DRIVE HUB, QUICK-DISCONNECT, AND COUPLING ASSEMBLY – CONTINUED

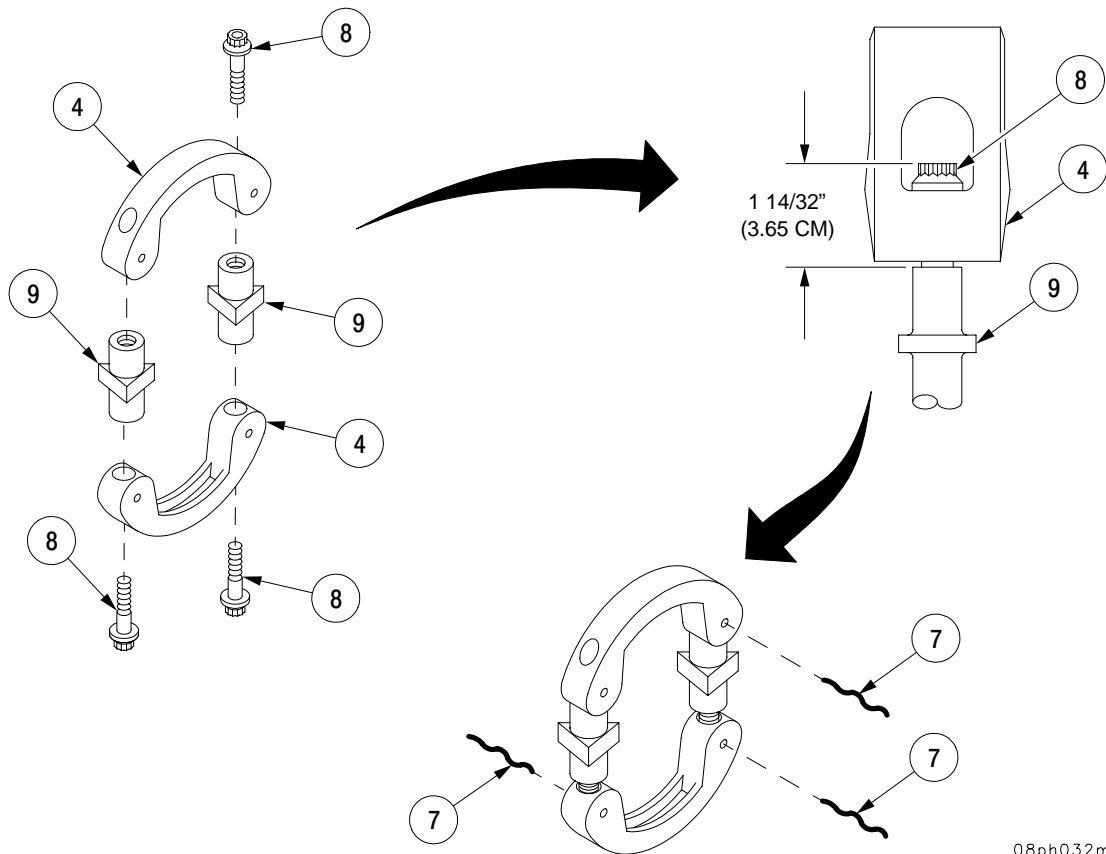
**c. Assembly – Continued**

- 6 Apply lubricant to threads of screws (8)
- 7 Connect two clevises (4) by loosely installing three screws (8) and two clevis nuts (9).

**CAUTION**

After establishing proper bolt engagement in clevis nuts, care **MUST** be taken not to turn clevis nuts during subsequent handling of quick-disconnect assembly.

- 8 Thread three screws (8) into clevis nuts (9) until the measured distance between the top of the bolt head and the clevis nut end is  $1 \frac{14}{32}$  in. (3.65 cm), as shown. Secure three screws (8) with new lock wires (7).



08ph032m

---

## 10-3 FINAL DRIVE HUB, QUICK-DISCONNECT, AND COUPLING ASSEMBLY – CONTINUED

---

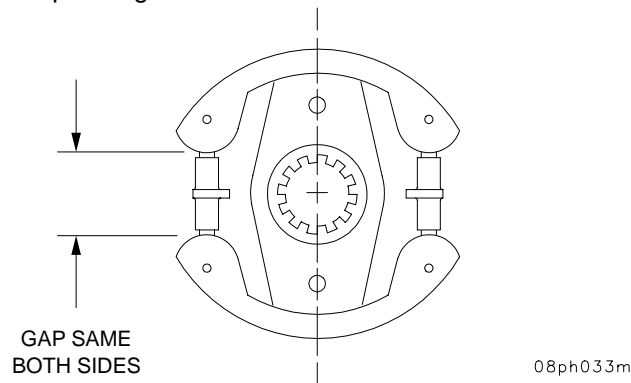
### d. Installation.

**WARNING**

Coupling joint assembly weighs 60 lbs (27.24 kg).  
Two soldiers are required to lift it to prevent serious  
injury to personnel.

### NOTE

- In order to ensure proper thread engagement, clevis nuts **MUST** be centered between the ends of the clevis clamps. If clevis nuts are not centered properly, sudden failure of the quick-disconnect may occur, resulting in unexpected steering of the vehicle and loss of control.
- Clevis clamps **MUST** be centered on hub adapters so the gap size between clevis clamp ends is approximately equal on both sides of the disconnect. Excessive gap on one side of the disconnect assembly can result in an unsafe operating condition.



- Do not turn clevis nuts while handling quick-disconnect assembly.
- If necessary, use a pry bar to move final drive hub.

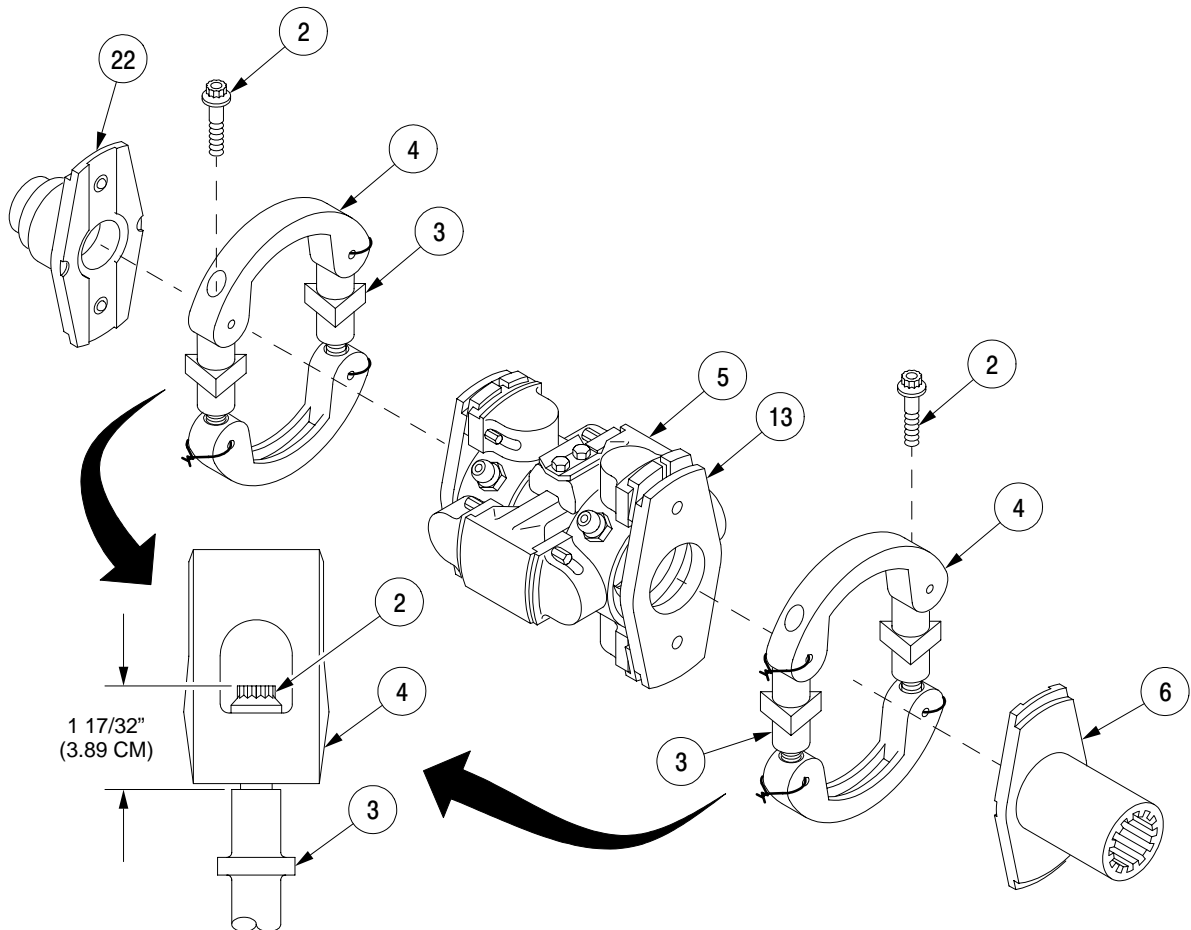
## 10-3 FINAL DRIVE HUB, QUICK-DISCONNECT, AND COUPLING ASSEMBLY – CONTINUED

### d. Installation – Continued

- 1 Install final drive hub (6) on final drive.
- 2 Apply lubricant to threads of screws (2) and holes in clamping clevises (4).
- 3 Position and align coupling assembly (5) between final drive hub (6) and transmission hub (22). Close gap by moving final drive hub (6). Secure with two clamping clevis pairs (4) and two screws (2). Torque two screws (2) to 37–42 lb–ft (50–57 N•m).
- 4 Using a ruler, measure the distance between the bolt head and clevis nut end of the two unwired screws (2), as shown.

### NOTE

Measure screw lengths. MUST be no more than 1 17/32 in. (3.89 cm). If the measured screws fail this specification, loosen or remove the quick-disconnect assembly from hub and hub adapter and repeat step 3. If problem continues to exist, pre-wired screws may be improperly adjusted.



08ph034m

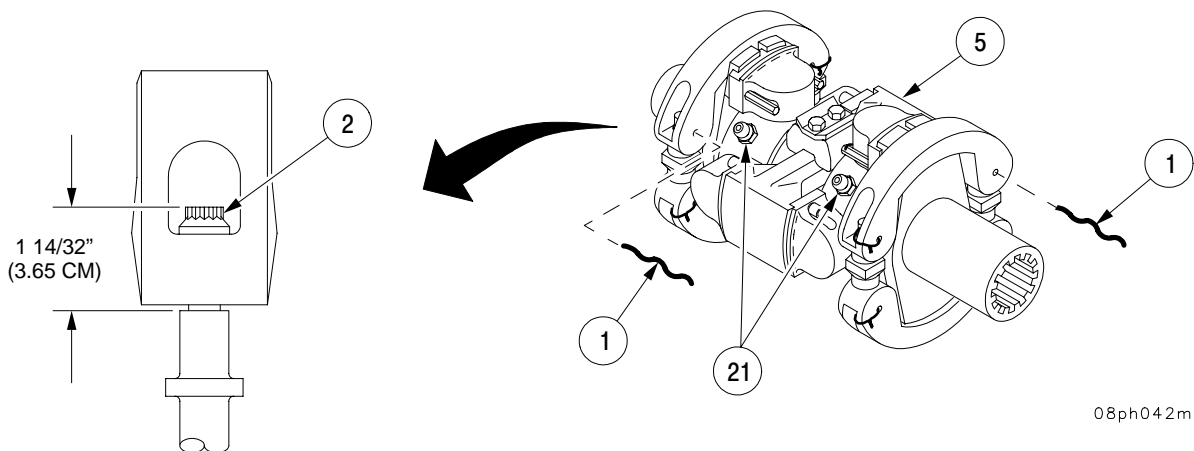
## 10-3 FINAL DRIVE HUB, QUICK-DISCONNECT, AND COUPLING ASSEMBLY – CONTINUED

### d. Installation – Continued

#### CAUTION

Using a ruler, remeasure the distance between the bolt head and clevis nut ends of the six pre-wired screws, para (c), step 7. Measured lengths should be approximately 1 14/32 in. (3.65 cm). If any distance is off more than  $\pm 2/32$  in. (.16 cm), quick-disconnect requires re-assembly.

- 5 Secure two unwired screws (2) with two new lockwires (1).
- 6 Lubricate two fittings (21) in coupling assembly (5) per TM 9-2350-314-10.



08ph042m

#### NOTE

##### FOLLOW-ON MAINTENANCE:

Install speedometer angle drive and VMS drive cable  
(right coupling assembly only) (para 20-1)  
Close and secure transmission access doors  
(TM 9-2350-314-10)  
Remove track blocks (TM 9-2350-314-10)

# CHAPTER 11

## BRAKES

---

### GENERAL

This chapter illustrates and defines procedures for removal, disassembly, assembly, installation, and adjustment of the hand brake and mechanical brake systems.

---

<u>CONTENTS</u>		<u>Page</u>
Section I.	HAND BRAKE	
11-1	BRAKE CONTROLS .....	11-2
11-2	PARKING BRAKE LINKAGE .....	11-4
11-3	PARKING BRAKE WARNING SWITCH .....	11-8
Section II.	MECHANICAL BRAKE SYSTEM	
11-4	BRAKE PEDAL AND PARKING BRAKE ASSEMBLY .....	11-10
11-5	SERVICE BRAKE LINKAGE .....	11-18
11-6	STOPLIGHT SWITCH .....	11-20

## Section I. HAND BRAKE

---

### 11-1 BRAKE CONTROLS.

---

This task covers: Adjustment

---

#### INITIAL SETUP

##### Tools

General mechanic's tool kit  
(SC 5180-90-N26)

##### Materials/Parts

Cotter pin (item 8, Appx E)  
Lockwashers (2) (item 9, Appx E)

##### Equipment Conditions

Vehicle on level surface with tracks blocked  
(TM 9-2350-314-10)  
Parking brake released  
(TM 9-2350-314-10)  
Transmission access doors open  
(TM 9-2350-314-10)

##### References

TM 9-2350-314-10

---

#### WARNING

Tracks must be blocked so that the vehicle will not roll out of control when the brake linkage is disconnected. Failure to block tracks may result in severe injury to personnel or equipment damage.

#### NOTE

If brakes cannot be adjusted with this procedure, refer to para 9-4 "Transmission Internal Brake" adjustment.

#### Adjustment.

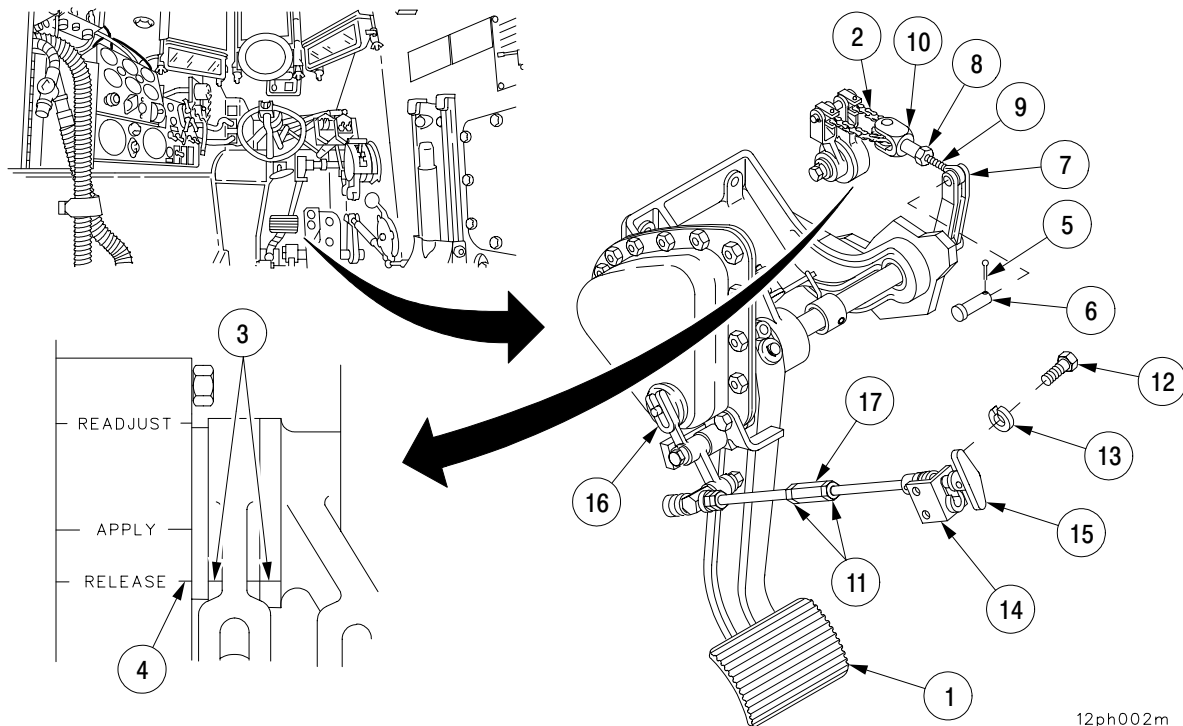
- 1 With brake pedal (1) fully raised, check for slack in chain (2) and alignment of brake lever index marks (3) with RELEASE mark (4). If index marks are aligned and no slack is present, go to step 7.
- 2 Remove cotter pin (5) and headed pin (6) from lever (7). Discard cotter pin.
- 3 Loosen nut (8) and adjust rod end (9) in clevis (10) until all slack is removed from chain (2) and holes in rod end (9) and lever (7) are aligned, and brake lever index marks (3) are at RELEASE mark (4).
- 4 Secure rod end (9) to lever (7) with headed pin (6) and new cotter pin (5).
- 5 Tighten nut (8) against clevis (10).
- 6 Loosen two nuts (11).
- 7 Remove two screws (12) and two lockwashers (13) from attaching bracket (14). Discard lockwashers.

## Section I. HAND BRAKE – CONTINUED

### 11-1 BRAKE CONTROLS – CONTINUED

#### Adjustment – Continued

- 8 With parking brake handle (15) in unlocked position and no pressure on bellcrank (16), turn nut (17) in either direction until holes in bracket (14) align with mating holes in hull.
- 9 Attach bracket (14) with two screws (12) and two new lockwashers (13).
- 10 Tighten two nuts (11) against nut (17).
- 11 Fully depress brake pedal (1) and pull back on handle (15) to lock parking brake. Remove foot from brake pedal. Brake should stay locked.



12ph002m

#### NOTE

#### FOLLOW-ON MAINTENANCE:

- Close transmission access doors  
(TM 9-2350-314-10)
- Adjust parking brake warning switch  
(para 11-3)
- Adjust stoplight switch (para 11-6)



## Section I. HAND BRAKE – CONTINUED

---

### 11-2 PARKING BRAKE LINKAGE.

---

This task covers:    a. Removal                    b. Disassembly                    c. Assembly                    d. Installation

---

#### **INITIAL SETUP**

##### Tools

General mechanic's tool kit  
(SC 5180-90-N26)

##### Equipment Conditions

Vehicle on level surface with tracks blocked  
(TM 9-2350-314-10)

##### Materials/Parts

Lockwashers (2) (item 9, Appx E)  
Lockwashers (2) (item 3, Appx E)  
Spring pins (2) (item 10, Appx E)  
Cotter pin (item 11, Appx E)

##### References

TM 9-2350-314-10

---

#### **a. Removal.**

#### **WARNING**

Tracks must be blocked so that vehicle will not roll out of control when brake linkage is disconnected. Failure to block tracks may result in severe injury to personnel or equipment damage.

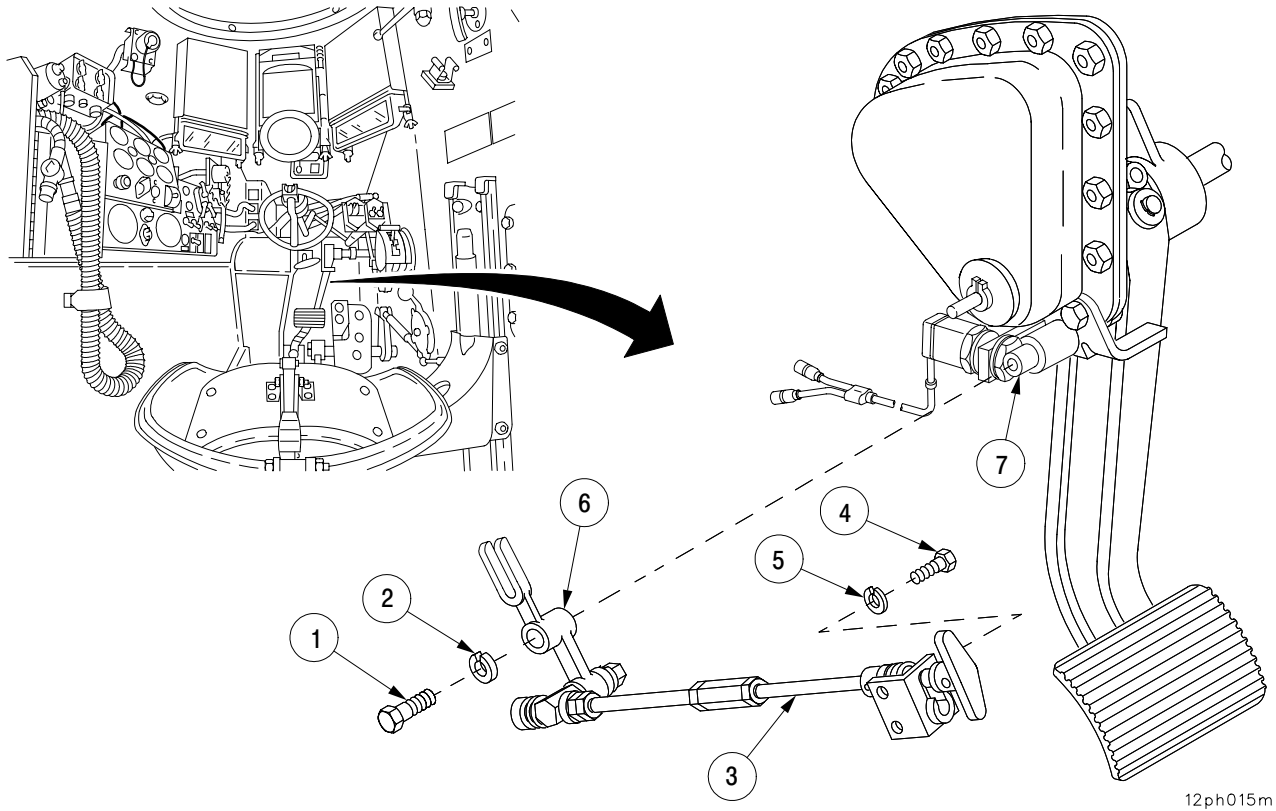
- 1 Remove screw (1) and lockwasher (2). Discard lockwasher.
- 2 Support parking brake linkage (3) and remove two screws (4) and two lockwashers (5). Discard lockwashers.

**Section I. HAND BRAKE – CONTINUED**

**11-2 PARKING BRAKE LINKAGE – CONTINUED**

**a. Removal – Continued**

- 3 Remove bellcrank (6) from bracket spindle (7) and remove parking brake linkage (3).



12ph015m

**Section I. HAND BRAKE – CONTINUED**

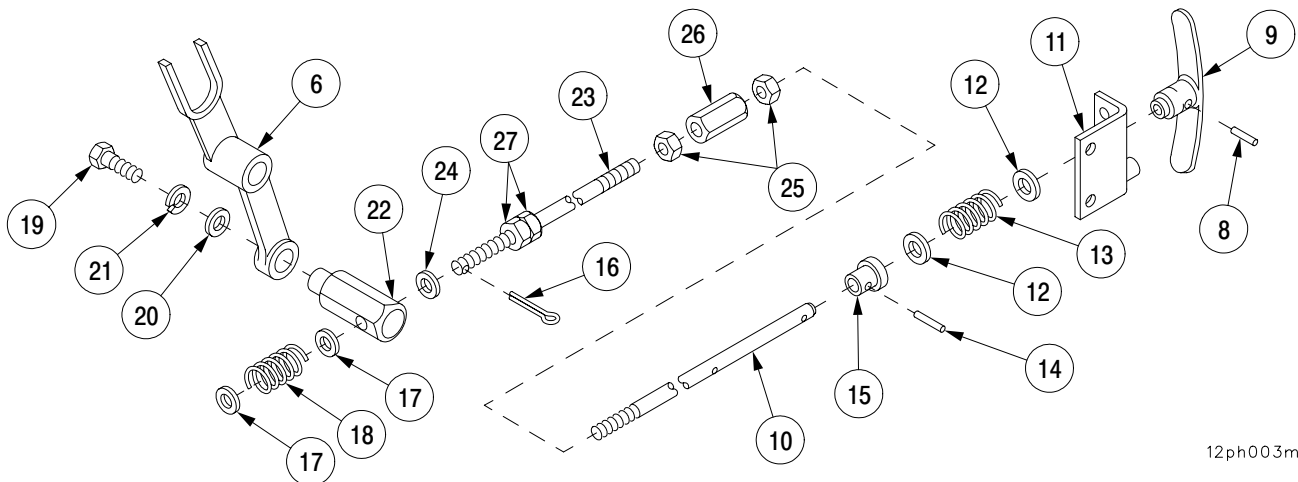
**11-2 PARKING BRAKE LINKAGE – CONTINUED**

**b. Disassembly.**

- 1 Remove spring pin (8) and T-handle (9) from rod (10). Discard spring pin.
- 2 Remove bracket (11), two flat washers (12), and spring (13).
- 3 Remove spring pin (14) and collar (15). Discard spring pin.
- 4 Remove cotter pin (16), two flat washers (17), and spring (18). Discard cotter pin.
- 5 Remove screw (19), flat washer (20), lockwasher (21), bellcrank (6), and rod guide (22) from rod (23). Discard lockwasher.
- 6 Remove flat washer (24).
- 7 Loosen two nuts (25) and separate two rods (10 and 23) from nut (26).
- 8 Remove four nuts (25 and 27) from two rods (10 and 23).

**c. Assembly.**

- 1 Install four nuts (25 and 27) on two rods (10 and 23).
- 2 Install nut (26) on two rods (10 and 23). Tighten two nuts (25) against nut (26).
- 3 Install flat washer (24), rod guide (22), two flat washers (17), spring (18), and new cotter pin (16).
- 4 Install bellcrank (6) on rod guide (22) with screw (19), new lockwasher (21), and flat washer (20).
- 5 Install collar (15) on rod (10) with new spring pin (14).
- 6 Install two flat washers (12), spring (13), and bracket (11).
- 7 Install T-handle (9) on rod (10) with new spring pin (8).



12ph003m

---

**Section I. HAND BRAKE – CONTINUED**

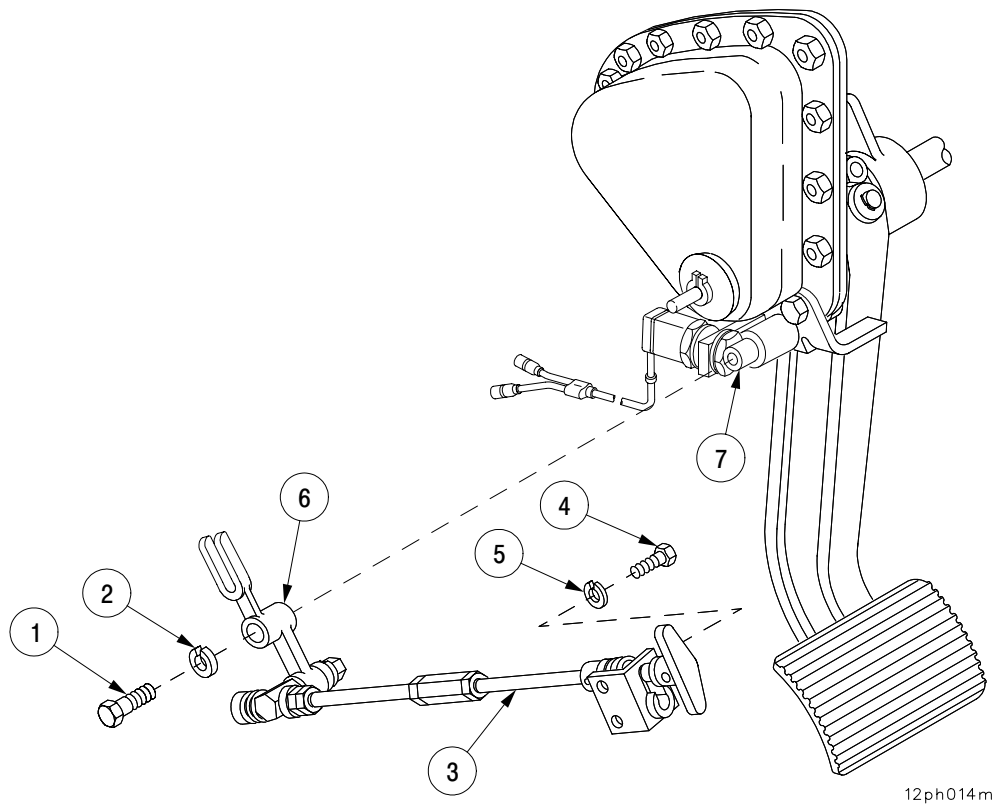
---

**11-2 PARKING BRAKE LINKAGE – CONTINUED**

---

**d. Installation.**

- 1 Install bellcrank (6) on bracket spindle (7).
- 2 Install parking brake linkage (3) with two screws (4) and two new lockwashers (5).
- 3 Install screw (1) and new lockwasher (2).

**NOTE**

**FOLLOW-ON MAINTENANCE:**  
Adjust brake controls (para 11-1)

**Section I. HAND BRAKE – CONTINUED**

**11-3 PARKING BRAKE WARNING SWITCH.**

This task covers: a. Removal b. Installation c. Adjustment

**INITIAL SETUP**

Tools

General mechanic's tool kit  
(SC 5180-90-N26)

Equipment Conditions

Vehicle MASTER switch OFF  
(TM 9-2350-314-10)

Materials/Parts

Lockwasher (item 12, Appx E)

References

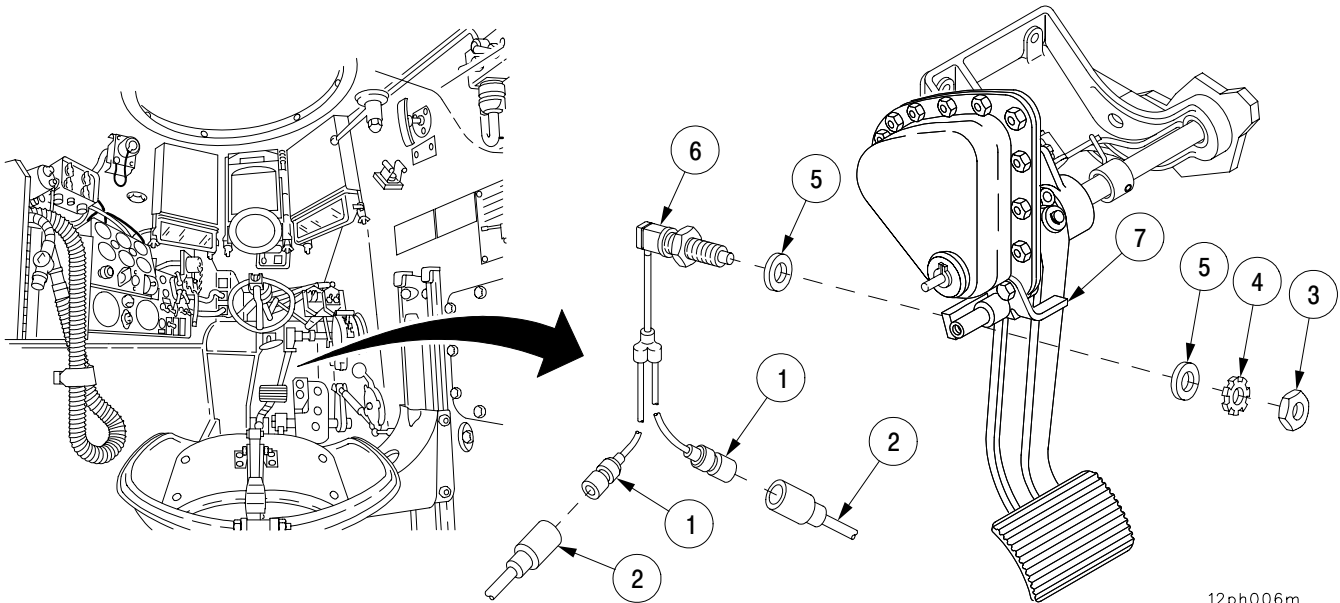
TM 9-2350-314-10

**a. Removal.**

- 1 Disconnect two parking brake electrical leads (1) from two wiring harness W114 wires 509E (2).
- 2 Remove nut (3), lockwasher (4), two flat washers (5), and parking brake switch (6) from bracket (7). Discard lockwasher.

**b. Installation.**

- 1 Install parking brake switch (6) on bracket (7) with two flat washers (5), new lockwasher (4), and nut (3). Do not tighten nut.
- 2 Connect two wiring harness W114 wires 509E (2) to two parking brake electrical leads (1).



12ph006m

---

**Section I. HAND BRAKE – CONTINUED**

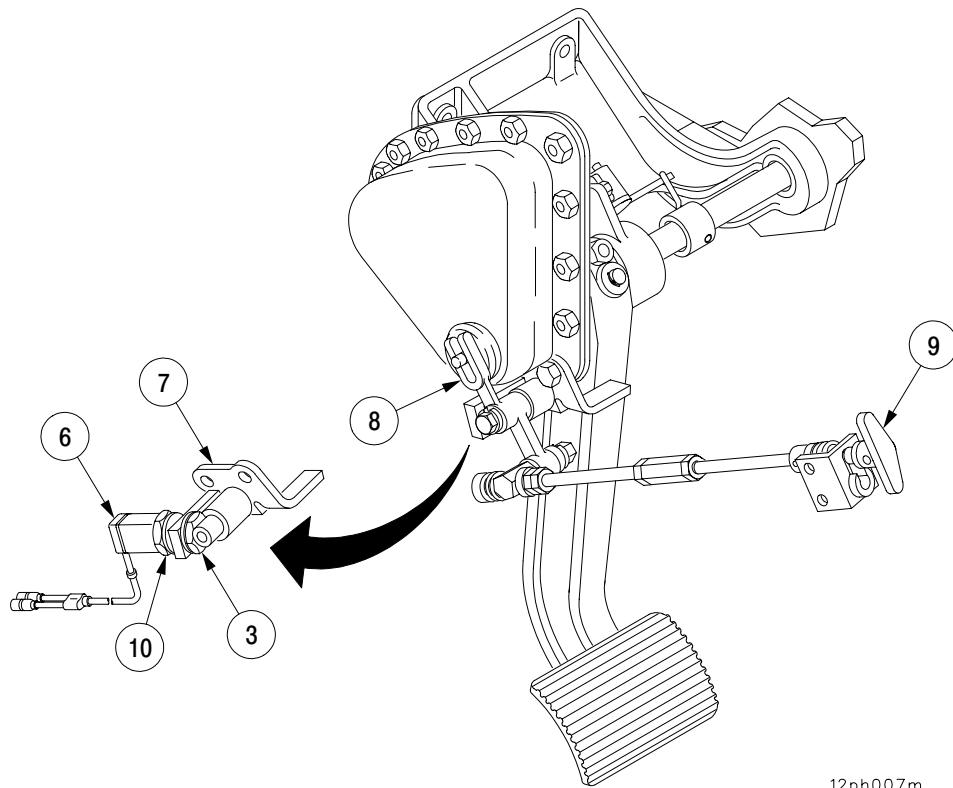
---

**11-3 PARKING BRAKE WARNING SWITCH – CONTINUED**

---

**c. Adjustment.**

- 1 Adjust position of parking brake switch (6) to obtain approximately 3/8-in. (9.5 mm) of movement of bellcrank (8) before parking brake light is energized when parking brake (9) is applied.
- 2 Tighten two nuts (3 and 10) against bracket (7).



12ph007m

## Section II. MECHANICAL BRAKE SYSTEM

---

### 11-4 BRAKE PEDAL AND PARKING BRAKE ASSEMBLY.

---

This task covers:    a. Removal                      b. Disassembly                      c. Assembly                      d. Installation

---

#### **INITIAL SETUP**

##### Tools

General mechanic's tool kit  
(SC 5180-90-N26)  
Snapping pliers (item 42, Appx F)

##### Materials/Parts

Lockwashers (6) (item 9, Appx E)  
Lockwashers (4) (item 3, Appx E)  
Cotter pins (2) (item 1, Appx E)  
Cotter pin (item 8, Appx E)  
Retaining ring (item 13, Appx E)  
Self-locking nut (item 14, Appx E)  
Self-locking nuts (3) (item 15, Appx E)  
Self-locking nuts (10) (item 16, Appx E)  
Gasket (item 17, Appx E)  
Nonmetallic seal (item 18, Appx E)  
Seal (item 19, Appx E)  
Lockwire (item 23, Appx E)

##### Equipment Conditions

Vehicle on level surface with tracks blocked  
(TM 9-2350-314-10)  
Vehicle MASTER switch OFF  
(TM 9-2350-314-10)  
Transmission access doors open  
(TM 9-2350-314-10)  
Parking brake linkage removed  
(para 11-2)

##### References

TM 9-2350-314-10

---

---

**Section II. MECHANICAL BRAKE SYSTEM – CONTINUED**

---

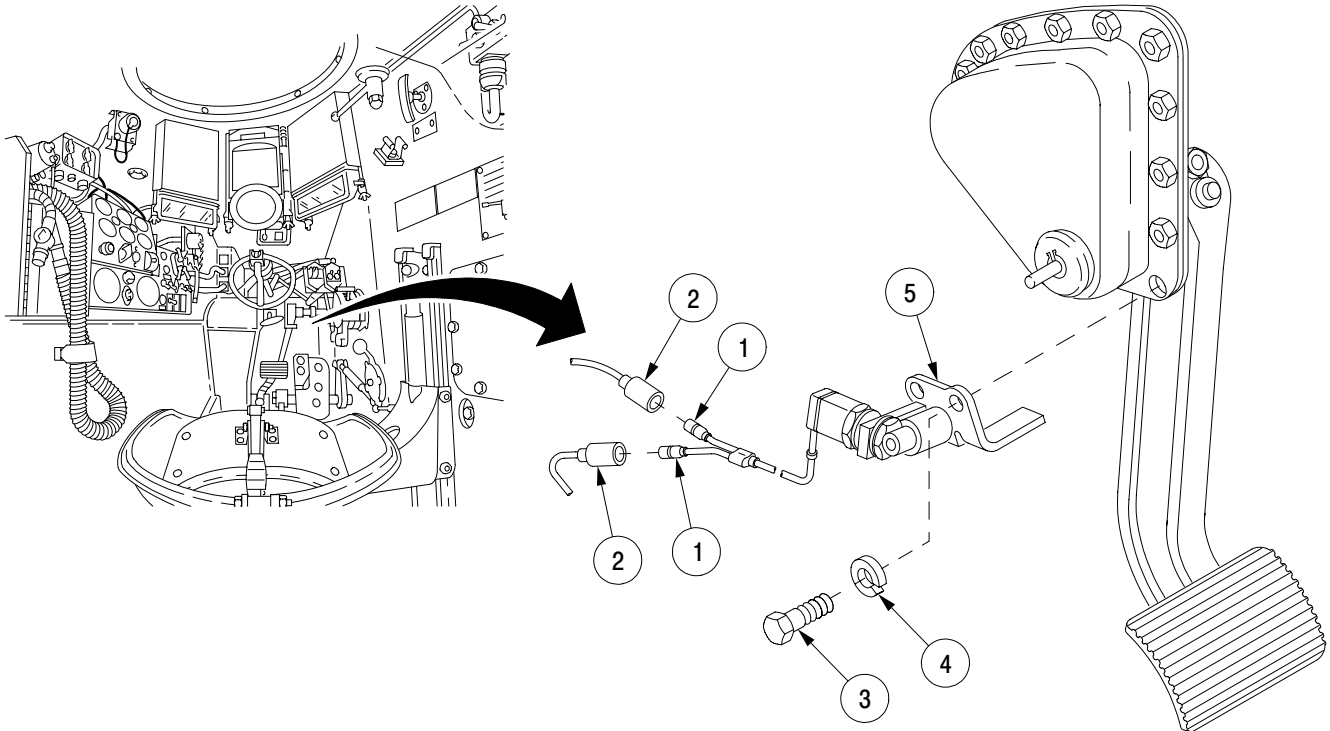
**11-4 BRAKE PEDAL AND PARKING BRAKE ASSEMBLY – CONTINUED**

---

**a. Removal.****WARNING**

Tracks must be blocked so that the vehicle will not roll out of control when the brake linkage is disconnected. Failure to block tracks may result in severe injury to personnel or equipment damage.

- 1 Disconnect two parking brake electrical leads (1) from two wiring harness W114 wires 509E (2).
- 2 Remove two screws (3), two lockwashers (4), and bracket (5) with parking brake warning switch attached. Discard lockwashers.



12ph008m



---

## Section II. MECHANICAL BRAKE SYSTEM – CONTINUED

---

### 11-4 BRAKE PEDAL AND PARKING BRAKE ASSEMBLY – CONTINUED

---

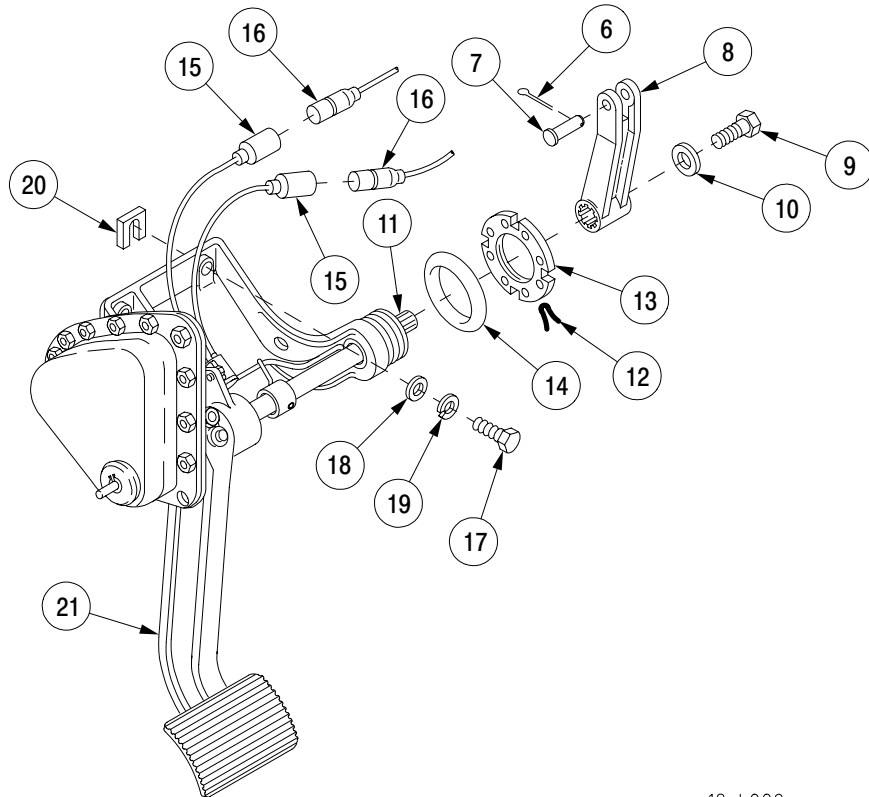
#### a. Removal – Continued

- 3 In powerpack compartment, remove cotter pin (6) and headed pin (7) from lever (8). Discard cotter pin.
- 4 Remove screw (9), flat washer (10), and lever (8) from shaft (11).
- 5 Remove lockwire (12), retainer plate (13), and seal (14). Discard lockwire and seal.
- 6 Disconnect two stoplight switch electrical leads (15) from two wiring harness W115 wires 75 (16).

#### NOTE

Quantity and location of shims will vary. Note quantity and location of shims during removal to aid in installation.

- 7 Remove four screws (17), four flat washers (18), four lockwashers (19), shims (20), and brake assembly (21) from driver's compartment bulkhead. Discard lockwashers.



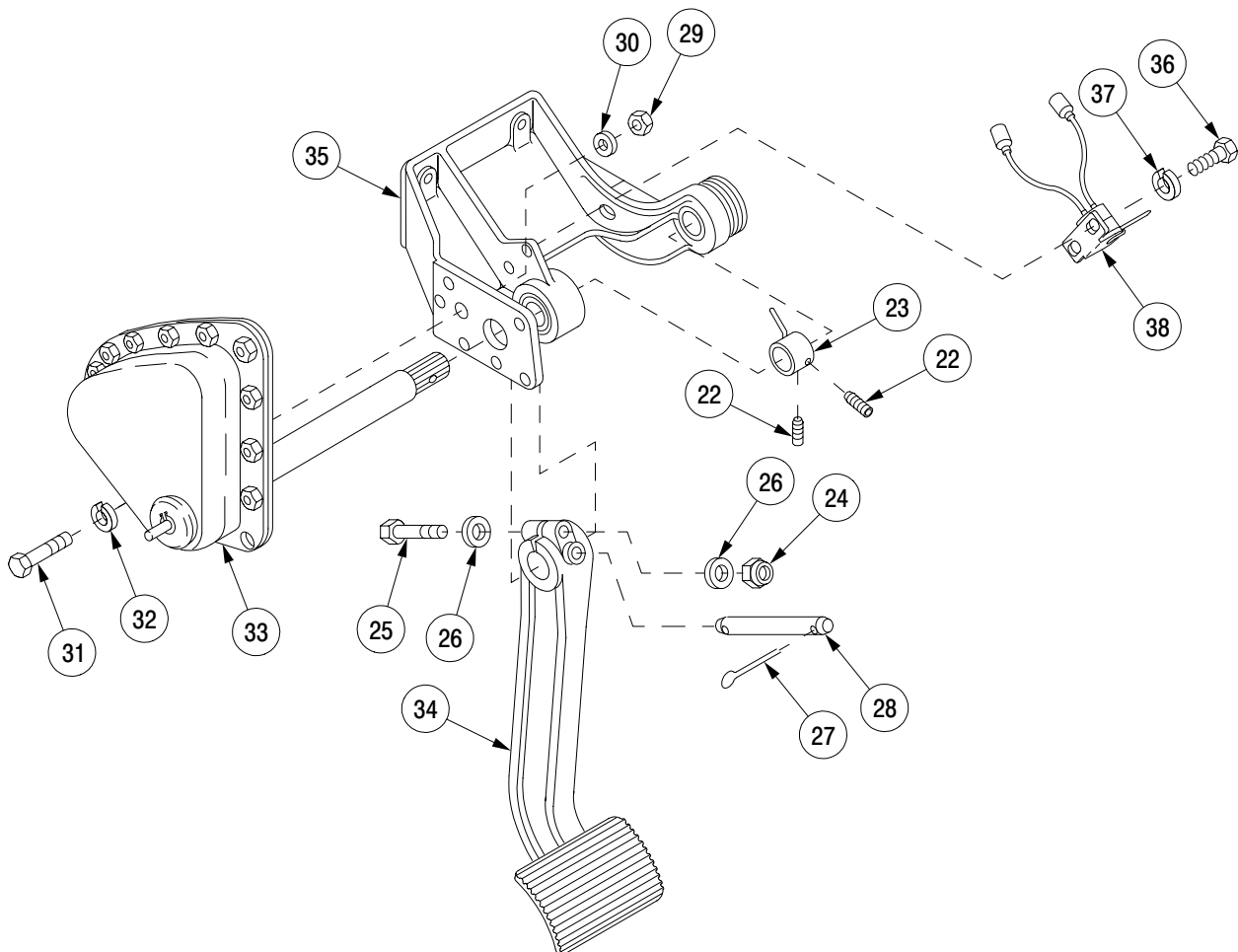
12ph009m

## Section II. MECHANICAL BRAKE SYSTEM – CONTINUED

### 11-4 BRAKE PEDAL AND PARKING BRAKE ASSEMBLY – CONTINUED

#### b. Disassembly.

- 1 Loosen two setscrews (22) in actuator (23).
- 2 Remove self-locking nut (24), screw (25), and two flat washers (26). Discard self-locking nut.
- 3 Remove two cotter pins (27) and pin (28). Discard cotter pins.
- 4 Remove three self-locking nuts (29), three flat washers (30), two screws (31), and two lockwashers (32). Discard self-locking nuts and lockwashers.
- 5 Remove parking brake assembly (33), brake pedal (34), and actuator (23) from bracket (35).
- 6 Remove two screws (36), two lockwashers (37), and stoplight switch (38) from bracket (35). Discard lockwashers.



12ph010m

---

## Section II. MECHANICAL BRAKE SYSTEM – CONTINUED

---

### 11-4 BRAKE PEDAL AND PARKING BRAKE ASSEMBLY – CONTINUED

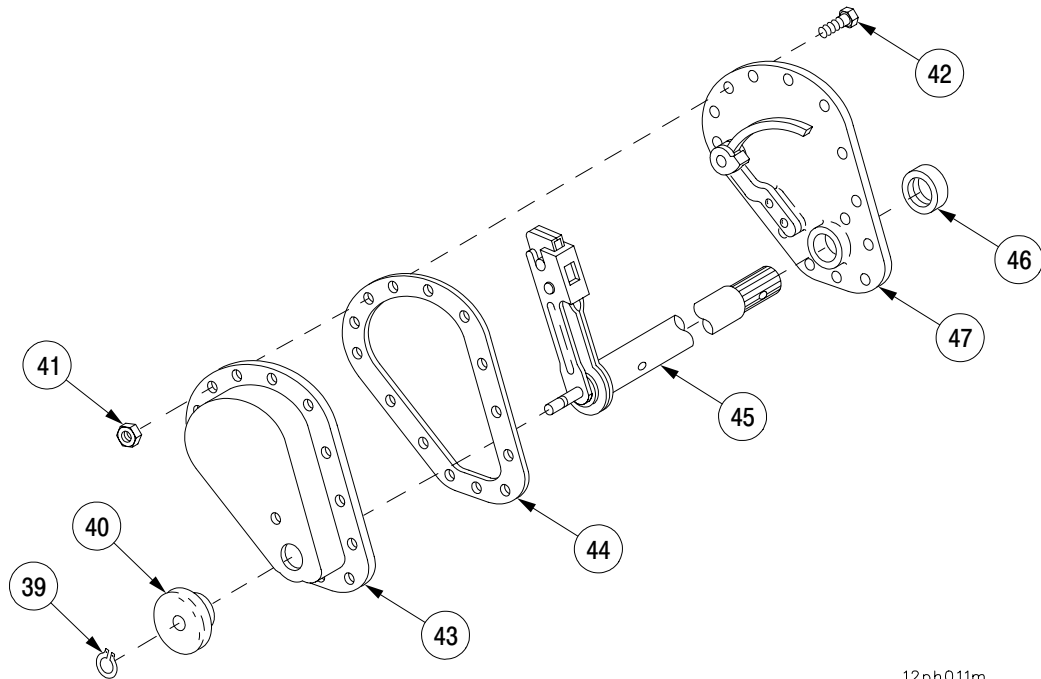
---

#### b. Disassembly – Continued

- 7 Remove snapping (39) and boot (40). Discard snapping.
- 8 Remove ten self-locking nuts (41), ten screws (42), cover (43), and gasket (44). Discard self-locking nuts and gasket.
- 9 Remove latch assembly (45) and seal (46) from bracket assembly (47). Discard seal.

#### c. Assembly.

- 1 Install new seal (46) and latch assembly (45) in bracket assembly (47).
- 2 Install new gasket (44) and cover (43) with ten screws (42) and ten new self-locking nuts (41).
- 3 Install boot (40) and new snapping (39).



12ph011m

---

**Section II. MECHANICAL BRAKE SYSTEM – CONTINUED**

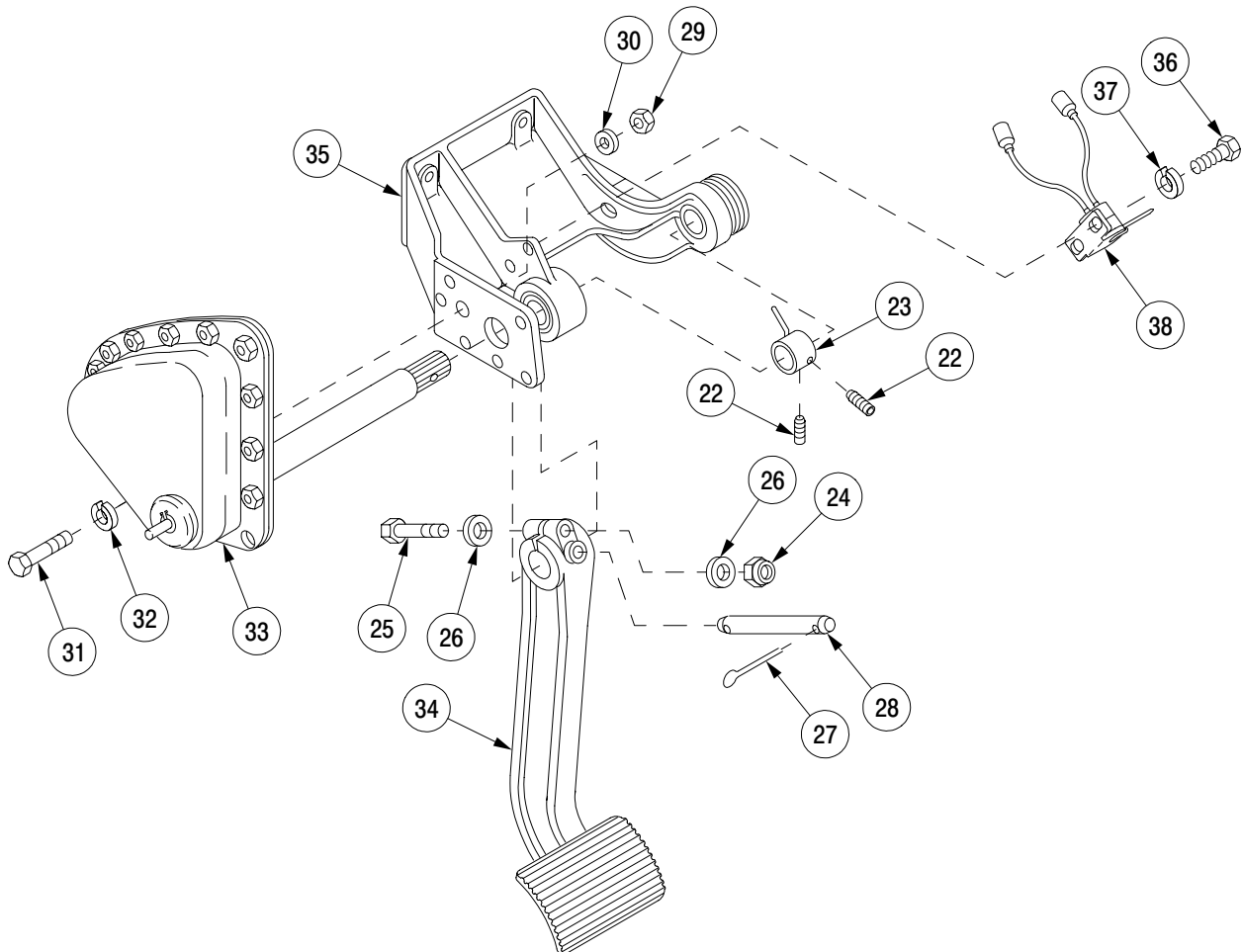
---

**11-4 BRAKE PEDAL AND PARKING BRAKE ASSEMBLY – CONTINUED**

---

**c. Assembly – Continued**

- 4 Install parking brake assembly (33) through bracket (35), brake pedal (34), and actuator (23).
- 5 Install two screws (31), two new lockwashers (32), three flat washers (30), and three new self-locking nuts (29).
- 6 Install pin (28) and two new cotter pins (27).
- 7 Install screw (25), two flat washers (26), and new self-locking nut (24).
- 8 Install stoplight switch (38) with two screws (36) and two new lockwashers (37).



12ph010m

---

## Section II. MECHANICAL BRAKE SYSTEM – CONTINUED

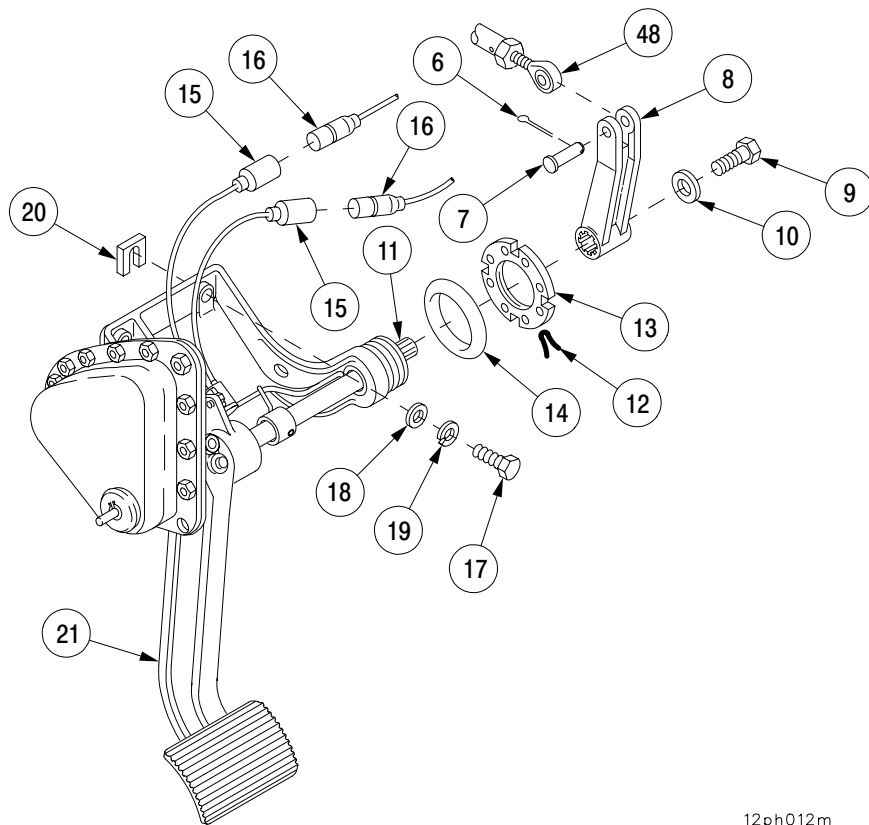
---

### 11-4 BRAKE PEDAL AND PARKING BRAKE ASSEMBLY – CONTINUED

---

#### d. Installation.

- 1 Install brake assembly (21) and shims (20), if required, with four screws (17), four new lockwashers (19), and four flat washers (18).
- 2 Connect two wiring harness W115 wires 75 (16) to two stoplight switch electrical leads (15).
- 3 In powerpack compartment, install new seal (14) and retaining plate (13).
- 4 Secure retaining plate (13) with new lockwire (12).
- 5 Install lever (8) with screw (9) and flat washer (10).
- 6 Connect rod end (48) to lever (8) with headed pin (7) and new cotter pin (6).



12ph012m

---

**Section II. MECHANICAL BRAKE SYSTEM – CONTINUED**

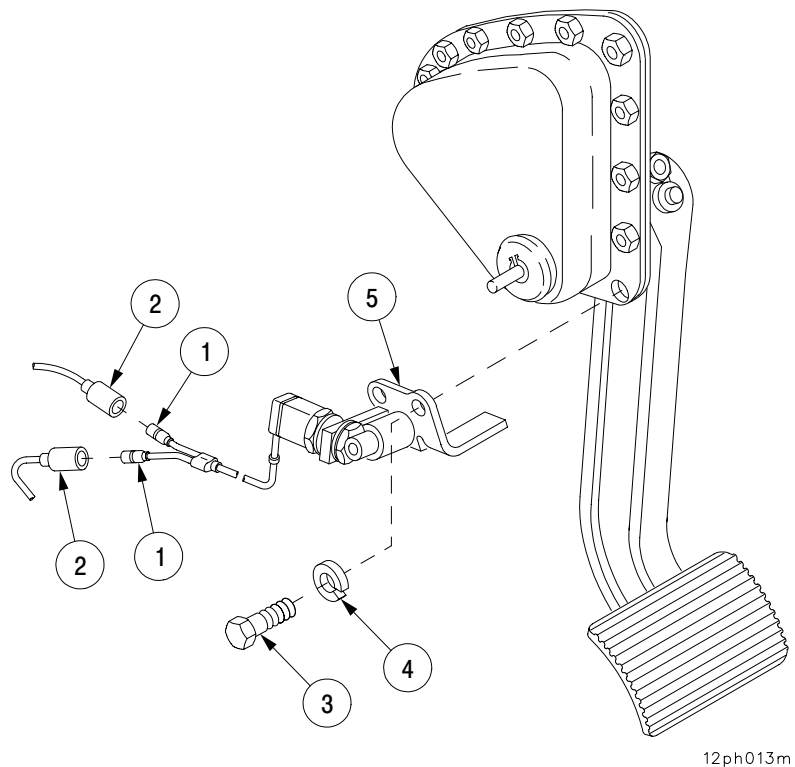
---

**11-4 BRAKE PEDAL AND PARKING BRAKE ASSEMBLY – CONTINUED**

---

**d. Installation – Continued**

- 7 Install bracket (5), with parking brake warning switch attached, with two screws (3) and two new lockwashers (4).
- 8 Connect two wiring harness W114 wires 509E (2) to two parking brake electrical leads (1).

**NOTE**

**FOLLOW-ON MAINTENANCE:**  
Install parking brake linkage (para 11-2)  
Close transmission access doors  
(TM 9-2350-314-10)

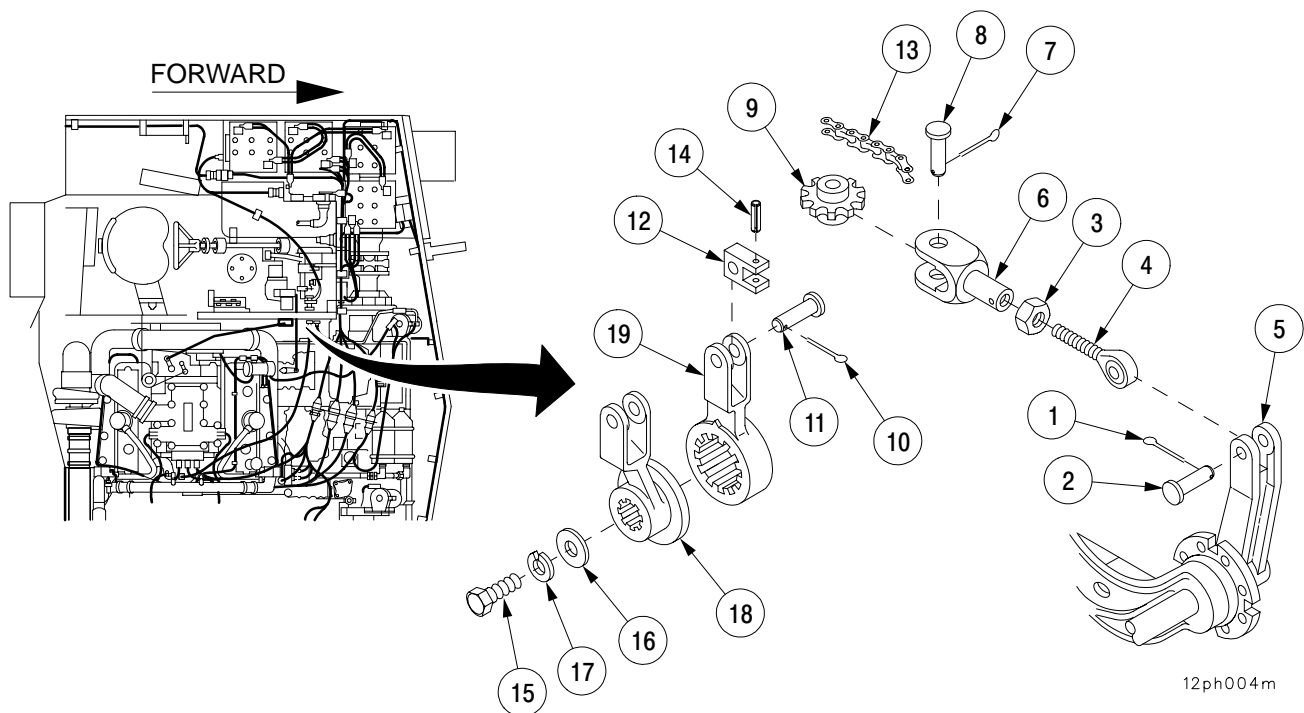


## Section II. MECHANICAL BRAKE SYSTEM – CONTINUED

### 11-5 SERVICE BRAKE LINKAGE – CONTINUED

#### b. Installation.

- 1 Install right brake lever (19) and left brake lever (18) with screw (15), new lockwasher (17), and flat washer (16).
- 2 Install chain (13) in two clevises (12) with two new spring pins (14).
- 3 Install two clevises (12) in brake levers (18 and 19) with two headed pins (11) and two new cotter pins (10).
- 4 Insert sprocket (9) into chain (13) and install in clevis (6) with headed pin (8) and new cotter pin (7).
- 5 Install nut (3) on rod end (4). Do not tighten.
- 6 Install rod end (4) into clevis (6) until no slack is present in chain (13) and holes in rod end (4) and lever (5) are aligned.
- 7 Tighten nut (3) against clevis (6).
- 8 Connect rod end (4) to lever (5) with headed pin (2) and new cotter pin (1).



12ph004m

#### NOTE

**FOLLOW-ON MAINTENANCE:**  
Close and secure transmission access doors  
(TM 9-2350-314-10)



## Section II. MECHANICAL BRAKE SYSTEM – CONTINUED

---

### 11-6 STOPLIGHT SWITCH.

---

This task covers:    a. Removal                    b. Disassembly                    c. Assembly                    d. Installation  
                                 e. Adjustment

---

#### **INITIAL SETUP**

##### Tools

General mechanic's tool kit  
(SC 5180-90-N26)

##### Equipment Conditions

Vehicle MASTER switch OFF  
(TM 9-2350-314-10)

##### Materials/Parts

Lockwashers (2) (item 9, Appx E)

##### References

TM 9-2350-314-10

---

#### **a. Removal.**

- 1 Disconnect two stoplight switch electrical leads (1) from two wiring harness W115 wires 75 (2).
- 2 Remove two screws (3), two lockwashers (4), and stoplight switch (5). Discard lockwashers.

#### **b. Disassembly.**

Remove two slotted washers (6) and two electrical shells (7) from stoplight switch electrical leads (1).

#### **c. Assembly.**

Install two electrical shells (7) on stoplight switch electrical leads (1) with two slotted washers (6).

#### **d. Installation.**

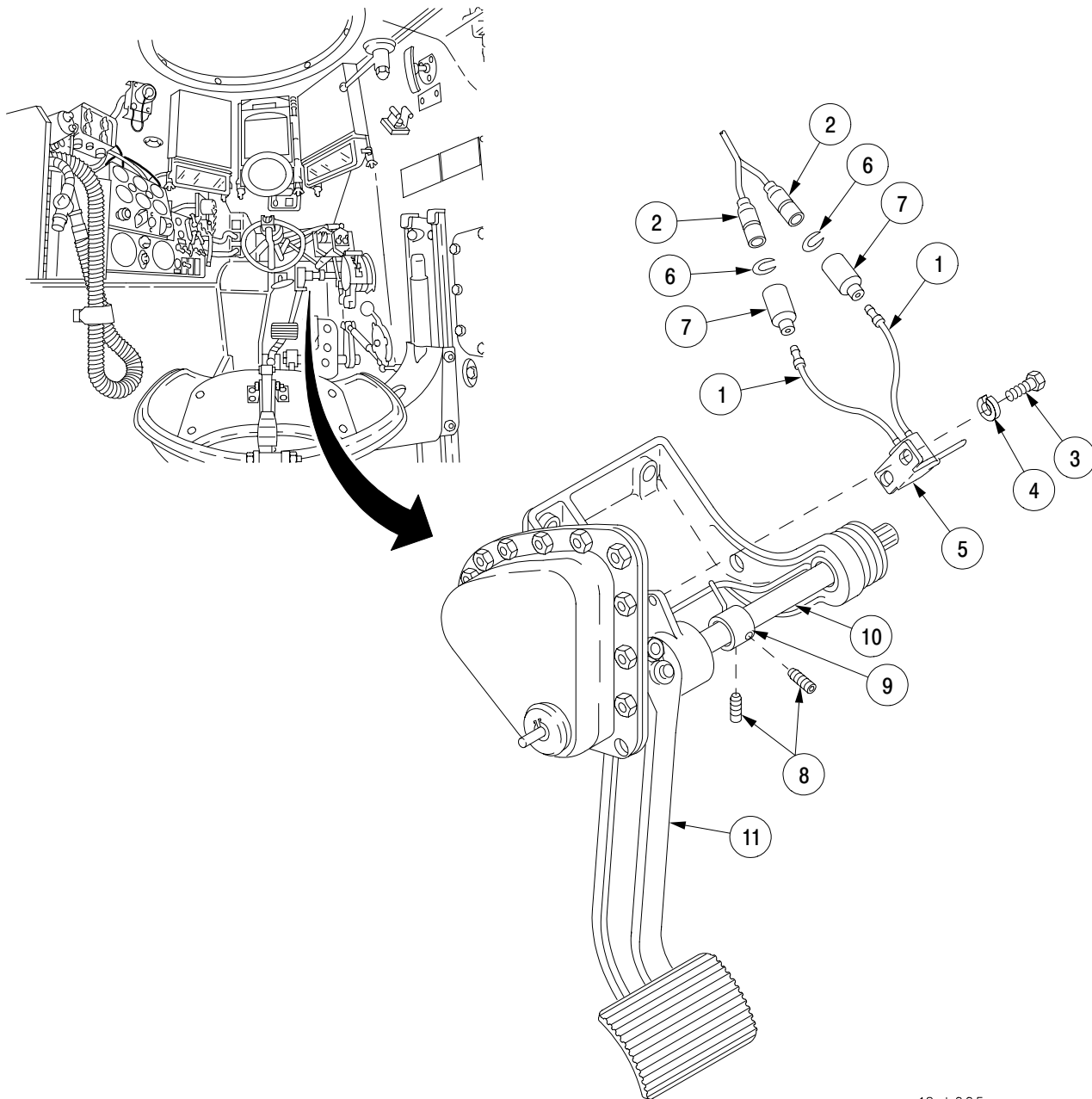
- 1 Install stoplight switch (5) with two screws (3) and two new lockwashers (4).
- 2 Connect two wiring harness W115 wires 75 (2) to two stoplight switch electrical leads (1).

#### **e. Adjustment.**

- 1 Loosen two setscrews (8). Adjust actuator (9) on shaft (10) so that stoplight illuminates with 3/4-in. (19 mm) of brake pedal (11) travel.
- 2 Tighten two setscrews (8).

Section II. MECHANICAL BRAKE SYSTEM – CONTINUED

11-6 STOPLIGHT SWITCH – CONTINUED



12ph005m

# CHAPTER 12 WHEELS AND TRACKS








## GENERAL





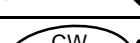
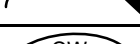

This chapter illustrates and defines procedures for removal, disassembly, assembly, and installation of the suspension assembly and track-related components. This chapter also covers checking and adjusting track tension.

<u>CONTENTS</u>		<u>Page</u>
Section I.	SUSPENSION ASSEMBLY	
12-1	TORSION BAR, ANCHOR, ROAD ARM, AND ROADWHEEL HUB AND CAP ASSEMBLY IDENTIFICATION CHART .....	12-2
12-2	ROAD ARM ASSEMBLY AND HOUSING ASSEMBLY .....	12-4
12-3	ROAD ARM ASSEMBLY STOP PINS .....	12-12
12-4	ROADWHEEL HUB AND CAP ASSEMBLY .....	12-14
12-5	ROADWHEELS .....	12-20
12-6	TORSION BAR .....	12-24
12-7	TORSION BAR ANCHORS, POSITIONS 1, 2, 4, 5, 6, AND 7 .....	12-26
Section II.	TRACK IDLERS AND BRACKETS	
12-8	IDLER WHEELS AND IDLER ARM HUB AND CAP ASSEMBLY .....	12-28
12-9	IDLER ARM HOUSING .....	12-34
12-10	IDLER ARM ASSEMBLY .....	12-35
12-11	TRACK ADJUSTER ASSEMBLY AND MOUNTING BRACKET .....	12-38
Section III.	TRACK DRIVE SPROCKET	
12-12	FINAL DRIVE SPROCKET AND HUB .....	12-40
Section IV.	TRACK ASSEMBLY	
12-13	TRACK PAD .....	12-42
12-14	TRACK TENSION .....	12-44
12-15	TRACK SHOE .....	12-46
12-16	TRACK .....	12-50

**Section I. SUSPENSION ASSEMBLY**

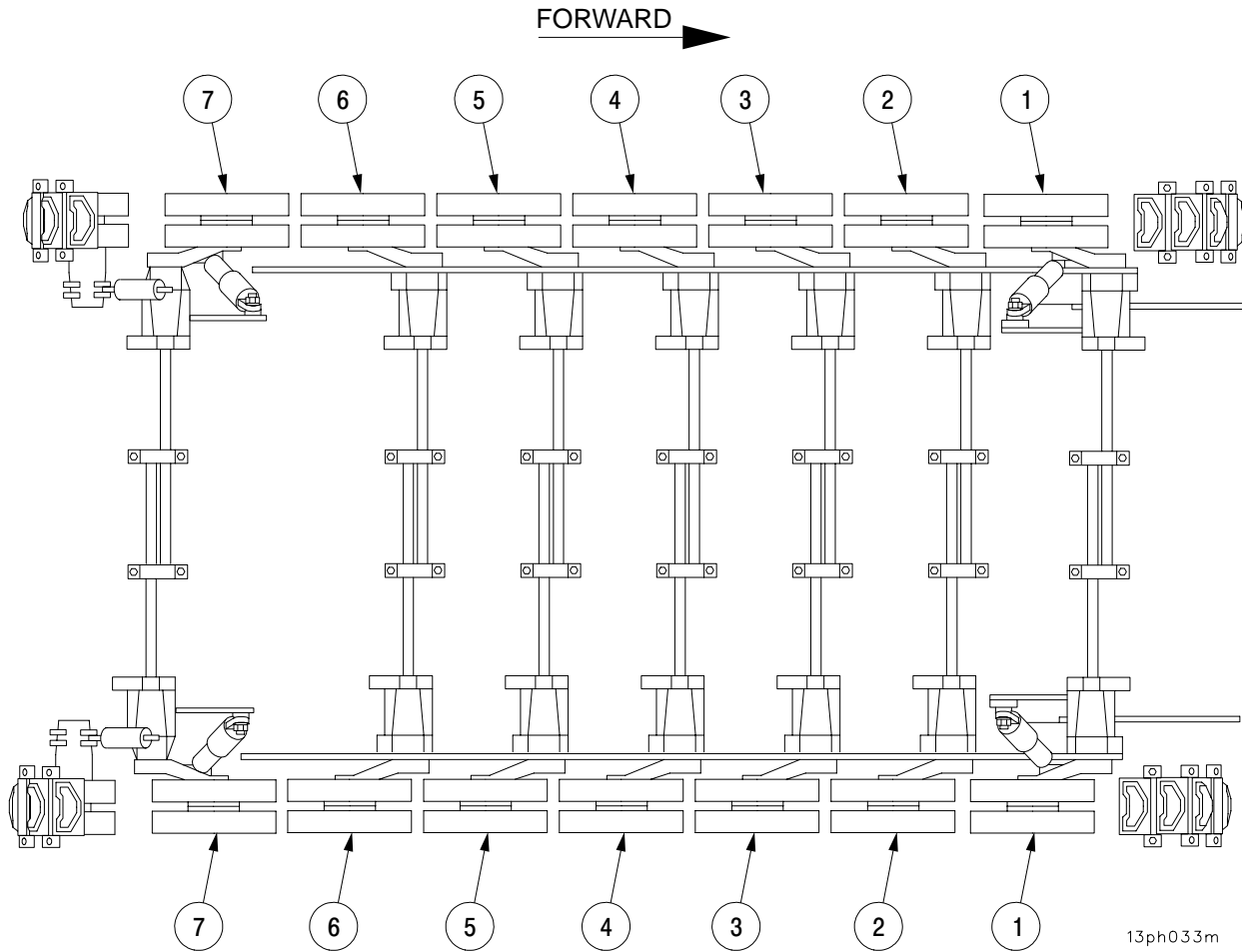
**12-1 TORSION BAR, ANCHOR, ROAD ARM, AND ROADWHEEL HUB AND CAP ASSEMBLY IDENTIFICATION CHART.**

TORSION BAR, ANCHOR, ROAD ARM, AND ROADWHEEL HUB AND CAP ASSEMBLY (LEFT SIDE)		
VEHICLE POSITION	TORSION BAR IDENTIFYING ARROW (PRESET)	LOCATION OF BLIND SPLINE IN ANCHOR
1 FRONT		12 O'CLOCK
2 INTERMEDIATE		12 O'CLOCK
3 INTERMEDIATE		12 O'CLOCK
4 INTERMEDIATE		12 O'CLOCK
5 INTERMEDIATE		12 O'CLOCK
6 INTERMEDIATE		12 O'CLOCK
7 REAR		12 O'CLOCK

TORSION BAR, ANCHOR, ROAD ARM, AND ROADWHEEL HUB AND CAP ASSEMBLY (RIGHT SIDE)		
VEHICLE POSITION	TORSION BAR IDENTIFYING ARROW (PRESET)	LOCATION OF BLIND SPLINE IN ANCHOR
1 FRONT		12 O'CLOCK
2 INTERMEDIATE		12 O'CLOCK
3 INTERMEDIATE		12 O'CLOCK
4 INTERMEDIATE		12 O'CLOCK
5 INTERMEDIATE		12 O'CLOCK
6 INTERMEDIATE		12 O'CLOCK
7 REAR		12 O'CLOCK

**Section I. SUSPENSION ASSEMBLY – CONTINUED**

**12-1 TORSION BAR, ANCHOR, ROAD ARM, AND ROADWHEEL HUB AND CAP ASSEMBLY IDENTIFICATION CHART – CONTINUED**



## Section I. SUSPENSION ASSEMBLY – CONTINUED

---

### 12-2 ROAD ARM ASSEMBLY AND HOUSING ASSEMBLY.

---

This task covers:      a. Removal                      b. Disassembly                      c. Inspection                      d. Assembly  
                                 e. Installation

---

#### **INITIAL SETUP**

##### Tools

General mechanic's tool kit  
(SC 5180-90-N26)  
Wrench face socket (item 70, Appx F)  
Replacer handle (item 28, Appx F)  
Seal replacer (item 54, Appx F)  
Seal replacer (item 53, Appx F)  
Torque wrench (item 87, Appx F)  
Lubricating gun (item 24, Appx F)

##### Materials/Parts

Preformed packings (2) (item 200, Appx E)  
Seal (item 285, Appx E)  
Keywasher (item 174, Appx E)  
Seal (item 63, Appx E)  
Sealing compound (item 52, Appx C)  
Dry-cleaning solvent (item 59, Appx C)  
Polyurethane coating (item 42, Appx C)

##### Equipment Conditions

Shock absorber disconnected – required for  
removal of road arms 1 and 7 (para 15-1)  
Torsion bar removed (para 12-6)

##### Personnel Required

Two

##### References

TM 9-214  
TM 9-2350-314-10

---

#### **WARNING**

Road arm assembly weighs approximately 100 lb  
(45 kg). Injury to personnel may occur without proper  
support during removal and installation.

##### **a. Removal.**

- 1 Remove eight screws (1) securing road arm assembly (2) to hull.
- 2 Remove road arm assembly (2) and preformed packing (3). Discard preformed packing.

---

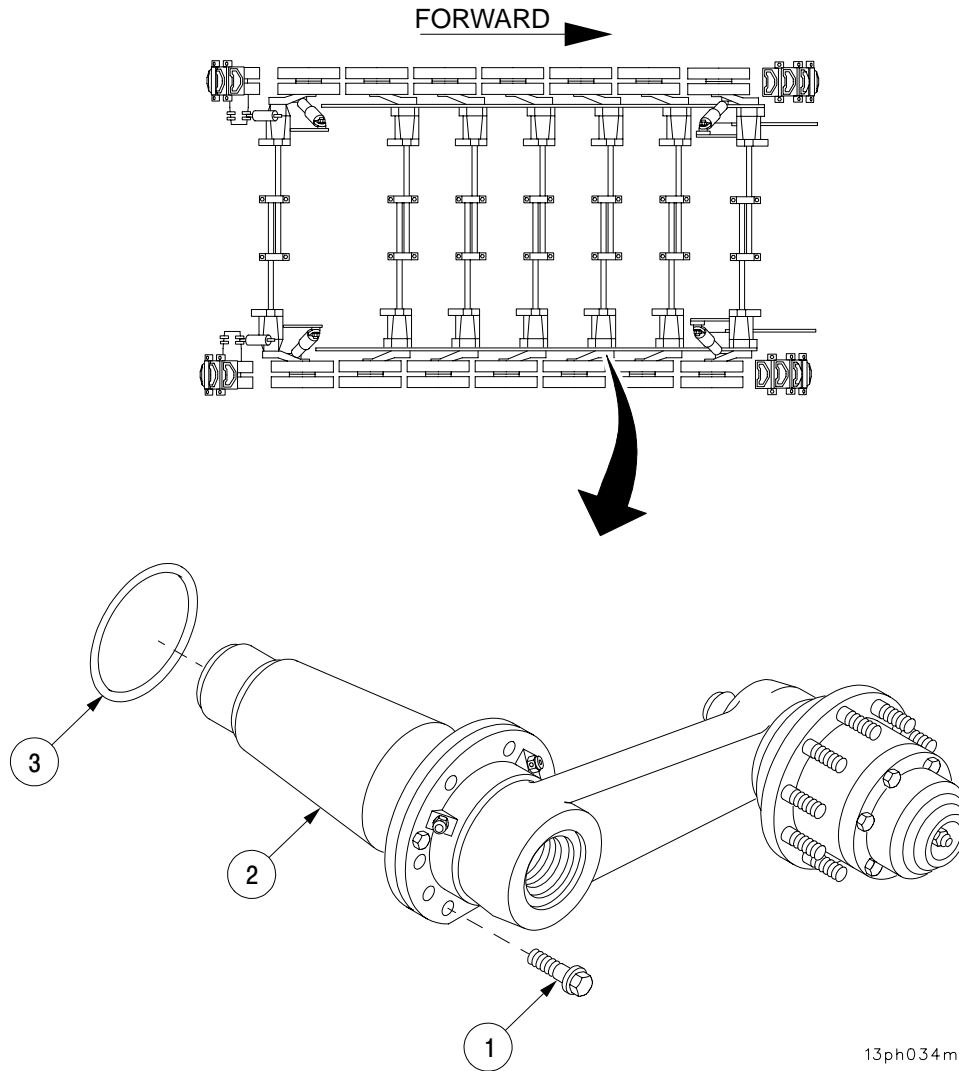
**Section I. SUSPENSION ASSEMBLY – CONTINUED**

---

**12-2 ROAD ARM ASSEMBLY AND HOUSING ASSEMBLY – CONTINUED**

---

**a. Removal – Continued**



**Section I. SUSPENSION ASSEMBLY – CONTINUED**

**12-2 ROAD ARM ASSEMBLY AND HOUSING ASSEMBLY – CONTINUED**

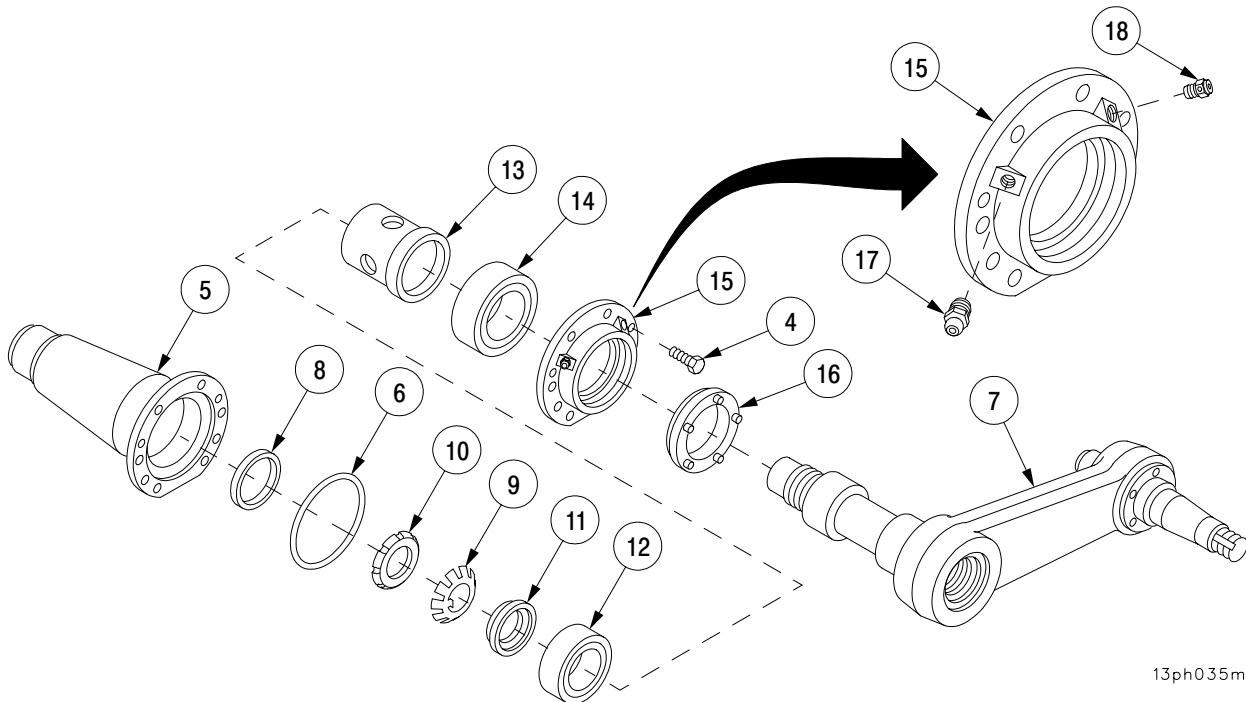
**b. Disassembly.**

- 1 Remove two screws (4), housing assembly (5), and preformed packing (6) from upper spindle assembly (7). Discard preformed packing.
- 2 Remove seal (8) from housing assembly (5). Discard seal.
- 3 Straighten tangs of key washer (9).
- 4 Remove nut (10), key washer (9), spacer (11), and bearing (12) from upper spindle assembly (7). Discard key washer.
- 5 Remove spacer (13), bearing (14), and retainer (15) from upper spindle assembly (7).
- 6 Remove seal (16) from retainer (15). Discard seal.

**NOTE**

Note the location of the lubrication fitting and relief valve prior to their removal to ensure proper installation.

- 7 Remove lubrication fitting (17) and relief valve (18) from retainer (15).



13ph035m



---

**Section I. SUSPENSION ASSEMBLY – CONTINUED**

---

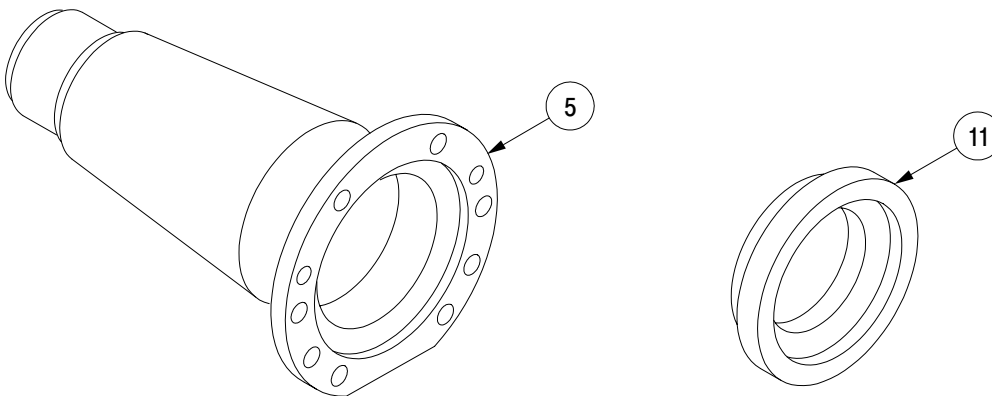
**12-2 ROAD ARM ASSEMBLY AND HOUSING ASSEMBLY – CONTINUED**

---

**c. Inspection****WARNING**

Dry-cleaning solvent (P-D-680) is toxic and flammable. To avoid injury, wear protective goggles and gloves and use only in a well-ventilated area. Avoid contact with skin, eyes, and clothes. Do not breathe vapors. Do not use near open flame or excessive heat. Do not smoke when using solvent. Failure to do so could cause **SERIOUS INJURY**. If you become dizzy while using dry-cleaning solvent, get fresh air immediately, and if necessary, get medical attention. If contact with skin or clothes is made, flush thoroughly with water. If the solvent contacts your eyes, wash them with water immediately and obtain medical aid (FM 21-11).

- 1 Clean all parts with dry-cleaning solvent.
- 2 Inspect housing assembly (5) for cracks or distortion. Replace if cracked or distorted.
- 3 Inspect spacer (11). Replace if distorted, burred, cracked, or chipped.



13ph037m

---

## Section I. SUSPENSION ASSEMBLY – CONTINUED

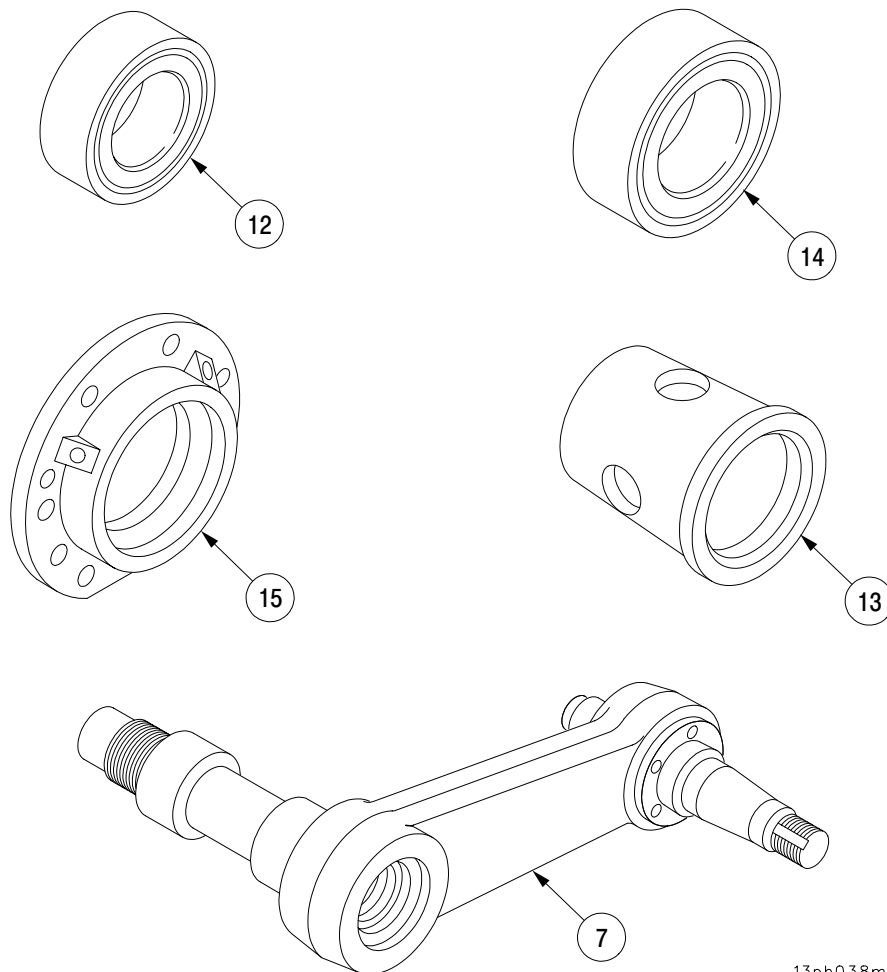
---

### 12-2 ROAD ARM ASSEMBLY AND HOUSING ASSEMBLY – CONTINUED

---

#### c. Inspection – Continued

- 4 Inspect bearing (12) and bearing (14) for damage or defects (TM 9-14). Replace if defective.
- 5 Inspect spacer (13) for damage, cracks, or distortion. Replace if damaged, cracked, or distorted. Spacer ends are not parallel.
- 6 Inspect retainer (15) from damage or cracks. Replace if damaged or cracked.
- 7 Inspect spindle and arm (7) for damage, cracks, or distortion. Replace if damaged, cracked, or distorted.



13ph038m

---

**Section I. SUSPENSION ASSEMBLY – CONTINUED**


---

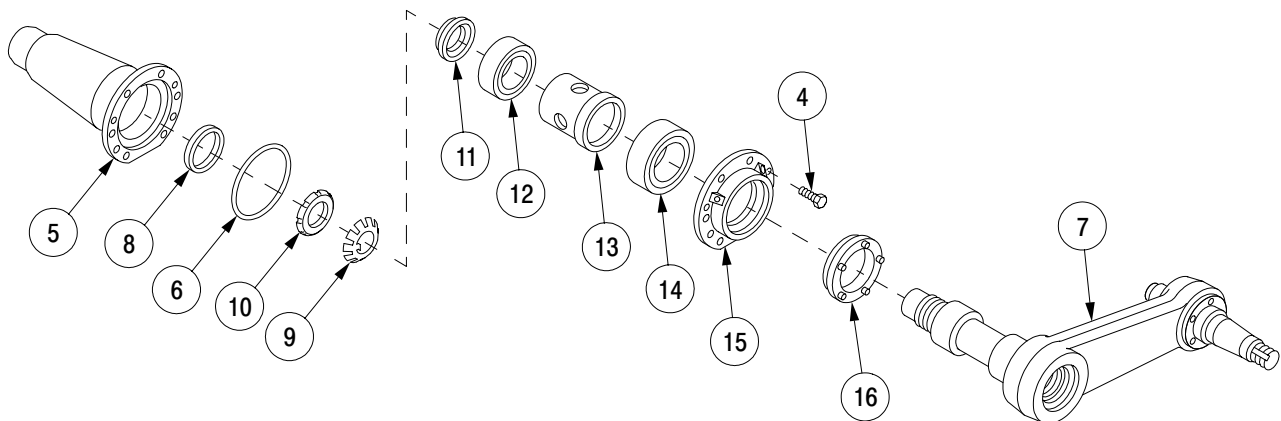
**12-2 ROAD ARM ASSEMBLY AND HOUSING ASSEMBLY – CONTINUED**


---

**d. Assembly.****NOTE**

- Before installing seals, make sure surfaces of seal and housing or retainer are free of dirt and foreign material.
- Do not apply sealing compound to seal surfaces.

- 1 Apply a bead of sealing compound 1/64 to 1/32 inch (0.396–0.793 mm) wide centered on seal mating surface of retainer (15).
- 2 Install new seal (16) in retainer (15).
- 3 Install retainer (15), bearing (14), and spacer (13) on upper spindle assembly (7) making sure seal pins of seal (16) align with holes in upper spindle assembly (7).
- 4 Install bearing (12), spacer (11), new key washer (9), and nut (10) on upper spindle assembly (7). Torque nut (10) to 255–275 lb–ft (34–37 N·m).
- 5 Bend all tangs of key washer (9) down into slot or recessed diameter of nut (10).
- 6 Install new seal (8) in housing assembly (5).
- 7 Install housing assembly (5) and new preformed packing (6) on upper spindle assembly (7) with two screws (4).



13ph039m

---

**Section I. SUSPENSION ASSEMBLY – CONTINUED**

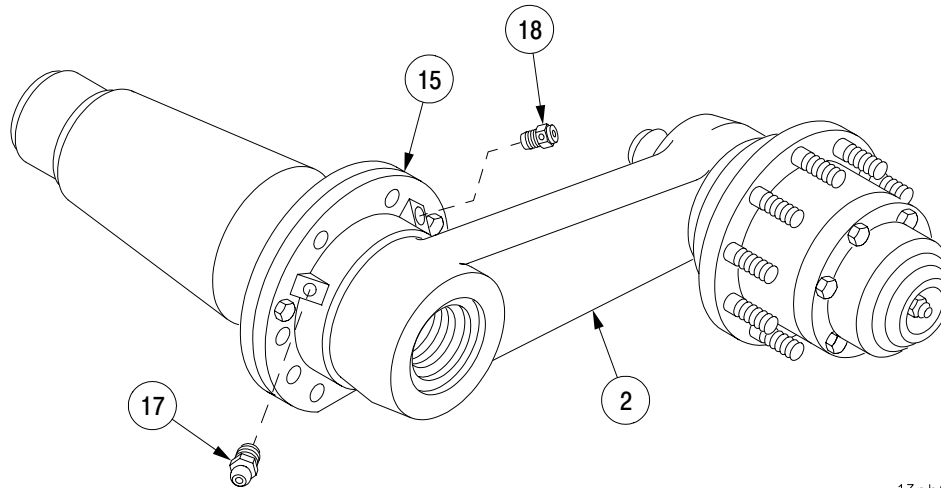
---

**12-2 ROAD ARM ASSEMBLY AND HOUSING ASSEMBLY – CONTINUED**

---

**d. Assembly – Continued**

- 8 Install lubrication fitting (17) and relief valve (18) in retainer (15).



13ph040m

- 9 Lubricate housing assembly (2) (TM 9-2350-314-10).

---

**Section I. SUSPENSION ASSEMBLY – CONTINUED**

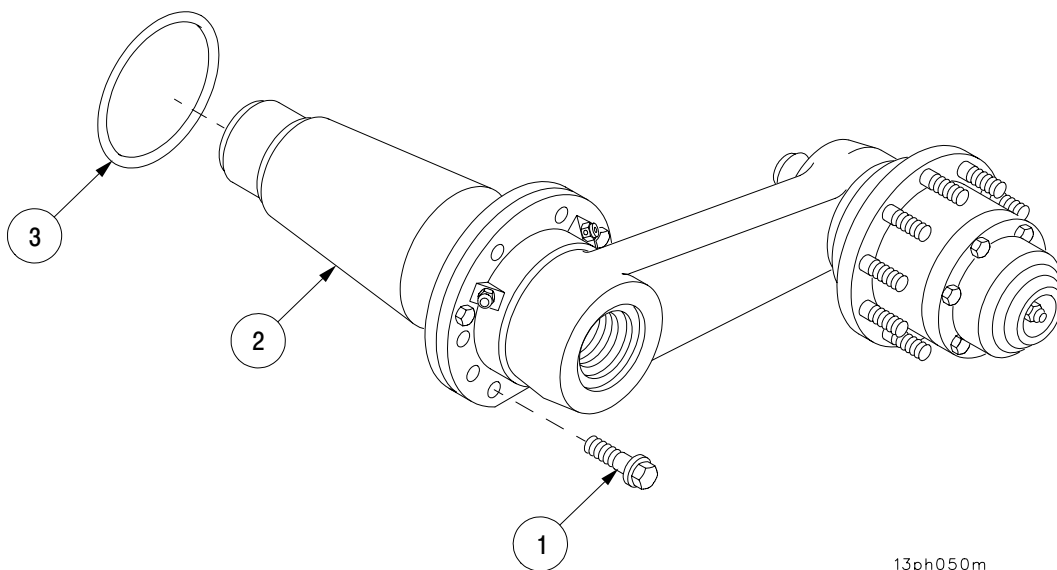
---

**12-2 ROAD ARM ASSEMBLY AND HOUSING ASSEMBLY – CONTINUED**

---

**e. Installation.**

- 1 Apply primer coating to mounting surfaces between hull and road arm assembly (2).
- 2 Install road arm assembly (2) with new preformed packing (3) and eight screws (1). Torque screws to 165–195 lb–ft (224–264 N·m).
- 3 Lubricate road arm assembly (2) (TM 9-2350-314-10).



13ph050m

**NOTE****FOLLOW-ON MAINTENANCE:**

Install torsion bar (para 12-6)  
Connect shock absorber – required for installation  
of road arms 1 and 7 (para 15-1)

## Section I. SUSPENSION ASSEMBLY – CONTINUED

---

### 12-3 ROAD ARM ASSEMBLY STOP PINS.

---

This task covers:                    a. Removal    b. Installation

---

<b>INITIAL SETUP</b>
----------------------

Tools

General mechanic's tool kit  
(SC 5180-90-N26)  
Socket adapter (item 2, Appx F)  
Socket wrench attachment (item 68, Appx F)  
Torque wrench (item 87, Appx F)  
Wire twisting pliers (item 43, Appx F)

Materials/Parts

Lockwire (item 312, Appx E)

Equipment Conditions

Shock absorber disconnected (para 15-1)  
Road arm assembly removed (para 12-2)

---

#### a. Removal.

#### NOTE

Stop pins are found only on road arms 1 and 7.

- 1 Remove lockwire (1) from four screws (2). Discard lockwire.
- 2 Remove four screws (2), four flat washers (3), and stop pin (4).

#### b. Installation.

#### NOTE

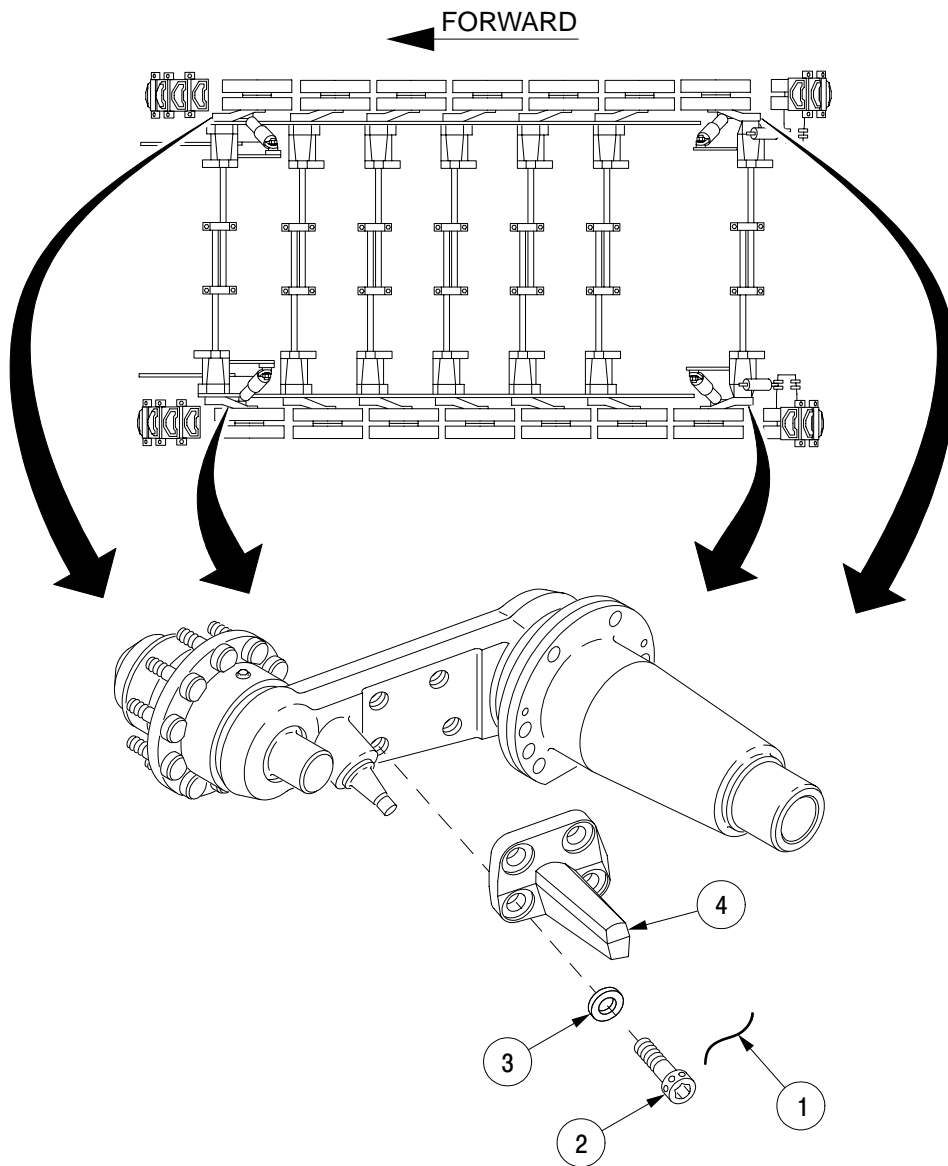
Stop pins are found only on road arms 1 and 7.

- 1 Install stop pin (4) with four flat washers (3) and four screws (2). Torque screws to 420-450 lb-ft (570-610 N-m).
- 2 Install new lockwire (1) on four screws (2).

**Section I. SUSPENSION ASSEMBLY – CONTINUED**

**12-3 ROAD ARM ASSEMBLY STOP PINS – CONTINUED**

**b. Installation – Continued**



13ph026m

**NOTE**

**FOLLOW-ON MAINTENANCE:**

- Install road arm assembly (para 12-2)
- Connect shock absorber (para 15-1)

## Section I. SUSPENSION ASSEMBLY – CONTINUED

---

### 12-4 ROADWHEEL HUB AND CAP ASSEMBLY.

---

This task covers:    a. Removal                    b. Disassembly                    c. Assembly                    d. Installation

---

#### **INITIAL SETUP**

##### Tools

General mechanic's tool kit  
(SC 5180-90-N26)  
Replacer handle (item 28, Appx F)  
Bearing cup replacer (inner) (item 50, Appx F)  
Bearing cup replacer (outer) (item 51, Appx F)  
Inner seal replacer (item 52, Appx F)  
Torque wrench (item 86, Appx F)  
Hand lubricating gun (item 24, Appx F)

##### Equipment Conditions

Roadwheel removed (para 12-5)

##### References

TM 9-2350-314-10

##### Materials/Parts

Cotter pin (item 201, Appx E)  
Preformed packing (item 202, Appx E)  
Encased plain seal (item 203, Appx E)

---

#### **a. Removal.**

#### **NOTE**

Roadwheels do not have to be removed to perform maintenance on cap assembly.

- 1 Remove grease fitting (1) from cap (2).
- 2 Remove six screws (3) and six flat washers (4).
- 3 Remove cap (2), static spring (5), cotter pin (6), nut (7), key washer (8), and packing (9). Discard packing and cotter pin.
- 4 Remove roadwheel hub (10) from roadwheel arm spindle (11).

#### **b. Disassembly.**

- 1 Remove seal (12) from roadwheel hub (10). Discard seal.



**Section I. SUSPENSION ASSEMBLY – CONTINUED**

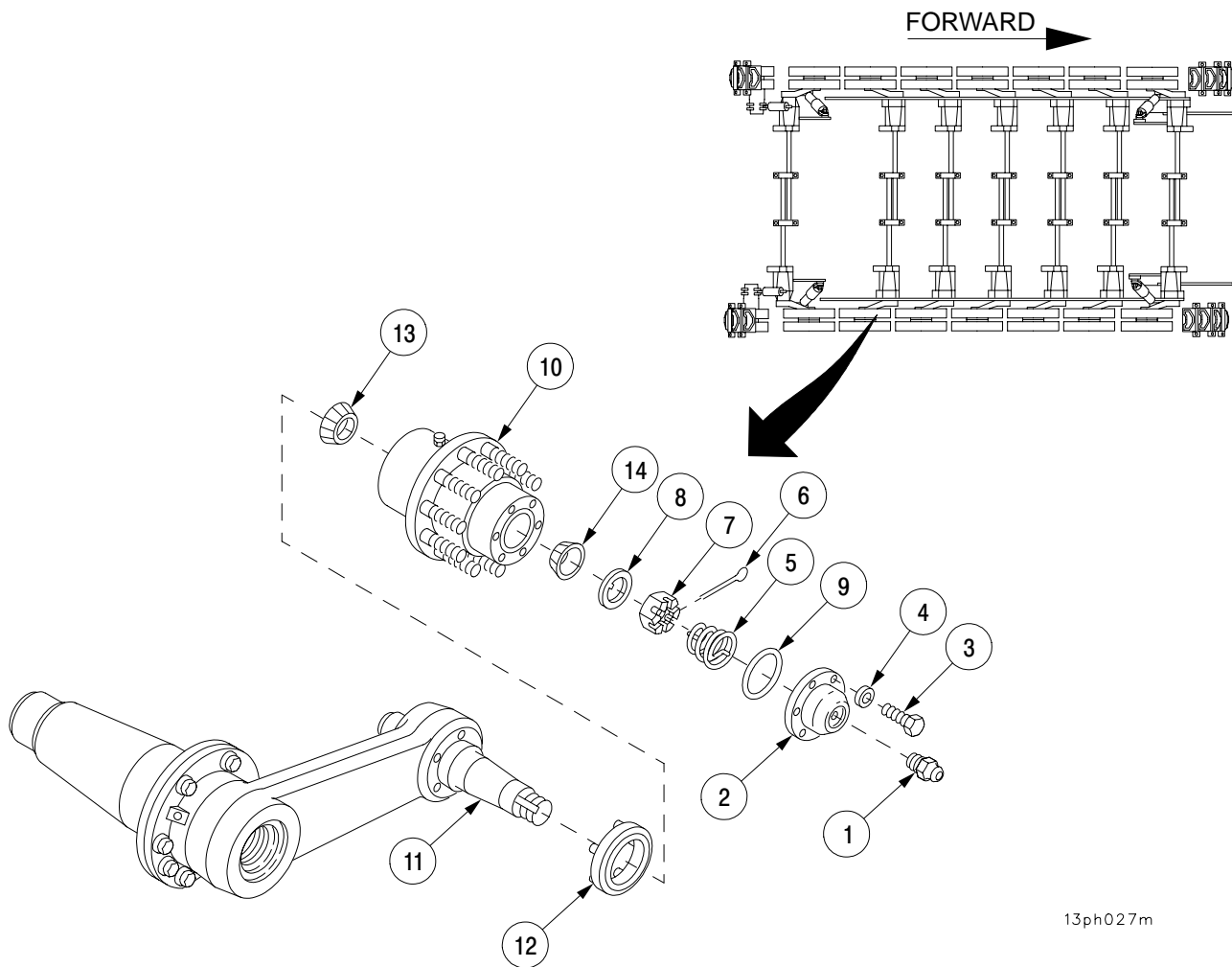
**12-4 ROADWHEEL HUB AND CAP ASSEMBLY – CONTINUED**

**b. Disassembly – Continued**

**NOTE**

- Bearing cones and bearing cups are used in matched sets only. If either is damaged, both cone and cup must be replaced.
- Bearing cups are to be removed only if damage to cup is evident or bearings are to be replaced.

2 Remove inner bearing cone (13) and outer bearing cone (14) from roadwheel hub (10).



13ph027m

## Section I. SUSPENSION ASSEMBLY – CONTINUED

---

### 12-4 ROADWHEEL HUB AND CAP ASSEMBLY – CONTINUED

---

#### b. Disassembly – Continued

- 3 Remove inner bearing cup (15) and outer bearing cup (16) from roadwheel hub (10).

#### NOTE

There are 10 bolts in roadwheel hub. Remove only those bolts that are damaged.

- 4 Remove bolts (17).
- 5 Remove relief valve (18) from roadwheel hub (10).

#### c. Assembly.

- 1 Install relief valve (18), if removed.
- 2 Install bolts (17), if removed.
- 3 Install inner bearing cup (15), if removed.
- 4 Install inner bearing cone (13) in roadwheel hub (10).

#### NOTE

Ensure seal mating surface in hub is clean of grease, oil and dirt prior to seal installation.



Be careful not to damage or deform the seal lip when installing seal in hub. Do not press on pins when installing seal.

- 5 Install new seal (12) in roadwheel hub (10) with outer lip of seal (12) flush with top surface of roadwheel hub (10).
- 6 Install outer bearing cup (16), if removed.
- 7 Install outer bearing cone (14).

---

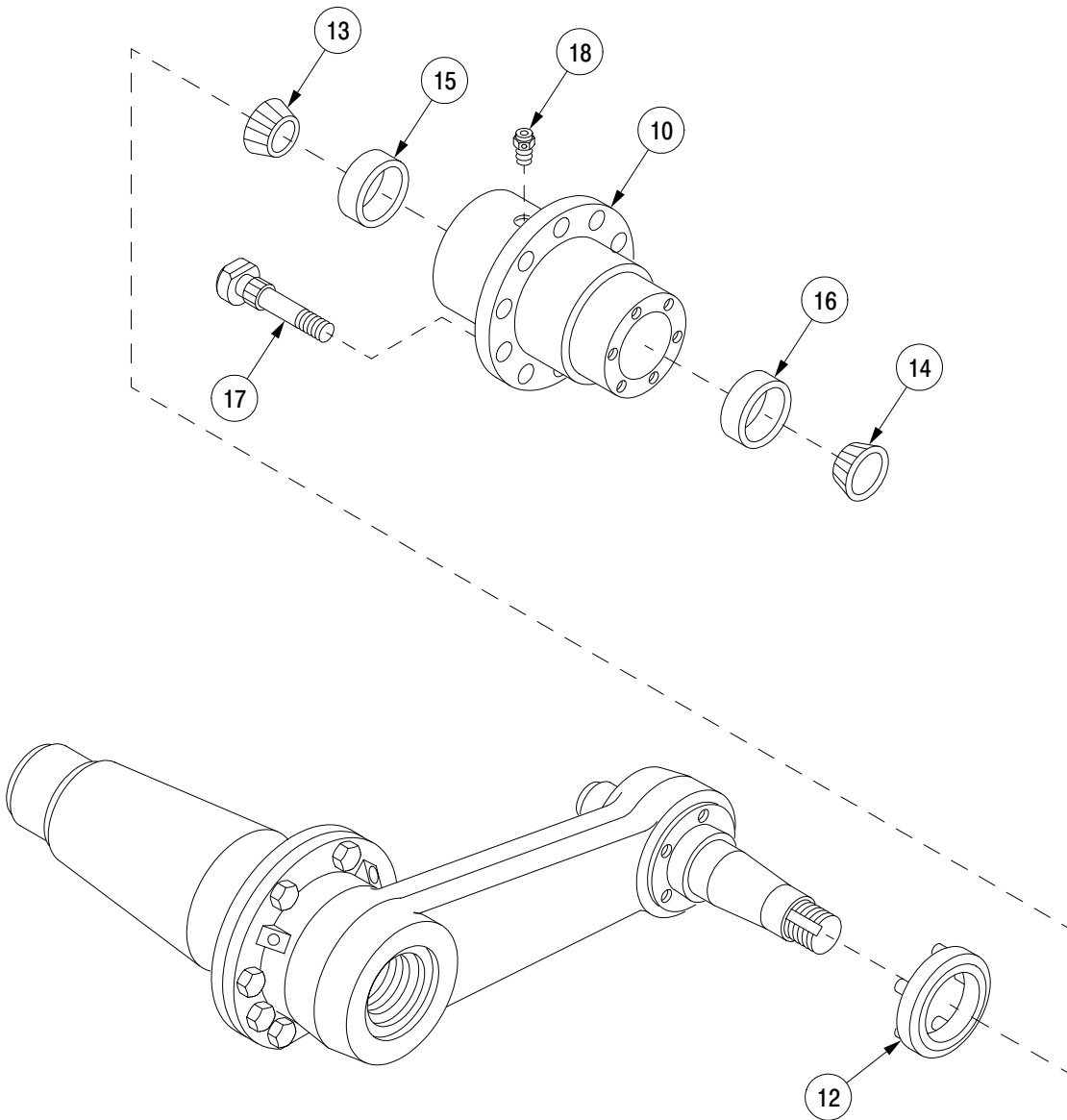
**Section I. SUSPENSION ASSEMBLY – CONTINUED**

---

**12-4 ROADWHEEL HUB AND CAP ASSEMBLY – CONTINUED**

---

**c. Assembly – Continued**



13ph028m

## Section I. SUSPENSION ASSEMBLY – CONTINUED

---

### 12-4 ROADWHEEL HUB AND CAP ASSEMBLY – CONTINUED

---

#### d. Installation.

#### NOTE

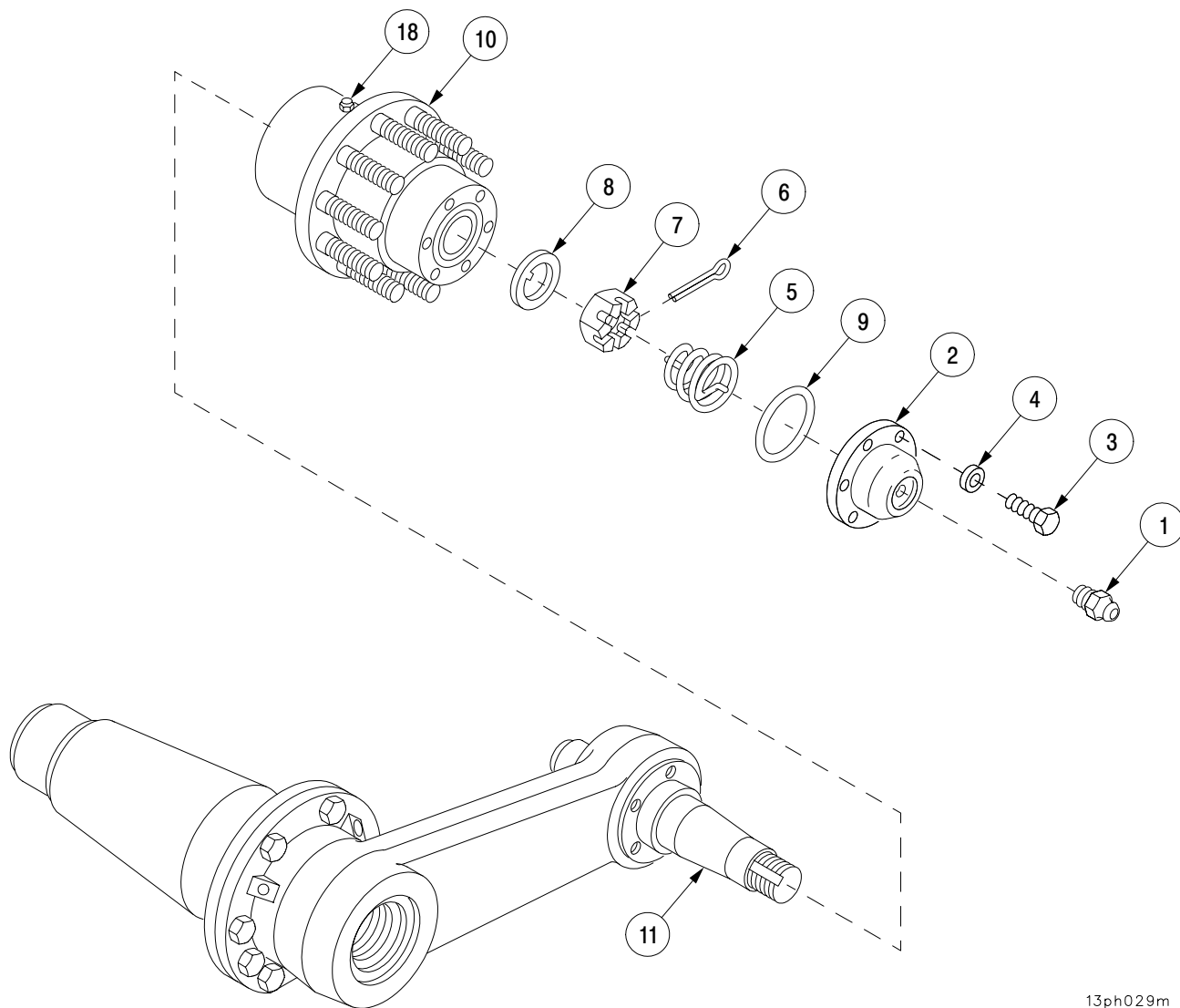
Make sure seal aligns with alignment holes on roadwheel arm spindle.

- 1 Install roadwheel hub (10) on roadwheel arm spindle (11) with key washer (8), nut (7), and new packing (9).
- 2 Torque nut (7) as follows:
  - (a) Torque nut (7) to 90–110 lb–ft (122–149 N·m).
  - (b) Back nut (7) off to zero torque.
  - (c) Rotate roadwheel hub (10) while applying torque to nut (7) to 25–30 lb–ft (34–41 N·m).
  - (d) If slots in nut (7) and hole in spindle (11) line up, install new cotter pin (6).
  - (e) If misaligned, back nut (7) off to line up with the first hole in spindle (11) and install new cotter pin (6).
  - (f) After adjustment, roadwheel hub (10) must rotate freely.
- 3 Install static spring (5).
- 4 Secure cap (2) to roadwheel hub (10) with six screws (3) and six flat washers (4). Torque screws (3) to 9–11 lb–ft (12–15 N·m).
- 5 Install grease fitting (1) onto cap (2).
- 6 Fill hub (10) with lubricant until air-free lubricant flows from relief valve (18) (TM 9-2350-314-10).
- 7 Rotate hub assembly (10) a minimum of three revolutions and repeat grease application until air-free lubricant flows from relief valve (18).

**Section I. SUSPENSION ASSEMBLY – CONTINUED**

**12-4 ROADWHEEL HUB AND CAP ASSEMBLY – CONTINUED**

**d. Installation – Continued**



13ph029m

**NOTE**

**FOLLOW-ON MAINTENANCE:**  
Install roadwheel (para 12-5)

## Section I. SUSPENSION ASSEMBLY – CONTINUED

---

### 12-5 ROADWHEELS.

---

This task covers:                    a. Removal    b. Installation

---

#### **INITIAL SETUP**

##### Tools

General mechanic's tool kit  
(SC 5180-90-N26)  
12-ton jack (item 32, Appx F)  
Roadwheel lifter (item 36, Appx F)  
Torque wrench (item 87, Appx F)  
Crowbar (item 12, Appx F)

##### Equipment Conditions

Track disconnected (para 12-16)

##### Personnel Required

Two

##### References

TM 9-2350-314-10

##### Materials/Parts

Self-locking nuts (10) (item 204, Appx E)

---

#### **WARNING**

Track must be blocked so that the vehicle will not roll out of control during roadwheel maintenance. Failure to securely block vehicle tracks may result in severe injury to personnel or equipment damage.

#### **a. Removal.**

- 1 Remove track from top of roadwheel (1) using crowbar.
- 2 Loosen, but do not remove, ten self-locking nuts (2) and ten flat washers (3).

#### **NOTE**

- Perform Removal steps 3, 4, and 7 and Installation steps 1, 3, and 4 for roadwheels 2 thru 6.
  - Perform Removal steps 5, 6, and 7 and Installation steps 1, 2, and 4 for roadwheels 1 and 7.
- 3 Place lifter (4) on roadwheel arm hub (5) and on inner side of track (6).

**Section I. SUSPENSION ASSEMBLY – CONTINUED**

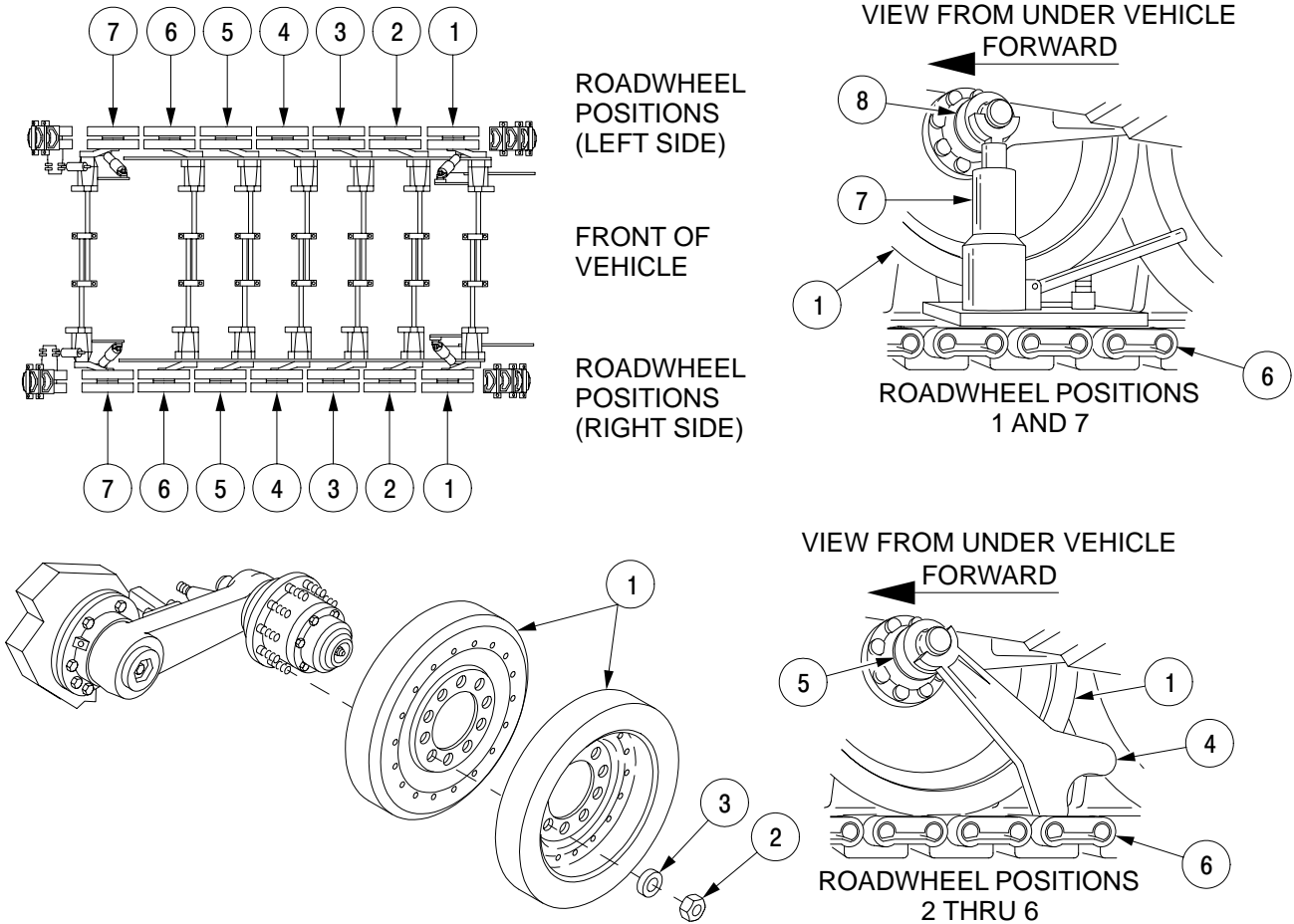
**12-5 ROADWHEELS – CONTINUED**

**a. Removal – Continued**

**WARNING**

When driving vehicle on or off lifters, clear the area.  
Lifters may fly out from under the vehicle and cause serious injury to personnel.

- 4 Start engine (TM 9-2350-314-10) and drive vehicle slowly backward until roadwheel (1) lifts off track (6).
- 5 Position jack base (7) on track (6) and locate head of jack under spindle extension of roadwheel arm (8).



13ph030m

## Section I. SUSPENSION ASSEMBLY – CONTINUED

---

### 12-5 ROADWHEELS – CONTINUED

---

#### a. Removal – Continued

- 6 Move jack up until roadwheel (1) clears track (6).
- 7 Remove ten self-locking nuts (2) with ten flat washers (3) and roadwheel (1). Discard self-locking nuts.

#### b. Installation.

- 1 Install roadwheel (1) on roadwheel arm (8) with ten flat washers (3) and ten new self-locking nuts (2). Tighten securely.
- 2 Lower roadwheel (1) to track (6) and remove jack (7).

**WARNING**

When driving vehicle on or off lifters, clear the area.  
Lifters may fly out from under the vehicle and cause  
serious injury to personnel.

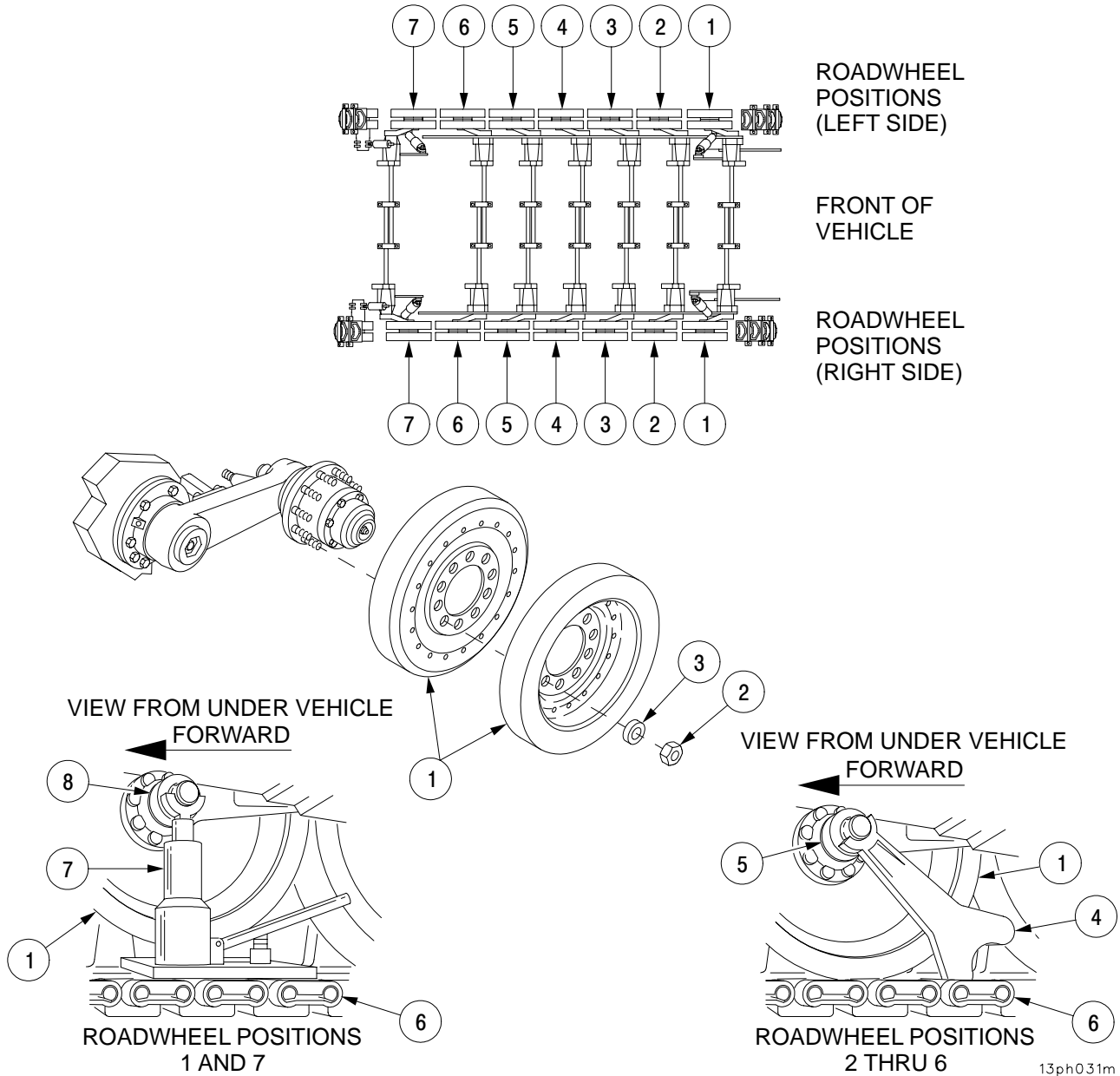
- 3 Start engine (TM 9-2350-314-10) and drive vehicle slowly forward until lifter (4) can be removed and roadwheel (1) is resting on track (6).
- 4 Torque ten new self-locking nuts (2) to 162-198 lb-ft (220-268 N·m).



**Section I. SUSPENSION ASSEMBLY – CONTINUED**

**12-5 ROADWHEELS – CONTINUED**

**b. Installation – Continued**



**NOTE**

**FOLLOW-ON MAINTENANCE:**  
Connect track (para 12-16)

## Section I. SUSPENSION ASSEMBLY – CONTINUED

---

### 12-6 TORSION BAR.

---

This task covers:                    a. Removal    b. Installation

---

#### **INITIAL SETUP**

##### Tools

General mechanic's tool kit  
(SC 5180-90-N26)  
Torsion bar retaining wrench (item 88, Appx F)  
Mechanical puller adapter (item 1, Appx F)  
Hammertype slide puller (item 48, Appx F)  
Torque wrench (item 86, Appx F)

##### Equipment Conditions

Roadwheel removed (para 12-5)

##### Personnel Required

Two

##### Materials/Parts

Gasket (item 206, Appx E)  
Automotive grease (item 23, Appx C)  
Self-locking bolt (item 205, Appx E)

---

#### **a. Removal.**

- 1 Remove screw (1) from torsion bar plug (2).
- 2 Insert wrench in torsion bar plug (2) and remove torsion bar plug (2) and gasket (3). Discard gasket.
- 3 Install adapter and puller, and remove torsion bar (4).

#### **b. Installation.**

- 1 Refer to identification chart (para 12-1) for the applicable torsion bar (4) you are replacing.
- 2 Lubricate splines at each end of torsion bar (4) with lubricant.

#### **CAUTION**

- Do not remove protective tape from ground (unsplined) surface of torsion bars.
- Do not use any tool other than torsion bar slide hammer puller.
- Torsion bar should slide in by hand. If not, use slide hammer puller as necessary.

**Section I. SUSPENSION ASSEMBLY – CONTINUED**

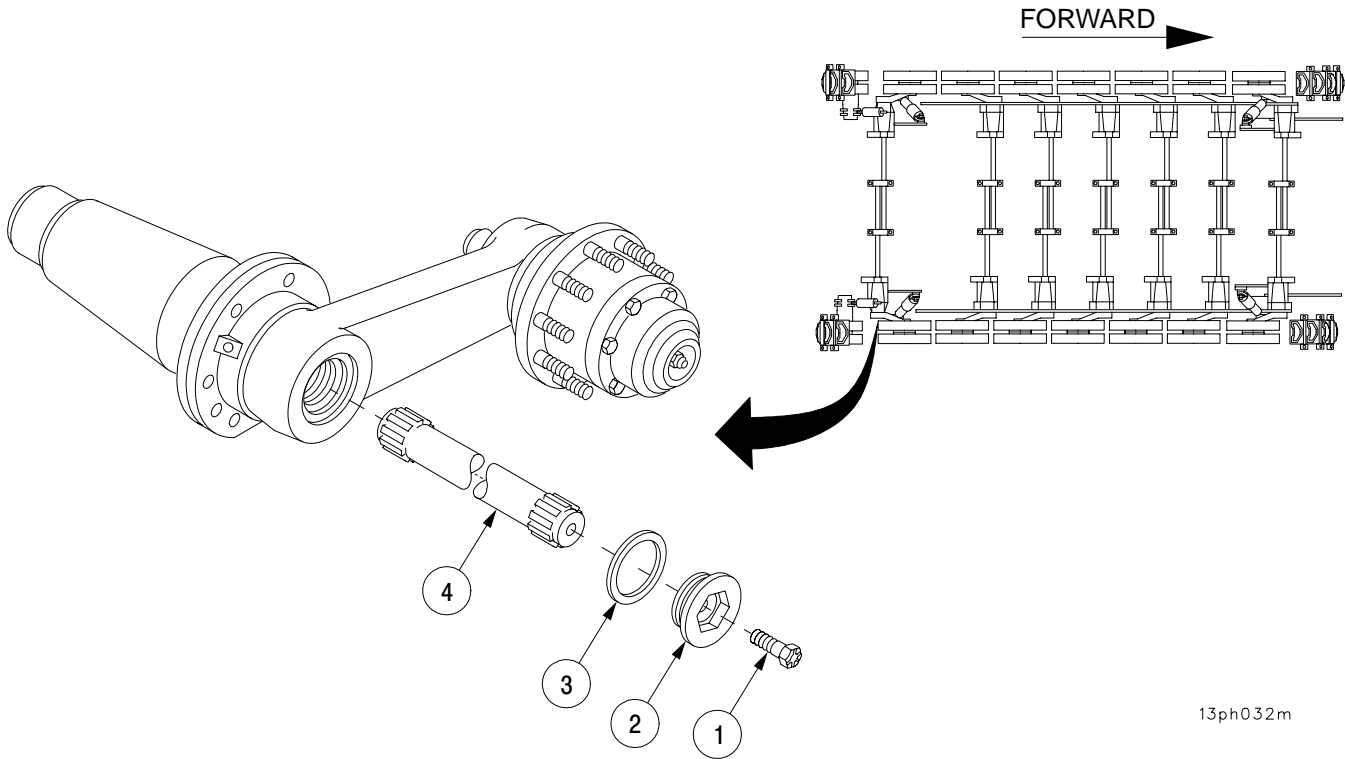
**12-6 TORSION BAR – CONTINUED**

**b. Installation – Continued**

**NOTE**

Hold roadwheel arms 1 through 6 at 4 o'clock position on vehicle left side and 8 o'clock on right, hold number 7 roadwheel arm at 8 o'clock on vehicle left side and 4 o'clock on right side while installing torsion bars.

- 3 Insert torsion bar (4), making certain splines on each end of torsion bar are aligned with blind splines in anchor and roadwheel arm.
- 4 Install new gasket (3) and torsion bar plug (2).
- 5 Install screw (1). Torque screw to 80–100 lb–ft (108–136 N·m).



13ph032m

**NOTE**

**FOLLOW-ON MAINTENANCE:**  
Install roadwheel (para 12-5)

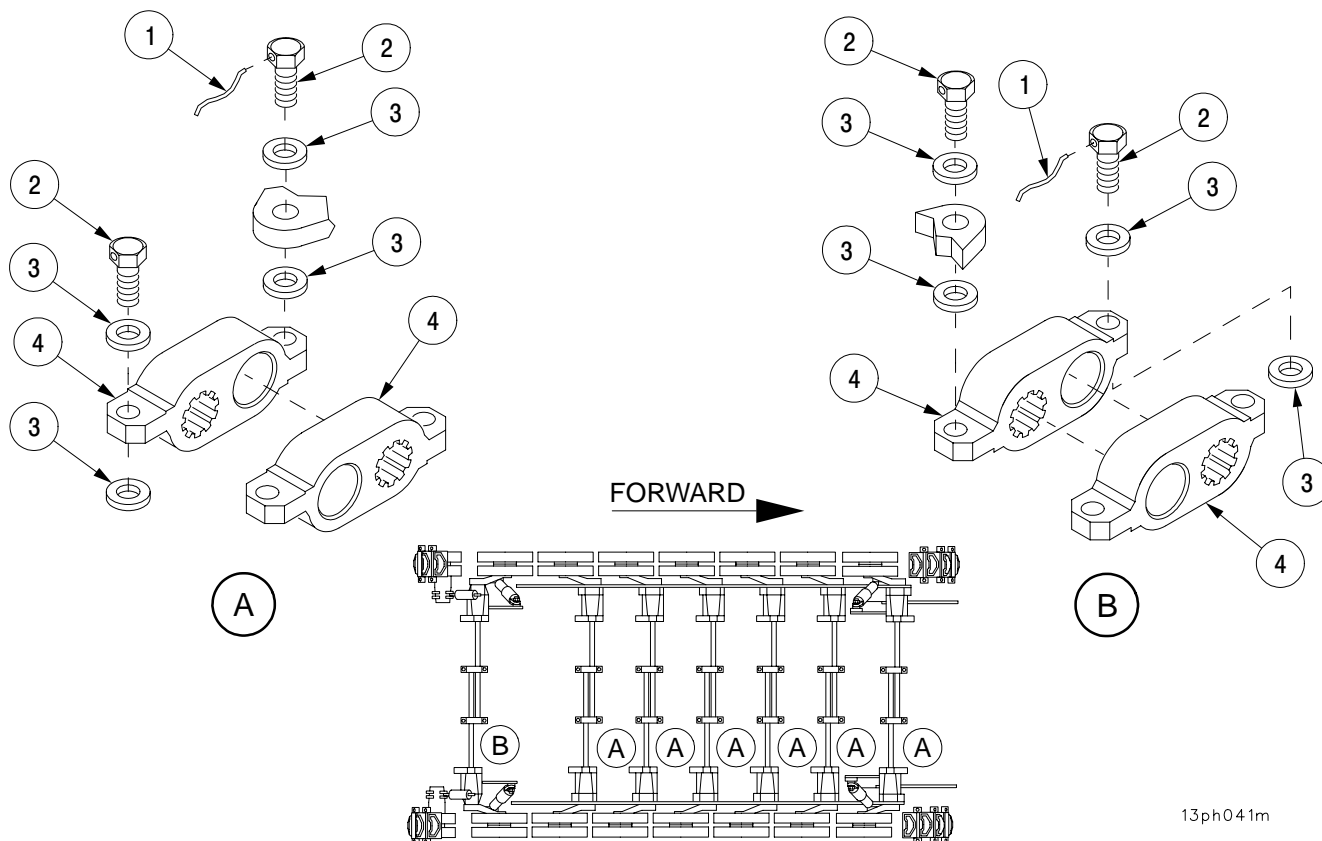


**Section I. SUSPENSION ASSEMBLY – CONTINUED**

**12-7 TORSION BAR ANCHORS, POSITIONS 1, 2, 4, 5, 6, AND 7 – CONTINUED**

**b. Installation – Continued**

- 1 Remove any water or dirt in torsion bar cavity. Dry thoroughly and clean using dry-cleaning solvent.
- 2 Install anchors (4) with eight flat washers (3) and four screws (2). Torque screws to 230–260 lb–ft (312–353 N-m).
- 3 Install new lockwire (1) through screws (2).
- 4 Coat torsion bar anchors (4) with lubricant.



**NOTE**

**FOLLOW-ON MAINTENANCE:**

- Install torsion bar anchor cover plate (para 16-40)
- Install torsion bar (para 12-6)

## Section II. TRACK IDLERS AND BRACKETS

---

### 12-8 IDLER WHEELS AND IDLER ARM HUB AND CAP ASSEMBLY.

---

This task covers:    a. Removal                    b. Disassembly                    c. Assembly                    d. Installation

---

#### **INITIAL SETUP**

##### Tools

General mechanic's tool kit  
(SC 5180-90-N26)  
Torque wrench (item 87, Appx F)  
Bearing cup replacer (item 50, Appx F)  
Bearing cup replacer (item 51, Appx F)  
Replacer handle (item 28, Appx F)  
Torque wrench (item 86, Appx F)  
Hand lubricating gun (item 24, Appx F)  
Inner seal replacer (item 52, Appx F)

##### Materials/Parts

Self-locking nuts (10) (item 204, Appx E)  
Cotter pin (item 201, Appx E)  
Plain encased seal (item 203, Appx E)  
Preformed packing (item 202, Appx E)

##### Equipment Conditions

Track disconnected (para 12-16)

##### References

TM 9-2350-314-10

---

#### **WARNING**

Track must be blocked so that the vehicle will not roll out of control during idler wheel and idler arm hub and cap assembly maintenance. Failure to securely block vehicle tracks may result in severe injury to personnel or equipment damage.

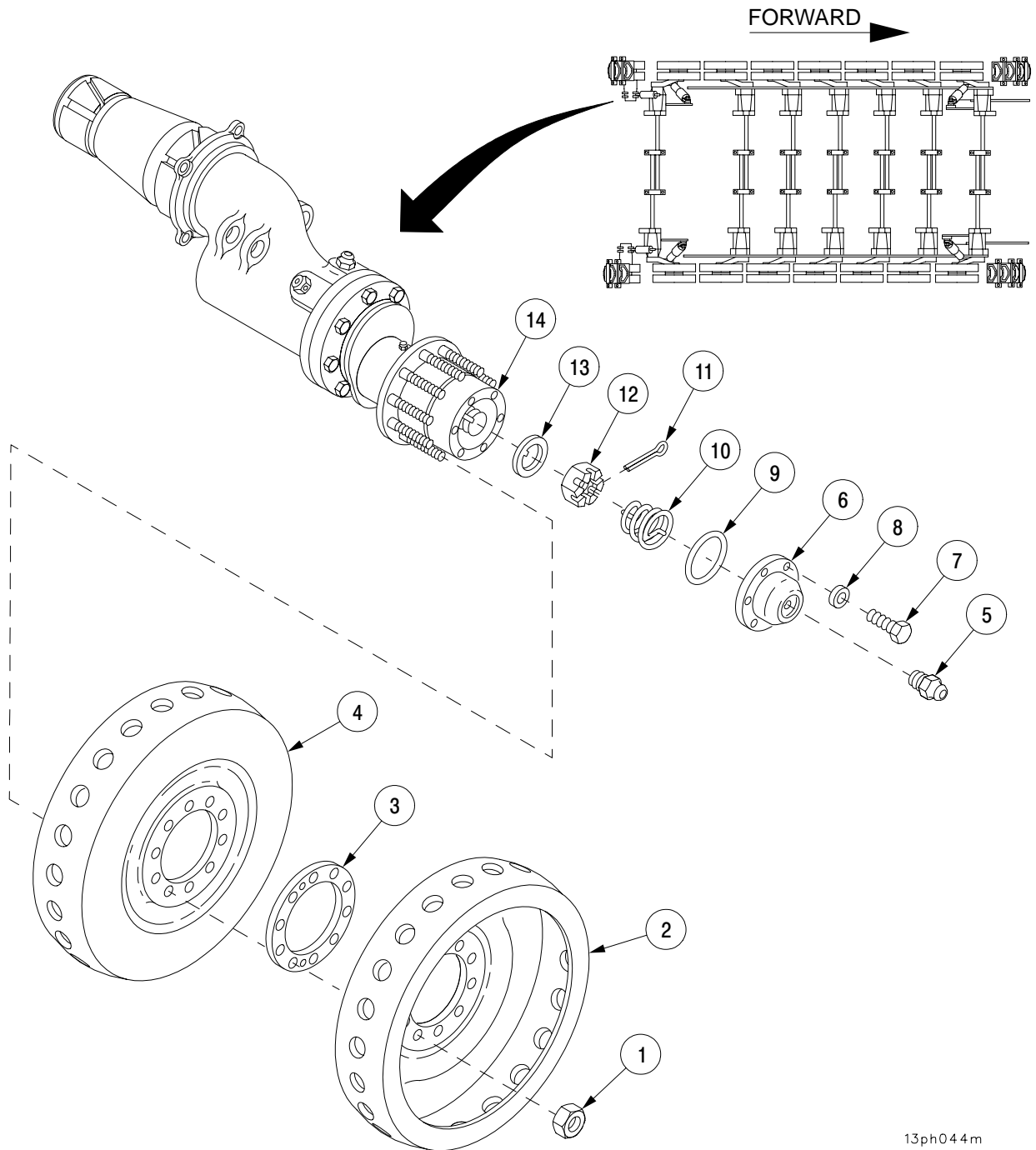
#### **a. Removal.**

- 1 Remove ten self-locking nuts (1). Discard self-locking nuts.
- 2 Remove outer idler wheel (2), spacer (3), and inner idler wheel (4).
- 3 Remove grease fitting (5) from cap (6).
- 4 Remove six screws (7), six flat washers (8), and cap (6).
- 5 Remove preformed packing (9) from cap (6). Discard preformed packing.
- 6 Remove static spring (10), cotter pin (11), nut (12), and key washer (13) from idler hub (14). Discard cotter pin.

Section II. TRACK IDLERS AND BRACKETS – CONTINUED

12-8 IDLER WHEELS AND IDLER ARM HUB AND CAP ASSEMBLY – CONTINUED

a. Removal – Continued



13ph044m

## Section II. TRACK IDLERS AND BRACKETS – CONTINUED

---

### 12-8 IDLER WHEELS AND IDLER ARM HUB AND CAP ASSEMBLY – CONTINUED

---

#### b. Disassembly.

- 1 Remove idler hub (14) from idler arm spindle (15).
- 2 Remove seal (16) from idler hub (14). Discard seal.

#### NOTE

- Bearing cones and bearing cups are used in matched sets only. If either is damaged, both cone and cup must be replaced.
  - Bearing cups are to be removed only if damage to cup is evident or bearings are to be replaced.
- 3 Remove inner bearing cone (17) and outer bearing cone (18) from idler hub (14).
  - 4 Remove inner bearing cup (19) and outer bearing cup (20) from idler hub (14).

#### NOTE

There are ten bolts in idler hub. Remove only those bolts that are damaged.

- 5 Remove bolts (21).
- 6 Remove relief valve (22) from idler hub (14).

#### c. Assembly.

- 1 Install relief valve (22), if removed.
- 2 Install bolts (21), if removed.
- 3 Install inner bearing cup (19), if removed.
- 4 Install inner bearing cone (17) in idler hub (14).



---

**Section II. TRACK IDLERS AND BRACKETS – CONTINUED**

---

**12-8 IDLER WHEELS AND IDLER ARM HUB AND CAP ASSEMBLY – CONTINUED**

---

**c. Assembly –Continued****NOTE**

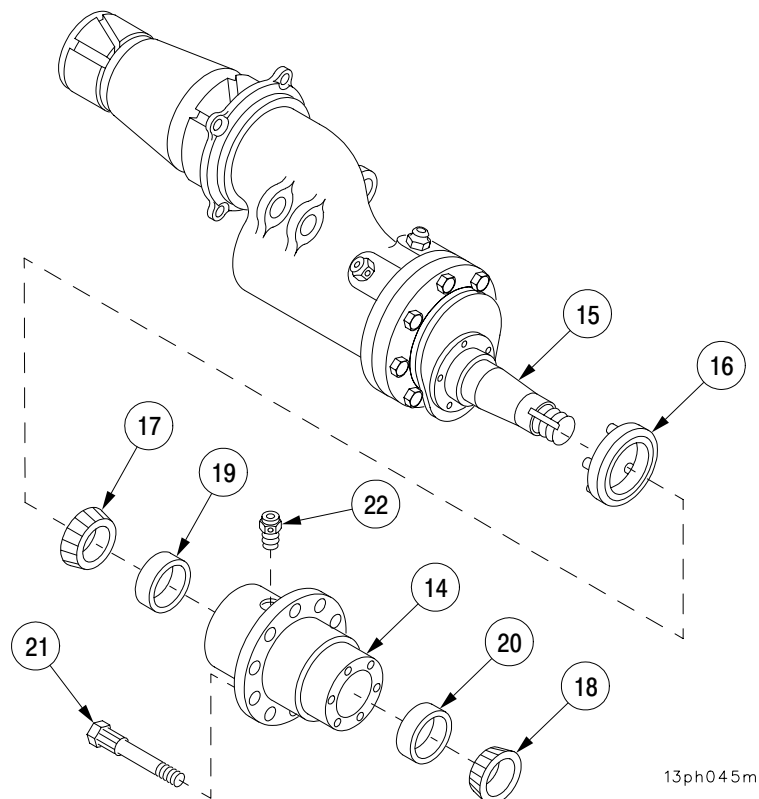
Make sure seal mating surface in hub is clean of grease, oil, and dirt prior to seal installation.

- 5 Install new seal (16) in idler hub (14).
- 6 Install outer bearing cup (20), if removed.
- 7 Install outer bearing cone (18).

**NOTE**

Make sure seal aligns with alignment holes on idler arm spindle.

- 8 Install idler hub (14) on idler arm spindle (15).

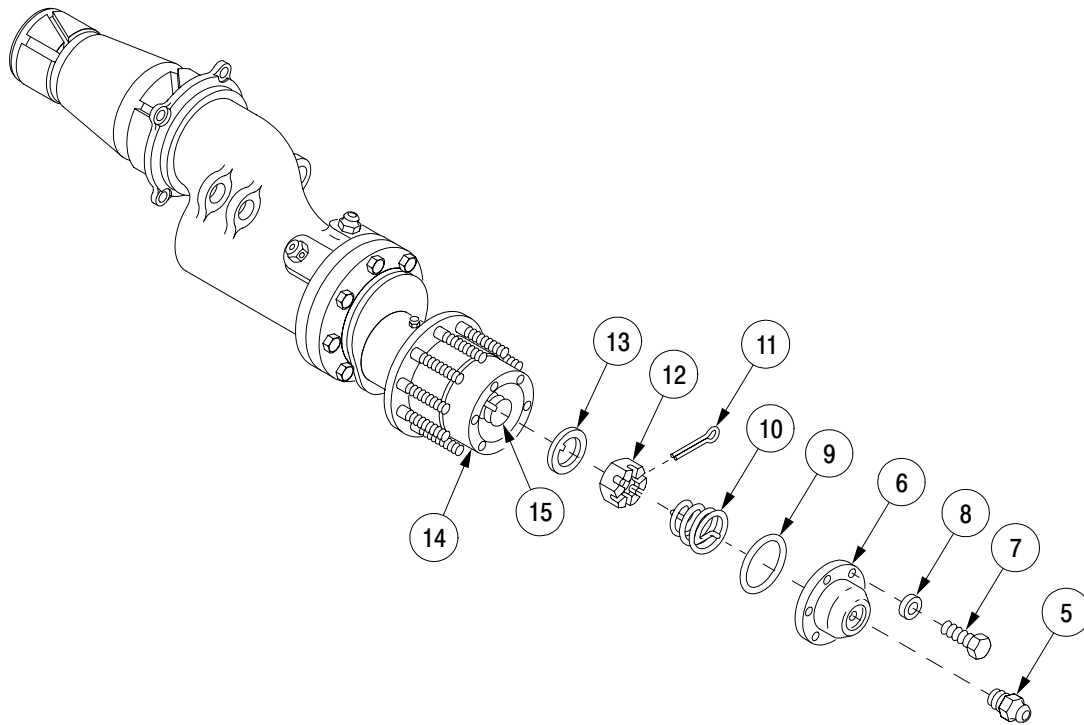


**Section II. TRACK IDLERS AND BRACKETS – CONTINUED**

**12-8 IDLER WHEELS AND IDLER ARM HUB AND CAP ASSEMBLY – CONTINUED**

**d. Installation.**

- 1 Install key washer (13) and nut (12).
- 2 Torque nut (12) as follows:
  - (a) Torque nut (12) to 90–110 lb–ft (123–149 N·m).
  - (b) Back nut (12) off to zero torque.
  - (c) Torque nut (12) to 25–30 lb–ft (34–41 N·m) while rotating idler arm hub (14).
  - (d) If slots in nut (12) and hole in spindle (15) line up, install new cotter pin (11).
  - (e) If misaligned, back nut (12) off to line up with first hole in spindle (15) and install new cotter pin (11).
  - (f) After adjustment, idler arm hub (14) must rotate freely.
- 3 Install new preformed packing (9) onto cap (6).
- 4 Install static spring (10), cap (6), six flat washers (8), and six screws (7). Torque six screws to 9–11 lb–ft (12–15 N·m).
- 5 Install grease fitting (5) into cap (6).



13ph046m

---

**Section II. TRACK IDLERS AND BRACKETS – CONTINUED**

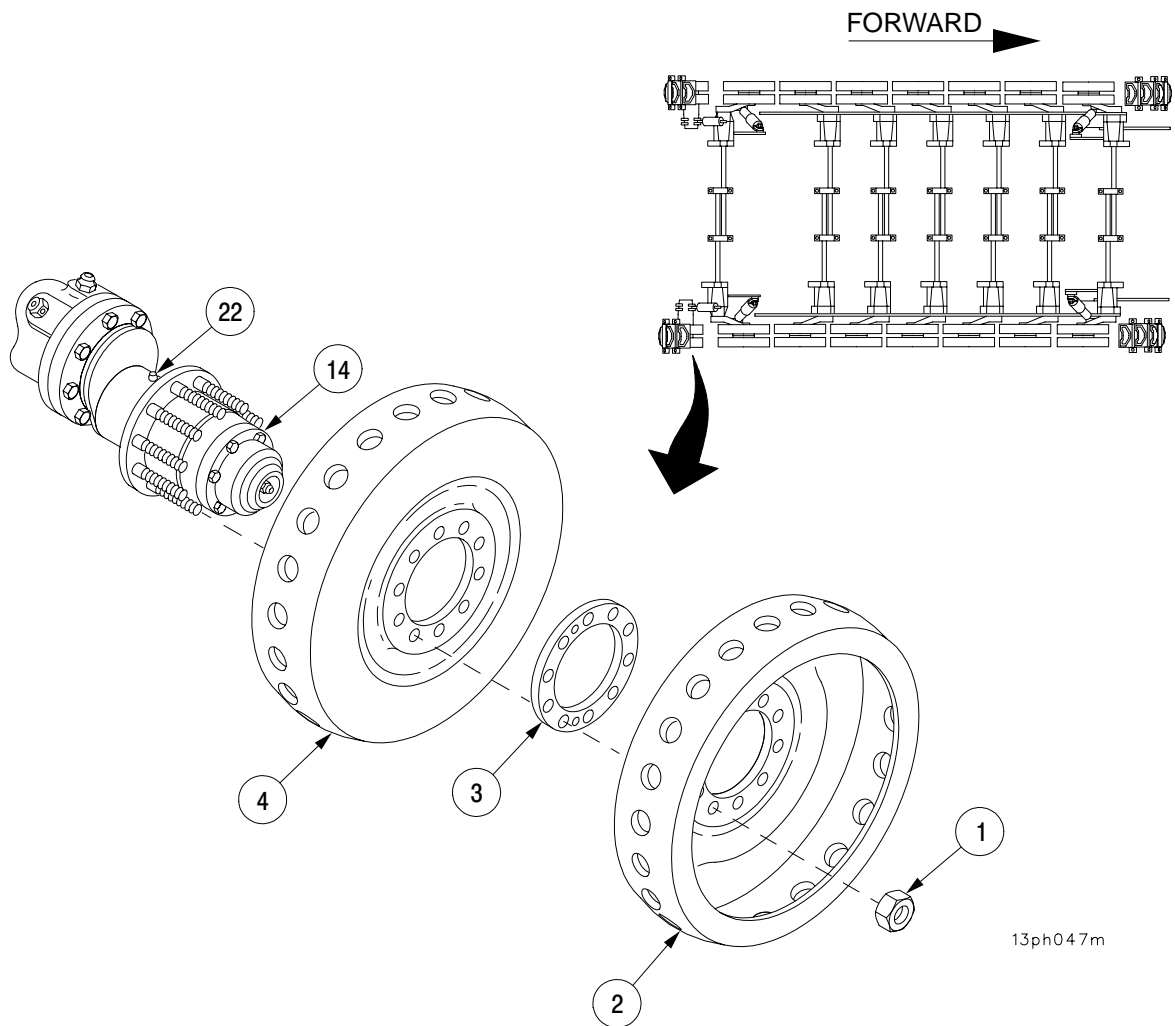
---

**12-8 IDLER WHEELS AND IDLER ARM HUB AND CAP ASSEMBLY – CONTINUED**

---

**d. Installation – Continued**

- 6 Fill idler hub (14) with lubricant until air-free lubricant flows from relief valve (22) (TM 9-2350-314-10).
- 7 Install inner idler wheel (4), spacer (3), and outer idler wheel (2).
- 8 Install ten new self-locking nuts (1). Torque nuts to 162–198 lb-ft (219–268 N-m).

**NOTE**

**FOLLOW-ON MAINTENANCE:**  
Connect track (para 12-16)

---

## Section II. TRACK IDLERS AND BRACKETS – CONTINUED

---

### 12-9 IDLER ARM HOUSING.

---

This task covers:

a. Removal

b. Installation

---

#### INITIAL SETUP

##### Tools

General mechanic's tool kit

(SC 5180-90-N26)

Torque wrench (item 87, Appx F)

##### Equipment Conditions

Idler arm assembly removed

(para 12-10)

Spade assembly removed (para 17-4)

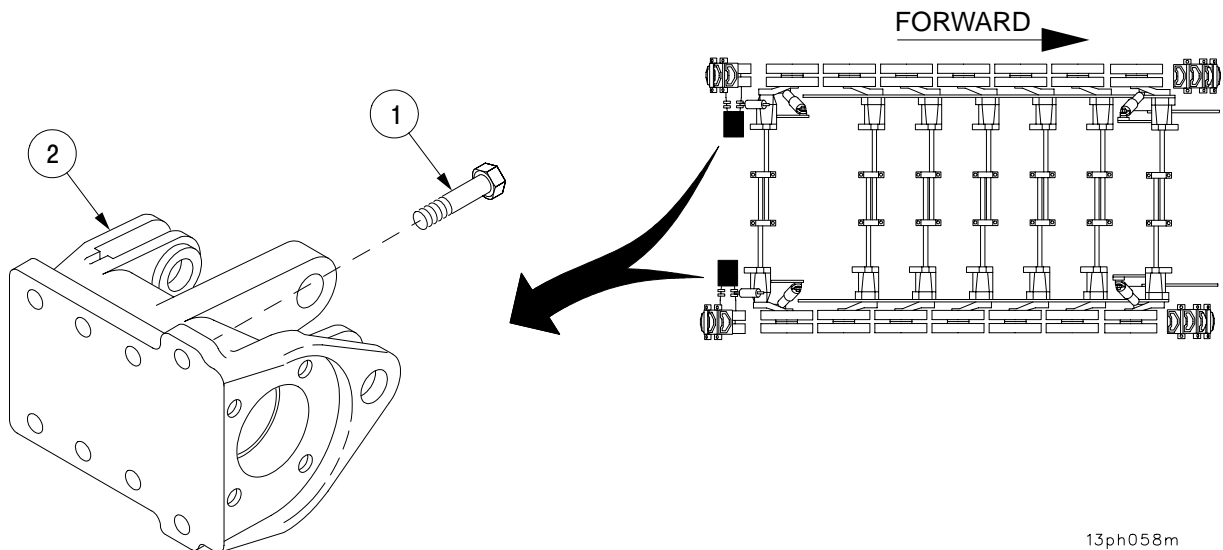
---

#### a. Removal.

Remove eight screws (1) and idler arm housing (2).

#### b. Installation.

Install idler arm housing (2) with eight screws (1). Torque screws to 320 lb-ft (434 N-m).



13ph058m

#### NOTE

##### FOLLOW-ON MAINTENANCE:

Install spade assembly (para 17-4)

Install idler arm assembly (para 12-10)

**Section II. TRACK IDLERS AND BRACKETS – CONTINUED**

**12-10 IDLER ARM ASSEMBLY.**

This task covers:      a. Removal      b. Disassembly      c. Assembly      d. Installation

**INITIAL SETUP**

Tools

General mechanic's tool kit  
(SC 5180-90-N26)  
Torque wrench (item 87, Appx F)  
Torque wrench (item 86, Appx F)  
Lubricating gun (item 24, Appx F)

Material/Parts

Preformed packing (item 209, Appx E)  
Preformed packing (item 210, Appx E)  
Gasket (item 207, Appx E)  
Nonmetallic seal (item 211, Appx E)  
Spring pin (item 208, Appx E)

Equipment Conditions

Idler wheels and idler arm hub removed  
(para 12-8)  
Track adjuster disconnected (para 12-11)

Personnel Required

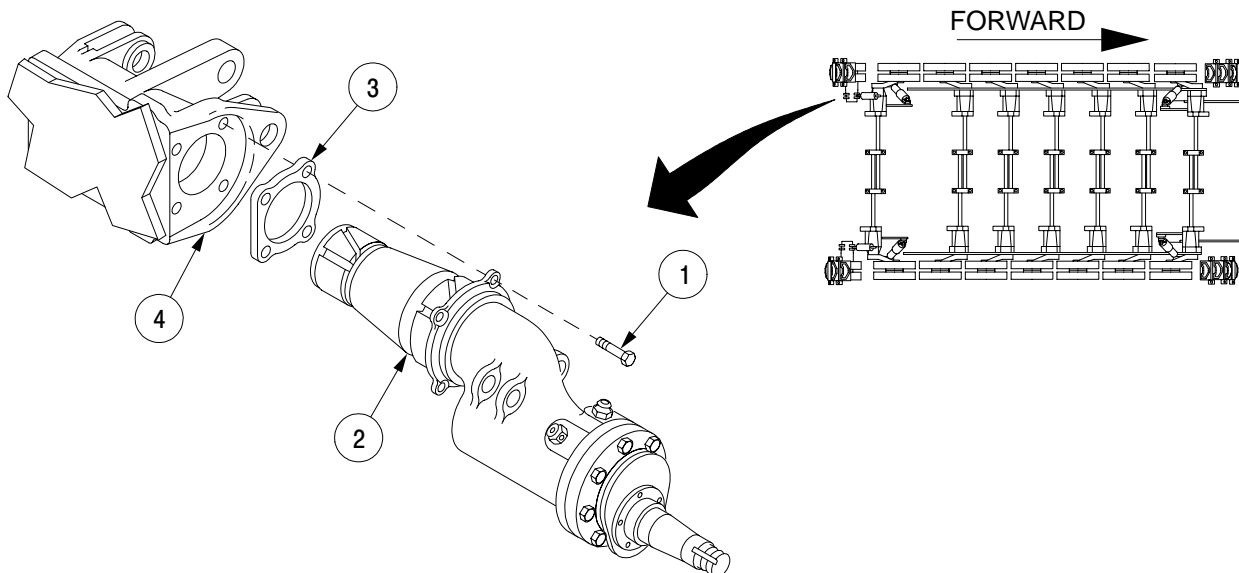
Three

References

TM 9-2350-314-10

**a. Removal.**

- 1 Remove four screws (1).
- 2 Remove idler arm assembly (2) and gasket (3) from idler arm housing (4). Discard gasket.



