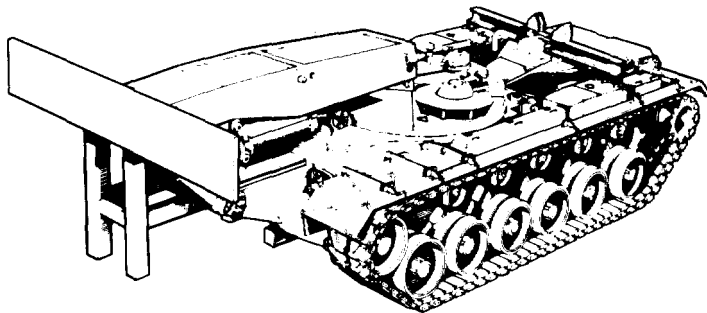


TECHNICAL MANUAL

ORGANIZATIONAL, DIRECT SUPPORT AND GENERAL SUPPORT MAINTENANCE MANUAL



LAUNCHER
M48A5 TANK CHASSIS,
TRANSPORTING:
FOR BRIDGE,
ARMORED-VEHICLE-LAUNCHED
SCISSORING TYPE, CLASS 60
(NSN 5420-01-076-6096)

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CHANGE

NO. 2

HEADQUARTERS
DEPARTMENT OF THE ARMY
Washington, D.C., 15 May 1996

ORGANIZATIONAL,
DIRECT SUPPORT AND GENERAL SUPPORT
MAINTENANCE MANUAL
LAUNCHER AND HYDRAULIC SYSTEM
M48A5 TANK CHASSIS,
TRANSPORTING:
FOR BRIDGE,
ARMORED-VEHICLE-LAUNCHED
SCISSORING TYPE, CLASS 60
(NSN 5420-01-076-6096)

TM 5-5420-227-24, dated 15 October 1981, is changed as follows:

1. Remove old pages and insert new pages as indicated below.
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Remove Pages

iii and iv
2-3 thru 2-11/(2-12 blank)
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2-51 and 2-52
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2-73 thru 2-76
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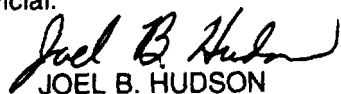
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2-57 thru 2-68
None
(2-71 blank)/2-72
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2-79 thru 2-92
2-95 and 2-96
2-99 and 2-100
FO-3

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JOEL B. HUDSON

*Administrative Assistant to the
Secretary of the Army
01891*

DENNIS J. REIMER
*General, United States Army
Chief of Staff*

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To be distributed in accordance with DA Form 12-37-E, block 1227, requirements for
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CHANGE

NO. 1

HEADQUARTERS
DEPARTMENT OF THE ARMY
Washington, D.C., 5 September 1986

Organizational, Direct Support and General Support
Maintenance Manual

LAUNCHER AND HYDRAULIC SYSTEM
M48A5 TANK CHASSIS, TRANSPORTING: FOR BRIDGE,
ARMORED-VEHICLE-LAUNCHED SCISSORING TYPE, CLASS 60
(5420-01-076-6096)

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i and ii
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2-1 thru 2-10
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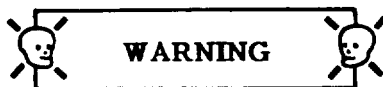
Official:

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

R.L. DILWORTH
Brigadier General, United States Army
The Adjutant General

Distribution:

To be distributed in accordance with DA Form 12-37, organizational and Direct and General Support maintenance requirements for Launching System, M48A5 (AVLB).

**CARBON MONOXIDE POISONING CAN BE DEADLY**

Carbon monoxide is a colorless, odorless, deadly poisonous gas, which when breathed, deprives the body of oxygen and causes suffocation. Exposure to air contaminated with carbon monoxide produces symptoms of headache, dizziness, loss of muscular control, apparent drowsiness, and coma. Permanent brain damage or death can result from severe exposure. It occurs in the exhaust fumes of fuel-burning heaters and internal combustion engines and becomes dangerously concentrated under conditions of inadequate ventilation. 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.

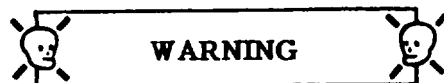
1. DO NOT operate heater or engine of vehicle in an enclosed area unless it is ADEQUATELY VENTILATED.
2. DO NOT idle engine for long periods without ventilator blower operating. If tactical situation permits, open hatches.
3. DO NOT drive any vehicle with inspection plates, cover plates, or engine compartment doors removed unless necessary for maintenance purposes.
4. BE ALERT at all times during vehicle operation for exhaust odors and exposure symptoms. If either are present, IMMEDIATELY VENTILATE personnel compartments. If symptoms persist, remove affected personnel from vehicle and treat as follows: expose to fresh air; keep warm; DO NOT PERMIT PHYSICAL EXERCISE: if necessary, administer artificial respiration.
5. Neither the gas-particulate filter unit nor the M25A1 protective mask will protect you against carbon monoxide poisoning.

THE BEST DEFENSE AGAINST CARBON MONOXIDE POISONING IS ADEQUATE VENTILATION.

For artificial respiration, refer to FM 21-11.

WARNING

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



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

1. Make sure all personnel are in a safe position before launching or retrieving bridge.
2. Neither the gas-particulate filter unit nor the M25A1 C-B tank mask will protect you against carbon monoxide poisoning.
3. Make sure fuel tank filler neck and fuel nozzle are touching while refueling.
4. Do not allow flames or sparks within area while refueling. Have a manned fire extinguisher handy.
5. Frostbite to the cheekbone area of the face may be experienced by wearers of the M25A1 protective mask from sub-freezing air delivered by the gas-particulate filter unit. Do not connect the protective mask to the filter unit unless ambient temperature is well above freezing.
6. Do not disconnect/connect any part of the electrical equipment with power on.
7. Operation of this equipment presents a noise hazard to personnel in the area. The noise level exceeds the allowable limits for unprotected personnel. Wear ear muffs or ear plugs which were fitted by a trained professional.

WARNING
HIGH VOLTAGE

High voltage is used in the operation of this equipment. Turn on IR (infra-red) power switch only when using infra-red periscopes M24. Be sure that IR power cables are connected to prevent accidental shock to personnel.

WARNING
HAZARDOUS-NOISE

1. Hearing protection (helmet) required.
2. Double hearing protection (helmet and ear plugs) required on road marches at speeds over 15 mph.

WARNING

Before You work around tracked vehicles, remove rings, bracelets, and wrist watches. These items may be caught on projections and cause injury or may be shorted across an electrical circuit and cause severe burns and electrical shock.

WARNING

FRH hydraulic fluid may contain Tricresyl Phosphate which, if taken internally, can produce paralysis. Hydraulic fluid may be absorbed through the skin. Wear long sleeves, gloves, goggles, and face shield. If FRH gets in eyes, wash them immediately and get medical aid immediately. If FRH gets on skin, thoroughly wash with soap and water. Wash hands thoroughly prior to eating or smoking. Application of these measures is considered an effective control of the hazard.

TECHNICAL MANUAL

HEADQUARTERS
DEPARTMENT OF THE ARMY
Washington, D. C., 15 October 1981

**Organizational, Direct Support and General Support
Maintenance Manual**

**LAUNCHER AND HYDRAULIC SYSTEM
M48A5 TANK CHASSIS, TRANSPORTING: FOR BRIDGE,
ARMORED-VEHICLE-LAUNCHED SCISSORING TYPE, CLASS 60
(5420-01476-6096)**

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 Command, ATTN: AMSTA-MB, Warren, MI 48397-5000. A reply will be furnished to you.

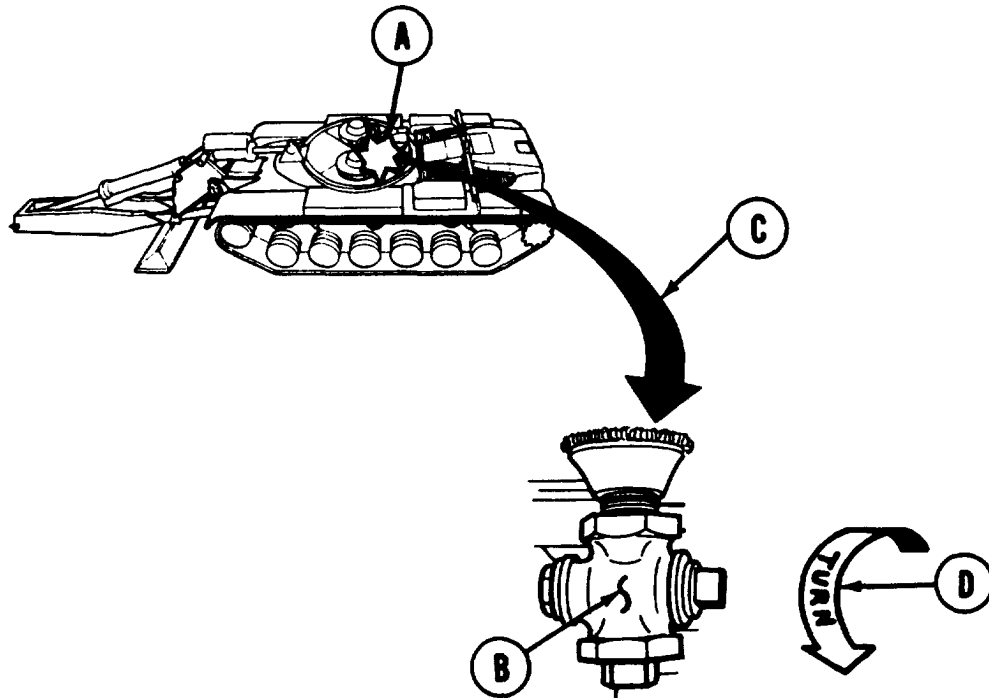
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HOW TO USE THIS MANUAL:

- Manual is divided into chapters.
- Chapters are by functional group code and presented in same order as the RPSTL (Repair Parts and Special Tool List).
- All manual references refer to page numbers.
- Steps are numbered and are to be performed in that order.
- Be sure to read all NOTES, WARNINGS, and CAUTIONS.
- Locator views are included wherever necessary. These will help you locate the item which the procedure is describing.
- Callouts on art are shown by a circle with a letter inside.
- Jagged circle (⌘) on locator (A) indicates a cutout and item is inside of tank.
- A (⌒) symbol represents the outside surface (B) of a piece of equipment.
- Locator arrows (C) are black and motion arrows (D) are white.



HOW TO USE THIS MANUAL - Continued

- Bridge will not be shown on vehicle on locator views.
- Locator views will show tongue in travel position (folded on top of vehicle) unless maintenance procedure requires it in another position.
- MASTER BATTERY switch should be in OFF position prior to performance of any maintenance procedures.
- Diagrams of the hydraulic system with reference designators, part numbers, and related maintenance tasks will be found on pages 3-61 thru 3-63. A schematic diagram of the hydraulic system (FO-3) is located at the back of this manual.
- All torque values are dry torques unless otherwise specified.
- A maintenance information index lists all maintenance tasks. It provides the location of all maintenance tasks related to a component in this manual.
- As a general maintenance practice, throw away all removed lockwashers, locknuts, and cotter pins and replace with new lockwashers, locknuts, and cotter pins at installation.
- LO 5-5420-226-12, M48A5 AVLB lubrication order, has been rescinded. All crew lubrication tasks have been incorporated into TM 5-5420-226-10 PMCS and are to be performed as required or as a part of crew PMCS. All organizational maintenance lubrication tasks have been incorporated into PMCS contained in this manual and in TM 5-5420-226-20-1 and are to be performed as required and as a part of organizational maintenance PMCS. Any reference to LO 5-5420-226-12 must be considered a reference to either the crew PMCS or organizational PMCS and must be performed in accordance with instructions provided in the applicable PMCS.

CHAPTER 1

INTRODUCTION

Section I GENERAL INFORMATION**SCOPE**

Type of Manual: Organizational, Direct Support, and General Support Maintenance.

Model Number and Equipment Name: Launcher, for M48A5 Tank Chassis, Transporting: for Bridge, Armored-Vehicle-Launched, Scissoring Type, Class 60.

Purpose of Equipment: To launch, retrieve, and transport a class 60 scissoring type bridge.

MAINTENANCE FORMS, RECORDS, AND REPORTS

Department of the Army forms and procedures used for equipment maintenance will be those prescribed by DA PAM 738-750, The Army Maintenance Management System (TAMMS).

DESTRUCTION OF ARMY MATERIAL TO PREVENT ENEMY USE

Refer to TM 750-244-6 for instructions on destruction of material to prevent enemy use.

ADMINISTRATIVE STORAGE

Refer to TM 740-90-1 for instructions on administrative storage.

QUALITY ASSURANCE/QUALITY CONTROL (QA/QC)

a. No particular quality assurance or quality control manual pertains specifically to this vehicle.

b. Defective material received through the supply system should be reported on Quality Deficiency Report (QDR) SF 368. Instructions for preparing QDR's are provided in DA PAM 738-750, Reporting of Quality Deficiency Data. QDR's should be mailed to Commander, U.S. Army Tank-Automotive Command, ATTN: AMSTA-Q, Warren, MI 48397-5000. A reply will be furnished directly to you.

REPORTING EQUIPMENT IMPROVEMENT RECOMMENDATIONS (EIR'S)

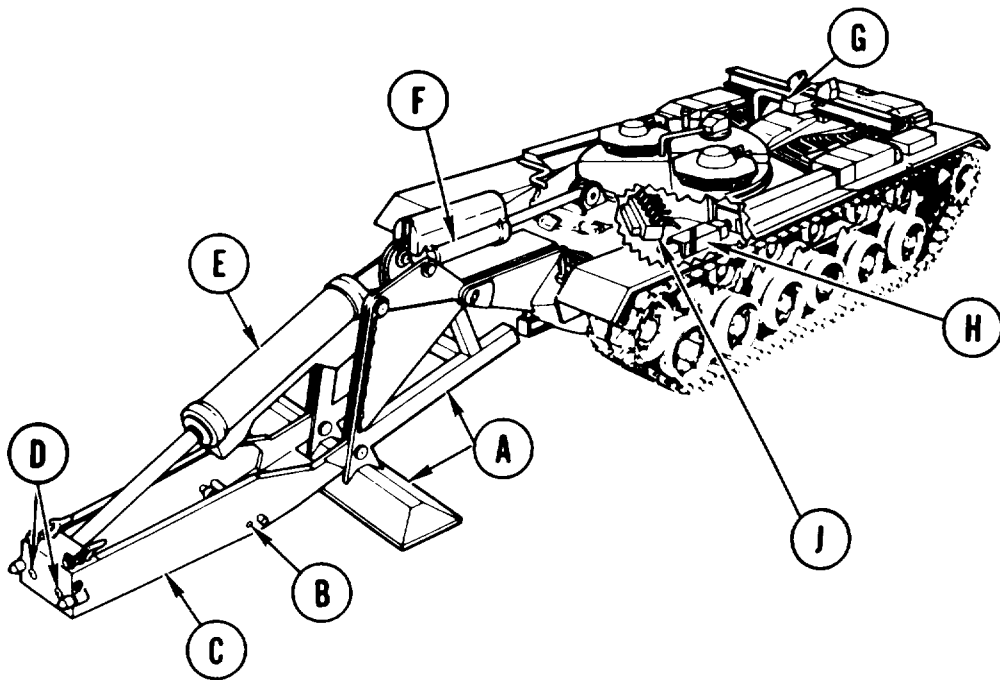
EIR's must be submitted by anyone who knows of an unsatisfactory condition with equipment design or use. You do not have to show a new design or list a better way to do a procedure, just tell why the design is unfavorable or why a procedure is hard. EIR's may be submitted on SF 368 (Quality Deficiency Report). Instructions for preparing SF 368 are provided in DA PAM 738-750. Mail directly to Commander, U.S. Army Tank-Automotive Command, AMSTA-Q, Warren, MI 48397-5000. A reply will be sent directly to you.

Section II EQUIPMENT DESCRIPTION AND DATA

PERFORMANCE DATA

Refer to TM 5-5420-226-10 for performance data.

LOCATION AND DESCRIPTION OF MAJOR COMPONENTS



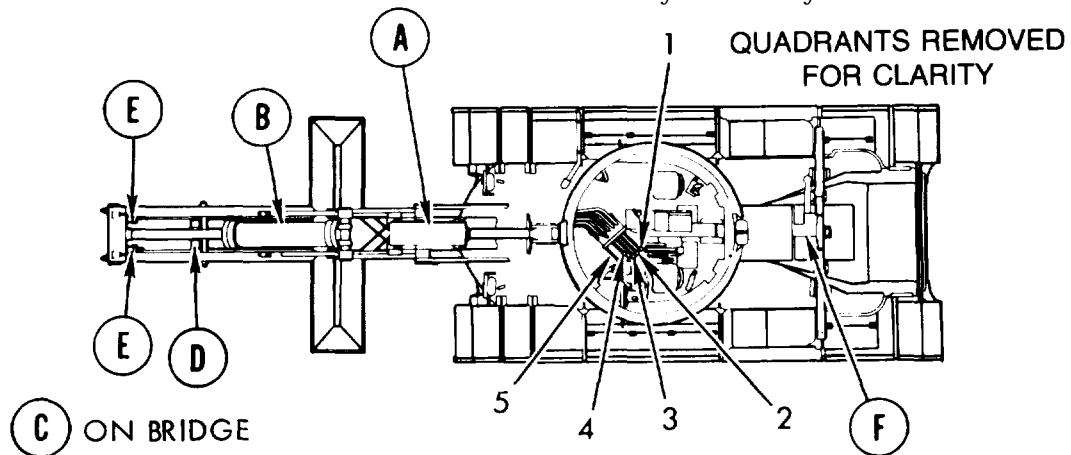
- (A) BOOM AND OUTRIGGER. Provides firm support for tongue to pivot on.
- (B) LOCKING CYLINDER. Locks scissoring bridge to the launcher tongue.
- (C) TONGUE. Contains hydraulics and provides necessary components to connect and disconnect scissoring bridge.
- (D) EJECTION CYLINDERS. Provides capability to push bridge loose from vehicle after locking cylinders are retracted.
- (E) TONGUE CYLINDER. Controls tongue and bridge movement from 90 degrees vertical to the ground.
- (F) OVERHEAD CYLINDER. Controls tongue and bridge movement from transport position to 90 degrees vertical.
- (G) HOLDDOWN CYLINDER. Provides capability to lock scissoring bridge at rear end of vehicle. It automatically unlocks when overhead cylinder operating lever is raised.
- (H) PUMP-CLUTCH. Provides hydraulic pressure for entire system.
- (J) VALVE BANK. Provides manual levers to actuate entire system.

IDENTIFICATION, LOCATION, AND INSTRUCTION INFORMATION

Refer to TM 5-5420-226-10 for identification, location, and instruction name plates, decals, and stencil information under "Stowage and Sign Guides."

Section III. PRINCIPLES OF OPERATION

Hydraulic pressure is used to actuate various components to launch and retrieve a bridge. A hydraulic pump is driven by the vehicle engine through a power take-off and a manually actuated clutch. Hydraulic pressure is delivered by the hydraulic pump to the manually operated valve bank. The valve bank in turn delivers pressure to either the cap end or the rod end of the various cylinders, to either extend or retract them. Pressure relief valves, flow regulators, and check valves are located in the system to provide protection to component parts. A master relief valve is in the pressure line from the hydraulic pump, located under the hydraulic reservoir, which protects the entire system. You will find a system diagram and a hydraulic schematic in the back of this manual to aid in system analysis.



- (A) OVERHEAD CYLINDER. This cylinder is actuated by lever (1) which will shut off or allow pressure to flow to either the cap end (lever up) or the rod end (lever down) of the cylinder.
- (B) TONGUE CYLINDER. This cylinder is actuated by lever (2) which will shut off or allow pressure to flow to either the cap end (lever up) or the rod end (lever down) of the cylinder.
- (C) SCISSORS CYLINDER. This cylinder (not illustrated, is on bridge) is actuated by lever (3) which will shut off or allow pressure to flow to either the rod end (lever up) or the cap end (lever down) of the cylinder.
- (D) LOCKING CYLINDER. This cylinder is actuated by lever (4) which will shut off or allow pressure to flow to either the rod end (lever up) or the cap end (lever down) of the cylinder.
- (E) EJECTION CYLINDERS. These cylinders are activated by lever (5), (for these cylinders to operate lever (4) must be held in the up position) which will allow pressure to flow to the cap end (lever up) or the rod end (lever down) of the cylinders.
- (F) HOLDDOWN CYLINDER. This cylinder is actuated by overhead cylinder lever (1) which will shut off or allow pressure to flow to either the rod end (lever up) or the cap end (lever down) of the cylinder.

TA170571

CHAPTER 2**MAINTENANCE INSTRUCTIONS**

Section L REPAIR PARTS, SPECIAL TOOLS, TMDE, AND SUPPORT EQUIPMENT**COMMON TOOLS AND EQUIPMENT**

For authorized common tools and equipment, refer to the Modified Table of Organization and Equipment (MTOE) applicable to your unit.

SPECIAL TOOLS, TMDE, AND SUPPORT EQUIPMENT

Special tools for organizational, direct support, and general support maintenance are listed in TM 5-5420-226-20P and TM 5-5420-226-34P, which are the authority for requisitioning replacements.

SPARE AND REPAIR PARTS

Spares and repair parts are listed and illustrated in TM 5-5420-226-20P and TM 5-5420-226-34P which are the authority for requisitioning replacements.

Section IL SERVICE UPON RECEIPT

1. This section contains information on services to be performed upon issue of the vehicle to the using organization. Where practicable, the crew will assist in services described. For services to be performed on the vehicle hull components, refer to TM 5-5420-226-34. Some of the services contained herein may not be required, depending upon the degree of preservation provided by the shipper and the planned use of the vehicle.
2. Cut hold-down straps and remove wooden boxes, containers of equipment, and any other tank components secured to the exterior or interior of the vehicle.
 - a. Inspect the equipment for damage incurred during shipment. If the equipment has been damaged, report the damage on Standard Form 364 (Report of Discrepancy) (ROD).
 - b. Check the equipment against the packing slip to see if the shipment is complete. Report all discrepancies in accordance with the instructions of DA PAM 738-750.
 - c. Check to see whether the equipment has been modified. Reference shall be made to the authorized equipment configuration changes list in chapter 1.
3. Conduct service upon receipt of the vehicle in accordance with the procedures specified in the following table.

| Step/Location | Item | Action | Remarks |
|---------------|-------------------|--|---------|
| 1. Launcher | Exterior | Check launcher components for damage. | — |
| 2. Hull | Hatches | Remove wrapping, barrier material, and tape. | — |
| 3. Hull | Periscope shields | Remove wrapping, barrier material, and tape. | — |
| 4. Hull | Optical glass | Remove wrapping, barrier material, and tape. | — |

PRELIMINARY SERVICING AND ADJUSTMENT

WARNING

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

1. If any exterior surfaces of the launcher components are coated with rust preventative compound, remove the coating with dry cleaning solvent.
2. Paint the equipment in accordance with unit camouflage requirements.
3. Follow instructions specified on tag DD Form 1397 regarding processing record and stowage of the vehicle and its equipment if the vehicle is not to be placed into immediate service. Tag DD Form 1397 will be found in the driver's compartment, attached to the steering control or transmission shift lever. If the using organization plans to place the tank into immediate service:
 - a. Open each wooden box and container. Inventory contents with packing list. Record missing items.
 - b. Check packing list against Basic Issue Items list (BII) in TM 5-5420-226-10 to make sure all items have been received.
 - c. Open inner packs and remove material.
 - d. Degrease equipment such as tools and hardware as necessary.

4. Stow basic issue items as indicated in TM 5-5420-226-10.
5. Check hydraulic level in reservoir in accordance with TM 5-5420-226-10. While filling, check for leaks at filter connections, drain plugs, link quick disconnects, and valves.
6. Ensure parking brake is set, Start engine. Check hydraulic system for leaks, Shut down engine and correct leaks if any are found.
7. Check operation of all controls (TM 5-5420-226-10).
8. Perform preventive maintenance checks and services (PMCS) (page 2-4).
9. Equipment faults found during preliminary servicing or during the break-in period will be corrected by the using organization or by the supporting maintenance unit as appropriate, depending upon the nature of the fault.
10. Serious equipment faults which appear to involve unsatisfactory design or material will be reported using SF 368 (Quality Deficiency Report), as prescribed in DA PAM 738-750, The Army Maintenance Management System (TAMMS).

SECTION III. PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS), LUBRICATION INSTRUCTIONS, AND MANDATORY REPLACEMENT PARTS

INTRODUCTION

a. General.

Preventive maintenance is the systematic care, inspection, and service of the M48A5 AVLB launcher to keep it in serviceable condition and to detect faults and failures before extensive and time consuming repairs or replacement are required. Maintenance checks are services performed by organizational maintenance and are described below.

This section contains the procedures and instructions to perform M48A5 AVLB launcher organizational preventive maintenance checks and services. These services are performed by organizational maintenance personnel assisted by the vehicle crew. Ensure that all crew level hull PMCS procedures have been completed prior to performing organizational PMCS. Refer to DA PAM 738-750 for instructions on the use of forms pertaining to PMCS.

Organizational services are defined by, and restricted to, the procedures outlined in this section and Appendix B, Maintenance Allocation Chart, unless approval to perform higher category services has been given by the support maintenance unit.

Knowledge of operating and maintenance procedures outlined in TM 5-5420-226-10 is essential to the performance of organizational PMCS. Organizational mechanics must be familiar with these procedures so that they can apply them in the performance of their duties.

The driver of the vehicle is often unaware of gradually developing defects. Therefore, the vehicle must be road tested by organizational maintenance personnel during preventive maintenance checks and services. Any repairs or adjustments necessary to ensure safe operation should be made prior to road test. All faults and corrective actions will be noted on DA Form 2404. The item number recorded in column "a" of DA Form 2404 must correspond to the PMCS item number. After deficiencies have been corrected and the tactical situation permits, an additional road test must be made for a distance of not less than three nor more than five miles.

The preventive maintenance checks and services listed in this section are to be performed on condition and semiannually.

Hard (fixed) time intervals and the related man-hour times are based on normal operation. Change the interval if your lubricants are contaminated or if you are operating the equipment under adverse conditions, including longer-than-usual operating hours. The interval may be extended during periods of low activity. If extended, adequate preservation precautions must be taken.

PMCS items and intervals have been determined by using Reliability Centered Maintenance (RCM) logic.

INTRODUCTION - **Continued**

Preventive maintenance checks and services for the vehicle hull are contained in TM 5-5420-226-20-1. Preventive maintenance checks and services for the communication system will be performed by maintenance personnel in accordance with the appropriate technical manuals. The services will be performed in conjunction with hull PMCS.

If anything looks wrong and cannot be freed, report it on DA Form 2404. If something looks dangerous or may cause equipment damage, report it immediately to your maintenance supervisor.

b. PMCS Procedures. PMCS column explanations are as follows:

Column 1 - Item No. The first column contains the item number which shall be used as a source of item numbers for the TM Number Column on DA Form 2404, Equipment Inspection and Maintenance Worksheet, in recording results of PMCS.

Column 2 - Interval. The second column lists the interval at which the items are to be inspected.

Column 3 - Location - Item to Check/Service. The third column lists the item to be checked or serviced.

Column 4 - Procedure. The fourth column contains all the information required to accomplish the checks and services.

Column 5 - Not Fully Mission Capable if. The fifth column contains all the conditions which make the vehicle not fully mission capable.

c. Special Information.

(1) Precautions. The following precautions will help prevent personal injury or damage to equipment:

WARNING

Do not use turbine fuel, diesel fuel, gasoline, paint thinner, or benzene (benzol) for cleaning. These liquids may cause personal injury.

CAUTION

- Do not spill solvent, fuel, or lubricants on rubber parts. Solvent, fuel, and lubricant may damage rubber parts.
- Do not clean inside hull with high pressure steam, water, or air. Some parts inside hull may rust or be damaged.
- Do not use polishing cloths, liquids, pastes, or other rough cleaners to clean instrument lenses or mirrors. Use lens tissue paper to clean lenses and mirrors. Remove fingerprints, oil, and dirt with lens cleaning compound and lens tissue paper.

(2) Services. Services performed by the organizational maintenance mechanic consist of the following tasks:

Adjusting. Making all necessary adjustments and alinements.

INTRODUCTION - Continued

Servicing. Draining and refilling unite with oil and changing or cleaning oil filters, fuel filters, and air cleaners.

Tightening. Tightening nuts, bolts, screws, and other types of fasteners with a torque wrench to the value listed in the maintenance manual. Do not overtighten; this may strip threads and break off the part being tightened.

Repairing. Repairing includes inspection, cleaning, preserving, adjusting, replacing, welding, strengthening, and other tasks associated with putting parts in working condition.

(3) General Cleaning Instructions.

If a steam cleaner is available, it may be used to remove any remaining dirt. After water or steam cleaning, lubricate launcher. Check all lubricant reservoirs for water droplets. If water is found, drain and refill. Clean grease, oil, or dirt from all metal parts with dry cleaning solvent, cleaning compound, or equivalent.

Use mild soap and water to clean or wash parts not made of metal. Rinse thoroughly after cleaning with water and then dry.

Remove rust or dirt from fine-machined surfaces with dry cleaning solvent and crocus cloth, if necessary. Do not use any other material. Be careful not to change the dimensions of parts when rubbing off rust. Coat bare metal surfaces, after cleaning, with lubricating oil.

Nameplates, caution plates, and instruction plates may rust quickly. When they are rusty, clean parts and coat them with lubricating oil.

(4) General Maintenance Instructions.

Put protective caps or plugs on all tubes, hoses, and fittings as soon as you disconnect them. Dirt could get in and ruin the system. Do not remove caps or plugs until you are ready to connect the system.

Replace bent, broken, or stripped bolts, nuts, screws, and washers. Bolts, screws, and nuts may be loose if rust, chipped paint, or bare metal is around them. Tighten loose screws, bolts, and nuts. Replace missing parts.

Inspect electric wires for broken, chafed, cracked, discolored, frayed, loose, melted, or worn insulation. Replace or repair bad parts.

Have another soldier help align mating ends of connectors, plugs, and receptacles on larger harnesses. Make sure that pins and keyways line up. Tighten twist-snap type connectors, plugs, or receptacles until a click is heard. Tighten screw-on type connectors until a ratchet noise is heard to indicate that connectors, plugs, or receptacles are tight.

Hold fitting adapter with one wrench and tighten nut with another wrench. When tightening fittings, tighten nut snug and then tighten 1/6-turn to 1/8-turn more. If fitting leaks, loosen nut a full turn and then tighten. If still leaking, replace defective parts.

INTRODUCTION - Continued

Service, clean, or change oil filters, as applicable, when they are known to be contaminated clogged; service is recommended by AOAP laboratory analysis; or at prescribed hardtime intervals.

Look at hoses, fluid lines, and tubes for bends, wear, cracks, or leaks. Replace bad parts. Make sure all clamps and fittings are tight. If a fitting leaks, tighten it.

(5) Lubrication.

Use only authorized lubricants.

All lubrication instructions are mandatory.

When checking fluid levels, vehicle must be on level surface.

Oil filters shall be serviced/cleaned/changed when they are known to be contaminated or clogged, service is recommended by AOAP, or hard time service is required.

Dispose of used lubricant in accordance with local Standing Operating Procedures (SOP).

For arctic operation, see FM 9-207.

For desert operation, see FM 90-3.

Clean all grease fittings before attaching grease gun.

When using grease gun, operate until grease appears around seals or out of relief valve and check escaping grease for contamination. If contamination is found, notify support maintenance.

If no other treatment is directed, paint or clean and coat unprotected metal surfaces with cleaner, lubricant, preservative (CLP).

Clean around filler necks/drain plugs/openings before servicing to keep dirt from entering system.

(6) Leakage Definitions.

Fluid leaks affect vehicle status. Learn the following classes of fluid leaks for unit PMCS.

- Class I Seepage of fluid (as indicated by wetness or discoloration) not great enough to form drops.
- Class II Leakage of fluid great enough to form drops but not enough to cause drops to drip from item being checked.
- Class III Leakage of fluid great enough to form drops that fall from the item being checked.

All Class III leaks and any class fuel leak in the engine compartment or in the personnel heater system must be repaired before operating the vehicle. Vehicle may be operated with Class I or Class II leaks.

INTRODUCTION - Continued

(7) Corrosion. Check for corrosion on entire launcher. Become familiar with the four stages of corrosion listed below and take the appropriate maintenance action required outlined below.

- Stage 1- Red, black, or white corrosion deposits on surface with etching or pitting. However, base metal is sound.
- Stage 2- Powdered granular or scaled condition. Base metal is sound.
- Stage 3- Surface condition is similar to stage 2 except that metal in the corroded area is unsound and pin holes may be present.
- Stage 4- No metal remaining at point of severest corrosion. Corrosion holes in the area or metal completely worn away.

Stages 1 & 2- Areas are to be cleaned, primed, and painted IAW TB 43-0213.

Stages 3 & 4- Try to repair metal. If not economical or reparable, replace with new parts.

INITIAL SETUP

Preventive maintenance includes complete inspection to make sure adjustment, securing, and assembly of all parts of the launcher are correct. All cleaning, replacement, lubrication, and protection of parts or assemblies must be done as stated for trouble-free operation until the next preventive maintenance is performed.

Maintenance Forms and Records. Refer to DA PAM 738-750.

Publications. Be sure all needed publications are on hand before starting task.

Special Tools. Be sure all special tools are on hand.

Supplies. Be sure all parts and supplies are on hand.

Tools. Be sure all common tools are on hand.

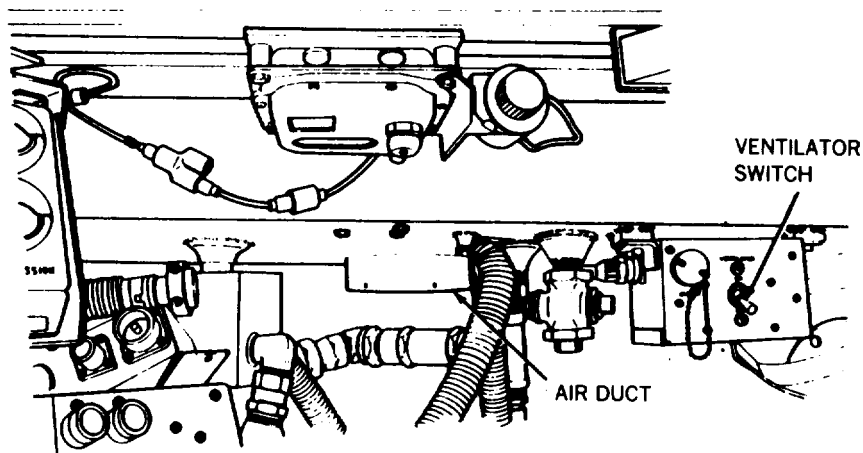
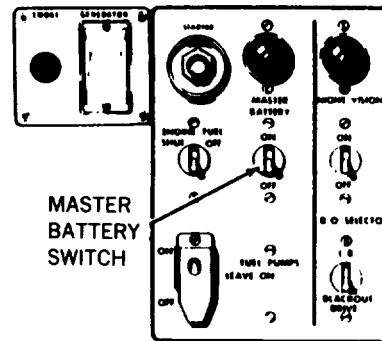
Modification Work Order (MWO) Application. Check the list of current MWO's in DA PAM 25-30. Do not make any vehicle modifications except as ordered by official Army directive.

Preventive Maintenance Checks and Services for M48A5 AVLB Launcher

| Item No. | Interval | Location | Procedure | Not Fully Mission Capable if: |
|---|--------------|-----------------------|--|-------------------------------|
| | | Item to Check/Service | | |
| <u>WARNING</u> | | | | |
| <p>FRH hydraulic fluid may contain tricresyl phosphate which, if taken internally, can produce paralysis. Hydraulic fluid may be absorbed through the skin. Wear long sleeves, gloves, goggles, and faceshield. If FRH gets in eyes, wash them immediately and get medical aid immediately. If FRH gets on skin, thoroughly wash with soap and water. Wash hands thoroughly prior to eating or smoking. Application of these measures is considered an effective control of the hazard.</p> | | | | |
| 1 | Semiannual | Reservoir | <p>Perform hydraulic fluid sampling IAW DA PAM 738-750.</p> <p>ARMY OIL ANALYSIS PROGRAM (AOAP). FRH hydraulic fluid samples from the launcher system must be submitted to an assigned AOAP laboratory semiannually or every 25 hours of operation whichever occurs first, in accordance with DA PAM 738-750. FRH hydraulic fluid will be analyzed for condition and will be changed only when directed by the AOAP laboratory. In the event AOAP laboratory support is not available, drain FRH hydraulic fluid annually. Annual hydraulic fluid changes are to be coordinated with seasonal changes.</p> | |
| 2 | On Condition | Reservoir | <p>Drain hydraulic reservoir (page 3-68). Fill hydraulic reservoir (TM 5-5420-226-10). Operate hydraulic system for 5 minutes (TM 5-5420-226-10). Bleed system if required (page 3-66).</p> | |

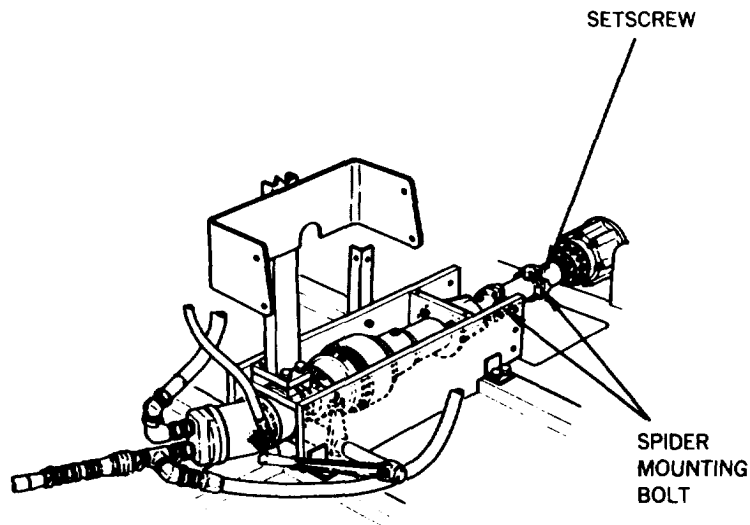
Preventive Maintenance Checks and Services for M48A5 AVLB Launcher -
Continued

| Item No. | Interval | Location | Procedure | Not Fully Mission Capable if: |
|----------|------------|-----------------------|---|------------------------------------|
| | | Item to Check/Service | | |
| 3 | Semiannual | Ventilating Blower | <p>Set MASTER BATTERY switch to ON. Set VENTILATOR switch to ON. Listen for ventilating blower motor.</p> <p>Check that flow of air can be felt at air duct.</p> <p>Set VENTILATOR switch to OFF. Set MASTER BATTERY switch to OFF.</p> | Ventilating blower is inoperative. |



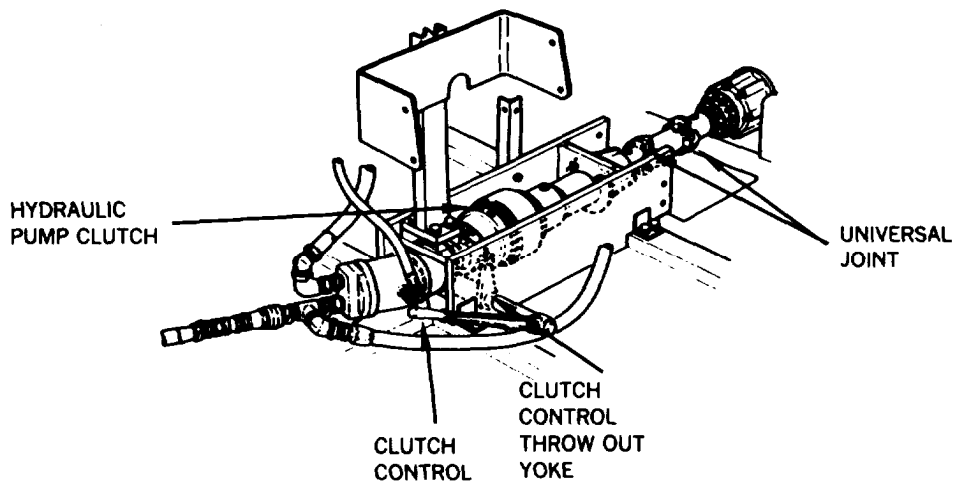
Preventive Maintenance Checks and Services for M48A5 AVLB Launcher -
Continued

| Item No. | Interval | Location | Procedure | Not Fully Mission Capable if: |
|----------|------------|-----------------------------|---|---|
| | | Item to Check/Service | | |
| 4 | Semiannual | Hydraulic Pump Clutch | <p>Check hydraulic reservoir fluid level (TM 5-5420226-10).</p> <p>Remove universal joint cover (page 3-55) and cover plate (page 3-59) from hydraulic pump clutch.</p> <p>Operate hydraulic system (TM 5-5420-226-10) and check clutch for proper operation (distinct snap). Adjust clutch, if required (page 3-60).</p> | Clutch is inoperative. |
| 5 | Semiannual | Pump Drive Universal Joints | <p>Check that universal joints spider mounting bolts and setscrew are tight. Tighten loose bolts to 265-325 lb-in (30-36 N. m).</p> | Universal joints indicate excessive wear or mounting bolts are missing. |



Preventive Maintenance Checks and Services for M48A5 AVLB Launcher -
Continued

| Item No. | Interval | Location | Procedure | Not Fully Mission Capable if: |
|----------|------------|--|---|-------------------------------|
| | | Item to Check/Service | | |
| 6 | Semiannual | Hydraulic Pump Clutch and Pump Drive Universal Joints | <p>Lubricate hydraulic pump clutch and pump drive universal joints.</p> <p>If any universal joint lubrication hole is plugged, remove plug and install lubrication fitting. Do not remove fittings after lubrication. Lubricate clutch control throw out yoke.</p> <p>Install clutch cover plate (page 3-59) and universal joint cover (page 3-55).</p> | |



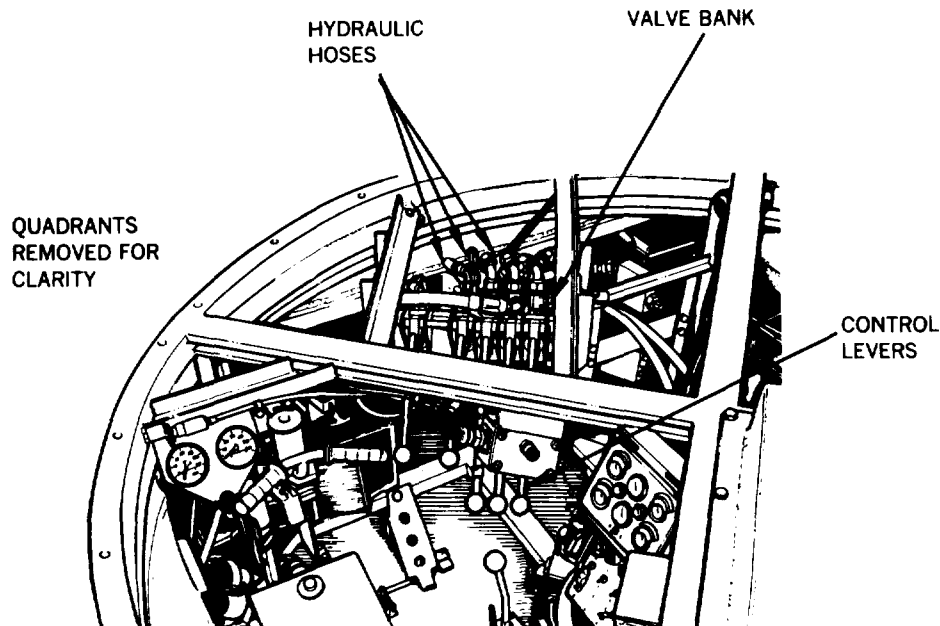
Clutch, Throw Out Yoke, and Universal Joints Lubricant

| Temperature Range | Lubricant Mil. Symbol (NATO Code) Specification | Capacity | Interval | Man-hour |
|--|---|----------|----------|----------|
| Clutch Throw Out Yoke Pump Drive Shaft Universal Joints All Temperatures | WTR (G-395) MIL-G-81322 | AR | S | 0.2 |

For arctic operation, see FM 9-207

Preventive Maintenance Checks and Services for M48A5 AVLB Launcher - Continued

| Item No. | Interval | Location | Procedure | Not Fully Mission Capable if: |
|----------|------------|--------------------------|---|---|
| | | Item to Check/Service | | |
| 7 | Semiannual | Launch Operation | <p style="text-align: center;"><u>WARNING</u></p> <p>Ensure area required for launch above and in front of launcher is clear of personnel and other equipment before attempting to launch bridge. Failure to do so could result in death or injury to personnel.</p> <p>Perform launch and retrieve procedures three times (TM 5-5420-226-10). Then perform launch procedure but do not retrieve.</p> <p>Check control levers for proper response.</p> | Any control lever sticking or binding. |
| 8 | Semiannual | Valve Bank | Visually check valve bank for leaks while performing launch and retrieve operations. | Any Class III leak. |
| 9 | Semiannual | Interior Hydraulic HoseS | Inspect interior hydraulic hoses for cracks, splits, blisters, or leaks. | Any Class III leak. Cracked, blistered, or split hoses. |

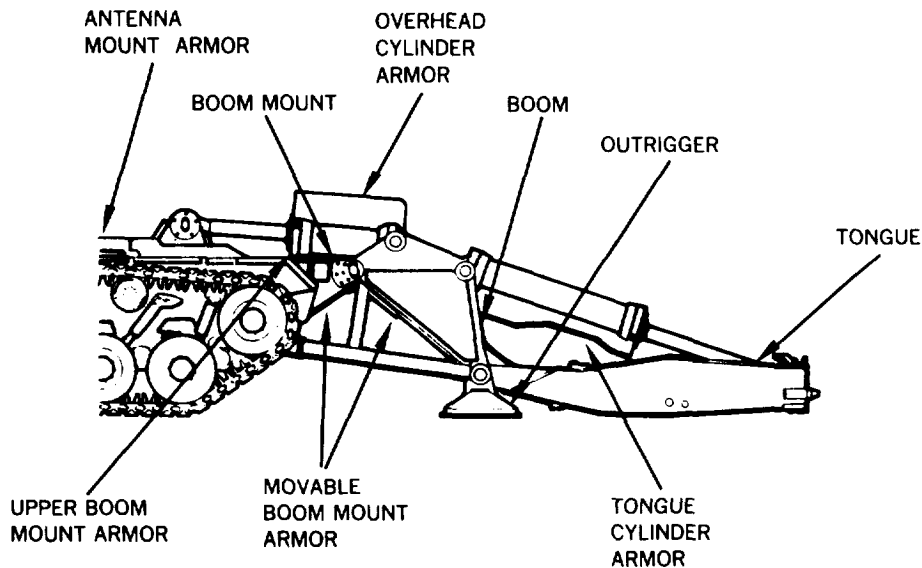


**Preventive Maintenance Checks and Services for M48A5 AVLB Launcher -
Continued**

| Item No. | Interval | Location | Procedure | Not Fully Mission Capable if: |
|----------|------------|---------------------------|--|-------------------------------|
| | | Item to Check/Service | | |
| 10 | Semiannual | Reservoir Filter Assembly | <p align="center"><u>WARNING</u></p> <ul style="list-style-type: none"> • Dry Cleaning Solvent P-D-680 is toxic and flammable. To avoid injury, wear protective goggles and gloves and use in a well-ventilated area. Avoid contact with skin, eyes, and clothes, and do not breathe vapors. Do not use near open fire or excessive heat. The flash point for Type I Dry Cleaning Solvent is 100°F (38°C), and for Type II is 140°F (60°C). If you become dizzy while using Dry Cleaning Solvent, get fresh air immediately and get medical aid. If contact with eyes is made, wash your eyes with water and get medical aid immediately. • FRH hydraulic fluid may contain tricresyl phosphate which, if taken internally, can produce paralysis. Hydraulic fluid may be absorbed through the skin. Wear long sleeves, gloves, goggles, and faceshield. If FRH gets in eyes, wash them immediately and get medical aid immediately. If FRH gets on skin, thoroughly wash with soap and water. Wash hands thoroughly prior to eating or smoking. Application of these measures is considered an effective control of the hazard. <p align="center">NOTE</p> <p>Filter assembly can be removed without draining the hydraulic system.</p> | Any Class III leak. |
| | | | <p>Service hydraulic reservoir filter assembly (page 3-200).</p> <p>Operate hydraulic system for 5 minutes (TM 5-5420-226-10).</p> <p>Check for hydraulic fluid leaks.</p> <p>Check hydraulic reservoir fluid level and fill as required. (TM 5-5420-226-10).</p> | |

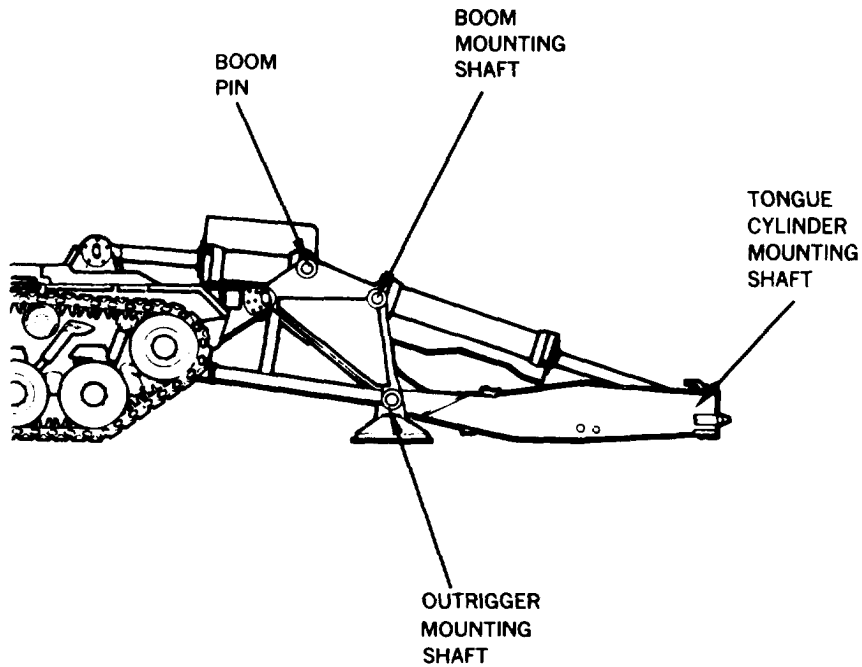
Preventive Maintenance Checks and Services for M48A5 AVLB Launcher -
Continued

| Item No. | Interval | Location | Procedure | Not Fully Mission Capable if: |
|----------|------------|--|---|-------------------------------|
| | | Item to Check/Service | | |
| 11 | Semiannual | Tongue, Boom, Outrigger, and Boom Mount | Inspect tongue, boom, outrigger, and boom mount for cracks and broken welds. | Any cracked or broken welds. |
| 12 | Semiannual | Armor Protection for Tongue Cylinder, Overhead Cylinder, Boom Mount, and Antenna Mount | Inspect tongue cylinder armor, overhead cylinder armor, upper boom mount armor, lower front fixed and movable boom mount armor, and antenna armor for damage and for loose or missing mounting bolts. | Missing or damaged armor. |



Preventive Maintenance Checks and Services for M48A5 AVLB Launcher - Continued

| Item No. | Interval | Location | Procedure | Not Fully Mission Capable if: |
|----------|------------|-----------------------|--|------------------------------------|
| | | Item to Check/Service | | |
| 13 | Semiannual | Retaining Rings | <p>Inspect for broken retaining rings at left and right outrigger mounting shafts, boom mounting shaft, boom pin, and tongue cylinder mounting shafts,</p> <p>Perform retrieve and launch procedures (TM 5-5420-226-10).</p> | Broken or missing retaining rings. |



Preventive Maintenance Checks and Services for M48A5 AVLB Launcher -
Continued

| Item No. | Interval | Location | Procedure | Not Fully Mission Capable if: |
|----------|------------|-----------------------------|---|---|
| | | Item to Check/Service | | |
| 14 | Semiannual | Exterior Hoses and Fittings | <p>Remove overhead cylinder armor (page 3-217), tongue cylinder armor (page 3-226), and boom mount hose armor (page 3-116).</p> <p>Inspect hydraulic lines and fittings to overhead cylinder, tongue cylinder, and hull manifold for cracks, splits, blisters, and leaks.</p> | Any Class III leak. Any cracks, splits, or blisters in hydraulic lines. |

The diagram illustrates the hydraulic system components of the M48A5 AVLB launcher. It shows the hull manifold (hidden), overhead cylinder hydraulic lines, and tongue cylinder hydraulic lines. The launcher is shown in profile, with the hydraulic lines connecting the hull manifold to the overhead and tongue cylinders.

Preventive Maintenance Checks and Services for M48A5 AVLB Launcher - Continued

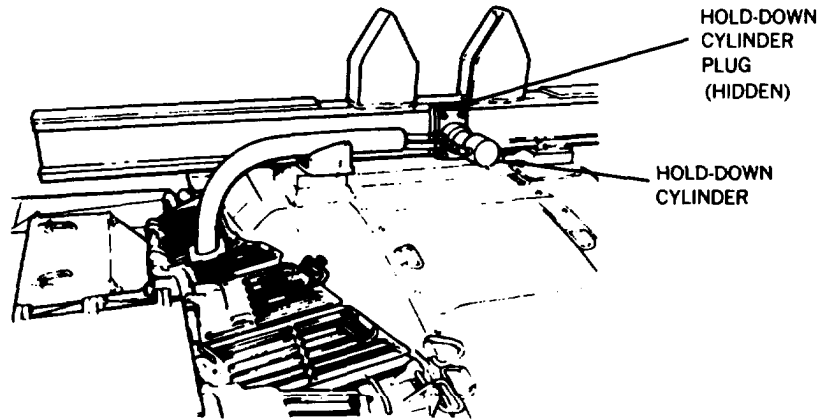
| Item No. | Interval | Location | Procedure | Not Fully Mission Capable if: | | | | | | | | | | | | | | | | | |
|---|---|-----------------------|--|-------------------------------|-------------------|---|----------|----------|----------|----------------------------|-------------------------------|----|---|-----|----------------------------------|------------------------|-------------------------|---------------------|---------------------------|-------------------|------------------------------|
| | | Item to Check/Service | | | | | | | | | | | | | | | | | | | |
| | Semiannual | Launcher Components | Lubricate the following components (left and right sides): | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | |
| Launcher Lubricant | | | | | | | | | | | | | | | | | | | | | |
| <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 25%;">Temperature Range</th> <th style="width: 30%;">Lubricant Mil. Symbol (NATO Code) Specification</th> <th style="width: 10%;">Capacity</th> <th style="width: 10%;">Interval</th> <th style="width: 10%;">Man-hour</th> </tr> </thead> <tbody> <tr> <td>Tongue Cylinder Clevis Pin</td> <td rowspan="8" style="text-align: center; vertical-align: middle;"> WTR (G-395) MIL-G-81322 </td> <td rowspan="8" style="text-align: center; vertical-align: middle;">AR</td> <td rowspan="8" style="text-align: center; vertical-align: middle;">S</td> <td rowspan="8" style="text-align: center; vertical-align: middle;">1.5</td> </tr> <tr> <td>Overhead Cylinder Clevis Bracket</td> </tr> <tr> <td>Locking Cylinder Plugs</td> </tr> <tr> <td>Tongue Cylinder Cap Pin</td> </tr> <tr> <td>Tongue Mounting Pin</td> </tr> <tr> <td>Overhead Cylinder Cap Pin</td> </tr> <tr> <td>Boom Mounting Pin</td> </tr> <tr> <td>Overhead Cylinder Clevis Pin</td> </tr> </tbody> </table> | | | | | Temperature Range | Lubricant Mil. Symbol (NATO Code) Specification | Capacity | Interval | Man-hour | Tongue Cylinder Clevis Pin | WTR (G-395) MIL-G-81322 | AR | S | 1.5 | Overhead Cylinder Clevis Bracket | Locking Cylinder Plugs | Tongue Cylinder Cap Pin | Tongue Mounting Pin | Overhead Cylinder Cap Pin | Boom Mounting Pin | Overhead Cylinder Clevis Pin |
| Temperature Range | Lubricant Mil. Symbol (NATO Code) Specification | Capacity | Interval | Man-hour | | | | | | | | | | | | | | | | | |
| Tongue Cylinder Clevis Pin | WTR (G-395) MIL-G-81322 | AR | S | 1.5 | | | | | | | | | | | | | | | | | |
| Overhead Cylinder Clevis Bracket | | | | | | | | | | | | | | | | | | | | | |
| Locking Cylinder Plugs | | | | | | | | | | | | | | | | | | | | | |
| Tongue Cylinder Cap Pin | | | | | | | | | | | | | | | | | | | | | |
| Tongue Mounting Pin | | | | | | | | | | | | | | | | | | | | | |
| Overhead Cylinder Cap Pin | | | | | | | | | | | | | | | | | | | | | |
| Boom Mounting Pin | | | | | | | | | | | | | | | | | | | | | |
| Overhead Cylinder Clevis Pin | | | | | | | | | | | | | | | | | | | | | |
| For arctic operation, see FM 9-207 | | | | | | | | | | | | | | | | | | | | | |

Preventive Maintenance Checks and Services for M48A5 AVLB Launcher - Continued

| Item | Interval | Location | Procedure | Not Fully Mission Capable if: | | | | | | | | | | | | | | | | | |
|--|---|---------------------------------|--|-------------------------------|-------------------|---|----------|----------|----------|-------------------------|-------------------------------|----|---|-----|--------------------------------|-----------------|--------------------------|---------------------|-----------------------|----------------------------|------------------|
| | | Item to Check/Service | | | | | | | | | | | | | | | | | | | |
| 15 | Ssemiannual | Launcher Components - Continued | Lubricate the following components (left and right sides): | | | | | | | | | | | | | | | | | | |
| <p style="text-align: center;">Launcher Lubricant</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 30%;">Temperature Range</th> <th style="width: 30%;">Lubricant Mil. Symbol (NATO Code) Specification</th> <th style="width: 10%;">Capacity</th> <th style="width: 10%;">Interval</th> <th style="width: 10%;">Man-hour</th> </tr> </thead> <tbody> <tr> <td>Ejection Cylinder Plugs</td> <td rowspan="7" style="text-align: center; vertical-align: middle;">WTR (G-395) MIL-G-81322</td> <td rowspan="7" style="text-align: center; vertical-align: middle;">AR</td> <td rowspan="7" style="text-align: center; vertical-align: middle;">S</td> <td rowspan="7" style="text-align: center; vertical-align: middle;">1.5</td> </tr> <tr> <td>Tongue Cylinder Clevis Bracket</td> </tr> <tr> <td>Tongue Mounting</td> </tr> <tr> <td>Tongue Cylinder Mounting</td> </tr> <tr> <td>Tongue Cylinder Cap</td> </tr> <tr> <td>Overhead Cylinder Cap</td> </tr> <tr> <td>Overhead Cylinder Mounting</td> </tr> <tr> <td>All Temperatures</td> </tr> </tbody> </table> | | | | | Temperature Range | Lubricant Mil. Symbol (NATO Code) Specification | Capacity | Interval | Man-hour | Ejection Cylinder Plugs | WTR (G-395) MIL-G-81322 | AR | S | 1.5 | Tongue Cylinder Clevis Bracket | Tongue Mounting | Tongue Cylinder Mounting | Tongue Cylinder Cap | Overhead Cylinder Cap | Overhead Cylinder Mounting | All Temperatures |
| Temperature Range | Lubricant Mil. Symbol (NATO Code) Specification | Capacity | Interval | Man-hour | | | | | | | | | | | | | | | | | |
| Ejection Cylinder Plugs | WTR (G-395) MIL-G-81322 | AR | S | 1.5 | | | | | | | | | | | | | | | | | |
| Tongue Cylinder Clevis Bracket | | | | | | | | | | | | | | | | | | | | | |
| Tongue Mounting | | | | | | | | | | | | | | | | | | | | | |
| Tongue Cylinder Mounting | | | | | | | | | | | | | | | | | | | | | |
| Tongue Cylinder Cap | | | | | | | | | | | | | | | | | | | | | |
| Overhead Cylinder Cap | | | | | | | | | | | | | | | | | | | | | |
| Overhead Cylinder Mounting | | | | | | | | | | | | | | | | | | | | | |
| All Temperatures | | | | | | | | | | | | | | | | | | | | | |
| For arctic operation, see FM 9-207 | | | | | | | | | | | | | | | | | | | | | |

**Preventive Maintenance Checks and Services for M48A5 AVLB Launcher -
Continued**

| Item No. | Interval | Location | Procedure | Not Fully Mission Capable if: |
|----------|------------|------------------------------|---|-------------------------------|
| | | Item to Check/Service | | |
| 16 | Semiannual | Hold-down Cylinder and Armor | <p>Remove holddown cylinder armor (page 3-247). Inspect holddown cylinder armor for damage.</p> <p>Check holddown cylinder for leaks</p> <p>Extend and coat holddown cylinder plug with grease.</p> <p>Install overhead cylinder armor (page 3-218), tongue cylinder armor (page 3-227), boom mount hose armor (page 3-116), and holddown cylinder armor (page 3-247).</p> <p>Perform retrieval procedure (TM 5-5420-226-10).</p> | Any Class III leak |

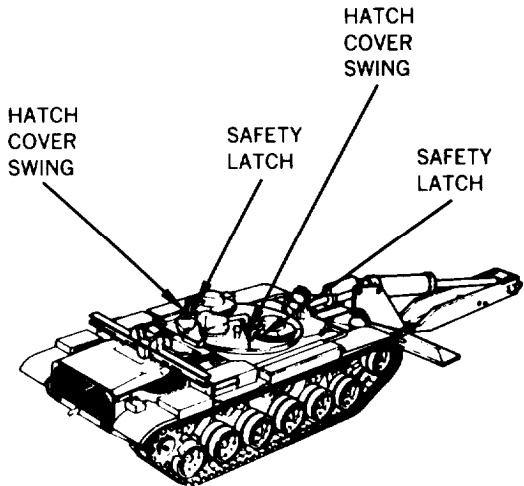


Hold-Down Cylinder Plug Lubricant

| Temperature Range | Lubricant Mil. Symbol (NATO Code) Specification | Capacity | Interval | Man-hour |
|---|---|----------|----------|----------|
| Hold-Down Cylinder Plug All Temperatures | WTR (G-395) MIL-G-81322 | AR | S | 0.1 |

For arctic operation, see FM 9-207

**Preventive Maintenance Checks and Services for M48A5 AVLB Launcher -
Continued**

| Item No. | Interval | Location | Procedure | Not Fully Mission Capable if: | | | | | | | | | | |
|--|---|------------------------------------|--|-------------------------------|-------------------|---|----------|----------|----------|--|-------------------------------|----|---|-----|
| | | Item to Check/Service | | | | | | | | | | | | |
| 17 | Semiannual | Hatch Cover Swing and Safety Latch | Lubricate left and right hatch cover swing and safety latch. | | | | | | | | | | | |
|  | | | | | | | | | | | | | | |
| Hatch Cover Swing and Safety Latch Lubricant | | | | | | | | | | | | | | |
| <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 25%;">Temperature Range</th> <th style="width: 30%;">Lubricant Mil. Symbol (NATO Code) Specification</th> <th style="width: 10%;">Capacity</th> <th style="width: 10%;">Interval</th> <th style="width: 10%;">Man-hour</th> </tr> </thead> <tbody> <tr> <td>Hatch Cover Swing and Safety Latch All Temperatures</td> <td align="center">WTR (G-395) MIL-G-81322</td> <td align="center">AR</td> <td align="center">S</td> <td align="center">0.1</td> </tr> </tbody> </table> | | | | | Temperature Range | Lubricant Mil. Symbol (NATO Code) Specification | Capacity | Interval | Man-hour | Hatch Cover Swing and Safety Latch All Temperatures | WTR (G-395) MIL-G-81322 | AR | S | 0.1 |
| Temperature Range | Lubricant Mil. Symbol (NATO Code) Specification | Capacity | Interval | Man-hour | | | | | | | | | | |
| Hatch Cover Swing and Safety Latch All Temperatures | WTR (G-395) MIL-G-81322 | AR | S | 0.1 | | | | | | | | | | |
| For arctic operation, see FM 9-207 | | | | | | | | | | | | | | |

Section IV. **TROUBLESHOOTING**

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| o Troubleshooting System Index | 2-34 |
| o Troubleshooting Subject Index | 2-34 |
| o Troubleshooting Symptom and Resource Index | 2-35 |
| o STE/ICE Troubleshooting User Guide | 2-36 |
| o Detailed Troubleshooting Procedures: Symptoms 1 through 8 | 2-59 |

GENERAL

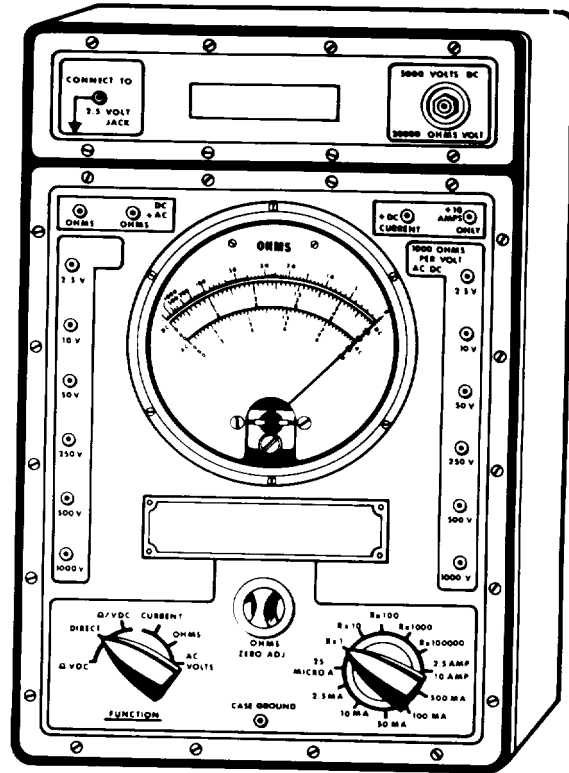
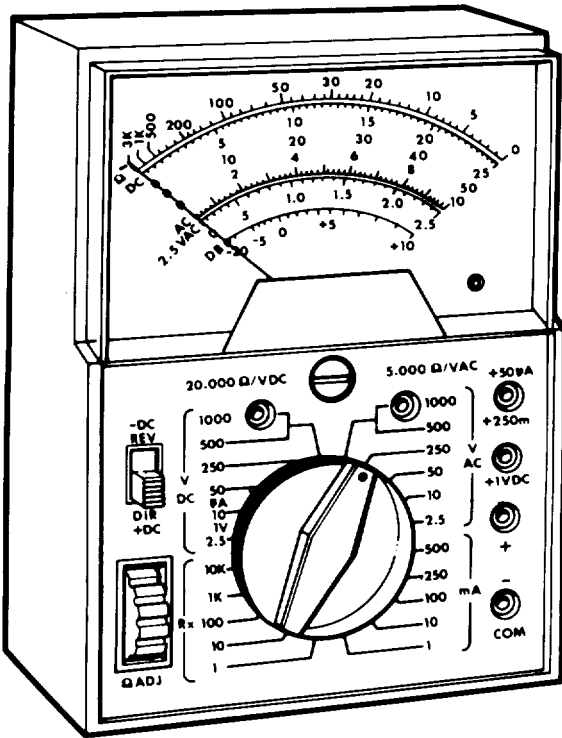
Troubleshooting is a step-by-step process of finding and repairing what is wrong with your vehicle. This section contains tests and information (including STE/ICE, simplified test for internal combustion engines) for troubleshooting common faults that may develop in the launcher. Due to the numerous operating conditions of the vehicle, not all possible troubles are covered.

GENERAL INSTRUCTIONS FOR USE OF MULTIMETERS AS DC VOLTMETER

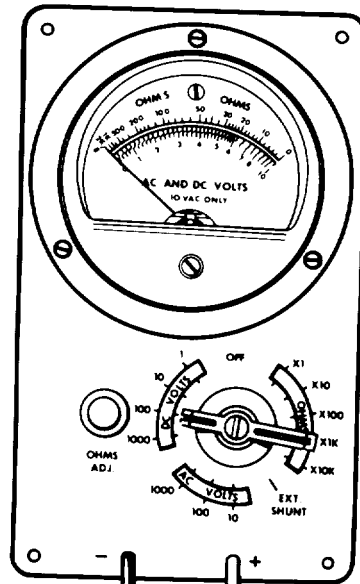
a. General. Shop sets may contain any one of three multimeters: the Simpson 160, the TS-352 B/U, or the AN/URM-105 (page 2-14). Any of these can be used to troubleshoot the vehicle electrical system. The following paragraph and accompanying illustrations contain instructions for use of multimeters as dc voltmeters.

b. DC Voltage Measurement. Before using the multi meter to measure dc voltage, proceed according to instructions on pages 2-15 and 2-16 to set up the multi meter to measure dc voltage, proceed as instructed on page 2-17.

SIMPSON 160
NSN 6625-00-935-1333

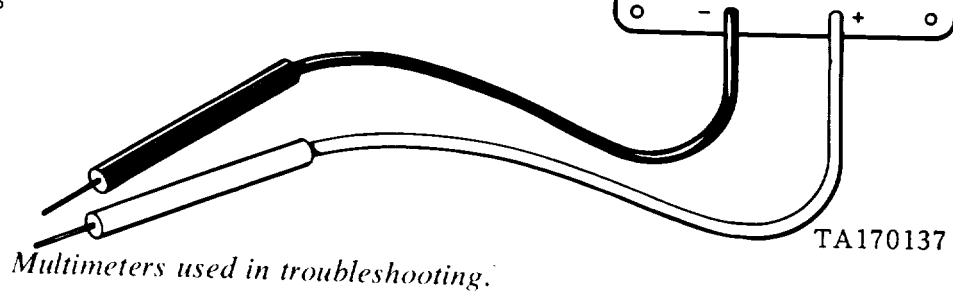


TS-352B/U
NSN 6625-00-553-0142



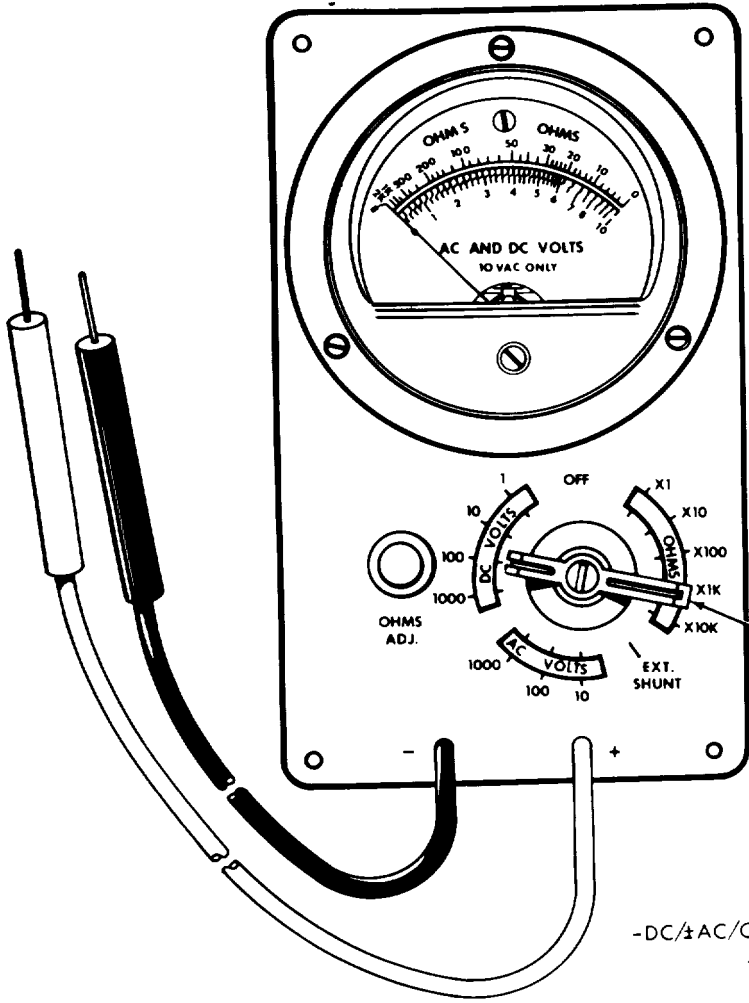
AN/URM-105
NSN 6625-00-999-6282

NOTE: THE SIMPSON 160 IS ONLY AVAILABLE IN NEW SHOP SETS AS A SUBSTITUTE FOR THE TS-352B/U OR AN/URM-105.



TA170137

Multimeters used in troubleshooting.



AN/URM-J 05

TURN SELECTOR SWITCH TO DC VOLTS RANGE REQUIRED FOR VOLTAGE YOU WISH TO MEASURE.

(E. G., TO MEASURE 24 VOLTS DC, SET SELECTOR AT DC VOLTS 100.)

IF YOU ARE UNSURE OF VOLTAGE TO BE MEASURED, SET SELECTOR AT DC VOLTS 1000 FOR THE FIRST READING. IF FIRST READING WAS LESS THAN 100 VOLTS, SET SELECTOR TO DC VOLTS 100. IF SECOND READING WAS LESS THAN 10 VOLTS, SET SELECTOR TO DC VOLTS 10 AND TAKE THIRD READING, ETC.

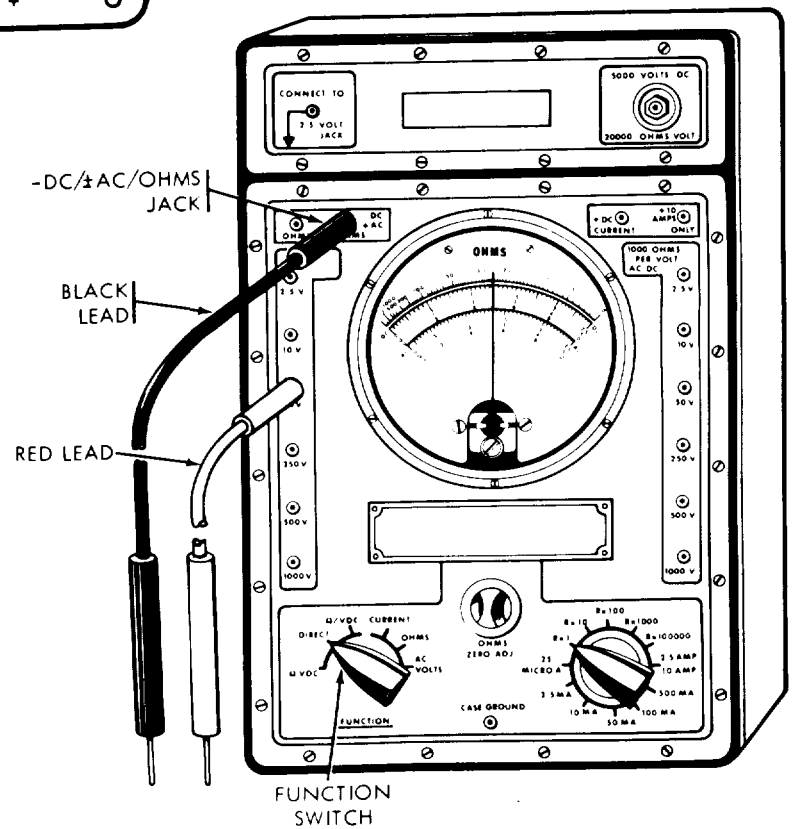
SET ON DC VOLTS 100

TS-352 B/U

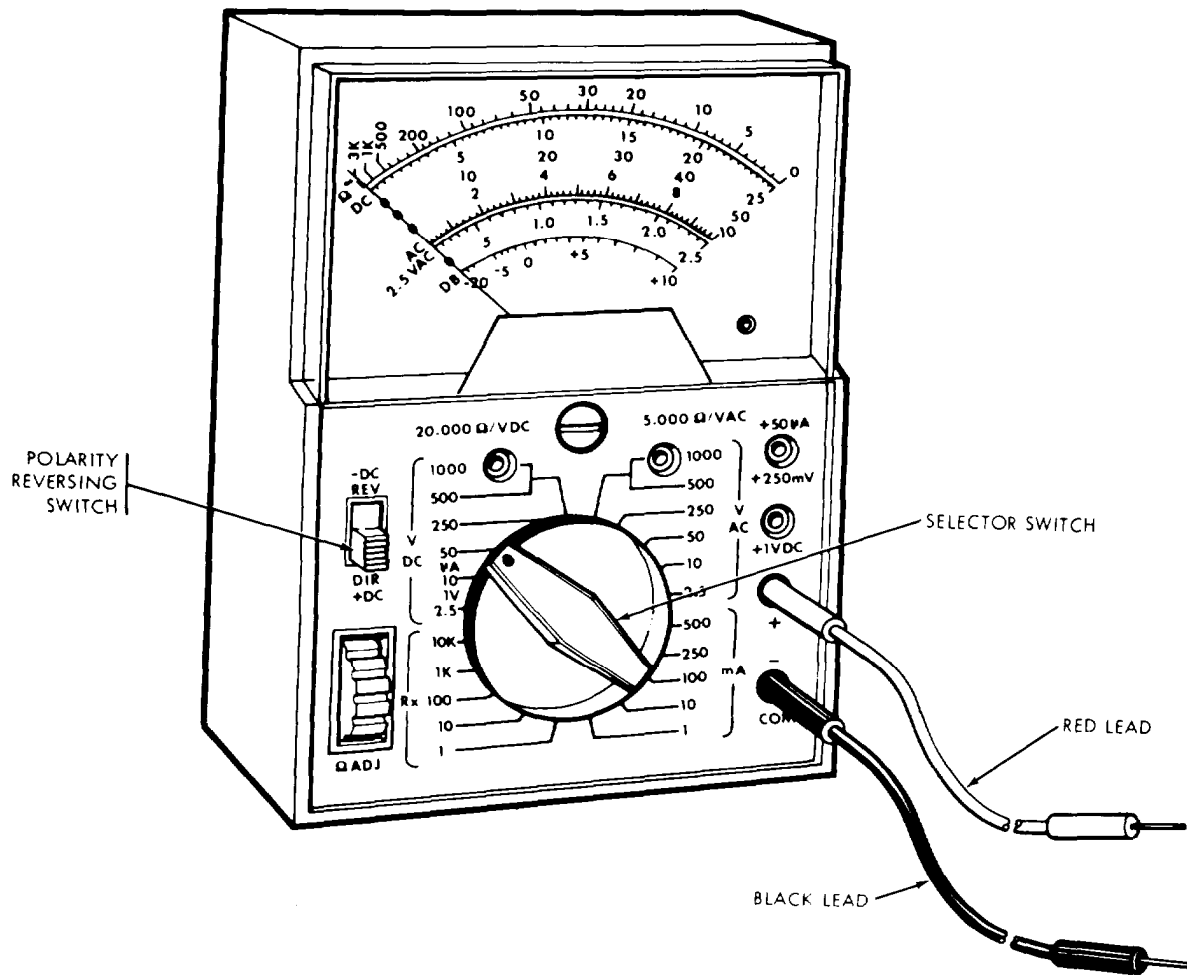
1. SET FUNCTION SWITCH TO DIRECT. (RANGE SWITCH CAN BE IN ANY POSITION.)
2. PLUG BLACK LEAD INTO -DC/±AC/OHMS JACK.
3. PLUG RED LEAD INTO JACK ON LEFT SIDE OF METER SUITABLE FOR RANGE OF VOLTAGE YOU WISH TO MEASURE.

(E. G., TO MEASURE 24 VOLTS, PLUG RED LEAD INTO 50V JACK, TO MEASURE LESS THAN 10 VOLTS, USE 10V JACK. TO MEASURE LESS THAN 2.5 VOLTS, USE 2.5V JACK.)

IF YOU ARE UNSURE OF VOLTAGE TO BE MEASURED, PLUG RED LEAD INTO 1000V JACK FOR FIRST READING, THEN, REDUCE RANGE AS SHOWN ABOVE FOR THE AN/URM-105 MU LTI-METER BUT USING YOUR RANGES. NEXT READING WOULD BE MADE FROM 500V JACK.



TA170138



SIMPSON 160

1. PLUG BLACK LEAD INTO -COM JACK.
2. PLUG RED LEAD INTO +JACK.
3. SET POLARITY REVERSING SWITCH TO +DIR POSITION.
4. TURN SELECTOR SWITCH TO PROPER VDC RANGE FOR VOLTAGE YOU WISH TO MEASURE.

(E.G. TO MEASURE 24 VOLTS DC, TURN SELECTOR TO V 'DC 50. TO MEASURE LESS THAN 10 VOLTS, TURN SELECTOR TO V/DC 10. TO MEASURE LESS THAN 2.5 VOLTS, TURN SELECTOR TO V/DC 2.5.)

IF YOU ARE UNSURE OF VOLTAGE TO BE MEASURED, TURN SELECTOR TO V 'DC 1000 FOR FIRST READING, THEN REDUCE RANGE AS SHOWN ABOVE FOR THE AN/URM-105 MULTIMETER. USING YOUR RANGES, NEXT READING WOULD BE MADE IN V 'DC 50A POSITION.

TA170139

MEASURING DC VOLTAGE:

1. SET UP MULTIMETER.

CAUTION

IF YOU ARE UNSURE OF ANY VOLTAGE TO BE MEASURED, ALWAYS START WITH THE HIGHEST RANGE GIVEN IN THE SETUP INSTRUCTIONS TO AVOID DAMAGE TO THE MULTIMETER.

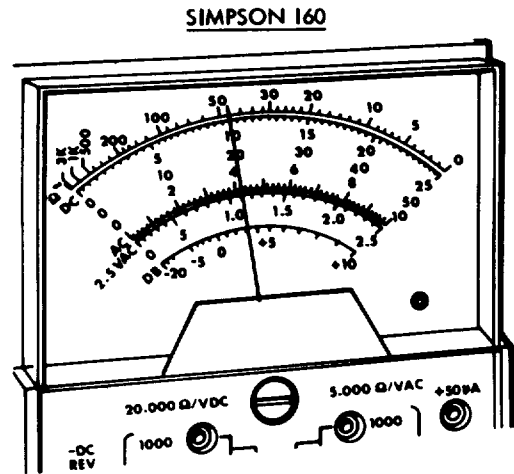
2. WITH ALL THREE METERS, CONNECT THE RED PROBE TO THE POSITIVE (+) OF THE CIRCUIT UNDER TEST AND THE BLACK PROBE TO THE NEGATIVE (-) SIDE. IF NEEDLE TRIES TO MOVE OFF SCALE TO LEFT, REVERSE PROBES ON CIRCUIT UNDER TEST.

3. READ METER. THE EXAMPLES ON THIS PAGE SHOW HOW TO READ ALL THREE METERS.

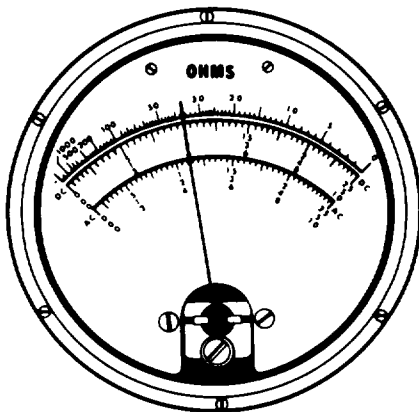
SIMPSON 160

READ DC SCALE FOR RANGE CHOSEN BY SELECTOR SWITCH. METER AT RIGHT SHOWS FOLLOWING READINGS:

| SWITCH | SCALE | READING |
|----------|-----------------------|-------------|
| V/DC 50 | 0 - 50 | 20 VOLTS DC |
| V/DC 10 | 0 - 10 | 4 VOLTS DC |
| V/DC 2.5 | 0 - 25 (DIVIDE BY 10) | 1 VOLT DC |



TS-352B/U



TS-352B/U

READ DC SCALE FOR RANGE OF JACK RED LEAD IS CONNECTED TO. METER AT LEFT SHOWS FOLLOWING READINGS:

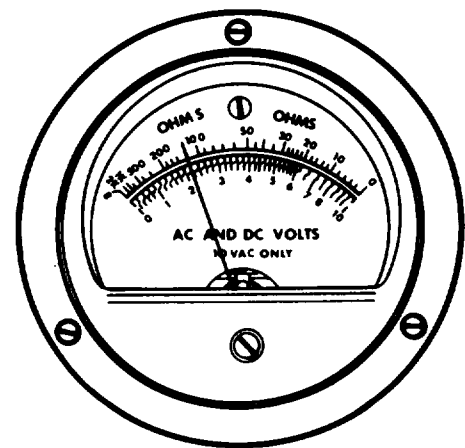
| RANGE | SCALE | READING |
|-------|------------------------|-------------|
| 50 V | 0 - 5 (MULTIPLY BY 10) | 20 VOLTS DC |
| 10 V | 0 - 10 | 4 VOLTS DC |
| 2.5 V | 0 - 2.5 | 1 VOLT DC |

AN/URM-105

READ UPPER BLACK STRAIGHT LINED PORTION OF AC AND DC VOLTS SCALE FOR RANGE CHOSEN BY SELECTOR SWITCH. METER AT RIGHT SHOWS FOLLOWING READINGS:

| SWITCH | SCALE | READING |
|-----------|--------------------------|--------------|
| 1000 DC V | 0 - 10 (MULTIPLY BY 100) | 200 VOLTS DC |
| 100 DC V | 0 - 10 (MULTIPLY BY 10) | 20 VOLTS DC |
| 10 DC V | 0 - 10 | 2 VOLTS DC |
| 1 DC V | 0 - 10 (DIVIDE BY 10) | .2 VOLT DC |

AN/URM-105



DC voltage measurement.

TA170140

DETAILED TROUBLESHOOTING PROCEDURE TROUBLESHOOTING

USER GUIDE

NOTE

This **TROUBLESHOOTING USER GUIDE** is presented in the same format as the detailed troubleshooting procedures you will be using to identify and correct the trouble with your vehicle.

1

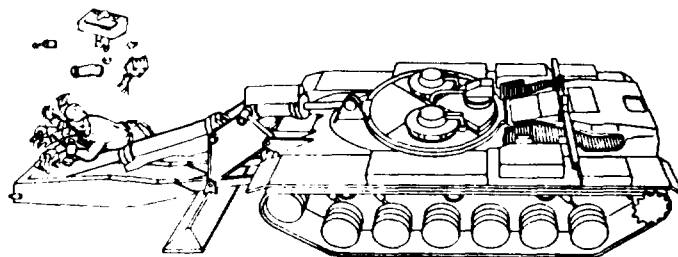
Check the four key steps that make good troubleshooting (troubleshooting without the **SHOTGUN APPROACH**).

- Identify the trouble.
- Find the right troubleshooting procedure.
- Determine the test equipment, special tools and number of technicians needed to perform the procedure.
- Use the troubleshooting procedure to isolate and repair the trouble.

How do you "identify" the trouble spot?

NOTE

This line indicates the procedure is continued on the next page.



THE SHOTGUN APPROACH

TA170141

**DETAILED TROUBLESHOOTING PROCEDURE
TROUBLESHOOTING
USER GUIDE
(Continued)**

NOTE

This line indicates the procedure is continued from the previous page.

WARNING

Do not attempt to operate the vehicle if there is any chance the trouble may harm personnel or damage equipment.

2

To identify the troublespot, check DA Form 2404 filled out by the crew.

- Check what the crew has entered on DA Form 2404.
- Question the crew to get as much information as possible about the trouble.

EXAMPLE:

- Does the hydraulic pump work?
- Is the reservoir full of oil?
- Is there any apparent leakage?
- Make sure there was no crew error in following the operator procedure listed in TM5-5420-226-10.
- If necessary, operate the vehicle to help identify the problem.

Now that you have an idea what the trouble is, how do you find the right troubleshooting procedure?

DETAILED TROUBLESHOOTING PROCEDURE
TROUBLESHOOTING
USER GUIDE
(Continued)

NOTE
 The circled number at the top left corner of each block is a step number.

3 Check the **TROUBLESHOOTING SYSTEM INDEX** to find the proper system/subsystem.

- Turn to **TROUBLESHOOTING SYSTEM INDEX (PAGE 2-34)**.
- Find the system in which your trouble occurs.
- Find the subsystem in which your trouble occurs.

TROUBLESHOOTING SYSTEM INDEX

| | | |
|------------------------------|------------------------------|-----------|
| LAUNCHER OPERATION | SYMPTOM AND RESOURCE TABLE 1 | PAGE 2-35 |
| • LAUNCHER SYSTEM HYDRAULICS | | |
| SUPPORT SYSTEM | SYMPTOM AND RESOURCE TABLE 2 | PAGE 2-35 |
| • VENTILATION | | |

NOTE

- Most troubleshooting procedures contain many branches (paths).
- You will not follow every possible branch.
- The branch you follow will depend on your answer to each question block.
- If your answer is **NO**, follow this branch.
- If your answer is **YES**, follow this branch.

Were you able to find the proper system/subsystem in which your trouble occurs?

4 If you have trouble locating the proper system/subsystem, check the **TROUBLESHOOTING SUBJECT INDEX (page 2-34)**.

- See Step **8**.

YES NO

**DETAILED TROUBLESHOOTING PROCEDURE
TROUBLESHOOTING
USER GUIDE
(Continued)**

5 Find the right troubleshooting procedure.

- Note the TROUBLESHOOTING SYMPTOM AND RESOURCE TABLE listed for the system/subsystem in which your trouble occurs.
- Turn to the page number indicated for the above table.
- Find the same subsystem.
- Check the symptom titles listed under this subsystem until you find the one that describes your trouble.

Have you found the proper symptom title?

TROUBLESHOOTING SYSTEM INDEX

| | | | |
|------------------------------|------------------------------|------|------|
| LAUNCHER OPERATION | SYMPTOM AND RESOURCE TABLE 1 | PAGE | 2-35 |
| • LAUNCHER SYSTEM HYDRAULICS | | | |
| SUPPORT SYSTEM | SYMPTOM AND RESOURCE TABLE 2 | PAGE | 2-35 |
| • VENTILATION | | | |

6 Notify your supervisor.

NO

7

- Determine the test equipment, special tools and number of technicians required.
- See step **13**.

YES

TABLE 1 LAUNCHER OPERATION SYMPTOM AND RESOURCE TABLE

| SYMPTOM NO / SUBSYSTEM | SYMPTOM TITLE | PAGE | RESOURCES REQUIRED | | | |
|------------------------|---|------|-----------------------|---------------|-----------|---|
| | | | MULTIMETER OR STE/ICE | SPECIAL TOOLS | PERSONNEL | |
| | | | Ref App B | | | |
| | | | A | B | C | D |
| HYDRAULICS | | | | | | |
| 1 | Bridge does not lift off bridge seat | 2-59 | X | | 1,2,3,4,5 | 2 |
| 2 | Bridge does not lower smoothly from vertical position | 2-71 | X | | 1,2,3,4,5 | 2 |
| 3 | Bridge does not scissor open or does not open smoothly | 2-74 | X | | 1,2,3,4,5 | 2 |
| 4 | Launcher does not release/engage bridge | 2-81 | X | | 1,2,3,4,5 | 2 |
| 5 | Bridge does not retrieve | 2-87 | X | | 1,2,3,4,5 | 2 |
| 6 | Bridge does not scissor closed or does not close smoothly | 2-80 | X | | 1,2,3,4,5 | 2 |
| 7 | Bridge does not retract from vertical position or does not retract smoothly | 2-97 | X | | 1,2,3,4,5 | 2 |

TABLE 2 SUPPORT SYSTEM SYMPTOM AND RESOURCE TABLE

| SYMPTOM NO / SUBSYSTEM | SYMPTOM TITLE | PAGE | RESOURCES REQUIRED | | | |
|------------------------|--|-------|-----------------------|---------------|-----------|---|
| | | | MULTIMETER OR STE/ICE | SPECIAL TOOLS | PERSONNEL | |
| | | | A | B | C | D |
| VENTILATION | | | | | | |
| 8 | Ventilating blower motor does not work | 2-100 | | X | | 1 |

TA170144

**DETAILED TROUBLESHOOTING PROCEDURE
TROUBLESHOOTING
USER GUIDE
(Continued)**

FROM STEP

4

8

If you can not locate the proper system/subsystem in the SYSTEM INDEX, find an item in the TROUBLESHOOTING SUBJECT INDEX that pertains to your trouble.

- Turn to TROUBLESHOOTING SUBJECT INDEX (page 2-34).
- Check the subjects listed in this index until you find one that pertains to your trouble.

Can you find an item that pertains to your trouble?

TROUBLESHOOTING SUBJECT INDEX

| SUBJECT | SYMPTOM AND RESOURCE TABLE(S) | PAGE | SYMPTOM NUMBER(S) |
|--------------------|-------------------------------|------------------------|-------------------|
| Bridge Engaging | 1 | 2-81 | 4 |
| Bridge Lift Off | 1 | 2-59 | 1 |
| Bridge Lowering | 1 | 2-71 | 2 |
| Bridge Releasing | 1 | 2-81 | 4 |
| Bridge Retracting | 1 | 2-87 | 7 |
| Bridge Retrieving | 1 | 2-87 | 5 |
| Bridge Scissoring | 1 | 2-74, 2-90 | 3,8 |
| Engaging Bridge | 1 | 2-81 | 4 |
| Launching Bridge | 1 | 2-59, 2-71, 2-74, 2-81 | 1, 2, 3, 4 |
| Lowering Bridge | 1 | 2-71, 2-74 | 2, 3 |
| Retracting Bridge | 1 | 2-80, 2-87 | 6, 7 |
| Retrieving Bridge | 1 | 2-87 | 5 |
| Scissoring Closed | 1 | 2-80 | 6 |
| Scissoring Open | 1 | 2-74 | 3 |
| Ventilating Blower | 2 | 2-100 | 8 |

9

Notify your supervisor.

YES

NO

**DETAILED TROUBLESHOOTING PROCEDURE
TROUBLESHOOTING
USER GUIDE
(Continued)**

10

Find the right troubleshooting procedure.

- Check the SYMPTOM AND RESOURCE TABLE listed for the subject you have selected.
- Note the symptom number(s) listed for your subject.
- Turn to the page number indicated for the SYMPTOM AND RESOURCE TABLE.

TROUBLESHOOTING SUBJECT INDEX

| SUBJECT | SYMPTOM AND RESOURCE TABLE(S) | PAGE | SYMPTOM NUMBER(S) |
|--------------------|-------------------------------|------------------------|-------------------|
| Bridge Engage | 1 | 2-81 | 4 |
| Bridge Lift Off | 1 | 2-59 | 1 |
| Bridge Lowering | 1 | 2-71 | 2 |
| Bridge Releasing | 1 | 2-81 | 4 |
| Bridge Retracting | 1 | 2-87 | 5 |
| Bridge Retraction | 1 | 2-87 | 5 |
| Bridge Sticking | 1 | 2-90 | 3,6 |
| Engaging Bridge | 1 | 2-81 | 4 |
| Launching Bridge | 1 | 2-59, 2-71, 2-74, 2-81 | 1, 2, 3, 4 |
| Lowering Bridge | 1 | 2-71, 2-74 | 2, 3 |
| Retracting Bridge | 1 | 2-90, 2-97 | 6, 7 |
| Retrieving Bridge | 1 | 2-87 | 5 |
| Securing Closed | 1 | 2-90 | 6 |
| Securing Open | 1 | 2-74 | 3 |
| Ventilating Blower | 2 | 2-100 | 8 |

DETAILED TROUBLESHOOTING PROCEDURE TROUBLESHOOTING USER GUIDE (Continued)

STEP **10** CONTINUED

- Find the same symptom number(s).
- The title listed for this number is the symptom title that describes your trouble.

TABLE 1 LAUNCHER OPERATION SYMPTOM AND RESOURCE TABLE

| SYMPTOM NO./SUBSYSTEM | SYMPTOM TITLE | PAGE | RESOURCES REQUIRED | | | |
|-----------------------|--|------|-----------------------|---------------|-----------|---|
| | | | MULTIMETER OR STE/ICE | SPECIAL TOOLS | PERSONNEL | |
| | | | A | B | C | D |
| HYDRAULICS | | | | | | |
| 1 | Bridge does not lift off bridge seat. | 2-70 | X | | 1,2,3,4,5 | 2 |
| 2 | Bridge does not lower smoothly from vertical position. | 2-71 | X | | 1,2,3,4,5 | 2 |
| 3 | Bridge does not open smoothly. | 2-74 | X | | 1,2,3,4,5 | 2 |
| 4 | Launcher does not release/engage bridge. | 2-81 | X | | 1,2,3,4,5 | 2 |
| 5 | Launcher does not retrieve. | 2-87 | X | | 1,2,3,4,5 | 2 |
| 6 | Bridge does not close or does not close smoothly. | 2-80 | X | | 1,2,3,4,5 | 2 |
| 7 | Bridge does not retract from vertical position or does not retract smoothly. | 2-97 | X | | 1,2,3,4,5 | 2 |

TABLE 2 SUPPORT SYSTEM SYMPTOM AND RESOURCE TABLE

| SYMPTOM NO./SUBSYSTEM | SYMPTOM TITLE | PAGE | RESOURCES REQUIRED | | | |
|-----------------------|---|-------|-----------------------|---------------|-----------|---|
| | | | MULTIMETER OR STE/ICE | SPECIAL TOOLS | PERSONNEL | |
| | | | A | B | C | D |
| VENTILATION | | | | | | |
| 1 | Ventilating blower motor does not work. | 2-100 | X | | | 1 |

NOTE

If there is more than one symptom number listed, review the symptom title for each number until you find the title that describes your trouble.

Have you found the proper symptom title?

11 Notify your supervisor.

NO

12

- Determine the test equipment, special tools, and number of technicians required.
- See step **13**.

YES

TA170147

**DETAILED TROUBLESHOOTING PROCEDURE
TROUBLESHOOTING
USER GUIDE
(Continued)**

FROM STEP

7 OR 12

13 Determine the test equipment, special tools, and number of technicians required to perform the procedure.

- Locate the RESOURCES REQUIRED COLUMNS.
- Check Column B to see if you will need test equipment. Either a multimeter or a STE/ICE set can be used. You do not need both.
- Check Column C to see if you will need special tools.

NOTE

- If Column C indicates that special tools are needed, see Appendix B, Section III (page B-7).
- Locate the same item number in this section. This will tell you which special tool is needed.

- Check Column D to determine how many technicians are required to perform the procedure.

Now that you have identified the trouble; found the right troubleshooting procedure; and obtained the test equipment, special tools, and number of technicians required: what is the last step to good troubleshooting?

TABLE 1. LAUNCHER OPERATION SYMPTOM AND RESOURCE TABLE

| SYMPTOM NO./SUBSYSTEM | SYMPTOM TITLE | PAGE | RESOURCES REQUIRED | | |
|-----------------------|--|------|-----------------------|---------------|-----------|
| | | | MULTIMETER OR STE/ICE | SPECIAL TOOLS | PERSONNEL |
| | | | Ref. App B | | |
| | | A | B | C | D |
| HYDRAULICS | | | | | |
| 1 | Bridge does not lift off bridge seat. | 2-39 | X | 1,2,3,4,5 | 2 |
| 2 | Bridge does not lower smoothly from vertical position. | 2-71 | X | 1,2,3,4,5 | 2 |
| 3 | Bridge does not extend open or does not open smoothly. | 2-74 | X | 1,2,3,4,5 | 2 |
| 4 | Launcher does not release/engage bridge. | 2-81 | X | 1,2,3,4,5 | 2 |
| 5 | Bridge does not retract. | 2-87 | X | 1,2,3,4,5 | 2 |
| 6 | Bridge does not extend closed or does not close smoothly. | 2-88 | X | 1,2,3,4,5 | 2 |
| 7 | Bridge does not retract from vertical position or does not retract smoothly. | 2-97 | X | 1,2,3,4,5 | 2 |

TABLE 2. SUPPORT SYSTEM SYMPTOM AND RESOURCE TABLE

| SYMPTOM NO./SUBSYSTEM | SYMPTOM TITLE | PAGE | RESOURCES REQUIRED | | | |
|-----------------------|--------------------------------------|-------|-----------------------|---------------|-----------|---|
| | | | MULTIMETER OR STE/ICE | SPECIAL TOOLS | PERSONNEL | |
| | | | A | B | C | D |
| VENTILATION | | | | | | |
| 8 | Vacuuming Mover motor does not work. | 2-100 | X | | | 1 |

DETAILED TROUBLESHOOTING PROCEDURE TROUBLESHOOTING USER GUIDE (Continued)

WARNING

Do not start your troubleshooting procedure until you have studied step 16. This step contains important information you will need to know in order to perform the procedure safely.

14

Use the troubleshooting procedure to isolate and repair the trouble.

- After studying step 16, you will be ready to begin your Troubleshooting Procedure.

Are you familiar with the Important Troubleshooting Information contained in step 16 ?

NO

YES

15

- Turn to the page number indicated in Column A.
- On this page you will see the procedure that covers your trouble.
- Use this troubleshooting procedure to isolate and repair the trouble.

TABLE 1. LAUNCHER OPERATION SYMPTOM AND RESOURCE TABLE

| SYMPTOM NO./SUBSYSTEM | SYMPTOM TITLE | PAGE | RESOURCES REQUIRED | | | |
|-----------------------|---|------|-----------------------|------------------------------|----------|-----------|
| | | | MULTIMETER OR STE/ICE | Ref. App. B SPECIAL TOOLS | | PERSONNEL |
| | | | A | B | C | D |
| HYDRAULICS | | | | | | |
| 1 | Bridge does not lift off bridge seat | 2-99 | X | | 1.2.3A.5 | 2 |
| 2 | Bridge does not lower smoothly from vertical position. | 2-7 | X | | 1.2.3A.5 | 2 |
| 3 | Bridge does not extend open or does not open smoothly. | 2-4 | X | | 1.2.3A.5 | 2 |
| 4 | Launcher does not release/engage bridge | 2-81 | X | | 1.2.3A.5 | 2 |
| 5 | Bridge does not retract. | 2-87 | X | | 1.2.3A.5 | 2 |
| 6 | Bridge does not extend closed or does not close smoothly. | 2-80 | X | | 1.2.3A.5 | 2 |
| 7 | Bridge does not retract from vertical position or does not retract smoothly | 2-97 | X | | 1.2.3A.5 | 2 |

TABLE 2. SUPPORT SYSTEM SYMPTOM AND RESOURCE TABLE

| SYMPTOM NO./SUBSYSTEM | SYMPTOM TITLE | PAGE | RESOURCES REQUIRED | | | |
|-----------------------|--|-------|-----------------------|---------------|---|-----------|
| | | | MULTIMETER OR STE/ICE | SPECIAL TOOLS | | PERSONNEL |
| | | | A | B | C | D |
| VENTILATION | | | | | | |
| 8 | Ventilating blower motor does not work | 2-100 | X | | | 1 |

**DETAILED TROUBLESHOOTING PROCEDURE
TROUBLESHOOTING
USER GUIDE
(Continued)**

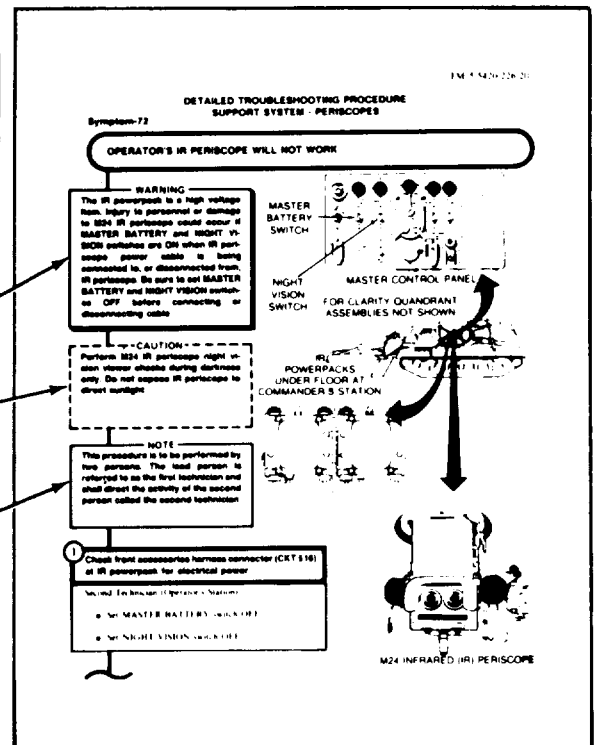
16

IMPORTANT TROUBLESHOOTING INFORMATION

- Be sure you read every **WARNING**, **CAUTION**, and **NOTE**.
- A **WARNING**: Instructions which if not followed, could result in injury or death of personnel.
- A **CAUTION** indicates possible equipment damage only.
- A **NOTE** contains information you will need to know in order to properly perform the troubleshooting procedure.

WARNING

- Be sure there is no electrical power at the cable to be disconnected or repaired.
- Before making cable repairs or disconnecting any cable, be sure **MASTER BATTERY** switch is set **OFF**.



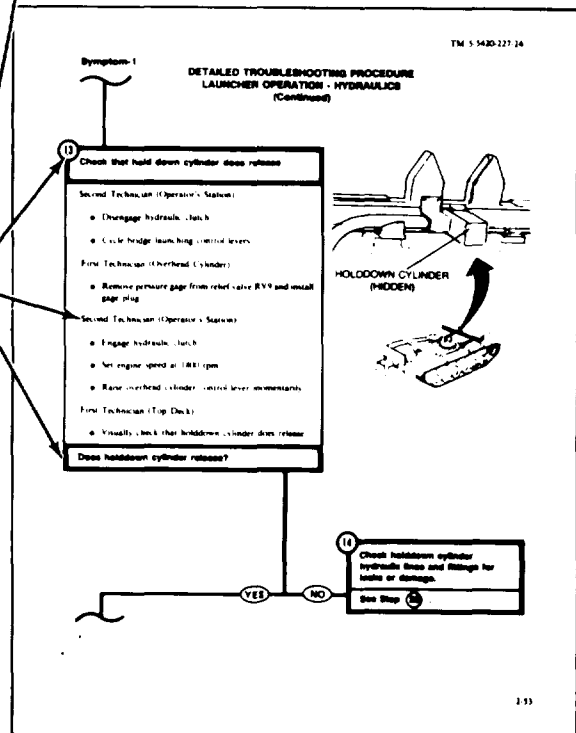
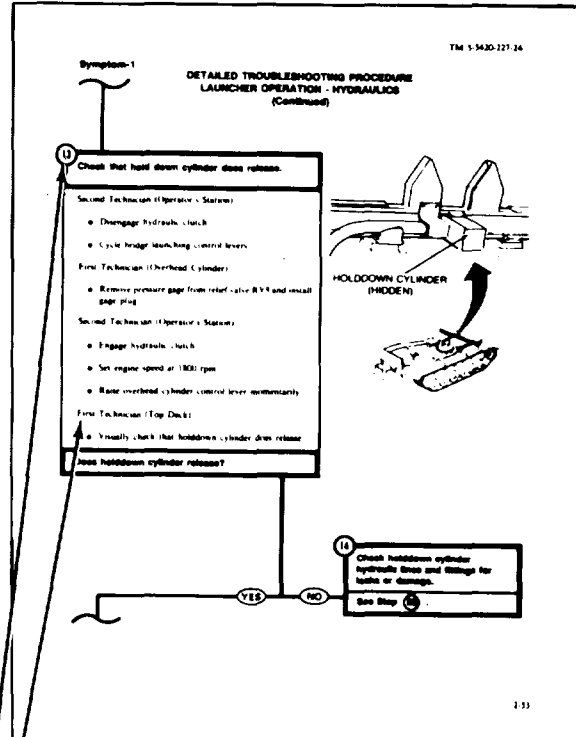
**DETAILED TROUBLESHOOTING PROCEDURE
TROUBLESHOOTING
USER GUIDE
(Continued)**

STEP **16** CONTINUED

WARNING

- **Setting MASTER BATTERY switch OFF will not de-energize the following circuits: 49, 81, 400, 459 and 975. When working with any of the above circuits, the battery ground straps must be disconnected.**
- **When working with CKT 405, set HEATER MASTER switch OFF.**
- **Failure to de-energize any electrical circuit prior to working on it may result in serious injury to personnel.**

- **If you are a skilled technician and already know how to perform the test or inspection called for here, you may skip the part of that step that is not shaded with heavy lines and printed in bold type.**
- **If you do not know how to do the test or inspection called for, you must perform every part of each step.**

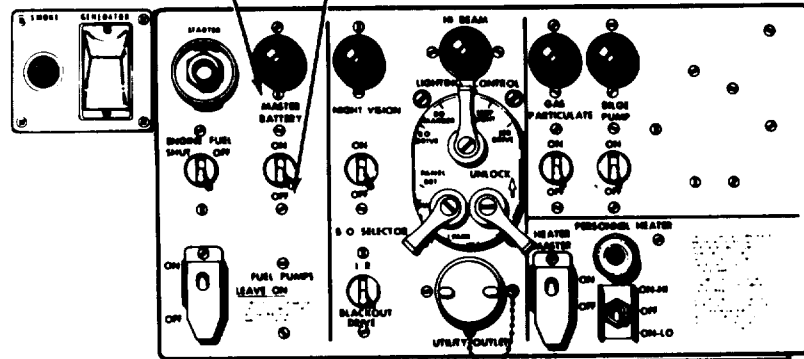
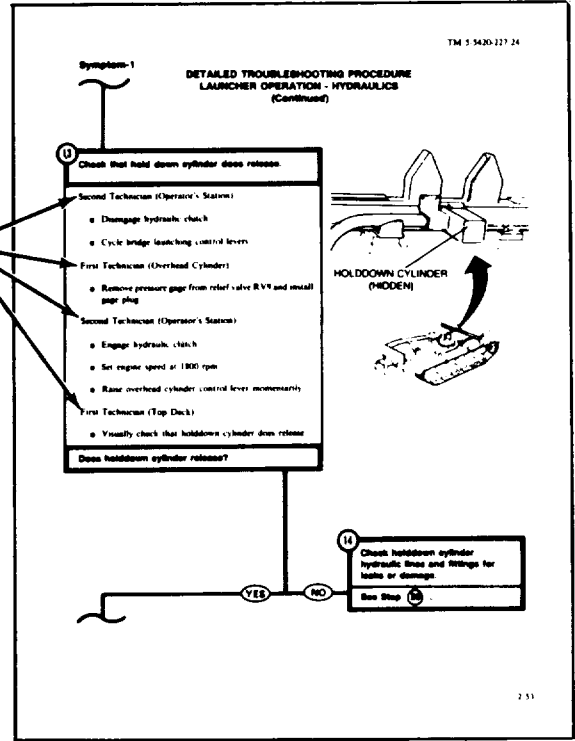


TA170151

DETAILED TROUBLESHOOTING PROCEDURE
TROUBLESHOOTING
USER GUIDE
(Continued)

STEP 16 CONTINUED

- These locators tell you two things:
 - Which person will do the task that follows.
 - Where this person must be in order to do the task.
- Example: First Technician (Top Deck)
- The words printed in **BOLD TYPE** show you what you will see marked on the actual equipment you will be using.
- Example: • Set **MASTER BATTERY** switch **OFF**.



TA170152

DETAILED TROUBLESHOOTING PROCEDURE TROUBLESHOOTING USER GUIDE (Continued)

STEP **16** CONTINUED.

- Some steps call for the use of test equipment.
- If you do not know how to use this equipment (or if you have forgotten how to do the test called for) see page 2-17 for multimeter or page 2-36 for STE/ICE instructions.
- A picture is included with most steps to make the task easier to understand, or show you where a particular part is located.

TM 5-5420-227-24

Symptom-0 **DETAILED TROUBLESHOOTING PROCEDURE**
SUPPORT SYSTEM - VENTILATION

VENTILATING BLOWER MOTOR DOES NOT WORK

1 Check CRT 159 harness connector at blower motor for electrical power.

Technician (Operator's Station)

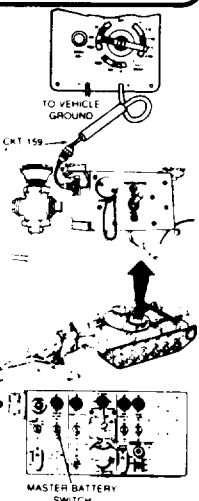
- NO MASTER BATTERY JACKED OUT
- Disconnect CRT 159 harness connector from ventilating blower.
- Set multimeter to measure DC voltage (use STE/ICE Test No. 89 (page 2-45)).
- Connect red probe of multimeter to one of harness connector to ventilating blower and black probe to ground.
- NO MASTER BATTERY JACKED ON
- NO VENTILATOR SWITCHES
- CHECK if meter indicates 18 to 28 volts dc?

Does meter indicate 18 to 28 volts dc?

2 Replace ventilating blower assembly (page 3-25).

YES

NO



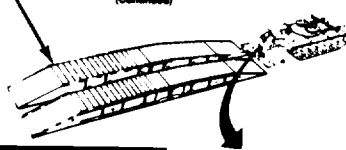
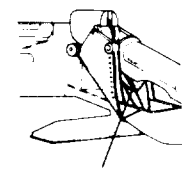
TO VEHICLE GROUND

CRT 159

MASTER BATTERY SWITCH

TM 5-5420-227-24

Symptom-2 **DETAILED TROUBLESHOOTING PROCEDURE**
LAUNCHER OPERATION - HYDRAULICS
(Continued)

3 Check tongue cylinder hydraulic lines and fittings for leaks or damage.

First Technician (Operator's Station)

- Disengage hydraulic clutch
- Cycle bridge launching control levers

Second Technician (Commander's Station)

- Remove pressure gauge from gauge port and install gauge plug.

First Technician (Operator's Station)

- Launch the bridge (TM 5-5240-226-10)
- Disengage hydraulic clutch

Both Technicians (Launcher Tongue)

- Remove tongue cylinder armor (page 3-215)

First Technician (Operator's Station)

- Engage hydraulic check
- Set engine speed at 1800 rpm
- Raise tongue cylinder control lever

Second Technician (Launcher Tongue)

- Visually check hydraulic lines and fittings for leaks, chipping or other damage.

Are hydraulic lines or fittings leaking or damaged?

4 Identify leaking hydraulic line by reference on line with diagram (page 3-66).

● Replace leaking line.

NO

YES

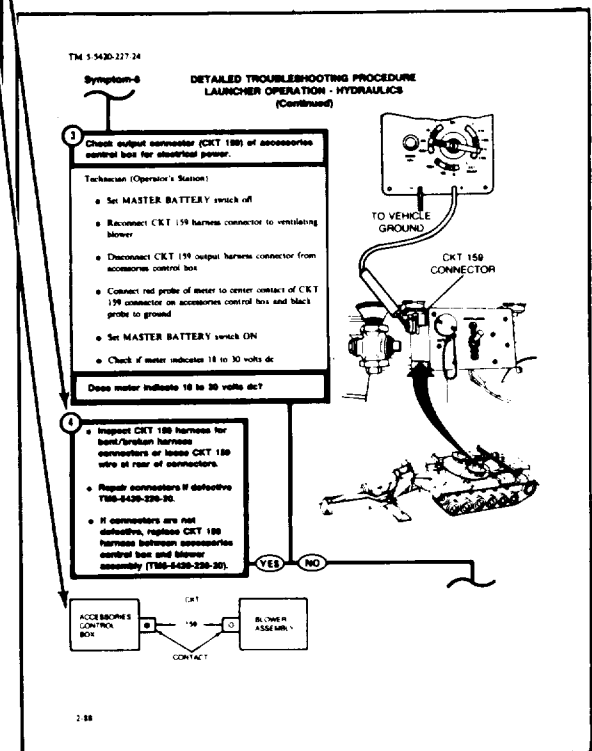
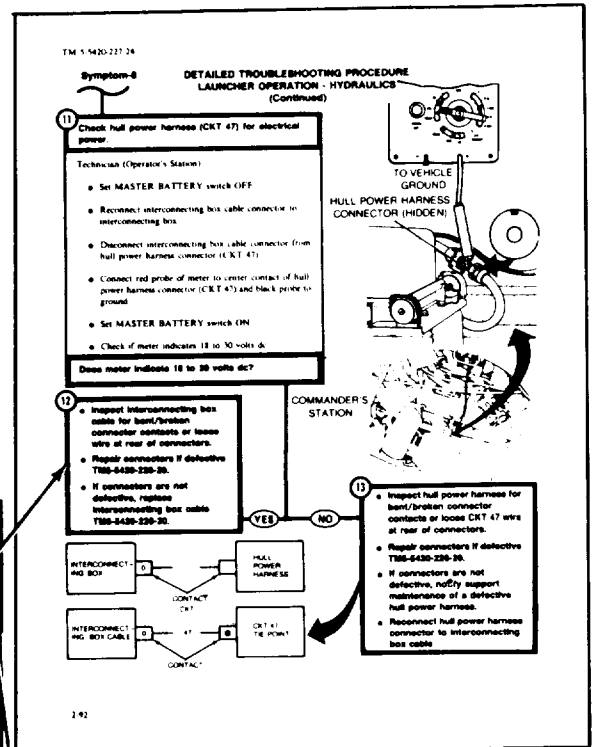
TA170153

DETAILED TROUBLESHOOTING PROCEDURE TROUBLESHOOTING USER GUIDE (Continued)

STEP 16 CONTINUED

- When a step tells you inspect for bent/broken connector contacts or loose wires at the rear of connectors (or repair a harness)—a circuit diagram is included.
- This circuit diagram will show you which connectors to inspect/repair and where they are located.

- Indicates a male pin, single contact.
- Indicates female socket, single contact.



TA170154

DETAILED TROUBLESHOOTING PROCEDURE TROUBLESHOOTING USER GUIDE (Continued)

STEP 16 CONTINUED

- After you finish any repair in a troubleshooting procedure, check to see that the trouble has been corrected.
- If the problem still exists, go back to step 1 of the same procedure and repeat procedure again. If the problem still exists after performing the procedure twice, notify your supervisor.

TM 5-5420-227-24

Symptom-1
**DETAILED TROUBLESHOOTING PROCEDURE
LAUNCHER OPERATION - HYDRAULICS
(Continued)**

1 Check master relief valve RV-1 for pressure setting of 3000 ± 50 psi.

Second Technician (Operator's Station)

- Place suitable container under inlet section of valve head.
- Remove gage plug from inlet section of valve head and connect pressure gage.
- Start engine.
- Engage hydraulic clutch.
- Set engine speed at 1800 rpm.
- In press screen cylinder control lever momentarily.
- Check pressure gage indicates 3000 ± 50 psi to pressure 3000 ± 50 psi?

OPERATOR'S STATION

COMMANDER'S STATION

2 Adjust master relief valve RV-1 (page 2-64).

- If relief valve setting cannot be brought to within tolerance, replace cartridge in relief valve (page 2-62).

YES NO

2-51

TM 5-5420-227-24

Symptom-6
**DETAILED TROUBLESHOOTING PROCEDURE
LAUNCHER OPERATION - HYDRAULICS
(Continued)**

VENTILATING BLOWER MOTOR DOES NOT WORK

1 Check CRT 159 harness connector of blower motor for electrical power.

Technician (Operator's Station)

- Set MASTER BATTERY switch OFF.
- Disconnect CRT 159 harness connector from ventilating blower.
- Set multimeter to measure 18 to 30 volts dc, or use STE/ICE Test No. 89 (page 2-45).
- Connect red probe of meter to center contact of harness connector to ventilating blower and black probe to ground.
- Set MASTER BATTERY switch ON.
- Set VENTILATOR switch ON.
- Check if meter indicates 18 to 30 volts dc.

Does meter indicate 18 to 30 volts dc?

TO VEHICLE GROUND

CRT 159

MASTER BATTERY SWITCH

2 Replace ventilating blower assembly (page 2-5).

YES NO

2-57

TA170155

DETAILED TROUBLESHOOTING PROCEDURE TROUBLESHOOTING USER GUIDE (Continued)

STEP 16 CONTINUED

Do you understand all the information in this USER GUIDE?

17 Ask your supervisor to help you with the part you don't understand.

18

- Turn to the page number indicated in Column A.
- On this page you will see the procedure that pertains to your trouble.
- Use this DETAILED TROUBLESHOOTING PROCEDURE to isolate and repair the trouble.

TABLE 1 LAUNCHER OPERATION SYMPTOM AND RESOURCE TABLE

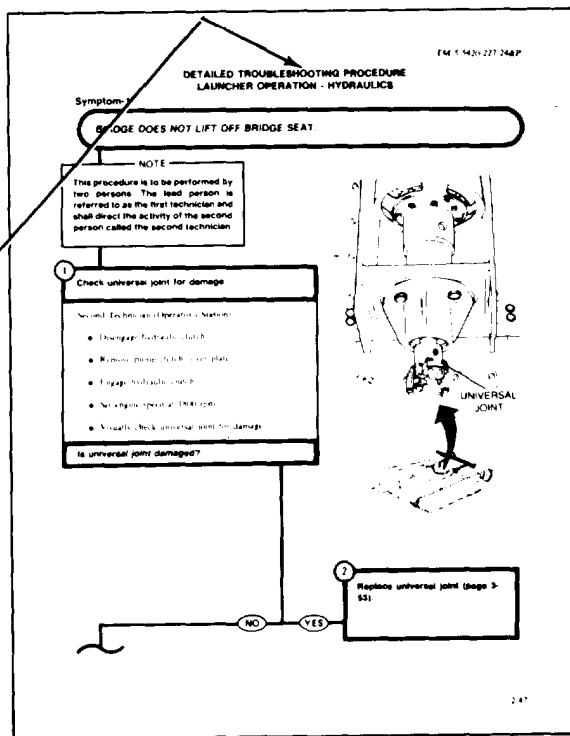
| SYMPTOM NO / SUBSYSTEM | SYMPTOM TITLE | PAGE | RESOURCES REQUIRED | | |
|------------------------|---|------|-----------------------|---------------|-----------|
| | | | MULTIMETER OR STE/ICE | Ref App B | |
| | | | | SPECIAL TOOLS | PERSONNEL |
| A | B | C | D | | |
| HYDRAULICS | | | | | |
| 1 | Bridge does not lift off bridge seat | 2-99 | X | 1,2,3,4,5 | 2 |
| 2 | Bridge does not lower smoothly from vertical position | 2-71 | X | 1,2,3,4,5 | 2 |
| 3 | Bridge does not scissor open or does not open smoothly | 2-74 | X | 1,2,3,4,5 | 2 |
| 4 | Launcher does not release/engage bridge | 2-81 | X | 1,2,3,4,5 | 2 |
| 5 | Bridge does not retrieve | 2-87 | X | 1,2,3,4,5 | 2 |
| 6 | Bridge does not scissor close or does not close smoothly | 2-80 | X | 1,2,3,4,5 | 2 |
| 7 | Bridge does not retract from vertical position or does not retract smoothly | 2-97 | X | 1,2,3,4,5 | 2 |

TABLE 2 SUPPORT SYSTEM SYMPTOM AND RESOURCE TABLE

| SYMPTOM NO / SUBSYSTEM | SYMPTOM TITLE | PAGE | RESOURCES REQUIRED | | |
|------------------------|--|-------|-----------------------|---------------|---|
| | | | MULTIMETER OR STE/ICE | PERSONNEL | |
| | | | | SPECIAL TOOLS | D |
| A | B | C | D | | |
| VENTILATION | | | | | |
| 1 | Ventilating blower motor does not work | 2-100 | X | | 1 |

NO

YES



TA170156

TROUBLESHOOTING SYSTEM INDEX

| | | |
|-------------------------------------|--------------------------------------|-----------|
| LAUNCHER OPERATION | SYMPTOM AND RESOURCE TABLE 1. | PAGE 2-35 |
| ● LAUNCHER SYSTEM HYDRAULICS | | |
| SUPPORT SYSTEM | SYMPTOM AND RESOURCE TABLE 2. | PAGE 2-35 |
| ● VENTILATION | | |

TROUBLESHOOTING SUBJECT INDEX

| SUBJECT | SYMPTOM AND RESOURCE TABLE(S) | PAGE | SYMPTOM NUMBER(S) |
|--------------------|--------------------------------------|------------------------|--------------------------|
| Bridge Engaging | 1 | 2-82 | 4 |
| Bridge Lift Off | 1 | 2-59 | 1 |
| Bridge Lowering | 1 | 2-72 | 2 |
| Bridge Releasing | 1 | 2-82 | 4 |
| Bridge Retracting | 1 | 2-98 | 7 |
| Bridge Retrieving | 1 | 2-88 | 5 |
| Bridge Scissoring | 1 | 2-75, 2-91 | 3,6 |
| Engaging Bridge | 1 | 2-82 | 4 |
| Launching Bridge | 1 | 2-59, 2-72, 2-75, 2-82 | 1, 2, 3, 4 |
| Lowering Bridge | 1 | 2-72, 2-75, | 2, 3 |
| Retracting Bridge | 1 | 2-91, 2-98 | 6, 7 |
| Retrieving Bridge | 1 | 2-88 | 5 |
| Scissoring Closed | 1 | 2-91 | 6 |
| Scissoring Open | 1 | 2-75 | 3 |
| Ventilating Blower | 2 | 2-101 | 8 |

TA170158

TABLE 1. LAUNCHER OPERATION SYMPTOM AND RESOURCE TABLE

| SYMPTOM NO./ SUBSYSTEM | SYMPTOM TITLE | PAGE | RESOURCES REQUIRED | | |
|---------------------------|--|------|-----------------------------|------------------|-----------|
| | | | MULTIMETER OR STE/ICE | Ref. App. B | PERSONNEL |
| | | | | SPECIAL TOOLS | |
| A | B | C | D | | |
| HYDRAULICS | | | | | |
| 1 | Bridge does not lift off bridge seat. | 2-59 | x | 1,2,3,4,5. | 2 |
| 2 | Bridge does not lower smoothly from vertical position. | 2-72 | x | 1,2,3,4,5. | 2 |
| 3 | Bridge does not scissor open or does not open smoothly. | 2-75 | x | 1,2,3,4,5 | 2 |
| 4 | Launcher does not release/engage bridge. | 2-82 | x | 1,2,3,4,5 | 2 |
| 5 | Bridge does not retrieve. | 2-88 | x | 1,2,3,4,5 | 2 |
| 6 | Bridge does not scissor closed or does not close smoothly. | 2-91 | x | 1,2,3,4,5, | 2 |
| 7 | Bridge does not retract from vertical position or does not retract smoothly. | 2-98 | x | 1,2,3,4,5 | 2 |

TABLE 2. SUPPORT SYSTEM SYMPTOM AND RESOURCE TABLE

| SYMPTOM NO./ SUBSYSTEM | SYMPTOM TITLE | PAGE | RESOURCES REQUIRED | | |
|---------------------------|--|-------|-----------------------------|---------|-----------|
| | | | MULTIMETER OR STE/ICE | SPECIAL | PERSONNEL |
| | | | | TOOLS | |
| A | B | C | D | | |
| VENTILATION | | | | | |
| 8 | Ventilating blower motor does not work | 2-101 | x | | 1 |

***STE/ICE TROUBLESHOOTING (SIMPLIFIED
TEST EQUIPMENT FOR INTERNAL COMBUSTION ENGINES)***

● ***General***

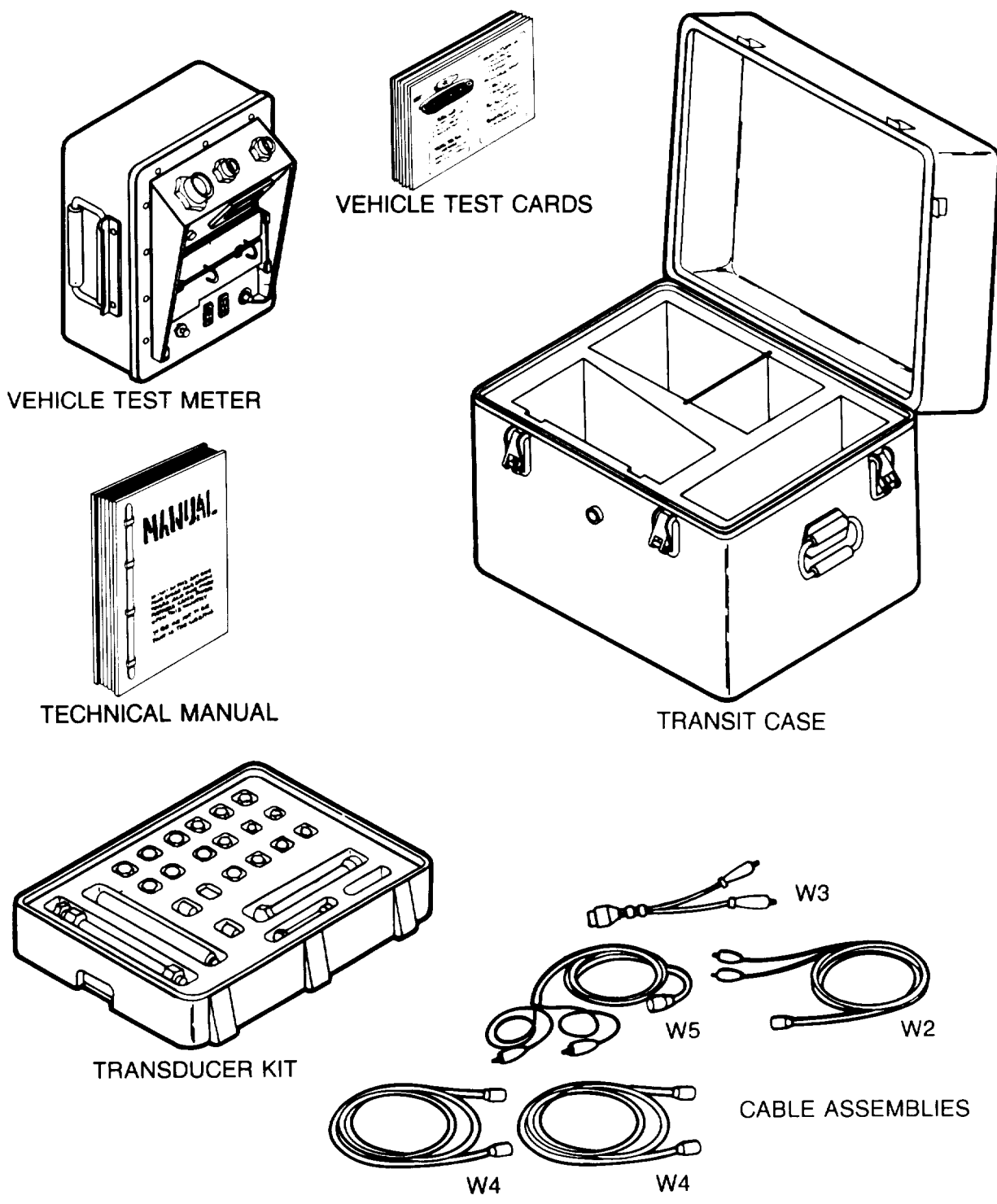
- a. This section is applicable only if STE/ICE is available. This section contains information and tests which may be used with STE/ICE to locate malfunctions that may develop in the vehicle hull. The tests can be used during troubleshooting or after replacing parts to isolate malfunctions, and to make sure that proper repairs have been made.
- b. STE/ICE is used primarily with the vehicle electrical system. These tests cannot cover all possible troubles which may occur. To obtain the maximum number of observed symptoms of the malfunction, question the vehicle crew.

● ***STE/ICE Tests and Set-Up Procedures.***

- a. The STE/ICE testing capability that may be applied to the launcher are tests No. 51, 0-4000 PSIG Pressure Test and No. 89, DC Voltage Test.
- b. STE/ICE set up and confidence test (Tests No. 66/60) must be performed prior to performing any tests.

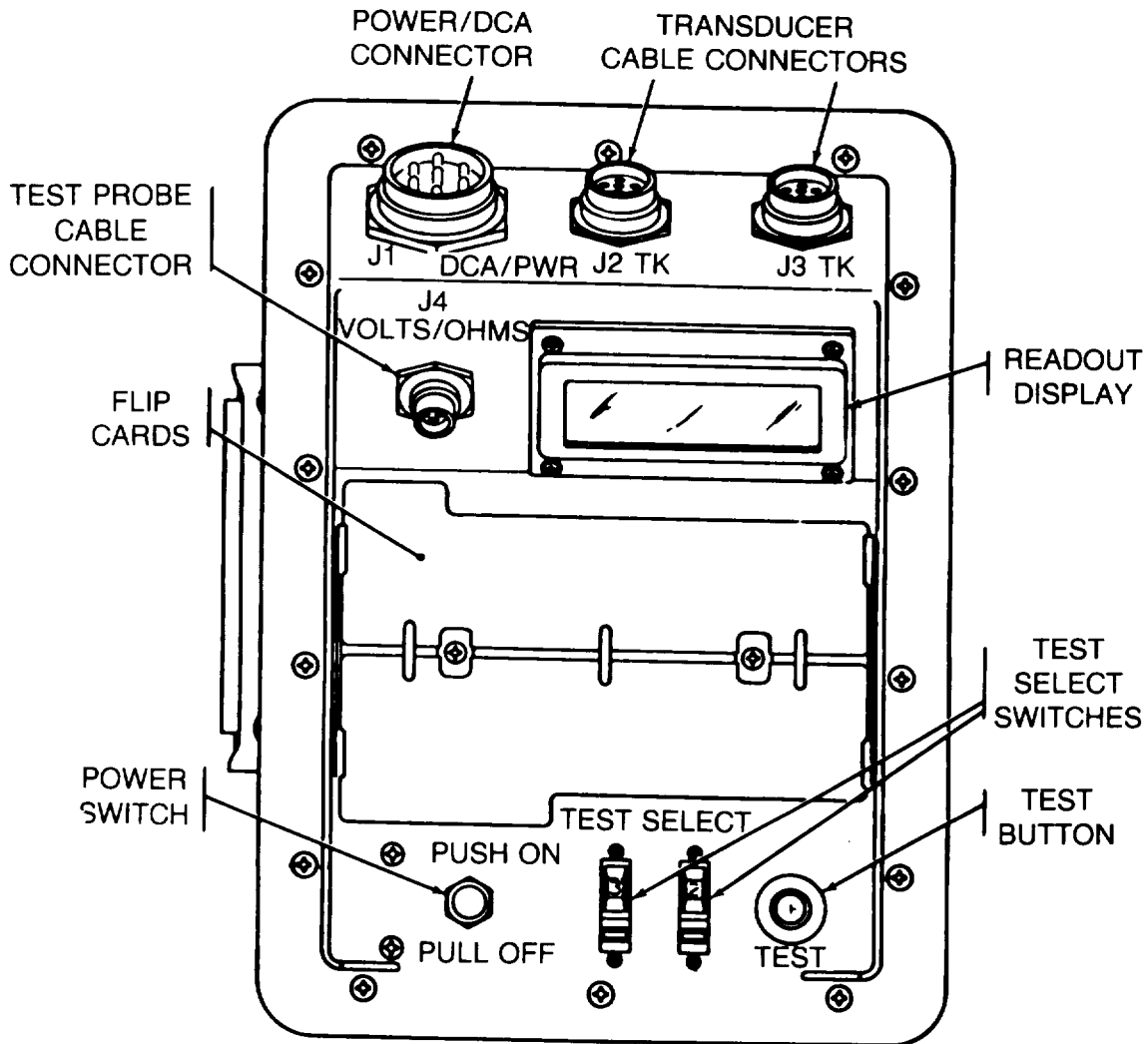
● ***STE/ICE Description and Operation.***

- a. General. The following describes the operation of the STE/ICE system and contains detailed operating procedures. It is used to test the serviceability of vehicles and to perform primary fault detection and isolation. After the technician has identified a faulty part or subsystem, he is referred to a paragraph number for replacement or repair procedures for individual parts.
- b. Description and Operation. STE/ICE is used in this technical manual as a measuring device for DC voltage. STE/ICE is portable and operates on either 12 or 24 volt vehicle batteries or equivalent power source. The STE/ICE system consists of a vehicle test meter (VTM), a transducer kit (TK), four electrical cables, a transit case, and technical publications. Only the VTM and cables W2 and W5 are required for STE/ICE tests in this manual.



Simplified test equipment internal combustion engine (STE/ICE) system.

TA170160



VTM controls and readout display.

TA170161

c. Vehicle Test Meter.

(1) General. The VTM provides a method for the technician to test vehicle electrical components, Readings are either pass/fail indications or digital displays in units such as volts. Operating power for the VTM is drawn from the vehicle batteries or some equivalent battery source.

(2) Controls and Indicators. The controls and readout display on the VTM are illustrated on page 2-38.

- (a) Power Switch (PUSH ON/PULL OFF). VTM power is on when the power switch is pushed in and off when pulled out. The power switch contains a 4-amp circuit breaker and will pop out automatically if something is wrong which causes the VTM to use more power than it should. If the switch pops, check your hookup carefully and try again before turning in the VTM to support maintenance.
- (b) Test Select Switches. The TEST SELECT switches are used to select the actual test to be performed. There are ten positions on each switch numbered 0 through 9. The number dialed into these switches is read by the VTM when you press the TEST button.
- (c) Test Button. Pressing and releasing the TEST button causes the test measurement to begin. Observe the measured value on the readout display. The TEST button must be pressed and immediately released, unless instructions in the test being performed state otherwise.
- (d) Readout Display. The readout display will show different types of readouts during testing up to a maximum of 4-characters (for example .8.8 .8.8). The types of readouts you will see are summarized as follows:
 - 1. Status Readout. A status readout keeps the technician informed of what is happening. The status readout displays are described in page 2-40.
 - 2. Prompting Message. A prompting message is a technician action message. Prompting messages are described in page 2-40.
 - 3. Numerical Readout. A numerical readout is the measured value in units of the measurement being made. For example, if you are measuring 0-45 volts dc, 24.2 is volts dc.
 - 4. Error Readout. There are 5 different error readouts used with this vehicle. All error readouts start with E. All error messages must be corrected before continuing testing. Error messages are listed in page 2-41.
 - 5. Confidence Error Readouts. C004 is a typical error readout resulting from the detection of a fault y VTM during confidence test.

d. Cable Assemblies. Cable assemblies are referred to by the cable number and by a name which describes how the cable is used. For example power cable W5, test probe cable W2. If you experience any difficulty during testing and suspect a cable is bad, refer to TM9-4910-571-12 & P for checking cable continuity.

Status Readouts

| VTM Readout | Interpretation |
|--------------|---|
| .8.8.8.8 | A readout of .8.8.8.8 appears for 1 to 2 seconds each time the power is applied to the VTM. It means that there is power to the VTM, and that all elements of the readout display are operative. |
| ---- | <p>A readout of ---- indicates the following:</p> <ul style="list-style-type: none"> (1) After power turn on it signifies that the VTM is ready for testing. (2) During a compression unbalance test it signifies testing is in progress. (3) During battery condition test it signifies battery may be in discharged state. |
| .9.9.9.9 | A readout of .9.9.9.9 indicates that the VTM is reading a test value beyond the range of its measurement capability. Either (1) the wrong test number is selected, or (2) there is a fault in the vehicle, (3) during battery condition test, it signifies bad connections, discharged, or bad batteries. |
| PASS FAIL | A PASS or FAIL readout is the result of a test that checks the condition of a component being measured. A PASS/FAIL readout means just that - the component either passes the test or fails the test. |

Prompting Messages

| VTM Readout | Interpretation |
|-------------|--|
| CAL | Signal to the technician to release the TEST button during an offset test. |
| 66 | Numbers are used for prompting messages in several tests. They are as follows: in confidence test 66 signals the technician to dial in "99"; in CI acceleration/deceleration power test No. 12, the first numerical readout signals the technician to shut off fuel. |

TA170163

Error Readouts

| VTM Readout | Interpretation |
|-------------|---|
| E000 | Occurs if you request the VTM for information it does not have. For example, if you request the vehicle ID and it has not been entered. |
| E001 | It indicates that a non-existent test number has been dialed into the TEST SELECT switches. |
| E002 | Required transducer is not connected. |
| E005 | Indicates that the transducer offset test was not performed. |
| E013 | Indicates bad data were taken for the test in progress. Repeat the test one (1) time. |

TA170164

STE/ICE Test Procedures

VTM GENERAL SET UP

--CAUTION--

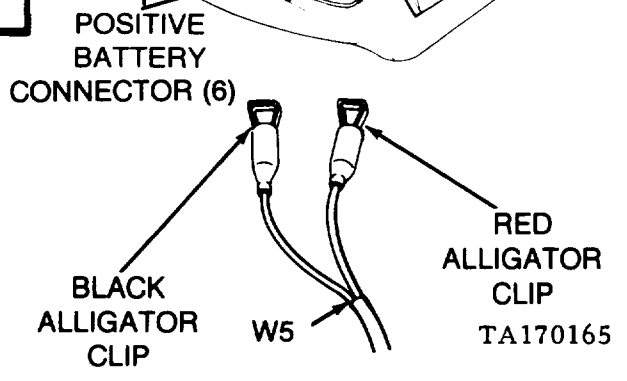
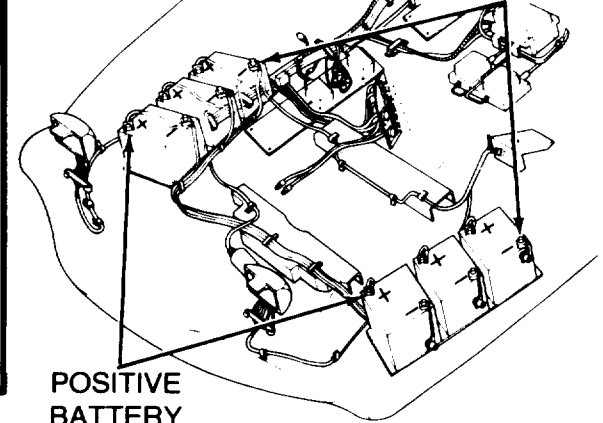
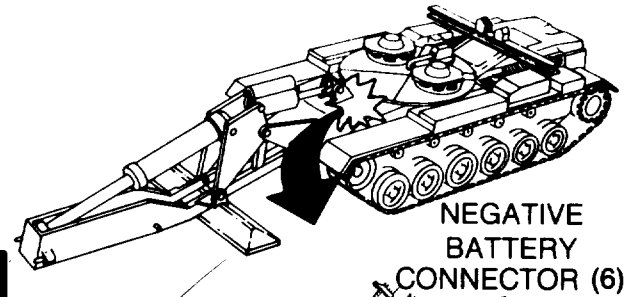
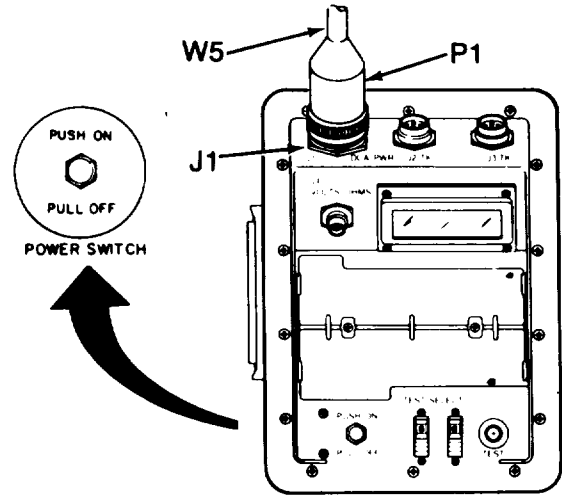
Do not connect or disconnect VTM while vehicle engine is running.

--CAUTION--

Connect P1 of power cable W5 to J1 of VTM before connecting clip leads to battery cable.

--CAUTION--

Observe polarity. Make sure red alligator clip of power cable W5 connects to positive (+) connector on battery and black alligator clip of power cable W5 connects to negative (-) on battery.



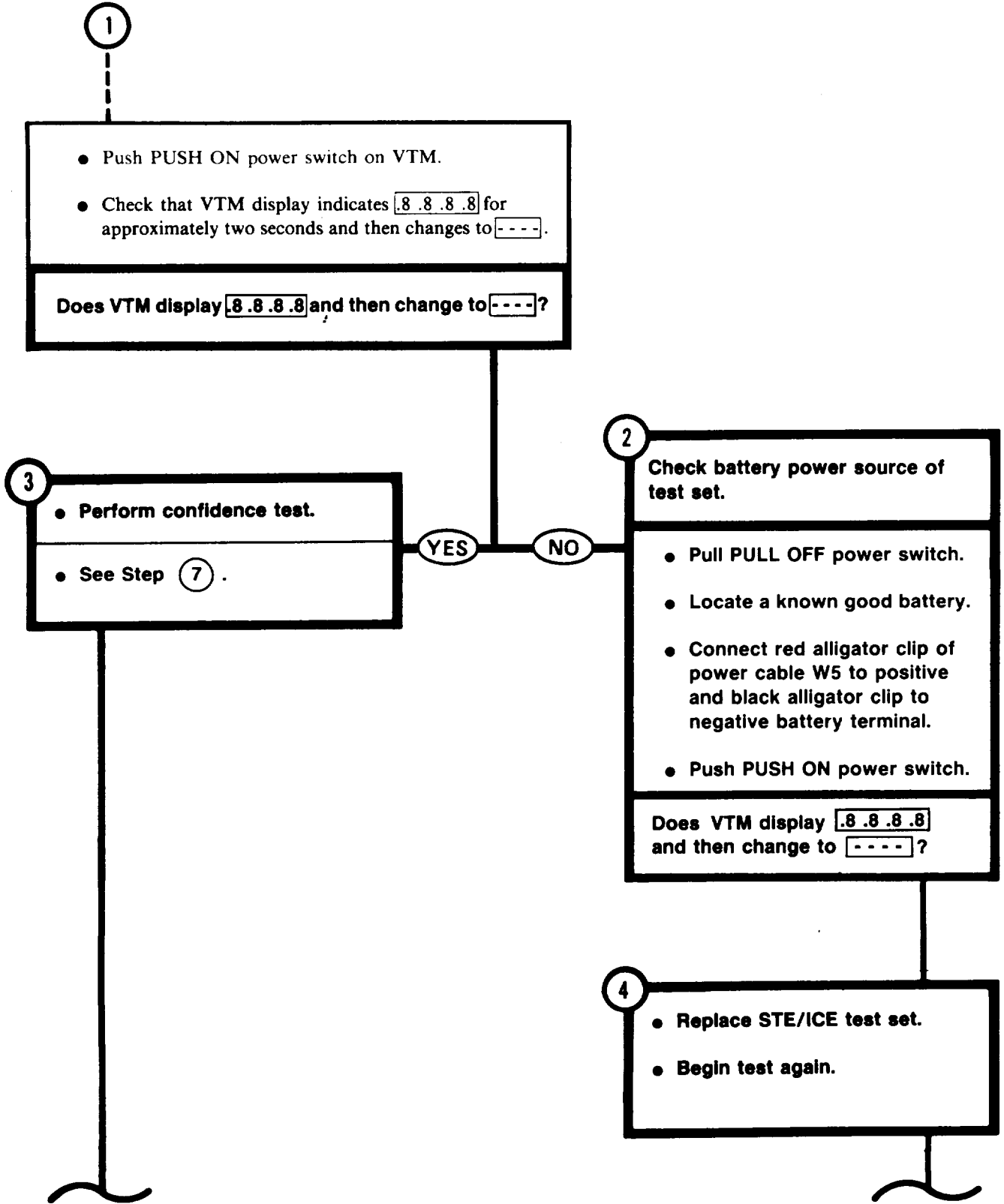
1

VTM general set up.

- Pull PULL OFF power switch on VTM.
- Connect P1 of power cable W5 to J1 on VTM.
- Connect red alligator clip of power cable W5 to positive (+) connector on battery.
- Connect black alligator clip of power cable W5 to negative (-) connector on battery.

FROM STEP

STE/ICE Test Procedures - Continued



TA170166

STE/ICE Test Procedures - Continued

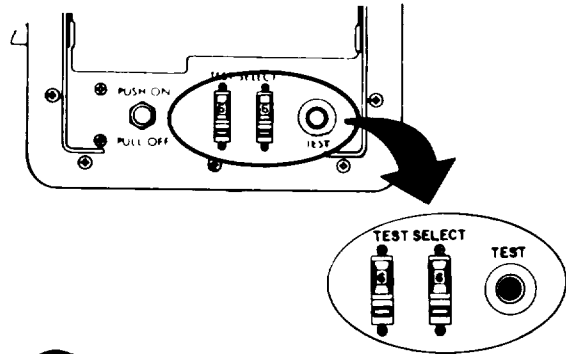
CONFIDENCE TEST 66

1

Confidence Test

- Dial TEST SELECT switches to 66.
- Press and release TEST button.
- Check that VTM display indicates **0066** and holds.

Does VTM display and hold **0066**?



2

Re-dial 66 and press TEST button.

Does VTM display indicate and hold **0066**?

YES

NO

3

Replace STE/ICE set.

4

- Dial TEST SELECT switches to 99.
- Check that several numbers appear on VTM display, **99**, **.8 .8 .8 .8** and others.
- Wait for VTM display to indicate **PASS**.

Does VTM display **PASS**?

5

- Repeat Confidence Test.
- Wait for VTM display to indicate **PASS**.

Does VTM display indicate **PASS**?

YES

NO

6

Replace STE/ICE set.

END TEST

TA170167

STE/ICE Test Procedures - Continued

TEST 89

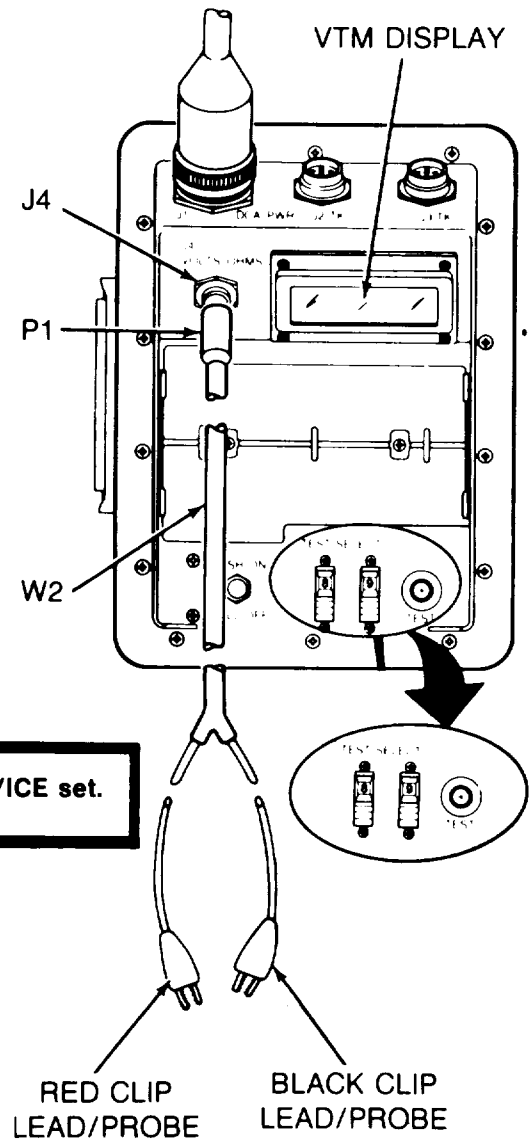
DC VOLTAGE TEST NO. 89

1 Perform VTM GENERAL SET UP AND CONFIDENCE TEST NO. 66 (page 2-42).

2 Connect test probe cable to VTM, do OFFSET test.

- Connect P1 of test probe cable W2 to J4 of VTM.
- Connect red and black clip leads/probes of cable W2 together.
- Dial TEST SELECT switches to 89.
- Press TEST button and hold until VTM display indicates **CAL**.
- Release TEST button.
- Check that offset measurement on VTM display indicates between **-6.8** to **+6.8**.

Does VTM display indicate between **-6.8** to **+6.8** ?



YES NO 3 Replace STE/ICE set.

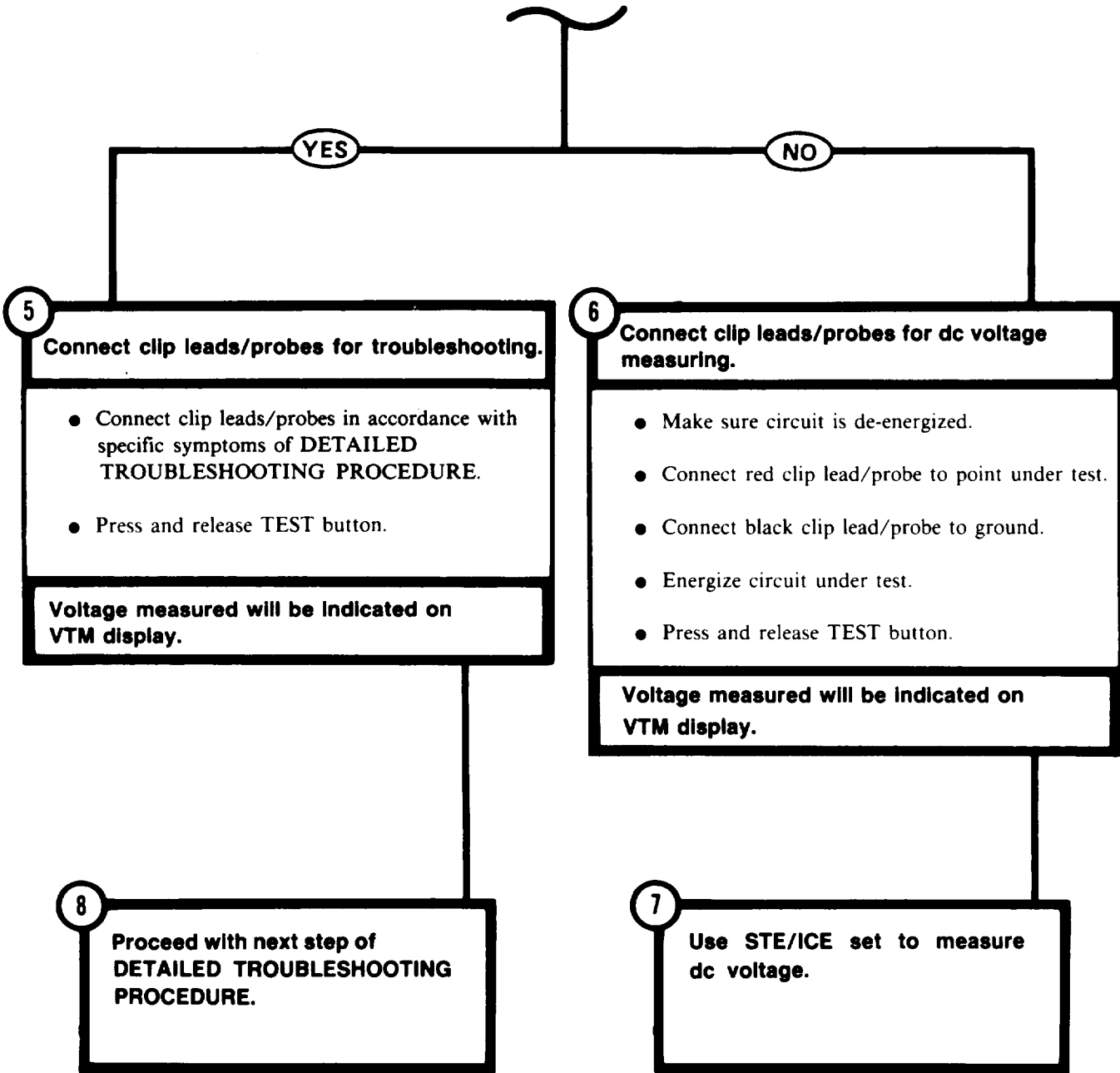
4 Determine use of STE/ICE set.

Check if STE/ICE set is to be used with DETAILED TROUBLESHOOTING PROCEDURES.

Is STE/ICE set to be used with DETAILED TROUBLESHOOTING PROCEDURES?

TA170168

STE/ICE Test Procedures - Continued



TA170169

STE/ICE Test Procedures

PRESSURE 0-4000 PSIG TEST 51.

NOTE
 This procedure is to be performed by two persons. The lead person is referred to as the first technician and shall direct the activity of the second person called the second technician.

1
 Perform VTM GENERAL SET UP, CONFIDENCE and IDENTIFICATION TEST NO. 66/60 (page 2-42).

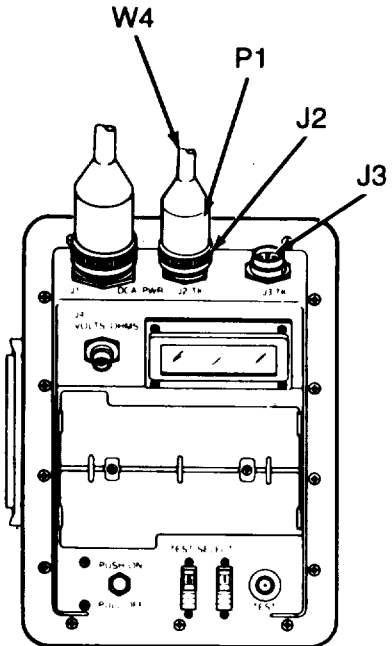
2
 Connect test cables and pressure transducer. Do OFFSET test.

First Technician (Operator's Station)

- If engaged, disengage hydraulic clutch.
- Cycle bridge launching control levers.
- Connect P1 of transducer cable W4 to J2 or J3 on VTM.
- Connect P2 of transducer cable W4 adapter MS3119E14-19.
- Connect P1 of second transducer cable W4 to adapter MS3119E14-19.

Second Technician (Relief Valve Being Tested)

- Place suitable container under relief valve to be tested (see next page for locator views).
- Remove gage plug from relief valve.
- Install 0-10,000 PSIG transducer (12258956) in gage port.



TA170170

STEP 2 CONTINUED

STE/ICE Test Procedures - Continued

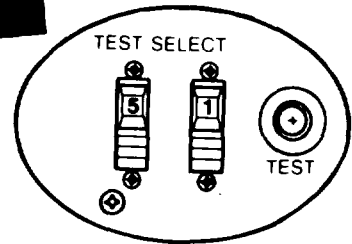
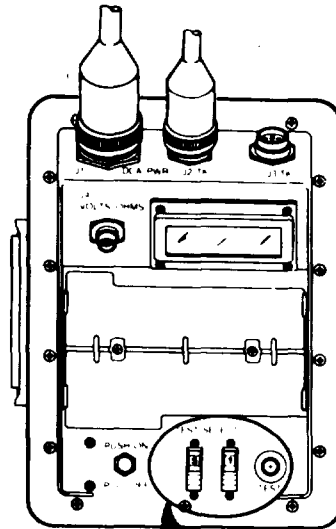
● Connect P2 of second transducer cable W4 to connector on transducer.

NOTE
When performing the **OFFSET** test, make sure system to be tested, is not pressurized.

First Technician (Operator's Station)

- Dial TEST SELECT switches to 51.
- Press and hold TEST button until VTM display indicates **CAL**.
- Release TEST button.
- Check that OFFSET measurement on VTM display indicates between **-1500** to **+1500**.

Does VTM display indicate between **-1500** to **+1500** ?



3 Perform **OFFSET FAULT ISOLATION** (TM 9-4910-571-12 & P)

4 Perform **pressure test**.

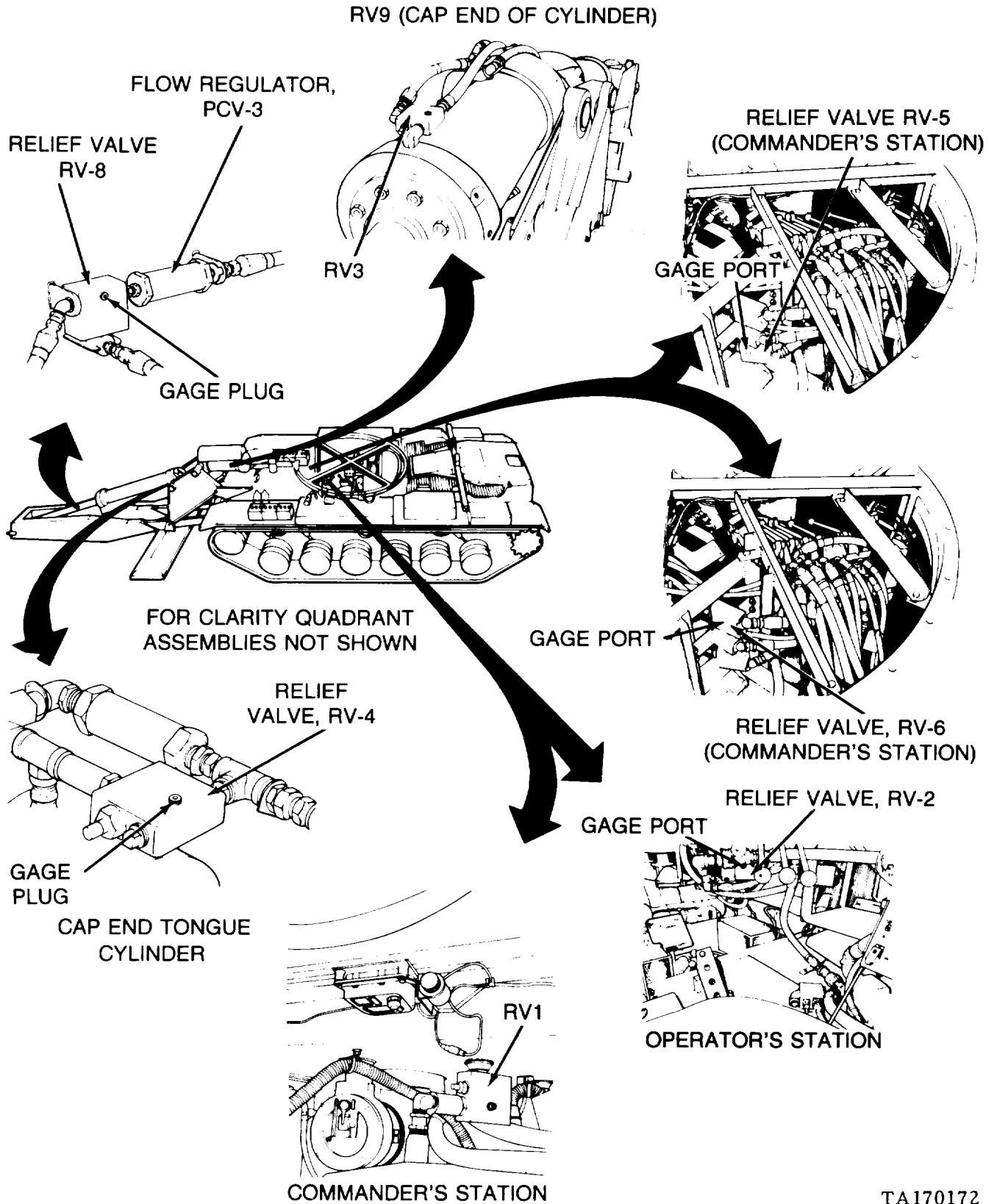
First Technician (Operator's Station)

- The next step to be performed depends on which relief valve is being tested.
- **FOR RELIEF VALVE - GO TO STEP**
 - RV1 (5)
 - RV2 (20)
 - RV3 (8)
 - RV4 (11)
 - RV5 (14)
 - RV6 (17)
 - RV8 (23)
 - RV9 (26)

TA170171

STE/ICE Test Procedures - Continued

LOCATOR VIEWS:



TA170172

FROM STEP

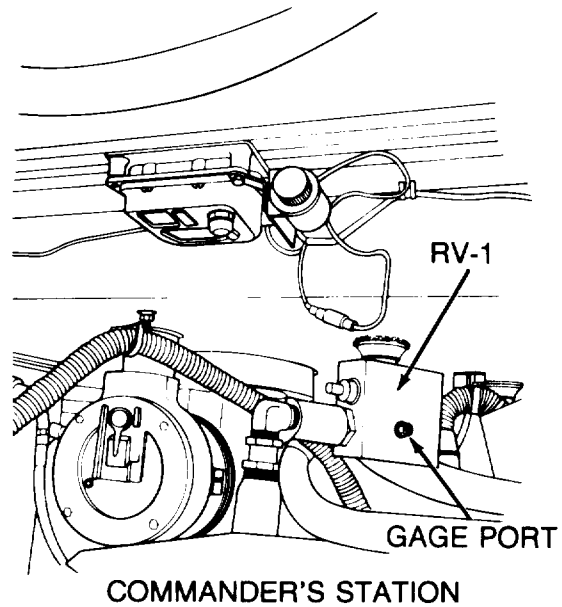
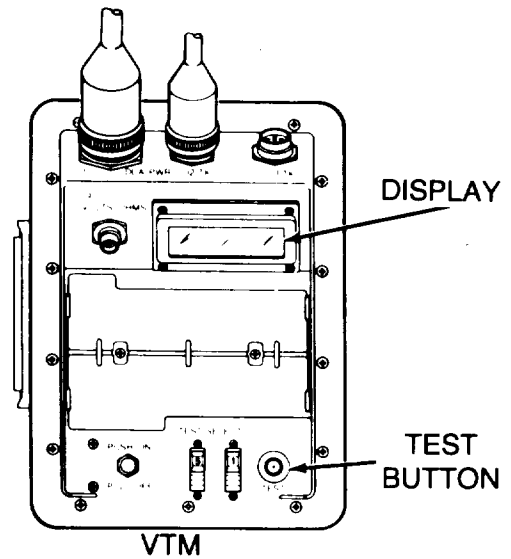
4

5 Check master relief valve RV-1 for pressure setting of 3800 ± 50 psi.

First Technician (Operator's Station)

- Start engine.
- Engage hydraulic clutch.
- Set engine speed at 1800 rpm.
- Depress scissor cylinder control lever.
- Press and hold TEST BUTTON until readout displays "CAL", then release button.
- Release scissor cylinder control lever.
- Check if pressure indication on VTM display is between **3750** to **3850** .

Does VTM display indicate between **3750** to **3850** ?



6

- Check relief valve RV9 for pressure setting of 3600 ± 50 psi.
- See Step **26** .

YES

NO

7

- Adjust master relief valve RV-1 (page 3-70). Steps **8** through **15** .
- If relief valve setting cannot be brought to within tolerance, replace cartridge in relief valve (page 3-67).

TA170173

STE/ICE Test Procedures - Continued

FROM STEP

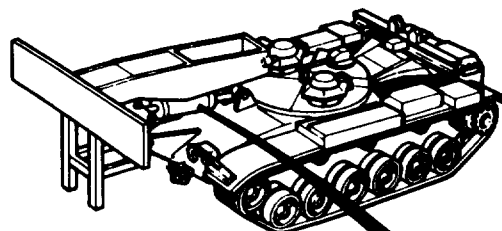
4

Check relief valve RV3 for pressure setting of 3800 ± 50 psi.

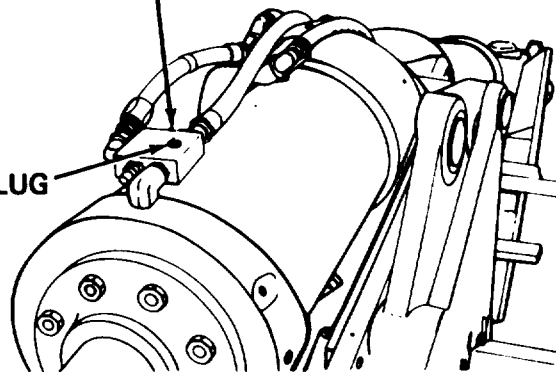
First Technician (Operator's Station)

- Engage hydraulic clutch.
- Set engine speed at 1800 rpm.
- Depress overhead cylinder control lever.
- Press and hold TEST BUTTON until readout displays "CAL", then release button.
- Release overhead cylinder control lever.
- Check if pressure indication on VTM display is between 3550 to 3650 psi.

Does VTM display indicate between 3550 to 3650 psi?

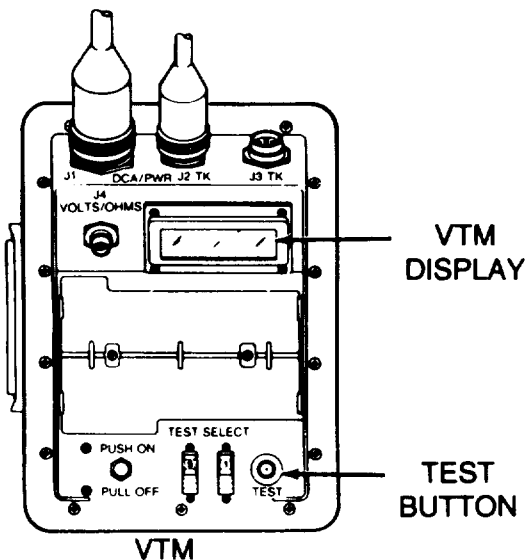


RELIEF VALVE RV3



GAGE PLUG

OVERHEAD CYLINDER



VTM DISPLAY

TEST BUTTON

VTM

- System is operational.
- Perform launch and retrieve procedures (TM 5-5420-226-10).

YES

NO

10

- Adjust relief value RV3 (page 3-75). Steps 8 through 15.
- If relief valve setting cannot be brought to within tolerance, replace cartridge in relief valve (page 3-74).

STE/ICE Test Procedures - Continued

FROM STEP

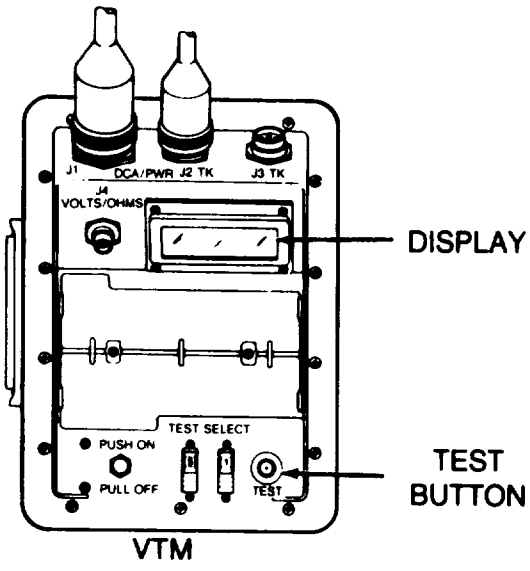
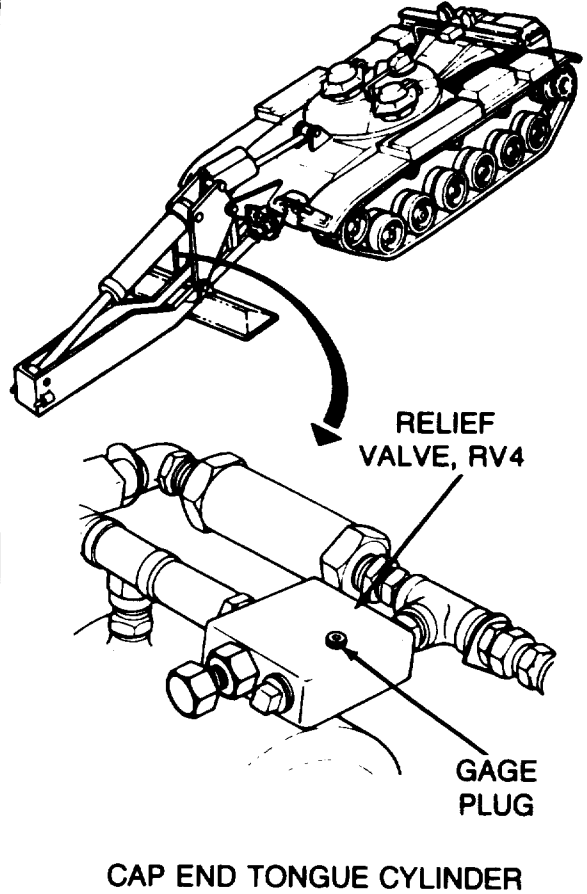
4

11 Check relief valve RV4 for pressure setting of 3600 ± 50 psi.

First Technician (Operator's Station)

- Engage hydraulic clutch.
- Set engine speed at 1800 rpm.
- Press and hold TEST BUTTON until readout displays "CAL", then release button.
- Release tongue cylinder control lever.
- Check if pressure indication on VTM display is between **3550** to **3650** psi.

Does VTM display indicate between **3550** to **3650** psi?



12

- Remove transducer and install plug in gage port.
- Replace check valve CV4 (page 3 - 93).

YES

NO

13

- Adjust relief valve RV4 (page 3 - 78). Steps **8** through **15**.
- If relief valve setting cannot be brought to within tolerance, replace cartridge in relief valve (page 3 - 77).

STE/ICE Test Procedures - Continued

FROM STEP

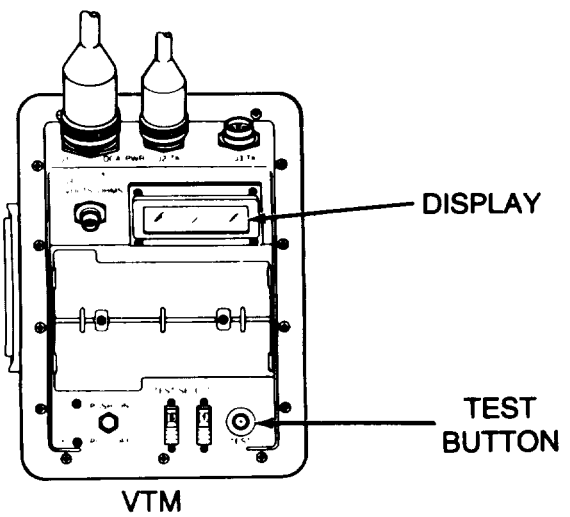
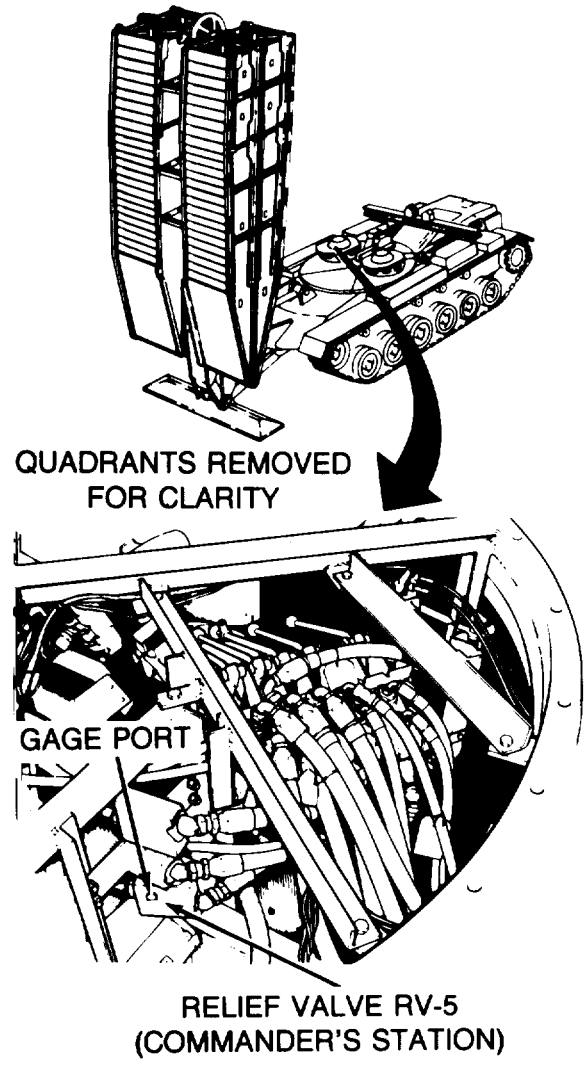
4

14 Check relief valve RV5 for pressure setting of 700 ± 50 psi.

First Technician (Operator's Station)

- Engage hydraulic clutch.
- Set engine speed at 1800 rpm.
- Raise tongue cylinder control lever.
- Press and hold TEST BUTTON until readout displays "CAL", then release button.
- Release tongue cylinder lever.
- Check if pressure indication on VTM display is between **650** to **750**.

Does VTM display indicate between **650** to **750** ?



15 Return to DETAILED TROUBLESHOOTING PROCEDURES, Symptom-2 Step **3**.

YES

16

- Adjust relief valve RV5 (page 3-80), Steps **8** through **15**.
- If relief valve setting cannot be brought to within tolerance, replace cartridge in relief valve (page 3-79).

NO

TA170176

FROM STEP

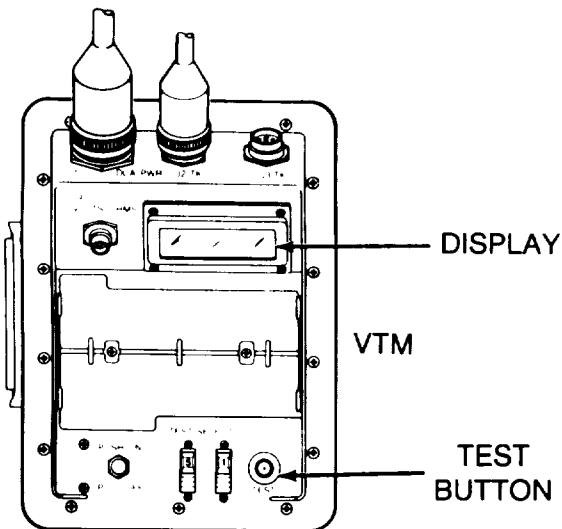
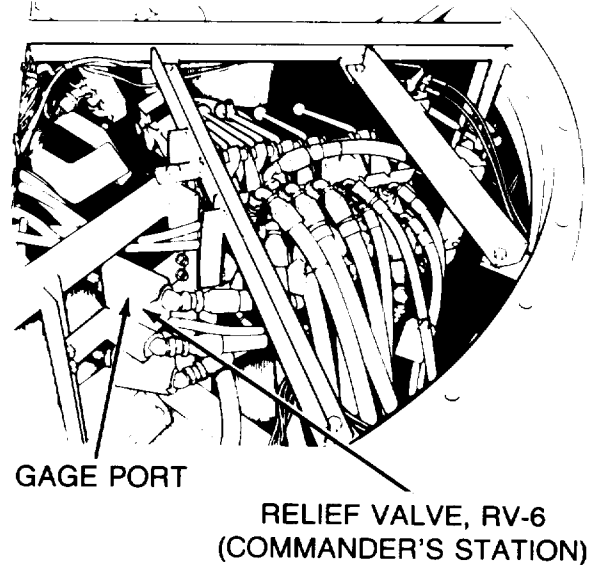
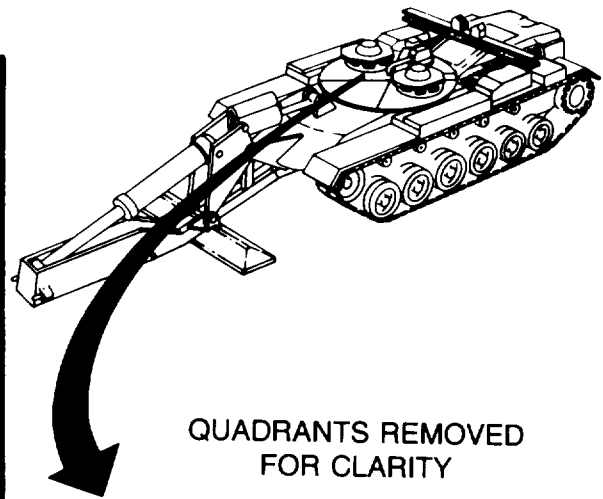
4

17 Check relief valve RV6 for pressure setting of 500 ± 50 psi.

First Technician (Operator's Station)

- Engage hydraulic clutch.
- Set engine speed at 1800 rpm.
- Depress locking cylinder control lever.
- Press and hold test button until readout displays "CAL", then release button.
- Release locking cylinder control lever.
- Check if pressure indication on VTM display is between **450** to **550** .

Does VTM display indicate between **450 to **550** ?**



18 Check relief valve RV2 for pressure setting of 3200 ± 50 psi.

See Step **20** .

YES NO

19

- Adjust relief valve RV6 (page 3-81), Steps 8 through 15.
- If relief valve setting cannot be brought to within tolerance, replace cartridge in relief valve (page 3-79).

TA170177

STE/ICE Test Procedures - Continued

FROM STEP

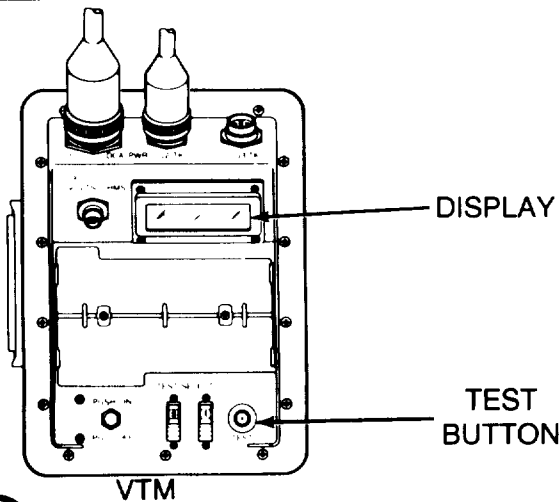
4 OR 19

20 Check relief valve, RV-2 for pressure setting of 3200 ± 50 psi.

First Technician (Operator's Station)

- Engage hydraulic clutch.
- Set engine speed at 1800 rpm.
- Raise and hold ejection cylinder and locking cylinder control levers.
- Press and hold TEST BUTTON until READOUT display "CAL", then release button.
- Release ejection cylinder and locking cylinder control levers.
- Check if pressure indication on VTM display is between 3150 to 3250 .

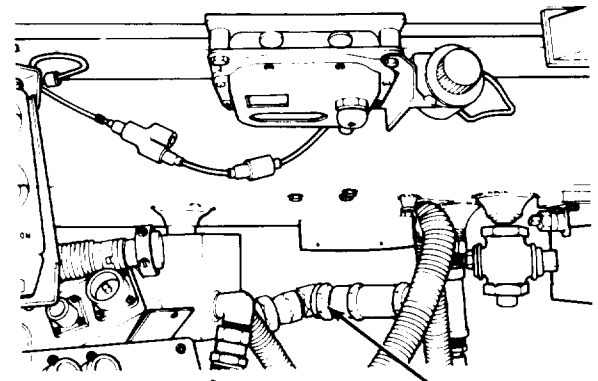
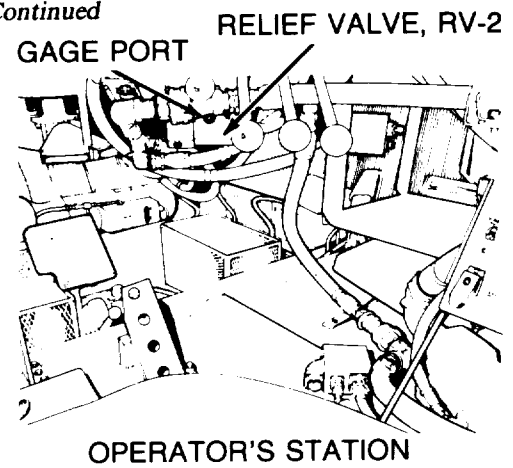
Does VTM display indicate between 3150 to 3250 ?



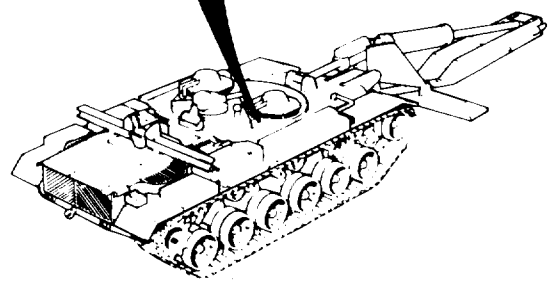
21 Replace check valve, CV-8 (page 3-112).

YES

NO



CHECK VALVE CV8



22

- Adjust relief valve RV2 (page 3-73), Steps 8 through 15 .
- If relief valve setting cannot be brought to within tolerance, replace valve bank assembly (page 4-53).

TA170178

FROM STEP

STE/ICE Test Procedures - Continued

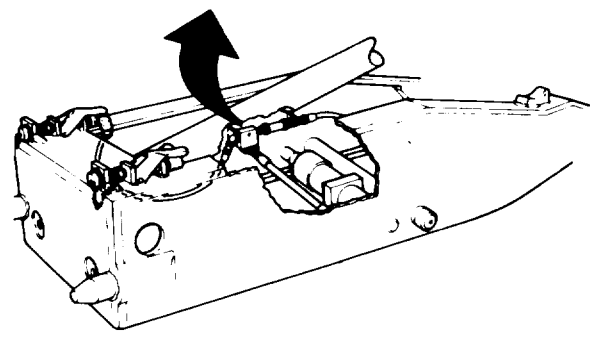
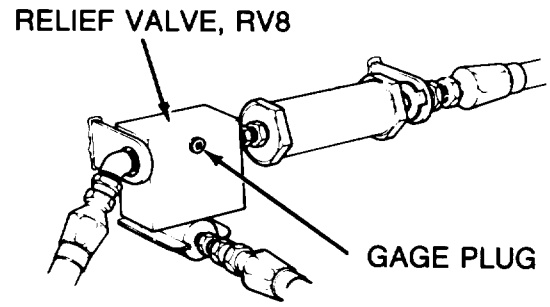
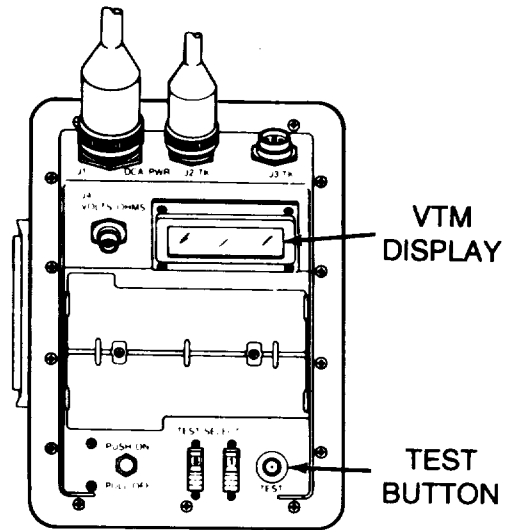
4

23 Check relief valve, RV8 for pressure setting of 3400 ± 50 psi.

First Technician (Operator's Station)

- Engage hydraulic clutch.
- Set engine speed at 1800 rpm.
- If performing DETAILED TROUBLESHOOTING PROCEDURE Symptom-3, raise scissor cylinder control lever.
- If performing DETAILED TROUBLESHOOTING PROCEDURE Symptom-6, depress scissor cylinder control lever.
- Press and hold test button until readout displays "CAL", then release button.
- Release scissor cylinder control lever.
- Check if pressure indication on VTM display is between 3350 to 3450 .

Does VTM display indicate between 3350 to 3450 ?



24

- If performing DETAILED TROUBLESHOOTING PROCEDURE Symptom-3, replace flow regulator PCV3 (page 3-100).
- If performing DETAILED TROUBLESHOOTING PROCEDURE Symptom-6, replace check valve CV7 (page 3-110).

YES NO

25

- Adjust relief valve RV8 (page 3-83), Steps 8 through 15.
- If relief valve setting cannot be brought to within tolerance, replace cartridge in relief valve (page 3-82).

TA170179

STE/ICE Test Procedures - Continued

FROM STEP

4 OR 6

26

Check relief valve RV9 for pressure setting of 3800 ± 50 psi.

First Technician (Operator's Station)

- Disengage hydraulic clutch.
- Cycle bridge launching control levers.
- Stop engine.
- Remove transducer from inlet section of valve bank and install gage plug.

Both Technicians (Outside Vehicle)

- Have bridge removed from launcher (TM 5-5420-203-14).
- Remove overhead cylinder armor (page 3 - 217).

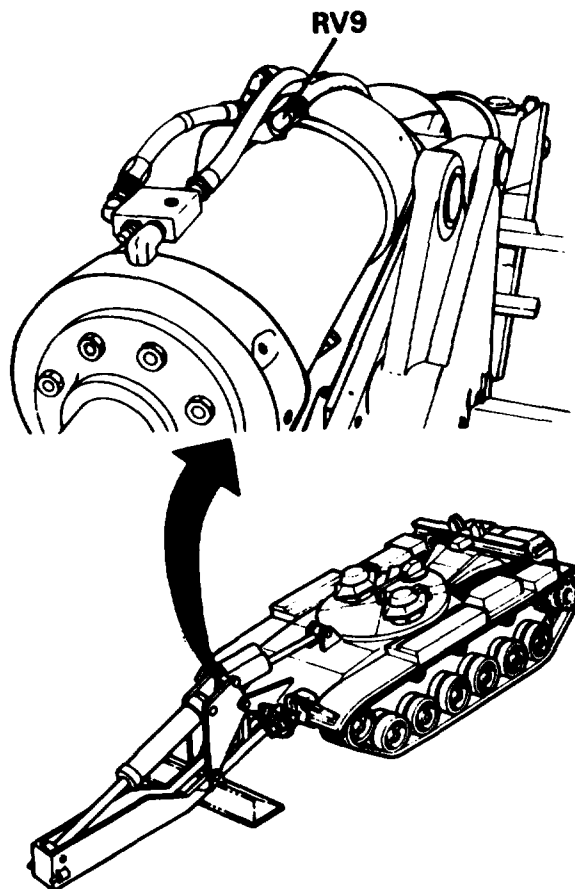
Second Technician (Overhead Cylinder)

- Place suitable fluid container under relief valve RV9.
- Remove gage plug from RV9 and install transducer.

First Technician (Operator's Station)

- Start engine.
- Engage hydraulic clutch.
- Set engine speed at 1800 rpm.
- Raise overhead cylinder control lever.

RV9 (CAP END OF CYLINDER)



STEP 26 CONTINUED

STE/ICE Test Procedures - Continued

First Technician (Operator's Station)

- Press and hold TEST BUTTON until readout displays "CAL", then release button.
- Release overhead cylinder control lever.
- Check if pressure indication on VTM display is between 3550 to 3650 psi.

Does VTM display indicate between 3550 to 3650 psi?

27
Return to DETAILED TROUBLESHOOTING PROCEDURES, Symptom-1, Step 13

YES

NO

28
● Adjust relief valve RV9 (page 3 - 76), Steps 8 through 15.
● If relief valve setting cannot be brought to within tolerance, replace cartridges in relief valve RV9 (page 3 - 74).

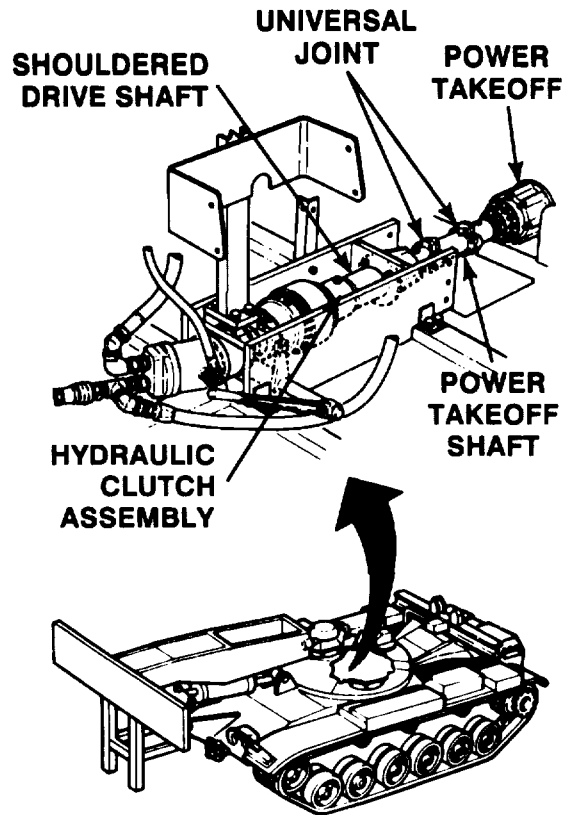
**DETAILED TROUBLESHOOTING PROCEDURE
LAUNCHER OPERATION - HYDRAULICS**

Symptom-1

BRIDGE DOES NOT LIFT OFF BRIDGE SEAT.

NOTE

This procedure is to be performed by two persons. The lead person is referred to as the first technician and shall direct the activity of the second person called the second technician.



1 Check shouldered drive shaft for rotation at hydraulic clutch assembly.

Second Technician (Operator's Station)

- Disengage hydraulic clutch.
- Remove pump clutch cover plate (page 3 – 59).
- Start engine.
- Visually check shouldered drive shaft for rotation at hydraulic clutch assembly.

Is shouldered drive shaft rotating at hydraulic clutch assembly?

YES

NO

2 Check universal joints or power takeoff shaft for damage.
Are universal joints or power takeoff shaft damaged?

YES

NO

Replace defective universal joint(s) or power takeoff shaft (page 3 – 56).

Notify support maintenance of defective power takeoff assembly.

Symptom-1

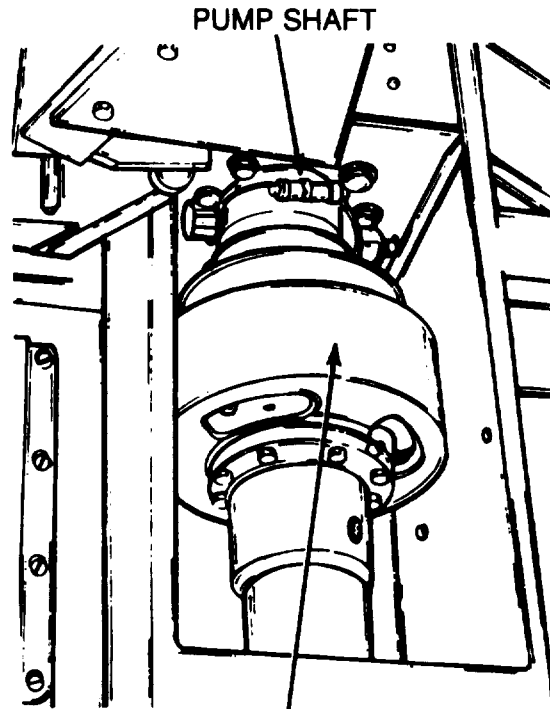
**DETAILED TROUBLESHOOTING PROCEDURE
LAUNCHER OPERATION - HYDRAULICS
(Continued)**

3 Check clutch assembly for slippage.

Second Technician (Inside Vehicle)

- Start engine.
- Engage and disengage hydraulic clutch lever several times. Clutch lever should have a distinct snap while being engaged.
- Engage hydraulic clutch.
- Set engine speed at 1800 rpm.
- Listen for hydraulic pump to start.
- Observe pump shaft turning.

Does hydraulic clutch slip?



HYDRAULIC CLUTCH ASSEMBLY

4 Adjust clutch assembly (page 3 - 60).

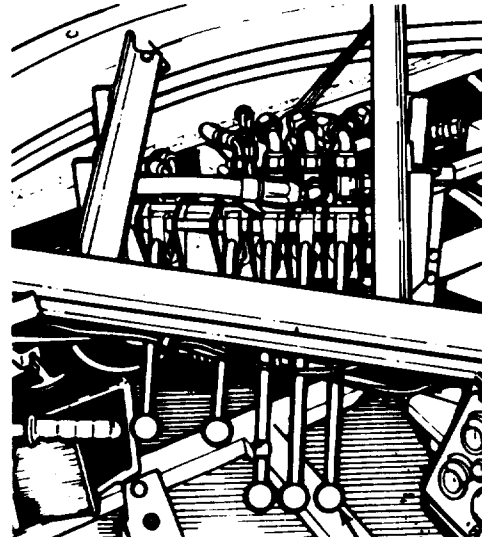
YES

NO

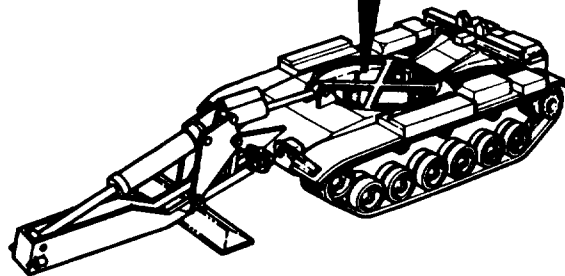
Symptom-1

**DETAILED TROUBLESHOOTING PROCEDURE
LAUNCHER OPERATION - HYDRAULICS
(Continued)**

QUADRANTS REMOVED
FOR CLARITY



LAUNCHER
CONTROL
LEVERS



5 Check hydraulic cylinder control levers on valve bank for broken or missing parts.

Second Technician (Operator's Station)

- Disengage hydraulic clutch.
- Stop engine.
- Cycle bridge launching control levers.
- Inspect control levers of valve bank for broken or missing parts.

Are any parts broken, missing, or leaking?

6 Replace defective or missing parts of control levers on valve bank (page 3 - 117).

NO YES

Symptom-1

**DETAILED TROUBLESHOOTING PROCEDURE
LAUNCHER OPERATION - HYDRAULICS
(Continued)**

7 Check master relief valve RV1 for pressure setting of 3800 ± 50 psi.

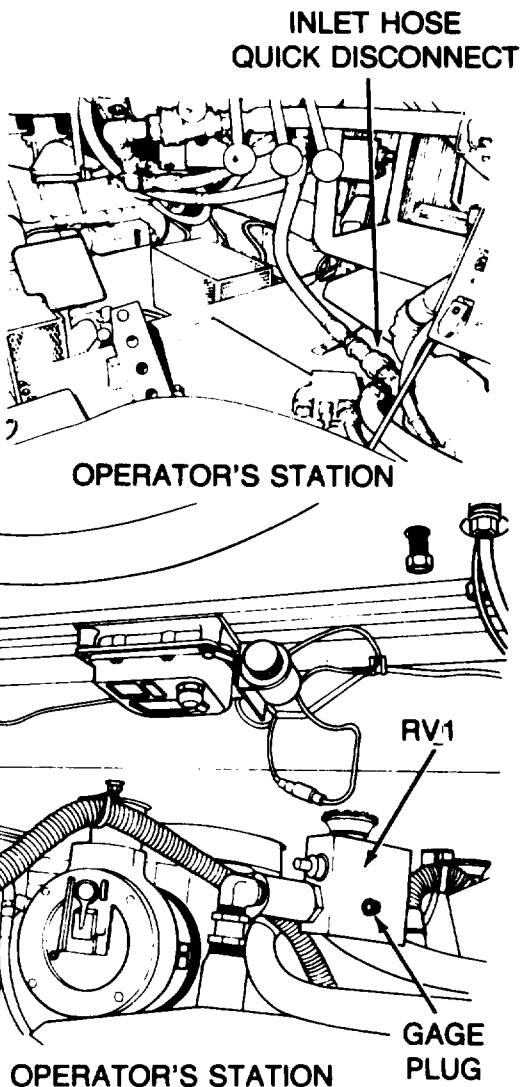
Second Technician (Operator's Station)

- Disconnect valve bank inlet hose at quick disconnect.
- Place suitable container under master relief valve RV1.
- If STE/ICE is available, proceed to Test No. 51 (page 2-47) to test master relief valve RV1.
- If STE/ICE is not available, remove gage plug from master relief valve RV1 and connect pressure gage.
- Start engine.
- Engage hydraulic clutch.
- Set engine speed at 1800 rpm.
- Check if pressure gage or STE/ICE indicates 3800 ± 50 psi.

Is pressure 3800 ± 50 psi?

YES

NO



8

- Adjust master relief valve RV1 (page 3-70), steps 8 through 14.
- If relief valve setting cannot be brought to within tolerance, replace cartridge in relief valve (page 3-67).
- If relief valve setting still cannot be brought within tolerance, notify support maintenance of faulty hydraulic pump.

Symptom-1

DETAILED TROUBLESHOOTING PROCEDURE LAUNCHER OPERATION - HYDRAULICS (Continued)

9

Check relief valve RV9 for pressure setting of 3600 \pm 50 psi.

Second Technician (Operator's Station)

- Disengage hydraulic clutch.
- Connect valve bank inlet hose.
- Stop engine.
- Remove pressure gage or STE/ICE from inlet section of valve bank and install gage plug.

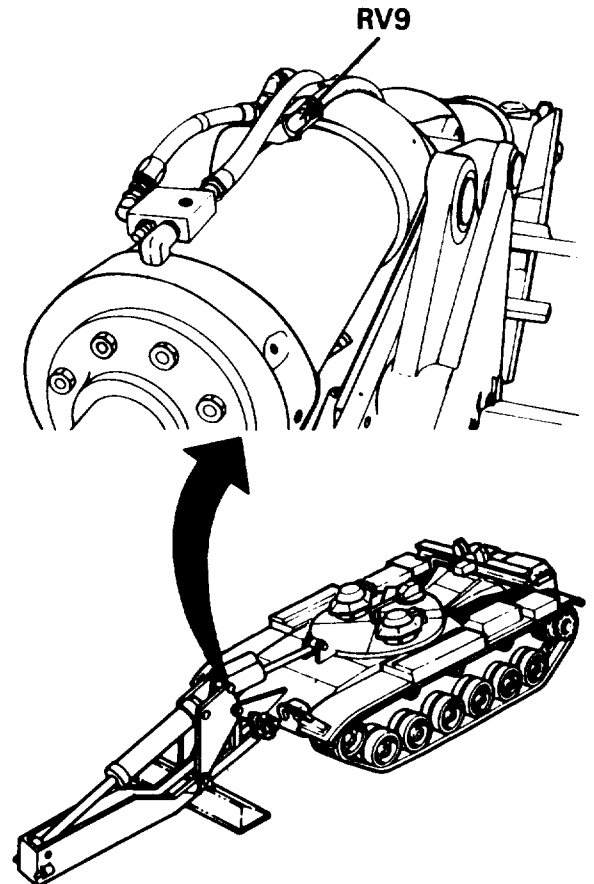
Both Technicians (Outside Vehicle)

- Have bridge removed from launcher.
(TM 5 - 5420 - 203 - 14)

Second Technician (Operator's Station)

- Start engine.
- Engage hydraulic clutch.
- Set engine speed at 1800 rpm.
- Raise tongue cylinder control lever until tongue cylinder is fully extended
- Disengage hydraulic clutch.
- Stop engine.
- Depress overhead cylinder control lever and allow tongue to lower slowly to ground.

RV9 (CAP END OF CYLINDER)



Symptom-1

**DETAILED TROUBLESHOOTING PROCEDURE
LAUNCHER OPERATION - HYDRAULICS
(Continued)**

STEP **9** CONTINUED

Both Technicians (Overhead Cylinder)

- Remove overhead cylinder armor (page 3 - 217).

First Technician (Overhead Cylinder)

- Place suitable fluid container under relief valve RV9.
- If STE/ICE is available, proceed to Test No. 51 (page 2-47) to test relief valve RV-9.
- If STE/ICE is not available, remove gage plug from RV-9 and install pressure gage.

Second Technician (Operator's Station)

- Start engine.
- Engage hydraulic clutch.
- Set engine speed at 1800 rpm.
- Raise overhead cylinder control lever for five minutes.

First Technician (Overhead Cylinder)

- Check if pressure gage indicates 3600 ± 50 psi.

Is pressure 3600 ± 50 psi?

NO

YES

Go to step **13**.

Symptom-1

**DETAILED TROUBLESHOOTING PROCEDURE
LAUNCHER OPERATION - HYDRAULICS
(Continued)**

10 Check overhead cylinder for leaks and damage and check outer surface for excessive heat.

Is overhead cylinder damaged, leaking, or overheating?

YES

NO

11 Replace overhead cylinder (page 3-219).

12

- Adjust relief valve RV9 (page 3-76), steps 8 through 15.
- If relief valve setting cannot be brought to within tolerance, replace cartridge in relief valve RV9 (page 3-74).
- If relief valve setting still cannot be brought within tolerance notify support maintenance of faulty valve body.

Symptom-1
FROM STEP

9

**DETAILED TROUBLESHOOTING PROCEDURE
LAUNCHER OPERATION - HYDRAULICS
(Continued)**

13 Check that hold down cylinder does release.

Second Technician (Operator's Station)

- Disengage hydraulic clutch.
- Cycle bridge launching control levers.

First Technician (Overhead Cylinder)

- Remove pressure gage or STE/ICE from relief valve RV9 and install gage plug.

