ARMY *TM 9-2320-272-23-3
AIR FORCE *TO 36A12-1C-1155-2-3

TECHNICAL MANUAL
FIELD MAINTENANCE MANUAL
FOR

TRUCK, 5-TON, 6X6, M939, M939A1, AND M939A2 SERIES TRUCKS (DIESEL)

TRUCK, CARGO: 5-TON, 6X6 DROPSIDE
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NSN 2320-01-050-2084 (EIC BRY)
M923A1
NSN 2320-01-206-4087 (EIC BSS)
M923A2
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TRUCK, VAN, EXPANSIBLE: 5-TON, 6X6
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M934A2
NSN 2320-01-230-0300 (EIC BTR)

TRUCK, MEDIUM WRECKER: 5-TON, 6X6
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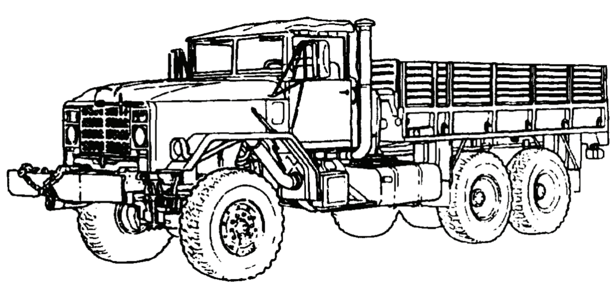
NSN 2320-01-206-4078 (EIC BS6)
M936A2
NSN 2320-01-230-0304 (EIC BTT)



***SUPERSEDURE NOTICE** - This manual supersedes TM 9-2320-272-24-1, TM 9-2320-272-24-2, TM 9-2320-272-24-3, TM 9-2320-272-24-4 and TO 36A12-1C-1155-2-1, TO 36A12-1C-1155-2-2, TO 36A12-1C-1155-2-3, & TO 36A12-1C-1155-2-4, dated 30 June 1998, including all changes

DISTRIBUTION STATEMENT A - Approved for public release; distribution is unlimited.

HEADQUARTERS, DEPARTMENTS OF THE ARMY AND THE AIR FORCE
10 SEPTEMBER 2012

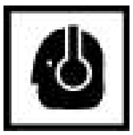
WARNING SUMMARY

This warning summary contains general safety warnings and hazardous materials warnings that must be understood and applied during operation and maintenance of the vehicle. Failure to observe these precautions or operating this vehicle without training or instruction may result in serious injury or death to personnel.

FIRST AID DATA

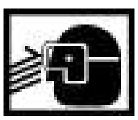
For information on first aid, refer to FM 4-25.11, First Aid.

EXPLANATION OF SAFETY WARNING ICONS



EAR PROTECTION - Headphones over ears show that noise level will harm ears.

ELECTRICAL - Electrical wire to hand with electricity symbol running through hand shows that shock hazard is present.



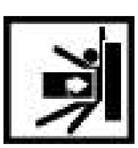
EYE PROTECTION - Person with goggles shows that the material will injure the eyes.

FIRE - Flame shows that a material may ignite and cause burns.

HEAVY OBJECT - Human figure stooping over heavy object shows physical injury potential from improper lifting technique.

HEAVY PARTS - Hand with heavy object on top shows that heavy parts can crush and harm.

HEAVY PARTS - Foot with heavy object on top shows that heavy parts can crush and harm.

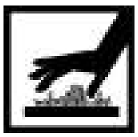


HEAVY PARTS - Heavy object pinning human figure against wall shows that heavy, moving parts present a danger to life or limb.

WARNING SUMMARY - Continued

EXPLANATION OF SAFETY WARNING ICONS - Continued

HEAVY PARTS - Heavy object on human figure shows that heavy parts present a danger to life or limb.

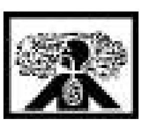


HOT AREA - Hand over object radiating heat shows that part is hot and can burn.

MOVING PARTS - Hand with fingers caught between gears shows that the moving parts of the equipment present a danger to life or limb.

RADIATION - Three circular wedges shows that the material emits radioactive energy and can injure human tissue.

SLICK FLOOR - Wavy line on floor with legs prone shows that slick floor presents a danger for falling.



VAPOR - Human figure in a cloud shows that material vapors present a danger to life or health.

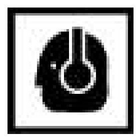
WARNING SUMMARY - Continued

GENERAL SAFETY WARNINGS DESCRIPTION

WARNING

Ensure electrical power is off prior to working on all electrical connections. Prior to working on or around vehicle, remove all jewelry, such as rings, ID tags, bracelets, etc. Jewelry, and tools can catch on equipment, contact positive electrical circuits, and cause a direct short, severe burns, or electrical shock. Failure to comply may result in injury or death to personnel.

WARNING



Personnel hearing can be permanently damaged if exposed to constant high noise levels of 85 dB or greater. Failure to comply may reslult in injury to personnel.

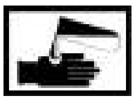
WARNING

Unless otherwise specified, perform all maintenance procedures with all attachments lowered to the ground, pilot shutoff lever in the up position, and engine shut off. Failure to comply may result in injury or death to personnel.

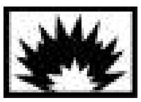
WARNING SUMMARY - Continued

EXPLANATION OF HAZARDOUS MATERIALS ICONS

BIOLOGICAL - Abstract symbol bug shows that a material may contain bacteria or viruses that present a danger to life or health.



CHEMICAL - Drops of liquid on hand shows that the material will cause burns or irritation to human skin or tissue.



EXPLOSION - Rapidly expanding symbol shows that the material may explode if subjected to high temperatures, sources of ignition, or high pressure.

POISON - Skull and crossbones symbol shows that dangerous gases, sprays, vapors, liquids, or materials contain compounds that present a danger to life or health.

WARNING SUMMARY - Continued

HAZARDOUS MATERIALS DESCRIPTIONS

WARNING

CARBON MONOXIDE

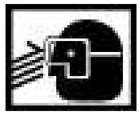
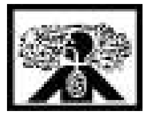
- Carbon monoxide is a colorless, odorless, deadly poison which, when breathed, deprives the body of oxygen and causes suffocation. Exposure to air containing carbon monoxide produces symptoms of headache, dizziness, loss of muscular control, apparent drowsiness, and coma. Permanent brain damage or death to personnel can result from severe exposure.
- Carbon monoxide occurs in exhaust fumes from internal combustion engines. It also occurs in exhaust fumes from engine coolant heater (arctic machine only). Carbon monoxide can become dangerously concentrated under conditions of inadequate ventilation. The following precautions must observed to ensure safety of personnel when engine of vehicle is operated.

1. DO NOT operate engine in enclosed area without adequate ventilation.
2. DO NOT idle engine without adequate ventilation.
3. DO NOT drive machine with inspection plates or cover plates removed.
4. BE ALERT for exhaust poisoning symptoms. They are:
    - Headache
    - Dizziness
    - Sleepiness
    - Loss of muscular control
5. If you see another person with exhaust poisoning symptoms:
    - Remove person from area
    - Expose to fresh air
    - Keep person warm
    - DO NOT permit physical exercise
    - Administer cardiopulmonary resuscitation (CPR) if necessary
    - Notify a Medic
6. BE AWARE. The field protective mask for Nuclear-Biological-Chemical (NBC) protection will not protect you from carbon monoxide poisoning.

WARNING SUMMARY - Continued

HAZARDOUS MATERIALS DESCRIPTIONS - Continued

WARNING

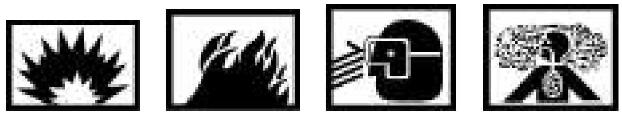
CHEMICAL AGENT RESISTANT COATING (CARC) PAINT

Chemical Agent Resistant Coating (CARC) paint contains isocyanate which is highly irritating to skin and respiratory system. High concentrations of isocyanate can produce symptoms of itching and reddening of skin, a burning sensation in the throat and nose, and watering of the eyes. In extreme concentrations, isocyanate can cause cough, shortness of breath, pain during respiration, increased sputum production, and chest tightness. First aid for ingestion: do not induce vomiting. Seek immediate medical attention. First aid fro skin contact: remove contaminated clothing. Wash skin thoroughly with soap and water. if symptoms persist, seek medical attention. First aid for inhalation: move to fresh air. If not breathing, provide artificial respiration. If symptoms persist, seek medical attention. Failure to comply may result in injury or death to personnel.

WARNING SUMMARY - Continued

HAZARDOUS MATERIALS DESCRIPTIONS - Continued

WARNING



SOLVENT CLEANING COMPOUND

Solvent cleaning compound MIL-PRF-680 type II and III may be irritating to the eyes and skin. Use protective gloves and goggles. Use in well ventilated areas. Use respirator as needed.

Accidental ingestion can cause irritation of digestive tract and repository tract, and may cause lung and central nervous system damage. Can be fatal if swallowed. First aid for ingestion: do not induce vomiting. Seek immediate medical attention.

First aid for skin contact: remove contaminated clothing, Wash skin thoroughly with soap and water. If symptoms persist, seek medical attention.

First aid for eye contact: flush with water for 15 minutes or until irritation subsides. If symptoms persist, seek medical attention.

Inhalation of high/massive concentrations can cause coma or be fatal. First aid for inhalation: move to fresh air. If not breathing, provide artificial respiration. If symptoms persist, seek medical attention.

Keep away from open flames and other sources of ignition. Failure to comply may result in injury or death to personnel. The flash point for type II solvent cleaning compound is 141°F to 198°F (61°C to 92°C) and type III is 200°F to 241°F (93°C to 116°C). Fire extinguishers should be placed nearby when using solvent cleaning compound.

Improper cleaning methods and use of unauthorized cleaning solvents may injure personnel and damage equipment.

Cloths or rags saturated with solvent cleaning compound must be disposed of using authorized facilities procedures.

Eye shields must be worn when cleaning with a wire brush. Flying rust and metal particles may cause injury.

WARNING SUMMARY - Continued

HAZARDOUS MATERIALS DESCRIPTIONS - Continued

WARNING

LUBRICATING OIL

Prolonged contact with lubricating oil may cause skin rash. Remove saturated clothing immediately and wash skin thoroughly that comes in contact with lubricating oil. Failure to comply may result in injury or death to personnel.

Spilled hydraulic oil is slippery and creates a hazardous condition. Clean up and properly dispose of hydraulic oil. Failure to comply may result in injury or death to personnel.

WARNING

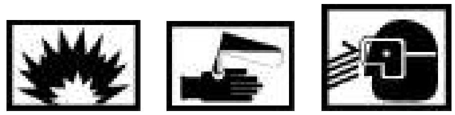
NUCLEAR, BIOLOGICAL, OR CHEMICAL

If Nuclear, Biological, or Chemical (NBC) exposure is suspected, all filter media should be handled by personnel wearing protective equipment. Consult your unit NBC Officer or NBC NCO for appropriate handling or disposal instructions. Failure to comply may result in injury or death to personnel.

WARNING SUMMARY - Continued

HAZARDOUS MATERIALS DESCRIPTIONS - Continued

WARNING



LEAD-ACID BATTERIES

Avoid battery electrolyte contact with skin, eyes, and clothing. If battery electrolyte spills, take the following immediate action to stop burning effects:

External - If battery electrolyte contacts skin, immediately flush affected area with cold running water. Failure to comply may result in injury or death to personnel.

Eyes - If battery electrolyte contacts eyes, immediately flush eyes with cold water for 15 minutes and seek immediate medical attention. IMPORTANT - If only one eye is affected, ensure the affected eye is always kept lower then the unaffected eye, during both flushing and transport. This will keep the the affected eye from draining into and contaminating the unaffected eye. Failure to comply may result in injury or death to personnel.

Internal - If battery electrolyte is ingested, drink large amounts of water or milk. Follow with milk of magnesia, a beaten egg or vegetable oil and seek immediate medical attention. Failure to comply may result in injury or death to personnel.

Clothing or vehicle - immediately flush area with cold water and neutralize battery electrolyte with baking soda or household ammonia solution. Failure to comply may result in injury or death to personnel.

Batteries produce explosive gases. Do not smoke or use open flame near batteries. Do not allow hot, parking or glowing objects near batteries. If batteries are giving off gases, the presence of heat, flame, or spark may cause fire and/or explosion. Failure to comply may result in injury or death to personnel.

Wear proper eye protection, gloves, and an apron when working near batteries. Failure to comply may result in injury or death to personnel.

WARNING SUMMARY - Continued

HAZARDOUS MATERIALS DESCRIPTIONS - Continued

WARNING

DIESEL FUEL

- Diesel fuel is highly flammable and can be accidentally ignited. Do not smoke or allow open flame or sparks in the vicinity while working on any part of the fuel system. Keep fire extinguisher within easy reach when working with fuel. Failure to comply may result in injury or death to personnel.
- Spilled fuel is slippery and creates a hazardous condition. Clean up and properly disposed of spilled fuel as soon as possible. Failure to comply may result in injury or death to personnel.
- Do not work on fuel system when engine is hot. Failure to comply may result in injury or death to personnel.
- Safety glassed must be worn when working on pressurized systems. Failure to comply may result in injury or death to personnel.

WARNING

ADHESIVES AND SEALANTS

Adhesives and sealants are flammable, can give off harmful vapors, and are harmful to skin and clothing. Keep away from open fire and use in a well-ventilated area. If adhesive or sealant contacts eye, flush with large amounts of water, and seek medical attention. If adhesive or sealant get on skin or clothing, flush with large amounts of water. If irritation persists, seek medical attention. Failure to comply may result in serious injury or death to personnel.

LIST OF EFFECTIVE PAGES/WORK PACKAGES

NOTE: *Supersedes TM 9-2320-272-24-1, TM 9-2320-272-24-2, TM 9-2320-272-24-3, TM 9-2320-272-24-4 and TO 36A12-1C-1155-2-1, TO 36A12-1C-1155-2-2, TO 36A12-1C-1155-2-3, & TO 36A12-1C-1155-2-4, dated 30 June 1998. Zero in the Change No. Column indicates an original page or work package.

Date of issue for the original manual is:

Original 10 September 2012

TOTAL NUMBER OF VOLUMES IS 5, TOTAL NUMBER OF PAGES FOR FRONT AND REAR MATTER IS 74 AND TOTAL NUMBER OF WORK PACKAGES IS 202 CONSISTING OF THE FOLLOWING:

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Front Cover (2 pages)	0	WP 0387 (6 pages)	0
WARNING SUMMARY (10 pages)	0	WP 0388 (4 pages)	0
i-xxxix/xl blank (40 pages)	0	WP 0389 (6 pages)	0
Chapter 8 Title Page	0	WP 0390 (6 pages)	0
WP 0351 (4 pages)	0	WP 0391 (6 pages)	0
WP 0352 (6 pages)	0	WP 0392 (6 pages)	0
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WP 0355 (6 pages)	0	WP 0395 (4 pages)	0
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WP 0359 (30 pages)	0	WP 0399 (4 pages)	0
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WP 0361 (4 pages)	0	WP 0401 (14 pages)	0
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WP 0384 (4 pages)	0	WP 0424 (6 pages)	0
WP 0385 (18 pages)	0	WP 0425 (6 pages)	0

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WP 0428 (10 pages)	0	WP 0479 (6 pages)	0
WP 0429 (10 pages)	0	WP 0480 (8 pages)	0
WP 0430 (10 pages)	0	WP 0481 (10 pages)	0
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DEPARTMENTS OF THE ARMY AND THE AIR FORCE
WASHINGTON, D.C., 10 SEPTEMBER 2012

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TRUCK, MEDIUM WRECKER: 5-TON, 6X6
M936
NSN 2320-01-047-8754 (EIC BTF)
M936A1
NSN 2320-01-206-4078 (EIC BS6)
M936A2
NSN 2320-01-230-0304 (EIC BTT)

REPORTING ERRORS AND RECOMMENDING IMPROVEMENTS

You can help improve this publication. If you find any mistakes, or if you know of a way to improve the procedures, please let us know: Reports, as applicable by the requiring service, should be submitted as follows:
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***SUPERSEDURE NOTICE** - This manual supersedes TM 9-2320-272-24-1, TM 9-2320-272-24-2, TM 9-2320-272-24-3, TM 9-2320-272-24-4 and TO 36A12-1C-1155-2-1, TO 36A12-1C-1155-2-2, TO 36A12-1C-1155-2-3, & TO 36A12-1C-1155-2-4, dated 30 June 1998, including all changes

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Chapter 8 - MAINTENANCE INSTRUCTIONS

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HOW TO USE THIS MANUAL

WARNINGS, CAUTIONS, AND NOTES

Read all WARNINGS, CAUTIONS, and NOTES before performing any procedure.

Warnings, cautions, notes, subject headings, and other essential information is printed in **BOLD** type, making them easier for the user to see.

GENERAL INFORMATION

This manual is divided into CHAPTERS and WORK PACKAGES. For a specific Chapter or Work Package, refer to the TABLE OF CONTENTS.

VOLUME 3

- The TABLE OF CONTENTS lists the titles of each Chapter and Work Package.
- CHAPTER 8 provides maintenance instructions.

The illustrations throughout this manual contain numerical callouts pointing to various components mentioned in the procedural steps. Mandatory replacement parts must be discarded after removal and replaced with a new part, which is listed in the Materials/Parts section located at the beginning of the task.

Prior to performing any maintenance functions on the 5-ton, 6x6, M939, M939A1, and M939A2 Diesel Truck series, ALWAYS do the following:

- Read and follow all WARNINGS in all work packages.
- Read the Safety Summary.
- Read the Equipment Description and Data located in Chapter 1.
- Read completely through the maintenance procedure to familiarize yourself with the procedure and the affected parts before beginning work.

Troubleshooting section is setup by either how a physical problem is occurring or how an active or stored trouble code is read from a diagnostic tool. By following a prescribed flow path through making decisions will lead you to a solution to remedy the problem. RPSTL manual, TM 9-2320-272-24P, is to be used in conjunction with this manual to help find needed parts for procurement. RPSTL manual lists and authorized spares and repair parts; special tools, special Test, Measurement, and Diagnostic Equipment (TMDE); and other special support equipment required for performance of Field Maintenance on the 5-ton, 6x6, M939, M939A1, and M939A2 Diesel Truck series. It authorizes the requisitioning, issue, and disposition of spares, repair parts, and special tools as indicated by the Source, Maintenance, and Recoverability (SMR) codes.

METRIC SYSTEM

The equipment described herein contains metric components and requires metric, common, and special tools. Therefore, metric units and English units will be used throughout this publication. An English-to-Metric conversion table is included as the last page of this manual inside the back cover.

CHAPTER 8

MAINTENANCE INSTRUCTIONS

FIELD MAINTENANCE
INSTRUMENT CLUSTER HARNESS REPLACEMENT

INITIAL SETUP:

Tools and Special Tools

Tool Kit, General Mechanic's: Automotive (Volume 5, WP 0826, Table 1, Item 56)

Equipment Condition

Parking brake set. (TM 9-2320-272-10)

Battery ground cables disconnected. (Volume 2, WP 0350)

REMOVAL

Disconnect five leads (Figure 1, Item 6), nut (Figure 1, Item 4), washer (Figure 1, Item 3), cable assembly (Figure 1, Item 5), and washer (Figure 1, Item 2) from speedometer stud (Figure 1, Item 1).

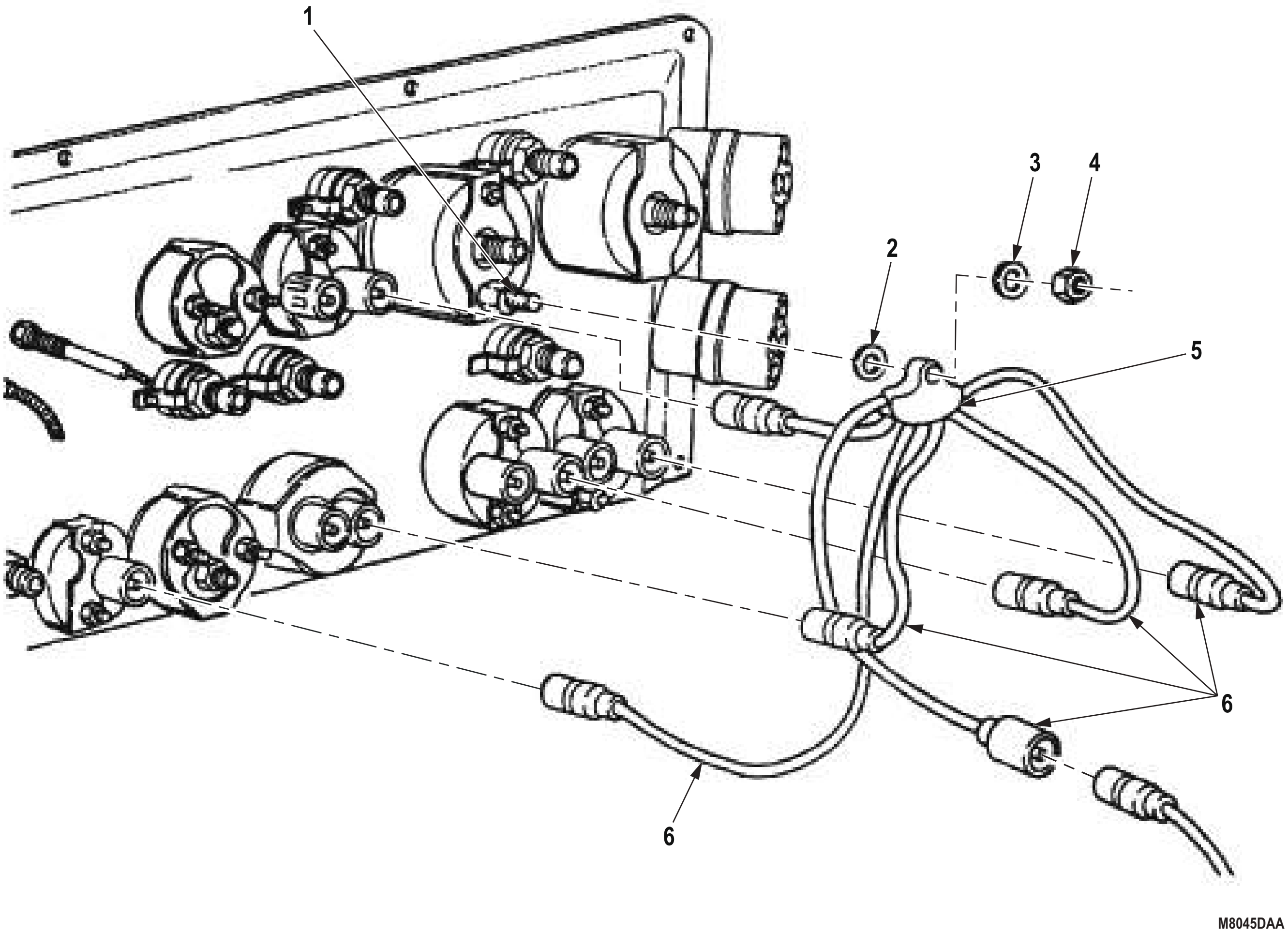


Figure 1. Cluster Harness Removal.

END OF TASK

INSTALLATION

Install cable assembly (Figure 2, Item 5) on speedometer stud (Figure 2, Item 1) with washer (Figure 2, Item 2), washer (Figure 2, Item 3), and nut (Figure 2, Item 4) and connect five leads (Figure 2, Item 6).

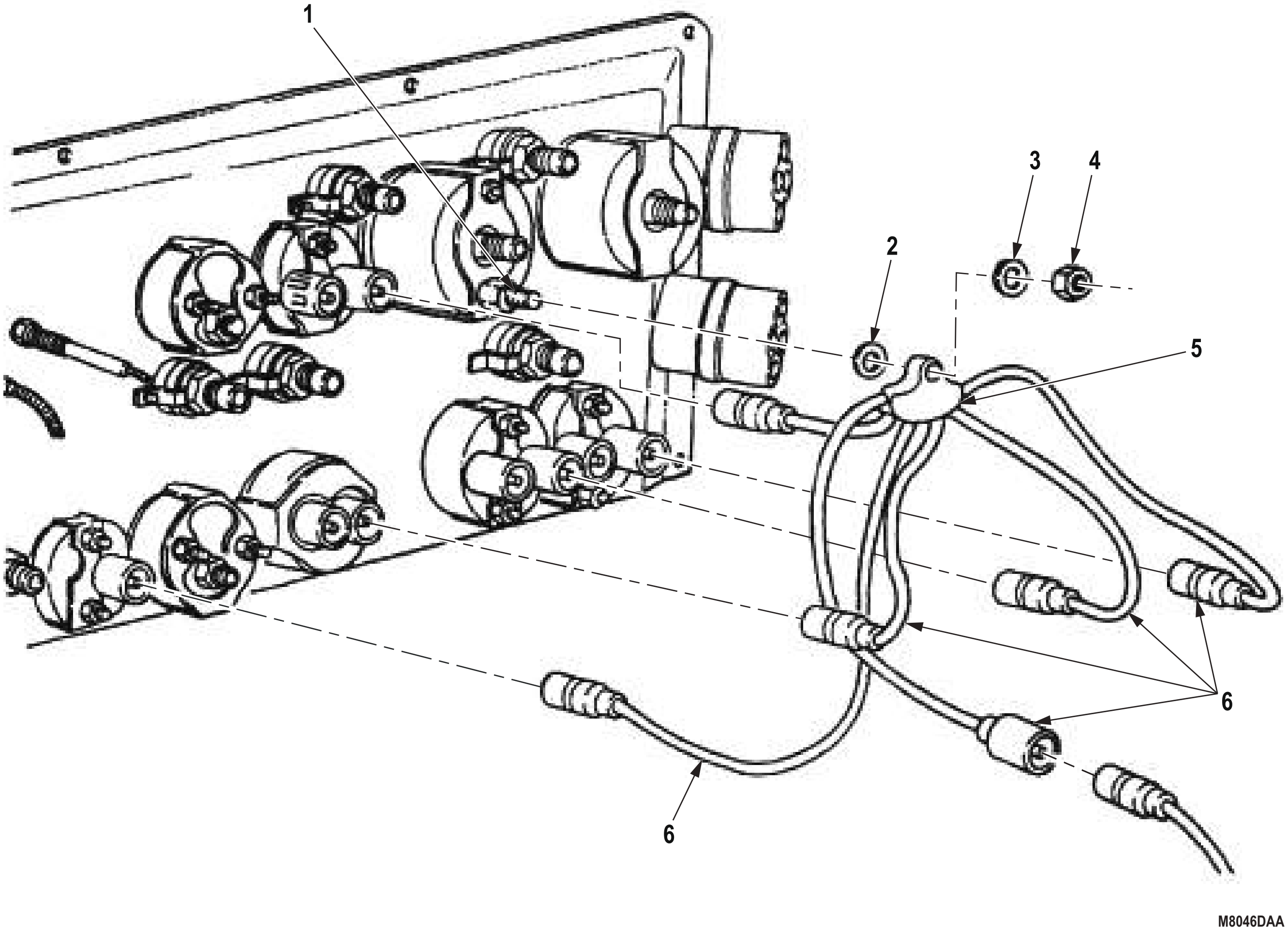


Figure 2. Cluster Harness Installation.

END OF TASK

FOLLOW-ON MAINTENANCE

Connect battery ground cables. (Volume 2, WP 0350)

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
WIRING HARNESS REPAIR

INITIAL SETUP:

Tools and Special Tools
- Tool Kit, General Mechanic's: Automotive (Volume 5, WP 0826, Table 1, Item 56)
- Tool Kit, Electrical Contact (Volume 5, WP 0826, Table 1, Item 55)
- Heat Gun, Electric (Volume 5, WP 0826, Table 1, Item 23)
- Torch Kit, Soldering (Volume 5, WP 0826, Table 1, Item 57)

Materials/Parts
- Solder (Volume 5, WP 0825, Table 1, Item 64)

References
- TB SIG-222

Equipment Condition
- Parking brake set. (TM 9-2320-272-10)
- Battery ground cables disconnected. (Volume 2, WP 0350)

TERMINAL-TYPE CABLE CONNECTOR

WARNING

Do not wear jewelry when repairing harnesses. Failure to comply may result in damage to equipment, injury, or death to personnel.

NOTE

If a wiring harness is damaged beyond repair, notify unit maintenance for replacement.

1. Strip cable insulation (Figure 1, Item 1) from cable (Figure 1, Item 2) to equal depth of terminal well (Figure 1, Item 4).
2. Slide insulator (Figure 1, Item 3) over cable (Figure 1, Item 2).
3. Insert cable (Figure 1, Item 2) into terminal well (Figure 1, Item 4) and crimp.
4. Slide insulator (Figure 1, Item 3) over crimped end of terminal (Figure 1, Item 5).

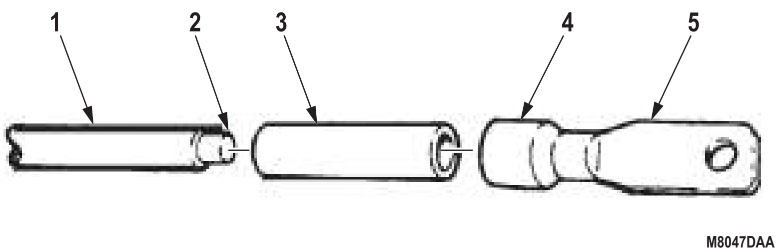


Figure 1. Terminal-Type Cable Connector.

END OF TASK

MALE CABLE CONNECTOR

1. Strip cable insulation (Figure 2, Item 1) from cable (Figure 2, Item 2) equal to depth of ferrule well (Figure 2, Item 5).
2. Slide shell (Figure 2, Item 3) over cable (Figure 2, Item 2).
3. Insert cable (Figure 2, Item 2) into ferrule well (Figure 2, Item 5) and crimp.
4. Place C-washer (Figure 2, Item 4) over crimped junction at terminal (Figure 2, Item 6).
5. Slide shell (Figure 2, Item 3) over C-washer (Figure 2, Item 4) and terminal (Figure 2, Item 6).

MALE CABLE CONNECTOR - Continued

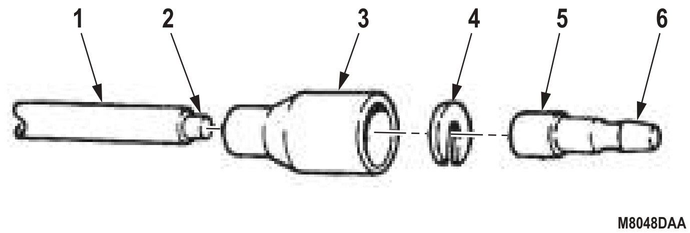


Figure 2. Male Cable Connector.

END OF TASK

FEMALE CABLE CONNECTOR (WITH SLEEVE)

1. Strip cable insulation (Figure 3, Item 1) from cable (Figure 3, Item 2) equal depth of terminal well (Figure 3, Item 5).
2. Slide shell (Figure 3, Item 3) and sleeve (Figure 3, Item 4) over cable (Figure 3, Item 2).
3. Insert cable (Figure 3, Item 2) into ferrule well (Figure 3, Item 5) and crimp.
4. Slide shell (Figure 3, Item 3) and sleeve (Figure 3, Item 4) over terminal (Figure 3, Item 6).

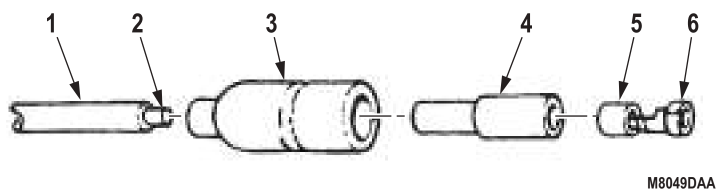


Figure 3. Female Cable Connector.

END OF TASK

PLUG ASSEMBLY

NOTE

Refer to TB SIG-222 for soldering instructions.

1. Strip cable insulation (Figure 4, Item 6) to equal depth of solder wells (Figure 4, Item 1) of inserts (Figure 4, Item 2).
2. Pass cable ends (Figure 4, Item 8) through grommet retaining nut (Figure 4, Item 7), grommet (Figure 4, Item 3), and coupling nut (Figure 4, Item 5).
3. Insert ends (Figure 4, Item 8) into solder wells (Figure 4, Item 1) of inserts (Figure 4, Item 2) and solder.
4. Slide grommet (Figure 4, Item 3) over inserts (Figure 4, Item 2) and press into shell assembly (Figure 4, Item 4) until seated.
5. Slide grommet retaining nut (Figure 4, Item 7) up cable (Figure 4, Item 8) and install on shell assembly (Figure 4, Item 4).

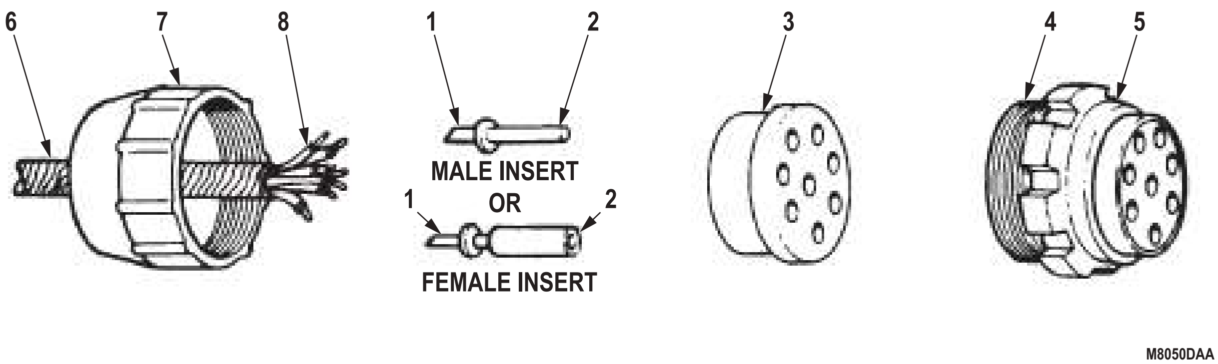


Figure 4. Plug Assembly.

END OF TASK

RECEPTACLE ASSEMBLY

NOTE

Refer to TB SIG-222 for soldering instructions.

1. Strip cable insulation (Figure 5, Item 5) from cable (Figure 5, Item 7) equal to equal depth of solder wells (Figure 5, Item 1) of inserts (Figure 5, Item 2).
2. Pass cable ends (Figure 5, Item 7) through grommet retaining nut (Figure 5, Item 6) and grommet (Figure 5, Item 3).
3. Insert cable ends (Figure 5, Item 7) into solder wells (Figure 5, Item 1) of insert (Figure 5, Item 2) and solder.
4. Slide grommet (Figure 5, Item 3) over inserts (Figure 5, Item 2) and press into receptacle assembly (Figure 5, Item 4) until seated.
5. Thread grommet retaining nut (Figure 5, Item 6) into receptacle (Figure 5, Item 4) until seated.

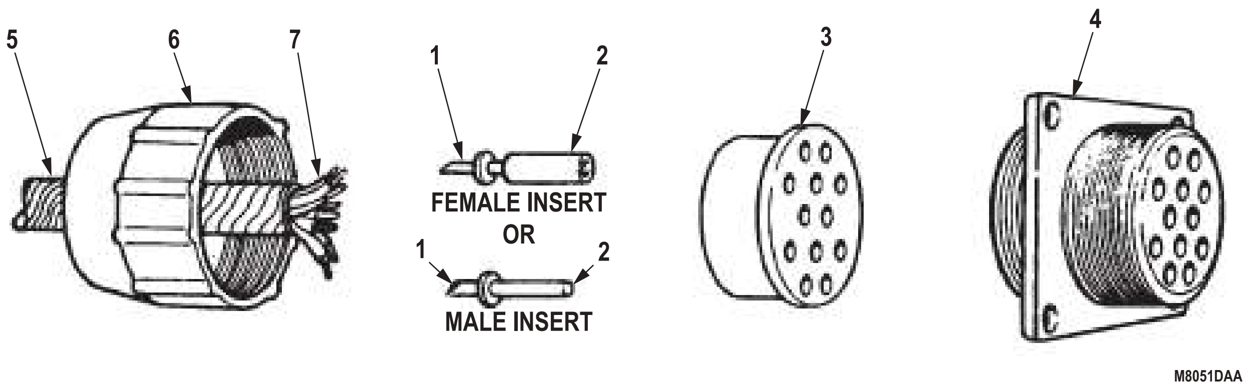


Figure 5. Receptacle Assembly.

END OF TASK

FOLLOW-ON MAINTENANCE

Connect battery ground cables. (Volume 2, WP 0350)

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
SLAVE RECEPTACLE REPLACEMENT

INITIAL SETUP:

Tools and Special Tools

Tool Kit, General Mechanic's: Automotive
(Volume 5, WP 0826, Table 1, Item 56)

Materials/Parts

Gasket (Volume 5, WP 0827, Table 1, Item 34)
Qty: 1

Lockwasher
(Volume 5, WP 0827, Table 1, Item 186)
Qty: 2

Equipment Condition

Parking brake set. (TM 9-2320-272-10)

Equipment Condition (cont.)

Battery ground cables disconnected. (Volume 2, WP 0350)

REMOVAL

WARNING

- Remove all jewelry. If jewelry or disconnected battery ground cable contacts positive battery terminal, a direct short will result. Failure to comply may result in damage to equipment, injury, or death to personnel.
- Do not remove slave receptacle before disconnecting battery ground cables. If energized battery cable contacts cab, a direct short will result. Failure to comply may result in damage to equipment, injury, or death to personnel.

1. Remove four nuts (Figure 1, Item 10), screws (Figure 1, Item 12), rope (Figure 1, Item 11), and cover (Figure 1, Item 13) from cab (Figure 1, Item 6).

NOTE

Insulating hose remains inside cab.

2. Pull slave receptacle (Figure 1, Item 14) until battery cables (Figure 1, Items 3 and 9) are exposed.
3. Remove two screws (Figure 1, Item 1), lockwashers (Figure 1, Item 2), and battery cables (Figure 1, Items 3 and 9) from slave receptacle (Figure 1, Item 14). Discard lockwashers.
4. Remove insulator (Figure 1, Item 5) and gasket (Figure 1, Item 4) from slave receptacle (Figure 1, Item 14).
5. Pull cables (Figure 1, Items 3 and 9) clear of insulating hose (Figure 1, Item 7) and remove from battery box (Figure 1, Item 8).

REMOVAL - Continued

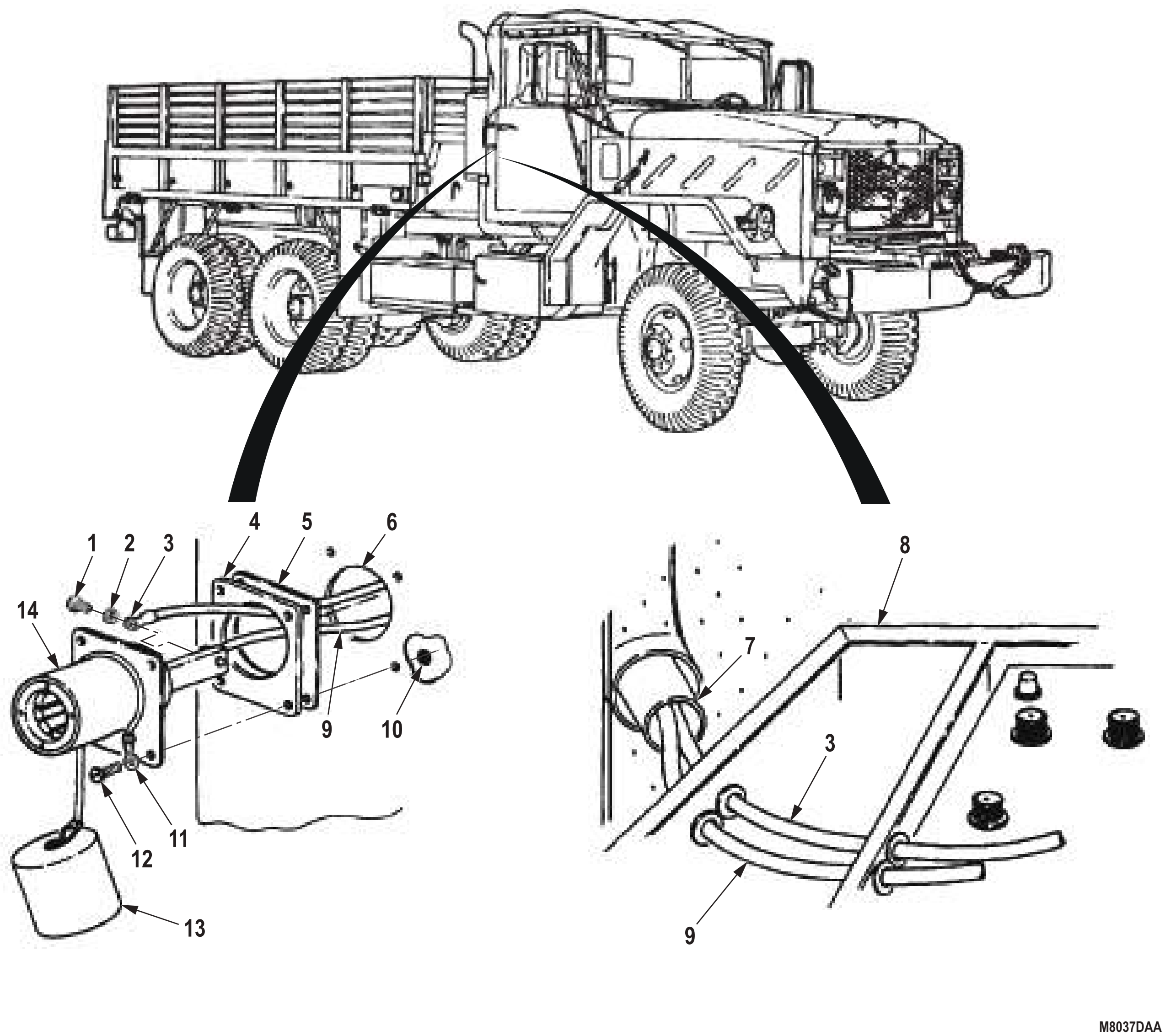


Figure 1. Slave Receptacle Removal.

END OF TASK

INSTALLATION

1. Route cables (Figure 2, Items 3 and 9) through insulating hose (Figure 2, Item 7) and battery box (Figure 2, Item 8).
2. Pull cables (Figure 2, Items 3 and 9) through insulating hose (Figure 2, Item 7) until exposed outside cab (Figure 2, Item 6).
3. Install gasket (Figure 2, Item 4) and insulator (Figure 2, Item 5) on slave receptacle (Figure 2, Item 14).
4. Install battery cables (Figure 2, Items 3 and 9) on slave receptacle (Figure 2, Item 14) with two lockwashers (Figure 2, Item 2) and screws (Figure 2, Item 1).
5. Insert slave receptacle (Figure 2, Item 14) in cab (Figure 2, Item 6) and position insulating hose (Figure 2, Item 7) over screws (Figure 2, Item 1). Install slave receptacle with three screws (Figure 2, Item 12) and nuts (Figure 2, Item 10).
6. Install cover (Figure 2, Item 13) and rope (Figure 2, Item 11) on slave receptacle (Figure 2, Item 14) with screw (Figure 2, Item 12) and nut (Figure 2, Item 10).

INSTALLATION - Continued

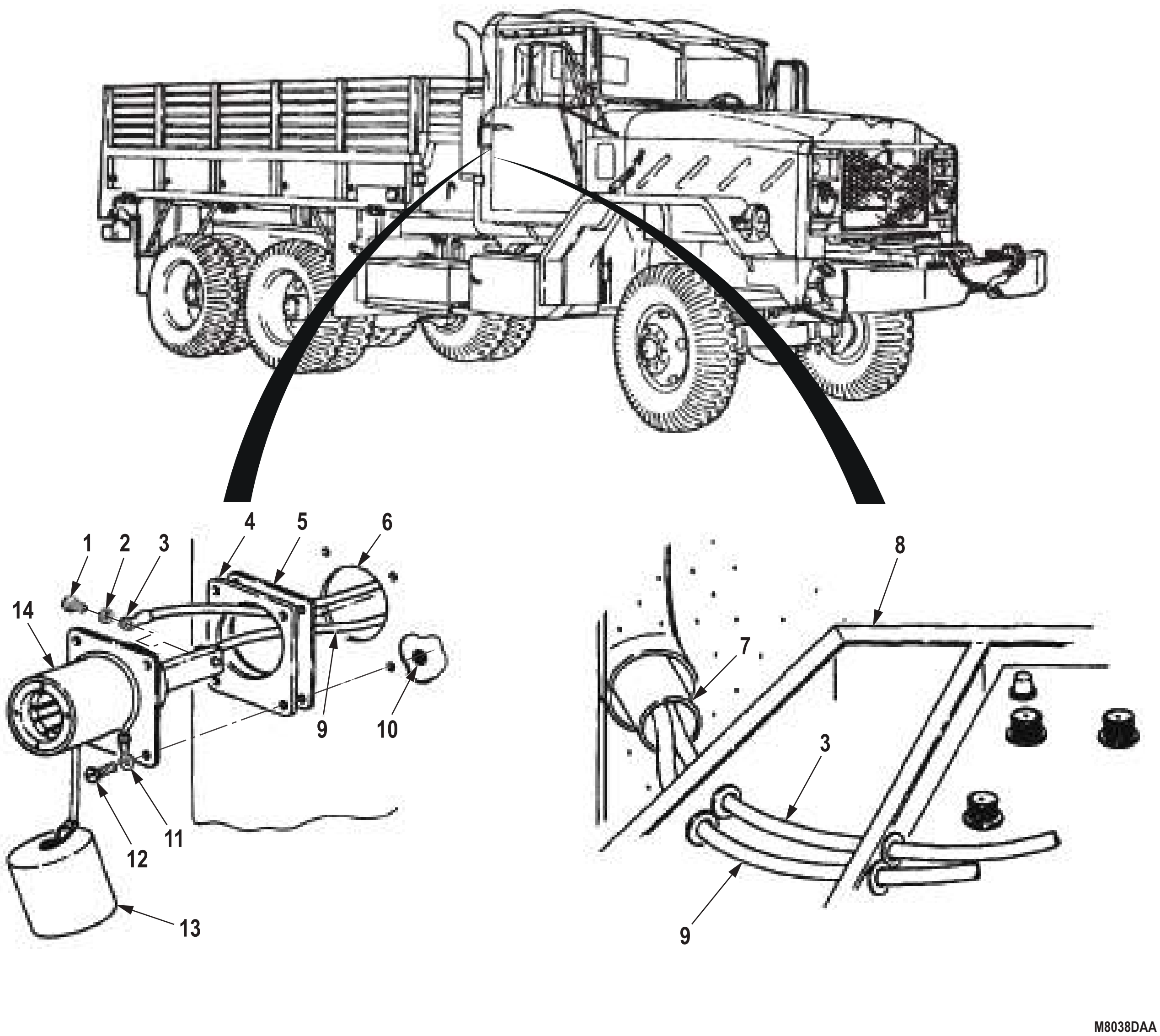


Figure 2. Slave Receptacle Installation.

END OF TASK

FOLLOW-ON MAINTENANCE

Install battery ground cables. (Volume 2, WP 0350)

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
GROUND STRAP REPLACEMENT

INITIAL SETUP:

Tools and Special Tools

Tool Kit, General Mechanic's: Automotive
(Volume 5, WP 0826, Table 1, Item 56)

Materials/Parts

Locknut (M939/A1)
(Volume 5, WP 0827, Table 1, Item 285)
Qty: 1

Lockwasher (M939/A1)
(Volume 5, WP 0827, Table 1, Item 404)
Qty: 1

Lockwasher (M939/A1)
(Volume 5, WP 0827, Table 1, Item 425)
Qty: 3

Lockwasher (M939/A1)
(Volume 5, WP 0827, Table 1, Item 426)
Qty: 1

Lockwasher (M939A2)
(Volume 5, WP 0827, Table 1, Item 386)
Qty: 3

Materials/Parts (cont.)

Lockwasher (M939A2)
(Volume 5, WP 0827, Table 1, Item 390)
Qty: 2

Lockwasher (M939A2)
(Volume 5, WP 0827, Table 1, Item 426)
Qty: 4

Equipment Condition

Parking brake set. (TM 9-2320-272-10)
Hood raised and secured. (TM 9-2320-272-10)

GROUND STRAP (M939/A1) REMOVAL

1. Remove screw (Figure 1, Item 1), washer (Figure 1, Item 2), ground strap (Figure 1, Item 6), lockwasher (Figure 1, Item 4), and clamp (Figure 1, Item 3) from firewall (Figure 1, Item 5). Discard lockwasher.
2. Remove screw (Figure 1, Item 7), wire (Figure 1, Item 9), ground strap (Figure 1, Item 6), and lockwasher (Figure 1, Item 8) from engine (Figure 1, Item 10). Discard lockwasher.

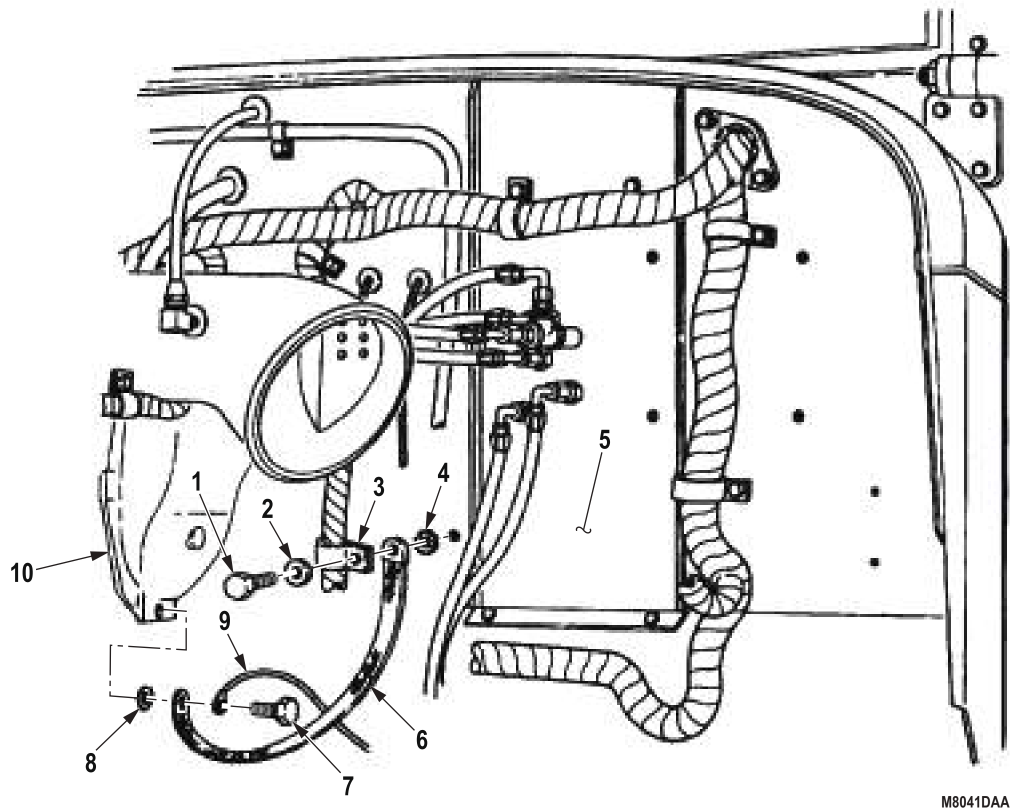


Figure 1. Ground Strap Removal.

3. Remove screw (Figure 2, Item 9), two washers (Figure 2, Item 10), ground strap (Figure 2, Item 3), and lockwasher (Figure 2, Item 2) from air compressor (Figure 2, Item 1). Discard lockwasher.
4. Remove locknut (Figure 2, Item 6), clamp (Figure 2, Item 7), screw (Figure 2, Item 4), lockwasher (Figure 2, Item 8), and ground strap (Figure 2, Item 3) from frame rail (Figure 2, Item 5). Discard locknut and lockwasher.