13ph042m

## Section II. TRACK IDLERS AND BRACKETS – CONTINUED

---

### 12–10 IDLER ARM ASSEMBLY – CONTINUED

---

#### b. Disassembly.

- 1 Remove screw (5), flat washer (6), idler arm cap (7), and spring pin (8). Discard spring pin.
- 2 Remove inner sleeve bearing (9), bearing spacer (10), outer sleeve bearing (11), idler arm retainer (12), and preformed packing (13). Discard preformed packing.
- 3 Remove from idler arm (14), eight screws (15), inner sleeve bearing (16), outer sleeve bearing (17), preformed packing (18), two retainers (19), retainer (20), spindle (21), seal (22), safety relief valve (23), and grease fitting (24). Discard preformed packing and seal.
- 4 Remove plug (25) from housing (4).

#### c. Assembly.

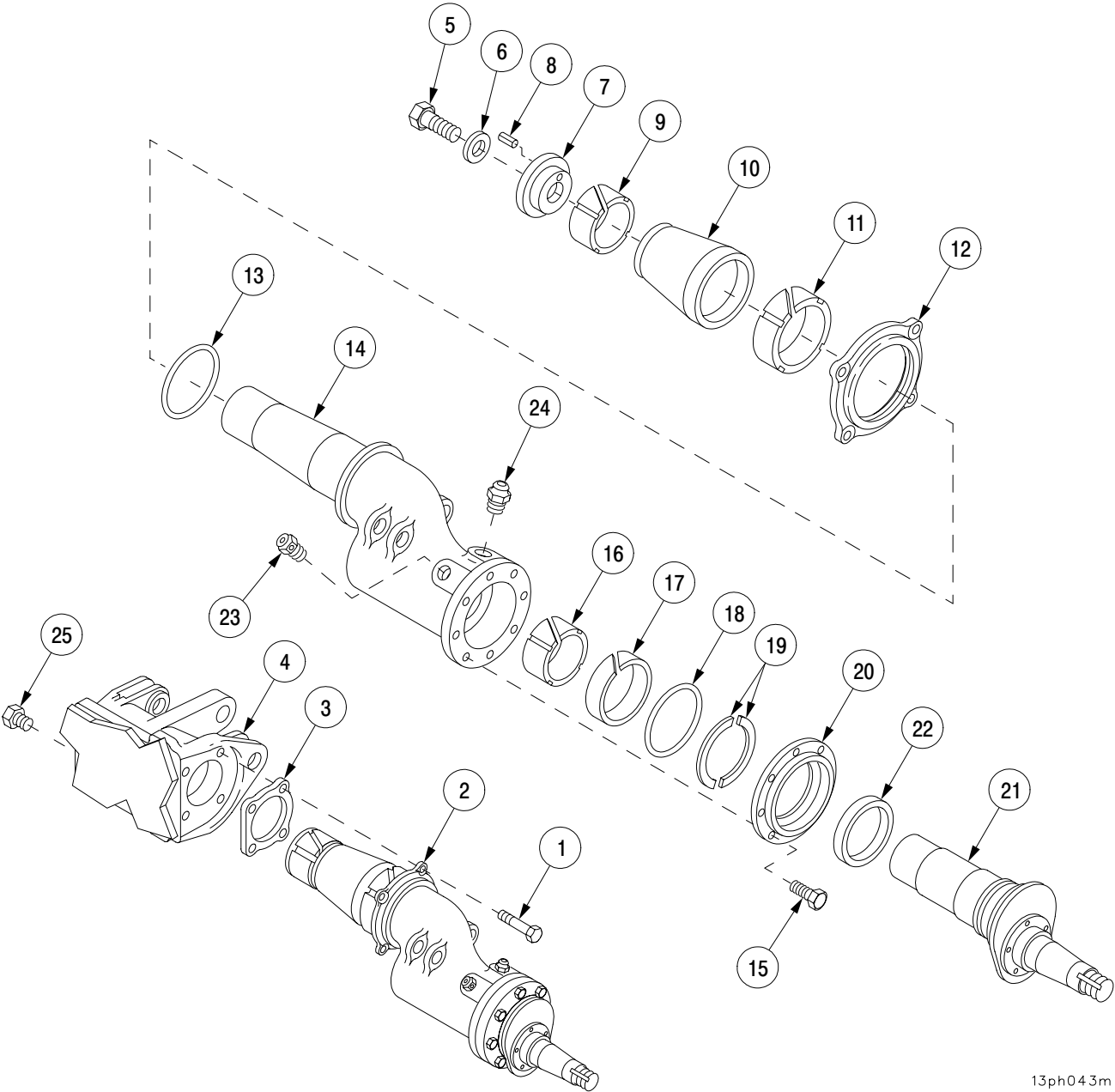
- 1 Install outer sleeve bearing (17) and inner sleeve bearing (16) in idler arm (14).
- 2 Install new preformed packing (18), two retainers (19), and retainer (20).
- 3 Secure retainer (20) to idler arm (14) with eight screws (15). Torque screws to 31–38 lb–ft (42–52 N·m).
- 4 Install spindle (21) with new seal (22).
- 5 Install grease fitting (24) and safety relief valve (23) in idler arm (14).
- 6 Install inner sleeve bearing (9) and outer sleeve bearing (11) on bearing spacer (10).
- 7 Install new preformed packing (13) on idler arm (14).
- 8 Install idler arm retainer (12) and bearing spacer (10) on idler arm (14).
- 9 Install idler arm cap (7) with flat washer (6) and screw (5). Torque screw to 288–352 lb–ft (391–477 N·m).
- 10 Fill idler arm (14) and idler arm housing (4) with lubricant (TM 9–2350–314–10).
- 11 Install new spring pin (8) in idler arm cap (7).

#### d. Installation.

- 1 Install plug (25) in idler arm housing (4).
- 2 Install idler arm assembly (2) with new gasket (3) on idler arm housing (4).
- 3 Install four screws (1). Torque to 90 lb–ft (122 N·m).

Section II. TRACK IDLERS AND BRACKETS – CONTINUED

12-10 IDLER ARM ASSEMBLY – CONTINUED



13ph043m

**NOTE**

**FOLLOW-ON MAINTENANCE:**  
Connect track adjuster (para 12-11)  
Install idler wheels and idler arm hub (para 12-8)

---

## Section II. TRACK IDLERS AND BRACKETS – CONTINUED

---

### 12-11 TRACK ADJUSTER ASSEMBLY AND MOUNTING BRACKET.

---

This task covers:                    a. Removal    b. Installation

---

#### **INITIAL SETUP**

##### Tools

General mechanic's tool kit  
(SC 5180-90-N26)  
Hammertype slide puller (item 48, Appx F)  
Torque wrench (item 87, Appx F)  
Pinch point crowbar (item 12, Appx F)  
Lubricating gun (item 24, Appx F)

##### Materials/Parts

Cotter pins (2) (item 212, Appx E)  
Tape, antiseizing (item 60, Appx C)

##### Equipment Conditions

Fenders removed (para 16-33)

##### References

TM 9-2350-314-10

---

#### **WARNING**

Track must be blocked so that the vehicle will not roll out of control during track adjuster assembly maintenance. Failure to securely block vehicle tracks may result in severe injury to personnel or equipment damage.

#### **a. Removal.**

#### **WARNING**

Lubricant is under high pressure. Loosen bleed plug slowly to avoid injury.

#### **NOTE**

It is not necessary to disconnect track or remove idler wheels in order to remove or install track adjuster. Wheels are shown removed for clarity.

- 1 Loosen bleed plug (1) to reduce track tension.
- 2 Remove two cotter pins (2) and headless pin (3) from lug (4) of idler arm assembly (5). Discard cotter pins.

#### **NOTE**

Fabricate an adapter to pull pivot pin by welding a 1-in. NC thread nut to the head of a 7/8-in. NF thread bolt, 2 in. (5 cm) long. Use with puller when required.

- 3 Remove screw (6), flat washer (7), pivot pin (8), and track adjuster (9).



## Section II. TRACK IDLERS AND BRACKETS – CONTINUED

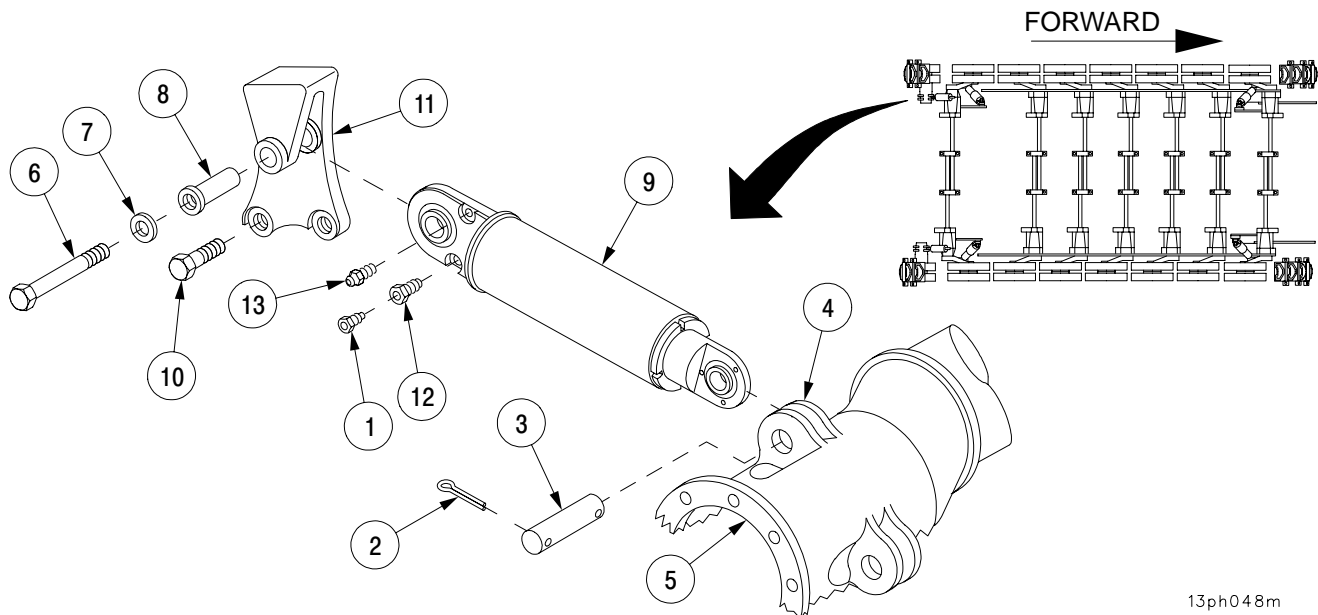
### 12-11 TRACK ADJUSTER ASSEMBLY AND MOUNTING BRACKET – CONTINUED

#### a. Removal – Continued

- 4 Remove two screws (10) and mounting bracket (11).
- 5 Remove bleed plug (1), bleeder body (12), and grease fitting (13).

#### b. Installation.

- 1 Apply antiseizing tape to threads of bleeder plug (1).
- 2 Install grease fitting (13), bleeder body (12), and bleeder plug (17).
- 3 Add lubricant to track adjuster (9) until piston is extended 1/2 to 1 in. (12–25 mm) (TM 9-2350-314-10).
- 4 Install mounting bracket (11) and two screws (10). Torque screws to 300–350 lb–ft (407–475 N·m).
- 5 Install track adjuster (9), pivot pin (8), flat washer (7), and screw (6). Torque screw to 300–350 lb–ft (407–475 N·m).
- 6 Install pin (3) in lug (4) of idler arm assembly (5).
- 7 Rotate idler arm assembly (5) counterclockwise with crowbar.
- 8 Secure track adjuster (9) to idler arm assembly (5) with headless pin (3) and two new cotter pins (2). Adjust track (para 12-14).



13ph048m

#### NOTE

**FOLLOW-ON MAINTENANCE:**  
Install fenders (para 16-33)

---

## Section III. TRACK DRIVE SPROCKET

---

### 12-12 FINAL DRIVE SPROCKET AND HUB.

---

This task covers:                    a. Removal    b. Installation

---

#### **INITIAL SETUP**

##### Tools

General mechanic's tool kit  
(SC 5180-90-N26)  
Torque wrench (item 86, Appx F)  
Torque wrench (item 87, Appx F)  
Socket (item 67, Appx F)

##### Equipment Conditions

Track disconnected (para 12-16)

##### Personnel

Two

##### Materials/Parts

Self-locking nuts (20) (item 213, Appx E)  
Self-locking bolts (8) (item 214, Appx E)  
Lubricating oil (item 31, Appx C)

---

#### **WARNING**

Track must be blocked so that the vehicle will not roll out of control during final drive sprocket and hub maintenance. Failure to securely block vehicle tracks may result in severe injury to personnel or equipment damage.

#### **a. Removal.**

#### **NOTE**

Hub with inner and outer sprockets attached may be removed as an assembly by removing eight screws.

- 1 Remove 10 self-locking nuts (1), 10 screws (2), and outer sprocket (3). Discard self-locking nuts.

#### **WARNING**

Hub is very heavy. Use at least two men when removing and installing to prevent serious injury to personnel.

- 2 Remove eight self-locking bolts (4) from hub (5). Insert two bolts (4) in hub pilot holes. Tighten to pull hub (5) away from drive assembly (6). Remove hub (5) with inner sprocket (7) from drive assembly (6). Discard self-locking bolts.

## Section III. TRACK DRIVE SPROCKET – CONTINUED

### 12-12 FINAL DRIVE SPROCKET AND HUB – CONTINUED

#### a. Removal – Continued

- 3 Remove 10 self-locking nuts (8), 10 screws (9), and hub (5) from inner sprocket (7). Discard self-locking nuts.

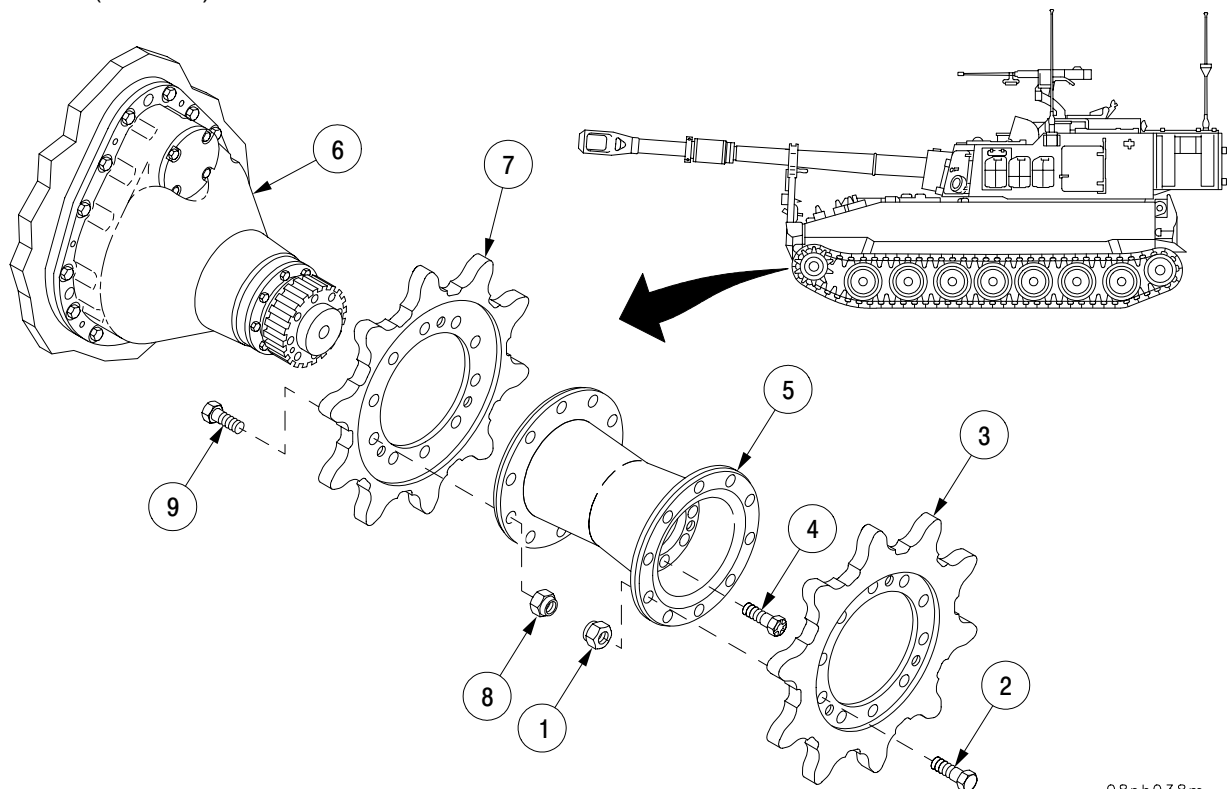
#### b. Installation.

- 1 Install inner sprocket (7) on hub (5) with 10 screws (9) and 10 new self-locking nuts (8). Torque screws to 90 lb-ft (122 N·m).
- 2 Apply a light coat of lubricating oil to threads of new self-locking bolts (4).

### WARNING

Hub is very heavy. Use at least two men when removing and installing to prevent serious injury to personnel.

- 3 Install hub (5) on final drive assembly (6) with eight new self-locking bolts (4). Torque screws to 450–475 lb-ft (610–644 N·m).
- 4 Install outer sprocket (3) on hub (5) with 10 screws (2) and 10 new self-locking nuts (1). Torque screws to 90 lb-ft (122 N·m).



08ph038m

### NOTE

**FOLLOW-ON MAINTENANCE:**  
Connect track (para 12-16)

## Section IV. TRACK ASSEMBLY

---

### 12-13 TRACK PAD.

---

This task covers:                    a. Removal    b. Installation

---

#### **INITIAL SETUP**

##### Tools

General mechanic's tool kit  
(SC 5180-90-N26)  
Torque wrench (item 86, Appx F)  
Wire brush (item 7, Appx F)

##### Materials/Parts

Self-locking nut (item 14, Appx E)

---

#### **WARNING**

Track must be blocked so that the vehicle will not roll out of control during track pad maintenance. Failure to securely block vehicle tracks may result in severe injury to personnel or equipment damage.

#### **a. Removal.**

#### **NOTE**

Vehicle must be positioned so that track pad to be replaced is off the ground and between roadwheel and idler wheel, or between drive sprocket and roadwheel.

- 1 Remove self-locking nut (1). Discard self-locking nut.
- 2 Remove pad (2) from track shoe (3).

#### **b. Installation.**

- 1 Clean track shoe (3) using wire brush.
- 2 Install pad (2) in track shoe (3) with new self-locking nut (1). Torque self-locking nut to 110-150 lb-ft (149-203 N·m).

---

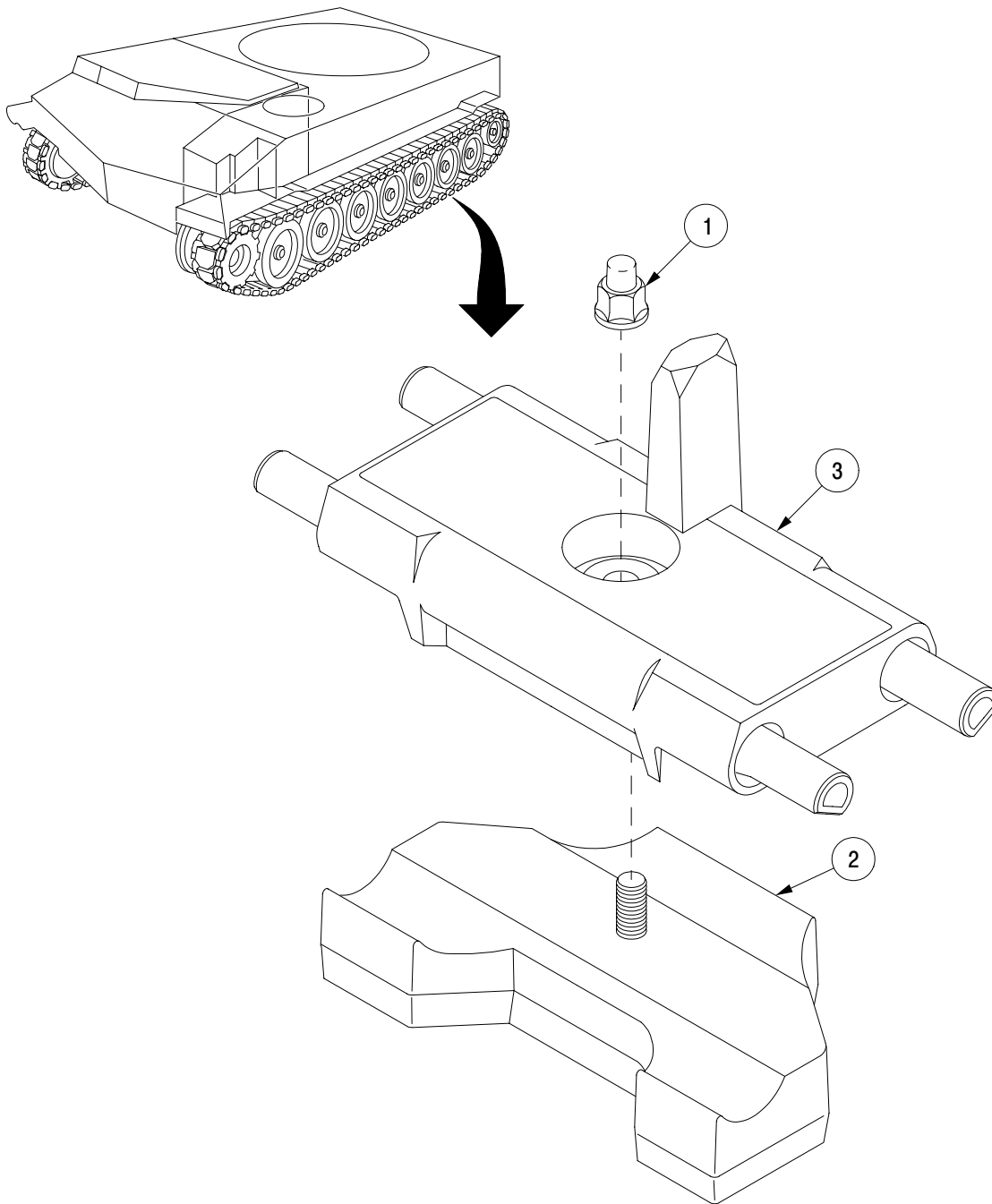
**Section IV. TRACK ASSEMBLY – CONTINUED**

---

**12-13 TRACK PAD – CONTINUED**

---

**b. Installation – Continued**



13ph049m



---

**Section IV. TRACK ASSEMBLY – CONTINUED**


---

**12-14 TRACK TENSION – CONTINUED**


---

**b. Adjusting.**

**CAUTION**

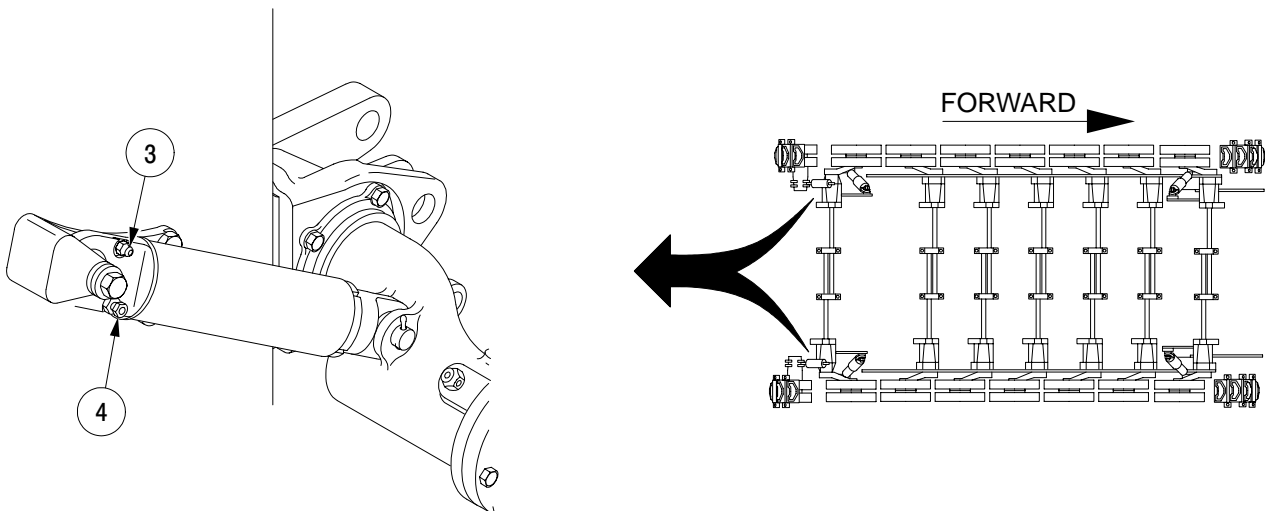
Do not allow track adjuster to extend more than 3-1/2 in. (88.9 mm). Remove a shoe to shorten track if necessary.

- 1 Clean grease fitting (3).
- 2 To increase track tension, add lubricant (TM 9-2350-314-10) until distance from top of third roadwheel (2) to bottom of upper track (1) is 1/4 in. (6.4 mm).

**WARNING**

Lubricant is under high pressure. Loosen bleed plug slowly to avoid injury to personnel.

- 3 To decrease track tension, slowly loosen bleed plug (4) to allow lubricant to escape until track (1) hangs loose.
- 4 Clean off excess lubricant.
- 5 Tighten bleed plug (4).



13ph052m

## Section IV. TRACK ASSEMBLY – CONTINUED

---

### 12-15 TRACK SHOE.

---

This task covers:                    a. Removal    b. Installation

---

#### **INITIAL SETUP**

##### Tools

General mechanic's tool kit  
(SC 5180-90-N26)  
Pinch point crowbar (item 12, Appx F)  
Track connecting fixture  
(item 19, Appx F)  
Torque wrench (item 86, Appx F)  
End connector puller (item 45, Appx F)

##### Equipment Conditions

Track tension decreased (para 12-14)

##### Personnel Required

Three

---

#### **WARNING**

Track must be blocked so that the vehicle will not roll out of control during track shoe maintenance. Failure to securely block vehicle tracks may result in severe injury to personnel or equipment damage.

#### **a. Removal.**

#### **NOTE**

Move vehicle so that track shoe to be removed is off the ground, either between the roadwheel and the idler wheel, or between the drive sprocket and the front roadwheels.

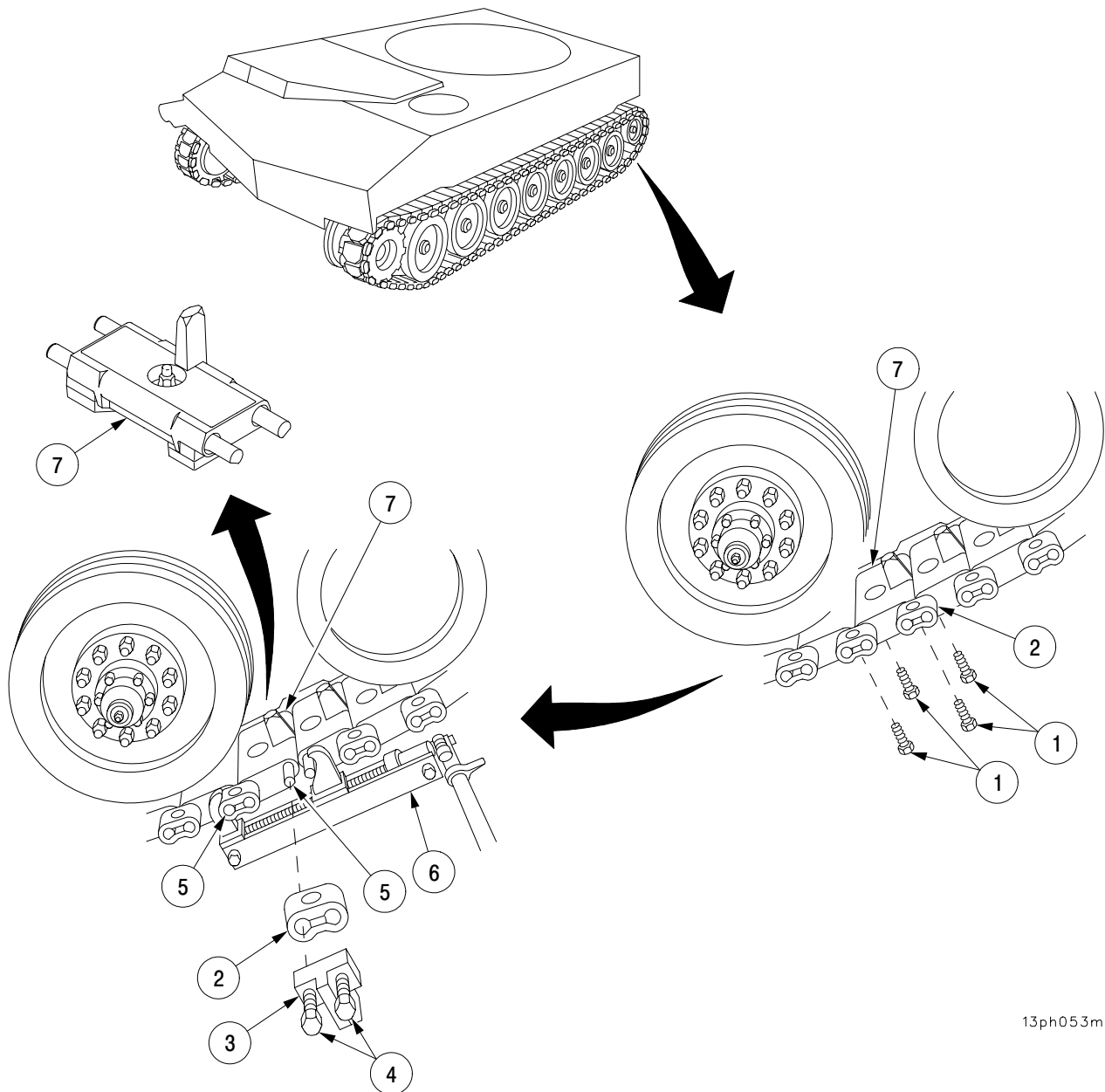
- 1 Remove four bolts (1) from four end connectors (2).
- 2 Install end connector puller (3). Tighten screws (4) against ends of track link pins (5).
- 3 Tighten two screws (4) until each of the four end connectors (2) moves out approximately 1 in. (25.4 mm).
- 4 Install two track-connecting fixtures (6) on track link pins (5) adjacent to track shoe (7) being removed.
- 5 Remove end connector puller (3), four end connectors (2), and track shoe (7).



Section IV. TRACK ASSEMBLY – CONTINUED

12-15 TRACK SHOE- CONTINUED

a. Removal – Continued



13ph053m

---

## Section IV. TRACK ASSEMBLY – CONTINUED

---

### 12-15 TRACK SHOE – CONTINUED

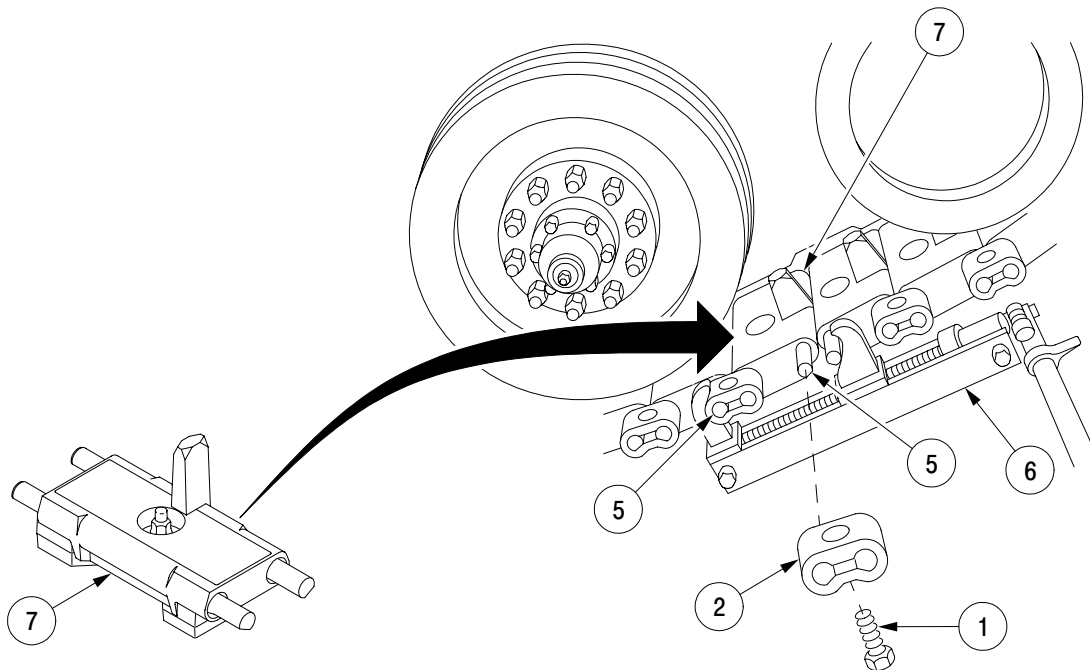
---

b. Installation.

**WARNING**

Track is heavy. Before removing track-connecting fixtures, support weight of track with crowbar to lower track to ground, to prevent possible injury.

- 1 Position track shoe (7) to track and install four end connectors (2) on track link pins (5).
- 2 Remove two track-connecting fixtures (6).
- 3 Install four end connectors (2) on track shoe (7) by tapping with hammer until end connectors (2) are flush with track link pins (5).



13ph054m

## Section IV. TRACK ASSEMBLY – CONTINUED

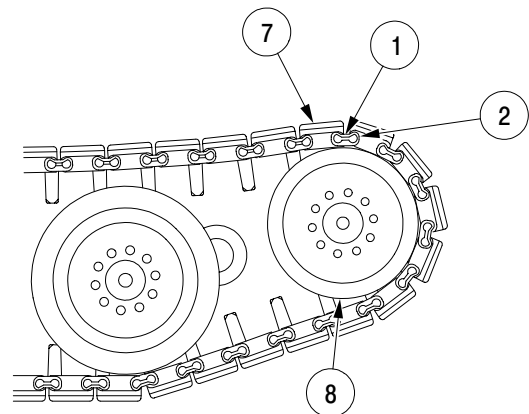
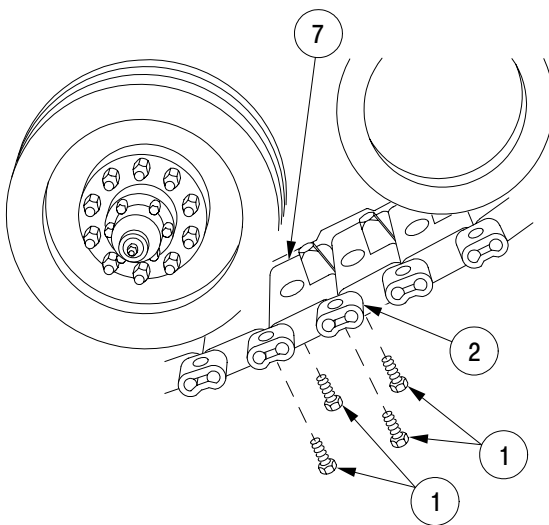
### 12-15 TRACK SHOE – CONTINUED

#### b. Installation – Continued

#### NOTE

A lubricant is applied to end connector bolts at the manufacturer. Any end connector bolt torqued dry is incorrectly torqued (too LOW). If a bolt is removed and reinstalled, a new coating of lube must be applied. Any oil or grease is acceptable.

- 4 Secure four end connectors (2) to track shoe (7) with four bolts (1). Tighten four bolts (1).
- 5 Mark the end connectors (2).
- 6 Move track so that the end connectors (2) being replaced or reused are at the 12 o'clock position (top) of the idler wheel (8).
- 7 Torque bolts (1) to 380–420 lb–ft (515–570 N·m) wet.
- 8 Drive vehicle at a speed not to exceed 10 mph for a short distance alternating right and left steers.
- 9 Stop vehicle and visually inspect the four end connectors (2) of the replaced track shoe (7). Reposition any end connectors (2) that have shifted.
- 10 Torque the four end connector bolts (1) (steps 6 and 7).



13ph059m

#### NOTE

#### FOLLOW-ON MAINTENANCE:

Adjust track tension (para 12-14)

## Section IV. TRACK ASSEMBLY – CONTINUED

### 12-16 TRACK.

This task covers:

a. Removal

b. Installation

#### INITIAL SETUP

##### Tools

General mechanic's tool kit

(SC 5180-90-N26)

Crowbar (item 12, Appx F)

Track connecting fixture

(item 19, Appx F)

Torque wrench (item 86, Appx F)

End connector puller (item 45, Appx F)

##### Material/Parts

Rope (item 45, Appx C)

##### Equipment Conditions

Track tension decreased (para 12-14)

##### Personnel Required

Three

##### References

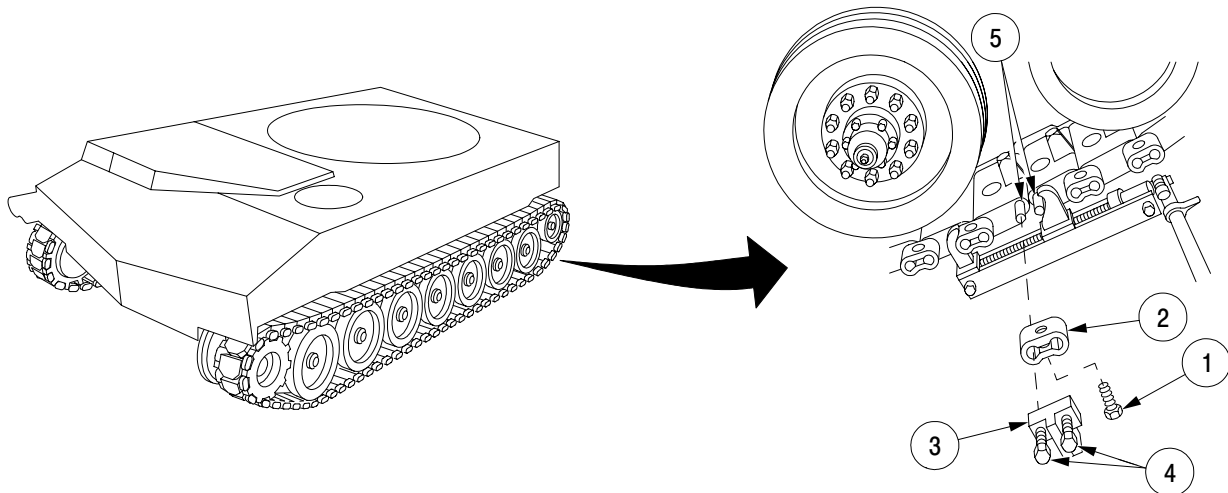
TM 9-2350-314-10

#### a. Removal.

#### NOTE

Move vehicle so that track shoe to be disconnected is off the ground, either between the roadwheel and the idler wheel or between the drive sprocket and the front roadwheels.

- 1 Remove two bolts (1) from two end connectors (2).
- 2 Install end connector puller (3). Tighten screws (4) against ends of track link pins (5).



13ph067m

---

## Section IV. TRACK ASSEMBLY – CONTINUED

---

### 12-16 TRACK – CONTINUED

---

#### a. Removal – Continued

- 3 Tighten two screws (4) until each of the two end connectors (2) moves out approximately 1 in. (25.4 mm).

#### NOTE

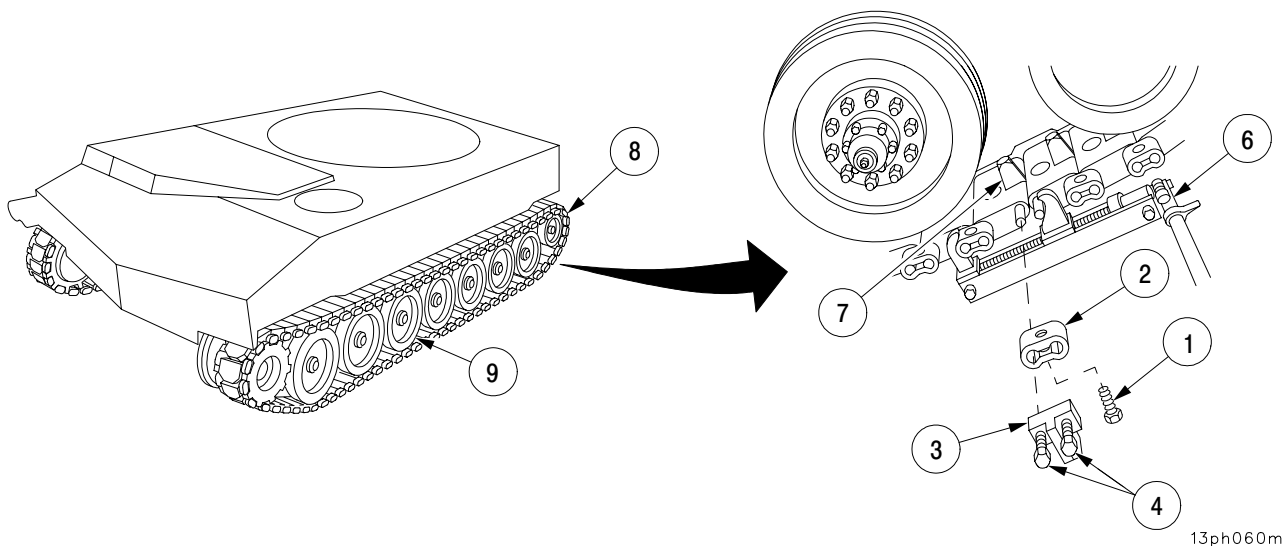
Tighten both fixtures equally, removing tension from shoe or track connectors being removed.

- 4 Install track connecting fixtures (6) on both ends of track shoe (7) being disconnected, engaging end connectors (2) in adjacent shoes.
- 5 Remove two end connectors (2) and end connector puller (3) with screws (4).

**WARNING**

Before removing track connecting fixtures, support weight of track using crowbar to lower track to ground. Failure to comply may result in injury to personnel.

- 6 Remove two track connecting fixtures (6) and lower track (8) to ground.
- 7 Start engine (TM 9-2350-314-10) and drive slowly off track (8), allowing track (8) to unravel from roadwheels (9).



**Section IV. TRACK ASSEMBLY – CONTINUED**

**12-16 TRACK – CONTINUED**

**b. Installation.**

- 1 Lay track (8) out in front of vehicle in a straight line directly ahead and touching the first roadwheel (9).

**CAUTION**

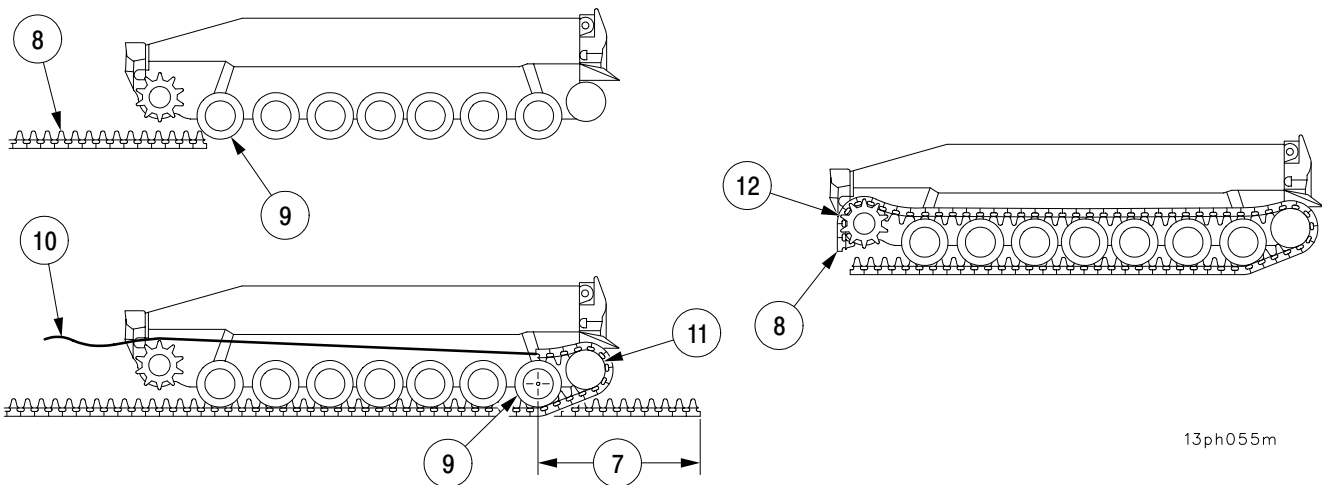
Use extreme care when moving vehicles on only one track. Drive slowly, moving only short distances.

- 2 Drive slowly onto track (8) until 11 track shoes (7) extend past centerline of last roadwheel (9).
- 3 Attach rope (10) to end of track (8).
- 4 Lift track (8) with crowbar and rope (10) over idler wheel (11) to top of last roadwheel (9).

**CAUTION**

Raise end of track and pull with rope to prevent it from getting caught between roadwheels.

- 5 Drive forward slowly, steering in direction of removed track (8), keeping track (8) tight against idler wheel (11) with crowbar while pulling track (8) forward with rope (10).
- 6 Stop when track (8) can be laid on drive sprocket (12).
- 7 Lay track (8) on drive sprocket (12), and remove rope (10).
- 8 Steer towards opposite track.



13ph055m

---

## Section IV. TRACK ASSEMBLY – CONTINUED

---

### 12-16 TRACK – CONTINUED

---

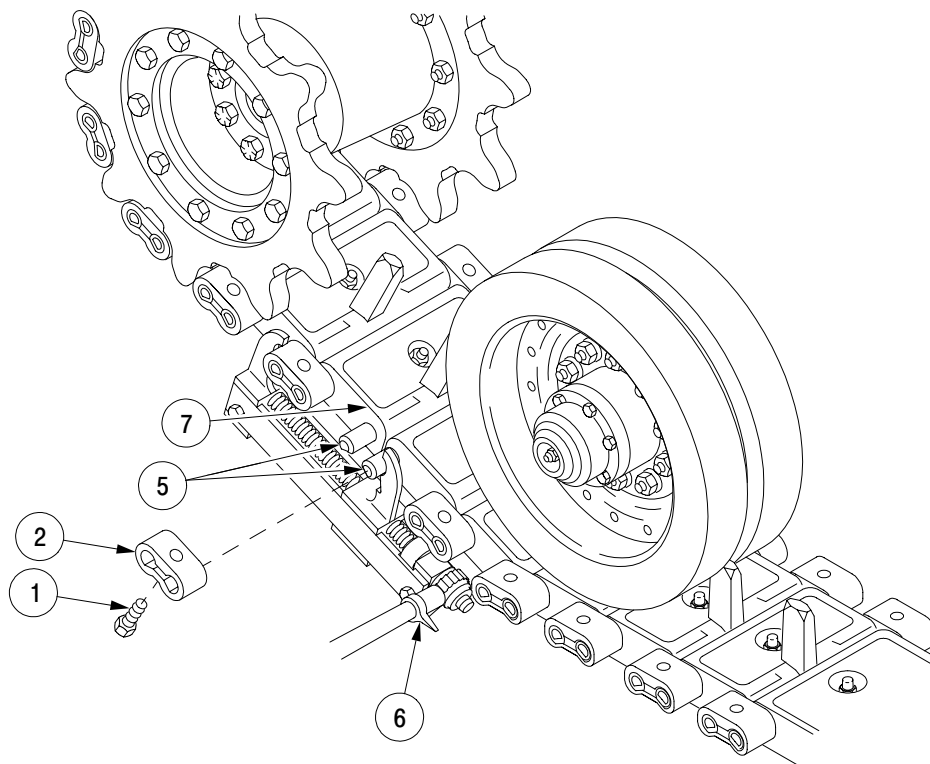
#### b. Installation – Continued

- 9 Move forward slowly, and stop vehicle when track-connecting fixtures (6) can be connected to track link pins (5) on adjacent shoes.
- 10 Apply parking brakes (TM 9-2350-314-10). Install two track-connecting fixtures (6) over track link pins (5).
- 11 Tighten until end connectors (2) can be installed on track link pins (5).
- 12 Connect track shoe (7) with two end connectors (2) and remove two track fixtures (6).
- 13 Install two end connectors (2) on track shoe (7) by tapping with hammer until end connectors (2) are flush with track link pins (5).
- 14 Mark end connectors (2).

#### NOTE

A lubricant is applied to end connector bolts at the manufacturer. Any end connector bolt torqued dry is incorrectly torqued (too LOW). If a bolt is removed and reinstalled a new coating of lube must be applied. Any oil or grease is acceptable.

- 15 Secure two end connectors (2) on track shoe (7) with two bolts (1). Tighten bolts (1).



13ph056m

---

## Section IV. TRACK ASSEMBLY – CONTINUED

---

### 12-16 TRACK – CONTINUED

---

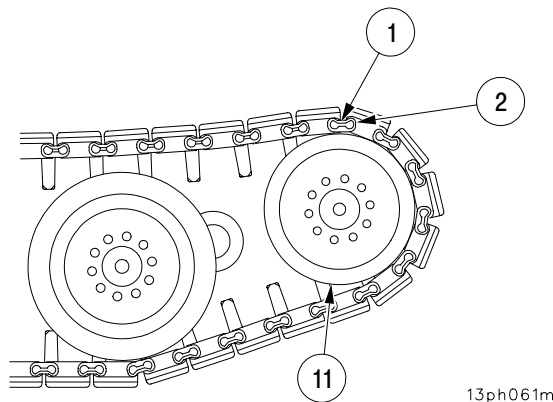
#### b. Installation – Continued

- 16 Drive forward until two end connectors (2) are at 12 o'clock position (top) of the idler wheel (11).
- 17 Torque bolts (1) to 380–420 lb–ft (515–570 N·m) wet.
- 18 Adjust track tension (para 12-14).



Hard pivot steers are unacceptable and may cause a track to be thrown.

- 19 Drive vehicle at a speed not to exceed 10 mph for a short distance alternating right and left steers.
- 20 Stop vehicle and visually inspect the track for any end connectors (2) that may have shifted. If any end connectors (2) have shifted position, reposition and torque bolts (steps 17 and 18).
- 21 Torque all bolts (1) again after 50 miles (80 Km) of operation.



#### NOTE

FOLLOW-ON MAINTENANCE:  
Adjust track tension (para 12-14)



# CHAPTER 13

## STEERING

---

### GENERAL

This chapter illustrates and defines procedures for removal, disassembly, assembly, installation, and adjustment of steering control linkage components.

---

<u>CONTENTS</u>		<u>Page</u>
13-1	STEERING CONTROL LINKAGE .....	13-2
13-2	STEERING CONTROL LINKAGE ADJUSTMENT .....	13-11



## 13-1 STEERING CONTROL LINKAGE.

This task covers: a. Removal b. Disassembly c. Assembly d. Installation

### INITIAL SETUP

#### Tools

General mechanic's tool kit  
(SC 5180-90-N26)  
Snapping pliers (item 42, Appx F)

#### Materials/Parts

Lockwashers (11) (item 3, Appx E)  
Lockwashers (3) (item 22, Appx E)  
Lockwashers (2) (item 9, Appx E)  
Cotter pins (3) (item 8, Appx E)  
Retaining rings (2) (item 89, Appx E)  
Spring pin (item 24, Appx E)  
Lockwire (item 160, Appx E)

#### Equipment Conditions

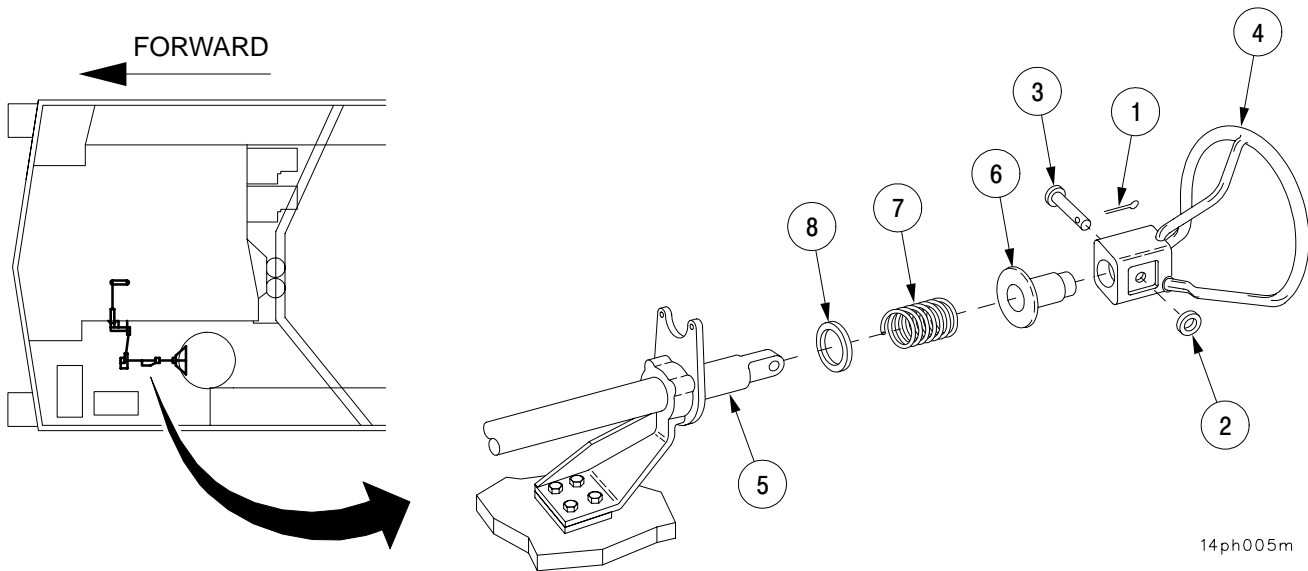
Warning light assembly removed from steering shaft (para 8-40)  
Air intake grille door open and secured (TM 9-2350-314-10)

#### References

TM 9-2350-314-10

#### a. Removal.

- 1 Remove cotter pin (1), flat washer (2), headed pin (3), and steering wheel (4) from shaft (5). Discard cotter pin.
- 2 Remove sleeve bearing (6), spring (7), and flat washer (8) from shaft (5).



## 13-1 STEERING CONTROL LINKAGE – CONTINUED

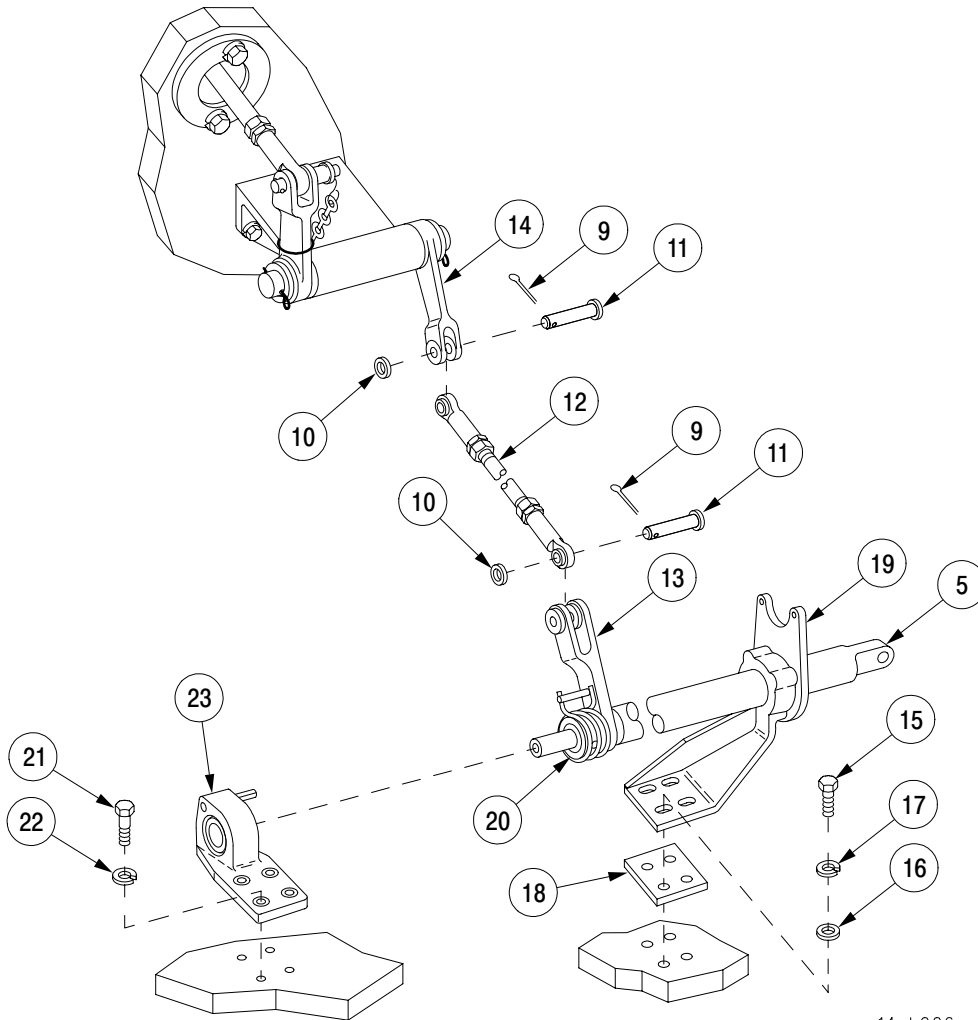
### a. Removal – Continued

- 3 Remove two cotter pins (9), two flat washers (10), two headed pins (11), and rod assembly (12) from levers (13 and 14). Discard cotter pins.

#### NOTE

The same number of spacers removed (if present) must be reinstalled at installation.

- 4 Remove four screws (15), four flat washers (16), four lockwashers (17), spacer (18), and bracket (19) with shaft (5), lever (13), and spring (20). Discard lockwashers.
- 5 Remove four screws (21), four lockwashers (22), and bracket (23). Discard lockwashers.

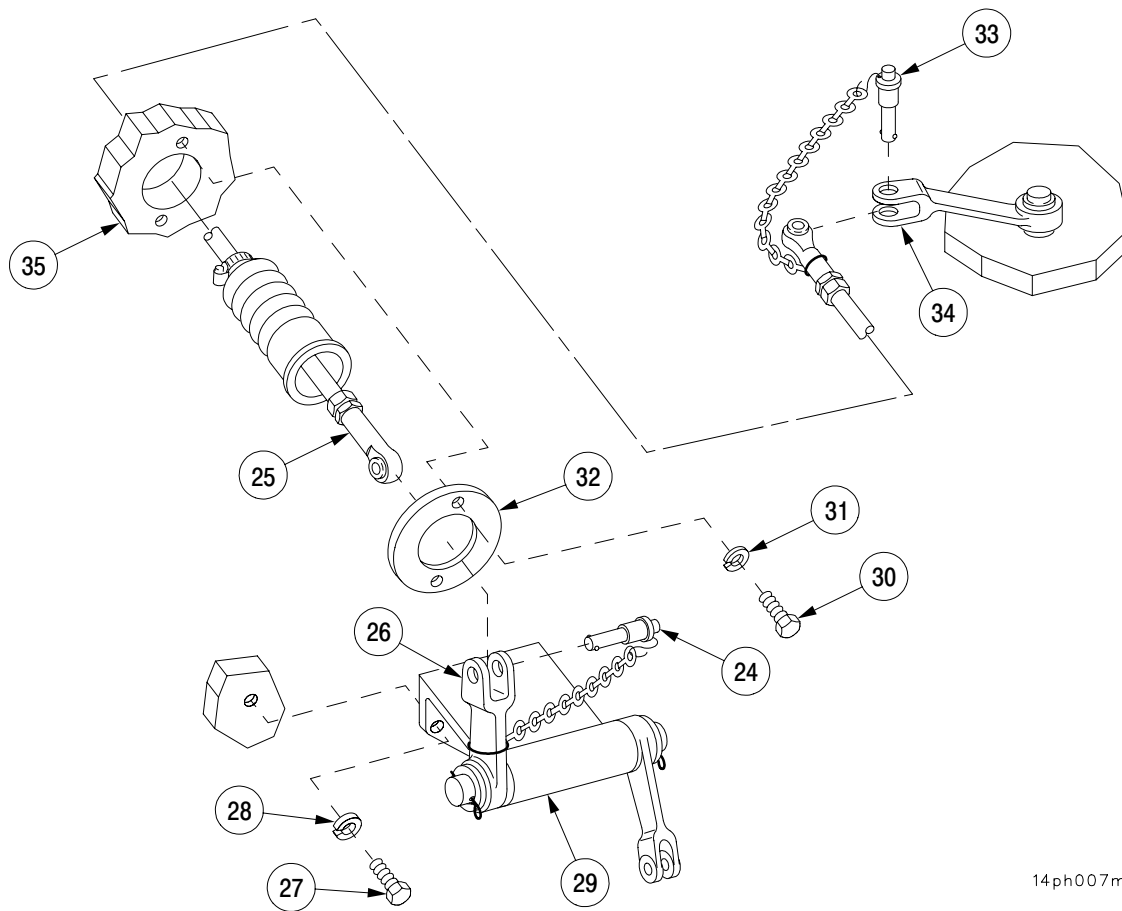


14ph006m

## 13-1 STEERING CONTROL LINKAGE – CONTINUED

### a. Removal – Continued

- 6 Remove quick-release pin (24) from rod assembly (25) and lever (26).
- 7 Remove three screws (27), three lockwashers (28), and housing assembly (29). Discard lockwashers.
- 8 Remove two screws (30), two lockwashers (31), and cover (32). Discard lockwashers.
- 9 Remove quick-release pin (33), and rod assembly (25) from lever (34) and bulkhead (35).

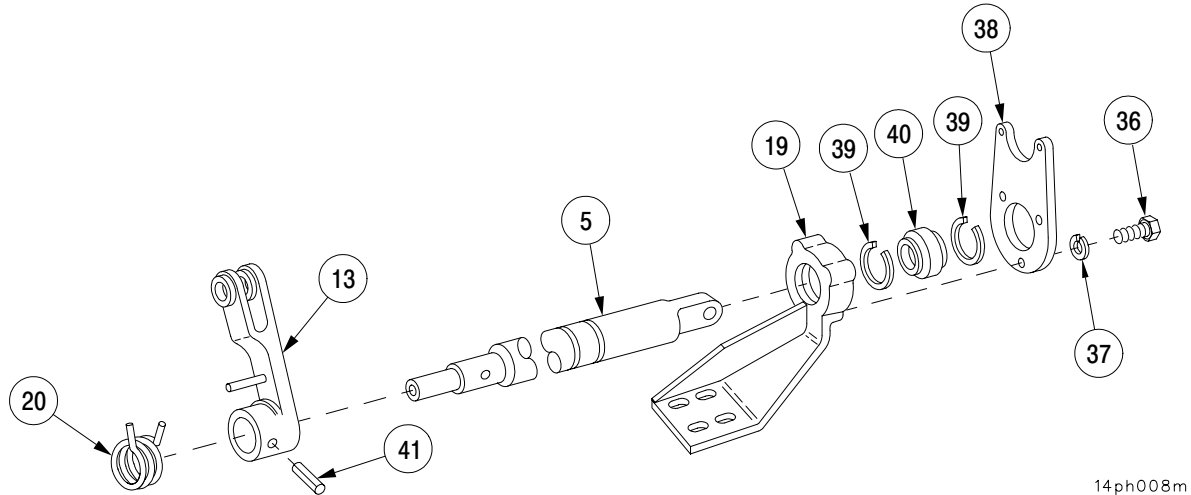


14ph007m

## 13-1 STEERING CONTROL LINKAGE – CONTINUED

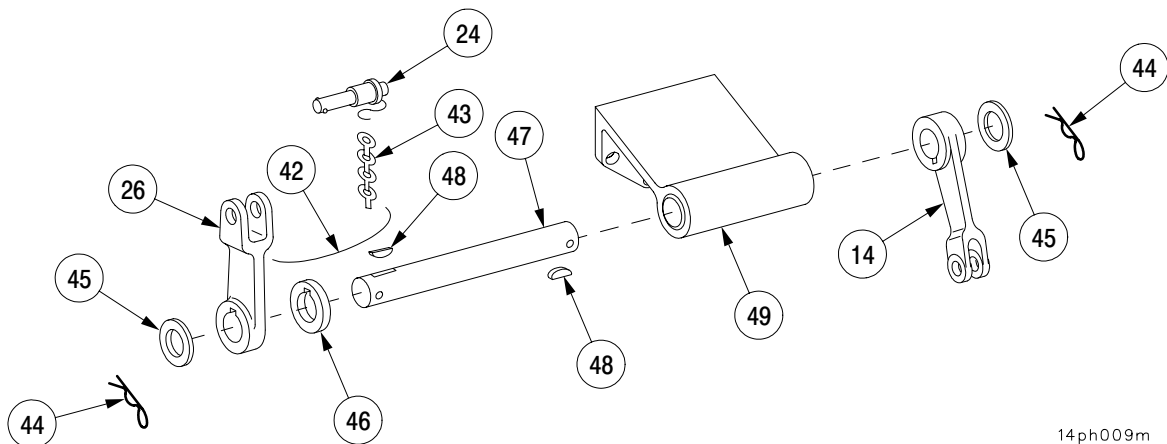
### b. Disassembly.

- 1 Remove three screws (36), three lockwashers (37), and master warning light bracket (38) from bracket (19).
- 2 Remove two retaining rings (39), bearing (40), and bracket (19) from shaft (5). Discard retaining rings.
- 3 Remove spring pin (41), spring (20), and lever (13) from shaft (5). Discard spring pin.



14ph008m

- 4 Remove lockwire (42), chain (43) and quick-release pin (24) from lever (26). Discard lockwire.
- 5 Remove two lockpins (44), two flat washers (45), lever (14), lever (26) and spacer (46) from shaft (47).
- 6 Remove two woodruff keys (48) from shaft (47).
- 7 Remove shaft (47) from housing (49).



14ph009m

## 13-1 STEERING CONTROL LINKAGE – CONTINUED

### b. Disassembly – Continued

- 8 Remove lockwire (50), chain (51), and quick-release pin (33) from rod assembly (25). Discard lockwire.

#### NOTE

Both rod assemblies are disassembled in the same manner.

- 9 Remove four rod ends (52), four nuts (53) and two rods (54 and 55) from rod assemblies (12 and 25).
- 10 Remove clamp (56) and boot (57) from rod (55).

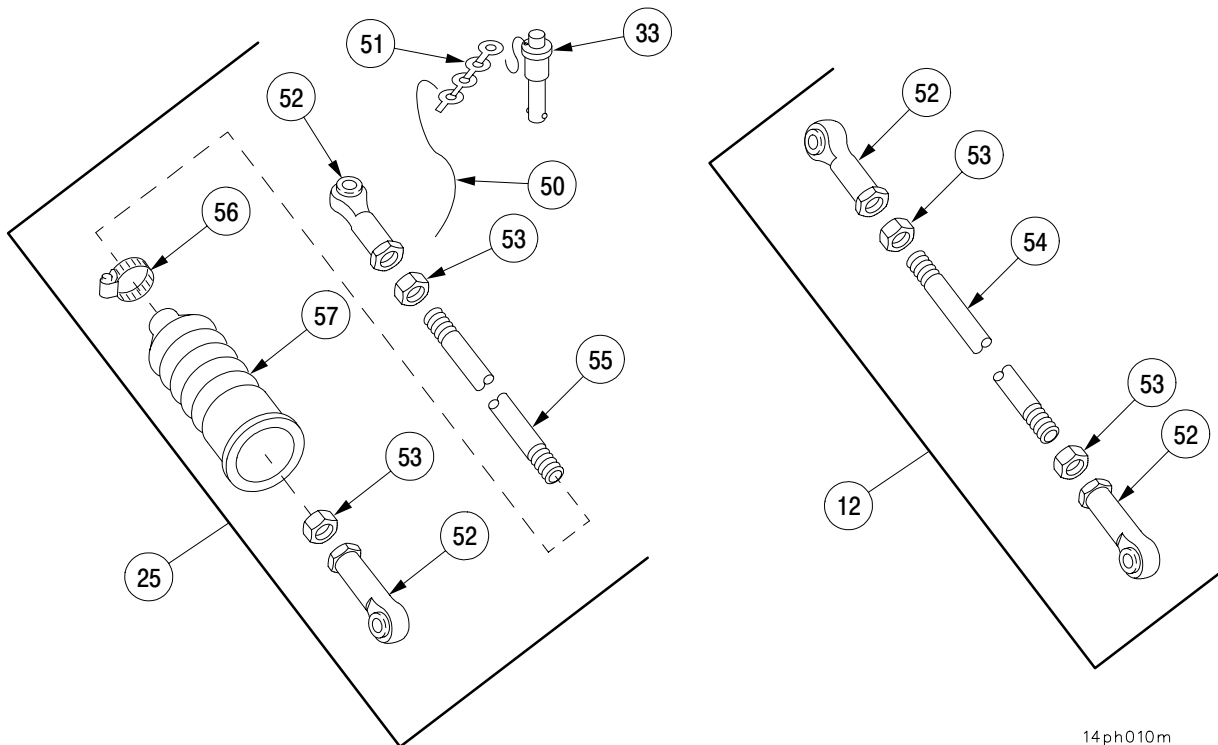
### c. Assembly.

- 1 Install boot (57) and clamp (56) on rod (55).

#### NOTE

Both rod assemblies are assembled in the same manner.

- 2 Install four nuts (53) and four rod ends (52) on two rods (54 and 55).
- 2 Install quick-release pin (33), chain (51), and new lockwire (50) on rod assembly (25).

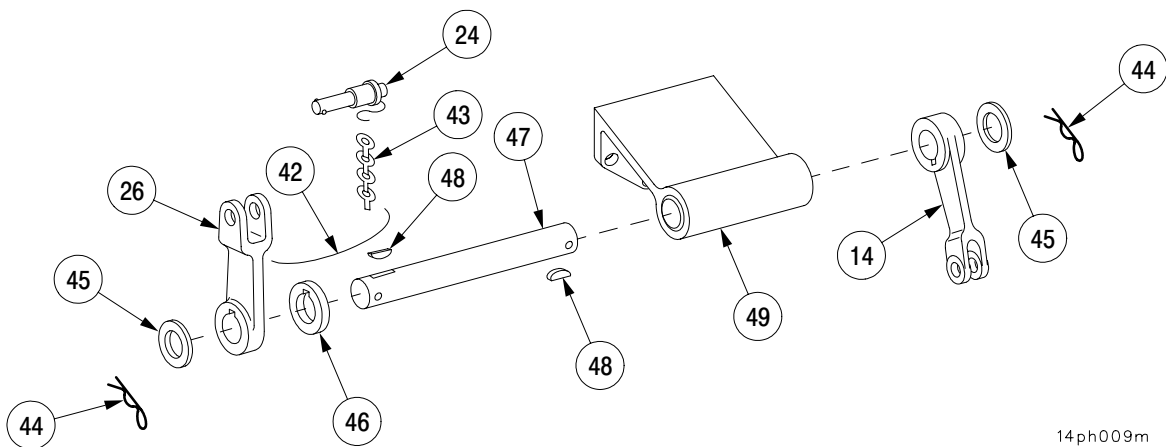


14ph010m

## 13-1 STEERING CONTROL LINKAGE – CONTINUED

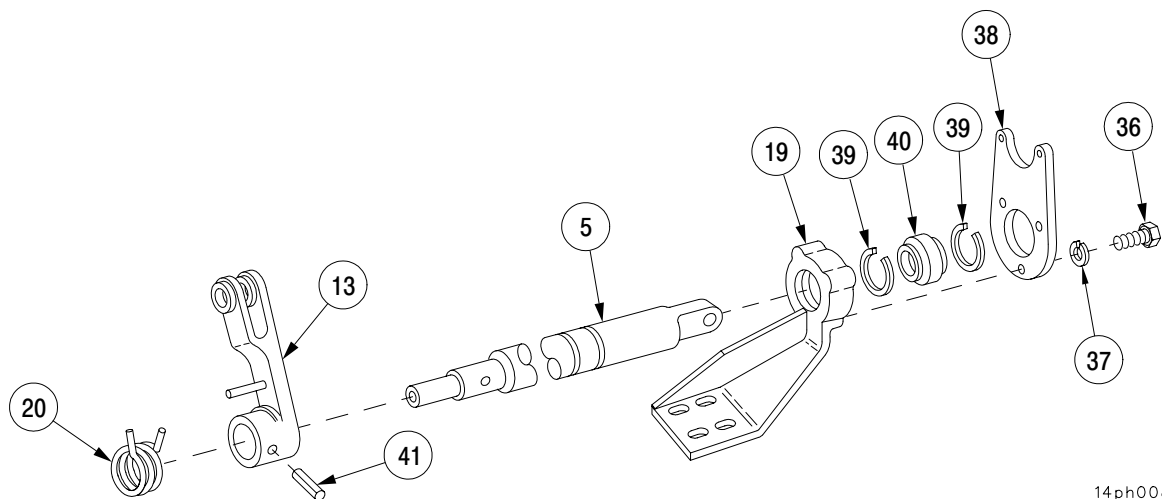
### c. Assembly – Continued

- 4 Install shaft (47) in housing (49).
- 5 Install two woodruff keys (48), spacer (46), two levers (14 and 26), two flat washers (45), and two lockpins (44) on shaft (47).
- 6 Install quick-release pin (24), chain (43), and new lockwire (42) on lever (26).



14ph009m

- 7 Install lever (13), new spring pin (41), and spring (20) on shaft (5).
- 8 Install bearing (40) and two new retaining rings (39) on bracket (19) and bracket (19) on shaft (5).
- 9 Install master warning light bracket (38), with three new lockwashers (37), and three screws (36) on bracket (19).

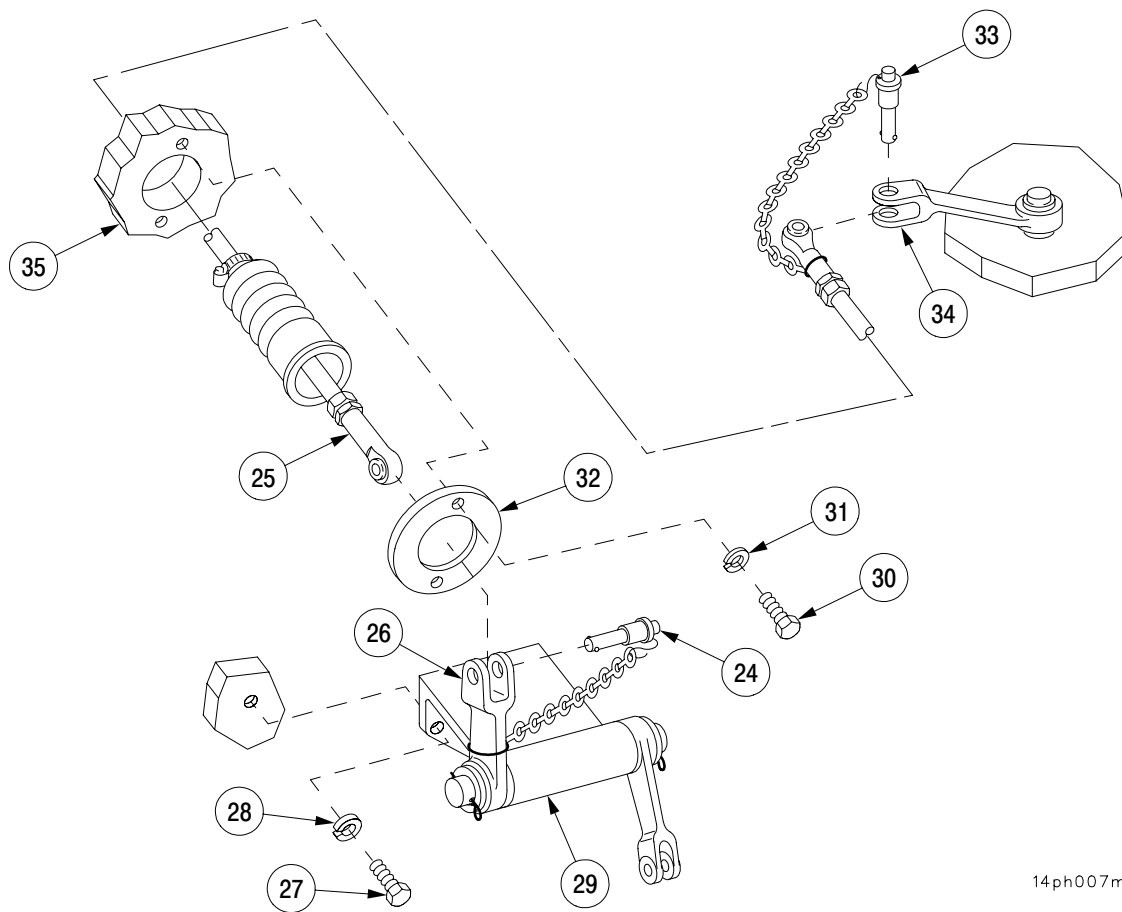


14ph008m

## 13-1 STEERING CONTROL LINKAGE – CONTINUED

### d. Installation.

- 1 Install rod assembly (25) through bulkhead (35).
- 2 Install cover (32) on bulkhead (35) with two screws (30) and two new lockwashers (31).
- 3 Connect rod assembly (25) to lever (34) with quick-release pin (33).
- 4 Install housing assembly (29) with three screws (27) and three new lockwashers (28).
- 5 Connect rod assembly (25) to lever (26) with quick-release pin (24).



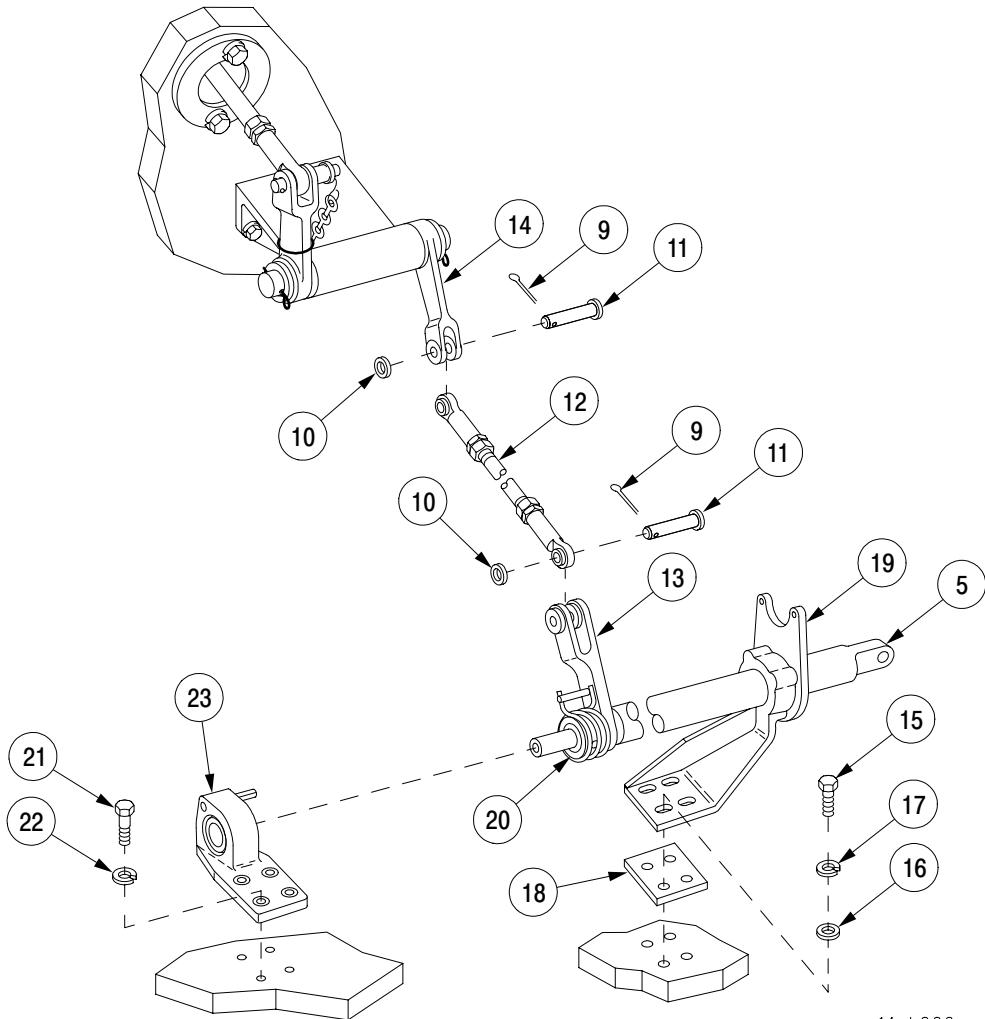
14ph007m



13-1 STEERING CONTROL LINKAGE - CONTINUED

d. Installation - Continued

- 6 Install bracket (23) with four screws (21) and four new lockwashers (22).
- 7 Install assembly of bracket (19), shaft (5), lever (13), and spring (20) with spacer (18), four screws (15), four new lockwashers (17), and four flat washers (16).
- 8 Install rod assembly (12), with two headed pins (11), two flat washers (10), and two new cotter pins (9) in levers (13 and 14).



14ph006m

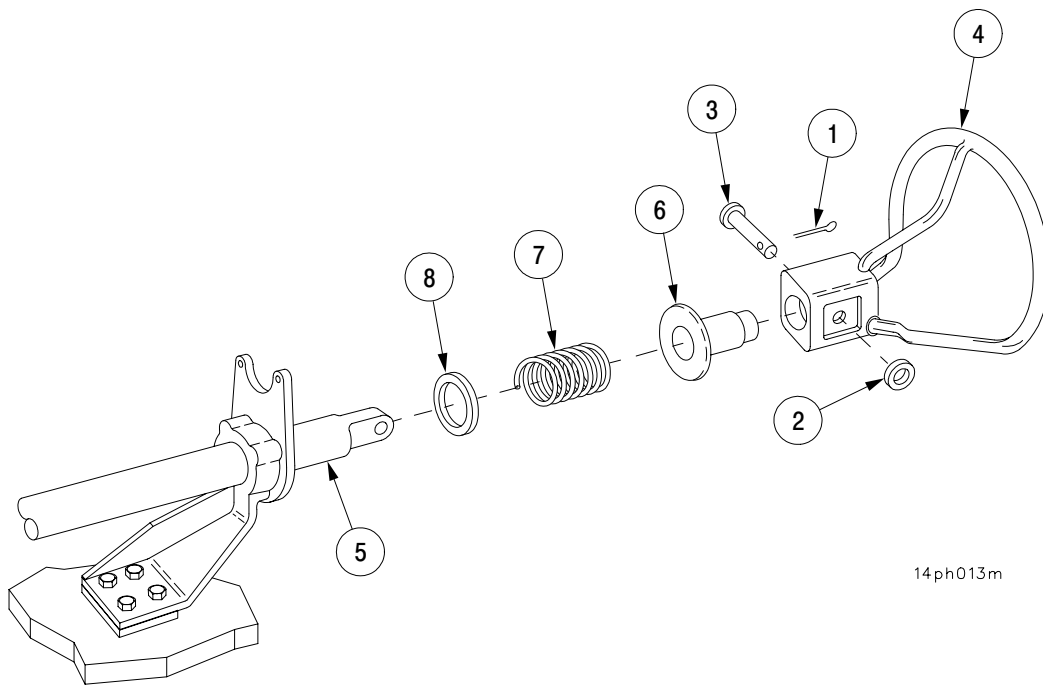
---

## 13-1 STEERING CONTROL LINKAGE – CONTINUED

---

### d. Installation – Continued

- 9 Install flat washer (8), spring (7), and sleeve bearing (6) on shaft (5).
- 10 Install steering wheel (4), headed pin (3), flat washer (2), and new cotter pin (1).



14ph013m

### NOTE

#### FOLLOW-ON MAINTENANCE:

- Adjust steering control linkage (para 13-2)
- Lubricate steering control linkage  
(TM 9-2350-314-10)
- Install warning light assembly (para 8-40)
- Close and secure air intake grille  
(TM 9-2350-314-10)

---

## 13-2 STEERING CONTROL LINKAGE ADJUSTMENT.

---

This task covers: Adjustment

---

### INITIAL SETUP

#### Tools

General mechanic's tool kit  
(SC 5180-90-N26)

#### Equipment Conditions

Air intake grille open and secured  
(TM 9-2350-314-10)

#### Materials/Parts

Cotter pins (2) (item 8, Appx E)

#### References

TM 9-2350-314-10

---

### Adjustment.

#### NOTE

- All adjustments to steering linkage must finish with lever on transmission in neutral position (pointer on the transmission steer shaft pointing to center mark on screw) and steering wheel in normal forward position (center wheel spoke-vertical).
- If any adjustment is made to length of steering shaft, an equal and opposite adjustment must be made to the rod assembly in order to maintain forward driving position of steering wheel.

## 13-2 STEERING CONTROL LINKAGE ADJUSTMENT – CONTINUED

---

### Adjustment – Continued

- 1 Turn steering wheel (1) full left and hold. Check for contact between rod end (2) and bottom of bulkhead hole. If interference exists, perform step 2. If no interference exists, perform step 4.
- 2 Remove two quick-release pins (3) and disconnect rod assembly (4) from two levers (5 and 6). Loosen two nuts (7). Repeat step 1 and readjust rod assembly (4) as needed.
- 3 Increase end-to-end length of rod assembly (4) by rotating two rod ends (2) counter-clockwise. Reconnect rod assembly (4) to two levers (5 and 6) with two quick-disconnect pins (3). Tighten two nuts (7). Repeat step 1 and readjust rod assembly (4) as needed.
- 4 Turn steering wheel (1) full right and hold. Check for contact between rod end (2) and top of bulkhead hole. If interference exists, perform step 5; if no interference exists, perform step 10.
- 5 Remove two quick-release pins (3) and disconnect rod assembly (4) from two levers (5 and 6). Loosen two nuts (7).
- 6 Decrease end-to-end length of rod assembly (4) by rotating two rod ends (2) clockwise. Reconnect rod assembly (4) to two levers (5 and 6) with two quick-disconnect pins (3). Tighten two nuts (7). Repeat step 4 and readjust rod assembly (4), as needed.
- 7 Remove two cotter pins (9), two flat washers (10), two pins (11), and rod assembly (12) from two levers (13 and 14). Discard cotter pins.

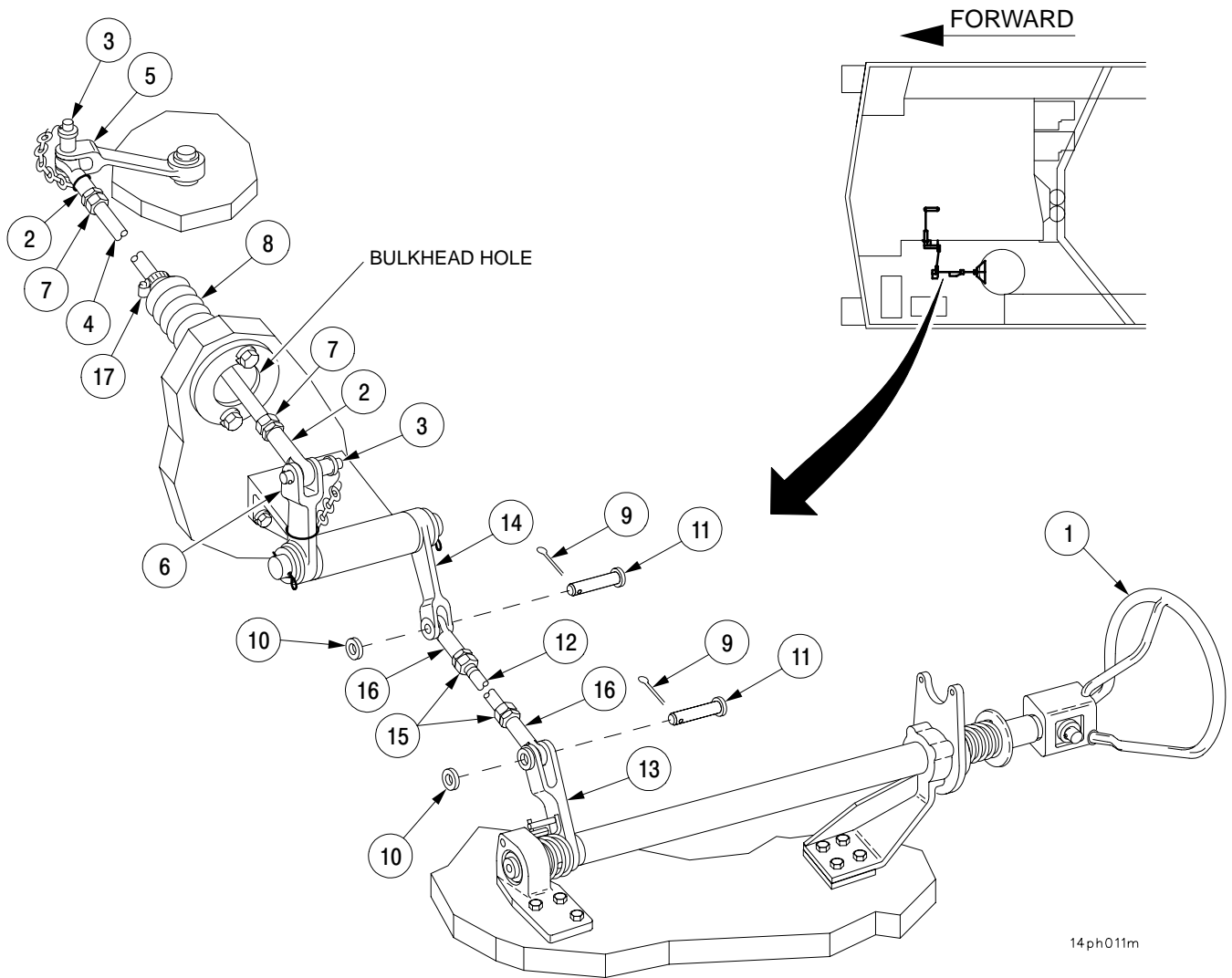
### NOTE

Change of end-to-end length of rod assembly in driver's compartment must be equal, but opposite to adjustment made to rod assembly located in engine compartment.

- 8 Loosen two nuts (15) and increase or decrease end-to-end length of rod assembly (12) by rotating two rod ends (16).
- 9 Install rod assembly (12) in two levers (13 and 14) with two pins (11), two flat washers (10), and two new cotter pins (9). Make sure steering wheel (1) is in the normal forward position (center spoke-vertical), increase or decrease end-to-end length of rod assembly (12) until center spoke is in vertical position. Tighten two nuts (15).
- 10 Turn and hold steering wheel (1) full left. Loosen clamp (17) and adjust boot (8) so it is at its free length (not extended, not compressed). Tighten clamp (17).

13-2 STEERING CONTROL LINKAGE ADJUSTMENT - CONTINUED

Adjustment - Continued



14ph011m

## 13-2 STEERING CONTROL LINKAGE ADJUSTMENT – CONTINUED

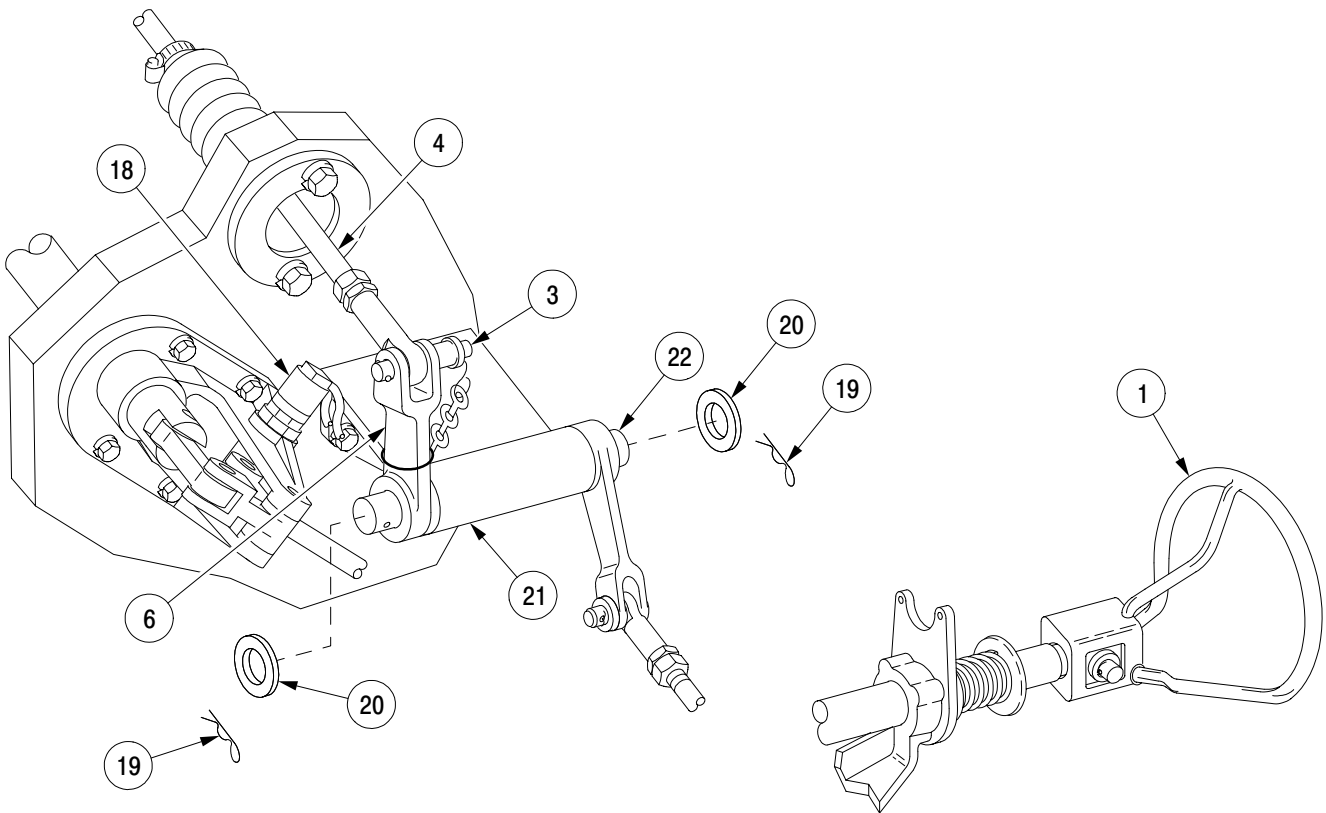
### Adjustment – Continued

- 11 Place steering wheel (1) in full left position. Check for clearance between neutral safety switch (18) and lever (6) and/or pin (3).
- 12 If clearance is 0.25 in. (6.35 mm) or greater, adjustment is complete.
- 13 If clearance is less than 0.25 in. (6.35 mm), remove quick-release pin (3) and disconnect rod assembly (4) from lever (6).
- 14 Remove lockpin (19), flat washer (20), lever (6), and spacer (21) from shaft (22).

### NOTE

Clearance is increased by installing spacer between lever and washer.

- 15 Reinstall lever (6), spacer (21), flat washer (20), and lockpin (19) onto shaft (22). Install quick-release pin (3) in rod assembly (4) and lever (6).



### NOTE

#### FOLLOW-ON MAINTENANCE:

Close and secure air intake grille  
(TM 9-2350-3140-10)

14ph012m

# CHAPTER 14

## TOWING ATTACHMENTS

---

### GENERAL

This chapter illustrates and defines procedures for removal, disassembly, assembly, and installation of the towing components used with this vehicle.

---

<u>CONTENTS</u>		<u>Page</u>
14-1	TOWING PINTLE .....	14-2
14-2	TOW HOOK .....	14-4
14-3	TOWING EYE BUSHING REPLACEMENT .....	14-6



## 14–1 TOWING PINTLE.

---

This task covers:      a. Removal      b. Disassembly      c. Assembly      d. Installation

---

### INITIAL SETUP

#### Tools

General mechanic's tool kit  
(SC 5180–90–N26)

Snapping pliers (item 42, Appx F)

Lubricating gun (item 24, Appx F)

#### References

TM 9–2350–314–10

#### Materials/Parts

Cotter pin (item 217, Appx E)

Lockwashers (4) (item 59, Appx E)

Retaining rings (4) (item 218, Appx E)

---

#### **a. Removal.**

- 1 Remove four screws (1), four lockwashers (2), bracket (3), and pintle assembly (4). Discard lockwashers.
- 2 Remove cotter pin (5), slotted nut (6), flat washer (7), and pintle assembly (4) from bracket (3). Discard cotter pin.

#### **b. Disassembly.**

- 1 Remove grease fitting (8).
- 2 Remove two grease fittings (9).
- 3 Remove four retaining rings (10). Discard retaining rings.
- 4 Remove pin (11) and latch (12).
- 5 Remove pin (13) and latch (14).
- 6 Remove pin (15) and spring (16).

#### **c. Assembly.**

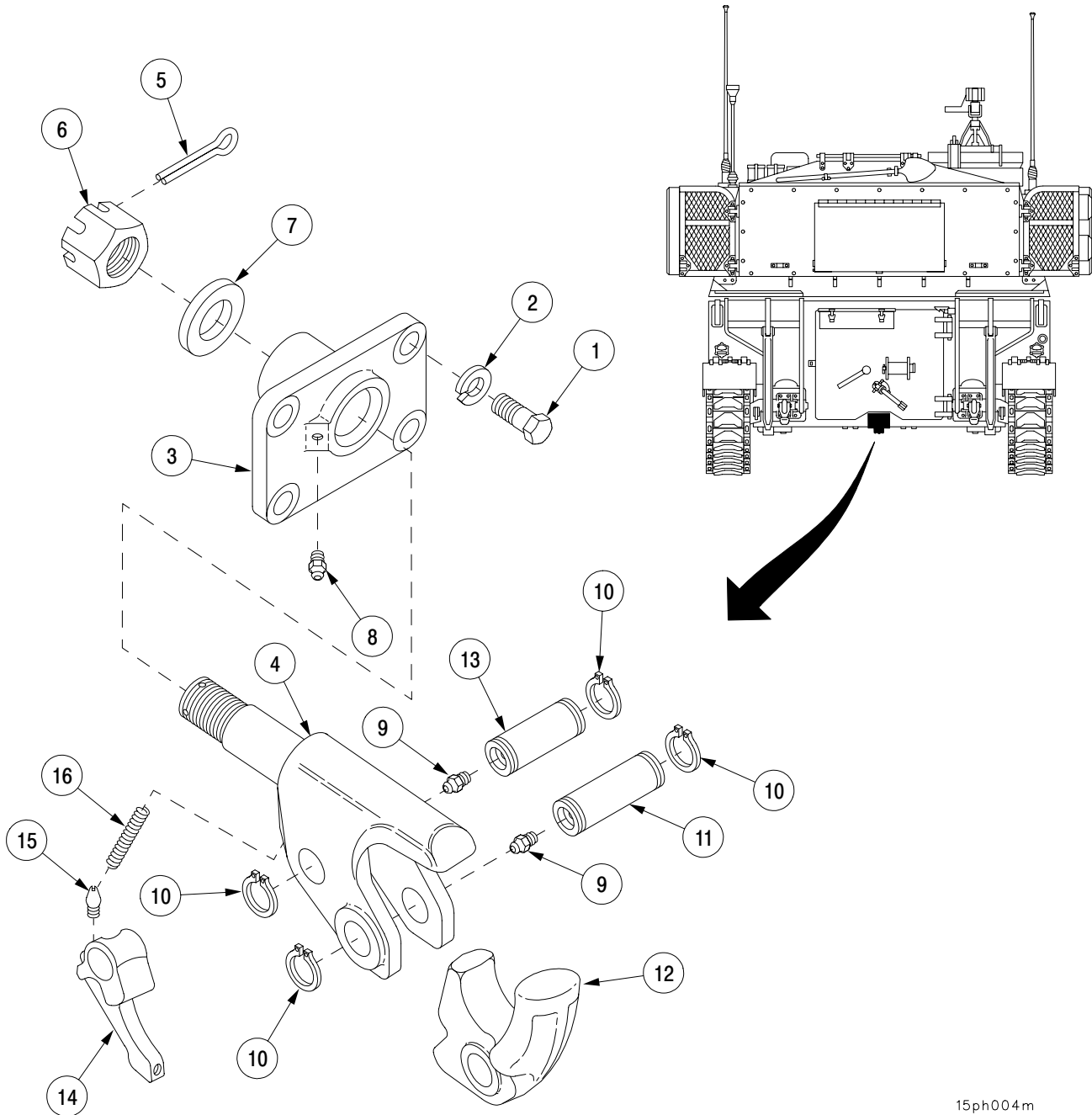
- 1 Install spring (16) and pin (15).
- 2 Install latch (14) and pin (13).
- 3 Install latch (12) and pin (11).
- 4 Install four new retaining rings (10).
- 5 Install two grease fittings (9).
- 6 Install grease fitting (8).



## 14-1 TOWING PINTLE – CONTINUED

### d. Installation.

- 1 Install pintle assembly (4) with flat washer (7), slotted nut (6), and new cotter pin (5) in bracket (3).
- 2 Install bracket (3) and pintle assembly (4) with four new lockwashers (2) and four screws (1).
- 3 Lubricate two grease fittings (9) and grease fitting (8) (TM 9-2350-314-10).



15ph004m

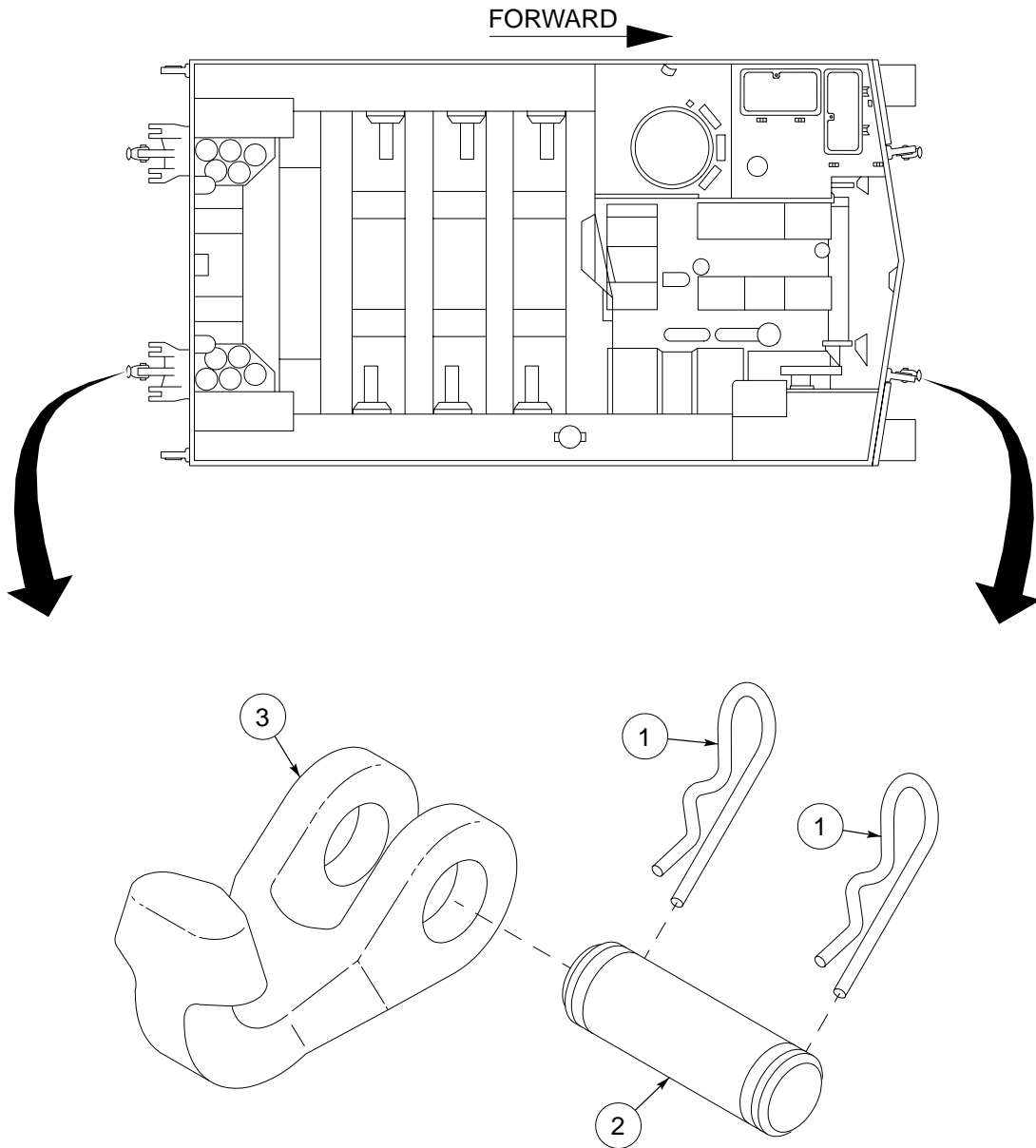


---

## 14-2 TOW HOOK – CONTINUED

---

### b. Installation – Continued



hiph950

---

## 14-3 TOWING EYE BUSHING REPLACEMENT.

---

This task covers:      a. Removal                                      b. Installation

---

### INITIAL SETUP

Tools

General mechanic's tool kit  
(SC 5180-90-N26)

Equipment Conditions

Vehicle parked on level ground  
(TM 9-2350-314-10)  
Tow cable hook removed  
(TM 9-2350-314-10)

References

TM 9-2350-314-10

---

### NOTE

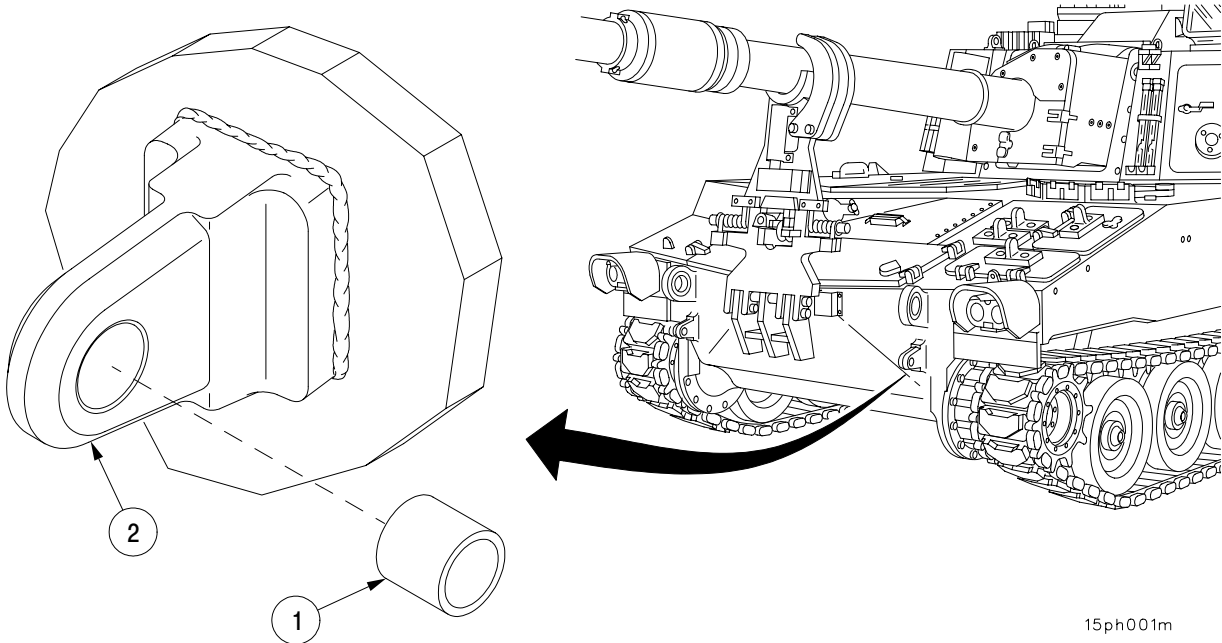
There is one towing eye bushing in each of two towing eyes. Both bushings are replaced the same way.

**a. Removal.**

Remove bushing (1) from towing eye (2).

**b. Installation.**

Install bushing (1) in towing eye (2).



### NOTE

**FOLLOW-ON MAINTENANCE:**

Install tow cable hook  
(TM 9-2350-314-10)

# CHAPTER 15

## SHOCK ABSORBERS

---

### GENERAL

This chapter illustrates and defines procedures for removal, disassembly, assembly, and installation of the shock absorber and related components.

---

### CONTENTS

	<u>Page</u>
15-1 SHOCK ABSORBER, BEARING, AND BRACKET .....	15-2
15-2 SUSPENSION BRACKET .....	15-7
15-3 HYDRAULIC BUMPER AND BUMPER BRACKETS .....	15-8



---

## 15-1 SHOCK ABSORBER, BEARING, AND BRACKET.

---

This task covers:      a. Removal                      b. Disassembly                      c. Assembly                      d. Installation

---

### INITIAL SETUP

#### Tools

General mechanic's tool kit  
(SC 5180-90-N26)  
Shock absorber puller (item 47, Appx F)  
Torque wrench (item 86, Appx F)  
Bearing remover and replacer  
(item 49, Appx F)

#### Equipment Conditions

Powerpack removed (right front mount)  
(para 4-1)  
Ammunition rack top bracket removed  
(right rear mount) (para 16-70)  
Enclosure assembly bracket removed  
(left rear mount) (para 8-21)

#### Materials/Parts

Cotter pins (2) (item 219, Appx E)  
Seals (2) (item 220, Appx E)  
Lubricating oil (item 31, Appx C)

---

### WARNING

Track must be blocked so that the vehicle will not roll out of control during shock absorber, bearing, and bracket maintenance. Failure to securely block vehicle may result in severe injury to personnel or equipment damage.

#### **a. Removal.**

- 1 Remove cotter pin (1), castle nut (2), and flat washer (3). Discard cotter pin.
- 2 Screw shock absorber puller on threaded end of bearing. Turn screw head with wrench to pull shock absorber (4) from arm spindle of upper shock absorber mount (5).
- 3 Remove top end of shock absorber (4) from upper shock absorber mount (5). Use puller if required.
- 4 Remove cotter pin (6), castle nut (7), retainer (8), flat washer (9), and seal (10). Discard cotter pin and seal.
- 5 Screw shock absorber puller on threaded end of bearing. Turn screw head with wrench to pull shock absorber (4) from arm spindle of lower shock absorber mount (11).
- 6 Remove bottom end of shock absorber (4) from lower shock absorber mount (11). Use puller if required.
- 7 Remove seal (12) and retainer (13). Discard seal.

## 15-1 SHOCK ABSORBER, BEARING, AND BRACKET – CONTINUED

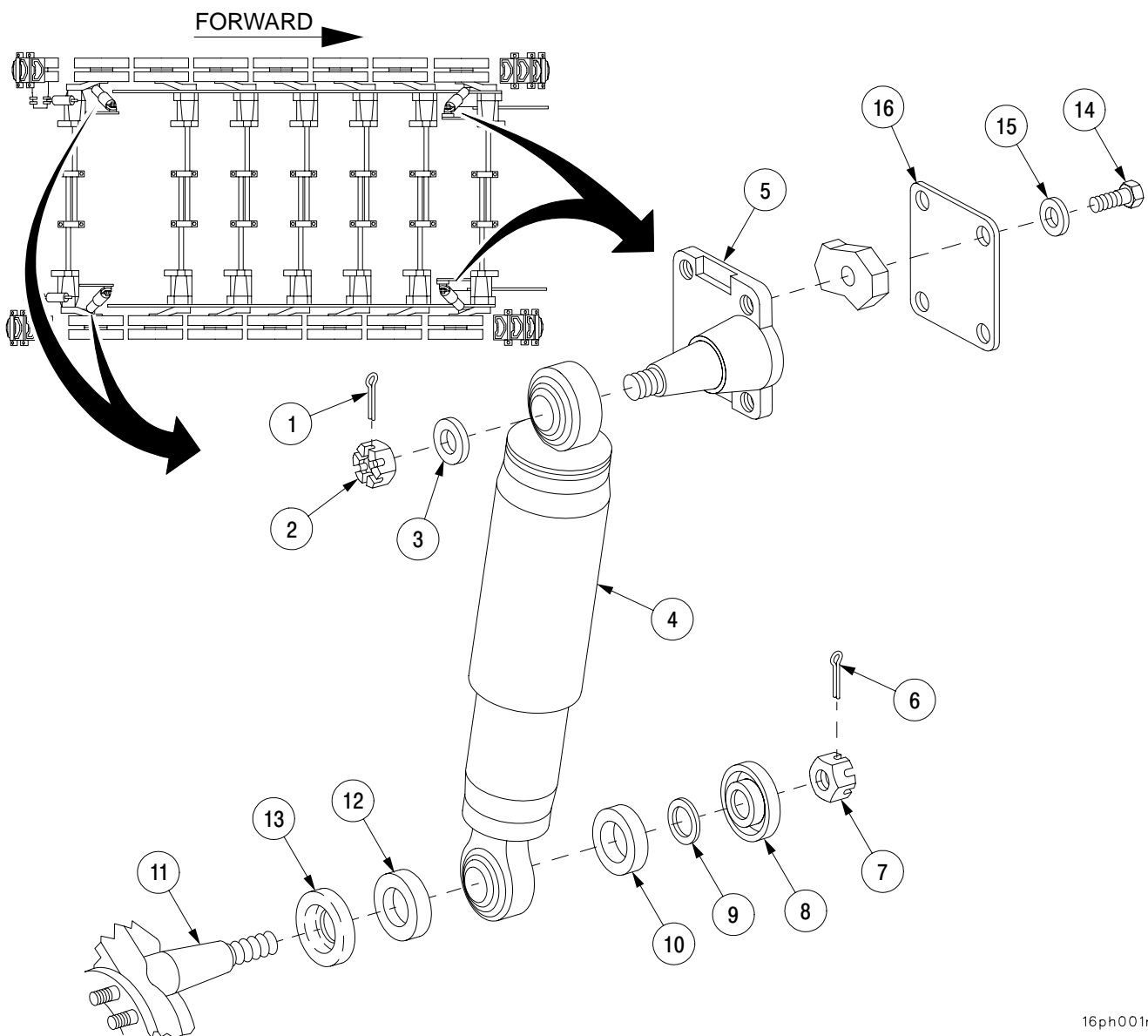
### a. Removal – Continued

#### NOTE

- Perform step 7 if removing rear shock mounts.
- Perform step 8 if removing front shock mounts.

7 Remove four screws (14), four flat washers (15), and shock absorber mount (5) from hull.

8 Remove four screws (14), shock absorber mount (5), and plate (16) from hull.



16ph001m

---

## 15-1 SHOCK ABSORBER, BEARING, AND BRACKET – CONTINUED

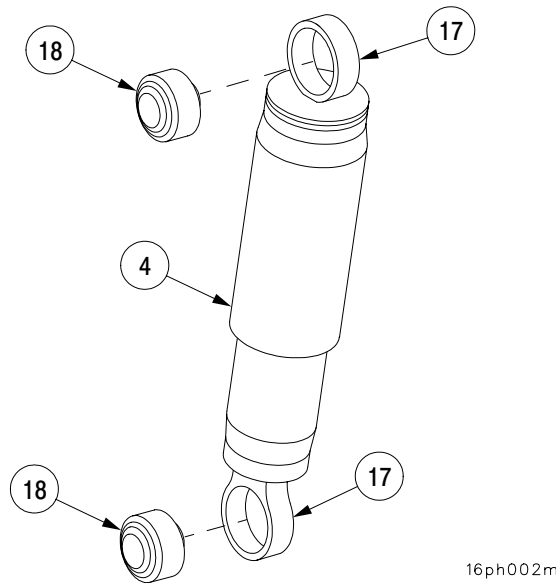
---

### b. Disassembly.

- 1 Install remover and puller tool in shock absorber eye (17) of shock absorber (4).
- 2 Turn nut of puller clockwise and remove bearing (18). Bearing (18) will be pulled into collar of remover. Discard bearing.

### c. Assembly.

- 1 Remove stake marks and burrs from inner surface of shock absorber eye (17).
- 2 Start new bearing (18) into shock absorber eye (17).
- 3 Insert remover and puller tool through bearing (18).
- 4 Turn nut of puller clockwise to install bearing (18).
- 5 Stake bearing (18) at six equally spaced points on both sides of shock absorber eye (17).



### d. Installation.

#### NOTE

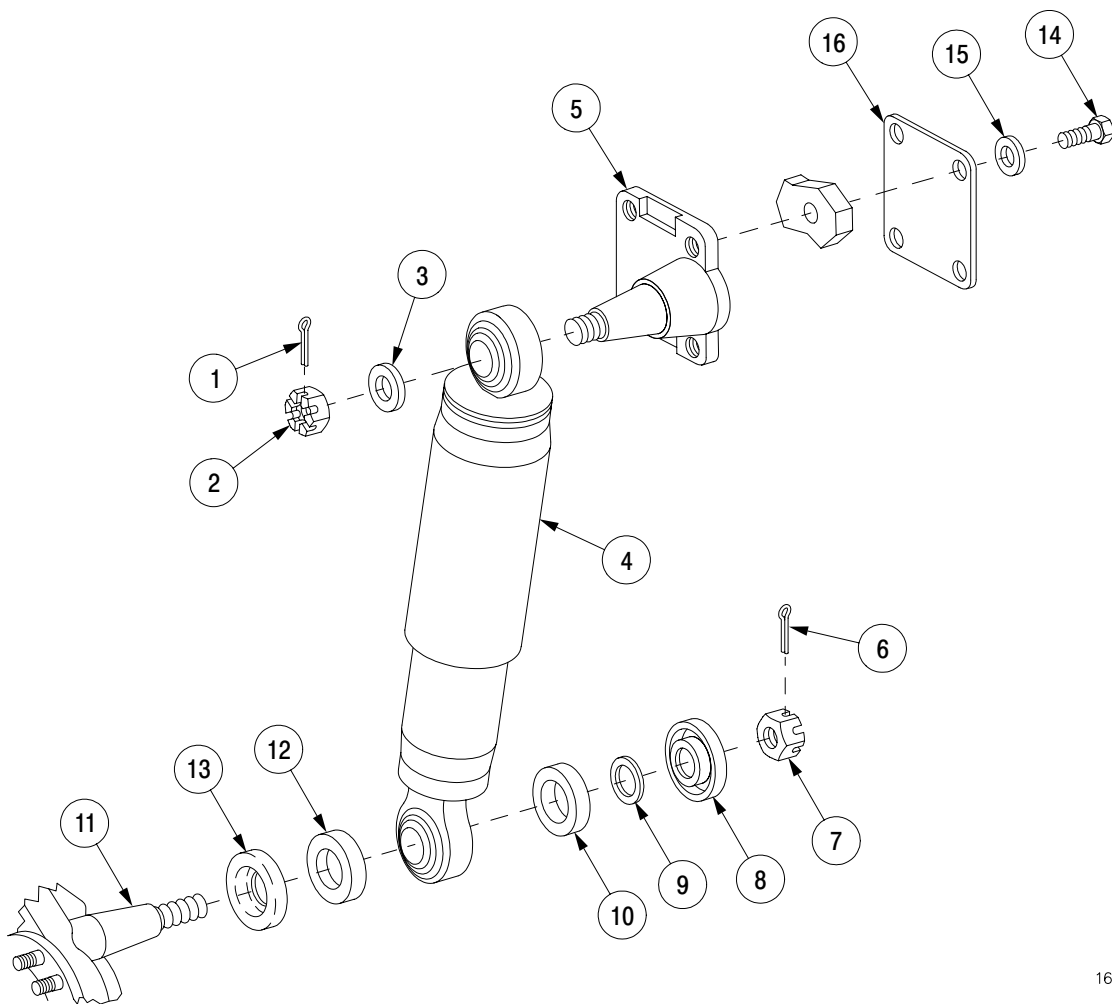
- Perform step 1 if installing front shock mount.
  - Perform step 2 if installing rear shock mount.
- 1 Install plate (16) and upper shock absorber mount (5) on hull with four screws (14). Torque screws to 80-100 lb-ft (108-136 N·m).



## 15-1 SHOCK ABSORBER, BEARING, AND BRACKET – CONTINUED

### d. Installation – Continued

- 2 Install upper shock absorber mount (5) on hull with four flat washers (15) and four screws (14). Torque screws to 95–120 lb–ft (129–163 N·m).
- 3 Lubricate two new seals (12 and 10).
- 4 Secure lower end of shock absorber (4) to lower shock absorber mount (11) with two retainers (13 and 8), two new seals (12 and 10), flat washer (9), and castle nut (7). Torque nut to 100–140 lb–ft (136–190 N·m).
- 5 Install new cotter pin (6).
- 6 Secure upper end of shock absorber (4) to upper shock absorber mount (5) with flat washer (3) and castle nut (2). Torque nut to 100–140 lb–ft (136–190 N·m).
- 7 Install new cotter pin (1).



16ph003m

**15-1 SHOCK ABSORBER, BEARING, AND BRACKET – CONTINUED**

---

**d. Installation – Continued**

**NOTE**

**FOLLOW-ON MAINTENANCE:**

Install enclosure assembly bracket (left rear mount) (para 8-21)

Install ammunition rack top bracket (right rear mount) (para 16-70)

Install powerpack (right front mount) (para 4-1)

**15-2 SUSPENSION BRACKET.**

This task covers: a. Removal b. Installation

**INITIAL SETUP**

Tools

- General mechanic's tool kit (SC 5180-90-N26)
- Socket (item 66, Appx F)
- Extension (item 18, Appx F)
- Ratchet handle (item 27, Appx F)
- Torque wrench (item 87, Appx F)

Equipment Conditions

- Roadwheels removed (para 12-5)

**WARNING**

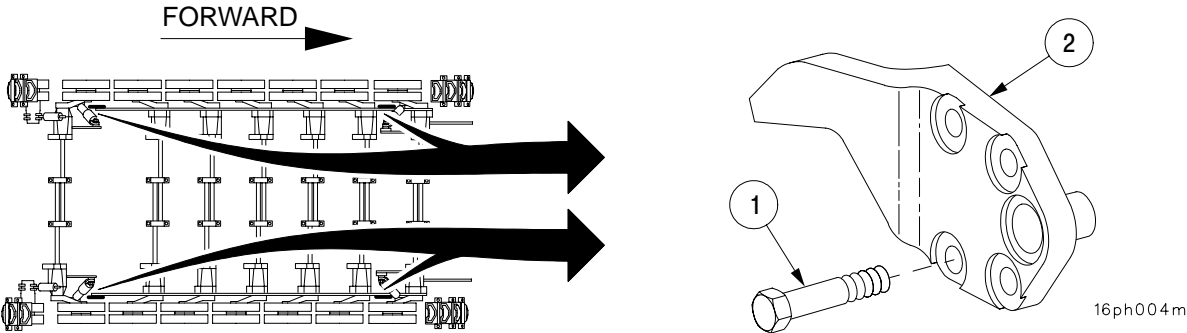
Track must be blocked so that the vehicle will not roll out of control during suspension bracket maintenance. Failure to securely block vehicle may result in severe injury to personnel or equipment damage.

**a. Removal.**

Remove four screws (1) and suspension bracket (2).

**b. Installation.**

Install suspension bracket (2) with four screws (1). Torque four screws (1) to 300-350 lb-ft (407-475 N.m).



**NOTE**

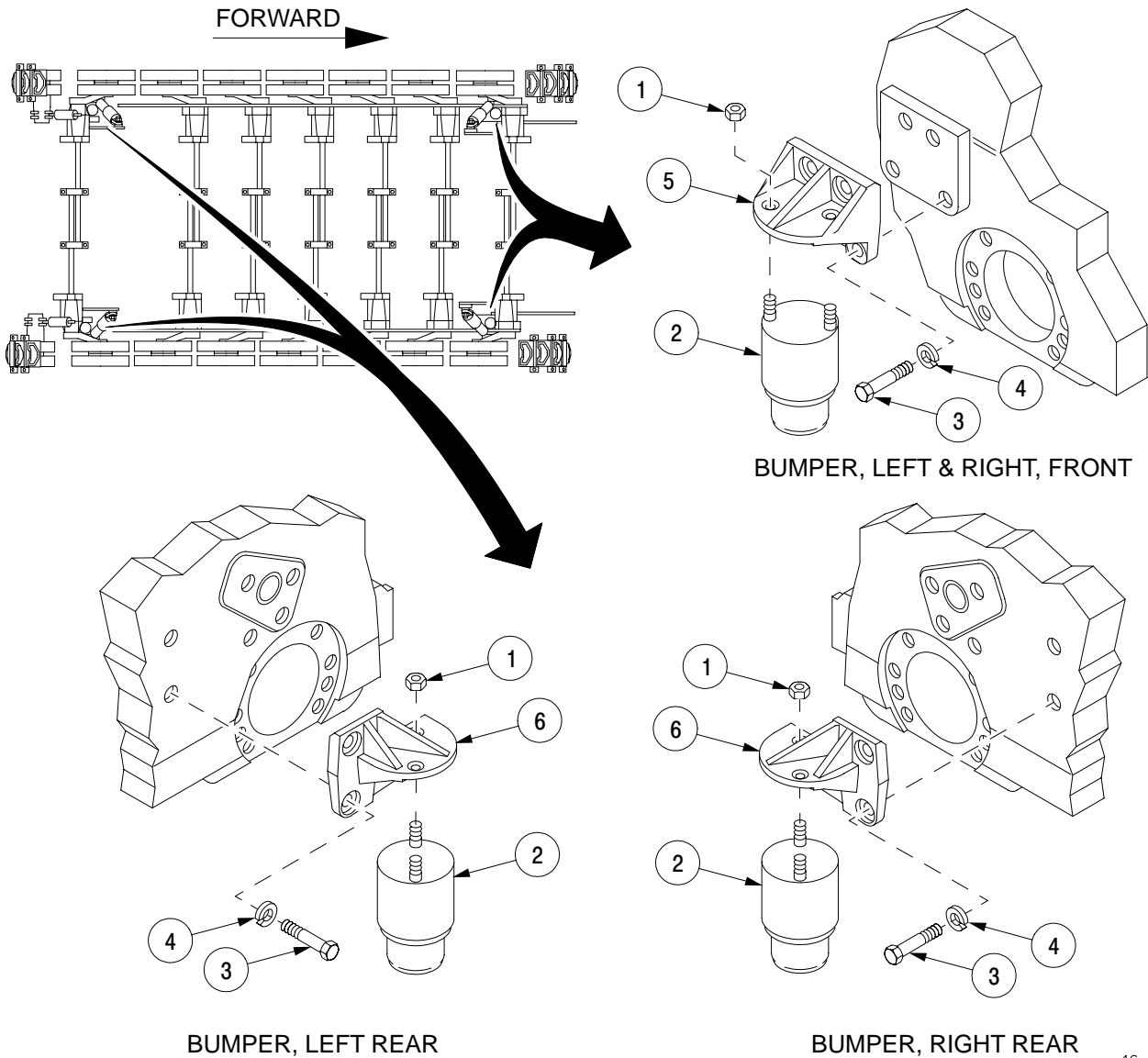
**FOLLOW-ON MAINTENANCE:**  
Install roadwheels (para 12-5)



## 15-3 HYDRAULIC BUMPER AND BUMPER BRACKETS – CONTINUED

### b. Installation – Continued

- 2 Install bumper bracket (5 or 6) with screws (3) and new lockwashers (4). Torque screws to 300–350 lb–ft (407–475 N·m).
- 3 Install hydraulic bumper (2) with two new self–locking nuts (1). Torque self–locking nuts to 80–100 lb–ft (108–136 N·m).



16ph005m

### NOTE

**FOLLOW-ON MAINTENANCE:**  
Install roadwheels (para 12-5)

## CHAPTER 16

### BODY, CAB, HOOD, AND HULL

---

#### GENERAL

This chapter illustrates and defines procedures for removal, disassembly, assembly, and installation of hull-related components, stowage racks, stowage boxes, and brackets. This chapter also covers adjustment of the gun tube travel lock and actuator.

---

<u>CONTENTS</u>	<u>Page</u>
Section I. BODY, CAB, HOOD, AND HULL ASSEMBLIES	
16-1 VENTILATION AIR DUCT .....	16-4
16-2 LEAD FILTER .....	16-8
16-3 LEAD FILTER VENT TUBE, FITTING, AND ELBOW .....	16-10
16-4 LEAD FILTER DRAIN HOSES AND CLAMPS .....	16-12
16-5 LEAD FILTER GRILLE ASSEMBLY .....	16-14
16-6 LEAD FILTER HOUSING HOLD-DOWN LATCH .....	16-16
16-7 ENGINE COMPARTMENT ACCESS COVER .....	16-18
16-8 TRANSMISSION ACCESS COVER .....	16-21
16-9 GUN TUBE TRAVEL LOCK .....	16-22
16-10 GUN TUBE TRAVEL LOCK ACTUATOR AND PIN ASSEMBLY .....	16-43
16-11 GUN TUBE TRAVEL LOCK PIN ASSEMBLY .....	16-46
16-12 GUN TUBE TRAVEL LOCK ACTUATOR ADJUSTMENT .....	16-48
16-13 GUN TUBE TRAVEL LOCK BUMPER STOP .....	16-60
16-14 GUN TUBE TRAVEL LOCK QUICK-RELEASE PINS AND WIRE ROPE .....	16-62
16-15 GUN TUBE TRAVEL LOCK SUPPORT BRACKET BEARINGS .....	16-64
16-16 HULL REAR DOOR LATCH .....	16-66
16-17 HULL REAR DOOR SEAL .....	16-67
16-18 HULL REAR DOOR, HOLD-OPEN ROD, AND HANDLE .....	16-69
16-19 BATTERY ACCESS DOORS .....	16-76
16-20 BATTERY ACCESS DOOR SEALS .....	16-78
16-21 TRANSMISSION ACCESS DOORS AND DOOR SUPPORT BRACKET .....	16-82
16-22 TRANSMISSION ACCESS DOOR SEALS .....	16-85
16-23 GUN TUBE TRAVEL LOCK SUPPORT .....	16-88
16-24 EXHAUST DEFLECTORS .....	16-90
16-25 HULL EXHAUST GRILLE .....	16-91
16-26 FAN ACCESS DOOR .....	16-92
16-27 RADIATOR CAP ACCESS COVER .....	16-94
16-28 ENGINE DIPSTICK ACCESS COVER .....	16-96
16-29 AIR INTAKE GRILLE .....	16-98
16-30 HULL FRONT SLOPE AND EXHAUST GRILLE SUPPORT PLATE .....	16-102
16-31 GRILLE ADJUSTABLE SUPPORT ASSEMBLY .....	16-105
16-32 FUEL FILL ACCESS DOOR .....	16-108

<u>CONTENTS</u>		<u>Page</u>
Section II. FENDERS		
16-33	FENDERS .....	16-109
Section III. DRIVER'S HATCH AND PERISCOPIES		
16-34	DRIVER'S HATCH ARMOR PLATE AND HANDGRIPS .....	16-111
16-35	DRIVER'S HATCH COVER AND LOCK COMPONENTS .....	16-113
16-36	NIGHT VIEWER AND M45 PERISCOPE COVER DOORS, PINS, SPRINGS, AND SEALS .....	16-122
16-37	NIGHT VIEWER AND M45 PERISCOPE COVER AND GASKET .....	16-124
16-38	NIGHT VIEWER AND M45 PERISCOPE SUPPORTS, SPRINGS, SPACERS, AND RODS ..	16-126
Section IV. DRAIN PLUGS		
16-39	SUBFLOOR DRAIN PLUGS .....	16-128
Section V. FLOOR, SUBFLOOR, AND RELATED COMPONENTS		
16-40	TORSION BAR ANCHOR COVER PLATES .....	16-130
16-41	HULL SUBFLOOR ACCESS COVERS .....	16-134
16-42	FINAL DRIVE SKID PLATES .....	16-136
16-43	HULL EXPANSION PLUGS .....	16-138
Section VI. DRIVER'S SEAT		
16-44	DRIVER'S SEAT .....	16-139
Section VII. STOWAGE RACKS, BOXES, STRAPS, CARRYING CASES, AND CABLE REELS		
16-45	TELEPHONE CABLE REEL, HANDCRANK, AND BRACKET .....	16-151
16-46	NIGHT VIEWER STOWAGE BRACKET .....	16-152
16-47	NIGHT VIEWER STOWAGE BRACKET SUPPORT PLATE .....	16-154
16-48	GUN BARREL BRACKET ASSEMBLY .....	16-155
16-49	GUN BUTT BRACKET ASSEMBLY .....	16-158
16-50	PERISCOPE BRACKET AND SHROUD ASSEMBLY .....	16-161
16-51	STOWAGE BOX SEALS (DRIVER'S COMPARTMENT) .....	16-162
16-52	STOWAGE BOX LATCH (DRIVER'S COMPARTMENT) .....	16-164
16-53	STOWAGE BOX ASSEMBLY (DRIVER'S COMPARTMENT) .....	16-166
16-54	GRENADE BOX ASSEMBLY .....	16-167
16-55	GRENADE BOX ASSEMBLY, 40MM .....	16-169
16-56	STRAPS .....	16-172
16-57	STRAP WITH REMOVABLE HOOK .....	16-173
16-58	STRAPS WITH PERMANENT ATTACHED HOOK .....	16-174
16-59	NET ASSEMBLY AND FASTENERS .....	16-175
16-60	SPACER .....	16-176
16-61	SPARE TRACK SHOE CLAMPS .....	16-177
16-62	RIFLE CLIP .....	16-178
16-63	FLASHLIGHT HOLDER .....	16-179
16-64	EXTRACTOR ASSEMBLY STOWAGE CLAMPS .....	16-180
16-65	OIL CAN BRACKET AND MOUNTING PLATE .....	16-181
16-66	PORTABLE FIRE EXTINGUISHER AND BRACKET .....	16-182

CONTENTS

	<u>Page</u>
16-67 VERTICAL LATCH ASSEMBLY .....	16-183
16-68 HORIZONTAL LATCH ASSEMBLY .....	16-186
16-69 LOCK ASSEMBLY (AMMUNITION RACKS) .....	16-189
16-70 AMMUNITION RACKS .....	16-192
16-71 PROJECTILE STOWAGE STRAPS, SPACERS, AND STRAP BRACKET .....	16-196
16-72 HINGED AND TRIPLE CRADLES .....	16-198
16-73 SINGLE CRADLES, CANTILEVER CRADLES, CRADLE, AND LATCH BRACKETS .....	16-201





---

**Section I. BODY, CAB, HOOD, AND HULL ASSEMBLIES – CONTINUED**

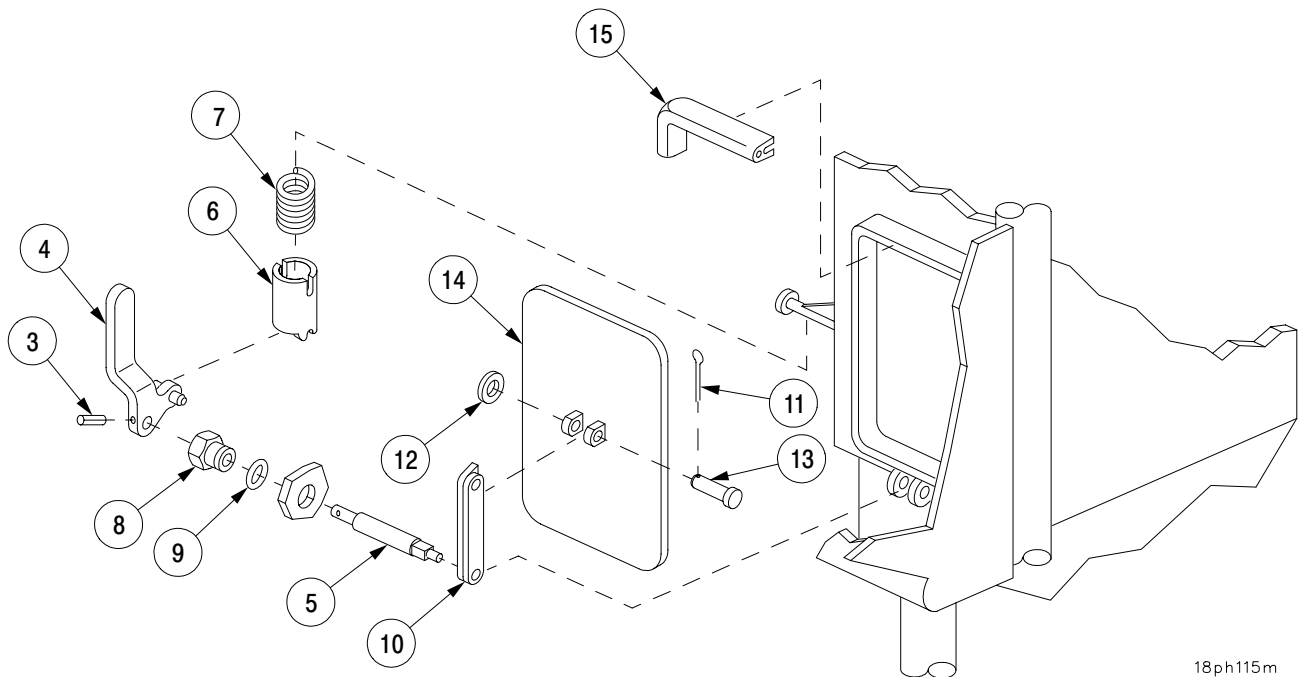
---

**16-1 VENTILATION AIR DUCT – CONTINUED**

---

**a. Removal – Continued**

- 2 Remove spring pin (3) and handle (4) from hinge pin (5) inside of hull. Discard spring pin.
- 3 Remove spring retainer (6) and spring (7).
- 4 Remove nut (8), preformed packing (9), and hinge pin (5) from arm (10). Discard preformed packing.
- 5 Remove cotter pin (11), flat washer (12), pin (13), arm (10), and access door (14) from outside of hull. Discard cotter pin.
- 6 Remove seal (15), if damaged.



18ph115m

**Section I. BODY, CAB, HOOD, AND HULL ASSEMBLIES – CONTINUED**

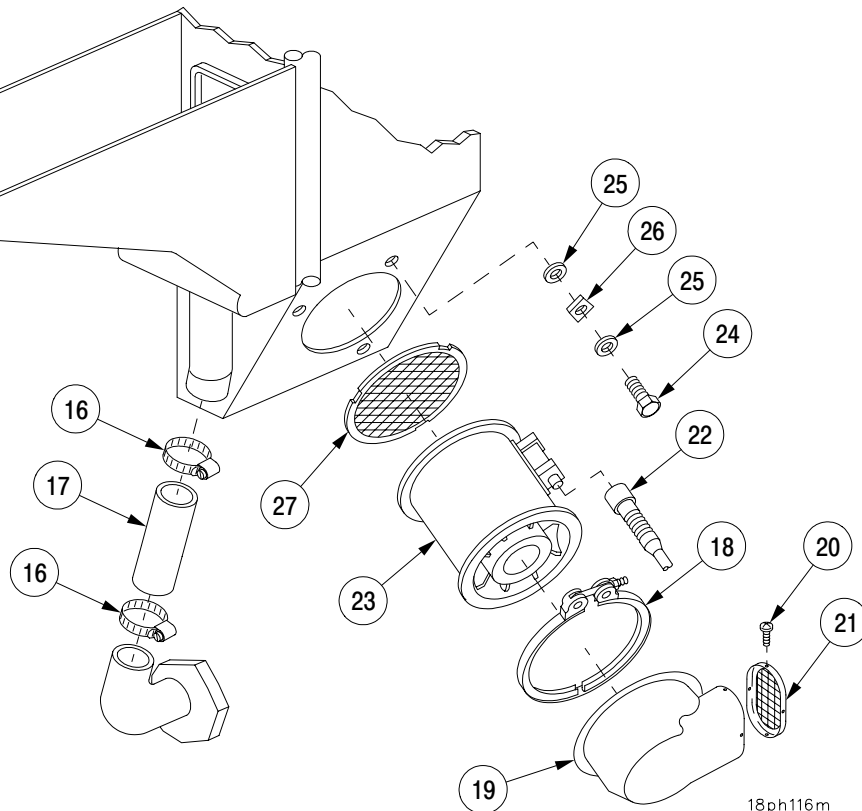
**16-1 VENTILATION AIR DUCT – CONTINUED**

**a. Removal – Continued**

- 7 Slide two hose clamps (16) off hose (17) and remove hose (17) from ducting inside of hull.
- 8 Remove clamp coupling (18), air elbow (19), four tapping screws (20), and screen (21). Discard tapping screws.
- 9 Remove wiring harness W119 connector P3 (22) from fan (23).
- 10 Remove three screws (24), six flat washers (25), three retaining plates (26), fan (23), and vent screen (27) from bulkhead.

**b. Installation.**

- 1 Install vent screen (27) and fan (23) in bulkhead with three retaining plates (26), six flat washers (25), and three screws (24).
- 2 Connect wiring harness W119 connector P3 (22) to fan (23).
- 3 Install screen (21) on air elbow (19) with four new tapping screws (20).
- 4 Install air elbow (19) on fan (23) with clamp coupling (18).
- 5 Slide two hose clamps (16) on each end of hose (17) and secure hose (17) to ducting with two hose clamps (16).

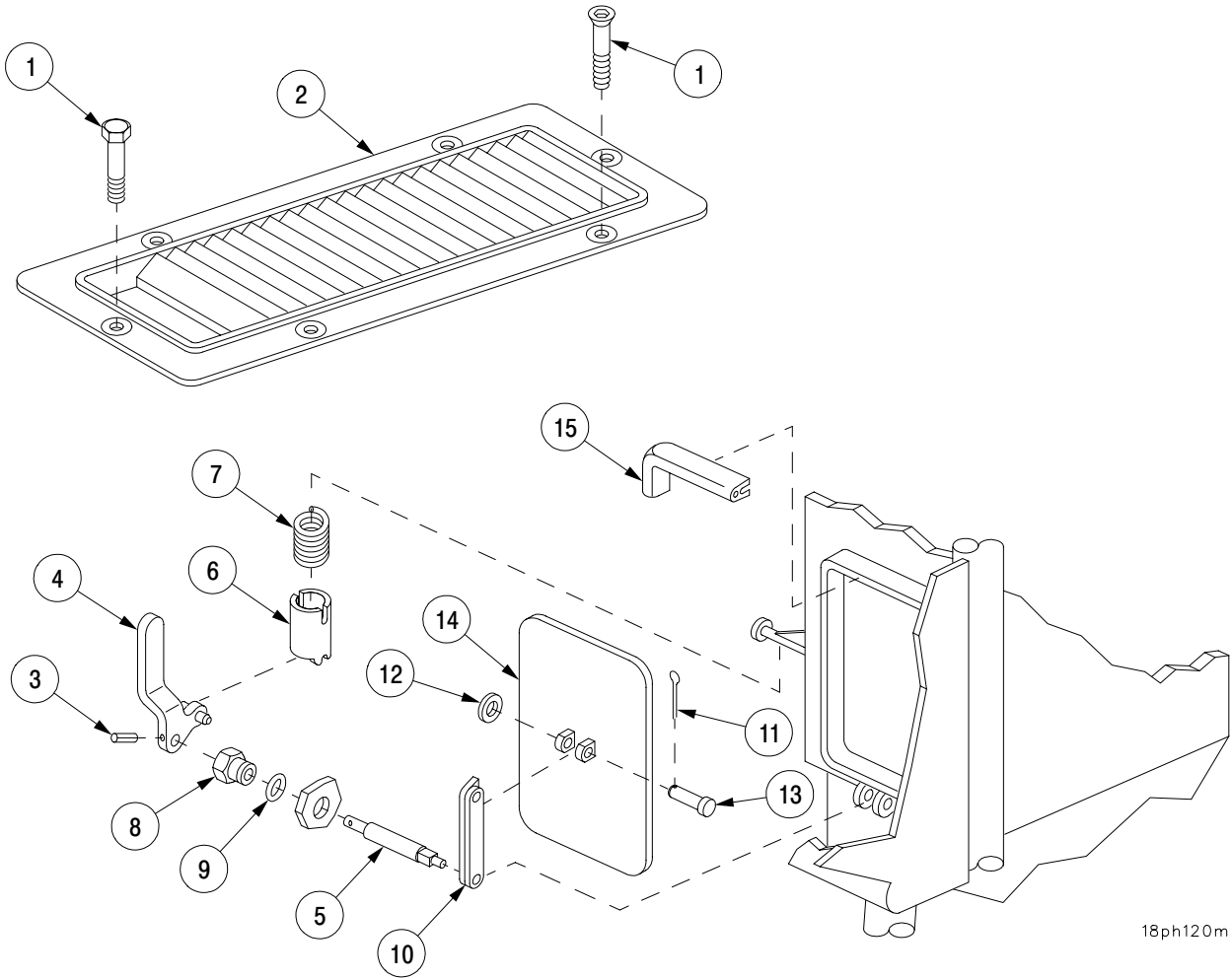


**Section I. BODY, CAB, HOOD, AND HULL ASSEMBLIES – CONTINUED**

**16-1 VENTILATION AIR DUCT – CONTINUED**

**b. Installation – Continued**

- 6 Apply adhesive and install new seal (15), if removed.
- 7 Install arm (10) on access door (14) with pin (13), flat washer (12), and new cotter pin (11).
- 8 Install access door (14) with arm (10) to outside of hull. Install hinge pin (5), new preformed packing (9), and nut (8) to arm (10).
- 9 Install spring (7) in spring retainer (6) and install retainer (6).
- 10 Install handle (4) on hinge pin (5) with new spring pin (3).
- 11 Install grille (2) with six screws (1) on outside of hull.



18ph120m

---

**Section I. BODY, CAB, HOOD, AND HULL ASSEMBLIES – CONTINUED**

---

**16-2 LEAD FILTER.**

---

This task covers:      a. Removal                      b. Installation                      c. Test

---

**INITIAL SETUP**

Tools

General mechanic's tool kit  
(SC 5180-90-N26)

Equipment Conditions

Vehicle MASTER switch OFF  
(TM 9-2350-314-10)

Materials/Parts

Shipping and storage drum (item 18, Appx C)

References

TM 9-2350-314-10  
TM 9-2350-314-20-1-1

---

**WARNING**

- This filter may contain high concentrations of lead dust particles. Dropping or shaking filter during removal can release harmful lead dust particles. DEATH or serious illness may result from inhaling the dust.
- Contact local environmental safety office to review standard safety procedures prior to handling, storage, and disposal of contaminated filter.
- Personnel must wear gloves, safety goggles, and respirators when removing lead filter.
- Make sure vehicle MASTER switch is OFF. Accidental start-up of lead filter intake fan during maintenance will expose personnel to a high lead concentration and entire vehicle will require decontamination.

**NOTE**

- Ensure work area is well ventilated.
- Vacate area of unnecessary personnel.
- Do not allow food, drink, or smoking in the area.
- Open all vehicle doors and hatches when removing lead filter.

---

**Section I. BODY, CAB, HOOD, AND HULL ASSEMBLIES – CONTINUED**


---

**16-2 LEAD FILTER – CONTINUED**


---

**a. Removal.**

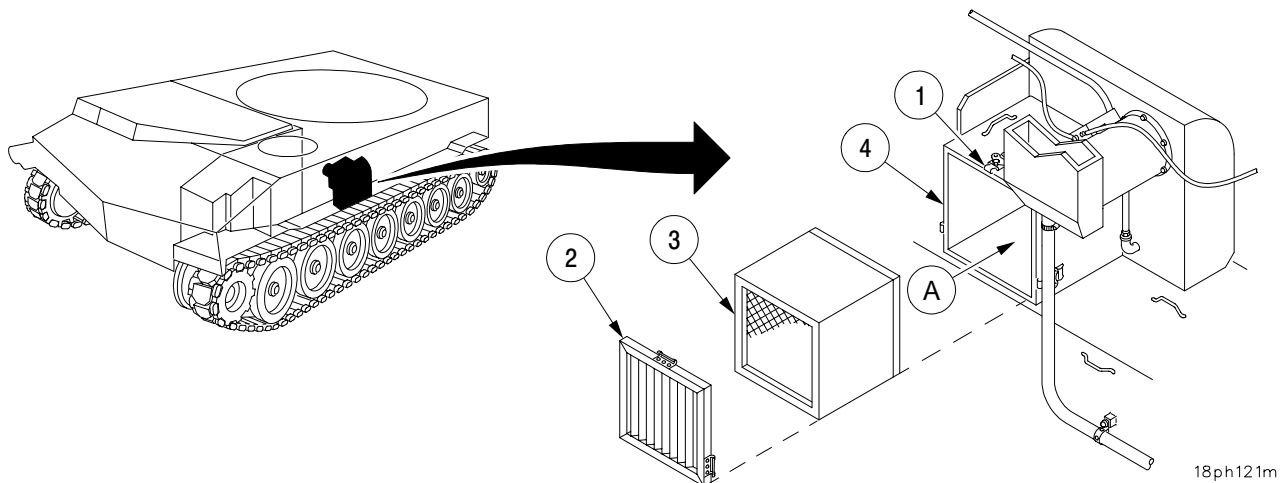
- 1 Release three latches (1) and remove outlet grille assembly (2).
- 2 Remove grille assembly (2) from vehicle.
- 3 Remove and place filter element (3) in container.
- 4 Wipe excess dirt and debris from filter housing (4) with a damp or wet rag. Fold rag as necessary when it becomes dirty. Place rag in container with used lead filter element (3).
- 5 Wipe outlet grille assembly (2) with a damp or wet rag. Fold rag as necessary when it becomes dirty. Place used rag in container with lead filter element (3).
- 6 Seal container tightly and apply warning label provided. If warning label is missing, container shall be marked with the following: CAUTION: HAZARDOUS WASTE, FILTER CONTAMINATED WITH LEAD. DO NOT REMOVE DUST BY BLOWING OR SHAKING. Contact local DRMO and/or waste management office to arrange for final disposal.
- 7 Thoroughly wash contaminated protective gear (goggles, gloves, and respirator). Do not remove dust by blowing, shaking, or dry wiping.
- 8 Wash hands after handling lead contaminated filter.

**b. Installation.**

- 1 Install new filter element (3) in housing (4) with gasket against surface A.
- 2 Install outlet grille assembly (2) and secure with three latches (1).

**c. Test.**

Test lead filter in accordance with PMCS (Table 2-1, PMCS item 11).



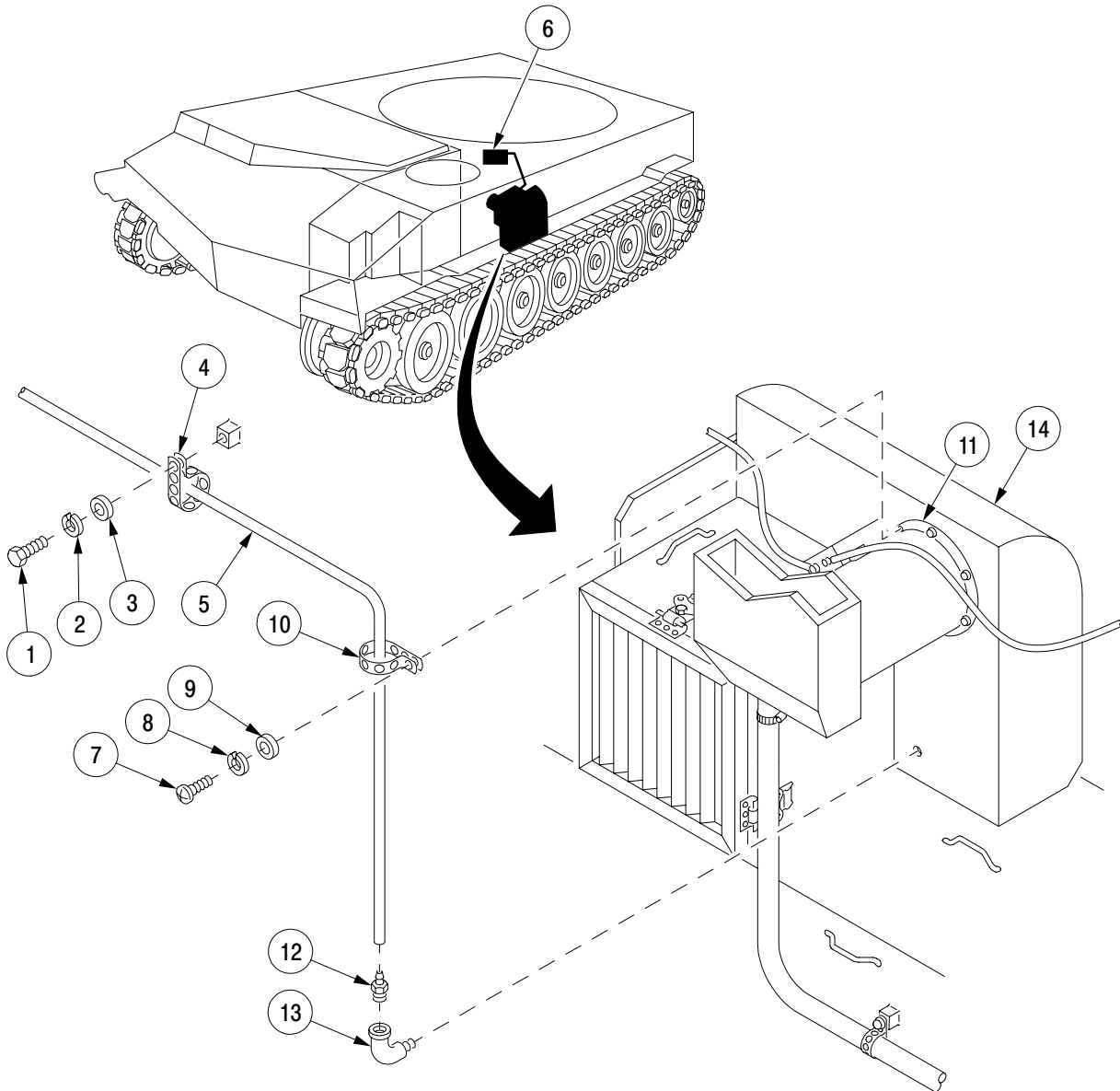
18ph121m



**Section I. BODY, CAB, HOOD, AND HULL ASSEMBLIES – CONTINUED**

**16-3 LEAD FILTER VENT TUBE, FITTING, AND ELBOW.**

**b. Installation – Continued**



18ph122m



**Section I. BODY, CAB, HOOD, AND HULL ASSEMBLIES – CONTINUED**

---

**16-4 LEAD FILTER DRAIN HOSES AND CLAMPS.**

---

This task covers:      a. Removal                                      b. Installation

---

**INITIAL SETUP**

Tools

General mechanic's tool kit  
(SC 5180-90-N26)

Equipment Conditions

Vehicle MASTER switch OFF  
(TM 9-2350-314-10)

Materials/Parts

Lockwashers (3) (item 22, Appx E)

References

TM 9-2350-314-10

---

**a. Removal.**

- 1 Remove three screws (1), three flat washers (2), three lockwashers (3), three straps (4), and hose (5) from bulkhead. Discard lockwashers.
- 2 Remove clamp (6) and hose (5) from outlet tube (7).

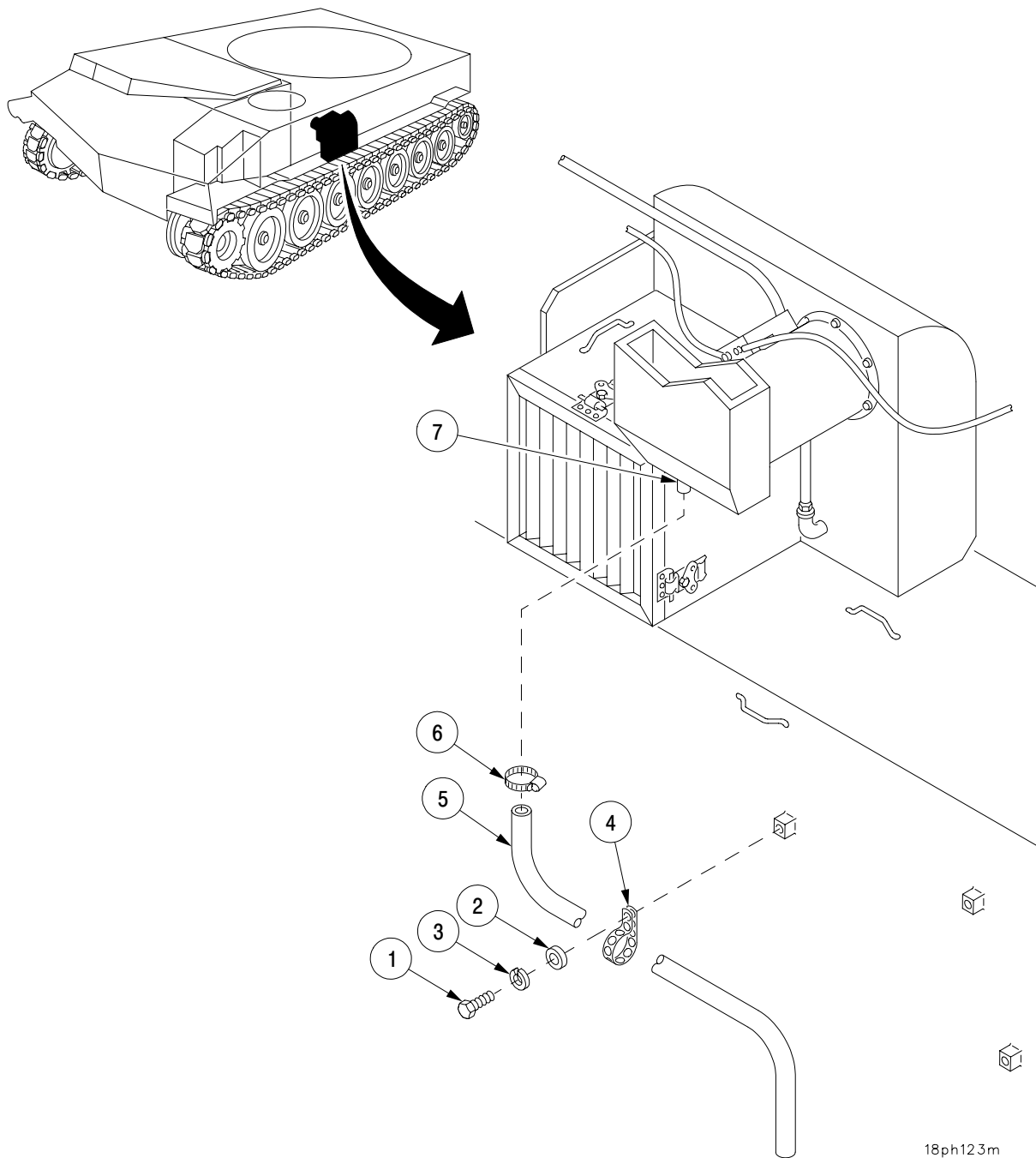
**b. Installation.**

- 1 Install hose (5) on outlet tube (7) with clamp (6).
- 2 Install hose (5) to bulkhead with three straps (4), three screws (1), three new lockwashers (3), and three flat washers (2).

**Section I. BODY, CAB, HOOD, AND HULL ASSEMBLIES – CONTINUED**

**16-4 LEAD FILTER DRAIN HOSES AND CLAMPS – CONTINUED**

**b. Installation – Continued**



**Section I. BODY, CAB, HOOD, AND HULL ASSEMBLIES – CONTINUED**

---

**16-5 LEAD FILTER GRILLE ASSEMBLY.**

---

This task covers:      a. Removal      b. Disassembly      c. Assembly      d. Installation

---

**INITIAL SETUP**

Tools

General mechanic's tool kit  
(SC 5180-90-N26)  
Electric drill (item 15, Appx F)  
Twist drill set (item 16, Appx F)

Equipment Conditions

Vehicle MASTER switch OFF  
(TM 9-2350-314-10)

References

TM 9-2350-314-10

Materials/Parts

Blind rivets (3) (item 293, Appx E)

---

**a. Removal.**

Unhook three latches (1) and remove grille (2).

**b. Disassembly.**

**NOTE**

There are three keepers on grille assembly. This task replaces only one keeper.

Remove three rivets (3) and keeper (4) from grille (2). Discard rivets.

**c. Assembly.**

Install keeper (4) on grille (2) with three new rivets (3).

**d. Installation.**

Install grille (2) and secure with three latches (1).

---

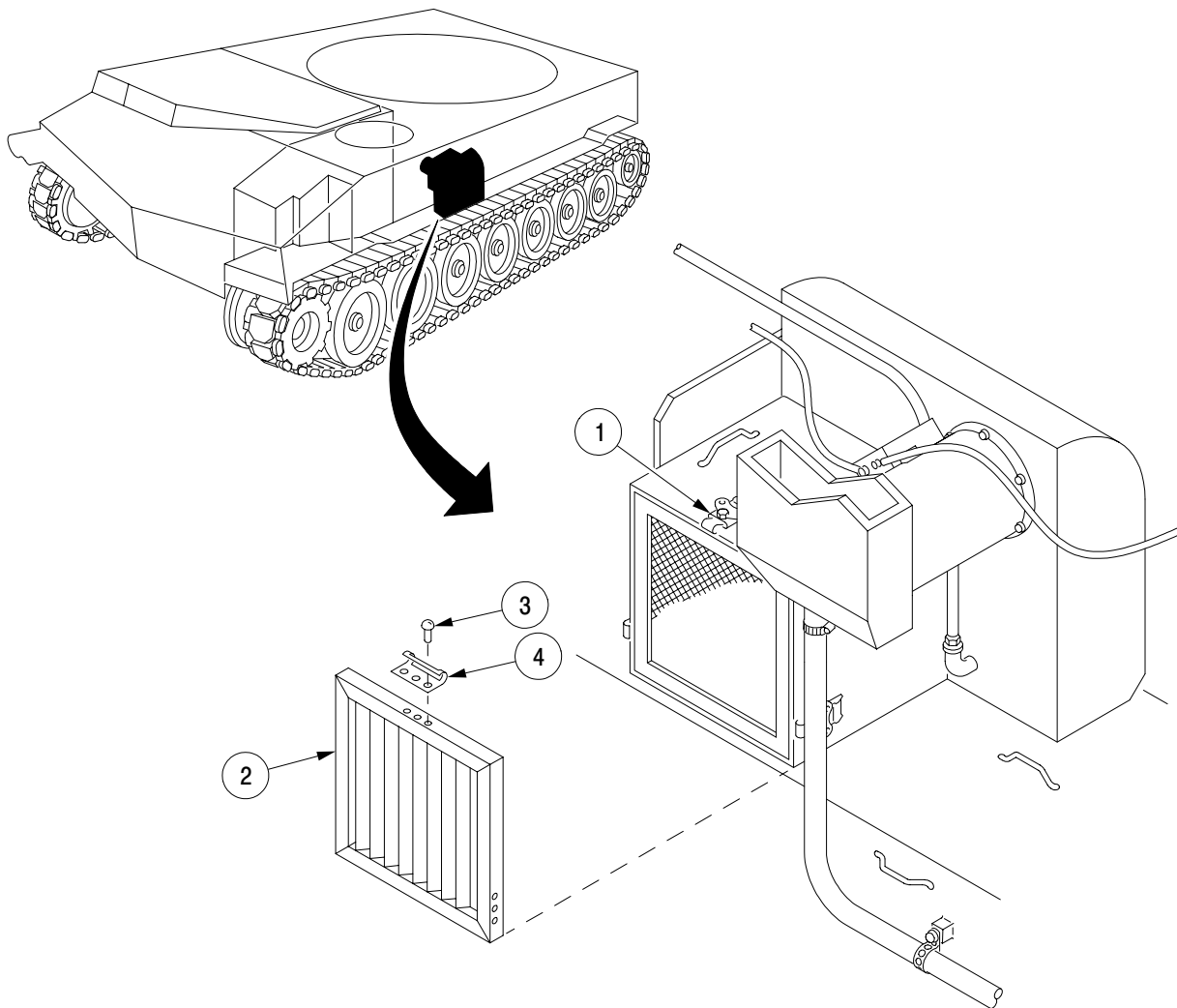
**Section I. BODY, CAB, HOOD, AND HULL ASSEMBLIES – CONTINUED**

---

**16-5 LEAD FILTER GRILLE ASSEMBLY – CONTINUED**

---

**d. Installation – Continued**



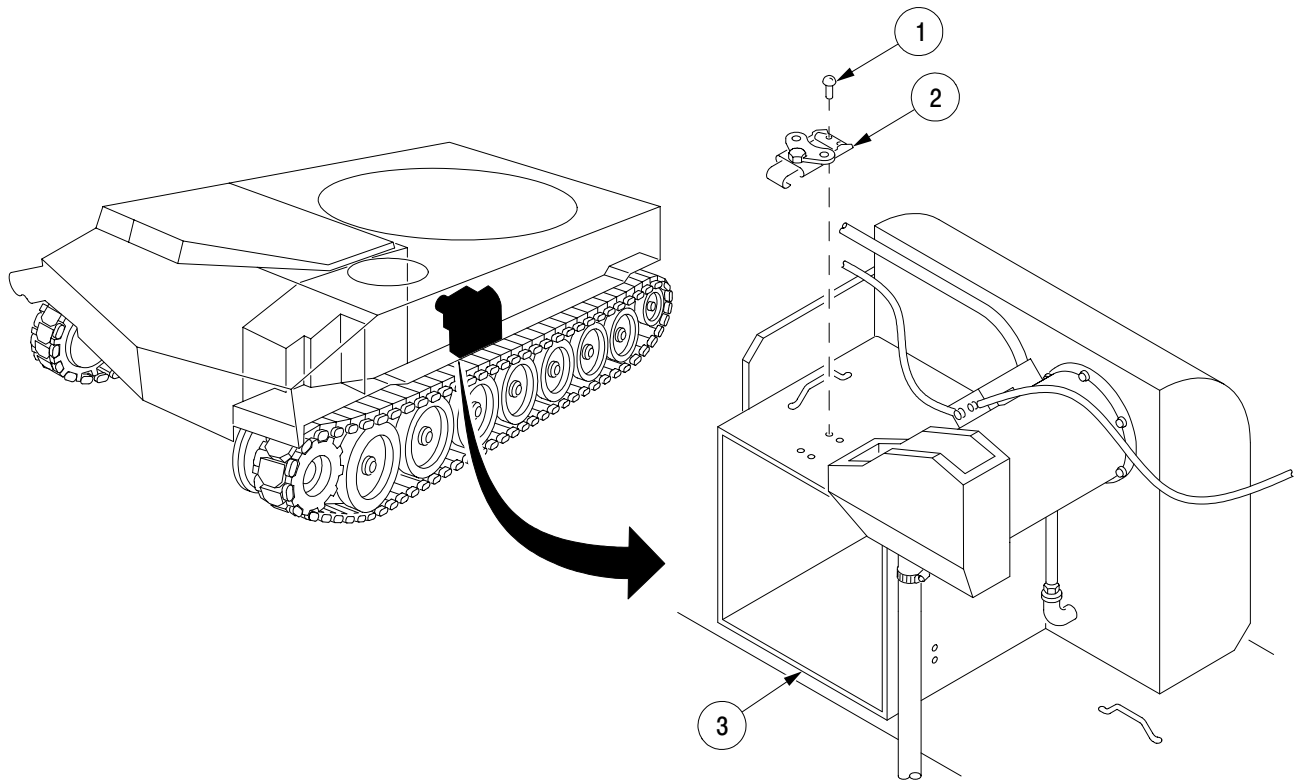
18ph124m



**Section I. BODY, CAB, HOOD, AND HULL ASSEMBLIES – CONTINUED**

**16-6 LEAD FILTER HOUSING HOLD-DOWN LATCH – CONTINUED**

**b. Installation – Continued**



18ph125m

**NOTE**

**FOLLOW-ON MAINTENANCE:**  
 Install lead filter (para 16-2)

---

**Section I. BODY, CAB, HOOD, AND HULL ASSEMBLIES – CONTINUED**

---

**16-7 ENGINE COMPARTMENT ACCESS COVER.**

---

This task covers:      a. Removal      b. Disassembly      c. Assembly      d. Installation

---

**INITIAL SETUP**

Tools

General mechanic's tool kit  
(SC 5180-90-N26)  
Wire brush (item 7, Appx F)

Materials/Parts

Adhesive (item 3, Appx C)  
Dry cleaning solvent (item 59, Appx C)  
Lockwashers (12) (item 5, Appx E)  
Nonmetallic seal (item 33, Appx E)  
Pad (item 34, Appx E)  
Pad (item 35, Appx E)  
Pad (item 36, Appx E)  
Pad (item 37, Appx E)  
Acid swabbing brush (item 13, Appx C)

---

**a. Removal.**

- 1 Disconnect hose assembly (1) at clamp (2). Move hose assembly (1) away from front of access cover (3).
- 2 Remove 12 screws (4), 12 lockwashers (5), and access cover (3). Discard lockwashers.