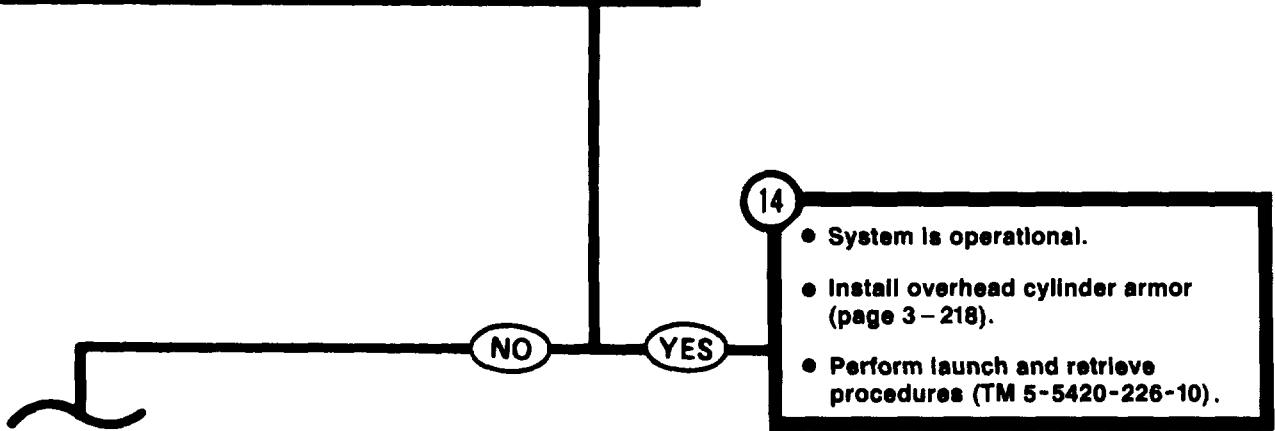
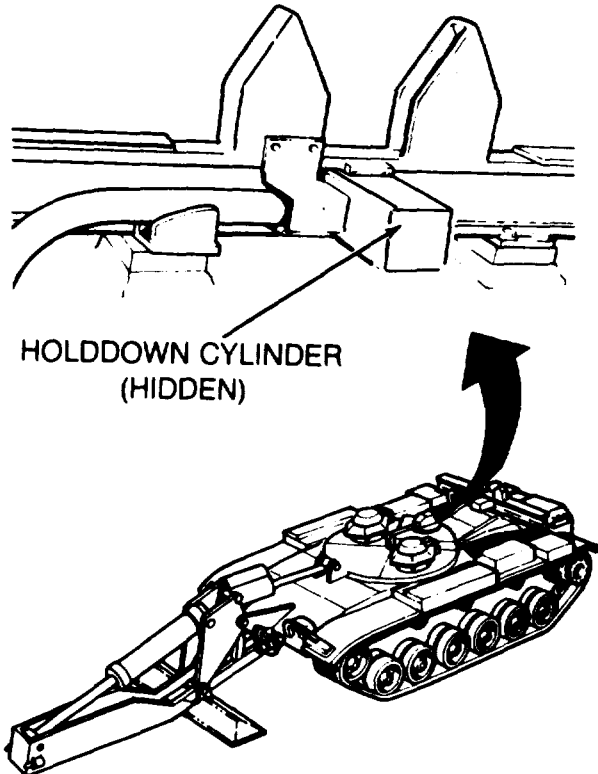
Second Technician (Operator's Station)

- Engage hydraulic clutch.
- Set engine speed at 1800 rpm.
- Raise overhead cylinder control lever momentarily.

First Technician (Top Deck)

- Visually check that holddown cylinder does release.

Does holddown cylinder release?



14

- System is operational.
- Install overhead cylinder armor (page 3 - 218).
- Perform launch and retrieve procedures (TM 5-5420-226-10).

Symptom-1

**DETAILED TROUBLESHOOTING PROCEDURE
LAUNCHER OPERATION - HYDRAULICS
(Continued)**

15 Check holddown cylinder hydraulic lines and fittings for leaks or damage.

Second Technician (Operator's Station)

- Disengage hydraulic clutch.

First Technician (Top Deck)

- Remove holddown cylinder armor (page 3-247).

Second Technician (Operator's Station)

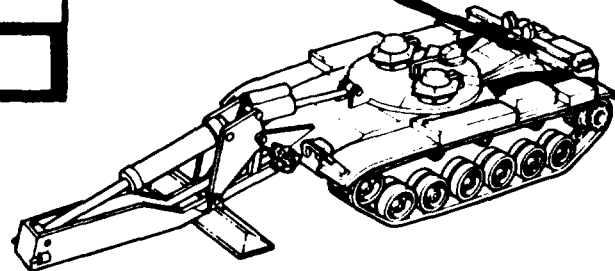
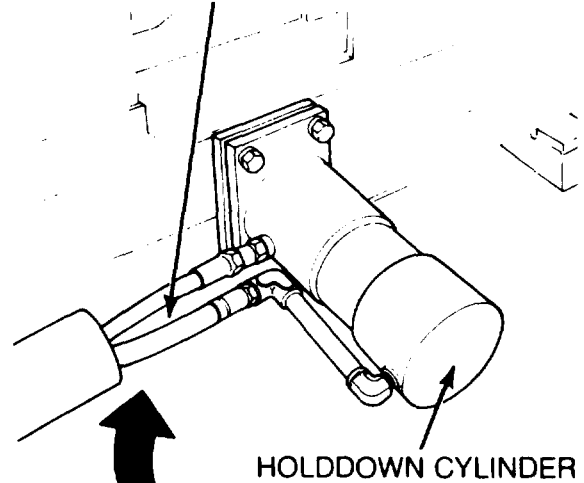
- Engage hydraulic clutch.
- Set engine speed at 1800 rpm.
- Momentarily raise overhead cylinder control lever.

First Technician (Top Deck)

- Visually check holddown cylinder hydraulic lines for leaks or damage.

Are hydraulic lines leaking or damaged?

HYDRAULIC HOSES



16

- Identify leaking hydraulic line by reference designator on line with diagram (page 3-61).
- Replace leaking line.

NO YES

Symptom-1

**DETAILED TROUBLESHOOTING PROCEDURE
LAUNCHER OPERATION - HYDRAULICS
(Continued)**

17 Inspect holddown cylinder for leaks, damage, and outer surface for excessive heat.

Second Technician (Operator' Station)

- Raise overhead cylinder control lever for 5 minutes.

First Technician (Top Deck)

- Visually check holddown cylinder for leaks or damage. Check outer surface for overheating.

Is holddown cylinder leaking, damaged or overheating?

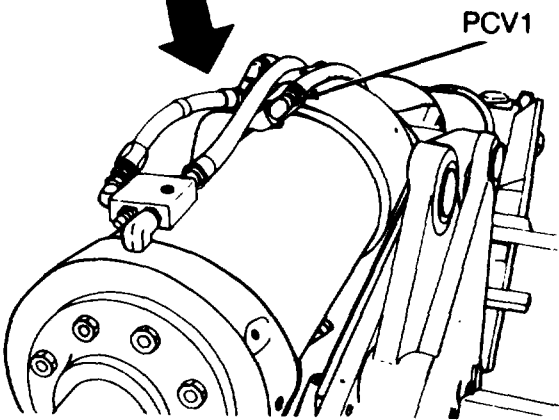
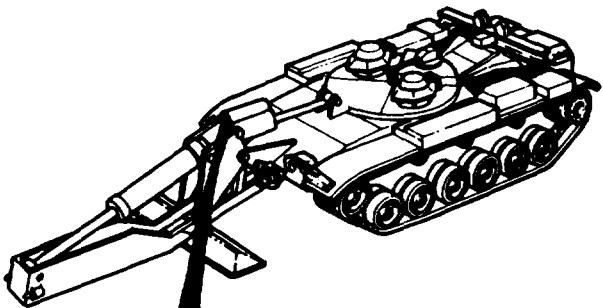
18 Replace holddown cylinder (page 3 - 248).

YES

19

- Replace flow regulator PCV-1 (page 3 - 104).
- Install holddown cylinder armor (page 3 - 247).

NO



FOR CLARITY OVERHEAD CYLINDER SHOWN IN LAUNCHED POSITION

All data on pages 2-69 thru 2-71 deleted.

**DETAILED TROUBLESHOOTING PROCEDURE
LAUNCHER OPERATION - HYDRAULICS**

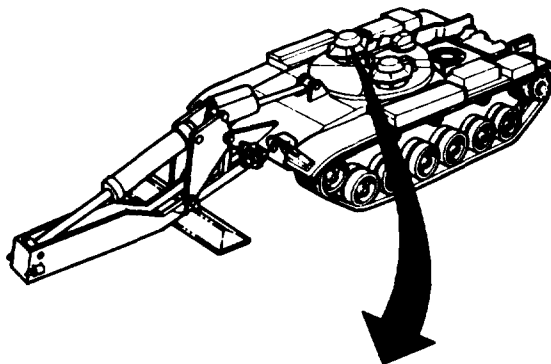
Symptom-2

(Continued)

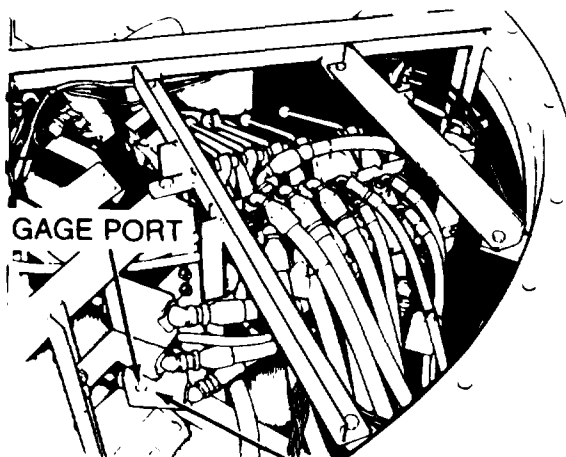
BRIDGE DOES NOT LOWER SMOOTHLY FROM VERTICAL POSITION

NOTE

This procedure is to be performed by two persons. The lead person is referred to as the first technician and shall direct the activity of the second person called the second technician.



QUADRANTS REMOVED FOR CLARITY



**RELIEF VALVE RV5
(COMMANDER'S STATION)**

1 Check relief valve RV5 for pressure setting of 700 ± 50 psi.

First Technician (Operator's Station)

- Disengage hydraulic clutch.
- Cycle bridge launching control levers.

Second Technician (Commander's Station)

- Place one gallon container under relief valve RV5.
- If STE/ICE is available, proceed to Test No. 51 (page 2-47) to test master relief valve RV5.
- If STE/ICE is not available, remove gage plug from relief valve RV5 and install pressure gage.

First Technician (Operator's Station)

- Engage hydraulic clutch.
- Set engine speed at 1800 rpm.
- Raise tongue cylinder control lever.

Second Technician (Commander's Station)

- Check if pressure gage or STE/ICE indicates 700 ± 50 psi.

Is pressure 700 ± 50 psi?

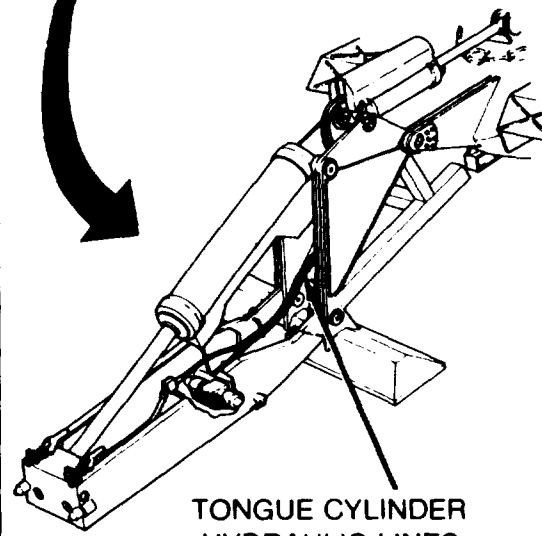
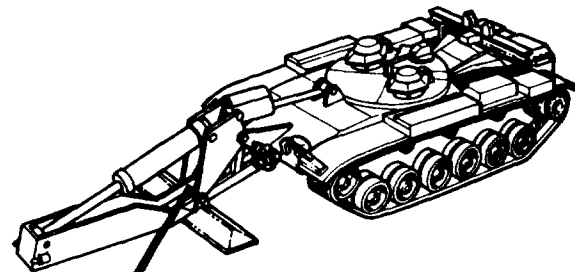
2

- Adjust relief valve RV5 (page 3 - 80), steps **8** through **14**.
- If relief valve setting cannot be brought to within tolerance, replace cartridge in relief valve (page 3 - 79).

YES **NO**

Symptom-2

**DETAILED TROUBLESHOOTING PROCEDURE
LAUNCHER OPERATION - HYDRAULICS
(Continued)**



TONGUE CYLINDER
HYDRAULIC LINES

3 Check tongue cylinder hydraulic lines and fittings for leaks or damage.

First Technician (Operator's Station)

- Disengage hydraulic clutch.
- Cycle bridge launching control levers.

Second Technician (Commander's Station)

- Remove pressure gage or STE/ICE from gage port and install gage plug.

First Technician (Operator's Station)

- Launch the bridge (TM 5 - 5420 - 226 - 10).
- Disengage hydraulic clutch.

Both Technicians (Launcher Tongue)

- Remove tongue cylinder armor (page 3 - 226).

First Technician (Operator's Station)

- Engage hydraulic clutch.
- Set engine speed at 1800 rpm.
- Raise tongue cylinder control lever.

Second Technician (Launcher Tongue)

- Visually check hydraulic lines and fittings for leaks, crimping or other damage.

Are hydraulic lines or fittings leaking or damaged?

4

- Identify leaking hydraulic line by reference on line with diagram (page 3 - 61).
- Replace leaking line.

NO YES

TA251369

Symptom-2

**DETAILED TROUBLESHOOTING PROCEDURE
LAUNCHER OPERATION - HYDRAULICS
(Continued)**

TONGUE CYLINDER

5 Check tongue cylinder for leaks, damage, or excessive heat.

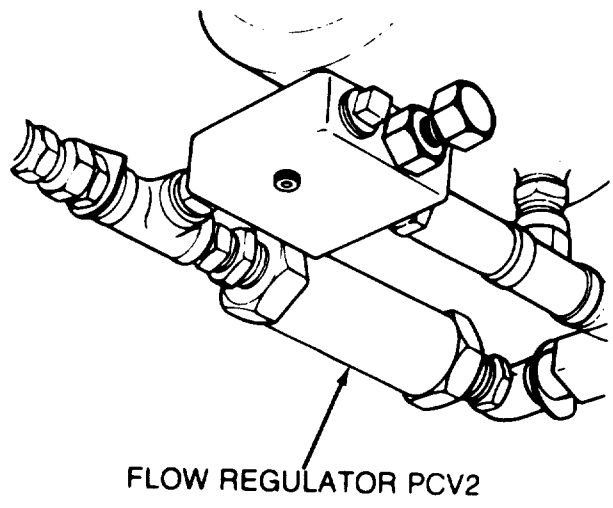
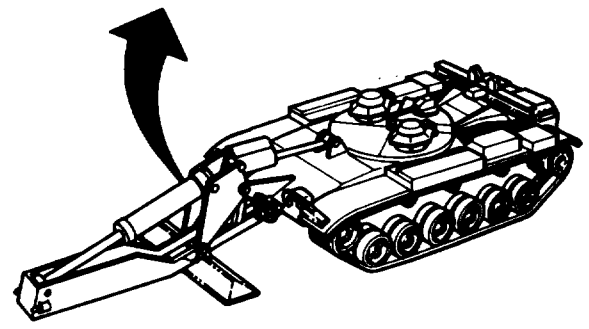
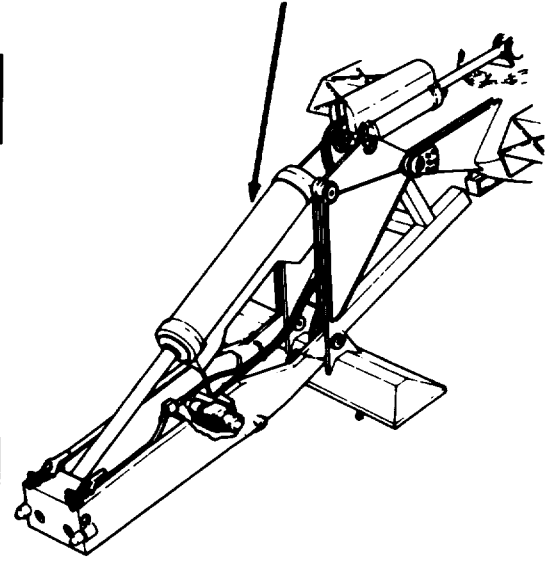
First Technician (Operator's Station)

- Raise tongue cylinder control lever.

Second Technician (Launcher Tongue)

- Visually check tongue cylinder for leaks, or damage. Check outer surface for overheating.

Is tongue cylinder leaking, damaged, or overheating?



FLOW REGULATOR PCV2

6 Replace tongue cylinder (page 3 - 228).

7 Replace flow regulator PCV2 (page 3 - 108).

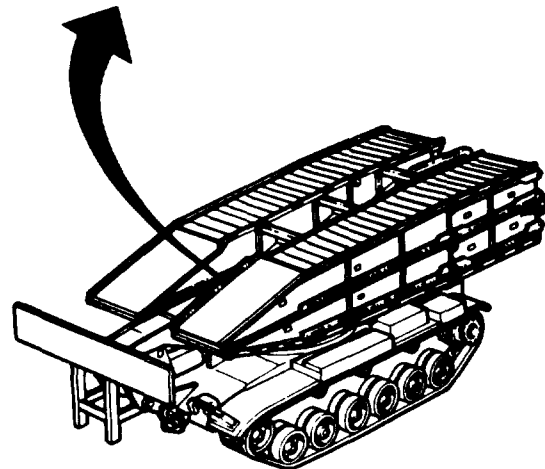
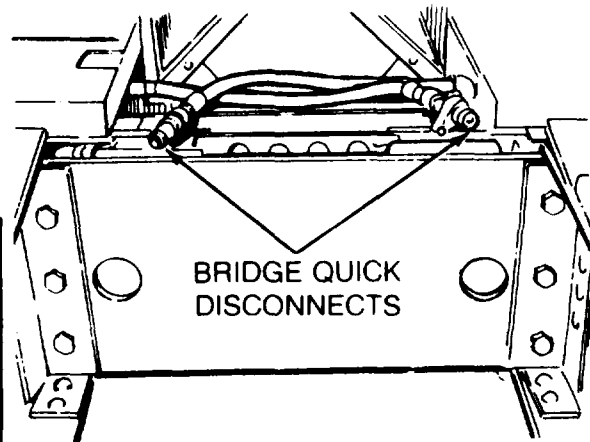
**DETAILED TROUBLESHOOTING PROCEDURE
LAUNCHER OPERATION - HYDRAULICS
(Continued)**

Symptom-3

BRIDGE DOES NOT SCISSOR OPEN OR DOES NOT OPEN SMOOTHLY

NOTE

This procedure is to be performed by two persons. The lead person is referred to as the first technician and shall direct the activity of the second person called the second technician.



1 Check bridge quick disconnects for proper operation.

First Technician (Operator's Station)

- Return bridge to bridge seat (TM 5 - 5420 - 226 - 10).
- Disengage hydraulic clutch.
- Cycle bridge launching control levers.

Second Technician (Bridge)

- Check quick disconnects between bridge and launcher are connected and secure.

Do quick disconnects operate properly?

2 Replace quick disconnects (TM5-5420-203-14).

NO

YES

Symptom-3

DETAILED TROUBLESHOOTING PROCEDURE LAUNCHER OPERATION - HYDRAULICS (Continued)

3 Check scissoring cylinder bleed valves for proper operation.

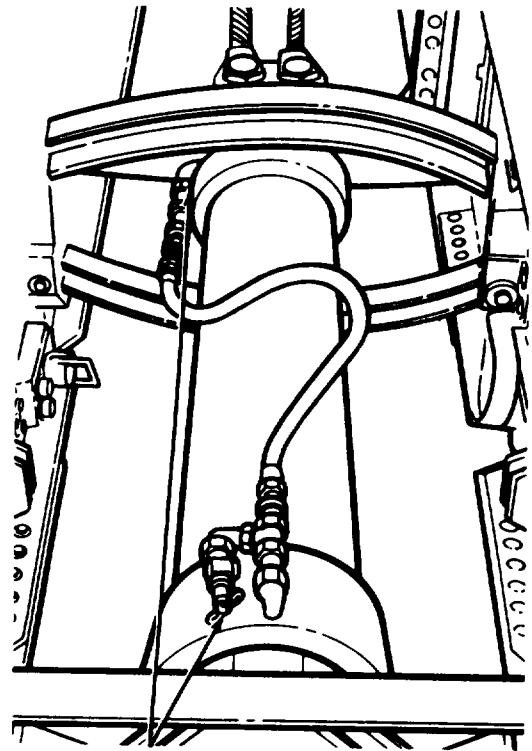
First Technician (Operator's Station)

- Cycle bridge launching control levers.

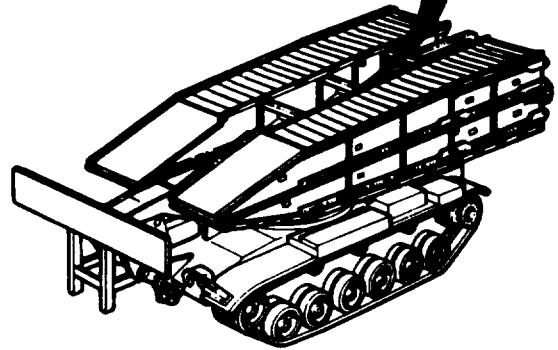
Second Technician (Bridge)

- Open and close both bleed valves (allow air to bleed out).
- Be sure both bleed valves are closed.

Do both bleed valves operate properly?



SCISSORING CYLINDER
BLEED VALVES



4 Replace defective bleed valves (TM5-5420-203-14).

YES

NO

**DETAILED TROUBLESHOOTING PROCEDURE
LAUNCHER OPERATION - HYDRAULICS
(Continued)**

Symptom-3

5 Check bridge piping, hydraulic lines and fittings for leaks or damage.

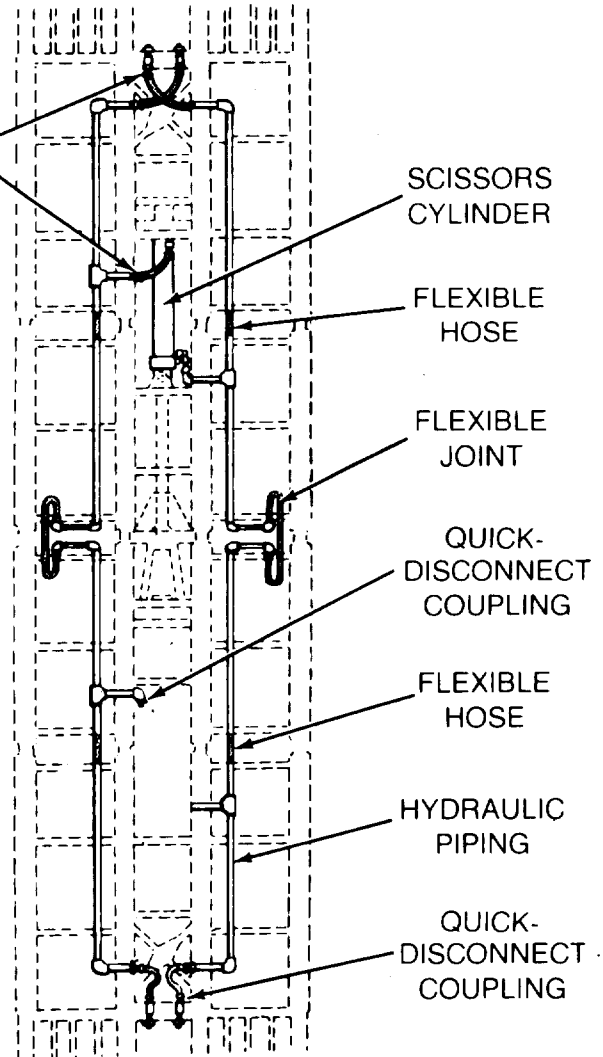
First Technician (Operator's Station)

- Engage hydraulic clutch.
- Set engine speed at 1800 rpm.
- Cycle scissor cylinder control lever into retrieve and launch positions.

Second Technician (Bridge)

- Visually check bridge piping, hydraulic lines and fittings for leaks, crimping or other damage.

Is bridge piping or hydraulic lines and fittings leaking or damaged?



BRIDGE HYDRAULIC SYSTEM

6 Replace defective hydraulic lines or fittings (TM5-5420-203-14).

NO YES

Symptom-3

**DETAILED TROUBLESHOOTING PROCEDURE
LAUNCHER OPERATION - HYDRAULICS
(Continued)**

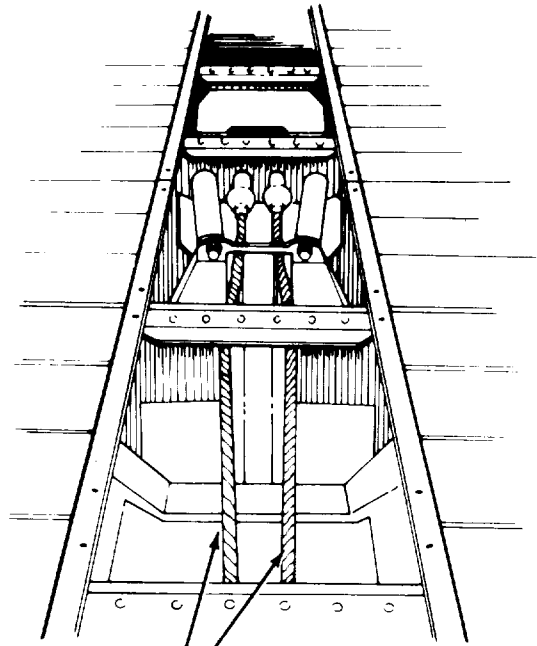
QUADRANT ASSEMBLY

7 Check quadrant and cable assemblies for proper operation.

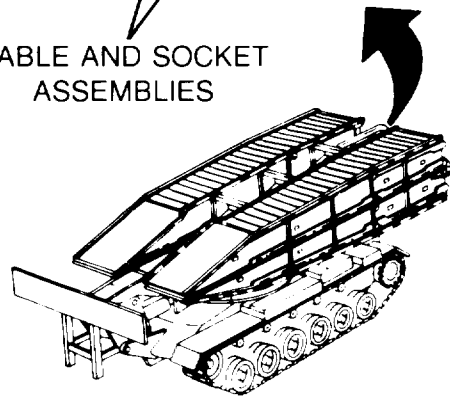
Second Technician (Bridge)

- Visually check quadrant for loose or broken struts, misalignment or other damage.
- Visually check scissoring cable assembly for broken, loose or frayed condition.

Is quadrant or scissoring cables damaged?



CABLE AND SOCKET ASSEMBLIES

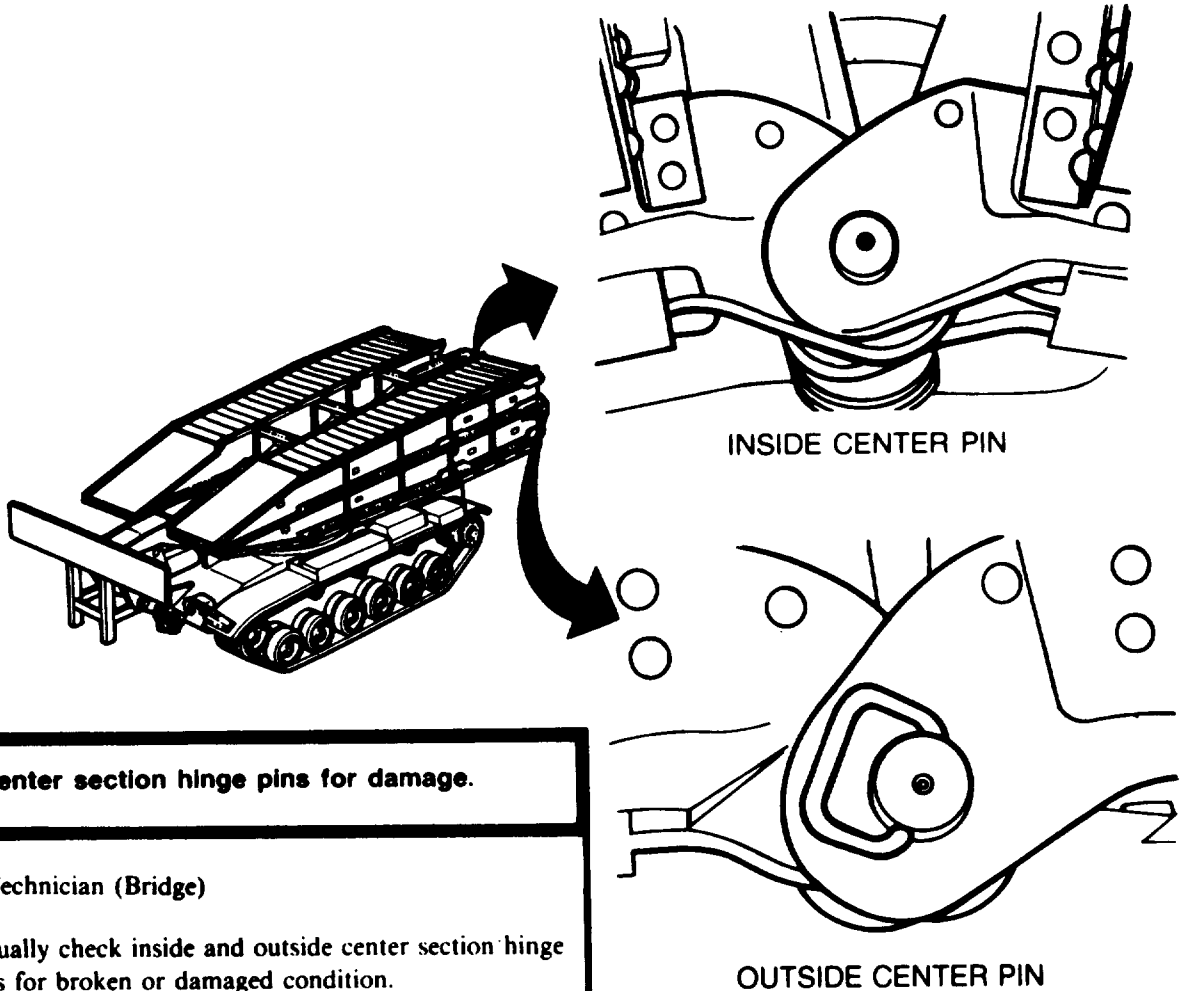


8 Replace scissoring cables and quadrant assembly (TM5-5420-203-14).

NO YES

Symptom-3

DETAILED TROUBLESHOOTING PROCEDURE LAUNCHER OPERATION - HYDRAULICS (Continued)



9

Check center section hinge pins for damage.

Second Technician (Bridge)

- Visually check inside and outside center section hinge pins for broken or damaged condition.

Are center section hinge pins broken or damaged?

10

Replace damaged center section hinge pins (TM5-5420-203-14).

NO YES

Symptom-3

**DETAILED TROUBLESHOOTING PROCEDURE
LAUNCHER OPERATION - HYDRAULICS
(Continued)**

11 Check scissoring cylinder for leaks, damage, or excessive heat.

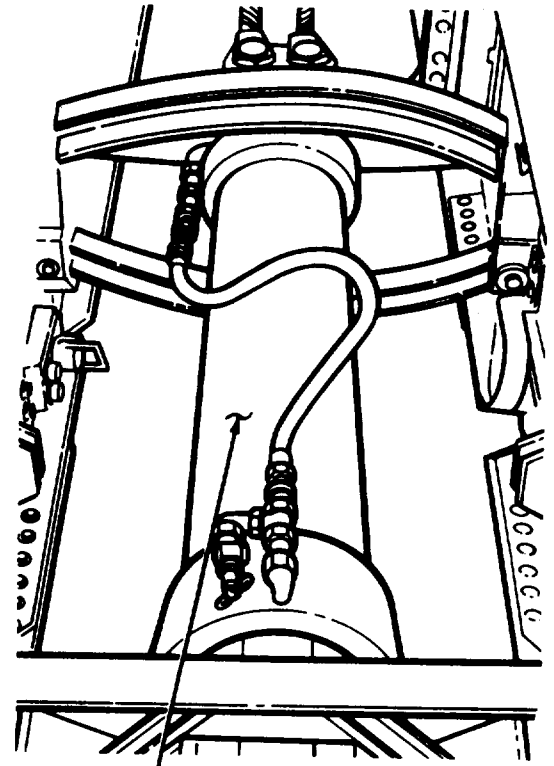
First Technician (Operator's Station)

- Engage hydraulic clutch.
- Set engine speed at 1800 rpm.
- Set scissoring cylinder control lever in launch position for 5 minutes.

Second Technician (Bridge)

- Visually check hydraulic lines and cap end of scissoring cylinder for leaks or damage. Check outer surface of cylinder for overheating.

Is scissoring cylinder leaking, damaged, or overheating?

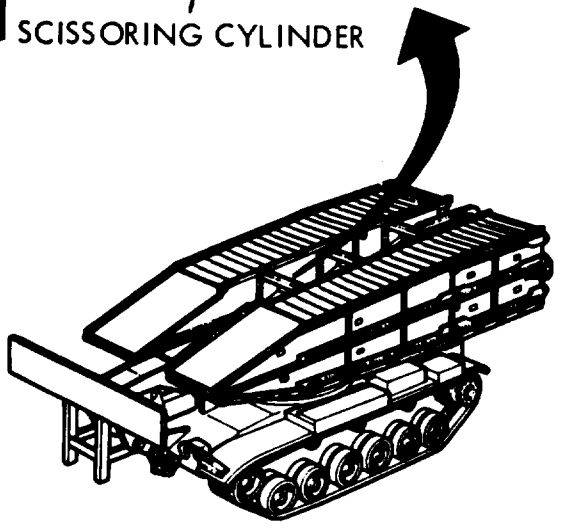


SCISSORING CYLINDER

12 Replace scissoring cylinder (TM5-5420-203-14).

YES

NO



Symptom-3

**DETAILED TROUBLESHOOTING PROCEDURE
LAUNCHER OPERATION - HYDRAULICS
(Continued)**

Check relief valve, RV8 for pressure setting of 3400 ± 50 psi.

First Technician (Operator's Station)

- Disengage hydraulic clutch.
- Cycle bridge launching control levers.

Second Technician (Top Deck)

- Place one gallon container under relief valve RV8.
- If STE/ICE is available, proceed to Test No. 51 (page 2-47) to test relief valve RV8.
- If STE/ICE is not available, remove gage plug from relief valve RV8 and install pressure gage port.

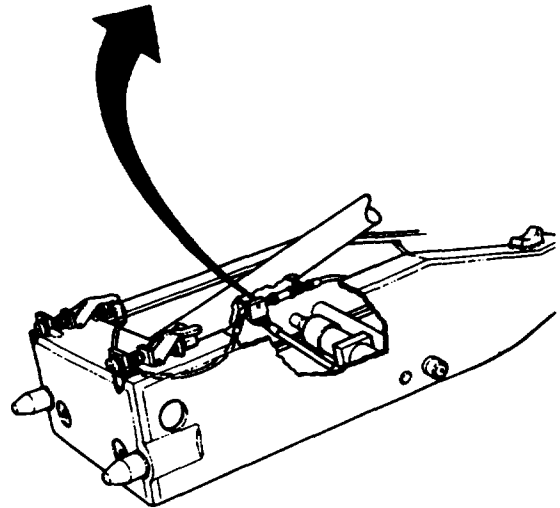
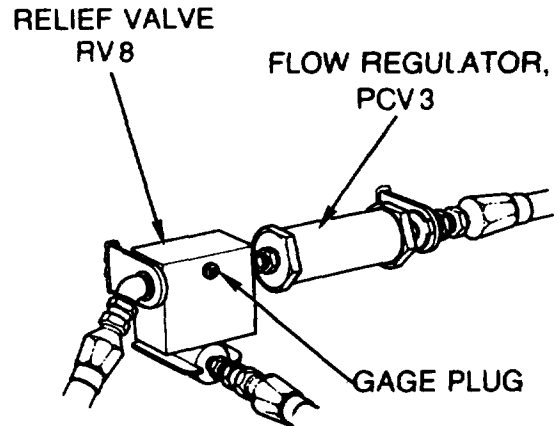
First Technician (Operator's Station)

- Engage hydraulic clutch.
- Set engine speed, at 1800 rpm.
- Raise scissor cylinder control lever.

Second Technician (Top Deck)

- Check if pressure gage indicates 3400 ± 50 psi.

Is pressure 3400 ± 50 psi?



14

- Adjust relief valve RV8 (page 3-83), steps 8 through 14.
- If relief valve setting cannot be brought to within tolerance, replace cartridge in relief valve (page 3-82).
- If relief valve setting still cannot be brought to within tolerance, notify support maintenance of defective valve bank.

NO

YES

15

Replace flow regulator, PCV3 (page 3-100).

**DETAILED TROUBLESHOOTING PROCEDURE
LAUNCHER OPERATION - HYDRAULICS
(Continued)**

Symptom-4

LAUNCHER DOES NOT RELEASE/ENGAGE BRIDGE.

NOTE
This procedure is to be performed by two persons. The lead person is referred to as the first technician and shall direct the activity of the second person called the second technician.

1 Check locking cylinder hydraulic lines and fittings for leaks or damage.

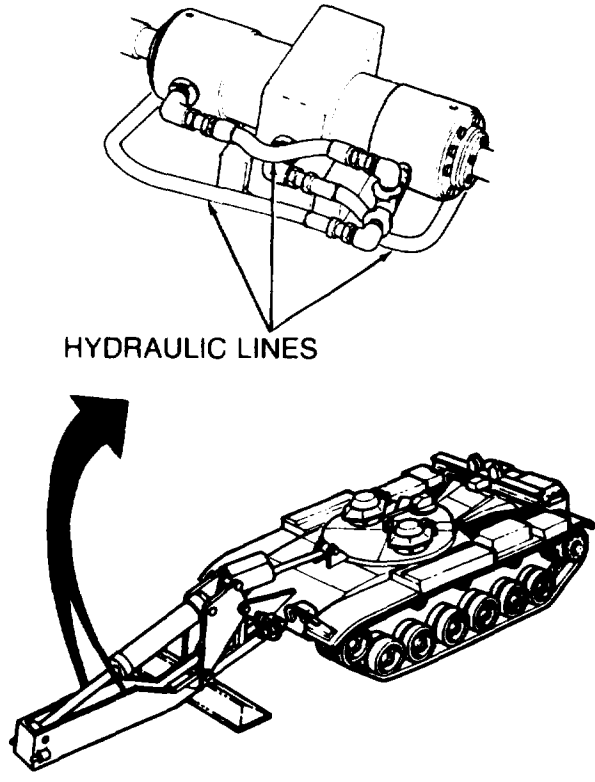
First Technician (Operator's Station)

- Engage hydraulic clutch.
- Set engine speed at 1800 rpm.
- Cycle locking cylinder control lever.

Second Technician (Launcher Tongue)

- Visually check locking cylinder hydraulic lines and fittings for leaks, crimping or other damage.

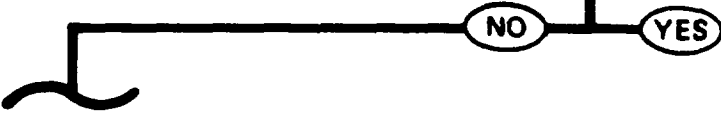
Are hydraulic lines and fittings leaking or damaged?



BRIDGE REMOVED FOR CLARITY

2

- Identify leaking hydraulic line by reference designator on line with diagram (page 3 - 61).
- Replace leaking line or fitting.



Symptom-4

**DETAILED TROUBLESHOOTING PROCEDURE
LAUNCHER OPERATION - HYDRAULICS
(Continued)**

3 Check locking cylinder for leaks, damage, or excessive heat.

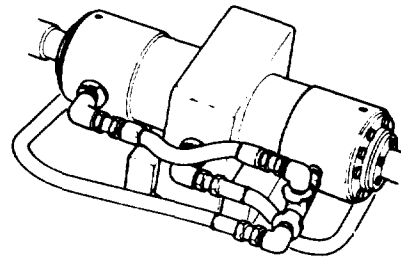
First Technician (Operator's Station)

- Engage hydraulic clutch.
- Set engine speed at 1800 rpm.
- Cycle locking cylinder control lever for 5 minutes.

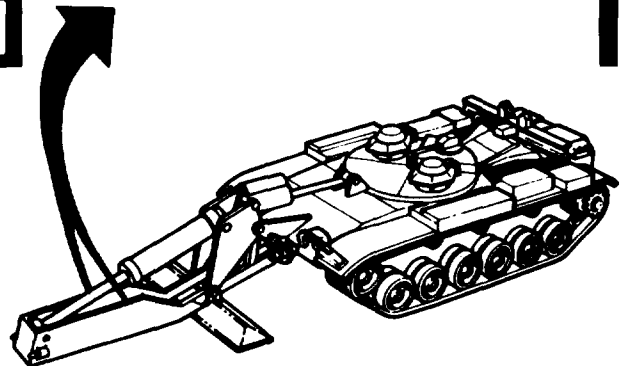
Second Technician (Launcher Tongue)

- Visually check locking cylinder for leaks or damage. Check outer surface of cylinder for overheating.

Is locking cylinder leaking, damaged, or overheating?



LOCKING CYLINDER



4 Replace locking cylinder (page 3 - 236).

NO YES

Symptom-4

**DETAILED TROUBLESHOOTING PROCEDURE
VEHICLE OPERATION - LAUNCHER SYSTEM
(Continued)**

5 Check ejection cylinders hydraulic lines and fittings for leaks or damage.

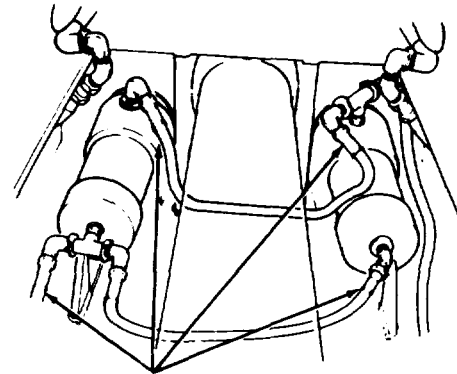
First Technician (Operator's Station)

- Engage hydraulic clutch.
- Set engine speed at 1800 rpm.
- Cycle ejection cylinder control lever.

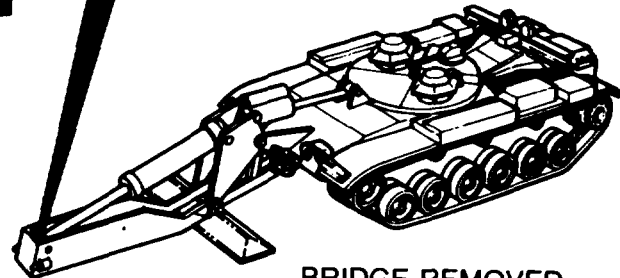
Second Technician (Launcher Tongue)

- Visually check hydraulic lines on both ejection cylinders for leaks, crimping or other damage.

Are hydraulic lines or fittings leaking or damaged?



EJECTION CYLINDER
HYDRAULIC LINES



BRIDGE REMOVED
FOR CLARITY

6

- Identify leaking hydraulic line by reference designator on line with diagram (page 3 - 61).
- Replace leaking line.

NO YES

Symptom-4

**DETAILED TROUBLESHOOTING PROCEDURE
LAUNCHER OPERATION - HYDRAULICS
(Continued)**

7

Check locking cylinder for leaks, damage, or excessive heat.

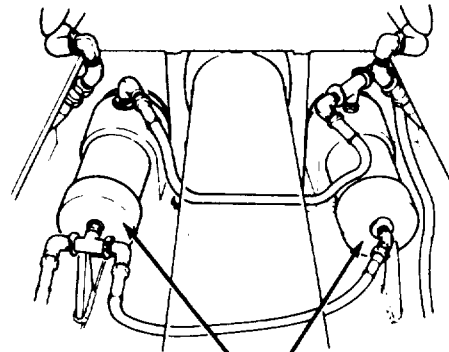
First Technician (Operator's Station)

- Engage hydraulic clutch.
- Set engine speed at 1800 rpm.
- Cycle locking cylinder control lever for 5 minutes.

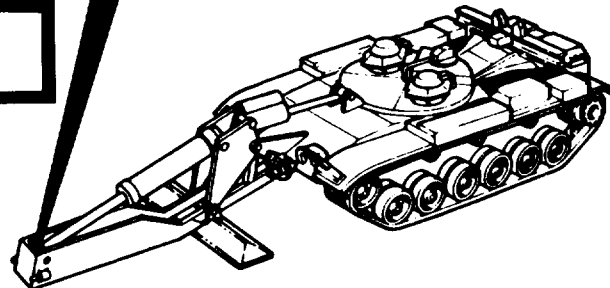
Second Technician (Launcher Tongue)

- Visually check both ejection cylinders for leaks or damage. Check outer surface of cylinder for overheating.

Are ejection cylinders leaking, damaged, or overheating?



EJECTION CYLINDERS



8

Replace leaking or damaged ejection cylinders (pages 3-237 or 3-241).

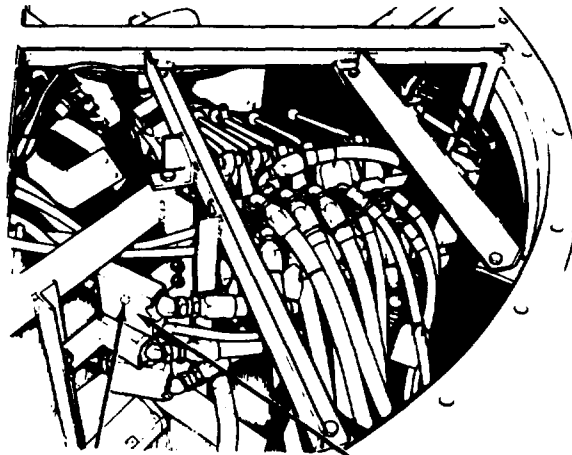
NO

YES

Symptom-4

**DETAILED TROUBLESHOOTING PROCEDURE
LAUNCHER OPERATION - HYDRAULICS
(Continued)**

QUADRANTS REMOVED
FOR CLARITY



GAGE PORT

RELIEF VALVE, RV6
(COMMANDER'S STATION)

9 Check relief valve, RV6 for pressure setting of 500 ± 50 psi.

Second Technician (Commander's Station)

- Place one gallon container under relief valve, RV6.

First Technician (Operator's Station)

- Disengage hydraulic clutch.
- Cycle all hydraulic control levers into launch and retrieve positions several times to relieve hydraulic system pressure.

Second Technician (Commander's Station)

- If STE/ICE is available, proceed to Test No. 51 (page 2-47) to test relief valve RV6.
- If STE/ICE is not available, remove gage plug from relief valve RV6 and install pressure gage.

First Technician (Operator's Position)

- Engage hydraulic clutch.
- Set engine speed at 1800 rpm.
- Depress locking cylinder control lever.

Second Technician (Commander's Station)

- Check if pressure gage or STE/ICE indicates 500 ± 50 psi.

Is pressure 500 ± 50 psi?

YES

NO

10

- Adjust relief valve RV6 (page 3-81), steps **8** through **14**.
- If relief valve setting cannot be brought to within tolerance, replace cartridge in relief valve (page 3-79).

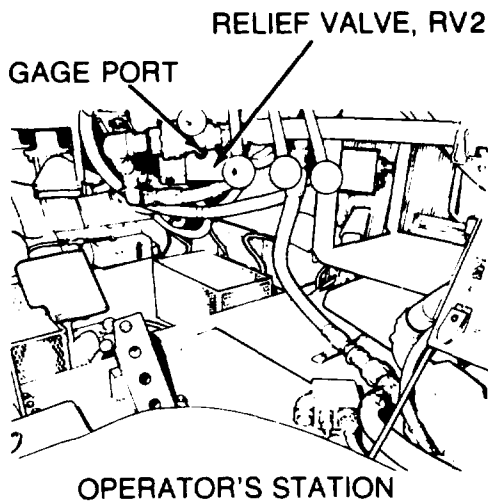
Symptom-4

**DETAILED TROUBLESHOOTING PROCEDURE
LAUNCHER OPERATION - HYDRAULICS
(Continued)**

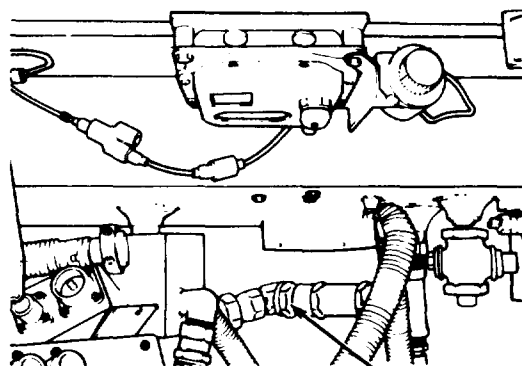
11 Check relief valve, RV2 for pressure setting of 3200 ± 50 psi.

First Technician (Operator's Station)

- Disengage hydraulic clutch.
- Place one gallon container under relief valve, RV2.
- Cycle bridge launching control levers.
- If STE/ICE is available, proceed to Test No. 51 (page 2-47) to test relief valve RV2.
- If STE/ICE is not available, remove gage plug from relief valve RV2 and install pressure gage.
- Engage hydraulic clutch.
- Set engine speed at 1800 rpm.
- Depress ejection cylinder and locking cylinder control levers for 5 minutes.
- Check if pressure gage indicates 3200 ± 50 psi.

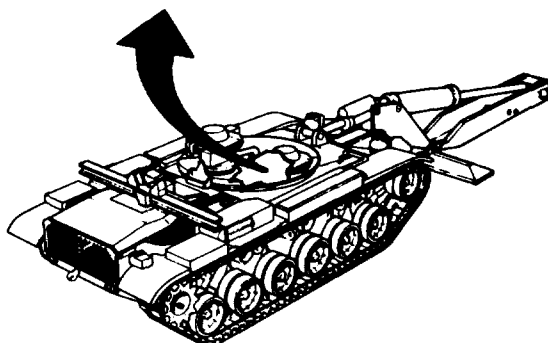


Is pressure 3200 ± 50 psi?



12

- Adjust relief valve RV2 (page 3-73), steps 8 through 14.
- If relief valve setting cannot be brought to within tolerance, replace valve cartridge (page 3-72).
- If relief valve RV2 is not faulty, notify support maintenance of faulty valve bank.



13

Replace check valve, CV8 (page 3-112).

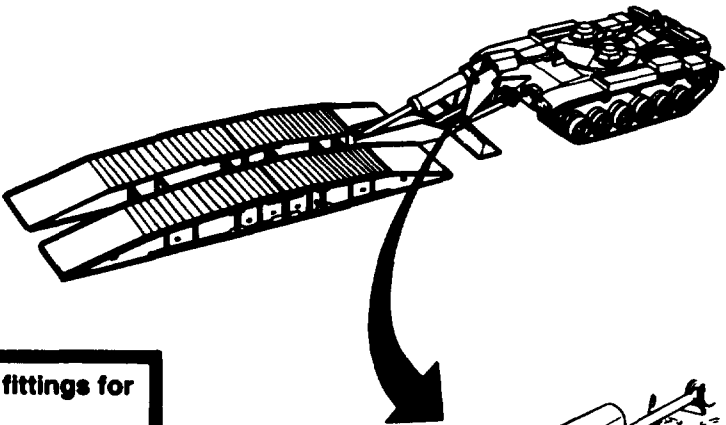


**DETAILED TROUBLESHOOTING PROCEDURE
LAUNCHER OPERATION - HYDRAULICS
(Continued)**

Symptom-5

BRIDGE DOES NOT RETRIEVE.

NOTE
This procedure is to be performed by two persons. The lead person is referred to as the first technician and shall direct the activity of the second person called the second technician.



1 Check tongue cylinder hydraulic lines and fittings for leaks, crimping or damage.

Second Technician (Launcher Tongue)

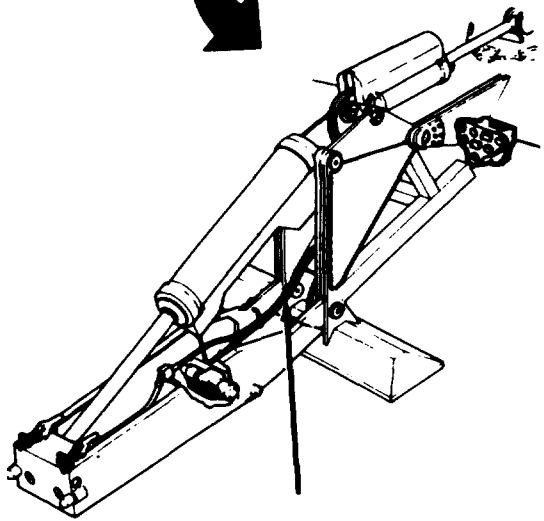
- Remove tongue cylinder armor (page 3 - 226).

First Technician (Operator's Station)

- Engage hydraulic clutch.
- Set engine speed at 1800 rpm.
- Cycle tongue cylinder control lever.

Second Technician (Launcher Tongue)

- Visually check hydraulic lines and fittings for leaks, crimping or other damage.



TONGUE CYLINDER HYDRAULIC LINES

Are hydraulic lines or fittings leaking or damaged?

NO **YES**

2

- Identify leaking hydraulic line by reference designator on line with diagram (page - 61).
- Replace leaking line.

Symptom-5

**DETAILED TROUBLESHOOTING PROCEDURE
LAUNCHER OPERATION - HYDRAULICS
(Continued)**

3

Check tongue cylinder for leaks, damage or excessive heat.

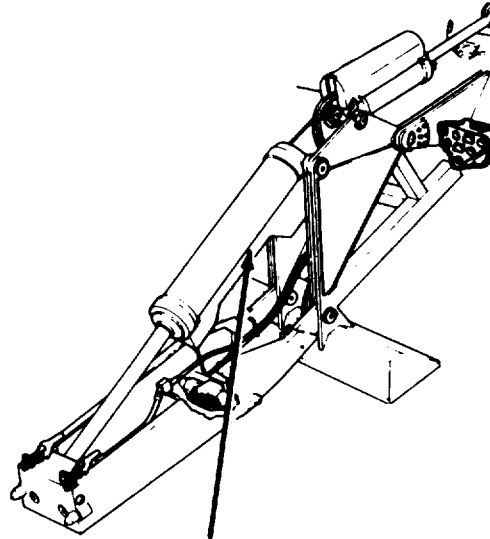
First Technician (Operator's Station)

- Cycle tongue cylinder control lever for 5 minutes.

Second Technician (Launcher Tongue)

- Visually check tongue cylinder for leaks or other damage. Check outer surface for overheating.

Is tongue cylinder leaking, damaged, or overheating?



TONGUE CYLINDER

4

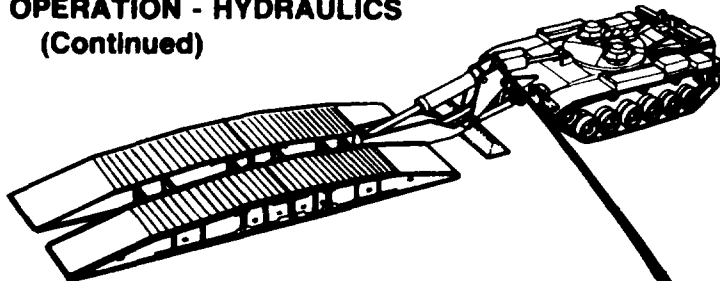
- **Replace tongue cylinder (page 3-228).**

NO

YES

Symptom-5

**DETAILED TROUBLESHOOTING PROCEDURE
LAUNCHER OPERATION - HYDRAULICS
(Continued)**



5 Check relief valve RV4 for pressure setting of 3600 ± 50 psi.

First Technician (Operator's Station)

- Disengage hydraulic clutch.
- Cycle bridge launching control levers.

Second Technician (Launcher Tongue)

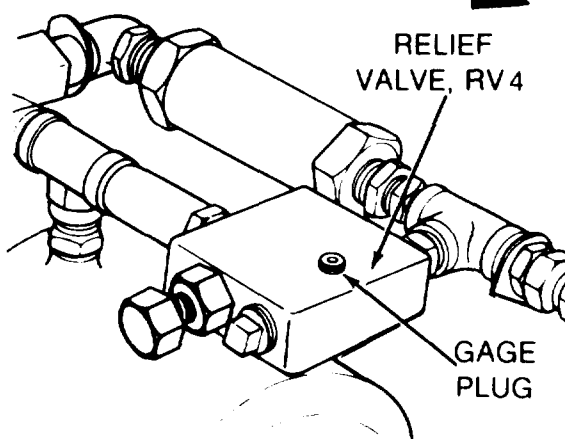
- Place one gallon container under relief valve RV4.
- If STE/ICE is available, proceed to Test No. 51 (page 2-47) to test relief valve RV4.
- Remove gage plug from relief valve RV4, and install pressure gage in gage port.

First Technician (Operator's Station)

- Engage hydraulic clutch.
- Set engine speed at 1800 rpm.
- Raise tongue cylinder control lever.

Second Technician (Launcher Tongue)

- Check pressure gage or STE/ICE indicates 3600 ± 50 psi.



CAP END TONGUE CYLINDER

Is pressure 3600 ± 50 psi?

6

- Remove pressure gage and install plug in gage port.
- Replace check valve CV4 (page 3-93).

YES

NO

7

- Adjust relief valve RV4 (page 3-78) steps 8 through 15.
- If relief valve setting cannot be brought to within tolerance, replace cartridge in relief valve (page 3-77).
- If relief valve setting still cannot be brought within tolerance, notify support maintenance of defective valve bank.

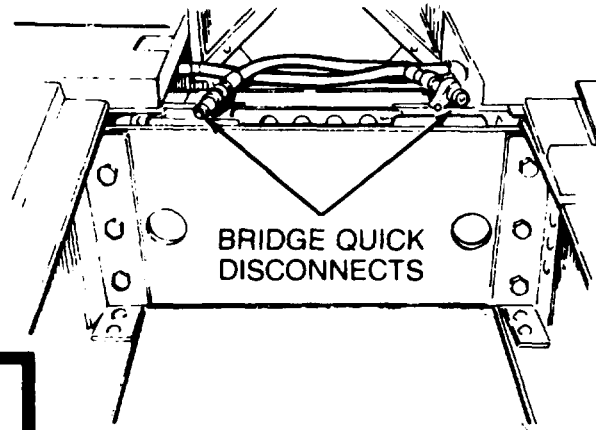
**DETAILED TROUBLESHOOTING PROCEDURE
LAUNCHER OPERATION - HYDRAULICS
(Continued)**

Symptom-6

BRIDGE DOES NOT SCISSOR CLOSED OR DOES NOT CLOSE SMOOTHLY.

NOTE

This procedure is to be performed by two persons. The lead person is referred to as the first technician and shall direct the activity of the second person called the second technician.



1 Check bridge quick disconnects for proper operation.

First Technician (Operator's Station)

- Return bridge to launched position (TM 5-5420-226 - 10).
- Disengage hydraulic clutch.
- Cycle bridge launching control levers.

Second Technician (Bridge)

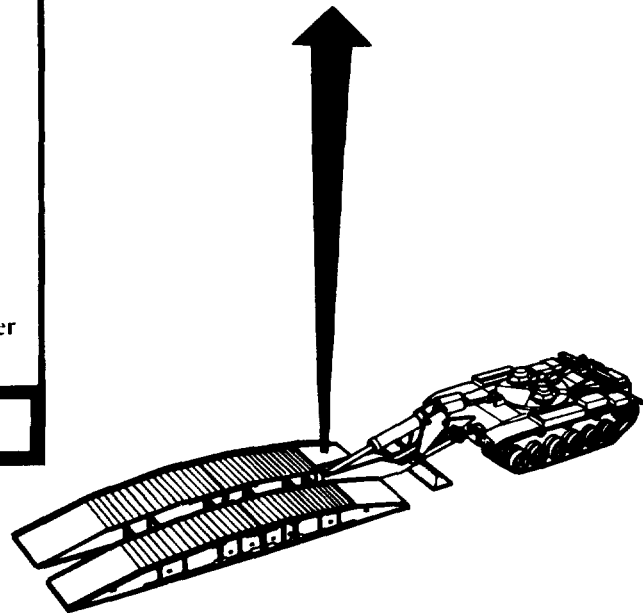
- Check quick disconnects between bridge and launcher tongue are connected and secure.

Do quick disconnects operate properly?

2 Replace quick disconnects (TM5-5420-203-14).

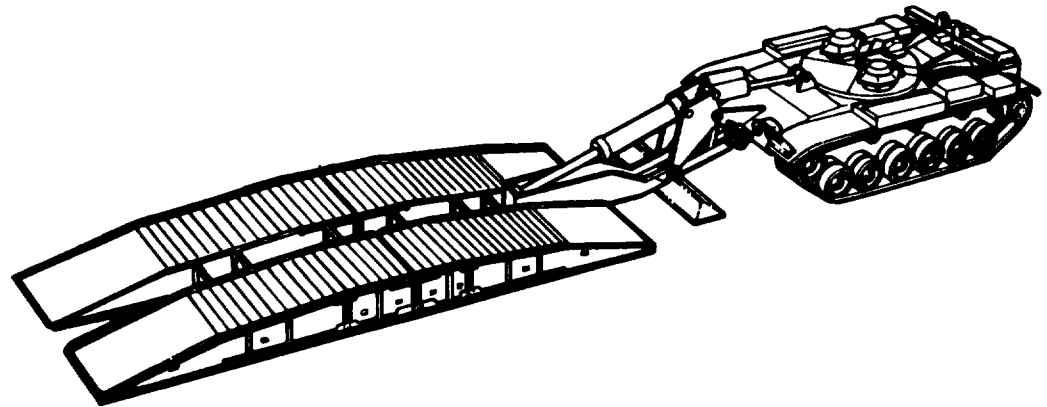
NO

YES



Symptom-6

DETAILED TROUBLESHOOTING PROCEDURE LAUNCHER OPERATION - HYDRAULICS (Continued)



3 Check scissoring cylinder bleed valves for proper operation.

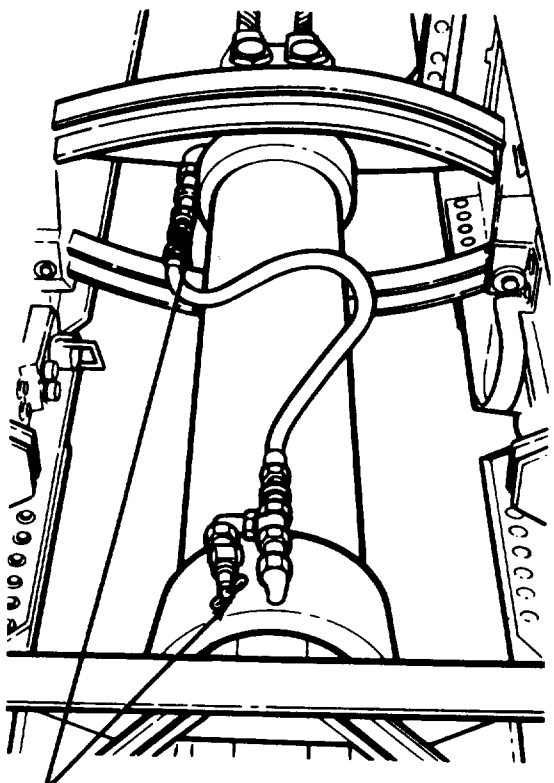
First Technician (Operator's Station)

- Cycle bridge launching control levers.

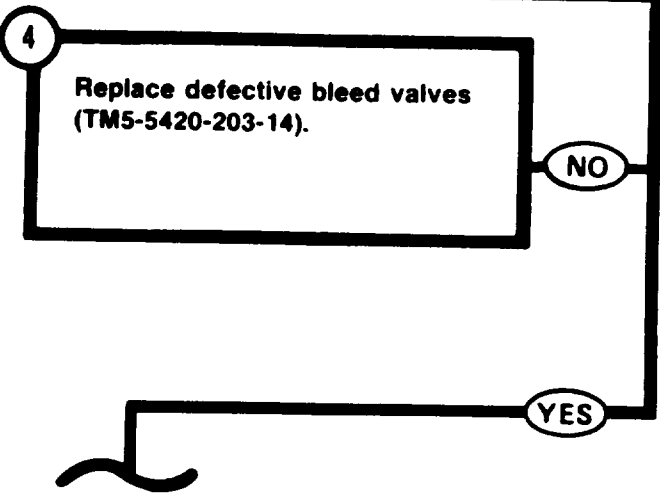
Second Technician (Bridge)

- Open both bleed valves to release air. Close both bleed valves.
- Be sure both bleed valves are closed.

Do both bleed valves operate properly?



SCISSORING CYLINDER
BLEED VALVES



Symptom-6

**DETAILED TROUBLESHOOTING PROCEDURE
LAUNCHER OPERATION - HYDRAULICS
(Continued)**

5 Check bridge piping, hydraulic lines and fittings for leaks or damage.

First Technician (Operator's Station)

- Engage hydraulic clutch.
- Set engine speed at 1800 rpm.
- Cycle scissor cylinder control lever into retrieve and launch positions.

Second Technician (Bridge)

- Visually check bridge piping for leaks, crimping or other damage.

Is bridge piping leaking or damaged?

6 Replace leaking or damaged bridge piping (TM5-5420-203-14).

YES

NO

QUICK-DISCONNECT
COUPLING

SCISSORS
CYLINDER

FLEXIBLE
HOSE

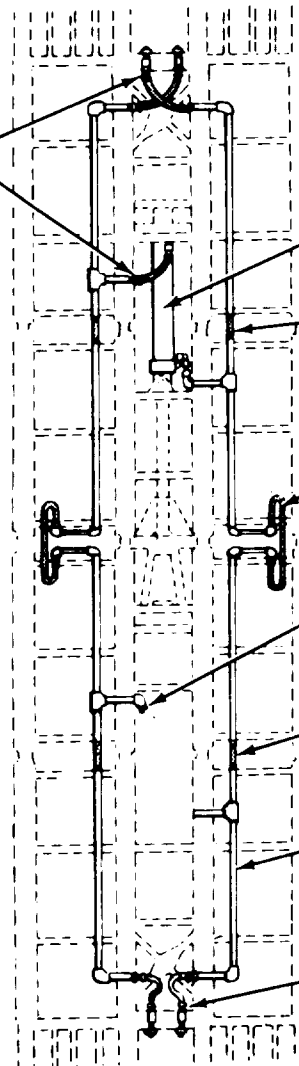
FLEXIBLE
JOINT

QUICK-
DISCONNECT
COUPLING

FLEXIBLE
HOSE

HYDRAULIC
PIPING

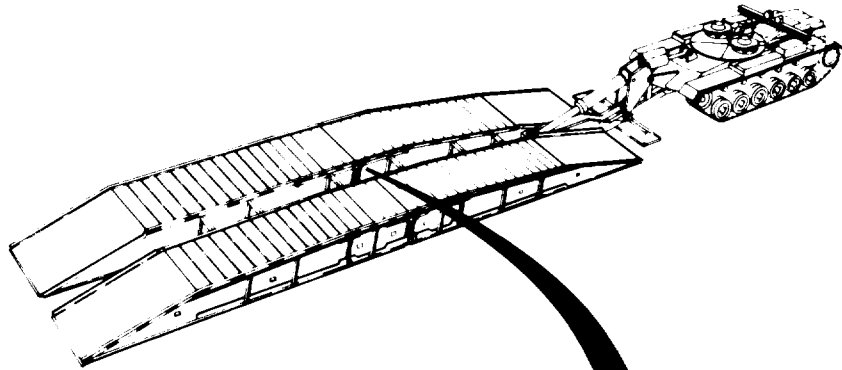
QUICK-
DISCONNECT
COUPLING



BRIDGE HYDRAULIC SYSTEM

Symptom-6

**DETAILED TROUBLESHOOTING PROCEDURE
LAUNCHER OPERATION - HYDRAULICS
(Continued)**

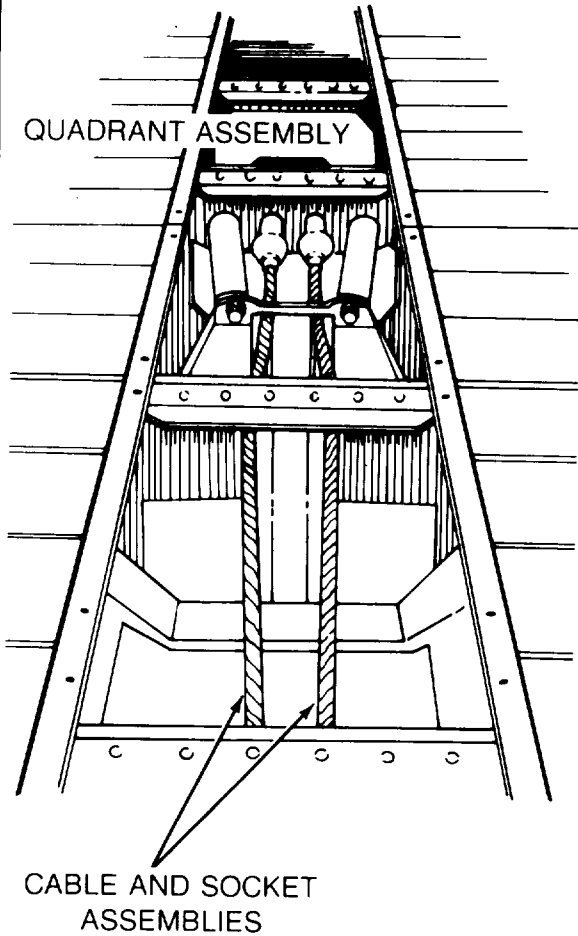


7 Check quadrant and cable assemblies for proper operation.

Second Technician (Bridge)

- Visually check quadrant for loose or broken struts, misalignment or other damage.
- Visually check scissoring cable assembly for broken, loose or frayed condition.

Is quadrant or scissoring cables damaged?



8 Replace scissoring cables and quadrant assembly (TM5-5420-203-14).

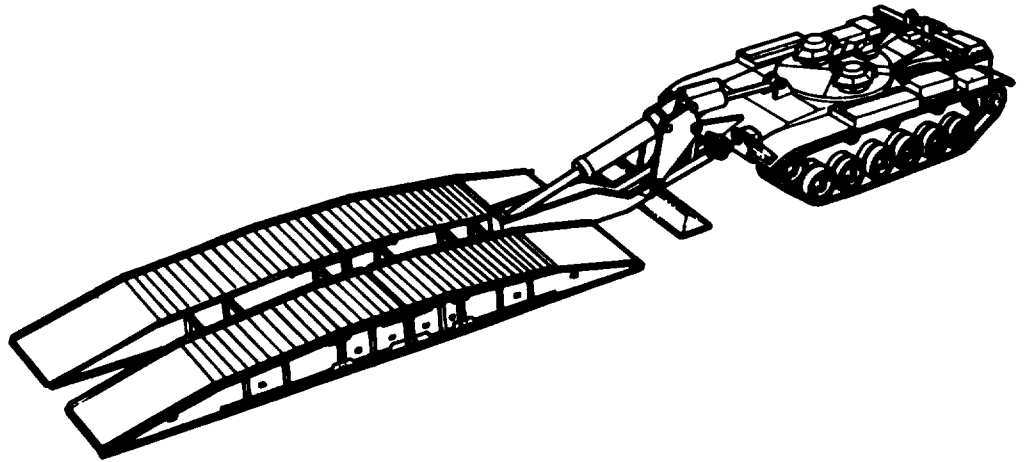
YES

NO

TA170217

Symptom-6

DETAILED TROUBLESHOOTING PROCEDURE LAUNCHER OPERATION - HYDRAULICS (Continued)

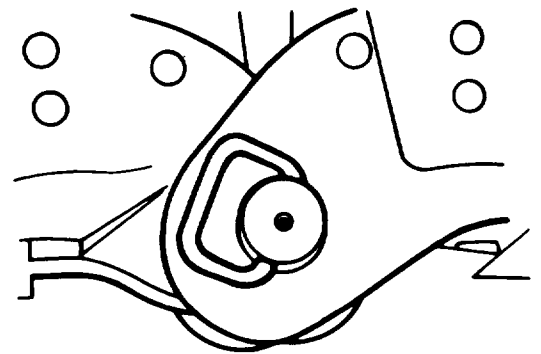


9 Check center section hinge pins for damage.

Second Technician (Bridge)

Visually check inside and outside center section hinge pins for broken or damaged condition.

Are center section hinge pins broken or damaged?

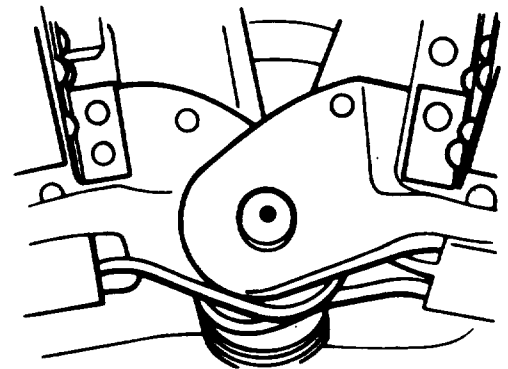


OUTSIDE CENTER PIN

10 Replace damaged center section hinge pins (TM5-5420-203-14).

YES

NO



INSIDE CENTER PIN

Symptom-6

**DETAILED TROUBLESHOOTING PROCEDURE
LAUNCHER OPERATION - HYDRAULICS
(Continued)**

11 Check scissoring cylinder for leaks, damage, or excessive heat.

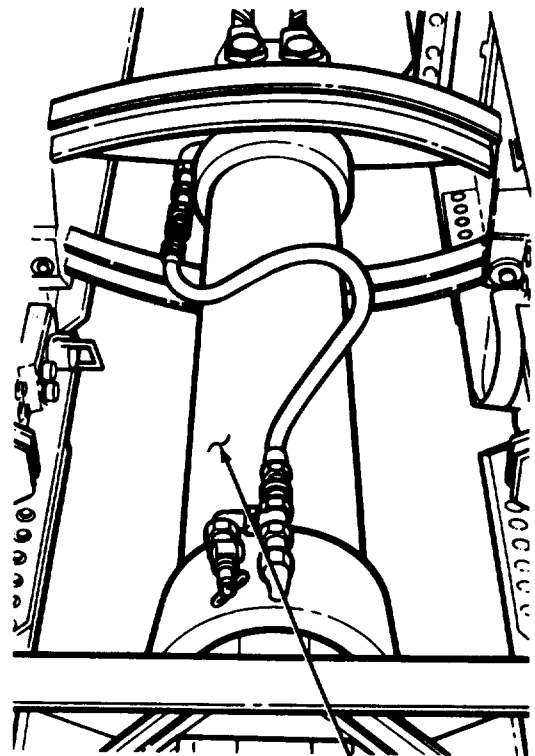
First Technician (Operator's Station)

- Engage hydraulic clutch.
- Set engine speed at 1800 rpm.
- Set scissor cylinder control lever in retrieve position for 5 minutes.

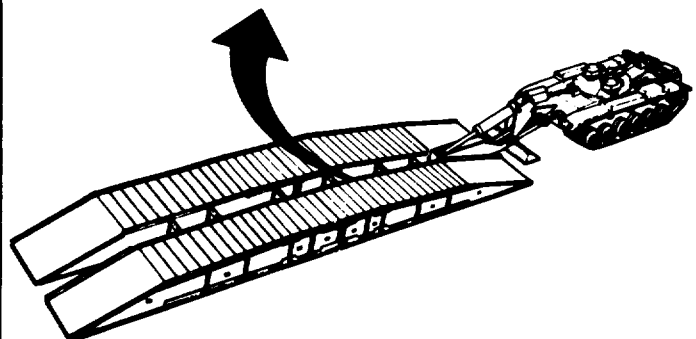
Second Technician (Bridge)

- Visually check hydraulic lines and rod end of scissor cylinder for leaks or damage. Check outer surface for overheating.

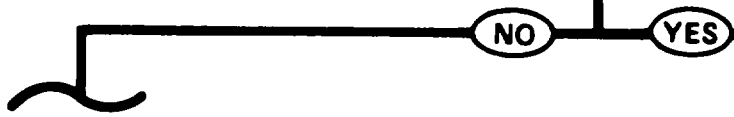
Is scissoring cylinder leaking, damaged, or overheating?



SCISSORING CYLINDER



12 Replace scissoring cylinder (TM5-5420-203-14).



Symptom-6

**DETAILED TROUBLESHOOTING PROCEDURE
LAUNCHER OPERATION - HYDRAULICS
(Continued)**

13

Check relief valve, RV8 for pressure setting of 3400 ± 50 psi.

First Technician (Operator's Station)

- Disengage hydraulic clutch.
- Cycle bridge launching control levers.

Second Technician (Launcher Tongue)

- Place one gallon container under relief valve RV8.
- If STE/ICE is available, proceed to Test No. 51 (page 2-47).
- Remove gage plug and install pressure gage or STE/ICE in gage part.

First Technician (Operator's Station)

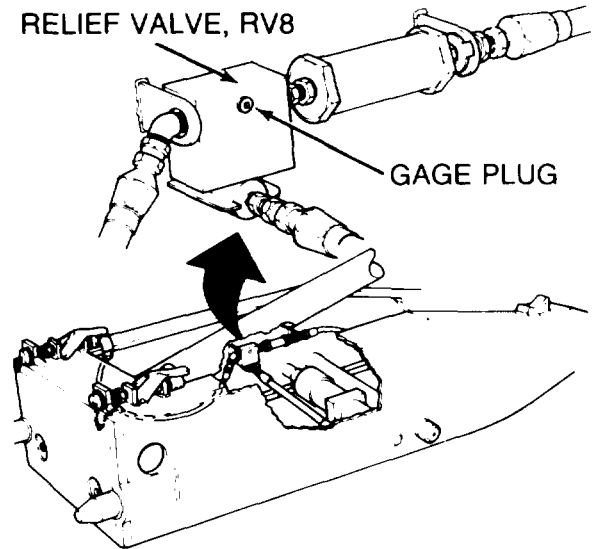
- Engage hydraulic clutch.
- Set engine speed at 1800 rpm.
- Lower scissor cylinder control lever.

Second Technician (Launcher Tongue)

- Check if pressure gage or STE/ICE indicates 3400 ± 50 psi.

Is pressure 3400 ± 50 psi?

RELIEF VALVE, RV8



GAGE PLUG

14

- Adjust relief valve RV8 (page 3-83).
- If relief valve setting cannot be brought to within tolerance, replace cartridge in relief valve (page 3-82).

NO

15

- Replace check valve, CV7 (page 3-110).

YES

TA170220

**DETAILED TROUBLESHOOTING PROCEDURE
LAUNCHER OPERATION - HYDRAULICS
(Continued)**

Symptom-7

BRIDGE DOES NOT RETRACT FROM VERTICAL POSITION OR DOES NOT RETRACT SMOOTHLY.

NOTE

This procedure is to be performed by two persons. The lead person is referred to as the first technician and shall direct the activity of the second person called the second technician.

1 Check overhead cylinder hydraulic lines and fittings for leaks or damage.

First Technician (Operator's Station)

- Engage hydraulic clutch.
- Set engine speed at 1800 rpm.
- Launch bridge (TM 5-5420-226-10).
- Disengage hydraulic clutch.

Both Technicians (Launcher)

- Remove overhead cylinder armor.

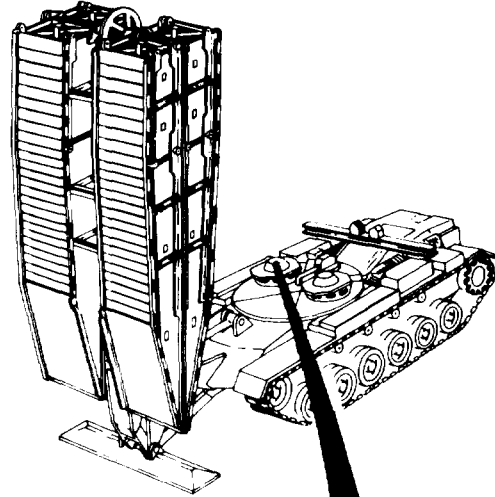
First Technician (Operator's Station)

- Engage hydraulic clutch.
- Set engine speed at 1800 rpm.
- Cycle overhead cylinder control lever.

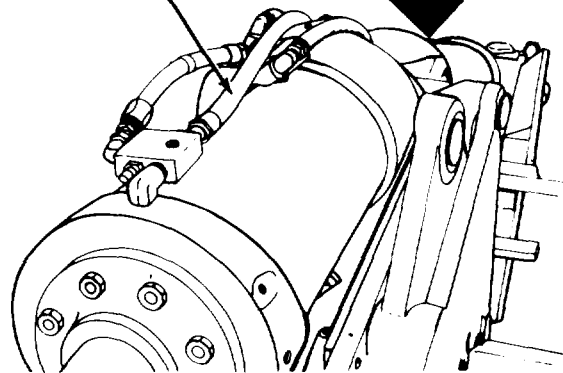
Second Technician (Launcher)

- Visually check overhead cylinder hydraulic lines and fittings for leaks, crimping or damage.

Are hydraulic lines or fittings leaking or damaged?



OVERHEAD CYLINDER
HYDRAULIC LINES



2

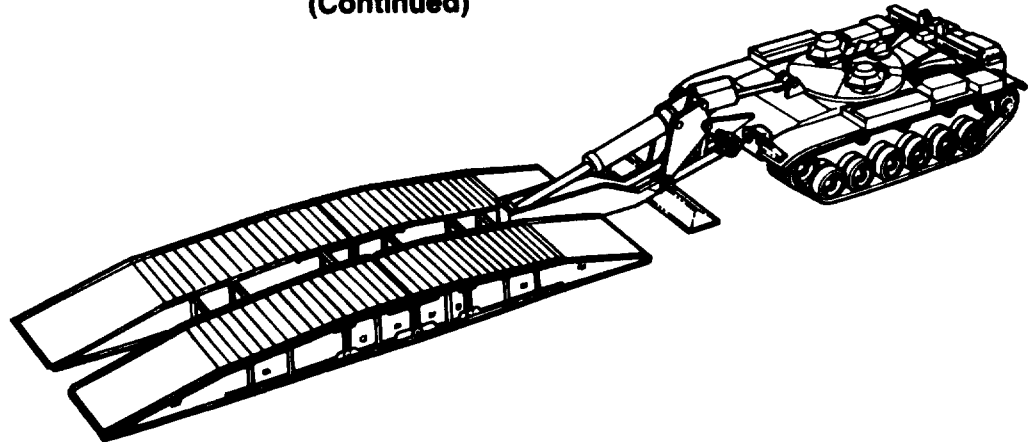
- Identify leaking hydraulic line by reference designator on line with diagram (page 3-61).
- Replace leaking line.

NO YES

TA170221

Symptom-7

DETAILED TROUBLESHOOTING PROCEDURE LAUNCHER OPERATION - HYDRAULICS (Continued)



3

Check overhead cylinder for leaks, damage, or excessive heat.

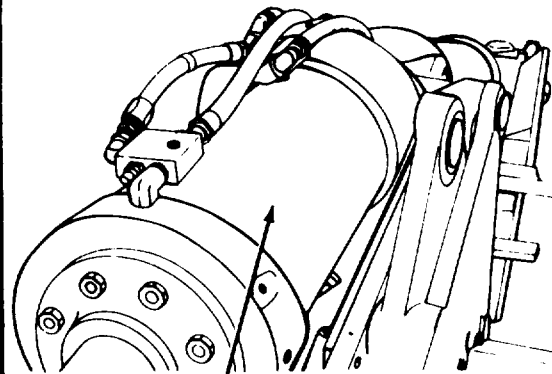
First Technician (Operator's Station)

- Engage hydraulic clutch.
- Set engine speed at 1800 rpm.
- Cycle overhead cylinder control lever for 5 minutes.

Second Technician (Launcher Tongue)

- Visually check overhead cylinder for leaks or damage. Check outer surface of cylinder for overheating.

Is locking cylinder leaking, damaged, or overheating?



OVERHEAD CYLINDER

4

Replace overhead cylinder (page 3 - 219).

NO

YES

Symptom-7

**DETAILED TROUBLESHOOTING PROCEDURE
LAUNCHER OPERATION - HYDRAULICS
(Continued)**

5 Check relief valve RV3 for pressure setting of 3600 ± 50 psi.

Second Technician (Launcher)

- Place one gallon container under relief valve RV3.

First Technician (Operator' Station)

- Disengage hydraulic clutch.
- Cycle bridge launching control levers.

Second Technician (Launcher)

- If STE/ICE is available, proceed to Test No. 51 (page 2-47) to test relief valve RV3.
- If STE/ICE is not available, remove gage plug RV3 and connect pressure gage in gage port.

First Technician (Operator's Station)

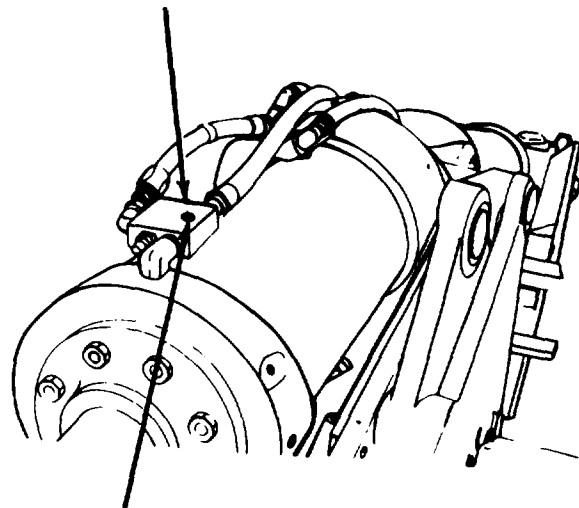
- Engage hydraulic clutch.
- Set engine speed at 1800 rpm.
- Depress overhead cylinder control lever.

Second Technician (Launcher)

- Check if pressure gage or STE/ICE indicates 3600 ± 50 psi.

Is pressure 3600 ± 50 psi?

RELIEF VALVE RV3



GAGE PLUG

6

- System is operational.
- Perform launch and retrieve procedures (TM5-5420-226-10).

YES

NO

7

- Adjust relief valve RV3 (page 3-75) steps 8 through 15.
- If relief valve setting cannot be brought to within tolerance, replace cartridge in relief valve (page 3-74).
- If relief valve setting still cannot be brought within tolerance, notify support maintenance of defective valve bank.

Symptom-8

**DETAILED TROUBLESHOOTING PROCEDURE
SUPPORT SYSTEM - VENTILATION**

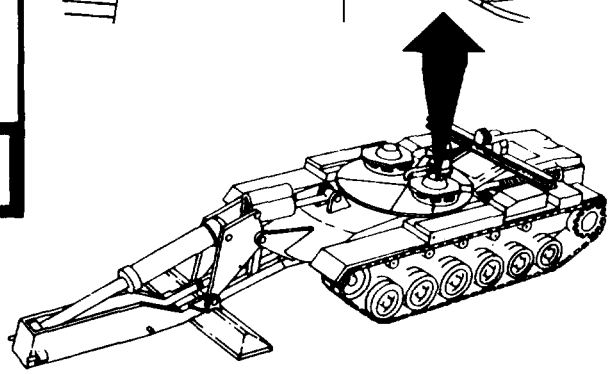
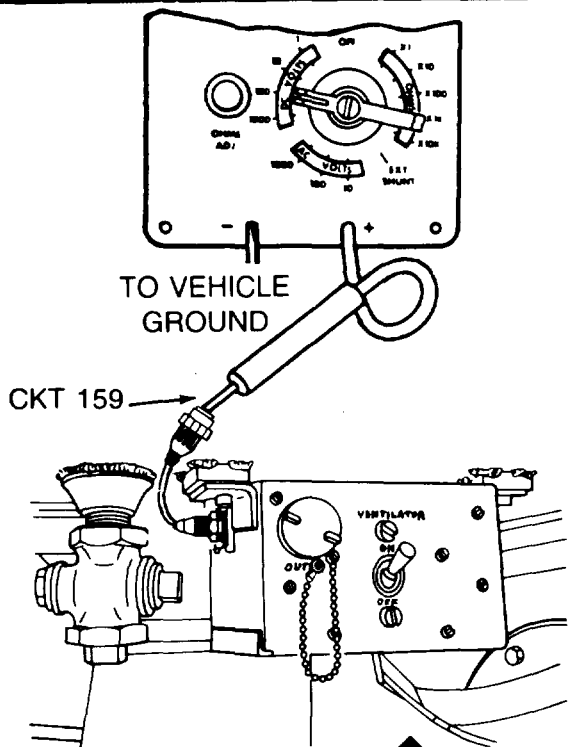
VENTILATING BLOWER MOTOR DOES NOT WORK

1 Check CKT 159 harness connector at blower motor for electrical power.

Technician (Operator's Station)

- Set MASTER BATTERY switch OFF.
- Disconnect CKT 159 harness connector from ventilating blower.
- Set multimeter to measure 18 to 30 volts dc, or use STE/ICE Test No. 89 (page 2-45).
- Connect red probe of meter to center contact of harness connector to ventilating blower and black probe to ground.
- Set MASTER BATTERY switch ON.
- Set VENTILATOR switch ON.
- Check if meter indicates 18 to 30 volts dc.

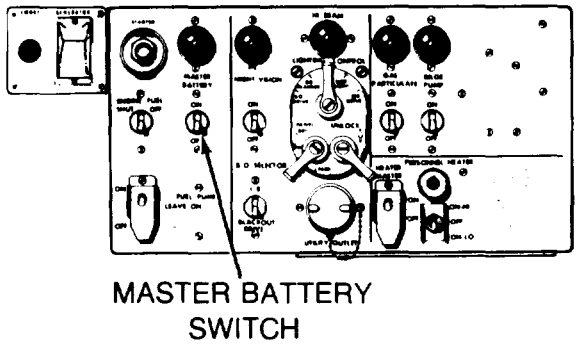
Does meter indicate 18 to 30 volts dc?



2 Replace ventilating blower assembly (page 3-2).

YES

NO



TA170224

Symptom-8

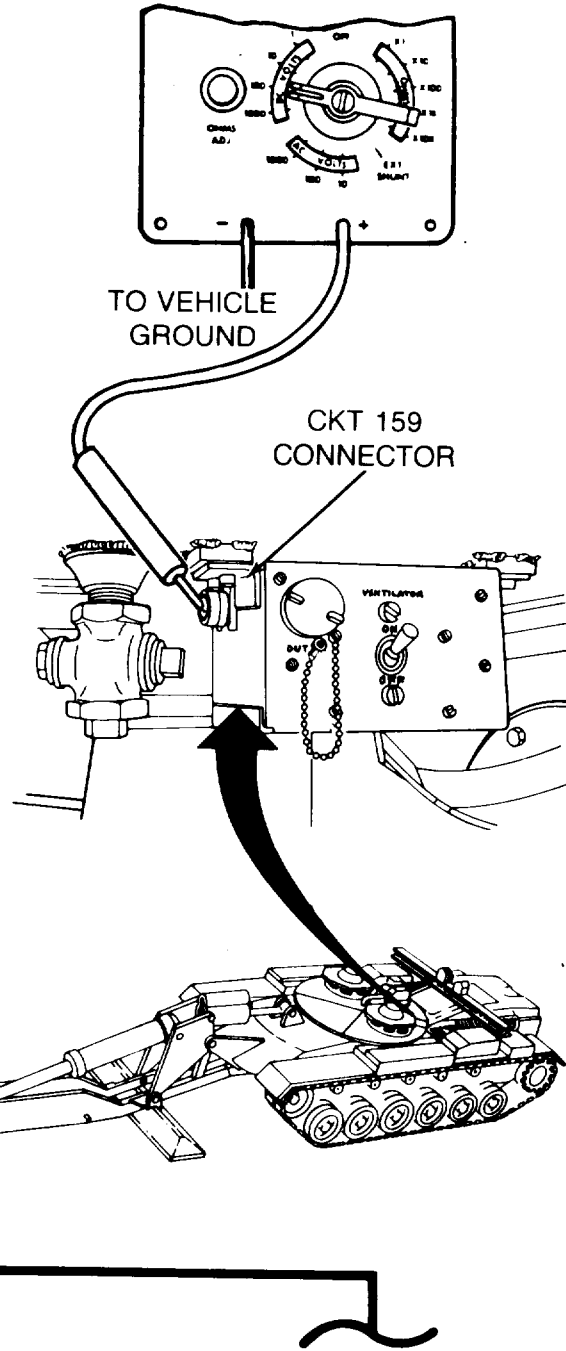
**DETAILED TROUBLESHOOTING PROCEDURE
SUPPORT SYSTEM - VENTILATION
(Continued)**

3 Check output connector (CKT 159) of accessories control box for electrical power.

Technician (Operator's Station)

- Set MASTER BATTERY switch off.
- Reconnect CKT 159 harness connector to ventilating blower.
- Disconnect CKT 159 output harness connector from accessories control box.
- Connect red probe of meter to center contact of CKT 159 connector on accessories control box and black probe to ground.
- Set MASTER BATTERY switch ON.
- Check if meter indicates 18 to 30 volts dc.

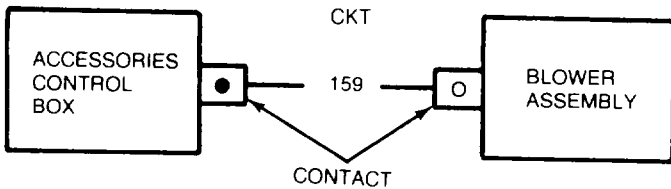
Does meter indicate 18 to 30 volts dc?



4

- Inspect CKT 159 harness for bent/broken harness connectors or loose CKT 159 wire at rear of connectors.
- Repair connectors if defective (TM5-5420-226-20).
- If connectors are not defective, replace CKT 159 harness between accessories control box and blower assembly (TM5-5420-226-20).

YES NO



TA170225

Symptom-8

**DETAILED TROUBLESHOOTING PROCEDURE
SUPPORT SYSTEM - VENTILATION
(Continued)**

5 Check CKT 159 harness connector at input of accessories control box for electrical power.

Technician (Operator's Station)

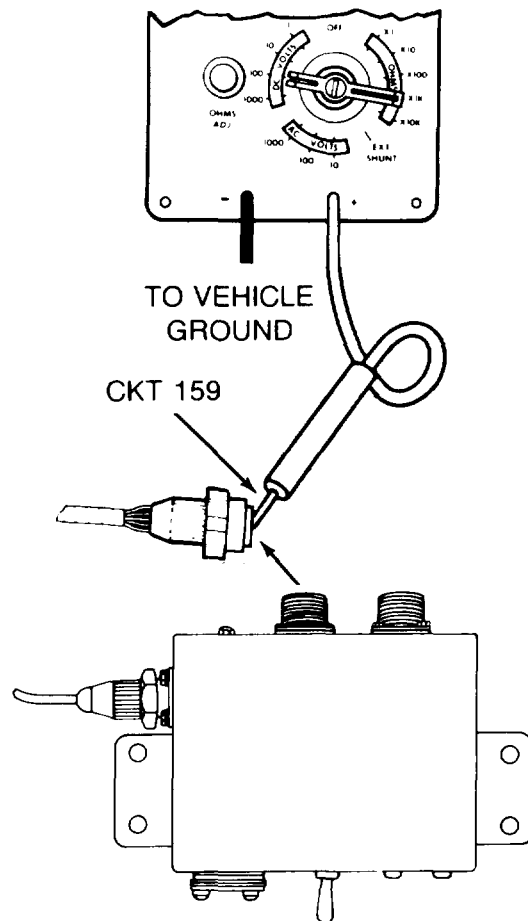
- Set MASTER BATTERY switch OFF.
- Reconnect CKT 159 harness connector to output connector of accessories control box.
- Disconnect CKT 159 harness connector from input connector of accessories control box.
- Connect red probe of meter to center contact of CKT 159 harness connector and black probe to ground.
- Set MASTER BATTERY switch ON.
- Check if meter reads 18 to 30 volts dc.

Does meter read 18 to 30 volts dc?

6 Replace accessories control box (page 3-7).

YES

NO



TA170226

Symptom-8

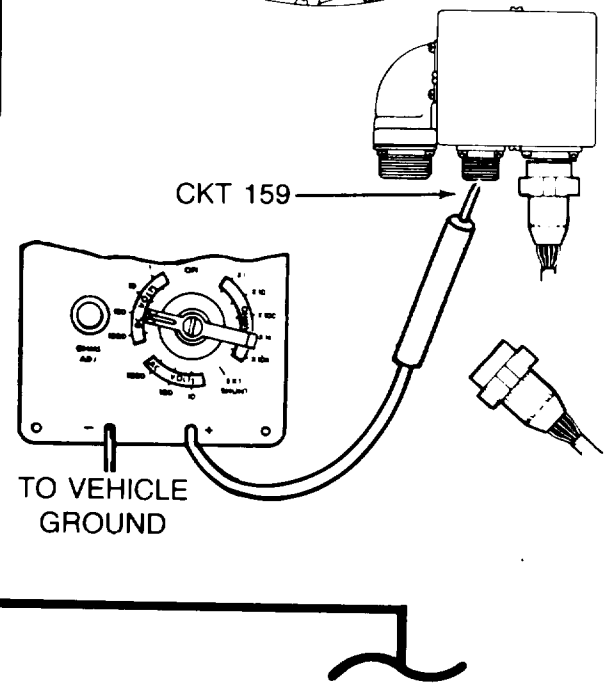
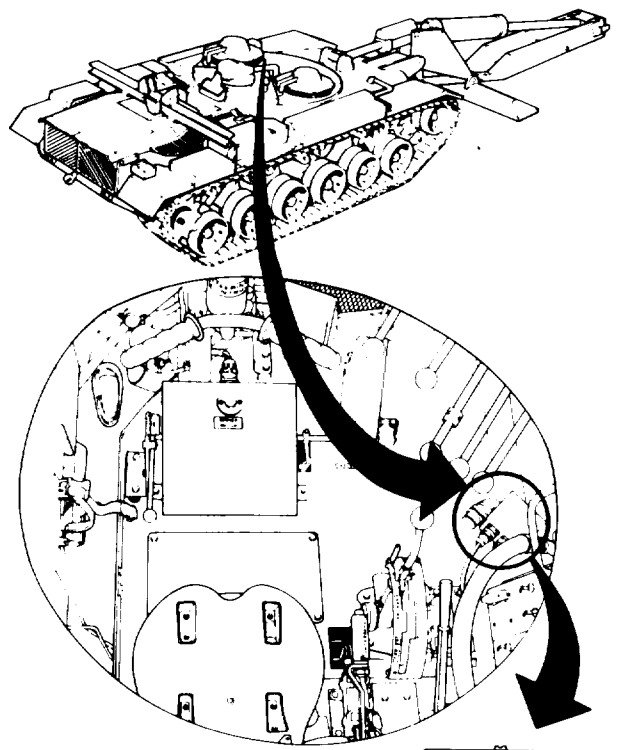
**DETAILED TROUBLESHOOTING PROCEDURE
SUPPORT SYSTEM - VENTILATION
(Continued)**

7 Check output connector (CKT 159) of interconnecting box for electrical power.

Technician (Operator's Station)

- Set MASTER BATTERY switch OFF.
- Set VENTILATOR switch OFF.
- Reconnect CKT 159 harness connector to input connector of accessories control box.
- Disconnect CKT 159 harness connector from interconnecting box.
- Connect red probe of meter to center contact of CKT 159 connector on interconnecting box and black probe to ground.
- Set MASTER BATTERY switch ON.
- Check if meter indicates 18 to 30 volts dc.

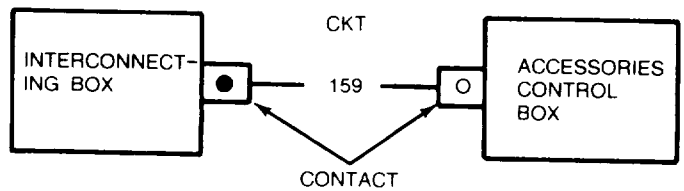
Does meter indicate 18 to 30 volts dc?



8

- Inspect CKT 159 harness for bent/broken harness connectors or loose CKT 159 wire at rear of connectors.
- Repair connectors if defective TM5-5420-226-20.
- If connectors are not defective, replace CKT 159 harness between interconnecting box and accessories control box.

YES NO



TA170227

Symptom-8

**DETAILED TROUBLESHOOTING PROCEDURE
SUPPORT SYSTEM - VENTILATION
(Continued)**

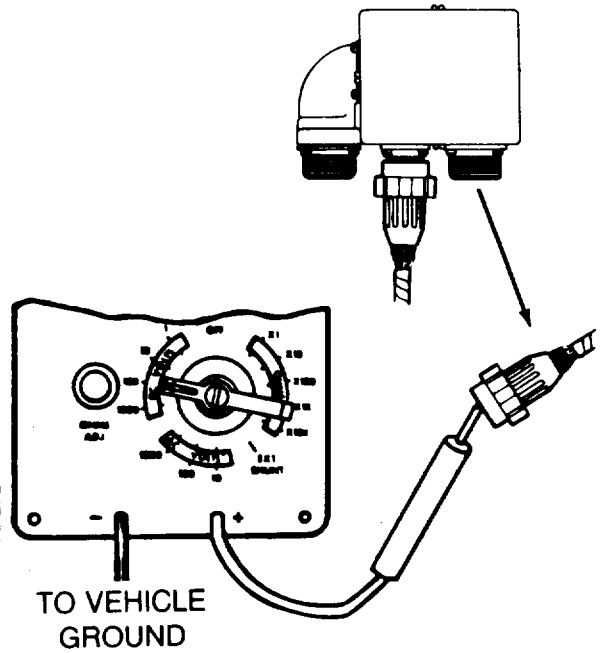
9

Check interconnecting box cable for electrical power.

Technician (Operator's Station)

- Set MASTER BATTERY switch OFF.
- Reconnect CKT 159 harness connector to interconnecting box.
- Disconnect interconnecting box cable from interconnecting box.
- Connect red probe of meter to center contact of interconnecting box cable and black probe to ground.
- Set MASTER BATTERY switch ON.
- Check if meter indicates 18 to 30 volts dc.

Does meter indicate 18 to 30 volts dc?



10

Repair electrical harness inside interconnecting box (TM5-5420-226-20).

NO

YES

TA170228

Symptom-8

**DETAILED TROUBLESHOOTING PROCEDURE
SUPPORT SYSTEM - VENTILATION
(Continued)**

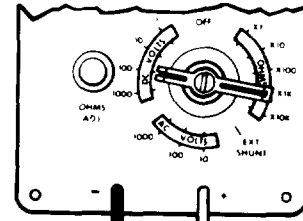
11

Check hull power harness (CKT 47) for electrical power.

Technician (Operator's Station)

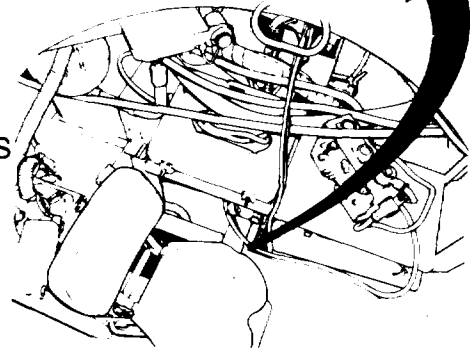
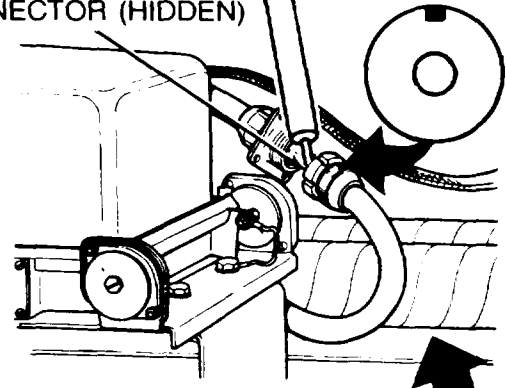
- Set MASTER BATTERY switch OFF.
- Reconnect interconnecting box cable connector to interconnecting box.
- Disconnect interconnecting box cable connector from hull power harness connector (CKT 47).
- Connect red probe of meter to center contact of hull power harness connector (CKT 47) and black probe to ground.
- Set MASTER BATTERY switch ON.
- Check if meter indicates 18 to 30 volts dc.

Does meter indicate 18 to 30 volts dc?



TO VEHICLE
GROUND

HULL POWER HARNESS
CONNECTOR (HIDDEN)



COMMANDER'S
STATION

12

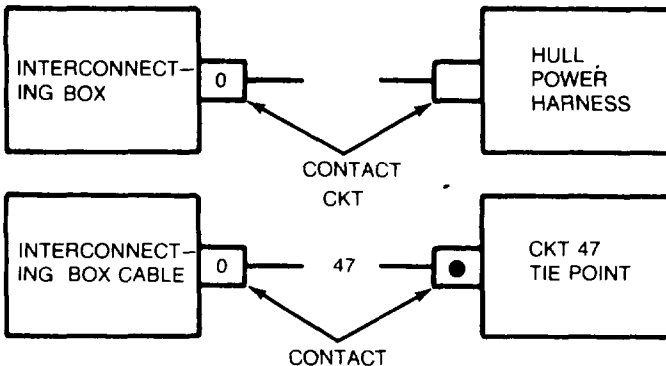
- Inspect interconnecting box cable for bent/broken connector contacts or loose wire at rear of connectors.
- Repair connectors if defective TM5-5420-226-20.
- If connectors are not defective, replace interconnecting box cable TM5-5420-226-20.

YES

NO

13

- Inspect hull power harness for bent/broken connector contacts or loose CKT 47 wire at rear of connectors.
- Repair connectors if defective TM5-5420-226-20.
- If connectors are not defective, notify support maintenance of a defective hull power harness.
- Reconnect hull power harness connector to interconnecting box cable.



TA170229

CHAPTER 3
ORGANIZATIONAL MAINTENANCE INSTRUCTIONS

INDEX

| SECTION | PROCEDURES | PAGE |
|---------|--|-------|
| I | Mechanical and Miscellaneous | 3-2 |
| II | Valves and Associated Hydraulics (Hydraulic Diagram Index) | 3-61 |
| III | Filter, Hose Assemblies, and Associated Hydraulics | 3-119 |
| IV | Hydraulic Cylinders | 3-217 |
| V | Hydraulic Reservoir Components and Antenna Base Armor | 3-251 |

Section I. MECHANICAL AND MISCELLANEOUS PROCEDURES

RESERVOIR QUADRANT BLOWER ASSEMBLY REPLACEMENT {Sheet 1 of 5}

PROCEDURE INDEX

| PROCEDURE | PAGE |
|--------------|------|
| Removal | 3-2 |
| Installation | 3-4 |

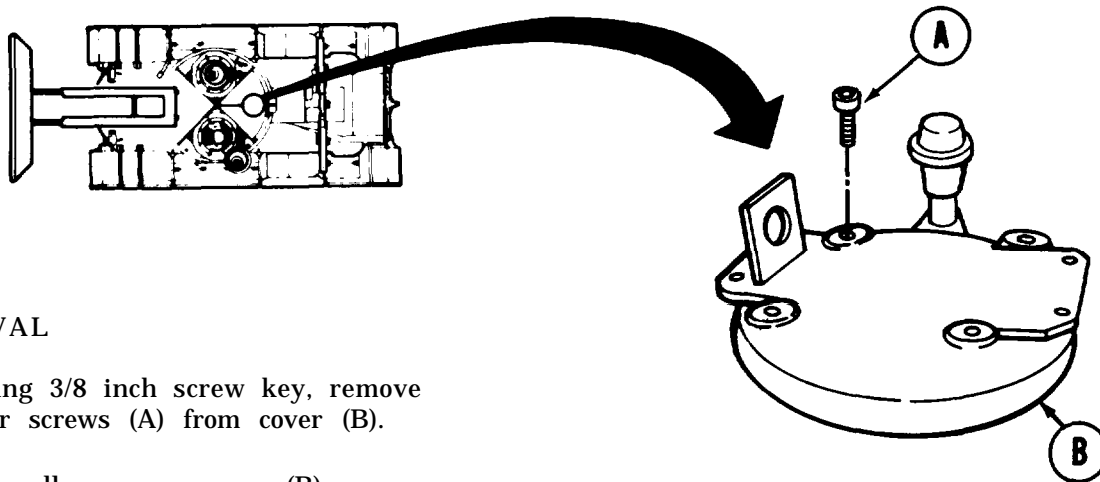
TOOLS: 3/16 in. socket head screw key (allen wrench)
 5/16 in. socket head screw key (allen wrench)
 3/8 in. socket head screw key (allen wrench)
 7/16 in. combination box and open end wrench
 3/4 in. socket with 1/2 in. drive
 Ratchet with 1/2 in. drive
 Flat-tip screwdriver
 Putty knife
 3/8 in. combination wrench
 1-1/8 in. open end wrench
 Hammer

SUPPLIES: Gasket
 Lockwashers (10 required)

PERSONNEL: Two

REFERENCE: TM 5-5420-226-10

PRELIMINARY PROCEDURE: Remove antenna base armor (page 3-254)



REMOVAL

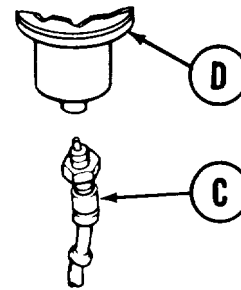
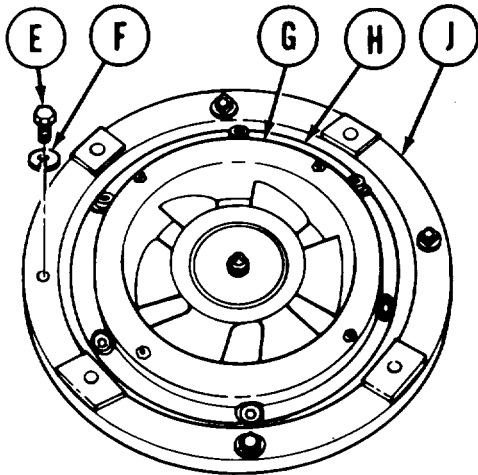
1. Using 3/8 inch screw key, remove four screws (A) from cover (B).
2. Manually remove cover (B).

Go on to Sheet 2

TA170230

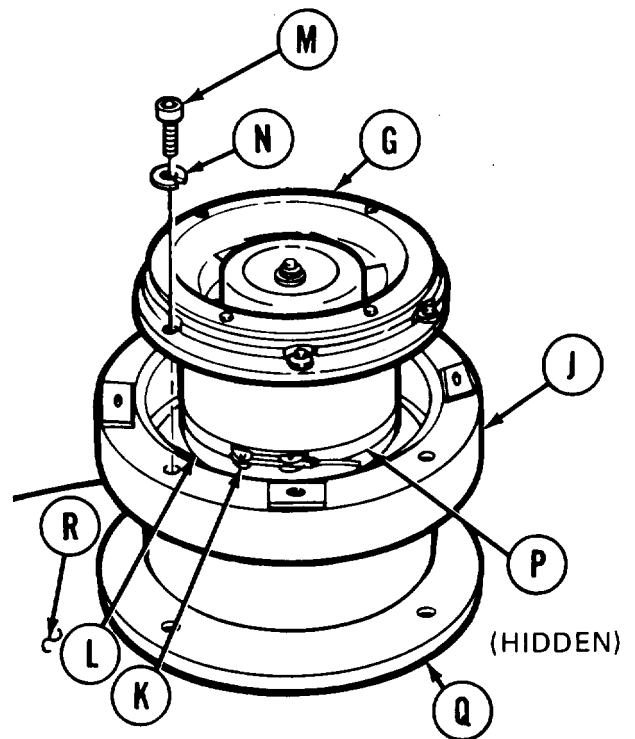
RESERVOIR QUADRANT BLOWER ASSEMBLY REPLACEMENT (Sheet 2 of 5)

- Using 1-1/8 inch wrench inside vehicle, disconnect electrical lead (C) from blower assembly (D).



- Using 3/4 inch socket, remove four screws (E) and lockwashers (F). Throw lockwashers (F) away.
- Using second technician, lift blower assembly (G) shock mount (H) and ring (J) from vehicle.

- Using 3/8 inch wrench, remove clamp (K) from motor silencer (L).
- Using one person to support ring (J), use 5/16 inch screw key to remove six screws (M) and lockwashers (N). Throw lockwashers (N) away.
- Remove ring (J) from blower assembly (G).
- Using flat-tip screwdriver, bend tabs (P) of silencer (L) away from blower assembly (G).
- Remove silencer (L) and ring (J) from blower assembly (G).
- Using putty knife, remove gasket (Q) from bottom of ring (J) or quadrant (R).

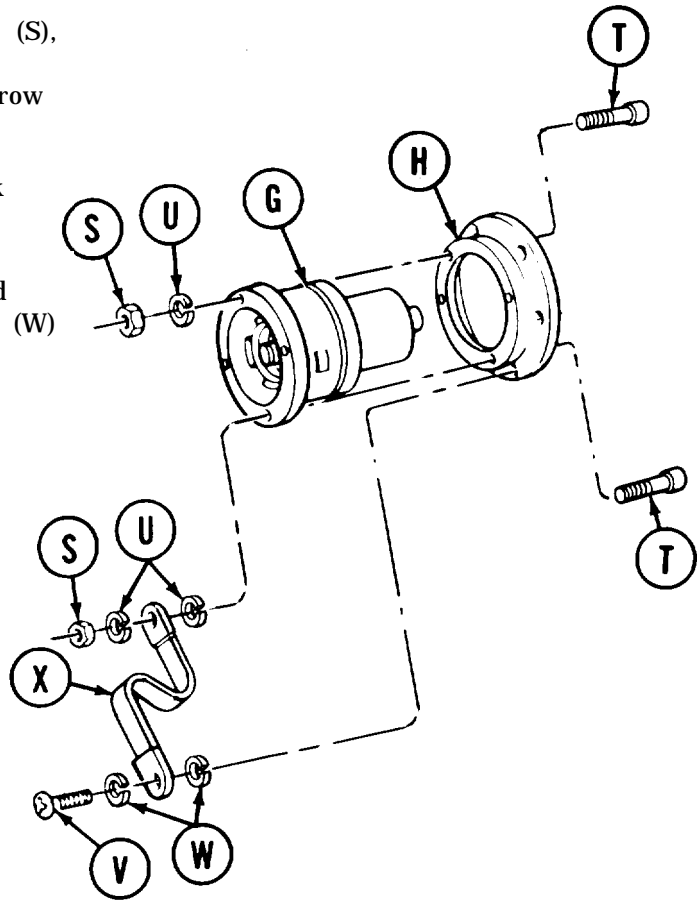


Go on to Sheet 3

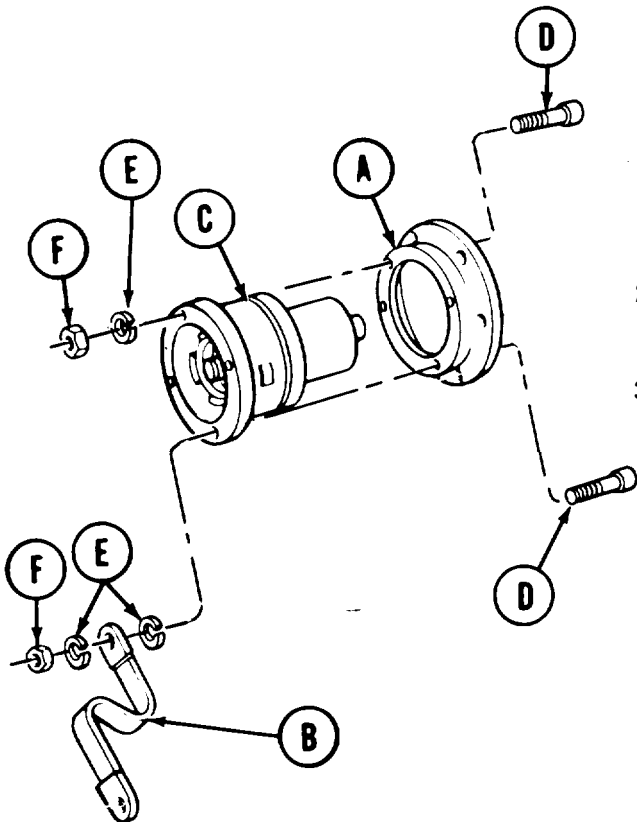
TA170231

RESERVOIR QUADRANT BLOWER ASSEMBLY REPLACEMENT (Sheet 3 of 5)

12. Using 7/16 inch wrench to hold four nuts (S), use 3/16 inch screw key to remove four screws (T) and five lockwashers (U). Throw lockwashers (U) away.
13. Remove blower assembly (G) from shock mount (H).
14. Using screwdriver, remove screw (V) and two lockwashers (W). Throw lockwashers (W) away.
15. Remove ground strap (X).



INSTALLATION:



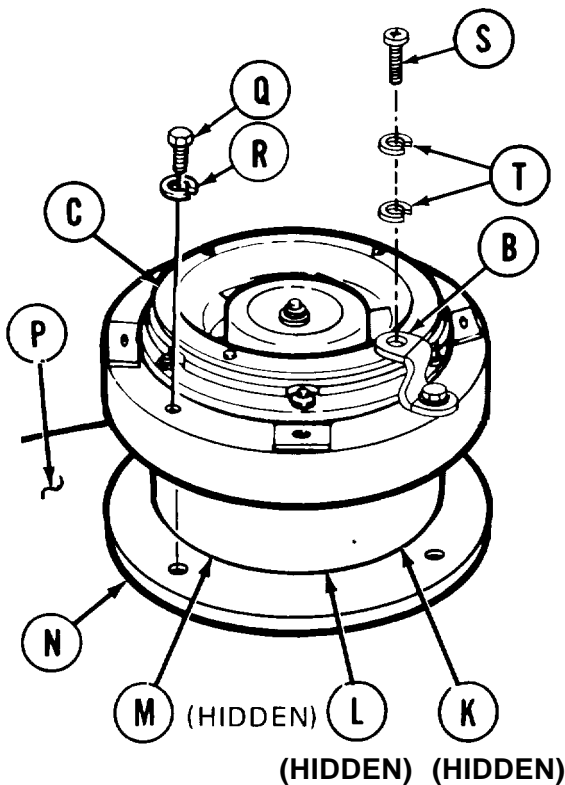
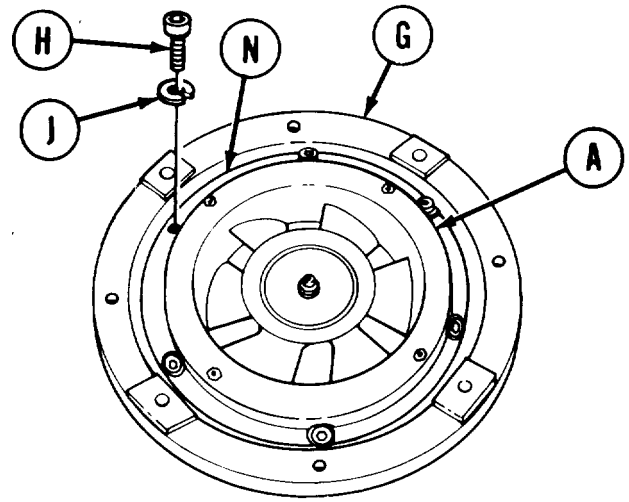
1. Place shock mount (A) and ground strap (B) in position on blower assembly (C).
2. Manually install four screws (D), five lockwashers (E), and four nuts (F).
3. Using 7/16 inch wrench to hold four nuts (F), use 3/16 inch screw key to tighten four screws (D) to secure blower assembly (C) and ground strap (B) to shock mount (A).

Go on to Sheet 4

TA170232

RESERVOIR QUADRANT BLOWER ASSEMBLY REPLACEMENT (Sheet 4 of 5)

4. Position ring (G) onto shock mount (A).
5. Using 5/16 inch socket head screw key, install six screws (H) and lockwashers (J) securing ring (G) to shock mount (A).
6. Manually position silencer (K) on blower assembly (C).
7. Using hammer, bend tabs (L) of silencer (K) against blower assembly (C).
8. Using 3/8 inch wrench, install clamp (M) on silencer (K).
9. Position gasket (N) on quadrant (P).



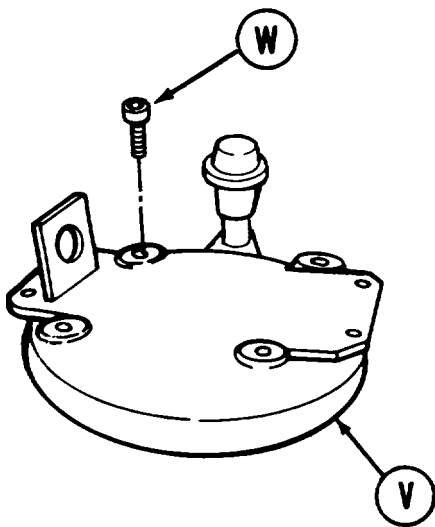
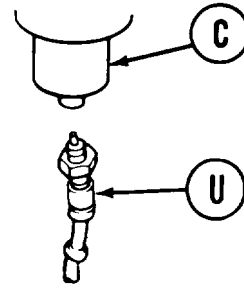
10. Using second person, position blower assembly (C), shock mount (A) and ring (G) in quadrant (P).
11. Using 3/4 inch socket, install four screws (Q) and lockwashers (R) to secure blower assembly (C) to quadrant (P).
12. Using screwdriver, install screw (S), two lockwashers (T) and free end of ground strap (B) to shock mount (A).

Go on to Sheet 5

TA170233

RESERVOIR QUADRANT BLOWER ASSEMBLY REPLACEMENT (Sheet 5 of 5)

- Using 1-1/8 inch wrench, connect electrical lead (U) on blower assembly (C).



- From outside vehicle, place cover (V) in position over blower assembly (C).
- Using 3/8 inch socket head screw key, install four screws (W).

- Install antenna base armor (page 3-255).

End of Task

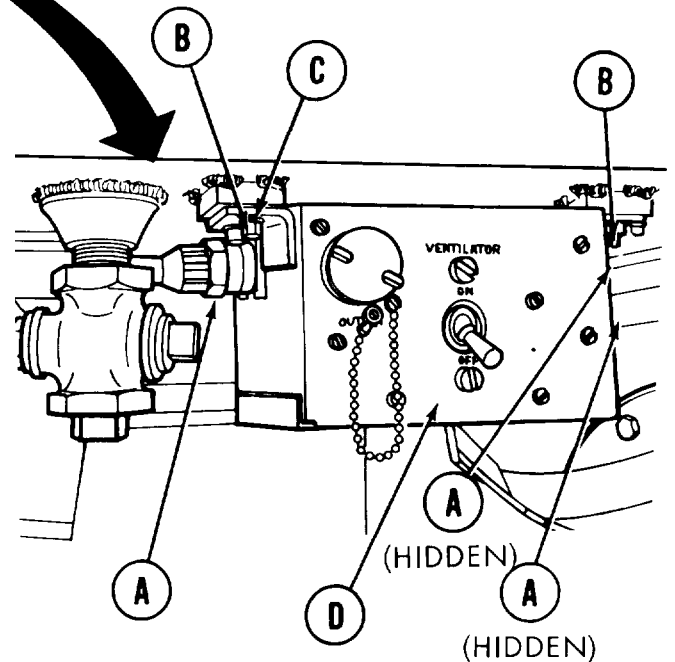
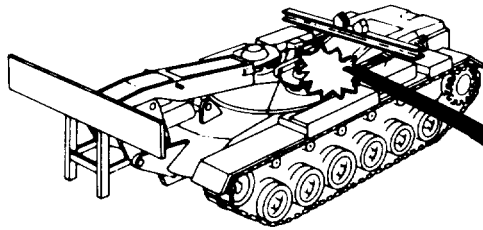
TA170234

ACCESSORIES CONTROL BOX REPLACEMENT (Sheet 1 of 1)

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

SUPPLIES: Lockwashers (4)

REFERENCE: TM 5-5420-226-10



REMOVAL:

1. Using spanner wrench, remove three electrical connectors (A).
2. Using 7/16 inch socket and extension, remove four screws (B), washers and lockwashers (C). Throw lockwashers away.
3. Remove accessories control box (D).

INSTALLATION:

1. Place accessories control box (D) in position in vehicle.
2. Using 7/16 inch socket and extension, install four screws (B), washers and new lockwashers (C).
3. Using spanner wrench, install three electrical connectors (A).
4. Do operational test (TM 5-5420-226-10).

End of Task

TA170235

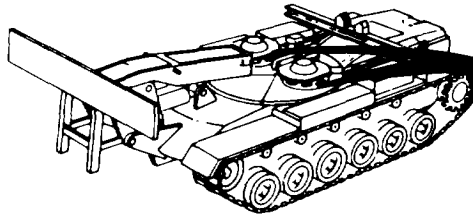
CUPOLA COVER REPLACEMENT (Sheet 1 of 2)

TOOLS: Roller head pry bar
 Snap ring pliers
 Hammer
 Crowbar
 5/16 in. socket head screw key (allen wrench)
 Brass drift

SUPPLIES: Retaining rings (2)
 Rope, 1/2 in. (app. 10 ft.)

PRELIMINARY PROCEDURES: Remove hatch mount lid (page 3-22).
 Remove cupola cover handles (page 3-15).

PERSONNEL: Two

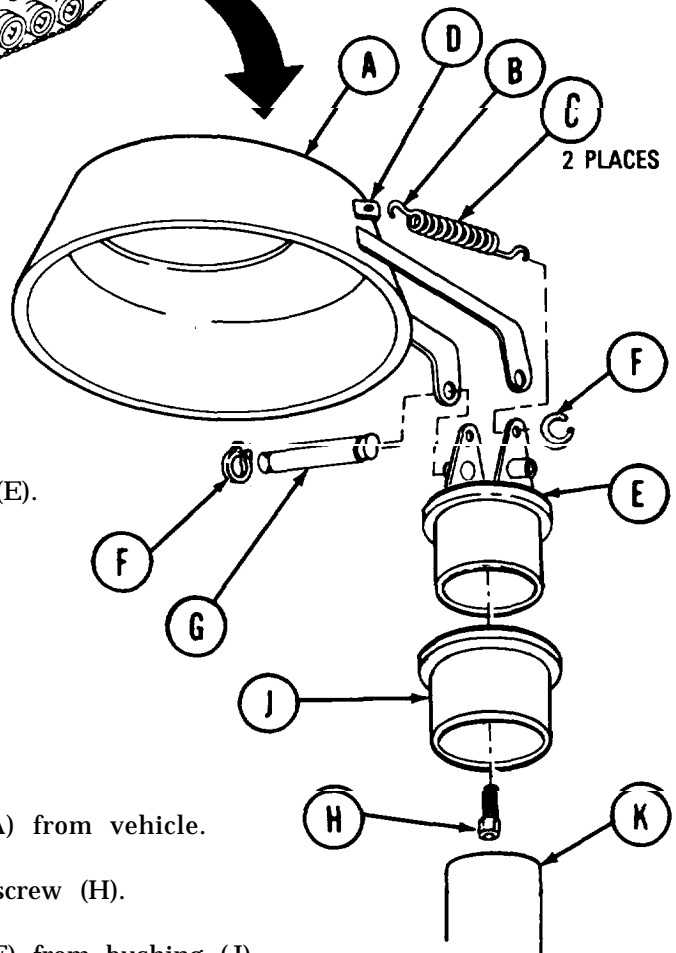


REMOVAL:

NOTE

Left and right covers are identical.

1. Open cover (A).
2. Loop rope around forward eye (B) of spring (C) and while first technician pulls 'slowly forward and side to side with rope, second technician uses pry bar to pry forward eye (B) of spring (C) out of cover bracket (D).
3. Remove spring (C) from swing assembly (E).
4. Repeat steps 2 and 3 for opposite spring. Close cover (A).
5. Using pliers, remove two retaining rings (F) from hinge pin (G).
6. Using hammer, and brass drift tap out hinge pin (G).
7. With second technician, remove cover (A) from vehicle.
8. From inside vehicle, use key to remove screw (H).
9. Using crowbar, pry out swing assembly (E) from bushing (J).
10. Using crowbar, pry out bushing (J) from mount (K).



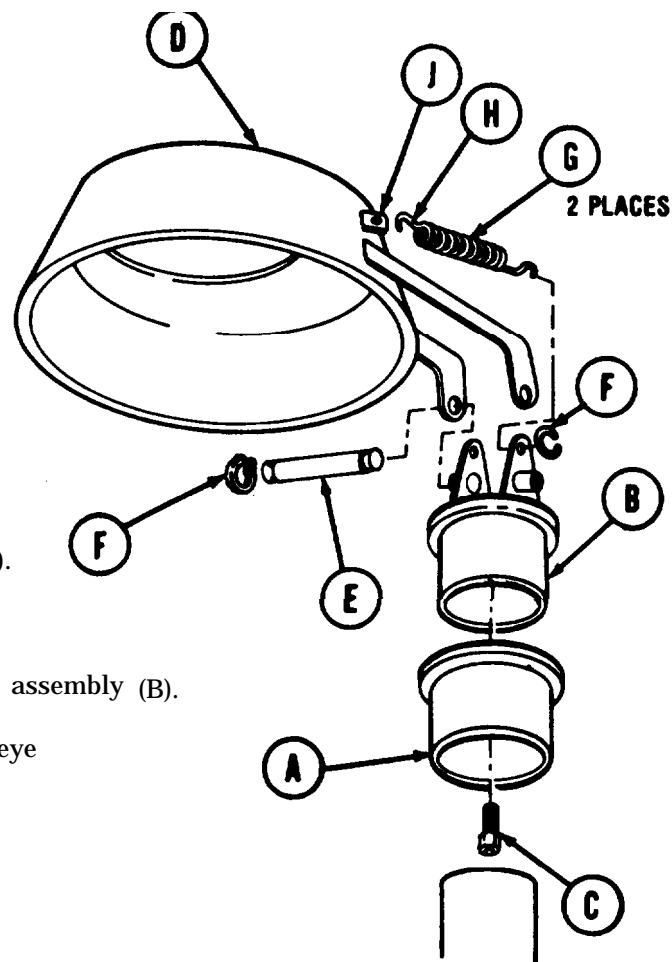
TA170236

Go on to Sheet 2

CUPOLA COVER REPLACEMENT (Sheet 2 of 2)

INSTALLATION:

1. Manually install bushing (A).
2. Using hammer as needed, install swing assembly (B) until firmly positioned and seated on vehicle in bushing (A).
3. From inside vehicle, use key to install screw (C) into swing assembly (B).
4. With second technician, position cover (D) on vehicle in closed position.
5. Using hammer, tap in hinge pin (E).
6. Using pliers, install two retaining rings (F).
7. Lock cover (D) in open position.
8. Place two springs (G) in position on swing assembly (B).
9. Using pry bar and hammer guide forward eye (H) of springs (G) into cover eye (J).
10. Install hatch mount lid (page 3-23).
11. Install cupola cover handles (page 3-16).



End of Task

TA170237

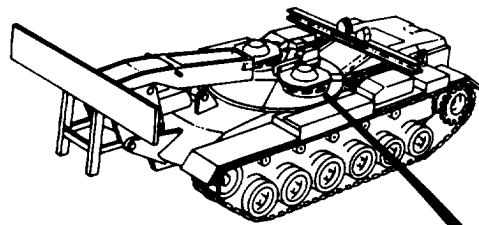
CUPOLA TOP AND VISION BLOCK REPLACEMENT (Sheet 1 of 3)

TOOLS: Diagonal cutting pliers (side cutters)
1-1/8 in. socket with 1/2 in. drive
3/4 in. socket with 1/2 in. drive
Crowbar
Sledge hammer
Putty knife
1/2 in. combination wrench

Chisel
Hammer
Ratchet with 1/2 in. drive
1-1/8 in. socket with 3/4 in. drive
Pliers, slip joint
Torque wrench 0 to 600 lb-ft 3/4 in. drive
(0 to 813 N•m)

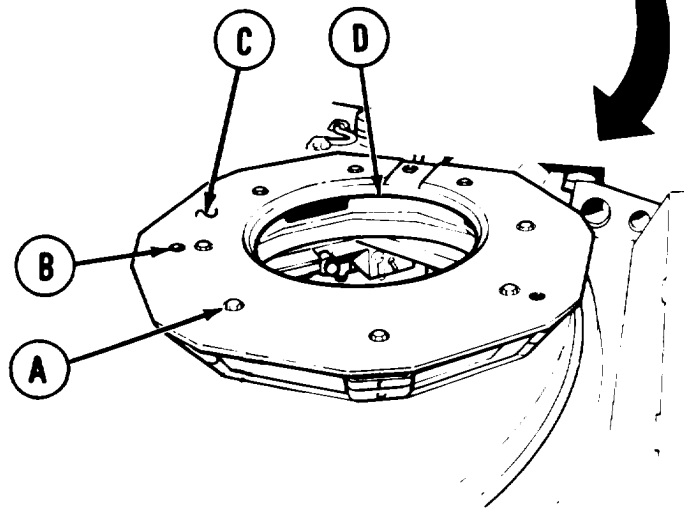
SUPPLIES: Sealing compound (Item 2, Appendix D)
Lockwire (Item 20, Appendix D)
Seal
Brush (Item 4, Appendix D)

PERSONNEL: Two



REMOVAL:

1. Using 1-1/8 inch socket, remove eight screws (A).
2. Using 3/4 inch socket, remove three screws (B).
3. Using crowbar, pry up on edge of cupola top (C) while second technician taps edge of cupola top (C) with sledge hammer to loosen it.
4. Using second technician, remove cupola top (C) from vehicle.
5. Using putty knife, remove seal (D).



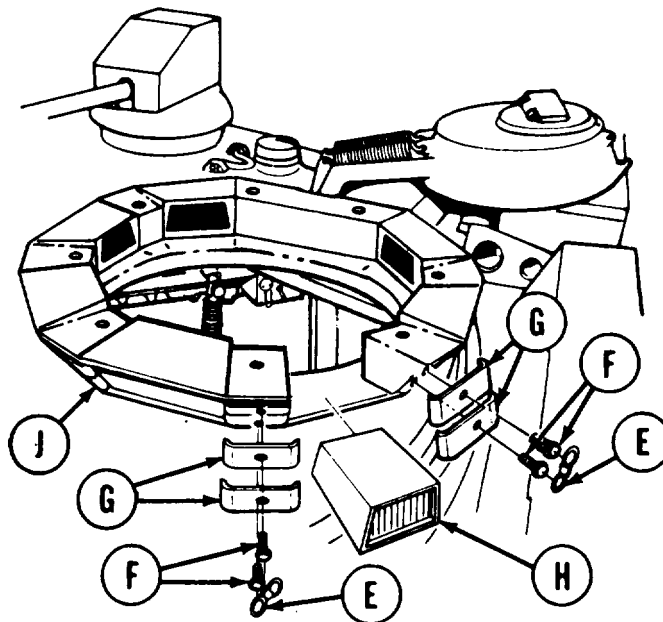
Go on to Sheet 2

CUPOLA TOP AND VISION BLOCK REPLACEMENT (Sheet 2 of 3)

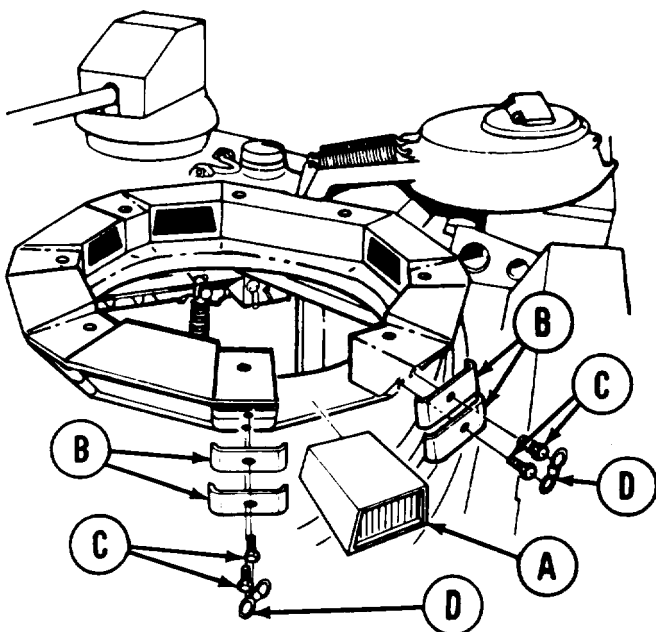
NOTE

Removal and installation are the same for all seven blocks except two rear blocks. Rear blocks have only three retainers.

6. Using side cutters, remove lockwire (E).
7. Using 1/2 inch wrench, remove screws (F) and retainers (G).
8. Using chisel and hammer, remove vision block (H).
9. Using putty knife, remove sealant from vision block (H) and cupola body (J).



INSTALLATION:



1. Using brush, coat sides, top, and bottom of vision block (A) with sealing compound.
2. Place vision block (A) in position.
3. Place retainers (B) in position.
4. Manually install screws (C) to secure vision block (B).
5. Using 1/2 inch wrench, tighten screws (c).
6. Using pliers, install lockwire (D).

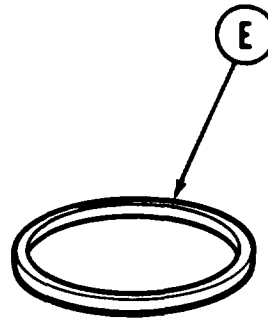
Go on to Sheet 3

TA170241

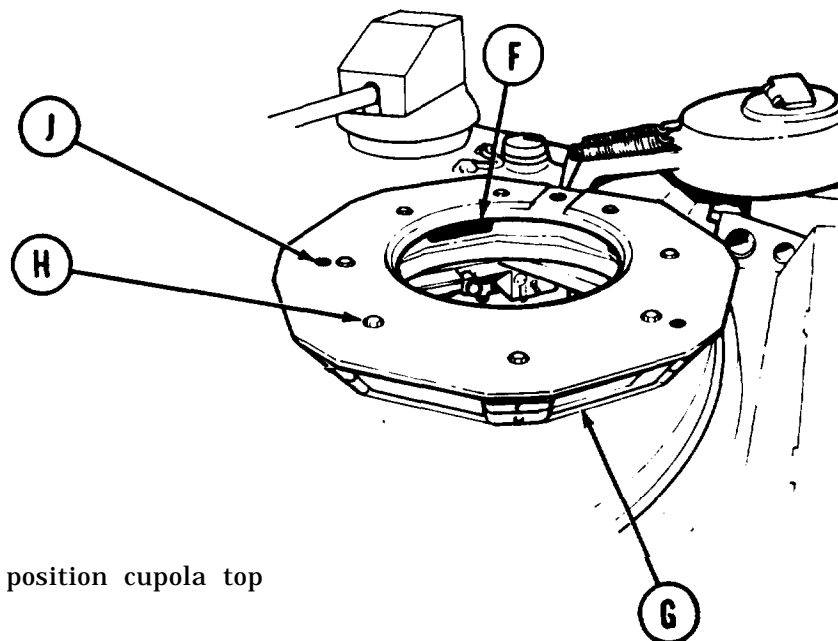
CUPOLA TOP AND VISION BLOCK REPLACEMENT (Sheet 3 of 3)

7. Using putty knife, apply adhesive to new seal (E) and around cupola top (F).

8. Install seal (E) on to cupola top (F).



9. Using brush, coat underside mating surface of cupola top (F) with sealant.



10. With second technician, position cupola top (F) on body (G).

11. Using brush, apply sealant to eight screws (H).

12. Using 1-1/8 inch socket, install eight screws (H).

13. Using torque wrench, tighten eight screws (H) to 280-310 lb-ft (379-420 N•m).

14. Using brush, apply sealing compound to three screws (J).

15. Using 3/4 inch socket, install three screws (J).

END OF TASK

CUPOLA BODY REPLACEMENT (Sheet 1 of 2)

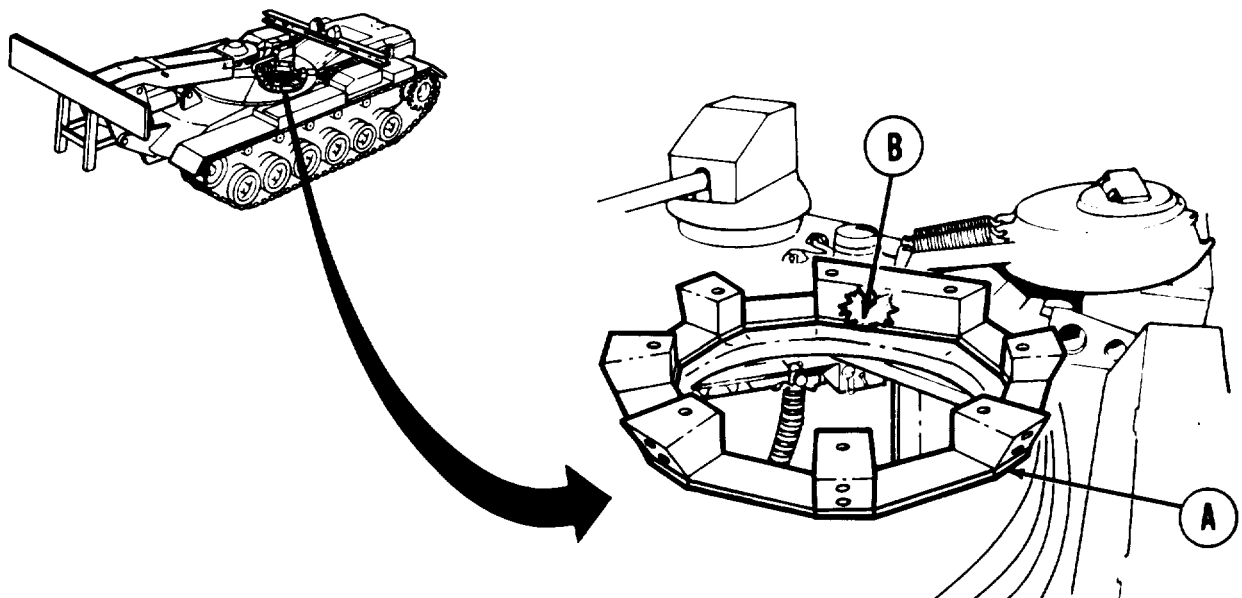
TOOLS: Putty knife

SUPPLIES: Seal
Adhesive (Item 2, Appendix D)
Brush (Item 4, Appendix D)

PERSONNEL: Two

REFERENCE: TM 5-5420-226-10

PRELIMINARY PROCEDURE: Remove cupola top and vision blocks (page 3-10).

**REMOVAL:**

1. With second technician, remove body (A) from vehicle.
2. Using putty knife, scrape away seal (B).

Go on to Sheet 2

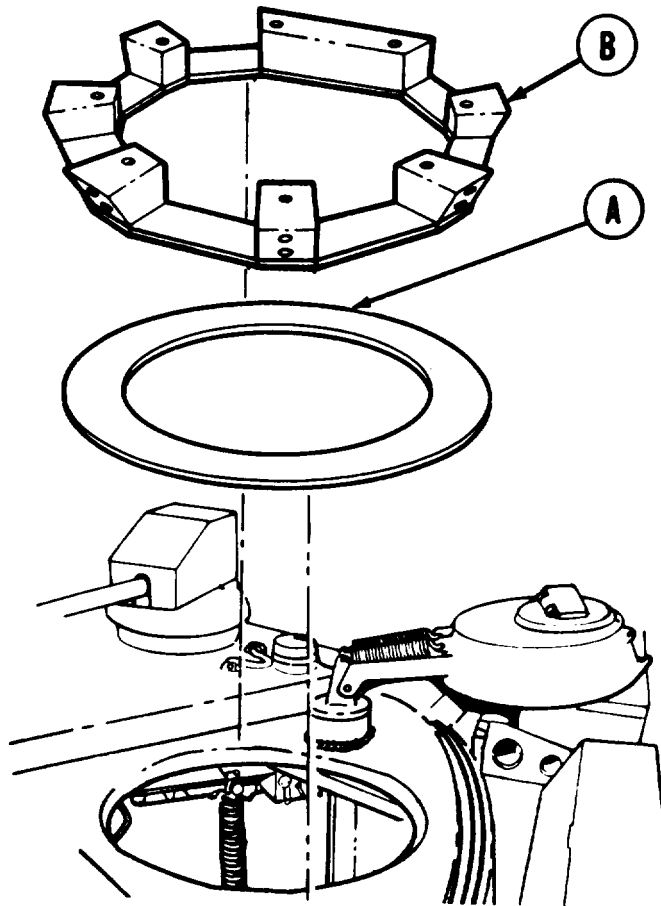
TA170238

CUPOLA BODY REPLACEMENT (Sheet 2 of 2)

INSTALLATION:

1. Using putty knife, apply adhesive to new seal (A).
2. Install seal (A).
3. Using brush, coat bottom of body (B)" with sealant.
4. With second technician, position body (B) on vehicle.
5. Install vision blocks and cupola top (page 3-13).

End of Task

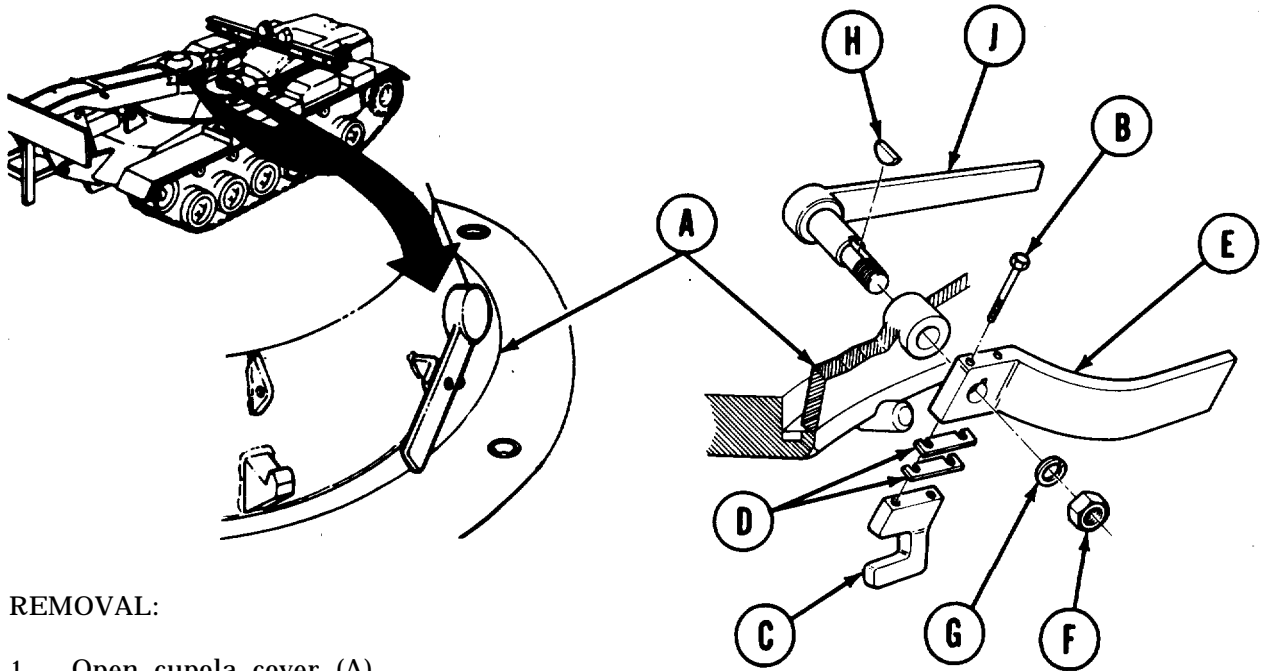


CUPOLA COVER HANDLES REPLACEMENT (Sheet 1 of 2)

TOOLS: 7/16 in. combination wrench
 15/16 in. socket with 1/2 in. drive
 Ratchet with 1/2 in. drive
 Hammer

SUPPLIES: Shims (as required)
 Lockwasher

PERSONNEL: Two



REMOVAL:

1. Open cupola cover (A).

NOTE

**If replacing only outside handle,
 go to step 4.**

2. Using wrench, remove two screws (B).
3. Remove hook (C) and shims (D), if any, from inside handle (E). Retain shims (D) for installation.
4. Using 15/16 inch socket, remove nut (F) and lockwasher (G). Throw lockwasher (G) away.
5. Manually pull off inside handle (E).
6. Manually remove woodruff key (H) and retain for installation.
7. Using hammer, tap out outside handle (J).

Go on to Sheet 2

TA170243

CUPOLA COVER HANDLES REPLACEMENT (Sheet 2 of 2)

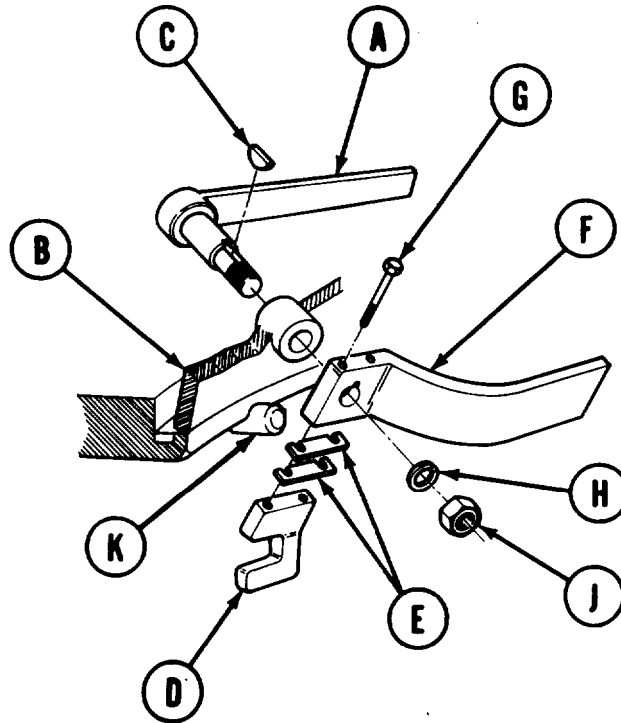
INSTALLATION:

1. Manually slide outside handle (A) through cupola cover (B).
2. Manually install woodruff key (C).

NOTE

If only outside handle was replaced, go to step 6.

3. Place hook (D) and shims (E), if any, in position on inside handle (F).
4. Manually install two screws (G).
5. Using wrench, tighten two screws (G).



6. Manually slide inside handle (F) into position on shaft of outside handle (A).
7. Manually install new lockwasher (H) and nut (J).
8. Using 15/16 inch socket, tighten nut (H).
9. From inside vehicle, close cupola cover (B).
10. Have second technician hold down cover (B) from outside of vehicle while performing next step.
11. Latch inside handle (F) to see that hook (D) properly contacts locking lug (K) and seals cupola cover (B).
12. If hook (D) does not contact lug (K) or seal properly, add or remove shims (E) as needed between hook (D) and inside handle (F).

End of Task

TA170244

CUPOLA COVER SAFETY LATCH REPLACEMENT (Sheet 1 of 2)

TOOLS: 3/4 in. socket with 1/2 in. drive
 Ratchet with 1/2 in. drive
 3/4 in. combination wrench
 1/8 in. drive pin punch
 Hammer
 Long round nose pliers

SUPPLIES: Cotter pin
 Lockwasher
 Spring pin

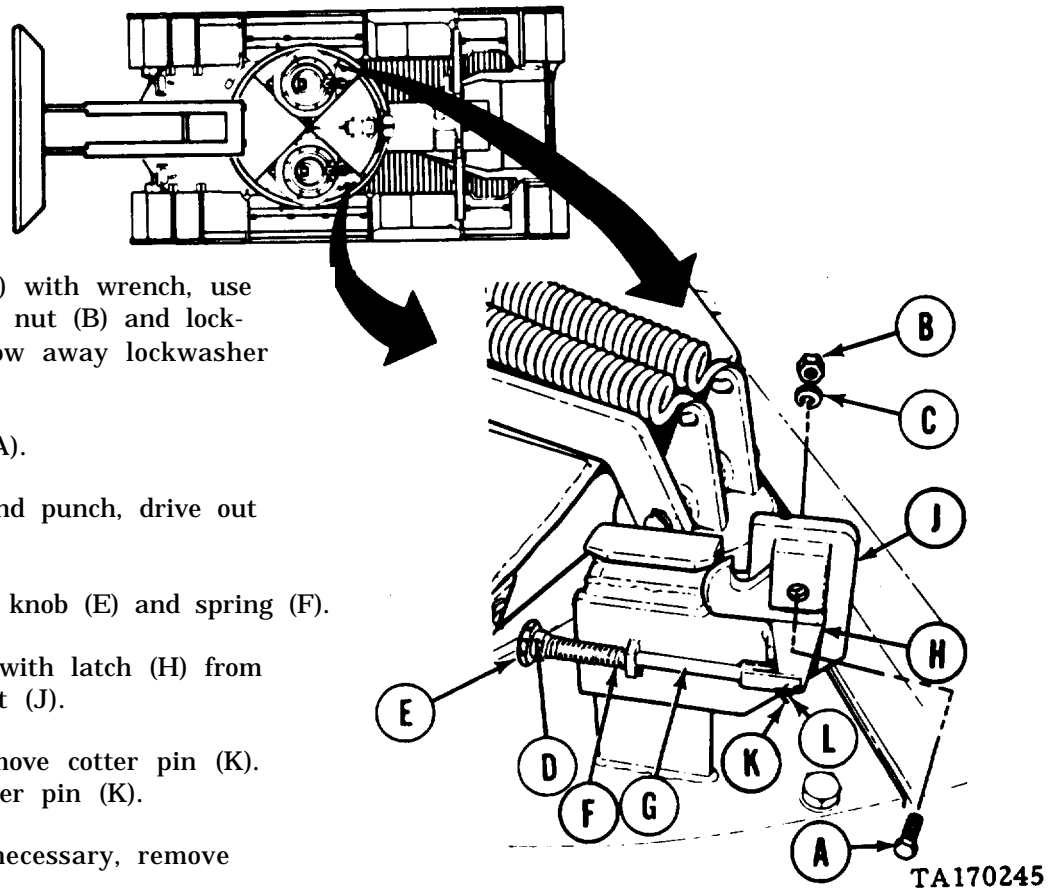
PERSONNEL: One

REFERENCE: TM 5-5420-226-10

PRELIMINARY PROCEDURE: Close cupola cover (TM 5420-226-10)

REMOVAL:

1. Holding screw (A) with wrench, use socket to remove nut (B) and lockwasher (C). Throw away lockwasher (c).
2. Remove screw (A).
3. Using hammer and punch, drive out spring pin (D).
4. Manually remove knob (E) and spring (F).
5. Remove rod (G) with latch (H) from mounting bracket (J).
6. Using pliers, remove cotter pin (K). Throw away cotter pin (K).
7. Using pliers if necessary, remove headed pin (L).

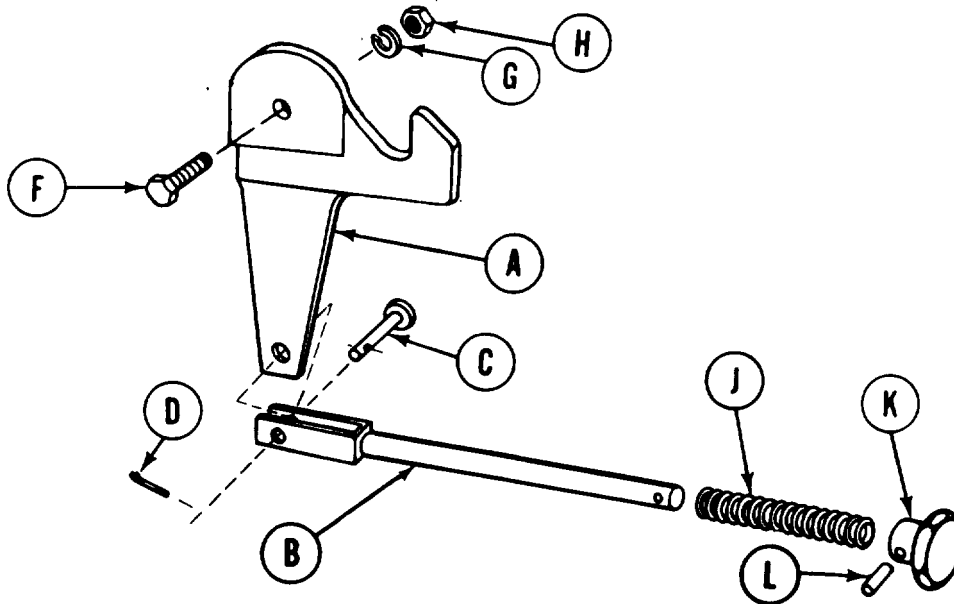


Go on to Sheet 2

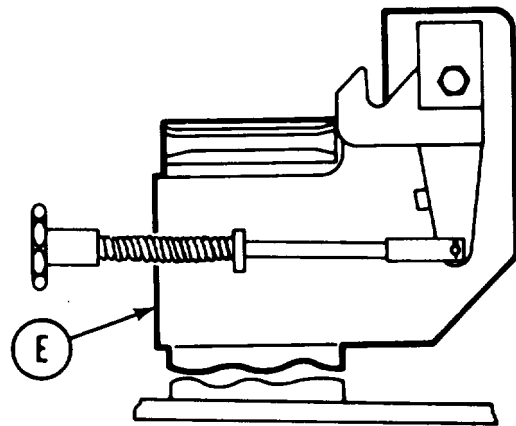
CUPOLA COVER SAFETY LATCH REPLACEMENT (Sheet 2 of 2)

INSTALLATION:

1. Position latch (A) in rod (B) with holes alined.
2. Manually insert headed pin (C) through holes with head in direction shown.
3. Using pliers, install new cotter pin (D).
4. Place rod (B) with latch (A) in position on mounting bracket (E).



5. Manually install screw (F), new lockwasher (G), and nut (H).
6. Holding screw (F) with wrench, use socket to tighten nut (H) so that latch (A) can move freely.
7. Place spring (J) on end of rod (B).
8. Place knob (K) in position on rod (B).
9. Using punch, aline holes in knob (K) and rod (B).
10. Using hammer and punch, install new spring pin (L).
11. Do operational check (TM 5-5420-226-10).



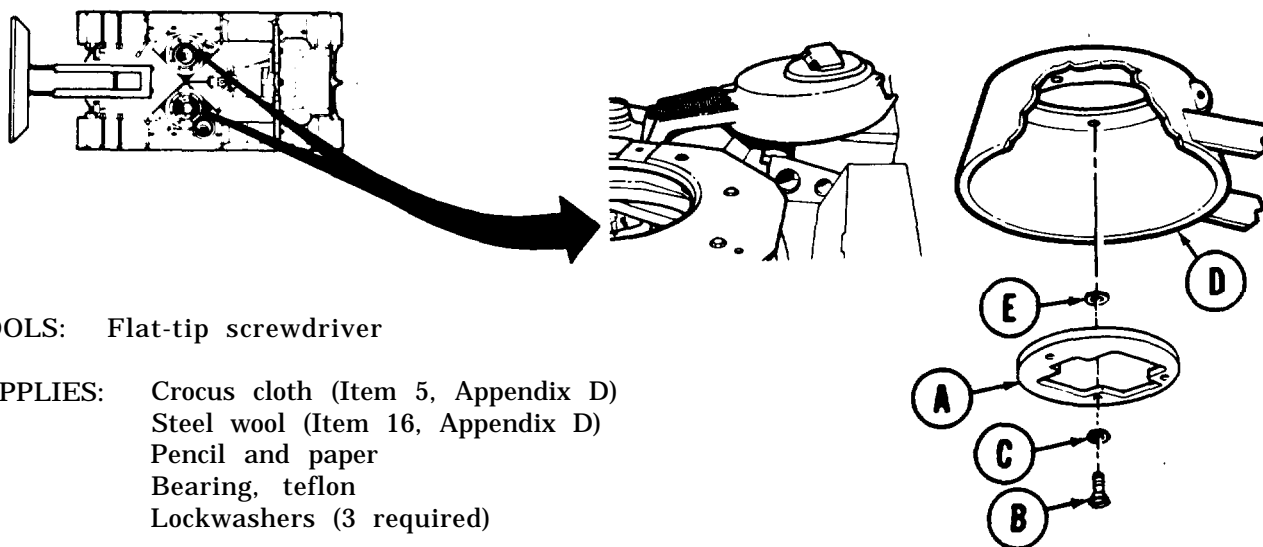
End of Task

TA170246

PERISCOPE MOUNT REPLACEMENT (Sheet 1 of 3)

PROCEDURE INDEX

| PROCEDURE | PAGE |
|-------------------------|------|
| Removal | 3-19 |
| Cleaning and Inspection | 3-20 |
| Installation | |



TOOLS: Flat-tip screwdriver

SUPPLIES: Crocus cloth (Item 5, Appendix D)
 Steel wool (Item 16, Appendix D)
 Pencil and paper
 Bearing, teflon
 Lockwashers (3 required)

REFERENCE: TM 5-5420-226-10

PRELIMINARY PROCEDURE: Close hatch cover (TM 5-5420-226-10)

REMOVAL:

1. Firmly support mounting plate (A) in position with one hand.
2. With other hand, use screwdriver to remove three screws (B) and three lockwashers (C) from lower side of plate (A). Throw lockwashers (C) away.

NOTE

Shims are positioned on top of mounting plate (A). Keep mount plate (A) as level as possible when removing.

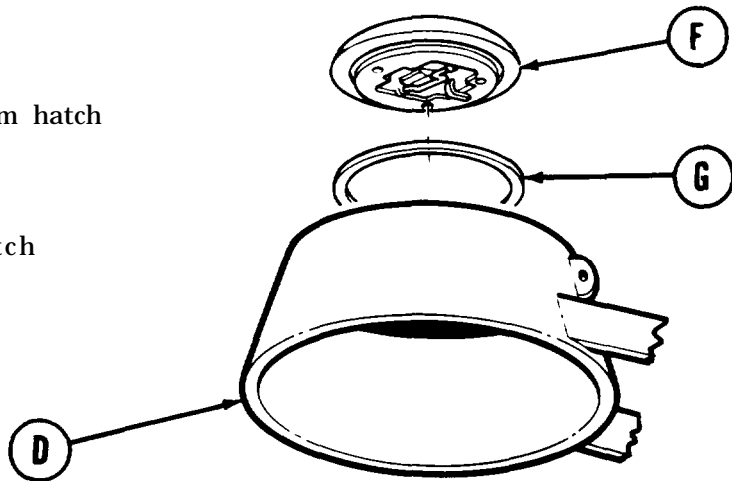
3. With both hands firmly supporting mounting plate (A), lower mounting plate from cover (D).
4. Remove shims (E) from upper side of plate (A). Record number of shims positioned at each location for installation purposes.

Go on to Sheet 2

TA170247

PERISCOPE MOUNT REPLACEMENT (Sheet 2 of 3)

5. Push up mount (F) and separate from hatch cover (D).
6. Remove bearing (G) from top of hatch cover (D). Throw bearing (G) away.

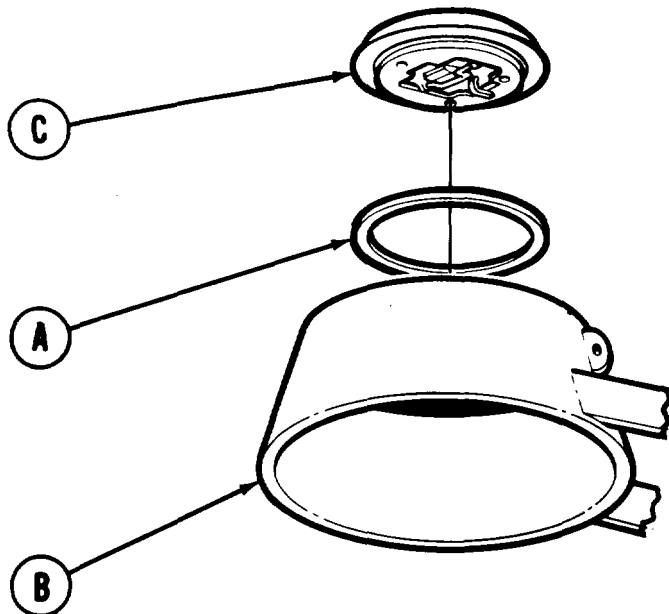


CLEANING AND INSPECTION:

1. Visually inspect all parts for damage or wear. All damaged or worn parts must be replaced.
2. Visually inspect all parts for corrosion. Corroded metallic parts which cannot be cleaned with crocus cloth or steel wool must be replaced.

INSTALLATION:

1. Place new bearing (A) on cover (B) at mount opening.
2. Place mount (C) on hatch cover (B).

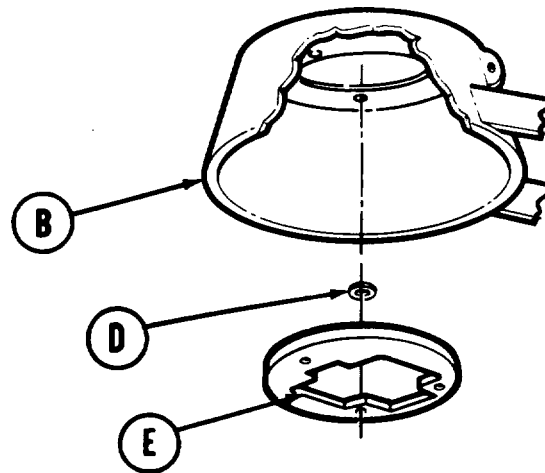


Go on to Sheet 3

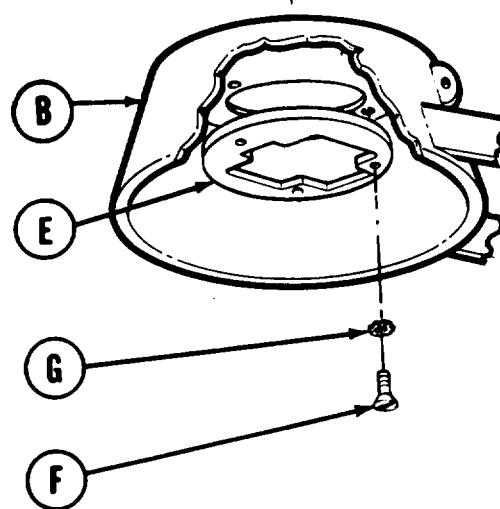
TA170248

PERISCOPE MOUNT REPLACEMENT (Sheet 3 of 3)

3. Position Shims(D) on topside of plate (E) in exact order as recorded.
4. Raise plate (E) with shims (D) to aline plate with holes in hatch cover (B).



5. Hold plate (E) in alined position and manually install three screws (F) and new lock-washers (G) to hatch cover (B).
6. Using screwdriver, tighten screws (F).
7. Open hatch cover (TM 5-5420-226-10).



End of Task

TA170249

PERISCOPE MOUNT LID REPLACEMENT (Sheet 1 of 3)

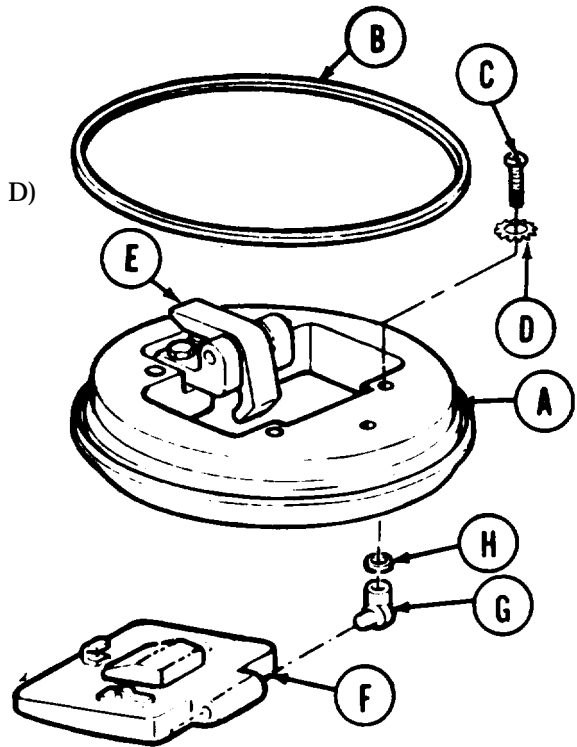
TOOLS: Flat-tip screwdriver
Putty knife

SUPPLIES: Pencil
Paper
Adhesive (Item 1, Appendix D)
Crocus cloth (Item 5, Appendix D)
Steel wool (Item 16, Appendix D)
Dry cleaning solvent (Item 15, Appendix D)
Lockwashers (2 required)
Seal, lid

PRELIMINARY PROCEDURE: Remove periscope mount (page 3-19)

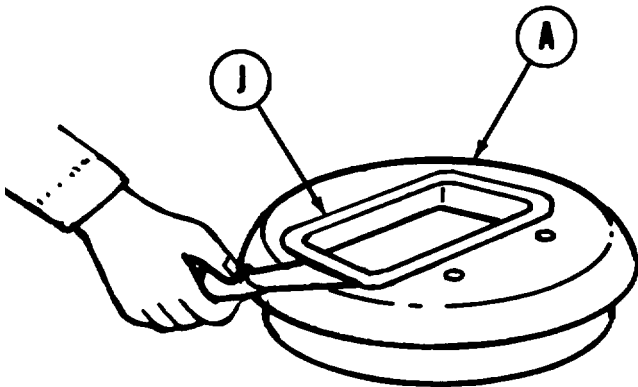
REMOVAL:

1. Position mount (A) bottom side up.
2. Remove seal (B).
3. Using screwdriver, remove two screws (C) and lockwashers (D) from mount (A). Throw lockwashers (D) away.
4. Press latch (E) to free lid (F).
5. Position mount (A) top side up.



NOTE

Record quantity and location of shims during removal for correct lid alignment during installation.



6. Remove lid (F), two hinges (G), and shims (H) from mount (A).
7. Separate two hinges (G) from lid (F).

8. Using putty knife, remove lid seal (J). Throw lid seal (J) away.

Go on to Sheet 2

TA170250

PERISCOPE MOUNT LID REPLACEMENT (Sheet 2 of 3)**CLEANING AND INSPECTION:**

1. Visually inspect all parts for cracks. All cracked parts must be replaced.
2. Visually inspect all parts for mechanical damage or wear. All damaged or worn parts must be replaced.
3. Visually inspect all parts for corrosion. Corroded parts which cannot be cleaned with crocus cloth or steel wool must be replaced.
4. Using putty knife, remove paint and other debris from lid seal mounting surface.

WARNING

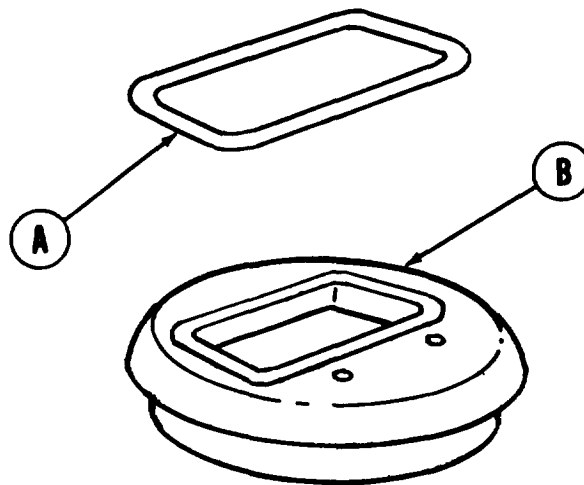
Cleaning agent specified is flammable. Use only in well ventilated areas. Keep away from flames, sparks, or heat. Do not smoke while using. Prevent contact with eyes, mouth, and/or skin. Wear rubber gloves when performing cleaning procedures.

5. Clean mounting surface with clean cloth soaked in dry cleaning solvent.

INSTALLATION:**NOTE**

Minimum room temperature for bonding is 65° F. Do not use taps to hold parts in place.

1. Apply thin coat of adhesive to lid seal groove.
2. Allow adhesive to set for 15 minutes.
3. Place lid seal (A) in groove in mount (B).

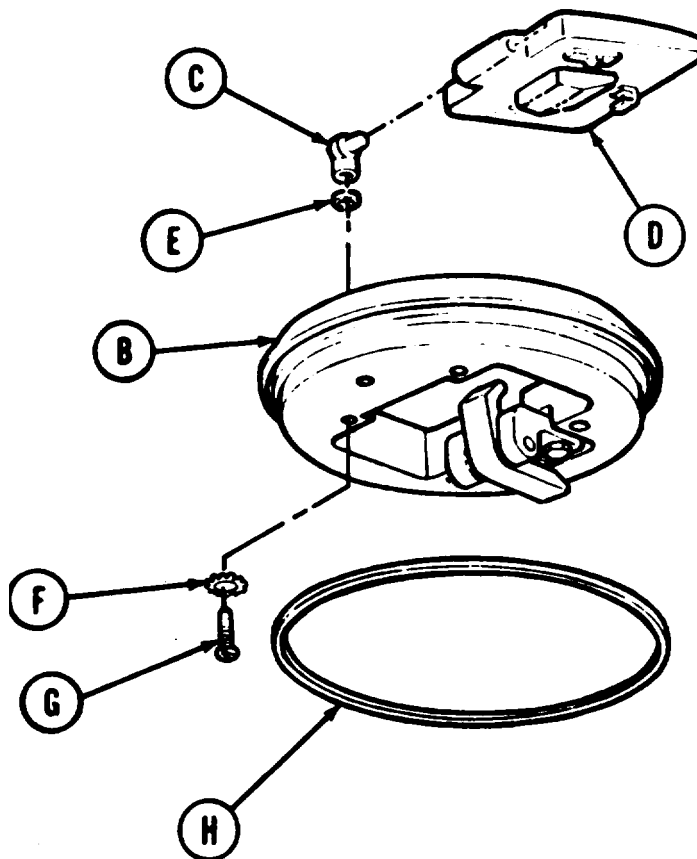


Go on to Sheet 3

TA170251

PERISCOPE MOUNT LID REPLACEMENT (Sheet 3 of 3)

4. Position two hinges (C) into lid (D).
5. Position shims (E) on mount in same order as at removal.
6. Position lid (D) with attached hinges (C) on top side of mount (B).
7. Place two new lock washers (F) onto two screws (G).
8. Using screwdriver, install two screws (G).
9. Press seal (H) in groove of mount (B).
10. Install periscope mount (page 3-21).



End of Task

TA170252

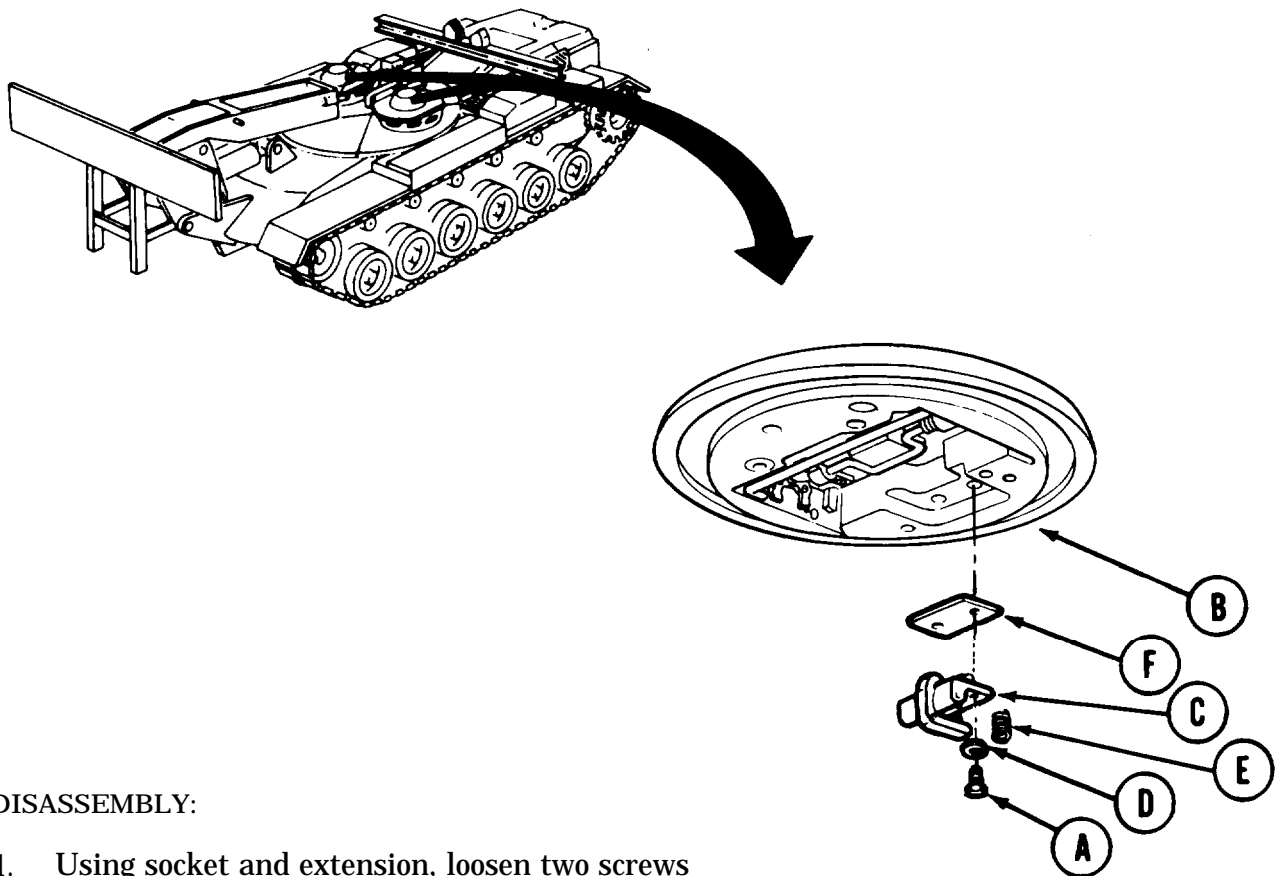
PERISCOPE MOUNT LID LATCH REPAIR (Sheet 1 of 2)

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

SUPPLIES: Crocus cloth (Item 5, Appendix D)
 Steel wool (Item 16, Appendix D)
 Lockwashers (2 required)

REFERENCE: TM 5-5420-226-10

PRELIMINARY PROCEDURE: Close driver's hatch (TM 5-5420-226-1 O)



DISASSEMBLY:

1. Using socket and extension, loosen two screws (A) on underside of mount (B) at latch (C).
2. Supporting latch (C) with one hand, remove two screws (A) and two lockwashers (D). Throw lockwashers (D) away.
3. Lower latch (C) from mount (B) together with latch spring (E) and shim (F).
4. With latch (C) removed from mount (B), separate latch from shim (F) and remove spring (E).

Go on to Sheet 2

TA170253

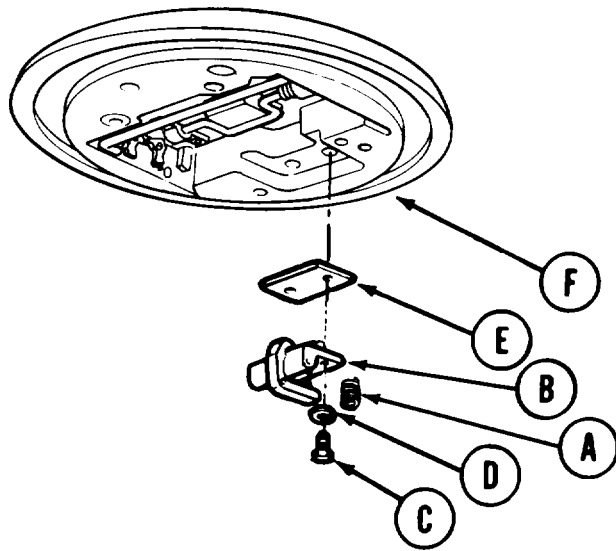
PERISCOPE MOUNT LID LATCH REPAIR (Sheet 2 of 2)

CLEANING AND INSPECTION:

1. Visually inspect all parts for damage or wear. All damaged or worn parts must be replaced.
2. Visually inspect all parts for corrosion. All corroded parts which cannot be cleaned with crocus cloth or steel wool must be replaced.

ASSEMBLY:

1. Place spring (A) on seat provided in latch (B).
2. Put screws (C) and new lockwashers (D) in latch (B).
3. Position shim (E) on screws (C).
4. Place latch (B) in position on mount (F).
5. Manually start screws (C).
6. Using 7/16 inch socket and extension, tighten screws (C).
7. Open driver's hatch (TM 5-5420-226-1 O).



End of Task

PERISCOPE MOUNT RETAINER REPAIR (Sheet 1 of 3)

TOOLS: Flat-tip screwdriver

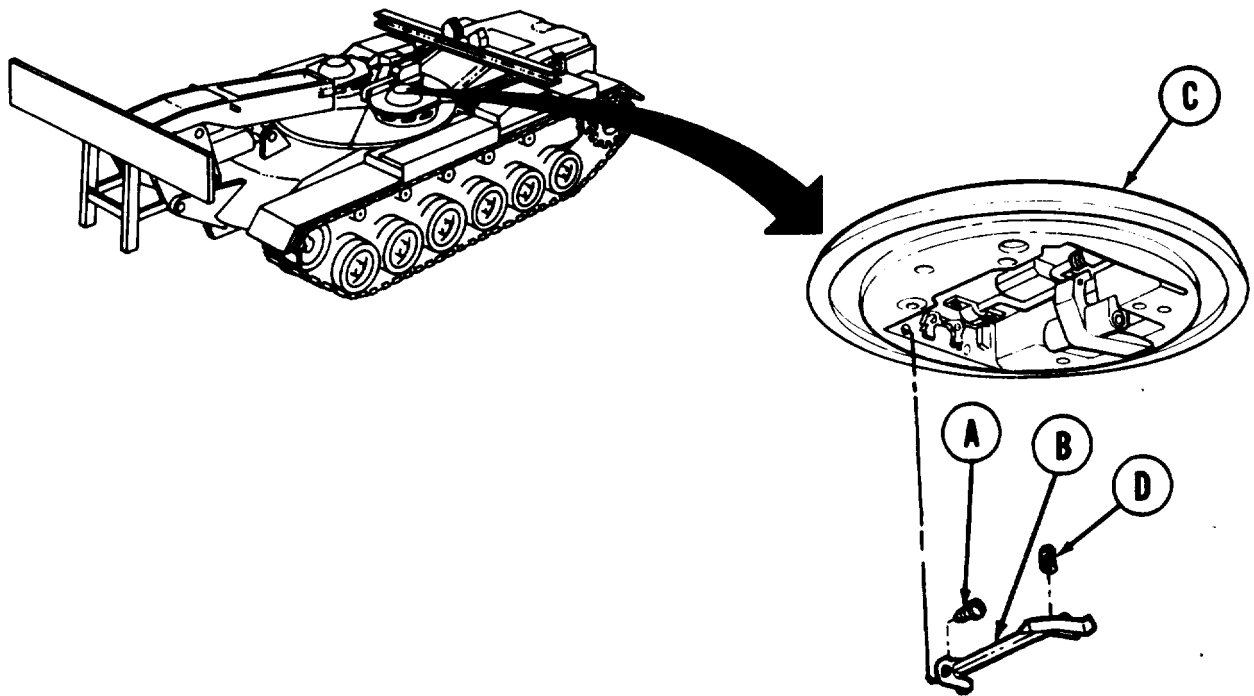
SUPPLIES: Crocus cloth (Item 5, Appendix D)
Steel wool (Item 16, Appendix D)

REFERENCE: TM 5-5420-226-10

PRELIMINARY PROCEDURE: Close hatch cover (TM 5-5420-226-10)

DISASSEMBLY:

1. Using screwdriver, remove two screws (A) securing latch (B) while holding it to mount (C).
2. Remove latch (B) together with two springs (D).

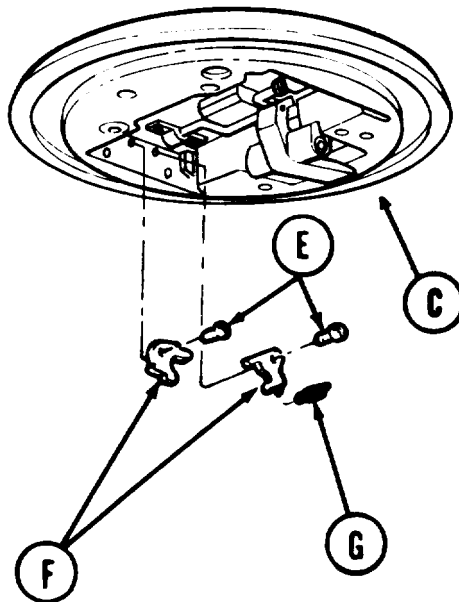


Go on to Sheet 2

TA170255

PERISCOPE MOUNT RETAINER REPAIR (Sheet 2 of 3)

3. Using screwdriver, remove four shoulder screws (E).
4. Remove four retainers (F) together with two extension springs (G) from mount (C).



CLEANING AND INSPECTION:

1. Visually inspect all parts for damage or wear. All damaged or worn parts must be replaced.
2. Visually inspect parts for corrosion. All corroded parts which cannot be cleaned with crocus cloth or steel wool must be replaced.

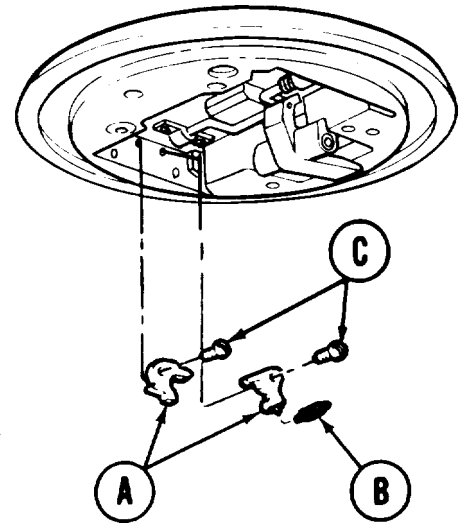
Go on to Sheet 3

TA170256

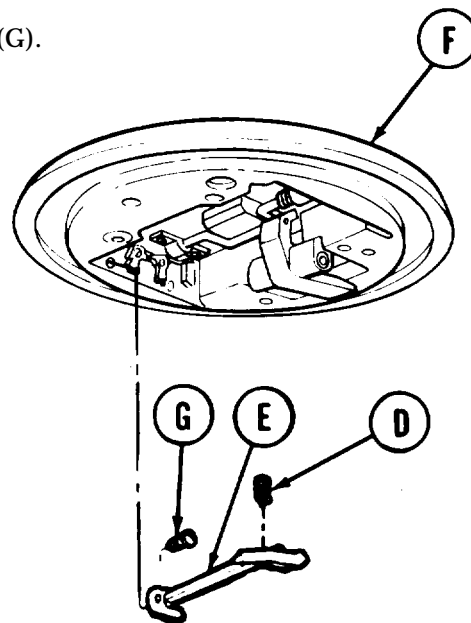
PERISCOPE MOUNT RETAINER REPAIR (Sheet 3 of 3)

ASSEMBLY:

1. Position four retainers (A) with one extension spring (B) for each two retainers (A).
2. Manually install each of the four retainers (A) with shoulder screw (C).
3. Using screwdriver, tighten four screws (C).



4. Using both hands, install two latch compression springs (D) in latch (E).
5. Position latch (E) with springs on mount (F) and attach two screws (G) through latch (E) into mount (F).
6. Using screwdriver, tighten two screws (G).
7. Open hatch cover (TM 5-5420-226-10).



End of Task

PERISCOPE MOUNT LID ASSEMBLY REPAIR (Sheet 1 of 3)

TOOLS: 1/2 in. portable electric drill
3/8 in. drill bit
Cross-tip screwdriver

Vise
Welding equipment
Electric grinder

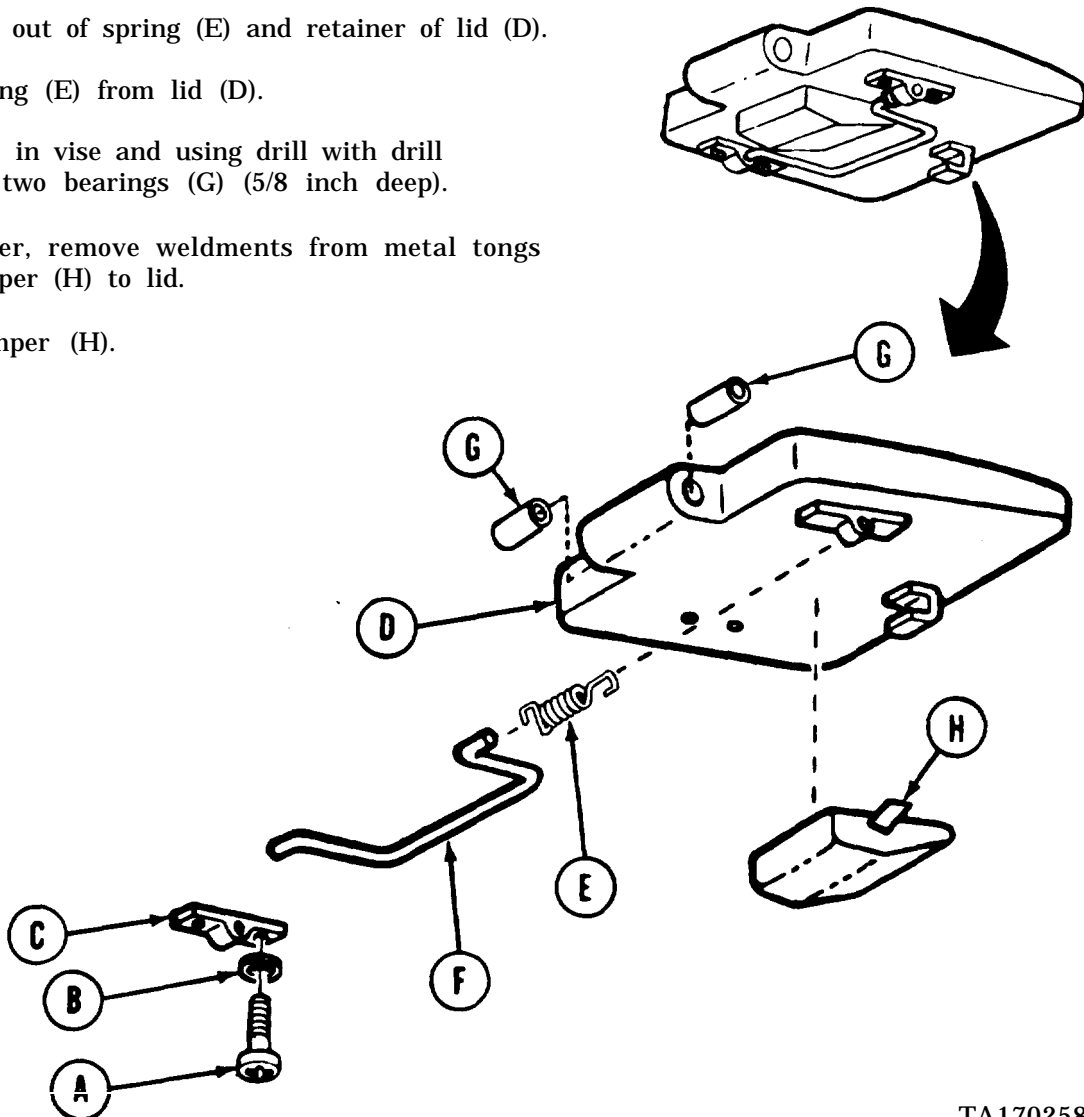
SUPPLIES: Dry cleaning solvent (Item 15, Appendix D)
Steel wool (Item 16, Appendix D)
Asbestos (Item 3, Appendix D)

Water
Lockwashers (2 required)
Bearings (2 required)

PRELIMINARY PROCEDURE: Remove lid assembly from mount (page 3-22)

DISASSEMBLY:

1. Using screwdriver, remove two screws (A), lockwashers (B), and strap (C) from lid (D). Throw lockwashers (B) away.
2. Pull lightly on loop of spring (E) to release loop from handle (F).
3. Slide handle out of spring (E) and retainer of lid (D).
4. Remove spring (E) from lid (D).
5. Place lid (D) in vise and using drill with drill bit, remove two bearings (G) (5/8 inch deep).
6. Using grinder, remove weldments from metal tongs holding bumper (H) to lid.
7. Remove bumper (H).



Go on to Sheet 2

TA170258

PERISCOPE MOUNT LID ASSEMBLY REPAIR (Sheet 2 of 3)

CLEANING AND INSPECTION:

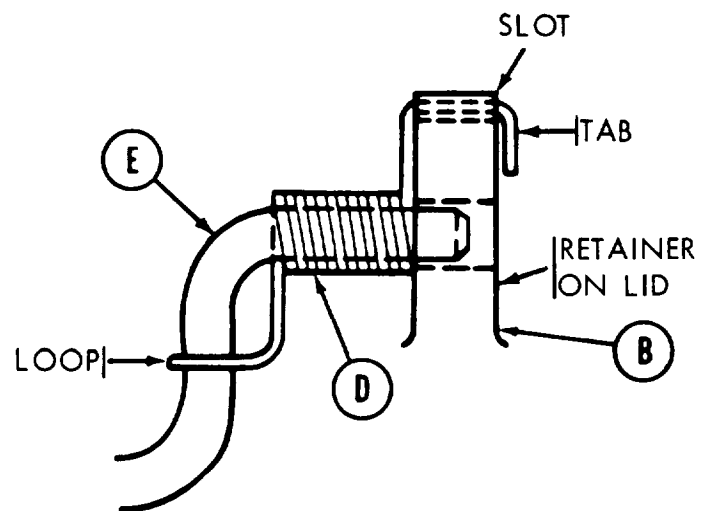
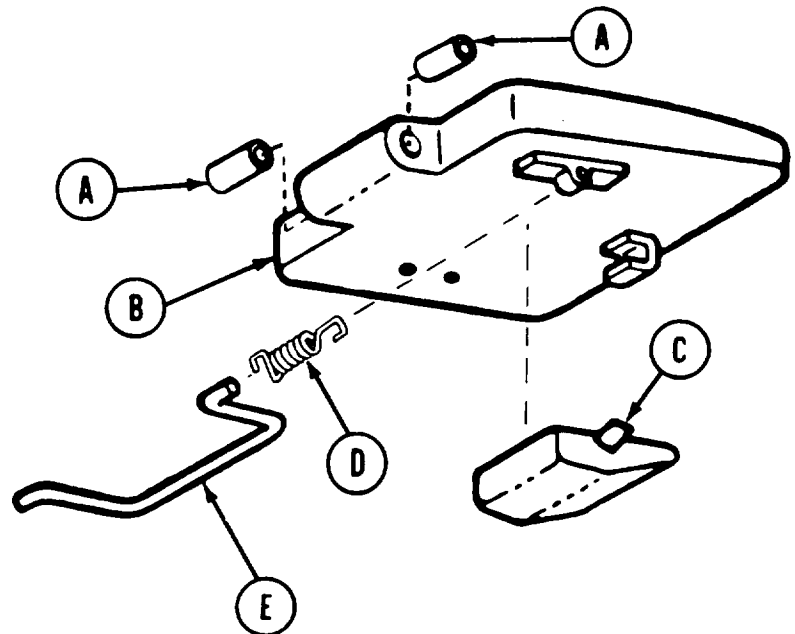
WARNING

Cleaning agent specified is flammable. Use only in well ventilated areas. Keep away from flames, sparks, or heat. Do not smoke while using. prevent contact with eyes, mouth, and/or skin. Wear rubber gloves when performing cleaning procedures.

1. Clean all parts using dry cleaning solvent and steel wool.
2. Inspect all parts for damage or wear. Replace all unserviceable parts.

ASSEMBLY:

1. Using vise, squeeze two bearings (A) into lid (B).
2. Position bumper (C) on lid (B) and cover rubber portion with wet asbestos.
3. Using welding equipment, weld metal tongs of bumper (C) to lid (B).
4. Remove asbestos from bumper (c).
5. Position tab of spring (D) in slot of retainer of lid (B).
6. Insert end of handle (E) through center of spring (D) into hole in retainer on lid (B).
7. Pull loop end of spring (D) beyond handle (E) and release spring over handle to allow spring to hold handle against lid (B).

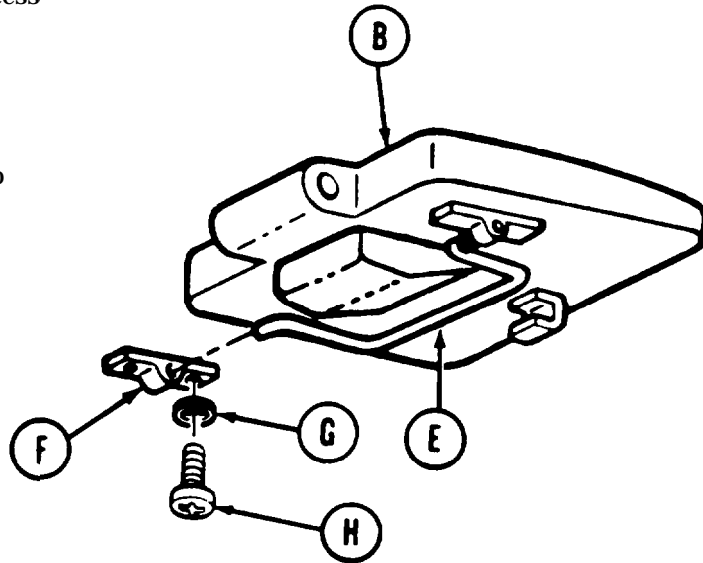


Go on to Sheet 3

TA170259

PERISCOPE MOUNT LID ASSEMBLY REPAIR (Sheet 3 of 3)

8. Position other end of handle (E) in recess of lid (B).
9. Position strap (F) on lid (B).
10. Place two new lockwashers (G) on two screws (H).
11. Using screwdriver, install two screws (H).
12. Install lid assembly (page 3-23).



End of Task

NIGHT VIEWER LATCH REPLACEMENT (Sheet 1 of 5)

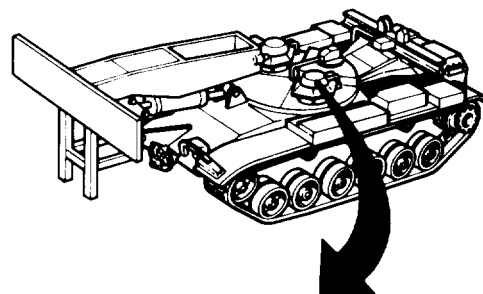
PROCEDURE INDEX

| PROCEDURE | PAGE |
|-------------------------|--------|
| Removal | 3-32.2 |
| Cleaning and Inspection | 3-32.3 |
| Installation | 3-32.3 |

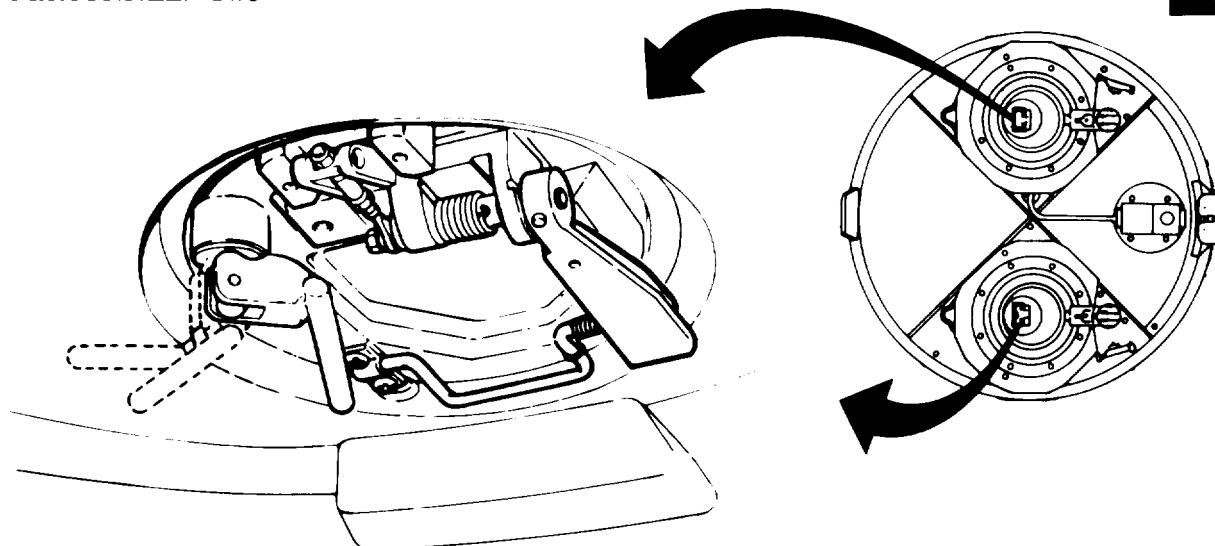
TOOLS: Ratchet with 1/2 in. drive
 3/4 in. socket with 1/2 in. drive
 Torque wrench with 1/2 in. drive (0-175 ft-lb) (0-237 N•m)
 Spring scale
 Putty knife
 1/2 in. combination box and open end wrench
 Flat-tip screwdriver
 3 in. extension with 1/2 in. drive

SUPPLIES: Rags (Item 12, Appendix D)
 Dry cleaning solvent (Item 15, Appendix D)
 Adhesive (Item 2, Appendix D)
 Gasket
 Steel wool (Item 16, Appendix D)
 Sealing compound (Item 21, Appendix D)
 Pad
 Lockwasher (2 required)

Goggles (Item 22, Appendix D)
 Rubber gloves (Item 23, Appendix D)



PERSONNEL: Two



Go on to Sheet 2

NIGHT VIEWER LATCH REPLACEMENT (Sheet 2 of 5)

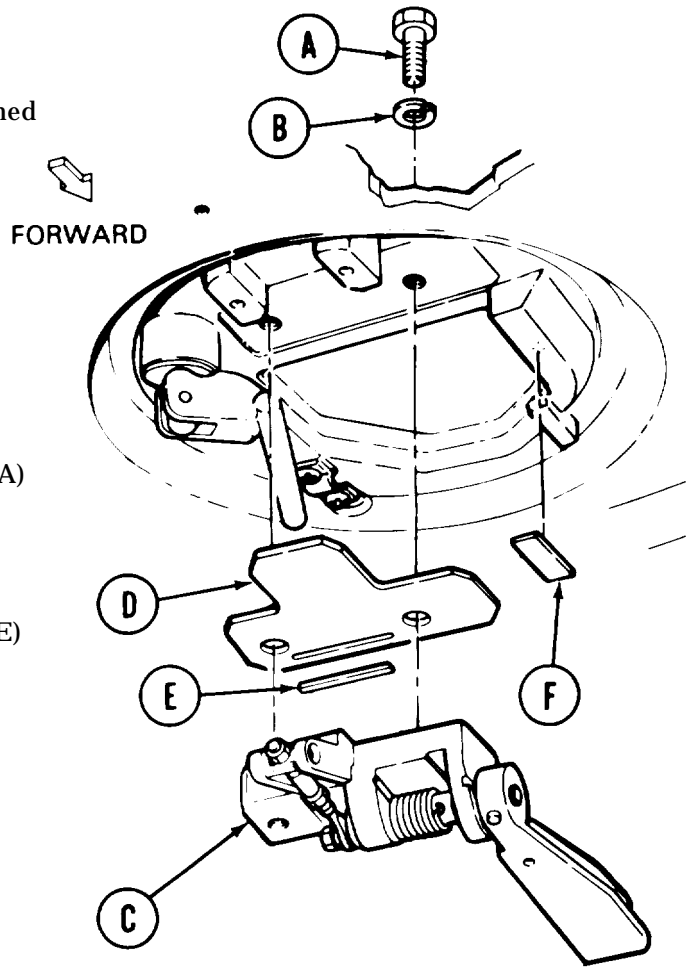
REMOVAL:

1. Position cupola cover in closed but not latched position with night viewer latch in latched position.

NOTE

Before performing step 2, get another person to hold inside components upon removal of screws (A).

2. Using 3/4 inch socket, remove two screws (A) and lockwashers (B).
3. Remove latch mechanism (C) and plate (D).
4. Using flat-tip screwdriver, remove gasket (E) and pad (F).



Go on to Sheet 3

NIGHT VIEWER LATCH REPLACEMENT (Sheet 3 of 5)

CLEANING AND INSPECTION:

- Using putty knife and steel wool, remove old sealant and adhesive from hatch and all parts.

WARNING

Dry Cleaning Solvent P-D-680 is toxic and flammable. To avoid injury, wear protective goggles and gloves and use in a well-ventilated area. Avoid contact with skin, eyes, and clothes, and do not breathe vapors. Do not use near open fire or excessive heat. The flash point for Type I Dry Cleaning Solvent is 100°F (38°C). If you become dizzy while using Dry Cleaning Solvent, get fresh air immediately and get medical aid. If contact with eyes is made, wash your eyes with water and get medical aid immediately.

- Using dry cleaning solvent and rags, remove remaining debris and dirt.
- Inspect all parts for damage or wear. Replace defective parts.

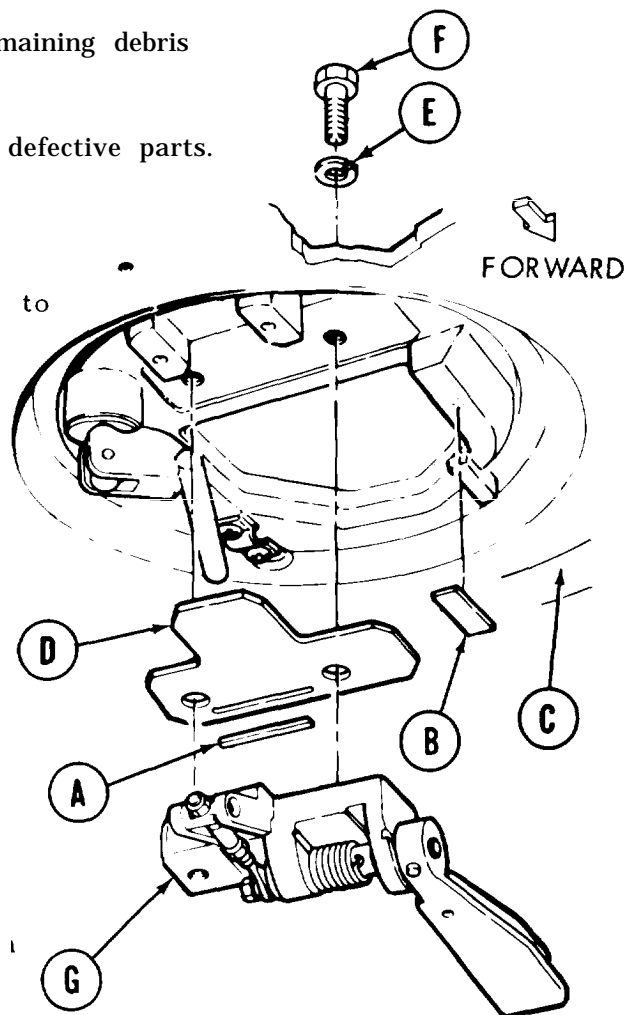
INSTALLATION:

- With putty knife, apply adhesive to one side of new gasket (A) and new pad (B). Apply adhesive to mating surfaces on cupola cover (C) and plate (D).
- When adhesive is tacky, align and apply new gasket (A) and new pad (B).
- Place new lockwashers (E) on two screws (F) and apply sealing compound to screw threads.