GROUND STRAP (M939/A1) REMOVAL - Continued

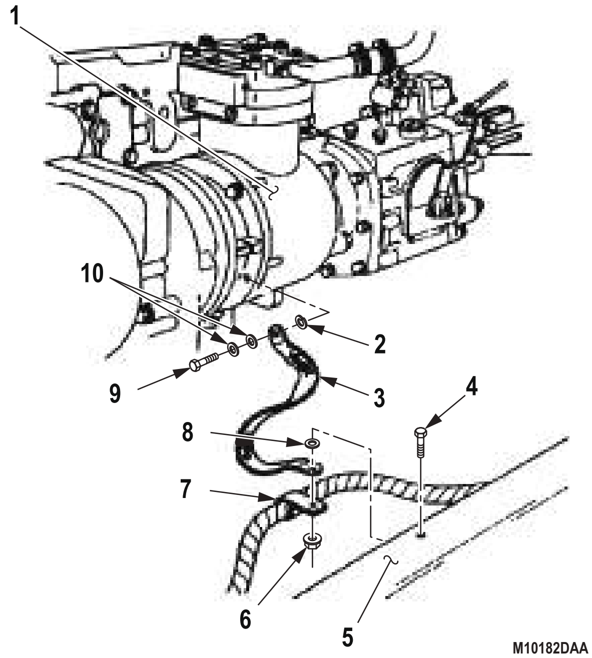


Figure 2. Ground Strap Removal.

5. Remove screw (Figure 3, Item 3), washer (Figure 3, Item 2), ground strap (Figure 3, Item 1), and lockwasher (Figure 3, Item 10) from engine (Figure 3, Item 9). Discard lockwasher.

6. Remove nut (Figure 3, Item 7), washer (Figure 3, Item 6), wires (Figure 3, Items 5 and 8), and ground strap (Figure 3, Item 1) from engine starter (Figure 3, Item 4).

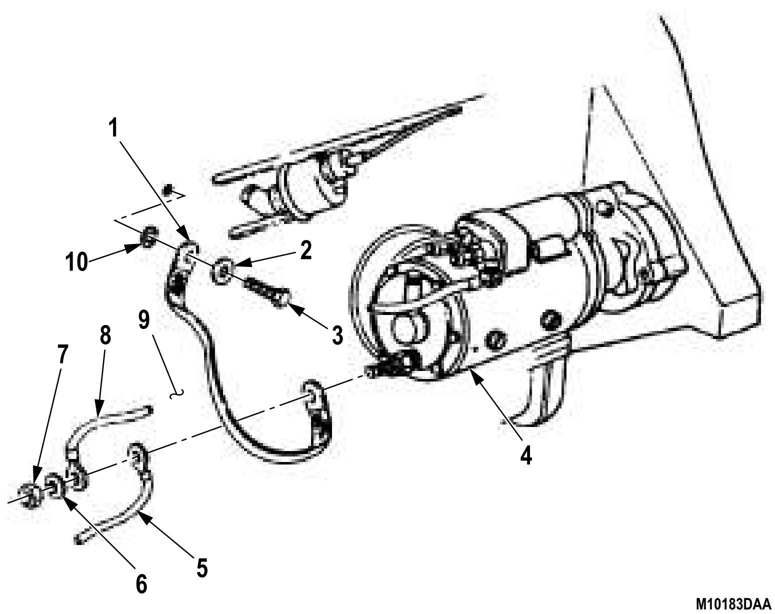


Figure 3. Ground Strap Removal.

END OF TASK

GROUND STRAP (M939/A1) INSTALLATION

1. Install ground strap (Figure 4, Item 1) on engine starter (Figure 4, Item 4) with wires (Figure 4, Items 5 and 8), washer (Figure 4, Item 6), and nut (Figure 4, Item 7).
2. Install lockwasher (Figure 4, Item 10), ground strap (Figure 4, Item 1), washer (Figure 4, Item 2), and screw (Figure 4, Item 3) on engine (Figure 4, Item 9).

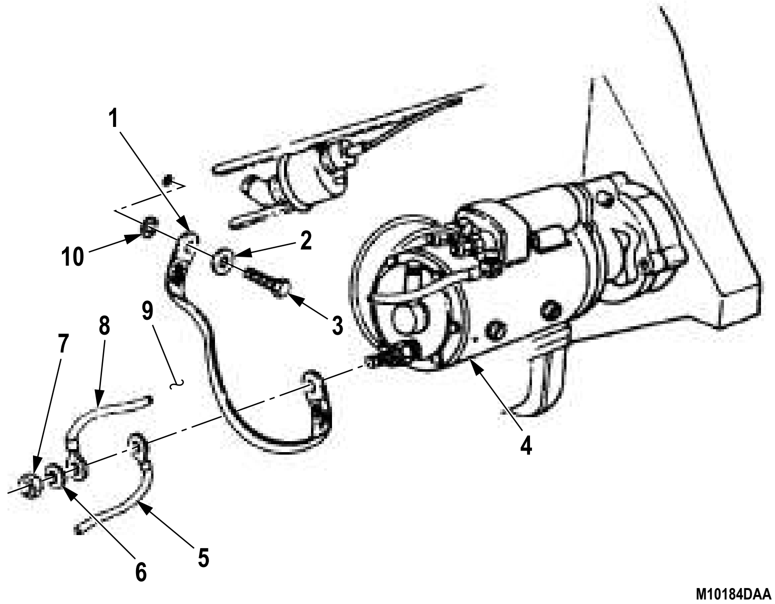


Figure 4. Ground Strap Installation.

GROUND STRAP (M939/A1) INSTALLATION - Continued

3. Install screw (Figure 5, Item 4), lockwasher (Figure 5, Item 8), ground strap (Figure 5, Item 3), clamp (Figure 5, Item 7), and locknut (Figure 5, Item 6) on frame rail (Figure 5, Item 5).
4. Install lockwasher (Figure 5, Item 2), ground strap (Figure 5, Item 3), two washers (Figure 5, Item 10), and screw (Figure 5, Item 9) on air compressor (Figure 5, Item 1).

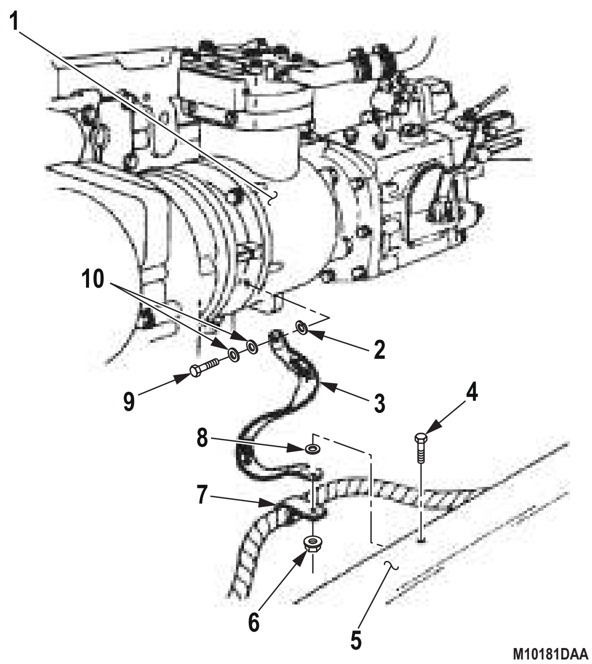


Figure 5. Ground Strap Installation.

GROUND STRAP (M939/A1) INSTALLATION - Continued

5. Install lockwasher (Figure 6, Item 8), ground strap (Figure 6, Item 6), wire (Figure 6, Item 9), and screw (Figure 6, Item 7) on engine (Figure 6, Item 10).
6. Install lockwasher (Figure 6, Item 4), ground strap (Figure 6, Item 6), clamp (Figure 6, Item 3), washer (Figure 6, Item 2), and screw (Figure 6, Item 1) on firewall (Figure 6, Item 5).

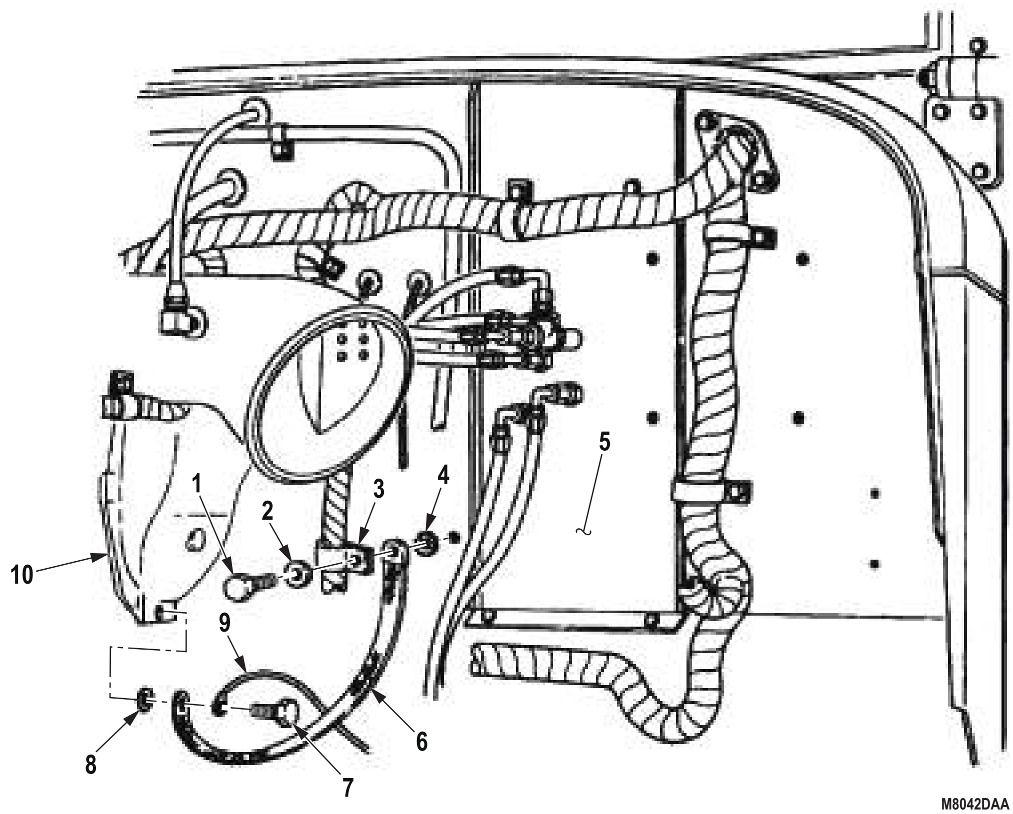


Figure 6. Ground Strap Installation.

END OF TASK

GROUND STRAP (M939A2) REMOVAL

1. Remove nut (Figure 7, Item 1), washer (Figure 7, Item 2), lockwasher (Figure 7, Item 12), ground strap (Figure 7, Item 5), lockwasher (Figure 7, Item 11), and screw (Figure 7, Item 9) from frame rail (Figure 7, Item 10). Discard lockwashers.
2. Remove screw (Figure 7, Item 6), washer (Figure 7, Item 7), ground strap (Figure 7, Item 5), three wires (Figure 7, Item 8), and lockwasher (Figure 7, Item 4) from engine block (Figure 7, Item 3). Discard lockwasher.

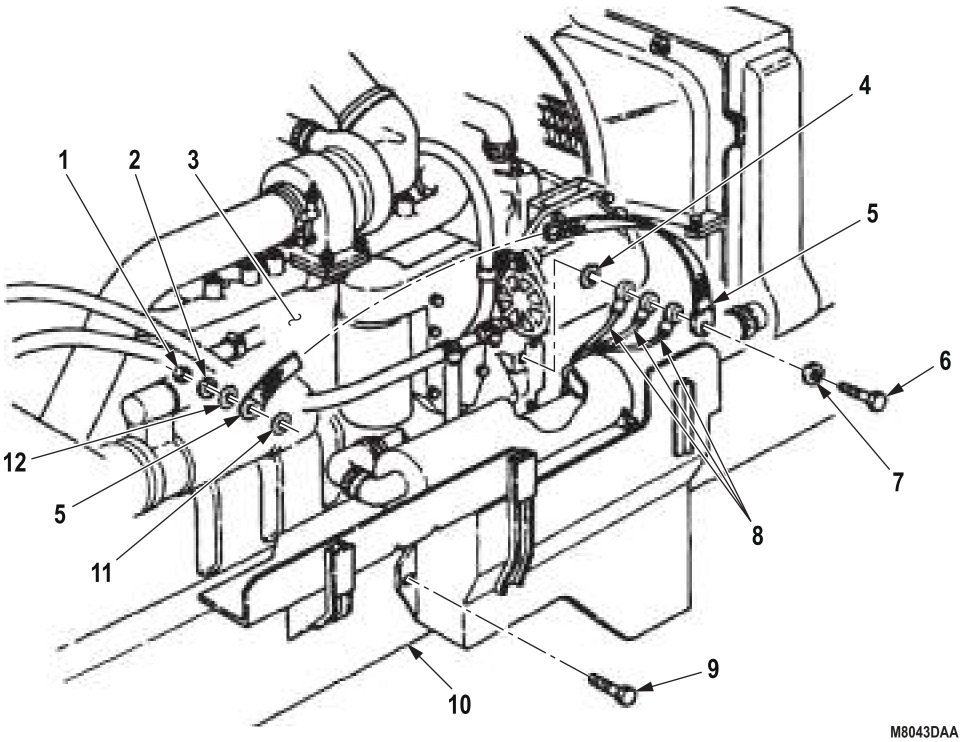


Figure 7. Ground Strap Removal.

GROUND STRAP (M939A2) REMOVAL - Continued

3. Remove nut (Figure 8, Item 7), lockwasher (Figure 8, Item 8), screw (Figure 8, Item 12), washer (Figure 8, Item 11), ground strap (Figure 8, Item 4), and lockwasher (Figure 8, Item 10) from frame rail (Figure 8, Item 9). Discard lockwashers.
4. Remove nut (Figure 8, Item 1), lockwasher (Figure 8, Item 2), screw (Figure 8, Item 6), washer (Figure 8, Item 5), ground strap (Figure 8, Item 4), and lockwasher (Figure 8, Item 3) from hood (Figure 8, Item 13). Discard lockwashers.

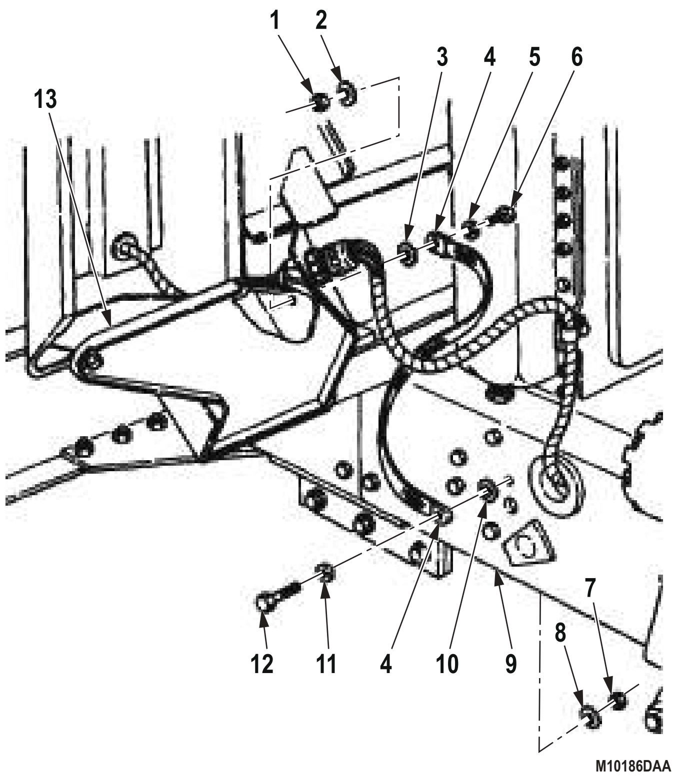


Figure 8. Ground Strap Removal.

GROUND STRAP (M939A2) REMOVAL - Continued

5. Remove screw (Figure 9, Item 9), lockwasher (Figure 9, Item 7), clamp (Figure 9, Item 10), ground strap (Figure 9, Item 3), and bracket (Figure 9, Item 8) from firewall (Figure 9, Item 6). Discard lockwasher.
6. Remove screw (Figure 9, Item 5), washer (Figure 9, Item 4), ground strap (Figure 9, Item 3), lockwasher (Figure 9, Item 2), temperature sensor (Figure 9, Item 1), and washer (Figure 9, Item 12) from engine block (Figure 9, Item 11). Discard lockwasher.

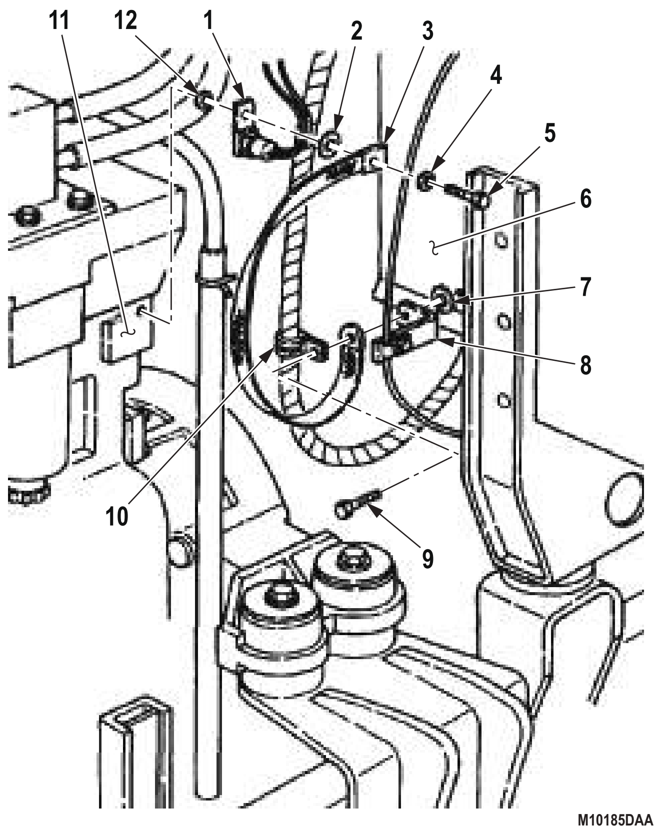


Figure 9. Ground Strap Removal.

END OF TASK

GROUND STRAP (M939A2) INSTALLATION

1. Install washer (Figure 10, Item 12), temperature sensor (Figure 10, Item 1), lockwasher (Figure 10, Item 2), ground strap (Figure 10, Item 3), washer (Figure 10, Item 4), and screw (Figure 10, Item 5) on engine block (Figure 10, Item 11).
2. Install bracket (Figure 10, Item 8), ground strap (Figure 10, Item 3), clamp (Figure 10, Item 10), lockwasher (Figure 10, Item 7), and screw (Figure 10, Item 9) on firewall (Figure 10, Item 6).

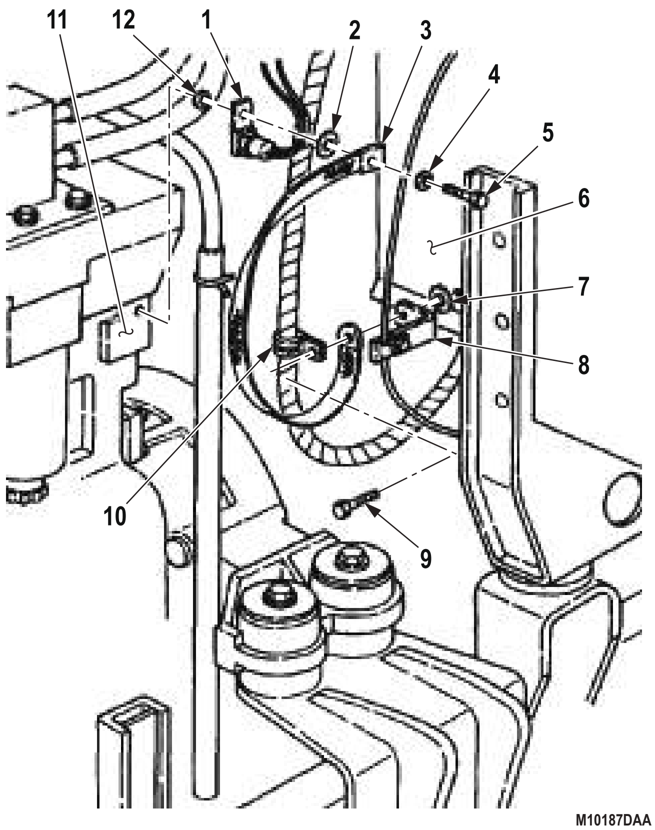


Figure 10. Ground Strap Installation.

GROUND STRAP (M939A2) INSTALLATION - Continued

3. Install lockwasher (Figure 11, Item 3), ground strap (Figure 11, Item 4), washer (Figure 11, Item 5), screw (Figure 11, Item 6), lockwasher (Figure 11, Item 2), and nut (Figure 11, Item 1) on hood (Figure 11, Item 13).
4. Install lockwasher (Figure 11, Item 10), ground strap (Figure 11, Item 4), washer (Figure 11, Item 11), screw (Figure 11, Item 12), lockwasher (Figure 11, Item 8), and nut (Figure 11, Item 7) on frame rail (Figure 11, Item 9).

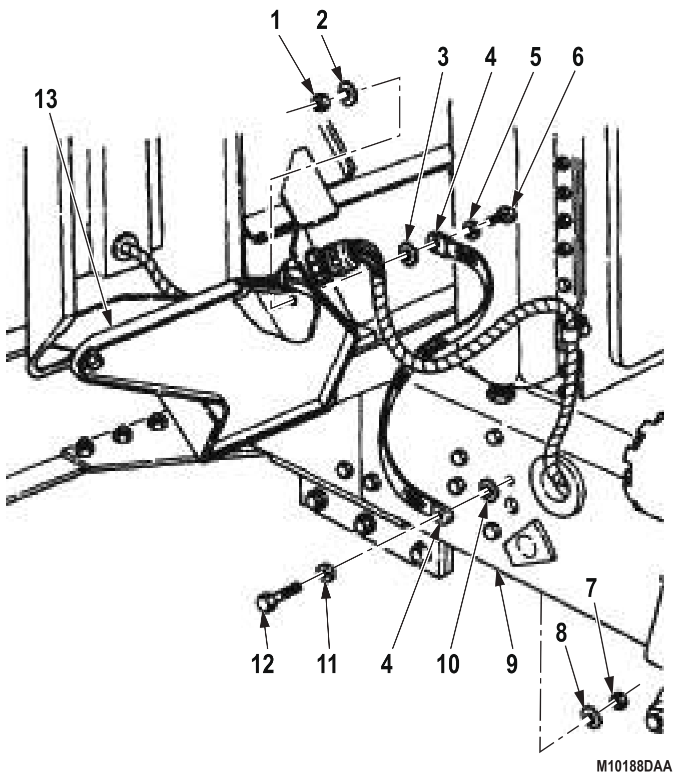


Figure 11. Ground Strap Installation.

GROUND STRAP (M939A2) INSTALLATION - Continued

5. Install lockwasher (Figure 12, Item 4), three wires (Figure 12, Item 8), ground strap (Figure 12, Item 5), washer (Figure 12, Item 7), and screw (Figure 12, Item 6) on engine block (Figure 12, Item 3).
6. Install lockwasher (Figure 12, Item 11), ground strap (Figure 12, Item 5), lockwasher (Figure 12, Item 12), screw (Figure 12, Item 9), washer (Figure 12, Item 2), and nut (Figure 12, Item 1) on frame rail (Figure 12, Item 10).

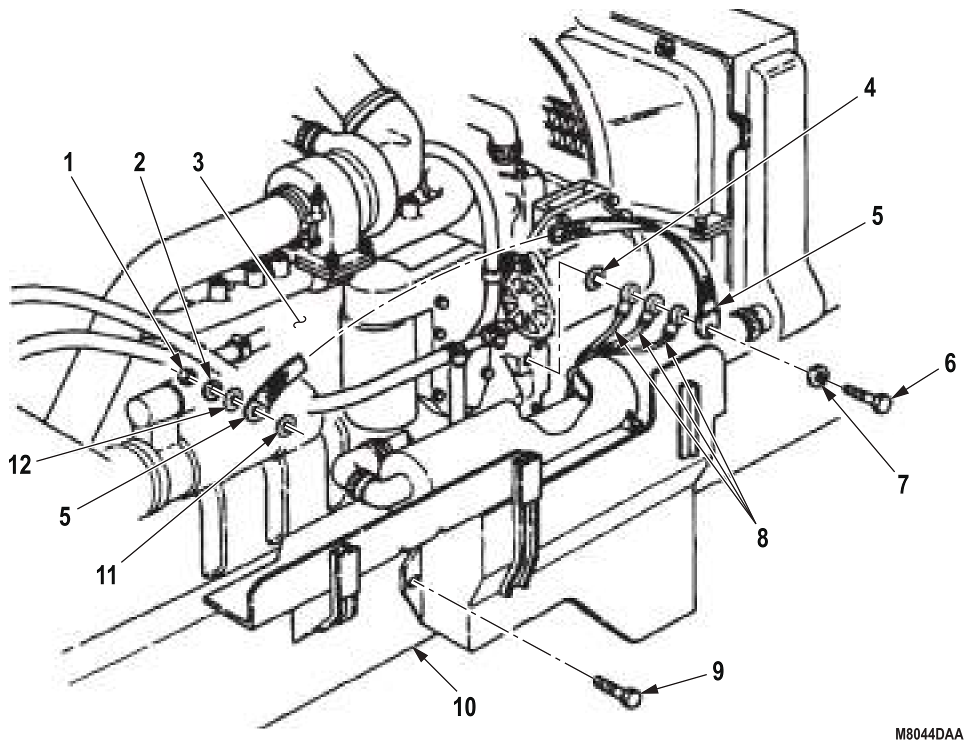


Figure 12. Ground Strap Installation.

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
CRANE WIRING HARNESS REPLACEMENT

INITIAL SETUP:

Tools and Special Tools
Tool Kit, General Mechanic's: Automotive (Volume 5, WP 0826, Table 1, Item 56)

Personnel Required
(2)

Equipment Condition
Parking brake set. (TM 9-2320-272-10)
Battery ground cables disconnected. (Volume 2, WP 0350)

REMOVAL

1. Disconnect gondola floodlight wire leads (Figure 1, Item 13) from floodlight (Figure 1, Item 12).
2. Remove three screws (Figure 1, Item 22), clamps (Figure 1, Item 14), and gondola floodlight wire (Figure 1, Item 21) from gondola (Figure 1, Item 11).
3. Pull gondola floodlight wire (Figure 1, Item 17) through side plate (Figure 1, Item 15).
4. Disconnect leads (Figure 1, Item 4) of oil reservoir floodlight wire (Figure 1, Item 17) from oil reservoir floodlight (Figure 1, Item 5).
5. Remove three screws (Figure 1, Item 3), clamps (Figure 1, Item 18), and oil reservoir floodlight wire (Figure 1, Item 17) from side plate (Figure 1, Item 6).
6. Pull gondola floodlight wire (Figure 1, Item 17) through side plate (Figure 1, Item 6).

WARNING

- Assistant must remain at crane controls until removal operation is completed. Injury to personnel may result if boom control lever is accidentally engaged while work is being done between raised boom and swivel base. Failure to comply may result in injury or death to personnel.
- All personnel must stand clear during hoisting operations. A snapped cable, or swinging or shifting load, may occur. Failure to comply may result in injury or death to personnel.

NOTE

- Assistant will operate crane.
- Mechanic will continue with removal operation after boom has been raised.

7. Raise boom (Figure 1, Item 1) to a 45-degree position (TM 9-2320-272-10).
8. Disconnect crane harness leads (Figure 1, Item 16) from floodlight wire leads (Figure 1, Item 2).
9. Remove six screws (Figure 1, Item 8), clamps (Figure 1, Item 10), and crane harness (Figure 1, Item 7) from turntable (Figure 1, Item 9) and side plates (Figure 1, Items 6 and 15).
10. Disconnect crane harness leads (Figure 1, Item 20) from swivel leads (Figure 1, Item 19) and remove crane harness (Figure 1, Item 7) from vehicle.

REMOVAL - Continued

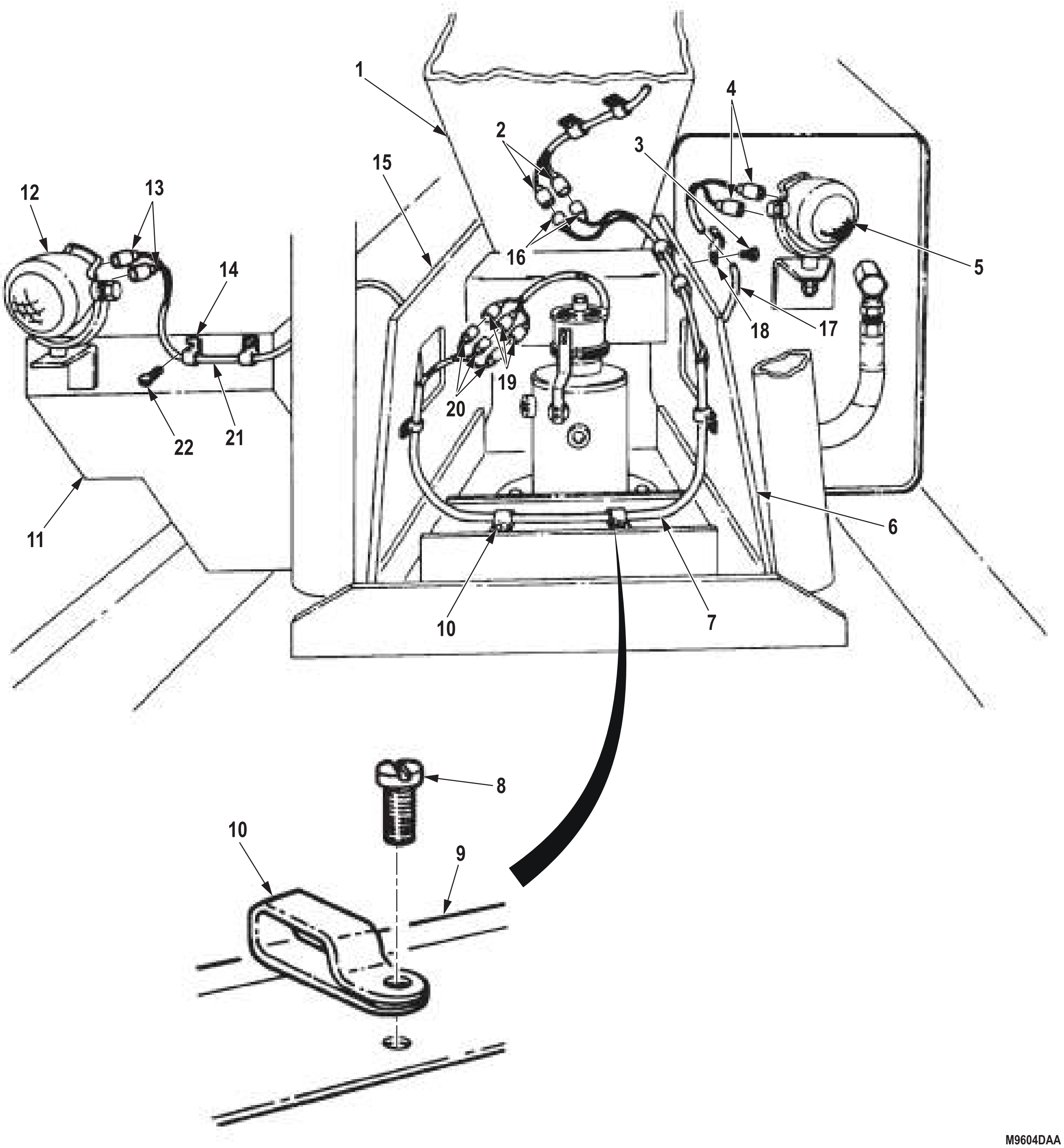


Figure 1. Crane Wiring Harness Removal.

END OF TASK

INSTALLATION

WARNING

- Assistant must remain at crane controls until removal operation is completed. Injury to personnel may result if boom control lever is accidentally engaged while work is being done between raised boom and swivel base. Failure to comply may result in injury or death to personnel.
- All personnel must stand clear during hoisting operations. A snapped cable, or swinging or shifting load, may occur. Failure to comply may result in injury or death to personnel.

1. Raise boom (Figure 2, Item 1) to a 45-degree position.
2. Spread out crane harness (Figure 2, Item 7) on vehicle along general lines of installation.
3. Thread gondola floodlight wire (Figure 2, Item 21) through side plate (Figure 2, Item 15) and connect leads (Figure 2, Item 13) to floodlight (Figure 2, Item 12).
4. Connect crane harness leads (Figure 2, Item 20) to swivel leads (Figure 2, Item 19).
5. Connect crane harness leads (Figure 2, Item 16) to floodlight wire leads (Figure 2, Item 2).
6. Thread oil reservoir floodlight wire (Figure 2, Item 17) through side plate (Figure 2, Item 6) and connect leads (Figure 2, Item 4) to oil reservoir floodlight (Figure 2, Item 5).
7. Install oil reservoir floodlight wire (Figure 2, Item 17) on side plate (Figure 2, Item 6) with three clamps (Figure 2, Item 18) and screws (Figure 2, Item 3).
8. Install crane harness (Figure 2, Item 7) on turntable (Figure 2, Item 9) and side plates (Figure 2, Items 6 and 15) with six clamps (Figure 2, Item 10) and screws (Figure 2, Item 8).
9. Install gondola floodlight wire (Figure 2, Item 21) on gondola (Figure 2, Item 11) with three clamps (Figure 2, Item 14) and screws (Figure 2, Item 22).
10. Lower boom (Figure 2, Item 1) (TM 9-2320-272-10).

INSTALLATION - Continued

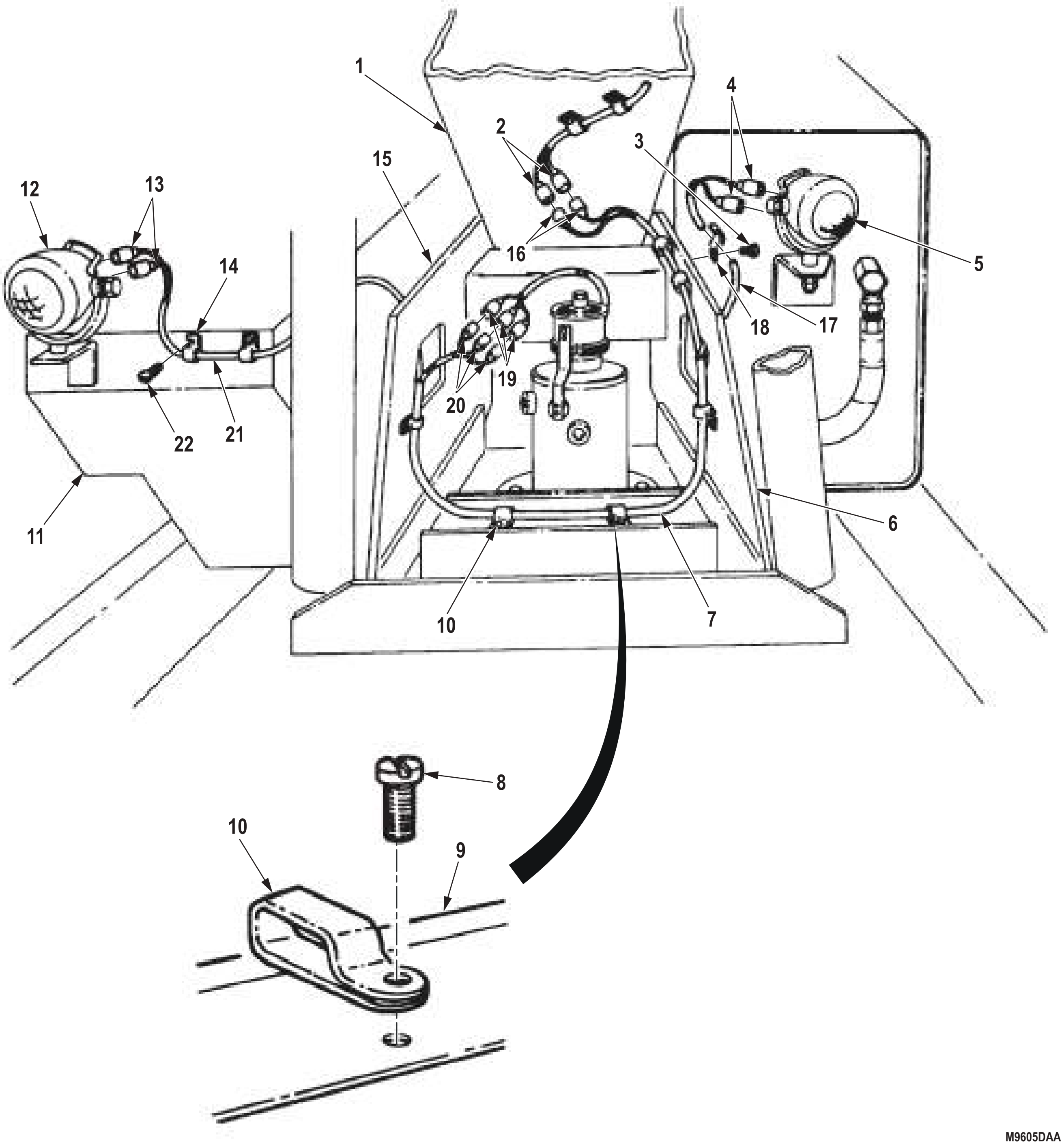


Figure 2. Crane Wiring Harness Installation.

END OF TASK

FOLLOW-ON MAINTENANCE

1. Connect battery ground cables. (Volume 2, WP 0350)
2. Check boom floodlight for proper operation. (TM 9-2320-272-10)
3. Lower boom and secure for travel. (TM 9-2320-272-10)

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
FRONT LIGHTS CABLE ASSEMBLY REPLACEMENT (M939/A1)

INITIAL SETUP:

Tools and Special Tools

Tool Kit, General Mechanic's: Automotive
(Volume 5, WP 0826, Table 1, Item 56)

Materials/Parts

Locknut (Volume 5, WP 0827, Table 1, Item 283)
Qty: 8
Locknut (Volume 5, WP 0827, Table 1, Item 285)
Qty: 10
Lockwasher
(Volume 5, WP 0827, Table 1, Item 392)
Qty: 4
Lockwasher

Materials/Parts (cont.)

(Volume 5, WP 0827, Table 1, Item 425)
Qty: 1

Equipment Condition

Hood raised and secured. (TM 9-2320-272-10)
Parking brake set. (TM 9-2320-272-10)
Battery ground cables disconnected. (Volume 2, WP 0350)
Splash shields removed. (TM 9-2320-272-10)

REMOVAL

NOTE

Tag wires and connectors for installation.

1. Disconnect front light cable connector (Figure 1, Item 14) from wiring harness connector (Figure 1, Item 11).
2. Remove four nuts (Figure 1, Item 16), lockwashers (Figure 1, Item 15), screws (Figure 1, Item 12), and wiring harness connector (Figure 1, Item 11) from left fender (Figure 1, Item 13). Discard lockwashers.
3. Remove four locknuts (Figure 1, Item 20) and screws (Figure 1, Item 18) from right fender (Figure 1, Item 17) and wiring cover (Figure 1, Item 22). Discard locknuts.
4. Remove grommet (Figure 1, Item 19) from wiring cover (Figure 1, Item 22).
5. Disconnect wires (Figure 1, Items 23, 24, 25, and 26) from cable assembly (Figure 1, Item 21).
6. Remove wiring cover (Figure 1, Item 22) from cable assembly (Figure 1, Item 21).
7. Remove four locknuts (Figure 1, Item 5) and screws (Figure 1, Item 1) from left fender (Figure 1, Item 2) and wiring cover (Figure 1, Item 4). Discard locknuts.
8. Remove grommet (Figure 1, Item 7) from wiring cover (Figure 1, Item 4).
9. Disconnect wires (Figure 1, Items 3, 8, 9, and 10) from cable assembly (Figure 1, Item 6).
10. Remove wiring cover (Figure 1, Item 4) from cable assembly (Figure 1, Item 6).

REMOVAL - Continued

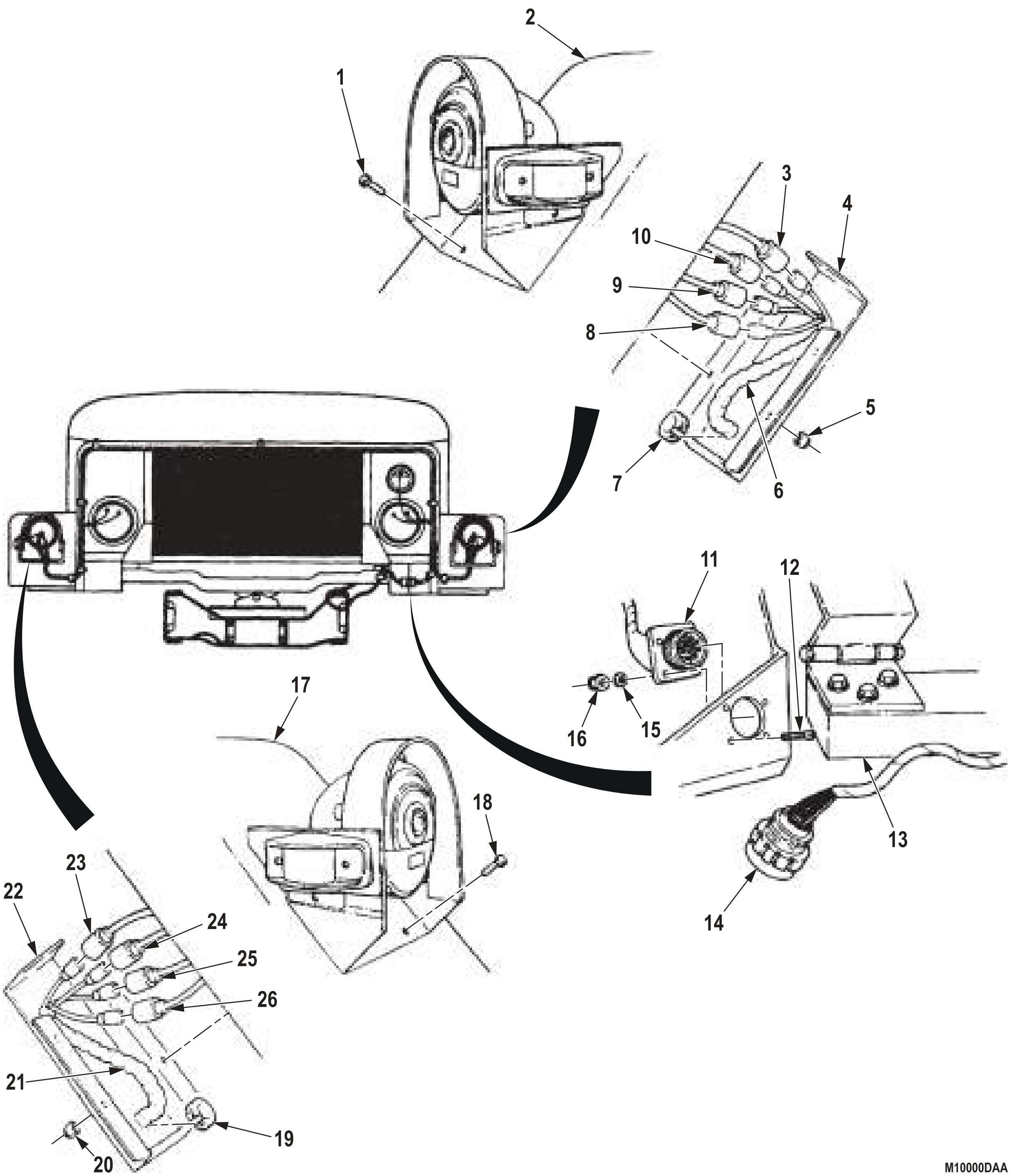


Figure 1. Front Lights Cable Assembly Removal.

REMOVAL - Continued

NOTE

- Left and right headlamps are removed the same.
- Steps (11) through (13) cover the right headlamp assembly.

11. Disconnect connectors (Figure 2, Items 13 and 14) from right headlamp (Figure 2, Item 15).
12. Disconnect right headlamp ground connector (Figure 2, Item 16) from headlamp (Figure 2, Item 15).
13. Remove screw (Figure 2, Item 9), washer (Figure 2, Item 10), ground wire (Figure 2, Item 11), and lockwasher (Figure 2, Item 12) from panel (Figure 2, Item 17). Discard lockwasher.
14. Disconnect connector (Figure 2, Item 7) from blackout lamp (Figure 2, Item 8).

NOTE

M936/A1/A2 vehicles have only eight screws and clamps to be removed in Step (15).

15. Remove ten locknuts (Figure 2, Item 3), screws (Figure 2, Item 4), and clamps (Figure 2, Item 2) from vehicle (Figure 2, Item 5) and cable assembly (Figure 2, Item 1). Discard locknuts.

REMOVAL - Continued

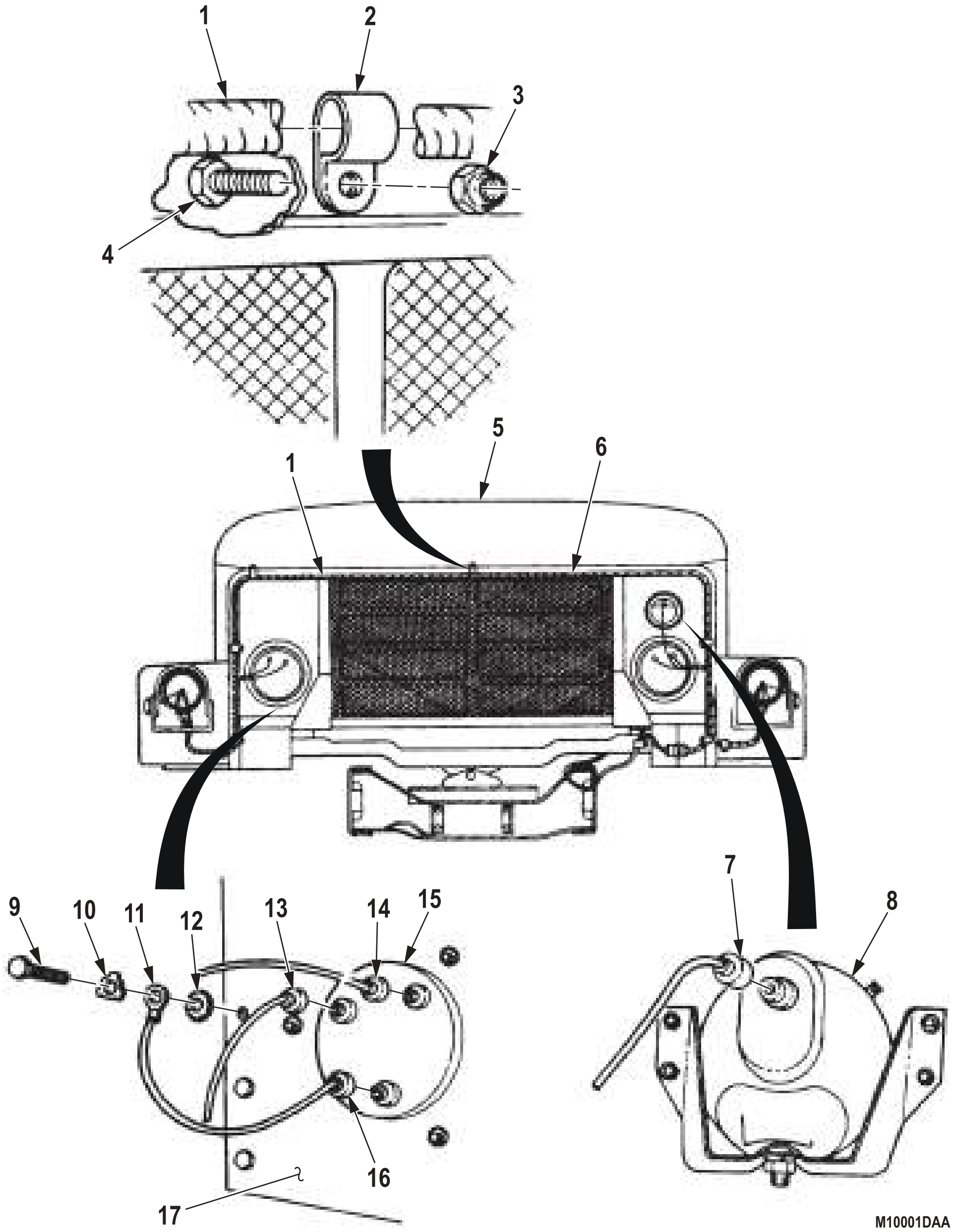


Figure 2. Front Lights Cable Assembly Removal.

END OF TASK

INSTALLATION

CAUTION

Do not install wiring harness to hood retaining rod mounting bracket screw. Movement will cause clamp to cut harness.

NOTE

M936 vehicles use only eight screws and clamps for Step (1).

1. Route cable (Figure 3, Item 1) along perimeter of grille (Figure 3, Item 6), and install ten clamps (Figure 3, Item 2) on vehicle (Figure 3, Item 5) with screws (Figure 3, Item 4) and locknuts (Figure 3, Item 3).
2. Connect connector (Figure 3, Item 7) to blackout lamp (Figure 3, Item 8).

NOTE

Left and right headlamps are installed the same. Steps (3) and (4) cover the right headlamps.

3. Connect connectors (Figure 3, Items 13 and 14) on right headlamp (Figure 3, Item 15).
4. Connect connector (Figure 3, Item 16) on right headlamp (Figure 3, Item 15) and secure eye end of ground wire (Figure 3, Item 11) to panel (Figure 3, Item 17) with lockwasher (Figure 3, Item 12), washer (Figure 3, Item 10), and screw (Figure 3, Item 9).

INSTALLATION - Continued

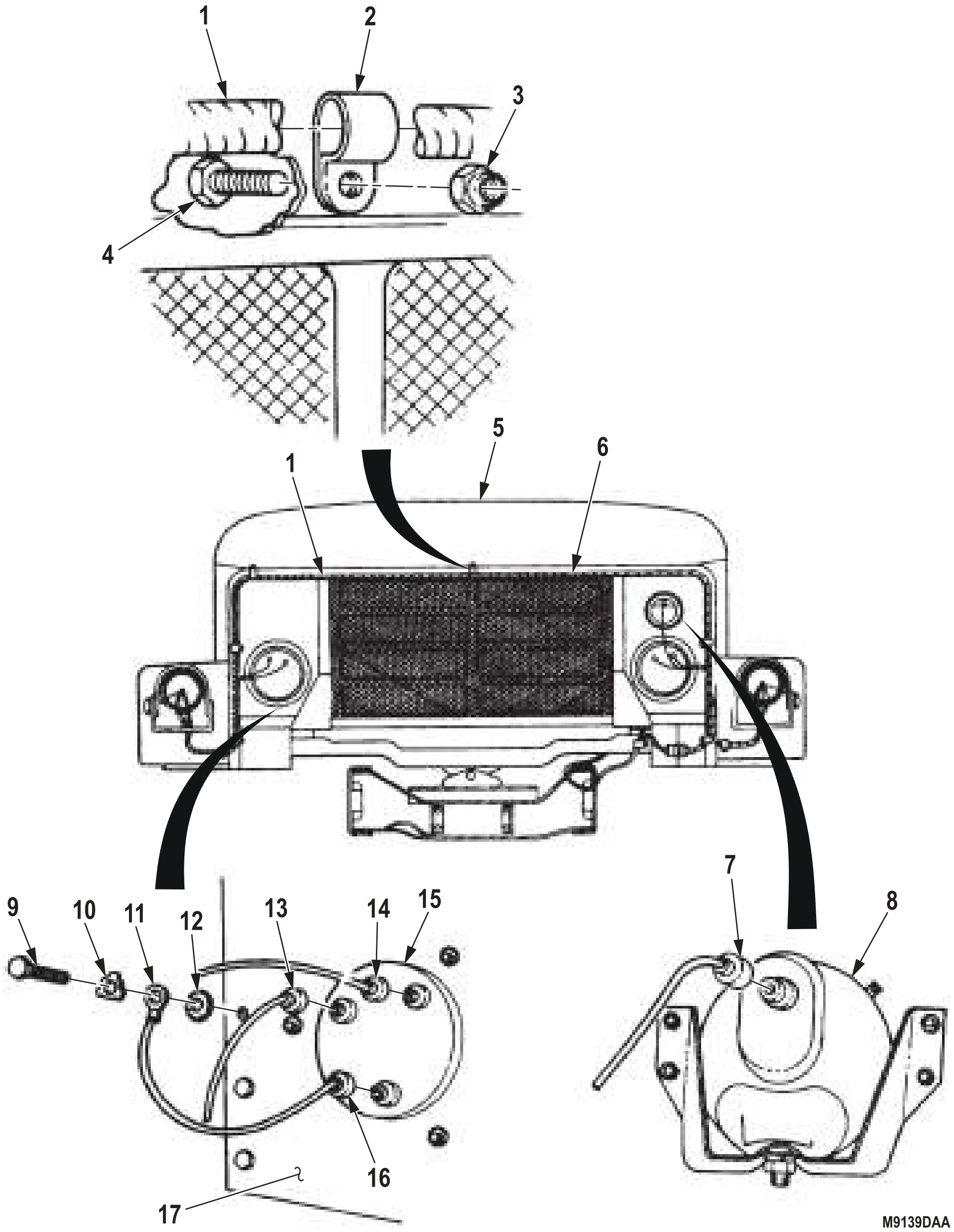


Figure 3. Front Lights Cable Assembly Installation.