**b. Disassembly.**

- 1 Remove insulation (6) from access cover (3).
- 2 Remove seal (7) and four pads (8) from access cover (3). Discard seal and pads.

**WARNING**

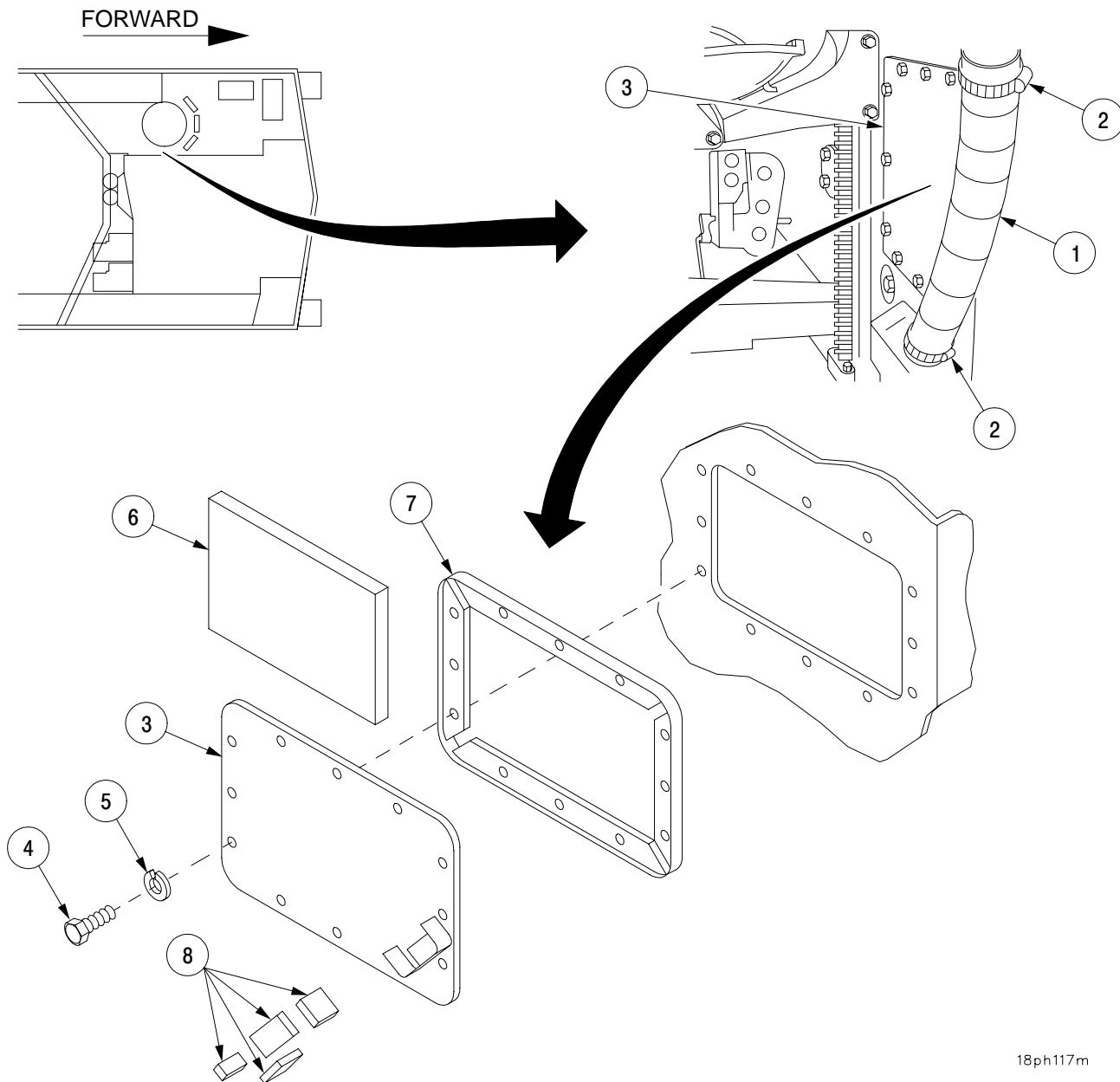
Dry-cleaning solvent (P-D-680), used to clean parts, is toxic and flammable. Wear protective goggles and gloves and use only in a well-ventilated area. Avoid contact with skin, eyes, and clothes. Do not breathe vapors. Do not use near open flame or excessive heat. Do not smoke when using solvent. Failure to do so could cause SERIOUS INJURY. If you become dizzy while using dry-cleaning solvent, get fresh air immediately, and if necessary, get medical attention. If contact with skin or clothes is made, flush thoroughly with water. If the solvent contacts your eyes, wash them with water immediately and obtain medical aid (ref. FM 21-11).

**Section I. BODY, CAB, HOOD, AND HULL ASSEMBLIES – CONTINUED**

**16-7 ENGINE COMPARTMENT ACCESS COVER – CONTINUED**

**b. Disassembly – Continued**

- 3 Clean access cover (3) with dry-cleaning solvent and wire brush.



18ph117m



---

**Section I. BODY, CAB, HOOD, AND HULL ASSEMBLIES – CONTINUED**

---

**16-7 ENGINE COMPARTMENT ACCESS COVER – CONTINUED**

---

**c. Assembly.**

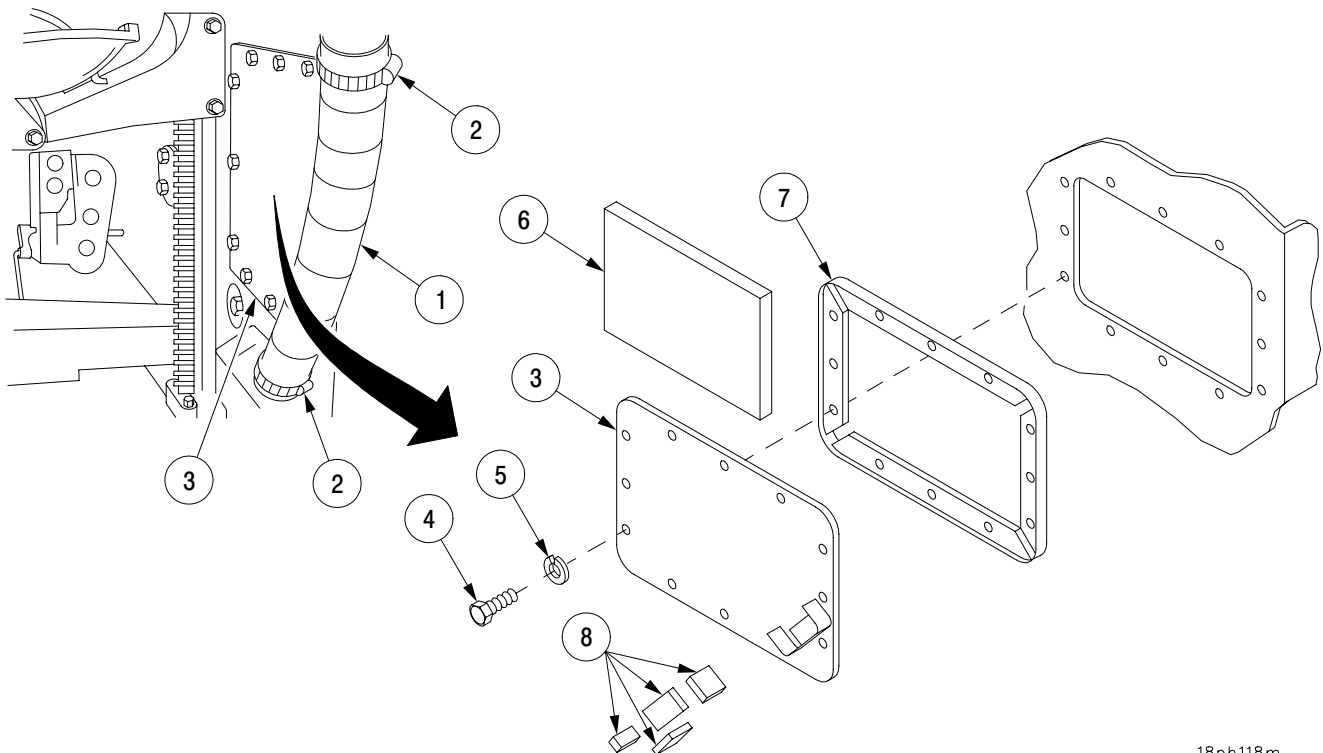
- 1 Install new seal (7) and four new pads (8) on access cover (3) with adhesive and acid brush.
- 2 Install insulation (6) on access cover (3).

**d. Installation.**

**WARNING**

When installing engine compartment access cover, make sure that all screws are secured. Carbon monoxide poisoning could result if cover is loose.

- 1 Install access cover (3) with 12 screws (4) and 12 new lockwashers (5).
- 2 Connect hose assembly (1) and secure with clamp (2).



18ph118m

**Section I. BODY, CAB, HOOD, AND HULL ASSEMBLIES – CONTINUED**

**16-8 TRANSMISSION ACCESS COVER.**

This task covers: a. Removal b. Installation

**INITIAL SETUP**

Tools

General mechanic's tool kit  
(SC 5180-90-N26)

Materials/Parts

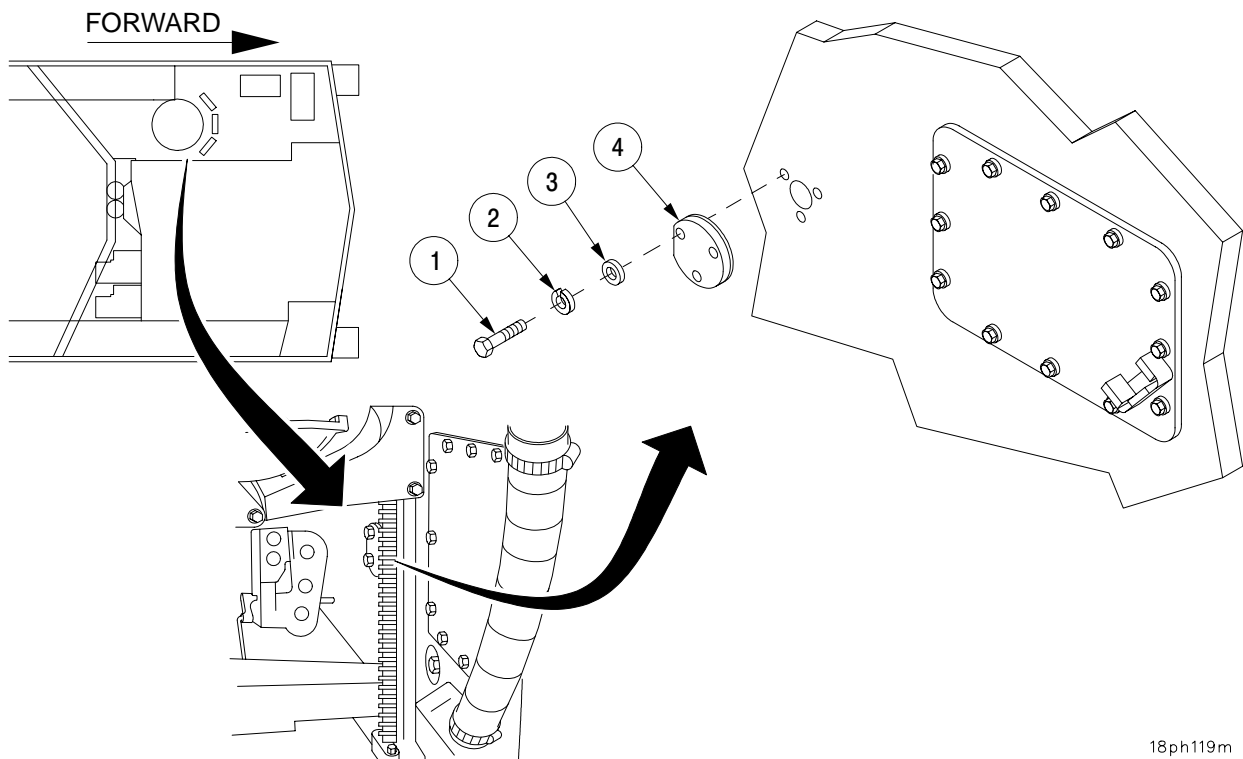
Lockwashers (3) (item 9, Appx E)

**a. Removal.**

Remove three screws (1), three lockwashers (2), three flat washers (3), and cover (4). Discard lockwashers.

**b. Installation.**

Install cover (4) with three flat washers (3), three new lockwashers (2), and three screws (1).



18ph119m

---

## Section I. BODY, CAB, HOOD, AND HULL ASSEMBLIES – CONTINUED

---

### 16-9 GUN TUBE TRAVEL LOCK

---

This task covers:    a. Removal                    b. Disassembly                    c. Assembly                    d. Installation  
                                 e. Adjustment

---

#### **INITIAL SETUP**

##### Tools

General mechanic's tool kit  
(SC 5180-90-N26)  
Torque wrench (item 86, Appx F)  
Suitable lifting device  
Mechanical puller (item 46, Appx F)  
Endless sling (item 59, Appx F)  
Wire brush (item 7, Appx F)  
Crowfoot socket wrench attachment (item 13, Appx F)  
Socket adapter (item 2, Appx F)  
Torque wrench (item 87, Appx F)

##### Materials/Parts

Cotter pin (item 49, Appx E)  
Cotter pins (4) (item 50, Appx E)  
Lockwashers (24) (item 5, Appx E)  
Cotter pins (4) (item 51, Appx E)

##### Materials/Parts – Continued

Shim package (item 53, Appx E)  
Key washer (item 52, Appx E)  
Lumber (item 38, Appx C)  
Adhesive (item 5, Appx C)  
Acid swabbing brush (item 13, Appx C)  
Cotter pin (item 130, Appx E)  
Cotter pin (item 307, Appx E)

##### Equipment Conditions

Gun tube travel lock bumper stop removed  
(para 16-13)

##### Personnel Required

Two

##### References

TM 9-2350-314-10

---

#### **a. Removal.**

#### **WARNING**

Travel lock weighs about 400 lbs. Use extreme care while handling to avoid injury to personnel or damage to equipment.

- 1 Stow gun tube and lock cab (TM 9-2350-314-10). Make a vertical alignment mark on travel lock assembly and hull.
- 2 Unlock travel lock and cab. Raise gun tube enough to clear travel lock. Traverse gun tube to side. Leave travel lock vertical (TM 9-2350-314-10).
- 3 Disconnect wiring harness W126 connector P2 (1) (para 8-84).
- 4 Secure travel lock (2) in sling on lifting device.

**Section I. BODY, CAB, HOOD, AND HULL ASSEMBLIES – CONTINUED**

**16-9 GUN TUBE TRAVEL LOCK – CONTINUED**

**a. Removal – Continued**

- 5 Remove two quick-release pins (3).

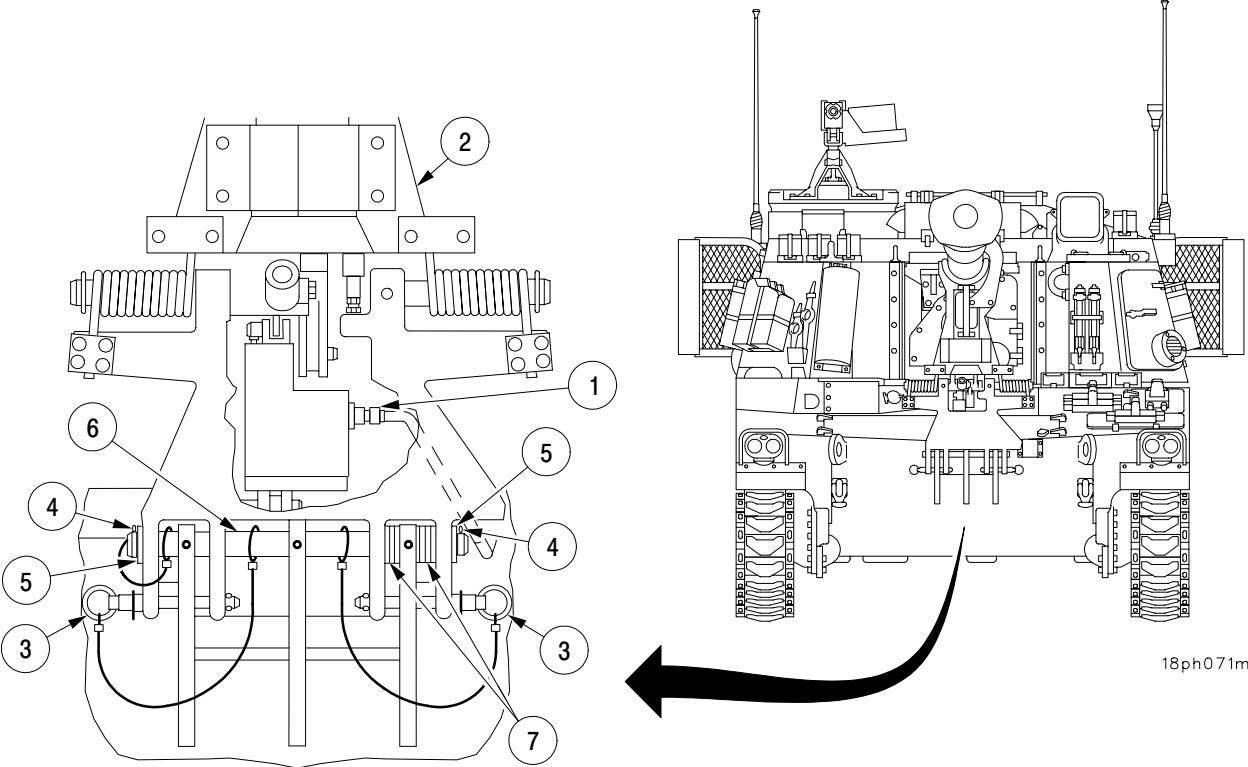
**WARNING**

Stand on left side of vehicle to remove last pin to prevent travel lock from swinging into personnel.

**NOTE**

Note location and quantity of flat washers. Flat washers will fall when mounting bracket pin is removed. Do not lose.

- 6 Remove two cotter pins (4), four end washers (5), mounting bracket (6), and flat washers (7). Discard cotter pins.
- 7 Remove travel lock (2).



**Section I. BODY, CAB, HOOD, AND HULL ASSEMBLIES – CONTINUED**

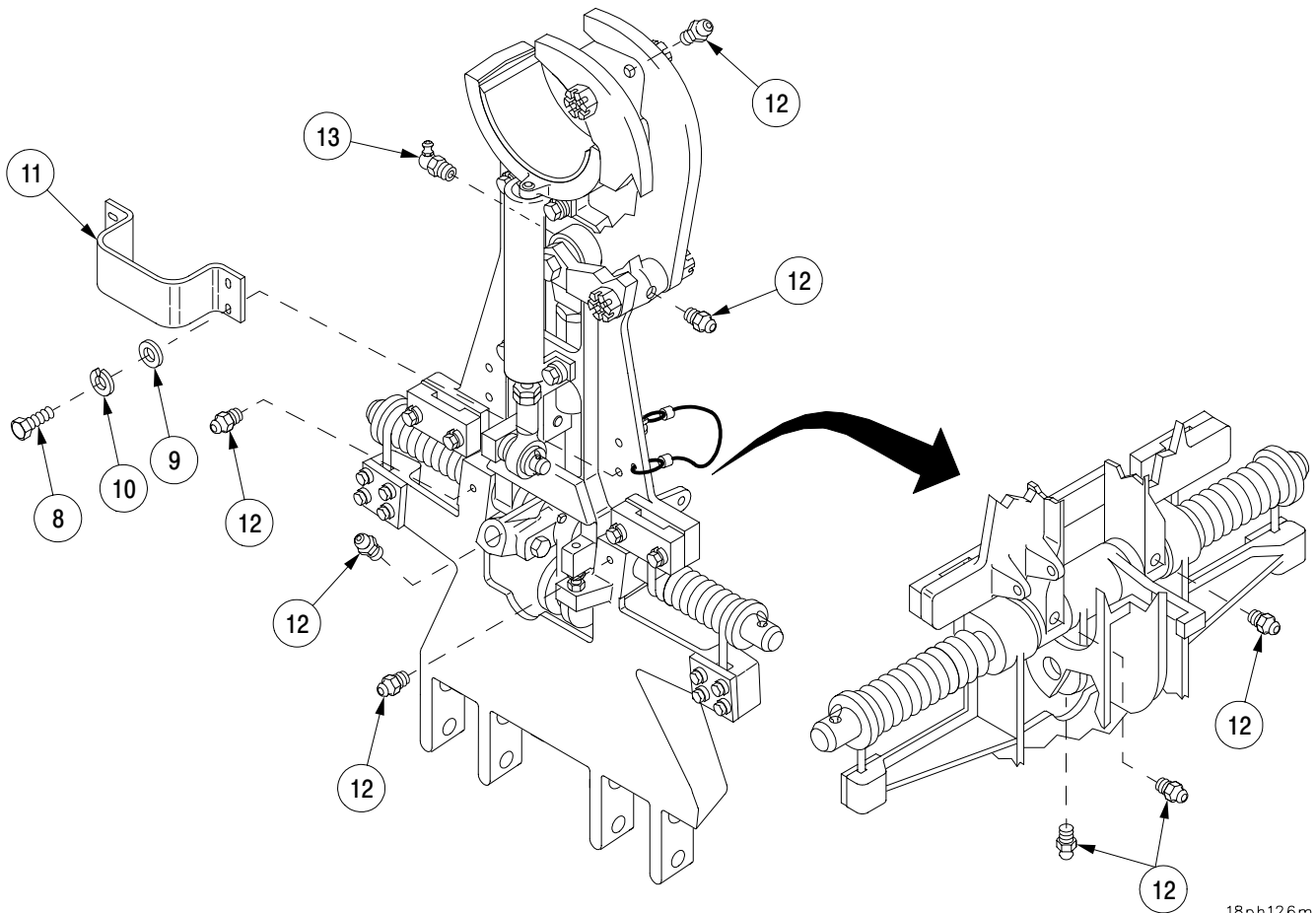
**16-9 GUN TUBE TRAVEL LOCK – CONTINUED**

**b. Disassembly.**

**NOTE**

Have blocking material on hand before starting disassembly.

- 1 Remove four screws (8), four flat washers (9), four lockwashers (10), and guard (11). Discard lockwashers.
- 2 Remove eight lubrication fittings (12) and lubrication fitting (13).



18ph126m

---

**Section I. BODY, CAB, HOOD, AND HULL ASSEMBLIES – CONTINUED**

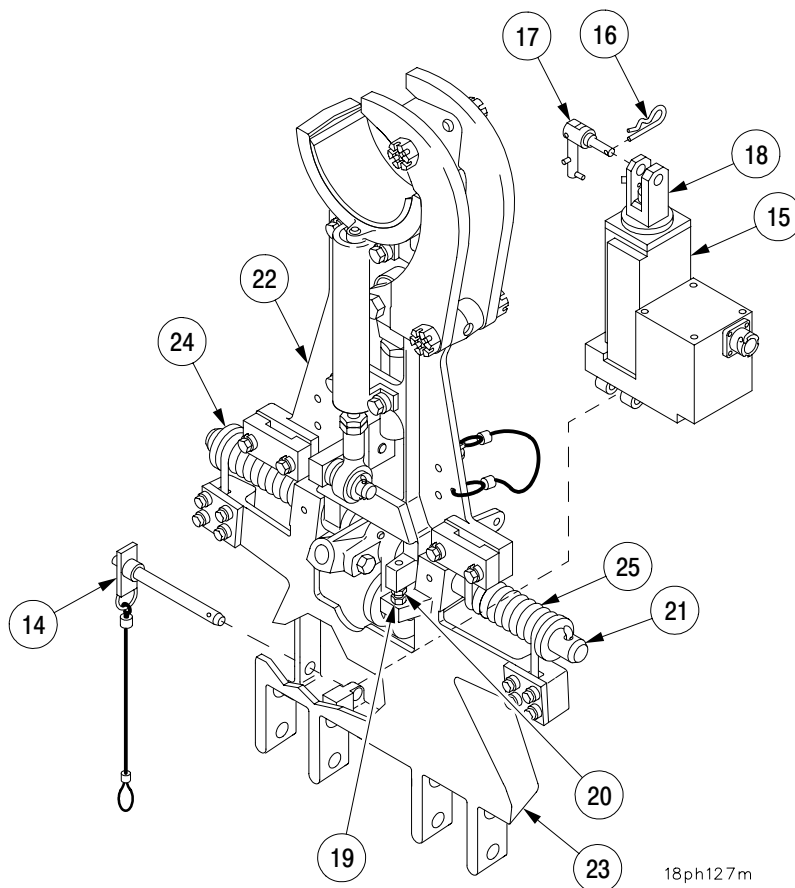
---

**16-9 GUN TUBE TRAVEL LOCK – CONTINUED**

---

**b. Disassembly – Continued**

- 3 Remove quick-release pin (14) from bottom of actuator (15).
- 4 Remove retaining clip (16) and pin (17) from upper clevis (18) on actuator (15).
- 5 Remove actuator (15).
- 6 Screw stop screw (19) down after loosening stop nut (20).
- 7 Place blocks under support pin (21) that joins frame assembly (22) to travel lock support (23). Tension on springs (24 and 25) is now reduced.



## Section I. BODY, CAB, HOOD, AND HULL ASSEMBLIES – CONTINUED

---

### 16-9 GUN TUBE TRAVEL LOCK – CONTINUED

---

#### b. Disassembly – Continued

**WARNING**

Springs may pop off with force. Use caution to avoid injury to personnel.

- 8 Remove eight screws (26), four screws (27), twelve lockwashers (28), two plates (29), and two retainers (30) that hold down the ends of spring (24) and spring (25). Discard lockwashers.
- 9 Remove two cotter pins (31) at end of support pin (21). Remove two washers (32). Discard cotter pins.
- 10 Remove springs (24 and 25). A small amount of tension may still be on one spring. Use a pry bar to lift on bottom of spring while striking top of spring with a hammer.

**WARNING**

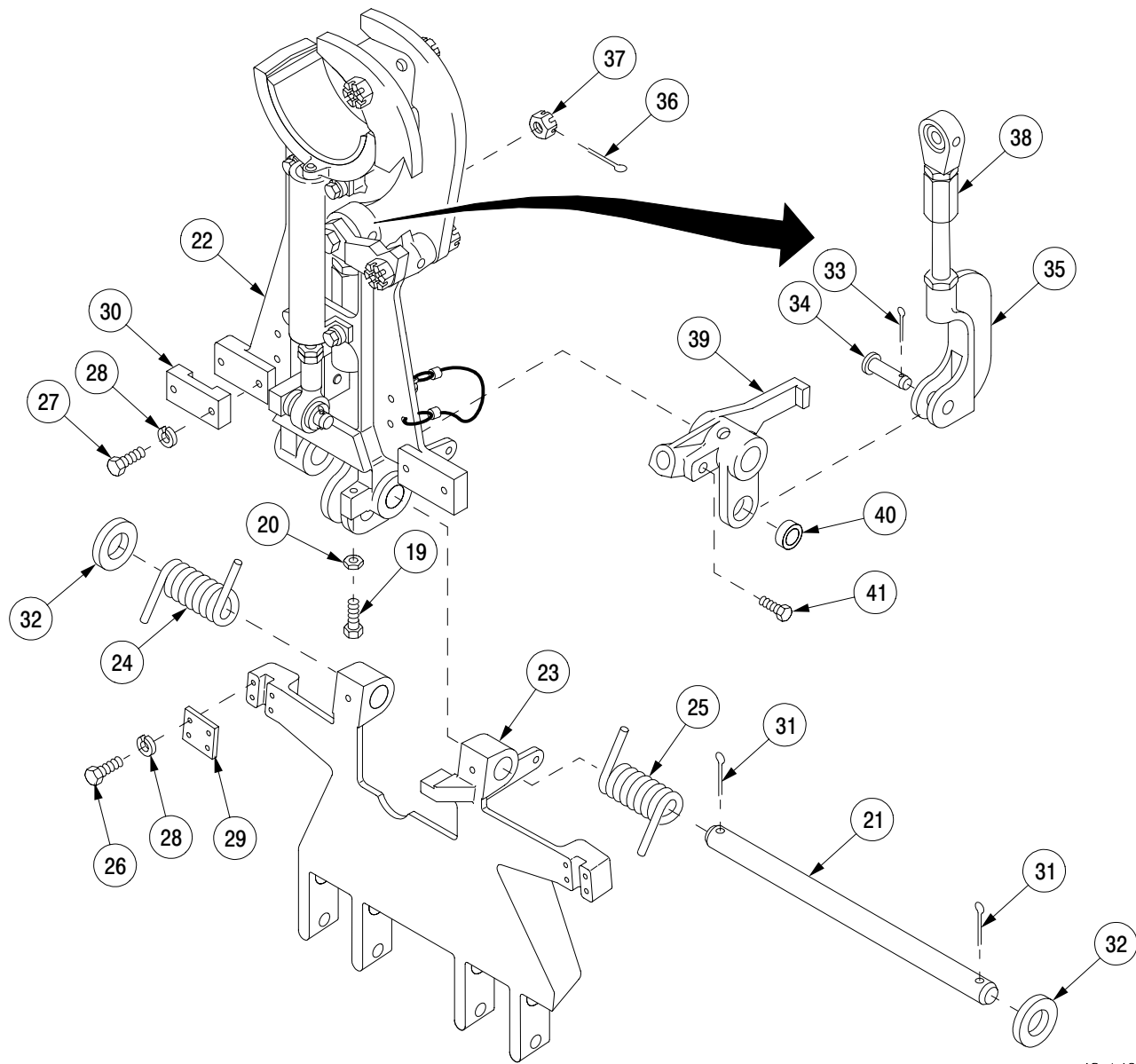
Travel lock support and frame assembly are heavy. Use two personnel to move.

- 11 Raise travel lock support (23) and remove stop bolt (19) and stop nut (20).
- 12 Remove cotter pin (33) and pin (34) from arm (35). Remove cotter pin (36) from castellated nut (37) securing upper rod assembly (38). Loosen castellated nut (37). Discard cotter pins.
- 13 Remove block from under frame assembly (22) and travel lock support (23). Frame assembly and travel lock support should be level. Raise arm (35) just enough to remove weight on support pin (21). Remove pin (210).
- 14 Remove lever assembly (39).
- 15 Press bearing (40) from lever assembly (39).
- 16 Remove screw (41) from lever assembly (39).
- 17 Inspect lever assembly (39) from wear or damage. Discard lever assembly if unserviceable.
- 18 Separate travel lock support (23) from frame assembly (22).

**Section I. BODY, CAB, HOOD, AND HULL ASSEMBLIES – CONTINUED**

**16-9 GUN TUBE TRAVEL LOCK – CONTINUED**

**b. Disassembly – Continued**



18ph128m

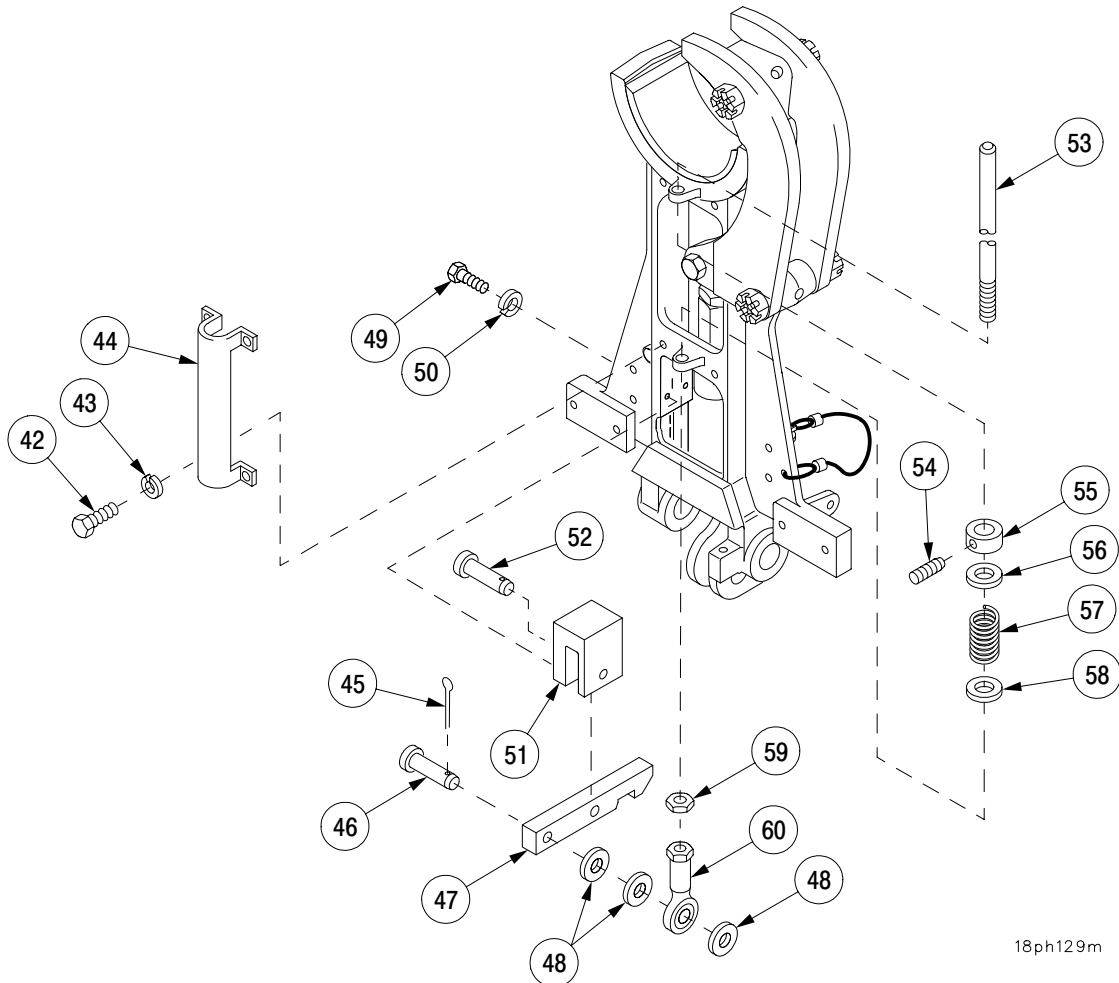


**Section I. BODY, CAB, HOOD, AND HULL ASSEMBLIES – CONTINUED**

**16-9 GUN TUBE TRAVEL LOCK – CONTINUED**

**b. Disassembly – Continued**

- 19 Remove four screws (42), four lockwashers (43), and cover (44). Discard lockwashers.
- 20 Remove cotter pin (45) from pin (46) in catch (47). Remove pin (46) and three flat washers (48). Discard cotter pin.
- 21 Remove four screws (49), four lockwashers (50), and block (51) with catch (47). Discard lockwashers.
- 22 Remove pin (52) from block (51). Separate catch (47) from block (51).
- 23 Pull push rod (53) out. Loosen setscrew (54) and remove collar (55), flat washer (56), spring (57), and flat washer (58). Loosen nut (59) and remove rod end (60) and nut (59) from push rod (53).



18ph129m

---

**Section I. BODY, CAB, HOOD, AND HULL ASSEMBLIES – CONTINUED**

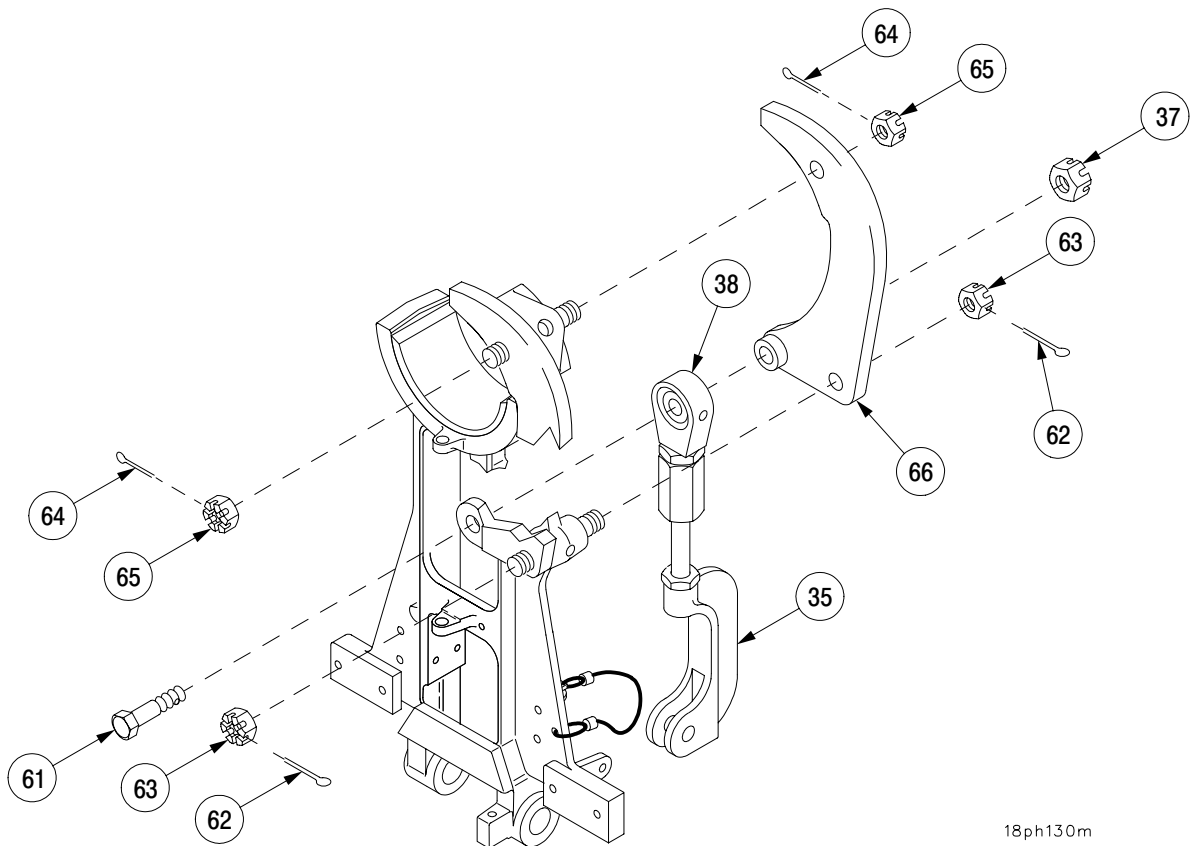
---

**16-9 GUN TUBE TRAVEL LOCK – CONTINUED**

---

**b. Disassembly – Continued**

- 24 Remove castellated nut (37) on upper rod assembly (38). Remove screw (61).
- 25 Remove two cotter pins (62) from two castellated nuts (63). Remove two castellated nuts (63). Discard cotter pins.
- 26 Remove two cotter pins (64), two castellated nuts (65), and clamp (66). Discard cotter pins.
- 27 Remove arm (35).



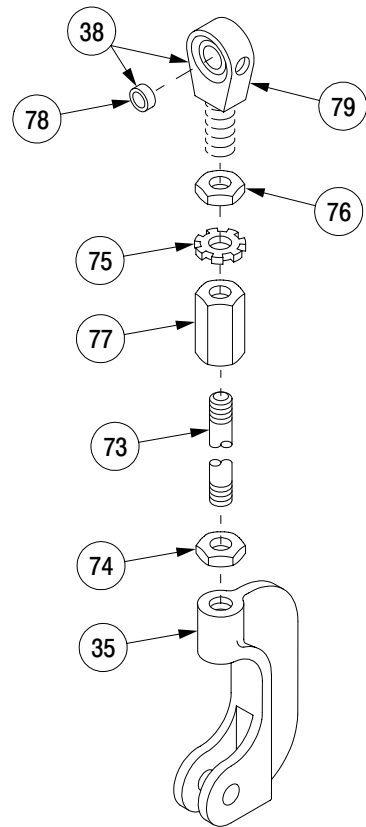
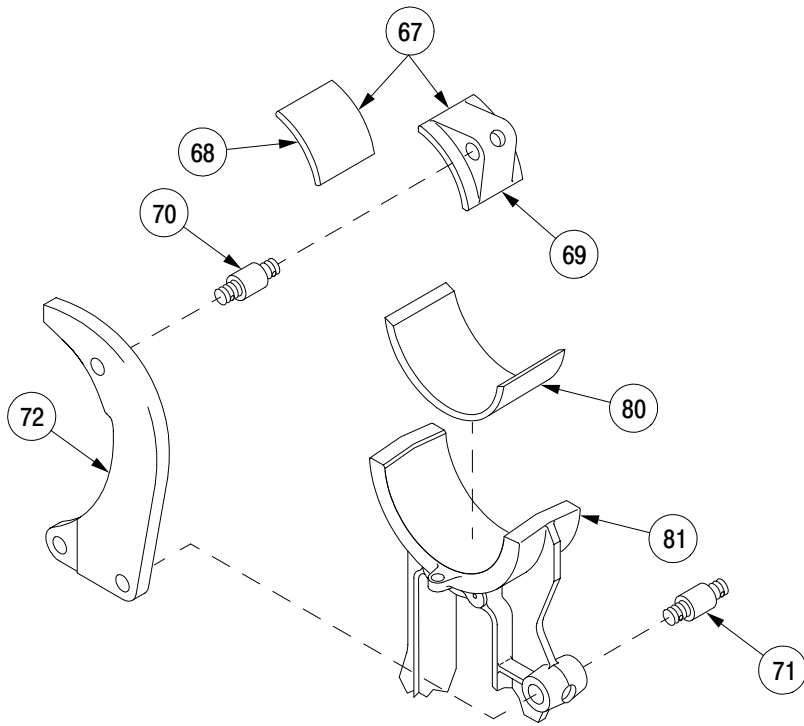
18ph130m

**Section I. BODY, CAB, HOOD, AND HULL ASSEMBLIES – CONTINUED**

**16-9 GUN TUBE TRAVEL LOCK – CONTINUED**

**b. Disassembly – Continued**

- 28 Remove pad assembly (67).
- 29 Remove lining (68) and adhesive from pad (69). Remove two pins (70 and 71).
- 30 Remove clamp (72).
- 31 If necessary for maintenance, remove arm (35) from rod (73) by loosening nut (74) to allow removal of arm (35). Remove nut (74) from rod (73). Separate rod (73) from upper rod assembly (38) by straightening tab on washer (75) and loosening nut (76) sufficiently to allow removal of upper rod assembly (38). Remove nut (76), key washer (75), and coupling (77) from rod (73). Discard key washer.
- 32 Press bearing (78) from upper rod (79).
- 33 Remove lining (80) and adhesive from frame (81).



18ph131m

---

**Section I. BODY, CAB, HOOD, AND HULL ASSEMBLIES – CONTINUED**

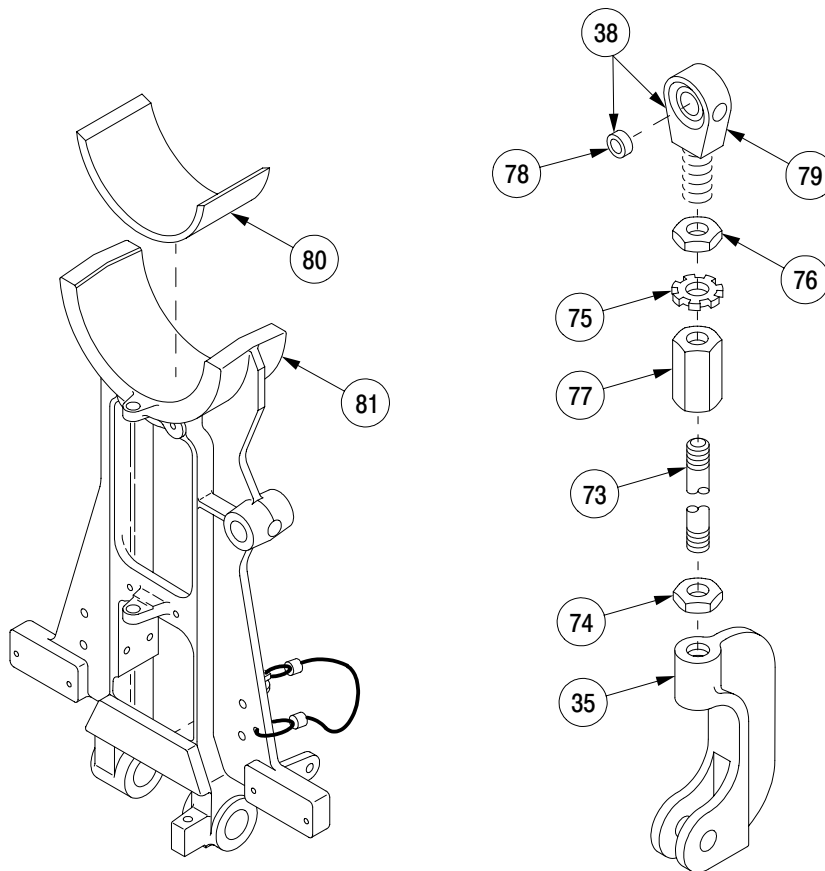
---

**16-9 GUN TUBE TRAVEL LOCK – CONTINUED**

---

**c. Assembly – Continued**

- 1 Clean mating surfaces of lining (80) and frame (81) with wire brush.
- 2 Apply adhesive to mating surfaces of lining (80) and frame (81) with acid brush.
- 3 Place lining (80) onto frame (81). Allow 15 minutes drying time.
- 4 Press bearing (78) into upper rod (79).
- 5 Install coupling (77) on rod (73). Install nut (76) and new key washer (75) on upper rod assembly (38). Connect upper rod assembly (38) to rod (73). Install nut (74) and arm (35) on rod (73).



---

**Section I. BODY, CAB, HOOD, AND HULL ASSEMBLIES – CONTINUED**

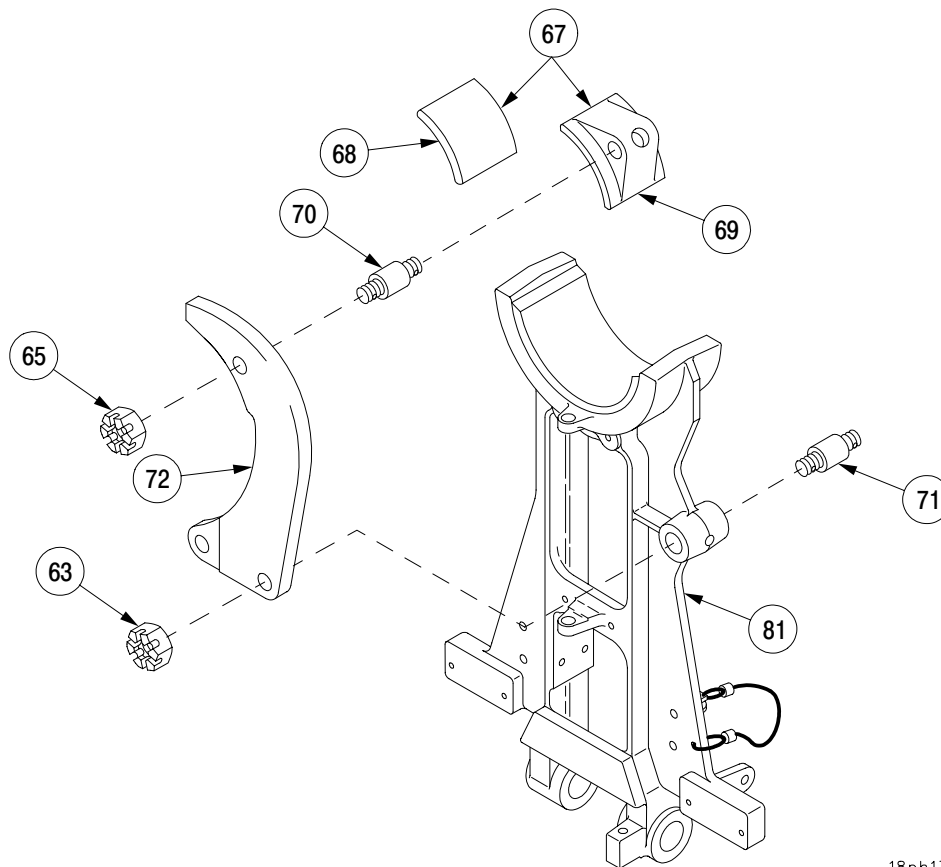
---

**16-9 GUN TUBE TRAVEL LOCK – CONTINUED**

---

**c. Assembly – Continued**

- 6 Install upper pin (70) into clamp (72). Install lower pin (71) into frame (81).
- 7 Clean mating surfaces of lining (68) and pad (69) with wire brush.
- 8 Apply adhesive to mating surfaces of lining (68) and pad (69) with acid brush. Place lining (68) onto pad (69). Allow 15 minutes drying time.
- 9 Install two castellated nuts (65 and 63), but do not tighten. Install pad assembly (67).



18ph133m

---

**Section I. BODY, CAB, HOOD, AND HULL ASSEMBLIES – CONTINUED**

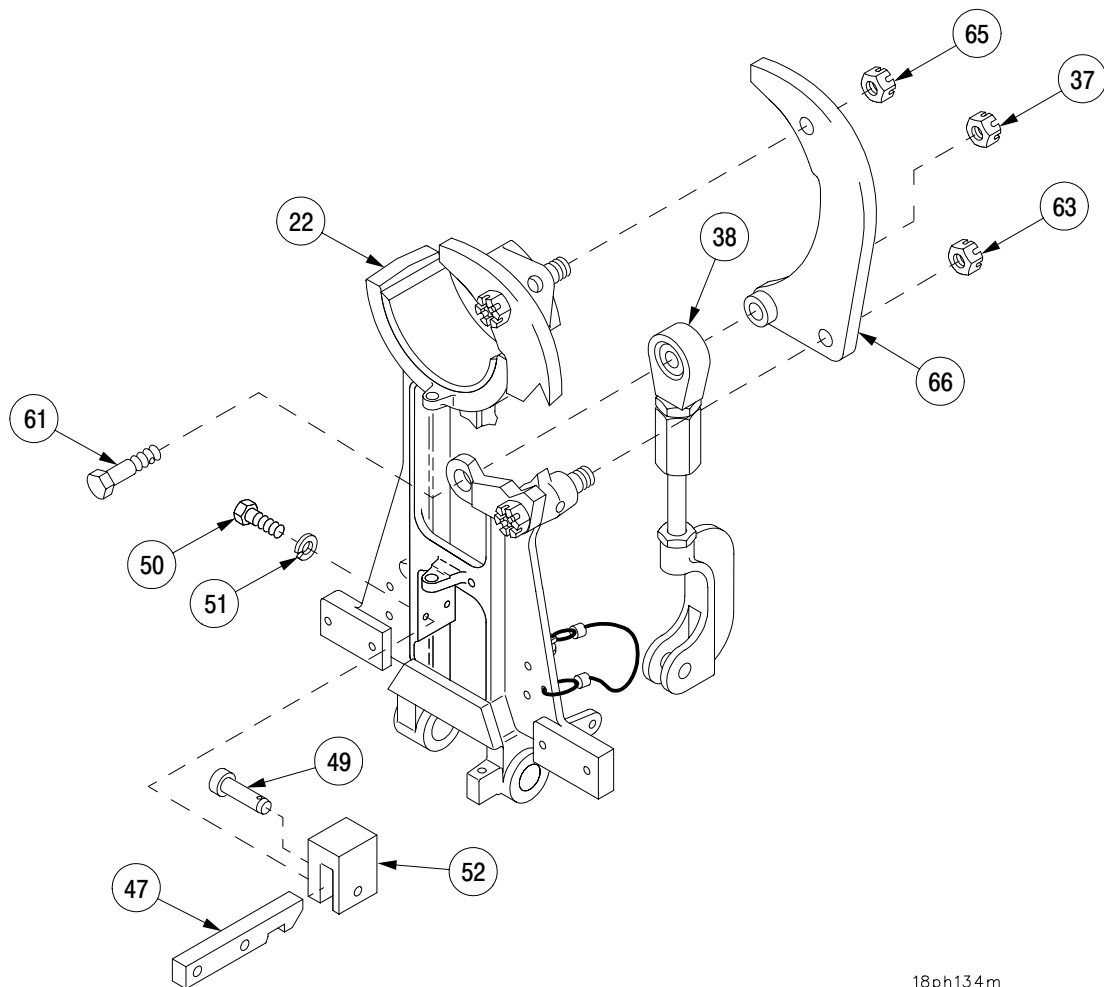
---

**16-9 GUN TUBE TRAVEL LOCK – CONTINUED**

---

**c. Assembly – Continued**

- 10 Turn frame assembly (22) over. Install upper rod assembly (38). Install clamp (66).
- 11 Install screw (61) through upper rod assembly (38). Install castellated nut (37), but do not tighten.
- 12 Install two castellated nuts (65 and 63), but do not tighten.
- 13 Install catch (47) in slot on block (52). Install pin (49).
- 14 Install four screws (50), four new lockwashers (51), and block (52) with catch (47).



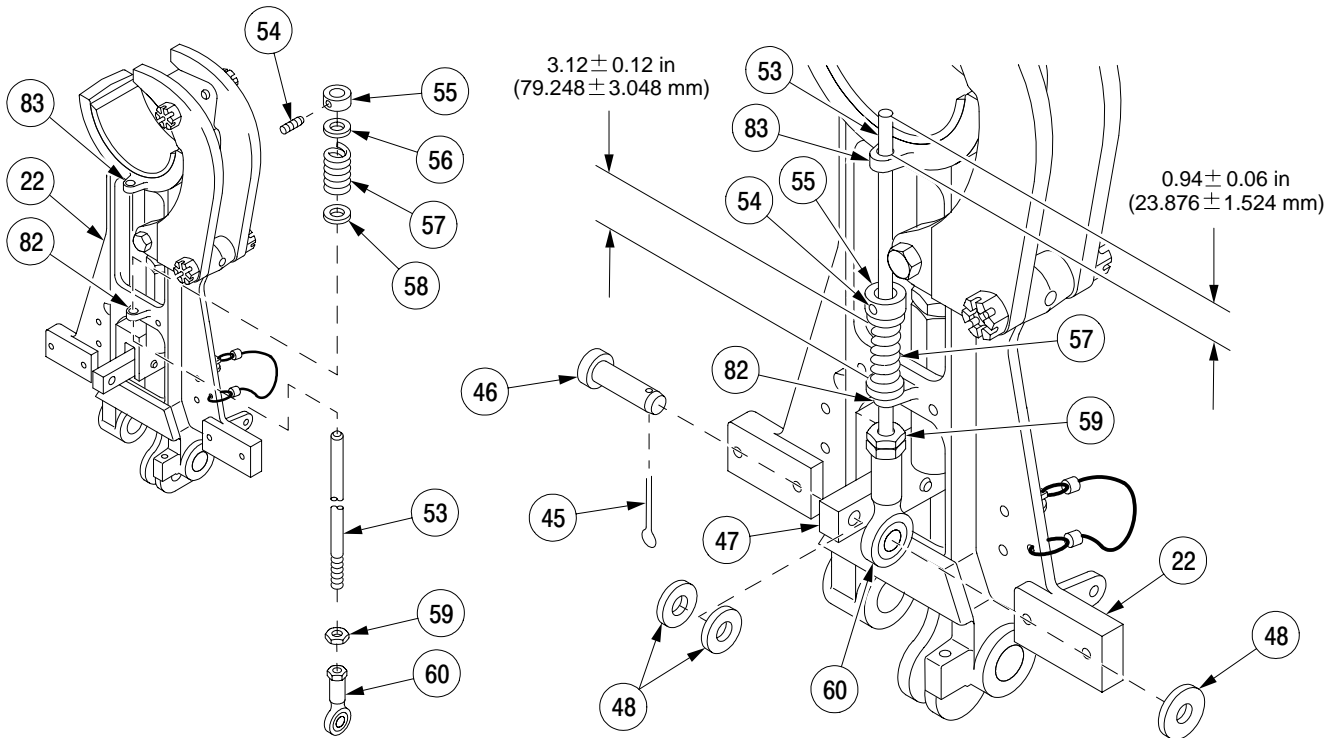
18ph134m

**Section I. BODY, CAB, HOOD, AND HULL ASSEMBLIES – CONTINUED**

**16-9 GUN TUBE TRAVEL LOCK – CONTINUED**

**c. Assembly – Continued**

- 15 Install nut (59) and rod end (60) on push rod (53). Insert push rod (53) through lower welded tab (82) on frame assembly (22). Install flat washer (58), spring (57), flat washer (56), and collar (55) with setscrew (54) on push rod (53).
- 16 Insert push rod through upper welded tab (83) on frame assembly (22). Install pin (46) through catch (47). Install two flat washers (48). Install pin (46) through rod end (60), and install flat washer (48) and new cotter pin (45).
- 17 Hold catch (47) in up position and adjust push rod (53) until end of push rod (53) extends  $0.94 \pm 0.6$  in. ( $23.876 \pm 1.524$ mm) beyond welded tab (83). Secure nut (59) to rod end (60).
- 18 Hold catch (47) in up position. Move collar (55) so that spring (57) is compressed to  $3.12 \pm 0.12$  in. ( $79.248 \pm 3.048$  mm) against welded tab (82). Secure collar (55) to push rod (53) with setscrew (54).



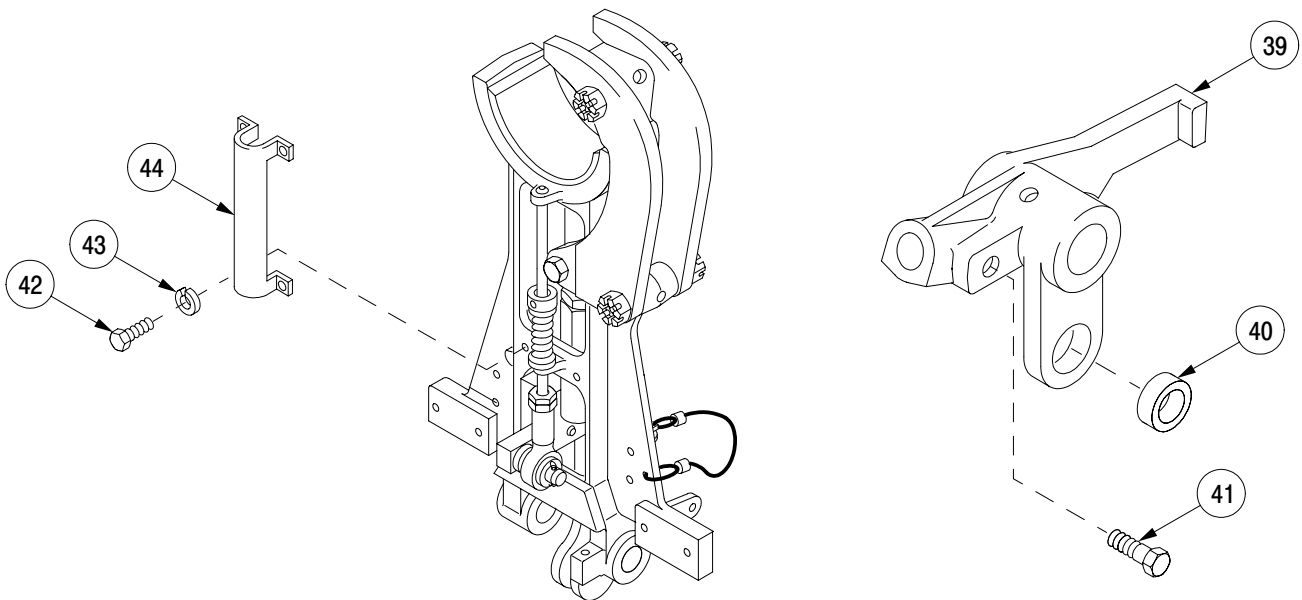
18ph135m

**Section I. BODY, CAB, HOOD, AND HULL ASSEMBLIES – CONTINUED**

**16-9 GUN TUBE TRAVEL LOCK – CONTINUED**

**c. Assembly – Continued**

- 19 Install cover (44), four new lockwashers (43), and four screws (42).
- 20 Install screw (41) into lever assembly (39).
- 21 Press bearing (40) into lever assembly (39).



18ph136m



**Section I. BODY, CAB, HOOD, AND HULL ASSEMBLIES – CONTINUED**

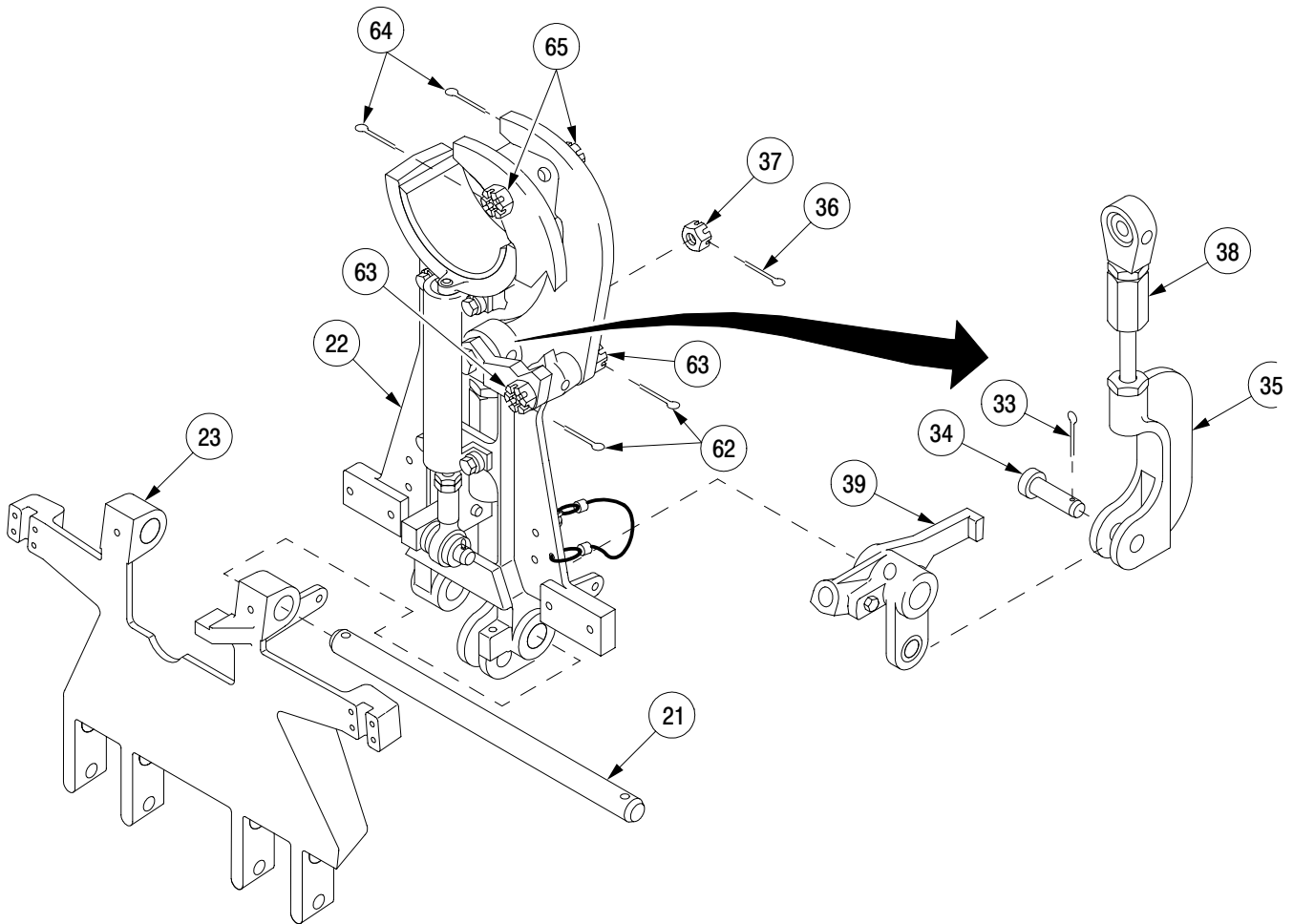
**16-9 GUN TUBE TRAVEL LOCK – CONTINUED**

**c. Assembly – Continued**

**WARNING**

Travel lock support and frame assembly are heavy.  
Use two men to install pin.

- 22 Position travel lock support (23), lever assembly (39), and frame assembly (22) so that support pin (21) may be inserted. Raise arm (35) so that pin (21) may be installed. Use rubber mallet if pin is difficult to install.
- 23 Install arm (35) onto lever assembly (39). Install pin (34) and secure with new cotter pin (33).
- 24 Torque castellated nut (37) on upper rod assembly (38) to 100–150 lb–ft (136–203 N·m). Install new cotter pin (36).
- 25 Torque castellated nuts (65 and 63) to 100–150 lb–ft (136–203 N·m). Secure with four new cotter pins (64 and 62).



18ph137m

---

**Section I. BODY, CAB, HOOD, AND HULL ASSEMBLIES – CONTINUED**

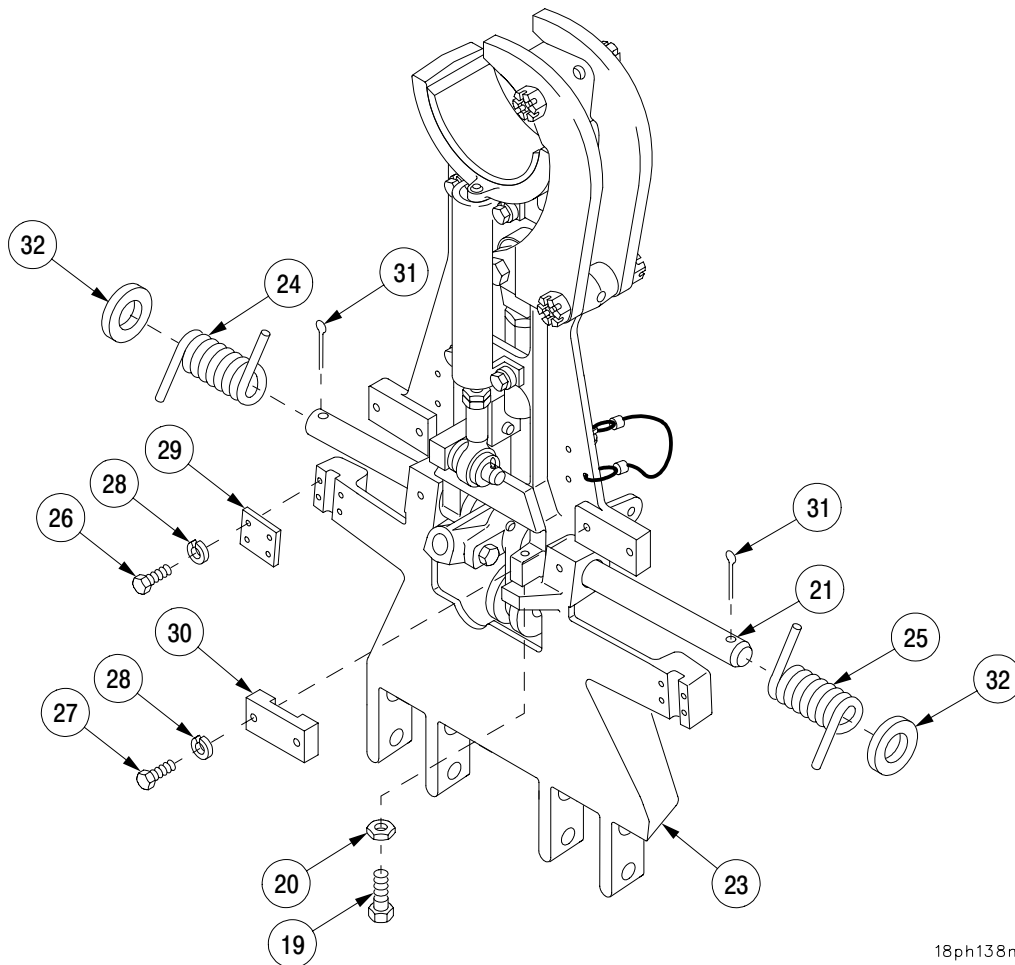

---

**16-9 GUN TUBE TRAVEL LOCK – CONTINUED**


---

**c. Assembly – Continued**

- 26 Raise travel lock support (23) and install stop screw (19) and stop nut (20). Position stop screw (19) all the way down.
- 27 Place blocks under support pin (21). Install spring (25) and spring (24). One spring may require pry bar and hammer to install. Lift bottom of spring with pry bar while striking top of spring with hammer. Bottom of spring must be in groove.
- 28 Install two washers (32) and two new cotter pins (31).
- 29 Install two plates (29), two retainers (30), twelve new lockwashers (28), eight screws (26), and four screws (27).
- 30 Remove blocks.



18ph138m

---

**Section I. BODY, CAB, HOOD, AND HULL ASSEMBLIES – CONTINUED**

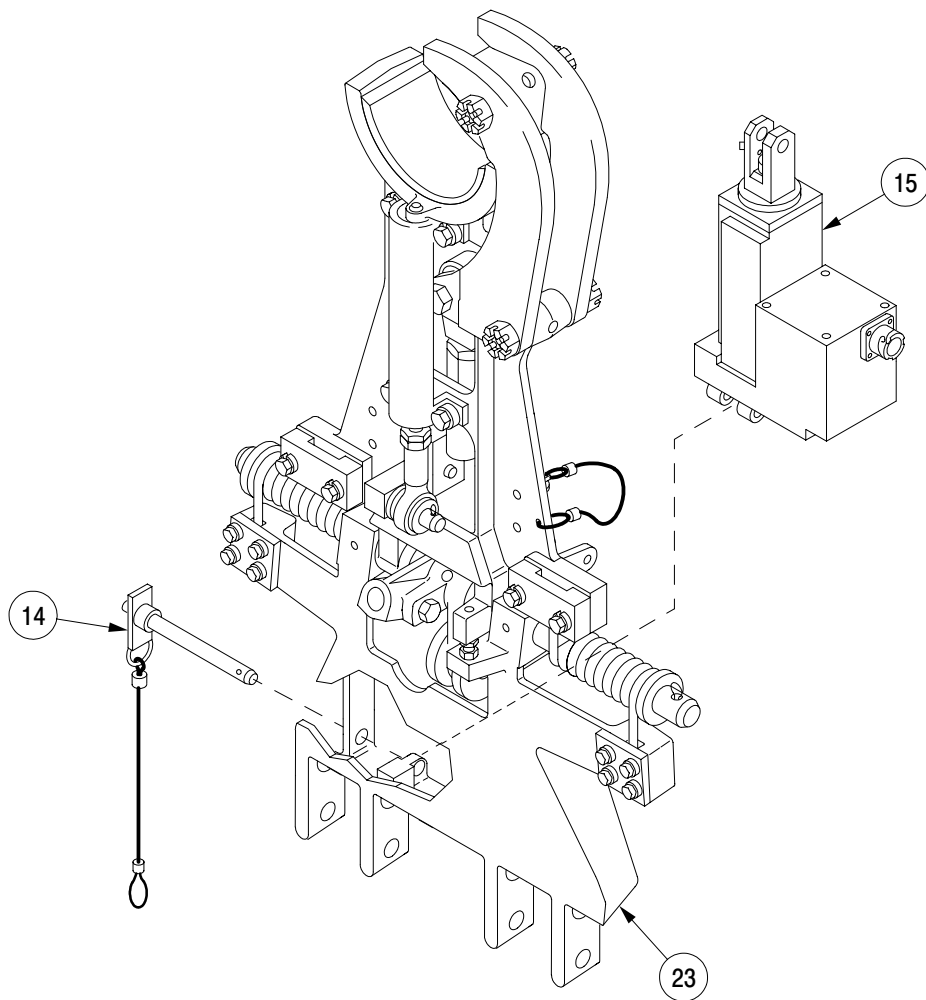
---

**16-9 GUN TUBE TRAVEL LOCK – CONTINUED**

---

**c. Assembly – Continued**

- 31 Install actuator (15) by installing quick-release pin (14) through bottom of cylinder and tab on travel lock support (23).



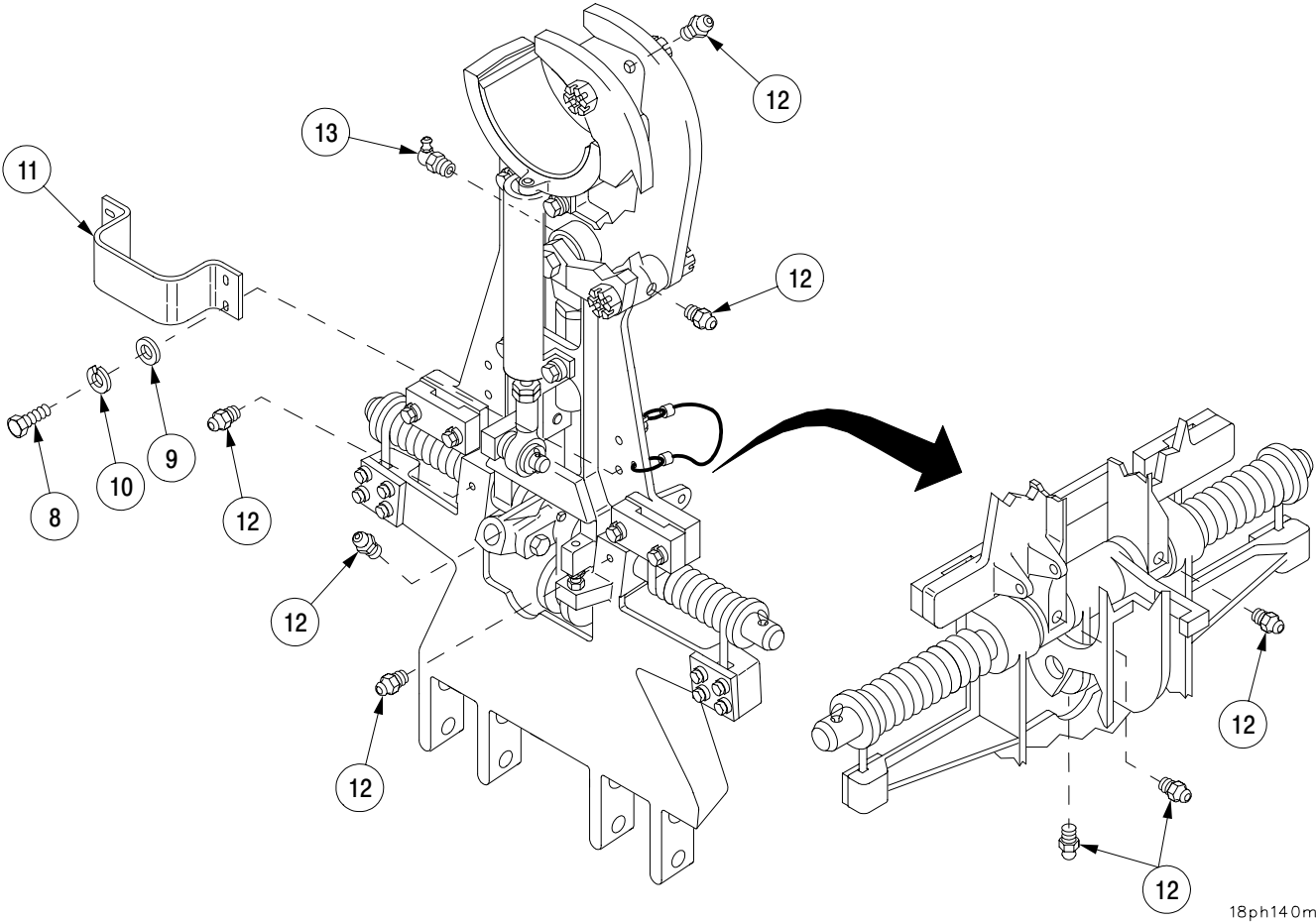
18ph139m

**Section I. BODY, CAB, HOOD, AND HULL ASSEMBLIES – CONTINUED**

**16-9 GUN TUBE TRAVEL LOCK – CONTINUED**

**c. Assembly – Continued**

- 32 Install eight lubrication fittings (12) and lubrication fitting (13).
- 33 Install four screws (8), four new lockwashers (10), four flat washers (9), and guard (11).



18ph140m

**Section I. BODY, CAB, HOOD, AND HULL ASSEMBLIES – CONTINUED**

---

**16-9 GUN TUBE TRAVEL LOCK – CONTINUED**

---

**d. Installation.**

**WARNING**

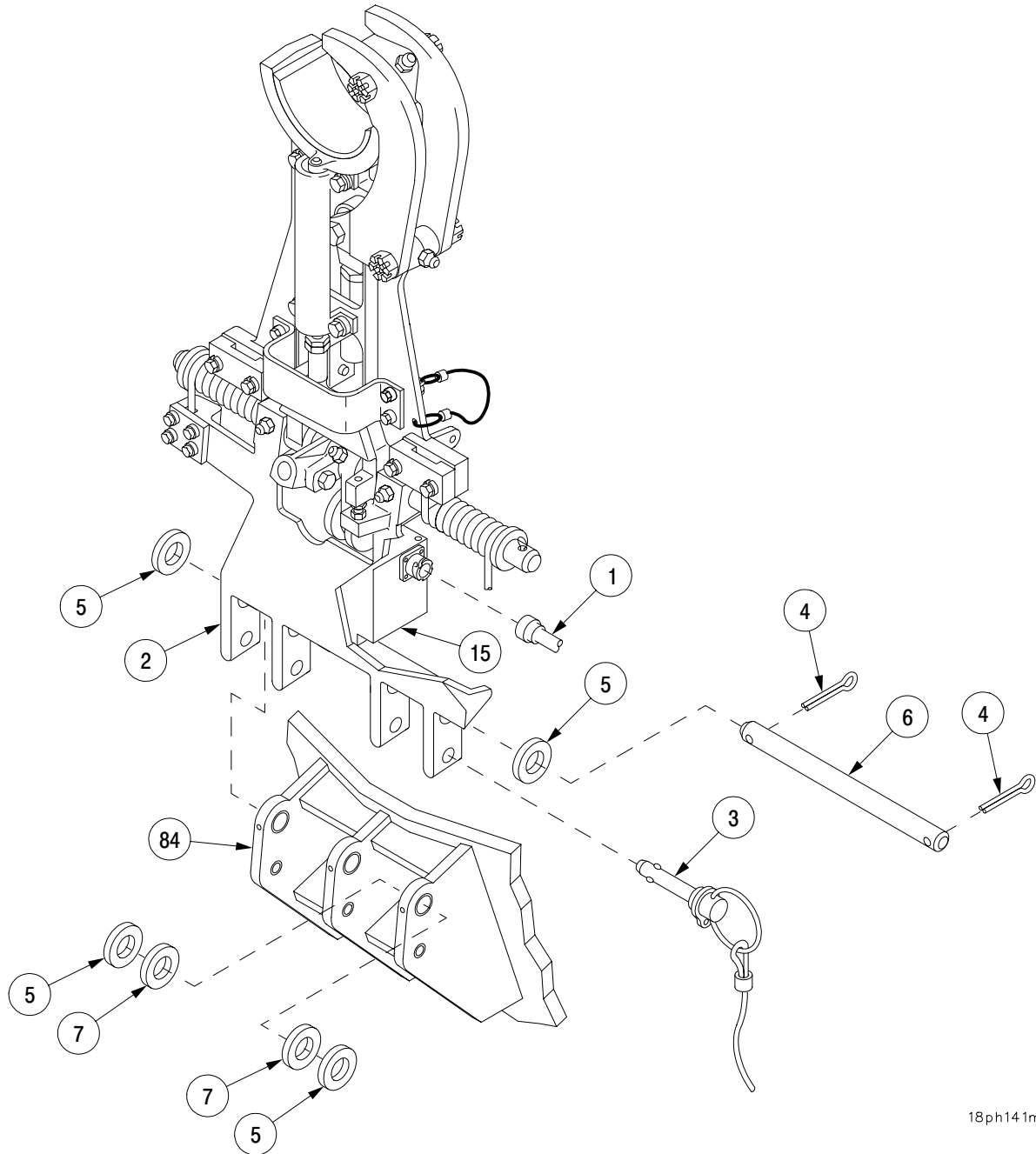
Travel lock assembly weighs about 400 lbs. Use extreme care while handling to avoid injury to personnel or damage to equipment.

- 1 Secure travel lock assembly (2) vertically in sling on lifting device.
- 2 Position travel lock assembly (2) on mounting bracket (84) and secure with mounting bracket pin (6). Temporarily secure pin (6) with end washer (5) and new cotter pin (4) on one end of pin (6).
- 3 Slide pin (6) left to third bracket. Install a sufficient number of flat washers (7) between first and second bracket, and between second and third bracket to prevent side-to-side movement of travel lock assembly (2), and ensure that alignment marks on hull and travel lock assembly are aligned.
- 4 Slide pin (6) back to correct position. Install end washer (5) and new cotter pin (4) on right side.
- 5 Install two quick-release pins (3).
- 6 Connect wiring harness W126 connector P2 (1) to actuator (15) (para 8-84).
- 7 Align mark on cab and hull. Stow gun tube and lock cab (TM 9-2350-314-10).
- 8 Lubricate travel lock in accordance with TM 9-2350-314-10.

**Section I. BODY, CAB, HOOD, AND HULL ASSEMBLIES – CONTINUED**

**16-9 GUN TUBE TRAVEL LOCK – CONTINUED**

**d. Installation – Continued**



18ph141m

**NOTE**

**FOLLOW-ON MAINTENANCE:**  
 Install gun tube travel lock bumper stop  
 (para 16-13)

**Section I. BODY, CAB, HOOD, AND HULL ASSEMBLIES – CONTINUED**

**16-9 GUN TUBE TRAVEL LOCK – CONTINUED**

**e. Adjustment.**

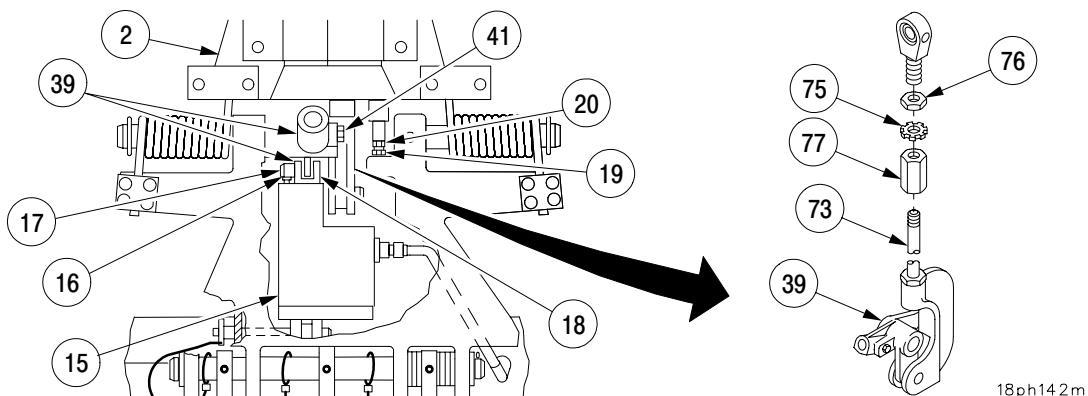
**WARNING**

Use care when manually unlocking gun tube travel lock. If jaw is not fully unclamped, crowbar will snap back. Failure to comply could result in injury to personnel.

**NOTE**

This procedure covers only vertical adjustment. Horizontal adjustment is covered under Installation.

- 1 Adjust stop screw (19) until travel lock assembly (2) rests in upright position, perpendicular to tube. There should be no gaps between pad and tube. Tighten nut (20).
- 2 Coupling (77) on rod (73) is for tension adjustment. Place crowfoot socket wrench on bolt (41) of lever (39) and unlock travel lock assembly (2) while observing torque registered on torque wrench. Torque should be 200–300 lb–ft (271–407 N-m). If tension is more or less than required torque, adjust coupling (77) in half–face (30 degrees) increments until proper tension is achieved.
- 3 Hand tighten nut (76). Bend tab on washer (75) to secure nut (76).
- 4 Extend actuator (15) as far as it will go (TM 9-2350-314-10). Unlock travel lock (2). Actuator clevis (18) must line up with mounting hole in lever assembly (39). Install upper clevis quick–release pin (17). Secure quick–release pin (17) with retaining clip (16).



**Section I. BODY, CAB, HOOD, AND HULL ASSEMBLIES – CONTINUED**

**16-10 GUN TUBE TRAVEL LOCK ACTUATOR AND PIN ASSEMBLY.**

This task covers:      a. Removal                                      b. Installation

**INITIAL SETUP**

Tools

General mechanic's tool kit  
(SC 5180-90-N26)

Equipment Conditions

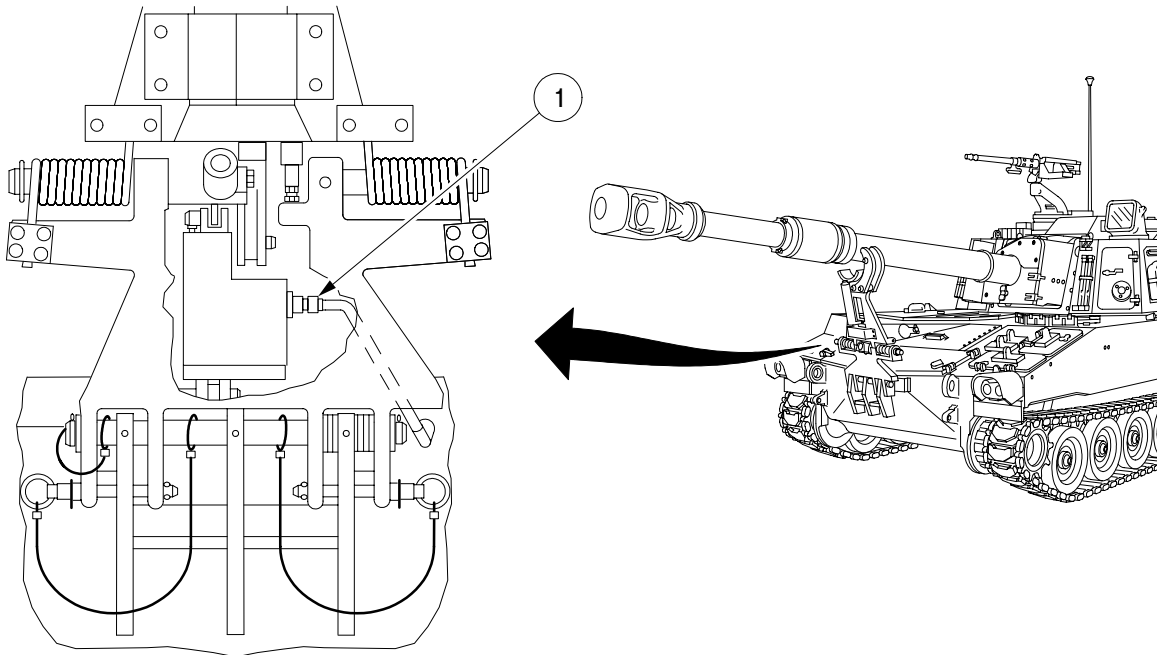
Gun tube clear of travel lock  
(TM 9-2350-314-10)  
Gun tube travel lock in maintenance  
position (TM 9-2350-314-10)

References

TM 9-2350-314-10

**a. Removal.**

- 1 Disconnect wiring harness W126 connector P2 (1) (para 8-84).



18ph143m



**Section I. BODY, CAB, HOOD, AND HULL ASSEMBLIES – CONTINUED**

---

**16-10 GUN TUBE TRAVEL LOCK ACTUATOR AND PIN ASSEMBLY – CONTINUED**

---

**a. Removal – Continued**

**WARNING**

When quick-release pins are removed from actuator, travel lock must be in maintenance position or serious personal injury may occur.

- 2 Remove quick-release pin (2) securing bottom of actuator (3) to travel lock (4).

**CAUTION**

Support actuator during next step to prevent damage.

- 3 Remove retaining clip (5) and pin (6) from clevis (7) at top of actuator (3). Remove actuator (3) with clevis (7).
- 4 Remove clevis (7) from actuator (3).

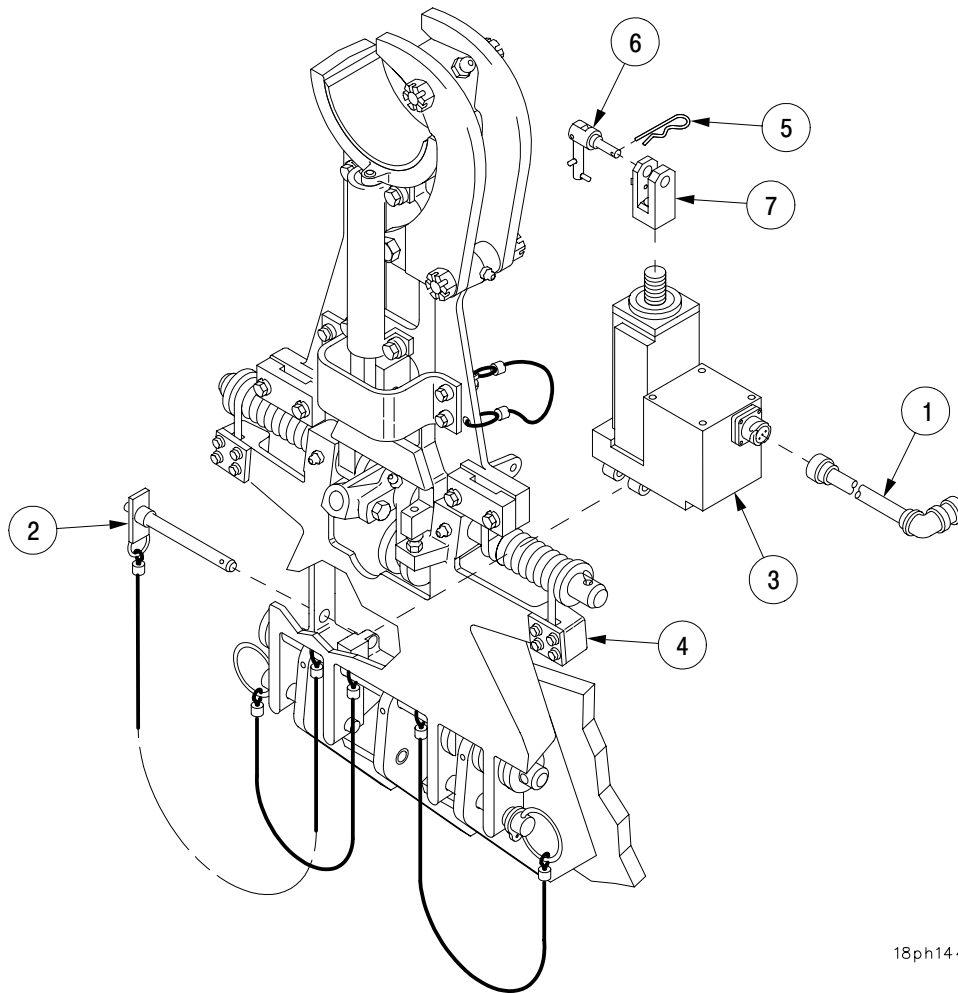
**b. Installation.**

- 1 Install clevis (7) on actuator (3).
- 2 Position actuator (3) on travel lock (4). Secure bottom of actuator (3) with quick-release pin (2).
- 3 Align clevis (7) with mounting hole and secure with pin (6) and retaining clip (5).
- 4 Connect wiring harness W126 connector P2 (1) to actuator (3) (para 8-84).

**Section I. BODY, CAB, HOOD, AND HULL ASSEMBLIES – CONTINUED**

**16-10 GUN TUBE TRAVEL LOCK ACTUATOR AND PIN ASSEMBLY – CONTINUED**

**b. Installation – Continued**



18ph144m

**NOTE**

**FOLLOW-ON MAINTENANCE:**

- Adjust travel lock actuator (para 16-12)
- Position gun tube travel lock in travel position  
(TM 9-2350-314-10)
- Secure gun tube in travel lock  
(TM 9-2350-314-10)

## Section I. BODY, CAB, HOOD, AND HULL ASSEMBLIES – CONTINUED

---

### 16-11 GUN TUBE TRAVEL LOCK PIN ASSEMBLY.

---

This task covers:      a. Disassembly                      b. Assembly

---

#### **INITIAL SETUP**

##### Tools

General mechanic's tool kit  
(SC 5180-90-N26)

##### Equipment Conditions

Remove gun tube travel lock pin  
assembly (para 16-10)

##### Materials/Parts

Lockwasher (item 123, Appx E)  
Spring pin (item 302, Appx E)

---

#### **a. Disassembly.**

- 1 Remove retaining clip (1) from pin (2).
- 2 Remove pin (2) and handle (3) from clevis (4).
- 3 Remove spring pin (5) and separate handle (3) from pin (2). Discard spring pin.
- 4 Remove two pins (6 and 7) from handle (3).
- 5 Remove screw (8), lockwasher (9), and spring clip (10) from clevis (4). Discard lockwasher.

#### **b. Assembly.**

- 1 Install spring clip (10) on clevis (4) using new lockwasher (9) and screw (8).
- 2 Install two pins (6 and 7) in handle (3).
- 3 Install new spring pin (5) in handle (3) and pin (2).
- 4 Install pin (2) in clevis (4).
- 5 Install retaining clip (1) on pin (2).

---

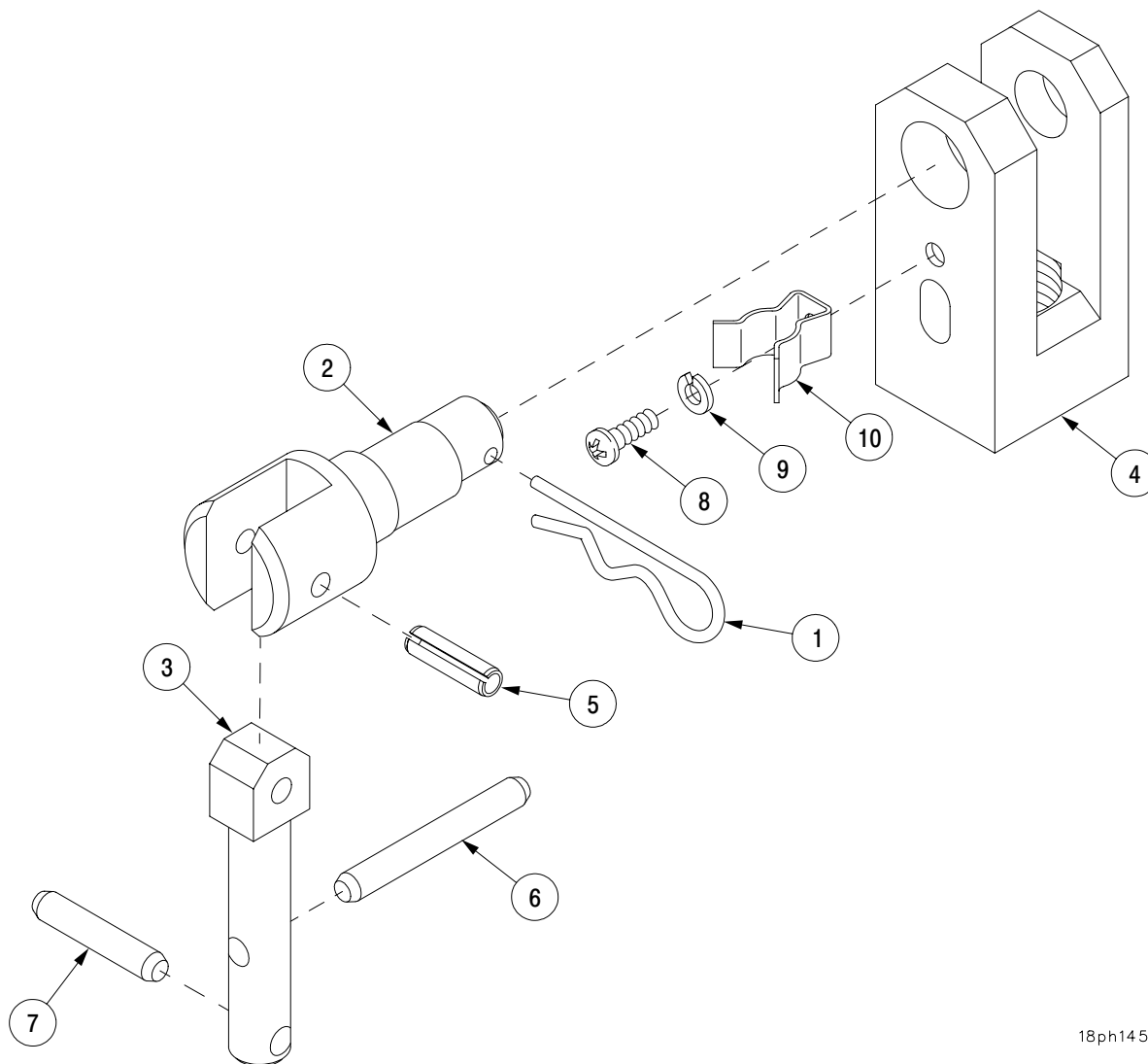
**Section I. BODY, CAB, HOOD, AND HULL ASSEMBLIES – CONTINUED**

---

**16-11 GUN TUBE TRAVEL LOCK PIN ASSEMBLY – CONTINUED**

---

**b. Assembly – Continued**



18ph145m

**NOTE**

**FOLLOW-ON MAINTENANCE:**  
Install tube travel lock pin assembly (para 16-10)

## Section I. BODY, CAB, HOOD, AND HULL ASSEMBLIES – CONTINUED

---

### 16-12 GUN TUBE TRAVEL LOCK ACTUATOR ADJUSTMENT.

---

This task covers: Adjustment

---

#### **INITIAL SETUP**

##### Tools

General mechanic's tool kit  
(SC 5180-90-N26)

##### Materials/Parts

Preformed packing (item 225, Appx E)

##### Equipment Conditions

Gun tube clear of travel lock  
(TM 9-2350-314-10)  
Vehicle MASTER switch OFF  
(TM 9-2350-314-10)

##### Personnel Required

Two

##### References

TM 9-2350-314-10

---

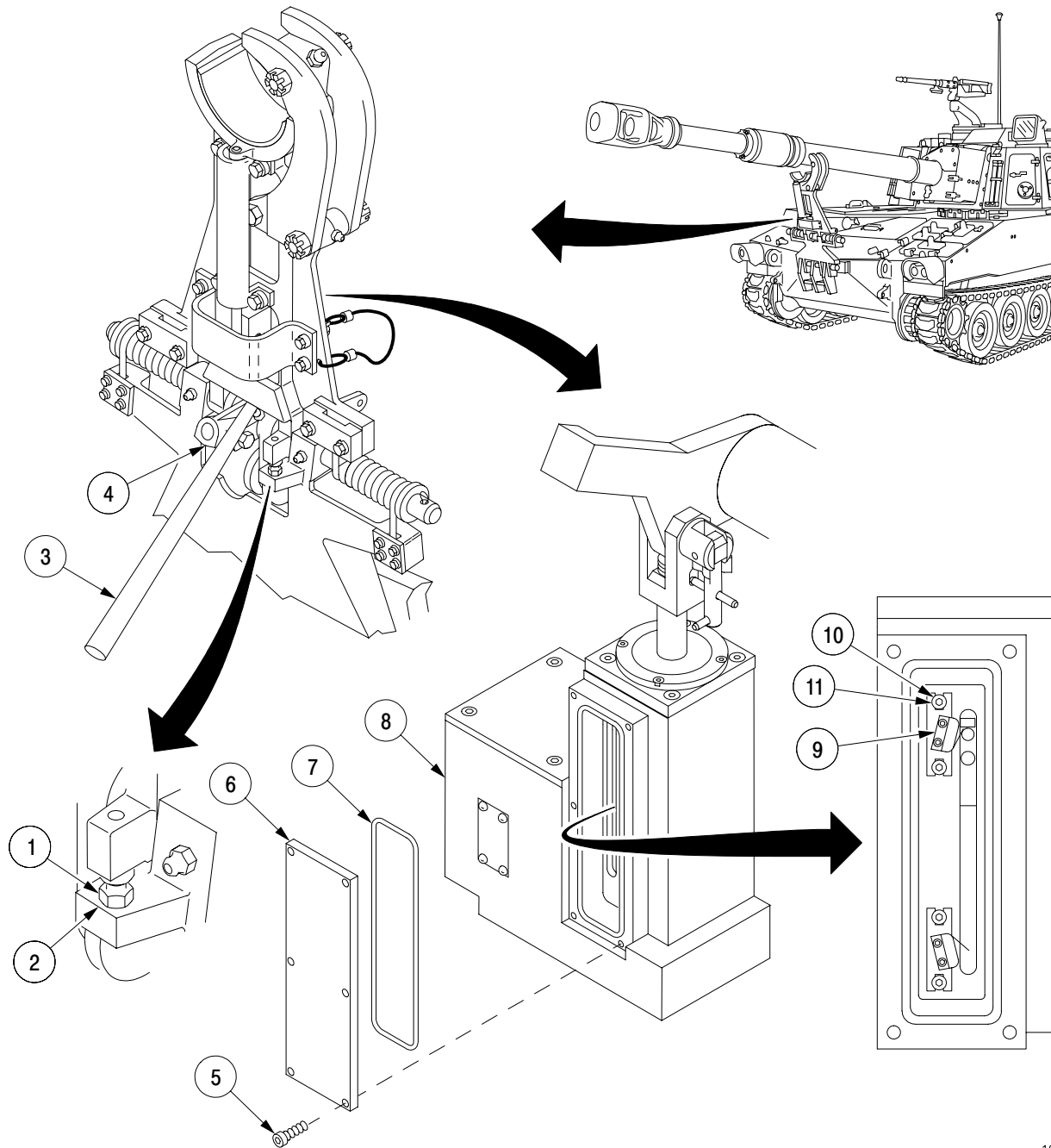
#### **Adjustment.**

- 1 Turn vehicle MASTER switch ON (TM 9-2350-314-10).
- 2 Release gun tube from travel lock (TM 9-2350-314-10).
- 3 Check if stop screw (1) is hitting stop (2). If a gap is present, insert crowbar (3) as shown (pivoting on lever (4) to pry the top frame portion of the travel lock assembly forward just until the stop screw (1) hits stop (2). With upper travel lock frame held in this position, lower gun tube into travel lock cradle (TM 9-2350-314-10). Remove crowbar (3).
- 4 Check for gaps between gun tube and cradle. If gaps are present between the gun tube and cradle pad, perform both horizontal and vertical adjustments (para 16-9) and repeat steps 1 through 3.
- 5 Place travel lock in maintenance position (TM 9-2350-314-10).
- 6 Remove six screws (5), access cover (6), and preformed packing (7) from actuator (8). Discard preformed packing. Return travel lock to travel position (TM 9-2350-314-10).
- 7 Extend actuator (8) upward to approximately mid-travel (TM 9-2350-314-10) and adjust upper microswitch (9) by loosening two screws (10) with two flat washer (11) and sliding microswitch (9) up to highest position. Tighten screws (10).

Section I. BODY, CAB, HOOD, AND HULL ASSEMBLIES – CONTINUED

16-12 GUN TUBE TRAVEL LOCK ACTUATOR ADJUSTMENT – CONTINUED

Adjustment – Continued



18ph146m

---

**Section I. BODY, CAB, HOOD, AND HULL ASSEMBLIES – CONTINUED**

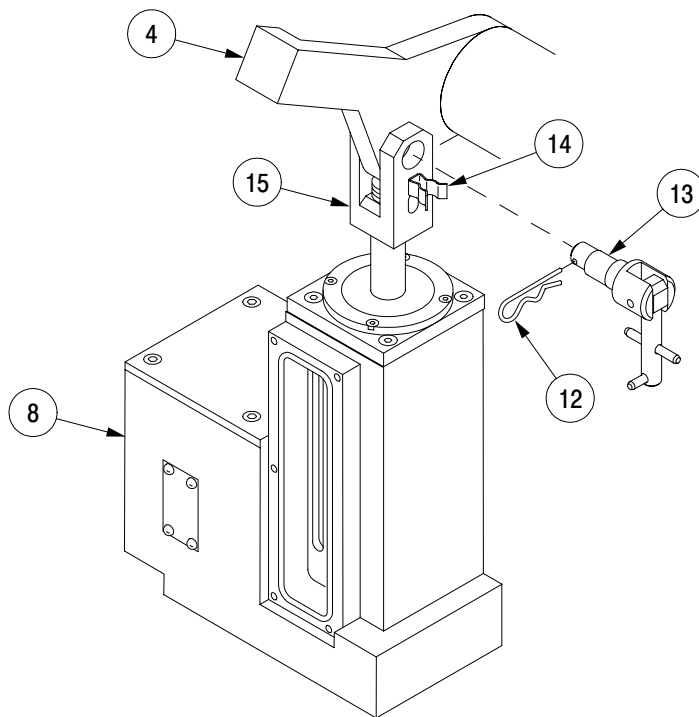
---

**16-12 GUN TUBE TRAVEL LOCK ACTUATOR ADJUSTMENT – CONTINUED**

---

**Adjustment – Continued**

- 8 While holding actuator (8) in position, remove retainer clip (12) from pin (13), remove pin (13) from spring clip (14), actuator clevis (15), and lever assembly (4).
- 9 Swing actuator (8) clear of lever (4) and thread clevis (15) on shaft of actuator (8) until clevis (15) sits on shoulder of actuator shaft.
- 10 Unthread clevis (15) on actuator shaft no more than one turn to allow realignment of clevis (15) with lever (4). Swing actuator (8) forward and align hole in clevis (15) with new hole in lever (4) by activating actuator (8) slightly or manually rotating lever (4). Install pin (13) through aligned holes and lock in spring clip (14) as shown.



18ph14 7m

---

**Section I. BODY, CAB, HOOD, AND HULL ASSEMBLIES – CONTINUED**


---

**16-12 GUN TUBE TRAVEL LOCK ACTUATOR ADJUSTMENT – CONTINUED**

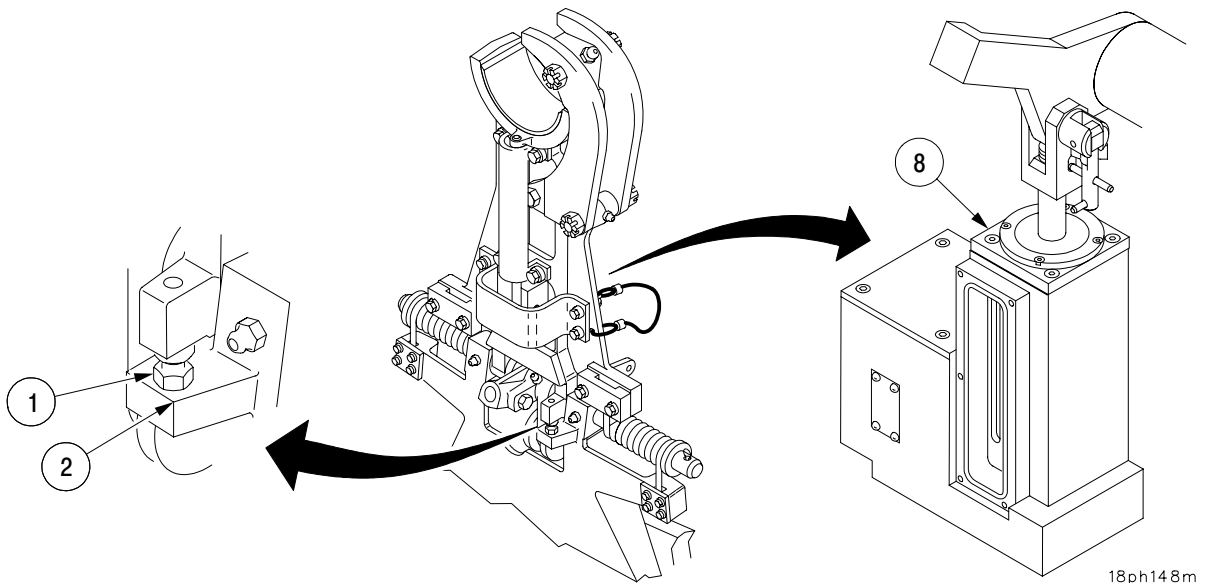

---

**Adjustment – Continued**

- 11 Activate actuator (8) up to maximum position.
- 12 Raise gun tube clear of travel lock cradle (TM 9-2350-314-10).
- 13 Activate actuator (8) first down to approximately mid-travel, then back up to maximum position. Check if the stop screw (1) is positively hitting the stop (2) and if the light in the travel lock control box lights at the end of actuator travel (TM 9-2350-314-10). If these conditions are met, go to step 19.

**NOTE**

- If the stop screw does not positively hit the stop at the end of actuator travel and travel lock control box light is on, the actuator clevis must be unthreaded. Go to step (14).
- If the stop screw does hit the stop at the end of actuator travel and the actuator does not stop and the travel lock control box light does not light, then the safety clutch in the actuator is slipping, and the upper microswitch needs to be adjusted down. If this condition is observed, avoid prolonged operation of the actuator; go to step 17.





---

**Section I. BODY, CAB, HOOD, AND HULL ASSEMBLIES – CONTINUED**

---

**16-12 GUN TUBE TRAVEL LOCK ACTUATOR ADJUSTMENT – CONTINUED**

---

**Adjustment – Continued**

- 14 Lower gun tube into cradle. Activate actuator (8) down to approximately mid-travel. While holding actuator (8) in position, remove pin (13) from actuator clevis (15) and lever assembly (4), and swing actuator (8) clear of lever (4).



Do not unthread clevis more than a total of four complete revolutions

- 15 Unthread clevis (15) one complete revolution. Realign clevis (15) and lever assembly (4), and install pin (13) through aligned holes and lock in spring clip (14).
- 16 Activate actuator (8) up to maximum position. Raise the gun tube clear of cradle. Reactivate actuator (8) down to approximately mid-travel, then back up to maximum position. Check if the stop screw (1) is positively hitting the stop (2) and if the light in the travel lock control box lights at the end of actuator travel. If these conditions are met, got to step 19.

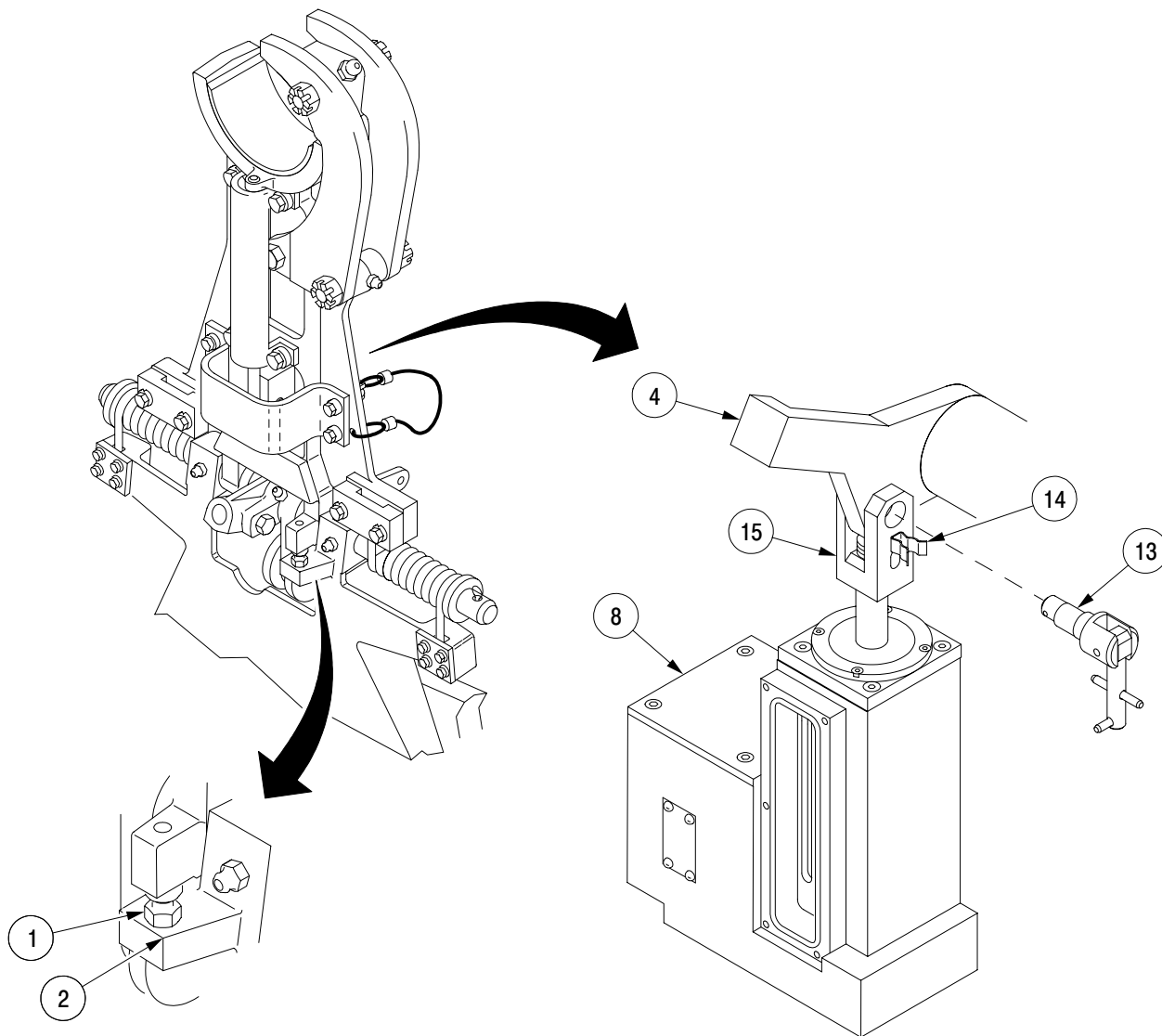
**NOTE**

- If the clevis has been unthreaded less than four revolutions, and the stop screw does not positively hit stop at the end of actuator travel and the travel lock control box light is on, the clevis must be unthreaded one more turn; repeat steps 14 through 16.
- If the clevis has been unthreaded four revolutions, and the stop screw does not positively hit stop at the end of actuator travel and the travel lock control box light is on, go to step 19.
- If the stop screw positively hits stop at the end of actuator travel, and the actuator does not stop and the travel lock control box light is off, then the safety clutch in the actuator is slipping and the upper microswitch needs to be adjusted down. If this condition is observed, avoid prolonged operation of the actuator; go to step 17.

**Section I. BODY, CAB, HOOD, AND HULL ASSEMBLIES – CONTINUED**

**16-12 GUN TUBE TRAVEL LOCK ACTUATOR ADJUSTMENT – CONTINUED**

Adjustment – Continued



18ph149m

**Section I. BODY, CAB, HOOD, AND HULL ASSEMBLIES – CONTINUED**

---

**16-12 GUN TUBE TRAVEL LOCK ACTUATOR ADJUSTMENT – CONTINUED**

---

**Adjustment – Continued**

- 17 To adjust upper microswitch (9) down, activate actuator (8) down approximately 1/8 of travel. Move upper microswitch (9) by loosening two screws (10) with flat washers (11) and sliding switch down fully to lowest position. Tighten screws (10). Activate actuator (8) down to approximately mid-travel, and then back up to maximum. Check if stop screw (1) is hitting stop (2), and if travel lock control box light is on. If these conditions are met, go to step 19.

**NOTE**

If the stop screw does not hit stop, and the light on the travel lock control box is on, the upper microswitch must be adjusted up.

- 18 If the upper microswitch (9) requires adjustment up, activate actuator (8) down approximately 1/8 of travel. Loosen the two screws (10) with flat washers (11) and adjust the microswitch (9) up slightly. Tighten screws (10). Activate actuator (8) down to approximately mid-travel, then back up to maximum position. Check if the stop screw (1) is hitting stop screw (2) and if the travel lock control box light is on. Repeat this procedure until the stop screw (1) hits the stop (2) and the light on the travel lock control box lights when the actuator is up to maximum.

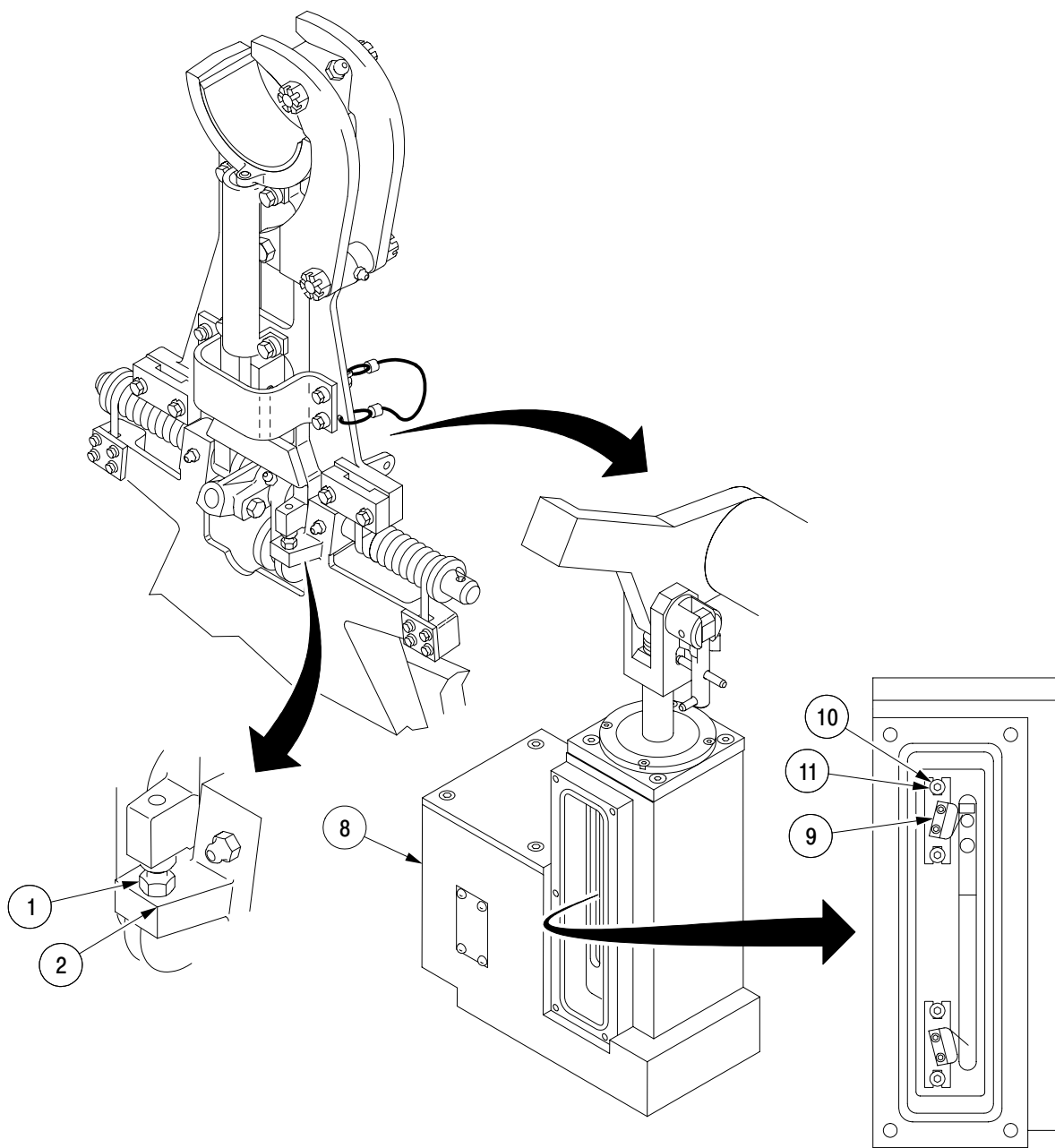
**NOTE**

The light on the travel lock control box must light at end of actuator travel when the control switch is activated. If the light on the travel lock control box does not light and the actuator does not stop at the end of actuator travel with the control switch activated, then the microswitch has been adjusted too far and the safety clutch in the actuator is slipping. If this condition is observed, repeat steps 17 and 18.

**Section I. BODY, CAB, HOOD, AND HULL ASSEMBLIES – CONTINUED**

**16-12 GUN TUBE TRAVEL LOCK ACTUATOR ADJUSTMENT – CONTINUED**

Adjustment – Continued



18ph150m

## Section I. BODY, CAB, HOOD, AND HULL ASSEMBLIES – CONTINUED

---

### 16-12 GUN TUBE TRAVEL LOCK ACTUATOR ADJUSTMENT – CONTINUED

---

#### Adjustment – Continued

- 19 Lower gun in cradle. Activate actuator (8) down maximum. Check if the “C” shaped arm (16) is positively touching the back of lever assembly (4) and if the travel lock control box light is on. If these conditions are met, go to step 22.

#### NOTE

If the “C” shaped arm does hit the lever at the end of actuator travel and the actuator does not stop and the travel lock control box light does not light, then the safety clutch in the actuator is slipping and the lower microswitch needs to be adjusted up. If this condition is observed, avoid prolonged operation of the actuator.

- 20 Adjust lower microswitch (9) up by loosening two screws (10) with flat washers (11) and sliding microswitch (9) up to highest position. Tighten screws (10). Activate (8) down until the travel lock control box lights. Check that the inside of the “C” shaped arm (16) touches lever assembly (4).

#### NOTE

If the inside of the “C” shaped arm does not touch the lever assembly, the lower microswitch must be adjusted down.

- 21 If the lower microswitch (9) requires adjustment down, activate actuator (8) up approximately 1/4 of travel before making adjustments. Loosen the two screws (10) with flat washers (11) and adjust the microswitch (9) down. Tighten screws (10). Activate actuator (8) down to check if “C” shaped arm (16) touches lever assembly (4). Repeat this procedure until “C” shaped arm (16) touches lever assembly (4) and the light on the travel lock control box lights when the actuator is down maximum.

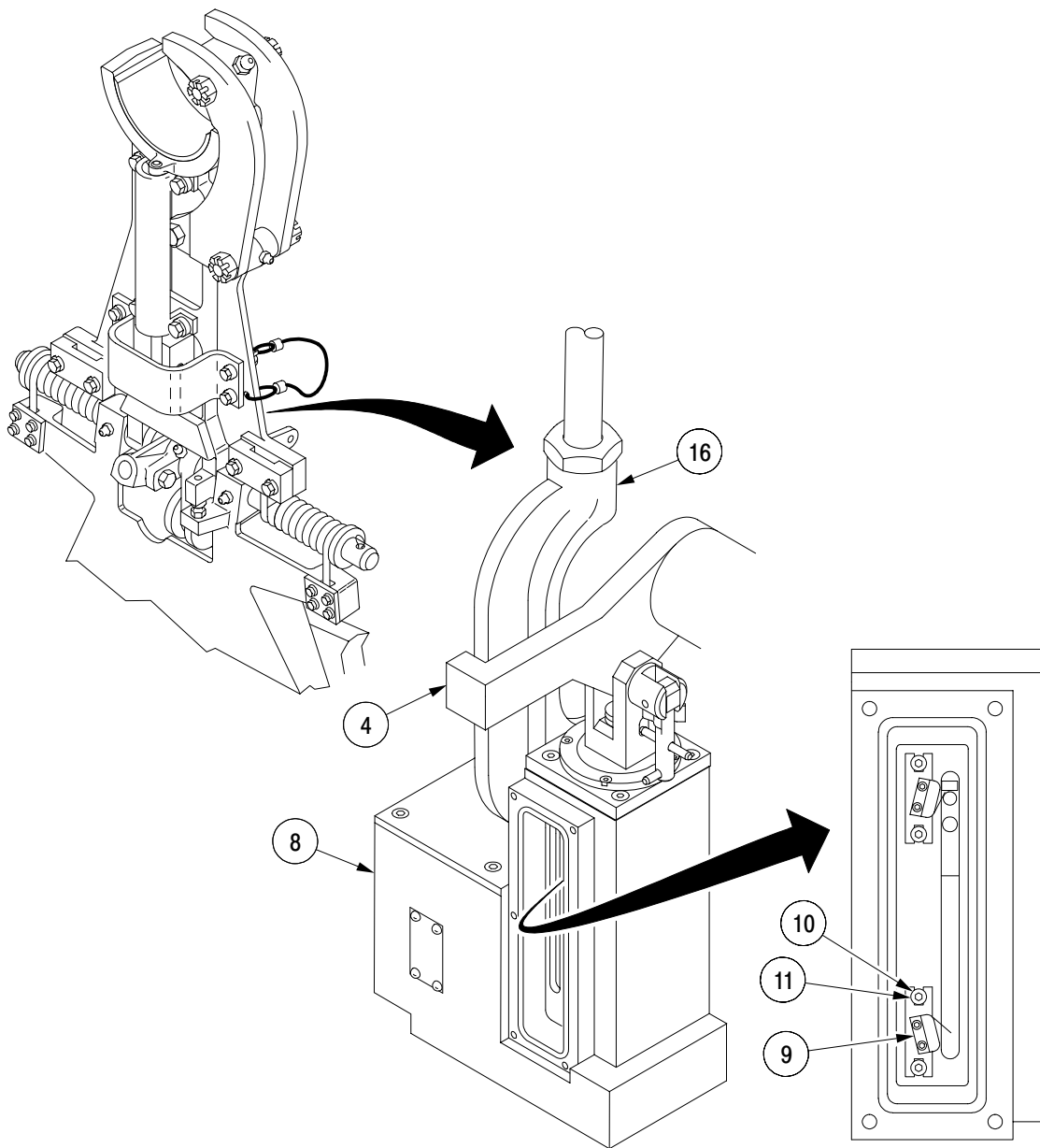
#### NOTE

The light on the travel lock control box must light at each end of travel when the travel lock control box is activated. If the light on the travel lock control box does not light and the actuator does not stop at the end of actuator travel with the travel lock control switch activated, then the microswitch has been adjusted too far and the safety clutch in the actuator is slipping. If this condition is observed, repeat steps 20 and 21.

**Section I. BODY, CAB, HOOD, AND HULL ASSEMBLIES – CONTINUED**

**16-12 GUN TUBE TRAVEL LOCK ACTUATOR ADJUSTMENT – CONTINUED**

Adjustment – Continued



18ph151m

**Section I. BODY, CAB, HOOD, AND HULL ASSEMBLIES – CONTINUED**

---

**16-12 GUN TUBE TRAVEL LOCK ACTUATOR ADJUSTMENT – CONTINUED**

---

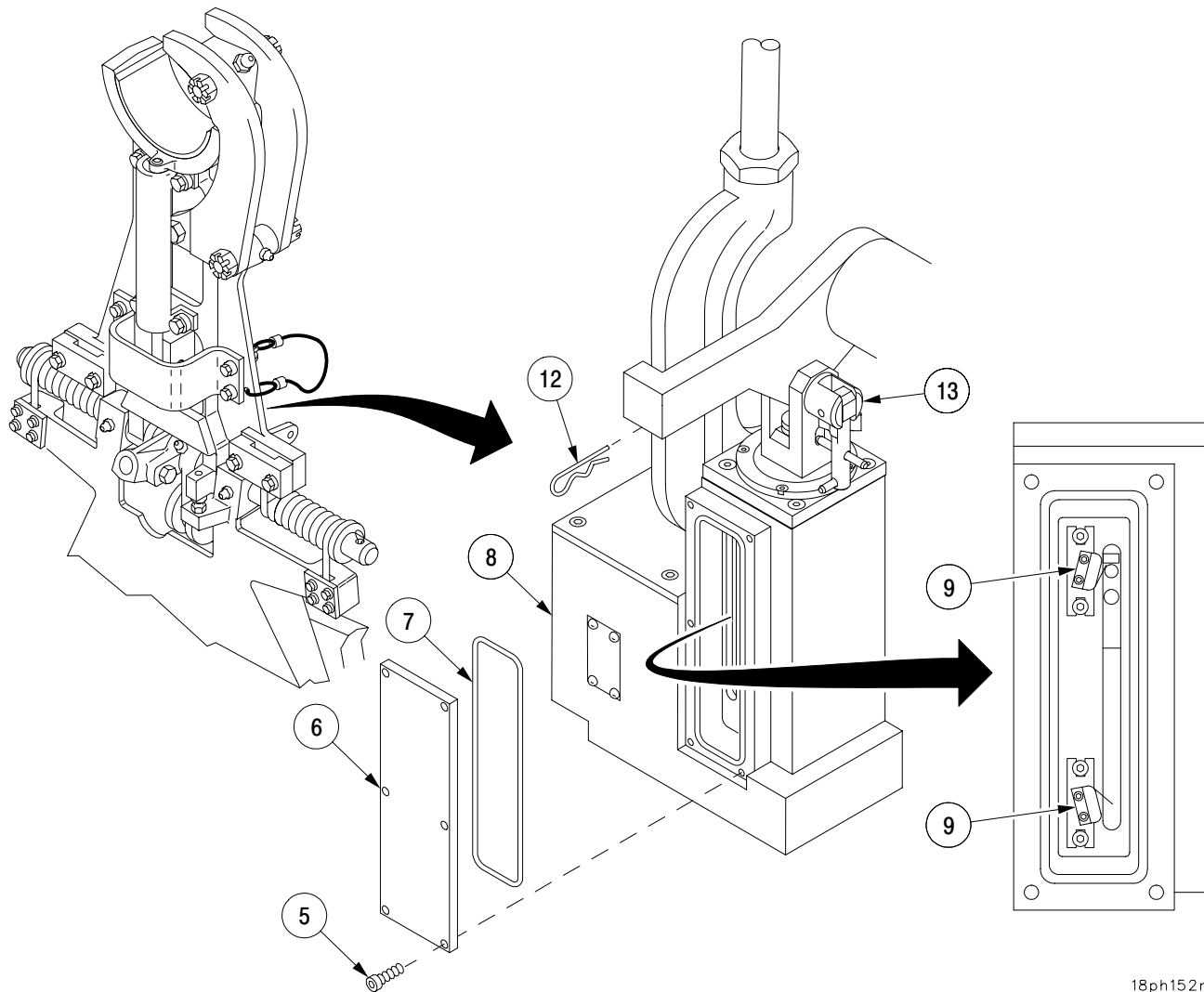
**Adjustment – Continued**

- 22 After completing microswitch (9) adjustments, cycle the travel lock two or three times (with gun tube in cradle) to check for proper clamping operation. Check for complete range of travel lock motion, and that the light on the travel lock control box lights at the end of each actuator travel. Repeat this step first with gun tube raised clear of cradle to check for proper stowage action, and then again with gun tube lowered back n travel lock cradle.
- 23 Place travel lock in maintenance position (TM 9-2350-314-10).
- 24 Install new preformed packing (7) and access cover (6) on actuator (8) with six screws (5). Install retainer clip (12) in pin (13). Return travel lock to travel position (TM 9-2350-314-10).

**Section I. BODY, CAB, HOOD, AND HULL ASSEMBLIES – CONTINUED**

**16-12 GUN TUBE TRAVEL LOCK ACTUATOR ADJUSTMENT – CONTINUED**

**Adjustment – Continued**



18ph152m

**NOTE**

**FOLLOW-ON MAINTENANCE:**

- Secure gun tube in travel lock  
(TM 9-2350-314-10)
- Turn vehicle MASTER switch OFF  
(TM 9-2350-314-10)

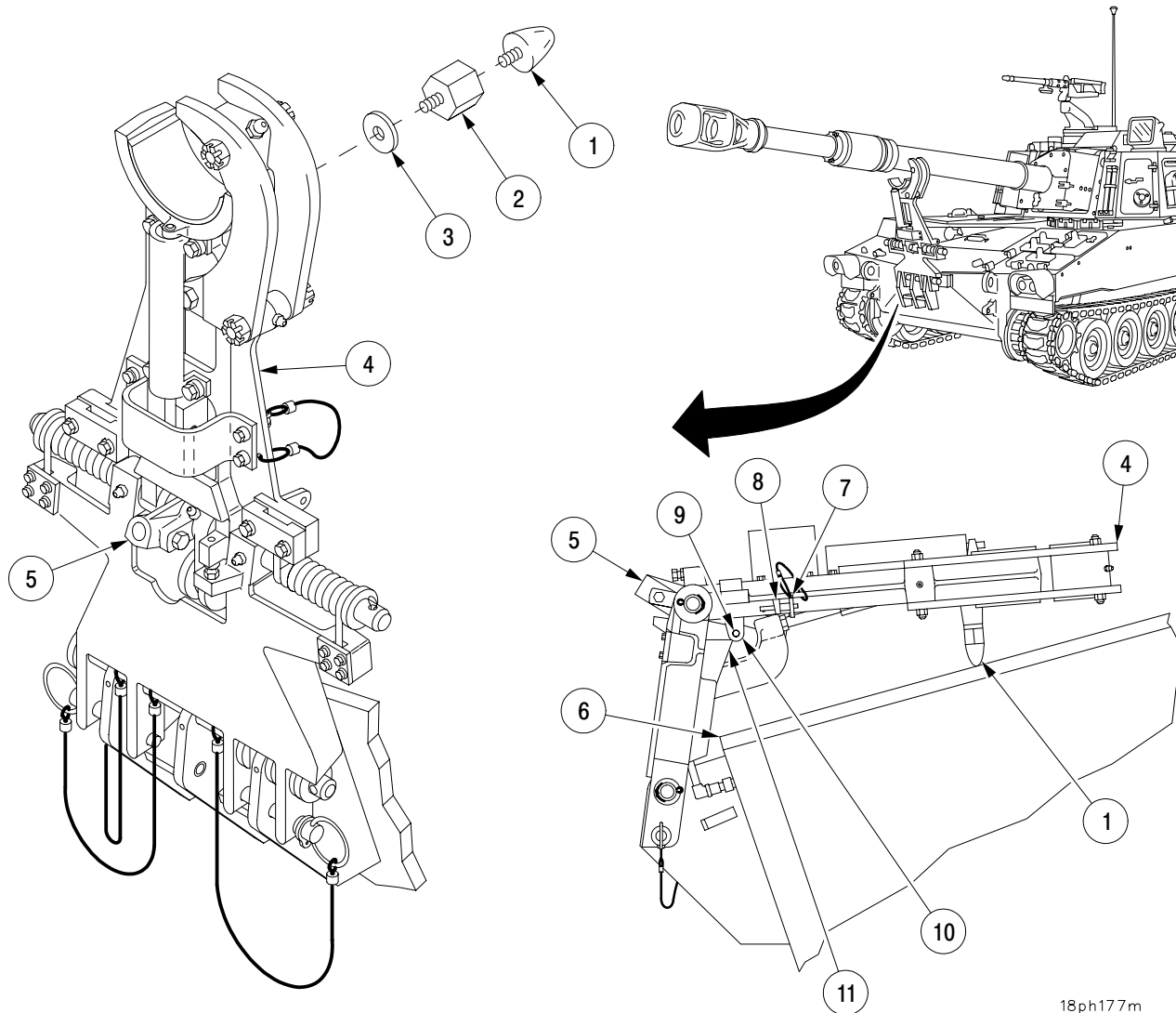




**Section I. BODY, CAB, HOOD, AND HULL ASSEMBLIES – CONTINUED**

**16-13 GUN TUBE TRAVEL LOCK BUMPER STOP – CONTINUED**

**c. Adjustment – Continued**



18ph177m

**NOTE**

**FOLLOW-ON MAINTENANCE:**

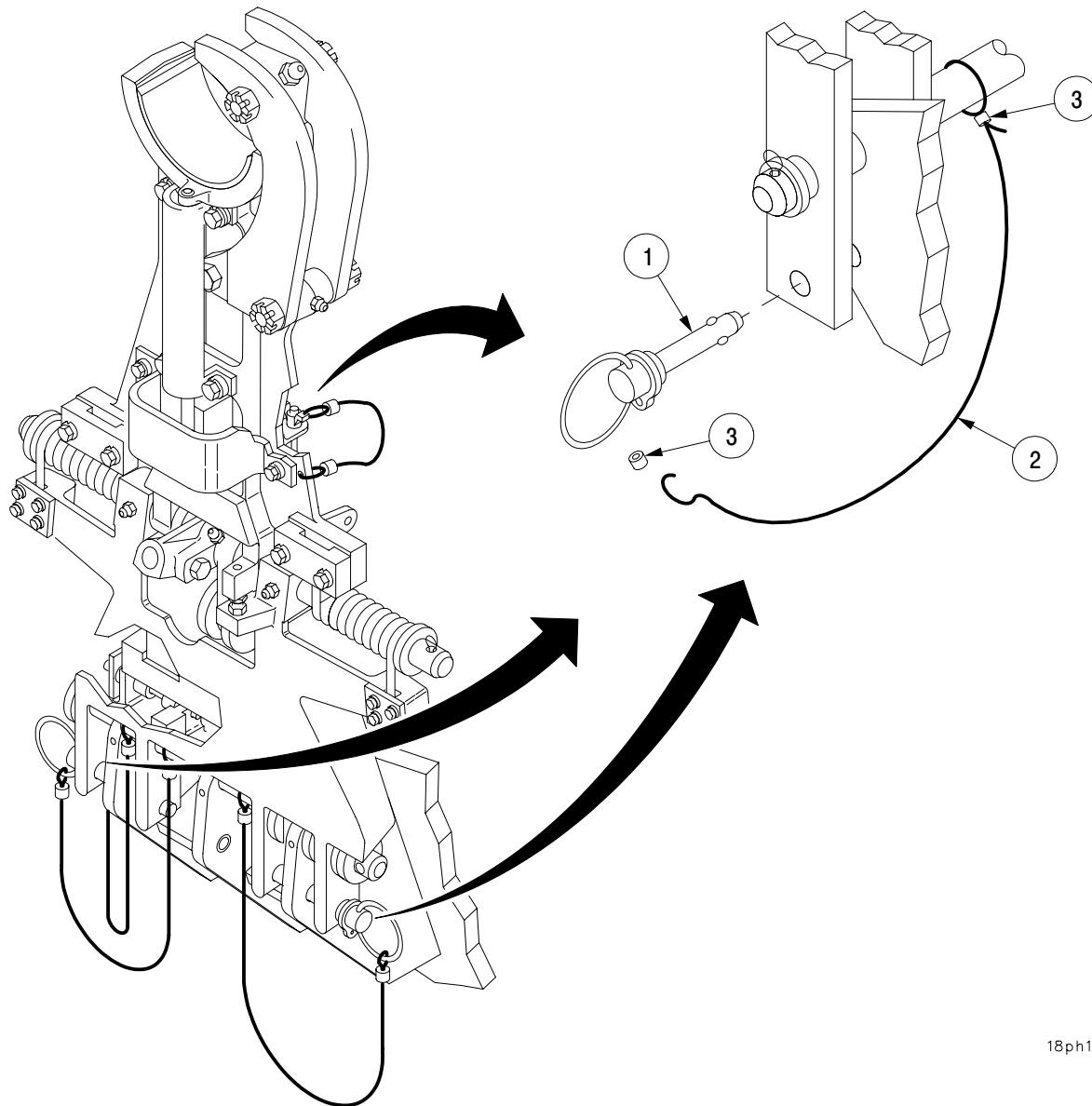
Secure gun tube in travel lock  
(TM 9-2350-314-10)



**Section I. BODY, CAB, HOOD, AND HULL ASSEMBLIES – CONTINUED**

**16-14 GUN TUBE TRAVEL LOCK QUICK-RELEASE PINS AND WIRE ROPE – CONTINUED**

**b. Installation – Continued**



18ph176m

**NOTE**

**FOLLOW-ON MAINTENANCE:**

Secure gun tube in travel lock  
(TM 9-2350-314-10)



---

**Section I. BODY, CAB, HOOD, AND HULL ASSEMBLIES – CONTINUED**

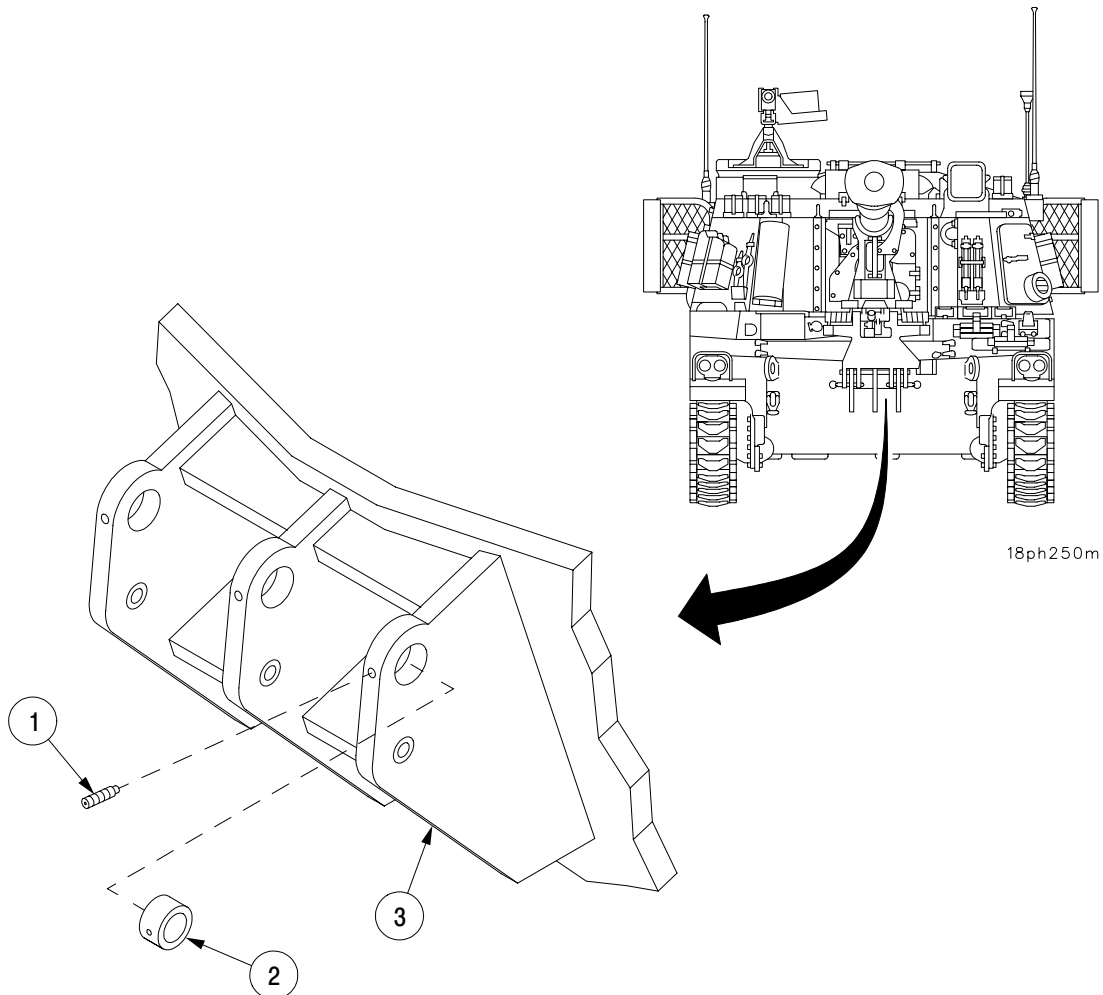

---

**16-15 GUN TUBE TRAVEL LOCK SUPPORT BRACKET BEARINGS – CONTINUED**


---

**b. Installation**

- 1 Apply retaining compound inside hole of support bracket (3) and on mating outer surface of bearing (2).
- 2 Install bearing (2) into hole of support bracket (3). Align hole in outer surface of bearing (2) with hole in support bracket (3) prior to installation of setscrew.
- 3 Apply primer and retaining compound to threads of setscrew (1).
- 4 Install setscrew (1) to support bracket (3) and bearing (2).
- 5 Torque setscrew to 5–7.5 lb–ft (6.8 – 10.2 N•m).


**NOTE**

**FOLLOW-ON MAINTENANCE:**  
Install gun tube travel lock (para 16-9)

**Section I. BODY, CAB, HOOD, AND HULL ASSEMBLIES – CONTINUED**

**16-16 HULL REAR DOOR LATCH.**

This task covers:      a. Removal                                      b. Installation

**INITIAL SETUP**

Tools

General mechanic's tool kit  
(SC 5180-90-N26)

Materials/Parts

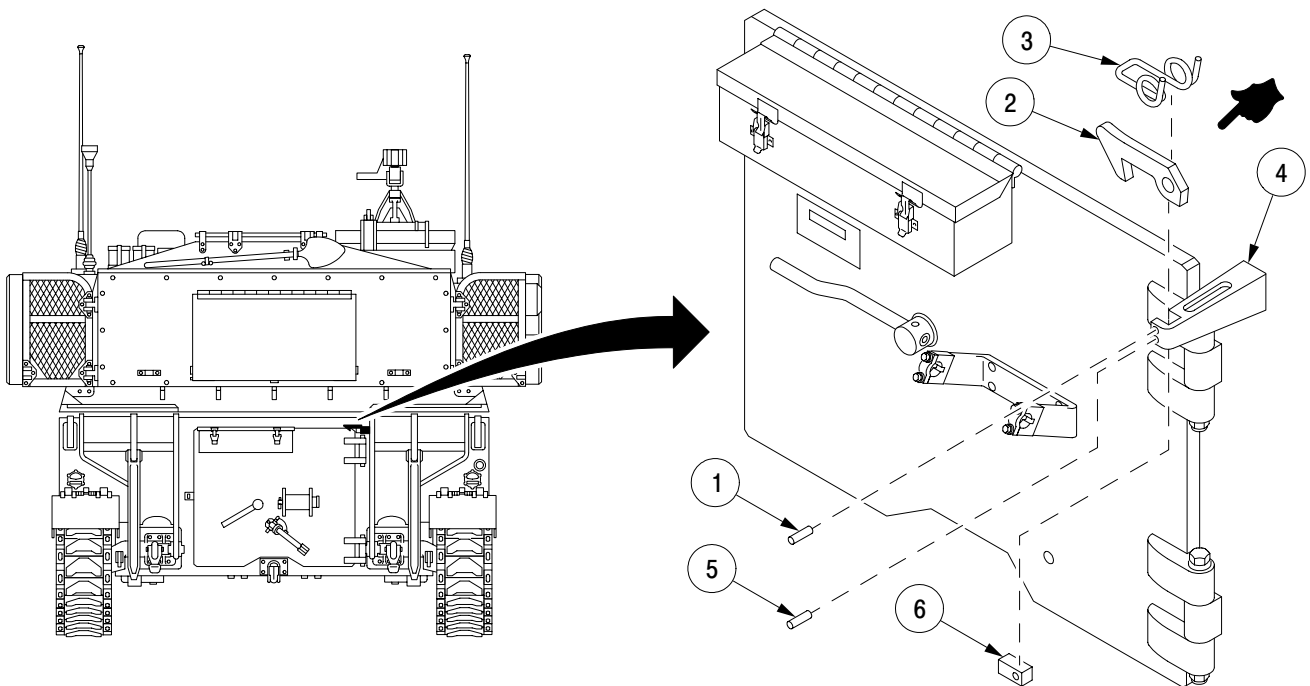
Spring pins (2)  
(item 226, Appx E)

**a. Removal.**

- 1 Remove spring pin (1), latch (2), and spring (3) from bracket (4). Discard spring pin.
- 2 Remove spring pin (5) and bumper (6) from bracket (4). Discard spring pin.

**b. Installation.**

- 1 Install bumper (6) to bracket (4) with new spring pin (5).
- 2 Install spring (3) and latch (2) to bracket (4) with new spring pin (1).



18ph153m





**Section I. BODY, CAB, HOOD, AND HULL ASSEMBLIES – CONTINUED**

**16-17 HULL REAR DOOR SEAL – CONTINUED**

**a. Removal – Continued**

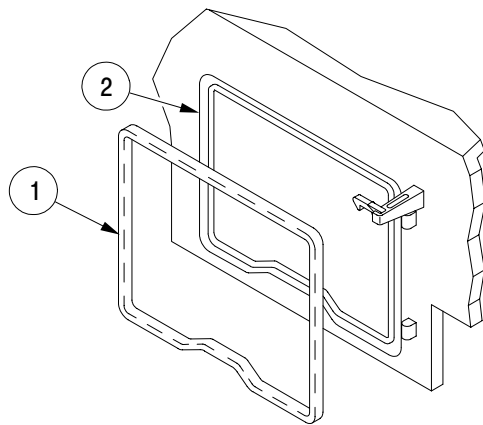
**WARNING**

Dry-cleaning solvent (P-D-680), used to clean parts, is toxic and flammable. Wear protective goggles and gloves and use only in a well-ventilated area. Avoid contact with skin, eyes, and clothes. Do not breathe vapors. Do not use near open flame or excessive heat. Do not smoke when using solvent. Failure to do so could cause **SERIOUS INJURY**. If you become dizzy while using dry-cleaning solvent, get fresh air immediately, and if necessary, get medical attention. If contact with skin or clothes is made, flush thoroughly with water. If the solvent contacts your eyes, wash them with water immediately and obtain medical aid (ref. FM 21-11).

- 2 Clean seal cavity (2) with dry-cleaning solvent and wire brush.

**b. Installation.**

- 1 Apply adhesive to seal cavity (2) of hull with acid brush.
- 2 Install new seal (1) in seal cavity (2) of hull until properly seated.



DOOR OMITTED FOR CLARITY

18ph155m

**NOTE**

**FOLLOW-ON MAINTENANCE:**

Close and secure rear door  
(TM 9-2350-314-10)



**Section I. BODY, CAB, HOOD, AND HULL ASSEMBLIES – CONTINUED**

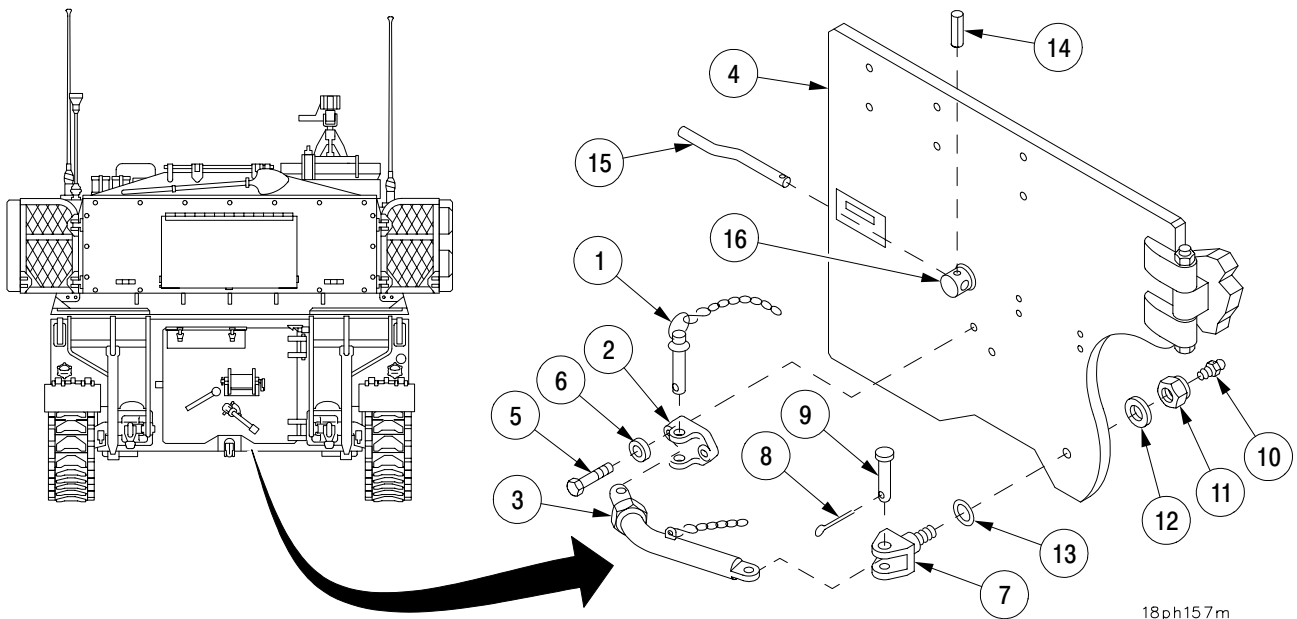
**16-18 HULL REAR DOOR, HOLD-OPEN ROD, AND HANDLE – CONTINUED**

**NOTE**

To replace sign, perform Removal step 13 and Installation step 9.

**a. Removal.**

- 1 Remove pin assembly (1) from bracket (2) and swing rod (3) out of way.
- 2 Remove bracket (2) from door (4) by removing two screws (5) and two flat washers (6).
- 3 Remove rod (3) from bracket (7) by removing cotter pin (8) and pin (9). Discard cotter pin.
- 4 Open door (4).
- 5 Remove grease fitting (10) from bracket (7), if damaged.
- 6 Remove bracket (7) from door (4) by removing self-locking nut (11), flat washer (12), and preformed packing (13). Discard preformed packing and self-locking nut.
- 7 Remove spring pin (14) and outside handle (15) from shaft (16). Discard spring pin.



---

**Section I. BODY, CAB, HOOD, AND HULL ASSEMBLIES – CONTINUED**


---

**16-18 HULL REAR DOOR, HOLD-OPEN ROD, AND HANDLE – CONTINUED**


---

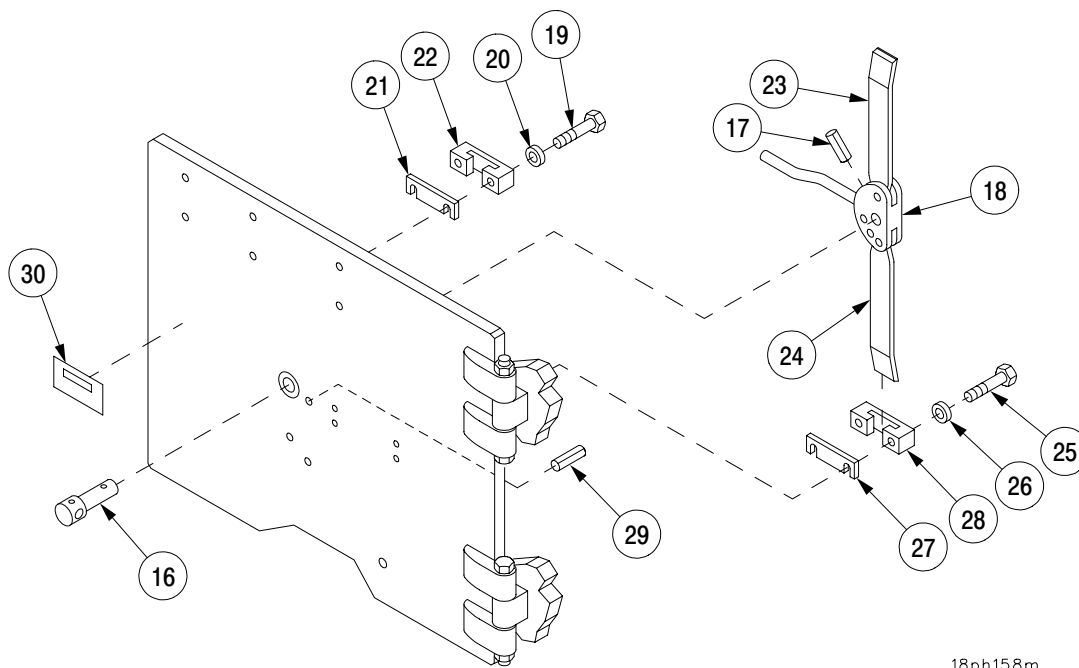
**a. Removal – Continued**

- 8 Remove spring pin (17) from shaft (16) inside cam (18) and remove shaft (16). Discard spring pin.

**NOTE**

Quantity of shims for upper and lower guides are not the same. For ease of installation, note quantity of shims removed from upper and lower guides during removal.

- 9 Remove two screws (19), two flat washers (20), shims (21), and upper guide (22).
- 10 Remove cam (18) and both bars (23 and 24) as complete assembly.
- 11 Remove two screws (25), two flat washers (26), shims (27), and lower guide (28).
- 12 Remove spring pin (29). Discard spring pin.
- 13 Remove sign (30), if damaged.



18ph158m

**Section I. BODY, CAB, HOOD, AND HULL ASSEMBLIES – CONTINUED**

---

**16-18 HULL REAR DOOR, HOLD-OPEN ROD, AND HANDLE – CONTINUED**

---

**a. Removal – Continued**

**NOTE**

If replacement of the cam or bars is required, perform steps 14 thru 17.

- 14 Remove clip (31) from plunger (32) inside cam (18) and remove plunger (32).
- 15 Remove two bearings (33) from cam (18).
- 16 Remove two spring pins (34) securing bars (23 and 24) to cam (18). Discard spring pins.
- 17 Remove spring pin (35) securing handle (36) to cam (18). Discard spring pin.

**NOTE**

Turret must be traversed 90° to enable lifting device to remove door.

- 18 Attach sling and lifting device to rear door (4).

**WARNING**

Hull door is extremely heavy. Use care while handling to avoid injury to personnel or damage to door.

- 19 Remove two screws (37), four flat washers (38), two self-locking nuts (39), and door (4). Discard self-locking nuts.
- 20 Remove two bearings (40) from door (4).

**Section I. BODY, CAB, HOOD, AND HULL ASSEMBLIES – CONTINUED**

**16-18 HULL REAR DOOR, HOLD-OPEN ROD, AND HANDLE – CONTINUED**

**b. Installation.**

- 1 Install two bearings (40) in door (4).

**WARNING**

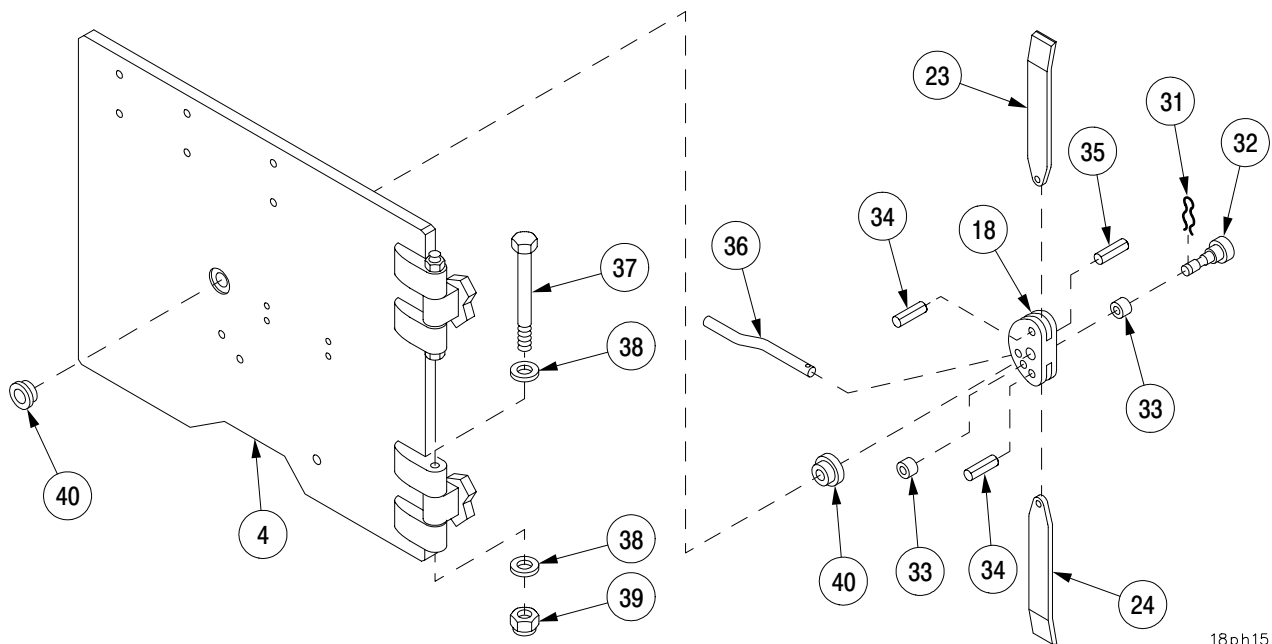
Hull door is extremely heavy. Use care while handling to avoid injury to personnel or damage to door.

- 2 Install door (4) on hinges with sling, suitable lifting device, two screws (37), four flat washers (38), and two new self-locking nuts (39).
- 3 Remove sling from door (4).

**NOTE**

If replacement of cam or bars is required, perform steps 4 thru 8.

- 4 Install handle (36) to cam (18) with new spring pin (35).
- 5 Install bars (23 and 24) to cam (18) with two new spring pins (34).
- 6 Apply sealing compound to bearings (33).
- 7 Install two bearings (33) in cam (18).
- 8 Install plunger (32) and clip (31) inside cam (18).



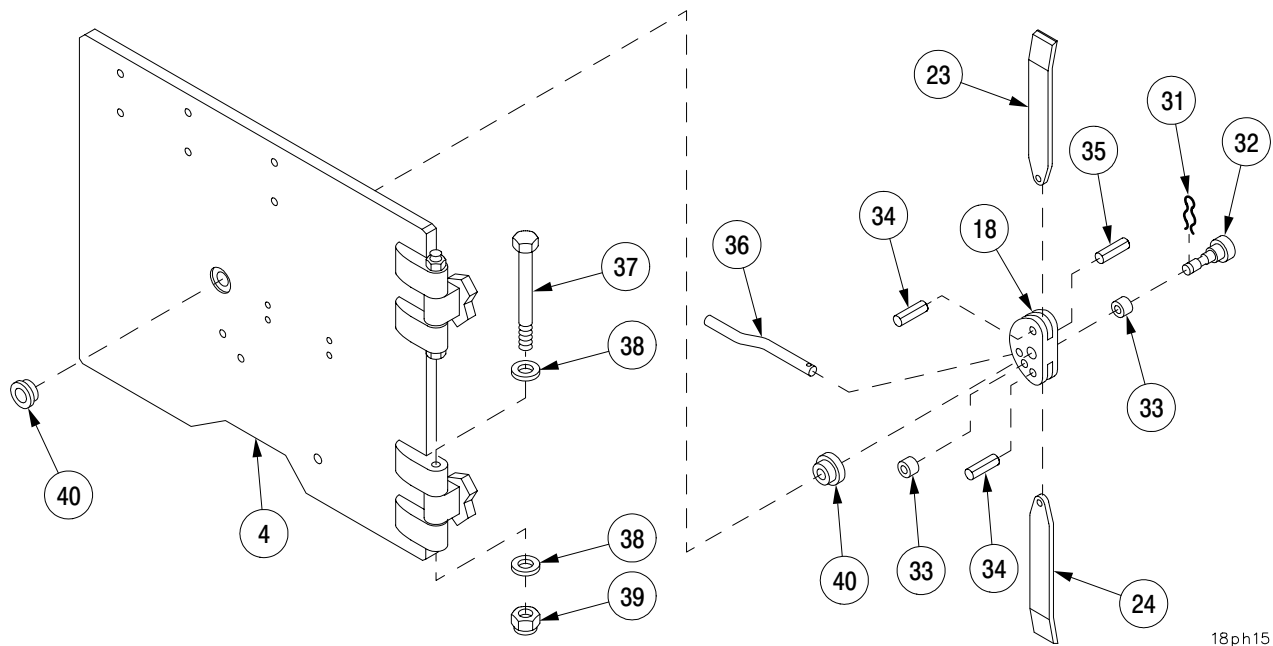
18ph159m

**Section I. BODY, CAB, HOOD, AND HULL ASSEMBLIES – CONTINUED**

**16-18 HULL REAR DOOR, HOLD-OPEN ROD, AND HANDLE – CONTINUED**

**b. Installation – Continued**

- 9 Install sign (30), if removed.
- 10 Install new spring pin (29).
- 11 Install lower guide (28) and shims (27) with two screws (25) and two flat washers (26).
- 12 Install cam (18) and both bars (23 and 24) as complete assembly.
- 13 Install upper guide (22) and shims (21) with two screws (19) and two flat washers (20).
- 14 Install shaft (16) to cam (18) and secure shaft (16) with new spring pin (17) inside cam (18).