NOTE

Before performing step 4, get another person to help align holes in plate (D) and latch mechanism (G) with holes in cupola cover.

- Using fingers, start screws (F) through cupola cover (C) into latch mechanism (G).
- Using 3/4 inch socket and torque wrench, tighten two screws (F) to 98-122 lb-ft (133-165 N•m).



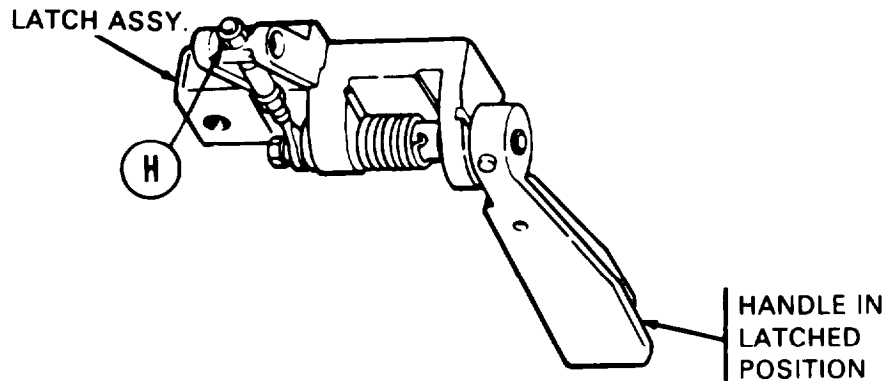
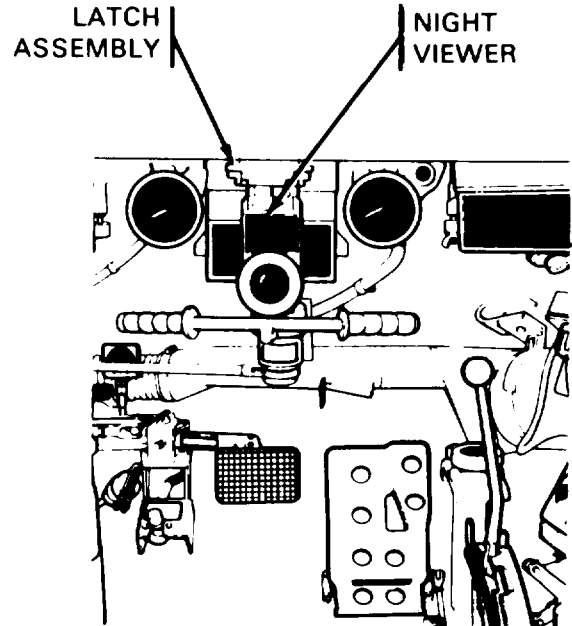
Go on to Sheet 4

NIGHT VIEWER LATCH REPLACEMENT (Sheet 4 of 5)

CAUTION

Keep night viewer switch in OFF position and covers on lenses. Do not expose night viewer to any bright light (spotlights, flares, full moon, sun, etc.).

6. Install night viewer in cupola cover (TM 5-5420-226-10).
7. Check that latch assembly secures night viewer with no looseness with handle in latched position.
8. If adjustment is necessary, remove night viewer and perform steps 9 thru 12. If no adjustment is required, go to step 13.
9. Using 1/2 inch wrench, loosen end nut (H).



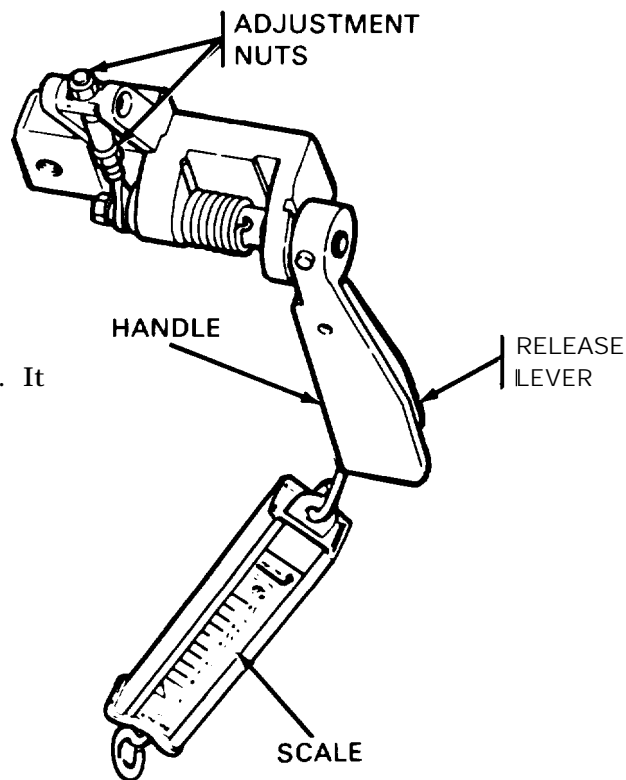
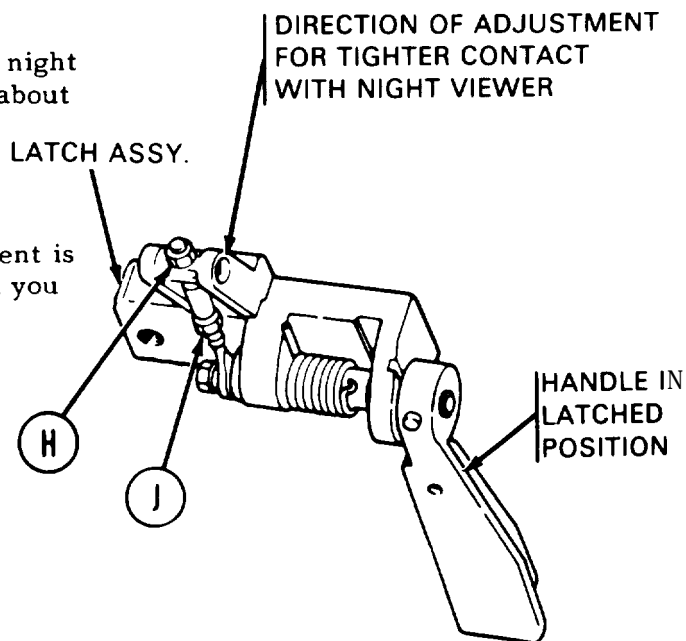
Go on to Sheet 5

NIGHT VIEWER LATCH REPLACEMENT (Sheet 5 of 5)

10. For tighter latch assembly contact with night viewer, back off (toward clevis) nut (J) about two threads, using 1/2 inch wrench.
11. Using 1/2 inch wrench, tighten nut (H).
12. Perform steps 6 and 7. If more adjustment is necessary, do steps 9 thru 11 again until you have a satisfactory fit.

CAUTION

Have another person support night viewer and push release lever while performing the following step.



13. Attach scale to end of latch handle and measure force to begin movement of handle. It should be 9.5 to 15.5 pounds.
14. If force to begin movement of handle is less than 9.5 pounds or more than 15.5 pounds, replace spring (page 3-32.6).

End of Task

NIGHT VIEWER LATCH REPAIR (Sheet 1 of 10)

PROCEDURE INDEX

| PROCEDURE | PAGE |
|-------------------------|---------|
| Disassembly | 3-32.6 |
| Cleaning and Inspection | 3-32.10 |
| Assembly | 3-32.10 |

TOOLS: 7/16 in. combination box and open end wrench
 3/16 in. drive punch
 1/8 in. drive punch
 Flat-tip screwdriver
 1/2 in. combination box and open end wrench
 1/2 in. socket with 1/2 in. drive

Soft-jawed (padded) vise
 3/32 in. alining pin
 Hammer
 Long round nose pliers
 1/4 in. drill bit
 Thickness gage
 Ratchet with 1/2 in. drive
 Knife, Pocket

SUPPLIES: Dry cleaning solvent (Item 15, Appendix D)
 Rags (Item 12, Appendix D)
 Pencils (Item 24, Appendix D)
 Paper (Item 25, Appendix D)
 Goggles (Item 22, Appendix D)
 Rubber gloves (Item 23, Appendix D)

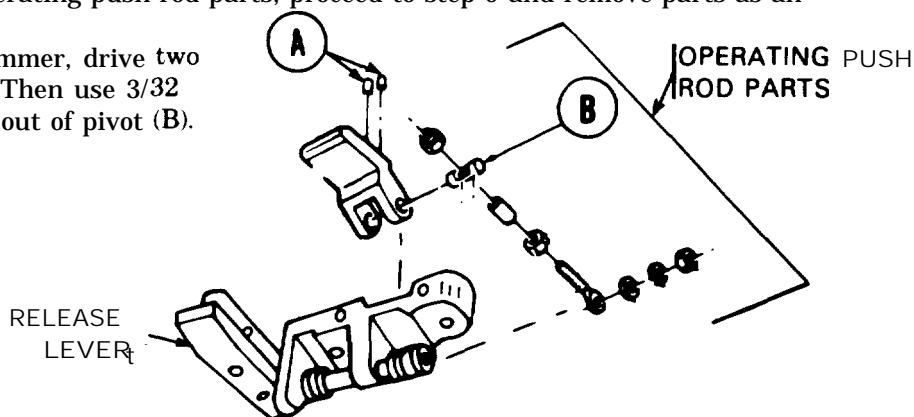
Cotter pin
 Teflon washers
 Lockwasher
 Shims
 Self-locking nut

PERSONNEL: Two

PRELIMINARY PROCEDURE: Remove night viewer latch (page 3-32.1).

DISASSEMBLY:

- Carefully press release lever and allow mechanism to unwind about one-half turn to latched position.
- If faulty part is not within operating push rod parts, proceed to step 9 and remove parts as an assembly.
- Using 1/8 inch punch and hammer, drive two pins (A) flush with pivot (B). Then use 3/32 inch alining pin to drive pins out of pivot (B).



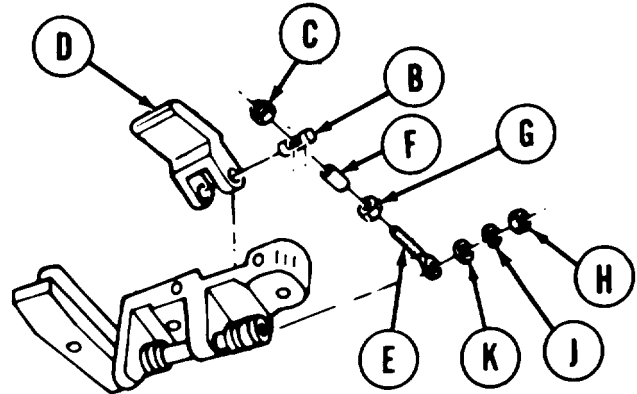
Go on to Sheet 2

NIGHT VIEWER LATCH REPAIR (Sheet 2 of 10)

4. Using socket, remove nut (C).

5. Slide plunger (D) with pivot (B) off rod (E).

6. Remove pivot (B) from plunger (D).



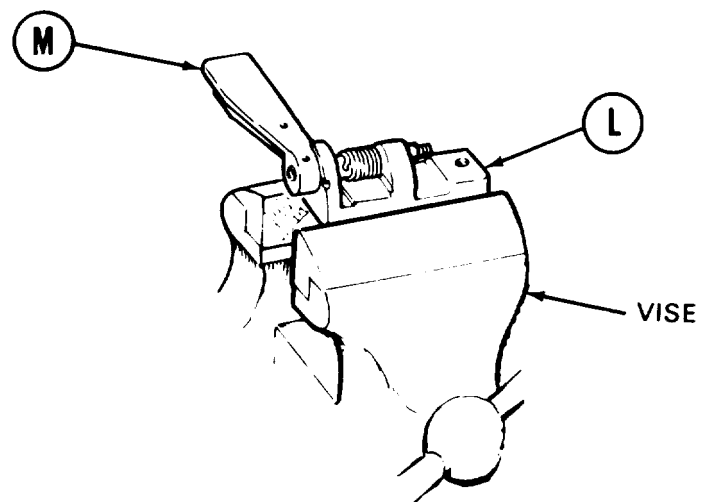
7. Slip sleeve (F) off rod (E).

8. Using 1/2 inch wrench, remove nut (G).

9. Using 7/16 inch wrench, remove nut (H), lockwasher (J), flat washer (K), and rod (E)

NOTE

Put support (L) in vise with handle (M) and support positioned as shown.



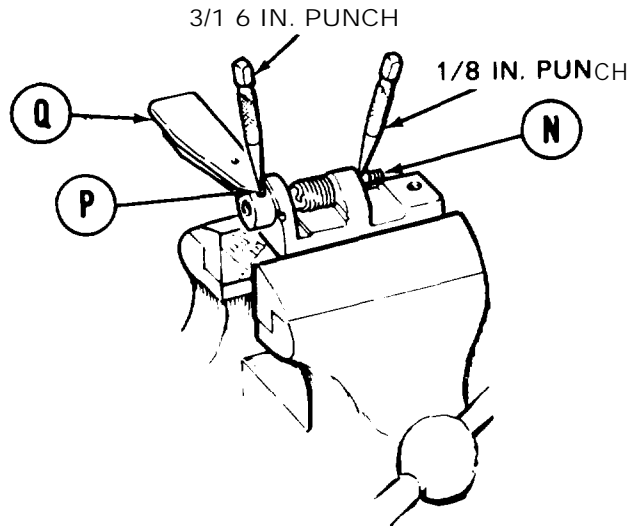
Go on to Sheet 3

NIGHT VIEWER LATCH REPAIR (Sheet 3 of 10)

NOTE

Insert 1/8 inch punch in tooling hole in flange of shaft (N). Push back on punch against spring pressure to aid in removal of pin (P). Have one person hold punch while another person does step 10.

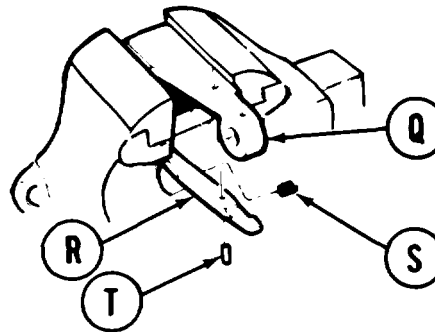
10. Using 3/16 inch punch and hammer, drive pin (P) out of handle (Q).
11. Using hand, work handle (Q) off shaft (N).
12. Carefully relieve pressure of spring by allowing 1/8 inch punch to come toward you about 1/4 turn.



NOTE

If handle (Q), lever (R), and spring (S) were operating satisfactorily, you need not disassemble them. Proceed to step 15.

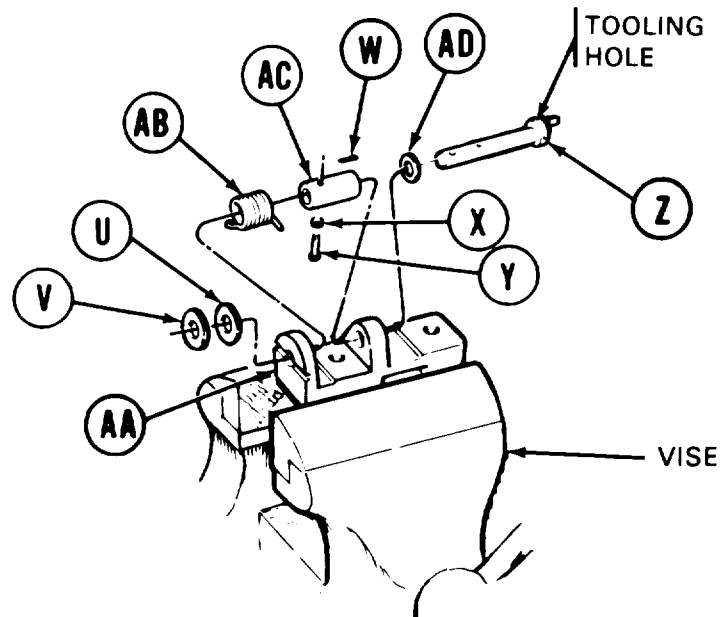
13. Place lever (R) in vise and, using 1/8 inch punch and hammer, drive pin (T) out of lever (R), being careful not to loosen spring (S).
14. Remove lever (R), spring (S), and handle (Q).



Go on to Sheet 4

NIGHT VIEWER LATCH REPAIR (Sheet 4 of 10)

15. Using fingers, remove teflon washer (U) and spacer (V).



16. Using screwdriver and pliers, remove cotter pin (W). Remove washer (X) and pin (Y).

17. Slide shaft (Z) from holes in support (AA). Remove spring (AB), sleeve (AC), and teflon washer (AD).

18. Remove support (AA) from vise.

Go on to Sheet 5

CLEANING AND INSPECTION:

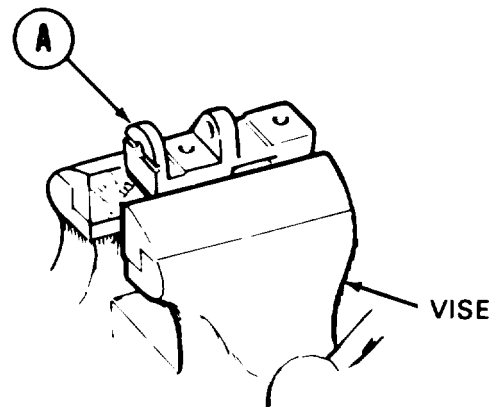
WARNING

Dry Cleaning Solvent P-D-680 is toxic and flammable. To avoid injury, wear protective goggles and gloves and use in a well-ventilated area. Avoid contact with skin, eyes, and clothes, and do not breathe vapors. Do not use near open fire or excessive heat. The flash point for Type I Dry Cleaning Solvent is 100°F (38 °C). If you become dizzy while using Dry Cleaning Solvent, get fresh air immediately and get medical aid. If contact with eyes is made, wash your eyes with water and get medical aid immediately.

1. Using dry cleaning solvent and rags, remove debris and dirt from all parts.
2. Inspect all parts for damage or wear. Replace defective parts.

ASSEMBLY:

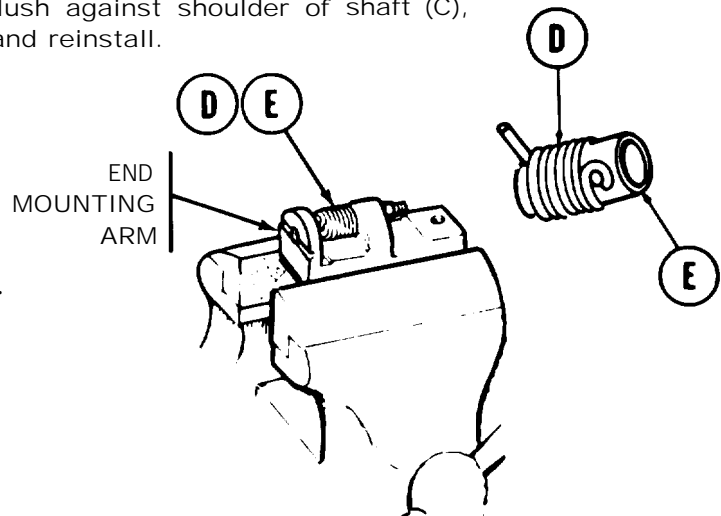
1. Secure support (A) in vise.
2. Using fingers, place new teflon washer (B) on shaft (C).



NOTE

Using knife, remove sharp edge (chamfer) of teflon washer (B) at hole. If it does not fit flush against shoulder of shaft (C), remove washer, reverse it, and reinstall.

3. Place spring (D) on sleeve (E) with loop of spring over hole in sleeve.
4. Position assembled spring (D) and sleeve (E) between mounting arms of support (A), with loop end of spring nearest end mounting arm.



Go on to Sheet 6

NIGHT VIEWER LATCH REPAIR (Sheet 6 of 10)

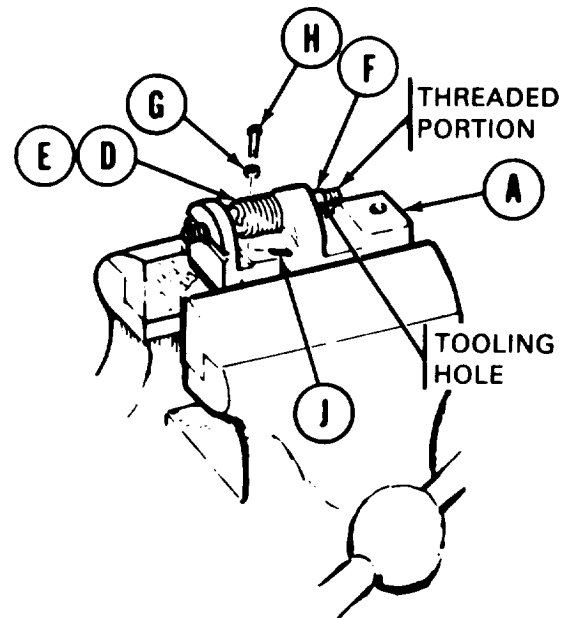
5. **Insert** shaft (F) with offset threaded portion in down position (nearest support (A) and tooling hole facing you).

6. Line up loop of spring (D) with holes of sleeve (E) and shaft (F).

7. Place washer (G) on pin (H) and insert pin from the back side.

8. Insert new cotter pin (J) through hole in pin (H).

9. Using screwdriver and pliers, bend legs of cotter pin (J).



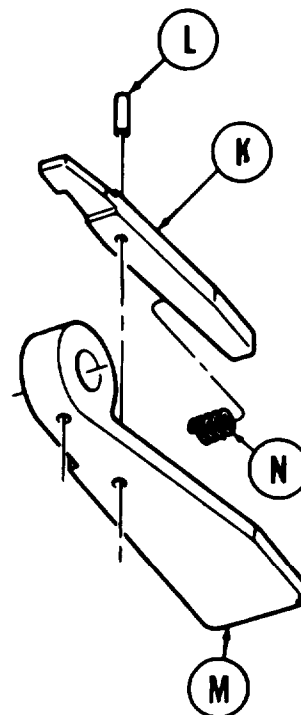
NOTE

If handle was not disassembled, go to step 13.

10. Place lever (K) on bench and, using hammer, drive pin (L) partly through lever.

11. Place handle (M) on bench and position spring (N) in recess of handle (M) and lever (K).

12. Using hammer, drive pin (L) through lever (K) and handle (M).



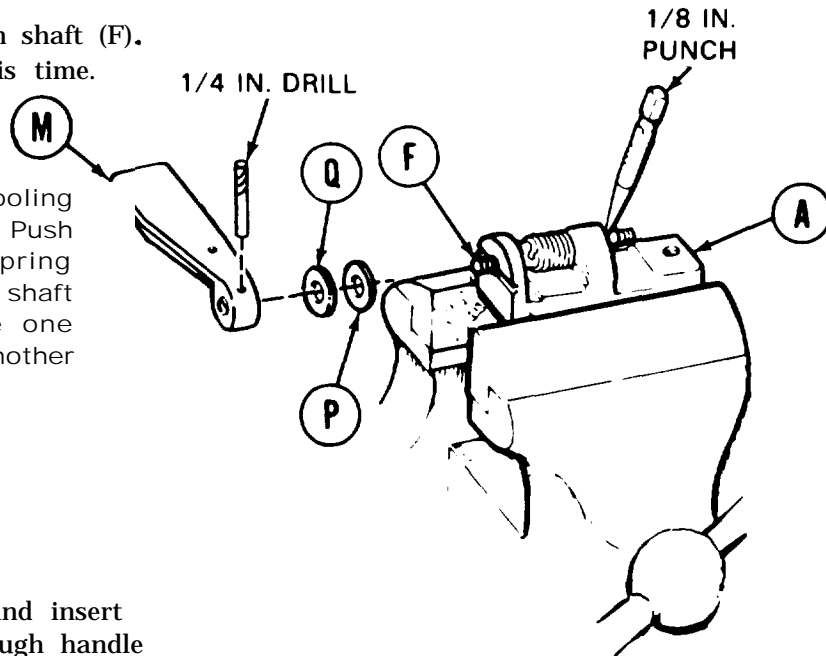
Go on to Sheet 7

NIGHT VIEWER LATCH REPAIR (Sheet 7 of 10)

13. Place new teflon washer (P) on shaft (F).
Do not install spacer (Q) at this time.

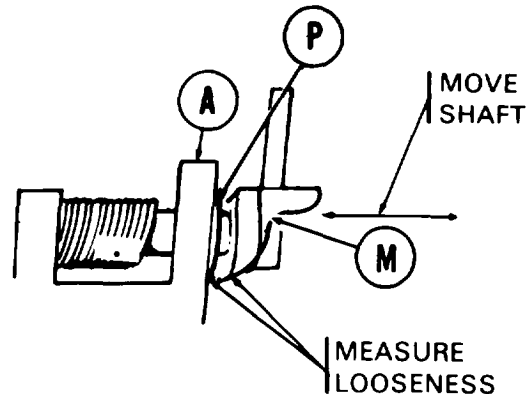
NOTE

Insert 1/8 inch punch in tooling hole in flange of shaft (F). Push back on punch against spring pressure until hole in end of shaft (F) is up and down. Have one person hold punch while another does step 14.



14. Place handle (M) on shaft (F), and insert shank end of 1/4 inch drill through handle and shaft to temporarily retain handle.

15. Move shaft back and forth. Using feeler gage, measure maximum clearance between handle (M) and teflon washer (P). Clearance should be between 0.005 and 0.040 inch. If OK go to step 17. If not, record clearance in excess of .040 inch, and go to step 16.



NOTE

A new spacer is 0.094 inch thick, and each lamination is 0.002 inch thick.

16. To determine size of new spacer (Q) required, add 0.018 inch to the excess clearance determined in step 15. Peel off laminations from new spacer (Q) until required size is attained.

Go on to Sheet 8

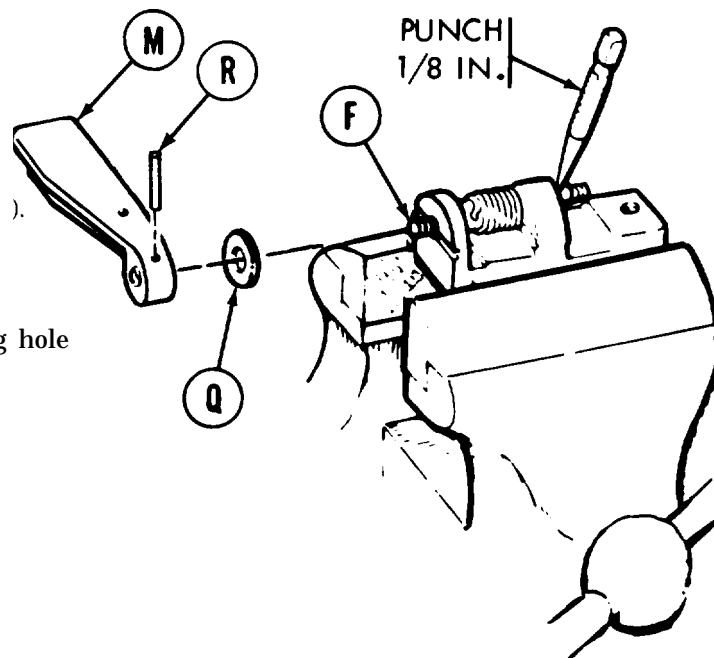
NIGHT VIEWER LATCH REPAIR (Sheet 8 of 10)

17. With one person relieving load with punch, remove drill bit and handle (M).

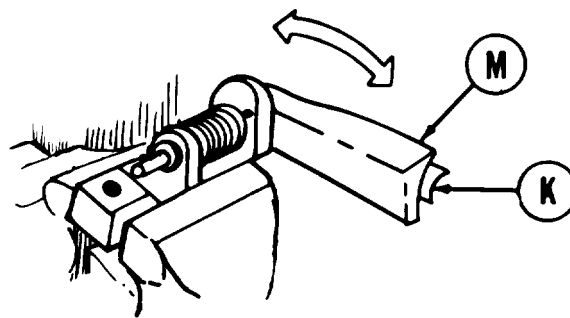
18. Place spacer (Q) and handle (M) on shaft (F).

19. Using hammer, drive pin (R) into retaining hole of handle (M) and shaft (F).

20. Remove punch.



21. Release lever (K) and push handle (M) forward 1/2 turn to locked position. Release and return to position shown.



NOTE

Handle should lock in both forward and aft positions and should not bind during movement.

22. Remove assembled parts from vise.

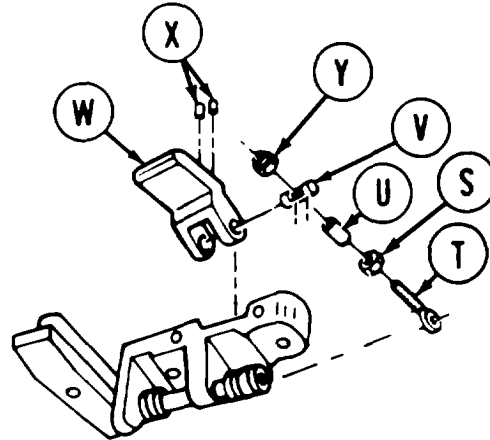
Go on to Sheet 9

NIGHT VIEWER LATCH REPAIR (Sheet 9 of 10)

23. If operating push rod parts were not disassembled, proceed to step 29.

24. Start new nut (S) onto rod (T) with locking collar first. Run it on to approximately 1/4 inch from end of threads. Use 1/2 inch wrench if locking collar is tight. Use vise if necessary.

25. Place sleeve (U) on rod (T).



26. Insert pivot (V) in plunger (W). Using hammer, drive in two pins (X) through pivot (V).

NOTE

Position pins (X) through pivot (V) so that they each stick through pivot equally on both sides.

27. Pivot (V) has flat faces on two surfaces. Rotate pivot so smaller flat face is facing sleeve (U). Slide rod (T) through pivot (V).

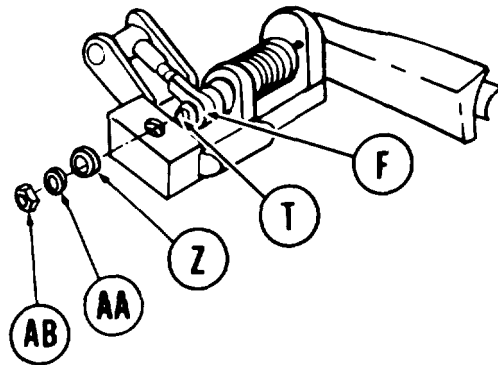
28. Using socket, install nut (Y) onto rod (T) while holding nut (S) with 1/2 inch wrench.

Go on to Sheet 10

NIGHT VIEWER LATCH REPAIR (Sheet 10 of 10)

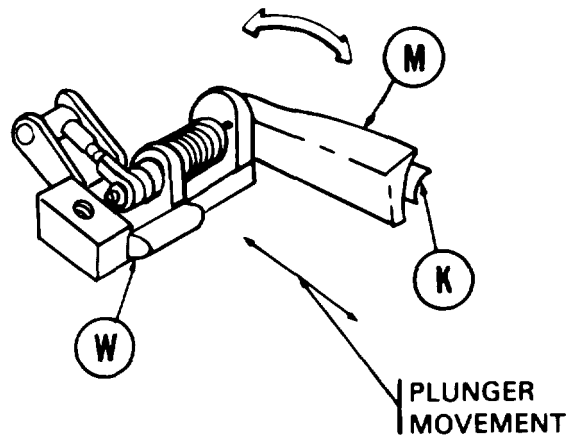
29. Position assembled parts as shown with rod (T) over threaded portion of shaft (F).

30. Place flat washer (Z), new lockwasher (AA), and nut (AB) on shaft (F).



31. Using 7/16 inch wrench, tighten nut (AB).

32. Hold night viewer latch firmly on a flat surface. Release lever (K) and turn handle (M) forward 1/2 turn to locked position. Release and return to position shown.



NOTE

Handle should lock in both forward and rear positions and plunger (W) should not bind during movement.

33. Install night viewer latch (page 3-32.3).

End of Task

NIGHT VIEWER ACCESS DOOR AND SEAL REPLACEMENT (Sheet 1 of 5)

PROCEDURE INDEX

| PROCEDURE | PAGE |
|-------------------------|---------|
| Disassembly | 3-32.16 |
| Cleaning and Inspection | 3-32.17 |
| Assembly | 3-32.18 |

TOOLS: Flat-tip screwdriver
 1/8 in. drive punch
 3/4 in. drive punch
 Putty knife
 Hammer
 External retaining ring pliers

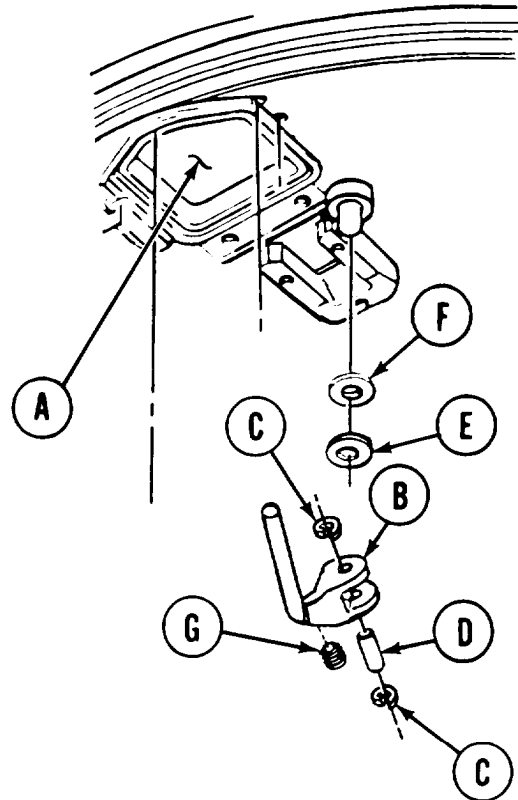
SUPPLIES: Seal
 Preformed packing
 Adhesive (Item 1, Appendix D)
 Dry cleaning solvent (Item 15, Appendix D)
 Crocus cloth (Item 5, Appendix D)
 Steel wool (Item 16, Appendix D)
 Goggles (Item 22, Appendix D)
 Rubber gloves (Item 23, Appendix D)

PERSONNEL: Two

DISASSEMBLY:

1. Have one person stand on access door (A).
2. Move handle (B) to unlocked position (pull down).
3. Using external retaining ring pliers, remove two retaining rings (C) securing pin (D).
4. Using 1/8 inch punch and hammer, drive out pin (D).
5. Remove handle (B), spacer (E), and shims(s) (F).
6. Using screwdriver, remove plunger (G) as necessary.

Go on to Sheet 2



NIGHT VIEWER ACCESS DOOR AND SEAL REPLACEMENT (Sheet 2 of 5)

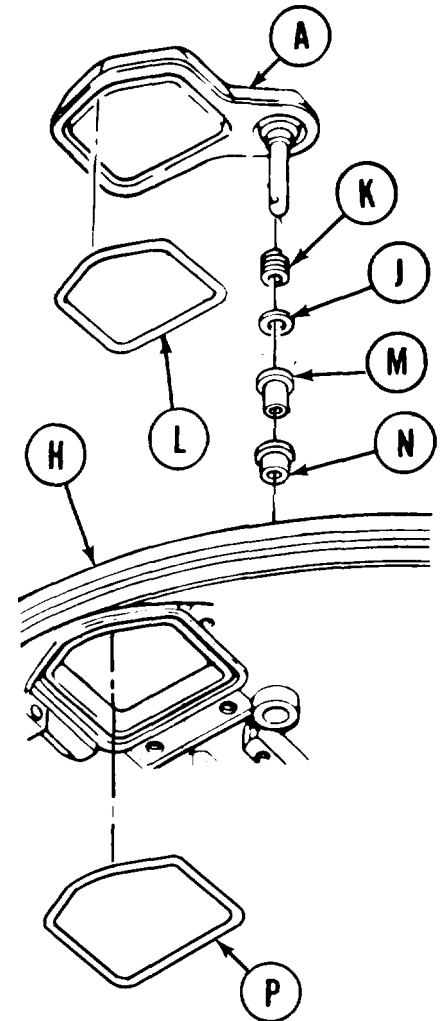
7. Remove access door (A) from cupola (H) and remove shim (J) and spring (K).
8. Remove and discard seal (L) from grooves in access door (A). Use flat-tip screwdriver, if necessary.
9. Using 3/4 inch punch and hammer, drive out bushings (M) and (N) from inside driver's station.
10. Remove and discard preformed packing (P) from groove in cupola.

CLEANING AND INSPECTION:

WARNING

Dry Cleaning Solvent P-D-680 is toxic and flammable. To avoid injury, wear protective goggles and gloves and use in a well-ventilated area. Avoid contact with skin, eyes, and clothes, and do not breathe vapors. Do not use near open fire or excessive heat. The flash point for Type I Dry Cleaning Solvent is 100°F (38°C). If you become dizzy while using Dry Cleaning Solvent, get fresh air immediately and get medical aid. If contact with eyes is made, wash your eyes with water and get medical aid immediately.

1. Clean all parts and bushing hole in cupola of any foreign matter with dry cleaning solvent.
2. Clean seal and packing grooves of door assembly (A) and cupola (H) with dry cleaning solvent. Use screwdriver to remove old adhesive, if necessary.
3. Visually inspect all parts for cracks, damage, and corrosion. Replace any defective parts.
4. Corroded metallic parts which cannot be cleaned with crocus cloth or steel wool shall be replaced.



Go on to Sheet 3

NIGHT VIEWER ACCESS DOOR AND SEAL REPLACEMENT (Sheet 3 of 5)

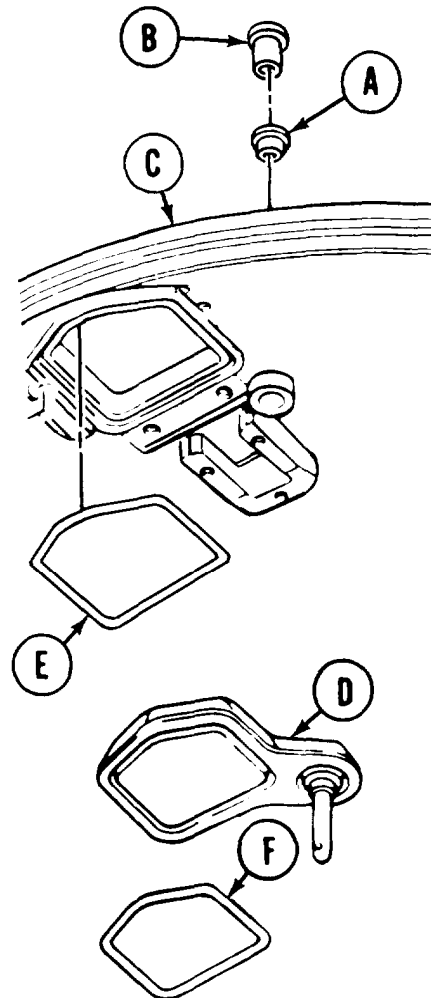
ASSEMBLY:

1. Insert small bushing (A) into bottom hole and large bushing (B) into top hole in cupola (C). Use 3/8 inch punch and hammer to fully seat bushings in holes.
2. Using putty knife, apply thin coat of adhesive on seal and packing grooves of access door (D) and cupola (C).

NOTE

Use care to keep adhesive in groove only. Wait until adhesive is tacky before installing new packing and seal.

3. Lay new preformed packing (E) and new seal (F) into grooves carefully without stretching or compressing them.
4. Use dry cleaning solvent to remove any excess adhesive on or near preformed packing (E) or seal (F).



Go on to Sheet 4

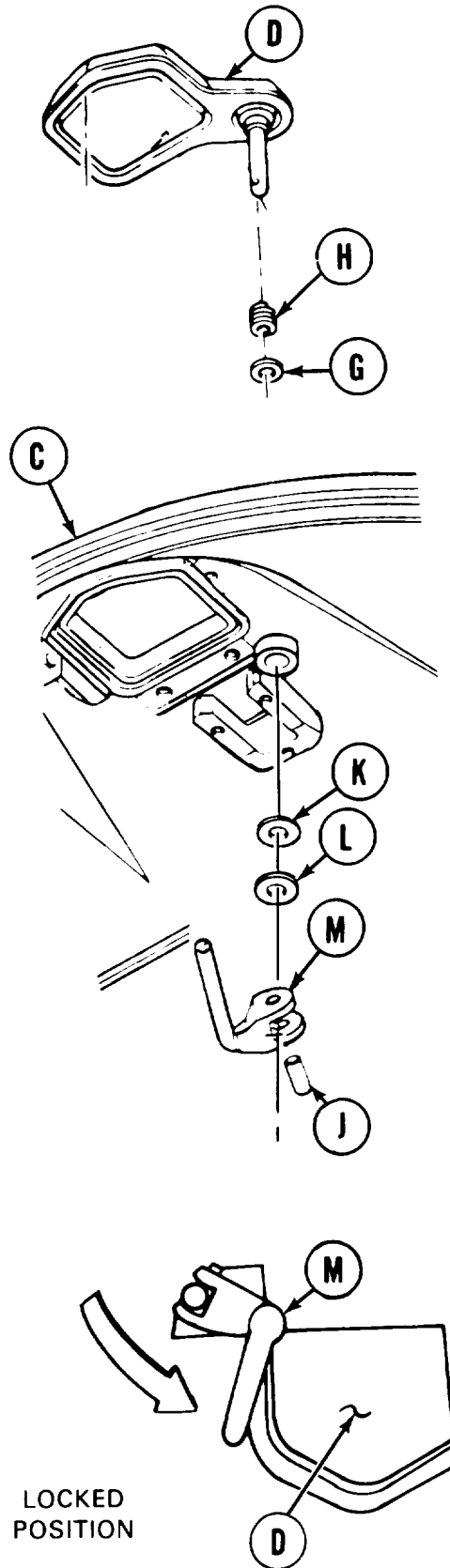
NIGHT VIEWER ACCESS DOOR AND SEAL REPLACEMENT (Sheet 4 of 5)

5. Place shim (G) and spring (H) onto shaft of access door (D).
6. Carefully insert shaft of access door (D) through bushings in cupola (C).
7. Push access door (D) down a few times to seat all components, then use second person to stand on access door (D) to hold it closed.

NOTE

Drive pin (J) in only far **enough to** retain assembled parts.

8. Place shim (s) (K), spacer (L), and handle (M) on shaft of access door (D). Retain temporarily with pin (J).
9. Move handle (M) to locked position and have second person get off access door (D).



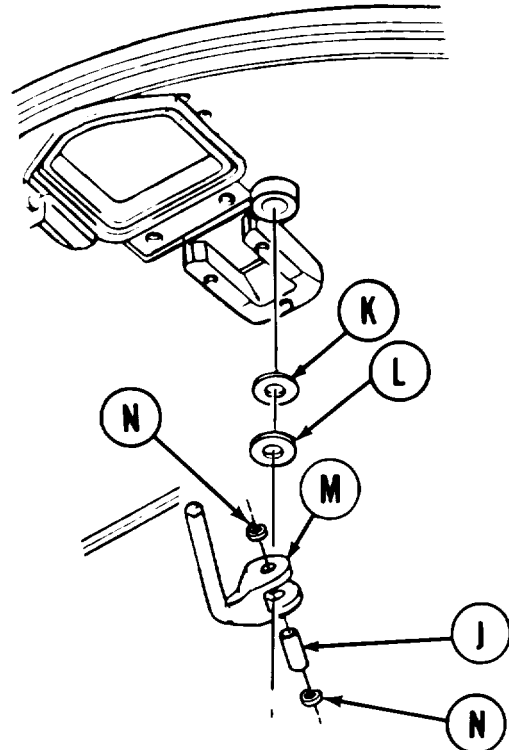
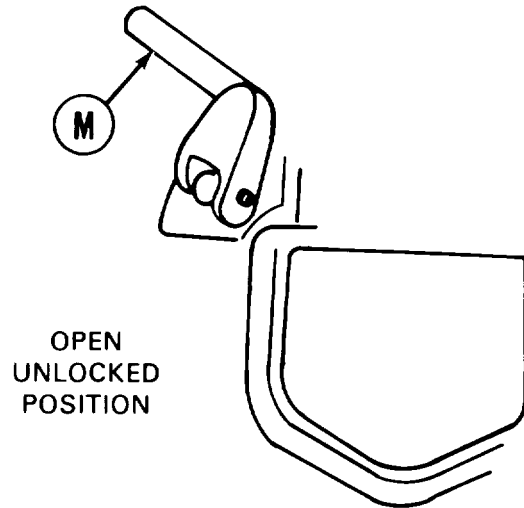
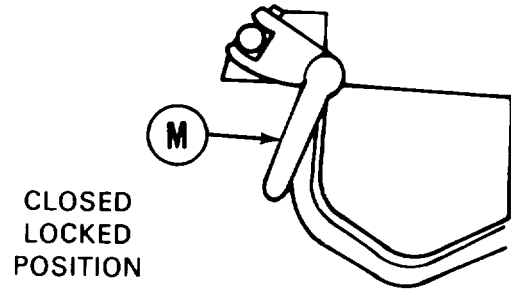
NIGHT VIEWER ACCESS DOOR AND SEAL REPLACEMENT (Sheet 5 of 5)

10. Move handle (M) through its various positions to check proper operation.
11. Move handle (M) to locked position and make sure that door seal is seated all around and that handle (M) is retained firmly in locked position.

NOTE

If requirements of step 11 are not met, shims (K) may be added. They are approximately 1/32 inch thick.

12. Drive pin (J) all the way into handle (M).
13. Using external retaining ring pliers, install two retaining rings (N) to secure pin (J).



End of Task

LEFT CUPOLA QUADRANT REPLACEMENT (Sheet 1 of 2)

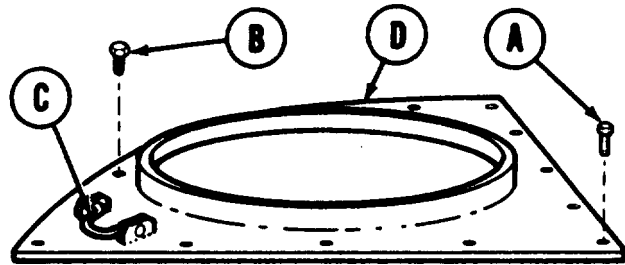
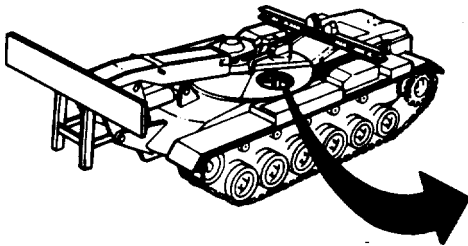
TOOLS: 3/4 in. socket with 3/4 in. drive
 1-5/16 in. socket with 3/4 in. drive
 Ratchet with 3/4 in. drive
 Lifting device (500 lbs capacity)
 Putty knife

SUPPLIES: Sealing compound (Item 2, Appendix D)
 Brush (Item 4, Appendix D)

PERSONNEL: Three

REFERENCE: TM 5-5420-226-10

PRELIMINARY PROCEDURES: Remove cupola cover (page 3-8)
 Remove cupola body (page 3-10)
 Remove cupola cover safety latch (page 3-17)

**REMOVAL:**

1. Using 3/4 inch socket, remove seven screws (A).
2. Using 1-5/16 inch socket, remove six screws (B).
3. Attach lifting device to handle (C).
4. Using lifting device, lift quadrant (D) slowly from vehicle.
5. Have technician operating lifting device slowly lower quadrant (D) to desired location.
6. Remove lifting device from handle (C).
7. Using putty knife, remove old sealant from mating surfaces of vehicle and quadrant.

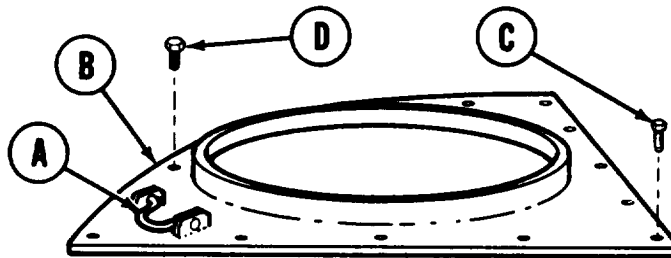
Go on to Sheet 2

TA170261

LEFT CUPOLA QUADRANT REPLACEMENT (Sheet 2 of 2)

INSTALLATION:

1. Using brush, apply sealant to mating surfaces of vehicle and quadrant.
2. Attach lifting device to handle (A).
3. Have technician operating lifting device slowly lift quadrant (B) into position over vehicle.
4. While two technicians guide quadrant (B), have person operating lifting device slowly lower quadrant (B) into position on vehicle.
5. Remove lifting device from handle (A).
6. Using 3/4 inch socket, install seven screws (C).
7. Using 1-5/16 inch socket, install six screws (D).
8. Install cupola body (page 3-1 1).
- 9* Install cupola cover (page 3-9).



End of Task

RIGHT CUPOLA QUADRANT REPLACEMENT (Sheet 1 of 4)

PROCEDURE INDEX

| PROCEDURE | PAGE |
|--------------|------|
| Removal | 3-35 |
| Installation | 3-37 |

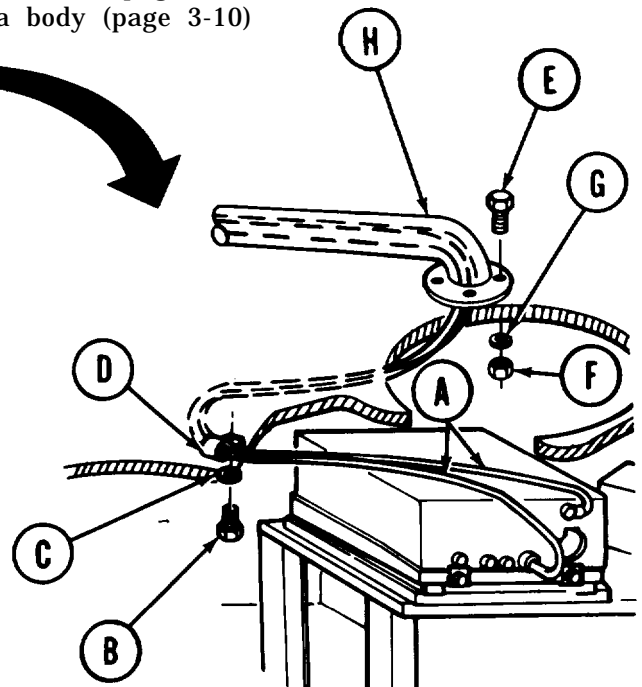
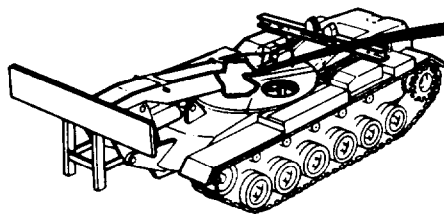
TOOLS: 3/4 in. socket with 3/4 in. drive
 1-5/16 in. socket with 3/4 in. drive
 Ratchet with 3/4 in. drive
 Lifting device (500 lbs capacity)
 Putty knife
 1/4 in. combination box and open end wrench
 1/4 in. socket with 3/8 in. drive
 Ratchet with 3/8 in. drive
 Sling

SUPPLIES: Sealing compound (Item 2, Appendix D) Lockwashers (5 required)
 Brush (Item 4, Appendix D) Lockwashers (6 required)
 Gasket Lockwashers (7 required)

PERSONNEL: Three

REFERENCE: TM 5-5420-226-10

PRELIMINARY PROCEDURES: Remove cupola cover (page 3-8)
 Remove cupola body (page 3-10)



REMOVAL:

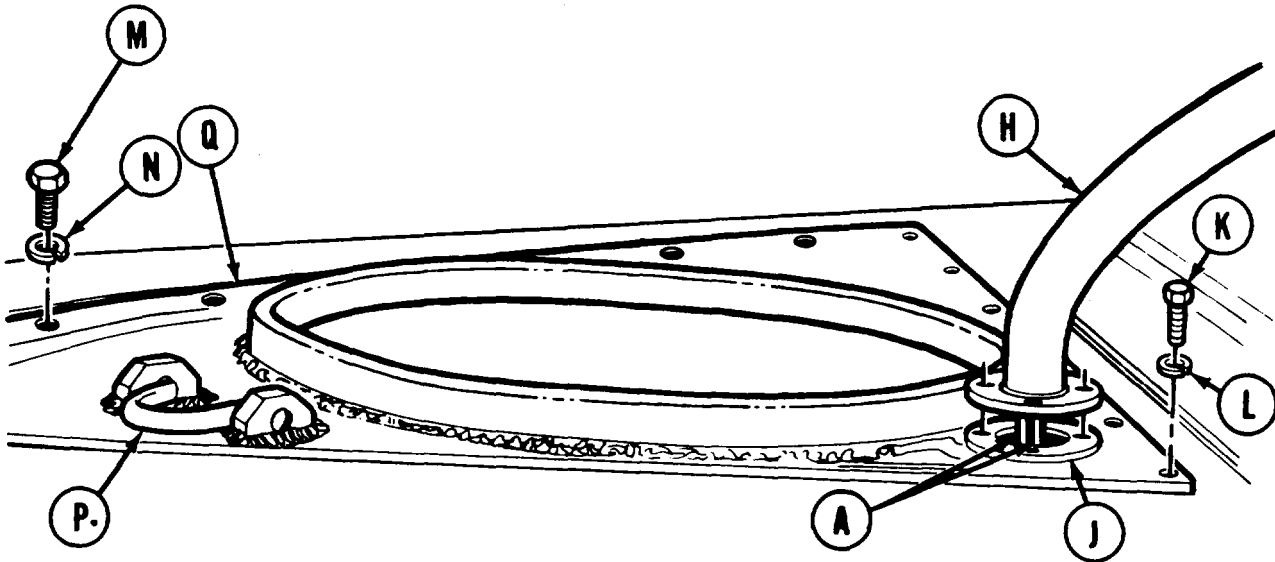
1. From inside commander's area, remove two wires (A) from radio.
2. Using 1/4 inch socket, remove screw (B) and lockwasher (C). Throw lockwasher (C) away.
3. Manually remove clamp (D).
4. Using 1/4 inch socket on screws (E) and wrench on nuts (F), remove four nuts (F).
5. Manually, remove four screws (E) and lockwashers (G) from conduit (H). Throw lockwashers (G) away.

Go on to Sheet 2

TA170263

RIGHT CUPOLA QUADRANT REPLACEMENT (Sheet 2 of 4)

6. Place conduit (H) and wires (A) on reservoir quadrant where it will not interfere with right quadrant removal.
7. Using putty knife, remove gasket (J).



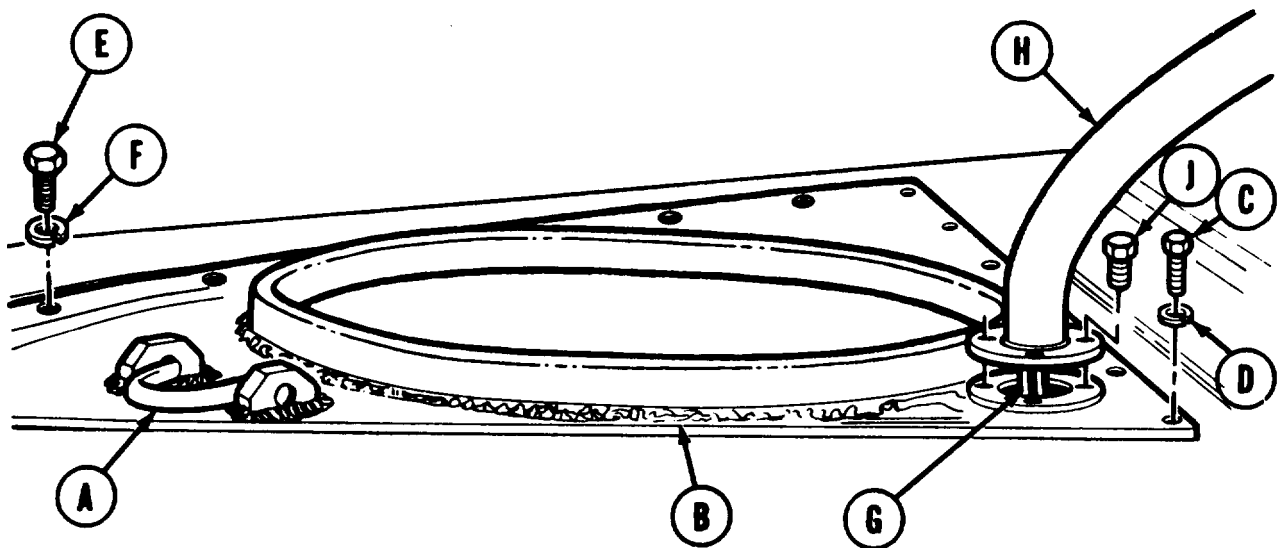
8. Using 3/4 inch socket, remove seven screws (K) and lockwashers (L). Throw lockwashers (L) away.
9. Using 1-5/ 16 inch socket, remove six screws (M) and lockwashers (N). Throw lockwashers (N) away.
10. Attach sling to handle (P) and use lifting device to remove right cupola quadrant (Q) from vehicle.
11. Using putty knife, remove old sealant from mating surfaces of vehicle and quadrant (Q).

Go on to Sheet 3

TA170264

RIGHT CUPOLA QUADRANT REPLACEMENT (Sheet 3 of 4)**INSTALLATION:**

1. Using brush apply sealant to mating surfaces of vehicle and quadrant.
2. Attach sling to handle (A).
3. Have technician operating lifting device slowly lift quadrant (B) into position over vehicle.
4. While two technicians guide quadrant (B), have person operating lifting device slowly lower quadrant (B) into position on vehicle.
5. Remove sling from handle (A).
6. Using 3/4 inch socket, install seven screws (C) and new lockwashers (D).
7. Using 1-5/16 inch socket, install six screws (E) and new lockwashers (F).



8. Position wires (G) and conduit (H) onto quadrant (B).
9. Place four screws (J) in position through conduit (H).

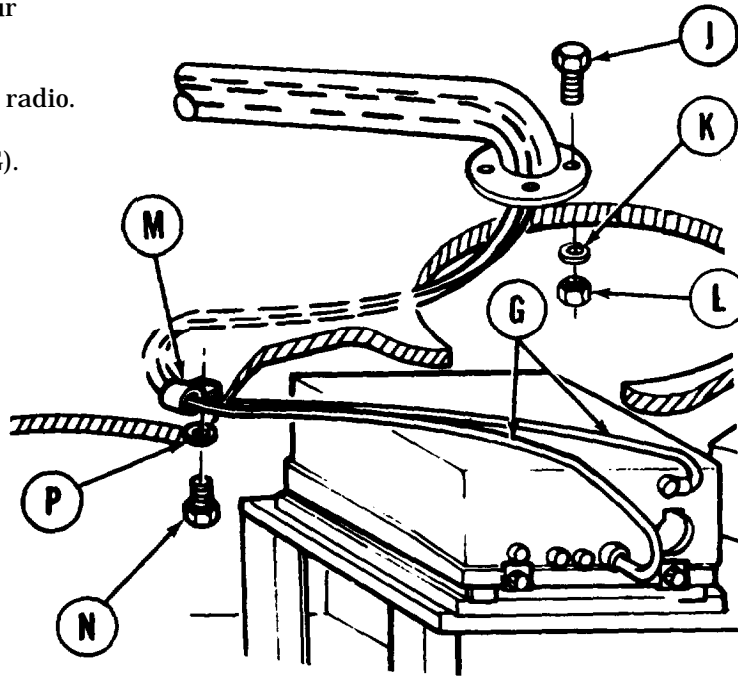
Go on to Sheet 4

TA170265

RIGHT CUPOLA QUADRANT REPLACEMENT (Sheet 4 of 4)

10. From inside vehicle, manually install four new lockwashers (K) and four nuts (L).
11. Using 1/4 inch socket on screws (J) and wrench on nuts (L), tighten four nuts (L).
12. Manually, install two wires (G) on radio.
13. Place clamp (M) over two wires (G).
14. Using 1/4 inch socket, install screw (N) and new lockwasher (P)
15. Install cupola body (Page 3-11).
16. Install cupola cover (page 3-9).

End of Task

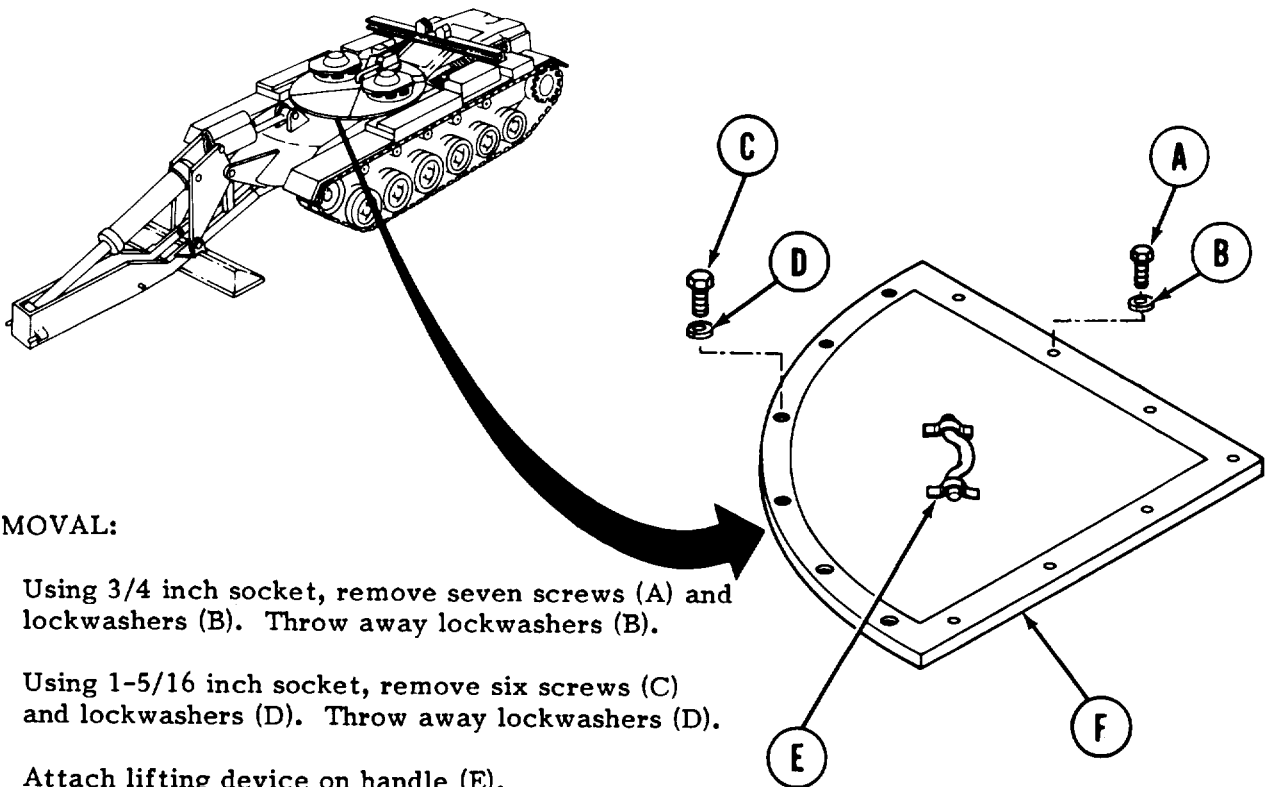


FRONT QUADRANT REPLACEMENT (Sheet 1 of 2)

TOOLS: Ratchet with 1/2 in. drive
 3/4 in. socket with 1/2 in. drive
 1-5/16 in. socket with 3/4 in. drive
 Ratchet with 3/4 in. drive
 Lifting device (400 +lbs minimum capacity)

SUPPLIES: Sealing compound (Item 2, Appendix D)
 Lockwashers (7 required)
 Lockwashers (6 required)

PERSONNEL: Three

**REMOVAL:**

1. Using 3/4 inch socket, remove seven screws (A) and lockwashers (B). Throw away lockwashers (B).
2. Using 1-5/16 inch socket, remove six screws (C) and lockwashers (D). Throw away lockwashers (D).
3. Attach lifting device on handle (E).
4. Have technician operating lifting device, lift quadrant (F) slowly from vehicle.
5. Have technician operating lifting device slowly lower quadrant (F) to desired location.
6. Remove lifting device from handle (E).

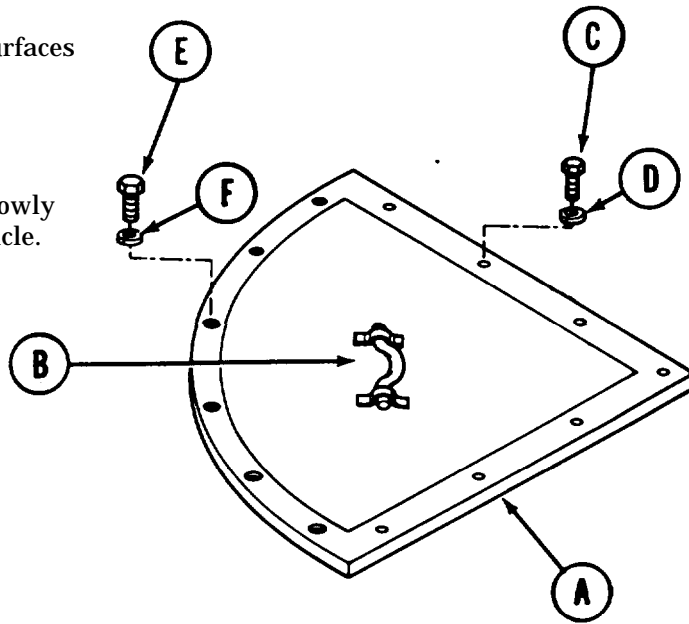
Go on to Sheet 2

TA170267

FRONT QUADRANT REPLACEMENT (Sheet 2 of 2)

INSTALLATION:

1. Using brush, apply sealant to mating surfaces of vehicle and quadrant (A).
2. Attach lifting device to handle (B).
3. Have person operating lifting device, slowly lift quadrant (A) into position over vehicle.



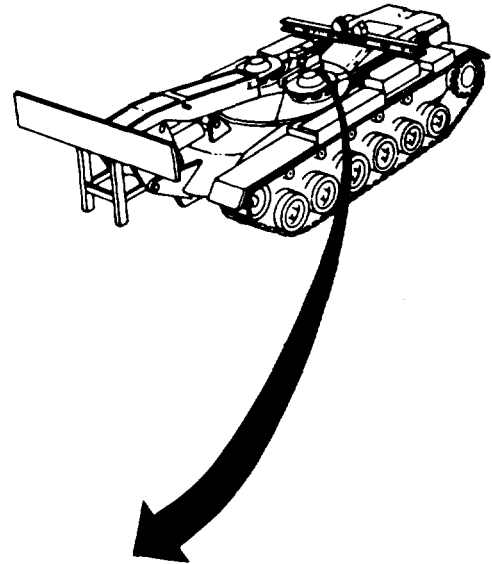
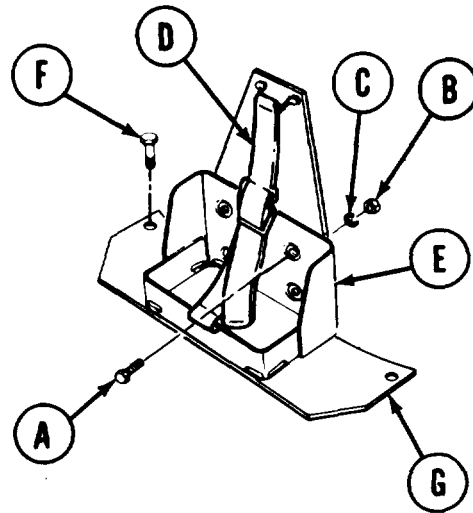
4. While two technicians guide quadrant (A), have technician operating lifting device slowly lower quadrant (A) into position on vehicle.
5. Remove lifting device from handle (B).
6. Using 3/4 inch socket, install seven screws (C) and new lockwashers (D).
7. Using 1-5/16 inch socket, install six screws (E) and new lockwashers (F).

End of Task

WATER CAN STORAGE BRACKET AND MOUNT REPLACEMENT (Sheet 1 of 2)

TOOLS: 9/16 in. socket with 1/2 in. drive
 Ratchet with 1/2 in. drive
 9/16 in. open end wrench
 1-5/16 in. socket with 3/4 in. drive
 Ratchet with 3/4 in. drive

SUPPLIES: Lockwashers (4 required)



REMOVAL:

1. Using 9/16 inch socket on screws (A) and wrench on nuts (B), remove four screws (A), nuts (B), and lockwashers (C). Throw lockwashers (C) away.
2. Manually remove strap (D).
3. Remove water can bracket assembly (E).
4. Using 1-5/16 inch socket, remove two screws (F).
5. Remove mount bracket (G).

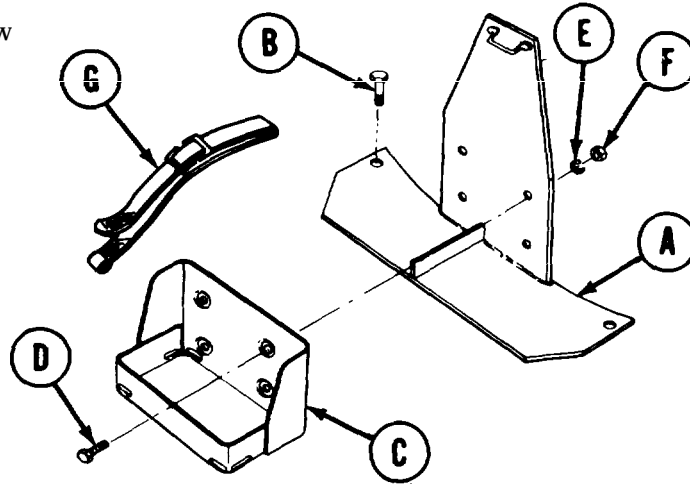
Go on to Sheet 2

TA170269

WATER CAN STORAGE BRACKET AND MOUNT REPLACEMENT (Sheet 2 of 2)

INSTALLATION: .

1. Place mount bracket (A) in position on vehicle.
2. Using 1-5/16 inch socket, install two screws (B).
3. Place water can bracket assembly (C) in place on mount bracket (A).
4. Manually install four screws (D), new lockwashers (E), and nuts (F).



5. Using 9/16 inch socket and wrench, tighten four nuts (F).
6. Manually install strap (G).

End of Task

TA170270

BRIDGE SEAT ASSEMBLY REPLACEMENT (Sheet 1 of 4)

PROCEDURE INDEX

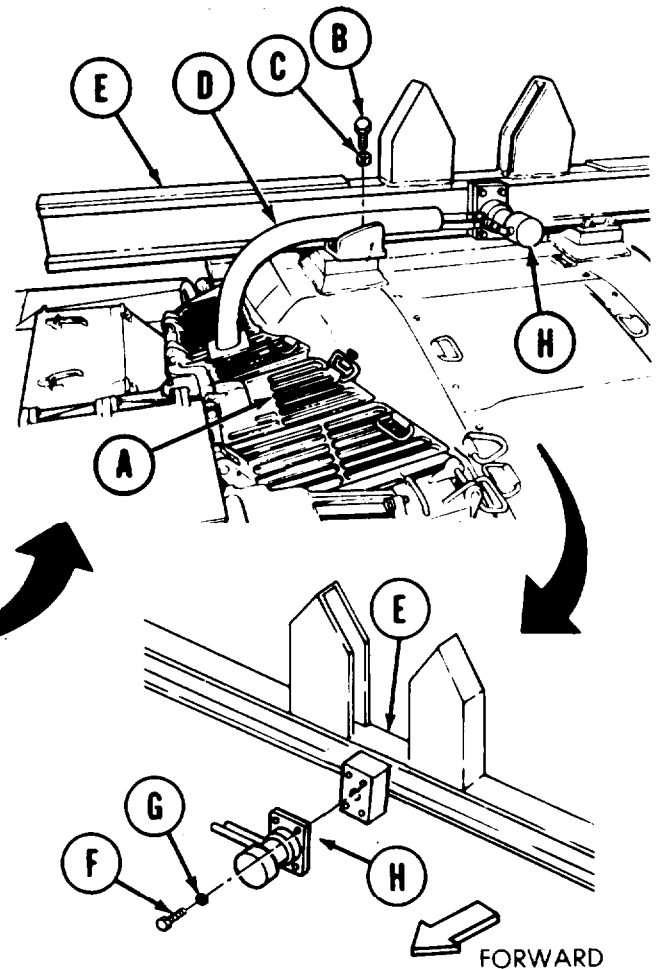
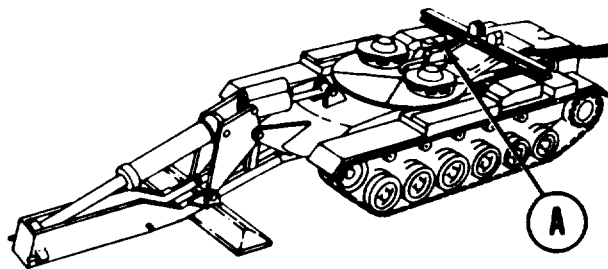
| PROCEDURE | PAGE |
|--------------|------|
| Removal | 3-43 |
| Installation | 3-45 |

TOOLS: Ratchet with 3/4 in. drive
 Ratchet with 1/2 in. drive
 9/16 in. socket with 1/2 in. drive
 1-1/2 in. socket with 3/4 in. drive
 Sling
 Lifting device (500 lb min capacity)
 15/16 in. socket with 1/2 in. drive

SUPPLIES: Lockwashers (4 required)
 Lockwashers (8 required)
 Lockwashers (20 required)

PERSONNEL: Three

PRELIMINARY PROCEDURE:
 Remove hold-down cylinder armor (page 3-247)



REMOVAL:

1. Using 15/16 inch socket, loosen setscrew securing No. 3 right top grille door (A).
2. Open No. 3 top grille door (A).
3. Using 1-1/2 inch socket, remove two screws (B) and lockwashers (C) securing hose guard pipe (D) and bridge seat (E) to vehicle. Throw lockwashers (C) away.

NOTE

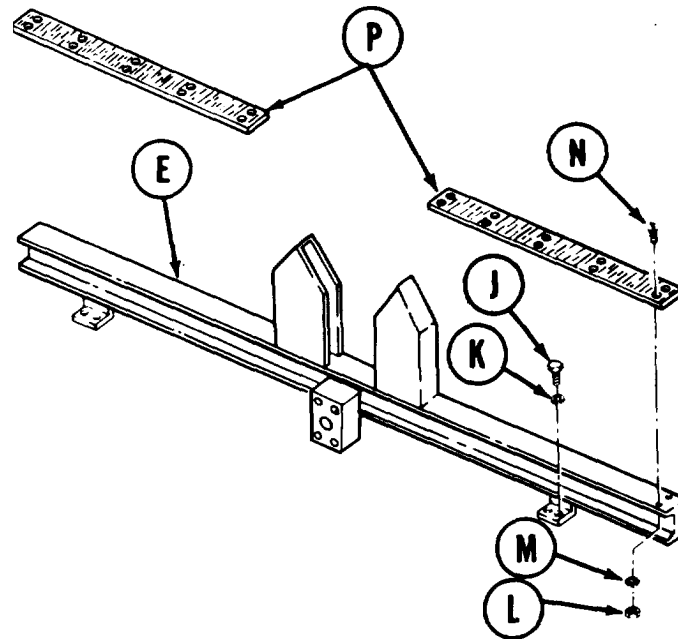
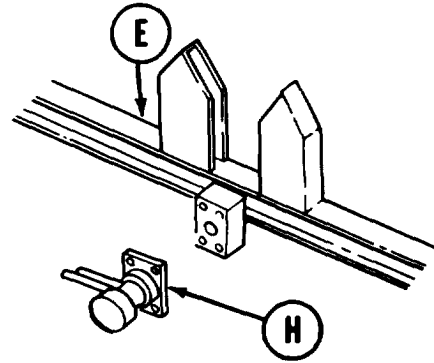
- Have second technician carefully support hold-down cylinder while screws are being removed.
4. Using 15/16 inch socket, remove four screws (F) and lockwashers (G) securing hold-down cylinder (H) to bridge seat (E). Throw lockwashers (G) away.

Go on to Sheet 2

TA170271

BRIDGE SEAT ASSEMBLY REPLACEMENT (Sheet 2 of 4)

5. Carefully pull hold-down cylinder (H) toward front of vehicle until cylinder plug clears bridge seat (E).
6. Care fully lay hold-down cylinder (H) with attached parts on top deck.
7. Position sling on bridge seat (E) and attach lifting device.
8. Using 1-1/2 inch socket, remove remaining six screws (J) and lockwashers (K) securing bridge seat (E) to vehicle. Throw lockwashers (K) away.
9. Using lifting device and two technicians, guide bridge seat (E) away from vehicle and lower to resting place.



10. Using 9/16 inch socket, remove 20 nuts (L), lockwashers (M), and screws (N) securing two belts (P) to bridge seat (E). Throw lockwashers (M) away.

11. Remove two belts (P).

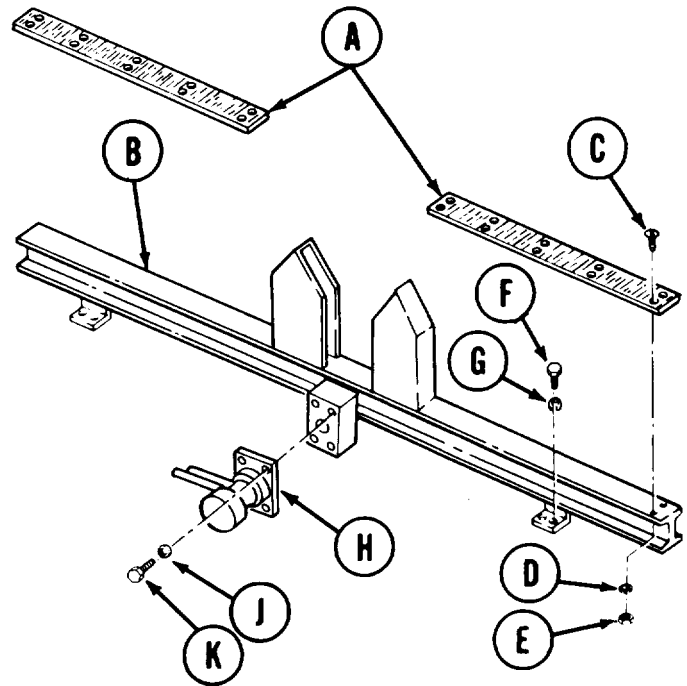
Go on to Sheet 3

TA170272

BRIDGE SEAT ASSEMBLY REPLACEMENT (Sheet 3 of 4)

INSTALLATION:

1. Place two belts (A) in position on bridge seat (B).
2. Manually install 20 screws (C), new lockwashers (D), and nuts (E) securing two belts (A) to bridge seat (B).
3. Using 9/16 inch socket, tighten 20 nuts (E).
4. Position sling on bridge seat (B).



5. Using lifting device and two technicians, lift bridge seat (B) and place in position on vehicle.
6. Using 1-1/2 inch socket, install six shorter screws (F) and new lockwashers (G) securing left forward, left rear, and right rear bridge seat (B) mounts to vehicle.
7. Carefully lift hold-down cylinder (H) and push into bridge seat (B).

NOTE

Have second technician support hold-down cylinder (H) while screws are being installed.

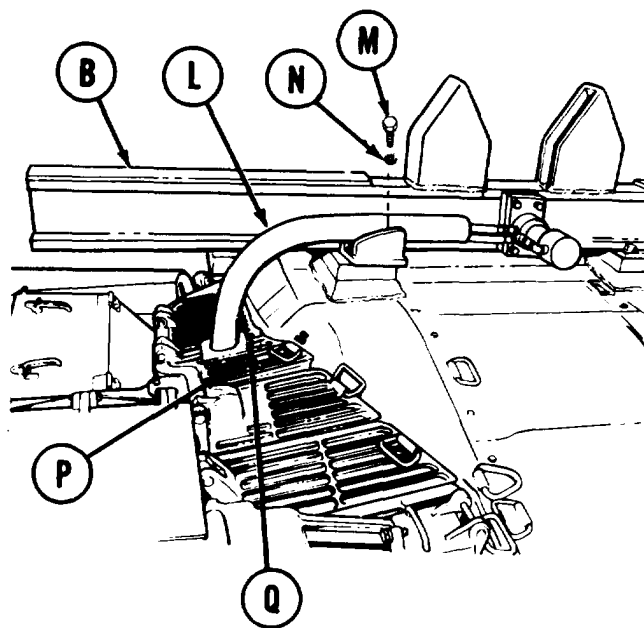
8. Using 15/16 inch socket, install four screws (J) and new lockwashers (K) securing hold-down cylinder (H) to bridge seat (B).

Go on to Sheet 4

TA170273

BRIDGE SEAT ASSEMBLY REPLACEMENT (Sheet 4 of 4)

9. Place hose guard pipe (L) in position on bridge seat (B) mount.
10. Using 1-1/2 inch socket, install two longer screws (M) and lockwashers (N).
11. Close top deck grille door (P).
12. Using 15/16 inch socket, tighten screw (Q) securing No. 3 right top grille door (P).
13. Install hold-down cylinder armor (page 3-248).

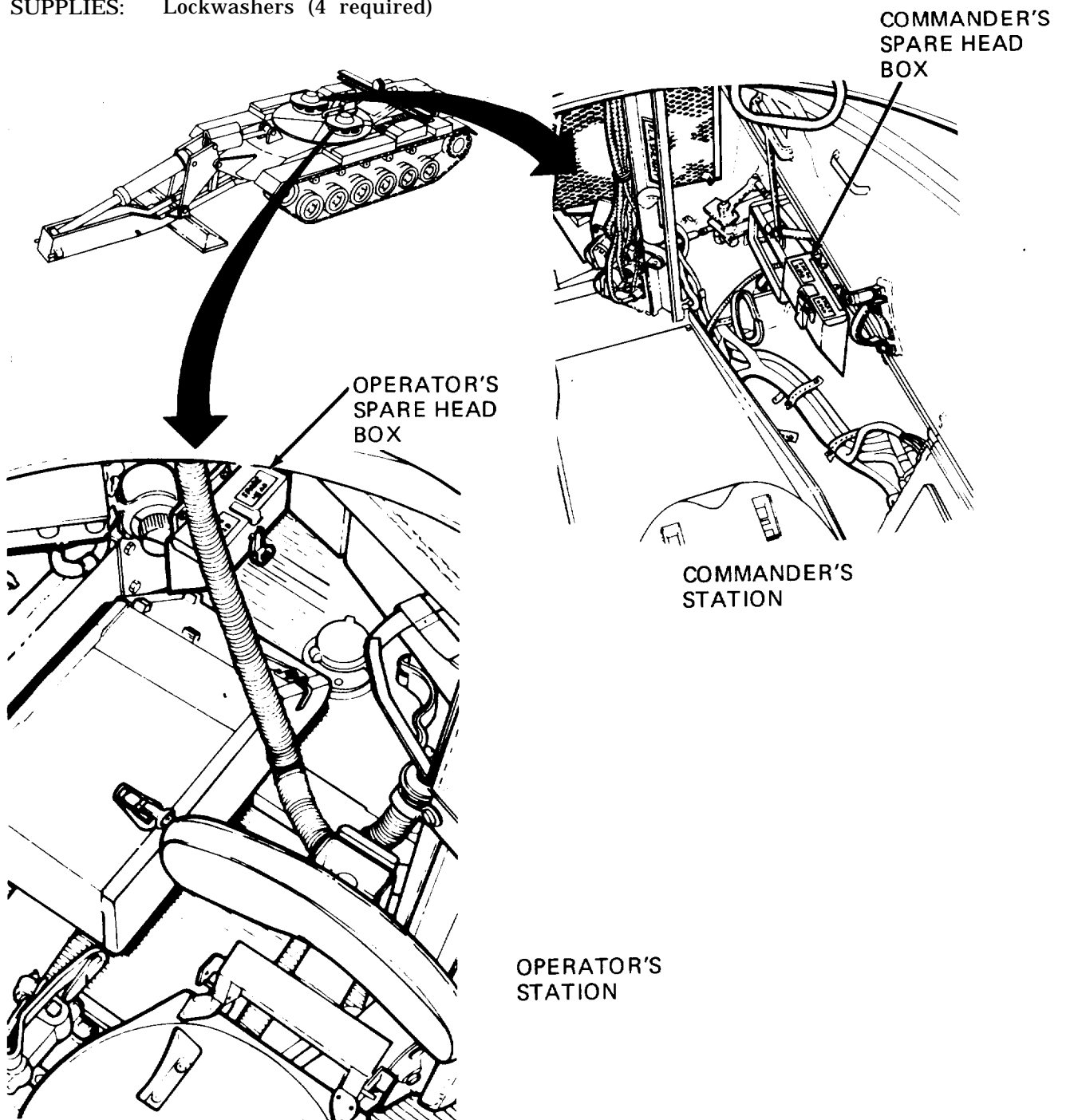


End of Task

SPARE HEAD STOWAGE BOXES REPLACEMENT (Sheet 1 of 2)

TOOLS: 7/16 in. socket with 3/8 in. drive
Ratchet with 3/8 in. drive
5 in. extension with 3/8 in. drive

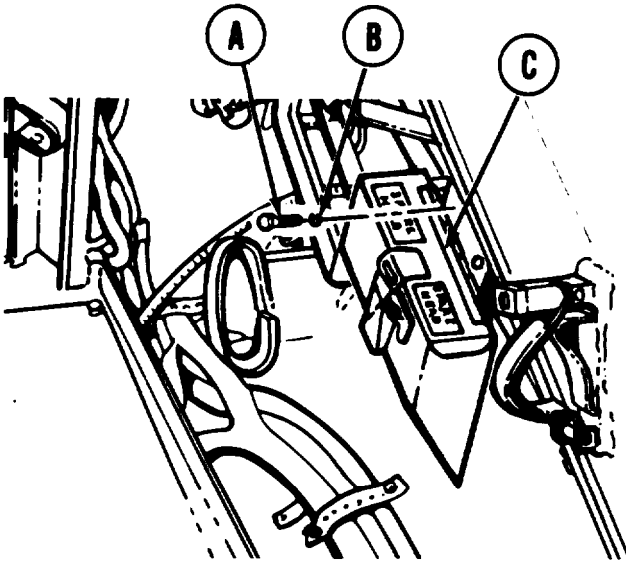
SUPPLIES: Lockwashers (4 required)



Go on to Sheet 2

TA170275

SPARE HEAD STOWAGE BOXES REPLACEMENT (Sheet 2 of 2)



COMMANDER'S SPARE
HEAD BOX SHOWN:
OPERATOR'S BOX SIMILAR

REMOVAL:

1. Using socket and extension remove four screws (A) and lockwashers (B). Throw lockwashers (B) away.
2. Remove spare head stowage box (C).

INSTALLATION:

1. Place spare head stowage box (C) in position.
2. Using socket and extension, install four screws (A) and lockwashers (B).

End of Task

TA170276

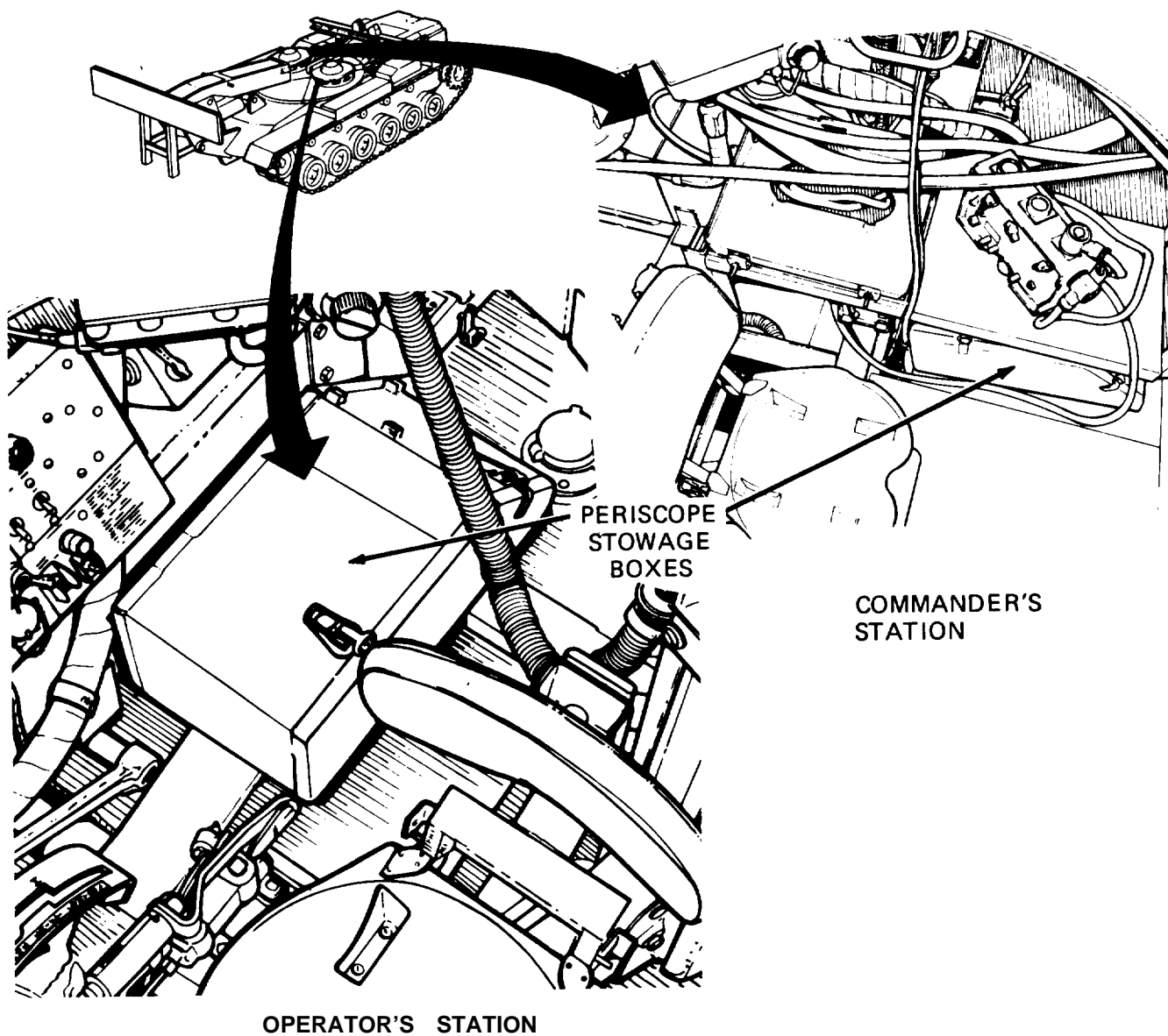
PERISCOPE STOWAGE BOXES REPLACEMENT (Sheet 1 of 2)

TOOLS: 1/2 in. socket with 3/8 in. drive
Ratchet with 3/8 in. drive
9/16 in. socket with 3/8 in. drive
9/16 in. combination box and open end wrench

SUPPLIES: Lockwashers (9 required)

REFERENCE: TM 5-5420-226-10

PRELIMINARY PROCEDURE: Remove periscopes from stowage boxes (TM 5-5420-226-10)



go on to Sheet 2

TA170277

PERISCOPE STOWAGE BOXES REPLACEMENT (Sheet 2 of 2)

REMOVAL:

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

2. Remove periscope storage box (C) with bracket (D) from vehicle.

3. Open periscope storage box (C).

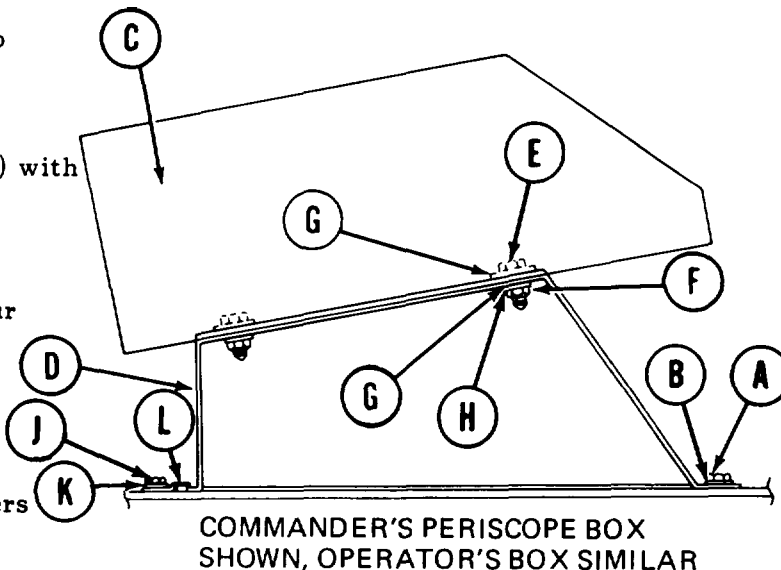
4. Using 9/16 inch wrench to hold four screws (E), use 9/16 inch socket to remove four nuts (F).

5. Manually remove four screws (E), eight flat washers (G), and four lockwashers (H). Throw lockwashers (H) away.

6. Remove periscope storage box (C) from bracket (D).

7. Using 1/2 inch socket, remove remaining three screws (J) and lockwashers (K) from clip (L). Throw lockwashers (K) away.

8. Remove clip (L) from vehicle.



INSTALLATION:

1. Place periscope storage box (A) in position on bracket (B).

2. Open periscope storage box (A).

3. Manually install four screws (C), eight flat washers (D), four new lockwashers (E), and four nuts (F).

4. Using 9/16 inch wrench to hold screws (C), use 9/16 inch socket to tighten four nuts (F).

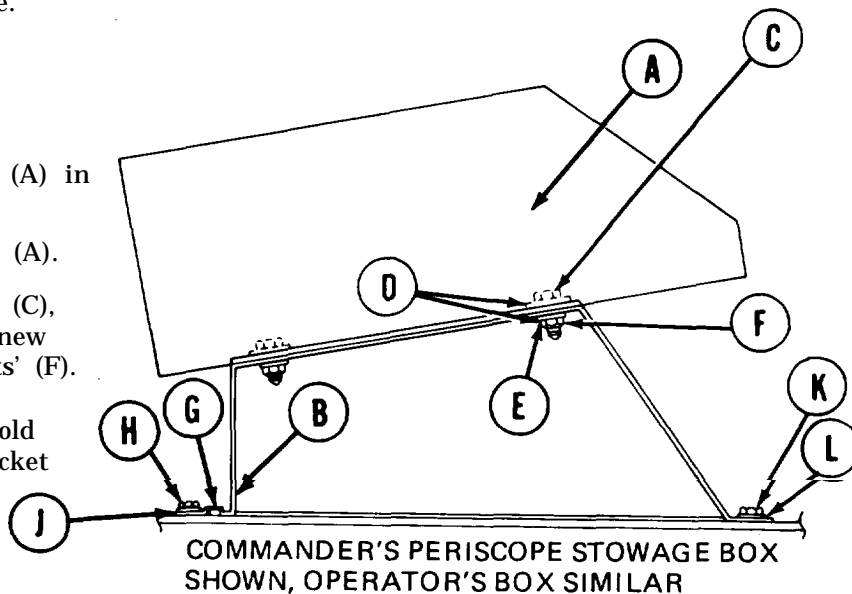
5. Place clip (G) in position in vehicle.

6. Using 1/2 inch socket, install three screws (H) and new lockwashers (J).

7. Slide bracket (B) with periscope storage box (A) into clip (G).

8. Using 1/2 inch socket, install two screws (K) and new lockwashers (L).

9. Stow periscopes in stowage boxes (TM 5-5420-226-1 O).



End of Task

TA170278

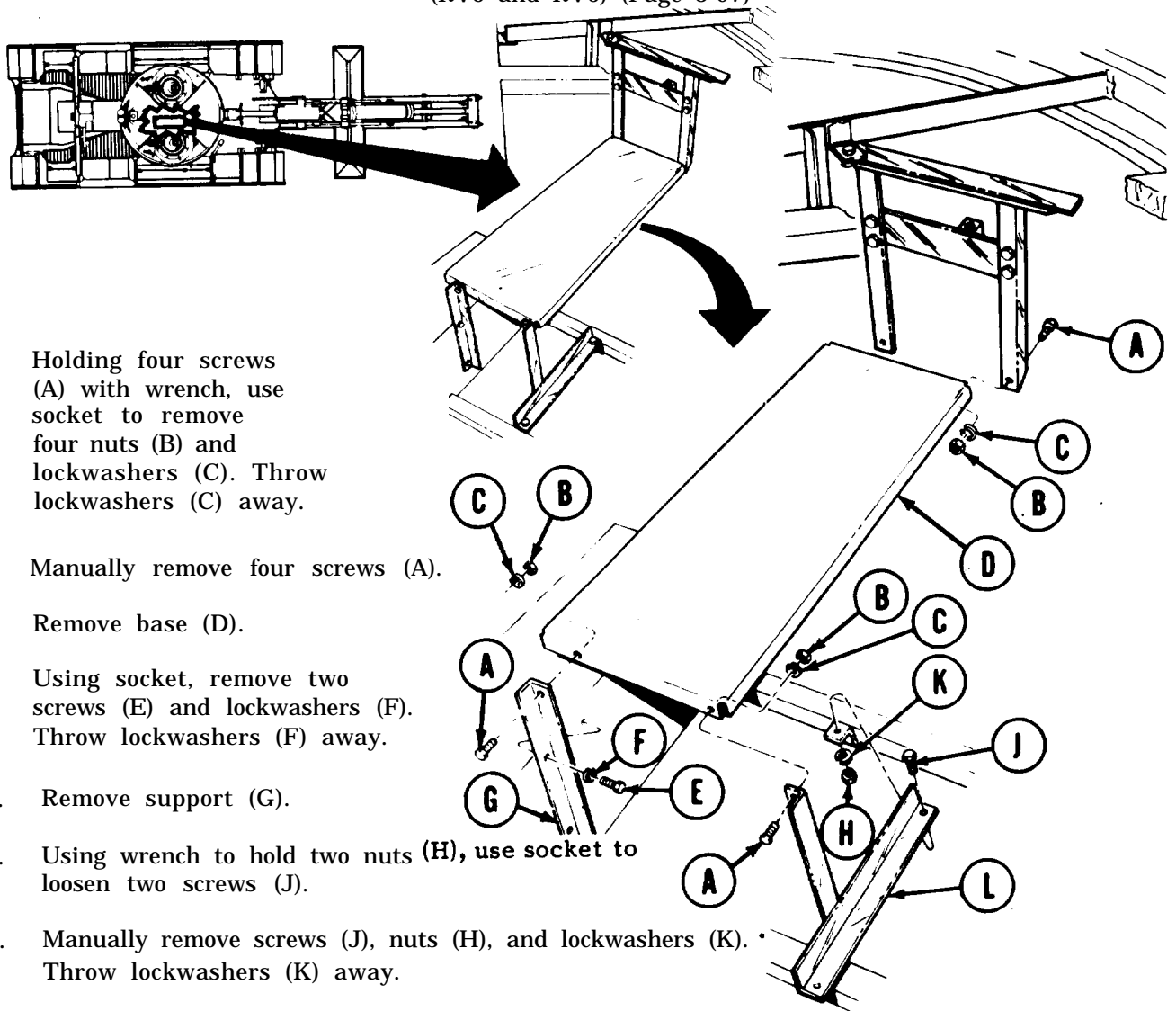
RADIO INSTALLATION MOUNT REPLACEMENT (Sheet 1 of 3)

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

SUPPLIES: Lockwashers (14 required)

REFERENCES: TM 11-5820-401-12
 TM 11-5820-498-12

PRELIMINARY PROCEDURES: Remove radio equipment (TM 11-5820-401-12 or
 TM 11-5820-498-12)
 Remove commander's periscope storage box (page 3-49)
 Remove sequence and locking cylinder relief valves
 (RV5 and RV6) (Page 3-97)



1. Holding four screws (A) with wrench, use socket to remove four nuts (B) and lockwashers (C). Throw lockwashers (C) away.
2. Manually remove four screws (A).
3. Remove base (D).
4. Using socket, remove two screws (E) and lockwashers (F). Throw lockwashers (F) away.
5. Remove support (G).
6. Using wrench to hold two nuts (H), use socket to loosen two screws (J).
7. Manually remove screws (J), nuts (H), and lockwashers (K). Throw lockwashers (K) away.
8. Remove support (L).

Go on to Sheet 2

TA170279

RADIO INSTALLATION MOUNT REPLACEMENT (Sheet 2 of 3)

9. Using socket, remove screw (M) and lockwasher (N).
Throw lockwashers (N) away.

10. Using wrench to hold screw (P), use socket to remove nut (Q) and lockwasher (R).
Throw lockwashers (R) away.

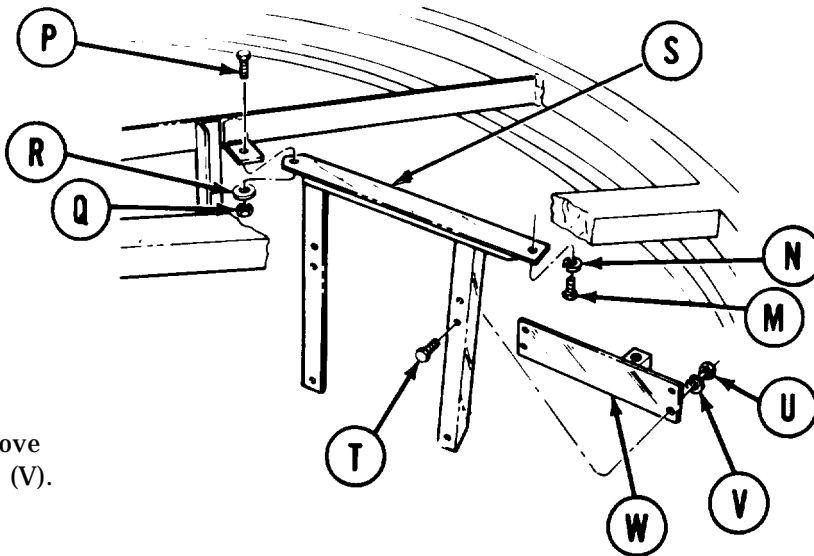
11. Remove screw (P).

12. Remove radio mount frame (s).

13. Using wrench to hold four screws (T), use socket to remove four nuts (U) and lockwashers (V).
Throw lockwashers (V) away.

14. Remove four screws (T).

15. Remove valve mount (W).



INSTALLATION:

1. Place valve mount (A) in position on radio mount frame (B).

2. Manually install four screws (C), lockwashers (D), and nuts (E).

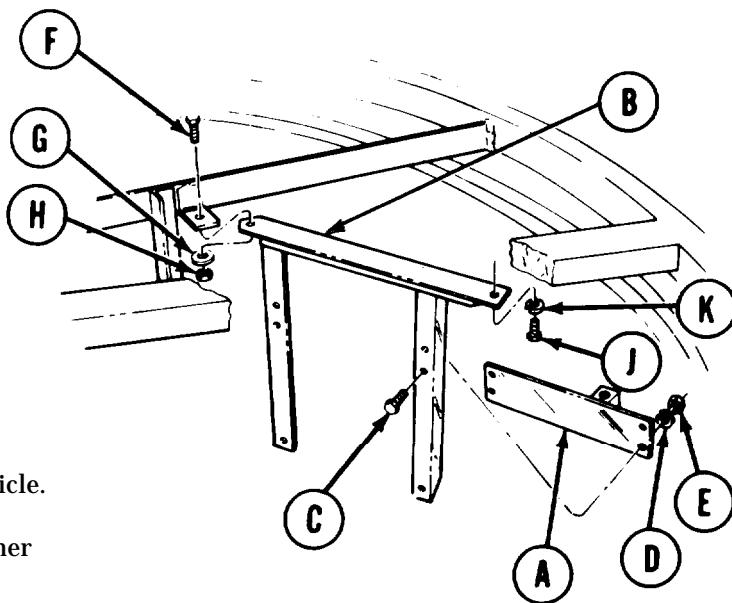
3. Using wrench to hold screws (C), use socket to tighten nuts (E).

4. Place radio mount frame (B) in vehicle.

5. Manually install screw (F), lockwasher (G), and nut (H).

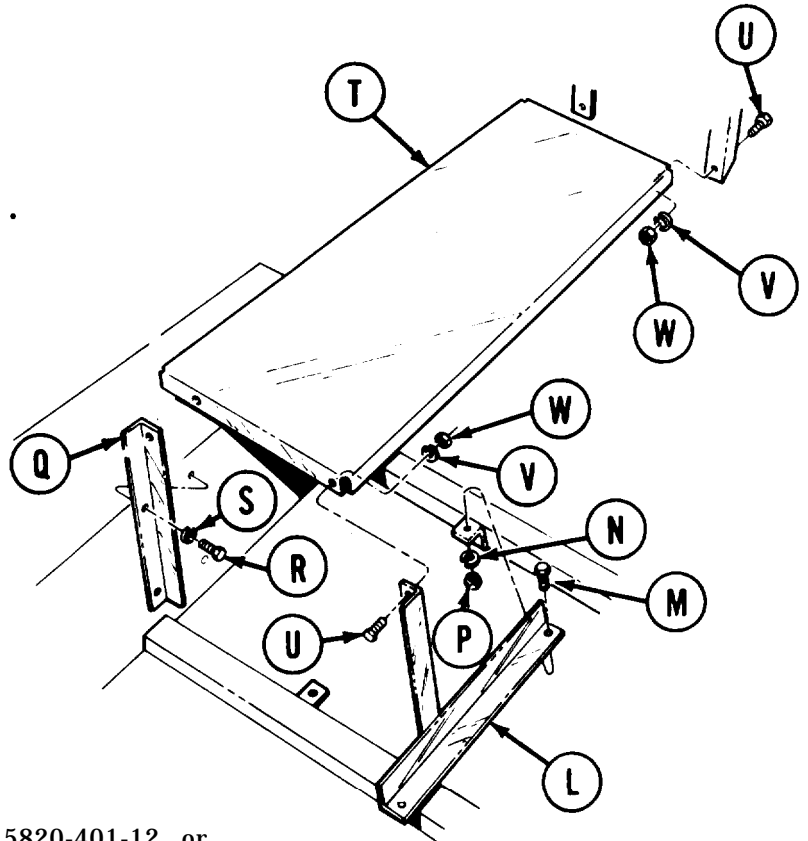
6. Using wrench to hold screw (F), use socket to tighten nut (H).

7. Using socket, install screw (J) and lockwasher (K).



RADIO INSTALLATION MOUNT REPLACEMENT (Sheet 3 of 3)

8. Place support (L) in position.
9. Manually install two screws (M) lockwashers (N), and nuts (P).
10. Using wrench to hold nuts (P), use socket to tighten screws (M).
11. Place support (Q) in position.
12. Using socket, install two screws (R) and lockwashers (S).
13. Place base (T) in position.
14. Manually install four screws (U), lockwashers (V), and nuts (W).
15. Using wrench to hold nuts (W), use socket to tighten screws (U).
16. Install periscope storage box (page 3-50).
17. Install radio equipment (TM 11-5820-401-12 or TM 11-5820-498-12).
18. Install. sequence and locking relief valves (RV5 and RV6) (page 3-98).

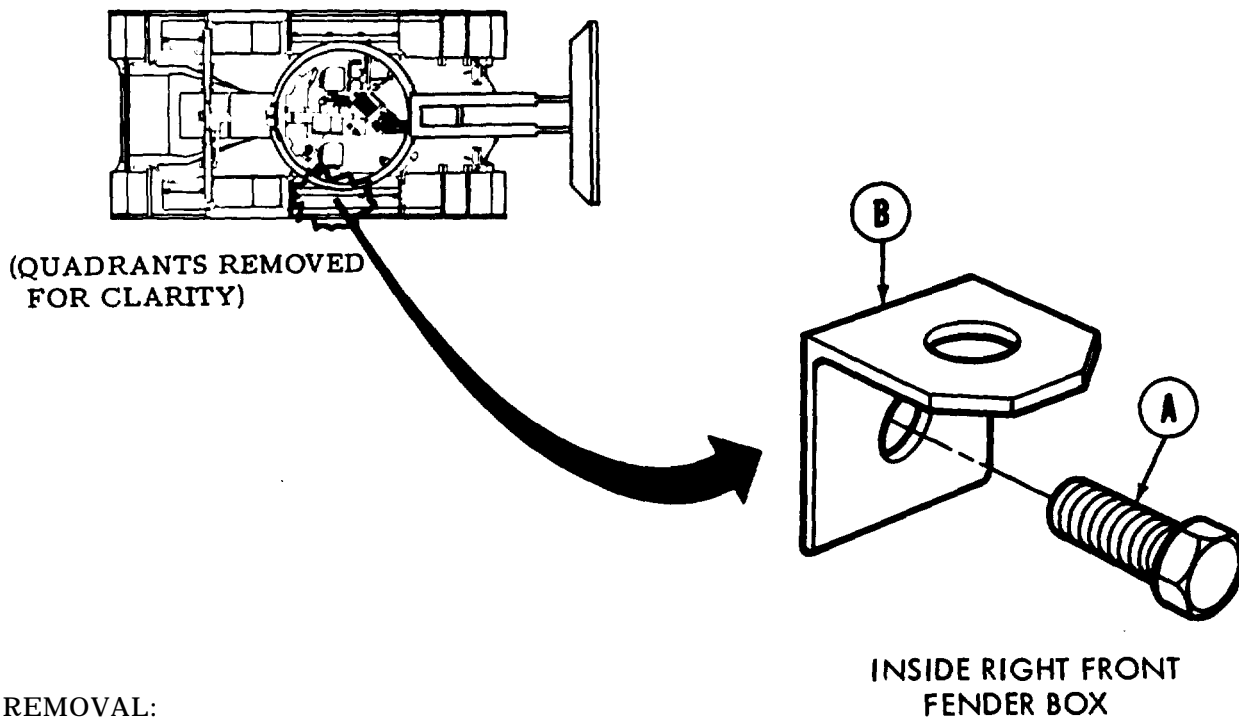


End of Task

TA170281

TIE DOWN ANGLE REPLACEMENT (Sheet 1 of 1)

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



REMOVAL:

1. Using socket, remove screw (A).
2. Remove tie down angle (B).

INSTALLATION:

1. Place tie down angle (B) in position on stowage box.
2. Using socket, install screw (A).

End of Task

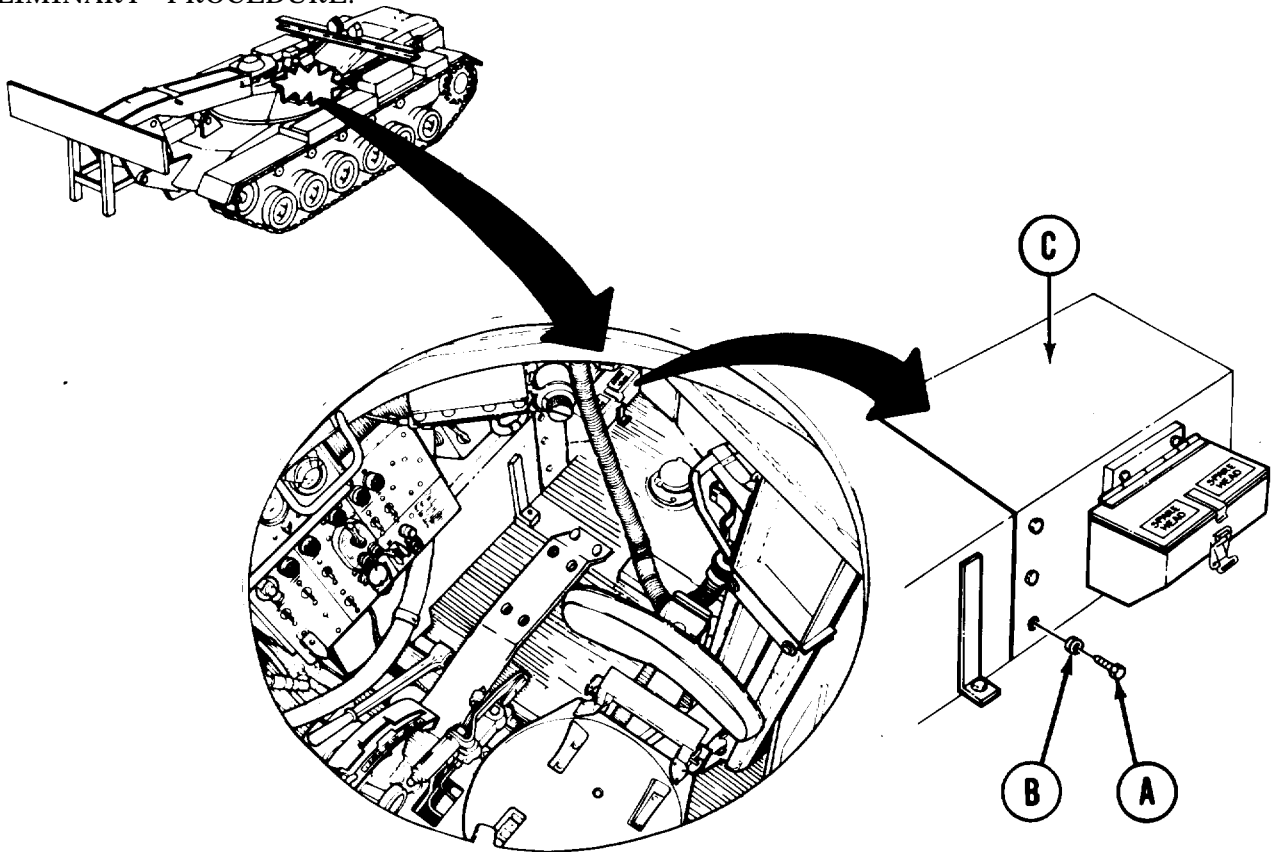
TA170282

UNIVERSAL JOINT COVER REPLACEMENT (Sheet 1 of 1)

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

SUPPLIES: Lockwashers (6 required)

PRELIMINARY PROCEDURE: Remove periscope stowage box (page 3-49)

**REMOVAL:**

1. Using socket, remove six screws (A) and lockwashers (B). Throw lockwashers (B) away.
2. Remove universal joint cover (C) with spare head stowage box attached.
3. If universal joint cover (C) is to be turned in, remove spare head stowage box (page 3-47).

INSTALLATION:

1. Position universal joint cover (C) and align holes.
2. Using socket, install six new lockwashers (B) and screws (A).
3. Install periscope stowage box (page 3-50).
4. Install spare head stowage box if it was removed (page 3-48).

End of Task

TA170283

UNIVERSAL JOINT REPLACEMENT (Sheet 1 of 3)

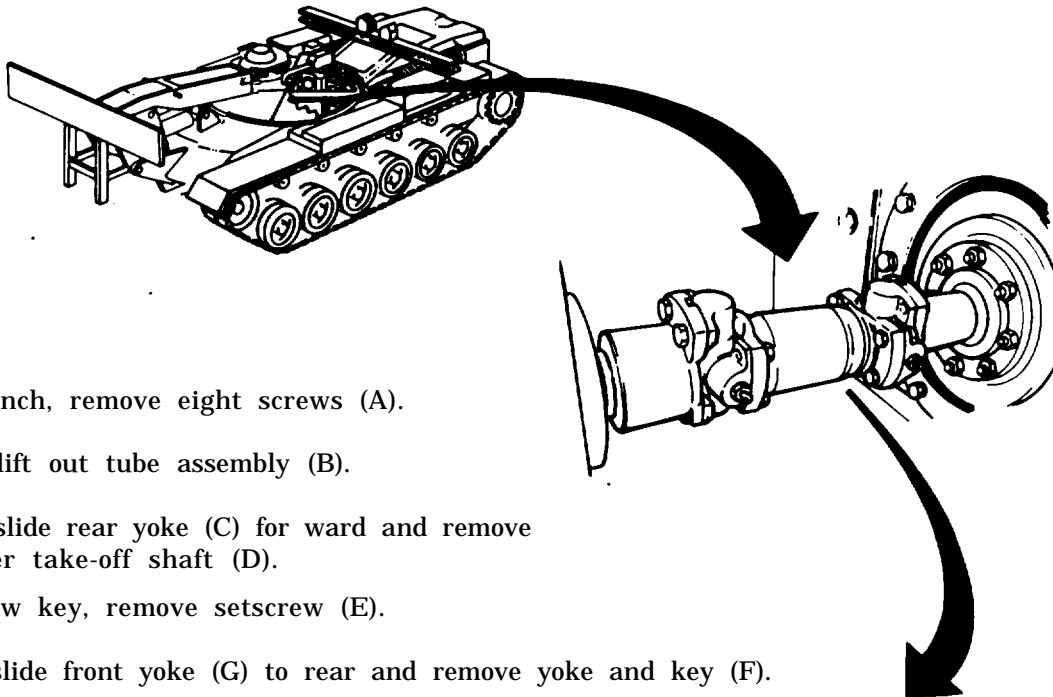
TOOLS: 7/16 in. combination box and open end wrench
1/4 in. socket head screw key
Torque wrench with 3/8 in. drive (0-600 lb-in)

SPECIAL TOOL: 7/16 in. crowfoot wrench with 3/8 in. drive

SUPPLIES: Universal joint parts kit
Dry cleaning solvent (Item 15, Appendix D)

PRELIMINARY PROCEDURE: Remove universal joint cover (page 3-55)

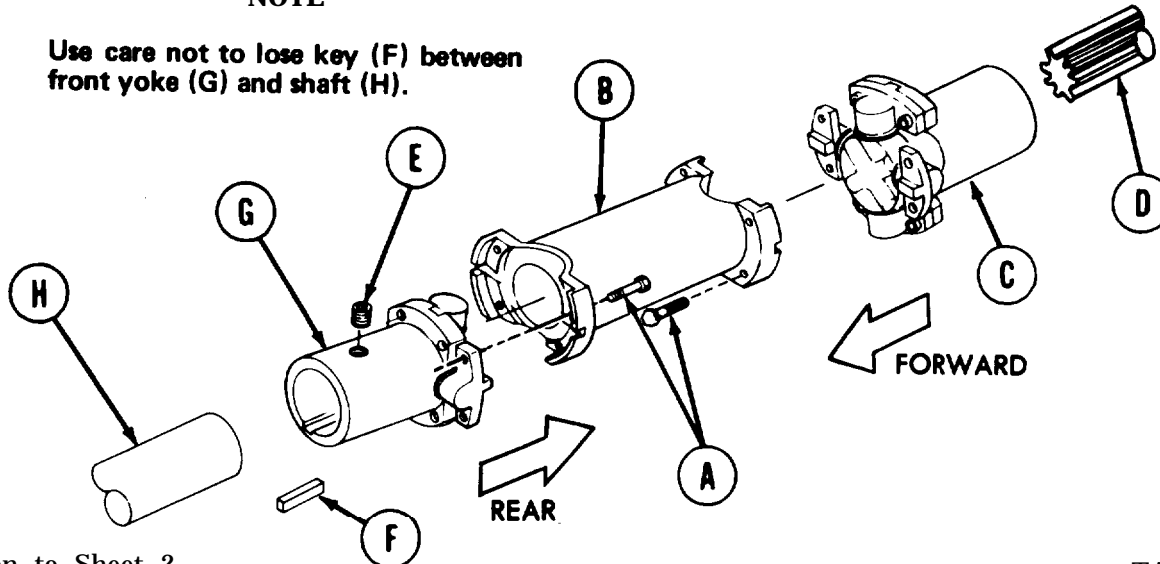
REMOVAL:



1. Using wrench, remove eight screws (A).
2. Manually lift out tube assembly (B).
3. Manually slide rear yoke (C) for ward and remove from power take-off shaft (D).
4. Using screw key, remove setscrew (E).
5. Manually slide front yoke (G) to rear and remove yoke and key (F).

NOTE

Use care not to lose key (F) between front yoke (G) and shaft (H).

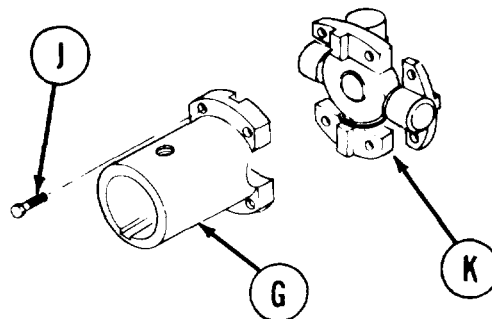
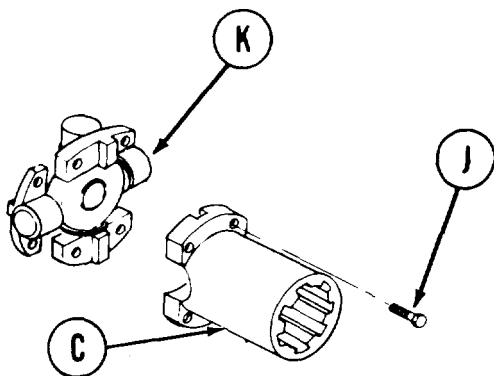


Go on to Sheet 2

TA170284

UNIVERSAL JOINT REPLACEMENT (Sheet 2 of 3)

- Using wrench, remove four screws(J) and universal joint (K) from yoke (G).



- Using wrench, remove four screws (J) and universal joint (K) from yoke (C).

CLEANING AND INSPECTION:

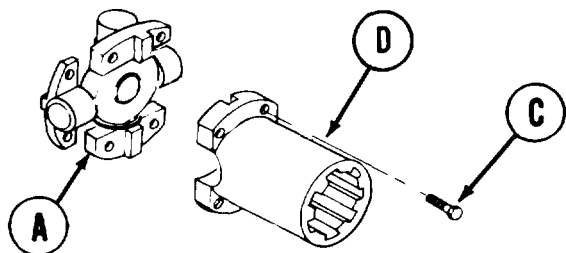
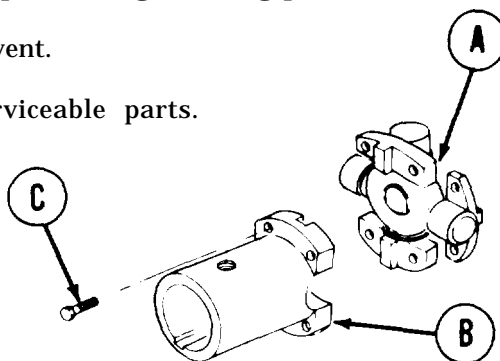
WARNING

Cleaning agent specified is flammable. Use only in well ventilated areas. Keep away from flames, sparks, or heat. Do not smoke while using. Prevent contact with eyes, mouth, and/or skin. Wear rubber gloves when performing cleaning procedures.

- Clean all parts to be reused in dry cleaning solvent.
- Inspect all parts for damage. Replace all unserviceable parts.

INSTALLATION:

- Position universal joint (A) on yoke (B) and manually install four screws (C) in universal joint.



- Position universal joint (A) on yoke (D) and manually install four screws (C) in universal joint (A).

- Using torque wrench and 7/16 inch crowfoot wrench, tighten all screws (C) in both yokes (B and D) to 265 to 325 lb-in (30 - 36 N·m).

CAUTION

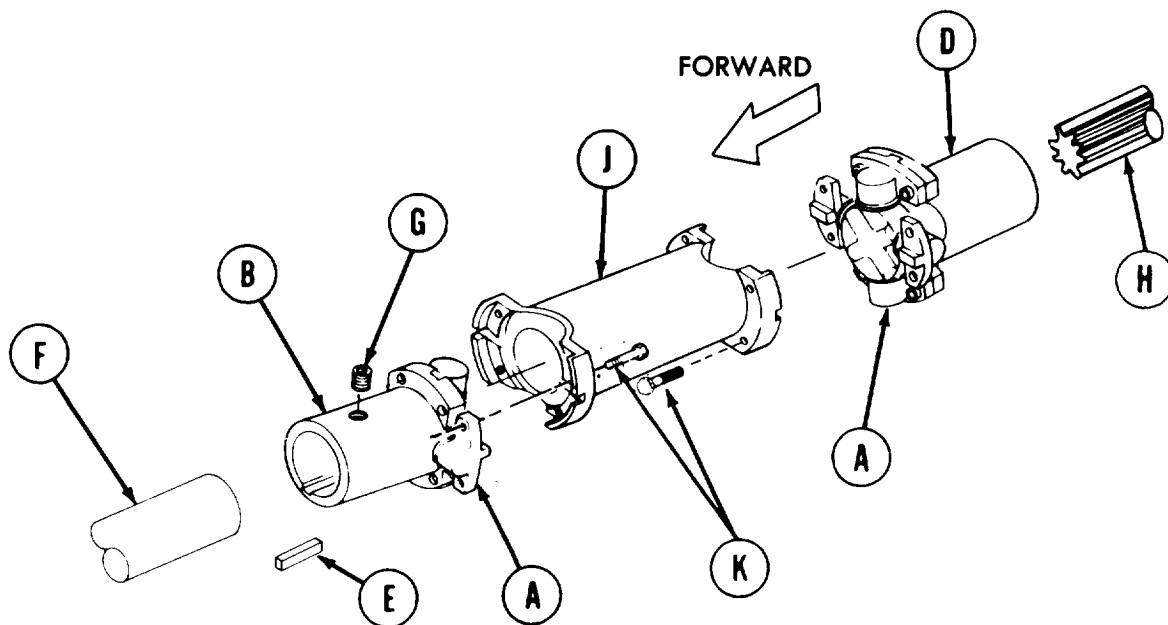
Replace any screws (C) which have been over torqued beyond 325 lb.-in. (36N.m).

Go on to Sheet 3

TA170285

UNIVERSAL JOINT REPLACEMENT (Sheet 3 of 3)

4. Position key (E) between front yoke (B) and shaft (F) and slide yoke (B) forward on shaft (F) until it bottoms out.
5. Using screw key, install setscrew (G).



6. Aline splines of yoke (D) and shaft (H), and slide yoke (D) on shaft (H).
7. Position tube assembly (J) between yokes (B and D) and rotate yoke (B) until both universal joints (A) are alined, then slide yoke (D) forward.
8. Aline holes and manually start four screws (K) on each end of tube assembly (J).
9. Using torque wrench and 7/16 inch crowfoot wrench, tighten eight screws (K) to 265 to 325 lb-in (30 to 36 N•m).

NOTE

Replace any screws (K) which have been over torqued beyond 325 lb-in (36 N m).

10. Lubricate per LO 5-5420-226-12.
11. Install universal joint cover (page 3-55).

End of Task

TA170286

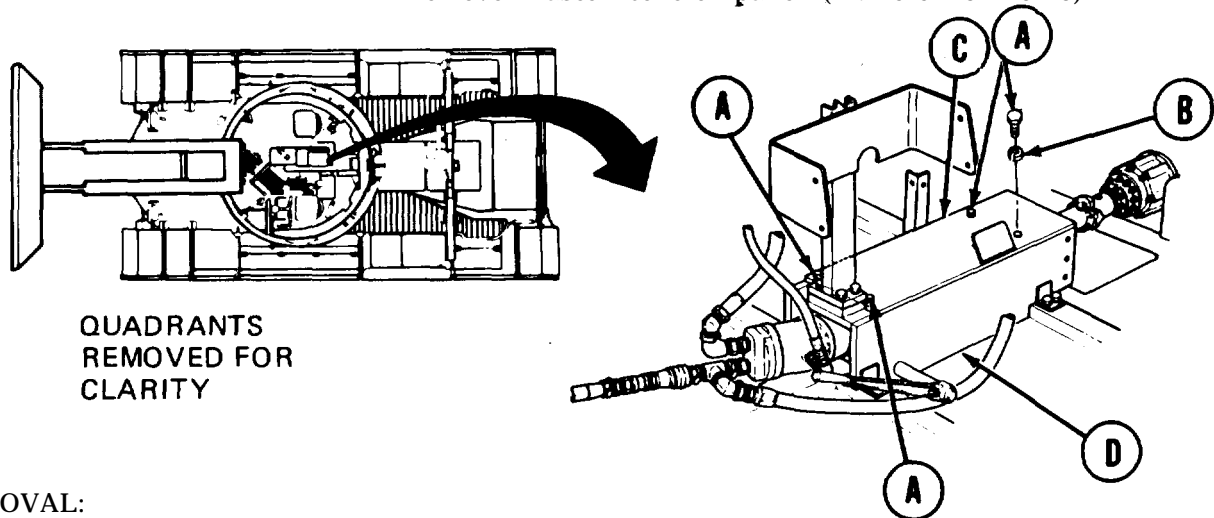
PUMP-CLUTCH COVER PLATE REPLACEMENT (Sheet 1 of 1)

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

SUPPLIES: Lockwashers (4 required)

REFERENCE: TM 5-5420-226-20

PRELIMINARY PROCEDURES: Remove driver's intercommunication control
(TM 5-5420-226-20)
Remove master control panel (TM 5-5420-226-20)

**REMOVAL:**

1. Using socket, remove four screws (A) and lockwashers (B). Throw lockwashers (B) away.
2. Manually remove cover plate (C) from support (D).

INSTALLATION:

1. Manually position cover plate (C) on support (D).
2. Using socket, install four screws (A) and lockwashers (B).
3. Install master control panel (TM 5-5420-226-20).
4. Install driver's intercommunication control (TM 5-5420-226-20).

End of Task

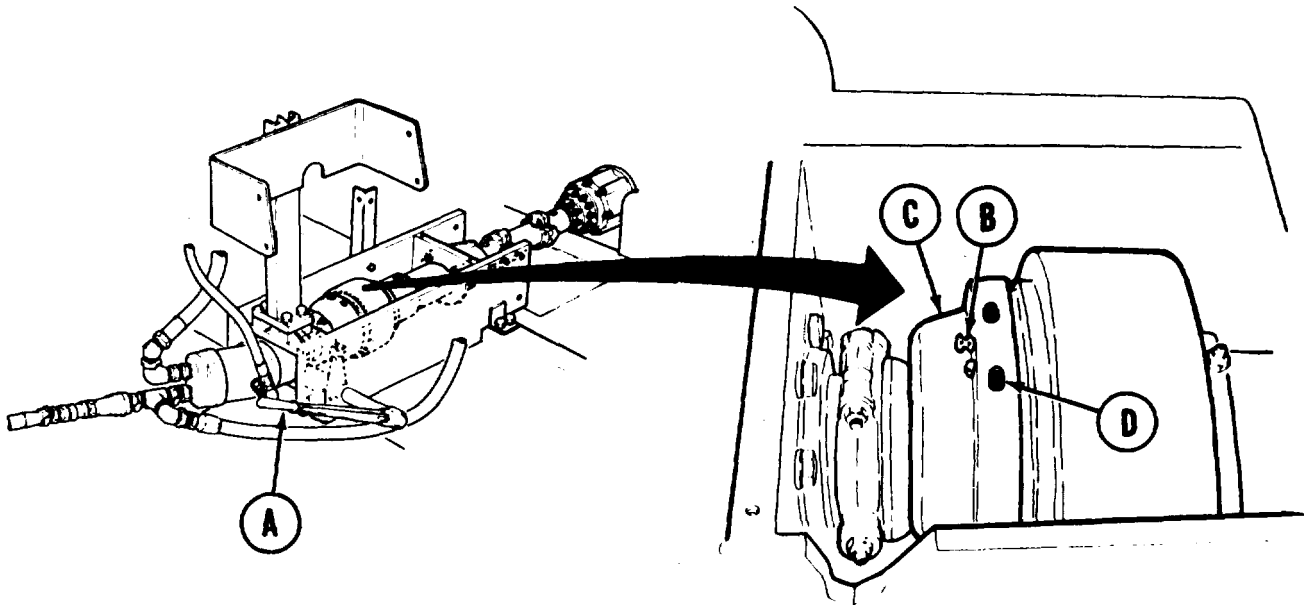
TA170287

HYDRAULIC CLUTCH ADJUSTMENT (Sheet 1 of 1)

SUPPLIES: Lockwire

REFERENCE: TM 5-5420-226-10

PRELIMINARY PROCEDURE: Remove pump-clutch cover plate (page 3-59).

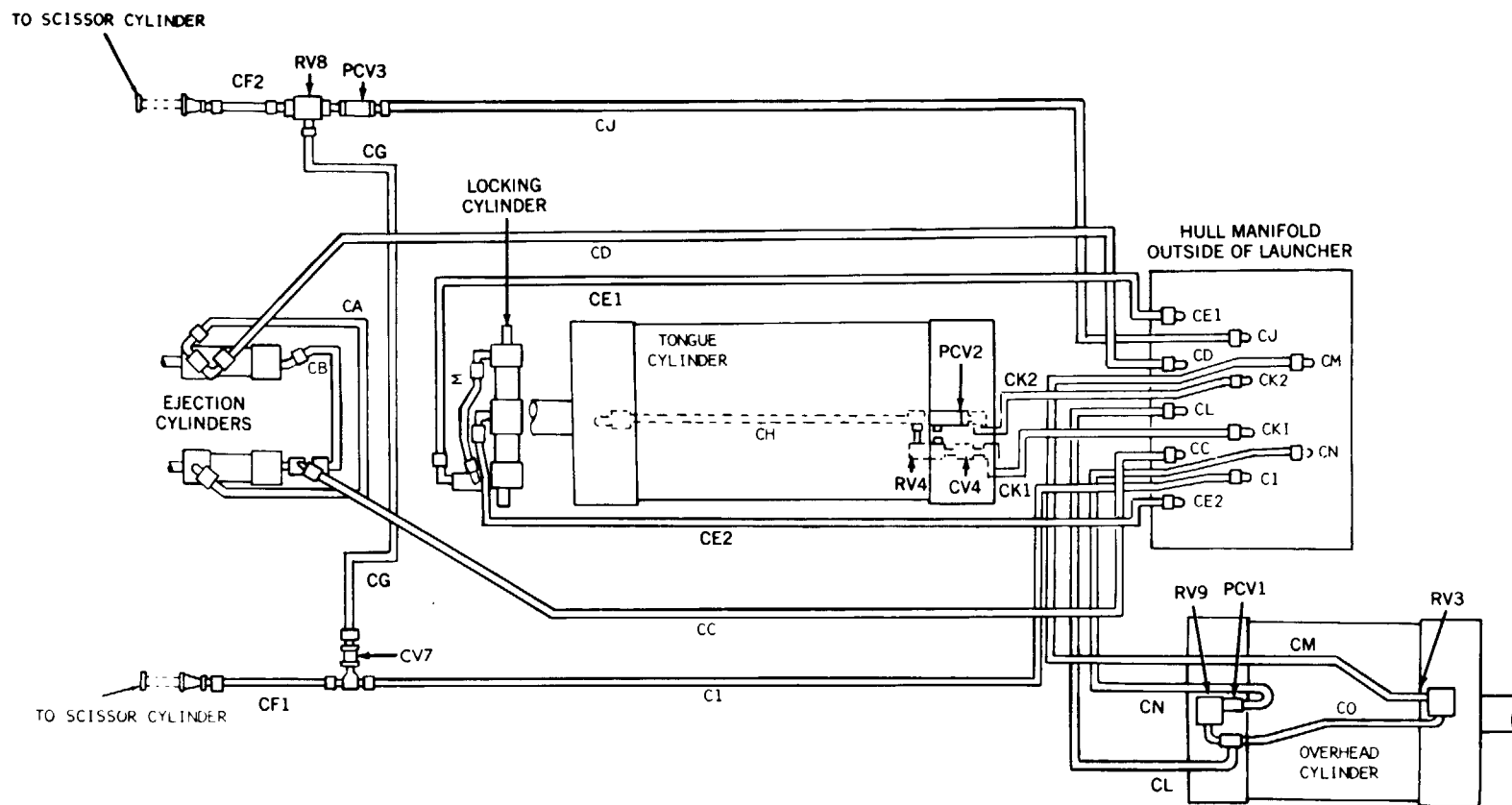


ADJUSTMENT:

1. Push clutch control lever (A) downward to disengage.
2. Turn clutch manually until pin (B) can be reached.
3. Pull pin (B) out and lock by inserting lockwire through hole in pin (B).
4. Turn cover (C) clockwise one or two adjusting holes (D).
5. Pull clutch control lever (A) up to engage.
6. Repeat steps 4 and 5 until clutch control lever (A) requires definite force to engage clutch.
7. Remove lockwire from pin (B) and push pin in.
8. Install pump-clutch cover (page 3-59)
9. Operate pump-clutch to insure proper operation (TM 5-5420-226-10).

End of Task

TA170288



NOTE

Reference designators (letters on diagrams) are used to identify parts on the vehicle and to find the maintenance procedure in this manual. Find the reference designator on the diagram, then look on the facing page for the maintenance procedure, part number, and page number where the task is detailed. Reference designators will be found stamped on the vehicle components as follows: Stamped on tab of collars (large flat washers with a tab) located at each end of hose assemblies; Stamped on hull manifold where hose assemblies connect.

OUTSIDE HYDRAULICS

OUTSIDE HYDRAULICS

HOSE ASSEMBLIES

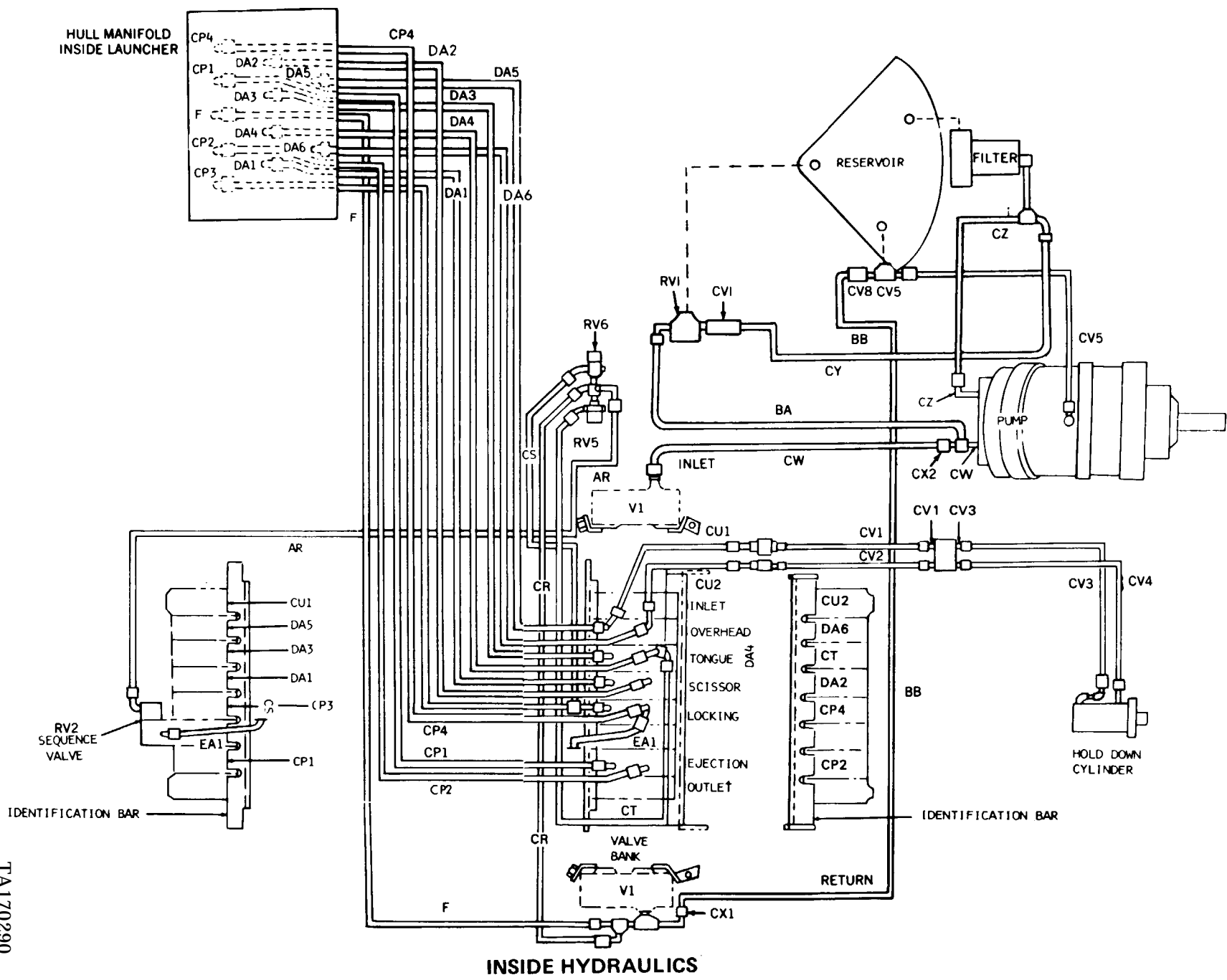
| Reference Designator | | Part No. | Page No. |
|----------------------|---|----------------|----------|
| CA | Ejection Cylinder Hose Assy Replacement | C13211E3036-5 | 3-149 |
| CB | Ejection Cylinder Hose Assy Replacement | C13211E3036-2 | 3-149 |
| CC | Ejection Cylinder Hose Assy Replacement | C13211E3036-7 | 3-149 |
| CD | Ejection Cylinder Hose Assy Replacement | C13211E3036-8 | 3-149 |
| CE1 & CE2 | Locking Cylinder Hose Assy Replacement | C13211E3036-6 | 3-145 |
| CF1 & CF2 | Scissors Cylinder Hose Assy Replacement | C13211E3148-5 | 3-133 |
| c c | Scissors Cylinder Hose Assy Replacement | C13211E3148-2 | 3-133 |
| CH | Tongue Cylinder Hose Assy Replacement | C13211E3148-1 | 3-129 |
| C1 | Scissors Cylinder Hose Assy Replacement | C13211E3148-13 | 3-133 |
| CJ | Scissors Cylinder Hose Assy Replacement | C13211E3148-12 | 3-133 |
| CK1 & CK2 | Tongue Cylinder Hose Assy Replacement | C13211E3148-11 | 3-129 |
| CL | Overhead Cylinder Hose Assy Replacement | C13211E3148-8 | 3-119 |
| CM | Overhead Cylinder Hose Assy Replacement | C13211E3148-10 | 3-119 |
| CN | Overhead Cylinder Hose Assy Replacement | C13211E3148-9 | 3-119 |
| CO | Overhead Cylinder Hose Assy Replacement | C13211E3148-3 | 3-119 |
| M | Locking Cylinder Hose Assy Replacement | C13211E3036-1 | 3-145 |

VALVES AND REGULATORS

| | | | |
|------|--|---------------|-------|
| CV4 | Tongue Cylinder Relief Valve & Check Valve Replacement | B13211E3214 | 3-93 |
| CV7 | Scissors Cylinder Check Valve Replacement | B13211E3222-1 | 3-110 |
| PCV1 | Overhead Cylinder Relief Valve & Flow Regulator Replacement | C13211E3217-2 | 3-104 |
| 2 | Tongue Cylinder Flow Regulator Replacement | C13211E3217-2 | 3-108 |
| 3 | Scissors Cylinder Relief Valve Elbow Regulator Replacement | C13211E3217-1 | 3-100 |
| RV3 | Overhead Cylinder Relief Valve (Rod End) Cartridge Replacement | | 3-74 |
| | Overhead Cylinder Relief Valve (Rod End) Adjustment | | 3-75 |
| | Overhead Cylinder Relief Valve (Rod End) Replacement | C13211E3210-1 | 3-89 |
| RV4 | Tongue Cylinder Relief Valve (Rod End) Cartridge Replacement | | 3-77 |
| | Tongue Cylinder Relief Valve (Rod End) Adjustment | | 3-78 |
| | Tongue Cylinder Relief Valve (Rod End) Replacement | C13211E3210-1 | 3-93 |
| RV8 | Scissors Cylinder Relief Valve (Rod End) Cartridge Replacement | | 3-82 |
| | Scissors Cylinder Relief Valve (Rod End) Adjustment | | 3-83 |
| | Scissors Cylinder Relief Valve (Rod End) Replacement | C13211E3210A | 3-100 |
| RV9 | Overhead Cylinder Relief Valve (Cap End) Cartridge Replacement | | 3-74 |
| | Overhead Cylinder Relief Valve (Cap End) Adjustment | | 3-76 |
| | Overhead Cylinder Relief Valve (Cap End) Replacement | C13211E3210-1 | 3-104 |

NOTE

Reference designators (letters on diagrams) are used to identify parts on the vehicle and to find the maintenance procedure in this manual. Find the reference designator on the diagram, then look on the facing page for the maintenance procedure, part number, and page number where the task is detailed. Reference designators will be found stamped on the vehicle components as follows: Stamped on tab of collars (large flat washers with a tab) located at each end of hose assemblies; Stamped on hull manifold where hose assemblies connect.



INSIDE HYDRAULICS

INSIDE HYDRAULICS

HOSE ASSEMBLIES

| Reference Designator | | Part No. | Page No. |
|----------------------|--|---------------|----------|
| AR | Sequence Valve Hose Assy Replacement | C13211E3037 | 3-159 |
| BA | Master Relief Valve to Pump Hose Assy Replacement | C13211E3280-5 | 3-191 |
| BB | Reservoir to Valve Bank Return Hose Assy Replacement | C13211E3280-4 | 3-185 |
| CP1 & CP2 | Ejection Cylinder Hose Assy Replacement | C13211E3025 | 3-172 |
| CP3 & CP4 | Locking Cylinder Hose Assy Replacement | C13211E3025 | 3-174 |
| CR | Outlet to Relief Valve Mount Hose Assy Replacement | C13211E3148-4 | 3-156 |
| CS | Locking Cylinder Hose Assy Replacement | C13211E3153-1 | 3-174 |
| CT | Tongue Cylinder Hose Assy Replacement | C13211E3153-2 | 3-160 |
| CU1 & CU2 | Hold Down Cylinder Hose Assy Replacement | C13211E3036-4 | 3-167 |
| CV1 thru CV4 | Hold Down Cylinder Hose Assy Replacement | C13211E3036-3 | 3-167 |
| CV5 | Reservoir to Pump Hose Assy Replacement | C13211E3036-3 | 3-188 |
| CW | Pump to Valve Bank Hose Assy Replacement | C13211E3280-2 | 3-183 |
| CY | Reservoir Filter Bypass Hose Assy Replacement | C13211E3280-1 | 3-197 |
| CZ | Filter to Pump Hose Assy Replacement | C13211E3281 | 3-194 |
| DA1 & DA2 | Scissors Cylinder Hose Assy Replacement | C13211E3153-3 | 3-178 |
| DA3 & DA4 | Tongue Cylinder Hose Assy Replacement | C13211E3153-3 | 3-160 |
| DA5 & DA6 | Overhead Cylinder Hose Assy Replacement | C13211E3153-3 | 3-164 |
| EA1 | Locking Cylinder Tube Assy Replacement | C13211E3263 | 3-174 |
| F | Overhead Cylinder Return Hose Assy Replacement | C13211E3148-7 | 3-157 |

VALVES, REGULATORS, AND DISCONNECTS

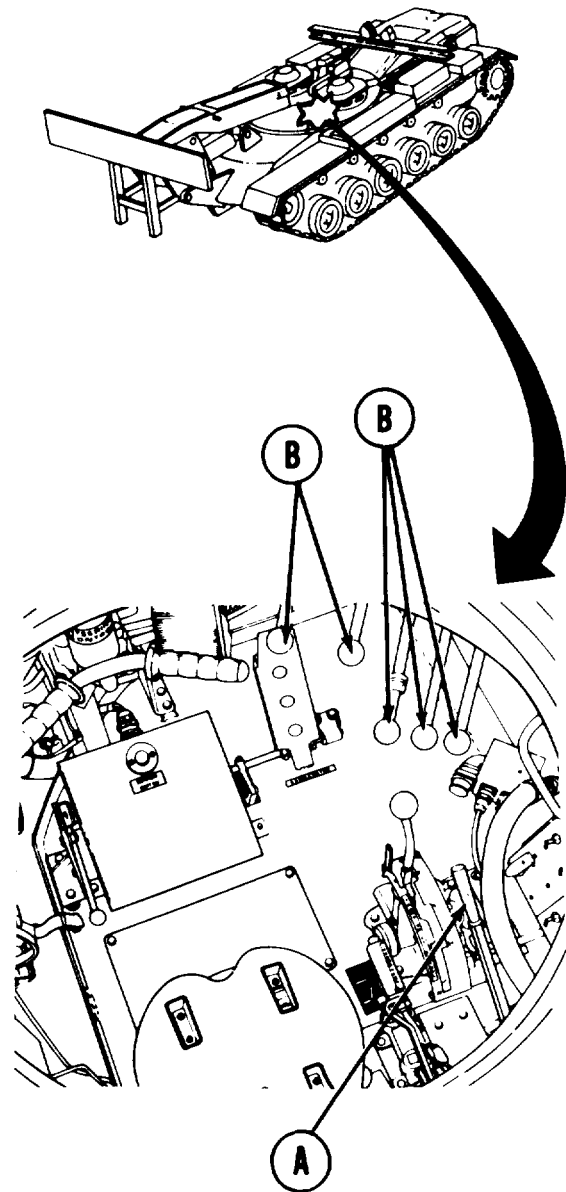
| | | | |
|-----|---|---------------|-------|
| CV1 | Check Valve | B13211E3225-2 | 3-84 |
| CV5 | Check Valve | B13211E3225-1 | 3-114 |
| CV8 | Check Valve | B13211E3222-2 | 3-112 |
| CX1 | Quick Disconnect (Return) | | 3-185 |
| CX2 | Quick Disconnect (Inlet) | | 3-183 |
| RV1 | Relief Valve (Master) Cartridge Replacement | | 3-67 |
| | Relief Valve (Master) Adjustment | | 3-70 |
| | Relief Valve (Master) Replacement | C13211E3218 | 3-84 |
| RV2 | Relief Valve (Sequence) Cartridge Replacement | | 3-72 |
| | Relief Valve (Sequence) Adjustment | | 3-73 |
| RV5 | Tongue Cylinder Relief Valve (Cap End) Cartridge Replacement | | 3-79 |
| | Tongue Cylinder Relief Valve (Cap End) Adjustment | | 3-80 |
| | Tongue Cylinder Relief Valve (Cap End) Replacement | B13211E3210-2 | 3-97 |
| RV6 | Locking Cylinder Relief Valve (Cap End) Cartridge Replacement | | 3-79 |
| | Locking Cylinder Relief Valve (Cap End) Adjustment | | 3-81 |
| | Locking Cylinder Relief Valve (Cap End) Replacement | B13211E3210-3 | 3-97 |
| v] | Valve Bank Replacement | D13211E3255 | 4-53 |

RELIEVING HYDRAULIC PRESSURE (Sheet 1 of 1)**WARNING**

Serious injury could result from high pressure hydraulic fluid spray, if this procedure is not followed when disconnecting any hydraulic lines or fittings.

1. Push down clutch lever (A).
2. Pull up, then push down on all hydraulic control levers (B) at least three times.
3. Cover line or fitting to be disconnected with a rag.

End of Task



TA170291

BLEED HYDRAULIC SYSTEM (Sheet 1 of 1)

REFERENCE: TM 5-5420-226-10

NOTE

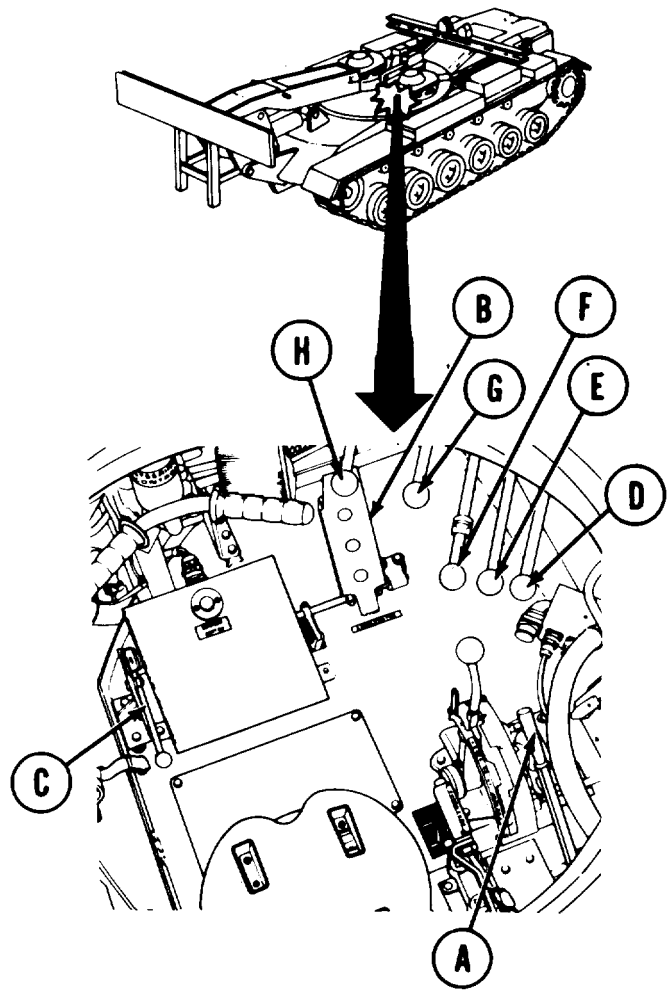
The vehicle hydraulic system is self bleeding, through operation it eliminates air from the hydraulic fluid. Whenever hydraulic components are removed or replaced this procedure should be followed after maintenance.

1. Start engine (TM 5-5420-226-10).

CAUTION

Do not pull up clutch lever (A) with engine running over idle rpm, since power take off components could be damaged.

2. Pull up clutch lever (A).
3. Press accelerator (B) until engine is running at 1800 rpm.
4. Pull up accelerator lock (C).
5. Pull up then push down on all levers, (D thru H) one at a time to actuate each cylinder. Generally actuating just the cylinder to which hoses or fittings have been removed will be enough. In addition consider the following:
 - a. To actuate the hold down cylinder, move overhead cylinder lever (D).
 - b. To actuate the ejection cylinders you must pull up and hold locking lever (G) then move ejection lever (H) up (eject) or down (retract).



End of Task

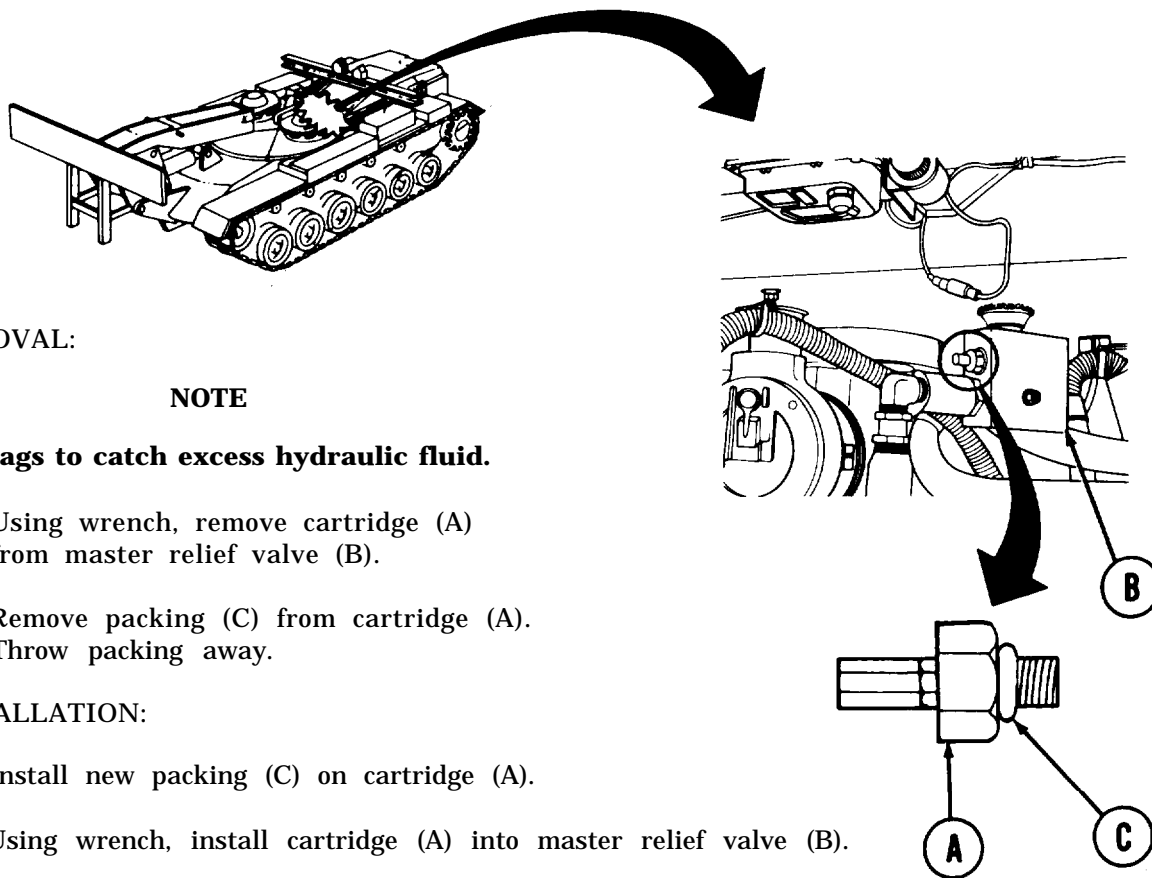
MASTER RELIEF VALVE (RV1) CARTRIDGE REPLACEMENT (Sheet 1 of 1)

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

SUPPLIES: Rags (Item 12, Appendix D)
Packing

REFERENCE: LO 5-5420-226-12

PRELIMINARY PROCEDURE: Drain hydraulic reservoir (page 3-68)

**REMOVAL:****NOTE**

Use rags to catch excess hydraulic fluid.

1. Using wrench, remove cartridge (A) from master relief valve (B).
2. Remove packing (C) from cartridge (A). Throw packing away.

INSTALLATION:

1. Install new packing (C) on cartridge (A).
2. Using wrench, install cartridge (A) into master relief valve (B).
3. Refill hydraulic reservoir (LO 5-5420-226-12).
4. Bleed hydraulic system (page 3-66).
5. Check for hydraulic leaks and correct as necessary.
6. Refill hydraulic reservoir (LO 5-5420-226-12)
7. Adjust relief valve pressure (page 3-70).

End of Task

TA170293

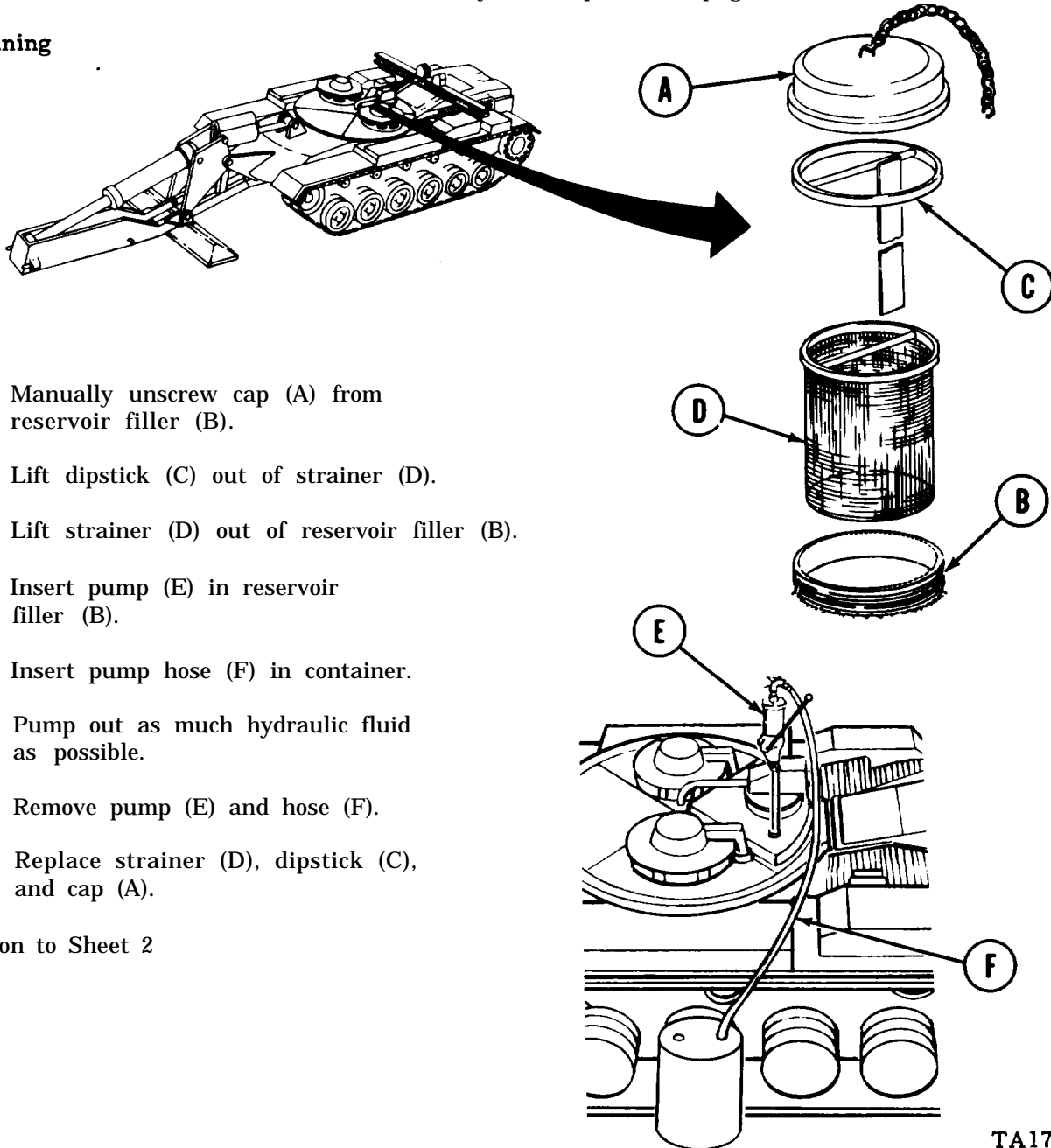
DRAINING HYDRAULIC RESERVOIR (Sheet 1 of 2)

TOOLS: 15 in. adjustable wrench
5/8 in. combination wrench
3/4 in. combination wrench
Dispensing pump

SUPPLIES: Container (open 5 gallon capacity)
Containers (55 gallon capacity) 2 ea.

PRELIMINARY PROCEDURE: Relieve hydraulic pressure (page 3-65)

Draining



1. Manually unscrew cap (A) from reservoir filler (B).
2. Lift dipstick (C) out of strainer (D).
3. Lift strainer (D) out of reservoir filler (B).
4. Insert pump (E) in reservoir filler (B).
5. Insert pump hose (F) in container.
6. Pump out as much hydraulic fluid as possible.
7. Remove pump (E) and hose (F).
8. Replace strainer (D), dipstick (C), and cap (A).

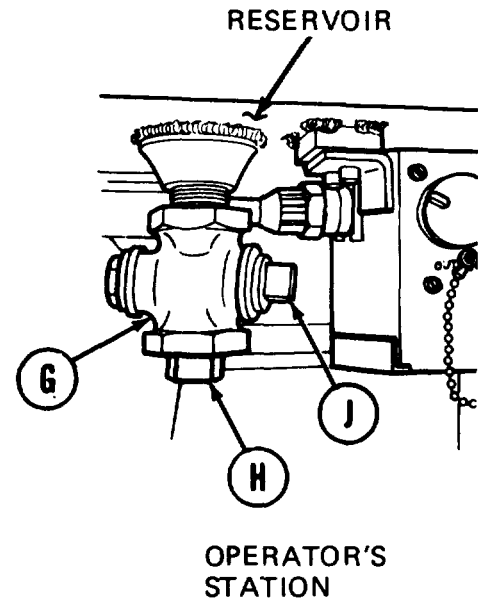
Go on to Sheet 2

TA170294

DRAINING HYDRAULIC RESERVOIR (Sheet 2 of 2)

9. Position container to catch hydraulic fluid.
10. Holding drain valve (G) with adjustable wrench, use 5/8 inch wrench to remove plug (H).
11. Using 3/4 inch wrench, turn valve (J) and allow hydraulic fluid to drain from reservoir.
12. After reservoir has drained, use 3/4 inch wrench to return valve (J) to off position.
13. Holding drain valve (G) with adjustable wrench, use 5/8 inch wrench to install plug (H).

End of Task



TA170295

MASTER RELIEF VALVE (RV1) ADJUSTMENT (Sheet 1 of 2)

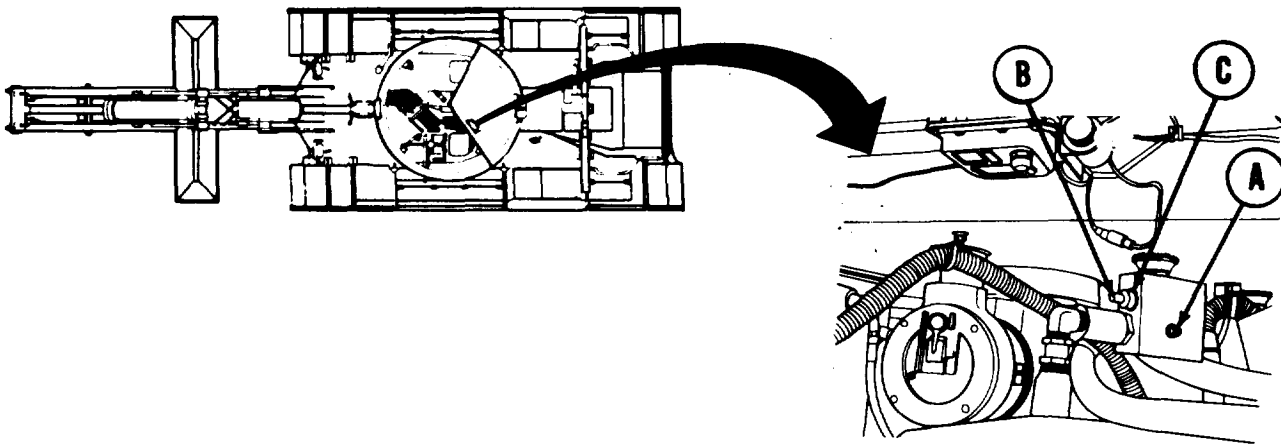
TOOLS: 1/4in. socket head screw key
3/16 in. socket head screw key
9/16 in. open end wrench

SPECIAL TOOL: Gage, pressure (item 3, sec III, app B)

PERSONNEL: Two

REFERENCE: TM 5-5420-226-10

PRELIMINARY PROCEDURE: Relieve hydraulic pressure (page 3-65)



NOTE

If STE/ICE is available, go to STE/ICE test 51 (page 2-47).

ADJUSTMENT:

1. Using 1/4 inch screw key, remove plug (A).
2. Manually install pressure gage in opening left by plug (A).
3. Engage hydraulic pump (TM 5-5420-226-10).
4. Set engine speed at 1800 rpm.
- 5* Slowly press down scissor cylinder control lever all the way and hold in that position.
6. Have second technician observe pressure gage reading.
7. Return scissor cylinder control lever to neutral position.

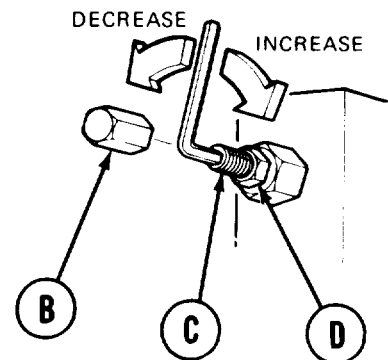
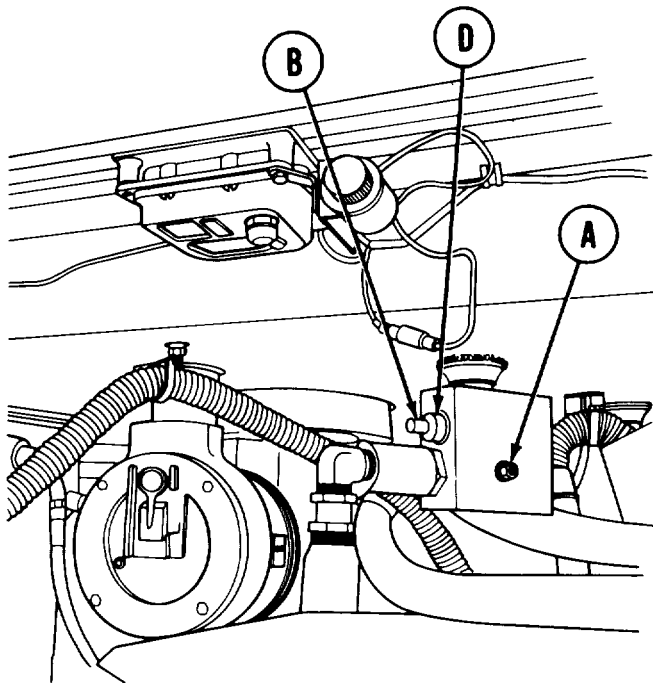
Go on to Sheet 2

TA170296

MASTER RELIEF VALVE (RV1) ADJUSTMENT (Sheet 2 of 2)**NOTE**

Correct pressure is 3800 ± 50 psi (26220 ± 340 kPa).

8. Using wrench, remove adjusting screw cap (B).
9. To adjust relief valve pressure, hold adjusting screw (C) with 3/16 inch screw key and use wrench to loosen jamnut (D). Using 3/16-inch screw key, turn adjusting screw (C) clockwise to increase pressure or counterclockwise to decrease pressure.
10. Repeat steps 3 through 9 until pressure gage shows reading of 3800 + 50 psi (26220± 340 kPa).
11. Holding adjusting screw (C) with 3/16 inch screw key, use wrench to tighten jamnut (D).
12. Using wrench, install adjusting screw cap (B).
13. Remove pressure gage.
14. Using 1/4 inch screw key, install plug (A).



End of Task

TA170297

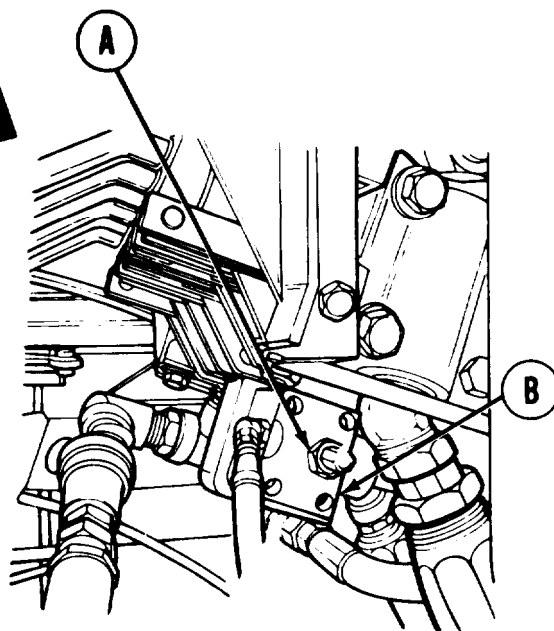
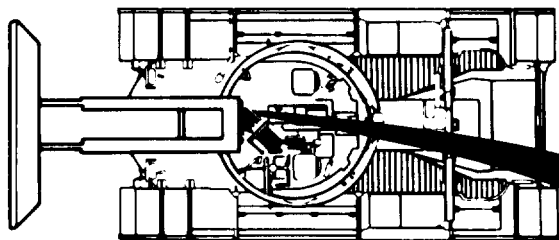
SEQUENCE VALVE (RV2) CARTRIDGE REPLACEMENT (Sheet 1 of 1)

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

SUPPLIES: Rags (Item 12, Appendix D)
Preformed packing

PRELIMINARY PROCEDURE: Relieve hydraulic pressure (page 3-65)

QUADRANTS REMOVED FOR CLARITY



REMOVAL:

NOTE

Use rags to catch excess hydraulic fluid.

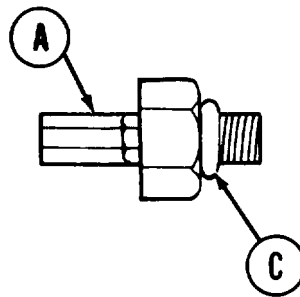
1. Using wrench, remove cartridge (A) from relief valve (B).
2. Remove packing (C) from cartridge (A).
Throw packing (C) away.

INSTALLATION:

1. Install packing (C) on cartridge (A).
2. Using wrench, install cartridge (A) into relief valve (B).
3. Adjust relief valve pressure (page 3-78).

End of Task

UNDER VALVE BANK



SEQUENCE VALVE (RV2) ADJUSTMENT (Sheet 1 of 1)

TOOLS: 3/16 in. socket head screw key
5/16 in. socket head screw key
9/16 in. open end wrench

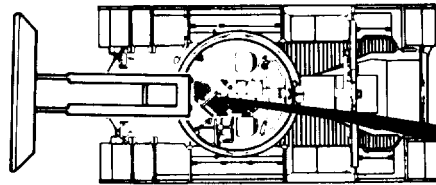
SPECIAL TOOL: Gage, pressure (item 3, sec III, app B)

PERSONNEL: Two

REFERENCE: TM 5-5420-226-10

PRELIMINARY PROCEDURE: Relieve hydraulic pressure (page 3-65)

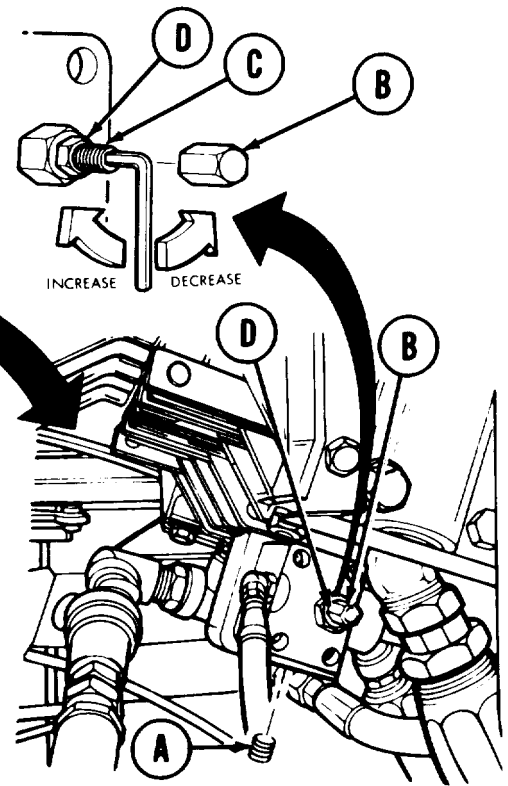
QUADRANTS REMOVED FOR CLARITY

**NOTE**

If STE/ICE is available, go to STE/ICE Test 51 (page 247).

ADJUSTMENT:

1. Using 5/16 inch screw key, remove plug (A).
2. Manually install pressure gage in opening left by plug (A).
3. Engage hydraulic pump (TM 5-5420-226-10).
4. Set engine speed at 1800 rpm.
5. Pull up on locking cylinder control and ejection cylinder levers.
6. Have second technician observe pressure gage reading.
7. Return locking and ejection cylinder control levers to neutral position.
8. Remove adjusting screw cap (B) using wrench.
9. To adjust pressure, hold adjusting screw (C) with 3/16 inch screw key and use wrench to loosen jamnut (D). Using 3/16 inch screw key, turn adjusting screw (C) clockwise to increase pressure or counterclockwise to decrease pressure.
10. Repeat steps 3 through 9 until pressure gage shows reading of 3200 ± 50 psi (22064 ± 340 kPa).
11. Holding adjusting screw (B) with 3/16 inch screw key, use wrench to tighten jamnut (D).
12. Install adjusting screw cap (B) using wrench.
13. Remove pressure gage.
14. Using 5/16 inch screw key, install plug (A).



End of Task

TA170299

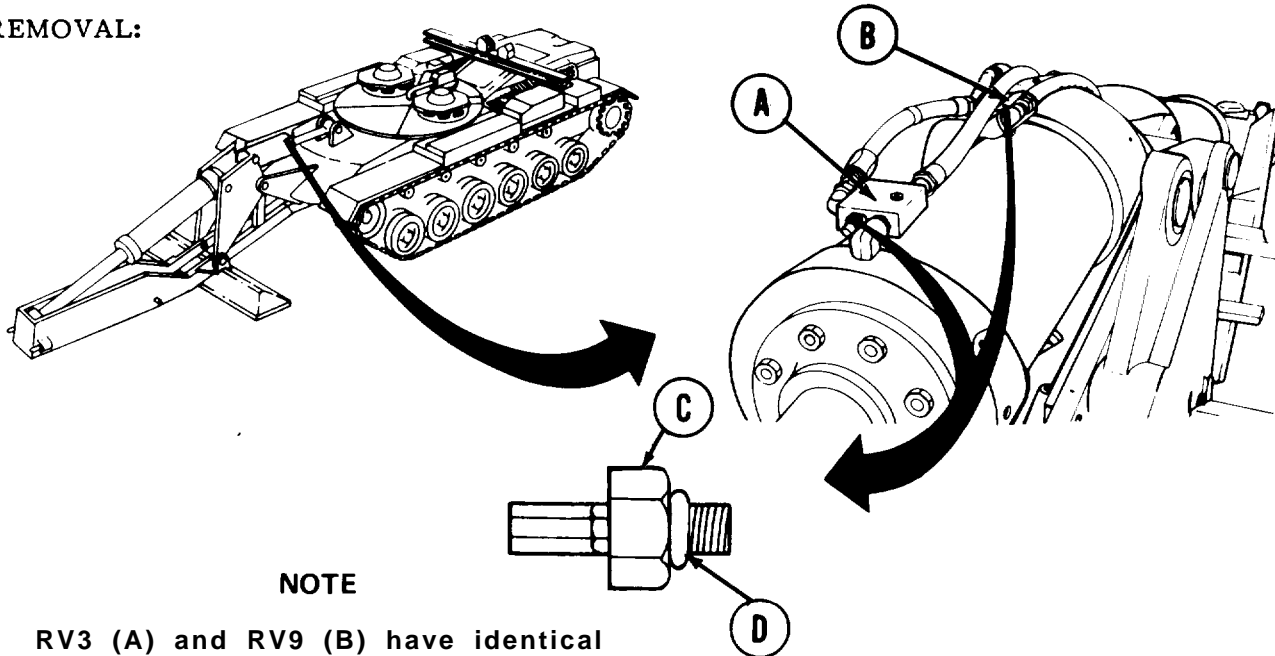
OVERHEAD CYLINDER RELIEF VALVES (RV3 and RV9) CARTRIDGE REPLACEMENT (Sheet 1 of 1)

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

SUPPLIES: Rags (Item 12, Appendix D)
Packing

PRELIMINARY PROCEDURES: Remove overhead cylinder armor (page 3-217)
Relieve hydraulic pressure (page 3-65)

REMOVAL:



NOTE

RV3 (A) and RV9 (B) have identical configuration. Use the same procedure for both cartridges.

NOTE

Use rags to catch excess hydraulic fluid.

1. Using wrench, remove cartridge (C) from relief valve (RV3) (A) or (RV9) (B).
2. Remove packing (D) from cartridge (C). Throw packing away.

INSTALLATION:

1. Install new packing (D) on cartridge (C).
2. Using wrench, install cartridge (C) into relief valve (RV3) (A) or (RV9) (B).
3. Adjust relief valve pressure (RV3) (page 3-75), (RV9) (page 3-76).
4. Install overhead cylinder armor (page 3-218).

End of Task

TA170300

OVERHEAD CYLINDER RELIEF VALVE (RV3) ADJUSTMENT (Sheet 1 of 1)

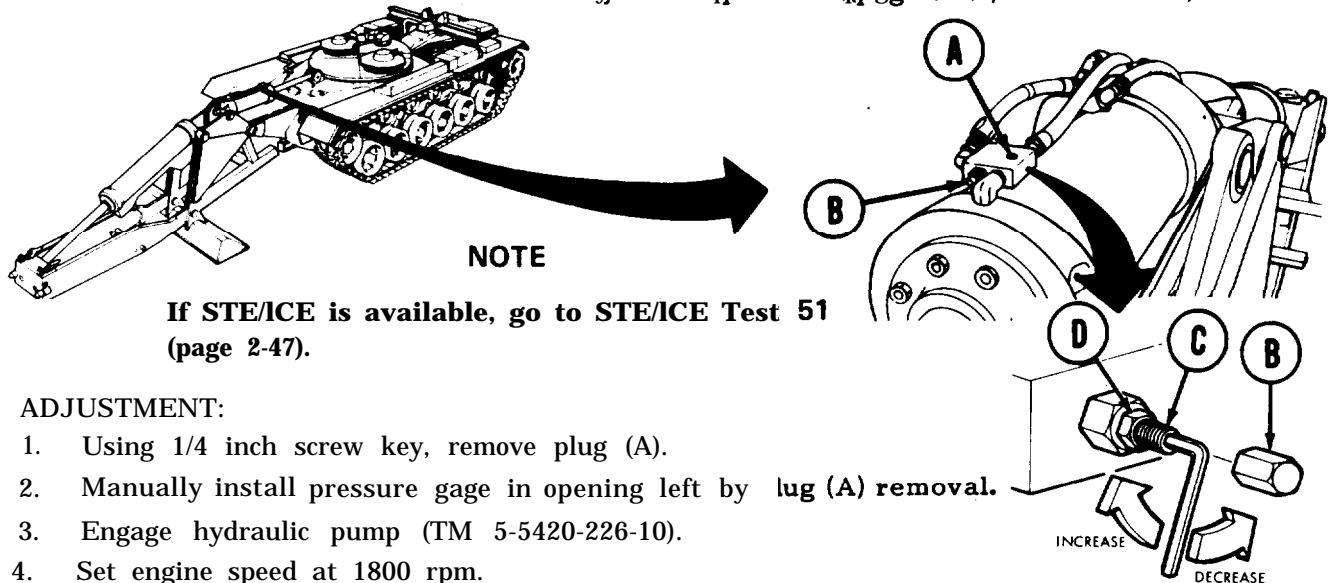
TOOLS: 1/4 in. socket head screw key
 3/16 in. socket head screw key
 9/16 in. open end wrench

SPECIAL TOOL: Gage, pressure (item 3, sec III, app B)

PERSONNEL: Two

REFERENCE: TM 5-5420-226-10

PRELIMINARY PROCEDURES: Remove overhead cylinder armor (page 3-217)
 Relieve hydraulic pressure (page 3-65).

**NOTE**

If STE/ICE is available, go to STE/ICE Test 51 (page 2-47).

ADJUSTMENT:

1. Using 1/4 inch screw key, remove plug (A).
2. Manually install pressure gage in opening left by lug (A) removal.
3. Engage hydraulic pump (TM 5-5420-226-10).
4. Set engine speed at 1800 rpm.
5. Slowly push down overhead cylinder control lever all the way and hold in that position.
6. When overhead cylinder is fully retracted, have second technician observe pressure gage reading.
7. Return overhead cylinder control lever to neutral position.
8. Remove adjusting screw cap (B) using wrench.

NOTE

Correct pressure is 3600 ± 50 psi (24822 ± 340 kPa).

9. To adjust relief valve pressure, hold adjusting screw (C) with 3/16 inch screw key and use wrench to loosen jamnut (D). Using screw key, turn adjusting screw (C) clockwise to increase pressure or counterclockwise to decrease pressure.
10. Repeat steps 3 through 9 until pressure gage shows reading of 3600 ± 50 psi (24822 ± 340 kPa).
11. Holding adjusting screw (C) with 3/16 inch screw key, use wrench to tighten jamnut (D).
12. Remove pressure gage.
13. Using 1/4 inch screw key, install plug (A).
14. Install adjusting screw cap (B) using wrench.
15. Install overhead cylinder armor (page 3-218).

End of Task

TA170301

OVERHEAD CYLINDER RELIEF VALVE (RV9) ADJUSTMENT (Sheet 1 of 1)

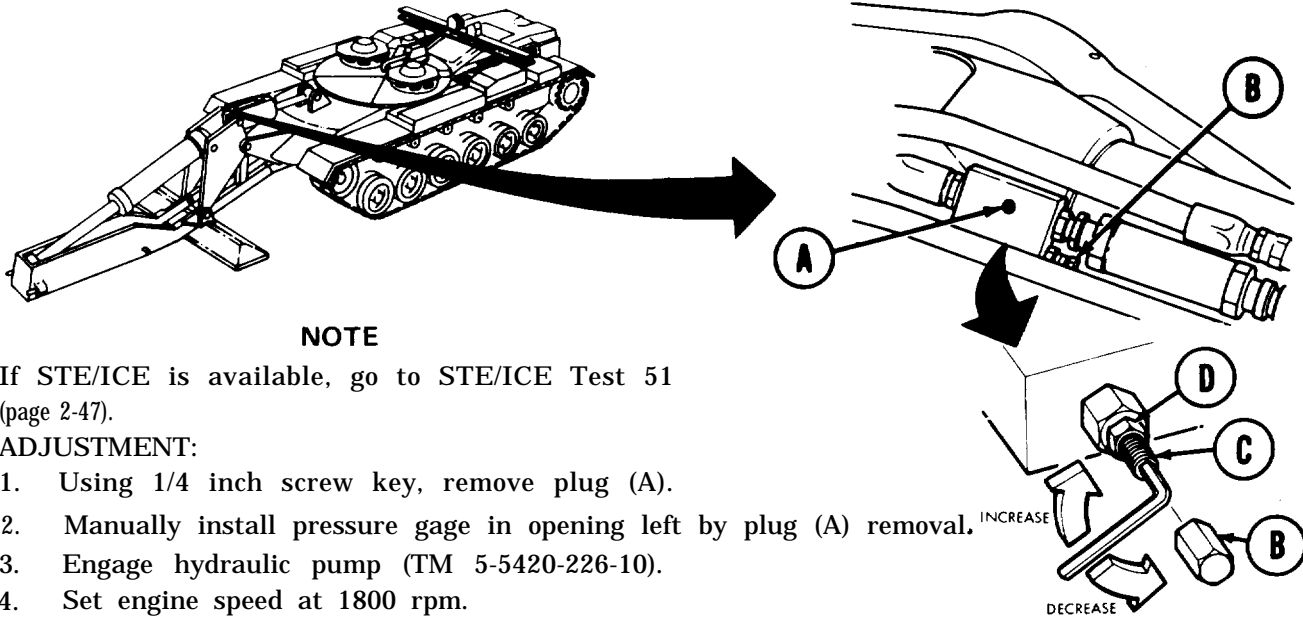
TOOLS: 1/4 in. socket head screw key
 3/16 in. socket head screw key
 9/16 in. open end wrench

SPECIAL TOOL: Gage, pressure (item 3, sec III, app B)

PERSONNEL: Two

REFERENCE: TM 5-5420-226-10

PRELIMINARY PROCEDURES: Remove overhead cylinder armor (page 3-217)
 Relieve hydraulic pressure (page 3-65)



NOTE

If STE/ICE is available, go to STE/ICE Test 51 (page 2-47).

ADJUSTMENT:

1. Using 1/4 inch screw key, remove plug (A).
2. Manually install pressure gage in opening left by plug (A) removal.
3. Engage hydraulic pump (TM 5-5420-226-10).
4. Set engine speed at 1800 rpm.
5. Slowly push up overhead cylinder control lever all the way and hold in that position.
6. Have second technician observe pressure gage reading.
7. Return overhead cylinder control lever to neutral position.
8. Remove adjusting screw cap (B) using wrench.

NOTE

Correct pressure is 3600 ± 50 psi (246223 340 kPa).

9. To adjust relief valve pressure, hold adjusting screw (C) with 3/16 inch screw key and use wrench to loosen jamnut (D). Using 3/16 inch screw key, turn adjusting screw (C) clockwise to increase pressure or counterclockwise to decrease pressure.
10. Repeat steps 3 through 9 until pressure gage shows reading of 3600 ± 50 psi (24822 ± 340 kPa).
11. Holding adjusting screw (C) with 3/16 inch screw key, use wrench to tighten jamnut (D).
12. Remove pressure gage.
13. Using 1/4 inch screw key, install plug (A).
14. Install adjusting screw cap (B) using wrench.
15. Install overhead cylinder armor (page 3-218).

End of Task

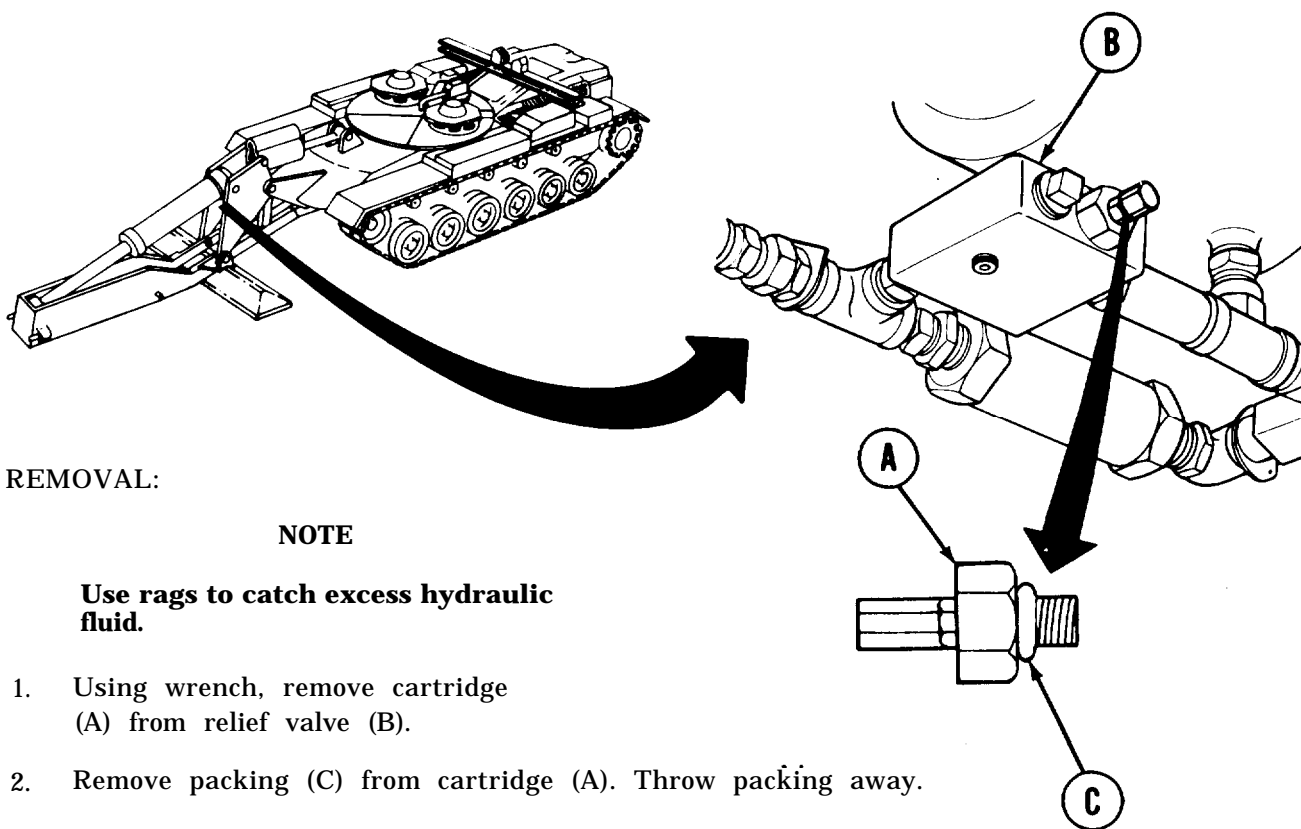
TA170302

TONGUE CYLINDER RELIEF VALVE (RV4) CARTRIDGE REPLACEMENT (Sheet 1 of 1)

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

SUPPLIES: Rags (Item 12, Appendix D)
Packing

PRELIMINARY PROCEDURES: Remove tongue cylinder armor (page 3-226)
Relieve hydraulic pressure (page 3-65)

**REMOVAL:****NOTE**

Use rags to catch excess hydraulic fluid.

1. Using wrench, remove cartridge (A) from relief valve (B).
2. Remove packing (C) from cartridge (A). Throw packing away.

INSTALLATION:

1. Install new packing (C) on cartridge (A).
2. Using wrench, install cartridge (A) into relief valve (B).
3. Adjust relief valve pressure (page 3-78).
4. Install tongue cylinder armor (page 3-227).

End of Task

TA170303

TONGUE CYLINDER RELIEF VALVE (RV4) ADJUSTMENT (Sheet 1 of 1)

TOOLS: 3/16 in. socket head screw key
 1/4 in. socket head screw key
 9/16 in. openend wrench

SPECIAL TOOLS: Adapter ell (item 1, sec III, app B)
 Adapter straight (item 2, sec III, app B)
 Gage, pressure (item 3, sec III, app B)
 Hose assembly (item 4, sec III, app B)

PERSONNEL: Two

REFERENCE: TM 5-5420-226-10

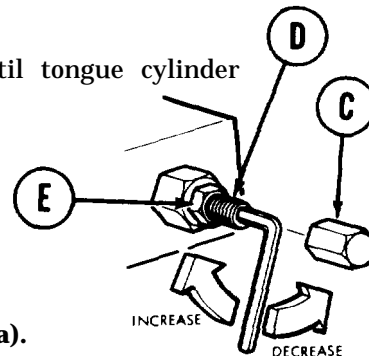
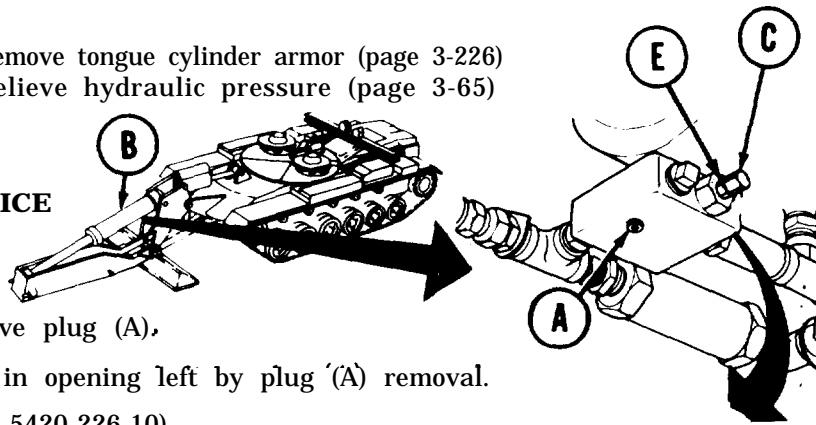
PRELIMINARY PROCEDURES: Remove tongue cylinder armor (page 3-226)
 Relieve hydraulic pressure (page 3-65)

NOTE

If STE/ICE is available, go to STE/ICE Test 51 (page 2-47).

ADJUSTMENT:

1. Using 1/4 inch screw key, remove plug (A).
2. Manually install gage assembly in opening left by plug (A) removal.
3. Engage hydraulic pump (TM 5-5420-226-10).
4. Set engine speed at 1800 rpm.
5. Slowly push down tongue cylinder control lever all the way until tongue cylinder (B) is in fully retracted position.
6. Have second technician observe pressure gage reading.
7. Return tongue cylinder control lever to neutral position.
8. Using wrench, remove adjusting screw cap (C).



NOTE

Correct pressure is 3600 ± 50 psi (24622 ± 340 kPa).

9. To adjust relief valve pressure, hold adjusting screw (D) with 3/16 inch screw key and use wrench to loosen jamnut (E). Using 3/16 inch screw key, turn adjusting screw (D) clockwise to increase pressure or counterclockwise to decrease pressure.
10. Repeat steps 3 through 9 until pressure gage shows reading of 3600 ± 50 psi (24822 ± 340 kPa).
11. Holding adjusting screw (D) with 3/16 inch screw key, use wrench to tighten jamnut (E).
12. Remove gage assembly.
13. Using 1/4 inch screw key, install plug (A).
14. Install adjusting screw cap (C) using wrench.
15. Install tongue cylinder armor (page 3-227).

End of Task

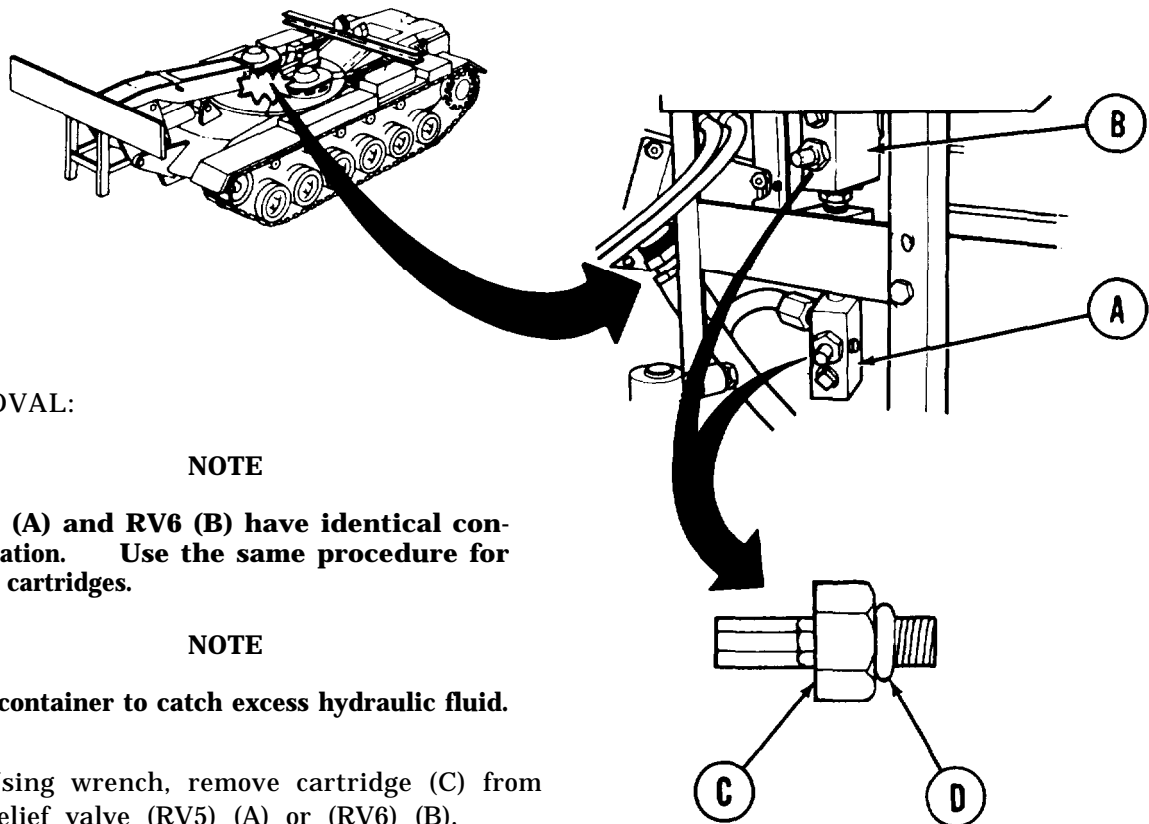
TA170304

SEQUENCE AND LOCKING RELIEF VALVES (RV5 AND RV6) CARTRIDGE REPLACEMENT (Sheet 1 of 1)

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

SUPPLIES: Drip pan
Packing

PRELIMINARY PROCEDURE: Relieve hydraulic pressure (page 3-65)



REMOVAL:

NOTE

RV5 (A) and RV6 (B) have identical configuration. Use the same procedure for both cartridges.

NOTE

Use container to catch excess hydraulic fluid.

1. Using wrench, remove cartridge (C) from relief valve (RV5) (A) or (RV6) (B).
2. Remove packing (D) from cartridge (C). Throw packing away.

INSTALLATION:

1. Install new packing (D) on cartridge (C).
2. Using wrench, install cartridge (C) into relief valve (RV5) (A) or (RV6) (B).
3. Adjust relief valve pressure, (RV5) (page 3-80), (RV6) (page 3-81).

End of Task

TA170305

SEQUENCE RELIEF VALVE (RV5) ADJUSTMENT (Sheet 1 of 1)

TOOLS: 3/16 in. socket head screw key
 1/4 in. socket head screw key
 9/16 in. open end wrench

SPECIAL TOOL: Gage, pressure (item 3, sec III, app B)

PERSONNEL: Two

REFERENCE: TM 5-5420-226-10

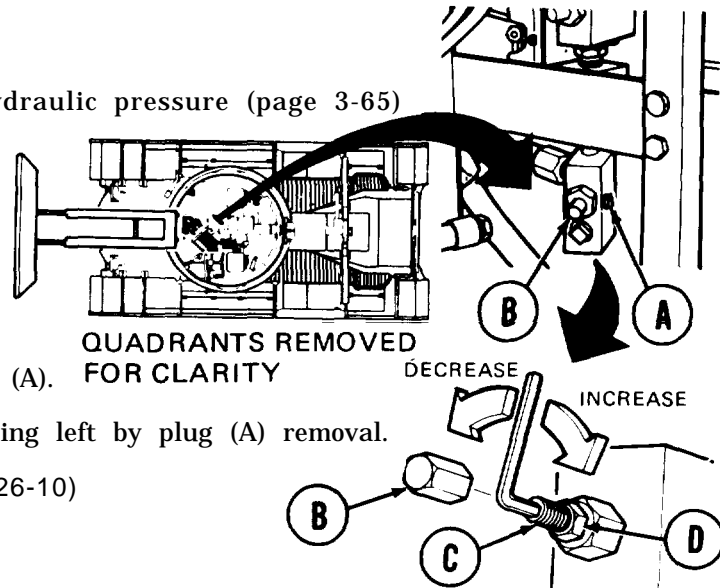
PRELIMINARY PROCEDURE: Relieve hydraulic pressure (page 3-65)

NOTE

If STE/ICE is available, go to STE/ICE Test 51 (page 2-47).

ADJUSTMENT:

1. Using 1/4 inch screw key, remove plug (A).
2. Manually install pressure gage in opening left by plug (A) removal.
3. Engage hydraulic pump (TM 5-5420-226-10)
4. Set engine speed at 1800 rpm.
5. Slowly push up tongue cylinder control lever all the way to extend and hold in that position.
6. Have second technician observe pressure gage reading.
7. Return tongue cylinder control lever to neutral position.
8. Remove adjusting screw cap (B) using wrench.



NOTE

Correct pressure is 700 ± 50 psi (4626 ± 340 kPa).

9. To adjust relief valve pressure, hold adjusting screw (C) with 3/16 inch screw key and use wrench to loosen jamnut (D). Using 3/16 inch screw key, turn adjusting screw (C) clockwise to increase pressure or counterclockwise to decrease pressure.
10. Repeat steps 3 through 9 until pressure gage shows reading of 700 ± 50 psi (4826 ± 340 kPa).
11. Holding adjusting screw (C) with 3/16 inch screw key, use wrench to tighten jamnut (D).
12. Remove pressure gage.
13. Using 1/4 inch screw key, install plug (A).
14. Install adjusting screw cap (B) using wrench.

End of Task

TA170306

LOCKING RELIEF VALVE (RV6) ADJUSTMENT (Sheet 1 of 1)

TOOLS: 1/4 in. socket head screw key
 3/16 in. socket head screw key
 9/16 in. open end wrench

SPECIAL TOOLS: Gage, pressure (item 3, sec III, app B)

PERSONNEL: Two

REFERENCE: TM 5-5420-226-10

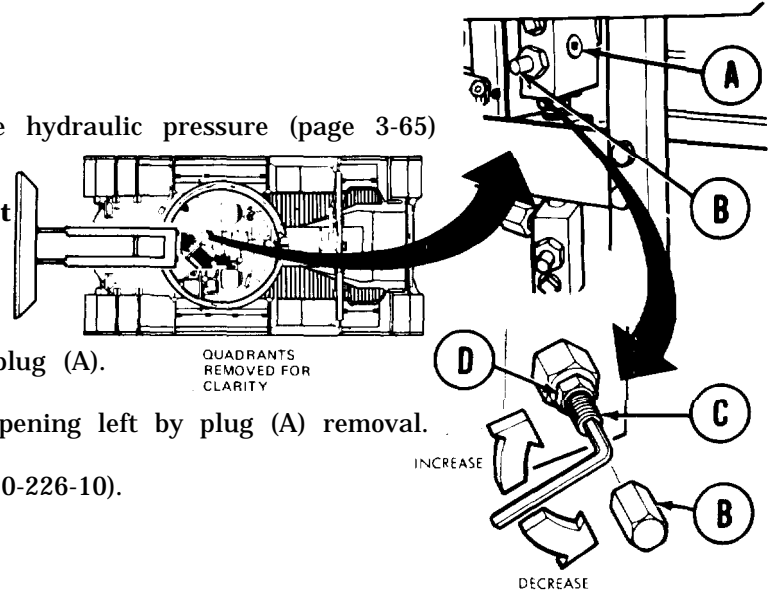
PRELIMINARY PROCEDURE: Relieve hydraulic pressure (page 3-65)

NOTE

If STE/ICE is available, go to STE/ICE Test 51 (page 2-47).

ADJUSTMENT:

1. Using 1/4 inch screw key, remove plug (A).
2. Manually install pressure gage in opening left by plug (A) removal.
3. Engage hydraulic pump (TM 5-5420-226-10).
4. Set engine speed at 1800 rpm.
5. Slowly push down locking cylinder control lever all the way and hold in that position.
6. Have second technician observe pressure gage reading.
7. Return locking cylinder control lever to neutral position.
8. Remove adjusting screw cap (B) using wrench.



NOTE

Correct pressure is 500 ± 50 psi (3447 ± 340 kPa).

9. To adjust relief valve pressure, hold adjusting screw (C) with 3/16 inch screw key and use wrench to loosen jamnut (D). Using 3/16 inch screw key, turn adjusting screw (C) clockwise to increase pressure or counterclockwise to decrease pressure.
10. Repeat steps 3 through 9 until pressure gage shows reading of 500 ± 50 psi (3447 ± 340 kPa).
11. Holding adjusting screw (C) with 3/16 inch screw key, use wrench to tighten jamnut (D).
12. Remove pressure gage.
13. Using 1/4 inch screw key, install plug (A).
14. Install adjusting screw cap (B) using wrench.