INSTALLATION - Continued

5. Insert ends of wires (Figure 4, Items 13, 18, 19, and 20) through hole in wiring cover (Figure 4, Item 14) and connect to mating connectors of cable (Figure 4, Item 15).
6. Install grommet (Figure 4, Item 17) in wiring cover (Figure 4, Item 14).
7. Install wiring cover (Figure 4, Item 14) on fender (Figure 4, Item 12) with four screws (Figure 4, Item 11) and locknuts (Figure 4, Item 16).
8. Insert ends of wires (Figure 4, Items 7, 8, 9, and 10) through hole in wiring cover (Figure 4, Item 6) and connect to mating connectors of cable (Figure 4, Item 5).
9. Install grommet (Figure 4, Item 3) in wiring cover (Figure 4, Item 6).
10. Install wiring cover (Figure 4, Item 6) on fender (Figure 4, Item 1) with four screws (Figure 4, Item 2) and locknuts (Figure 4, Item 4).
11. Install front wiring harness connector (Figure 4, Item 21) on fender (Figure 4, Item 24) with four screws (Figure 4, Item 22), lockwashers (Figure 4, Item 25), and nuts (Figure 4, Item 26).
12. Connect front lights cable connector (Figure 4, Item 23) to front wiring harness connector (Figure 4, Item 21).

INSTALLATION - Continued

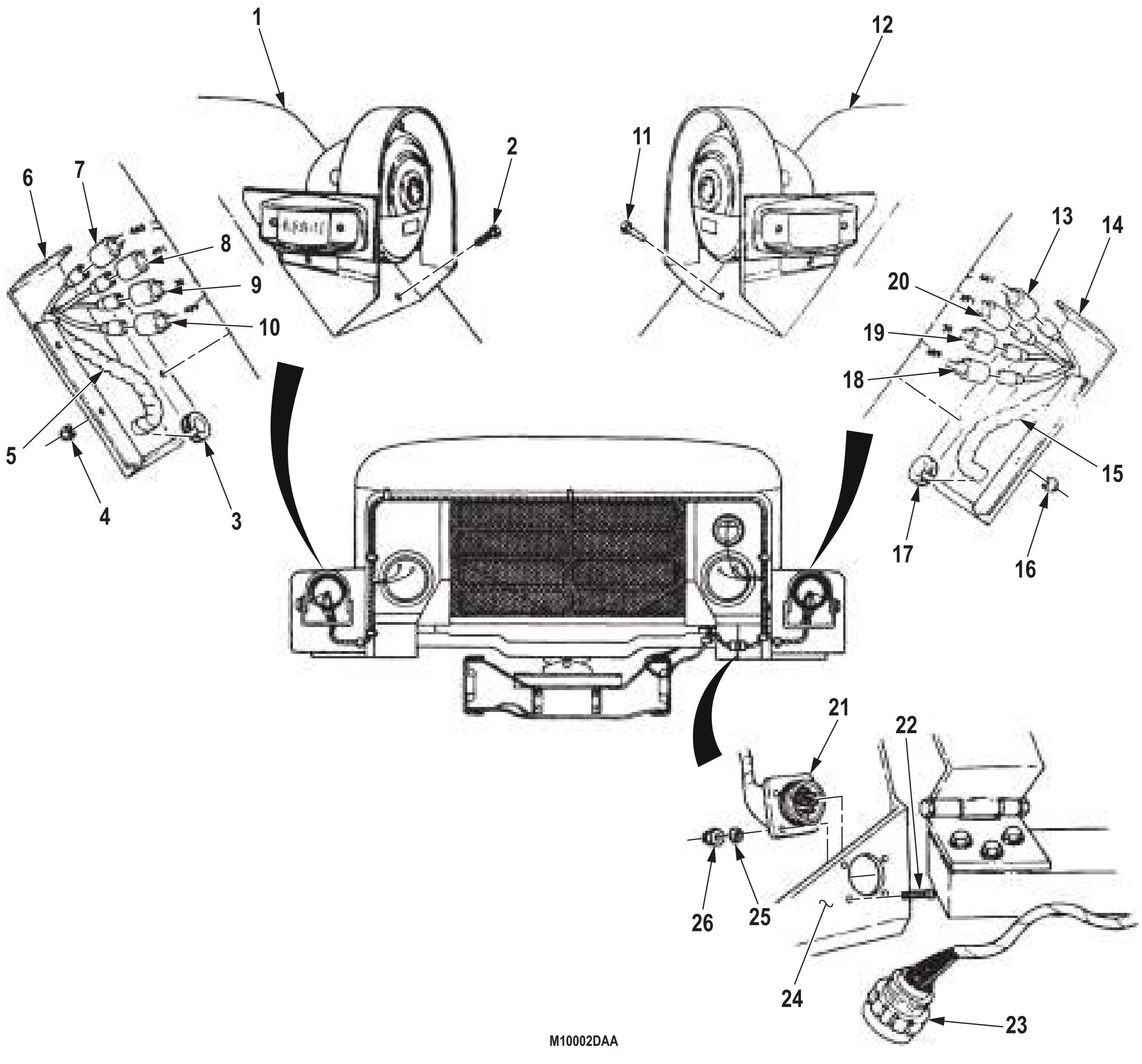


Figure 4. Front Lights Cable Assembly Installation.

END OF TASK

FOLLOW-ON MAINTENANCE

1. Connect battery ground cables. (Volume 2, WP 0350)
2. Check operation of all front lights. (TM 9-2320-272-10)
3. Install splash shields. (TM 9-2320-272-10)

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
FRONT WIRING HARNESS REPLACEMENT (M939/A1)

INITIAL SETUP:

Tools and Special Tools

Tool Kit, General Mechanic's: Automotive
(Volume 5, WP 0826, Table 1, Item 56)

Materials/Parts

Adhesive, Silicone Rubber
(Volume 5, WP 0825, Table 1, Item 4)
Cotter Pin
(Volume 5, WP 0827, Table 1, Item 257)
Qty: 1
Locknut (Volume 5, WP 0827, Table 1, Item 285)
Qty: 4
Lockwasher
(Volume 5, WP 0827, Table 1, Item 406)
Qty: 2
Lockwasher
(Volume 5, WP 0827, Table 1, Item 215)
Qty: 1
Lockwasher
(Volume 5, WP 0827, Table 1, Item 384)
Qty: 8
Lockwasher
(Volume 5, WP 0827, Table 1, Item 394)
Qty: 4
Lockwasher
(Volume 5, WP 0827, Table 1, Item 410)
Qty: 3
Lockwasher
(Volume 5, WP 0827, Table 1, Item 420)
Qty: 1
Lockwasher
(Volume 5, WP 0827, Table 1, Item 425)
Qty: 2
Lockwasher, Screw Assembled

Materials/Parts (cont.)

(Volume 5, WP 0827, Table 1, Item 187)
Qty: 2
Spring Nut
(Volume 5, WP 0827, Table 1, Item 428)
Qty: 1
Tiedown Strap
(Volume 5, WP 0827, Table 1, Item 370)
Qty: 3
Tiedown Strap
(Volume 5, WP 0827, Table 1, Item 377)
Qty: 4

Personnel Required

(2)

Equipment Condition

Parking brake set. (TM 9-2320-272-10)
Splash shields removed. (TM 9-2320-272-10)
Air intake pipe removed. (TM 9-2320-272-10)
Battery ground cables disconnected. (Volume 2, WP 0350)
Failsafe warning module removed. (Volume 2, WP 0336)
Main light switch removed. (Volume 2, WP 0315)
Protective control box removed. (Volume 2, WP 0319)
Turn signal flasher removed. (Volume 2, WP 0318)

REMOVAL

NOTE

Tag wires, connectors, and cables for installation.

1. Disconnect front wiring harness connector (Figure 1, Item 8) from front lights cable assembly receptacle (Figure 1, Item 1).
2. Remove nut (Figure 1, Item 5), washer (Figure 1, Item 3), screw (Figure 1, Item 2), washer (Figure 1, Item 3), cable clamp (Figure 1, Item 4), and wiring harness (Figure 1, Item 7) from radiator (Figure 1, Item 6).
3. Disconnect tachometer pulse sender connector (Figure 1, Item 19) from fuel pump connector (Figure 1, Item 18).
4. Disconnect fuel pressure transducer connector (Figure 1, Item 17) on fuel pump (Figure 1, Item 16) from front wiring harness connector (Figure 1, Item 20).
5. Remove screw (Figure 1, Item 11), washer (Figure 1, Item 12), and cable clamp (Figure 1, Item 10) from engine intake manifold (Figure 1, Item 9).
6. Remove nut (Figure 1, Item 14) and two wires (Figure 1, Item 13) from fuel pump shut-off solenoid (Figure 1, Item 15).
7. Disconnect wire (Figure 1, Item 23) from engine temperature sending unit (Figure 1, Item 22) and remove wiring harness from behind air compressor (Figure 1, Item 21) and intake manifold (Figure 1, Item 9).
8. Disconnect wires (Figure 1, Items 25 and 26) from ether start fuel pump pressure switch (Figure 1, Item 24).

REMOVAL - Continued

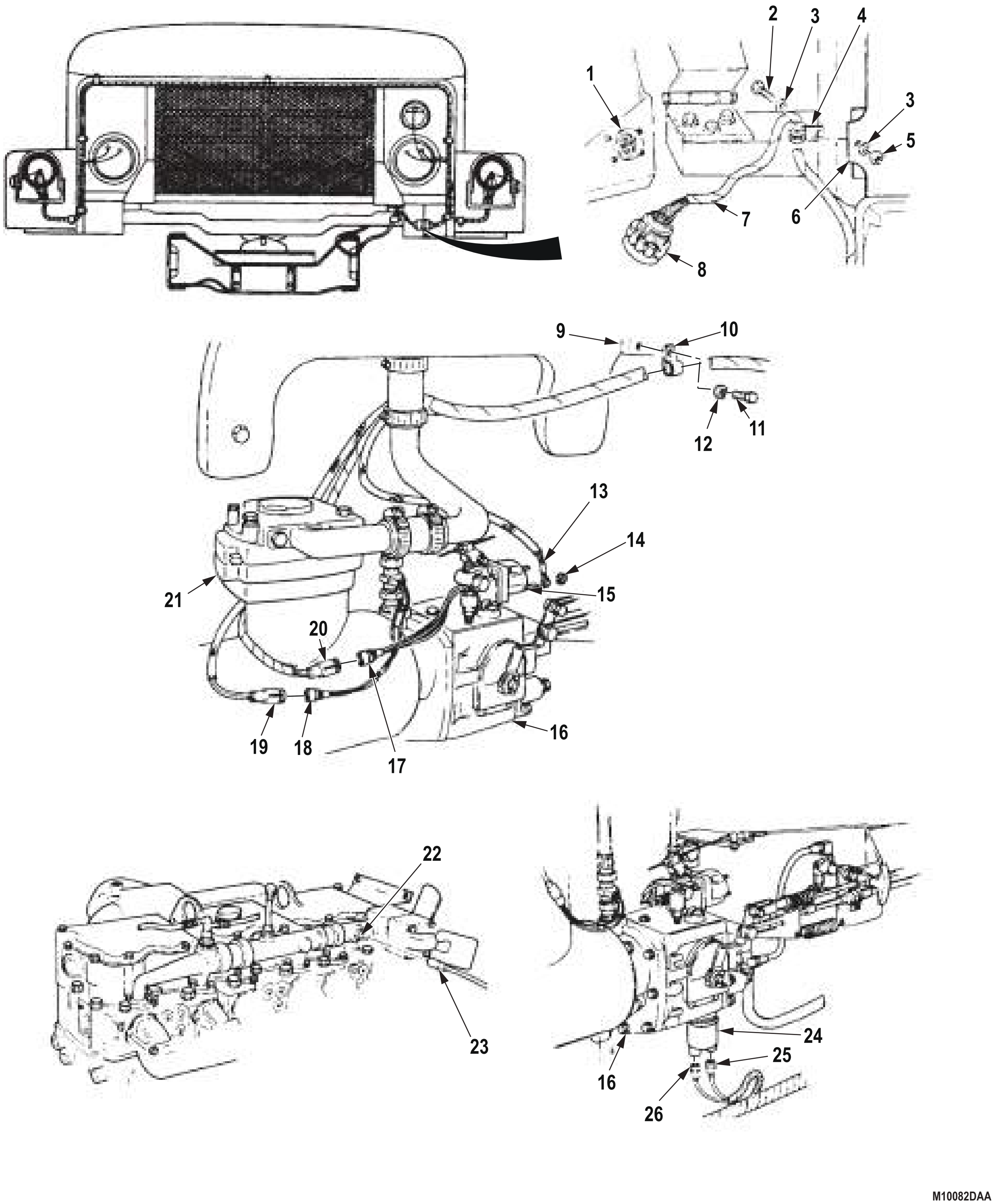


Figure 1. Front Wiring Harness Replacement.

REMOVAL - Continued

9. Disconnect wire (Figure 2, Item 2) from oil pressure sending unit (Figure 2, Item 1).
10. Remove screw assembled washer (Figure 2, Item 3), washer (Figure 2, Item 4), and wire (Figure 2, Item 5) from starter solenoid (Figure 2, Item 6).

NOTE

M936 vehicles may not have lockwasher.

11. Remove nut (Figure 2, Item 15), lockwasher (Figure 2, Item 16), wire (Figure 2, Item 17), and wire (Figure 2, Item 14) from solenoid post (Figure 2, Item 7). Discard lockwasher.
12. Place wire (Figure 2, Item 17) on post (Figure 2, Item 7) and secure with nut (Figure 2, Item 15).
13. Remove nut (Figure 2, Item 12), lockwasher (Figure 2, Item 13), wire (Figure 2, Item 11), and wire (Figure 2, Item 10) from starter motor terminal (Figure 2, Item 8). Discard lockwasher.
14. Place wire (Figure 2, Item 11) and grounding sleeve (Figure 2, Item 9) on post (Figure 2, Item 8) and secure with nut (Figure 2, Item 12).
15. Remove screw assembled washer (Figure 2, Item 20), wire (Figure 2, Item 21), ground strap (Figure 2, Item 22), and lockwasher (Figure 2, Item 23) from intake manifold (Figure 2, Item 24). Discard lockwasher.
16. Disconnect connectors (Figure 2, Items 18 and 19).

REMOVAL - Continued

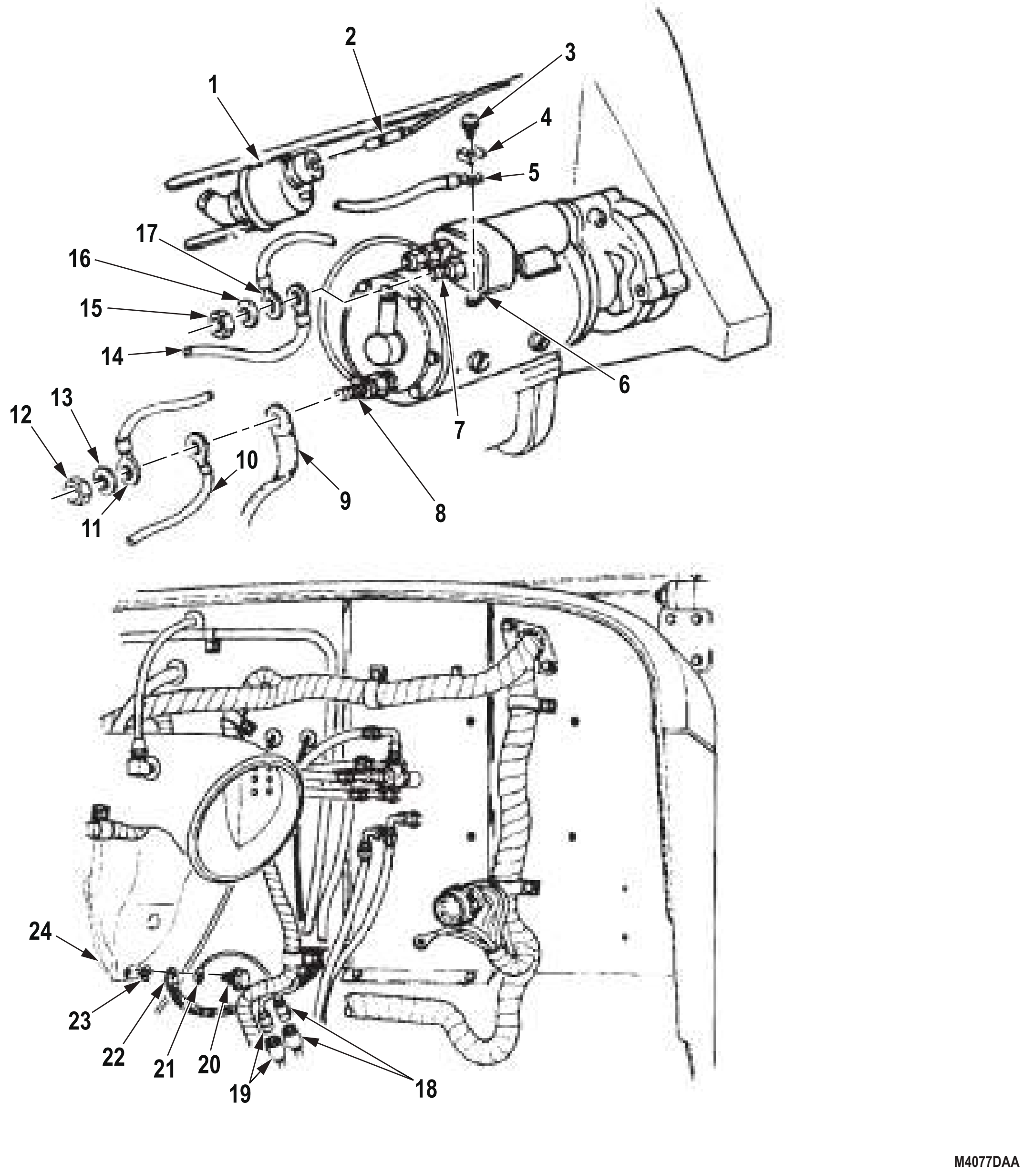


Figure 2. Front Wiring Harness Replacement.

REMOVAL - Continued

17. Disconnect wires (Figure 3, Items 1 and 23) from horn circuit breaker (Figure 3, Item 2).
18. Disconnect wires (Figure 3, Items 3 and 20) from transmission control and spring brake circuit breaker (Figure 3, Item 4).
19. Remove and discard two tiedown straps from wiring harness.
20. Disconnect wire (Figure 3, Item 6) from engine temperature switch wire (Figure 3, Item 5).
21. Disconnect wire (Figure 3, Item 17) from personnel hot water heater (Figure 3, Item 18).
22. Disconnect wires (Figure 3, Items 14 and 15) from horn solenoid (Figure 3, Item 16).
23. Disconnect wire (Figure 3, Item 12) from transorb diode coupling assembly wire (Figure 3, Item 13).
24. Remove four tiedown straps (Figure 3, Item 11) from front wiring harness cable (Figure 3, Item 21). Discard tiedown straps.
25. Remove three screws (Figure 3, Item 10) and cable clamps (Figure 3, Item 8) from firewall (Figure 3, Item 7). Tag cable clamps for installation.

REMOVAL - Continued

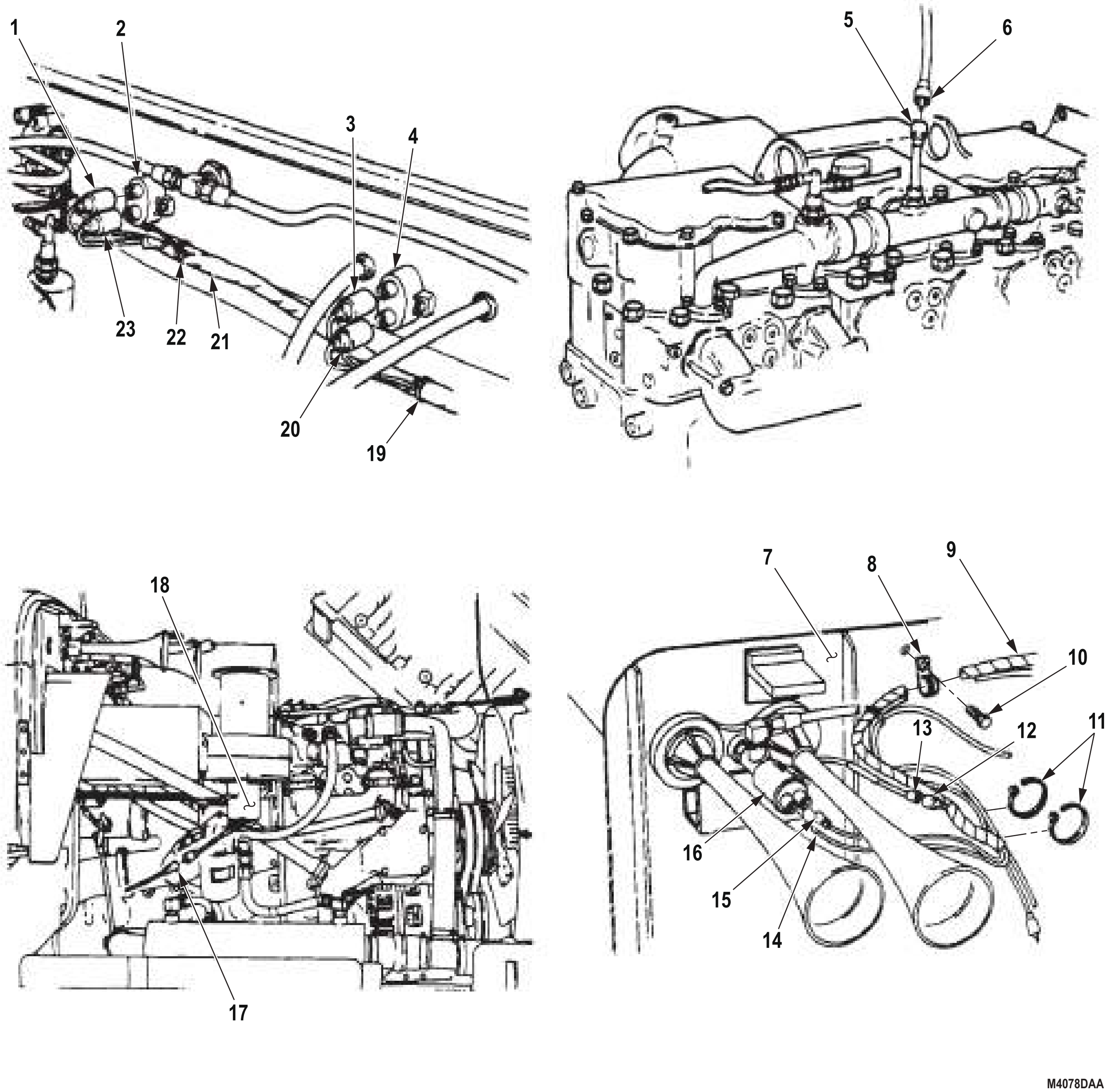


Figure 3. Front Wiring Harness Replacement.

REMOVAL - Continued

26. Remove two screw assembled lockwashers (Figure 4, Item 5) and terminal cover (Figure 4, Item 4) from alternator (Figure 4, Item 10). Discard screw assembled lockwashers.
27. Remove two screws (Figure 4, Item 3), lockwashers (Figure 4, Item 2), and wire retaining strap (Figure 4, Item 1) from alternator (Figure 4, Item 10). Discard lockwashers.
28. Remove screw (Figure 4, Item 15), lockwasher (Figure 4, Item 14), and wire (Figure 4, Item 13) from alternator (Figure 4, Item 10). Discard lockwasher.

NOTE

Sealant must be removed before removing wires.

29. Remove nut (Figure 4, Item 19), lockwasher (Figure 4, Item 18), washer (Figure 4, Item 17), and wire (Figure 4, Item 16) from alternator (Figure 4, Item 10). Discard lockwasher.
30. Remove nut (Figure 4, Item 6), lockwasher (Figure 4, Item 7), washer (Figure 4, Item 8), and wire (Figure 4, Item 9) from alternator (Figure 4, Item 10). Discard lockwasher.
31. Disconnect connectors (Figure 4, Item 11).

NOTE

One tiedown strap is near alternator. Other two are located along inside of right frame rail.

32. Remove and discard three tiedown straps.

REMOVAL - Continued

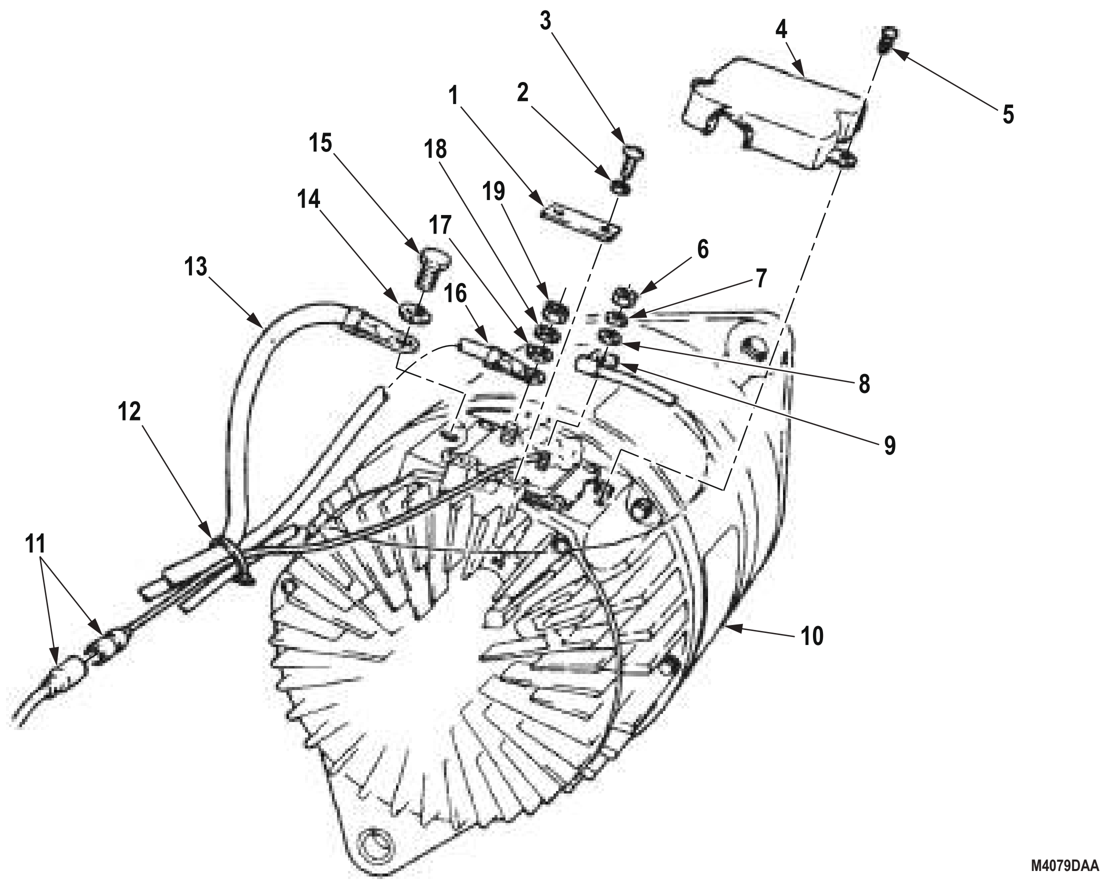


Figure 4. Front Wiring Harness Replacement.

REMOVAL - Continued

33. Disconnect wires (Figure 5, Items 3, 4, and 5) from headlight beam selector switch (Figure 5, Item 6).
34. Remove four nuts (Figure 5, Item 7), lockwashers (Figure 5, Item 8), screws (Figure 5, Item 2), and connector (Figure 5, Item 1) from rear wiring harness receptacle (Figure 5, Item 9). Discard lockwashers.
35. Disconnect wire (Figure 5, Item 11) from wire (Figure 5, Item 10).
36. Disconnect wire (Figure 5, Item 15) from transfer case switch capacitor wire (Figure 5, Item 12).

NOTE

Perform Step (37) for M936 wrecker only.

37. Disconnect wire (Figure 5, Item 14) from 5th gear lock-up capacitor wire (Figure 5, Item 13).

REMOVAL - Continued

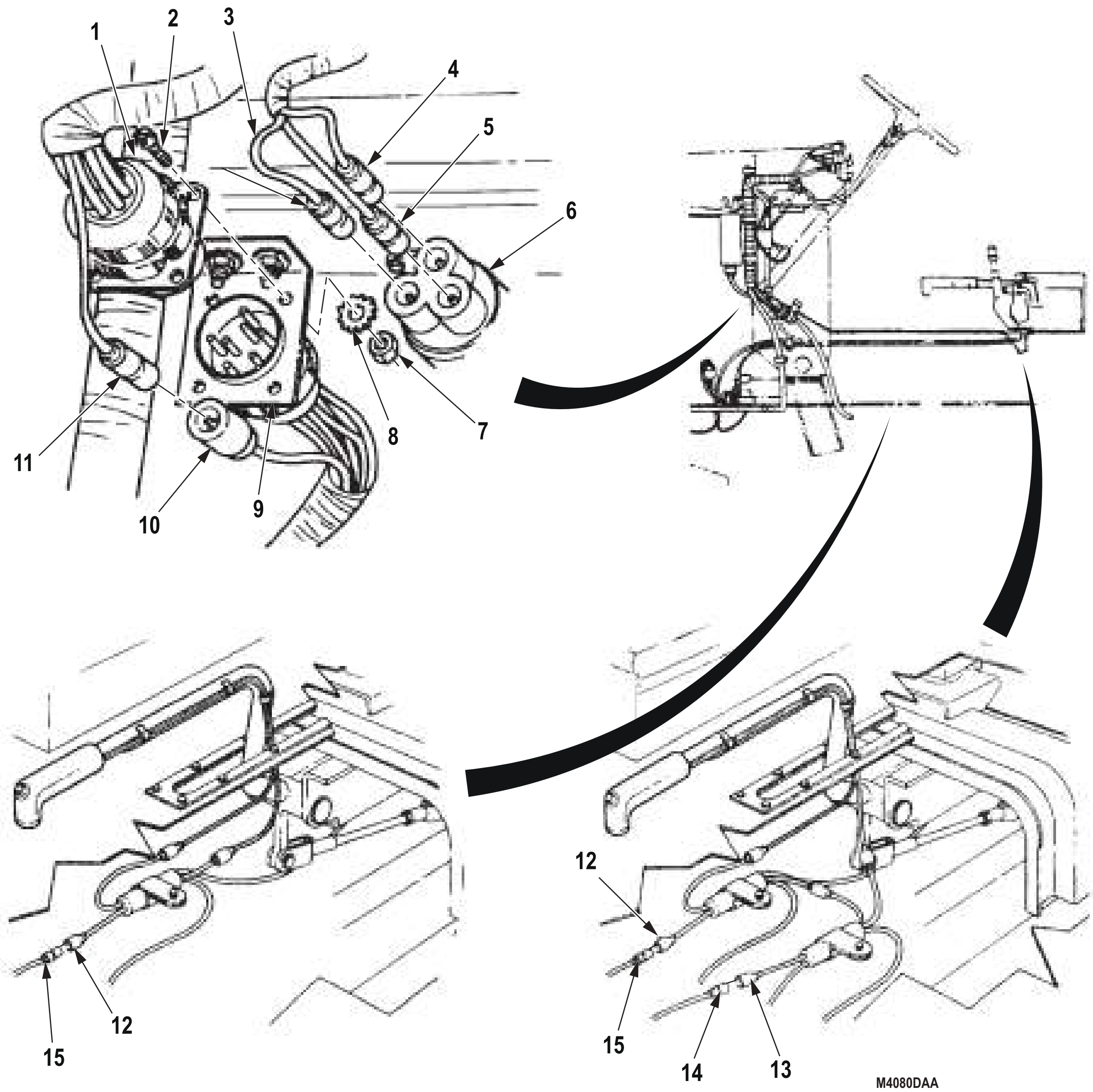


Figure 5. Front Wiring Harness Replacement.

REMOVAL - Continued

38. Remove locknut (Figure 6, Item 7), screw (Figure 6, Item 1), lockwasher (Figure 6, Item 9), and alternator ground wire (Figure 6, Item 8) from frame crossmember (Figure 6, Item 3) and air line bracket (Figure 6, Item 5). Discard lockwasher and locknut.
39. Remove locknut (Figure 6, Item 6), screw (Figure 6, Item 2), and air line clamp (Figure 6, Item 4) from air line bracket (Figure 6, Item 5).
40. Disconnect wire (Figure 6, Item 10) from parking brake switch wire (Figure 6, Item 11).

REMOVAL - Continued

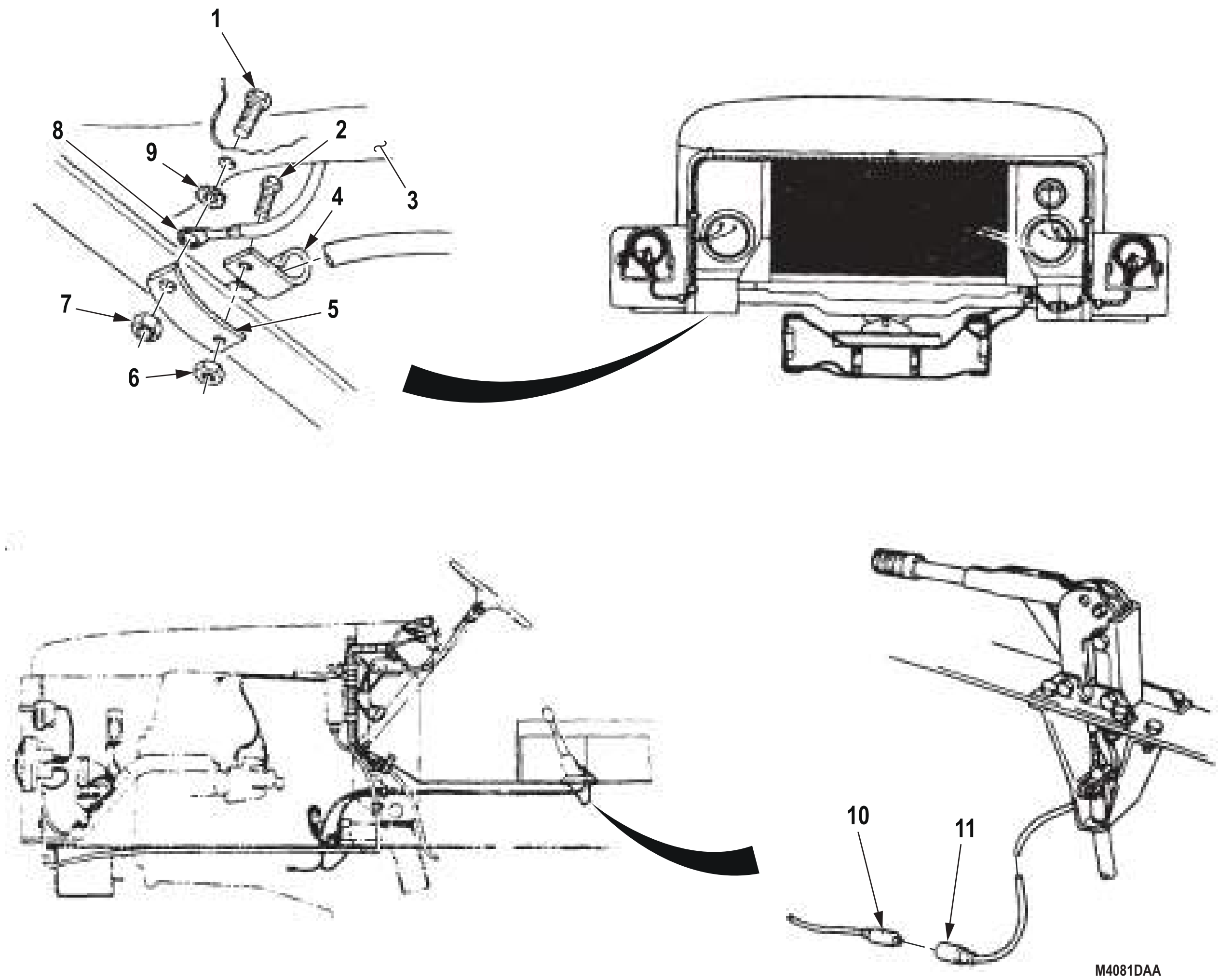


Figure 6. Front Wiring Harness Replacement.

REMOVAL - Continued

41. Disconnect front harness connector (Figure 7, Item 2) from turn signal control (Figure 7, Item 1).
42. Disconnect wire (Figure 7, Item 4) from horn switch (Figure 7, Item 3).
43. Disconnect wires (Figure 7, Items 5 and 6) from electrical circuit breaker (Figure 7, Item 9).
44. Disconnect wire (Figure 7, Item 8) from heater blower motor circuit breaker (Figure 7, Item 7).

NOTE

Perform Step (45) for M927, M930, M931, M932, and M936 vehicles.

45. Disconnect wires (Figure 7, Items 12, 13, and 14) from fuel selector switch (Figure 7, Item 11).
46. Disconnect connector (Figure 7, Item 15) from front wheel drive lock-in switch (Figure 7, Item 10).

REMOVAL - Continued

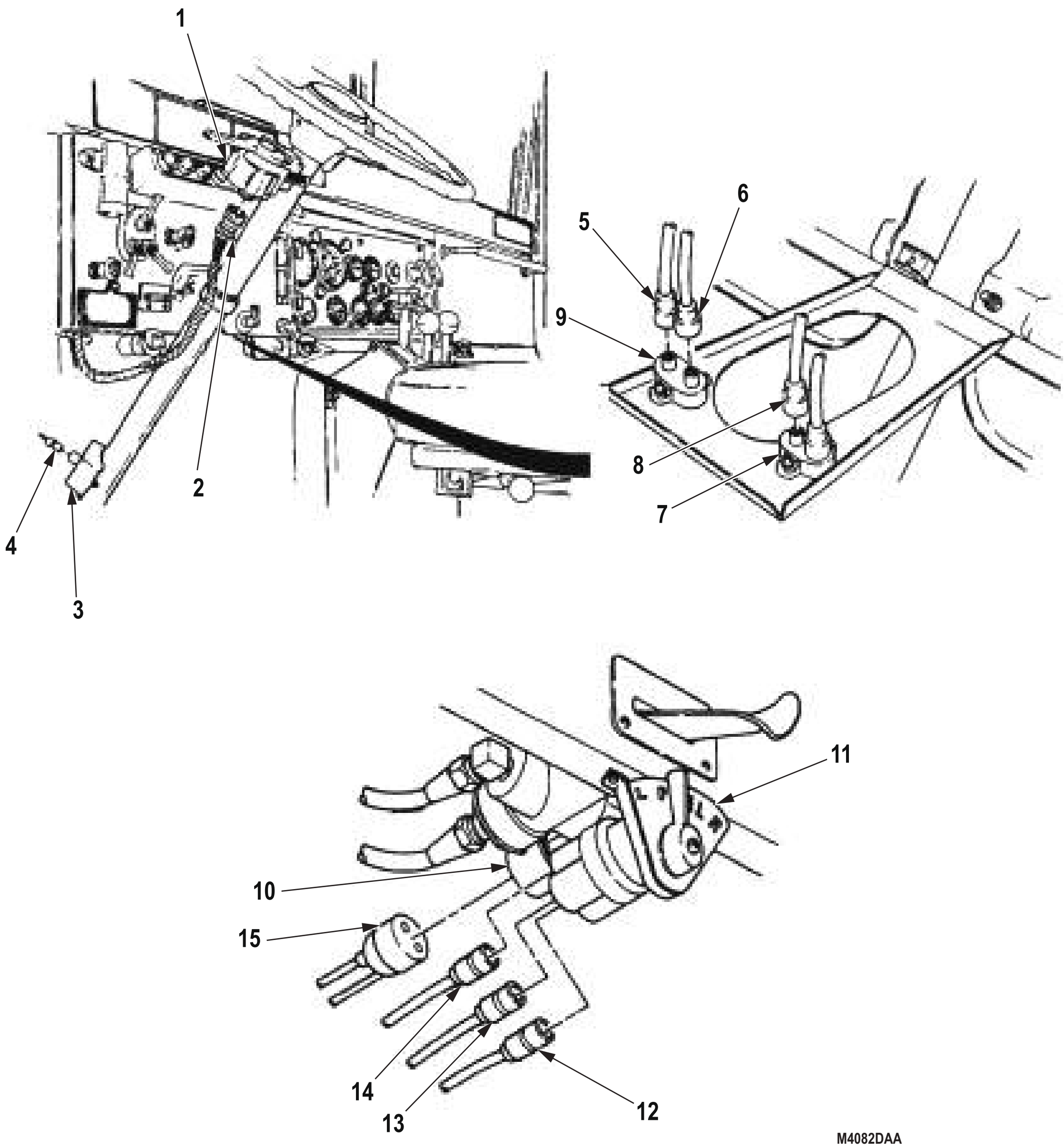


Figure 7. Front Wiring Harness Replacement.

REMOVAL - Continued

47. Disconnect wires (Figure 8, Items 2 and 3) from ether start switch (Figure 8, Item 1).
48. Disconnect wires (Figure 8, Items 5, 6, and 7) from heater blower motor switch (Figure 8, Item 4).
49. Disconnect wire (Figure 8, Item 9) from warning signal lamp switch (Figure 8, Item 8).

NOTE

After harness wires have been removed in Steps (50) through (52), cables and hardware should be installed on terminal adapters for installation.

50. Remove nut (Figure 8, Item 10), screw (Figure 8, Item 14), battery cables (Figure 8, Items 11 and 12), and wire (Figure 8, Item 13) from terminal adapter (Figure 8, Item 15).
51. Remove nut (Figure 8, Item 16), screw (Figure 8, Item 19), wire (Figure 8, Item 20), and battery cable (Figure 8, Item 18) from terminal adapter (Figure 8, Item 17).
52. Remove nut (Figure 8, Item 21), screw (Figure 8, Item 23), battery cables (Figure 8, Items 22 and 26), and wire (Figure 8, Item 24) from terminal adapter (Figure 8, Item 25).
53. Push wires (Figure 8, Items 13, 20, and 24) through hole in cab floor.
54. Remove four screws (Figure 8, Item 36) from warning light panel (Figure 8, Item 28) and pull panel away from instrument panel (Figure 8, Item 29).
55. Disconnect wire (Figure 8, Item 30) from parking brake indicator light (Figure 8, Item 27).
56. Disconnect wire (Figure 8, Item 31) from low air pressure indicator light (Figure 8, Item 41).
57. Disconnect wire (Figure 8, Item 32) from spring brake override indicator light (Figure 8, Item 40).
58. Disconnect wire (Figure 8, Item 33) from engine hot indicator light (Figure 8, Item 39).
59. Disconnect wire (Figure 8, Item 34) from axle lock-in indicator light (Figure 8, Item 38).
60. Disconnect wire (Figure 8, Item 35) from high-beam indicator light (Figure 8, Item 37).

REMOVAL - Continued

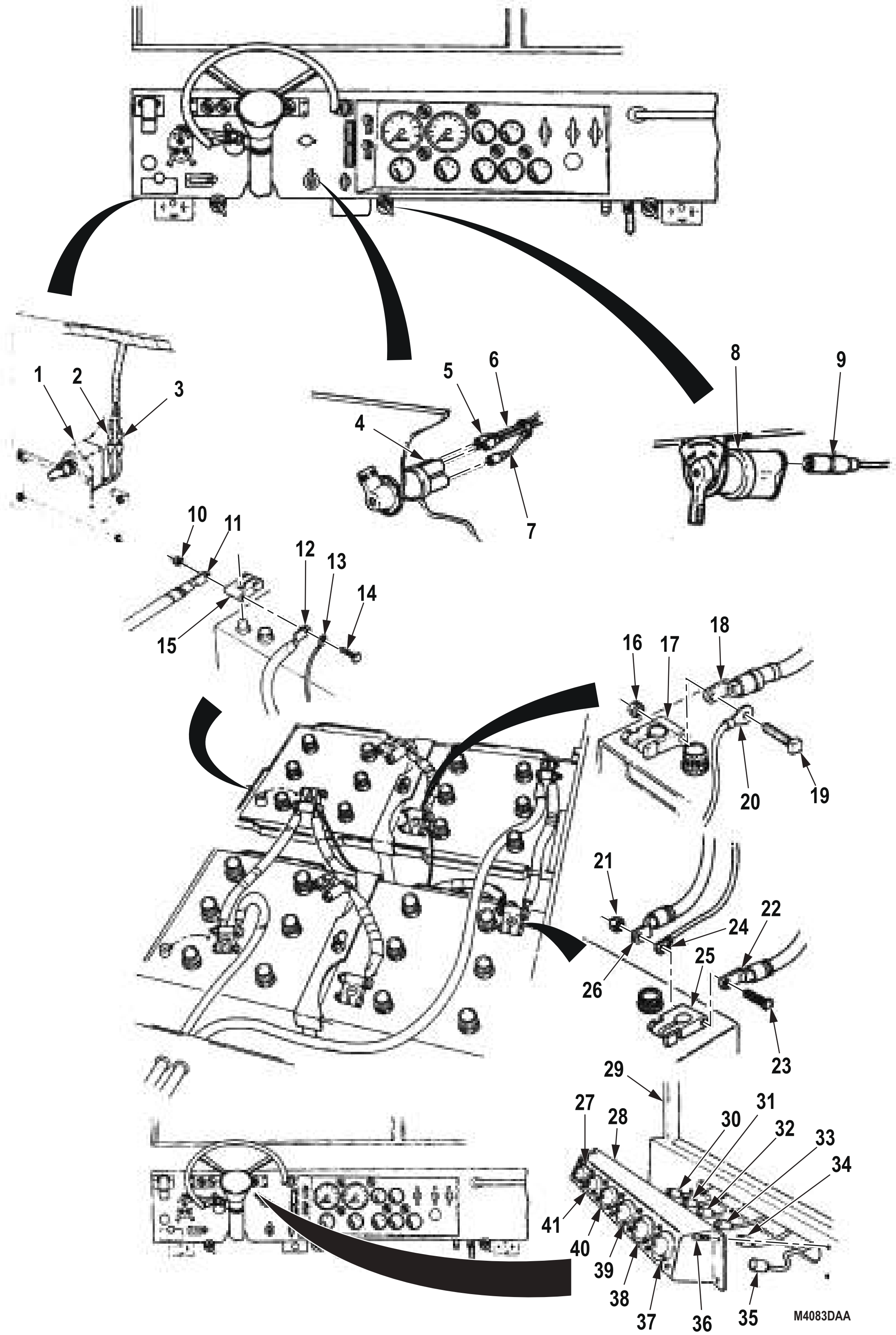


Figure 8. Front Wiring Harness Replacement.

REMOVAL - Continued

61. Remove eight screws (Figure 9, Item 3) from instrument cluster (Figure 9, Item 1) and pull cluster away from instrument panel (Figure 9, Item 2).
62. Remove screw (Figure 9, Item 7), retainer nut (Figure 9, Item 9), and clamp (Figure 9, Item 8) from heater assembly (Figure 9, Item 4) in right side of engine compartment.
63. Remove cotter pin (Figure 9, Item 10) from fresh air control cable (Figure 9, Item 6). Discard cotter pin.
64. Remove fresh air control cable (Figure 9, Item 6) and spring nut (Figure 9, Item 5) from heater (Figure 9, Item 4). Discard spring nut.
65. From behind instrument cluster (Figure 9, Item 1), disconnect tachometer driveshaft (Figure 9, Item 18).
66. Disconnect speedometer driveshaft (Figure 9, Item 17) from instrument cluster (Figure 9, Item 1).
67. Disconnect air tube (Figure 9, Item 11) from instrument cluster (Figure 9, Item 1).
68. Disconnect wire (Figure 9, Item 20), two wires (Figure 9, Item 21), and wire (Figure 9, Item 22) from battery switch (Figure 9, Item 19).
69. Disconnect wires (Figure 9, Items 23, 24, and 25) from starter switch (Figure 9, Item 26).
70. Disconnect wire (Figure 9, Item 31) from wire (Figure 9, Item 32) on instrument cluster wire assembly (Figure 9, Item 14).
71. Disconnect five wires (Figure 9, Item 16) from five instrument cluster lights (Figure 9, Item 15).
72. Disconnect wire (Figure 9, Item 27) from fuel gauge (Figure 9, Item 28).
73. Disconnect wire (Figure 9, Item 30) from oil pressure gauge (Figure 9, Item 29).
74. Disconnect wire (Figure 9, Item 33) from transmission oil temperature gauge (Figure 9, Item 36).
75. Disconnect wire (Figure 9, Item 13) from engine temperature gauge (Figure 9, Item 12).
76. Disconnect two wires (Figure 9, Item 34) from spring brake pressure switch (Figure 9, Item 35).

REMOVAL - Continued

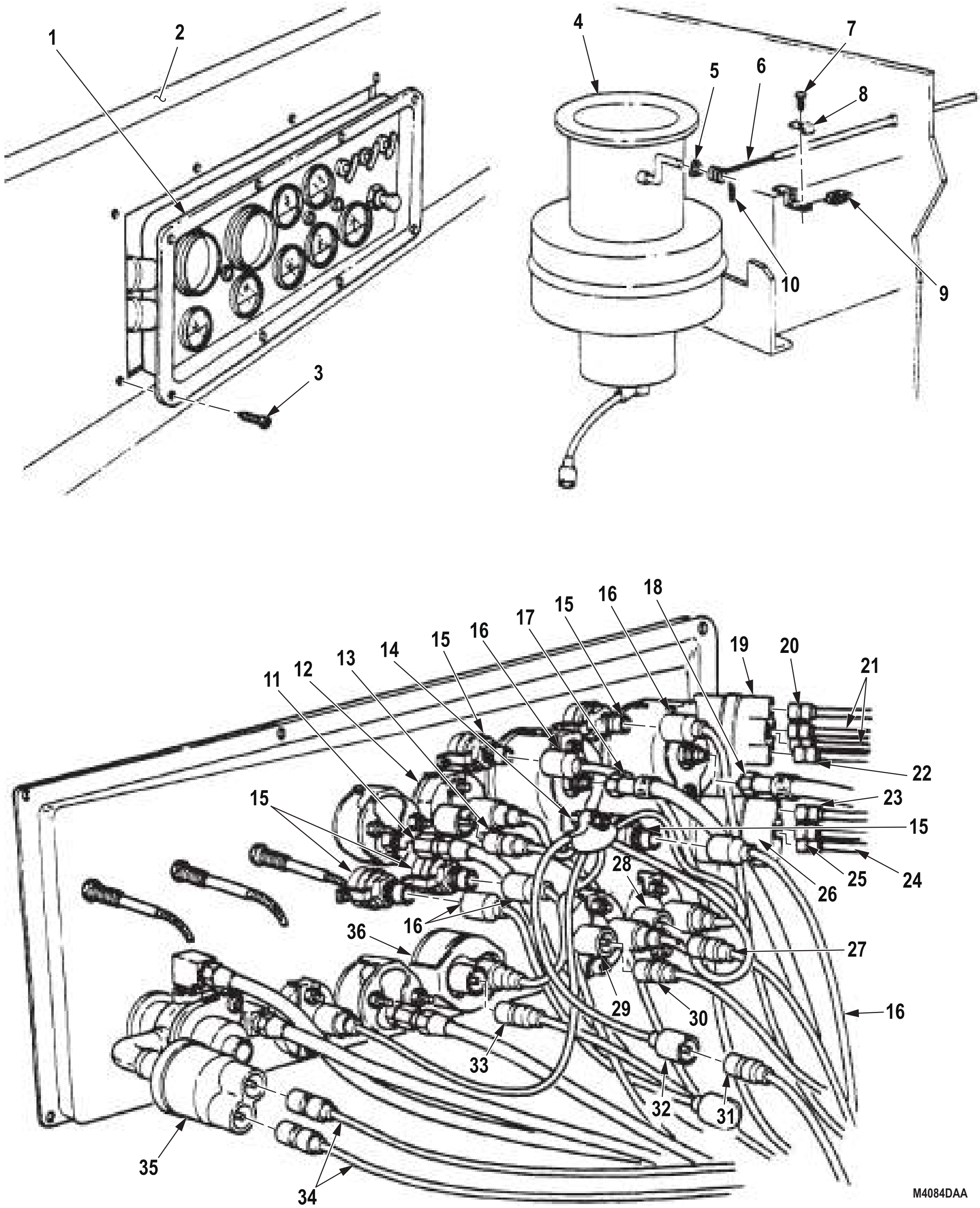


Figure 9. Front Wiring Harness Replacement.

