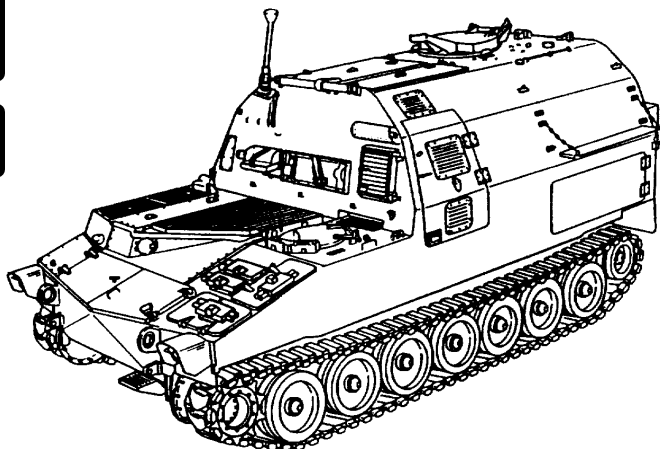


TECHNICAL MANUAL



**UNIT MAINTENANCE
MANUAL
FOR
CARRIER, AMMUNITION,
TRACKED
M992A1
(NSN 2350-01-352-3021)
EIC: AE6**

**Approved for public release; distribution is
unlimited.**

**HEADQUARTERS, DEPARTMENT OF THE
ARMY
OCTOBER 1993**

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TECHNICAL MANUAL

NO. 9-2350-287-20-2

HEADQUARTERS
DEPARTMENT OF THE ARMY
Washington, D.C., 22 OCTOBER 1993

**UNIT MAINTENANCE MANUAL
FOR
CARRIER, AMMUNITION, TRACKED
M992A1
(NSN 2350-01-352-3201)EIC:AE6**

REPORTING ERRORS AND RECOMMENDING IMPROVEMENTS

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

You may also provide DA Form 2028-2 information to TACOM via datafax or e-mail:

- TACOM's fax number is DSN 786-6323 or Commercial (810) 574-6323
- TACOM's e-mail address is tacom-tech-pubs@cc.tacom.army.mil

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HOW TO USE THIS MANUAL

SCOPE.

This technical manual contains Unit maintenance procedures for the M992A1 Carrier Ammunition, Tracked. Chapter 1 contains general information; Chapter 2 contains information on general maintenance procedures and describes and illustrates troubleshooting procedures; and Chapters 3 through 22 describe and illustrate maintenance procedures for various systems and components. Ten appendixes and a subject index are also included in this manual.

INDEXING.

Four indexing procedures are used to help you locate information quickly:

- Cover index. Lists chapter titles and important parts of the manual, with corresponding page numbers. Each chapter or part listed is boxed in, with a black outer edge that is in line with the first page of that chapter or part.
- Table of contents. The table of contents follows the Safety Summary. The table of contents lists all chapters numerically, with corresponding page numbers.
- Chapter indexes. Each chapter starts with a numerical listing of all paragraphs in that chapter.
- Alphabetical index. The alphabetically arranged subject index starts on page Index 1.

MAINTENANCE TEXT AND ILLUSTRATIONS (CHAPTERS 3 THROUGH 22).

Each chapter begins with a numerical listing of all paragraphs. The first paragraph in each chapter is titled "General" and describes the system(s) to be covered. General repair and inspection procedures may also be given.

Each paragraph contains the following information, as appropriate:

- The common or specials tools and test equipment required to perform the procedures are listed under the heading "Tools/Test Equipment." Common and special tools are listed in Appendix I.
- Materials and mandatory replacement parts that will be discarded during the procedure are listed under the heading "Materials/Parts." A Materials/Parts list does not contain items that maybe replaced if found defective during inspection. Also, the list does not contain the item named in the paragraph title. Materials may be found in Appendix D. Mandatory replacement parts maybe found in Appendix H. Refer to TM 9-2350-287-24P for information on other parts that may have to be replaced.
- If more than one person is required to perform the procedure, the number is specified under the heading "Personnel Required."
- Technical manuals, technical bulletins, field manuals, or other reference material that maybe required to perform the procedure are listed under the heading "References." Note that the titles of all publications and forms referenced in the manual are listed in Appendix A,
- Procedures that must be performed on the vehicle prior to the maintenance procedure are listed under the heading "Equipment Conditions."

TEXT AND ILLUSTRATIONS.

Maintenance procedures are to be performed in the sequence given in the text and illustrations.

Illustrations are numbered clockwise, beginning at the 11 o'clock position. Because an illustration is keyed to the text, parts that are removed sequentially may not have sequential numbers. For example:

1. Remove screw (4), lockwasher (6), washer (7), and bracket (5) from transmission.

IMPORTANT.

Be sure to read the entire paragraph before beginning a maintenance procedure. Also, read the general information in Chapter 1 before beginning a procedure.

Warnings and cautions appear immediately preceding the step to which they pertain. It is important to read and thoroughly understand the warnings and/or cautions before beginning maintenance.

Notes may precede or follow the steps to which they pertain, depending on what makes the most sense. Notes highlight essential operating or maintenance procedures, conditions, or statements.

PROBLEM SOLVING.