End of Task

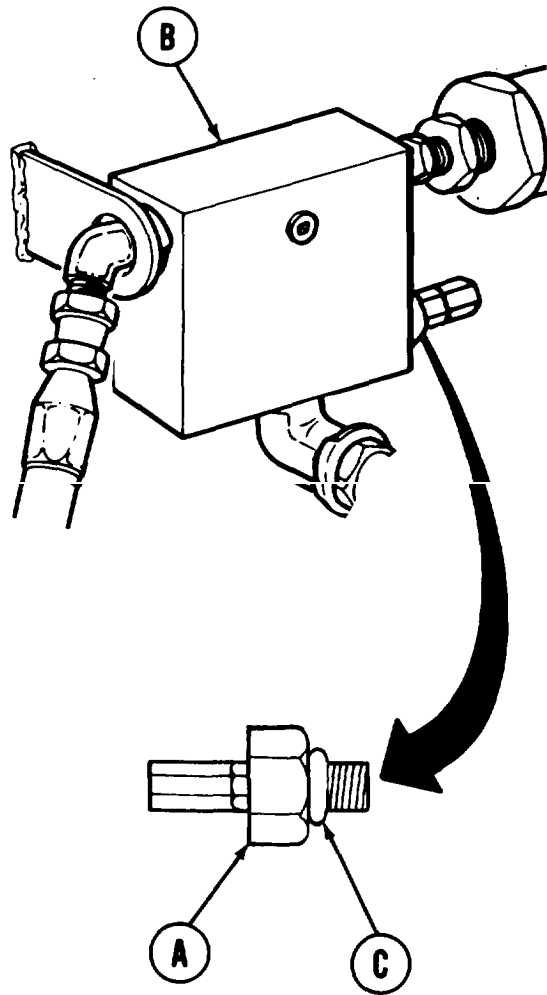
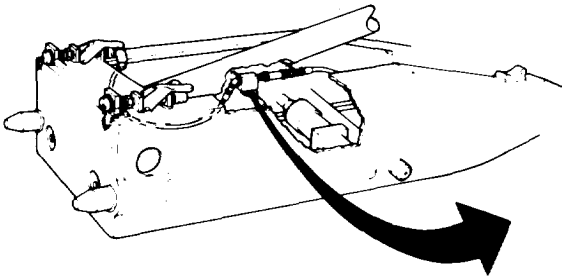
TA170307

SCISSOR CYLINDER RELIEF VALVE (RV8) CARTRIDGE REPLACEMENT (Sheet 1 of 1)

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

SUPPLIES: Rags (Item 12, Appendix D)
Packing

PRELIMINARY PROCEDURE: Relieve hydraulic pressure (page 3-65).



REMOVAL:

NOTE

Use rags to catch excess hydraulic fluid.

1. Using wrench, remove cartridge (A) from relief valve (B).
2. Remove packing (C) from cartridge (A). Throw packing away.

INSTALLATION:

1. Install new packing (C) on cartridge (A).
2. Using wrench, install cartridge (A) in relief valve (B).
3. Adjust relief valve pressure (page 3-83).

End of Task

TA170308

SCISSOR CYLINDER RELIEF VALVE (RV8) ADJUSTMENT (Sheet 1 of 1)

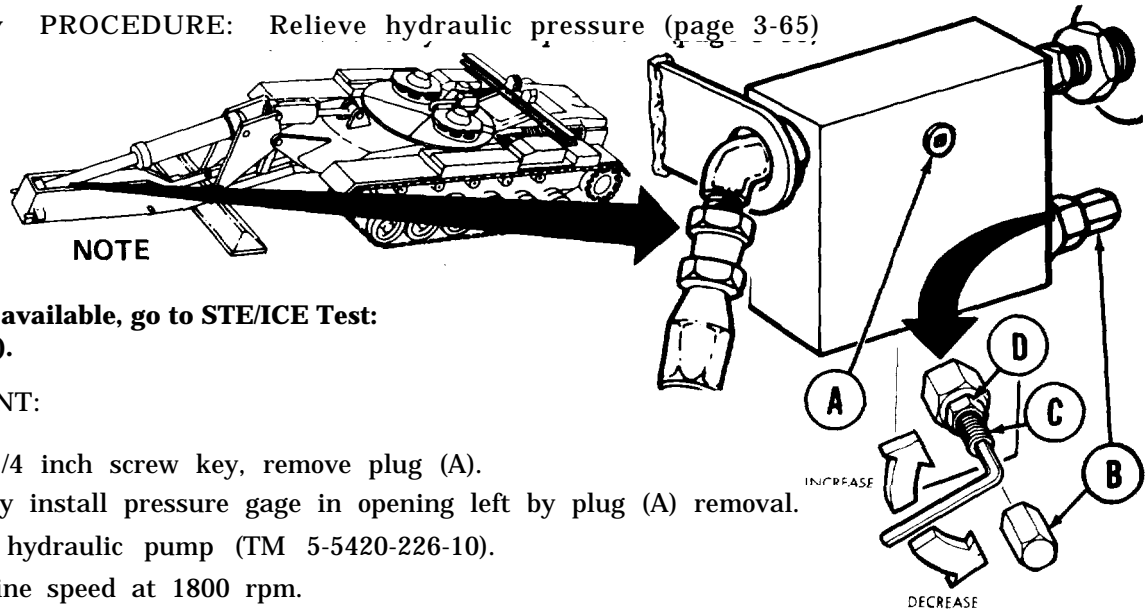
TOOLS: 3/16 in. socket head screw key
 1/4 in. socket head screw key
 9/16 in. open end wrench

SPECIAL TOOLS: Gage, pressure (item 3, sec III, app B)

PERSONNEL: Two

REFERENCE: TM 5-5420-226-10

PRELIMINARY PROCEDURE: Relieve hydraulic pressure (page 3-65)



If STE/ICE is available, go to STE/ICE Test: 51 (page 2-47).

ADJUSTMENT:

1. Using 1/4 inch screw key, remove plug (A).
2. Manually install pressure gage in opening left by plug (A) removal.
3. Engage hydraulic pump (TM 5-5420-226-10).
4. Set engine speed at 1800 rpm.
5. Slowly push up overhead cylinder control lever until outrigger contacts ground and hold in that position.
6. Have second technician observe pressure gage reading.
7. Return overhead cylinder control lever to neutral position.
8. Remove adjusting screw cap (B) using wrench.

NOTE

Correct pressure is 3400 ± 50 psi (23443 ± 340 kPa).

9. To adjust relief valve pressure, hold adjusting screw (C) with 3/16 inch screw key and use wrench to loosen jamnut (D). Using 3/16 inch screw key, turn adjusting screw (C) clockwise to increase pressure or counterclockwise to decrease pressure.
10. Repeat steps 3 through 9 until pressure gage shows reading of 3400 ± 50 psi (23443 ± 340 kPa).
11. Holding adjusting screw (C) with 3/16 inch screw key, use wrench to tighten jamnut (D).
12. Remove pressure gage.
13. Using 1/4 inch screw key, install plug (A).
14. Install adjusting screw cap (B) using wrench.

End of Task

TA170309

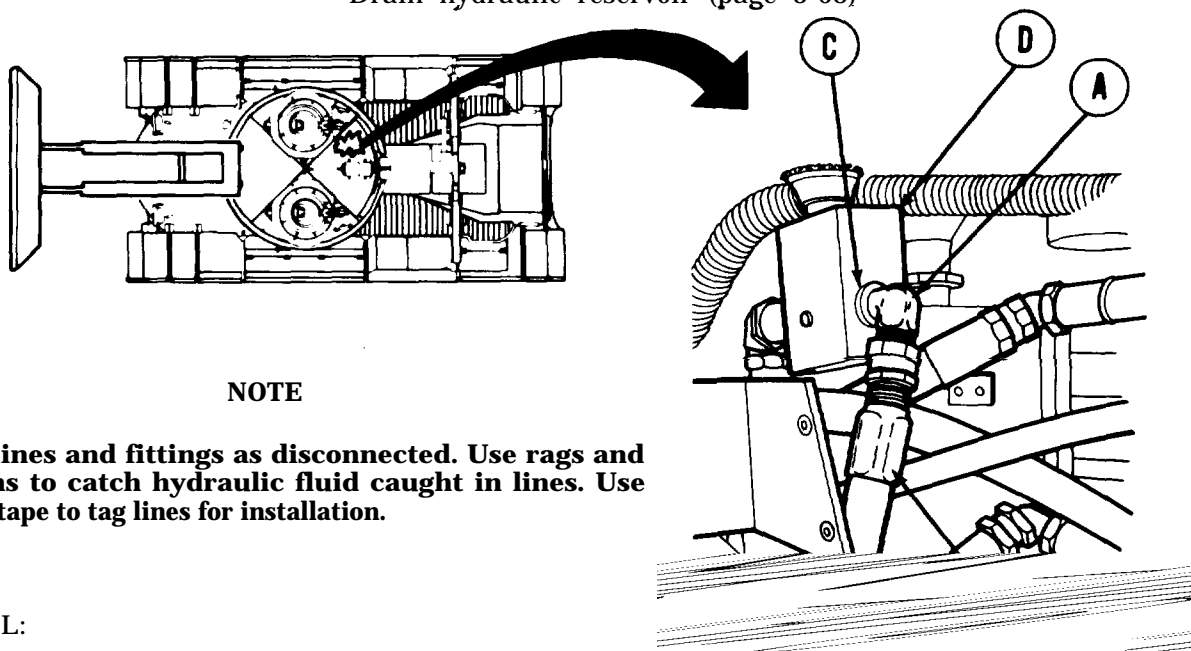
MASTER RELIEF VALVE (RV1) AND CHECK VALVE (CV1) REPLACEMENT (Sheet 1 of 3)

TOOLS: 1-7/16 in. open end wrench
12 in. adjustable wrench
15 in. adjustable wrench
10 in. pipe wrench

SUPPLIES: Drip pans
Rags (Item 12, Appendix D)
Pipe tape (Item 19, Appendix D)
Masking tape (Item 18, Appendix D)
Pencil
Protective caps and plugs (assorted sizes)
Nipple

REFERENCES: LO 5-5420-226-12 TM 11-5820-498-12
 TM 5-5420-226-10

PRELIMINARY PROCEDURES: Relieve hydraulic pressure (page 3-65)
Remove radio from mount (TM 11-5820-498-12)
Drain hydraulic reservoir (page 3-68)



NOTE

Cap all lines and fittings as disconnected. Use rags and drip pans to catch hydraulic fluid caught in lines. Use masking tape to tag lines for installation.

REMOVAL:

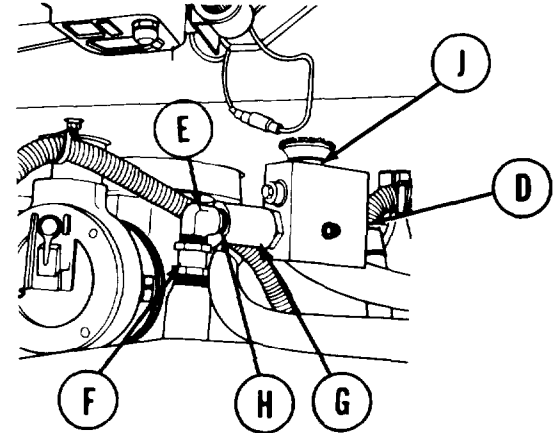
1. Holding elbow (A) with 12 inch adjustable wrench, use 1-7 /16 inch wrench to disconnect hose assembly "BA" (B).
2. Using 12 inch adjustable wrench, remove elbow (A) and collar "BA" (C) from master relief valve "RV1" (D).

Go on to Sheet 2

TA170310

MASTER RELIEF VALVE (RV1) AND CHECK VALVE (CV1) REPLACEMENT (Sheet 2 of 3)

3. Holding elbow (E) with 12 inch adjustable wrench, use 1-7/16 inch wrench to disconnect hose assembly "CY" (F).
4. Holding check valve "CV1" (G) with 15 inch adjustable wrench, use 12 inch adjustable wrench to remove elbow (E) and collar "CY" (H).
5. Using 15 inch adjustable wrench, remove check valve "CV1" (G).
6. Using 15 inch adjustable wrench, remove master relief valve "RV1" (D).
7. If nipple (J) was removed with master relief valve "RV1" (D), use pipe wrench to remove nipple (J) and throw it away.

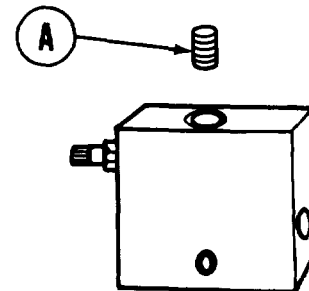


INSTALLATION:

NOTE

Remove all caps and plugs as necessary during installation. Before installing, use pipe tape on all male threads. Start tape on second thread so tape will not enter hydraulic system.

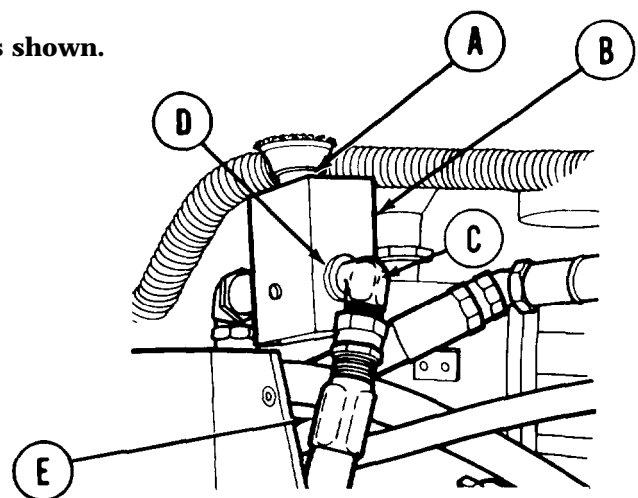
1. If nipple (A) was removed, manually install nipple in top port of relief valve "RV1" (B).



NOTE

Be sure to install master relief valve "RV1" (B) as shown.

2. Using 15 inch adjustable wrench, install master relief valve "RV1" (B) and nipple (A) in base of reservoir.
3. Using 12 inch adjustable wrench, install elbow (C) and collar "BA" (D).
4. Holding elbow (C) with 12 inch adjustable wrench, use 1-7/16 inch wrench to install hose assembly "BA" (E).

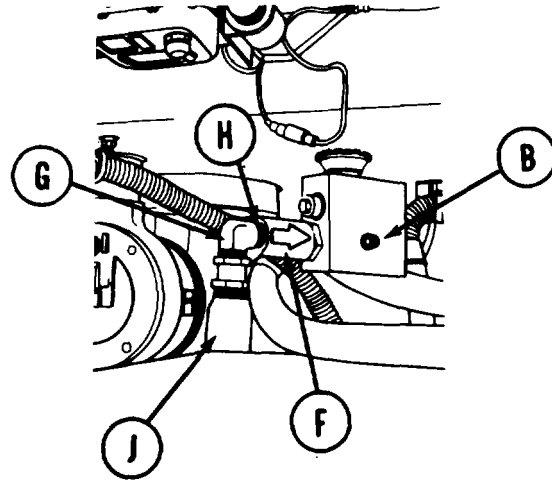


Go on to Sheet 3

TA170311

MASTER RELIEF VALVE (RV1) AND CHECK VALVE (CV1) REPLACEMENT (Sheet 3 of 3)

5. Using 15 inch adjustable wrench, install check valve "CV1" (F) with flow arrow pointing toward master relief valve "RV1" (B).
6. Holding check valve "CV1" (F) with 15 inch adjustable wrench, use 12 inch adjustable wrench to install elbow (G) and collar "CY" (H).
7. Holding elbow (G) with adjustable wrench, use 1-7/16 inch wrench to install hose assembly "CY" (J).
8. Service hydraulic reservoir (LO 5-5420-226-12).
9. Bleed hydraulic system (page 3-66).
10. Check for hydraulic leaks and correct as necessary.
11. Service hydraulic reservoir (LO 5-5420-226-12).
12. Adjust pressure in relief valve (page 3-70).
13. Install radio in mount (TM 11-5820-498-12).



End of Task

TA170312

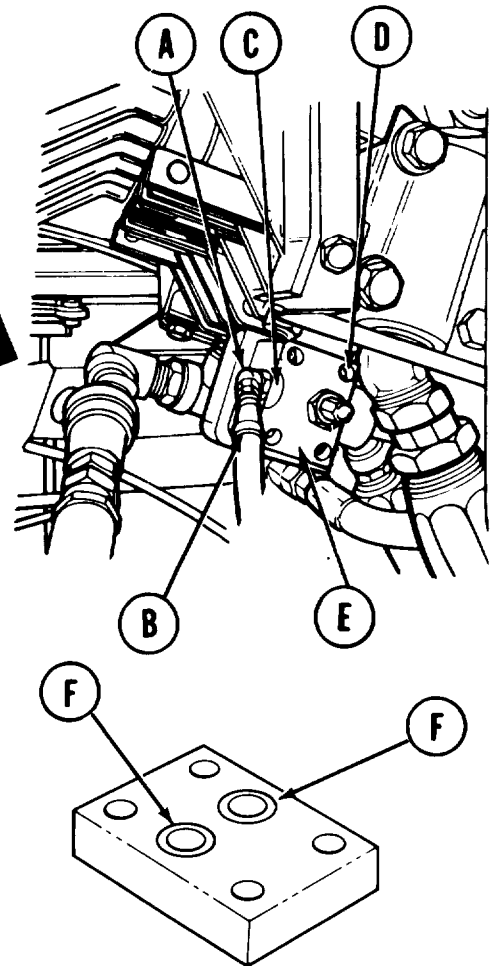
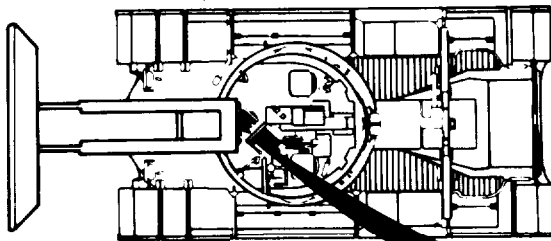
SEQUENCE RELIEF VALVE (RV2) REPLACEMENT (Sheet 1 of 2)

TOOLS: 5/16 in. socket head screw key
 8 in. adjustable wrench
 9/16 in. open end wrench

SUPPLIES: Pipe tape (Item 19, Appendix D)
 Rags (Item 12, Appendix D)
 Drip pan
 Protective caps and plugs (assorted sizes)
 Packing (2 required)

REFERENCES: LO 5-5420-226-12
 TM 5-5420-226-10

PRELIMINARY PROCEDURE: Relieve hydraulic pressure (page 3-65)
QUADRANTS REMOVED FOR CLARITY



REMOVAL:

NOTE

Use rags and drip pan to catch excess hydraulic fluid. Cap all lines and fittings as disconnected.

1. Holding elbow (A) with adjustable wrench, use open end wrench to remove hose assembly (B).
2. Using adjustable wrench, remove elbow (A) and collar (C).
3. Using screw key, remove four screws (D).
4. Remove sequence relief valve (E).
5. Manually remove two packings (F). Throw packings away.

Go on to Sheet 2

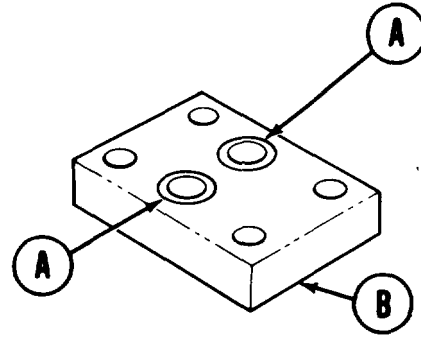
TA170313

SEQUENCE VALVE (RV2) REPLACEMENT (Sheet 2 of 2)

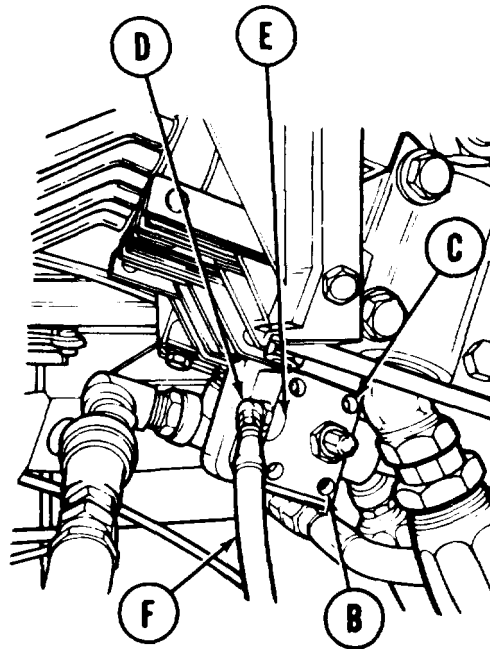
INSTALLATION:

NOTE

Remove all caps and plugs as necessary during installation. Before installing, use pipe tape on all male threads. Start tape on second thread so tape will not enter hydraulic system.



1. Manually install two packings (A) in grooves of relief valve (B).
2. Place relief valve (B) in position on valve bank.
3. Using screw key, install four screws (C).
4. Using adjustable wrench, install elbow (D) and collar (E) .
5. Holding elbow (D) with adjustable wrench, use open end wrench to install hose assembly (F).
6. Bleed hydraulic system (page 3-66).
7. Check for hydraulic leaks and correct as necessary.
8. Refill hydraulic reservoir (LO 5-5420-226-12).
9. Adjust sequence valve pressure (page 3-73).



End of Task

**OVERHEAD CYLINDER RELIEF VALVE (RV3) REPLACEMENT (Sheet 1 of 4)
PROCEDURE INDEX**

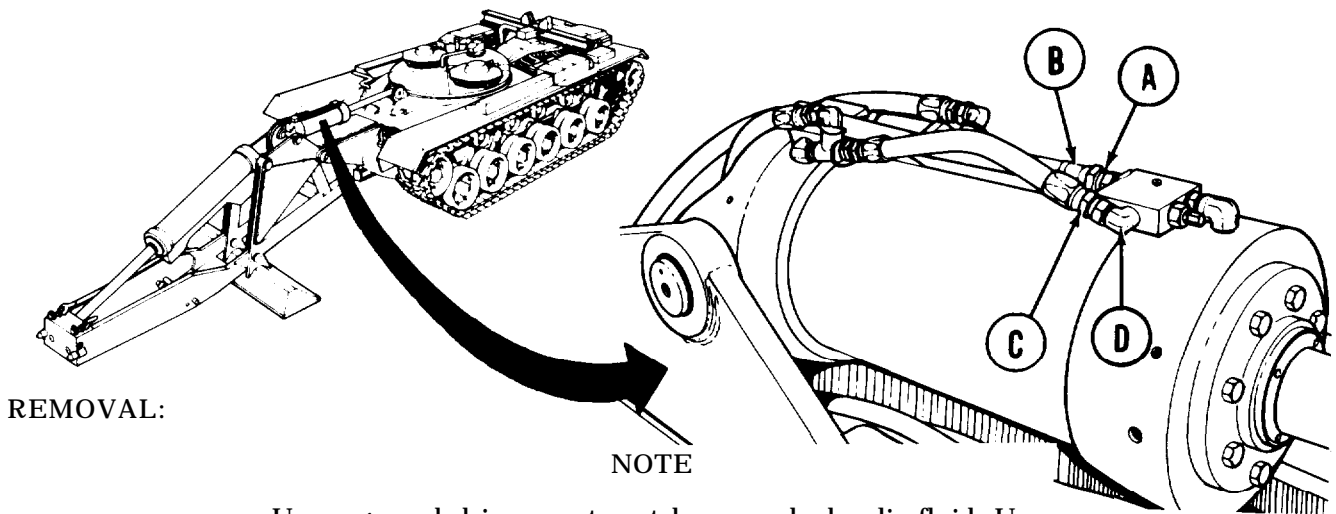
| PROCEDURE | PAGE |
|--------------|------|
| Removal | 3-89 |
| Installation | 3-91 |

TOOLS: 1-1/8 in. open end wrench
 1-1/4 in. open end wrench
 12 in. adjustable wrench
 Vice

SUPPLIES: Drip pans
 Rags (Item 12, Appendix D)
 Masking tape (Item 18, Appendix D)
 Pencil
 Pipe tape (Item 19, Appendix D)
 Caps and plugs (assorted sizes)

REFERENCES: TM 5-5420-226-10
 LO 5-5420-226-12

PRELIMINARY PROCEDURES: Remove overhead cylinder armor (page 3-217)
 Relieve hydraulic pressure (page 3-65)



REMOVAL:

NOTE

Use rags and drip pans to catch excess hydraulic fluid. Use masking tape to tag lines for installation. Cap or plug all lines and fittings as disconnected.

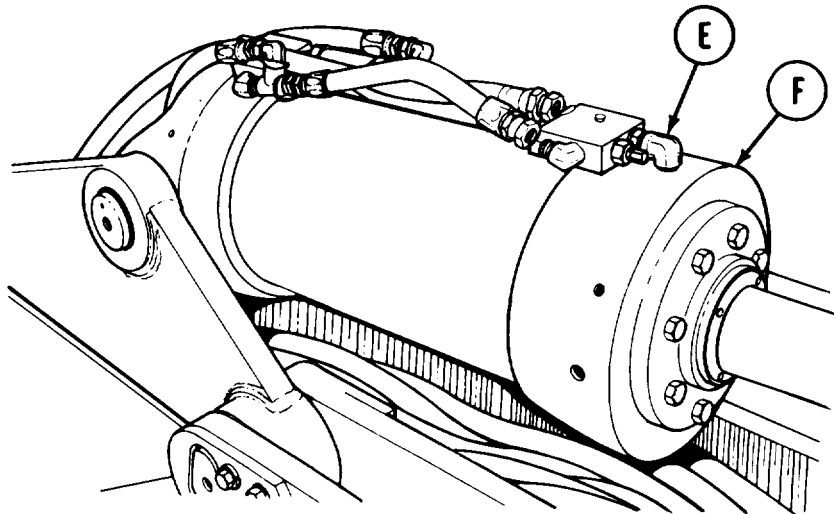
1. Holding adapter (A) with 1-1/8 inch wrench, use 1-1/4 inch wrench to remove hose assembly "CM" (B).
2. Using 1-1/4 inch wrench, remove hose assembly "CO" (C) from elbow (D).

Go on to Sheet 2

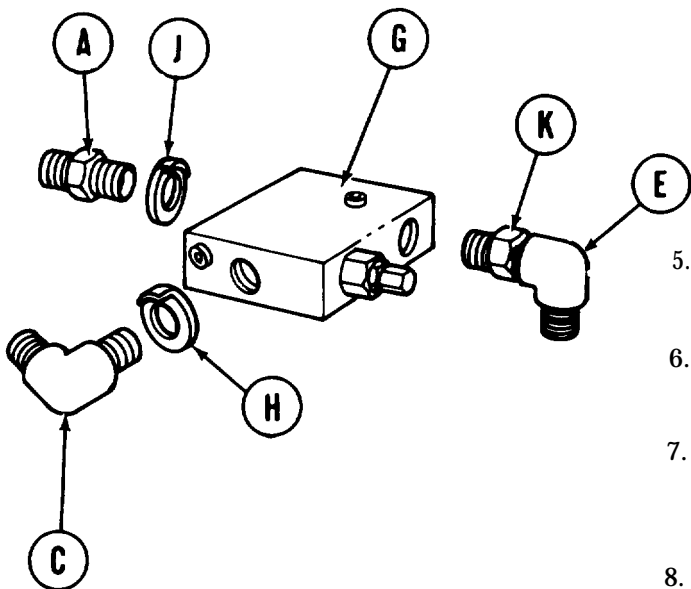
TA170315

OVERHEAD CYLINDER RELIEF VALVE (RV3) REPLACEMENT (Sheet 2 of 4)

- Using adjustable wrench, remove elbow (E) and attached parts from rod end of cylinder (F).



- Using care to prevent damage, clamp relief valve "RV3" (G) in vise.



- Using adjustable wrench, remove elbow (C) and collar "CO" (H).
- Using 1-1/4 inch wrench, remove adapter (A) and collar "CM" (J),
- Holding nipple (K) with 1-1/8 inch wrench, use an adjustable wrench to remove elbow (E).
- Using 1-1/8 inch wrench, remove nipple (K).
- Remove relief valve "RV3" (G) from vise.

Go on to Sheet 3

TA170316

OVERHEAD CYLINDER RELIEF VALVE (RV3) REPLACEMENT (Sheet 3 of 4)

INSTALLATION:

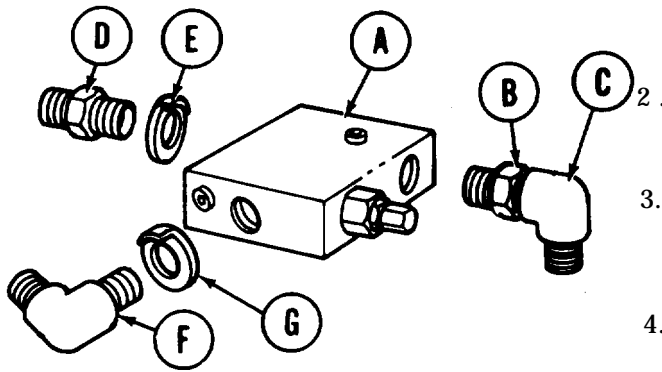
NOTE

Remove all caps and plugs as necessary during installation. Before installation, use pipe tape on all male threads. Start tape on second thread so tape will not enter hydraulic system.

1. Using care to prevent damage, clamp relief valve "RV3" (A) in vise.

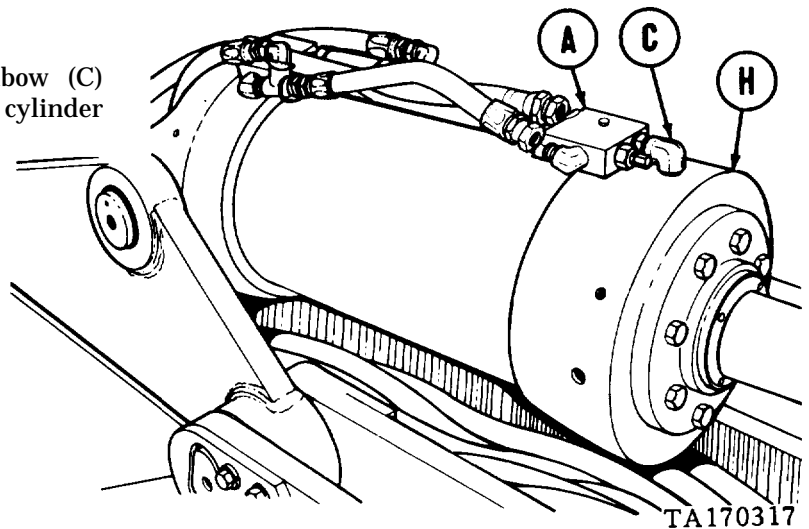
NOTE

Locate and aline parts as shown in illustrations to make sure connecting parts mate at final assembly.



2. Using 1-1/8 inch wrench, install nipple (B) in relief valve (A).
3. Holding nipple (B) with 1-1/8 inch wrench, use an adjustable wrench to install elbow (C) on nipple (B).
4. Using 1-1/4 inch wrench, install adapter (D) and collar "CM" (E).

5. Using adjustable wrench, install elbow (F) and collar "CO" (G) in relief valve (A).
6. Remove relief valve "RV3" (A) and attached parts from vise.
7. Using adjustable wrench, install elbow (C) with attached parts in rod end of cylinder (H).

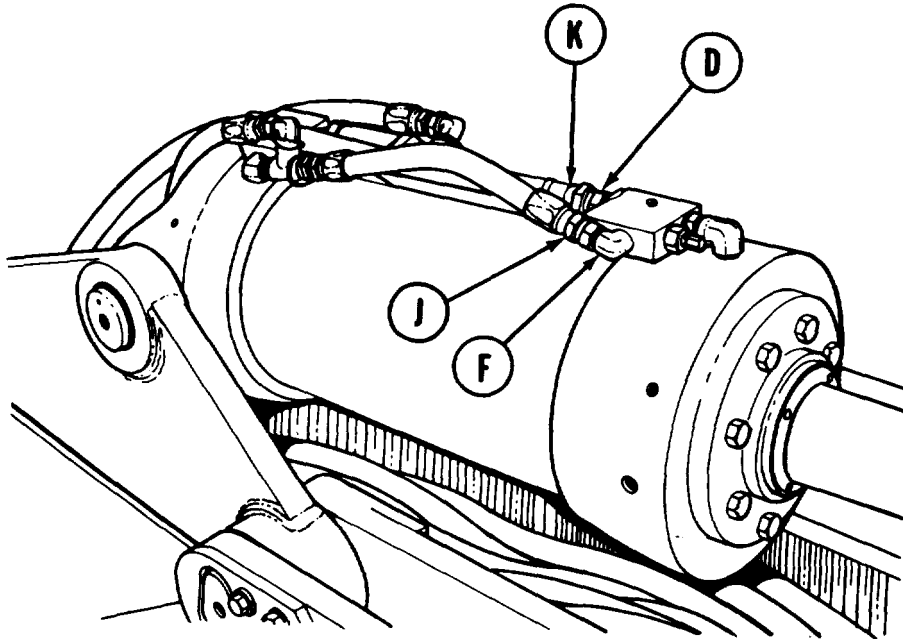


Go on to Sheet 4

TA170317

OVERHEAD CYLINDER RELIEF VALVE (RV3) REPLACEMENT (Sheet 4 of 4)

8. Using 1-1/4 inch wrench, install hose assembly "CO" (J) on elbow (F).



- 9* Holding adapter (D) with 1-1/8 inch wrench, use 1-1/4 inch wrench to install hose assembly "CM" (K) to adapter (D).
10. Bleed hydraulic system (page 3-66).
11. Check for hydraulic leaks and correct as necessary.
12. Service hydraulic reservoir (LO 5-5420-226-12).
13. Adjust relief valve pressure (page 3-75).
14. Install overhead cylinder armor (page 3-218).

End of Task

TA170318

TONGUE CYLINDER HYDRAULICS, RELIEF VALVE (RV4), AND CHECK VALVE (CV4) REPLACEMENT (Sheet 1 of 4)

PROCEDURE INDEX

| PROCEDURE | PAGE |
|--------------|------|
| Removal | 3-93 |
| Installation | 3-94 |

TOOLS: 1-1/8 in. open end wrench
 1-3/8 in. open end wrench
 1-1/4 in. open end wrench

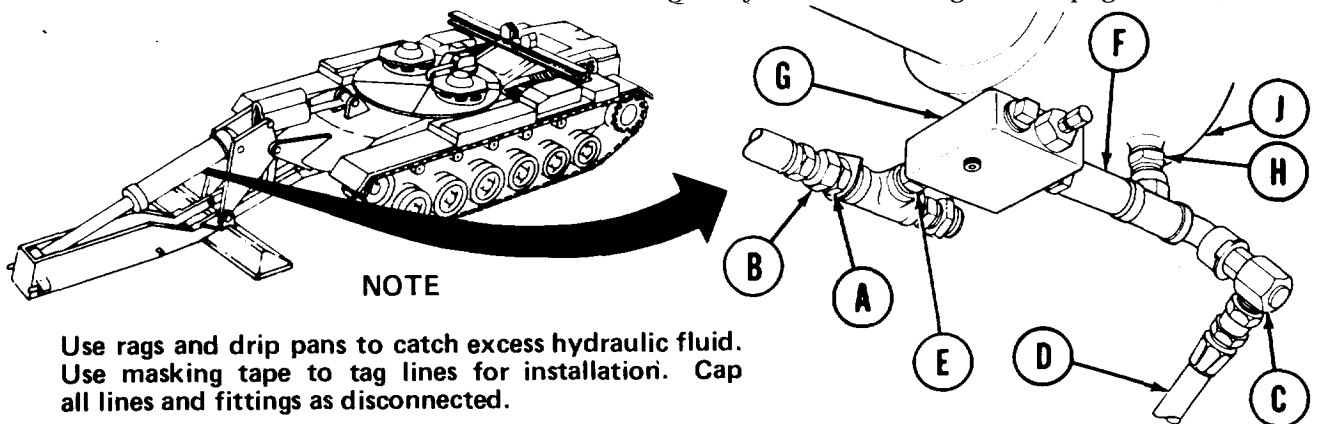
12 in. adjustable wrench
 15 in. adjustable wrench
 Vice

SUPPLIES: Drip pans
 Rags (Item 12, Appendix D)
 Masking tape (Item 18, Appendix D)

Pencil
 Pipe tape (Item 19, Appendix D)
 Caps and plugs (assorted sizes)

REFERENCE: LO 5-5420-226-12

PRELIMINARY PROCEDURES: Remove tongue cylinder armor (page 3-226)
 Relieve hydraulic pressure (page 3-65)
 Remove tongue cylinder flow regulator (page 3-108)



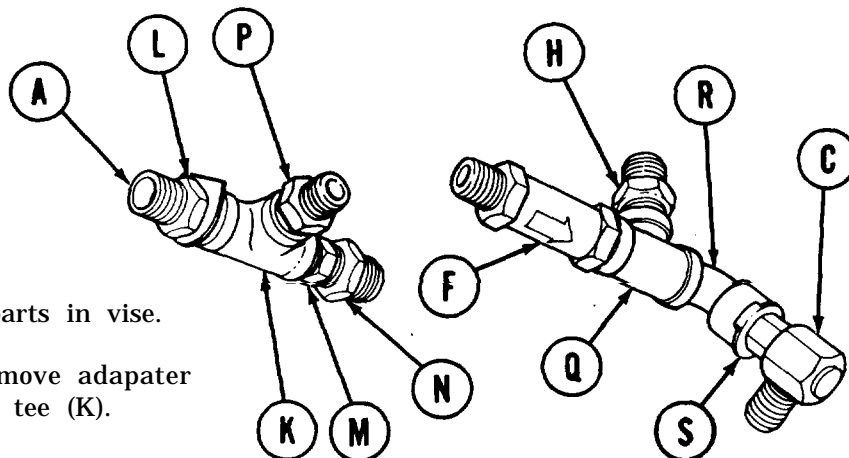
REMOVAL:

1. Holding nipple (A) with 1-1/8 inch wrench, use 1-1/4 inch wrench to disconnect hose assembly "CH" (B) from nipple (A).
2. Holding elbow (C) with 15 inch adjustable wrench, use 1-1/4 inch wrench to remove hose assembly "CK 1" (D) from elbow (C).
3. Using 1-1/8 inch wrench, remove nipple (E) and attached parts as an assembly from relief valve "RV4" (G).
4. Holding check valve "CV4" (F) with 1-3/8 inch wrench, use 15 inch adjustable wrench to remove relief valve "RV4" (G) from check valve "CV4" (F).
5. Using 1-1/8 inch wrench, remove nipple (H) and its attached parts as an assembly from tongue cylinder (J).

Go on to Sheet 2

TA170319

**TONGUE CYLINDER HYDRAULICS, RELIEF VALVE (RV4),
AND CHECK VALVE (CV4) REPLACEMENT (Sheet 2 of 4)**



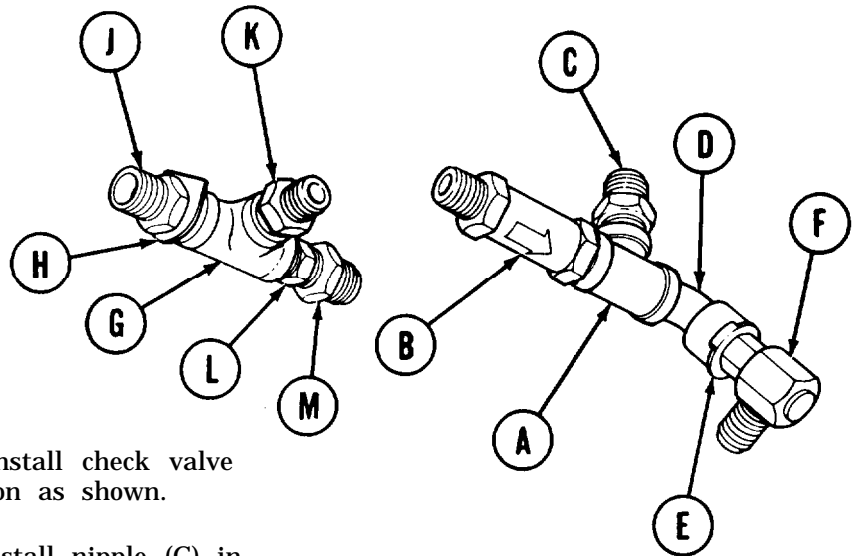
6. Place tee (K) and attached parts in vise.
7. Using 1-1/8 inch wrench, remove adapter (A) and collar "CH" (L) from tee (K).
8. Using 1-1/8 inch wrench to hold nipple (M), use 1-3/8 inch wrench to remove bushing (N) from nipple (M).
9. Using 1-1/8 inch wrench, remove two nipples (M, P) from tee (K).
10. Remove tee (K) from vise.
11. Place tee (Q) and attached parts in vise.
12. Using 1-3/8 inch wrench, remove check valve "CV4" (F) from tee (Q).
13. Using 1-1/8 inch wrench, remove nipple (H) from tee (Q).
14. Holding elbow (R) with 12 inch adjustable wrench, use 1-1/8 inch wrench to remove elbow (C) and collar (S) from elbow (R).
15. Using 12 inch adjustable wrench, remove elbow (R) from tee (Q).
16. Remove tee (Q) from vise.

INSTALLATION:

NOTE

Remove all caps and plugs as necessary during installation. Before installation, use pipe tape on all male threads. Start tape on second thread so tape will not enter hydraulic system.

**TONGUE CYLINDER HYDRAULICS, RELIEF VALVE (RV4),
AND CHECK VALVE (CV4) REPLACEMENT (Sheet 3 of 4)**



1. Place tee (A) in vise.
2. Using 1-3/8 inch wrench, install check valve "CV4" (B) with flow direction as shown.
3. Using 1-1/8 inch wrench, install nipple (C) in tee (A).
4. Using 12 inch adjustable wrench, install elbow (D) into tee (A) and align as shown.
5. Holding elbow (D) with 12 inch adjustable wrench, use 1-1/8 inch wrench to install collar "CK1" (E) and elbow (F).
6. Remove tee (A) from vise.
7. Place tee (G) in vise.
8. Using 1-1/8 inch wrench, install collar "CH" (H) and nipple (J) in tee (G).
9. Using 1-1/8 inch wrench, install nipple (K) in tee (G).
10. Using 1-1/8 inch wrench, install nipple (L) in tee (G).
11. Holding nipple (L) with 1-1/8 inch wrench, use 1-3/8 inch wrench to install bushing (M) in nipple (L).
12. Remove tee (G) from vise.

Go on to Sheet 4

TA170321

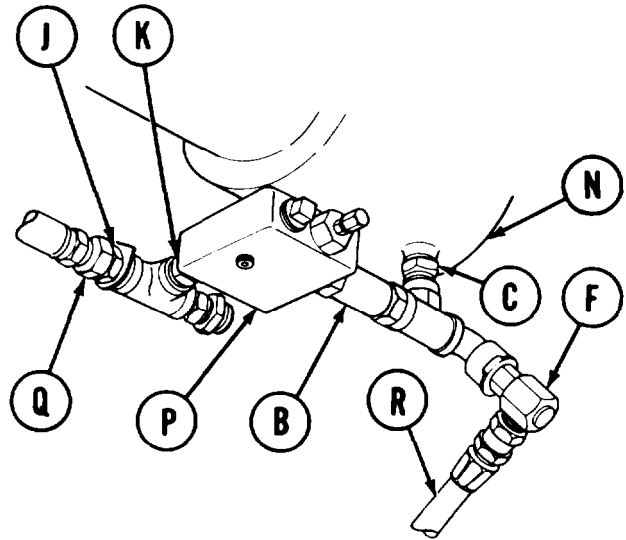
TONGUE CYLINDER HYDRAULICS, RELIEF VALVE (RV4), AND CHECK VALVE (CV4) REPLACEMENT (Sheet 4 of 4)

13. Using 1-1/8 inch wrench, install nipple (C) and attached parts as an assembly on tongue cylinder (N). Aline as shown.

14. Holding check valve "CV4" (B) with 1-1/8 inch wrench, use 15 inch adjustable wrench to install and aline relief valve "RV4" (P) as shown.

15. Using 1-1/8 inch wrench, install nipple (K) and attached parts as assembly to relief valve "RV4" (P).

16. Holding nipple (J) with 1-1/8 inch wrench, use 1-1/4 inch wrench to install hose assembly "CH" (Q).



17. Using 15 inch adjustable wrench to hold elbow (F), use 1-1/4 inch wrench to connect hose assembly "CK1" (R) to elbow (F).

18. Install tongue cylinder flow regulator valve (page 3-109).

19. Bleed hydraulic system (page 3-66).

20. Check for hydraulic leaks and correct as necessary.

21. Service hydraulic reservoir (LO 5-5420-226-12).

22. Adjust relief valve pressure (page 3-78).

23. Install tongue cylinder armor (page 3-227).

End of Task

**SEQUENCE AND LOCKING CYLINDER RELIEF VALVE (RV5 AND RV6) REPLACEMENT
(Sheet 1 of 3)**

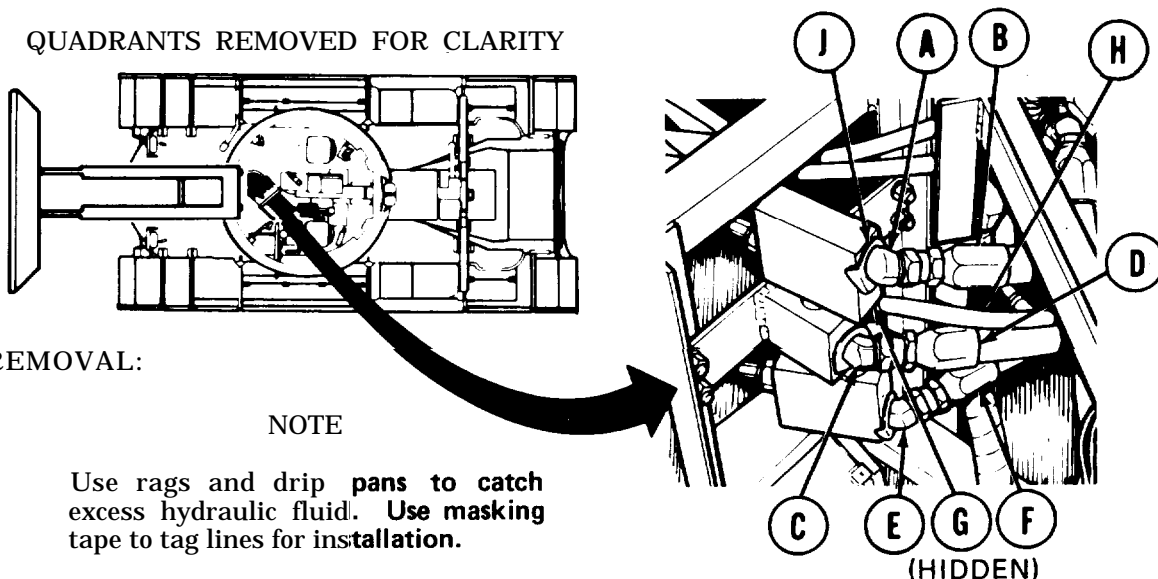
TOOLS: 9/16 in. open end wrench
 3/4 in. combination wrench
 12 in. adjustable wrench (2)
 3/4 in. socket with 1/2 in. drive
 Ratchet with 1/2 in. drive
 Vice
 1-1/4 in. open end wrench
 1-1/8 in. open end wrench

SUPPLIES: Pipe tape (Item 19, Appendix D) Drip pan
 Masking tape (Item 18, Appendix D) Rags (Item 12, Appendix D)
 Pencil Lockwashers (4)

REFERENCES TM 5-5420-226-10
 LO 5-5420-226-12

PRELIMINARY PROCEDURES: Remove front quadrant (page 3-39)
 Relieve hydraulic pressure (page 3-65)

QUADRANTS REMOVED FOR CLARITY



REMOVAL:

NOTE

Use rags and drip pans to catch excess hydraulic fluid. Use masking tape to tag lines for installation.

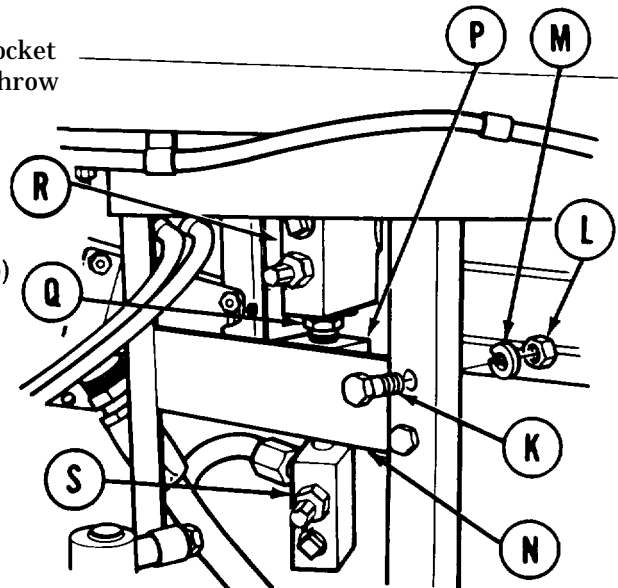
1. Holding elbow (A) with adjustable wrench, use 1-1/4 inch wrench to remove hose assembly "CS" (B).
2. Holding elbow (C) with adjustable wrench, use 1-1/4 inch wrench to remove hose assembly "CR" (D).
3. Holding elbow (E) with adjustable wrench, use 1-1/4 inch wrench to remove hose assembly "CT" (F).
4. Holding elbow (G) with adjustable wrench, use 9/16 inch wrench to remove hose assembly "AR" (H).
5. Using adjustable wrench, remove four elbows (A), (C), (E), and (G), and four collars (J).

Go on to Sheet 2

TA170323

**SEQUENCE AND LOCKING CYLINDER RELIEF VALVE (RV5 AND RV6) REPLACEMENT
(sheet 2 of 3)**

6. Holding screws (K) with 3/4 inch wrench, use socket to remove four nuts (L) and lockwashers (M). Throw lockwashers (M) away.
7. Remove four screws (K) and bracket (N) with manifold (P) attached.
8. Using 1-1/8 inch wrench, remove two nipples (Q) with relief valves "RV6" (R) and "RV5" (S) from manifold (P).
9. Using vise to secure two relief valves (R) and (S), use 1-1/8 inch wrench to remove two nipples (Q) from relief valves (R) and (S).

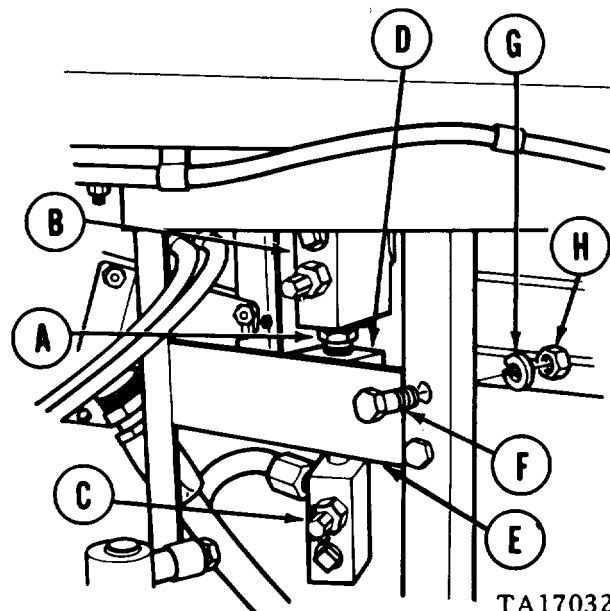


INSTALLATION:

NOTE

Before installation, use pipe tape on all male threads. Start tape on second thread so tape will not enter hydraulic system.

1. Using 1-1/8 inch wrench, install two nipples (A) in relief valves "RV6" (B) and "RV5" (C).
2. Using 1-1/8 inch wrench, install two nipples (A) with relief valves (B) and (C) in manifold (D).
3. Place bracket (E) with manifold (D) attached in position in vehicle.
4. Manually install four screws (F), new lockwashers (G), and nuts (H).
5. Holding screws (F) with 3/4 inch wrench, use socket to tighten four nuts (H).

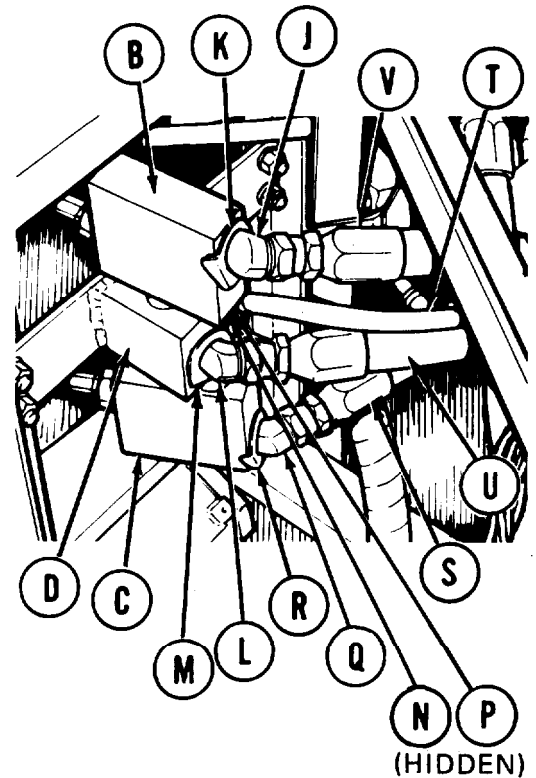


TA170324

Go on to Sheet 3

**SEQUENCE AND LOCKING CYLINDER RELIEF VALVE (RV5 AND RV6) REPLACEMENT
(sheet 3 of 3)**

6. Using adjustable wrench, install elbow (J) and collar "C S" (K) on top relief valve "RV6" (B).
7. Using adjustable wrench, install elbow (L) and collar "CR" (M) on rear of manifold (D).
8. Using adjustable wrench, install elbow (N) and collar "AR" (P) on side of manifold (D).
9. Using adjustable wrench, install elbow (Q) and collar "CT" (R) on bottom relief valve "RV5" (C).
10. Using 1-1/4 inch wrench, install hose assembly "CT" (S) on elbow (Q).



11. Using 9/16 inch wrench, install hose assembly "AR" (T) on elbow (N).
12. Using 1-1/4 inch wrench, install hose assembly "CR" (U) on elbow (L).
13. Using 1-1/4 inch wrench, install hose assembly "CS" (V) on elbow (J).
14. Bleed hydraulic system (page 3-66).
15. Check for hydraulic leaks and correct as necessary.
16. Service hydraulic reservoir (LO 5-5420-226-12).
17. Adjust pressure in relief valves (pages 3-80 and 3-81).
18. Install front quadrant (page 3-40).

End of Task

TA170325

**SCISSORS CYLINDER RELIEF VALVE (RV8) AND FLOW REGULATOR (PCV3) REPLACEMENT
(Sheet 1 of 4)**

PROCEDURE INDEX

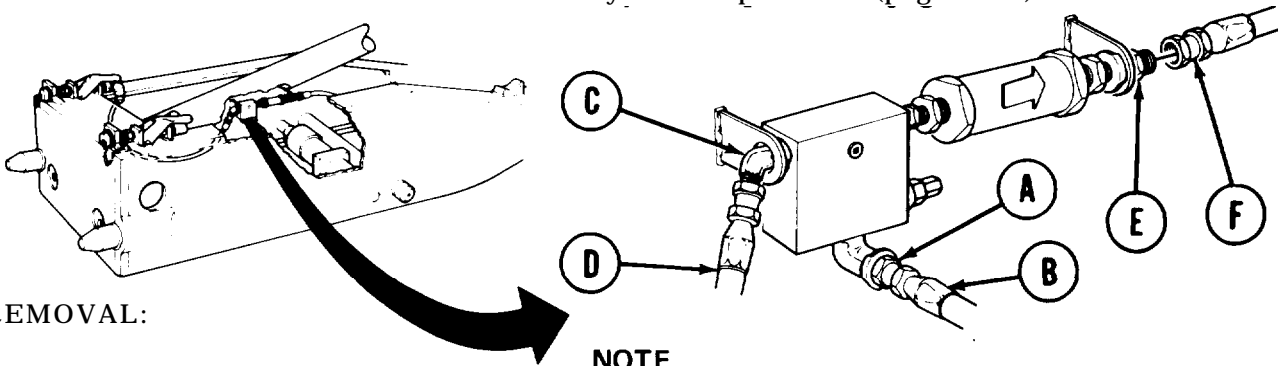
| PROCEDURE | PAGE |
|--------------|-------|
| Removal | 3-100 |
| Installation | 3-102 |

TOOLS: 1-1/4 in. open end wrench (2)
 1-1/8 in. open end wrench
 1-3/8 in. open end wrench
 12 in. adjustable wrench
 15 in. adjustable wrench
 Vice

SUPPLIES: Pipe tape (Item 19, Appendix D)
 Masking tape (Item 18, Appendix D)
 Pencil
 Drip pans
 Rags (Item 12, Appendix D)
 Caps and plugs (assorted sizes)

REFERENCE: LO 5-5420-226-12

PRELIMINARY PROCEDURES: Relieve hydraulic pressure (page 3-65)



NOTE
 Use rags and drip pans to catch excess hydraulic fluid. Use masking tape to tag lines for installation. Cap all lines and fittings as removed.

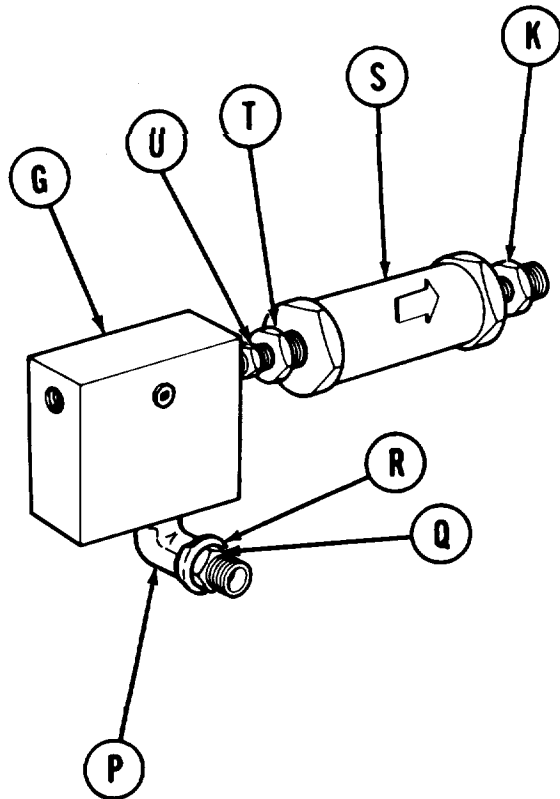
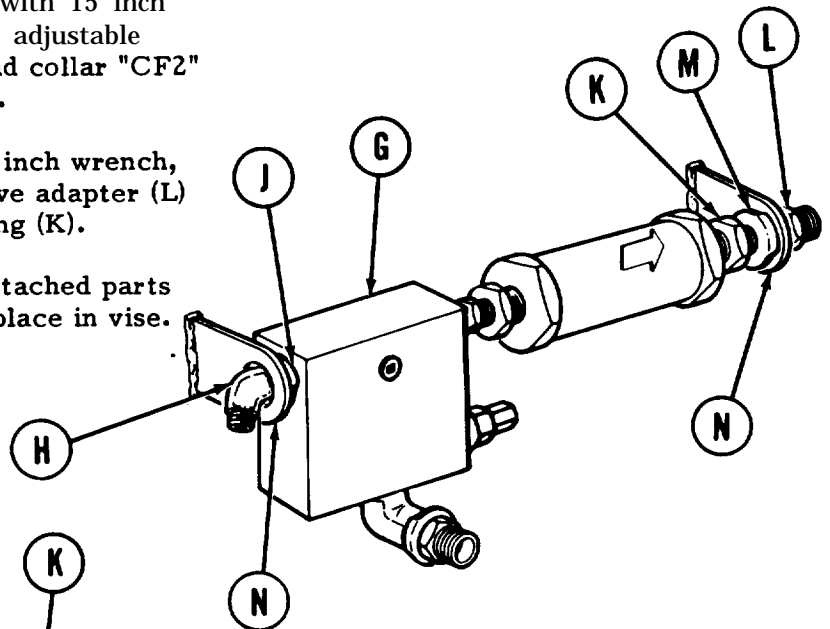
1. Holding adapter (A) with 1-1/8 inch wrench, use 1-1/4 inch wrench to remove hose assembly "CG" (B) from adapter (A).
2. Holding elbow (C) with 12 inch adjustable wrench, use 1-1/4 inch wrench to remove hose assembly "CF2" (D) from elbow (C).
3. Holding adapter (E) with 1-1/8 inch wrench, use 1-1/4 inch wrench to remove hose assembly "CJ" (F) from adapter (E).

Go on to Sheet 2

TA170326

SCISSORS CYLINDER RELIEF VALVE (RV8) AND FLOW REGULATOR (PCV3) REPLACEMENT
 (Sheet 2 of 4)

4. Holding relief valve "RV8" (G) with 15 inch adjustable wrench, use 12 inch adjustable wrench to remove elbow (H) and collar "CF2" (J) from relief valve "RV8" (G).
5. Holding bushing (K) with 1-3/8 inch wrench, use 1-1/8 inch wrench to remove adapter (L) and collar "CJ" (M) from bushing (K).
6. Remove relief valve (G) and attached parts from welded brackets (N) and place in vise.



7. Holding elbow (P) with 12 inch adjustable wrench, use 1-1/8 inch wrench to remove adapter (Q) and collar "CG" (R) from elbow (P).
8. Using 12 inch adjustable wrench, remove elbow (P) from relief valve "RV8" (G).
9. Holding flow regulator "PCV3" (S) with 15 inch adjustable wrench, use 1-3/8 inch wrench to remove bushing (K) from flow regulator "PCV3" (S).
10. Holding bushing (T) with 1-3/8 inch wrench, use 15 inch adjustable wrench to remove flow regulator "PCV3" (S) from bushing (T).
11. Holding nipple (U) with 1-1/8 inch wrench, use 1-3/8 inch wrench to remove bushing (T) from nipple (U).
12. Using 1-1/8 inch wrench, remove nipple (U) from relief valve "RV8" (G).
13. Remove relief valve "RV8" (G) from vise.

Go on to Sheet 3

TA170327

SCISSORS CYLINDER RELIEF VALVE (RV8) AND FLOW REGULATOR (PCV3) REPLACEMENT
(Sheet 3 of 4)

INSTALLATION:

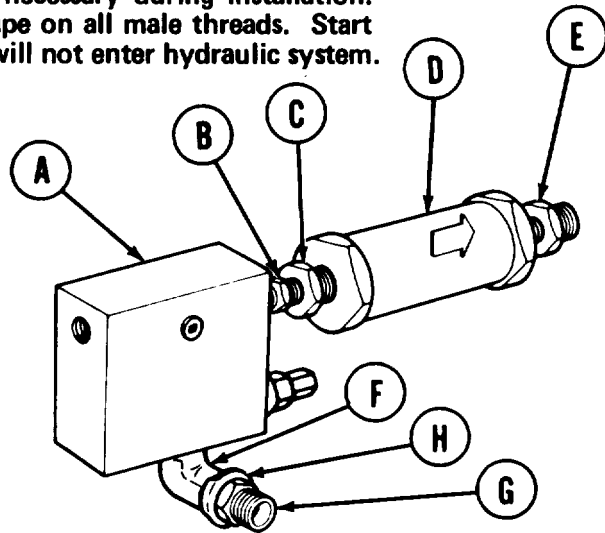
NOTE

Remove all caps and plugs as necessary during installation. Before installation, use pipe tape on all male threads. Start tape on second thread so tape will not enter hydraulic system.

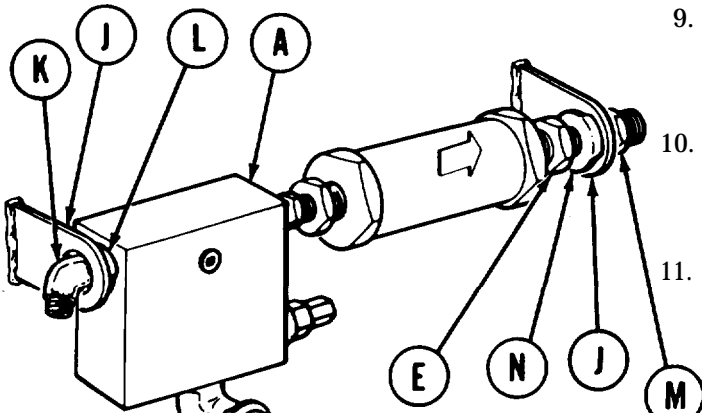
1. Place relief valve "RV8" (A) in vise.

NOTE

You must install parts in relief valve "RV8" (A) exactly as shown, or valve will not install or function properly.



2. Using 1-1/8 inch wrench, install nipple (B) on relief valve "RV8" (A).
3. Using 1-3/8 inch wrench, install bushing (C) on nipple (B).
4. Holding bushing (C) with 1-3/8 inch wrench, use 15 inch adjustable wrench to install flow regulator "PCV3" (D) on bushing (C) with flow arrow pointing away from relief valve "RV8" (A).
5. Holding flow regulator "PCV3" (D) with 15 inch adjustable wrench, use 1-3/8 inch wrench to install bushing (E) on flow regulator "PCV3" (D).
6. Using 12 inch adjustable wrench, install elbow (F) on relief valve "RV8" (A).
7. Holding elbow (F) with 12 inch adjustable wrench, use 1-1/8 inch wrench to install adapter (G) and collar "CG" (H) on elbow (F).
8. Remove relief valve "RV8" (A) and attached parts from vise and position between welded support brackets (J).



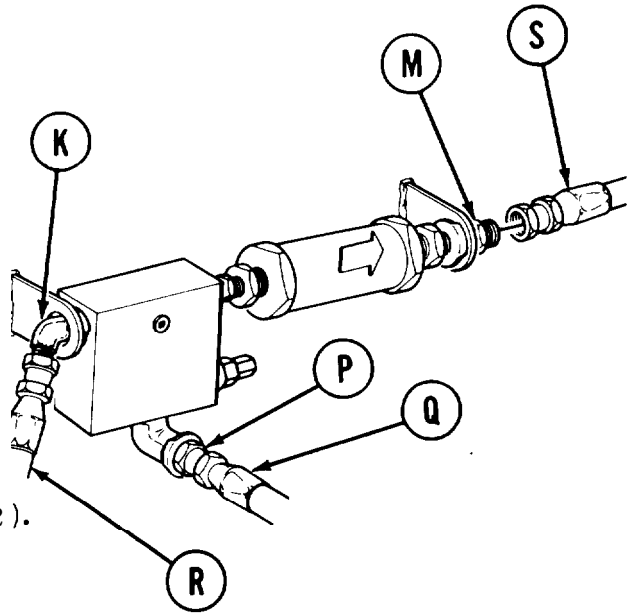
9. Manually install elbow (K) and collar "CF2" (L) to relief valve "RV8" (A) and adapter (M) and collar "C J" (N) to bushing (E).
10. Holding relief valve "RV8" (A) with 15 inch adjustable wrench, use 12 inch adjustable wrench to tighten elbow (K).
11. Holding bushing (E) with 1-3/8 inch wrench, use 1-1/8 inch wrench to tighten adapter (M).

Go on to Sheet 4

TA170328

SCISSORS CYLINDER RELIEF VALVE (RV8) AND FLOW REGULATOR (PCV3) REPLACEMENT (Sheet 4 of 4)

12. Holding adapter (P) with 1-1/8 inch wrench, use 1-1/4 inch wrench to install hose assembly "CG" (Q) to adapter (P).
13. Holding elbow (K) with 12 inch adjustable wrench, use 1-1/4 inch wrench to install hose assembly "CF2" (R) to elbow (K).
14. Holding adapter (M) with 1-1/8 inch wrench, use 1-1/4 inch wrench to install hose assembly "CJ" (S) to adapter (M).
15. Service hydraulic reservoir (LO 5-5420-226-12).
16. Bleed hydraulic system (page 3-66).
17. Check for hydraulic leaks and correct as necessary.
18. Service hydraulic reservoir (LO 5-5420-226-12).
19. Adjust relief valve pressure (page 3-83).



End of Task

**OVERHEAD CYLINDER RELIEF VALVE (RV9) AND FLOW REGULATOR (PCV1)
REPLACEMENT (Sheet 1 of 4)**

PROCEDURE INDEX

| PROCEDURE | PAGE |
|--------------|-------|
| Removal | 3-104 |
| Installation | 3-106 |

TOOLS: 12 in. adjustable wrench (2)
 1-1/8 in. open end wrench
 1-1/4 in. open end wrench
 1-3/8 in. open end wrench
 15 in. adjustable wrench

REFERENCES: LO 5-5420-226-12

PRELIMINARY PROCEDURES: Remove overhead cylinder armor (page 3-217)
 Relieve hydraulic pressure (page 3-65)

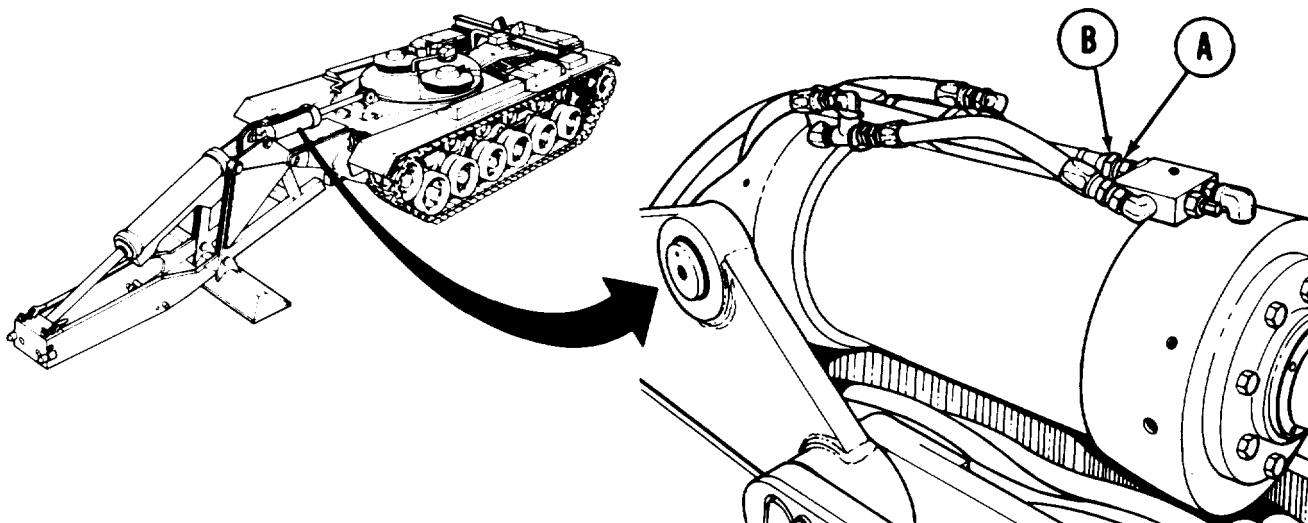
REMOVAL:

NOTE

Use rags and drip pans to catch excess hydraulic fluid. Use masking tape to tag lines for installation. Cap or plug all lines and fittings as disconnected.

NOTE

Lay hose assemblies aside, as disconnected, to provide clear work area around relief valve (RV9) and connected parts.



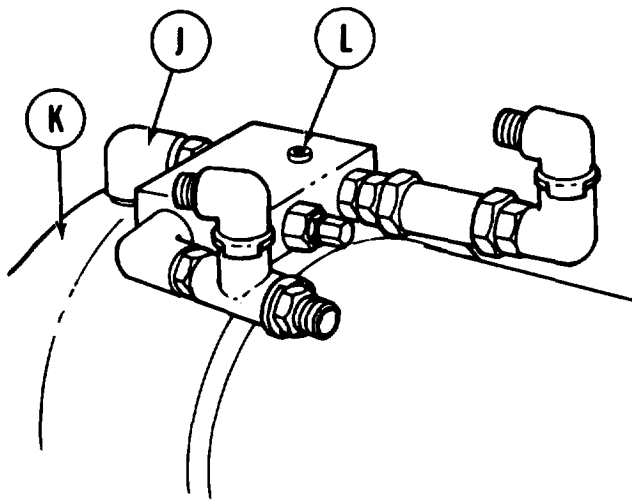
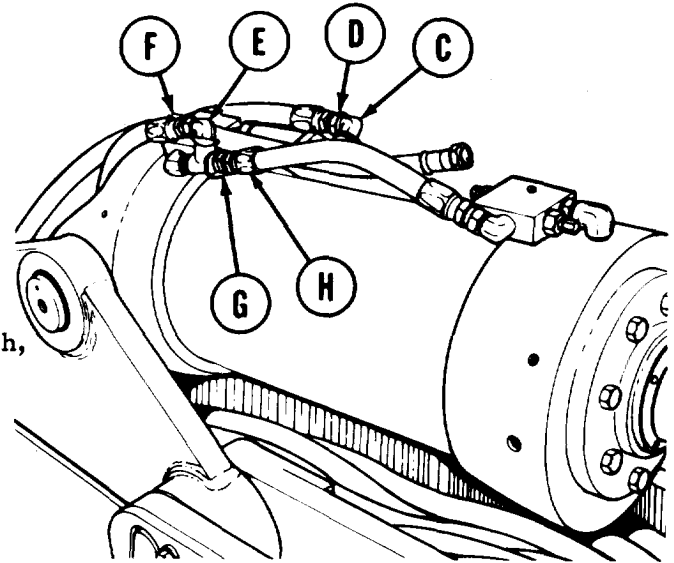
1. Holding adapter (A) with 1-1/8 inch wrench, use 1-1/4 inch wrench to remove hose assembly "CM" (B).

Go on to Sheet 2

TA170330

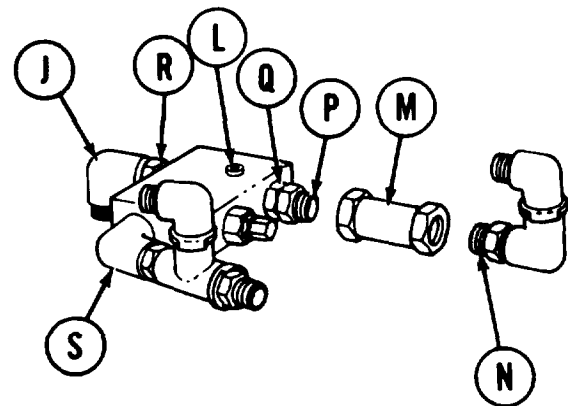
OVERHEAD CYLINDER RELIEF VALVE (RV9) AND FLOW REGULATOR (PCV1) REPLACEMENT (Sheet 2 of 4)

2. Holding elbow (C) with 12 inch adjustable wrench, use 1-1/4 inch wrench to remove hose assembly "CN" (D).
3. Holding elbow (E) with 12 inch adjustable wrench, use 1-1/4 inch open end wrench to remove hose assembly "CL" (F).
4. Holding adapter (G) with 1-1/8 inch wrench, use 1-1/4 inch wrench to remove hose assembly "CO" (H).



5. Using adjustable wrench, remove elbow (J) and attached parts from cap end of cylinder (K).
6. Using care to prevent damage, clamp relief valve (L) in vise.

7. Holding regulator (M) with 15 inch adjustable wrench, use 1-3/8 inch wrench to remove bushing (N) and attached fittings.
8. Holding bushing (P) with 1-3/8 inch wrench, use 15 inch adjustable wrench to remove regulator (M).
9. Using 1-1/8 inch wrench, remove nipple (Q) and attached bushing (P).
10. Using 1-1/8 inch wrench, remove nipple (R) and attached elbow (J).
11. Using 12 inch adjustable wrench, remove elbow (S) and attached fittings.
12. Remove relief valve (L) from vise.



Go on to Sheet 3

TA170331

**OVERHEAD CYLINDER RELIEF VALVE (RV9) AND FLOW REGULATOR (PCV1)
REPLACEMENT (Sheet 3 of 4)**

INSTALLATION:

NOTE

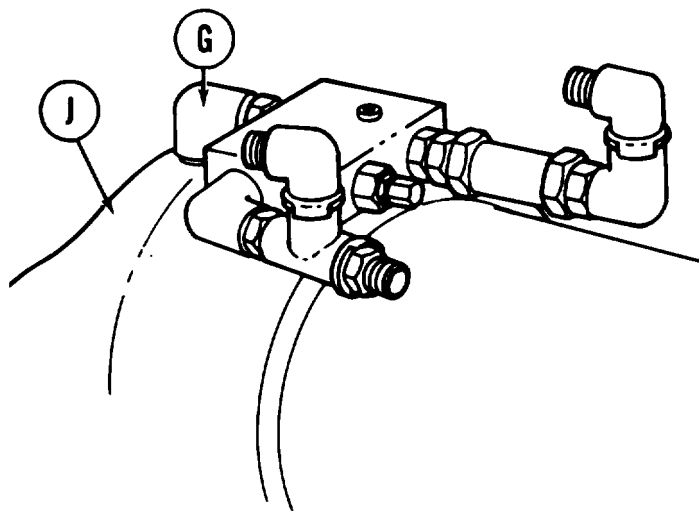
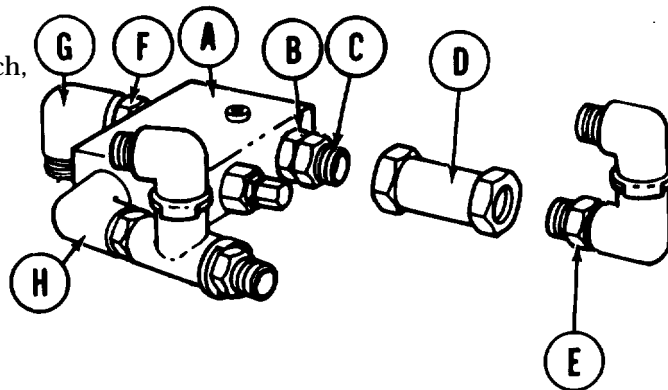
Remove all caps and plugs as necessary during installation. Before installation, use pipe tape on all male threads. Start tape on second thread so tape will not enter hydraulic system.

1. Using care to prevent damage, clamp relief valve (A) in vise.

NOTE

Locate and align parts as shown in illustrations to make sure connecting parts mate at final assembly.

2. Using 1-1/8 inch wrench, install nipple (B) and attached bushing (C) in hole next to pressure adjustment fitting.
3. Holding bushing (C) with 1-3/8 inch wrench, use 15 inch adjustable wrench to install regulator (D) on bushing (C).
4. Using 1-3/8 inch wrench, install bushing (E) and attached parts.
5. Using 1-1/8 inch wrench, install nipple (F) and attached elbow (G).
6. Using 12 inch adjustable wrench, install elbow (H) and attached parts.
7. Remove relief valve (A) and attached parts from vise.



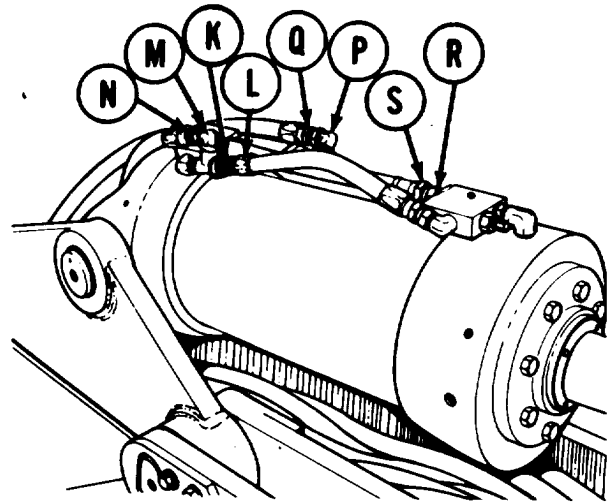
8. Using adjustable wrench, install elbow (G) and attached parts in cap end of cylinder (J).

Go on to Sheet 4

TA170332

OVERHEAD CYLINDER RELIEF VALVE (RV9) AND FLOW REGULATOR (PCV1) REPLACEMENT (Sheet 4 of 4)

9. Holding adapter (K) with 1-1/8 inch open end wrench, use 1-1/4 inch wrench to install hose assembly "CO" (L).
10. Holding elbow (M) with 12 inch adjust able wrench, use 1-1/4 inch wrench to install hose assembly "CL" (N).
11. Holding elbow (P) with 12 inch adjustable wrench, use 1-1/4 inch wrench to install hose assembly "CN" (Q).
12. Holding adapter (R) with 1-1/8 inch wrench, use 1-1/4 inch wrench to install hose assembly "CM" (S).



13. Bleed hydraulic system (page 3-66).
14. Check for hydraulic leaks and correct as necessary.
15. Service hydraulic reservoir (LO 5-5420-226-12).
16. Adjust relief valve pressure (page 3-76).
17. Install overhead cylinder armor (page 3-218).

End of Task

TM 5-5420-227-24

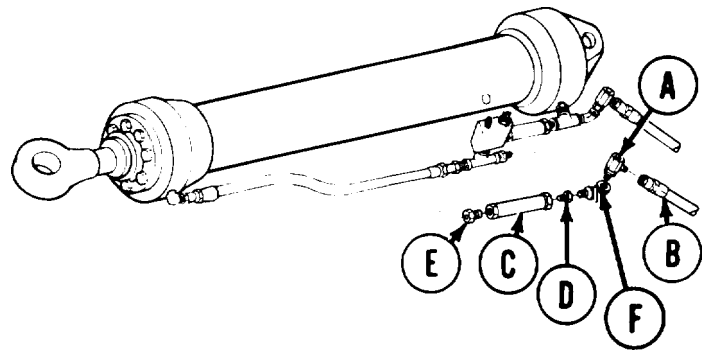
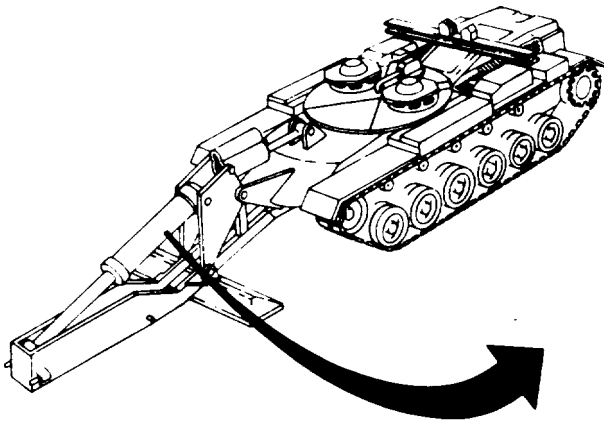
TONGUE CYLINDER FLOW REGULATOR (PCV2) REPLACEMENT (Sheet 1 of 2)

TOOLS: 1-1/4 in. open end wrench
1-3/8 in. open end wrench
15 in. adjustable wrench
12 in. adjustable wrench

SUPPLIES: Drip pans
Rags (Item 12, Appendix D)
Pipe tape (Item 19, Appendix D)
Caps and plugs (assorted sizes)

REFERENCE: LO 5-5420-226-12

PRELIMINARY PROCEDURES Remove tongue cylinder armor (page 3-226)
Relieve hydraulic pressure (page 3-65)



REMOVAL:

NOTE

Use rags and drip pans to catch excess hydraulic fluid. Cap all lines and fittings as disconnected.

1. Holding elbow (A) with 15 inch adjustable wrench, use 1-1/4 inch wrench to remove hose assembly "CK2" (B).
2. Holding flow regulator "PCV2" (C) with 15 inch adjustable wrench, use 1-3/8 inch wrench to remove reducer (D) with attached parts.
3. Holding bushing (E) with 1-3/8 inch wrench, use 15 inch adjustable wrench to remove flow regulator "PCV2" (C).
4. Holding reducer (D) with 1-3/8 inch wrench, use 12 inch adjustable wrench to remove elbow (F).
5. Holding elbow (F) with 12 inch adjustable wrench, use 15 inch adjustable wrench to remove elbow (A).

Go on to Sheet 2

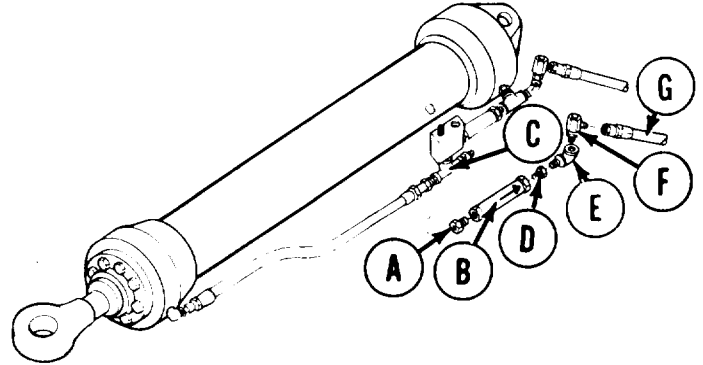
TA170334

TONGUE CYLINDER FLOW REGULATOR (PCV2) REPLACEMENT (Sheet 2 of 2)

INSTALLATION:

NOTE

Remove all caps and plugs as necessary during installation. Before installation, use pipe tape on all male threads. Start tape on second thread so tape will not enter hydraulic system.



1. Holding bushing (A) with 1-3/8 inch wrench, use 15 inch adjustable wrench to install flow regulator "PCV2" (B) with flow arrow pointing away from tee (C).
2. Holding flow regulator "PCV2" (B) with 15 inch adjustable wrench, use 1-3/8 inch wrench to install reducer (D).
3. Holding reducer (D) with 1-3/8 inch wrench, use 12 inch adjustable wrench to install elbow (E).
4. Holding elbow (E) with 12 inch adjustable wrench, use 15 inch adjustable wrench to install elbow (F).
5. Holding elbow (F) with 15 inch adjustable wrench, use 1-1/4 inch wrench to install hose assembly "CK2" (G).
6. Bleed hydraulic system (page 3-66).
7. Check for hydraulic leaks and correct as necessary.
8. Service hydraulic reservoir (LO 5-5420-226-12).
9. Install tongue cylinder armor (page 3-227).

End of Task

TA170335

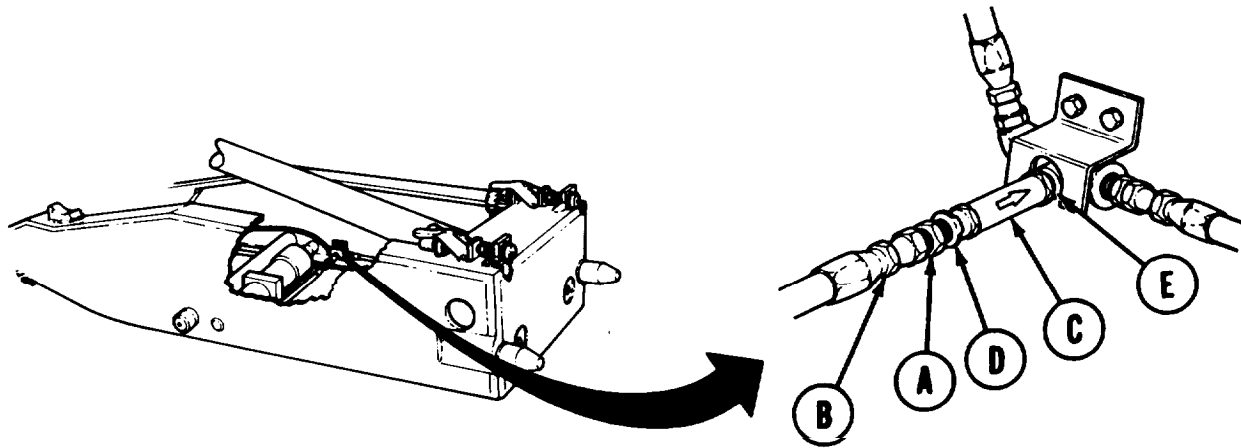
SCISSORS CYLINDER CHECK VALVE (CV7) REPLACEMENT (Sheet 1 of 2)

TOOLS: 1-1/8 in. open end wrench
1-1/4 in. open end wrench
15 in. adjustable wrench

SUPPLIES: Pipe tape (Item 19, Appendix D)
Rags (Item 12, Appendix D)
Drip pan
Caps and plugs (assorted sizes)

REFERENCE: LO 5-5420-226-12

PRELIMINARY PROCEDURE Relieve hydraulic pressure (page 3-65)



REMOVAL:

NOTE

Use rags and drip pans to catch excess hydraulic fluid. Cap all lines and fittings as disconnected.

1. Holding adapter (A) with 1-1/8 inch wrench, use 1-1/4 inch wrench to remove hose assembly "CG" (B).
2. Holding check valve "CW" (C) with 15 inch adjustable wrench, use 1-1/8 inch wrench to remove adapter (A) and collar "CG" (D).
3. Using 15 inch adjustable wrench, remove check valve "CV7" (C) from tee (E).

Go on to Sheet 2

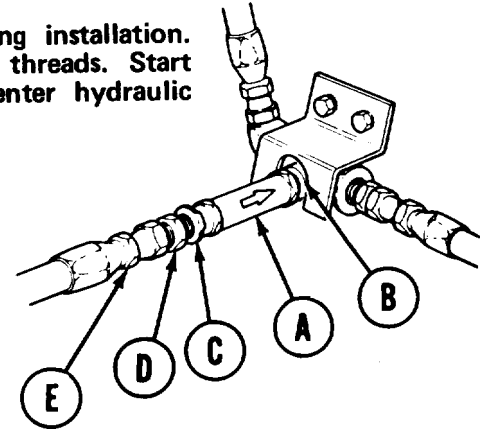
TA170336

SCISSORS CYLINDER CHECK VALVE (CV7) REPLACEMENT (Sheet 2 of 2)

INSTALLATION:

NOTE

Remove caps and plugs as necessary during installation. Before installation, use pipe tape on all male threads. Start tape on second thread so tape will not enter hydraulic system.



1. Using 15 inch adjustable wrench, install check valve "CV7" (A) with flow arrow pointing toward tee (B).
2. Holding check valve "CV7" (A) with 15 inch adjustable wrench, use 1-1/8 inch wrench to install collar "CG" (C) and adapter (D).
3. Holding adapter (D) with 1-1/8 inch wrench, use 1-1/4 inch wrench to install hose assembly (E).
4. Bleed hydraulic system (page 3-66).
5. Check for hydraulic leaks and correct as necessary.
6. Service hydraulic reservoir (LO 5-5420-226-12).

End of Task

TM 5-5420-227-24

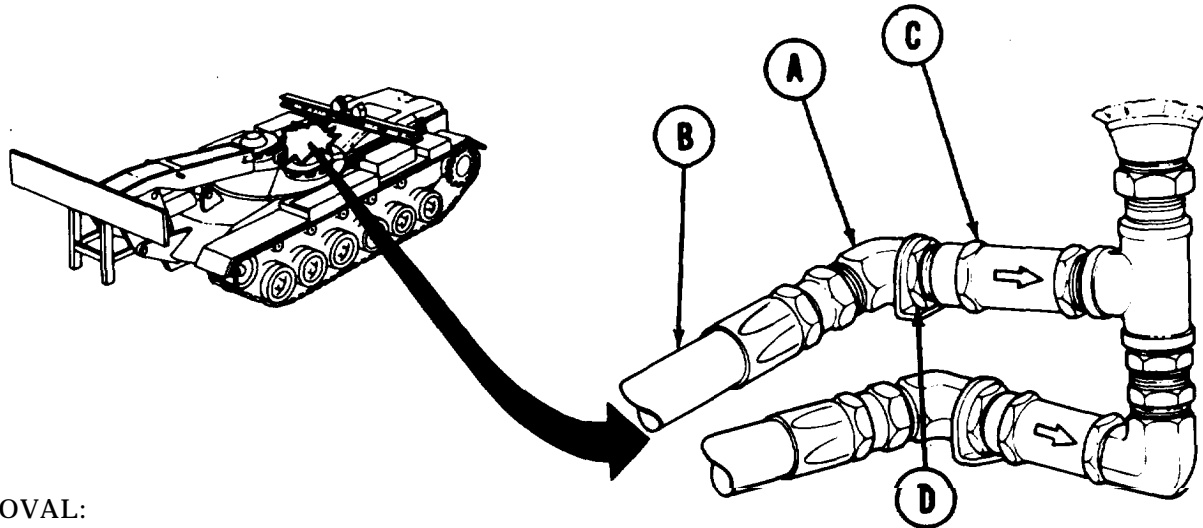
RESERVOIR RETURN CHECK VALVE (CV8) REPLACEMENT (Sheet 1 of 2)

TOOLS: 1-1/2in. open end wrench
1-3/4 in. open end wrench
15 in. adjustable wrench

SUPPLIES: Pipe tape (Item 19, Appendix D)
Drip pans
Rags (Item 12, Appendix D)

REFERENCE LO 5-5420-226-12

PRELIMINARY PROCEDURE Drain hydraulic reservoir (page 3-68)



UNDER RESERVOIR

REMOVAL:

NOTE

Use rags and drip pens to catch hydraulic fluid trapped in lines.

1. Holding elbow (A) with adjustable wrench, use 1-1/2 inch wrench to remove hose assembly "BB" (B).
2. Holding check valve "CV8" (C) with adjustable wrench, use 1-3/4 inch wrench to remove bushing (D) and attached parts.
3. Use adjustable wrench to remove check valve "CV8" (C).

Go on to Sheet 2

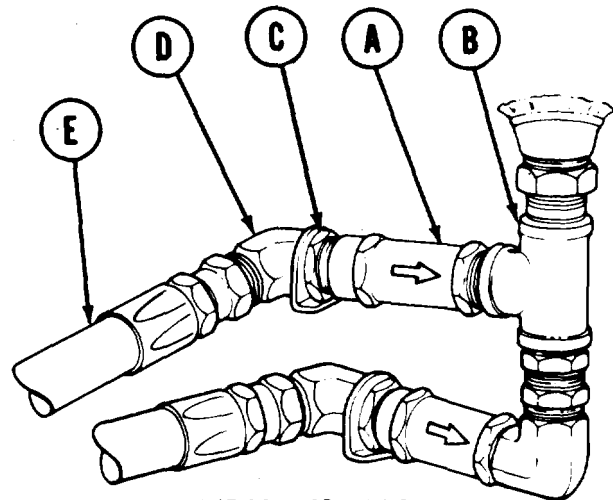
TA170338

RESERVOIR RETURN CHECK VALVE (CV8) REPLACEMENT (Sheet 2 of 2)

INSTALLATION:

NOTE

Before installation, use pipe tape on all male threads. Start tape on second thread so tape will not enter hydraulic system.



UNDER RESERVOIR

1. Use adjustable wrench to install check valve "CV8" (A) with flow arrow pointing toward tee (B).
2. Holding check valve "CV8" with adjustable wrench, use 1-3/4 inch wrench to install bushing (C) and attached parts.
3. Holding elbow (D) with adjustable wrench, use 1-1/2 inch wrench to install hose assembly "BB" (E).
4. Service hydraulic reservoir (LO 5-5420-226-12).
5. Bleed hydraulic system (page 3-66).
6. Check for hydraulic leaks and correct as necessary.
7. Service hydraulic reservoir (LO 5-5420-226-12).

End of Task

TM 5-5420-227-24

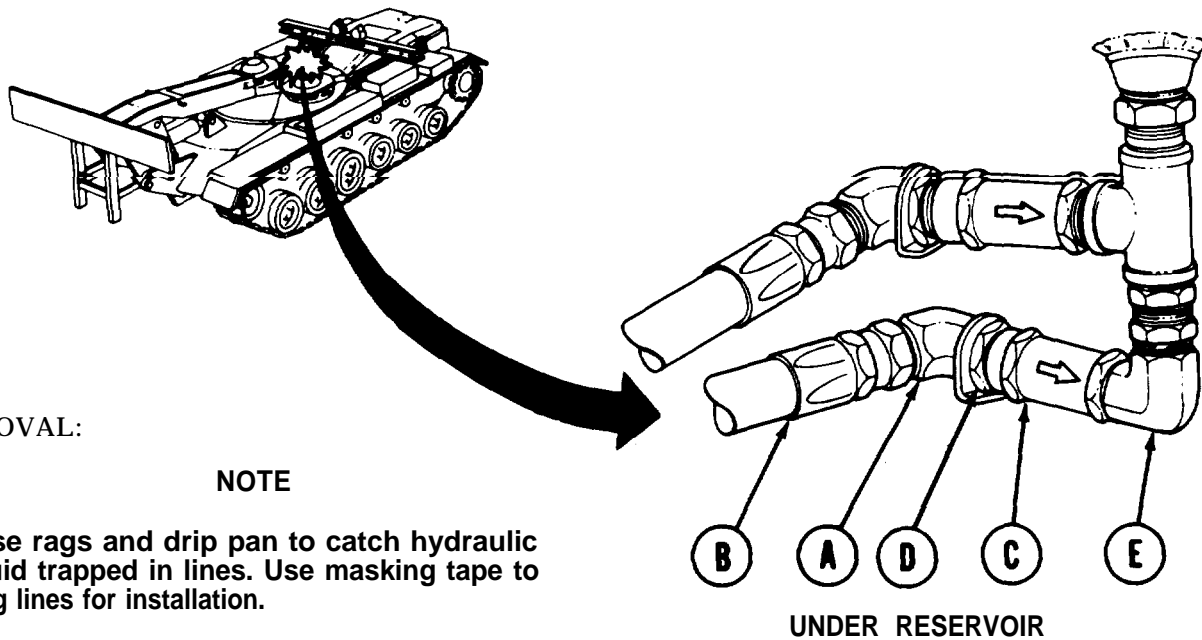
PUMP RELIEF CHECK VALVE (CV5) REPLACEMENT (Sheet 1 of 2)

TOOLS: 7/8 in. open end wrench
1-1/8 in. open end wrench
1-1/2 in. open end wrench
12 in. adjustable wrench

SUPPLIES: Pipe tape (Item 19, Appendix D)
Drip pans
Rags (Item 12, Appendix D)
Masking tape (Item 18, Appendix D)
Pencil

REFERENCES: LO 5-5420-226-12

PRELIMINARY PROCEDURE: Drain hydraulic reservoir (page 3-68)



1. Holding elbow (A) with adjustable wrench, use 7/8 inch wrench to remove hose assembly "CV5" (B).
2. Holding check valve "CV5" (C) with 1-1/2 inch wrench, use 1-1/8 inch wrench to remove bushing (D) and attached parts.
3. Holding elbow (E) with adjustable wrench, use 1-1/2 inch wrench to remove check valve "CV5" (C).

Go on to Sheet 2

TA170340

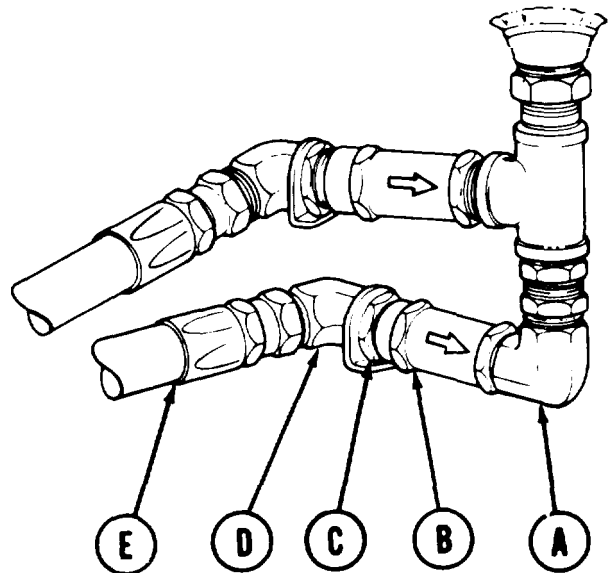
PUMP RELIEF CHECK VALVE (CV5) REPLACEMENT (Sheet 2 of 2)

INSTALLATION:

NOTE

Before installing, use pipe tape on all male threads. Start tape on second thread so tape will not enter hydraulic system.

1. Holding elbow (A) with adjustable wrench, using 1-1/2 inch wrench to install check valve "CV5" (B) with flow arrow pointing toward elbow (A).
2. Holding check valve "CV5" (B) with 1-1/2 inch wrench, use 1-1/8 inch wrench to install bushing (C) with attached parts.
3. Holding elbow (D) with adjustable wrench, use 7/8 inch wrench to install hose assembly "CV5" (E).
4. Service hydraulic reservoir (LO 5-5420-226-12).
5. Bleed hydraulic system (page 3-66).
6. Check for hydraulic leaks and correct as necessary.
7. Service hydraulic reservoir (LO 5-5420-226-12).



End of Task

TA170341

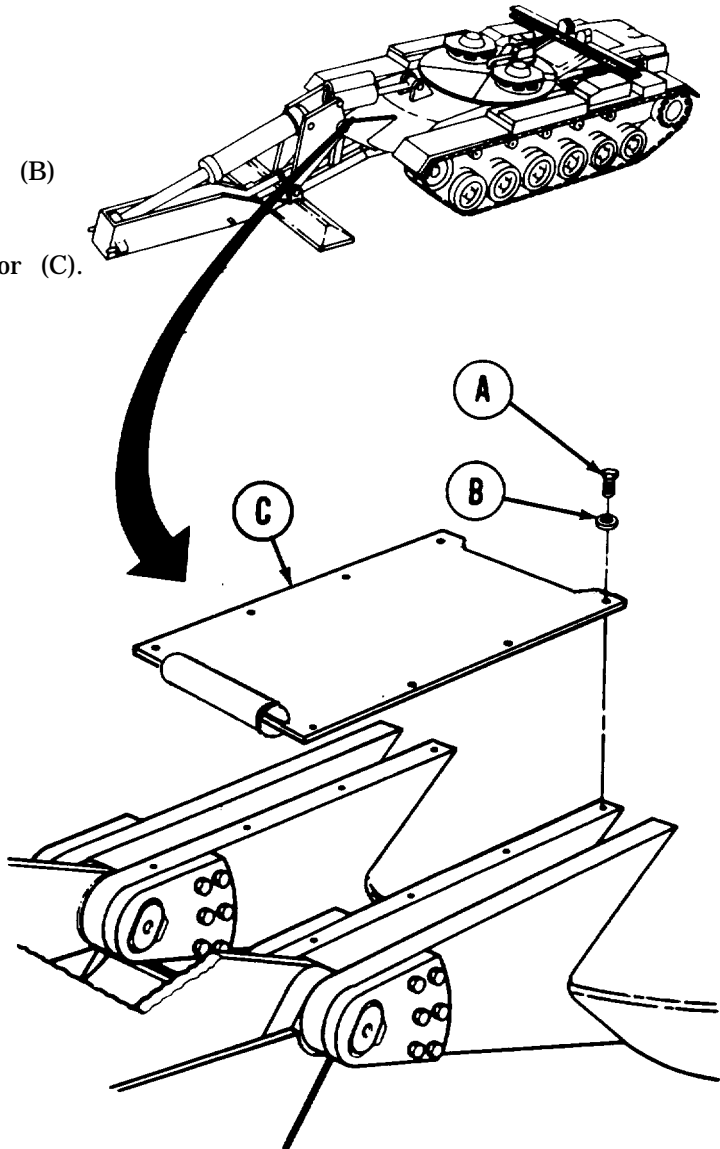
BOOM MOUNT HOSE ARMOR REPLACEMENT (Sheet 1 of 1)

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

SUPPLIES: Lockwashers (8 required)

REMOVAL:

1. Using socket, remove eight screws (A) and lockwashers (B). Throw lockwashers (B) away.
2. Manually remove boom mount hose armor (C).



INSTALLATION:

1. Manually position boom mount hose armor (C).
2. Place new lockwashers (B) on eight screws (A).
3. Manually install eight screws (A).
4. Using socket, tighten eight screws (A).

End of Task

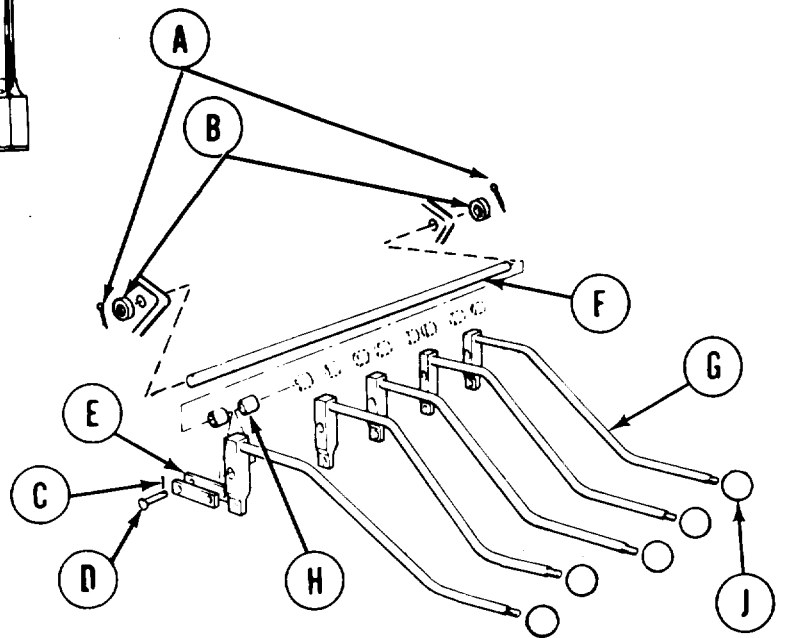
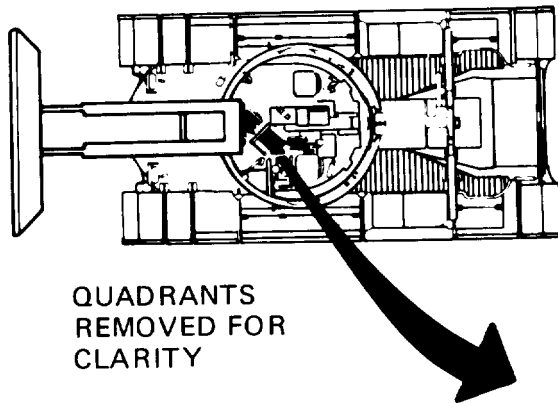
TA170342

VALVE BANK ASSEMBLY CONTROLS REPLACEMENT (Sheet 1 of 2)

TOOLS: Slip joint pliers
 Hammer
 Punch

SUPPLIES: Cotter pins

REFERENCE: TM 5-5420-226-10



REMOVAL:

1. Using pliers, remove two cotter pins(A) and washers (B). Throw pins (A) away.
2. Using pliers, remove ten cotter pins (C)and throw away.
3. Remove 10 straight pins (D) and 10 links (E).
4. Using hammer and punch, tap out pin (F).
5. Using pliers slowly pull out pin (F) and remove five control levers (G) and 10 spacers (H).
6. Manually remove five knobs (J) by unscrewing.

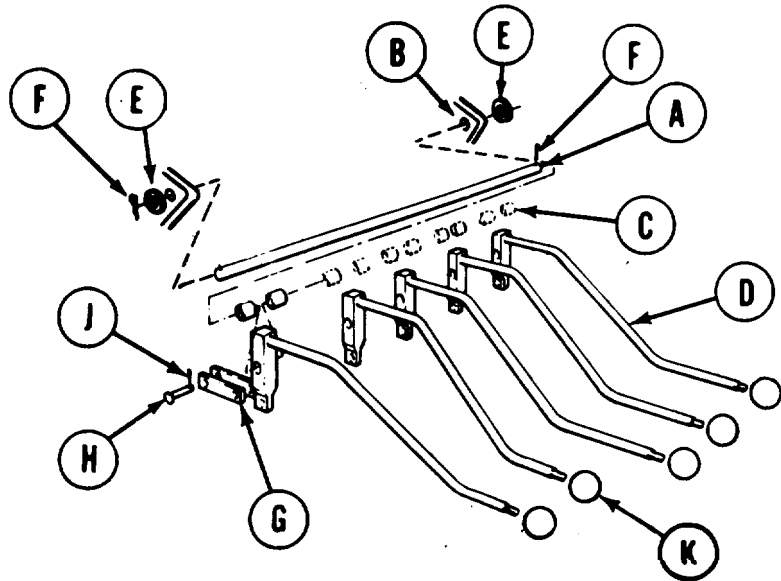
Go on to Sheet 2

TA170343

VALVE BANK ASSEMBLY CONTROLS REPLACEMENT (Sheet 2 of 2)

INSTALLATION:

1. Manually start pin(A) through valve bank (B).
2. While tapping pin (A), install ten spacers (C) and five control levers (D) as shown.
3. Using pliers, install two washers (E) and new cotter pins (F).
4. Place ten links (G) in position.
5. Manually install ten straight pins (H).
6. Using pliers, install ten new cotter pins (J).
7. Manually screw five knobs (K) onto five control levers (D).
8. Operate each control lever (D) to insure proper operation.
(TM 5-5420-226-10).



End of Task

**Section III. FILTER, HOSE ASSEMBLIES, AND ASSOCIATED HYDRAULICS
OVERHEAD CYLINDER HOSE ASSEMBLIES (CL, CM, CN, AND CO) AND HYDRAULICS
REPLACEMENT (Sheet 1 of 8)**

PROCEDURE INDEX

| PROCEDURE | PAGE |
|--------------|-------|
| Removal | 3-119 |
| Installation | 3-123 |

TOOLS: 12 in. adjustable wrench
1-1/4 in. open end wrench
1-1/8 in. open end wrench
1-3/8 in. open end wrench
15 in. adjustable wrench

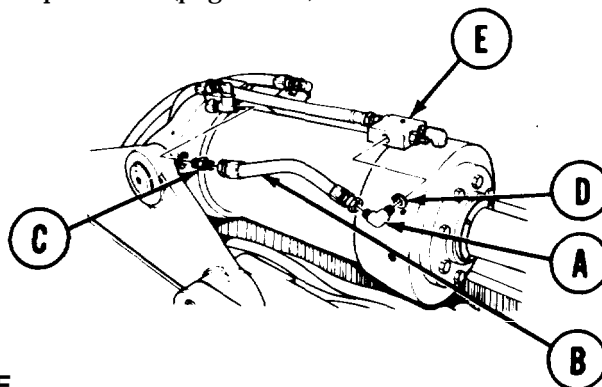
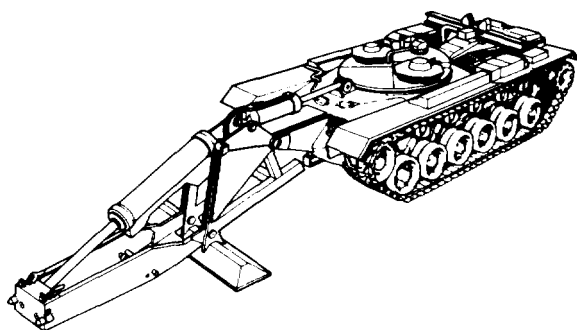
9/16 in. socket with 1/2 in. drive
Ratchet with 1/2 in. drive
Vise

SUPPLIES: Drip pans
Rags (Item 12, Appendix D)
Masking tape (Item 18, Appendix D)
Preformed packing (3 required)

Pencil
Pipe tape (Item 19, Appendix D)
Caps and plugs (assorted sizes)
Lockwashers (8 required)

REFERENCE: LO 5-5420-226-12

PRELIMINARY PROCEDURES: Remove overhead cylinder armor (page 3-217)
Remove front fixed and moveable hose armor (page 3-127)
Relieve hydraulic pressure (page 3-65)



REMOVAL:

NOTE

Use rags and drip pans to catch excess hydraulic fluid. Use masking tape to tag lines for installation. Cap or plug all lines and fittings as disconnected.

1. Holding elbow (A) with 12 inch adjustable wrench, use 1-1/4 inch wrench to disconnect hose assembly (B) from elbow (A).
2. Holding adapter (C) with 1-1/8 inch wrench, use 1-1/4 inch wrench to remove hose assembly (B) from adapter (C).
3. Using 12 inch adjustable wrench, remove elbow (A) and collar (D) from relief valve (E).

Go on to Sheet 2

TA170345

OVERHEAD CYLINDER HOSE ASSEMBLIES (CL, CM, CN, AND CO) AND HYDRAULICS REPLACEMENT (Sheet 2 of 8)

4. Holding tee (F) with 12 inch adjustable wrench, use 1-1/8 inch wrench to remove adapter (C) and collar (G) from tee (F).

5. Holding elbow (H) with 1-1/8 inch wrench, use 1-1/4 inch wrench to remove hose assembly (J) from elbow (H).

6. Holding tee (F) with 12 inch adjustable wrench, use 1-1/8 inch wrench to remove elbow (H) and collar (K).

7. Holding nipple (L) with 1-1/8 inch wrench, use 12 inch adjustable wrench to remove tee (F) from nipple (L).

8. Holding elbow (M) with 12 inch adjustable wrench, use 1-1/8 inch wrench to remove nipple (L) from elbow (M).

9. Using 12 inch adjustable wrench, remove elbow (M) from relief valve (N).

10. Holding adapter (P) with 1-1/8 inch wrench, use 1-1/4 inch wrench to remove hose assembly (Q).

11. Holding relief valve (E) with 15 inch adjustable wrench, use 1-1/8 inch wrench to remove adapter (P) and collar (R).

12. Using 12 inch adjustable wrench, remove elbow (S) and attached nipple (T) and relief valve (E) from overhead cylinder (U).

13. Using care not to cause damage, clamp relief valve (E) in vise.

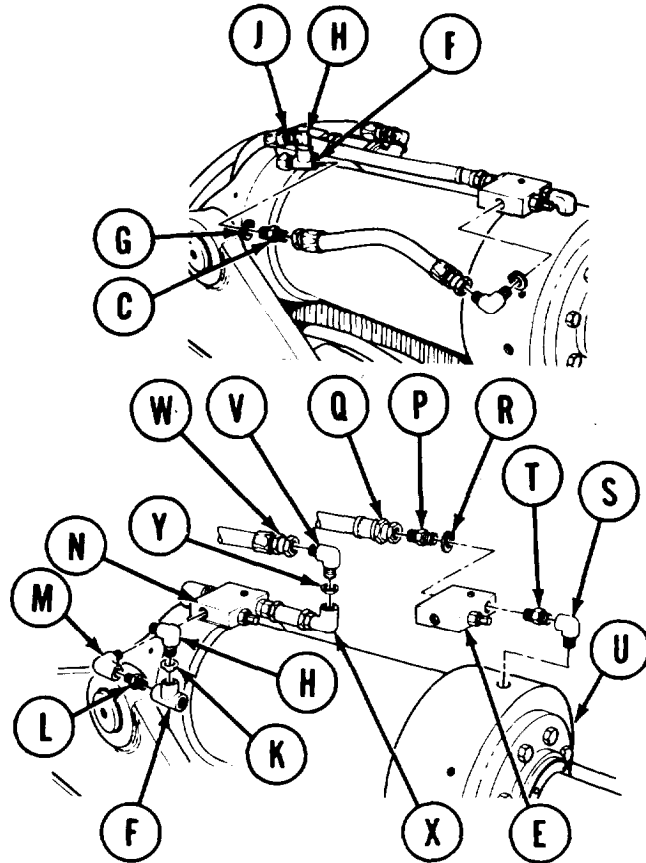
14. Holding nipple (T) with 1-1/8 inch wrench, use 12 inch adjustable wrench to remove elbow (S) from nipple (T).

15. Using 1-1/8 inch wrench, remove nipple (T) from relief valve (E).

16. Remove relief valve (E) from vise.

17. Holding elbow (V) with 12 inch adjustable wrench, use 1-1/4 inch wrench to remove hose assembly (W) from elbow (V).

18. Holding elbow (X) with 15 inch adjustable wrench, use 12 inch adjustable wrench to remove elbow (V) and collar (Y).

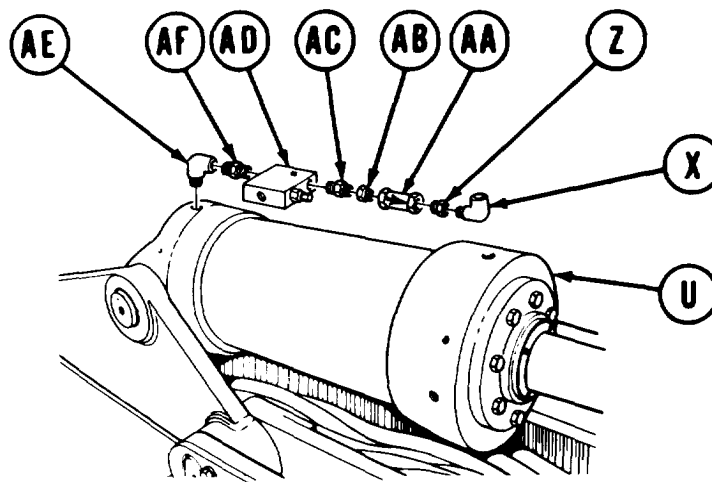


Go on to Sheet 3

TA170346

**OVERHEAD CYLINDER HOSE ASSEMBLIES (CL, CM, CN, AND CO) AND HYDRAULICS
REPLACEMENT (Sheet 3 of 8)**

19. Holding bushing (Z) with 1-1/8 inch wrench, use 12 inch adjustable wrench to remove elbow (X) from bushing (Z).
20. Holding regulator (AA) with 15 inch adjustable wrench, use 1-3/8 inch wrench to remove bushing (Z) from regulator (AA).
21. Holding bushing (AB) with 1-3/8 inch wrench, use 15 inch adjustable wrench to remove regulator (AA) from bushing (AB).
22. Holding nipple (AC) with 1-1/8 inch wrench, use 1-3/8 inch wrench to remove bushing (AB) from nipple (AC).

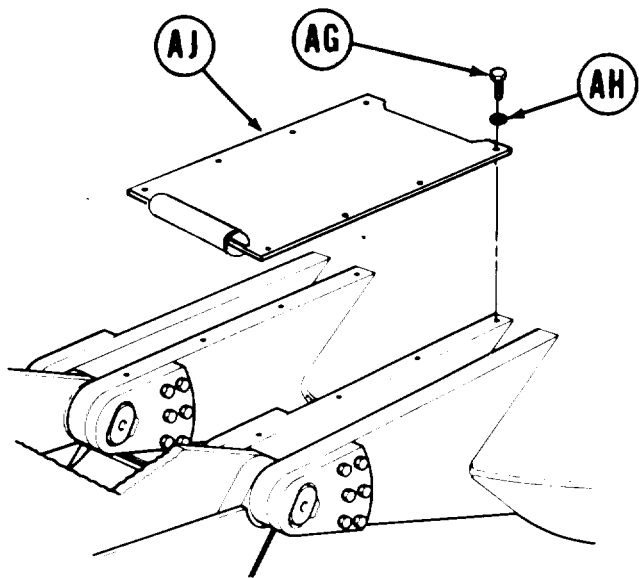


23. Holding relief valve (AD) with 15 inch adjustable wrench, use 1-1/8 inch wrench to remove nipple (AC) from valve (AD).
24. Using 12 inch adjustable wrench, remove elbow (AE) and attached nipple (AF) and relief valve (AD) from overhead cylinder (U).
25. Using care not to cause damage, clamp relief valve (AD) in vise.
26. Holding nipple (AF) with 1-1/8 inch wrench, use 12 inch adjustable wrench to remove elbow (AE) from nipple (AF).
27. Using 1-1/8 inch wrench, remove nipple (AF) from relief valve (AD).
28. Remove relief valve (AD) from vise.

Go on to Sheet 4

TA170347

OVERHEAD CYLINDER HOSE ASSEMBLIES (CL, CM, CN, AND CO) AND HYDRAULICS REPLACEMENT (Sheet 4 of 8)



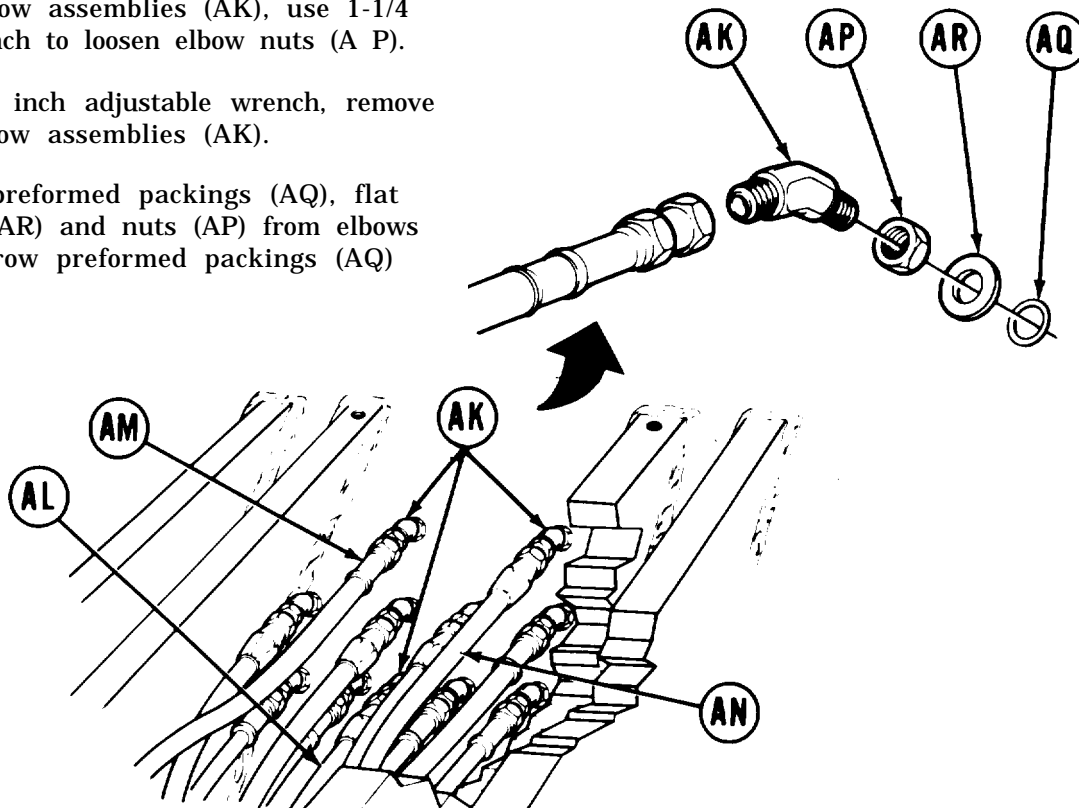
- 29. Using socket, remove eight screws (AG) and lockwashers (AH). Throw lockwashers (AH) away.
- 30. Manually remove front hose armor (AJ) from vehicle.

31. Using 12 inch adjustable wrench to hold three elbow assemblies (AK), use 1-1/4 inch wrench to remove three hose assemblies (AL, AM, AN) from elbow assemblies (AK).

32. Using 12 inch adjustable wrench to hold three elbow assemblies (AK), use 1-1/4 inch wrench to loosen elbow nuts (A P).

33. Using 12 inch adjustable wrench, remove three elbow assemblies (AK).

34. Remove preformed packings (AQ), flat washers (AR) and nuts (AP) from elbows (AK). Throw preformed packings (AQ) away.



Go on to Sheet 5

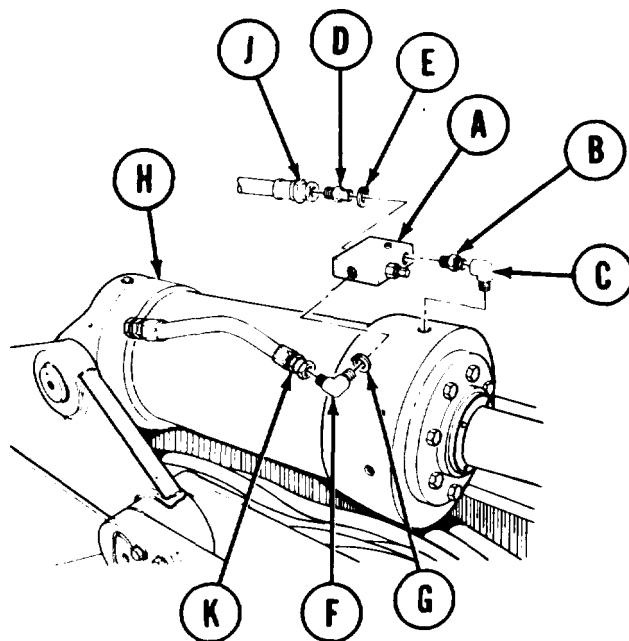
TA170348

OVERHEAD CYLINDER HOSE ASSEMBLIES (CL, CM, CN, AND CO) AND HYDRAULICS REPLACEMENT (Sheet 5 of 8)

INSTALLATION:

NOTE

Remove all caps and plugs as necessary during installation. Before installation, use pipe tape on all male threads. Start tape on second thread so tape will not enter hydraulic system. Locate and align parts as shown in illustrations to make sure connecting parts mate at final assembly.

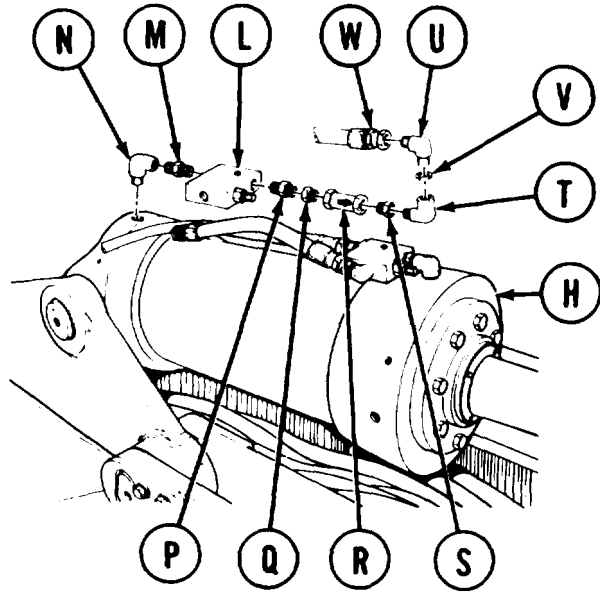


1. Using care to prevent damage, clamp relief valve (A) in vise.
2. Using 1-1/8 inch wrench, install nipple (B) into valve (A).
3. Holding nipple (B) with 1-1/8 inch wrench, use 12 inch adjustable wrench to install elbow (C) on nipple (B).
4. Using 1-1/8 inch wrench, install adapter (D) and collar (E) on relief valve (A).
5. Using 12 inch adjustable wrench, install elbow (F) and collar (G) into relief valve (A).
6. Remove relief valve (A) and attached parts from vise.
7. Using 12 inch adjustable wrench, install elbow (C) and attached parts on rod end of cylinder (H).
8. Holding adapter (D) with 1-1/8 inch wrench, use 1-1/4 inch wrench to install hose assembly (J) on nipple (D).
9. Holding elbow (F) with 12 inch adjustable wrench, use 1-1/4 inch wrench to connect hose assembly (K) to elbow (F).

Go on to Sheet 6

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OVERHEAD CYLINDER HOSE ASSEMBLIES (CL, CM, CN, AND CO) AND HYDRAULICS
REPLACEMENT (Sheet 6 of 8)



10. Using care to prevent damage, clamp relief valve (L) in vise.
11. Using 1-1/8 inch wrench, install nipple (M) into relief valve (L).
12. Using 12 inch adjustable wrench, install elbow (N) onto nipple (M).
13. Using 1-1/8 inch wrench, install nipple (P) into relief valve (L).
14. Holding nipple (P) with 1-1/8 inch wrench, use 1-3/8 inch wrench to install bushing (Q) onto nipple (P).

NOTE

Install regulator (R) with flow arrow pointing away from relief valve (L).

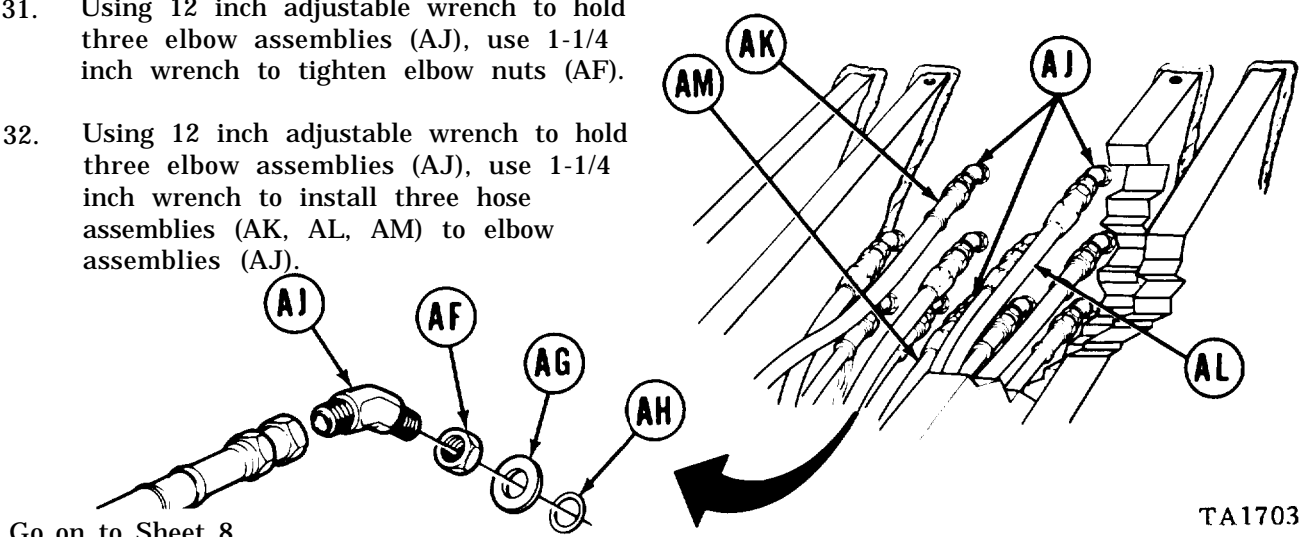
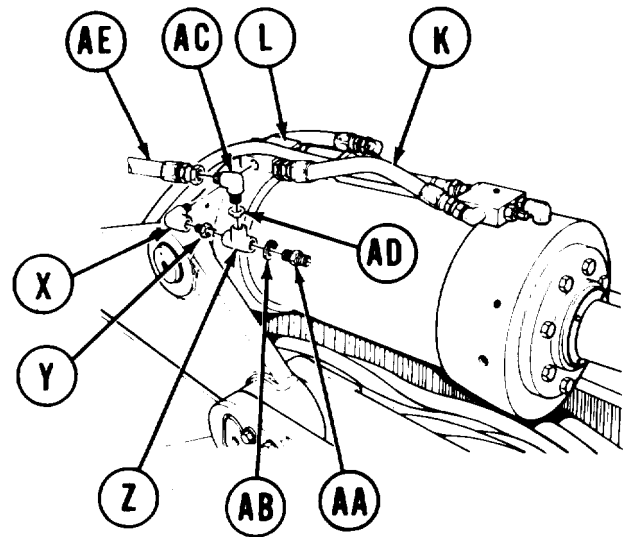
15. Holding bushing (Q) with 1-3/8 inch wrench, use 15 inch adjustable wrench to install regulator (R) onto nipple (P).
16. Holding regulator (R) with 15 inch adjustable wrench, use 1-3/8 inch wrench to install bushing (S) onto regulator (R).
17. Holding bushing (S) with 1-3/8 inch wrench, use 12 inch adjustable wrench to install elbow (T) into bushing (S).
18. Holding elbow (T) with 15 inch adjustable wrench, use 12 inch adjustable wrench to install elbow (U) and collar (V) into elbow (T).
19. Remove relief valve (L) and attached parts from vise.
20. Using 12 inch adjustable wrench, install elbow (N) and attached parts in cap end of cylinder (H).
21. Holding elbow (U) with 12 inch adjustable wrench, use 1-1/4 inch wrench to install hose assembly (W) onto elbow (U).

Go on to Sheet 7

TA170350

OVERHEAD CYLINDER HOSE ASSEMBLIES (CL, CM, CN, AND CO) AND HYDRAULICS REPLACEMENT (Sheet 7 of 8)

22. Holding relief valve (L) with 15 inch adjustable wrench, use 12 inch adjustable wrench to install elbow (X) into relief valve (L).
23. Holding elbow (X) with 12 inch adjustable wrench, use 1-1/8 inch wrench to install nipple (Y) into elbow (X).
24. Holding nipple (Y) with 1-1/8 inch wrench, use 12 inch adjustable wrench to install tee (Z) onto nipple (Y).
25. Holding tee (Z) with 12 inch adjustable wrench, use 1-1/8 inch wrench to install adapter (AA) and collar (AB) into tee (Z).
26. Holding adapter (AA) with 1-1/8 inch wrench, use 1-1/4 inch wrench to install hose assembly (K) onto adapter (AA).
27. Holding tee (Z) with 15 inch adjustable wrench, use 12 inch adjustable wrench to install elbow (AC) and collar (AD) into tee (Z).
28. Holding elbow (AC) with 15 inch adjustable wrench, use 1-1/4 inch wrench to install hose assembly (AE) onto elbow (AC).
29. Install nuts (AF), flat washers (AG), and preformed packings (AH) on three elbows (AJ).
30. Manually install and position three elbow assemblies (AJ) on vehicle.
31. Using 12 inch adjustable wrench to hold three elbow assemblies (AJ), use 1-1/4 inch wrench to tighten elbow nuts (AF).
32. Using 12 inch adjustable wrench to hold three elbow assemblies (AJ), use 1-1/4 inch wrench to install three hose assemblies (AK, AL, AM) to elbow assemblies (AJ).

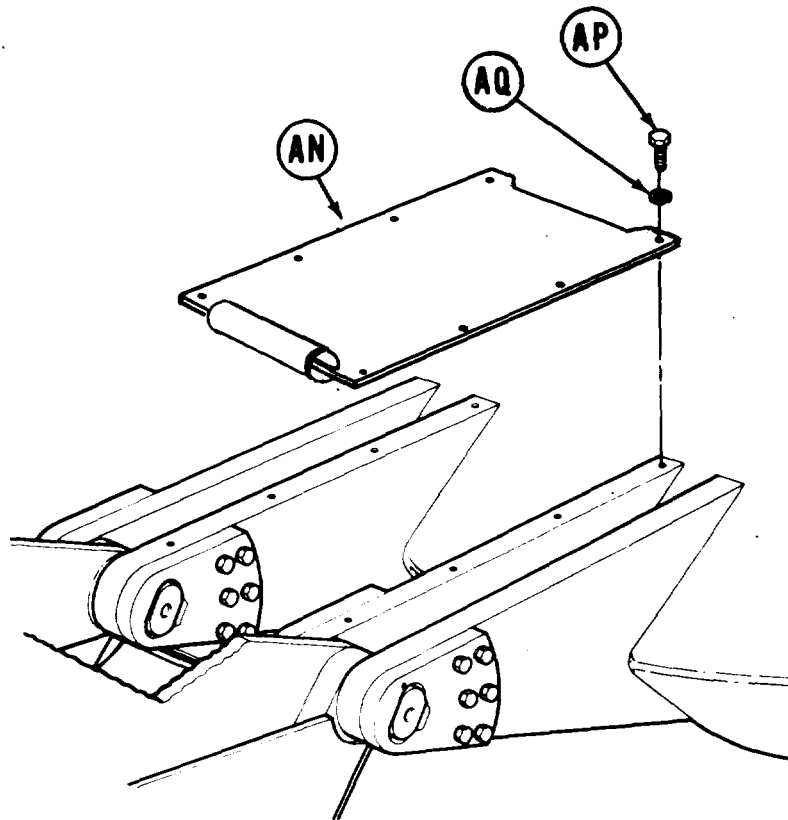


Go on to Sheet 8

TA170351

**OVERHEAD CYLINDER HOSE ASSEMBLIES (CL, CM, CN, AND CO) AND HYDRAULICS
REPLACEMENT (Sheet 8 of 8)**

33. Bleed hydraulic system (page 3-66).
34. Check for hydraulic leaks and correct as necessary.
35. Service hydraulic reservoir as needed (LO 5-5420-226-12).
36. Adjust relief valve pressure (RV3 and RV9) (pages 3-75 and 3-76).
37. Place front hose armor (AN) in position.
38. Using socket, install eight screws (AP) and lockwashers (AQ).
- 39* Install front fixed and moveable hose armor (page 3-128).
40. Install overhead cylinder armor (page 3-218).



End of Task

TA170352

FRONT FIXED AND MOVEABLE HOSE ARMOR REPLACEMENT (Sheet 1 of 2)

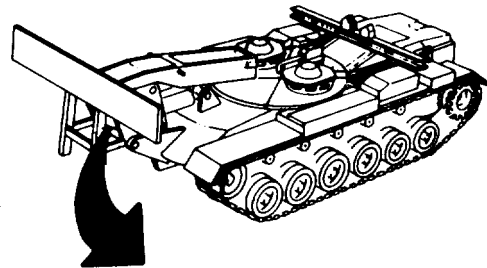
TOOLS: 3/4 in. socket with 1/2 in. drive
 Ratchet with 1/2 in. drive
 Slip joint pliers
 Hammer
 Brass drift

SUPPLIES: Cotter pins (2 required)
 Lockwashers (6 required)

PERSONNEL: Two

REMOVAL:

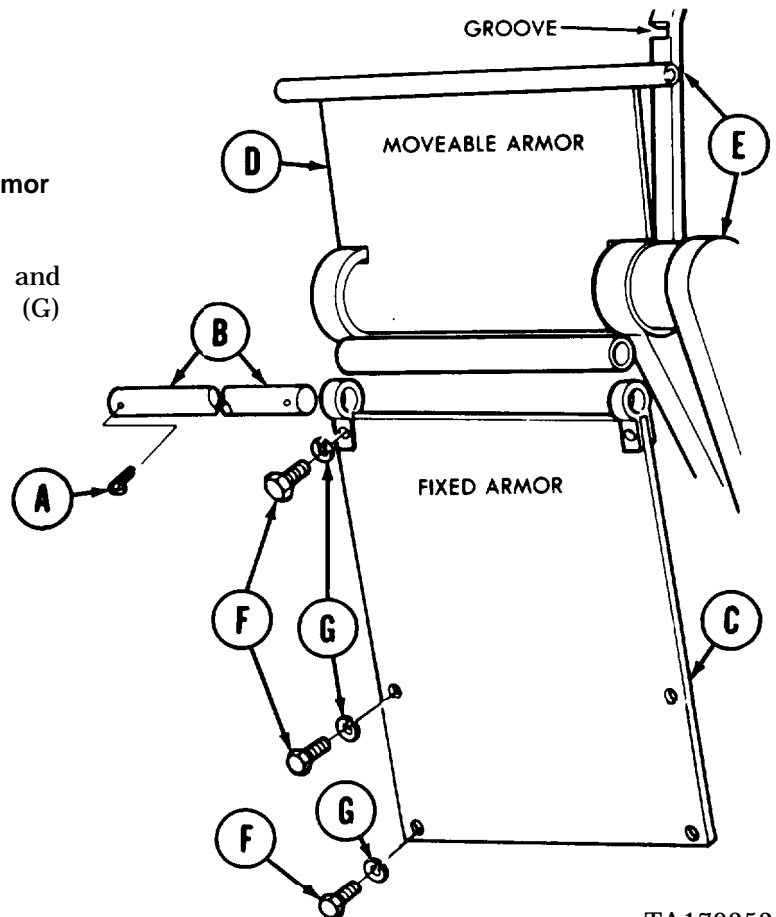
1. Using pliers, remove two cotter pins (A). Throw cotter pins away.
2. Using hammer and brass drift, drive pin (B) from fixed armor (C) and moveable armor (D).
3. Remove moveable armor (D) by sliding it upward until bar comes out of groove of boom and outrigger assembly (E).



NOTE

Have second technician hold fixed armor (C) while performing step 4.

4. Using socket, remove six screws (F) and lockwashers (G). Throw lockwasher (G) away.
5. Remove fixed armor (C).



Go on to Sheet 2

TA170353

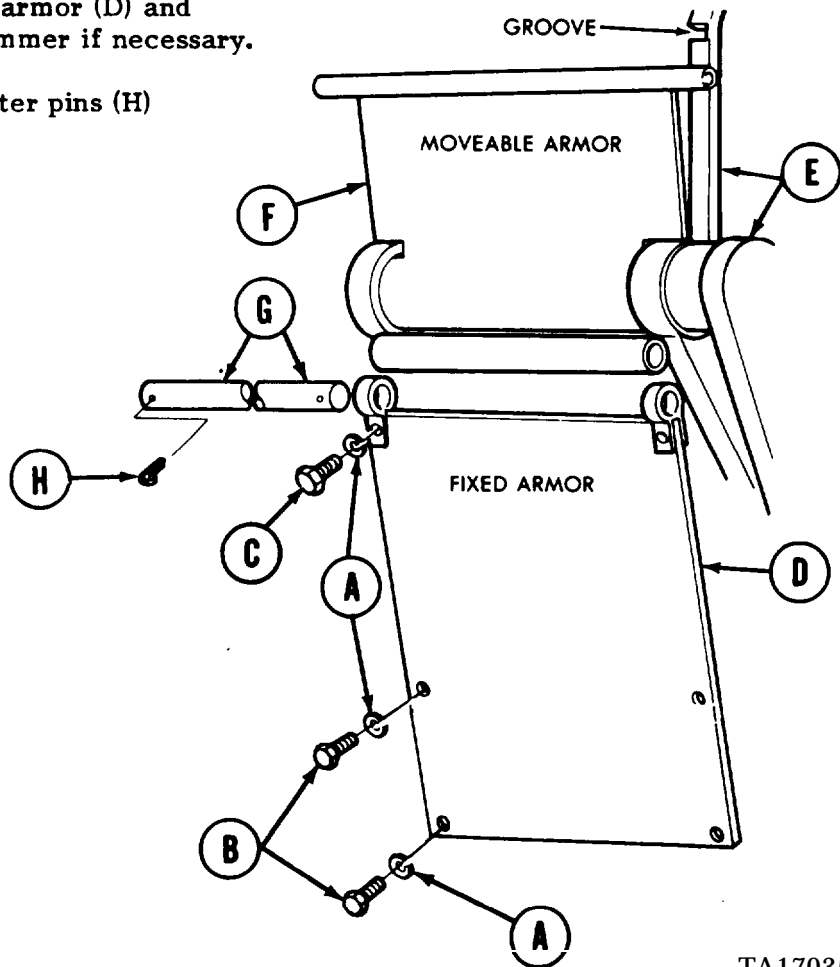
FRONT FIXED AND MOVEABLE HOSE ARMOR REPLACEMENT (Sheet 2 of 2)

INSTALLATION:

NOTE

Have second technician hold armor in alignment during step 3.

1. Place new lockwashers (A) on four screws (B) and two long screws (C).
2. Position fixed armor (D) on boom and outrigger assembly (E) with fastener holes aligned.
3. Manually install four screws (B) and two screws (C).
4. Position moveable armor (F) with bar in grooves of boom and outrigger assembly (E) and slide moveable armor down grooves until aligned with fixed armor (D).
5. Using socket, tighten four screws (B) and two screws (C).
6. Insert pin (G) through fixed armor (D) and movable armor (F). Use hammer if necessary.
7. Using pliers, install two cotter pins (H) through holes in pin (G).



End of Task

TA170354

TONGUE CYLINDER HOSE ASSEMBLIES REPLACEMENT (CH, CK1, AND CK2) (Sheet 1 of 4)
PROCEDURE INDEX

| PROCEDURE | PAGE |
|--------------|-------|
| Removal | 3-129 |
| Installation | 3-131 |

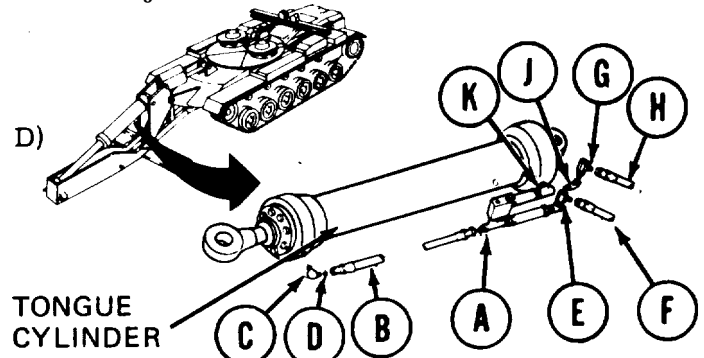
TOOLS: 1-1/8 in. open end wrench
 9/16 in. socket with 1/2 in. drive
 10 in. extension with 1/2 in. drive
 1-1/4 in. open end wrench (2)
 12 in. adjustable wrench (2)
 3/4 in. socket with 1/2 in. drive
 Ratchet with 1/2 in. drive
 15 in. adjustable wrench

SUPPLIES: Pipe tape (Item 19, Appendix D)
 Drip pans
 Rags (Item 12, Appendix D)
 Masking tape (Item 18, Appendix D)
 Pencil
 Caps and plugs (assorted sizes)
 Preformed packings (2)
 Lockwashers (10 required)

REFERENCE: LO 5-5420-226-12

PRELIMINARY PROCEDURES: Remove tongue cylinder armor (page 3-226)
 Relieve hydraulic pressure (page 3-65)

REMOVAL:



NOTE

Use rags and drip pans to catch excess hydraulic fluid. Use masking tape to tag lines for installation. Cap all lines and fittings as disconnected.

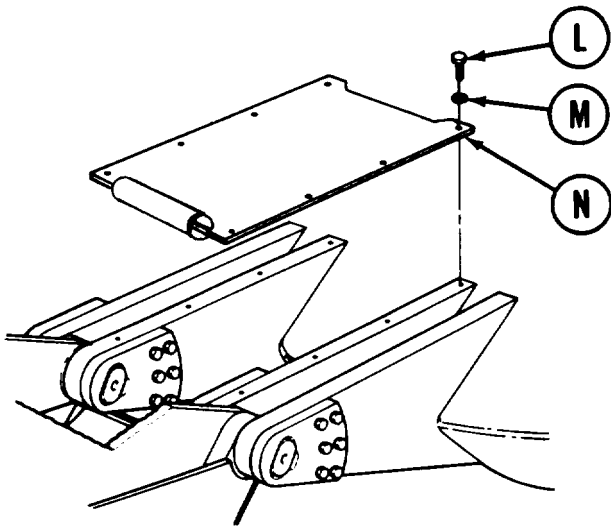
1. Holding adapter (A) with 1-1/8 inch wrench, use 1-1/4 inch wrench to disconnect hose assembly "CH" (B) from adapter (A).
2. Holding elbow (C) with 12 inch adjustable wrench, use 1-1/4 inch wrench to remove hose assembly "CH" (B) and collar "CH" (D) from elbow (C).
3. Using 12 inch adjustable wrench, remove elbow (C) from tongue cylinder.
4. Holding elbow (E) with 15 inch adjustable wrench, use 1-1/4 inch wrench to remove hose assembly "CK2" (F) from elbow (E).
5. Holding elbow (G) with 15 inch adjustable wrench, use 1-1/4 inch wrench to remove hose assembly "CK1" (H) from elbow (G).
6. Holding elbow (J) with 12 inch adjustable wrench, use 15 inch adjustable wrench to remove elbow (G) from elbow (J).
7. Using 12 inch adjustable wrench, remove elbow (J) from tee (K).

Go on to Sheet 2

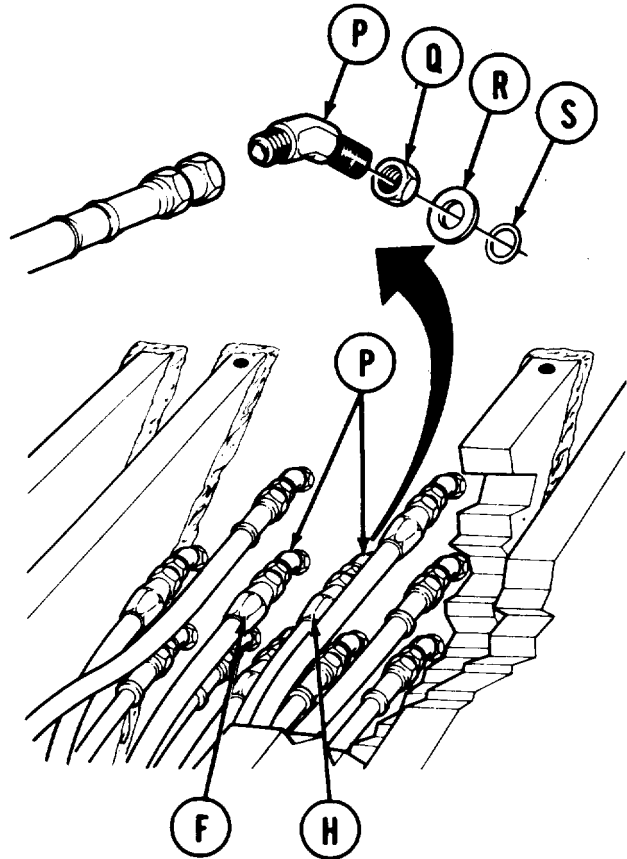
TA170355

TONGUE CYLINDER HOSE ASSEMBLIES REPLACEMENT (CH, CK1, AND CK2) (Sheet 2 of 4)

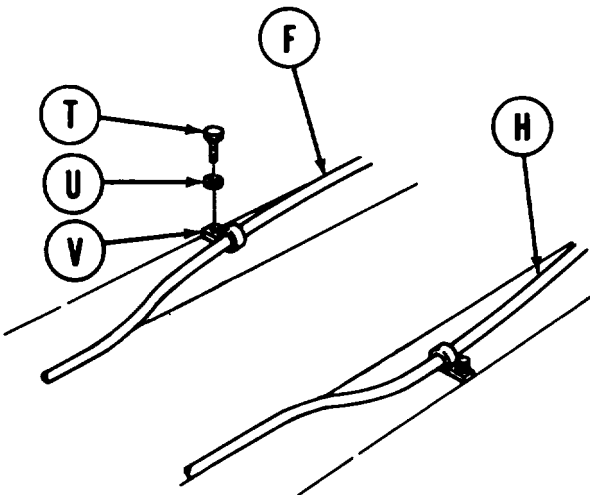
8. Using 9/16 inch socket, remove eight screws (L) and lockwashers (M). Throw lockwashers (M) away.



9. Manually remove boom mount hose armor (N) from vehicle.



10. Holding two elbows (P) with 12 inch adjustable wrench, use 1-1/4 inch wrench to disconnect hose assemblies "CK1" (H) and "CK2" (F) from elbows (P).



11. Using 12 inch adjustable wrench to hold two elbows (P), use 1-1/4 inch wrench to loosen elbow nut (Q).
12. Manually remove two elbow nuts (Q), flat washers (R) and packings (S) from elbows (P). Throw packings (S) away.
13. Using 3/4 inch socket and extension, remove two screws (T) and lockwashers (U). Throw lockwashers (U) away.
14. Manually remove two clamps (V).
15. Remove two hose assemblies (F) and (H) from vehicle.

Go on to Sheet 3

TA170356

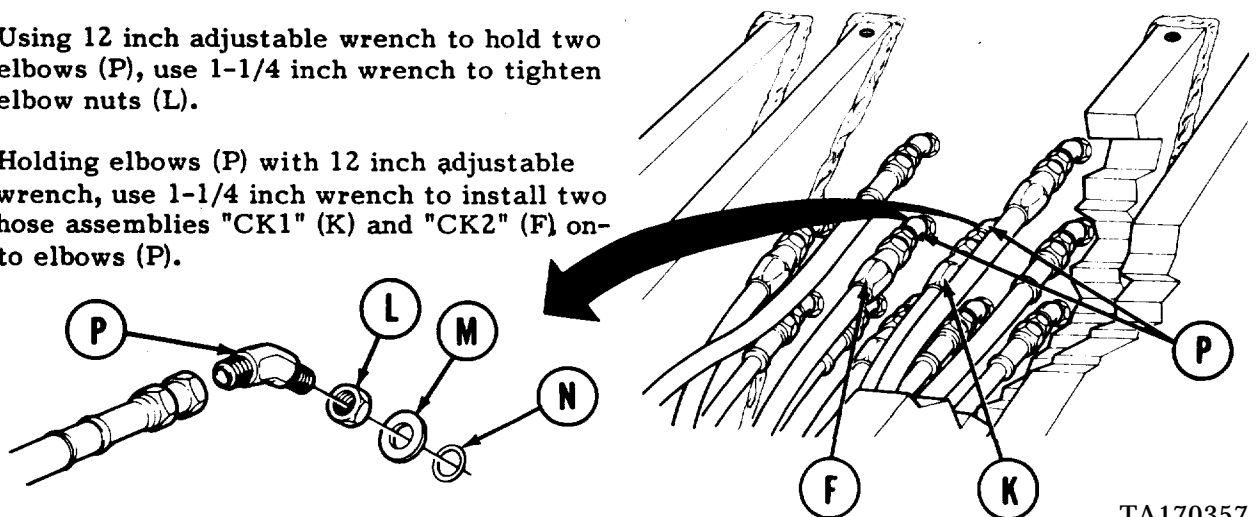
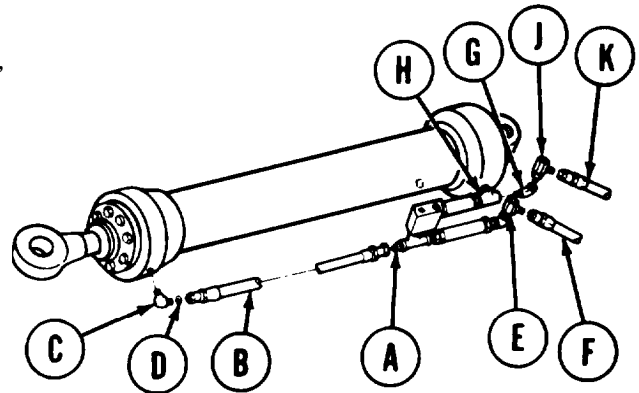
TONGUE CYLINDER HOSE ASSEMBLIES REPLACEMENT (CH, CK1, AND CK2) (Sheet 3 of 4)

INSTALLATION:

NOTE

Remove all caps and plugs as necessary during installation. Before installation, use pipe tape on all male threads. Start tape on second thread so tape will not enter hydraulic system.

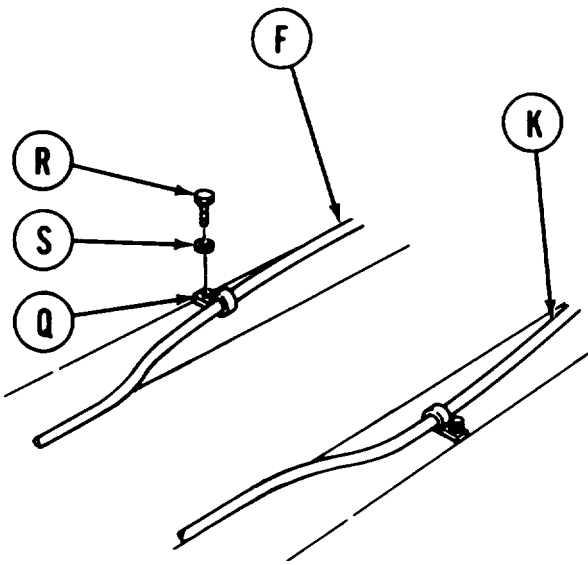
1. Holding adapter (A) with 1-1/8 inch wrench, use 1-1/4 inch wrench to install hose assembly "CH" (B) on adapter (A).
2. Using 12 inch adjustable wrench, install elbow (C).
3. Holding elbow (C) with 12 inch adjustable wrench, use 1-1/4 inch wrench to install hose assembly "CH" (B) and collar (D) to elbow (C).
4. Holding elbow (E) with 15 inch adjustable wrench, use 1-1/4 inch wrench to install hose assembly "CK2" (F) to elbow (E).
5. Using 12 inch adjustable wrench, install elbow (G) in tee (H).
6. Holding elbow (G) with 12 inch adjustable wrench, use 15 inch adjustable wrench to install elbow (J) into elbow (G).
7. Holding elbow (J) with 15 inch adjustable wrench, use 1-1/4 inch wrench to install hose assembly "CK1" (K) on elbow (J).
8. Position nuts (L), flat washers (M) and packings (N) on elbows (P).
9. Manually install two elbow assemblies (P).
10. Using 12 inch adjustable wrench to hold two elbows (P), use 1-1/4 inch wrench to tighten elbow nuts (L).
11. Holding elbows (P) with 12 inch adjustable wrench, use 1-1/4 inch wrench to install two hose assemblies "CK1" (K) and "CK2" (F) onto elbows (P).



Go on to Sheet 4

TA170357

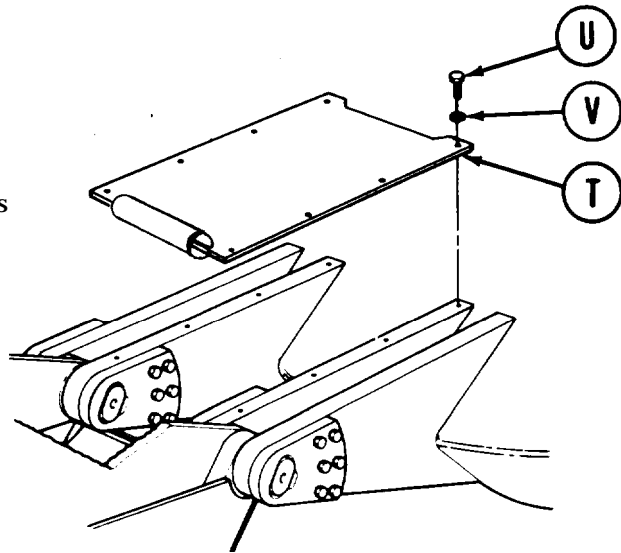
TONGUE CYLINDER HOSE ASSEMBLIES REPLACEMENT (CH, CK1, AND CK2) (Sheet 4 of 4)



12. Position two hose assemblies (F) and (K) as shown.
13. Place two clamps (Q) in position.
14. Using 3/4 inch socket with extension, install two screws (R) and new lockwashers (S).
15. Bleed hydraulic system (page 3-66).
16. Check for hydraulic leaks and correct as necessary.
17. Service hydraulic reservoir. (LO 5-5420-226-12).

18. Place boom mount hose armor (T) in position.
19. Using 9/16 inch socket, install eight screws (U) and new lockwashers (V).
20. Install tongue cylinder armor (page 3-227).

End of Task



SCISSORS CYLINDER HOSE ASSEMBLIES (CF1, CF2, CG, CI, AND CJ) AND HYDRAULICS REPLACEMENT (Sheet 1 of 12)

PROCEDURE INDEX

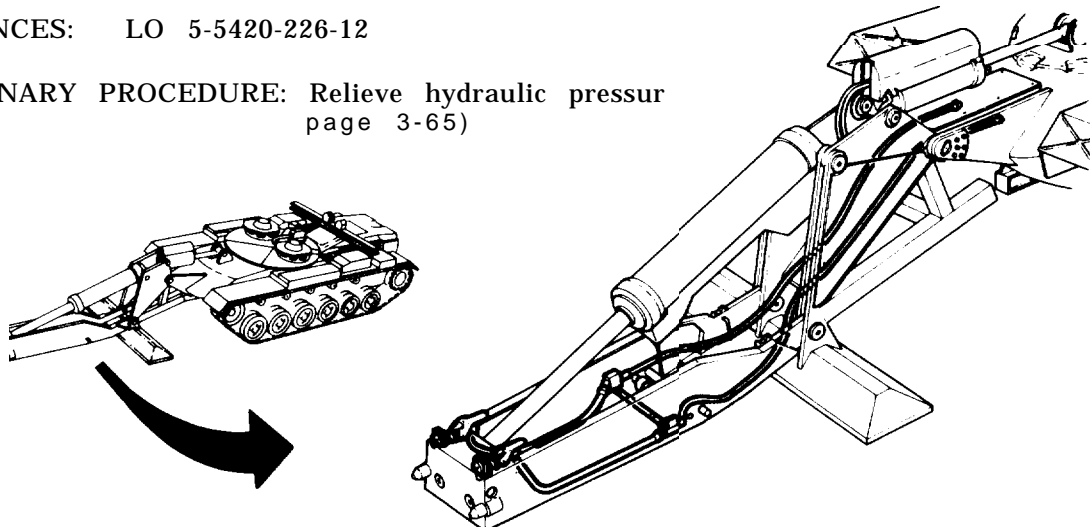
| PROCEDURE | PAGE |
|--------------|-------|
| Removal | 3-133 |
| Installation | 3-139 |

TOOLS: 12 in. adjustable wrench (2) 9/16 in. socket with 1/2 in. drive
 1-1/4 in. open end wrench (2) Hammer
 1/2 in. socket with 1/2 in. drive Pliers, long round nose
 Ratchet with 1/2 in. drive
 3/8 in. socket with 1/2 in. drive
 14 in. pipe wrench
 Vise
 1-5/16 in. open end wrench
 1-1/8 in. open end wrench
 1-3/8 in. open end wrench
 15 in. adjustable wrench

SUPPLIES: Pipe tape (Item 19, Appendix D) Lockwashers (2 required)
 Masking tape (Item 18, Appendix D) Preformed packings (2 required)
 Pencil
 Rags (Item 12, Appendix D)
 Drip pans
 Caps and plugs (various sizes)

REFERENCES: LO 5-5420-226-12

PRELIMINARY PROCEDURE: Relieve hydraulic pressure (page 3-65)



NOTE

Use rags and drip pans to catch excess hydraulic fluid. Use masking tape to tag lines for installation. Cap all lines and fittings as removed.

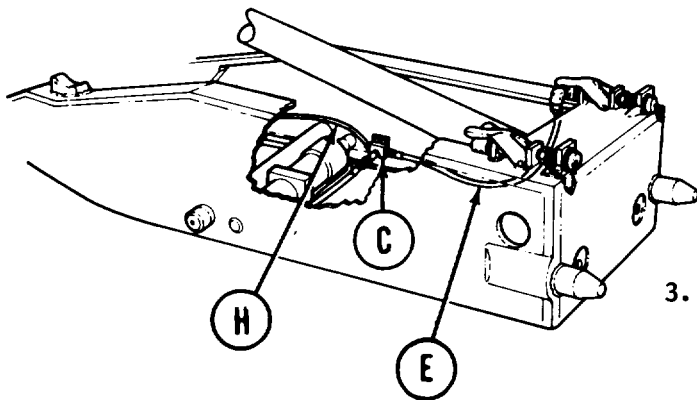
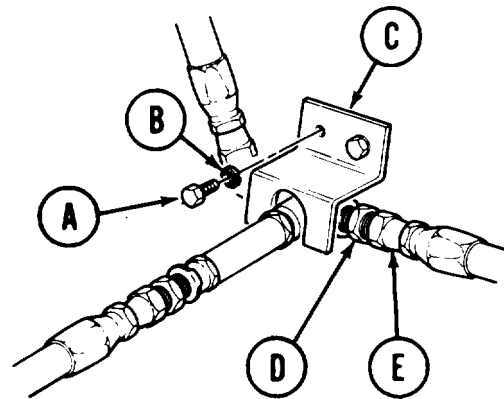
Go on to Sheet 2

TA170359

SCISSORS CYLINDER HOSE ASSEMBLIES (CF1, CF2, CG, CI, AND CJ) AND HYDRAULICS REPLACEMENT (Sheet 2 of 12)

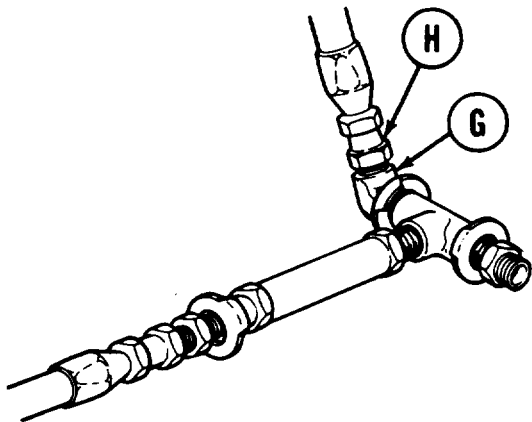
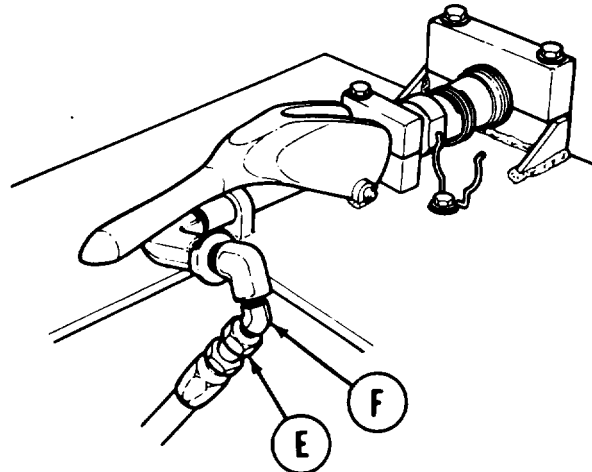
REMOVAL:

1. Using 9/16 inch socket, remove two screws (A) and lockwashers (B).
2. Remove bracket (C).



3. Holding adapter (D) with 1-1/8 inch wrench, use 1-1/4 inch wrench to disconnect hose assembly "CF1" (E) from adapter (D).

4. Holding elbow (F) with 12 inch adjustable wrench, use 1-1/4 inch wrench to remove hose assembly "CF1" (E) from elbow (F).



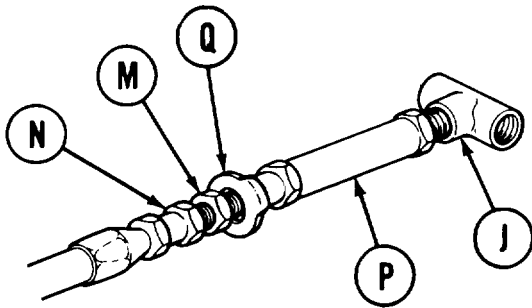
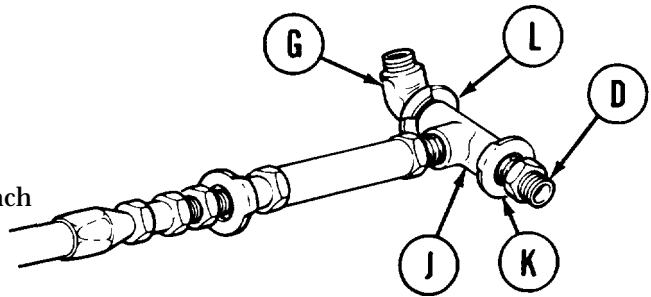
5. Holding elbow (G) with 12 inch adjustable wrench, use 1-1/4 inch wrench to disconnect hose assembly "C1" (H) from elbow (G).

Go on to Sheet 3

TA170360

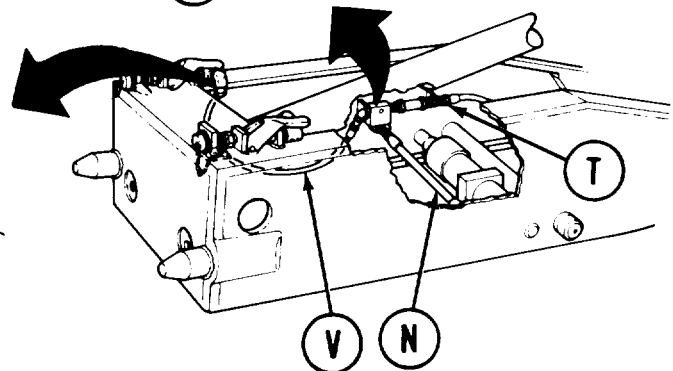
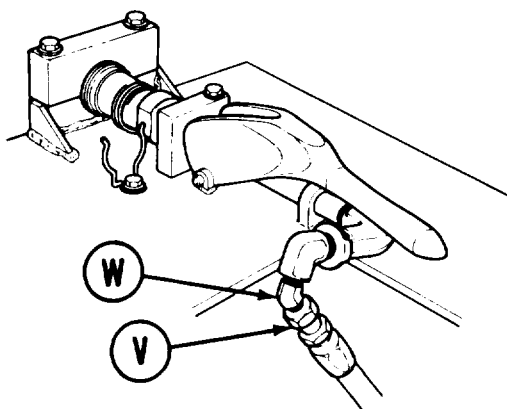
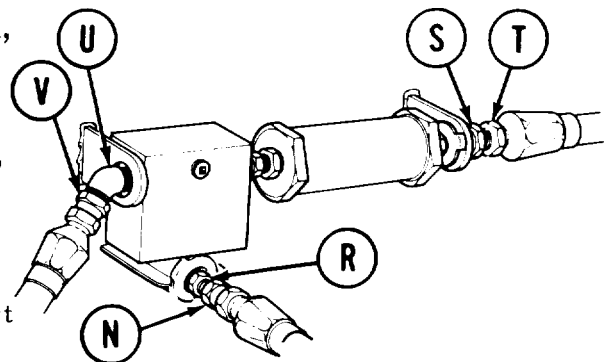
SCISSORS CYLINDER HOSE ASSEMBLIES (CF1, CF2, CG, CI, AND CJ) AND HYDRAULICS REPLACEMENT (Sheet 3 of 12)

6. Holding tee (J) with 12 inch adjustable wrench, use 1-1/8 inch wrench to remove adapter (D) and collar "CF1" (K) from tee (J).
7. Holding tee (J) with 12 inch adjustable wrench, use other 12 inch adjustable wrench to remove elbow (G) and collar "CI" (L).



8. Holding adapter (M) with 1-1/8 inch wrench, use 1-1/4 inch wrench to disconnect hose assembly "CG" (N) from adapter (M).
9. Holding check valve "CV7" (P) with 15 inch adjustable wrench, use 1-1/8 inch wrench to remove adapter (M) and collar "CG" (Q) from check valve (P).

11. Holding adapter (R) with 1-1/8 inch wrench, use 1-1/4 inch wrench to remove hose assembly "CG" (N) from adapter (R).
12. Holding adapter (S) with 1-1/8 inch wrench, use 1-1/4 inch wrench to disconnect hose assembly "CJ" (T) from adapter (S).
13. Holding elbow (U) with 12 inch adjustable wrench, use 1-1/4 inch wrench to disconnect hose assembly "CF2" (V) from elbow (U).



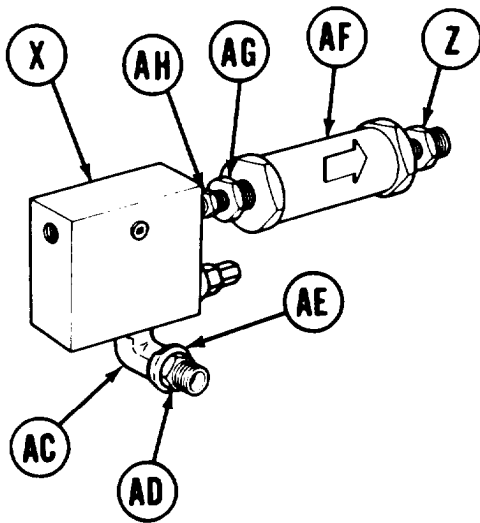
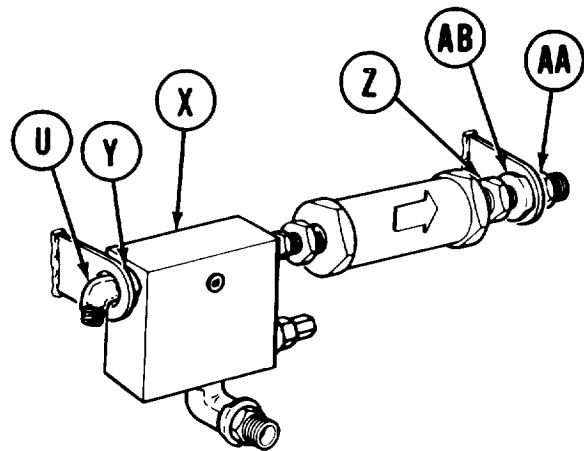
14. Holding elbow (W) with 12 inch adjustable wrench, use 1-1/4 inch wrench to remove hose assembly "CF2" (V) from elbow (W).

Go on to Sheet 4

TA170361

SCISSORS CYLINDER HOSE ASSEMBLIES (CF1, CF2, CG, CI, AND CJ) AND HYDRAULICS REPLACEMENT (Sheet 4 of 12)

15. Holding relief valve "RV8" (X) with 15 inch adjustable wrench, use 12 inch adjustable wrench to remove elbow (U) and collar "CF2" (Y) from relief valve (X).
16. Holding bushing (Z) with 1-3/8 inch wrench, use 1-1/8 inch wrench to remove adapter (AA) and collar "CJ" (AB) from bushing (Z).
17. Remove relief valve "RV8" (X) and attached parts from brackets and place in vise.



18. Holding elbow (AC) with 12 inch adjustable wrench, use 1-1/8 inch wrench to remove adapter (AD) and collar "CG" (AE) from elbow (AC).
19. Using 12 inch adjustable wrench, remove elbow (AC) from relief valve (X).
20. Holding flow regulator "PCV3" (AF) with 15 inch adjustable wrench, use 1-3/8 inch wrench to remove bushing (Z) from flow regulator (AF).
21. Holding bushing (AG) with 1-3/8 inch wrench, use 15 inch adjustable wrench to remove flow regulator "PCV3" (AF) from bushing (AG).
22. Holding nipple (AH) with 1-1/8 inch wrench, use 1-3/8 inch wrench to remove bushing (AG) from nipple (AH).

23. Using 1-1/8 inch wrench, remove nipple (AH) from relief valve (X).
24. Remove relief valve "RV8" (X) from vise.

Go on to Sheet 5

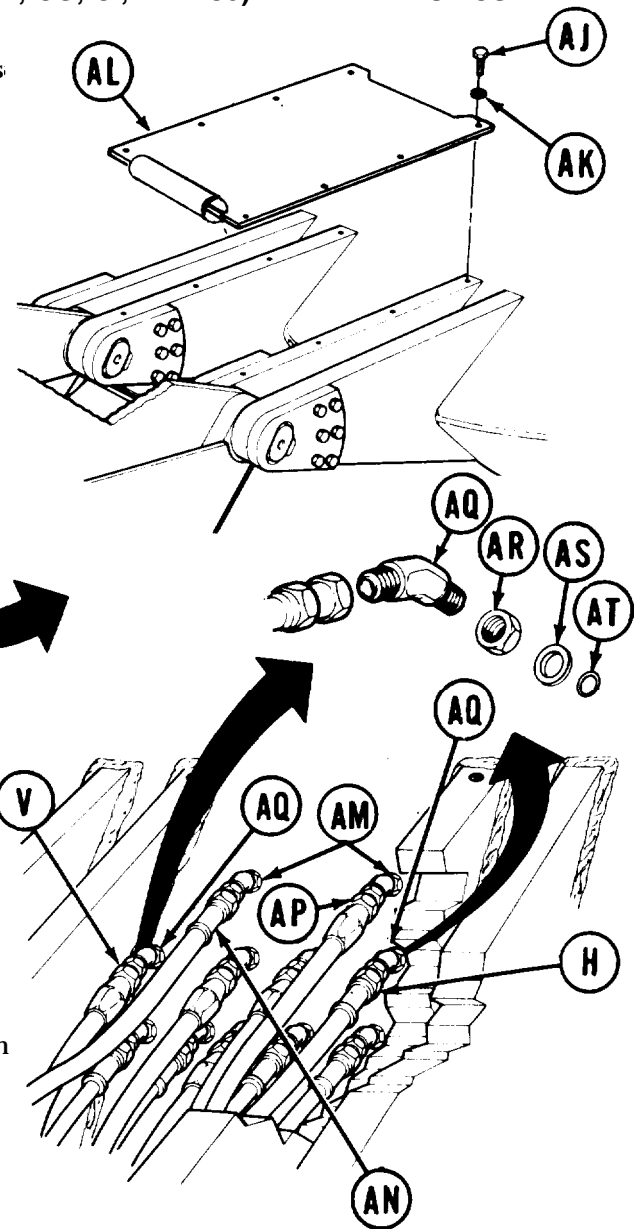
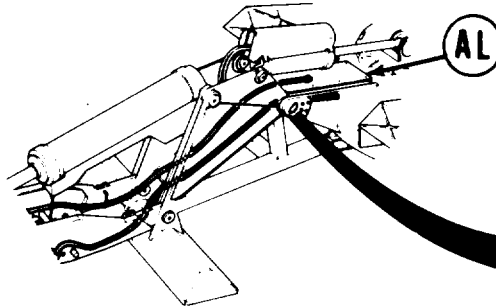
TA170362

SCISSORS CYLINDER HOSE ASSEMBLIES (CF1, CF2, CG, CI, AND CJ) AND HYDRAULICS REPLACEMENT (Sheet 5 of 12)

25. Using 9/16 inch socket, remove eight screws (AJ) and lockwashers (AK). Throw lockwashers (AK) away.
26. Remove boom mount hose armor (AL).

NOTE

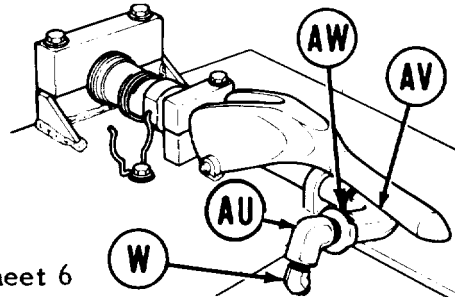
Two upper hose assemblies are removed in step 27, to provide clearance for removal of "CJ" and "CI".



27. Holding two elbows (AM) with 12 inch adjustable wrench, use 1-1/4 inch wrench to remove hose assemblies (AN) and (AP) from two elbows (AM).
28. Holding two elbow assemblies (AQ) with 12 inch adjustable wrench, use 1-1/4 inch wrench to remove hose assemblies "CJ" (V) and "CI" (H) from elbows (AQ).
29. Using 12 inch adjustable wrench on two elbows (AQ), use 1-1/4 inch wrench to loosen elbow nuts (AR).
30. Using 12 inch adjustable wrench, remove elbows (AQ), elbow nuts (AR), flat washers (AS) and preformed packings (AT).

NOTE

Procedure for removal of right side components and left side components is identical. Right side is shown.



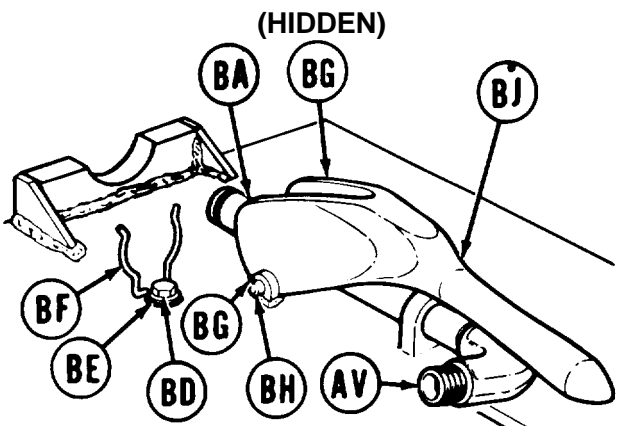
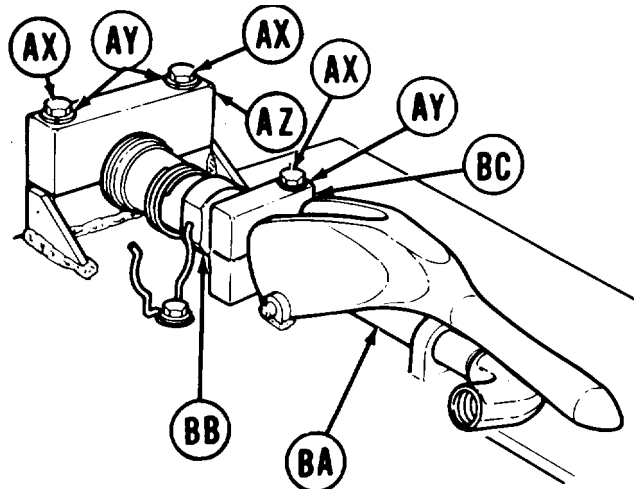
31. Holding elbow (AU) with 12 inch adjustable wrench, use 12 inch adjustable wrench to remove elbow (W) from elbow (AU).
32. Holding elbow (AV) with 12 inch adjustable wrench, use 12 inch adjustable wrench to remove elbow (AU) and collar "CF2" (AW) from elbow (AV).

Go on to Sheet 6

TA170363

SCISSORS CYLINDER HOSE ASSEMBLIES (CF1, CF2, CG, CI, AND CJ) AND HYDRAULICS REPLACEMENT (Sheet 6 of 12)

33. Using 1/2 inch socket, remove three screws (AX) and lockwashers (AY) from clamp (AZ).
34. Remove clamp (AZ) from vehicle.
35. Holding nipple (BA) with pipe wrench, use 1-5/16 inch wrench to remove quick disconnect socket (BB).
36. Remove clamp (BC) from nipple (BA).



37. Manually remove nipple (BA) with elbow (AV) from vehicle.
38. Holding nipple (BA) with pipe wrench, use 12 inch adjustable wrench to remove elbow (AV).
39. Using 3/8 inch socket, remove screw (BD) and lockwasher (BE). Throw lockwasher (BE) away.

40. Manually remove spring retainer (BF) from vehicle.
41. Using long round nose pliers, remove two cotter pins (BG) from pins (BH).
42. Using hammer, tap out pin (BH) while holding handle (BJ).
43. Manually remove handle (BJ) from vehicle.
44. Repeat steps 31 through 43 for left side.

SCISSORS CYLINDER HOSE ASSEMBLIES (CF1, CF2, CG, CI, AND CJ) AND HYDRAULICS REPLACEMENT (Sheet 7 of 12)

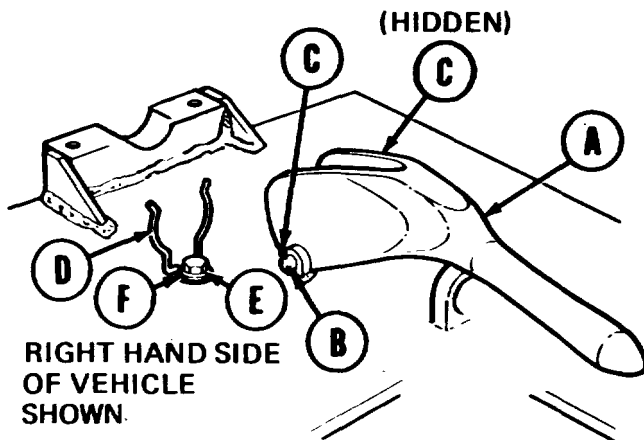
INSTALLATION:

NOTE

Remove all caps and plugs as necessary during installation. Before installation, use pipe tape on all male threads. Start tape on second thread so tape will not enter hydraulic system.

NOTE

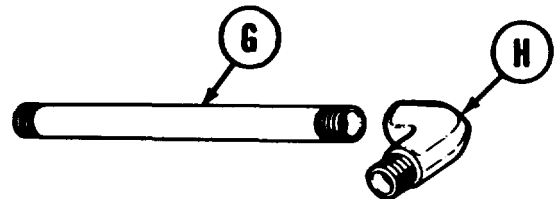
Procedure for installation of right side components and left side components is identical. Right side shown.



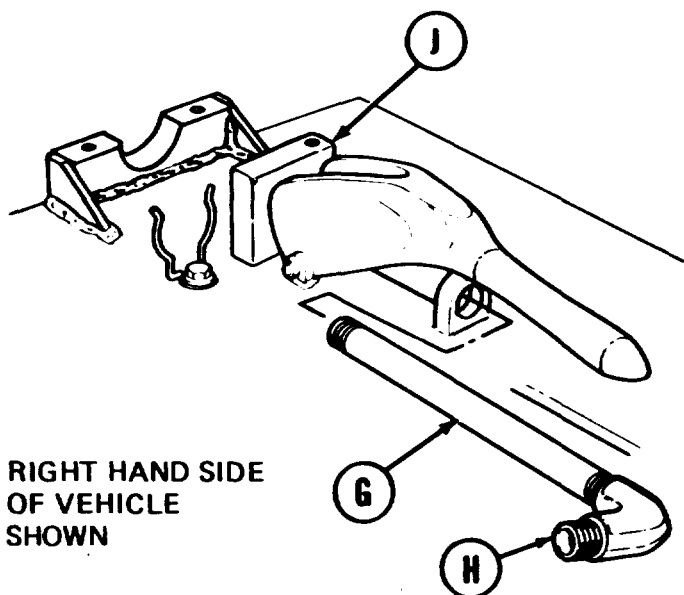
1. Place handle (A) in position.
2. using hammer, tap pin (B) into position.
3. Using long round nose pliers, install two cotter pins (C) to secure pin (B).
4. Place spring retainer (D) into position.

5. Using 3/8 inch socket, install screw (E) and lockwasher (F) securing spring retainer (D).

6. Holding nipple (G) with pipe wrench, use 12 inch adjustable wrench to install elbow (H).



7. Manually install nipple (G) with elbow (H) in position.
8. Manually install clamp (J) in position on nipple (G).

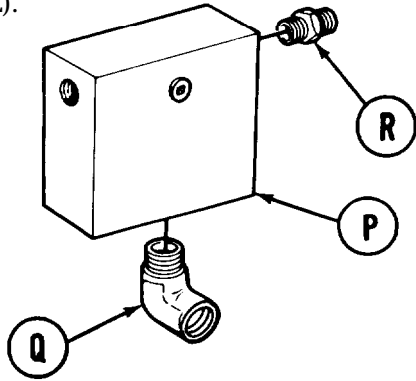
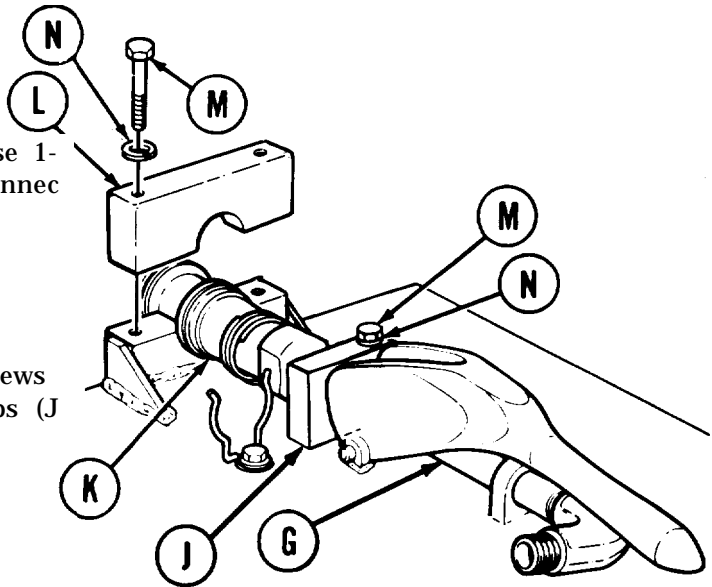


Go on to Sheet 8

TA170365

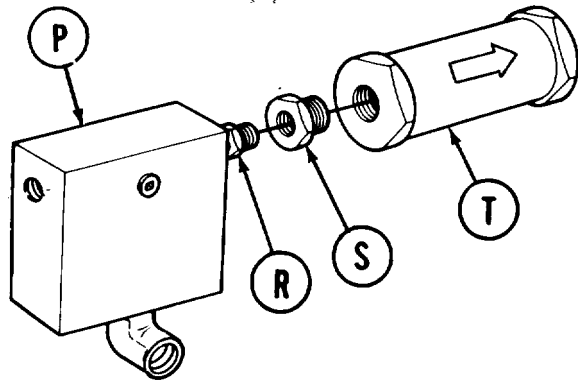
SCISSORS CYLINDER HOSE ASSEMBLIES (CF1, CF2, CG, CI, AND CJ) AND HYDRAULICS REPLACEMENT (Sheet 8 of 12)

9. Holding nipple (G) with pipe wrench, use 1-5/16 inch wrench to install quick disconnect socket (K) to nipple (G).
10. Place clamp (L) in position over quick disconnect socket (K).
11. Using 1/2 inch socket, install three screws (M) and lockwashers (N) securing clamps (J and L).



12. Place relief valve "RV8" (P) in vise.
13. Using 12 inch adjustable wrench, install elbow (Q) into relief valve (P).
14. Using 1-1/8 inch wrench, install nipple (R) into relief valve (P).

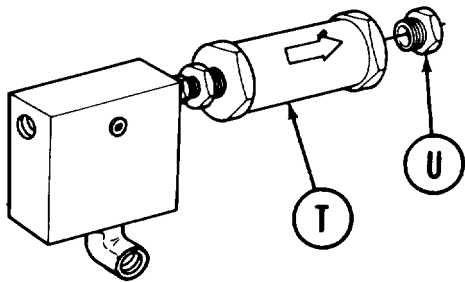
15. Holding nipple (R) with 1-1/8 inch wrench, use 1-3/8 inch wrench to install bushing (S) onto nipple (R).



NOTE

Install regulator "PCV3" (T) with flow arrow pointing away from relief valve (P).

16. Holding bushing (S) with 1-3/8 inch wrench, use 15 inch adjustable wrench to install regulator "PCV3" (T) onto bushing (S).



17. Holding regulator "PCV3" (T) with 15 inch adjustable wrench, use 1-3/8 inch wrench to install bushing (U) into regulator (T).

Go on to Sheet 9

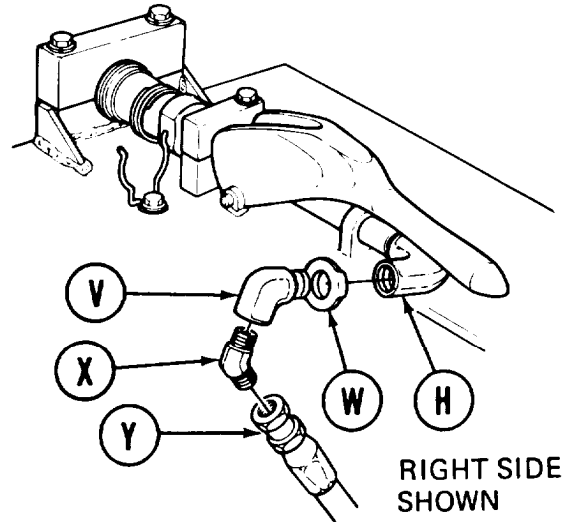
TA170366

SCISSORS CYLINDER HOSE ASSEMBLIES (CF1, CF2, CG, CI, AND CJ) AND HYDRAULICS REPLACEMENT (Sheet 9 of 12)

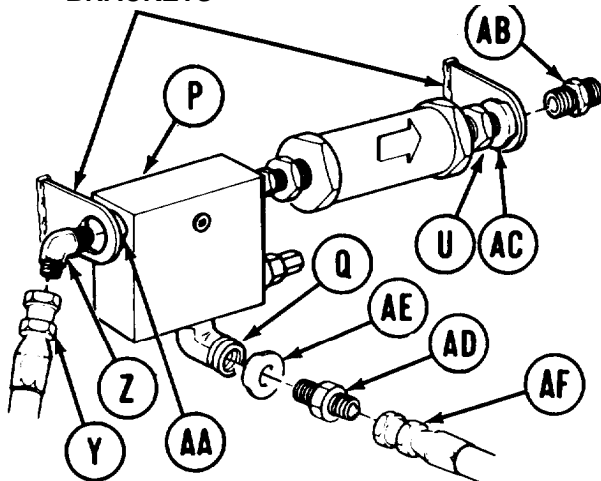
NOTE

Collar marked "CF1" goes on left side. Collar marked "CF2" goes on right side.

18. Holding elbow (H) with 12 inch adjustable wrench, use 12 inch adjustable wrench to install elbow (V) and collar "CF2" (W).
19. Holding elbow (V) with 12 inch adjustable wrench, use 12 inch adjustable wrench to install elbow (X).
20. Repeat steps 1 through 19 for left side.
21. Holding elbow (X) with 12 inch adjustable wrench, use 1-1/4 inch wrench to install hose assemblies "CF2" (Y) on elbow (X).



MOUNTING BRACKETS



22. Manually position relief valve "RV8" (P) and attached parts between mounting brackets.
23. Manually install elbow (Z), collar "CF2" (AA), adapter (AB), and collar "CJ" (AC).
24. Holding relief valve "RV8" (P) with 15 inch adjustable wrench, use 12 inch adjustable wrench to tighten elbow (Z).

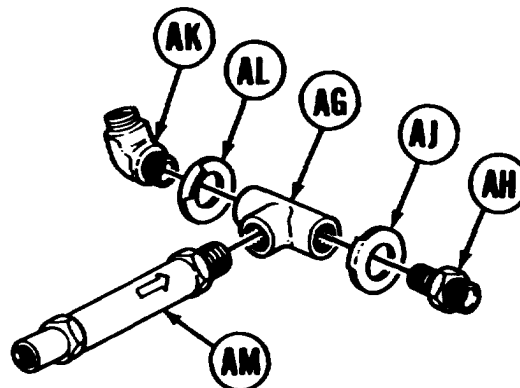
25. Holding bushing (U) with 1-3/8 inch wrench, use 1-1/8 inch wrench to tighten adapter (AB).
26. Holding elbow (Z) with 12 inch adjustable wrench, use 1-1/4 inch wrench to install hose assembly "CF2" (Y) on elbow (Z).
27. Holding elbow (Q) with 12 inch adjustable wrench, use 1-1/8 inch wrench to install adapter (AD) and collar "CG" (AE) onto elbow (Q).
28. Holding adapter (AD) with 1-1/8 inch wrench, use 1-1/4 inch wrench to install hose assembly "CG" (AF) on adapter (AD).

Go on to Sheet 10

TA170367

SCISSORS **CYLINDER** HOSE ASSEMBLIES (CF1, CF2, CG, CI, AND CJ) AND HYDRAULICS REPLACEMENT (Sheet 10 of 12)

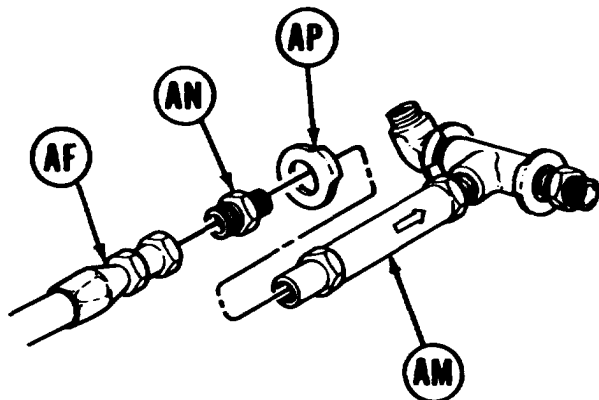
29. Holding tee (AG) with 12 inch adjustable wrench, use 1-1/8 inch wrench to install adapter (AH) and collar "CF1" (AJ) onto tee (AG).
30. Holding tee (AG) with 12 inch adjustable wrench use 12 inch adjustable wrench to install elbow (AK) and collar "CI" (AL) onto tee (AG).



NOTE

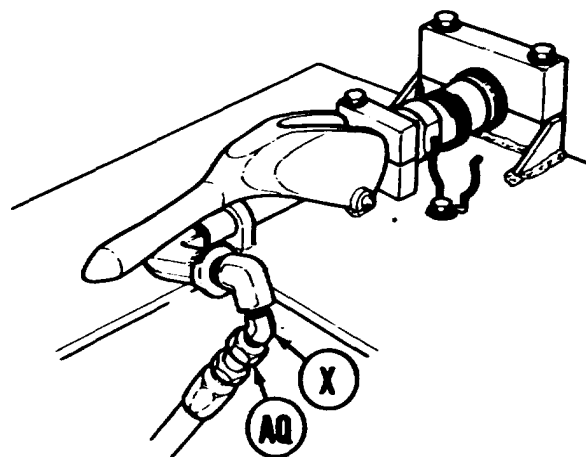
Install check valve "CV7" (AM) so that flow arrow points toward tee (AG).

31. Holding tee (AG) with 12 inch adjustable wrench, use 15 inch adjustable wrench to install check valve "CV7" (AM) into tee (AG).



32. Holding check valve "CV7" (AM) with 15 inch adjustable wrench, use 1-1/8 inch wrench to install adapter (AN) and collar "CG" (AP) into check valve (AM).

33. Holding adapter (AN) with 1-1/8 inch wrench, use 1-1/4 inch wrench to install hose assembly "CG" (AF) onto adapter (AN).



LEFT SIDE SHOWN

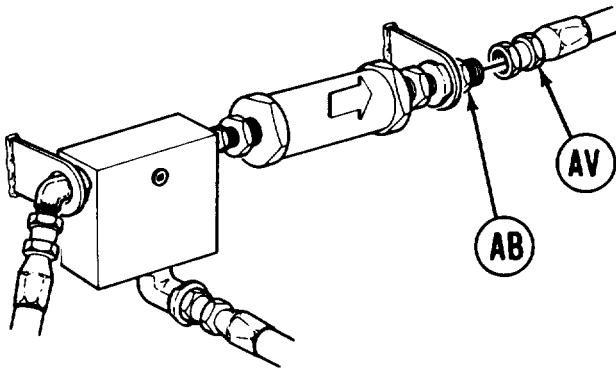
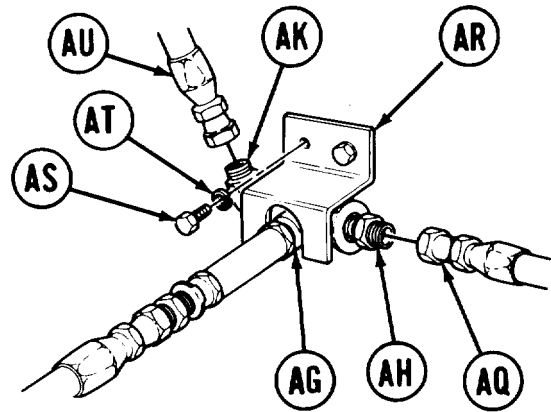
34. Holding elbow (X) with 12 inch adjustable wrench, use 1-1/4 inch wrench to install hose assembly "CF1" (AQ) on elbow (X).

Go onto Sheet 11

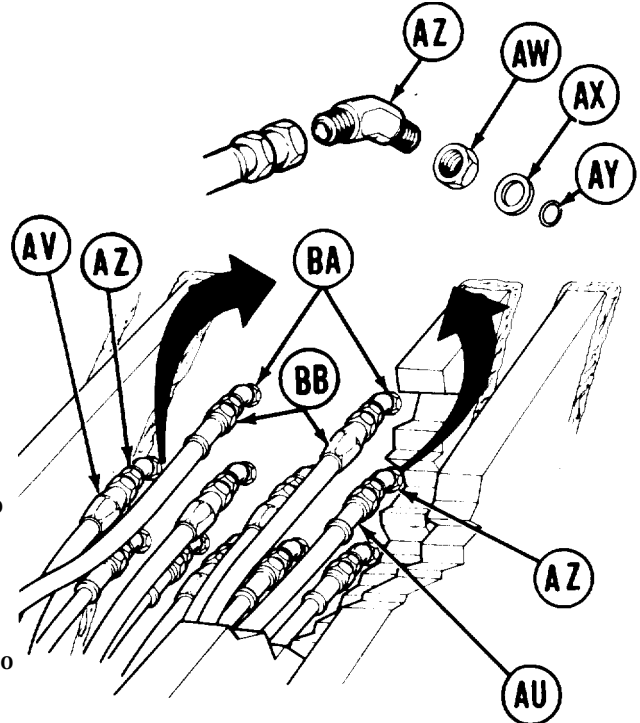
TA170368

SCISSORS CYLINDER HOSE ASSEMBLIES (CF1, CF2, CG, CI, AND CJ) AND HYDRAULICS REPLACEMENT (Sheet 11 of 12)

35. Holding adapter (AH) with 1-1/8 inch wrench, use 1-1/4 inch wrench to install hose assembly "CF1" (AQ).
36. Manually position tee (AG).
37. Place bracket (AR) over tee (AG).
38. Using 1/2 inch socket, install two screws (AS) and lockwashers (AT).
39. Holding elbow (AK) with 12 inch adjustable wrench, use 1-1/4 inch wrench to install hose assembly "CI" (AU).



40. Holding adapter (AB) with 1-1/8 inch wrench, use 1-1/4 inch wrench to install hose assembly "CJ" (AV).



41. Manually install nuts (AW), flat washers (AX), and packing (AY) on elbows (AZ).
42. Manually install and position two elbows (AZ) on vehicle.
43. Using 12 inch adjustable wrench to hold two elbows (AZ), use 1-1/4 inch wrench to tighten elbow nuts (AW).
44. Holding two elbows (AZ) with 12 inch adjustable wrench, use 1-1/4 inch wrench to install two hose assemblies "CI" (AU) and "CJ" (AV).

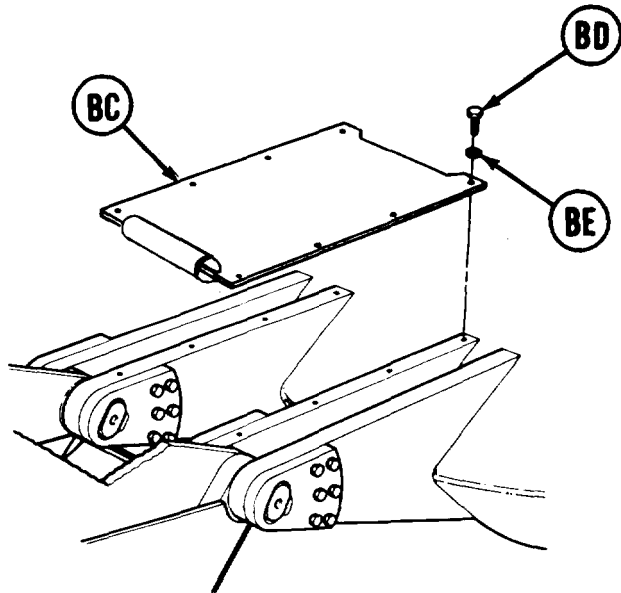
45. Holding two elbows (BA) with 12 inch adjustable wrench, use 1-1/4 inch wrench to install two hose assemblies (BB).

Go on to Sheet 12

TA170369

SCISSORS CYLINDER HOSE ASSEMBLIES (CF1, CF2, CG, CI, AND CJ) AND HYDRAULICS REPLACEMENT (Sheet 12 of 12)

46. Bleed hydraulic system (page 3-66).
47. Check for hydraulic leaks and correct as necessary.



48. Service hydraulic reservoir (LO 5-5420-226-12).
49. Manually place boom mount hose armor (BC) in position.
50. Using 9/16 inch socket, install eight screws (BD) and lockwashers (BE).

End of Task

LOCKING CYLINDER HOSE ASSEMBLIES (CE1, CE2, AND M) AND HYDRAULICS REPLACEMENT
(Sheet 1 of 4)

PROCEDURE INDEX

| PROCEDURE | PAGE |
|--------------|-------|
| Removal | 3-145 |
| Installation | 3-147 |

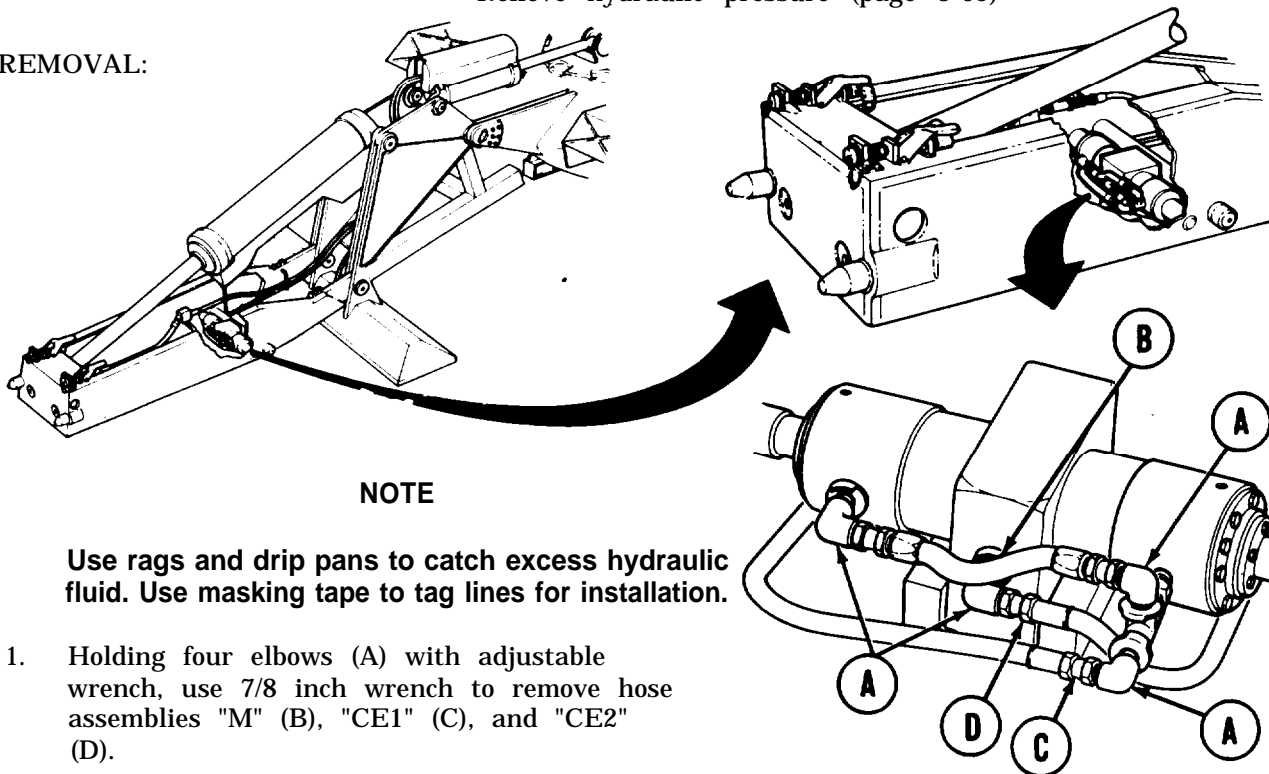
TOOLS: 7/8 in. open end wrench
3/4 in. open end wrench
12 in. adjustable wrench (2)

SUPPLIES: Rags (Item 12, Appendix D)
Drip pans
Pipe tape (Item 19, Appendix D)
Masking tape (Item 18, Appendix D)
Pencil
Preformed packing (2)

REFERENCE: LO 5-5420-226-12

PRELIMINARY PROCEDURES: Remove boom mount hose armor (page 3-116)
Remove front fixed and moveable hose armor (page 3-127)
Relieve hydraulic pressure (page 3-65)

REMOVAL:



NOTE

Use rags and drip pans to catch excess hydraulic fluid. Use masking tape to tag lines for installation.