18ph159m

---

**Section I. BODY, CAB, HOOD, AND HULL ASSEMBLIES – CONTINUED**

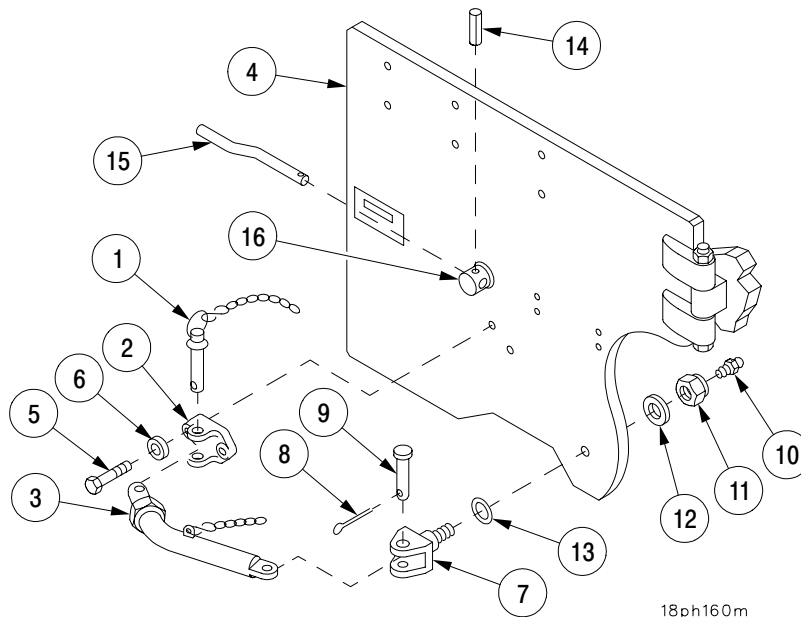

---

**16-18 HULL REAR DOOR, HOLD-OPEN ROD, AND HANDLE – CONTINUED**


---

**b. Installation – Continued**

- 15 Install outside handle (15) to shaft (16) with new spring pin (14).
- 16 Install bracket (7) in door (4) with new preformed packing (13), flat washer (12), and new self-locking nut (11).
- 17 Install grease fitting (10) to bracket (7), if removed.
- 18 Close door (4).
- 19 Install rod (3) in bracket (7) with pin (9) and new cotter pin (8).
- 20 Install bracket (2) on door (4) with two screws (5) and two flat washers (6).
- 21 Secure rod (3) to bracket (2) with pin assembly (1).


**NOTE**
**FOLLOW-ON MAINTENANCE:**

- Install oil can bracket and mounting plate (para 16-65)
- Install telephone cable reel, handcrank, and bracket (para 16-45)
- Install 40MM grenade box assembly (para 16-55)

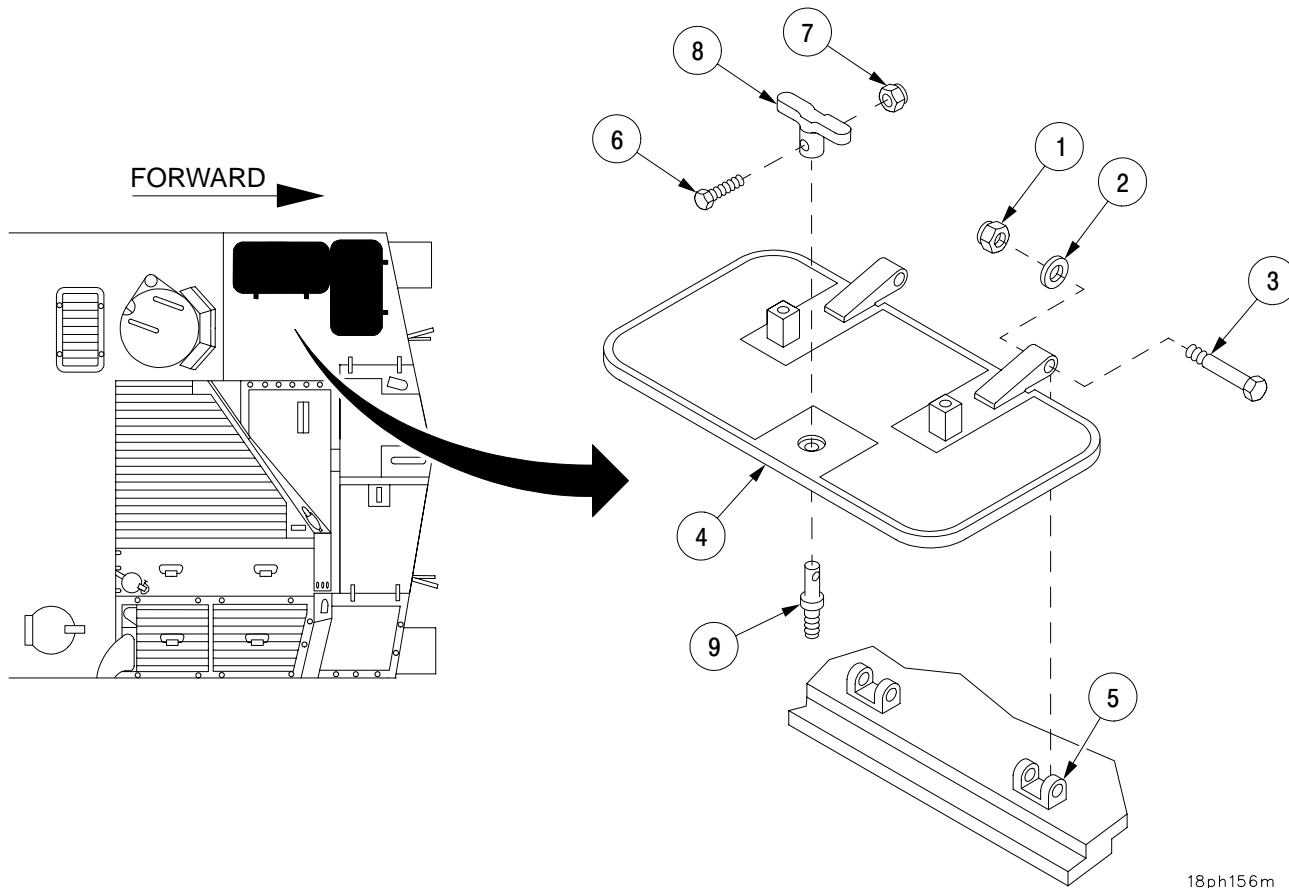




**Section I. BODY, CAB, HOOD, AND HULL ASSEMBLIES – CONTINUED**

**16-19 BATTERY ACCESS DOORS – CONTINUED**

**b. Installation – Continued**



18ph156m

**NOTE**

**FOLLOW-ON MAINTENANCE:**  
Install spare track shoe clamps (para 16-61)

---

## Section I. BODY, CAB, HOOD, AND HULL ASSEMBLIES – CONTINUED

---

### 16-20 BATTERY ACCESS DOOR SEALS.

---

This task covers:      a. Removal                                      b. Installation

---

#### **INITIAL SETUP**

##### Tools

General mechanic's tool kit  
(SC 5180-90-N26)  
Wire brush (item 7, Appx F)

##### Materials/Parts

Adhesive (item 2, Appx C)  
Dry-cleaning solvent (item 59, Appx C)  
Acid swabbing brush (item 13, Appx C)

##### Equipment Conditions

Battery access door opened  
(TM 9-2350-314-10)

##### References

TM 9-2350-314-10

---

#### **NOTE**

The following procedure applies to replacement of seals in both battery access doors.

##### **a. Removal.**

- 1 Scrape seal (1) from seal channel (2) on underside of door (3).

#### **WARNING**

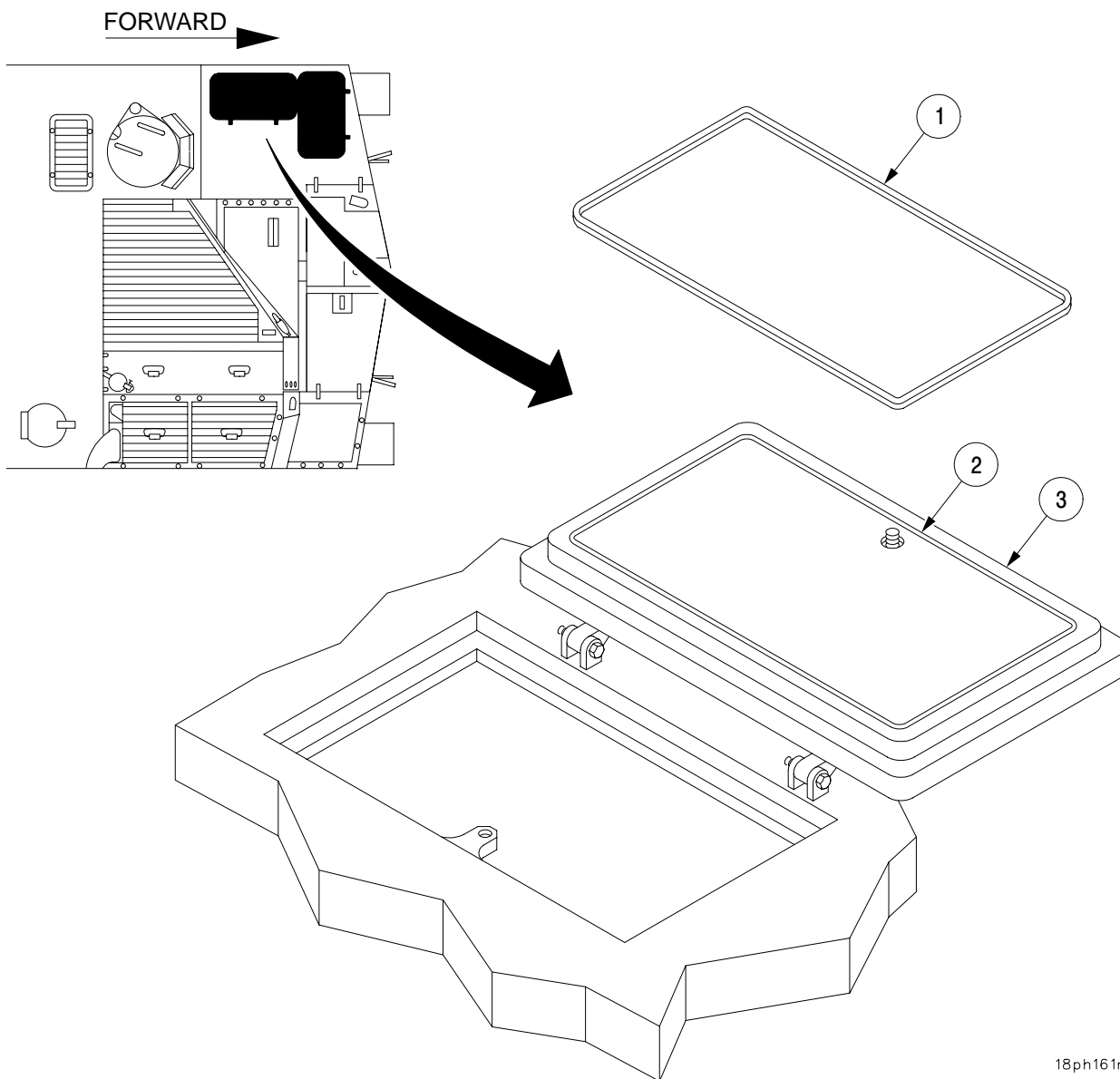
Dry-cleaning solvent (P-D-680) is toxic and flammable. To avoid injury, wear protective goggles and gloves and use only in a well-ventilated area. Avoid contact with skin, eyes, and clothes. Do not breathe vapors. Do not use near open flame or excessive heat. Do not smoke when using solvent. Failure to do so could cause **SERIOUS INJURY**. If you become dizzy while using dry-cleaning solvent, get fresh air immediately, and if necessary, get medical attention. If contact with skin or clothes is made, flush thoroughly with water. If the solvent contacts your eyes, wash them with water immediately and obtain medical aid (FM 21-11).

- 2 Remove all debris from seal channel (2) using dry-cleaning solvent and wire brush.

**Section I. BODY, CAB, HOOD, AND HULL ASSEMBLIES – CONTINUED**

**16-20 BATTERY ACCESS DOOR SEALS – CONTINUED**

**a. Removal – Continued**



18ph161m

## Section I. BODY, CAB, HOOD, AND HULL ASSEMBLIES – CONTINUED

---

### 16-20 BATTERY ACCESS DOOR SEALS – CONTINUED

---

#### b. Installation.

- 1 Make sure seal channel (2) is clean and dry. Apply light coat of adhesive to flat side of seal (1) and deepest part of seal channel (2) using acid brush. Allow to dry (5 minutes) until tacky.
- 2 Insert seal (1) in seal channel (2) at middle of hinge edge of door (3). Lip of seal (1) must face hinges. Press seal (1) into place working around seal channel (2) until properly seated. Do not stretch or bunch seal (1).

**WARNING**

Dry-cleaning solvent (P-D-680) is toxic and flammable. To avoid injury, wear protective goggles and gloves and use only in a well-ventilated area. Avoid contact with skin, eyes, and clothes. Do not breathe vapors. Do not use near open flame or excessive heat. Do not smoke when using solvent. Failure to do so could cause SERIOUS INJURY. If you become dizzy while using dry-cleaning solvent, get fresh air immediately, and if necessary, get medical attention. If contact with skin or clothes is made, flush thoroughly with water. If the solvent contacts your eyes, wash them with water immediately and obtain medical aid (FM 21-11).

- 3 Clean excess adhesive from face of seal (1) using dry-cleaning solvent.
- 4 Allow adhesive to cure for 30 minutes.

---

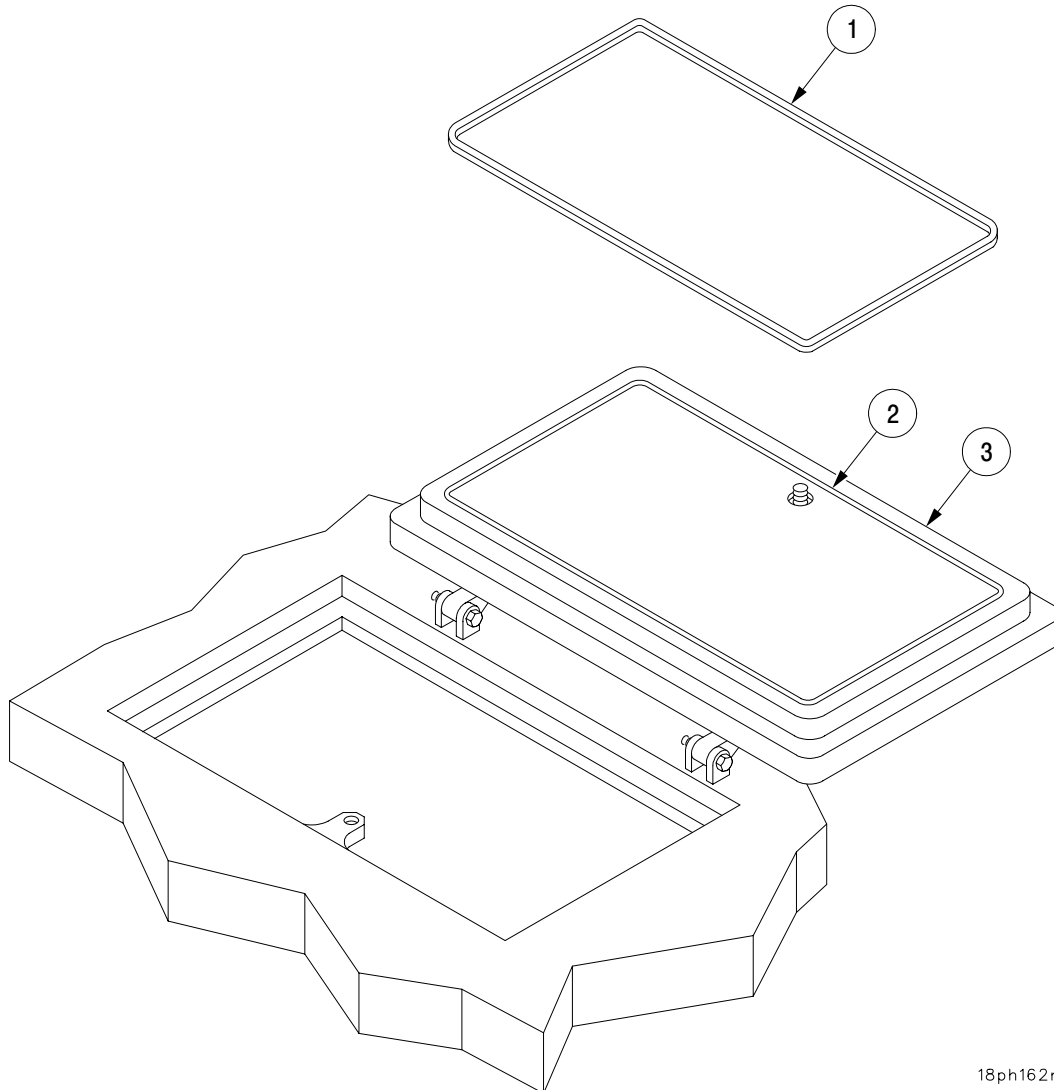
**Section I. BODY, CAB, HOOD, AND HULL ASSEMBLIES – CONTINUED**

---

**16-20 BATTERY ACCESS DOOR SEALS – CONTINUED**

---

**b. Installation – Continued**



18ph162m

**NOTE**

**FOLLOW-ON MAINTENANCE:**  
Close and secure battery access door  
(TM 9-2350-314-10)

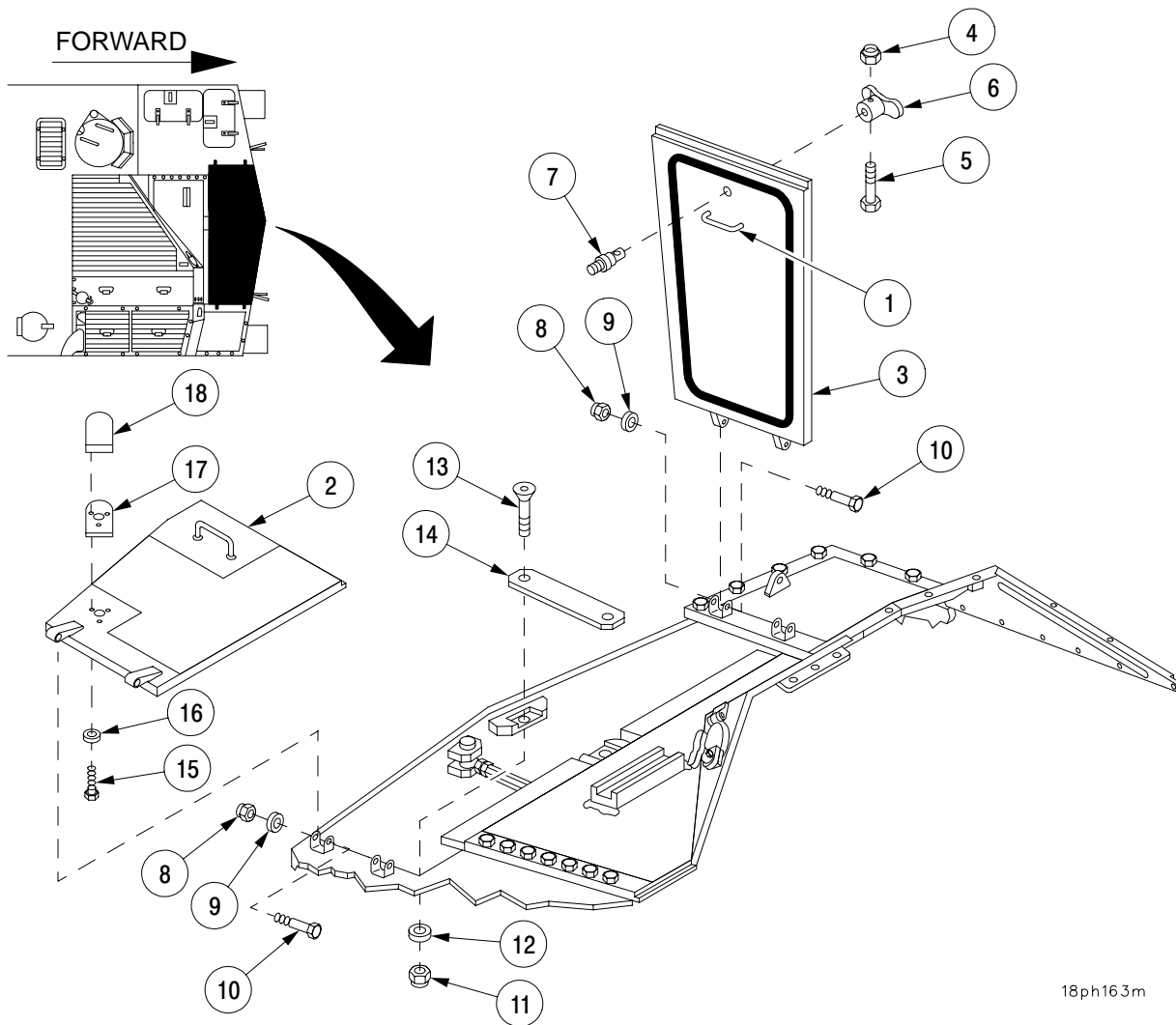


**Section I. BODY, CAB, HOOD, AND HULL ASSEMBLIES – CONTINUED**

**16-21 TRANSMISSION ACCESS DOORS AND DOOR SUPPORT BRACKET – CONTINUED**

**b. Installation.**

- 1 Install exhaust cover (18) with new gasket (17) on transmission door (2) with three flat washers (16) and three screws (15).
- 2 Install door support bracket (14) on hull with two screws (13), two flat washers (12), and two new self-locking nuts (11).
- 3 Attach nylon sling to handle (1) of door (2 or 3). Lift door (2 or 3) into position on hull using suitable lifting device and install two screws (10), two flat washers (9), and two new self-locking nuts (8).



18ph163m



---

**Section I. BODY, CAB, HOOD, AND HULL ASSEMBLIES – CONTINUED**

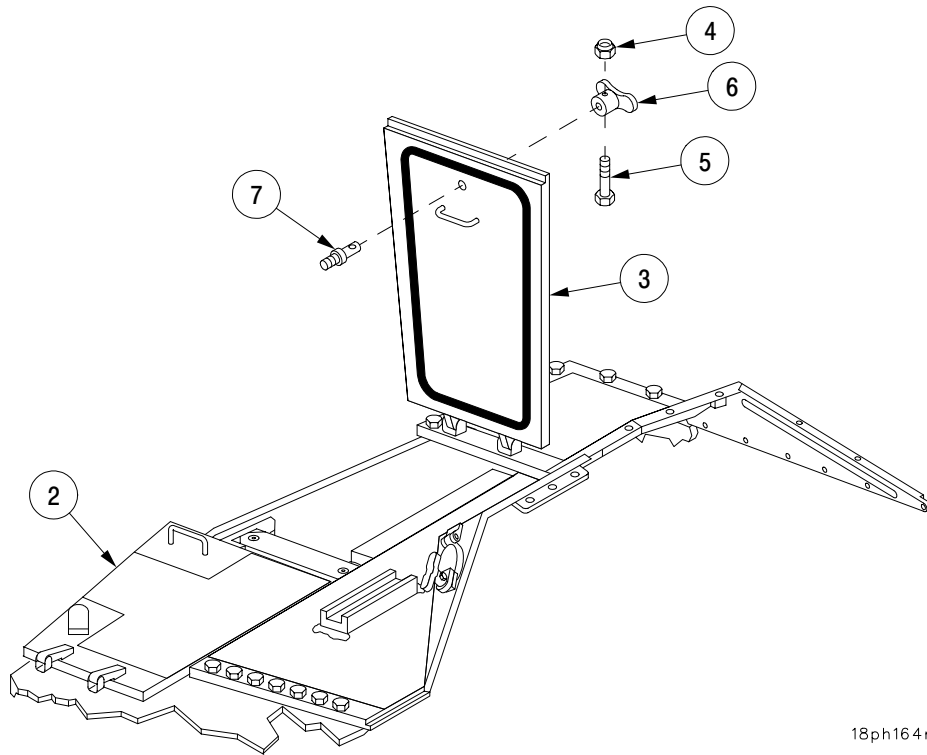
---

**16-21 TRANSMISSION ACCESS DOORS AND DOOR SUPPORT BRACKET – CONTINUED**

---

**b. Installation – Continued**

- 4 Insert stud (7) from bottom side of door (3). Install handle (6) on handle stud (7) and secure with screw (5) and new self-locking nut (4).
- 5 Remove nylon sling from door (2 or 3).



18ph164m

**NOTE**

**FOLLOW-ON MAINTENANCE:**

- Close and secure transmission access doors  
(TM 9-2350-314-10)
- Position gun tube travel lock in travel position  
(TM 9-2350-314-10)
- Secure gun tube in travel lock  
(TM 9-2350-314-10)



**Section I. BODY, CAB, HOOD, AND HULL ASSEMBLIES – CONTINUED**

---

**16-22 TRANSMISSION ACCESS DOOR SEALS – CONTINUED**

---

**a. Removal – Continued**

**WARNING**

Dry-cleaning solvent (P-D-680) is toxic and flammable. To avoid injury, wear protective goggles and gloves and use only in a well-ventilated area. Avoid contact with skin, eyes, and clothes. Do not breathe vapors. Do not use near open flame or excessive heat. Do not smoke when using solvent. Failure to do so could cause **SERIOUS INJURY**. If you become dizzy while using dry-cleaning solvent, get fresh air immediately, and if necessary, get medical attention. If contact with skin or clothes is made, flush thoroughly with water. If the solvent contacts your eyes, wash them with water immediately and obtain medical aid (FM 21-11).

- 2 Remove all debris from seal channel (2) using dry-cleaning solvent and wire brush.

**b. Installation.**

- 1 Make sure seal channel (2) is clean and dry. Apply light coat of adhesive to flat side of new seal (1) and deepest part of seal channel (2) with acid brush. Allow to dry (5 minutes) until tacky.
- 2 Insert new seal (1) in seal channel at middle of hinge edge of door. Lip of seal (1) must face hinges. Press new seal (1) into place working around seal channel (2) until properly seated. Do not stretch or bunch new seal (1).

---

**Section I. BODY, CAB, HOOD, AND HULL ASSEMBLIES – CONTINUED**

---

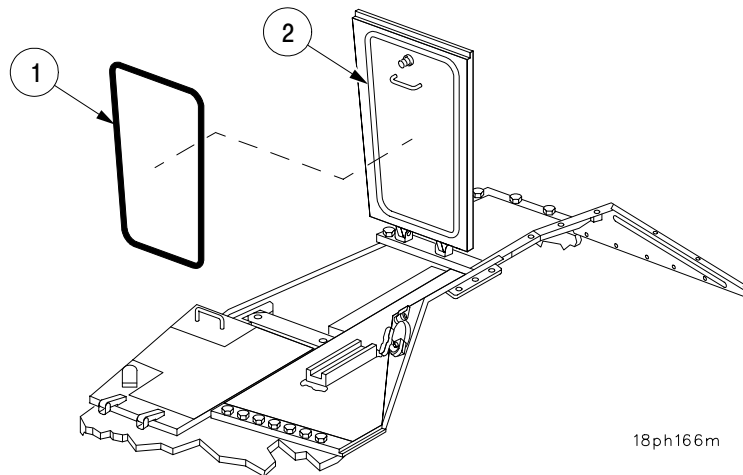
**16-22 TRANSMISSION ACCESS DOOR SEALS – CONTINUED**

---

**b. Installation – Continued****WARNING**

Dry-cleaning solvent (P-D-680), used to clean parts, is toxic and flammable. Wear protective goggles and gloves and use only in a well-ventilated area. Avoid contact with skin, eyes, and clothes. Do not breathe vapors. Do not use near open flame or excessive heat. Do not smoke when using solvent. Failure to do so could cause **SERIOUS INJURY**. If you become dizzy while using dry-cleaning solvent, get fresh air immediately, and if necessary, get medical attention. If contact with skin or clothes is made, flush thoroughly with water. If the solvent contacts your eyes, wash them with water immediately and obtain medical aid (ref FM 21-11).

- 3 Clean all adhesive from face of seal (1) using dry-cleaning solvent. Allow adhesive to cure for approximately 30 minutes.



18ph166m

**NOTE****FOLLOW-ON MAINTENANCE:**

- Close and secure transmission access doors (TM 9-2350-314-10)
- Position gun tube travel lock in travel position (TM 9-2350-314-10)
- Secure gun tube in travel lock (TM 9-2350-314-10)



---

**Section I. BODY, CAB, HOOD, AND HULL ASSEMBLIES – CONTINUED**

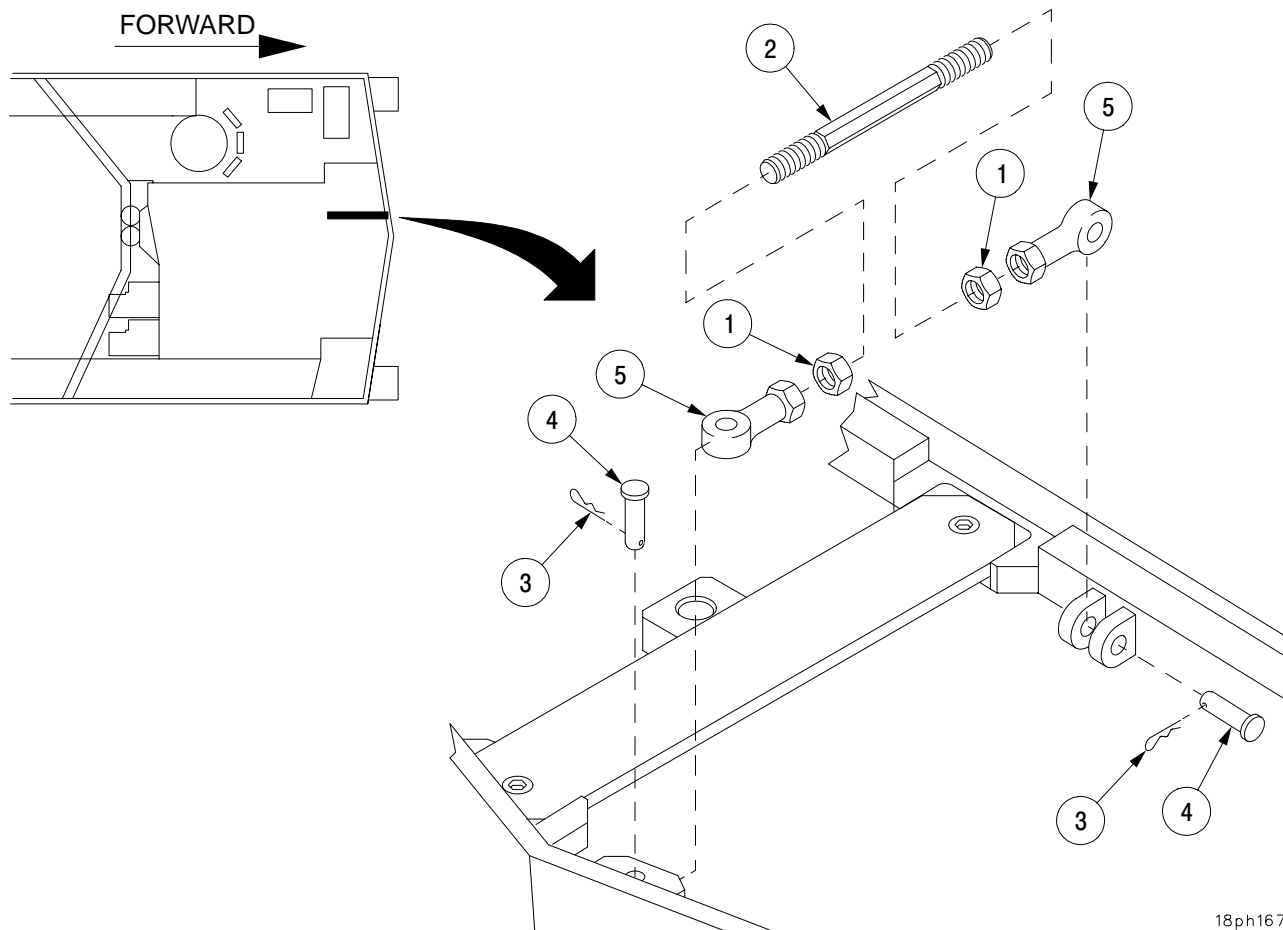

---

**16-23 GUN TUBE TRAVEL LOCK SUPPORT – CONTINUED**


---

**b. Installation – Continued**

- 6 By hand, rotate rod (2) to pull rod ends (5) tight.
- 7 Torque two nuts (1) to 100–120 lb–ft (136–163 N·m)



18ph167m

**NOTE**
**FOLLOW-ON MAINTENANCE:**

- Close and secure transmission access doors  
(TM 9-2350-314-10)
- Position gun tube travel lock in travel position  
(TM 9-2350-314-10)
- Secure gun tube in travel lock  
(TM 9-2350-314-10)



**Section I. BODY, CAB, HOOD, AND HULL ASSEMBLIES – CONTINUED**

**16-25 HULL EXHAUST GRILLE.**

This task covers: a. Removal b. Installation

**INITIAL SETUP**

Tools

General mechanic's tool kit  
(SC 5180-90-N26)  
Lifting sling (item 60, Appx F)  
Suitable lifting device

Equipment Conditions

Exhaust deflector removed (para 16-24)

Personnel Required

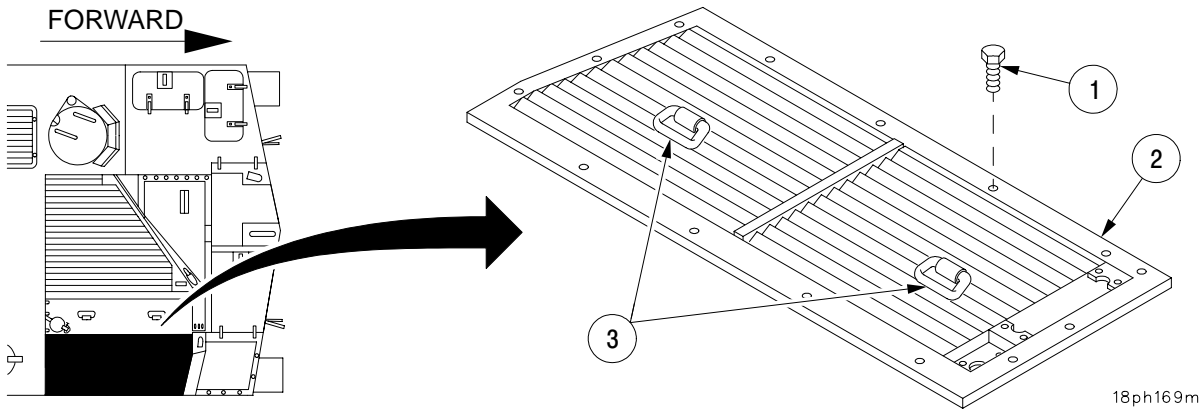
Two

**a. Removal.**

- 1 Remove 14 screws (1) securing exhaust deck (2).
- 2 Install sling on exhaust deck (2) lifting handles (3).
- 3 Remove exhaust deck (2) from vehicle using suitable lifting device.

**b. Installation.**

- 1 Install sling on exhaust deck lifting handles (3).
- 2 Lift exhaust deck (2) into position using suitable lifting device and secure with 14 screws (1).



**NOTE**  
**FOLLOW-ON MAINTENANCE:**  
Install exhaust deflector (para 16-24)



**Section I. BODY, CAB, HOOD, AND HULL ASSEMBLIES – CONTINUED**

---

**16-26 FAN ACCESS DOOR.**

---

This task covers:      a. Removal                                      b. Installation

---

**INITIAL SETUP**

Tools

General mechanic's tool kit  
(SC 5180-90-N26)  
Lifting sling (item 60, Appx F)  
Suitable lifting device

Equipment Conditions

Gun tube clear of travel lock  
(TM 9-2350-314-10)  
Air intake grille open and secured  
(TM 9-2350-314-10)  
Hull exhaust grille removed (para 16-25)

Personnel Required

Two

References

TM 9-2350-314-10

---

**a. Removal.**

- 1 Remove six screws (1) and six flat washers (2) securing fan access door (3).
- 2 Remove fan access door (3) using nylon sling and suitable lifting device.

**b. Installation.**

- 1 Position fan access door (3) on vehicle using nylon sling and suitable lifting device.
- 2 Secure fan access door (3) to vehicle with six flat washers (2) and six screws (1).

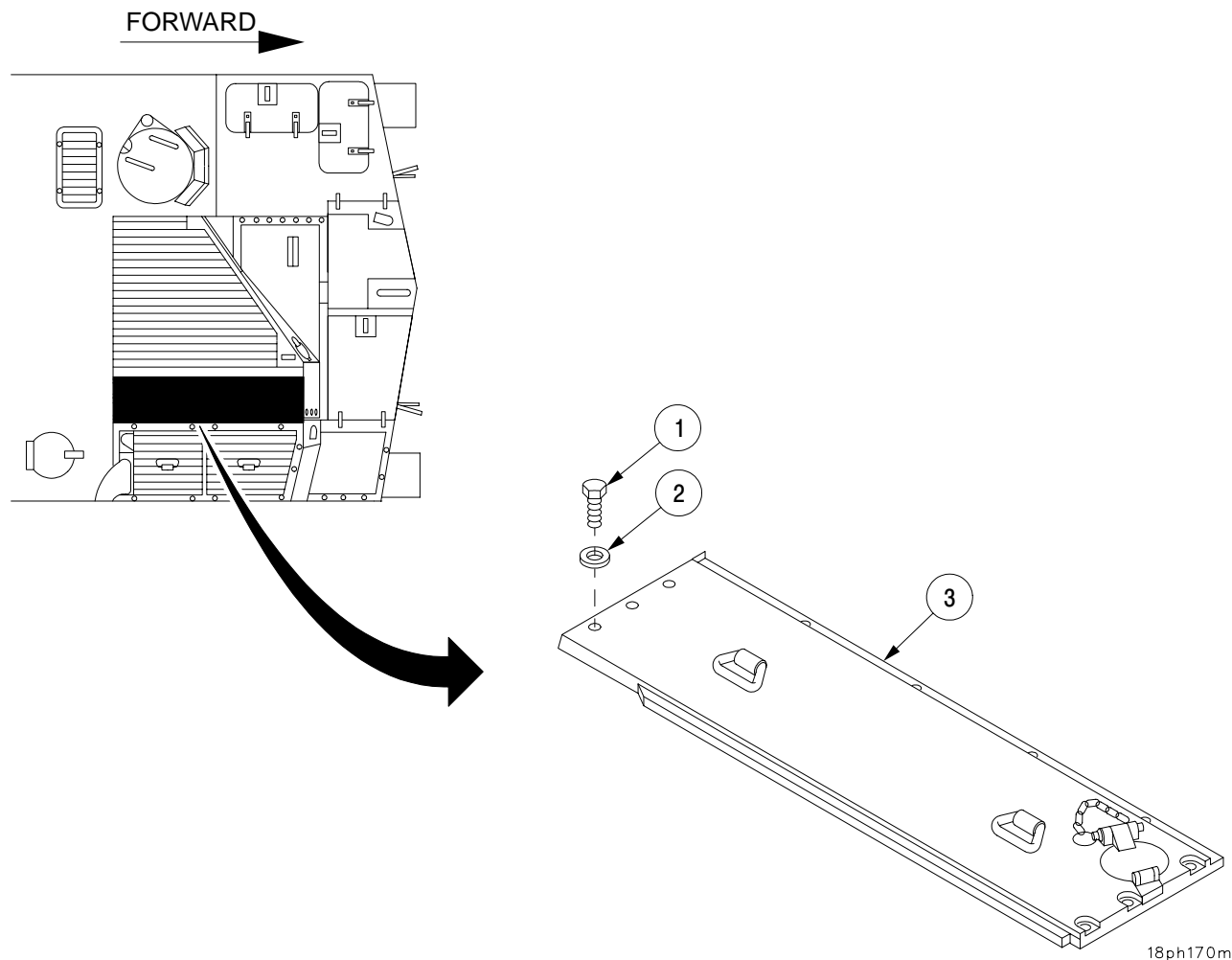
---

**Section I. BODY, CAB, HOOD, AND HULL ASSEMBLIES – CONTINUED**

---

**16-26 FAN ACCESS DOOR – CONTINUED**

---

**b. Installation – Continued****NOTE**

**FOLLOW-ON MAINTENANCE:**  
Install hull exhaust grille (para 16-25)  
Close and secure air intake grille  
(TM 9-2350-314-10)  
Secure gun tube in travel lock  
(TM 9-2350-314-10)

## Section I. BODY, CAB, HOOD, AND HULL ASSEMBLIES – CONTINUED

---

### 16-27 RADIATOR CAP ACCESS COVER.

---

This task covers:      a. Removal      b. Disassembly      c. Assembly      d. Installation

---

#### **INITIAL SETUP**

##### Tools

General mechanic's tool kit

(SC 5180-90-N26)

Machinist vise (item 74, Appx F)

Vise jaw caps (item 9, Appx F)

---

#### **a. Removal.**

- 1 Remove quick-release pin (1).
- 2 Remove two screws (2) releasing hinge latch (3) and radiator cap access cover (4) from fan access door (5).

#### **b. Disassembly.**

- 1 Place cover (4) in vise with jaw caps. Remove pin (6) and access cover (4) from hinge latch (3).
- 2 Remove S-hook (7) from welded eyelet on access cover (4) and from chain (8).
- 3 Remove S-hook (9) from quick-release pin (1) and chain (8).

#### **c. Assembly.**

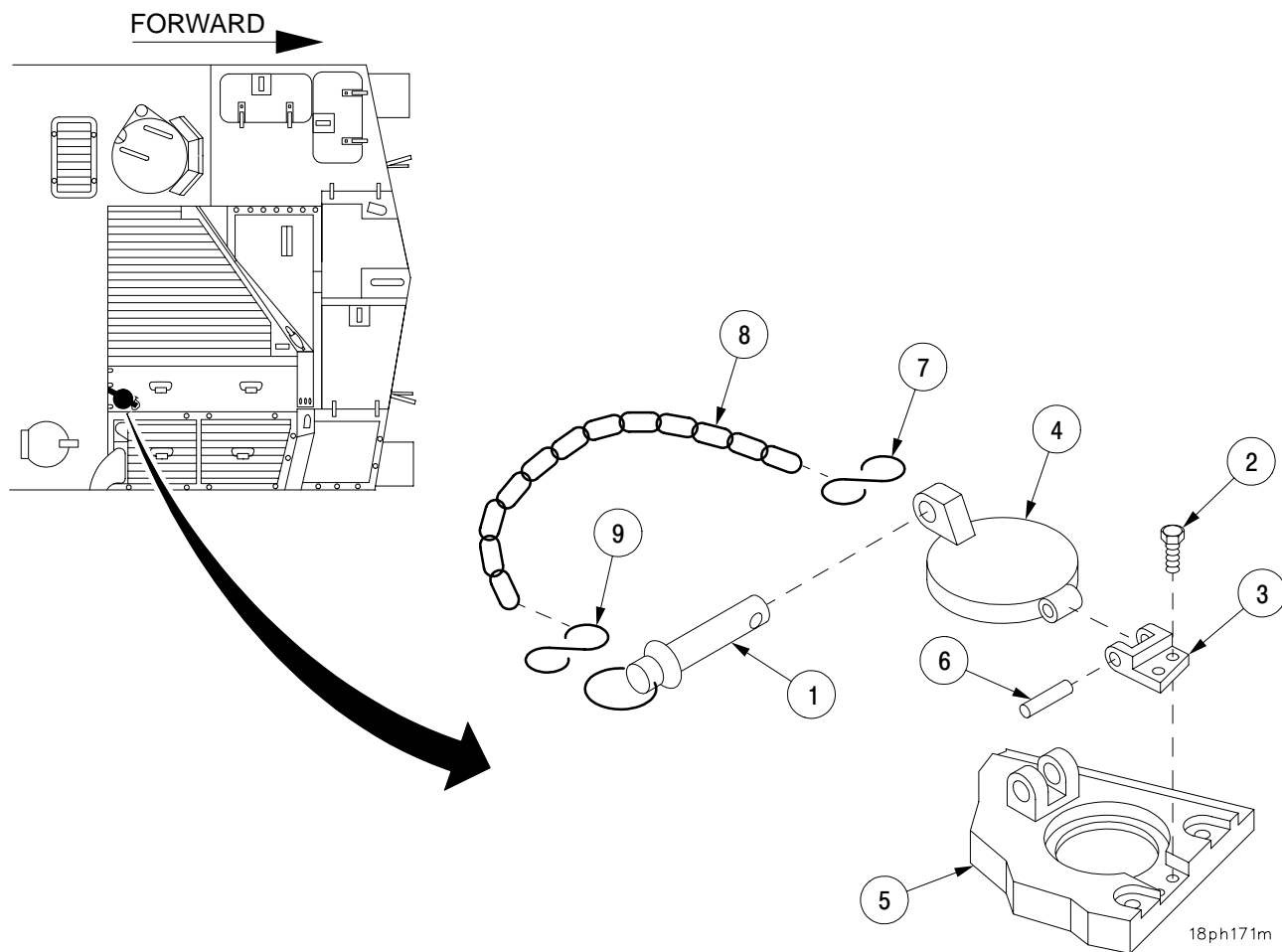
- 1 Install access cover (4) in hinge latch (3) with pin (6).
- 2 Connect S-hook (9) to quick-release pin (1).
- 3 Connect chain (8) to S-hook (9) and S-hook (7).
- 4 Connect chain (8) to welded eyelet of access cover (4) with S-hook (7).
- 5 Remove cover (4) from vise with jaw caps.

**Section I. BODY, CAB, HOOD, AND HULL ASSEMBLIES – CONTINUED**

**16-27 RADIATOR CAP ACCESS COVER – CONTINUED**

**d. Installation.**

- 1 Install hinge latch (3) on fan access door (5) with two screws (2).
- 2 Close access cover (4). Secure with quick-release pin (1).



## Section I. BODY, CAB, HOOD, AND HULL ASSEMBLIES – CONTINUED

---

### 16-28 ENGINE DIPSTICK ACCESS COVER.

---

This task covers:      a. Removal                                      b. Installation

---

#### **INITIAL SETUP**

##### Tools

General mechanic's tool kit  
(SC 5180-90-N26)

##### Materials/Parts

Self-locking nuts (2) (item 230, Appx E)

---

#### **a. Removal.**

- 1 Open engine dipstick access cover (1) by turning handle (2) counterclockwise.
- 2 Remove self-locking nut (3) and screw (4). Discard self-locking nut.
- 3 Pull handle (2) from stud (5) and stud (5) from engine dipstick access cover (1).
- 4 Remove self-locking nut (6), screw (7), and engine dipstick access cover (1) from front slope plate (8). Discard self-locking nut.

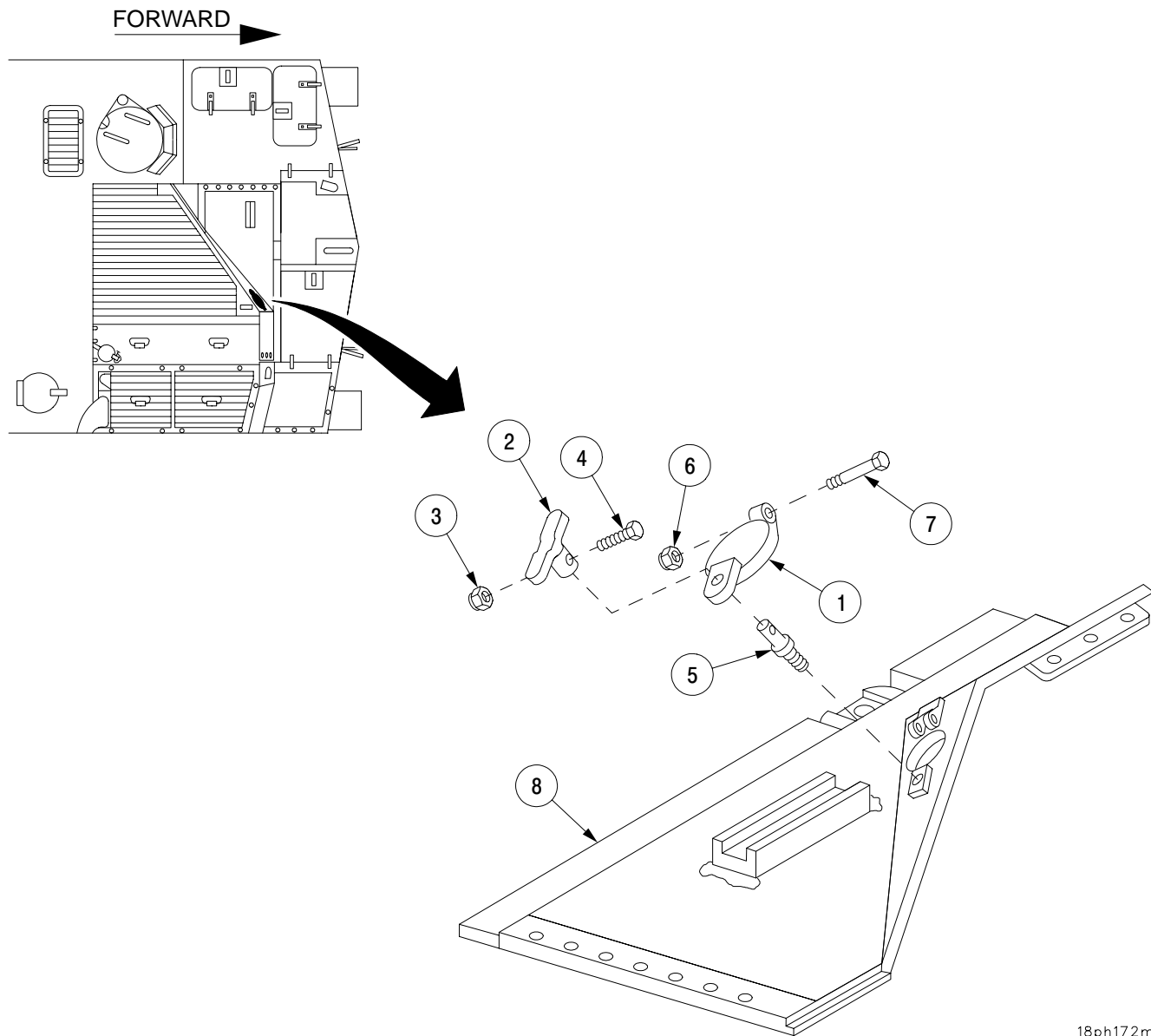
#### **b. Installation.**

- 1 Install engine dipstick access cover (1) on front slope plate (8) with screw (7) and new self-locking nut (6).
- 2 Insert stud (5) through from underside of engine dipstick access cover (1). Install handle (2) on stud (5) with screw (4) and new self-locking nut (3).
- 3 Close and secure engine dipstick access cover (1).

**Section I. BODY, CAB, HOOD, AND HULL ASSEMBLIES – CONTINUED**

**16-28 ENGINE DIPSTICK ACCESS COVER – CONTINUED**

**b. Installation – Continued**



18ph172m

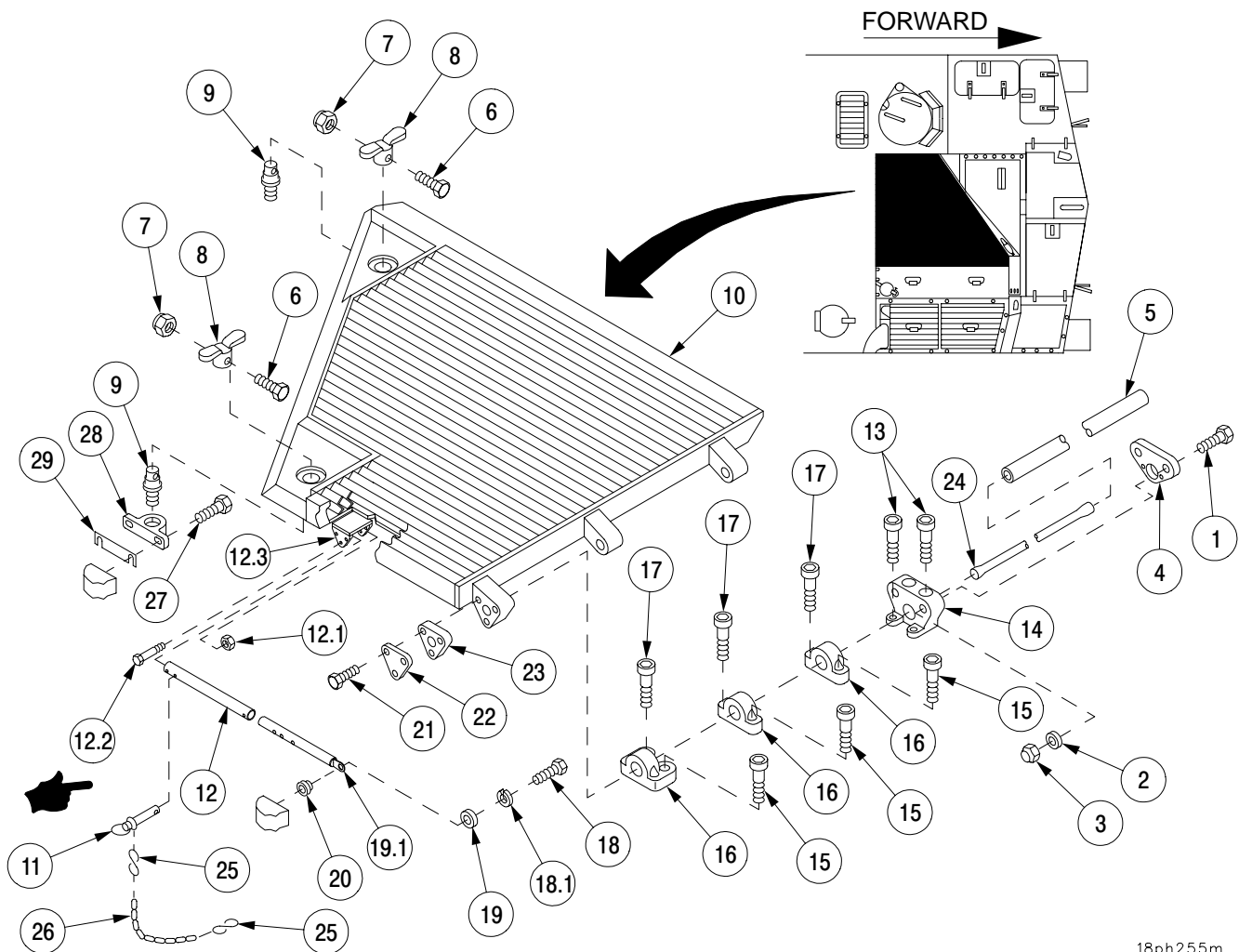


**Section I. BODY, CAB, HOOD, AND HULL ASSEMBLIES – CONTINUED**

**16-29 AIR INTAKE GRILLE – CONTINUED**

**a. Removal – Continued**

- 9 Remove screw (18), lockwasher (18.1) flat washer (19), and intake grille support (19.1). Remove bearing (20) from end of intake grille support (19.1). Discard lockwasher.
- 10 Lift air intake grille (10) off vehicle.
- 11 Remove three screws (21), shield (22), and adapter (23) from left end of lower air intake grille (10).
- 12 Remove torsion bar housing (5), torsion bar (24), and torsion bar clamps (16) from intake grille (10).
- 13 Disconnect two S-hooks (25) and remove chain (26) from quick-release pin (11) and air intake grille (10).
- 14 Remove and discard two screws (27), bracket (28), and shims (29).



18ph255m



---

## Section I. BODY, CAB, HOOD, AND HULL ASSEMBLIES – CONTINUED

---

### 16-29 AIR INTAKE GRILLE – CONTINUED

---

#### b. Installation.

- 1 Apply thin coating of primer coating on mating surface of hull and new bracket (28).

#### NOTE

Replacement of air intake grille or support bracket requires use of grille kit to ensure proper alignment of bracket and grille.

- 2 Install new bracket (28) and new shims (29) as required on hull with two new screws (27).

#### NOTE

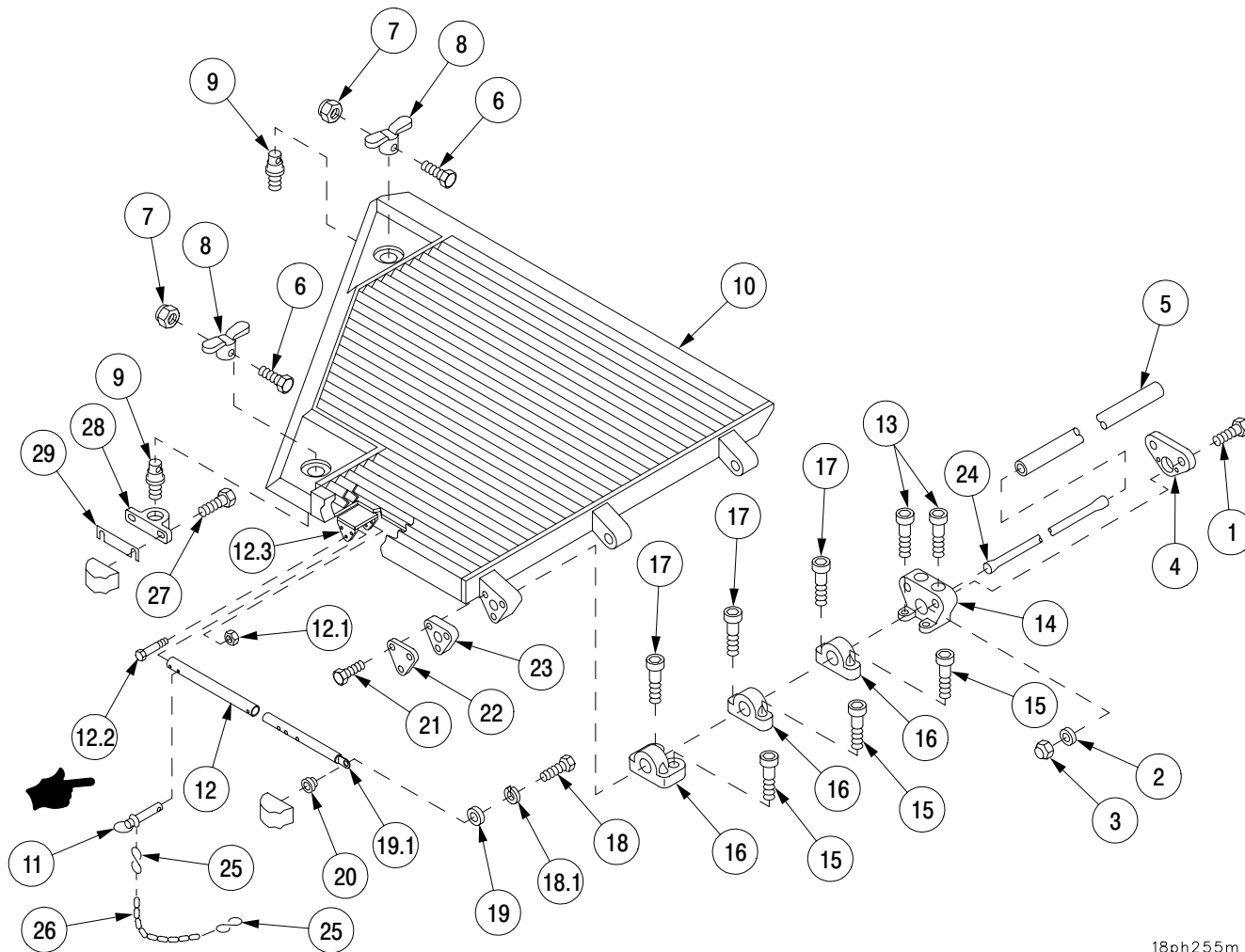
Current vehicle configuration may reflect original production parts for air intake grille support assembly. Use grille kit 57K1684 for repair of new configuration as shown in illustration. Production configuration may be repaired with original parts as listed in TM 9-2350-314-24P-1.

- 3 Connect chain (26) to quick-release pin (11) and air intake grille (10) with two S-hooks (25).
- 3.1 Install sleeve (12) to bracket (12.3) with bolt (12.2) and new self-locking nut (12.1).
- 4 Install torsion bar housing (5), torsion bar (24), and torsion bar clamps (16) onto air intake grille (10).
- 5 Attach sling to air intake grille (10) and suitable lifting device. Lift air intake grille (10) into position and align mounting holes.
- 6 Install four hex key screws (17) in front of torsion bar clamps (16).
- 7 Insert bearing (20) in end of air intake grille support (19.1). Secure bearing (20) and air intake grille support (19.1) with screw (18), new lockwasher (18.1), and flat washer (19).
- 8 Lower air intake grille (10).
- 9 Install four hex key screws (15) in rear of torsion bar clamps (16).
- 10 Install four hex key screws (13) in right end cap (14).
- 11 Raise air intake grille (10).
- 12 Install shield (22) and adapter (23) at left end of torsion bar housing (5) with three screws (21).
- 13 Install two studs (9) and two handles (8) with two screws (6) and two self-locking nuts (7).
- 14 Install shield and anchor (4) at right end of torsion bar housing (5) with two screws (1), two flat washers (2), and two nuts (3).

**Section I. BODY, CAB, HOOD, AND HULL ASSEMBLIES – CONTINUED**

**16-29 AIR INTAKE GRILLE – CONTINUED**

**b. Installation – Continued**



18ph255m

**NOTE**

Install exhaust deflector (para 16-23)  
 Close and secure air intake grille  
 (TM 9-2350-314-10)  
 Rotate gun tube 90° (TM 9-2350-314-10)



**Section I. BODY, CAB, HOOD, AND HULL ASSEMBLIES – CONTINUED**

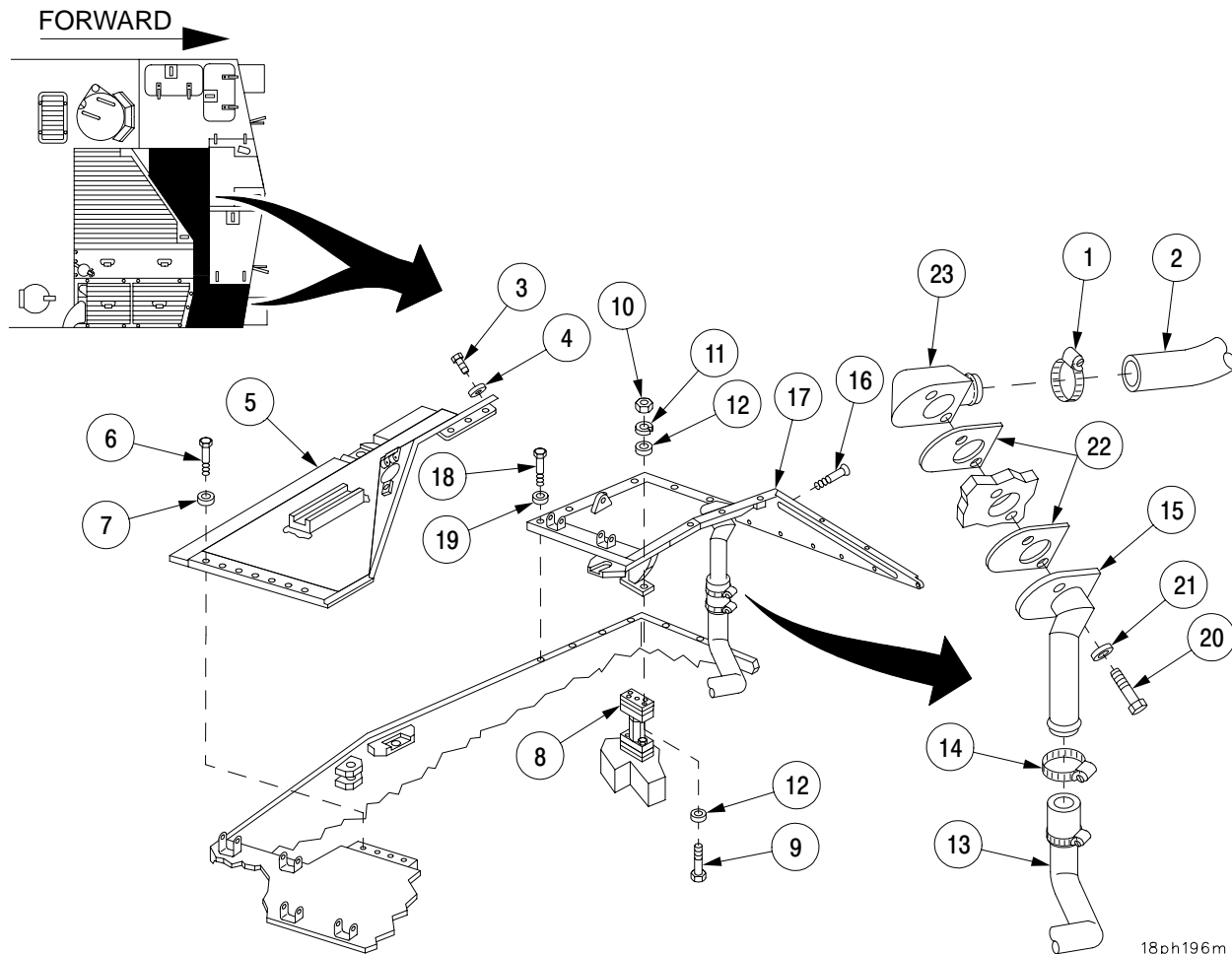
**16-30 HULL FRONT SLOPE AND EXHAUST GRILLE SUPPORT PLATE – CONTINUED**

**b. Installation.**

**NOTE**

Perform step 1 only if exhaust grille support plate was replaced.

- 1 Install cover (23), two gaskets (22), tube (15) with two flat washers (21), and two screws (20).
- 2 Position exhaust grille support plate (17) on vehicle and install seven flat washers (19) and seven screws (18).
- 3 Install six hex head screws (16) into exhaust grille support plate (17).

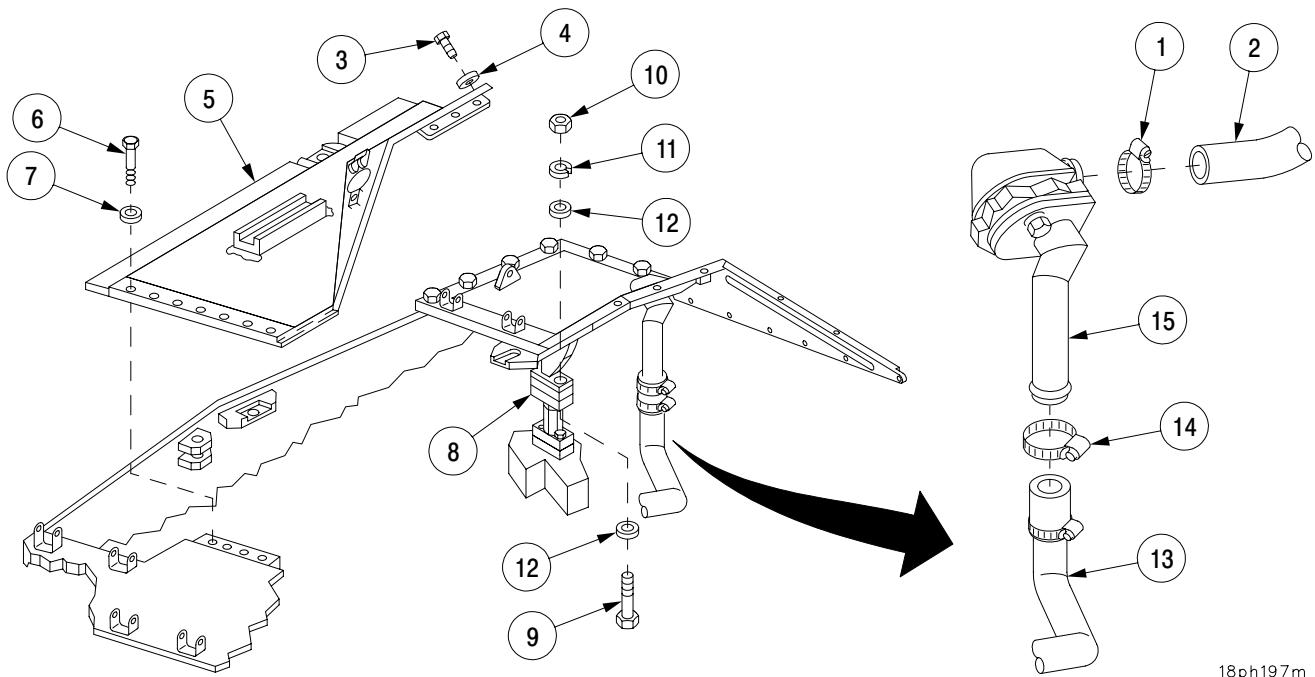


**Section I. BODY, CAB, HOOD, AND HULL ASSEMBLIES – CONTINUED**

**16-30 HULL FRONT SLOPE AND EXHAUST GRILLE SUPPORT PLATE – CONTINUED**

**b. Installation – Continued**

- 4 Connect hose (13) to tube (15) with clamp (14).
- 5 Connect support (8) by installing four flat washers (12) and two new lockwashers (11) with two nuts (10), and two screws (9).
- 6 Position front slope plate (5) on vehicle with sling and suitable lifting device.
- 7 Install seven flat washers (7) and seven screws (6) into front slope plate (5).
- 8 Install three flat washers (4) and three screws (3).
- 9 Install hose (2) and clamp (1).



18ph197m

**NOTE**

**FOLLOW-ON MAINTENANCE:**  
 Install fan access cover (para 16-26)  
 Install gun tube travel lock support (para 16-23)  
 Install transmission door support bracket  
 (para 16-21)  
 Install right transmission access door  
 (para 16-21)

**Section I. BODY, CAB, HOOD, AND HULL ASSEMBLIES – CONTINUED**

**16-31 GRILLE ADJUSTABLE SUPPORT ASSEMBLY.**

This task covers: a. Removal b. Disassembly c. Assembly d. Installation

**INITIAL SETUP**

Tools

General mechanic’s tool kit (SC 5180-90-N26)  
Machinist vise (item 74, Appx F)  
Vise jaw caps (item 9, Appx F)

Equipment Conditions

Right transmission access door opened (TM 9-2350-314-10)

References

TM 9-2350-314-10

Materials/Parts

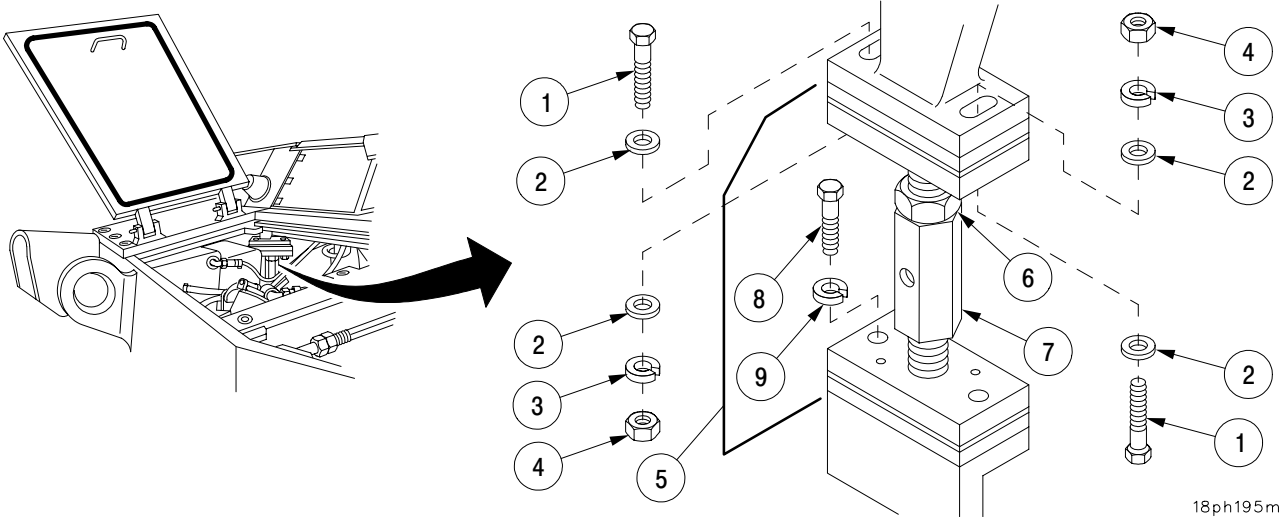
Lockwashers (4) (item 47, Appx E)  
Spring pins (2) (item 237, Appx E)

**a. Removal.**

**NOTE**

Bilge pump hose clamp is secured with lower bracket mounting screw.

- 1 Remove two screws (1), four flat washers (2), two lockwashers (3), and two nuts (4) from grille adjustable support assembly (5). Discard lockwashers.
- 2 Loosen jamnut (6) and turn grille support adjustment bar (7) counterclockwise to relieve load on adjustable support assembly (5).
- 3 Remove two screws (8), two lockwashers (9), and adjustable support assembly (5) from vehicle. Discard lockwashers.



18ph195m

## Section I. BODY, CAB, HOOD, AND HULL ASSEMBLIES – CONTINUED

---

### 16-31 GRILLE ADJUSTABLE SUPPORT ASSEMBLY – CONTINUED

---

#### NOTE

There are two adjustable screws. Each adjustable screw is threaded differently. Left and right handed threads. Tag adjustable screws prior to removal to ensure they are installed in the same position.

#### b. Disassembly.

- 1 Unscrew jamnut (6) and grille support adjustment bar (7) to disengage adjustable screws (10 and 11). Separate adjustable screws (10 and 11) and mounting plates (12) with attached parts.
- 2 Clamp mounting plate (12) in vise. Remove two spring pins (13), plate (12), shim (14), and plate (15). Discard spring pins.
- 3 Lift ball portion of adjustable screw (10 or 11) from plate (12).
- 4 Pull pin (16) from ball portion of adjustable screw (10 or 11).

#### c. Assembly.

- 1 Install pin (16) in ball portion of adjustable screw (10 or 11).
- 2 Install ball portion of adjustable screw (10 or 11) in plate (12).
- 3 Connect plate (15), shim (14), and plate (12) with two new spring pins (13).
- 4 Install jamnut (6) and adjustment bar (7) on adjustable screws (10 and 11).

#### d. Installation.

#### NOTE

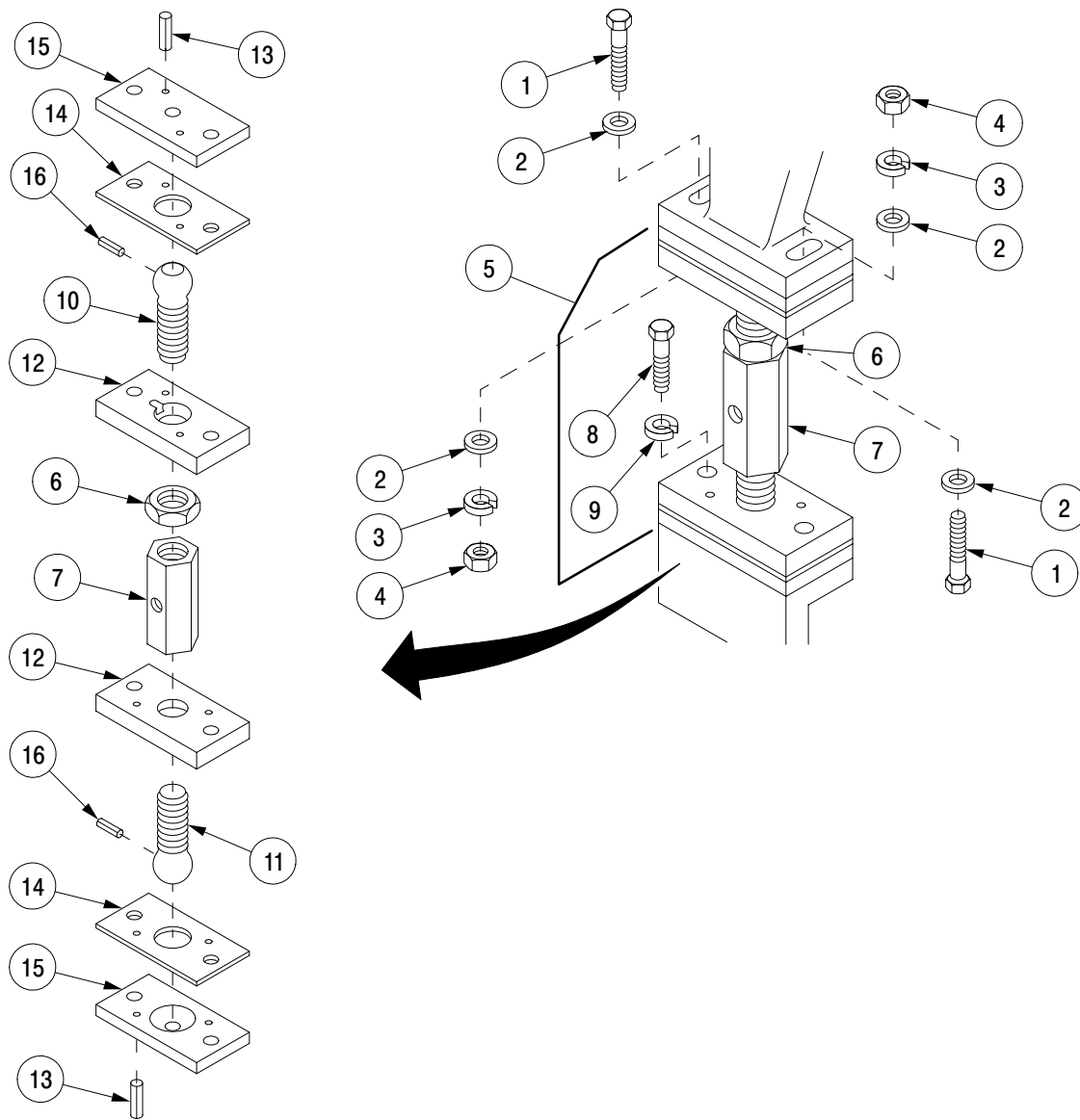
Bilge pump hose clamp is secured with lower bracket mounting screw.

- 1 Position grille adjustable support assembly (5) between upper mount on underside of grille support plate and lower mount on hull.
- 2 Secure lower end of grille adjustable support assembly (5) with two screws (8) and two new lockwashers (9).
- 3 Secure upper end of grille adjustable support assembly (5) with two screws (1), four flat washers (2), two new lockwashers (3), and two nuts (4).
- 4 Adjust height of grille adjustable support assembly (5) to support weight of grille by turning grille support adjustment bar (7). Tighten jamnut (6).

**Section I. BODY, CAB, HOOD, AND HULL ASSEMBLIES – CONTINUED**

**16-31 GRILLE ADJUSTABLE SUPPORT ASSEMBLY – CONTINUED**

**d. Installation – Continued**



18ph175m

**NOTE**

**FOLLOW-ON MAINTENANCE:**

Close and secure right transmission access door  
(TM 9-2350-314-10)





**Section II. FENDERS**

**16-33 FENDERS.**

This task covers: a. Removal b. Installation

**INITIAL SETUP**

Tools

General mechanic's tool kit  
(SC 5180-90-N26)

Personnel Required

Two (rear fender only)

Materials/Parts

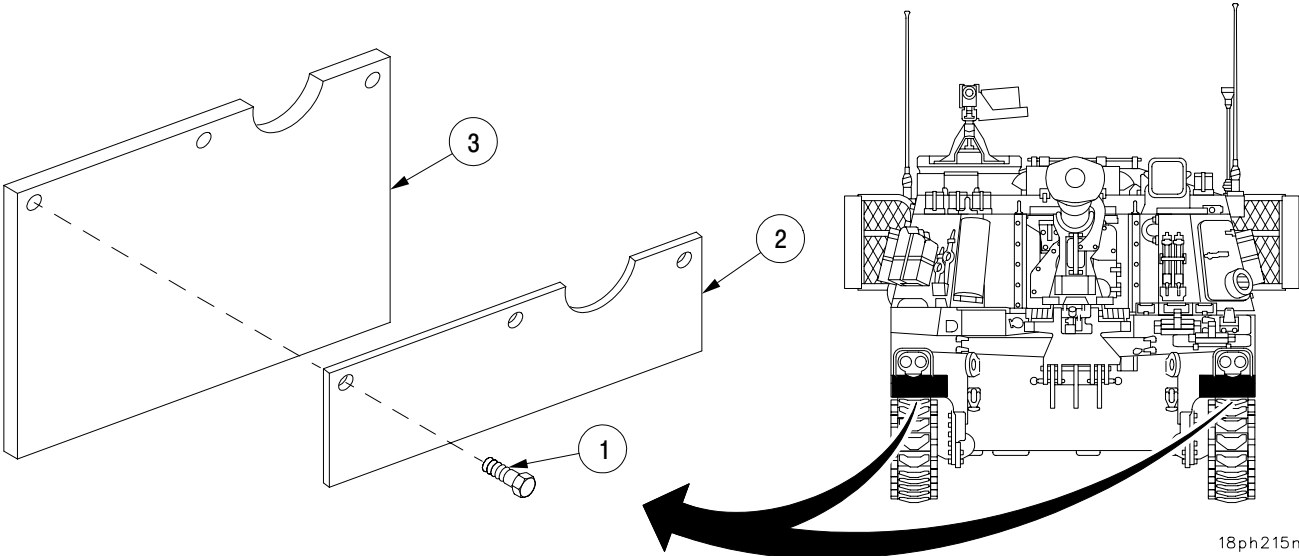
Cotter pins (2) (item 238, Appx E)

**NOTE**

- To replace front fender, perform Removal step 1 and Installation step 2.
- To replace rear fender, perform Removal step 2 and Installation step 1.

**a. Removal.**

1 Remove three screws (1), retainer (2), and front fender (3).



---

## Section II. FENDERS – CONTINUED

---

### 16-33 FENDERS – CONTINUED

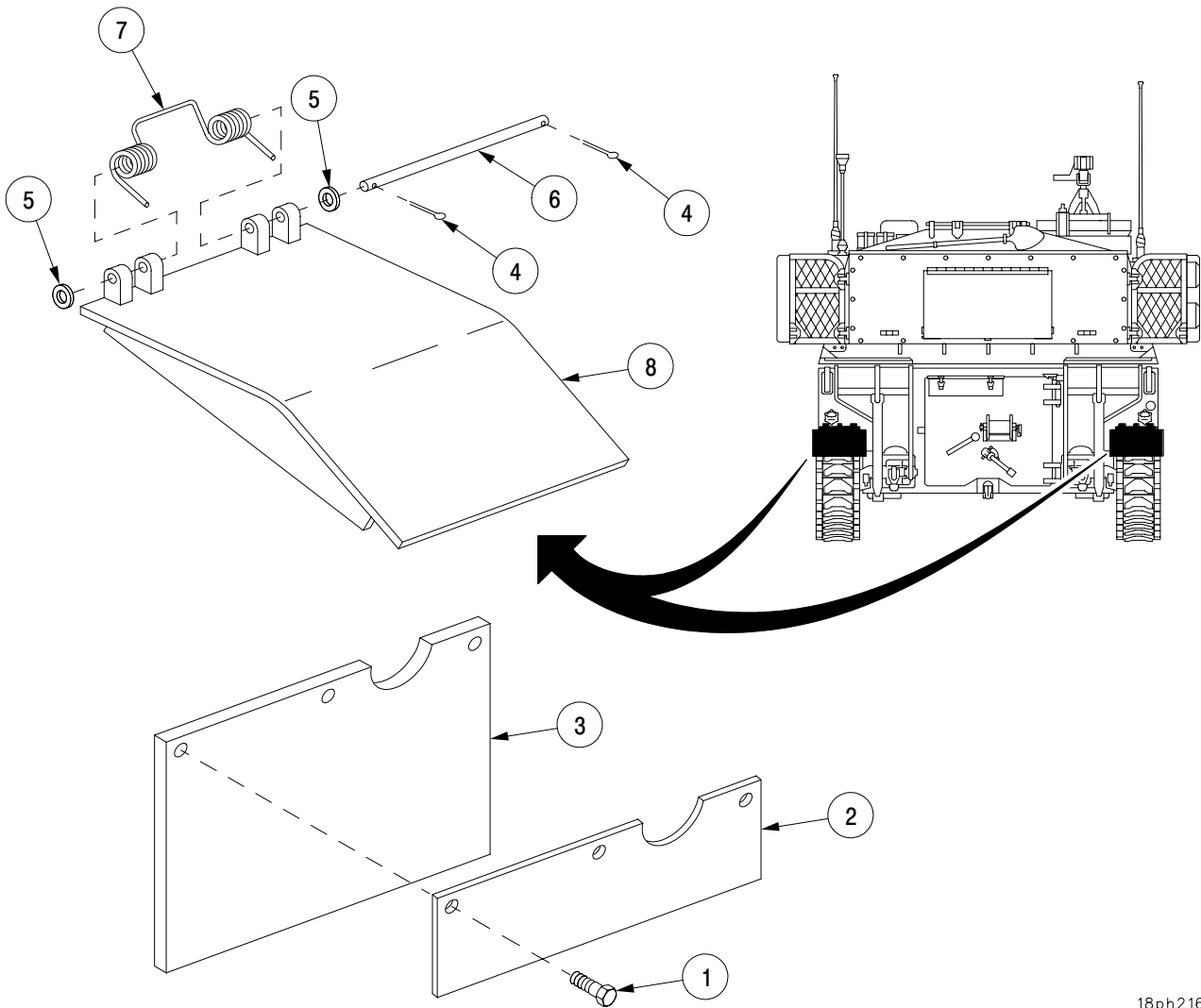
---

#### a. Removal – Continued

- 2 Remove two cotter pins (4), two flat washers (5), rod (6), spring (7), and rear fender (8). Discard cotter pins.

#### b. Installation.

- 1 Install rear fender (8) with spring (7), rod (6), two flat washers (5), and two new cotter pins (4).
- 2 Install front fender (3) with retainer (2) and three screws (1).



18ph216m

---

**Section III. DRIVER'S HATCH AND PERISCOPES**

---

**16-34 DRIVER'S HATCH ARMOR PLATE AND HANDGRIPS.**

---

This task covers:        a. Removal                                b. Installation

---

**INITIAL SETUP**

Tools

General mechanic's tool kit  
(SC 5180-90-N26)  
Torque wrench (item 86, Appx F)

Materials/Parts

Lockwashers (13) (item 5, Appx E)  
Lockwashers (4) (item 22, Appx E)

Equipment Condition

Driver's hatch secured in closed position  
(TM 9-2350-314-10)

Personnel Required

Two

References

TM 9-2350-314-10

---

**Section III. DRIVER'S HATCH AND PERISCOPE – CONTINUED**

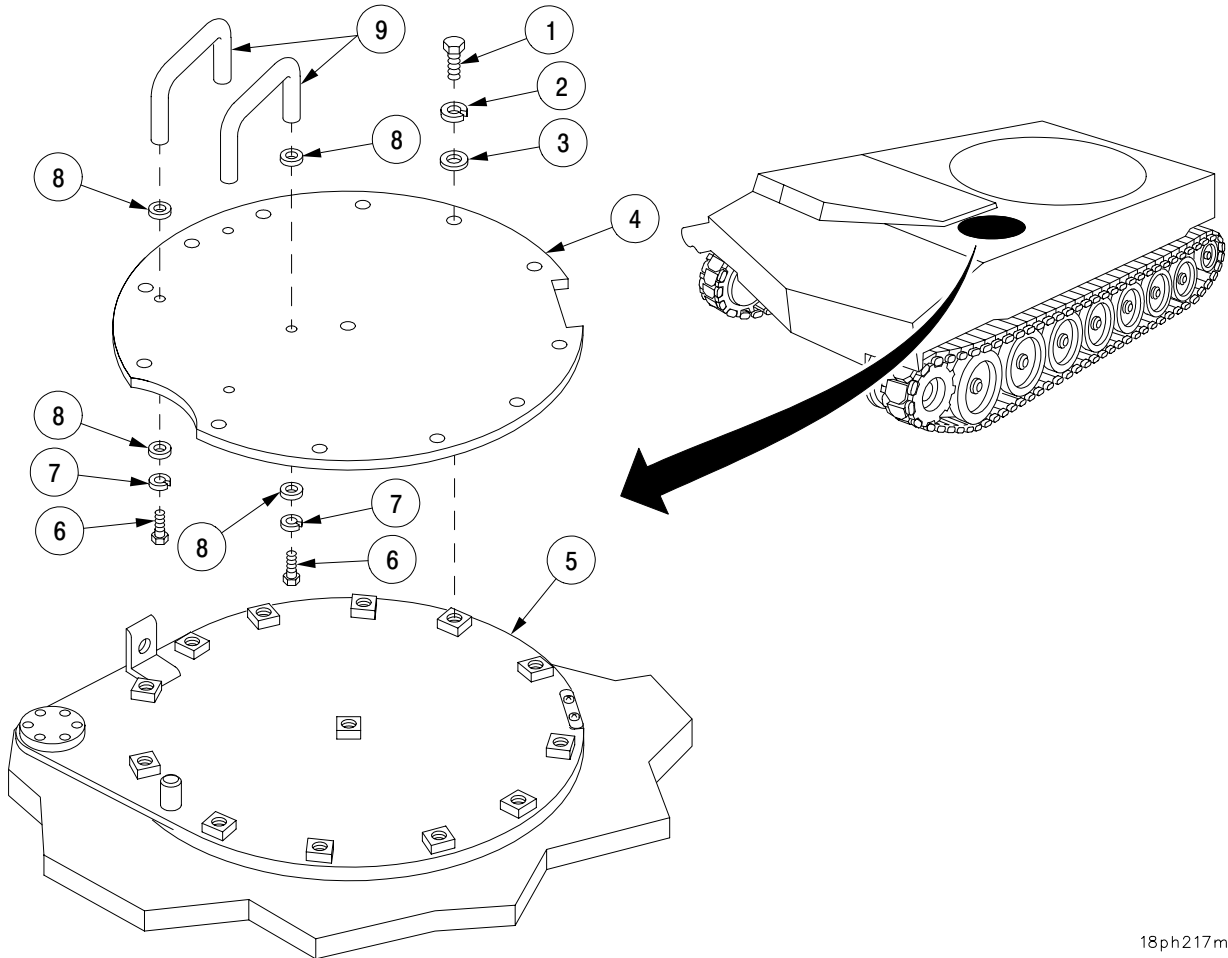
**16-34 DRIVER'S HATCH ARMOR PLATE AND HANDGRIPS – CONTINUED**

**a. Removal.**

- 1 Remove 13 screws (1), 13 lockwashers (2), 13 flat washers (3), and armor plate (4) from driver's hatch cover (5). Discard lockwashers.
- 2 Remove four screws (6), four lockwashers (7), eight flat washers (8), and two handgrips (9) from armor plate (4). Discard lockwashers.

**b. Installation.**

- 1 Install two handgrips (9), eight flat washers (8), four new lockwashers (7), and four screws (6) on armor plate (4). Torque screws to 8-10 lb-ft (11-14 N·m).
- 2 Install armor plate (4), 13 flat washers (3), 13 new lockwashers (2), and 13 screws (1) on driver's hatch cover (5). Torque screws to 32-34 lb-ft (43-46 N·m).



18ph217m



**Section III. DRIVER'S HATCH AND PERISCOPE – CONTINUED**

---

**16-35 DRIVER'S HATCH COVER AND LOCK COMPONENTS – CONTINUED**

---

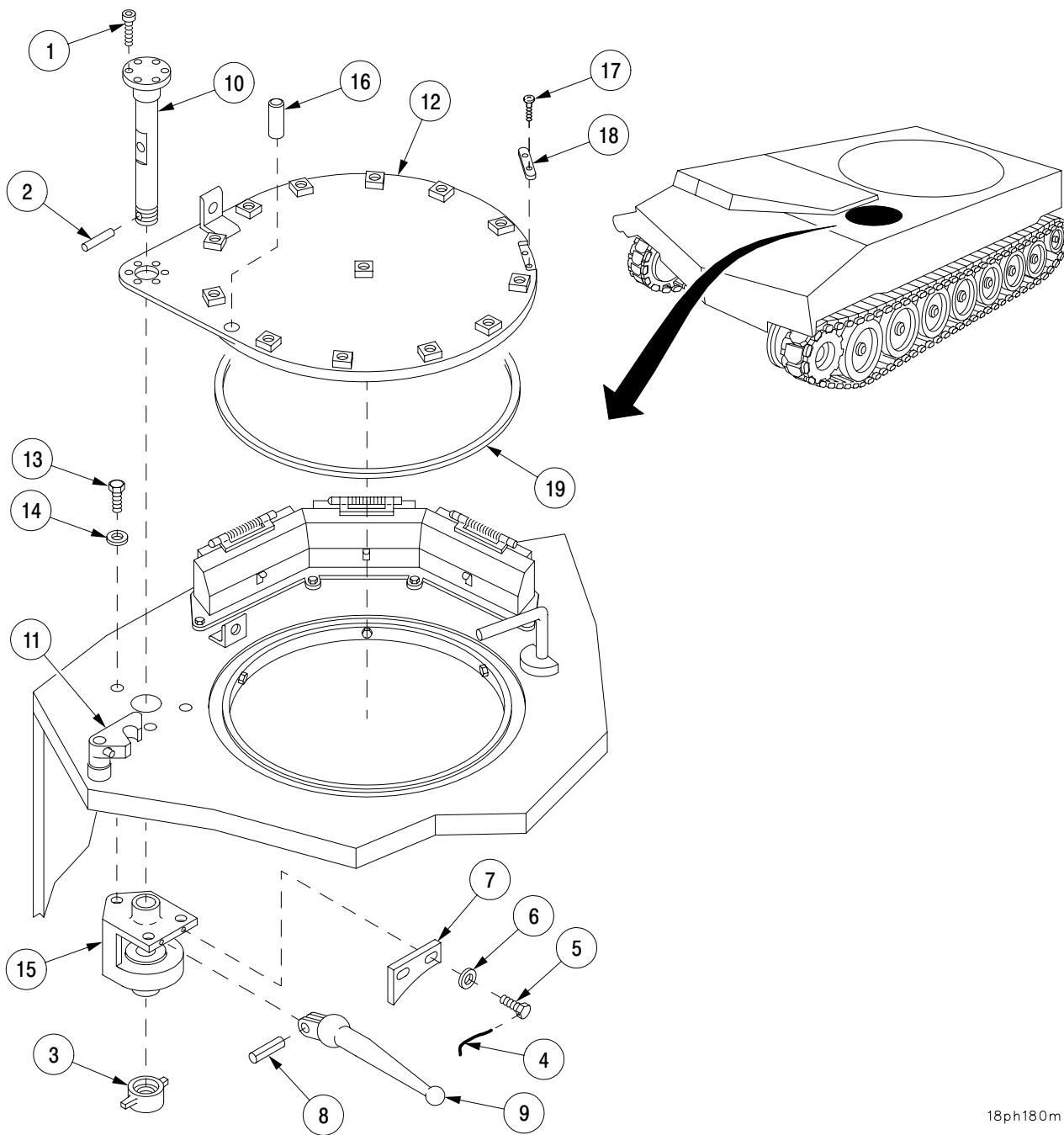
**a. Removal.**

- 1 Remove six screws (1), spring pin (2), and chuck (3) from closed hatch cover assembly. Discard spring pin.
- 2 Remove lockwire (4), two screws (5), two flat washers (6), and camlock (7). Discard lockwire.
- 3 Punch out spring pin (8). Discard spring pin.
- 4 Remove lever (9) and shaft (10).
- 5 Swing hatch stop (11) away from hatch and lift off hatch cover (12).
- 6 Remove three screws (13), three flat washers (14), and housing (15).
- 7 Remove pin (16), two screws (17), and plate (18).
- 8 Remove preformed packing (19) from hatch cover (12). Discard preformed packing.

Section III. DRIVER'S HATCH AND PERISCOPES – CONTINUED

16-35 DRIVER'S HATCH COVER AND LOCK COMPONENTS – CONTINUED

a. Removal – Continued



18ph180m



### Section III. DRIVER'S HATCH AND PERISCOPE – CONTINUED

---

#### 16-35 DRIVER'S HATCH COVER AND LOCK COMPONENTS – CONTINUED

---

a. Removal – Continued

**NOTE**

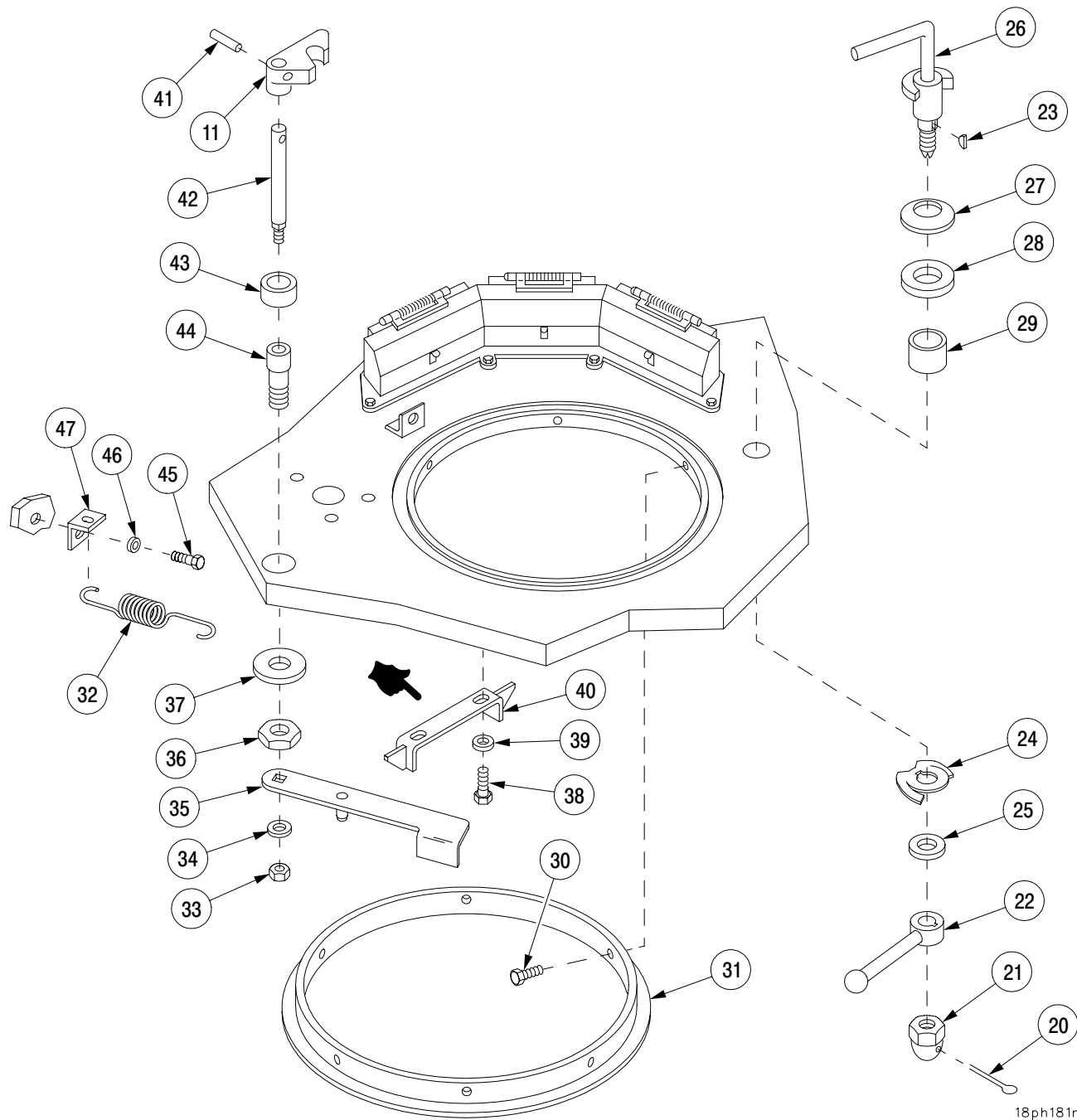
Flat washer quantity will vary with installation.

- 9 Remove the following located inside the hull: cotter pin (20), adjusting nut (21), lever (22), woodruff key (23), special spring (24), and flat washer (25). Discard cotter pin and special spring.
- 10 Remove the following located outside the hull: locking cam (26), spring washer (27), flat washer (28), and sleeve bearing (29). Discard spring washer.
- 11 Remove six screws (30) and nonmetallic seal (31). Discard seal.
- 12 Remove spring (32), nut (33), flat washer (34), and handle (35).
- 13 Remove nut (36) and flat washer (37).
- 14 Remove two screws (38), two flat washers (39), and holding lever stop (40).
- 15 Remove grooved pin (41), hatch stop (11), pin (42), bumper (43), and locking sleeve (44). Discard grooved pin.
- 16 Remove screw (45), flat washer (46), and angle bracket (47).

Section III. DRIVER'S HATCH AND PERISCOPE – CONTINUED

16-35 DRIVER'S HATCH COVER AND LOCK COMPONENTS – CONTINUED

a. Removal – Continued



18ph181m

### Section III. DRIVER'S HATCH AND PERISCOPE – CONTINUED

---

#### 16-35 DRIVER'S HATCH COVER AND LOCK COMPONENTS – CONTINUED

---

##### b. Installation.

- 1 Install angle bracket (47) with screw (45) and flat washer (46).
- 2 Install locking sleeve (44), bumper (43), pin (42), hatch stop (11), and new grooved pin (41).
- 3 Install holding lever stop (40) with two screws (38) and two flat washers (39). Install flat washer (37) and nut (36).
- 4 Install handle (35) with flat washer (34) and nut (33).
- 5 Install spring (32).

**WARNING**

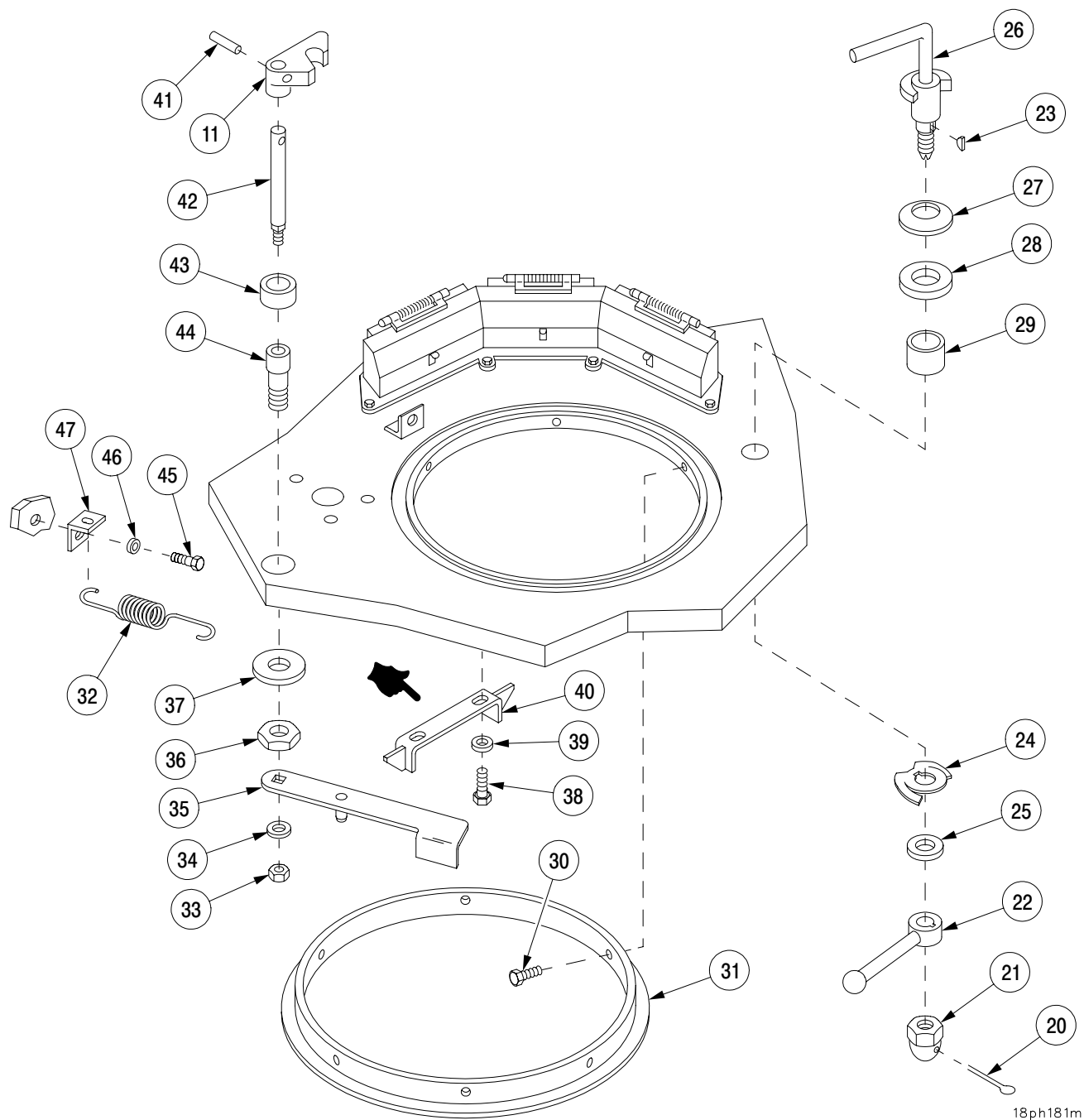
Dry-cleaning solvent (P-D-680) is toxic and flammable. To avoid injury, wear protective goggles and gloves and use only in a well-ventilated area. Avoid contact with skin, eyes, and clothes. Do not breathe vapors. Do not use near open flame or excessive heat. Do not smoke when using solvent. Failure to do so could cause **SERIOUS INJURY**. If you become dizzy while using dry-cleaning solvent, get fresh air immediately, and if necessary, get medical attention. If contact with skin or clothes is made, flush thoroughly with water. If the solvent contacts your eyes, wash them with water immediately and obtain medical aid (FM 21-11).

- 6 Remove old sealing compound with dry-cleaning solvent and wire brush.
- 7 Apply new sealing compound to seal ring on hatch opening using acid brush.
- 8 Install new nonmetallic seal (31) with six screws (30). Make sure a complete seal is made.
- 9 Install sleeve bearing (29), flat washers (28), new spring washer (27), and locking cam (26).
- 10 Install flat washer (25), new special spring (24), woodruff key (23), lever (22), adjusting nut (21), and new cotter pin (20).

Section III. DRIVER'S HATCH AND PERISCOPE – CONTINUED

16-35 DRIVER'S HATCH COVER AND LOCK COMPONENTS – CONTINUED

b. Installation – Continued



18ph181m

### Section III. DRIVER'S HATCH AND PERISCOPE – CONTINUED

---

#### 16-35 DRIVER'S HATCH COVER AND LOCK COMPONENTS – CONTINUED

---

##### b. Installation – Continued

- 11 Install housing (15) to hull interior using three screws (13) and three flat washers (14).

**WARNING**

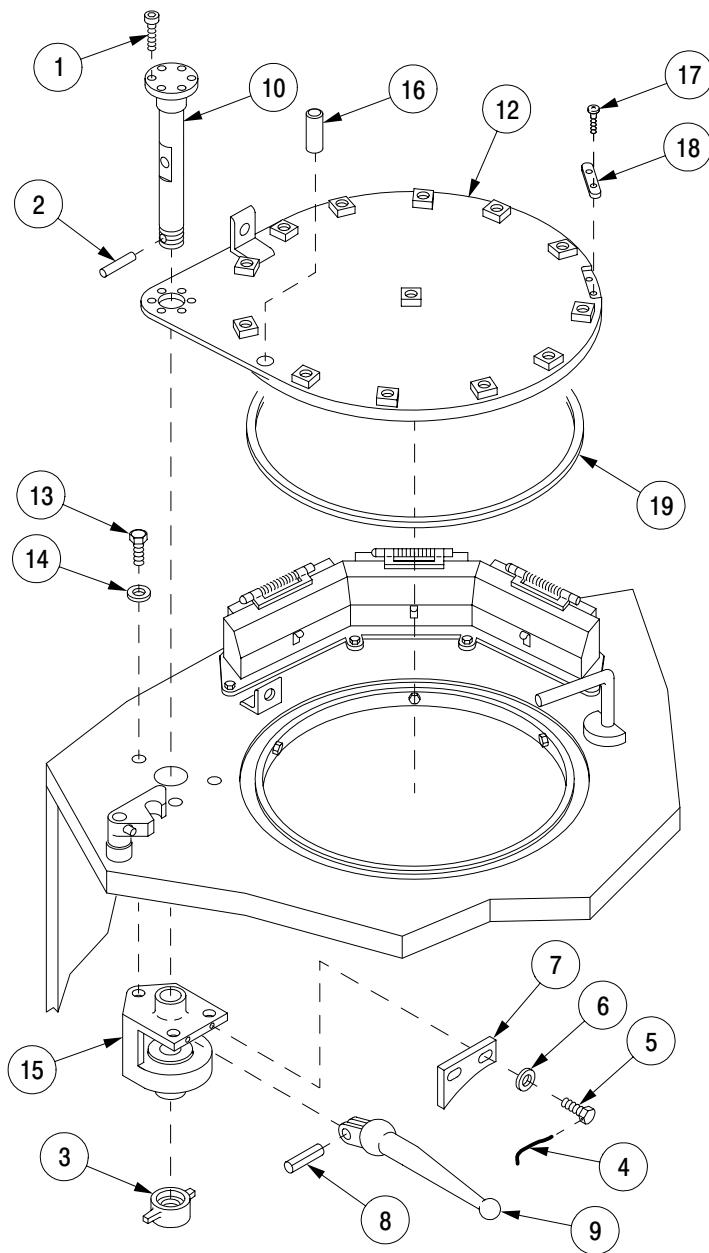
Dry-cleaning solvent (P-D-680) is toxic and flammable. To avoid injury, wear protective goggles and gloves and use only in a well-ventilated area. Avoid contact with skin, eyes, and clothes. Do not breathe vapors. Do not use near open flame or excessive heat. Do not smoke when using solvent. Failure to do so could cause SERIOUS INJURY. If you become dizzy while using dry-cleaning solvent, get fresh air immediately, and if necessary, get medical attention. If contact with skin or clothes is made, flush thoroughly with water. If the solvent contacts your eyes, wash them with water immediately and obtain medical aid (FM 21-11).

- 12 Remove old sealing compound with dry-cleaning solvent and wire brush.
- 13 Apply new sealing compound to seal ring on hatch cover (12) using acid brush.
- 14 Install new preformed packing (19) to seal ring on hatch cover (12). Make sure a complete seal is made.
- 15 Carefully lower hatch cover (12) into a closed position.
- 16 Install shaft (10) and lever (9).
- 17 Install new spring pin (8).
- 18 Install camlock (7) with two screws (5) and two flat washers (6). Install new lockwire (4).
- 19 Install chuck (3), new spring pin (2), and six screws (1).
- 20 Install pin (16), two screws (17), and plate (18).

Section III. DRIVER'S HATCH AND PERISCOPEs – CONTINUED

16-35 DRIVER'S HATCH COVER AND LOCK COMPONENTS – CONTINUED

d. Installation – Continued



18ph182m

**NOTE**  
**FOLLOW-ON MAINTENANCE:**  
 Install armor plate (para 16-34)



---

**Section III. DRIVER'S HATCH AND PERISCOPES – CONTINUED**

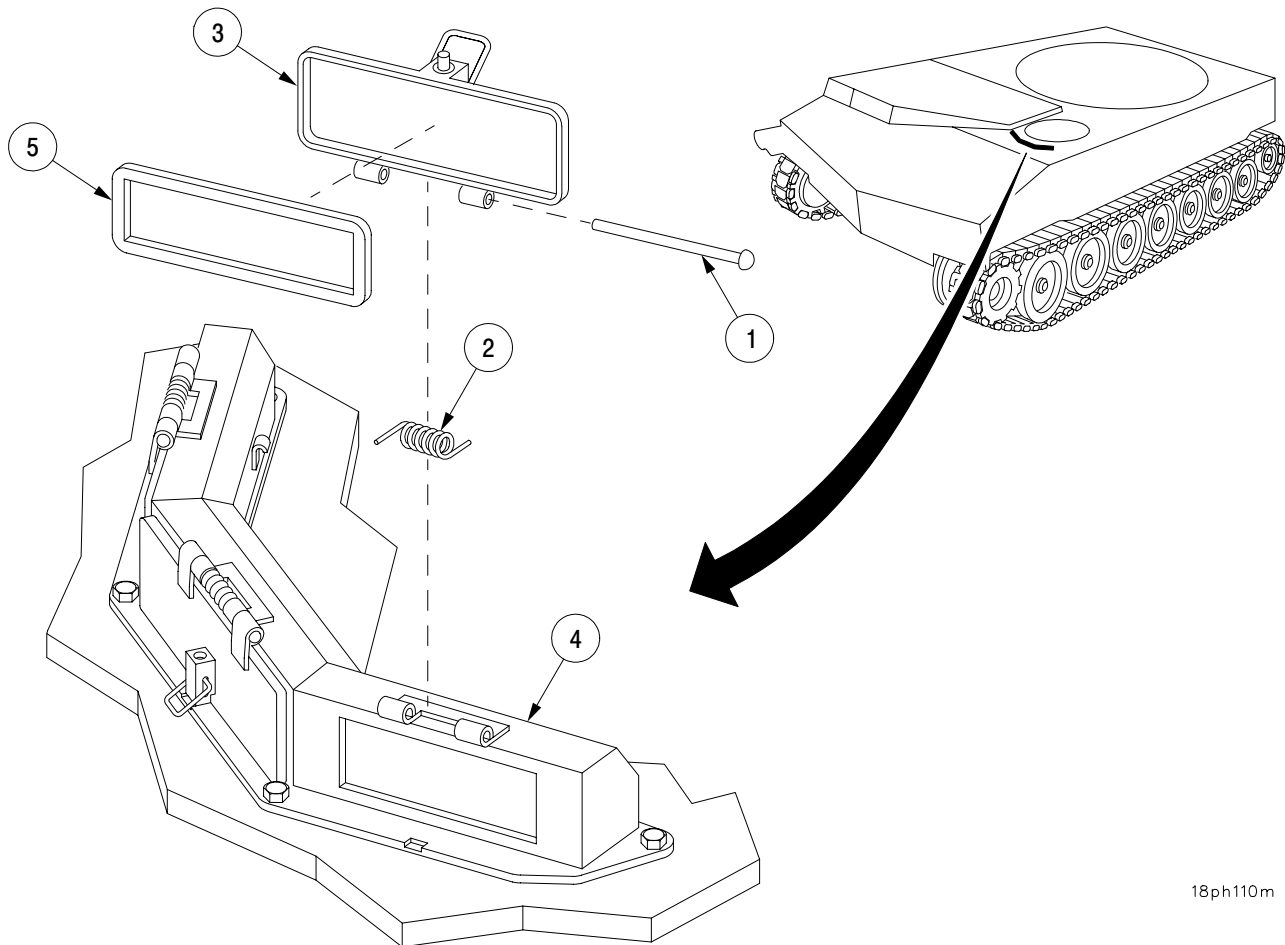

---

**16-36 NIGHT VIEWER AND M45 PERISCOPE COVER DOORS, PINS, SPRINGS, AND SEALS – CONTINUED**


---

**b. Installation.**

- 1 Apply thin coat of adhesive on mounting surface of door (3) using acid brush.
- 2 Install new seal (5) in mounting surface of door (3).
- 3 Install door (3) on cover (4) with spring (2) and new pin (1). Peen pin (1).



18ph110m

**NOTE**

**FOLLOW-ON MAINTENANCE:**  
 Install periscope (TM 9-2350-314-10)  
 Install driver's night viewer  
 (TM 9-2350-314-10)

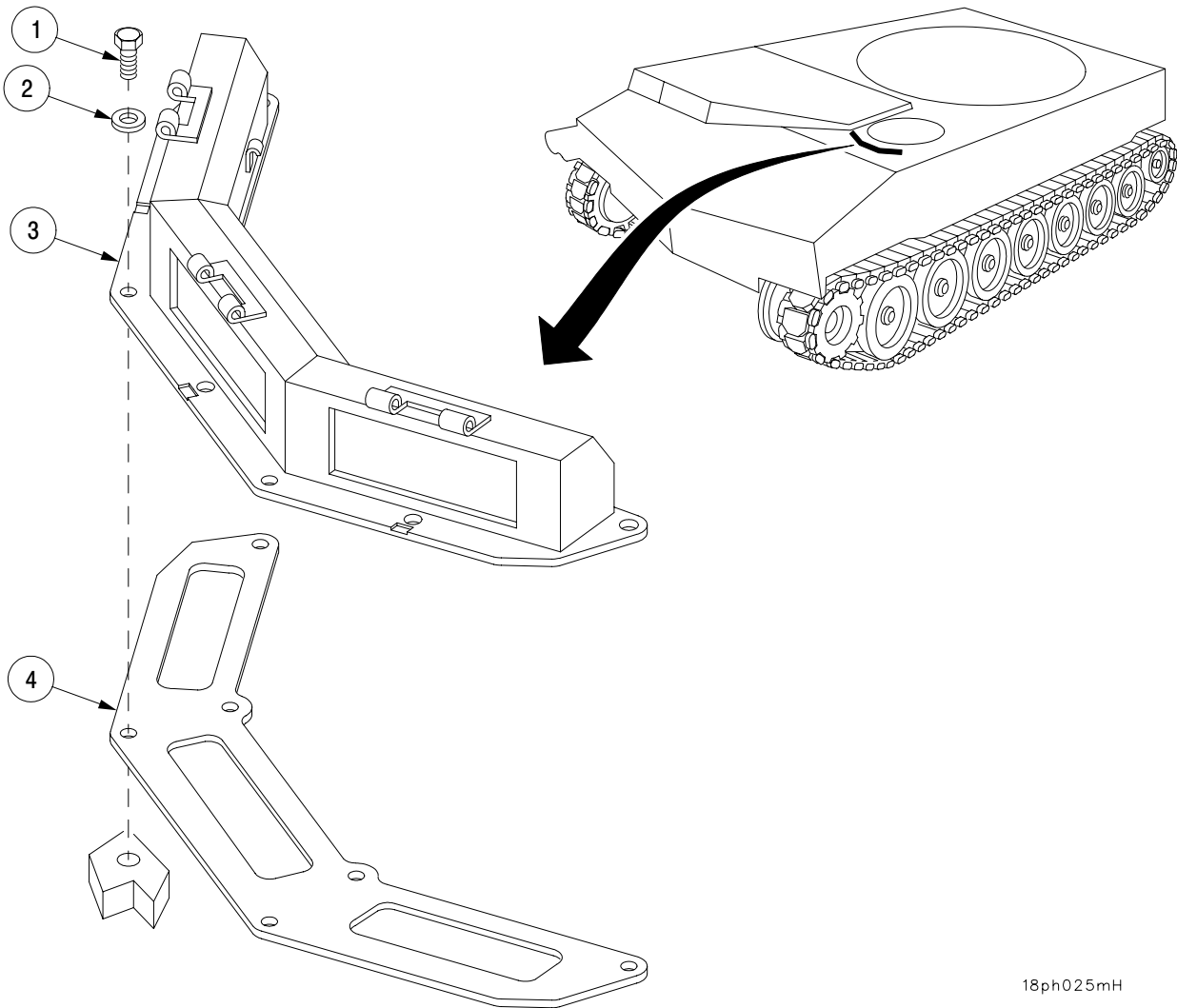




**Section III. DRIVER'S HATCH AND PERISCOPES – CONTINUED**

**16-37 NIGHT VIEWER AND M45 PERISCOPE COVER AND GASKET – CONTINUED**

**b. Installation – Continued**



**NOTE**

**FOLLOW-ON MAINTENANCE:**  
 Install cover doors (para 16-36)  
 Install periscope (TM 9-2350-314-10)  
 Install driver's night viewer (TM 9-2350-314-10)

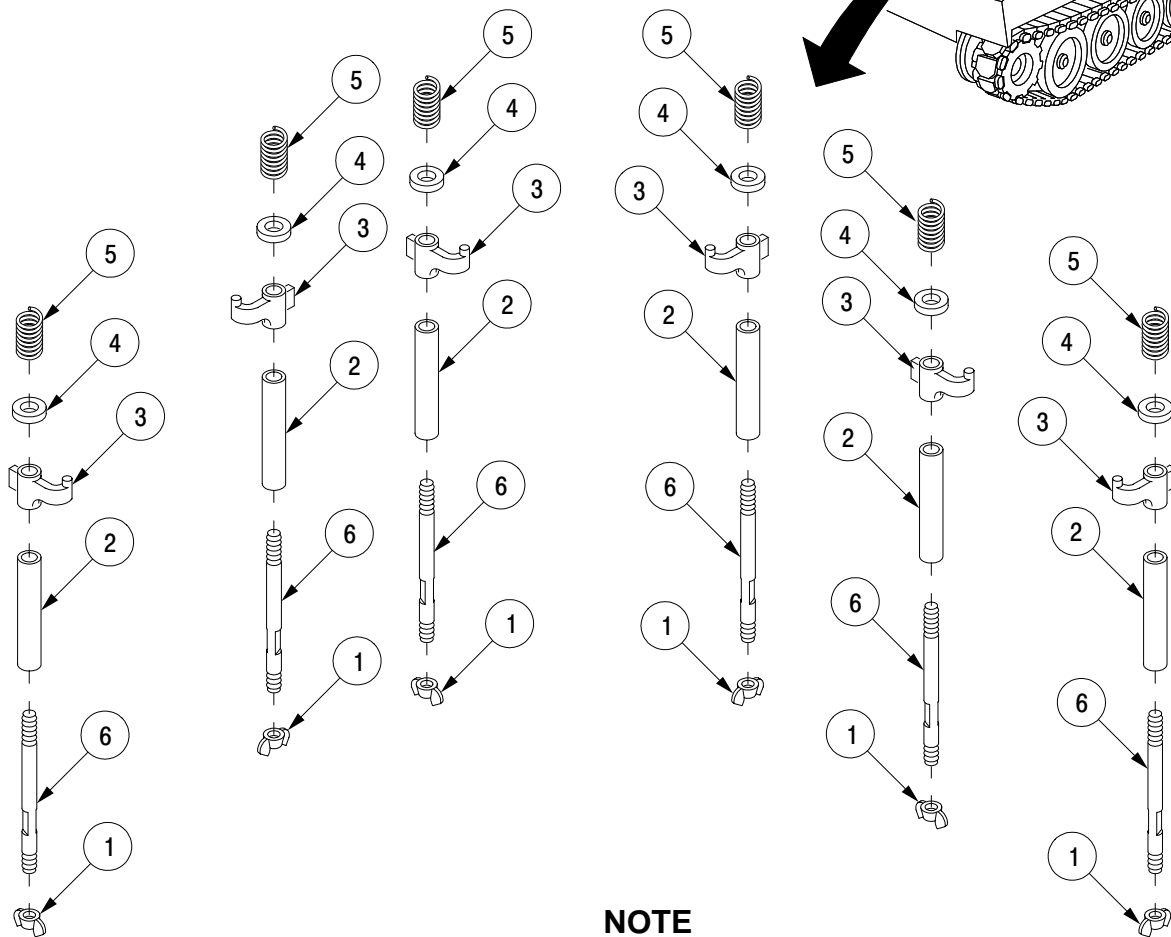


**Section III. DRIVER'S HATCH AND PERISCOPES – CONTINUED**

**16-38 NIGHT VIEWER AND M45 PERISCOPE SUPPORTS, SPRINGS, SPACERS, AND RODS – CONTINUED**

**b. Installation.**

- 1 Apply sealing compound to rod ends.
- 2 Install rod (6) in hull.
- 3 Install spring (5) on rod (6).
- 4 Install flat washer (4) and support (3) on rod (6).
- 5 Install spacer (2).
- 6 Install wingnut (1).
- 7 Peen rod end (6).



**NOTE**  
**FOLLOW-ON MAINTENANCE:**  
 Install periscope (TM 9-2350-314-10)  
 Install driver's night viewer (TM  
 9-2350-314-10)

18ph063m

## Section IV. DRAIN PLUGS

---

### 16-39 SUBFLOOR DRAIN PLUGS.

---

This task covers:    a. Removal                    b. Disassembly                    c. Assembly                    d. Installation

---

#### **INITIAL SETUP**

##### Tools

General mechanic's tool kit  
(SC 5180-90-N26)

##### Materials/Parts

Preformed packing (item 250, Appx E)  
Cotter pin (item 249, Appx E)

---

#### **WARNING**

Track must be blocked so that the vehicle will not roll out of control during subfloor drain plug maintenance. Failure to securely block vehicle tracks may result in severe injury to personnel or equipment damage.

#### **NOTE**

All drain plug assemblies are removed/disassembled/assembled/installed in the same manner.

##### **a. Removal.**

Remove drain plug assembly (1).

##### **b. Disassembly.**

- 1 Remove and discard cotter pin (2) from fastener (3).
- 2 Remove and discard preformed packing (4) from drain plug (5).

##### **c. Assembly.**

- 1 Install new preformed packing (4) on drain plug (5).
- 2 Install new cotter pin (2) in fastener (3).

##### **d. Installation.**

Install drain plug assembly (1) in vehicle with new cotter pin (2).

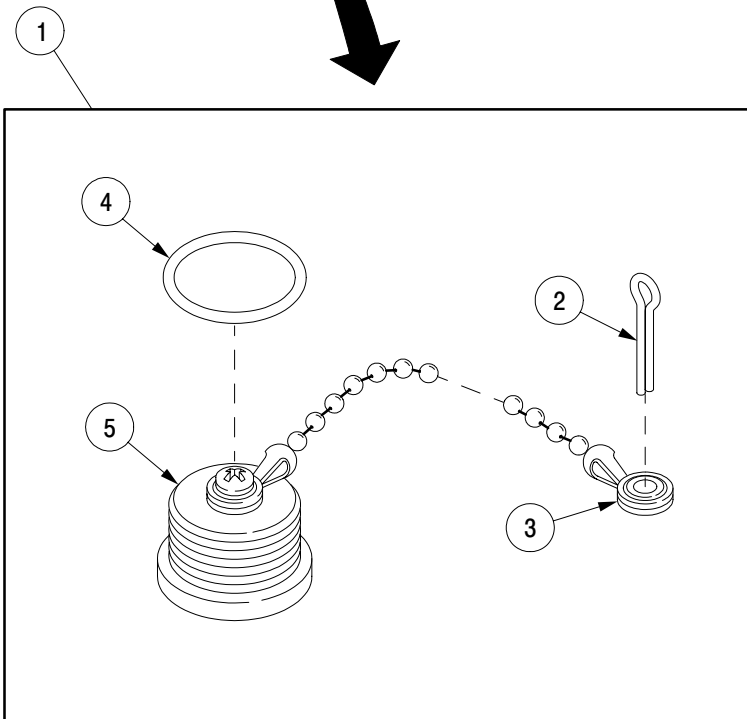
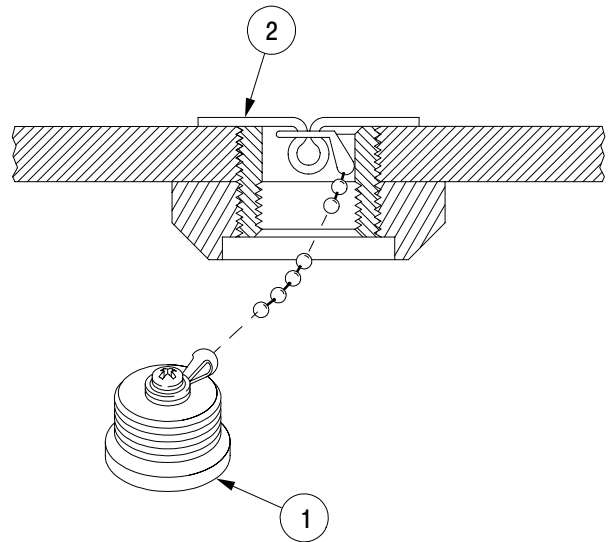
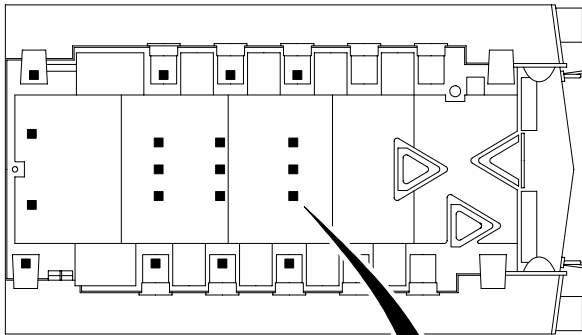
Section IV. DRAIN PLUGS – CONTINUED

16-39 SUBFLOOR DRAIN PLUGS – CONTINUED

d. Installation – Continued

BOTTOM VIEW OF VEHICLE

FORWARD 



18ph178m



**Section V. FLOOR, SUBFLOOR, AND RELATED COMPONENTS – CONTINUED**

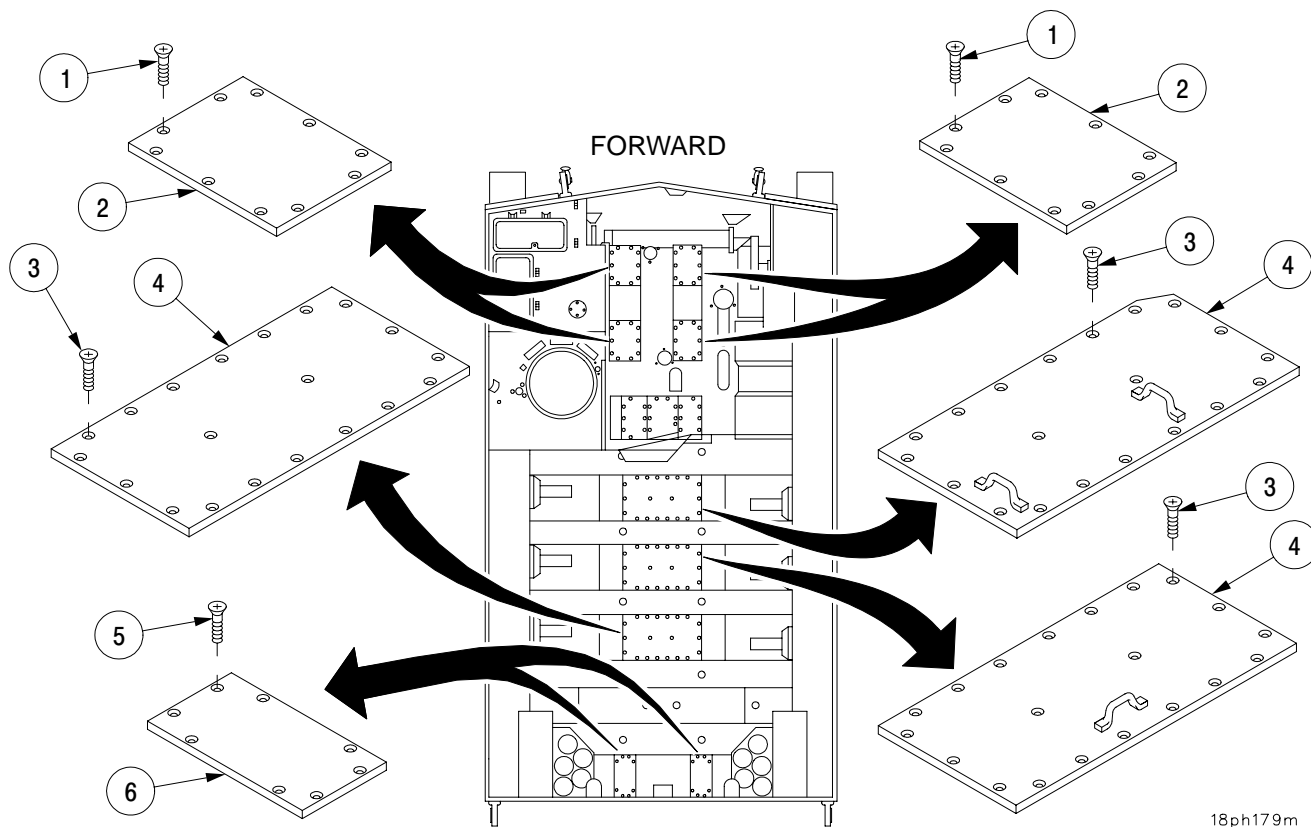
**16-40 TORSION BAR ANCHOR COVER PLATES – CONTINUED**

**a. Removal – Continued**

**NOTE**

Each of two plates is removed in the same manner.

- 3 Remove eight screws (5) and plate (6).



18ph179m



**Section V. FLOOR, SUBFLOOR, AND RELATED COMPONENTS – CONTINUED**

---

**16-40 TORSION BAR ANCHOR COVER PLATES – CONTINUED**

---

**a. Removal – Continued**

**WARNING**

Dry-cleaning solvent (P-D-680) is toxic and flammable. To avoid injury, wear protective goggles and gloves and use only in a well-ventilated area. Avoid contact with skin, eyes, and clothes. Do not breathe vapors. Do not use near open flame or excessive heat. Do not smoke when using solvent. Failure to do so could cause **SERIOUS INJURY**. If you become dizzy while using dry-cleaning solvent, get fresh air immediately, and if necessary, get medical attention. If contact with skin or clothes is made, flush thoroughly with water. If the solvent contacts your eyes, wash them with water immediately and obtain medical aid (FM 21-11).

- 4 Clean mounting and mating surfaces of plates (2, 4, and 6) with dry-cleaning solvent and wire brush.

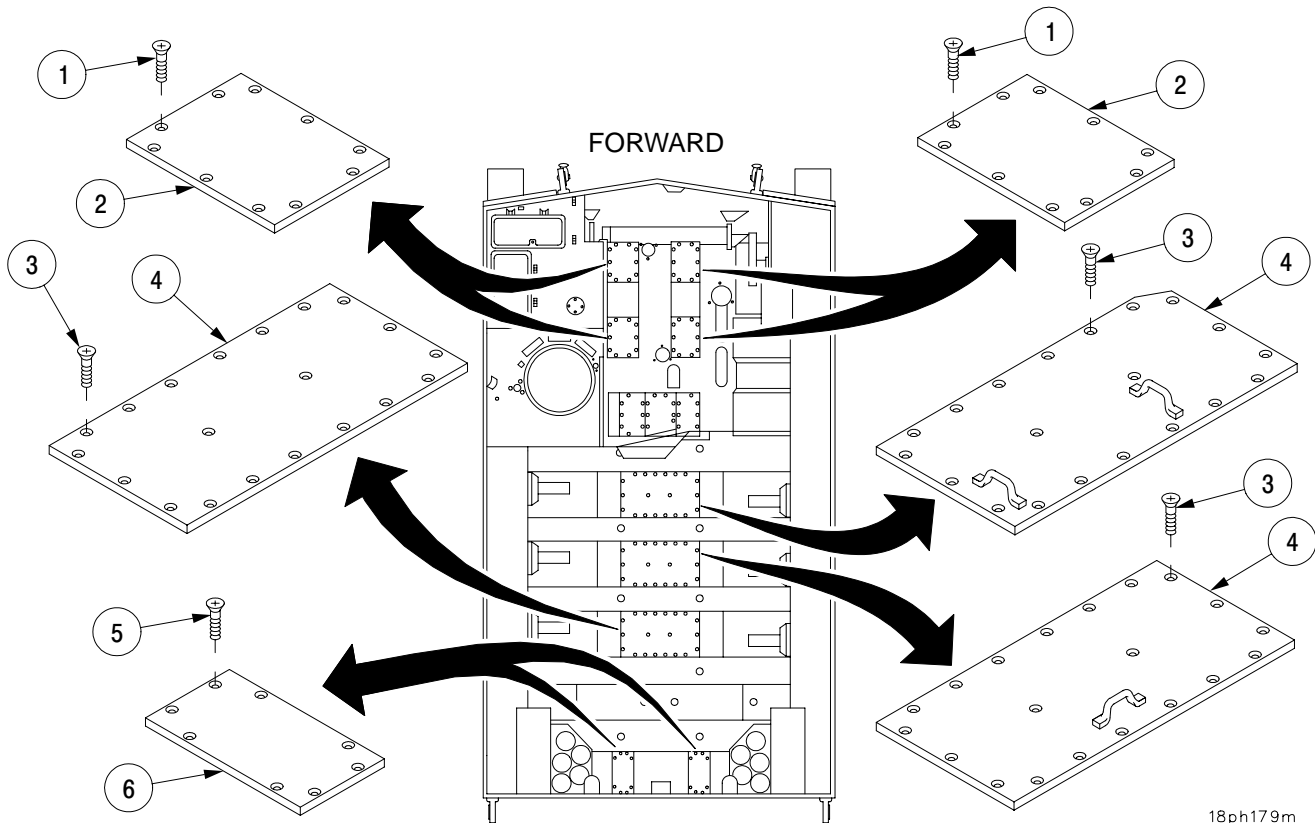
**b. Installation.**

- 1 Apply sealing compound around edges of cover plates (2, 4, and 6) and threads of screws (1 and 5).
- 2 Install plate (6) with eight screws (5). Torque screws to 15–20 lb-ft (20–27 N·m).
- 3 Install plate (4) with 20 screws (3). Torque screws to 15–20 lb-ft (20–27 N·m).
- 4 Install plate (2) with 10 screws (1). Torque screws to 15–20 lb-ft (20–27 N·m).
- 5 Clean excess sealing compound from plates (2, 4, and 6).

**Section V. FLOOR, SUBFLOOR, AND RELATED COMPONENTS – CONTINUED**

**16-40 TORSION BAR ANCHOR COVER PLATES – CONTINUED**

**b. Installation – Continued**



18ph179m

**NOTE**

**FOLLOW-ON MAINTENANCE:**

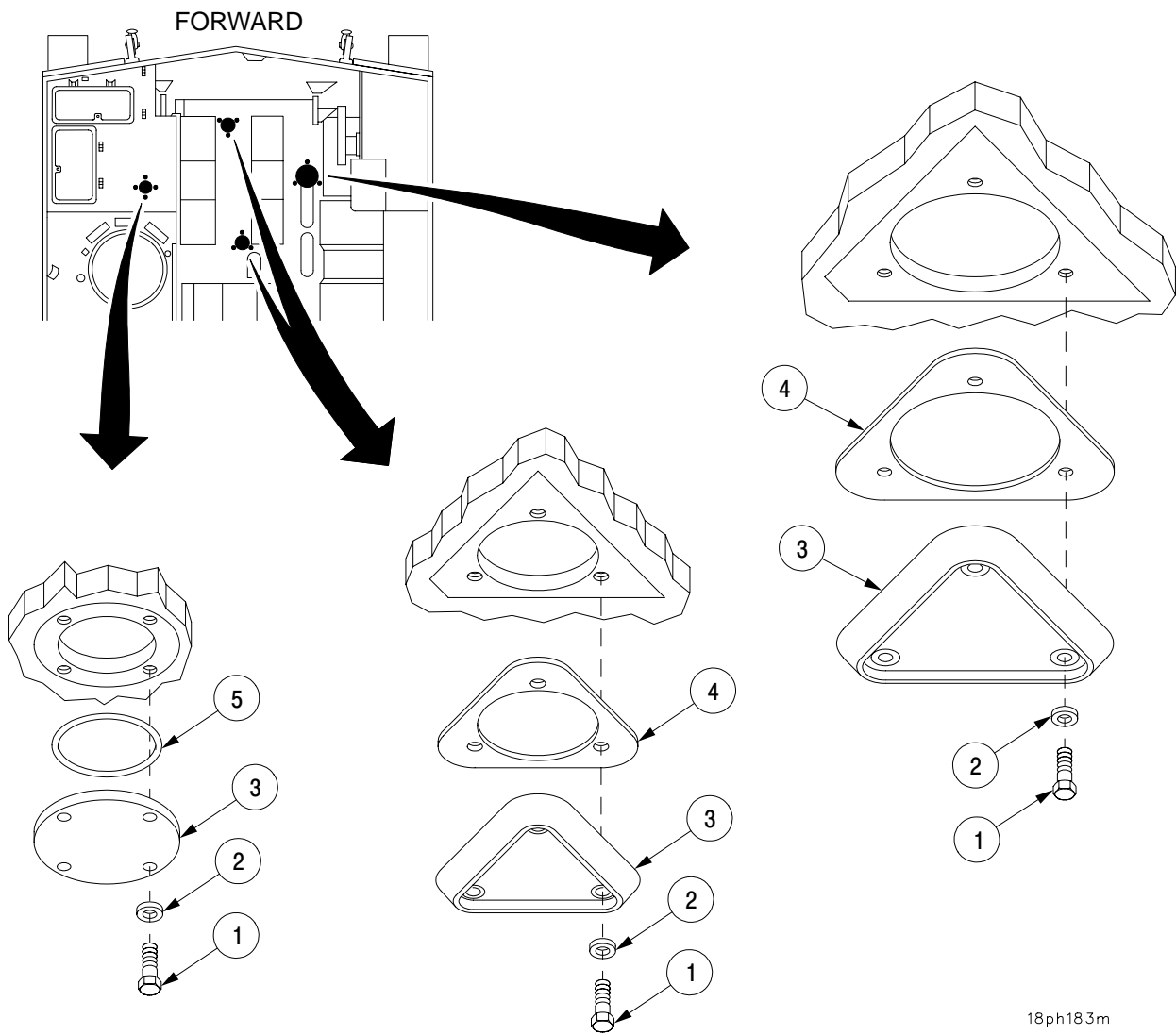
- Install floor mats
- Install air cleaner motor bracket (station 4 only)  
(para 5-8)
- Install powerpack (stations 1 and 2 only)  
(para 4-1)



Section V. FLOOR, SUBFLOOR, AND RELATED COMPONENTS – CONTINUED

16-41 HULL SUBFLOOR ACCESS COVERS – CONTINUED

b. Installation – Continued



18ph183m



---

**Section V. FLOOR, SUBFLOOR, AND RELATED COMPONENTS – CONTINUED**

---

**16-42 FINAL DRIVE SKID PLATES – CONTINUED**

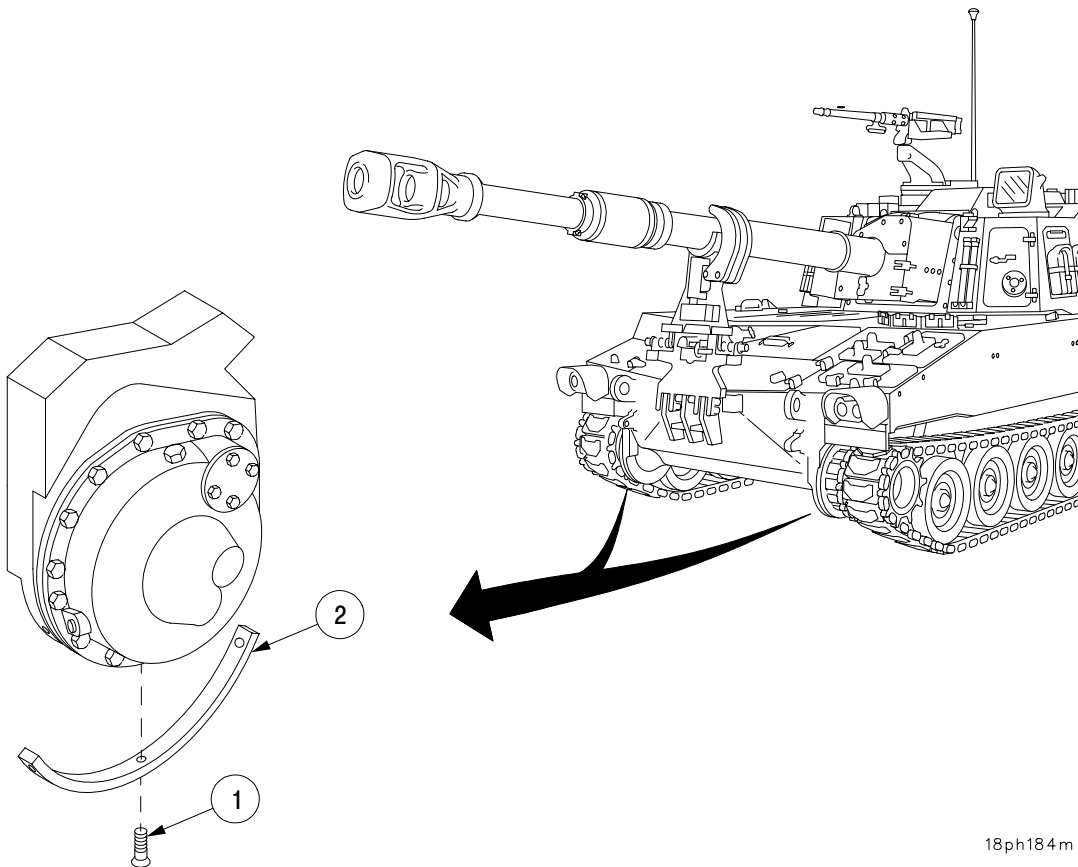
---

**a. Removal.**

Remove three screws (1) and final drive skid plate (2) from bottom of vehicle.

**b. Installation.**

Install final drive skid plate (2) on bottom of vehicle with three screws (1).



18ph184m

---

**Section V. FLOOR, SUBFLOOR, AND RELATED COMPONENTS – CONTINUED**

---

**16-43 HULL EXPANSION PLUGS.**

---

This task covers:      a. Removal                                      b. Installation

---

**INITIAL SETUP**

Tools

General mechanic's tool kit  
(SC 5180-90-N-26)

Equipment Conditions

Floor mats removed

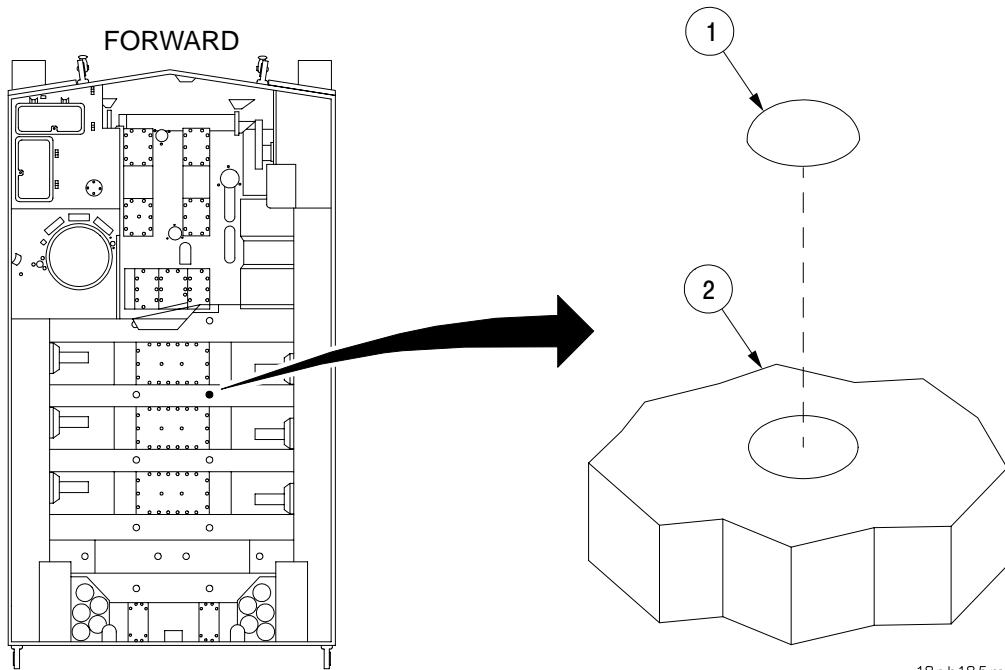
---

**a. Removal.**

Remove plug (1) from vehicle floor (2).

**b. Installation.**

Install plug (1) in vehicle floor (2).



18ph185m

**NOTE**

**FOLLOW-ON MAINTENANCE:**

Install floor mats

**Section VI. DRIVER'S SEAT**

**16-44 DRIVER'S SEAT.**

This task covers: a. Removal b. Disassembly c. Assembly d. Installation

**INITIAL SETUP**

Tools

General mechanic's tool kit  
(SC 5180-90-N26)

Materials/Parts

Sealing compound (item 51, Appx C)  
Cotter pin (item 238, Appx E)  
Self-locking nut (item 232, Appx E)  
Self-locking nut (item 14, Appx E)  
Self-locking nuts (4) (item 254, Appx E)  
Self-locking nuts (4) (item 255, Appx E)  
Self-locking nut (item 256, Appx E)  
Cotter pin (item 137, Appx E)  
Self-locking nuts (2) (item 231, Appx E)

Equipment Conditions

Driver's hatch open and secured  
(TM 9-2350-314-10)

Personnel Required

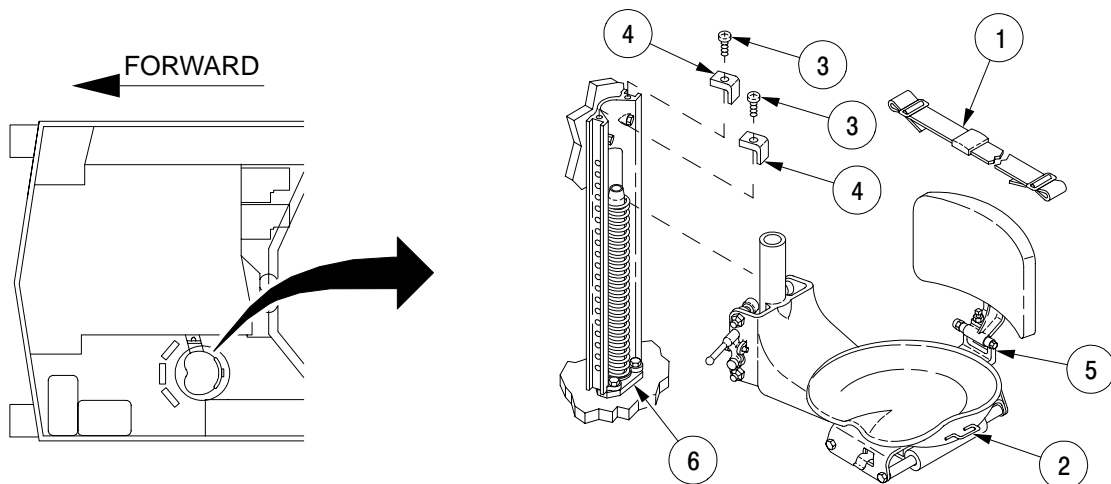
Two

References

TM 9-2350-314-10

**a. Removal.**

- 1 Remove seatbelt (1) from seat retainers (2).
- 2 Remove two screws (3) and two pads (4).
- 3 Lift driver's seat assembly (5) off vertical support (6).



18ph186m

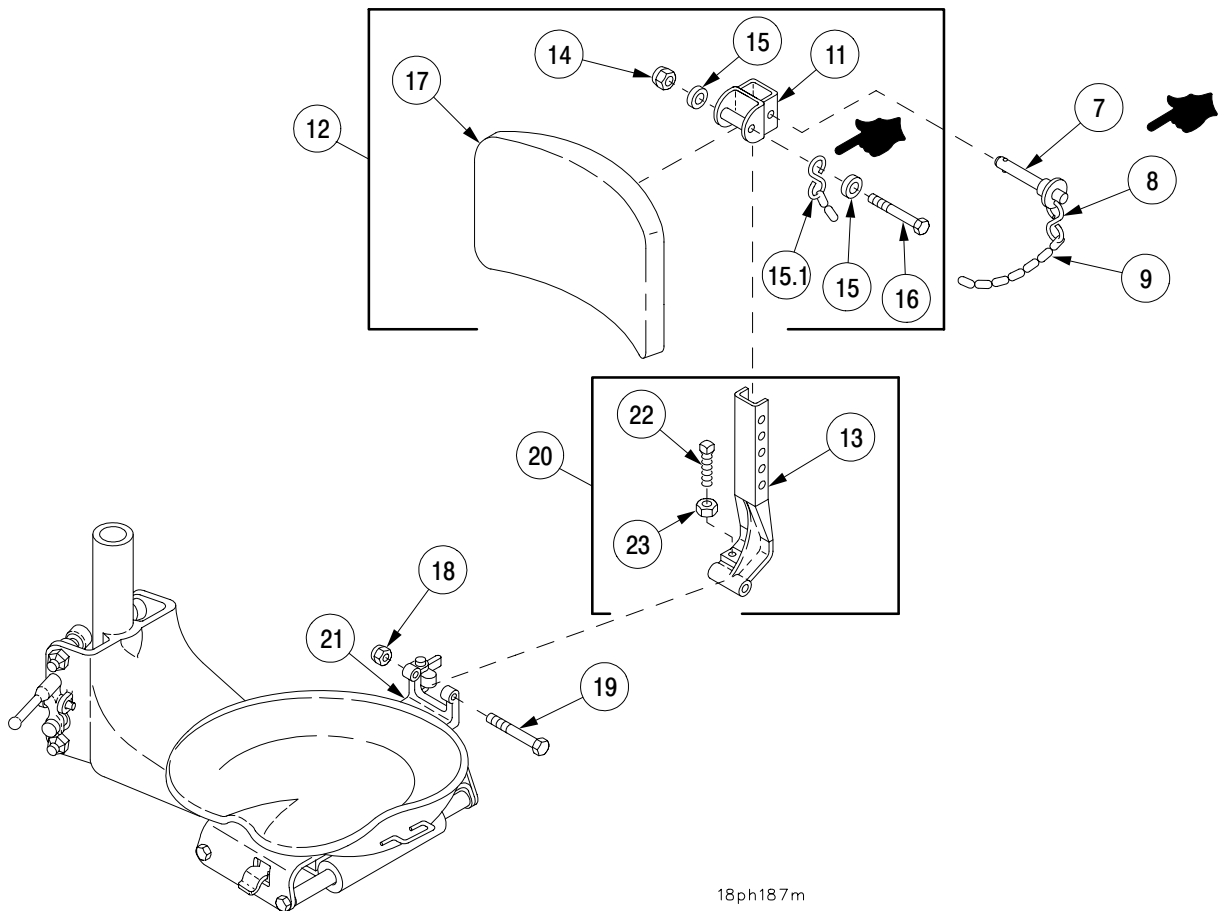


Section VI. DRIVER'S SEAT – CONTINUED

16-44 DRIVER'S SEAT – CONTINUED

b. Disassembly.

- 1 Remove quick-release pin (7) with hook (8), and chain (9) from bracket (11).
- 2 Remove backrest assembly (12) from seat support (13).
- 3 Remove self-locking nut (14), two flat washers (15), hook (15.1) with chain (9) and screw (16) from bracket (11). Discard self-locking nut.
- 4 Remove bracket (11) from backrest frame (17).
- 5 Remove self-locking nut (18), screw (19), and backrest support assembly (20) from backrest bracket (21).
- 6 Remove adjusting screw (22) and nut (23) from seat support (13).



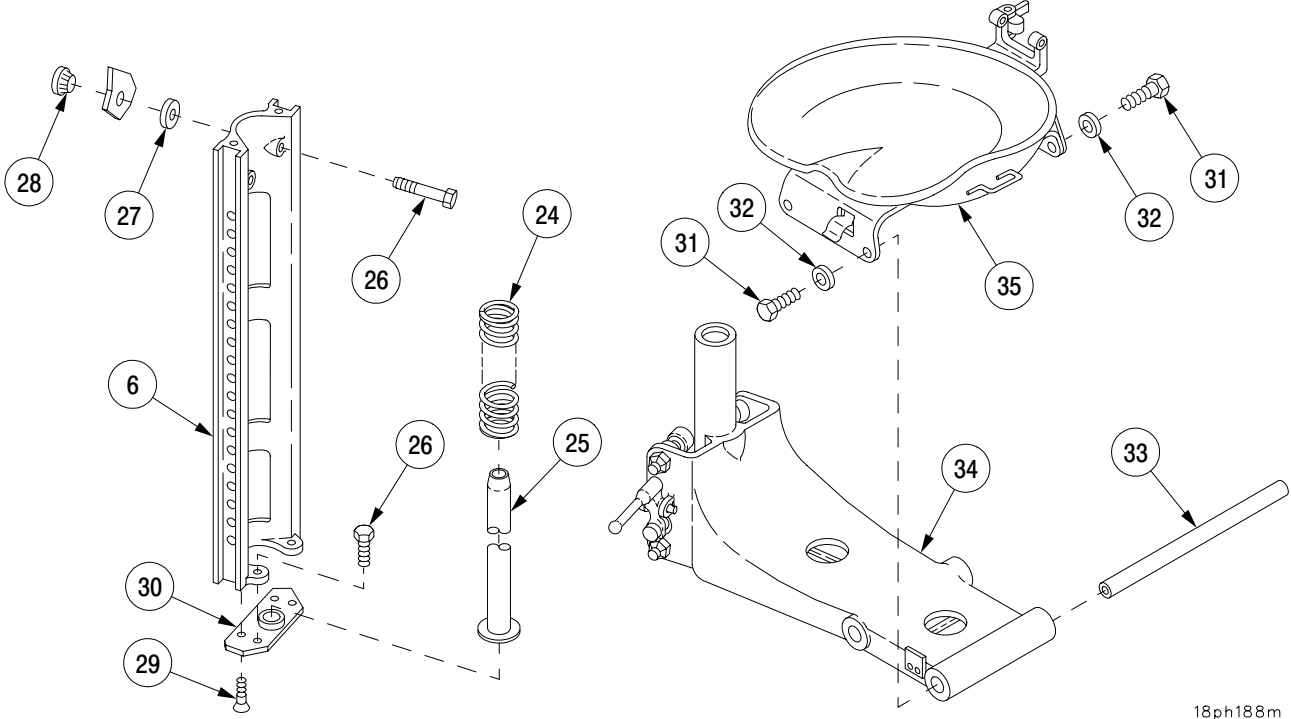
18ph187m

**Section VI. DRIVER'S SEAT – CONTINUED**

**16-44 DRIVER'S SEAT – CONTINUED**

**b. Disassembly – Continued**

- 7 Remove spring (24) and vertical guide (25) from vertical support (6).
- 8 Remove four screws (26), two flat washers (27), two nuts (28), and vertical support (6) from driver's compartment.
- 9 Remove two screws (29) and base plate (30) from vertical support (6).
- 10 Remove four screws (31), four flat washers (32), two horizontal slide bars (33), and seat support bracket (34) from seat assembly (35).



18ph188m

---

## Section VI. DRIVER'S SEAT – CONTINUED

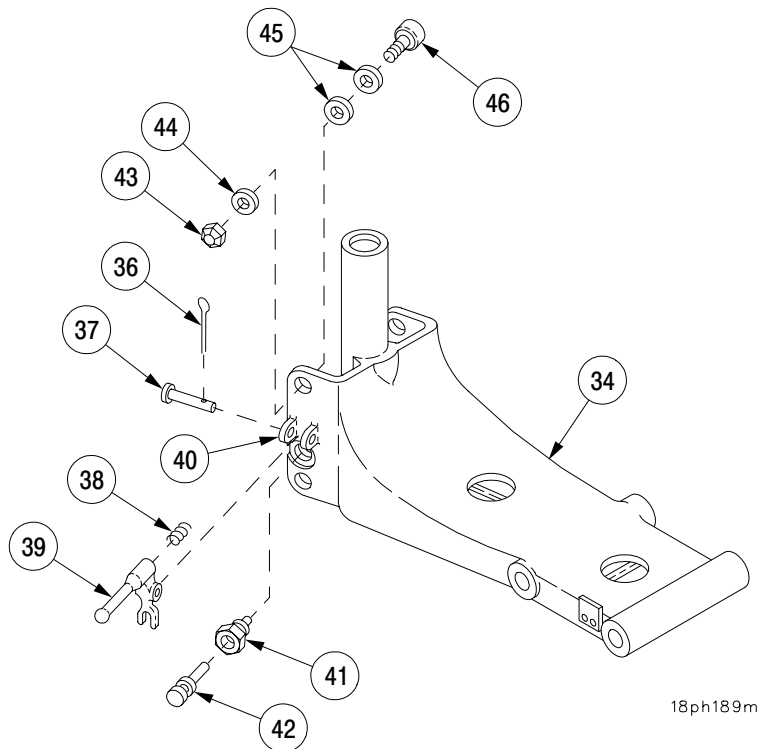
---

### 16-44 DRIVER'S SEAT – CONTINUED

---

#### b. Disassembly – Continued

- 11 Remove cotter pin (36), headed pin (37), spring (38), and vertical adjusting lever (39) from vertical adjusting lever bracket (40) and seat support bracket (34). Discard cotter pin.
- 12 Remove threaded sleeve (41) and plunger (42).
- 13 Remove four self-locking nuts (43), four flat washers (44), shims (45), and four cam followers (46) from seat support bracket (34). Discard self-locking nuts.



---

**Section VI. DRIVER'S SEAT – CONTINUED**

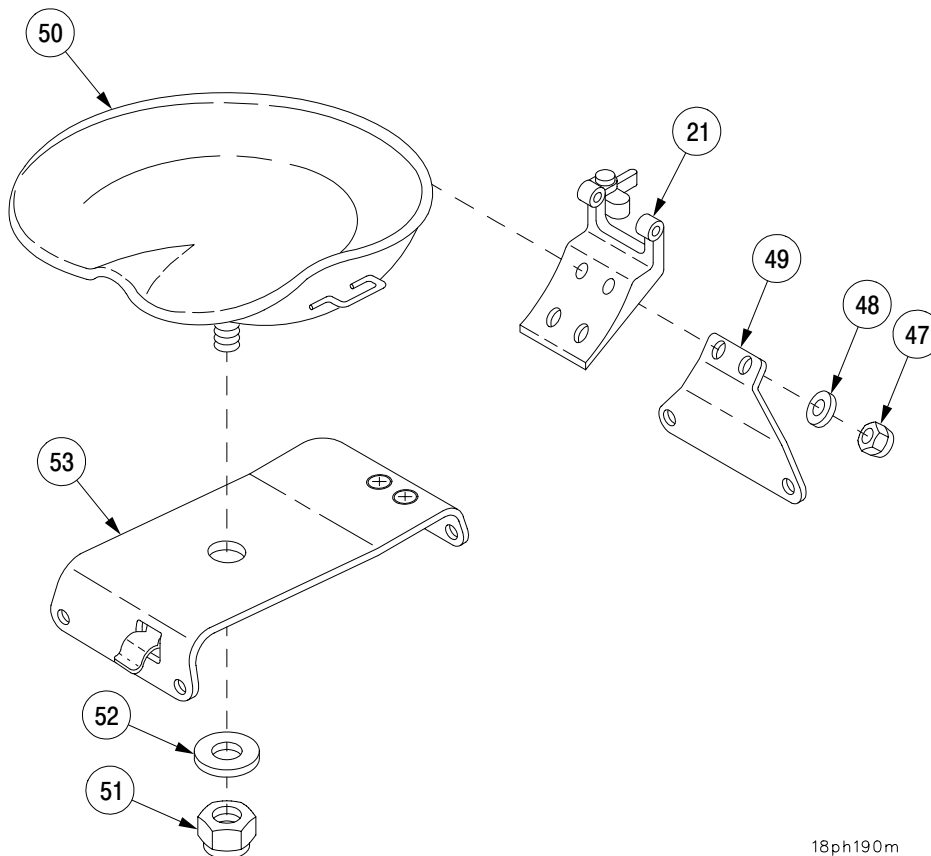
---

**16-44 DRIVER'S SEAT – CONTINUED**

---

**b. Disassembly – Continued**

- 14 Remove four self-locking nuts (47), two flat washers (48), reinforcement bracket (49), and backrest bracket (21) from seat (50). Discard self-locking nuts.
- 15 Remove self-locking nut (51), flat washer (52), and driver's seat bracket (53) from seat (50). Discard self-locking nut.