The best way for you to fulfill your responsibility for maintaining the equipment covered in this manual is to make maximum use of your maintenance manual. The following three sample problems illustrate ways to use the manual efficiently:

1. How do I replace the roadwheel hub?
 - Look in the subject index for "roadwheel hub replacement" and turn to the appropriate page.
2. An equipment condition for replacing surge tank hoses (para 6-4) is, "Powerpack removed (para 3-2). " How do I find out what page paragraph 3-2 begins on?
 - Look in the chapter index for Chapter 3 until you find paragraph 3-2, Powerpack Replacement; then turn to the appropriate page.
3. The auxiliary power unit (APU) engine won't start. How do I find out what's wrong?
 - Turn to the Quick Guide to Troubleshooting (para 2-18). Find the name of the item that doesn't work (APU).
 - Find the problem (ENGINE CRANKS BUT FAILS TO START) in the listing for APU.
 - Turn to the paragraph in the Troubleshooting Chart (para 2-19) that is referenced-in this case, paragraph 2-19u (1).

CHAPTER 10

BRAKES MAINTENANCE

Paragraph Number	Paragraph Title	Page Number
10-1	General	10-1
10-2	Service and Parking Brake Linkage Replacement/Adjustment	10-1
10-3	Powerpack Compartment Brake Linkage Replacement/Adjustment	10-6
10-4	Driver's Compartment Brake Assembly Repair	10-10

10-1. GENERAL.

This chapter illustrates and describes the removal, installation and adjustment of the brake system. The following procedures are addressed:

Service and Parking Brake Linkage Replacement/Adjustment
 Powerpack Compartment Brake Linkage Replacement/Adjustment
 Driver's Compartment Brake Assembly Repair

10-2. SERVICE AND PARKING BRAKE LINKAGE REPLACEMENT/ADJUSTMENT.

This task covers:

- | | |
|---|--|
| a. Removal
c. Cleaning and Inspection
e. Installation | b. Disassembly
d. Assembly
f. Adjustment |
|---|--|

Initial Setup:

Tools/Test Equipment:

- General mechanic's tool kit (Item 24, Appendix I)

- Spring (Item 346, Appendix H)
- Spring (Item 347, Appendix H)
- Spring pin (2) (Item 353, Appendix H)

Materials/Parts:

- Drycleaning solvent (Item 28, Appendix D)
- Rag (Item 56, Appendix D)
- Cotter pin (Item 27, Appendix H)
- Lockwasher (2) (Item 175, Appendix H)
- Lockwasher (2) (Item 177, Appendix H)

Equipment Conditions:

- Vehicle parked on level ground (refer to TM 9-2350-287-10).
- Track blocked (refer to TM 9-2350-287-10).
- Parking brake released (refer to TM 9-2350-287-10).

10-2. SERVICE AND PARKING BRAKE LINKAGE REPLACEMENT/ADJUSTMENT (continued).

a. REMOVAL

1. Remove screw (1) and lockwasher (2) from bellcrank (3). Discard lockwasher.
2. Remove two screws (5) and lockwashers (6) from angle bracket (7). Discard lockwashers.

NOTE

Support service and parking brake linkage by hand.