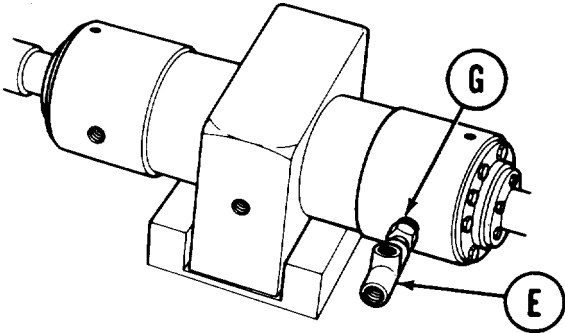
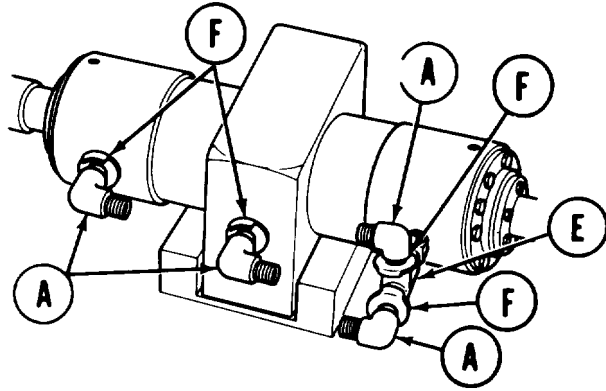
1. Holding four elbows (A) with adjustable wrench, use 7/8 inch wrench to remove hose assemblies "M" (B), "CE1" (C), and "CE2" (D).

Go on to Sheet 2

TA17037

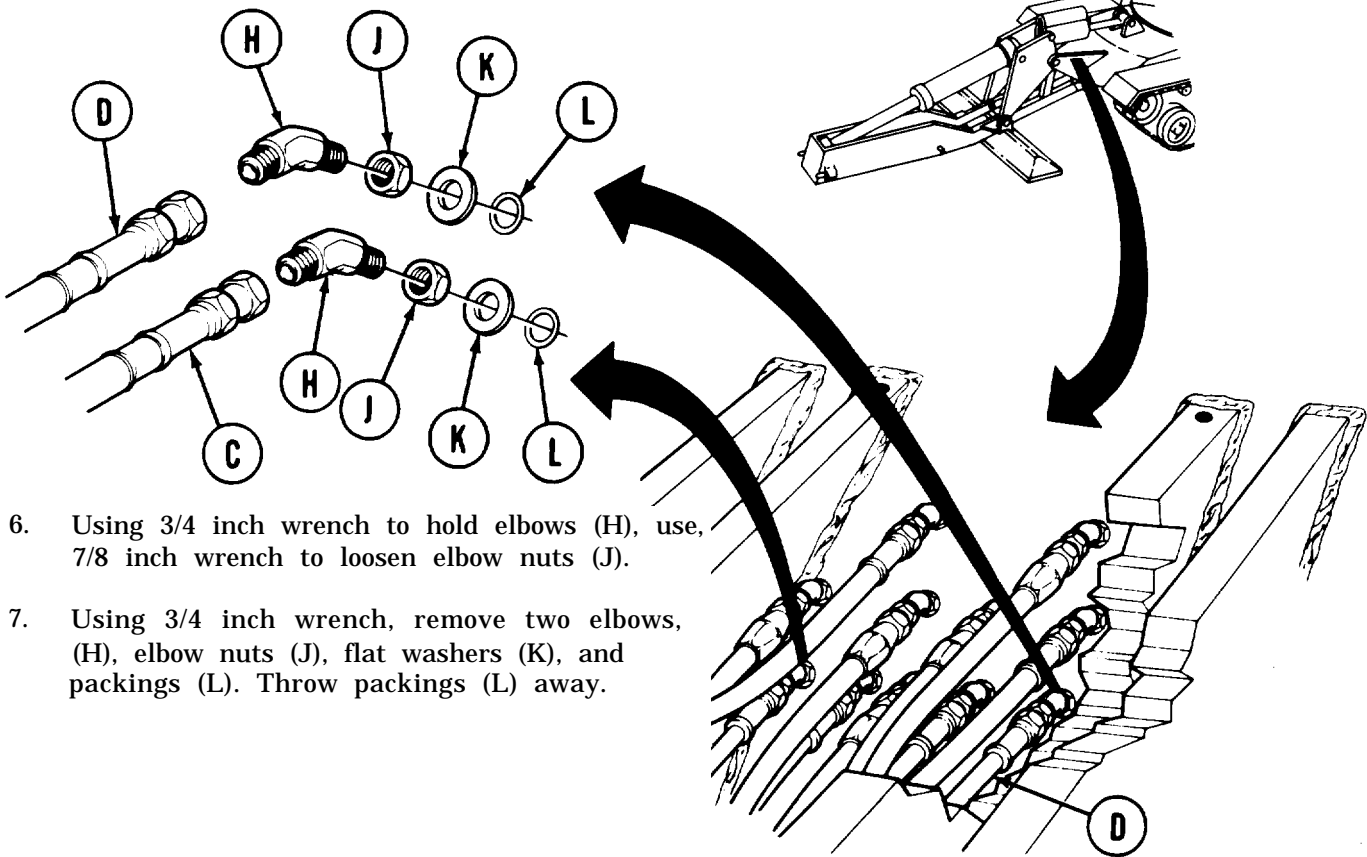
LOCKING CYLINDER HOSE ASSEMBLIES (CE1, CE2, AND M) AND HYDRAULICS REPLACEMENT
(Sheet 2 of 4)

2. Holding tee (E) with adjustable wrench, use adjustable wrench to remove four elbows (A) and four collars (F).



3. Holding nipple (G) with 3/4 inch wrench, use adjustable wrench to remove tee (E).
4. Using 3/4 inch wrench, remove nipple (G).

5. Using 3/4 inch wrench to hold two elbows (H), use 7/8 inch wrench to remove hose assemblies "CE1" (C) and "CE2" (D).



6. Using 3/4 inch wrench to hold elbows (H), use 7/8 inch wrench to loosen elbow nuts (J).
7. Using 3/4 inch wrench, remove two elbows, (H), elbow nuts (J), flat washers (K), and packings (L). Throw packings (L) away.

Go on to Sheet 3.

TA170372

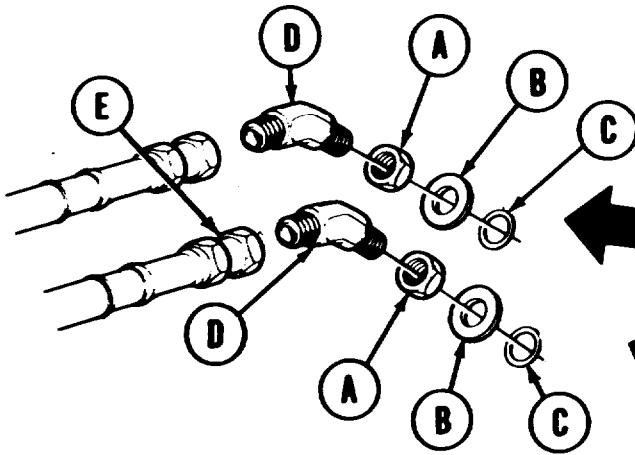
LOCKING CYLINDER HOSE ASSEMBLIES (CE1, CE2, AND M) AND HYDRAULICS REPLACEMENT
(Sheet 3 of 4)

INSTALLATION:

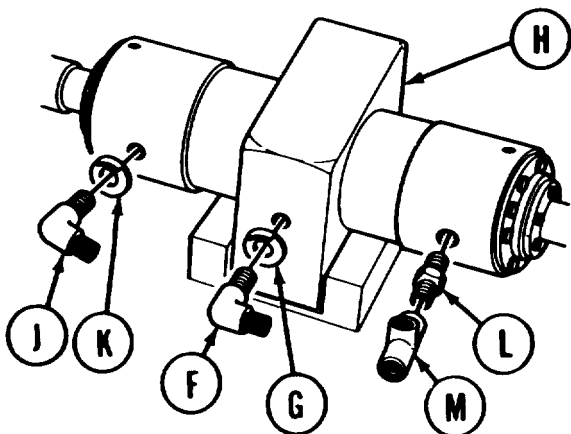
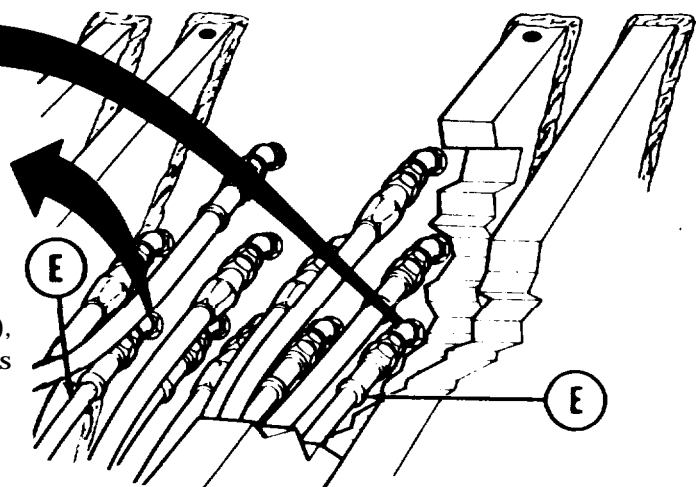
NOTE

Before installation, use pipe tape on all male threads. Start tape on second tread so tape will not enter hydraulic system.

1. Manually install nuts (A), flat washers (B), and new packings (C) on elbows (D).
2. Install and aline two elbows (D).



3. Using 3/4 inch wrench to hold elbows (D), use 7/8 inch wrench to tighten elbow nuts (A).
4. Holding elbows (D) with 3/4 inch wrench, use 7/8 inch wrench to install hose assemblies "CE1" and "CE2" (E).



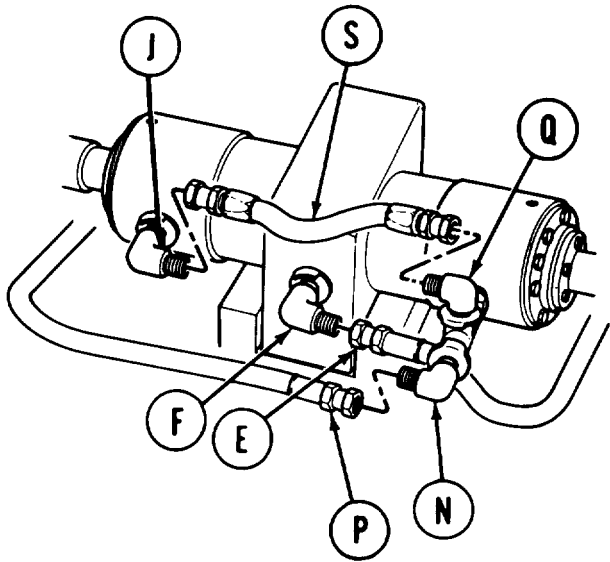
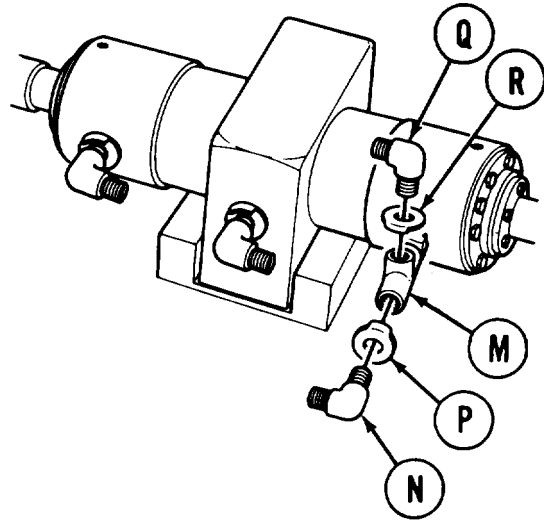
5. Using adjust able wrench, install elbow (F) and collar "CE2" (G) on middle port of locking cylinder (H).
6. Using adjustable wrench, install elbow (J) and collar "M" (K) on right port of locking cylinder (H).
7. Using 3/4 inch wrench, install nipple (L) on left port of locking cylinder (H).
8. Holding nipple (L) with 3/4 inch wrench use adjustable wrench to install tee (M) on nipple (L).

Go on to Sheet 4

TA170373

LOCKING CYLINDER HOSE ASSEMBLIES (CE1, CE2, AND M) AND HYDRAULICS REPLACEMENT
(Sheet 4 of 4)

9. Holding tee (M) with adjustable wrench, use adjustable wrench to install elbow (N) and collar "CE1" (P).
10. Holding tee (M) with adjustable wrench, use adjustable wrench to install elbow (Q) and collar "M" (R).



11. Holding elbow (F) with adjustable wrench, use 7/8 inch wrench to install hose assembly "CE2" (E).
12. Holding elbow (N) with adjustable wrench, use 7/8 inch wrench to install hose assembly "CE1" (P).
13. Holding elbows (Q) and (J) with adjustable wrench, use 7/8 inch wrench to install hose assembly "M" (S).

14. Bleed hydraulic system (page 3-66).
15. Check for hydraulic leaks and correct as necessary.
16. Service hydraulic reservoir (LO 5-5420-226-12).
17. Install front fixed and movable hose armor (page 3-128).
18. Install boom mount hose armor (page 3-116).

End of Task

EJECTION CYLINDER HOSE ASSEMBLIES (CA, CB, CC, AND CD) AND HYDRAULICS REPLACEMENT (Sheet 1 of 7)

PROCEDURE INDEX

| PROCEDURE | PAGE |
|--------------|-------|
| Removal | 3-149 |
| Installation | 3-152 |

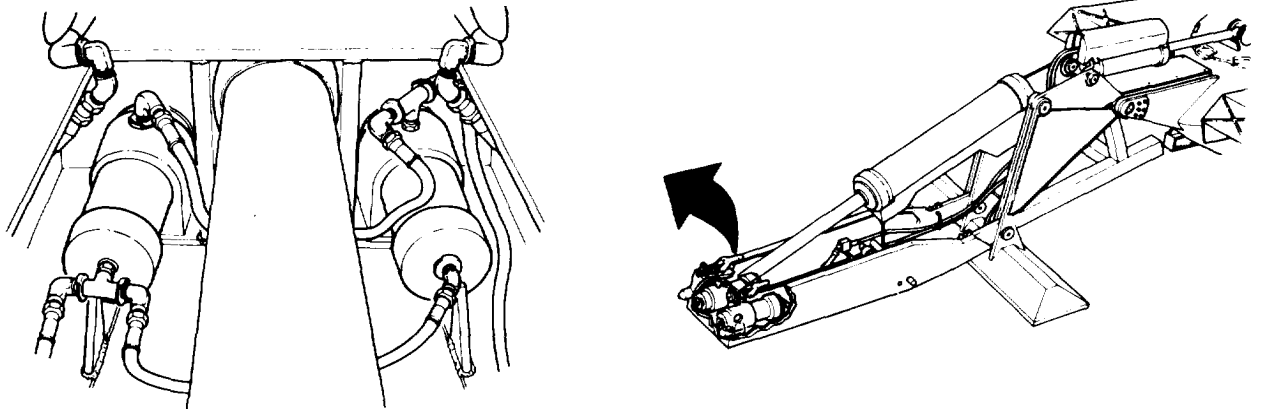
TOOLS: 12 in. adjustable wrench (2)
 7/8 in. open end wrench
 9/16 in. socket with 1/2 in. drive
 Ratchet with 1/2 in. drive
 3/4 in. open end wrench

SUPPLIES: Pencil
 Rags (Item 12, Appendix D)
 Pipe tape (Item 19, Appendix D)
 Drip pans
 Masking tape (Item 18, Appendix D)
 Preformed packing (2)
 Lockwashers (8)

REFERENCE: LO 5-5420-226-12

PRELIMINARY PROCEDURES: Remove front fixed and movable hose armor (page 3-127)
 Relieve hydraulic pressure (page 3-65)

REMOVAL:



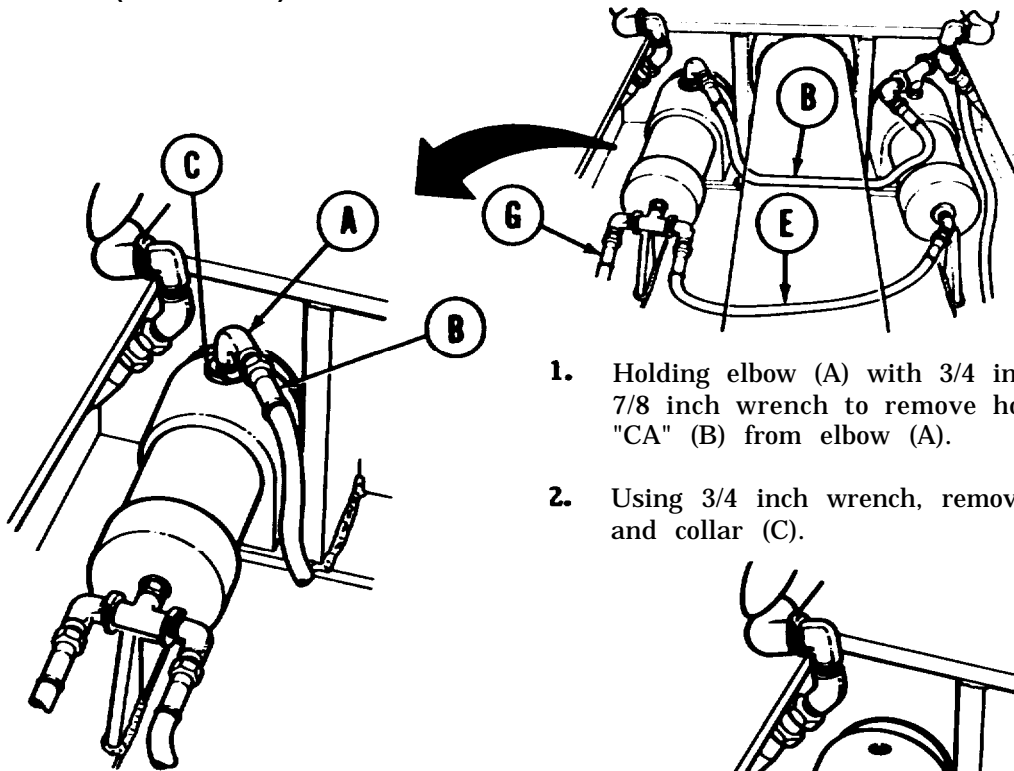
NOTE

Use rags and drip pans to catch excess hydraulic fluid. Use masking tape to tag lines for installation.

Go on to Sheet 2

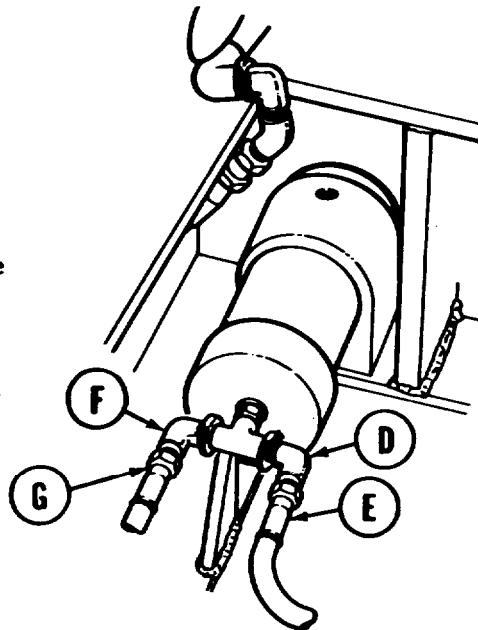
TA170375

EJECTION CYLINDER HOSE ASSEMBLIES (CA, CB, CC, AND CD) AND HYDRAULICS REPLACEMENT (Sheet 2 of 7)

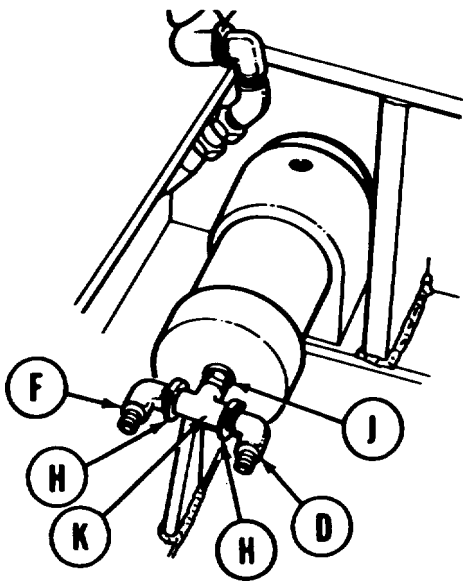


1. Holding elbow (A) with 3/4 inch wrench, use 7/8 inch wrench to remove hose assembly "CA" (B) from elbow (A).
2. Using 3/4 inch wrench, remove elbow (A) and collar (C).

3. Holding elbow (D) with 3/4 inch wrench, use 7/8 inch wrench to remove hose assembly "CB" (E).
4. Holding elbow (F) with 3/4 inch wrench, use 7/8 inch wrench to remove hose assembly "CC" (G).



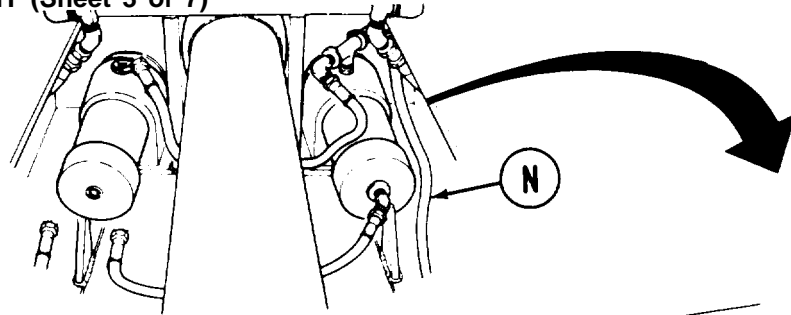
5. Using 3/4 inch wrench, remove two elbows (D) and (F) and two collars (H).
6. Holding nipple (J) with 3/4 inch wrench, use adjustable wrench to remove tee (K).
7. Using 3/4 inch wrench, remove nipple (J).



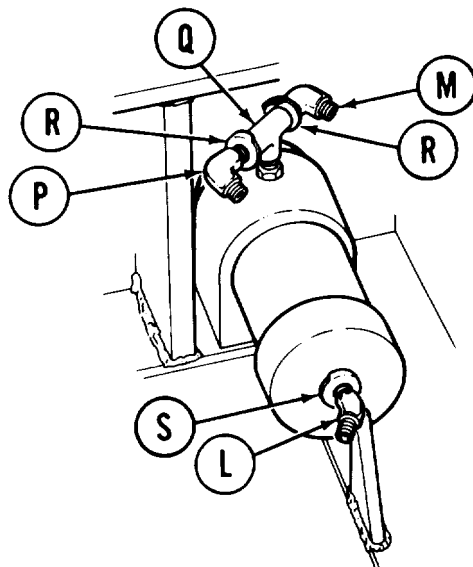
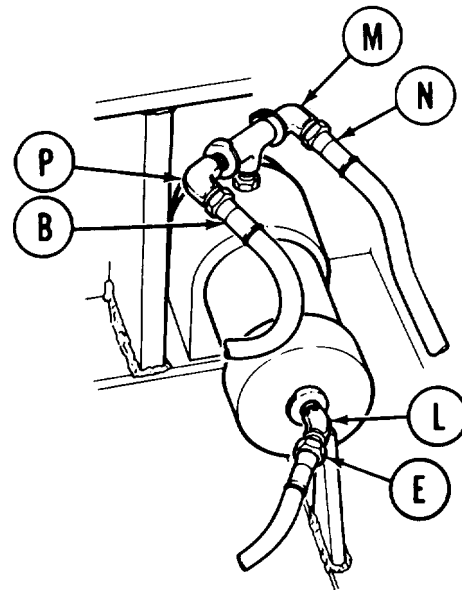
Go on to Sheet 3

TA170376

EJECTION CYLINDER HOSE ASSEMBLIES (CA, CB, CC, AND CD) AND HYDRAULICS REPLACEMENT (Sheet 3 of 7)

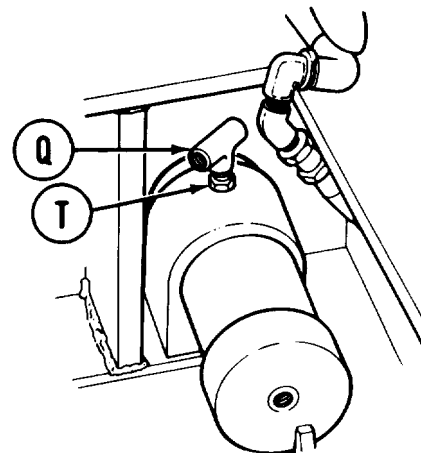


8. Holding elbow (L) with 3/4 inch wrench, use 7/8 inch wrench to remove hose assembly "CB" (E).
9. Holding elbow (M) with 3/4 inch wrench, use 7/8 inch wrench to remove hose assembly "CD" (N).
10. Holding elbow (P) with 3/4 inch wrench, use 7/8 inch wrench to remove hose assembly "CA" (B).



11. Using adjust able wrench to hold tee (Q), use 3/4 inch wrench to remove elbows (M) and (P) and collars (R).
12. Using 3/4 inch wrench, remove elbow (L) and collar (S).

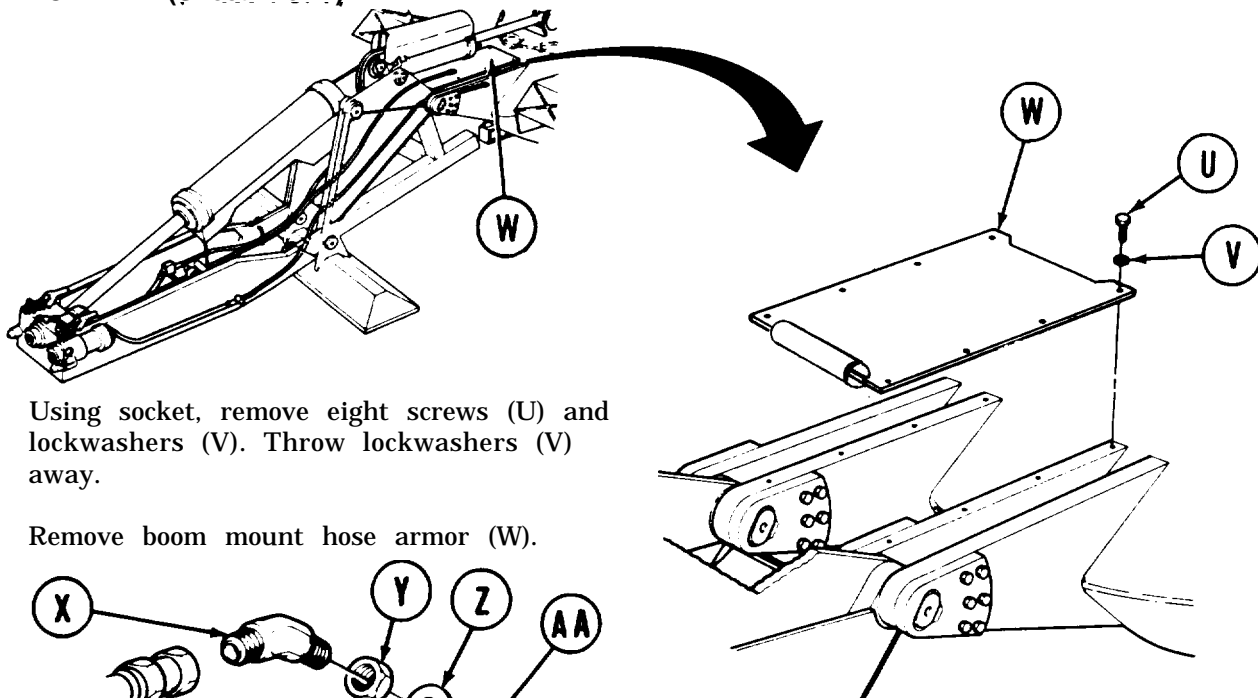
13. Holding nipple (T) with 3/4 inch wrench, use adjustable wrench to remove tee (Q).
14. Using 3/4 inch wrench, remove nipple (T).



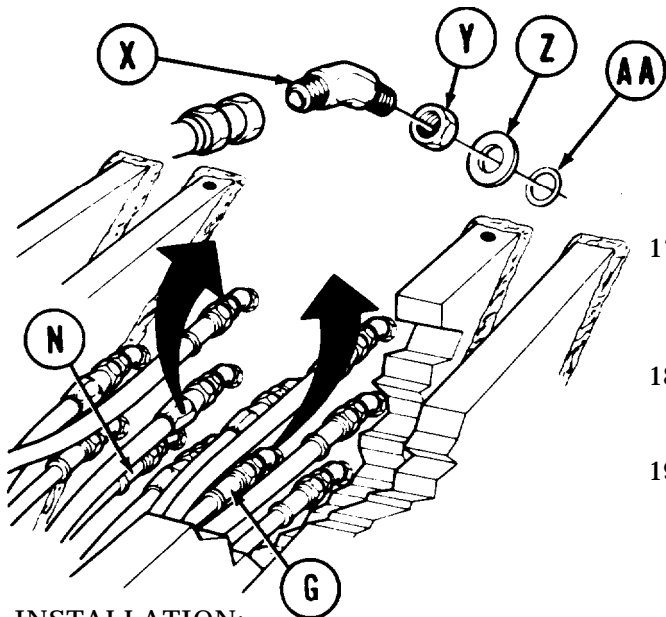
Go on to Sheet 4

TA170377

EJECTION CYLINDER HOSE ASSEMBLIES (CA, CB, CC, AND CD) AND HYDRAULICS REPLACEMENT (Sheet 4 of 7)



15. Using socket, remove eight screws (U) and lockwashers (V). Throw lockwashers (V) away.
16. Remove boom mount hose armor (W).



17. Holding two elbows (X) with 3/4 inch wrench, use 7/8 inch wrench to remove hose assemblies "CD" (N) and "CC" (G).
18. Using 3/4 inch wrench on elbows (X), use 7/8 inch wrench to loosen elbow nuts (Y).
19. Using adjustable wrench, remove two elbows (X), elbow nuts (Y), flat washers (Z) and packings (AA). Throw packings (AA) away.

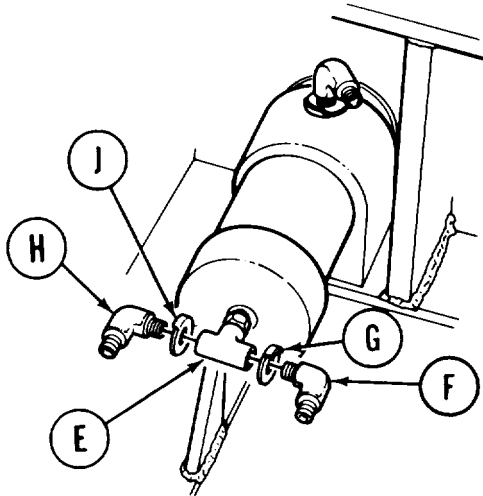
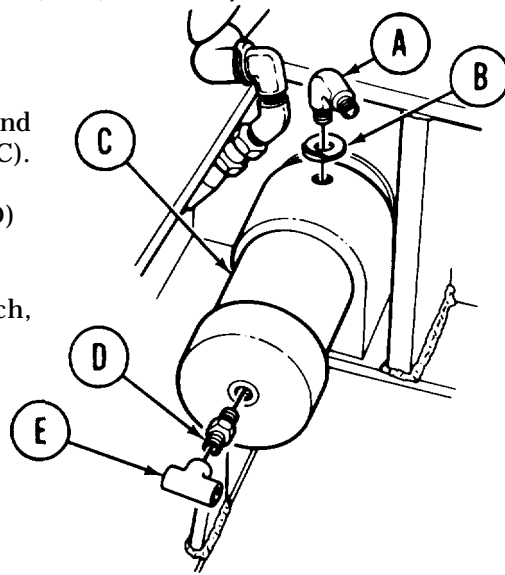
INSTALLATION:

NOTE

Before installation, use pipe tape on all male threads. Start tape on second thread so tape will not enter hydraulic system.

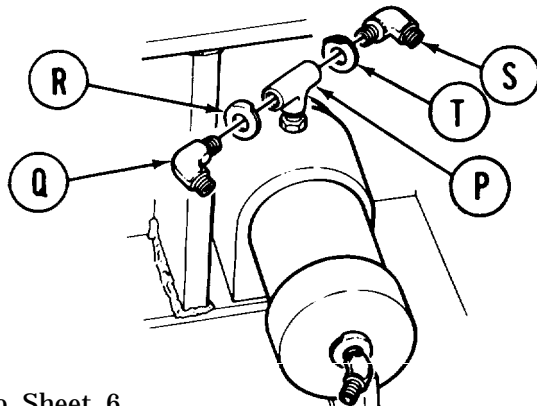
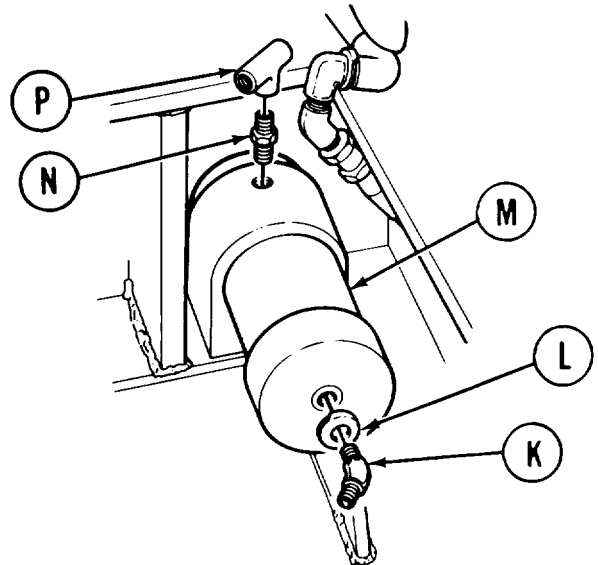
EJECTION CYLINDER HOSE ASSEMBLIES (CA, CB, CC, AND CD) AND HYDRAULICS REPLACEMENT (Sheet 5 of 7)

1. Using 3/4 inch wrench, install elbow (A) and collar "CA" (B) on left ejection cylinder (C).
2. Using 3/4 inch wrench, install nipple (D) left ejection cylinder (C).
3. Holding nipple (D) with 3/4 inch wrench, adjustable wrench to install tee (E).



4. Holding tee (E) with adjustable wrench, use 3/4 inch wrench to install elbow (F) and collar "CB" (G).
5. Holding tee (E) with adjustable wrench, use 3/4 inch wrench to install elbow (H) and collar "CC" (J).

6. Using 3/4 inch wrench, install elbow (K) and collar "CB" (L) on right ejection cylinder (M).
7. Using 3/4 inch wrench, install nipple (N) in right ejection cylinder (M).
8. Holding nipple (N) with 3/4 inch wrench, use adjustable wrench to install tee (P).



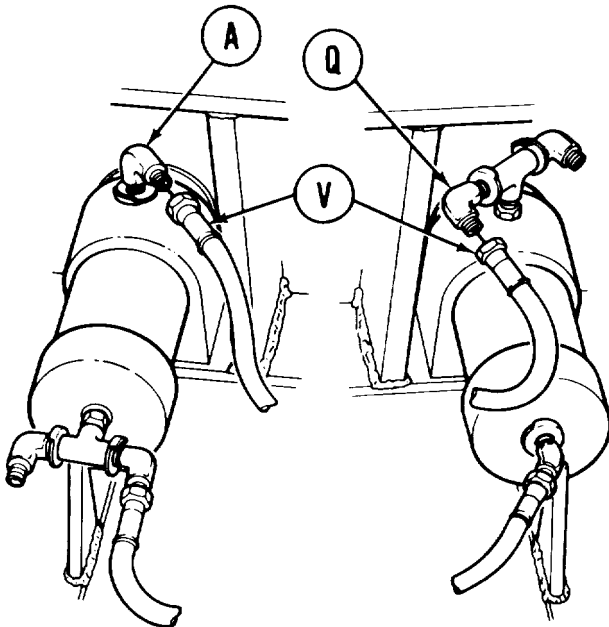
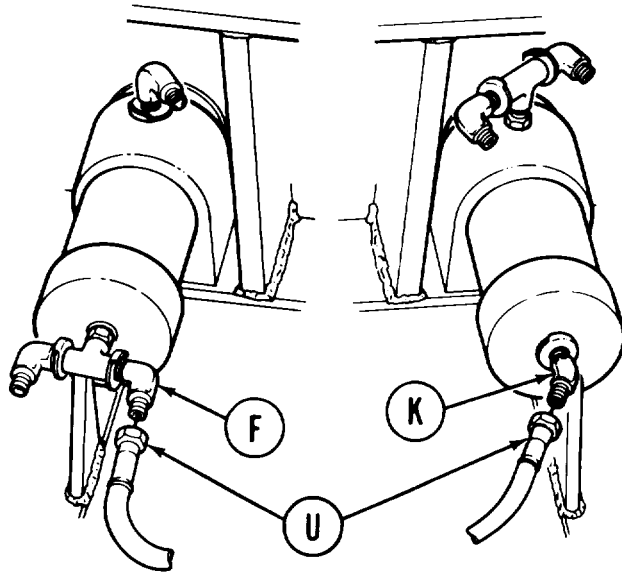
9. Holding tee (P) with adjustable wrench, use 3/4 inch wrench to install elbow (Q) and collar "CA" (R).
10. Holding tee (P) with adjustable wrench, use 3/4 inch wrench to install elbow (S) and collar "CD" (T).

Go on to Sheet 6

TA170379

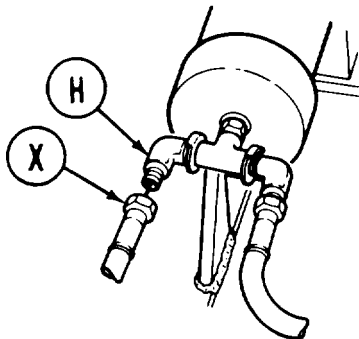
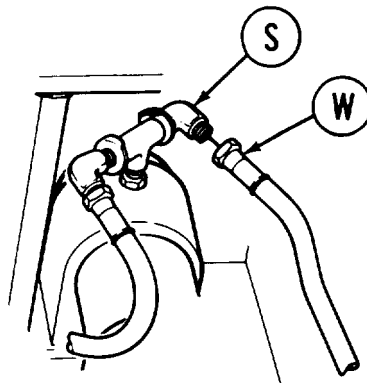
EJECTION CYLINDER HOSE ASSEMBLIES (CA, CB, CC, AND CD) AND HYDRAULICS REPLACEMENT (Sheet 6 of 7)

11. Holding elbow (K) with 3/4 inch wrench, use 7/8 inch wrench to install hose assembly "CB" (U).
12. Holding elbow (F) with 3/4 inch wrench, use 7/8 inch wrench to install hose assembly "CB" (U).



13. Holding elbow (A) with 3/4 inch wrench, use 7/8 inch wrench to install hose assembly "CA" (V).
14. Holding elbow (Q) with 3/4 inch wrench, use 7/8 inch wrench to install hose assembly "CA" (V).

15. Holding elbow (S) with 3/4 inch wrench, use 7/8 inch wrench to install hose assembly "CD" (W).



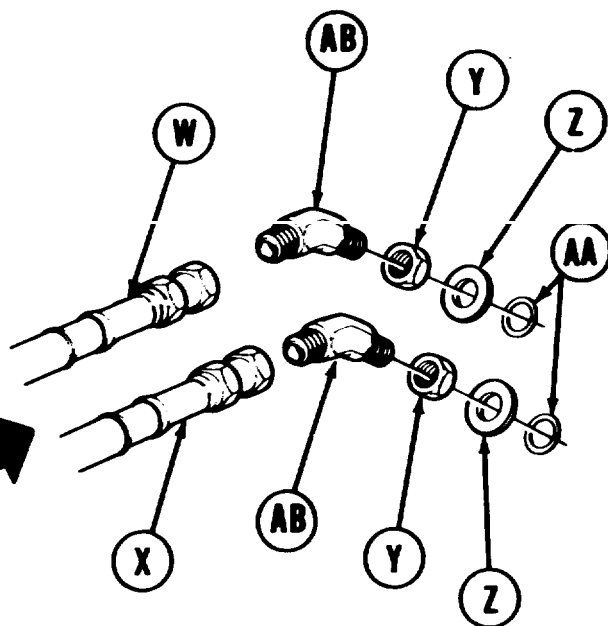
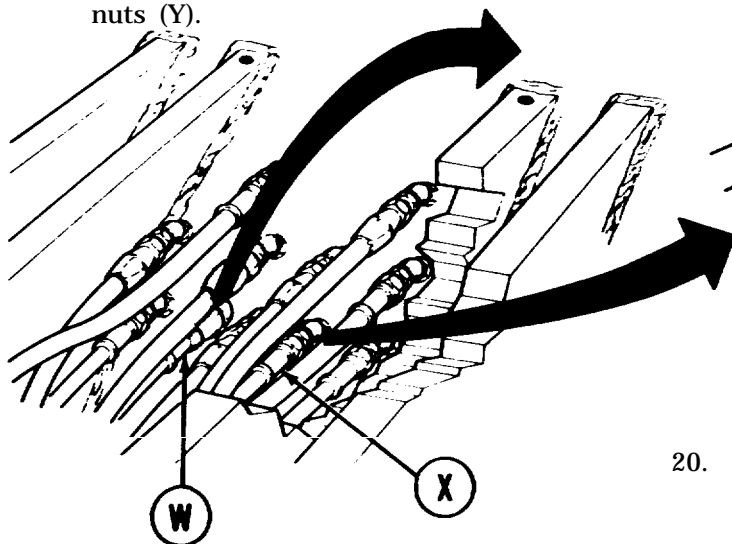
16. Holding elbow (H) with 3/4 inch wrench, use 7/8 inch wrench to install hose assembly "CC" (X).

Go on to Sheet 7

TA170380

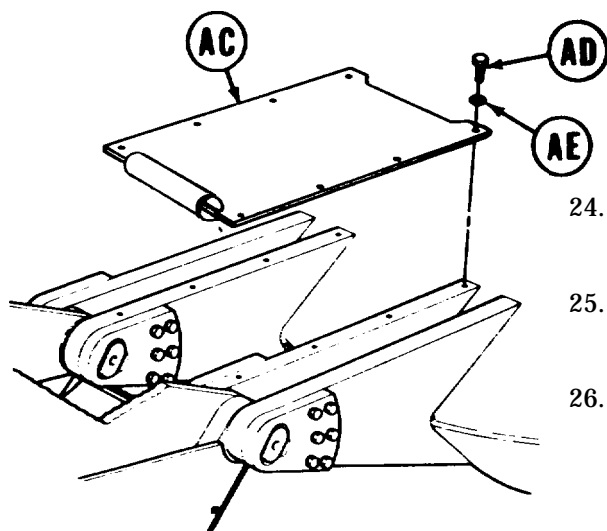
EJECTION CYLINDER HOSE ASSEMBLIES (CA, CB, CC, AND CD) AND HYDRAULICS REPLACEMENT (Sheet 7 of 7)

17. Manually install nuts (Y), flat washers (Z), and new packings (AA) on elbows (AB).
18. Manually install two elbows (AB) on vehicle and aline elbows (AB).
19. Using 3/4 inch wrench to hold elbows (AB), use 7/8 inch wrench to tighten elbow nuts (Y).



20. Holding elbows (AB) with 3/4 inch wrench, use 7/8 inch wrench to install hose assemblies "CD" (W) and "CC" (X).

21. Bleed hydraulic system (page 3-66).
22. Check for hydraulic leaks and correct as necessary.
23. Service hydraulic reservoir (LO 5-5420-226-12).



24. Install front fixed and movable hose armor (page 3-128).
25. Place boom mount hose armor (AC) in position.
26. Using socket, install eight screws (AD) and new lockwashers (AE).

End of Task

TA170381

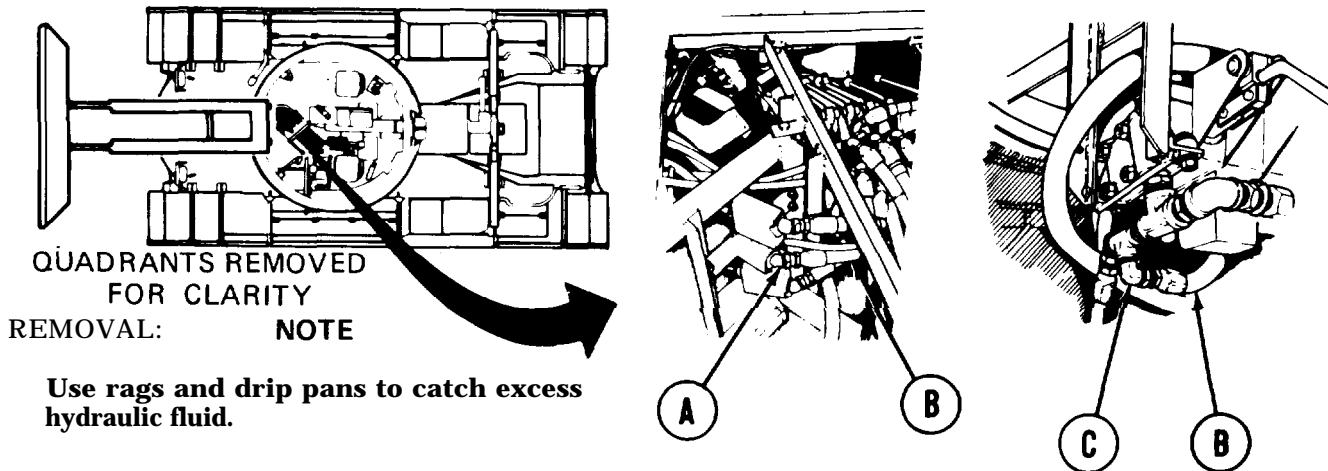
OUTLET TO RELIEF VALVE MOUNT HOSE ASSEMBLY (CR) REPLACEMENT (Sheet 1 of 1)

TOOLS: 12 in. adjustable wrench
1-1/4 in. open end wrench

SUPPLIES: Drip pan
Rags (Item 12, Appendix D)
Pipe tape (Item 19, Appendix D)

REFERENCE: LO 5-5420-226-12

PRELIMINARY PROCEDURES: Remove front quadrant (page 3-39)
Relieve hydraulic pressure (page 3-65)



1. Holding elbow (A) with adjustable wrench, use 1-1/4 inch wrench to remove hose assembly "CR" (B).
2. Holding elbow (C) with adjustable wrench, use 1-1/4 inch wrench to remove hose assembly "CR" (B).

INSTALLATION:

NOTE

Before installation, use pipe tape on all male threads. Start tape on second thread so tape will not enter hydraulic system.

1. Holding elbow (A) with adjustable wrench, use 1-1/4 inch wrench to install hose assembly "CR" (B).
2. Holding elbow (C) with adjustable wrench, use 1-1/4 inch wrench to install hose assembly "CR" (B).
3. Bleed hydraulic system (page 3-66).
4. Check for hydraulic leaks and correct as necessary.
5. Install front quadrant (page 3-40).
6. Service hydraulic reservoir (LO 5-5420-226-12).

End of Task

TA170382

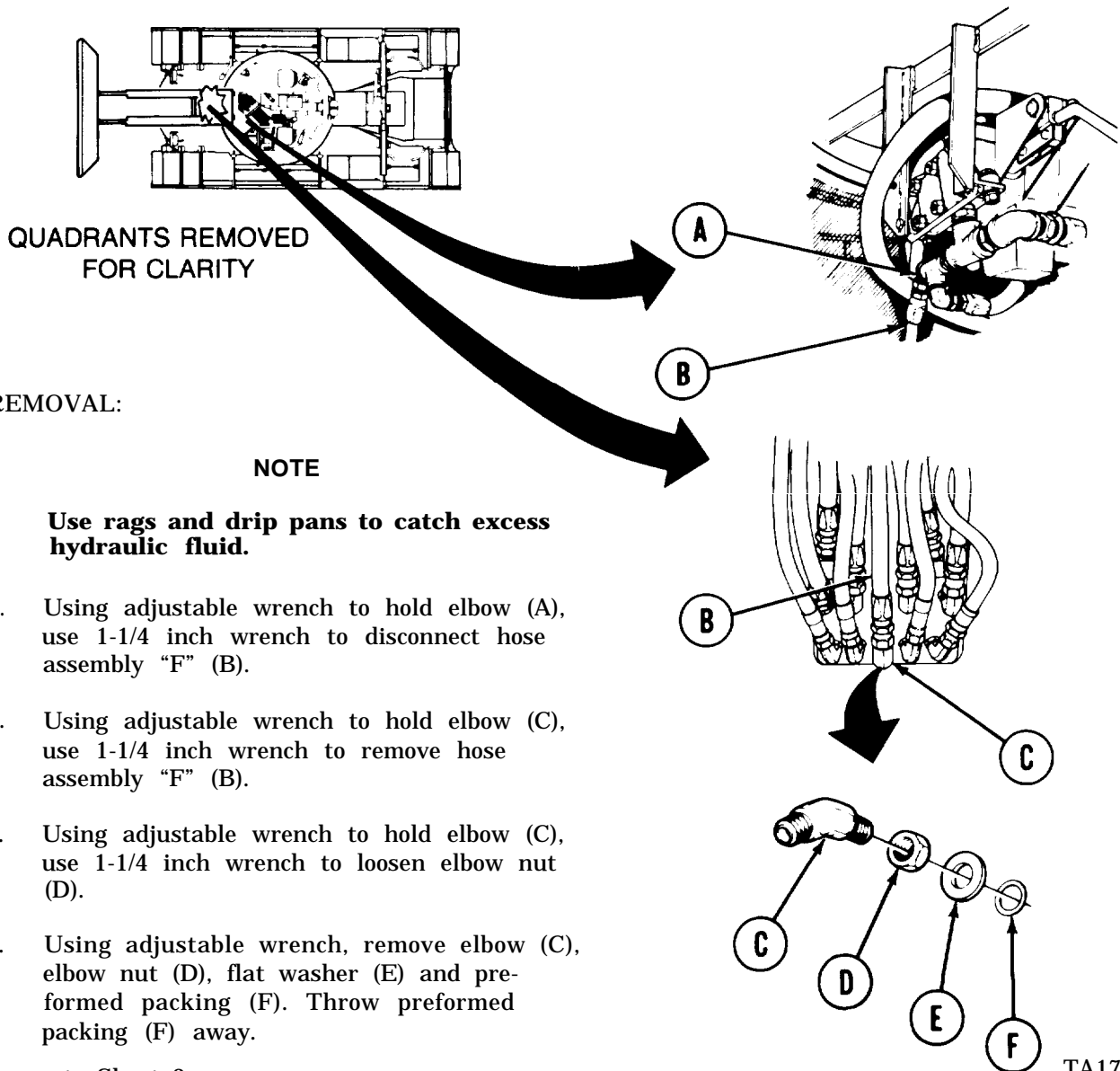
OVERHEAD CYLINDER RETURN HOSE ASSEMBLY (F) REPLACEMENT (Sheet 1 of 2)

TOOLS: 1-1/4 in. open end wrench
12 in. adjustable wrench

SUPPLIES: Drip pan
Rags (Item 12, Appendix D)
Pipe tape (Item 19, Appendix D)
Preformed packing

REFERENCE: LO 5-5420-226-12

PRELIMINARY PROCEDURE: Relieve hydraulic pressure (page 3-65)



Go on to Sheet 2

TA170383

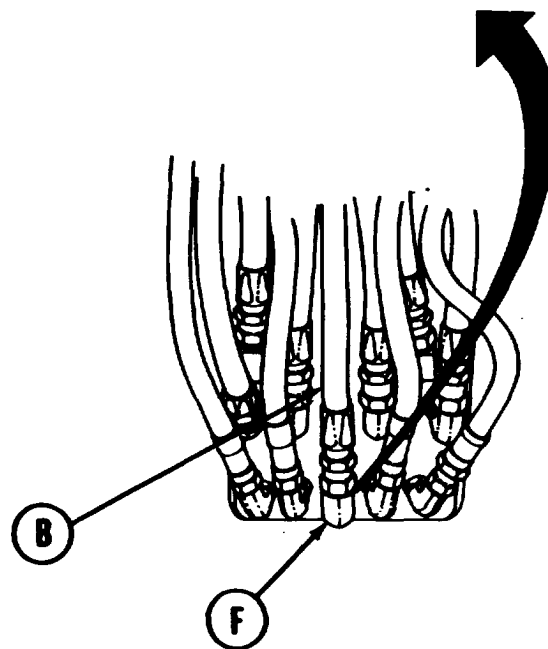
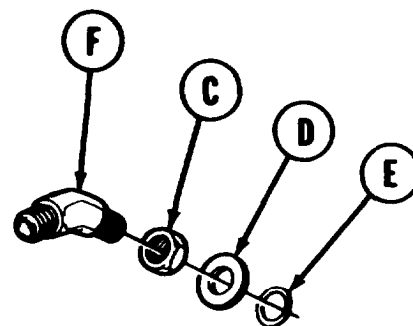
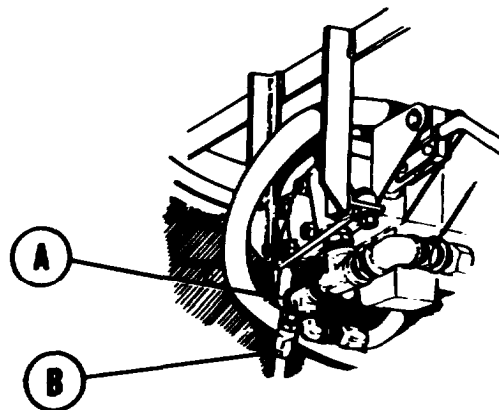
OVERHEAD CYLINDER RETURN HOSE ASSEMBLY (F) REPLACEMENT (Sheet 2 of 2)

INSTALLATION:

NOTE

Before installation, use pipe tape on all male threads. Start tape on second thread so tape will not enter hydraulic system.

1. Using adjustable wrench to hold elbow (A), use 1-1/4 inch wrench to install hose assembly "F" (B).
2. Manually place elbow nut (C), flat washer (D) and new preformed packing (E) on elbow (F).
3. Manually install elbow (F) and align elbow (F).
4. Using adjustable wrench to hold elbow (F), use 1-1/4 inch wrench to tighten elbow nut (C).
5. Using adjustable wrench to hold elbow (F), use 1-1/4 inch wrench to install hose assembly "F" (B).
6. Bleed hydraulic system (page 3-66).
7. Check for hydraulic leaks and correct as necessary.
8. Service hydraulic reservoir as needed (LO 5-5420-226-12).



End of Task

TA170384

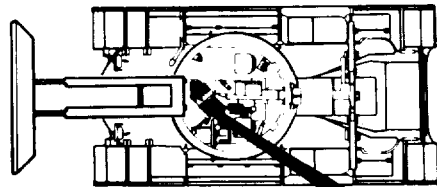
SEQUENCE VALVE HOSE ASSEMBLY (AR) REPLACEMENT (Sheet 1 of 1)

TOOLS: 9/16 in. open end wrench
12 in. adjustable wrench

SUPPLIES: Drip pans
Rags (Item 12, Appendix D)
Pipe tape (Item 19, Appendix D)

REFERENCE: LO 5-5420-226-12

PRELIMINARY PROCEDURES: Remove front quadrant (page 3-39)
Relieve hydraulic pressure (page 3-65)



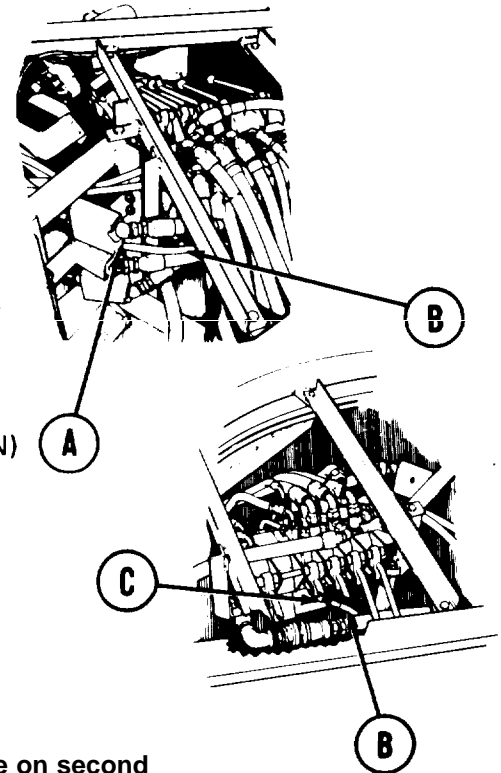
QUADRANTS
REMOVED
FOR CLARITY

REMOVAL:**NOTE**

Use rags and drip pans to catch excess hydraulic fluid.

1. Using adjustable wrench to hold elbow assembly (A), use open end wrench to disconnect hose assembly "AR" (B).
2. Using adjustable wrench to hold elbow assembly (C), use open end wrench to remove hose assembly "AR" (B).

(HIDDEN)

**INSTALLATION:****NOTE**

Before installation, use pipe tape on all male threads. Start tape on second thread so tape will not enter hydraulic system.

1. Using adjust able wrench to hold elbow assembly (A), use open end wrench on hose assembly "AR" (B) and connect hose.
2. Using adjust able wrench to hold elbow assembly (C), use open end wrench on hose assembly "AR" (B) and install hose.
3. Bleed hydraulic system (page 3-66).
4. Check for hydraulic leaks and correct as necessary.
5. Install front quadrant (page 3-40).
6. Refill hydraulic reservoir (LO 5-5420-226-12).

End of Task

TA170385

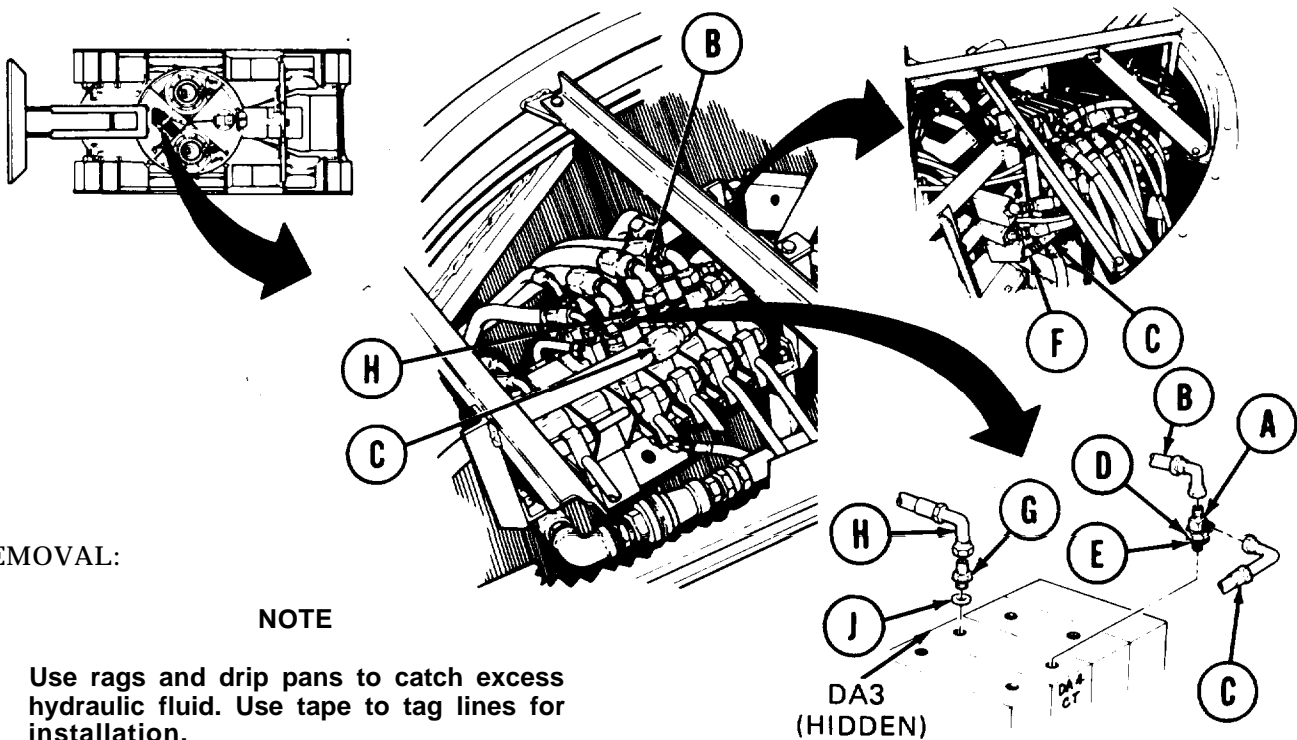
**TONGUE CYLINDER HOSE ASSEMBLIES (CT, DA3, AND DA4) AND HYDRAULICS REPLACEMENT
(Sheet 1 of 4)**

TOOLS: 1-1/4 in. open end wrench (2)
12 in. adjustable wrench

SUPPLIES: Preformed packings (3) Pipe tape (Item 19, Appendix D)
Drip pans Pencil
Rags (Item 12, Appendix D) Masking tape (Item 18, Appendix D)

REFERENCE: LO 5-5420-226-12

PRELIMINARY PROCEDURES: Remove front quadrant (page 3-39)
Relieve hydraulic pressure (page 3-65)



REMOVAL:

NOTE

Use rags and drip pans to catch excess hydraulic fluid. Use tape to tag lines for installation.

1. Using adjustable wrench to hold tee (A), use 1-1/4 inch wrench to disconnect hose assembly "DA4" (B) and hose assembly "CT" (C).
2. Using adjustable wrench, hold tee (A), use 1-1/4 inch wrench to loosen nut (D).
3. Using adjustable wrench, remove tee (A), nut (D), and packing (E). Throw packing (E) away.
4. Using 1-1/4 inch wrench, remove hose assembly "CT" (C) from elbow (F).
5. Using 1-1/4 inch wrench to hold adapter (G), use 1-1/4 inch wrench to remove hose assembly "DA3" (H).
6. Using 1-1/4 inch wrench, remove adapter (G) and packing (J). Throw packing (J) away.

Go on to Sheet 2

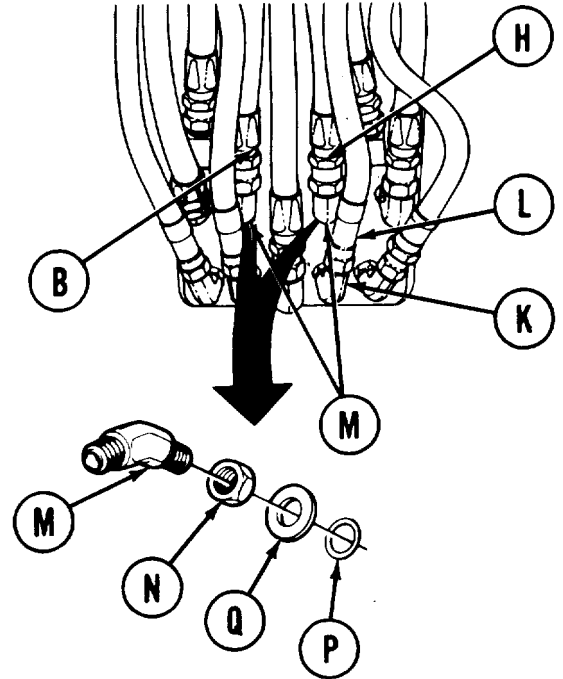
TA170386

TONGUE CYLINDER HOSE ASSEMBLIES (CT, DA3, AND DA4) AND HYDRAULICS REPLACEMENT (Sheet 2 of 4)

NOTE

Hose assembly in step 7 is being removed to provide wrench clearance for removal of parts in the following steps.

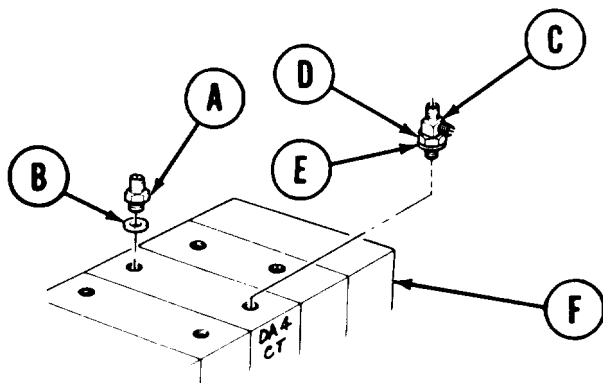
7. Using adjust able wrench to hold elbow (K), use 1-1/4 inch wrench to disconnect hose assembly "CP1" (L).
8. Using adjustable wrench to hold elbows (M), use 1-1/4 inch wrench to disconnect hose assemblies "DA3" (H) and "DA4" (B) from elbows (M).
9. Using adjustable wrench to hold elbows (M), use 1-1/4 inch wrench to loosen nuts (N).
10. Using adjustable wrench, remove two elbows (M).
11. Manually remove packings (P), flat washers (Q), and nuts (N) from elbows (M). Throw packings (P) away.



INSTALLATION:

NOTE

Before installation, use pipe tape on all male threads. Start tape on second thread so tape will not enter hydraulic system.

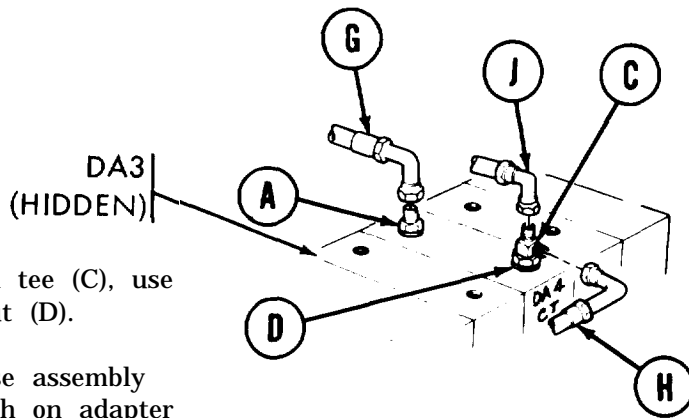


1. Using 1-1/4 inch wrench, install adapter (A) and new packing (B).
2. Manually install tee (C), nut (D), and new packing (E) into valve body (F).

Go on to Sheet 3

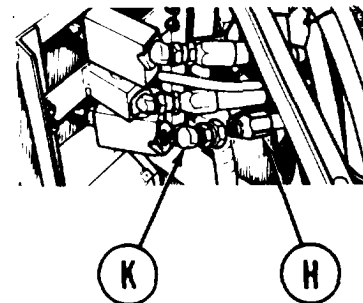
TA170387

TONGUE CYLINDER HOSE ASSEMBLIES (CT, DA3, AND DA4) AND HYDRAULICS REPLACEMENT (Sheet 3 of 4)

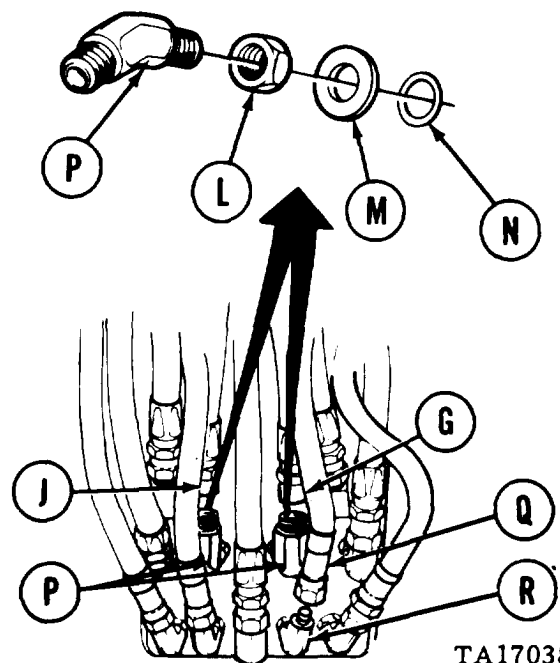


3. Using adjustable wrench to hold tee (C), use 1-1/4 inch wrench to tighten nut (D).
4. Using 1-1/4 inch wrench on hose assembly "DA3" (G) and 1-1/4 inch wrench on adapter (A), install hose (G).
5. Using 1-1/4 inch wrench on hose assembly "CT" (H) and adjustable wrench on tee (C), install hose assembly (H).
6. Using 1-1/4 inch wrench on hose assembly "DA4" (J) and adjustable wrench on tee (C), install hose assembly (J).

7. Using 1-1/4 inch wrench on hose assembly "CT" (H) and adjustable wrench on elbow (K), install hose assembly (H).
8. Manually install nuts (L), flat washers (M) and new packings (N) on elbows (P).
9. Manually install two elbows (P) and align elbows.



10. Using adjustable wrench to hold elbows (P), use 1-1/4 inch wrench to tighten nuts (L).
11. Using 1-1/4 inch wrench on hose assemblies (J) and (G) and adjustable wrench on elbows (P), install hose assembly "DA4" (J) and hose assembly "DA3" (G).
12. Using 1-1/4 inch wrench on hose assembly "CP1" (Q) and adjustable wrench on elbow (R), install hose assembly (Q).



Go on to Sheet 4

TA170388

**TONGUE CYLINDER HOSE ASSEMBLIES (CT, DA3, AND DA4) AND HYDRAULICS REPLACEMENT
(Sheet 4 of 4)**

13. Bleed hydraulic system (page 3-66).
14. Check for hydraulic leaks and correct as necessary.
15. Install front quadrant (page 3-40).
16. Service hydraulic reservoir (LO 5-5420-226-12).

End of Task

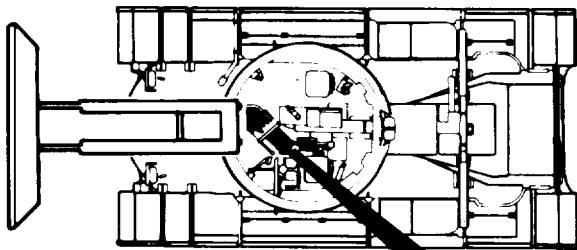
OVERHEAD CYLINDER HOSE ASSEMBLIES (DA5 AND DA6) AND HYDRAULICS REPLACEMENT (Sheet 1 of 3)

TOOLS: 7/8 in. combination wrench
 1-1/4 in. open end wrench
 12 in. adjustable wrench

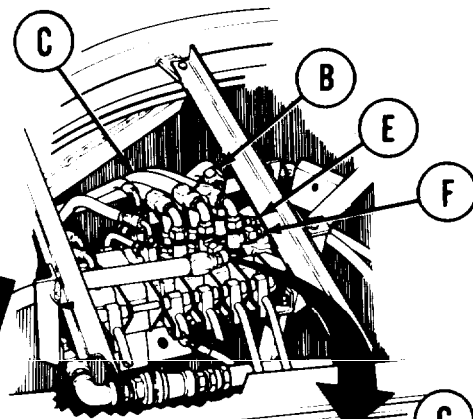
SUPPLIES: Drip pan
 Rags (Item 12, Appendix D)
 Pipe tape (Item 19, Appendix D)
 Pencil
 Masking tape (Item 18, Appendix D)
 Preformed packings (4)
 Caps and plugs

REFERENCE: LO 5-5420-226-12

PRELIMINARY PROCEDURES: Remove front quadrant (page 3-39)
 Relieve hydraulic pressure (page 3-65)



QUADRANTS REMOVED FOR CLARITY

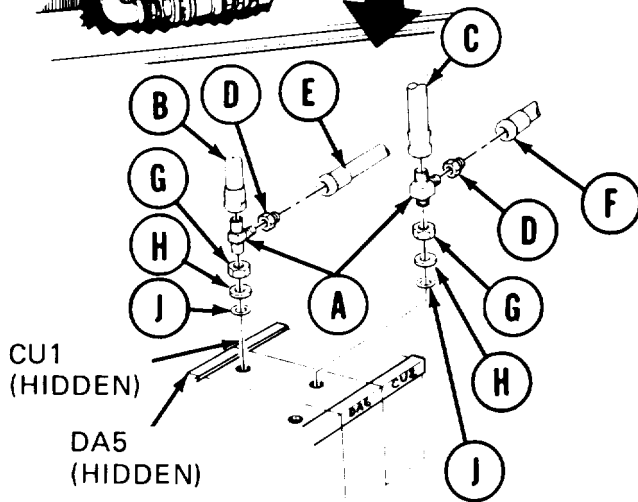


REMOVAL:

NOTE

Cap all lines and fittings as disconnected. Use rags and drip pans to catch excess hydraulic fluid. Use tape lines for installation.

1. Using adjustable wrench to hold tees (A), use 1-1/4 inch wrench to remove hose assemblies "DA5" (B) and "DA6" (C).
2. Using 1-1/4 inch wrench to hold adapters (D), use 7/8 inch wrench to remove hose assemblies "CU1" (E) and "CU2" (F).
3. Use 1-1/4 inch wrench to remove two adapters (D).
4. Using adjustable wrench to hold tees (A), use 1-1/4 inch wrench to loosen nuts (G).
5. Using adjustable wrench, remove two tees (A), nuts (G), flat washers (H) and packings (J). Throw packings (J) away.



Go on to Sheet 2

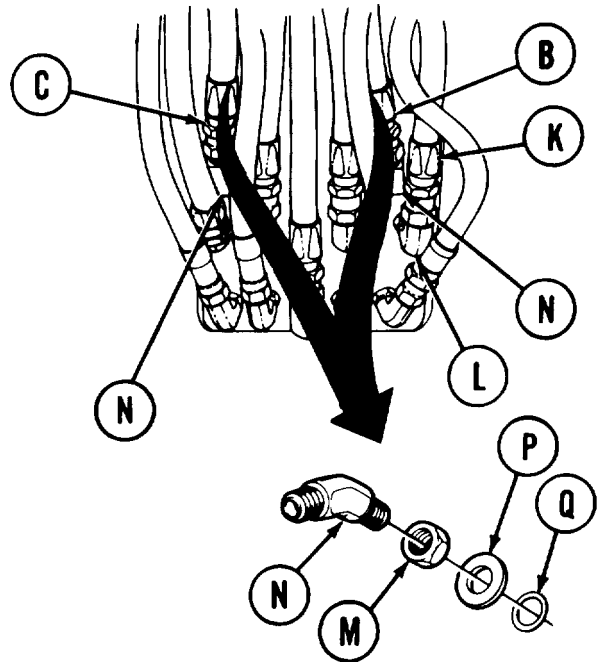
TA170389

OVERHEAD CYLINDER HOSE ASSEMBLIES (DA5 AND DA6) AND HYDRAULICS REPLACEMENT (Sheet 2 of 3)

NOTE

Hose assembly in step 6 is being removed to provide wrench clearance for removal of parts in the following steps.

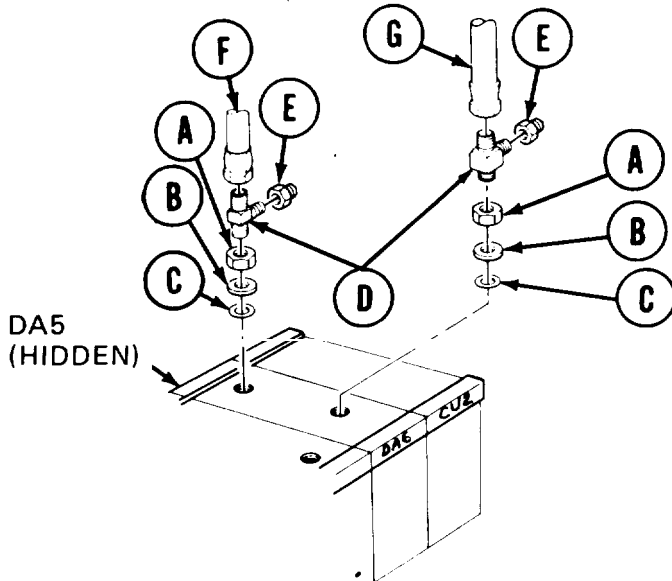
6. Using 1-1/4 inch wrench remove hose assembly "DA2" (K) from elbow (L).
7. Using 1-1/4 inch wrench, remove hose assemblies "DA6" (C) and "DA5" (B).
8. Using 1-1/4 inch wrench, loosen elbow nuts (M).
9. Using adjustable wrench, remove elbows (N), nuts (M), flat washers (P), and packings (Q). Throw packings (Q) away.



INSTALLATION:

NOTE

Remove caps and plugs as necessary during installation. Tape all male threads before installation with pipe tape:



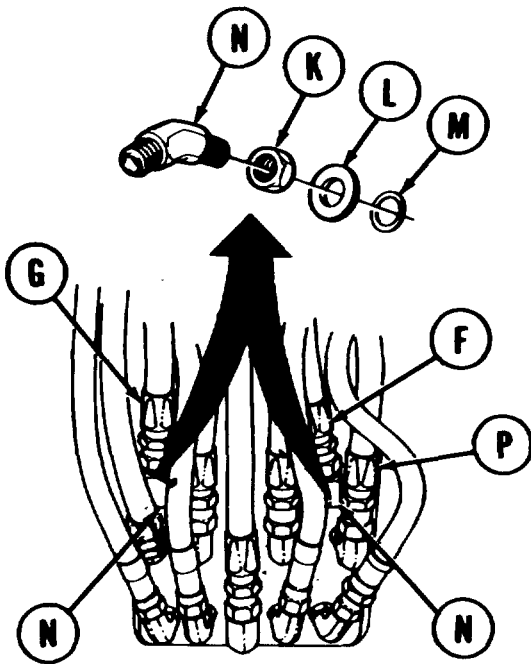
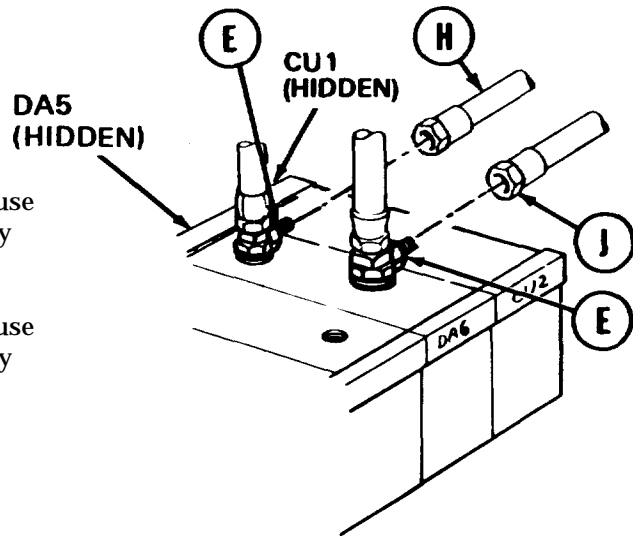
1. Manually install nuts (A), flat washers (B), and new packings (C) onto tees (D).
2. Manually install and align tees (D).
3. Using adjustable wrench to hold tees (D), use 1-1/4 inch wrench to tighten nuts (A).
4. Using adjustable wrench to hold tees (D), use 1-1/4 inch wrench to install adapters (E).
5. Using adjustable wrench to hold tee (D), use 1-1/4 inch wrench to install hose assembly "DA5" (F).
6. Using adjustable wrench to hold tee (D), use 1-1/4 inch wrench to install hose assembly "DA6" (G).

Go on to Sheet 3

TA170390

**OVERHEAD CYLINDER HOSE ASSEMBLIES (DA5 AND DA6) AND HYDRAULICS REPLACEMENT
(Sheet 3 of 3)**

7. Using 1-1/4 inch wrench on adapter (E), use 7/8 inch wrench to connect hose assembly "CU1" (H).
8. Using 1-1/4 inch wrench on adapter (E), use 7/8 inch wrench to connect hose assembly "CU2" (J).



9. Manually install nuts (K), flat washers (L), and new packings (M) onto elbows (N).
10. Manually install and align elbows (N).
11. Using adjustable wrench on elbows (N), use 1-1/4 inch wrench to tighten nuts (K).
12. Using adjustable wrench on elbow (N), use 1-1/4 inch wrench to connect hose assembly "DA5" (F).
13. Using adjustable wrench on elbow (N), use 1-1/4 inch wrench to connect hose assembly "DA6" (G).

14. Using 1-1/4 inch wrench, connect hose assembly "DA2" (P).
15. Bleed hydraulic system (page 3-66).
16. Check for hydraulic leaks and correct as necessary.
17. Install front quadrant (page 3-40).
18. Service hydraulic reservoir (LO 5-5420-226-12).

End of Task

TA170391

HOLD DOWN CYLINDER HOSE ASSEMBLIES (CU1, CU2, CV1 THRU CV4) AND HYDRAULICS REPLACEMENT (Sheet 1 of 5)

PROCEDURE INDEX

| PROCEDURE | PAGE |
|--------------|-------|
| Removal | 3-167 |
| Installation | 3-169 |

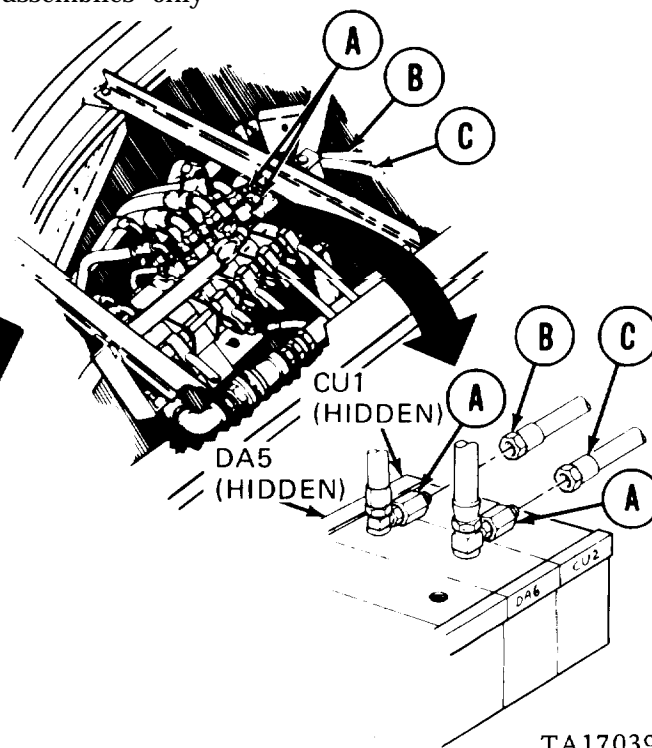
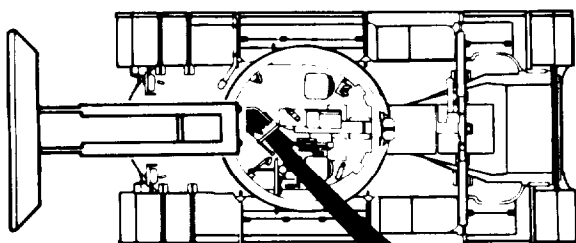
TOOLS: 7/8 in. open end wrench 13/16 in. combination box and open end wrench
 12 in. adjustable wrench 1-1/4 in. open end wrench
 Vise

SUPPLIES: Drip pans Pencil
 Rags (Item 12, Appendix D) Masking tape (Item 18, Appendix D)
 Pipe tape (Item 19, Appendix D) Caps and plugs (assorted sizes)

REFERENCES: TM 5-5420-226-10
 LO 5-5420-226-12

PRELIMINARY PROCEDURES: Relieve hydraulic pressure (page 3-65)
 Remove front quadrant (page 3-39) CU1 and CU2 hose assemblies only
 Remove powerplant (TM 5-5420-226-20) CV1 and CV2 hose assemblies only
 Remove hold down cylinder armor (page 3-247) CV3 and CV4 hose assemblies only

QUADRANTS REMOVED FOR CLARITY



REMOVAL:

NOTE

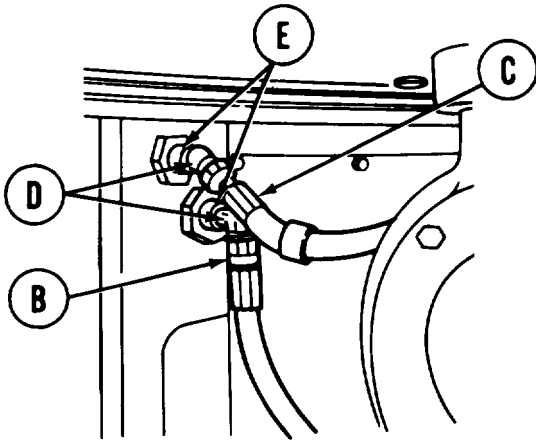
Use rags and drip pans to catch excess hydraulic fluid. Use tape to tag lines for installation. Cap all lines and fittings as disconnected.

1. Holding two adapters (A) with 1-1/4 inch wrench, use 7/8 inch wrench to disconnect hose assemblies "CU1" (B) and "CU2" (C).

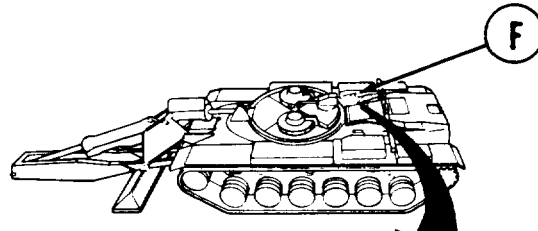
Go on to Sheet 2

TA170392

HOLD DOWN CYLINDER HOSE ASSEMBLIES (CU1 CU2, CV1 THRU CV4) AND HYDRAULICS REPLACEMENT (Sheet 2 of 5)



2. Using adjustable wrench to hold two elbows (D), use 7/8 inch wrench to disconnect hose assemblies "CU1" (B) and "CU2" (C).
3. Using adjustable wrench, remove two elbows (D) and collars (E).



4. Open right side grille doors (F) (TM 5-5420-226-10).

5. Using adjustable wrench on elbows (G), use 7/8 inch wrench to disconnect hose assembly "CV1" (H) and "CV2" (J).

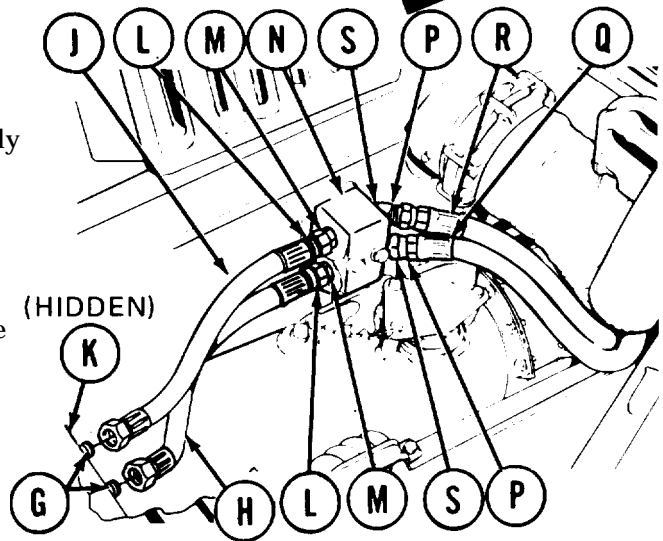
6. Using adjustable wrench, remove two elbows (G) and collars (K).

7. Using 13/16 inch wrench on adapter (L), use 7/8 inch wrench to remove hose assemblies "CV1" (H) and "CV2" (J).

8. Using 13/16 inch wrench, remove two adapters (L) and collars (M) from manifold (N).

9. Using adjustable wrench on elbows (P), use 7/8 inch wrench to disconnect hose assembly "CV3" (Q) and "CV4" (R).

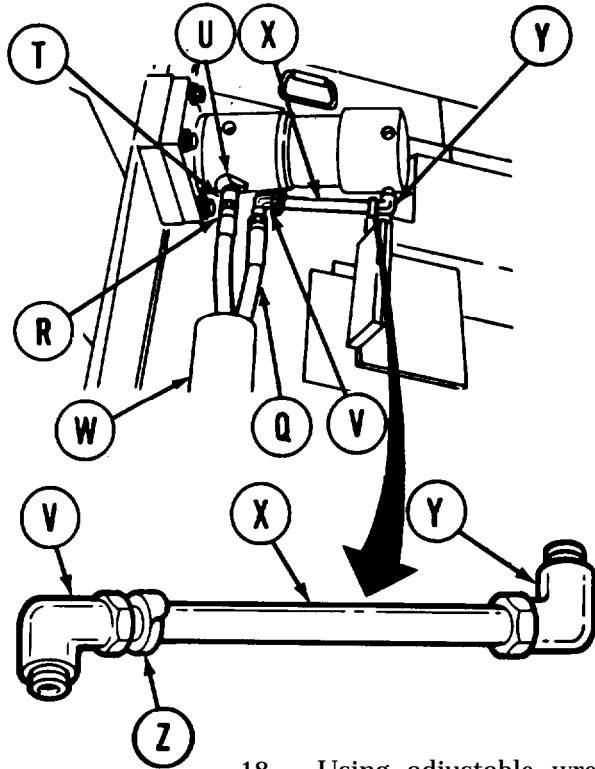
10. Using adjustable wrench, remove two elbows (P) and collars (S) from manifold (N).



Go on to Sheet 3

TA170393

HOLD DOWN CYLINDER HOSE ASSEMBLIES (CU1, CU2, CV1 THRU CV4) AND HYDRAULICS REPLACEMENT (Sheet 3 of 5)



11. Using 13/16 inch wrench on adapter (T), use 7/8 inch wrench to remove hose assembly "CV4" (R).
12. Using 13/16 inch wrench, remove adapter (T) and collar (U).
13. Using adjust able wrench on elbow (V), use 7/8 inch wrench to remove hose assembly "CV3" (Q).
14. Remove hose assemblies (Q) and (R) from armor (W).
15. Using adjustable wrench, remove elbow (V), nipple (X), and elbow (Y) as an assembly.
16. Place nipple (X) in a vise.
17. Use adjustable wrench to remove elbow (Y).

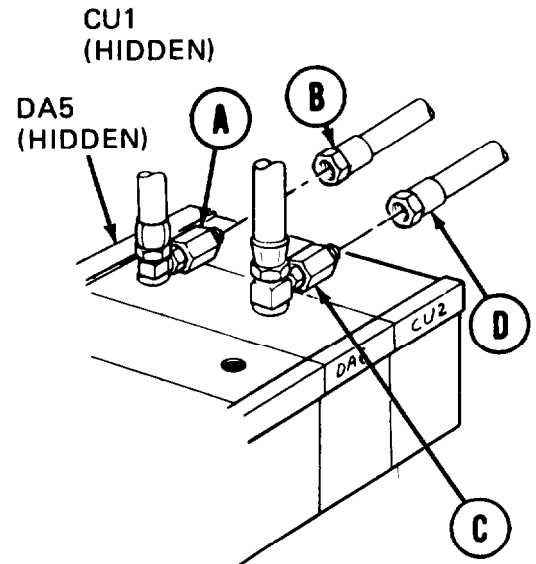
18. Using adjustable wrench, remove elbow (V) and collar (Z) from nipple (X).

INSTALLATION:

NOTE

Remove caps and plugs es necessary during installation. Before installation, use pipe tape on all male threads. Start tape on second thread so tape will not enter hydraulic system.

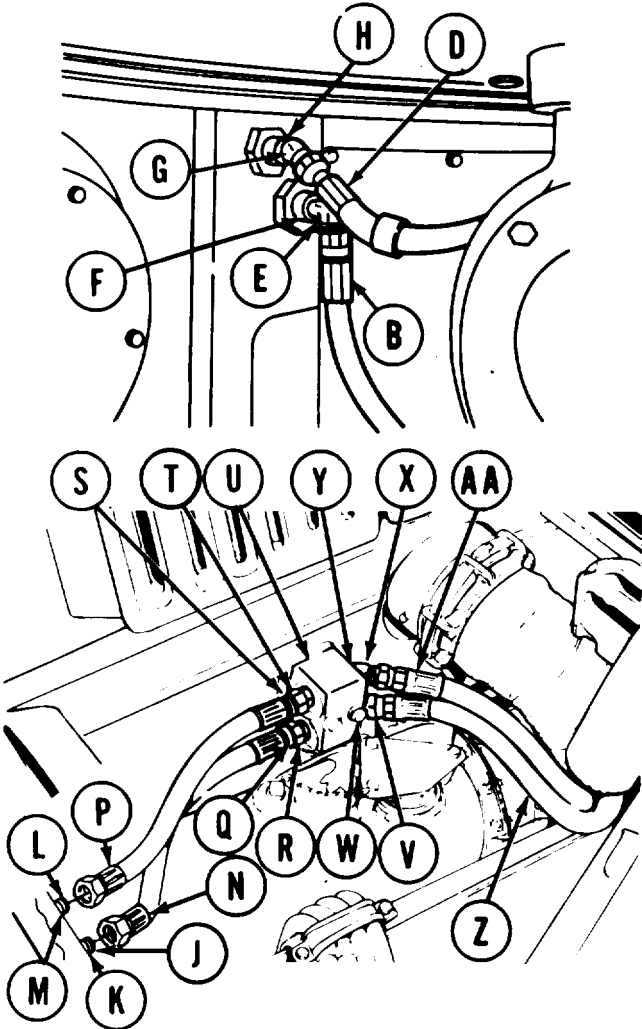
1. Holding adapter (A) with 1-1/4 inch wrench, use 7/8 inch wrench to connect hose assembly "CU1" (B).
2. Holding adapter (C) with 1-1/4 inch wrench, use 7/8 inch wrench to connect hose assembly "CU2" (D).



Go on to Sheet 4

TA170394

HOLD DOWN CYLINDER HOSE ASSEMBLIES (CU1, CU2, CV1 THRU CV4) AND HYDRAULICS REPLACEMENT (Sheet 4 of 5)



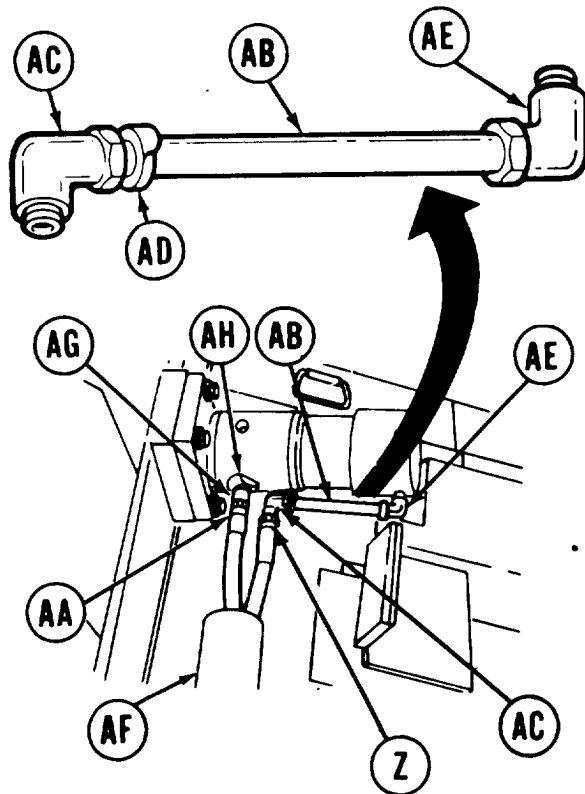
3. Using adjustable wrench, install elbow (E) and collar "CU1" (F) and elbow (G) and collar "CU2" (H).
4. Using adjust able wrench on elbow (E), use 7/8 inch wrench to install hose assembly "CU1" (B).
5. Using adjust able wrench on elbow (G), use 7/8 inch wrench to install hose assembly "CU2" (D).
6. Using adjustable wrench, install elbow (J) and collar "CV1" (K) and elbow (L) and collar "CV2" (M).
7. Using adjust able wrench on elbow (J), use 7/8 inch wrench to install hose assembly "CV1" (N).
8. Using adjust able wrench on elbow (L), use 7/8 inch wrench to install hose assembly "CV2" (P).

9. Using 13/16 inch wrench. install adapter (Q) and collar "CV1" (R) and adapter (S) and collar "CV2" (T) on manifold (U).
10. Using 13/16 inch wrench on adapter (Q), use 7/8 inch wrench to install hose assembly "CV1" (N).
11. Using 13/16 inch wrench on adapter (S), use 7/8 inch wrench to install hose assembly "CV2" (P).
12. Using adjustable wrench, install elbow (V) and collar "CV3" (W) and elbow (X) and collar "CV4" (Y) on manifold (U).
13. Using adjustable wrench on elbow (V), use 7/8 inch wrench to install hose assembly "CV3" (Z).
14. Using adjustable wrench on elbow (X), use 7/8 inch wrench to install hose assembly "CV4" (AA).

Go on to Sheet 5

TA170395

HOLD DOWN CYLINDER HOSE ASSEMBLIES (CU1, CU2, CV1 THRU CV4) AND HYDRAULICS REPLACEMENT (Sheet 5 of 5)



15. Place nipple (AB) in vise.
16. Using adjustable wrench, install elbow (AC) and collar "CV3" (AD) on nipple (AB).
17. Use adjustable wrench to install elbow (AE) on nipple (AB). Aline elbows facing in opposite directions as shown.
18. Using adjustable wrench, install elbow (AC) nipple collar (AD), and nipple (AB) and elbow (AE) as an assembly. Aline as shown.
19. Insert hose assemblies "CV3" (Z) and "CV4" (AA) through armor (AF).
20. Using adjustable wrench on elbow (AC), use 7/8 inch wrench to install hose assembly "CV3" (Z).

21. Using 13/16 inch wrench, install adapter (AG) and collar "CV4" (AH).
22. Using 13/16 inch wrench on adapter (AG), use 7/8 inch wrench to install hose assembly "CV4" (AA).
23. Bleed hydraulic system (page 3-66).
24. Check for hydraulic leaks and correct as necessary.
25. Service hydraulic reservoir (LO 5-5420-226-12).
26. Close right side grille doors (TM 5-5420-226-10).
27. Install front quadrant (page 3-40) "CU1" and "CU2" hose assemblies only.
28. Install powerplant (TM 5-5420-226-20) "CV1" and "CV2" hose assemblies only.
29. Install holddown cylinder armor (page 3-247) "CV3" and "CV4" hose assemblies only.

End of Task

TA170396

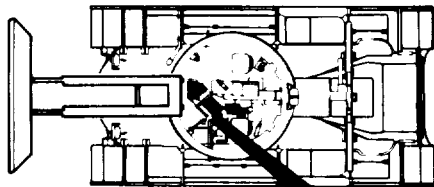
**EJECTION CYLINDER HOSE ASSEMBLIES (CP1 AND CP2) AND HYDRAULIC REPLACEMENT
(Sheet 1 of 2)**

TOOLS: 7/8 in. combination wrench
 11/16 in. open end wrench
 12 in. adjustable wrench
 1-1/4 in. open end wrench

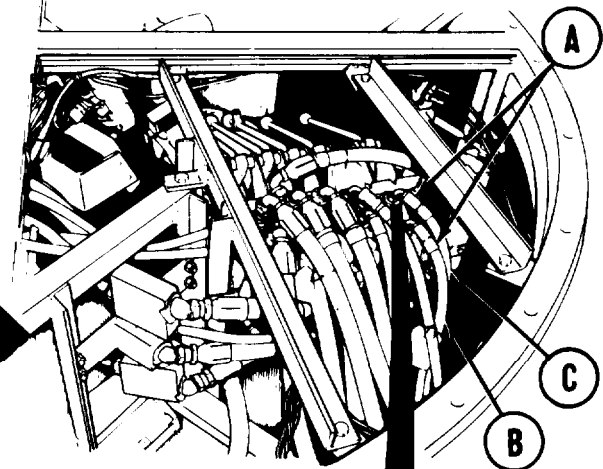
SUPPLIES: Drip pans
 Rags (Item 12, Appendix D)
 Pipe tape (Item 19, Appendix D)
 Pencil
 Preformed packings (4)
 Tags, identification

REFERENCE: LO 5-5420-226-12

PRELIMINARY PROCEDURES: Remove front quadrant (page 3-39)
 Relieve hydraulic pressure (page 3-65)



**QUADRANTS
 REMOVED
 FOR CLARITY**

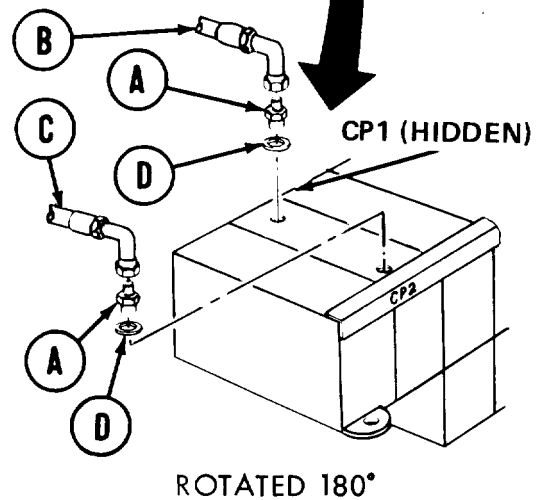


REMOVAL:

NOTE

Use rags and drip pans to catch excess hydraulic fluid. Use tags to identify lines for installation.

1. Using 1-1/4 inch wrench to hold adapters (A), use 11/16 inch wrench to remove two hose assemblies "CP1" (B) and "CP2" (C).
2. Using 1-1/4 inch wrench, remove two adapters (A) and preformed packings (D). Throw packings away.

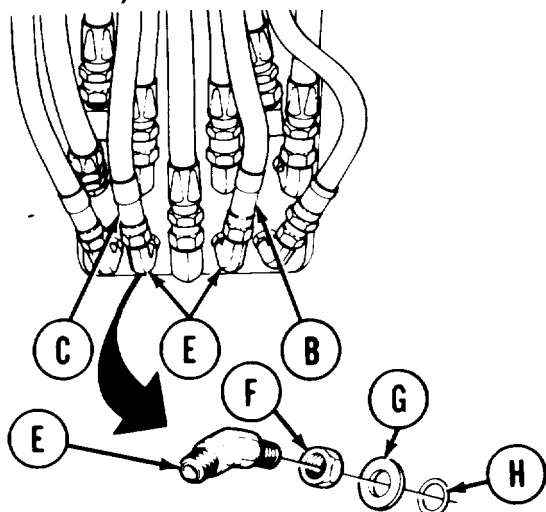


ROTATED 180°

Go on to Sheet 2

TA170397

EJECTION CYLINDER HOSE ASSEMBLIES (CP1 AND CP2) AND HYDRAULIC REPLACEMENT
 (Sheet 2 of 2)



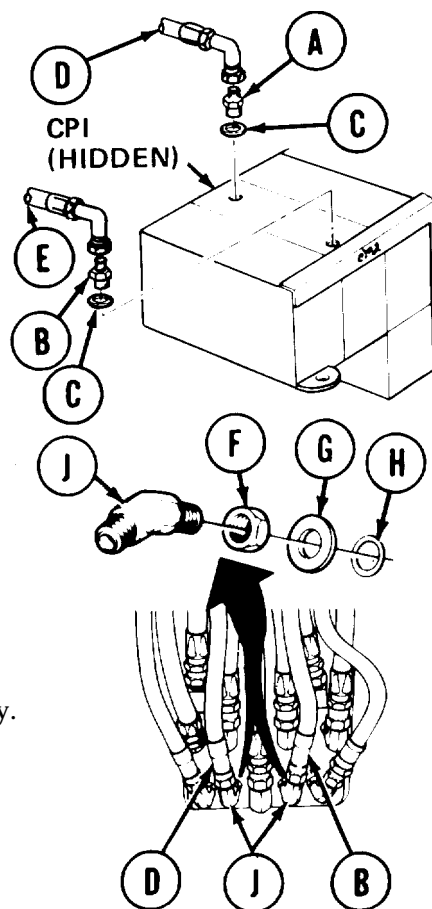
3. Using adjustable wrench to hold elbows (E), use 7/8 inch wrench to remove hose assemblies "CP1" (B) and "CP2" (C).
4. Using adjustable wrench to hold elbows (E), use 7/8 inch wrench to loosen elbow nuts (F).
5. Using adjustable wrench, remove elbows (E), flat washers (G), nuts (F), and preformed packings (H). Throw packings away.

INSTALLATION:

NOTE

Before installation, use pipe tape on all male threads. Start on second thread so tape will not enter hydraulic system.

1. Using 1-1/4 inch wrench, install adapters (A) and (B) and new preformed packings (C).
2. Using 1-1/4 inch wrench on adapters (A) and (B), use 11/16 inch wrench to install hose assemblies "CP1" (D) and "CP2" (E).
3. Manually install nuts (F), flat washers (G), and packings (H) on elbows (J).
4. Manually install and align elbows (J).
5. Using adjustable wrench on elbows (J), use 7/8 inch wrench to tighten elbow nuts (F).
6. Using adjustable wrench on elbows (J), use 7/8 inch wrench to install hose assemblies "CP1" (D) and "CP2" (E).
7. Bleed hydraulic system (page 3-66).
8. Check for hydraulic leaks and correct as necessary.
9. Install front quadrant (page 3-40).
10. Service hydraulic reservoir (LO 5-5420-226-12).



End of Task

TA170398

LOCKING CYLINDER HOSE ASSEMBLIES (EA1, CP3, CP4 and CS) AND HYDRAULICS REPLACEMENT (Sheet 1 of 4)

PROCEDURE INDEX

| PROCEDURE | PAGE |
|--------------|-------|
| Removal | 3-174 |
| Installation | 3-175 |

TOOLS: 12 in. adjustable wrench (2)
 8 in. pipe wrench
 11/16 in. open end wrench

15/16 in. open end wrench
 1-1/4 in. open end wrench
 7/8 in. open end wrench

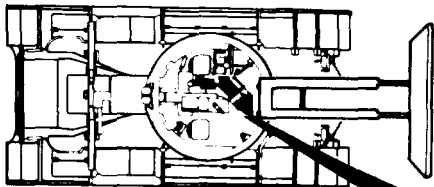
SUPPLIES: Drip pans
 Rags (Item 12, Appendix D)
 Pipe tape (Item 19, Appendix D)

Pencil
 Tags, identification
 Preformed packing (4 required)

REFERENCE: LO 5-5420-226-12

PRELIMINARY PROCEDURES:

Remove front quadrant (page 3-39)
 Relieve hydraulic pressure (page 3-65)



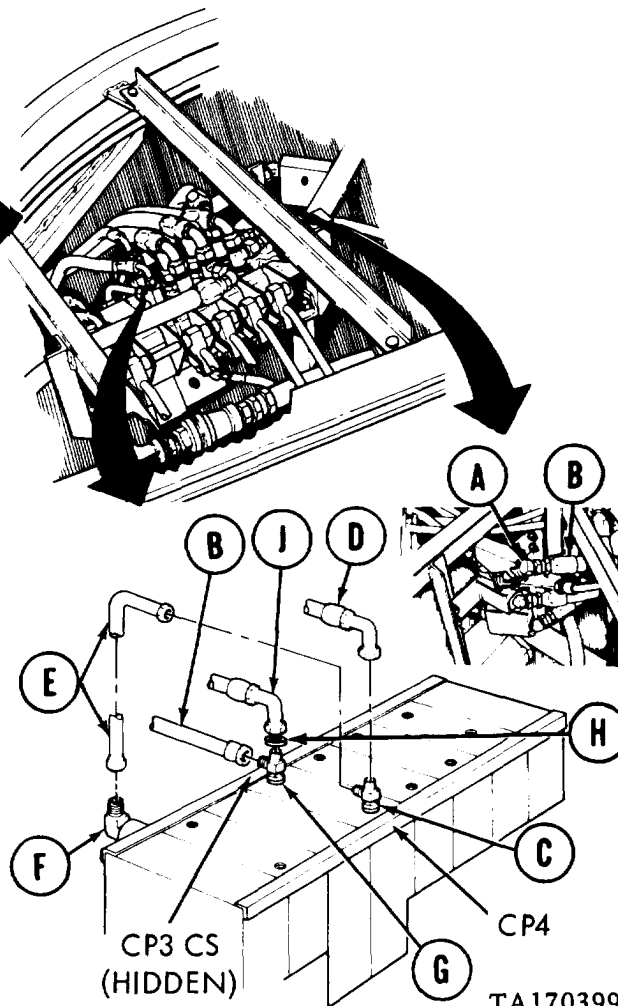
QUADRANTS REMOVED FOR CLARITY

REMOVAL:

NOTE

Use rags and drip pans to catch excess hydraulic fluid. Use tags to identify lines for installation.

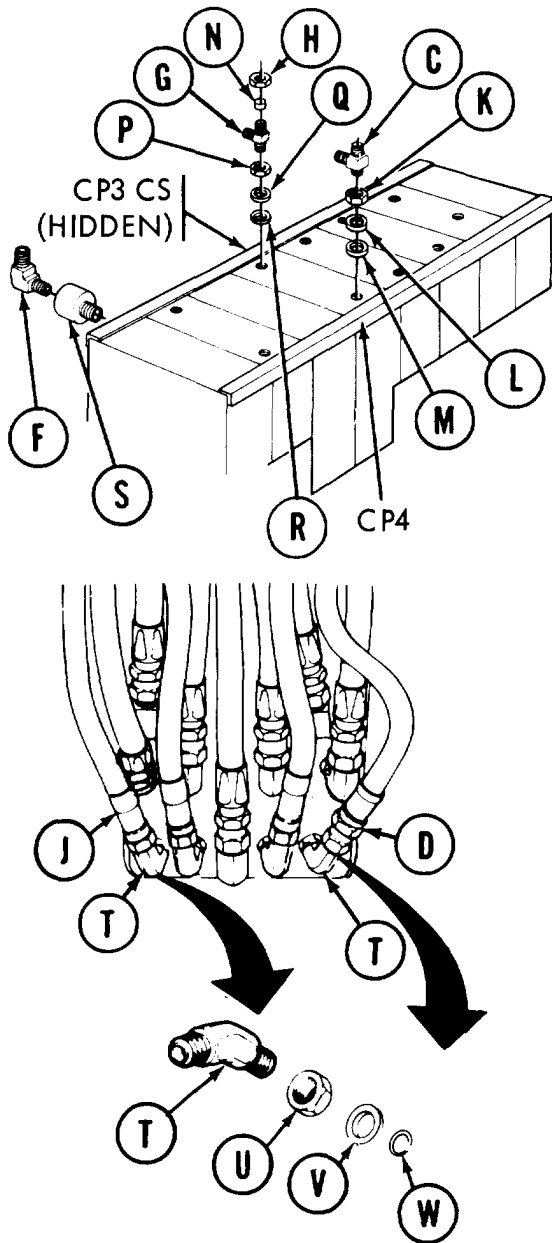
- Using adjustable wrench on elbow (A), use 1-1/4 inch wrench to remove hose assembly "CS" (B).
- Using adjustable wrench on tee (C), use adjustable wrench to disconnect hose assemblies "CP4" (D) and "EA1" (E).
- Using adjustable wrench on elbow (F), use 15/16 inch wrench to remove hose assembly "EA1" (E).
- Using adjustable wrench on tee (G), use 1-1/4 inch wrench to remove hose assembly "CS" (B).
- Using 1-1/4 inch wrench on nut (H), use 11/16 inch wrench to remove hose assembly "CP3" (J).



Go on to Sheet 2

TA170399

LOCKING CYLINDER HOSE ASSEMBLIES (EA1, CP3, CP4 and CS) AND HYDRAULICS REPLACEMENT (Sheet 2 of 4)



6. Holding tee (C) with adjustable wrench, use 1-1/4 inch wrench to loosen nut (K).
7. Using adjustable wrench, remove tee (C), nut (K), flat washer (L), and preformed packing (M). Throw preformed packing (M) away.
8. Using 1-1/4 inch wrench, remove nut (H) and sleeve (N) as an assembly from tee (G).
9. Push sleeve (N) out of nut (H).
10. Using adjustable wrench, remove tee (G), nut (P), flat washer (Q), and preformed packing (R). Throw preformed packing (R) away.
11. Using adjustable wrench on elbow (F) and pipe wrench on coupling (S), remove elbow (F).
12. Using pipe wrench, remove coupling (S).
13. Using adjustable wrench on elbows (T), use 7/8 inch wrench to remove hose assemblies "CP3" (J) and "CP4" (D).
14. Using adjustable wrench to hold elbows (T), use 7/8 inch wrench to loosen nuts (U).
15. Using adjustable wrench, remove two elbows (T), nuts (U), flat washers (V), and preformed packings (W). Throw preformed packings (W) away.

INSTALLATION:

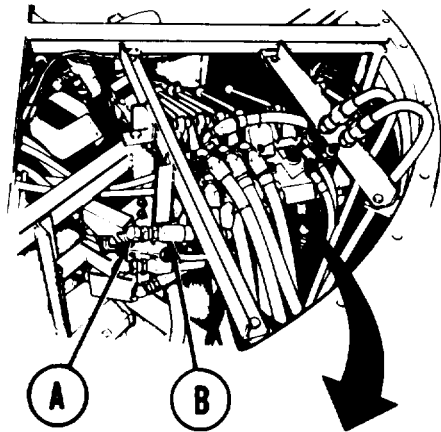
NOTE

Before installation, use pipe tape on all male threads. Start tape on second thread so tape will not enter hydraulic system.

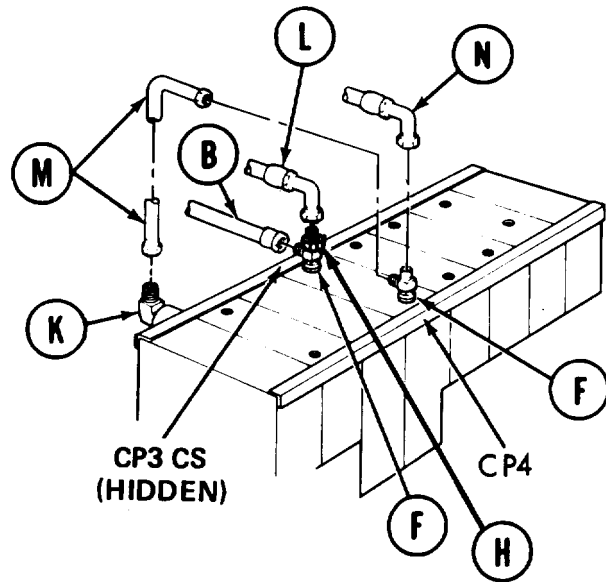
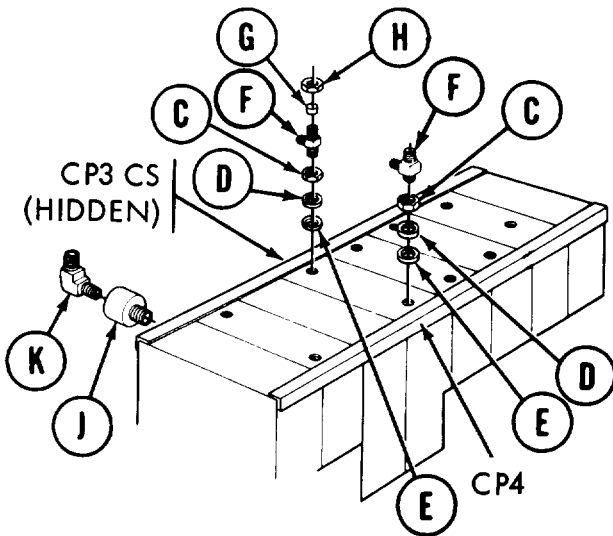
Go on to Sheet 3

TA170400

LOCKING CYLINDER HOSE ASSEMBLIES (EA1, CP3, CP4 and CS) AND HYDRAULICS REPLACEMENT (Sheet 3 of 4)



1. Using adjustable wrench on elbow (A), use 1-1/4 inch wrench to connect hose assembly "CS" (B).
2. Manually install nuts (C), flat washers (D), and preformed packings (E) onto tees (F).
3. Using adjustable wrench, install tees (F). Aline tees (F) as shown.
4. Install sleeve (G) into nut (H).
5. Using 1-1/4 inch wrench, install nut (H) and sleeve (G) as an assembly on tee (F).
6. Using pipe wrench, install coupling (J).
7. Using pipe wrench on coupling (J), use adjustable wrench to install and aline elbow (K), as shown.

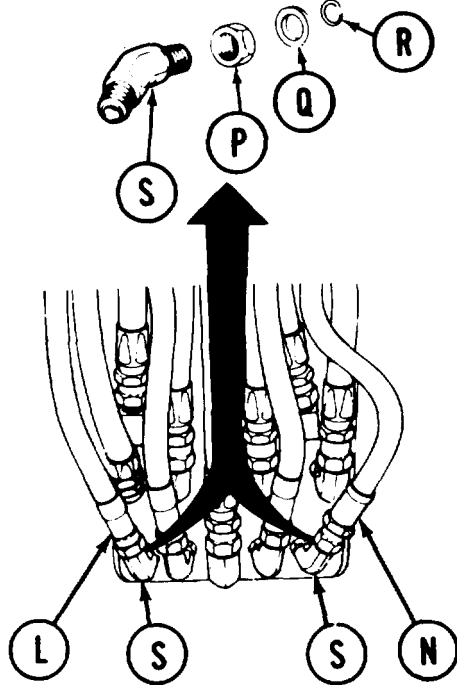


8. Using adjustable wrench to hold tee (F), use 1-1/4 inch wrench to install hose assembly "CS" (B).
9. Using 1-1/4 inch wrench on nut (H), use 11/16 inch open end wrench to connect hose assembly "CP3" (L).
10. Using adjustable wrench on tee (F), use adjustable wrench to connect hose assemblies "EA1" (M) and "CP4" (N).
11. Using adjustable wrench on elbow (K), use 15/16 inch wrench to install hose assembly "EA1" (M).

Go on to Sheet 4

TA170401

LOCKING CYLINDER HOSE ASSEMBLIES (EA1, CP3, CP4 and CS) AND HYDRAULICS REPLACEMENT (Sheet 4 of 4)



12. Manually install nuts (P), flat washers (Q), and preformed packings (R) on elbows (S).
13. Manually install and align elbows (S).
14. Using adjustable wrench to hold elbows (S), use 7/8 inch wrench to tighten nuts (P).
15. Using adjustable wrench on elbows (S), use 7/8 inch wrench to install hose assemblies "CP3" (L) and "CP4" (N).
16. Bleed hydraulic system (page 3-66).
17. Check for hydraulic leaks and correct as necessary.
18. Install front quadrant (page 3-40).
19. Service hydraulic reservoir (LO 5-5420-226-12).

End of Task

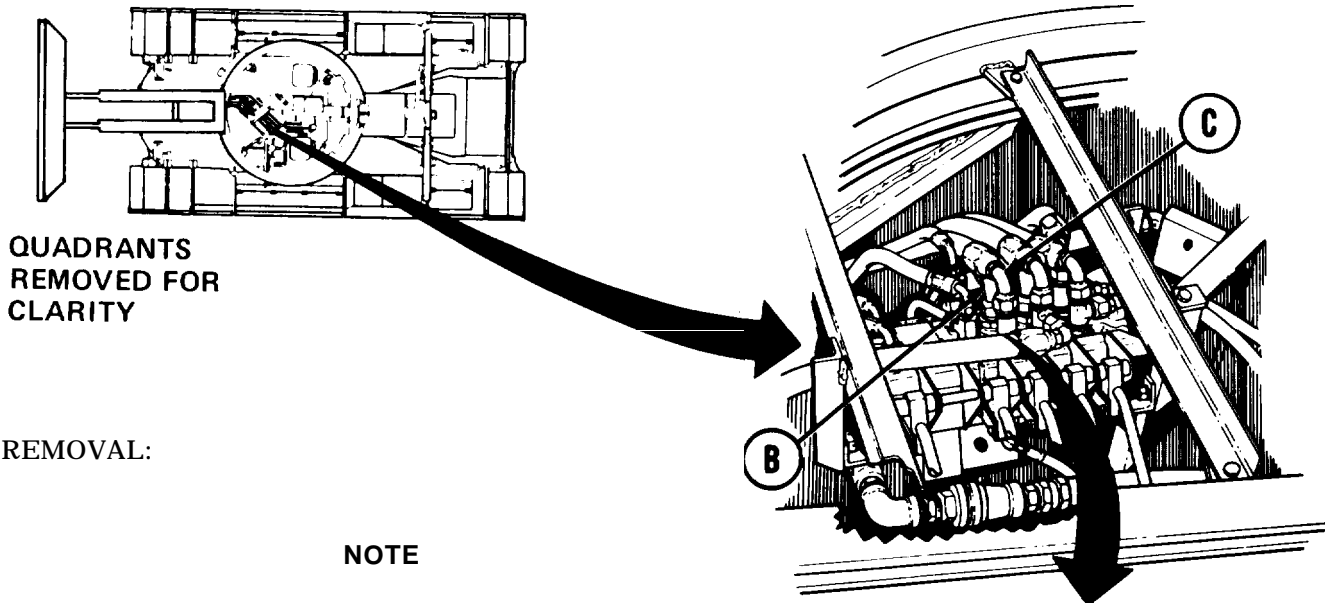
SCISSORS CYLINDER HOSE ASSEMBLIES (DA1 AND DA2) AND HYDRAULICS REPLACEMENT (Sheet 1 of 2)

TOOLS: 1-1/4 in. open end wrench (2)
12 in. adjustable wrench

SUPPLIES: Drip pans
Rags (Item 12, Appendix D)
Pipe tape (Item 19, Appendix D)
Pencil
Masking tape (Item 18, Appendix D)
Preformed packings (4 required)

REFERENCE: LO 5-5420-226-12

PRELIMINARY PROCEDURES: Remove front quadrant (page 3-39)
Relieve hydraulic pressure (page 3-65)



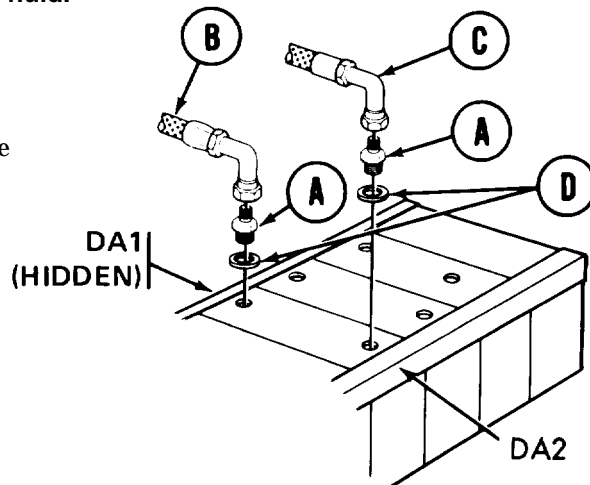
QUADRANTS
REMOVED FOR
CLARITY

REMOVAL:

NOTE

Use rags and drip pans to catch excess hydraulic fluid.
Use tags to identify lines for installation.

1. Using 1-1/4 inch wrench on adapters (A), use 1-1/4 inch wrench to disconnect hose assemblies "DA1" (B) and "DA2" (C).
2. Using 1-1/4 inch wrench, remove two adapters (A) and preformed packings (D). Throw packings away.

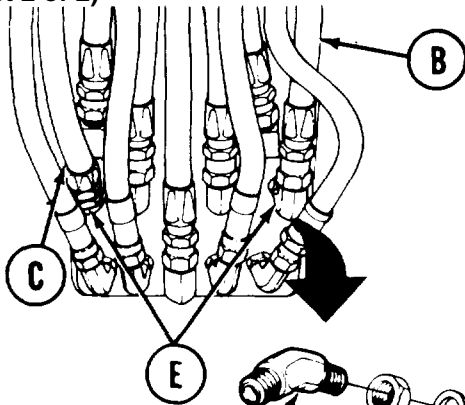


Go on to Sheet 2

TA170403

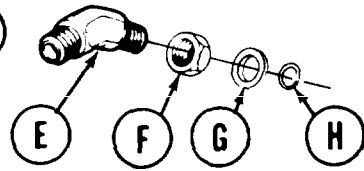
SCISSORS CYLINDER HOSE ASSEMBLIES (DA1 AND DA2) AND HYDRAULICS REPLACEMENT

(Sheet 2 of 2)



3. Using adjustable wrench on elbows (E), use 1-1/4 inch wrench to remove hose assemblies "DA1" (B) and "DA2" (C).
4. Using adjustable wrench to hold elbows (E), use 1-1/4 inch wrench to loosen elbow nuts (F).
5. Using adjustable wrench, remove two elbows (E), flat washers (G), nuts (F), and preformed packings (H). Throw away packings.

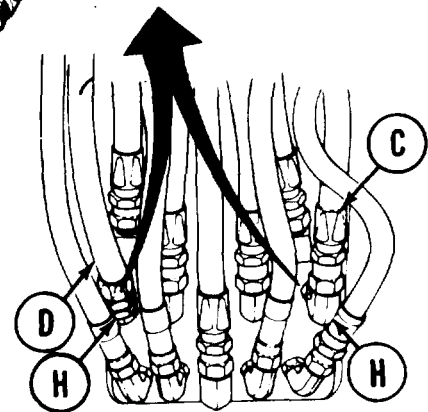
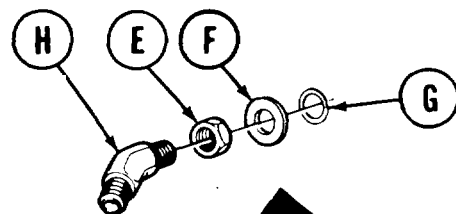
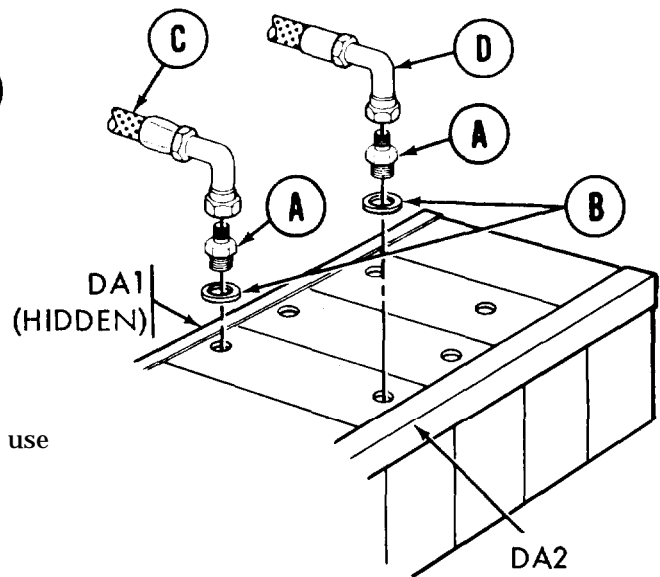
INSTALLATION:



NOTE

Before installation, use pipe tape on all male threads. Start tape on second thread so tape will not enter hydraulic system.

1. Using 1-1/4 inch wrench, install two adapters (A) and new preformed packings (B).
2. Using 1-1/4 inch wrench on adapters (A), use 1-1/4 inch wrench to connect hose assemblies "DA1" (C) and "DA2" (D).
3. Manually install nuts (E), flat washers (F), and preformed packing (G) on elbows (H).
4. Manually install two elbows (H) and align elbows.
5. Using adjustable wrench to hold elbows (H), use 1-1/4 inch wrench to tighten elbow nuts (E).
6. Using adjustable wrench on elbows (H), use 1-1/4 inch wrench to install hose assemblies "DA1" (C) and "DA2" (D).
7. Bleed hydraulic system (page 3-66).
8. Check for hydraulic leaks and correct as necessary.
9. Install front quadrant (page 3-40).
10. Service hydraulic reservoir (LO 5-5420-226-12).



End of Task

TA170404

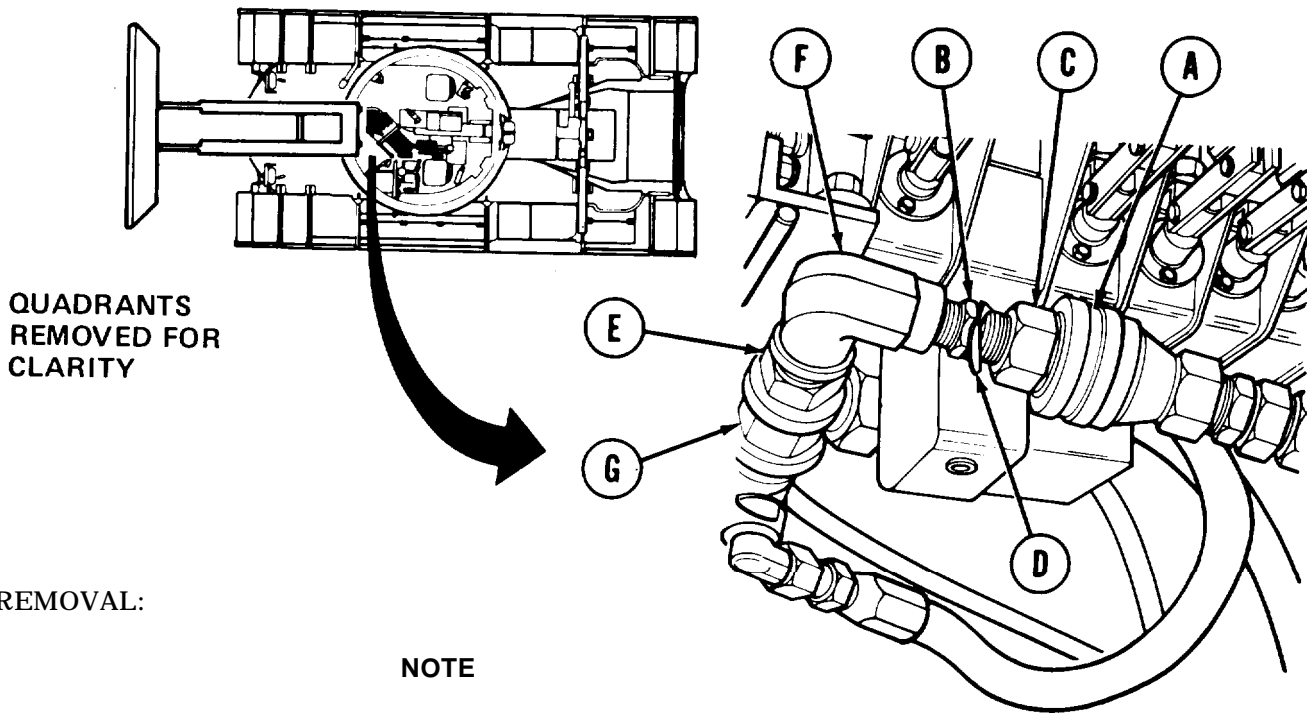
VALVE BANK RETURN PORT FITTINGS REPLACEMENT (Sheet 1 of 3)

TOOLS: 12 in. adjustable wrench
1-1/4 in. open end wrench
1-5/8 in. open end wrench
1-1/8 in. open end wrench
1-3/8 in. open end wrench
15 in. adjustable wrench

SUPPLIES: Rags (Item 12, Appendix D)
Drip pans
Pipe tape (Item 19, Appendix D)

REFERENCE: LO 5-5420-226-12

PRELIMINARY PROCEDURE: Relieve hydraulic pressure (page 3-65).



REMOVAL:

NOTE

Use rags and drip pans to catch excess hydraulic fluid.

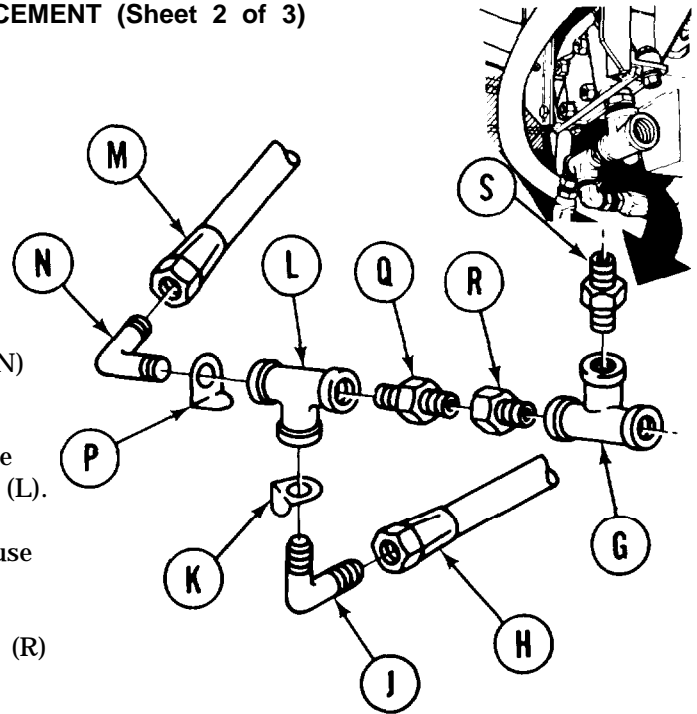
1. Manually disconnect quick disconnect socket "BB" (A).
2. Using 1-3/8 inch wrench to hold nipple (B), use 1-5/8 inch wrench to remove quick disconnect plug (C) and collar (D).
3. Using 1-3/8 inch wrench, remove nipple (B).
4. Using 1-3/8 inch wrench to hold nipple (E), use 15 inch adjustable wrench to remove elbow (F).
5. Using 1-3/8 inch wrench, remove nipple (E) from tee (G).

Go on to Sheet 2

TA170405

VALVE BANK RETURN PORT FITTINGS REPLACEMENT (Sheet 2 of 3)

6. Using 1-1/4 inch wrench, remove hose assembly "CR" (H) from elbow (J).
7. Using 12 inch adjustable wrench, remove elbow (J) and collar (K) from tee (L).
8. Using 1-1/4 inch wrench, remove hose assembly "F" (M).
9. Using adjustable wrench, remove elbow (N) and collar (P).
10. Using 1-1/8 inch wrench on nipple (Q), use 12 inch adjustable wrench to remove tee (L).
11. Using 1-3/8 inch wrench on bushing (R), use 1-1/8 inch wrench to remove nipple (Q).
12. Using 1-3/8 inch wrench, remove bushing (R) from tee (G).
13. While holding nipple (S) with 1-3/8 inch wrench, use 12 inch adjustable wrench to remove tee (G) from nipple (S).
14. Using 1-3/8 inch wrench, remove nipple (S) from valve bank.

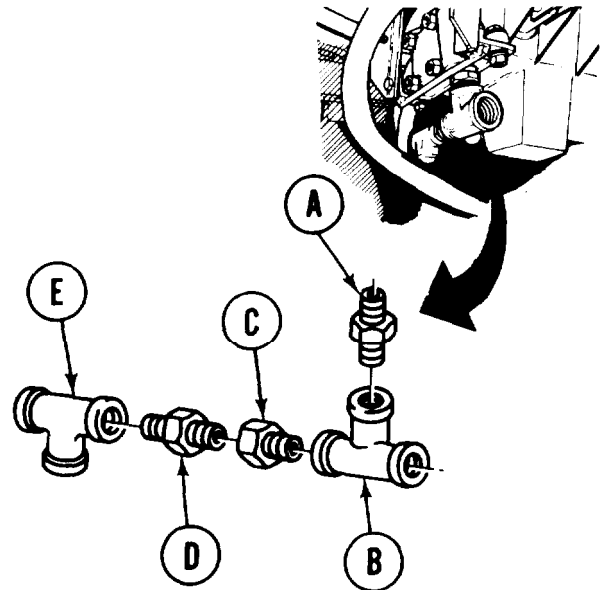


INSTALLATION:

NOTE

Before installation, use pipe tape on all male threads. Start tape on second thread so tape will not enter hydraulic system.

1. Using 1-3/8 inch wrench, install nipple (A) into valve bank.
2. Using 1-3/8 inch wrench to hold nipple (A), use 12 inch adjustable wrench to install tee (B).
3. Using 1-3/8 inch wrench, install bushing (C).
4. Using 1-3/8 inch wrench to hold bushing (C), use 1-1/8 inch wrench to install nipple (D).
5. Holding nipple (D) with 1-1/8 inch wrench, use 12 inch adjustable wrench to install tee (E).

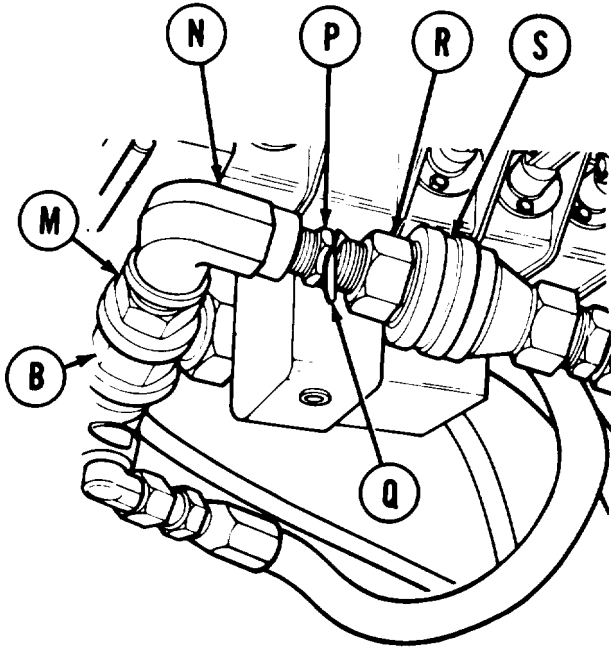
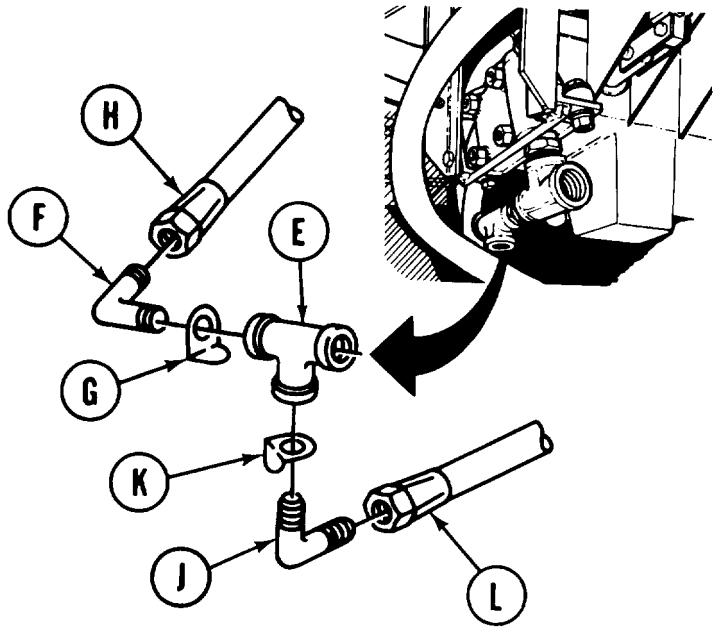


Go on to Sheet 3

TA170406

VALVE BANK RETURN PORT FITTINGS REPLACEMENT (Sheet 3 of 3)

6. Using 12 inch adjustable wrench, install elbow (F) and collar "F" (G) into tee (E).
7. Using 1-1/4 inch wrench, install hose assembly "F" (H).
8. Using 12 inch adjustable wrench, install elbow (J) and collar "CR" (K).
9. Using 1-1/4 inch wrench, install hose assembly "CR" (L).



10. Using 1-3/8 inch wrench, install nipple (M) on tee (B).
11. Holding nipple (M) with a 1-3/8 inch wrench, use 15 inch adjustable wrench to install elbow (N) on nipple (M).
12. Using 1-3/8 inch wrench, install nipple (P).
13. While holding nipple (P) with 1-3/8 inch wrench, use 1-5/8 inch wrench to install collar "BB" (Q) and quick disconnect plug (R) on nipple (P).
14. Manually connect quick disconnect socket "BB" (S).

15. Bleed hydraulic system (page 3-66).
16. Check for hydraulic leaks and correct as necessary.
17. Service hydraulic reservoir (LO 5-5420-226-12).

End of Task

TA170407

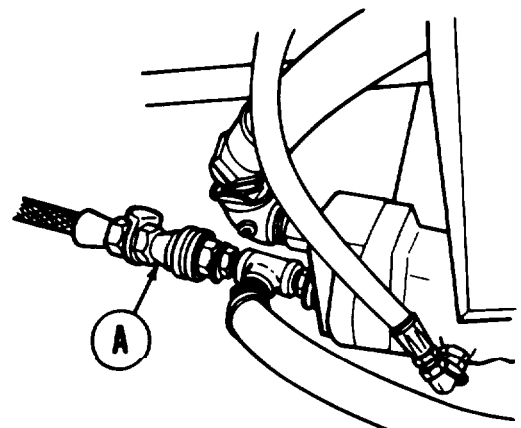
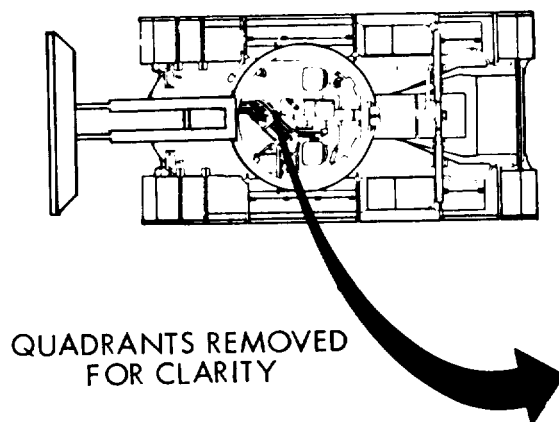
PUMP-TO-VALVE BANK HOSE ASSEMBLY (CW) REPLACEMENT (Sheet 1 of 2)

TOOLS: 1-1/2 in. open end wrench
 1-5/8 in. open end wrench
 12 in. adjustable wrench
 1-3/8 in. open end wrench

SUPPLIES: Pipe tape (Item 19, Appendix D)
 Rags (Item 12, Appendix D)
 Drip pans
 Plastic plugs

REFERENCE: LO 5-5420-226-12

PRELIMINARY PROCEDURE: Relieve hydraulic pressure (page 3-65)



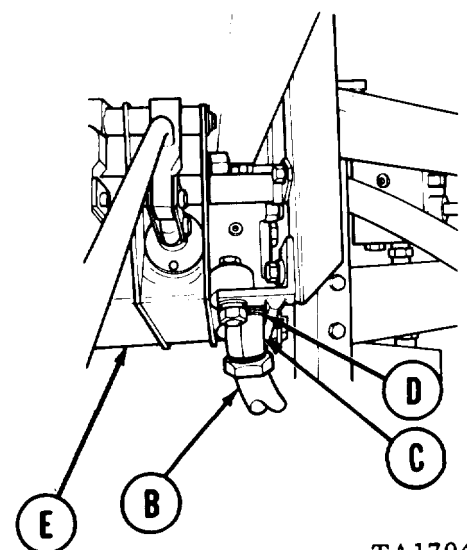
REMOVAL:

NOTE

Use drip pan and rags to catch excess hydraulic fluid.

1. Using fingers, disconnect quick disconnect socket (A).
2. Using 1-1/2 inch wrench, remove hose assembly "CW" (B) from elbow (C).
3. Using adjustable wrench, remove elbow (C) and collar (D) from valve bank (E).

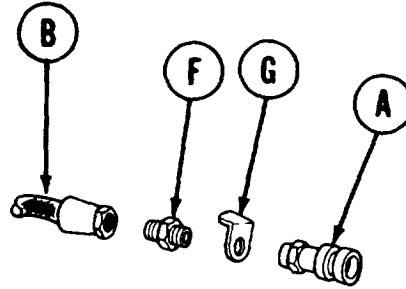
Go on to Sheet 2



TA170408

PUMP-TO-VALVE BANK HOSE ASSEMBLY (CW) REPLACEMENT (Sheet 2 of 2)

4. Using 1-1/2 inch wrench to hold adapter (F), use 1-5/8 inch wrench to remove quick disconnect (A).
5. Using 1-1/2 inch wrench to hold adapter (F), use 1-3/8 inch wrench to disconnect hose assembly (B) and collar (G).

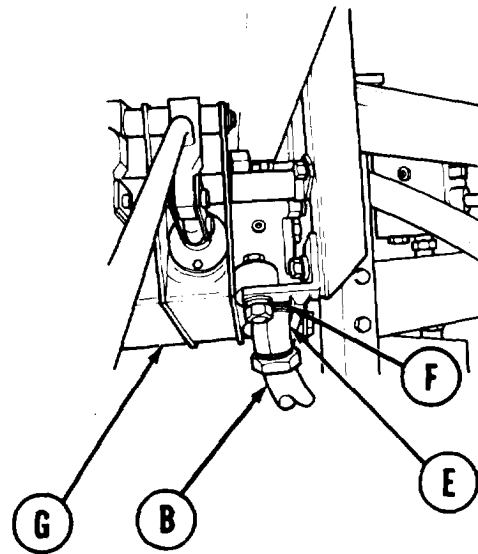
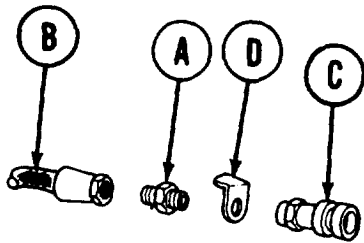


INSTALLATION:

NOTE

Before installation, use pipe tape on all male pipe threads. Start tape on second thread so tape will not enter hydraulic system. Remove all caps and plugs as necessary during installation.

1. Using 1-1/2 inch wrench to hold adapter (A), use 1-3/8 inch wrench to install hose assembly (B).
2. Using 1-1/2 inch wrench to hold adapter (A), use 1-5/8 inch wrench to install quick disconnect socket (C) and collar (D).
3. Using fingers, connect quick disconnect socket (C).



4. Using adjustable wrench, install elbow (E) and collar (F) on valve bank (G).
5. Using 1-1/2 inch wrench, connect end of hose assembly "CW" (B) on elbow (E).

6. Bleed hydraulic system (page 3-66).
7. Check for hydraulic leaks and correct as necessary.
8. Service hydraulic reservoir (LO 5-5420-226-12).

End of Task

TA170409

RESERVOIR-TO-VALVE BANK RETURN HOSE ASSEMBLY (BB) REPLACEMENT (Sheet 1 of 3)

TOOLS: 1-3/8 in. open end wrench
 1-1/2 in. open end wrench
 1-5/8 in. open end wrench

SUPPLIES: Pipe tape (Item 19, Appendix D)
 Drip pans
 Rags (Item 12, Appendix D)
 Bucket

REFERENCE: LO 5-5420-226-12

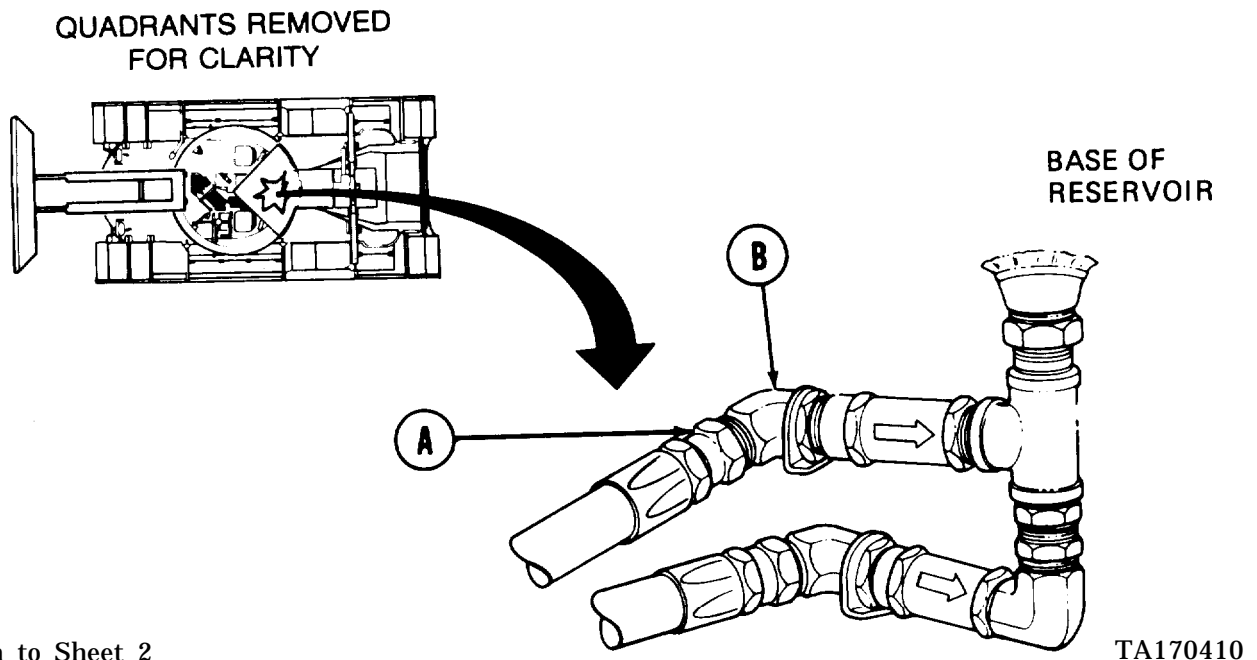
PRELIMINARY PROCEDURE: Drain hydraulic reservoir (page 3-68)

REMOVAL:

NOTE

Use rags and drip pan to catch hydraulic fluid trapped in line.

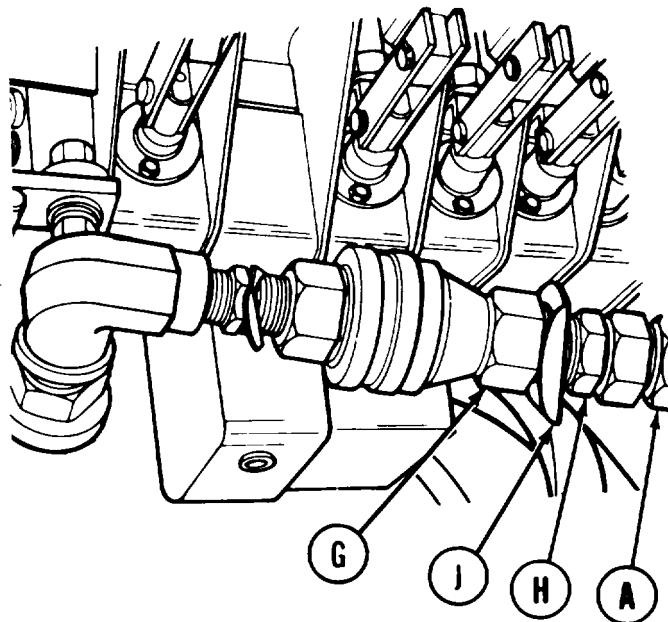
- Using 1-1/2 inch wrench, disconnect hose assembly "BB" (A) from elbow (B).



Go on to Sheet 2

RESERVOIR-TO-VALVE BANK RETURN HOSE ASSEMBLY (BB) REPLACEMENT (Sheet 2 of 3)

2. Using fingers, disconnect quick disconnect coupling half (G).
3. Using 1-3/8 inch wrench on adapter (H), use 1-5/8 inch wrench to remove quick disconnect coupling half (G) and collar "BB" (J).
4. Using 1-3/8 inch wrench on adapter (H), use 1-1/2 inch wrench on hose assembly "BB" (A) and remove adapter (H).

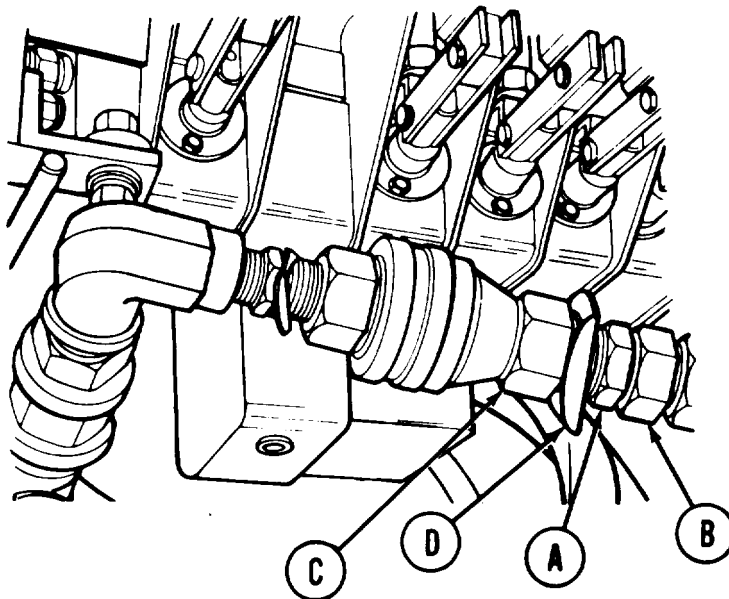


INSTALLATION:

NOTE

Before installation, use pipe tape on all male pipe threads. Start tape on second thread so tape will not enter hydraulic system.

1. Using 1-3/8 inch wrench on adapter (A), use 1-1/2 inch wrench to connect hose assembly "BB" (B).
2. Using 1-3/8 inch wrench on adapter (A), use 1-5/8 inch wrench to install quick disconnect coupling half (C) and collar "BB" (D).
3. Using fingers, connect quick disconnect coupling half (C).

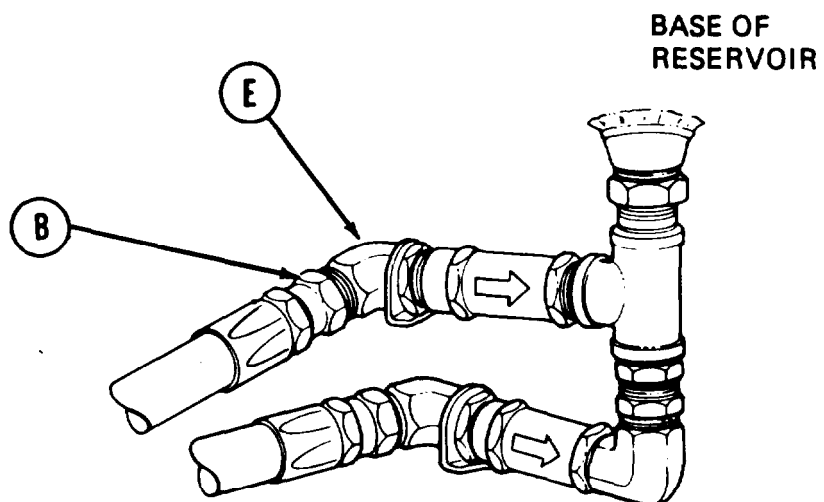


Go on to Sheet 3

TA170411

RESERVOIR-TO-VALVE BANK RETURN HOSE ASSEMBLY (BB) REPLACEMENT (Sheet 3 of 3)

4. Using 1-1/2 inch wrench, install hose assembly "BB" (B) on elbow (E).
5. Service hydraulic reservoir (LO 5-5420-226-12).
6. Bleed hydraulic system (page 3-66).
7. Check for hydraulic leaks and correct as necessary.
8. Service hydraulic reservoir (LO 5-5420-226-12).



End of Task

TA170412

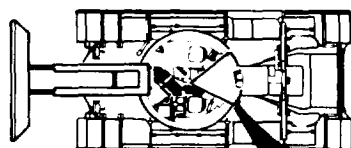
RESERVOIR-TO-PUMP HOSE ASSEMBLY (CV5) R EMPLACEMENT (Sheet 1 of 3)

TOOLS: 7/8 in. open end wrench
1-1/8 in. open end wrench
1-7/16 in. open end wrench
1-3/4 in. open end wrench
12 in. adjustable wrench

SUPPLIES: Pipe tape (Item 19, Appendix D)
Drip pans
Rags (Item 12, Appendix D)
Masking tape (Item 18, Appendix D)
Pencil

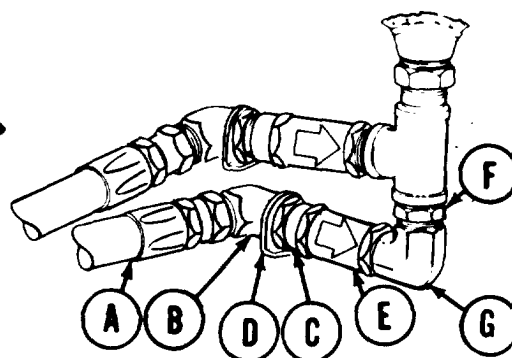
REFERENCE: LO 5-5420-226-12

PRELIMINARY PROCEDURE: Drain hydraulic reservoir (page 3-68)



QUADRANTS REMOVED FOR CLARITY

BASE OF RESERVOIR



REMOVAL:

NOTE

Use drip pan and rags to catch hydraulic fluid trapped in lines. Use masking tape to tag lines for installation.

1. Using 7/8 inch wrench, disconnect hose assembly "CV5" (A) from elbow (B).
2. Using 1-1/8 inch wrench to hold bushing (C), use adjustable wrench to remove elbow (B) and collar (D).
3. Using 1-7/16 inch wrench to hold check valve (E), use 1-1/8 inch wrench to remove bushing (C).
4. Using 1-7/16 inch wrench, remove check valve (E).
5. Using 1-3/4 inch wrench to hold bushing (F), use adjustable wrench to remove elbow (G).

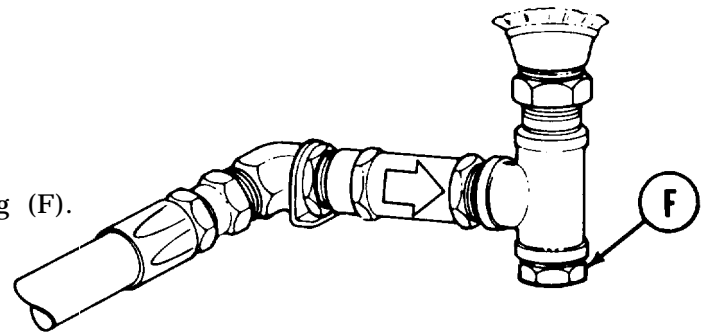
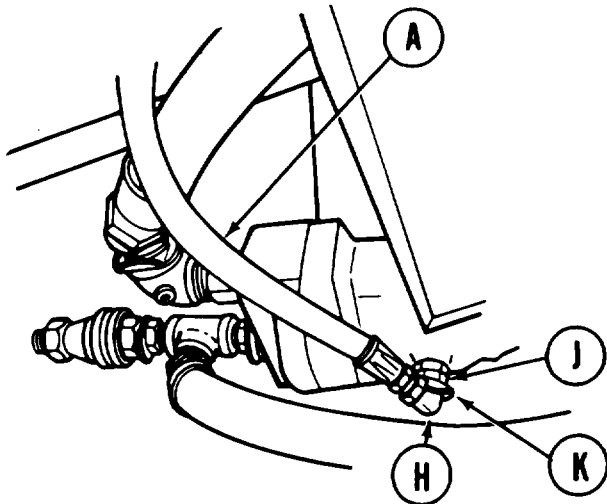
Go on to Sheet 2

TA170413

RESERVOIR-TO-PUMP HOSE ASSEMBLY (CV5) REPLACEMENT (Sheet 2 of 3)

BASE OF RESERVOIR

6. Using 1-3/4 inch wrench, remove bushing (F).



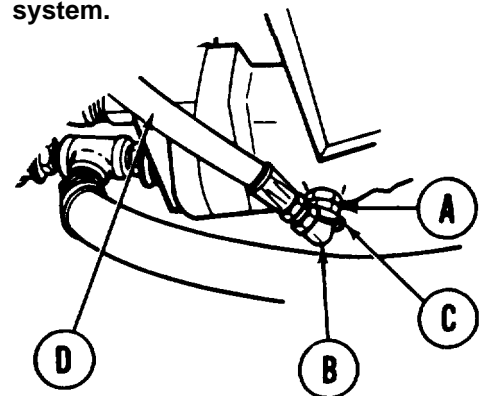
7. Using 7/8 inch wrench, remove hose assembly "CV5" (A) from elbow (H).
8. Using 1-1/8 inch wrench to hold bushing (J), use adjustable wrench to remove elbow (H) and collar (K).
9. Using 1-1/8 inch wrench, remove bushing (J).

INSTALLATION:

NOTE

Before installing fittings, use pipe, tape on male threads. Start tape on second thread so tape will not enter hydraulic system.

1. Using 1-1/8 inch wrench, install bushing (A).
2. Using 1-1/8 inch wrench to hold bushing (A), use adjustable wrench to install elbow (B) and collar (C).
3. Using 7/8 inch wrench, connect hose assembly "CV5" (D) on elbow (B).

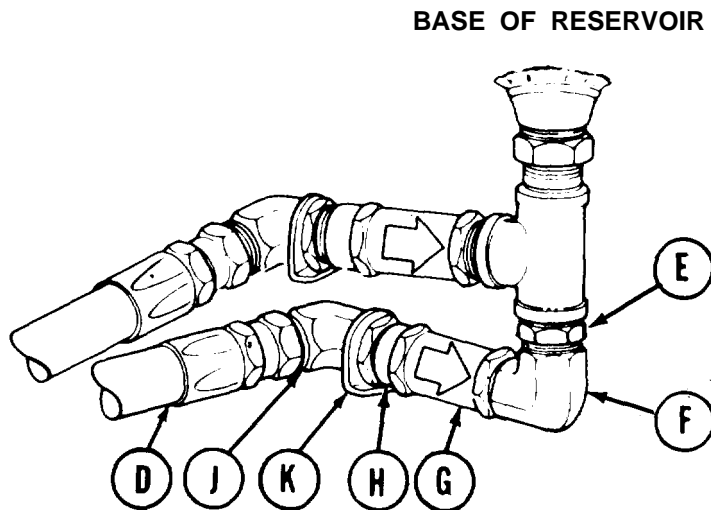


Go on to Sheet 3

TA170414

RESERVOIR-TO-PUMP HOSE ASSEMBLY (CV5) REPLACEMENT (Sheet 3 of 3)

4. Using 1-3/4 inch wrench, install bushing (E).
5. Using 1-3/4 inch wrench to hold bushing (E), use adjustable wrench to install elbow (F).



6. Using 1-7/16 inch wrench, install check valve (G) with flow arrow pointing to elbow (F).
7. Using 1-7/16 inch wrench to hold check valve (G), use 1-1/8 inch wrench to install bushing (H).
8. Using 1-1/8 inch wrench to hold bushing (H), use adjustable wrench to install elbow (J) and collar (K).
9. Using 7/8 inch wrench, install hose assembly "CV5" (D).
10. Service hydraulic reservoir (LO 5-5420-226-12).
11. Bleed hydraulic system (page 3-66).
12. Check for hydraulic leaks and correct as necessary.
13. Service hydraulic reservoir (LO 5-5420-226-12).

End of Task

TA170415

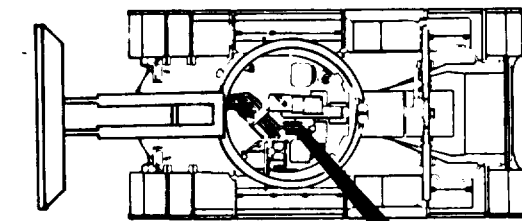
MASTER RELIEF VALVE-TO-PUMP HOSE ASSEMBLY (BA) REPLACEMENT (Sheet 1 of 3)

TOOLS: 1-1/2 in. open end wrench
 12 in. adjustable wrench
 7/16 in. combination wrench

SUPPLIES: Drip pans
 Rags (Item 12, Appendix D)
 Pipe tape (Item 19, Appendix D)

REFERENCES: LO 5-5420-226-12

PRELIMINARY PROCEDURE: Drain hydraulic reservoir (page 3-68)



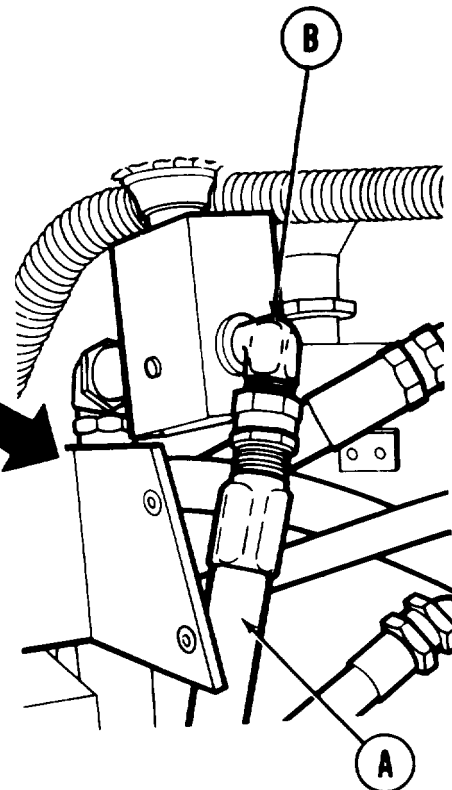
QUADRANTS REMOVED FOR CLARITY

REMOVAL:

NOTE

Use drip pan and rags to catch hydraulic fluid caught in lines.

1. Using 1-1/2 inch wrench, remove hose assembly "BA" (A) from elbow (B).

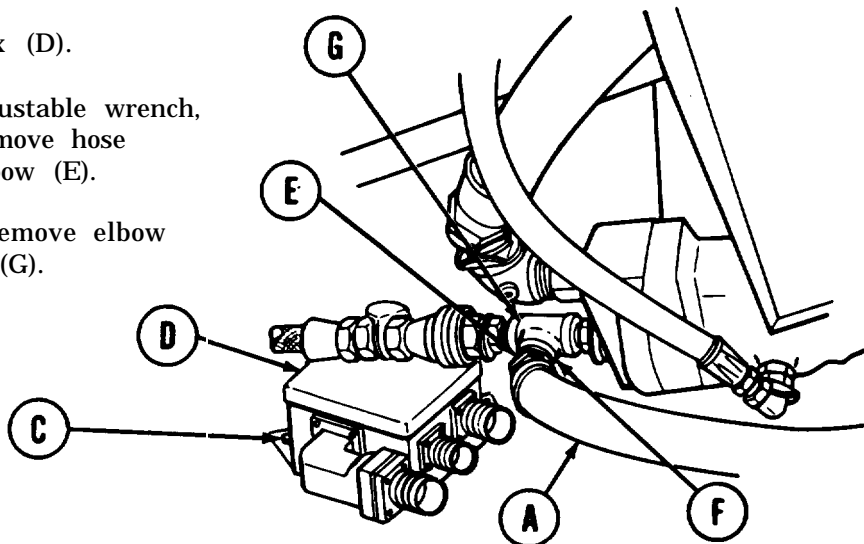


Go on to Sheet 2

TA170416

MASTER RELIEF VALVE-TO-PUMP HOSE ASSEMBLY (BA) REPLACEMENT (Sheet 2 of 3)

2. Using 7/16 inch wrench, remove two screws (C).
3. Displace interconnector box (D).
4. Holding elbow (E) with adjustable wrench, use open end wrench to remove hose assembly "BA" (A) from elbow (E).
5. Using adjustable wrench, remove elbow (E) and collar (F) from tee (G).

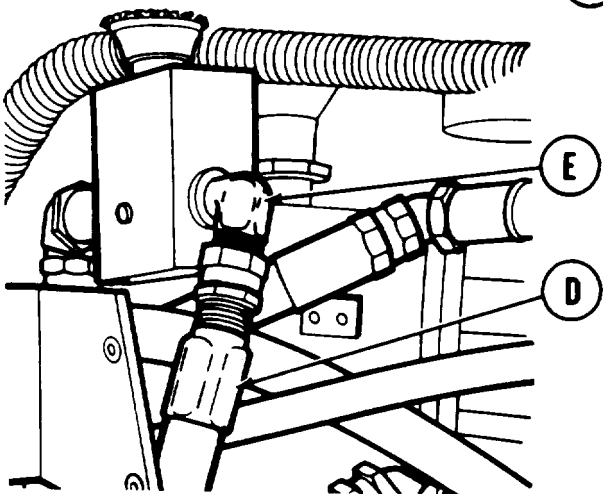
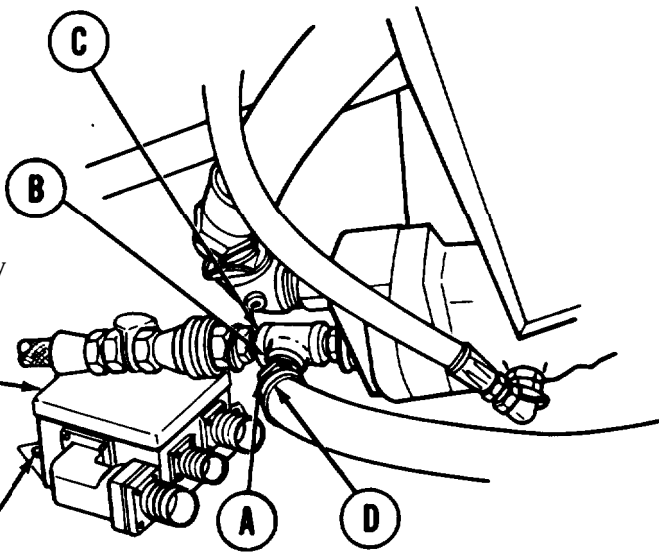


INSTALLATION:

NOTE

Before installing, use pipe tape on all male threads. Start tape on second thread so tape will not enter hydraulic system.

1. Using adjustable wrench, install elbow (A) and collar (B) on tee (C).
2. Using open end wrench, install hose assembly "BA" (D) on elbow (A).



3. Using open end wrench, install hose assembly "BA" (D) on elbow (E).
4. Place interconnector box (F) in position.
5. Using 7/16 inch wrench, install two screws (G).
6. Service hydraulic reservoir (LO 5-5420-226-12).

Go on to Sheet 3

TA170417

MASTER RELIEF VALVE-TO-PUMP HOSE ASSEMBLY (BA) REPLACEMENT (Sheet 3 of 3)

7. Bleed hydraulic system (page 3-66).
8. Check for hydraulic leaks and correct as necessary.
9. Service hydraulic reservoir (LO 5-5420-226-12).

End of Task

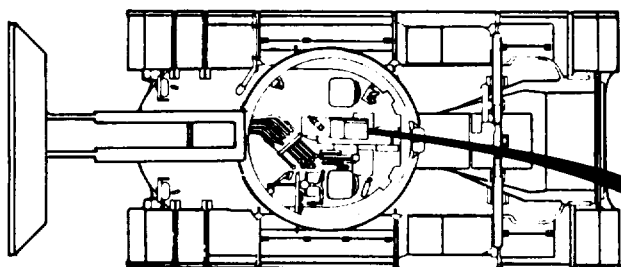
FILTER-TO-PUMP HOSE ASSEMBLY (CZ) REPLACEMENT (Sheet 1 of 3)

TOOLS: 15 in. adjustable wrench
14 in. pipe wrench

SUPPLIES: Pipe tape (Item 19, Appendix D)
Drip pans
Rags (Item 12, Appendix D)

REFERENCE: LO 5-5420-226-12

PRELIMINARY PROCEDURE: Drain hydraulic reservoir (page 3-68)



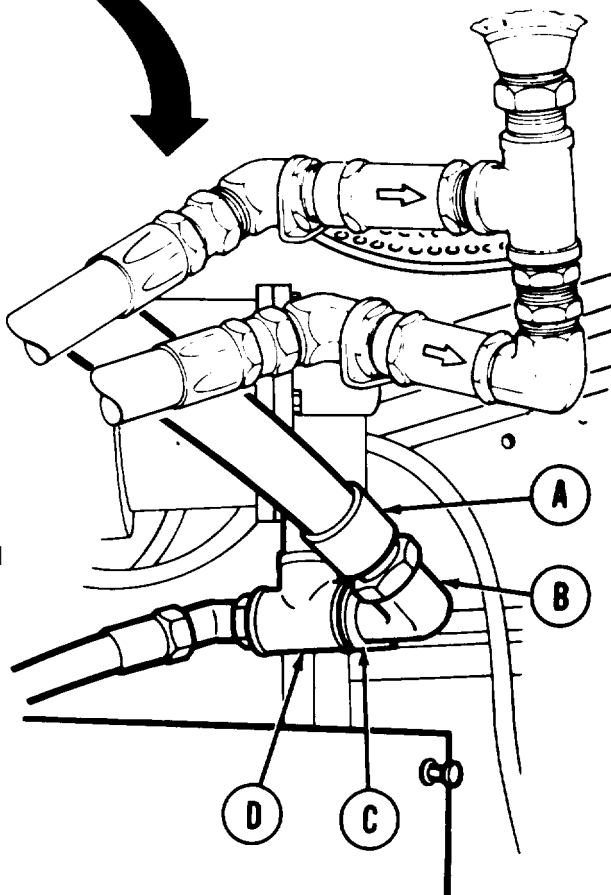
QUADRANTS REMOVED FOR CLARITY

REMOVAL:

1. Using adjustable wrench, remove hose assembly "CZ" (A) from elbow (B).
2. Using adjustable wrench, remove elbow (B) and collar (C) from tee (D).

NOTE

Use drip pans and rags to catch hydraulic fluid trapped in lines.

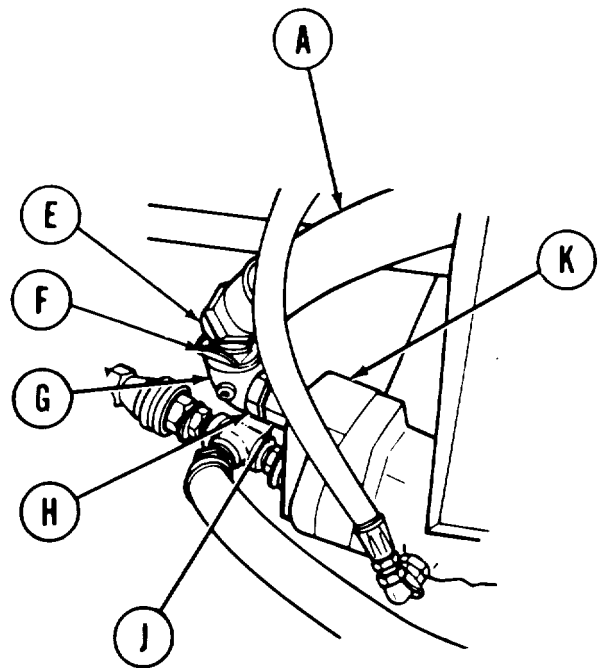


Go on to Sheet 2

TA170418

FILTER-TO-PUMP HOSE ASSEMBLY (CZ) REPLACEMENT (Sheet 2 of 3)

3. Use adjustable wrench to remove hose assembly "CZ" (A) from elbow (E).
4. Using adjustable wrench, remove elbow (E) and collar (F) from elbow (G).
5. Holding bushing (H) with adjustable wrench, use pipe wrench to remove elbow (G) from bushing (H).
6. Using adjustable wrench, remove bushing (H).



NOTE

Nipple (J) may come out with bushing (H). If it does, nipple (J) may be used again.

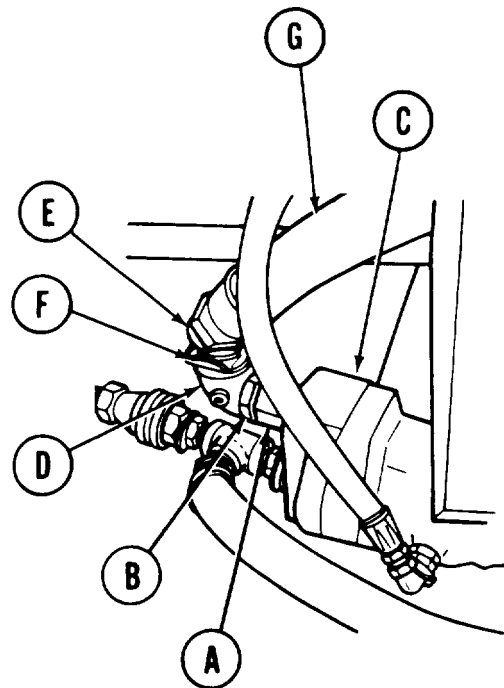
7. Using pipe wrench, remove nipple (J) from pump (K) and throw nipple away.

INSTALLATION:

NOTE

Before installing, use pipe tape on all male threads. Start tape on second thread so tape will not enter hydraulic system.

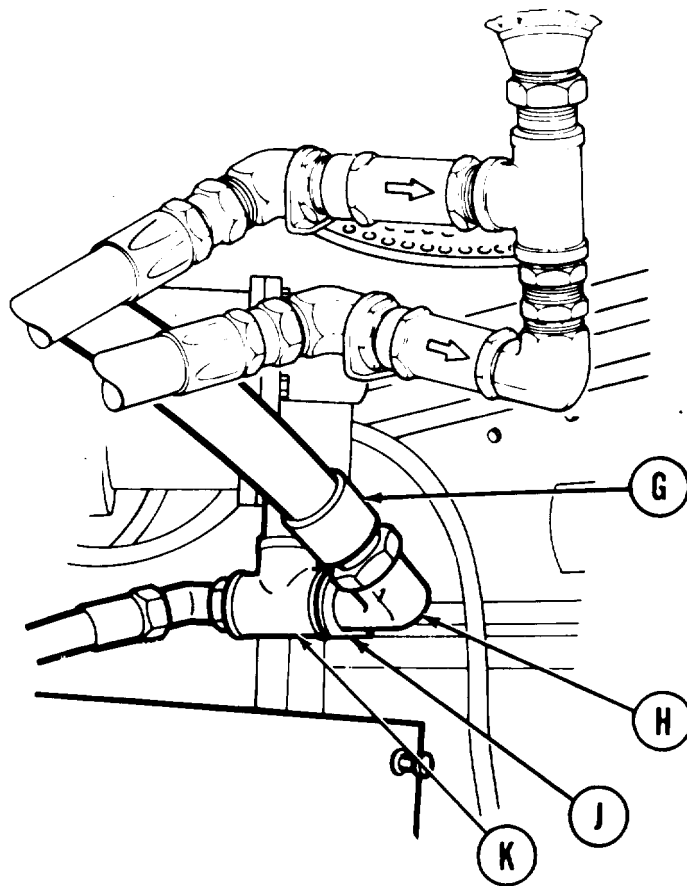
1. Manually install nipple (A) in bushing (B).
2. Using adjustable wrench, install bushing (B) and nipple (A) in pump (C).
3. Using adjustable wrench to hold bushing (B), use pipe wrench to install elbow (D) on bushing (B).
4. Using adjustable wrench, install elbow (E) and collar (F) on elbow (D).
5. Using adjustable wrench, install hose assembly "CZ" (G) on elbow (E).



Go on to Sheet 3

FILTER-TO-PUMP HOSE ASSEMBLY (CZ) REPLACEMENT (Sheet 3 of 3)

6. Using adjustable wrench, install elbow (H) and collar (J) on tee (K).
7. Using adjustable wrench, install hose assembly "CZ" (G) on elbow (H).
8. Service hydraulic reservoir (LO 5-5420-226-12).
9. Bleed hydraulic system (page 3-66).
10. Check for hydraulic leaks and correct as necessary.
11. Service hydraulic reservoir (LO 5-5420-226-12).



End of Task

TA170420

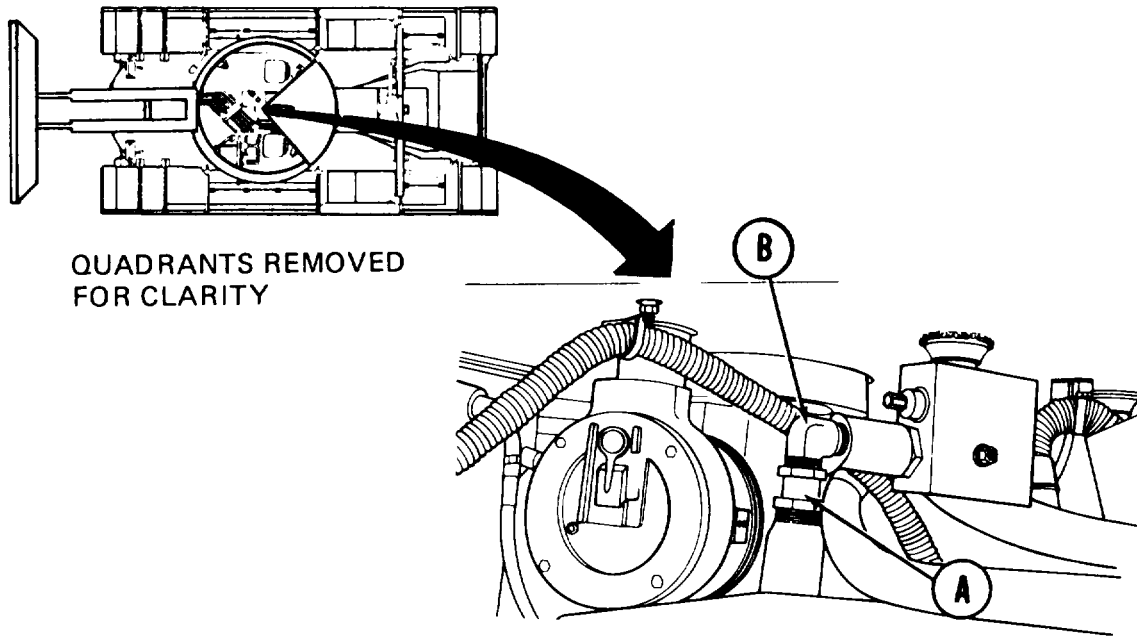
RESERVOIR-TO-FILTER HOSE ASSEMBLY (CY) REPLACEMENT (Sheet 1 of 3)

TOOLS: 1-1/2 in. open end wrench
 15 in. adjustable wrench
 12 in. adjustable wrench

SUPPLIES: Drip pans
 Rags (Item 12, Appendix D)
 Pipe tape (Item 19, Appendix D)

REFERENCE: LO 5-5420-226-12

PRELIMINARY PROCEDURE: Drain hydraulic reservoir (page 3-68)



REMOVAL:

NOTE

Use drip pan and rags to catch hydraulic fluid trapped in lines.

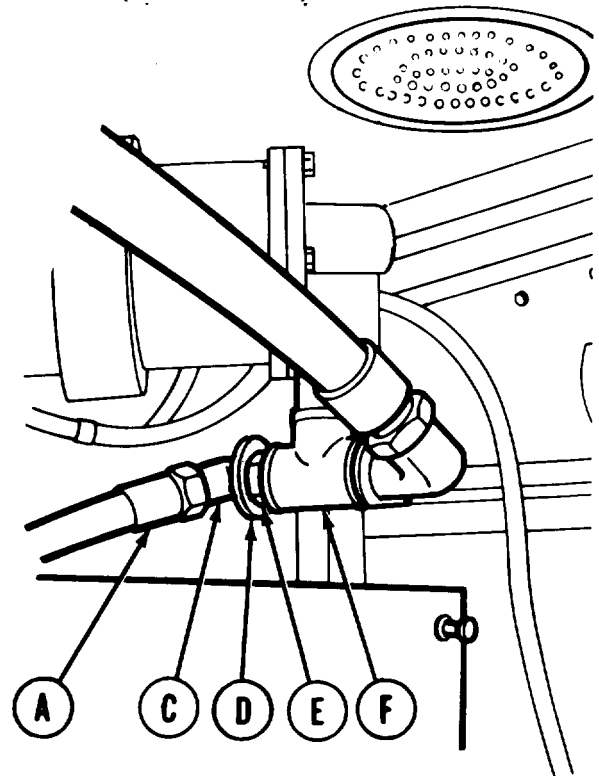
1. Using 1-1/2 inch wrench, disconnect hose assembly "CY" (A) from elbow (B).

Go on to Sheet 2

TA170421

RESERVOIR-TO-FILTER HOSE ASSEMBLY (CY) REPLACEMENT (Sheet 2 of 3)

2. Using 1-1/2 inch wrench, remove hose assembly "CY" (A) from elbow (C).
3. Using 15 inch adjustable wrench to hold bushing (E), use 12 inch adjustable wrench to remove elbow (C) and collar (D) from bushing (E).
4. Using 15 inch adjustable wrench, remove bushing (E) from tee (F).

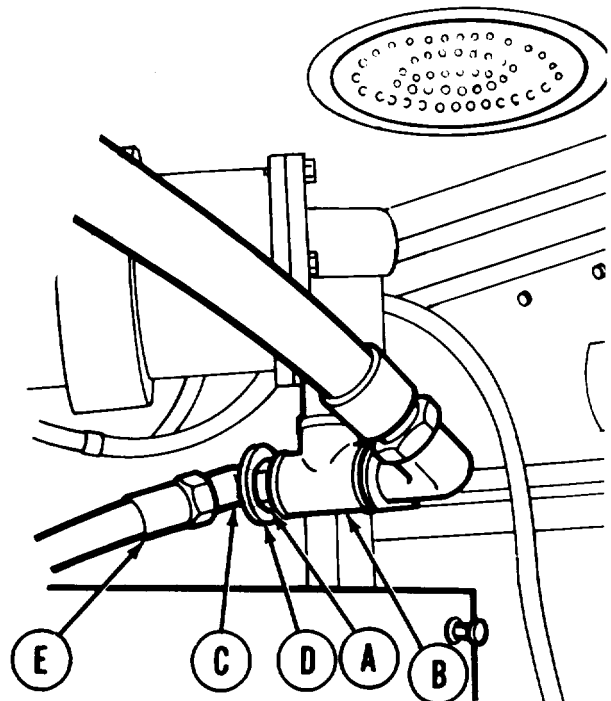


INSTALLATION:

NOTE

Before installation, use pipe tape on all male threads. Start tape on second thread so tape will not enter hydraulic system.

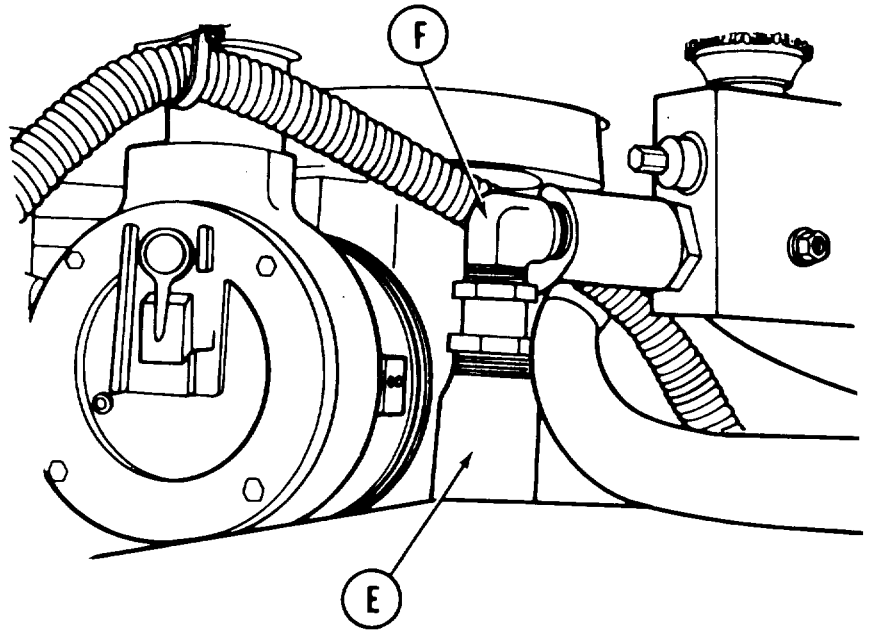
1. Using 15 inch adjustable wrench, install bushing (A) in tee (B).
2. Using 15 inch adjustable wrench to hold bushing (A), use 12 inch adjustable wrench to install elbow (C) and collar (D) in bushing (A).
3. Using 1-1/2 inch wrench, install hose assembly "CY" (E) on elbow (C).



Go on to Sheet 3

TA170422

RESERVOIR-TO-FILTER HOSE ASSEMBLY (CY) REPLACEMENT (Sheet 3 of 3)



4. Using 2-1/2 inch wrench, install hose assembly "CY" (E) on elbow (F).
5. Service hydraulic reservoir (LO 5-5420-226-12).
6. Bleed hydraulic system (page 3-66).
7. Check for hydraulic leaks and correct as necessary.
8. Service hydraulic reservoir (LO 5-5420-226-12).

End of Task

TA170423

SERVICING HYDRAULIC RESERVOIR FILTER ASSEMBLY (Sheet 1 of 2)

TOOLS: Flat-tip screwdriver (small)
1/2 in. socket with 1/2 in. drive
Ratchet with 1/2 in. drive

SUPPLIES: Packing (AN6230B37)
Packing (MS28775-144)
Container (to catch fluid, approx. 2 gal.)
Lockwashers (4 required)
Rags (Item 12, Appendix D)
Dry cleaning solvent (Item 15, Appendix D)

REFERENCE: LO 5-5420-226-12

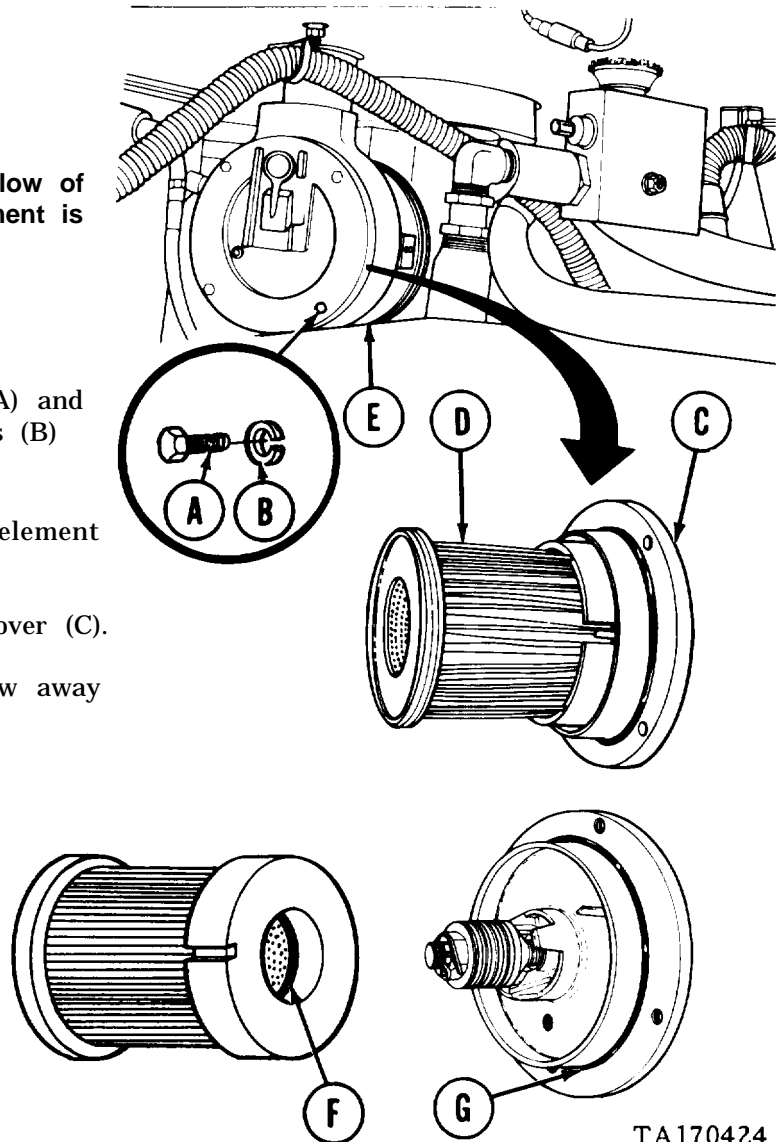
PRELIMINARY PROCEDURE: Relieve hydraulic pressure (page 3-65)

REMOVAL:

NOTE

A built in shut off will block the flow of fluid from reservoir when filter element is removed.

1. Position container to catch fluid.
2. Using socket, remove four screws (A) and lockwashers (B). Throw lockwashers (B) away.
3. Pull cover (C) with attached filter element (D) from housing (E).
4. Pull filter element (D) loose from cover (C).
5. Using screwdriver, remove and throw away two packings (F and G).



Go on to Sheet 2

TA170424

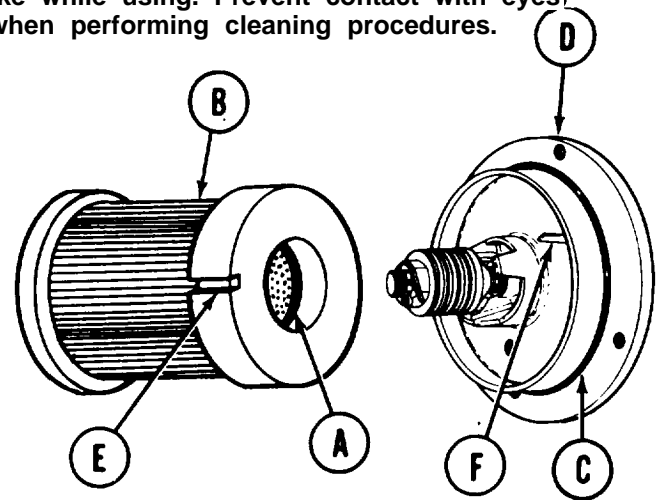
SERVICING HYDRAULIC RESERVOIR FILTER ASSEMBLY (Sheet 2 of 2)

CLEANING AND INSPECTION:

WARNING

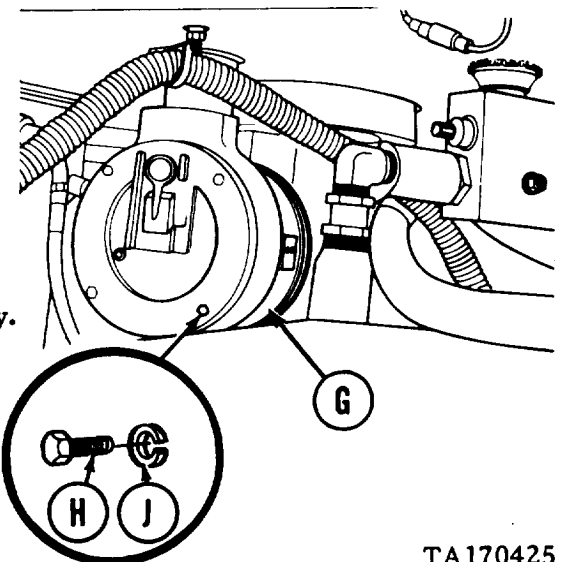
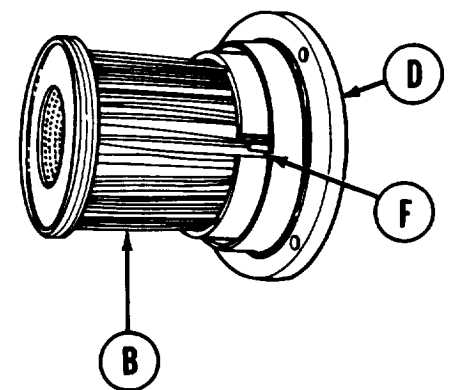
Cleaning agent specified is flammable. Use only in well ventilated areas, Keep away from flames, sparks, or heat. Do not smoke while using. Prevent contact with eyes, mouth, and/or skin. Wear rubber gloves when performing cleaning procedures.

1. Using rags and dry cleaning solvent, clean all parts.
2. Inspect filter element for damage, cracks, or deterioration.
3. Replace filter element if defective (page 3-205).



INSTALLATION:

1. Manually install new packing (A) in filter element (B).
2. Manually install new packing (C) in cover (D).
3. Aline groove (E) of filter element (B) with tab (F) on cover (D) and press filter element (B) on cover (D) until tab (F) snaps in place.
4. Insert assembled filter element (B) and cover (D) in housing (G) and aline screw holes.
5. Manually install four screws (H) and new lockwashers (J).
6. Using socket, tighten four screws (H).
7. Service hydraulic reservoir (LO 5-5420-226-12).
8. Bleed hydraulic system (page 3-66).
9. Check for hydraulic leaks and correct as necessary.
10. Service hydraulic reservoir (LO 5-5420-226-12).



End of Task

TA170425

HYDRAULIC FLUID FILTER ASSEMBLY REPLACEMENT (Sheet 1 of 3)

TOOLS: 7/16 in. open end wrench
 1-1/2 in. open end wrench
 15 in. adjustable wrench
 1/4 in. socket head screw key
 18 in. pipe wrench
 Vise

SUPPLIES: Drip pan
 Rags (Item 12, Appendix D)
 Lockwasher
 Pipe tape (Item 19, Appendix D)

REFERENCE: LO 5-5420-226-12

PRELIMINARY PROCEDURE: Drain hydraulic reservoir (page 3-68)

REMOVAL:

NOTE

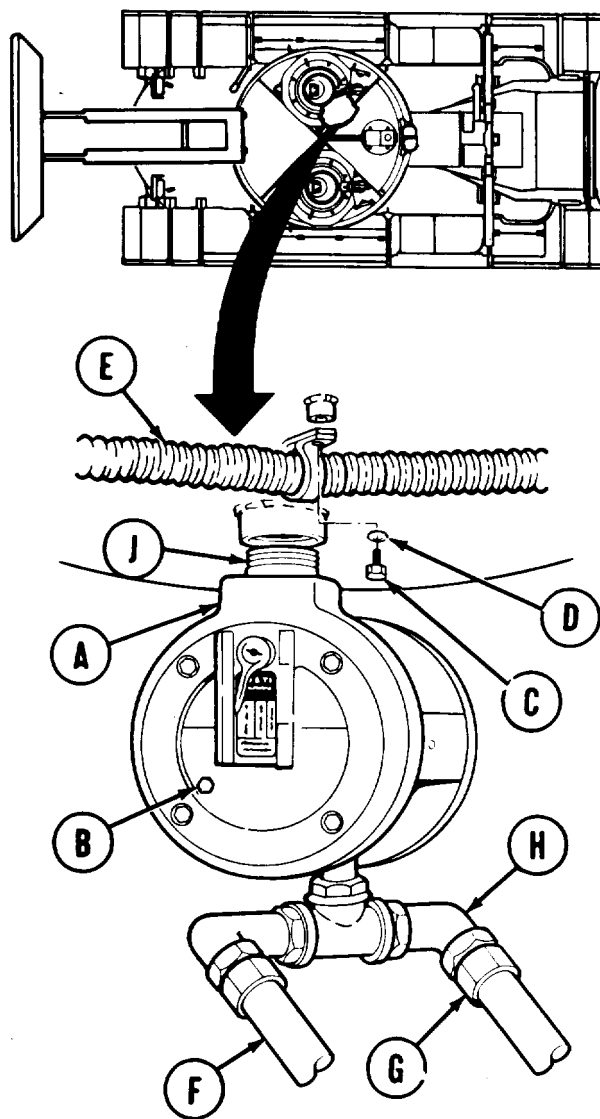
Use drip pan to catch hydraulic fluid trapped in filter assembly (A).

1. Using 1/4 inch screw key, remove pipe plug (B).
2. After hydraulic fluid has stopped draining from filter assembly (A), use 1/4 inch screw key to install plug (B) in filter assembly (A).
3. Using 7/16 inch wrench, remove screw (C) and lockwasher (D). Throw lockwasher (D) away.
4. Lower hose (E) to allow access to filter assembly (A).

NOTE

Use rags and drip pan to catch hydraulic fluid trapped in hoses (F and G).

5. Using 1-1/2 inch wrench, remove hose assembly "CY" (F).
6. Using adjustable wrench, remove collar and hose assembly "CZ" (G).
7. Using adjustable wrench, remove elbow (H).
8. Using pipe wrench, remove nipple (J) with filter assembly (A) attached.
9. Place filter assembly (A) in vise.



Go on to Sheet 2

TA170426

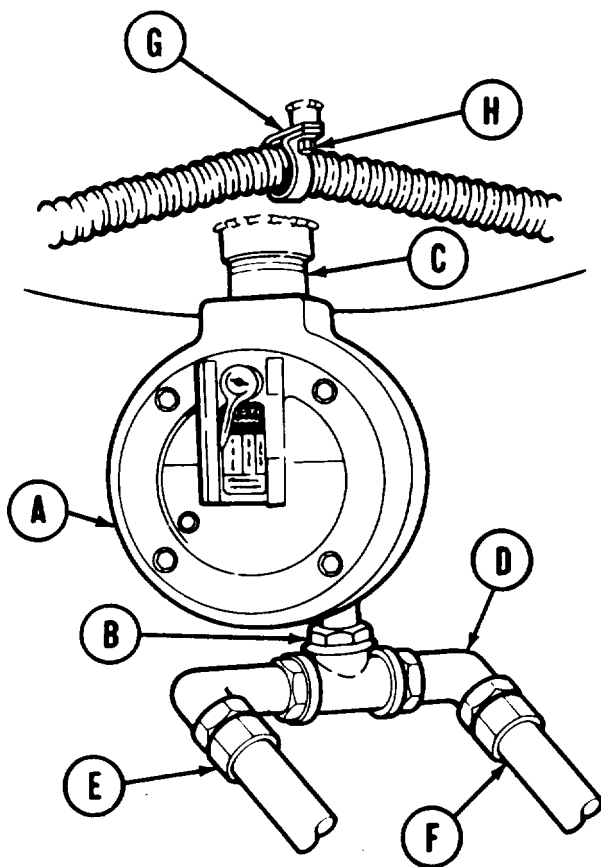
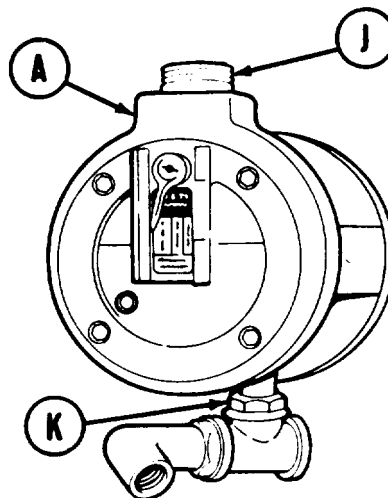
HYDRAULIC FLUID FILTER ASSEMBLY REPLACEMENT (Sheet 2 of 3)

10. Using adjustable wrench, remove reducer (K) and attached parts from filter assembly (A).
11. Use pipe wrench to remove nipple (J).

INSTALLATION:

NOTE

Before installing, use pipe tape on all male threads. Start tape on second thread so tape does not enter hydraulic system.



1. Place filter assembly (A) in vise.
2. Using adjustable wrench, install reducer (B) and attached parts.
3. Use pipe wrench to install nipple (C) in filter assembly (A).
4. Using pipe wrench, install nipple (C) with attached filter assembly (A) in vehicle.
5. Using adjustable wrench, install and align elbow (D).
6. Using 1-1/2 inch wrench, install hose assembly "CY" (E).
7. Using adjustable wrench, install collar and hose assembly "CZ" (F).
8. Place clamp (G) with hose in position"
9. Using 7/16 inch wrench, install screw and new lockwasher (H).

10. Service hydraulic reservoir (LO 5-5420-226-12).

Go on to Sheet 3

TA170427

HYDRAULIC FLUID FILTER ASSEMBLY REPLACEMENT (Sheet 3 of 3)

11. Bleed hydraulic system (page 3-66).
12. Check for hydraulic leaks and correct as necessary.
13. Service hydraulic reservoir (LO 5-5420-226-12).

End of Task

HYDRAULIC FLUID FILTER ASSEMBLY REPAIR (Sheet 1 of 8)

PROCEDURE INDEX

| PROCEDURE | PAGE |
|-------------------------|-------|
| Disassembly | 3-205 |
| Cleaning and Inspection | 3-209 |
| Assembly | 3-209 |

TOOLS: 18 in. pipe wrench
 Hammer
 9/64 in. socket head screw key (allen wrench)
 1/4 in. socket head screw key (allen wrench)
 Flat-tip screwdriver
 1/2 in. socket with 1/2 in. drive
 Ratchet with 1/2 in. drive
 Slip joint pliers
 15/16 in. open end wrench

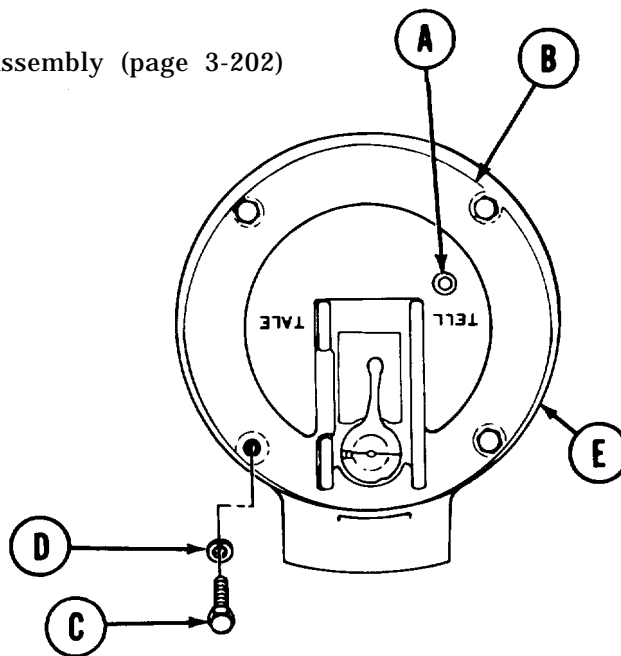
SUPPLIES: Gasket
 Preformed packing (2 required)
 Rags (Item 12, Appendix D)
 Dry cleaning solvent (Item 15, Appendix D)
 Ring, wiper
 Drive screws (4 required)

PERSONNEL: Two

PRELIMINARY PROCEDURE: Remove filter assembly (page 3-202)

DISASSEMBLY:

1. Using 1/4 inch screw key, remove plug (A) from cover (B).
2. Using socket, remove four screws (C) and lockwashers (D). Throw lockwashers (D) away.
3. Manually remove cover (B) and attached parts as an assembly from housing (E).