REMOVAL - Continued

77. Place transmission selector assembly (Figure 10, Item 1) in N (neutral) position.
78. Remove four screws (Figure 10, Item 3), lockwashers (Figure 10, Item 4), and transmission selector assembly (Figure 10, Item 1) from console (Figure 10, Item 2). Discard lockwashers.
79. Disconnect transmission selector wires (Figure 10, Items 5, 6, and 7) from three harness leads (Figure 10, Item 8).

NOTE

Perform Step (80) for M936 wrecker only.

80. Disconnect connector (Figure 10, Item 9) from connector (Figure 10, Item 10) of floodlight switch (Figure 10, Item 25) and auxiliary receptacle (Figure 10, Item 26).
81. Remove cap (Figure 10, Item 17) from connector (Figure 10, Item 22).
82. Remove nut (Figure 10, Item 13), lockwasher (Figure 10, Item 14), screw (Figure 10, Item 19), and ground wire (Figure 10, Item 15) from mounting bracket (Figure 10, Item 21). Discard lockwasher.
83. Remove nut (Figure 10, Item 11), lockwasher (Figure 10, Item 12), screw (Figure 10, Item 18), and cap chain (Figure 10, Item 16) from mounting bracket (Figure 10, Item 21). Discard lockwasher.
84. Remove two nuts (Figure 10, Item 24), lockwashers (Figure 10, Item 23), screws (Figure 10, Item 20), and connector (Figure 10, Item 22) from three mounting brackets (Figure 10, Item 21). Discard lockwashers.

REMOVAL - Continued

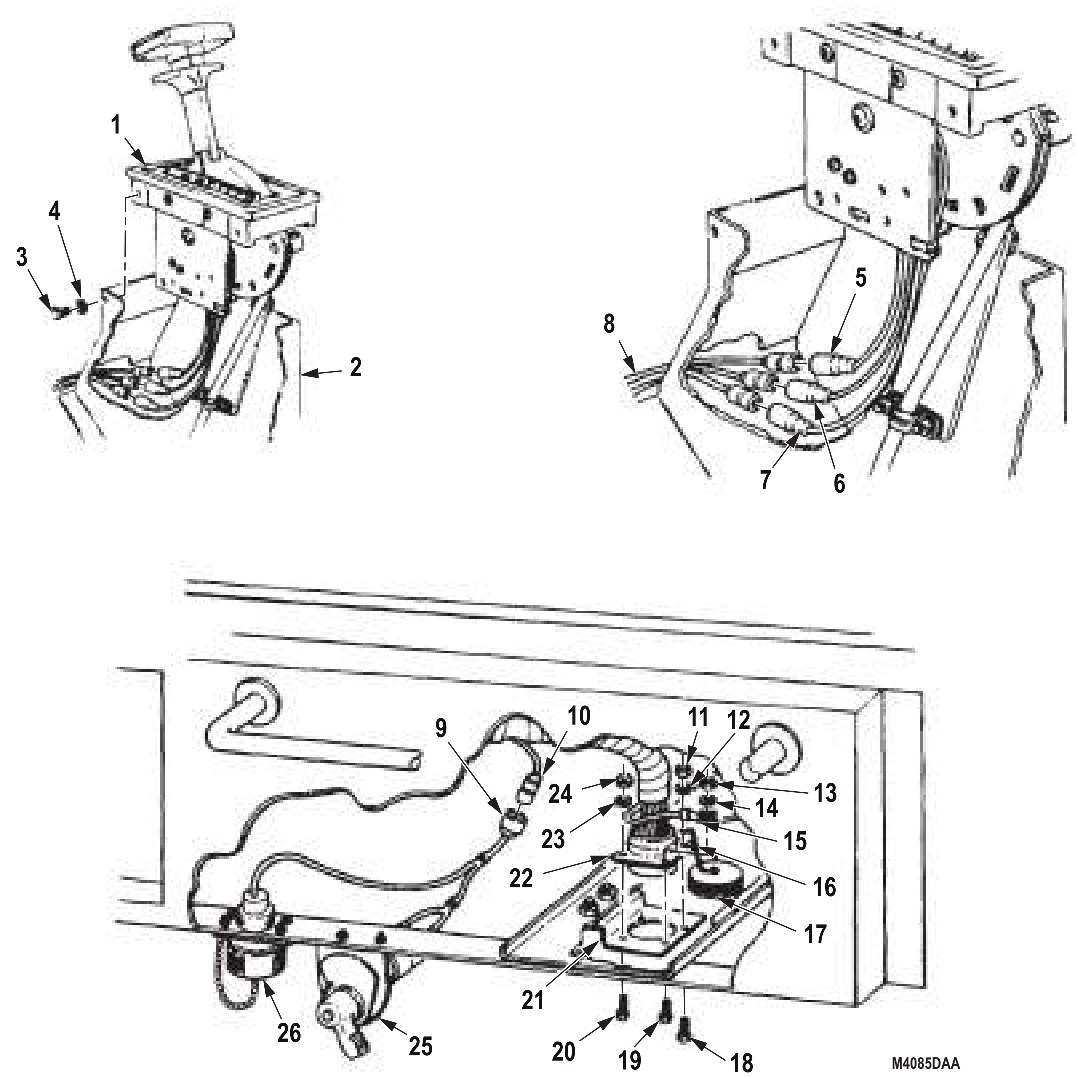


Figure 10. Front Wiring Harness Replacement.

REMOVAL - Continued

85. Remove two screws (Figure 11, Item 1), washers (Figure 11, Item 2), and grommets (Figure 11, Item 3) from firewall (Figure 11, Item 4).
86. Remove two locknuts (Figure 11, Item 8), seven screws (Figure 11, Item 6), and harness clamps (Figure 11, Item 7) from front harness (Figure 11, Item 5) and vehicle. Discard locknuts.

NOTE

Tag clamps for installation.

87. Remove front wiring harness (Figure 11, Item 9) from vehicle.

REMOVAL - Continued

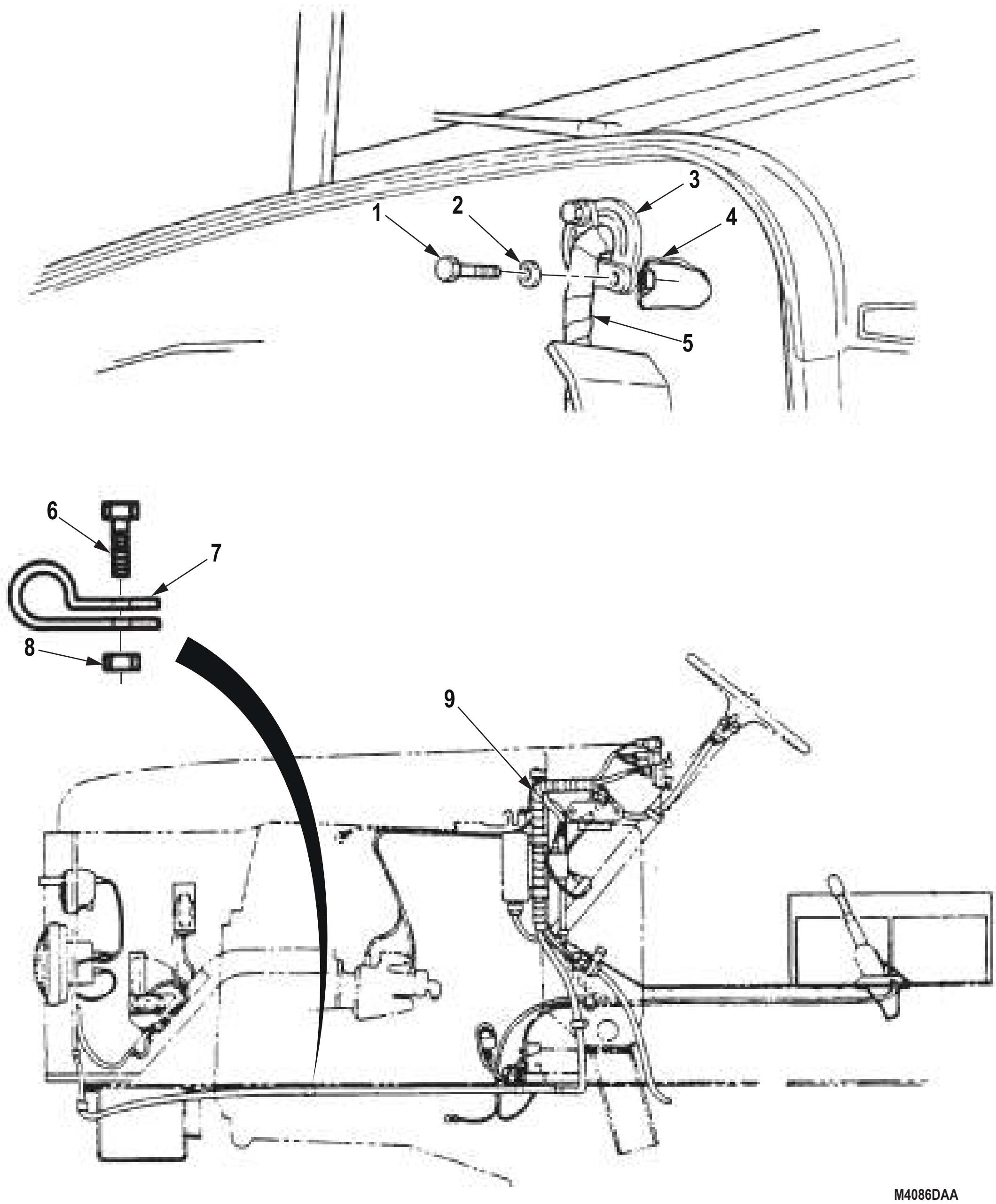


Figure 11. Front Wiring Harness Replacement.

END OF TASK

INSTALLATION

CAUTION

Use care when routing harness. Snagging may result and forceful pulling will cause damage to harness.

NOTE

Assistant will help with Step (1).

1. Position front wiring harness (Figure 12, Item 5) on vehicle.
2. Insert front wiring harness (Figure 12, Item 5) through hole in firewall and route as high as possible behind instrument panel (Figure 12, Item 6).
3. Install two grommets (Figure 12, Item 3) on firewall (Figure 12, Item 4) with two washers (Figure 12, Item 2) and screws (Figure 12, Item 1).
4. Install seven harness clamps (Figure 12, Item 8) on front wiring harness (Figure 12, Item 5), and install with screws (Figure 12, Item 7) and two locknuts (Figure 12, Item 9).

INSTALLATION - Continued

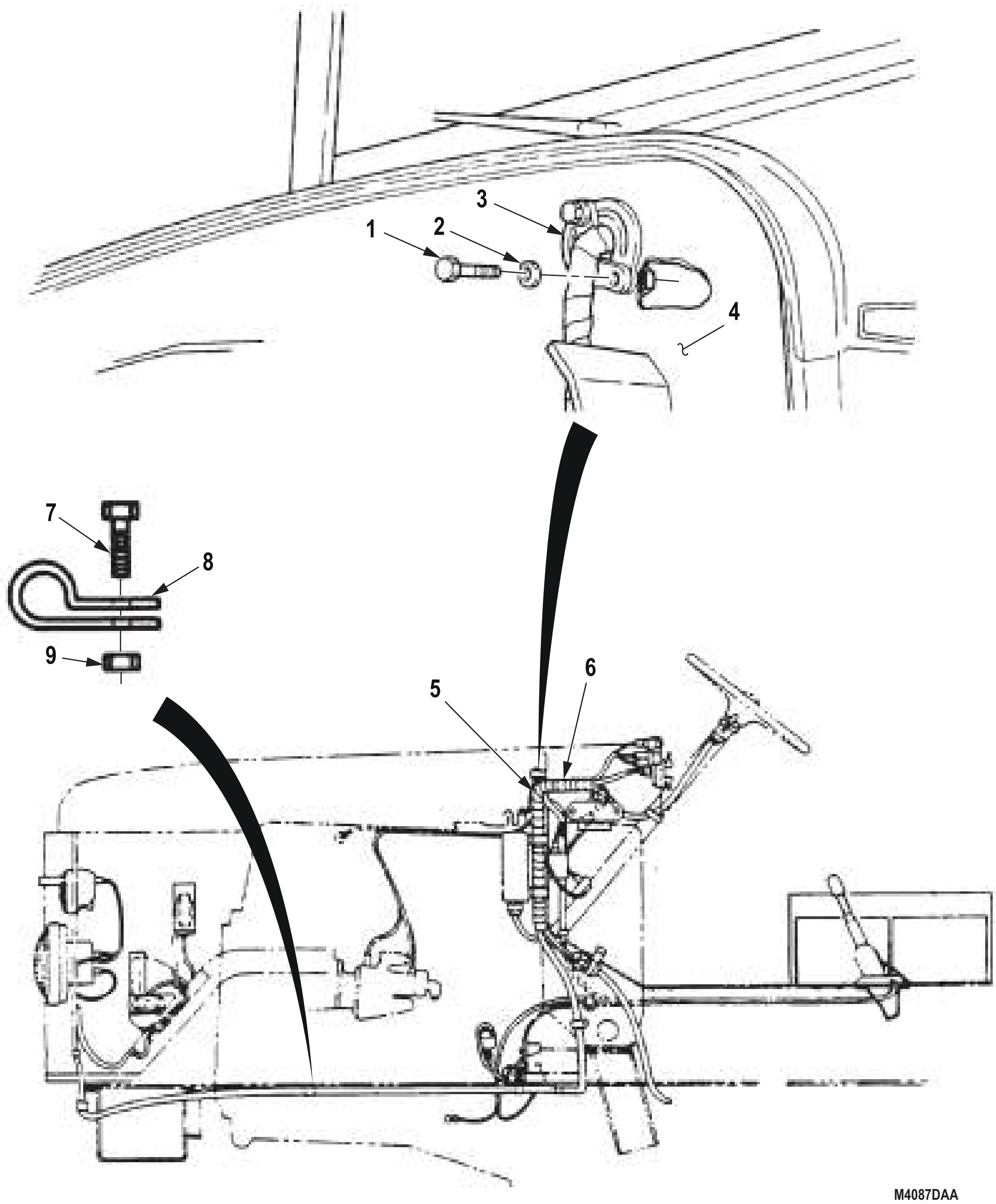


Figure 12. Front Wiring Harness Replacement.

INSTALLATION - Continued

5. Install connector (Figure 13, Item 17) on top of mounting bracket (Figure 13, Item 13) under right side of instrument panel (Figure 13, Item 14) with two screws (Figure 13, Item 12), lockwashers (Figure 13, Item 18), and nuts (Figure 13, Item 19).
6. Install cap chain (Figure 13, Item 8) on mounting bracket (Figure 13, Item 13) with screw (Figure 13, Item 10), lockwasher (Figure 13, Item 4), and nut (Figure 13, Item 3).
7. Install ground wire (Figure 13, Item 7) on mounting bracket (Figure 13, Item 13) with screw (Figure 13, Item 11), lockwasher (Figure 13, Item 6), and nut (Figure 13, Item 5).
8. Install cap (Figure 13, Item 9) on connector (Figure 13, Item 17).
9. Connect connector (Figure 13, Item 2) to connector (Figure 13, Item 1) of floodlight switch (Figure 13, Item 15) and auxiliary receptacle (Figure 13, Item 16).
10. Place wires (Figure 13, Items 24, 25, and 26) in console (Figure 13, Item 21) and connect to selector assembly wires (Figure 13, Items 22, 23, and 29).
11. Install transmission selector assembly (Figure 13, Item 20) on console (Figure 13, Item 21) with four lockwashers (Figure 13, Item 28) and screws (Figure 13, Item 27).

INSTALLATION - Continued

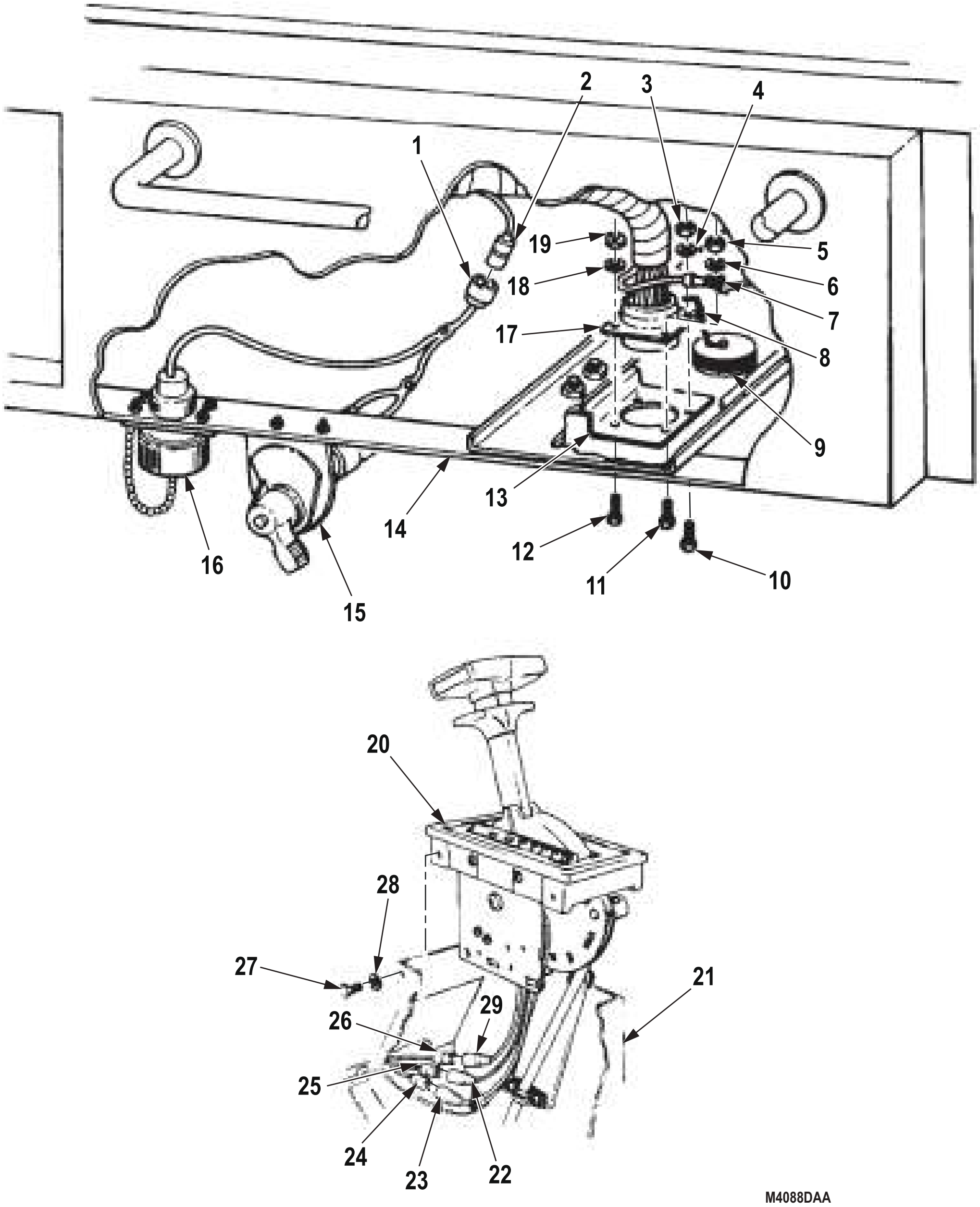


Figure 13. Front Wiring Harness Replacement.

INSTALLATION - Continued

12. Connect two wires (Figure 14, Item 24) to spring brake pressure switch (Figure 14, Item 25).
13. Connect wire (Figure 14, Item 3) to engine temperature gauge (Figure 14, Item 2).
14. Connect wire (Figure 14, Item 23) to transmission oil temperature gauge (Figure 14, Item 27).
15. Connect wire (Figure 14, Item 19) to engine oil pressure gauge (Figure 14, Item 20).
16. Connect wire (Figure 14, Item 17) to fuel gauge (Figure 14, Item 18).
17. Connect five wires (Figure 14, Item 6) to instrument cluster lights (Figure 14, Item 5).
18. Connect wire (Figure 14, Item 21) to wire (Figure 14, Item 22) on instrument cluster wire assembly (Figure 14, Item 4).
19. Connect wires (Figure 14, Items 13, 14, and 15) to starter switch (Figure 14, Item 16).
20. Connect wire (Figure 14, Item 10), two wires (Figure 14, Item 11), and wire (Figure 14, Item 12) to battery switch (Figure 14, Item 9).
21. Connect tachometer driveshaft (Figure 14, Item 8) to tachometer on instrument panel (Figure 14, Item 26).
22. Connect speedometer driveshaft (Figure 14, Item 7) to speedometer on panel (Figure 14, Item 26).
23. Install air tube (Figure 14, Item 1) to air pressure gauge (Figure 14, Item 28) on panel (Figure 14, Item 26).

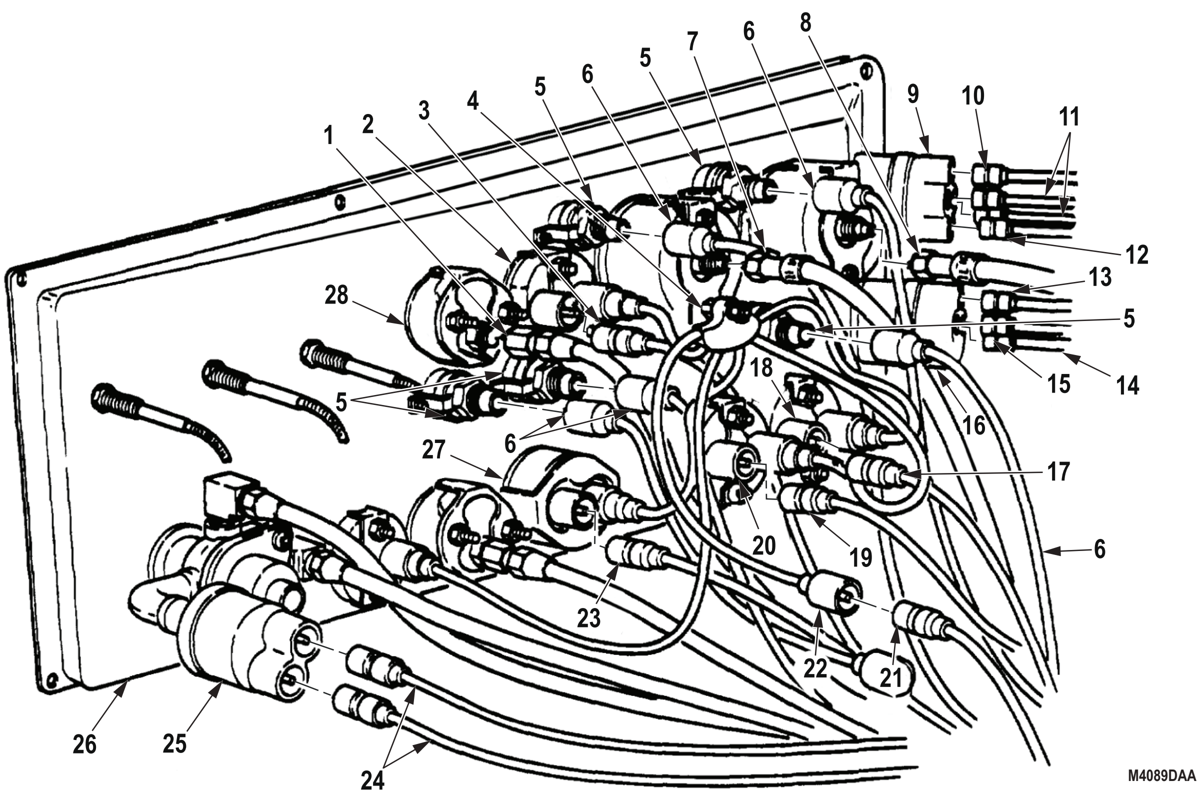


Figure 14. Front Wiring Harness Replacement.

INSTALLATION - Continued

24. Install fresh air control cable (Figure 15, Item 3) on heater assembly (Figure 15, Item 1) in right side of engine compartment with spring nut (Figure 15, Item 2) and cotter pin (Figure 15, Item 7).
25. Secure cable (Figure 15, Item 3) with screw (Figure 15, Item 4), clamp (Figure 15, Item 5), and retainer nut (Figure 15, Item 6).
26. Install instrument cluster (Figure 15, Item 9) on instrument panel (Figure 15, Item 8) with eight screws (Figure 15, Item 10).

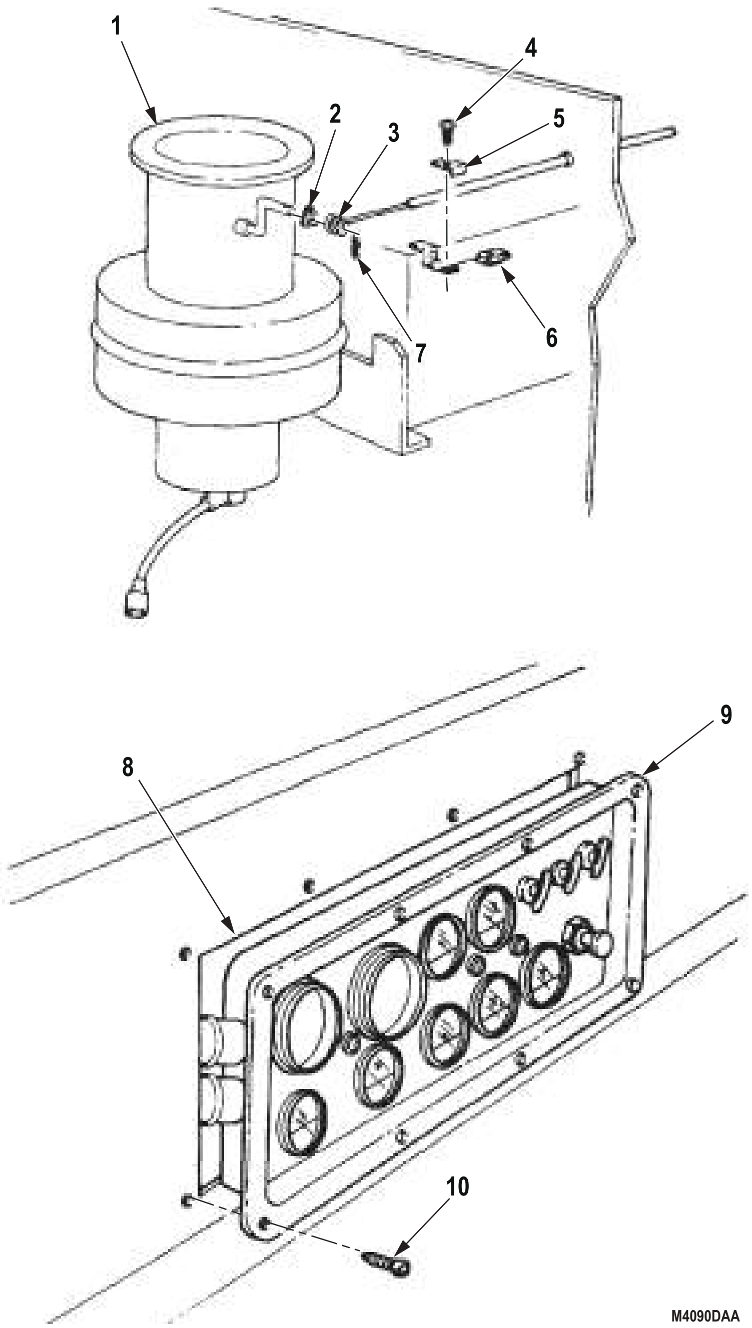


Figure 15. Front Wiring Harness Replacement.

INSTALLATION - Continued

27. Connect wire (Figure 16, Item 8) to high-beam indicator light (Figure 16, Item 10) on warning light panel (Figure 16, Item 1).
28. Connect wire (Figure 16, Item 7) to axle lock-in indicator light (Figure 16, Item 11).
29. Connect wire (Figure 16, Item 6) to engine hot indicator light (Figure 16, Item 12).
30. Connect wire (Figure 16, Item 5) to spring brake override indicator light (Figure 16, Item 13).
31. Connect wire (Figure 16, Item 4) to low air pressure indicator light (Figure 16, Item 14).
32. Connect wire (Figure 16, Item 3) to parking brake indicator light (Figure 16, Item 15).
33. Install warning light panel (Figure 16, Item 1) on instrument panel (Figure 16, Item 2) with four screws (Figure 16, Item 9).

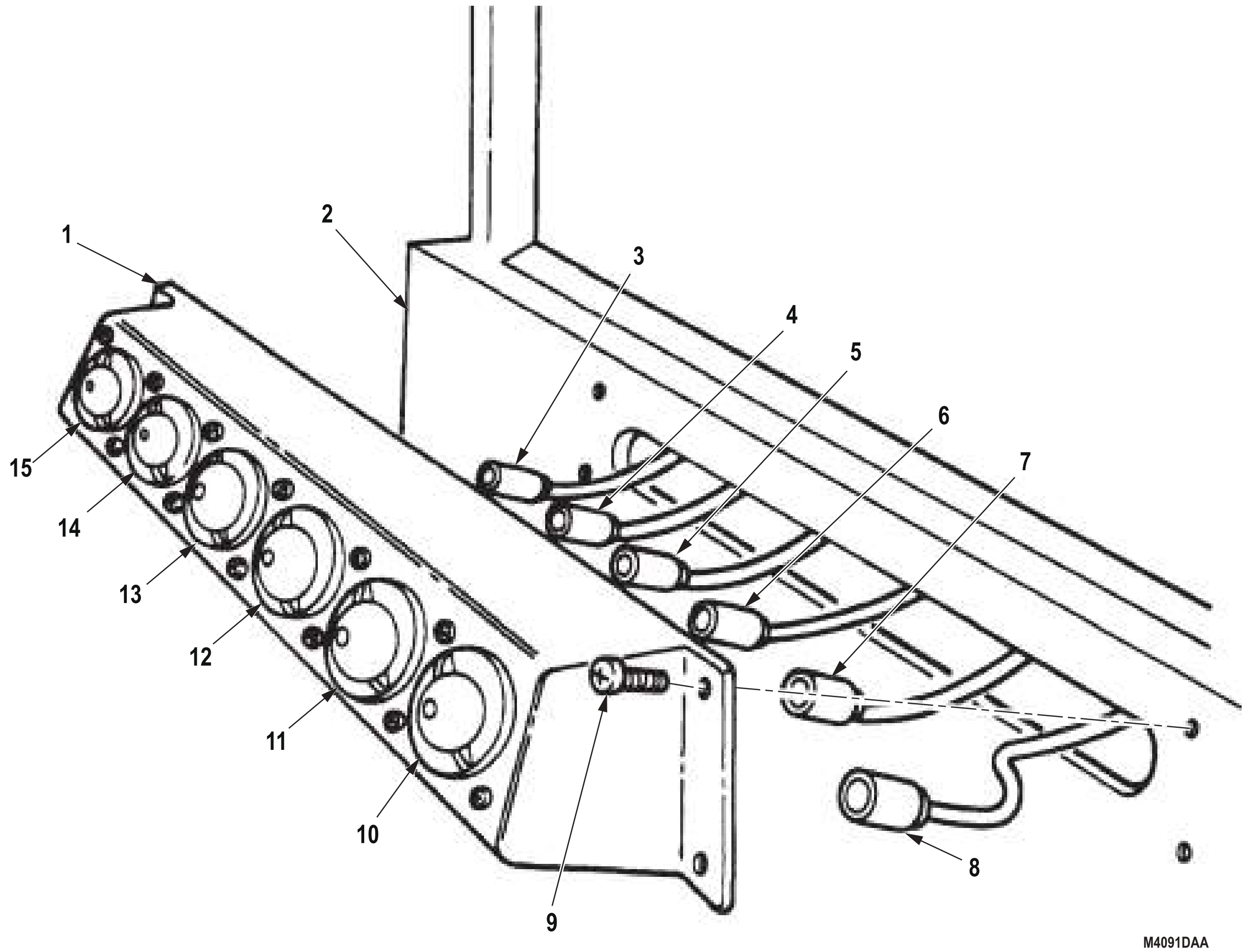


Figure 16. Front Wiring Harness Replacement.

INSTALLATION - Continued

34. Push wires (Figure 17, Items 4, 11, and 14) through hole in cab floor.
35. Install cables (Figure 17, Items 2 and 3) and wire (Figure 17, Item 4) on terminal adapter (Figure 17, Item 6) with screw (Figure 17, Item 5) and nut (Figure 17, Item 1).
36. Install cable (Figure 17, Item 9) and wire (Figure 17, Item 11) on terminal adapter (Figure 17, Item 8) with screw (Figure 17, Item 10) and nut (Figure 17, Item 7).
37. Install wire (Figure 17, Item 13) and cables (Figure 17, Items 14 and 17) on terminal adapter (Figure 17, Item 16) with screw (Figure 17, Item 15) and nut (Figure 17, Item 12).

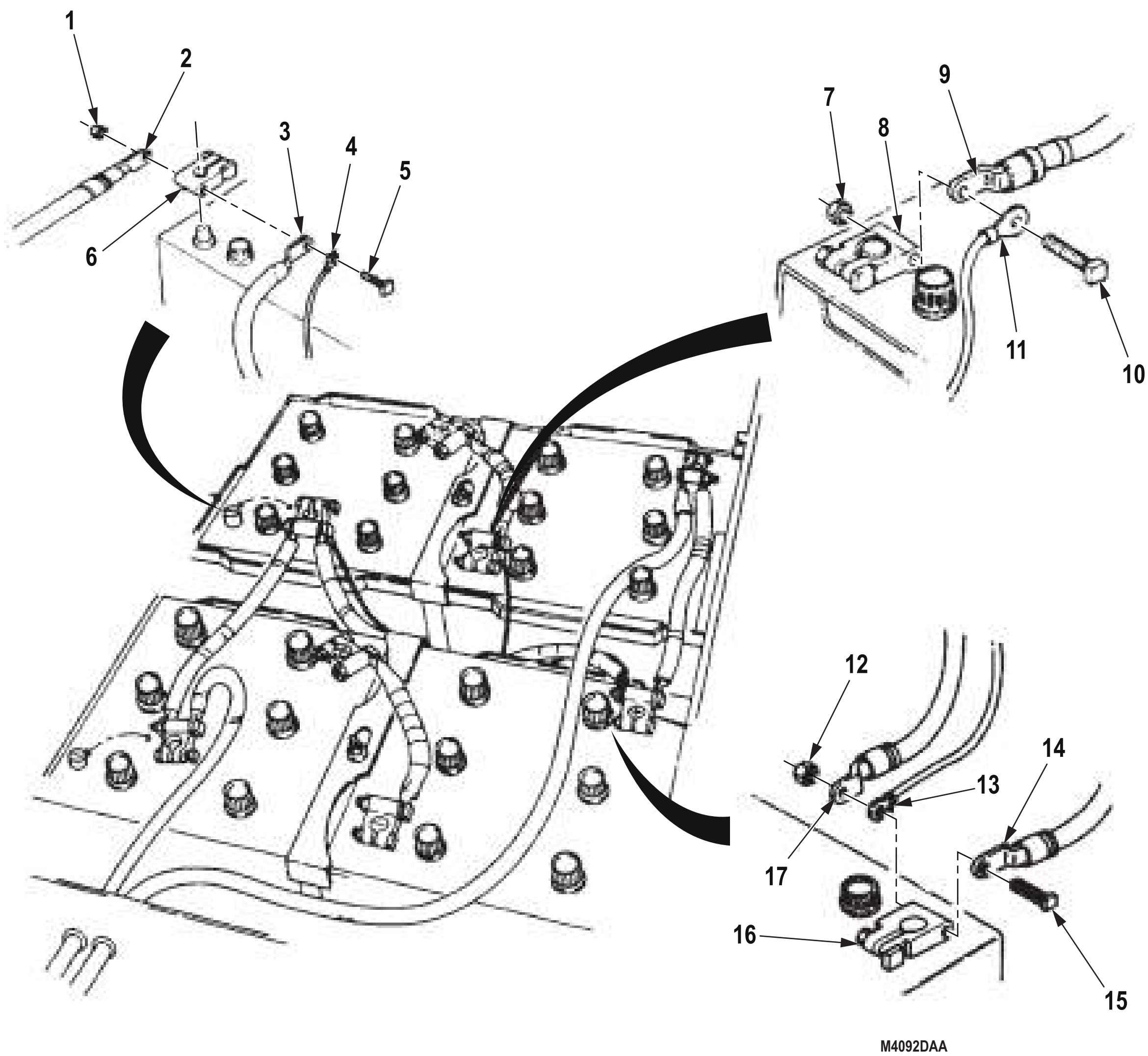


Figure 17. Front Wiring Harness Replacement.

INSTALLATION - Continued

38. Connect wire (Figure 18, Item 9) to warning signal lamp switch (Figure 18, Item 8).
39. Connect wires (Figure 18, Items 5, 6, and 7) to heater blower motor switch (Figure 18, Item 4).
40. Connect wires (Figure 18, Items 2 and 3) to ether start switch (Figure 18, Item 1).
41. Connect connector (Figure 18, Item 15) to front wheel drive lock-in switch (Figure 18, Item 10).

NOTE

Perform Step (42) for M929, M930, M931, M932, and M936 vehicles only.

42. Connect wires (Figure 18, Items 12, 13, and 14) to fuel selector switch (Figure 18, Item 11).

INSTALLATION - Continued

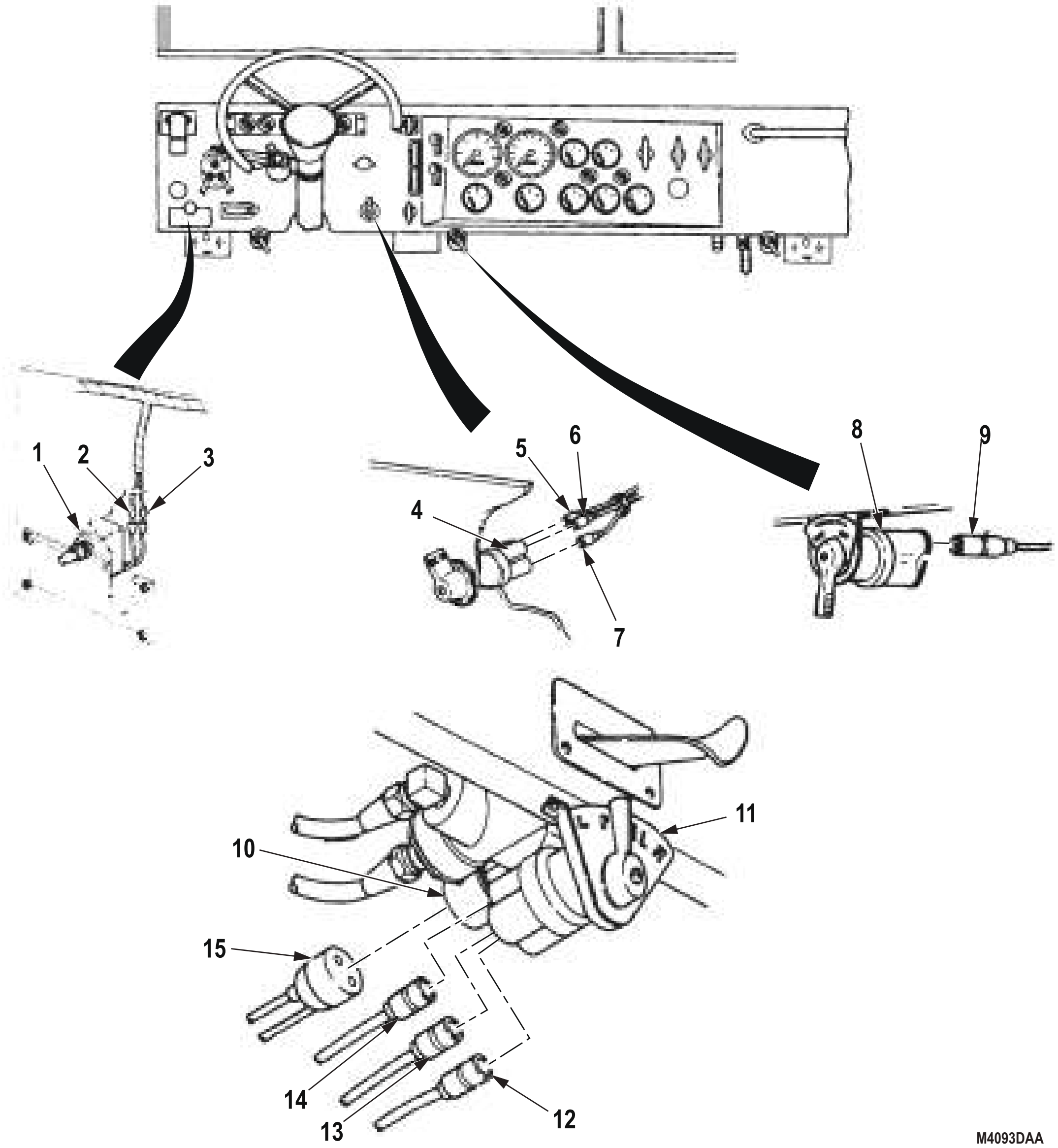


Figure 18. Front Wiring Harness Replacement.

INSTALLATION - Continued

43. Connect wire (Figure 19, Item 8) to heater blower circuit breaker (Figure 19, Item 7).
44. Connect wires (Figure 19, Items 5 and 6) to electrical gauge circuit breaker (Figure 19, Item 9).
45. Connect wire (Figure 19, Item 4) to horn switch (Figure 19, Item 3).
46. Connect front harness connector (Figure 19, Item 2) to turn signal control (Figure 19, Item 1).
47. Install air line clamp (Figure 19, Item 13) on air line bracket (Figure 19, Item 14) with screw (Figure 19, Item 11) and locknut (Figure 19, Item 15).
48. Install alternator ground wire (Figure 19, Item 17) on frame crossmember (Figure 19, Item 12) with lockwasher (Figure 19, Item 18), air line bracket (Figure 19, Item 14), screw (Figure 19, Item 10), and locknut (Figure 19, Item 16).

INSTALLATION - Continued

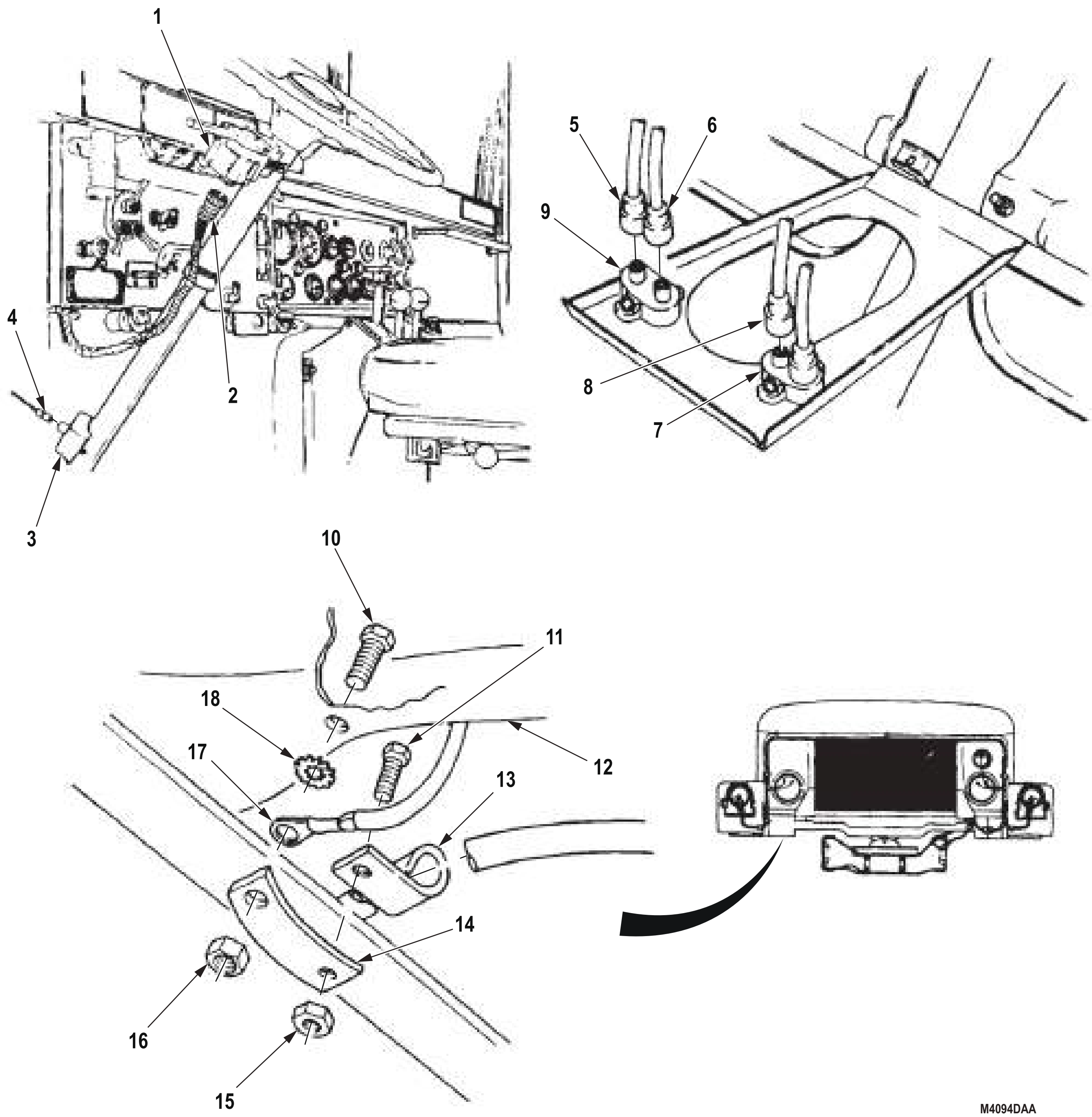


Figure 19. Front Wiring Harness Replacement.

INSTALLATION - Continued

49. Connect wire (Figure 20, Item 1) to parking brake switch wire (Figure 20, Item 2).
50. Connect wire (Figure 20, Item 17) to 5th gear lock-up capacitor wire (Figure 20, Item 16).
51. Connect wire (Figure 20, Item 15) to transfer case switch capacitor wire (Figure 20, Item 14).
52. Connect wire (Figure 20, Item 12) to wire (Figure 20, Item 11).

NOTE

Perform Step (53) for M929/A1, M930/A1, M931/A1, M932/A1, and M936/A1 vehicles only.

53. Install connector (Figure 20, Item 13) on receptacle of rear wiring harness receptacle (Figure 20, Item 10) with four screws (Figure 20, Item 3), lockwashers (Figure 20, Item 9), and nuts (Figure 20, Item 8).
54. Connect wires (Figure 20, Items 4, 5, and 6) to headlight beam selector switch (Figure 20, Item 7).

INSTALLATION - Continued

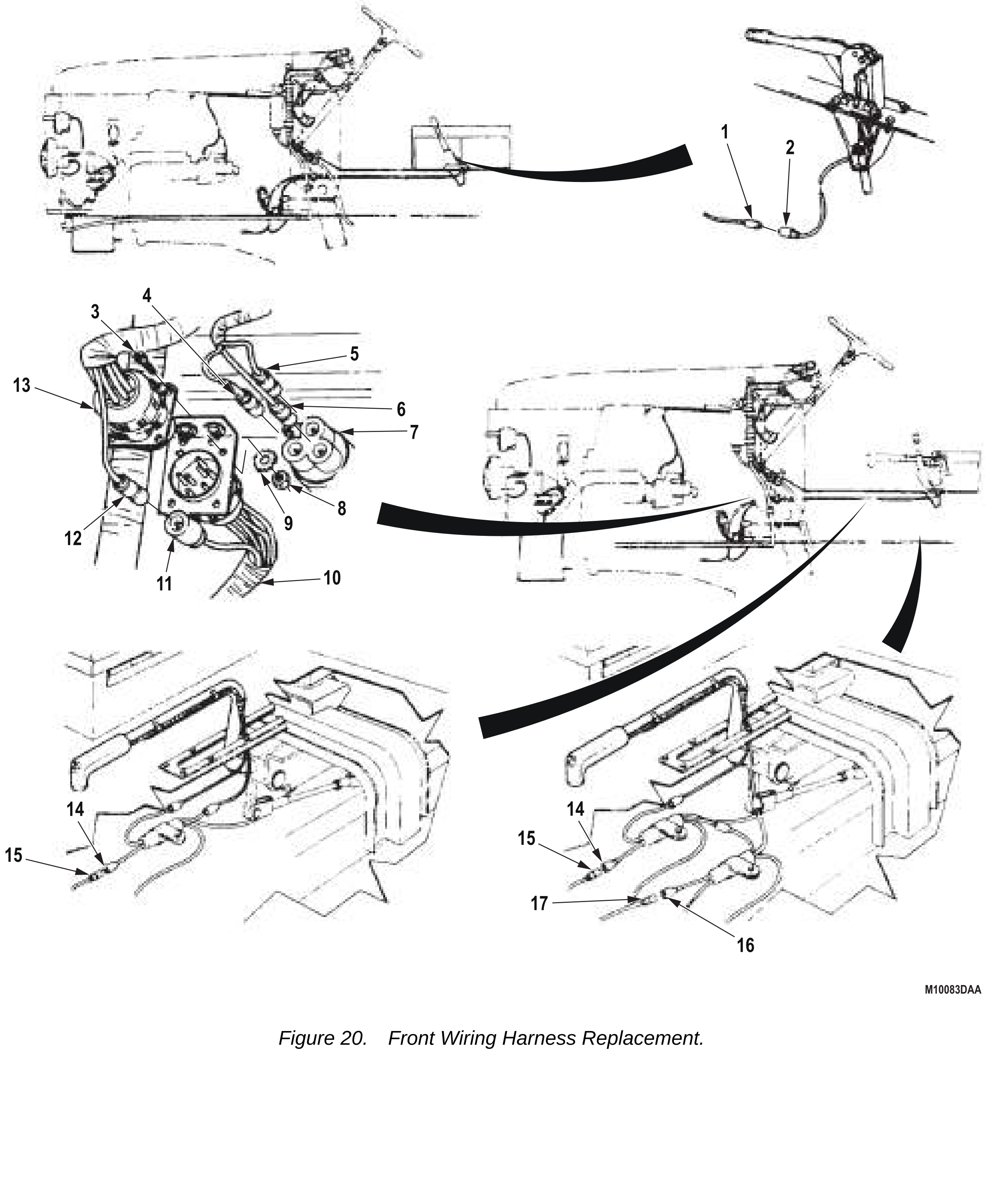


Figure 20. Front Wiring Harness Replacement.

INSTALLATION - Continued

55. Connect two connectors (Figure 21, Item 11) of alternator (Figure 21, Item 10) wiring.
56. Install wire (Figure 21, Item 9) on alternator (Figure 21, Item 10) with washer (Figure 21, Item 8), lockwasher (Figure 21, Item 7), and nut (Figure 21, Item 6). Tighten nut 20 to 25 lb-in. (2 to 3 N·m).
57. Install wire (Figure 21, Item 13) on alternator (Figure 21, Item 10) with washer (Figure 21, Item 17), lockwasher (Figure 21, Item 18), and nut (Figure 21, Item 19). Tighten nut 45 to 55 lb-in. (5 to 6 N·m).
58. Install wire retaining strap (Figure 21, Item 1) over wire (Figure 21, Item 11) and on alternator (Figure 21, Item 10) with two lockwashers (Figure 21, Item 2) and screws (Figure 21, Item 3).
59. Install wire (Figure 21, Item 14) on alternator (Figure 21, Item 10) with lockwasher (Figure 21, Item 15) and screw (Figure 21, Item 16). Tighten screw 82 to 102 lb-in. (9 to 12 N·m).
60. Apply silicone rubber adhesive on wires (Figure 21, Items 9 and 13) and install cover (Figure 21, Item 4) on alternator (Figure 21, Item 10) with two screw assembled lockwashers (Figure 21, Item 5).

NOTE

Two tiedown straps go over wires on inside right frame rail.

61. Install three tiedown straps (Figure 21, Item 12).
62. Connect wire (Figure 21, Item 25) to transorb diode coupling assembly wire (Figure 21, Item 22).
63. Connect wires (Figure 21, Items 26 and 27) to horn solenoid (Figure 21, Item 28).
64. Install four tiedown straps (Figure 21, Item 24) on rear of harness.
65. Install three cable clamps (Figure 21, Item 21) on firewall (Figure 21, Item 20) with three screws (Figure 21, Item 23).