3. Pull bellcrank (3) off bracket spindle (4), and remove brake linkage (8) from vehicle.

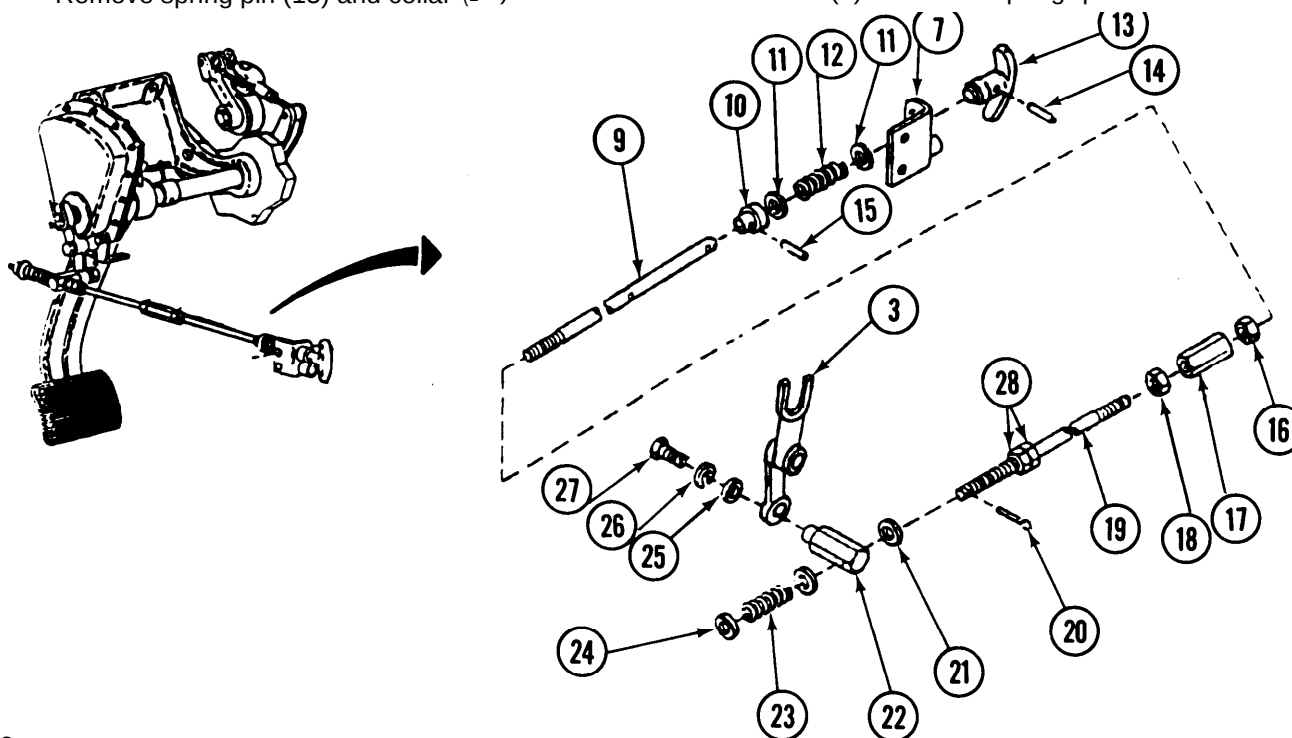
b. DISASSEMBLY

1. Remove spring pin (14) and brake handle (13) from end of brake control rod (9). Discard spring pin.

WARNING

Use care when removing spring. Spring is under tension and can act as a projectile when released and could cause severe eye injury.

2. Remove angle bracket (7), two washers (11), and spring (12) from brake control rod (9). Discard spring.
3. Remove spring pin (15) and collar (10) from brake control rod (9). Discard spring pin.



10-2. SERVICE AND PARKING BRAKE LINKAGE REPLACEMENT/ADJUSTMENT (continued).

WARNING

Use care when removing spring. Spring is under tension and can act as a projectile when released and could cause severe eye injury.

4. Remove cotter pin (20), two washers (24), spring (23), rod guide (22), and washer (21) from brake control rod (19). Discard cotter pin and spring.
5. Remove screw (27), lockwasher (26), washer (25), and rod guide (22) from bellcrank (3). Discard lockwasher.
6. Loosen two nuts (16 and 18) and remove two brake control rods (9 and 19) from mechanical post (17).
7. Remove nut (18) and two nuts (28) from brake control rod (19).
8. Remove nut (16) from brake control rod (9).

c. CLEANING AND INSPECTION

WARNING

Drycleaning solvent P-D-680 is toxic and flammable. Always wear protective goggles and gloves, and use only in a well-ventilated area. Avoid contact with skin, eyes, and clothes, and DO NOT breathe vapors. DO NOT use near open flame or excessive heat.

1. Clean all parts with drycleaning solvent and rag.
2. Inspect all parts for damage. Replace any damaged parts.

d. ASSEMBLY

1. Install nut (16) on brake control rod (9).
2. Install two nuts (28) and nut (18) on brake control rod (19).
3. Install two brake control rods (9 and 19) in mechanical post (17), then tighten two nuts (16 and 18).

WARNING

Use care when installing spring. Spring is under tension and can act as a projectile when released and could cause severe eye injury.

4. Install washer (21), rod guide (22), new spring (23), and two washers (24) on end of brake control rod (19), and secure with new cotter pin (21).
5. Install bellcrank (3) on rod guide (22) and secure with screw (27), washer (25), and new lockwasher (26).

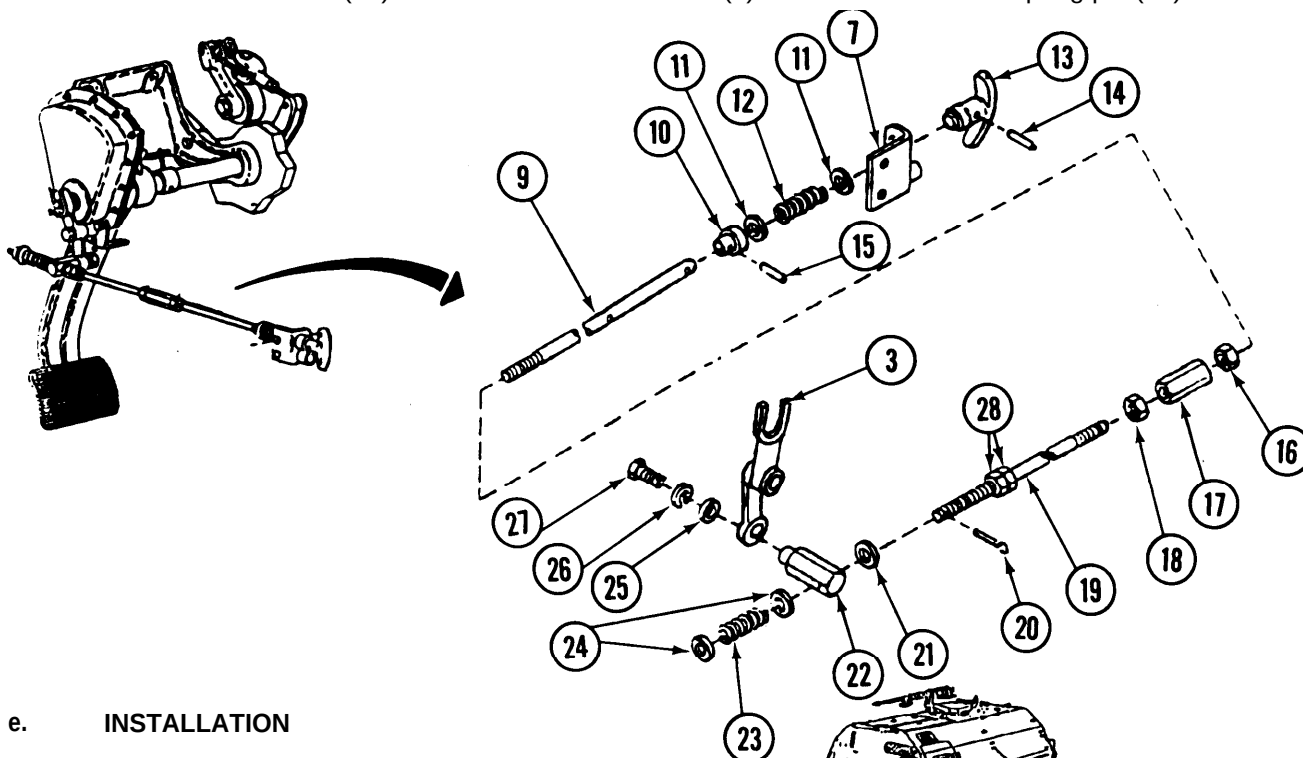
10-2. SERVICE AND PARKING BRAKE LINKAGE REPLACEMENT/ADJUSTMENT (continued).