18ph190m

---

**Section VI. DRIVER'S SEAT – CONTINUED**

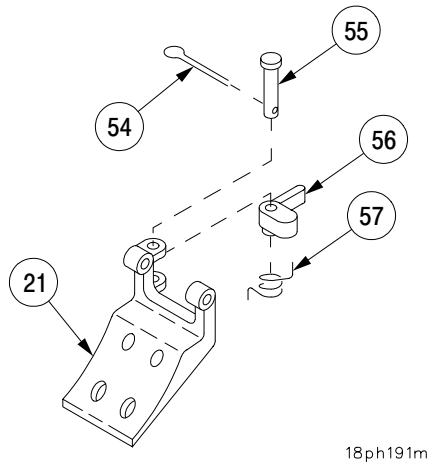
---

**16-44 DRIVER'S SEAT – CONTINUED**

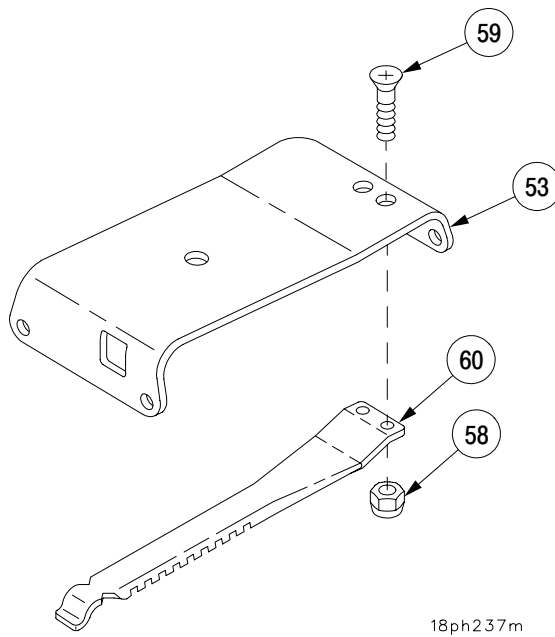
---

**b. Disassembly – Continued**

- 16 Remove cotter pin (54) from headed pin (55) and remove headed pin (55), pawl (56), and spring (57) from backrest bracket (21). Discard cotter pin.



- 17 Remove two self-locking nuts (58), two screws (59), and horizontal adjusting bar (60) from driver's seat bracket (53). Discard self-locking nuts.

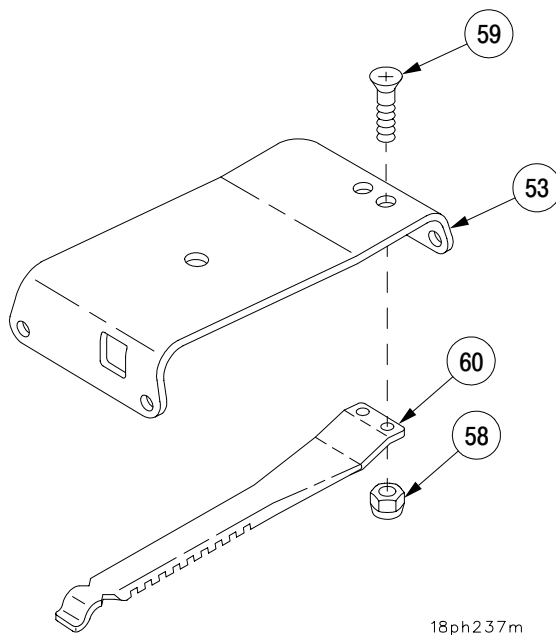


**Section VI. DRIVER'S SEAT – CONTINUED**

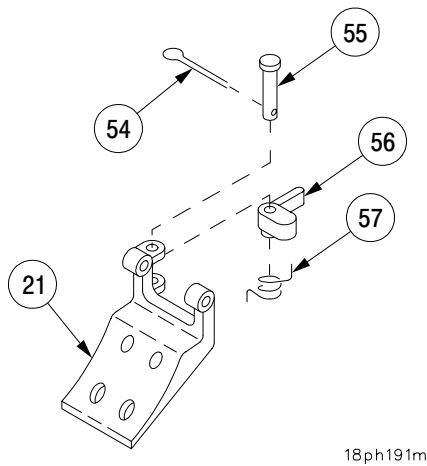
**16-44 DRIVER'S SEAT – CONTINUED**

**c. Assembly.**

- 1 Install horizontal adjusting bar (60) on driver's seat bracket (53) with two screws (59), and two new self-locking nuts (58).



- 2 Install pawl (56) and spring (57) on backrest bracket (21) with headed pin (55) and new cotter pin (54).



## Section VI. DRIVER'S SEAT – CONTINUED

---

### 16-44 DRIVER'S SEAT – CONTINUED

---

#### c. Assembly – Continued

- 3 Install driver's seat bracket (53) on seat (50) with flat washer (52) and new self-locking nut (51).
- 4 Install backrest bracket (21) and reinforcement bracket (49) on seat (50) with two flat washers (48) and four new self-locking nuts (47).

#### NOTE

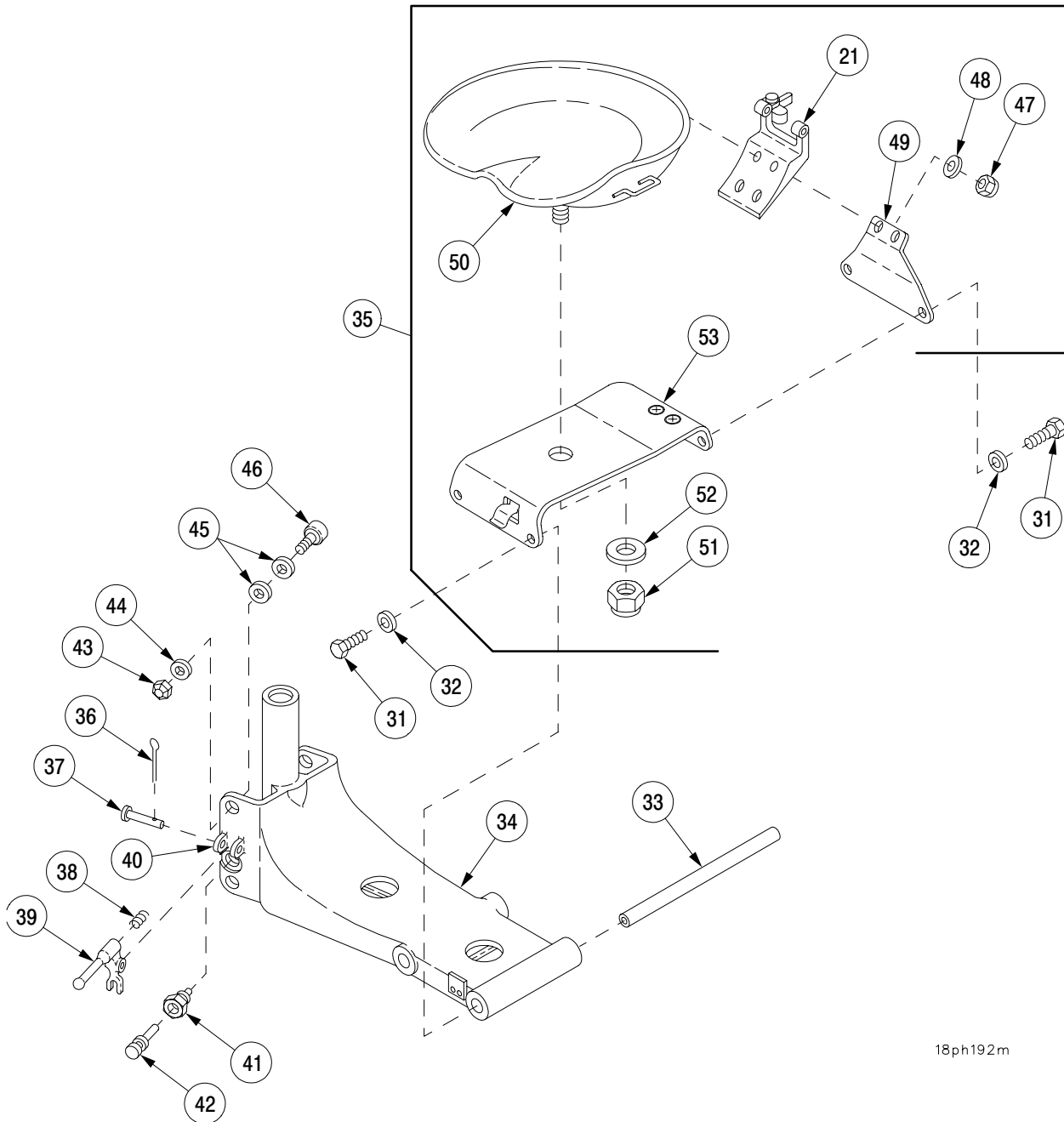
Install shims as required to provide a snug fit between cam follower and seat support bracket.

- 5 Install four cam followers (46) on seat support bracket (34) with shims (45), four flat washers (44), and four new self-locking nuts (43).
- 6 Apply sealing compound to threads of sleeve (41).
- 7 Install plunger (42) and threaded sleeve (41) in seat support bracket (34).
- 8 Install vertical adjusting lever (39) in vertical adjusting lever bracket (40) on seat support bracket (34) with spring (38), headed pin (37), and new cotter pin (36).
- 9 Apply sealing compound to threads of four screws (31).
- 10 Install seat support bracket (34) on seat assembly (35) with two horizontal slide bars (33), four flat washers (32), and four screws (31).

Section VI. DRIVER'S SEAT – CONTINUED

16-44 DRIVER'S SEAT – CONTINUED

c. Assembly – Continued



18ph192m



---

## Section VI. DRIVER'S SEAT – CONTINUED

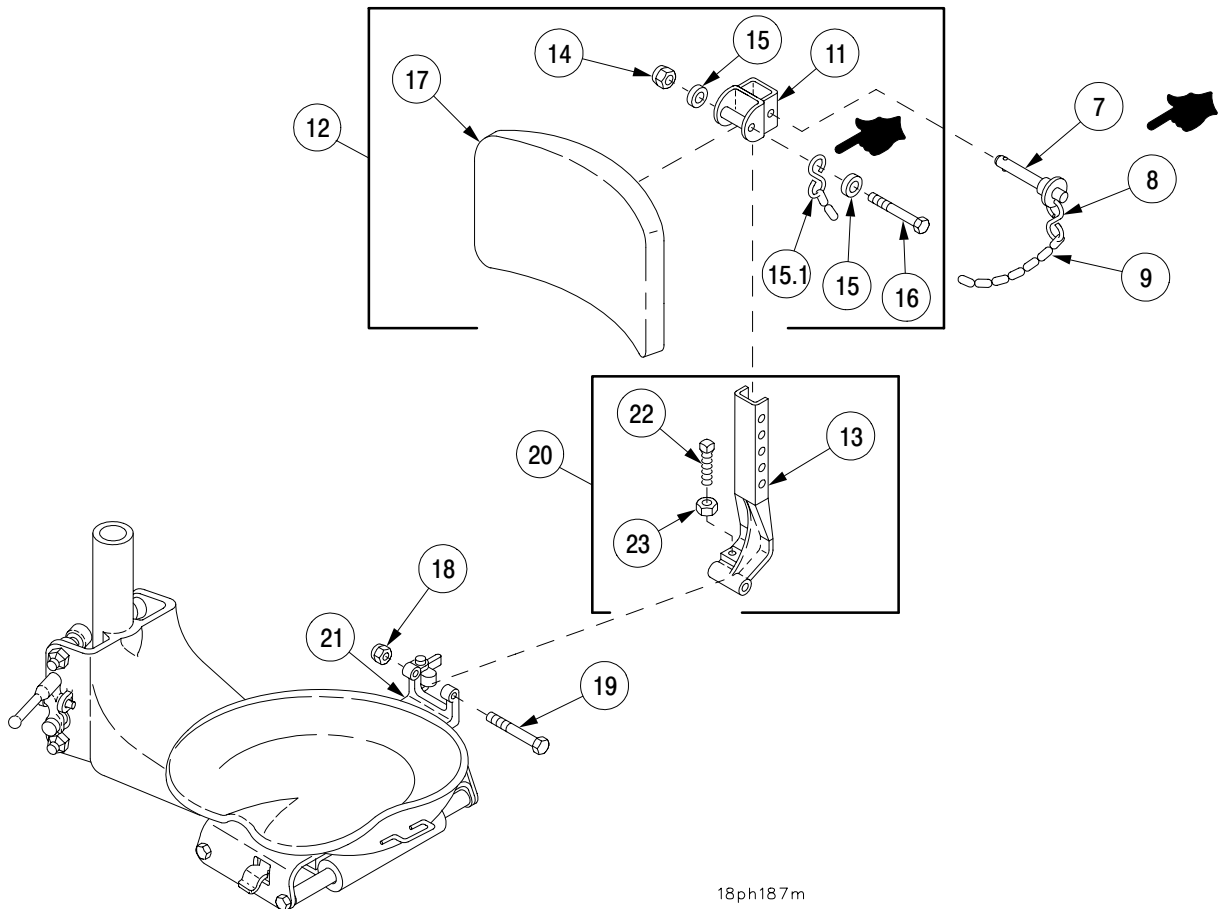
---

### 16-44 DRIVER'S SEAT – CONTINUED

---

#### c. Assembly – Continued

- 11 Install nut (23) and adjusting screw (22) in seat support (13).
- 12 Install backrest support assembly (20) on backrest bracket (21) with screw (19) and new self-locking nut (18).
- 13 Attach bracket (11) to backrest frame (17) with screw (16), hook (15.1) with chain (9), two flat washers (15), and new self-locking nut (14).
- 14 Install backrest assembly (12) on seat support (13).
- 15 Install quick-release pin (7) with hook (8) and chain (9) onto bracket (11).



---

**Section VI. DRIVER'S SEAT – CONTINUED**

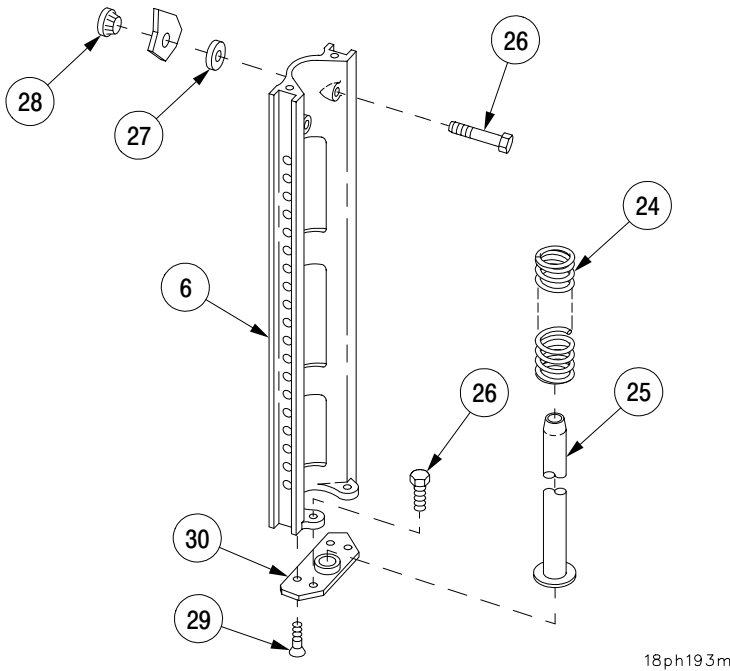
---

**16-44 DRIVER'S SEAT – CONTINUED**

---

**c. Assembly – Continued**

- 16 Apply sealing compound to threads of two screws (29).
- 17 Install base plate (30) on vertical support (6) with two screws (29).
- 18 Install vertical support (6) in driver's compartment with four screws (26), two flat washers (27), and two nuts (28).
- 19 Install spring (24) and vertical guide (25) on vertical support (6).



18ph193m

---

**Section VI. DRIVER'S SEAT – CONTINUED**

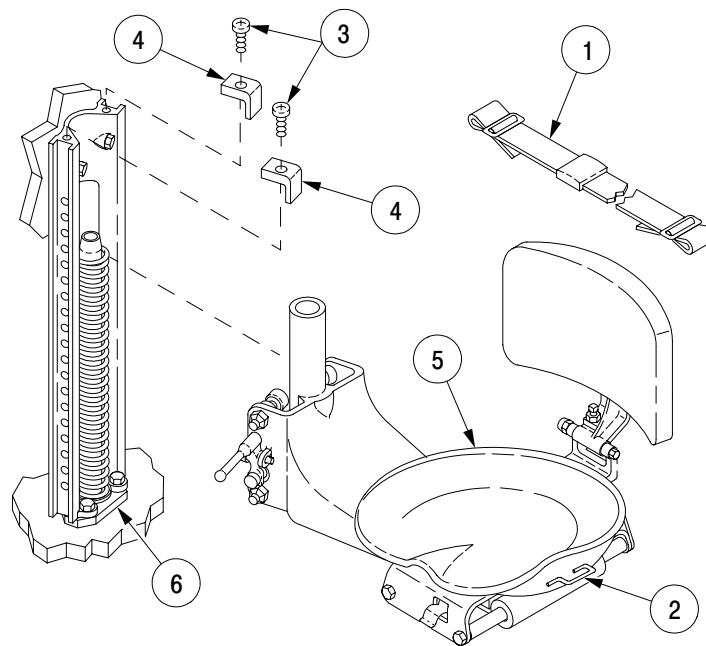
---

**16-44 DRIVER'S SEAT – CONTINUED**

---

**d. Installation.**

- 1 Place driver's seat assembly (5) on vertical support (6).
- 2 Install two screws (3) and two pads (4) on vertical support (6).
- 3 Install seatbelt (1) through seat retainers (2).



18ph194m

**NOTE**

**FOLLOW-ON MAINTENANCE:**

Close and secure driver's hatch  
(TM 9-2350-314-10)

**Section VII. STOWAGE RACKS, BOXES, STRAPS, CARRYING CASES, AND CABLE REELS**

**16-45 TELEPHONE CABLE REEL, HANDCRANK, AND BRACKET**

This task covers: a. Removal b. Installation

**INITIAL SETUP**

Tools

General mechanic's tool kit  
(SC 5180-90-N26)

Materials/Parts

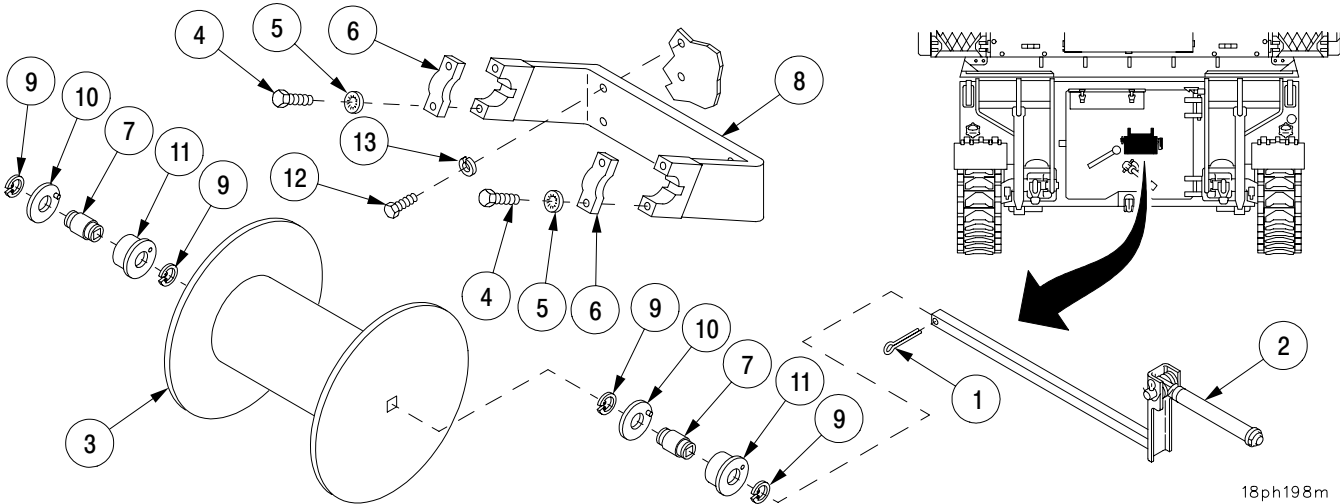
Cotter pin (item 287, Appx E)  
Lockwashers (4) (item 5, Appx E)  
Lockwashers (4) (item 122, Appx E)

**a. Removal.**

- 1 Remove cotter pin (1) and pull handcrank assembly (2) from cable reel assembly(3). Discard cotter pin.
- 2 Remove four screws (4), four lockwashers (5), two clamps (6), and two bearings (7) from mount (8). Discard lockwashers.
- 3 Remove two retaining rings (9), plate (10) and housing (11) from bearing (7).
- 4 Remove four screws (12), four lockwashers (13), and bracket (8). Discard lockwashers.

**b. Installation.**

- 1 Install bracket (8) with four screws (12) and four new lockwashers (13).
- 2 Install housing (11) and plate (10) on bearing (7) with two retaining rings (9).
- 3 Install two bearings (7) on mount (8) with two clamps (6), two screws (4), and four new lockwashers.
- 4 Install handcrank assembly (2) in cable reel assembly (3) with new cotter pin (1).



18ph198m

## Section VII. STOWAGE RACKS, BOXES, STRAPS, CARRYING CASES, AND CABLE REELS – CONTINUED

---

### 16-46 NIGHT VIEWER STOWAGE BRACKET.

---

This task covers:    a. Removal                    b. Disassembly                    c. Assembly                    d. Installation

---

#### **INITIAL SETUP**

##### Tools

General mechanic's tool kit  
(SC 5180-90-N26)  
Twist drill set (item 16, Appx F)  
Hand riveter (item 55, Appx F)  
Electric drill (item 15, Appx F)

##### Materials/Parts

Spring pin (item 258, Appx E)  
Lockwashers (4) (item 257, Appx E)  
Rivets (4) (item 259, Appx E)  
Lockwashers (4) (item 3, Appx E)

---

#### **a. Removal.**

Remove four nuts (1), four lockwashers (2), four flat washers (3), four lockwashers (4) and four screws (5) securing night viewer stowage bracket (6). Discard lockwashers.

#### **b. Disassembly.**

- 1 Remove spring pin (7), spring (8), and lid (9). Discard spring pin.
- 2 Drill out four rivets (10) and remove catch (11) and strike (12). Discard rivets.

#### **c. Assembly.**

- 1 Install catch (11) and strike (12) with four new rivets (10).
- 2 Install new spring pin (7), spring (8), and lid (9).

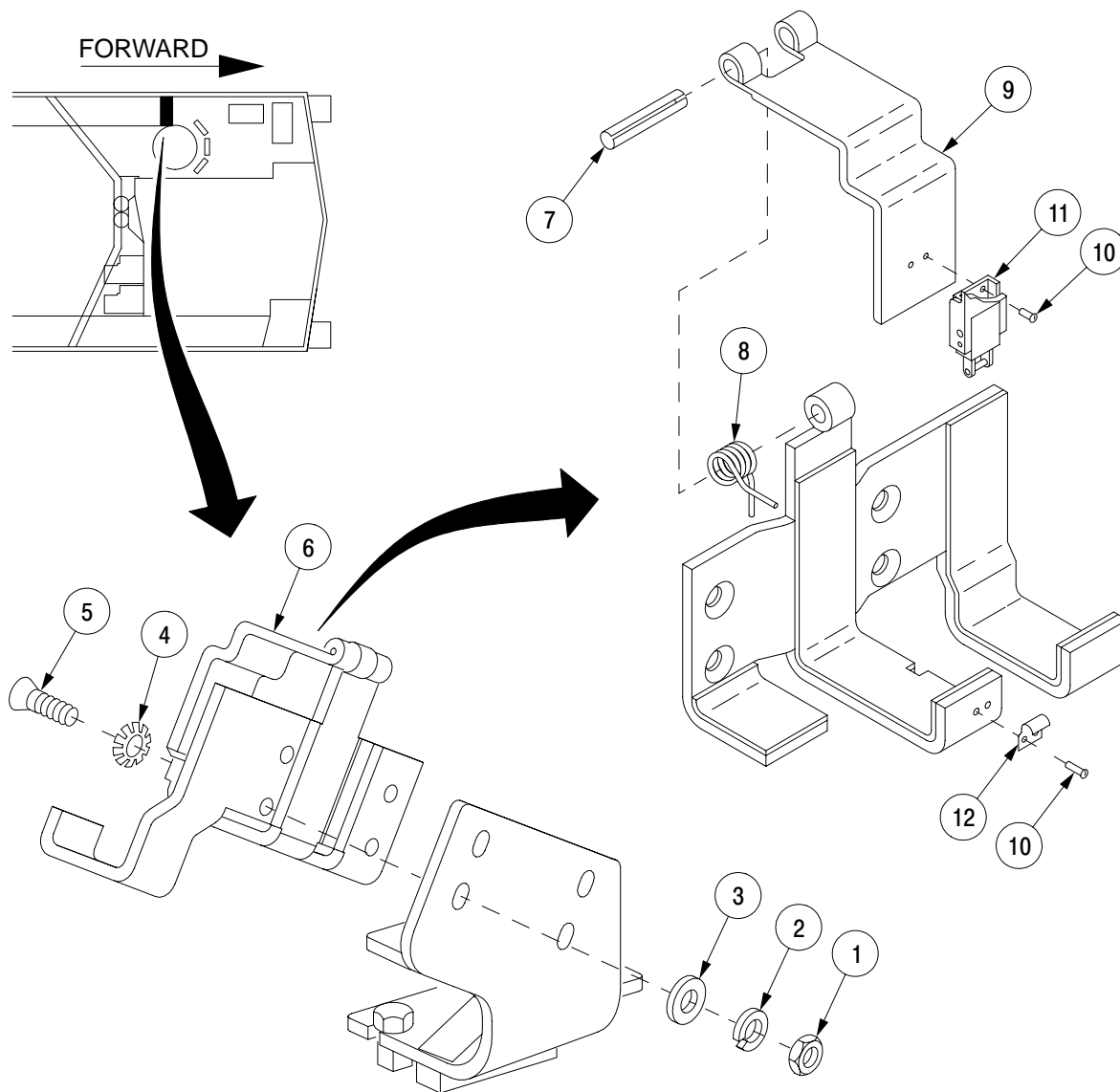
#### **d. Installation.**

Secure night viewer stowage bracket (6) with four screws (5), four new lockwashers (4), four flat washers (3), four new lockwashers (2), and four nuts (1).

**Section VII. STOWAGE RACKS, BOXES, STRAPS, CARRYING CASES, AND CABLE REELS – CONTINUED**

**16-46 NIGHT VIEWER STOWAGE BRACKET – CONTINUED**

**d. Installation – Continued**



18ph199m



**Section VII. STOWAGE RACKS, BOXES, STRAPS, CARRYING CASES, AND CABLE REELS- CONTINUED**

**16-48 GUN BARREL BRACKET ASSEMBLY.**

This task covers:    a. Removal                      b. Disassembly                      c. Assembly                      d. Installation

**INITIAL SETUP**

Tools

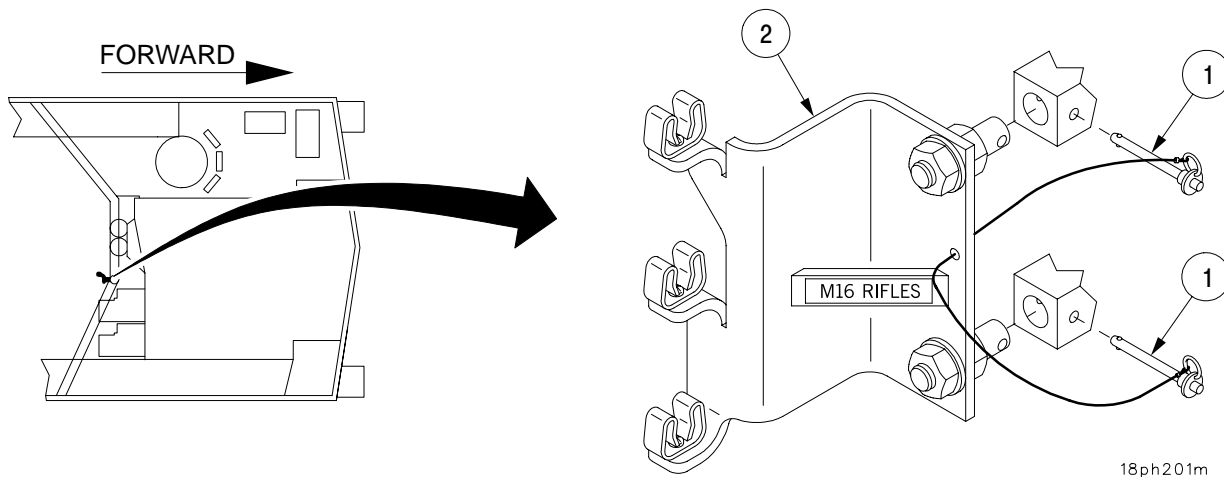
General mechanic's tool kit  
(SC 5180-90-N26)

Materials/Parts

Lockwashers (3) (item 122, Appx E)  
Wire swagging sleeves (2) (item 54, Appx E)  
Wire rope (item 65, Appx E)

**a. Removal.**

- 1 Remove two quick-release pins (1) securing gun barrel bracket assembly (2).
- 2 Remove gun barrel bracket assembly (2) from welded lugs.



18ph201m



**Section VII. STOWAGE RACKS, BOXES, STRAPS, CARRYING CASES, AND CABLE REELS – CONTINUED**

---

**16-48 GUN BARREL BRACKET ASSEMBLY – CONTINUED**

---

**b. Disassembly.**

- 1 Remove three nuts (3), three lockwashers (4), three screws (5), and three clips (6) from support (7). Discard lockwashers.
- 2 Remove four nuts (8) and four flat washers (9) securing two rods (10) to support (7).
- 3 Remove two quick-release pins (1) from wire rope (11).

**NOTE**

Perform step 4 if wire rope is defective.

- 4 Cut wire rope (11) and pull from support (7). Discard wire rope.

**c. Assembly.**

**NOTE**

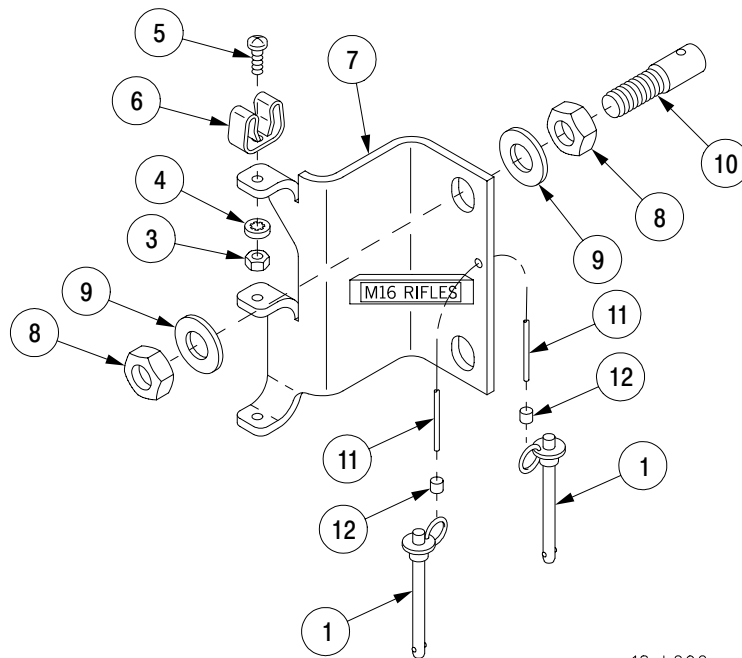
Perform steps 1 and 2 if wire rope is defective.

- 1 Form loop in one end of new wire rope (11) and install new sleeve (12) 3/4 in. (1.90 cm) from top of loop. Crimp sleeve (12).
- 2 Thread wire rope (11) through hole in support (7) and form loop in wire rope (11). Install new sleeve (12) 3/4 in. (1.90 cm) from top of rope. Crimp sleeve (12).
- 3 Install two quick-release pins (1) on wire rope (11).
- 4 Secure two rods (10) to support (7) with four flat washers (9) and four nuts (8). Adjust nuts (8) to allow rods (10) to protrude 1 in. (2.54 cm) from support. Tighten nuts (8).
- 5 Secure three clips (6) to support (7) with three screws (5), three new lockwashers (4), and three nuts (3).

**Section VII. STOWAGE RACKS, BOXES, STRAPS, CARRYING CASES, AND CABLE REELS – CONTINUED**

**16-48 GUN BARREL BRACKET ASSEMBLY – CONTINUED**

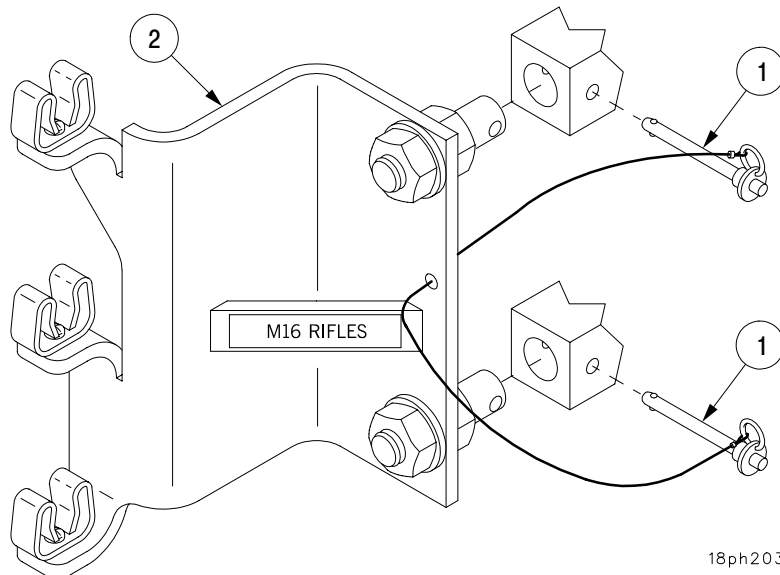
**c. Assembly – Continued**



18ph202m

**d. Installation.**

Install gun barrel bracket assembly (2) on welded lugs with two quick-release pins (1).



18ph203m

**Section VII. STOWAGE RACKS, BOXES, STRAPS, CARRYING CASES, AND CABLE REELS – CONTINUED**

**16-49 GUN BUTT BRACKET ASSEMBLY.**

This task covers: a. Removal b. Disassembly c. Assembly d. Installation

**INITIAL SETUP**

Tools

General mechanic's tool kit  
(SC 5180-90-N26)

Materials/Parts

Lockwashers (6) (item 22, Appx E)  
Wire rope  
Sleeves (2) (item 54, Appx E)

**a. Removal.**

- 1 Remove two quick-release pins (1) securing gun butt bracket assembly (2) to bulkhead.
- 2 Remove gun butt bracket assembly (2) from welded lugs on bulkhead by pulling straight out.

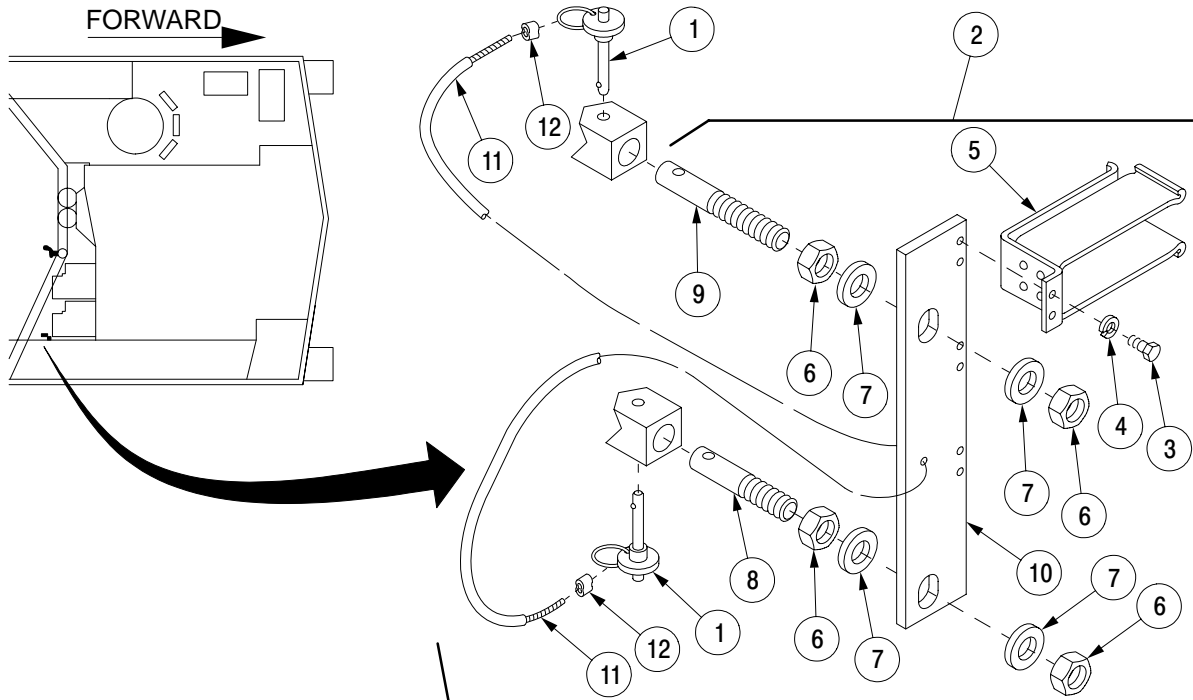
**b. Disassembly.**

- 1 Remove six screws (3), six lockwashers (4), and rifle butt clips (5). Discard lockwashers.
- 2 Remove four nuts (6), four flat washers (7), and two rods (8 and 9) from plate (10).

**NOTE**

Perform steps 3 and 4 only if wire rope is defective.

- 3 Remove two quick-release pins (1) from wire rope (11).
- 4 Cut wire rope (11) and pull from plate (10). Discard wire rope.



18ph204m

## Section VII. STOWAGE RACKS, BOXES, STRAPS, CARRYING CASES, AND CABLE REELS – CONTINUED

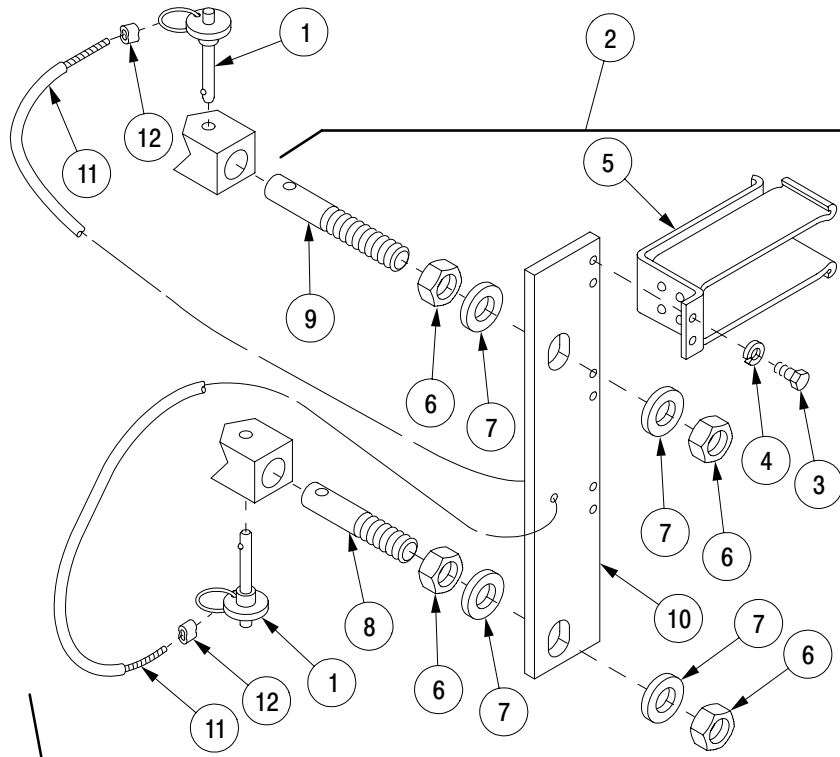
### 16-49 GUN BUTT BRACKET ASSEMBLY – CONTINUED

#### c. Assembly.

#### NOTE

Perform steps 1 thru 4 only if wire rope is defective.

- 1 Form loop in one end of new wire rope (11) and install new sleeve (12) 3/4 in. (1.90 cm) from top of loop. Crimp sleeve (12).
- 2 Thread wire rope (11) through hole in plate (10) and form loop in other end of wire rope (11).
- 3 Install new sleeve (12) 3/4 in. (1.90 cm) from top of loop. Crimp sleeve (12).
- 4 Install two quick-release pins (1) on wire rope (11).
- 5 Secure two rods (8 and 9) to plate (10) with four flat washers (7) and four nuts (6).
- 6 Secure rifle butt clips (5) to plate (10) with six new lockwashers (4) and six screws (3).



18ph204m

---

**Section VII. STOWAGE RACKS, BOXES, STRAPS, CARRYING CASES, AND CABLE REELS – CONTINUED**

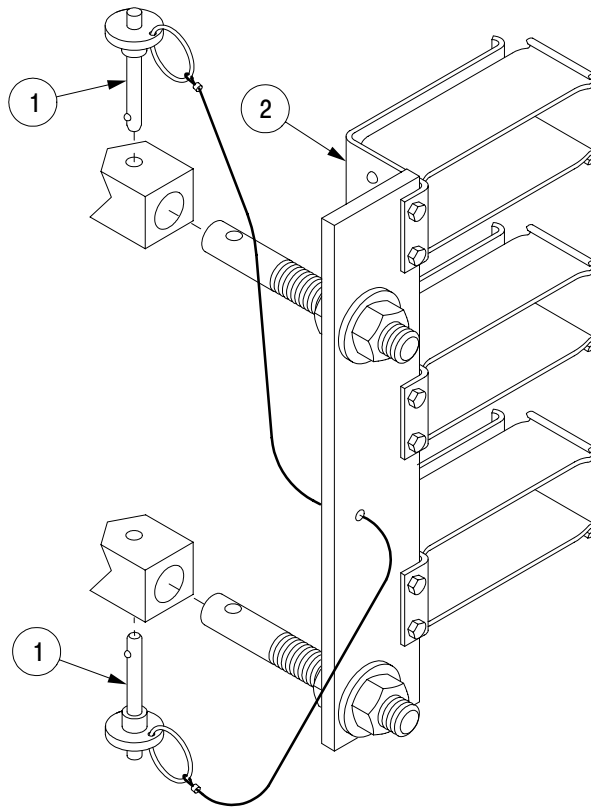
---

**16-49 GUN BUTT BRACKET ASSEMBLY – CONTINUED**

---

**d. Installation.**

- 1 Position gun butt bracket assembly (2) on welded lugs on bulkhead.
- 2 Install two quick-release pins (1) to secure gun butt bracket assembly (2) to bulkhead.



18ph205m



---

## Section VII. STOWAGE RACKS, BOXES, STRAPS, CARRYING CASES, AND CABLE REELS – CONTINUED

---

### 16-51 STOWAGE BOX SEALS (DRIVER'S COMPARTMENT).

---

This task covers:

a. Removal

b. Installation

---

#### INITIAL SETUP

##### Tools

General mechanic's tool kit  
(SC 5180-90-N26)  
Wire brush (item 7, Appx F)

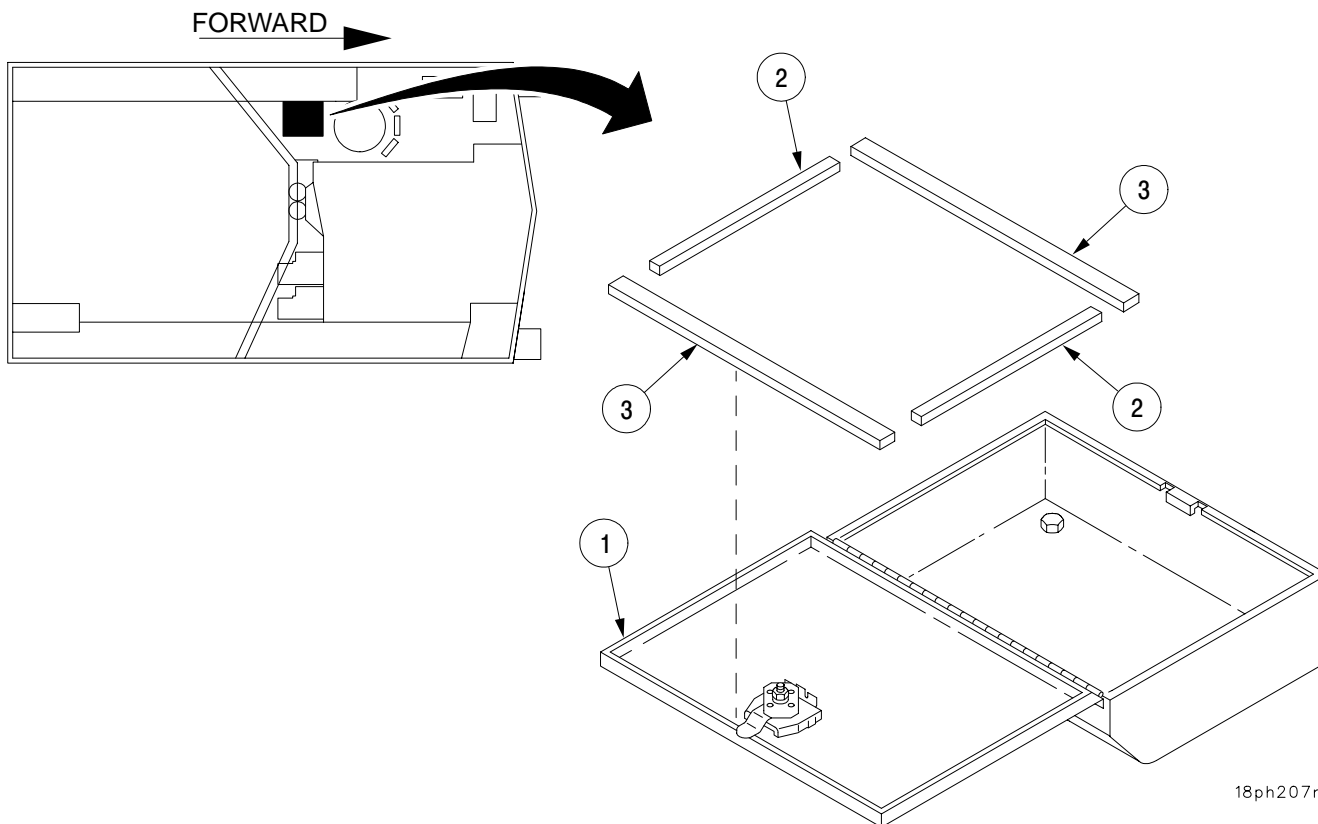
##### Materials/Parts

Adhesive (item 1, Appx C)  
Dry-cleaning solvent (item 59, Appx C)  
Acid swabbing brush (item 13, Appx C)

---

#### a. Removal.

- 1 Open stowage box door (1).
- 2 Remove damaged seals (2 and 3) from door (1).



18ph207m

---

**Section VII. STOWAGE RACKS, BOXES, STRAPS, CARRYING CASES, AND CABLE REELS – CONTINUED**

---

**16-51 STOWAGE BOX SEALS (DRIVER'S COMPARTMENT) – CONTINUED**

---

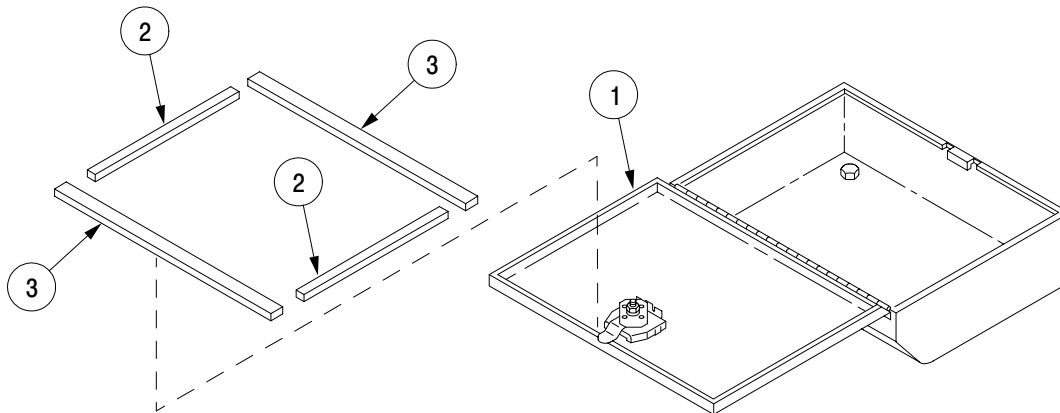
**a. Removal – Continued****WARNING**

Dry-cleaning solvent (P-D-680) is toxic and flammable. To avoid injury, wear protective goggles and gloves and use only in a well-ventilated area. Avoid contact with skin, eyes, and clothes. Do not breathe vapors. Do not use near open flame or excessive heat. Do not smoke when using solvent. Failure to do so could cause **SERIOUS INJURY**. If you become dizzy while using dry-cleaning solvent, get fresh air immediately, and if necessary, get medical attention. If contact with skin or clothes is made, flush thoroughly with water. If the solvent contacts your eyes, wash them with water immediately and obtain medical aid (FM 21-11).

- 3 Clean old adhesive from door (1) with dry-cleaning solvent and wire brush.

**b. Installation.**

- 1 Apply adhesive to mating surface of door (1) with acid brush.
- 2 When adhesive is dry and tacky, install new seals (2 and 3) on door (1).
- 3 Close and secure stowage box door (1).



18ph208m



**Section VII. STOWAGE RACKS, BOXES, STRAPS, CARRYING CASES, AND CABLE REELS – CONTINUED**

**16-52 STOWAGE BOX LATCH (DRIVER’S COMPARTMENT).**

This task covers:                    a. Removal    b. Installation

**INITIAL SETUP**

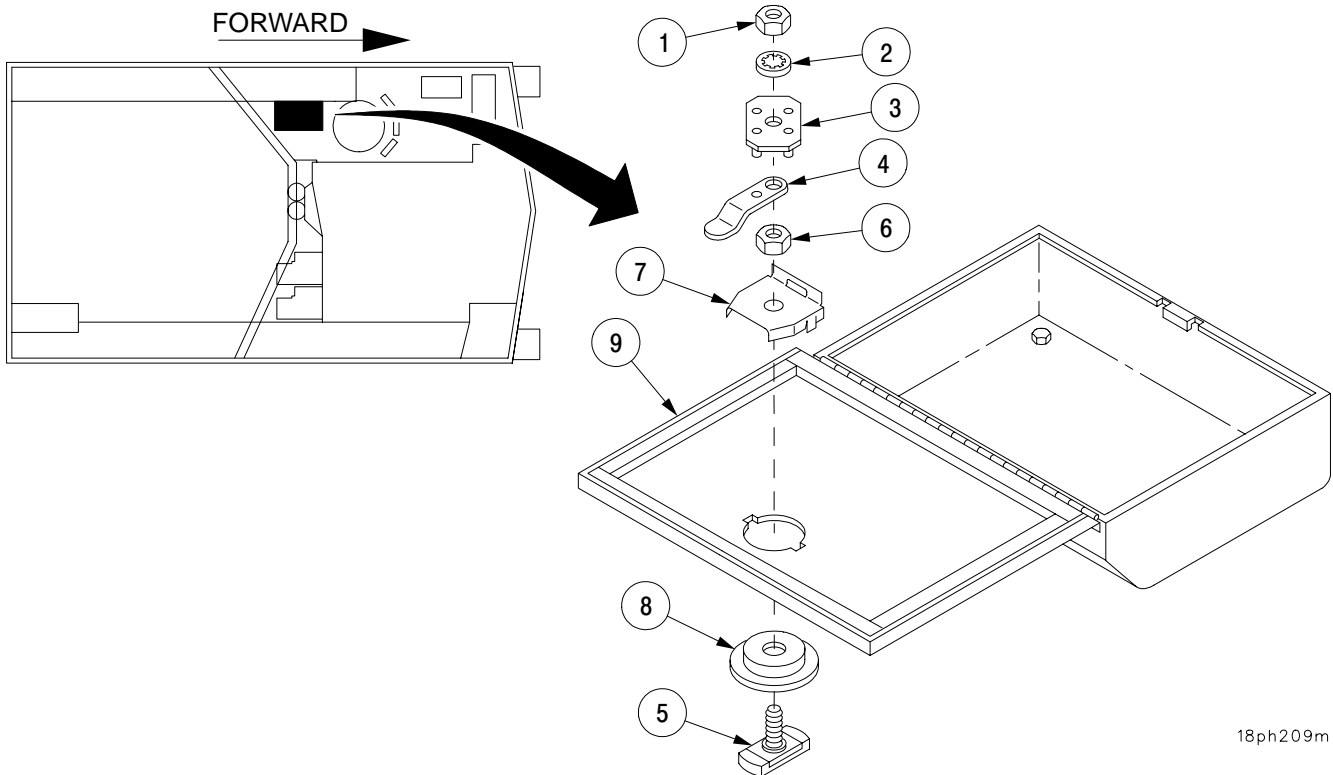
Tools  
General mechanic’s tool kit  
(SC 5180-90-N26)

**a. Removal.**

**NOTE**

Latch is supplied with all mounting hardware needed to mount latch in place.

- 1 Remove nut (1), lockwasher (2), actuator (3), and lever (4) from handle/shaft assembly (5).
- 2 Remove nut (6), housing (7), handle/shaft assembly (5), and cup (8) from door (9).



18ph209m

**Section VII. STOWAGE RACKS, BOXES, STRAPS, CARRYING CASES, AND CABLE REELS – CONTINUED**

**16-52 STOWAGE BOX LATCH (DRIVER'S COMPARTMENT) – CONTINUED**

**b. Installation.**

- 1 Install cup (8) and handle/shaft assembly (5) on door (9) from outside.

**NOTE**

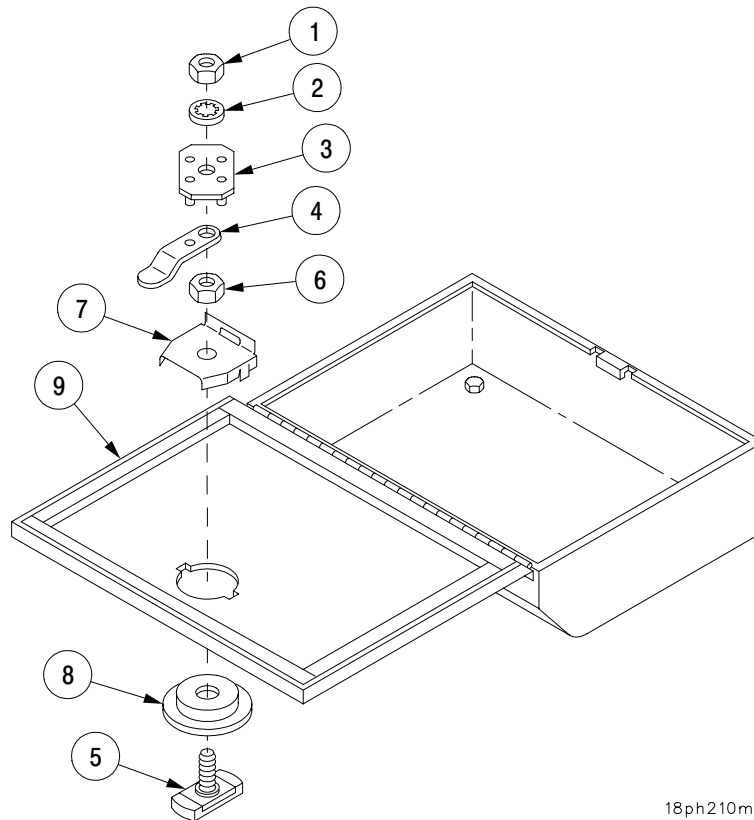
Make sure tab on housing is mated with notches in door.

- 2 Install housing (7) on handle/shaft assembly (5) from inside of door.
- 3 Secure housing (7) to handle/shaft assembly (5) with nut (6).

**NOTE**

Tab on actuator must be installed through hole in lever.

- 4 Install lever (4) and actuator (3) on handle/shaft assembly (5) and secure with lockwasher (2) and nut (1).



18ph210m

---

**Section VII. STOWAGE RACKS, BOXES, STRAPS, CARRYING CASES, AND CABLE REELS – CONTINUED**

---

**16-53 STOWAGE BOX ASSEMBLY (DRIVER'S COMPARTMENT).**

---

This task covers:

a. Removal

b. Installation

---

**INITIAL SETUP**

Tools

General mechanic's tool kit  
(SC 5180-90-N26)

Materials/Parts

Lockwashers (4) (item 5, Appx E)

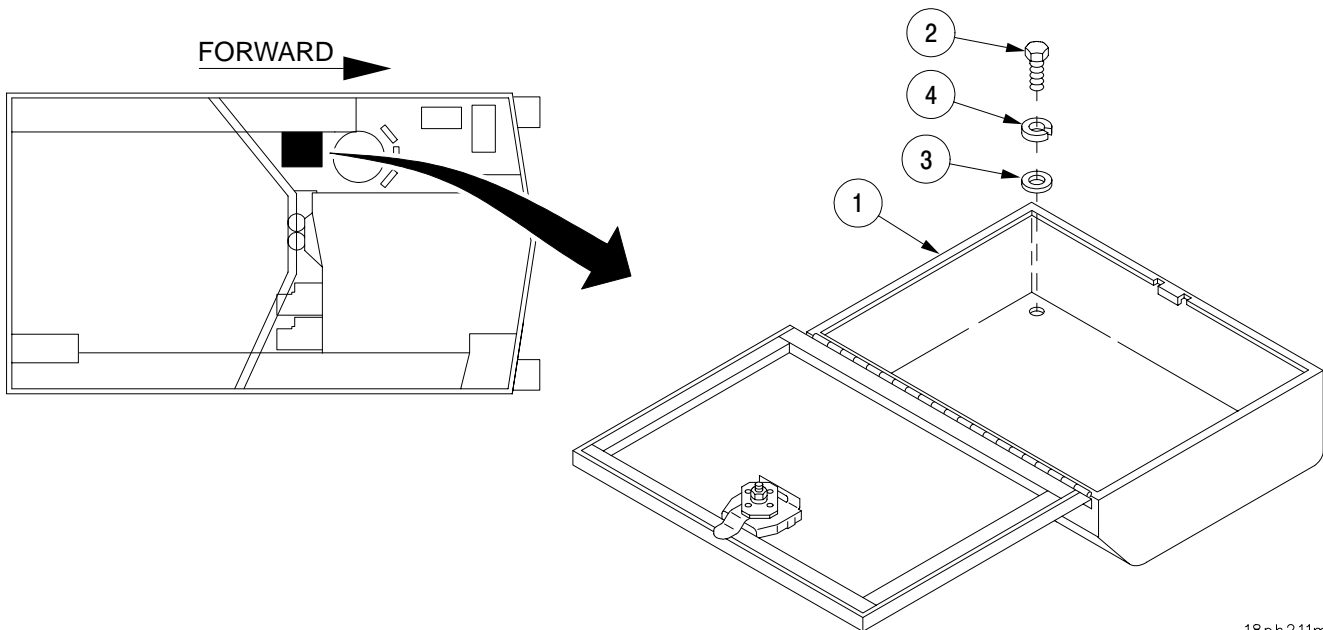
---

**a. Removal.**

- 1 Open stowage box (1).
- 2 Remove four screws (2), four flat washers (3), four lockwashers (4), and stowage box (1). Discard lockwashers.

**b. Installation.**

- 1 Position stowage box (1) on hull floor with mounting holes aligned.
- 2 Secure stowage box (1) with four screws (2), four new lockwashers (4), and four flat washers (3).



18ph211m

**Section VII. STOWAGE RACKS, BOXES, STRAPS, CARRYING CASES, AND CABLE REELS – CONTINUED**

**16-54 GRENADE BOX ASSEMBLY.**

This task covers:    a. Removal                    b. Disassembly                    c. Assembly                    d. Installation

**INITIAL SETUP**

Tools

General mechanic’s tool kit  
(SC 5180-90-N26)  
Wire brush (item 7, Appx F)

Materials/Parts

Lockwashers (4) (item 5, Appx E)  
Flat washer seals (4) (item 265, Appx E)  
Seals (2) (item 266, Appx E)  
Seals (2) (item 267, Appx E)  
Adhesive (item 1, Appx C)  
Dry-cleaning solvent (item 59, Appx C)  
Acid swabbing brush (item 13, Appx C)

Personnel Required

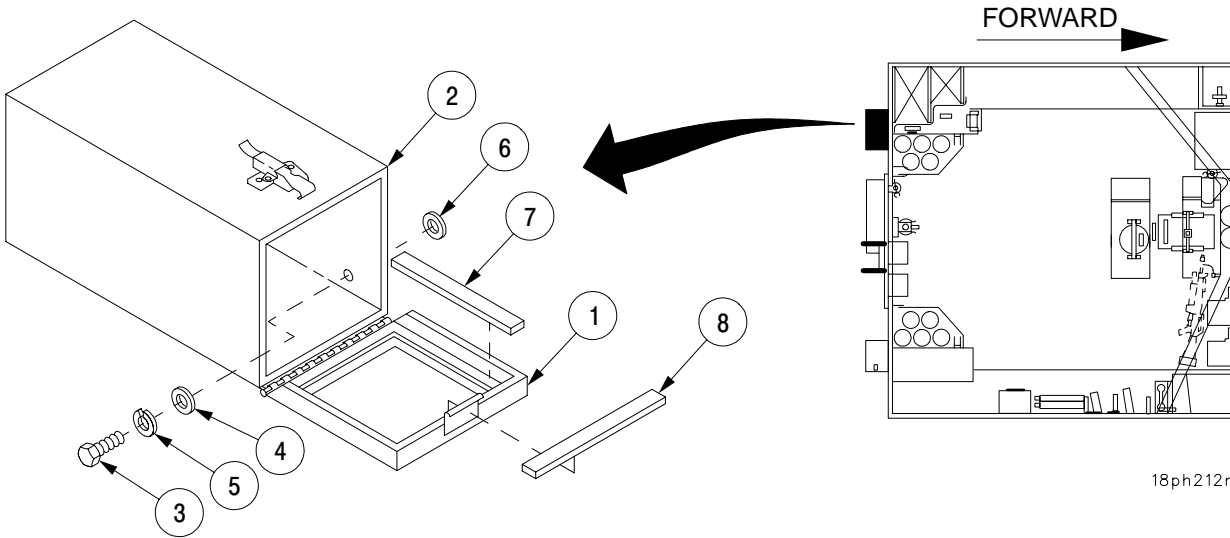
Two

**a. Removal.**

Open door (1) on grenade box (2) and remove four screws (3), four flat washers (4), four lockwashers (5), four flat washer seals (6), and grenade box (2). Discard lockwashers and flat washer seals.

**b. Disassembly.**

1 Remove two door seals (7) and two door seals (8) from door (1). Discard door seals.



18ph212m

**Section VII. STOWAGE RACKS, BOXES, STRAPS, CARRYING CASES, AND CABLE REELS – CONTINUED**

**16-54 GRENADE BOX ASSEMBLY – CONTINUED**

**b. Disassembly – Continued**

**WARNING**

Dry-cleaning solvent (P-D-680) is toxic and flammable. To avoid injury, wear protective goggles and gloves and use only in a well-ventilated area. Avoid contact with skin, eyes, and clothes. Do not breathe vapors. Do not use near open flame or excessive heat. Do not smoke when using solvent. Failure to do so could cause **SERIOUS INJURY**. If you become dizzy while using dry-cleaning solvent, get fresh air immediately, and if necessary, get medical attention. If contact with skin or clothes is made, flush thoroughly with water. If the solvent contacts your eyes, wash them with water immediately and obtain medical aid (FM 21-11).

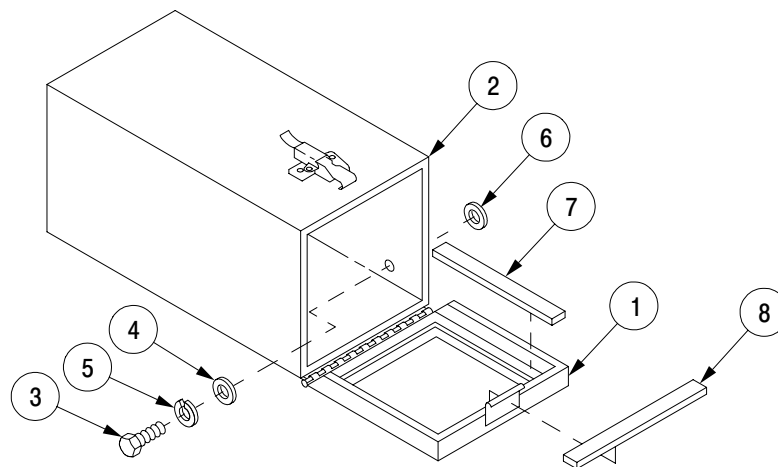
- 2 Clean old adhesive from door (1) with dry-cleaning solvent and wire brush.

**c. Assembly.**

- 1 Apply adhesive to door (1), two new door seals (7), and two new door seals (8) with acid brush.
- 2 When adhesive is dry and tacky, install two new door seals (7) and two new door seals (8) on door (1).

**d. Installation.**

- 1 Install grenade box (2) with four new flat washer seals (6), four new lockwashers (5), four flat washers (4), and four screws (3).
- 2 Close and secure door (1).



18ph213m

**Section VII. STOWAGE RACKS, BOXES, STRAPS, CARRYING CASES, AND CABLE REELS – CONTINUED**

**16-55 GRENADE BOX ASSEMBLY, 40MM.**

This task covers: a. Removal b. Disassembly c. Assembly d. Installation

**INITIAL SETUP**

Tools

General mechanic's tool kit (SC 5180-90-N26)  
Wire brush (item 7, Appx F)

Materials/Parts

Lockwashers (6) (item 5, Appx E)  
Flat washer seals (6) (item 265, Appx E)  
Seals (2) (item 268, Appx E)  
Seals (2) (item 269, Appx E)  
Dry-cleaning solvent (item 59, Appx C)  
Adhesive (item 1, Appx C)  
Acid swabbing brush (item 13, Appx C)

Personnel Required

Two

**a. Removal.**

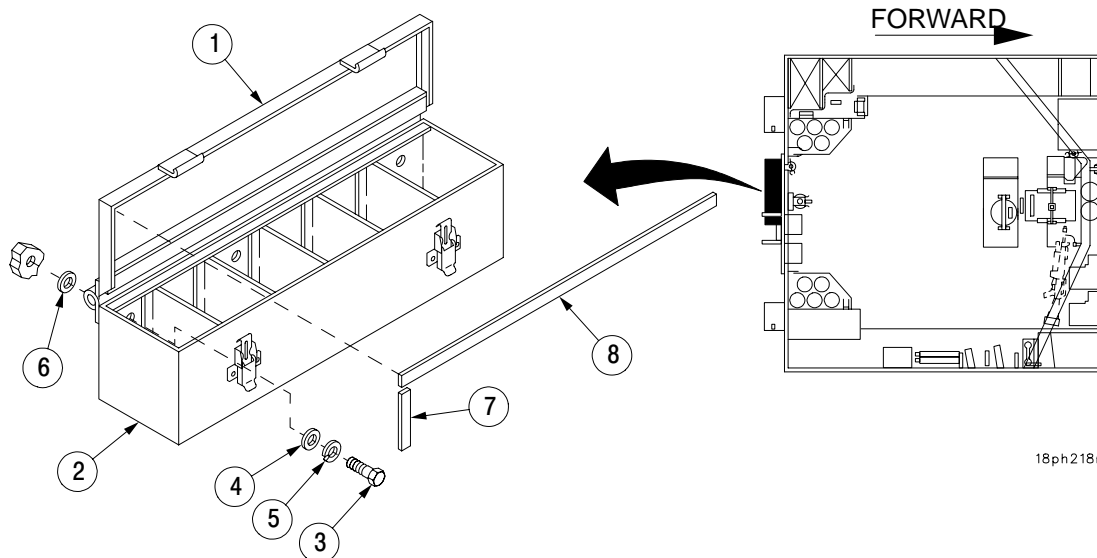
Open door (1) on grenade box (2) and remove six screws (3), six flat washers (4), six lockwashers (5), and six flat washer seals (6) securing grenade box (2). Discard lockwashers and flat washer seals.

**NOTE**

All door seals removed and installed in the same manner.

**b. Disassembly.**

1 Remove two door seals (7) and two door seals (8) from door (1). Discard door seals.



18ph218m

---

**Section VII. STOWAGE RACKS, BOXES, STRAPS, CARRYING CASES, AND CABLE REELS – CONTINUED**

---

**16-55 GRENADE BOX ASSEMBLY, 40MM – CONTINUED**

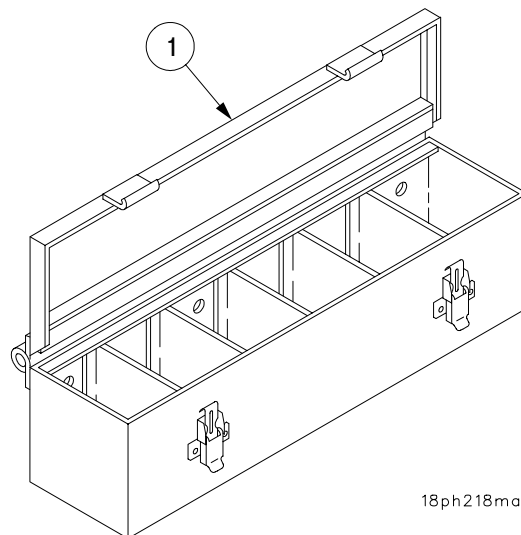
---

**b. Disassembly – Continued**

**WARNING**

Dry-cleaning solvent (P-D-680) is toxic and flammable. To avoid injury, wear protective goggles and gloves and use only in a well-ventilated area. Avoid contact with skin, eyes, and clothes. Do not breathe vapors. Do not use near open flame or excessive heat. Do not smoke when using solvent. Failure to do so could cause **SERIOUS INJURY**. If you become dizzy while using dry-cleaning solvent, get fresh air immediately, and if necessary, get medical attention. If contact with skin or clothes is made, flush thoroughly with water. If the solvent contacts your eyes, wash them with water immediately and obtain medical aid (FM 21-11).

- 2 Clean old adhesive from door (1) with wire brush and dry-cleaning solvent.



18ph218ma

---

**Section VII. STOWAGE RACKS, BOXES, STRAPS, CARRYING CASES, AND CABLE REELS – CONTINUED**

---

**16-55 GRENADE BOX ASSEMBLY, 40MM – CONTINUED**

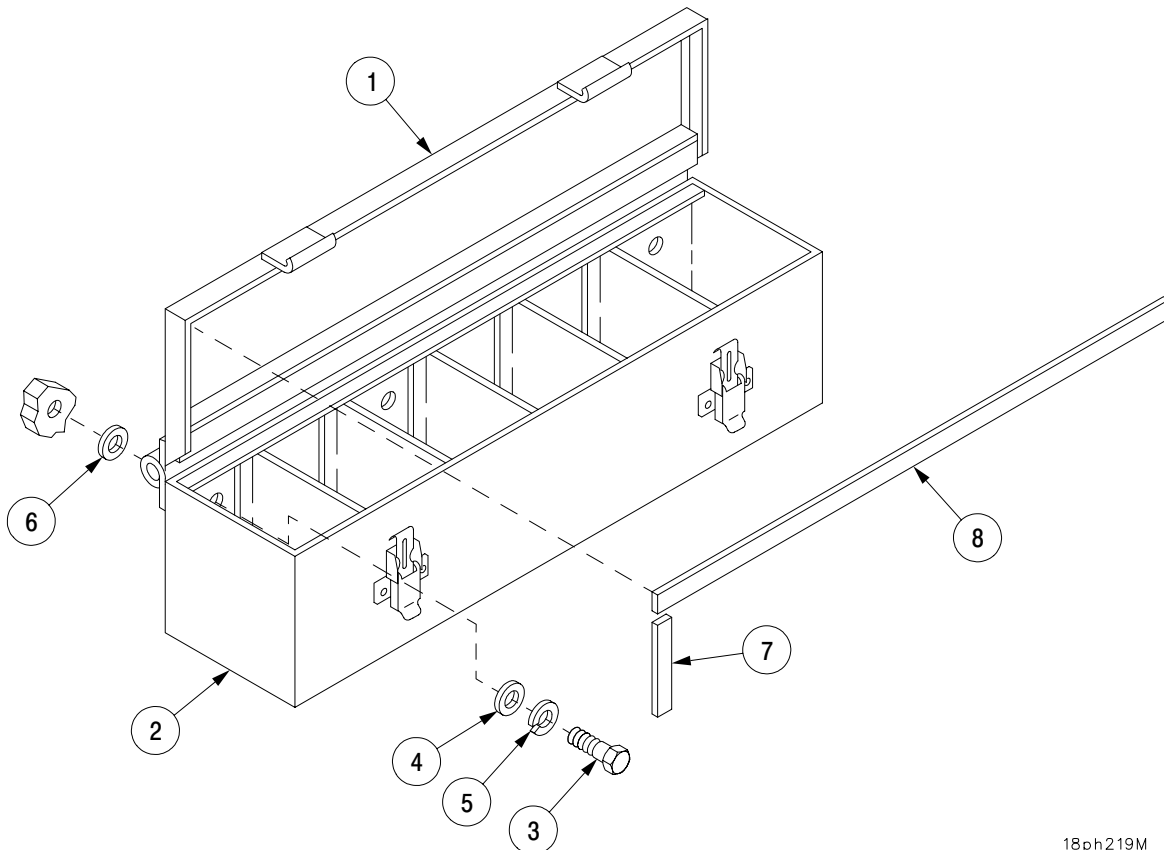
---

**c. Assembly.**

- 1 Apply adhesive to door (1), two new door seals (7), and two new door seals (8) with acid brush.
- 2 When adhesive is dry and tacky, position new door seals (7 and 8) on door (1).

**d. Installation.**

- 1 Install grenade box (2) with six new flat washer seals (6), six new lockwashers (5), six flat washers (4), and six screws (3).
- 2 Close and secure door (1).



18ph219M



**Section VII. STOWAGE RACKS, BOXES, STRAPS, CARRYING CASES, AND CABLE REELS – CONTINUED**

**16-56 STRAPS.**

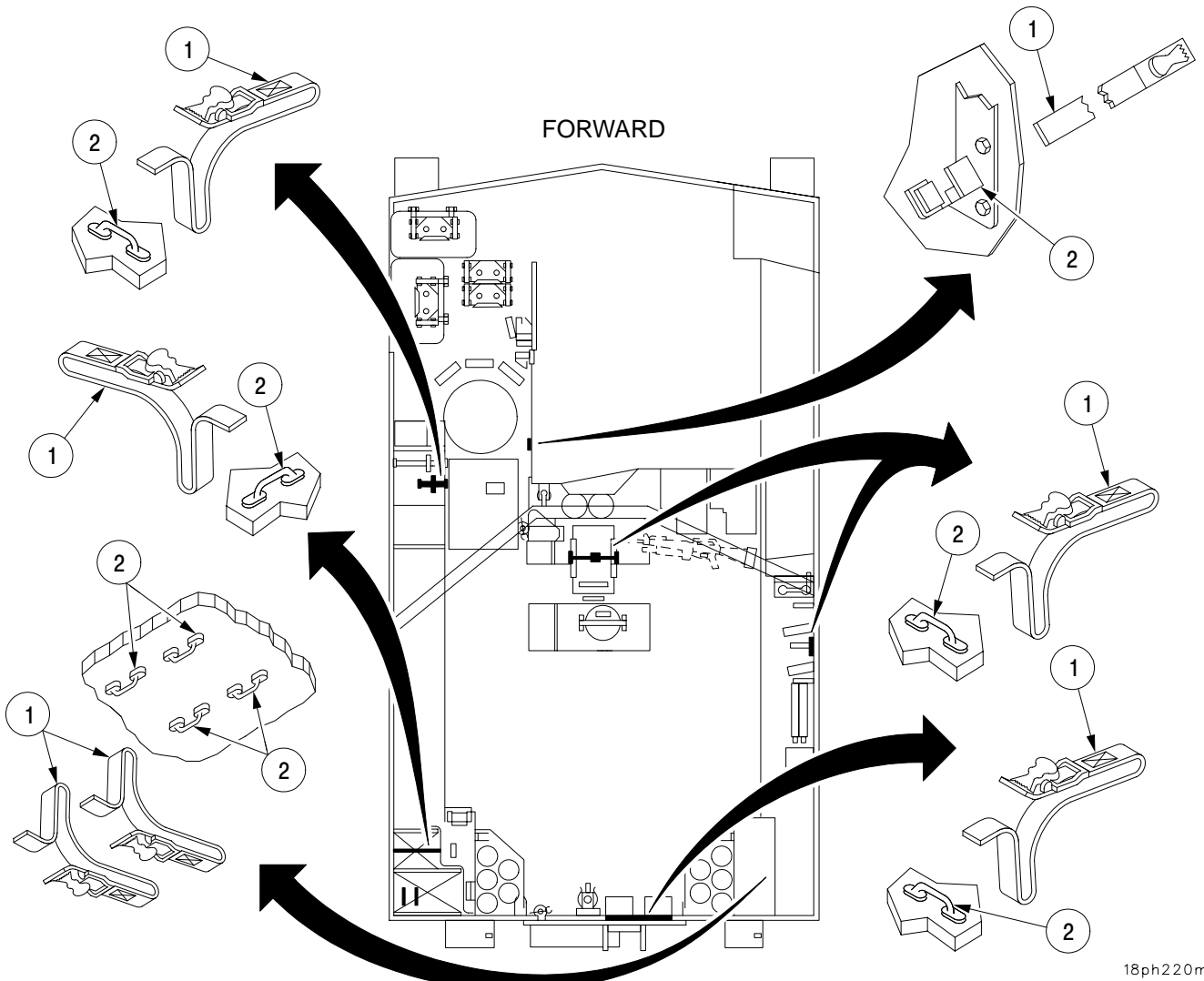
This task covers:      a. Removal                                      b. Installation

**a. Removal.**

Unbuckle strap (1) and slide end of strap (1) from retainer (2).

**b. Installation.**

Thread strap (1) through retainer (2) and tighten strap (1).



---

**Section VII. STOWAGE RACKS, BOXES, STRAPS, CARRYING CASES, AND CABLE REELS – CONTINUED**

---

**16-57 STRAP WITH REMOVABLE HOOK.**

---

This task covers:      a. Removal                                      b. Installation

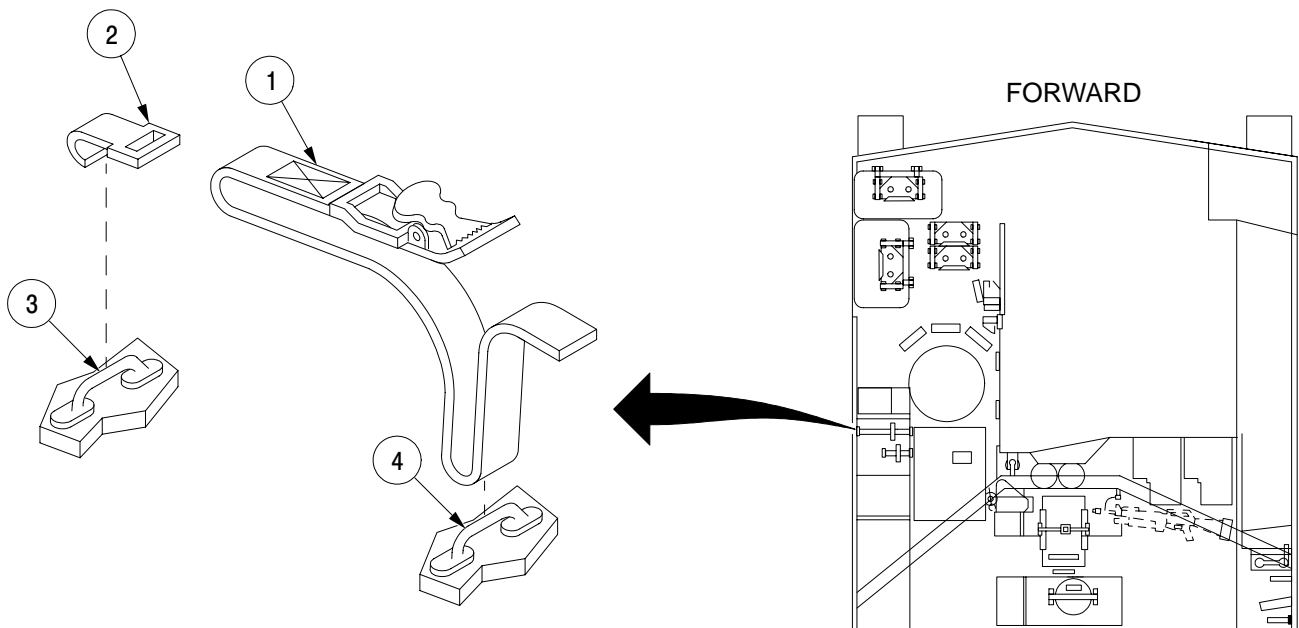
---

**a. Removal.**

- 1 Loosen strap (1) and remove hook (2) from retainer (3).
- 2 Unbuckle strap (1) and pull strap (1) from retainer (4).
- 3 Remove hook (2) from strap (1).

**b. Installation.**

- 1 Install hook (2) on strap (1).
- 2 Thread strap (1) through retainer (4) and buckle strap (1).
- 3 Place hook (2) over retainer (3) and tighten strap (1).



18ph221m





---

**Section VII. STOWAGE RACKS, BOXES, STRAPS, CARRYING CASES, AND CABLE REELS – CONTINUED**

---

**16-60 SPACER.**

---

This task covers:      a. Removal                                      b. Installation

---

**INITIAL SETUP**

Tools

General mechanic's tool kit  
(SC 5180-90-N26)

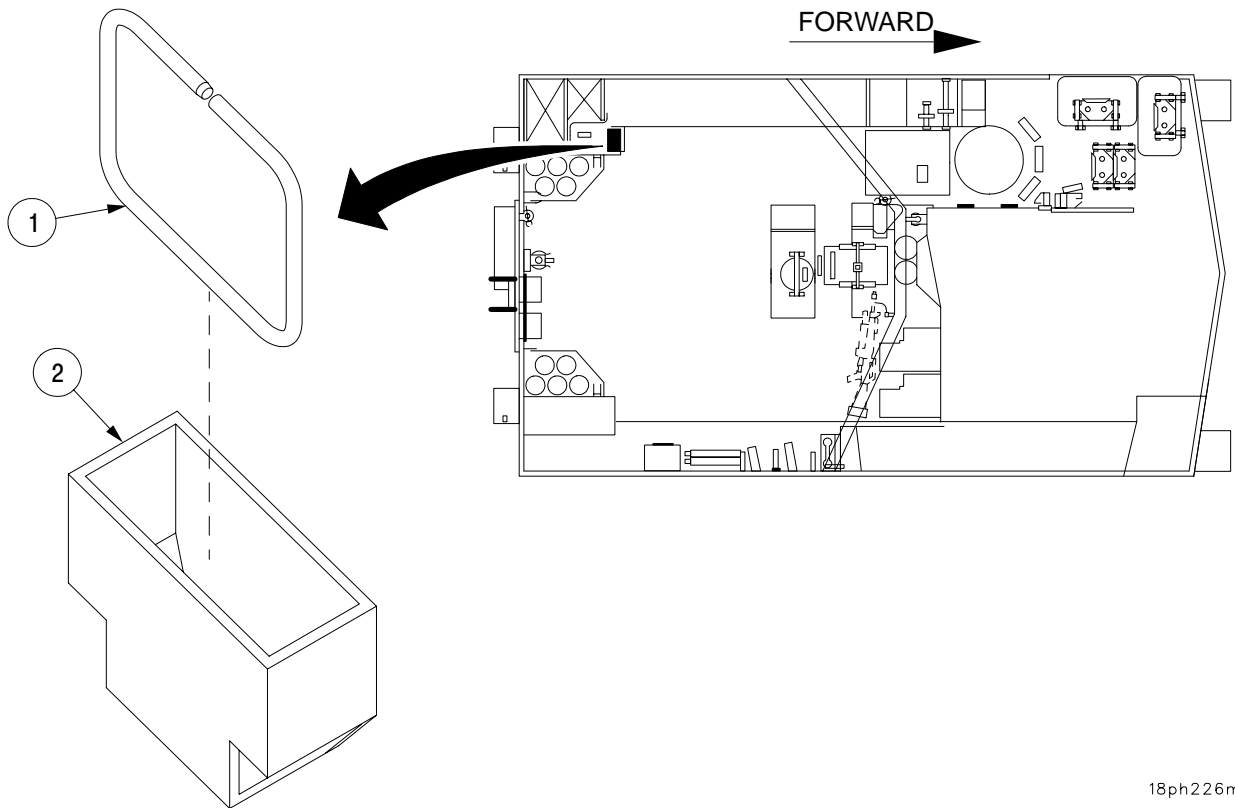
---

**a. Removal.**

Remove spacer (1) from projectile box (2).

**b. Installation.**

Install spacer (1) into projectile box (2).



18ph226m









**Section VII. STOWAGE RACKS, BOXES, STRAPS, CARRYING CASES, AND CABLE REELS – CONTINUED**

**16-64 EXTRACTOR ASSEMBLY STOWAGE CLAMPS.**

This task covers:                      a. Removal                                      b. Installation

**INITIAL SETUP**

Tools

General mechanic's tool kit  
(SC 5180-90-N26)

Materials/Parts

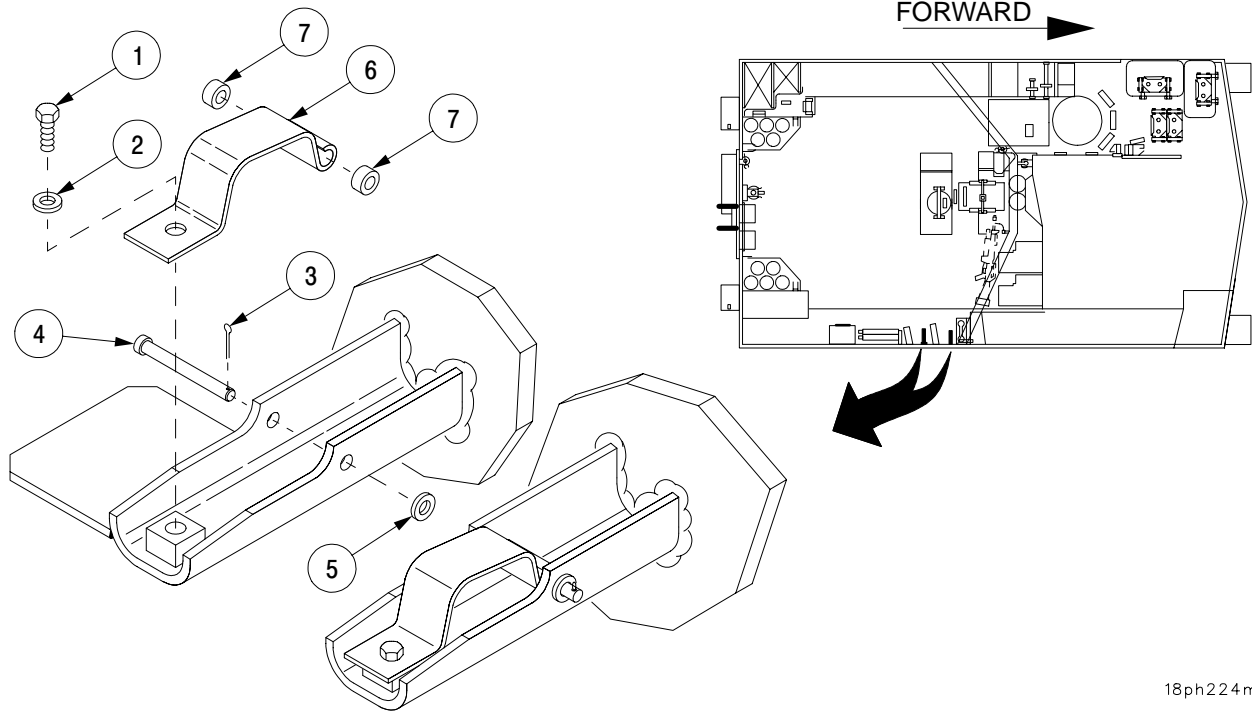
Cotter pins (2) (item 8, Appx E)

**a. Removal.**

Remove two screws (1), two flat washers (2), two cotter pins (3), two headed pins (4), two flat washers (5), two clamps (6), and four bearings (7). Discard cotter pins.

**b. Installation.**

Install two clamps (6) with four bearings (7), two flat washers (5), two headed pins (4), two new cotter pins (3), two screws (1), and two flat washers (2).



18ph224m

**Section VII. STOWAGE RACKS, BOXES, STRAPS, CARRYING CASES, AND CABLE REELS – CONTINUED**

**16-65 OIL CAN BRACKET AND MOUNTING PLATE.**

This task covers:                    a. Removal    b. Installation

**INITIAL SETUP**

Tools

General mechanic's tool kit  
(SC 5180-90-N26)

Equipment Conditions

Oil can removed  
(TM 9-2350-314-10)

Materials/Parts

Lockwashers (4) (item 5, Appx E)

References

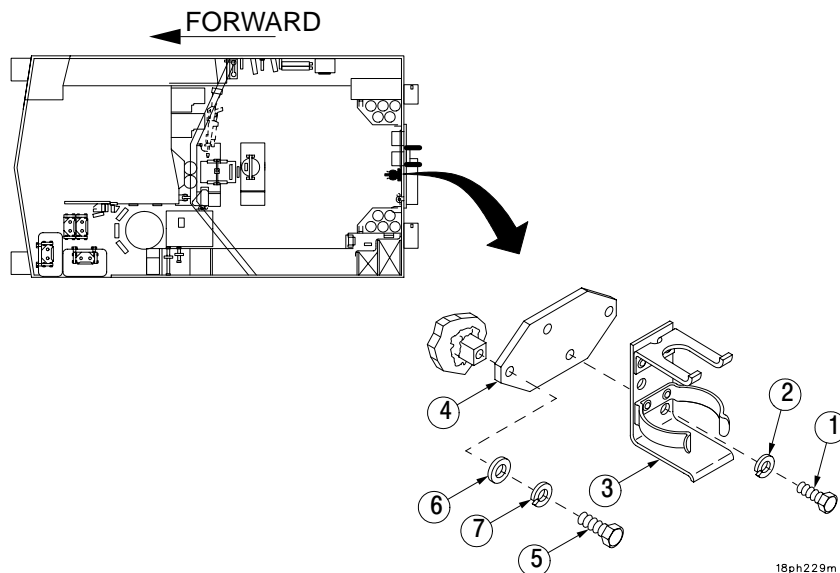
TM 9-2350-314-10

**a. Removal.**

- 1 Remove two screws (1), two lockwashers (2), and oil can bracket (3) from plate (4). Discard lockwashers.
- 2 Remove two screws (5), two flat washers (6), two lockwashers (7), and plate (4) from inside vehicle rear door. Discard lockwashers.

**b. Installation.**

- 1 Install plate (4) on inside of vehicle rear door with two screws (5), two new lockwashers (7), and two flat washers (6).
- 2 Install oil can bracket (3) on plate (4) with two screws (1) and two new lockwashers (2).



**NOTE**

**FOLLOW-ON MAINTENANCE:**  
Install oil can (TM 9-2350-314-10)



**Section VII. STOWAGE RACKS, BOXES, STRAPS, CARRYING CASES, AND CABLE REELS – CONTINUED**

**16-67 VERTICAL LATCH ASSEMBLY.**

This task covers: a. Removal b. Disassembly c. Assembly d. Installation

**INITIAL SETUP**

Tools

General Mechanic's Tool Kit  
(SC 5180-90-N26)  
Snapping pliers (item 42, Appx F)

Equipment Conditions

Projectiles removed from projectile racks  
(TM 9-2359-314-10)

Materials/Parts

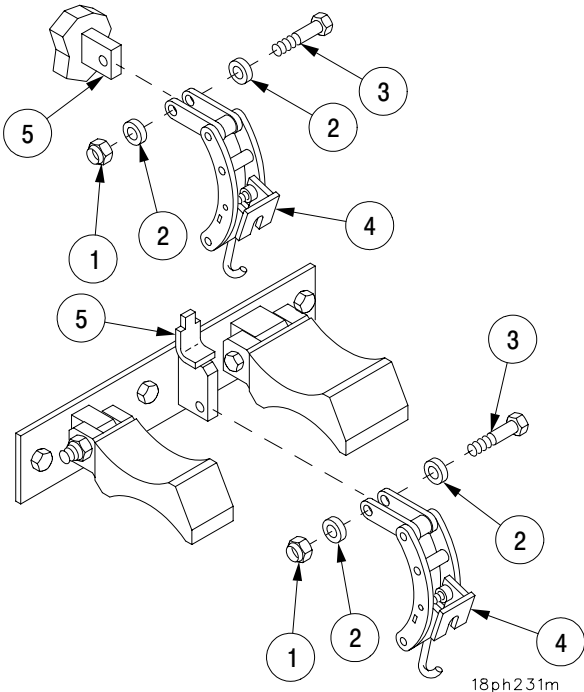
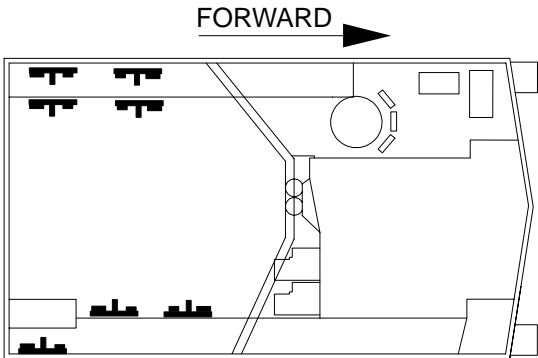
Retaining rings (2) (item 271, Appx E)  
Self-locking nut (item 118, Appx E)  
Spring pin (item 272, Appx E)

References

TM 9-2350-314-10

**a. Removal.**

Remove self-locking nut (1), two flat washers (2), screw (3), and latch assembly (4) from bracket (5). Discard self-locking nut.



---

**Section VII. STOWAGE RACKS, BOXES, STRAPS, CARRYING CASES, AND CABLE REELS – CONTINUED**

---

**16-67 VERTICAL LATCH ASSEMBLY – CONTINUED**

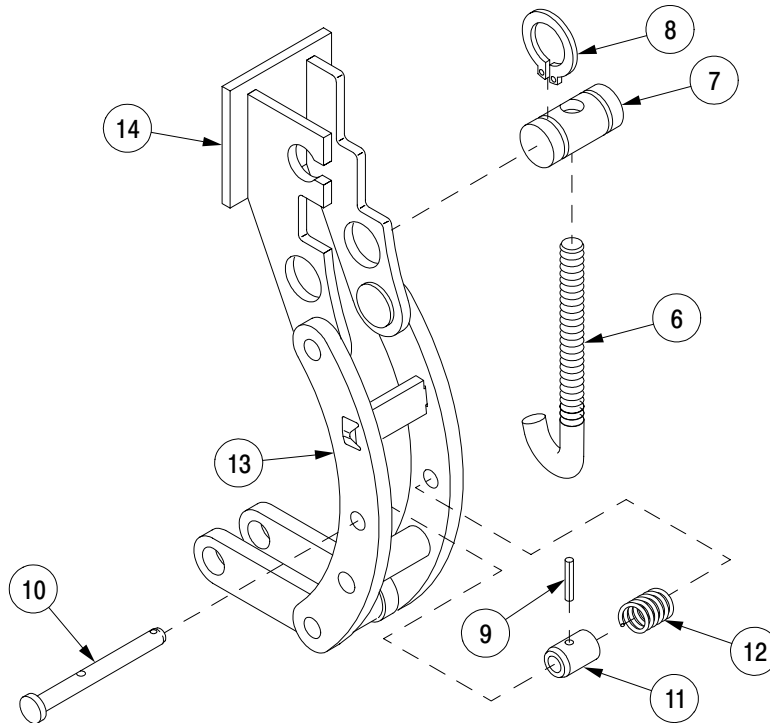
---

**b. Disassembly.**

- 1 Remove hook (6) from shaft (7).
- 2 Remove two retaining rings (8) and shaft (7). Discard retaining rings.
- 3 Remove spring pin (9) from pin (10). Discard spring pin.
- 4 Remove pin (10), collar (11), and spring (12) from inner latch (13) and frame (14).

**c. Assembly.**

- 1 Install pin (10), collar (11), and spring (12) in frame (14) and inner latch (13). Secure pin (10) and collar (11) with new spring pin (9).
- 2 Install shaft (7) with two new retaining rings (8).
- 3 Install hook (6) on shaft (7).



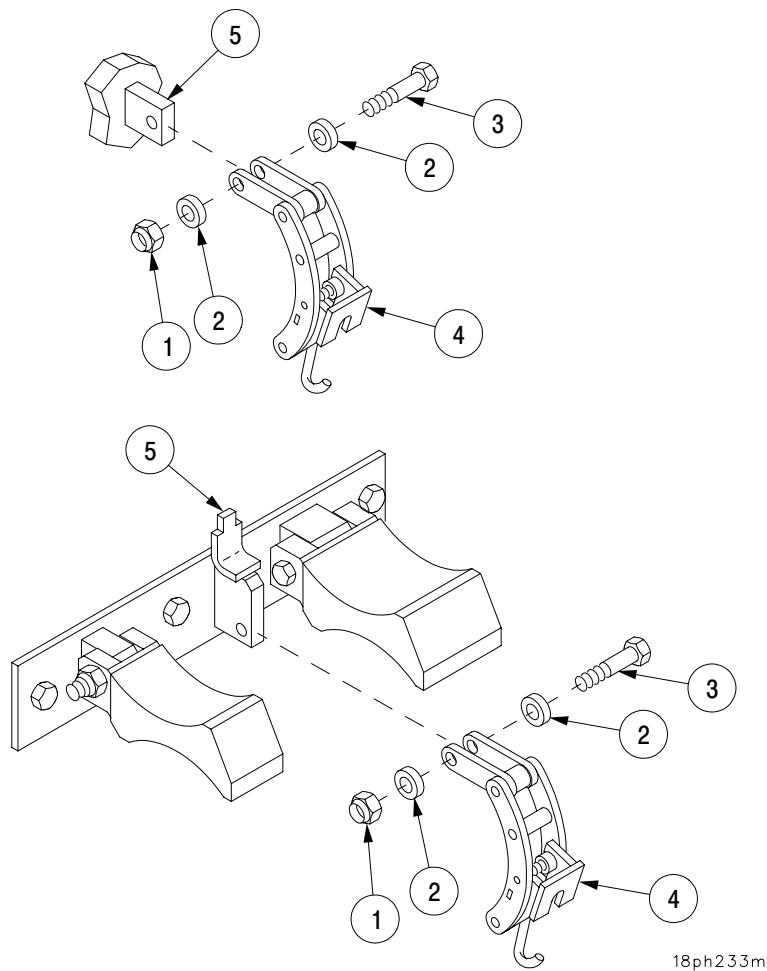
18ph232m

**Section VII. STOWAGE RACKS, BOXES, STRAPS, CARRYING CASES, AND CABLE REELS – CONTINUED**

**16-67 VERTICAL LATCH ASSEMBLY – CONTINUED**

**d. Installation.**

Install latch assembly (4) with screw (3), two flat washers (2), and new self-locking nut (1) to bracket (5).



**NOTE**

**FOLLOW-ON MAINTENANCE:**  
 Install projectiles in projectile racks  
 (TM 9-2350-314-10)

**Section VII. STOWAGE RACKS, BOXES, STRAPS, CARRYING CASES, AND CABLE REELS – CONTINUED**

**16-68 HORIZONTAL LATCH ASSEMBLY.**

This task covers: a. Removal b. Disassembly c. Assembly d. Installation

**INITIAL SETUP**

Tools

General mechanic's tool kit  
(SC 5180-90-N26)  
Snapping pliers (item 42, Appx F)

Materials/Parts

Retaining rings (2) (item 271, Appx E)  
Self-locking nut (item 118, Appx E)  
Spring pin (item 272, Appx E)

Equipment Conditions

Projectiles removed from projectile racks  
(TM 9-2350-314-10)

References

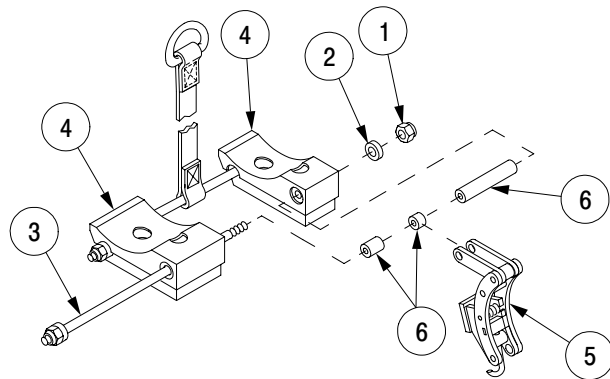
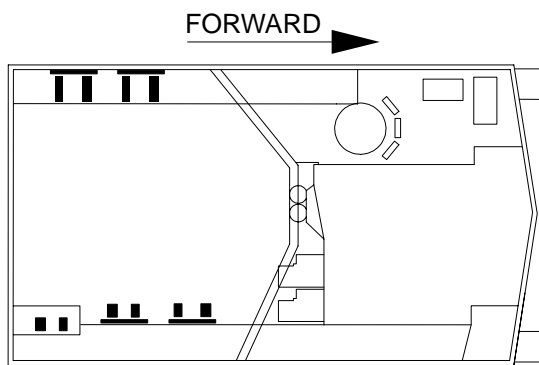
TM 9-2350-314-10

**NOTE**

For ease of installation, note position and quantity of spacers during removal of latch assembly.

**a. Removal.**

- 1 Remove self-locking nut (1) and flat washer (2) from one end of pin (3). Discard self-locking nut.
- 2 Slide pin (3) partially out of cradle bracket (4) to allow for removal of latch assembly (5) and spacers (6).
- 3 Remove latch assembly (5) from pin (3).



18ph234m

---

**Section VII. STOWAGE RACKS, BOXES, STRAPS, CARRYING CASES, AND CABLE REELS – CONTINUED**

---

**16-68 HORIZONTAL LATCH ASSEMBLY – CONTINUED**

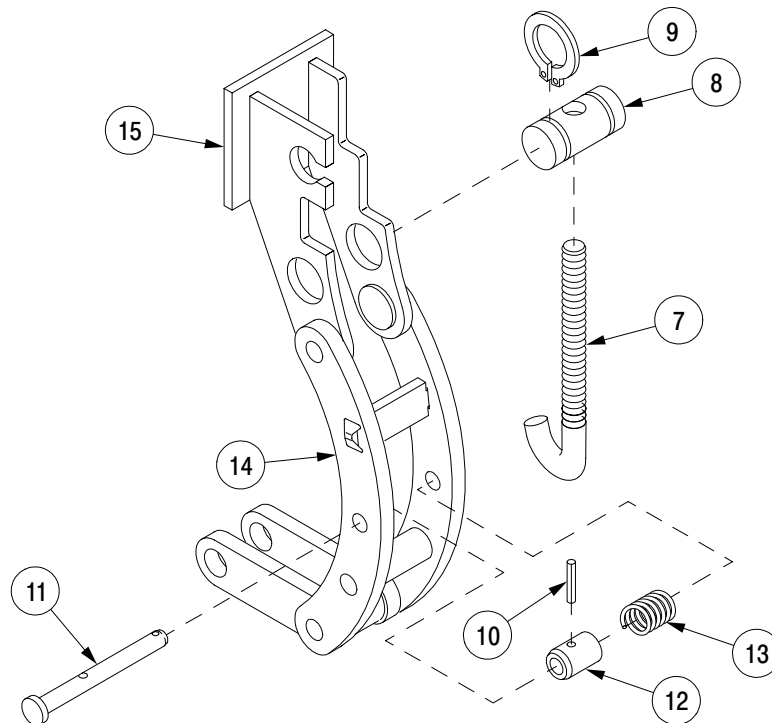
---

**b. Disassembly.**

- 1 Remove hook (7) from shaft (8).
- 2 Remove two retaining rings (9) and shaft (8). Discard retaining rings.
- 3 Remove spring pin (10) from pin (11). Discard spring pin.
- 4 Remove pin (11), collar (12), and spring (13) from inner latch (14) and frame (15).

**c. Assembly.**

- 1 Install pin (11), collar (12), and spring (13) in frame (15) and inner latch (14). Secure pin (11) and collar (12) with new spring pin (10).
- 2 Install shaft (8) with two new retaining rings (9).
- 3 Install hook (7) in shaft (8).



18ph235m



---

**Section VII. STOWAGE RACKS, BOXES, STRAPS, CARRYING CASES, AND CABLE REELS – CONTINUED**

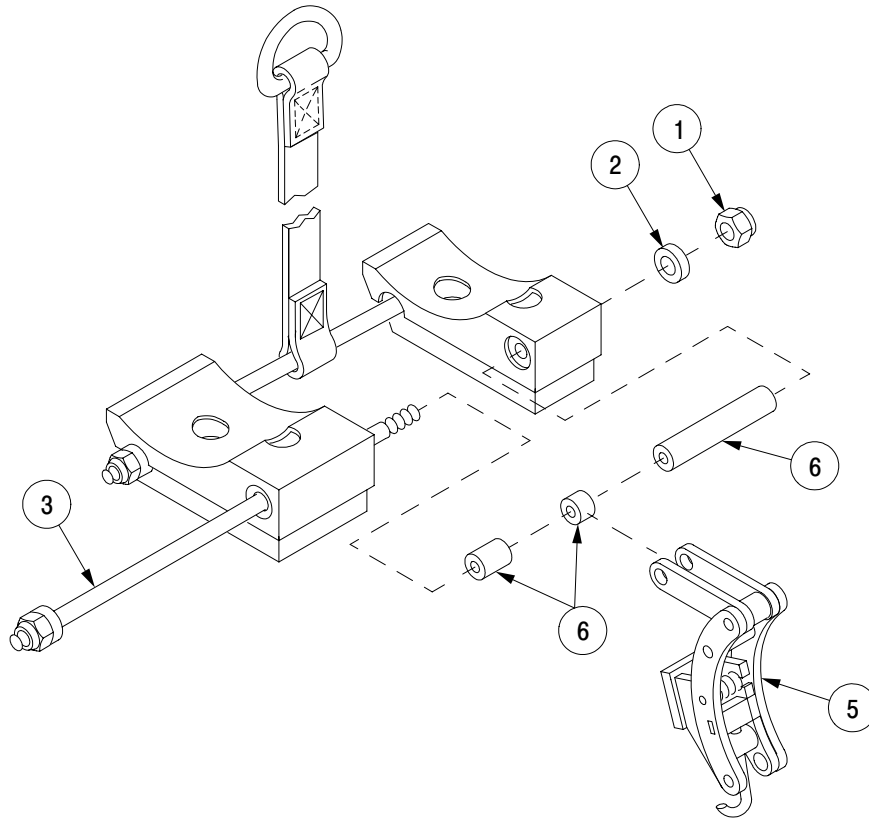
---

**16-68 HORIZONTAL LATCH ASSEMBLY – CONTINUED**

---

**d. Installation.**

Install latch assembly (5) and spacers (6) with pin (3), flat washer (2), and new self-locking nut (1).



18ph238m

**NOTE**

**FOLLOW-ON MAINTENANCE:**

Install projectiles in projectile racks  
(TM 9-2350-314-10)

---

**Section VII. STOWAGE RACKS, BOXES, STRAPS, CARRYING CASES, AND CABLE REELS – CONTINUED**

---

**16-69 LOCK ASSEMBLY (AMMUNITION RACKS).**

---

This task covers:    a. Removal                    b. Disassembly                    c. Assembly                    d. Installation

---

**INITIAL SETUP**Tools

General mechanic's tool kit  
(SC 5180-90-N26)

Materials/Parts

Cotter pin (item 273, Appx E)  
Spring pin (item 274, Appx E)

Equipment Conditions

Projectiles removed from ammunition rack  
(TM 9-2350-314-10)

References

TM 9-2350-314-10

---

**Section VII. STOWAGE RACKS, BOXES, STRAPS, CARRYING CASES, AND CABLE REELS – CONTINUED**

---

**16-69 LOCK ASSEMBLY (AMMUNITION RACKS) – CONTINUED**

---

**NOTE**

Right or left ammunition rack lock assemblies are replaced in the same manner.

**a. Removal.**

- 1 Loosen wingnut (1) and open ammunition rack (2).
- 2 Remove cotter pin (3) from headed pin (4). Discard cotter pin.
- 3 Remove lock assembly (5) from bracket (6).
- 4 Remove two screws (7), two flat washers (8), shims (9) and bracket (6) with lock assembly (5).

**b. Disassembly.**

- 1 Remove spring pin (10) from eyebolt (11). Discard spring pin.
- 2 Remove wingnut (1) and two nuts (12) from eyebolt (11).

**c. Assembly.**

- 1 Install two nuts (12) and wingnut (1) on eyebolt (11).
- 2 Install new spring pin (10) in eyebolt (11).

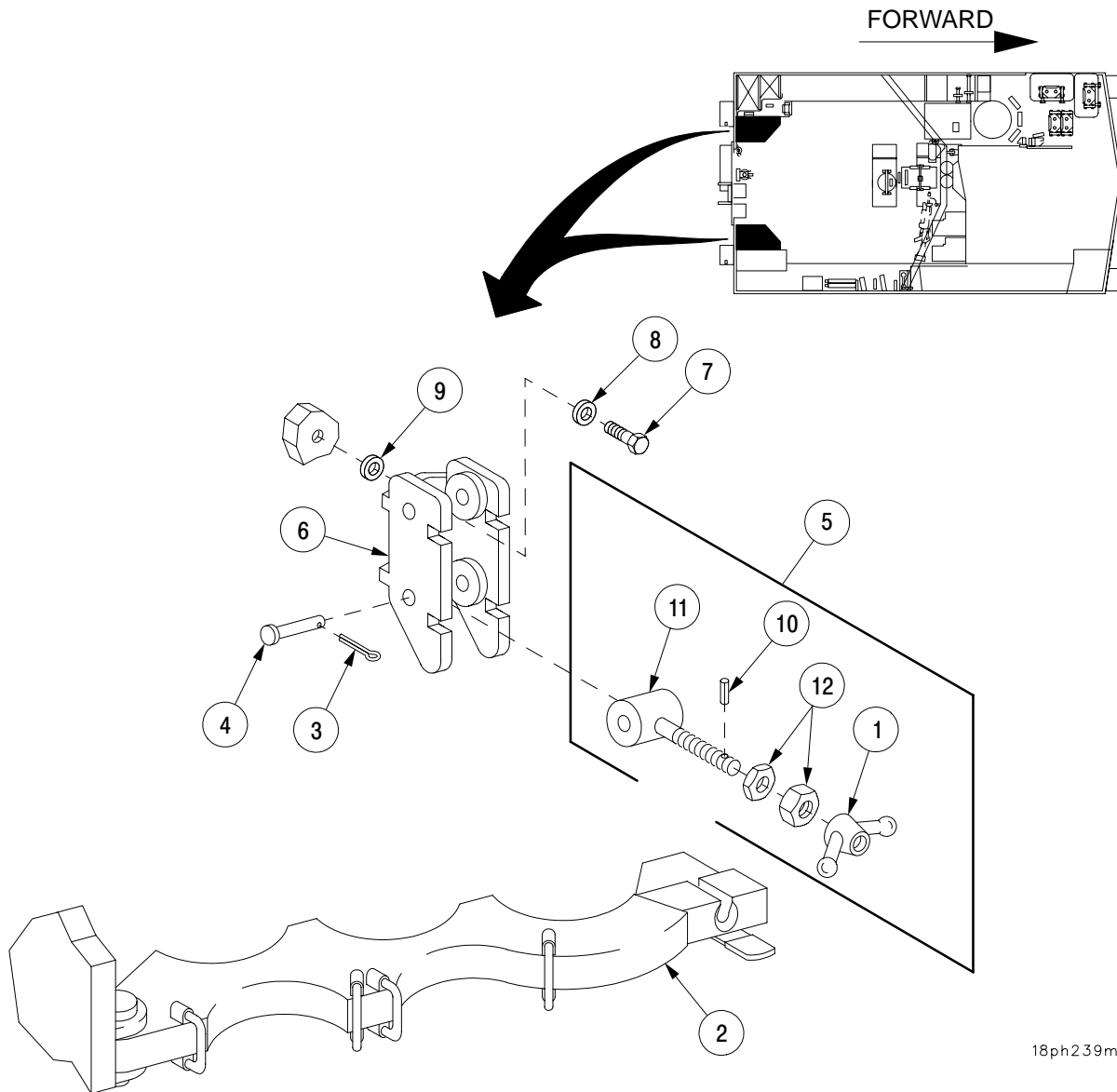
**d. Installation.**

- 1 Install bracket (6) with lock assembly (5) in vehicle with two screws (7), two flat washers (8), and shims (9) as required.
- 2 Install lock assembly (5) in bracket (6) with headed pin (4) and new cotter pin (3).
- 3 Close ammunition rack (2) and secure with wingnut (1).

**Section VII. STOWAGE RACKS, BOXES, STRAPS, CARRYING CASES, AND CABLE REELS – CONTINUED**

**16-69 LOCK ASSEMBLY (AMMUNITION RACKS) – CONTINUED**

**d. Installation – Continued**



18ph239m

**NOTE**  
**FOLLOW-ON MAINTENANCE:**  
 Install projectiles in ammunition  
 racks (TM 9-2350-314-10)

---

## Section VII. STOWAGE RACKS, BOXES, STRAPS, CARRYING CASES, AND CABLE REELS – CONTINUED

---

### 16-70 AMMUNITION RACKS.

---

This task covers:    a. Removal                    b. Disassembly                    c. Assembly                    d. Installation

---

#### **INITIAL SETUP**

##### Tools

General mechanic's tool kit  
(SC 5180-90-N26)

##### Equipment Conditions

Projectiles removed from ammunition racks  
(TM 9-2350-314-10)

##### Materials/Parts

Cotter pin (item 49, Appx E)  
Adhesive (item 1, Appx C)  
Sealing compound (item 51, Appx C)  
Spring pins (2) (item 275, Appx E)

##### References

TM 9-2350-314-10

---

#### **NOTE**

Right or left ammunition racks are replaced in the same manner.

#### **a. Removal.**

- 1 Remove cotter pin (1) and headed pin (2) from bracket (3). Discard cotter pin.
- 2 Loosen wingnut (4) on lock assembly (5) and remove arm (6).

#### **NOTE**

Quantity of shims may vary with location of ammunition rack.

- 3 Remove four screws (7), four flat washers (8), cradle (9), and strip (10) from vehicle.

#### **b. Disassembly.**

- 1 Remove four screws (11), four flat washers (12), bracket (3), and spacer (13) from vehicle.
- 2 Remove screw (14), flat washer (15), tab (16), and two spring pins (17) from arm (6). Discard spring pins.
- 3 Remove two straps (18) with two hooks (19) from arm (6).

**Section VII. STOWAGE RACKS, BOXES, STRAPS, CARRYING CASES, AND CABLE REELS – CONTINUED**

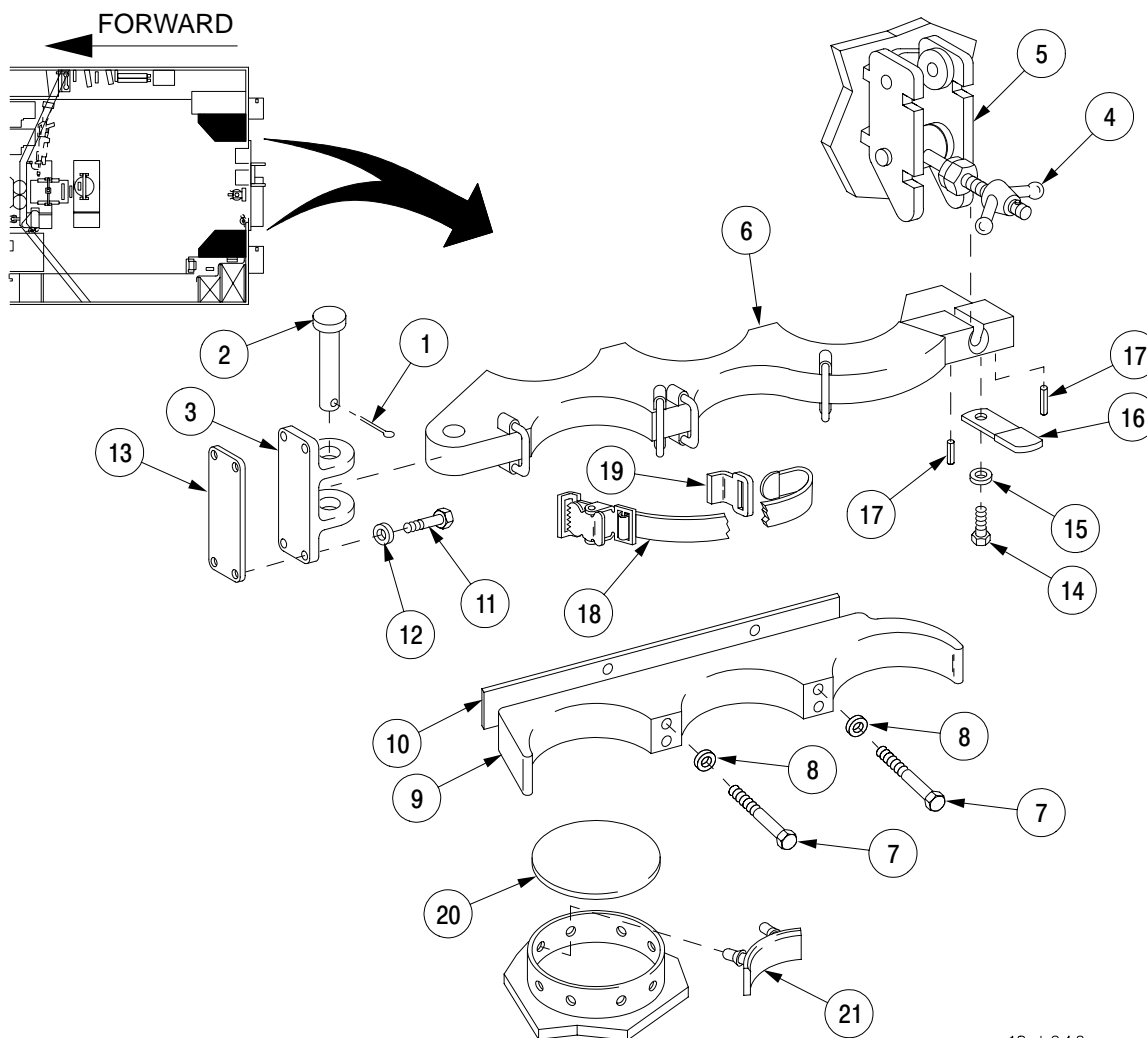
**16-70 AMMUNITION RACKS – CONTINUED**

**b. Disassembly – Continued**

**NOTE**

Each ammunition rack assembly has five cushioning pads and 20 nonmetallic pads. Remove pads only if damaged.

- 4 Remove cushioning pads (20) and nonmetallic pads (21) from floor of vehicle, if damaged.



18ph242m

**Section VII. STOWAGE RACKS, BOXES, STRAPS, CARRYING CASES, AND CABLE REELS – CONTINUED**

---

**16-70 AMMUNITION RACKS – CONTINUED**

---

**c. Assembly.**

- 1 Apply adhesive to nonmetallic pads (21) and cushioning pads (20), if removed.
- 2 Install nonmetallic pads (21) and cushioning pads (20) on floor of vehicle, if removed.
- 3 Install two straps (18) with two hooks (19) on arm (6).
- 4 Apply sealing compound to threads of screws (14 and 11).
- 5 Install tab (16) with screw (14) and flat washer (15).
- 6 Install two new spring pins (17) in arm (6).
- 7 Install bracket (3) with spacer (13), four screws (11), and four flat washers (12).

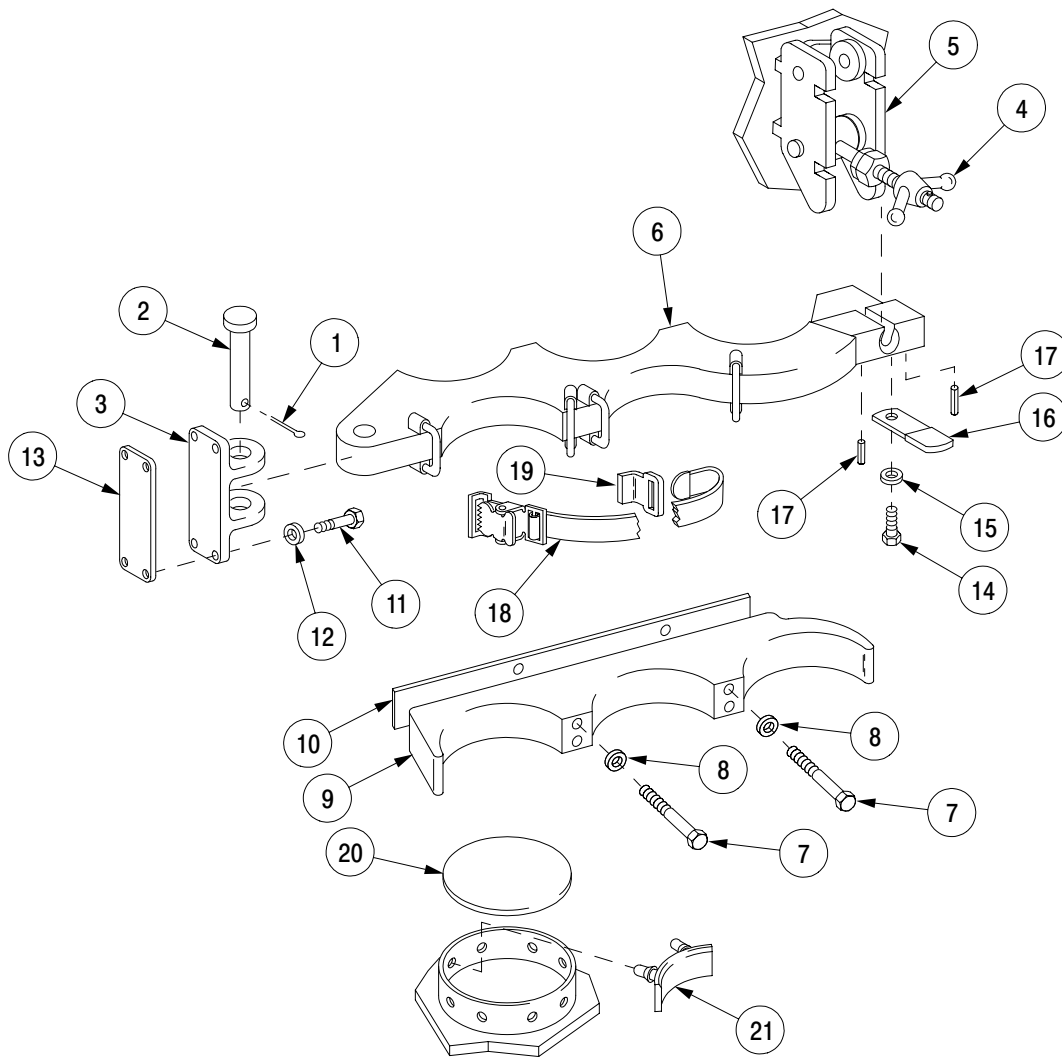
**d. Installation.**

- 1 Install cradle (9) and strip (10) with four screws (7) and four flat washers (8).
- 2 Install arm (6) in bracket (3) with headed pin (2) and new cotter pin (1).
- 3 Secure arm (6) with wingnut (4) on lock assembly (5).

**Section VII. STORAGE RACKS, BOXES, STRAPS, CARRYING CASES, AND CABLE REELS – CONTINUED**

**16-70 AMMUNITION RACKS – CONTINUED**

**d. Installation – Continued**



18ph241m

**NOTE**

**FOLLOW-ON MAINTENANCE:**

Install projectiles in ammunition racks (TM 9-2350-314-10)



---

## Section VII. STOWAGE RACKS, BOXES, STRAPS, CARRYING CASES, AND CABLE REELS – CONTINUED

---

### 16-71 PROJECTILE STOWAGE STRAPS, SPACERS, AND STRAP BRACKET.

---

This task covers:                    a. Removal    b. Installation

---

#### **INITIAL SETUP**

##### Tools

General mechanic's tool kit  
(SC 5180-90-N26)

##### Equipment Conditions

Projectiles removed from cradle  
(TM 9-2350-314-10)

##### Materials/Parts

Self-locking nut (item 118, Appx E)

##### References

TM 9-2350-314-10

---

#### **NOTE**

- Quantity, size, and location of spacers for each cradle will vary. For ease of installation, note quantity, size, and location of spacers removed from cradle.
- The procedures to remove straps and spacers are the same, with the exception of the triple cradle, which uses a strap and strap bracket.
- To replace straps or spacers, perform Removal steps 1, 2, and 3, and Installation steps 3 and 4.
- To replace strap or strap bracket, perform Removal steps 1, 2, and 4, and Installation steps 1, 2, and 4.
- Remove self-locking nut from side of pin necessary to correct fault.

#### **a. Removal.**

- 1 Remove self-locking nut (1) and flat washer (2) from one end of pin (3). Discard self-locking nut.
- 2 Slide pin (3) partially out of cradle bracket (4) to allow for removal of strap (5), spacer (6), and/or horizontal latch assembly (7), or strap bracket (8).

**Section VII. STOWAGE RACKS, BOXES, STRAPS, CARRYING CASES, AND CABLE REELS – CONTINUED**

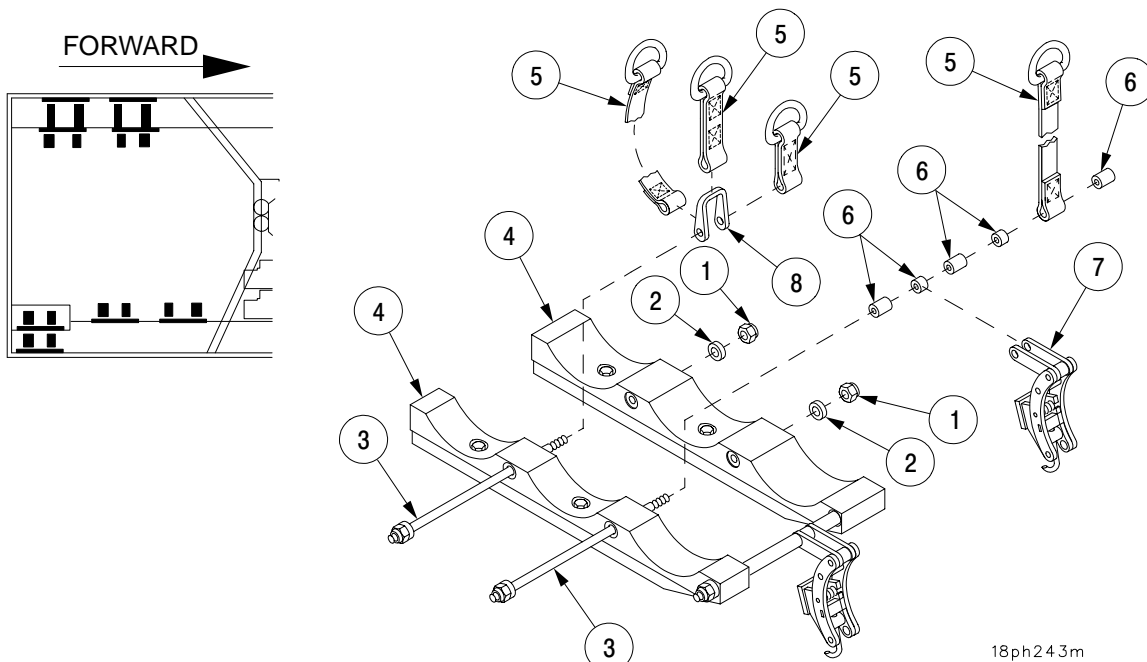
**16-71 PROJECTILE STOWAGE STRAPS, SPACERS, AND STRAP BRACKET – CONTINUED**

**a. Removal – Continued**

- 3 Remove strap (5) or spacer (6) and/or horizontal latch assembly (7) from pin (3).
- 4 Remove strap bracket (8) and/or horizontal latch assembly (7) from pin (3). Separate strap (5) from strap bracket (8).

**b. Installation.**

- 1 Install strap (5) on strap bracket (8).
- 2 Install strap bracket (8) with strap (5) on pin (3).
- 3 Install strap (5) or spacer (6) and/or horizontal latch assembly (7) on pin (3).
- 4 Slide pin (3) through cradle bracket (4) and secure with flat washer (2) and new self-locking nut (1).



**NOTE**

**FOLLOW-ON MAINTENANCE:**  
 Install projectiles in cradle  
 (TM 9-2350-314-10)

## Section VII. STOWAGE RACKS, BOXES, STRAPS, CARRYING CASES, AND CABLE REELS – CONTINUED

---

### 16-72 HINGED AND TRIPLE CRADLES.

---

This task covers:                    a. Removal    b. Installation

---

#### **INITIAL SETUP**

##### Tools

General mechanic's tool kit  
(SC 5180-90-N26)

##### Equipment Conditions

Projectiles removed from cradles  
(TM 9-2350-314-10)

##### Materials/Parts

Self-locking nut (Hinged cradle) (item 118, Appx E)  
Lockwashers (2) (Triple cradle) (item 3, Appx E)  
Self-locking nuts (3) (Triple cradle) (item 118, Appx E)

##### References

TM 9-2350-314-10

---

#### **NOTE**

- Quantity, size, and location of spacers will vary. For ease of installation, note quantity, size, and location of spacers during removal.
- To replace hinged cradle, perform Removal step 1 and Installation step 3.
- To replace triple cradle, perform Removal steps 2, 3, and 4 and Installation steps 1 and 2.

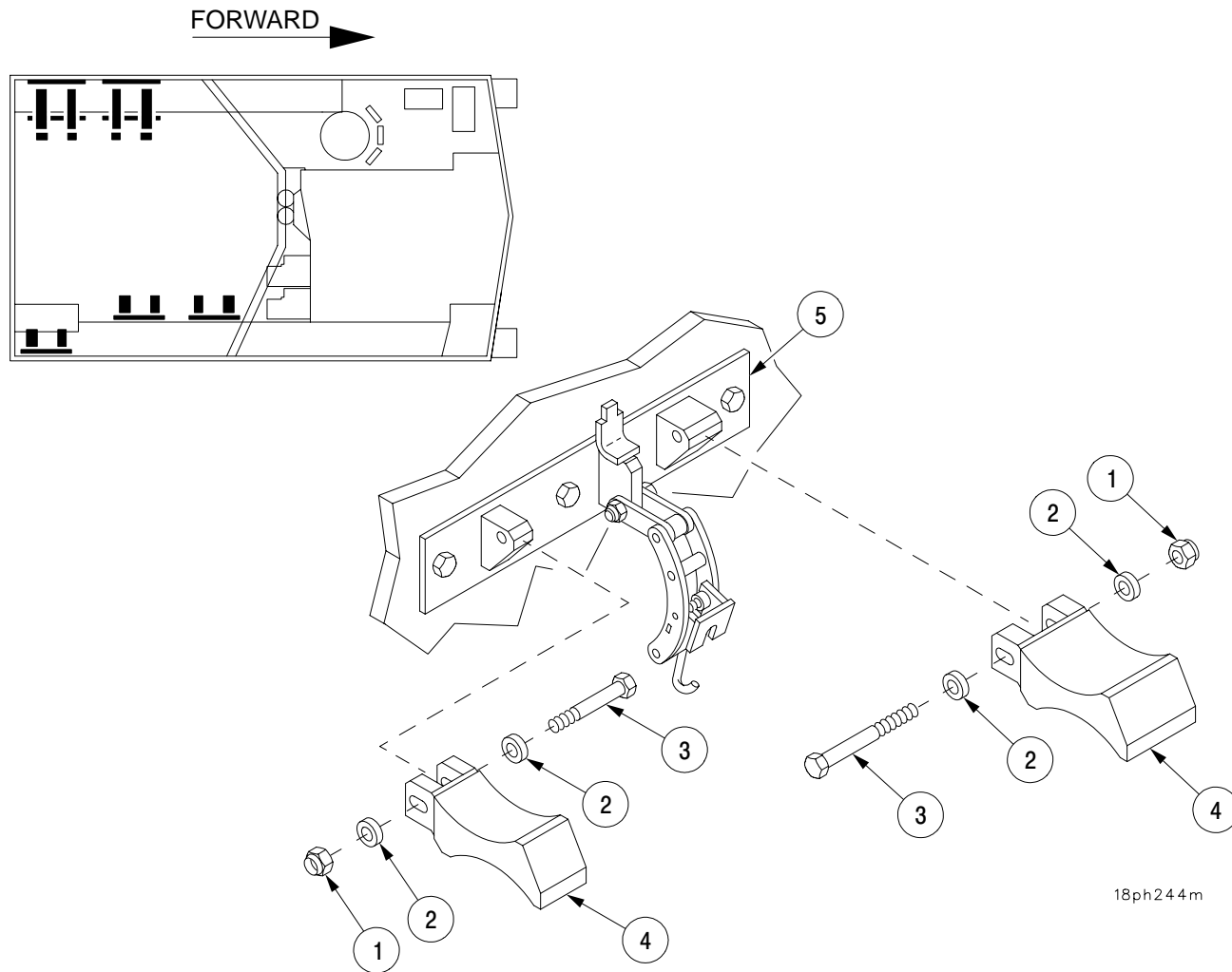
#### **a. Removal.**

- 1 Remove self-locking nut (1), two flat washers (2), screw (3), and hinged cradle (4) from cradle bracket (5). Discard self-locking nut.

**Section VII. STOWAGE RACKS, BOXES, STRAPS, CARRYING CASES, AND CABLE REELS – CONTINUED**

**16-72 HINGED AND TRIPLE CRADLES – CONTINUED**

**a. Removal – Continued**



**Section VII. STOWAGE RACKS, BOXES, STRAPS, CARRYING CASES, AND CABLE REELS – CONTINUED**

**16-72 HINGED AND TRIPLE CRADLES – CONTINUED**

**a. Removal – Continued**

**NOTE**

Remove attaching hardware from side of cradle to be replaced.

- 2 Remove two screws (6), two lockwashers (7), and two flat washers (8) securing triple cradle (9) to mounting bracket. Discard lockwashers.
- 3 Remove three self-locking nuts (10) and three flat washers (11) from three pins (12). Discard self-locking nuts.
- 4 Remove triple cradle (9) from three pins (12) and mounting bracket.

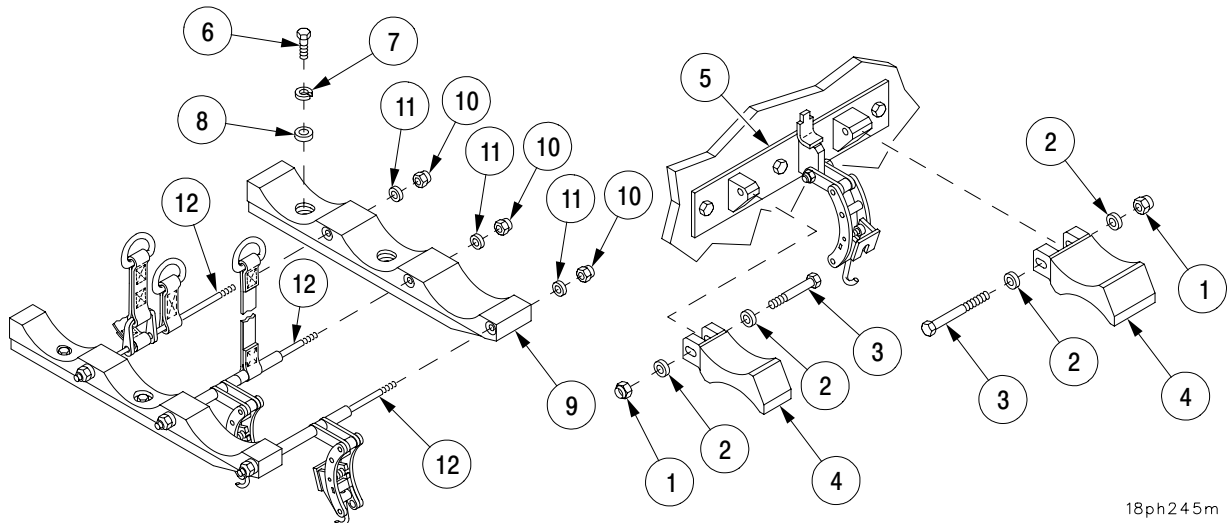
**b. Installation.**

- 1 Install triple cradle (9) on three pins (12) with three flat washers (11) and three new self-locking nuts (10).
- 2 Secure triple cradle (9) to mounting bracket with two screws (6), two new lockwashers (7), and two flat washers (8).

**NOTE**

Install self-locking nut securing hinged cradle so that end of screw extends a minimum of 0.01 inches and hinged cradle slides on screw within limitations of slot.

- 3 Install hinged cradle (4) on cradle bracket (5) with screw (3), two flat washers (2), and new self-locking nut (1).



18ph245m

**NOTE**

**FOLLOW-ON MAINTENANCE:**

Install projectiles in cradle  
(TM 9-2350-314-10)



**Section VII. STOWAGE RACKS, BOXES, STRAPS, CARRYING CASES, AND CABLE REELS – CONTINUED**

**16-73 SINGLE CRADLES, CANTILEVER CRADLES, CRADLE, AND LATCH BRACKETS – CONTINUED**

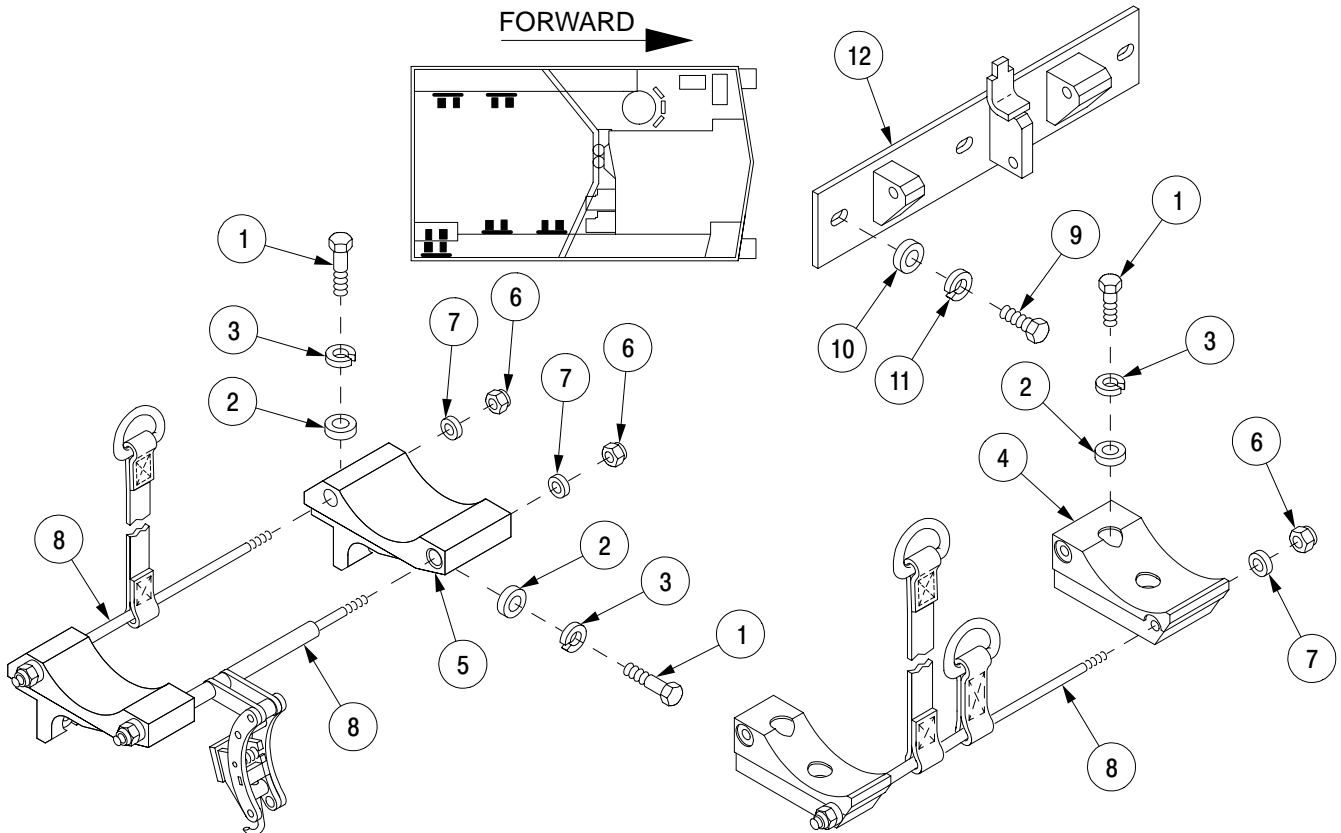
**a. Removal.**

- 1 Remove two screws (1), two flat washers (2), and two lockwashers (3) securing single cradle (4) or cantilever cradle (5) to mounting bracket. Discard lockwashers.

**NOTE**

Remove self-locking nuts and flat washers from side of cradle being replaced.

- 2 Remove two self-locking nuts (6) and two flat washers (7) from two pins (8). Discard self-locking nuts.
- 3 Remove single cradle (4) or cantilever cradle (5) from two pins (8).
- 4 Remove three screws (9), three flat washers (10), three lockwashers (11), and cradle mounting bracket (12). Discard lockwashers.



18ph246m

**Section VII. STOWAGE RACKS, BOXES, STRAPS, CARRYING CASES, AND CABLE REELS – CONTINUED**

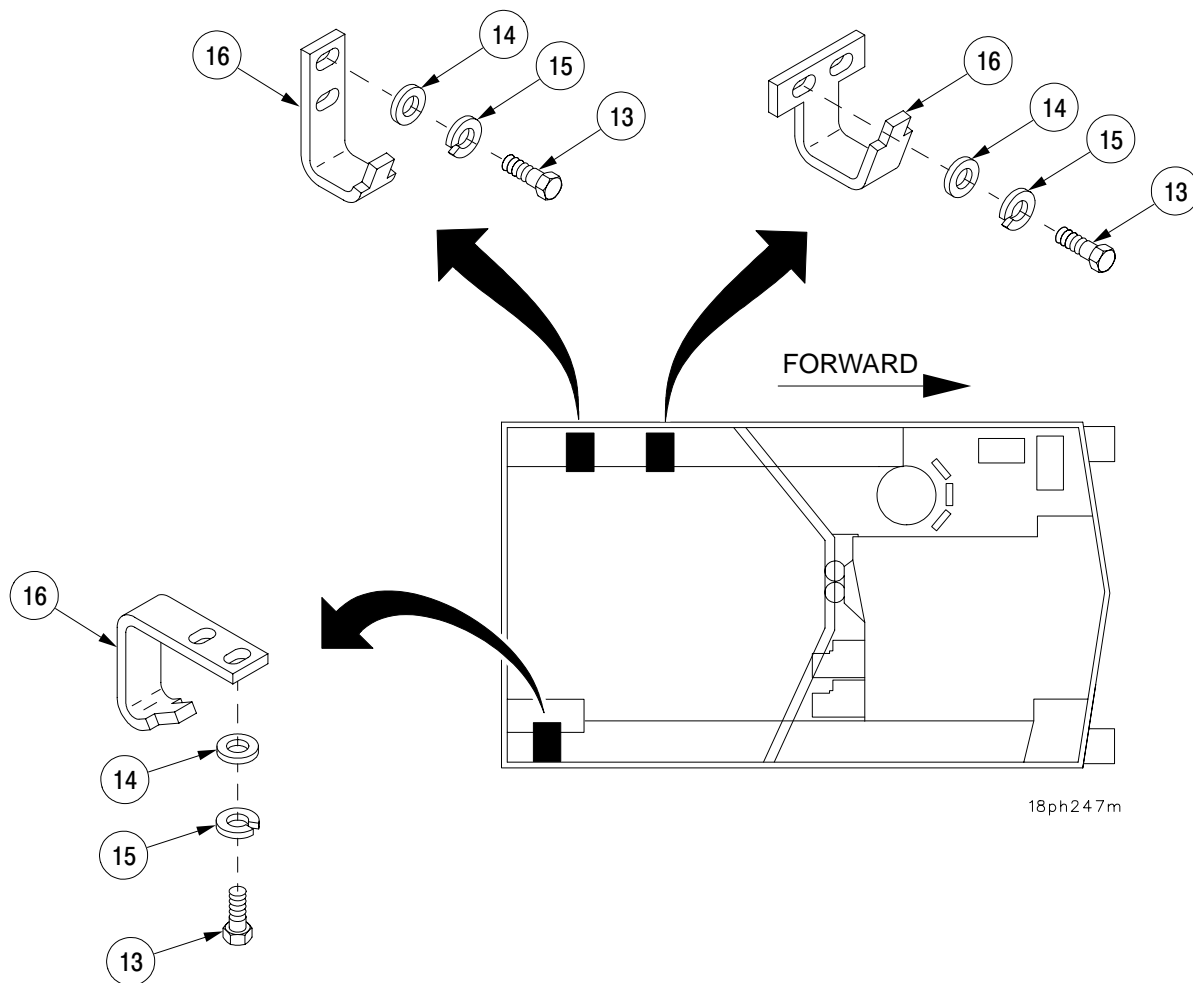
**16-73 SINGLE CRADLES, CANTILEVER CRADLES, CRADLE, AND LATCH BRACKETS – CONTINUED**

**a. Removal – Continued**

- 5 Remove two screws (13), two flat washers (14), two lockwashers (15), and latch bracket (16). Discard lockwashers.

**b. Installation.**

- 1 Install latch bracket (16) with two screws (13), two new lockwashers (15), and two flat washers (14).



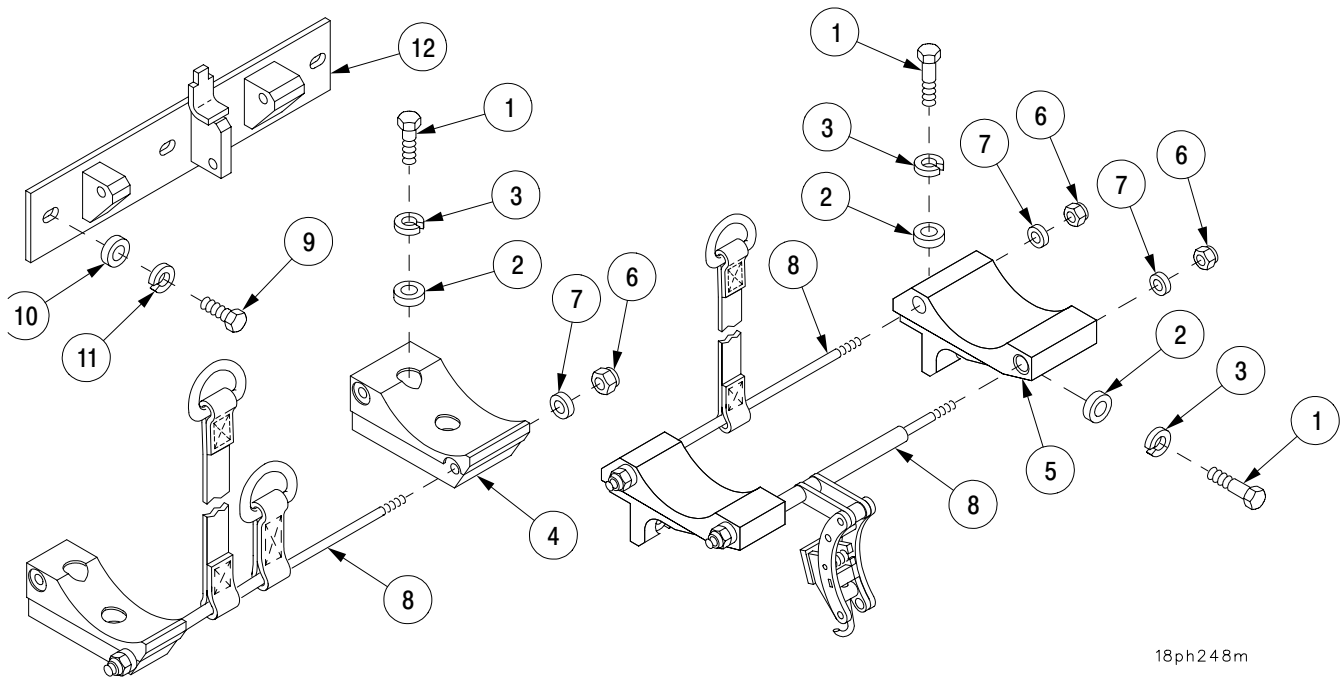


**Section VII. STOWAGE RACKS, BOXES, STRAPS, CARRYING CASES, AND CABLE REELS – CONTINUED**

**16-73 SINGLE CRADLES, CANTILEVER CRADLES, CRADLE, AND LATCH BRACKETS – CONTINUED**

**b. Installation – Continued**

- 2 Install cradle mounting bracket (12) with three screws (9), three new lockwashers (11), and three flat washers (10).
- 3 Install single cradle (4) or cantilever cradle (5) on two pins (8) with two flat washers (7) and two new self-locking nuts (6).
- 4 Secure single cradle (4) or cantilever cradle (5) to mounting bracket with two screws (1), two new lockwashers (3), and two flat washers (2).



18ph248m

**NOTE**

**FOLLOW-ON MAINTENANCE:**

- Install hinged cradle (para 16-72)  
(cradle bracket only)
- Install vertical latch assembly  
(para 16-67) (cradle bracket only)
- Install projectile in cradle  
(TM 9-2350-314-10)

# CHAPTER 17

## SPADE ASSEMBLIES

---

### GENERAL

This chapter illustrates and defines procedures for removal, disassembly, assembly, installation, and adjustment of the spade assemblies and related components.

---

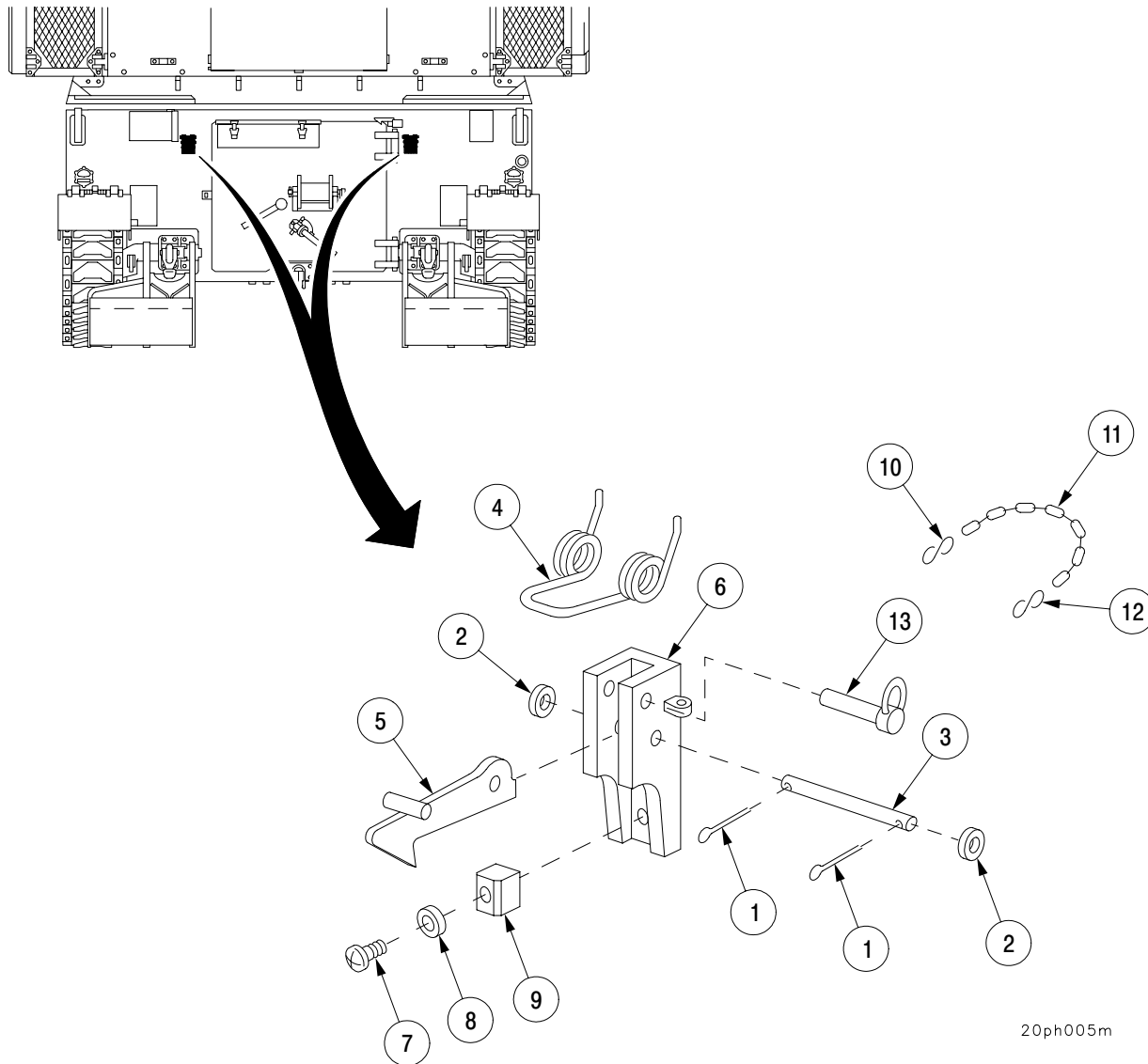
<u>CONTENTS</u>		<u>Page</u>
17-1	SPADE LATCH AND PIN ASSEMBLY .....	17-2
17-2	SPADE STRUT LATCH AND PEDAL .....	17-4
17-3	SPADE STRUT AND CABLE .....	17-6
17-4	SPADE .....	17-9





17-1 SPADE LATCH AND PIN ASSEMBLY – CONTINUED

b. Installation – Continued



20ph005m

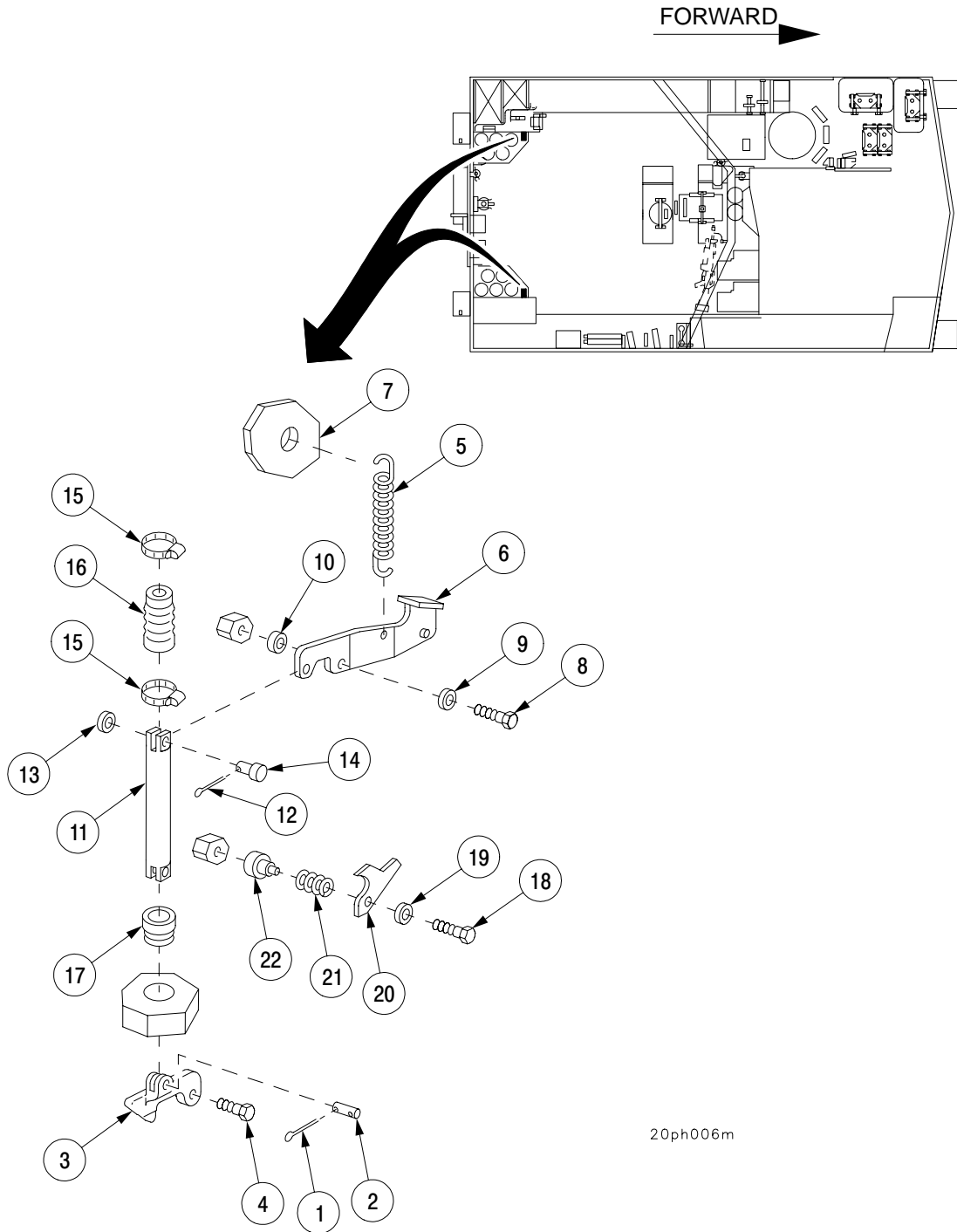
**NOTE**

**FOLLOW-ON MAINTENANCE:**  
 Raise and latch spade in stowed position  
 (TM 9-2350-314-10)



## 17-2 SPADE STRUT LATCH AND PEDAL – CONTINUED

### b. Installation – Continued



### 17-3 SPADE STRUT AND CABLE.

---

This task covers:    a. Removal                    b. Installation                    c. Adjustment

---

<b>INITIAL SETUP</b>
----------------------

Tools

General mechanic's tool kit

(SC 5180-90-N26)

Snapping pliers (item 42, Appx F)

Materials/Parts

Retaining rings (2) (item 2, Appx E)

References

TM 9-2350-314-10

---

**a. Removal.**

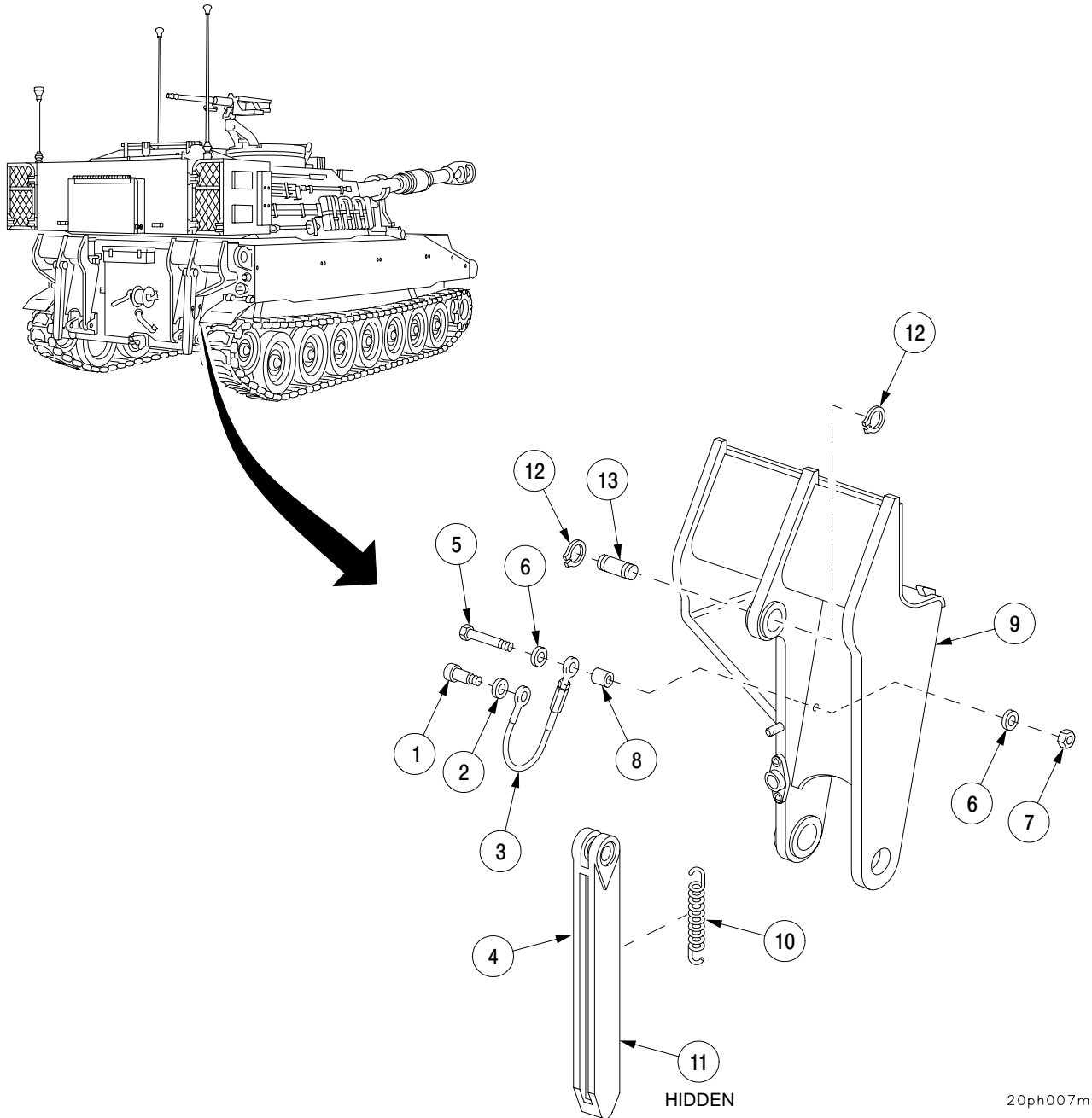
- 1 Remove screw (1) and flat washer (2) securing cable (3) to strut (4).
- 2 Remove screw (5), two flat washers (6), and nut (7) securing cable (3) and spacer (8) to spade (9).
- 3 Remove spring (10) from two pins (11).
- 4 Remove two retaining rings (12) and headless pin (13) securing strut (4) to spade (9). Discard retaining rings.

**b. Installation.**

- 1 Install strut (4) on spade (9) with headless pin (13) and two new retaining rings (12).
- 2 Install spring (10) on two pins (11).
- 3 Install spacer (8) and cable (3) on spade (9) with screw (5), two flat washers (6), and nut (7).
- 4 Install cable (3) on strut (4) with screw (1) and flat washer (2).

## 17-3 SPADE STRUT AND CABLE – CONTINUED

### b. Installation – Continued



20ph007m



## 17-3 SPADE STRUT AND CABLE – CONTINUED

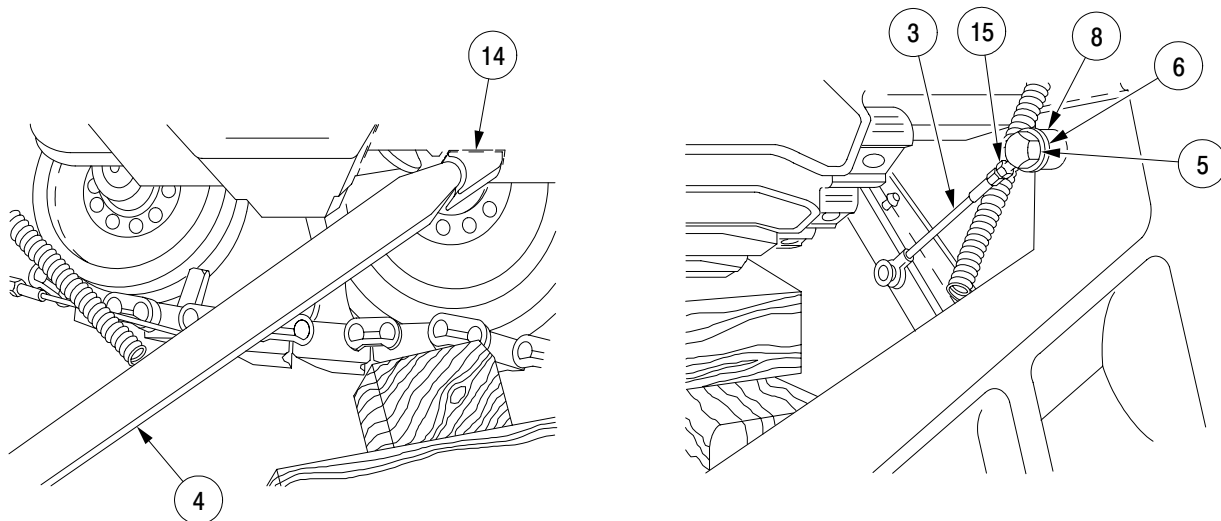
### c. Adjustment.