INSTALLATION - Continued

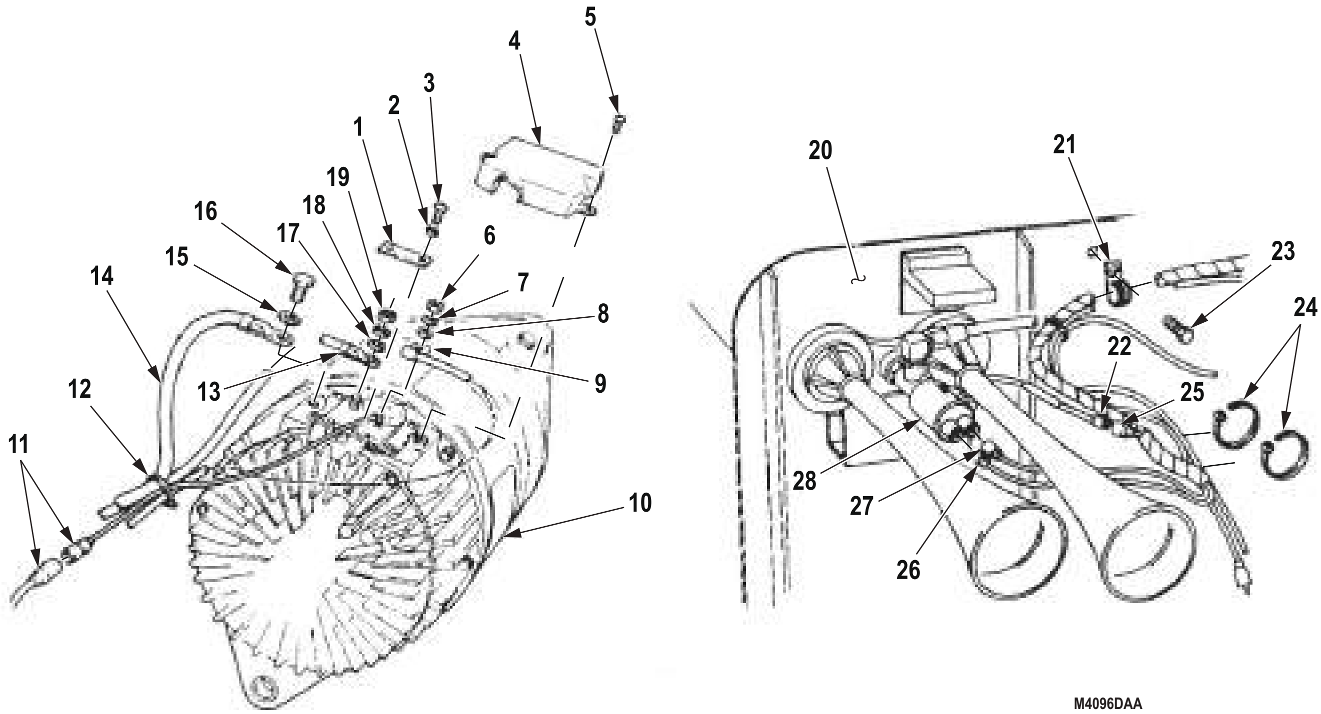


Figure 21. Front Wiring Harness Replacement.

INSTALLATION - Continued

66. Connect wire (Figure 22, Item 2) to engine temperature switch wire (Figure 22, Item 1).
67. Connect wire (Figure 22, Item 5) to wire (Figure 22, Item 4) on personnel heater (Figure 22, Item 3).
68. Connect wires (Figure 22, Items 9 and 10) to transmission control and spring break circuit breaker (Figure 22, Item 7).
69. Connect wires (Figure 22, Items 12 and 13) to horn circuit breaker (Figure 22, Item 6).
70. Install two tiedown straps (Figure 22, Item 8) on wiring harness (Figure 22, Item 11).

INSTALLATION - Continued

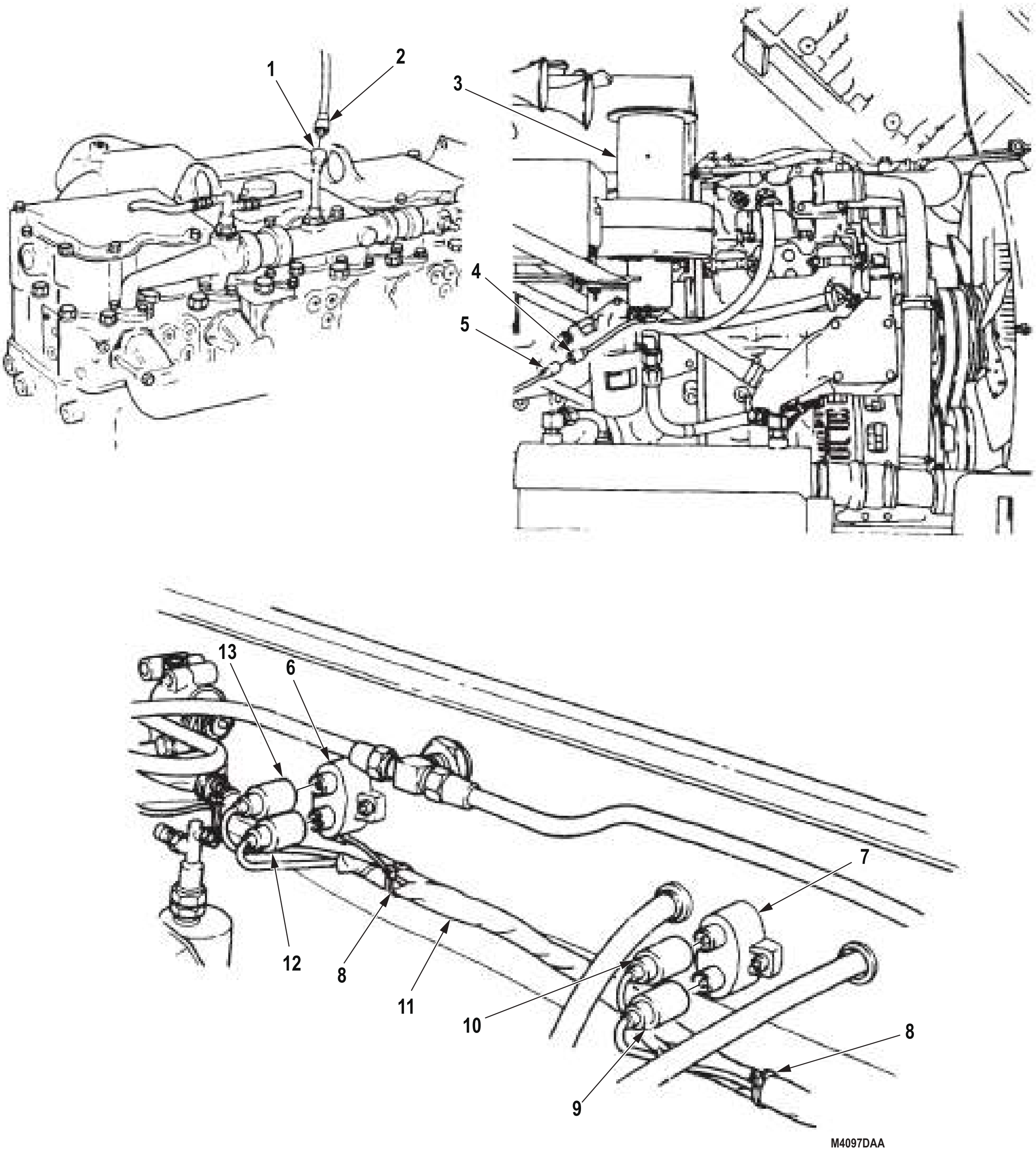


Figure 22. Front Wiring Harness Replacement.

INSTALLATION - Continued

71. Install ground strap (Figure 23, Item 9) and wires (Figure 23, Items 10 and 11) on starter post (Figure 23, Item 8) with lockwasher (Figure 23, Item 13) and nut (Figure 23, Item 12).
72. Install wires (Figure 23, Items 14 and 17) on starter post (Figure 23, Item 7) with lockwasher (Figure 23, Item 16) and nut (Figure 23, Item 15).
73. Install wire (Figure 23, Item 5) on solenoid terminal (Figure 23, Item 6) with washer (Figure 23, Item 4) and screw assembled washer (Figure 23, Item 3).
74. Connect wire (Figure 23, Item 2) to oil pressure sending unit (Figure 23, Item 1).
75. Connect two wires (Figure 23, Items 18 and 19).
76. Install ground wire (Figure 23, Item 21) on intake manifold (Figure 23, Item 24) with lockwasher (Figure 23, Item 23), ground strap (Figure 23, Item 22), and screw assembled washer (Figure 23, Item 20).

INSTALLATION - Continued

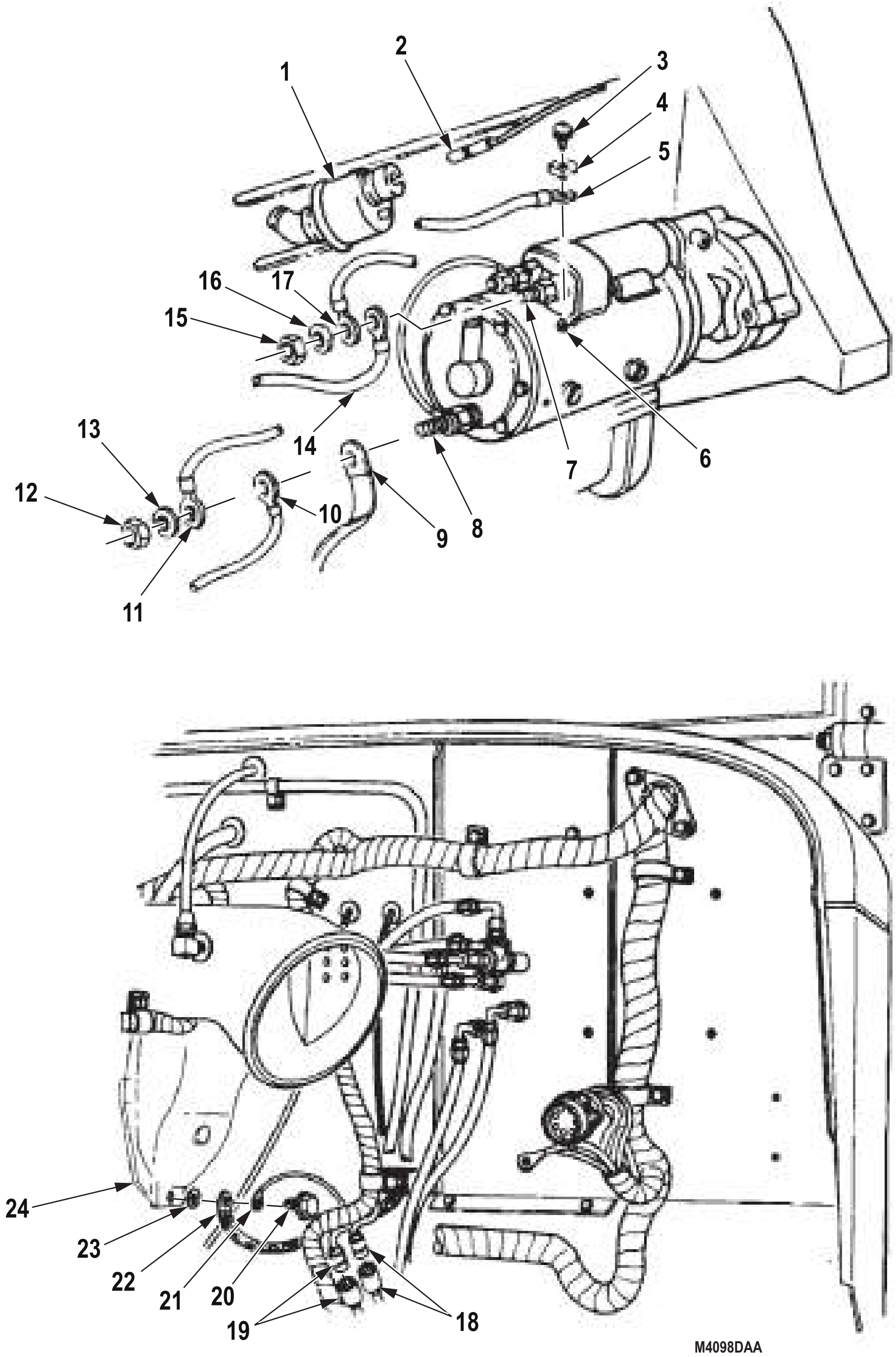


Figure 23. Front Wiring Harness Replacement.

INSTALLATION - Continued

77. Connect wires (Figure 24, Items 1 and 3) on ether start fuel pressure switch (Figure 24, Item 2)
78. Connect wire (Figure 24, Item 5) to engine temperature sending unit (Figure 24, Item 4).
79. Install wire (Figure 24, Item 11) on fuel pump solenoid terminal (Figure 24, Item 13) with nut (Figure 24, Item 12).
80. Connect fuel pressure transducer wires (Figure 24, Items 14 and 17).
81. Connect tachometer pulse sender wires (Figure 24, Items 15 and 16).
82. Install clamp (Figure 24, Item 9) on harness (Figure 24, Item 6) and install on intake manifold (Figure 24, Item 10) with washer (Figure 24, Item 8) and screw (Figure 24, Item 7).

INSTALLATION - Continued

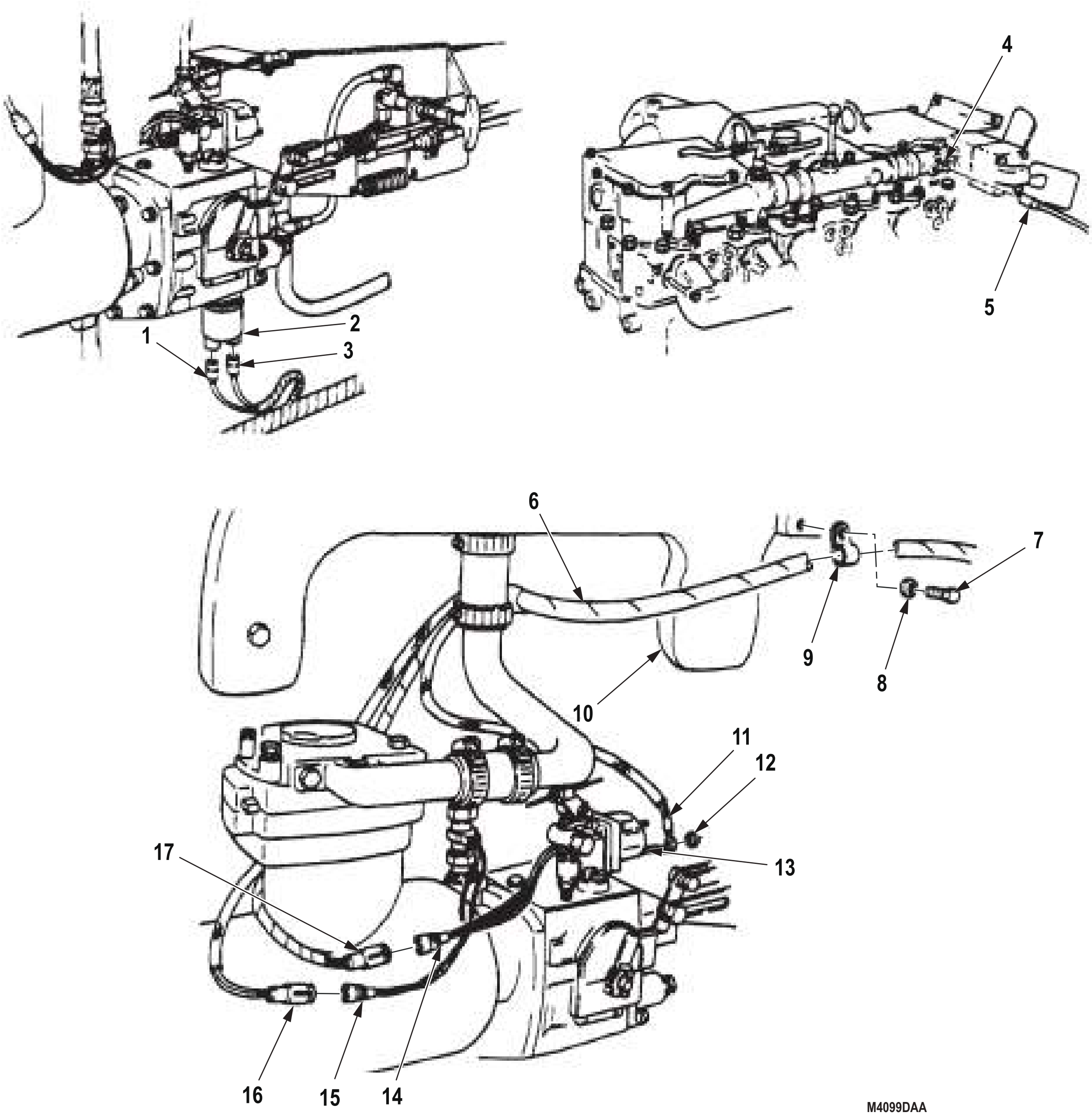


Figure 24. Front Wiring Harness Replacement.

INSTALLATION - Continued

83. Connect front wiring harness connector (Figure 25, Item 9) to front lights cable assembly receptacle (Figure 25, Item 1).

84. Install cable clamp (Figure 25, Item 4) on harness (Figure 25, Item 8) and install on radiator (Figure 25, Item 7) with washer (Figure 25, Item 3), screw (Figure 25, Item 2), washer (Figure 25, Item 5), and nut (Figure 25, Item 6).

85. Install seven harness clamps (Figure 25, Item 11) on front wiring harness (Figure 25, Item 8) with seven screws (Figure 25, Item 10) and two nuts (Figure 25, Item 12).

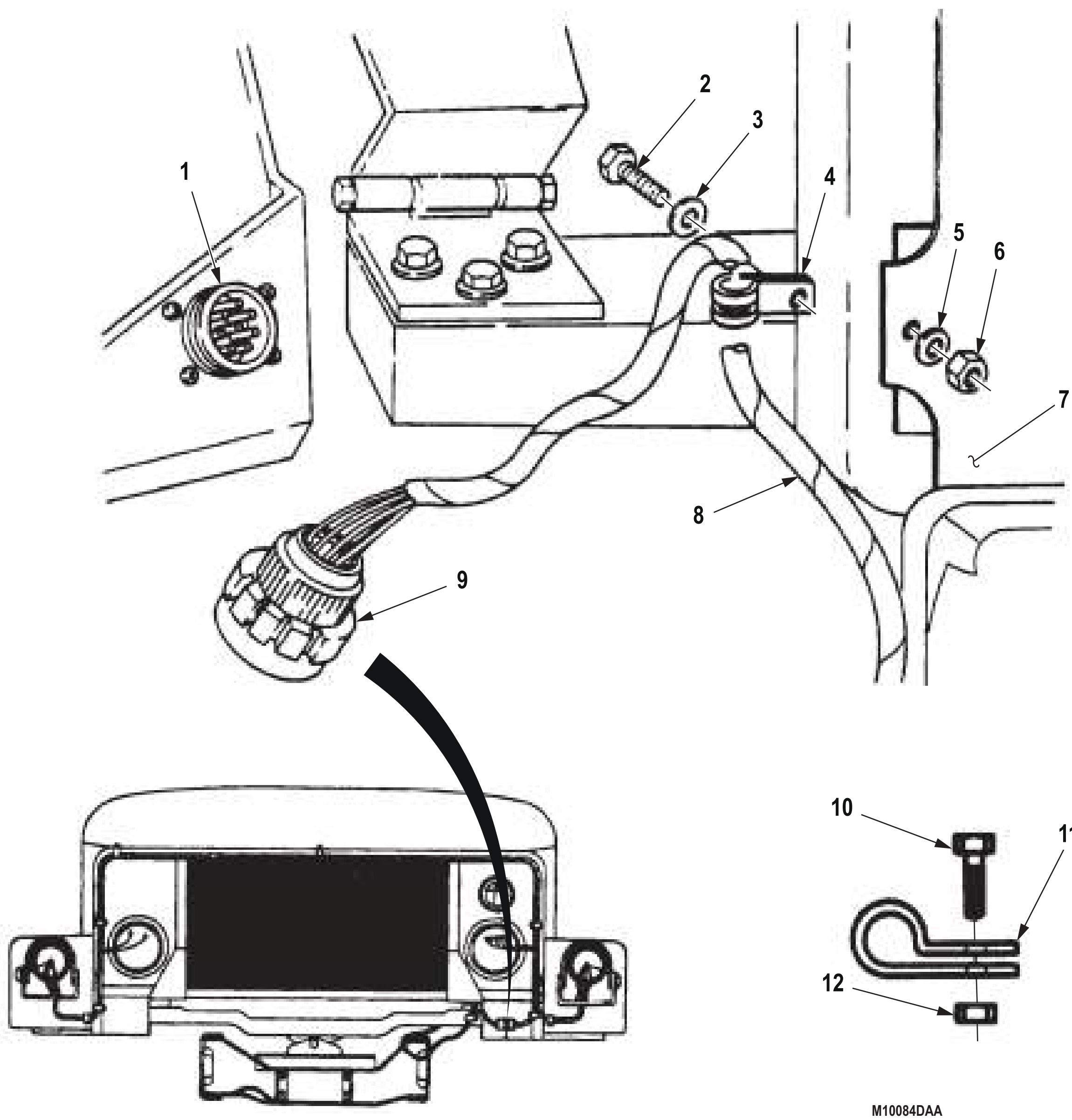


Figure 25. Front Wiring Harness Replacement.

END OF TASK

FOLLOW-ON MAINTENANCE

1. Install main light switch. (Volume 2, WP 0315)
2. Install failsafe warning module. (Volume 2, WP 0336)
3. Install turn signal flasher. (Volume 2, WP 0318)
4. Install protective control box. (Volume 2, WP 0319)
5. Install battery ground cables. (Volume 2, WP 0350)
6. Install splash shields. (TM 9-2320-272-10)
7. Install air intake pipe. (TM 9-2320-272-10)

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
FRONT WIRING HARNESS REPLACEMENT (M939/A2)

INITIAL SETUP:

Tools and Special Tools

Tool Kit, General Mechanic's: Automotive
(Volume 5, WP 0826, Table 1, Item 56)

Materials/Parts

Sealing Compound
(Volume 5, WP 0825, Table 1, Item 57)
Cotter Pin
(Volume 5, WP 0827, Table 1, Item 257)
Qty: 1
Locknut (Volume 5, WP 0827, Table 1, Item 285)
Qty: 1
Locknut (Volume 5, WP 0827, Table 1, Item 327)
Qty: 1
Lockwasher
(Volume 5, WP 0827, Table 1, Item 406)
Qty: 4
Lockwasher
(Volume 5, WP 0827, Table 1, Item 215)
Qty: 1
Lockwasher
(Volume 5, WP 0827, Table 1, Item 384)
Qty: 8
Lockwasher
(Volume 5, WP 0827, Table 1, Item 394)
Qty: 4
Lockwasher
(Volume 5, WP 0827, Table 1, Item 403)
Qty: 1
Lockwasher

Materials/Parts (cont.)

(Volume 5, WP 0827, Table 1, Item 420)
Qty: 1
Lockwasher, Screw Assembled
(Volume 5, WP 0827, Table 1, Item 187)
Qty: 2
Spring Nut
(Volume 5, WP 0827, Table 1, Item 428)
Qty: 1
Tiedown Strap
(Volume 5, WP 0827, Table 1, Item 379)
Qty: 1

Personnel Required

(2)

References

WP 0352

Equipment Condition

Splash shields removed. (TM 9-2320-272-10)
Protective control box removed. (Volume 2, WP 0319)
Turn signal flasher removed. (Volume 2, WP 0318)
Failsafe wiring module disconnected. (Volume 2, WP 0336)
Main headlight switch disconnected. (Volume 2, WP 0315)
Air intake pipe removed. (TM 9-2320-272-10)

REMOVAL

NOTE

- For inspection and repair of front wiring harness, refer to (WP 0352).
- Tag wires and connectors for installation.

1. Remove nut (Figure 1, Item 4), lockwasher (Figure 1, Item 3), and wire (Figure 1, Item 6) from solenoid (Figure 1, Item 1). Discard lockwasher.
2. Remove nut (Figure 1, Item 8), lockwasher (Figure 1, Item 7), battery cable (Figure 1, Item 10), and wire (Figure 1, Item 9) from solenoid (Figure 1, Item 1). Discard lockwasher.
3. Remove nut (Figure 1, Item 5), lockwasher (Figure 1, Item 2), and wire (Figure 1, Item 12) from starter (Figure 1, Item 16). Discard lockwasher.
4. Remove nut (Figure 1, Item 13), lockwasher (Figure 1, Item 11), and wires (Figure 1, Items 14 and 15) from starter (Figure 1, Item 16). Discard lockwasher.
5. Remove two screw assembled lockwashers (Figure 1, Item 32) and terminal cover (Figure 1, Item 31) from alternator (Figure 1, Item 26). Discard screw assembled lockwashers.

NOTE

Sealing compound must be removed from wiring before removing wires.

6. Disconnect wire (Figure 1, Item 34) from lead (Figure 1, Item 35).
7. Remove screw (Figure 1, Item 36), lockwasher (Figure 1, Item 37), and wire (Figure 1, Item 38) from alternator (Figure 1, Item 26). Discard lockwasher.
8. Remove nut (Figure 1, Item 28), lockwasher (Figure 1, Item 27), and wire (Figure 1, Item 39) from alternator (Figure 1, Item 26). Discard lockwasher.
9. Remove nut (Figure 1, Item 30), lockwasher (Figure 1, Item 29), and wire (Figure 1, Item 33) from alternator (Figure 1, Item 26). Discard lockwasher.
10. Remove screw (Figure 1, Item 51), clamp (Figure 1, Item 52), and front wiring harness (Figure 1, Item 50) from engine block (Figure 1, Item 40).
11. Remove screw (Figure 1, Item 46), washer (Figure 1, Item 45), ground strap (Figure 1, Item 44), and ground wires (Figure 1, Items 41, 42, and 43) from engine block (Figure 1, Item 40).
12. Remove screw (Figure 1, Item 48), washer (Figure 1, Item 47), clamp (Figure 1, Item 49), and wiring harnesses (Figure 1, Items 50 and 53) from engine block (Figure 1, Item 40).
13. Disconnect wire (Figure 1, Item 25) from coolant temperature sending unit (Figure 1, Item 24).
14. Remove locknut (Figure 1, Item 20), washer (Figure 1, Item 21), screw (Figure 1, Item 23), washer (Figure 1, Item 21), clamp (Figure 1, Item 22), and front wiring harness (Figure 1, Item 18) from radiator (Figure 1, Item 19). Discard locknut.
15. Disconnect wiring harness (Figure 1, Item 18) from front lights cable receptacle (Figure 1, Item 17).

REMOVAL - Continued

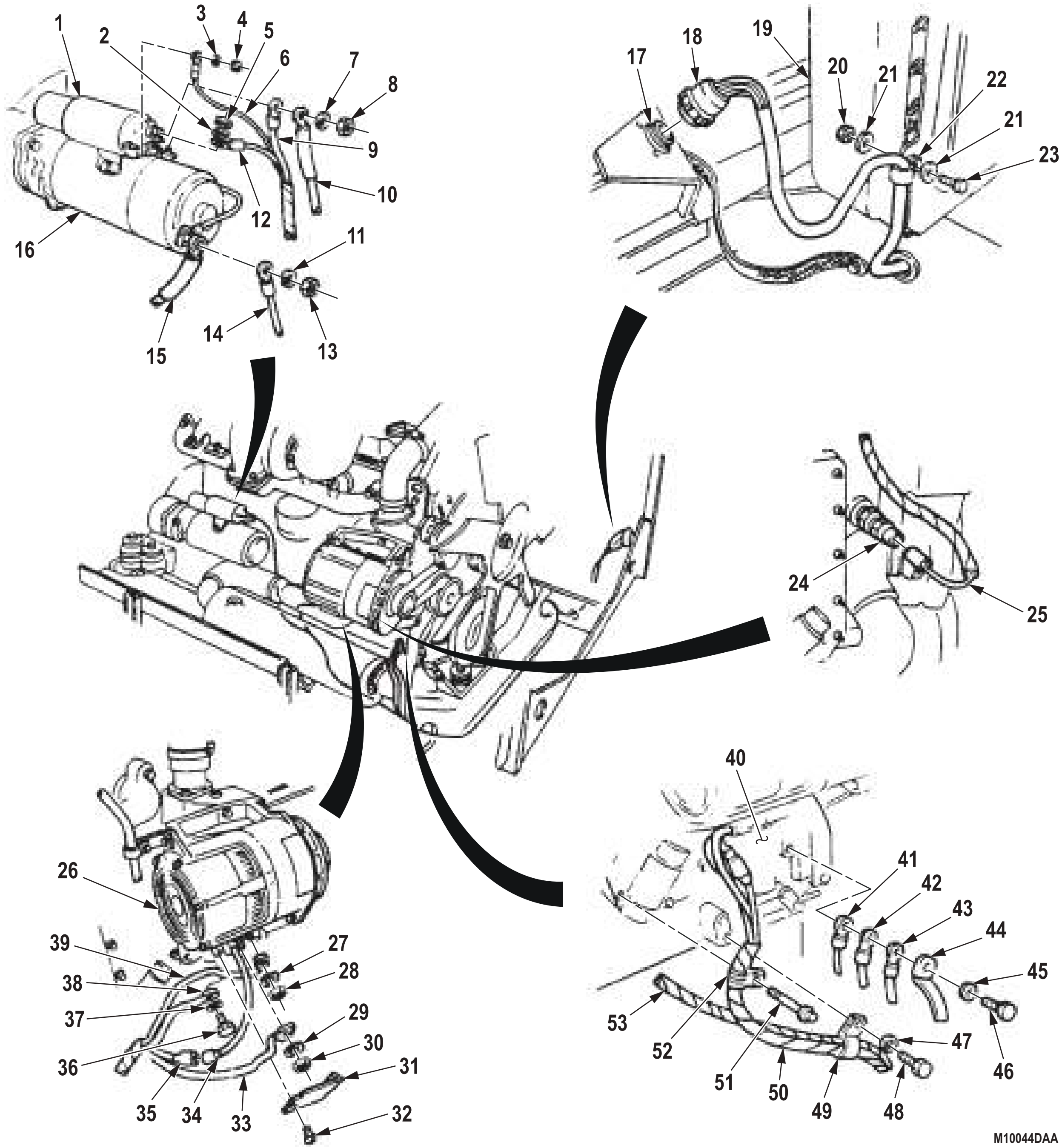


Figure 1. Front Wiring Harness Replacement.

REMOVAL - Continued

16. Remove two screws (Figure 2, Item 7) and clamps (Figure 2, Item 6) from firewall (Figure 2, Item 5).
17. Remove two nuts (Figure 2, Item 10), washers (Figure 2, Item 9), screws (Figure 2, Item 12), and clamps (Figure 2, Item 13) from frame rail (Figure 2, Item 8).
18. Disconnect wire (Figure 2, Item 11) from oil pressure sending unit (Figure 2, Item 14).
19. Remove two screws (Figure 2, Item 1), washers (Figure 2, Item 2), lockwashers (Figure 2, Item 4), and grommets (Figure 2, Item 3) from firewall (Figure 2, Item 5). Discard lockwashers.

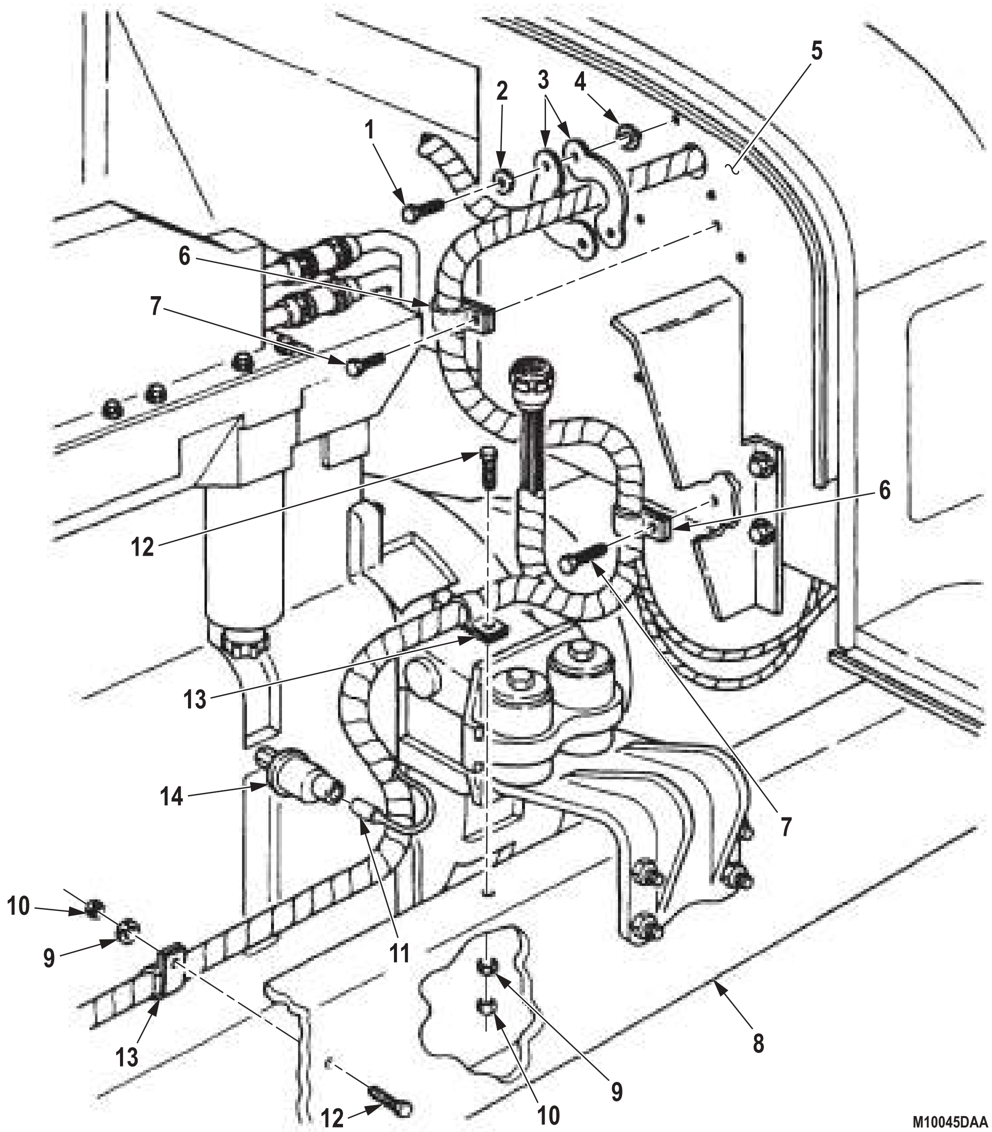


Figure 2. Front Wiring Harness Replacement.

REMOVAL - Continued

20. Disconnect wires (Figure 3, Items 3 and 4) from horn solenoid (Figure 3, Item 2).
21. Disconnect wire (Figure 3, Item 16) from transorb diode coupling (Figure 3, Item 17).
22. Disconnect wires (Figure 3, Items 7 and 8) from circuit breaker (Figure 3, Item 6).
23. Disconnect wires (Figure 3, Items 10 and 11) from circuit breaker (Figure 3, Item 9).
24. Disconnect wire (Figure 3, Item 18) from personnel hot water heater wire (Figure 3, Item 19).
25. Remove three screws (Figure 3, Item 15) and clamps (Figure 3, Item 5) from firewall (Figure 3, Item 1).
26. Remove screw (Figure 3, Item 13), washer (Figure 3, Item 14), and clamp (Figure 3, Item 12) from firewall (Figure 3, Item 1).

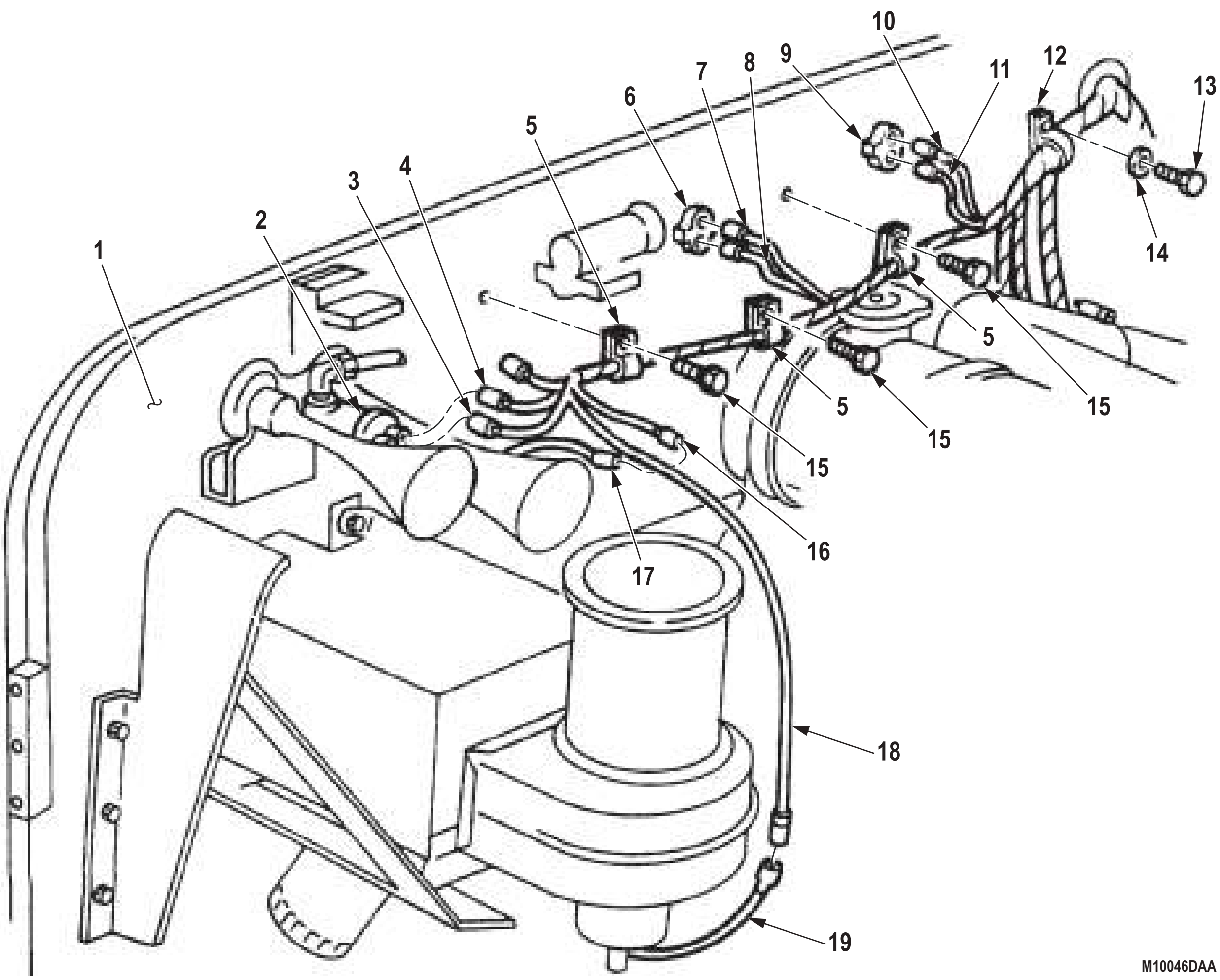


Figure 3. Front Wiring Harness Replacement.

REMOVAL - Continued

27. Disconnect connector (Figure 4, Item 17) from throttle control solenoid (Figure 4, Item 20).
28. Disconnect connector (Figure 4, Item 18) from fuel pressure transducer (Figure 4, Item 19).
29. Disconnect wires (Figure 4, Items 10 and 12) from two connectors (Figure 4, Item 11).
30. Remove screw (Figure 4, Item 5), washer (Figure 4, Item 4), and ground wire (Figure 4, Item 6) from flywheel housing (Figure 4, Item 16).
31. Remove screw (Figure 4, Item 15), washer (Figure 4, Item 14), clamp (Figure 4, Item 13), bracket (Figure 4, Item 7), and ground strap (Figure 4, Item 9) from firewall (Figure 4, Item 8).
32. Remove screw (Figure 4, Item 1), washer (Figure 4, Item 2), and clamp (Figure 4, Item 3) from firewall (Figure 4, Item 8).
33. Remove tiedown straps (Figure 4, Item 21) from dryer heater wire (Figure 4, Item 22). Discard tiedown straps.
34. Disconnect wire (Figure 4, Item 23) from dryer heater wire (Figure 4, Item 22).

REMOVAL - Continued

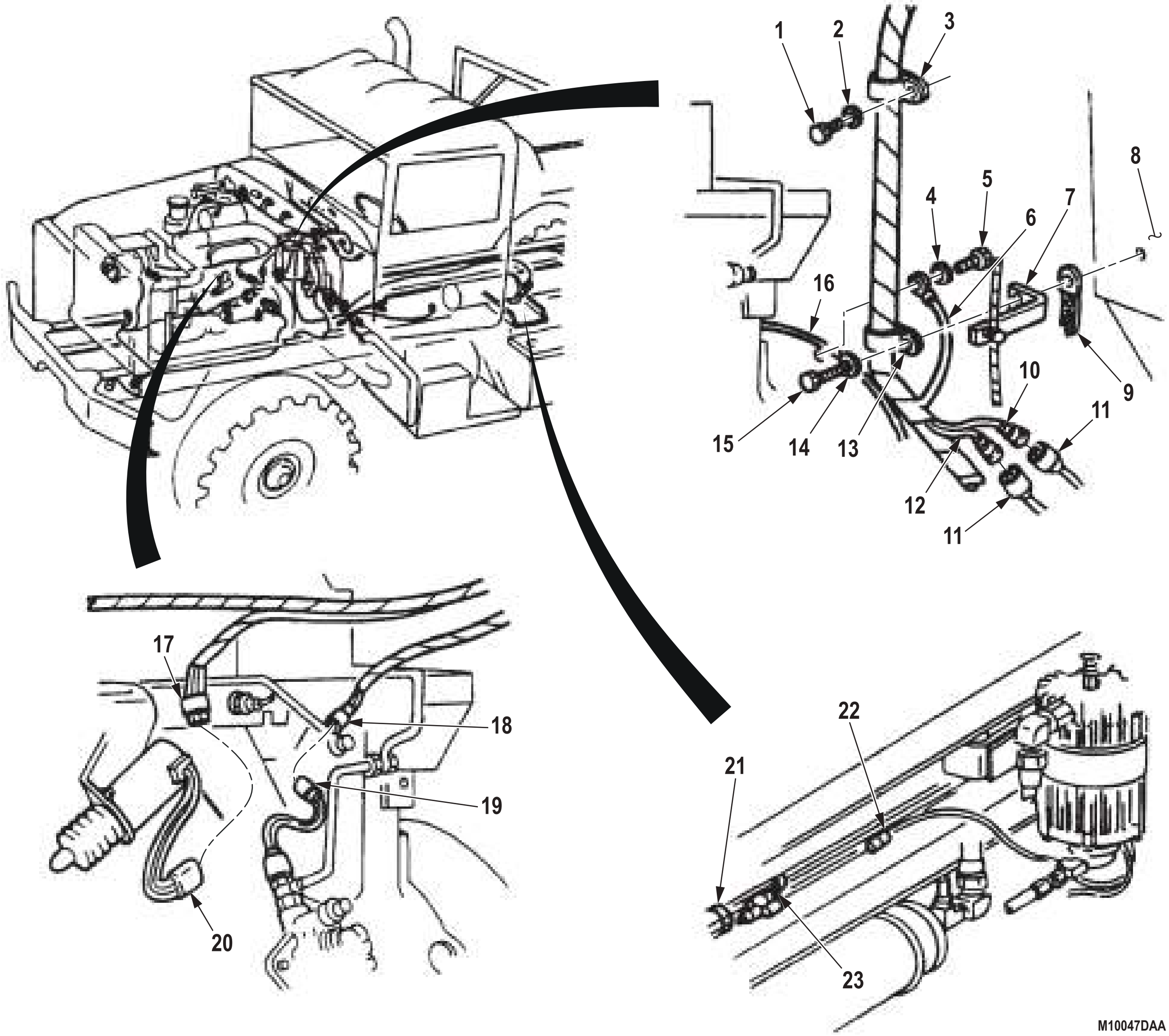


Figure 4. Front Wiring Harness Replacement.

REMOVAL - Continued

35. Disconnect three wires (Figure 5, Item 2) from high-beam selector switch (Figure 5, Item 3).

NOTE

Perform Step (36) for M929A2, M930A2, M931A2, M932A2, and M936A2 vehicles only.

36. Disconnect wire (Figure 5, Item 7) from wire (Figure 5, Item 8).
37. Remove four nuts (Figure 5, Item 4), lockwashers (Figure 5, Item 5), and screws (Figure 5, Item 1) from front wiring harness connector (Figure 5, Item 6) and rear wiring harness connector (Figure 5, Item 9). Discard lockwashers.
38. Disconnect front wiring harness connector (Figure 5, Item 6) from rear wiring harness connector (Figure 5, Item 9).
39. Disconnect wire (Figure 5, Item 14) from parking brake switch wire (Figure 5, Item 15).
40. Disconnect wire (Figure 5, Item 10) from transfer case switch capacitor lead (Figure 5, Item 11).

NOTE

Perform Step (41) for M936A2 vehicles only.

41. Disconnect wire (Figure 5, Item 13) from 5th gear lock-up capacitor lead (Figure 5, Item 12).

REMOVAL - Continued

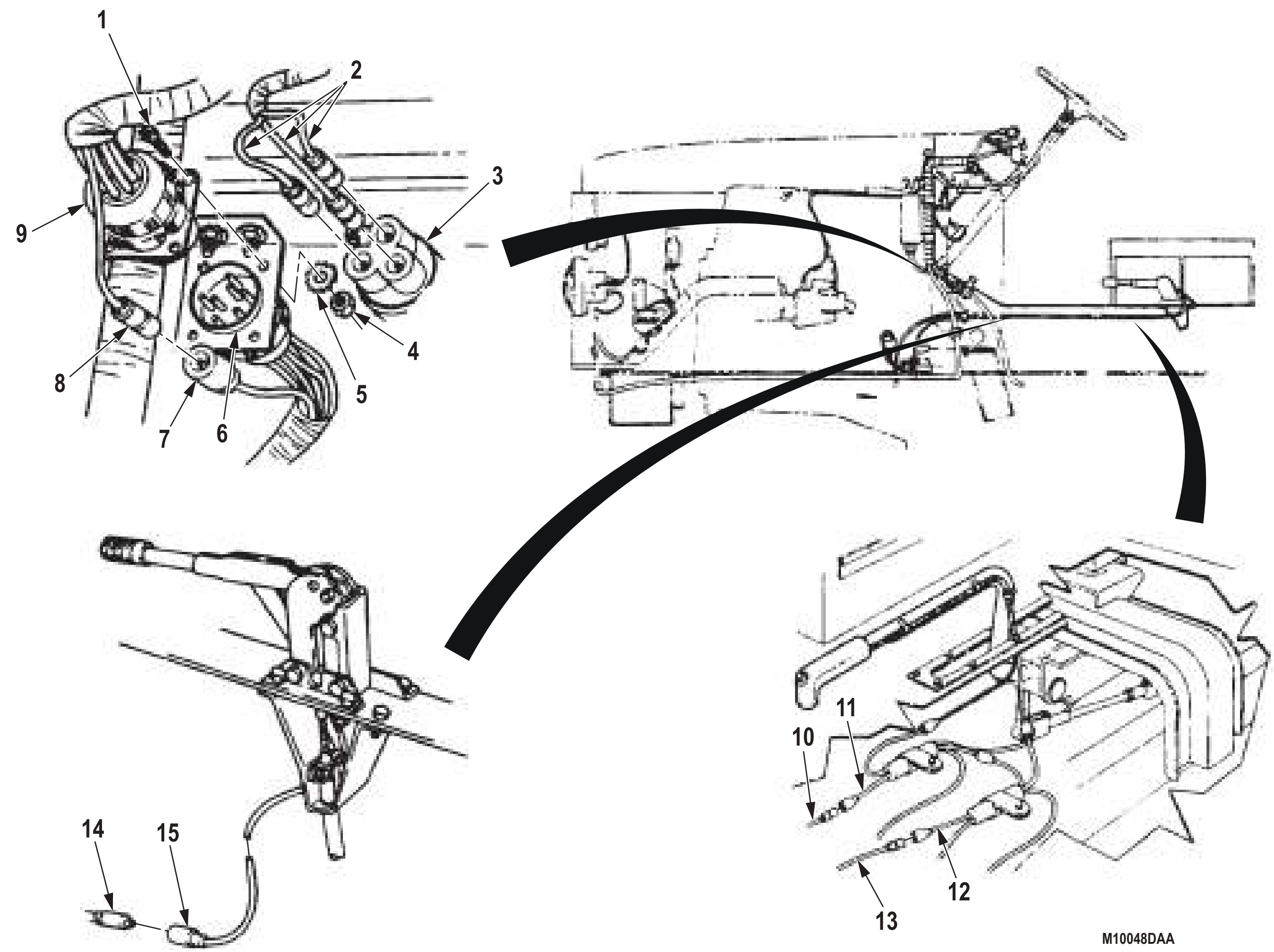


Figure 5. Front Wiring Harness Replacement.

REMOVAL - Continued

42. Disconnect front harness connector (Figure 6, Item 2) from turn signal control (Figure 6, Item 1).
43. Disconnect wire (Figure 6, Item 4) from horn switch (Figure 6, Item 3).
44. Disconnect two wires (Figure 6, Item 5) from electrical gauge circuit breaker (Figure 6, Item 8).
45. Disconnect two wires (Figure 6, Item 6) from heater blower motor circuit breaker (Figure 6, Item 7).
46. Disconnect connector (Figure 6, Item 10) from tachometer pulse sensor (Figure 6, Item 9).

NOTE

Perform Step (47) for M936A2 vehicles only.

47. Disconnect wire (Figure 6, Item 11) from warning signal lamp switch (Figure 6, Item 12).
48. Disconnect three wires (Figure 6, Item 17) from heater blower motor switch (Figure 6, Item 18).
49. Disconnect two wires (Figure 6, Item 19) from ether start switch wires (Figure 6, Item 20).
50. Disconnect wire (Figure 6, Item 13) from CTIS blackout connector (Figure 6, Item 14).
51. Disconnect CTIS power supply connector (Figure 6, Item 16) from CTIS wiring harness connector (Figure 6, Item 15).

REMOVAL - Continued

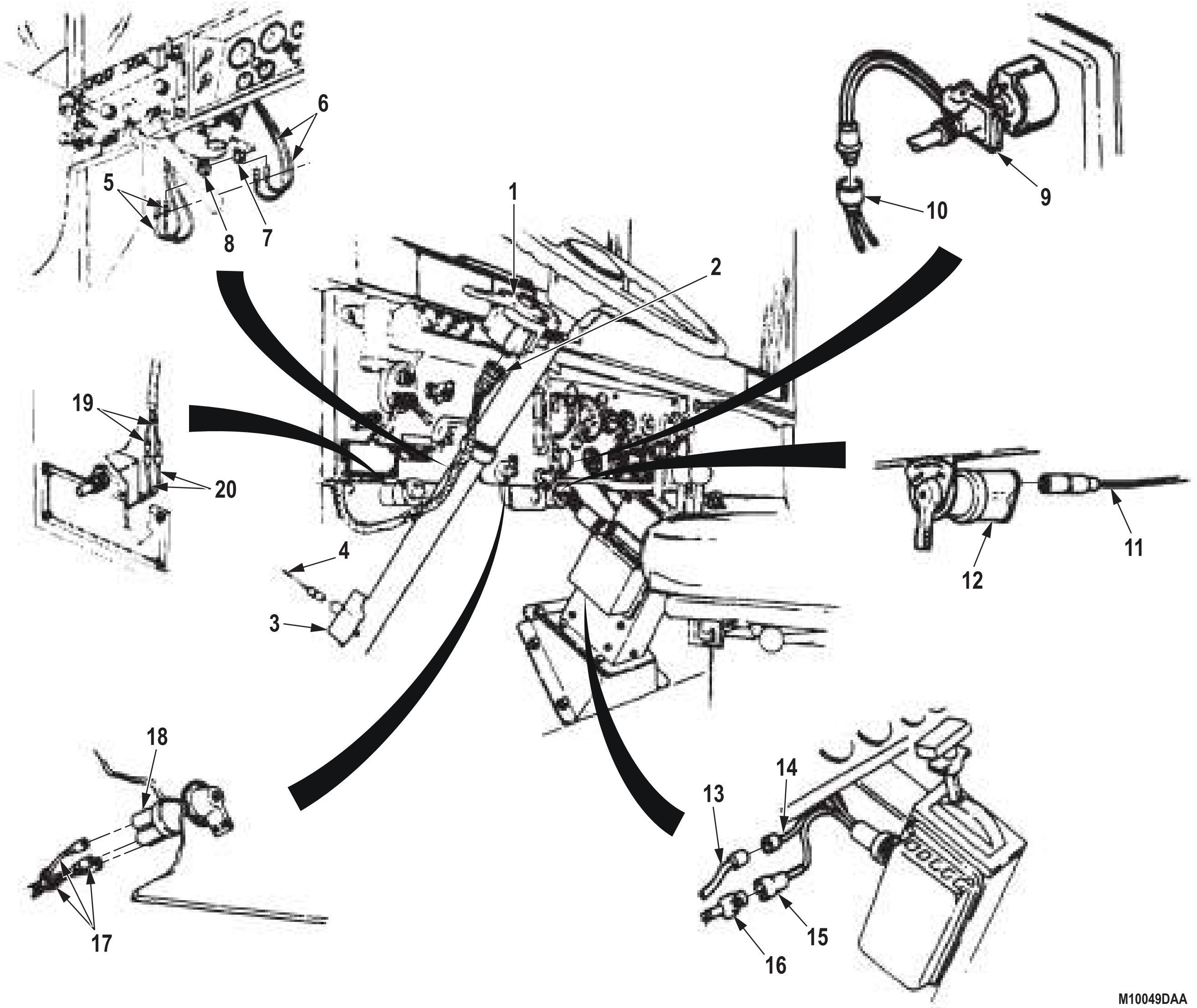


Figure 6. Front Wiring Harness Replacement.