6. Install collar (10) on end of brake control rod (9) and secure with new spring pin (15).

WARNING

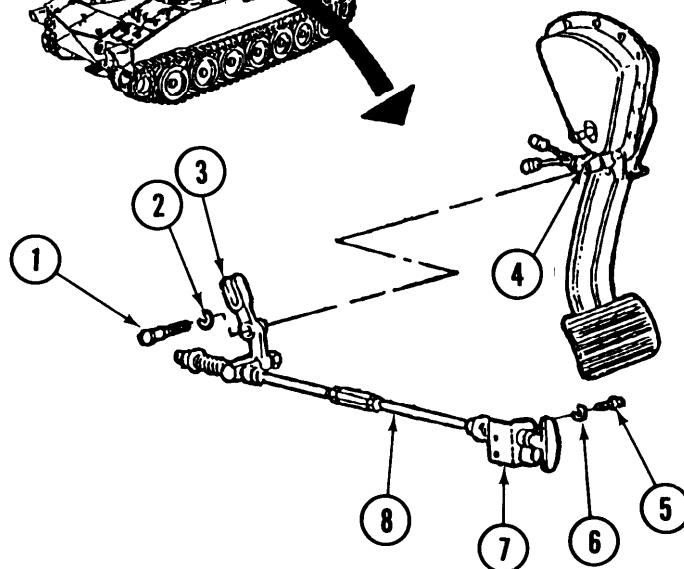
Use care when installing spring. Spring is under tension and can act as a projectile when released and could cause severe eye injury.

7. Install two washers (11), new spring (12), and angle bracket (7) on brake control rod (9).
8. Install brake handle (13) on end of brake control rod (9) and secure with new spring pin (14).



e. INSTALLATION

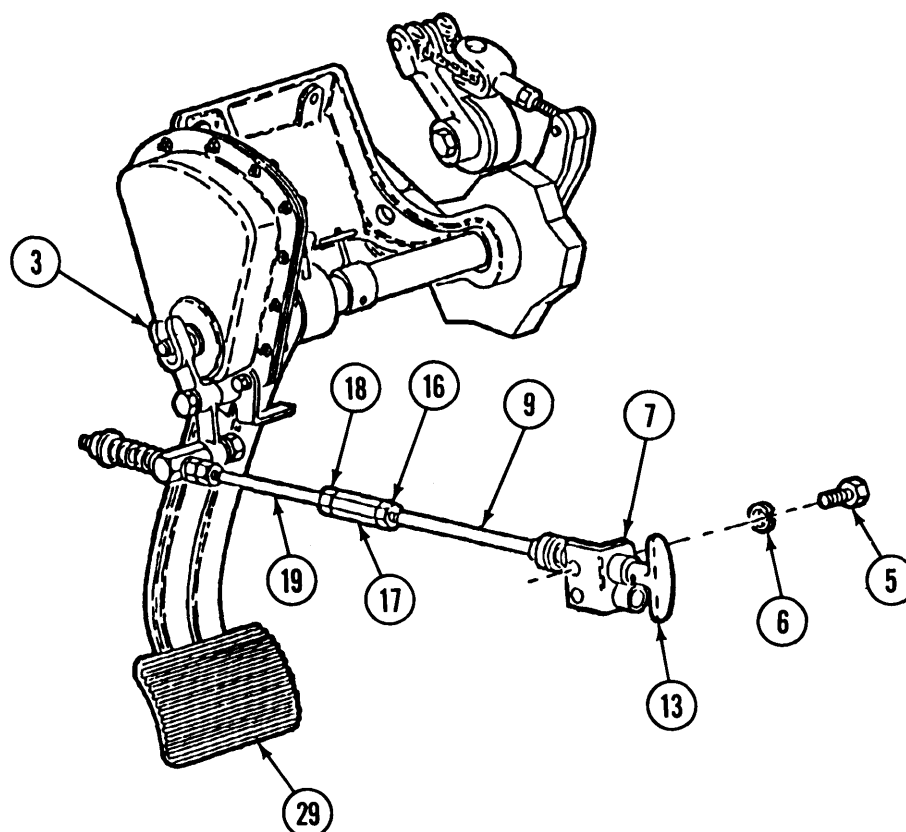
1. Position brake linkage (8) and bellcrank (3) in place on bracket spindle (4).
2. Install two screws (5) and new lockwashers (6) on angle bracket (7).
3. Install screw (1) and new lockwasher (2) to secure bellcrank (3) on bracket spindle (4).
4. Adjust service and parking brake linkage (para 10-2).