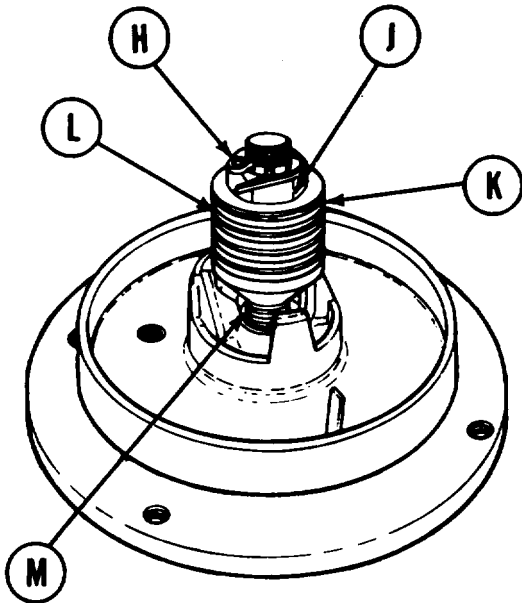
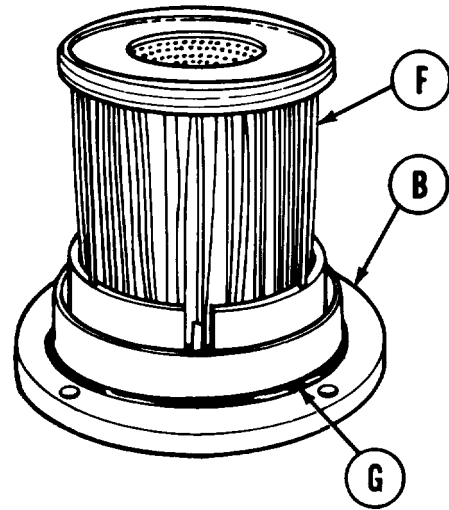


Go on to Sheet 2

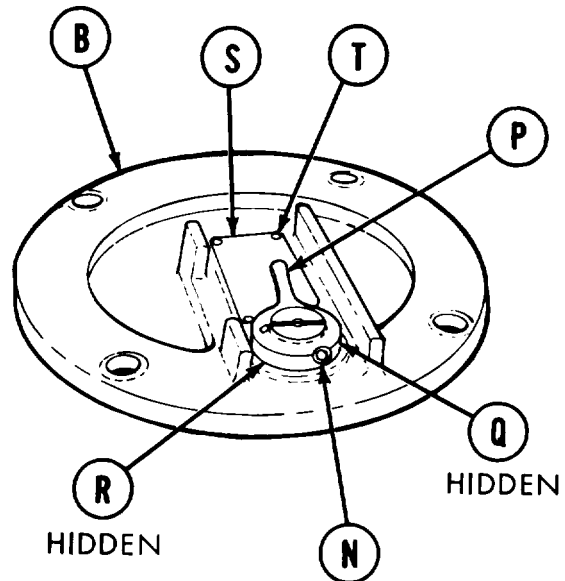
TA170428

HYDRAULIC FLUID FILTER ASSEMBLY REPAIR (Sheet 2 of 8)

4. Manually remove filter (F) from cover (B).
5. Manually remove packing (G) from cover (B).



6. Using pliers, remove cotter pin (H).
7. Using 15/16 inch wrench, remove nut (J).
8. Manually remove four magnetic washers (K) and five spacers (L).
9. Using pipe wrench, remove shaft (M).



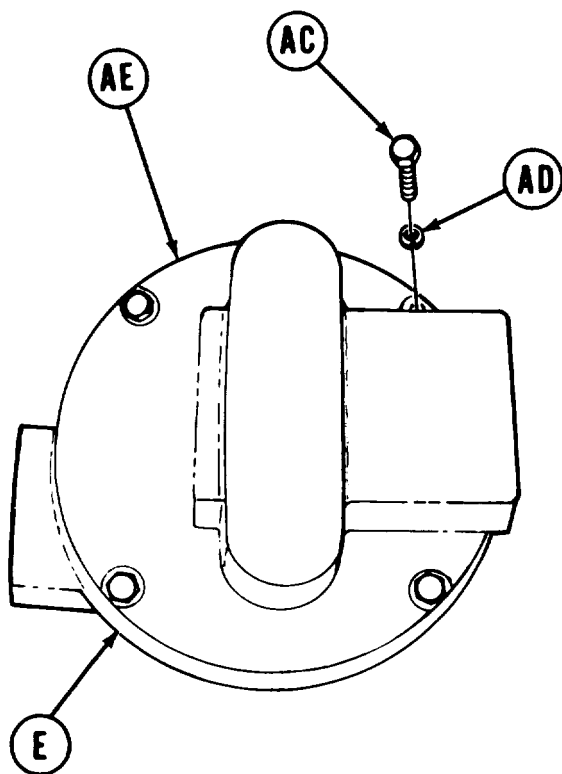
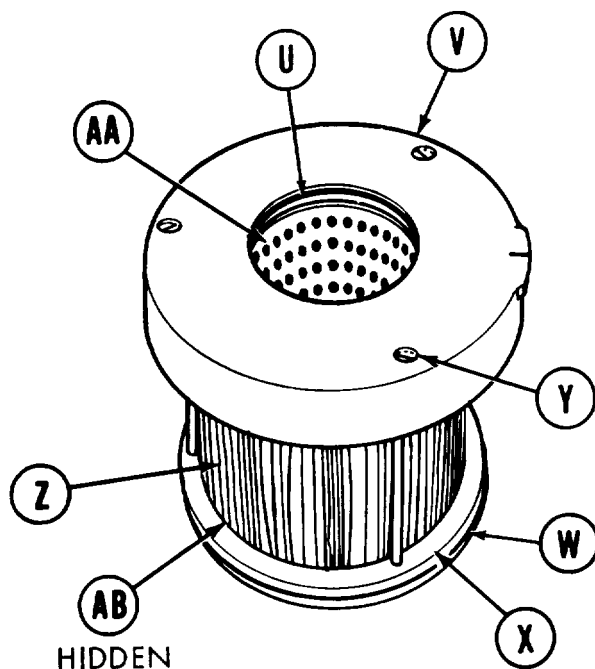
10. Using 9/64 inch screw key, remove setscrew (N).
11. Manually remove indicator arm (P) and washer (Q).
12. Manually remove shaft (R) from cover (B).
13. Using flat-tip screwdriver, remove indicator plate (S) and four drive screws (T).

Go on to Sheet 3

TA170429

HYDRAULIC FLUID FILTER ASSEMBLY REPAIR (Sheet 3 of 8)

14. Manually remove packing (U) from cap (V).
15. Manually remove wiper ring (W) from plate (x).
16. Using flat-tip screwdriver, remove three screws (Y).
17. Lift cap (V) from filter element (Z).
18. Manually remove filter element (Z).
19. Manually remove strainer (AA).
20. Manually remove gasket (AB).



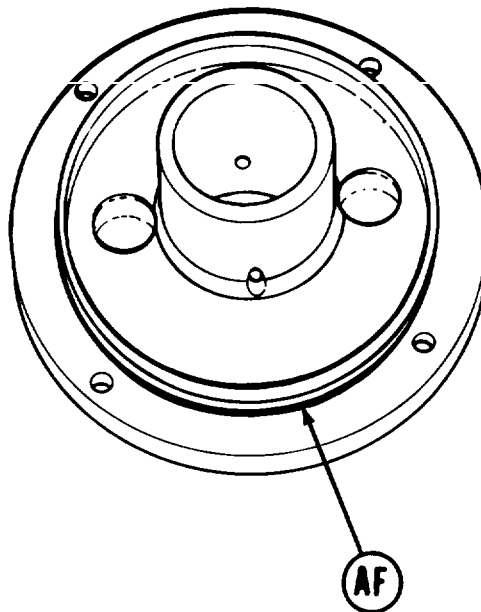
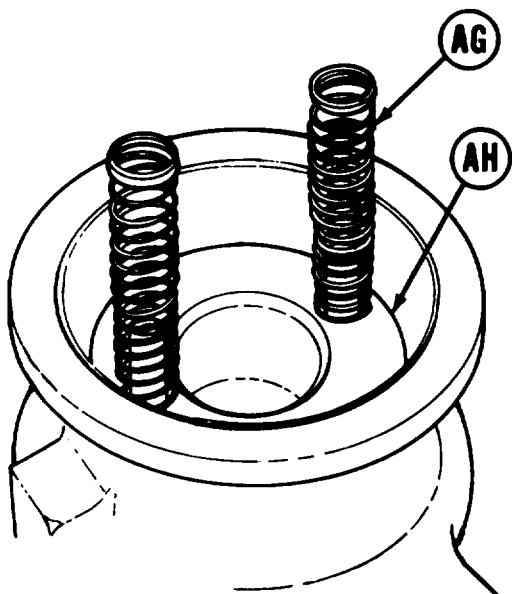
21. Using socket, remove four screws (AC) and lockwashers (AD). Throw lockwashers (AD) away.
22. Manually remove cover (AE) from housing (E).

Go on to Sheet 4

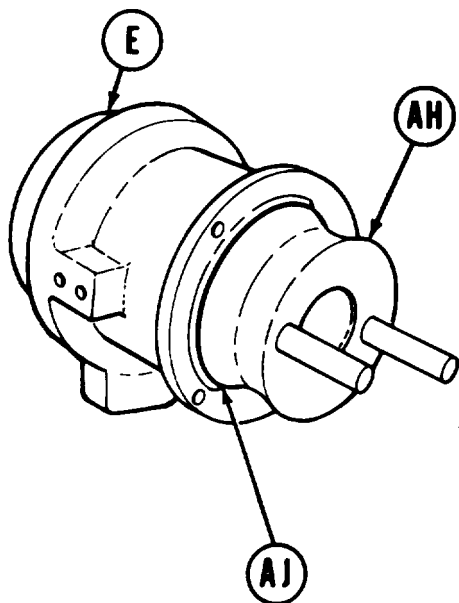
TA170430

HYDRAULIC FLUID FILTER ASSEMBLY REPAIR (Sheet 4 of 8)

- 23. Manually remove packing (AF).
- 24. Manually remove two springs (AG) from piston (AH).



- 25. Pull piston (AH) from housing (E).
- 26. Manually remove wiper ring (AJ) from piston (AH).



Go on to Sheet 5

TA170431

HYDRAULIC FLUID FILTER ASSEMBLY REPAIR (Sheet 5 of 8)

CLEANING AND INSPECTION:

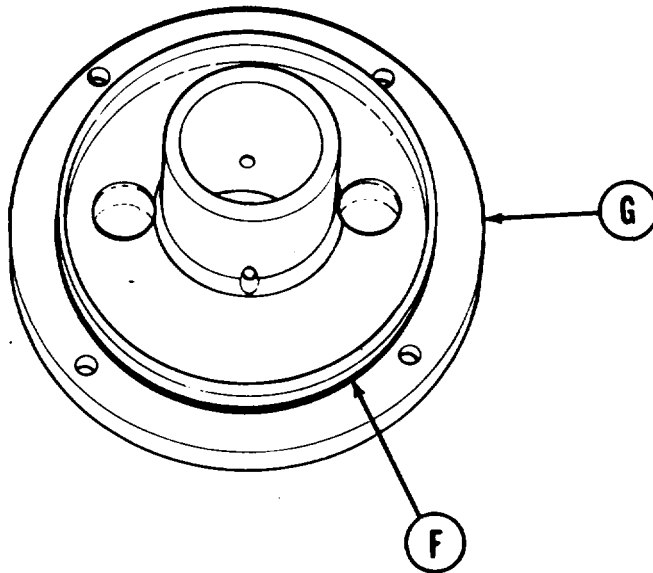
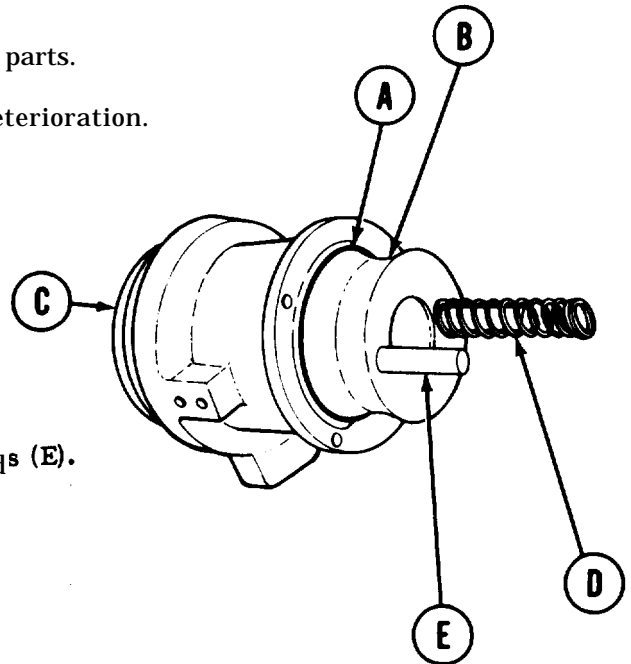
WARNING

Cleaning agent specified is flammable. Use only in well ventilated areas. Keep away from flames, sparks, or heat. Do not smoke while using. Prevent contact with eyes, mouth, and/or skin. Wear rubber gloves when performing cleaning procedures.

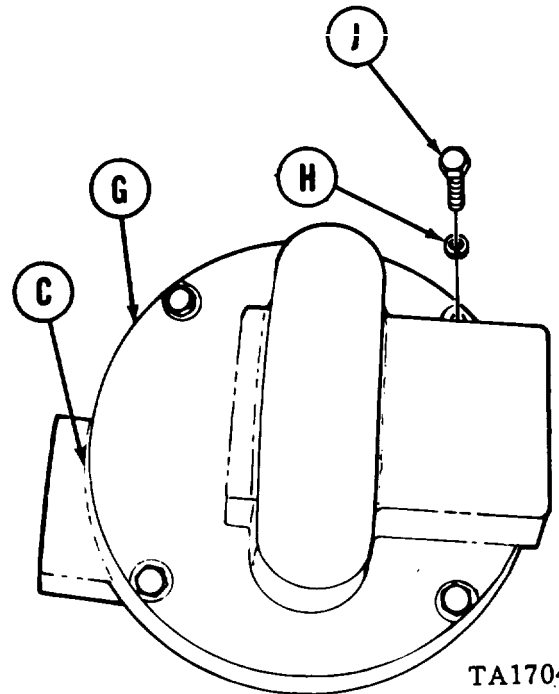
1. Using rags and dry cleaning solvent, clean all parts.
2. Inspect parts for damage, wear, cracks, or deterioration.
3. Replace all defective parts.

ASSEMBLY:

1. Manually install wiper ring (A) on piston (B).
2. Manually install piston (B) in housing (C) as far as possible.
3. Manually install two springs (D) on piston studs (E).



4. Manually install preformed packing (F) on cover (G).
5. Position cover (G) on housing (C).
6. Using socket, install four lockwashers (H) and screws (J) securing cover (G) to housing (C).

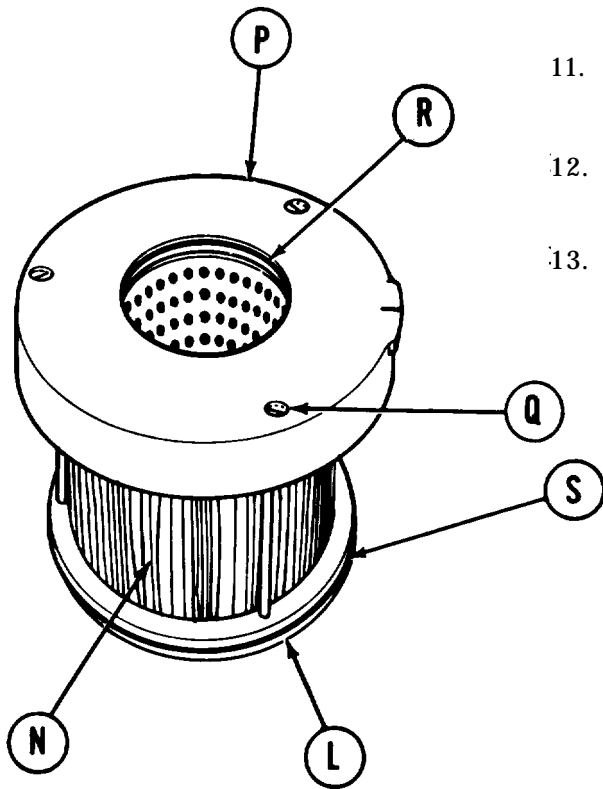
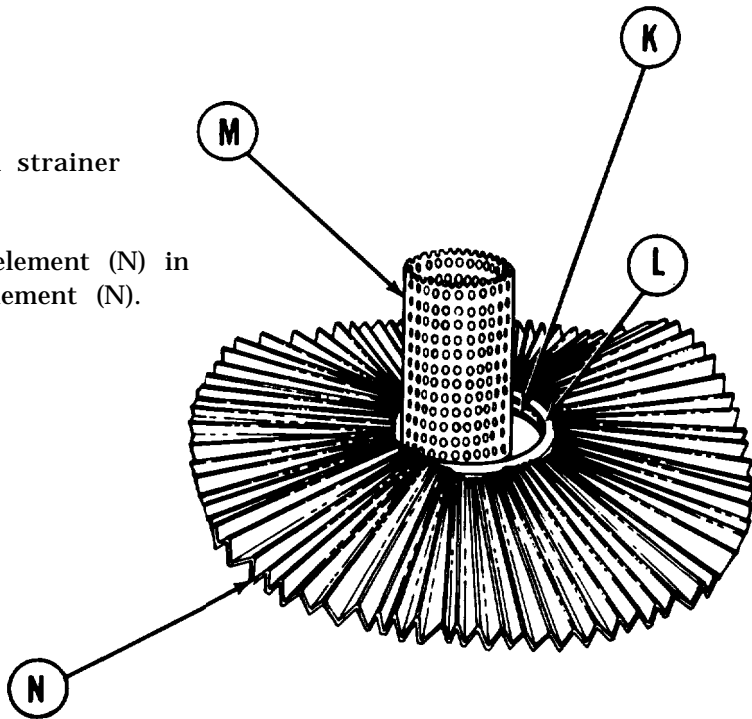


Go on to Sheet 6

TA170432

HYDRAULIC FLUID FILTER ASSEMBLY REPAIR (Sheet 6 of 8)

7. Position gasket (K) on plate (L).
8. Position strainer (M) on plate (L).
9. Position filter element (N) around strainer (M).
10. While one technician holds filter element (N) in position, place cap (P) on filter element (N).

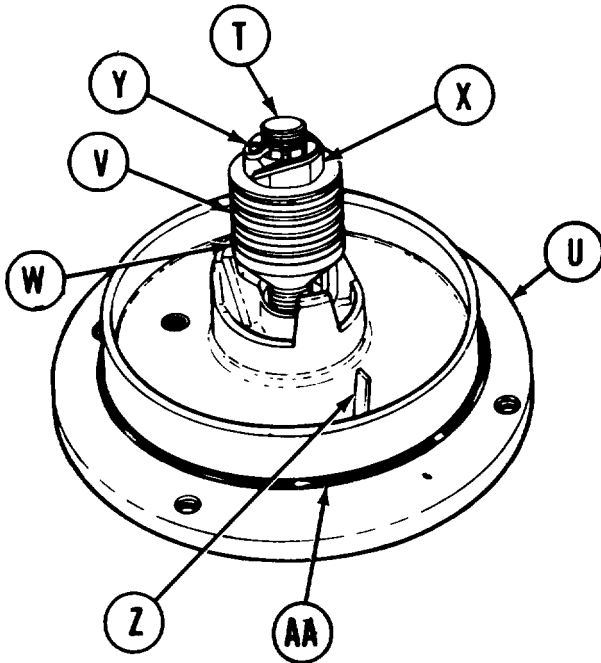


11. Using flat-tip screwdriver, install three screws (Q).
12. Manually install preformed packing (R) in cap (P).
13. Manually install wiper ring (S) on plate (L).

Go on to Sheet 7

TA170433

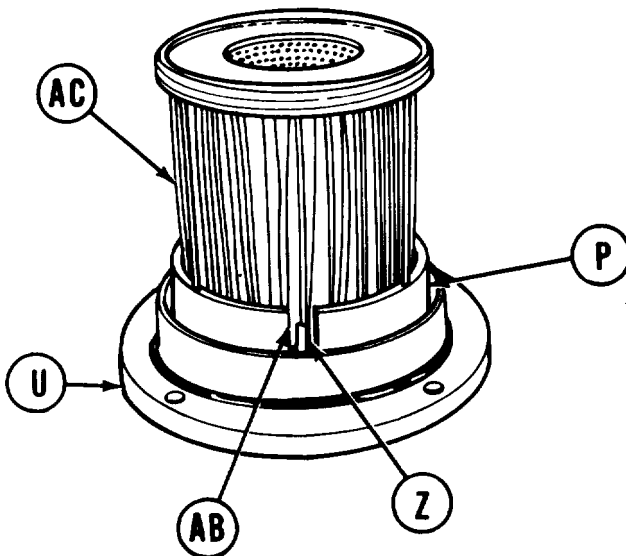
HYDRAULIC FLUID FILTER ASSEMBLY REPAIR (Sheet 7 of 8)



14. Using pipe wrench, install shaft (T) in cover (U).
15. Manually install four magnetic washers (V) and five spacers (W) on shaft (T).
16. Using 15/16 inch wrench, install nut (X) on shaft (T).
17. Using pliers, install cotter pin (Y) through nut (X) and shaft (T).
18. Manually install shaft (Z) in cover (U).
19. Manually install packing (AA) on cover (U).

NOTE

Insure notch (AB) in cap (P) goes over shaft (Z).



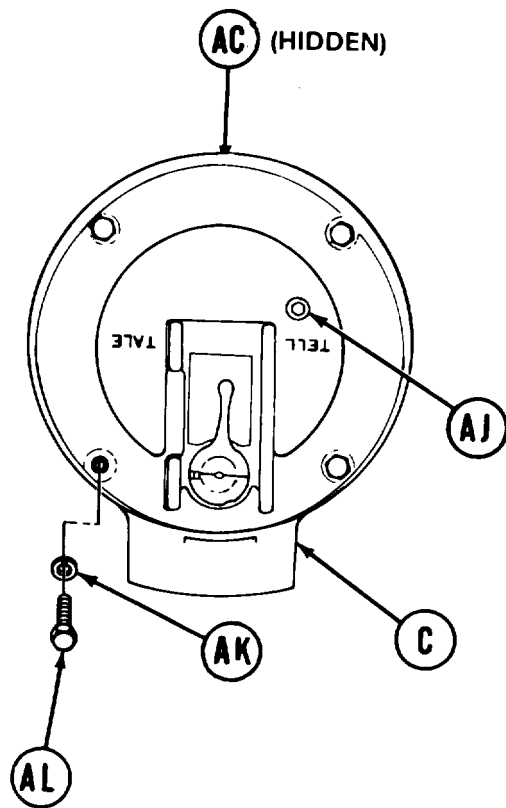
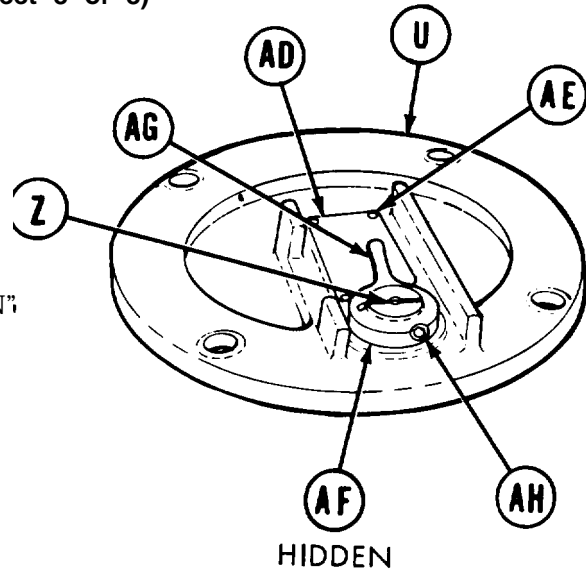
20. Manually position filter assembly (AC) on cover (U).

Go on to Sheet 8

TA170434

HYDRAULIC FLUID FILTER ASSEMBLY REPAIR (Sheet 8 of 8)

21. Manually place indicator plate (AD) in position on cover (U).
22. Using hammer, install four drive screws (AE).
23. Manually place washer (AF) and indicator lever (AG) on shaft (Z) over "FILTER CLEAN" on indicator plate (AD).
24. Using 9/64 inch screw key, install setscrew (AH).
25. Using 1/4 inch screw key, install pipe plug (AJ).



26. Position filter assembly (AC) in housing (C) and aline holes.
27. Manually install four lock washers (AK) and screws (AL).
28. Using 1/2 inch socket, tighten four screws (AL).
29. Install filter assembly (page 3-203).

End of Task

TA170435

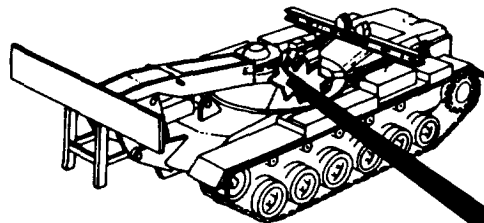
RESERVOIR DRAIN VALVE REPLACEMENT (Sheet 1 of 2)

TOOLS: 1-1/2 in. openend wrench
 5/8 in. combination wrench
 15 in. adjustable wrench
 14 in. pipe wrench

SUPPLIES: Rags (Item 12, Appendix D)
 Pipe tape
 Nipple

REFERENCE: LO 5-5420-226-12

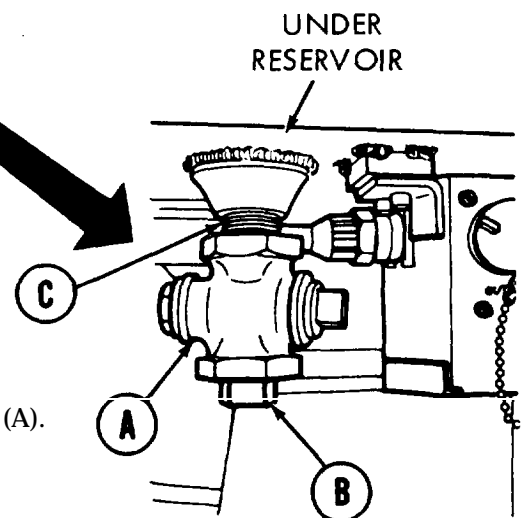
PRELIMINARY PROCEDURE: Drain reservoir (page 3-68)

**NOTE**

Use rags to catch hydraulic fluid left in line.

REMOVAL:

1. "Using adjustable wrench on flats, remove drain valve (A).
2. Place drain valve (A) in vise.
3. Using 5/8 inch wrench, remove pipe plug (B).
4. Using pipe wrench, remove nipple (C) from either drain valve (A) or reservoir" Throw nipple away.
5. Remove drain valve (A) from vise.



Go on to Sheet 2

TA170436

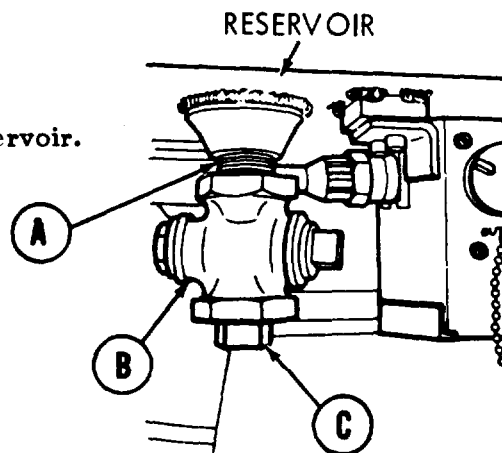
RESERVOIR DRAIN VALVE REPLACEMENT (Sheet 2 of 2)

INSTALLATION:

NOTE

Before installing use pipe tape on all male threads. Start tape on second thread so tape will not enter hydraulic system.

1. Manually install new nipple (A) in drain valve (B).
2. Using 5/8 inch wrench, install pipe plug (C).
3. Using adjustable wrench, install drain valve (A) on reservoir.
4. Fill reservoir (LO 5-5420-226-12).
5. Bleed hydraulic system (page 3-66).
6. Check for hydraulic leaks and correct as necessary.
7. Refill hydraulic reservoir (LO 5-5420-226-12).

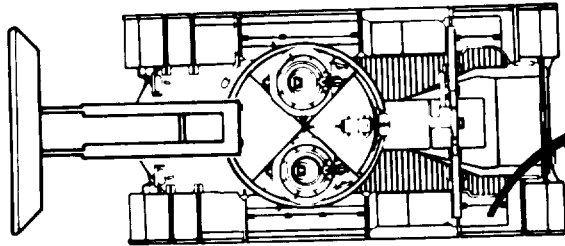


End of Task

TA170437

HYDRAULIC SLAVE HOSE ASSEMBLY REPAIR (Sheet 1 of 2)

TOOLS: 15 in. adjustable wrench (2)
Vise

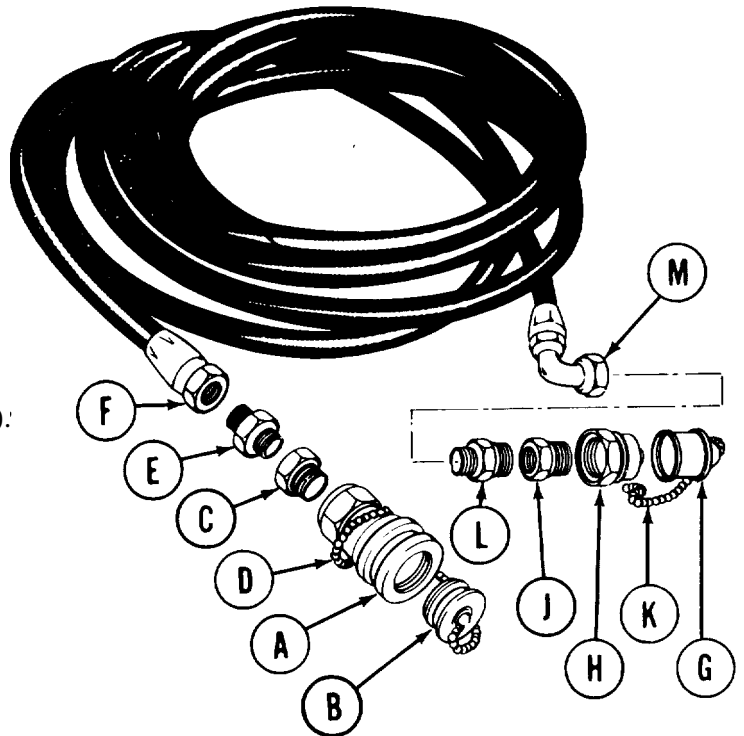


1. Manually pull back quick-disconnect coupling (A) and pull socket dust cap (B) from coupling (A).

NOTE

It may be necessary to use a vise.

2. Using wrench to hold pipe fitting (C), use wrench to remove coupling (A):
3. Manually slide chain (D) off socket (B).
4. Using wrench to hold tube fitting (E), use wrench to remove pipe fitting (C).
5. Using wrench to hold hose fitting (F), use wrench to remove tube fitting (E).
6. Manually pull plug dust cap (G) from plug (H).
7. Using wrench to hold pipe fitting (J), use wrench to remove plug (H).
8. Manually slide chain (K) off plug (H).
9. Using wrench to hold tube fitting (L), use wrench to remove pipe fitting (J).
10. Using wrench to hold hose fitting (M), use wrench to remove tube fitting (L).



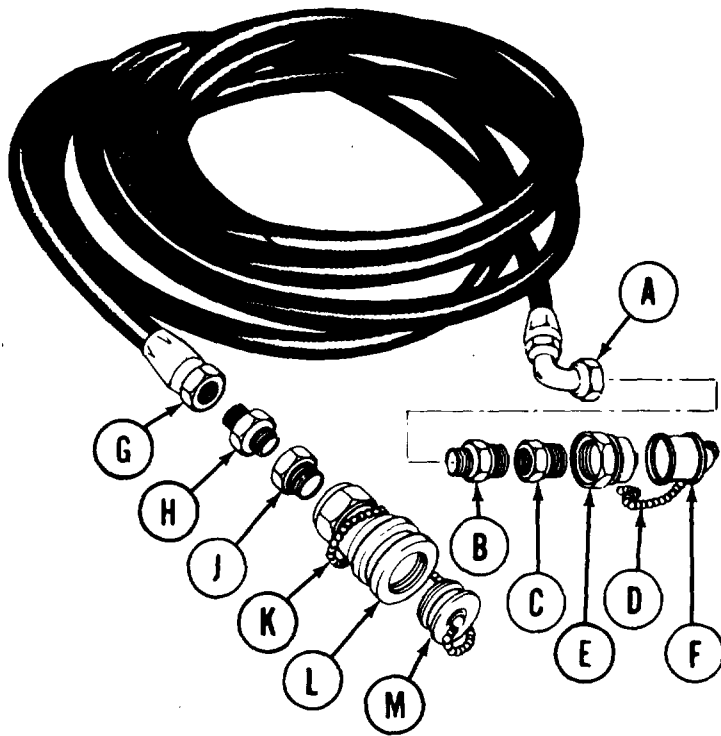
TA170438

Go on to Sheet 2

HYDRAULIC SLAVE HOSE ASSEMBLY REPAIR (Sheet 2 of 2)

ASSEMBLY:

1. Using wrench to hold hose fitting (A), use wrench to install tube fitting (B).
2. Using wrench to hold tube fitting (B), use wrench to install pipe fitting (C).
3. Manually slip chain (D) onto plug (E).
4. Using wrench to hold pipe fitting (C), use wrench to install plug (E).
5. Manually install plug dust cap (F) on plug (E).
6. Using wrench to hold hose fitting (G), use wrench to install pipe fitting (H).
7. Using wrench to hold tube fitting (H), use wrench to install pipe fitting (J).
8. Manually slip chain (K) onto socket (L).
9. Using wrench to hold pipe fitting (J), use wrench to install quick-disconnect coupling (L).
10. Pull back quick-disconnect coupling (L) and push in dust cap (M).



End of Task

TA170439

Section IV. HYDRAULIC CYLINDERS

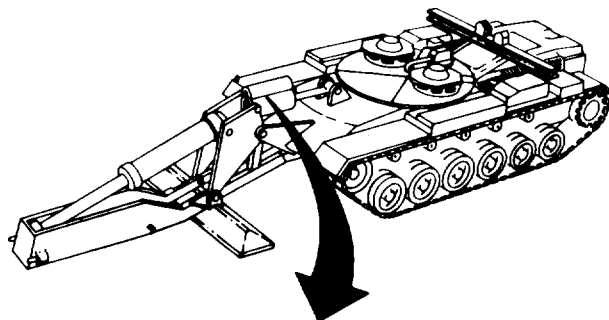
OVERHEAD CYLINDER ARMOR REPLACEMENT (Sheet 1 of 2)

- TOOLS: 9/16 in. socket with 1/2 in. drive
 15/16 in. socket with 1/2 in. drive
 Ratchet with 1/2 in. drive
 9/16 in. combination box end and open end wrench
 Pry bar
 Sling
 Lifting device (200 lbs capacity)

- SUPPLIES: Lockwashers (2 required)
 Lockwashers (4 required)

REFERENCE: TM 5-5420-226-10

REMOVAL:

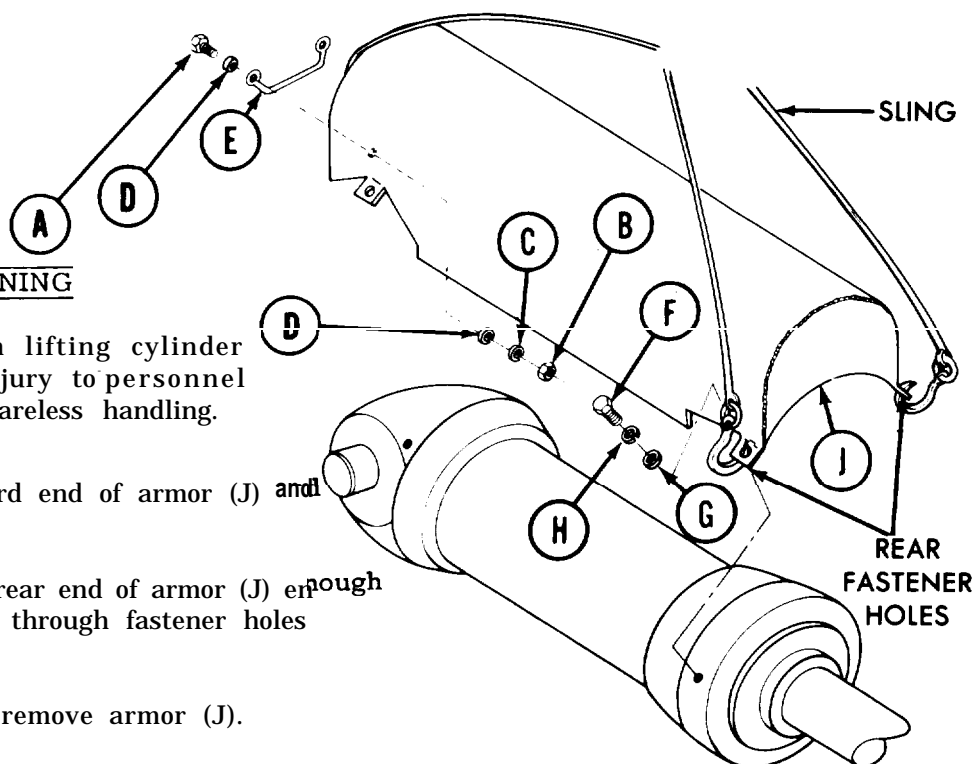


- Using 9/16 inch socket on screw (A) and box wrench on nut (B), remove two screws (A), nuts (B), lockwashers (C), four flat washers (D), and stop (E). Throw lockwashers (C) away.
- Using 15/16 inch socket, remove four screws (F), flat washers (G), and lockwashers (H). Throw lockwashers (H) away.

WARNING

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

- Attach sling to forward end of armor (J) and attach lifting device.
- Using pry bar, raise rear end of armor (J) enough to get hooks of sling through fastener holes at rear end of armor.
- Using lifting device, remove armor (J).
- Remove sling from armor (J).



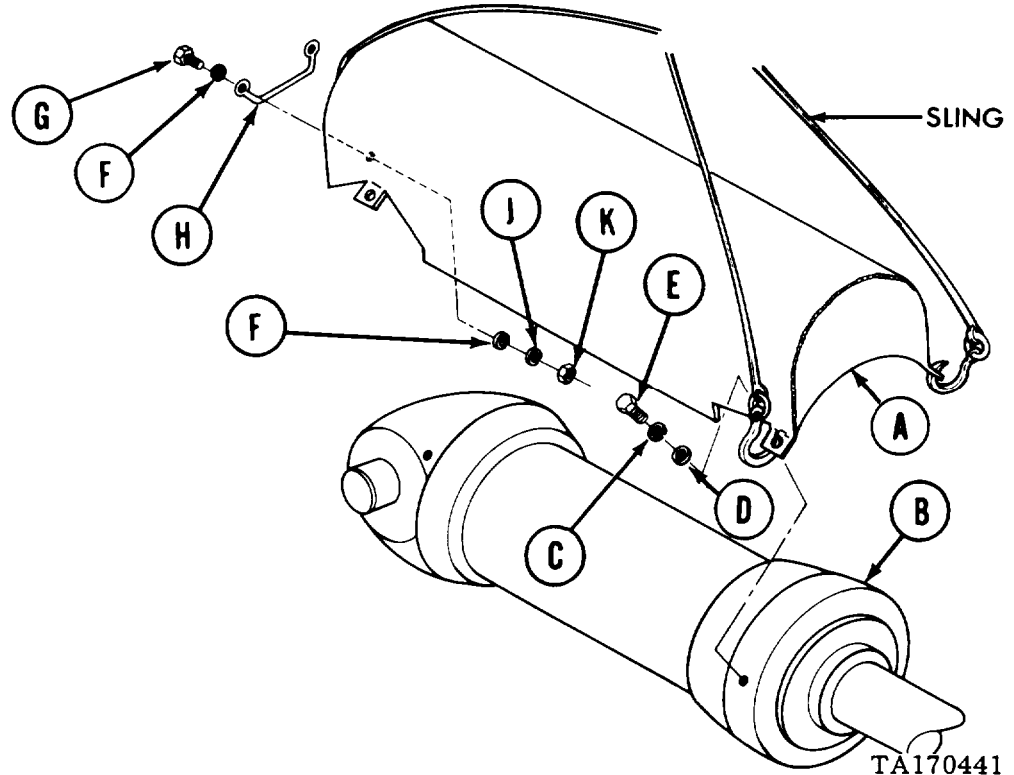
TA170440

Go on to Sheet 2

OVERHEAD CYLINDER ARMOR REPLACEMENT (Sheet 2 of 2)

INSTALLATION:

1. Attach sling to armor (A).
2. Using lifting device, position armor on overhead cylinder (B).
3. Remove sling from armor (A); use pry bar to aid removal of hooks at rear of armor.
4. Place new lockwashers (C) and flat washers (D) on four screws (E).
5. Using pry bar, aline holes of armor (A) with those in overhead cylinder (B).
6. Manually install four screws (E).
7. Using 15/16 inch socket, tighten four screws (E).
8. Place flat washer (F) on two screws (G).
9. Position stop (H) on armor (A) and insert two screws (G).
10. Place flat washers (F), new lockwashers (J), and nuts (K) on two screws (G).
11. Using 9/16 inch socket on screw (G) and wrench on nut (K), tighten two screws.



End of Task

TA170441

OVERHEAD CYLINDER REPLACEMENT (Sheet 1 of 7)
PROCEDURE INDEX

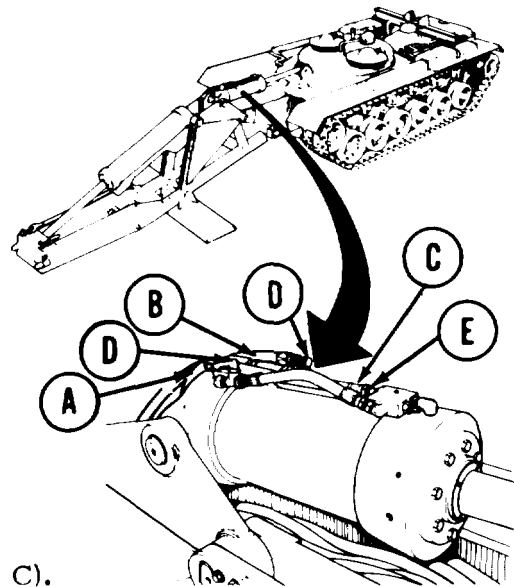
| PROCEDURE | PAGE |
|--------------|-------|
| Removal | 3-219 |
| Installation | 3-222 |

- TOOLS:** 12 in. adjustable wrench
 1-1/4 in. open end wrench
 7/16 in. socket with 3/8 in. drive
 Snap ring pliers (outside)
 Hammer
 Lifting device (2000 lb capacity)
 Punch, drive pin 3/4 in. x 10 in.
- Ratchet with 3/8 in. drive
 5 in. extension with 3/8 in. drive
 1-5/16 in. socket with 3/4 in. drive
 Ratchet with 3/4 in. drive
 Crow bar
 Sling
 Cylinder rod wrench, 4-9/16 in.
 1-1/8 in. open end wrench
- SUPPLIES:** Pencil
 Container (to catch fluid)
 Tags, identification
 (for hoses)
- Plastic plugs (3) (suitable protective coverings)
 Plastic caps (3) (suitable protective coverings)
 Lockwashers (10 required)
 Masking tape (Item 18, Appendix D)
- PERSONNEL:** Three
- REFERENCES:** LO 5-5420-226-12
 TM 5-5420-226-10

PRELIMINARY PROCEDURES Extend tongue (TM 5-5420-226-10)
 Remove overhead cylinder armor (page 3-217)
 Relieve hydraulic pressure (page 3-65)

REMOVAL:

1. Tag and mark for identification, hose assemblies (A, B, and C) and their connecting parts as follows: hose assembly (A) mark "CL", (B) mark "CN", (C) mark "CM".
2. Position container to catch fluid.
3. Using 1-1/4 inch wrench on nuts of hose assemblies (A and B) and adjustable wrench on adapter elbows (D), disconnect two hose assemblies (A and B).
4. Using 1-1/4 inch wrench on nut of hose assembly (C) and 1-1/8 inch wrench on adapter (E), disconnect hose assembly (C).
5. Put protective caps on hose assemblies (A, B, and C).

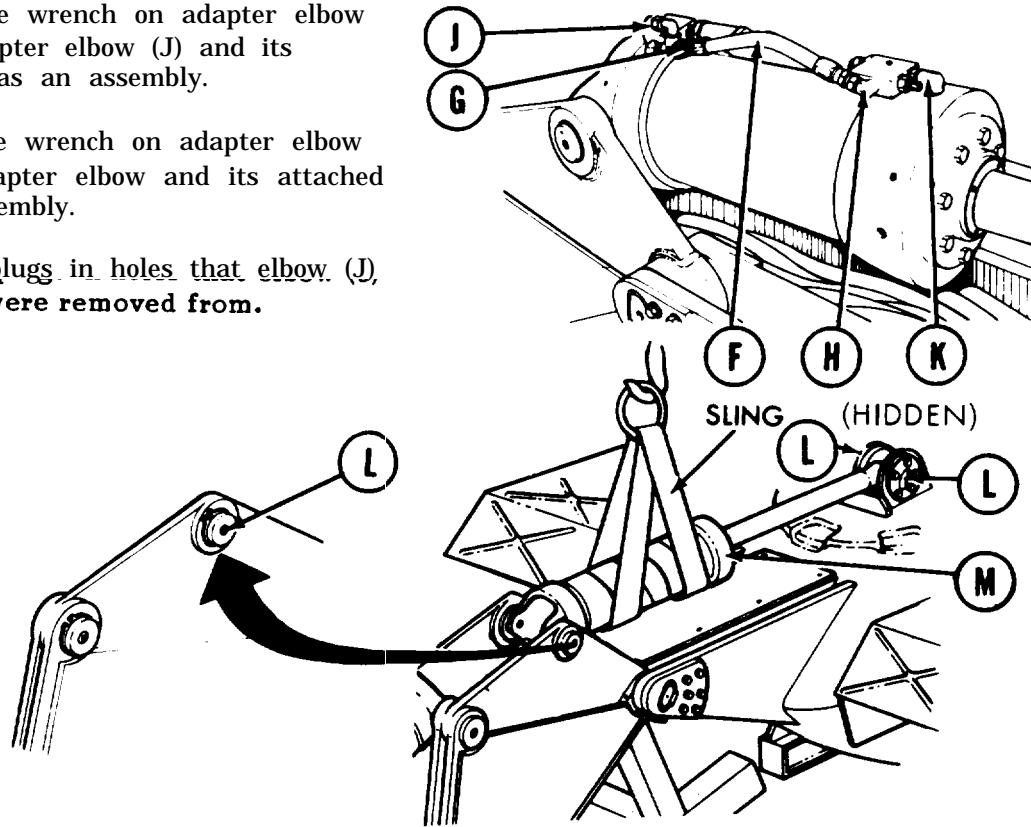


Go on to Sheet 2

TA170442

OVERHEAD CYLINDER REPLACEMENT (Sheet 2 of 7)

6. Using 1-1/4 inch wrench on nuts of hose assembly "CO" (F) and adjustable wrench on adapter (G) and adapter elbow (H), remove hose assembly (F).
7. Using adjustable wrench on adapter elbow (J), remove adapter elbow (J) and its attached parts as an assembly.
8. Using adjustable wrench on adapter elbow (K), remove adapter elbow and its attached parts as an assembly.
9. Put protective plugs in holes that elbow (J) and elbow (K) were removed from.



10. Using 7/16 inch socket, remove four grease fittings (L).
11. Position sling around overhead cylinder (M) and attach lifting device (use spreader if necessary).

WARNING

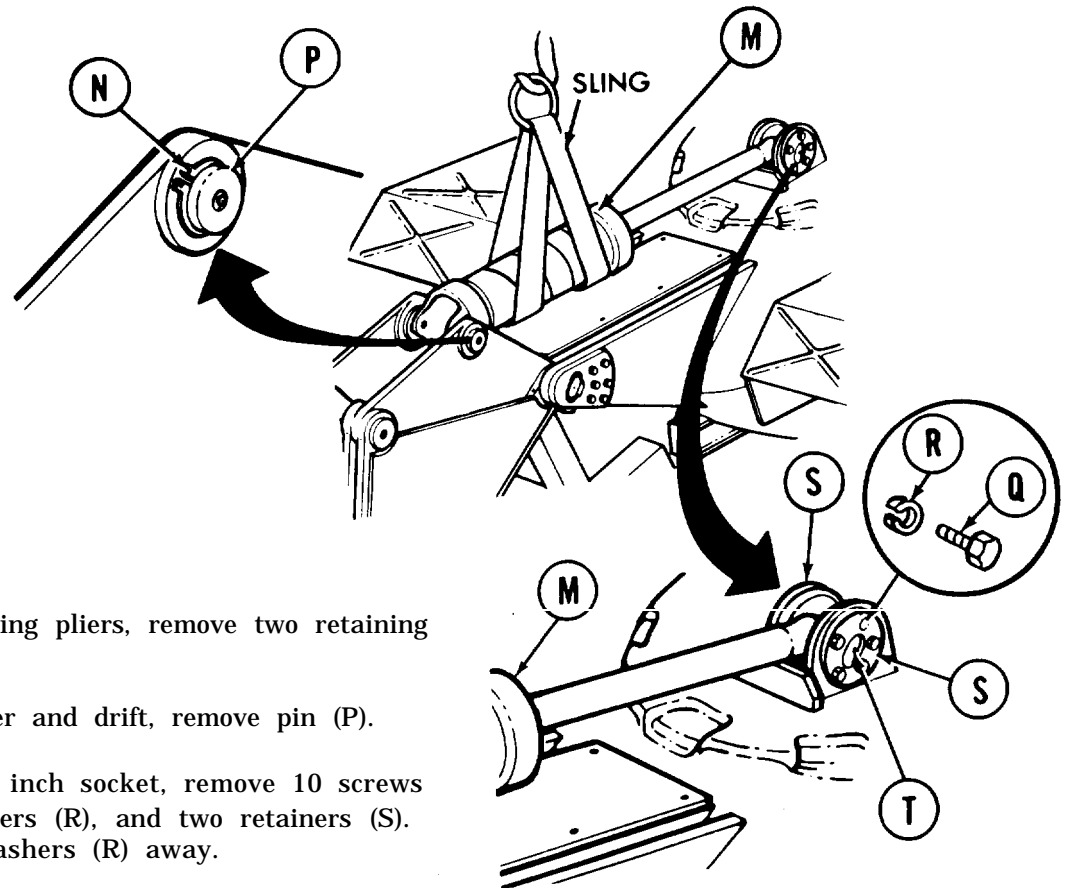
Make sure sling is wrapped on overhead cylinder (M) so that it cannot slide loose.

12. Raise lifting device until sling is tight enough to support overhead cylinder (M).

Go on to Sheet 3

TA170443

OVERHEAD CYLINDER REPLACEMENT (Sheet 3 of 7)



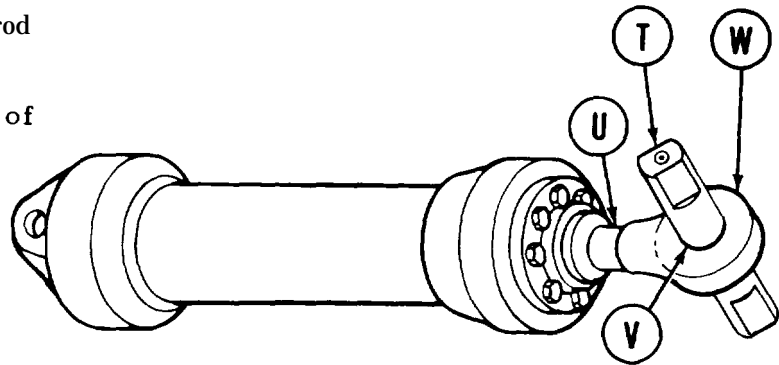
13. Using snap ring pliers, remove two retaining rings (N).
14. Using hammer and drift, remove pin (P).
15. Using 1-5/16 inch socket, remove 10 screws (Q), lockwashers (R), and two retainers (S). Throw lockwashers (R) away.
16. Using hammer and drift, remove pin (T).
17. Using lifting device, remove overhead cylinder (M) from vehicle.
18. Move overhead cylinder (M) to suitable work area.
19. Remove sling.
20. Remove container and throw away drained fluid.

Go on to Sheet 4

TA170444

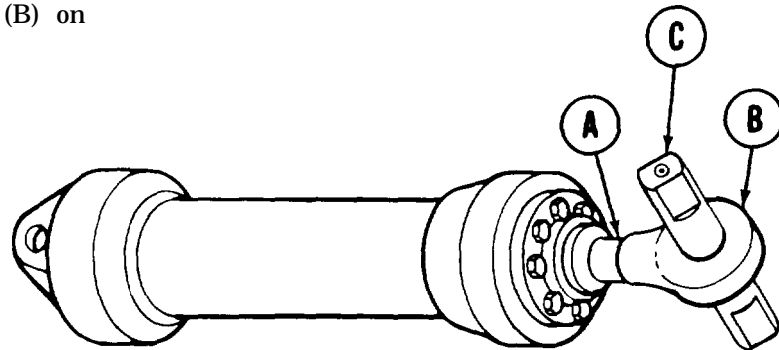
OVERHEAD CYLINDER REPLACEMENT (Sheet 4 of 7)

21. Have one technician using cylinder rod wrench on flats of cylinder rod (U), and second person insert pin (T) through rod end connector eye (V).
22. Using pin (T) as a lever, remove rod end connector (W).
23. Using masking tape, tape threads of cylinder rod (U).



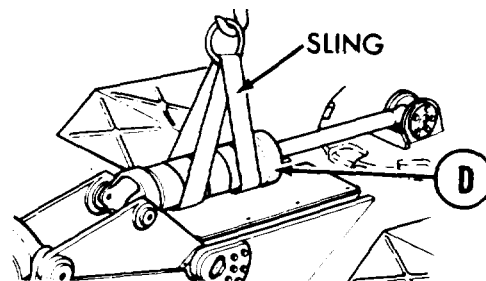
INSTALLATION:

1. Remove tape from threads of cylinder rod (A).
2. Manually start rod end connector (B) on piston rod (A).



3. Have one technician using cylinder rod wrench on flats of cylinder rod (A), and second technician insert pin (C) through eye of rod end connector (B).
4. Using pin (C) as a lever, turn rod end connector (B) clockwise and tighten. Remove pin (C).

5. Position sling around overhead cylinder (D) (use spreader if necessary), and attach lifting device.



WARNING

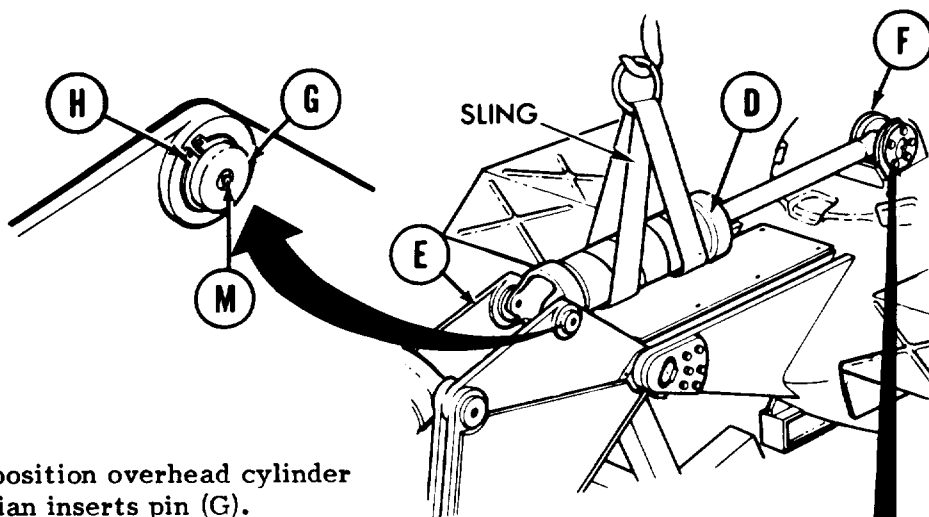
Make sure sling is wrapped on overhead cylinder (A) so that it cannot slide loose.

Go on to Sheet 5

TA170445

OVERHEAD CYLINDER REPLACEMENT (Sheet 5 of 7)

6. Lift overhead cylinder (D) and position it between boom (E) and mount (F) with hydraulic openings facing up.



7. Have two technicians position overhead cylinder (D) while third technician inserts pin (G).

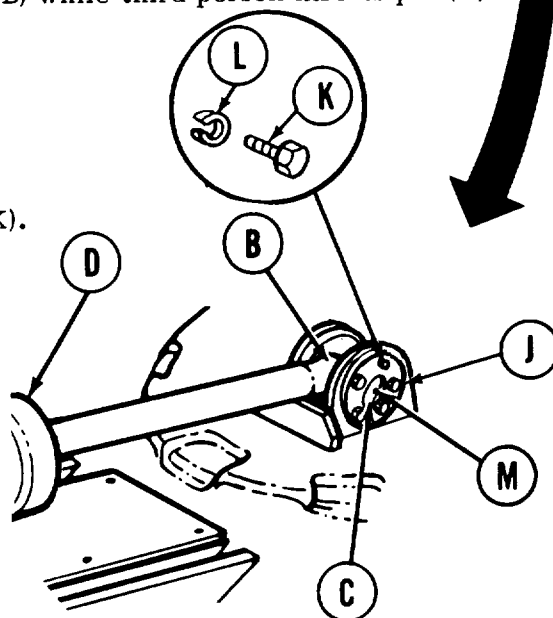
8. Using snap ring pliers, install two retaining rings (H).

9. Have two persons position rod end connector (B) while third person inserts pin (C).

10. Position two retainers (J) (one on each side).

11. Manually install 10 screws (K) and lock-washers (L) (5 in each retainer (J)).

12. Using 1-5/16 inch socket, tighten 10 screws (K).



13. Using 7/16 inch socket, install four grease fittings (M).

14. Remove lifting sling.

Go on to Sheet 6

TA170446

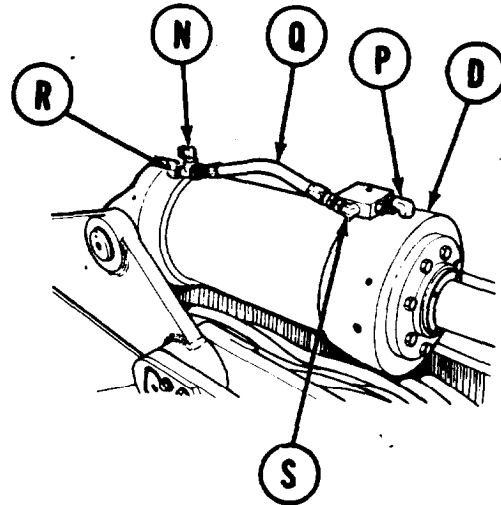
OVERHEAD CYLINDER REPLACEMENT (Sheet 6 of 7)

15. Remove protective caps from hoses and plugs from overhead cylinder.

NOTE

Put pipe tape on male threads of all hydraulic fittings.

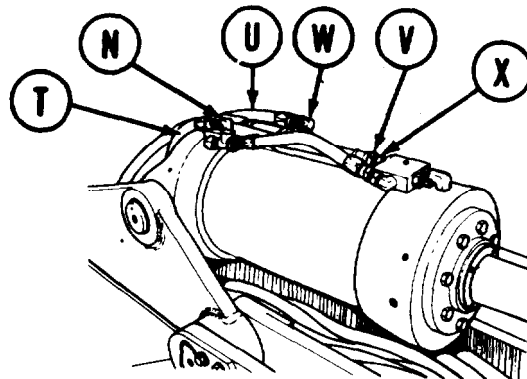
16. Manually install adapter elbow (N) and its attached parts to overhead cylinder (D).
17. Using adjustable wrench, tighten adapter elbow (N).
18. Manually install adapter elbow (P) and its attached parts to overhead cylinder (D).
19. Using adjustable wrench, tighten adapter elbow (P).
20. Manually install hose assembly "CO" (Q) to adapter elbow (R) and adapter elbow (S).
21. Using 1-1/4 inch wrench, tighten nuts of hose assembly (Q).



CAUTION

Make sure when connecting hose assemblies (T, U, and V) to check for matching tags. Hose (T) is marked "CL", hose (U) is marked "CN", hose (V) is marked "CM".

22. Manually connect three hose assemblies (T, U, and V) to elbows (N and W) and adapter (X).



23. While holding elbow (N) and elbow (W) with adjustable wrench, use 1-1/4 inch wrench to tighten nuts to two hose assemblies (T and U).
24. While holding adapter (X) with 1-1/8 inch wrench, use 1-1/4 inch wrench to tighten hose assembly nut (V).

Go on to Sheet 7

TA170447

OVERHEAD CYLINDER REPLACEMENT (Sheet 7 of 7)

25. Service hydraulic reservoir (LO 5-5420-226-12).
26. Bleed hydraulic system (page 3-66).
27. Check for hydraulic leaks and correct as necessary.
28. Service hydraulic reservoir (LO 5-5420-226-12).
- 29. Install overhead cylinder armor (page 3-218).**

End of Task

TONGUE CYLINDER ARMOR REPLACEMENT (Sheet 1 of 2)

TOOLS: 15/16 in. socket with 1/2 in. drive
5 in. extension with 1/2 in. drive

Ratchet with 1/2 in. drive
Paulin strap

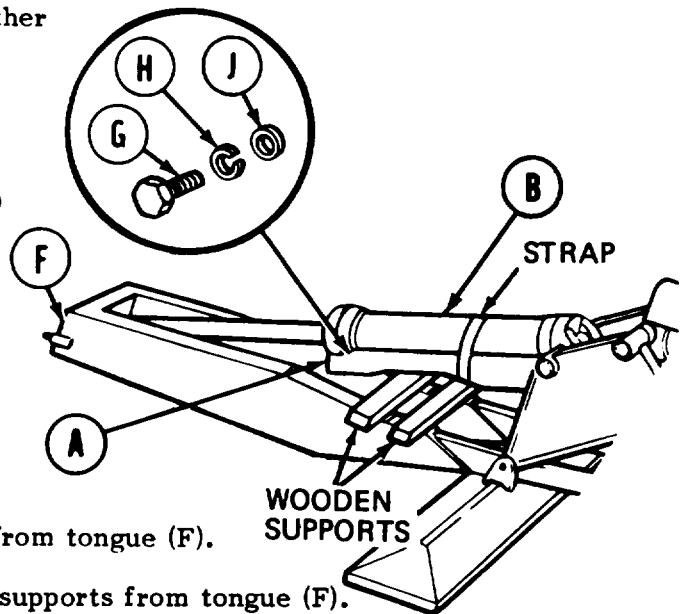
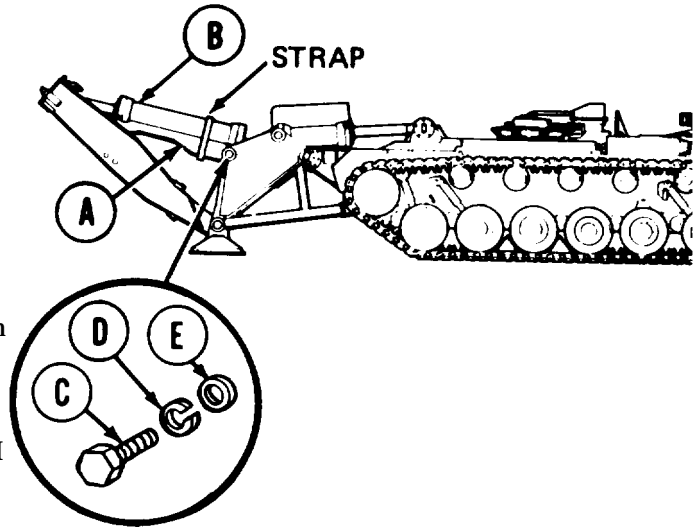
SUPPLIES: Wooden supports (2 x 4 x 36 inches 2 required)
Lockwashers (4 required)

PERSONNEL: Five

REFERENCE: TM 5-5420-226-10

REMOVAL:

1. Position tongue as shown (TM 5-5420-226-10).
2. Fasten strap around armor (A) and tongue cylinder (B) to hold armor in place while removing fasteners.
3. Using socket, remove two screws (C), lockwashers (D), and flat washers (E) from rear end of tongue cylinder (B). Throw lockwashers (D) away.
4. Extend tongue fully to position shown (TM 5-5420-226-10).
5. Place two wooden supports on tongue (F).
6. Have one technician hold armor while another using socket removes two screws (G), lockwashers (H), and flat washers (J) from forward end of tongue cylinder (B). Throw lockwashers (H) away.
7. Loosen strap and manually lower armor (A) down to rest on wooden supports.



8. Using five technicians, remove armor (A) from tongue (F).
- 9* Remove strap from armor (A) and wooden supports from tongue (F).

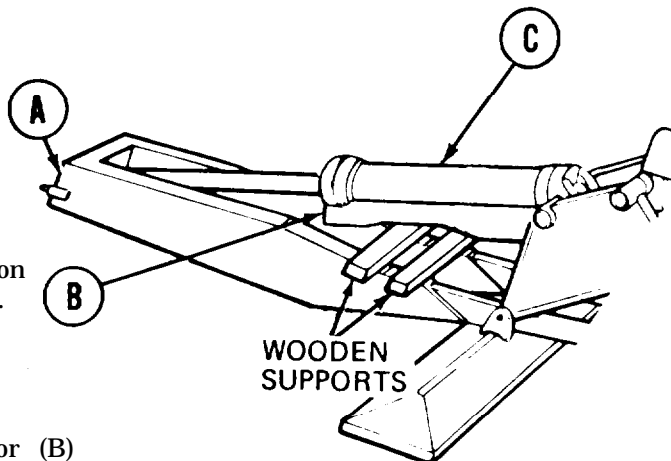
Go on to Sheet 2

TA170448

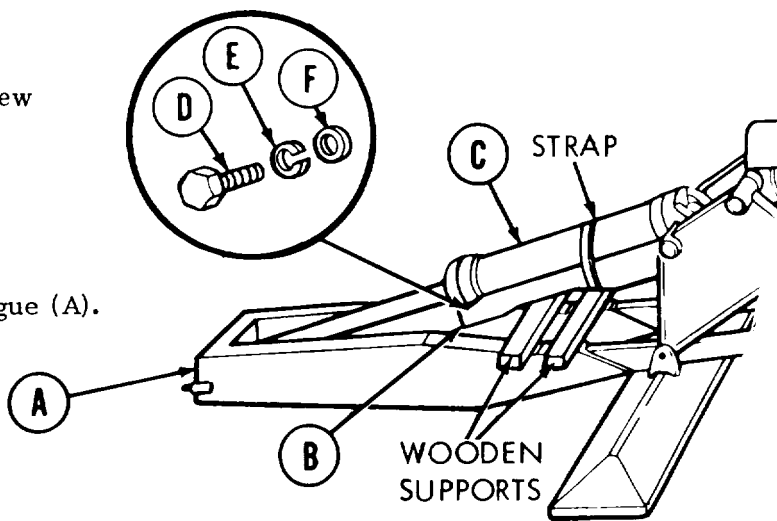
TONGUE CYLINDER ARMOR REPLACEMENT (Sheet 2 of 2)

INSTALLATION:

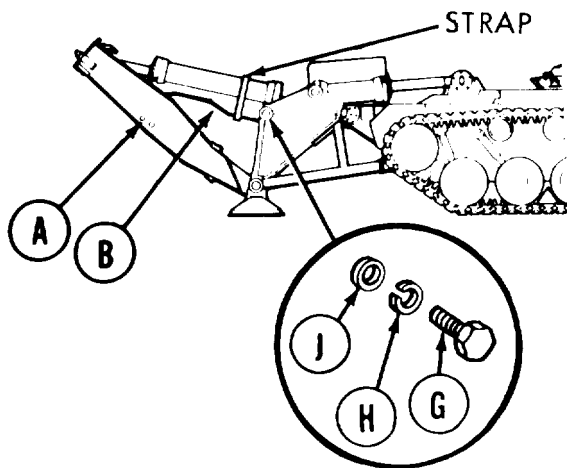
1. Place wooden supports on tongue (A).
2. Using five technicians, position armor (B) on wooden supports under tongue cylinder (C).
3. Using five technicians, manually raise armor (B) to position on tongue cylinder (C) and fasten strap around tongue cylinder and armor.



4. Using socket, install two screws (D), new lockwasher (E), and flat washers (F).
5. Remove wooden supports from tongue (A).



6. Raise tongue (A) to position shown (TM 5-5420-226-10).
7. Using socket, install two screws (G), new lockwashers (H), and flat washers (J).
8. Remove strap holding armor (B).



End of Task

TA170449

TONGUE CYLINDER REPLACEMENT (Sheet 1 of 6)
 PROCEDURE INDEX

| PROCEDURE | PAGE |
|--------------|-------|
| Removal | 3-228 |
| Installation | 3-231 |

TOOLS: 10 in. adjustable wrench
 1-1/4 in. open end wrench
 7/16 in. socket with 1/2 in. drive
 Snap ring pliers (outside)
 Ratchet with 1/2 in. drive
 Hammer
 Drift
 Lifting device (2000 lb capacity)
 Sling

1-1/8 in. open end wrench
 cylinder rod wrench

SUPPLIES: Wooden blocks
 Tags, identification
 Plastic plugs (2) (or suitable protective covering)
 Plastic caps (2) (or suitable protective covering)
 Container (catch fluid)
 Pipe tape (Item 19, Appendix D)

PERSONNEL: Three

REFERENCES: TM 5-5420-226-10
 LO 5-5420-226-12

PRELIMINARY PROCEDURE: Remove tongue cylinder armor (page 3-226)

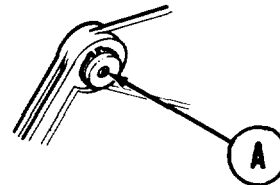
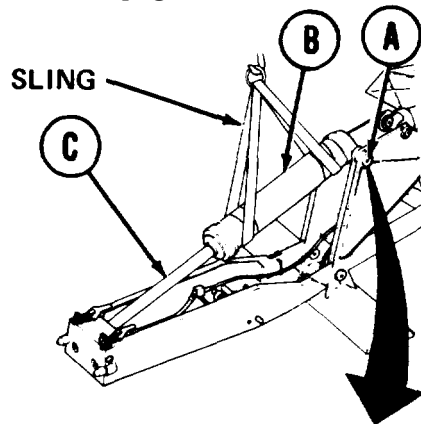
REMOVAL:

- Using socket, remove two grease fittings (A).
- Position sling around tongue cylinder (B) and attach lifting device (use spreader if necessary).

WARNING

Make sure sling is routed under hydraulic lines and tongue cylinder (B) so that it cannot slip.

- Raise lifting device until sling is tight enough to support tongue cylinder (B), then raise slightly to take load off forward end of tongue cylinder rod (C).

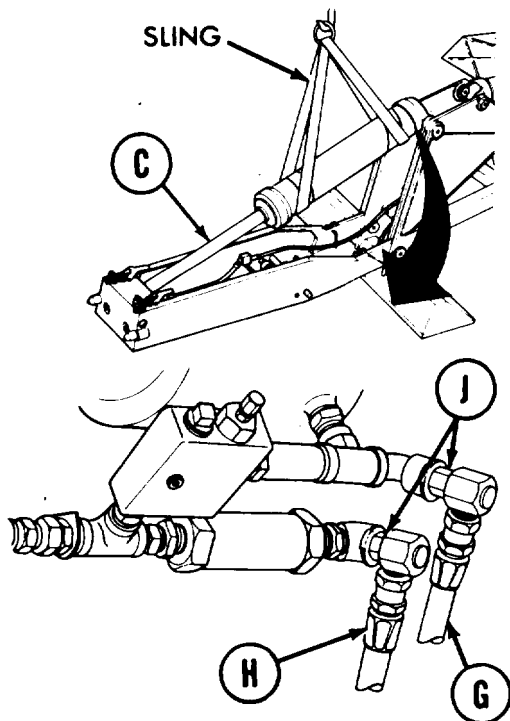
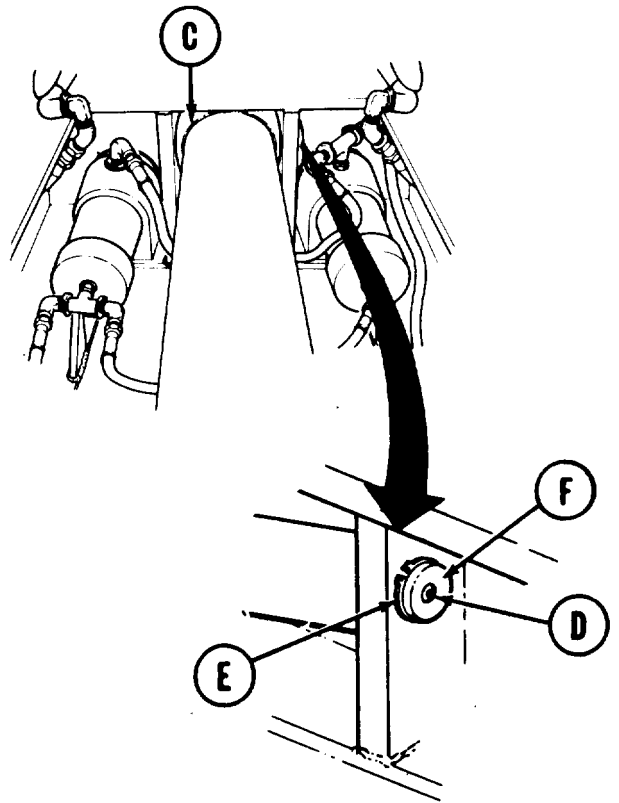


Go on to Sheet 2

TA170450

TONGUE CYLINDER REPLACEMENT (Sheet 2 of 6)

- 4* Using socket, remove two grease fittings (D).
5. Using snap ring pliers, remove two retaining rings (E).
6. Using hammer and drift, remove pin (F).
7. Retract tongue cylinder rod (C) (TM 5-5420-226-10).



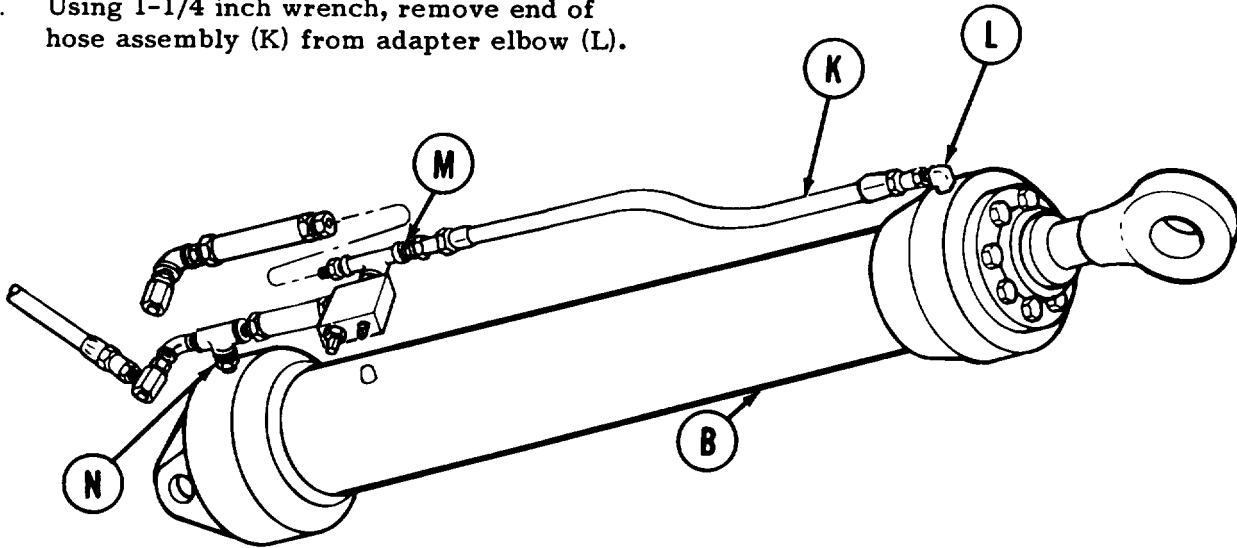
8. Tag and mark for identification hose assemblies (G) and (H) and swivel elbows (J): vehicle left side "CK1" and right side "CK2".
9. Position container to catch fluid.
10. Using 1-1/4 inch wrench on nuts of hose assemblies (G and H) and adjustable wrench on swivel elbows (J), disconnect two hose assembly nuts.
11. Put protective covering over open hydraulic ports.

Go on to Sheet 3

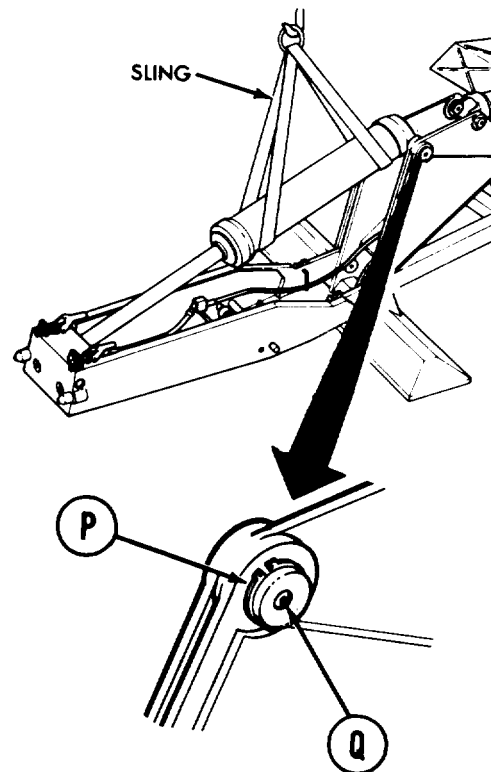
TA170451

TONGUE CYLINDER REPLACEMENT (Sheet 3 of 6)

12. Using 1-1/4 inch wrench, remove end of hose assembly (K) from adapter elbow (L).



13. Using 1-1/4 inch wrench on end of hose assembly (K) and 1-1/8 inch wrench on adapter (M), remove hose assembly.
14. Put protective covering over open hose assembly (K) ends.
15. Using adjustable wrench, remove adapter elbow (L).
16. Using 1-1/8 inch wrench on nipple (N), remove nipple (N) and its attached parts as a unit.
17. Put protective covering on open ports of tongue cylinder (B), nipple (N), and its attached parts.
18. Using snap ring pliers, remove two retaining rings (P).
19. Using hammer and drift, remove pin (Q).

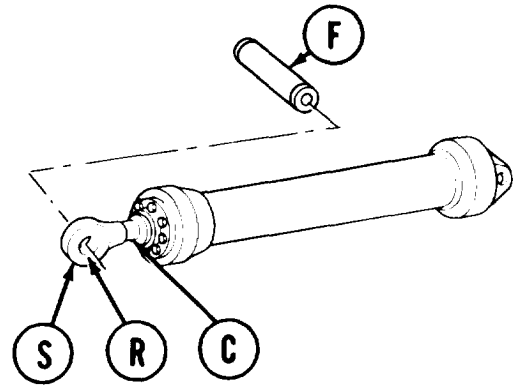


Go on to Sheet 4

TA170452

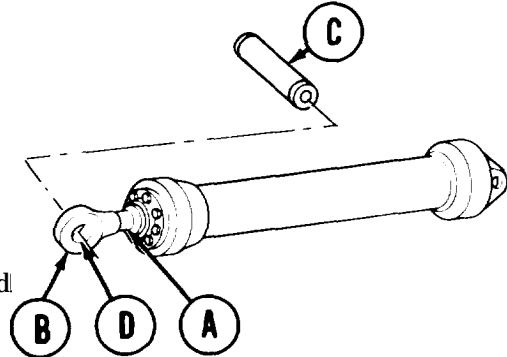
TONGUE CYLINDER REPLACEMENT (Sheet 4 of 6)

20. Using hoist, carefully lift tongue cylinder (B) and place on suitable work bench.
21. Remove container and throw away drained fluid.
22. Have one person using cylinder rod wrench on flats of cylinder rod (C) and second person insert pin (F) (previously removed) through rod end connector eye (R).
23. Using pin (F) as a lever, turn rod end connector (S) counterclockwise and remove. Remove pin (F) from rod end connector (S).
24. Tape threads of rod (C).



INSTALLATION:

1. Remove tape from threads of cylinder rod (A).
2. Using second technician, manually start rod end connector (B) on cylinder rod (A).
3. Have one technician using cylinder rod wrench on flats of cylinder rod (A), and second technician insert pin (C) through rod end connector eye (D).
4. Using pin (C) as a lever, turn rod end connector (B) clockwise and install. Remove pin (C) from rod end connector (B).



NOTE

Put pipe tape on male threads of all hydraulic fittings.

Go on to Sheet 5

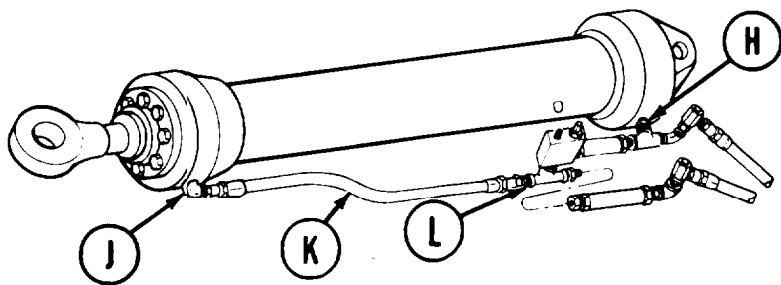
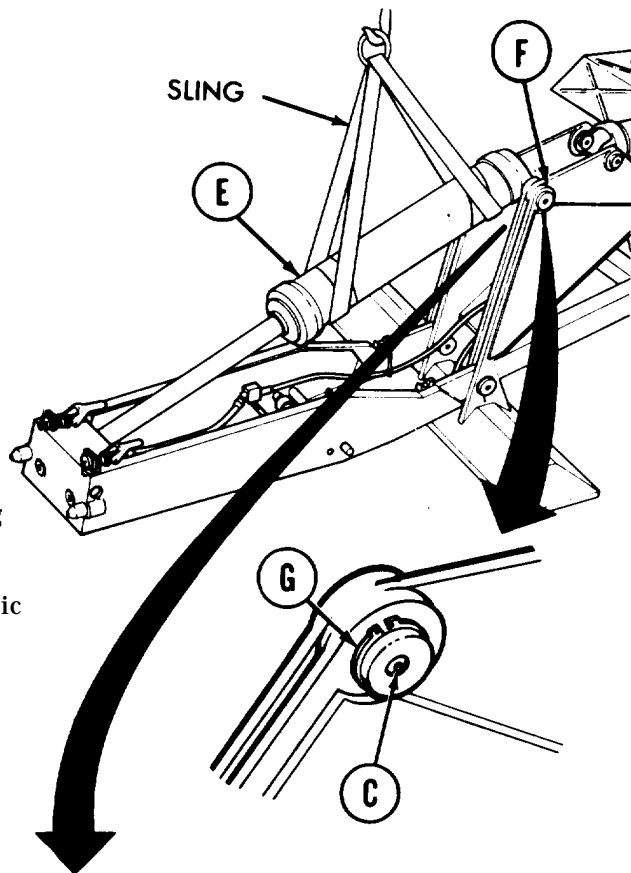
TA170453

TONGUE CYLINDER REPLACEMENT (Sheet 5 of 6)

CAUTION

Use care when attaching sling and when positioning tongue cylinder (E) to not damage attached fittings.

5. Position sling around tongue cylinder (E) (use spreader if necessary), and attach lifting device.
6. Raise tongue cylinder (E) into position and align mounting hole with boom (F).
7. Have two persons align tongue cylinder (E) while third person inserts pin (C).
8. Using snap ring pliers, install two retaining rings (G).
9. Remove protective coverings from hydraulic parts.



10. Manually start nipple (H) and its attached parts on tongue cylinder (E).
11. Using 1-1/8 inch wrench, tighten nipple (H) and align parts as shown.
12. Using adjustable wrench, install adapter elbow (J).
13. Manually start nuts of hose assembly (K) on adapter (L) and elbow (J).
14. Using 1-1/4 inch wrench, tighten two nuts of hose assembly (K).

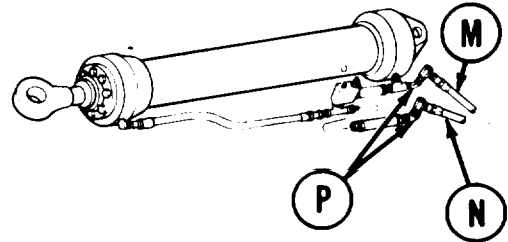
Go on to Sheet 6

TA170454

TONGUE CYLINDER REPLACEMENT (Sheet 6 of 6)

NOTE

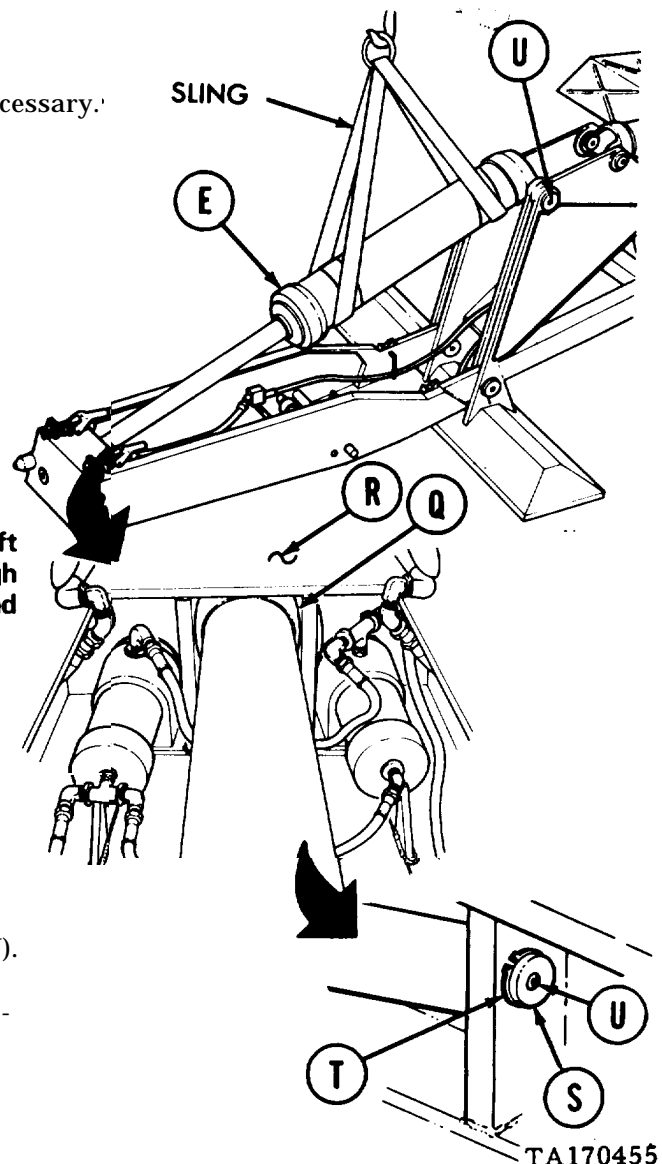
Make sure hose marked "CK1" is on vehicle left side and hose marked "CK2" is on the right.



15. Manually start nuts of hose assemblies (M and N) on swivel elbows (P).
16. Using 1-1/4 inch wrench on nuts of hose assemblies (M and N) and adjustable wrench on swivel elbows (P), tighten nuts of hose assemblies.
17. Service hydraulic reservoir (LO 5-5420-226-12).
18. Bleed hydraulic system (page 3-66).
19. Check for hydraulic leaks and correct as necessary.
20. Extend tongue cylinder (E) and position rod end connector (Q) in support of tongue (R) (TM 5-5420-226-10).
21. Have one technician hold rod end connector (Q) in position while another inserts pin (S).

NOTE

It may be necessary to use hammer and drift on pin (S) after it has been started through both the support of tongue (R) and rod end connector (Q).



22. Using snap ring pliers, install two retaining rings (T).
23. Remove sling and lifting device.
24. Using socket, install four grease fittings (U).
25. Service hydraulic reservoir (LO 5-5420-226-12).
26. Install tongue cylinder armor (page 3-227).

End of Task

TA170455

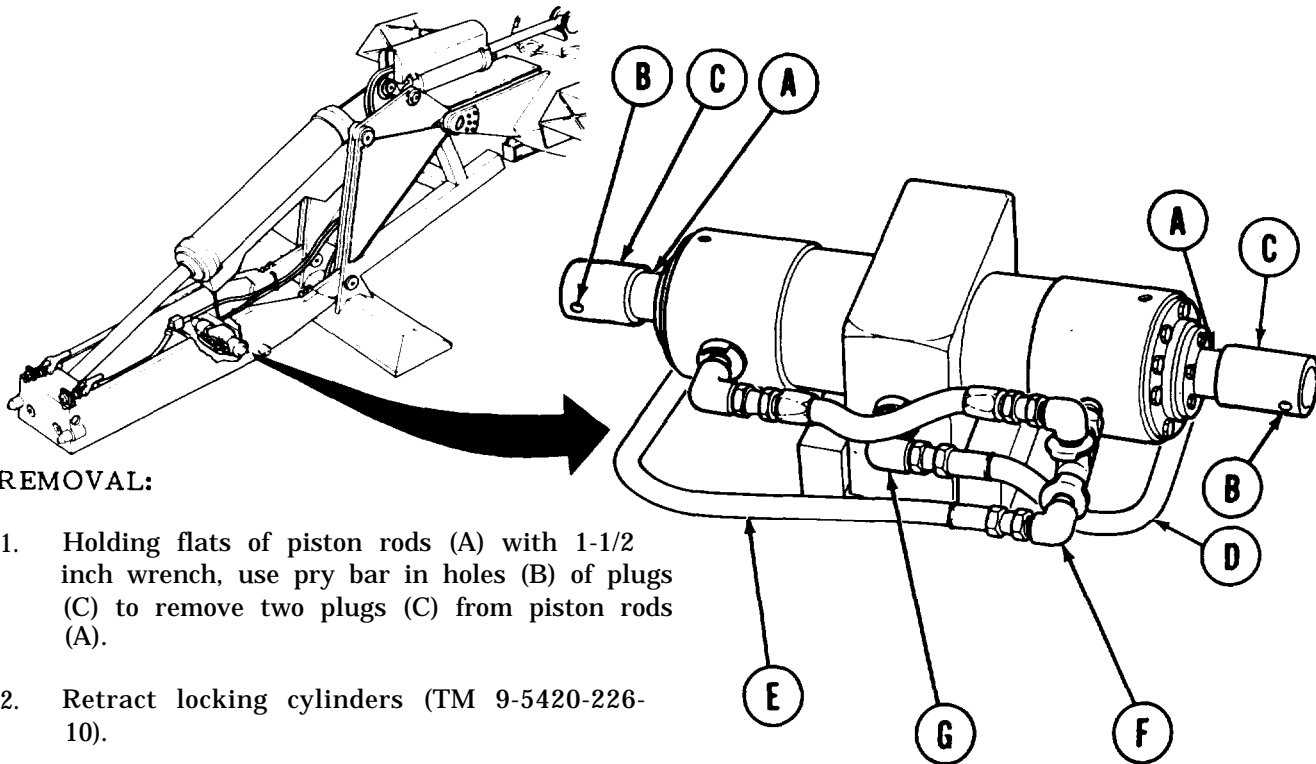
LOCKING CYLINDER REPLACEMENT (Sheet 1 of 3)

TOOLS: 10 in. adjustable wrench
1-1/2 in. cylinder rod wrench (stowed right fender box)
7/8 in. open end wrench
3/4 in. combination wrench
Roller head pry bar

SUPPLIES: Container (to catch fluid) Protective coverings (assorted sizes)
Tags, identification (for hoses) Pipe tape (Item 19, Appendix D)

REFERENCES: LO 5-5420-226-12
TM 5-5420-226-10

PRELIMINARY PROCEDURE: Extend locking cylinder (TM 5-5420-226-10).



REMOVAL:

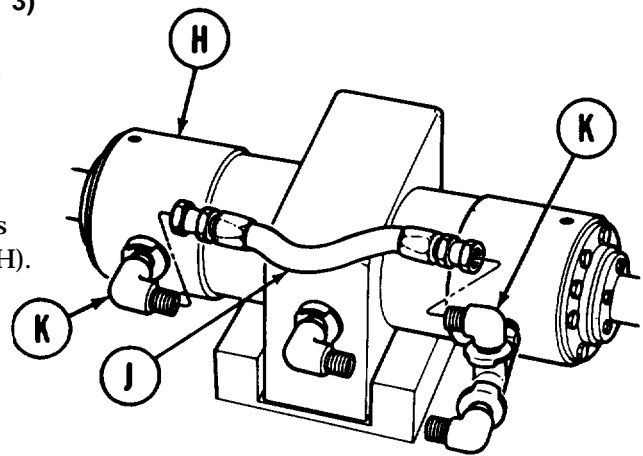
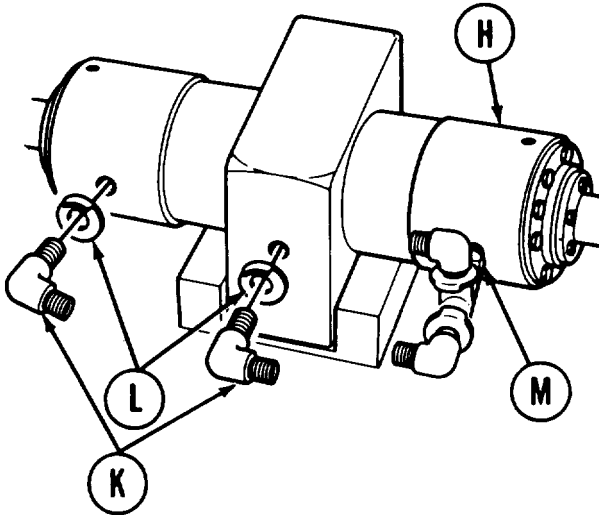
1. Holding flats of piston rods (A) with 1-1/2 inch wrench, use pry bar in holes (B) of plugs (C) to remove two plugs (C) from piston rods (A).
2. Retract locking cylinders (TM 9-5420-226-10).
3. Relieve hydraulic pressure (page 3-65).
4. Tag and mark for identification, hose assemblies "CE2" (D) and "CE1" (E) to aid in installation.
5. Position container to catch fluid.
6. Using 7/8 inch wrench, disconnect hose assemblies "CE2" (D) and "CE1" (E) from elbows (F and G).
7. Put protective coverings on hose assemblies "CE2" (D) and "CE1" (E).

Go on to Sheet 2

TA170456

LOCKING CYLINDER REPLACEMENT (Sheet 2 of 3)

8. Remove locking cylinder (H) from vehicle.
9. Using 7/8 inch wrench, remove hose assembly (J) from two elbows (K).
10. Using 3/4 inch wrench, remove two elbows (K) and collars (L) from locking cylinder (H).



11. Using 3/4 inch wrench, remove nipple (M) and its attached parts from locking cylinder (H).
12. Put protective covering on all hydraulic parts.
13. Remove container and throw away drained fluid.

INSTALLATION:

NOTE

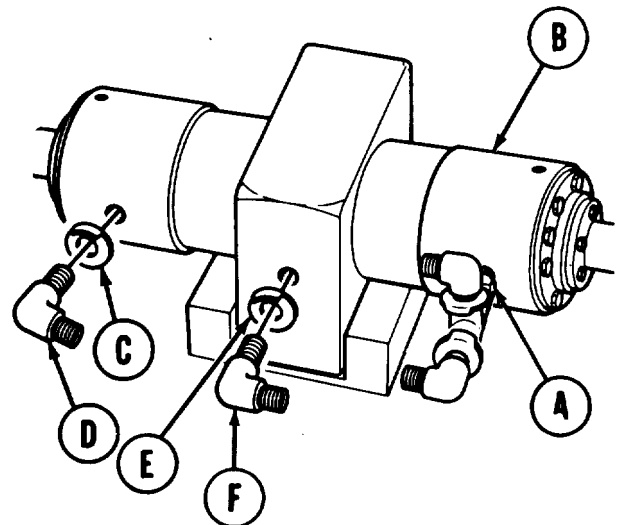
Remove protective covering and put pipe tape on all male threads of hydraulic fittings.

1. Using 3/4 inch wrench, install nipple (A) and its attached parts on locking cylinder (B).

NOTE

Collar (C), marked "M" is used with elbow (D) and collar (E), marked "CE2" is used with elbow (F).

2. Using 3/4 inch wrench, install two elbows (D, F) and collars (C, E).

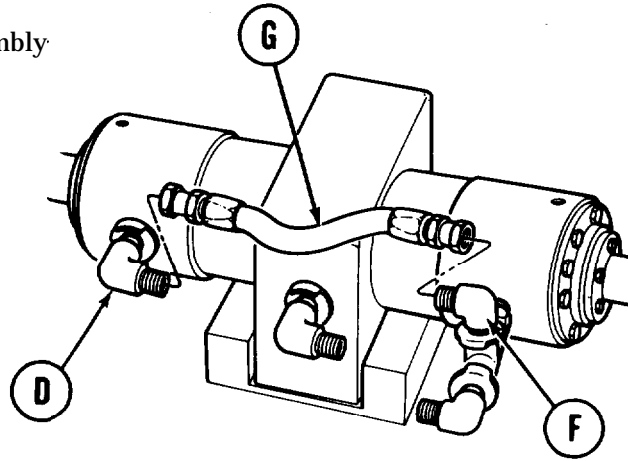


Go on to Sheet 3

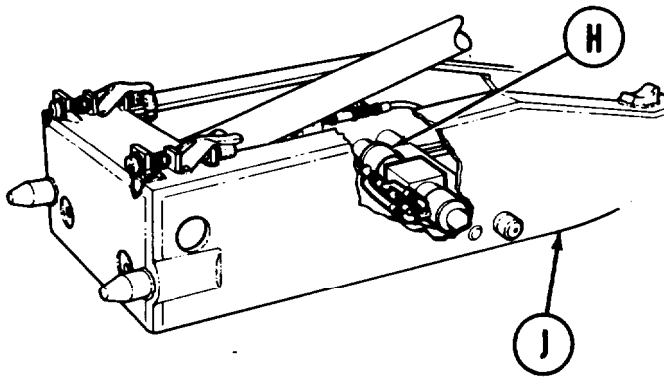
TA170457

LOCKING CYLINDER REPLACEMENT (Sheet 3 of 3)

3. Using 7/8 inch wrench, install hose assembly (G) to elbows (D, F).

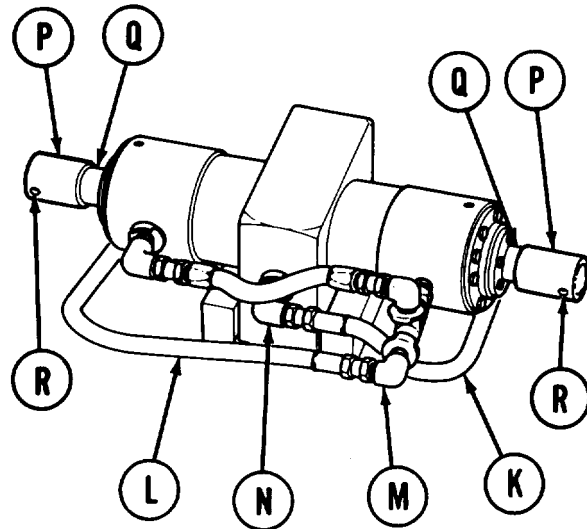


Position locking cylinder (H) in launcher tongue (J) with all hydraulic ports facing forward.



5. Manually install two hose assemblies (K, L) as follows: hose assembly (L) marked "CE1" to elbow (M) and hose assembly (K) marked "CE2" to elbow (N).

6. Using 7/8 inch wrench, tighten nuts of hose assemblies (K, L).
7. Service hydraulic reservoir (LO 5-5420-226-12).
8. Bleed hydraulic system (page 3-66).
9. Check for hydraulic leaks and correct as necessary.
10. Service hydraulic reservoir (LO 5-5420-226-12).
11. Extend locking cylinder (TM 5-5420-226-10).
12. Manually install plugs (P) on piston rod (Q).
13. Using pry bar through holes (R) in plugs (P) and 1-1/2 inch wrench on flats of piston rod (Q), tighten two plugs (P).



End of Task

TA170458

EJECTION CYLINDER REPLACEMENT (LEFT) (Sheet 1 of 4)

PROCEDURE INDEX

| P R O C E D U R E | P A G E |
|-------------------|---------|
| Removal | 3-237 |
| Installation | 3-239 |

TOOLS: 3/8 in. drift punch
 Sledge hammer
 Flat-tip screwdriver (3/4 to 1 in. across flats)
 10 in. adjustable wrench
 3/4 in. open end wrench
 1-1/2 in. open end wrench
 7/8 in. open end wrench

SUPPLIES: Pipe tape (Item 19, Appendix D)
 Container (to catch fluid)
 Tags, identification (for hoses)
 Wooden block at least 4 in. thick
 Protective covers and caps (assorted sizes)
 Lockwashers (2 required)

REFERENCES: LO 5-5420-226-12
 TM 5-5420-226-10

PRELIMINARY PROCEDURE: Extend ejection cylinder's (TM 5-5420-226-10)

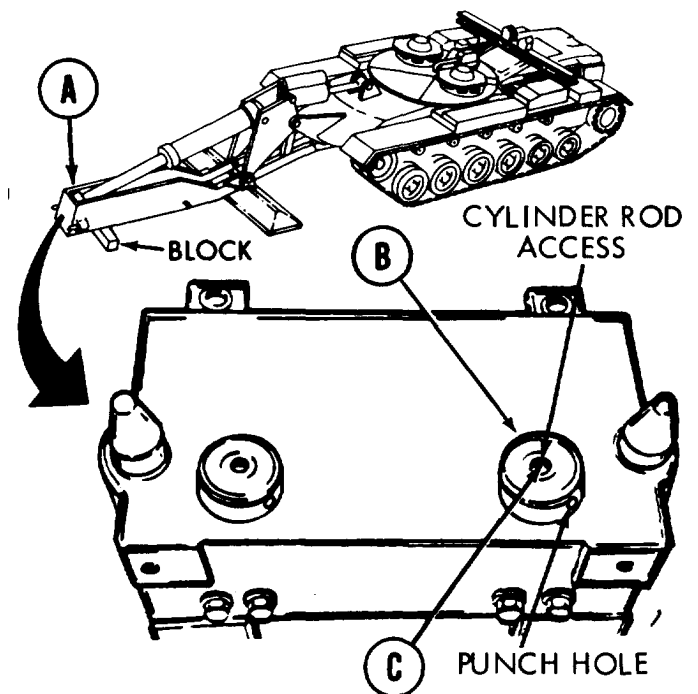
REMOVAL:

1. Place wooden block under tongue (A) and lower tongue (A) (TM 5-5420-226-10).

NOTE

It may be necessary to hit plug (B) with sledge hammer in order to loosen plug (B).

2. Using punch in hole of plug (B), unscrew plug (B) while holding cylinder rod (C) from turning with screwdriver.
3. Remove plug (B) from tongue (A).
4. Relieve hydraulic pressure (page 3-65).

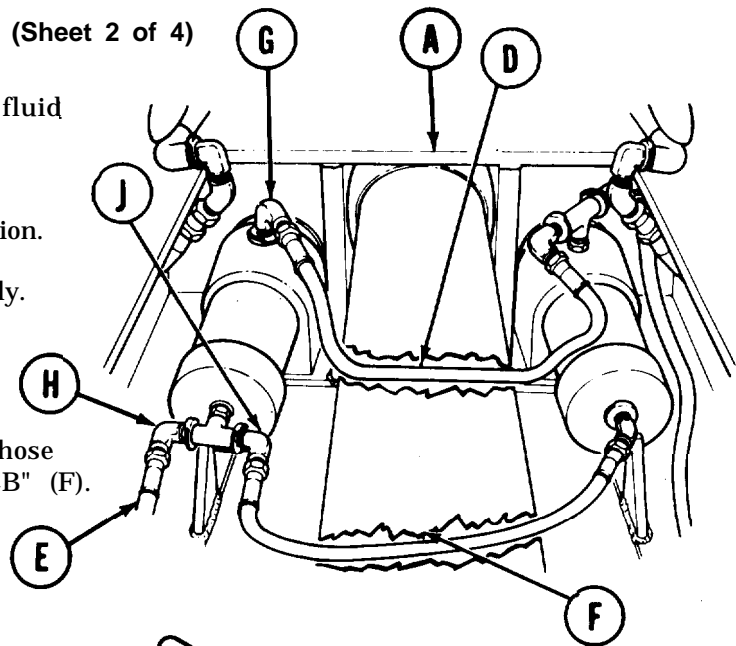


TA170459

Go on to Sheet 2

EJECTION CYLINDER REPLACEMENT (LEFT) (Sheet 2 of 4)

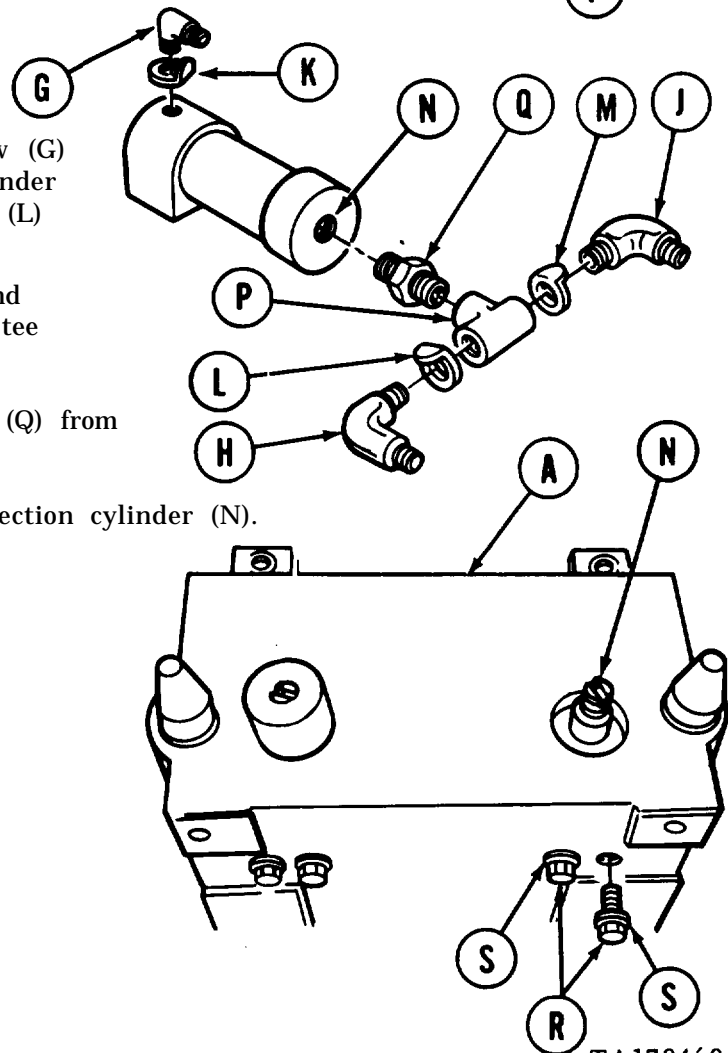
5. Position container to catch hydraulic fluid in tongue (A).
6. Tag and mark hose assemblies CA (D), "CC" (E), and "CB" (F) for identification.
7. Using 7/8 inch wrench on hose assembly nuts and adjustable wrench on elbows (G, H, J), disconnect hose assemblies "CA" (D), "CC" (E) and CB (F).
8. Put protective covering over ends of hose assemblies "CA" (D), "CC" (E), and "CB" (F).



NOTE

When removing parts, be sure to keep collars "CA" (K), "CC" (L), and "CB" (M) with hose assemblies of same markings.

9. Using adjustable wrench, remove elbow (G) and collar "CA" (K) from ejector cylinder (N) and elbows (H, J) and collars "CC" (L) and "CB" (M) from tee (P).
10. Using 3/4 inch wrench on nipple (Q) and adjustable wrench on tee (P), remove tee (P) from nipple (Q).
11. Using 3/4 inch wrench, remove nipple (Q) from ejector cylinder (N).
12. Put protective covering on ports of ejector cylinder (N).
13. Using 1-1/2 inch wrench, remove two screws (R) and lockwashers (S) from bottom of tongue (A). Throw lockwashers (S) away.
14. Manually remove ejector cylinder (N) from inside of tongue (A).
15. Remove container and throw away drained fluid.

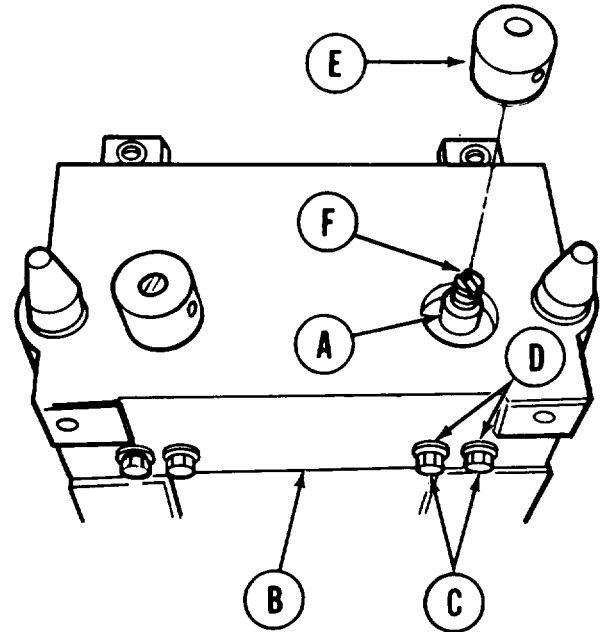


Go on to Sheet 3

EJECTION CYLINDER REPLACEMENT (LEFT) (Sheet 3 of 4)

INSTALLATION:

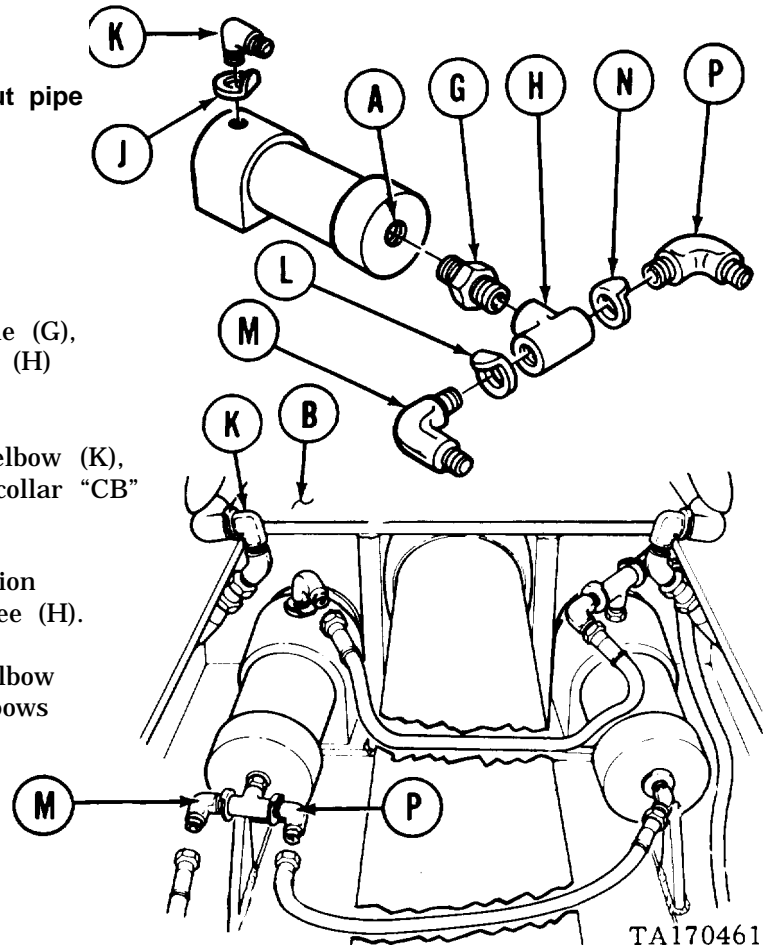
1. Position ejection cylinder (A) in tongue (B).
2. Manually install two screws (C) and new lockwashers (D) in bottom of tongue (B) to secure ejection cylinder (A).
3. Using 1-1/2 inch wrench, tighten two screws (C) and lockwashers (D).
4. Manually start plug (E) on threads of cylinder rod (F).
5. Using punch in hole of plug (E), tighten plug (E) while holding cylinder rod (F) from turning with screwdriver.



NOTE

Remove protective coverings and put pipe tape on all male hydraulic fittings.

6. Using 3/4 inch wrench, install nipple (G) in ejection cylinder (A).
7. Using 3/4 inch wrench to hold nipple (G), use adjustable wrench to install tee (H) on nipple (G).
8. Manually place collar "CA" (J) on elbow (K), collar "CC" (L) on elbow (M), and collar "CB" (N) on elbow (P).
- 9* Manually install elbow (K) on ejection cylinder (A) and elbows (M, P) on tee (H).
10. Using adjustable wrench, tighten elbow (K) on ejection cylinder (A) and elbows (M, P) on tee (H).



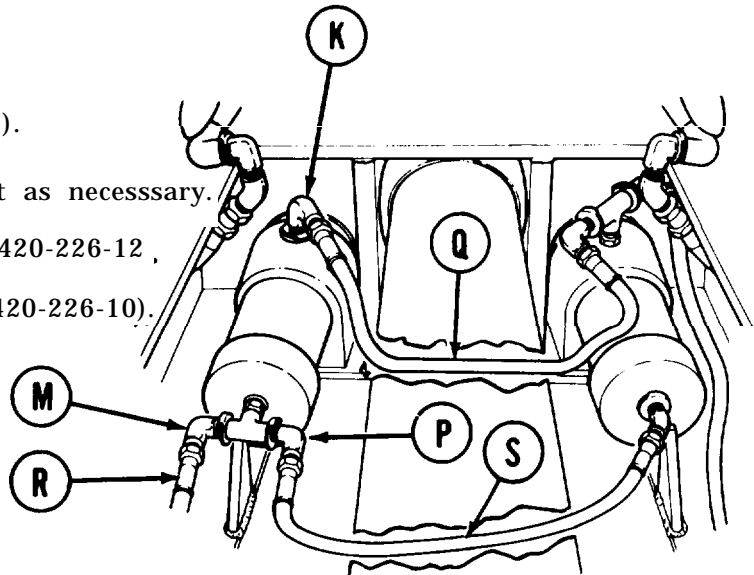
Go on to Sheet 4

TA170461

EJECTION CYLINDER REPLACEMENT (LEFT) (Sheet 4 of 4)

11. Using 7/8 inch wrench, install nuts of hose assemblies "CA" (Q), "CC" (R), and "CB" (S) to elbows (K, M, P).
12. Bleed hydraulic system (page 3-66).
13. Check for hydraulic leaks and correct as necessary.
14. Service hydraulic reservoir (LO 5-5420-226-12).
15. Retract ejection cylinders (TM 5-5420-226-10).

End of Task



EJECTION CYLINDER REPLACEMENT (RIGHT) (Sheet 1 of 4)

PROCEDURE INDEX

| PROCEDURE | Page. |
|--------------|-------|
| Removal | 3-241 |
| Installation | 3-243 |

TOOLS: 3/8 in. drift punch
 Sledge hammer
 Flat-tip screwdriver (3/4 to 1 in. across flats)
 10 in. adjustable wrench
 1-1/2 in. combination box and open end wrench
 7/8 in. open end wrench
 3/4 in. open end wrench

SUPPLIES: Pipe tape (Item 19, Appendix D)
 Container (to catch fluid)
 Tags, identification (for hoses)
 Wooden block at least 4 in. thick
 Protective covering (assorted sizes)
 Lockwashers (2)

REFERENCES: LO 5-5420-226-12
 TM 5-5420-226-10

PRELIMINARY PROCEDURE: Extend ejection cylinders (TM 5-5420-226-10)

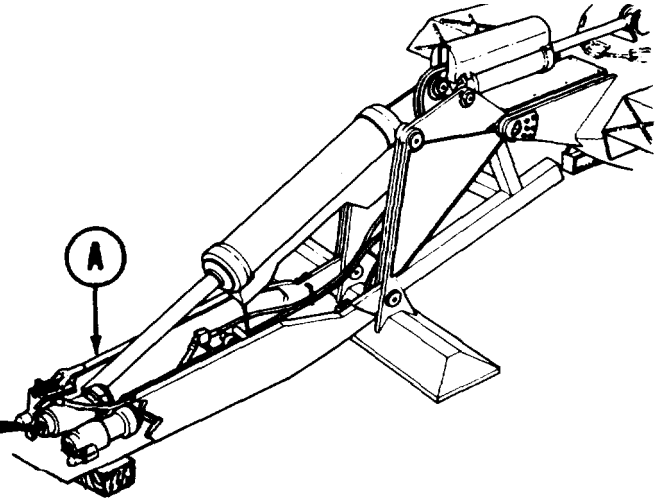
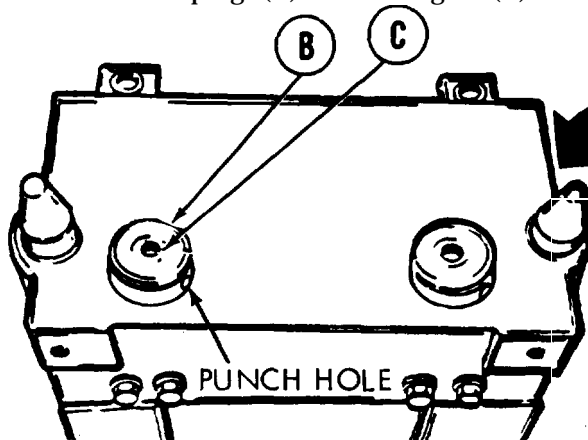
REMOVAL:

1. Place wooden block under tongue (A) and lower tongue (A) (TM 5-5420-226-10).
2. Using punch in hole of plug (B), unscrew plug (B) while holding cylinder rod (C) from turning with screwdriver.

NOTE

It may be necessary to hit plug (B) with a sledge hammer in order to loosen.

3. Remove plug (B) from tongue (A).



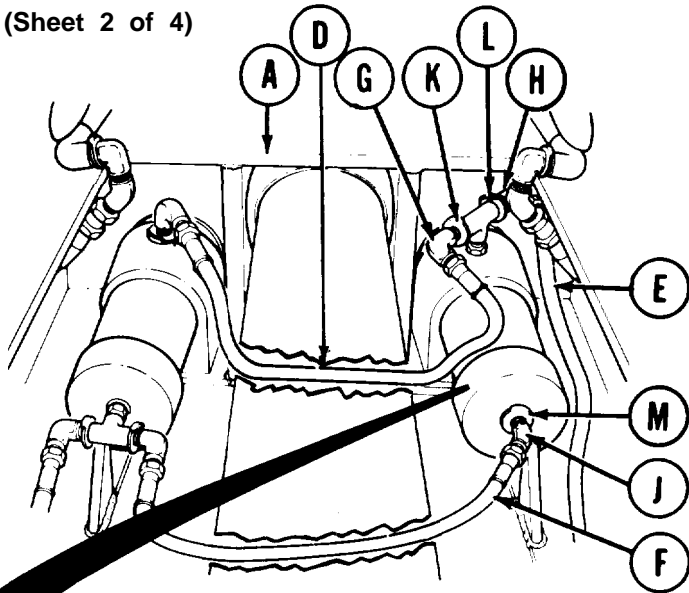
Relieve hydraulic pressure (page 3-65).

Position container to catch hydraulic fluid in tongue (A).

TA170463

EJECTION CYLINDER REPLACEMENT (RIGHT) (Sheet 2 of 4)

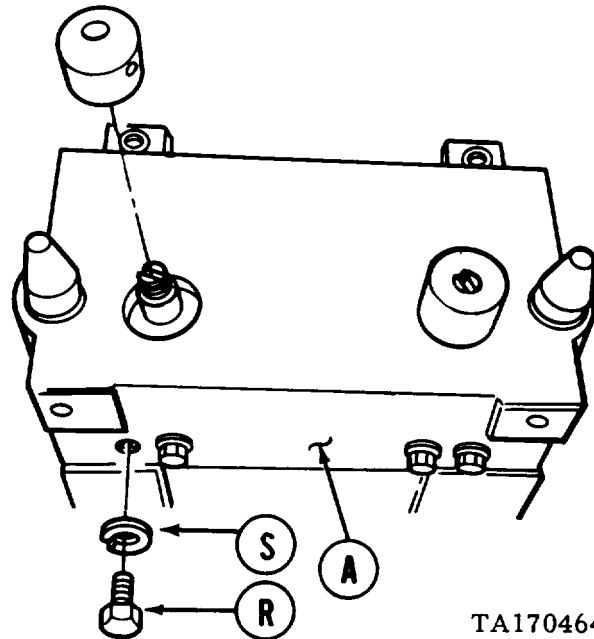
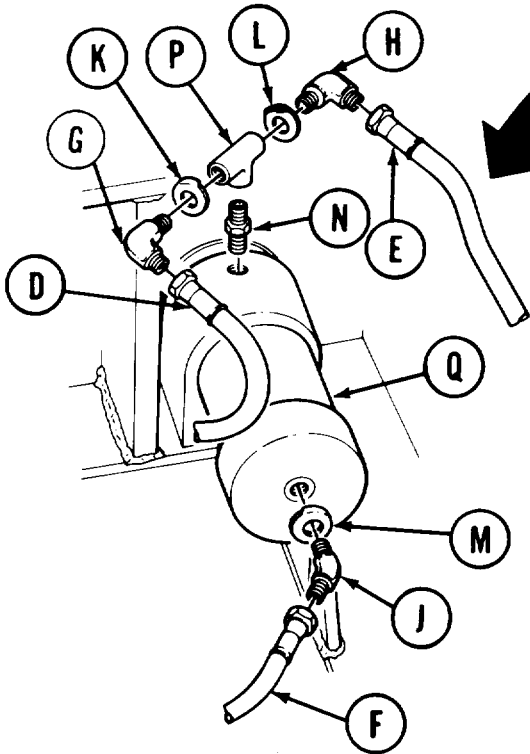
6. Tag and mark, for identification, hose assemblies "CA" (D), "CD" (E), and "CB" (F).
7. Using 7/8 inch wrench on hose assembly nuts and adjustable wrench on elbows (G, H, J), disconnect hose assemblies "CA" (D) from elbow (G), "CD" (E) from elbow (H), and "CB" (F) from elbow (J).
8. Put protective covering over ends of hose assemblies "CA" (D), "CD" (E) "CB" (F).



NOTE

When removing parts, make sure to keep collars "CA" (K), "CD" (L), and "CB" (M) with hose assemblies of same markings.

9. Using adjustable wrench, remove elbows (G, H) and collars "CA" (K) and "CD" (L) from tee (P) and elbow (J) and collar "CB" (M) from ejection cylinder.
10. Using 3/4 inch wrench on nipple (N) and adjustable wrench on tee (P), remove tee (P).
11. Using 3/4 inch wrench, remove nipple (N).
12. Put protective covering on ports of ejection cylinder (Q).



13. Using 1-1/2 inch wrench, remove two screws (R) and lockwashers (S) from" bottom of tongue (A). Throw lockwashers (S) away.
14. Manually remove ejection cylinder (Q).
15. Remove container and throw away drained fluid.

Go on to Sheet 3

TA170464

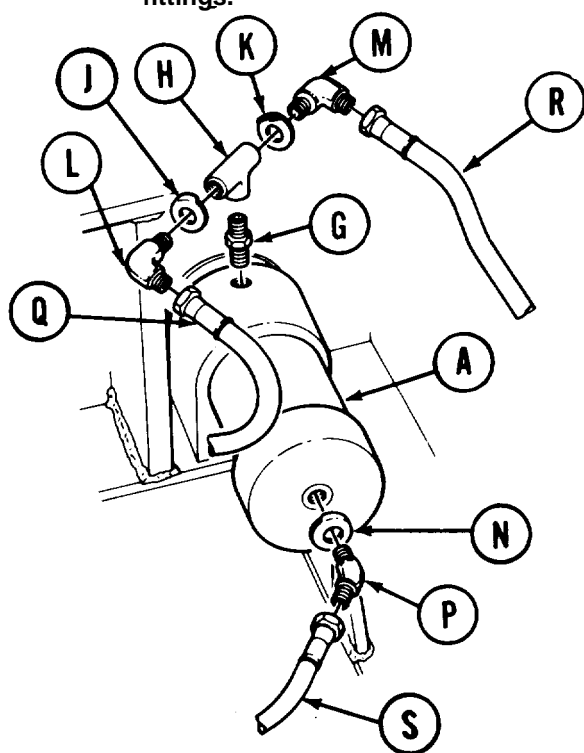
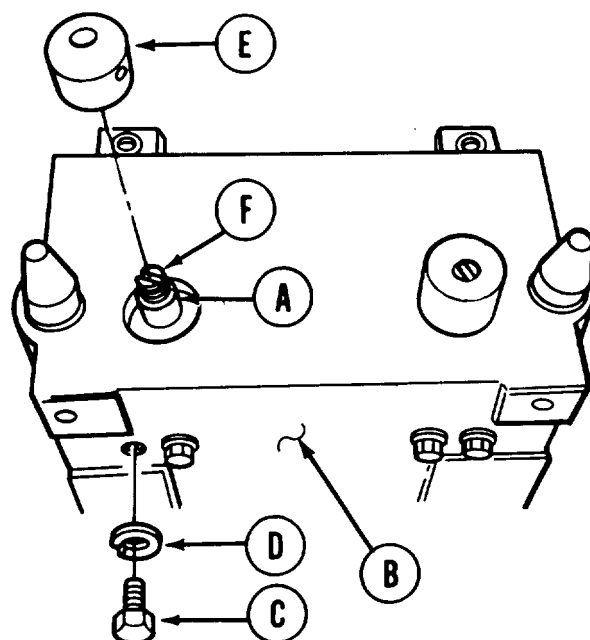
EJECTION CYLINDER REPLACEMENT (RIGHT) (Sheet 3 of 4)

INSTALLATION :

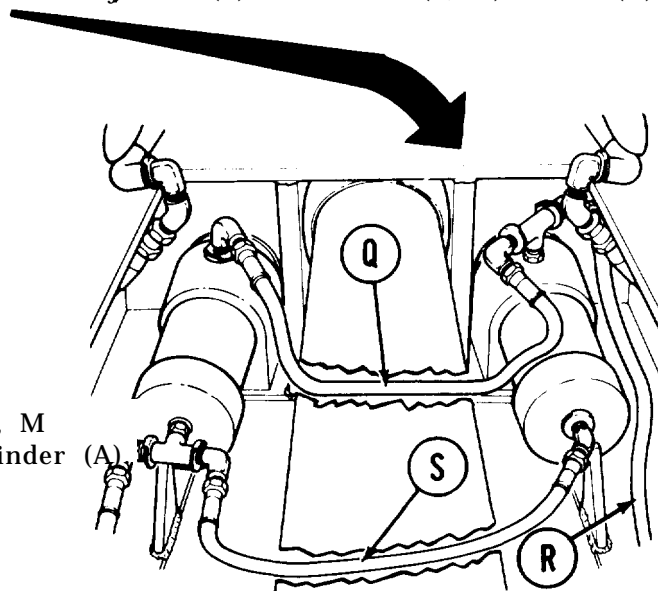
1. Position ejection cylinder (A) in tongue (B).
2. Manually install two screws (C) and new lockwashers (D) in bottom of tongue to secure ejection cylinder (A).
3. Using 1-1/2 inch wrench, tighten two screws (C) and lockwashers (D).
4. Manually start plug (E) on threads of cylinder rod (F).
5. Using punch in hole of plug (E), tighten plug (E) while holding cylinder rod (F) from turning with screwdriver.

NOTE

Remove protective coverings and put pipe tape on all male hydraulic fittings.



6. Using 3/4 inch wrench, install nipple (G) in ejection cylinder (A).
7. Using 3/4 inch wrench to hold nipple (G), use adjustable wrench to install tee (H).
8. Manually place collars "CA" (J) and "CD" (K) on elbows (L, M) and collar "CB" (N) on elbow (P).
9. Manually install elbow (P) on ejection cylinder (A) and elbows (L, M) on tee (H).



- 10* Using adjustable wrench, tighten elbows (L, M) to tee (H) and elbow (P) to ejection cylinder (A).
11. Manually install hose assemblies "CA" (Q) to elbow (L), "CD" (R) to elbow (N), and "CB" (S) to elbow (P).

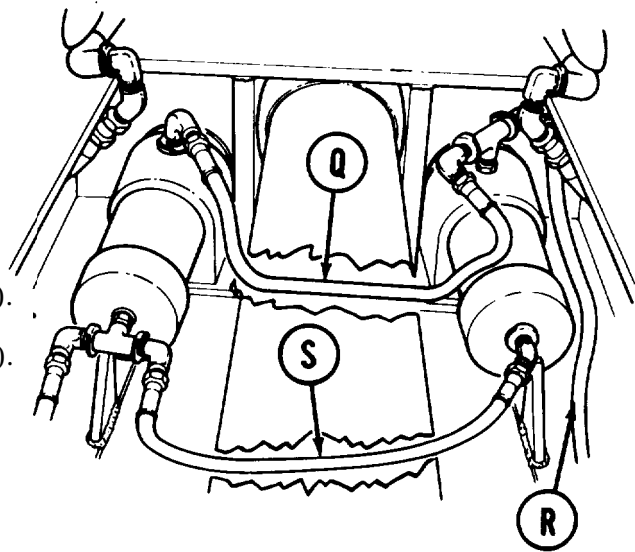
Go on to Sheet 4

TA170465

EJECTION CYLINDER REPLACEMENT (RIGHT) (Sheet 4 of 4)

12. Using 7/8 inch wrench, tighten nuts of hose assemblies "CA" (Q), "CD" (R) and "CB" (S).
13. Bleed hydraulic system (page 3-66).
14. **Check for hydraulic leaks and correct as necessary.**
15. Service hydraulic reservoir (LO 5-5420-226-12).
16. Retract ejection cylinders (TM 5-5420-226-10).

End of Task



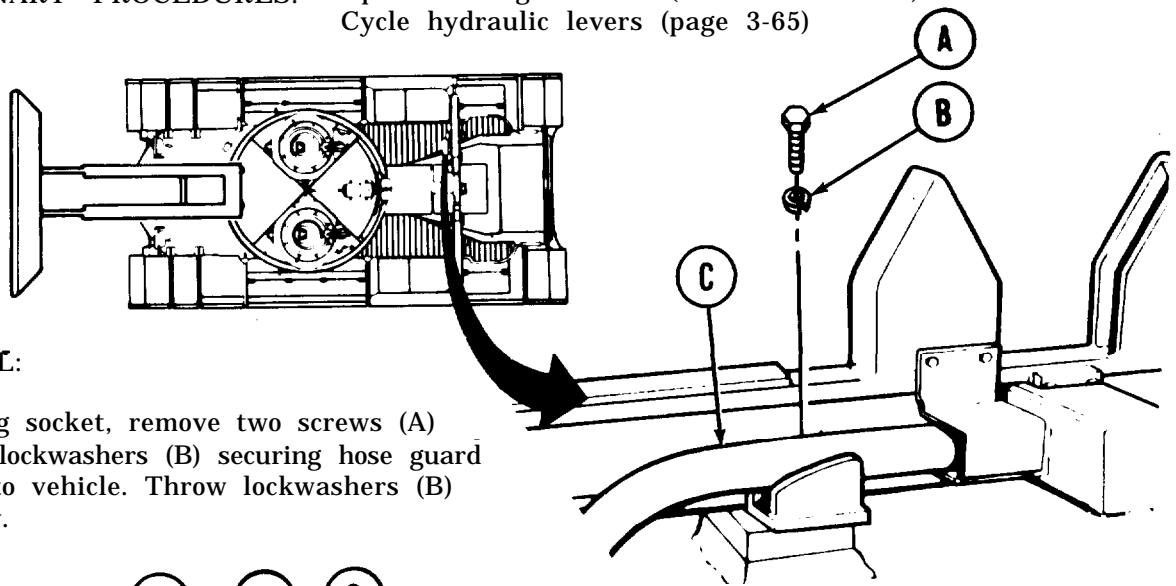
HOLDDOWN CYLINDER HOSE GUARD REPLACEMENT (Sheet 1 of 2)

TOOLS: 7/8 in. open end wrench
 1-1/2 in. socket with 3/4 in. drive
 Ratchet with 3/4in. drive

SUPPLIES: Rags (Item 12, Appendix D)
 Protective plugs (4)
 Pipe tape (Item 19, Appendix D)
 Pencil
 Masking tape (Item 18, Appendix D)
 Lockwashers (2 required)

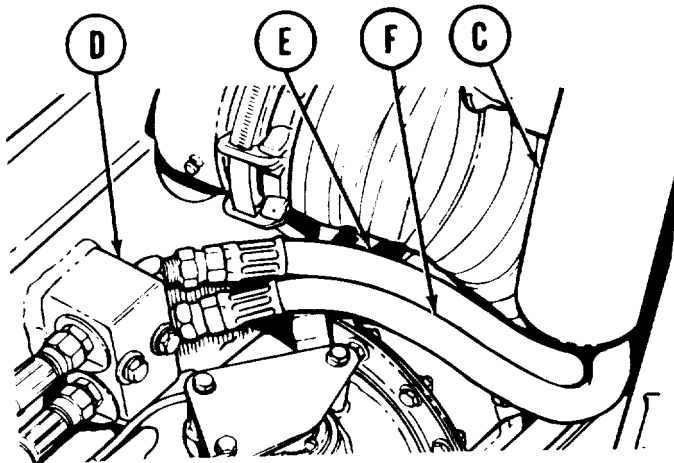
REFERENCE: TM 5-5420-226-10

PRELIMINARY PROCEDURES: Open No. 3 grille door (TM 5-5420-226-10)
 Cycle hydraulic levers (page 3-65)



REMOVAL:

1. Using socket, remove two screws (A) and lockwashers (B) securing hose guard (C) to vehicle. Throw lockwashers (B) away.



NOTE

Cap lines and manifold (D) when disconnected. Use pencil and masking tape to tag lines for installation.

2. Using wrench, remove hose assemblies "CV3" (E) and "CV4" (F) from manifold (D).
3. Slide hose guard (C) off hose assemblies (E and F).

Go on to Sheet 2

TA170467

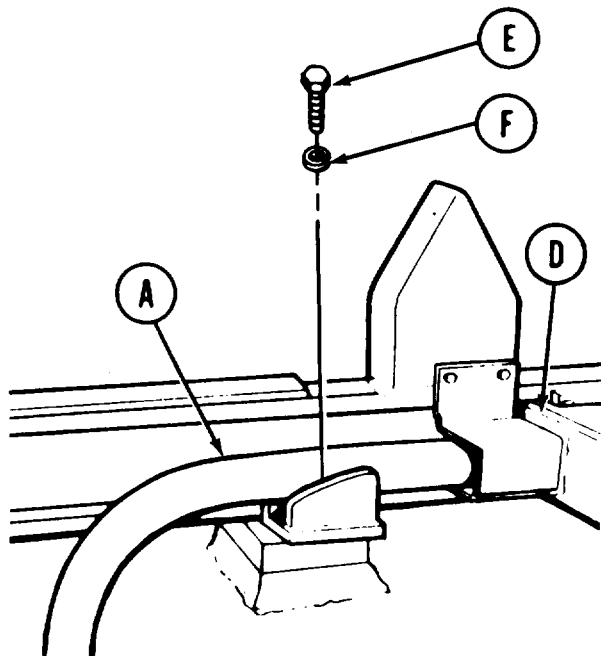
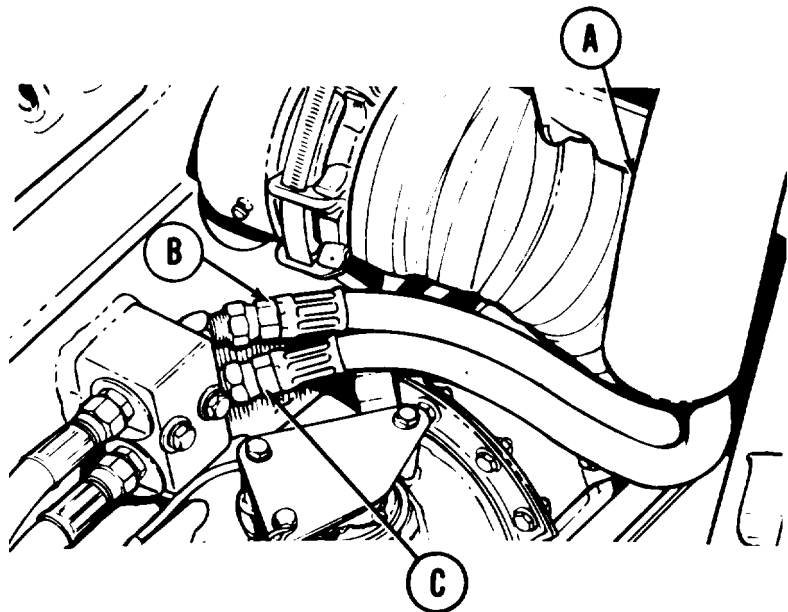
HOLDDOWN CYLINDER HOSE GUARD REPLACEMENT (Sheet 2 of 2)

INSTALLATION:

NOTE

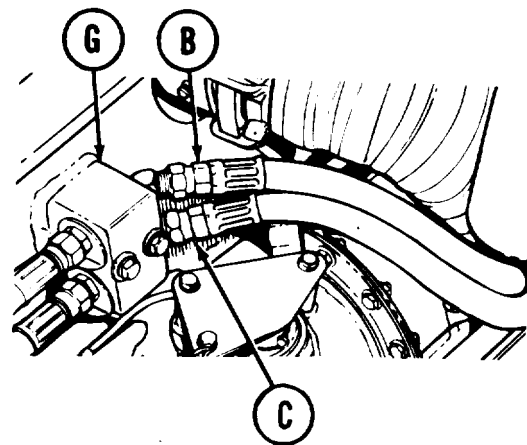
Use pipe tape on all male threads before installation. Start tape on second thread so tape will not enter hydraulic system.

1. Slide hose guard (A) over two hose assemblies (B) and (C).



2. Slip hose guard (A) into position against holddown cylinder armor (D).
3. Using socket, install two screws (E) and new lockwashers (F).

4. Using wrench, install hose assemblies "CV3" (C) and "CV4" (B) on manifold (G) as shown.
5. Close engine right No. 3 grille door (TM-5-5420-226-10).



End of Task

TA170468

HOLD-DOWN CYLINDER ARMOR REPLACEMENT (Sheet 1 of 1)

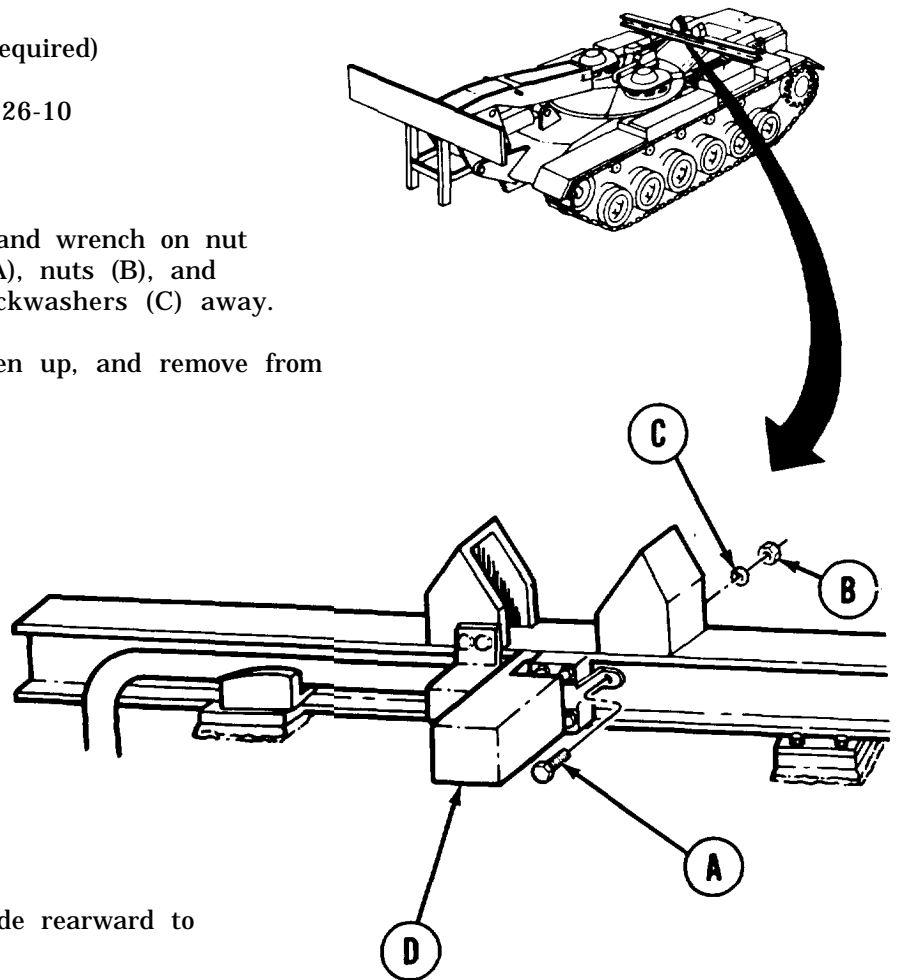
TOOLS: 3/4 in. combination box and open end wrench
 3/4 in. socket with 1/2 in. drive
 5 in. extension with 1/2 in. drive
 Ratchet with 1/2 in. drive

SUPPLIES: Lockwashers (3 required)

REFERENCE: TM 5-5420-226-10

REMOVAL:

1. Using socket on screw (A) and wrench on nut (B), remove three screws (A), nuts (B), and lockwashers (C). Throw lockwashers (C) away.
2. Lift armor (D) forward, then up, and remove from vehicle.

**INSTALLATION:**

1. Position armor (D) and slide rearward to align holes.
2. Insert three screws (A).
3. Place new lockwashers (C) and start nuts (B) on three screws (A).
4. Using socket on three screws (A) and wrench on nuts, tighten screws (A).

End of Task

TA170469

HOLD-DOWN CYLINDER REPLACEMENT (Sheet 1 of 3)

TOOLS: Ratchet 3/4 in. drive
Flat-tip screwdriver (large)
1-1/2 in. cylinder rod wrench (stowed right fender box)
7/8 in. open end wrench
10 in. adjustable wrench
Vise
13/16 in. combination wrench
15/16 in. socket 3/4 in. drive

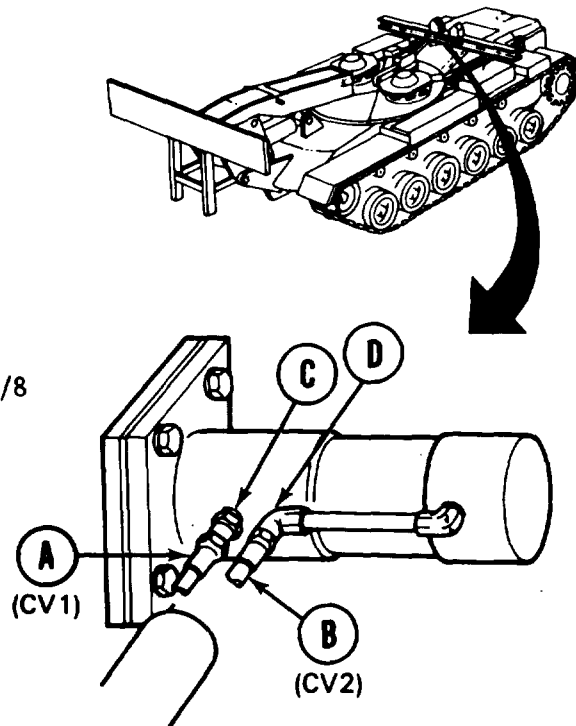
SUPPLIES Container (to catch fluid)
Tags, identification (for hoses)
Protective covers and caps (assorted sizes)
Pipe tape (Item 19, Appendix D)
Lockwashers (4 required)

REFERENCE: LO 5-5420-226-12

PRELIMINARY PROCEDURES: Remove hold-down cylinder armor (page 3-247)
Relieve hydraulic pressure (page 3-65)

REMOVAL:

1. Tag and mark for identification, hose assemblies (A and B), adapter (C), and adapter elbow (D) as follows: hose assembly (A) mark CV1; and (B) mark CV2.
2. Position container to catch hydraulic fluid.
3. Using 13/16 inch wrench on adapter (C) and 7/8 inch wrench on nut of hose assembly (A), disconnect hose assembly (A).
4. Using adjustable wrench on elbow (D) and 7/8 inch wrench on nut of hose assembly (B), disconnect hose assembly (B).
5. Put protective covers over ends of hose assemblies (A and B).

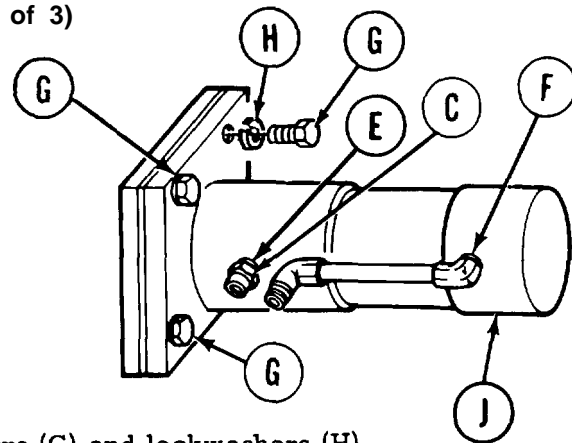


Go on to Sheet 2

TA170470

HOLD-DOWN CYLINDER REPLACEMENT (Sheet 2 of 3)

6. Using 7/8 inch wrench on adapter (C), remove adapter and collar (E).
7. Using adjustable wrench, remove elbow (F) and its attached parts.
8. Place protective coverings over all open hydraulic parts.



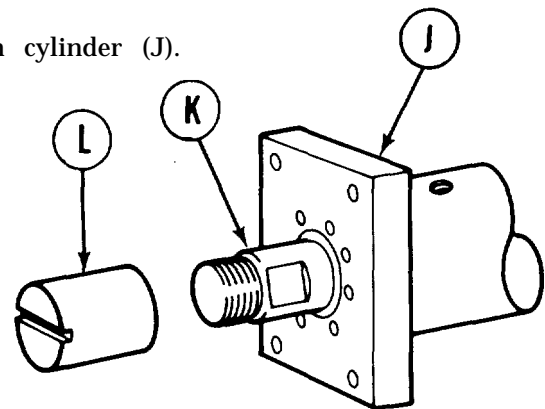
Using 15/16 inch wrench, remove four screws (G) and lockwashers (H). Throw lockwashers (H) away.

10. Manually slide hold-down cylinder (J) forward and remove from vehicle.

11. Drain remaining hydraulic fluid from hold-down cylinder (J).

12. Place hold-down cylinder (J) in a vise.

13. Using 1-1/2 inch wrench to hold rod (K) of hold-down cylinder (J), use screwdriver to remove plug (L).

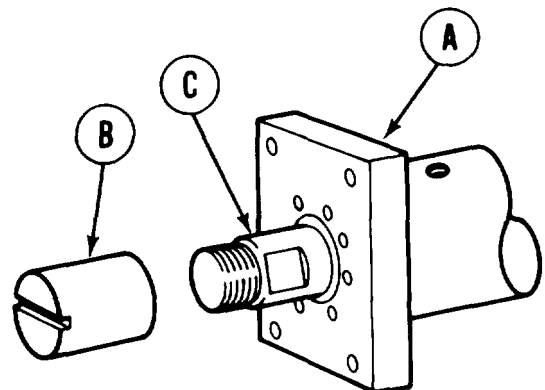


14. Remove container and throw away drained fluid.

15. Remove hold-down cylinder from vise.

INSTALLATION:

1. Place hold-down cylinder (A) in a vise.
2. Manually start plug (B) on rod (C) of hold-down cylinder (A).
3. Using 1-1/2 wrench to hold rod (C), use screwdriver to tighten plug (B).
4. Remove hold-down cylinder (A) from vise.



Go on to Sheet 3

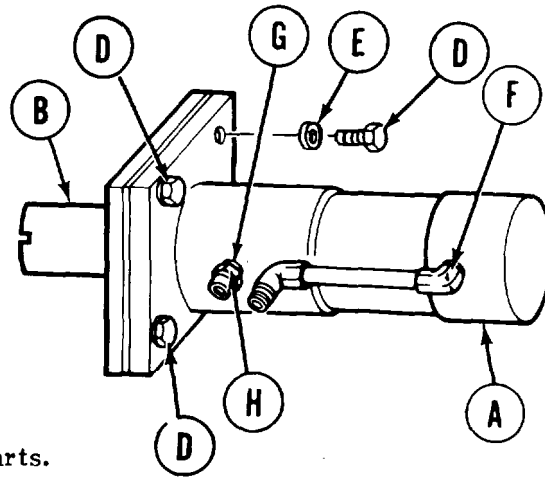
TA170471

HOLD-DOWN CYLINDER REPLACEMENT (Sheet 3 of 3)

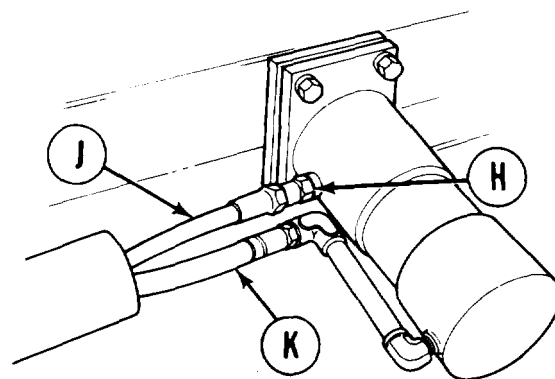
5. Position hold-down cylinder (A) and insert plug (B) through recess in bridge seat.
6. Using 15/16 inch wrench, install four screws (D) and new lockwashers (E).

NOTE

Remove protective covers from all ports and put pipe tape on male threads of all hydraulic fittings.



7. Manually install elbow (F) with its attached parts.
8. Using adjustable wrench, tighten elbow (F).
9. Place collar (G) on adapter (H).
10. Using 13/16 inch wrench, install and tighten adapter (H).
11. Manually connect nuts of hose assemblies (J and K).
12. Using 7/8 inch wrench, tighten nuts of hose assemblies (J and K).
13. Fill hydraulic reservoir (LO 5-5420-226-12).
14. Bleed hydraulic system (page 3-66).
15. Check for hydraulic leaks and correct as necessary.
16. Refill hydraulic reservoir (LO 5-5420-226-12).
17. Install hold-down cylinder armor (page 3-247).



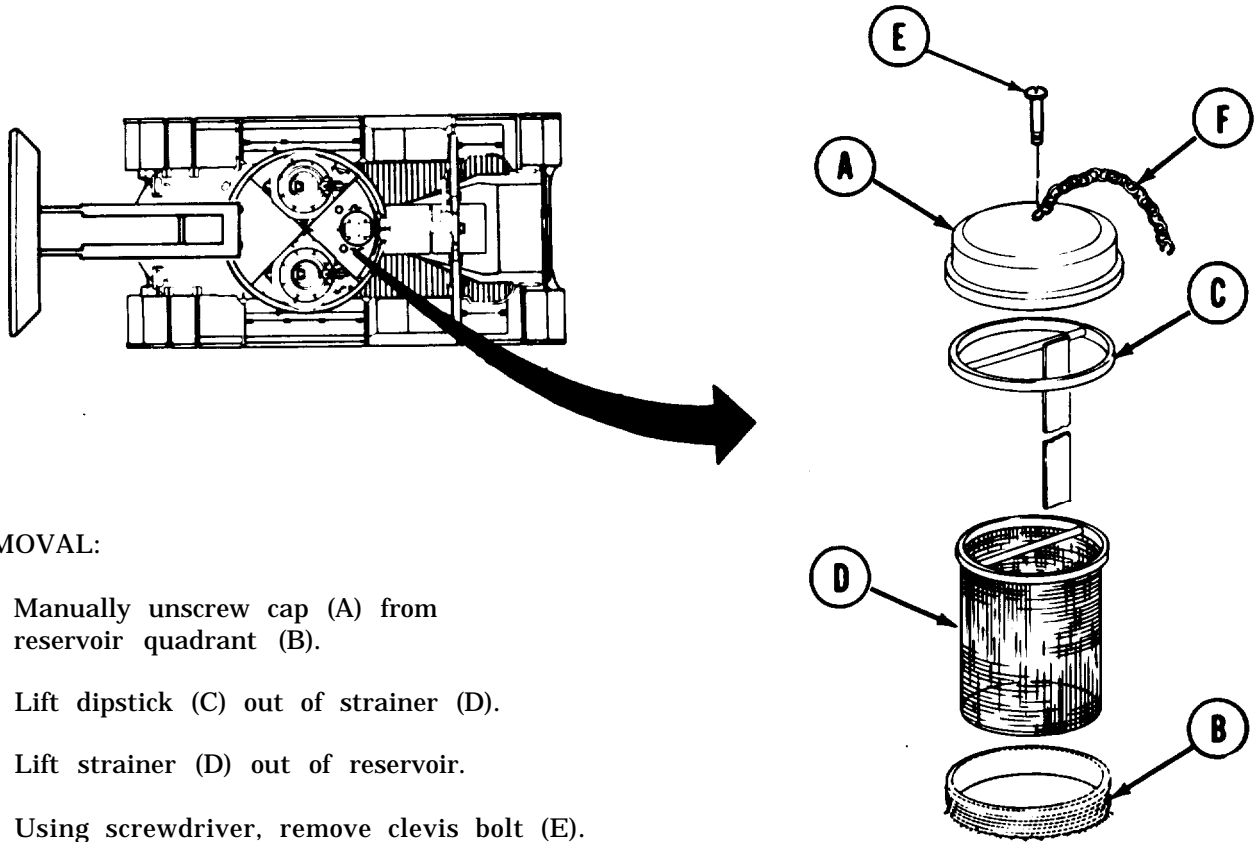
End of Task

TA170472

Section V. HYDRAULIC RESERVOIR COMPONENTS AND ANTENNA BASE ARMOR

RESERVOIR QUADRANT OIL STRAINER, CAP, AND DIPSTICK REPLACEMENT (Sheet 1 of 1)

TOOLS: Flat-tip screwdriver



REMOVAL:

1. Manually unscrew cap (A) from reservoir quadrant (B).
2. Lift dipstick (C) out of strainer (D).
3. Lift strainer (D) out of reservoir.
4. Using screwdriver, remove clevis bolt (E).
5. Remove chain (F) from cap (A).

INSTALLATION:

1. Place chain (F) in position on cap (A).
2. Using screwdriver, install clevis bolt (E) through chain (F) and into cap (A).
3. Place strainer (D) in reservoir.
4. Place dipstick (C) into strainer (D).
5. Manually screw cap (A) onto reservoir quadrant (B).

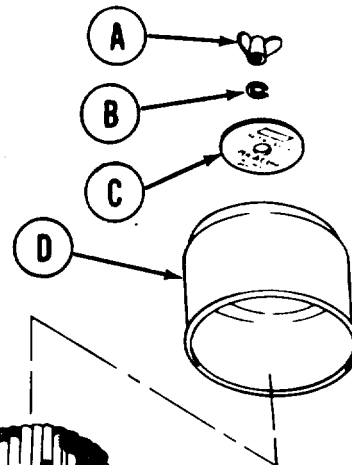
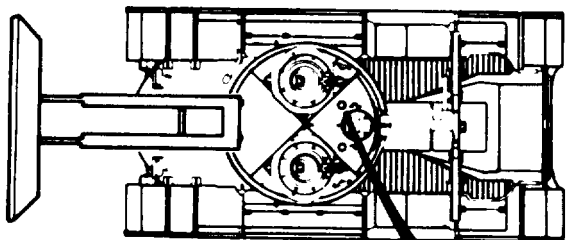
End of Task

TA170473

RESERVOIR QUADRANT AIR FILTER REPLACEMENT (Sheet 1 of 2)

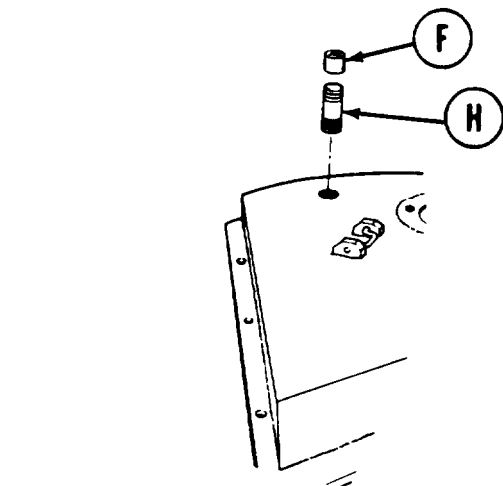
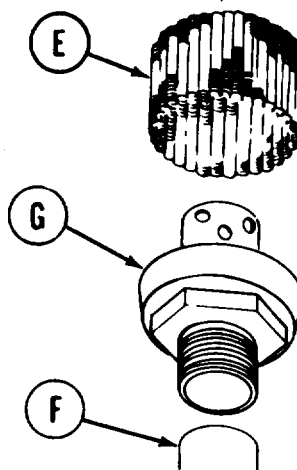
TOOLS Slip joint pliers
15 in. adjustable wrench
14 in. pipe wrench (2 required)

SUPPLIES: Filter element
Lockwasher



REMOVAL:

1. Using pliers if needed, remove wing nut (A).
2. Manually remove lockwasher (B), nameplate (C), and hood (D). Throw lockwasher (B) away.
3. Remove filter element (E).



4. Using pipe wrench to hold coupling (F), use adjustable wrench on flats to remove body (G).
5. Using pipe wrench to hold nipple (H), use pipe wrench to remove coupling (F).
6. Using pipe wrench, remove nipple (H).

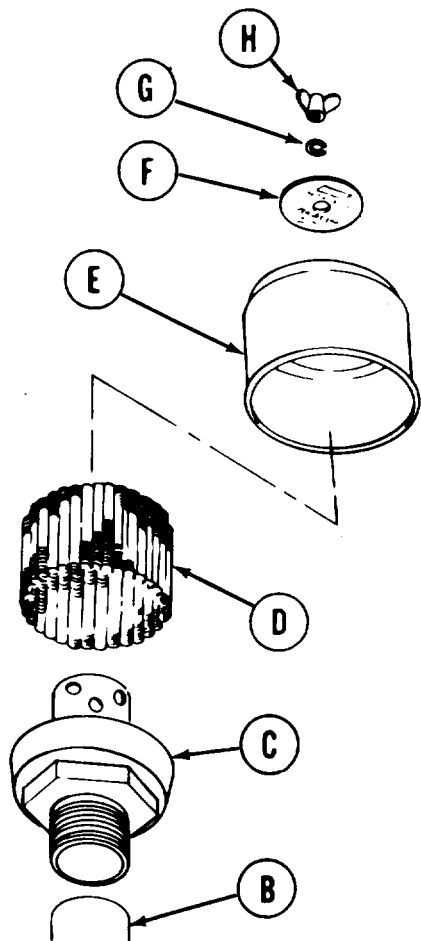
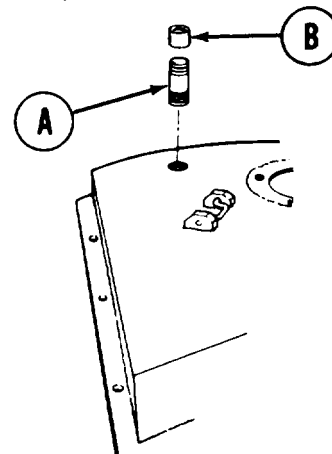
Go on to Sheet 2

TA170474

RESERVOIR QUADRANT AIR FILTER REPLACEMENT (Sheet 2 of 2)

INSTALLATION:

1. Using pipe wrench, install nipple (A).
2. While holding nipple (A) with pipe wrench, use pipe wrench to install coupling (B).



3. While holding coupling (B) with pipe wrench, use adjustable wrench on flats to install body (C) on coupling (B).
4. Manually install new filter (D), hood (E), nameplate (F), new lockwasher (G), and wing nut (H) on body (C).

End of Task

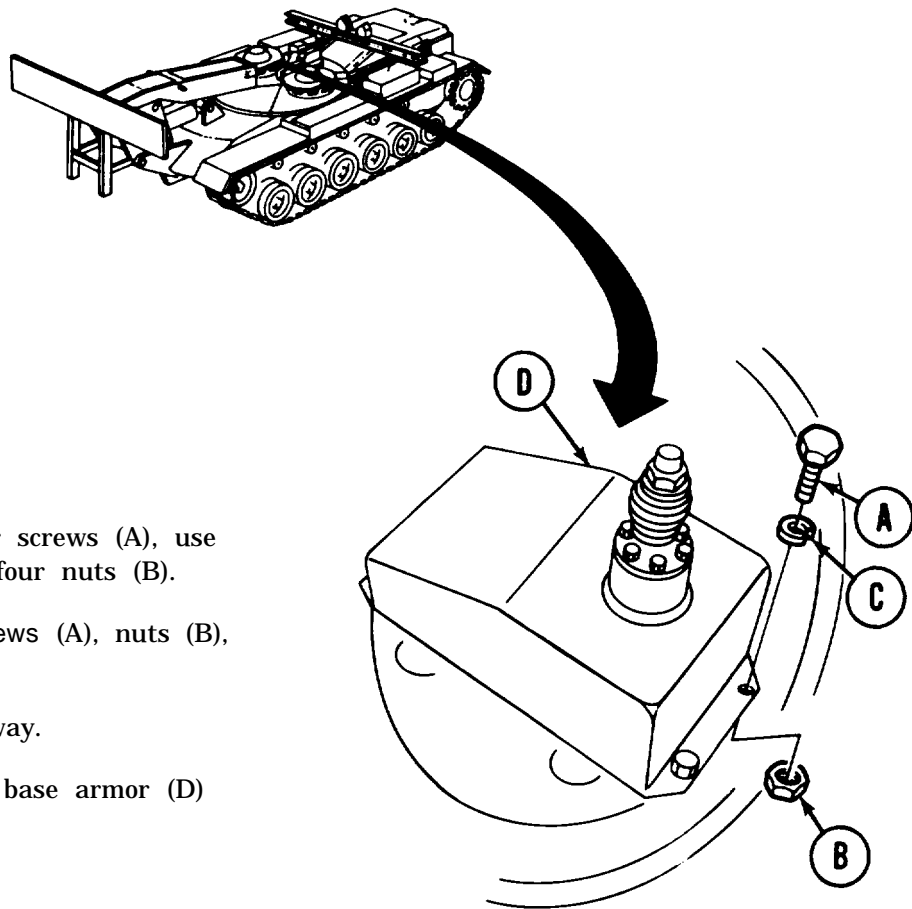
ANTENNA BASE ARMOR AND CONDUIT REPLACEMENT (Sheet 1 of 5)

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

SUPPLIES: Gasket
Grommet
Lockwashers (8)
Lockwashers (8)
Spacer

REFERENCE: TM 9-5420-226-10

PRELIMINARY PROCEDURE: Remove antenna (TM 5-5420-226-10)
Open commander's hatch (TM 5-5420-226-10)



REMOVAL:

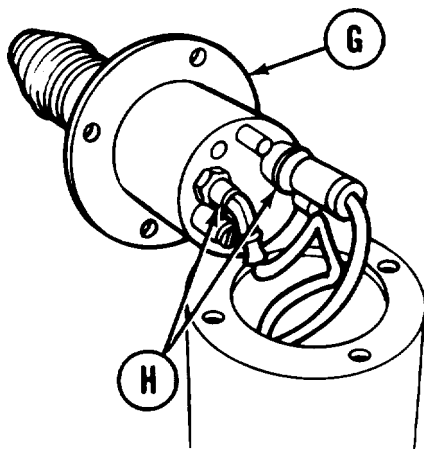
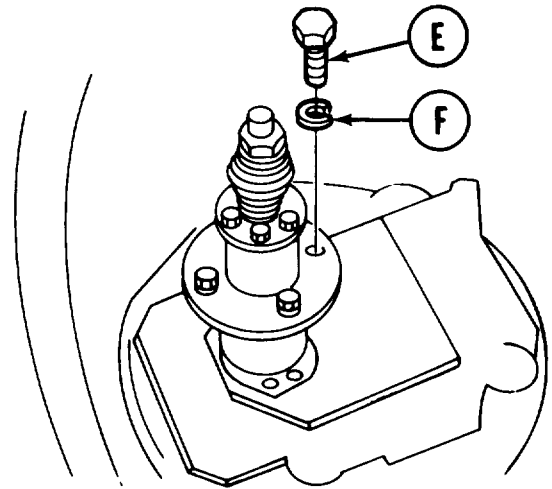
1. Using wrench to hold four screws (A), use 3/4 inch socket to loosen four nuts (B).
2. Manually remove four screws (A), nuts (B), and lockwashers (C).
3. Throw lockwashers (C) away.
4. Manually remove antenna base armor (D) **from** vehicle.

Go on to Sheet 2

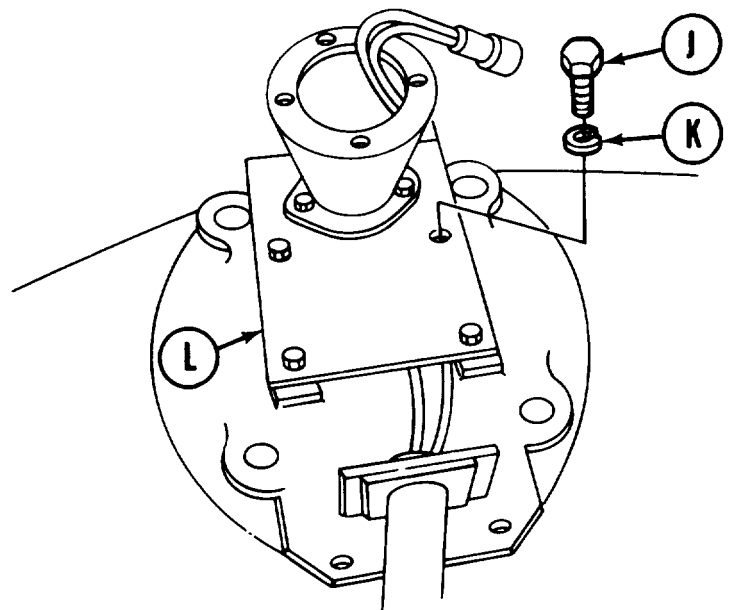
TA170476

ANTENNA BASE ARMOR AND CONDUIT REPLACEMENT (Sheet 2 of 5)

5. Using 9/16 inch socket, remove four screws (E) and lockwashers (F). Throw lockwashers (F) away.
6. Displace antenna matching unit (G).
7. Remove two connectors (H) from antenna matching unit (G).

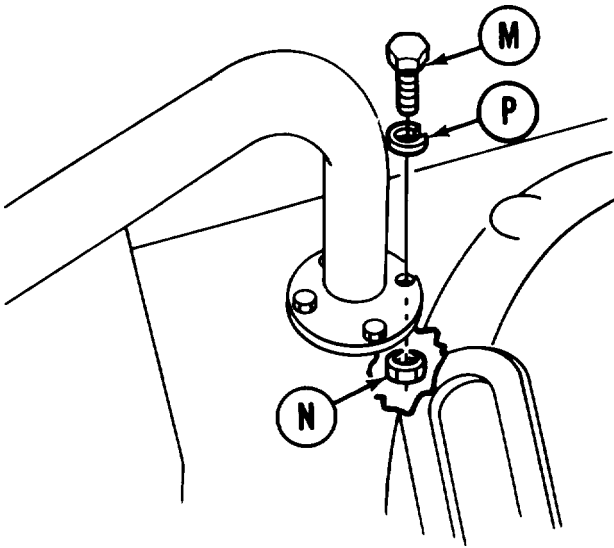


8. Using 9/16 inch socket, remove four screws (J) and lockwashers (K). Throw lockwashers (K) away.
9. Manually remove mount (L).

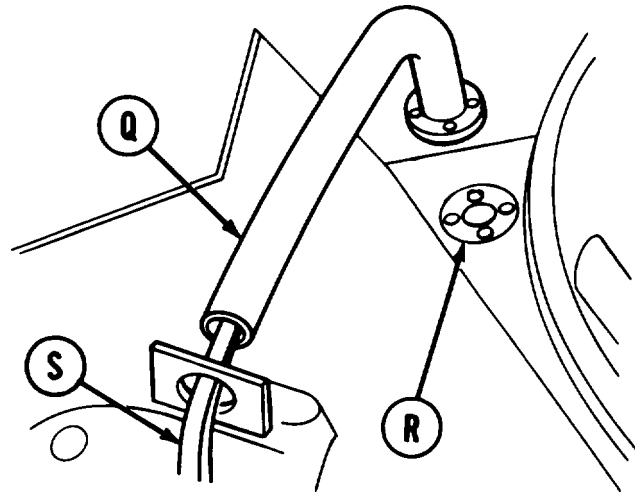


Go on to Sheet 3

ANTENNA BASE ARMOR AND CONDUIT REPLACEMENT (Sheet 3 of 5)

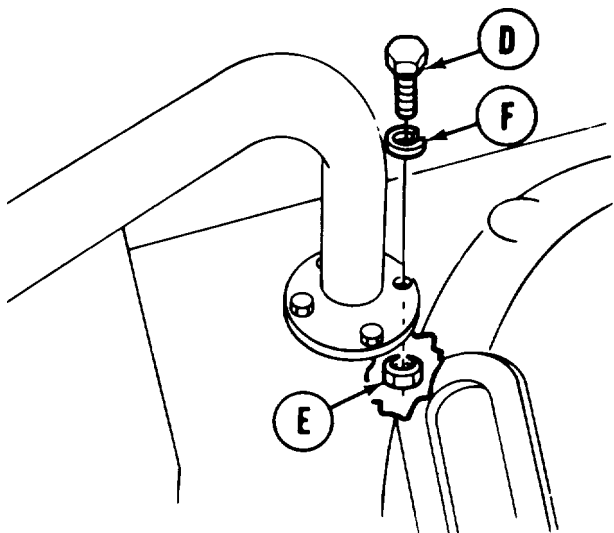
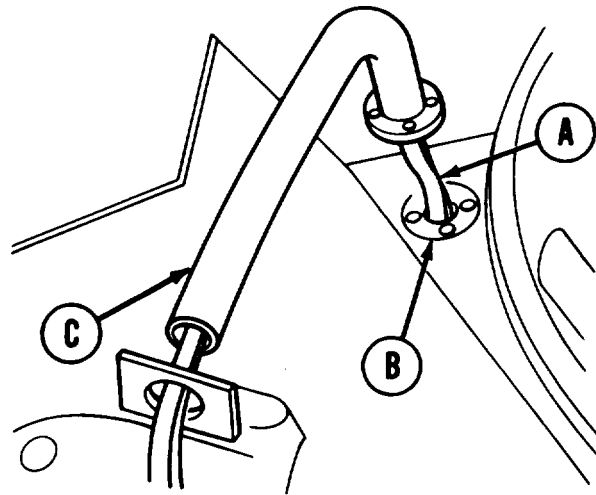


10. Standing on commander's seat, hold screw (M) with wrench and use 3/4 inch socket to remove four nuts (N). Remove four screws (M), lockwashers (P). Throw lockwashers (P) away.
11. Carefully slide conduit (Q) and gasket (R) off antenna wires (S). Throw gasket (R) away.



INSTALLATION:

1. Thread antenna wires (A) through gasket (B) and conduit (C).
2. Manually install four screws (D), nuts (E), and lockwashers (F) securing conduit (C) and gasket (B) to vehicle.
3. Holding screw (D) with wrench, use 3/4 inch socket to tighten nuts (E).

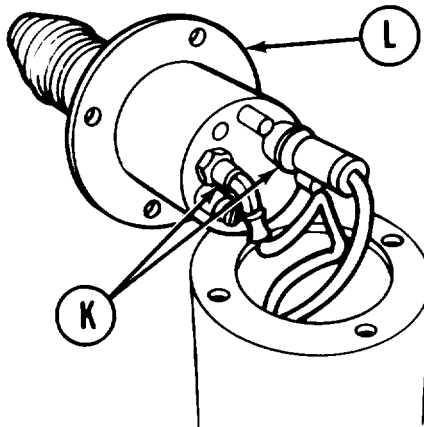
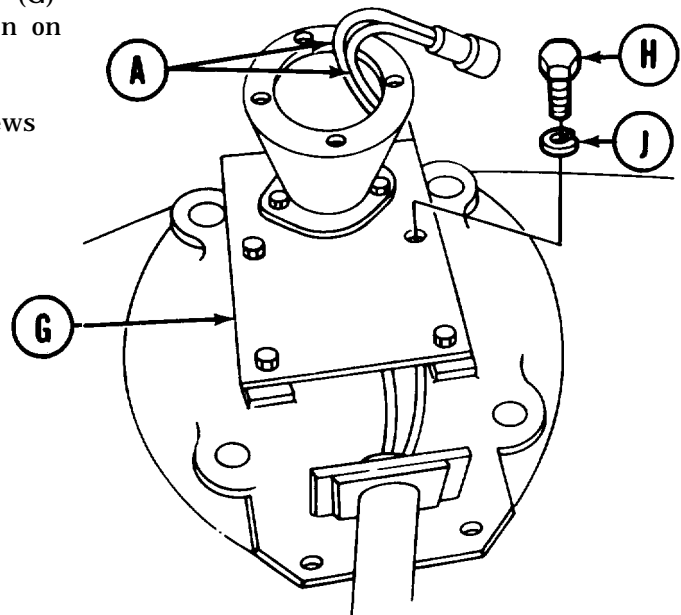


Go on to Sheet 4

TA170478

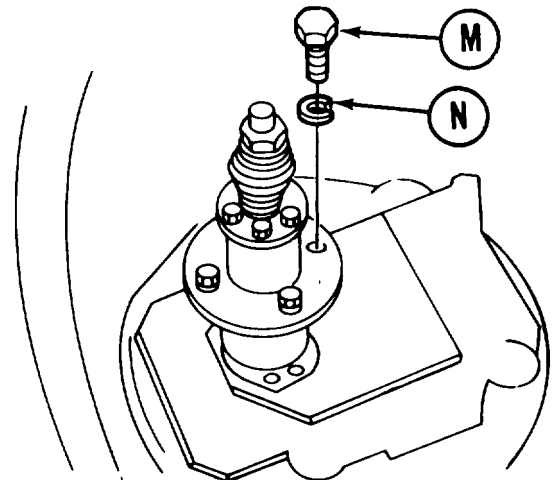
ANTENNA BASE ARMOR AND CONDUIT REPLACEMENT (Sheet 4 of 5)

4. Thread antenna wires(A) through mount (G) as shown, and place mount (G) in position on vehicle.
5. Using 9/16 inch socket, install four screws (G) and lockwashers (J).



6. Connect two connectors (K) to base of antenna matching unit (L).
7. Position matching unit (L) on mount (G).

8. Using 9/16 inch socket, install four screws (M) and lockwashers (N).



Go on to Sheet 5

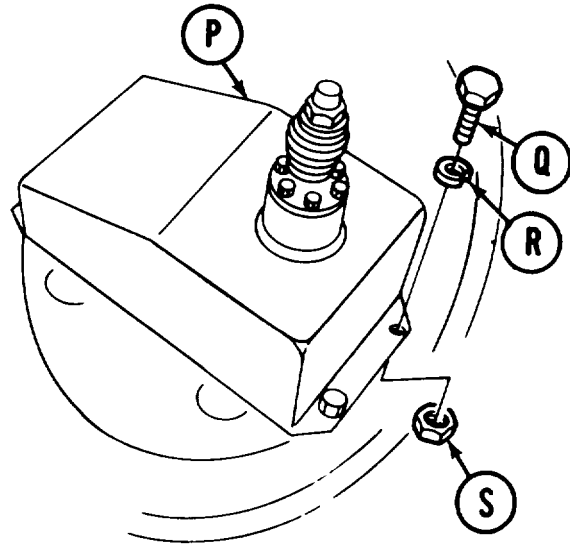
TA170479

TM 5-5420-227-24

ANTENNA BASE ARMOR AND CONDUIT REPLACEMENT (Sheet 5 of 5)

9. Place antenna base armor (P) in position on vehicle.
10. Manually install four screws (Q), lockwashers (R), and nuts (S).
11. Using wrench to hold screws (Q), use 3/4 inch socket to tighten nuts (S).
12. Install antenna (TM 5-5420-226-10).
13. Close commander's hatch (TM 5-5420-226-10).

End of Task



TA170480

CHAPTER 4

**DIRECT SUPPORT AND GENERAL SUPPORT
MAINTENANCE INSTRUCTIONS**

INDEX

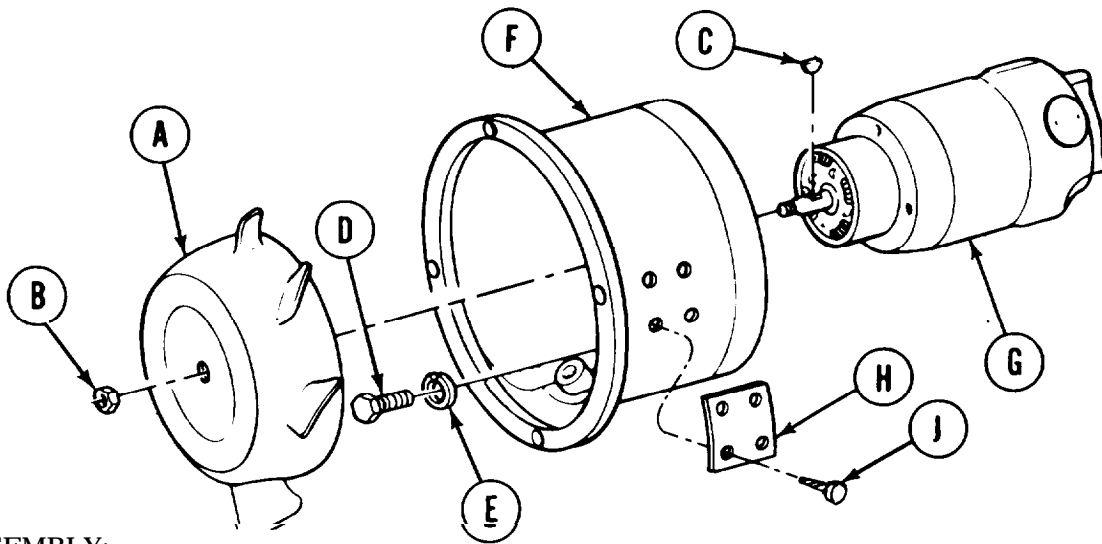
| SECTION | PROCEDURES | PAGE |
|---------|-----------------------------------|------|
| I | Mechanical and Miscellaneous | 4-2 |
| II | Pump-Clutch and Valve Bank | 4-23 |
| III | Hydraulic Cylinders and Reservoir | 4-70 |

Section I. MECHANICAL AND MISCELLANEOUS
RESERVOIR QUADRANT BLOWER ASSEMBLY REPAIR (Sheet 1 of 2)

TOOLS: 12 in. extension 3/8 in. drive
Flat-tip screwdriver
Hammer
7/16 in. socket with 3/8 in. drive
3/4 in. socket with 3/8 in. drive
Punch 1-1/2 x 1/4 inch
Ratchet with 3/8 in. drive

SUPPLIES: Round head drive screws (4 required)
Lockwashers (4 required)

PRELIMINARY PROCEDURE: Remove blower assembly from vehicle (page 3-2).



DISASSEMBLY:

1. While holding impeller (A) stationary, use 3/4 inch socket and extension to remove nut (B).
2. Manually remove impeller (A).
3. Using hammer and punch, remove key (C) and set aside.
4. Using 7/16 inch socket and extension, remove four screws (D) and lockwashers (E). Throw lockwashers (E) away.
5. Manually remove shroud (F) from motor (G).

NOTE

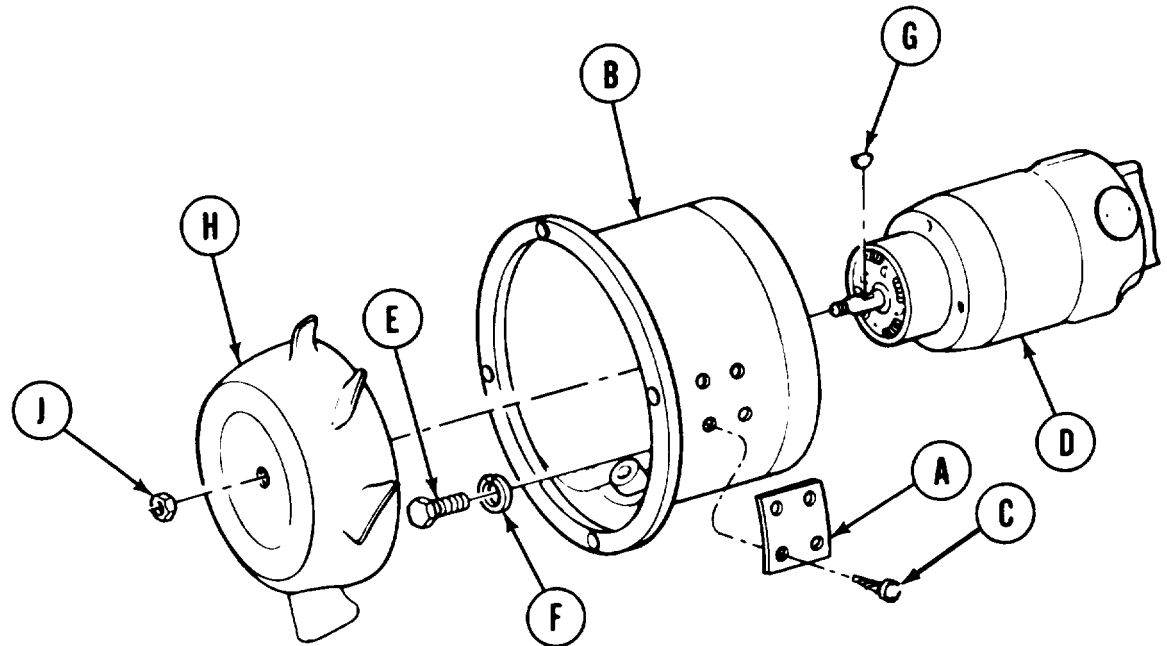
Do step 6 only if necessary.

6. Using screwdriver, pry up identification plate (H) and four drive screws (J). Throw drive screws (J) away.

Go on to Sheet 2

TA170481

RESERVOIR QUADRANT BLOWER ASSEMBLY REPAIR (Sheet 2 of 2)



NOTE

Do steps 1 and 2 only if plate (A) was removed.

ASSEMBLY:

1. Place identification plate (A) on shroud (B).
2. Using hammer, install four new drive screws (C).
3. Place motor (D) in shroud (B).
4. Using 7/16 inch socket and extension, install four screws (E) and new lockwashers (F).
5. Place key (G) in position.
6. Place impeller (H) in position.
7. Manually holding impeller (H) stationary, use 3/4 inch socket and extension to install nut (J).
8. Install blower assembly in vehicle (page 3-4).

End of Task

TA170482

PROCEDURE INDEX

| PROCEDURE | PAGE |
|-------------------------|------|
| Disassembly | 4-4 |
| Cleaning and Inspection | 4-5 |
| Assembly | 4-6 |

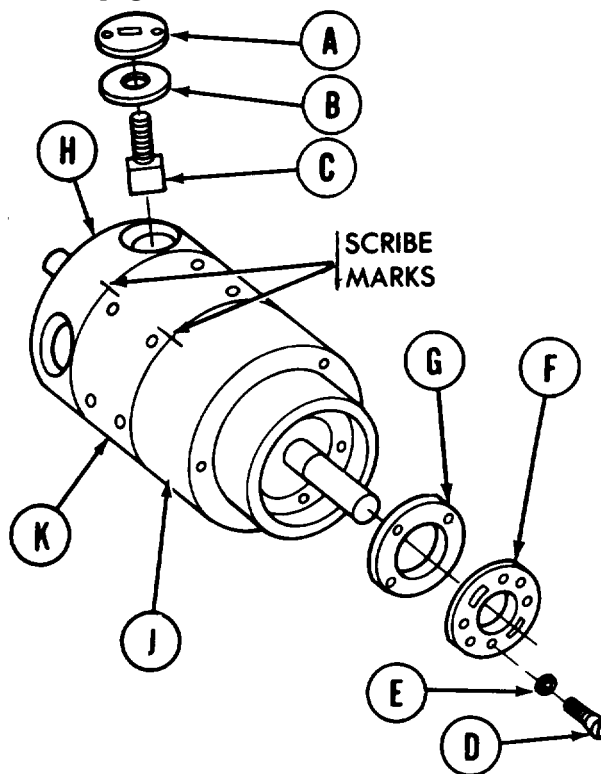
TOOLS: Flat-tip screwdriver
 Spanner wrench
 Scriber
 10 in. adjustable wrench

SUPPLIES Gaskets (8) Seal Assembly
 Dry cleaning solvent (Item 15, Appendix D) Brushes (4 required)
 Lockwashers (4 required)
 Lockwashers (5 required)
 Rags (Item 12, Appendix D)

PRELIMINARY PROCEDURE: Remove blower motor (page 4-2).

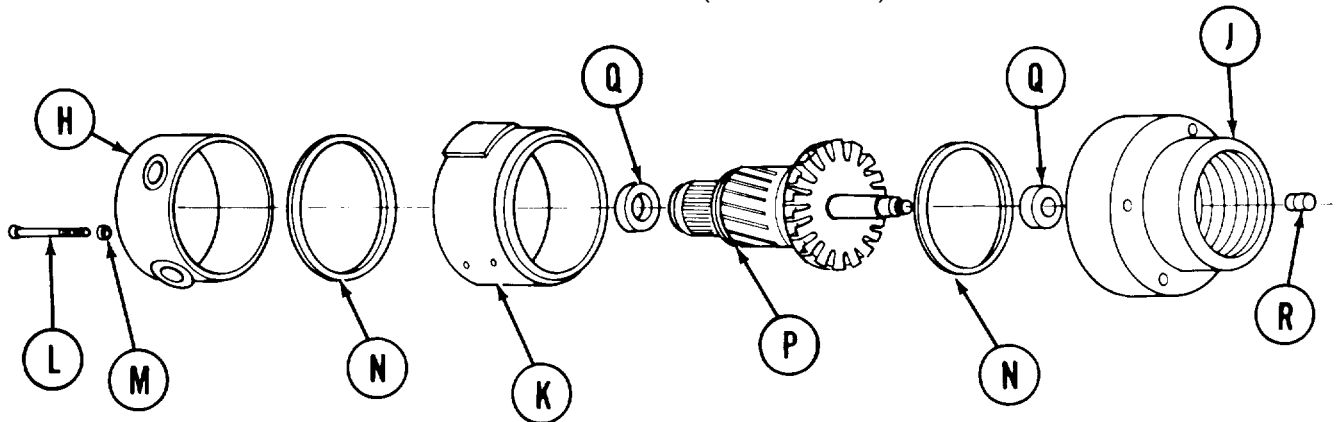
DISASSEMBLY:

1. Using spanner wrench, remove four caps (A).
2. Manually remove four gaskets (B) and brushes (C) and throw brushes (C) and gaskets (B) away.
3. Using screwdriver, remove four screws (D) and washers (E).
4. Manually remove cap (F) and gasket (G). Throw gasket (G) away.
5. Using scriber, scribe locating mark across commutator head (H), fan head (J), and frame (K), and scribe frame (K) to indicate commutator end and fan end.

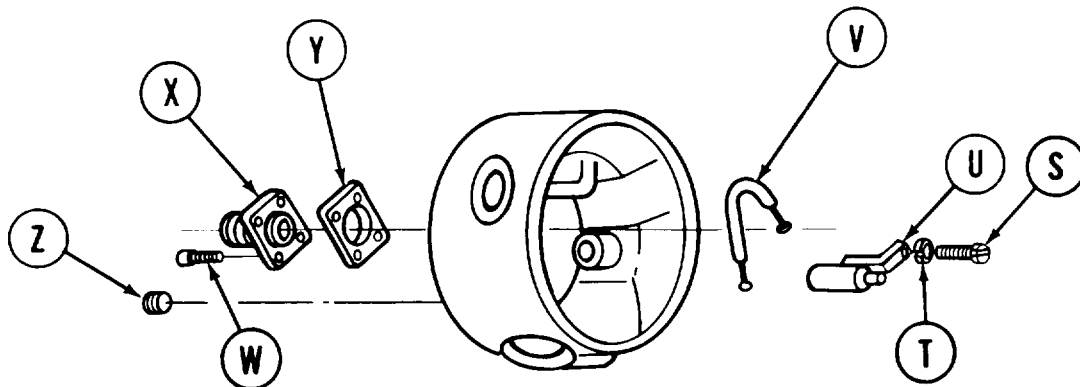


Go on to Sheet 2

RESERVOIR QUADRANT BLOWER MOTOR REPAIR (Sheet 2 of 4)



6. Using screwdriver, remove four screws (L) and lockwashers (M). Throw lockwashers (M) away.
7. Manually separate commutator head (H), fan head (J), frame (K), two gaskets (N), armature (P), two bearings (Q), and seal assembly (R). Throw gaskets (N) and seal assembly (R) away.



8. Using screwdriver, remove five screws (S) and lockwashers (T). Throw lockwashers (T) away.
9. Manually remove capacitor (U) and cable assembly (V).
10. Using screwdriver, remove four screws (W).
11. Manually remove receptacle assembly (X) and gasket (Y). Throw gasket (Y) away.
12. Using adjustable wrench, remove pipe plug (Z).

CLEANING AND INSPECTION:

WARNING

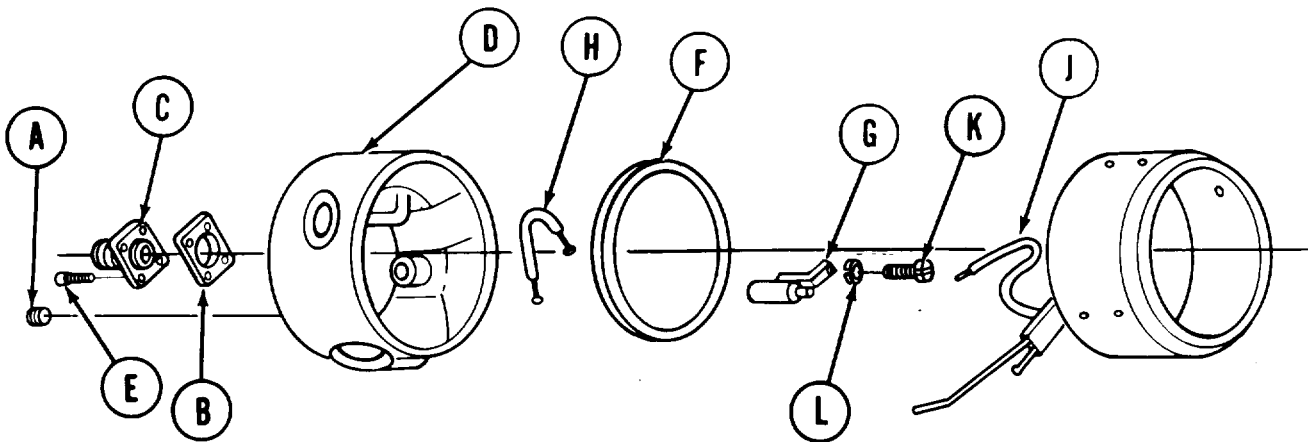
Cleaning agent specified is flammable. Use only in well ventilated areas. Keep away from flames, sparks, or heat. Do not smoke while using. Prevent contact with eyes, mouth, and/or skin. Wear rubber gloves when performing cleaning procedures.

1. Clean all metallic parts with rags and solvent.
2. Inspect all parts for damage or wear.
3. Replace all unserviceable parts.

Go on to Sheet 3

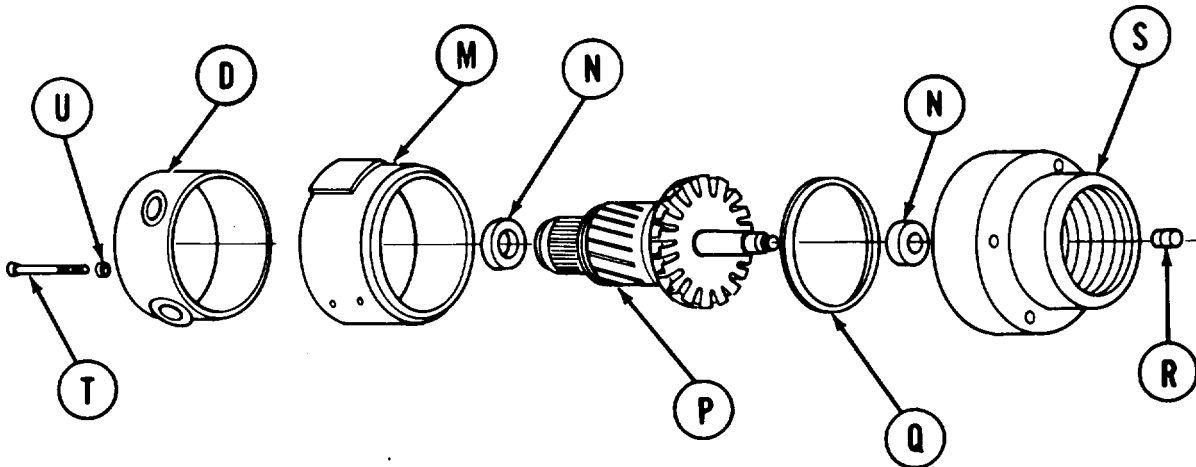
TA170484

ASSEMBLY:



1. Using adjustable wrench, install pipe plug (A).
2. Place new gasket (B) and receptacle assembly (C) on commutator head (D).
3. Using screwdriver, install four screws (E).
4. Place new gasket (F) in position.
5. Place capacitor (G), cable assembly (H), and leads of coil assembly (J) in position in commutator head (D).
6. Using screwdriver, install five screws (K) and new lockwashers (L).

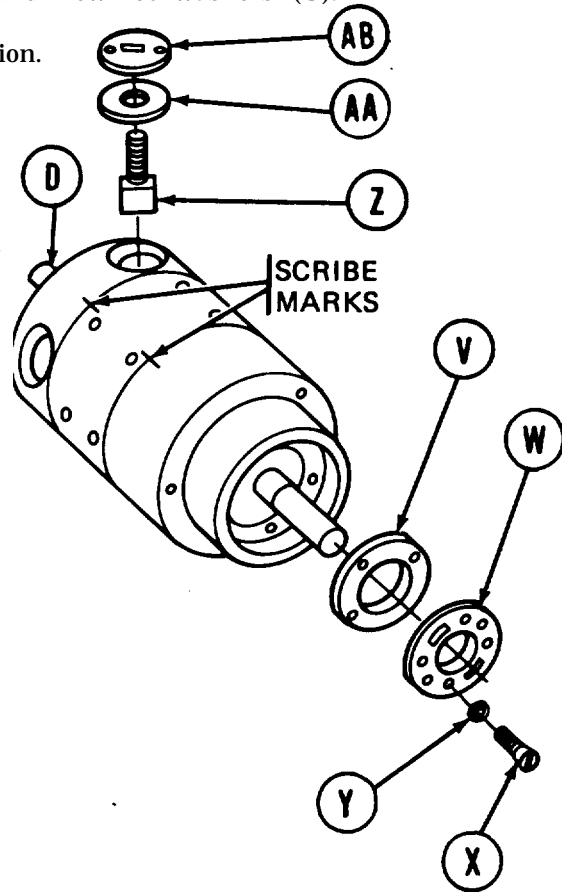
RESERVOIR QUADRANT BLOWER MOTOR REPAIR (Sheet 4 of 4)



7. Alining scribe marks, assemble commutator head (D), frame (M), two bearings (N), armature (P), new gasket (Q), new seal assembly (R), and fan head (S).
8. Using screwdriver, install four screws (T) and new lockwashers (U).

9* Place new gasket (V) and cap (W) in position.

10. Using screwdriver, install four screws (X) and washers (Y).
11. Install four new brushes (Z) and four new gaskets (AA) in commutator head (D).
12. Using spanner wrench, install four caps (AB).
13. Install blower motor (page 4-3).



End of Task

TA170486

PROCEDURE INDEX

| PROCEDURE | PAGE |
|-------------|------|
| Disassembly | 4-8 |
| Assembly | 4-11 |

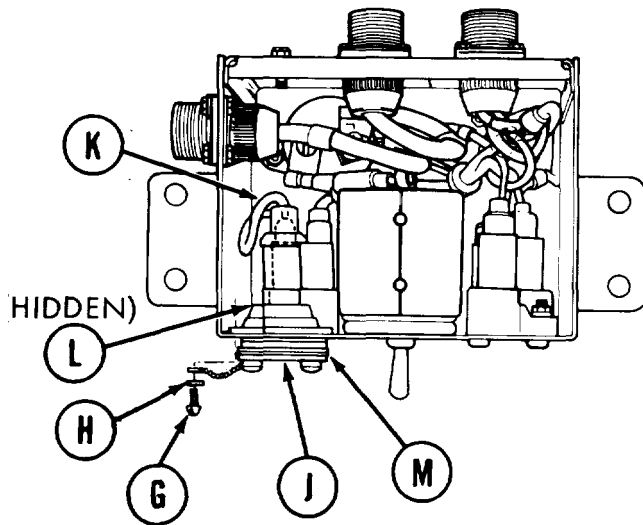
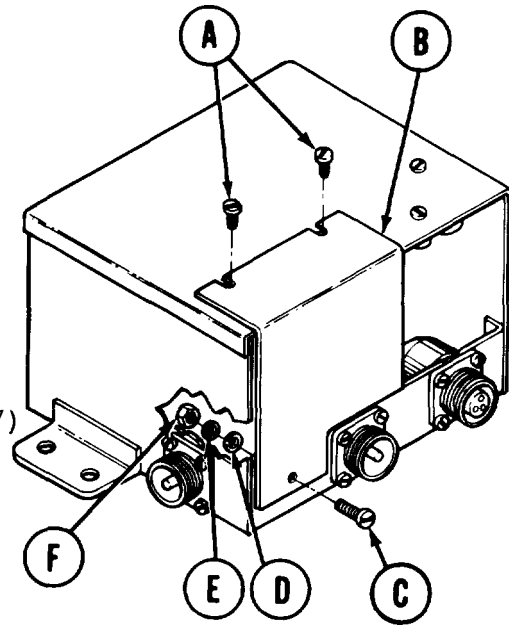
TOOLS: 3/8 in. open end wrench
 7/16 in. open end wrench
 11/3 2 in. open end wrench
 5/16 in. open end wrench
 Flat-tip screwdriver

SUPPLIES: Silicone compound (Item 7, Appendix D)
 Lockwasher
 Lockwashers (2 required)
 Lockwashers (6 required)
 Lockwashers (8 required)
 Lockwashers (12 required)

PRELIMINARY PROCEDURE: Remove accessories control box (page 3-7)

DISASSEMBLY:

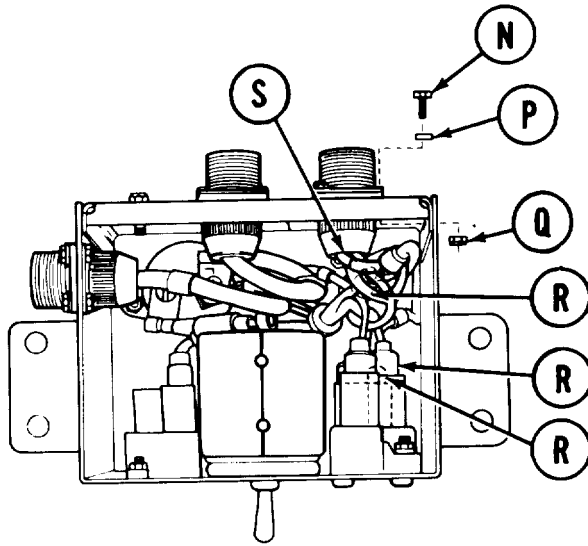
- Using flat-tip screwdriver, loosen two screws (A) at bottom of angle bracket (B).
- Using flat-tip screwdriver and 3/8 inch wrench, remove screw (C), flat washer (D), lockwasher (E), and nut (F). Throw lockwasher (E) away.
- Manually remove angle bracket (B).
- Using flat-tip screwdriver, remove two screws (G) and lockwashers (H) from utility outlet cover (J). Throw lockwashers (H) away.
- Manually remove utility outlet cover (J) with chain.
- Remove electrical connector (K) from circuit breaker (L).
- Remove socket assembly (M).



Go on to Sheet 2

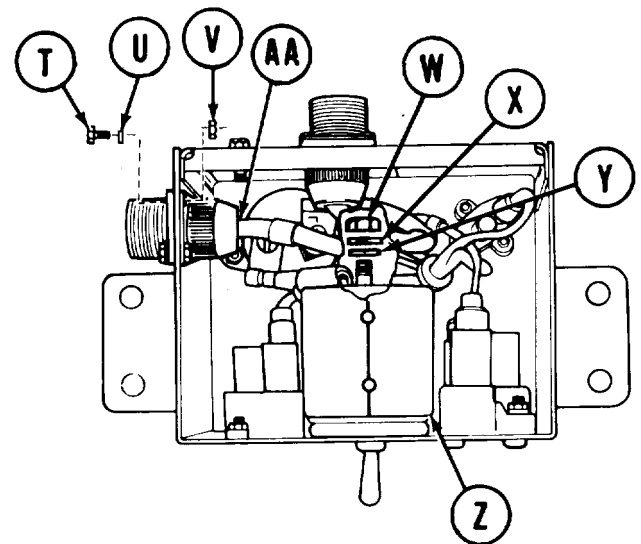
TA170487

ACCESSORIES CONTROL BOX REPAIR (Sheet 2 of 8)

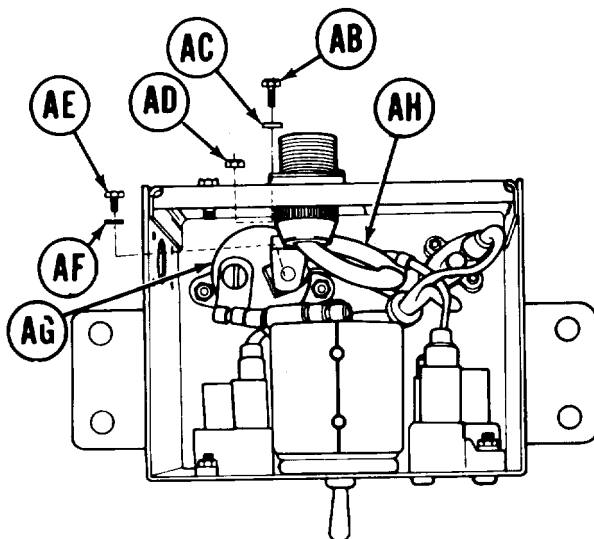


8. Using 5/16 inch wrench and flat-tip screwdriver, remove four screws (N), lockwashers (P), and nuts (Q). Throw lockwashers (p) away.
9. Manually remove three electrical connectors (R).
10. Remove harness assembly (S).

11. Using flat-tip screwdriver and 5/16 inch wrench, remove four screws (T), lock washers (U), and nuts (V). Throw lockwashers (U) away.
12. Using 7/16 inch wrench, remove nut (W), lockwasher (X), and flat washer (Y) from rear of switch assembly (Z).
13. Remove cable assembly (AA).