REMOVAL - Continued

52. Disconnect connector (Figure 7, Item 4) from front wheel drive lock-in switch (Figure 7, Item 1).

NOTE

Perform Step (53) for M929A2, M930A2, M931A2, M932A2, and M936A2 vehicles only.

53. Disconnect three wires (Figure 7, Item 3) from fuel selector switch (Figure 7, Item 2).
54. Remove four screws (Figure 7, Item 12) and warning light panel (Figure 7, Item 5) from instrument panel (Figure 7, Item 6).
55. Disconnect wire (Figure 7, Item 7) from parking brake indicator light (Figure 7, Item 17).
56. Disconnect wire (Figure 7, Item 8) from low air pressure indicator light (Figure 7, Item 16).
57. Disconnect wire (Figure 7, Item 9) from spring brake override indicator light (Figure 7, Item 15).
58. Disconnect wire (Figure 7, Item 10) from axle lock-in indicator light (Figure 7, Item 14).
59. Disconnect wire (Figure 7, Item 11) from high-beam indicator light (Figure 7, Item 13).
60. With selector (Figure 7, Item 19) in N (neutral), remove four screws (Figure 7, Item 23), lockwashers (Figure 7, Item 24), and transmission selector (Figure 7, Item 18) from tower (Figure 7, Item 20). Discard lockwashers.
61. Disconnect three wires (Figure 7, Item 22) from wires (Figure 7, Item 21).

REMOVAL - Continued

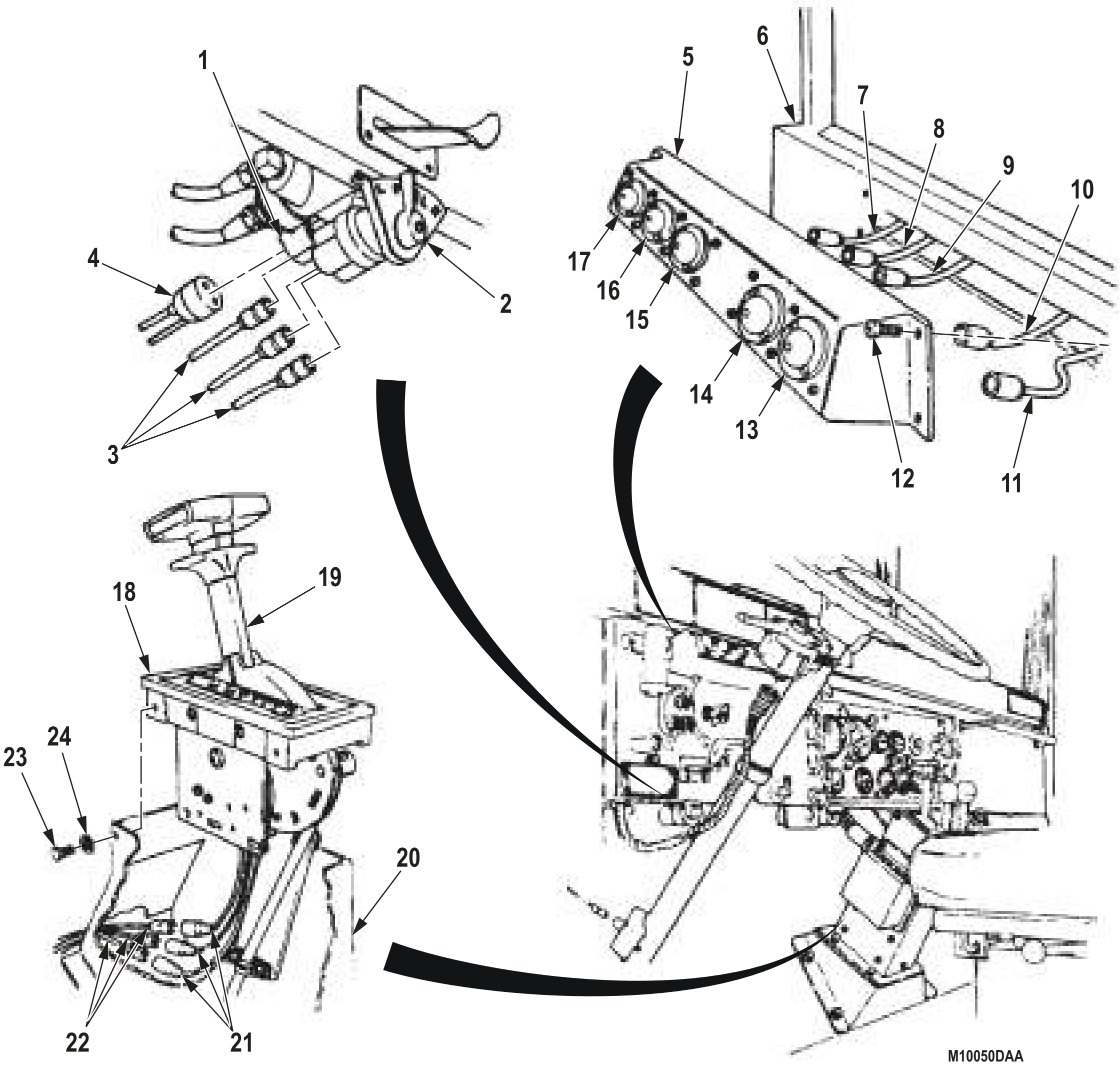


Figure 7. Front Wiring Harness Replacement.

REMOVAL - Continued

62. Remove eight screws (Figure 8, Item 3) and instrument cluster (Figure 8, Item 1) from instrument panel (Figure 8, Item 2).
63. Remove screw (Figure 8, Item 7), clamp (Figure 8, Item 8), and retainer nut (Figure 8, Item 9) from fresh air control cable (Figure 8, Item 6) and bracket (Figure 8, Item 10).
64. Remove cotter pin (Figure 8, Item 11), fresh air control cable (Figure 8, Item 6), and spring nut (Figure 8, Item 5) from heater (Figure 8, Item 4). Discard cotter pin and spring nut.

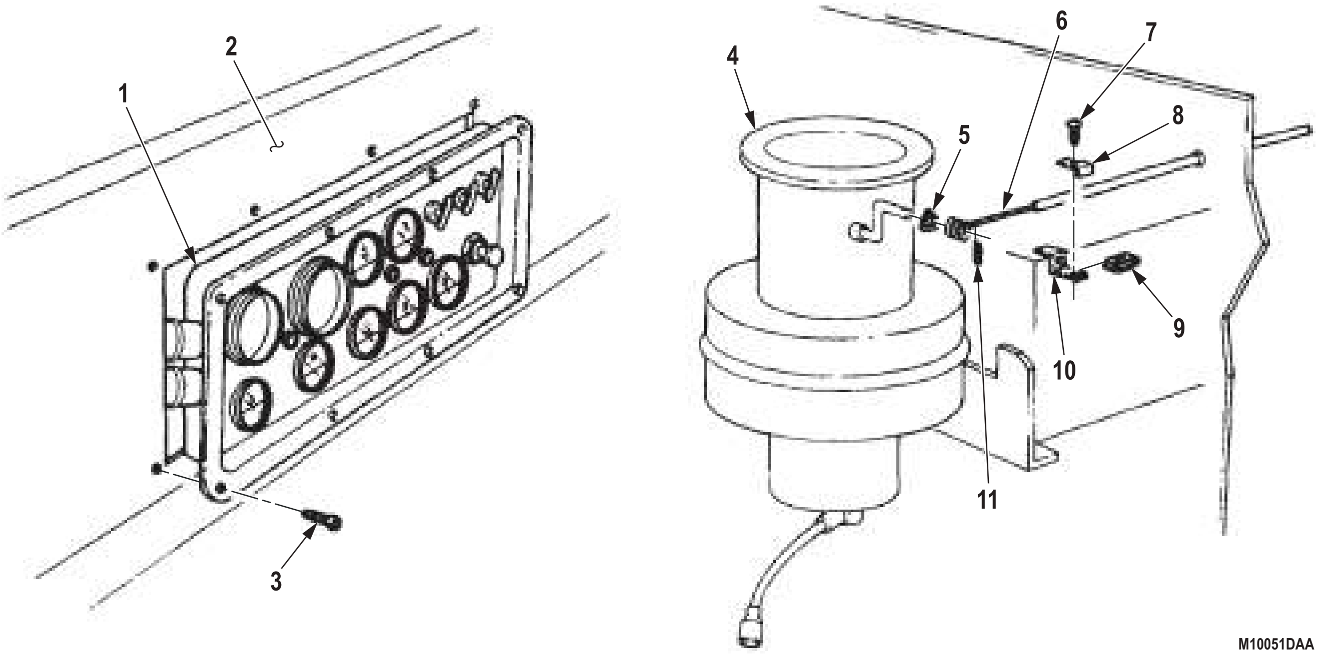


Figure 8. Front Wiring Harness Replacement.

REMOVAL - Continued

65. Disconnect three wires (Figure 9, Item 6) from battery switch (Figure 9, Item 5).
66. Disconnect three wires (Figure 9, Item 7) from starter switch (Figure 9, Item 4).
67. Disconnect wire (Figure 9, Item 18) from instrument cluster wiring harness (Figure 9, Item 17).
68. Disconnect five wires (Figure 9, Items 8, 9, 12, 14, and 21) from five instrument cluster lights (Figure 9, Item 2).
69. Disconnect wire (Figure 9, Item 10) from fuel gauge (Figure 9, Item 11).
70. Disconnect wire (Figure 9, Item 15) from oil pressure gauge (Figure 9, Item 16).
71. Disconnect wire (Figure 9, Item 19) from transmission oil temperature gauge (Figure 9, Item 20).
72. Disconnect wire (Figure 9, Item 13) from engine temperature gauge (Figure 9, Item 3).
73. Disconnect two wires (Figure 9, Item 22) from spring brake pressure switch (Figure 9, Item 23).

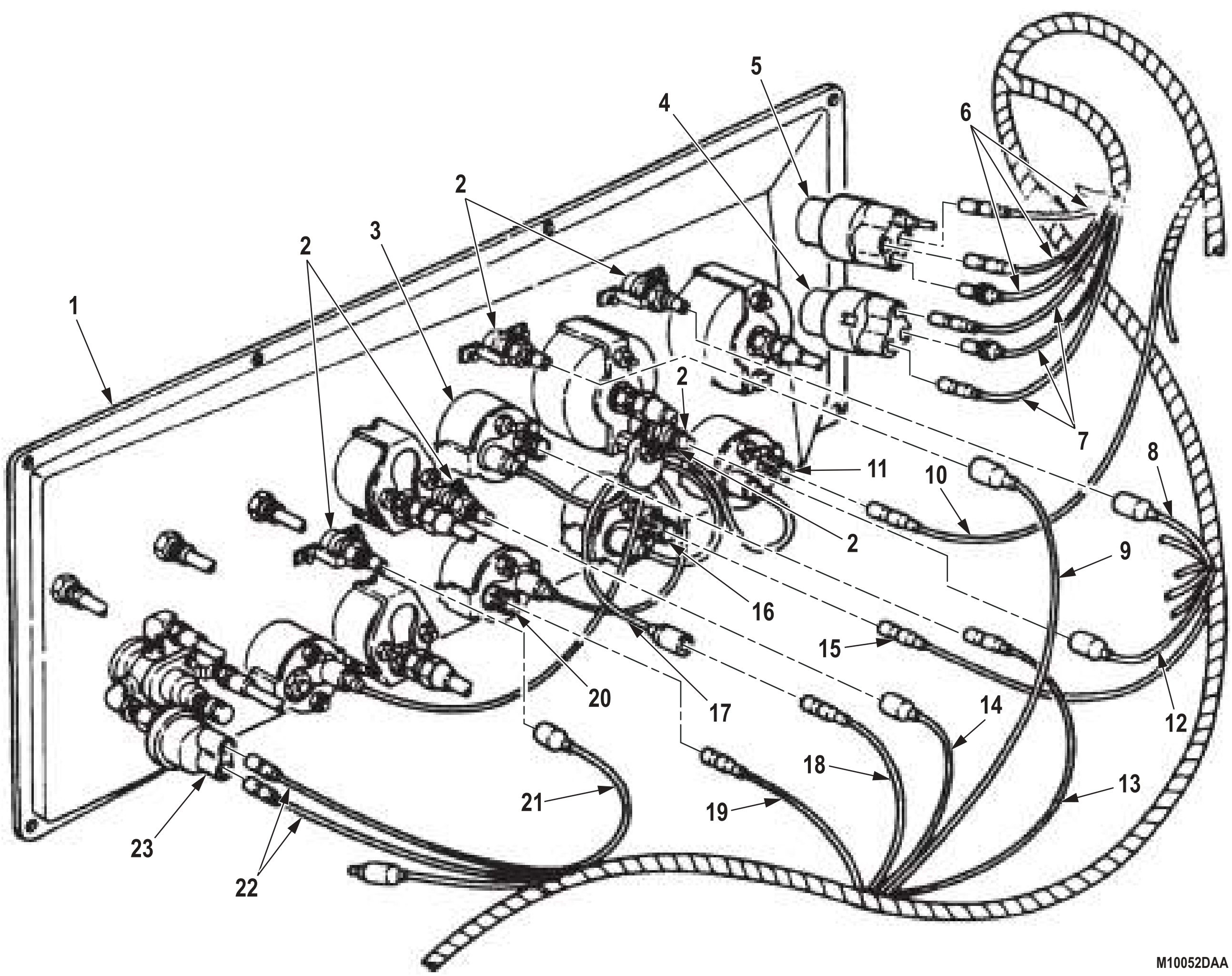


Figure 9. Front Wiring Harness Replacement.

REVIEW - Continued

NOTE

Perform Step (74) for M936A2 vehicles only.

74. Disconnect wire (Figure 10, Item 21) from floodlight switch and auxiliary receptacle wire (Figure 10, Item 20).
75. Remove cap (Figure 10, Item 30) from diagnostic connector (Figure 10, Item 35).
76. Remove nut (Figure 10, Item 26), lockwasher (Figure 10, Item 27), ground wire (Figure 10, Item 28), and screw (Figure 10, Item 32) from mounting bracket (Figure 10, Item 34). Discard lockwasher.
77. Remove nut (Figure 10, Item 24), lockwasher (Figure 10, Item 25), cap chain (Figure 10, Item 29), and screw (Figure 10, Item 31) from mounting bracket (Figure 10, Item 34). Discard lockwasher.
78. Remove two nuts (Figure 10, Item 22), lockwashers (Figure 10, Item 23), screws (Figure 10, Item 33), and diagnostic connector (Figure 10, Item 35) from mounting bracket (Figure 10, Item 34). Discard lockwashers.

NOTE

After harness wires have been removed in Steps (79) through (82), cables and hardware should be installed on terminal adapters for installation.

79. Remove nut (Figure 10, Item 4), screw (Figure 10, Item 5), battery cables (Figure 10, Items 7 and 8), and wire (Figure 10, Item 6) from terminal clamp (Figure 10, Item 3).
80. Remove nut (Figure 10, Item 9), screw (Figure 10, Item 11), battery cable (Figure 10, Item 10), and wire (Figure 10, Item 12) from terminal clamp (Figure 10, Item 1).
81. Remove nut (Figure 10, Item 13), screw (Figure 10, Item 17), battery cables (Figure 10, Items 14 and 15), and wire (Figure 10, Item 16) from terminal clamp (Figure 10, Item 2).

NOTE

Assistant will help with Step (82).

82. Carefully remove front wiring harness (Figure 10, Item 19) from vehicle (Figure 10, Item 18).

REMOVAL - Continued

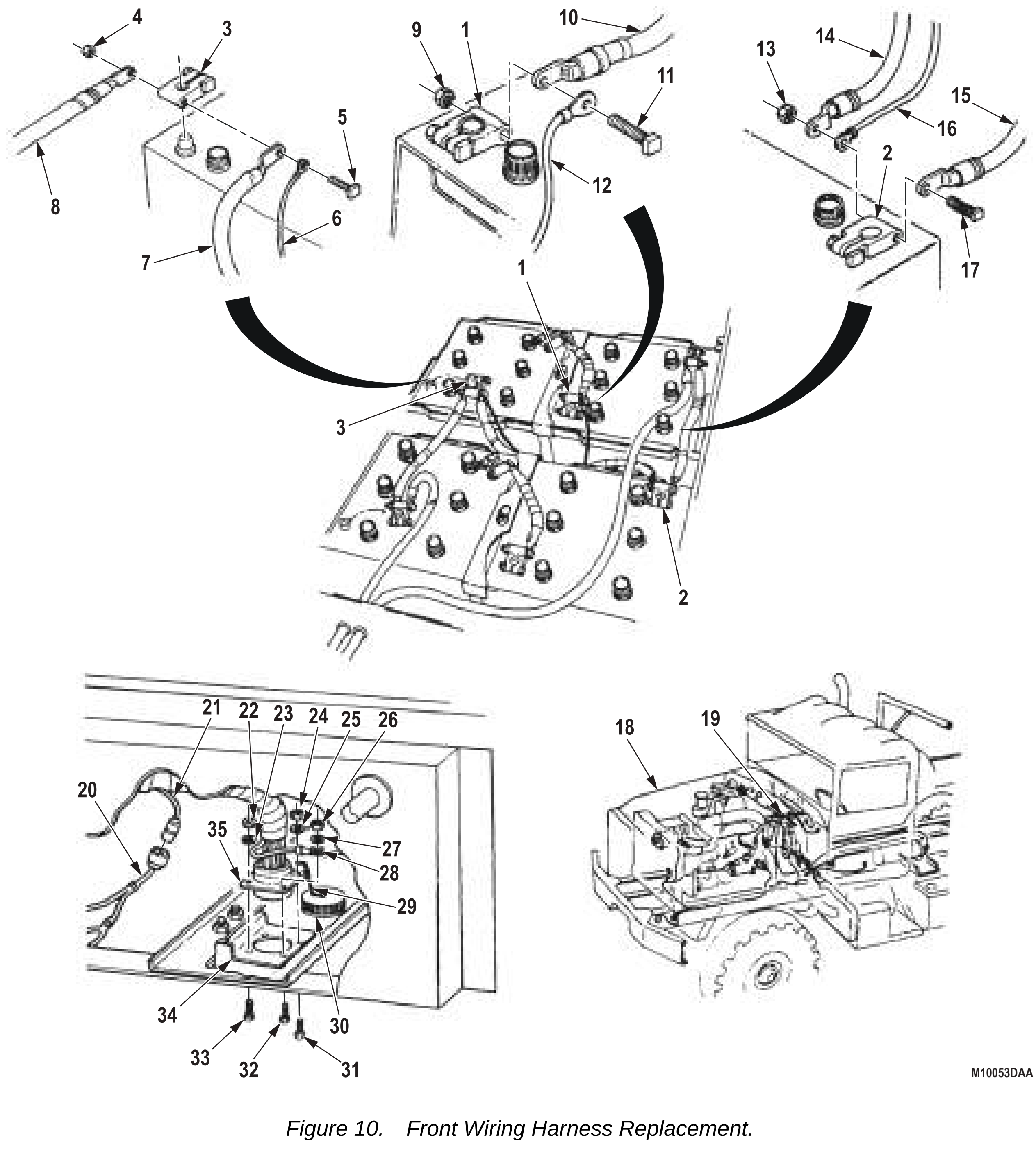


Figure 10. Front Wiring Harness Replacement.

END OF TASK

INSTALLATION

CAUTION

Use care when routing harness. Snagging may result and forceful pulling will cause damage to harness.

NOTE

Assistant will help with Step (1).

1. Position front wiring harness (Figure 11, Item 2) in the vehicle (Figure 11, Item 1), routing branches in approximate positions and through firewall (Figure 11, Item 3).
2. Connect two wires (Figure 11, Item 24) to spring brake pressure switch (Figure 11, Item 25).
3. Connect wire (Figure 11, Item 15) to engine temperature gauge (Figure 11, Item 5).
4. Connect wire (Figure 11, Item 21) to transmission oil temperature gauge (Figure 11, Item 22).
5. Connect wire (Figure 11, Item 17) to oil pressure gauge (Figure 11, Item 18).
6. Connect wire (Figure 11, Item 12) to fuel gauge (Figure 11, Item 13).
7. Connect five wires (Figure 11, Items 10, 11, 14, 16, and 23) to five instrument cluster lights (Figure 11, Item 4).
8. Connect wire (Figure 11, Item 20) to instrument cluster wiring harness (Figure 11, Item 19).
9. Connect three wires (Figure 11, Item 9) to starter switch (Figure 11, Item 6).
10. Connect three wires (Figure 11, Item 8) to battery switch (Figure 11, Item 7).
11. Install fresh air control cable (Figure 11, Item 28) on heater (Figure 11, Item 26) with spring nut (Figure 11, Item 27) and cotter pin (Figure 11, Item 33).
12. Install fresh air control cable (Figure 11, Item 28) on bracket (Figure 11, Item 32) with clamp (Figure 11, Item 30), nut (Figure 11, Item 31), and screw (Figure 11, Item 29).
13. Install instrument cluster assembly (Figure 11, Item 34) on instrument panel (Figure 11, Item 35) with eight screws (Figure 11, Item 36).

INSTALLATION - Continued

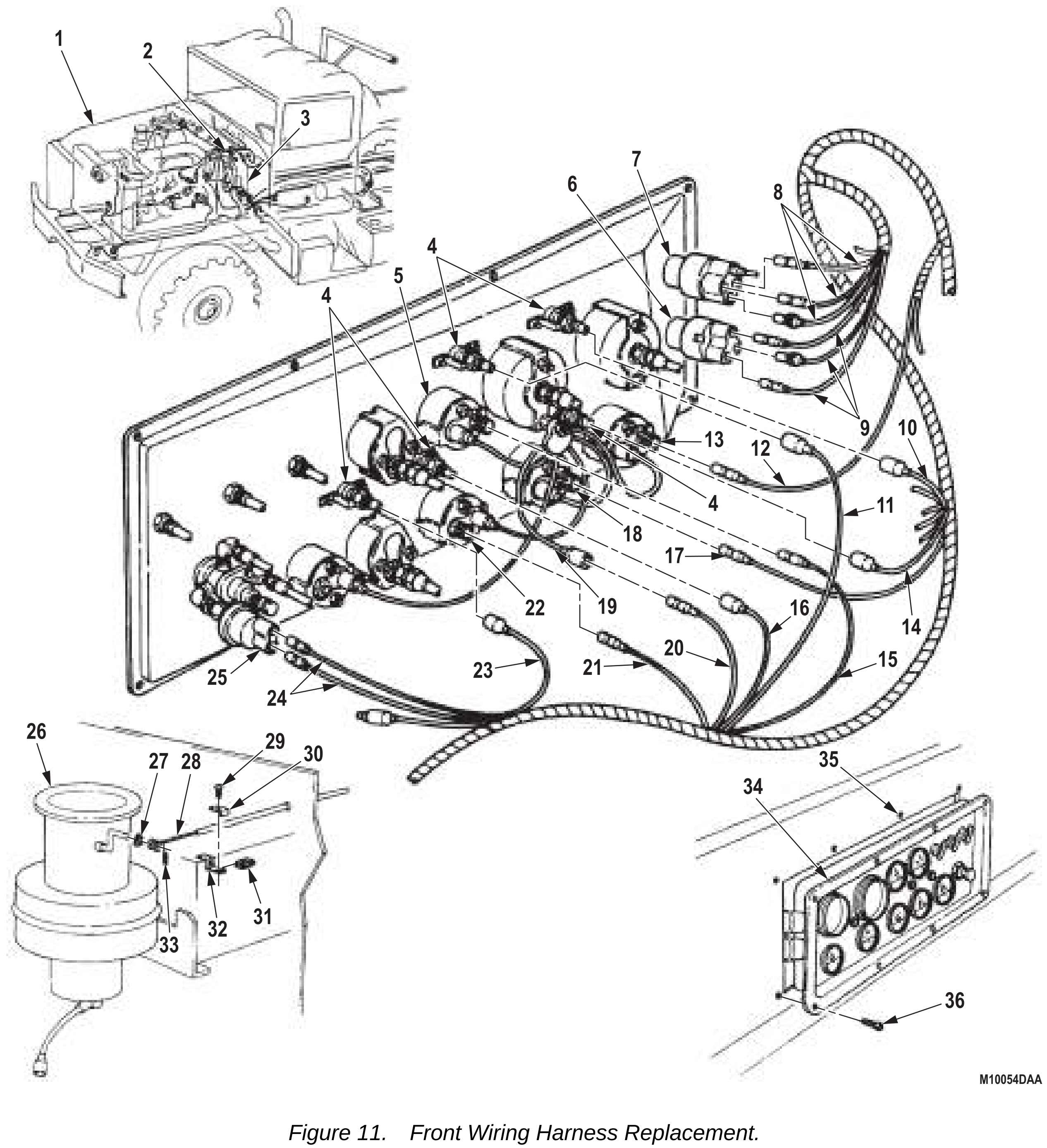


Figure 11. Front Wiring Harness Replacement.

INSTALLATION - Continued

14. Install wire (Figure 12, Item 15) and battery cables (Figure 12, Items 14 and 16) on terminal clamp (Figure 12, Item 3) with screw (Figure 12, Item 17) and nut (Figure 12, Item 13).
15. Install wire (Figure 12, Item 12) and battery cable (Figure 12, Item 10) on terminal clamp (Figure 12, Item 2) with screw (Figure 12, Item 11) and nut (Figure 12, Item 9).
16. Install wire (Figure 12, Item 6) and battery cables (Figure 12, Items 7 and 8) on terminal clamp (Figure 12, Item 1) with screw (Figure 12, Item 5) and nut (Figure 12, Item 4).
17. Install diagnostic connector (Figure 12, Item 20) on mounting bracket (Figure 12, Item 33) with two screws (Figure 12, Item 32), lockwashers (Figure 12, Item 22), and nuts (Figure 12, Item 23).
18. Install cap chain (Figure 12, Item 28) on mounting bracket (Figure 12, Item 33) with screw (Figure 12, Item 30), lockwasher (Figure 12, Item 25), and nut (Figure 12, Item 24).
19. Install ground wire (Figure 12, Item 21) on mounting bracket (Figure 12, Item 33) with screw (Figure 12, Item 31), lockwasher (Figure 12, Item 27), and nut (Figure 12, Item 26).
20. Install cap (Figure 12, Item 29) on diagnostic connector (Figure 12, Item 20).

NOTE

Perform Step (21) for M936A2 vehicles only.

21. Connect wire (Figure 12, Item 19) to floodlight switch and auxiliary receptacle wire (Figure 12, Item 18).

INSTALLATION - Continued

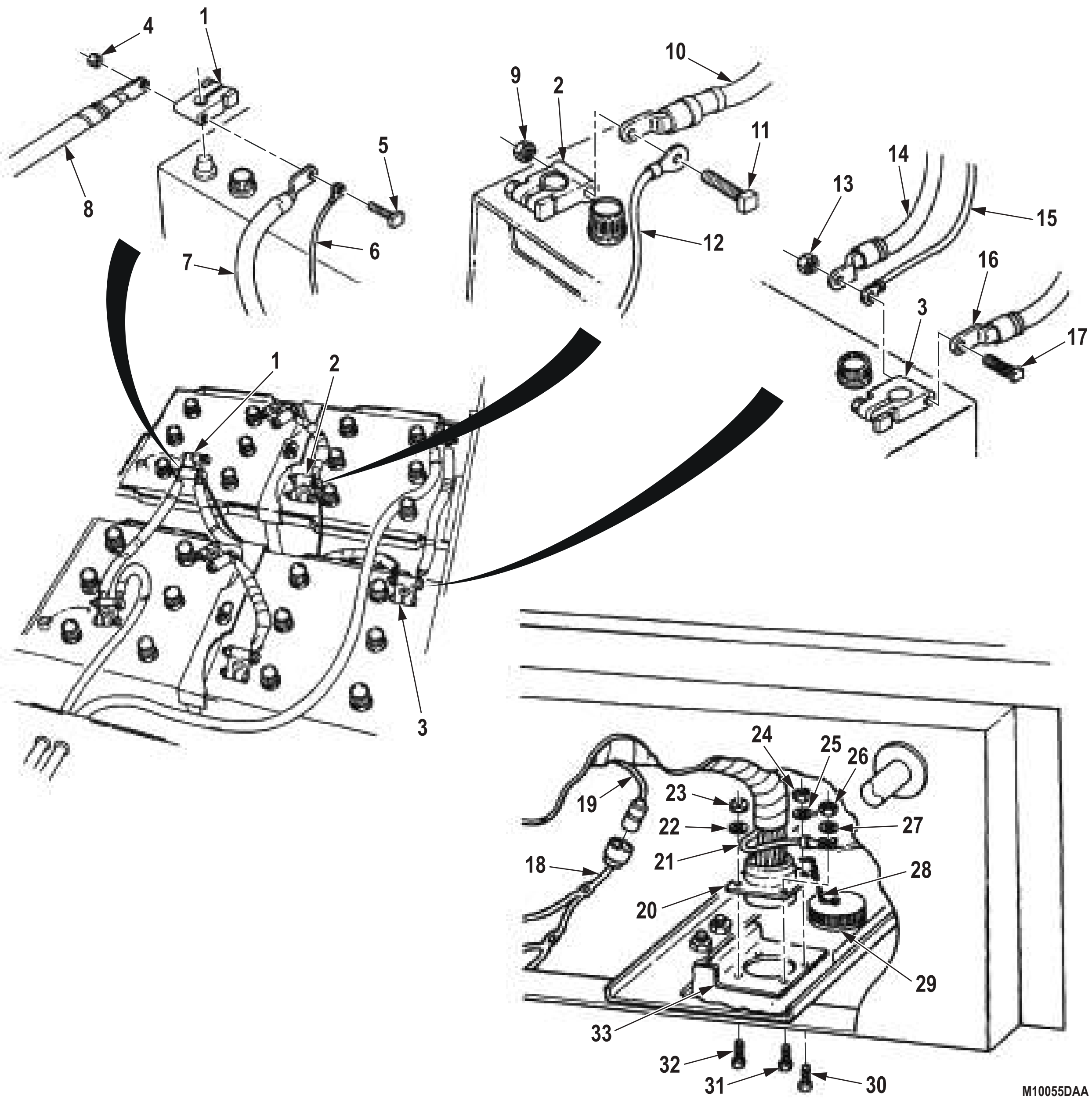


Figure 12. Front Wiring Harness Replacement.

INSTALLATION - Continued

22. Connect three wires (Figure 13, Item 5) to wires (Figure 13, Item 4).
23. With selector (Figure 13, Item 2) in N (neutral), install transmission selector (Figure 13, Item 1) on tower (Figure 13, Item 3) with four lockwashers (Figure 13, Item 7) and screws (Figure 13, Item 6).
24. Connect wire (Figure 13, Item 14) to high-beam indicator light (Figure 13, Item 16).
25. Connect wire (Figure 13, Item 13) to axle lock-in indicator light (Figure 13, Item 17).
26. Connect wire (Figure 13, Item 12) to spring brake override indicator light (Figure 13, Item 18).
27. Connect wire (Figure 13, Item 11) to low pressure indicator light (Figure 13, Item 19).
28. Connect wire (Figure 13, Item 10) to parking brake indicator light (Figure 13, Item 20).
29. Install warning light panel (Figure 13, Item 8) on instrument panel (Figure 13, Item 9) with four screws (Figure 13, Item 15).

NOTE

Perform Step (30) for M929A2, M930A2, M931A2, M932A2, and M936A2 vehicles only.

30. Connect three wires (Figure 13, Item 22) to fuel selector switch (Figure 13, Item 21).
31. Connect connector (Figure 13, Item 23) to front wheel drive lock-in switch (Figure 13, Item 24).

INSTALLATION - Continued

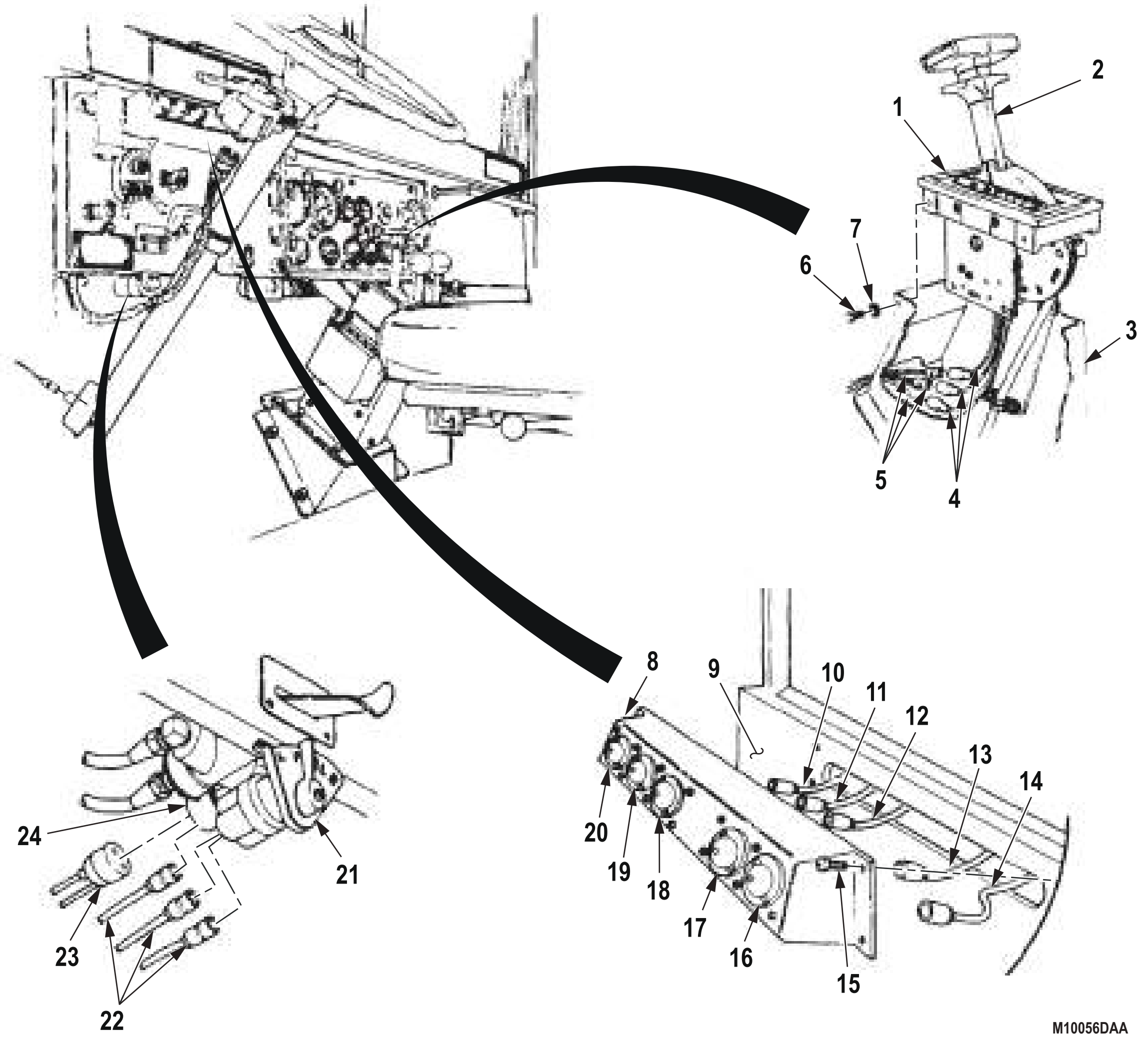


Figure 13. Front Wiring Harness Replacement.

INSTALLATION - Continued

32. Connect two wires (Figure 14, Item 5) to ether start switch wires (Figure 14, Item 6).
33. Connect three wires (Figure 14, Item 8) to heater blower motor switch (Figure 14, Item 7).

NOTE

Perform Step (34) for M936A2 vehicles only.

34. Connect wire (Figure 14, Item 10) to warning signal lamp switch (Figure 14, Item 9).
35. Connect wire (Figure 14, Item 13) to CTIS and blackout connector (Figure 14, Item 14).
36. Connect CTIS power supply connector (Figure 14, Item 12) to CTIS wiring harness (Figure 14, Item 11).
37. Connect wire (Figure 14, Item 4) to horn switch (Figure 14, Item 3).
38. Connect front harness connector (Figure 14, Item 1) to turn signal control (Figure 14, Item 2).
39. Connect connector (Figure 14, Item 19) to tachometer pulse sensor (Figure 14, Item 20).
40. Connect two wires (Figure 14, Item 16) to electrical gauge circuit breaker (Figure 14, Item 15).
41. Connect two wires (Figure 14, Item 18) to heater blower motor circuit breaker (Figure 14, Item 17).

INSTALLATION - Continued

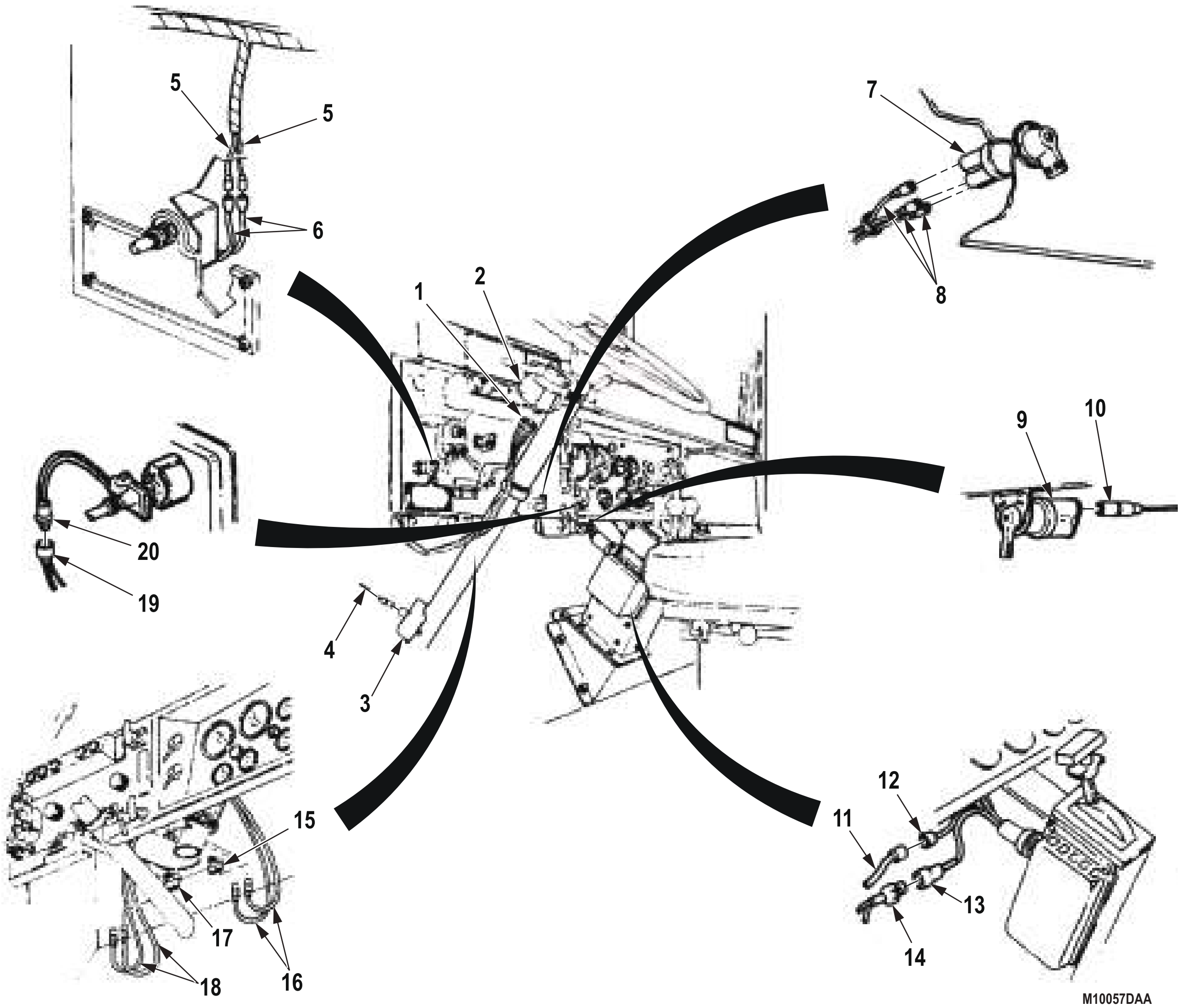


Figure 14. Front Wiring Harness Replacement.

INSTALLATION - Continued

42. Connect wire (Figure 15, Item 1) to transfer case switch capacitor lead (Figure 15, Item 2).

NOTE

Perform Step (43) for M936A2 vehicles only.

43. Connect wire (Figure 15, Item 4) to 5th gear lock-up capacitor lead (Figure 15, Item 3).
44. Connect wire (Figure 15, Item 5) to parking brake switch wire (Figure 15, Item 6).
45. Connect front wiring harness connector (Figure 15, Item 15) to rear wiring harness connector (Figure 15, Item 12).
46. Install four screws (Figure 15, Item 7), lockwashers (Figure 15, Item 11), and nuts (Figure 15, Item 10) on front wiring harness connector (Figure 15, Item 15) and rear wiring harness connector (Figure 15, Item 12).

NOTE

Perform Step (47) for M929A2, M930A2, M931A2, M932A2, and M936A2 vehicles only.

47. Connect wire (Figure 15, Item 14) to wire (Figure 15, Item 13).
48. Connect three wires (Figure 15, Item 8) to high-beam selector switch (Figure 15, Item 9).

INSTALLATION - Continued

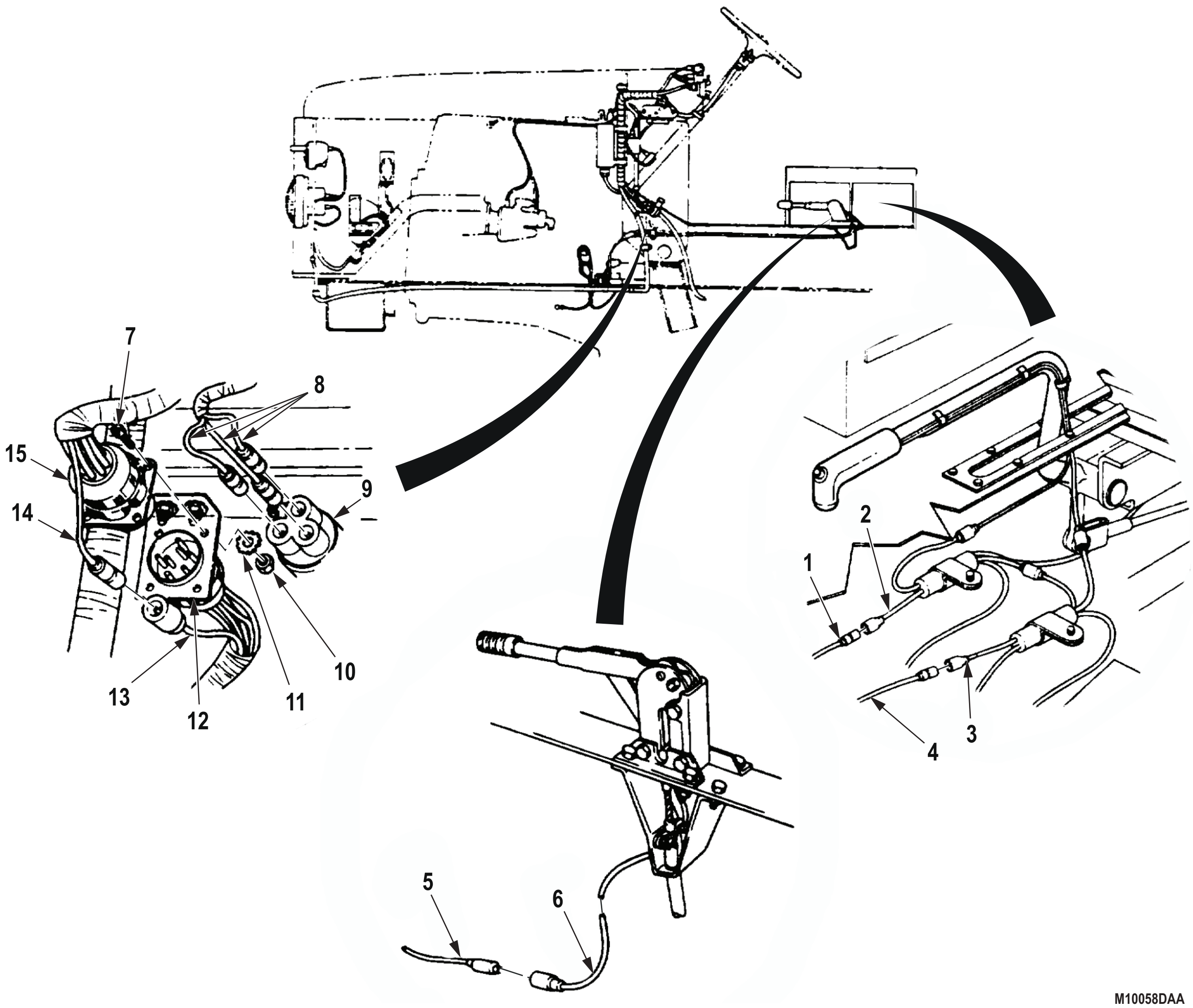


Figure 15. Front Wiring Harness Replacement.

INSTALLATION - Continued

49. Connect wire (Figure 16, Item 3) to air dryer heater wire (Figure 16, Item 2).
50. Install tiedown straps (Figure 16, Item 1) on wire (Figure 16, Item 3).
51. Install clamp (Figure 16, Item 4) on firewall (Figure 16, Item 9) with washer (Figure 16, Item 19) and screw (Figure 16, Item 18).
52. Install ground strap (Figure 16, Item 8), bracket (Figure 16, Item 10), and clamp (Figure 16, Item 14) on firewall (Figure 16, Item 9) with washer (Figure 16, Item 15) and screw (Figure 16, Item 16).
53. Install ground wire (Figure 16, Item 5) on flywheel housing (Figure 16, Item 17) with washer (Figure 16, Item 6) and screw (Figure 16, Item 7).
54. Connect two wires (Figure 16, Item 12) to connectors (Figure 16, Items 11 and 13).
55. Connect connector (Figure 16, Item 21) to fuel pressure transducer (Figure 16, Item 22).
56. Connect connector (Figure 16, Item 20) to throttle control solenoid (Figure 16, Item 23).

INSTALLATION - Continued

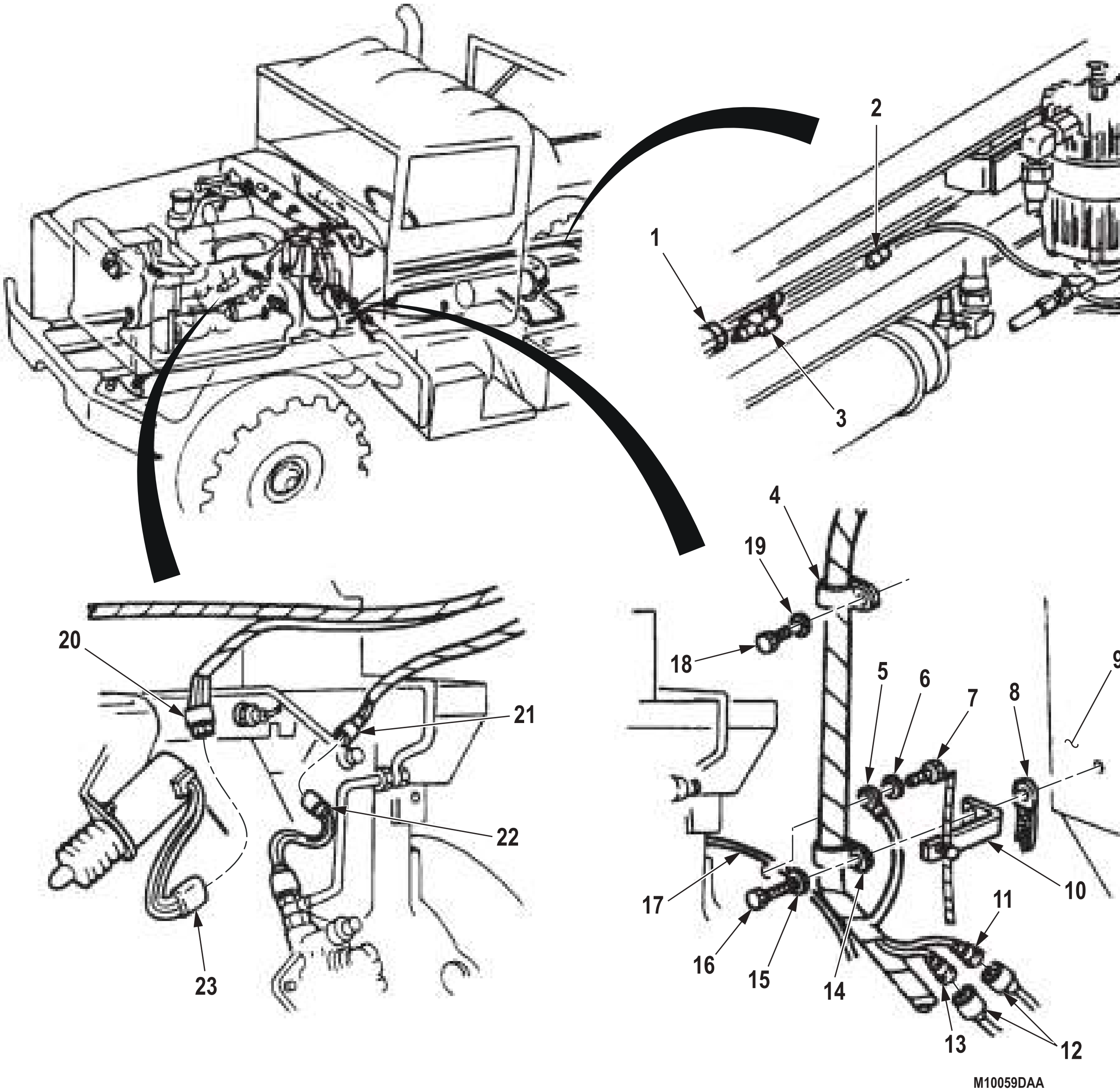


Figure 16. Front Wiring Harness Replacement.

INSTALLATION - Continued

57. Install clamp (Figure 17, Item 12) on right firewall (Figure 17, Item 1) with washer (Figure 17, Item 14) and screw (Figure 17, Item 13).
58. Install three clamps (Figure 17, Item 5) on right firewall (Figure 17, Item 1) with screws (Figure 17, Item 15).
59. Connect wire (Figure 17, Item 18) to personnel hot water heater wire (Figure 17, Item 19).
60. Connect wires (Figure 17, Items 10 and 11) to circuit breaker (Figure 17, Item 9).
61. Connect wires (Figure 17, Items 7 and 8) to circuit breaker (Figure 17, Item 6).
62. Connect wire (Figure 17, Item 16) to transorb diode coupling (Figure 17, Item 17).
63. Connect wires (Figure 17, Items 3 and 4) to horn solenoid (Figure 17, Item 2).