10-2. SERVICE AND PARKING BRAKE LINKAGE REPLACEMENT/ADJUSTMENT (continued).

f. ADJUSTMENT

1. Remove two screws (5) and lockwashers (6) to loosen angle bracket (7). Discard lockwashers.
2. Loosen two nuts (16 and 18) on brake control rods (9 and 19).
3. Turn mechanical post (17) in either direction until screw holes in angle bracket (7) lineup with mounting holes in bulkhead and no pressure is on bellcrank (3).
4. Install two screws (5) and new lockwashers (6) to secure angle bracket (7) to bulkhead.
5. Tighten two nuts (16 and 18) on brake control rods (9 and 19).
6. Depress service brake pedal (29), and pull brake handle (13) to lock parking brake.
7. Release service brake pedal (29). Brake should stay locked; if it does not, repeat steps 1 through 6.



FOLLOW-ON MAINTENANCE:

- Adjust parking brake light switch (para 7-20).
- Unblock tracks (refer to TM 9-2350-287-10).

10-3. POWERPACK COMPARTMENT BRAKE LINKAGE REPLACEMENT/ADJUSTMENT.

This task covers:

- | | |
|----------------------------|----------------|
| a. Removal | b. Disassembly |
| c. Cleaning and Inspection | d. Assembly |
| e. Installation | f. Adjustment |

Initial Setup:

Tools/Test Equipment:

- General mechanic's tool kit (Item 24, Appendix I)

Materials/Parts:

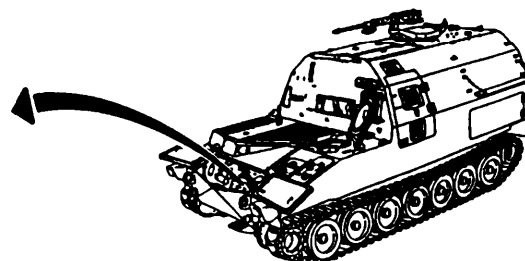
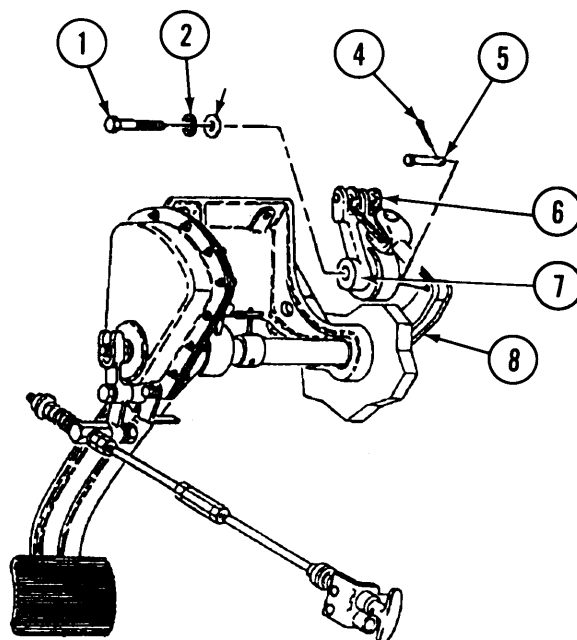
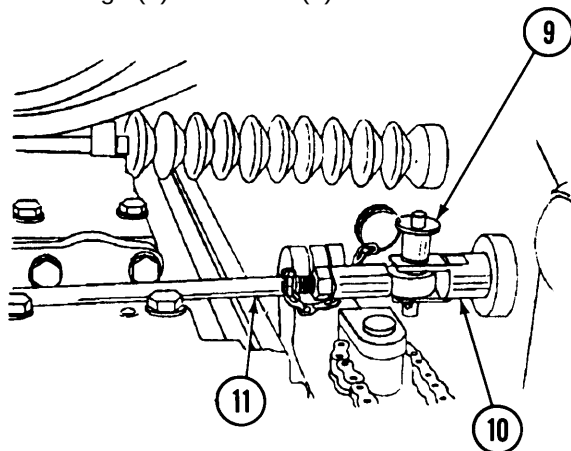
- Drycleaning solvent (Item 28, Appendix D)
- Rag (Item 56, Appendix D)
- Cotter pin (4) (Item 17, Appendix H)
- Lockwasher (Item 176, Appendix H)
- Spring pin (2) (Item 367, Appendix H)

Equipment Conditions:

- Vehicle parked on level ground (refer to TM 9-2350-287-10).
- Parking brake released (refer to TM 9-2350-287-10).
- Transmission doors opened (refer to TM 9-2350-287-10).
- Track blocked (refer to TM 9-2350-287-10).