- 1 Start vehicle. Back vehicle over log or other object (at least 18 inches high) to allow full extension of spade when lowered (TM 9-2350-314-10).
- 2 Lower spade (TM 9-2350-314-10).
- 3 Check strut (4) position relative to latch socket (14). Strut should be in latch socket (14) when adjusted correctly. If strut (4) is not in socket (14), perform Adjustment steps 4 through 8.
- 4 Remove screw (5), flat washer (6), cable (3), and spacer (8).
- 5 Loosen jamnut (15) on cable (3) and adjust cable length until strut (4) seats in latch socket (14).
- 6 Tighten jamnut (15).
- 7 Install spacer (8) and cable (3) with screw (5) and flat washer (6).

### NOTE

Spade adjustment should be verified in firing position as soon as practical.

- 8 Raise and lower spade several times to verify adjustment (TM 9-2350-314-10).



20ph008m

**17-4 SPADE.**

This task covers: a. Removal b. Disassembly c. Assembly d. Installation

**INITIAL SETUP**

Tools

General mechanic's tool kit  
(SC 5180-90-N26)

Equipment Conditions

Spade strut and cable removed  
(para 17-3)  
Spade lowered to ground  
(TM 9-2350-314-10)

Personnel Required

Three

References

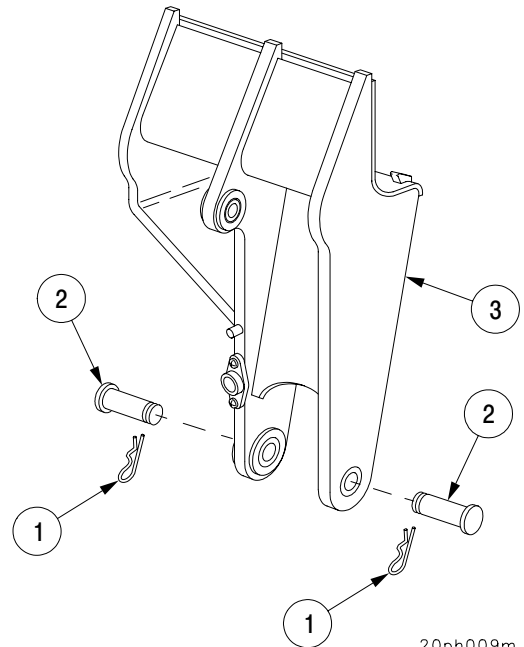
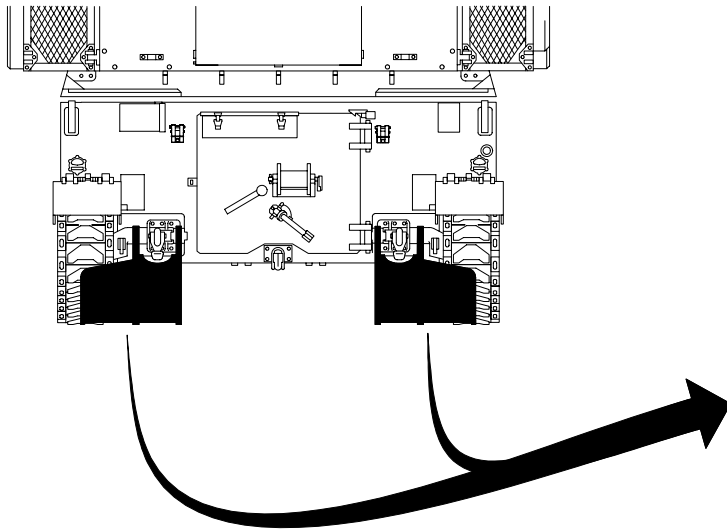
TM 9-2350-314-10

**a. Removal.**

**WARNING**

Spade is heavy. Use at least three personnel to assist in lowering and removing it from hull. Failure to comply may result in injury to personnel.

Remove two lockpins (1), two headed pins (2), and spade (3).



20ph009m

---

## 17-4 SPADE – CONTINUED

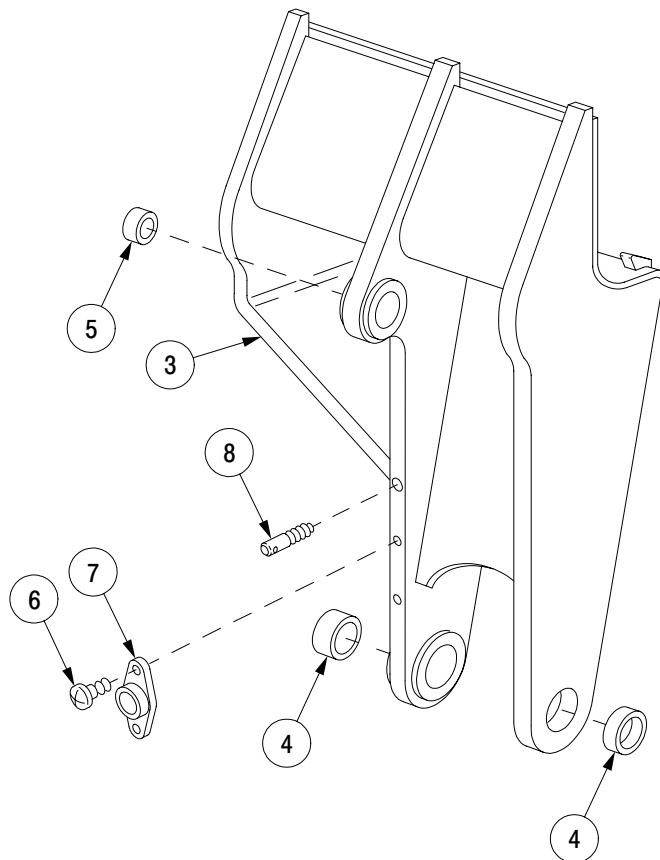
---

### b. Disassembly.

- 1 Remove two bushings (4) from spade (3).
- 2 Remove bushing (5) from spade (3).
- 3 Remove two screws (6) and socket base (7) from spade (3).
- 4 Remove pin (8) from spade (3).

### c. Assembly.

- 1 Install pin (8) in spade (3).
- 2 Install socket base (7) on spade (3) with two screws (6).
- 3 Install bushing (5) in spade (3).
- 4 Install two bushings (4) in spade (3).



20ph010m

---

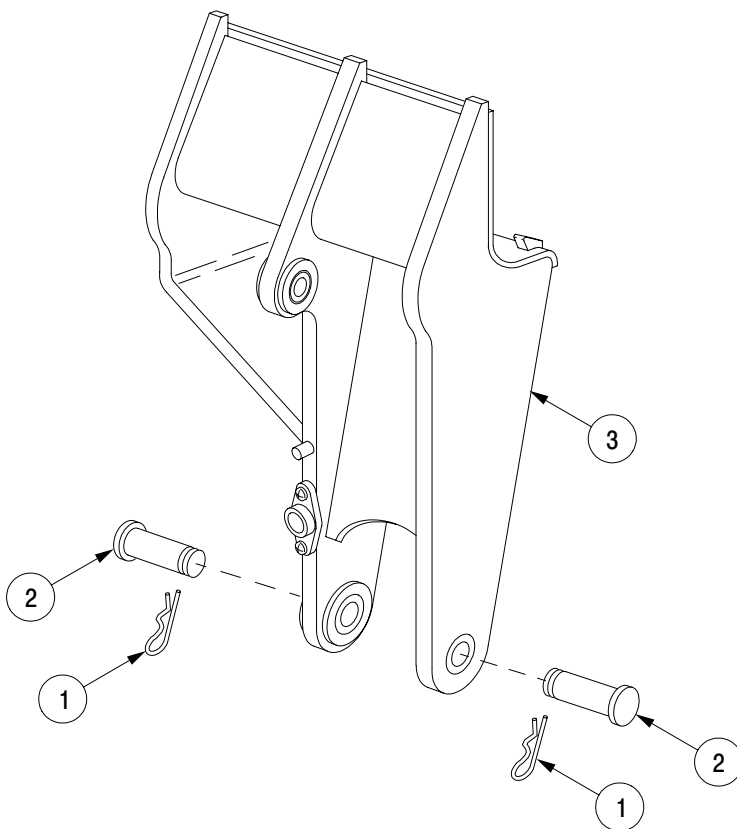
**17-4 SPADE – CONTINUED**

---

**d. Installation.****WARNING**

Spade is heavy. Use at least three personnel to assist in raising and installing it on hull. Failure to comply may result in injury to personnel.

Install spade (3) with two headed pins (2) and two lockpins (1).



20ph011m

**NOTE****FOLLOW-ON MAINTENANCE:**

Raise and latch spade in stowed position  
(TM 9-2350-314-10)  
Install strut and cable (para 17-3)  
Adjust cable (para 17-3)

## CHAPTER 18

### BODY, CHASSIS, OR HULL ACCESSORY ITEMS

---

#### GENERAL

This chapter illustrates and defines procedures for removal and installation of hull intercom components, bilge pump, strainer and outlet tubing, personnel heater, exhaust system and related components. This chapter also covers the replacement and location of hull decals and stencils.

Refer to TM 11-5830-263-10 and TM 11-5830-263-20&P for repair of the intercom system components.

---

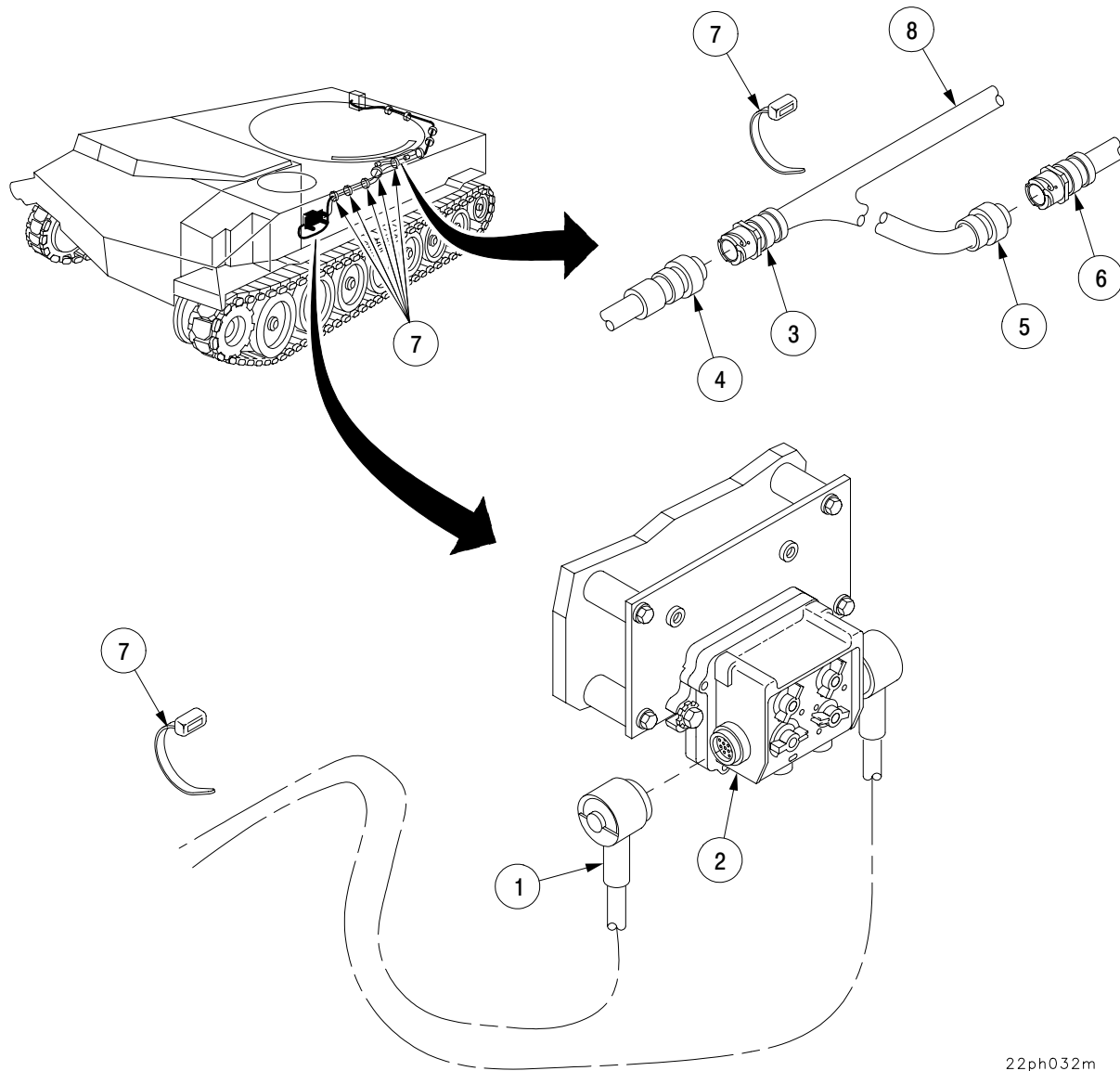
<u>CONTENTS</u>	<u>Page</u>
Section I. ACCESSORY ITEMS	
18-1 INTERCOM CABLE – INTERNAL .....	18-2
18-2 FULL FUNCTION CREW STATION, DRIVER'S – INTERNAL .....	18-4
18-3 INTERCOM CABLE – EXTERNAL .....	18-5
18-4 INTERCOM BOX AND FULL FUNCTION CREW STATION – EXTERNAL .....	18-6
Section II. BILGE PUMP	
18-5 BILGE PUMP, STRAINER, HOSES, TUBES, AND CLAMPS .....	18-8
Section III. WINTERIZATION EQUIPMENT	
18-6 PERSONNEL HEATER MOUNTING HARDWARE, CLAMPS, AND DUCTS .....	18-12
18-7 PERSONNEL HEATER FUEL FILTER AND TUBES .....	18-16
18-8 PERSONNEL HEATER FUEL PUMP .....	18-18
18-9 PERSONNEL HEATER FUEL HOSES, TUBES, AND FITTINGS .....	18-20
18-10 PERSONNEL HEATER .....	18-24
18-11 PERSONNEL HEATER SUPPORT ASSEMBLY AND ASSOCIATED HARDWARE .....	18-27
18-12 PERSONNEL HEATER EXHAUST TUBE .....	18-30
Section IV. DATA PLATES AND INSTRUCTION HOLDERS	
18-13 DECALS .....	18-34
18-14 STENCIL LOCATIONS .....	18-36
18-15 VEHICLE IDENTIFICATION PLATE .....	18-38



**Section I. ACCESSORY ITEMS – CONTINUED**

**18-1 INTERCOM CABLE – INTERNAL – CONTINUED**

**b. Installation – Continued**



22ph032m

**NOTE**

**FOLLOW-ON MAINTENANCE:**  
 Connect battery ground leads  
 (para 8-33)





## Section I. ACCESSORY ITEMS – CONTINUED

### 18-3 INTERCOM CABLE – EXTERNAL.

This task covers:      a. Removal                                      b. Installation

#### INITIAL SETUP

##### Tools

General mechanic's tool kit  
(SC 5180-90-N26)

##### Materials

Tiedown straps (7) (item 308, Appx E)

##### Equipment Conditions

Vehicle MASTER switch OFF  
(TM 9-2350-314-10)  
Battery ground leads disconnected  
(para 8-33)  
Right spade lowered  
(TM 9-2350-314-10)  
External full function crew station removed  
(para 18-4)

##### References

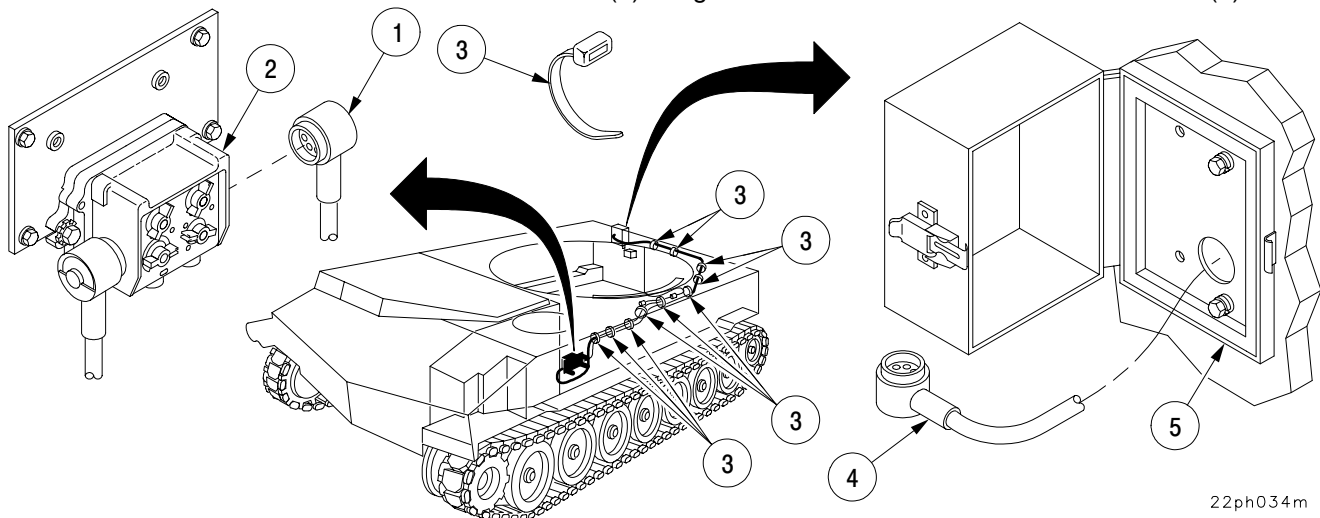
TM 9-2350-314-10

#### a. Removal.

- 1 Disconnect cable A3206317-27 connector P2 (1) from right side of driver's full function crew station (2).
- 2 Cut and discard tiedown straps (3) securing cable A3206317-27 (4) in hull.
- 3 Remove cable A3206317-27 (4) from external full function crew station mounting box (5) and pull through hull.

#### b. Installation.

- 1 Insert cable A3206317-27 (4) through hull and into external full function crew station mounting box (5).
- 2 Secure cable A3206317-27 (4) in hull with new tiedown straps (3).
- 3 Connect cable A3206317-27 connector P2 (1) to right side of driver's full function crew station (2).



#### NOTE

##### FOLLOW-ON MAINTENANCE:

Install external full function crew station (para 18-4)  
Raise right spade (TM 9-2350-314-10)  
Connect battery ground leads (para 8-33)



---

**Section I. ACCESSORY ITEMS – CONTINUED**


---

**18-4 INTERCOM BOX AND FULL FUNCTION CREW STATION – EXTERNAL – CONTINUED**

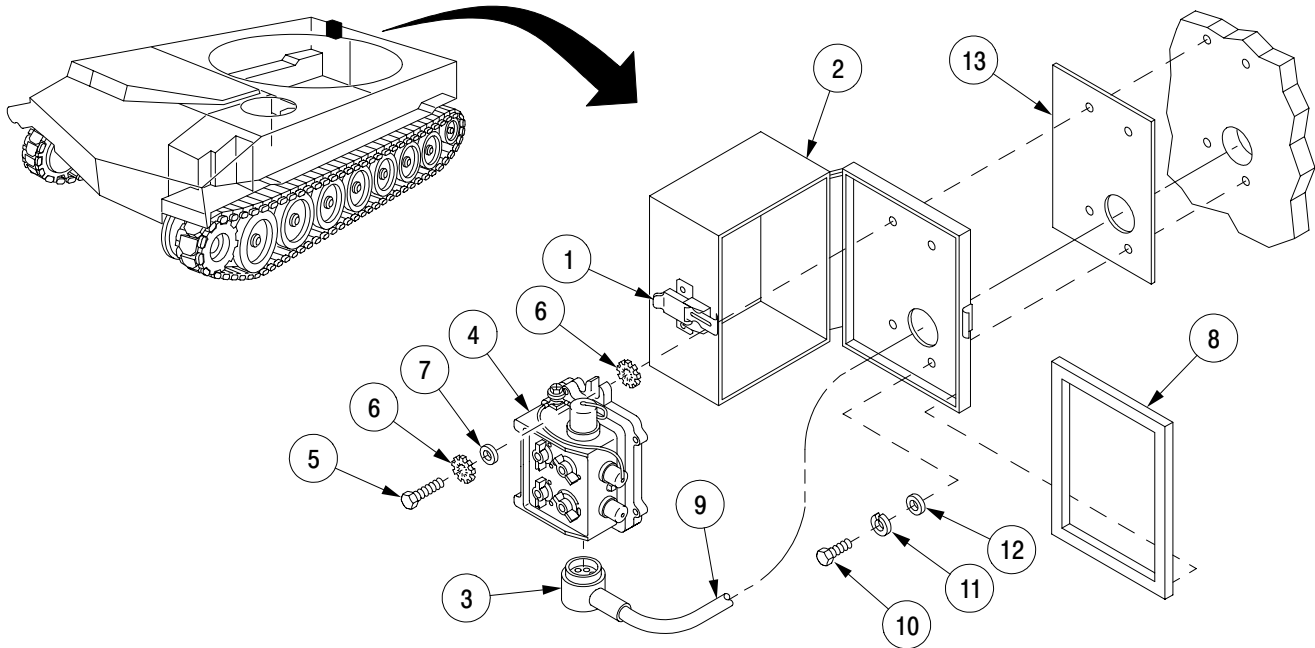

---

**NOTE**

If full function crew station is being replaced, set crew station address number in the new full function crew station prior to installation. Refer to TM 11-5830-263-12 for setting instructions.

**b. Installation.**

- 1 Install new gasket (13) and intercom box (2) to hull with two screws (10), two new lockwashers (11), and two flat washers (12).
- 2 Apply adhesive to new seal (8).
- 3 Install new seal (8) in intercom box (2).
- 4 Insert cable A3206317-27 (9) through hull and intercom box (2).
- 5 Install full function crew station (4) in intercom box (2) with two screws (5), four new lockwashers (6), and two flat washers (7).
- 6 Connect cable A3206312-27 connector P2 (3) to full function crew station (4).



22ph035m

**NOTE****FOLLOW-ON MAINTENANCE:**

Raise right spade (TM 9-2350-314-10)  
 Connect battery ground leads (para 8-33)



**Section II. BILGE PUMP – CONTINUED**

**18-5 BILGE PUMP, STRAINER, HOSES, TUBES, AND CLAMPS – CONTINUED**

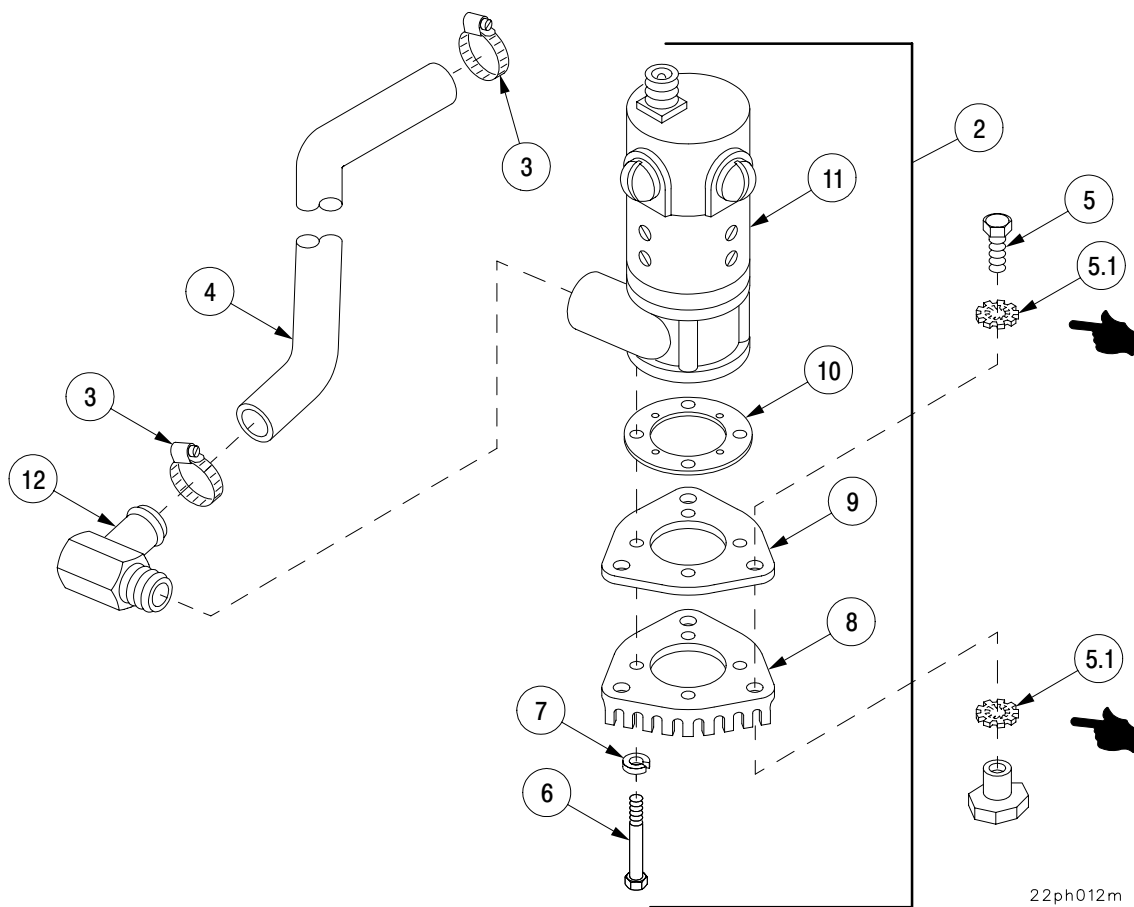
**a. Removal – Continued**

- 2 Remove two clamps (3) and hose (4).
- 3 Remove three screws (5), six lockwashers (5.1) and bilge pump assembly (2) from hull. Discard lockwashers.
- 4 Remove elbow (12) from bilge pump (11).

**NOTE**

If bilge pump is removed for repair, install four screws and four lockwashers to secure impeller cover to bilge pump assembly.

- 5 Remove four screws (6), four lockwashers (7), strainer (8), bracket (9), and impeller cover (10) from bilge pump (11). Discard lockwashers.

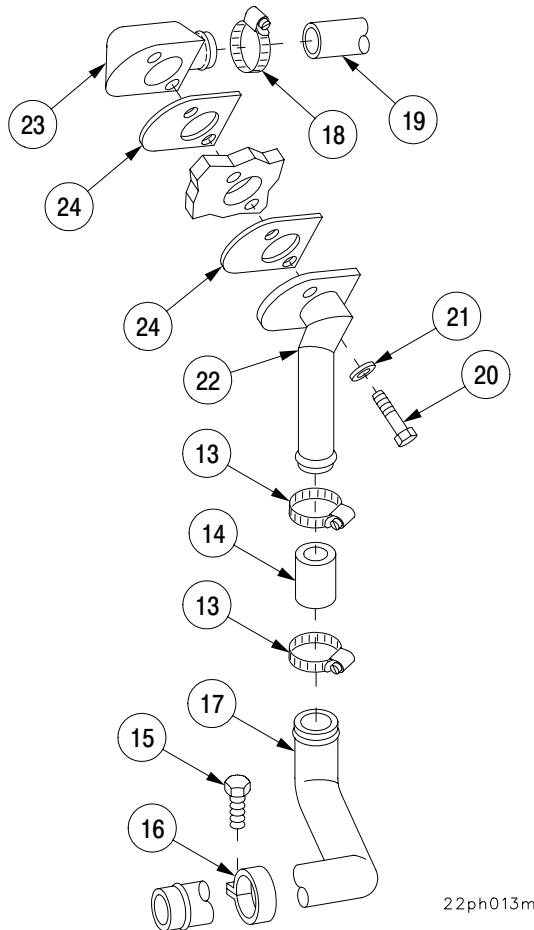


**Section II. BILGE PUMP – CONTINUED**

**18-5 BILGE PUMP, STRAINER, HOSES, TUBES, AND CLAMPS – CONTINUED**

**a. Removal – Continued**

- 6 Remove two clamps (13), hose (14), screw (15), clamp (16), and tube (17).
- 7 Remove clamp (18) and hose (19).
- 8 Remove two screws (20), two flat washers (21), tube (22), outlet (23), and two gaskets (24) from deck plate. Discard gaskets.



22ph013m

**b. Installation.**

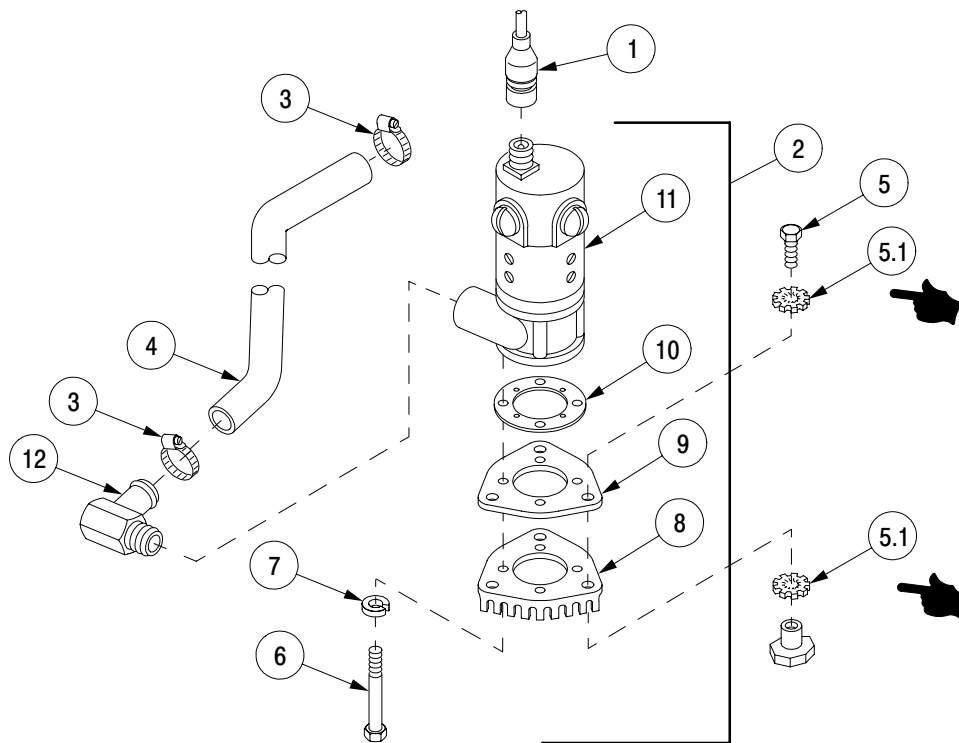
- 1 Install two new gaskets (24), outlet (23), and tube (22) on deck plate with two screws (20) and two flat washers (21).
- 2 Install hose (19) and clamp (18).
- 3 Install two clamps (13), hose (14), tube (17), and clamp (16) with screw (15).

**Section II. BILGE PUMP – CONTINUED**

**18-5 BILGE PUMP, STRAINER, HOSES, TUBES, AND CLAMPS – CONTINUED**

**b. Installation – Continued**

- 3 Install impeller cover (10), bracket (9), and strainer (8) to bilge pump (11) with four screws (6) and four new lockwashers (7).
- 4 Apply lubricating oil to threads of elbow (12).
- 5 Install elbow (12) in bilge pump (11).
- 6 Apply sealing compound to threads of three screws (5).
- 7 Install bilge pump assembly (2) in hull with three screws (5) and six new lockwashers (5.1).
- 8 Install hose (4) and two clamps (3).
- 9 Connect wiring harness W113 connector P3 (1) to bilge pump assembly (2).



22ph014m

**NOTE**

**FOLLOW-ON MAINTENANCE:**

Install exhaust grille support plate (hoses, tubes, and clamps) (para 16-30)

Install powerpack (bilge pump and strainer) (para 4-1)





**Section III. WINTERIZATION EQUIPMENT – CONTINUED**

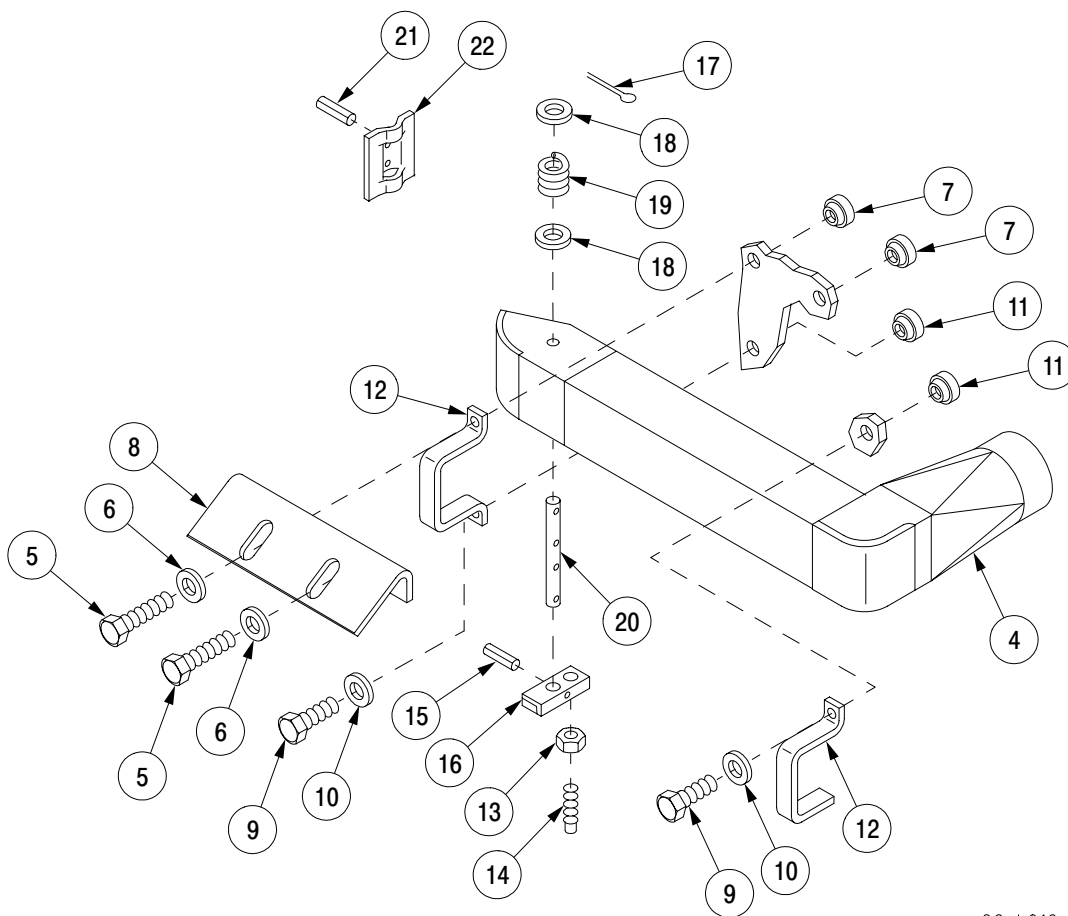
**18-6 PERSONNEL HEATER MOUNTING HARDWARE, CLAMPS, AND DUCTS – CONTINUED**

**a. Removal – Continued**

**NOTE**

Nuts referred to in removal steps 2 and 3, and installation steps 4 and 5 are not removable.

- 2 Remove two screws (5), two flat washers (6), from two nuts (7), and guard (8).
- 3 Remove two screws (9) and two flat washers (10) from two nuts (11), two clamps (12), and duct (4).
- 4 Loosen nut (13) and remove setscrew (14), spring pin (15), handle (16), cotter pin (17), two flat washers (18), spring (19), shaft (20), two spring pins (21), and gate valve (22). Discard cotter pin and spring pins.



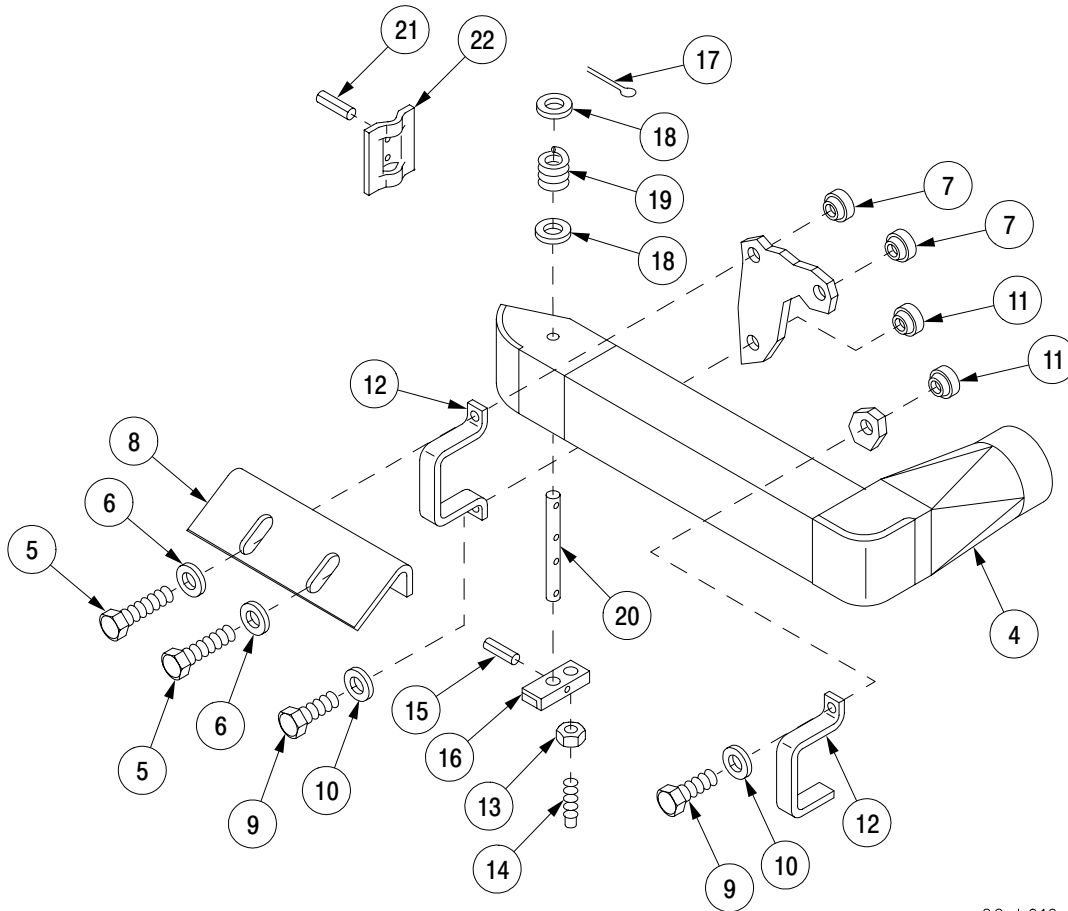
22ph016m

**Section III. WINTERIZATION EQUIPMENT – CONTINUED**

**18-6 PERSONNEL HEATER MOUNTING HARDWARE, CLAMPS, AND DUCTS – CONTINUED**

**b. Installation.**

- 1 Install gate valve (22) in duct (4).
- 2 Install shaft (20), two new spring pins (21), handle (16), new spring pin (15), two flat washers (18), spring (19), and new cotter pin (17).
- 3 Install setscrew (14) and nut (13) in handle (16).
- 4 Install and secure duct (4) and two clamps (12) to two nuts (11) with two screws (9) and two flat washers (10).
- 5 Install and secure guard (8) to two nuts (7) with two screws (5) and two flat washers (6).



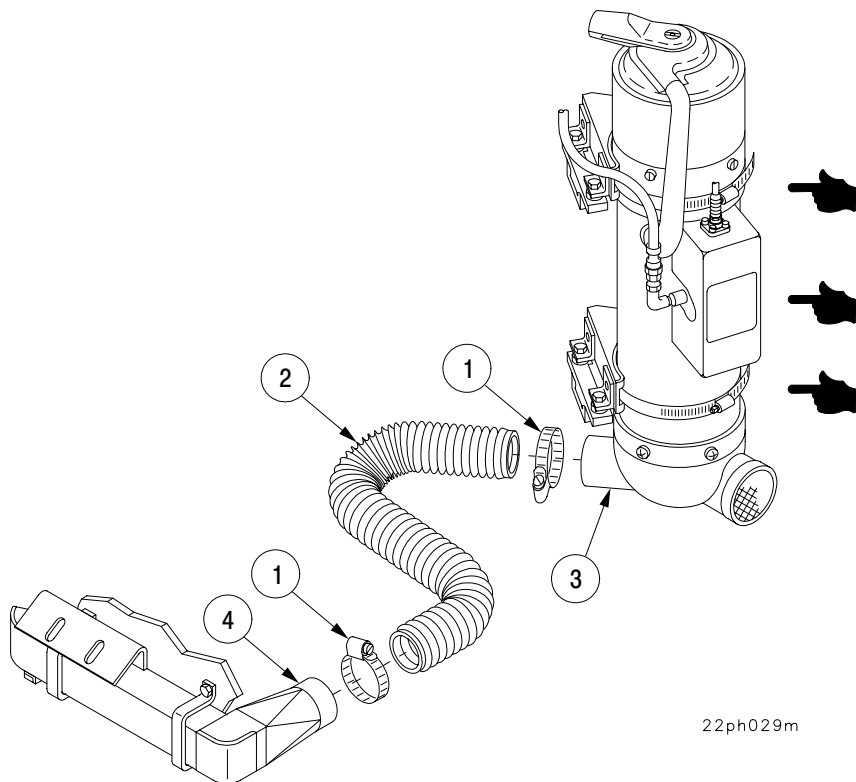
22ph016m

**Section III. WINTERIZATION EQUIPMENT – CONTINUED**

**18-6 PERSONNEL HEATER MOUNTING HARDWARE, CLAMPS, AND DUCTS – CONTINUED**

**b. Installation – Continued**

- 6 Install air duct hose (2) on personnel heater duct (3) and duct (4) with two clamps (1).



**NOTE**

**FOLLOW-ON MAINTENANCE:**  
 Install engine compartment access cover  
 (para 16-7)  
 Install stowage box (para 16-53)



---

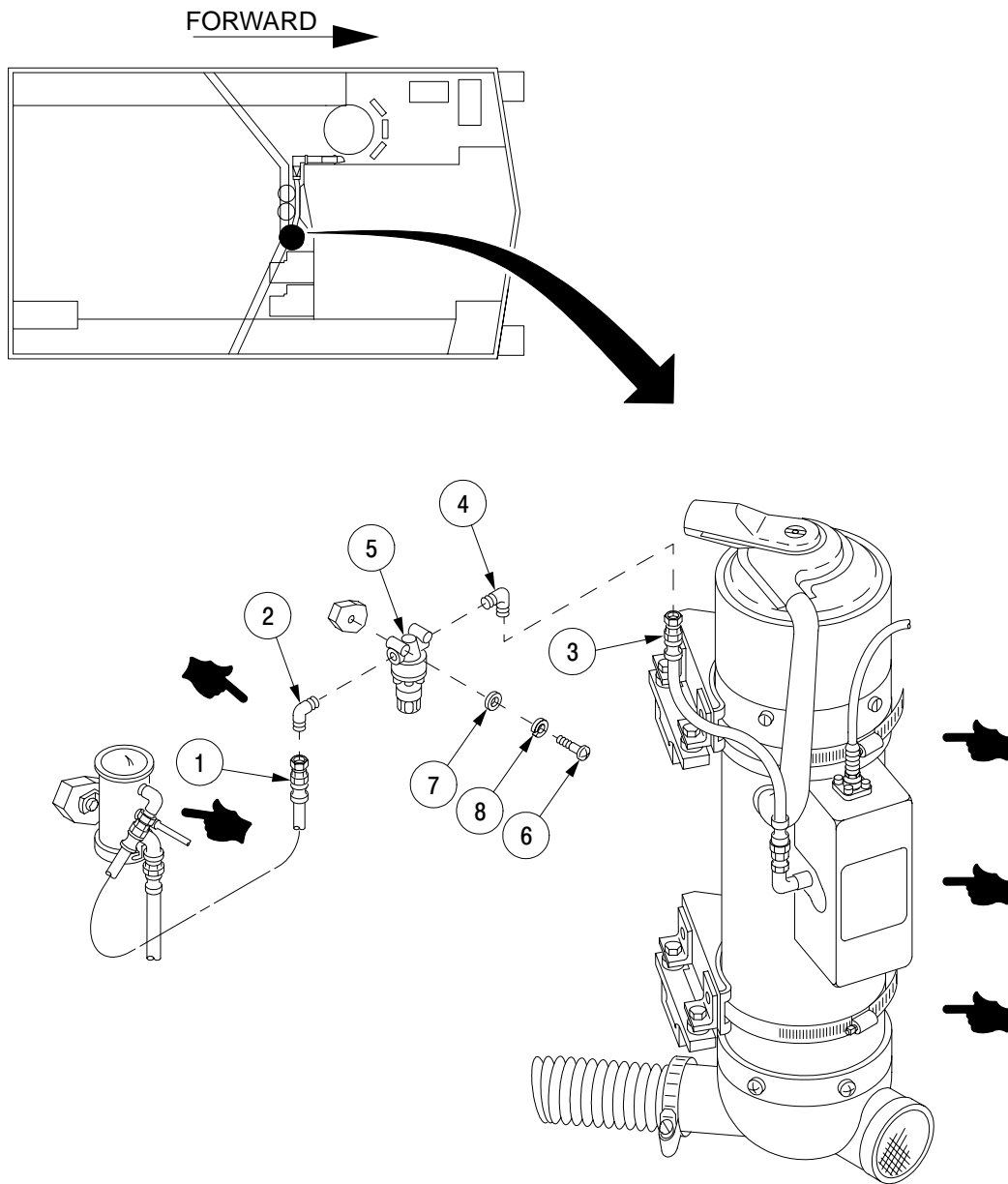
**Section III. WINTERIZATION EQUIPMENT – CONTINUED**

---

**18-7 PERSONNEL HEATER FUEL FILTER AND TUBES – CONTINUED**

---

**b. Installation – Continued**



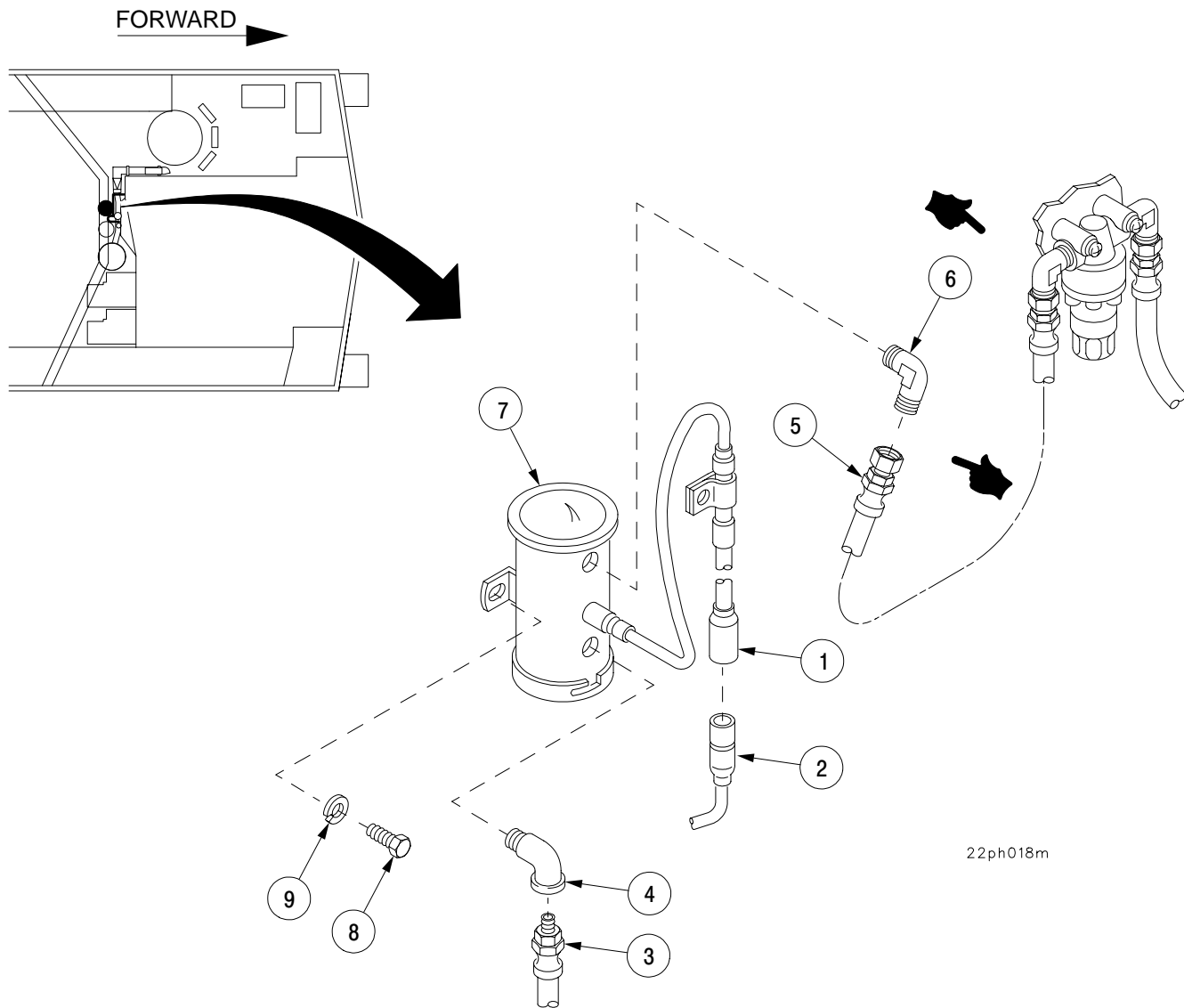
22ph017m



**Section III. WINTERIZATION EQUIPMENT – CONTINUED**

**18-8 PERSONNEL HEATER FUEL PUMP – CONTINUED**

**b. Installation – Continued**



22ph018m

**NOTE**

**FOLLOW-ON MAINTENANCE:**  
 Connect battery ground leads (para 8-33)

**Section III. WINTERIZATION EQUIPMENT – CONTINUED**

**18-9 PERSONNEL HEATER FUEL HOSES, TUBES, AND FITTINGS.**

This task covers:      a. Removal                                      b. Installation

**INITIAL SETUP**

Tools

General mechanic's tool kit  
(SC 5180-90-N26)

Materials/Parts

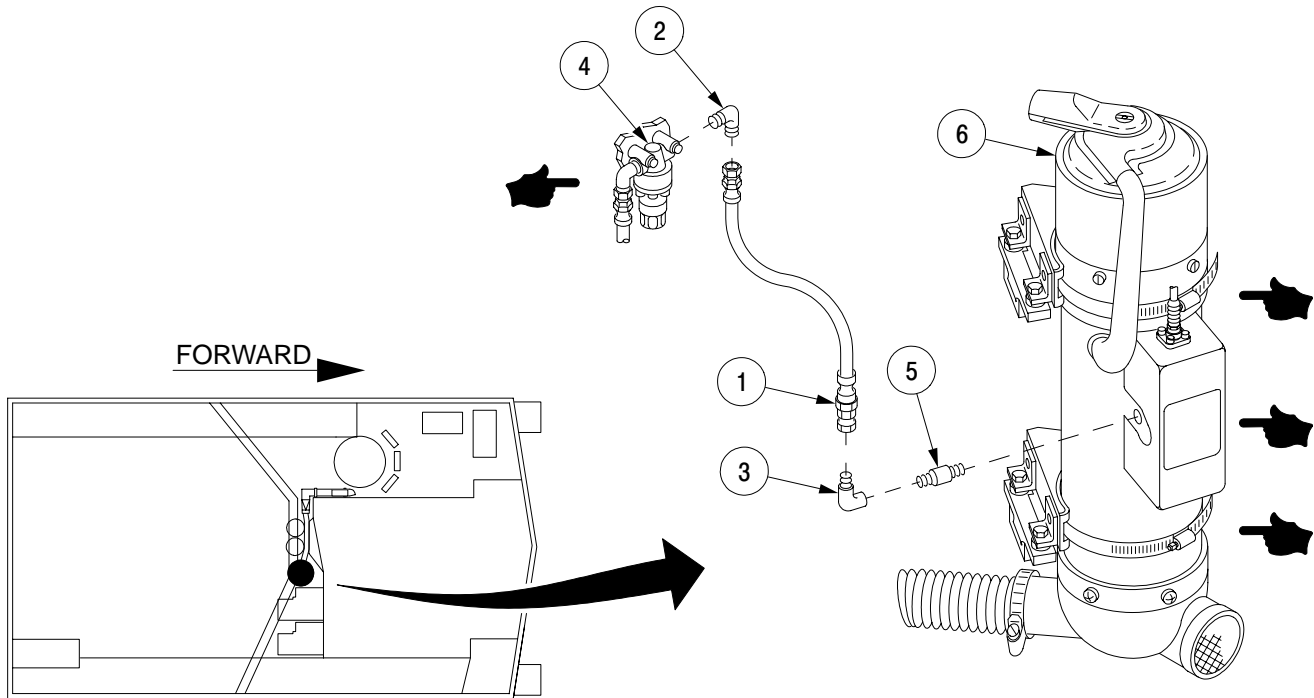
Sealing compound (item 52, Appx C)

**a. Removal.**

**WARNING**

Do not smoke or use open flame while performing maintenance on personnel heater fuel system. An explosion or fire may occur, causing injury or death to personnel.

- 1 Remove hose assembly (1) from elbow (2) and elbow (3).
- 2 Remove elbow (2) from fuel filter (4).
- 3 Remove elbow (3) and nipple (5) from personnel heater (6).



22ph019m



---

**Section III. WINTERIZATION EQUIPMENT – CONTINUED**

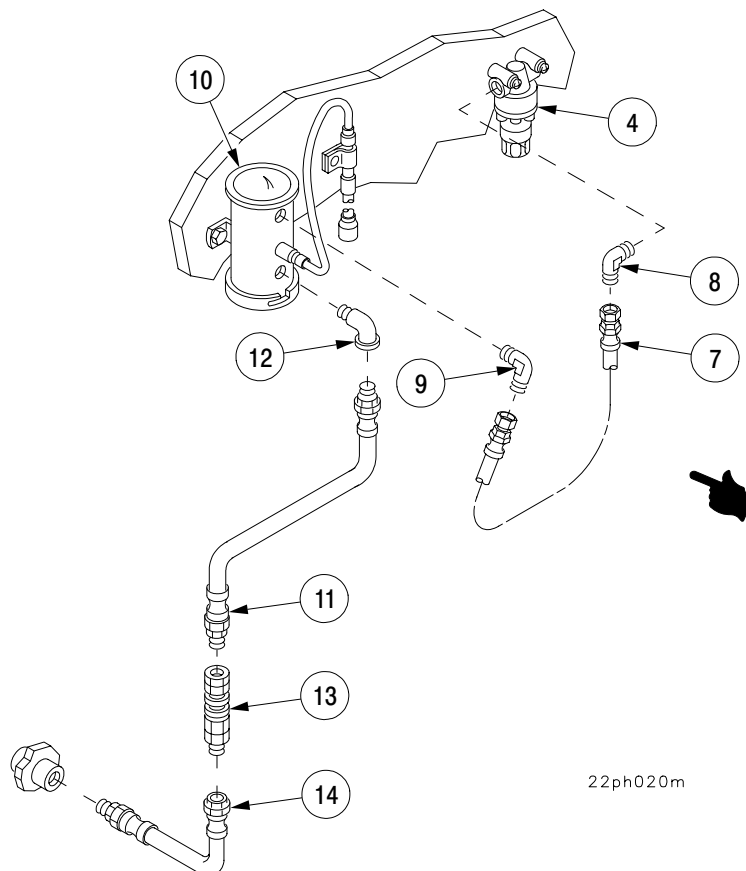
---

**18-9 PERSONNEL HEATER FUEL HOSES, TUBES, AND FITTINGS – CONTINUED**

---

**a. Removal – Continued**

- 4 Remove hose assembly (7) from elbow (8) and elbow (9).
- 5 Remove elbow (8) from fuel filter (4).
- 6 Remove elbow (9) from fuel pump (10).
- 7 Remove hose assembly (11) from elbow (12) and coupling assembly (13).
- 8 Remove elbow (12) from fuel pump (10).
- 9 Remove hose assembly (14) from coupling assembly (13).
- 10 Remove hose assembly (14) from bulkhead.



---

### Section III. WINTERIZATION EQUIPMENT – CONTINUED

---

#### 18-9 PERSONNEL HEATER FUEL HOSES, TUBES, AND FITTINGS – CONTINUED

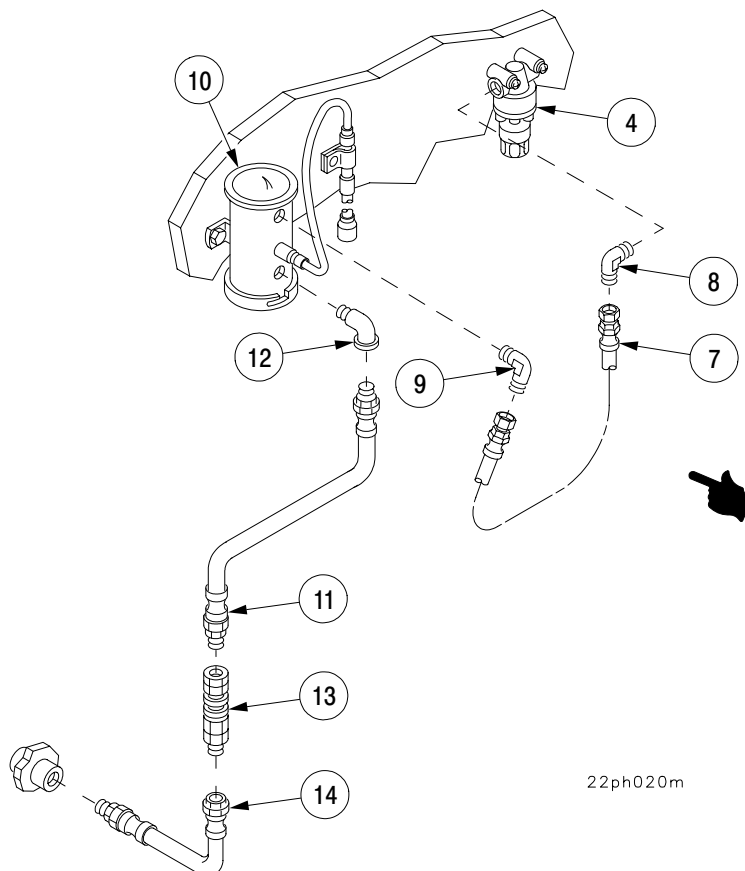
---

b. Installation.

**NOTE**

Apply sealing compound to threads of all pipe fittings prior to installation.

- 1 Install hose assembly (14) in bulkhead.
- 2 Install coupling assembly (13) on hose assembly (14) and hose assembly (11).
- 3 Install elbow (12) in fuel pump (10).
- 4 Install hose assembly (11) on elbow (12).
- 5 Install elbow (9) in fuel pump (10) and elbow (8) in fuel filter (4).
- 6 Install hose assembly (7) on elbow (9) and elbow (8).

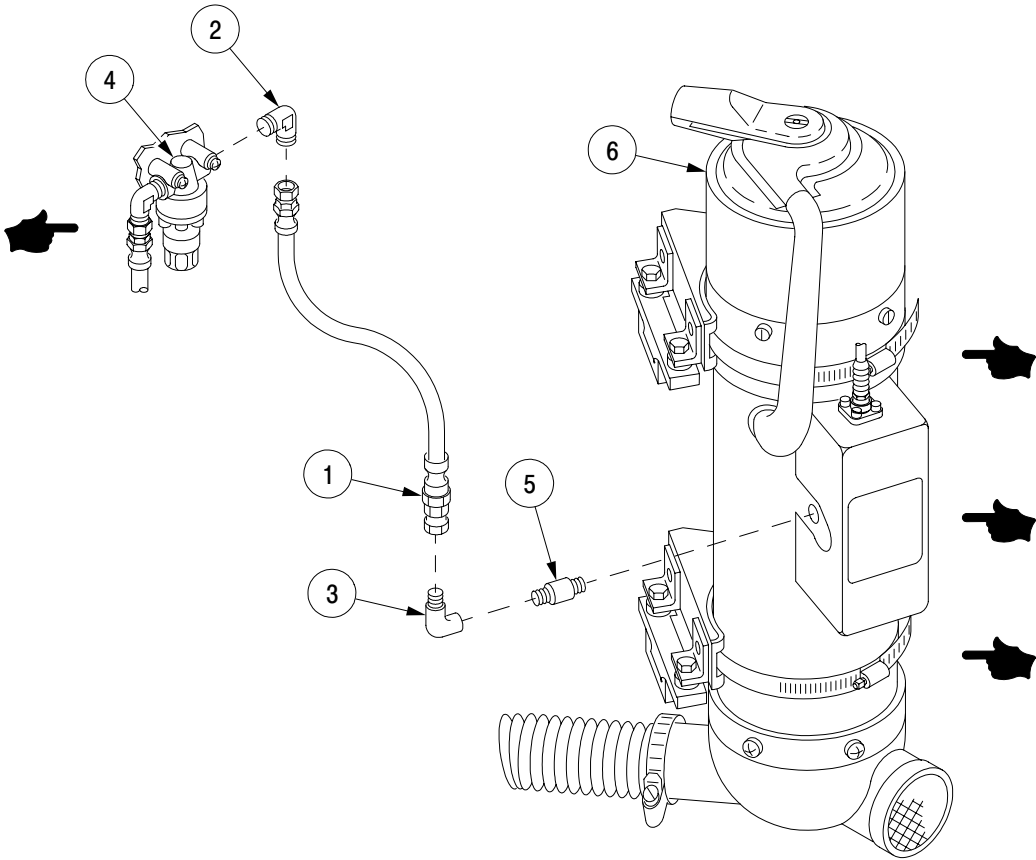


**Section III. WINTERIZATION EQUIPMENT – CONTINUED**

**18-9 PERSONNEL HEATER FUEL HOSES, TUBES, AND FITTINGS – CONTINUED**

**b. Installation – Continued**

- 7 Install elbow (2) in fuel filter (4).
- 8 Install nipple (5) in personnel heater (6).
- 9 Install elbow (3) on nipple (5).
- 10 Install hose assembly (1) on elbow (3) and elbow (2).



22ph021m

---

### Section III. WINTERIZATION EQUIPMENT – CONTINUED

---

#### 18-10 PERSONNEL HEATER.

---

This task covers:      a. Removal                                      b. Installation

---

#### **INITIAL SETUP**

Tools

General mechanic's tool kit  
(SC 5180-90-N26)

Material/Parts

Lockwashers (4) (item 28, Appx E)  
Sealing compound (item 52, Appx C)

Equipment Conditions

Vehicle MASTER switch OFF  
(TM 9-2350-314-10)  
Battery ground leads disconnected  
(para 8-33)

References

TM 9-2350-314-10

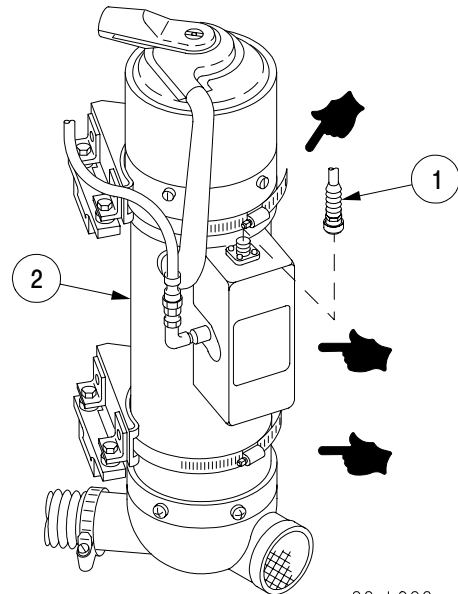
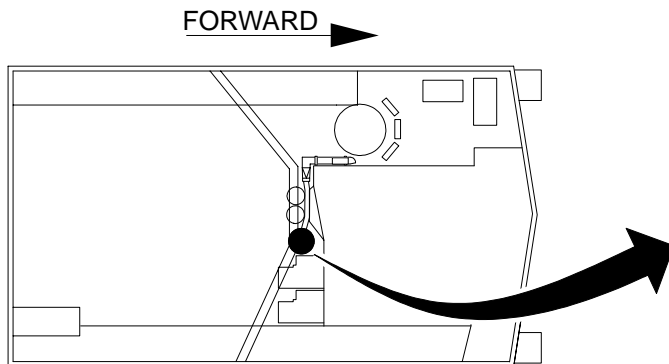
---

#### a. Removal.

#### **WARNING**

Do not smoke or use open flame while performing maintenance of heater. Heater may retain fuel, which could explode or burn, causing injury or death to personnel.

- 1 Disconnect wiring harness W119 connector P4 (1) from personnel heater (2).



22ph022m

---

**Section III. WINTERIZATION EQUIPMENT – CONTINUED**

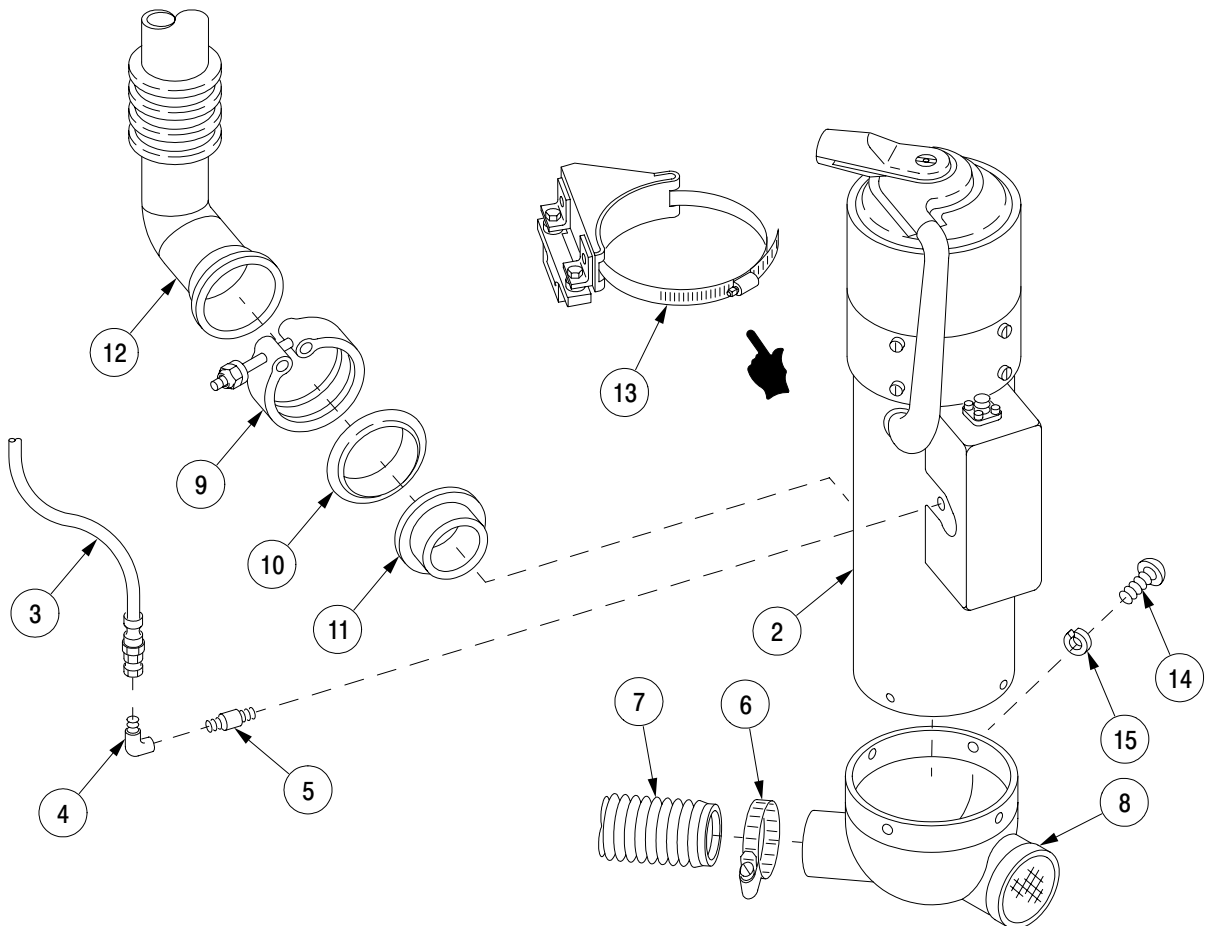
---

**18-10 PERSONNEL HEATER – CONTINUED**

---

**a. Removal – Continued**

- 2 Disconnect fuel hose (3) from elbow (4).
- 3 Remove elbow (4) and nipple (5) from personnel heater (2).
- 4 Loosen clamp (6) and remove outlet hose (7) from duct (8).
- 5 Remove clamp (9), spacer sleeve (10), and flange (11) from tube assembly (12).
- 6 Open two clamps (13) and remove personnel heater (2) from vehicle.
- 7 Remove four screws (14), four lockwashers (15), and duct (8) from personnel heater (2). Discard lockwashers.



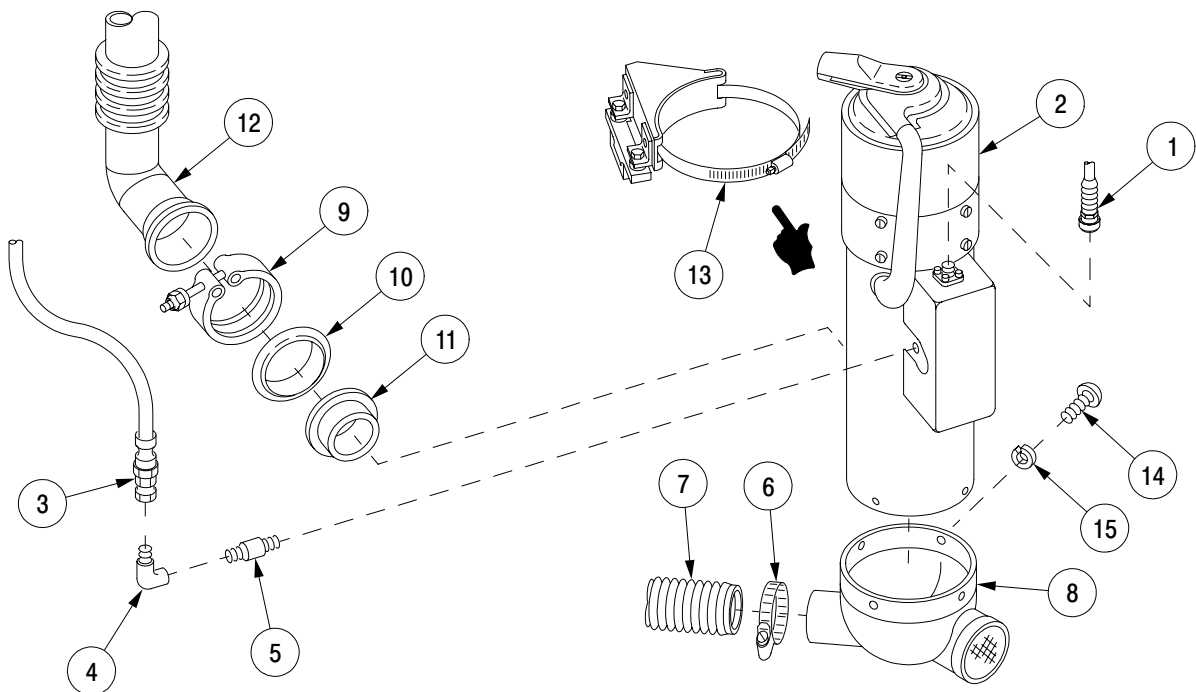
22ph023m

**Section III. WINTERIZATION EQUIPMENT – CONTINUED**

**18-10 PERSONNEL HEATER – CONTINUED**

**b. Installation.**

- 1 Install duct (8) on personnel heater (2) with four screws (14) and four new lockwashers (15).
- 2 Install personnel heater (2) in vehicle with two clamps (13).
- 3 Install tube assembly (12) on personnel heater (2) with flange (11), spacer sleeve (10), and clamp (9).
- 4 Install outlet hose (7) on duct (8) and tighten clamp (6).
- 5 Apply sealing compound to threads of nipple (5).
- 6 Install nipple (5) and elbow (4) in personnel heater (2).
- 7 Install fuel hose (3) on elbow (4).
- 8 Connect wiring harness W119 connector P4 (1) to personnel heater (2).



22ph024m

**NOTE**

**FOLLOW-ON MAINTENANCE:**  
 Connect battery ground leads (para 8-33)

---

**Section III. WINTERIZATION EQUIPMENT – CONTINUED**

---

**18-11 PERSONNEL HEATER SUPPORT ASSEMBLY AND ASSOCIATED HARDWARE.**

---

This task covers:      a. Removal                              b. Installation

---

**INITIAL SETUP**

Tools

General mechanic's tool kit  
(SC 5180-90-N26)

Equipment Conditions

Personnel heater removed  
(para 18-10)

Materials/Parts

Self-locking nuts (2) (item 16, Appx E) (brackets)

---

### Section III. WINTERIZATION EQUIPMENT – CONTINUED

---

#### 18-11 PERSONNEL HEATER SUPPORT ASSEMBLY AND ASSOCIATED HARDWARE – CONTINUED

---

##### NOTE

- Perform Removal step 1 and Installation step 5 for maintenance of clamps.
- Perform Removal steps 1 and 2, and Installation steps 4 and 5 for maintenance of saddle brackets.
- Perform Removal steps 3 and 4, and Installation steps 2 and 3 for maintenance of mounts.
- Perform Removal steps 3, 4, and 5, and Installation steps 1, 2, and 3 for maintenance of support assembly.

##### a. Removal.

- 1 Remove clamp (4).
- 2 Remove two screws (5), two flat washers (6), and saddle bracket (7).
- 3 Remove two self-locking nuts (8), two flat washers (9), two screws (10), and two brackets (11) with saddle bracket (7) attached. Discard self-locking nuts.
- 4 Remove two mounts (12).
- 5 Remove two screws (13), two flat washers (14), and support (15) from bracket (16).

##### b. Installation.

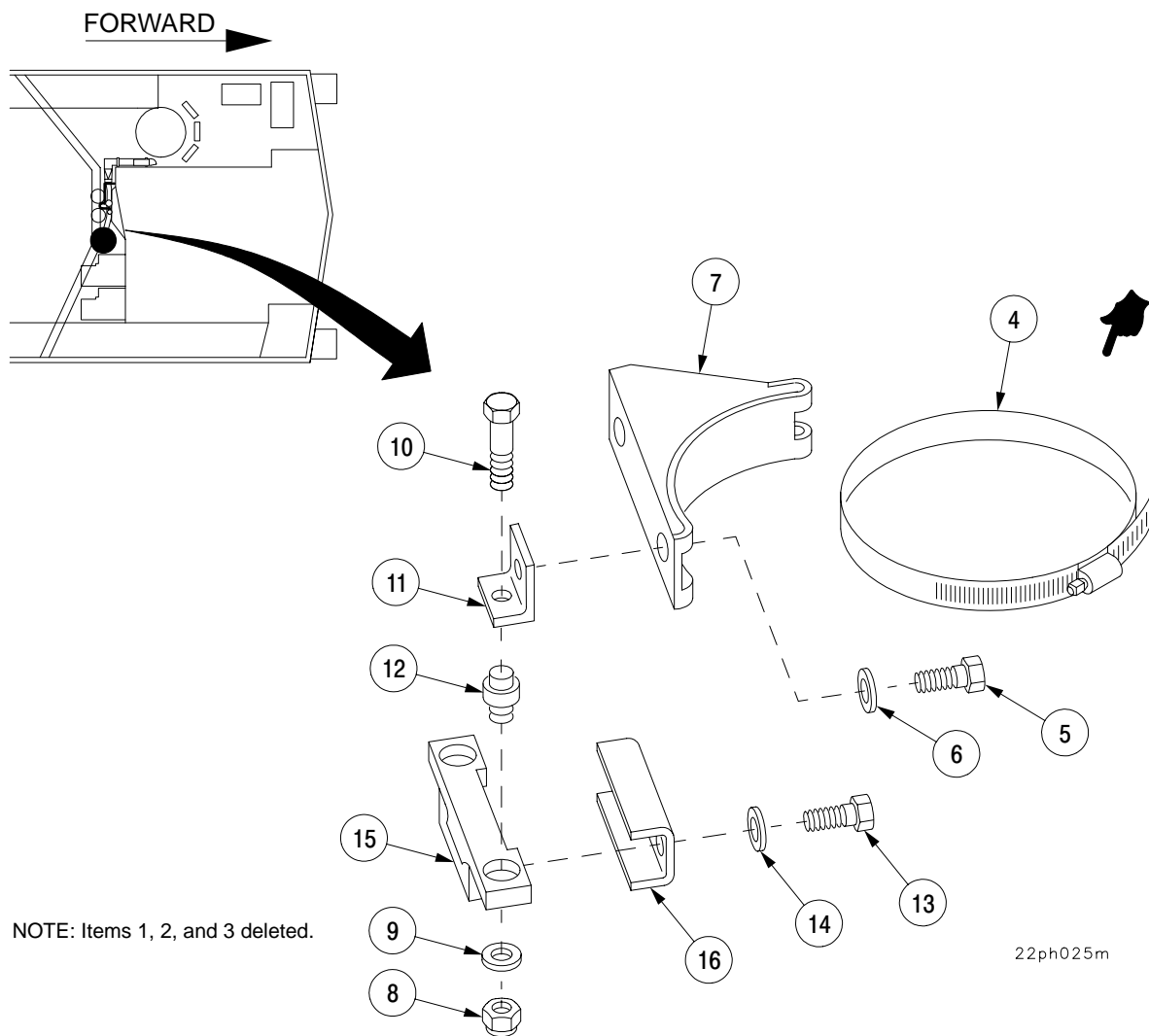
- 1 Install support (15) on bracket (16) with two screws (13) and two flat washers (14).
- 2 Install two mounts (12).
- 3 Install two brackets (11) with saddle bracket (7) attached, two screws (10), two flat washers (9), and two new self-locking nuts (8).
- 4 Install saddle bracket (7) with two screws (5) and two flat washers (6).
- 5 Install clamp (4) to saddle bracket (7).



Section III. WINTERIZATION EQUIPMENT – CONTINUED

18-11 PERSONNEL HEATER SUPPORT ASSEMBLY AND ASSOCIATED HARDWARE – CONTINUED

b. Installation – Continued



**NOTE**

**FOLLOW-ON MAINTENANCE:**  
Install personnel heater (para 18-10)



---

**Section III. WINTERIZATION EQUIPMENT – CONTINUED**

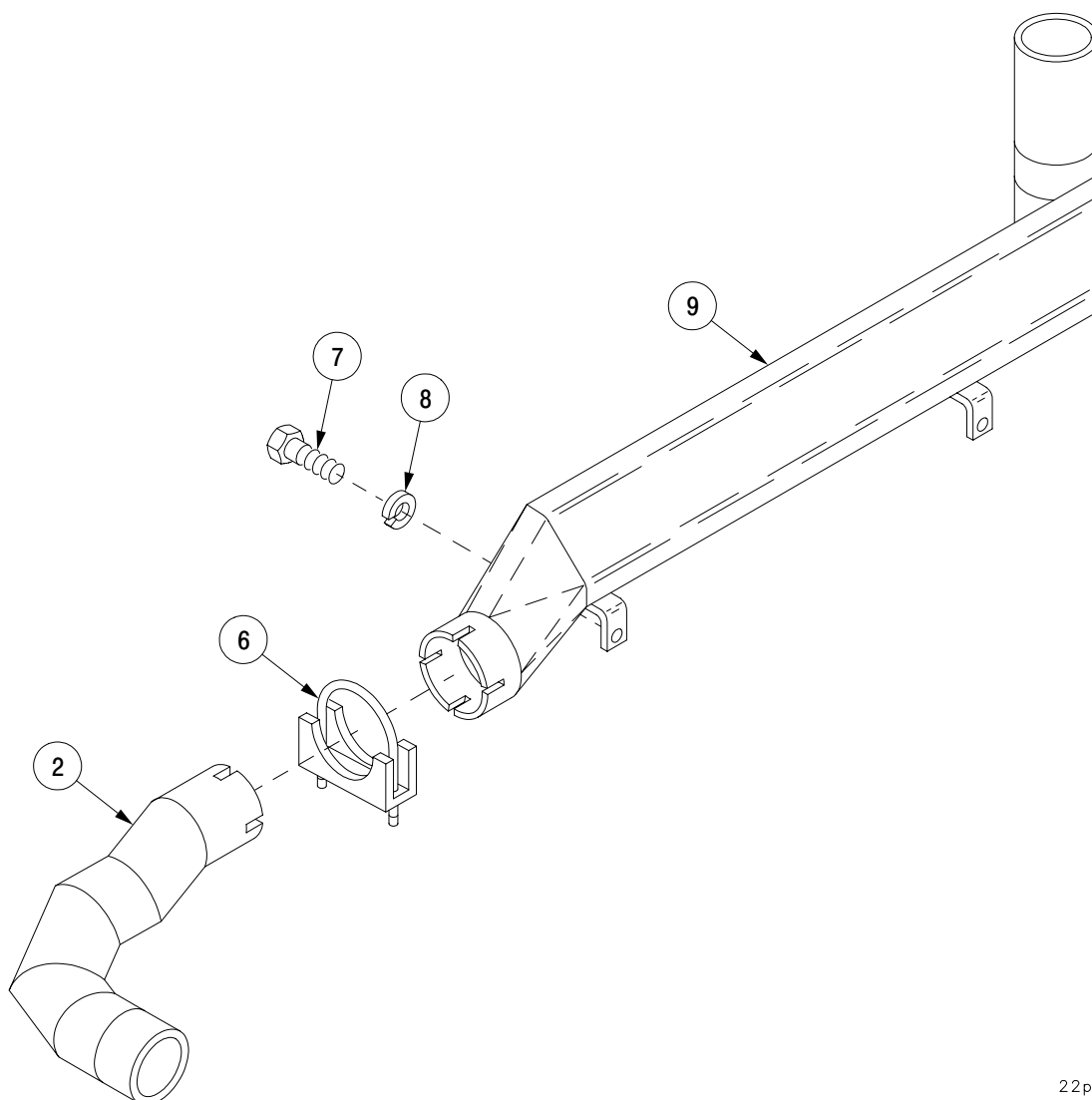
---

**18-12 PERSONNEL HEATER EXHAUST TUBE – CONTINUED**

---

**a. Removal – Continued**

- 3 Loosen and remove muffler clamp (6) and engine compartment exhaust pipe (2).
- 4 Remove two screws (7), two lockwashers (8), and engine compartment heater exhaust pipe (9) from bulkhead. Discard lockwashers.



22ph027m

---

**Section III. WINTERIZATION EQUIPMENT – CONTINUED**

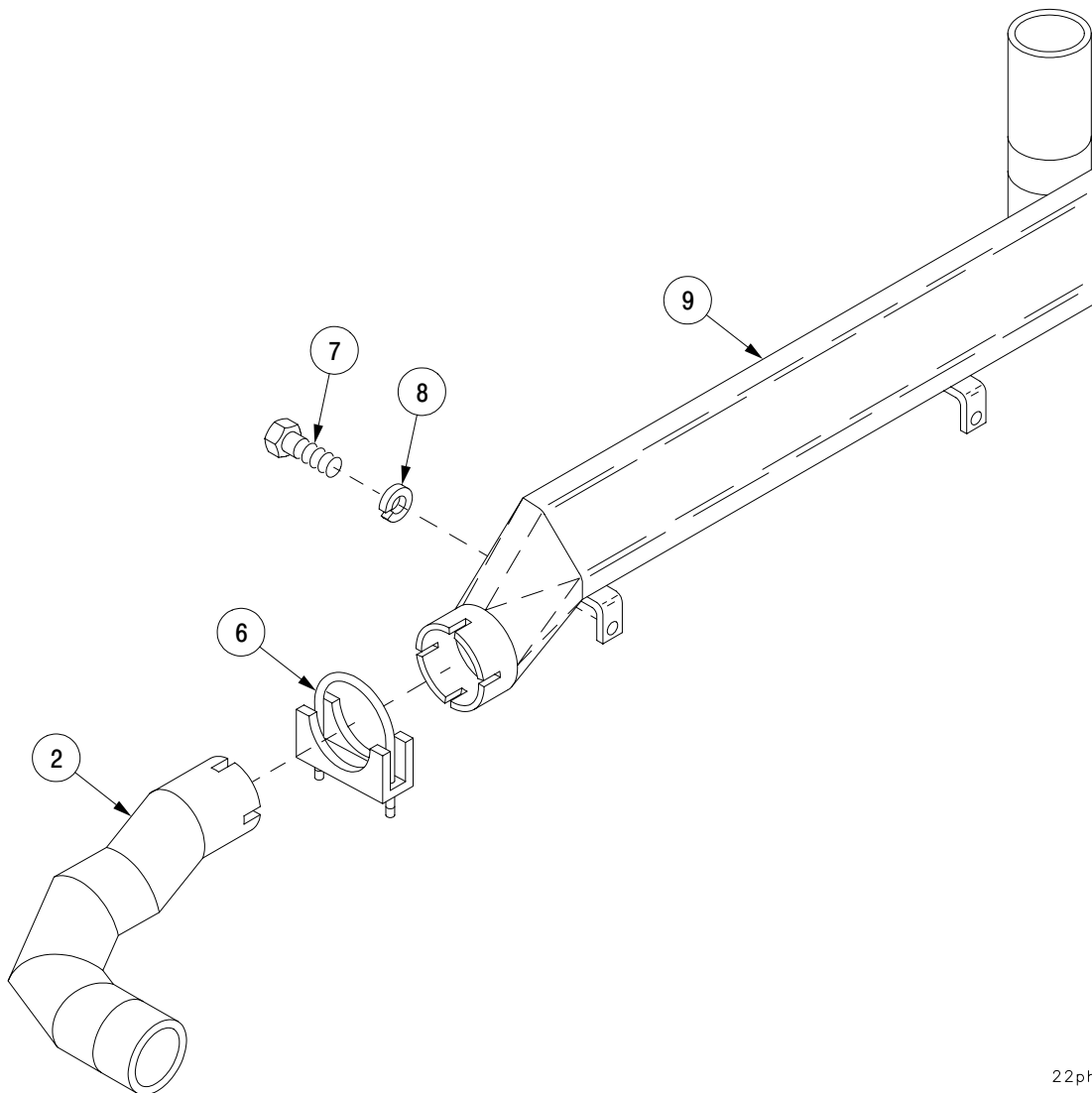
---

**18-12 PERSONNEL HEATER EXHAUST TUBE – CONTINUED**

---

**b. Installation.**

- 1 Install engine compartment heater exhaust pipe (9) on bulkhead with two screws (7) and two new lockwashers (8).
- 2 Install engine compartment exhaust pipe (2) with muffler clamp (6).



22ph027m

---

**Section III. WINTERIZATION EQUIPMENT – CONTINUED**

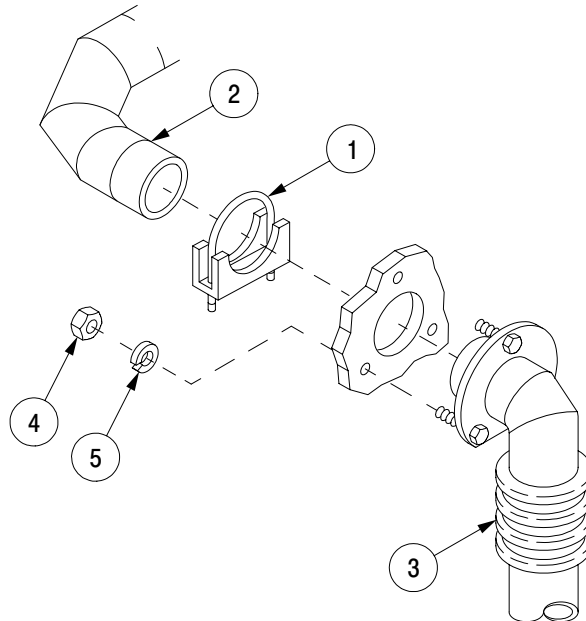
---

**18-12 PERSONNEL HEATER EXHAUST TUBE – CONTINUED**

---

**b. Installation – Continued**

- 3 Install tube assembly (3) at bulkhead with three new lockwashers (5) and three nuts (4).
- 4 Install engine compartment exhaust pipe (2) on tube assembly (3) with muffler clamp (1).



22ph028m

**NOTE****FOLLOW-ON MAINTENANCE:**

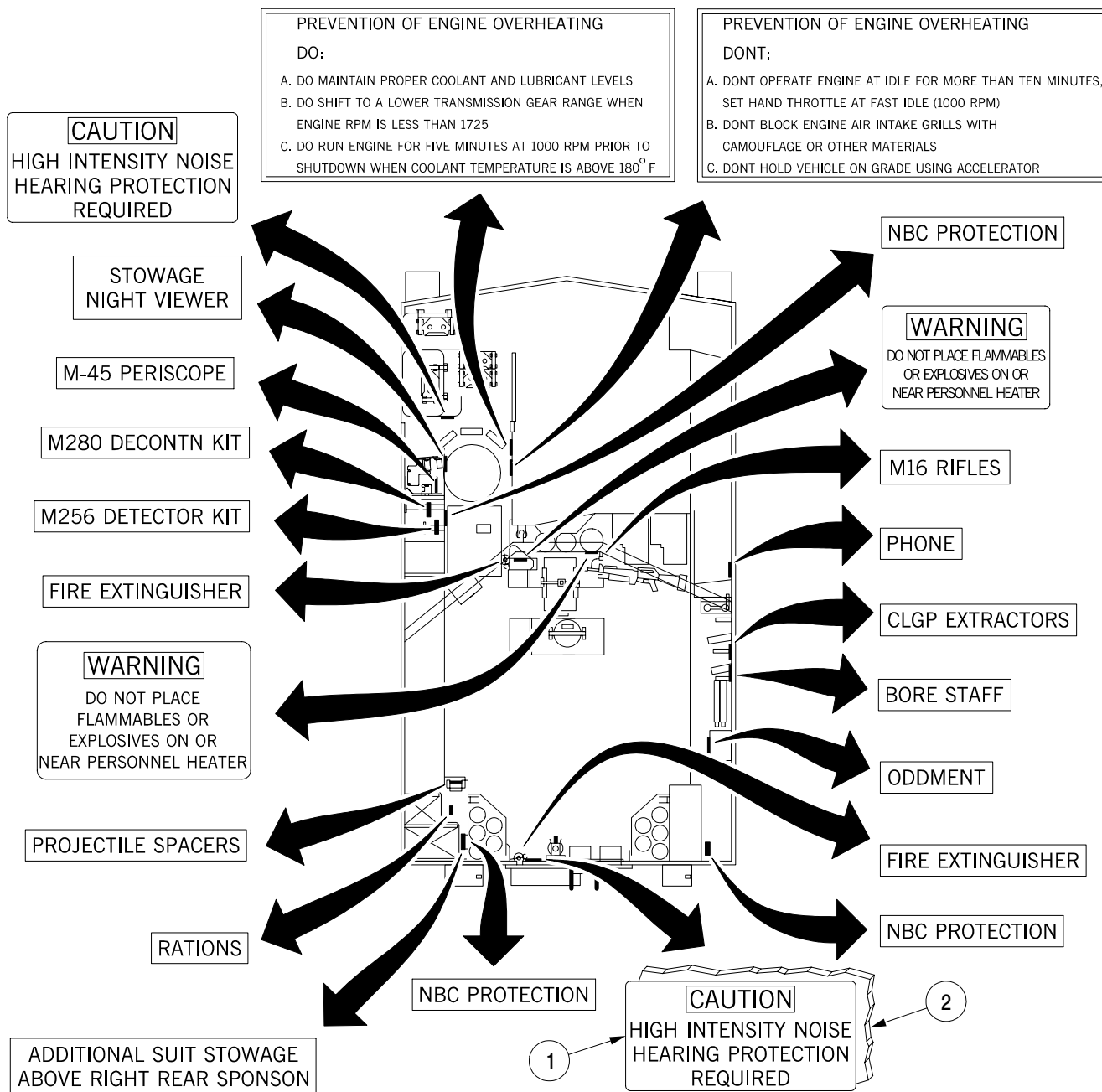
- Install radiator (para 7-1)
- Close and secure air intake grille  
(TM 9-2350-314-10)
- Install personnel heater (para 18-10)



**Section IV. DATA PLATES AND INSTRUCTION HOLDERS – CONTINUED**

**18-13 DECALS – CONTINUED**

**b. Installation – Continued**



22ph030m

## Section IV. DATA PLATES AND INSTRUCTION HOLDERS – CONTINUED

---

### 18-14 STENCIL LOCATIONS.

---

This task covers: Stenciling of Hull Stowage

---

#### INITIAL SETUP

##### Tools

General mechanic's tool kit  
(SC 5180-90-N26)  
Marking stencil set (item 71, Appx F)

##### Materials/Parts

Dry-cleaning solvent (item 59, Appx C)  
Enamel (TM 43-0139)

##### References

TM 9-2350-314-10

---

#### Stenciling of Hull Stowage.

#### WARNING

Dry-cleaning solvent (P-D-680) is toxic and flammable. To avoid injury, wear protective goggles and gloves and use only in a well-ventilated area. Avoid contact with skin, eyes, and clothes. Do not breathe vapors. Do not use near open flame or excessive heat. Do not smoke when using solvent. Failure to do so could cause SERIOUS INJURY. If you become dizzy while using dry-cleaning solvent, get fresh air immediately, and if necessary, get medical attention. If contact with skin or clothes is made, flush thoroughly with water. If the solvent contacts your eyes, wash them with water immediately and obtain medical aid (FM 21-11).

#### NOTE

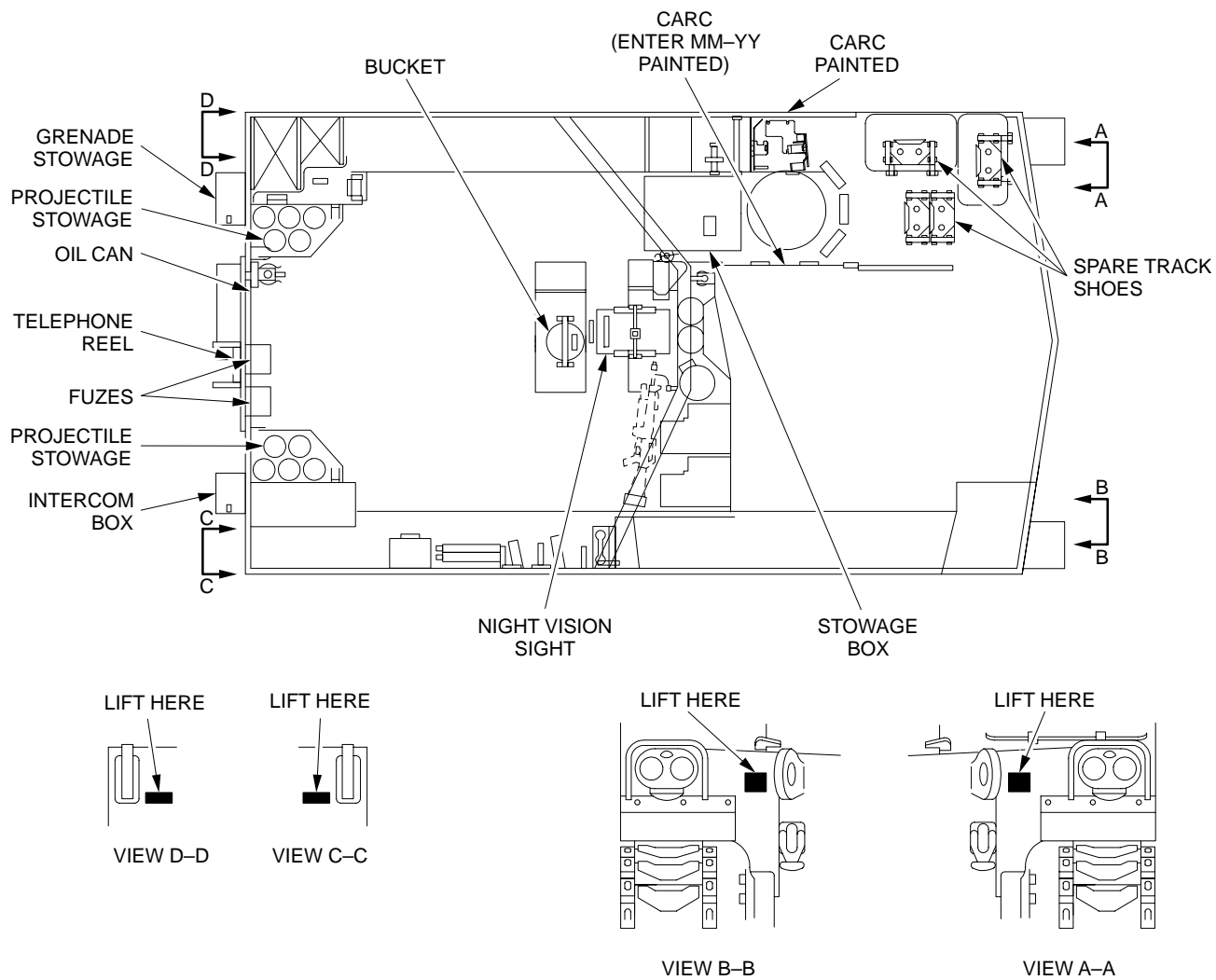
- All letters must be 1/10 in. (2.5 mm) x 1/2 in. (12.7 mm) high.
  - All spacing between lines must be 1/4 in. (6.4 mm)
- 1 Clean surface to be stenciled with dry-cleaning solvent.
  - 2 Position stencil on surface to be stenciled.
  - 3 Apply paint to letters on stencil.



Section IV. DATA PLATES AND INSTRUCTION HOLDERS – CONTINUED

18-14 STENCIL LOCATIONS – CONTINUED

Stenciling of Hull Stowage – Continued



22ph031m

**Section IV. DATA PLATES AND INSTRUCTION HOLDERS – CONTINUED**

**18-15 VEHICLE IDENTIFICATION PLATE.**

This task covers: a. Removal b. Installation

**INITIAL SETUP**

Tools

- General mechanic's tool kit (SC 5180-90-N26)
- Electric drill (item 15, Appx F)
- Twist drill set (item 16, Appx F)

Materials/Parts

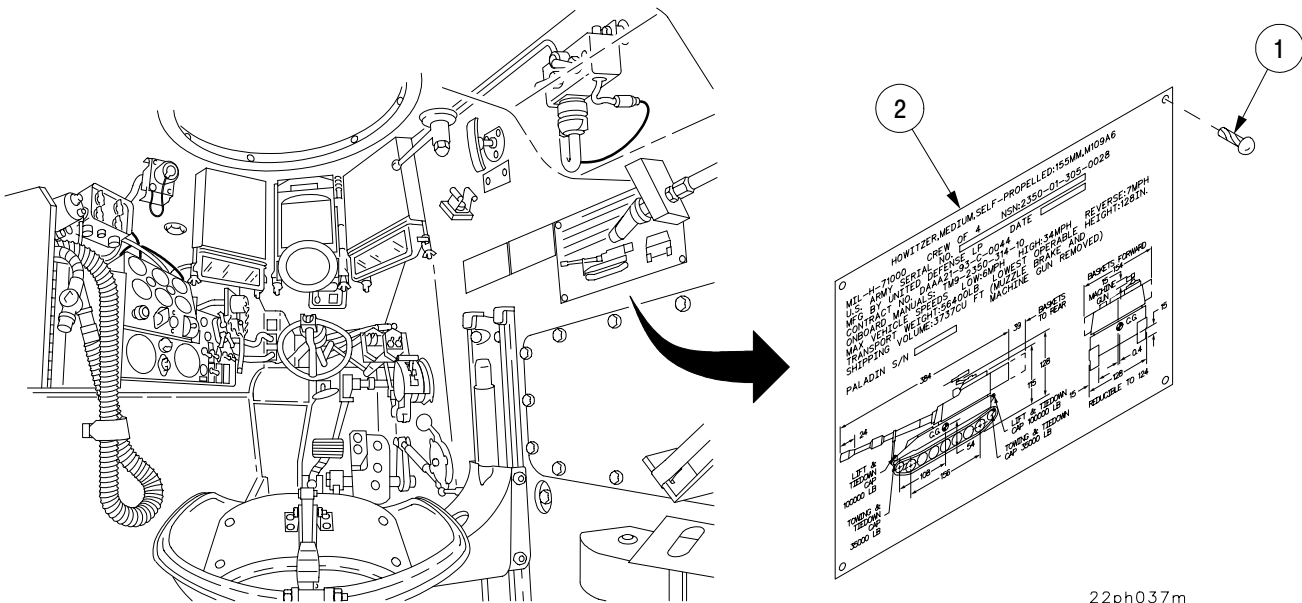
- Drive screws (4) (item 46, Appx E)

**a. Removal.**

Remove four drive screws (1) and identification plate (2) from driver's compartment. Discard drive screws.

**b. Installation.**

Install identification plate (2) to driver's compartment with four new drive screws (1).



DRIVER'S COMPARTMENT

22ph037m

# CHAPTER 19

## SPECIAL PURPOSE KITS

---

### GENERAL

This chapter illustrates and defines procedures for removal and installation of special purpose kit components (winterization kit components).

---

<u>CONTENTS</u>		<u>Page</u>
19-1	ENGINE COOLANT HEATER ASSEMBLY AND BRACKETS .....	19-2
19-2	FUEL PUMP ASSEMBLY .....	19-5
19-3	HEATER CONTROL BOX AND BRACKET .....	19-7
19-4	EXHAUST OUTLET ASSEMBLY .....	19-8
19-5	BATTERY HEATER AND INSULATION BLANKETS .....	19-9
19-6	COOLANT PUMP AND BRACKET .....	19-13
19-7	FUEL FILTER .....	19-16
19-8	WINTERIZATION KIT WIRING HARNESS (BULKHEAD TO CONTROL BOX) .....	19-18
19-9	AIR INTAKE AND EXHAUST GRILLE COVERS AND STRIPS .....	19-22
19-10	WINTERIZATION KIT WIRING HARNESS (COOLANT HEATER TO BULKHEAD) .....	19-24
19-11	COOLANT SYSTEM BLEEDING .....	19-27
19-12	EXHAUST TUBE AND SUPPORT .....	19-29
19-13	FUEL PUMP AND FUEL FILTER MOUNTING BRACKET .....	19-30
19-14	FUEL LINES AND HOSES .....	19-31
19-15	COOLANT HOSES .....	19-34
19-16	MCS HEATER (M3) SUPPLY HOSE .....	19-38



## 19-1 ENGINE COOLANT HEATER ASSEMBLY AND BRACKETS.

This task covers: a. Removal b. Installation

### INITIAL SETUP

#### Tools

General mechanic's tool kit  
(SC 5180-90-N26)

#### Materials/Parts

Lockwasher (6) (item 9, Appx E)

#### Equipment Condition

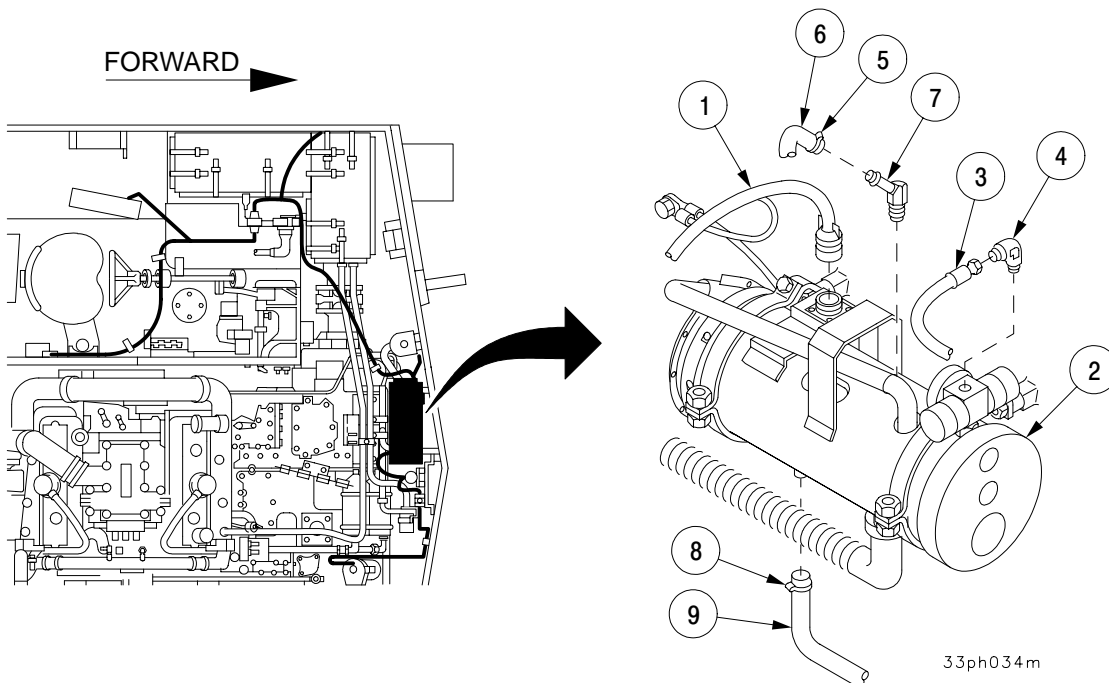
Vehicle MASTER switch OFF  
(TM 9-2350-314-10)  
Battery ground leads disconnected  
(para 8-33)  
Transmission access doors open  
(TM 9-2350-314-10)  
Cooling system drained  
(TM 9-2350-314-10)

#### References

TM 9-2350-314-10

### a. Removal.

- 1 Disconnect coolant heater to bulkhead wiring harness (1) at coolant heater (2).
- 2 Disconnect fuel hose (3) from elbow (4) on coolant heater (2).
- 3 Remove elbow (4) from coolant heater (2).
- 4 Loosen clamp (5) and remove hose (6) from elbow (7) on coolant heater (2).
- 5 Remove elbow (7) from coolant heater (2).
- 6 Loosen clamp (8) and remove hose (9) from coolant heater (2).



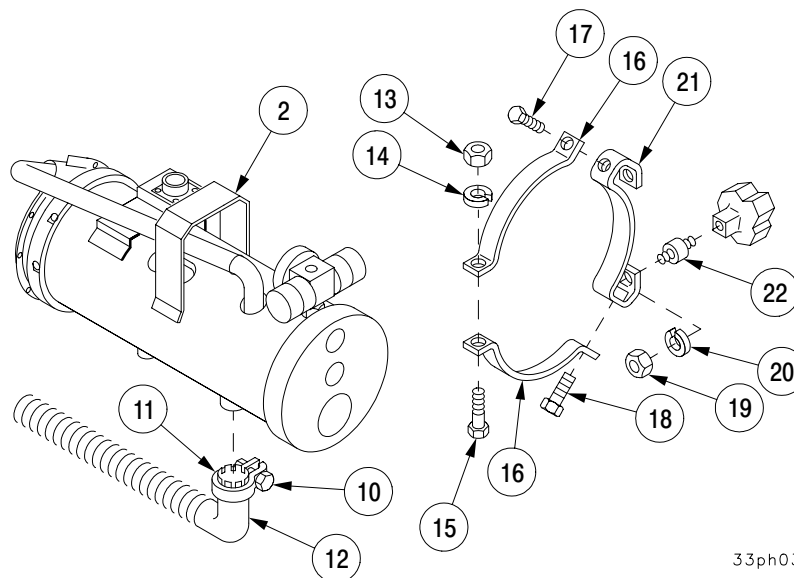
## 19-1 ENGINE COOLANT HEATER ASSEMBLY AND BRACKETS – CONTINUED

### a. Removal – Continued

- 7 Loosen screw (10) on clamp (11) and remove exhaust tube (12) from coolant heater (2).
- 8 Remove two nuts (13), two lockwashers (14), and two screws (15) and two screws (15) to loosen four bands (16). Discard lockwashers.
- 9 Remove two screws (17) and two upper bands (16).
- 10 Remove coolant heater (2) from two lower bands (16).
- 11 Remove two screws (18) and two lower bands (16).
- 12 Remove four nuts (19), four lockwashers (20), and two bracket assemblies (21). Discard lockwashers.
- 13 Remove four mounts (22).

### b. Installation.

- 1 Install four mounts (22) and two bracket assemblies (21) with four new lockwashers (20) and four nuts (19).
- 2 Install two lower bands (16) with two screws (18).
- 3 Install coolant heater (2) on two lower bands (16).
- 4 Install two upper bands (16) with two screws (17).
- 5 Secure four bands (16) with two screws (15), two new lockwashers (14), and two nuts (13).
- 6 Install exhaust tube (12) on coolant heater (2) with clamp (11) and screw (10).



33ph035m

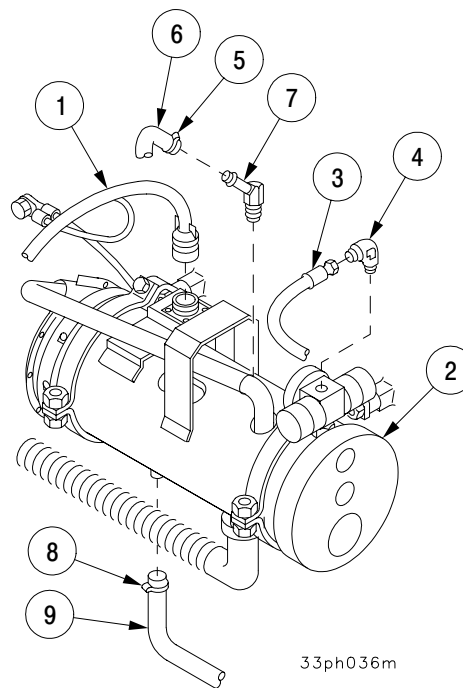
---

## 19-1 ENGINE COOLANT HEATER ASSEMBLY AND BRACKETS – CONTINUED

---

### b. Installation – Continued

- 7 Install hose (9) on coolant heater (2) and tighten clamp (8).
- 8 Install elbow (7) on coolant heater (2).
- 9 Install hose (6) on elbow (7) and tighten clamp (5).
- 10 Install elbow (4) on coolant heater (2).
- 11 Connect fuel hose (3) to elbow (4) on coolant heater (2).
- 12 Connect coolant heater to bulkhead wiring harness (1) to coolant heater (2).



### NOTE

#### FOLLOW-ON MAINTENANCE:

- Connect battery ground leads (para 8-33)
- Bleed coolant system (para 19-11)
- Close transmission access doors  
(TM 9-2350-314-10)

## 19-2 FUEL PUMP ASSEMBLY.

This task covers: a. Removal b. Installation

### INITIAL SETUP

#### Tools

General mechanic's tool kit  
(SC 5180-90-N26)

#### Materials/Parts

Lockwasher (item 172, Appx E)

#### Equipment Condition

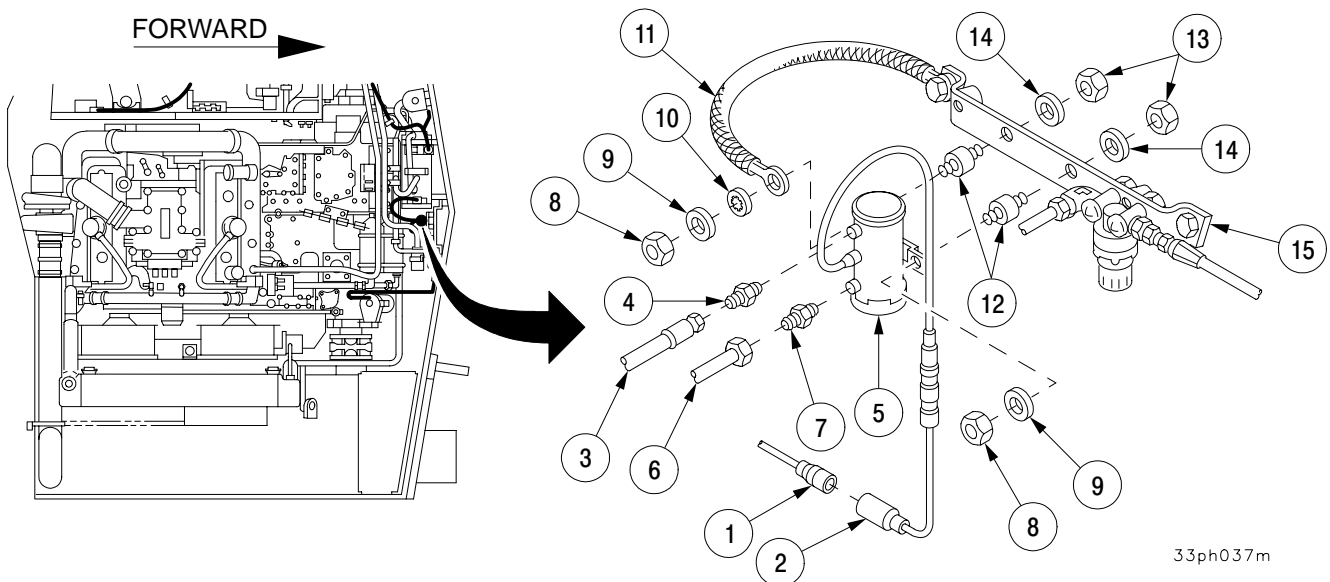
Vehicle MASTER switch OFF  
(TM 9-2350-314-10)  
Battery ground leads disconnected  
(para 8-33)  
Transmission access doors open  
(TM 9-2350-314-10)

#### References

TM 9-2350-314-10

### a. Removal.

- 1 Disconnect coolant heater to bulkhead lead 402C (1) from fuel pump lead (2).
- 2 Disconnect hose (3) from adapter (4) on fuel pump (5).
- 3 Disconnect tube (6) from adapter (7) on fuel pump (5).
- 4 Remove two nuts (8), lockwasher (9), two flat washers (10), ground strap (11), and fuel pump (5) from mounts (12). Discard lockwasher.
- 5 Remove adapter (4) and adapter (7) from fuel pump (5).
- 6 Remove two nuts (13), two flat washers (14), and two mounts (12) from bracket (15).

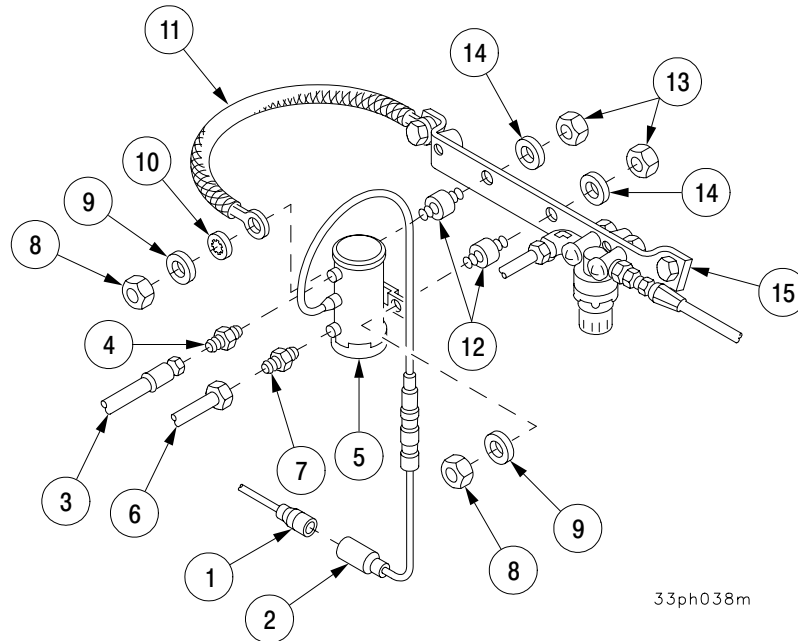


33ph037m

## 19-2 FUEL PUMP ASSEMBLY – CONTINUED

### b. Installation.

- 1 Install two mounts (12) on bracket (15) with two flat washers (14) and two nuts (13).
- 2 Install adapter (7) and adapter (4) on fuel pump (5).
- 3 Install fuel pump (5) and ground strap (11) on mounts (12) and secure with new lockwasher (9), two flat washers (10), and two nuts (8).
- 4 Connect tube (6) to adapter (7) on fuel pump (5).
- 5 Connect hose (3) to adapter (4) on fuel pump (5).
- 6 Connect fuel pump lead (2) to coolant heater to bulkhead lead 402C (1).



33ph038m

### NOTE

#### FOLLOW-ON MAINTENANCE:

Close transmission access doors  
 (TM 9-2350-314-10)  
 Connect battery ground leads  
 (para 8-33)



## 19-3 HEATER CONTROL BOX AND BRACKET.

This task covers: a. Removal b. Installation

### INITIAL SETUP

#### Tools

General mechanic's tool kit  
(SC 5180-90-N26)

#### Equipment Condition

Vehicle MASTER switch OFF  
(TM 9-2350-314-10)  
Battery ground leads disconnected  
(para 8-33)

#### References

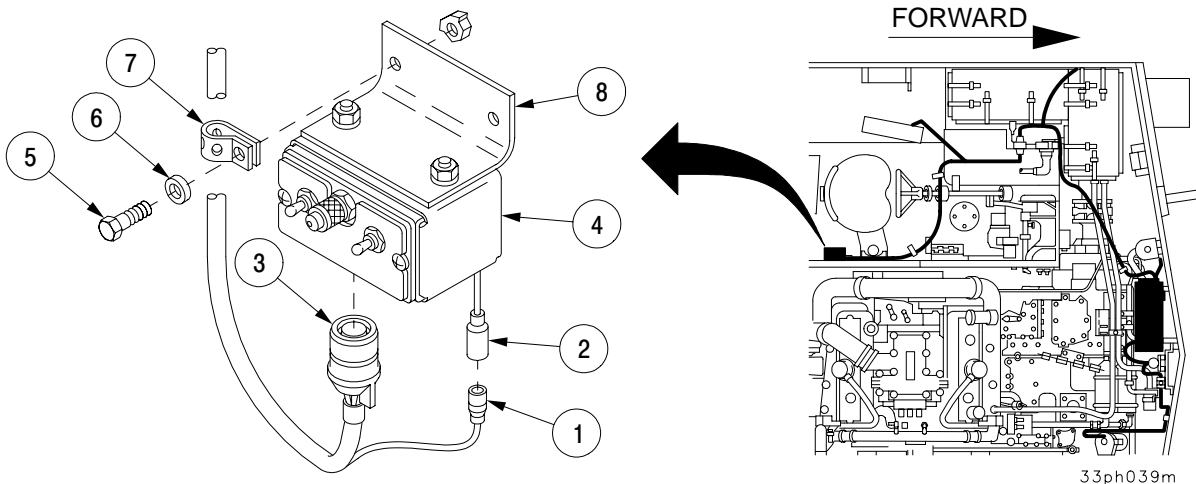
TM 9-2350-314-10

#### a. Removal.

- 1 Disconnect bulkhead to control box wiring harness lead 400 (1) from heater control box lead (2).
- 2 Disconnect bulkhead to control box wiring harness (3) from heater control box (4).
- 3 Remove two screws (5), two flat washers (6), strap (7), heater control box (4), and bracket (8) from engine bulkhead in driver's compartment.

#### b. Installation.

- 1 Install bracket (8) and heater control box (4) on engine bulkhead in driver's compartment and secure with strap (7), two flat washers (6), and two screws (5).
- 2 Connect bulkhead to control box wiring harness (3) to heater control box (4).
- 3 Connect bulkhead to control box wiring harness lead 400 (1) to heater control box lead (2).



#### NOTE

**FOLLOW-ON MAINTENANCE:**  
Connect batter ground leads (para 8-33)



**19-5 BATTERY HEATER AND INSULATION BLANKETS.**

This task covers: a. Removal b. Installation

**INITIAL SETUP**

Tools

General mechanic's tool kit  
(SC 5180-90-N26)

Materials/Parts

Lockwashers (8) (item 3, Appx E)  
Nonmetallic grommets (2) (item 290, Appx E)  
Lockwire (item 55, Appx E)

Equipment Condition

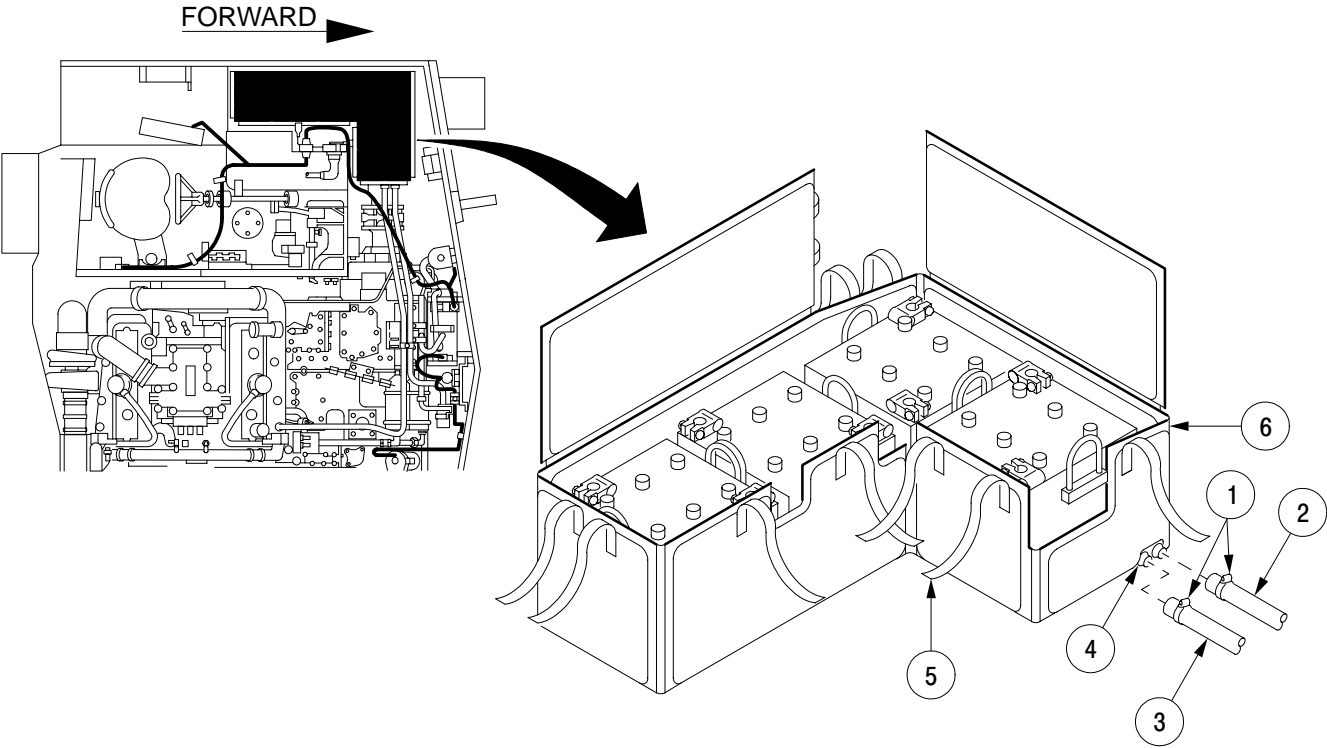
Battery access doors open  
(TM 9-2350-314-10)  
Coolant system drained  
(TM 9-2350-314-10)

References

TM 9-2350-314-10

**a. Removal.**

- 1 Loosen hose clamps (1) on inlet hose (2) and outlet hose (3) at battery heater (4).
- 2 Disconnect inlet hose (2) and outlet hose (3) from battery heater (4).
- 3 Disconnect straps (5) from insulation blanket (6).
- 4 Remove batteries (para 8-54).



33ph041m

## 19-5 BATTERY HEATER AND INSULATION BLANKETS – CONTINUED

---

### a. Removal – Continued

#### NOTE

Flat washers are used for shimming adjustment of support make it level. Note quantity of flat washers removed with each screw to aid in installation. The maximum quantity of flat washers with each screw should be three.

- 5 Remove eight screws (7), eight lockwashers (8), and 24 flat washers (9) from battery support (10) and battery heater (4). Discard lockwashers.
- 6 Remove two battery supports (10) and battery heater (4) from battery compartment.
- 7 Cut lockwire (11) securing insulation (12) to insulation (13) and remove insulation (12) and (13) from battery compartment. Discard lockwire.
- 8 Remove grommets (14) from battery heater (4). Discard grommets.
- 9 Remove insulation blanket (6) from battery compartment.

### b. Installation.

- 1 Install insulation blanket (6) in battery compartment.
- 2 Install new grommets (14) in battery heater (4).
- 3 Install insulation (13) and insulation (12) in battery compartment with new lockwire (11).

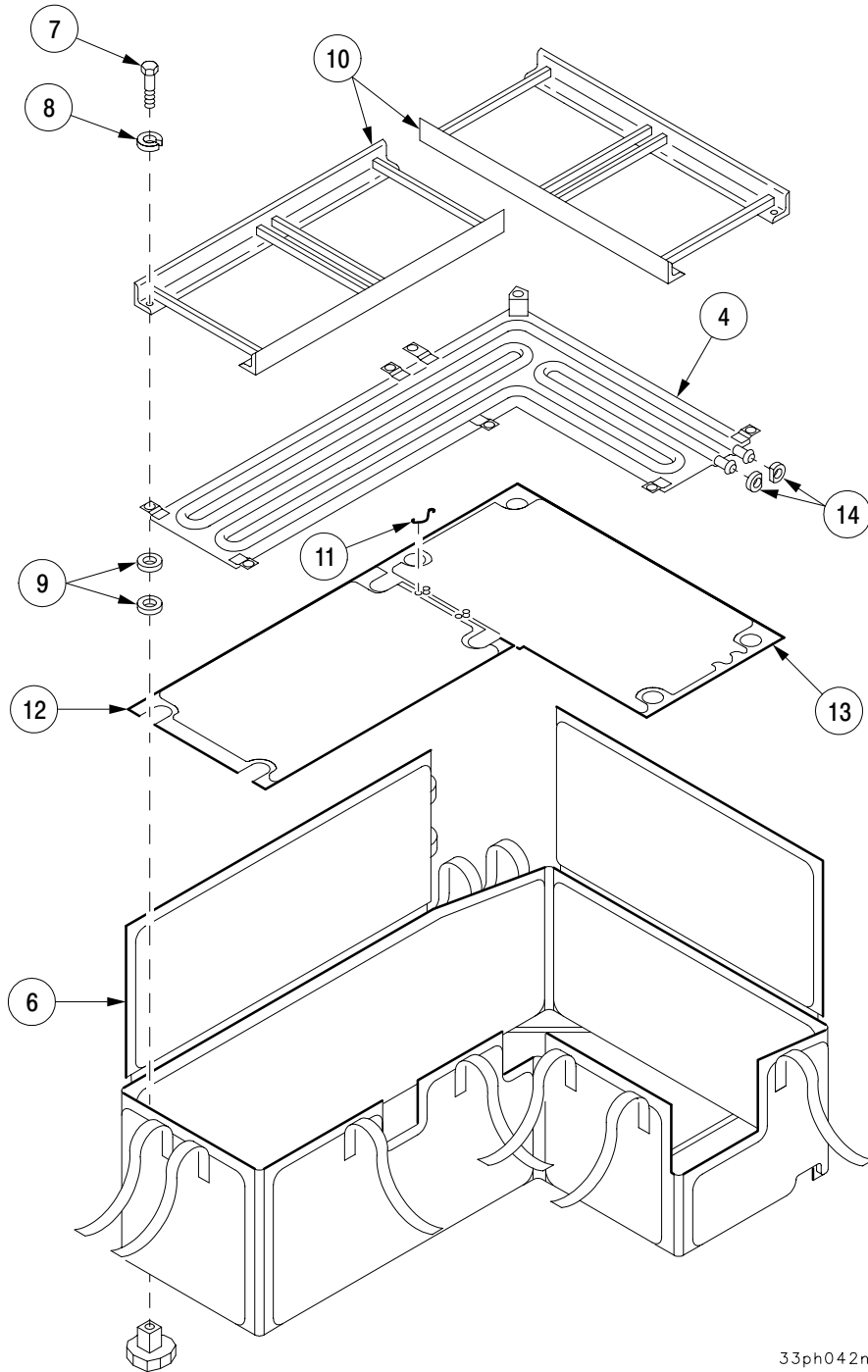
#### NOTE

Flat washers are used for shimming adjustment of support to make it level. The maximum number of flat washers used with each screw is three.

- 4 Install battery heater (4) and two battery supports (10) in battery compartment with 24 flat washers (9), eight new lockwashers (8), and eight screws (7).

**19-5 BATTERY HEATER AND INSULATION BLANKETS – CONTINUED**

**b. Installation – Continued**



33ph042m

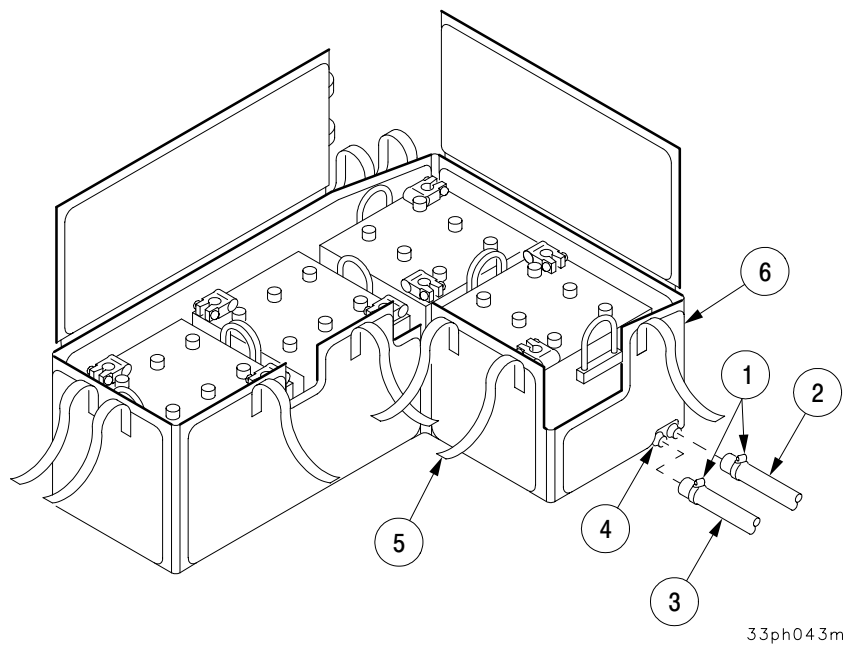
---

## 19-5 BATTERY HEATER AND INSULATION BLANKETS – CONTINUED

---

### b. Installation – Continued

- 5 Install batteries (para 8-54).
- 6 Close and secure insulation blanket (6) with straps (5).
- 7 Connect inlet hose (2) and outlet hose (3) to battery heater (4).
- 8 Tighten hose clamps (1) on outlet hose (3) and inlet hose (2).



### NOTE

#### FOLLOW-ON MAINTENANCE:

- Close battery access doors (TM 9-2350-314-10)
- Bleed coolant system (para 19-11)

**19-6 COOLANT PUMP AND BRACKET.**

This task covers: a. Removal b. Installation

**INITIAL SETUP**

Tools

General mechanic's tool kit  
(SC 5180-90-N26)

Materials/Parts

Lockwashers (2) (item 172, Appx E)  
Lockwashers (3) (item 38, Appx E)

Equipment Condition

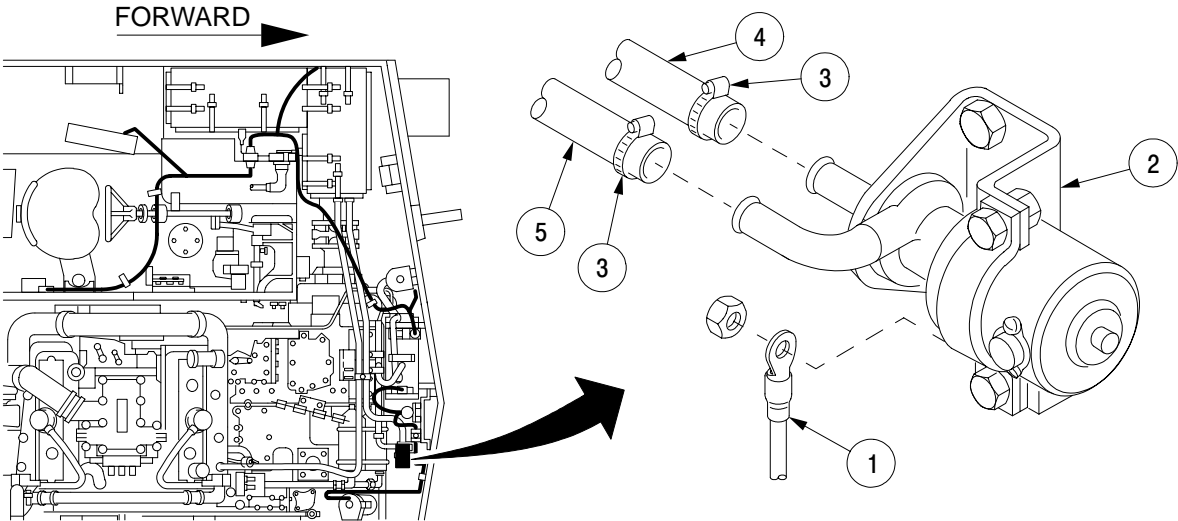
Vehicle MASTER switch OFF  
(TM 9-2350-314-10)  
Battery ground leads disconnected  
(para 8-33)  
Transmission access doors open  
(TM 9-2350-314-10)  
Coolant system drained  
(TM 9-2350-314-10)

References

TM 9-2350-314-10

**a. Removal.**

- 1 Disconnect electrical leads 403B (1) from coolant pump (2).
- 2 Loosen two hose clamps (3) on inlet hose (4) and outlet hose (5).
- 3 Disconnect hoses (4) and (5) from coolant pump (2).



33ph044m

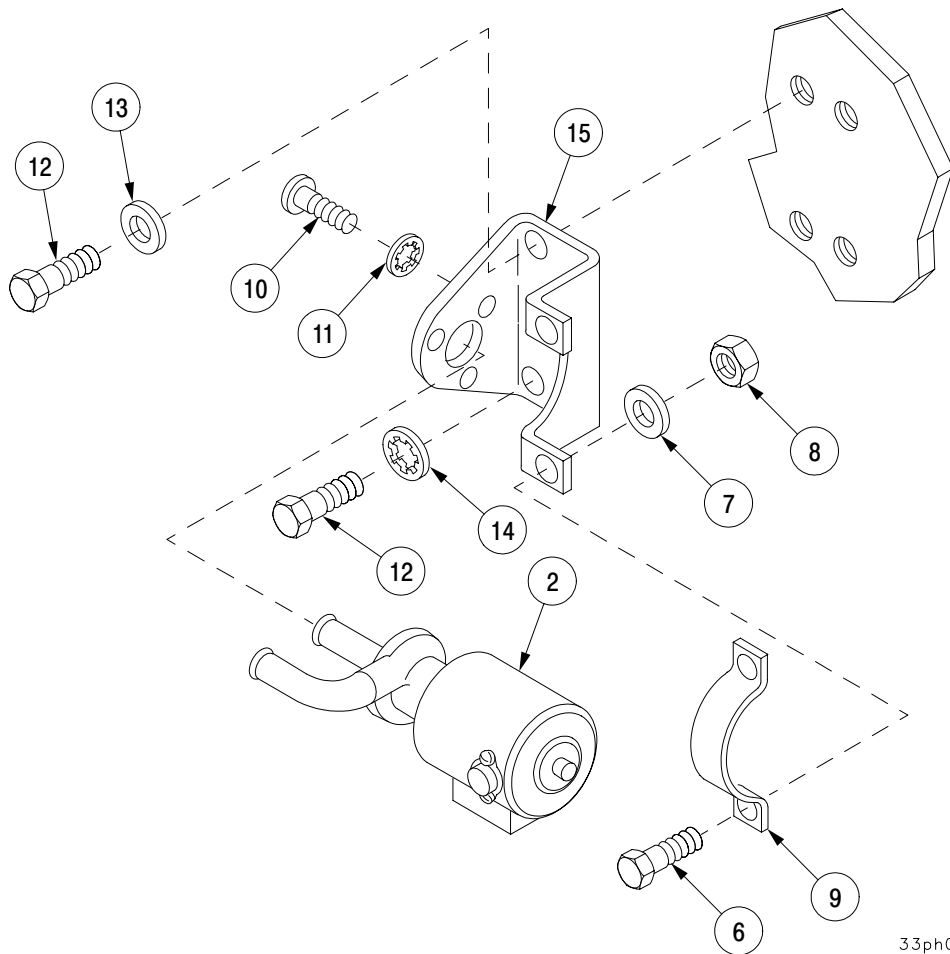
## 19-6 COOLANT PUMP AND BRACKET – CONTINUED

### a. Removal – Continued

- 4 Remove two screws (6), two flat washers (7), two nuts (8), and clamp bracket (9).
- 5 Remove three screws (10), three lockwashers (11), and coolant pump (2). Discard lockwashers.
- 6 Remove four screws (12), two flat washers (13), two lockwashers (14), and bracket (15). Discard lockwashers.

### b. Installation.

- 1 Install bracket (15) with four screws (12), two flat washers (13), and two new lockwashers (14).
- 2 Install coolant pump (2) with three new lockwashers (11) and three screws (10).
- 3 Install clamp bracket (9) and secure with two screws (6), two flat washers (7), and two nuts (8).



33ph045m



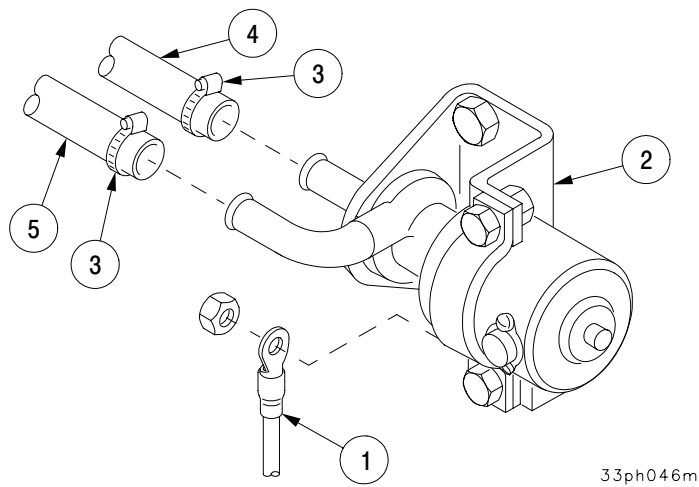
---

**19-6 COOLANT PUMP AND BRACKET – CONTINUED**

---

**b. Installation – Continued**

- 4 Connect inlet hose (4) and outlet hose (5) to coolant pump (2) with two hose clamps (3).
- 5 Connect electrical lead 403B (1) to coolant pump (2).

**NOTE****FOLLOW-ON MAINTENANCE:**

- Connect battery ground leads (para 8-33)
- Bleed coolant system (para 19-11)
- Close transmission access doors  
(TM 9-2350-314-10)



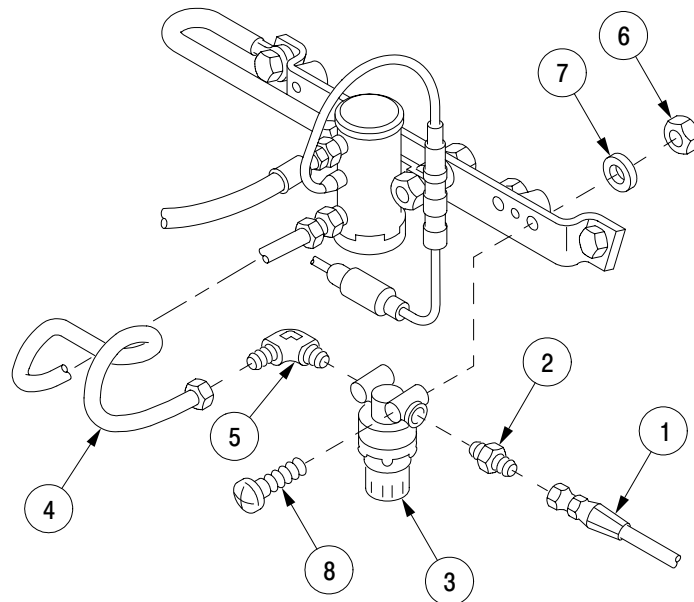
---

**19-7 FUEL FILTER – CONTINUED**

---

**b. Installation.**

- 1 Install fuel filter (3) with two screws (8), two flat washers (7), and two nuts (6).
- 2 Install elbow (5) on fuel filter (3).
- 3 Connect fuel filter-to-fuel filter pump tube (4) to elbow (5).
- 4 Install adapter (2) on fuel filter (3).
- 5 Connect primary fuel filter-to-fuel filter hose (1) to adapter (2).



33ph048m

**NOTE****FOLLOW-ON MAINTENANCE:**

Close transmission access doors  
(TM 9-2350-314-10)

## 19-8 WINTERIZATION KIT WIRING HARNESS (BULKHEAD TO CONTROL BOX).

This task covers: a. Removal b. Installation

### INITIAL SETUP

#### Tools

General mechanic's tool kit  
(SC 5180-90-N26)

#### Equipment Condition

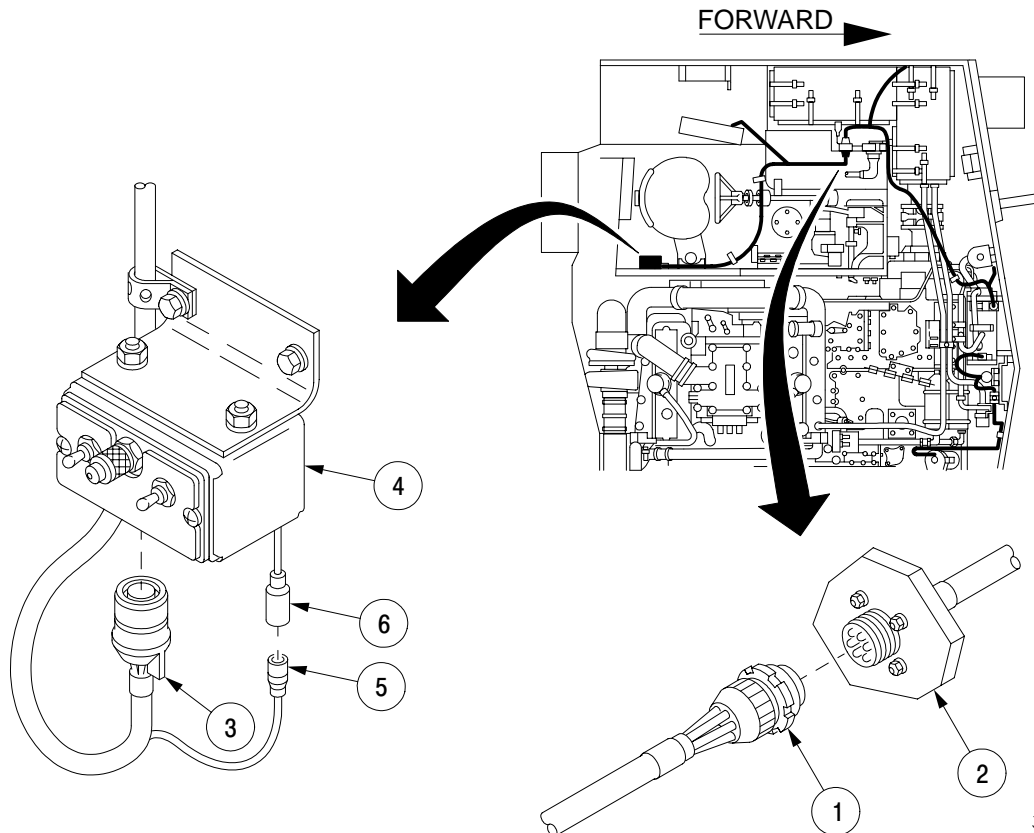
Vehicle MASTER switch OFF  
(TM 9-2350-314-10)  
Battery ground leads disconnected  
(para 8-33)

#### References

TM 9-2350-314-10

#### a. Removal.

- 1 Disconnect connector (1) at driver's bulkhead (2).
- 2 Disconnect connector (3) at heater control box (4).
- 3 Disconnect lead 400 (5) from heater control box lead (6).

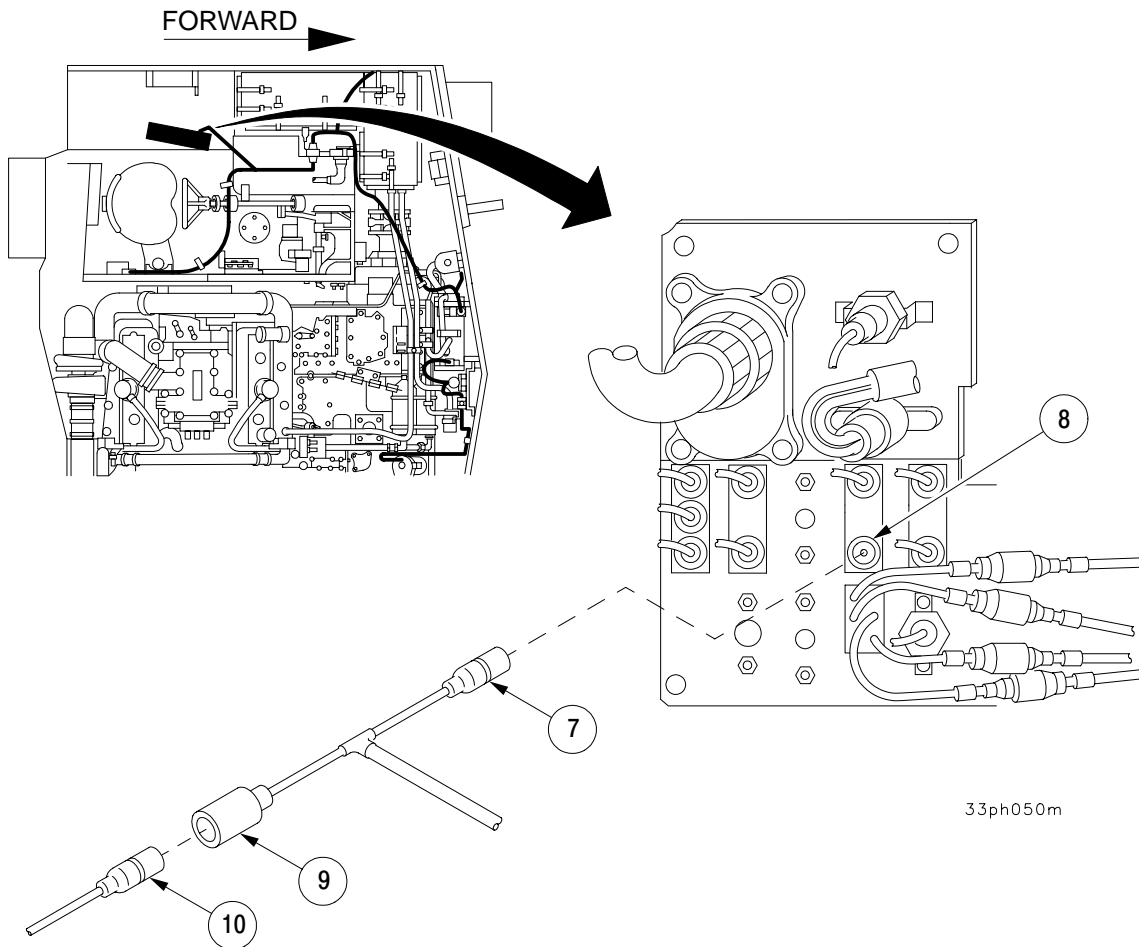


33ph049m

## 19-8 WINTERIZATION KIT WIRING HARNESS (BULKHEAD TO CONTROL BOX) – CONTINUED

### a. Removal – Continued

- 4 Disconnect lead 400 (7) from GLOW PLUGS switch (8) on driver's instrument panel.
- 5 Disconnect lead 400 (9) from wiring harness W120 lead 10S (10).



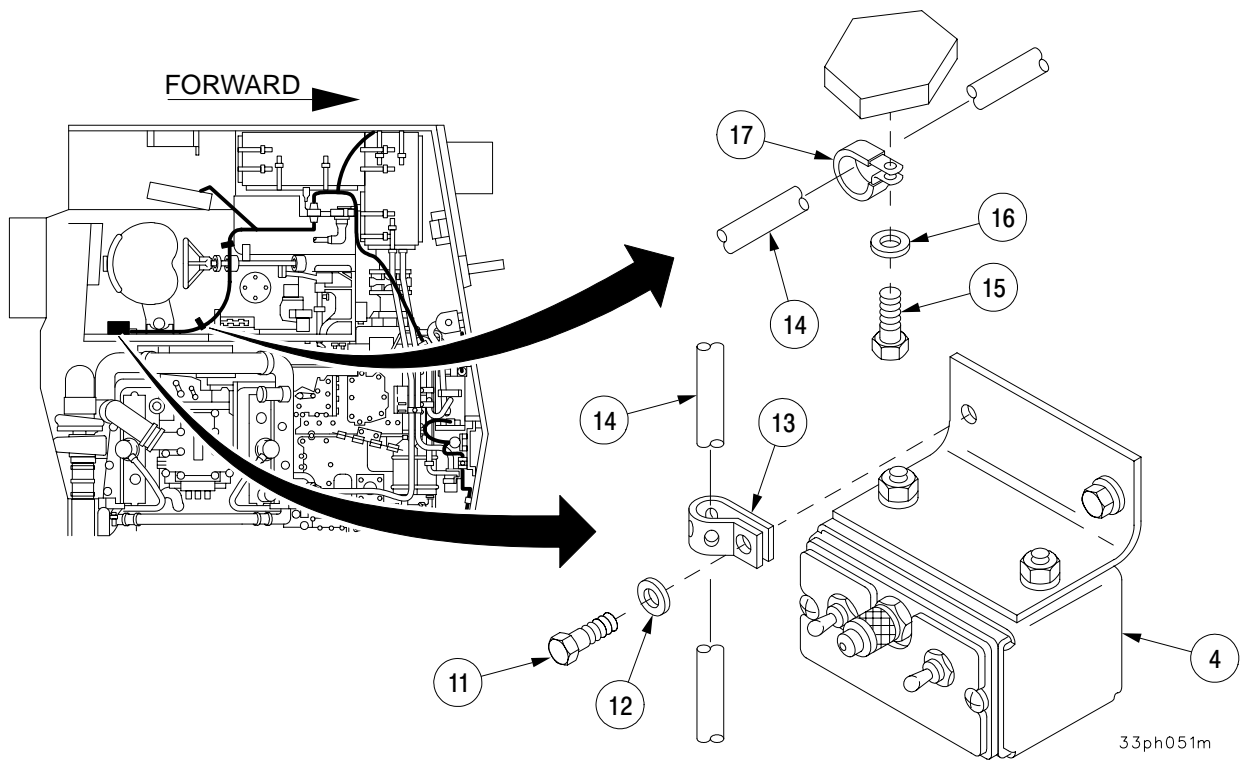
## 19-8 WINTERIZATION KIT WIRING HARNESS (BULKHEAD TO CONTROL BOX) – CONTINUED

### a. Removal – Continued

- 6 Remove screw (11), flat washer (12), and strap (13) securing harness (14) to control box (4).
- 7 Remove two screws (15), two flatwashers (16), and two straps (17) securing wiring harness (14) in driver's compartment.
- 8 Remove wiring harness (14) from driver's compartment.

### b. Installation.

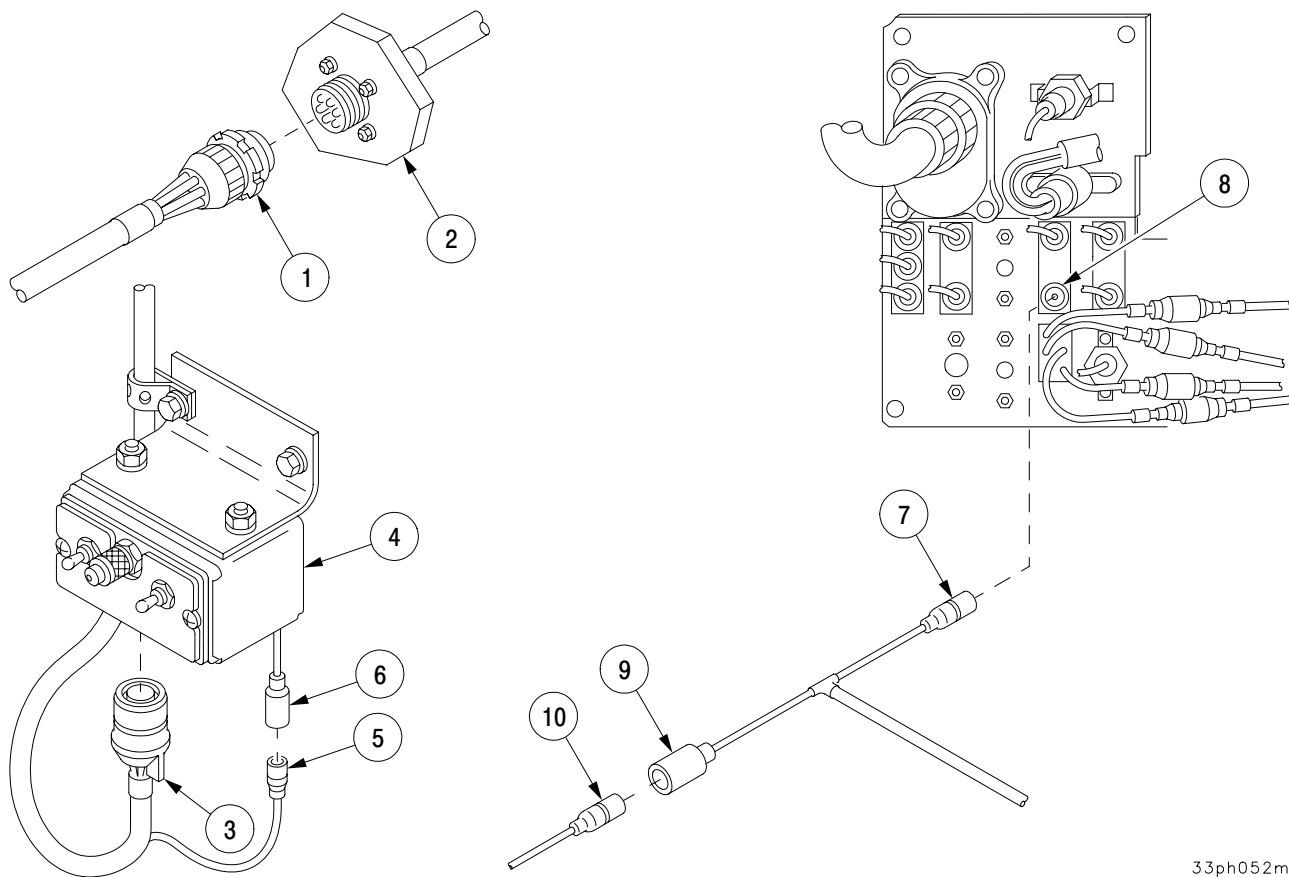
- 1 Install wiring harness (14) in driver's compartment with two straps (17), two screws (15), and two flat washers (16).
- 2 Install strap (13) on wiring harness (14) at heater control box (4) with screw (11) and flat washer (12).



## 19-8 WINTERIZATION KIT WIRING HARNESS (BULKHEAD TO CONTROL BOX) – CONTINUED

### b. Installation – Continued

- 3 Connect lead 400 (9) to wiring harness W120 lead 10S (10).
- 4 Connect lead 400 (7) to GLOW PLUGS switch (8) on driver's instrument panel.
- 5 Connect lead 400 (5) to heater control box lead (6).
- 6 Connect connector (3) to heater control box (4).
- 7 Connect connector (1) to driver's bulkhead (2).



33ph052m

### NOTE

**FOLLOW-ON MAINTENANCE:**  
 Connect battery ground leads  
 (para 8-33)

## 19-9 AIR INTAKE AND EXHAUST GRILLE COVERS AND STRIPS.

---

This task covers:      a. Removal                                      b. Installation

---

### **INITIAL SETUP**

#### Tools

General mechanic's tool kit  
(SC 5180-90-N26)

---

### **NOTE**

- Perform Removal steps 1 and 2, and Installation steps 3 and 4 for maintenance of air intake grille tarpaulin and strip.
- Perform Removal steps 3 through 5 and Installation steps 1 through 3 for maintenance of exhaust grille tarpaulin and strip.

#### **a. Removal.**

- 1 Remove six screws (1), six flat washers (2), and strip (3).
- 2 Disconnect 10 strap assemblies (4) from 10 footman loop fasteners (5) and remove air intake grille tarpaulin (6).
- 3 Remove screw (7) and flat washer (8).
- 4 Remove four screws (9), four flat washers (10), and strip (11).
- 5 Disconnect five strap assemblies (12) from five footman loop fasteners (13) and remove exhaust grille tarpaulin (14).

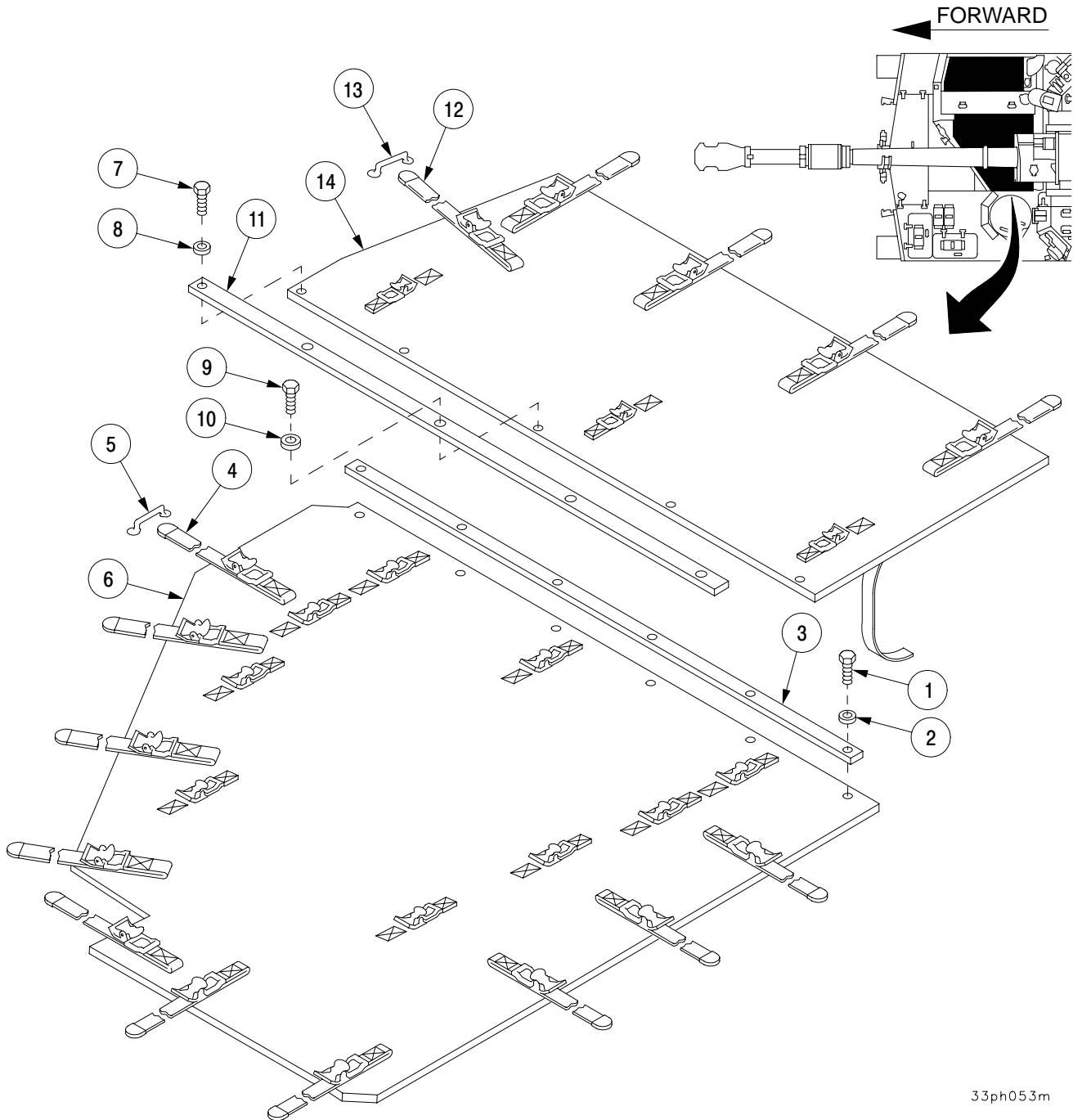
#### **b. Installation.**

- 1 Position exhaust grille tarpaulin (14) and connect five strap assemblies (12) to five footman loop fasteners (13).
- 2 Install strip (11) with four screws (9) and four flat washers (10).
- 3 Install screw (7) and flat washer (8).
- 4 Install air intake grille tarpaulin (6) and connect 10 strap assemblies (4) to 10 footman loop fasteners (5).
- 5 Install strip (3) and secure with six flat washers (2) and six screws (1).



**19-9 AIR INTAKE AND EXHAUST GRILLE COVERS AND STRIPS – CONTINUED**

**b. Installation – Continued**



33ph053m



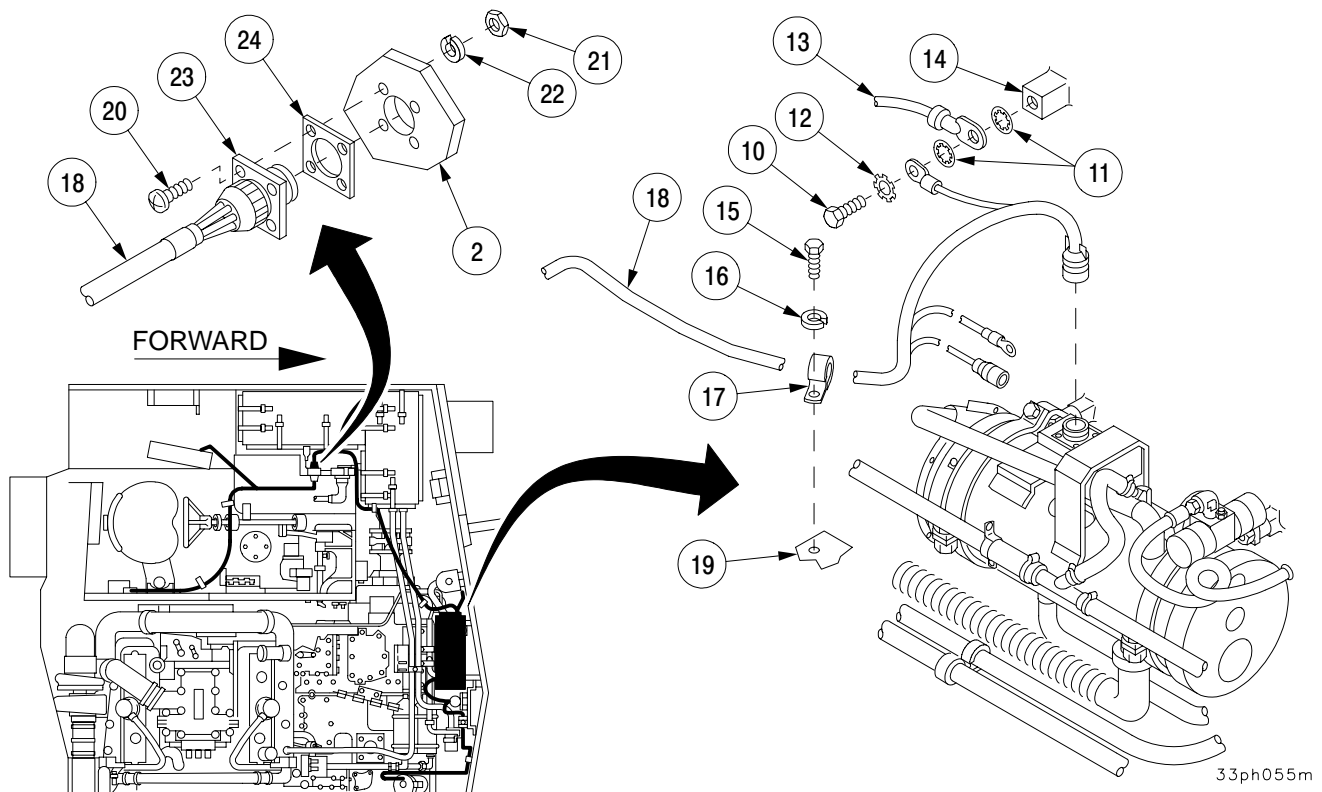
## 19-10 WINTERIZATION KIT WIRING HARNESS (COOLANT HEATER TO BULKHEAD) – CONTINUED

### a. Removal – Continued

- 5 Remove screw (10), two lockwashers (11), lockwasher (12), and ground lead (13) from hull (14). Discard lockwashers.
- 6 Remove screw (15), lockwasher (16), and clamp (17) securing harness (18) to transmission (19). Discard lockwasher.
- 7 Remove four screws (20), four nuts (21), four lockwashers (22), connector (23), and gasket (24) at driver's bulkhead (2). Discard gasket and lockwashers.
- 8 Remove harness (18) from vehicle.