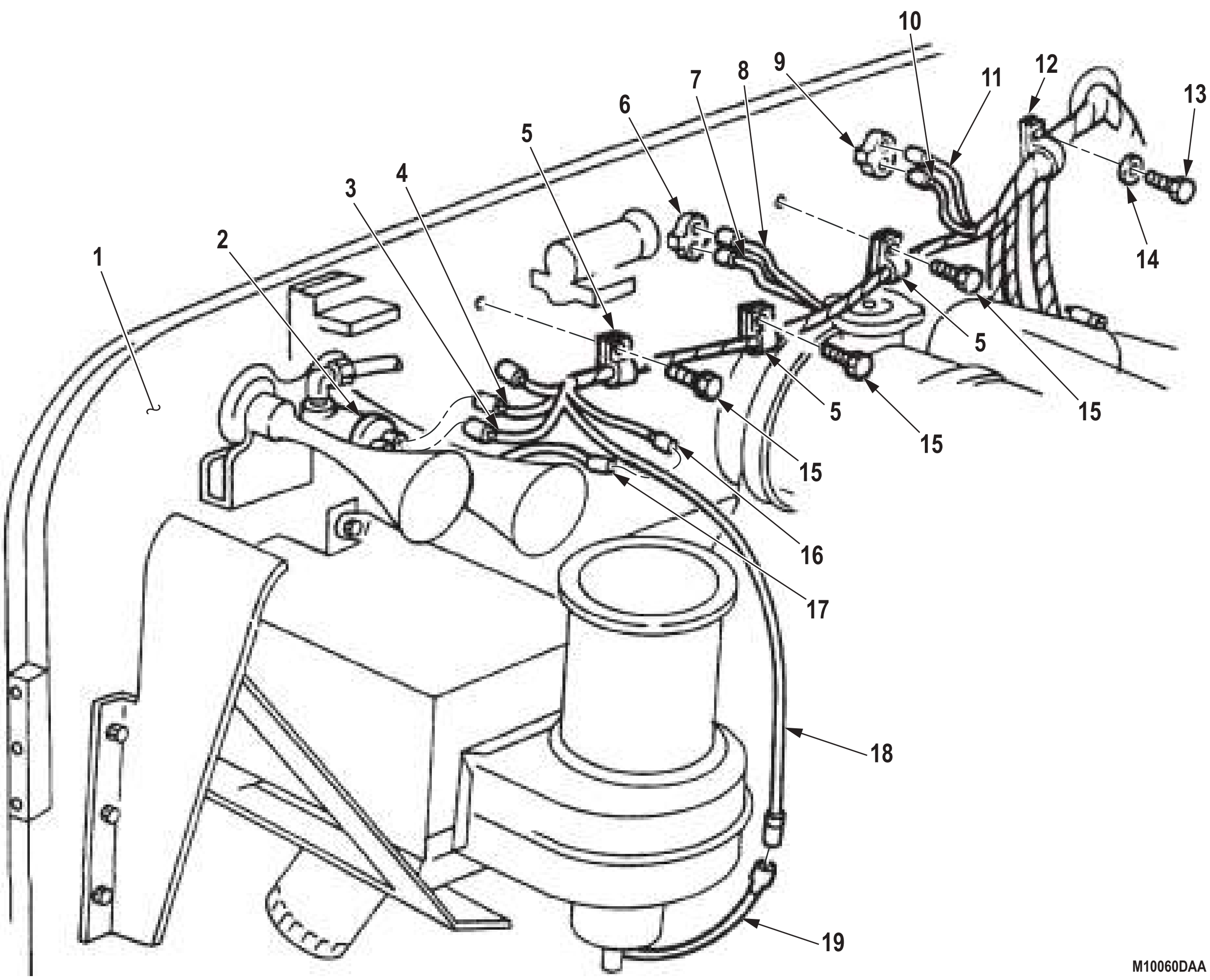


Figure 17. Front Wiring Harness Replacement.

INSTALLATION - Continued

64. Install grommets (Figure 18, Item 3) on left firewall (Figure 18, Item 5) with two lockwashers (Figure 18, Item 4), washers (Figure 18, Item 2), and screws (Figure 18, Item 1).
65. Connect wire (Figure 18, Item 11) to oil sending unit (Figure 18, Item 14).
66. Install two clamps (Figure 18, Item 13) on frame rail (Figure 18, Item 8) with screws (Figure 18, Item 12), washers (Figure 18, Item 9), and nuts (Figure 18, Item 10).
67. Install two clamps (Figure 18, Item 6) on left firewall (Figure 18, Item 5) with screws (Figure 18, Item 7).

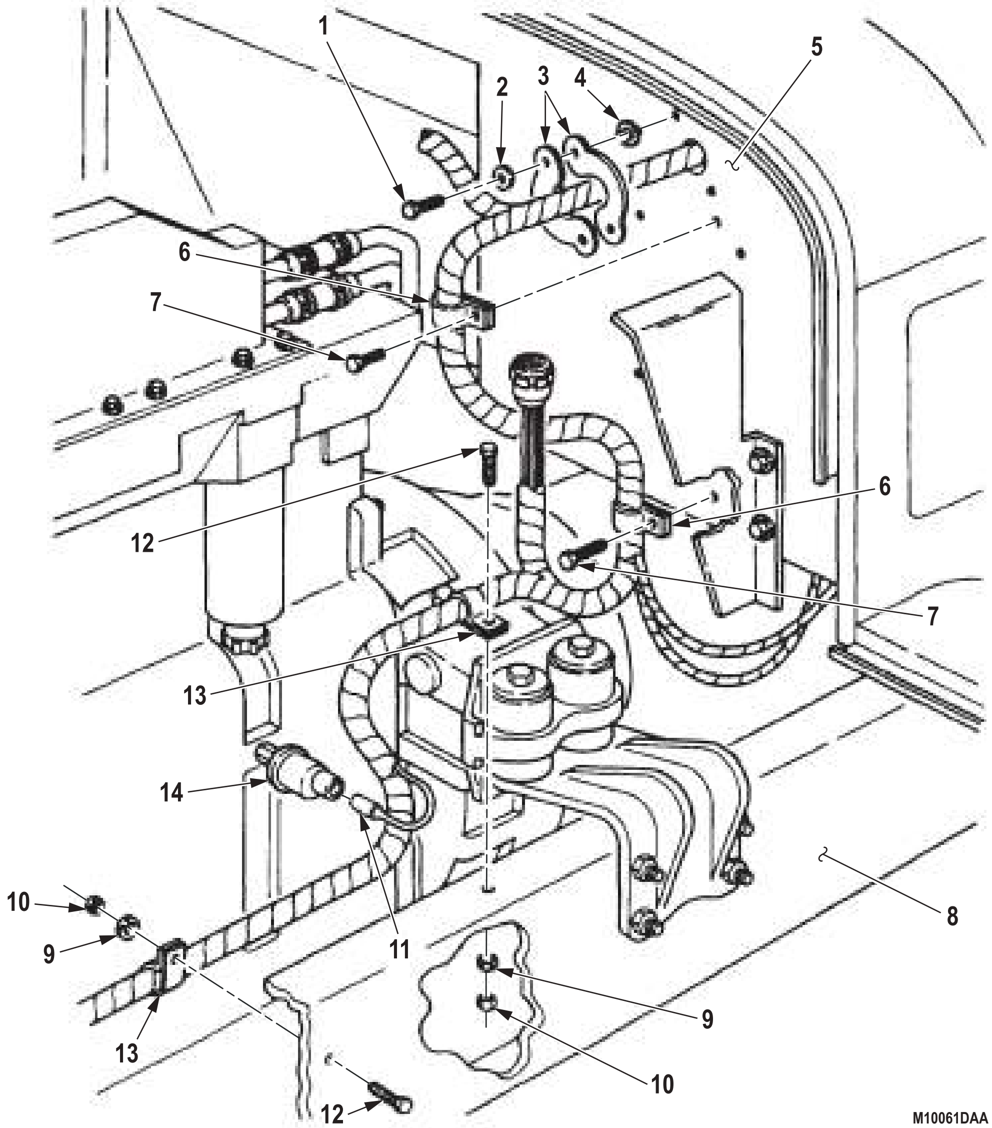


Figure 18. Front Wiring Harness Replacement.

INSTALLATION - Continued

68. Install front wiring harness (Figure 19, Item 1) on front crossmember (Figure 19, Item 2).
69. Connect connector (Figure 19, Item 4) to front lights cable receptacle (Figure 19, Item 3).
70. Install front wiring harness (Figure 19, Item 1) and clamp (Figure 19, Item 8) on radiator (Figure 19, Item 5) with washer (Figure 19, Item 7), screw (Figure 19, Item 9), washer (Figure 19, Item 7), and locknut (Figure 19, Item 6)
71. Connect wire (Figure 19, Item 24) to coolant temperature sending unit (Figure 19, Item 25).
72. Install wiring harnesses (Figure 19, Items 1 and 20) and clamp (Figure 19, Item 19) on engine block (Figure 19, Item 10) with washer (Figure 19, Item 17) and screw (Figure 19, Item 18).
73. Install ground wires (Figure 19, Items 11, 12, and 13) and ground strap (Figure 19, Item 14) on engine block (Figure 19, Item 10) with washer (Figure 19, Item 15) and screw (Figure 19, Item 16).
74. Install front wiring harness branch (Figure 19, Item 20) and clamp (Figure 19, Item 22) on oil cooler (Figure 19, Item 23) with screw (Figure 19, Item 21).

INSTALLATION - Continued

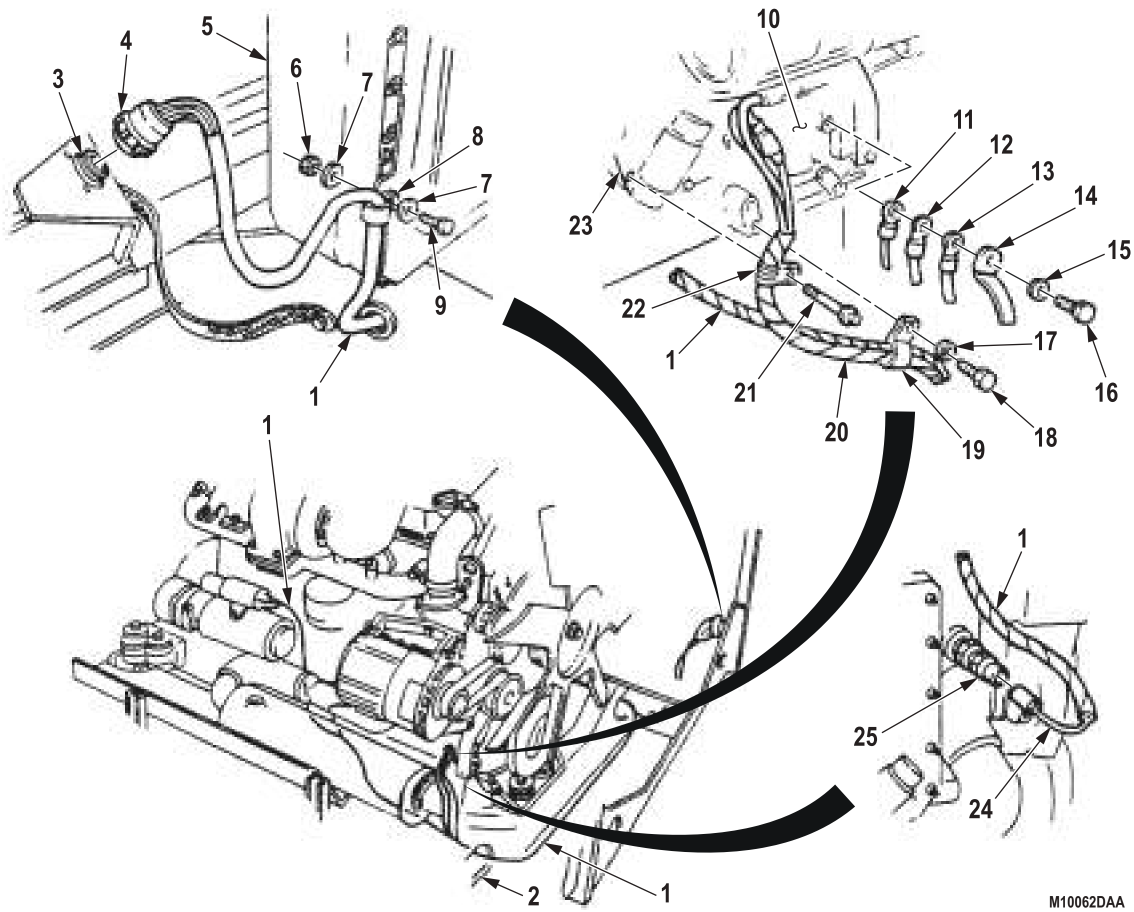


Figure 19. Front Wiring Harness Replacement.

INSTALLATION - Continued

75. Install wire (Figure 20, Item 23) on alternator (Figure 20, Item 30) with lockwasher (Figure 20, Item 19) and nut (Figure 20, Item 20).
76. Install wire (Figure 20, Item 29) on alternator (Figure 20, Item 30) with lockwasher (Figure 20, Item 17) and nut (Figure 20, Item 18).
77. Install wire (Figure 20, Item 28) on alternator (Figure 20, Item 30) with lockwasher (Figure 20, Item 27) and screw (Figure 20, Item 26).
78. Connect wire (Figure 20, Item 25) to connector (Figure 20, Item 24).

NOTE

Apply sealing compound to terminal cover and wires for installation.

79. Install terminal cover (Figure 20, Item 21) on alternator (Figure 20, Item 30) with two screw assembled lockwashers (Figure 20, Item 22).
80. Install wires (Figure 20, Items 12 and 13) on starter (Figure 20, Item 14) with lockwasher (Figure 20, Item 11) and nut (Figure 20, Item 10).
81. Install wire (Figure 20, Item 9) on starter (Figure 20, Item 14) with lockwasher (Figure 20, Item 15) and nut (Figure 20, Item 16).
82. Install wire (Figure 20, Item 5) and battery cable (Figure 20, Item 8) on solenoid (Figure 20, Item 1) with lockwasher (Figure 20, Item 6) and nut (Figure 20, Item 7).
83. Install wire (Figure 20, Item 2) on solenoid (Figure 20, Item 1) with lockwasher (Figure 20, Item 3) and nut (Figure 20, Item 4).

INSTALLATION - Continued

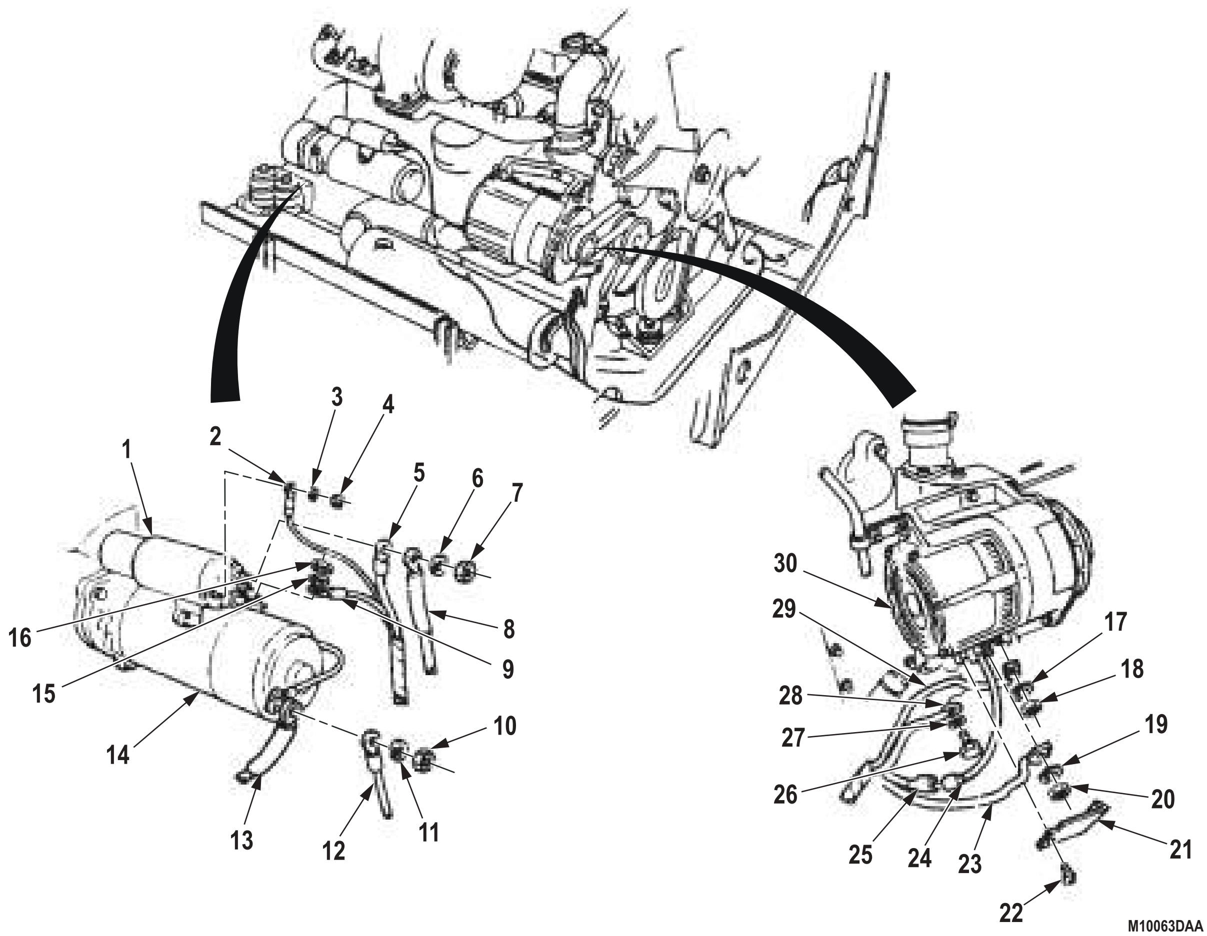


Figure 20. Front Wiring Harness Replacement.

END OF TASK

FOLLOW-ON MAINTENANCE

1. Install air intake pipe. (TM 9-2320-272-10)
2. Connect main light switch. (Volume 2, WP 0315)
3. Connect failsafe wiring module. (Volume 2, WP 0336)
4. Install turn signal flasher. (Volume 2, WP 0318)
5. Install protective control box. (Volume 2, WP 0319)
6. Install splash shields. (TM 9-2320-272-10)

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
REAR WIRING HARNESS REPLACEMENT

INITIAL SETUP:

Tools and Special Tools

Tool Kit, General Mechanic's: Automotive
(Volume 5, WP 0826, Table 1, Item 56)

Materials/Parts

Locknut (Volume 5, WP 0827, Table 1, Item 277)
Qty: 1
Locknut (M936/A1/A2)
(Volume 5, WP 0827, Table 1, Item 438)
Qty: 1
Locknut (M931/A1/A2, M932/A1/A2)

Materials/Parts (cont.)

(Volume 5, WP 0827, Table 1, Item 278)
Qty: 1
Lockwasher
(Volume 5, WP 0827, Table 1, Item 390)
Qty: 1
Lockwasher (M931/A1/A2, M932/A1/A2)
(Volume 5, WP 0827, Table 1, Item 420)
Qty: 1

Equipment Condition

Hood raised and secured. (TM 9-2320-272-10)
Battery ground cables disconnected. (Volume 2, WP 0350)

REMOVAL

NOTE

Tag wires, cables, and connectors for installation.

1. Disconnect wire (Figure 1, Item 1) from transmission temperature transmitter (Figure 1, Item 3) and remove from spring tension tab (Figure 1, Item 2).
2. Disconnect rear wiring harness connector (Figure 1, Item 5) from front wiring harness plug (Figure 1, Item 4).

NOTE

Perform Step (3) for M929/A1/A2, M930/A1/A2, M931/A1/A2, M932/A1/A2, and M936/A1/A2 vehicles only.

3. Disconnect wire (Figure 1, Item 6) from wire (Figure 1, Item 7).
4. Disconnect wires (Figure 1, Items 8 and 12) from wires (Figure 1, Items 9 and 11) of neutral start switch (Figure 1, Item 10).

REMOVAL - Continued

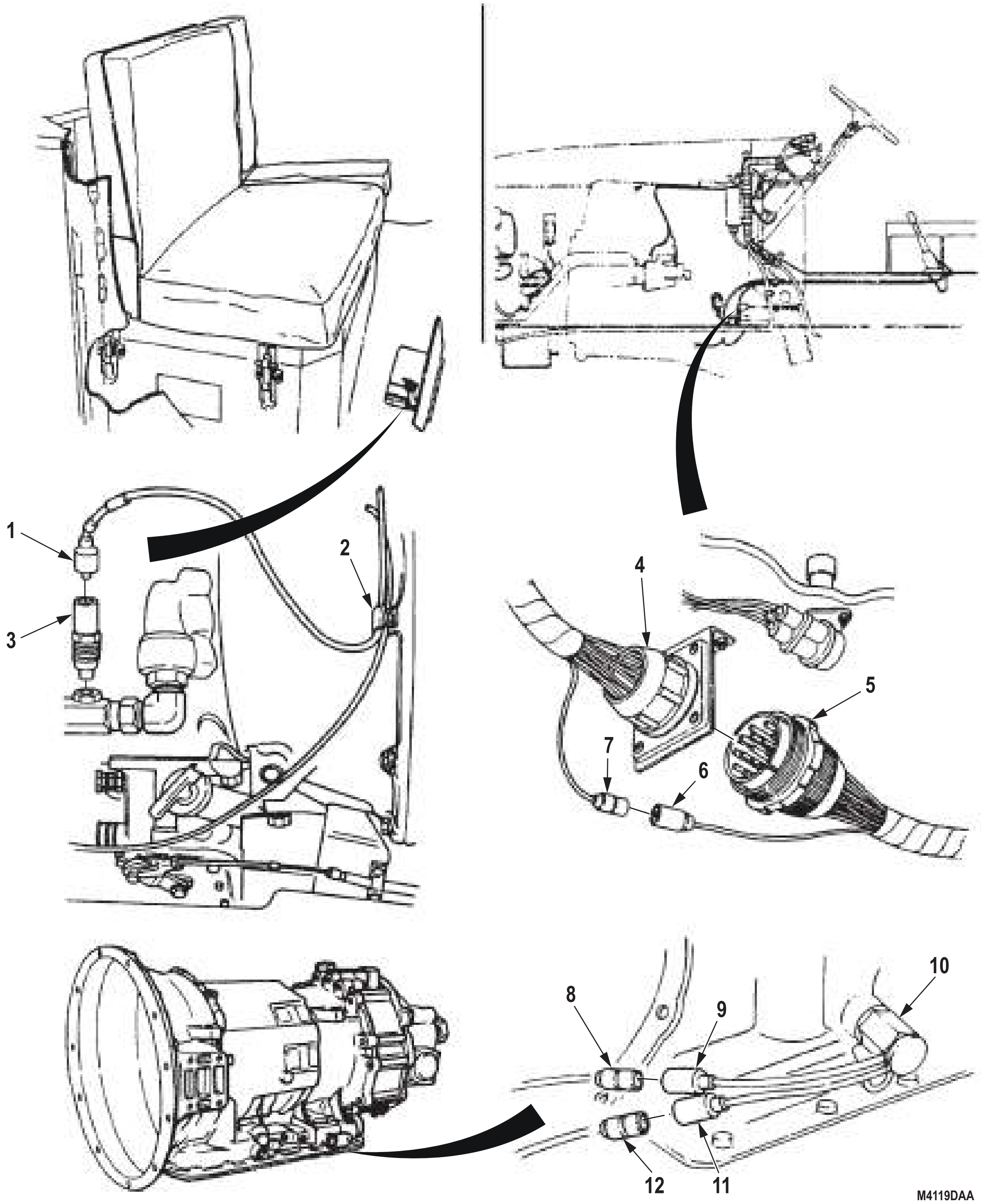


Figure 1. Rear Wiring Harness Replacement.

REMOVAL - Continued

5. Disconnect wire (Figure 2, Item 1) from fuel level sending unit (Figure 2, Item 2) on left-side fuel tank (Figure 2, Item 3).

NOTE

Perform Step (6) for M929/A1/A2, M930/A1/A2, M931/A1/A2, M932/A1/A2, and M936/A1/A2 vehicles only.

6. Disconnect wire (Figure 2, Item 6) for left- and right-side marker lights (Figure 2, Item 4) from connector (Figure 2, Item 5).

REMOVAL - Continued

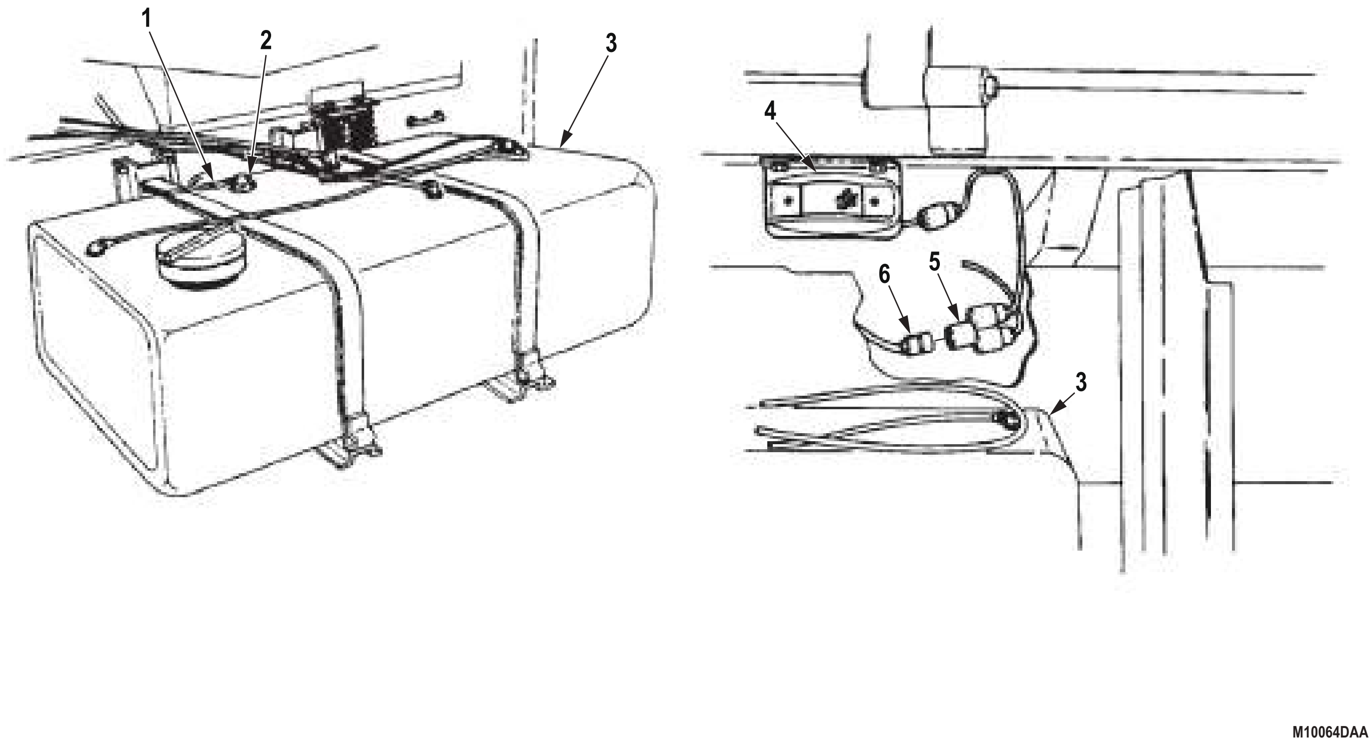


Figure 2. Rear Wiring Harness Replacement.

REMOVAL - Continued

NOTE

Perform Step (7) on all models except M931/A1/A2 and M932/A1/A2 vehicles.

7. Disconnect two wires (Figure 3, Item 2) from stoplight switch (Figure 3, Item 1).

NOTE

Perform Step (8) for M931/A1/A2 and 932/A1/A2 vehicles only.

8. Disconnect two wires (Figure 3, Item 4) from stoplight switch (Figure 3, Item 3).
9. Disconnect wire (Figure 3, Item 8) from primary low air pressure switch (Figure 3, Item 9).

NOTE

Perform Step (10) for M929/A1/A2, M930/A1/A2, M931/A1/A2, M932/A1/A2, and M936/A1/A2 vehicles only.

10. Disconnect wire (Figure 3, Item 5) from fuel level sending unit (Figure 3, Item 6) on right-side fuel tank (Figure 3, Item 7).

REMOVAL - Continued

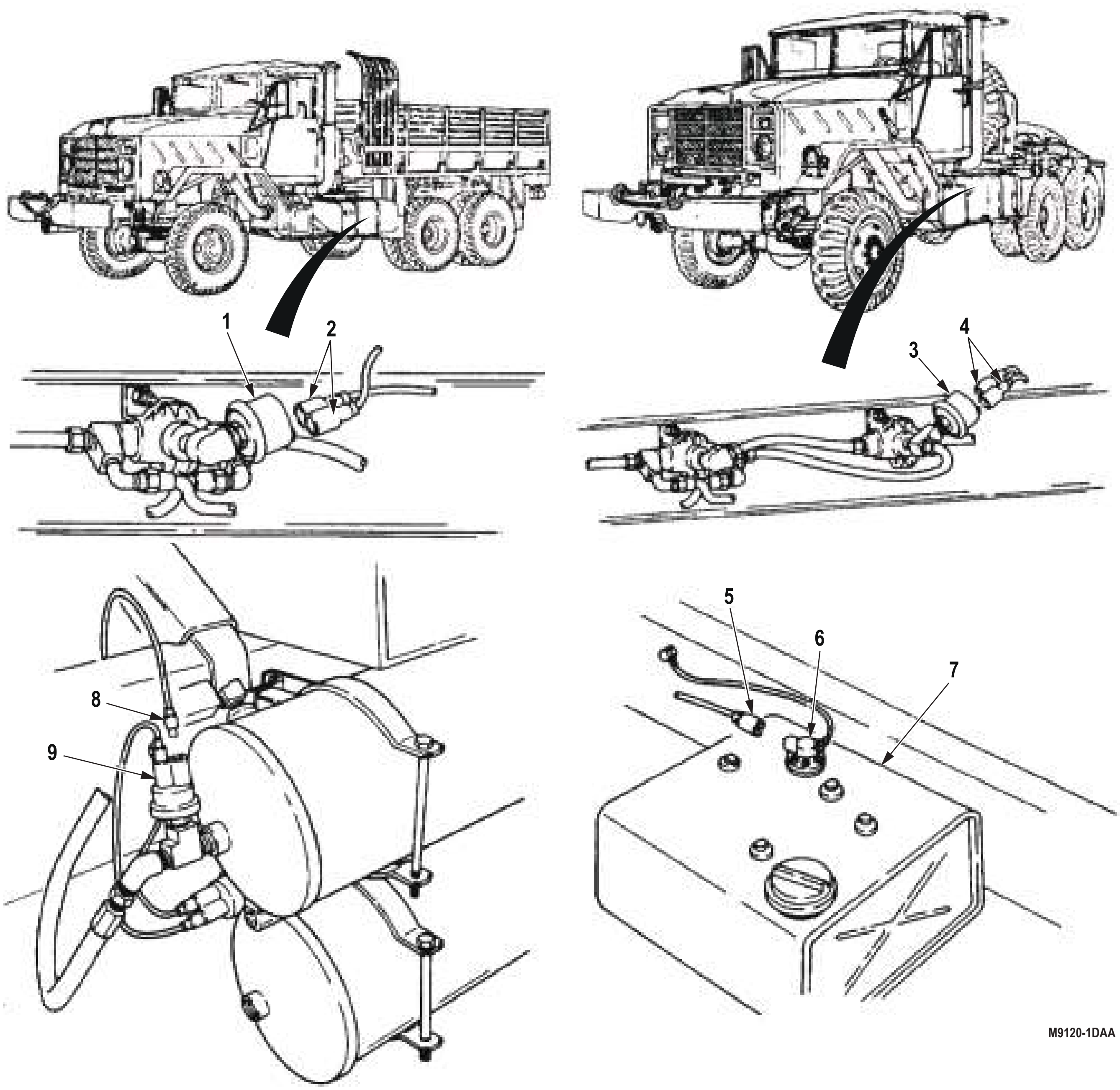


Figure 3. Rear Wiring Harness Replacement.

REMOVAL - Continued

NOTE

Perform Step (11) for M923/A1/A2, M925/A1/A2, M927/A1/A2, and M928/A1/A2 vehicles.

11. Disconnect wire (Figure 4, Item 4) for right rear and left rear side marker light (Figure 4, Item 3) from wire (Figure 4, Item 5).

NOTE

Perform Step (12) for M923/A1/A2 and M925/A1/A2 vehicles.

12. Open tension tab (Figure 4, Item 13) and remove wires (Figure 4, Items 6, 7, 8, and 9) from right rear composite light (Figure 4, Item 10) and left rear composite light (Figure 5, Item 20).
13. Disconnect right rear composite light wires (Figure 4, Items 6, 7, 8, and 9) from wires (Figure 4, Items 1, 2, 11, and 12).

REMOVAL - Continued

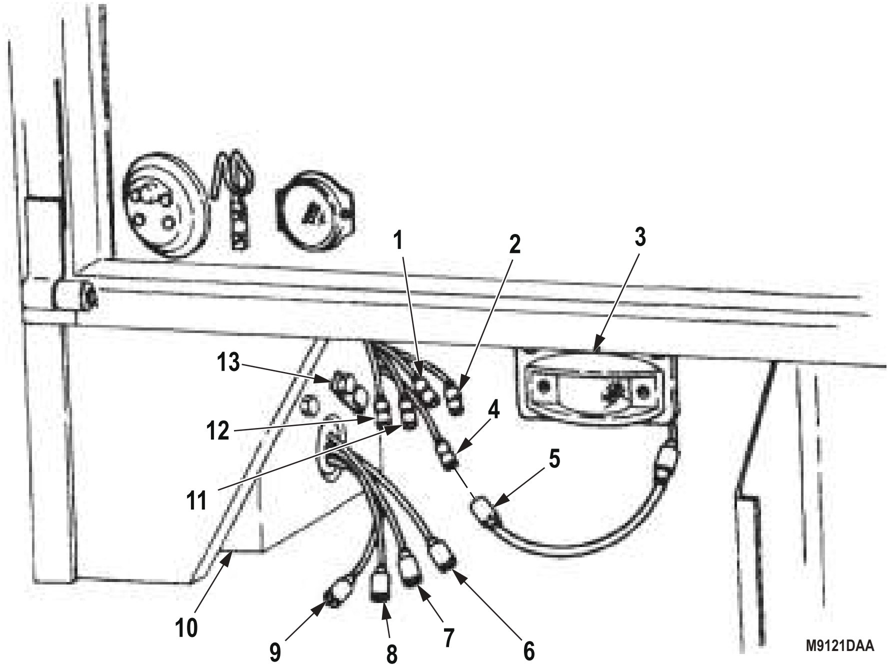


Figure 4. Rear Wiring Harness Replacement.

REMOVAL - Continued

14. Disconnect left rear composite light wires (Figure 5, Items 8, 10, 11, and 12) from wires (Figure 5, Items 7, 13, 14, and 15).

NOTE

Perform Step (15) for M929/A1/A2, M930/A1/A2, and M936/A1/A2 vehicles.

15. Disconnect wire (Figure 5, Item 16) for left side and right side marker lights (Figure 5, Items 5 and 6) from connector (Figure 5, Item 17).

NOTE

Perform Step (16) for M936/A1/A2 vehicles.

16. Remove locknut (Figure 5, Item 4), screw (Figure 5, Item 2), and wood block (Figure 5, Item 3) from left-side frame rail (Figure 5, Item 1). Discard locknut.

NOTE

Steps (17) through (19) apply to M934/A1/A2 vehicles.

17. Disconnect wires (Figure 5, Item 23) for left rear composite light (Figure 5, Item 20) from plug (Figure 5, Item 22).
18. Disconnect wire (Figure 5, Item 21) for left rear clearance light (Figure 5, Item 19) from wire (Figure 5, Item 24).
19. Disconnect wire (Figure 5, Item 26) of left rear blackout clearance light (Figure 5, Item 18) from wire (Figure 5, Item 25).

REMOVAL - Continued

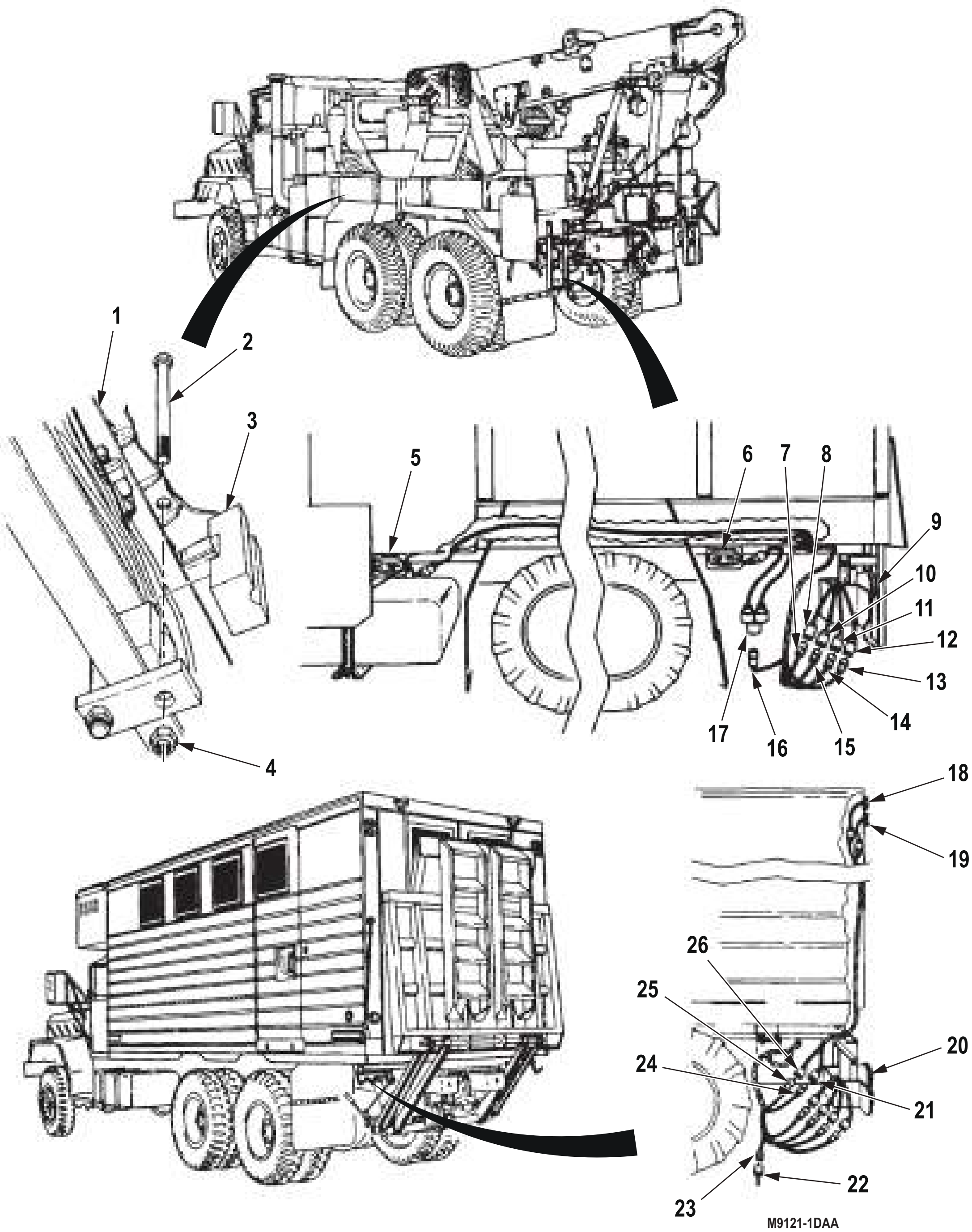


Figure 5. Rear Wiring Harness Replacement.

REMOVAL - Continued

NOTE

Steps (20) through (22) apply to M931/A1/A2 and M932/A1/A2 vehicles only.

20. Remove two nuts (Figure 6, Item 10), screws (Figure 6, Item 1), and clamps (Figure 6, Item 11) from frame rail (Figure 6, Item 2).
21. Disconnect harness connector (Figure 6, Item 8) from semitrailer receptacle (Figure 6, Item 6).
22. Remove two nuts (Figure 6, Item 9), ground wires (Figure 6, Item 3 and 7), two lockwashers (Figure 6, Item 4), and screws (Figure 6, Item 5) from semitrailer receptacle (Figure 6, Item 6). Discard lockwashers.

REMOVAL - Continued

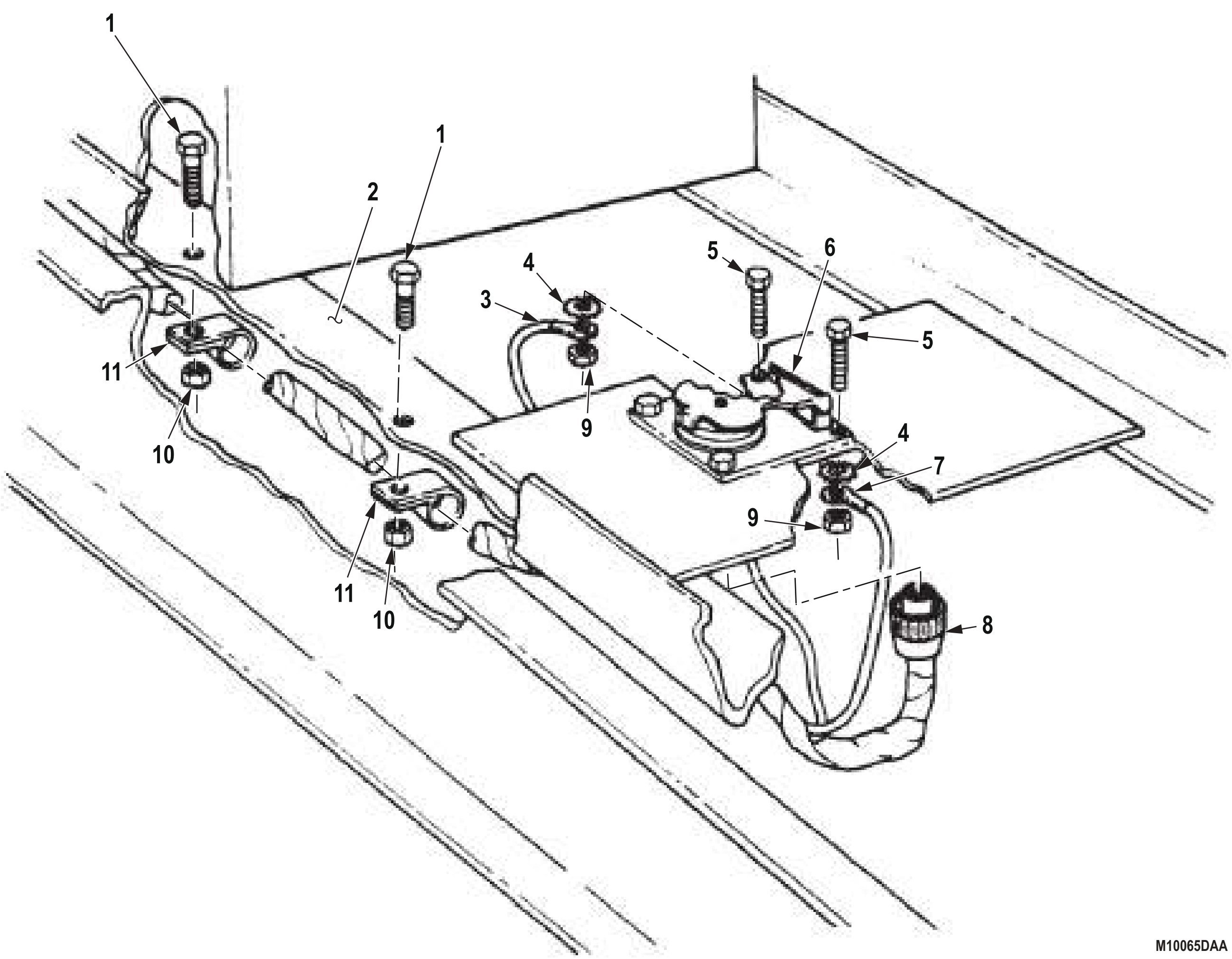


Figure 6. Rear Wiring Harness Replacement.

REMOVAL - Continued

NOTE

- Tag clamps for installation.
- Refer to Table 1 for number of harness clamps installed on each vehicle.

23. Remove nut (Figure 7, Item 4), screw (Figure 7, Item 2), and harness clamp (Figure 7, Item 3) from wiring harness (Figure 7, Item 1).

Table 1. Clamps Required for Rear Wiring Harness.

VEHICLE	NUMBER OF CLAMPS
M923/A1/A2, M925/A1/A2	18
M927/A1/A2, M928/A1/A2	10
M929/A1/A2, M930/A1/A2	11
M931/A1/A2, M932/A1/A2	12
M936/A1/A2	10

REMOVAL - Continued

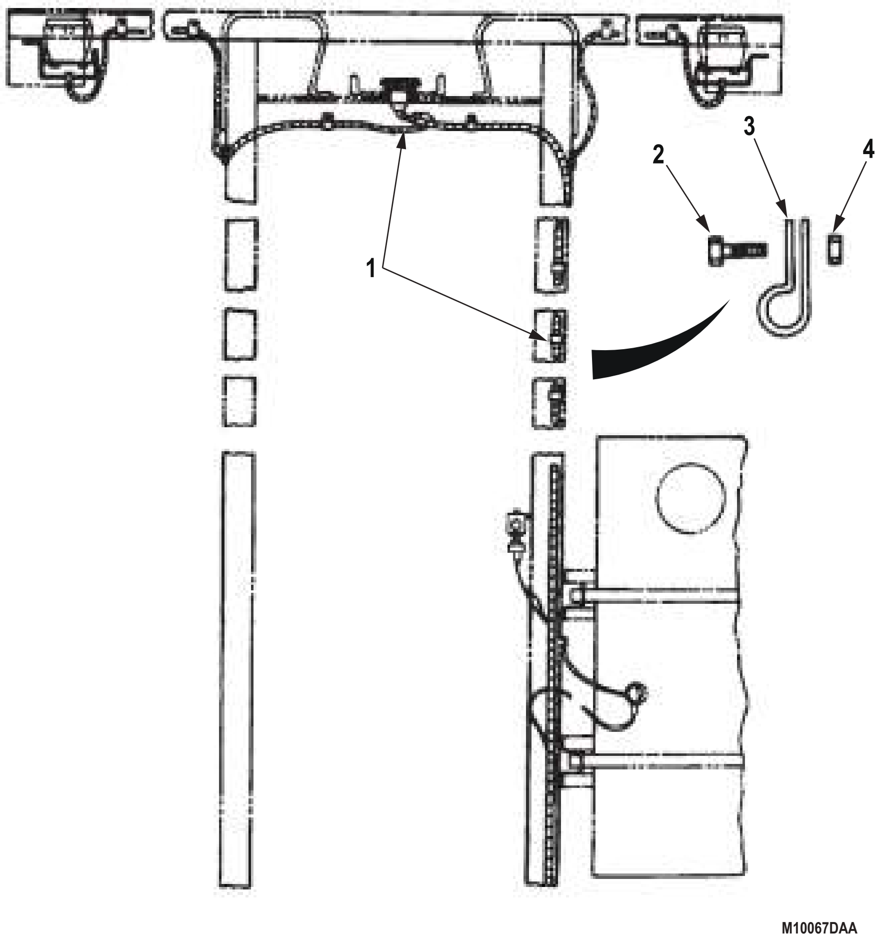


Figure 7. Rear Wiring Harness Replacement.

REMOVAL - Continued

NOTE

Perform Step (24) for M931/A1/A2 and M932/A1/A2 vehicles only.

24. Remove locknut (Figure 8, Item 4), screw (Figure 8, Item 2), clamp (Figure 8, Item 3), two ground wires (Figure 8, Item 6), and lockwasher (Figure 8, Item 5) from rear crossmember frame rail (Figure 8, Item 1). Discard locknut and lockwasher.

NOTE

Perform Step (25) for all vehicles except M931/A1/A2 and M932/A1/A2 vehicles.

25. Remove locknut (Figure 8, Item 11), screw (Figure 8, Item 7), two ground wires (Figure 8, Item 10), and lockwasher (Figure 8, Item 9) from rear frame rail (Figure 8, Item 8). Discard locknut and lockwasher.

NOTE

Receptacle cover must be lifted and held open to remove top two screws.

26. Remove four locknuts (Figure 8, Item 15), screws (Figure 8, Item 17), receptacle cover (Figure 8, Item 12), and trailer cable receptacle (Figure 8, Item 13) from rear crossmember frame (Figure 8, Item 8). Discard locknuts.
27. Pull rear portions of rear wiring harness (Figure 8, Item 16) through hole (Figure 8, Item 14) in rear crossmember frame (Figure 8, Item 8).

REMOVAL - Continued

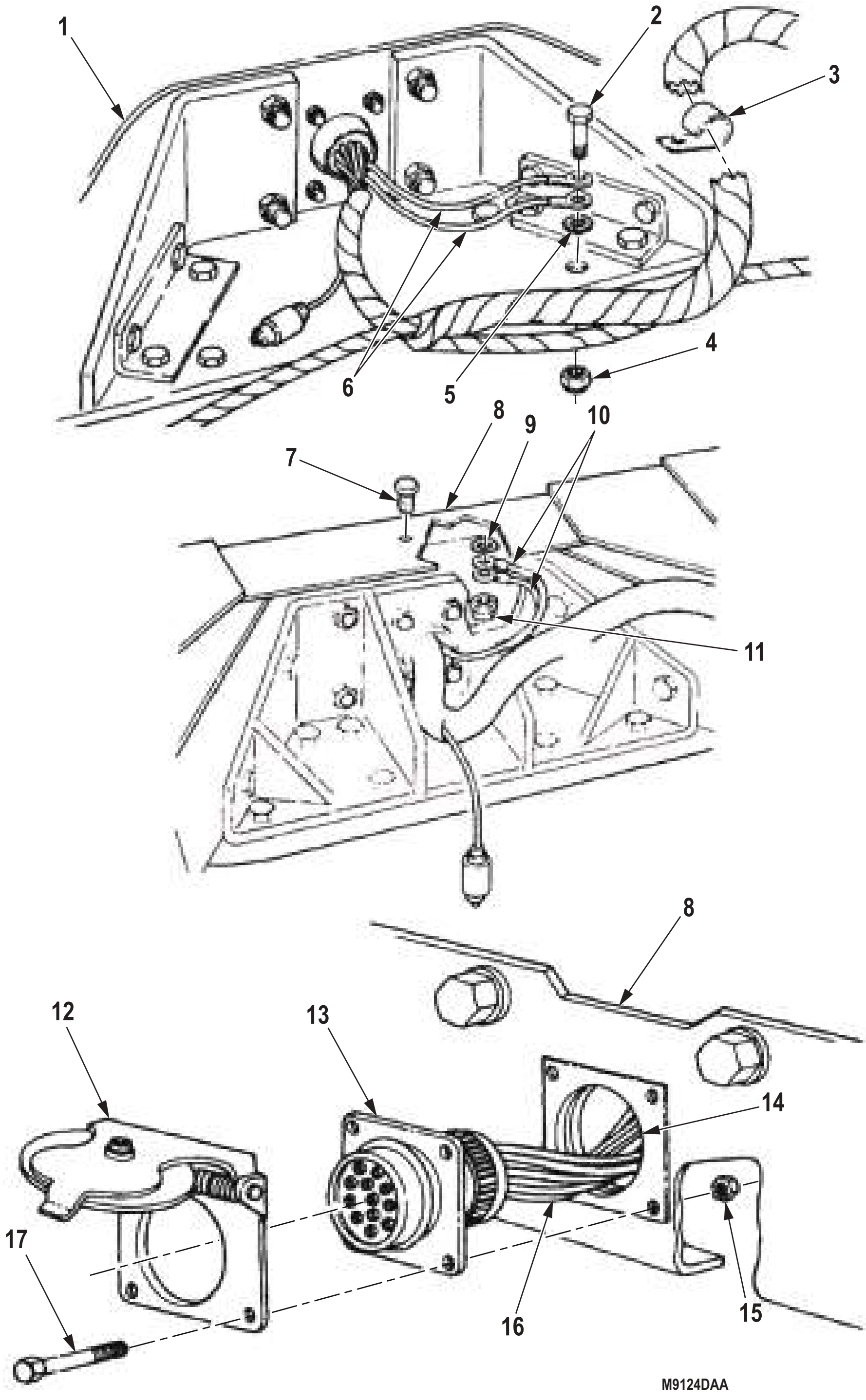


Figure 8. Rear Wiring Harness Replacement.

END OF TASK

INSTALLATION

CAUTION

Use care when routing harness. Snagging may occur and forceful pulling will result in damage to harness.