a. REMOVAL

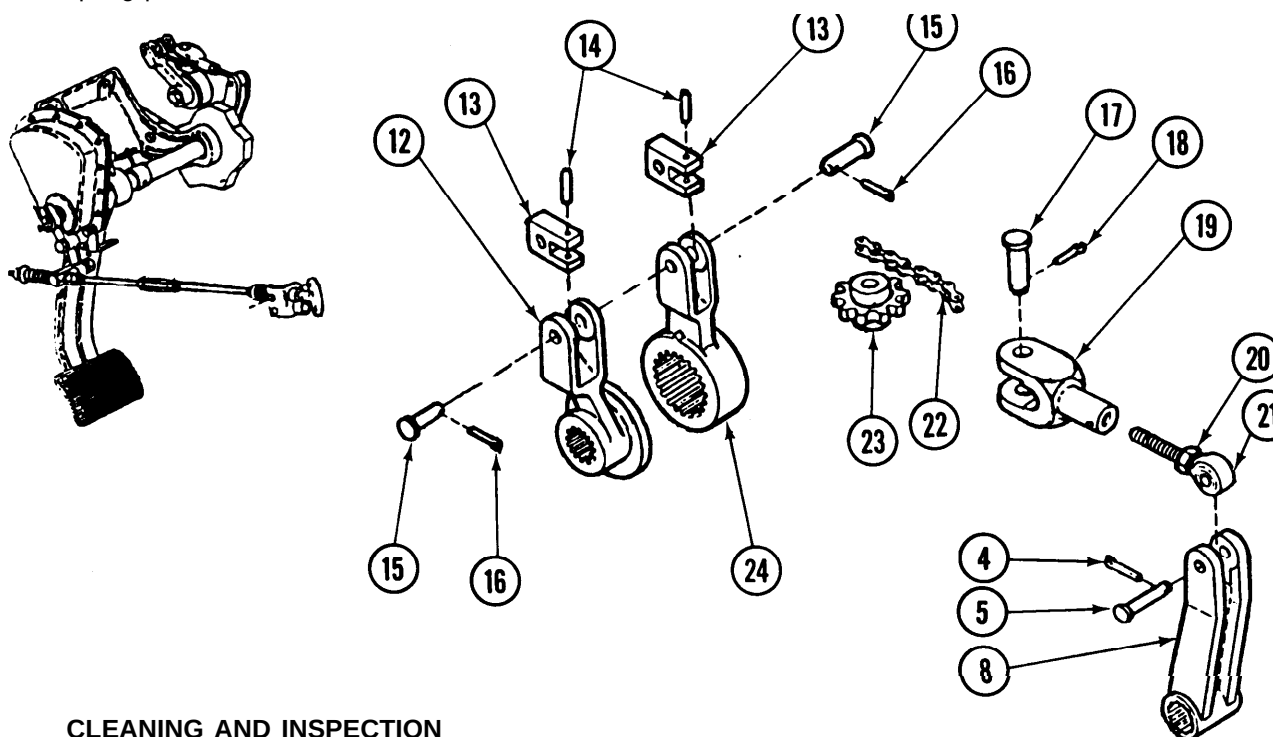
1. Remove quick-release pin (9) and disconnect shift linkage (11) from rod (10).
2. Remove cotter pin (4) and pin (5) from lever (8) and disconnect powerpack compartment brake linkage (6) from lever (8). Discard cotter pin.
3. Remove Screw (1), lockwasher (2), and washer (3) from shaft (7). Discard lockwasher.
4. Remove powerpack compartment brake linkage (6) from shaft (7).



10-3. POWERPACK COMPARTMENT BRAKE LINKAGE REPLACEMENT/ADJUSTMENT (continued).

b. DISASSEMBLY

1. Loosen nut (20) on rod end (21). Unscrew and remove rod end (21) from clevis (19).
2. Remove cotter pin (18), pin (17), sprocket (23), and chain (22) from clevis (19). Discard cotter pin.
3. Remove two cotter pins (16), pins (15), and clevises (13) and chain (22) from right brake lever (24) and left brake lever (12). Discard cotter pins.
4. Remove two spring pins (14) from two clevises (13), and separate chain (22) from two clevises (13). Discard spring pins.



c. CLEANING AND INSPECTION

WARNING

Drycleaning solvent P-D-680 is toxic and flammable. Always wear protective goggles and gloves and use only in a well-ventilated area. Avoid contact with skin, eyes, and clothes, and DO NOT breathe vapors. DO NOT use near open flame or excessive heat.