### b. Installation.

- 1 Install harness (18) in vehicle.
- 2 Install connector (23) on driver's bulkhead (2) with new gasket (24), four screws (20), four new lockwashers (22), and four nuts (21).
- 3 Secure harness (18) to transmission (19) with clamp (17), screw (15), and new lockwasher (16).
- 4 Connect ground lead (13) to hull (14) with new lockwasher (12), two new lockwashers (11), and screw (10).



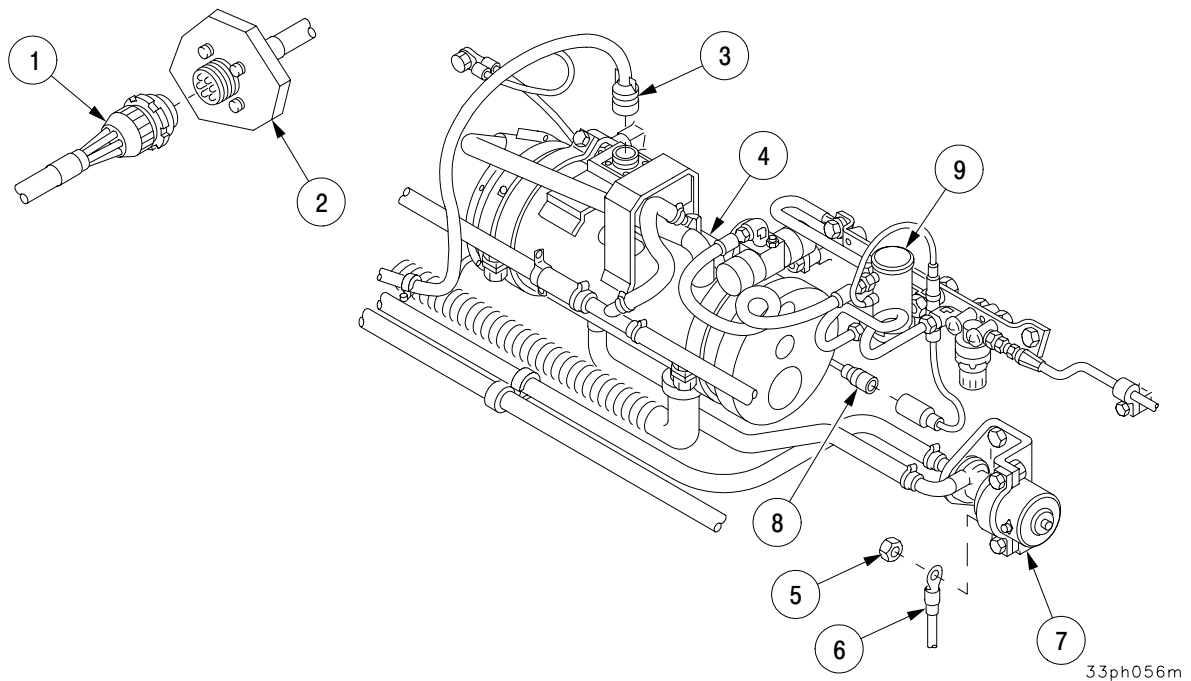
---

## 19-10 WINTERIZATION KIT WIRING HARNESS (COOLANT HEATER TO BULKHEAD) – CONTINUED

---

### b. Installation – Continued

- 5 Connect lead 402C (8) to fuel pump (9).
- 6 Install lead 403B (6) to coolant pump (7) with nut (5).
- 7 Connect connector (3) to coolant heater (4).
- 8 Connect bulkhead to control box wiring harness connector (1) at driver's bulkhead (2).



### NOTE

#### FOLLOW-ON MAINTENANCE:

- Close transmission access doors  
(TM 9-2350-314-10)
- Connect battery ground leads  
(para 8-33)

## 19-11 COOLANT SYSTEM BLEEDING.

This task covers: Coolant system bleeding

### INITIAL SETUP

#### Tools

General mechanic's tool kit  
(SC 5180-90-N26)  
Suitable container

#### Materials/Parts

Protective dust cap (item 299, Appx E)

#### Equipment Conditions

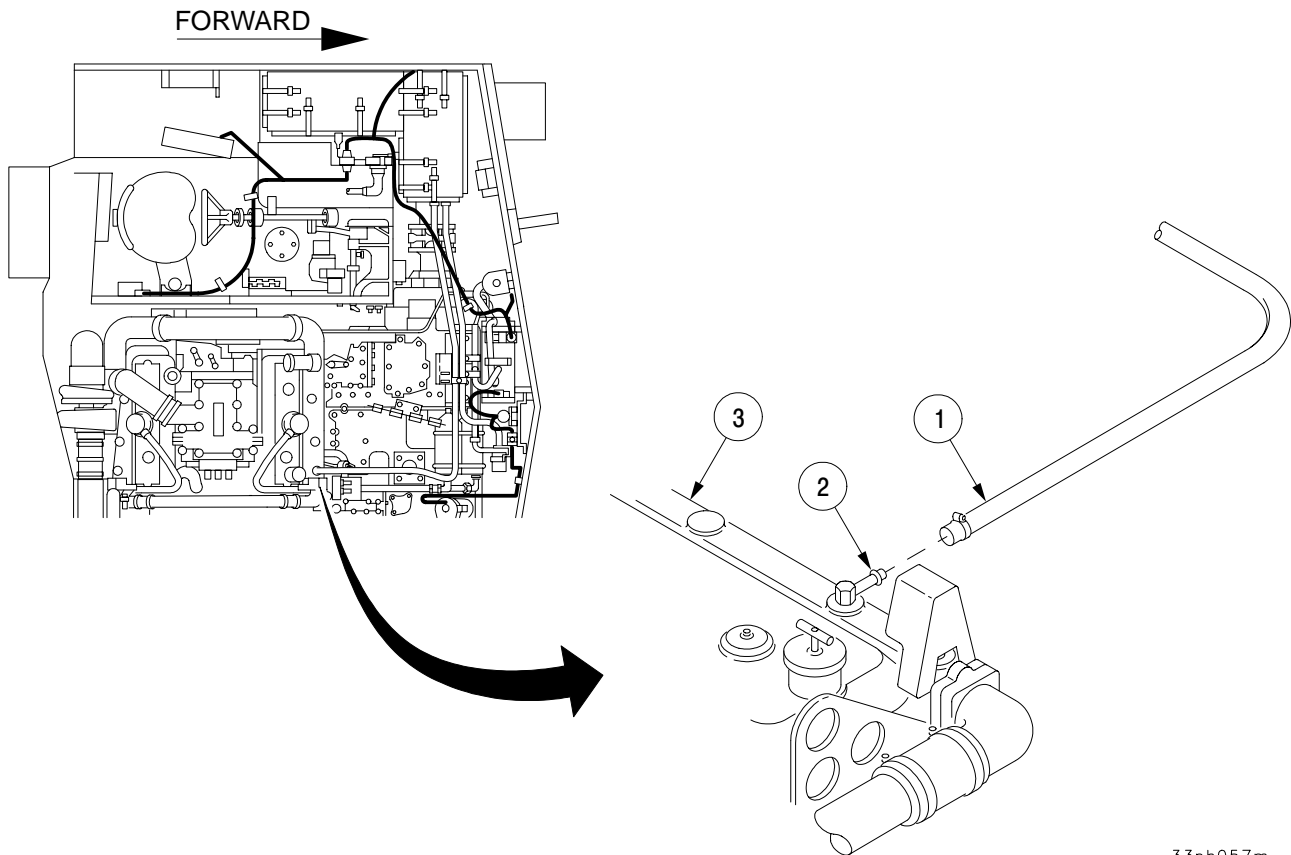
Air intake grille open  
(TM 9-2350-314-10)

#### References

TM 9-2350-314-10

### Coolant system bleeding.

- 1 Disconnect coolant hose (1) at elbow (2) on engine right bank manifold (3).
- 2 Install protective cap on elbow (2) and hold disconnected coolant hose (1) in suitable container.



33ph057m

---

## 19-11 COOLANT SYSTEM BLEEDING – CONTINUED

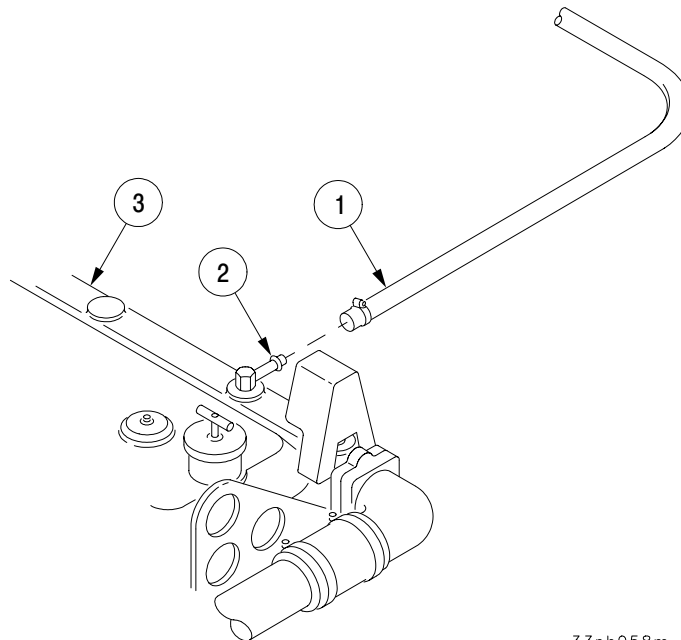
---

### Coolant system bleeding – Continued

- 3 Fill cooling system (TM 9-2350-314-10).

#### NOTE

- Do not overdrain coolant system. Return drained coolant to radiator, then continue air bleed procedure.
  - Air bleed should always be performed after removal or replacement of coolant heater or coolant lines.
- 4 Start engine (TM 9-2350-314-10) and run for short period observing flow of air and coolant out of disconnected hose. Continue until flow of coolant is without air bubbles.
  - 5 Shut down engine (TM 9-2350-314-10) and remove protective cap from elbow (2) and connect coolant hose (1) to elbow (2) on engine right bank manifold (3). Discard protective cap.



33ph058m

#### NOTE

#### FOLLOW-ON MAINTENANCE:

Close air intake grille  
(TM 9-2350-314-10)

## 19-12 EXHAUST TUBE AND SUPPORT.

This task covers: a. Removal b. Installation

### INITIAL SETUP

#### Tools

General mechanic's tool kit  
(SC 5180-90-N26)

#### Materials/Parts

Lockwashers (3) (item 3, Appx E)

#### Equipment Conditions

Transmission access doors open  
(TM 9-2350-314-10)

#### References

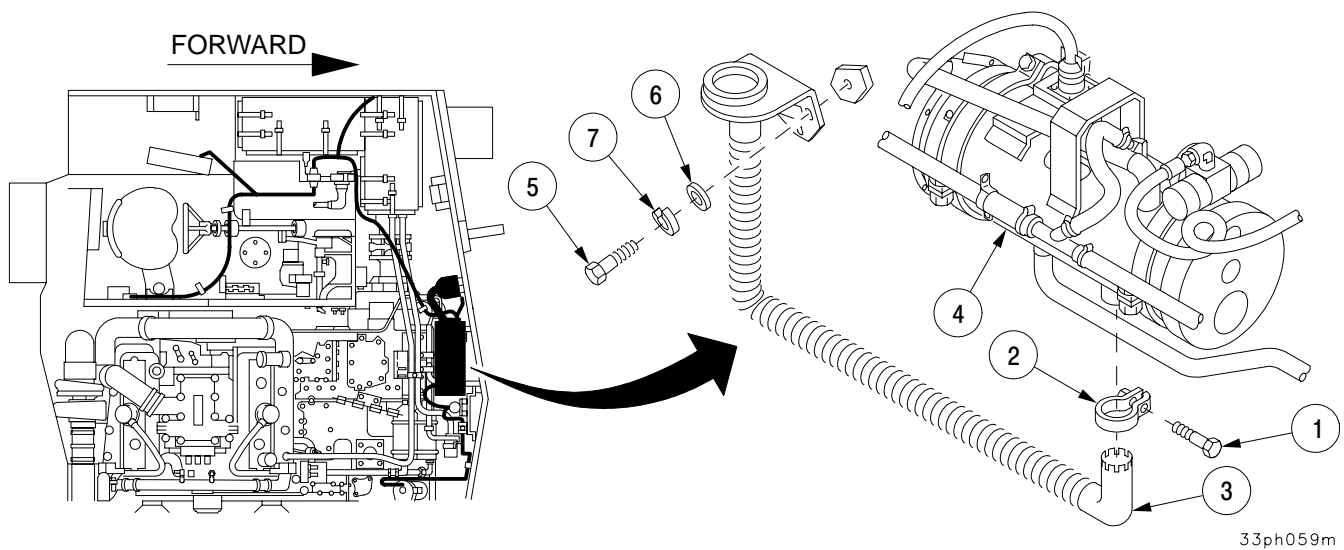
TM 9-2350-314-10

### a. Removal.

- 1 Remove screw (1) and clamp (2) to disconnect tube assembly (3) at coolant heater (4).
- 2 Remove three screws (5), three flat washers (6), three lockwashers (7), and tube assembly (3). Discard lockwashers.

### b. Installation.

- 1 Install tube assembly (3) with three new lockwashers (7), three flat washers (6), and three screws (5).
- 2 Connect tube assembly (3) to coolant heater (4) with clamp (2) and screw (1).



### NOTE

#### FOLLOW-ON MAINTENANCE:

Close transmission access doors  
(TM 9-2350-314-10)

## 19-13 FUEL PUMP AND FUEL FILTER MOUNTING BRACKET.

This task covers: a. Removal b. Installation

### INITIAL SETUP

#### Tools

General mechanic's tool kit  
(SC 5180-90-N26)

#### Materials/Parts

Lockwasher (item 172, Appx E)

#### Equipment Conditions

Fuel filter removed  
(para 19-7)

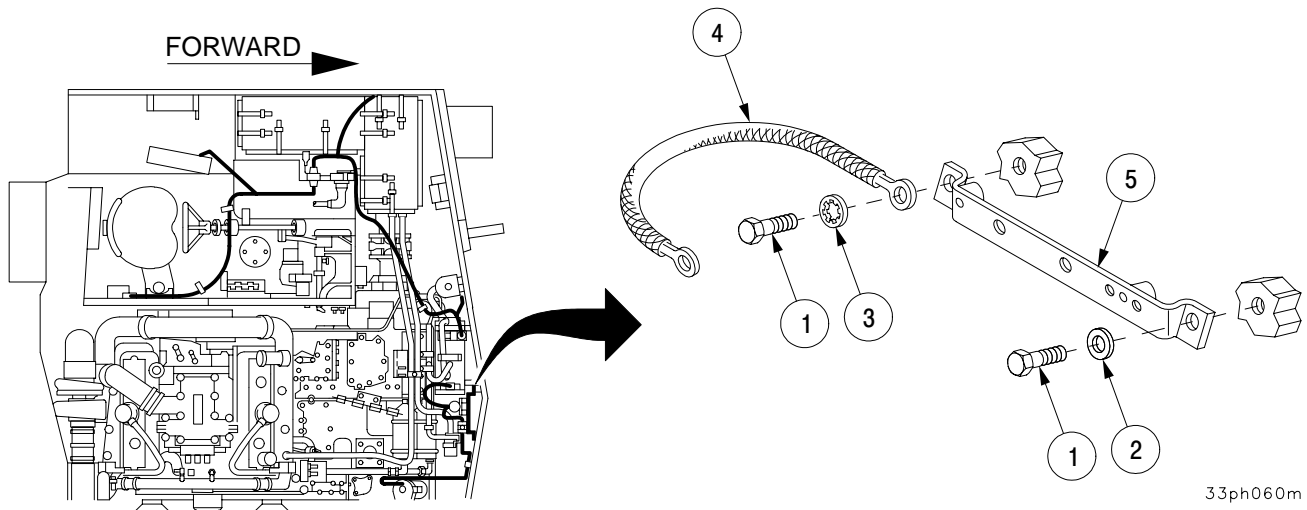
Fuel pump removed  
(para 19-2)

#### a. Removal.

Remove two screws (1), flat washer (2), lockwasher (3), ground strap (4) and bracket (5). Discard lockwasher.

#### b. Installation.

Install bracket (5) and strap (4) with new lockwasher (3), flat washer (2) and two screws (1).



#### NOTE

#### FOLLOW-ON MAINTENANCE:

Install fuel pump (para 19-2)  
Install fuel filter (para 19-7)





---

## 19-14 FUEL LINES AND HOSES – CONTINUED

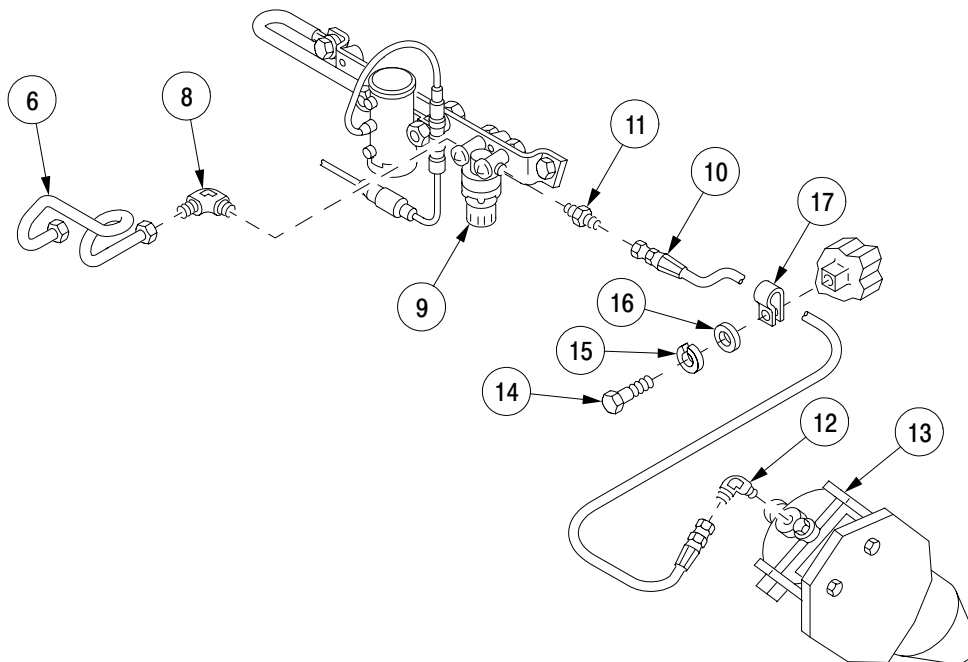
---

### a. Removal – Continued

- 7 Disconnect tube (6) from elbow (8) on fuel filter (9).
- 8 Remove elbow (8) from fuel filter (9).
- 9 Disconnect hose (10) from adapter (11) on fuel filter (9).
- 10 Remove adapter (11) from fuel filter (9).
- 11 Disconnect hose (10) from elbow (12) on primary fuel filter (13).
- 12 Remove elbow (12) from primary fuel filter (13).
- 13 Remove screw (14), lockwasher (15), flat washer (16), and clamp (17) that secures hose (10) to hull. Discard lockwasher.

### b. Installation.

- 1 Install hose (10) and secure to hull with clamp (17), screw (14), new lockwasher (15), and flat washer (16).
- 2 Install elbow (12) on primary fuel filter (13).
- 3 Connect hose (10) to elbow (12) on primary fuel filter (13).
- 4 Install adapter (11) on fuel filter (9).
- 5 Connect hose (10) to adapter (11) on fuel filter (9).
- 6 Install elbow (8) on fuel filter (9).
- 7 Connect tube (6) to elbow (8) on fuel filter (9).



33ph062m

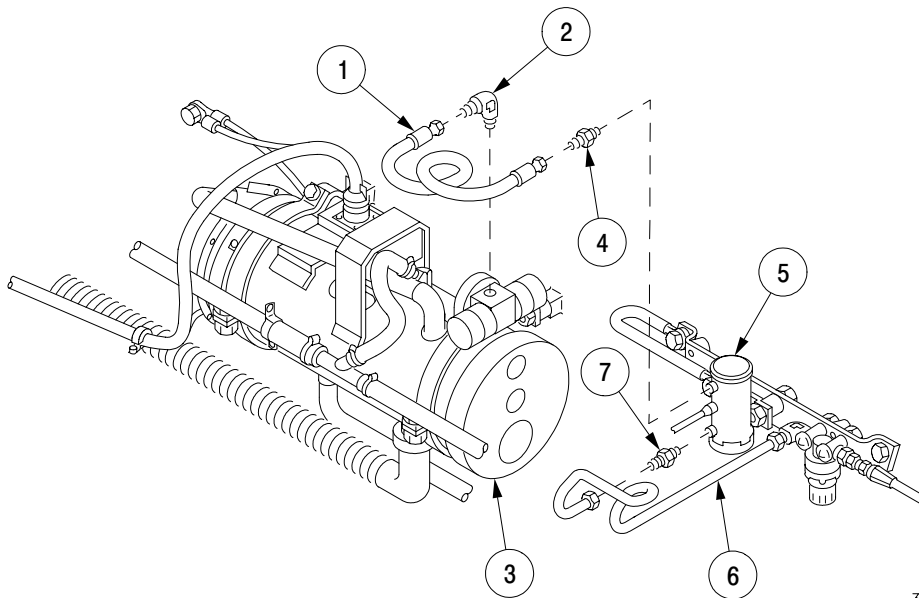
---

**19-14 FUEL LINES AND HOSES – CONTINUED**

---

**b. Installation – Continued**

- 8 Install adapter (7) on fuel pump (5).
- 9 Connect tube (6) to adapter (7) on fuel pump (5).
- 10 Install adapter (4) on fuel pump (5).
- 11 Connect hose (1) to adapter (4) on fuel pump (5).
- 12 Install elbow (2) on heater (3).
- 13 Connect hose (1) to elbow (2) on heater (3).



33ph063m

**NOTE****FOLLOW-ON MAINTENANCE:**

Close transmission access doors  
(TM 9-2350-314-10)

**19-15 COOLANT HOSES.**

This task covers: a. Removal b. Installation

**INITIAL SETUP**

Tools

General mechanic's tool kit  
(SC 5180-90-N26)

Equipment Conditions

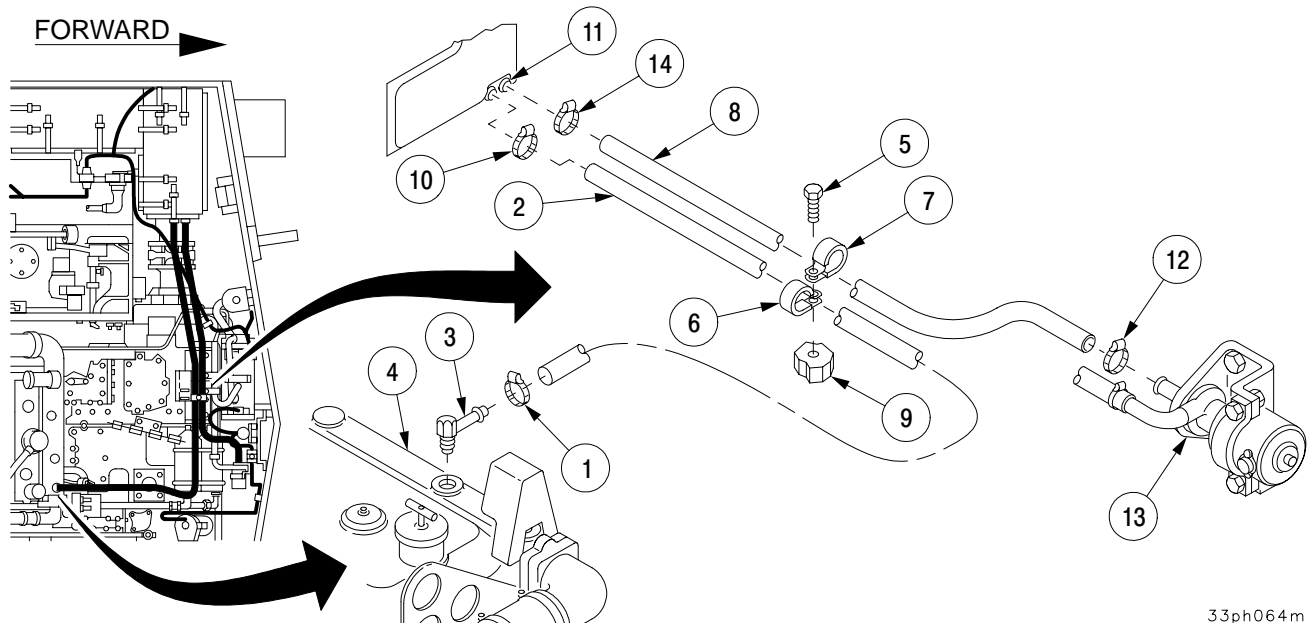
Transmission access doors open  
(TM 9-2350-314-10)  
Air intake access door open  
(TM 9-2350-314-10)

References

TM 9-2350-314-10

**a. Removal.**

- 1 Loosen clamp (1) and remove hose (2) at elbow (3) on engine right bank manifold (4).
- 2 Remove elbow (3) from engine right bank manifold (4).
- 3 Remove screw (5) and two clamps (6 and 7) securing two hoses (2 and 8) to transmission (9).
- 4 Loosen clamp (10) and remove hose (2) from battery heater (11).
- 5 Remove hose (2) and three clamps (1, 6, and 10).
- 6 Loosen clamp (12) and remove hose (8) from coolant pump (13).
- 7 Loosen clamp (14) and remove hose (8) from battery heater (11).
- 8 Remove hose (8) and three clamps (7, 12, and 14).

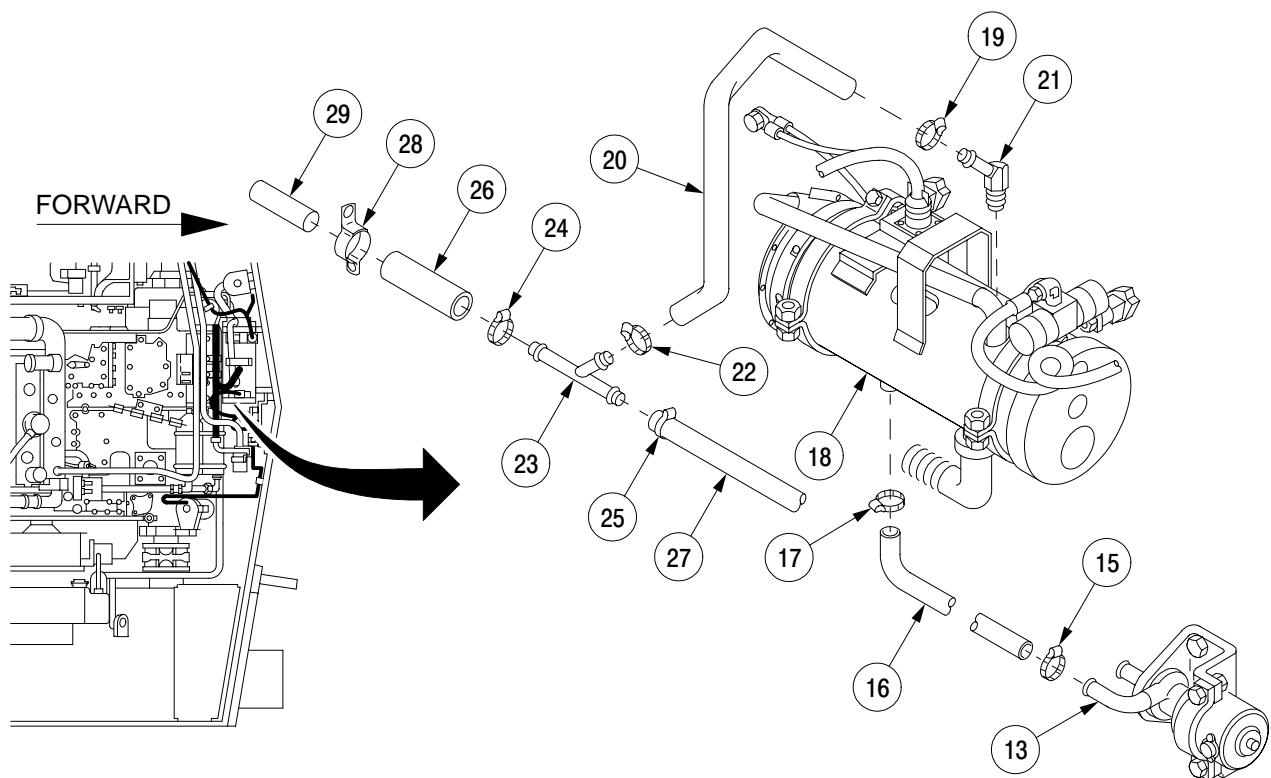


33ph064m

## 19-15 COOLANT HOSES – CONTINUED

### a. Removal – Continued

- 9 Loosen clamp (15) and remove hose (16) from coolant pump (13).
- 10 Loosen clamp (17) and remove hose (16) from coolant heater (18).
- 11 Remove hose (16) and two clamps (15 and 17).
- 12 Loosen clamp (19) and remove hose (20) from elbow (21) on coolant heater (18).
- 13 Remove elbow (21) from coolant heater (18).
- 14 Loosen clamp (22) and remove hose (20) from tube (23).
- 15 Remove hose (20) and two clamps (19 and 22).
- 16 Loosen two clamps (24 and 25), remove two hoses (26 and 27) from tube (23), and remove tube (23).
- 17 Loosen clamp (28) and remove hose (26) from tube (29).
- 18 Remove hose (26) and two clamps (24 and 28).

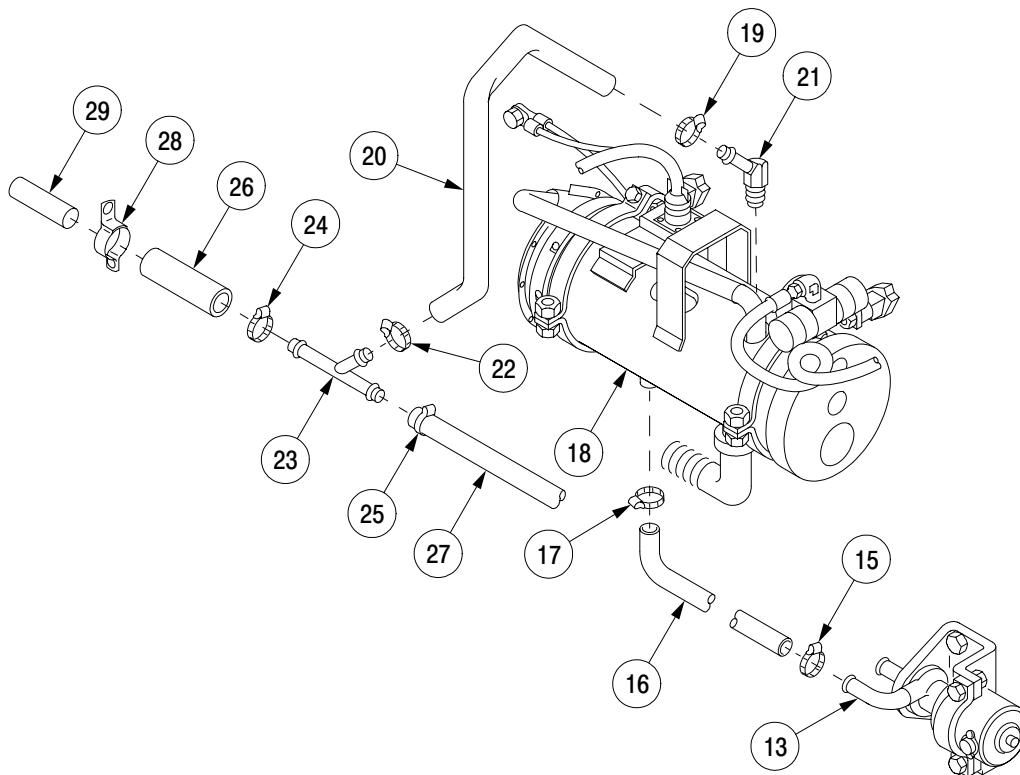


33ph065m

## 19-15 COOLANT HOSES – CONTINUED

### b. Installation.

- 1 Install two clamps (28 and 24) on hose (26).
- 2 Install hose (26) on two tubes (29) and (23) with two clamps (28 and 24).
- 3 Install tube (23) in two hoses (27 and 20) with two clamps (25 and 22).
- 4 Install clamp (19) on hose (20).
- 5 Install elbow (21) on coolant heater (18).
- 6 Install hose (20) on elbow (21) with clamp (19).
- 7 Install two clamps (15 and 17) on hose (16).
- 8 Install hose (16) on coolant heater (18) with clamp (17).
- 9 Install hose (16) on coolant pump (13) with clamp (15).

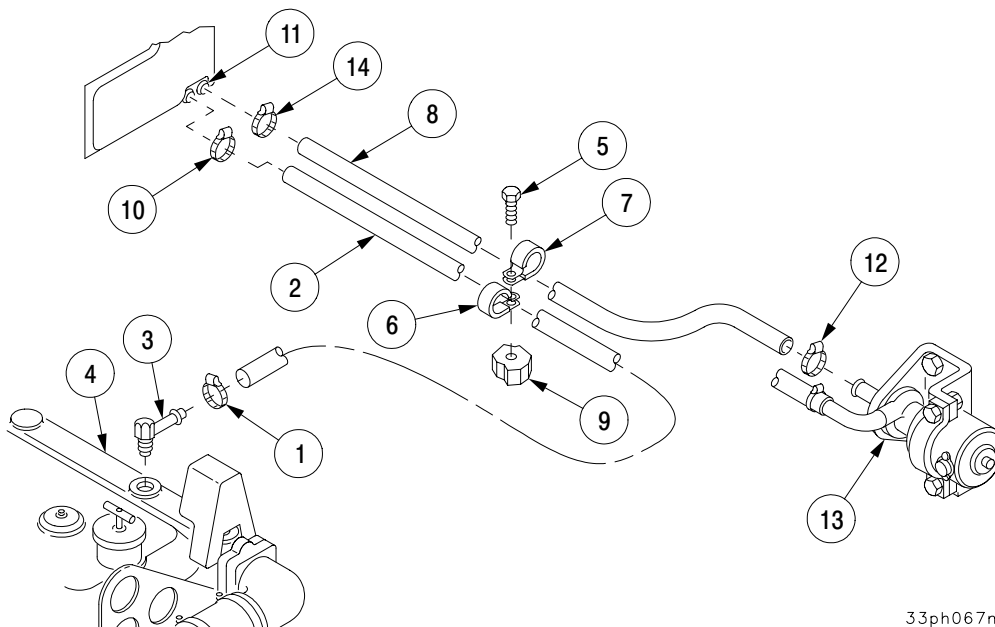


33ph066m

## 19-15 COOLANT HOSES – CONTINUED

### b. Installation – Continued

- 10 Install three clamps (7, 12, and 14) on hose (8).
- 11 Install hose (8) on battery heater (11) with clamp (14).
- 12 Install hose (8) on coolant pump (13) with clamp (12).
- 13 Install three clamps (1, 6, and 10) on hose (2).
- 14 Install hose (2) on battery heater (11) with clamp (10).
- 15 Secure two hoses (2 and 8) to transmission (9) with two clamps (6 and 7) and screw (5).
- 16 Install elbow (3) in engine right bank manifold (4).
- 17 Install hose (2) on elbow (3) with clamp (1).



33ph067m

### NOTE

#### FOLLOW-ON MAINTENANCE:

- Bleed coolant system (para 19-11)
- Close air intake access door  
(TM 9-2350-314-10)
- Close transmission access doors  
(TM 9-2350-314-10)





# CHAPTER 20

## GAGES

---

### GENERAL

This chapter illustrates and defines procedures for removal and installation of the speedometer and tachometer systems and related components.

---

<u>CONTENTS</u>		<u>Page</u>
20-1	SPEEDOMETER SYSTEM .....	20-2
20-2	TACHOMETER SYSTEM .....	20-6
20-3	PULSE TACHOMETER .....	20-10
20-4	SPEEDOMETER AND TACHOMETER SYSTEMS MOUNTING BRACKET .....	20-11



## 20-1 SPEEDOMETER SYSTEM.

This task covers: a. Removal b. Installation

### INITIAL SETUP

#### Tools

General mechanic's tool kit  
(SC 5180-90-N26)

#### Materials/Parts

Lockwashers (2) (item 9, Appx E)  
Lockwasher (item 281, Appx E)  
Lockwashers (4) (item 301, Appx E)  
Preformed packing (item 282, Appx E)  
Tiedown straps (3) (item 30, Appx E)

#### Equipment Conditions

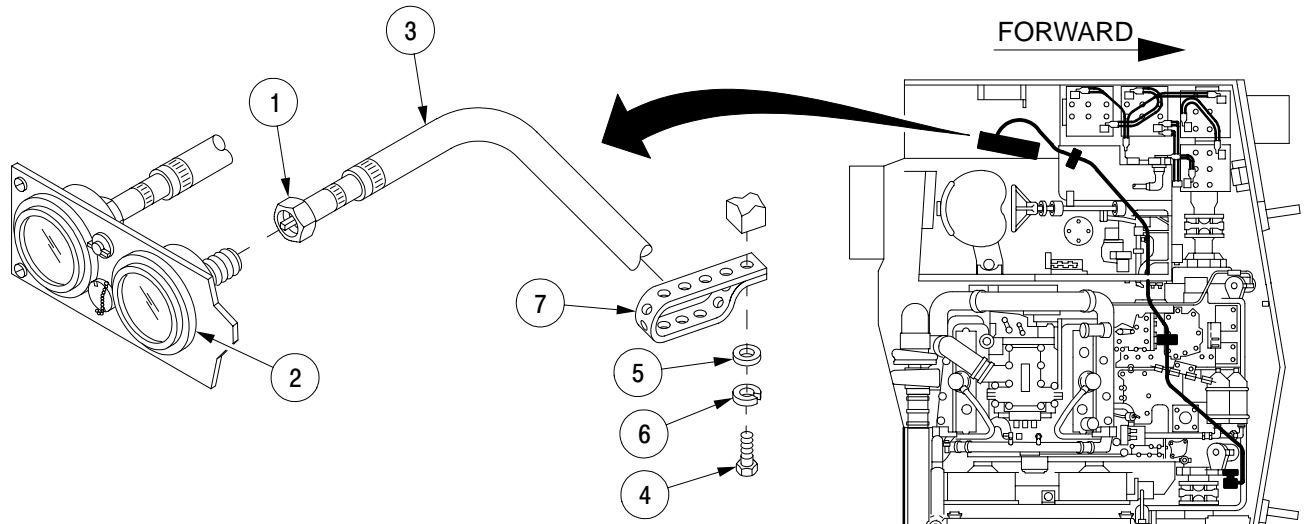
Portable instrument panel removed  
(TM 9-2350-314-10)  
Air intake grille open and secured  
(TM 9-2350-314-10)  
Right transmission support cap  
removed (para 4-1)  
Wiring harness W116 clamp in driver's  
compartment removed (para 8-75)

#### References

TM 9-2350-314-10

### a. Removal.

- 1 Loosen nut (1) from speedometer (2) at back of the instrument panel and disconnect speedometer flexible drive shaft (3).
- 2 Remove screw (4), flat washer (5), lockwasher (6), and tiedown strap (7) in the driver's compartment. Discard lockwasher and straps.

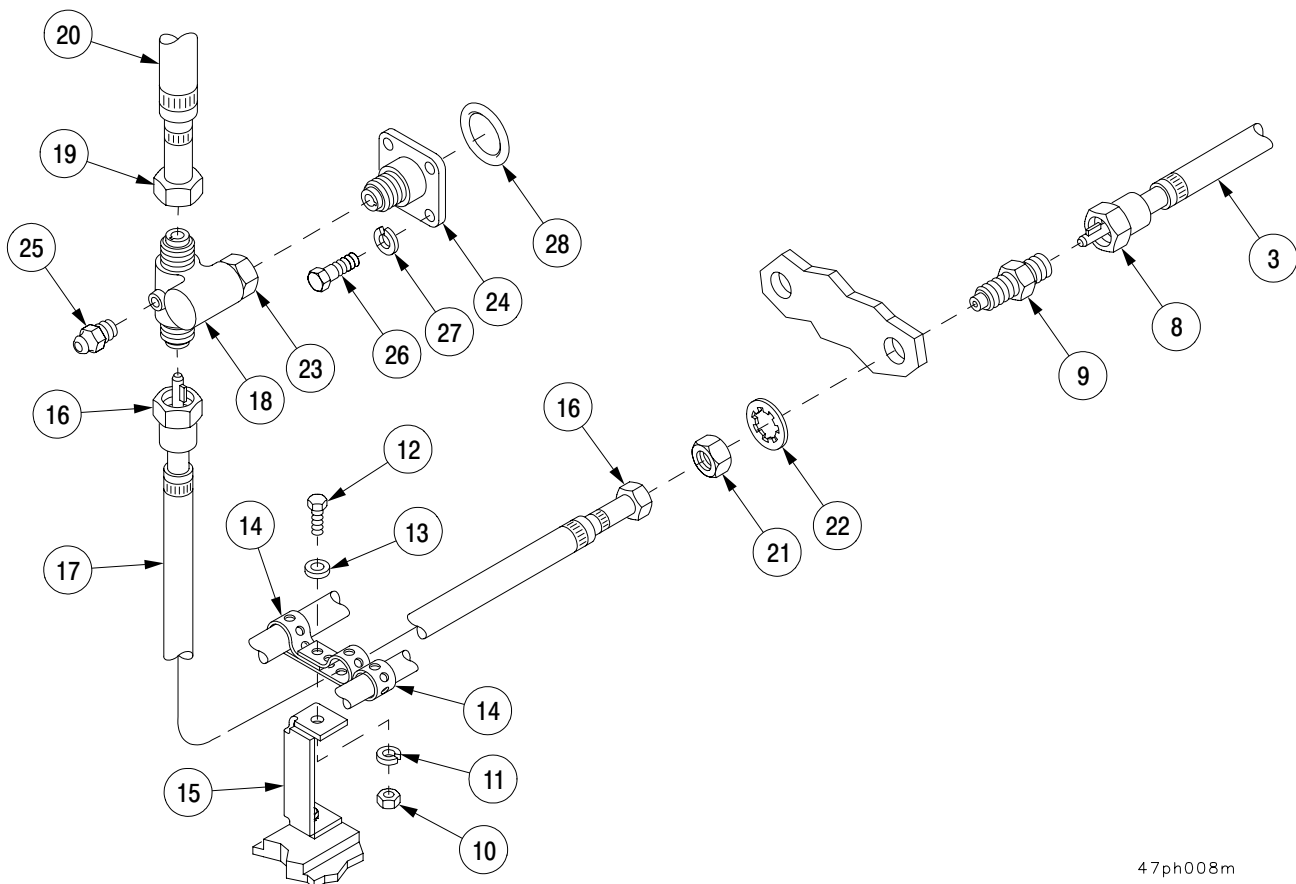


47ph007m

## 20-1 SPEEDOMETER SYSTEM – CONTINUED

### a. Removal – Continued

- 3 Loosen nut (8) and disconnect speedometer flexible drive shaft (3) from bulkhead adapter (9).
- 4 Remove nut (10), lockwasher (11), screw (12), flat washer (13), and two tiedown straps (14) at mounting bracket (15) on transmission. Discard lockwasher and straps.
- 5 Loosen two nuts (16) and disconnect flexible drive shaft (17) at angle drive adapter (18) and bulkhead adapter (9).
- 6 Loosen nut (19) and disconnect VMS shaft assembly (20) at angle drive adapter (18).
- 7 Remove nut (21), lockwasher (22), and adapter (9) at bulkhead. Discard lockwasher.
- 8 Loosen nut (23) and remove angle drive adapter (18) at straight drive adapter (24).
- 9 Remove grease fitting (25) from angle drive adapter (18).
- 10 Remove four screws (26), four lockwashers (27), straight drive adapter (24), and preformed packing (28) from transmission at right universal joint. Discard lockwashers and preformed packing.

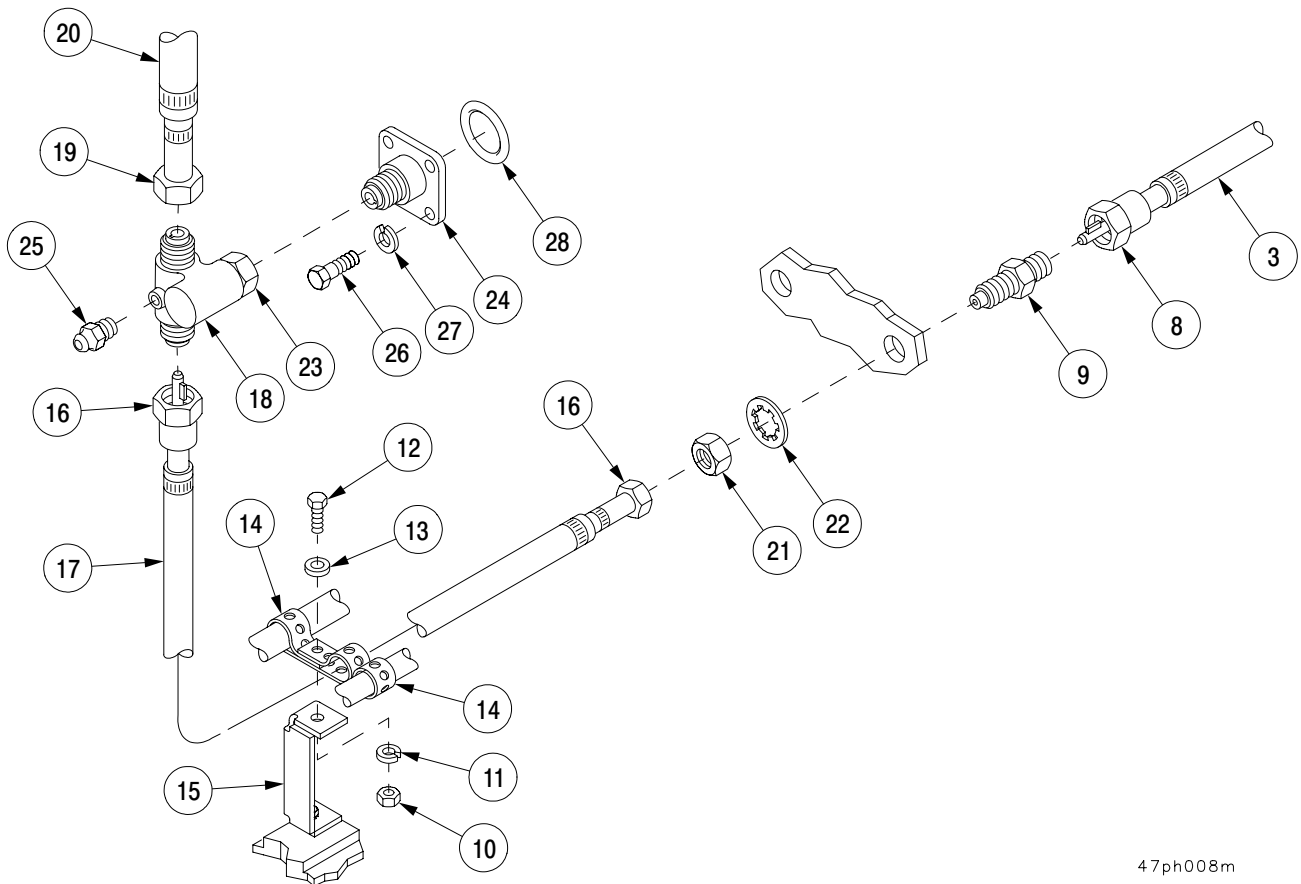


47ph008m

## 20-1 SPEEDOMETER SYSTEM – CONTINUED

### b. Installation.

- 1 Install straight drive adapter (24) with new preformed packing (28), four screws (26), and four new lockwashers (27) on transmission at right universal joint.
- 2 Connect angle drive adapter (18) to straight drive adapter (24) with nut (23).
- 3 Install grease fitting (25) on angle drive adapter (18).
- 4 Install bulkhead adapter (9) with new lockwasher (22) and nut (21) at bulkhead.
- 5 Connect VMS shaft assembly (20) to angle drive adapter (18) with nut (19).
- 6 Install flexible drive shaft (17) and two nuts (16) at angle drive adapter (18) and bulkhead adapter (9).
- 7 Secure flexible drive shaft (17) with two new tiedown straps (14), screw (12), flat washer (13), new lockwasher (11), and nut (10) to mounting bracket (15) on transmission.
- 8 Install speedometer flexible drive shaft (3) at bulkhead adapter (9) with nut (8).

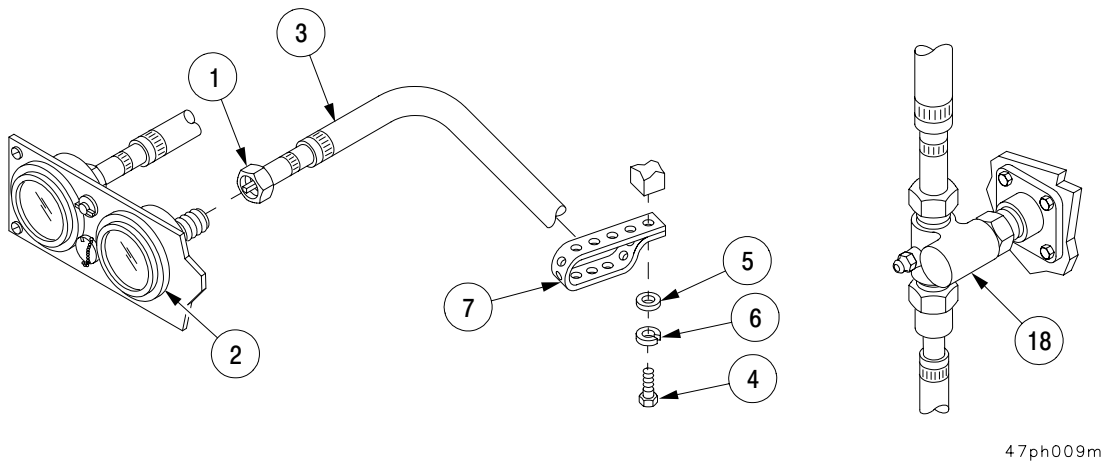


47ph008m

## 20-1 SPEEDOMETER SYSTEM – CONTINUED

### b. Installation – Continued

- 9 Install new tiedown strap (7), with screw (4), new lockwasher (6), and flat washer (5) in driver's compartment.
- 10 Connect speedometer cable (3) at the back of the instrument panel to speedometer (2) with nut (1).
- 11 Lubricate angle drive adapter (18) in accordance with TM 9-2350-314-10, Appx I.



### NOTE

#### FOLLOW-ON MAINTENANCE:

- Install right transmission support cap (para 4-1)
- Close and secure air intake grille  
(TM 9-2350-314-10)
- Install portable instrument panel  
(TM 9-2350-314-10)
- Install clamp on wiring harness W116 in driver's  
compartment (para 8-75)

## 20-2 TACHOMETER SYSTEM.

This task covers: a. Removal b. Installation

### INITIAL SETUP

#### Tools

General mechanic's tool kit  
(SC 5180-90-N26)

#### Materials/Parts

Lockwashers (2) (item 9, Appx E)  
Lockwasher (item 281, Appx E)  
Tiedown straps (3) (item 30, Appx E)

#### Equipment Conditions

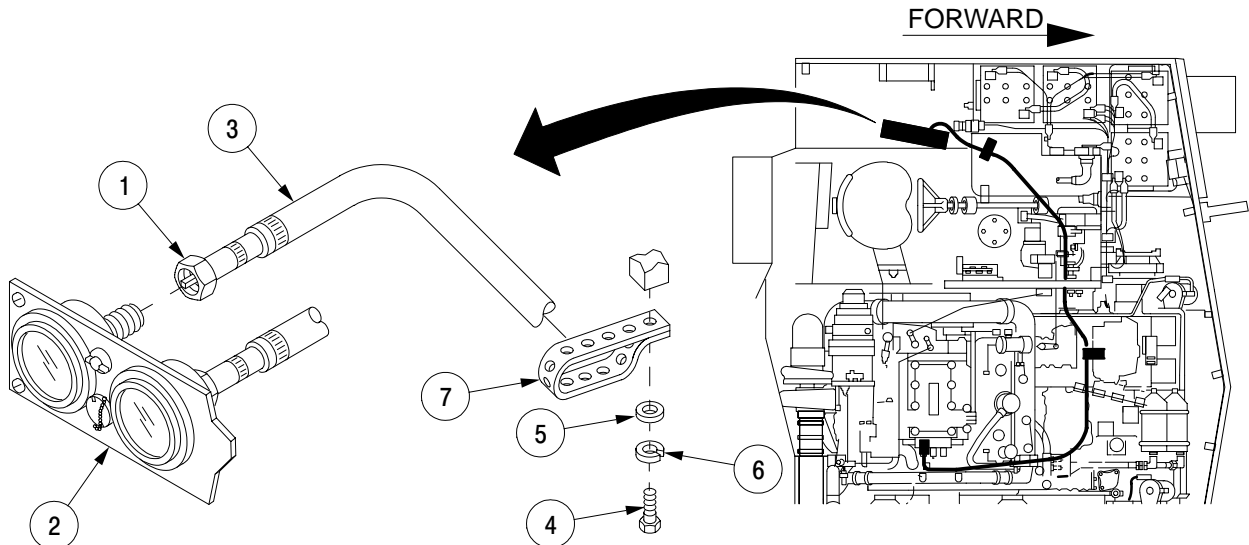
Portable instrument panel removed  
(TM 9-2350-314-10)  
Air intake grille open and secured  
(TM 9-2350-314-10)  
Transmission access doors opened  
(TM 9-2350-314-10)  
Battery ground leads disconnected  
(para 8-33)  
Wiring harness W116 clamp in driver's  
compartment removed (para 8-75)

#### References

TM 9-2350-314-10

### a. Removal.

- 1 Loosen nut (1) from tachometer (2) at back of instrument panel and disconnect tachometer flexible drive shaft (3).
- 2 Remove screw (4), flat washer (5), lockwasher (6), and tiedown strap (7) in the driver's compartment. Discard lockwasher and straps.

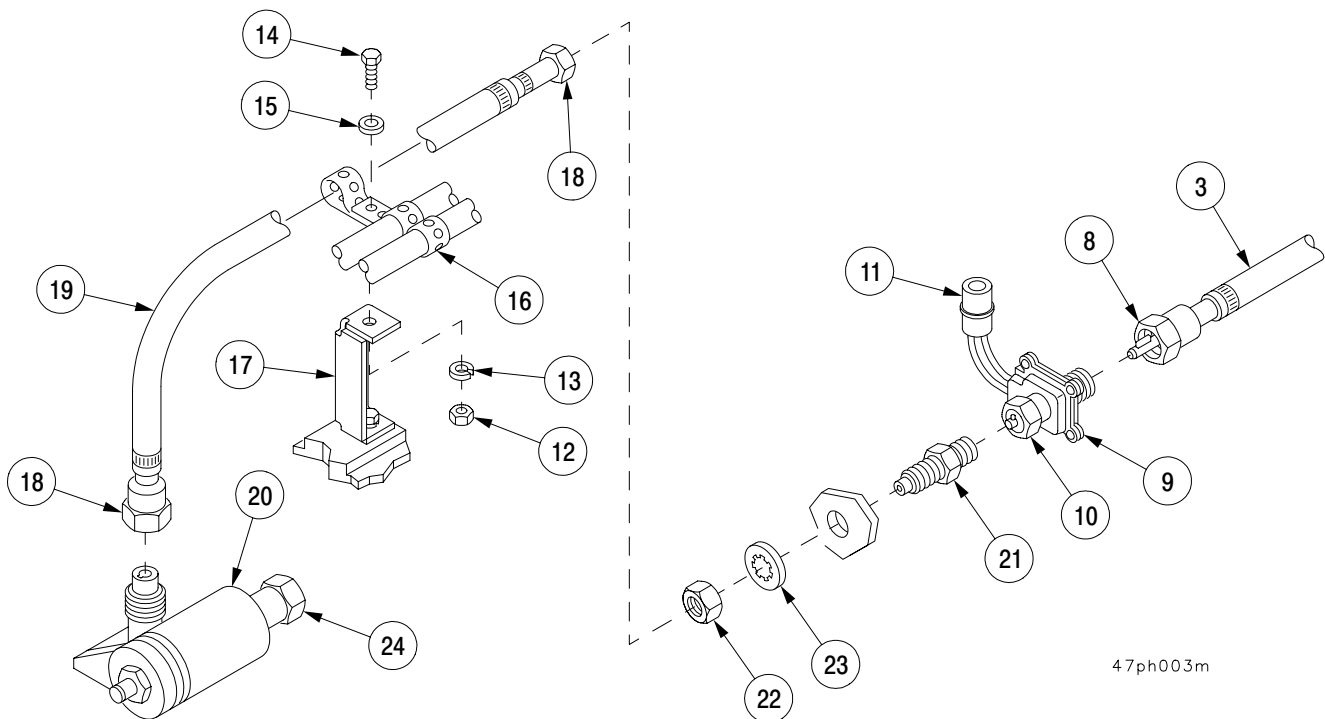


47ph002m

## 20-2 TACHOMETER SYSTEM – CONTINUED

### a. Removal – Continued

- 3 Loosen nut (8) and disconnect tachometer flexible drive shaft (3) from pulse tachometer (9).
- 4 Unscrew nut (10), disconnect transducer lead (11) from wiring harness W100 connector P3 and remove pulse tachometer (9).
- 5 Remove nut (12), lockwasher (13), screw (14), flat washer (15), and two tiedown straps (16) at mounting bracket (17) on transmission. Discard lockwasher and straps.
- 6 Loosen two nuts (18) and disconnect flexible drive shaft (19) at tachometer drive (20) and at bulkhead adapter (21).
- 7 Remove nut (22), lockwasher (23), and bulkhead adapter (21) at bulkhead. Discard lockwasher.
- 8 Remove nut (24) and tachometer drive (20) from engine.

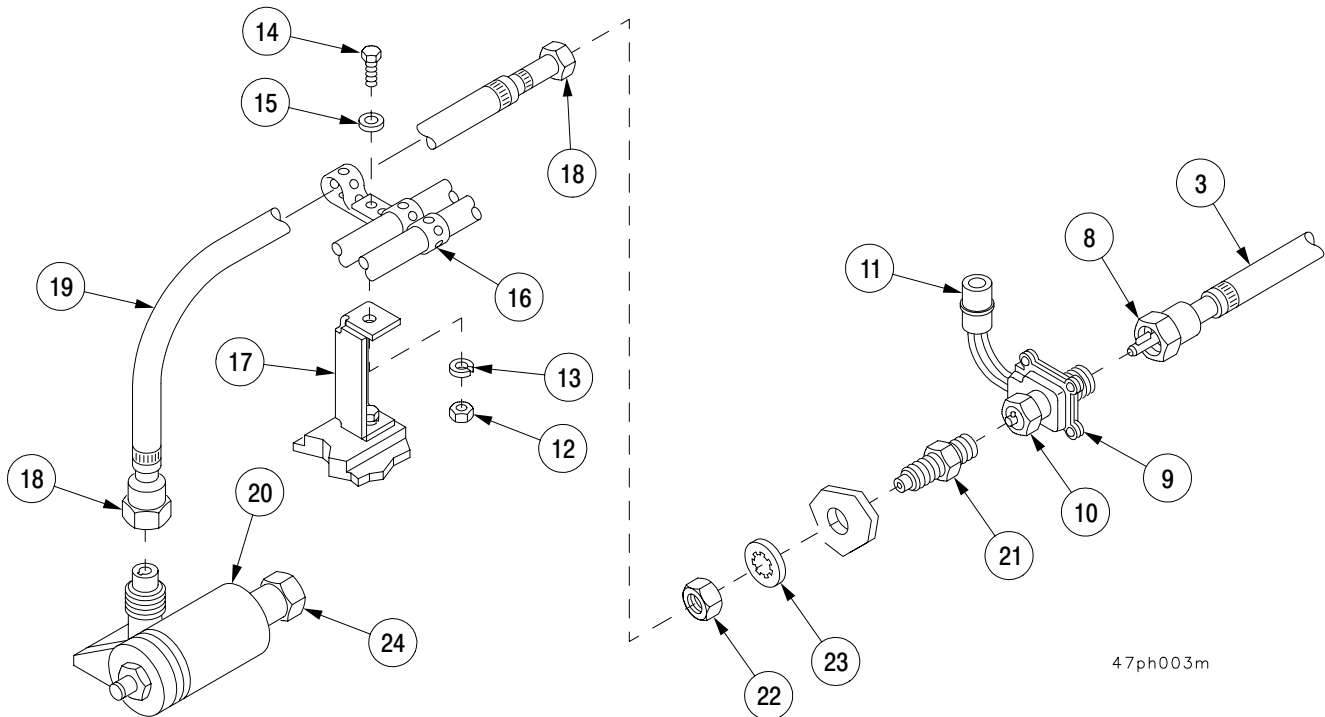


47ph003m

## 20-2 TACHOMETER SYSTEM – CONTINUED

### b. Installation.

- 1 Install tachometer drive (20) and nut (24) in engine.
- 2 Install bulkhead adapter (21) with new lockwasher (23) and nut (22) at bulkhead.
- 3 Install flexible drive shaft (19) with two nuts (18) at tachometer drive (20) and bulkhead adapter (21).
- 4 Secure flexible drive shaft (19) with two new tiedown straps (16), screw (14), flat washer (15), new lockwasher (13), and nut (12) to mounting bracket (17) on transmission.
- 5 Install pulse tachometer (9) with nut (10) and connect wiring harness W100 connector P3 (11).





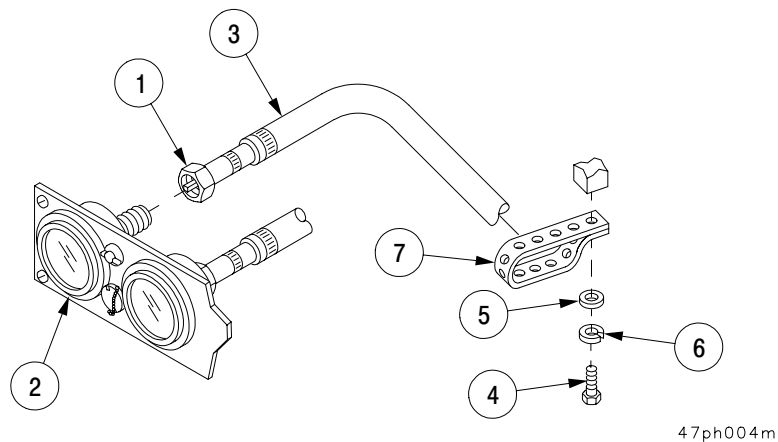
---

**20-2 TACHOMETER SYSTEM – CONTINUED**

---

**b. Installation – Continued**

- 6 Install new tiedown strap (7) with screw (4), new lockwasher (6), and flat washer (5) in driver's compartment.
- 7 Connect tachometer flexible drive shaft (3) to tachometer (2) with nut (1).

**NOTE****FOLLOW-ON MAINTENANCE:**

- Connect battery ground leads (para 8-33)
- Close and secure transmission access doors (TM 9-2350-314-10)
- Close and secure air intake grille (TM 9-2350-314-10)
- Install portable instrument panel (TM 9-2350-314-10)
- Install clamp on wiring harness W116 in driver's compartment (para 8-75)



## 20-4 SPEEDOMETER AND TACHOMETER SYSTEMS MOUNTING BRACKET.

This task covers: a. Removal b. Installation

### INITIAL SETUP

#### Tools

General mechanic's tool kit (SC 5180-90-N26)

#### Materials/Parts

Lockwasher (item 9, Appx E)

Lockwasher (item 3, Appx E)

Tiedown straps (2) (item 30, Appx E)

#### Equipment Conditions

Transmission access door opened  
(TM 9-2350-314-10)

#### References

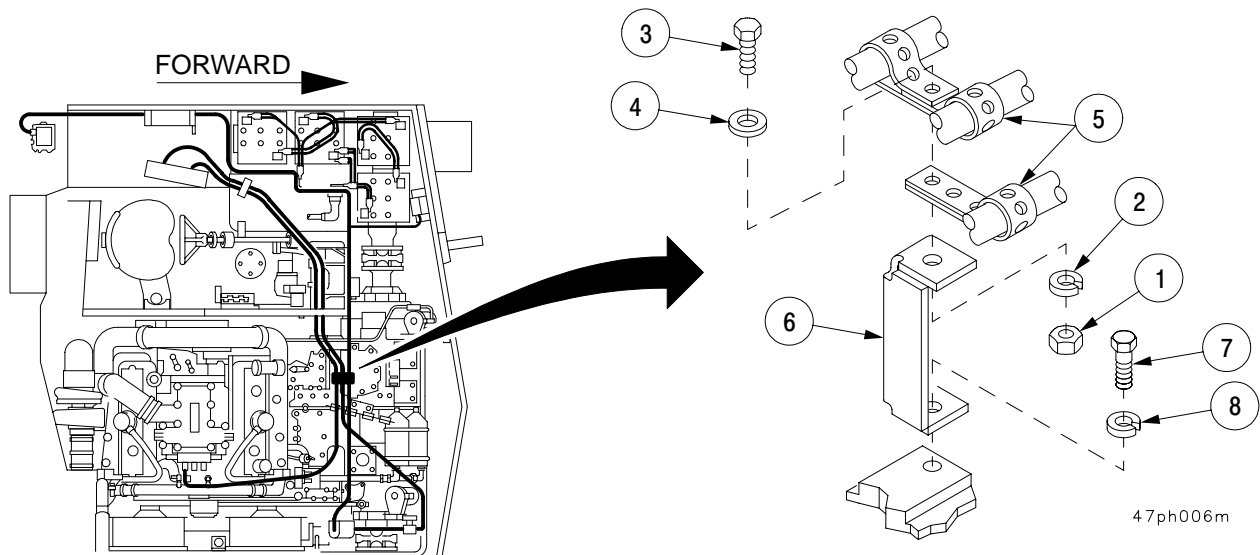
TM 9-2350-314-10

### a. Removal.

- 1 Remove nut (1), lockwasher (2), screw (3), flat washer (4), and two tiedown straps (5) (with flexible drive shafts) from mounting bracket (6) at transmission. Discard lockwasher and straps.
- 2 Remove screw (7), lockwasher (8), and mounting bracket (6) from transmission. Discard lockwasher.

### b. Installation.

- 1 Install screw (7), new lockwasher (8), and mounting bracket (6) on transmission.
- 2 Install screw (3), flat washer (4), new lockwasher (2), nut (1), and two new tiedown straps (5) (with flexible drive shafts) on mounting bracket (6) at transmission.



### NOTE

#### FOLLOW-ON MAINTENANCE:

Close and secure transmission access doors  
(TM 9-2350-314-10)

# CHAPTER 21

## FIRE FIGHTING EQUIPMENT

---

### GENERAL

This chapter illustrates and defines procedures for removal, disassembly, assembly, and installation of the fire extinguisher system and related components.

---

<u>CONTENTS</u>		<u>Page</u>
21-1	CYLINDER ASSEMBLY .....	21-2
21-2	CYLINDER RETAINING STRAPS .....	21-5
21-3	CYLINDER CAP RETAINING ASSEMBLIES .....	21-7
21-4	ACTUATOR CABLE ASSEMBLY .....	21-9
21-5	CONTROL VALVES AND TUBE ASSEMBLY .....	21-20
21-6	FLEXIBLE HOSES AND FITTINGS .....	21-24
21-7	ENGINE COMPARTMENT TUBES, NOZZLE, AND MOUNTING HARDWARE .....	21-26

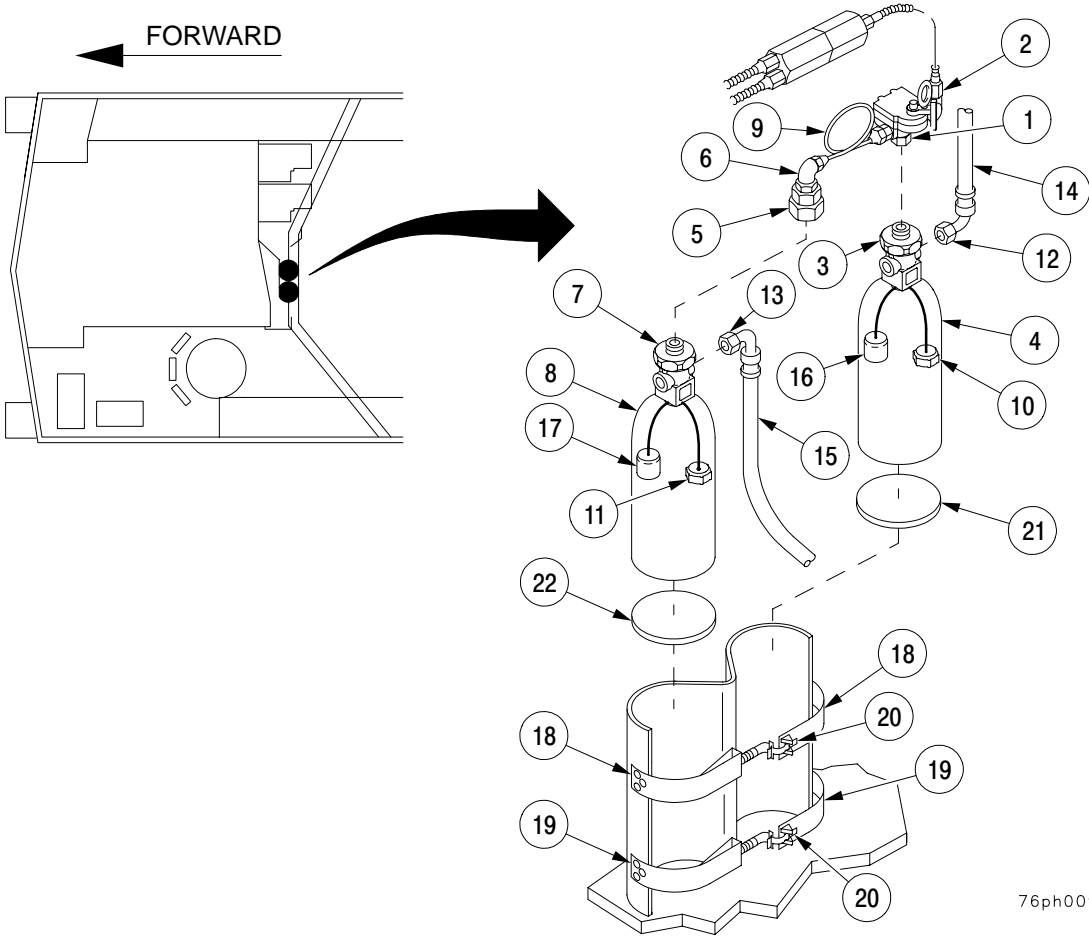




21-1 CYLINDER ASSEMBLY – CONTINUED

a. Removal – Continued

- 3 Use rope to tie control valve (2), tube assembly (9), and elbow (6) up and away from cylinder assemblies (4 and 8).
- 4 Install protective caps (10 and 11) on flood valves (3 and 7).
- 5 Loosen nuts (12 and 13) on hose assemblies (14 and 15) and move hose assemblies (14 and 15) away from cylinder assemblies (4 and 8).
- 6 Install diffuser caps (16 and 17) on outlet ports of flood valves (3 and 7).
- 7 Loosen retraining straps (18 and 19) on cylinder assemblies (4 and 8) by lifting retaining clips (20).
- 8 Remove cylinder assemblies (4 and 8).
- 9 Remove two cushioning pads (21 and 22), if damaged.

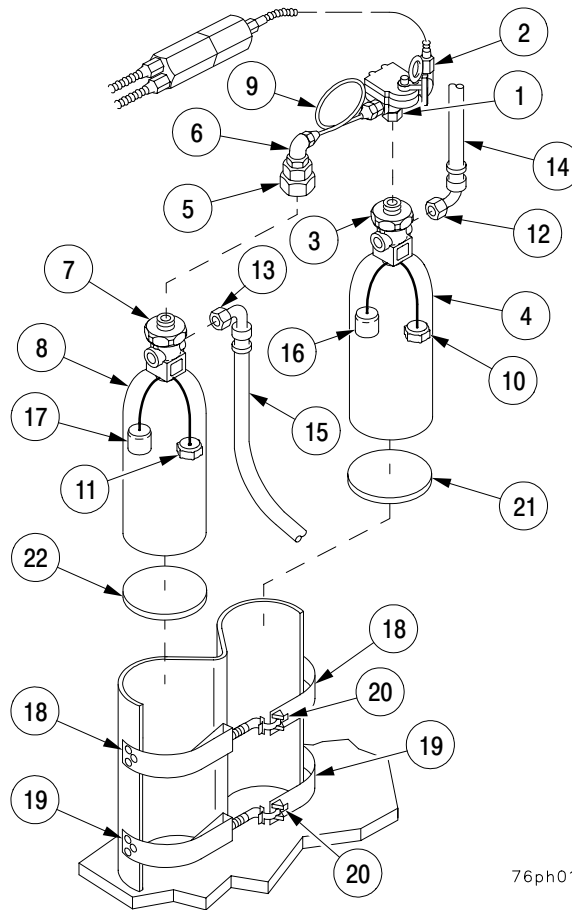


76ph009m

## 21-1 CYLINDER ASSEMBLY – CONTINUED

### b. Installation.

- 1 Secure cushioning pads (21 and 22) in position with adhesive, if removed.
- 2 Position cylinder assemblies (4 and 8) in brackets with outlet ports toward couplings of hose assemblies (14 and 15).
- 3 Tighten restraining straps (18 and 19) by closing retaining clips (20).
- 4 Remove diffuser caps (16 and 17) from output ports of flood valves (3 and 7) and install hose assemblies (14 and 15) on output ports of flood valves (3 and 7) with nuts (12 and 13).
- 5 Remove protective caps (10 and 11) from flood valves (3 and 7).
- 6 Release tube assembly (9), control valve (2), and elbow (6).
- 7 Position elbow (6) on flood valve (7), and control valve (2) on flood valve (3).
- 8 Secure elbow (6) to flood valve (7) with pressure head nut (5).
- 9 Secure control valve (2) to flood valve (3) with nut (1).



76ph010m

**21-2 CYLINDER RETAINING STRAPS.**

This task covers: a. Removal b. Installation

**INITIAL SETUP**

Tools

- General mechanic's tool kit (SC 5180-90-N26)
- Portable electrical drill (item 15, Appx F)
- Twist drill set, twist (item 16, Appx F)
- Hand riveter (item 55, Appx F)

Equipment Conditions

Cylinder removed (para 21-1)

Materials/Parts

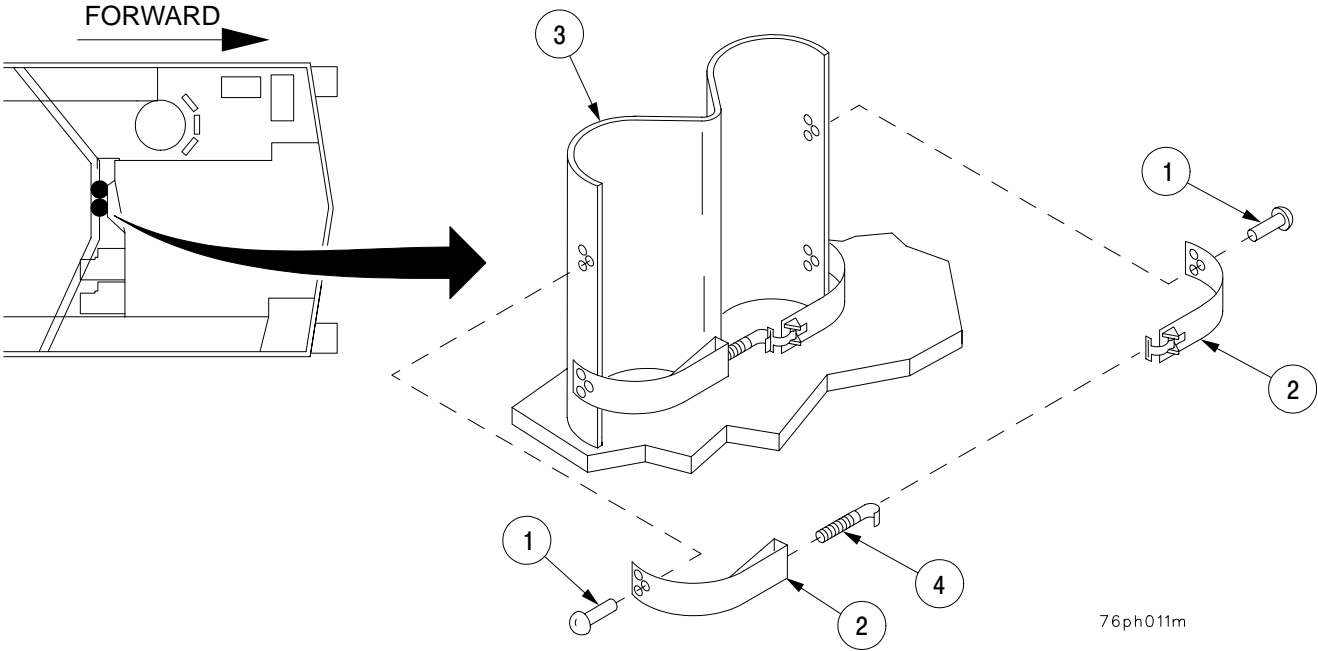
- Rivets (3) (item 94, Appx E)

**a. Removal.**

**NOTE**

There are four straps with three rivets in each. Remove only the strap requiring replacement.

- 1 Remove three rivets (1) securing strap (2) to cylinder support (3). Discard rivets.
- 2 Remove adjustable catch (4) from strap (2).



76ph011m



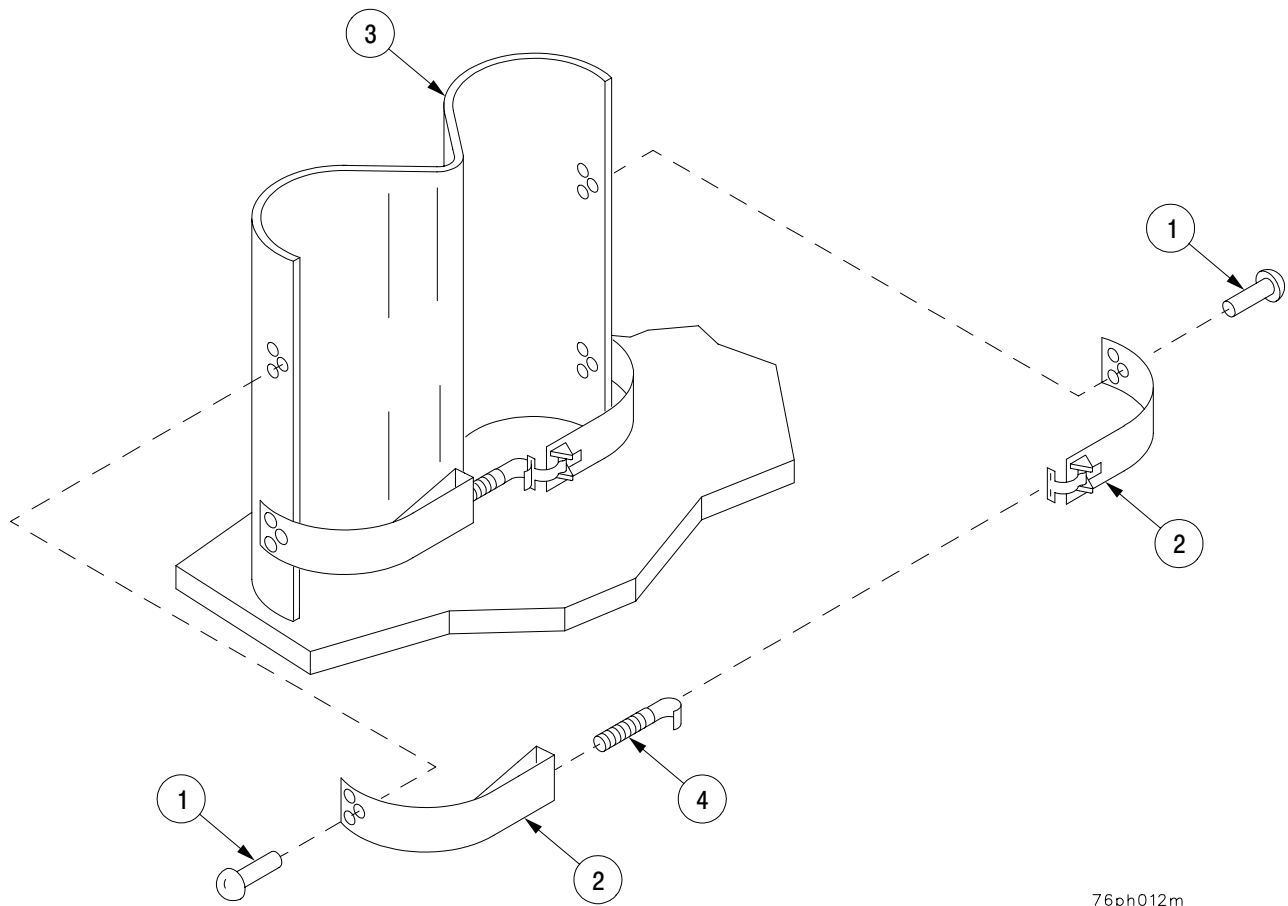
---

## 21-2 CYLINDER RETAINING STRAPS – CONTINUED

---

### b. Installation.

- 1 Install adjustable catch (4) in strap (2).
- 2 Install strap (2) to cylinder support (3) with three new rivets (1).



76ph012m

### NOTE

FOLLOW-ON MAINTENANCE:  
Install cylinder (para 21-1)

## 21-3 CYLINDER CAP RETAINING ASSEMBLIES.

This task covers: a. Removal b. Installation

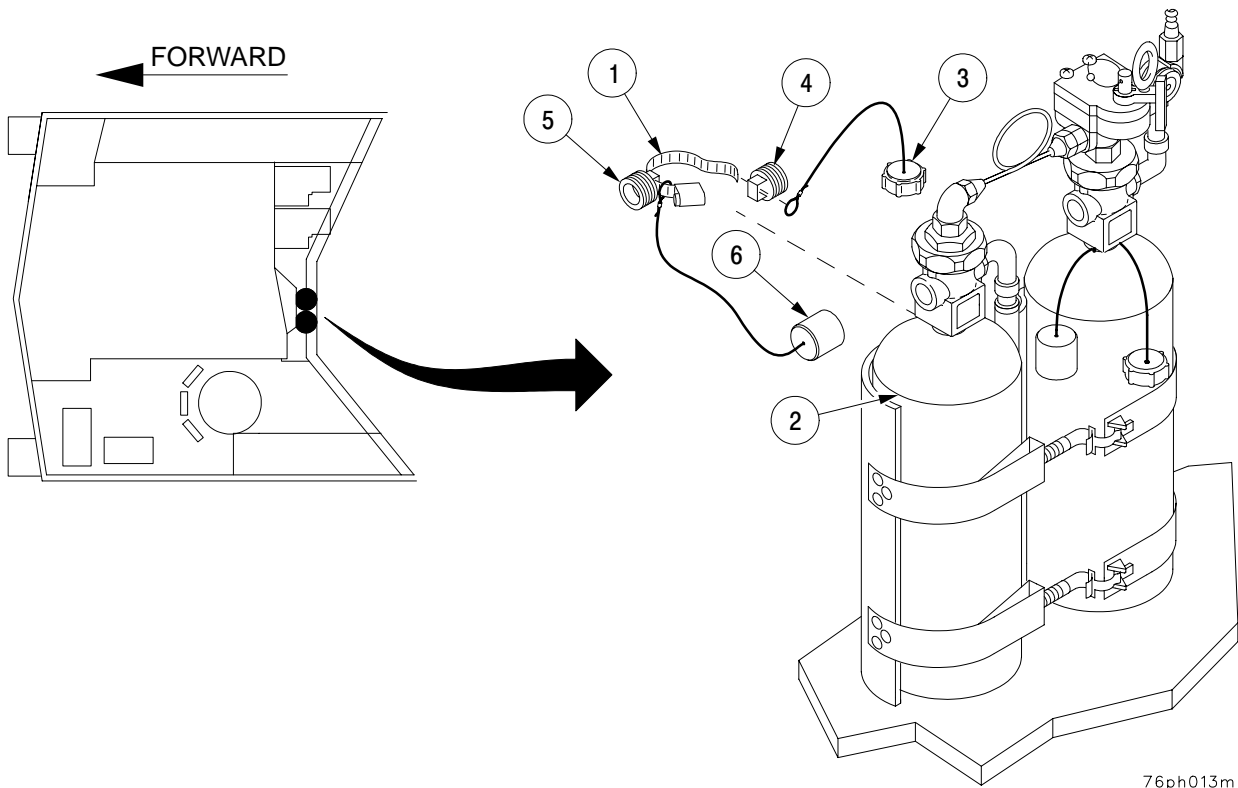
### INITIAL SETUP

#### Tools

General mechanic's tool kit  
(SC 5180-90-N26)

#### a. Removal.

- 1 Remove clamp (1) from cylinder (2).
- 2 Remove cap (3), two plugs (4 and 5) and diffuser cap (6) from clamp (1).



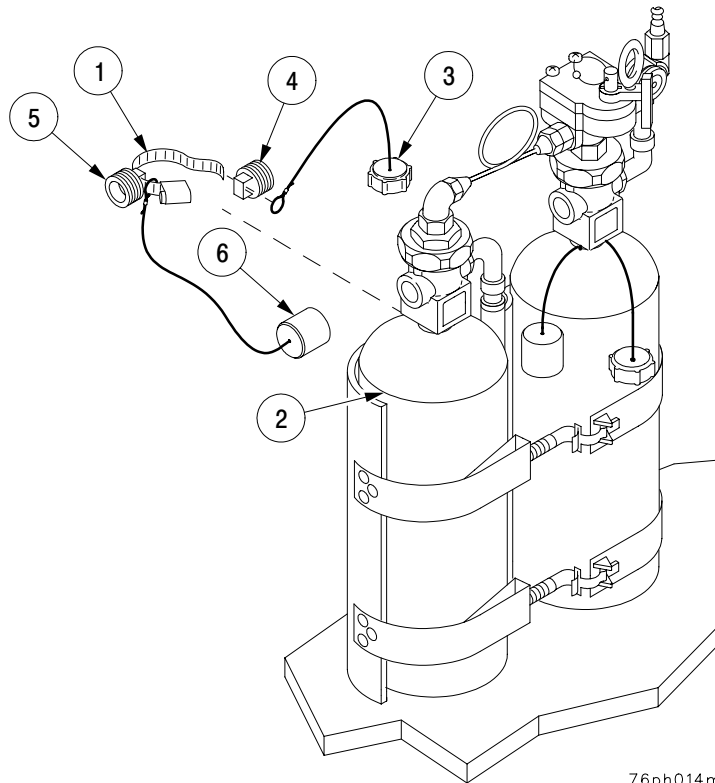
---

## 21-3 CYLINDER CAP RETAINING ASSEMBLIES – CONTINUED

---

### b. Installation.

- 1 Install diffuser cap (6), two plugs (4 and 5) and cap (3) on clamp (1).
- 2 Install clamp (1) on cylinder (2).



---

## 21-4 ACTUATOR CABLE ASSEMBLY.

---

This task covers:      a. Disassembly                      b. Assembly

---

### **INITIAL SETUP**

#### Tools

General mechanic's tool kit  
(SC 5180-90-N26)  
Combination wrench (item 76, Appx F)

#### Personnel Required

Two

#### Materials/Parts

Antipilferage seals (3) (item 131, Appx E)  
Lockwashers (3) (item 283, Appx E)  
Lockwashers (2) (item 9, Appx E)  
Antiseizing tape (item 60, Appx C)  
Dry graphite (item 21, Appx C)  
Packings (2) (item 284, Appx E)

---

### a. Disassembly.

#### **WARNING**

- Discharge on skin or eyes can cause frostbite. Wear protective clothing and goggles.
- Cylinders are under high pressure and can explode if dropped, struck, or exposed to temperatures above 140°F (60°C).

## 21-4 ACTUATOR CABLE ASSEMBLY – CONTINUED

---

### a. Disassembly – Continued

- 1 Remove seal (1) from control valve (2). Discard seal.

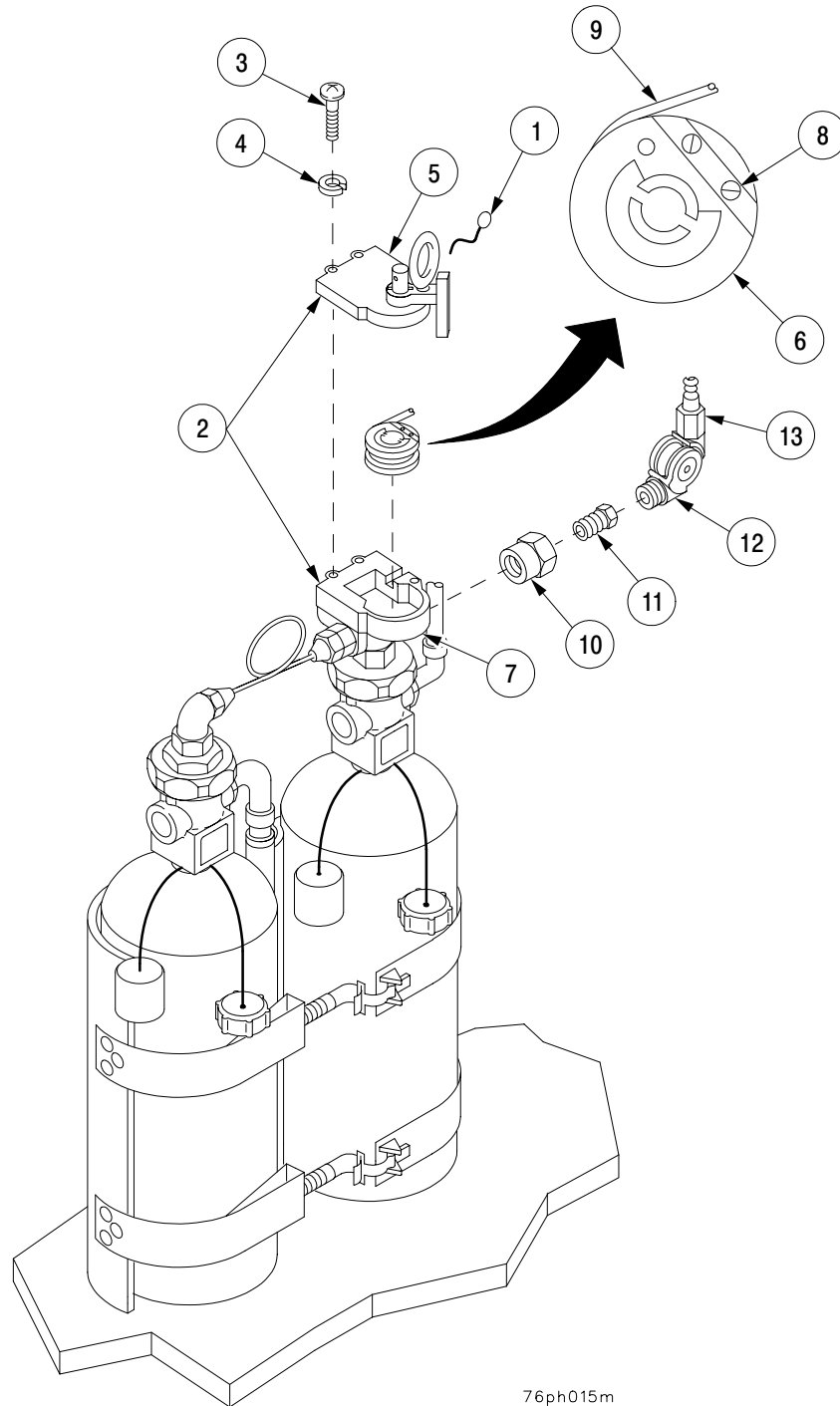
**WARNING**

To prevent accidental discharge of CO<sup>2</sup>, disconnect cylinder assembly connected to pull cable. Failure to comply may result in injury or death to personnel.

- 2 Remove three screws (3), three lockwashers (4), and cover plate (5) from control valve (2). Discard lockwashers.
- 3 Remove cable reel (6) from valve body (7). Loosen two setscrews (8) and remove cable assembly (9) from reel (6).
- 4 Unscrew captive nut (10) of adapter (11), between pulley (12) and valve body (7). Remove pulley (12) from control valve body (7).
- 5 Remove adapter (11) with captive nut (10) from valve body (7).
- 6 Remove pulley (12) from conduit (13).

## 21-4 ACTUATOR CABLE ASSEMBLY – CONTINUED

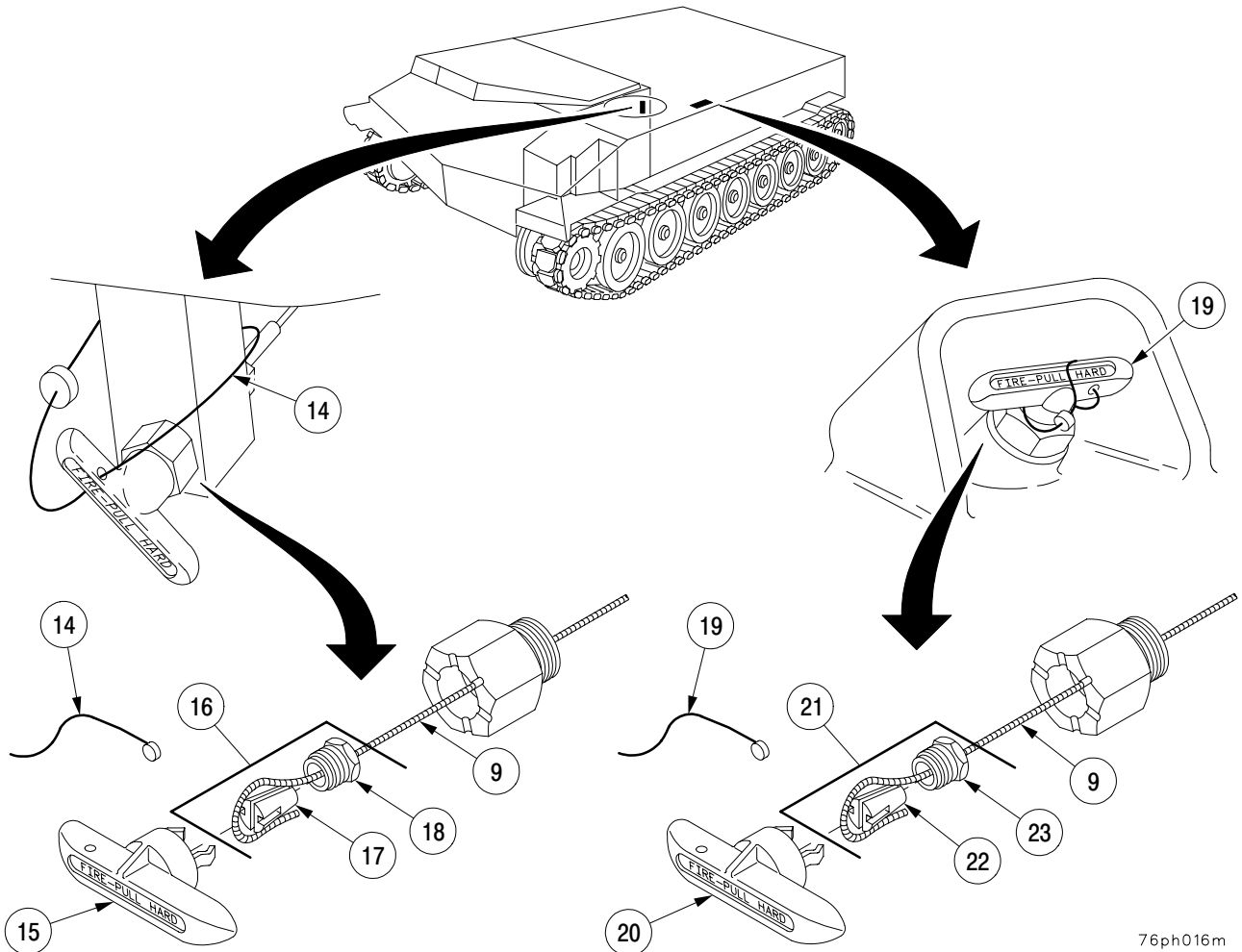
### a. Disassembly – Continued



## 21-4 ACTUATOR CABLE ASSEMBLY – CONTINUED

### a. Disassembly – Continued

- 7 Remove seal (14) from driver's compartment cable handle (15). Discard seal.
- 8 Pull driver's compartment cable handle (15). Hold cable fastener assembly (16) and remove cable handle (15).
- 9 Remove plug (17) from socket (18) and remove cable assembly (9) from plug (17).
- 10 Remove seal (19) from external cable handle (20). Discard seal.
- 11 Pull external cable handle (20). Hold cable fastener assembly (21) and remove cable handle (20).
- 12 Remove plug (22) from socket (23) and remove cable assembly (9) from plug (22).



76ph016m

## 21-4 ACTUATOR CABLE ASSEMBLY – CONTINUED

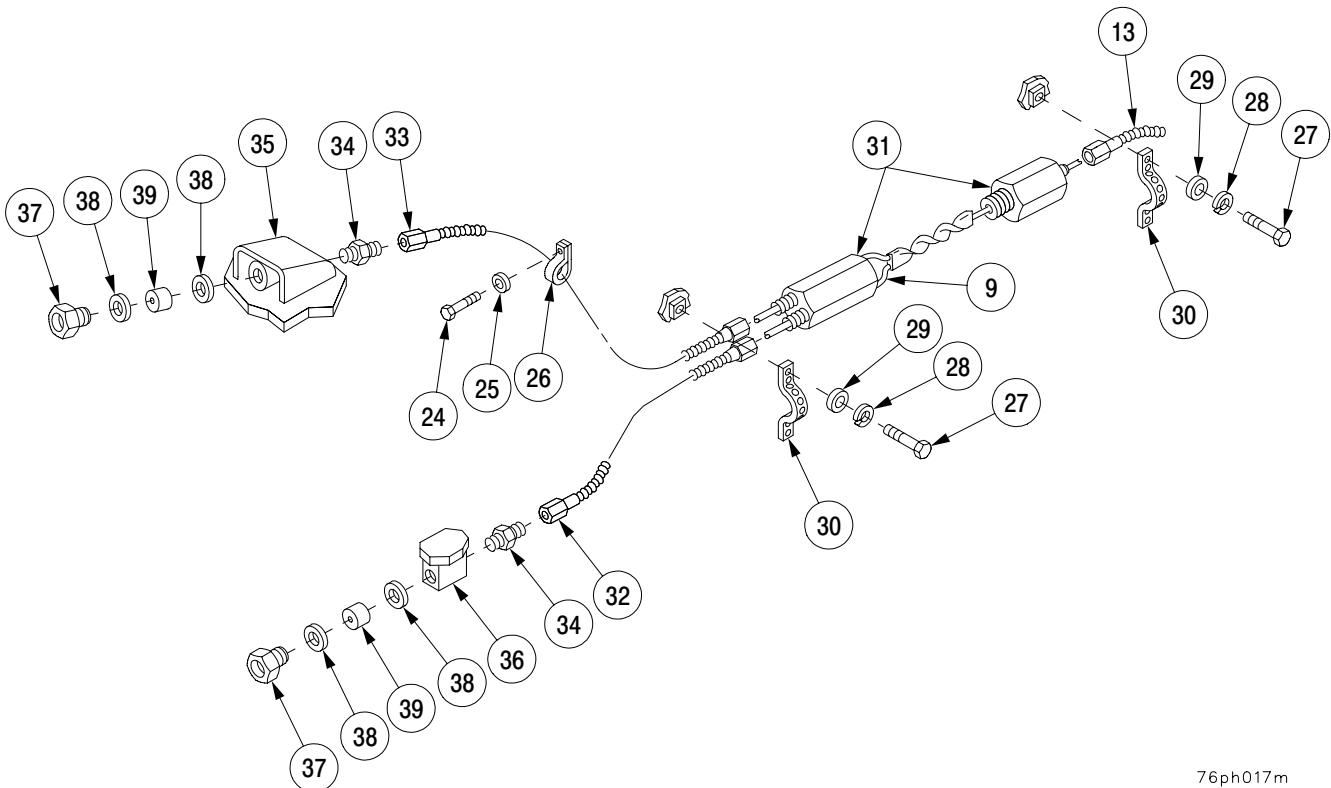
### a. Disassembly – Continued

- 13 Remove two screws (24), two flat washers (25), and two clamps (26).
- 14 Remove two screws (27), two lockwashers (28), and two flat washers (29), from top end of two straps (30). Discard lockwashers.
- 15 Remove dual-pull mechanism (31) with three conduits (13, 32, and 33) and cable assembly (9).
- 16 Remove three conduits (13, 32, and 33) from dual-pull mechanism (31).
- 17 Separate two halves of dual-pull mechanism (31) and remove cable assembly (9).
- 18 Remove two adapters (34) from threaded tube (35) and block (36).

### NOTE

Threaded tube and block are welded to vehicle.  
They are not removable.

- 19 Remove packing nut (37), two flat washers (38), and packing (39) from threaded tube (35) and block (36). Discard packings.



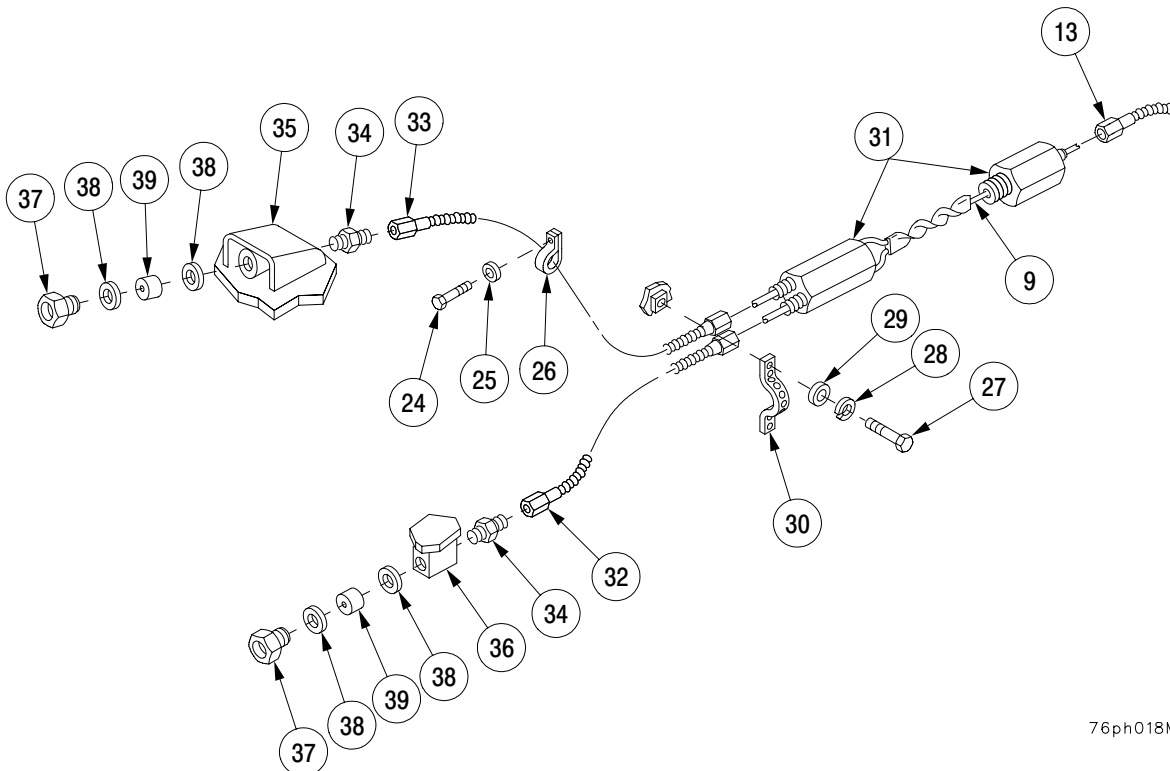
76ph017m



## 21-4 ACTUATOR CABLE ASSEMBLY – CONTINUED

### b. Assembly.

- 1 Install flat washer (38), new packing (39), flat washer (38), and packing nut (37) in threaded tube (35) and block (36).
- 2 Install one adapter (34) on threaded tube (35) and block (36).
- 3 Lubricate cable assembly (9) with graphite.
- 4 Install cable assembly (9) in dual-pull mechanism (31).
- 5 Apply antiseizing tape to male threads of dual-pull mechanism (31). Assemble mechanism.
- 6 Slide three conduits (13, 32, and 33) onto cable assembly (9). Connect three conduits (13, 32, and 33) to dual-pull mechanism (31).
- 7 Install dual-pull mechanism (31) and three conduits (13, 32, and 33). Secure top end of strap (30) with flat washer (29), new lockwashers (28), and screws (27).
- 8 Secure conduit (33) to hull with two clamps (26), two screws (24), and two flat washers (25).
- 9 Install two conduits (32 and 33) on two adapters (34).



76ph018M

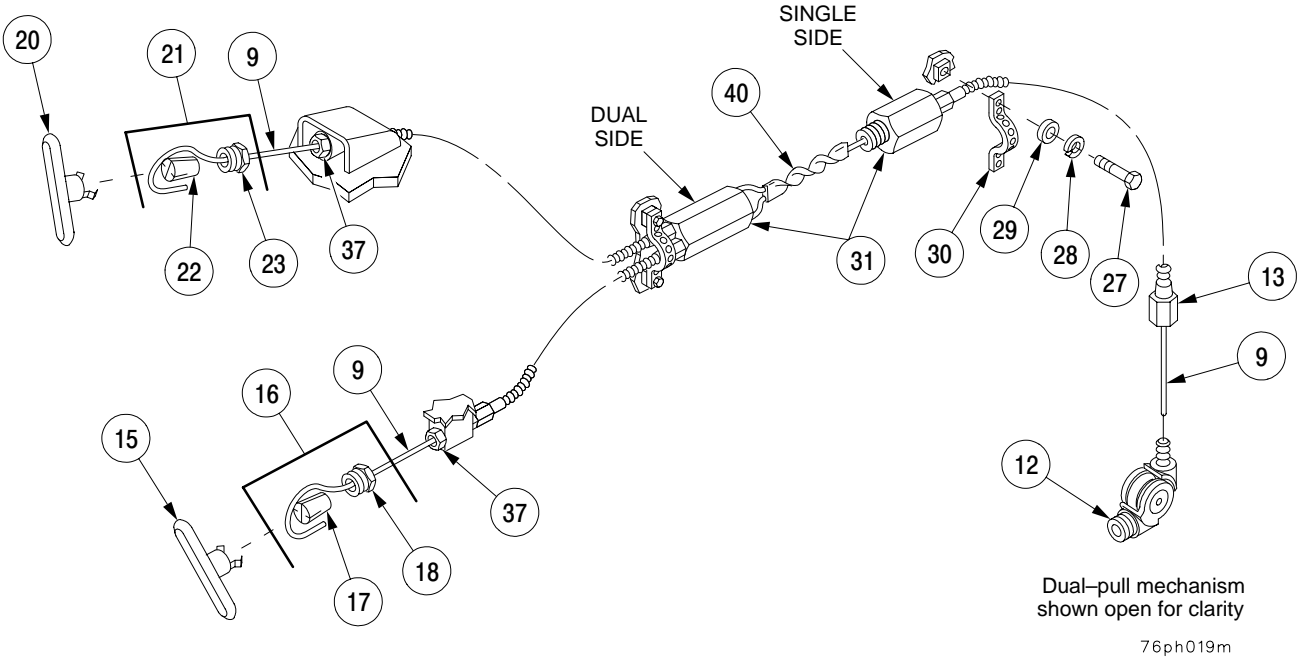
**21-4 ACTUATOR CABLE ASSEMBLY – CONTINUED**

**b. Assembly – Continued**

**NOTE**

Splice is positioned inside of dual-pull mechanism by pulling on ends of cable assembly.

- 10 Position splice (40) against dual side of dual-pull mechanism (31). Install two plugs (17 and 22) and two sockets (18 and 23) on cable assembly (9) ends leaving two inches of free cable between nuts (37) and cable fastener assemblies (16 and 21).
- 11 Hold cable fastener assemblies (16 and 21) and install two cable handles (15 and 20).
- 12 Position splice (40) against single side of dual-pull mechanism (31). Install end of cable assembly (9) in pulley (12).
- 13 Install conduit (13) on pulley (12).
- 14 Secure top end of strap (30) over conduit (13) with flat washer (29), new lockwasher (28), and screw (27).



## 21-4 ACTUATOR CABLE ASSEMBLY – CONTINUED

---

### b. Assembly – Continued

#### NOTE

Adapter with nut is supplied as part of pulley; it is physically attached to control valve at installation.

- 15 Install adapter (11) with captive nut (10) on valve body (7).
- 16 Insert end of cable assembly (9) into valve body (7).
- 17 Install pulley (12) on captive nut (10).
- 18 Insert end of cable assembly (9) into slot (41) in cable reel (6). Adjust cable length for five inches of free cable between point (A) where cable assembly (9) enters cavity of control valve body (7) and point (B) where cable enters slot (41) in cable reel (6). Secure cable assembly (9) with two setscrews (8).
- 19 Position cable reel (6) in body (7). Cam side must be down. Top of actuator pin (42) must contact cam surface. Align set arrow on reel with set line on body.

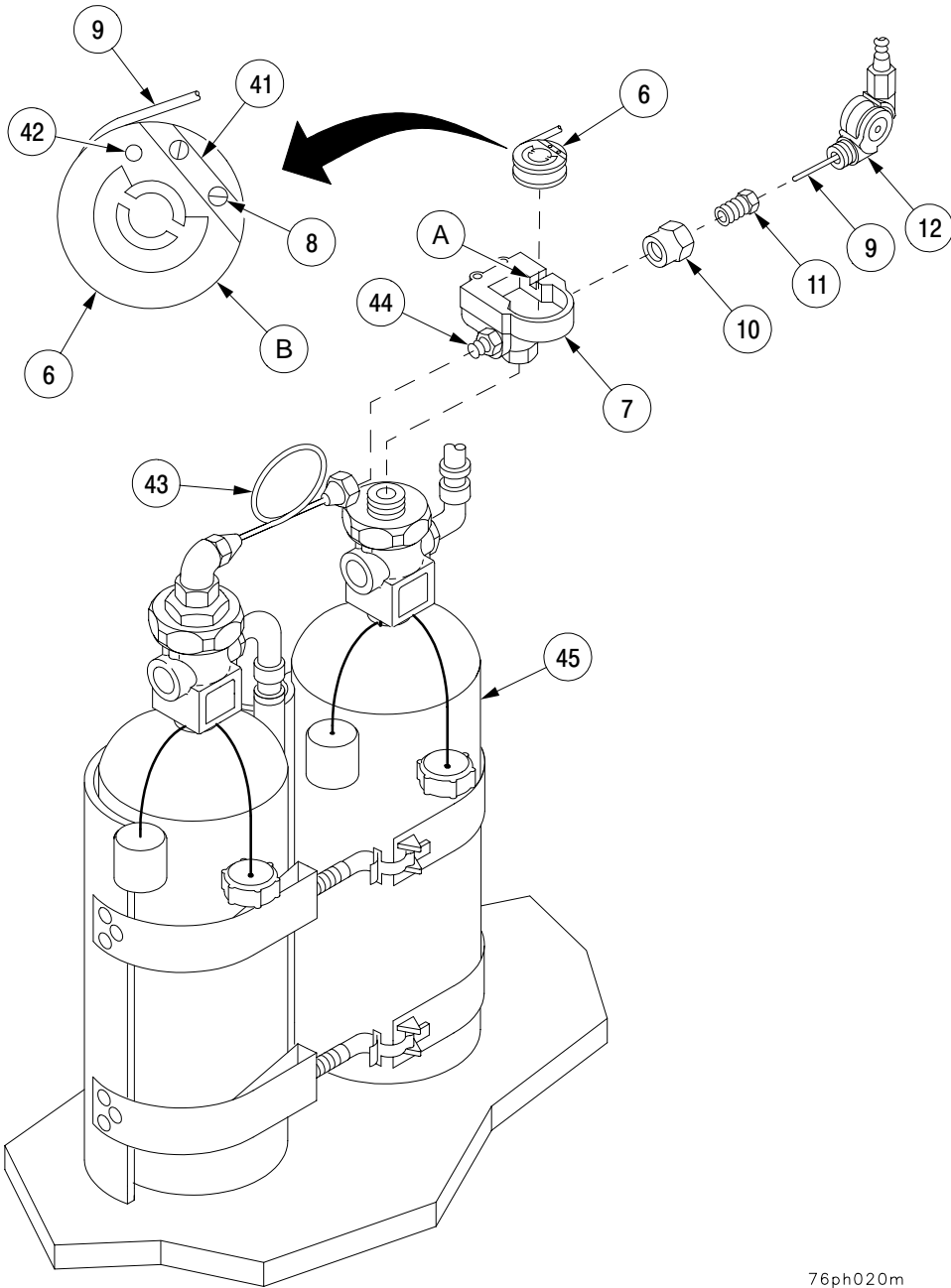
#### NOTE

Control valve must be removed from cylinder assembly to check for correct actuator cable assembly installation.

- 20 Disconnect tube assembly (43) from adapter (44).
- 21 Remove valve body (7) from cylinder assembly (45).

21-4 ACTUATOR CABLE ASSEMBLY - CONTINUED

b. Assembly - Continued



76ph020m

## 21-4 ACTUATOR CABLE ASSEMBLY – CONTINUED

---

### b. Assembly – Continued

**WARNING**

To avoid accidental discharge of CO<sup>2</sup>, make sure control valve is clear of cylinder assembly before installing cover plate.

- 22 Position cover plate (5) on control valve body (7) so that shaft (46) of manual discharge lever (47) goes through hub of cable reel (6). Pin through shaft (46) must engage slot (48) in hub of cable reel (6).
- 23 Install cover plate (5) with three screws (3) and three new lockwashers (4).
- 24 Hold control valve assembly clear of cylinder assembly (45), but close to final mounted position. Pull and hold driver's compartment cable handle (15). Measure length of actuator pin (49) that protrudes below control valve mounting flange (50). Protrusion must be 0.5 to 0.6 in. (13–15 mm). If not, readjust cable (9) at cable reel (6) and repeat steps 18 thru 24, as required.
- 25 Repeat step 24, using exterior release cable handle (20).

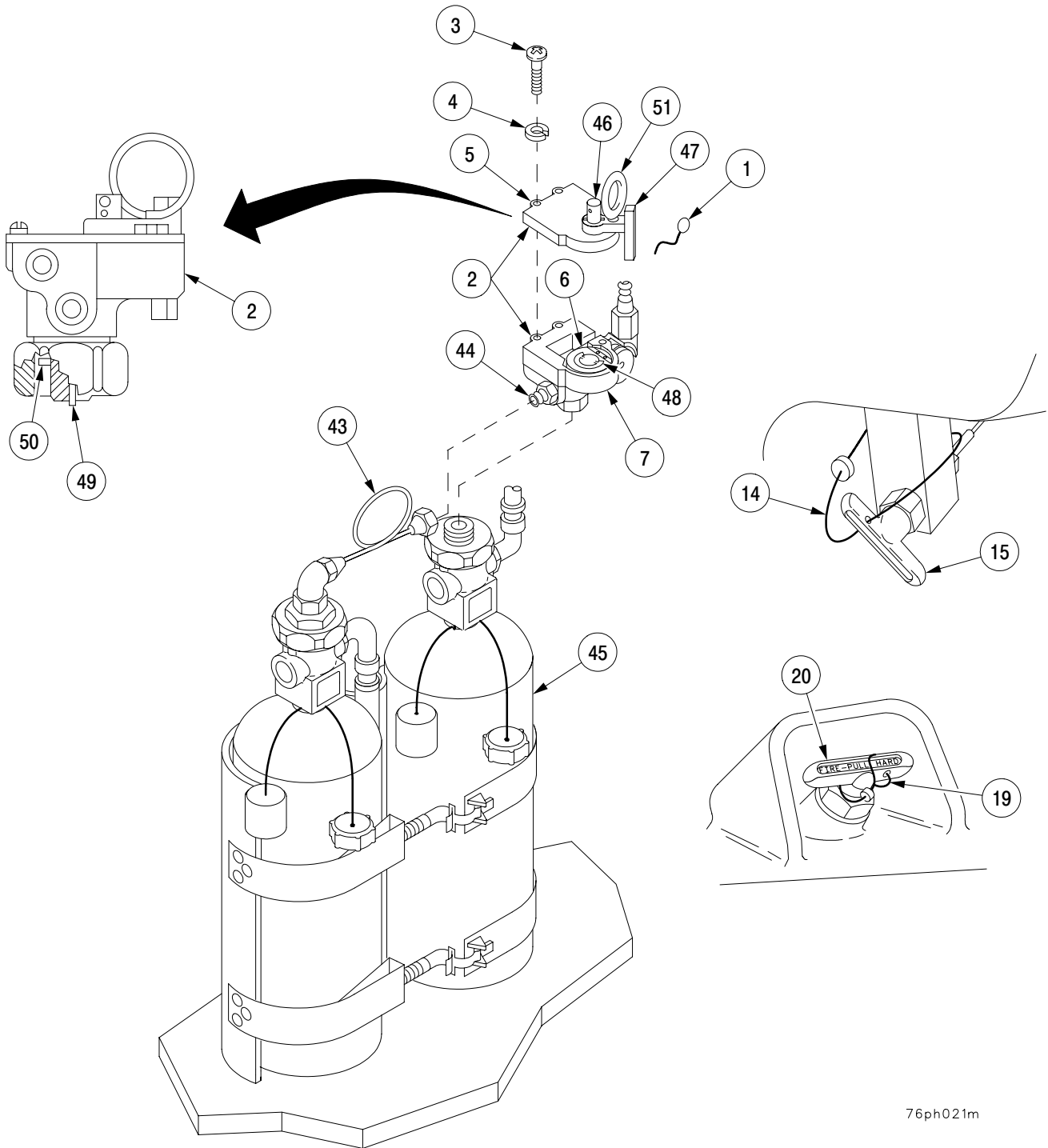
**WARNING**

To avoid accidental discharge of CO<sup>2</sup>, make sure both cable handles are returned to off position (seated) before installing control valve.

- 26 Install control valve assembly (2) on cylinder assembly (45).
- 27 Connect tube assembly (43) to control valve adapter (44).
- 28 Install new seal (1) through holes in two cover plate mounting screws (3), upper hole in shaft (46), and lockpin finger loop (51).
- 29 Install two new seals (14 and 19) on each of two cable handles (15 and 20).

21-4 ACTUATOR CABLE ASSEMBLY - CONTINUED

b. Assembly - Continued



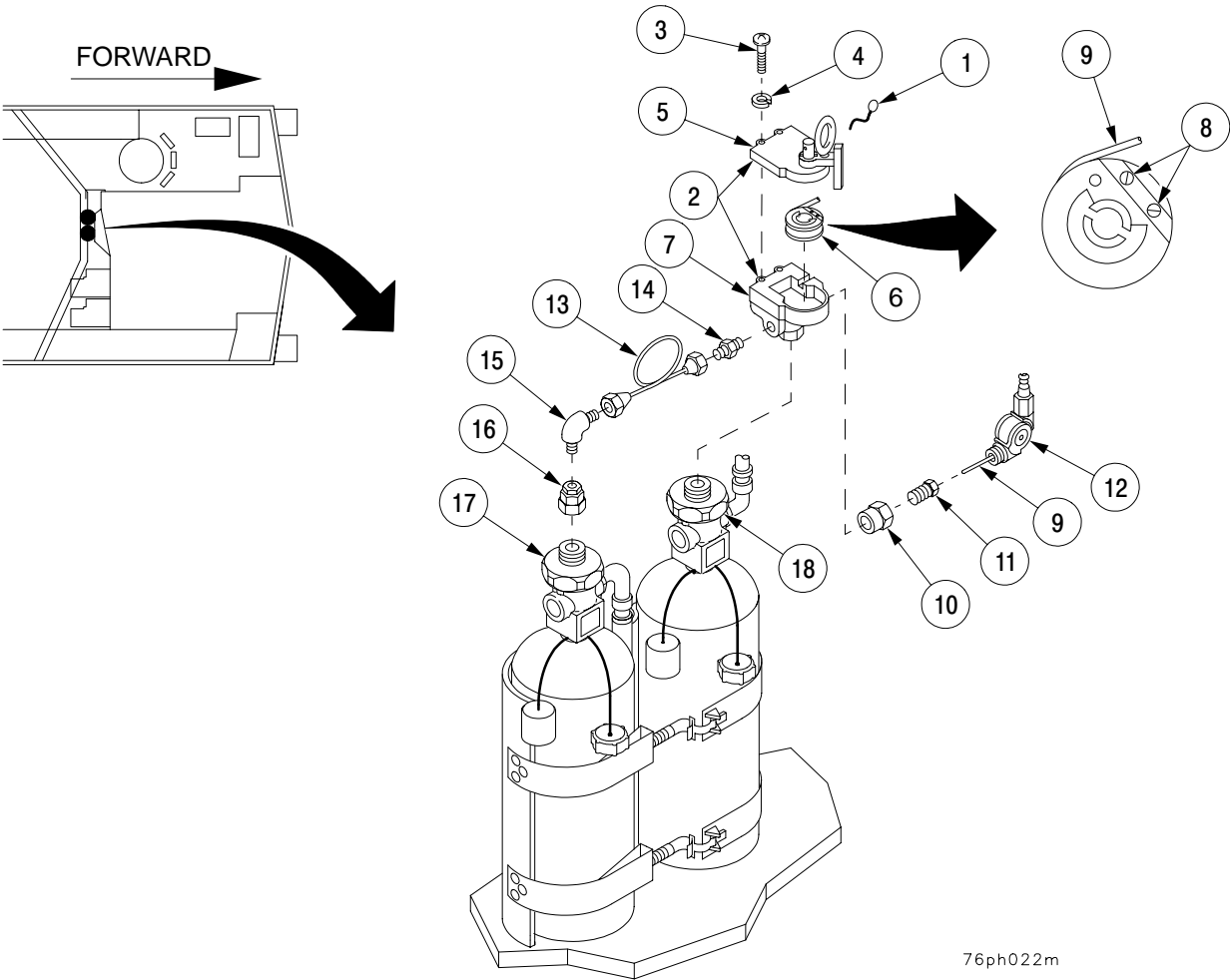
76ph021m



**21-5 CONTROL VALVES AND TUBE ASSEMBLY – CONTINUED**

**a. Removal – Continued**

- 3 Remove cable reel (6) from valve body (7). Loosen two setscrews (8) and remove cable assembly (9) from reel (6).
- 4 Unscrew captive nut (10) of adapter (11) between pulley (12) and valve body (7). Remove pulley (12) from valve body (7).
- 5 Remove adapter (11) and captive nut (10) from valve body (7).
- 6 Remove tube assembly (13) from adapter (14) and elbow (15).
- 7 Remove adapter (14) from valve body (7).
- 8 Remove elbow (15) from pressure head (16).
- 9 Remove pressure head (16) from cylinder assembly (17).
- 10 Remove valve body (7) from cylinder assembly (18).



76ph022m



## 21-5 CONTROL VALVES AND TUBE ASSEMBLY – CONTINUED

---

### b. Installation.

- 1 Install adapter (11) with captive nut (10) on valve body (7).
- 2 Feed end of cable assembly (9) through pulley (12), adapter (11), captive nut (10), and into valve body (7).
- 3 Install pulley (12) on adapter (11) with captive nut (10).
- 4 Pull cable assembly (9) tight enough to remove all slack.
- 5 Insert end of cable assembly (9) into slot (19) in cable reel (6). Adjust cable length for five inches of free cable between point (A) where the cable assembly (9) enters cavity of valve body (7) and point (B) where the cable enters the slot (19) in cable reel (6). Secure cable assembly (9) with two setscrews (8).
- 6 Position cable reel (6) in valve body (7) of control valve (2). Cam side must be down. Top of actuator pin (20) must contact cam surface. Align set arrow on reel with SET LINE on body.

**WARNING**

To avoid accidental discharge of CO<sup>2</sup>, make sure that control valve is clear of cylinder assembly before installing cover plate. Failure to comply may result in injury or death to personnel.

- 7 Position cover plate (5) on control valve body (7) so that shaft (21) of manual discharge lever (22) goes through hub of cable reel (6). Pin through shaft (21) must engage slot (23) in hub of cable reel (6).
- 8 Install cover plate (5) with three screws (3) and three new lockwashers (4).
- 9 Hold control valve (2) clear of cylinder assembly (18) but close to final mounted position. Pull and hold driver's compartment cable handle. Measure length of actuator pin (24) that protrudes below control valve mounting flange (25). Protrusion must be 0.5 to 0.6 inch (13–15 mm). If not, readjust cable (9) at cable reel (6), repeat steps 5 thru 9 as required.

**WARNING**

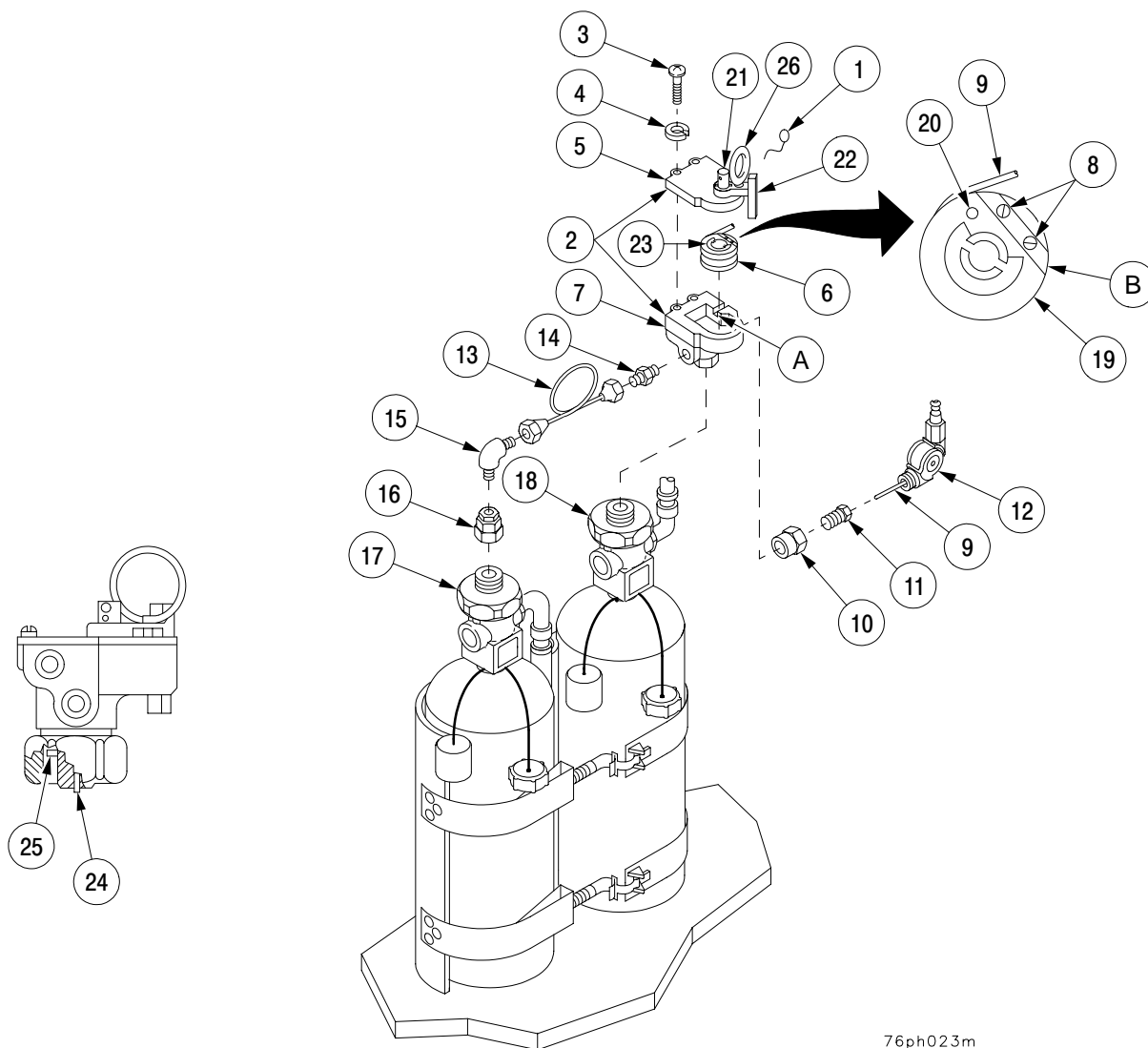
To avoid accidental discharge of CO<sup>2</sup>, make sure that both cable handles are returned to the off position (seated) before installing control valve. Failure to comply may result in injury or death to personnel.

- 10 Install control valve (2) on cylinder assembly (18).

## 21-5 CONTROL VALVES AND TUBE ASSEMBLY – CONTINUED

### b. Installation – Continued

- 11 Install pressure head (16) on cylinder assembly (17).
- 12 Install elbow (15) on pressure head (16).
- 13 Install adapter (14) on control valve (2).
- 14 Install tube assembly (13) on elbow (15).
- 15 Install free end of tube assembly (13) on adapter (14).
- 16 Install new seal (1) through holes in two cover plate mounting screws (3) and upper hole in shaft (21) and the lockpin finger loop (26). Secure new seal.



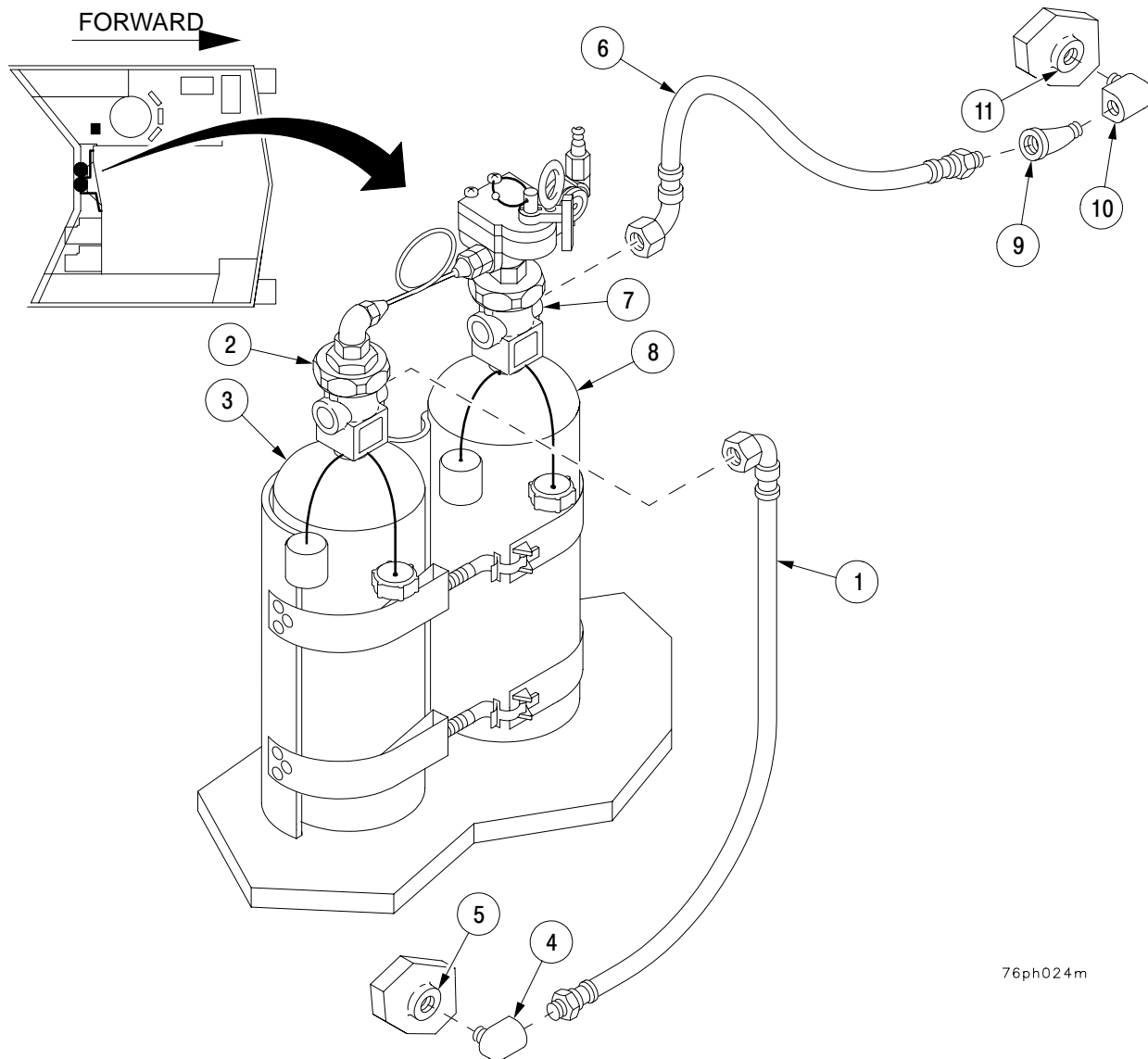
76ph023m



**21-6 FLEXIBLE HOSES AND FITTINGS – CONTINUED**

**b. Installation.**

- 1 Install elbow (10) in bulkhead (11).
- 2 Install elbow (9) in elbow (10).
- 3 Connect hose (6) to elbow (9).
- 4 Connect hose (6) to flood valve (7) on cylinder assembly (8).
- 5 Install elbow (4) in bulkhead (5).
- 6 Connect hose (1) to elbow (4).
- 7 Connect hose (1) to flood valve (2) on cylinder assembly (3).



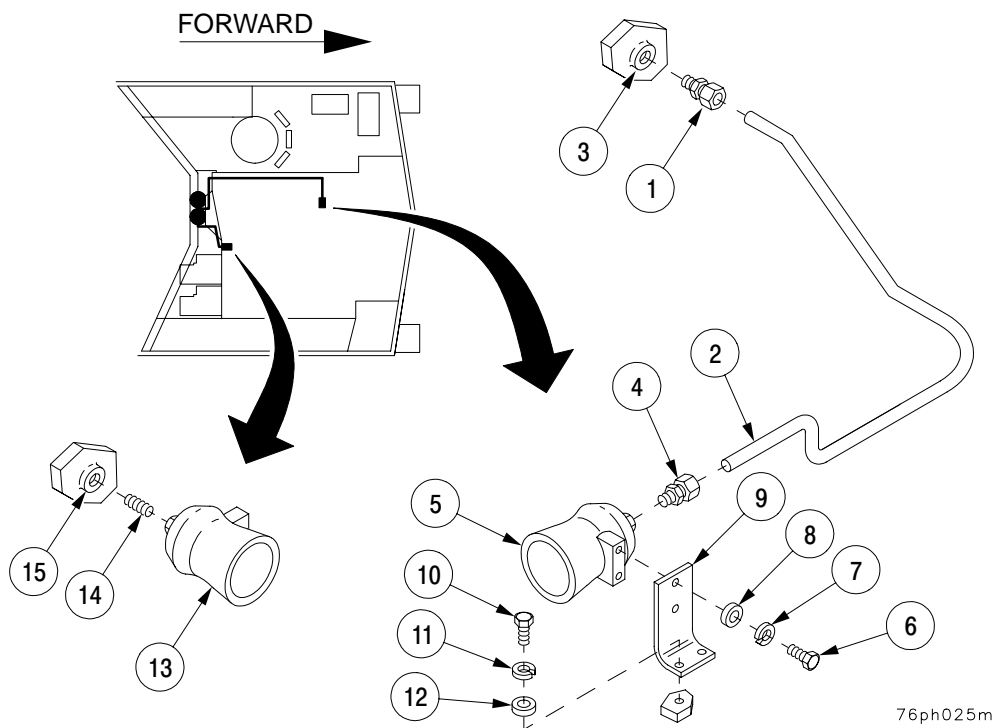
76ph024m



## 21-7 ENGINE COMPARTMENT TUBES, NOZZLE AND MOUNTING HARDWARE – CONTINUED

### b. Installation – Continued

- 6 Install adapter (4) and tube (2) in nozzle (5).
- 7 Install adapter (1) on tube (2).
- 8 Install adapter (1) and tube (2) in bulkhead (3).



76ph025m

### NOTE

#### FOLLOW-ON MAINTENANCE:

- Install engine compartment access cover (para 16-17)
- Install powerpack (para 4-1)

# CHAPTER 22

## NUCLEAR, BIOLOGICAL, AND CHEMICAL (NBC) EQUIPMENT

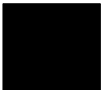
---

### GENERAL

This chapter illustrates and defines procedures for removal, disassembly, assembly, and installation of hull NBC and microclimate conditioning system (MCS) equipment.

---

<u>CONTENTS</u>		<u>Page</u>
22-1	MCS HOSE ASSEMBLIES AND HARDWARE .....	22-2
22-2	MCS HEATER (M3) PILOT LIGHT LENS, LAMP, AND KNOB .....	22-4
22-3	MCS CONNECTOR ASSEMBLY (SUPPLY HOSE TO FACE MASK AND VEST) AND BRACKET .....	22-6
22-4	MCS HEATER (M3) .....	22-8
22-5	MCS HEATER BRACKET .....	22-10



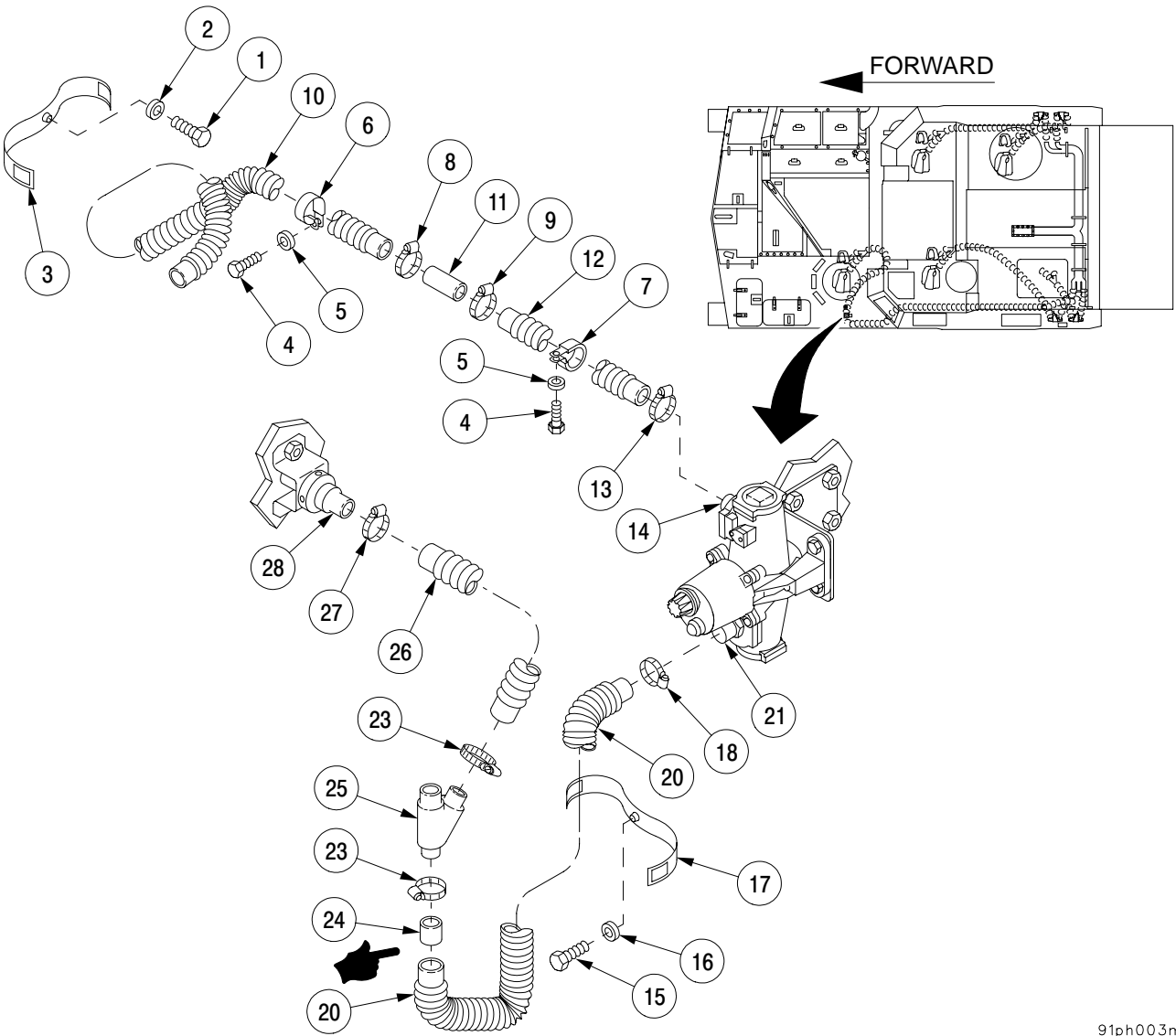




**22-1 MCS HOSE ASSEMBLIES AND HARDWARE – CONTINUED**

**b. Installation – Continued**

- 5 Secure hose (20) to vehicle with screw (15), flat washer (16), and strap (17).
- 6 Install hose clamp (13) on hose (12) and connect hose (12) to straight adapter (14). Tighten hose clamp (13).
- 7 Install hose clamp (9) on hose (12) and hose clamp (8) on hose (10). Connect hoses (12 and 10) to connector (11). Tighten hose clamps (8 and 9).
- 8 Secure hose (10 and 12) to vehicle with four screws (4), four flat washers (5), loop clamp (6), and three loop clamps (7).
- 9 Secure hose (10) to vehicle with screw (1), flat washer (2) and strap (3).



91ph003m

## 22-2 MCS HEATER (M3) PILOT LIGHT LENS, LAMP, AND KNOB.

---

This task covers:      a. Removal                                      b. Installation

---

### **INITIAL SETUP**

Tools

General mechanic's tool kit  
(SC 5180-90-N26)

Equipment Conditions

Vehicle MASTER switch OFF  
(TM 9-2350-314-10)

References

TM 9-2350-314-10

---

### a. Removal

#### **WARNING**

Make sure vehicle MASTER vehicle switch is OFF when working on hull electrical system to avoid electrical shocks and burns.

- 1 Remove pilot light lens (1) from heater (2).
- 2 Separate lamp (3) from pilot light lens (1).

#### **NOTE**

Make sure knob is in OFF position.

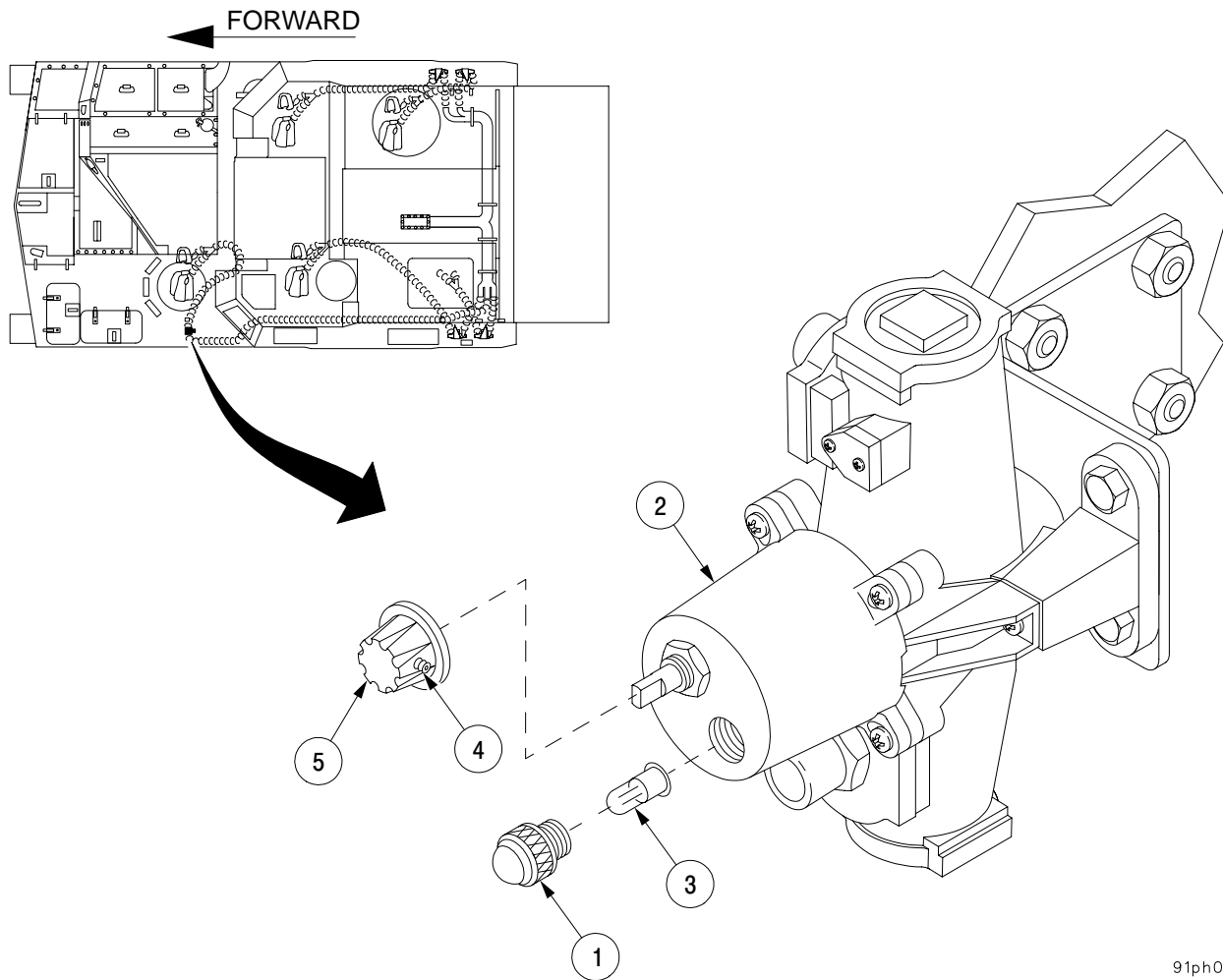
- 3 Loosen setscrew (4) and remove knob (5) from heater (2).

### b. Installation.

- 1 Install and secure knob (5) on heater (2) with setscrew (4).
- 2 Install lamp (3) in pilot light lens (1).
- 3 Install pilot light lens (1) in heater (2).

## 22-2 MCS HEATER (M3) PILOT LIGHT LENS, LAMP, AND KNOB – CONTINUED

### b. Installation – Continued



91ph004m

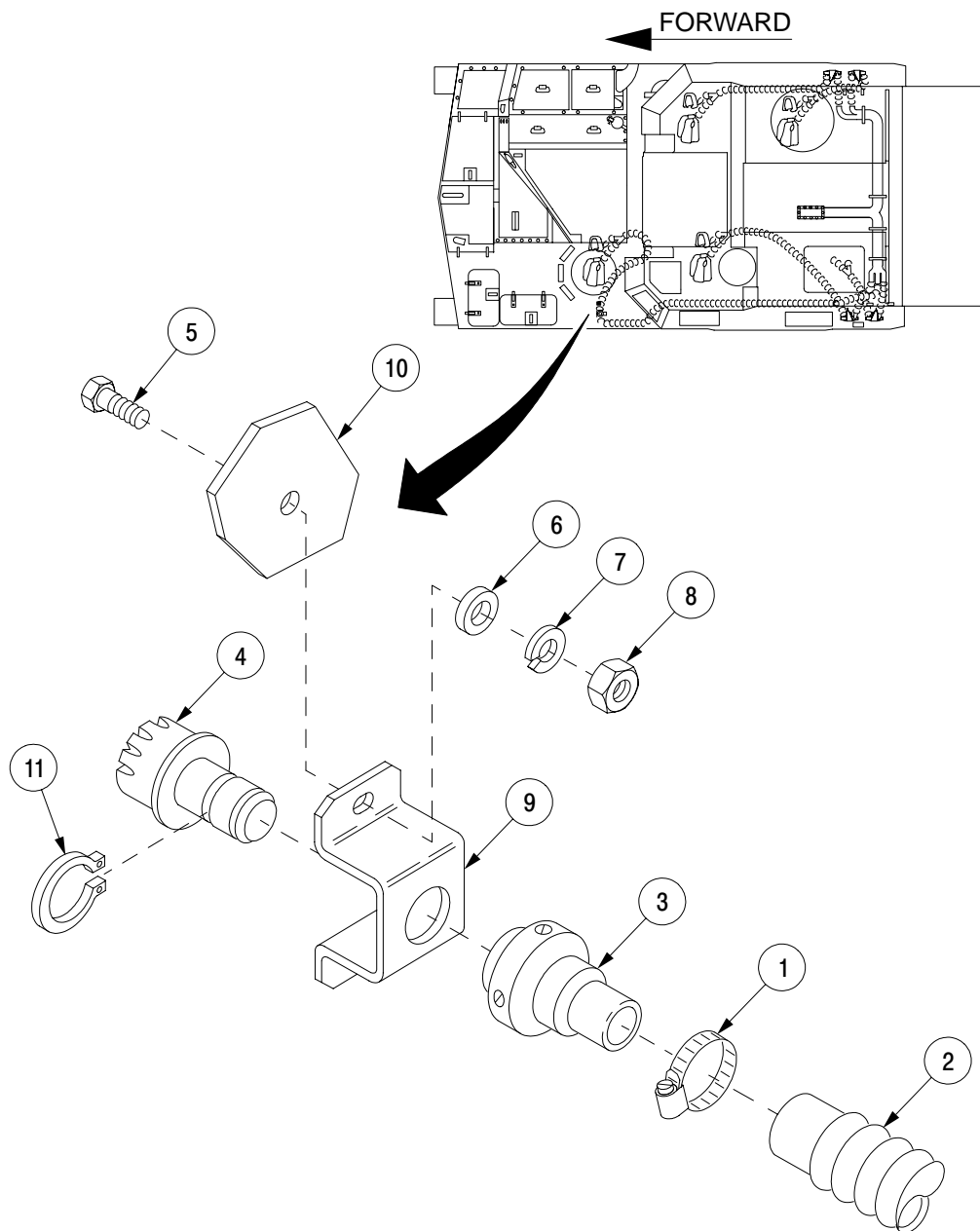


---

## 22-3 MCS CONNECTOR ASSEMBLY (SUPPLY HOSE TO FACE MASK AND VEST) AND BRACKET – CONTINUED

---

### b. Installation – Continued

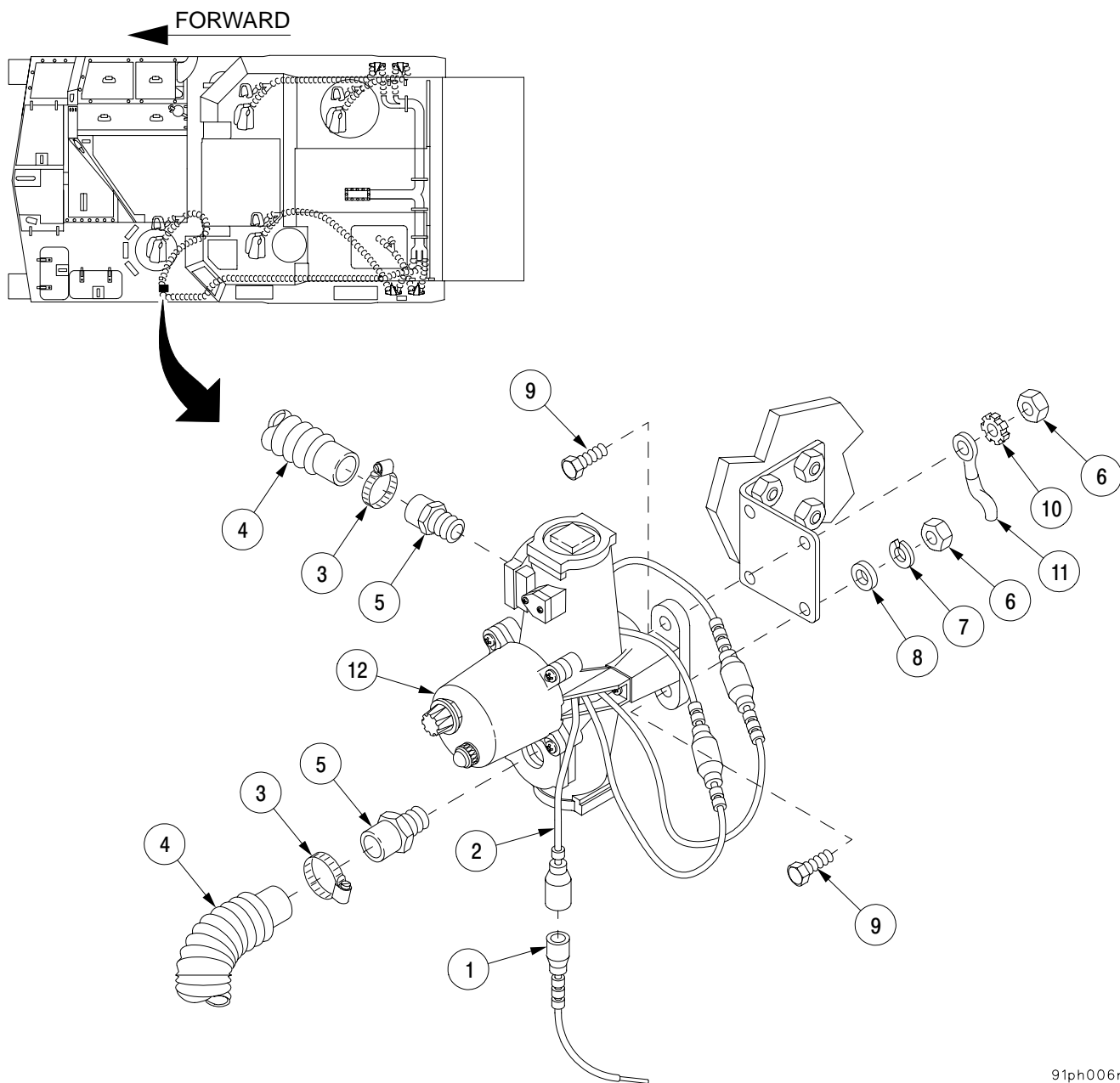


91ph005m



22-4 MCS HEATER (M3) – CONTINUED

b. Installation – Continued



91ph006m

**NOTE**

**FOLLOW-ON MAINTENANCE:**  
 Connect battery ground leads  
 (para 8-33)

---

## 22-5 MCS HEATER BRACKET.

---

This task covers:      a. Removal                                      b. Installation

---

### **INITIAL SETUP**

Tools

General mechanic's tool kit  
(SC 5180-90-N26)

Equipment Conditions

MCS heater (M3) removed  
(para 22-4)

Materials/Parts

Lockwashers (4) (item 22, Appx E)

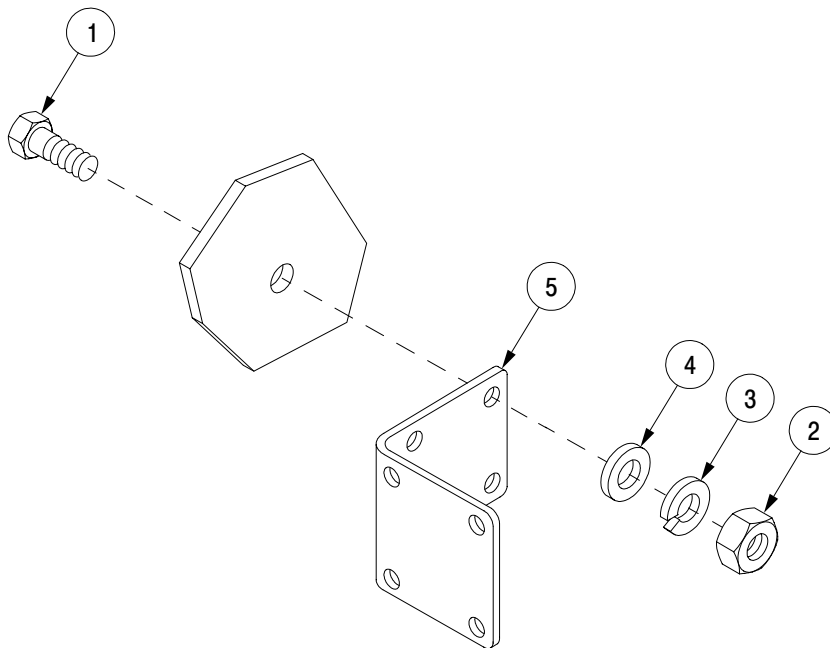
---

#### a. Removal

Remove four screws (1), four nuts (2), four lockwashers (3), four flat washers (4), and bracket (5) from vehicle. Discard lockwashers.

#### b. Installation.

Install bracket (5) in vehicle with four screws (1), four flat washers (4), four new lockwashers (3), and four nuts (2).



91ph007m

### **NOTE**

#### **FOLLOW-ON MAINTENANCE:**

Install MCS heater (M3) (para 22-4)



# CHAPTER 23 ADMINISTRATIVE STORAGE

## GENERAL

This chapter provides specific instructions for administrative storage of the M109A6 Howitzer.

<u>CONTENTS</u>		<u>Page</u>
23-1	GENERAL .....	23-2
23-2	DEFINITION OF ADMINISTRATIVE STORAGE .....	23-2
23-3	ADMINISTRATIVE STORAGE .....	23-2
23-4	CARE OF EQUIPMENT IN ADMINISTRATIVE STORAGE .....	23-4
23-5	RECEIPT FOR STORAGE .....	23-5
23-6	ROTATION .....	23-5
23-7	REMOVAL FROM ADMINISTRATIVE STORAGE .....	23-5
23-8	SERVICING .....	23-5



### 23-1 GENERAL.

The requirements specified herein are necessary for maintaining the M109A6 Howitzer in administrative storage and to achieve the maximum readiness condition.

### 23-2 DEFINITION OF ADMINISTRATIVE STORAGE.

- a. Equipment placement in administrative storage can be for short periods of time when:
  - (1) Unit lacks operating funds, personnel, other resources, or normal usage of its organic materiel.
  - (2) Materiel exceeding the owning unit's capability for operation or maintenance must be retained by that unit for contingency or other cogent reasons.
- b. Installation or unit commanders may authorize the administrative storage of their materiel within guidance furnished by MACOM commanders and AR 750-1. Howitzers should be ready for use within time factors determined by the directing authority.
- c. Throughout storage, appropriate maintenance records will be kept.

### 23-3 ADMINISTRATIVE STORAGE.

- a. Except as indicated in paragraphs 23-3.4 and 23-3.6, equipment placed in administrative storage should be capable of mission readiness within a 24-hour period or as otherwise prescribed by the approving authority. Before equipment is placed in administrative storage, current maintenance services, shortcomings, and deficiencies should be corrected, and all modification work orders (MWOs) should be applied.
- b. Report equipment in administrative storage in Materiel Readiness and Unit Readiness reports as prescribed for all reportable equipment. Refer to AR 220-1.
- c. Perform inspections, maintenance services, and lubrications in accordance with TM 9-2350-314 series manuals or applicable technical manuals.
- d. Records and reports to be maintained for equipment in administrative storage are those prescribed by DA PAM 738-750, for equipment in use.
- e. Ten percent variance is acceptable on time running hours or mileage used to determine maintenance actions required.

#### 23-3.1 Security.

Instructions contained herein do not modify security procedures and requirements for classified or pilferable items. Refer to AR 190-13 and AR 190-51.

#### 23-3.2 Storage Site.

- a. Select the best available site for administrative storage. Separate stored equipment from equipment in use. Conspicuously mark the area "Administrative Storage".
- b. Covered storage space is preferred. When insufficient covered space is available for all howitzers to be stored, select an open site.
- c. Open sites should be improved hardstand, if available. Unimproved sites should be firm, well-drained, and kept free of excessive vegetation.

## 23-3 ADMINISTRATIVE STORAGE – CONTINUED

### 23-3.3 Storage Plan.

- a. Store equipment to provide maximum protection from the elements and to provide access for inspection, maintenance, and exercising. Anticipate removal or deployment problems and take suitable precautions.
- b. Take into account environmental conditions, such as extreme heat or cold; high humidity; blowing sand, dust, or loose debris; soft ground; mud; heavy snows; earthquakes; or combinations thereof, and take adequate precautions.
- c. Establish a fire plan and provide for adequate firefighting equipment and personnel.

### 23-3.4 Maintenance Services and Inspections.

Prior to storage, perform the next scheduled major preventive maintenance service (monthly, quarterly, or semiannually).

### 23-3.5 Auxiliary Equipment and Basic Issue Items.

Process auxiliary and basic issue items simultaneously with the howitzer to which they are assigned. If possible, store auxiliary and basic issue items with the howitzer. If stored apart from the howitzer, mark auxiliary and basic issue items with tags indicating the howitzer, its registration or serial number, and location, and store in protective closures. In addition, place a tag or list indicating the location of the removed items in a conspicuous place on the howitzer.

### 23-3.6 Corrections of Shortcomings and Deficiencies.

Correct all shortcomings and deficiencies prior to storage, or obtain a deferment from the approving authority.

### 23-3.7 Lubrication.

Lubricate equipment in accordance with the applicable technical manual. Retract hydraulic systems linkage and coat exposed portions of shafts with grease.

### 23-3.8 General Cleaning, Painting, and Preservation.

- a. Clean the equipment of dirt, grease, and other contaminants in accordance with this manual.



Do not direct water or steam under pressure against air cleaners, air duct outlets, exhaust outlets, unsealed electrical systems, fire control instruments, or any exterior opening, or component damage may occur.

### NOTE

Touch-up painting will be in accordance with TM 43-0139.

- b. Removal of rust and damaged paint by scraping, wire brushing, sanding, or buffing is not authorized on cannon, fire control, or other armament components.
- c. After cleaning and drying, immediately coat unpainted metal surfaces with an oil or grease as appropriate.

## 23-3 ADMINISTRATIVE STORAGE – CONTINUED

### 23-3.8 General Cleaning, Painting, and Preservation – Continued

#### NOTE

- Air circulation under draped covers reduces deterioration from moisture and heat.
  - Place a piece of barrier material between desiccant bags and metal surfaces.
- d. Sunlight, heat, moisture (humidity), and dirt tend to accelerate deterioration. Install all covers (including vehicle protection closures) authorized for the equipment. Close and secure all openings except those required for venting and draining. Seal openings to prevent the entry of rain, snow, or dust. Insert desiccant when complete seal is required. Place equipment and provide blocking or framing to allow for ventilation and water drainage. Support cover away from howitzer surfaces which may rust, rot, or mildew.

## 23-4 CARE OF EQUIPMENT IN ADMINISTRATIVE STORAGE.

### 23-4.1 Maintenance Services.

After equipment has been placed in administrative storage, suspend all regularly scheduled preventive maintenance services and inspect and exercise as specified herein. Do not reduce Prescribed Load List.

### 23-4.2 Inspection.

- a. Vehicle to be prepared for administrative storage must be given an administrative technical inspection and processed as prescribed on DD Form 1397. The results of the inspection and classification will be entered on DA Form 2404.
- b. If a vehicle is not shipped or issued upon expiration of the administrative storage period, process as applicable in accordance with MIL-H-46709.
- c. If a vehicle to be shipped will reach its destination within the administrative storage period, it need not be reprocessed when removed from storage, unless necessary because of anticipated in-transit weather conditions.
- d. Inspection will usually be visual and must consist of at least a walk-around examination of all equipment to observe any deficiencies that may have occurred. Inspect equipment in open storage weekly and that in covered storage monthly. Immediately after any severe storm of environmental change, inspect all equipment. The following are examples of things to look for during visual inspection:
- (1) Leaks: coolant, fuel, oil, or hydraulic fluid.
  - (2) Condition of preservatives, seals, and wraps. Seals may develop leaks during storage, during exercise, or shortly thereafter. If leaking continues, refer to the repair procedures in this manual or notify support maintenance.
  - (3) Corrosion or other deterioration.
  - (4) Missing or damaged parts.
  - (5) Water in compartments.
  - (6) Any other readily recognizable shortcomings or deficiencies.

**23-5 RECEIPT FOR STORAGE.**

- a. When received for storage and already processed for domestic shipment by the manufacturer as indicated on DD Form 1397, the vehicle will not be reprocessed unless inspection performed on receipt of materiel reveals corrosion, deterioration, etc.
- b. Upon receipt from manufacturing facilities, if the processing data on the tag indicates that preservation has been rendered ineffective by operation or by freight shipping damage, completely process the vehicle in accordance with MIL-H-46709.
- c. Prepare SF Form 364 for all shipments received in a damaged or otherwise unsatisfactory condition due to deficiencies in preservation, packaging, marking, handling, loading, or storage, and for apparently excessive preservation.