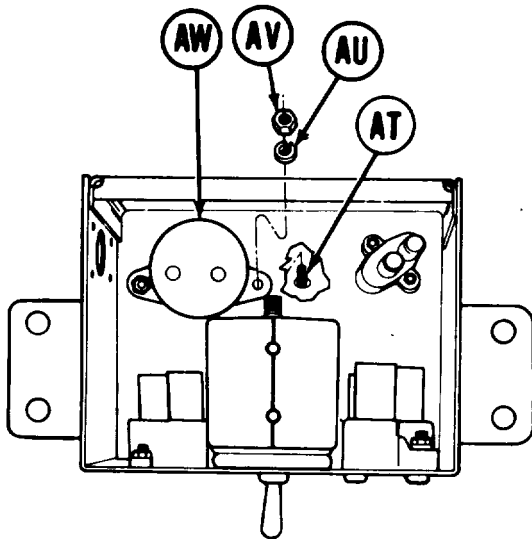
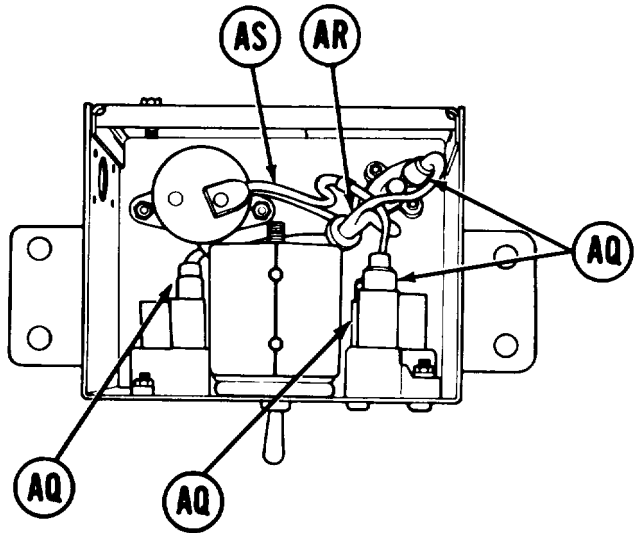
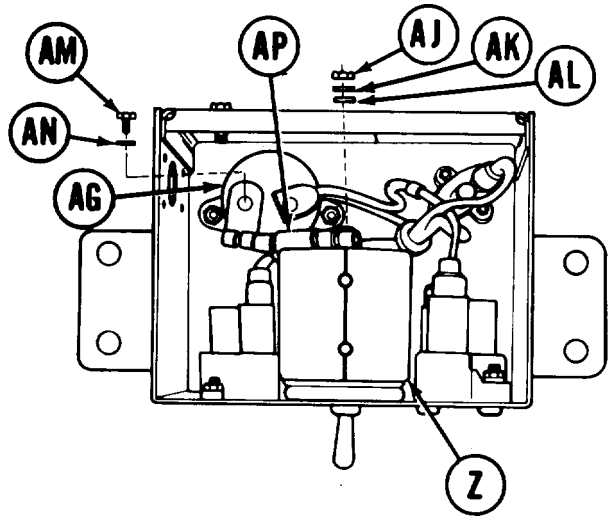
14. Using flat-tip screwdriver and 5/16 inch wrench, remove four screws (AB), lockwashers (AC), and nuts (AD). Throw lockwashers (AC) away.
15. Using flat-tip screwdriver, remove screw (AE) and washer (AF) from circuit breaker (AG).
16. Remove cable assembly (AH).



Go on to Sheet 3

TA170488

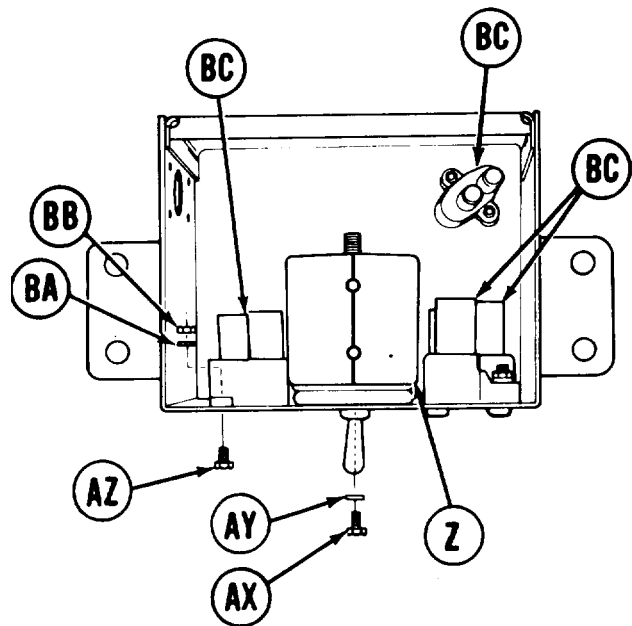
17. Using 7/16 inch wrench, remove remaining nut (A J), flat washer (AK), and lockwasher (AL) from rear of switch assembly (Z). Throw lockwasher (AL) away.
18. Using flat-tip screwdriver, remove remaining screw (AM) and washer (AN) from circuit breaker (AG).
19. Manually remove cable assembly (AP).
20. Manually remove four electrical connectors (AQ) by pulling out.
21. Remove harness assembly (AR) and cable assembly (AS).



22. Using flat-tip screwdriver, remove two screws (AT), lockwashers (AU), and nuts (AV). Throw lockwashers (AU) away.
23. Manually remove circuit breaker (AW).

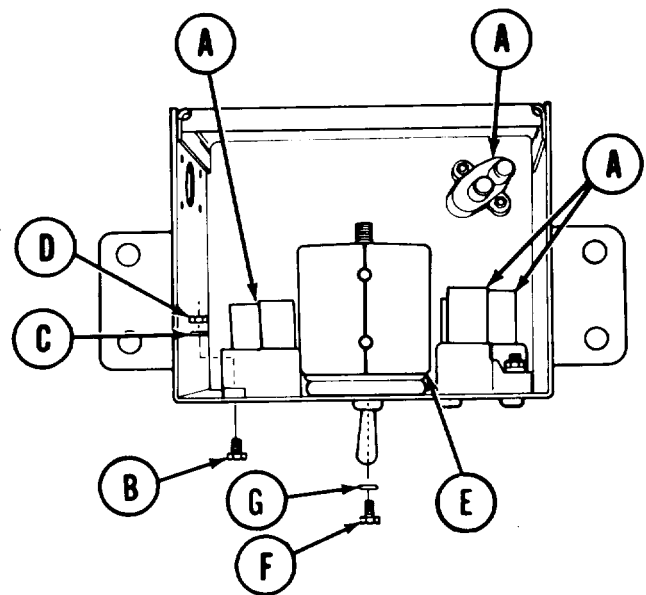
ACCESSORIES CONTROL BOX REPAIR (Sheet 4 of 8)

24. Using flat-tip screwdriver, remove two screws (AX) and lockwashers (AY). Throw lockwashers (AY) away.
25. Manually remove switch assembly (Z).
26. Using flat-tip screwdriver and 11/32 inch wrench, remove eight screws (AZ), lockwashers (BA), and nuts (BB) from four circuit breakers (BC). Throw lockwashers (BA) away.
27. Manually remove four circuit breakers (BC).



ASSEMBLY:

1. Place four circuit breakers (A) in position.
2. Using flat-tip screwdriver and 11/32 inch wrench, install eight screws (B), new lockwashers (C), and nuts (D).
3. Place switch assembly (E) in position.
4. Using flat-tip screwdriver, install two screws (F) and new lockwashers (G).



Go on to Sheet 5

TA170490

5. Place circuit breaker (H) in position.

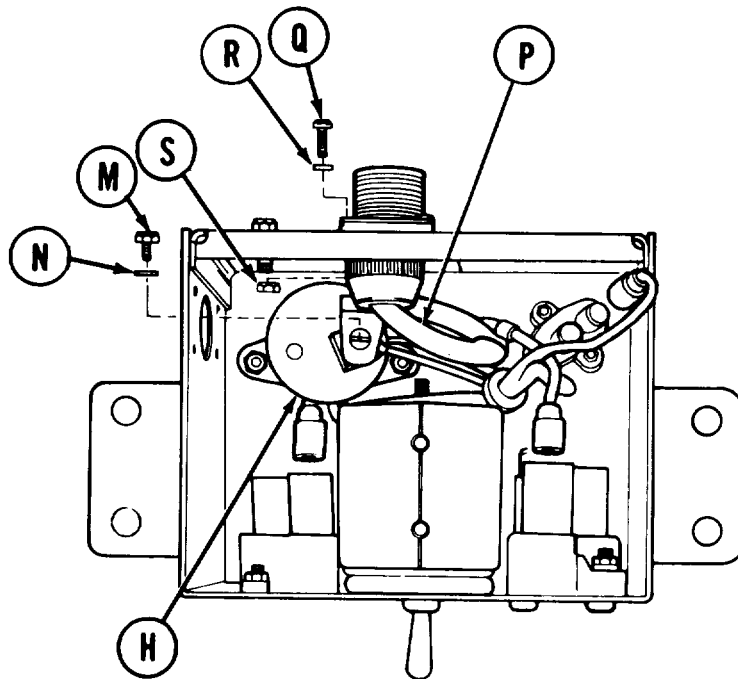
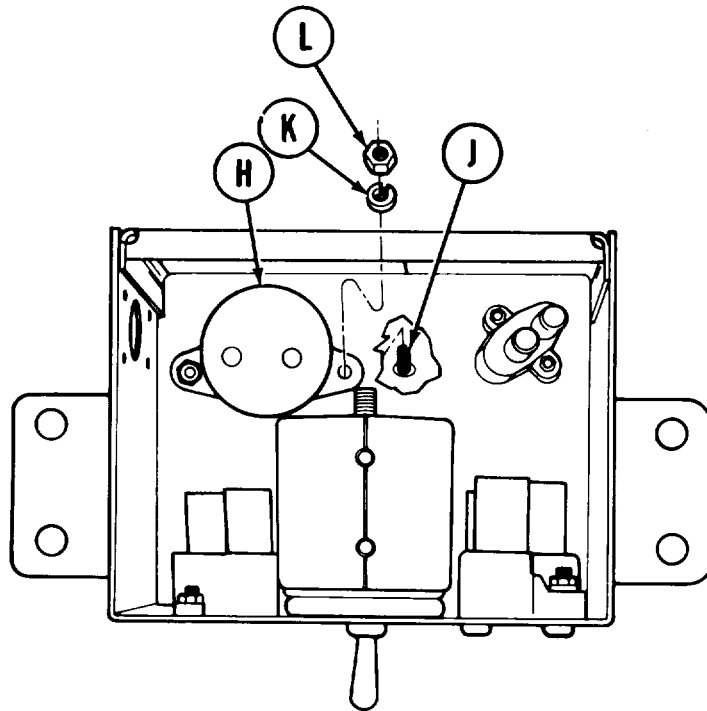
6. Manually install two screws (J), new lock-washers (K) and nuts (L).

7. Place flat ends of harness assembly (CKT 465), cable assembly (CKT 100A) and cable assembly (CKT 625) on circuit breaker (H).

8. Using flat-tip screwdriver, install screw (M) and new washer (N) to secure wires to circuit breaker (H).

9. Place cable assembly (P) in position with alignment key at 12 o'clock.

10. Using flat-tip screwdriver and 5/16 inch wrench, install four screws (Q), new lockwashers (R), and nuts (S).

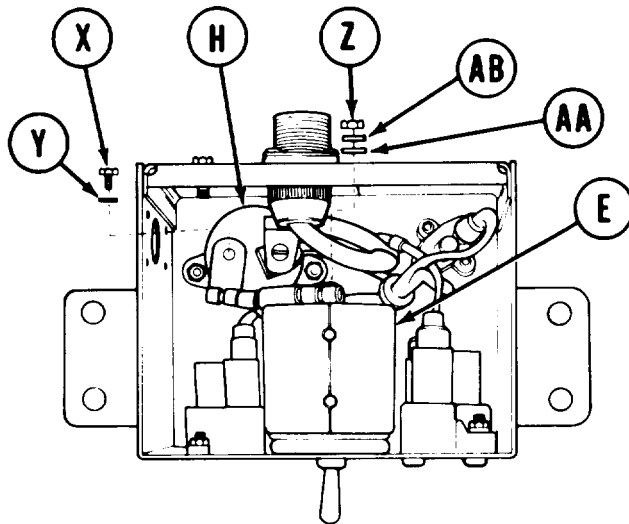
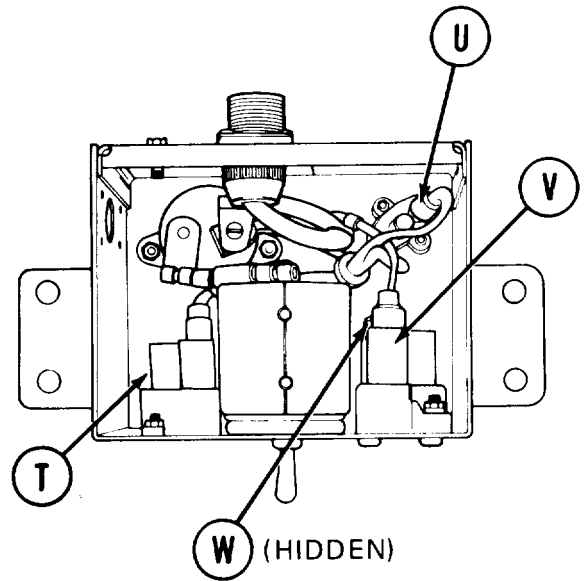


ACCESSORIES CONTROL BOX REPAIR (Sheet 6 of 8)

NOTE

Apply silicone compound to all rubber electrical connectors before installation.

11. Manually connect electrical connector (CKT 137) to circuit breaker (T).
12. Manually connect electrical connector (CKT 465) to circuit breaker (U).
13. Manually connect electrical connector (CKT 894) to circuit breaker (V).
14. Manually connect electrical connector (CKT 625) to circuit breaker (W).

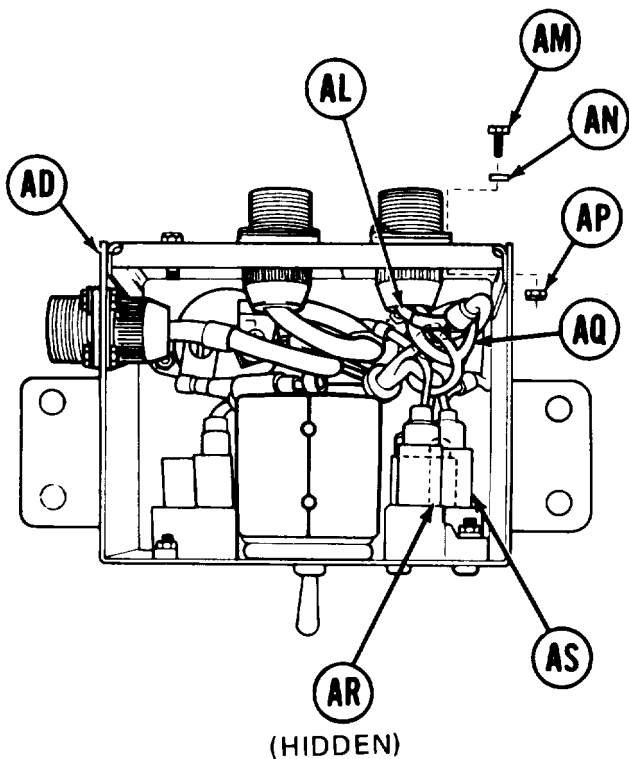
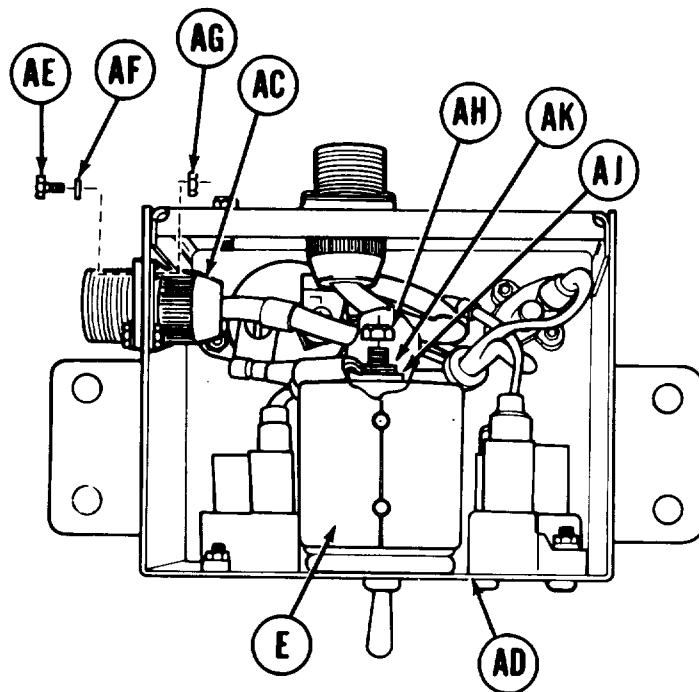


15. Place one end of cable assembly (CKT 159) on remaining terminal Of circuit breaker (H).
16. Using flat-tip screwdriver, install screw (X) and new lockwasher (Y) to circuit breaker (H).
17. Place remaining end of cable assembly (CKT 159) on rear of switch assembly (E).
18. Using 7/16 inch wrench, install nut (z), flat washer (AA), and new lockwasher (AB) to switch assembly (E).

Go on to Sheet 7

ACCESSORIES CONTROL BOX REPAIR (Sheet 7 of 8)

19. Place cable assembly (AC) (CKT 1 59) in position on accessories control box (AD).
20. Using flat-tip screwdriver and 5/16 inch wrench, install four screws (AE), new lockwashers (AF), and nuts (AG).
21. Place end of cable assembly (AC) on rear of switch assembly (E).
22. Using 7/16 inch wrench, install nut (AH), flat washer (AJ), and new lockwasher (AK).



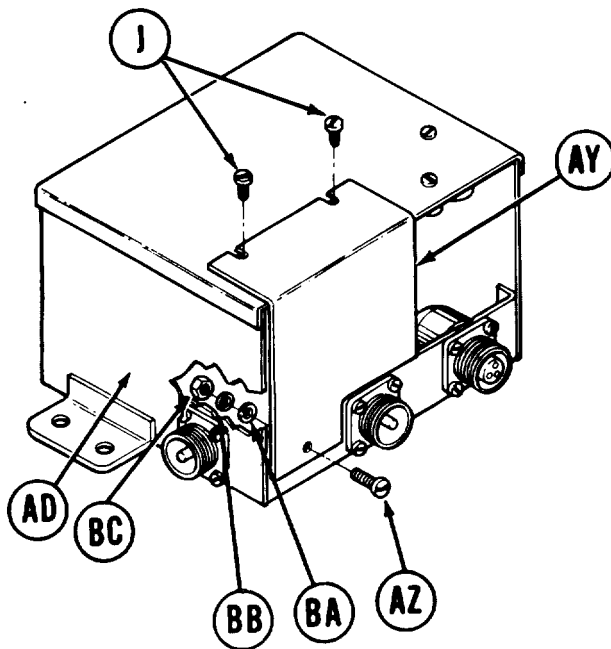
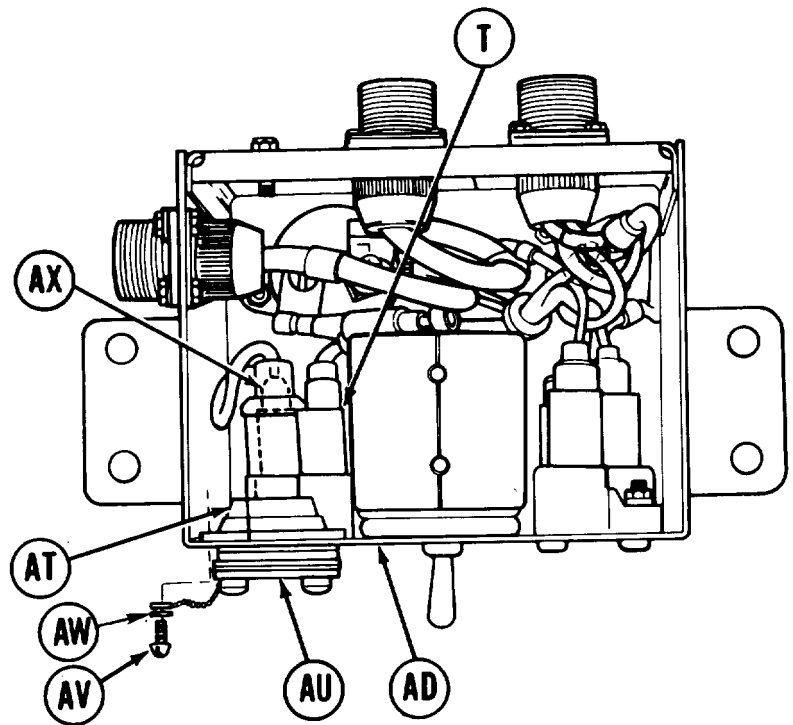
23. Place harness assembly (AL) in position on accessories control box (AD).
24. Using flat-tip screwdriver and 5/16 inch wrench, install four screws (AM), new lockwashers (AN), and nuts (AP).
25. Manually connect electrical connector (CKT 465) to circuit breaker (AQ).
26. Manually connect electrical connector (CKT 625) to circuit breaker (AR).
27. Manually connect electrical connector (CKT 894) to circuit breaker (AS).

Go on to Sheet 8

TA170493

ACCESSORIES CONTROL BOX REPAIR (Sheet 8 of 8)

28. Place socket assembly (AT) and outlet cover (AU) chain in position.
29. Using flat-tip screwdriver, install two screws (AV) and new lockwashers (AW).
30. Manually install electrical connector (AX) to circuit breaker (T).
31. Install outlet cover (AU) on control box (AD).



32. Place access cover (AY) in position on control box (AD).
33. Using 3/8 inch wrench and flat-tip screwdriver, install screw (AZ), flat washer (BA), new lockwasher (BB), and nut (BC).
34. Using flat-tip screwdriver, tighten two screws (J).
35. Install accessories control box (page 3-7).

End of Task

TA170494

PROCEDURE INDEX

| PROCEDURE | PAGE |
|--------------|------|
| Removal | 4-16 |
| Installation | 4-18 |

TOOLS: 7/16 in. socket with 1/2 in. drive
 Ratchet with 1/2 in. drive
 Sling
 Sledge hammer
 Lifting device (2000 lb. capacity)
 Snap ring pliers
 Brass drift

SUPPLIES: Lockwashers (4 required)

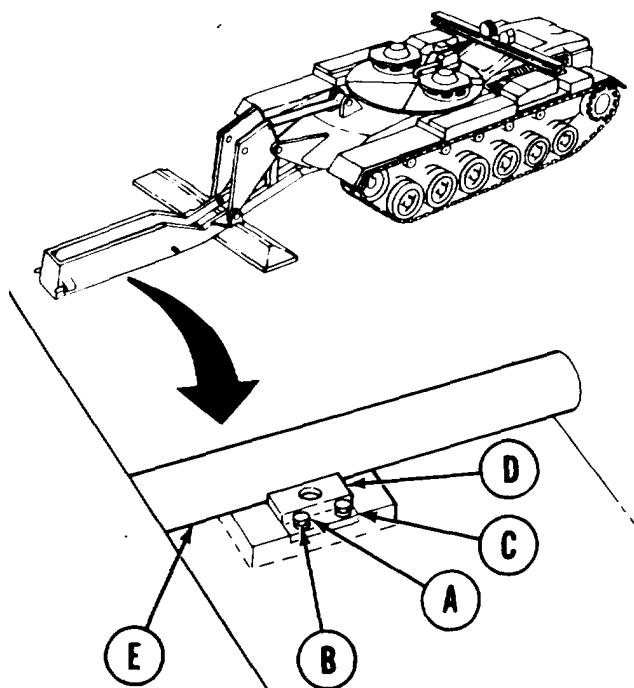
PERSONNEL: Three

REFERENCE: LO 5-5420-226-12

PRELIMINARY PROCEDURES: Remove tongue cylinder (page 3-228)
 Remove locking cylinder (page 3-234)
 Remove scissors cylinder hose assemblies (page 3-133)
 Remove ejection cylinders (pages 3-237 and 3-241)

NOTE

Make sure all hydraulic lines are placed so they will not be damaged during tongue assembly removal.



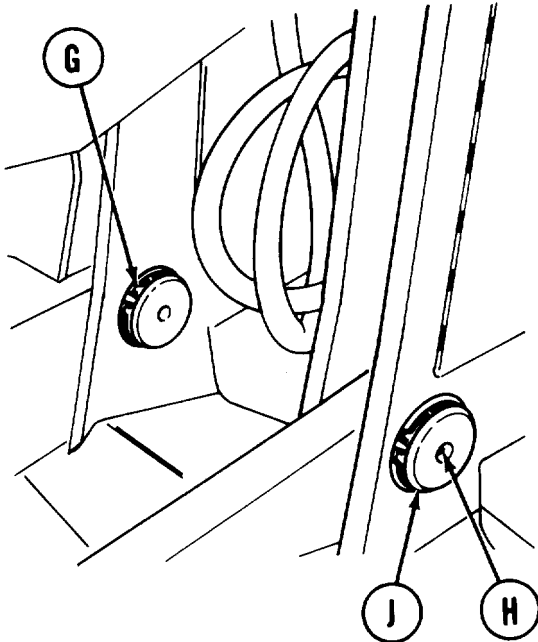
1. Using socket, remove four screws (A) and lockwashers (B). Throw lockwashers (B) away.
2. Manually remove two key retainers (C) and key (D).
3. Using hammer, tap out tongue cross pin (E).

Go on to Sheet 2

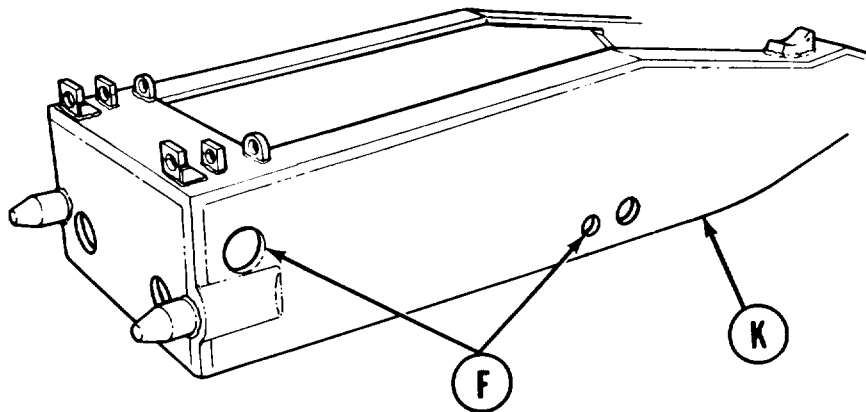
TA170495

TONGUE ASSEMBLY REPLACEMENT (Sheet 2 of 4)

4. Hook lifting device and sling onto four holes (F).



5. Using snap ring pliers, remove four retaining rings (G).
6. Using socket, remove four grease fittings (H).
7. Using hammer and drive pin, knock out two shafts (J).



8. While two technicians guide tongue assembly (K), have third technician operate lifting device to slowly pull tongue assembly (K) away from vehicle.
9. Remove lifting device.

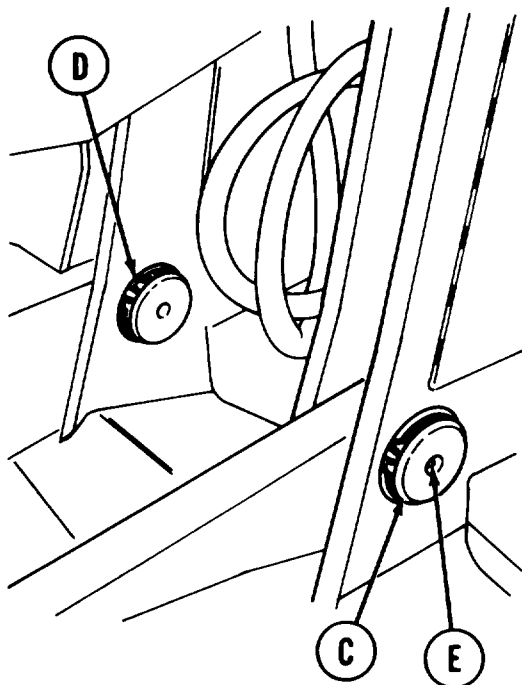
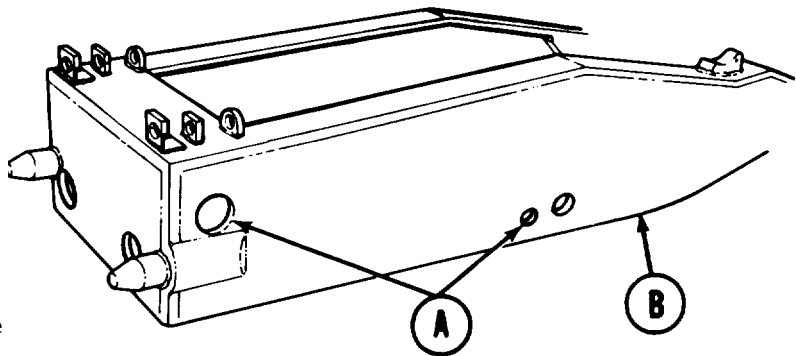
Go on to sheet 3

TA170496

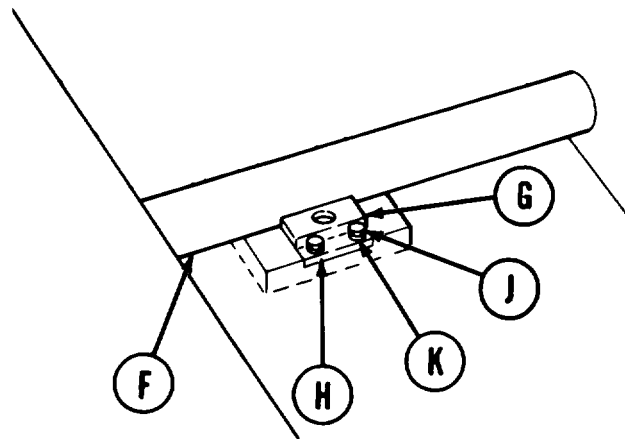
TONGUE ASSEMBLY REPLACEMENT (Sheet 3 of 4)

INSTALLATION:

1. Hook lifting device and sling onto four holes (A).
2. While two technicians guide tongue assembly (B), have third technician operating lifting device slowly lower tongue assembly (B) into position on vehicle.
3. When mounting holes are alined, use hammer and drive pin to drive in two shafts (C).



4. Using snap ring pliers, install four retaining rings (D).
5. Manually remove lifting device.
6. Using socket, install four grease fittings (E).



7. Using hammer, tap in tongue cross pin (F) with notch down.
8. Position key (G) under notch in tongue cross pin (F).
9. Place two key retainers (H) in position.
10. Using socket, install four screws (J) and new lockwashers (K).

Go on to Sheet 4

TA170497

TONGUE ASSEMBLY REPLACEMENT (Sheet 4 of 4)

11. Install tongue cylinder (page 3-231).
12. Install locking cylinder (page 3-235).
13. Install scissors cylinder hose assemblies (page 3-138).
14. Install ejection cylinders (pages 3-239 and 3-243).
15. Lubricate (LO 5-5420-226-12).
16. Bleed hydraulic system (page 3-66).
17. Check for hydraulic leaks and correct as necessary.
18. Service hydraulic reservoir as needed (LO 5-5420-226-12).

End of Task

BOOM-OUTRIGGER ASSEMBLY REPLACEMENT (Sheet 1 of 3)

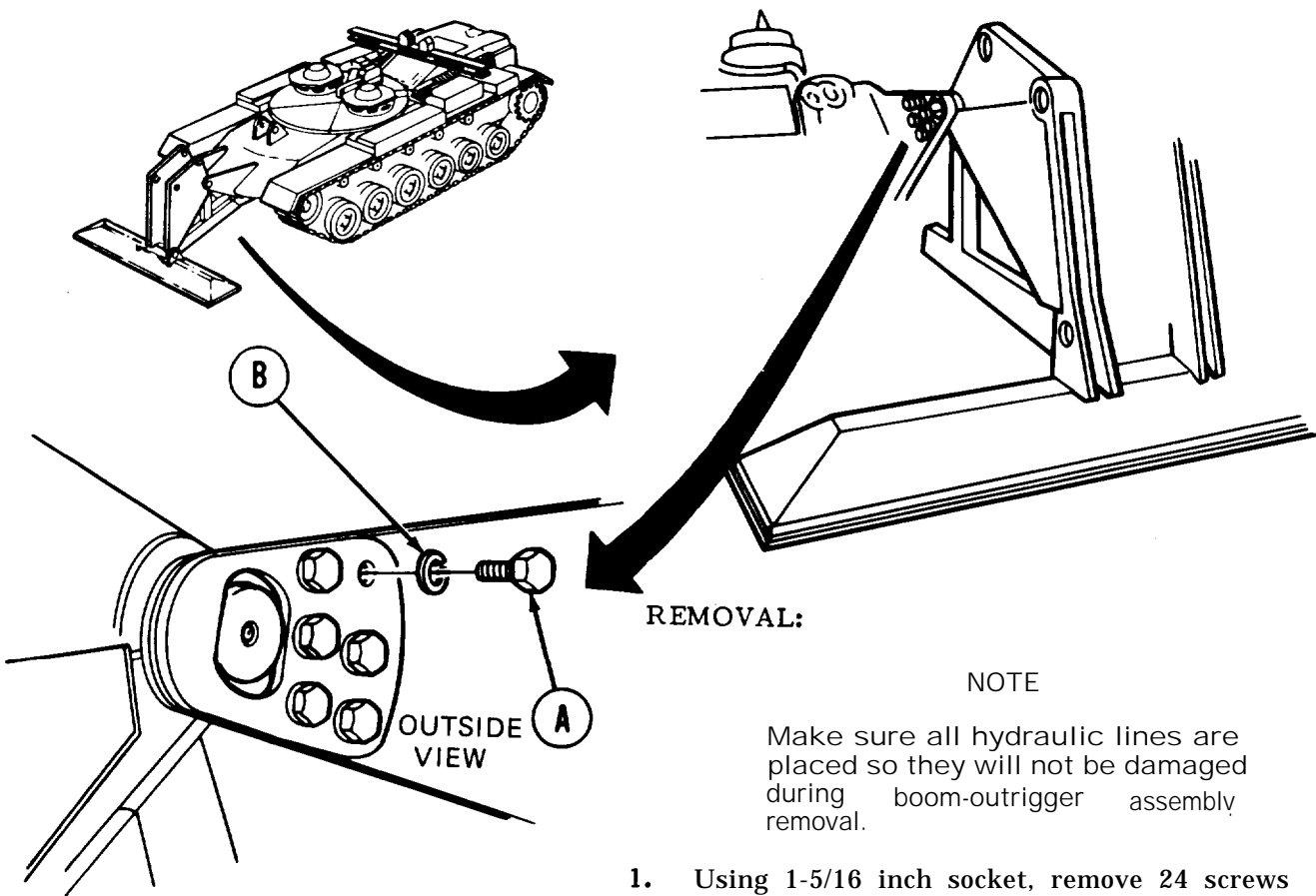
TOOLS: 1-5/16 in. socket with 3/4 in. drive
Ratchet with 3/4 in. drive
Hammer
Lifting device (2000lb. capacity)
Sling
7/16 in. socket with 1/2 in. drive
Ratchet with 1/2 in. drive
Brass drift

SUPPLIES: Lockwashers (24 required)
Wooden block 10 x 10 in., 3 in. thick

PERSONNEL: Three

REFERENCE: LO 5-5420-226-12

PRELIMINARY PROCEDURES: Remove tongue assembly (page 4-16)
Remove overhead cylinder (page 3-219)



NOTE

Make sure all hydraulic lines are placed so they will not be damaged during boom-outrigger assembly removal.

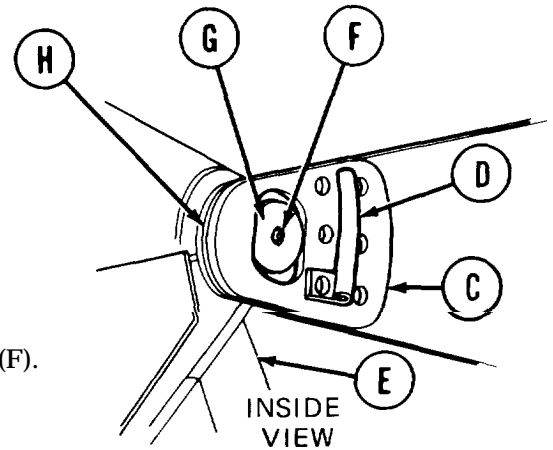
1. Using 1-5/16 inch socket, remove 24 screws (A) and lockwashers (B). Throw lockwashers (B) away.

Go on to sheet 2

TA170498

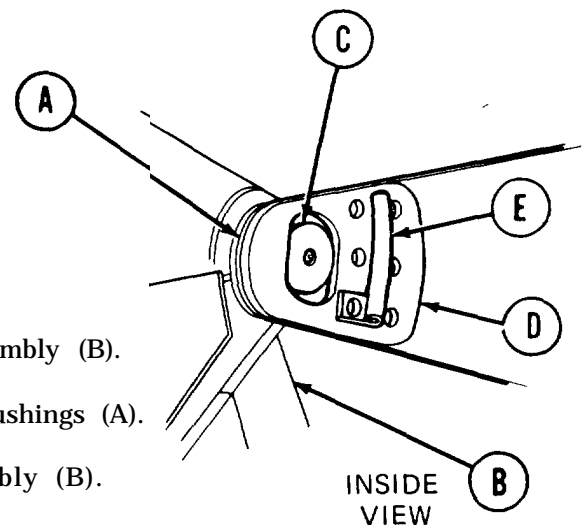
BOOM-OUTRIGGER ASSEMBLY REPLACEMENT (Sheet 2 of 3)

2. Remove four pin retainers (C) and two brackets (D).
3. Attach lifting device and sling to boom-outrigger assembly (E).
4. Have technician operating lifting device raise sling to take up slack.
5. Using 7/16 inch socket, remove four grease fittings (F).
6. Using hammer and drive pin, drive out two pins (G).
7. While two technicians guide boom-outrigger assembly (E), have technician operating lifting device slowly lift boom-outrigger assembly (E).
8. Move boom-outrigger assembly (E) to desired location and remove lifting device.
9. Using hammer and drive pin, drive out six bushings (H).



INSTALLATION:

1. Position six bushings (A) in boom-outrigger assembly (B).
2. Using hammer and wooden block, drive in six bushings (A).
3. Attach lifting device to boom-outrigger assembly (B).
4. While two technicians guide boom-outrigger assembly (B), use lifting device to move boom-outrigger assembly (B) into position on vehicle.
5. Using hammer and drift pin, drive two pins (C) into position.
6. Place four pin retainers (D) and two support brackets (E) on vehicle.

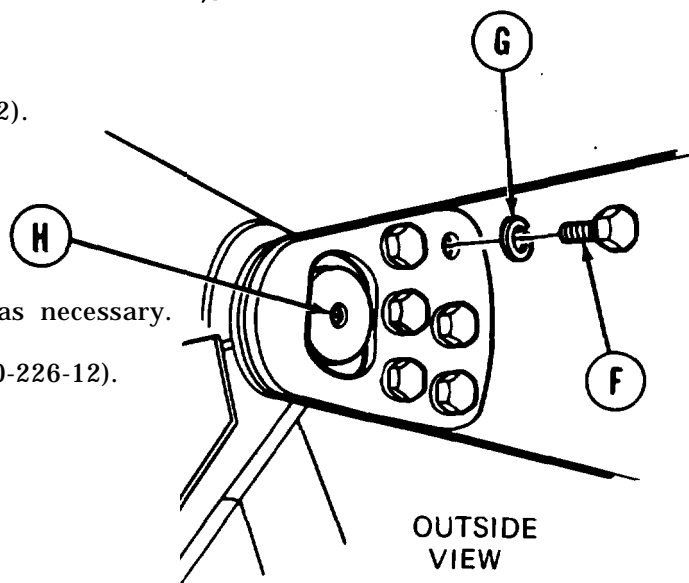


Go on to Sheet 3

TA170499

BOOM-OUTRIGGER ASSEMBLY REPLACEMENT (Sheet 3 of 3)

7. Using 1-5/16 inch socket, install 24 screws (F) and new lockwashers (G).
8. Remove lifting device.
9. Using 7/16 inch socket, install four grease fittings (H).
10. Install tongue assembly (page 4-18).
11. Install overhead cylinder (page 3-222).
12. Lubricate (LO 5-5420-226-12).
13. Bleed hydraulic system (page 3-66).
14. Check for hydraulic leaks and correct as necessary.
15. Service hydraulic reservoir (LO 5-5420-226-12).



End of Task

Section II. PUMP-CLUTCH AND VALVE BANK
 PUMP-CLUTCH DRIVE REPLACEMENT (Sheet 1 of 4)

PROCEDURE INDEX

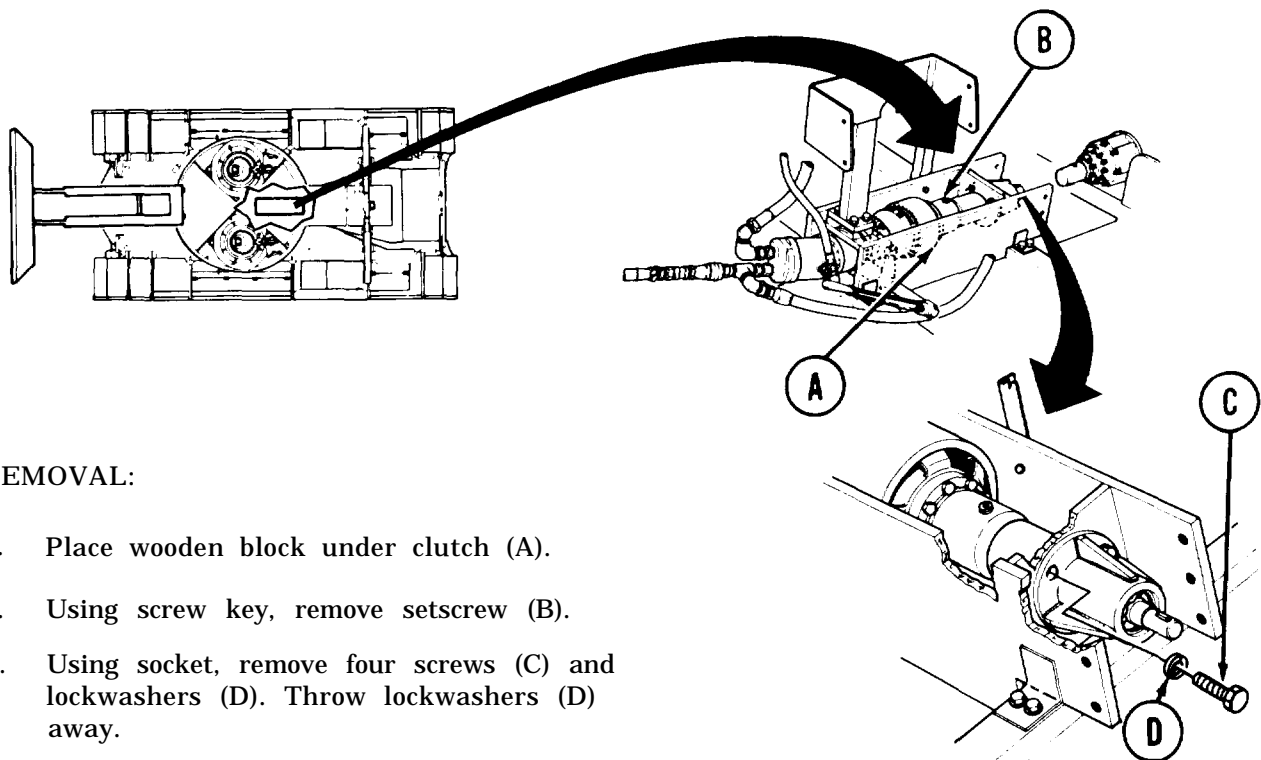
| PROCEDURE | PAGE |
|-------------------------|------|
| Removal | 4-23 |
| Cleaning and Inspection | 4-24 |
| Installation | 4-25 |

TOOLS: 3/4 in. socket with 1/2 in. drive
 5 in. extension with 1/2 in. drive
 Ratchet with 1/2 in. drive
 Snap ring pliers (inside)
 Puller kit
 Arbor press
 3/8 in. socket head screw key

SUPPLIES: Wooden block 1 x 4 in. 3 in. long
 Dry cleaning solvent (Item 15, Appendix D)
 Lockwashers (4 required)
 Rags (Item 12, Appendix D)

REFERENCES: TM 5-5420-226-10

PRELIMINARY PROCEDURES: Remove universal joint (page 3-56)
 Remove pump-clutch cover plate (page 3-59)



REMOVAL:

1. Place wooden block under clutch (A).
2. Using screw key, remove setscrew (B).
3. Using socket, remove four screws (C) and lockwashers (D). Throw lockwashers (D) away.

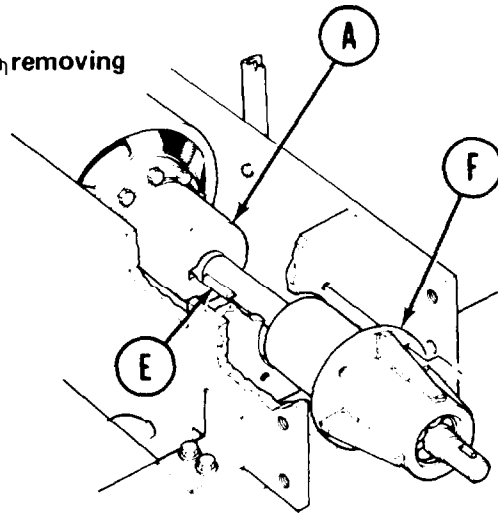
Go on to Sheet 2

TA170501

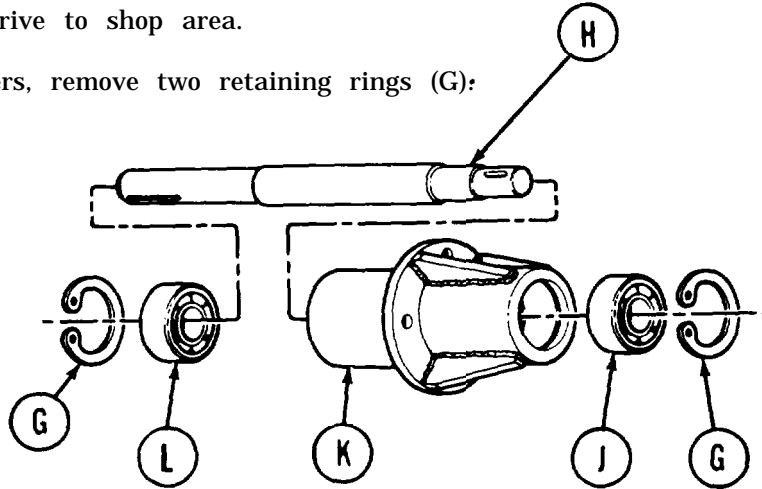
PUMP-CLUTCH DRIVE REPLACEMENT (Sheet 2 of 4)

NOTE

Be careful to not lose key (E) when removing pump-clutch drive (F) from clutch.



4. Slide pump-clutch drive (F) to rear out of clutch (A).
5. Remove key (E).
6. Take pump-clutch drive to shop area.
7. Using snap ring pliers, remove two retaining rings (G):



8. Using arbor press on long end of shaft (H), press shaft (H) and bearing (J) out of housing (K).
9. Using arbor press, remove bearing (3) from shaft (H).
10. Using puller, remove bearing (L) from housing (K).

CLEANING AND INSPECTION:

WARNING

Cleaning agent specified is flammable. Use only in well ventilated areas. Keep away from flames, sparks, or heat. Do not smoke while using. Prevent contact with eyes, mouth, and/or skin. Wear rubber gloves when performing cleaning procedures.

1. Clean all metallic parts with rags and solvent.

Go on to Sheet 3

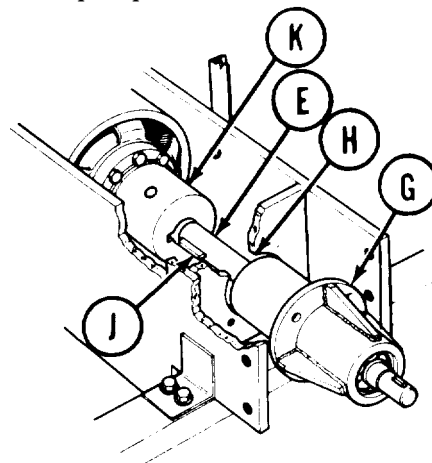
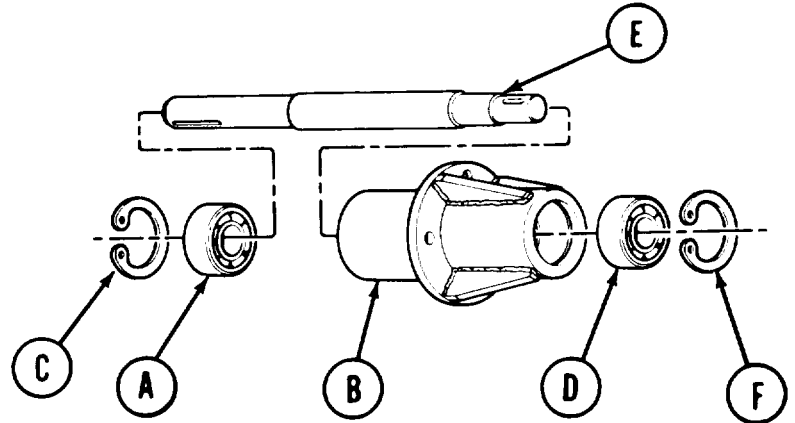
TA170502

PUMP-CLUTCH DRIVE REPLACEMENT (Sheet 3 of 4)

2. Inspect all parts for damage or wear. Replace all unserviceable parts.

INSTALLATION:

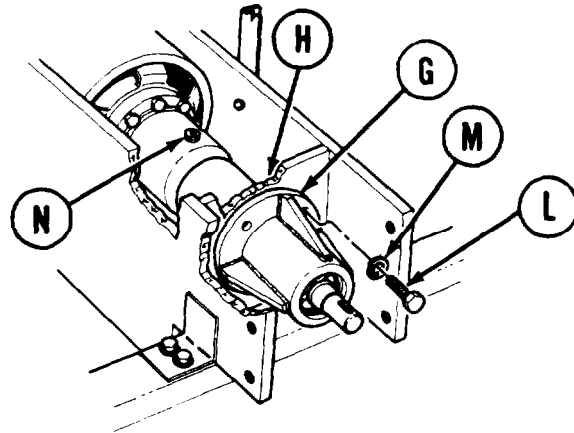
1. Using arbor press, install bearing (A) in housing (B).
2. Using snap ring pliers, install retaining ring (C).
3. Using arbor press, install bearing (D) on shaft (E).
4. Using arbor press, install bearing (D) and shaft (E) in housing (B).
5. Using snap ring pliers, install retaining ring (F).
6. Take pump-clutch drive (G) to vehicle.
7. Slide pump-clutch drive (G) through opening in end of support (H).
8. Put key (J) in groove of shaft (E).
9. Aline key (J) with keyway in clutch (K), then slide pump-clutch drive (G) into clutch (K).



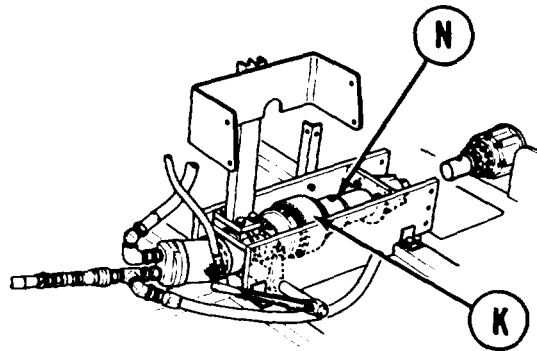
Go on to Sheet 4

TA170503

PUMP-CLUTCH DRIVE REPLACEMENT (Sheet 4 of 4)



- 10. Turn pump-clutch drive (G) to align with holes in support (H).
- 11. Using socket, install four screws (L) and new lockwashers (M).
- 12. Using screw key, install setscrew (N) in clutch (K).



- 13. Remove wooden block from under clutch (K).
- 14. Install pump-clutch cover plate (page 3-59).
- 15. Install universal joint (page 3-57).
- 16. Operate pump-clutch (TM 5-5420-226-10) to make sure unit is operational.

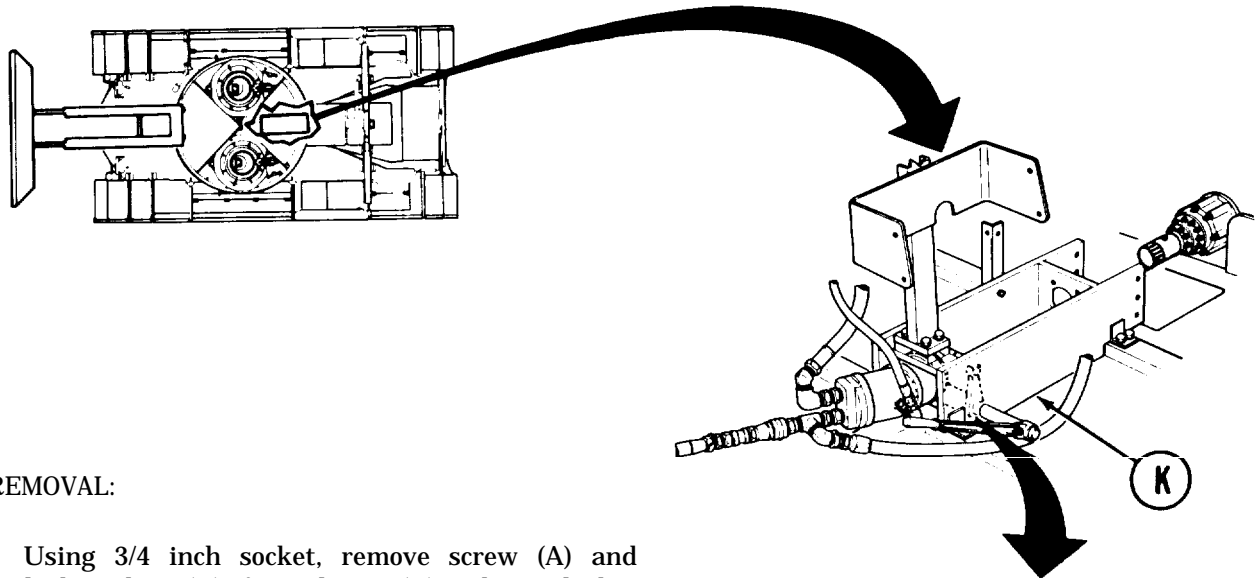
End of Task

CLUTCH CONTROLS REPLACEMENT (Sheet 1 of 2)

TOOLS: 3/4 in. socket with 1/2 in. drive
 9/16 in. socket with 1/2 in. drive
 Ratchet with 1/2 in. drive

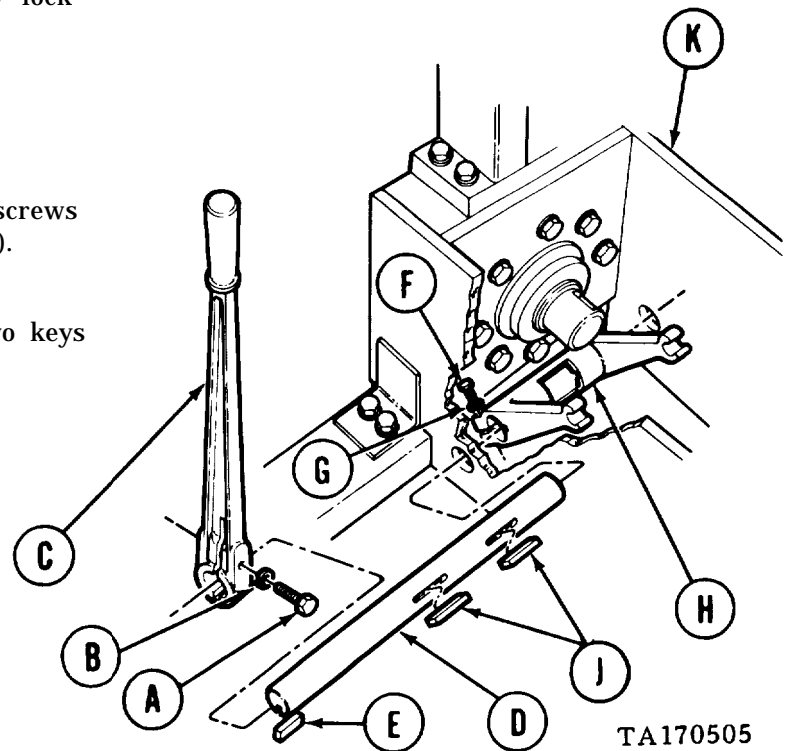
SUPPLIES: Lockwashers (3 required)

PRELIMINARY PROCEDURE: Remove clutch assembly (page 4-33)



REMOVAL:

1. Using 3/4 inch socket, remove screw (A) and lockwasher (B) from lever (C). Throw lockwasher (B) away.
2. Pull lever (C) off shaft (D).
3. Remove key (E).
4. Using 9/16 inch socket, remove two screws (F) and lockwashers (G) from yoke (H). Throw lockwashers (G) away.
5. Pull shaft (D) out of yoke (H) until two keys (J) are exposed.
6. Remove two keys (J).
7. Pull shaft (D) out of support (K).
8. Remove yoke (H) from support (K).



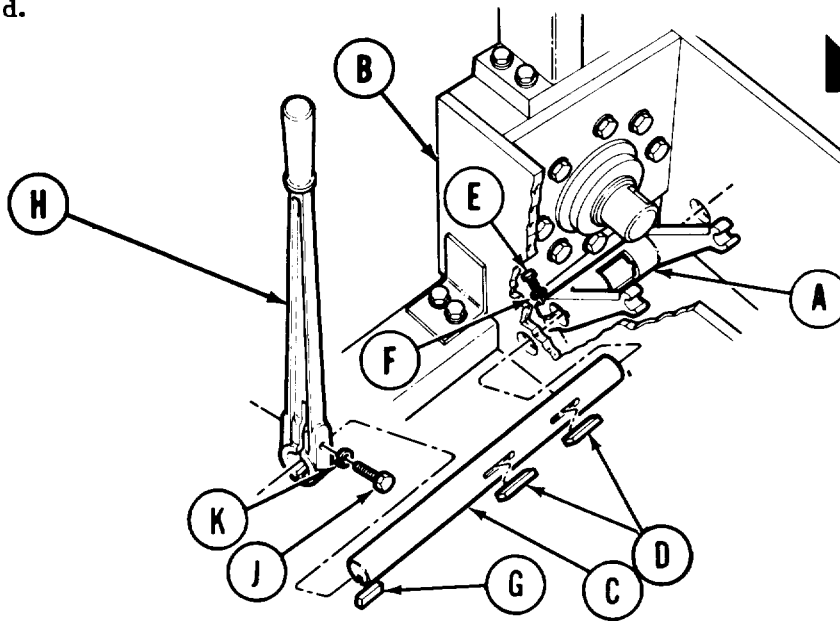
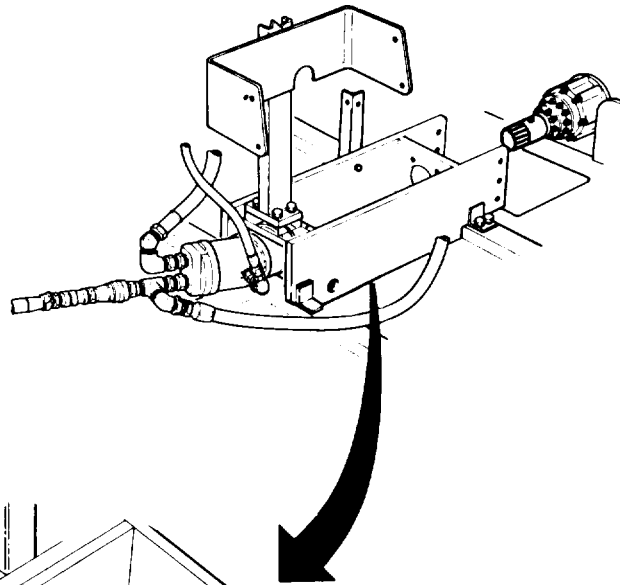
TA170505

Go on to Sheet 2

CLUTCH CONTROLS REPLACEMENT (Sheet 2 of 2)

INSTALLATION:

1. Place yoke (A) into bracket (B).
2. Slide shaft (C) through bracket (B) and into yoke (A) as shown.
3. Place two keys (D) in shaft (C).
4. Slide shaft (C) into yoke (A) until keys (D) are in yoke (A).
5. Using 9/16 inch socket, install two screws (E) and new lockwashers (F).
6. Place key (G) on shaft (C).
7. Slide lever (H) onto shaft (A) so keyways are aligned.



8. Using socket, install screw (J) and new lockwasher (K) so lever (H) is firmly attached to shaft (C).
9. Install clutch assembly (page 4-41).
10. Adjust clutch (page 3-60).

End of Task

TA170506

HYDRAULIC PUMP REPLACEMENT (Sheet 1 of 3)

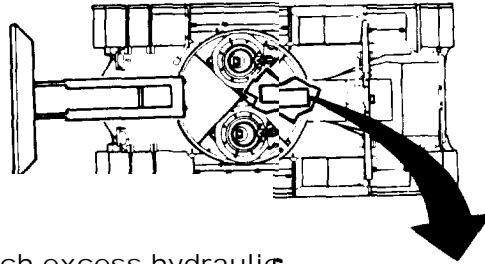
PROCEDURE INDEX

| PROCEDURE | PAGE |
|--------------|------|
| Removal | 4-29 |
| Installation | 4-30 |

TOOLS: 7/16 in. open end wrench
 7/8 in. open end wrench
 1-1/8 in. open end wrench
 1-1/2 in. open end wrench
 1-3/4 in. open end wrench
 15 in. adjustable wrench
 Ratchet with 1/2 in. drive
 12 in. adjustable wrench
 3/4 in. socket with 1/2 in. drive
 Vise

SUPPLIES: Pencil
 Pipe tape (Item 19, Appendix D)
 Rags (Item 12, Appendix D)
 Masking tape (Item 18, Appendix D)
 Drip pans
 Protective caps and plugs (assorted sizes)
 Lockwashers (8 required)

PRELIMINARY PROCEDURES: Drain hydraulic reservoir (page 3-68)
 Remove clutch assembly (page 4-33)

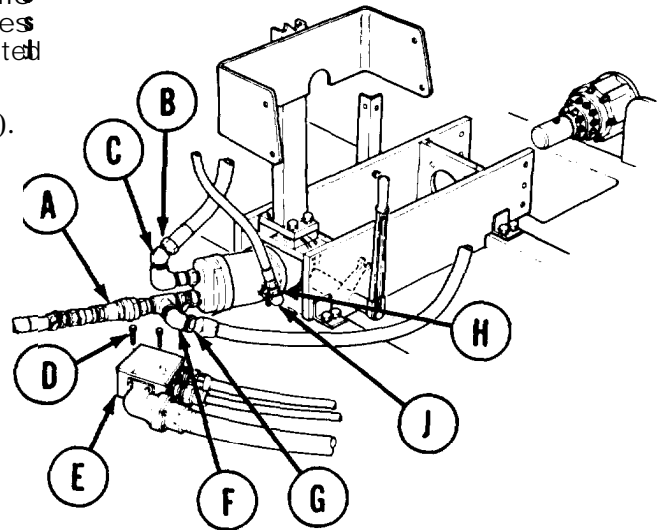


REMOVAL:

NOTE

Use rags and drip pans to catch excess hydraulic fluid. Use masking tape and pencil to tag lines for installation. Cap lines and fittings as disconnected so they are not contaminated.

1. Manually disconnect hose assembly "CW" (A).
2. Using 15 inch adjustable wrench, remove hose assembly "CZ" (B) from fitting (C).
3. Using 7/16 inch wrench, remove two screws (D).
4. Displace box (E).
5. Using adjustable wrench to hold elbow (F), use 1-1/2 inch wrench to remove hose assembly "BA" (G).
6. Using 7/8 inch wrench, remove hose assembly "CV5" (H) from elbow (J).

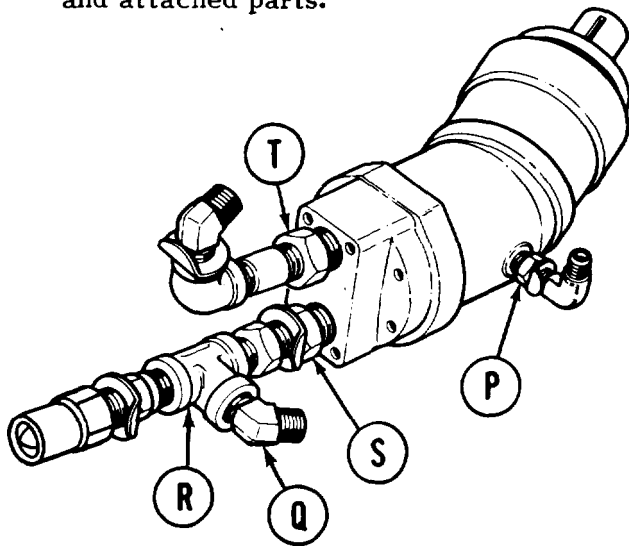
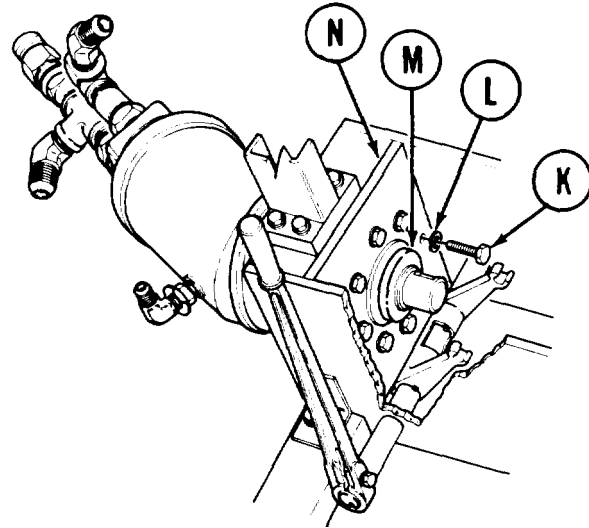


Go on to Sheet 2

TA170507

HYDRAULIC PUMP REPLACEMENT (Sheet 2 of 3)

7. Using socket, remove eight screws (K) and lockwashers (L) securing pump (M) to support (N). Throw lockwashers (L) away.
8. Remove pump (M) from vehicle and place in a vise.
- 9* Using 1-1/8 inch wrench, remove bushing (P) and attached parts.



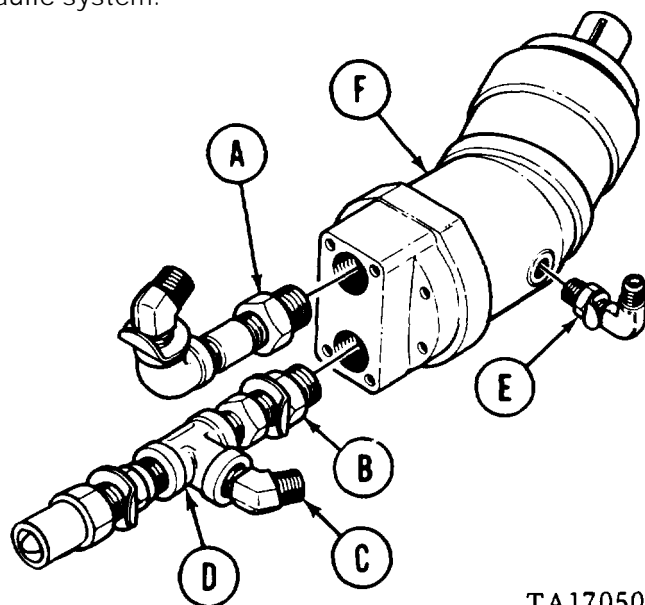
10. Using 12 inch adjustable wrench, remove elbow (Q) from tee (R).
11. Using 1-3/4 inch wrench, remove bushing (S) and attached parts.
12. Using 15 inch adjustable wrench, remove bushing (T) and attached parts.

INSTALLATION:

NOTE

Remove caps and plugs as necessary during installation. Before installation, use pipe tape on all male threads. Start tape on second thread so tape will not enter hydraulic system.

1. Using 15 inch adjustable wrench, install bushing (A) with attached parts. Tighten and aline to position shown.
2. Using 1-3/4 inch wrench, install bushing (B) with attached parts. Tighten and aline to position shown.
3. Using 12 inch adjustable wrench, install elbow (C) in tee (D).
4. Using 1-1/8 inch wrench, install bushing (E) with attached parts. Tighten and aline to position shown.
5. Place pump (F) in position in vehicle.

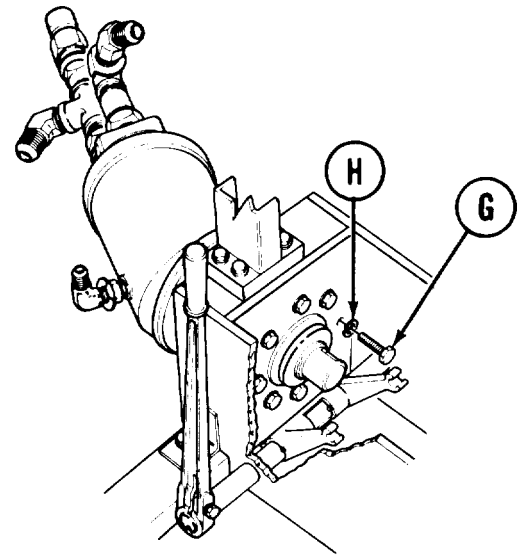


Go on to Sheet 3

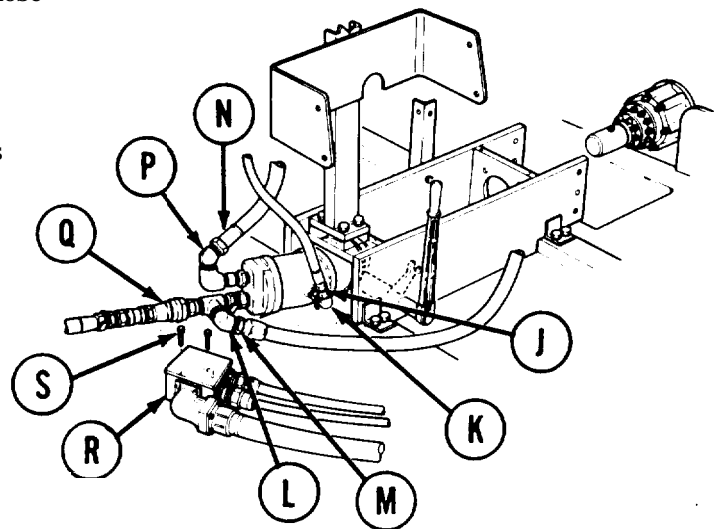
TA170508

HYDRAULIC PUMP REPLACEMENT (Sheet 3 of 3)

6. Using socket, install eight screws (G) and new lockwashers (H).



7. Using 7/8 inch wrench, install hose assembly "CV5" (J) on elbow (K).
8. Holding elbow (L) with adjustable wrench, use 1-1/2 inch wrench to install hose assembly "BA" (M).
9. Using 15 inch adjustable wrench, install hose assembly "CZ" (N) on fitting (P).
10. Manually install quick disconnect of hose assembly "CW" (Q).
11. Place box (R) in position.
12. Using 7/16 inch wrench, install two screws (s).



13. Install clutch assembly (page 4-41).
14. Service hydraulic reservoir (LO 5-5420-226-12).
15. Bleed hydraulic system (page 3-66).
16. Check for hydraulic leaks and correct as necessary.
17. Service hydraulic reservoir as needed (LO 5-5420-226-12).

End of Task

TA170509

PUMP-CLUTCH SUPPORT REPLACEMENT (Sheet 1 Of 1)

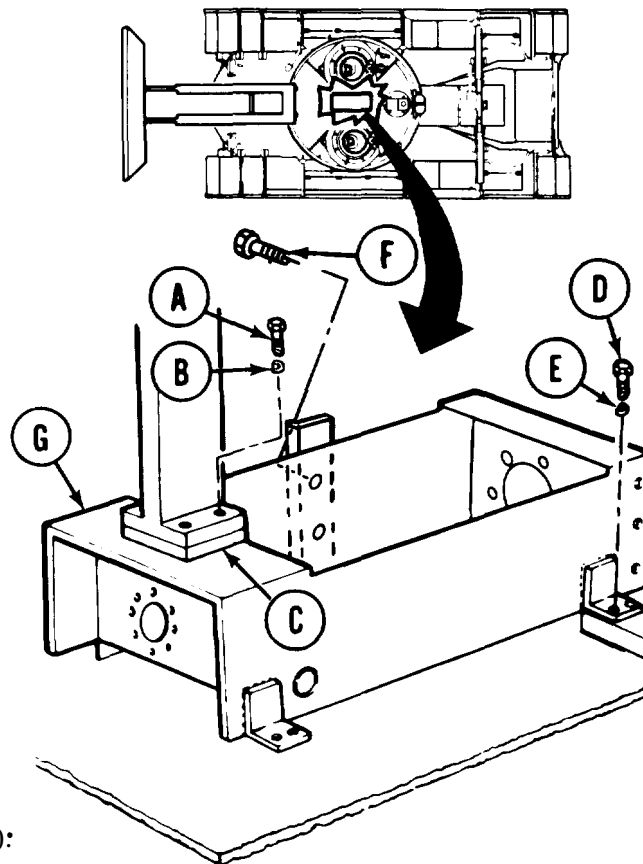
TOOLS: 9/16 in. socket with 1/2 in. drive
Ratchet with 1/2 in. drive
1/4 in. drive pin punch
3/4 in. socket with 1/2 in. drive
10 in. extension with 1/2 in. drive
Hammer

SUPPLIES: Lockwashers (8 required)
Lockwashers (4 required)

PRELIMINARY PROCEDURES: Remove pump (page 4-29)
Remove clutch controls (page 4-27)

REMOVAL:

1. Using 9/16 inch socket, remove four screws (A) and lockwashers (B). Throw lockwashers (B) away.
2. Using punch and hammer, drive out spacer (C).
3. Using 9/16 inch socket and extension, remove eight screws (D) and lockwashers (E). Throw lockwashers (E) away.
4. Using 3/4 inch socket, remove two screws (F).
5. Remove pump-clutch support (G).



INSTALLATION:

1. Place pump-clutch support (G) in position in vehicle.
2. Using 3/4 inch socket, install two screws (F):
3. Using 9/16 inch socket, install eight screws (D) and new lockwashers (E).
4. Using hammer and punch, drive spacer (C) into place.
- 5* Using 9/16 inch socket, install four screws (A) and new lockwashers (B).
6. Install pump (page 4-30).
7. Install clutch controls (page 4-28).

End of Task

TA170510

CLUTCH ASSEMBLY REPLACEMENT AND REPAIR (Sheet 1 of 9)

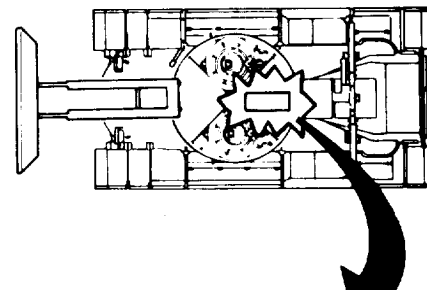
PROCEDURE INDEX

| PROCEDURE | PAGE |
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| Removal | 4-33 |
| Disassembly | 4-34 |
| Cleaning and Inspection | 4-37 |
| Assembly | 4-38 |
| Installation | 4-41 |

TOOLS: Flat-tip screwdriver
 7/16 in. open end wrench
 Hammer
 9/16 in. socket with 1/2 in. drive
 9/16 in. open end wrench (2)
 3/8 in. socket head screw key
 Arbor press

Chisel
 Ratchet with 1/2 in. drive
 3/16 in. drive pin punch
 Long round nose pliers
 1/4 in. socket head screw key
 Bearing puller

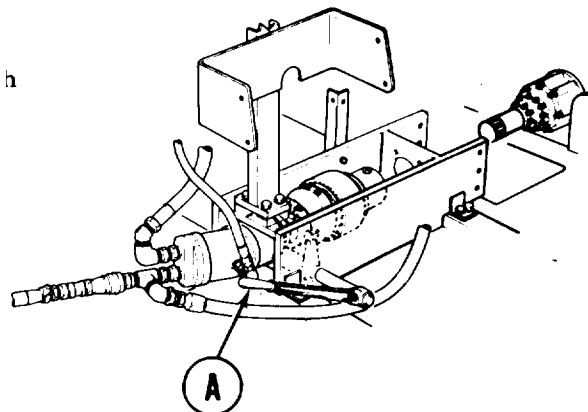
SUPPLIES: Dry cleaning solvent (Item 15, Appendix D)
 Rags (Item 12, Appendix D)
 Compressed air source
 1/16 in. locating pin
 Paper
 Grease (Item 9, Appendix D)
 Drive screws (4 required)
 Cotter pins (3 required)
 Drive screws (4 required)



PRELIMINARY PROCEDURES: Remove pump-clutch drive (page 4-23)

REMOVAL:

1. Push down on hand lever (A) to make sure clutch is disengaged.



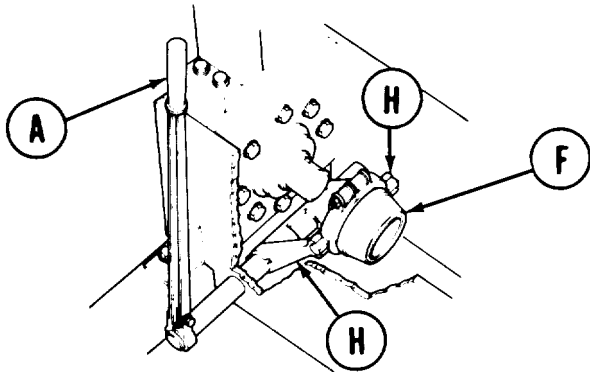
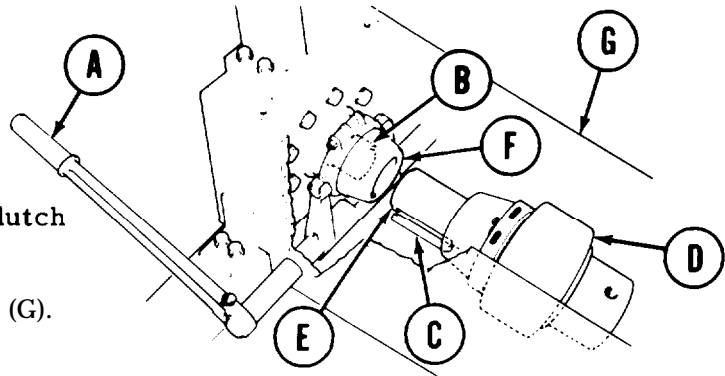
Go on to Sheet 2

CLUTCH ASSEMBLY REPLACEMENT AND REPAIR (Sheet 2 of 9)

NOTE

Be careful to not lose two keys (B) and (C) when removing clutch assembly (D).

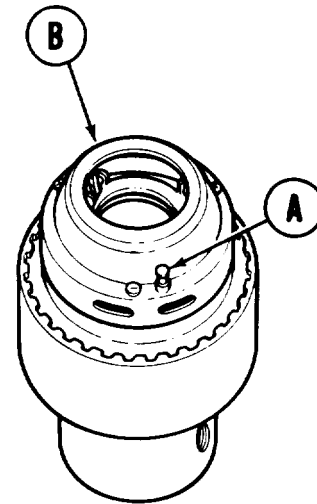
2. Pull clutch assembly (D) to rear until clutch shaft (E) clears ring (F).
3. Lift clutch assembly (D) out of support (G).
4. Remove two keys (B and C).



5. Pull up hand lever (A).
6. Lift ring (F) and its attached parts out of yoke (H) and remove from vehicle.

DISASSEMBLY:

1. Manually pull out pin (A) and lock in place by pushing locating pin through hole in pin (A).
2. Turn cover (B) counterclockwise until it comes off rest of assembly.

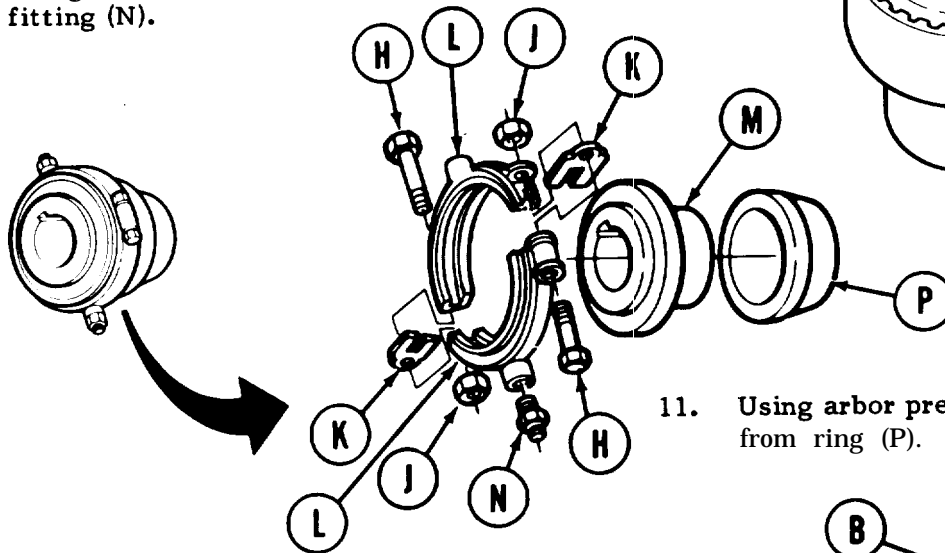
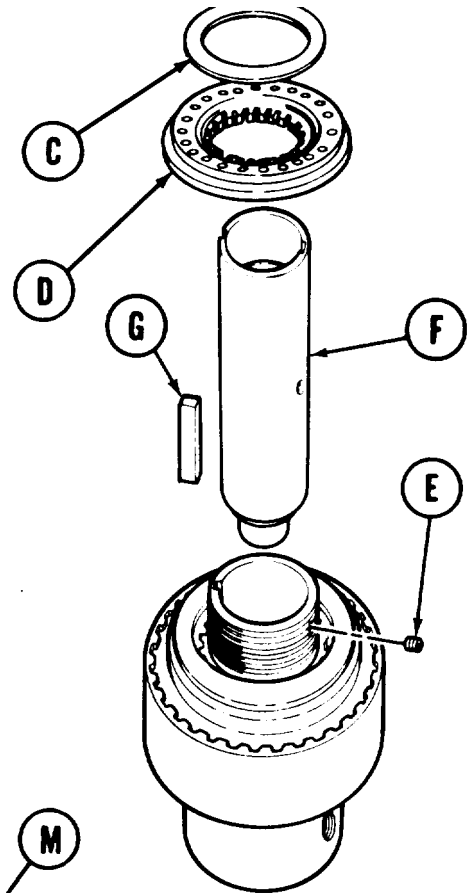


Go on to Sheet 3

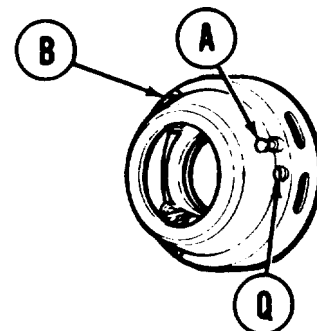
TA170512

CLUTCH ASSEMBLY REPLACEMENT AND REPAIR (Sheet 3 of 9)

3. Manually remove bearing (C) and gear (D).
4. Using 1/4 inch screw key, loosen setscrew (E).
5. Manually pull out shaft (F).
6. Using pliers, remove key (G).
7. Holding two screws (H) with 9/16 inch wrench, use 9/16 inch wrench to remove two nuts (J).
8. Manually remove two screws (H) and shims (K).
- 9* Separate two halves of collar (L) and remove from sleeve (M).
10. Using 7/16 inch wrench, remove lubrication fitting (N).



11. Using arbor press, remove sleeve (M) from ring (P).



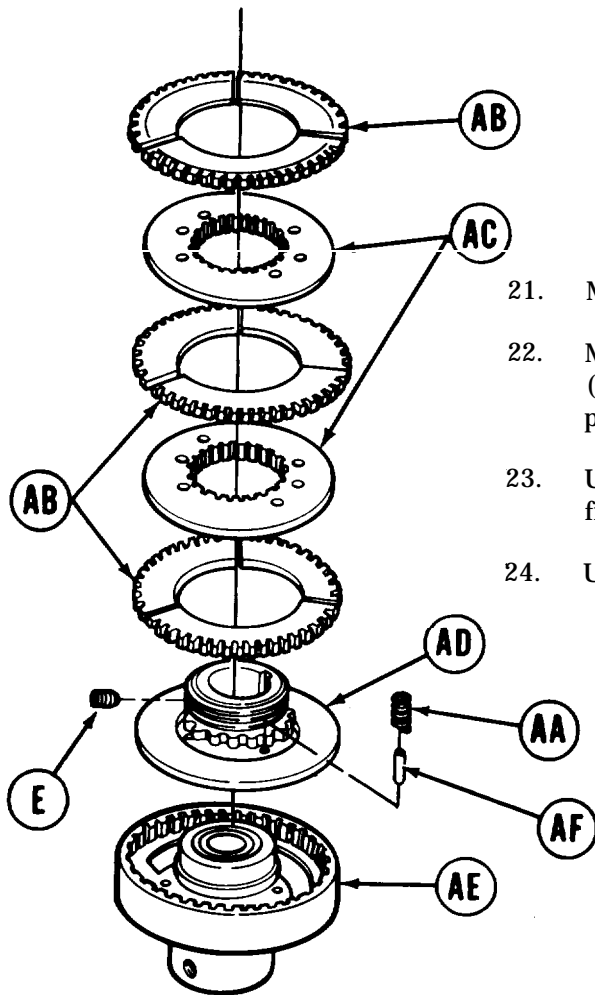
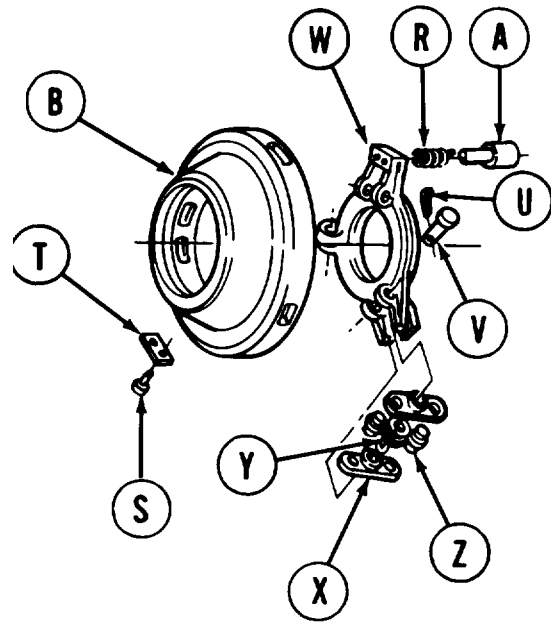
12. Remove locating pin from pin (A).
13. Using flat-tip screwdriver, remove three screws (Q) securing cover (B) to attached parts.

Go on to Sheet 4

TA170513

CLUTCH ASSEMBLY REPLACEMENT AND REPAIR (Sheet 4 of 9)

14. Remove cover (B).
15. Remove pin (A) and spring (R).
16. Using hammer and chisel, tap out two drive screws (S). Throw drive screws (S) away.
17. Remove plate (T) from cover (B).
18. Using pliers, remove three cotter pins (U). Throw cotter pins (U) away.
19. Manually remove three pins (V) from yoke (W).
20. Separate six levers (X), three springs (Y), and six pins (Z).



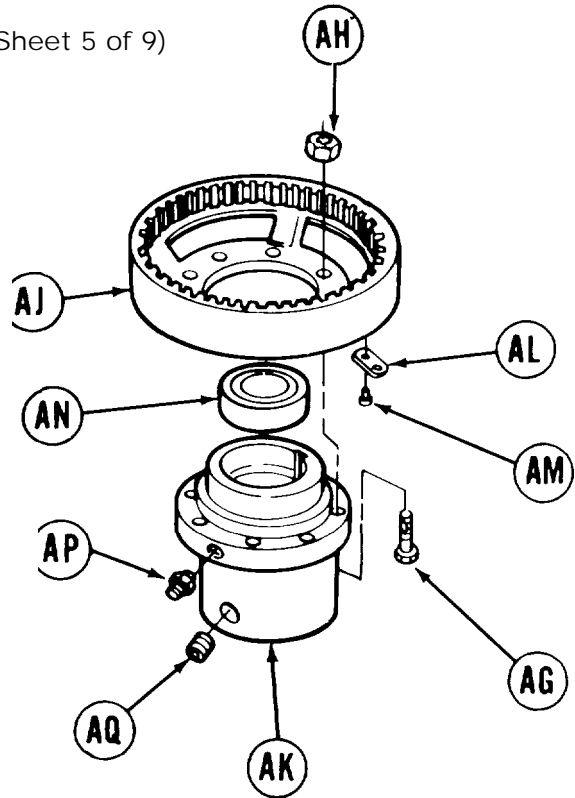
21. Manually remove six springs (AA).
22. Manually remove three sets of friction linings (AB), two clutch discs (AC), and hub and backplate (AD) from clutch spider assembly (AE).
23. Using 1/4 inch screw key, remove setscrew (E) from hub and backplate (AD).
24. Using hammer and punch, remove six pins (AF).

Go on to Sheet 5

TA170514

CLUTCH ASSEMBLY REPLACEMENT AND REPAIR (Sheet 5 of 9)

25. Using 9/16 inch wrench to hold screws (AG), use 9/16 inch socket to remove eight nuts (AH).
26. Using hammer, tap out screws (AG) from flange (AJ).
27. Remove flange (AJ) from hub (AK).



28. Using hammer and chisel, under nameplate (AL), remove two drive screws (AM) and nameplate (AL). Throw drive screws (AM) away.
29. Using bearing puller, remove bearing (AN) from hub (AK).
30. Using 7/16 inch wrench, remove lubrication fitting (AP).
31. Using 3/8 inch screw key, remove setscrew (AQ).

CLEANING AND INSPECTION:

WARNING

Cleaning agent specified is flammable. Use only in well ventilated areas. Keep away from flames, sparks, or heat. Do not smoke while using. Prevent contact with eyes, mouth, and/or skin. Wear rubber gloves when performing cleaning procedures.

WARNING

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

1. Using rags and solvent, clean all metal parts and dry with compressed air.
2. Lubricate bearing with grease and wrap in oiled paper.

Go on to Sheet 6

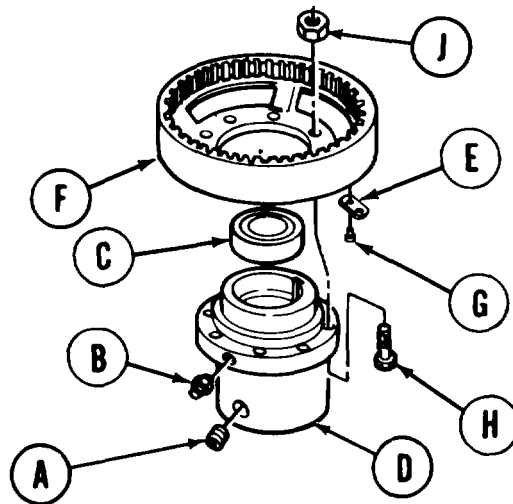
TA170515

CLUTCH ASSEMBLY REPLACEMENT AND REPAIR (Sheet 6 of 9)

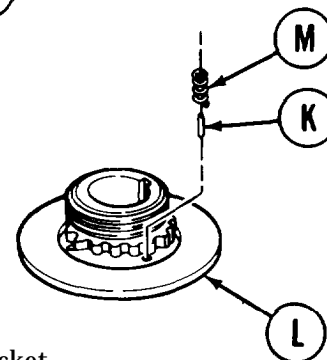
3. Inspect parts for worn teeth, distortion, stripped threads, and indications of wear.
4. Replace all worn or damaged parts.

ASSEMBLY:

1. Using 3/8 inch screw key, install setscrew (A).
2. Using 7/16 inch wrench, install lubrication fitting (B).
3. Using arbor press, install bearing (C) into hub (D).



4. Place nameplate (E) in position on flange (F).
5. Using hammer, install two new drive screws (G).
6. Place flange (F) in position on hub (D).
7. Manually install eight screws (H) and nuts (J).
8. Using 9/16 inch wrench to hold screws (H), use 9/16 inch socket to tighten nuts (J).
9. Using hammer, install six pins (K) in hub and backplate (L).
10. Manually install six springs (M) on pins (K).

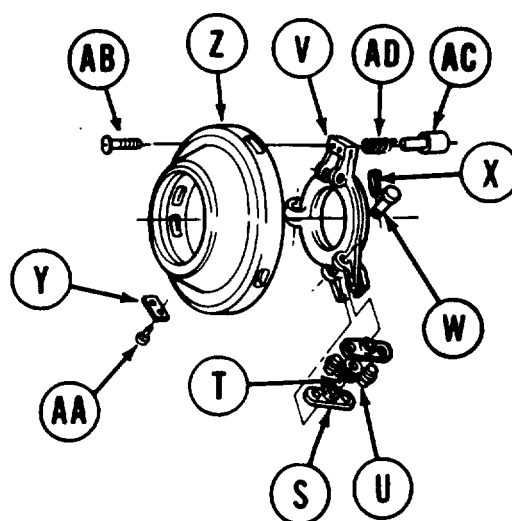
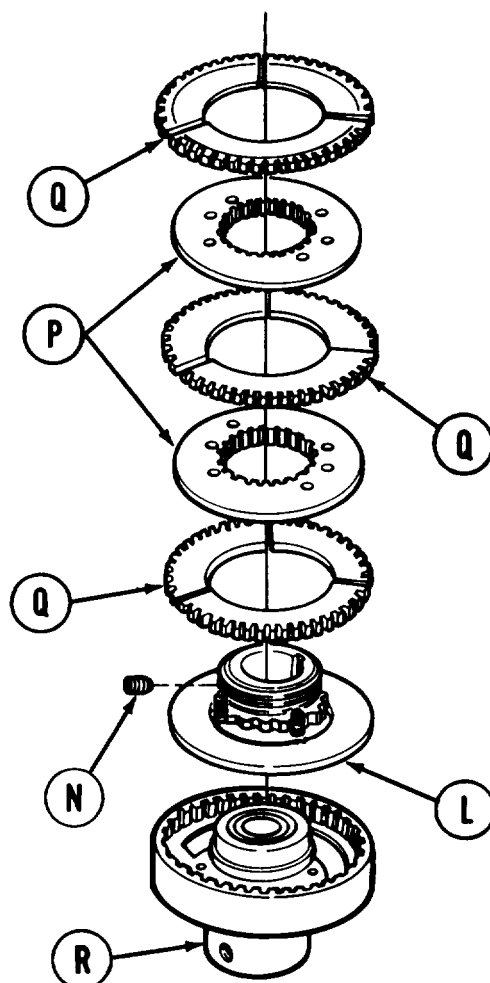


Go on to Sheet 7

TA170516

CLUTCH ASSEMBLY REPLACEMENT AND REPAIR (Sheet 7 of 9)

11. Using 1/4 inch screw key, loosely install setscrew (N) so it is below thread level of hub and backplate (L).
12. Manually install hub and backplate (L), two clutch discs (P), and three friction linings (Q) on clutch spider assembly (R) in order shown.
13. Assemble six levers (S), three springs (T), and six pins (U) into three assemblies as shown.
14. Place three assemblies in position on yoke (v).
15. Install three pins (W) securing three assemblies to yoke (V).
16. Using pliers, install three new cotter pins (X) through pins (W).
17. Place plate (Y) in position on cover (Z).
18. Using hammer, tap in two new drive screws (AA) into cover (Z).
19. Using flat-tip screwdriver, install three screws (AB) securing cover (Z) to yoke (V).
20. Place pin (AC) and spring (AD) in position through yoke (V) and cover (Z).
21. Manually pull out on pin (AC) and lock in place by pushing locating pin through hole in pin (AC).

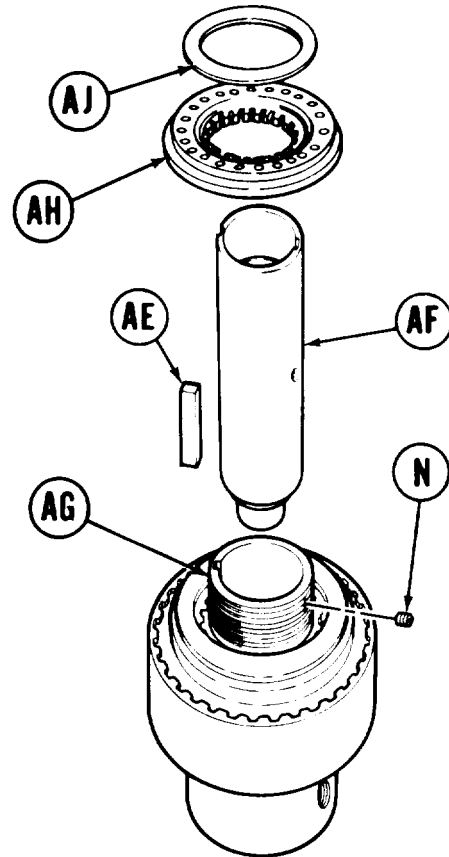


Go on to Sheet 8

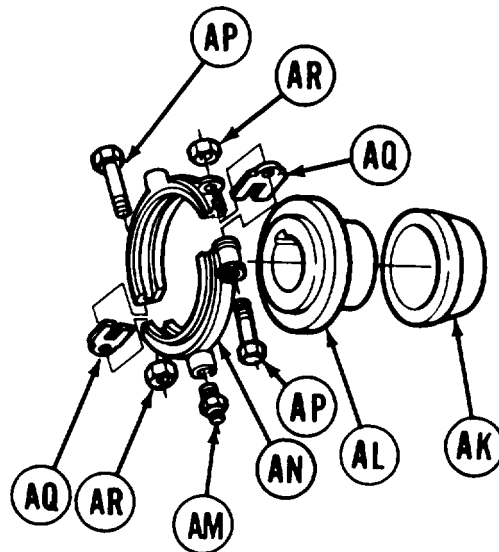
TA170517

CLUTCH ASSEMBLY REPLACEMENT AND REPAIR (Sheet 8 of 9)

22. Using 1/4 inch screw key, loosen setscrew (N).
23. Place key (AE) in shaft (AF).
24. Insert shaft (AF) in clutch assembly (AG) aligning recess in shaft with setscrew (N) and make sure shaft is seated in bearing.
25. Using 1/4 inch screw key, tighten set-screw (N).
26. Gently pull shaft (AF) to make sure it is firmly seated, being careful assembly does not separate.
27. Manually install gear (AH) and bearing (AJ) on clutch assembly (AG).



28. Using arbor press, press ring (AK) on sleeve (AL).
29. Using 7/16 inch wrench, install lubrication fitting (AM) on collar (AN).
30. Place two halves of collar (AN) on sleeve (AL).
31. Manually install two bolts (AP), shims (AQ), and nuts (AR).
32. Holding two bolts (AP) with 9/16 inch wrench, use 9/16 inch wrench to tighten two nuts (AR).

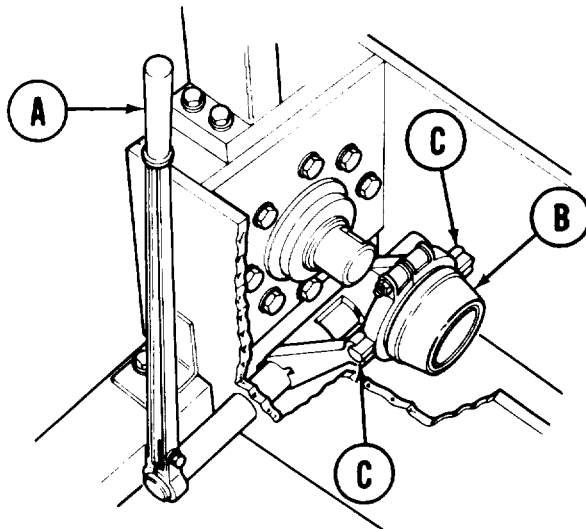
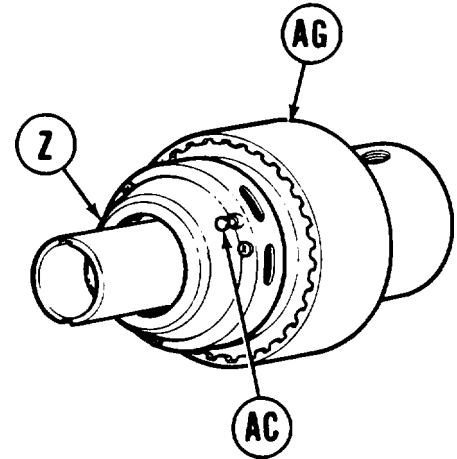


Go on to Sheet 9

TA170518

CLUTCH ASSEMBLY REPLACEMENT AND REPAIR (Sheet 9 of 9)

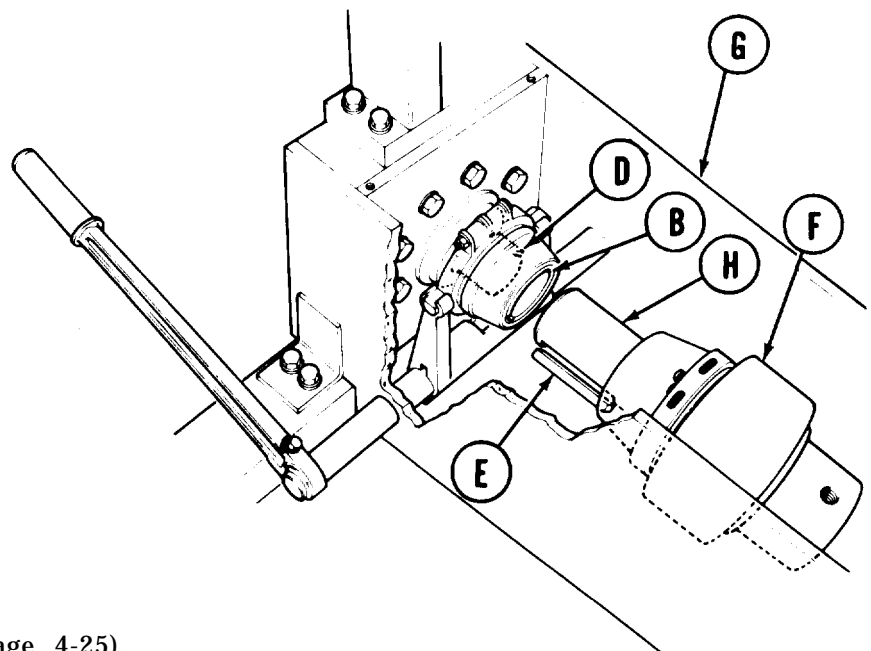
33. Place cover (Z) in clutch assembly (AG).
34. Turn cover (Z) clockwise until installed on assembly.
35. Remove locating pin from pin (AC) to lock cover (Z) in place.



INSTALLATION:

1. Pull up lever (A).
2. Place ring (B) and attached parts in yoke (C).
3. Push down lever (A) to be sure clutch is disengaged.

4. Install two keys (D and E).
5. Place clutch assembly (F) in support (G).
6. Pull clutch assembly (F) to rear until shaft (H) clears ring (B).
7. Insert shaft (H) in ring (B).
8. Install pump-clutch drive (page 4-25).
9. Adjust clutch (page 3-60).



End of Task

TA170519

PROCEDURE INDEX

| PROCEDURE | PAGE |
|-------------------------|------|
| Disassembly | 4-42 |
| Cleaning and Inspection | 4-47 |
| Assembly | 4-48 |

TOOLS: Long round nose pliers
 5/16 in. socket head screw key
 Arbor press
 1/4 in. drive pin punch
 Hammer
 3/4 in. open end wrench
 Scriber
 Puller kit
 Spray gun with air filter and water separator
 Gun, air blow
 Flat-tip screwdriver

3/16 in. socket head screw key
 9/16 in. socket head screw key

SUPPLIES: Dry cleaning solvent (Item 15, Appendix D) Packing
 Gasket Protective caps and plugs (assorted sizes)
 Cotter pin Hydraulic fluid (Item 8, Appendix D)
 Rags (Item 12, Appendix D) Gasket kit (P/N 919128)
 Lapping compound (Item 6, Appendix D) Compressed air source
 Paper Oil seal

PERSONNEL: Two

PRELIMINARY PROCEDURE: Remove hydraulic pump (page 4-29)

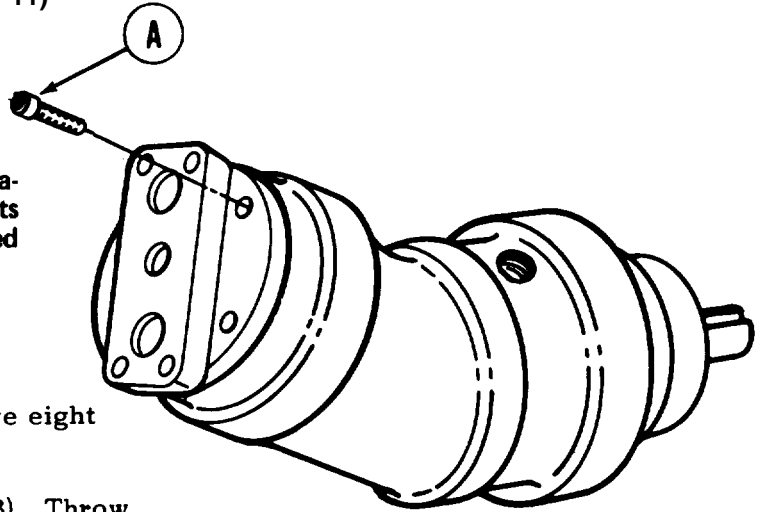
Go on to Sheet 2

HYDRAULIC PUMP REPAIR (Sheet 2 of 11)

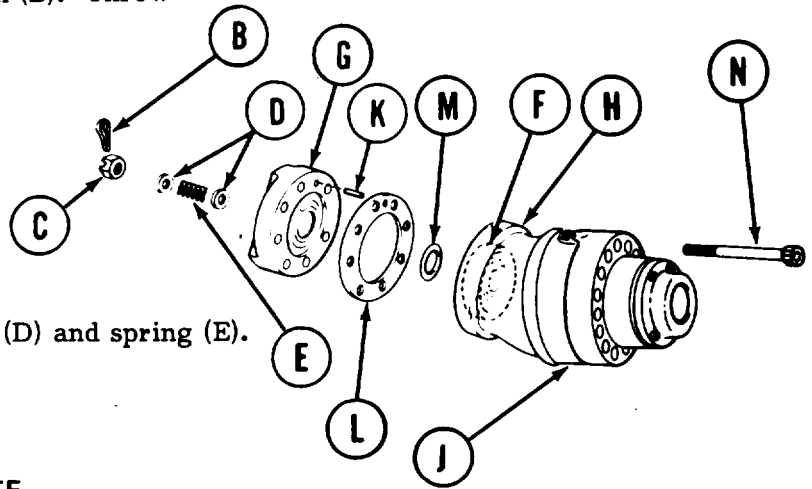
DISASSEMBLY:

CAUTION

The hydraulic pump is a finely machined device. Do not damage parts during disassembly. Set removed parts carefully aside on rags.



1. Using 5/16 inch screw key, remove eight screws (A).
2. Using pliers, remove cotter pin (B). Throw cotter pin (B) away.
3. Using wrench, remove nut (C).



4. Manually remove two washers (D) and spring (E).

NOTE

Make sure valve plate (F) does not come off with valve block (G). Using scriber, mark both subdeck (H) and bearing housing (J).

5. Lift valve block (G) off subdeck housing (H).
6. Using pliers, remove alignment pin (K).
7. Remove gasket (L) and packing (M). Throw gasket (L) and packing (M) away.
8. Using 5/16 inch screw key, remove eight screws (N).

Go on to Sheet 3

TA170520

HYDRAULIC PUMP REPAIR (Sheet 3 of 11)

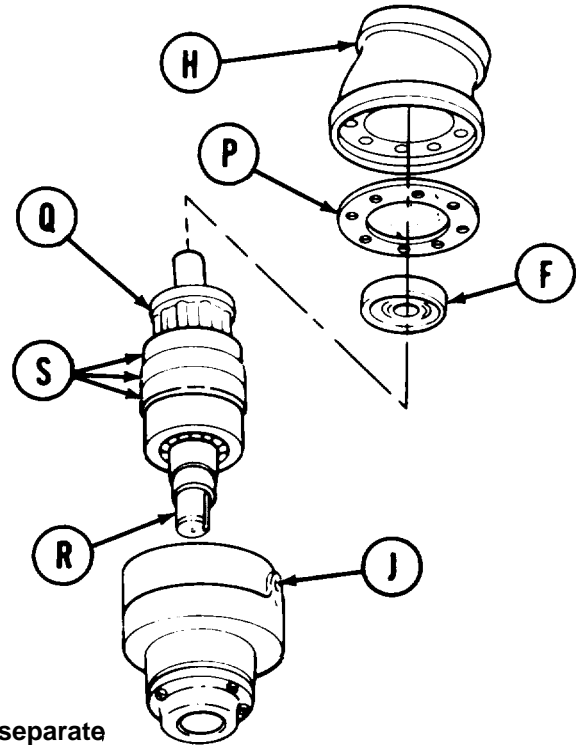
NOTE

Do not allow parts to separate while placing pump upright,

9. With help of second technician, carefully place pump in a vertical position with shaft end down.
10. While manually pushing down evenly on valve plate (F), ease subdeck housing (H) off bearing housing (J).

NOTE

Note position of valve plate (F) for assembly.



11. Manually remove valve plate (F) and gasket (P). Throw gasket (P) away.

CAUTION

Do not pull up on cylinder block (Q), as it will separate from drive shaft (R) and damage piston surfaces.

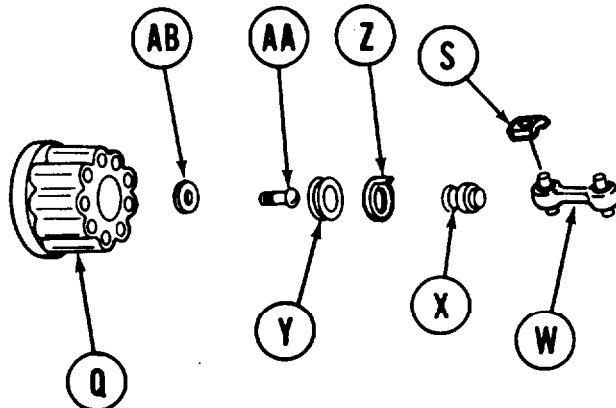
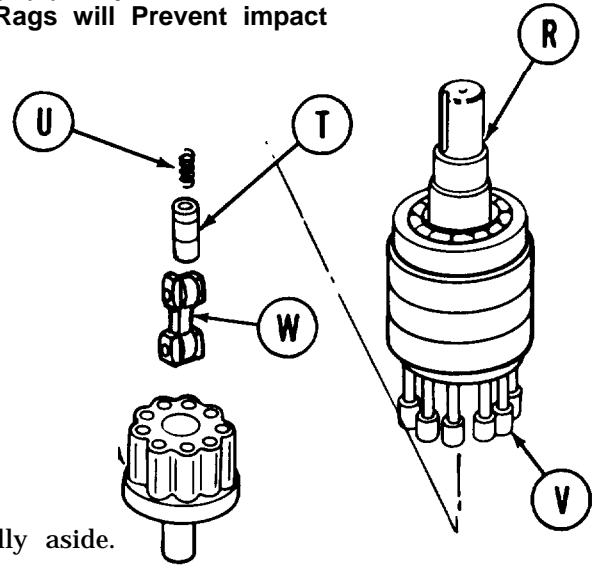
12. While manually pressing down on bearing housing (J), pull up on three bearings (S) to remove drive shaft (R) with cylinder block (Q) attached.
13. While holding three bearings (S), place other hand over cylinder block (Q) and turn drive shaft (R) and assembled parts up.

HYDRAULIC PUMP REPAIR (Sheet 4 of 11)

CAUTION

Do step 14 closely over a surface covered by rags. Knuckles (S), flex bearing (T), and spring (U) may fall out when cylinder block (Q) is removed. Rags will Prevent impact damage to falling parts.

14. Have second technician slowly slip cylinder block (Q) off pistons (V) so pistons do not strike each other and lay cylinder block (Q) care fully on rag.
15. Have second technician cap nine pistons (V) with protective caps.
16. Manually remove flex bearing (T) and spring (U) from drive shaft (R).
17. Lay drive shaft (R) and attached parts carefully aside.



18. Remove universal link and pin assembly (W) from cylinder block (Q).
19. Remove four knuckles (S) from link and pin assembly (W).
20. Remove fixed bearing (X) from fixed bearing retainer (Y).

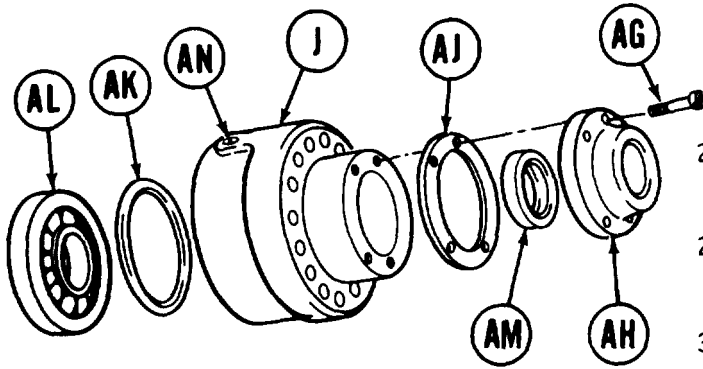
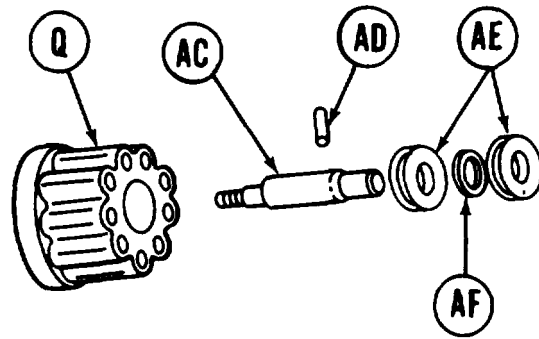
21. Using pliers, press ears of retaining ring (Z) together and remove retaining ring (Z) and bearing retainer (Y).
22. Using screwdriver, remove screw (AA).
23. Manually remove washer (AB).

Go on to Sheet 5

TA170522

HYDRAULIC PUMP REPAIR (Sheet 5 of 11)

- 25. Push shaft (AC) out of cylinder block (Q).
- 26. Using pliers, remove pin (AD).
- 27. Using arbor press, remove two bearings (AE) and washer (AF).

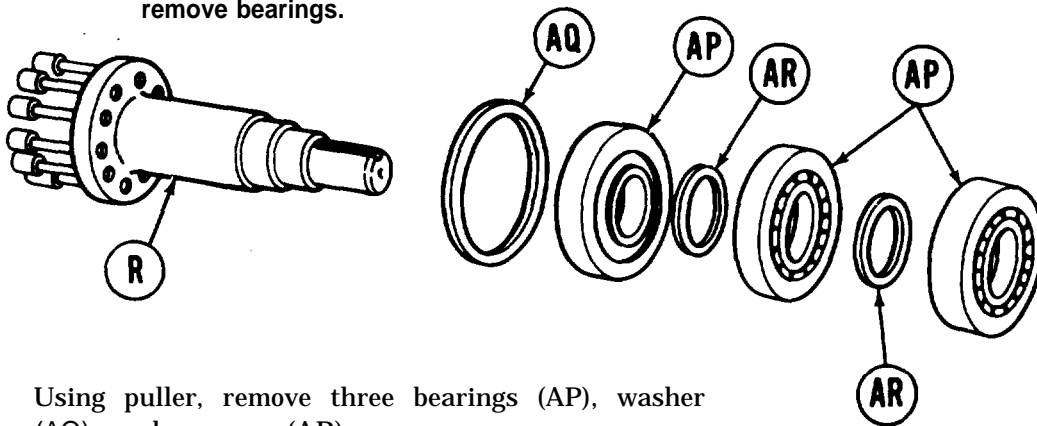


- 28. Using 3/16 inch screw key, remove four screws (AG) from bearing housing (J).
- 29. Manually remove retainer (AH) and gasket (AJ). Throw gasket (AJ) away.
- 30. Manually removing (AK) and bearing (AL).

- 31. Using arbor press, press oil seal (AM) out of retainer (AH). Throw oil seal (AM) away.
- 32. Using 9/16 inch screw key, remove drain plug (AN) from bearing housing (J).

NOTE

Three bearings (AP) should not be removed from drive shaft (R) unless necessary. Visually check bearings for bluish discoloration or nicks, scratches, or burrs. Manually spin bearings on drive shaft to check for binding, pulling, or sluggishness. If any of these conditions are found, remove bearings.



- 33. Using puller, remove three bearings (AP), washer (AQ), and spacers (AR).

Go on to Sheet 6

TA170523

HYDRAULIC PUMP REPAIR (Sheet 6 of 11)**CLEANING AND INSPECTION:****WARNING**

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

WARNING

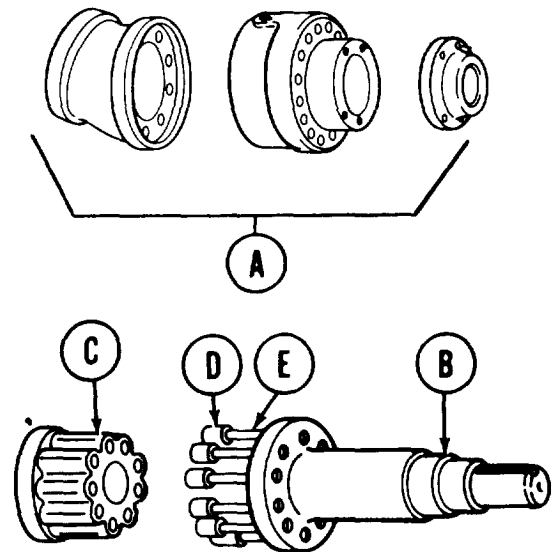
Cleaning agent specified is flammable. Use only in well ventilated areas. Keep away from flames, sparks, or heat. Do not smoke while using. Prevent contact with eyes, mouth, and/or skin. Wear rubber gloves when performing cleaning procedures.

- Using rags and dry cleaning solvent, wash all metal parts and dry with compressed air.

CAUTION

Do not spin bearings by hand. This causes wear on parts when not lubricated.

- If bearings have been removed, clean them by placing in container and agitating in dry cleaning solvent. Then use spray gun to flush bearings with dry cleaning solvent while turning slowly, rinse bearings with clean hydraulic fluid and wrap in clean oiled paper.
- Check all inside and outside surfaces of pump housing (A) for nicks, scratches, gouges, warping, burrs, or dents. Small nicks, scratches) and burrs may be removed with crocus cloth. If other damage is found, replace housing (A).
- Check threads of all attaching parts for stripping and wear. Replace as necessary.
- Examine drive shaft (B) and cylinder block (C), at the same time, check each piston (D) for scratches and nicks. Make sure each connecting rod (E) turns freely at both ends. Test cylinder block (C) sockets by installing and removing each piston (D) in each socket. Fit should be firm and smooth. Check outside of drive shaft (B) and cylinder block (C) for burrs and nicks. Using lapping compound, dress down any tiny burrs or nicks. Replace drive shaft (B), cylinder block (C), or both if anything more than tiny burrs or nicks are found.



Go on to Sheet 7

TA170524

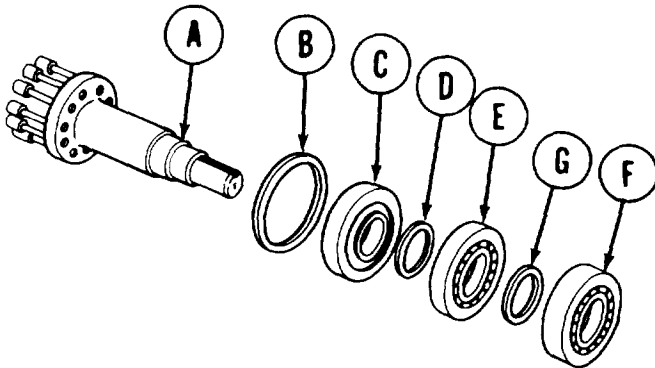
HYDRAULIC PUMP REPAIR (Sheet 7 of 11)

6. Valve plate (F) and cylinder block (C) must mate perfectly. Check mating surfaces for flatness of fit. If either surface is gouged, nicked, or damaged, replace part.
7. Examine all other parts for scratches, nicks, burrs, distortion, elongated holes, stripped threads, and firmness of fit. Replace defective parts.

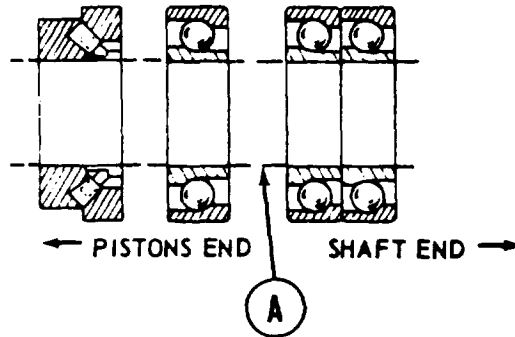
ASSEMBLY:

NOTE

Install bearings on drive shaft (A) in order and position shown.



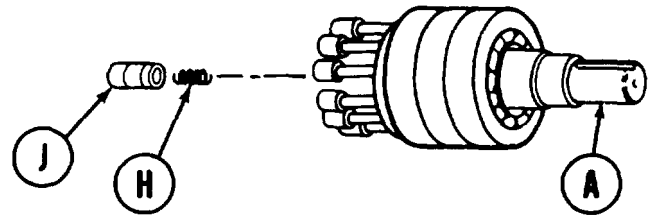
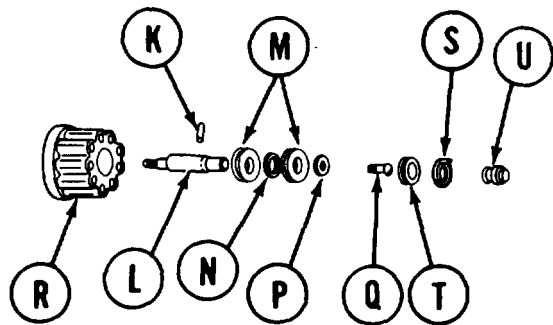
NOTE WIDE SIDE OF OUTER RACE



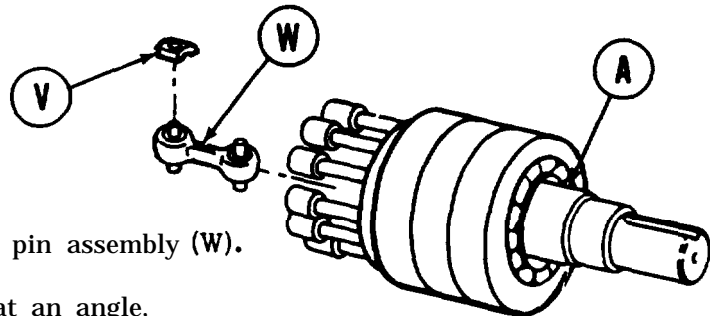
1. Manually place washer (B), bearing (C), and spacer (D) on drive shaft (A).

2. Using arbor press, install bearing (C).
3. Manually place bearings (E) and (F) and spacer (G) on drive shaft (A).
4. Using arbor press, install bearings (E) and (F).

HYDRAULIC PUMP REPAIR (Sheet 8 of 11)



5. Manually install spring (H) and flex bearing (J) in drive shaft (A).
6. Using hammer and punch, install pin (K) in shaft (L).
7. Using arbor press, install two bearings (M) and washer (N) onto shaft (L).
8. Using screwdriver, install flat washer (P) and screw (Q).
9. Manually install shaft (L) into cylinder block (R).
10. Using pliers, place retaining ring (S) on retainer (T).
11. Using pliers, install retaining ring (S) with retainer (T) into cylinder block (R).
12. Manually install bearing (U) in retainer (T).



13. Place four knuckles (V) on link and pin assembly (W).
14. Holding link and pin assembly (W) at an angle, slide one knuckle into drive shaft (A) with grooved end up.
15. Tilt link and pin assembly (W) forward and install second knuckle (V) in drive shaft (A) grooved end up.

Go on to Sheet 9

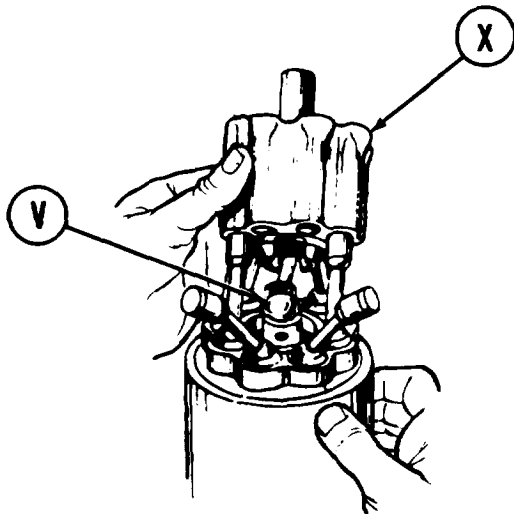
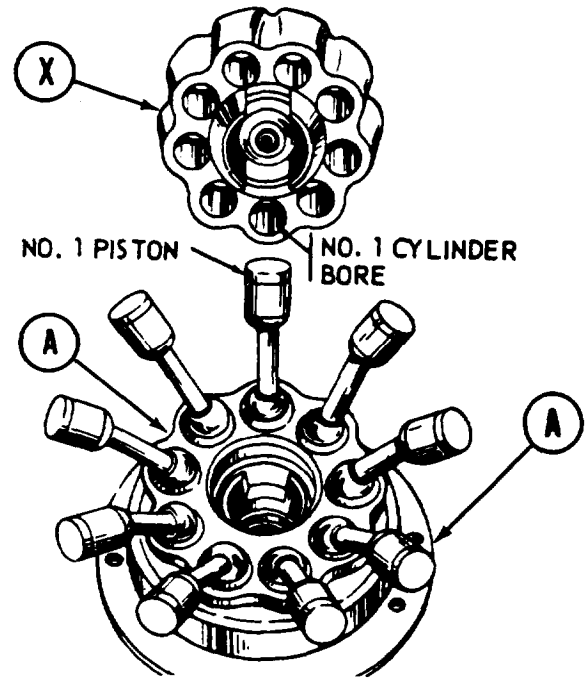
TA170526

HYDRAULIC PUMP REPAIR (Sheet 9 of 11)

NOTE

Cylinder bore in line with cylinder block (X) retainer slots is No. 1 cylinder bore. Piston in line with drive shaft (A) retainer slots is No. 1 piston. Remove protective caps as necessary.

16. Insert No. 1 piston in No. 1 cylinder bore.
17. Insert two pistons closest to No. 1 piston in their cylinder bores.



18. Continue inserting pistons, first on one side of No. 1 piston, then on other side, until only two pistons remain uninstalled.
19. Tilt cylinder block (X) carefully back and slip rear knuckle (V) into cylinder block retainer with grooved end up.

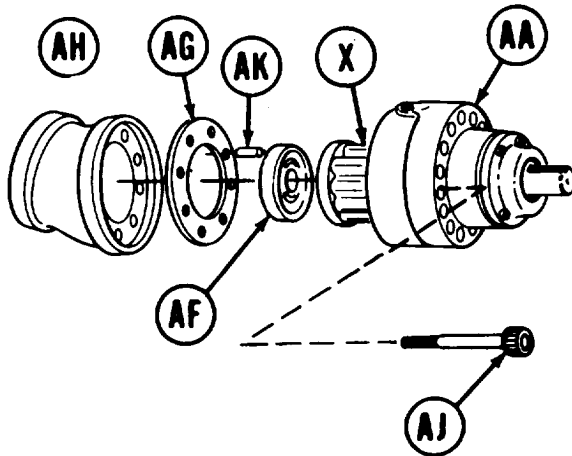
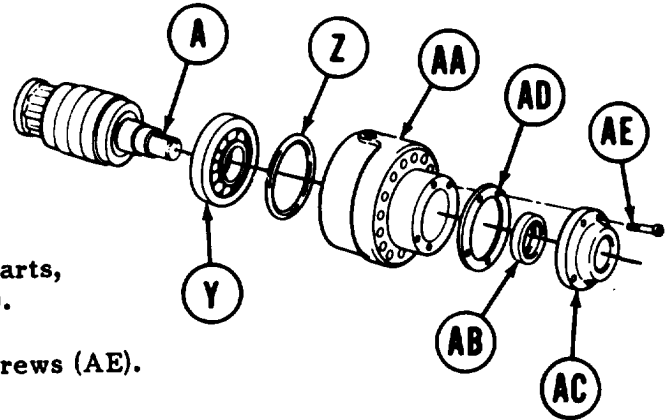
20. Tilt cylinder block (X) forward and slide remaining knuckle (V) into remaining retainer slot.
21. Install two remaining pistons.
22. Push cylinder block (X) straight down to check installation. Action should be smooth and springy.

Go on to Sheet 10

TA170527

HYDRAULIC PUMP REPAIR (Sheet 10 of 11)

23. Supporting drive shaft (A) and attached parts so parts do not separate, carefully install bearing (Y), ring (Z) and bearing housing (AA).
24. Using arbor press, press new oil seal (AB) into retainer (AC) with lip facing inside.
25. Supporting drive shaft (A) and attached parts, install new gasket (AD) and retainer (AC).
26. Using 3/16 inch screw key, install four screws (AE).



27. Have second technician lift bearing housing (AA) with attached parts and hold vertical.

NOTE

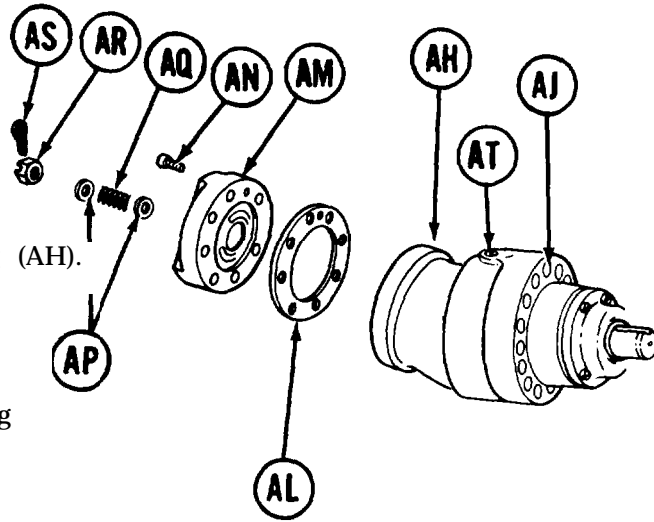
Install valve plate (AF) as noted during disassembly.

28. Place valve plate (AF) on cylinder block (x).
29. Place new gasket (AG) in position.
30. Place subdeck housing (AH) over assembled parts and onto bearing housing (AA).
31. Aline screw holes and scribe marks on subdeck housing (AH) and bearing housing (AA).
32. Using 5/16 inch screw key, loosely install eight screws (AJ).
33. Manually install alinement pin (AK) into valve plate (AF).

Go on to Sheet 11

TA170528

HYDRAULIC PUMP REPAIR (Sheet 11 of 11)



34. Place new gasket (AL) on subdeck housing (AH).
35. Aline screw holes and scribe marks on valve block (AM) and subdeck housing (AH).
36. Place valve block (AM) on subdeck housing (AH).
37. Using 5/16 inch screw key, install eight screws (AN).
38. Using 5/16 inch screw key, tighten eight screws (AJ).
39. Install two washers (AP), spring (AQ), and nut (AR).
40. Using pliers, install new cotter pin (AS).
41. Using 9/16 inch screw key, install drain plug (AT) in subdeck housing (AH).
42. Install hydraulic pump (page 4-30).

End of Task

TA170529

VALVE BANK ASSEMBLY AND BRACKETS REPLACEMENT (Sheet 1 of 17)

PROCEDURE•INDEX

| PROCEDURES | PAGE |
|-------------------------|------|
| Removal | 4-53 |
| Cleaning and Inspection | 4-61 |
| Installation | 4-62 |

TOOLS:

- 15 in. adjustable wrench
- 7/16 in. combination box and open end wrench
- 1/2 in. combination box and open end wrench
- 9/16 in. combination box and open end wrench
- 5/8 in. combination box and open end wrench
- 11/16 in. combination box and open end wrench
- 3/4 in. combination box and open end wrench
- 7/8 in. combination box and open end wrench
- 15/16 in. combination box and open end wrench
- 1-1/4 in. open end wrench
- 1-3/8 in. open end wrench
- 1-1/2 in. open end wrench
- 10 in. pipe wrench
- Ratchet with 1/2 in. drive
- 7/16 in. socket with 1/2 in. drive
- 1/2 in. socket with 1/2 in. drive
- 3/4 in. socket with 1/2 in. drive
- 1/4 in. socket head screw key
- 5/16 in. socket head screw key
- 3/8 in. socket head screw key

SUPPLIES:

- Rags (Item 12, Appendix D)
- Drip pans
- Pipe tape (Item 19, Appendix D)
- Dry cleaning solvent (Item 15, Appendix D)
- Preformed packing (11 required)
- Caps and plugs (assorted sizes)
- Identification tags
- Lockwashers (5 required)
- Lockwashers (2 required)
- Lockwashers (4 required)
- Lockwashers (6 required)
- Pencil

PERSONNEL: Two

Go on to Sheet 2

VALVE BANK ASSEMBLY AND BRACKETS REPLACEMENT (Sheet 2 of 17)

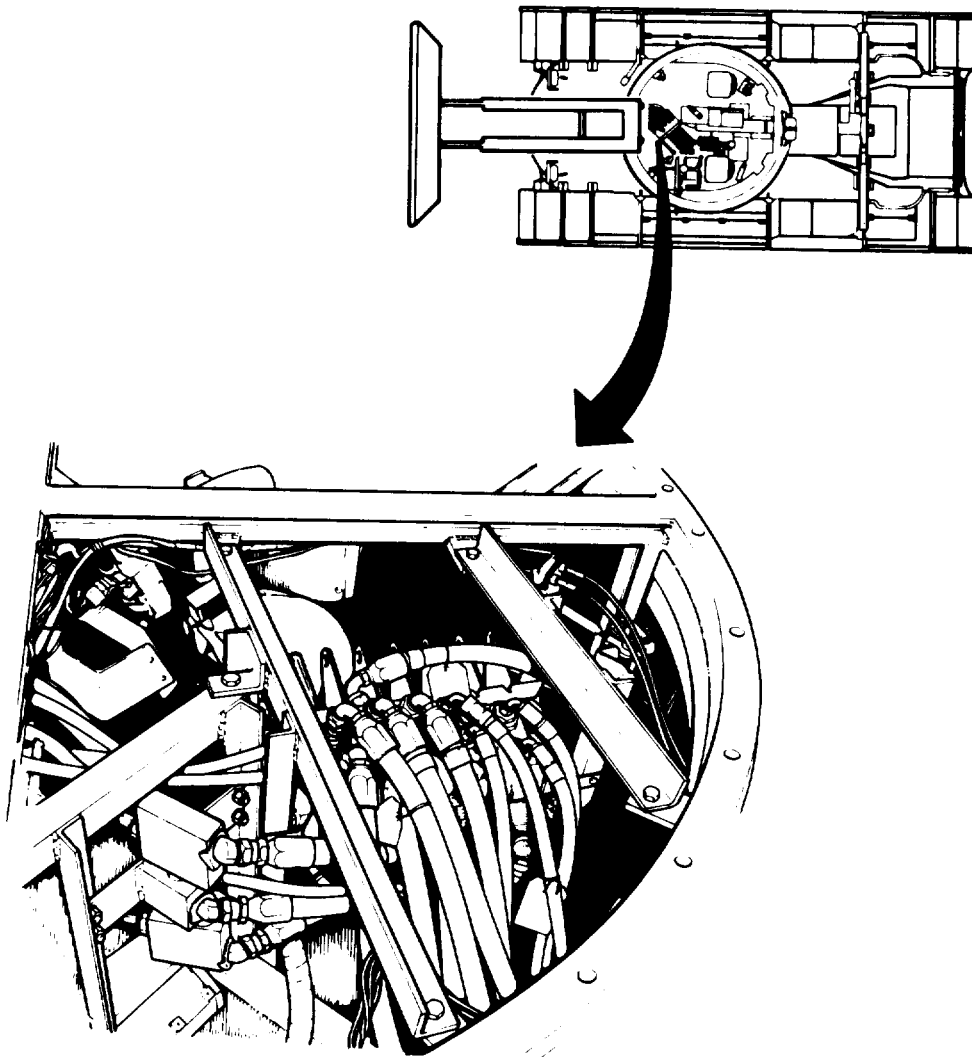
REFERENCE: LO 5-5420-226-12

PRELIMINARY PROCEDURES: Remove front quadrant (page 3-39)
Remove valve bank assembly control levers (page 3-117)

REMOVAL:

NOTE

Cap all lines and fittings when disconnected. Use rags and drip pans to catch hydraulic fluid trapped in lines. Tag lines for installation.

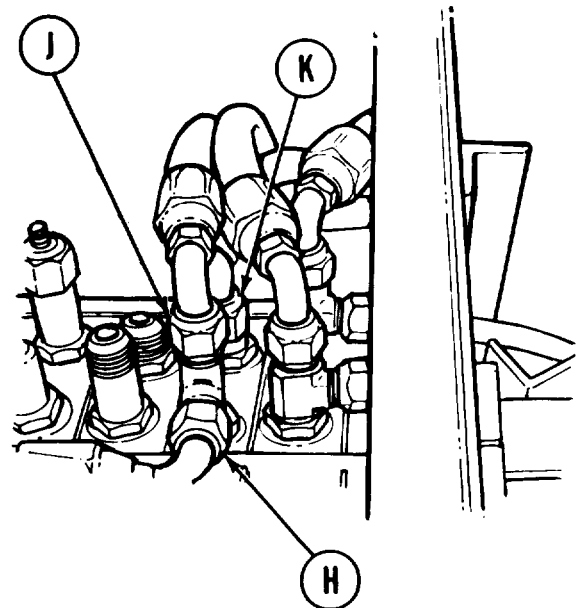
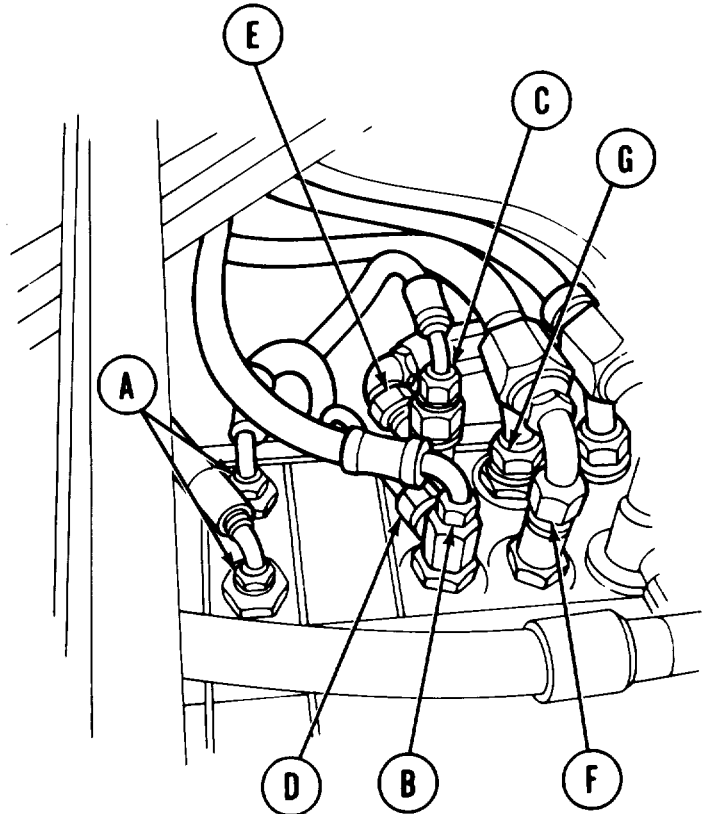


Go on to Sheet 3

TA170530

VALVE BANK ASSEMBLY AND BRACKETS REPLACEMENT (Sheet 3 of 17)

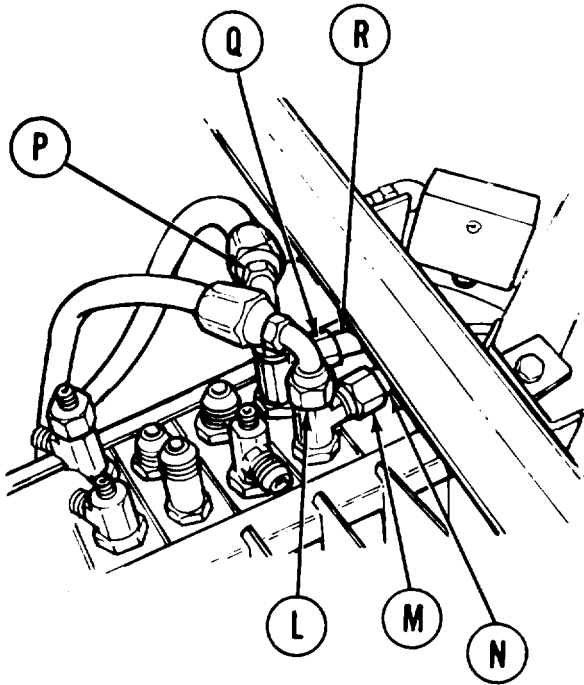
1. Using 11/16 inch wrench, disconnect hose assemblies (A).
2. Using 11/16 inch wrench, disconnect hose assembly (B).
3. Using 11/16 inch wrench, disconnect hose assembly (C).
4. Using 15/16 inch wrench, disconnect both ends of tube assembly (D) and remove tube assembly (D) from the vehicle.
5. Using 1-1/4 inch wrench, disconnect hose assembly (E).
6. Using 1-1/4 inch wrench, disconnect hose assembly (F).
7. Using 1-1/4 inch wrench, disconnect hose assembly (G).
8. Using 1-1/4 inch wrench, disconnect hose assembly (H).
9. Using 1-1/4 inch wrench, disconnect hose assembly (J).
10. Using 1-1/4 inch wrench, disconnect hose assembly (K).



Go on to Sheet 4

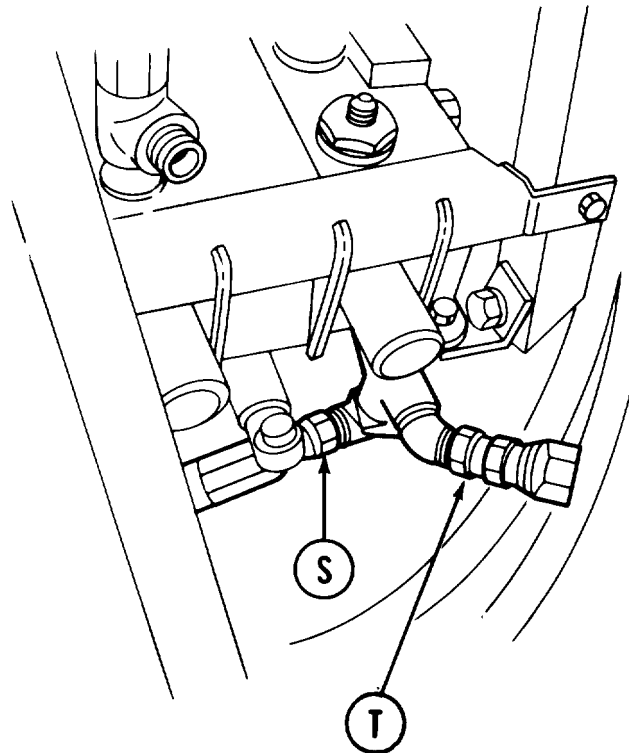
TA170531

VALVE BANK ASSEMBLY AND BRACKETS REPLACEMENT (Sheet 4 of 17)



11. Using 1-1/4 inch wrench, disconnect hose assembly (L).
12. Using 1-1/4 inch wrench to hold adapter (M), use 7/8 inch wrench to disconnect hose assembly (N).
13. Using 1-1/4 inch wrench, disconnect hose assembly (P).
14. Using 1-1/4 inch wrench to hold adapter (Q), use 7/8 inch wrench to disconnect hose assembly (R).

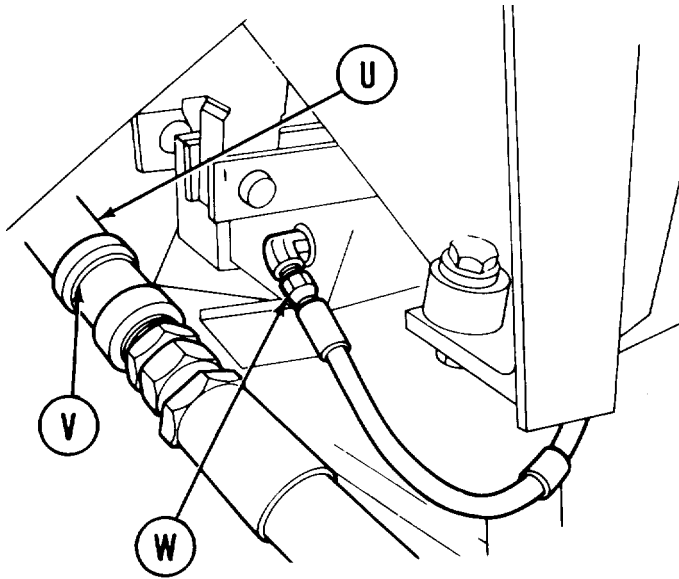
15. Using 1-1/4 inch wrench, disconnect hose assembly (S).
16. Using 1-1/4 inch wrench, disconnect hose assembly (T).



Go on to Sheet 5

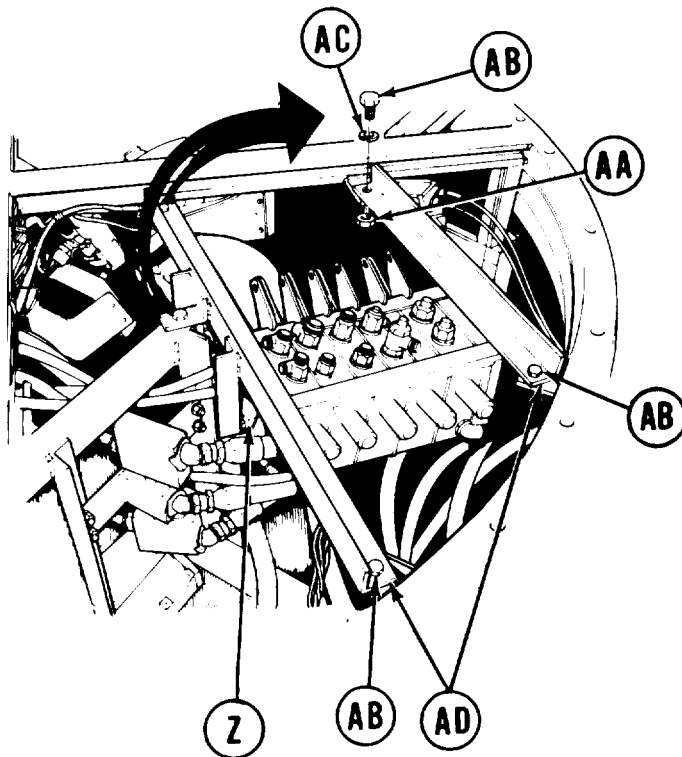
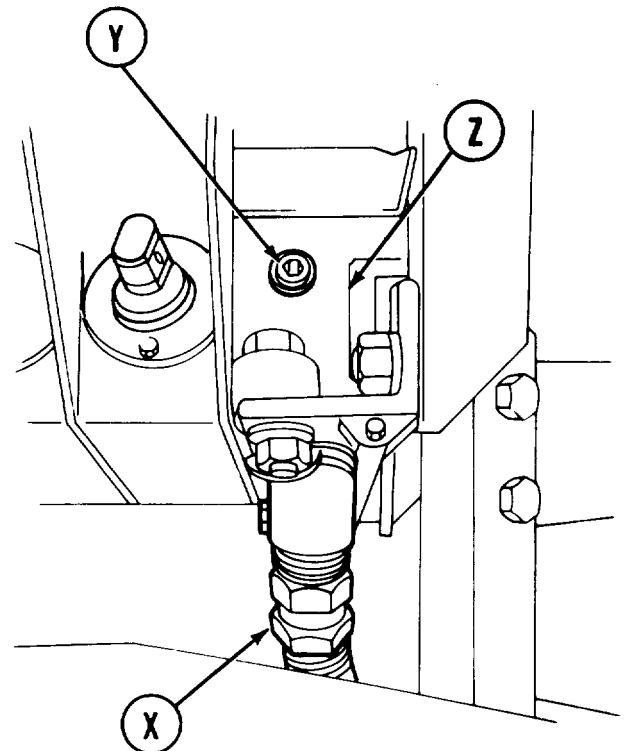
TA170532

VALVE BANK ASSEMBLY AND BRACKETS REPLACEMENT (Sheet 5 of 17)



17. Manually disconnect hose assembly (U) at quick disconnect (V).
18. using 9/16 inch wrench, disconnect hose assembly (W).

19. Using 1-1/2 inch wrench, disconnect hose assembly (X).
20. Using 1/4 inch screw key, remove pipe plug (Y) from valve bank (Z).



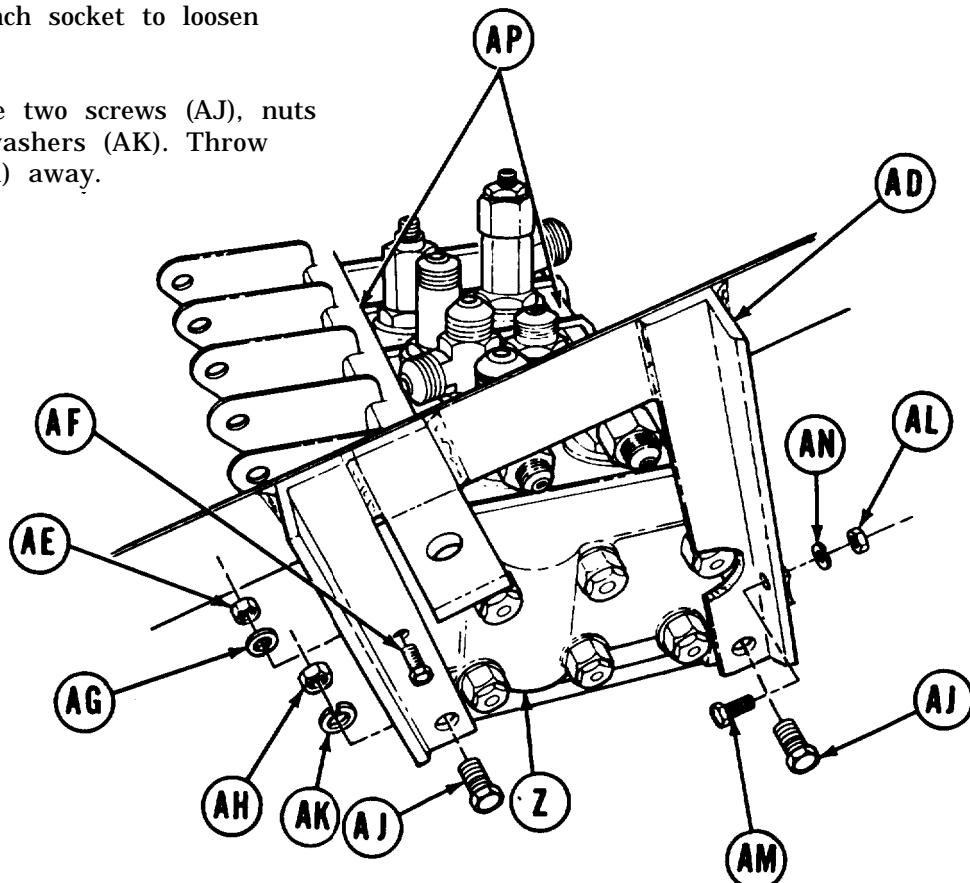
21. Using 3/4 inch wrench to hold five nuts (AA), use 3/4 inch socket to loosen five screws (AB).
22. Manually remove five screws (AB), nuts (AA), and lockwashers (AC). Throw lockwashers (AC) away.
23. Using second technician, remove valve bank (Z) and brackets (AD) to a suitable work area.

Go on to Sheet 6

TA170533

VALVE BANK ASSEMBLY AND BRACKETS REPLACEMENT (Sheet 6 of 17)

24. Using 7/16 inch wrench to hold nut (AE), use 7/16 inch socket to loosen screw (AF).
25. Manually remove screw (AF), nut (AE), lockwasher (AG). Throw lockwasher (AG) away.
26. Using 3/4 inch wrench to hold nuts (AH), use 3/4 inch socket to loosen screws (AJ).
27. Manually remove two screws (AJ), nuts (AH), and lockwashers (AK). Throw lockwashers (AK) away.



28. Using 1/2 inch wrench to hold nut (AL), use 1/2 inch socket to loosen screw (AM).
29. Manually remove screw (AM), nut (AL), and lockwasher (AN). Throw lockwasher (AN) away.
30. Manually remove bracket (AD) from valve bank (Z).
31. Repeat steps 24 thru 29 for other end of valve bank (Z).
32. Manually remove identification plates (AP).

Go on to Sheet 7

TA170534

VALVE BANK ASSEMBLY AND BRACKETS REPLACEMENT (Sheet 7 of 17)

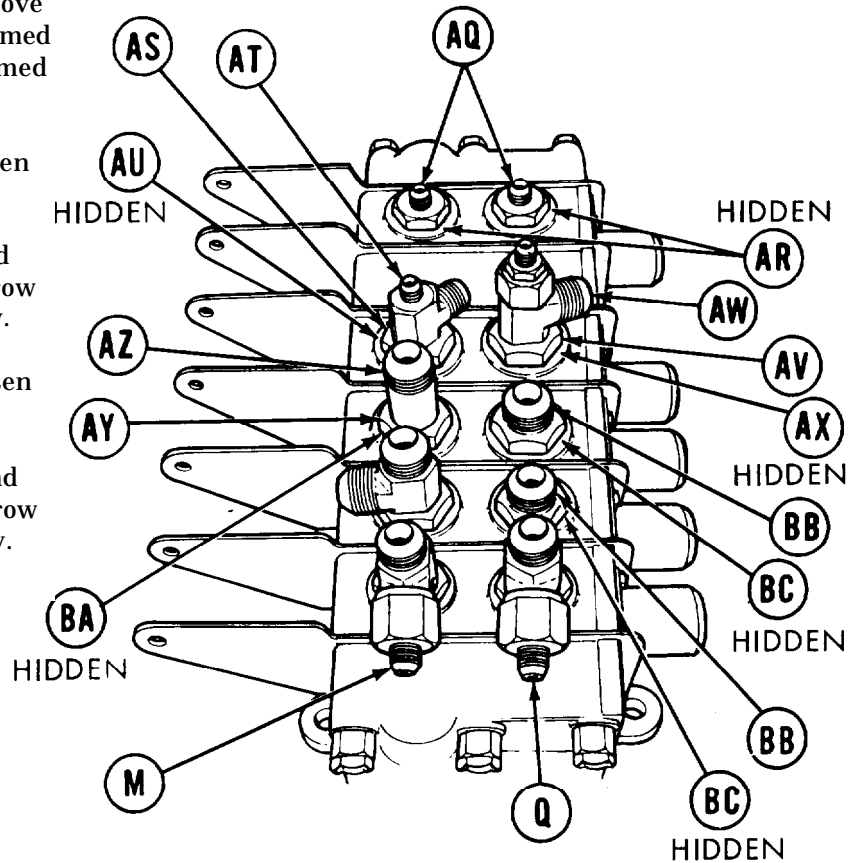
33. Using 1-1/4 inch wrench, remove two adapters (AQ) and preformed packings (AR). Throw preformed packings (AR) away.

34. Using 1-1/4 inch wrench, loosen jamnut (AS).

35. Manually remove tee (AT) and preformed packing (AU). Throw preformed packing (AU) away.

36. Using 1-1/4 inch wrench, loosen jamnut (AV).

37. Manually remove tee (AW) and preformed packing (AX). Throw preformed packing (AX) away.



38. Using 1-1/4 inch wrench, loosen jamnut (AY).

39. Manually remove nipple (AZ) and preformed packing (BA). Throw preformed packing (BA) away.

40. Using 1-1/4 inch wrench, remove two adapters (BB) and preformed packings (BC). Throw preformed packings (BC) away.

41. Using 1-1/4 inch wrench, remove two adapters (M and Q).

Go on to Sheet 8

TA170535

VALVE BANK ASSEMBLY AND BRACKETS REPLACEMENT (Sheet 8 of 17)

42. Using 1-1/4 inch wrench, loosen jamnut (BD).

43. Manually remove tee (BE) and preformed packing (BF). Throw preformed packing (BF) away.

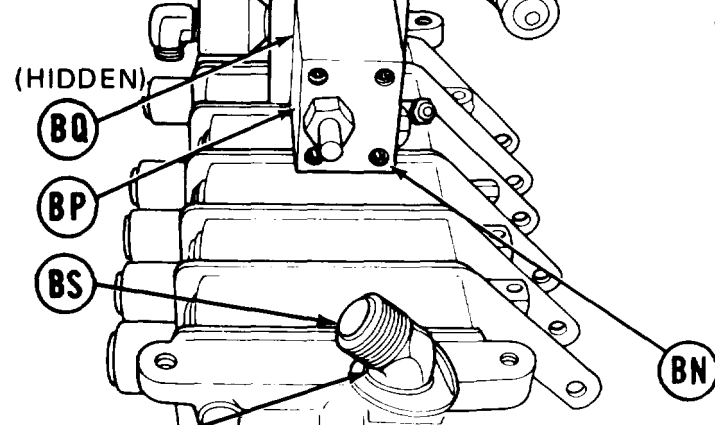
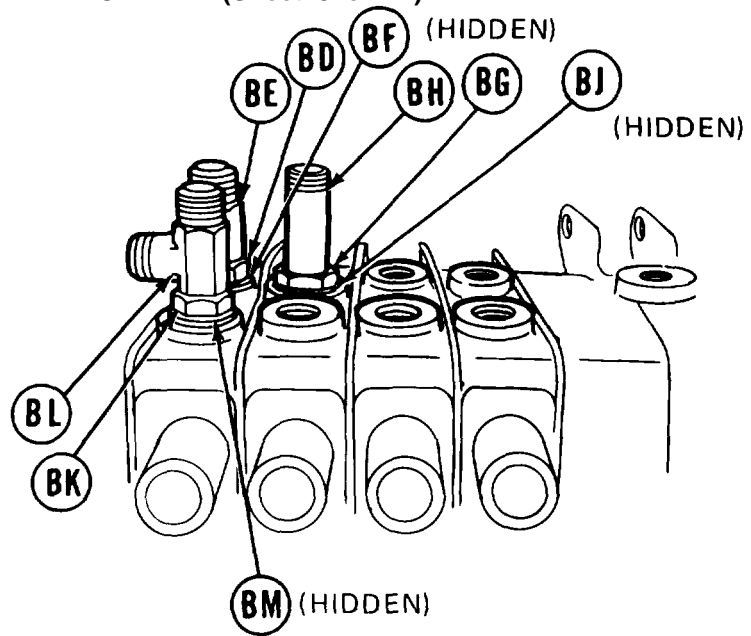
44. Using 1-1/4 inch wrench, loosen jamnut (BG).

45. Manually remove tee (BH) and preformed packing (BJ). Throw preformed packing (BJ) away.

46. Using 1-1/4 inch wrench loosen jamnut (BK).

47. Manually remove tee (BL) and preformed packing (BM). Throw preformed packing (BM) away.

48. Using 5/16 inch screw key, remove four screws (BN).



49. Manually remove relief valve (BP) and preformed packings (BQ). Throw preformed packings (BQ) away.

50. Using pipe wrench, remove adapter and attached elbow (BR).

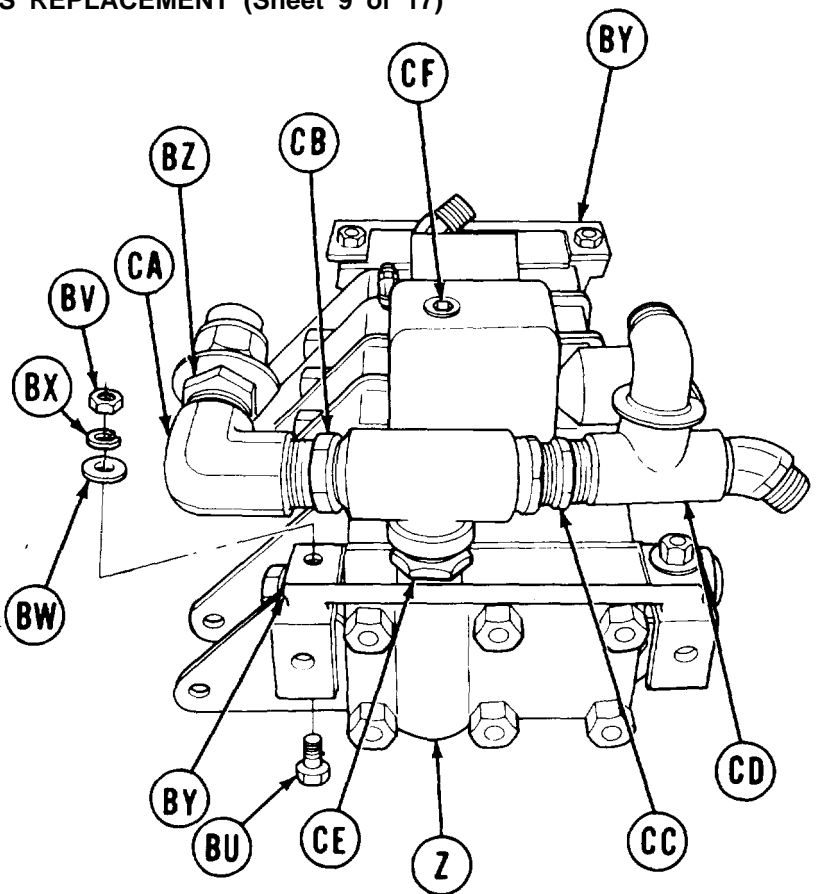
51. Using adjustable wrench, remove elbow (BS) and collar (BT).

Go on to Sheet 9

TA170536

VALVE BANK ASSEMBLY AND BRACKETS REPLACEMENT (Sheet 9 of 17)

52. Using 5/8 inch wrench to hold four screws (BU), use 3/4 inch wrench to loosen four nuts (BV).
53. Manually remove four screws (BU), nuts (BV), flat washers (BW), and lock washers (BX). Throw lock-washers (BX) away.
54. Remove two brackets (BY) from valve bank (Z).
55. Using 1-3/8 inch wrench, remove adapter (BZ) and attached parts from elbow (CA).
56. Holding adapter (CB) with 1-3/8 inch wrench, use adjustable wrench to remove elbow (CA).



57. Holding adapter (CC) with 1-1/4 inch wrench, use adjustable wrench to remove tee (CD) and attached parts from adapter (CC).
58. Using 1-3/8 inch wrench, remove adapter (CE) and attached parts from valve bank (Z).
59. Using 3/8 inch screw key, remove pipe plug (CF).

CLEANING AND INSPECTION:

WARNING

Cleaning agent specified is flammable. Use only in well ventilated areas. Keep away from flames, sparks, or heat. Do not smoke while using. Prevent contact with eyes, mouth, and/or skin. Wear rubber gloves when performing cleaning procedures.

1. Using dry cleaning solvent, clean all parts.
2. Using rags, dry all parts.
3. Inspect all parts for breaks, cracks, and excessive wear.
4. Replace bad parts.

Go on to Sheet 10

TA170537

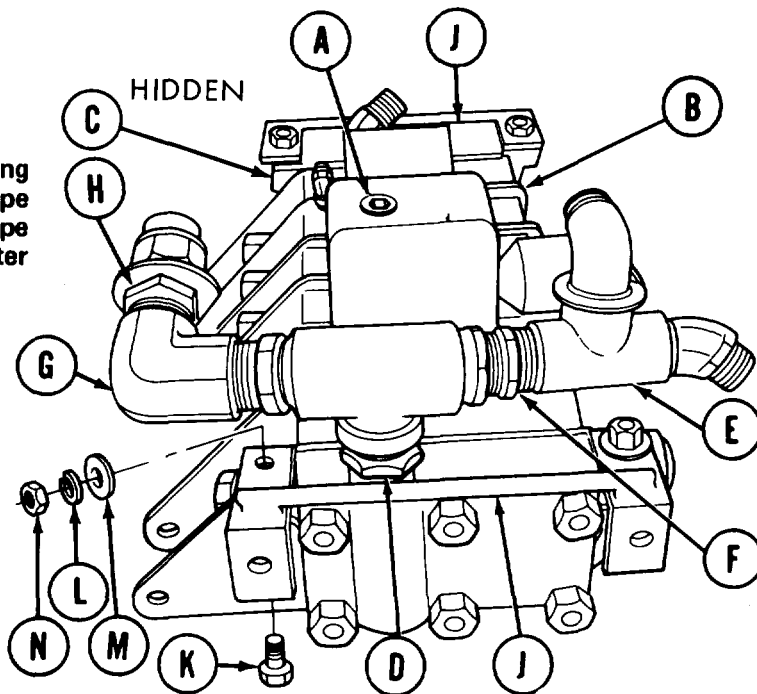
VALVE BANK ASSEMBLY AND BRACKETS REPLACEMENT (Sheet 10 of 17)

INSTALLATION:

NOTE

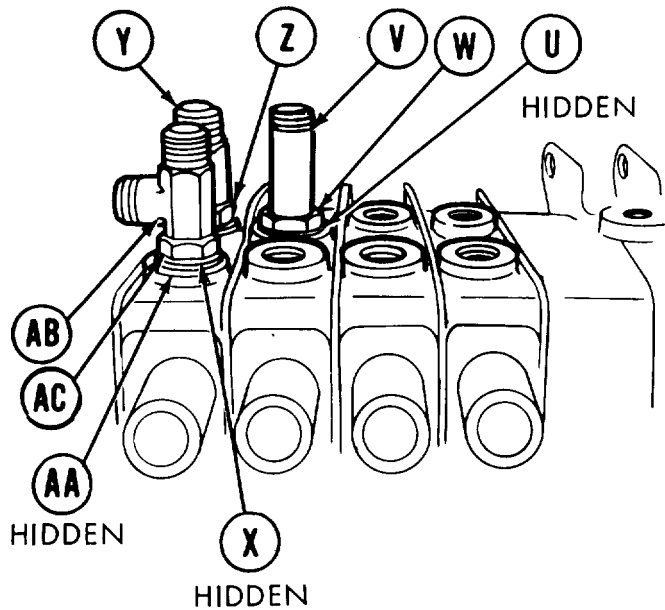
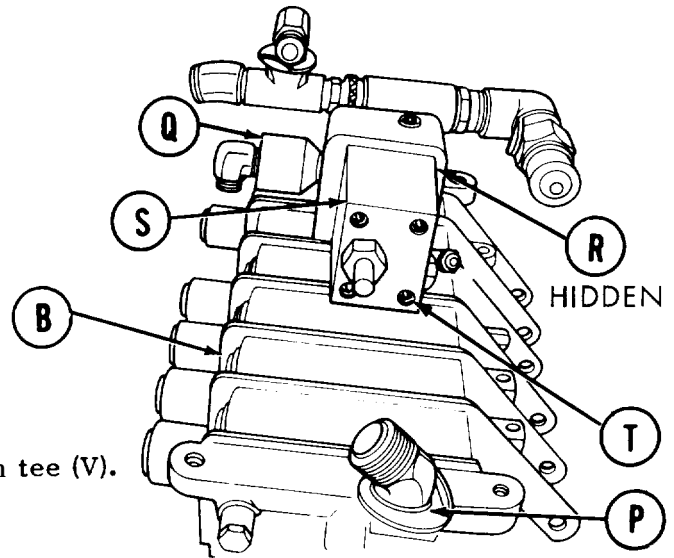
Remove caps and plugs as necessary during installation. Before installation use pipe tape on all male threads. Start pipe tape on second thread so that tape will not enter hydraulic system.

1. Using 3/8 inch screw key, install pipe plug (A) into valve bank (B).
2. Using 1/4 inch screw key, install pipe plug (C) into valve bank (B).
3. Using 1-3/8 inch wrench, install adapter (D) and attached parts into valve bank (B).
4. Using adjustable wrench, install tee (E) and attached parts on adapter (F).
5. Using adjustable wrench, install elbow (G).
6. Using 1-3/8 inch wrench, install adapter (H) and attached parts on elbow (G).
7. Position two brackets (J) on valve bank (B), one on each end.
8. Using 5/8 inch wrench on four screws (K), use 3/4 inch wrench to install new lockwashers (L), flat washers (M), and nuts (N).



VALVE BANK ASSEMBLY AND BRACKETS REPLACEMENT (Sheet 11 of 17)

9. Using adjustable wrench, install and aline collar "CW" and elbow (P).
10. Using pipe wrench, install and aline adapter and attached elbow (Q).
11. Manually install preformed packings (R) in relief valve (S).
12. Using 5/16 inch screw key, install four screws (T) securing relief valve (S) to valve bank (B).
13. Manually install preformed packing (U) on tee (V).
14. Manually install and aline tee (V).
15. Using adjustable wrench to hold tee (V), use 1-1/4 inch wrench to tighten jamnut (W).
16. Manually install preformed packing (X) on tee (Y).



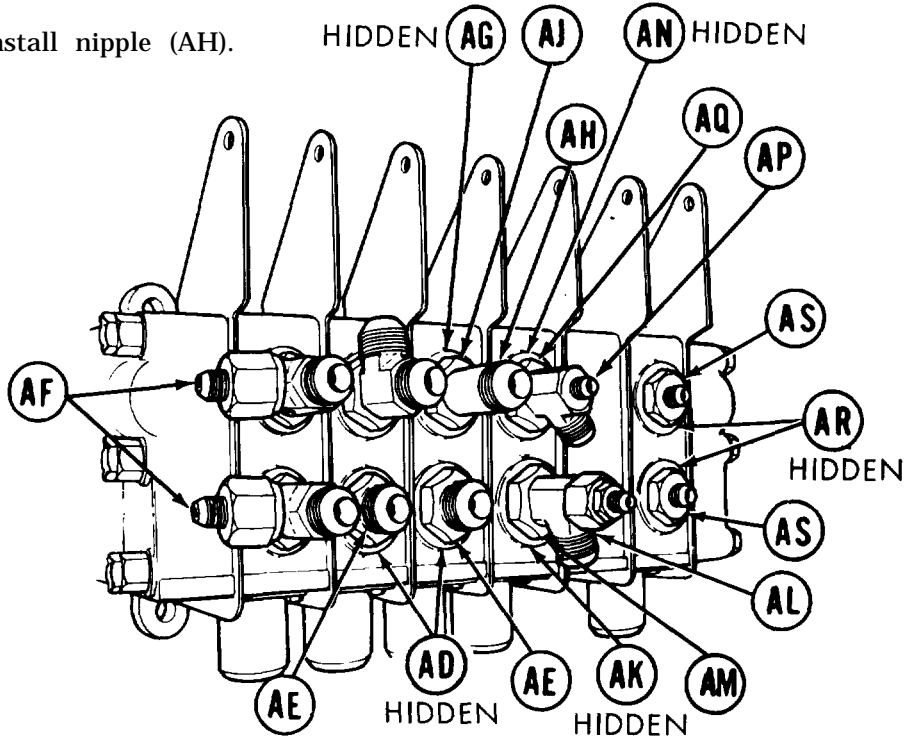
17. Manually install and aline tee (Y).
18. Using adjustable wrench to hold tee (Y), use 1-1/4 inch wrench to tighten jamnut (Z).
19. Manually install preformed packing (AA) on tee (AB).
20. Manually install and aline tee (AB).
21. Using adjustable wrench to hold tee (AB), use 1-1/4 inch wrench to tighten jamnut (AC).

Go on to Sheet 12

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VALVE BANK ASSEMBLY AND BRACKETS REPLACEMENT (Sheet 12 of 17)

22. Manually install two preformed packings (AD) on two adapters (AE).
23. Using 1-1/4 inch wrench, install two adapters (AE).
24. Using 1-1/4 inch wrench, install two adapters (AF).
25. Manually install preformed packing (AG) on nipple (AH).
26. Manually install nipple (AH).

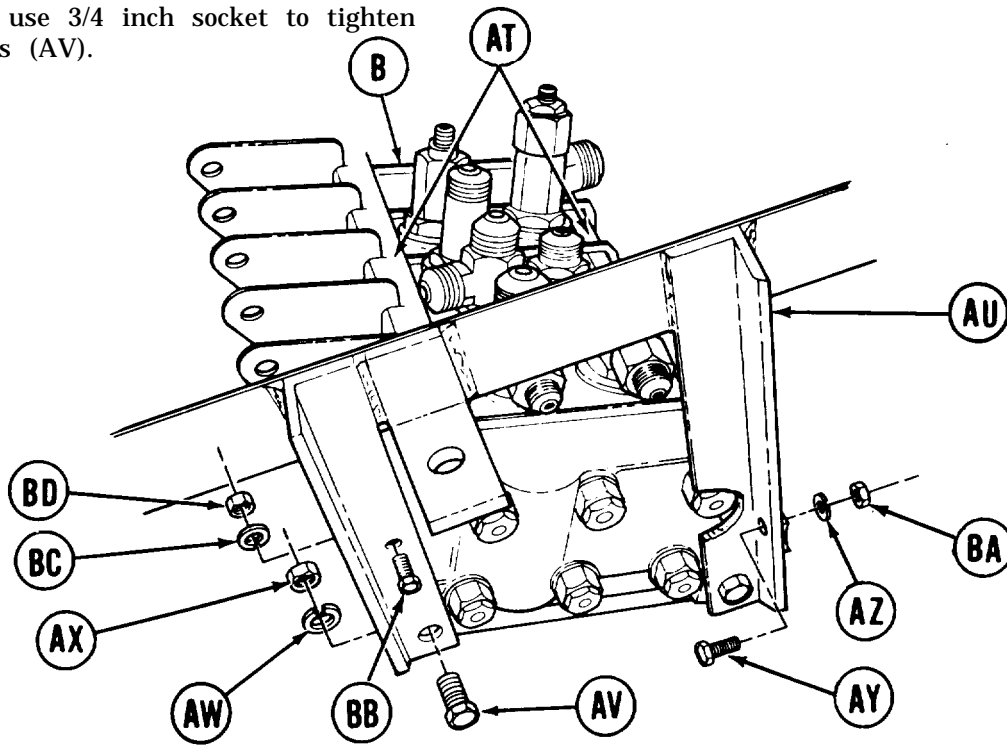


27. Using pipe wrench to hold nipple (AH), use 1-1/4 inch wrench to tighten jamnut (AJ).
28. Manually install preformed packing (AK) on tee (AL).
29. Manually install and align tee (AL).
30. Using adjustable wrench to hold tee (AL), use 1-1/4 inch wrench to tighten jamnut (AM).
31. Manually install preformed packing (AN) on tee (AP).
32. Manually install and align tee (AP).
33. Using adjustable wrench to hold tee (AP), use 1-1/4 inch wrench to tighten jamnut (AQ).
34. Manually install two preformed packings (AR) on two adapters (AS).
35. Using 1-1/4 inch wrench, install two adapters (AS).

Go on to Sheet 13

VALVE BANK ASSEMBLY AND BRACKETS REPLACEMENT (Sheet 13 of 17)

36. Manually position identification plates (AT) on valve bank (B).
37. Manually position two brackets (AU) on valve bank (B) (one on each end).
38. Manually install four screws (AV), new lockwashers (AW), and nuts (AX).
39. Using 3/4 inch wrench to hold nuts (AX), use 3/4 inch socket to tighten screws (AV).



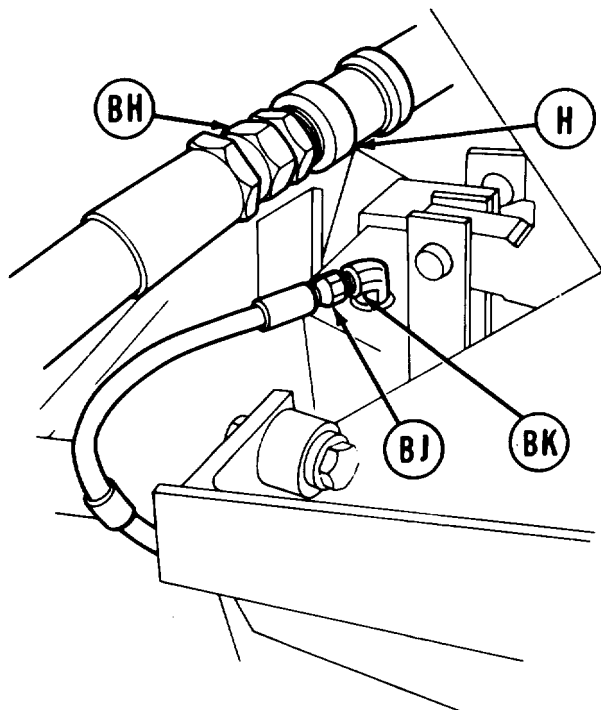
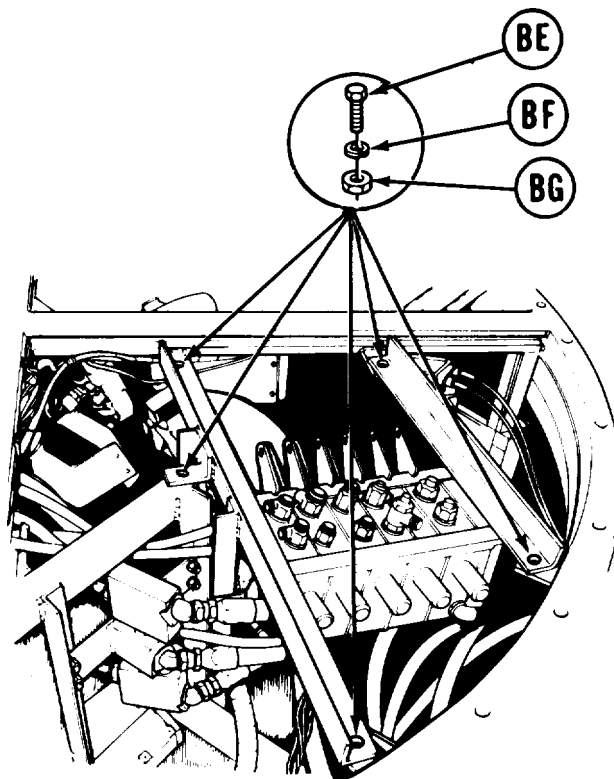
40. Manually install two screws (AY), new lockwashers (AZ), and nuts (BA).
41. Using 1/2 inch wrench to hold screw (AY), use 1/2 inch socket to tighten nut (BA).
42. Manually install two screws (BB), new lockwashers (BC), and nuts (BD).
43. Using 7/16 inch wrench to hold screws (BB), use 7/16 inch socket to tighten nuts (BD).
44. Using second technician, position valve bank assembly (B) and brackets (AU) in vehicle.

Go on to Sheet 14

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VALVE BANK ASSEMBLY AND BRACKETS REPLACEMENT (Sheet 14 of 17)

45. Manually install five screws (BE), new lockwashers (BF), and nuts (BG).
46. Using 3/4 inch wrench to hold nuts (BG), use 3/4 inch socket to tighten screws (BE).



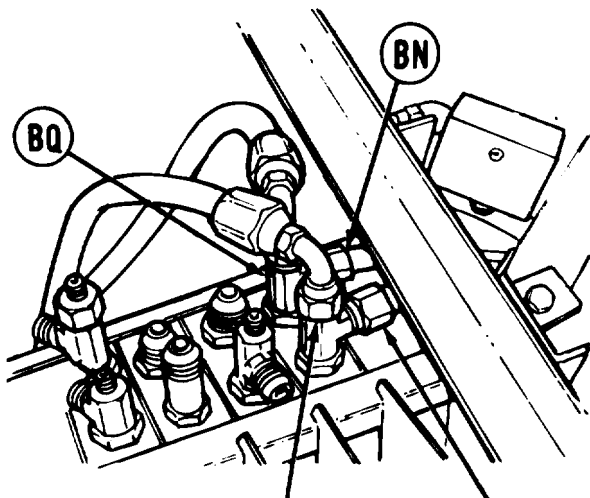
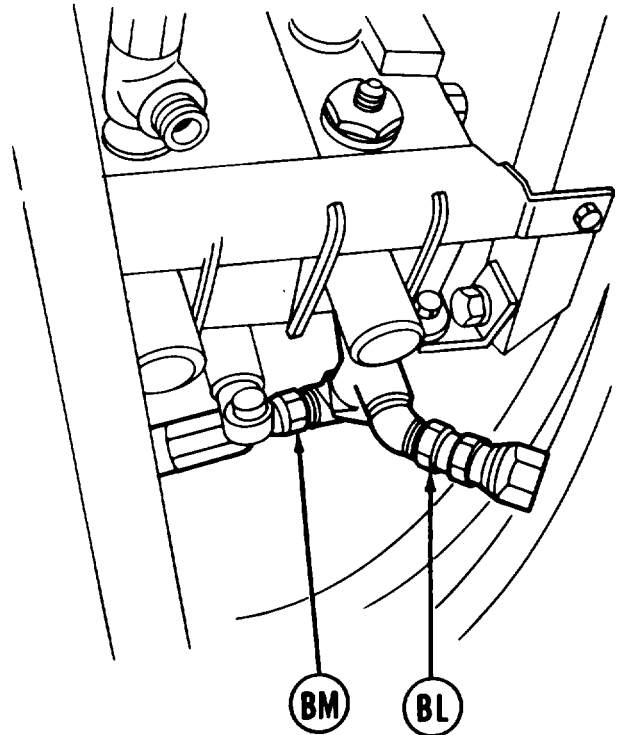
47. Manually install hose "BB" (BH) on adapter (H).
48. Using 9/16 inch wrench, install hose assembly "AR" (BJ) on elbow (BK).

Go on to Sheet 15

TA170542

VALVE BANK ASSEMBLY AND BRACKETS REPLACEMENT (Sheet 15 of 17)

49. Using 1-1/4 inch wrench, install hose assembly "F" (BL).
50. Using 1-1/4 inch wrench, install hose assembly "BR" (BM).



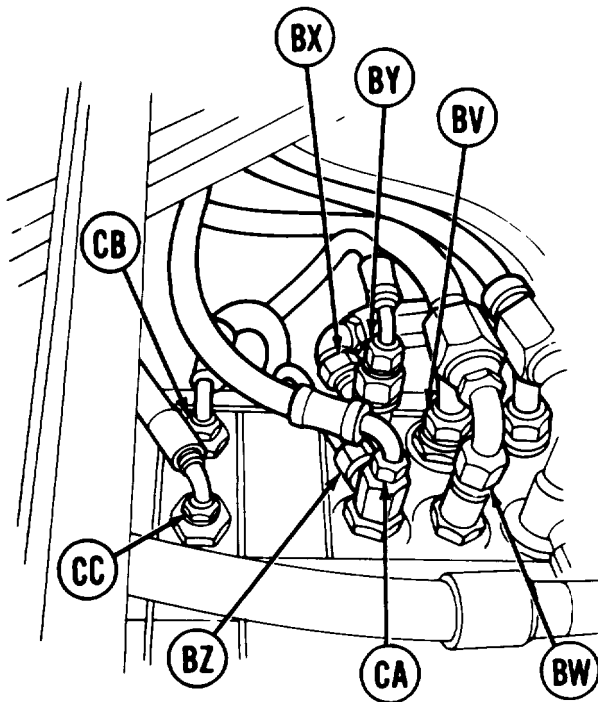
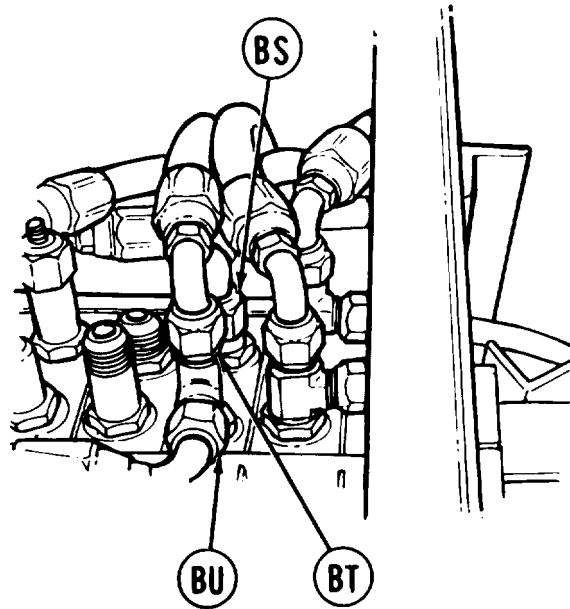
51. Using 7/8 inch wrench, install hose assembly "CU1" (BN).
52. Using 7/8 inch wrench, install hose assembly "CU2" (BP).
53. Using 1-1/4 inch wrench, install hose assembly "DA5" (BQ).
54. Using 1-1/4 inch wrench, install hose assembly "DA6" (BR).

Go on to Sheet 16

TA170543

VALVE BANK ASSEMBLY AND BRACKETS REPLACEMENT (Sheet 16 of 17)

- 55. Using 1-1/4 inch wrench, install hose assembly "DA3" (BS).
- 56. Using 1-1/4 inch wrench, install hose assembly "DA4" (BT).
- 57. Using 1-1/4 inch wrench, install hose assembly "CT" (BU).



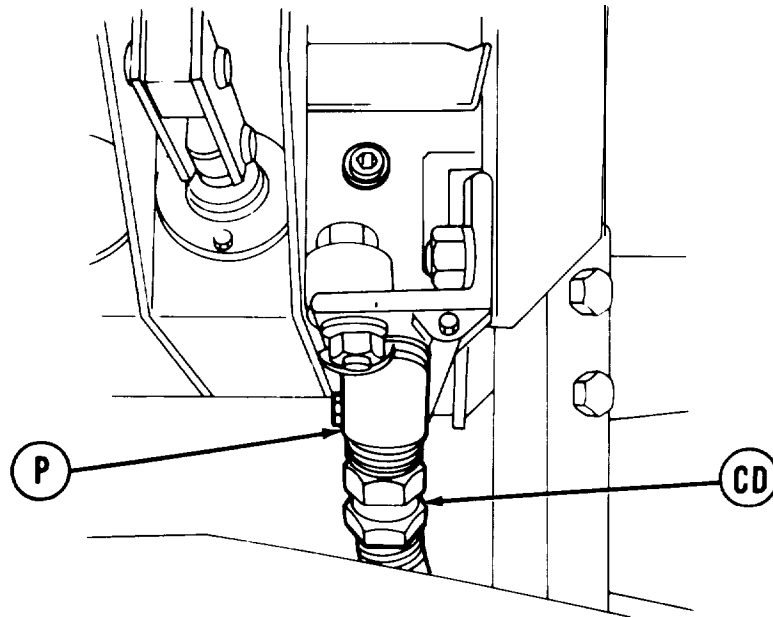
- 58. Using 1-1/4 inch wrench, install hose assembly "DA1" (BV).
- 59. Using 1-1/4 inch wrench, install hose assembly "DA2" (BW).
- 60. Using 1-1/4 inch wrench, install hose assembly "CS" (BX).
- 61. Using 11/16 inch wrench, install hose assembly "CP3" (BY).
- 62. Using 15/16 inch wrench, install both ends of tube assembly "EA1" (BZ).
- 63. Using 11/16 inch wrench, install hose assembly "CP4" (CA).
- 64. Using 11/16 inch wrench, install two hose assemblies "CP1" (CB) and "CP2" (CC).

Go on to Sheet 17

TA170544

VALVE BANK ASSEMBLY AND BRACKETS REPLACEMENT (Sheet 17 of 17)

65. Using 1-1/2 inch wrench, install hose assembly "CW" (CD) on elbow (P).
66. Service hydraulic reservoir (LO 5-5420-226-12).
67. Install valve bank assembly control levers (page 3-118).
68. Bleed hydraulic system (page 3-66).
69. Check for hydraulic leaks and correct as necessary.
70. Service hydraulic reservoir (LO 5-5420-226-12).
71. Install front quadrant (page 3-40).



End of Task

TA170545

**Section III. HYDRAULIC CYLINDERS AND RESERVOIR
OVERHEAD CYLINDER REPAIR (Sheet 1 of 6)**

PROCEDURE INDEX

| PROCEDURE | PAGE |
|-------------------------|------|
| Disassembly | 4-70 |
| Cleaning and Inspection | 4-72 |
| Assembly | 4-73 |

- TOOLS:** Ratchet with 3/4 in. drive
 1-5/16 in. socket with 3/4 in. drive
 Torque wrench with 3/4 in. drive (0 to 600 lb-ft capacity)
 Spanner wrench with 0 - 6-1/2 in. span
 Flat-tip screwdriver
 4-9/16 in. cylinder rod wrench (stow right fender box)
 Punch, drive pin 3/4 x 10 in.
 Sledge hammer
 Crowbar

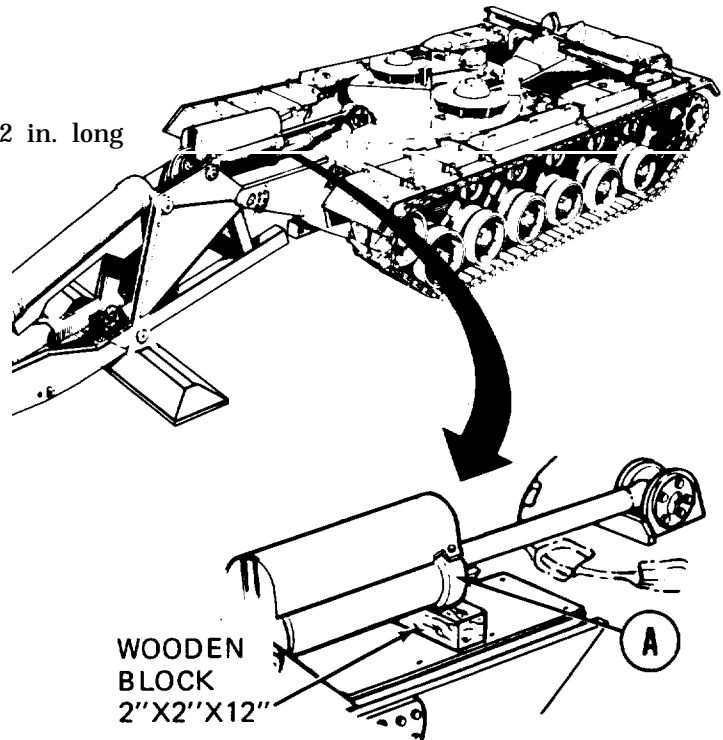
- SUPPLIES:** Dry cleaning solvent (Item 15, Appendix D)
 Rags (Item 12, Appendix D)
 Masking tape (Item 18, Appendix D)
 10/32 screw 1/2 in. long (4 required)
 Packing assembly
 Wiper ring (2 required)
 Preformed packing
 Spacer ring
 Wooden block 2 in. x 2 in. by 12 in. long
 Container (to catch fluid)
 Lockwasher (10 required)

PERSONNEL: Two

REFERENCES: LO 5-5420-226-12
 TM 5-5420-226-10

DISASSEMBLY:

- Place wooden block under overhead cylinder (A).



Go on to Sheet 2

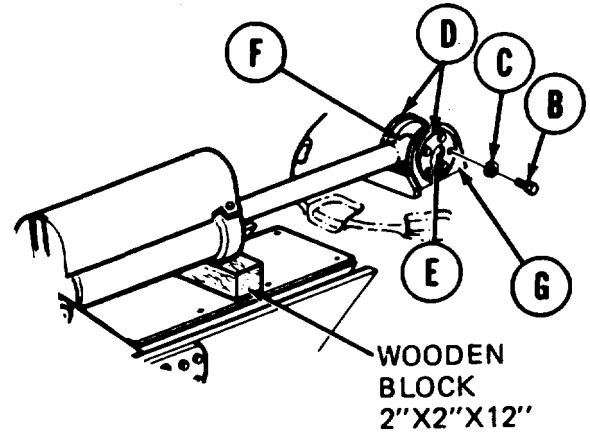
TA170546

OVERHEAD CYLINDER REPAIR (Sheet 2 of 6)

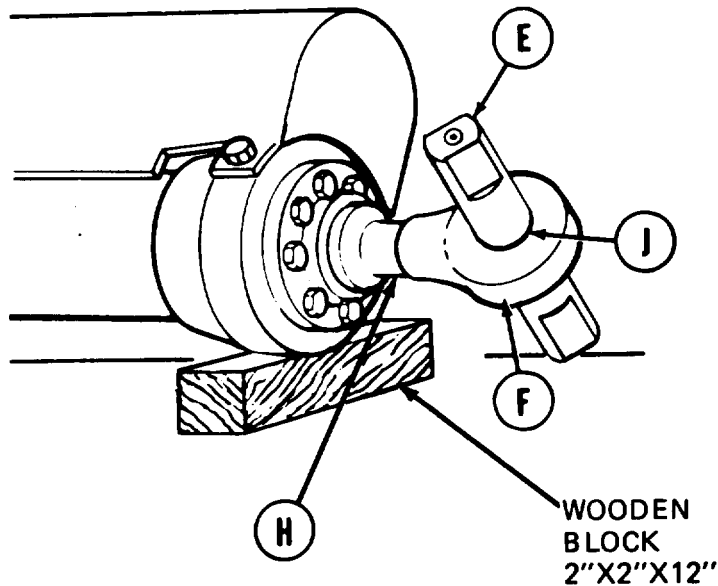
2. Using 1-5/16 inch socket, remove 10 screws (B) and lockwashers (C) and two retainers (D). Throw lockwashers (C) away.

WARNING

Do not hit grease fittings in pin (E) with hammer or punch.



3. Using hammer and punch, remove pin (E).
- 4* Retract overhead piston until rod end (F) is clear of mount (G) (TM 5-5420-226-10).
5. Relieve hydraulic pressure (page 3-65).
6. Have one technician hold flats of piston rod (H) using cylinder rod wrench, and second technician insert pin (E) through rod end eye (J).
7. Using pin (E) as a lever, turn rod end (F) counterclockwise and remove.
8. Tape threads of piston rod (H).



NOTE

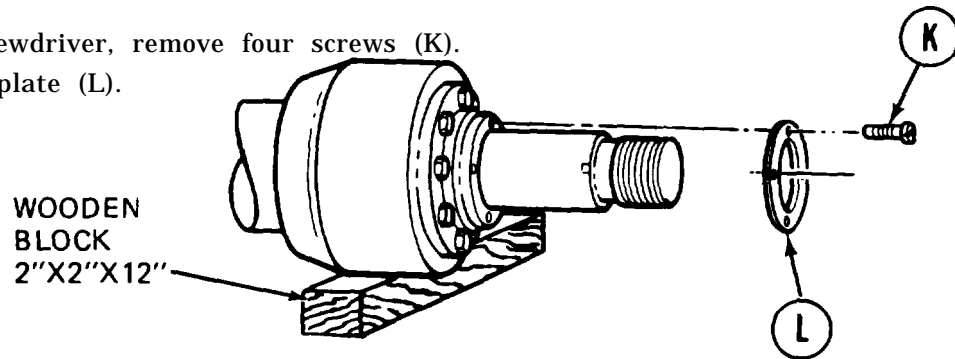
Place container under overhead cylinder to catch fluid.

Go on to Sheet 3

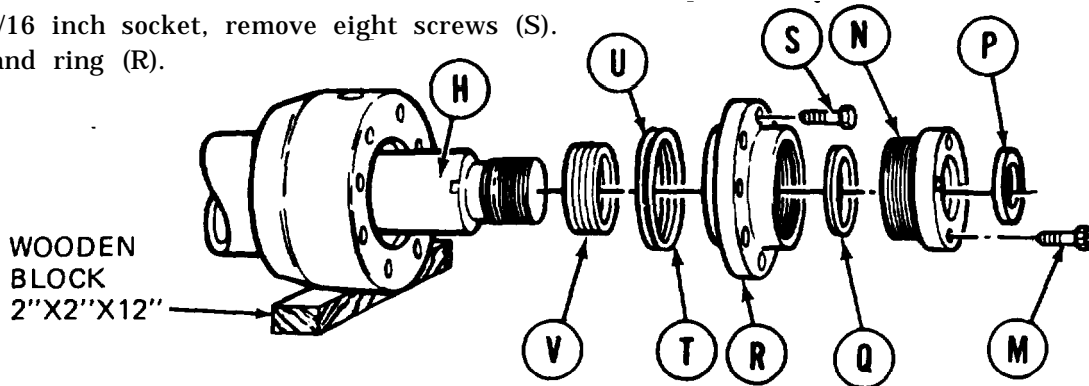
TA170547

OVERHEAD CYLINDER REPAIR (Sheet 3 of 6)

9. Using flat-tip screwdriver, remove four screws (K).
10. Remove retainer plate (L).



11. Manually install four 10/32 screws (M) into threaded holes of bushing (N).
12. Using spanner wrench on screws, remove bushing (N) from piston rod (H). Manually remove screws (M).
13. Remove wiper ring (P) from bushing (N). Throw wiper ring (P) away.
14. Remove wiper ring (Q) from land ring (R). Throw wiper ring (Q) away.
15. Using 1-5/16 inch socket, remove eight screws (S).
16. Remove land ring (R).



17. Remove preformed packing (T) from land ring (R). Throw preformed packing (T) away.
18. Remove spacer ring (U) from land ring (R). Throw spacer ring (U) away.

WARNING

Be careful when performing next step. Damage could occur when removing packing (V).

19. Using screwdriver, remove packing assembly (V) from piston rod (H). Throw packing assembly (V) away.

CLEANING AND INSPECTION:

WARNING

Cleaning agent specified is flammable. Use only in well ventilated areas. Keep away from flames, sparks, or heat. Do not smoke while using. Prevent contact with eyes, mouth, and/or skin. Wear rubber gloves when performing cleaning procedures.

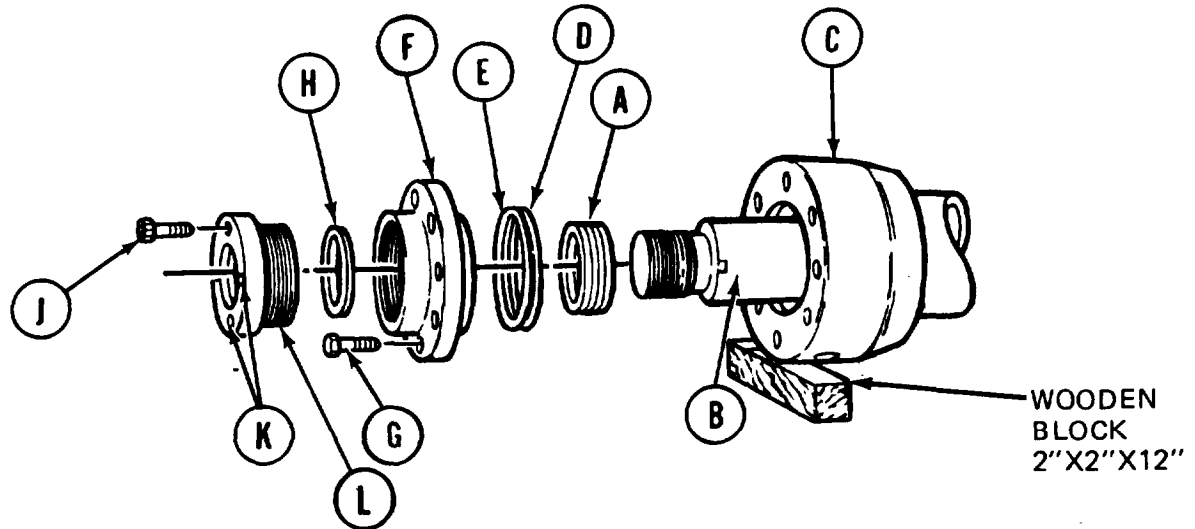
1. Using solvent, clean all metallic parts.
2. Using rags, dry all parts.
3. Inspect all parts for damage or wear. Replace all unserviceable parts.

Go on to Sheet 4

TA170548

OVERHEAD CYLINDER REPAIR (Sheet 4 of 6)

ASSEMBLY:

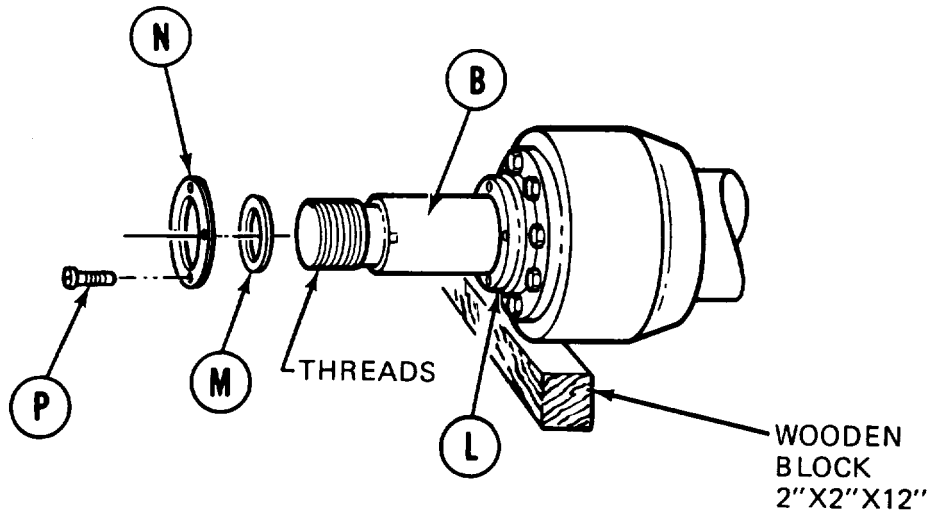


1. Install new packing assembly (A) on piston rod (B) and push it into overhead cylinder (c).
2. Install new spacer ring (D) and new preformed packing (E) on land ring (F).
3. Position land ring (F) on piston rod (B) and aline holes with overhead cylinder (C).
4. Manually install eight screws (G).
5. Using 1-5/16 inch socket and torque wrench, alternately tighten eight screws (G) to 320-330 lb-ft (440-445 N•m).
6. Manually install new wiper ring (H) in land ring (F).
7. Manually install four 10/32 screws (J) in threaded holes (K) of bushing (L).
8. Using spanner wrench on screws (J), tighten bushing (L) to land ring (F).
9. Manually remove screws (J) from bushing (L).

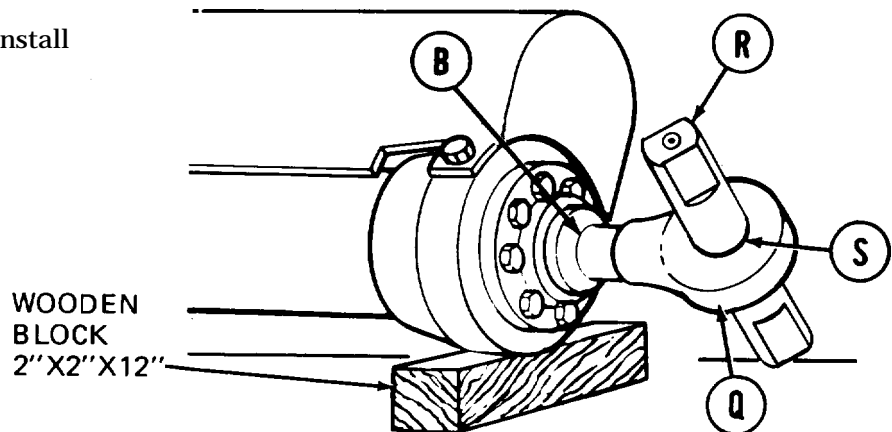
Go on to Sheet 5

TA170549

OVERHEAD CYLINDER REPAIR (Sheet 5 of 6)



10. Install new wiper ring (M) on piston rod (B).
11. Install retaining plate (N) on piston rod (B) and align holes with bushing (L).
12. Using flat-tip screwdriver, install four screws (P).
13. Remove container with drained fluid. Throw fluid away in accordance with local procedures.
14. Remove tape from threads of piston rod (B).
15. Using second technician, manually start rod end (Q) on piston rod (B).
16. Have one technician use cylinder rod wrench on flats of piston rod (B), and second technician insert pin (R) through rod end eye (S).
17. Using pin (R) as a lever, install rod end (Q).

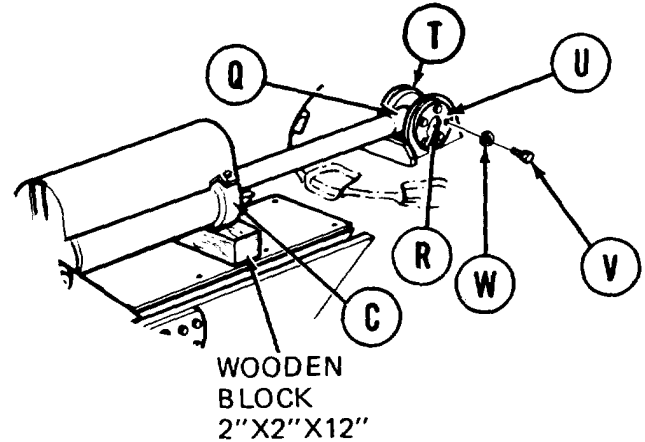


Go on to Sheet 6

TA170550

OVERHEAD CYLINDER REPAIR {Sheet 6 of 6}

18. Service hydraulic reservoir (LO 5-5420-226-12).
19. Bleed hydraulic system (page 3-66).
20. Extend overhead piston until rod end (Q) is alined with mount (T) (TM 5-5420-226-10).
21. Using crowbar, lift overhead cylinder and remove wooden block from beneath overhead cylinder (C).
22. Have one technician position rod end (Q) in mount (T) while another inserts pin (R).
23. Position two retainers (U), one on each side of mount (T).
24. Manually install 10 screws (V) and new lockwashers (W) securing retainers (U) to mount (T).
25. Using 1-5/16 inch socket, tighten 10 screws (V).
26. Check for hydraulic leaks and correct as necessary.
27. Service hydraulic reservoir (LO 5-5420-226-12).