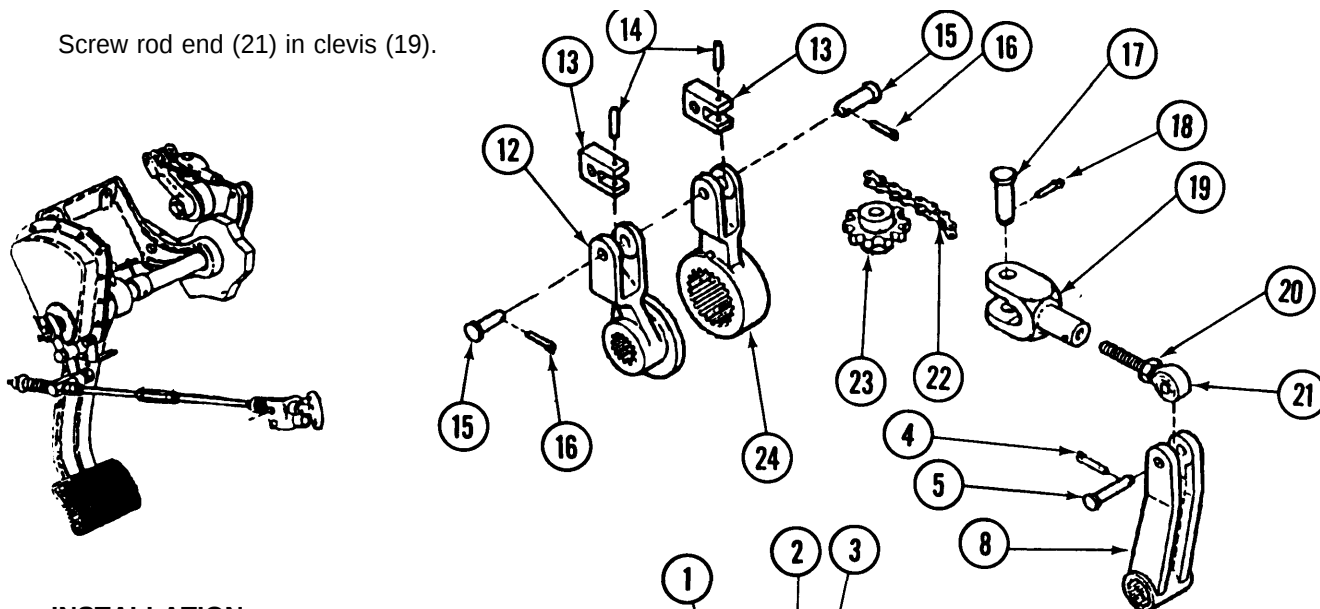
1. Clean all parts with drycleaning solvent and rag.
2. Inspect all parts for damage. Replace any damaged parts.

d. ASSEMBLY

1. Install two clevises (13) on ends of chain (22) with two new spring pins (14).
2. Position chain (22) and two clevises (13) in place on sprocket (23).

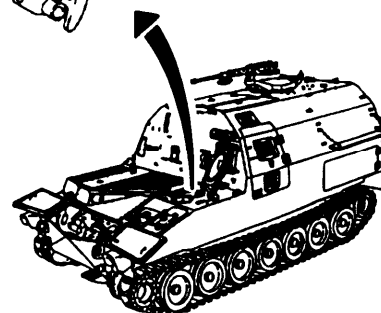
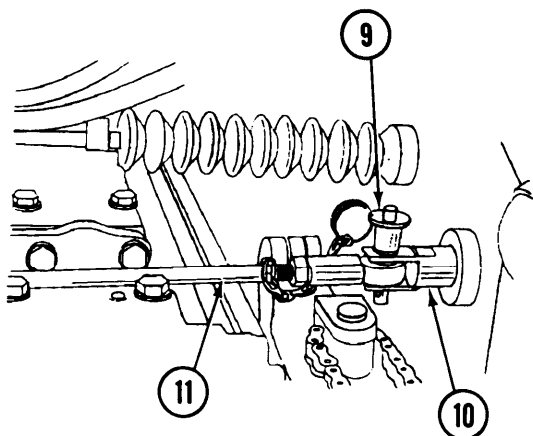
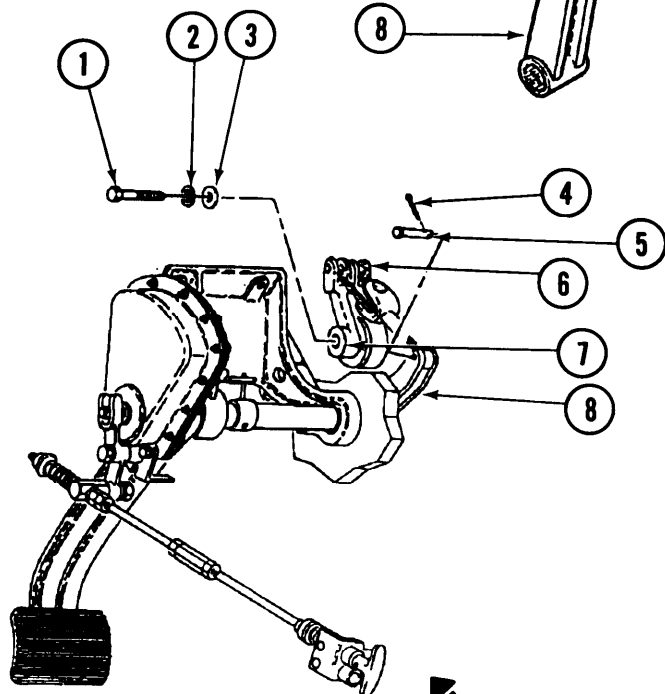
10-3. POWERPACK COMPARTMENT BRAKE LINKAGE REPLACEMENT/ADJUSTMENT _ (continued).