**23-6 ROTATION.**

To assure utilization of all assigned materiel, rotate items in accordance with any rotational plan that will keep equipment in operational condition and reduce maintenance effort.

**23-7 REMOVAL FROM ADMINISTRATIVE STORAGE.**

Remove preservative materials. Perform the next scheduled preventive maintenance service and prepare equipment for service as outlined in TM 9-2350-314-10 and in accordance with instructions on DD Form 1397.

**23-8 SERVICING.**

Resume the maintenance service scheduled in effect at the commencement of storage as per DD Form 314. Refer to DA PAM 738-750.

## APPENDIX A

### REFERENCES

#### A-1 SCOPE

The following publications are applicable at Unit Maintenance level to materiel covered in this technical manual. Appropriate indexes should be consulted frequently for latest applicable changes, revisions, and additions.

#### A-2 FORMS

Recommended Change to Publications .....	DA Form 2028
Recommended Change to Equipment Technical Publications .....	DA Form 2028-2
Equipment Inspection and Maintenance Worksheet .....	DA Form 2404
Uncorrected Fault Record .....	DA Form 2408-14
US Army Accident Report. ....	DA Form 285
Preventive Maintenance Schedule and Record .....	DD Form 314
Processing and Deprocessing Record for Shipment, Storage, and Issue of Vehicles and Spare Engines .....	DD Form 1397
Product Quality Deficiency Report .....	SF Form 368
Report of Discrepancy (ROD) .....	SF Form 364

#### A-3 FIELD MANUALS

NBC Protection .....	FM 3-4
NBC Decontamination .....	FM 3-5
First Aid for Soldiers .....	FM 21-11

#### A-4 TECHNICAL BULLETINS

Solder and Soldering .....	TB SIG 222
Color, Marking, and Camouflage Painting of Military Vehicles, Construction Equipment, and Materials Handling Equipment .....	TB 43-0209
Use of Antifreeze Solutions, Antifreeze Extender, Cleaning Compounds and Test Kit in Engine Cooling Systems .....	TB 750-651

#### A-5 TECHNICAL MANUALS

Storage, Shipment, Handling, and Disposal of Chemical Agents and Hazardous Chemicals .....	TM 3-250
Destruction of Conventional Ammunition and Improved Conventional Munitions ...	TM 43-0002-33
Painting Instructions for Army Materiel .....	TM 43-0139
Operator's, Organizational, and Direct Support Maintenance Manual (Including Repair Parts and Special Tools List) for Recharger, Fire Extinguisher Monobromotrifluoromethane, Skid Mounted, Electric Motor Driven Model RHA-101-M, Part Number 350501-001, S/N 3505-1 to 3505-368 (NSN 4210-01-176-3511) .....	TM 5-4210-218-13&P
Procedures for Destruction of Tank-Automotive Equipment to Prevent Enemy Use .....	TM 750-244-6
Cooling Systems: Tactical Vehicles .....	TM 750-254
Inspection, Care and Maintenance of Antifriction Bearings .....	TM 9-214
Operator's Manual: Howitzer, Medium Self-propelled: 155MM, M109A6 (NSN 2350-01-305-0028) .....	TM 9-2350-314-10
Unit Maintenance Manual for Hull Systems and Components: Howitzer, Medium, Self-propelled: 155MM, M109A6 (NSN 2350-01-305-0028) .....	TM 9-2350-314-20-1
Unit Maintenance Manual for Cab, Systems and Components: Howitzer, Medium, Self-propelled: 155MM, M109A6 (NSN 2350-01-305-0028) .....	TM 9-2350-314-20-2

**A-5 TECHNICAL MANUALS – CONTINUED**

- Unit, Direct Support and General Support Maintenance Repair Parts and Special Tools List (Including Depot Maintenance Repair Parts) for Hull Associated Components of Howitzer, Medium, Self-propelled: 155MM, M109A6 (NSN 2350-01-305-0028) ..... TM 9-2350-314-24P-1
- Unit, Direct Support and General Support Maintenance Repair Parts and Special Tools List (Including Depot Maintenance Repair Parts) for Cab and Associated Components of Howitzer, Medium, Self-propelled: 155MM, M109A6 (NSN 2350-01-305-0028) ..... TM 9-2350-314-24P-2
- Field and Depot Maintenance Manual for Power Train Assembly (8351100) (Allison Model XTG-411 2A/-4). Composed of Transfer Assembly, Transmission Input (NSN 2520-00-894-9435); Transmission Assembly (2520-00-894-9533); Drive Assembly, Transmission Output, Vehicle Left (2520-00-894-9534); Drive Assembly, Transmission Output, Vehicle Right (2520-00-894-9532) ..... TM 9-2520-234-35
- Unit, Direct Support and General Support Maintenance Manual Standards for Inspection and Classification of Tracks, Track Components, and Solid-Rubber Tires ..... TM 9-2530-200-24
- General Maintenance Procedures for Fire Control Materiel ..... TM 9-254
- Organizational, Direct Support and General Support Maintenance Manual (Including Repair Parts and Special Tools) for Heaters, Vehicular Compartment: Stewart-Warner 10560M (NSN 2540-01-071-0651), 10560M24B1 (2540-01-169-5159), 10560C24 (2540-01-083-0691), and 10560G (7540-01-262-6013): HUPP MF60A-24V (2540-00-930-8938), MF510B (2540-01-071-0652), MF510C, MF60B-24V (2540-01-162-3834); ESPAR V7S (2540-01-114-7688) ..... TM 9-2540-205-24&P
- Direct Support and General Support Maintenance for Engine, Diesel with Container Model 7083-7395 (NSN 2815-01-043-7092) (2815-01-260-0211) Engine, Diesel with Container Model 7083-7396 (2815-01-040-3120) (2815-01-260-0212) Engine, Diesel with Container Model 7083-7398 (2815-00-936-7695) Engine, Diesel with Container Model 7083-7399 (2815-00-134-4845) ..... TM 9-2815-202-34
- Unit Maintenance, Direct Support and General Support Maintenance Repair Parts and Special Tools Lists (Including Depot Maintenance Repair Parts and Special Tools List) for 8V71T Engines; Engine w/Container: Model 7083-7391 (NSN 2815-01-335-4579) Engine w/Container: Model 7083-7395 (2815-01-260-0211) (2815-01-043-7092) Engine w/Container: Model 7083-7396 (2815-01-040-3120) (2815-01-260-0212) Engine w/Container: Model 7083-7398 (2815-00-936-7659) Engine w/Container: Model 7083-7399 (2815-00-134-4845) ..... TM 9-2815-202-24P
- Direct Support, General Support, and Depot Maintenance Manual (Including Repair Parts) for Starter, Engine, Electrical Assembly (NSN 2920-00-226-6545) (Delco-Remy Model 1113943) (Military Part No. 10911018-1); Starter, Engine Electrical Assembly (2920-00-911-5637) (Delco-Remy Model 1113904) (Military Part No. 109110181), Starter, Engine Electrical Assembly (2920-00-912-9510) (Delco-Remy Model 1113944) ..... TM 9-2920-242-35

**A-5 TECHNICAL MANUALS – CONTINUED**

Direct Support and General Support Maintenance Manual (Including Repair Parts and Special Tools List) for Starter, Engine, Electrical (Leece-Neville Model M0017072MB) (NSN 2920-00-267-9987) . . . . . TM 9-2920-243-34

Direct Support, General Support, and Depot Maintenance Manual (Including Repair Parts) for Starter, Engine, Electrical Assembly (Prestolite Model MFY6101IUT) (NSN 2920-00-999-6216) . . . . . TM 9-2920-248-35

Operator's and Organizational Maintenance Manual (Including Repair Parts and Special Tools List for Simplified Test Equipment) for Internal Combustion Engines (NSN 4910-00-124-2554) . . . . . TM 9-4910-571-12&P

Direct Support and General Support Maintenance Manual Including Repair Parts and Special Tools List Simplified Test Equipment for Internal Combustion Engines Reprogrammable (STE/ICE-R) (NSN 4910-01-222-6589) . . . . . TM 9-4910-571-34&P

Operator's, Unit, Direct Support and General Support Maintenance Manual for Lead-Acid Storage Batteries; 4HN, 24 Volt (NSN 6140-00-059-3528) MS75047-1; 2HN, 12 Volt (6140-00-057-2553) MS35000-1; 6TN, 12 Volt (6140-00-057-2554) MS35000-3; 6TL, 12 Volt (6140-01-210-1964) MS52149-1 . . . . . TM 9-6140-200-14

Operator's Manual Vehicular Intercommunications Systems AN/VIC-3(V)-6 . . . . . TM 11-5830-263-10

Unit Maintenance Manual Vehicular Intercommunications Systems AN/VIC-3(V)-6 . . . . . TM 11-5830-263-20&P

**A-6 REGULATIONS**

Accident Reporting and Records . . . . . AR 385-40

The Army Physical Security Program . . . . . AR 190-13

Security of Unclassified Army Property (Sensitive and Nonsensitive) . . . . . AR 190-51

Unit Status Reporting . . . . . AR 220-1

Product Quality Deficiency Report Program . . . . . AR 702-7

Army Materiel Maintenance Policy and Retail Maintenance Operations . . . . . AR 750-1

**A-7 MILITARY SPECIFICATIONS**

Processing for Storage and Shipment of Howitzer, Medium, Self-propelled: 155MM, M109A2-5 . . . . . MIL-H-46709

**A-8 MISCELLANEOUS PUBLICATIONS**

Expendable/Durable Items (except Medical, Class V, Repair Parts, and Heraldic Items) . . . . . CTA 50-970

Army Medical Department Expendable/Durable Items . . . . . CTA 8-100

Wheels, Solid Rubber Tired used on Military Combat Vehicles . . . . . DMWR 9-2630-200/1

The Army Maintenance Management System (TAMMS) . . . . . DA PAM 738-750

Sets, Kits, Outfits, and Tools, Welding Shop, Trailer Mounted (NSN 3431-01-090-1231) . . . . . SC 3431-95-A04

Sets, Kits, Outfits, and Tools Shop Equipment, Machine Shop: Field Maintenance, Basic (NSN 3470-00-754-0708) . . . . . SC 3470-95-A02



**A-8 MISCELLANEOUS PUBLICATIONS – CONTINUED**

Sets, Kits, and Outfits Shop Equipment, Automotive Maintenance and Repair for Field Maintenance, Basic, Less Power (NSN 4910-00-754-0705) ..... SC 4910-95-A31

Sets, Kits, Outfits, and Tools for Shop Equipment, Automotive Maintenance and Repair: Field Maintenance, Supplemental No. 1, Less Power (NSN 4910-00-754-0706) (LIN T25619) and Shop Equipment Automotive Maintenance and Repair: Field Maintenance, Supplemental No. 1 MAP only (NSN 4910-00-919-0078) ..... SC 4910-95-A62

Sets, Kits, and Outfits for Shop Equipment, Automotive Maintenance and Repair: Organizational Maintenance, Supplemental No. 1 (NSN 4910-00-754-0653) ..... SC 4910-95-A73

Sets, Kits, and Outfits Shop Equipment, Automotive Maintenance and Repair: Organizational Maintenance, Common No. 1 (NSN 4910-00-754-0654) ..... SC 4910-95-A74

Sets, Kits, and Outfits Components List for Shop Equipment, Automotive Maintenance and Repair: Organizational Maintenance, Common No. 2, Less Power (NSN 4910-00-754-0650) (LIN W32730) and Shop Equipment, Auto, Maintenance and Repair: Organizational Maintenance, Common No. 2, and MAP only (4910-00-919-0082) ..... SC 4910-95-CL-A72

Shop Set, Small Arms: Field Maintenance, Basic, Less Power (NSN 4933-00-754-0664) and MAP Only (4933-00-919-0103) ..... SC 4933-95-CL-A11

Sets, Kits, and Outfits, Components List for Tool Set, Vehicle Full-Tracked: Organizational Maintenance, Supplemental No. 2, Less Power (NSN 4940-00-754-0743) and MAP only (4940-00-919-0106) ..... SC 4940-95-CL-A08

Sets, Kits, and Outfits for Components List, Shop Equipment, Fuel and Electrical Systems Engine: Field Maintenance, Basic, Less Power (NSN 4940-00-754-0714) (T30414) and Shop Equipment, Fuel and Electrical System Engine: Field Maintenance, MAP (4940-00-919-0083) ..... SC 4940-95-CL-B20

Sets, Kits, and Outfits Tool Kit, for General Mechanic's: Automotive (GMTK) (NSN 5180-00-177-7033) ..... SC 5180-90-N26

Sets, Kits, and Outfits, Components List, Tool Kit, Electronic Equipment, TK-105/G (NSN 5180-00-610-8177) ..... SC 5180-91-CL-R07

Sets, Kits, and Outfits, Tool Kit, Artillery and Turret Mechanic's: Ordnance (NSN 5180-00-357-7727) ..... SC 5180-95-A12

Sets, Kits, and Outfits Components List, Tool Kit, Automotive Fuel and Electrical System Repair (NSN 5180-00-754-0655) ..... SC 5180-95-CL-B08

## APPENDIX B

### MAINTENANCE ALLOCATION CHART

---

#### Section I. INTRODUCTION

##### B-1 THE ARMY MAINTENANCE SYSTEM MAC.

a. This introduction (Section I) provides a general explanation of all maintenance and repair functions authorized at various maintenance levels under the standard Army Maintenance System concept.

b. The Maintenance Allocation Chart (MAC) in Section II designates overall authority and responsibility for the performance of maintenance functions on the identified end item or component. The application of the maintenance functions to the end item or component will be consistent with capacities and capabilities of the designated maintenance levels, which are shown on the MAC in column (4) as:

**Unit** — includes two subcolumns, C (operator/crew) and O (unit) maintenance.

**Direct Support** — includes an F subcolumn.

**General Support** —includes an H subcolumn.

**Depot** —includes a D subcolumn.

c. Section III lists the tools and test equipment (both special tools and common tool sets) required for each maintenance function.

d. Section IV contains supplemental instructions and explanatory notes for a particular maintenance function.

##### B-2 MAINTENANCE FUNCTIONS.

Maintenance functions are limited to and defined as follows:

a. **Inspect.** To determine the serviceability of an item by comparing its physical, mechanical, and/or electrical characteristics with established standards through examination (e.g., by sight, sound, or feel).

b. **Test.** To verify serviceability by measuring the mechanical, pneumatic, hydraulic, or electrical characteristics of an item and comparing those characteristics with prescribed standards.

c. **Service.** Operations required periodically to keep an item in proper operating conditions; e.g., to clean (includes decontaminate, when required), to preserve, to drain, to paint, or to replenish fuel, lubricants, chemical fluids, or gases.

d. **Adjust.** To maintain or regulate, within prescribed limits, by bringing into proper position, or by setting the operating characteristics to specified parameters.

e. **Align.** To adjust specified variable elements of an item to bring about optimum or desired performance.

f. **Calibrate.** To determine and cause corrections to be made or to be adjusted on instruments or test, measuring, and diagnostic equipment used in precision measurement. Consists of comparisons of two instruments, one of which is a certified standard of known accuracy, to detect and adjust any discrepancy in the accuracy of the instrument being compared.

g. **Remove/Install.** To remove and install the same item when required to perform service or other maintenance functions. Install may be the act of emplacing, seating, or fixing into position a spare, repair part, or module (component or assembly) in a manner to allow the proper functioning of an equipment or system.

h. **Replace.** To remove an unserviceable item and install a serviceable counterpart in its place. "Replace" is authorized by the MAC and assigned maintenance level is shown as the 3rd position code of the SMR code.

## TM 9-2350-314-20-1-2

i. **Repair.** The application of maintenance services<sup>1</sup> including fault location/troubleshooting<sup>2</sup> removal/installation, and disassembly/assembly<sup>3</sup> procedures, and maintenance actions<sup>4</sup> to identify troubles and restore serviceability to an item by correcting specific damage, fault, malfunction, or failure in a part, subassembly, module (component or assembly), end item, or system.

j. **Overhaul.** That maintenance effort (service/action) prescribed to restore an item to a completely serviceable/operational condition as required by maintenance standards in appropriate technical publications (i.e., DMWR). Overhaul is normally the highest degree of maintenance performed by the Army. Overhaul does not normally return an item to like new condition.

k. **Rebuild.** Consists of those services/actions necessary for the restoration of unserviceable equipment to a like new condition in accordance with original manufacturing standards. Rebuild is the highest degree of materiel maintenance applied to Army equipment. The rebuild operation includes the act of returning to zero those age measurements (e.g., hours/miles) considered in classifying Army equipment/components.

### B-3 EXPLANATION OF COLUMNS IN THE MAC, SECTION II.

a. **Column 1, Group Number.** Column 1 lists functional group code numbers, the purpose of which is to identify maintenance significant components, assemblies, subassemblies, and modules with the next higher assembly.

b. **Column 2, Component/Assembly.** Column 2 contains the item names of components, assemblies, subassemblies, and modules for which maintenance is authorized.

c. **Column 3, Maintenance Functions.** Column 3 lists the functions to be performed on the item listed in Column 2. (For detailed explanation of these functions, see paragraph B-2.)

d. **Column 4, Maintenance Level.** Column 4 specifies each level of maintenance authorized to perform each function listed in Column 3, by indicating work time required (expressed as manhours in whole hours or decimals) in the appropriate subcolumn. This work-time figure represents the active time required to perform that maintenance function at the indicated level of maintenance. If the number or complexity of the tasks within the listed maintenance function vary at different maintenance levels, appropriate work-time figures are to be shown for each level. The work-time figure represents the average time required to restore an item (assembly, subassembly, component, module, end item, or system) to a serviceable condition under typical field operating conditions. This time includes preparation time (including any necessary disassembly/assembly time), troubleshooting/fault location time, and quality assurance time in addition to the time required to perform the specific tasks identified for the maintenance functions authorized in the maintenance allocation chart.

The symbol designations for the various maintenance levels are as follows:

- C . . . . . Operator or crew maintenance
- O . . . . . Unit maintenance
- F . . . . . Direct support maintenance
- L . . . . . Specialized Repair Activity (SRA)<sup>5</sup>
- H . . . . . General support maintenance
- D . . . . . Depot maintenance

<sup>1</sup> Services – Inspect, test, service, adjust, align, calibrate, and/or replace.

<sup>2</sup> Fault Columns used in the maintenance allocation chart will be limited to those shown. Entries for these columns are explained below: location/troubleshooting – The process of investigating and detecting the cause of equipment malfunctioning; the act of isolating a fault within a system or unit under test (UUT).

<sup>3</sup> Disassembly/assembly – The step-by-step breakdown (taking apart) of a spare/functional group coded item to the level of its least component that is assigned an SMR code for the level of maintenance under consideration (i.e., identified as maintenance significant).

<sup>4</sup> Actions – Welding, grinding, riveting, straightening, facing, machining, and/or resurfacing.

<sup>5</sup> This maintenance level is not included in Section II, column (4) of the Maintenance Allocation Chart. Functions to this level of maintenance are identified by a work-time figure in the “H” column of Section II, column (4), and an associated reference code is used in the Remarks column (6). This code is keyed to Section IV, Remarks, and the SRA complete repair application is explained there.

e. **Column 5, Tools and Test Equipment reference code.** Column 5 specifies, by code, those common tools sets (not individual tools), common TMDE, and special tools, special TMDE, and special support equipment required to perform the designated function. Codes are keyed to tools and test equipment in Section III.

f. **Column 6, Remarks.** When applicable, this column contains a letter code, in alphabetical order, which is keyed to the remarks contained in Section IV.

#### **B-4 EXPLANATION OF COLUMNS IN TOOL AND TEST EQUIPMENT REQUIREMENTS, SECTION III.**

a. **Column 1, Reference Code.** The tool and test equipment reference code correlates with a code used in the MAC, Section II, Column 5.

b. **Column 2, Maintenance Level.** The lowest level of maintenance authorized to use the tool or test equipment.

c. **Column 3, Nomenclature.** Name or identification of the tool or test equipment.

d. **Column 4, National Stock Number.** The National Stock Number of the tool or test equipment.

e. **Column 5, Tool Number.** The manufacturer's part number, model number, or type number.

#### **B-5 EXPLANATION OF COLUMNS IN REMARKS, SECTION IV.**

a. **Column 1, Remarks Code.** The code recorded in column 6, Section II.

b. **Column 2, Remarks.** This column lists information pertinent to the maintenance function being performed as indicated in the MAC, Section II.

**Section II. MAINTENANCE ALLOCATION CHART  
FOR  
M109A6**

(1)  GROUP NUMBER	(2)  COMPONENT/ASSEMBLY	(3)  MAINT. FUNCTION	(4)  MAINTENANCE LEVEL					(5)  TOOLS AND EQUIPMENT REF CODE	(6)  REMARKS CODE
			UNIT		DIRECT SUPPORT	GENERAL SUPPORT	DEPOT		
			C	O	F	H	D		
0100	POWERPACK	TEST	.0	3.6	.0	.0	.0	21, 45, 46	
		REM/INS	.0	2.8	.0	.0	.0	21, 45	
		REPAIR	.0	3.3	1.1	.0	.0	14, 17, 18, 21, 45	
0100	ENGINE ASSEMBLY	INSPECT	.1	1.0	.0	.0	.0		A
		TEST	.0	.2	.0	.0	.0		
		SERVICE	.0	.3	.0	.0	.0	21	
		REPLACE	.0	.0	6.0	.0	.0	14, 21, 38 53	
		REPAIR	.0	4.4	8.3	16.5	.0	17, 21, 45	
		OVERHAUL	.0	.0	.0	.0	****		
0100	BRACKET, ENGINE MOUNTING	REPLACE	.0	6.0	.0	.0	.0	21, 41, 45	
		REPAIR	.0	6.3	.0	.0	.0	21, 41, 45	
0106	OIL FILTER ASSEMBLY	SERVICE	.0	.1	.0	.0	.0		
		REPLACE	.0	.5	.0	.0	.0	21	
		REPAIR	.0	.3	.0	.0	.0	21	
0302	FUEL PUMP & HANGER, RIGHT	REPLACE	.0	18.4	.0	.0	.0	21, 46	
		REPAIR	.0	2.5	.0	.0	.0	14, 21	
0302	FUEL PUMP & HANGER, LEFT	REPLACE	.0	.2	.0	.0	.0	21, 45, 46	
		REPAIR	.0	2.5	.0	.0	.0	14, 21	
0302	PUMP ASSEMBLY, FUEL	TEST	.0	1.0	.0	.0	.0	17, 61	
		SERVICE	.0	1.0	.0	.0	.0	17, 21	
		REPLACE	.0	1.0	.0	.0	.0	17, 21	
0304	AIR CLEANER, INTAKE ASSEMBLY	INSPECT	.0	.2	.0	.0	.0		
		REPLACE	.0	.8	.0	.0	.0	21	
		REPAIR	.0	.7	.0	.0	.0	21	
0304	BOX, AIR CLEANER	REPLACE	.0	1.6	.0	.0	.0	21	
		REPAIR	.0	1.7	.0	.0	.0	21	
0304	CAP ASSEMBLY, AIR CLEANER	REPLACE	.0	1.7	.0	.0	.0	21	
		REPAIR	.0	1.8	.0	.0	.0	21	
0304	BLOWER, AIR CLEANER	REPLACE	.0	.5	.0	.0	.0	21	

**Section II. MAINTENANCE ALLOCATION CHART  
FOR  
M109A6 – CONTINUED**

(1)  GROUP NUMBER	(2)  COMPONENT/ASSEMBLY	(3)  MAINT. FUNCTION	(4)  MAINTENANCE LEVEL					(5)  TOOLS AND EQUIPMENT REF CODE	(6)  REMARKS CODE
			UNIT		DIRECT SUPPORT	GENERAL SUPPORT	DEPOT		
			C	O	F	H	D		
		REPAIR	.0	.0	1.5	.0	.0	14, 20, 24, 50	
0306	TANK, FUEL, UPPER	REPLACE	.0	.0	16.8	.0	.0	10, 14, 21	
		REPAIR	.0	.0	22.8	.0	.0	10, 14, 21	
0306	TANK, FUEL, LOWER	REPLACE	.0	.0	20.9	.0	.0	10, 14, 21 45, 46	
		REPAIR	.0	.0	6.0	.0	.0		
0309	PRIMARY FUEL FILTER	INSPECT	.1	.0	.0	.0	.0		
		SERVICE	.0	.3	.0	.0	.0	21	
		REPLACE	.0	.5	.0	.0	.0	17	
		REPAIR	.0	.3	.0	.0	.0	17, 21	
0309	SECONDARY FUEL FILTER	INSPECT	.1	.0	.0	.0	.0		
		SERVICE	.0	.3	.0	.0	.0	21	
		REPLACE	.0	.5	.0	.0	.0	17	
		REPAIR	.0	.3	.0	.0	.0	17, 21	
0312	BRACKET, THROTTLE	REPLACE	.0	.2	.0	.0	.0	21	
		REPAIR	.0	.1	.0	.0	.0	21	
0312	BRACKET ASSEMBLY, FUEL SHUTOFF CONTROLS	REPLACE	.0	.1	.0	.0	.0	21	
		REPAIR	.0	.2	.0	.0	.0	21	
0312	CONTROL ASSEMBLY, FUEL SHUTOFF	REPLACE	.0	.2	.0	.0	.0	21	
0501	RADIATOR, ENGINE	REPLACE	.0	1.7	.0	.0	.0	21	
		REPAIR	.0	.3	1.0	.0	.0	21	
0502	SHROUD ASSEMBLY, RADIATOR FAN	REPLACE	.0	2.2	.0	.0	.0	21	
		REPAIR	.0	2.1	.0	.0	.0	21, 45	
0505	FAN ASSEMBLY, ENGINE COOLING	INSPECT	.1	.0	.0	.0	.0		
		REPLACE	.0	0	2.5	.0	.0	18, 21, 45	
		REPAIR	.0	.1	.5	.0	.0	14, 15, 21 24, 43	

**Section II. MAINTENANCE ALLOCATION CHART  
FOR  
M109A6 - CONTINUED**

(1)  GROUP NUMBER	(2)  COMPONENT/ASSEMBLY	(3)  MAINT. FUNCTION	(4)  MAINTENANCE LEVEL					(5)  TOOLS AND EQUIPMENT REF CODE	(6)  REMARKS CODE	
			UNIT		DIRECT SUPPORT	GENERAL SUPPORT	DEPOT			
			C	O	F	H	D			
0505	GEAR BOX ASSEMBLY, ENGINE COOLING FAN	SERVICE	.0	2.0	.0	.0	.0	21, 45		
		REPLACE	.0	.0	2.5	.0	.0	12, 14, 21,		
		REPAIR	.0	.0	.6	.0	.0	21, 24		
0505	DRIVE ASSEMBLY, ENGINE COOLING FAN	REPLACE	.0	.0	.8	.0	.0	21		
		REPAIR	.0	.0	3.3	.0	.0	6, 12, 14, 15 16, 21, 25, 50, 60		
0601	CRADLE BRACKET	REPLACE	.0	8.5	.0	.0	.0	10, 18, 21 45		
		REPAIR	.0	9.5	.0	.0	.0	10, 18, 21 45		
0601	PULLEY, GROOVED	REPLACE	.0	1.0	.0	.0	.0	18, 21		
		REPAIR	.0	.0	.3	.0	.0	1, 15, 21, 47, 50		
0601	650 AMP GENERATOR	ALIGN	.0	1.0	.0	.0	.0	18, 21, 48		
		REPLACE	.0	14.4	.0	.0	.0	18, 21, 23, 45		
		REPAIR	.0	15.1	.0	.0	*	10, 18, 21, 45		B
0601	SHAFT, GENERATOR DRIVE	REPLACE	.0	.1	.0	.0	.0	21, 23		
0601	ROTOR-SLEEVE ASSEMBLY	REPLACE	.0	.0	.0	.0	*		B	
		REPAIR	.0	.0	.0	.0	*			
0601	STATOR, ENGINE GENERATOR	REPLACE	.0	.0	.0	.0	*		B	
		REPAIR	.0	.0	.0	.0	*			
0601	ROTOR, GENERATOR	REPLACE	.0	.0	.0	.0	*		B	
		REPAIR	.0	.0	.0	.0	*			
0603	STARTER, ENGINE	INSPECT	.0	.2	.0	.0	.0			
		TEST	.0	.0	.5	.0	.0			
		REPLACE	.0	6.8	.0	.0	.0			17, 21, 45
		REPAIR	.0	.0	2.0	.0	.0			
0607	PANEL ASSEMBLY, DRIVER'S INSTRUMENT	REPLACE	.0	.6	.0	.0	.0	21		
		REPAIR	.1	2.6	.0	.0	.0	18, 21		

**Section II. MAINTENANCE ALLOCATION CHART  
FOR  
M109A6 – CONTINUED**

(1)  GROUP NUMBER	(2)  COMPONENT/ASSEMBLY	(3)  MAINT. FUNCTION	(4)  MAINTENANCE LEVEL					(5)  TOOLS AND EQUIPMENT REF CODE	(6)  REMARKS CODE
			UNIT		DIRECT SUPPORT	GENERAL SUPPORT	DEPOT		
			C	O	F	H	D		
0607	SUPPORT ASSEMBLY, DRIVER'S INSTRUMENT PANEL	REPLACE	.0	.5	.0	.0	.0	21	
		REPAIR	.0	1.0	.0	.0	.0	18, 21	
0607	DRIVER'S PORTABLE INSTRUMENT PANEL	REPLACE	.0	.6	.0	.0	.0		
		REPAIR	.1	2.6	.0	.0	.0	18, 21	
0607	CONTROL BOX, GUN TUBE TRAVEL LOCK	REPLACE	.0	.3	.0	.0	.0	21	
		REPAIR	.0	.4	.9	.0	.0	14, 17, 24	
0607	CONTROL BOX, VOLTAGE REGULATOR	REPLACE	.0	.5	.0	.0	.0	21	
		REPAIR	.0	1.0	1.0	.0	.0	14, 21, 24	
0607	CONTROL BOX, ACCESSORY	REPLACE	.0	.5	.0	.0	.0	21	
		REPAIR	.0	2.5	.0	.0	.0	14, 24, 44, 49	
0607	ENCLOSURE ASSEMBLY, CREW COMPARTMENT WARNING LIGHT	REPLACE	.0	.2	.0	.0	.0	21	
		REPAIR	.0	.0	.7	.0	.0	14, 24	
0608	SUPPORT ASSEMBLY, STARTER PROTECTION AND BILGE PUMP RELAYS	REPLACE	.0	1.0	.0	.0	.0	18, 21	
		REPAIR	.0	1.0	.0	.0	.0	18, 21	
0608	COMBAT OVERRIDE SWITCH	REPLACE	.0	.2	.0	.0	.0	21	
		REPAIR	.0	.2	.0	.0	.0	21	
0609	HEADLIGHT	REPLACE	.0	.5	.0	.0	.0	21	
		REPAIR	.0	.5	.0	.0	.0	21	
0609	LIGHT, DOME	REPLACE	.0	.2	.0	.0	.0	21	
		REPAIR	.0	.4	.0	.0	.0	21	
0613	WIRING HARNESS W100	REPLACE	.0	.8	.0	.0	.0	21, 22	
		REPAIR	.0	1.3	1.0	.0	.0	14, 18, 21, 22, 24, 51	
0613	WIRING HARNESS W101	REPLACE	.0	.8	.0	.0	.0	21, 22	
		REPAIR	.0	1.3	1.5	.0	.0	14, 17, 21, 22, 51	
0613	WIRING HARNESS W102	REPLACE	.0	.9	.0	.0	.0	21	
		REPAIR	.0	1.4	1.0	.0	.0	17, 21, 22, 51	



**Section II. MAINTENANCE ALLOCATION CHART  
FOR  
M109A6 – CONTINUED**

(1)  GROUP NUMBER	(2)  COMPONENT/ASSEMBLY	(3)  MAINT. FUNCTION	(4)  MAINTENANCE LEVEL					(5)  TOOLS AND EQUIPMENT REF CODE	(6)  REMARKS CODE
			UNIT		DIRECT SUPPORT	GENERAL SUPPORT	DEPOT		
			C	O	F	H	D		
0613	WIRING HARNESS W104	REPLACE	.0	1.2	.0	.0	.0	21, 22	
		REPAIR	.0	1.7	1.7	.0	.0	14, 17, 21, 22, 51	
0613	WIRING HARNESS W105	REPLACE	.0	2.1	.0	.0	.0	21, 22	
		REPAIR	.0	3.5	1.5	.0	.0	17, 21, 22, 51	
0613	WIRING HARNESS W106	REPLACE	.0	.6	.0	.0	.0	21, 22	
		REPAIR	.0	1.1	1.5	.0	.0	14, 17, 21, 22, 51	
0613	WIRING HARNESS W107	REPLACE	.0	.7	.0	.0	.0	21, 22	
		REPAIR	.0	1.2	.0	.0	.0	17, 21, 22, 51	
0613	WIRING HARNESS W110	REPLACE	.0	.6	.0	.0	.0	21, 22	
		REPAIR	.0	1.1	.0	.0	.0	17, 21, 22, 51	
0613	WIRING HARNESS W111A	REPLACE	.0	2.4	.0	.0	.0	18, 21, 22	
		REPAIR	.0	3.9	1.0	.0	.0	13, 18, 21, 22, 24, 51	
0613	WIRING HARNESS W112	REPLACE	.0	2.0	.0	.0	.0	21, 22	
		REPAIR	.0	3.5	1.0	.0	.0	13, 18, 21, 22, 24, 51	
0613	WIRING HARNESS W113	REPLACE	.0	.6	.0	.0	.0	21, 22	
		REPAIR	.0	1.5	.3	.0	.0	17, 21, 22, 51	
0613	WIRING HARNESS W114	REPLACE	.0	2.0	.0	.0	.0	21, 22	
		REPAIR	.0	3.5	1.0	.0	.0	13, 14, 18, 21, 22, 51	
0613	WIRING HARNESS W115	REPLACE	.0	2.0	.0	.0	.0	21, 22	
		REPAIR	.0	3.5	1.0	.0	.0	13, 18, 21, 22, 24, 51	
0613	WIRING HARNESS W116	REPLACE	.0	2.1	.0	.0	.0	17, 18, 21	
		REPAIR	.0	3.5	.0	.0	.0	17, 18, 21, 51	

**Section II. MAINTENANCE ALLOCATION CHART  
FOR  
M109A6 – CONTINUED**

(1)  GROUP NUMBER	(2)  COMPONENT/ASSEMBLY	(3)  MAINT. FUNCTION	(4)  MAINTENANCE LEVEL					(5)  TOOLS AND EQUIPMENT REF CODE	(6)  REMARKS CODE
			UNIT		DIRECT SUPPORT	GENERAL SUPPORT	DEPOT		
			C	O	F	H	D		
0613	WIRING HARNESS W117	REPLACE	.0	2.0	.0	.0	.0	18, 21, 22	
		REPAIR	.0	3.5	.0	.0	.0	18, 21, 22, 51	
0613	WIRING HARNESS W119	REPLACE	.0	2.0	.0	.0	.0	21, 22	
		REPAIR	.0	3.5	1.0	.0	.0	14, 18, 21, 22, 51	
0613	WIRING HARNESS W124	REPLACE	.0	2.0	.0	.0	.0	21, 22	
		REPAIR	.0	3.5	1.0	.0	.0	13, 18, 21, 22, 24, 51	
0613	WIRING HARNESS W126	REPLACE	.0	.1	.0	.0	.0	21, 22	
		REPAIR	.0	.0	.3	.0	.0	17, 21, 22	
0613	LEAD ASSEMBLY (SLIP RING NEGATIVE)	REPLACE	.0	.7	.0	.0	.0	18, 21, 22	
		REPAIR	.0	1.2	.0	.0	.0	18, 21, 22, 51	
0613	LEAD ASSEMBLY (LEFT SLIP RING REAR NEGATIVE TO REAR SLAVE RECEPTACLE)	REPLACE	.0	.7	.0	.0	.0	18, 21, 22	
		REPAIR	.0	1.2	.0	.0	.0	18, 21, 22, 51	
0613	LEAD ASSEMBLY (RIGHT SLIP RING REAR NEGATIVE TO REAR SLAVE RECEPTACLE)	REPLACE	.0	.7	.0	.0	.0	18, 21, 22	
		REPAIR	.0	1.2	.0	.0	.0	18, 21, 22, 51	
0616	FAN, VENTILATING	REPLACE	.0	1.0	.0	.0	.0	21, 22	
		REPAIR	.0	.0	1.0	.0	.0	24	
0616	MOTOR, DIRECT, VENTILATING FAN	REPLACE	.0	.0	.5	.0	.0	24	
		REPAIR	.0	.0	1.0	.0	.0	20, 24, 61	
0616	FAN ASSEMBLY, LEAD FILTER	REPLACE	.0	1.0	.0	.0	.0	21, 22	
		REPAIR	.0	1.0	.0	.0	.0	21, 22	
0705	BASE ASSEMBLY, SHIFT CONTROL	INSPECT	.0	.5	.0	.0	.0		
		REPLACE	.0	.7	.0	.0	.0	21	
		REPAIR	.0	1.0	.0	.0	.0	17, 21	

**Section II. MAINTENANCE ALLOCATION CHART  
FOR  
M109A6 – CONTINUED**

(1)  GROUP NUMBER	(2)  COMPONENT/ASSEMBLY	(3)  MAINT. FUNCTION	(4)  MAINTENANCE LEVEL					(5)  TOOLS AND EQUIPMENT REF CODE	(6)  REMARKS CODE
			UNIT		DIRECT SUPPORT	GENERAL SUPPORT	DEPOT		
			C	O	F	H	D		
0710	TRANSMISSION	INSPECT	.1	.1	.0	.0	.0	21, 60 21, 56, 57, 58 53 14, 21, 38	D
		TEST	.0	.2	.0	.0	.0		
		ADJUST	.0	1.0	.0	.0	.0		
		REPLACE	.0	.0	3.0	.0	.0		
		REPAIR	.0	.3	1.5	.0	2.0		
0710	FILTER, TRANSMISSION FLUID	SERVICE	.0	1.8	.0	.0	.0	10, 17, 21	
		REPLACE	.0	1.5	.0	.0	.0	10, 17, 21	
		REPAIR	.0	1.5	.0	.0	.0	10, 17, 21	
0710	HUB ASSEMBLY, TRANSMISSION	REPLACE	.0	.3	.0	.0	.0	18, 21	
		REPAIR	.0	.5	.0	.0	.0	21	
0710	COVER, ACCESS, TRANSMISSION OIL SENSORS	ADJUST	.0	.1	.0	.0	.0	21	
		REPLACE	.0	.4	.0	.0	.0	21	
		REPAIR	.0	.5	.0	.0	.0	21	
0801	FINAL DRIVE	INSPECT	.0	.3	.0	.0	.0	21	
		SERVICE	.2	.0	.0	.0	.0		
		REPLACE	.0	5.0	.0	.0	.0	7, 18, 21, 28, 34, 62	
		REPAIR	.0	.0	20.0	.0	.0	4, 5, 14, 15, 21	
0801	CLEVIS, CLAMPING, QUICK DISCONNECT	REPLACE	.0	.3	.0	.0	.0	18, 21	
		REPAIR	.0	.5	.0	.0	.0	21	
0801	HUB, FINAL DRIVE	REPLACE	.0	.3	.0	.0	.0	18, 21	
		REPAIR	.0	.5	.0	.0	.0	21	
0801	COUPLING ASSEMBLY, FINAL DRIVE	INSPECT	.2	.3	.0	.0	.0	18, 21	
		SERVICE	.2	.0	.0	.0	.0		
		REPLACE	.0	.7	.0	.0	.0	17, 21	
		REPAIR	.0	.0	.0	.0	.0		
0801	TRANSFER	REPLACE	.0	.0	1.5	.0	.0	14, 38	D
		REPAIR	.0	.0	1.8	.0	.0		

**Section II. MAINTENANCE ALLOCATION CHART  
FOR  
M109A6 – CONTINUED**

(1)  GROUP NUMBER	(2)  COMPONENT/ASSEMBLY	(3)  MAINT. FUNCTION	(4)  MAINTENANCE LEVEL					(5)  TOOLS AND EQUIPMENT REF CODE	(6)  REMARKS CODE
			UNIT		DIRECT SUPPORT	GENERAL SUPPORT	DEPOT		
			C	O	F	H	D		
1201	PARK BRAKE ASSEMBLY	REPLACE	.0	1.9	.0	.0	.0	21	
		REPAIR	.0	2.4	.0	.0	.0	21	
1301	ROAD ARM ASSEMBLY	INSPECT	.1	.0	.0	.0	.0		
		SERVICE	.1	.0	.0	.0	.0		
		REPLACE	.0	1.5	.0	.0	.0	17, 18, 21, 27, 39, 42, 52, 54, 55, 62	
		REPAIR	.0	1.6	.0	.0	.0	1, 14, 15, 17, 18, 21, 27, 29, 30, 32, 33, 35, 39, 42	
1301	HUB ASSEMBLY, WHEEL	INSPECT	.1	.1	.0	.0	.0		
		SERVICE	.1	.0	.0	.0	.0		
		REPLACE	.0	1.2	.0	.0	.0	17, 18, 21, 30, 35	
		REPAIR	.0	2.0	.0	.0	.0	17, 18, 21, 30, 35, 36	
1301	HOUSING, MECHANICAL	REPLACE	.0	.3	.0	.0	.0	21	
		REPAIR	.0	.7	.0	.0	.0	21, 29, 35	
1301	ARM & HUB ASSEMBLY	INSPECT	.1	.0	.0	.0	.0		
		REPLACE	.0	1.5	.0	.0	.0	21	
		REPAIR	.0	1.5	.0	.0	.0	17, 18, 21, 30, 31, 35, 36	
1301	ARM & HOUSING	SERVICE	.1	.0	.0	.0	.0		
		REPLACE	.0	1.5	.0	.0	.0	18, 21, 33, 40, 52, 54, 55	
		REPAIR	.0	.2	1.3	.0	.0	14, 15, 21, 29, 32, 33, 35	

**Section II. MAINTENANCE ALLOCATION CHART  
FOR  
M109A6 – CONTINUED**

(1)  GROUP NUMBER	(2)  COMPONENT/ASSEMBLY	(3)  MAINT. FUNCTION	(4)  MAINTENANCE LEVEL					(5)  TOOLS AND EQUIPMENT REF CODE	(6)  REMARKS CODE
			UNIT		DIRECT SUPPORT	GENERAL SUPPORT	DEPOT		
			C	O	F	H	D		
1301	WHEEL,SOLID,RUBBER	INSPECT	.1	2.0	.0	.0	.0	17, 26	E
		REPLACE	.0	1.6	.0	.0	.0	17, 21, 40	
		REPAIR	.0	.0	.0	.0	2.0		
1303	ARM ASSEMBLY, IDLER	INSPECT	.1	.1	.0	.0	.0		
		SERVICE	.1	.0	.0	.0	.0		
		REPLACE	.0	2.5	.0	.0	.0	18, 21, 30, 35	
		REPAIR	.0	8.0	.0	.0	.0	17, 18, 21, 30, 35, 36	
1303	CYLINDER ASSEMBLY, TRACK ADJUSTER	INSPECT	.1	.0	.0	.0	.0		
		REPLACE	.0	1.5	.0	.0	.0	18, 21	
		REPAIR	.0	1.0	1.5	.0	.0	8, 14, 15, 18, 21	
1305	TRACK ASSEMBLY	INSPECT	.1	2.0	.0	.0	.0	17, 21	
		ADJUST	.1	.0	.0	.0	.0		
		REPLACE	.0	12.0	.0	.0	.0	17, 21, 39, 39.1, 42, 62	
		REPAIR	1.1	.0	.0	.0	.0	17	
1305	TRACK SHOE	REPLACE	.0	1.1	.0	.0	.0	17, 21, 39, 39.1, 42, 62	
		REPAIR	.0	.3	.0	.0	.0	17, 21, 39, 39.1, 42, 62	
1503	PINTLE ASSEMBLY	INSPECT	.1	.0	.0	.0	.0		
		SERVICE	.1	.0	.0	.0	.0		
		REPLACE	.0	.5	.0	.0	.0	21	
		REPAIR	.0	.5	.0	.0	.0	21	
1503	TOW LUGS	REPLACE	.0	.0	1.5	.0	.0	11	
		REPAIR	.0	.5	.0	.0	.0	21	
1604	SHOCK ABSORBER	INSPECT	.5	1.0	.0	.0	.0		
		REPLACE	.0	1.0	.0	.0	.0	18, 21, 27	
		REPAIR	.0	.3	.0	.0	.0	18, 21, 37	
1801	GRILLE	REPLACE	.0	.3	.0	.0	.0		
		REPAIR	.0	.5	.0	.0	.0	18, 21	

**Section II. MAINTENANCE ALLOCATION CHART  
FOR  
M109A6 – CONTINUED**

(1)  GROUP NUMBER	(2)  COMPONENT/ASSEMBLY	(3)  MAINT. FUNCTION	(4)  MAINTENANCE LEVEL					(5)  TOOLS AND EQUIPMENT REF CODE	(6)  REMARKS CODE
			UNIT		DIRECT SUPPORT	GENERAL SUPPORT	DEPOT		
			C	O	F	H	D		
1801	ENGINE ACCESS COVER	REPLACE	.0	.3	.0	.0	.0	21	
		REPAIR	.0	.8	.0	.0	.0	21	
1801	LOCK, TRAVEL, GUN TUBE	ADJUST	.0	.2	.0	.0	.0	21	
		SERVICE	.1	.0	.0	.0	.0	18	
		REPLACE	.0	.2	.0	.0	.0	9, 21	
		REPAIR	.0	2.2	.0	.0	.0	2, 3, 9, 18 21	
1801	ACTUATOR ASSEMBLY, GUN TUBE TRAVEL LOCK	ADJUST	.0	1.5	.0	.0	.0	21	
		REPLACE	.0	.1	.0	.0	.0	21	
		REPAIR	.0	1.0	1.0	.0	2.0	17, 21	
1801	PIN ASSEMBLY, GUN TUBE TRAVEL LOCK	REPLACE	.0	.1	.0	.0	.0	21	
		REPAIR	.0	.1	.0	.0	.0	21	
1801	ROD, UPPER, GUN TUBE TRAVEL LOCK	REPLACE	.0	.1	.0	.0	.0	18, 21	
		REPAIR	.0	.3	.0	.0	.0	18, 21	
1801	FRAME ASSEMBLY, GUN TUBE TRAVEL LOCK	REPLACE	.0	.3	.0	.0	.0	9, 18, 21	
		REPAIR	.0	.4	.0	.0	.0	18, 21	
1801	LEVER ASSEMBLY, GUN TUBE TRAVEL LOCK	REPLACE	.0	.3	.0	.0	.0	9, 21	
		REPAIR	.0	.4	.0	.0	.0	9, 18, 21	
1801	PAD ASSEMBLY, GUN TUBE TRAVEL LOCK	REPLACE	.0	.1	.0	.0	.0	18, 21	
		REPAIR	.0	.4	.0	.0	.0	18, 21	
1801	GUN TUBE TRAVEL LOCK SUPPORT BRACKET BEARINGS	REPLACE	.0	24.7	.0	.0	.0	9, 21	
1803	COVER ASSEMBLY, DRIVER'S HATCH	REPLACE	.0	2.0	.0	.0	.0	18, 21	
		REPAIR	.0	.5	.0	.0	.0	21	
1803	HOUSING, DRIVER'S HATCH	REPLACE	.0	.5	.0	.0	.0	21	
		REPAIR	.0	.0	.5	.0	.0	15	
1803	VIEWER, INFRARED	REPLACE	.1	.1	.0	.0	.0		
		REPAIR	.0	.0	.0	.0	1.0		

**Section II. MAINTENANCE ALLOCATION CHART  
FOR  
M109A6 – CONTINUED**

(1)  GROUP NUMBER	(2)  COMPONENT/ASSEMBLY	(3)  MAINT. FUNCTION	(4)  MAINTENANCE LEVEL					(5)  TOOLS AND EQUIPMENT REF CODE	(6)  REMARKS CODE
			UNIT		DIRECT SUPPORT	GENERAL SUPPORT	DEPOT		
			C	O	F	H	D		
1804	DRAIN PLUG ASSEMBLY	REPLACE	.0	.1	.0	.0	.0	21	
		REPAIR	.0	.2	.0	.0	.0	21	
1806	DRIVER'S SEAT ASSEMBLY	REPLACE	.0	2.0	.0	.0	.0	21	
		REPAIR	.0	1.5	.0	.0	.0	21	
1808	BRACKET, NIGHTVIEWER	REPLACE	.0	.1	.0	.0	.0	21	
		REPAIR	.0	.1	.0	.0	.0	18, 21	
1808	BRACKET, GUN BARREL	REPLACE	.0	.1	.0	.0	.0		
		REPAIR	.0	.3	.0	.0	.0	21	
1808	BRACKET, GUN BUTT	REPLACE	.0	.1	.0	.0	.0		
		REPAIR	.0	.4	.0	.0	.0	21	
1808	BRACKET ASSEMBLY, PERISCOPE MOUNTING	REPLACE	.0	.2	.0	.0	.0	21	
		REPAIR	.0	.1	.0	.0	.0	17, 21	
1808	BOX, ACCESSORIES	REPLACE	.0	.1	.0	.0	.0	21	
		REPAIR	.0	.2	.0	.0	.0	21	
1808	LATCH ASSEMBLY	REPLACE	.0	.1	.0	.0	.0	21	
		REPAIR	.0	.3	.0	.0	.0	21	
1808	LATCH ASSEMBLY	REPLACE	.0	.1	.0	.0	.0	21	
		REPAIR	.0	.3	.0	.0	.0	21	
2005	PIN ASSEMBLY, LATCH, ANCHOR SPADE	REPLACE	.0	.1	.0	.0	.0	21	
		REPAIR	.0	.1	.0	.0	.0	21	
2205	PUMP ASSEMBLY, BILGE	INSPECT	.1	.1	.0	.0	.0		
		REPLACE	.0	6.0	.0	.0	.0	21, 45	
		REPAIR	.0	.0	1.5	.0	.0	14, 20, 24 49, 60	
2207	SUPPORT ASSEMBLY, PERSONNEL HEATER	REPLACE	.0	.3	.0	.0	.0	21	
		REPAIR	.0	.2	.0	.0	.0	21	

**Section II. MAINTENANCE ALLOCATION CHART  
FOR  
M109A6 – CONTINUED**

(1)  GROUP NUMBER	(2)  COMPONENT/ASSEMBLY	(3)  MAINT. FUNCTION	(4)  MAINTENANCE LEVEL					(5)  TOOLS AND EQUIPMENT REF CODE	(6)  REMARKS CODE
			UNIT		DIRECT SUPPORT	GENERAL SUPPORT	DEPOT		
			C	O	F	H	D		
2207	HEATER ASSEMBLY, PERSONNEL	INSPECT	.1	.0	.0	.0	.0	18, 21	
		TEST	.0	.2	.0	.0	.0		
		ADJUST	.0	.2	.0	.0	.0		
		SERVICE	.0	.2	.0	.0	.0		
		REPLACE	.0	1.5	.0	.0	.0		
3303	WINTERIZATION KIT	REPAIR	.0	.0	3.5	.0	.0	17, 21	
		SERVICE	.0	.5	.0	.0	.0		
		REM/INS	.0	.0	16.0	.0	.0		
3303	COOLANT HEATER	REPAIR	.0	.6	.0	.0	.0	21	
		TEST	.0	.0	****	.0	.0		
		REPLACE	.0	1.0	.0	.0	.0		
3303	BLOWER MOTOR ASSEMBLY	REPAIR	.0	.0	2.0	.0	.0	24	F
		REPLACE	.0	.0	.3	.0	.0		
3303	HEATER CONTROL BOX	REPAIR	.0	.0	.8	.0	.0	24	
		REPLACE	.0	.5	.0	.0	.0		
7639	CYLINDER ASSEMBLY, FIRE EXTINGUISHER	REPAIR	.0	.0	1.5	.0	.0	21	
		REPLACE	.0	.3	.0	.0	.0		
		SERVICE	.0	.0	1.0	.0	.0		
9110	HEATER, MCS	REPLACE	.0	.2	.0	.0	.0	21	
		REPAIR	.0	2.0	.0	.0	.0		



**Section III. TOOLS AND TEST EQUIPMENT  
FOR  
M109A6**

TOOLS OR TEST EQUIPMENT REF CODE	MAINTENANCE LEVEL	NOMENCLATURE	NATIONAL STOCK NUMBER	TOOL NUMBER
1	O	ADAPTER, SOCKET	5120-00-227-8095	A-A-2172
2	O	ADAPTER, SOCKET	5120-00-227-8088	SH-131
3	O	CROWFOOT, SOCKET	5120-01-348-9472	AN8508-18A
4	H	SOCKET, SOCKET WR	5130-00-076-8631	IM1123
5	H	WORK STAND, FINAL DR	****_**_***_****	MI015
6	F	BRACKET, FABRICATED	****_**_***_****	MI016
7	O	BOLT, EYE	5306-00-050-0347	MS51937-5
8	F	WRENCH, ADJ SPANNER	5210-00-516-3863	MS8516-1
9	O	SLING, ENDLESS 4 FT	3940-00-675-5002	PD101-48
10	O,F	SLING, ENDLESS 8 FT	3940-00-675-5003	PD101-96
11	F	WELDING SHOP, TRLMTD	3431-01-090-1231	SC 3431-95-CL-A04
12	F,H	SH EQPT, MACHINE SHOP	3470-00-754-0708	SC 3470-95-CL-A02
13	F	SH EQPT, F&E SYSTEM	4940-00-754-0714	SC 4910-95-CL-A01
14	F,H	SH EQPT, AUTO MAINT	4910-00-754-0705	SC 4910-95-CL-A31
15	F	SH EQPT, AUTO FLD	4910-00-754-0706	SC 4910-95-CL-A62
16	F	SH EQPT, FM #2 SUPPL	4910-00-754-0707	SC 4910-95-CL-A63
17	C,O,F	SHOP EQPT, COMMON #2	4910-00-754-0650	SC 4910-95-CL-A72
18	C,O,F	SHOP EQPT, COMMON #1	4910-00-754-0654	SC 4910-95-CL-A74
19	O	TOOL SET, ORG MAINT	4940-00-754-0743	SC 4940-95-CL-A08
20	F	SH EQPT, F&E SYSTEM	4940-00-754-0714	SC 4940-95-B20
21	O,F,H	TOOL KIT, GEN MECH	5180-00-177-7033	SC 5180-90-CL-N26
22	H	TOOL KIT, ELECR EQPT	5180-00-605-0079	SC 5180-91-S21
23	O,F	TOOL KIT, ARTY/TUR	5180-00-357-7727	SC 5180-95-CL-A12
24	F	TOOL KIT, AUTO, F&E	5180-00-754-0655	SC 4910-95-CL-A50
25	F	MICROMETER, DEPTH	5210-00-542-4602	1JA1651H05
26	O	GAGE, ROADWHEEL	4910-00-034-0874	10911904
27	O	PULLER, SHOCK ABS	5120-00-084-7626	10913972
28	O	SLING, LIFTING, FINAL	4910-00-034-0875	10914179
29	F	REPLACER, OIL SEAL	5120-00-034-0878	10914185
30	O	REPLACER, OIL SEAL	5120-00-034-0879	10914186
31	O	REPLACER, BEARING	5120-00-034-0880	10914187

**Section III. TOOLS AND TEST EQUIPMENT  
FOR  
M109A6 – CONTINUED**

<b>TOOLS OR TEST EQUIPMENT REF CODE</b>	<b>MAINTENANCE LEVEL</b>	<b>NOMENCLATURE</b>	<b>NATIONAL STOCK NUMBER</b>	<b>TOOL NUMBER</b>
32	F	REPLACER, OIL SEAL	5120-00-034-0881	10914188
33	O,F	SOCKET, WRENCH, FACE	5120-00-034-0867	10914193
34	O	PIN, GUIDE	5315-00-034-0883	10914195
35	O,F	HANDLE, REPLACER	5340-00-034-0884	10914196
36	O	REPLACER, BEARING	5120-00-034-0885	10914197
37	O	PULLER, BEARING	5120-00-084-7627	10925993
38	F	SLING, LIFTING, ENG	3940-00-977-7398	10930560
39	O	PULLER, END CONNECT	5180-01-388-7855	57K3156
40	O,F	LIFTER, ROADWHEEL	4910-00-912-4469	11593605
41	O	WRENCH (1), BOX	5120-00-051-5567	11605662
42	O,F	PULLER, END CONNECT	5120-01-052-5642	12285479
43	F	SOCKET, WRENCH, FACE	5120-01-255-8232	12268253
44	F	TUBING, NONMETALLIC	4720-01-377-7404	12268571-1
45	O,F	SLING, POWERPACK	3940-01-280-0872	12355173
46	O,F	KIT, GROUND HOP	2920-01-372-6574	12370819
47	F	TOOL, PULLEY ASSEMBLY	3020-01-374-0765	12370877
48	O	GEN ALIGNMENT TOOL	4910-01-376-3166	12370878
49	F	RIVETER, HAND	5120-00-017-2849	250K
50	F	PLIERS, SNAP RING	5120-00-789-0492	4440R
51	O,F	HEATER, GUN TYPE	4940-01-028-7493	500A
52	O,F	PULLER, SLIDE HAMMER	5120-00-557-3615	5573615
53	F	SLING, LIFTING	4910-00-473-7556	7081593
54	O,F	WR TORSION BAR NUT	5120-00-708-3642	7083642
55	O,F	ADAPTER, MECH PULLER	5120-01-017-5328	12251805
56	O	GAGE, BRAKE	5210-00-733-5005	8351213
57	O	WRENCH, BRAKE	3040-00-733-8909	8351386
58	O	WRENCH, BRAKE	3040-00-733-8912	8351387
59	O	GAGE, PRESSURE	6685-00-572-8612	8356176
60	F	PLIERS, WIRE-TWISTING	5120-00-542-4171	GGGW340SIZE12
61	O	HOSE ASSEMBLY NONMETAL	4720-00-080-8586	8708306
62	O,F	FIXTURE, TRACK CONN	5120-00-605-3926	8741739

**Section IV. REMARKS  
FOR  
M109A6**

REMARKS CODE	REMARKS
A	Refer to TM 9-2815-202-24&P
B	Refer to DMWR 9-2920-259
C	Refer to TM 9-2920-242-35, TM 9-2920-243-34, OR TM 9-2920-248-35
D	Refer to TM 9-2520-234-35
E	Refer to DMWR 9-2630-200/1
F	Refer to TM 9-2990-207-23&P

## APPENDIX C EXPENDABLE AND DURABLE ITEMS LIST

---

### Section I. INTRODUCTION

#### **C-1. SCOPE**

This appendix lists expendable and durable items you will need to maintain the M109A6 hull. This listing is for informational purposes only and is not authority to requisition the listed items. These items are authorized to you by CTA 50-970, expendable items (except Medical, Class V, Repair Parts, and Heraldic Items).

#### **C-2. EXPLANATION OF COLUMNS**

a. Column (1) – Item number. This number is assigned to the entry in the listing for referencing when required.

b. Column (2) – Level. This column identifies the lowest level of maintenance that requires the listed item.

C – Operator/Crew  
O – Unit Maintenance  
F – Direct Support Maintenance  
H – General Support Maintenance

c. Column (3) – National Stock Number. This is the national stock number assigned to the item; use it to request or requisition the item.

d. Column (4) – Description. Indicates the federal item name and, if required, a description to identify the item. The last line for each item indicates the Commercial and Government Entity Code (CAGEC) in parentheses followed by the part number.

e. Column (5) – Unit of Measure (U/M)/Unit of Issue (U/I). This measure is expressed by a two-character alphabetical abbreviation (e.g., EA, IN, PR). If the unit of measure differs from the unit of issue as shown in the Army Master Data File (AMDF), requisition the lowest unit of issue that will satisfy your requirements.

**SECTION II. EXPENDABLE AND DURABLE ITEMS LIST**

(1) Item Number	(2) Level	(3) National Stock Number	(4) Description	(5) (U/M)/ (U/I)
1	O	8040-00-262-9025 8040-00-262-9026	Adhesive: (81348) MMM-A-1617 4 OZ tube 8 OZ can	TU CN
2	O	8040-00-664-4318	Adhesive, 1 PT can: (81348) MMM-A-1617	PT
3	O	8040-00-298-1946	Adhesive, 8 OZ can: (81348) MMM-A-1617TY3	CN
4	O	8040-00-832-6173	Adhesive, 5 OZ tube: (81348) MMM-A-121	TU
5	O	8040-00-926-9133	Adhesive, 1 PT can: (81349) MIL-A-46091	PT
6	O	8040-00-117-8510	Adhesive, 3 OZ Tube: (81349) MIL-A-46146 Type III Clear	TU
7	O	8040-00-118-2695	Adhesive sealant (80244) MIL-A-46146TY1	KT
8	O	6850-00-181-7929	Antifreeze, 1 GL bottle: (81349) MILA46153	GL
9	O	6850-00-174-1806	Antifreeze, 55 GL drum: (81349) MILA11755	DR
10	O	8030-01-044-5034	Antisize Compound, 1 LB can: (81349) MIL-T-5544	LB
11	O	8105-00-299-8532	Bag, plastic (100 each) (58536) A-A-1668	BX
12	O	8115-00-190-5020	Box, shipping (10 each, bdl) (81348) PPP-B-636	BD
13	O	7920-00-514-2417	Brush, Acid Swabbing, 1 Gross: (81348) H-B-643	GR
14	O	9150-01-054-6453	Cleaner, Lubricant, 1 PT bottle: (81349) MIL-L-63460	PT
15	O	5350-00-268-3116	Cloth Abrasive, 50 YD roll (81348) P-C-458	RO
16	O	9150-00-702-7100	Compound, Lubricating, 1 QT can: (07161) NYLUBE	EA
17	O	7930-00-530-8067 7930-00-527-1207	Detergent, General Purpose (83421) P-D-220 TY2 1 GL can 5 GL can	GL CN
18	O	8110-00-146-1588	Drum, Shipping and Stowage (96906) MS27683-3	EA
19	O	9110-00-391-7813	Fuel, Jellied, Alcohol, 2-5/8 OZ can: (50616) 4006	CN
20	O	6515-01-150-2976 6515-01-150-2978 6515-01-150-2977	Gloves, patient, exam (package of 100) (89875) E-010 Size small E-012 Size medium E-011 Size large	PG
21	O	9620-00-233-6712	Graphite, Dry, 1 LB can: (81348) SSG659	LB
22	O	9150-00-985-7246 9150-00-985-7247 9150-00-985-7248	Grease, Aircraft: (81349) MIL-G-23827 1-3/4 LB can 6-1/2 LB can 35 LB can	CN CN CN

**SECTION II. EXPENDABLE AND DURABLE ITEMS LIST- CONTINUED**

(1) Item Number	(2) Level	(3) National Stock Number	(4) Description	(5) (U/M)/ (U/I)
23	O	9150-01-197-7693 9150-01-197-7690 9150-01-197-7689	Grease, Automotive: (81349) MIL-G-10924 14 OZ cartridge 1-3/4 LB can 6-1/2 LB can	CA LB CN
24	O	9150-00-985-7316 9150-00-823-8047	Grease, General: (81349) MIL-G-23549 1-3/4 LB can 35 LB can	CN CN
25	O	9150-00-754-2595 9150-00-223-4004 9150-00-965-2003	Grease, Molybdenum: (81349) MIL-G-21164 1-3/4 LB can 6-1/2 LB can 35 LB can	CN CN CN
26	O	6850-00-753-4967	Inhibitor, Corrosion, 6 OZ can: (81348) O-I-OO490	OZ
27	O	7510-01-036-3724	Ink, Marking, 1 PT can: (81349) M43553-IIBLKPT	PT
28	O	9150-00-402-4478 9150-00-402-2372	Lubricating Oil: (15445) CONOCODN600FLUID 1 QT can 5 GL can	QT CN
29	O	9150-00-543-7220	Lubricating Oil, 1 LB can: (81349) DOD-L-25681	LB
30	O	9150-00-189-6727 9150-00-186-6668	Lubricating Oil: (81349) MIL-L-2104 10W grade 1 QT can 5 GL can	QT CN
31	O	9150-01-152-4117 9150-01-152-4118	Lubricating Oil: (81349) MIL-L-2104 15W-40 Grade 1 QT can 5 GL can	QT CN
32	O	9150-00-186-6681 9150-00-188-9858	Lubricating Oil: (81349) MIL-L-2104 30W Grade 1 QT can 5 GL can	QT CN
33	O	9150-01-035-5392 9150-01-035-5393	Lubricating Oil: (81349) MIL-L-2105 80W-90 Grade 1 QT can 5 GL can	QT CN
34	O	9150-01-260-2534 9150-00-954-7422	Lubricant (81349) MIL-L-23398 16 OZ can, Aerosol 1 QT can	CN QT
35	O	9150-01-385-6780	Lubricating Oil, 1 QT can: (81349) MIL-L-23699 (0-156)	QT

**SECTION II. EXPENDABLE AND DURABLE ITEMS LIST- CONTINUED**

(1) Item Number	(2) Level	(3) National Stock Number	(4) Description	(5) (U/M)/ (U/I)
36	O	9150-00-231-2361 9150-00-231-2356	Lubricating Oil: (81349) MIL-L-3150 1 QT can 5 GL can	QT CN
37	O	9150-00-231-6689 9150-00-231-9062	Lubricating Oil: (81348) VVL 800 1 QT can 5 GL can	QT CN
38	O	5510-00-962-7141	Lumber, 4" X 4" X 12': (81348) MM-L-736	EA
39	O	5350-00-598-5537	Paper, Abrasive: (80244) A-A-1202 TY1SZFINE	HD
40	O	8010-01-229-7541	Polyurethane Coating, 1 GL can: (80244) MIL-C-53039 BLACK	GL
41	O	8010-01-229-7543	Polyurethane Coating, 1 QT can: (80244) MIL-C-53039 BROWN 383	QT
42	O	8010-01-229-9561	Polyurethane Coating, 1 GL can: (80244) MIL-C-53039 GREEN 383	GL
43	O	8010-01-193-0519	Primer Coating, Epoxy Resin, 1 QT can: (81349) MIL-P-53030	KT
44	O	8010-00-063-5776	Primer Coating, 1 QT can: (81348) TT-P-666	QT
45	O	7920-00-205-1711	Rag, Wiping, 50 LB bale: (58536) A-A-2522	BE
46	O	4020-00-068-7906	Rope, Fibrous, 600 FT coil: (81348) T-R-571	CL
47	O	8030-01-375-5844	Sealing Compound, 5 OZ tube (18965) KR377-62	TU
48	O	1015-01-255-4144	Sealant, Pipe, 50 ML tube: (19207) 12297953	TU
49	O	8030-00-965-2438	Sealing Compound, 60 FT roll: (81349) MIL-S-11030	RO
50	O	8030-00-081-2336	Sealing Compound, 50 CC bottle: (81349) MIL-S-22473 GRAV	BT
51	O	8030-00-081-2333	Sealing Compound, 10 ea, 10 CC bottle (81349) MIL-S-22473	BX
52	O	8030-00-551-1059	Sealing Compound, 3 OZ tube: (81349) MIL-S-45180	TU
53	O	8030-00-181-7603	Sealing Compound, 50 CC bottle: (80244) MIL-R-46082 TY3	BT
54	O	8030-00-220-6973	Sealing Compound, 4 OZ can: (80244) MIL-S-45180 TY3	CN
55	O	8030-01-063-7510	Sealing Compound, 50 CC bottle: (81349) MIL-S-46163 TY1GRL	BT
56	O	8030-01-054-3968	Sealing Compound, 10 CC bottle: (81349) MIL-S-46163 TY2GRM	BT

**SECTION II. EXPENDABLE AND DURABLE ITEMS LIST- CONTINUED**

(1) Item Number	(2) Level	(3) National Stock Number	(4) Description	(5) (U/M)/ (U/I)
57	O	8030-01-142-3131	Sealing Compound, 250 CC bottle: (80244) MIL-S-46163 TY2GR0	BT
58	O	6850-00-880-7616	Silicone Compound, 8 OZ tube: (81349) MIL-S-8660	TU
59	O	6850-00-281-3061 6850-00-274-5421	Solvent, Dry-cleaning: (81348) P-D-680 4 OZ can 5 GL can	CN CN
60	O	8030-00-889-3535	Tape, Antiseizing, 260 IN spool: (81349) MIL-T-27730	EA
61	O	5970-00-419-4291	Tape, Insulation, 108 FT roll: (81349) MIL-I-24391	RO
62	O	7510-00-584-5785	Tape, Pressure, 180 FT roll: (81348) PPP-T-97	RO
63	O	7510-01-146-7767	Tape, Pressure Sensitive, 180 FT roll: (81348) PPP-T-60	RO



## APPENDIX D

### TORQUE LIMITS

---

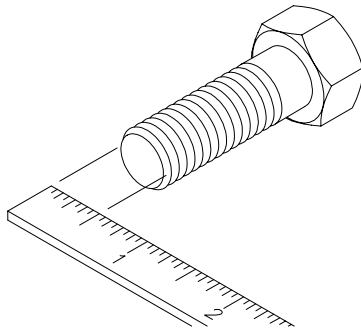
#### D-1 GENERAL.

This section provides general torque limits for screws used on the M109A6 vehicles. Special torque limits are indicated in the maintenance procedures for applicable components. The general torque limits given in this appendix shall be used when specific torque limits are not indicated in the maintenance procedure. These general torque limits cannot be applied to screws that retain rubber components. The rubber components will be damaged before the correct torque limit is reached. If a special torque limit is not given in the maintenance instructions, tighten the screw or nut until it touches the metal bracket, then tighten it one more turn.

#### D-2 TORQUE LIMITS.

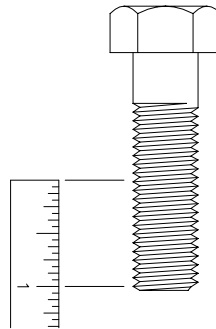
Table D-1 lists dry torque limits. Dry torque limits are used on screws that do not have lubricants applied to the threads. Table D-2 lists wet torque limits. Wet torque limits are used on screws that have high-pressure lubricants applied to the threads.

#### D-3 HOW TO USE TORQUE TABLE.



26ph008m

- a. Measure the diameter of the screw you are installing.

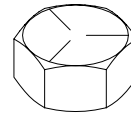
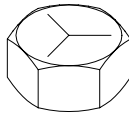
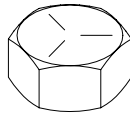


26ph009m

- b. Count the number of threads per inch or use a pitch gage.
- c. Under the heading SIZE, look down the left hand column until you find the diameter of the screw you are installing (there will usually be two lines beginning with the same size).
- d. In the second column under SIZE, find the number of threads per inch that matches the number of threads you counted in step b.

**D-3 HOW TO USE TORQUE TABLE – CONTINUED**

CAPSCREW HEAD MARKINGS  
 Manufacturer's marks  
 may vary. These are all SAE  
 Grade 5 (3 line)

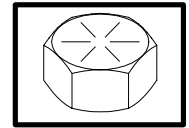
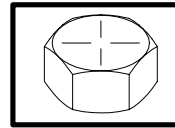
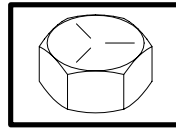
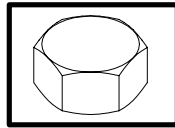


26ph007m

- e. To find the grade screw you are installing, match the markings on the head to the correct picture of CAPSCREW HEAD MARKINGS on the torque table.
- f. Look down the column under the picture you found in step e. until you find the torque limit in Lb-ft or N-m for the diameter and threads per inch of the screw you are installing.

**Table D-1. Torque Limits for Dry Fasteners**

SAE CAPSCREW HEAD MARKINGS



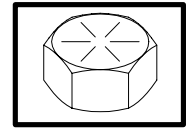
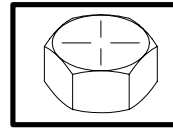
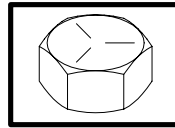
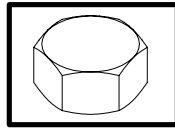
26ph006m

SIZE			TORQUE							
			SAE GRADE No. 1 or 2		SAE GRADE No. 5		SAE GRADE No. 6 or 7		SAE GRADE No. 9	
DIA. INS.	THREADS PER INCH	MMs	POUND- FEET	N-m	POUND- FEET	N-m	POUND- FEET	N-m	POUND- FEET	N-m
1/4	20	6.35	5	6.78	8.0	10.85	10	13.56	12.0	16.27
1/4	28	6.35	6	8.14	10.0	13.56	—	—	14.0	18.98
5/16	18	7.94	11	14.92	17.0	23.05	19	25.76	24.0	32.52
5/16	24	7.94	13	17.63	19.0	25.76	—	—	27.0	36.61
3/8	16	9.53	18	24.41	31.0	42.04	34	46.10	44.0	59.66
3/8	24	9.53	20	27.12	35.0	47.46	—	—	49.0	66.44
7/16	14	11.11	28	37.97	49.0	66.44	55	74.58	70.0	94.92
7/16	20	—	30	40.68	55.0	74.58	—	—	78.0	105.77
1/2	13	12.70	39	52.88	75.0	101.70	85	115.26	105.0	142.38
1/2	20	—	41	55.60	85.0	115.26	—	—	120.0	162.78
9/16	12	14.29	51	69.16	110.0	149.16	120	162.72	155.0	210.18
9/16	18	—	55	74.58	120.0	162.72	—	—	170.0	230.52
5/8	11	15.88	63	85.43	150.0	203.40	167	226.45	210.0	284.76
5/8	18	—	95	128.82	170.0	230.52	—	—	240.0	325.44
3/4	10	19.05	105	142.38	270.0	366.12	280	379.68	375.0	508.50
3/4	16	—	115	155.94	295.0	400.02	—	—	420.0	596.52
7/8	9	22.23	160	216.96	395.0	535.62	440	596.64	605.0	820.38
7/8	14	—	175	237.30	435.0	589.86	—	—	675.0	915.30
1	8	25.40	235	318.66	590.0	800.04	660	894.96	910.0	1233.96
1	14	—	250	339.00	660.0	894.96	—	—	990.0	1342.44
1-1/8	—	25.58	—	—	800.0	1064.8	—	—	1280.0	1735.7
					880.0	1193.3			1440.0	1952.8
1-1/4	—	31.75	—	—	—	—	—	—	1820.0	2467.9
									2000.0	2712.0
1-3/8	—	34.93	—	—	1460.0	1979.8	—	—	2380.0	3227.3
					1680.0	2278.1			2720.0	3688.3
1-1/2	—	38.10	—	—	1940.0	2630.6	—	—	3160.0	4285.0
					2200.0	2983.2			3560.0	4827.4

D-3 HOW TO USE TORQUE TABLE – CONTINUED

Table D-2. Torque Limits for Wet Fasteners

SAE CAPSCREW HEAD MARKINGS



26ph006m

SIZE			TORQUE							
			SAE GRADE No. 1 or 2		SAE GRADE No. 5		SAE GRADE No. 6 or 7		SAE GRADE No. 8	
DIA. INS.	THREADS PER INCH	MMs	POUND- FEET	N-m	POUND- FEET	N-m	POUND- FEET	N-m	POUND- FEET	N-m
1/4	20	6.35	4.9	6.10	7.2	9.76	9.0	12.20	10.8	14.64
1/4	28	6.35	5.4	7.33	9.0	12.20	—	—	12.6	17.08
5/16	18	7.94	9.9	13.34	15.3	22.54	17.1	23.18	21.6	29.27
5/16	24	7.94	11.7	15.87	17.1	23.18	—	—	24.3	32.95
3/8	16	9.53	16.2	21.97	27.9	37.84	30.6	41.49	39.6	53.69
3/8	24	9.53	18.0	24.41	31.5	42.71	—	—	44.1	59.80
7/16	14	11.11	25.2	34.17	44.1	59.80	49.5	67.12	63.0	85.42
7/16	20	—	27.0	36.61	49.5	67.12	—	—	70.2	95.19
1/2	13	12.70	35.1	47.59	67.5	91.53	76.5	103.73	94.5	128.14
1/2	20	—	36.9	50.04	76.5	103.73	—	—	108.0	146.50
9/16	12	14.29	45.9	62.24	99.0	134.24	108.0	146.45	139.5	189.16
9/16	18	—	49.5	67.12	108.0	146.45	—	—	153.0	207.47
5/8	11	15.88	56.7	76.89	135.0	183.06	150.3	203.80	189.0	256.28
5/8	18	—	85.5	115.94	153.0	207.47	—	—	216.0	296.90
3/4	10	19.05	94.5	128.14	243.0	329.51	252.0	341.71	337.5	457.65
3/4	16	—	103.5	140.35	265.5	360.2	—	—	378.0	536.87
7/8	9	22.23	144.0	195.26	355.5	482.06	396.0	536.98	544.5	738.34
7/8	14	—	157.5	213.57	391.5	530.87	—	—	607.5	823.77
1	8	25.40	211.5	286.79	531.0	720.04	594.0	805.46	819.0	1110.56
1	14	—	225.0	305.10	594.0	805.46	—	—	891.0	1208.20
1-1/8	—	25.58	—	—	720.0	976.32	—	—	1152.0	1562.13
					792.0	1073.97			1296.0	1757.52
1-1/4	—	31.75	—	—	—	—	—	—	—	2221.11
										2440.80
1-3/8	—	34.93	—	—	1314.0	1781.82	—	—	2142.0	2904.57
					1512.0	2050.29			2448.0	3319.47
1-1/2	—	38.10	—	—	1746.0	2367.54	—	—	2844.0	3856.5
					1980.0	2684.88			3204.0	4344.66

**D-4 TIGHTENING METAL FASTENERS.**

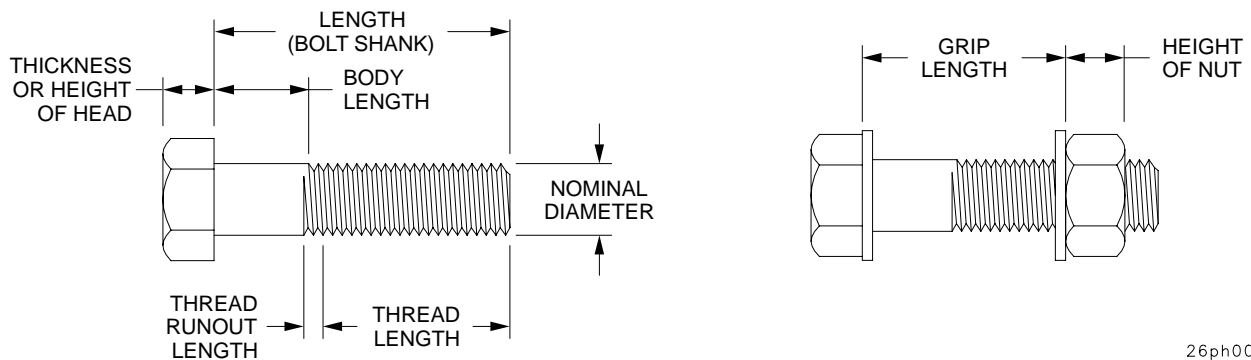
When torquing a fastener, select a torque wrench whose range (Table D-3) fits the required torque value. A torque wrench is most accurate from 25% to 75% of its stated range. A torque wrench with a stated range of 0 to 100 will be most accurate from 25 to 75 Pound-Feet. The accuracy of readings will decrease as you approach 0 Pound-Feet or 100 Pound-Feet. The following ranges (Table D-3) are based on this principle.

Table D-3 TORQUE RANGES	
STATED RANGE	MOST EFFECTIVE RANGE
0-200 lb-in	4-13 lb-ft
0-600 lb-ft	50-450 lb-ft
0-170 lb-ft	44-131 lb-ft
15-75 lb-ft	30-60 lb-ft

**D-5 FASTENER SIZE AND THREAD PATTERN.**

Threaded fasteners are categorized according to diameter of the fastener shank. Thread styles are divided into broad groups, the two most common being coarse (Unified Coarse-UNC) and fine (Unified Fine-UNF). These groups are defined by the number of threads per inch on the bolt shanks. In addition, threads are categorized by thread class (Table D-4), which is a measure of the degree of fit between the threads of the bolt or screw (external threads) and the threads of the attaching nut or tapped hole (internal threads). The most common thread class for bolts and screws is Class 2.

Table D-4 THREAD CLASSES AND DESCRIPTION		
EXTERNAL	INTERNAL	FIT
1A	1B	LOOSE FIT
2A	2B	MEDIUM FIT
3A	3B	CLOSE FIT



26ph005m

**D-6 FASTENER GRADE.**

In addition to being classified by thread type, threaded fasteners are also classified by material. The most familiar fastener classification system is the SAE grading system (Table D-5).

<b>Table D-5 SAE Screw and Bolt Markings</b>	
<b>SCREWS</b>	<b>BOLTS</b>
SAE GRADE 2 NO MARKING	SAE GRADE 6 4 RADIAL DASHES 90° APART
SAE GRADE 3 2 RADIAL DASHES 180° APART	SAE GRADE 7 5 RADIAL DASHES 72° APART
SAE GRADE 5 3 RADIAL DASHES 120° APART	SAE GRADE 8 6 RADIAL DASHES 60° APART

**Markings On Hex Locknuts**

- |                       |                    |
|-----------------------|--------------------|
| GRADE A – No Marks    | GRADE A – No Mark  |
| GRADE B – 3 Marks     | GRADE B – Letter B |
| GRADE C – 6 Marks     | GRADE C – Letter C |
|                       |                    |
| GRADE A – No Notches  |                    |
| GRADE B – One Notch   |                    |
| GRADE C – Two Notches |                    |

## APPENDIX E

### MANDATORY REPLACEMENT PARTS LIST

---

#### Section I. INTRODUCTION

##### **E-1. SCOPE.**

This appendix is a cross-reference of item numbers to part numbers and is included for that purpose only.

##### **E-2. EXPLANATION OF COLUMNS.**

a. Column (1) – Item Number. This number is assigned to the entry in the listing for cross-referencing to the part number.

b. Column (2) – Part Number. Indicates the primary number used by the manufacturer (individual, company, firm, corporation, or Government activity), which controls the design and characteristics of the item by means of its engineering drawings, specification, standards, and inspection requirements to identify an item or range of items.

c. Column (3) – Description. This column contains the nomenclature which appears on the first page of the task under the subheading “Materials/Parts”.

**Section II. MANDATORY REPLACEMENT PARTS LIST**

(1) Item No.	(2) Part Number	(3) Description
1	MS24665-353	PIN, COTTER
2	MS16624-1175	RING, RETAINING
3	MS35338-65	WASHER, LOCK
4	MS35338-66	WASHER, LOCK
5	MS35338-46	WASHER, LOCK
6	MS29513-222	PACKING, PREFORMED
7	MS21044N6	NUT, SELF-LOCKING
8	MS24665-283	PIN, COTTER
9	MS35338-69	WASHER, LOCK
10	MS16562-36	PIN, SPRING
11	MS24665-418	PIN, COTTER
12	MS35335-37	WASHER, LOCK
13	MS16624-1037	RING, RETAINING
14	NAS1409A6	NUT, SELF-LOCKING
15	MS21083N6	NUT, SELF-LOCKING
16	MS21044N4	NUT, SELF-LOCKING
17	7419534	GASKET
18	10921462	SEAL, NONMETALLIC
19	500033	SEAL
20	MS35338-45	WASHER, LOCK
21	MS9048-138	PIN, SPRING
22	MS35338-44	WASHER, LOCK
23	MS20995F47	LOCKWIRE
24	NAS561P8-22	PIN, SPRING
25	MS24665-208	PIN, COTTER
26	MS16562-112	PIN, SPRING
27	MS16562-13	PIN, SPRING
28	MS35338-62	WASHER, LOCK
29	Deleted	
30	10905840	STRAP, TIEDOWN
31	MS35338-70	WASHER, LOCK
32	M27426-3120C	RING, RETAINING
33	10954740	SEAL, NONMETALLIC
34	10903494	PAD
35	10953378-20	PAD
36	10903493	PAD
37	10953378-21	PAD
38	MS35333-38	WASHER, LOCK

## Section II. MANDATORY REPLACEMENT PARTS LIST – CONTINUED

(1) Item No.	(2) Part Number	(3) Description
39	MS35338-61	WASHER, LOCK
40	MS35333-39	WASHER, LOCK
41	MS35338-60	WASHER, LOCK
42	MS3367-1-9	STRAP, TIEDOWN
43	MS3367-3-0	STRAP, TIEDOWN
44	MS45904-76	WASHER, LOCK
45	5104507	GASKET
46	MS21348-29	SCREW, DRIVE
47	MS35338-48	WASHER, LOCK
48	MS35338-43	WASHER, LOCK
49	MS24665-425	PIN, COTTER
50	MS24665-426	PIN, COTTER
51	MS24665-627	PIN, COTTER
52	MS27111-10	WASHER, KEY
53	12389982	PACKAGE, SHIM
54	MS51844-82	SWAGGING SLEEVE, WIRE
55	900010-32C	LOCKWIRE
56	10919232	GASKET
57	10919233	GASKET
58	10920687	SEAL, PLAIN, ENCASED
59	23MS35338-50	WASHER, LOCK
60	5130995	GASKET
61	MS20426A3-5	RIVET, SOLID
62	MS20470AD6-6	RIVET, SOLID
63	12268229	SEAL, PLAIN, ENCASED
64	10897710	CUSHION
65	M83420/4-002	WIRE ROPE
66	MS35338-33	WASHER, LOCK
67	MS51007-8	GASKET
68	MS20470B4-8	RIVET, SOLID
69	AN8008F4	MOUNT, RESILIENT
70	24-00157-823	WASHER, LOCK
71	MS35335-29	WASHER, LOCK
72	MS52000-8	GASKET
73	MS35338-125	WASHER, LOCK
74	MS35333-37	WASHER, LOCK
75	7972346	GASKET
76	MS20995C20	LOCKWIRE



## Section II. MANDATORY REPLACEMENT PARTS LIST – CONTINUED

(1) Item No.	(2) Part Number	(3) Description
77	7972350	SEAL, NONMETALLIC ROUND SECTION
78	7972326	SEAL, NONMETALLIC
79	7972324	SEAL, NONMETALLIC
80	7972340	SEAL, NONMETALLIC
81	7972345	GASKET
82	MS16562-50	PIN, SPRING
83	MS35335-30	WASHER, LOCK
84	MS35764-1124	BOLT, SELF-LOCKING
85	MS35338-68	WASHER, LOCK
86	MS51922-68	NUT, SELF-LOCKING
87	10930585	SCREW, SELF-LOCKING
88	MS24665-497	PIN, COTTER
89	8748475	RING, RETAINING
90	MS3367-7-9	STRAP, TIEDOWN
91	MS35338-47	WASHER, LOCK
92	MS21044N12	NUT, SELF-LOCKING
93	MS25665-153	PIN, COTTER
94	MS20427F4-8	RIVET, SOLID
95	MS3393-4	PACKING, PREFORMED
96	5575086	GASKET
97	5571024	GASKET
98	6437298	GASKET SET
99	5187310	PACKING, PREFORMED
100	XSC131	RING, RETAINING
101	10922277	GASKET
102	5150193	GASKET
103	5161003	GASKET
104	MS20995C91	LOCKWIRE
105	10903593	GASKET
106	10925299	GASKET
107	10925300	GASKET
108	10903595	GASKET
109	10920707	SEAL, NONMETALLIC
110	10903399	GASKET
111	MS51861-44C	SCREW, TAPPING
112	MS16562-6	PIN, SPRING
113	10903415	SEAL, NONMETALLIC
114	B1821BH025C063L	BOLT, SELF-LOCKING

## Section II. MANDATORY REPLACEMENT PARTS LIST – CONTINUED

(1) Item No.	(2) Part Number	(3) Description
115	MS51922-13	NUT, SELF-LOCKING
116	10921234	GASKET
117	10895744	GASKET
118	MS51922-17	NUT, SELF-LOCKING
119	10910003	GASKET
120	MS51922-1	NUT, SELF-LOCKING
121	MS3367-2-0	STRAP, TIEDOWN
122	MS35333-40	WASHER, LOCK
123	MS35338-41	WASHER, LOCK
124	AN6920-6	PACKING, PREFORMED
125	5575032	FILTER ELEMENT, FLUID
126	5574508	FILTER ELEMENT, FLUID
127	MS24665-289	PIN, COTTER
128	5574126	GASKET
129	0F209	SEAT, HELICAL
130	103374	PIN, COTTER
131	8720150	SEAL, ANTIPILFERAGE
132	MS16562-39	PIN, SPRING
133	MS16562-67	PIN, SPRING
134	MS16562-44	PIN, SPRING
135	NAS561P8-18	PIN, SPRING
136	MS21318-46	SCREW, DRIVE
137	MS24665-132	PIN, COTTER
138	MS24662-233	RIVET, BLIND
139	AN125630	RIVET, SOLID
140	10903692	SEAL, NONMETALLIC SPECIAL SHAPED
141	10941596	SEAL, FUEL TANK
142	10941611	SEAL, NONMETALLIC
143	10903694	SEAL, RADIATOR AIR
144	11604872	SEAL, HEAT SHIELD
145	11636299	SEAL, HEAT SHIELD
146	11636303	SEAL, HEAT SHIELD
147	11604874	SEAL, HEAT SHIELD
148	11604870	SEAL, HEAT SHIELD
149	11604869	SEAL, HEAT SHIELD
150	10909717	PAD, INSULATION
151	MS35338-67	WASHER, LOCK
152	11636132	GASKET

## Section II. MANDATORY REPLACEMENT PARTS LIST – CONTINUED

(1) Item No.	(2) Part Number	(3) Description
153	8351752	GASKET
154	10922326	GASKET
155	12352907	SEAL, NONMETALLIC
156	11619289	SEAL, NONMETALLIC
157	MS24662-118	RIVET
158	10919234	GASKET
159	MS35338-63	WASHER, LOCK
160	MS20995-F32	WIRE, LOCK
161	5117962	PACKING, PREFORMED
162	MS3393-10	PACKING, PREFORMED
163	MS35338-141	WASHER, LOCK
164	MS35338-143	WASHER, LOCK
165	MS3393-8	PACKING, PREFORMED
166	11684168	PAD, CUSHIONING
167	MS3367-1-0	STRAP, TIEDOWN
168	8351284	GASKET
169	MS28775-121	PACKING, PREFORMED
170	MS35338-100	WASHER, LOCK
171	MS35338-103	WASHER, LOCK
172	MS35334-19	WASHER, LOCK
173	10922286	GASKET
174	MS19070-152	WASHER, KEY
175	7320655	GASKET
176	7962254	SEAL, NONMETALLIC
177	12343072	GASKET
178	7962242	SEAL, NONMETALLIC
179	7962251	PACKING, PREFORMED
180	MS35338-42	WASHER, LOCK
181	MS35338-40	WASHER, LOCK
182	MS21042-08	NUT, SELF-LOCKING
183	12361690-1	GASKET
184	MS3367-6-0	STRAP, TIEDOWN
185	1613	WASHER, LOCK
186	2434	WASHER, LOCK
187	4024-32-00-0541	WASHER, LOCK
188	12361690-2	GASKET
189	MS35335-33	WASHER, LOCK
190	MS24665-210	PIN, COTTER

## Section II. MANDATORY REPLACEMENT PARTS LIST – CONTINUED

(1) Item No.	(2) Part Number	(3) Description
191	MS9048-170	PIN, SPRING
192	MS9047-110	PIN, SPRING
193	MS9048-137	PIN, SPRING
194	MS35338-8	WASHER, LOCK
195	7374386	PACKING, PREFORMED
196	5703114	PARTS KIT, TRANSMISSION OIL FILTER
197	7710684	GASKET
198	7708123	SEAL, NONMETALLIC
199	8350176	GASKET
200	MS29513-260	PACKING, PREFORMED
201	AN381-6-40	PIN, COTTER
202	MS29513-241	PACKING, PREFORMED
203	12268362	SEAL, PLAIN, ENCASED
204	MS21044N10	NUT, SELF-LOCKING
205	MS35764-1066	BOLT, SELF-LOCKING
206	7098444	GASKET
207	10898122	GASKET
208	MS16562-62	PIN, SPRING
209	MS29513-427	PACKING, PREFORMED
210	AN124012	PACKING, PREFORMED
211	11604901	SEAL, NONMETALLIC
212	MS24665-639	PIN, COTTER
213	8712289	NUT, SELF-LOCKING
214	MS35764-720	BOLT, SELF-LOCKING
215	8743903-4	BOLT, SELF-LOCKING
216	0912793	SLEEVE, COMPRESSION, TUBE-HOSE FITTING
217	MS24665-628	PIN, COTTER
218	MS16624-1125	RING, RETAINING
219	MS24665-357	PIN, COTTER
220	10956227	SEAL
221	8712448	GASKET
222	MS35338-51	WASHER, LOCK
223	MS16562-38	PIN, SPRING
224	MS28775-110	PACKING, PREFORMED
225	2-047L737-65	PACKING, PREFORMED
226	MS171782	PIN, SPRING
227	MS9048-271	PIN, SPRING
228	MS16562-72	PIN, SPRING

## Section II. MANDATORY REPLACEMENT PARTS LIST – CONTINUED

(1) Item No.	(2) Part Number	(3) Description
229	MS16562-90	PIN, SPRING
230	8712289-7	NUT, SELF-LOCKING
231	8712289-1	NUT, SELF-LOCKING
232	NAS1409A5	NUT, SELF-LOCKING
233	MS17829-8C	NUT, SELF-LOCKING
234	10922805	GASKET
235	12376239	SEAL, NONMETALLIC
236	10936585	PACKING, PREFORMED
237	MS16562-159	PIN, SPRING
238	MS24665-300	PIN, COTTER
239	MS171540	PIN, SPRING
240	8712445	GASKET
241	12278617	PACKING, PREFORMED
242	7962686	SPRING, SPECIAL
243	6299516	WASHER, SPRING
244	10888632	SEAL, NONMETALLIC
245	MS35672-35	PIN, GROOVED
246	11593708	PIN, STRAIGHT HEADED
247	11605377	SEAL
248	10909588	GASKET
249	MS24665-370	PIN, COTTER
250	MS28778-8	PACKING, PREFORMED
251	MS29513-115	PACKING, PREFORMED
252	10903594	GASKET
253	MS29561-241	PACKING, PREFORMED
254	8712289-4	NUT, SELF-LOCKING
255	8712289-9	NUT, SELF-LOCKING
256	8712289-8	NUT, SELF-LOCKING
257	MS35336-39	WASHER, LOCK
258	MS171722	PIN, SPRING
259	MS20470A4-8	RIVET, SOLID
260	12361857-1	PAD
261	12361857-3	PAD
262	12361857-4	PAD
263	12361857-2	PAD
264	12361857-5	PAD
265	803336	SEAL, WASHER, FLAT
266	12361845-6	SEAL

## Section II. MANDATORY REPLACEMENT PARTS LIST – CONTINUED

(1) Item No.	(2) Part Number	(3) Description
267	12361845-7	SEAL
268	12361845-8	SEAL
269	12361845-9	SEAL
270	5574120	RING, RETAINING
271	MS16624-2050	RING, RETAINING
272	MS171434	PIN, SPRING
273	MS24665-355	PIN, COTTER
274	MS9048-136	PIN, SPRING
275	MS16562-235	PIN, SPRING
276	MS24665-287	PIN, COTTER
277	MS45904-68	WASHER, LOCK
278	12370521	SEAL
279	12370507	GASKET
280	10922933	GASKET
281	MS35333-46	WASHER, LOCK
282	MS28775-222	PACKING, PREFORMED
283	MS35338-99	WASHER, LOCK
284	7419324	PACKING
285	10921767	SEAL, PLAIN ENCASED
286	MS16624-4087	RING, RETAINING
287	590479	PIN, COTTER
288	MS35649-282	WASHER, LOCK
289	10898034	GASKET
290	10931159	GROMMET, NONMETALLIC
291	MS21044N8	NUT, SELF-LOCKING
292	MS20470B6-5	RIVET, SOLID
293	MS20604B6W4	RIVET, BLIND
294	MS35335-34	WASHER, LOCK
295	12268583-1	GASKET
296	12268583-2	GASKET
297	11602207	BRUSH ASSEMBLY
298	9417926	ASSEMBLY, SCREW
299	MIL-C-5501/3R10	CAP, DUST, PROTECTIVE
300	NAS561C8-48	PIN, SPRING
301	MS90725-6	WASHER, LOCK
302	MS16562-231	PIN, SPRING

**Section II. MANDATORY REPLACEMENT PARTS LIST – CONTINUED**

(1) Item No.	(2) Part Number	(3) Description
303	MS29513-228	PACKING, PREFORMED
304	MS21045-3	NUT, SELF-LOCKING, HEXAGON
305	M5423116-01	SEAL
306	12360844	GASKET
307	MS24665-359	PIN, COTTER
308	MS3367-3-9	STRAP, TIEDOWN
309	57K0966	GRILLE KIT
310	MS20995-C41	LOCKWIRE
311	MS20995F63	LOCKWIRE
312	MS20995F41	LOCKWIRE
313	11593606-3	GASKET
314	MS35335-31	WASHER, LOCK
315	11594003	WASHER, LOCK
316	MS3367-1-9	CLAMP, HOSE
317	MS51413-4	WASHER, LOCK
318	MS17830-08C	NUT, SELF-LOCKING, HEXAGON
319	57K1684	GRILLE SUPPORT KIT

## APPENDIX F

### TOOL IDENTIFICATION LIST

(1) ITEM NUM- BER	(2)  ITEM NAME	(3) NATIONAL STOCK NUMBER	(4)  PART NUMBER	(5)  REFERENCE
1	Adapter, mechanical puller	5120-00-322-5953	7083703	TM 9-2350-314-24P-1
2	Adapter, socket 1/2 M-3/4 F	5120-00-227-8088	A-A-2172	TM 9-2350-314-24P-1
3	Adapter, straight, pipe to tube	4730-00-266-0541	MS39158-7	TM 9-2350-314-24P-1
4	Alignment tool, generator		12370878	TM 9-2350-314-24P-1
5	Blade, hacksaw	5110-00-277-4588	31-51024	SC 4910-95-A74
6	Bolt, eye	5306-00-050-0347	MS51937-5	TM 9-2350-314-24P-1
7	Brush, wire	7920-00-291-5815	8078883	SC 4910-95-A74
8	Cable kit, special purpose, electrical 2 condct	2590-00-148-7961	11682379-1	SC 4910-95-A74
9	Cap, vise jaw, brass	5120-00-221-1506	GGG-C-137SZ4	SC 4910-95-A72
10	Cleaning tool, oil cooler	4910-00-494-8257	11641959	TM 9-2350-314-24P-1
11	Compressing tool	5120-00-323-2296	51X850	TM 9-2350-314-24P-1
12	Crowbar, pinch point, 5 ft long	5120-00-224-1390	10501985	TM 9-2350-314-10
13	Crowfoot attachment, socket wrench 1-1/8 in.; 1/2 in. dr	5120-01-348-9472	AN8508-18A	TM 9-2350-314-24P-1
14	Crowfoot, 1-7/8 in.	5120-00-293-1009	AC60	TM 9-2350-314-24P-1
15	Drill, electric	5130-00-807-3009	W-D-661	SC 4910-95-A74
16	Drill set, twist	5133-00-293-0983	800434	SC 4910-95-A74
17	Extension, 8 in., 3/4 in. dr	5120-01-399-9747	5661	SC 4910-95-A74
18	Extension, 16 in., 3/4 in. dr	5120-00-227-8079	L122	SC 4910-95-A74
19	Fixture, track connecting	5120-00-605-3926	8741739	TM 9-2350-314-10
20	Flaring tool, tube, hand	5120-00-251-2267	275FS	SC 4910-95-A74
21	Gage, brake adjusting	5120-00-733-5005	8351213	TM 9-2350-314-24P-1
22	Tester, pressure gage	6685-00-572-8612	8356176	TM 9-2350-314-24P-1
23	Gage, roadwheel wear plate	4910-00-034-0874	10911904	TM 9-2350-314-24P-1
24	Lubricating gun, hand	4930-00-253-2478	1142	SC 4910-95-A74
25	Hacksaw	5110-00-289-9657	163-20	SC 4910-95-A74
26	Handle, installer	5120-00-977-5578	J7079-2	TM 9-2350-314-24P-1
27	Handle, ratchet, 3/4 in. dr	5120-00-249-1076	1940708	SC 4910-95-A74
28	Handle, replacer	5120-00-034-0884	10914196	TM 9-2350-314-24P-1
29	Heater, gun type, electrical	4940-01-028-7493	500A	TM 9-2350-314-24P-1
30	Hose assembly, nonmetallic	4720-00-080-8586	8708306	TM 9-2350-314-24P-1
31	Installer, seal	5120-00-977-5579	J8550	TM 9-2350-314-24P-1
32	Jack, hydraulic, hand, 12 ton	5120-00-224-7330	D120	SC 4910-95-A72



**APPENDIX F – CONTINUED**  
**TOOL IDENTIFICATION LIST – CONTINUED**

(1) ITEM NUM- BER	(2) ITEM NAME	(3) NATIONAL STOCK NUMBER	(4) PART NUMBER	(5) REFERENCE
33	Key, socket head screw, 3/8	5120-00-198-5390	1940722	SC 4910-95-A72
34	Kit, ground hop	TBD	12370819	TM 9-2350-314-24P-1
35	Kit, probe	6625-01-102-6878	12303622	
36	Lifter, roadwheel	4910-00-912-4469	11593605	TM 9-2350-314-24P-1
37	Measure, liquid, 2 qt	7240-00-255-8113	N202	SC 4910-95-A74
38	Multimeter	6625-01-139-2512	T00377	SC 4910-95-A72
39	Optical battery/antifreeze tester	6630-00-105-1418	VUCHEK	SC 4910-95-A74
40	Pail, utility	7240-00-160-0455	A-A-1273	TM 9-2350-314-10
41	Pin, guide	5120-00-034-0883	10914195	TM 9-2350-314-24P-1
42	Pliers, snapping	5120-00-789-0492	4440R	SC 4910-95-A74
43	Pliers, wire twisting	5120-00-542-4171	8491162	SC 4910-95-A74
44	Puller, battery terminal	5120-00-944-4268	21	SC 4910-95-A74
45	Puller, end connector	5180-01-388-7855	57K3156	TM 9-2350-314-10
46	Puller mechanical, steering wheel	5120-00-620-0020	CG60DB	SC 4910-95-A72
47	Puller, shock absorber	5120-00-084-7626	10913972	TM 9-2350-314-24P-1
48	Puller, slide, hammertype	5120-00-557-3615	5573615	TM 9-2350-314-24P-1
49	Remover and replacer, shock, bearing	5120-00-084-7627	10925993	TM 9-2350-314-24P-1
50	Replacer, bearing cup	5120-00-034-0880	10914187	TM 9-2350-314-24P-1
51	Replacer, bearing cup	5120-00-034-0885	10914197	TM 9-2350-314-24P-1
52	Replacer (seal), inner	5120-00-034-0879	10914186	TM 9-2350-314-24P-1
53	Replacer (seal)	5120-00-034-0878	10914185	TM 9-2350-314-24P-1
54	Replacer (seal)	5120-00-034-0881	10914188	TM 9-2350-314-24P-1
55	Riveter, hand	5120-00-017-2849	250K	SC 4940-95-A08
56	Screens, fan protective	2510-01-247-2976	12268262	TM 9-2350-314-24P-1
57	Screwdriver, flat tip	5120-00-236-2140	66-117	SC 5180-95-A12
58	Shears	5110-00-203-9642	GGG-S-00278	SC 4910-95-A74
59	Sling, endless, 4 ft	3940-00-675-5002	PD101-48	TM 9-2350-314-24P-1
60	Sling, lifting, 8 ft	3940-00-675-5003	PD 101-96	TM 9-2350-314-24P-1
61	Sling, lifting, final drive	4910-00-034-0875	10914179	TM 9-2350-314-24P-1
62	Sling, lifting, powerplant	3940-01-280-0872	12355173	TM 9-2350-314-24P-1
63	Socket, 5/16 in.	5120-00-235-5878	10T	SC 4910-95-A74
64	Socket, 7/16 in.	5120-00-235-5869	A-A-1407	SC 4910-95-A74

**APPENDIX F – CONTINUED  
TOOL IDENTIFICATION LIST – CONTINUED**

(1) ITEM NUM- BER	(2) ITEM NAME	(3) NATIONAL STOCK NUMBER	(4) PART NUMBER	(5) REFERENCE
65	Socket, 1 in., 3/4 in. dr	5120-00-237-0989	A-A-1394	SC 4910-95-A74
66	Socket, 1-1/8 in., 3/4 in. dr	5120-00-239-0021	A-A-1394	SC 4910-95-A74
67	Socket, 1-5/16 in., 3/4 in. dr	5120-00-232-5681	A-A-1394	SC 4910-95-A74
68	Socket wrench attachment, screwdriver	5120-00-390-7797	VA7797	SC 4910-95-A74
69	Socket wrench attachment, screwdriver, 1/2 in. dr	5120-01-367-3461	SP42A	TM 9-2350-314-24P-1
70	Socket, wrench, face	5120-00-034-0867	10914193	TM 9-2350-314-24P-1
71	Stencil set, marking	7520-00-205-1760	A-A-130	TM 9-2350-314-24P
72	Test set, STE/ICE	4910-00-124-2554	2389409	TM 9-4910-571-12&P
73	Tool kit, electrical contact	5180-00-876-9336	7550526	SC 4910-95-A74
74	Vise, machinist, 4 in. jaws	5120-00-293-1439	504M2	SC 4910-95-A72
75	Wrench, adjustable	5120-00-264-3796	5323324	SC 4910-95-A74
76	Wrench, combination, 1-1/4 in.	5120-00-228-9517	1173	SC 4910-95-A72
77	Wrench, open end, 1-3/8 in. x 1-1/2 in.	5120-00-277-2325	41W1170-70	SC 4940-95-A08
78	Wrench, open end, 1-5/8 in. x 1-7/16 in.	5120-00-277-2326	41	SC 4910-95-A74
79	Wrench, open end, 1-1/2 in. x 1-3/4 in.	5120-00-277-9818	TKKX6	SC 4940-95-A08
80	Wrench, box, 12 point	5120-00-051-5567	11605662	TM 9-2350-314-24P-1
81	Wrench set, socket 3/8 in. dr	5120-00-322-6231	51200017510	SC4910-95-A74
82	Wrench, splined, brake left	3040-00-733-8909	8351386	TM 9-2350-314-24P-1
83	Wrench, splined, brake right	3040-00-733-8912	8351387	TM 9-2350-314-24P-1
84	Wrench, torque, 0-60 N-m, 3/8 in. dr	5120-01-112-9531	GGG-W-686	SC 4910-95-A72
85	Wrench, torque, 0-200 lb-in. 3/8 in. dr	5120-00-853-4538	F200-1	SC 4910-95-A72
86	Wrench, torque, 0-175 lb-ft, 1/2 in. dr	5120-00-640-6364	A-A-2411	SC 4910-95-A74
87	Wrench, torque, 0-600 lb-ft, 3/4 in. dr	5120-00-221-7983	A-A-2411	SC 4910-95-A74
88	Wrench, socket	5120-00-708-3642	7083642	TM 9-2350-314-24P-1
89	Tubing	4720-01-377-7404	12268571-1	TM 9-2350-314-24P-1

## APPENDIX G

### CORROSION PREVENTION AND CONTROL

---

#### G-1 SCOPE.

This appendix contains unit level maintenance Corrosion Prevention and Control (CPC) information for various corrosion problems, treatments, tools, and available materials.

While corrosion is usually associated with rusting of metals, it can also include the deterioration of other materials such as rubber and plastic. Unusual cracking, softening, swelling, or breaking of these materials may be a corrosion problem.

It is important that any corrosion problem be reported. This will allow the problem to be corrected, and improvements made to prevent the problem on future items. Report identified corrosion problems on Standard Form 368, Quality Deficiency Report. Use of key words such as corrosion, rust, deteriorating, or cracking will assure that the information is identified as a CPC problem.

The form should be submitted to the address specified in DA PAM 738-750.

#### G-2 GENERAL.

The Corrosion Prevention and Control (CPC) program is a planned and organized effort to prevent damage to the M109A6 Howitzer during its operation. This is accomplished by the proper and timely identification, documentation, and implementation of corrective actions. As the first line of defense, the mechanic will visually check the vehicle for corrosion and identify methods of treatment.

#### G-3 TYPES OF CORROSION PROBLEMS.

a. Corrosion. Corrosion is the chemical disintegration of metals caused by reaction with other elements in the environment. Corrosion destroys the usefulness of the metal by producing compounds that do not possess the physical characteristics of the metal from which they were formed. Listed and described below are four stages of corrosion to be found in metals.

(1) Stage I corrosion. Discoloration or staining. This stage of corrosion appears as a thin gray, black, or reddish film on ferrous metals; as a white or gray film on aluminum, magnesium, zinc, and their alloys; and in varied colors (green, blue-green, brown, or black) on copper and copper alloys. This is the initial stage of corrosion; it does not extend beyond the surface of the metals, and it is easily removed.

(2) Stage II corrosion. Etching. When rust or corrosion is removed, the surface of the metal is slightly roughened, but holes in the surface are not identifiable.

(3) Stage III corrosion. Pitting. In this type of corrosion, holes in the surface of the metal are visible after the corrosive coating is removed from the metal.

(4) Stage IV corrosion. Scales, pitting, and powdering. Corrosion in this stage has progressed to the point where fit, wear, function, or life of the part has been affected. Powdery or scaly conditions accompanied by deep pitting and/or irregular flaking of metal is encountered in this stage of corrosion.

b. Corrosion of Painted Surfaces. This type of corrosion occurs primarily on painted steel surfaces. The paint is often cracked and the area may have a reddish brown appearance. The size and location may vary from small spots to large areas. It may occur at mating parts such as where the suspension mates to the hull or around fasteners such as nuts, bolts, or washers.

c. Corrosion of Unpainted Moving Parts. This type of corrosion occurs on moving parts such as hinges, pins, and catches where the original protective finish was removed through use or exposure to weather. It also has a reddish brown appearance.

d. Stress Corrosion Cracks. Stress corrosion cracking is a form of corrosion that can occur in high strength steel and aluminum. It is found in the form of cracks or seams in areas where no parts are joined.

e. Selective Leaching. This type of corrosion occurs on brass or bronze components found primarily in electrical connectors. This has a spongy type appearance with much of the original metal removed.

## G-4 TREATMENT PROCEDURES.

**WARNING**

Dry-cleaning solvent (P-D-680) is toxic and flammable. To avoid injury, wear protective goggles and gloves and use only in a well-ventilated area. Avoid contact with skin, eyes, and clothes. Do not breathe vapors. Do not use near open flame or excessive heat. Do not smoke when using solvent. Failure to do so could cause **SERIOUS INJURY**. If you become dizzy while using dry-cleaning solvent, get fresh air immediately, and if necessary, get medical attention. If contact with skin or clothes is made, flush thoroughly with water. If the solvent contacts your eyes, wash them with water immediately and obtain medical aid (FM 21-11).

a. General. Keep the vehicle and its individual components clean. Dirt, grease, oil, and debris may conceal a serious problem. Clean components as needed. Use dry-cleaning solvent (item 55, Appx C) on all metal surfaces. Use mild soap (item 17, Appx C) and water to clean rubber and plastic parts.

Remove existing (old) lubricant with dry-cleaning solvent (item 55, Appx C) or cleaner if possible. Corrosion or corrosion products should be carefully removed with a soft bristle brush or abrasive cloth (item 15, Appx C). Do not use stainless steel brush, steel wool, or sand paper. Use care not to remove paint or protective finishes from other non-corroded parts. Thoroughly clean with solvent or cleaner.

Lubricate equipment in accordance with TM 9-2350-314-10.

Clean batteries in accordance with TM 9-6140-200-14.

b. Painted Surfaces. Notify support maintenance.

c. Unpainted Surfaces. Coat unpainted metal surfaces with oil or grease as appropriate.

d. Stress Corrosion Cracks. The crack should be verified by probing into the metal, and not just checking cracked paint. If cracked, notify support maintenance and weld in accordance with aluminum welding MIL-STD-372 or steel welding MIL-STD-1943.

e. Rubber and Plastic Materials. The only repair to deteriorating rubber or plastic is to replace at Unit Maintenance or a higher level of maintenance (if required).

f. Electrical parts. Solvents such as dry-cleaning solvent should not be used to clean electrical insulation, wires, cables, or wiring harnesses because of the damage effects of solvents on materials such as fibers and rubber. To clean these items, wipe clean with a damp cloth (item 44, Appx C) and immediately dry with a clean dry cloth (item 44, Appx C). Clean contact points with fine abrasive paper (item 38, Appx C) and dust thoroughly after cleaning. If selective leaching or cracking is present on connectors, replace connectors at Unit Maintenance or a higher level of maintenance (if required).

## G-5 TOOLS AND MATERIALS.

The tools and materials used by the mechanic in performing CPC on the M109A6 Howitzer are listed in Appendix C (Expendable/Durable Supplies and Materials List) and Appendix F (Tool Identification List).

## ALPHABETICAL INDEX

### A

Accessory Control Box and Brackets, 8-62  
 Accessory Items, 18-2  
 Actuator Cable Assembly, 21-9  
 Administrative Storage, 23-2  
   Auxiliary Equipment and Basic Issue Items, 23-3  
   Corrections of Shortcomings and Deficiencies, 23-3  
   General Cleaning, Painting, and Preservation, 23-3  
   Lubrication, 23-3  
   Maintenance Services and Inspections, 23-3  
   Security, 23-2  
   Storage Plan, 23-3  
   Storage Site, 23-2  
 Air Box Pressure Transducer, 8-129  
 Air Cleaner and Generator System Relay Switch, 8-136  
 Air Cleaner Blower Relay and Mounting Bracket, 8-80  
 Air Cleaner Pressure Transducer, 8-124  
 Air Intake and Exhaust Grille Covers and Strips, 19-22  
 Air Intake Grille, 16-98  
 Ammunition Racks, 16-192

### B

Batteries, 8-146, 8-148  
 Battery Access Door Seals, 16-78  
 Battery Access Doors, 16-76  
 Battery Compartment Access Port Cover and Gasket, 8-332  
 Battery Heater and Insulation Blankets, 19-9  
 Battery Supports, 8-150  
 Battery Terminal Lugs, 8-146  
 Bilge Pump, 18-8  
 Bilge Pump, Strainer, Hoses, Tubes, and Clamps, 18-8  
 Body, Cab, Hood, and Hull Assemblies, 16-4  
 Body, Chassis, or Hull Accessory Items, 18-1

Brake Controls, 11-2  
 Brake Pedal and Parking Brake Assembly, 11-10  
 Brakes, 11-1  
 Breather, Tube, and Mount, 9-28  
 Bus Bar (Positive or Negative) and Power Receptacle Assembly (Rear), 8-311

### C

Care Of Equipment In Administrative Storage Inspection, 23-4  
   Maintenance Services, 23-4  
 Care Of Equipment in Administrative Storage, 23-4  
 Circuit Breakers and Circuit Breaker Panels, 8-65  
 Combat Override Switch and Bracket, 8-82  
 Control Valves And Tube Assembly, 21-20  
 Coolant Hoses, 19-34  
 Coolant Pump and Bracket, 19-13  
 Coolant System Bleeding, 19-27  
 Coolant Temperature Switch, 8-144  
 Coolant Temperature Transmitter, 8-142  
 Corrosion Prevention and Control, G-1  
 Cradle Assembly, 8-25  
 Cradle Mounting Bracket, 8-28  
 Current Shunt and Ground Bus, 8-92  
 Cylinder Assembly, 21-2  
 Cylinder Cap Retaining Assemblies, 21-7  
 Cylinder Retaining Straps, 21-5

### D

Data Plates and Instruction Holders, 18-34  
 Decals, 18-34  
 Definition of Administrative Storage, 23-2  
 Dome Light, 8-113  
 Dome Light Mounting Bracket, 8-120  
 Drain Plugs, 16-128  
 Driver's Bulkhead Harness Cover, 8-91  
 Driver's Full Function Crew Station Mounting Plate, 8-88

## ALPHABETICAL INDEX – CONTINUED

Driver's Hatch and Periscopes, 16-111  
Driver's Hatch Armor Plate and Handgrips, 16-111  
Driver's Hatch Cover and Lock Components, 16-113  
Driver's Instrument Panel, 8-37  
Driver's Instrument Panel Support Assembly, 8-44  
Driver's Intercom Bracket, 8-89  
Driver's Portable Instrument Panel, 8-49  
Driver's Portable Instrument Panel Bracket (Outside Driver's Hatch and Crew Compartment), 8-55  
Driver's Seat, 16-139

### E

Electrical Systems, 8-1  
Enclosure Assembly and Bracket – Crew Compartment Warning Light, 8-68  
Engine Compartment Access Cover, 16-18  
Engine Compartment Tubes, Nozzle and Mounting Hardware, 21-26  
Engine Coolant Heater Assembly and Brackets, 19-2  
Engine Dipstick Access Cover, 16-96  
Engine Oil Pressure Switch, 8-134  
Engine Oil Pressure Transmitter, 8-138  
Engine Starter, 8-33  
Engine Wiring Harness Mounting Bracket, 8-334  
Exhaust Deflectors, 16-90  
Exhaust Outlet Assembly, 19-8  
Exhaust Tube and Support, 19-29  
Expendable and Durable Items List, C-1  
Extractor Assembly Stowage Clamps, 16-180

### F

Fan Access Door, 16-92  
Fenders, 16-109  
Field Manuals, A-1  
Final Drive Assembly, 10-4

Final Drive Breather Tubes and Breather, 10-2  
Final Drive Hub, Quick-Disconnect, and Coupling Assembly, 10-9  
Final Drive Skid Plates, 16-136  
Final Drive Sprocket and Hub, 12-40  
Fire Fighting Equipment, 21-1  
Flashlight Holder, 16-179  
Flexible Hoses And Fittings, 21-24  
Floor, Subfloor, and Related Components, 16-130  
Forms, A-1  
Fuel Fill Access Door, 16-108  
Fuel Filter, 19-16  
Fuel Lines and Hoses, 19-31  
Fuel Pressure Differential Transducer, 8-125  
Fuel Pump and Fuel Filter Mounting Bracket, 19-30  
Fuel Pump Assembly, 19-5  
Fuel Supply Pressure Transducer, 8-127  
Full Function Crew Station, Driver's – Internal, 18-4

### G

Gages, 20-1  
Gear Shift and Controls, 9-2  
Gear Shift Control Linkage, 9-2  
General, 23-2  
Generator, 8-5, 8-11  
Generator Alignment, 8-20  
Generator Drive Belt, 8-5  
Generator Drive Belt Tensioner and Bracket, 8-7  
Generator Drive Shaft and Shaft Screw, 8-23  
Generator Oil Cooling Manifold, Hoses, Valves, and Fittings, 8-29  
Generator Pulley Assembly, 8-9  
Generator/Fuel Pump Relay and Mounting Bracket, 8-78  
Grenade Box Assembly, 16-167  
Grenade Box Assembly, 40MM, 16-169  
Grille Adjustable Support Assembly, 16-105  
Gun Barrel Bracket Assembly, 16-155

## ALPHABETICAL INDEX – CONTINUED

Gun Butt Bracket Assembly, 16-158  
 Gun Tube Travel Lock, 16-22  
 Gun Tube Travel Lock Actuator Adjustment, 16-48  
 Gun Tube Travel Lock Actuator and Pin Assembly, 16-43  
 Gun Tube Travel Lock Bumper Stop, 16-60  
 Gun Tube Travel Lock Control Box and Voltage Regulator Control Box Bracket, 8-61  
 Gun Tube Travel Lock Control Box Assembly, 8-57  
 Gun Tube Travel Lock Pin Assembly, 16-46  
 Gun Tube Travel Lock Quick-Release Pins and Wire Rope, 16-62  
 Gun Tube Travel Lock Support, 16-88  
 Gun Tube Travel Lock Support Bracket Bearings, 16-64  
 Gun Tube Travel Lock Wiring Harness Connectors and Shield, 8-329

### H

Hand Brake, 11-2  
 Headlight Assembly, 8-98  
 Headlight Dimmer Switch, 8-84  
 Headlight Mount, 8-108  
 Headlight Sealed-Beam and Incandescent Lamps, 8-96  
 Heater Control Box and Bracket, 19-7  
 Hinged and Triple Cradles, 16-198  
 Horizontal Latch Assembly, 16-186  
 Hull Exhaust Grille, 16-91  
 Hull Expansion Plugs, 16-138  
 Hull Front Slope and Exhaust Grille Support Plate, 16-102  
 Hull Rear Door Latch, 16-66  
 Hull Rear Door Seal, 16-67  
 Hull Rear Door, Hold-Open Rod, and Handle, 16-69  
 Hull Subfloor Access Covers, 16-134  
 Hull Wiring Harness, 8-162  
 Hydraulic Bumper and Bumper Brackets, 15-8

### I

Idler Arm Assembly, 12-35  
 Idler Arm Housing, 12-34  
 Idler Wheels and Idler Arm Hub and Cap Assembly, 12-28  
 Instrument or Engine Control Panels, 8-37  
 Intercom Box and Full Function Crew Station – External, 18-6  
 Intercom Cable – External, 18-5  
 Intercom Cable – Internal, 18-2

### L

Lead Assembly Circuit Breaker to Driver's MCS Heater, 8-314  
 Lead Assembly, Accessory Control Box to Lead Filter Fan, 8-322  
 Lead Assembly, Generator to Engine Block Ground, 8-320  
 Lead Assembly, Lead Filter Fan to Ground, 8-324  
 Lead Assembly, Left Slip Ring Segment Rear Negative Terminal to Rear Power Receptacle, Negative Bus Bar, 8-302  
 Lead Assembly, Left Slip Ring Segment Rear Positive Terminal to Rear Power Receptacle, Positive Bus Bar, 8-306  
 Lead Assembly, Right Slip Ring Segment Rear Negative Terminal to Rear Power Receptacle, Negative Bus Bar, 8-304  
 Lead Assembly, Right Slip Ring Segment Rear Positive Terminal to Rear Power Receptacle, Positive Bus Bar, 8-300  
 Lead Assembly, Slip Ring Segment Front Negative Terminal to Slip Ring Segment Rear Negative Terminal, 8-298  
 Lead Assembly, Slip Ring Segment Front Positive Terminal to Slip Ring Segment Rear Positive Terminal, 8-296  
 Lead Filter, 16-8  
 Lead Filter Drain Hoses and Clamps, 16-12  
 Lead Filter Fan, 8-336  
 Lead Filter Grille Assembly, 16-14  
 Lead Filter Housing Hold-Down Latch, 16-16

## ALPHABETICAL INDEX – CONTINUED

Lead Filter Vent Tube, Fitting, and Elbow, 16-10  
Lead, Battery Positive Terminal to Master Relay Terminal A1, 8-151  
Lead, Battery Positive Terminal to Master Relay Terminal A1 and Wiring Harness W105, 8-159  
Leads, Negative Terminal to Ground Bus and Battery Positive Terminal to Battery Negative Terminal, 8-154  
Lights, 8-96  
Lock Assembly (Ammunition Racks), 16-189

### M

Maintenance Allocation Chart, B-1  
Maintenance Allocation Chart for M109A6, B-4  
Mandatory Replacement Parts List, E-1  
Master Relay and Bracket, 8-70  
MCS Connector Assembly (Supply Hose To Face Mask And Vest) and Bracket, 22-6  
MCS Heater (M3), 22-8  
MCS Heater (M3) Pilot Light Lens, Lamp, and Knob, 22-4  
MCS Heater (M3) Supply Hose, 19-38  
MCS Heater Bracket, 22-10  
MCS Hose Assemblies and Hardware, 22-2  
Mechanical Brake System, 11-10  
Military Specifications, A-3  
Miscellaneous Publications, A-3

### N

Net Assembly and Fasteners, 16-175  
Night Viewer and M45 Periscope Cover and Gasket, 16-124  
Night Viewer and M45 Periscope Cover Doors, Pins, Springs, and Seals, 16-122  
Night Viewer and M45 Periscope Supports, Springs, Spacers, and Rods, 16-126  
Night Viewer Stowage Bracket, 16-152  
Night Viewer Stowage Bracket Support Plate, 16-154

### INDEX-4

### O

Oil Can Bracket and Mounting Plate, 16-181  
Oil Sampling Valve, Transmission Oil Lines and, 9-36

### P

Parking Brake Linkage, 11-4  
Parking Brake Warning Switch, 11-8  
Periscope Bracket and Shroud Assembly, 16-161  
Personnel Heater, 18-24  
Personnel Heater Exhaust Tube, 18-30  
Personnel Heater Fuel Filter and Tubes, 18-16  
Personnel Heater Fuel Hoses, Tubes, and Fittings, 18-20  
Personnel Heater Fuel Pump, 18-18  
Personnel Heater Mounting Hardware, Clamps, and Ducts, 18-12  
Personnel Heater Support Assembly and Associated Hardware, 18-27  
Portable Fire Extinguisher and Bracket, 16-182  
Power Receptacle Guard, 8-310  
Powerpack Ground Lead, 8-316  
Projectile Stowage Straps, Spacers, and Strap Bracket, 16-196  
Protective Cover (Front and Rear), 8-140  
Protective Cover for Transmission Oil Temperature Transmitter and Transmission Oil High Temperature Switch, 9-33  
Pulse Tachometer, 20-10

### R

Radiator Cap Access Cover, 16-94  
Receipt For Storage, 23-5  
References, A-1  
Regulations, A-3  
Remarks, B-18  
Removal From Administrative Storage, 23-5  
Resistor Module Block and Bracket, 8-86



## ALPHABETICAL INDEX – CONTINUED

Rifle Clip, 16-178  
 Road Arm Assembly and Housing Assembly, 12-4  
 Road Arm Assembly Stop Pins, 12-12  
 Roadwheel Hub and Cap Assembly, 12-14  
 Roadwheels, 12-20- 12-33  
 Rotation, 23-5

### S

Sending Units and Warning Switches, 8-124  
 Service and Blackout Taillights, Stoplights, and Lamps, 8-110  
 Service Brake Linkage, 11-18  
 Servicing, 23-5  
 Shock Absorber, Bearing, and Bracket, 15-2  
 Shock Absorbers, 15-1  
 Single Cradles, Cantilever Cradles, Cradle, and Latch Brackets, 16-201  
 Slave Receptacle Assembly and Mounting Bracket (Front), 8-308  
 Spacer, 16-176  
 Spade, 17-9  
 Spade Assemblies, 17-1  
 Spade Latch and Pin Assembly, 17-2  
 Spade Strut and Cable, 17-6  
 Spade Strut Latch and Pedal, 17-4  
 Spare Track Shoe Clamps, 16-177  
 Special Purpose Kits, 19-1  
 Speedometer And Tachometer Systems Mounting Bracket, 20-11  
 Speedometer System, 20-2  
 Starter Ground Strap, 8-318  
 Starter Protection Relay, Bilge Pump Relay, Bilge Pump Circuit Breaker, and Mount, 8-72  
 Starting Motor, 8-33  
 STE Bracket, 8-90  
 Steering, 13-1  
 Steering Control Linkage, 13-2  
 Steering Control Linkage Adjustment, 13-11

Stencil Locations, 18-36  
 Stoplight Switch, 11-20  
 Stowage Box Assembly (Driver's Compartment), 16-166  
 Stowage Box Latch (Driver's Compartment), 16-164  
 Stowage Box Seals (Driver's Compartment), 16-162  
 Strap with Removable Hook, 16-173  
 Straps, 16-172  
 Straps with Permanent Attached Hook, 16-174  
 Subfloor Drain Plugs, 16-128  
 Suspension Bracket, 15-7

### T

Tachometer System, 20-6  
 Technical Bulletins, A-1  
 Technical Manuals, A-1  
 Telephone Cable Reel, Handcrank, and Bracket, 16-151  
 Tool Identification List, F-1  
 Tools and Test Equipment for M109A6, B-16  
 Torque Limits, D-1  
 Torsion Bar, 12-24  
 Torsion Bar Anchor Cover Plates, 16-130  
 Torsion Bar Anchors, Positions 1, 2, 4, 5, 6, and 7, 12-26  
 Torsion Bar, Anchor, Road Arm, and Roadwheel Hub and Cap Assembly Identification Chart, 12-2  
 Tow Hook, 14-4  
 Towing Attachments, 14-1  
 Towing Eye Bushing Replacement, 14-6  
 Towing Pintle, 14-2  
 Track, 12-50  
 Track Adjuster Assembly and Mounting Bracket, 12-38  
 Track Drive Sprocket, 12-40  
 Track Pad, 12-42  
 Track Shoe, 12-46

## ALPHABETICAL INDEX – CONTINUED

Track Tension, 12-44  
Transmission Access Cover, 16-21  
Transmission Access Door Seals, 16-85  
Transmission Access Doors and Door Support Bracket, 16-82  
Transmission Assembly and Associated Parts, 9-14  
Transmission Gage Rod and Seal, 9-26  
Transmission Hub Assembly, 9-31  
Transmission Internal Brake, 9-23  
Transmission Oil Filter, 9-21  
Transmission Oil Lines and Oil Sampling Valve, 9-36  
Transmission Oil Pressure Transmitter and Transmission Oil Low Pressure Switch, 8-132  
Transmission Oil Temperature Transmitter and Transmission Oil High Temperature Switch, 8-130  
Transmission Pressure Checks, 9-14

### V

Vehicle Identification Plate, 18-38  
Ventilating Equipment, 8-336  
Ventilation Air Duct, 16-4  
Vertical Latch Assembly, 16-183  
Voltage Regulator, 8-32  
Voltage Regulator Control Box Assembly, 8-59

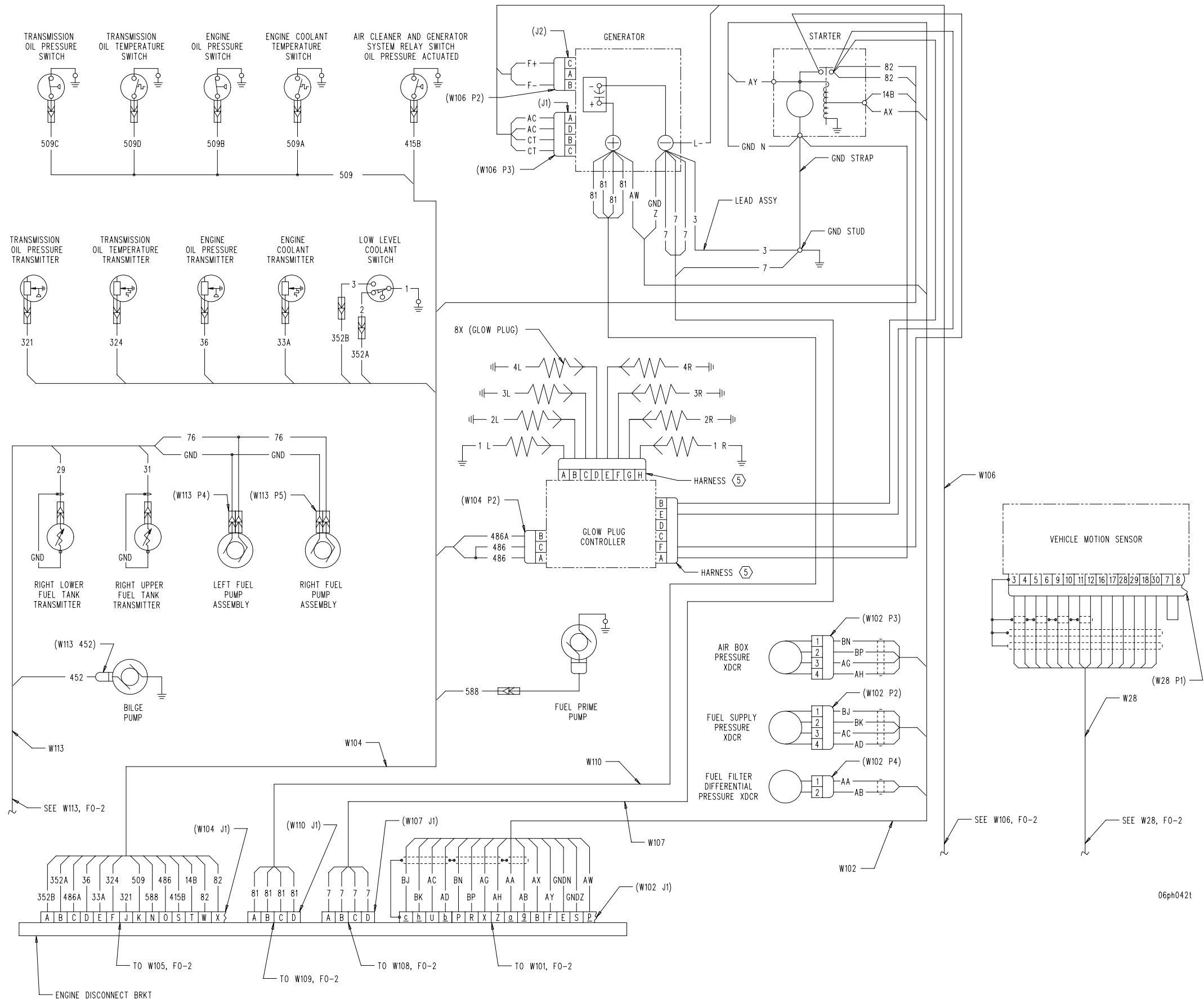
### W

Warning Light Assembly (Steering Shaft), 8-122  
Wheels and Tracks, 12-1  
Winterization Equipment, 18-12  
Winterization Kit Wiring Harness (Bulkhead to Control Box), 19-18

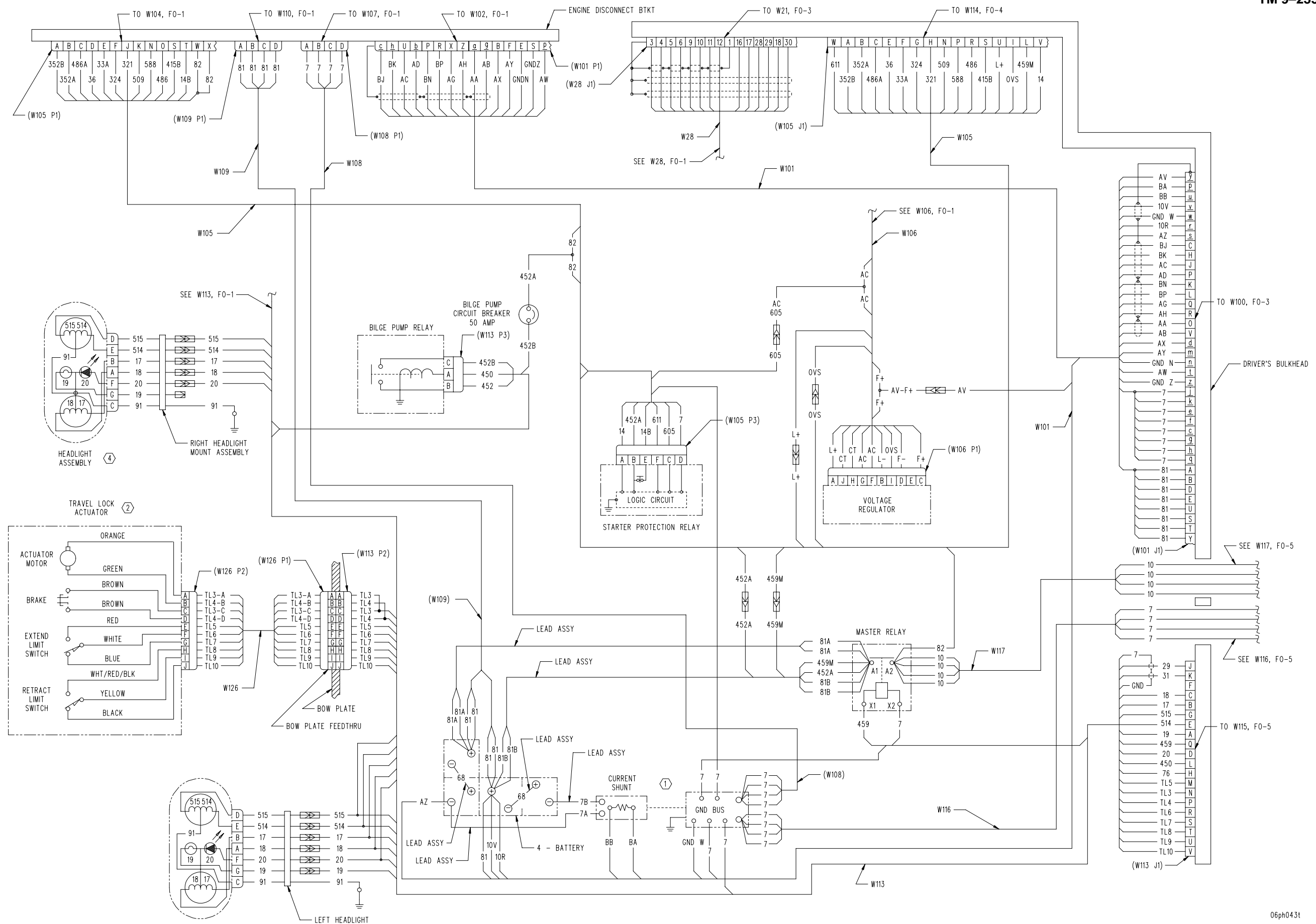
Winterization Kit Wiring Harness (Coolant Heater to Bulkhead), 19-24  
Wiring Harness and Cable Repair, 8-162  
Wiring Harness Hull Rear Access Covers, 8-328  
Wiring Harness Rear Access Guard, 8-326  
Wiring Harness W100, 8-166  
Wiring Harness W101, 8-172  
Wiring Harness W102, 8-182  
Wiring Harness W104, 8-187  
Wiring Harness W105, 8-194  
Wiring Harness W106, 8-200  
Wiring Harness W107, 8-206  
Wiring Harness W108, 8-211  
Wiring Harness W109, 8-213  
Wiring Harness W110, 8-217  
Wiring harness W111A, 8-221  
Wiring Harness W112, 8-225  
Wiring Harness W113, 8-230  
Wiring Harness W114, 8-238  
Wiring Harness W114 Access Guard, 8-327  
Wiring Harness W115, 8-246  
Wiring Harness W116, 8-254  
Wiring Harness W117, 8-260  
Wiring Harness W118, 8-266  
Wiring Harness W119, 8-269  
Wiring Harness W120, 8-276  
Wiring Harness W122, 8-280  
Wiring Harness W123, 8-284  
Wiring Harness W124, 8-286  
Wiring Harness W125, 8-290  
Wiring Harness W126, 8-295

NOTES:

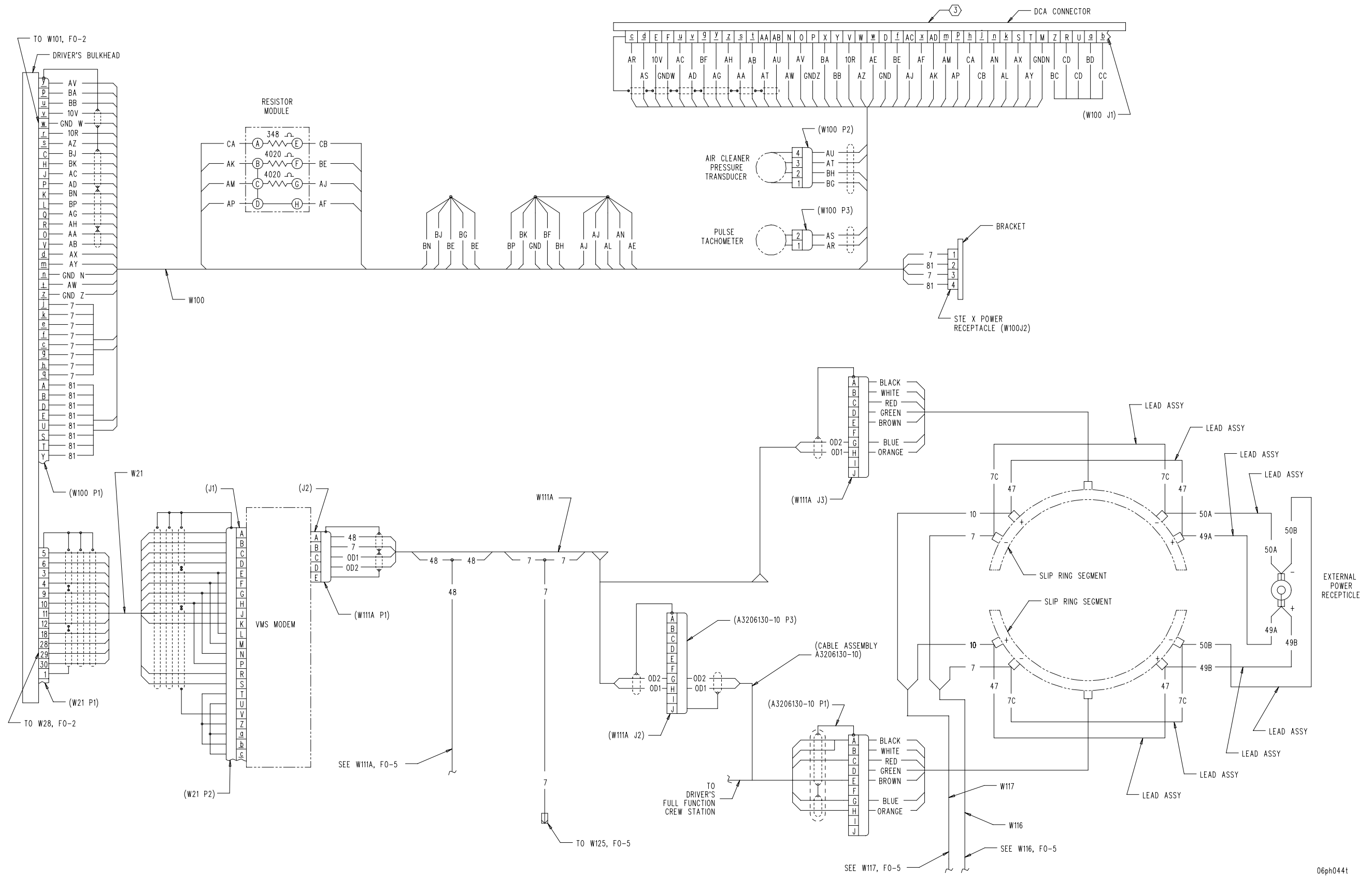
- ① ELECTRICAL PATH PROVIDED VIA BOLTING GND BUS TO CURRENT SHUNT.
- ② TRAVEL LOCK ACTUATOR SWITCHES SHOWN WITH GUN TUBE IN STOWED POSITION.
- ③ VEHICLE TEST METER (STE/ICE) CONNECTION.
- ④ HEADLIGHT CIRCUIT LEGEND:  
 18 - LOW BEAM SERVICE  
 17 - HIGH BEAM SERVICE  
 19 - B O DRIVER  
 20 - B O MARKER  
 91 - GND  
 514 - B O HIGH BEAM (I.R.)  
 515 - B O LOW BEAM (I.R.)
- ⑤ REFER TO TM9-2815-202-34.



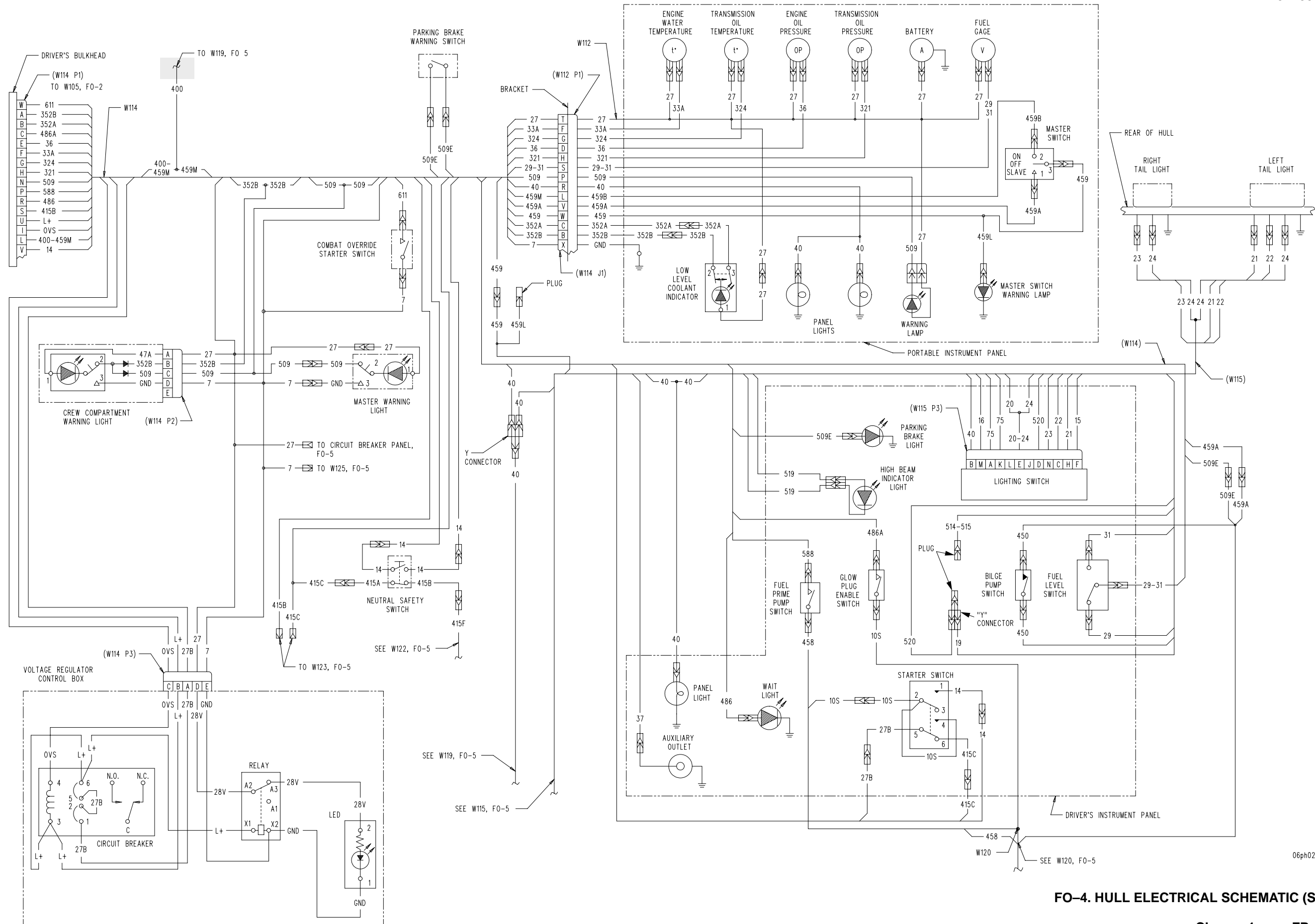
06ph042t



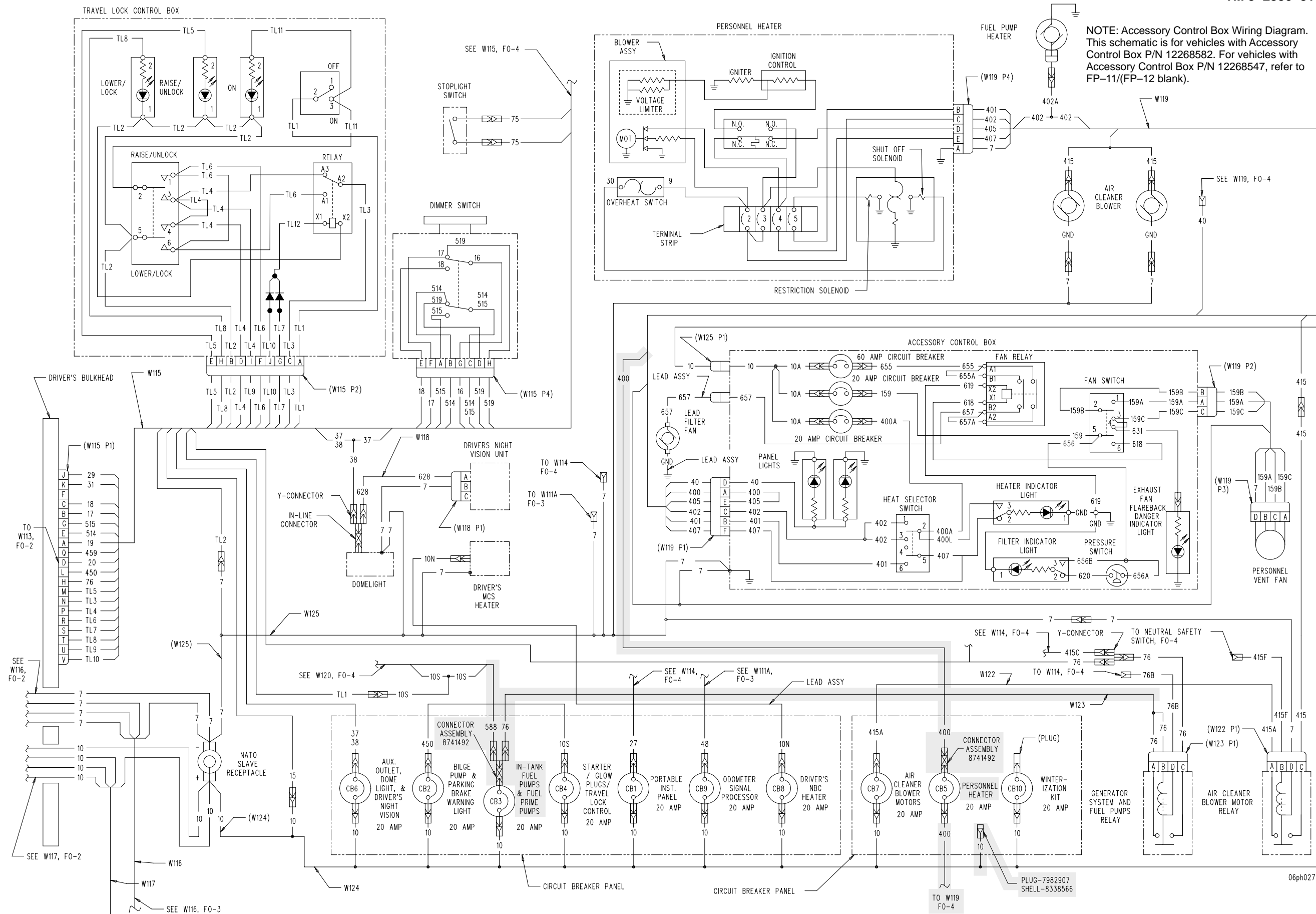
06ph043t



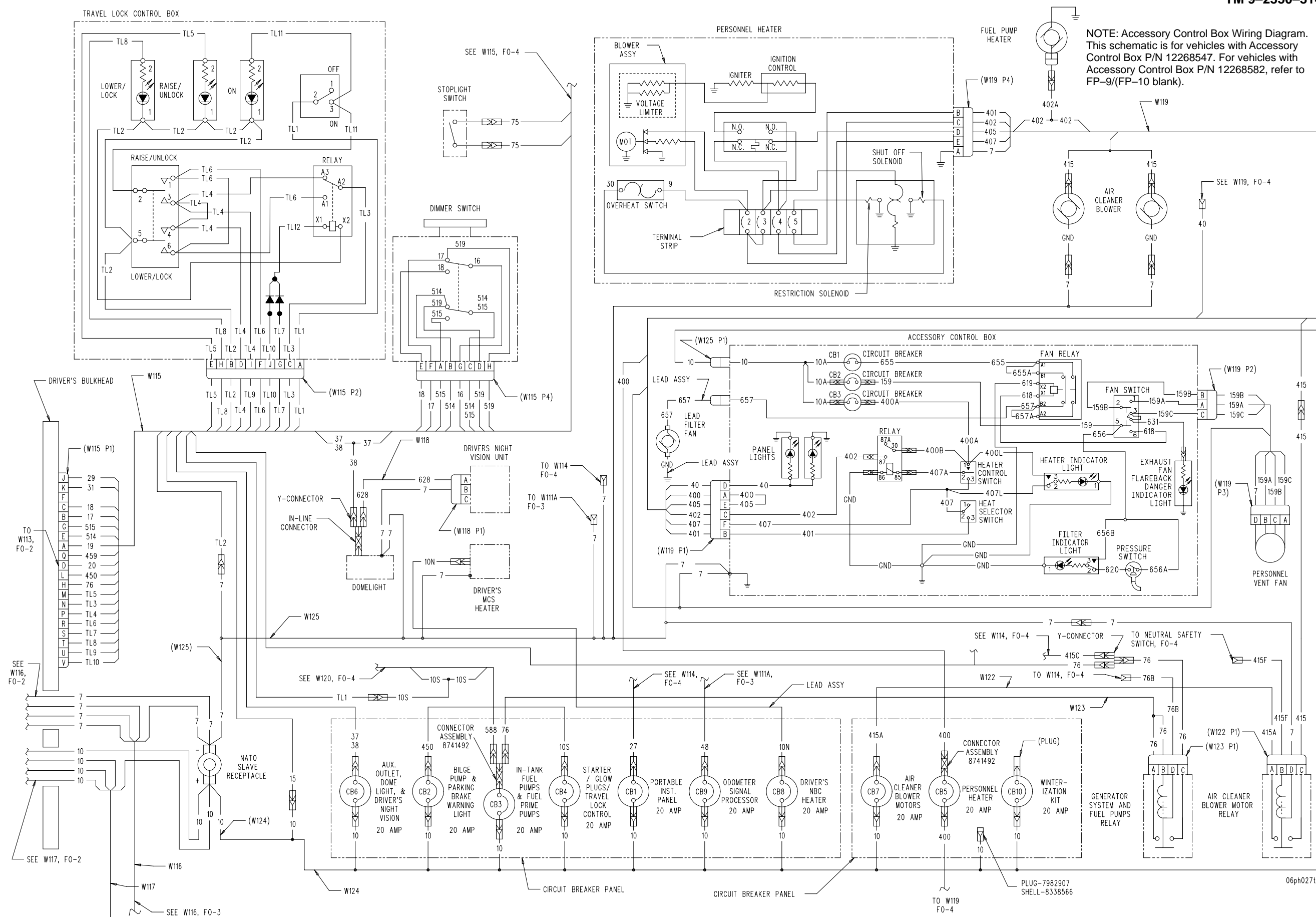
06ph044t



06ph026t



NOTE: Accessory Control Box Wiring Diagram. This schematic is for vehicles with Accessory Control Box P/N 12268582. For vehicles with Accessory Control Box P/N 12268547, refer to FP-11/(FP-12 blank).




NOTE: Accessory Control Box Wiring Diagram. This schematic is for vehicles with Accessory Control Box P/N 12268547. For vehicles with Accessory Control Box P/N 12268582, refer to FP-9/(FP-10 blank).



**By Order of the Secretary of the Army:**

**DENNIS J. REIMER**  
*General, United States Army*  
*Chief of Staff*

  
**JOEL B. HUDSON**  
*Acting Administrative Assistant to the*  
*Secretary of the Army*  
05382

**DISTRIBUTION:** To be distributed in accordance with DA Form 12-37-E, block 1933 requirements for TM 9-2350-314-20-1-2.



*THEN...JOT DOWN THE DOPE ABOUT IT ON THIS FORM, CAREFULLY TEAR IT OUT, FOLD IT AND DROP IT IN THE MAIL.*

# SOMETHING WRONG WITH THIS PUBLICATION?

FROM: (PRINT YOUR UNIT'S COMPLETE ADDRESS)

DATE SENT

PUBLICATION NUMBER

TM 9-2350-314-20-1-2

PUBLICATION DATE

February 1999

PUBLICATION TITLE

UNIT MAINTENANCE MANUAL FOR 155MM, M109A6, SP HOWITZER

BE EXACT. . .PIN-POINT WHERE IT IS

PAGE NO.	PARA-GRAPH	FIGURE NO.	TABLE NO.
5-2	5-1		

IN THIS SPACE TELL WHAT IS WRONG AND WHAT SHOULD BE DONE ABOUT IT:

Callout (3) in step 1 should be callout (2), and callout (2) in step 2 should be callout (5).

SAMPLE

TEAR ALONG PERFORATED LINE

PRINTED NAME GRADE OR TITLE AND TELEPHONE NUMBER

Your name, your title, your phone number

SIGN HERE

Your signature



*THEN...JOT DOWN THE DOPE ABOUT IT ON THIS FORM, CAREFULLY TEAR IT OUT, FOLD IT AND DROP IT IN THE MAIL.*

# SOMETHING WRONG WITH THIS PUBLICATION?

FROM: (PRINT YOUR UNIT'S COMPLETE ADDRESS)

DATE SENT

PUBLICATION NUMBER

TM 9-2350-314-20-1-2

PUBLICATION DATE

February 1999

PUBLICATION TITLE

UNIT MAINTENANCE MANUAL FOR 155MM, M109A6, SP HOWITZER

BE EXACT. . .PIN-POINT WHERE IT IS

PAGE NO.	PARA-GRAPH	FIGURE NO.	TABLE NO.
----------	------------	------------	-----------

IN THIS SPACE TELL WHAT IS WRONG AND WHAT SHOULD BE DONE ABOUT IT:

TEAR ALONG PERFORATED LINE

PRINTED NAME GRADE OR TITLE AND TELEPHONE NUMBER

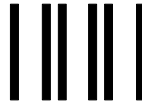
SIGN HERE

FILL IN YOUR  
UNIT'S ADDRESS



FOLD BACK

DEPARTMENT OF THE ARMY



OFFICIAL BUSINESS

NO POSTAGE  
NECESSARY  
IF MAILED  
IN THE  
UNITED STATES

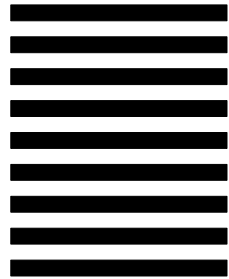
**BUSINESS REPLY MAIL**

FIRST CLASS

BRM PERMIT NO. 82

ROCK ISLAND, IL

POSTAGE WILL BE PAID BY ROCK ISLAND ARSENAL



**Technical Publication Information Office  
TACOM-RI  
1 Rock Island Arsenal  
Rock Island, IL 61299-7630**

TEAR ALONG PERFORATED LINE



# CONVERSION TABLE

inch	decimal	mm	inch	decimal	mm	inch	decimal	mm
1/64	0.015625	0.3969	23/64	0.359375	9.1281			
1/32	0.031250	0.7938	3/8	0.375000	9.5250	45/64	0.703125	17.8594
3/64	0.046875	1.1906				23/32	0.718750	18.2562
1/16	0.062500	1.5875	25/64	0.390625	9.9219	47/64	0.734375	18.6531
			13/32	0.406250	10.3188	3/4	0.750000	19.050
5/64	0.078125	1.9844	27/64	0.421875	10.7156			
3/32	0.093750	2.3812	7/16	0.437500	11.1125	49/64	0.765625	19.4469
7/64	0.109375	2.7781				25/32	0.781250	19.8437
1/8	0.125000	3.1750	29/64	0.453125	11.5094	51/64	0.796875	20.2406
			15/32	0.468750	11.9062	13/16	0.812500	20.6375
9/64	0.140625	3.5719	31/64	0.484375	12.3031			
5/32	0.156250	3.9688	1/2	0.500000	12.7000	53/64	0.828125	21.0344
11/64	0.171875	4.3656				27/32	0.843750	21.4312
3/16	0.187500	4.7625	33/64	0.515625	13.0969	55/64	0.859375	21.8281
			17/32	0.531250	13.4938	7/8	0.875000	22.2250
13/64	0.203125	5.1594	35/64	0.546875	13.8906			
7/32	0.218750	5.5562	9/16	0.562500	14.2875	57/64	0.890625	22.6219
15/64	0.234375	5.9531				29/32	0.906250	23.0188
1/4	0.250000	6.3500	37/64	0.578125	14.6844	59/64	0.921875	23.4156
			19/32	0.593750	15.0812	15/16	0.937500	23.8125
17/64	0.265625	6.7469	39/64	0.609375	15.4781			
9/32	0.281250	7.1438	5/8	0.625000	15.8750	61/64	0.953125	24.2094
19/64	0.296875	7.5406				31/32	0.967500	24.6062
5/16	0.312500	7.9375	41/64	0.640625	16.2719	63/64	0.984375	25.0031
			21/32	0.656250	16.6688			
21/64	0.328125	8.3344	43/64	0.671875	17.0656			
11/32	0.343750	8.7312	11/16	0.687500	17.4625	1	1.000000	25.4000

# THE METRIC SYSTEM AND EQUIVALENTS

## LINEAR MEASURE

1 Centimeter = 10 Millimeters = 0.01 Meters = 0.3937 Inches  
 1 Meter = 100 Centimeters = 1000 Millimeters = 39.37 Inches  
 1 Kilometer = 1000 Meters = 0.621 Miles

## WEIGHTS

1 Gram = 0.001 Kilograms = 1000 Milligrams = 0.035 Ounces  
 1 Kilogram = 1000 Grams = 2.2 Lb.  
 1 Metric Ton = 1000 Kilograms = 1 Megagram = 1.1 Short Tons

## LIQUID MEASURE

1 Milliliter = 0.001 Liters = 0.0338 Fluid Ounces  
 1 Liter = 1000 Milliliters = 33.82 Fluid Ounces

## SQUARE MEASURE

1 Sq. Centimeter = 100 Sq. Millimeters = 0.155 Sq. Inches  
 1 Sq. Meter = 10,000 Sq. Centimeters = 10.76 Sq. Feet  
 1 Sq. Kilometer = 1,000 Sq. Meters = 0.386 Sq. Miles

## CUBIC MEASURE

1 Cu. Centimeter = 1000 Cu. Millimeters = 0.06 Cu. Inches  
 1 Cu. Meter = 1,000,000 Cu. Centimeters = 35.31 Cu. Feet

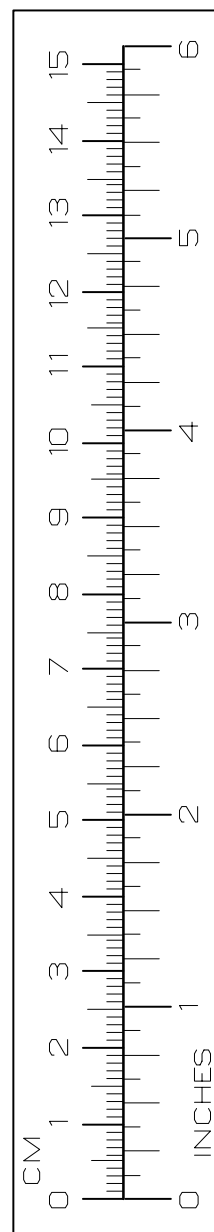
## TEMPERATURE

$^{\circ}\text{C} = 5/9 (^{\circ}\text{F} - 32)$   
 212 $^{\circ}$  Fahrenheit is equivalent to 100 $^{\circ}$  Celsius  
 90 $^{\circ}$  Fahrenheit is equivalent to 32.2 $^{\circ}$  Celsius  
 32 $^{\circ}$  Fahrenheit is equivalent to 0 $^{\circ}$  Celsius  
 $(9/5 \times ^{\circ}\text{C}) + 32 = ^{\circ}\text{F}$

## APPROXIMATE CONVERSION FACTORS

TO CHANGE	TO	MULTIPLY BY
Inches	Centimeters	2.540
Feet	Meters	0.305
Yards	Meters	0.914
Miles	Kilometers	1.609
Square Inches	Square Centimeters	6.451
Square Feet	Square Meters	0.093
Square Yards	Square Meters	0.836
Square Miles	Square Kilometers	2.590
Acres	Square Hectometers	0.405
Cubic Feet	Cubic Meters	0.028
Cubic Yards	Cubic Meters	0.765
Fluid Ounces	Millimeters	29.573
Pints	Liters	0.473
Quarts	Liters	0.946
Gallons	Liters	3.785
Ounces	Grams	28.349
Pounds	Kilograms	0.454
Short Tons	Metric Tons	0.907
Pound-Feet	Newton-Meters	1.356
Pounds per Square Inch	Kilopascals	6.895
Miles per Gallon	Kilometers per Liter	0.425
Miles per Hour	Kilometers per Hour	1.609

TO CHANGE	TO	MULTIPLY BY
Centimeters	Inches	0.394
Meters	Feet	3.280
Meters	Yards	1.094
Kilometers	Miles	0.621
Square Centimeters	Square Inches	0.155
Square Meters	Square Feet	10.764
Square Meters	Square Yards	1.196
Square Kilometers	Square Miles	0.386
Square Hectometers	Acres	2.471
Cubic Meters	Cubic Feet	35.315
Cubic Meters	Cubic Yards	1.308
Milliliters	Fluid Ounces	0.034
Liters	Pints	2.113
Liters	Quarts	1.057
Liters	Gallons	0.264
Grams	Ounces	0.035
Kilograms	Pounds	2.205
Metric Tons	Short Tons	1.102
Newton-Meters	Pound-Feet	0.738
Kilopascals	Pounds per Square Inch	0.145
Kilometers per Liter	Miles per Gallon	2.354
Kilometers per Hour	Miles per Hour	0.621



**PIN: 071823-001**