End of Task

TA170551

ROD END CONNECTOR REPAIR (Sheet 1 of 1)

TOOLS: Arbor press

PRELIMINARY PROCEDURE: Remove rod end connector (pages 3-222 and 3-231)

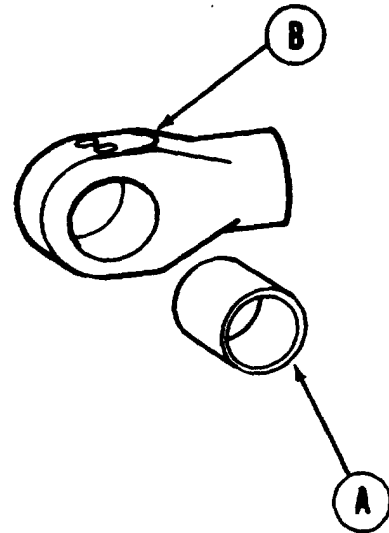
DISASSEMBLY:

Place rod end connector in arbor press and press sleeve bearing (A) out of clevis (B).

ASSEMBLY:

1. Position sleeve bearing (A) in alignment with hole in clevis (B).
2. Using arbor press, press sleeve bearing (A) into clevis (B).
3. Install rod end connector (pages 3-222 and 3-231).

End of Task



TONGUE CYLINDER REPAIR (Sheet 1 of 5)

| PROCEDURE | PROCEDURE INDEX | PAGE |
|-------------------------|-----------------|------|
| Disassembly | | 4-77 |
| Cleaning and Inspection | | 4-79 |
| Assembly | | 4-80 |

TOOLS: Ratchet with 3/4 in. drive
 1-5/16 in. socket with 3/4 in. drive
 Torque wrench with 3/4 in. drive
 (0 to 600 lb-ft capacity) (0-813 N•m)
 Spanner wrench with 0-6-1/2 in. span
 Flat-tip screwdriver
 4-9/16 in. cylinder rod wrench (stow right fender box)
 Crowbar

Snap ring pliers
 7/16 in. socket with 1/2 in. drive
 Ratchet with 1/2 in. drive
 Hammer
 Punch, drive pin 3/4 x 10 in.

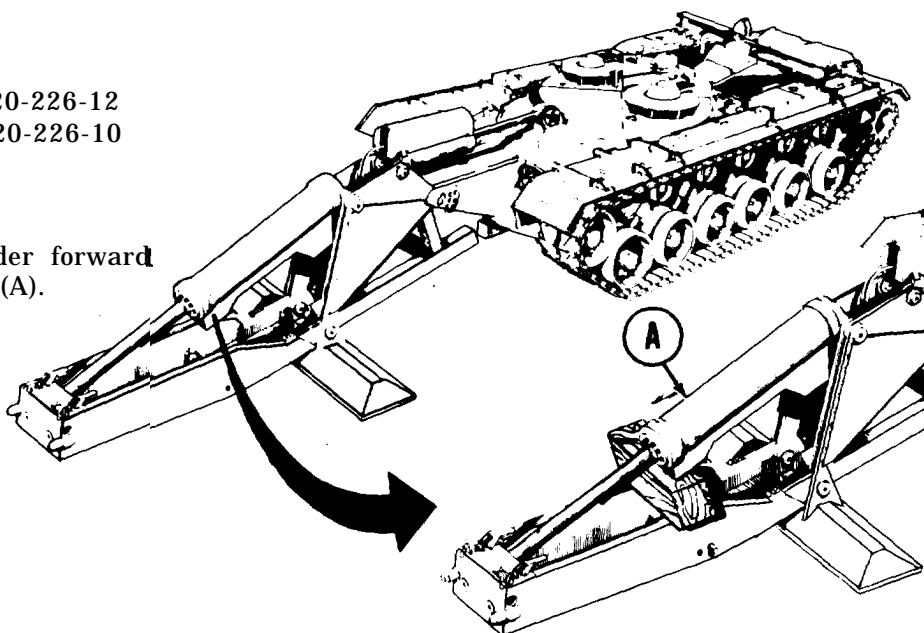
SUPPLIES: Dry cleaning solvent (Item 15, Appendix D)
 Rags (Item 12, Appendix D)
 Masking tape (Item 18, Appendix D)
 10/32 screw 1/2 in. long (4 required)
 Packing assembly
 Wiper ring (2 required)
 Preformed packing
 Spacer ring
 Wooden block 6 in. by 6 in. by 36 in. long
 Container (to catch fluid)

PERSONNEL: Two

REFERENCES: LO 5-5420-226-12
 TM 5-5420-226-10

DISASSEMBLY:

1. Place wooden block under forward end of tongue cylinder (A).

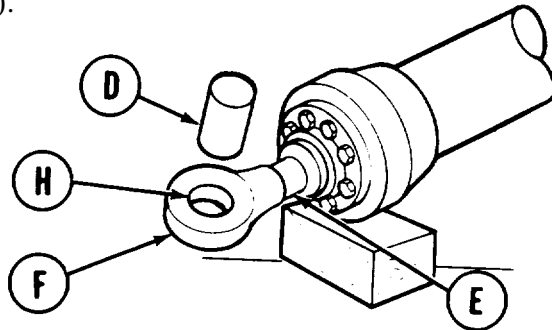
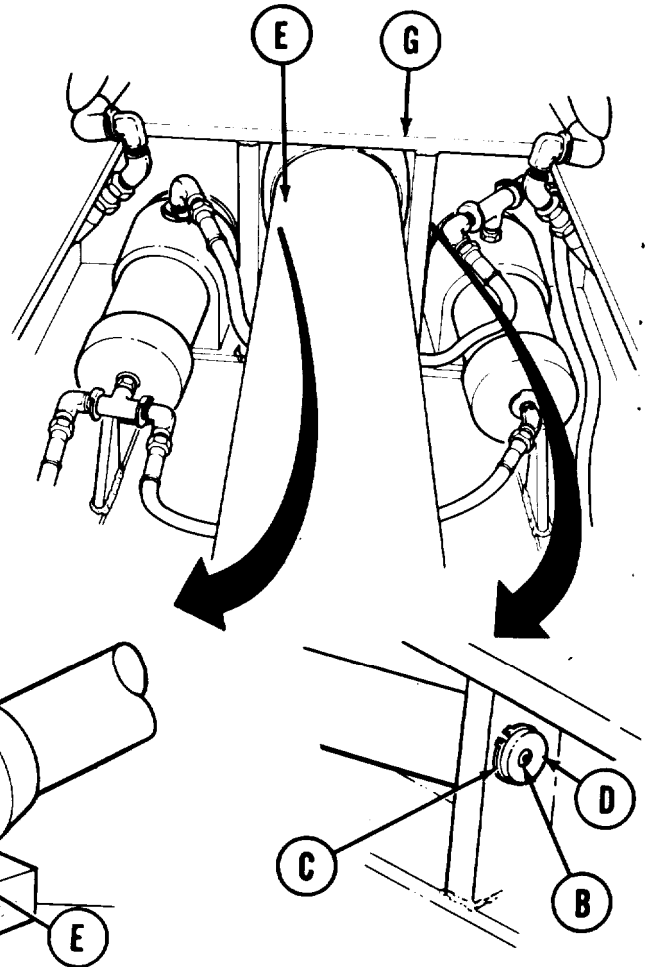


Go on to Sheet 2

TA170553

TONGUE CYLINDER REPAIR (Sheet 2 of 5)

2. Using 7/16 inch socket, remove two grease fittings (B).
3. Using snap ring pliers, remove two retaining rings (C).
4. Using hammer and punch, remove pin (D).
5. Retract tongue piston rod (E) until rod end connector (F) is clear of support (G) (TM 5-5420-226-10).
6. Relieve hydraulic pressure (page 3-65).
7. Have one technician use piston rod wrench on flats of piston rod (E), while second technician inserts pin (D) through rod end connector eye (H).

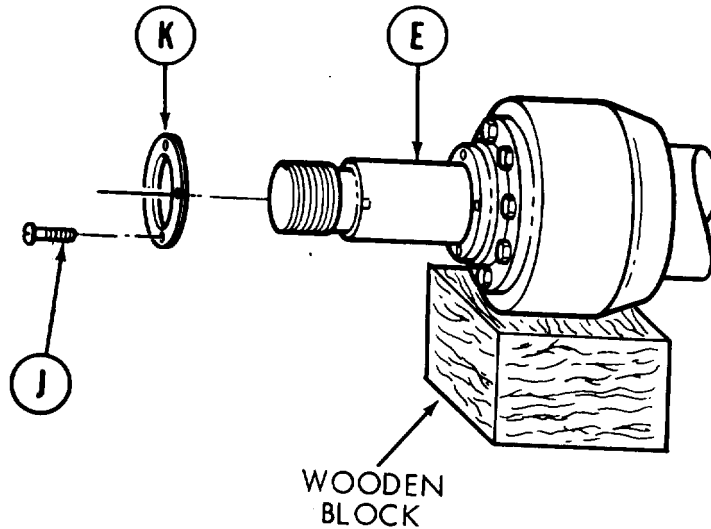


8. Using pin (D) as a lever, turn rod end connector (F) counterclockwise and remove.

9* Tape threads on end of piston rod (E).

10. Using flat-tip screwdriver, remove four screws (J).

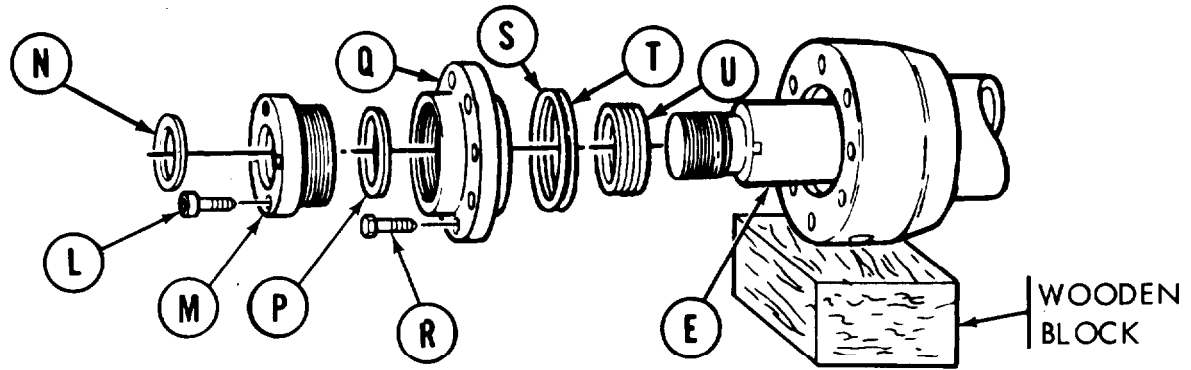
11. Remove retainer plate (K).



Go on to Sheet 3

TA170554

TONGUE CYLINDER REPAIR (Sheet 3 of 5)

**NOTE**

Place container under tongue cylinder to catch fluid.

12. Manually install four 10/32 screws (L) into threaded holes of bushing (M).
13. Using spanner wrench on screws, remove bushing (M) from piston rod (E). Manually remove screws (L).
14. Remove wiper ring (N) from bushing (M). Throw wiper ring (N) away.
15. Remove wiper ring (P) from land ring (Q). Throw wiper ring (P) away.
16. Using 1-5/16 inch socket, remove eight screws (R).
17. Remove land ring (Q).
18. Remove preformed packing (S) from land ring (Q). Throw preformed packing (S) away.
19. Remove spacer ring (T) from land ring (Q). Throw spacer ring (T) away.

WARNING

Be careful when performing next step. Damage could occur when removing packing assembly (U).

20. Using screwdriver, remove packing assembly (U) from piston rod (E). Throw packing assembly (U) away.

CLEANING AND INSPECTION:

WARNING

Cleaning agent specified is flammable. Use only in well ventilated areas. Keep away from flames, sparks, or heat. Do not smoke while using. Prevent contact with eyes, mouth, and/or skin. Wear rubber gloves when performing cleaning procedures.

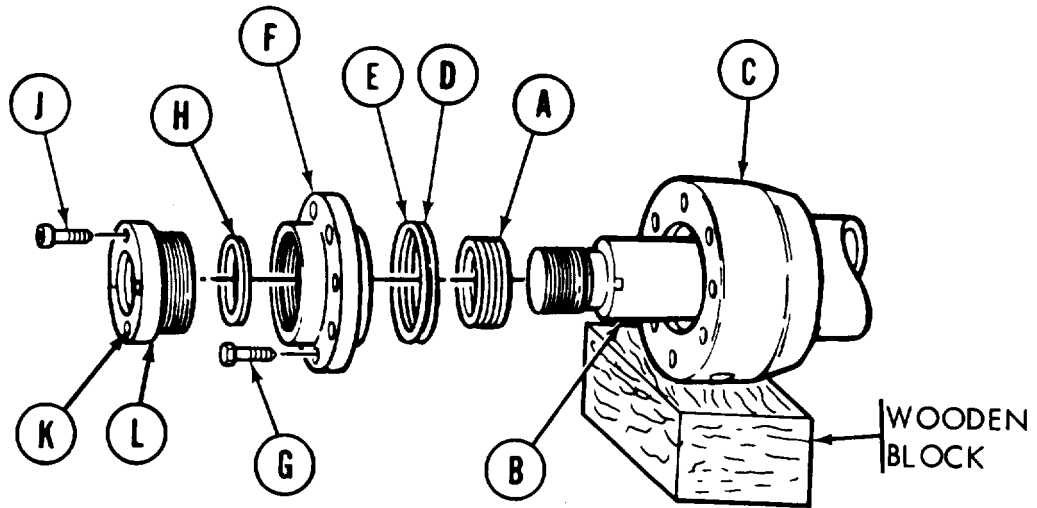
1. Using solvent, clean all metallic parts.
2. Using rags, dry all parts.
3. Inspect all parts for damage or wear. Replace all unserviceable parts.

Go on to Sheet 4

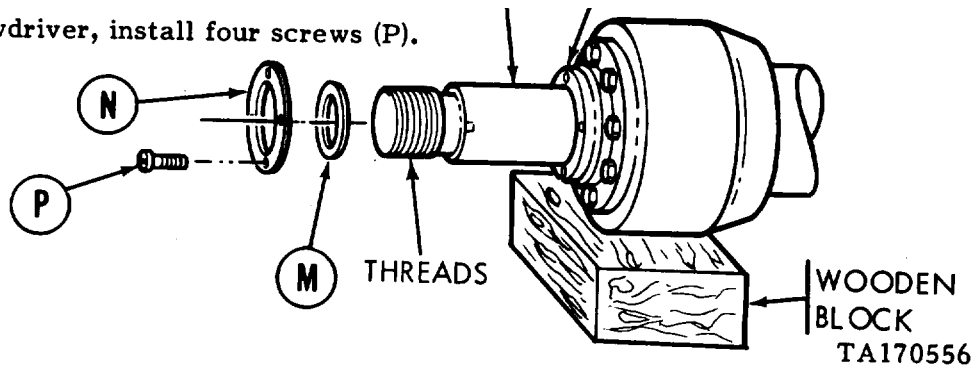
TA170555

TONGUE CYLINDER REPAIR (Sheet 4 of 5)

ASSEMBLY:



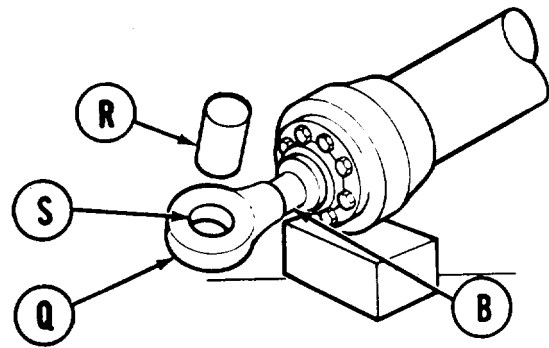
1. Install new packing assembly (A) on piston rod (B) and push it into tongue cylinder (C).
2. Install new spacer ring (D) and new preformed packing (E) on land ring (F).
3. Position land ring (F) on piston rod (B) and align holes with tongue cylinder (C).
4. Manually install eight screws (G).
- 5* Using 1-5/16 inch socket and torque wrench, alternately tighten eight screws (G) to 320-330 lb-ft (435-445 N•m).
6. Manually install new wiper ring (H) in land ring (F).
7. Manually install four 10/32 screws (J) in threaded holes (K) of bushing (L).
8. Using spanner wrench on screws (J), tighten bushing (L) to land ring (F).
9. Manually remove screws (J) from bushing (L).
10. Install new wiper ring (M) on piston rod (B).
11. Install retaining plate (N) on piston rod (B) and align holes with bushing (L).
12. Using flat-tip screwdriver, install four screws (P).



Go on to Sheet 5

TONGUE CYLINDER REPAIR (Sheet 5 of 5)

13. Remove tape from threads of piston rod (B).
14. Using second technician, manually start rod end connector (Q) on cylinder rod (B).



15. Have one technician use piston rod wrench on flats of cylinder rod (B) and second technician insert pin (R) through rod end connector eye (S).
16. Using pin (R) as a lever, turn rod end connector (Q) clockwise and tighten.
17. Service hydraulic reservoir (LO 5-5420-226-12).
18. Bleed hydraulic system (page 3-66).
19. Extend tongue piston rod (B) and position rod end connector (Q) into tongue (T) (TM 5-5420-226-10).

20. Have one technician hold rod end connector (Q) in position while second technician inserts pin (R) through rod end connector (Q).

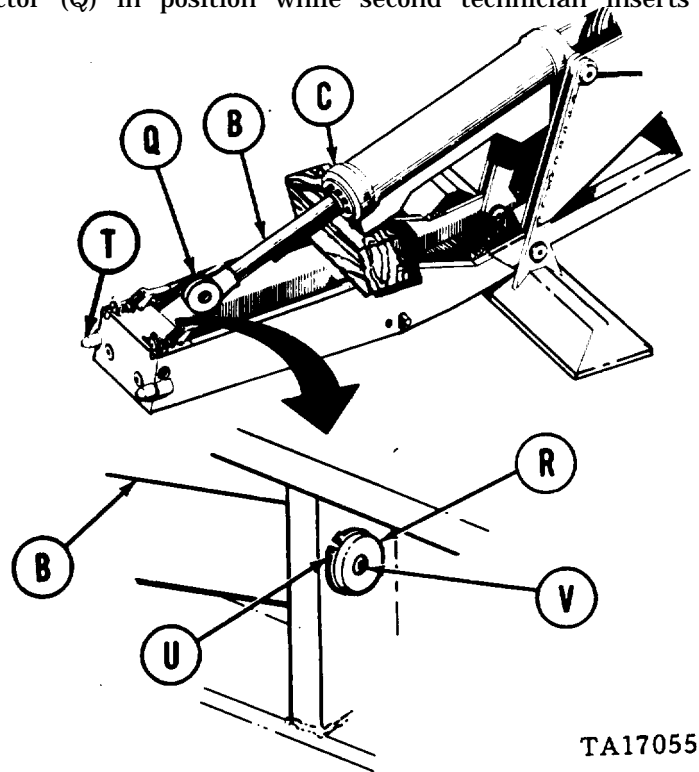
21. Using snap ring pliers, install two retaining rings (U).

22. Using 7/16 inch socket, install two grease fittings (V).

23. Remove wooden block from beneath cylinder tongue (C).

24. Check for hydraulic leaks and correct as necessary.

25. Service hydraulic reservoir (LO 5-5420-226-12).



End of Task

TA170557

LOCKING CYLINDER REPAIR (Sheet 1 of 4)

PROCEDURE INDEX

| PROCEDURE | PAGE |
|-------------------------|------|
| Disassembly | 4-82 |
| Cleaning and Inspection | 4-84 |
| Assembly | 4-84 |

TOOLS: 9/16 in. socket with 1/2 in. drive
 Ratchet with 1/2 in. drive
 Torque wrench with 1/2 in. drive (0-175 lb-ft capacity) (0-237 NŹm)
 Spanner wrench (adjustable face type 0-2 in. capacity)
 Cross-tip screwdriver
 Flat-tip screwdriver

SUPPLIES: Rags (Item 12, Appendix D)
 Dry cleaning solvent (Item 15, Appendix D)
 Packing assembly (2 required)
 Wiper ring (4 required)
 Preformed packing (2 required)
 Spacer ring (2 required)
 Friction tape (Item 17, Appendix D)

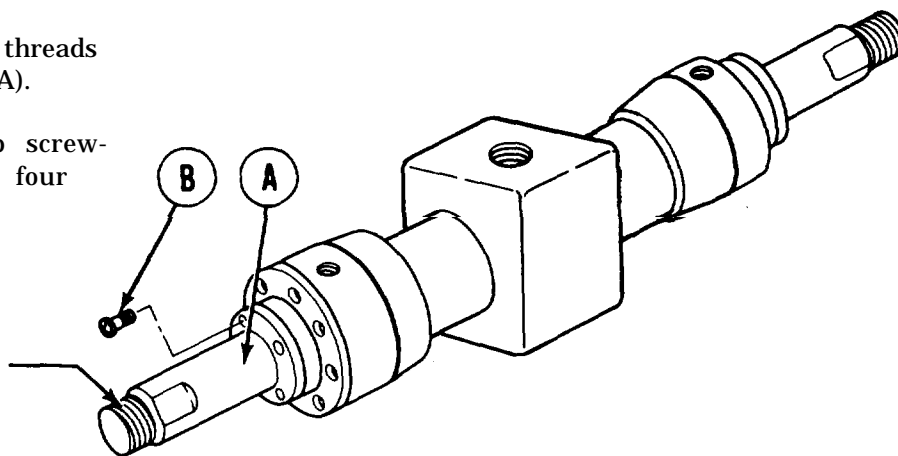
PRELIMINARY PROCEDURE: Remove locking cylinder (page 3-234)

NOTE

Both ends of this cylinder are the same. Repair of only one end shown in this task. Opposite end is the same.

DISASSEMBLY:

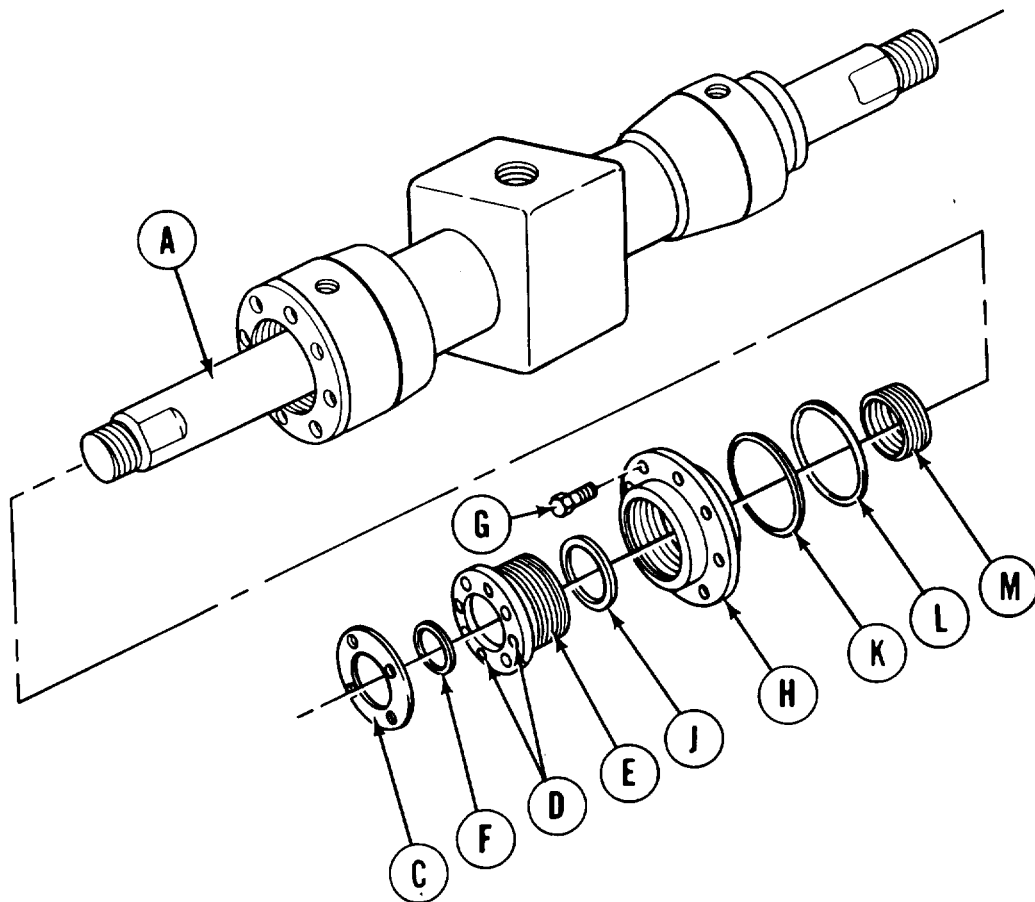
1. Place tape on threads of piston rod (A).
2. Using cross-tip screwdriver, remove four screws (B).



Go on to Sheet 2

TA170558

LOCKING CYLINDER REPAIR (Sheet 2 of 4)



3. Remove retainer plate (C) from piston rod (A).
4. Using spanner wrench in unthreaded holes (D), remove bushing (E).
5. Remove wiper ring (F) from bushing (E) and throw wiper ring away.
6. Using socket, remove eight screws (G).
7. Remove land ring (H) from Piston rod (A).
8. Remove wiper ring (J) from land ring (H) and throw wiper ring away.
9. Using flat-tip screwdriver, remove preformed packing (K) and spacer ring (L) from land ring (H). Throw preformed packing (K) and spacer ring (L) away.
10. Remove packing assembly (M) from piston rod (A) and throw packing assembly away.

Go on to Sheet 3

TA170559

LOCKING CYLINDER REPAIR (Sheet 3 of 4)

CLEANING AND INSPECTION:

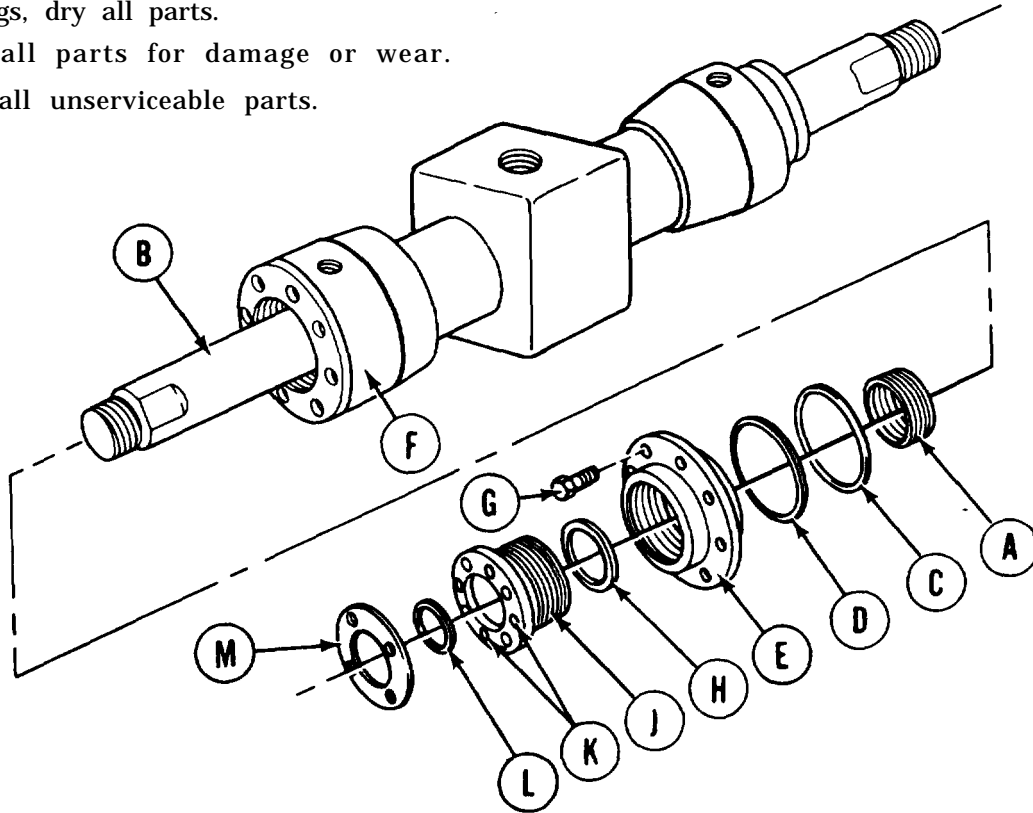
WARNING

Cleaning agent specified is flammable. Use only in well ventilated areas. Keep away from flames, sparks, or heat. Do not smoke while using. Prevent contact with eyes, mouth, and/or skin. Wear rubber gloves when performing cleaning procedures.

1. Using solvent, clean all metallic parts.
2. Using rags, dry all parts.
3. Inspect all parts for damage or wear.

Replace all unserviceable parts.

ASSEMBLY:

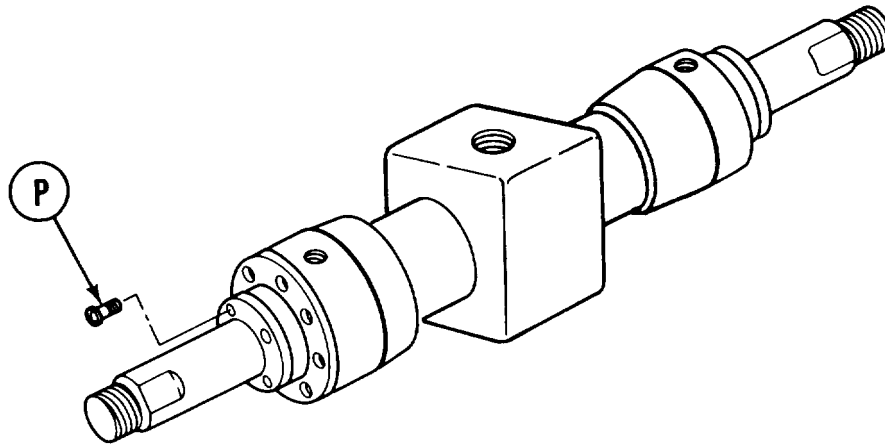


1. Install new packing assembly (A) on piston rod (B).
2. Install new spacer ring (C) and new preformed packing (D) on land ring (E).
3. Position land ring (E) on head (F) with holes aligned.
4. Using socket, loosely install eight screws (G).
5. Using torque wrench, tighten screws (G) 30 to 40 lb-ft (40.6 to 54.2 NŽm).
6. Install new wiper ring (H) in bushing (J).
7. Using spanner wrench in unthreaded holes (K) of bushing (J), tighten bushing to land ring (E).
8. Install new wiper ring (L) on piston rod (B).
9. Position retainer plate (M) on piston rod (B) and aline holes with threaded holes of bushing (J).

Go on to Sheet 4

TA170560

LOCKING CYLINDER REPAIR (Sheet 4 of 4)



10. Using cross-tip screwdriver, install four screws (P).
11. Install locking cylinder (page 3-235).

End of Task

EJECTION CYLINDERS REPAIR (Sheet 1 of 2)

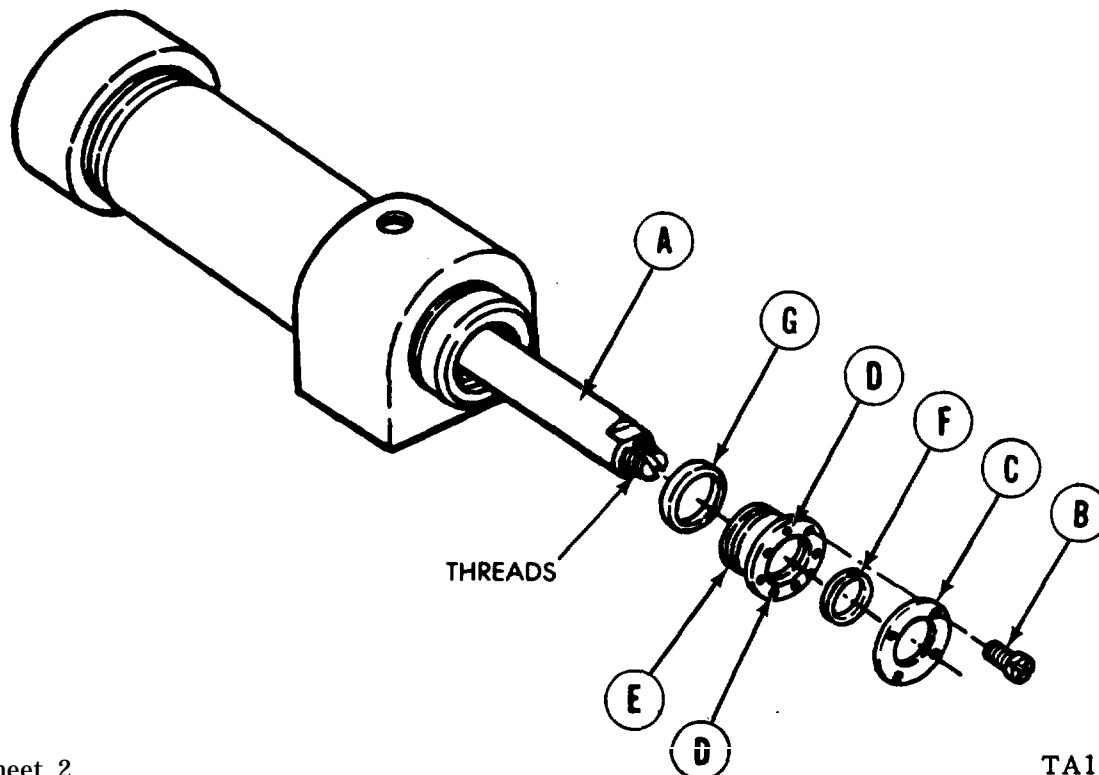
TOOLS: Spanner wrench (adjustable face type, 2 in. capacity)
Cross-tip screwdriver
Pliers, long round nose

SUPPLIES: Rags (Item 12, Appendix D)
Friction tape (Item 17, Appendix D)
Dry cleaning solvent (Item 15, Appendix D)
Wiper ring (2 required)

PRELIMINARY PROCEDURE: Remove ejection cylinders (pages 3-237 and 3-241)

DISASSEMBLY:

1. Place tape on threads of piston rod (A).
2. Using screwdriver, remove four screws (B).
3. Remove retainer plate (C) from piston rod (A).
4. Using spanner wrench in unthreaded holes (D), remove bushing (E).
5. Manually remove wiper ring (F) from bushing (E).
6. Using pliers, remove wiper ring (G). Throw wiper ring (G) away.



Go on to Sheet 2

TA170562

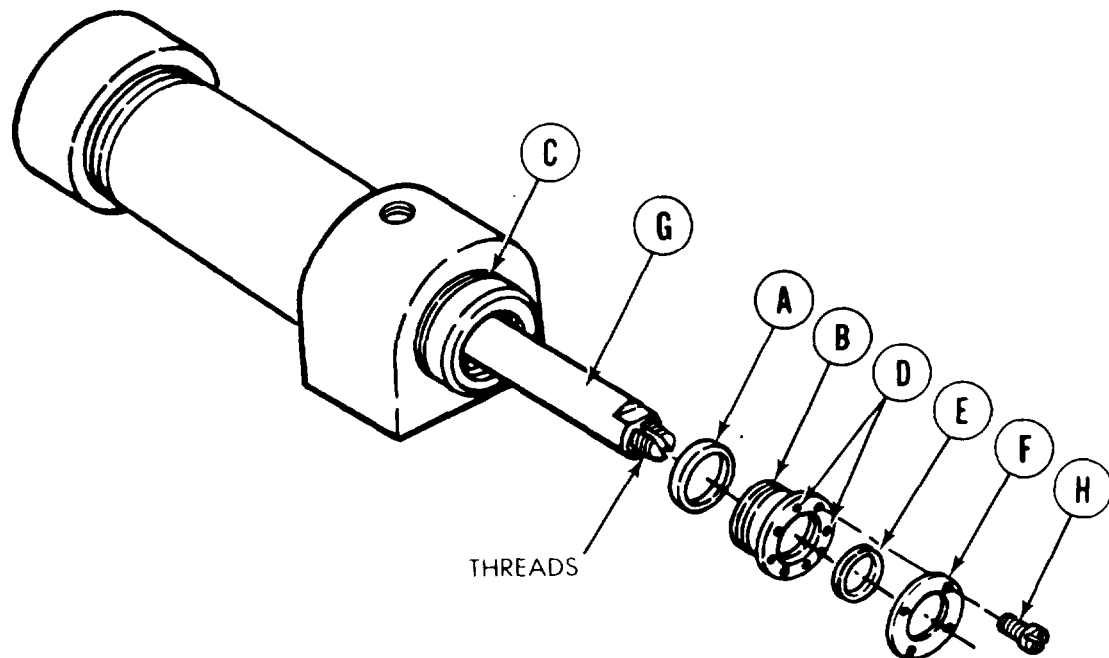
EJECTION CYLINDERS REPAIR (Sheet 2 of 2)**CLEANING AND INSPECTION:****WARNING**

Cleaning agent specified is flammable. Use only in well ventilated areas. Keep away from flames, sparks, or heat. Do not smoke while using. Prevent contact with eyes, mouth, and/or skin. Wear rubber gloves when performing cleaning procedures.

1. Using solvent, clean all metallic parts.
2. Using rags, dry all parts.
3. Inspect all parts for damage or wear. Replace all unserviceable parts.

ASSEMBLY:

1. Install new wiper ring (A) in bushing (B).
2. Screw bushing (B) into retainer (C).
3. Using spanner wrench in unthreaded holes (D), tighten bushing (B) to retainer (C).
4. Install new wiper ring (E) in bushing (B).
5. Install retainer plate (F) on piston rod (G).
6. Using screwdriver, install four screws (H).
7. Install ejection cylinders (pages 3-239 and 3-243).



End of Task

TA170563

HOLD-DOWN CYLINDER REPAIR (Sheet 1 of 4)

PROCEDURE INDEX

| PROCEDURE | PAGE |
|-------------------------|------|
| Disassembly | 4-88 |
| Cleaning and Inspection | 4-90 |
| Assembly | 4-90 |

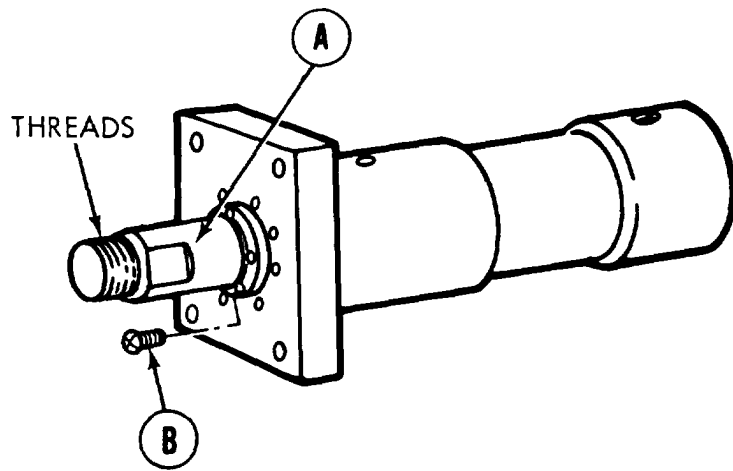
TOOLS: Cross-tip screwdriver
 Ratchet with 3/8 in. drive
 5/16 in. socket head screw attachment with 3/8 in. drive
 Torque wrench with 1/2 in. drive (175 lb-ft capacity) (0-237 N•m)
 Spanner wrench (adjustable face type 2 in. capacity)
 Adapter 1/2 in. to 3/8 in. drive

SUPPLIES: Rags (Item 12, Appendix D)
 Friction tape (Item 17, Appendix D)
 Dry cleaning solvent (Item 15, Appendix D)
 Packing assembly
 Wiper rings (2 required)
 Spacer ring
 Preferred packing

PRELIMINARY PROCEDURE: Remove hold-down cylinder (page 3-248)

DISASSEMBLY:

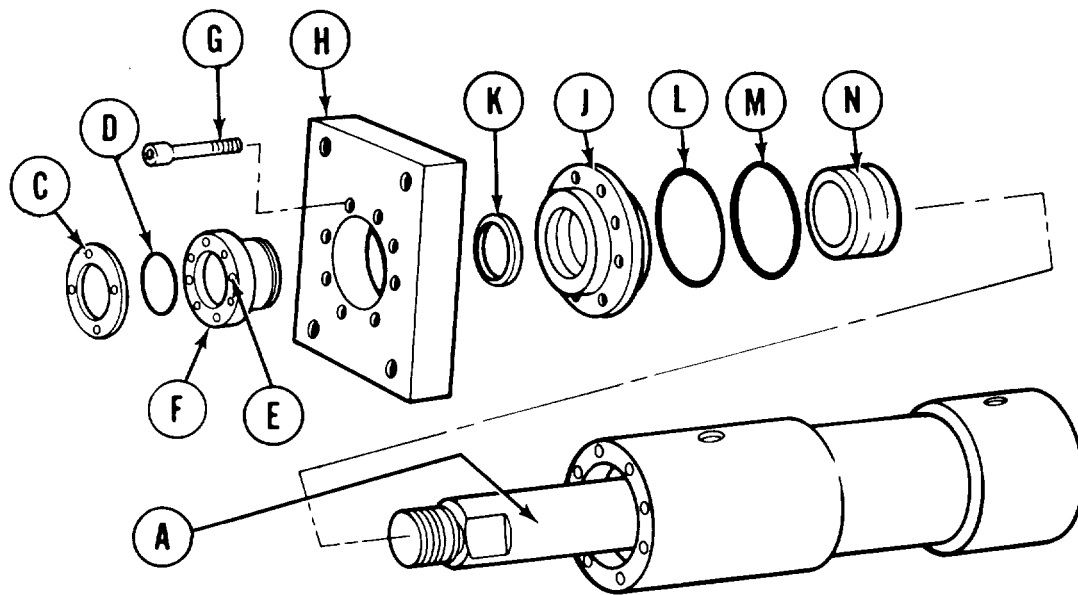
1. Cover threads of piston rod (A) with tape.
2. Using cross-tip screwdriver, remove four screws (B).



Go on to Sheet 2

TA170564

HOLD-DOWN CYLINDER REPAIR (Sheet 2 of 4)



3. Remove retainer plate (C) from piston rod (A).
4. Remove wiper ring (D) from piston rod (A). Throw wiper ring (D) away.
5. Using spanner wrench in unthreaded holes (E), remove bushing (F).
6. Using socket head screw attachment, remove eight screws (G).
7. Remove mount plate (H) and land ring (J).
8. Remove wiper ring (K) from land ring (J). Throw wiper ring (K) away.
9. Remove preformed packing (L) and spacer ring (M) from land ring (K). Throw preformed packing (L) and spacer ring (M) away.
10. Remove packing assembly (N) from piston rod (A). Throw packing assembly (N) away.

Go on to Sheet 3

TA170565

HOLD DOWN CYLINDER REPAIR (Sheet 3 of 4)

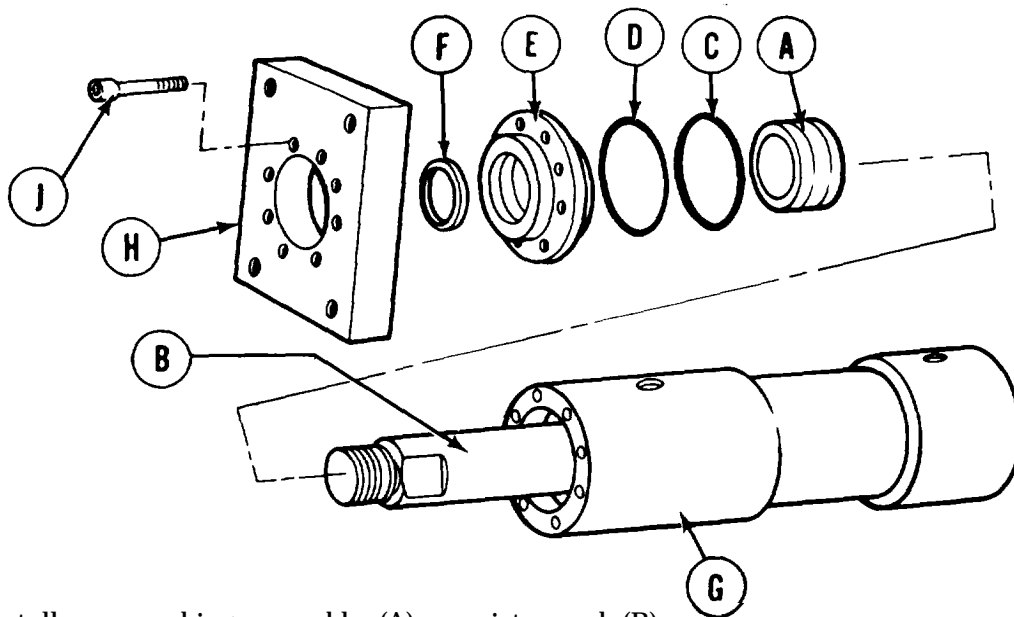
CLEANING AND INSPECTION:

WARNING

Cleaning agent specified is flammable. Use only in well ventilated areas. Keep away from flames, sparks, or heat. Do not smoke while using. Prevent contact with eyes, mouth, and/or skin. Wear rubber gloves when performing cleaning procedures.

1. Using solvent, clean all metallic parts.
2. Using rags, dry all parts.
3. Inspect all parts for damage or wear. Replace all unserviceable parts.

ASSEMBLY:

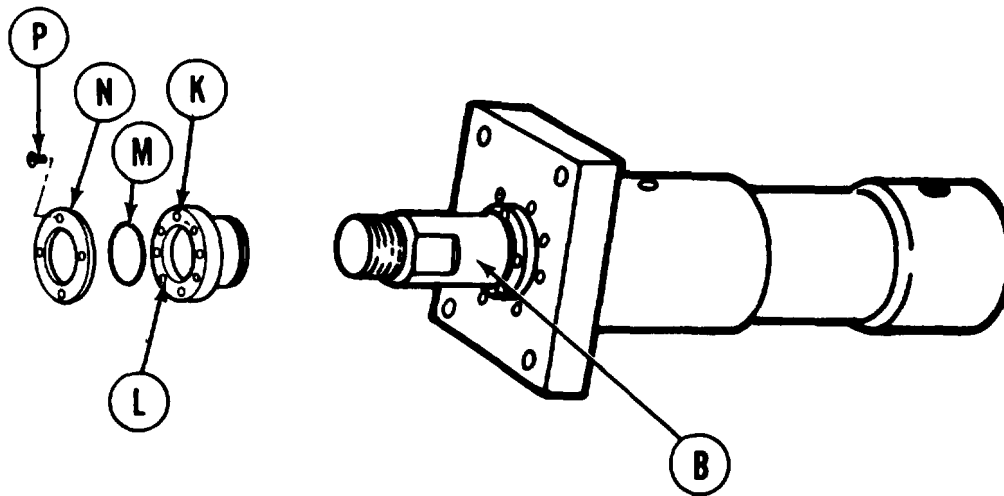


1. Install new packing assembly (A) on piston rod (B).
2. Install new spacer ring (C) and new preformed packing (D) on land ring (E).
3. Install new wiper ring (F) in land ring (E).
4. Install land ring (E) on piston rod (B) and align holes with head (G).
5. Install mount plate (H) on piston rod (B) and align holes with land ring (E) and head (G).
6. Using socket head screw attachment, loosely install eight screws (J).
7. Using torque wrench, adapter and socket head screw attachment, tighten screws (J) to 40 to 50 lb-ft (54-68 N·m).

Go on to Sheet 4

TA170566

HOLD-DOWN CYLINDER REPAIR (Sheet 4 of 4)



8. Install bushing (K) on piston rod (B).
9. Using spanner wrench in unthreaded holes (L), tighten bushing (K).
10. Install new wiper ring (M) on piston rod (B).
11. Install retainer plate (N) on piston rod (B) and align holes with threaded holes in bushing (K).
12. Using cross-tip screwdriver, install four screws (P).
13. Remove tape from threads of piston rod (B).
14. Install hold-down cylinder (page 3-249).

End of Task

TA170567

RESERVOIR QUADRANT REPLACEMENT (Sheet 1 of 4)

PROCEDURE INDEX

| PROCEDURE | PAGE |
|--------------|------|
| Removal | 4-92 |
| Cleaning | 4-94 |
| Installation | 4-94 |

- TOOLS:
- 1-5/16 in. socket with 3/4 in. drive
 - 3/4 in. socket with 1/2 in. drive
 - 7/16 in. socket with 1/2 in. drive
 - Ratchet with 3/4 in. drive
 - Ratchet with 1/2 in. drive
 - 15 in. adjustable wrench
 - Putty knife
 - Lifting device (capable of lifting 500 lbs)
 - Sling

- SUPPLIES:
- Sealing compound (Item 13 Appendix D)
 - Pipe tape (Item 19, Appendix D)
 - Rags (Item 12, Appendix D)
 - Dry cleaning solvent (Item 15, Appendix D)
 - Lockwasher (6 required)
 - Starwasher (2 required)
 - Lockwasher (7 required)

PERSONNEL: Three

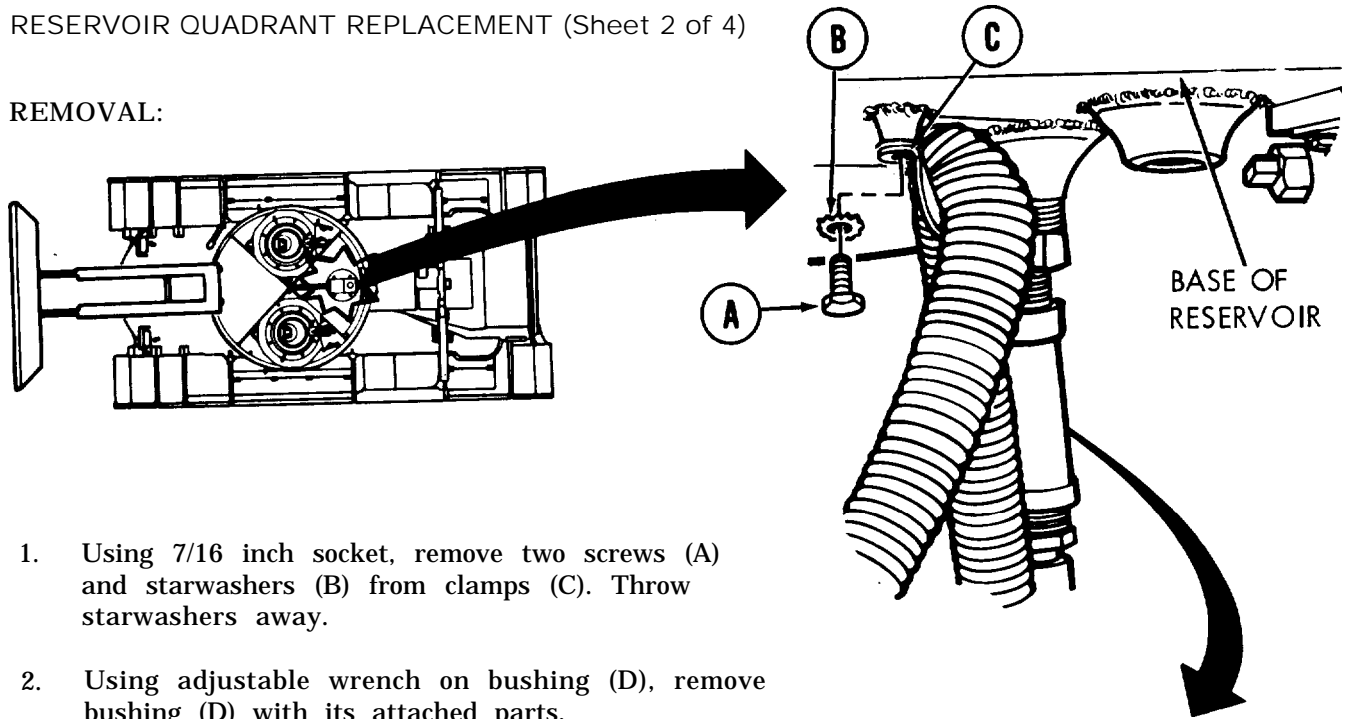
REFERENCE: LO 5-5420-226-12

- PRELIMINARY PROCEDURES:
- Remove air filter (page 3-252)
 - Remove oil strainer (page 3-251)
 - Remove ventilator blower (page 3-2)
 - Remove water can storage bracket (page 3-41)
 - Remove accessories control box (page 3-7)
 - Drain hydraulic reservoir (page 3-68)
 - Remove drain valve (page 3-213)
 - Remove master relief valve RV1 (page 3-84)
 - Remove pump relief check valve CV5 (page 3-114)
 - Remove reservoir return check valve CV8 (page 3-112)
 - Remove hydraulic fluid filter assembly (page 3-202)

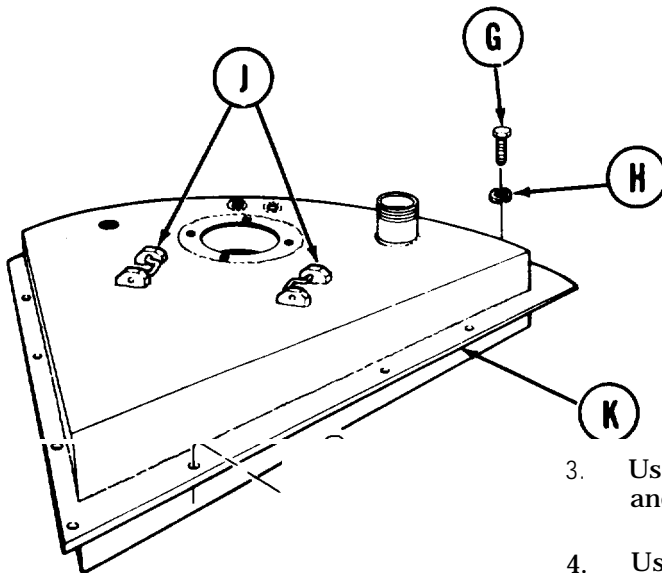
Go on to Sheet 2

RESERVOIR QUADRANT REPLACEMENT (Sheet 2 of 4)

REMOVAL:



1. Using 7/16 inch socket, remove two screws (A) and starwashers (B) from clamps (C). Throw starwashers away.
2. Using adjustable wrench on bushing (D), remove bushing (D) with its attached parts.



3. Using 3/4 inch socket, remove seven screws (E) and lock washers (F). Throw lockwashers away.
4. Using 1-5/16 inch socket, remove four screws (G) and lockwashers (H). Throw lockwashers away.
5. Attach sling and lifting device to two handles (J).
CAUTION

Have a technician in vehicle watching while reservoir quadrant is raised to insure hoses and wiring harnesses are not pulled out.

6. Have technician operating hoist lift reservoir quadrant (K) slowly from vehicle.

Go onto Sheet 3

TA170568

RESERVOIR QUADRANT REPLACEMENT (Sheet 3 of 4)

CLEANING:

1. Using putty knife, remove sealing compound from mating surfaces of reservoir quadrant and vehicle.

WARNING

Cleaning agent specified is flammable. Use only in well ventilated areas. Keep away from flames, sparks, or heat. Do not smoke while using. Prevent contact with eyes, mouth, and/or skin. Wear rubber gloves when performing cleaning procedures.

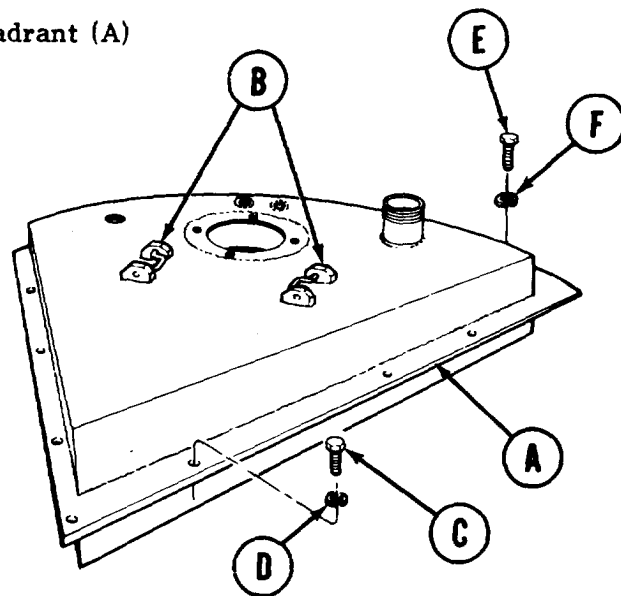
2. Clean using rags and dry cleaning solvent.

INSTALLATION:

NOTE

Before installing, use pipe tape on all male threads. Start tape on second thread so tape will not enter hydraulic system.

1. Using putty knife, apply sealant to mating surfaces of vehicle and reservoir quadrant (A).
2. Attach sling and lifting device to two handles (B).
3. Have technician operating hoist slowly lift quadrant (A) into position over vehicle.
4. While two technicians guide reservoir quadrant (A), have technician operating hoist slowly lower reservoir quadrant (A) into position on vehicle.
5. Remove lifting device and sling from two handles (B).
6. Using 3/4 inch socket, install seven screws (C) and new lockwashers (D).
7. Using 1-5/16 inch socket, install four screws (E) and new lockwashers (F).

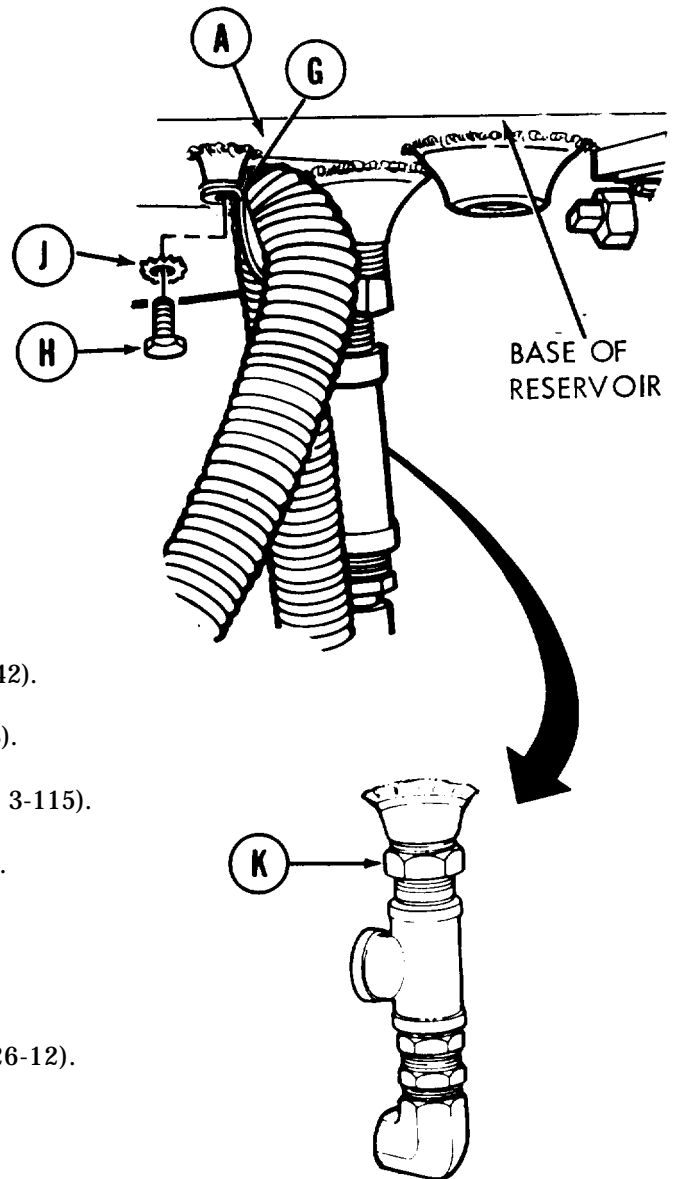


Go on to Sheet 4

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RESERVOIR QUADRANT REPLACEMENT (Sheet 4 of 4)

8. Place two clamps (G) in position On reservoir quadrant (A).
9. Using 7/16 inch socket, install two screws (H) and new starwashers (J) .
10. Using adjustable wrench on bushing (K), install bushing (K) with its attached parts.
11. Install ventilator blower (page 3-4).
12. Install hydraulic fluid filter assembly (page 3-203).
13. Install oil strainer (page 3-251).
14. Install air filter (page 3-253).
15. Install water can storage bracket (page 3-42).
16. Install return check valve CV8 (page 3-113).
17. Install pump relief check valve CV5 (page 3-115).
18. Install master relief valve RV1 (page 3-85).
19. Install drain valve (Page 3-214).
20. Install accessories control box (page 3-7).
21. Service hydraulic reservoir (LO 5-5420-226-12).
22. Bleed hydraulic system (page 3-66).
23. Check for hydraulic leaks and correct as necessary.
24. Service hydraulic reservoir (LO 5-5420-226-12).



End of Task

TA170570

APPENDIX A

REFERENCES

- LO 5-5420-226-12 Launcher, M48A5 Tank Chassis, Transporting: for Bridge, Armored-Vehicle-Launched, Scissoring Type, Class 60 (5420-01-076-6096)
- TM 5-5420-203-14 Operator's Organizational, Direct Support and General Support Maintenance Manual, Bridge, Armored-Vehicle-Launched, Scissoring Type, Aluminum, 60 Ft. Span for Use With M-48 and M-60 Launcher (All Makes and Models) (5420-00-522-9599)
- TM 5-5420-226-10 Operator's Manual Launcher and M48A5 Tank Chassis, Transporting: for Bridge, Armored-Vehicle-Launched Scissoring Type, Class 60 (5420-01-076-6096)
- TM 5-5420-226-20 Organizational Maintenance M48A5 Tank Chassis, Transporting: for Bridge, Armored-Vehicle-Launched Scissoring Type, Class 60 5420-01-076-6096)
- TM 5-5420-226-34 Direct Support and General Support Maintenance, M48A5 Tank Chassis, Transporting: for Bridge, Armored-Vehicle-Launched Scissoring Type, Class 60 (5420-01-076-6096)
- TM 9-4910-571-12&P Operator and Organizational Maintenance Manual Including Repair Parts and Special Tools List for Simplified Test Equipment for Internal Combustion Engines (STE/ICE) (NSN 4910-00-124-2554)
- TM 11-5820-401-12 Operator's and Organizational Maintenance Manual Including Repair Parts and Special Tools Lists: Radio Sets AN/VRC-12 (5820-00-223-7412), AN/VRC-43 (5820-00-233-7415), AN/VRC-44 (5820-00-223-7417), AN/VRC-45 (5820-00-223-7418), AN/VRC-46 (5820-00-223-7433), AN/VRC-47 (5820-00-223-7434), AN/VRC-48 (5820-00-223-7435), AN/VRC-49 (5820-00-223-7437), AN/VRC-54 (5820-00-223-7567), and AN/VRC-55 (5820-00-402-2265); Mounting MT-1029/VRC (5820-00-893-1323) and Mounting MT-1898/VRC (5820-00-893-1324); Antenna AT-912/VRC (5820-00-897-6357), Control Frequency Selector C-2742/VRC (5820-00-892-3343) and Control Radio Set C-2299/VRC (5820-00-892-3340)
- TM 11-5820-498-12 Operator's and Organizational Maintenance Manual Radio Sets AN/VRC-53 (NSN 5820-00-223-7467), AN/VRC-64 (5820-00-223-7475), AN/GRC-125 (5820-00-223-7411) and AN/GRC-160 (5820-00-223-7473) and Amplifier-Power Supply Groups OA-3633/GRC and OA-3633A/GRC (5820-00-973-3333)
- DAPAM 738-750 The Army Maintenance Management System
- TM 740-90-1 Administrative Storage of Equipment
- TM 750-244-6 Procedures for Destruction of Tank-Automotive Equipment to Prevent Enemy Use

APPENDIX B
MAINTENANCE ALLOCATION CHART
FOR
LAUNCHER
FOR BRIDGE, ARMORED-VEHICLE-LAUNCHED
SCISSORING TYPE, CLASS 60
NSN 5420-00-000-0000

SECTION L INTRODUCTION

B-1. General.

a. This section provides a general explanation of all maintenance and repair functions authorized at various maintenance levels.

b. **The** Maintenance Allocation Chart (MAC) in section II designates overall responsibility for the performance of maintenance functions on the identified end item or component. The implementation of the maintenance functions upon the end item or component will be consistent with the assigned maintenance functions.

c. Section III lists the special tools and test equipment required for each maintenance function as referenced from section II.

d. Section IV contains supplemental instructions and explanatory notes for a particular maintenance function.

B-2. Maintenance functions.

a. INSPECT. To determine the serviceability of an item by comparing its physical, mechanical and/or electrical characteristics with established standards through examination.

b. TEST. To verify serviceability and comparing those characteristics with prescribed standards.

c. SERVICE. Operations required periodically to keep an item in proper operating condition, i.e., to clean (decontaminate) to preserve, to drain, to paint, or to replenish fuel, lubricants, hydraulic fluids, or compressed air supplies.

d. ADJUST. To maintain, within prescribed limits, by bringing into proper or exact 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 equipments 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. INSTALL. The act of emplacing, seating, or fixing into position an item, part, or module (component or assembly) in a manner to allow the proper functioning of an equipment or system.

h. REPLACE. The act of substituting of a serviceable like type part, subassembly, or module (component or assembly) for an unserviceable counterpart.

i. REPAIR. The application of maintenance service or other maintenance actions to 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) necessary to restore an item to a completely serviceable/operational condition as prescribed by maintenance standards (i. e., DMWR) in appropriate technical publications. 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 service/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 (hours/-miles, etc.) considered in classifying Army equipments/components.

B.3. Column entries. Columns used in the maintenance allocation chart will be limited to those shown. Entries for these columns are explained below:

a. **COLUMN 1.** Group Number, Column 1 list group numbers, the purpose of which is to identify components, assemblies, subassemblies, and modules with the next higher assembly.

b. **COLUMN 2.** Component/Assembly. Column 2 contains the noun 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.

d. **COLUMN 4.** Maintenance Category. Column 4 specifies, by the listing of a "work time" figure in the appropriate subcolumn(s), the lowest level of maintenance authorized to perform the function listed in Column 3. This figure represents the active time required to perform that maintenance function at the indicated category of maintenance. If the number or complexity of the tasks within the listed maintenance function vary at different maintenance categories, appropriate "work time" figures will be shown for each category. The number of man-hours specified by the "work time" figure represents the average time required to restore an item to a serviceable condition under typical field operating conditions. This time includes preparation time, troubleshooting time, and quality assurance/quality control time in addition to the time required to perform the specific tasks identified for the maintenance functions authorized in the maintenance allocation chart.

e. **COLUMN 5.** Tools and Equipment. Column five (5) specifies by code, those common tool sets and special tools, test, and support equipment required to perform the designated function.

f. **COLUMN 6.** Remarks. Column six (6) contains an alphabetic code which leads to the remark in section IV, Remarks, which is pertinent to the item opposite the particular code.

B-4. Column Entries Used in Tool and Test Equipment Requirements.

a. **COLUMN 1.** Tool or Test Equipment Reference Code. The tool or test equipment reference code correlates with maintenance function on the identified end item or component.

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/NATO Stock Number. The National or NATO stock number of the tool or test equipment.

e. **COLUMN 5.** Tool Number. The manufacturer's part number.

B-5. Explanation of Columns in Remarks, Section IV.

a. **COLUMN 1.** Reference Code. The code recorded in column 4, section II.

b. **COLUMN 2.** Remarks. This column list information pertinent to the maintenance level being performed as indicated in the MAC, section II, column 4.

Section II. MAINTENANCE ALLOCATION CHART

| (1) Group Number | (2) Component/ Assembly | (3) Maintenance function | (4) Maintenance Category * | | | | | (5) Tools and equipment | (6) Remarks |
|---------------------|--|---|-------------------------------|-------------------|------------|---|---|-----------------------------|----------------|
| | | | C | O | F | H | D | | |
| 0616 | Blower Assy., Ventilating | Inspect Test Replace Repair | | 0.1 2.0 | 0.1 4.0 | | | 14, 18, 20 5 14, 18 | |
| 0616 | Control, Box, Ventilating Blower | Inspect Test Replace Repair | | 0.2 0.5 0.5 | 0.5 | | | 5, 6, 8 5 14, 18 | |
| 1803 | Hatches, Right & Left Sides | Inspect Service Replace Repair | 0.1 0.1 | 0.5 0.5 | | | | 5 5 | |
| 1803 | Door, Periscope, Right & Left Side | Inspect Service Replace Repair | 0.1 0.1 | 0.5 0.5 | | | | 5 5 | |
| 1803 | Cupola Assy., Right & Left Side | Inspect Service Adjust Replace Repair | 0.1 0.1 | 0.5 1.4 0.8 | | | | 5 5, 6, 8 5 | |
| 1803 | Block, Prism | Inspect Replace | 0.1 | 0.5 | | | | 5 | |
| 1803 | Latch, Safety Cover | Inspect Service Replace | 0.1 0.1 | 0.5 | | | | 5 | |
| 2400 | Boom assembly | Inspect Service Replace Repair | 0.1 0.1 | | 8.0 6.0 | | | 5, 16, 17, 19 10, 13, 17 | |

*The sub columns are as follows:

C-operator/crew
O-organizational
F-direct support

H-general support
D-Depot

**Indicates WT/MH required

Section II. MAINTENANCE ALLOCATION CHART - Continued

| (1) Group Number | (2) Component/ Assembly | (3) Maintenance function | (4) Maintenance Category * | | | | | (5) Tools and equipment | (6) Remarks |
|---------------------|-------------------------------|-----------------------------|-------------------------------|-----|------|-----|------|----------------------------|-------------------|
| | | | C | O | F | H | D | | |
| 2400 | Tongue assembly | Inspect | 0.1 | | | | | | |
| | | Service | 0.1 | | | | | | |
| | | Replace | | | 10.0 | | | | 5, 16, 17, 19 |
| | | Repair | | | 6.0 | | | | 10, 13, 17 |
| 2400 | Seat, bridge assembly | Inspect | 0.1 | | | | | | |
| | | Replace | | 3.2 | | | | | 5, 6, 8 |
| | | Repair | | 0.8 | 0.8 | | | | 5, 10, 13, 17 |
| 2401 | Pump & Clutch Support | Inspect | | 0.1 | | | | | |
| | | Replace | | | 26.0 | | | | 5, 17, 19 |
| | | Repair | | | 1.0 | | | | 10, 13, 17 |
| 2401 | Clutch Assembly | Inspect | | 0.1 | | | | | 5 |
| | | Service | | 0.1 | | | | | 6, 8 |
| | | Adjust | | 0.5 | | | | | 5 |
| | | Replace | | | 26.0 | | | | 5, 17, 19 |
| | | Repair | | | 16.0 | | | | 5, 17, 19 |
| | | Overhaul | | | | | 24.0 | | 5, 11, 12 |
| 2401 | Controls, clutch | Service | 0.1 | | | | | | |
| | | Replace | | | 0.5 | | | | 5, 17, 19 |
| 2401 | Universal joint | Inspect | | 0.1 | | | | | 5 |
| | | Service | 0.1 | | | | | | |
| | | Replace | | 1.6 | | | | | 5 |
| | | Repair | | 2.0 | | | | | 5 |
| 2401 | Pump, hydraulic | Inspect | 0.1 | | | | | | |
| | | Replace | | | 26.0 | | | | 5, 17, 19 |
| | | Repair | | | | 6.0 | | | 5, 12, 17 |
| | | Overhaul | | | | | 8.0 | | 11, 12 |
| 2402 | Valves, Check, flow & relief | Adjust | | 0.5 | | | | | 1, 2, 3, 4, 5 |
| | | Replace | | 3.0 | | | | | 5, 6, 8 |
| 2402 | Valve bank assy. | Inspect | 0.1 | | | | | | |
| | | Replace | | | 8.0 | | | | 5, 17, 19 |
| | | Repair | | | 6.0 | | | | 5, 16, 17 |
| | | Overhaul | | | | | 8.0 | | 5, 11, 12, 16, 19 |

*The subcolumns are as follows:

C-operator/crew
O-organizational
F-direct support

H-general support
D-Depot

**Indicates WT/MH required

Section II. MAINTENANCE ALLOCATION CHART-Continued

| (1) Group Number | (2) Component/ Assembly | (3) Maintenance function | (4) Maintenance Category * | | | | | (5) Tools and equipment | (6) Remarks |
|---------------------|-------------------------------|-----------------------------|-------------------------------|-----|-----|---|-----|----------------------------|----------------|
| | | | C | O | F | H | D | | |
| 2402 | Manifold Armor | Inspect | 0.1 | | | | | | |
| | | Replace | | 0.2 | | | | 5 | |
| | | Repair | | 0.5 | | | | 5, 7, 8, 9, 10 | |
| 2403 | Controls & levers | Inspect | 0.1 | | | | | | |
| | | Replace | | 0.3 | | | | 5 | |
| | | Repair | | 0.3 | | | | 5, 7, 9, 10 | |
| 2406 | Filter | Service | 1.0 | 1.0 | | | | 5, 6, 8 | |
| | | Replace | | 3.8 | | | | 5, 6, 8 | |
| 2406 | Fitting, Tube & Pipe | Inspect | 0.1 | | | | | | |
| | | Replace | | 0.5 | | | | 5, 6, 8 | |
| 2406 | Hose Assemblies | Inspect | 0.1 | | | | | | |
| | | Replace | | 0.5 | | | | 5, 6, 8 | |
| 2406 | Hose Armor | Inspect | 0.1 | | | | | | |
| | | Replace | | 0.3 | | | | 5 | |
| | | Repair | | 0.3 | | | | 7, 8, 9, 10 | |
| 2407 | Overhead Cylinder | Inspect | 0.1 | | | | | | |
| | | Replace | | 4.0 | | | | 5, 6, 8 | |
| | | Repair | | | 6.0 | | | 16, 17, 19 | |
| | | Overhaul | | | | | 8.0 | 11, 12, 16, 19 | |
| 2407 | Tongue Cylinder | Inspect | 0.1 | | | | | | |
| | | Replace | | 4.0 | | | | 5, 6, 8 | |
| | | Repair | | | 6.0 | | | 16, 17, 19 | |
| | | Overhaul | | | | | 8.0 | 11, 12, 16, 19 | |
| 2407 | Ejection Cylinder | Inspect | 1.0 | | | | | | |
| | | Replace | | 2.0 | | | | 5, 6, 8 | |
| | | Repair | | | 4.0 | | | 16, 17, 19 | |
| | | Overhaul | | | | | 6.0 | 11, 12, 16, 19 | |
| 2407 | Holddown Cylinder | Inspect | 1.0 | | | | | | |
| | | Replace | | 2.0 | | | | 5, 6, 8 | |
| | | Repair | | | 4.0 | | | 16, 17, 19 | |
| | | Overhaul | | | | | 6.0 | 11, 12, 16, 19 | |

*The subcolumns are as follows:

C-operator/crew
O-organizational
F-direct support

H-general support
D-Depot

**Indicates WT/MH required

Section II. MAINTENANCE ALLOCATION CHART - Continued

| (1) Group Number | (2) Component/ Assembly | (3) Maintenance function | (4) Maintenance Category * | | | | | (5) Tools and equipment | (6) Remarks |
|---------------------|-------------------------------|--|-------------------------------|------------|------------|---|-----|---|----------------|
| | | | C | O | F | H | D | | |
| 2407 | Locking Cylinder | Inspect Replace Repair Overhaul | 1.0 | 2.0 | 4.0 | | 6.0 | 5, 6, 8 16, 17, 19 11, 12, 16, 19 | |
| 2407 | Cylinder Armor (Overhead) | Inspect Replace Repair | 1.0 | 0.4 0.5 | | | | 5 7, 8, 9, 10 | |
| 2407 | Cylinder Armor (Tongue) | Inspect Replace Repair | 1.0 | 0.4 0.5 | | | | 5 7, 8, 9, 10 | |
| 2407 | Cylinder Armor (Holddown) | Inspect Replace Repair | 1.0 | 0.2 0.5 | | | | 5 7, 8, 9, 10 | |
| 2408 | Reservoir Hydraulic | Inspect Replace Repair | 1.0 | | 7.0 3.0 | | | 5, 17, 19 10, 11, 13 | |
| 2408 | Breather hood | Service Replace | 0.1 | 0.1 | | | | 5 | |
| 6714 | Antenna Base Armor | Inspect Replace Repair | 0.1 | 0.2 0.5 | | | | 5 7, 8, 9, 10 | |

*The subcolumns are as follows:

C-operator/crew
O-organizational
F-direct support

H-general support
D-Depot

**Indicates WT/MH required

SECTION III. SPECIAL TOOL AND TEST EQUIPMENT REQUIREMENTS

| (1) Reference code | (2) Maintenance level | (3) Nomenclature | (4) National/NATO stock number | (5) Tool number |
|--------------------------|-----------------------------|--|--------------------------------------|-----------------------|
| 1 | O | Adapter, Ell Male 90° | 4730-00-580-7469 | 518428 (8D212) |
| 2 | O | Adapter, Straight | 4730-00-994-8794 | 980693 (61848) |
| 3 | O | Gage, Pressure, Dial Indicating | 6685-00-581-5186 | 980279 (61848) |
| 4 | O | Hose Assembly | 4720-01-017-2241 | 981005 (61848) |
| COMMON TOOL SETS | | | | |
| 5 | O,F,H,D | Tool Kit, General | 5180-00-177-7033 | |
| 6 | O | Shop Equipment, Automotive Maintenance, OM, Common #1 | 4910-00-754-0654 | |
| 7 | O | Shop Equipment, Automotive Maintenance, OM, Suppl. #1 | 4910-00-754-0653 | |
| 8 | O | Shop Equipment, Automotive Maintenance, OM, Suppl. #2 | 4940-00-754-0743 | |
| 9 | O | Shop Equipment, Automotive Maintenance, OM, Common #2 | 4910-00-754-0650 | |
| 10 | O,F,H,D | Tool Kit, Welder's | 5180-00-754-0661 | |
| 11 | F,H,D | Shop Equipment, Machine Shop, FM | 3470-00-754-0708 | |
| 12 | H,D | Shop Equipment, General | 4940-00-287-4894 | |
| 13 | F,H,D | Shop Equipment, Welding, FM | 3470-00-357-7268 | |
| 14 | F,H,D | Tool Kit, Automotive Fuel and Electric | 4910-00-754-0655 | |
| 15 | O | Tool Kit, Electronic Equip. | 5180-00-064-5178 | |

SECTION III. SPECIAL TOOL AND TEST EQUIPMENT REQUIREMENTS - Continued

| (1) Reference code | (2) Maintenance level | (3) Nomenclature | (4) National/NATO stock number | (5) Tool number |
|------------------------------|-----------------------------|--|--------------------------------------|-----------------------|
| COMMON TOOL SETS (Continued) | | | | |
| 16 | F,H,D | Shop Equipment, Automotive Repair FM, Supplement #1 | 4910-00-754-0706 | |
| 17 | F,H,D | Shop Equipment, Contact Main. | 4940-00-294-9518 | |
| 18 | F,H,D | Shop Equipment, Electric Repair | 4940-00-294-9542 | |
| 19 | F,H,D | Shop Equipment, Automotive Maintenance, FM, Basic | 4910-00-754-0705 | |
| 20 | F,H,D | Shop Set, Fuel & Electric System, FM | 4910-00-754-0714 | |

SECTION IV. REMARKS

| Reference code | Remarks |
|----------------|--|
| A | <p>Repair at Organizational Maintenance level is limited to procedures in TM 5-5420-227-24 and does not include welding.</p> |

APPENDIX C

GENERAL MAINTENANCE

| <u>Procedure</u> | <u>Page</u> |
|---|-------------|
| Inspection and Repair of Welds | C-2 |
| Inspection, Care, and Maintenance of Antifriction Bearings | C-2 |
| Inspection and Repair of Cast Parts and Machined Surfaces | C-3 |
| Inspection and Repair of Splines | C-5 |
| Cleaning Threads and Nuts | C-7 |
| Loosening and Removing Nuts | C-8 |
| Cutting Nuts | C-9 |
| Bolt Removal | C-10 |
| Removal of Studs Broken at Surface | C-11 |
| Removal of Studs Broken Below Surface | C-14 |
| Removal of Studs Broken Above Surface | C-17 |
| Installation of New Studs | C-18 |
| Dowel Pin Removal | C-19 |
| Dowel Pin Installation | C-20 |
| Spring Pin Removal | C-21 |
| Spring Pin Installation | C-22 |
| Hand Lubrication of Bearings | C-23 |
| Wheel Bearing Packer Lubrication of Bearings | C-24 |
| Inspection and Repair of Gears | C-27 |
| Safety Wiring Procedures | C-28 |
| Single Fastener Double-Twist Safety Wiring | C-30 |
| Castellated Nuts on Undrilled Stud Double-Twist Safety Wiring | C-31 |
| Multiple Fastener Double-Twist Safety Wiring | C-32 |
| External Snap Ring Single Wire Safety Wiring | C-33 |
| Small Screws In Closely Spaced, Closed Geometrical Pattern Single Wire Safety Wiring | C-34 |

GENERAL MAINTENANCE -Continued

Inspection and Repair of Welds

1. **Inspect and repair welds in accordance with TM 9-237.**
2. **Military specifications referenced in this manual will be used as mandatory guidelines beyond-the scope of TM 9-237 during welding processes.**
3. **When welding requirements are beyond organizational capabilities, notify support maintenance personnel.**

Inspection, Care, and Maintenance of Antifriction Bearings, Refer to TM 9-214

GENERAL MAINTENANCE -Continued

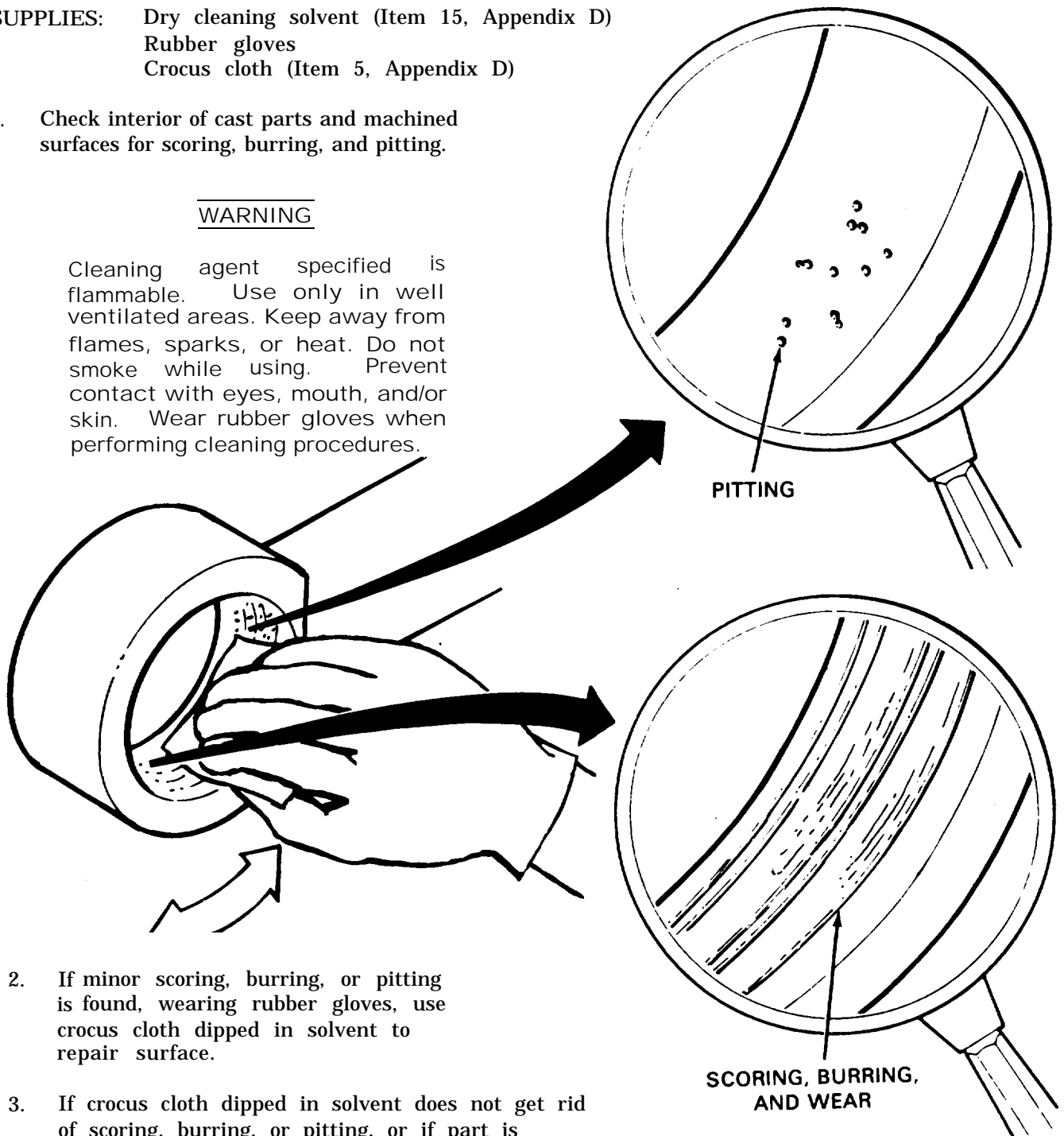
Inspection and Repair of Cast Parts and Machined Surfaces (Sheet 1 of 2)

SUPPLIES: Dry cleaning solvent (Item 15, Appendix D)
 Rubber gloves
 Crocus cloth (Item 5, Appendix D)

1. Check interior of cast parts and machined surfaces for scoring, burring, and pitting.

WARNING

Cleaning agent specified is flammable. Use only in well ventilated areas. Keep away from flames, sparks, or heat. Do not smoke while using. Prevent contact with eyes, mouth, and/or skin. Wear rubber gloves when performing cleaning procedures.



2. If minor scoring, burring, or pitting is found, wearing rubber gloves, use crocus cloth dipped in solvent to repair surface.
3. If crocus cloth dipped in solvent does not get rid of scoring, burring, or pitting, or if part is excessively scored, worn, pitted, or burred, turn in part.

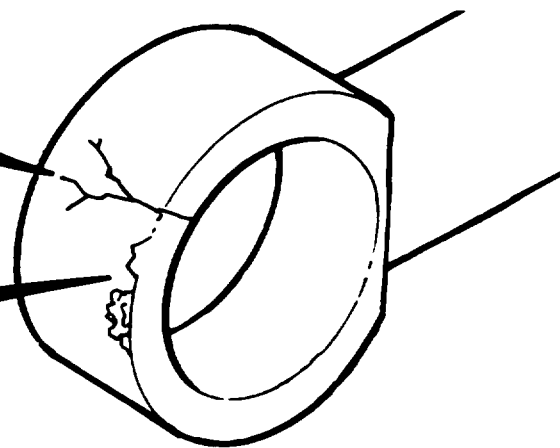
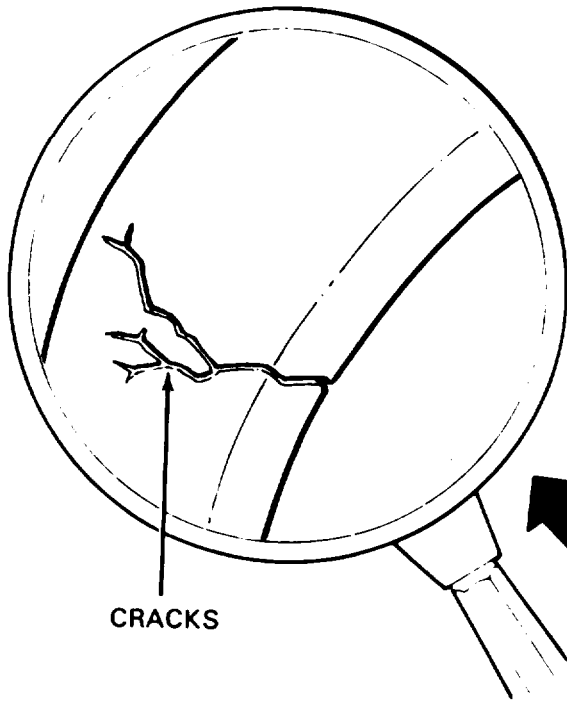
Go on to Sheet 2

TA169863

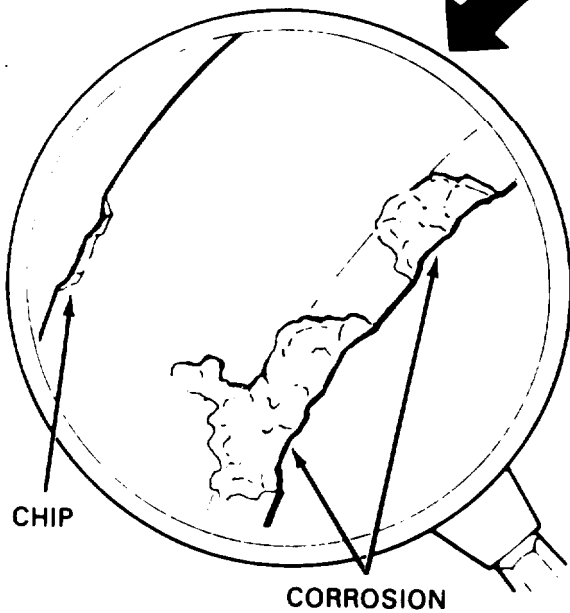
GENERAL MAINTENANCE -Continued

Inspection and Repair of Cast Parts and Machined Surfaces (Sheet 2 of 2)

4. Check exterior of cast parts and machined surfaces for cracks, chipping, and corrosion.



5. Throw part away if cracked, chipped, or heavily corroded.



End of Task

TA169864

GENERAL MAINTENANCE - Continued

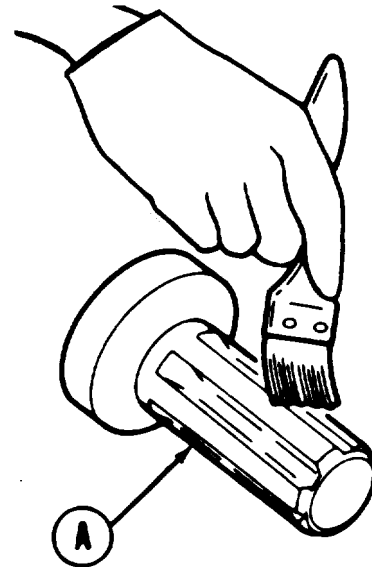
Inspection and Repair of Splines (Sheet 1 of 2)

TOOLS: Hand file
 Hand oiler
 1/4 in. paint brush

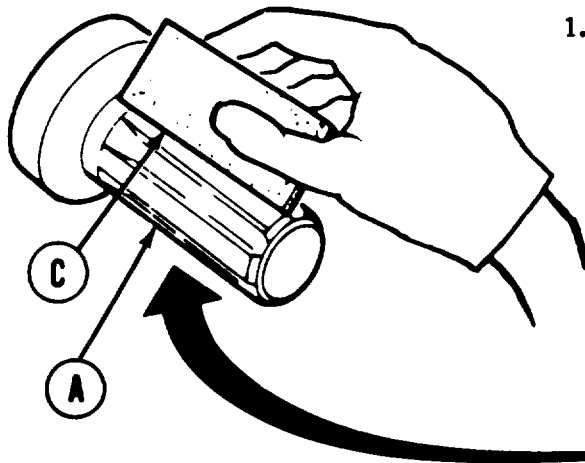
SUPPLIES: Dry cleaning solvent (Item 15, Appendix D)
 Rubber gloves
 Crocus cloth (Item 5, Appendix D)
 Clean rags (Item 12, Appendix D)
 Lubricating oil (Item 10, Appendix D)
 Protective wrapping (if required)

WARNING

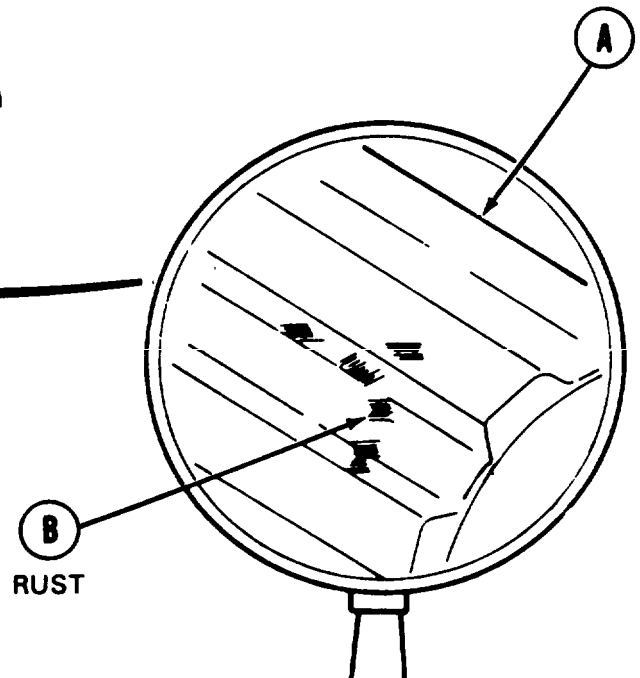
Cleaning agent specified is flammable. Use only in well ventilated areas. Keep away from flames, sparks, or heat. Do not smoke while using. Prevent contact with eyes, mouth, and/or skin. Wear rubber gloves when performing cleaning procedures.



1. Wearing gloves, use dry cleaning solvent and brush to clean spline (A). Make sure all traces of grease and dirt are gone.



2. Using clean rag, wipe spline (A) dry.
3. Check spline (A) for signs of rust (B).
4. Using crocus cloth (C), rub rust (B) off spline (A).



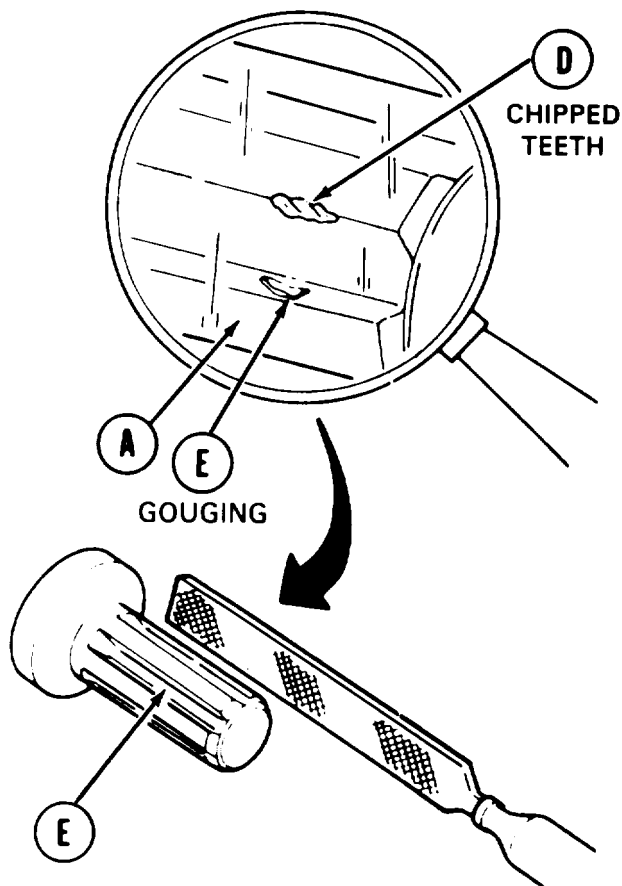
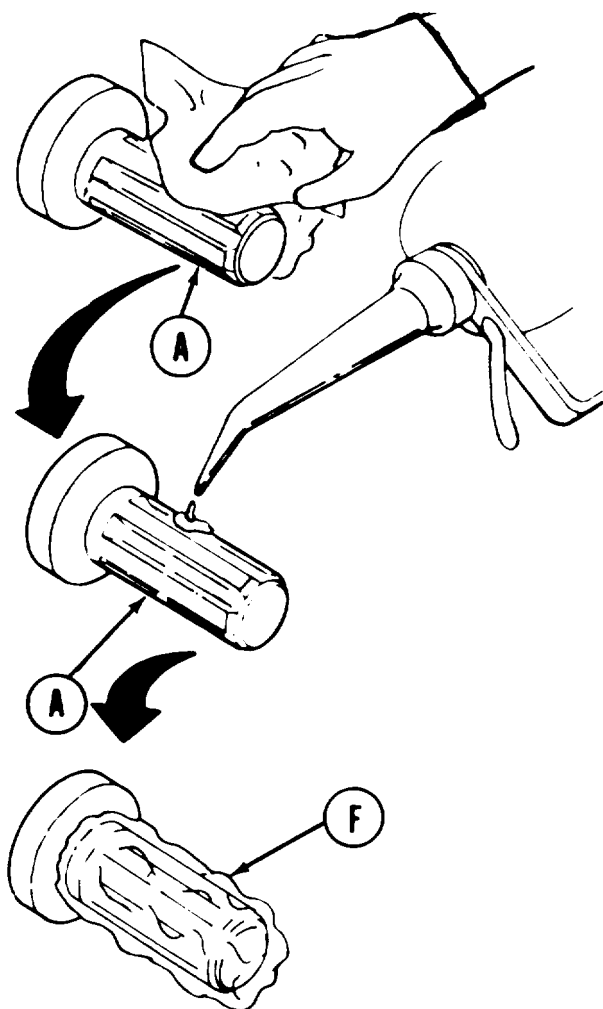
Go on to Sheet 2

TA169865

GENERAL MAINTENANCE -Continued

Inspection and Repair of Splines (Sheet 2 of 2)

5. Check for chipped teeth (D) and gouging (E) on face of spline (A).
6. Using hand file, get rid of sharp edges or light gouging (E).
7. Using rag dampened with dry cleaning solvent, wipe metal chips and metal dust from spline (A).



NOTE

Only if spline (A) will not be used right away, do steps 8 and 9.

8. Using oil, coat spline (A).
9. Using protective wrapping (F), wrap spline (A).

End of Task

TA169866

GENERAL MAINTENANCE -Continued

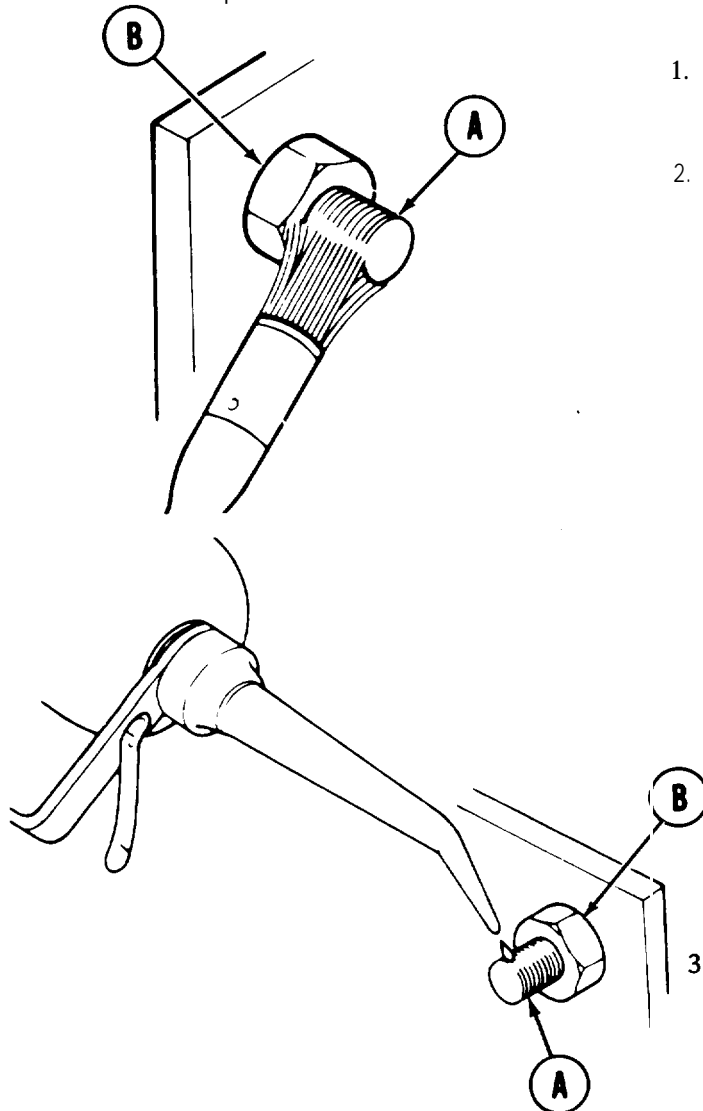
Cleaning Threads and Nuts

TOOLS: Wire brush
 1/4 in. paint brush
 Hand oiler

SUPPLIES: Dry cleaning solvent (Item 15, Appendix D)
 Penetrating oil (Item 11, Appendix D)
 Rubber gloves

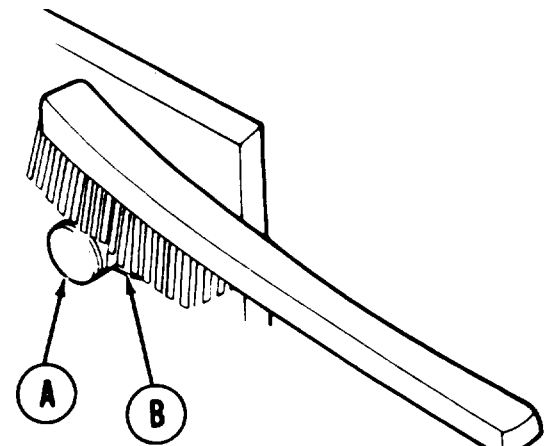
WARNING

Cleaning agent specified is flammable. Use only in well ventilated areas. Keep away from flames, sparks, or heat. Do not smoke while using. Prevent contact with eyes, mouth, and/or skin. Wear rubber gloves when performing cleaning procedures.



1. Wearing gloves, use dry cleaning solvent and brush to clean threads (A) and nut (B).

2. Using wire brush, clean threads (A) and nut (B). Make sure all traces of rust and dirt are removed.



3. Using penetrating oil, lube threads (A) and nut (B). Let oil seep between threads (A) and nut (B).

End of Task

TA169867

GENERAL MAINTENANCE -Continued

Loosening and Removing Nuts

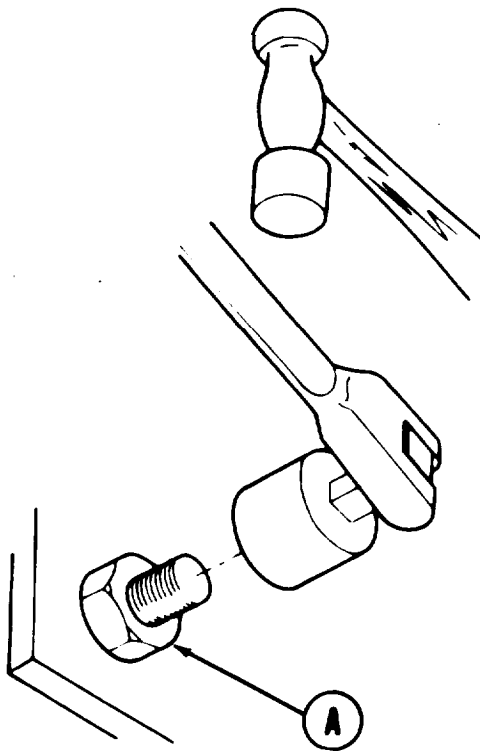
TOOLS: Ball peen hammer
Wire brush

1. Using socket, try to remove nut (A).
2. If nut (A) will not turn, clean threads and nut (page C-7).
3. Using hammer and socket wrench handle with socket, gently tap drive end to free nut (A).

NOTE

If nut (A) cannot be freed by step 3 above, go to page C-9.

4. Take off and throw away nut (A). If nut (A) was attached to a bolt, replace bolt.

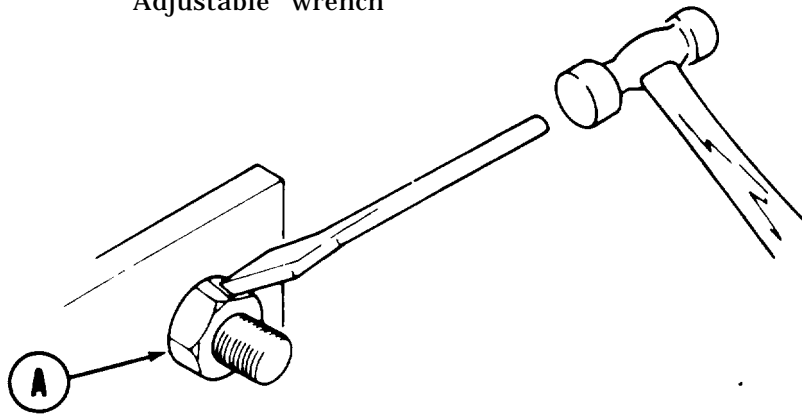


End of Task

GENERAL MAINTENANCE -Continued

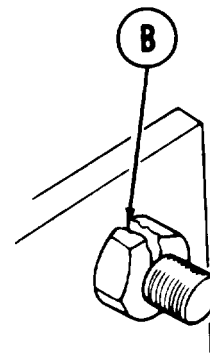
Cutting Nuts

TOOLS: Cape chisel
Screw threading set
Ball peen hammer
Adjustable wrench



1. Using hammer and cape chisel, cut flat side of nut (A).

2. Stop cutting when nut (A) spreads apart (B).

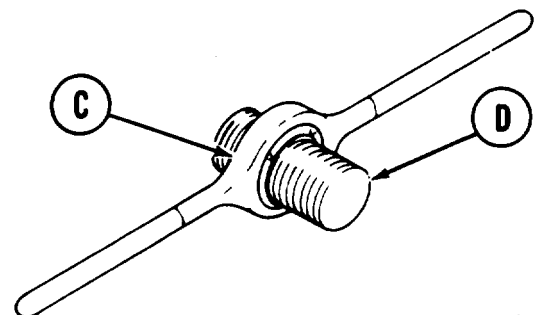


3. Using wrench remove nut (A).

NOTE

If nut (A) was removed from end of a bolt, throw bolt away if damaged. If nut (A) was removed from a stud or threaded shaft, do step 4.

4. Using die (C), clean up threads (D).



End of Task

TA169869

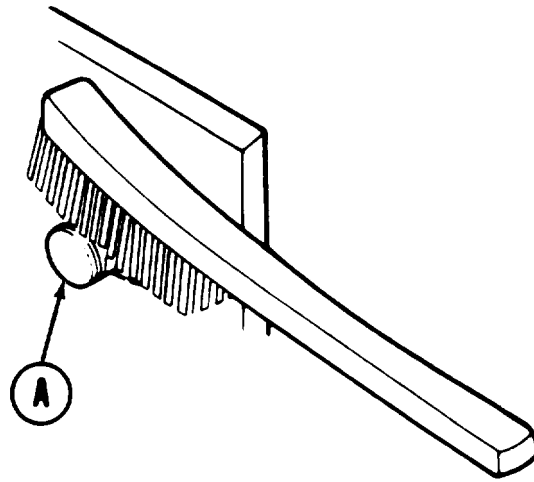
GENERAL MAINTENANCE -Continued

Bolt Removal

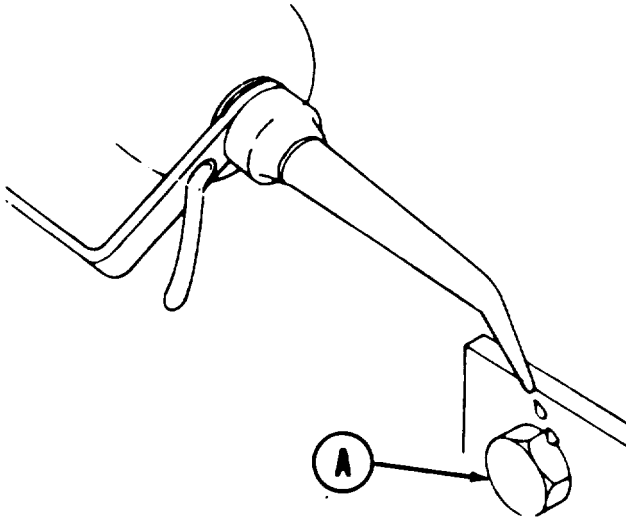
TOOLS: Ball peen hammer
Wire brush
Hand oiler

SUPPLIES: Penetrating oil (Item 11, Appendix D)

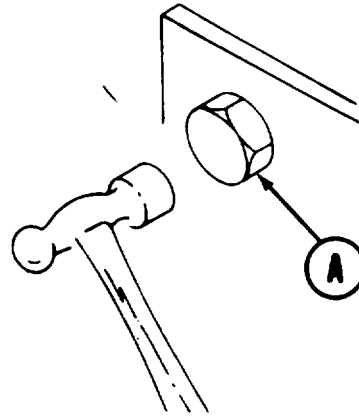
1. Using wire brush, clean head of bolt (A) and nearby area.



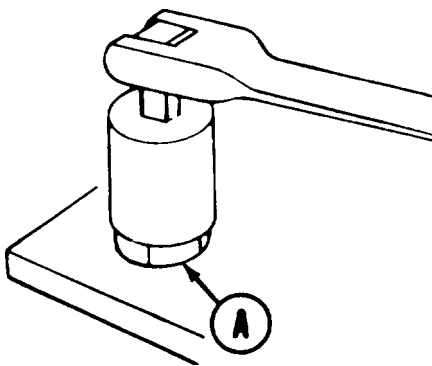
2. Using penetrating oil around head of bolt (A), allow oil to seep into threads.



3. Using hammer, lightly tap head of bolt (A).



4. Using socket wrench handle with socket, remove bolt (A). Throw away bolt (A) if damaged.



End of Task

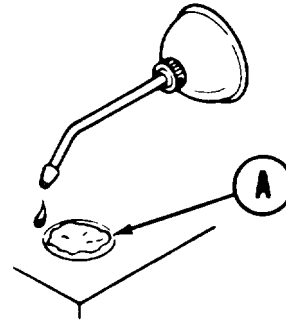
TA169870

GENERAL MAINTENANCE -Continued

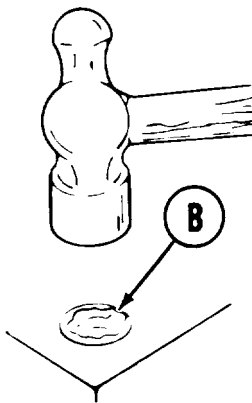
Removal of Studs Broken at Surface (Sheet 1 of 3)

- TOOLS:** Screw threading set
 Portable electric drill
 Twist drill set
 Screw extractor set
 Ball peen hammer
 Prick punch
 Hand oiler

- SUPPLIES:** penetrating oil (Item 9, Appendix D)
 Clean rags (Item 12, Appendix D)



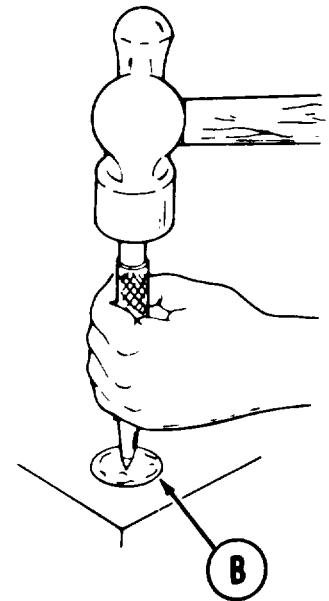
1. Using penetrating oil, lube thread area (A).



2. Using hammer, lightly tap stud (B).

NOTE

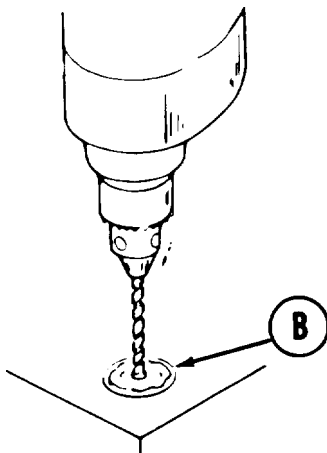
It is very important to drill out broken stud on exact center line.



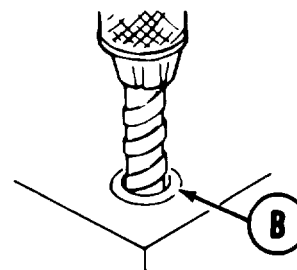
3. Using punch and hammer, punch center of broken stud (B).

WARNING

Safety glasses must be worn when using drill to prevent injury to eyes.



4. Using electric drill with pilot twist drill, drill center of stud (B).



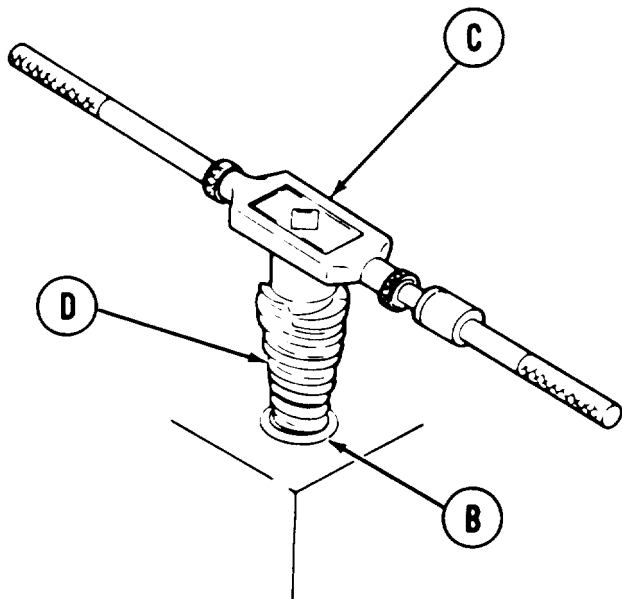
5. Using electric drill with twist drill slightly smaller than extractor, drill into stud (B).

Go on to Sheet 2

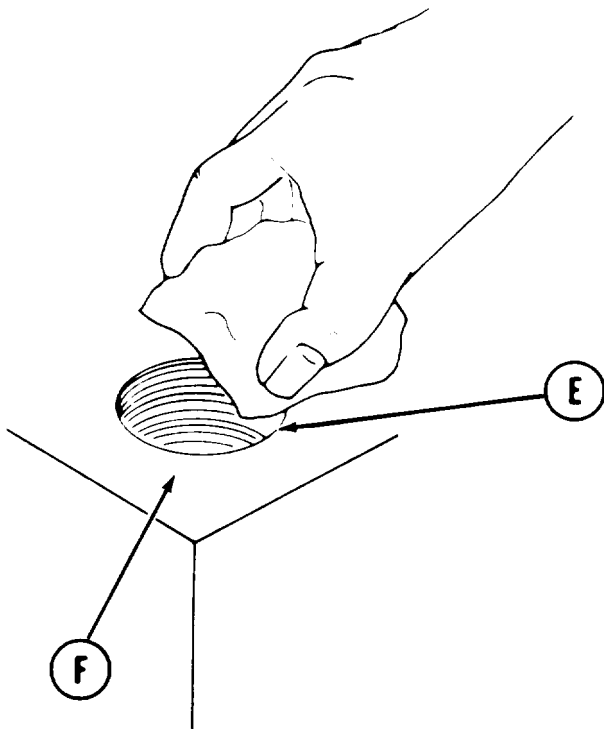
TA169871

GENERAL MAINTENANCE -Continued

Removal of Stud Broken at Surface (Sheet 2 of 3)



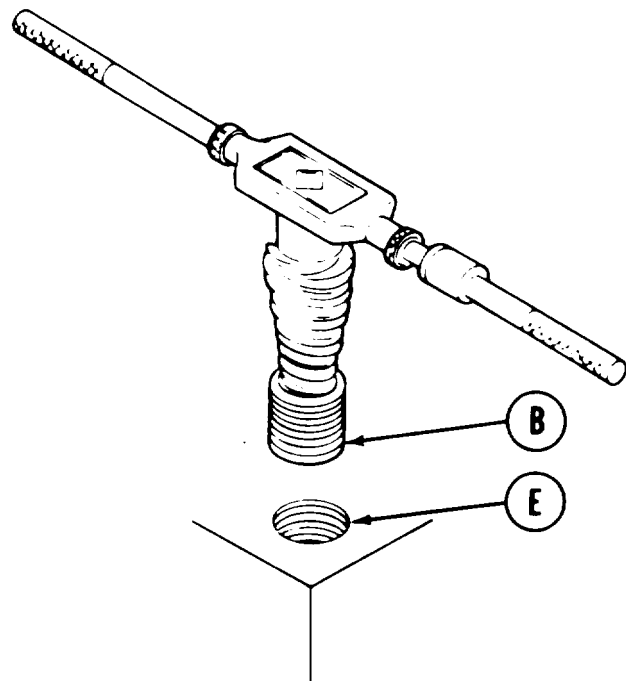
6. Using tap wrench handle (C) with screw extractor (D), turn tap wrench handle (C) counterclockwise to screw extractor (D) into stud (B).



Go on to Sheet 3

NOTE

After being drilled, studs broken at a surface may be removed either by using a spiral tapered screw extractor or a fluted type screw extractor. If a spiral tapered screw extractor is used, go to step 6. If a fluted type extractor is used, go to step 9.



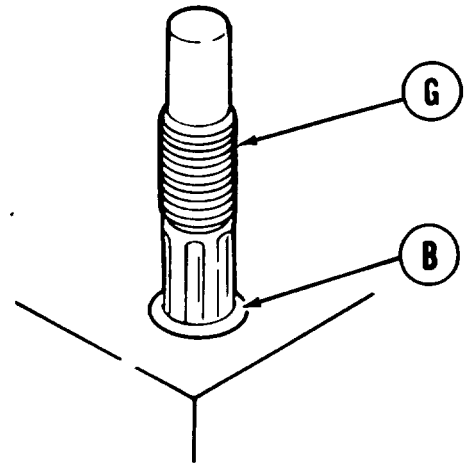
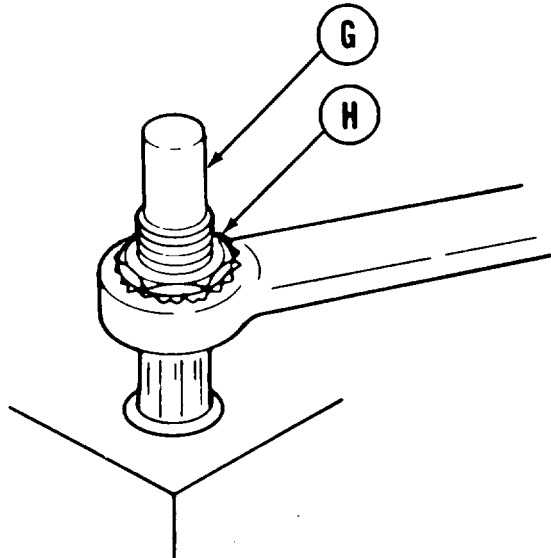
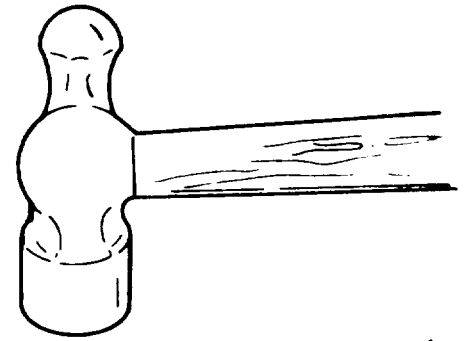
7. Keep turning extractor counterclockwise until stud (B) is removed from threaded hole (E).
8. Using clean rag, wipe out threaded hole (E) and surface (F).

TA169872

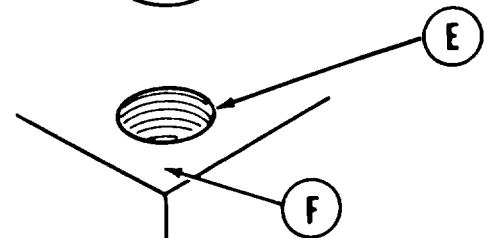
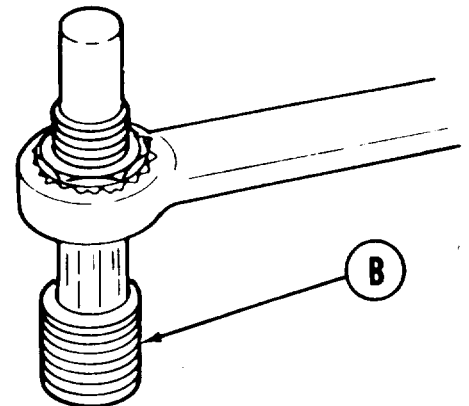
GENERAL MAINTENANCE -Continued

Removal of Studs Broken at Surface (Sheet 3 of 3)

9. Using hammer, drive fluted extractor (G) into stud (B).
10. Manually start nut (H) counterclockwise on extractor (G).



11. Using wrench, tighten nut (H) on extractor (G) by turning counterclockwise.
12. Using wrench, keep turning nut (H) counterclockwise until stud (B) is removed from threaded hole (E).
13. Using clean rag, wipe out threaded hole (E) and surface (F).



End of Task

TA169873

GENERAL MAINTENANCE -Continued

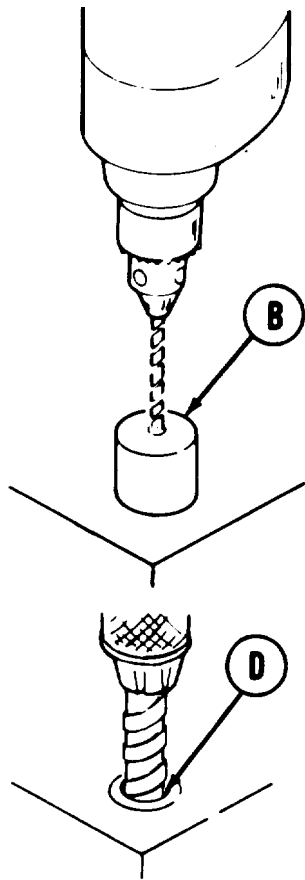
Removal of Studs Broken Below Surface (Sheet 1 of 3)

TOOLS: Screw extractor set
Portable electric drill
Twist drill set
Hand oiler
Ball peen hammer

SUPPLIES: Penetrating oil (Item 9, Appendix D)
Clean rags (Item 12, Appendix D)

1. Using penetrating oil, lube thread area (A).
2. Choose right size guide (B) to fit hole (C).

3. Place guide (B) into hole (C).



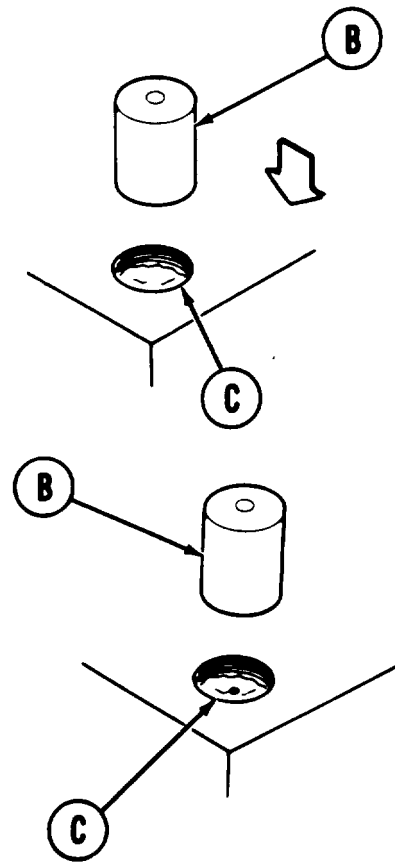
WARNING

Safety glasses must be worn when using drill to prevent injury to eyes.

4. Using electric drill with pilot twist drill, drill stud through center of guide (B).
5. Take guide (B) out of hole (C).
6. Using electric drill with twist drill slightly smaller than extractor, drill into stud (D).

NOTE

Make sure all metal chips are removed from hole (C) before using extractor.

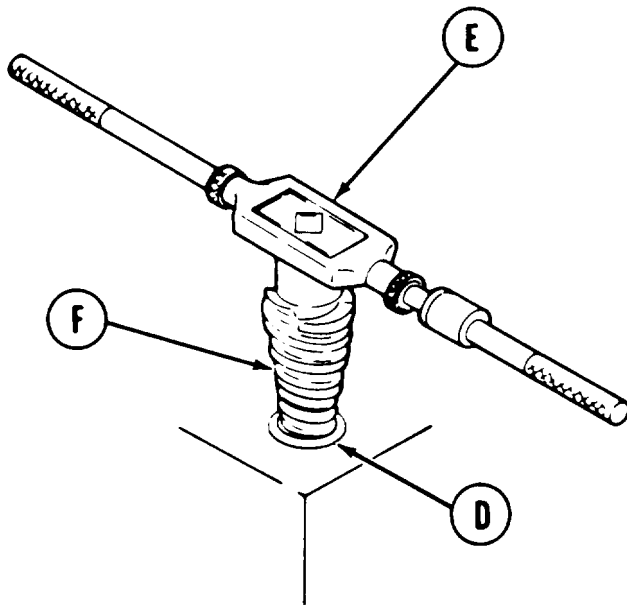


Go on to Sheet 2

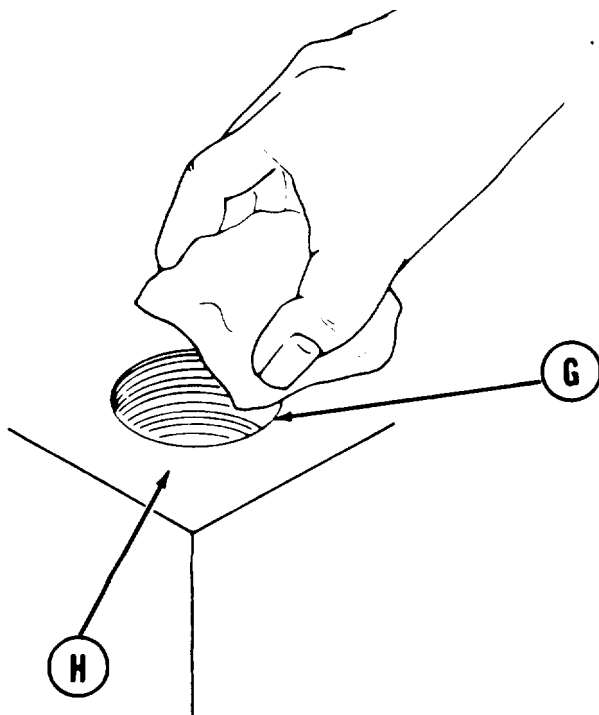
TA169874

GENERAL MAINTENANCE - **Continued**

Removal of Studs Broken Below Surface (Sheet **2** of **3**)



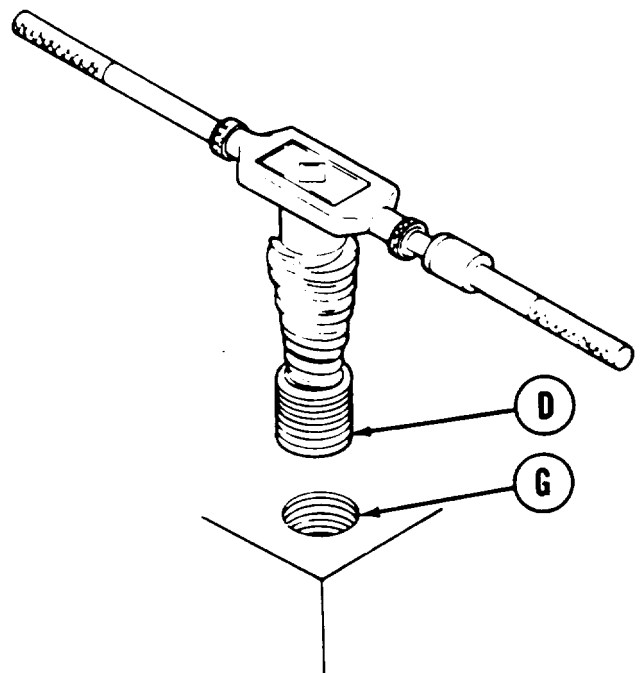
7. Using tap wrench handle (E) with screw extractor (F), turn tap wrench handle (E) counterclockwise to screw extractor (F) into stud (D).



Go on to Sheet 3

NOTE

After being drilled, studs broken below surface may be removed either by using a spiral tapered screw extractor or a fluted type. If a spiral tapered screw extractor is used, go to step 7. If a fluted type extractor is used, go to step 10.



8. Keep turning extractor counterclockwise until stud (D) is removed from threaded hole (G).
9. Using clean rag, wipe out threaded hole (G) and surface (H).

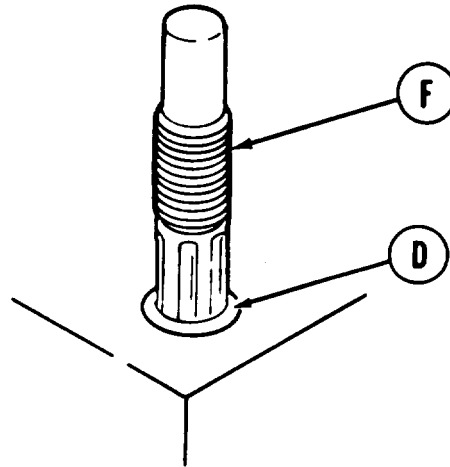
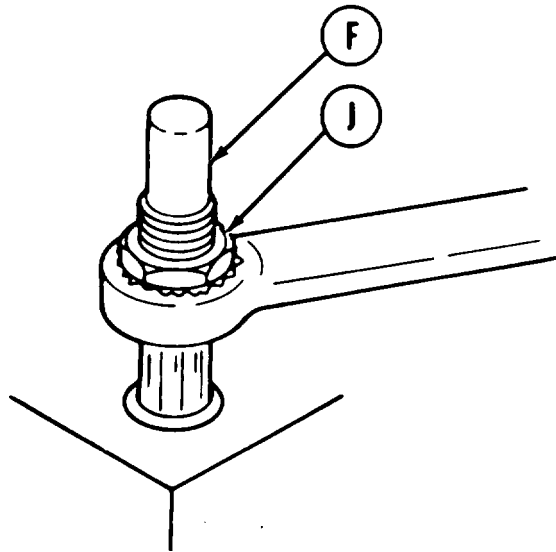
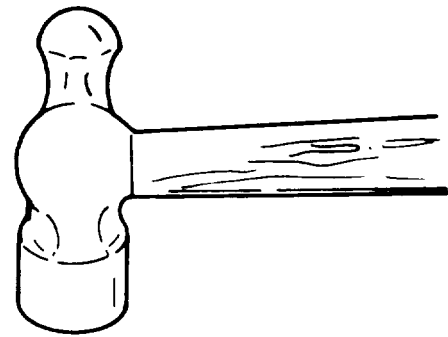
TA169875

GENERAL MAINTENANCE -Continued

Removal of Studs Broken Below Surface (Sheet 3 of 3)

10. Using hammer, drive fluted extractor (F) into stud (D).

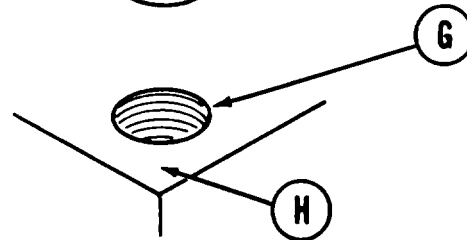
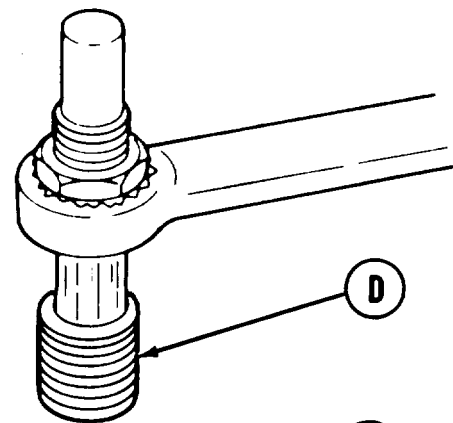
11. Manually start nut (J) counterclockwise on extractor (F).



12. Using wrench, tighten nut (J) on extractor (F) by turning counterclockwise.

13. Using wrench, keep turning nut (J) counterclockwise until stud (D) is removed from threaded hole (G).

14. Using clean rag, wipe out threaded hole (G) and surface (H).



End of Task

TA169876

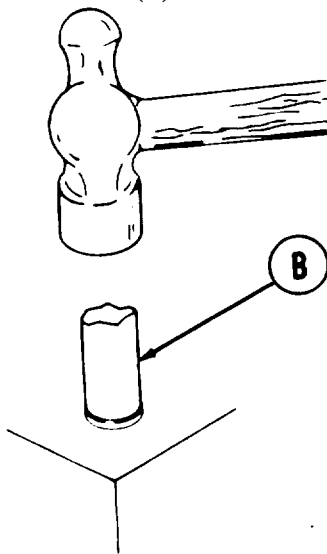
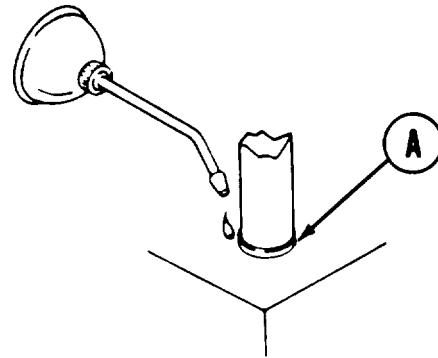
GENERAL MAINTENANCE -Continued

Removal of Studs Broken Above Surface

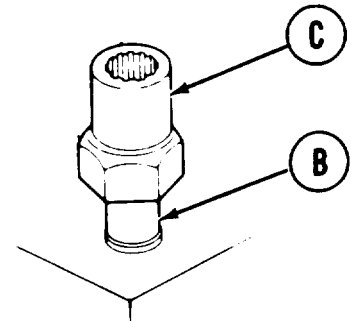
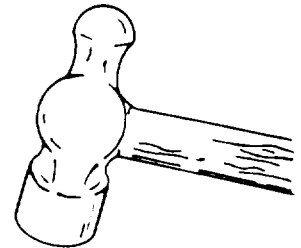
TOOLS: Ball peen hammer
Screw extractor set
Hand oiler

SUPPLIES: Penetrating oil (Item 11, Appendix D)
Clean rags (Item 12, Appendix D)

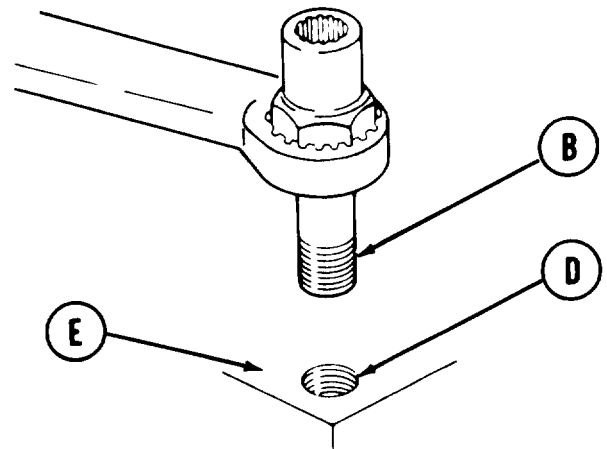
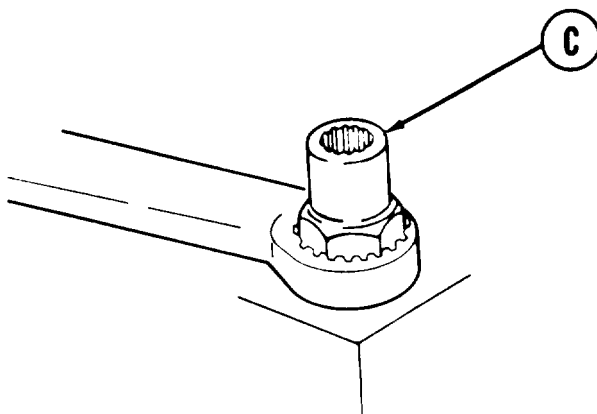
1. Using penetrating oil, lube threaded area (A).



2. Using hammer, lightly tap stud (B).
3. Using hammer, tap stud remover (C) on stud (B).
4. Using wrench, turn stud remover (C) counterclockwise.



5. Using wrench, keep turning stud remover (C) counterclockwise until stud (B) is removed from threaded hole (D).



6. Using clean rag, wipe out threaded hole (D) and surface (E).

End of Task

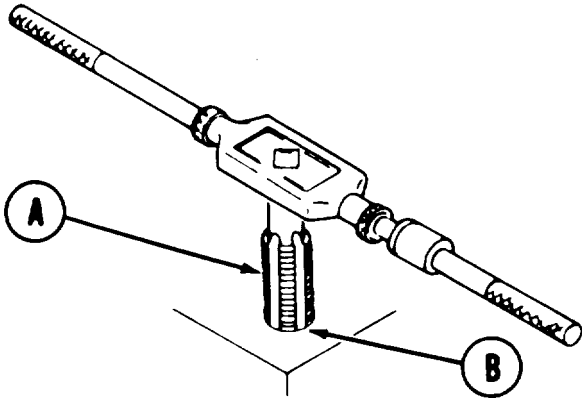
TA169877

GENERAL MAINTENANCE -Continued

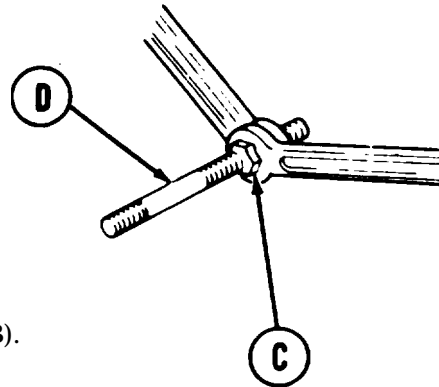
Installation of New Studs

TOOLS: Screw threading set

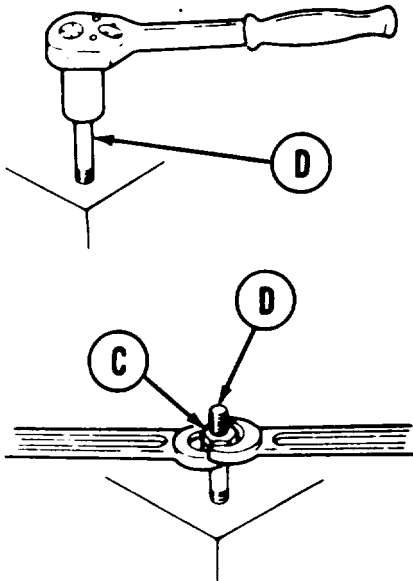
1. Using tap (A), clean out threads in hole (B).



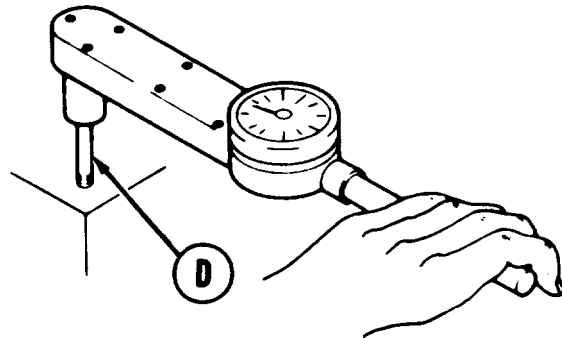
2. Using two wrenches, screw together and jam two nuts (C) onto end of new stud (D).



3. Using socket, loosely install new stud (D) into hole (B).



4. Using torque wrench, tighten new stud (D) to required value (refer to specific maintenance procedure).



Using two wrenches, remove two nuts (C) from new stud (D).

End of Task

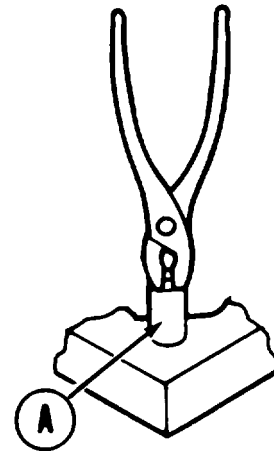
TA169878

GENERAL MAINTENANCE -Continued

Dowel Pin Removal

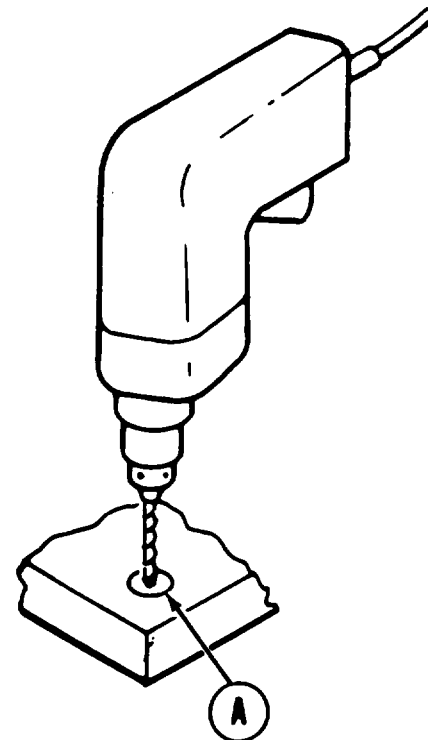
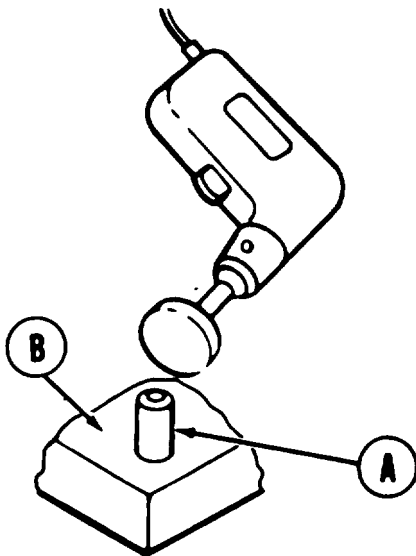
TOOLS: Slip joint pliers
 Portable electric hand grinder (if required)
 Portable electric drill (if required)
 Twist drill set

1. Using pliers, grip pin (A).



2. Using pliers, pull out pin (A) with twisting motion.

3. If unable to pull out pin (A) with pliers, using hand grinder, grind pin (A) off flush with surface (B).



4. Using electric drill and twist drill, drill out rest of pin (A).

End of Task

TA169879

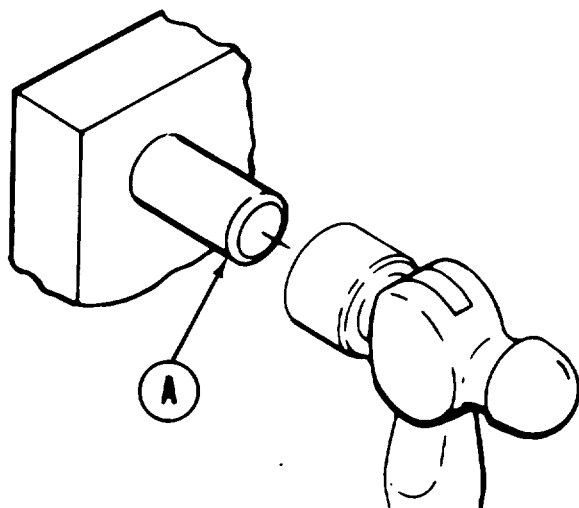
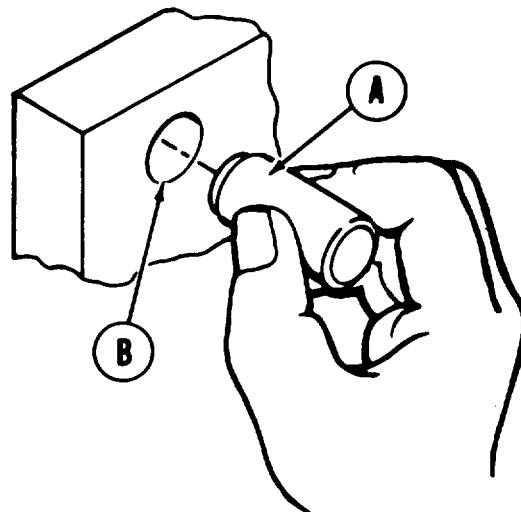
GENERAL MAINTENANCE -Continued

Dowel Pin Installation

TOOLS: Ball peen hammer

SUPPLIES: Wooden block

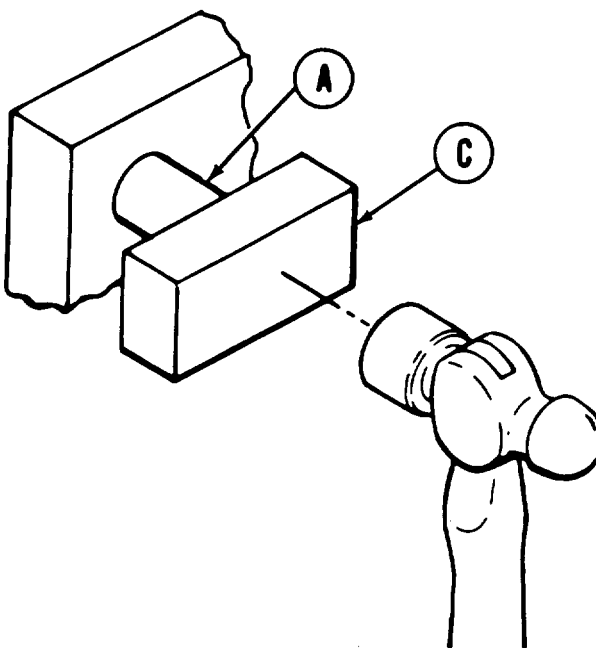
1. Place pin (A) into hole (B), keeping pin (A) as straight as possible.



CAUTION

If pin (A) is tapped too hard, end will flatten out and pin (A) will not properly seat.

2. Using hammer, lightly tap in pin (A) until seated.
3. If pin (A) cannot be driven by lightly tapping with hammer, using wooden block (C), put wooden block against pin (A) and hit with hammer until pin (A) is seated.



End of Task

TA169880

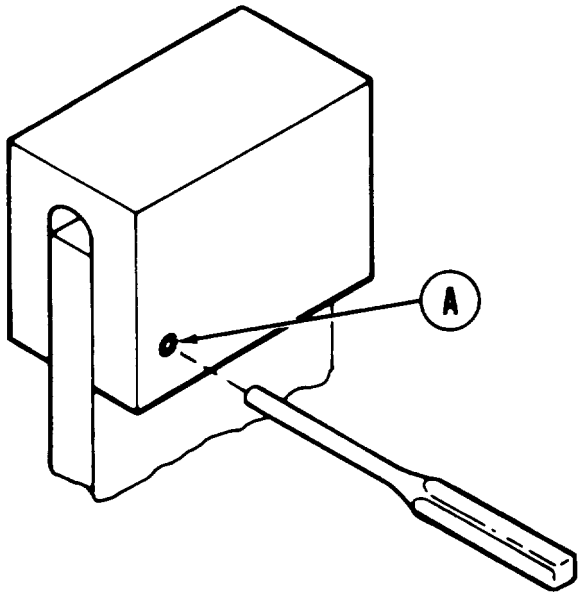
GENERAL MAINTENANCE -Continued

Spring Pin Removal

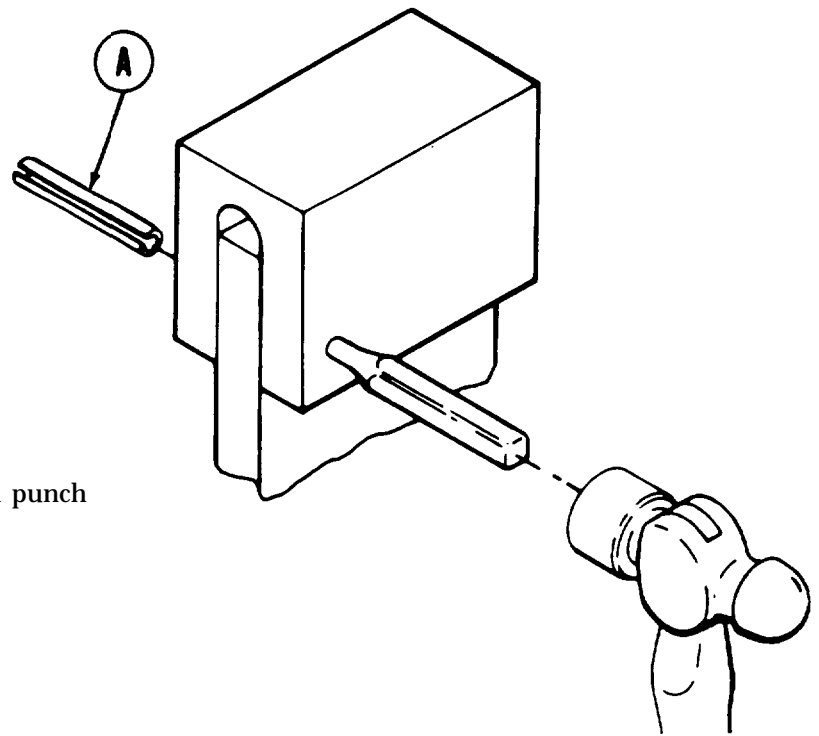
TOOLS: Ball peen hammer
 Drive pin punch

NOTE

Drive pin punch used to remove spring pin must be about 1/32 inch smaller than pin hole.



1. Put drive pin punch into spring hole and center on pin (A).



2. Using hammer, lightly tap drive pin punch until pin (A) is driven out of hole.

End of Task

TA169881

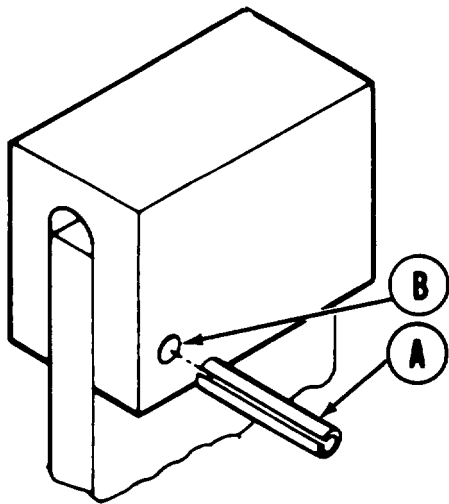
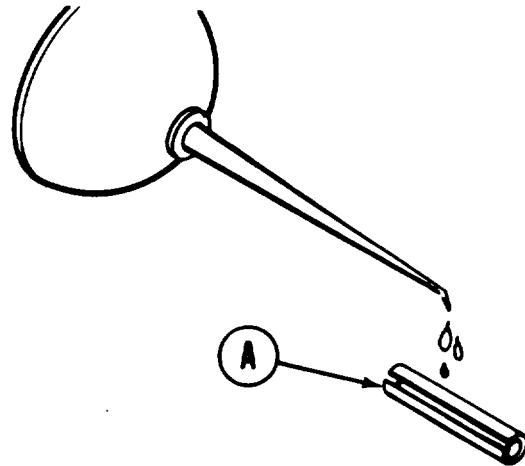
GENERAL MAINTENANCE -Continued

Spring Pin Installation

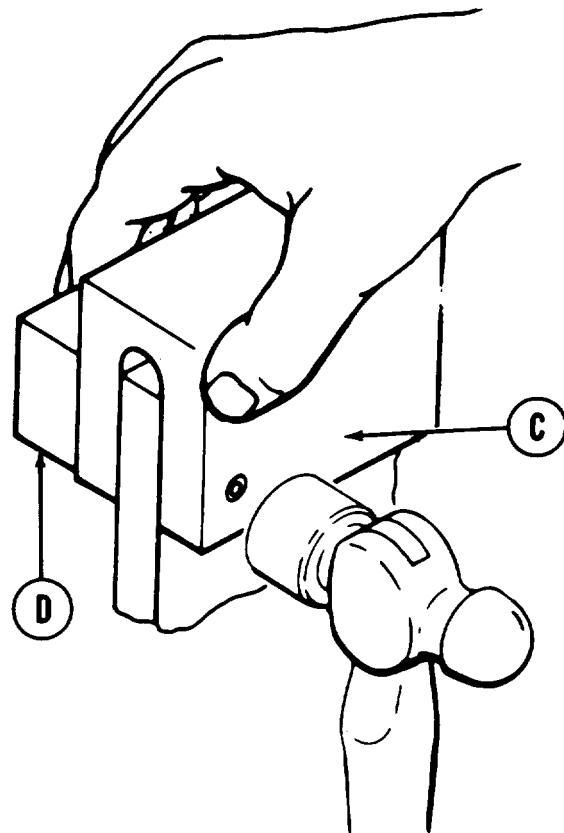
TOOLS: Ball peen hammer
Hand oiler

SUPPLIES: Lubricating oil (Item 10, Appendix D)
Wooden block

1. Using oil, lightly lube pin (A).



2. Putting spring pin (A) into hole (B), keep it as straight as possible.
3. Using hammer, tap pin (A) until flush with surface (C).



NOTE

If structure is not sturdy, support opposite end of hole with wooden block (D) while tapping pin (A) into place.

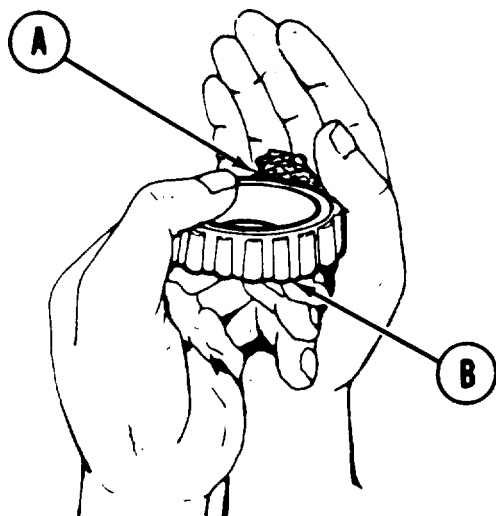
End of Task

TA169882

GENERAL MAINTENANCE -Continued

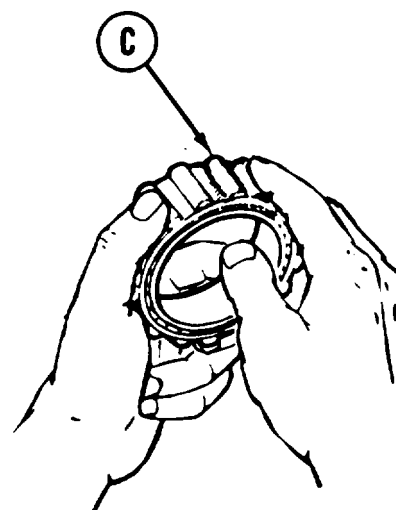
Hand Lubrication of Bearings

SUPPLIES: Grease (Item 9, Appendix D)
Clean rags (Item 12, Appendix D)



1. Place about 1 ounce of grease (A) into palm of one hand.
2. Holding bearing (B) in other hand, force grease (A) between inner race and cage.
3. Press bearing (B) into grease until grease (A) appears on other side of bearing (B).

4. Turning bearing (B) over, repeat steps 1, 2, and 3.
5. Using light film of grease (A), lube rollers (C).
6. Using clean rags, cover bearing (B) until ready for assembly.



End of Task

TA169883

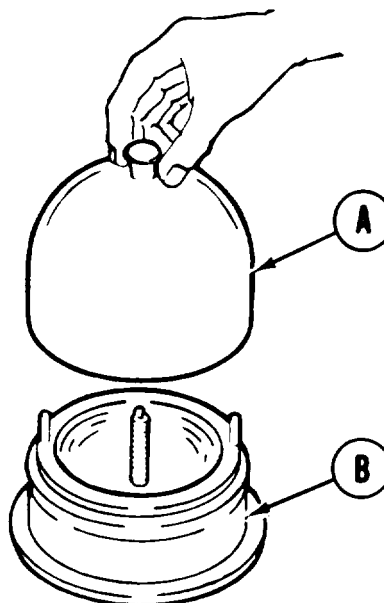
GENERAL MAINTENANCE -Continued

Wheel Bearing Packer Lubrication of Bearings (Sheet 1 of 3)

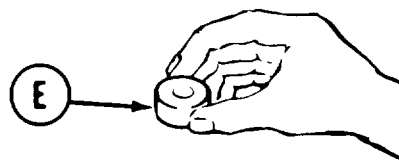
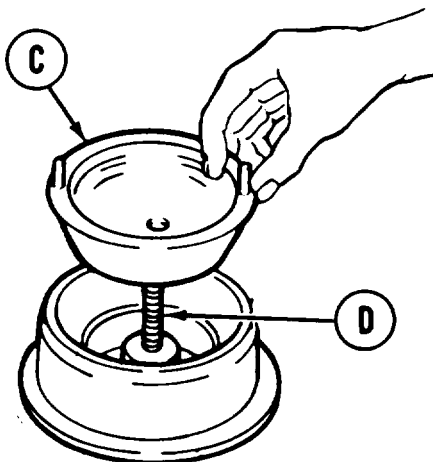
TOOLS: Wheel bearing packer
Hand grease gun

SUPPLIES: Grease (Item 9, Appendix D)
Clean rags (Item 12, Appendix D)

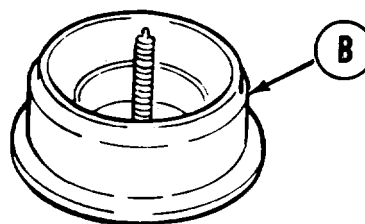
1. Take cover (A) off base (B).



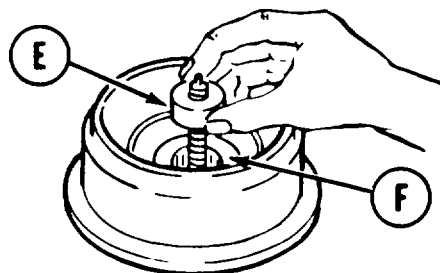
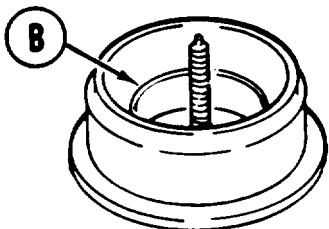
2. Unscrew cap (C) from center post (D).



3. Take insert (E) from base (B).



4. Put bearing (F) into base (B).



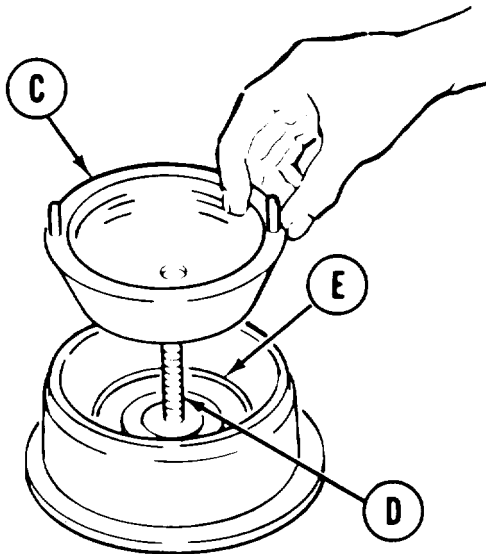
5. Put insert (E) in center of bearing (F) to act as filler.

Go on to Sheet 2

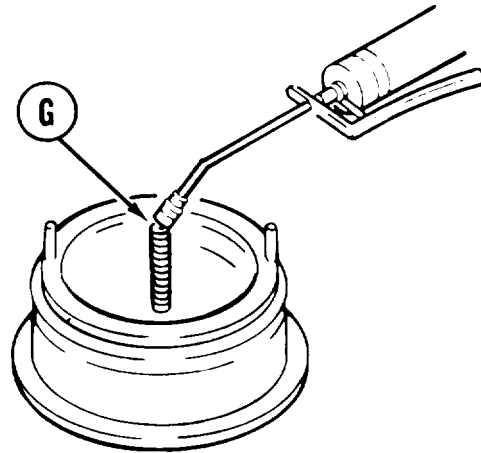
TA169884

GENERAL MAINTENANCE -Continued

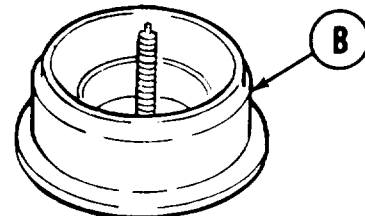
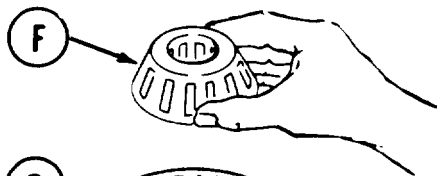
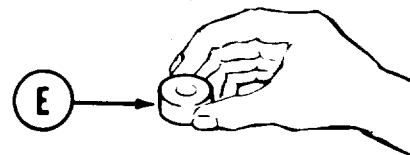
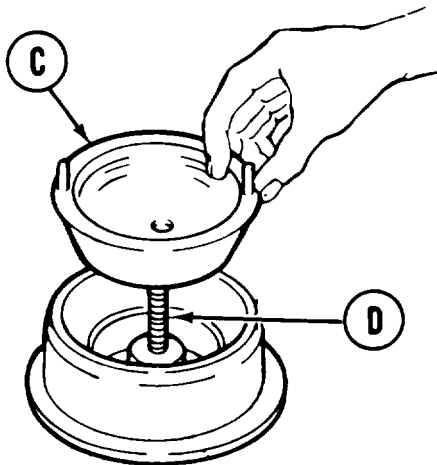
Wheel Bearing Packer_Lubrication_of_Bearings_(Sheet 2 of 3)



6. Screw cap (C) onto center post (D) to hold bearing (E) in position.
7. Using grease gun, pump grease into fitting (G) until resistance is felt.



8. Unscrew cap (C) from center post (D).
9. Take insert (E) from base (B).



10. Remove bearing (F) from base (B).

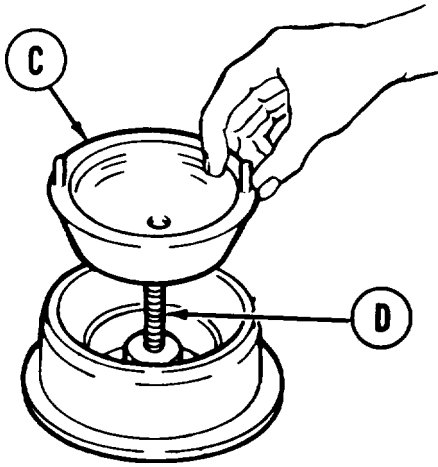
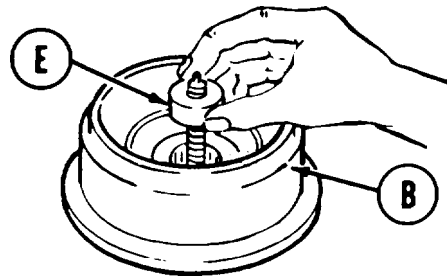
Go on to Sheet 3

TA169885

GENERAL MAINTENANCE

Wheel Bearing Packer Lubrication of Bearings (Sheet 3 of 3)

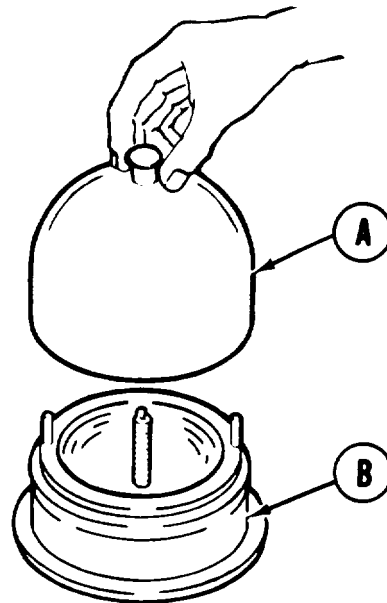
11. Put insert (E) into base (B).



12. Screw cap (C) onto center post (D),

13. Put cover (A) onto base (B).

14. Place clean rags over bearing until ready for assembly.



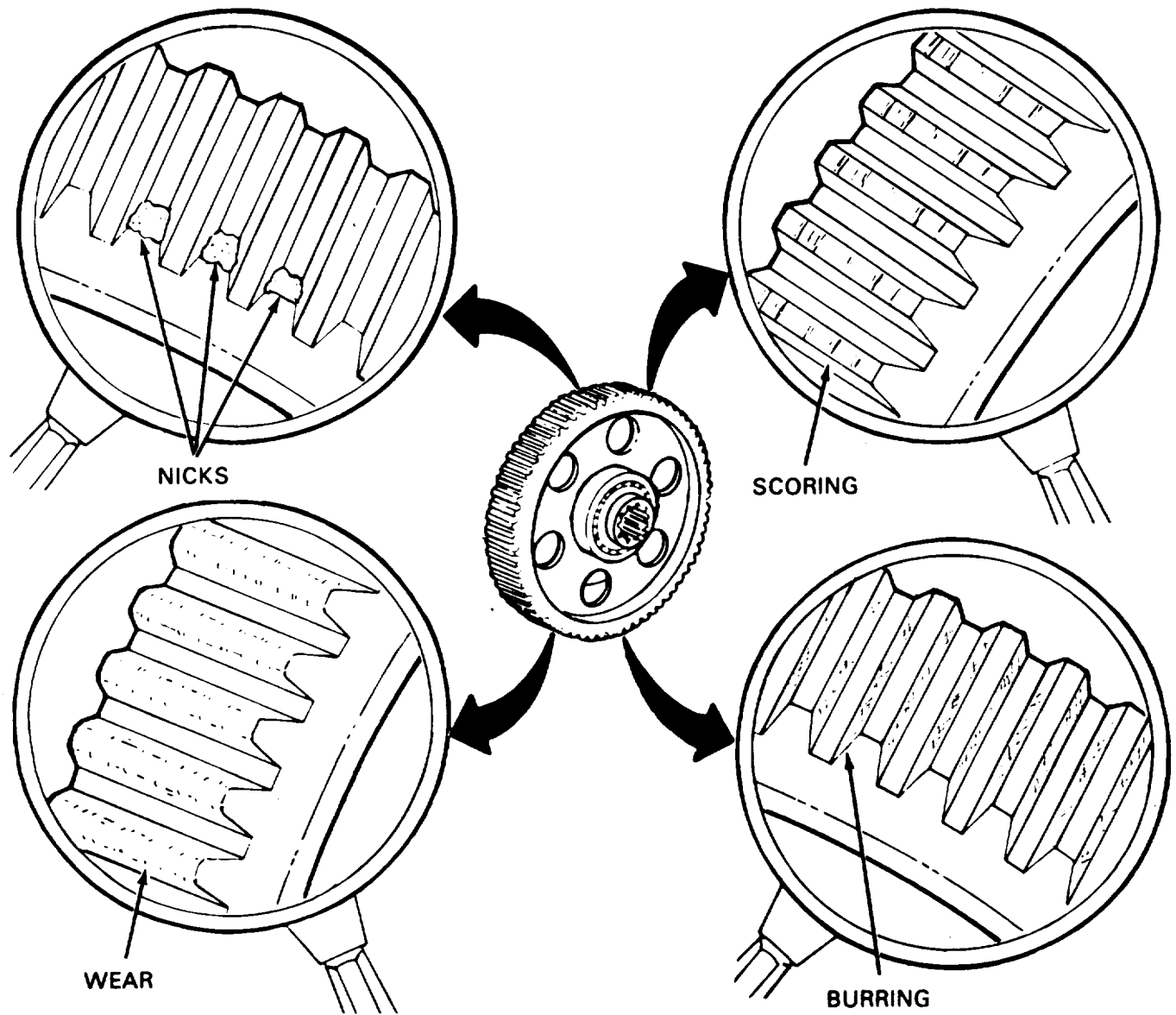
End of Task

TA169886

GENERAL MAINTENANCE -Continued

Inspection and Repair of Gears

SUPPLIES Crocus cloth (Item 5, Appendix D)



1. Check gears for wear, nicks, scoring, and burring.
2. Using crocus cloth, try to get rid of minor nicks or burring.
3. If minor nicks or burring cannot be removed with crocus cloth, or if any other damage is seen, replace gears.

TA169887

GENERAL MAINTENANCE -Continued

Safety Wiring Procedures (Sheet 1 of 2)

NOTE

The double-twist method of safety wiring is used as the common method of safety wiring. Use the double-twist method for screws in closed geometric patterns which secure hydraulic or air seals, hold hydraulic pressure, or are used in critical areas of clutch mechanisms.

NOTE

When safety wiring widely spaced multiple groups (fastenings from 4 to 6 inches apart) by the double-twist method, three units are the maximum number that may be wired in series. When safety wiring multiple groups, the maximum number of units that may be safety wired is limited to the number that can be wired with a 24 inch length of wire.

NOTE

The single-wire method is used in a closely spaced (maximum of 2 inches between centers), closed geometric pattern (triangle, square, rectangle, circle, etc.) on parts in electrical systems and in similar places that would make the single-wire method more feasible. Use the single wire method for shear and seal wiring applications.

NOTE

Use copper wire only for securing emergency devices and install so that it can be easily broken when required.

Go on to Sheet 2

TA169888

GENERAL MAINTENANCE - Continued

Safety Wiring Procedures (Sheet 2 of 2)

NOTE

Always use new lockwire.

NOTE

Drilled head bolts and screws installed with self-locking nuts or lockwashers usually do not require safety wiring.

NOTE

Do not **use lockwire to secure fasteners or fittings together that are spaced more than 6 inches apart.**

NOTE

Use care when installing lockwire to be sure it is tight but not overstressed.

NOTE

When safety wiring castellated nuts on drilled studs, tighten nut to low side of torque range (unless otherwise specified) and continue tightening until a slot aligns with hole.

NOTE

Safety wire drain plugs and cocks to adjacent (less than 6 inches away) bolts, nuts, or parts having a free lockhole.

NOTE

Safety wire electrical connectors which have threaded coupling rings or plugs which have screws to fasten the individual parts of the plug together. Safety wire connectors and plugs individually.

TA169889

End of Task

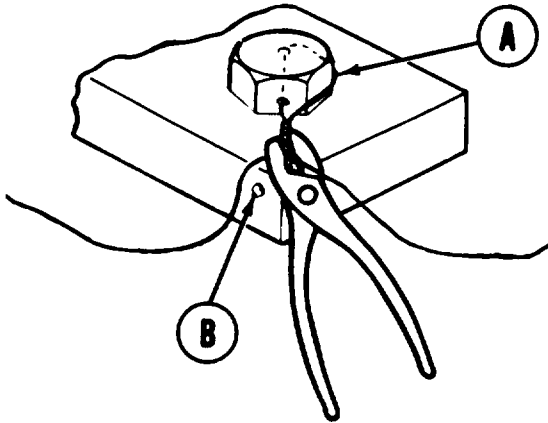
GENERAL MAINTENANCE - **Continued**

Single Fastener Double-Twist Safety Wiring

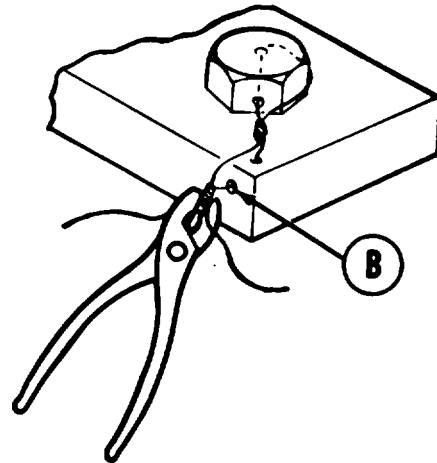
TOOLS: Slip joint pliers
Diagonal cutting pliers

SUPPLIES: Lockwire

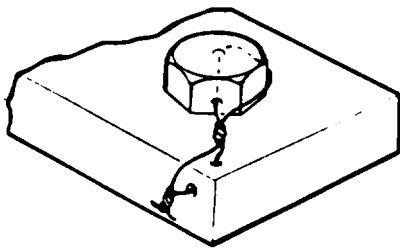
1. Using diagonal cutting pliers, cut piece of lockwire about 24 inches long.



2. Run wire through drilled bolt head (A), keeping length of free wire ends the same.
3. Using slip joint pliers, twist wire until wire twist almost reaches drilled hole (B) in plate.



4. Run one leg of wire through drilled hole (B) in plate.
5. Using slip joint pliers, twist wire at least six times.
6. Using diagonal cutting pliers, cut wire leaving a pigtail from 1/4 to 1/2 inch long.



7. Bend pigtail back under to prevent it from becoming a snag.

End of Task

TA169890

GENERAL MAINTENANCE -Continued

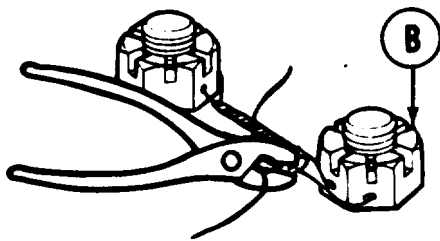
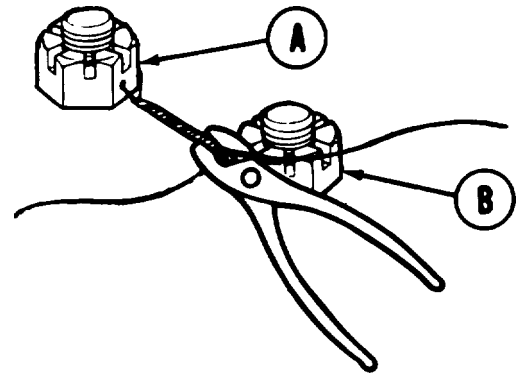
Castellated Nuts on Undrilled Stud Double-Twist Safety Wiring

TOOLS: Slip joint pliers
Diagonal cutting pliers

SUPPLIES: Lockwire

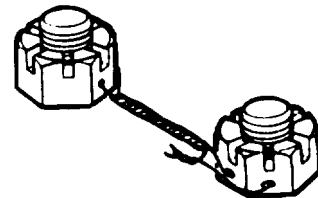
1. Using diagonal cutting pliers, cut a piece of lockwire about 24 inches long.

2. Run wire through nut (A) keeping length of free wire ends the same.
3. Using slip joint pliers, twist wire until wire twist almost reaches next nut (B).
4. Run one leg of wire through nut (B).



5. Using slip joint pliers, twist wire at least six times.

6. Using diagonal cutting pliers, cut wire leaving a pigtail from 1/4 to 1/2 inch long.
7. Bend pigtail back under to prevent it from becoming a snag.



End of Task

TA169891

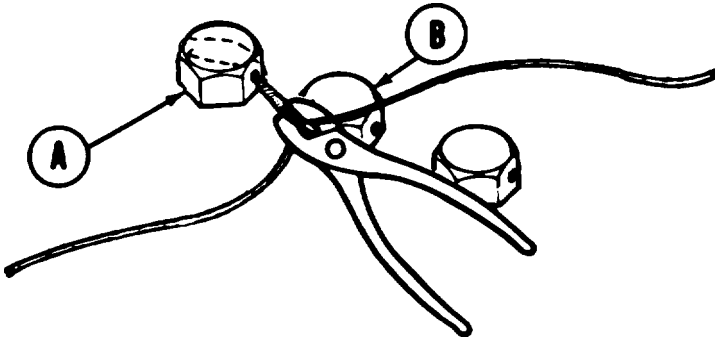
GENERAL MAINTENANCE - Continued

Multiple Fastener Double-Twist Safety Wiring

TOOLS: Slip joint pliers
Diagonal cutting pliers

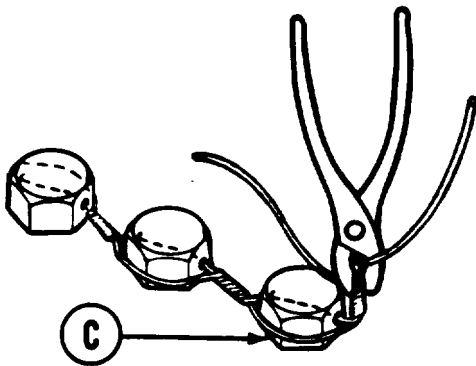
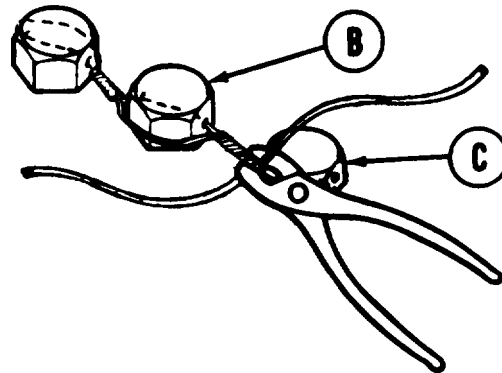
SUPPLIES: Lockwire

1. Using diagonal cutting pliers, cut a piece of lockwire about 24 inches long.



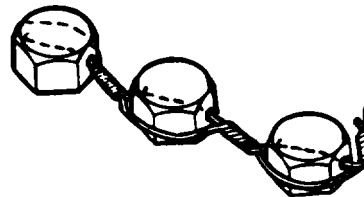
2. Run wire through drilled bolt (A) keeping length of free wire ends the same.

3. Using slip joint pliers, twist wire until twist almost reaches next bolt head (B).
4. Run one leg of wire through bolt head (B).
5. Using slip joint pliers, twist wire until wire twist almost reaches next bolt head (C).
6. Run one leg of wire through bolt head (C).



7. Using slip joint pliers, twist wire at least six times.
8. Using diagonal cutting pliers, cut wire leaving a pigtail from 1/4 to 1/2 inch long.

9. Bend pigtail back under to prevent it from becoming a snag.



End of Task

TA169892

GENERAL MAINTENANCE -Continued

External Snap Ring Single Wire Safety Wiring

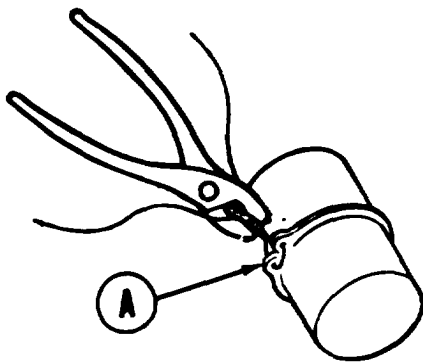
TOOLS: Slip joint pliers
Diagonal cutting pliers

SUPPLIES: Lockwire

NOTE

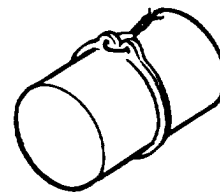
Do not safety wire internal snap rings.

1. Using diagonal cutting pliers, cut a piece of lockwire about 12 inches long.



2. Run wire through two holes in external snap ring (A), keeping length of free wire ends the same.
3. Using slip joint pliers, twist wire at least six times.

4. Using diagonal cutting pliers, cut wire leaving a pigtail from 1/4 to 1/2 inch long.
5. Bend pigtail back under to prevent it from becoming a snag.



End of Task

TA169893

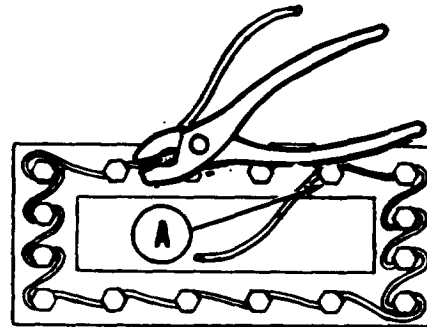
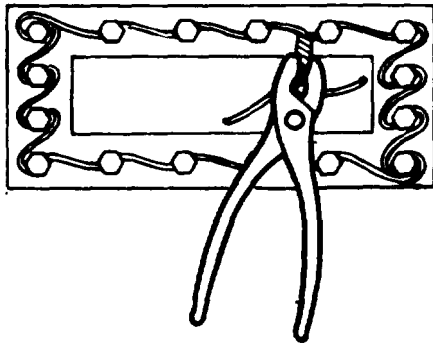
GENERAL MAINTENANCE - Continued

Small Screws in Closely Spaced, Closed Geometrical Pattern Single Wire Safety Wiring

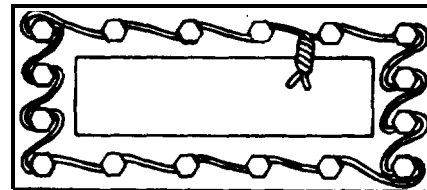
TOOLS: Slip joint pliers
Diagonal cutting pliers

SUPPLIES Lockwire

1. Using diagonal cutting pliers, cut a piece of lockwire long enough to hold the screws in the pattern being wired.
2. Using slip joint pliers, run wire through nuts, leaving enough wire pigtailing from nut (A) so completed lacing may be secured by twisting.



3. Using slip joint pliers, twist wire at least six times.



4. Using diagonal cutting pliers, cut wire leaving a pigtail from 1/4 to 1/2 inch long.
5. Bend pigtail back under to prevent it from becoming a snag.

End of Task

TA169894

APPENDIX D

EXPENDABLE SUPPLIES AND MATERIALS LIST

SECTION I. INTRODUCTION

1. SCOPE

This appendix lists expendable supplies and materials you will need to operate and maintain the M48A5 AVLB. These items are authorized to you by CTA 50-970, Expendable Items (except Medical, Class V, Repair Parts, and Heraldic Items).

2. EXPLANATION OF COLUMNS

a. Column 1 - Item number. This number is assigned to the entry in the listing and is referenced in the narrative instructions to identify the material (e.g., "Use cleaning compound, item 5, App. D").

b. Column 2 - Level. This column identifies the lowest level of maintenance that requires the listed item.

- C - Operator/Crew
- O - Organizational 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 Federal Supply Code for Manufacturer (FSCM) in parent heses followed by the part number.

e. Column 5- Unit of Measure (U/M). Indicates the measure used in performing the actual maintenance function. This measure is expressed by a t we-character alphabetical abbreviation (e.g., ea, in, pr). If the unit of measure differs from the unit of issue, requisition the lowest unit of issue that will satisfy your requirements.

**APPENDIX D
EXPENDABLE SUPPLIES AND MATERIALS LIST**

| ITEM | LEVEL | STOCK | DESCRIPTION | U/M |
|-------------|--------------|------------------|--|------------|
| 1. | c | 8040-00-262-9025 | Adhesive (MIL-A-5092, Type II) | PT |
| 2. | c | 8040-00-664-4318 | Adhesive, General Purpose, Synthetic Rubber: 1 Pt. Can (81348) (MMMA1617, Type II) | PT |
| 3. | o | | Asbestos, Sheet | FT |
| 4. | 0 | | Brush, Paint | EA |
| 5. | c | 5350-00-221-0872 | Cloth, Abrasive, Crocus, (CA), 50 Sheets (81348) PC458C1 | SH |
| 6. | o | | Compound, Lapping | |
| 7. | 0 | 6850-00-880-7616 | Compound, Silicone (MIL-S-8660) | OZ |
| 8. | c | 9120-00-111-6256 | Fluid, Hydraulic, FRH, (MIL-H-46170) Amend. 1 (81349) | QT |
| 9. | c | 9150-00-190-0904 | Grease, GAA: 1 Lb. Can (81349) (MIL-G-10924) | LB |
| 10. | o | | Oil, Lubricating, Grade 10, (OE/HDO 10), (MIL-L-2104) | QT |
| 11. | 0 | 9150-00-223-4119 | Oil, Penetrating (W-P-216) | QT |
| 12. | c | 7920-00-205-1711 | Rag, Wiping, Cotton, White: SOLB-DDDR 30GB | LB |
| 13. | o | 8030-00-322-6928 | Sealing Compound (MIL-S-7124) | |
| 14. | 0 | | Sealing Compound, (MIL-S-12158, Type II) | PT |
| 15. | 0 | 6850-00-660-5685 | Solvent, Dry Cleaning, (SD): 1 Gl. Can PD-680 T1 (81348) | GL |
| 16. | c | | Steel Wool | RL |

**APPENDIX D
EXPENDABLE SUPPLIES AND MATERIALS LIST (Continued)**

| ITEM | LEVEL | STOCK | DESCRIPTION | U/M |
|------|-------|------------------|---|-----|
| 17. | 0 | | Tape, Friction | RL |
| 18. | 0 | | Tape, Masking, 2" | RL |
| 19. | 0 | | Tape, Pipe | RL |
| 20. | 0 | 9505-00-248-9849 | Wire, Locking, MS20995-F41, 1 Lb. Roll | LB |
| 21. | 0 | 8030-01-158-6621 | Compound, Sealing (MIL-S-22473), Grade N, Form R | PT |
| 22. | 0 | 4240-00-816-3819 | Goggles, Industrial | PR |
| 23. | o | 8415-00-641-4601 | Gloves, Rubber | PR |
| 24. | o | 7510-00-189-7881 | Pencil, Writing, Package of 12 (81348) (SS-P-1605) | EA |
| 25. | o | 7530-00-285-5836 | "Paper, Writing, 3 x 5 inch Package of 100 (81348) (UU-P-121) | EA |

APPENDIX E

ABBREVIATIONS

| | |
|---------|---|
| AC | Alternating Current |
| DC | Direct Current |
| kPa | Kilopascals |
| N•m | Newton Meters |
| psi | pounds per square inch |
| STE/ICE | Simplified Test Equipment Internal Combustion Engine |

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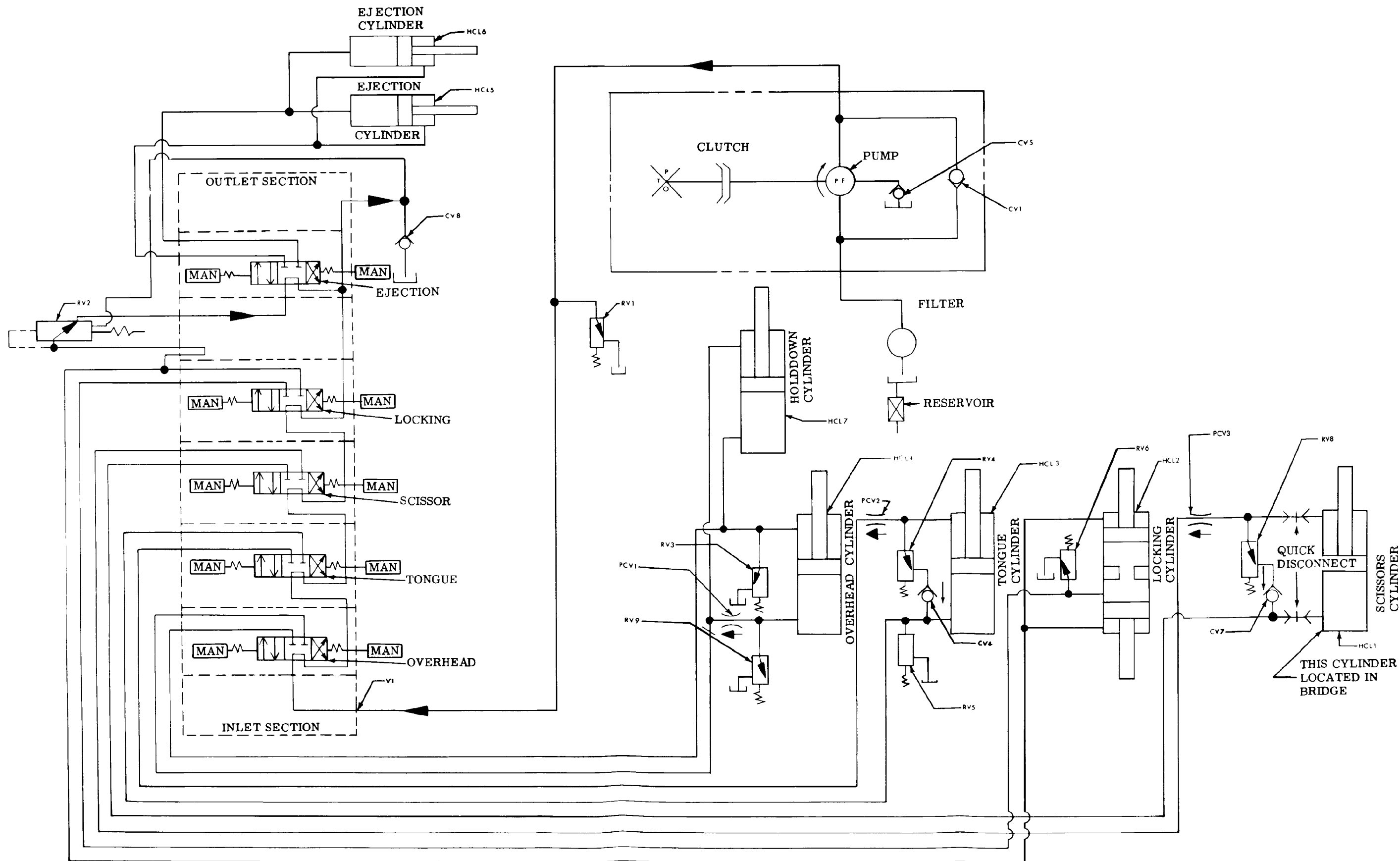
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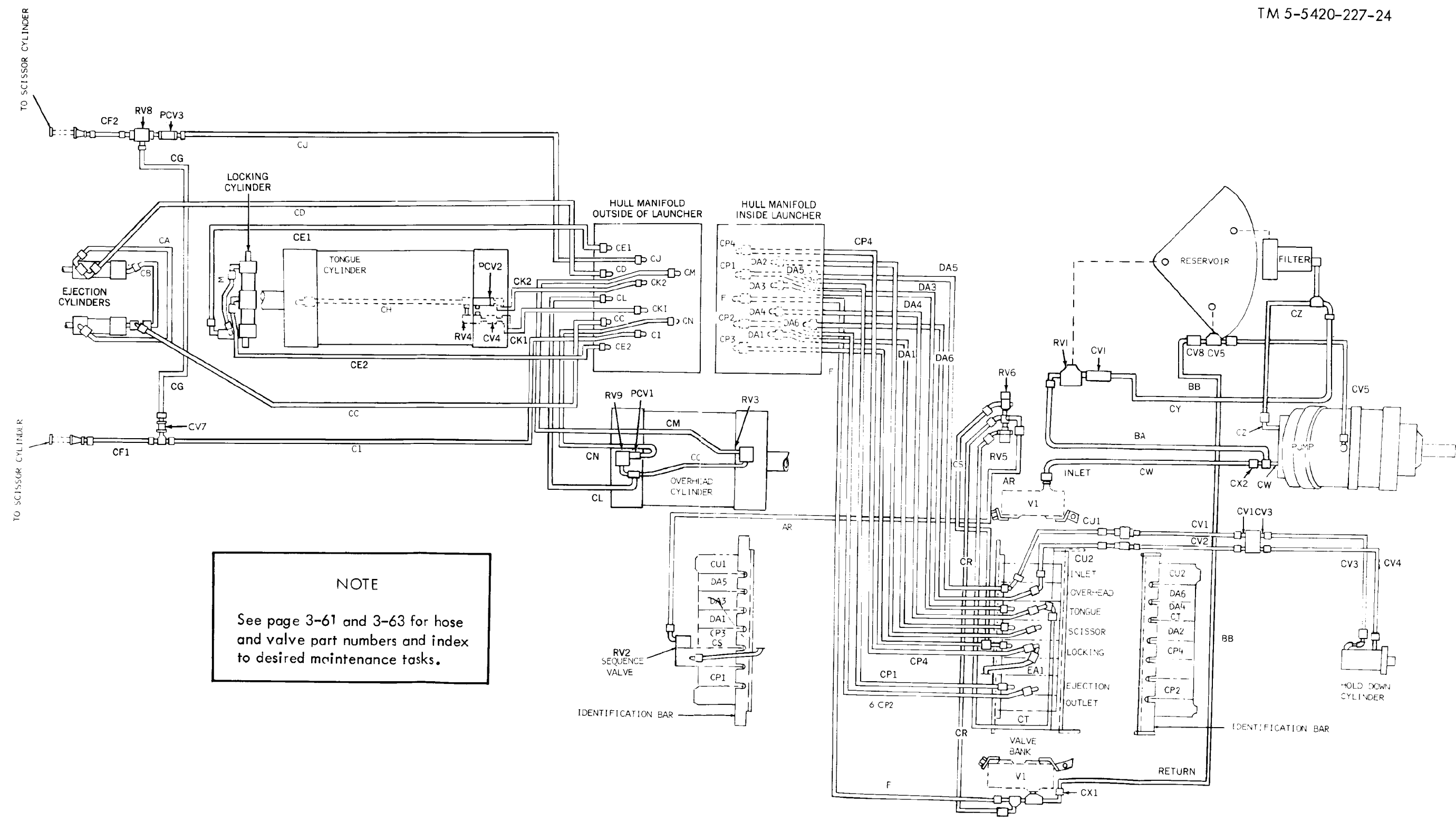
| | | |
|------|---------------|---|
| V1 | D13211E3255 | CONTROL VALVE BANK |
| RV9 | C13211E3210-1 | RELIEF VALVE, 5000 PSI, SET 3600 PSI, PILOT OPERATED |
| RV8 | C13211E3210-4 | RELIEF VALVE, 5000 PSI, SET 3400 PSI, PILOT OPERATED |
| RV6 | B13211E3210-3 | RELIEF VALVE, SET 500 PSI |
| RV5 | B13211E3210-2 | RELIEF VALVE, SET 700 PSI, PILOT OPERATED |
| RV4 | C13211E3210-1 | RELIEF VALVE, 5000 PSI, SET 3600 PSI, PILOT OPERATED |
| RV3 | C13211E3210-1 | RELIEF VALVE, 5000 PSI, SET 3600 PSI, PILOT OPERATED |
| RV2 | C13211E3216 | RELIEF VALVE, 5000 PSI, SET 3200 PSI, SEQUENCE, PILOT OPERATED |
| RV1 | C13211E3218 | RELIEF VALVE, 5000 PSI, SET 3800 PSI, PILOT OPERATED (MASTER RELIEF) |
| PF | C13211E3126 | PUMP, SINGLE FIXED DISPLACEMENT (VICKERS PF) |
| PCV3 | C13211E3217-1 | FLOW REGULATOR, PRESSURE COMPENSATED 33 GPM CONSTANT VOL 5000 PSI (1 FM NPTF THD) |
| PCV2 | C13211E3217-2 | FLOW REGULATOR, PRESSURE COMPENSATED 41 GPM CONSTANT VOL 5000 PSI (1 FM NPTF THD) |
| PCV1 | C13211E3217-2 | FLOW REGULATOR, PRESSURE COMPENSATED 41 GPM CONSTANT VOL 5000 PSI (1 FM NPTF THD) |
| HCL7 | D13211E3020 | CYLINDER HOLDDOWN, 3 1/4 DIA X 4 1/2 STROKE |
| HCL6 | D13211E3140 | CYLINDER, EJECTION, 4 DIA X 5 STROKE |
| HCL5 | D13211E3140 | CYLINDER, EJECTION, 4 DIA X 5 STROKE |
| HCL4 | D13211E3105-2 | CYLINDER, OVERHEAD, 13 DIA X 29 7/16 STROKE |
| HCL3 | D13211E3105-1 | CYLINDER, TONGUE, 13 DIA X 60 5/16 STROKE |
| HCL2 | D13211E3105-1 | CYLINDER, LOCKING, TANDEM 4 DIA X 3 STROKE |
| HCL1 | D13211E3105-1 | CYLINDER, SCISSORS 10 DIA X 54 1/4 STROKE |
| FLT | D13211E3203 | FILTER, 30 MICRON 50 GPM 2 NPTF |
| CV8 | B13211E3222-2 | CHECK VALVE, 5000 PSI, 1 TO 6 PSI CRACKING NG, 1 1/4 FNPT X 1 1/4 MNPT |
| CV7 | B13211E3222-1 | CHECK VALVE, 5000 PSI, 1 TO 6 PSI CRACKING, 3/4 FNPTF X 3/4 MNPTF HYD SV |
| CV5 | B13211E3225-1 | CHECK VALVE, 5000 PSI, 5 TO 1 PSI CRACKING, 3/4 MNPTF HYD SV |
| CV4 | B13211E3214 | CHECK VALVE, 5000 PSI, 1 TO 6 PSI CRACKING, 3/4 MNPTF X 3/4 MNPTF HYD SV |
| CV1 | B13211E3225-2 | CHECK VALVE, 5000 PSI, 5 TO 1 PSI CRACKING, 3/4 MNPTF HYD SV |
| KEY | IDENT NO. | NOMENCLATURE & DESCRIPTION |



- RETURN LINE TO RESERVOIR
- CHECK VALVE INDICATES FLOW FROM LEFT TO RIGHT
- () FLOW REGULATOR
- RELIEF VALVE
- QUICK DISCONNECT

TA170603

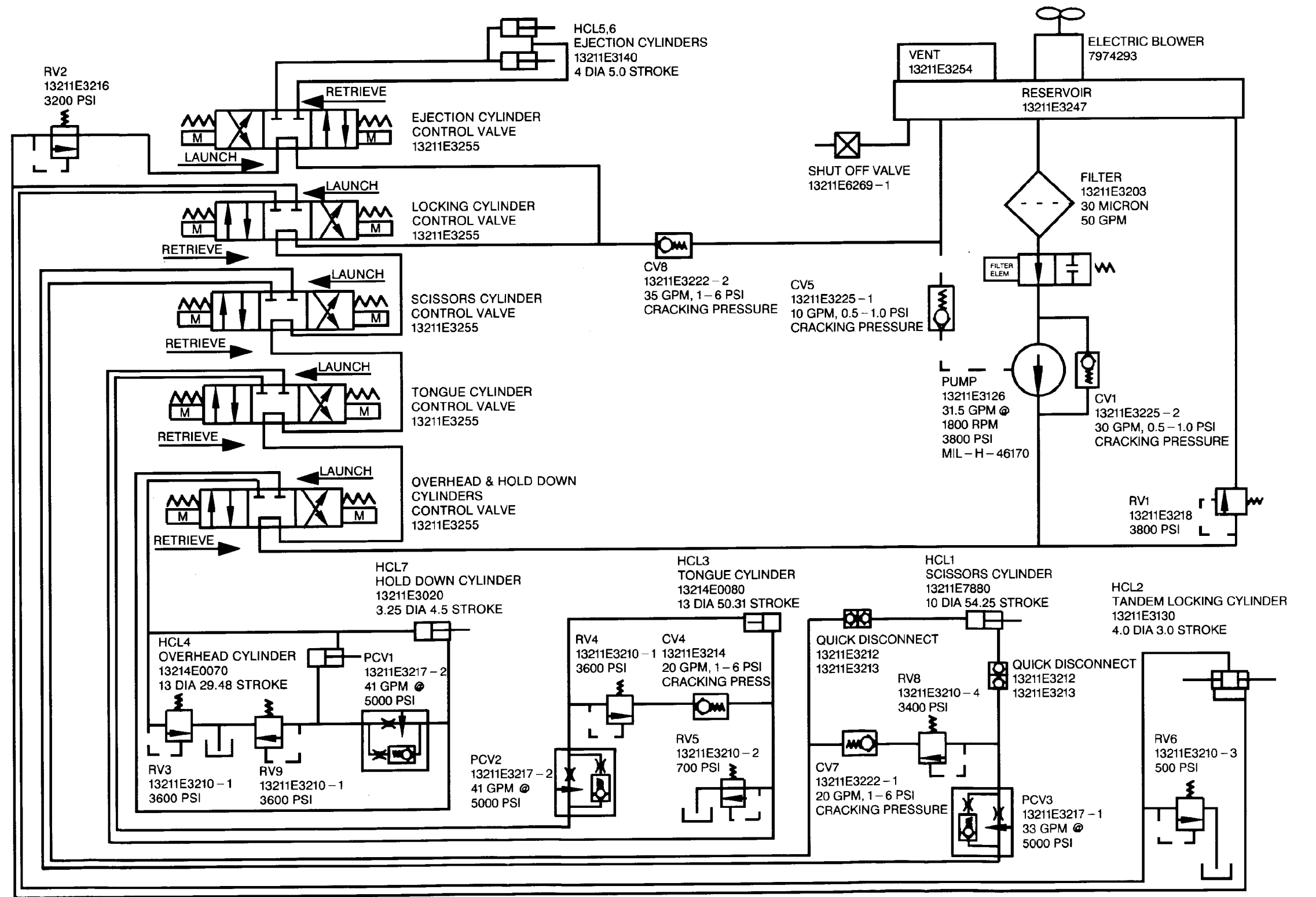
FO-1. Hydraulic system schematic.



NOTE

See page 3-61 and 3-63 for hose and valve part numbers and index to desired maintenance tasks.

FO-2. Hydraulic lines identification.



Change 2 FO-3. Launcher Hydraulic Schematic

By Order of the Secretary of the Army:

E. C. MEYER
General, United States Army
Chief of Staff

Official:

ROBERT M. JOYCE
Brigadier General, United States Army
The Adjutant General

Distribution:

To be distributed in accordance with DA Form 12-37, Organizational, Direct and General Support Maintenance instructions for Bridge, Armored Vehicle-Launched, Scissoring Type C lass 60.

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BE EXACT PIN-POINT WHERE IT IS

| PAGE NO | PARA-GRAPH | FIGURE NO | TABLE NO |
|---------|------------|-----------|----------|
| 3 | | 2 | |
| 109 | | 51 | |
| 2-8 | | | 2-1 |
| 12 | 1-6a | | |

IN THIS SPACE TELL WHAT IS WRONG AND WHAT SHOULD BE DONE ABOUT IT:

Item 10. Change illustration. Reason: Tube end shown assembled on wrong side of lever cam.

Item 3. The NSN and P/N are not listed on the AMDF nor the MCRL. Request correct NSN and P/N be furnished.

Preventive Maintenance Checks and Services. Item 7 under "Items to be inspected" should be changed to read as follows: Firing linkage and firing mechanism pawl.

Since there are both 20- and 30- round magazines for this rifle, data on both should be listed.

SAMPLE

PRINTED NAME GRADE OR TITLE AND TELEPHONE NUMBER

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John Doe

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FIGURE NO

TABLE NC

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THE METRIC SYSTEM AND EQUIVALENTS

LINEAR MEASURE

1 Centimeter = 10 Millimeters = 0.01 Meters = 0.3937 Inches
 1 Meter = 100 Centimeters = 1000 Millimeters = 39.37 Inches
 1 Kilometer = 1000 Meters = 0.621 Miles

WEIGHTS

1 Gram = 0.001 Kilograms = 1000 Milligrams = 0.035 Ounces
 1 Kilogram = 1000 Grams = 2.2 Lb.
 1 Metric Ton = 1000 Kilograms = 1 Megagram = 1.1 Short Tons

LIQUID MEASURE

1 Milliliter = 0.001 Liters = 0.0338 Fluid Ounces
 1 Liter = 1000 Milliliters = 33.82 Fluid Ounces

SQUARE MEASURE

1 Sq. Centimeter = 100 Sq. Millimeters = 0.155 Sq. Inches
 1 Sq. Meter = 10,000 Sq. Centimeters = 10.76 Sq. Feet
 1 Sq. Kilometer = 1,000,000 Sq. Meters = 0.386 Sq. Miles

CUBIC MEASURE

1 Cu. Centimeter = 1000 Cu. Millimeters = 0.06 Cu. Inches
 1 Cu. Meter = 1,000,000 Cu. Centimeters = 35.31 Cu. Feet

TEMPERATURE

$\frac{5}{9}(\text{°F} - 32) = \text{°C}$
 212° Fahrenheit is equivalent to 100° Celsius
 90° Fahrenheit is equivalent to 32.2° Celsius
 32° Fahrenheit is equivalent to 0° Celsius
 $\frac{9}{5} \text{°C} + 32 = \text{°F}$

APPROXIMATE CONVERSION FACTORS

| TO CHANGE | TO | MULTIPLY BY |
|------------------------|----------------------|-------------|
| Inches | Centimeters | 2.540 |
| Feet | Meters | 0.305 |
| Yards | Meters | 0.914 |
| Miles | Kilometers | 1.609 |
| Square Inches | Square Centimeters | 6.451 |
| Square Feet | Square Meters | 0.093 |
| Square Yards | Square Meters | 0.836 |
| Square Miles | Square Kilometers | 2.590 |
| Acres | Square Hectometers | 0.405 |
| Cubic Feet | Cubic Meters | 0.028 |
| Cubic Yards | Cubic Meters | 0.765 |
| Fluid Ounces | Milliliters | 29.573 |
| Pints | Liters | 0.473 |
| Quarts | Liters | 0.946 |
| Gallons | Liters | 3.785 |
| Ounces | Grams | 28.349 |
| Pounds | Kilograms | 0.454 |
| Short Tons | Metric Tons | 0.907 |
| Pound-Feet | Newton-Meters | 1.356 |
| Pounds per Square Inch | Kilopascals | 6.895 |
| Miles per Gallon | Kilometers per Liter | 0.425 |
| Miles per Hour | Kilometers per Hour | 1.609 |

| TO CHANGE | TO | MULTIPLY BY |
|----------------------|------------------------|-------------|
| Centimeters | Inches | 0.394 |
| Meters | Feet | 3.280 |
| Meters | Yards | 1.094 |
| Kilometers | Miles | 0.621 |
| Square Centimeters | Square Inches | 0.155 |
| Square Meters | Square Feet | 10.764 |
| Square Meters | Square Yards | 1.196 |
| Square Kilometers | Square Miles | 0.386 |
| Square Hectometers | Acres | 2.471 |
| Cubic Meters | Cubic Feet | 35.315 |
| Cubic Meters | Cubic Yards | 1.308 |
| Milliliters | Fluid Ounces | 0.034 |
| Liters | Pints | 2.113 |
| Liters | Quarts | 1.057 |
| Liters | Gallons | 0.264 |
| Grams | Ounces | 0.035 |
| Kilograms | Pounds | 2.205 |
| Metric Tons | Short Tons | 1.102 |
| Newton-Meters | Pound-Feet | 0.738 |
| Kilopascals | Pounds per Square Inch | 0.145 |
| Kilometers per Liter | Miles per Gallon | 2.354 |
| Kilometers per Hour | Miles per Hour | 0.621 |