3. Position two clevises (13) in place on left brake lever (12) and right brake lever (24) and secure with two pins (15) and new cotter pins (16).
4. Install sprocket (23) and chain (22) in clevis(19) and secure with pin (17) and new cotter pin (18).
5. Screw rod end (21) in clevis (19).



e. INSTALLATION

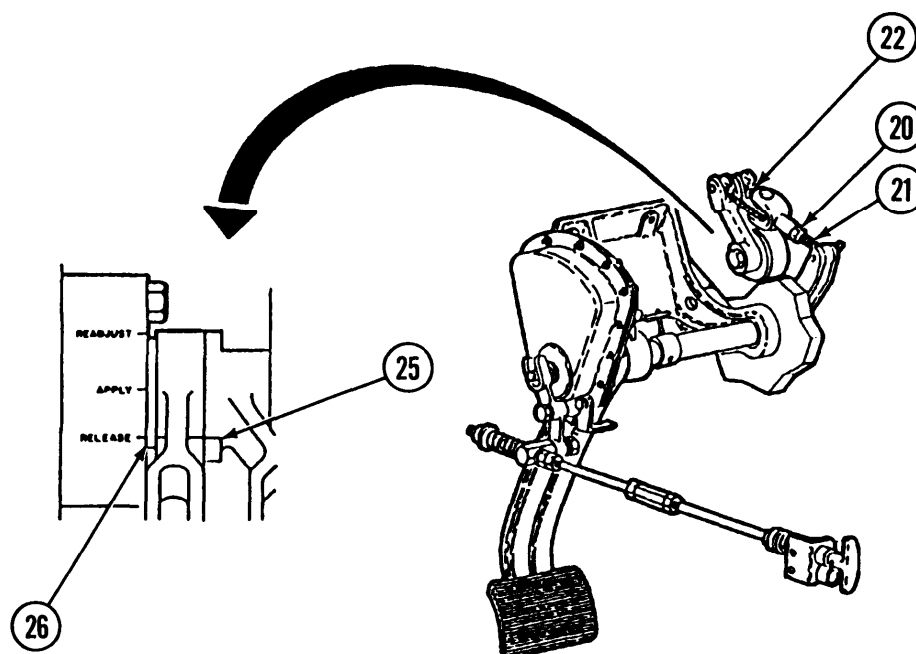
1. Position powerpack compartment brake linkage (6) in place on shaft (7).
2. Install screw (1), new lockwasher (2), and washer (3) in shaft (7).
3. Install rod end (21) in lever (8) and secure with pin (5) and new cotter pin (4).
4. Connect shift linkage (11) to rod (10) and install quick-release pin (9).



10-3. POWERPACK COMPARTMENT BRAKE LINKAGE REPLACEMENT/ADJUSTMENT (continued).

f. ADJUSTMENT

1. With brake pedal fully raised, check for slack in chain (22) and alinement of brake lever index marks (25) with release mark (26). If index marks are alined, no adjustment is necessary.
2. Remove cotter pin (4) and pin (5) from lever (8). Discard cotter pin.
3. Loosen nut (20) on rod end (21).
4. Rotate rod end (21) until all slack is removed from chain (22), holes in rod end (21) and lever (8) are alined, and brake lever index marks (25) are at release mark (26).
5. Install pin (5) and new cotter pin (4) on lever (8).
6. Check release marks (26) for alinement with brake lever index marks (25).
7. Tighten nut (20) against rod end (21).



FOLLOW-ON MAINTENANCE:

- Close transmission doors (refer to TM 9-2350-287-10).
- Adjust stoplight switch (para 7-20).

10-4. DRIVER'S COMPARTMENT BRAKE ASSEMBLY REPAIR.

This task covers:

- | | |
|----------------------------|----------------|
| a. Removal | b. Disassembly |
| c. Cleaning and Inspection | d. Assembly |
| e. Installation | f. Adjustment |

Initial Setup:

Tools/Test Equipment:

- General mechanic's tool kit (Item 24, Appendix I)
- Snapping pliers (Item 53, Appendix I)

Materials/Parts:

- Drycleaning solvent (Item 28, Appendix D)
- Rag (Item 56, Appendix D)
- Boot (Item 5, Appendix H)
- Cotter pin (2) (Item 17, Appendix H)
- Cotter pin (Item 24, Appendix H)
- Gasket (Item 95, Appendix H)
- Lockwasher (4) (Item 175, Appendix H)
- Lockwasher (4) (Item 177, Appendix H)
- Lockwire (Item 202, Appendix H)
- Retaining ring (Item 244, Appendix H)

- Seal (Item 269, Appendix H)
- Seal (Item 293, Appendix H)
- Self-locking nut (10) (Item 312, Appendix H)
- Self-locking nut (3) (Item 315, Appendix H)
- Self-locking nut (Item 330, Appendix H)

Equipment Conditions:

- Vehicle parked on level ground (refer to TM 9-2350-287-10).
- Track blocked (refer to TM 9-2350-287-10).
- Left and right transmission access doors opened (refer to TM 9-2350-287-10).
- Parking brake light switch and bracket removed (para 7-20).
- Center driver's periscope removed (refer to TM 9-2350-287-10).

a. REMOVAL

1. Remove quick-release pin (1) and disconnect shift linkage (3) from rod (2).
2. Remove cotter pin (10), straight pin (7), and lever (8) from rod end bearing (9). Discard cotter pin.
3. Remove screw (1), washer (12), and lever (8) from shaft (5).