1. Route rear wiring harness (Figure 9, Item 16) through hole (Figure 9, Item 14) in rear crossmember frame (Figure 9, Item 8) and lay out in approximate position.

NOTE

Receptacle cover must be lifted and held open to install top two screws.

2. Install trailer cable receptacle (Figure 9, Item 13) and receptacle cover (Figure 9, Item 12) with four screws (Figure 9, Item 17) and locknuts (Figure 9, Item 15).

INSTALLATION - Continued

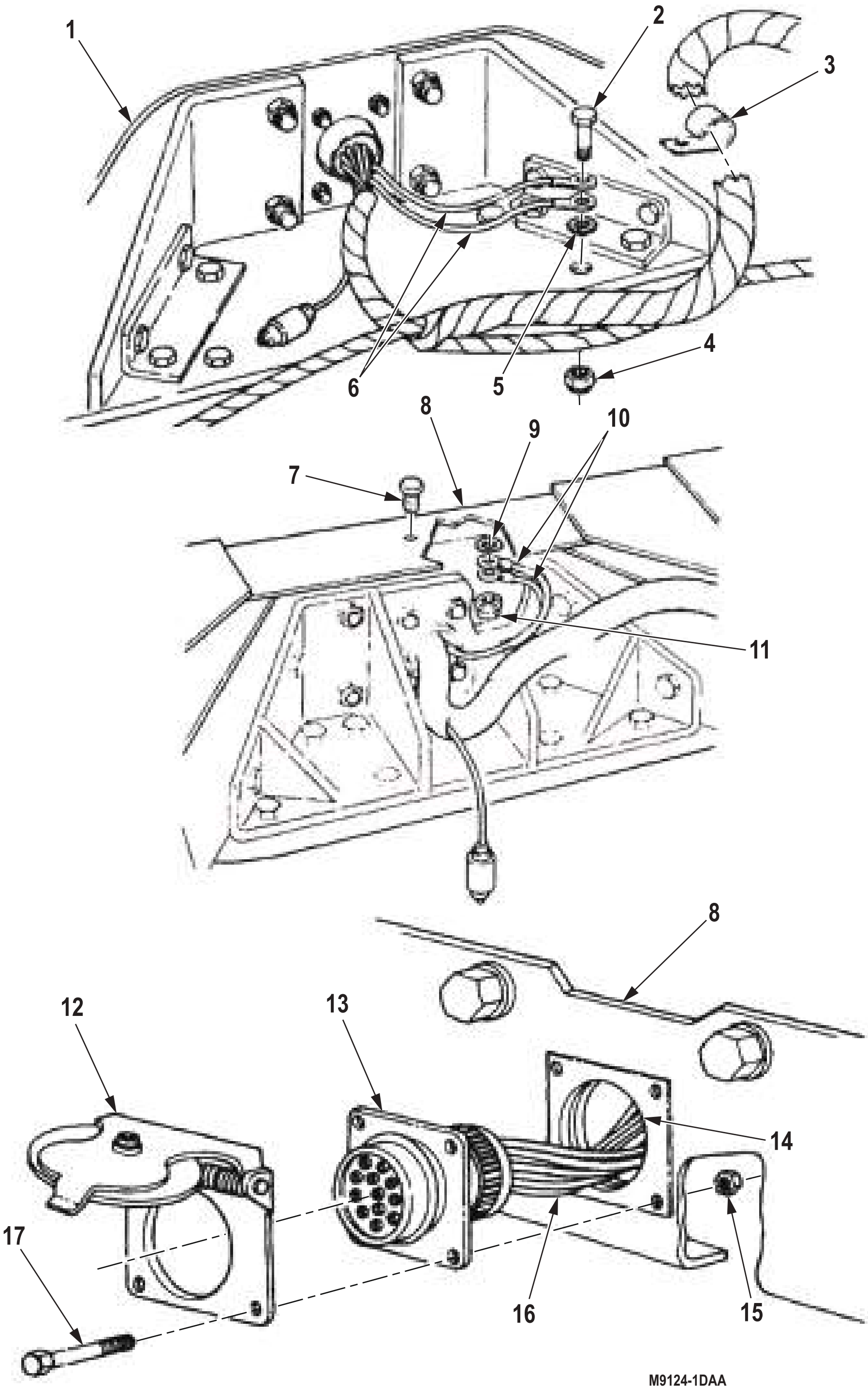


Figure 9. Rear Wiring Harness Replacement.

INSTALLATION - Continued

NOTE

Perform Step (3) for all vehicles except M931/A1/A2 and M932/A1/A2.

3. Install two ground wires (Figure 10, Item 4) on frame crossmember (Figure 10, Item 2) with screw (Figure 10, Item 1), lockwasher (Figure 10, Item 3), and locknut (Figure 10, Item 5).

NOTE

Perform Step (4) for M931/A1/A2 and M932/A1/A2 vehicles.

4. Install two ground wires (Figure 10, Item 11) on frame crossmember (Figure 10, Item 6) with screw (Figure 10, Item 7), clamp (Figure 10, Item 8), lockwasher (Figure 10, Item 10), and locknut (Figure 10, Item 9).

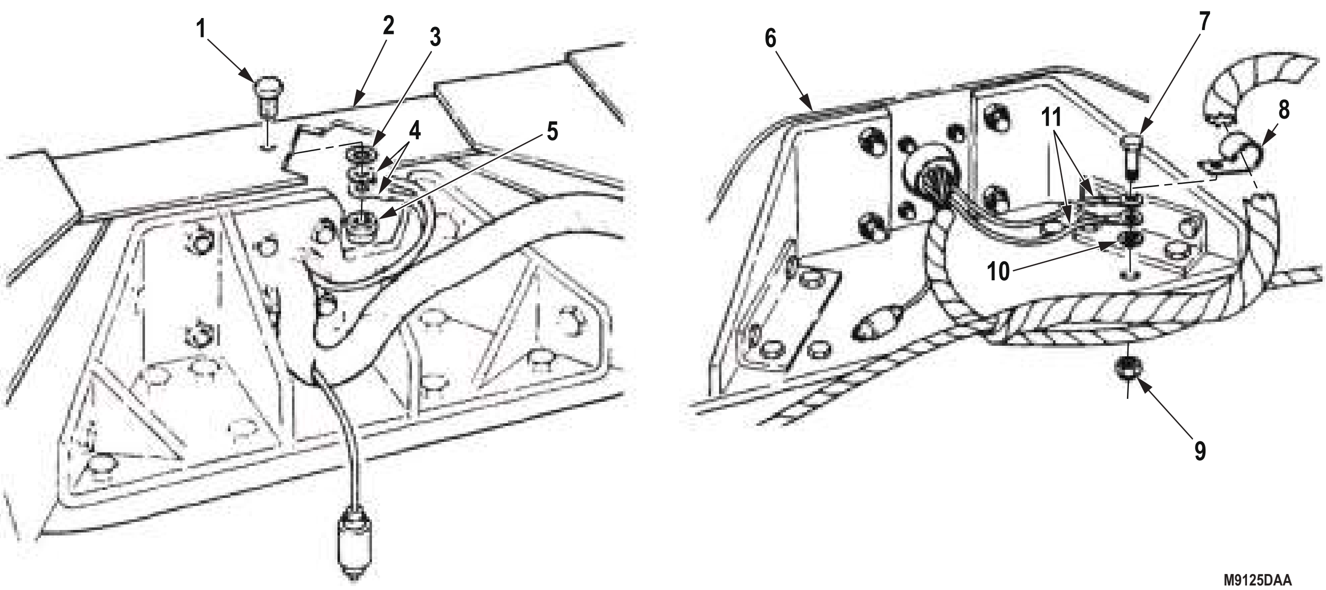


Figure 10. Rear Wiring Harness Replacement.

INSTALLATION - Continued

NOTE

Perform Step (5) for M923/A1/A2, M925/A1/A2, M927/A1/A2, and M928/A1/A2 vehicles only.

5. Connect wire (Figure 11, Item 5) for right- and left-side marker lights (Figure 11, Item 3) to wire (Figure 11, Item 4).
6. Connect wires (Figure 11, Items 1, 2, 11, and 12) for right rear composite light (Figure 11, Item 10) to wires (Figure 11, Items 6, 7, 8, and 9).

NOTE

Perform Step (7) for M923/A1/A2 and M925/A1/A2 vehicles only.

7. Close spring tension tab (Figure 11, Item 13) around wires (Figure 11, Items 6, 7, 8, and 9).

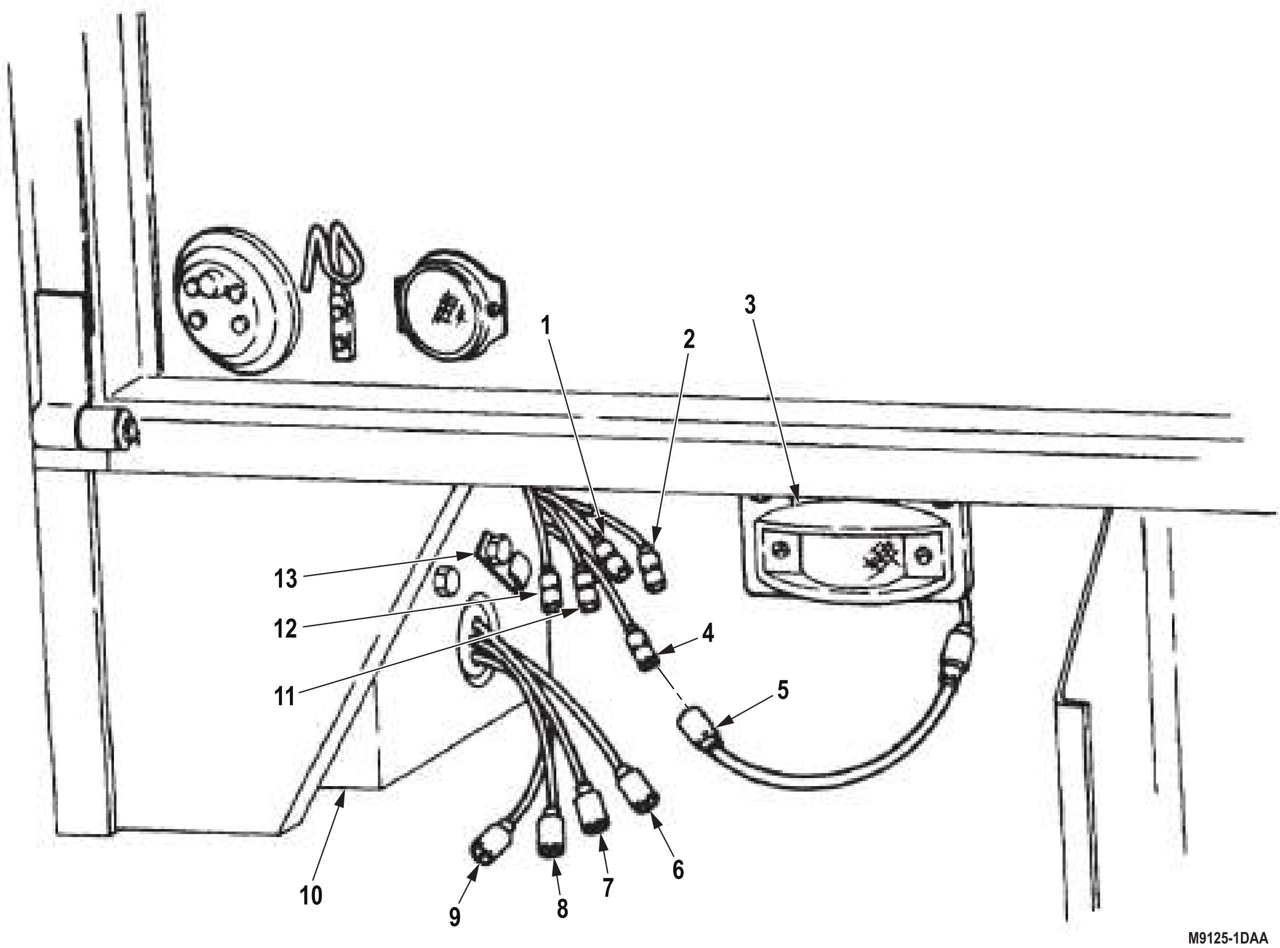


Figure 11. Rear Wiring Harness Replacement.

INSTALLATION - Continued

NOTE

Perform Step (8) for M936/A1/A2 vehicles only.

8. Install wood block (Figure 12, Item 3), screw (Figure 12, Item 2), and locknut (Figure 12, Item 4) on left-side frame rail (Figure 12, Item 1).
9. Connect wires (Figure 12, Items 8, 10, 11, and 12) for left rear composite light (Figure 12, Item 9) to wires (Figure 12, Items 7, 13, 14, and 15).

NOTE

Perform Step (10) for M929/A1/A2, M930/A1/A2, and M936/A1/A2 vehicles only.

10. Connect wire (Figure 12, Item 16) for left-side and right-side marker lights (Figure 12, Items 5 and 6) to connector (Figure 12, Item 17).

NOTE

- Perform Steps (11) through (15) for M934/A1/A2 vehicles only.
- Perform these steps in front of left rear composite light only.

11. Connect blackout clearance light (Figure 12, Item 18) wires (Figure 12, Items 24 and 25).
12. Connect clearance light (Figure 12, Item 19) wires (Figure 12, Items 20 and 23).
13. Install wire (Figure 12, Item 22) in wire plug (Figure 12, Item 21).

INSTALLATION - Continued

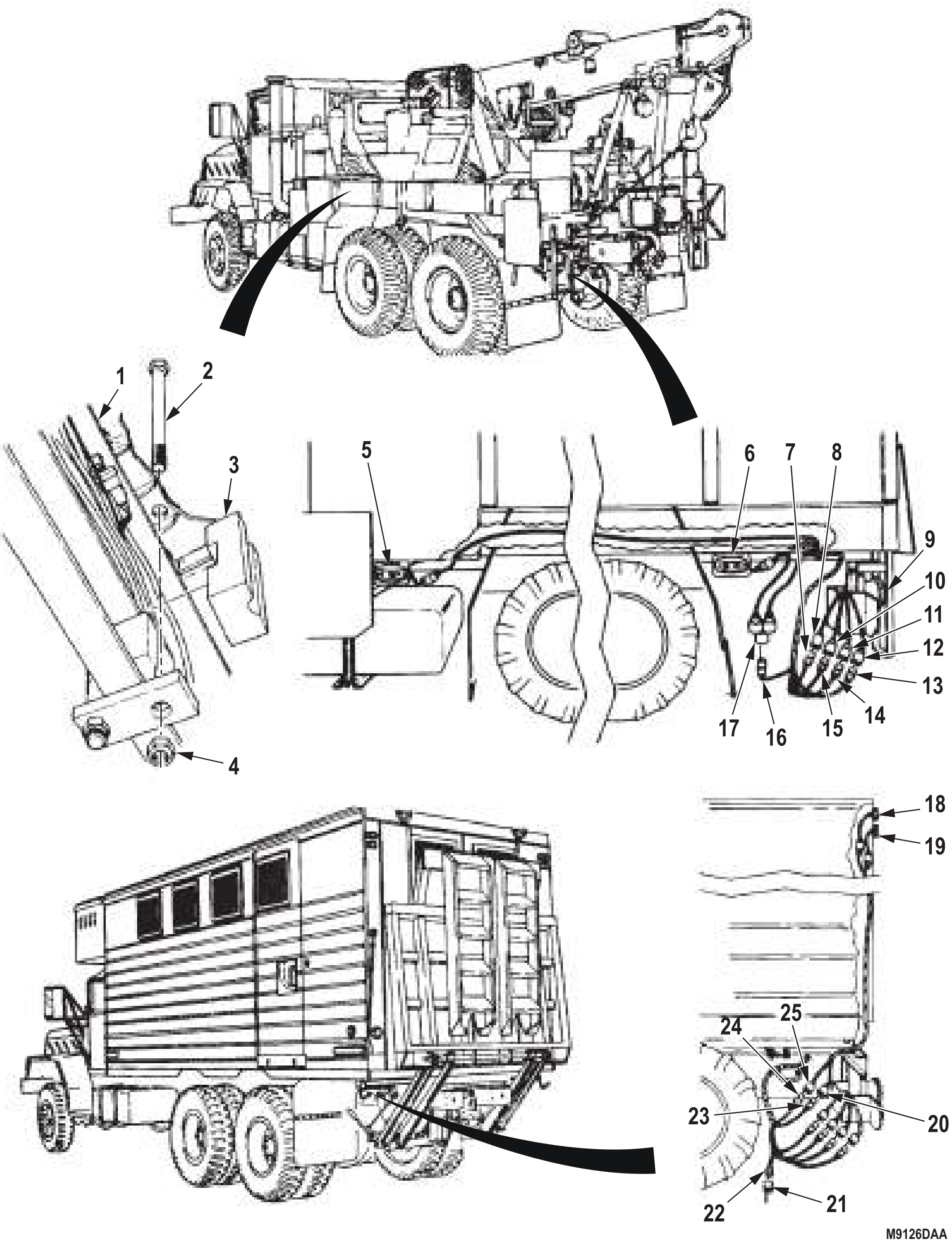


Figure 12. Rear Wiring Harness Replacement.

INSTALLATION - Continued

14. Connect wire (Figure 13, Item 1) to fuel level sending unit (Figure 13, Item 2) on right-side fuel tank (Figure 13, Item 3).
15. Connect wire (Figure 13, Item 4) to primary low air pressure switch (Figure 13, Item 5).

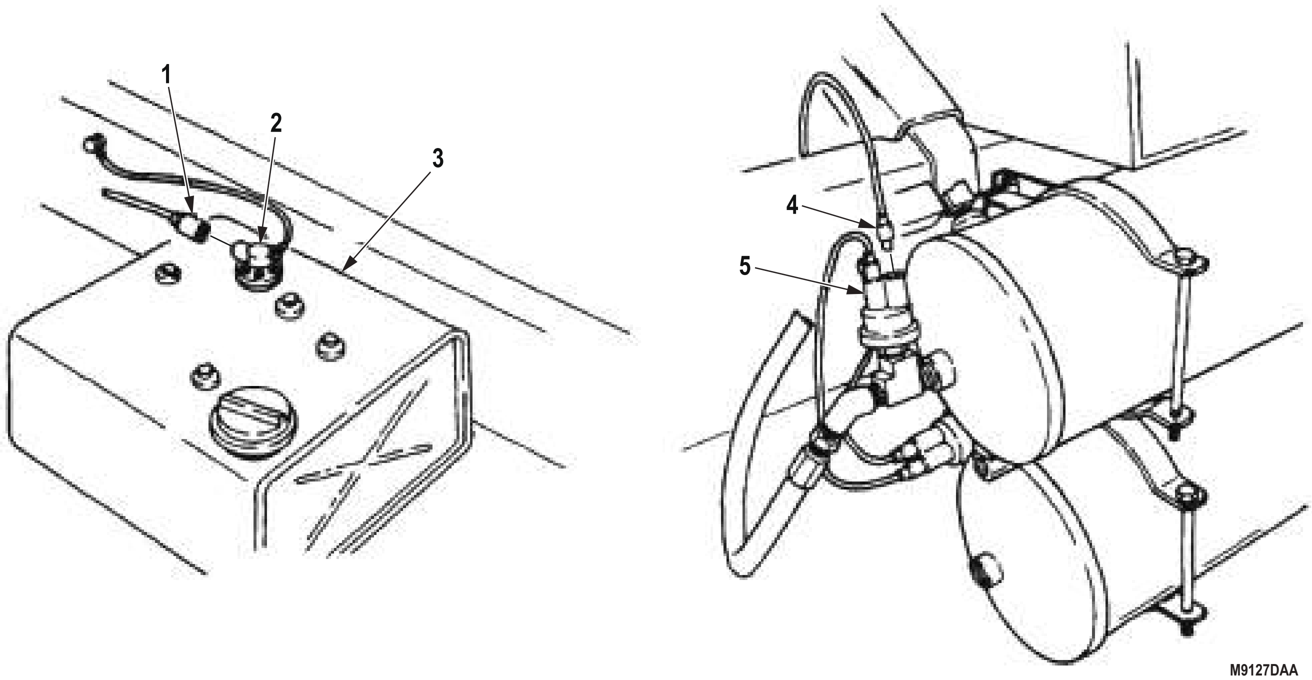


Figure 13. Rear Wiring Harness Replacement.

NOTE

Perform Step (16) for all except M931/A1/A2 and M932/A1/A2 vehicles.

16. Connect two wires (Figure 14, Item 2) to stoplight switch (Figure 14, Item 1).

NOTE

Perform Step (17) for M931/A1/A2 and M932/A1/A2 vehicles.

17. Connect two wires (Figure 14, Item 4) to stoplight switch (Figure 14, Item 3).

NOTE

Perform Step (18) for M923/A1/A2, M925/A1/A2, M927/A1/A2, and M928/A1/A2 vehicles only.

18. Connect wire (Figure 14, Item 8) to connector (Figure 14, Item 10) for left- and right-side marker lights (Figure 14, Item 9).
19. Connect wire (Figure 14, Item 5) to fuel level sending unit (Figure 14, Item 6) on left-side fuel tank (Figure 14, Item 7).

INSTALLATION - Continued

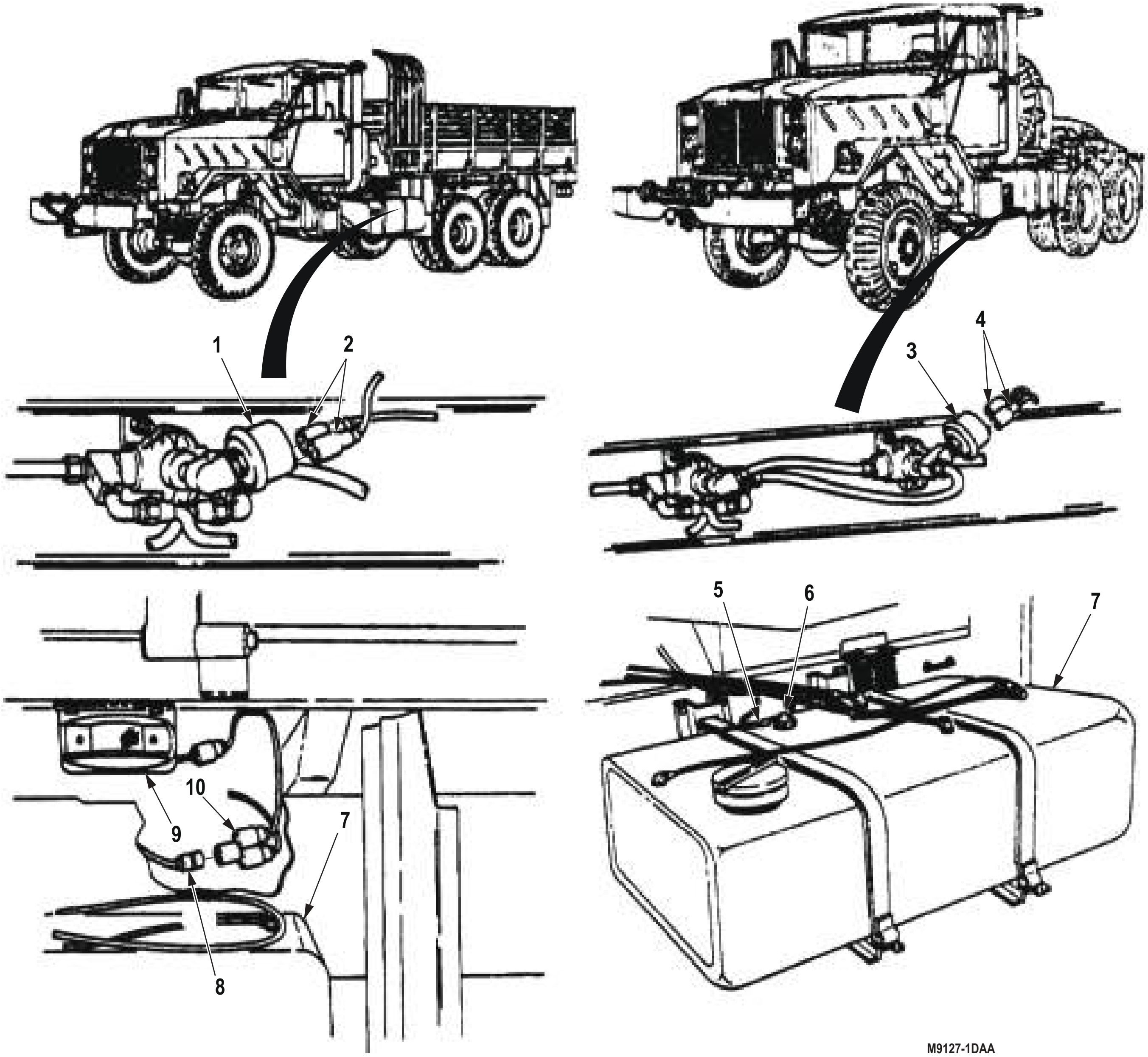


Figure 14. Rear Wiring Harness Replacement.

INSTALLATION - Continued

20. Connect wires (Figure 15, Items 1 and 4) to wires (Figure 15, Items 2 and 3).
21. Connect rear wiring harness connector (Figure 15, Item 6) to front wiring harness receptacle (Figure 15, Item 5).

NOTE

Perform step 22 for M929/A1/A2, M930/A1/A2, M931/A1/A2, M932/A1/A2, and M936/A1/A2 vehicles only.

22. Connect wires (Figure 15, Items 7 and 8).
23. Connect wire (Figure 15, Item 9) to transmission temperature sending unit (Figure 15, Item 12).
24. Close spring tension tab (Figure 15, Item 10) around wires (Figure 15, Items 9 and 11).

INSTALLATION - Continued

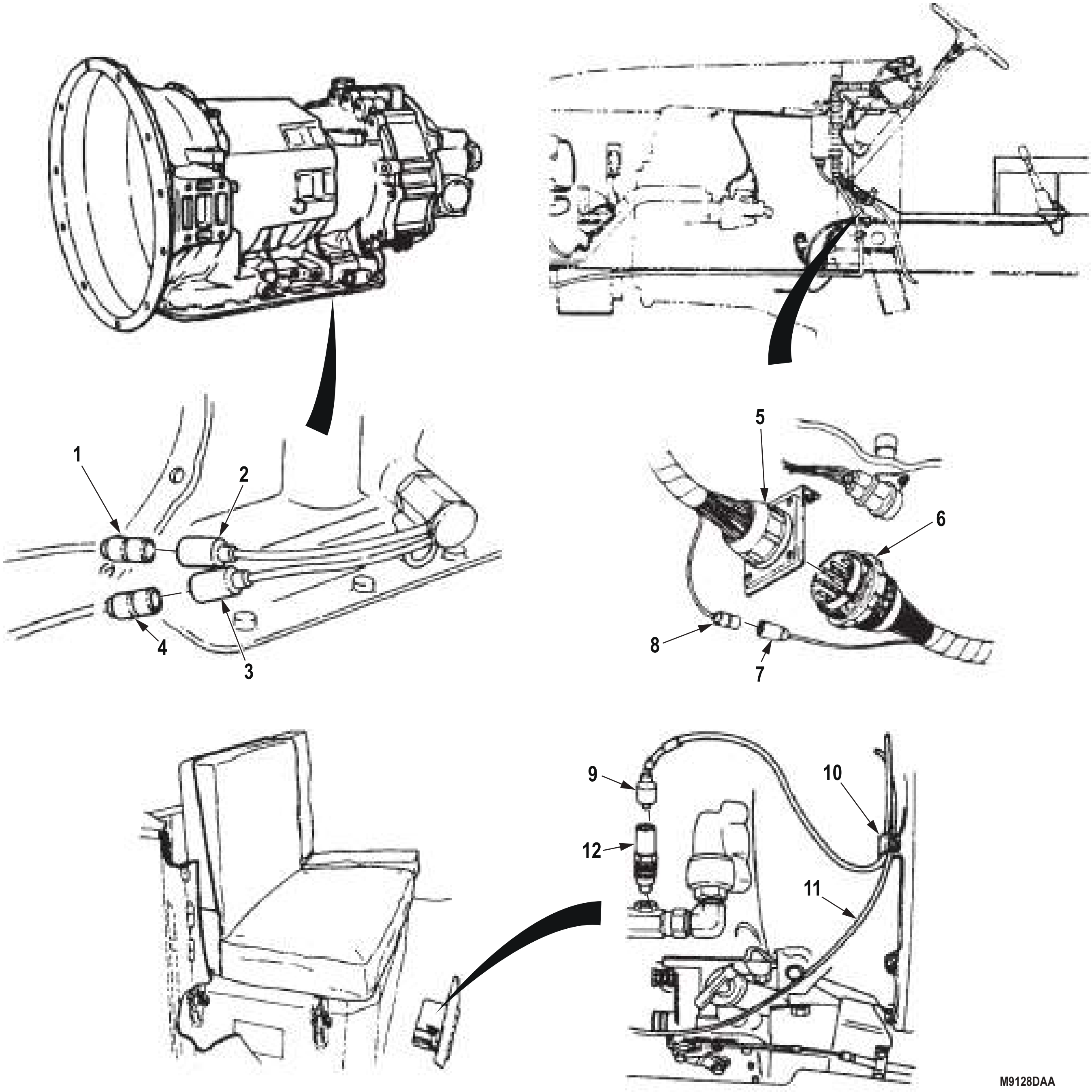


Figure 15. Rear Wiring Harness Replacement.

INSTALLATION - Continued

NOTE

Perform Steps (25) through (27) for M931/A1/A2 and M932/A1/A2 vehicles only.

25. Connect harness connector (Figure 16, Item 8) to semitrailer receptacle (Figure 16, Item 6).
26. Install two ground wires (Figure 16, Items 4 and 7) on receptacle (Figure 16, Item 6) and plate (Figure 16, Item 9) with two screws (Figure 16, Item 5), lockwashers (Figure 16, Item 2), and nuts (Figure 16, Item 3).
27. Install two clamps (Figure 16, Item 12) and wiring harness (Figure 16, Item 13) on frame rail (Figure 16, Item 10) with two screws (Figure 16, Item 1) and nuts (Figure 16, Item 11).

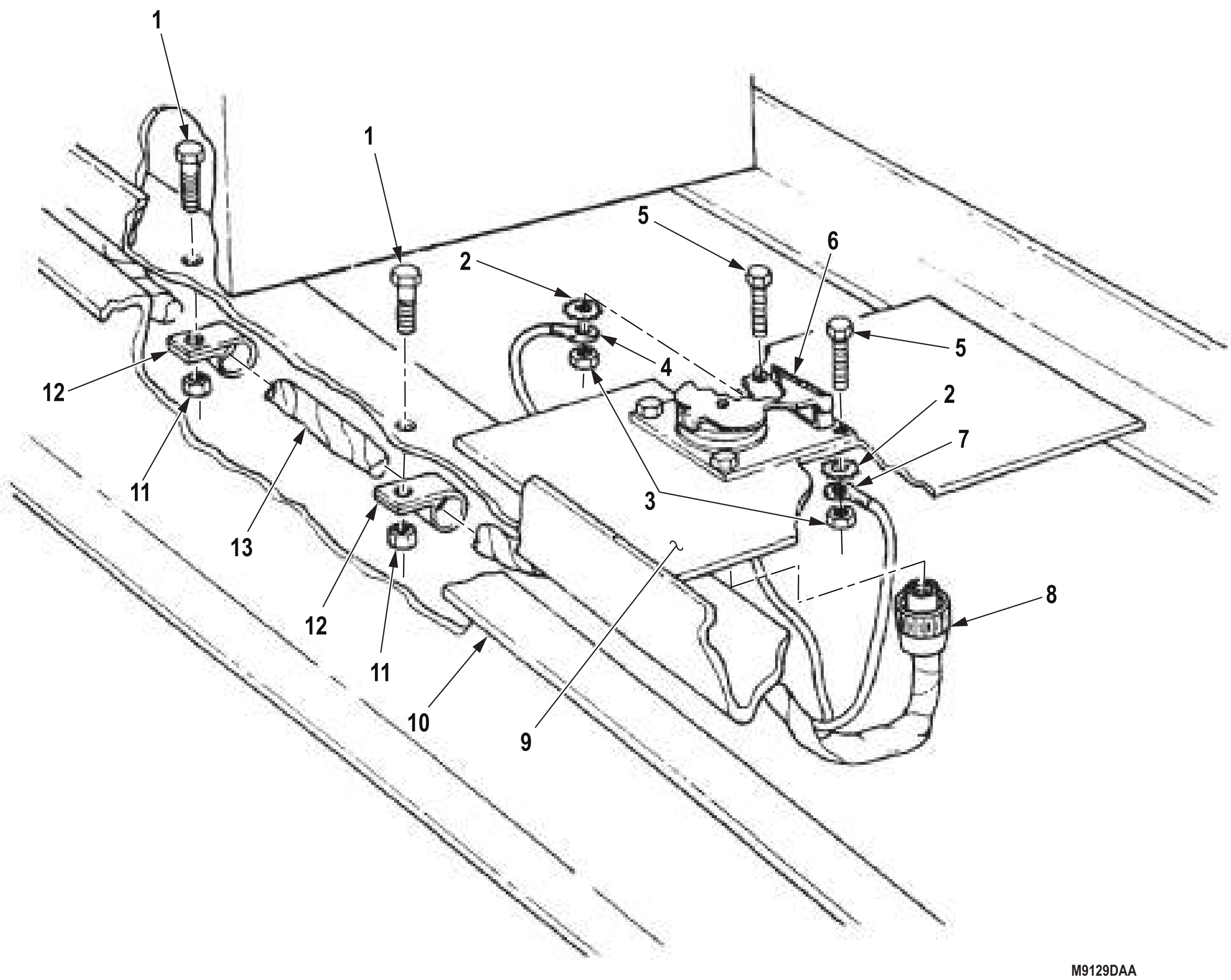


Figure 16. Rear Wiring Harness Replacement.

INSTALLATION - Continued

NOTE

Refer to Table 1 and accompanying diagram for number of harness clamps installed on each vehicle.

28. Install correct number of harness clamps (Figure 17, Item 3) on rear wiring harness (Figure 17, Item 1) with corresponding number of screws (Figure 17, Item 2) and nuts (Figure 17, Item 4).

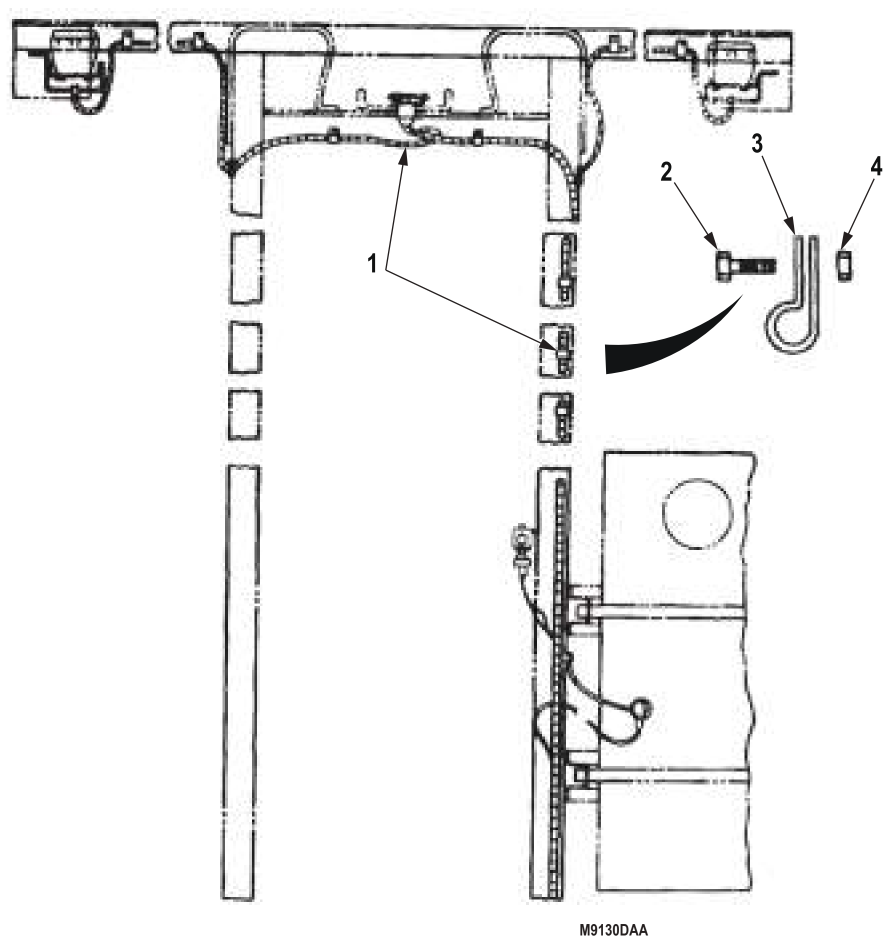


Figure 17. Rear Wiring Harness Replacement.

END OF TASK

FOLLOW-ON MAINTENANCE

1. Connect battery ground cables. (Volume 2, WP 0350)
2. Start vehicle and check operation of all rear lights, fuel selector switch, fuel gauge, low air pressure warning lights and gauges, and transmission temperature gauge. (TM 9-2320-272-10)

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
SIDE MARKER LIGHTS WIRING HARNESS REPAIR

INITIAL SETUP:

Tools and Special Tools

Tool Kit, General Mechanic's: Automotive (Volume 5, WP 0826, Table 1, Item 56)

Materials/Parts

Locknut (Volume 5, WP 0827, Table 1, Item 277)

References

Wiring Harness Repair (WP 0352)

Equipment Condition

Parking brake set. (TM 9-2320-272-10)

Battery ground cables disconnected. (Volume 2, WP 0350)

REMOVAL

NOTE

Front and rear side markers are replaced basically the same. This procedure is for rear side marker light.

1. Disconnect wiring harness connector (Figure 1, Item 1) from connector (Figure 1, Item 6).
2. Remove locknut (Figure 1, Item 7), screw (Figure 1, Item 8) and clamp (Figure 1, Item 9) from rail (Figure 1, Item 2). Discard locknut.
3. Remove wiring harness (Figure 1, Item 3) from clamp (Figure 1, Item 9).
4. Disconnect wiring harness connector (Figure 1, Item 4) from connector (Figure 1, Item 5).
5. Remove wiring harness (Figure 1, Item 3) from vehicle.

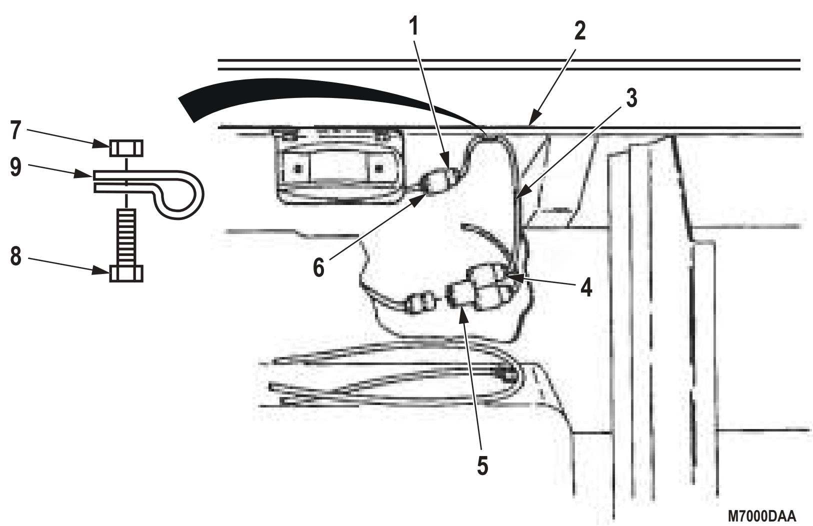


Figure 1. Side Marker Light Wiring Removal.

END OF TASK

INSPECTION

If banded, remove band and lay wiring harness flat for inspection. Inspect wiring harness for frays, splits, or missing or damaged insulation. Repair or replace affected wiring.

END OF TASK

REPAIR

Repair wiring harness as needed (WP 0352).

END OF TASK

INSTALLATION

1. Thread wiring harness (Figure 2, Item 3) through clamp (Figure 2, Item 9).
2. Connect wiring harness connector (Figure 2, Item 1) to connector (Figure 2, Item 6).
3. Connect wiring harness connector (Figure 2, Item 4) to connector (Figure 2, Item 5).
4. Install clamp around wiring harness (Figure 2, Item 3) and install clamp (Figure 2, Item 9) to rail (Figure 2, Item 2) with screw (Figure 2, Item 8) and locknut (Figure 2, Item 7).
5. Take up slack and put band back around wiring harness (Figure 1, Item 3).

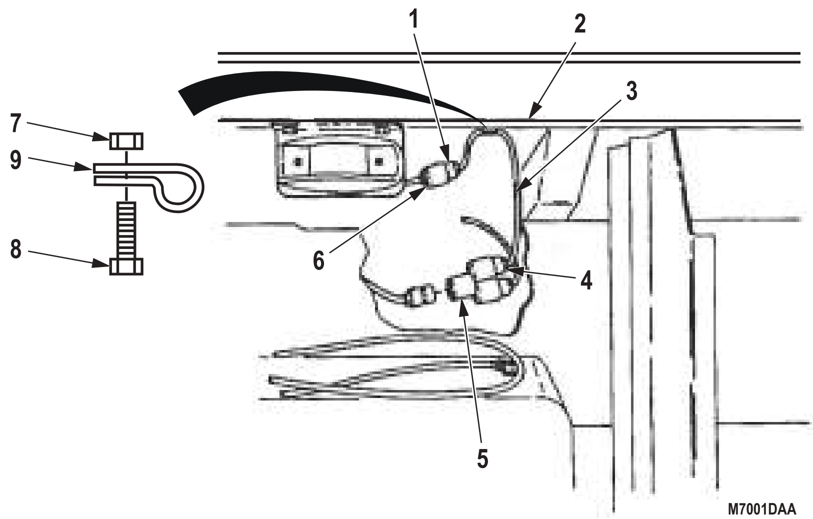


Figure 2. Side Marker Light Wiring Installation.

END OF TASK

FOLLOW-ON MAINTENANCE

1. Connect battery ground cables. (Volume 2, WP 0350)
2. Start vehicle and check operation of lights. (TM 2320-272-10)

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
TRANSMISSION MOUNT AND BUSHING REPLACEMENT

INITIAL SETUP:

Tools and Special Tools

Tool Kit, General Mechanic's: Automotive
(Volume 5, WP 0826, Table 1, Item 56)
Wrench, Torque, Click, Ratcheting, 1/2" Drive, 250 Ft-Lb
(Volume 5, WP 0826, Table 1, Item 63)

Materials/Parts

Lockwasher
(Volume 5, WP 0827, Table 1, Item 2)
Qty: 2
Lockwasher
(Volume 5, WP 0827, Table 1, Item 405)
Qty: 2

Equipment Condition

Parking brake set. (TM 9-2320-272-10)

REMOVAL

1. Remove screw (Figure 1, Item 1), lockwasher (Figure 1, Item 2), two screws (Figure 1, Item 3), lockwashers (Figure 1, Item 4), and bracket (Figure 1, Item 5) from transmission (Figure 1, Item 7) and bushing (Figure 1, Item 10). Discard lockwashers.
2. Remove screw (Figure 1, Item 8), lockwasher (Figure 1, Item 9), and bushing (Figure 1, Item 10) from crossmember (Figure 1, Item 6). Discard lockwasher.

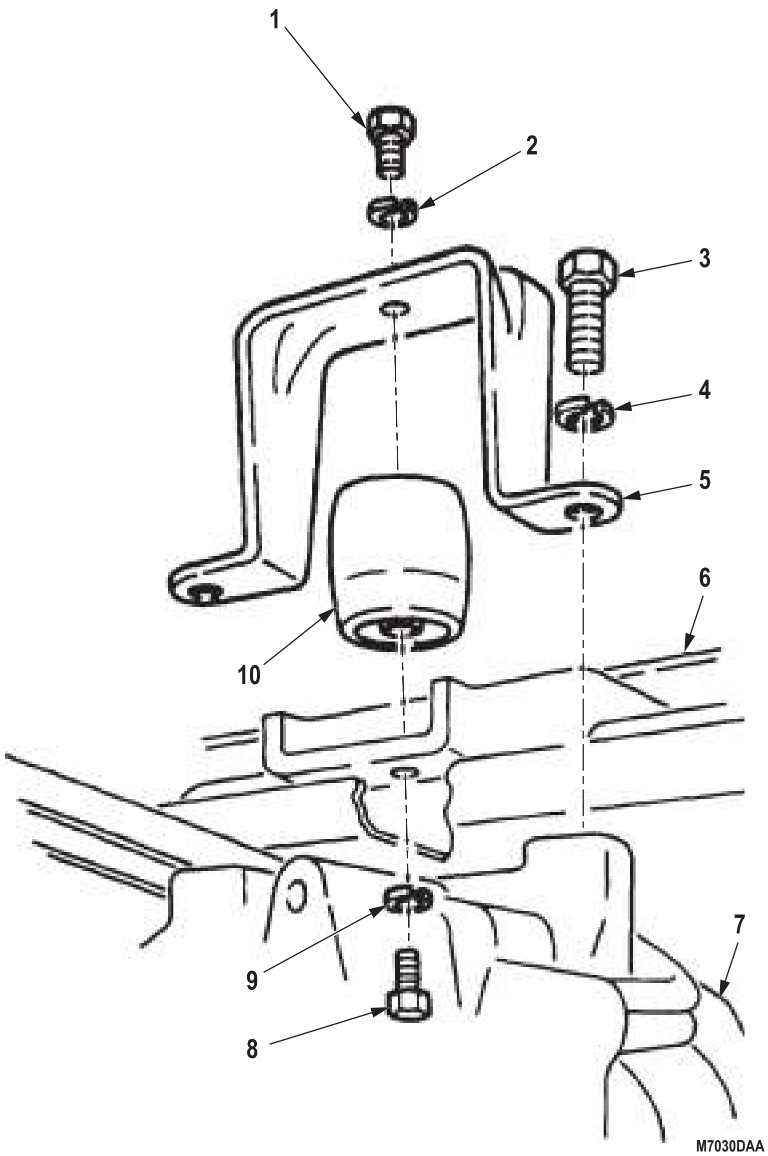


Figure 1. Transmission Mount and Bushing Removal.

END OF TASK

INSTALLATION

1. Install bushing (Figure 2, Item 10) on bracket (Figure 2, Item 5) with lockwasher (Figure 2, Item 2) and screw (Figure 2, Item 1). Tighten screw 75 to 83 lb-ft (102 to 113 N·m).
2. Install bracket (Figure 2, Item 5) and bushing (Figure 2, Item 10) on crossmember (Figure 2, Item 6) with lockwasher (Figure 2, Item 9) and screw (Figure 2, Item 8). Tighten screw 75 to 83 lb-ft (102 to 113 N·m).
3. Install bracket (Figure 2, Item 5) on transmission (Figure 2, Item 7) with two lockwashers (Figure 2, Item 4) and screws (Figure 2, Item 3). Tighten screws 75 to 83 lb-ft (102 to 113 N·m).

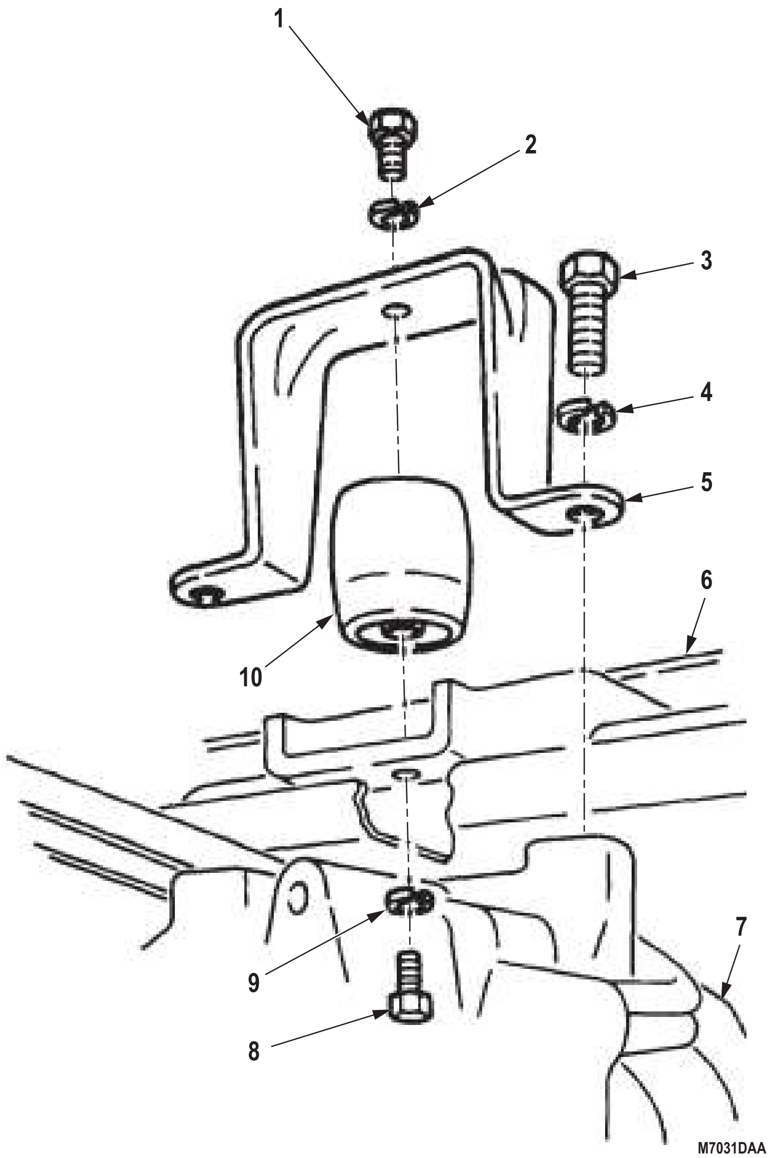


Figure 2. Transmission Mount and Bushing Installation.

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
TRANSMISSION OIL SERVICE INSTRUCTIONS

INITIAL SETUP:

Tools and Special Tools

Tool Kit, General Mechanic's: Automotive
(Volume 5, WP 0826, Table 1, Item 56)
Wrench, Torque, Click, Ratcheting, 1/2" Drive, 250 Ft-Lb
(Volume 5, WP 0826, Table 1, Item 63)

Materials/Parts

Cleaning Compound, Solvent
(Volume 5, WP 0825, Table 1, Item 16, 17)
Lubricating Oil, Engine
(Volume 5, WP 0825, Table 1, Item 36, 37, 38)
Gasket (Volume 5, WP 0827, Table 1, Item 67)
Qty: 1
Gasket (Volume 5, WP 0827, Table 1, Item 98)
Qty: 1
Governor Filter

Materials/Parts (cont.)

(Volume 5, WP 0827, Table 1, Item 195)
Qty: 1
Governor Filter O-ring
(Volume 5, WP 0827, Table 1, Item 196)
Qty: 1
O-ring (Volume 5, WP 0827, Table 1, Item 190)
Qty: 1
Tiedown Strap
(Volume 5, WP 0827, Table 1, Item 379)
Qty: 1
Transmission Oil Filter
(Volume 5, WP 0827, Table 1, Item 197)
Qty: 1

References

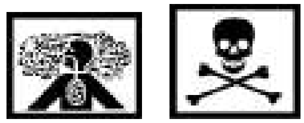
WP 0381
Volume 5, WP 0820

Equipment Condition

Parking brake set. (TM 9-2320-272-10)

DRAINING OIL

WARNING



- Exhaust gases can kill. Operate vehicle only in a well-ventilated area. Failure to comply may result in injury or death to personnel.
- Accidental or intentional introduction of liquid contaminants into the environment is in violation of state, federal, and military regulations. Refer to local Unit SOP for information concerning storage, use, and disposal of these liquids. Failure to comply may result in injury or death to personnel.

NOTE

Do not shift transmission through driving gear ranges when warming transmission oil. This is a procedure used only when replenishing transmission oil.

1. Start engine (TM 9-2320-272-10), operate at 700 to 750 rpm until transmission oil reaches normal operating temperature of 120°F-220°F (49°C-105°C), then shut off engine.

NOTE

- Have drainage container ready to catch oil.
- Use drain pans to retain leaking/draining fluids. Refer to local procedures and plans for preventing and responding to fluid spills or leaks. Comply with local regulations when disposing of clean up material and leaked and spilled fluids.

2. Remove drain plug (Figure 1, Item 3) and fiber washer (Figure 1, Item 2) from right rear of transmission oil pan (Figure 1, Item 1) and drain oil. Discard fiber washer.

NOTE

Inspect oil for grit, foaminess, and/or milkiness. If present, notify your supervisor.

3. Install fiber washer (Figure 1, Item 2) and drain plug (Figure 1, Item 3) in transmission oil pan (Figure 1, Item 1).

DRAINING OIL - Continued

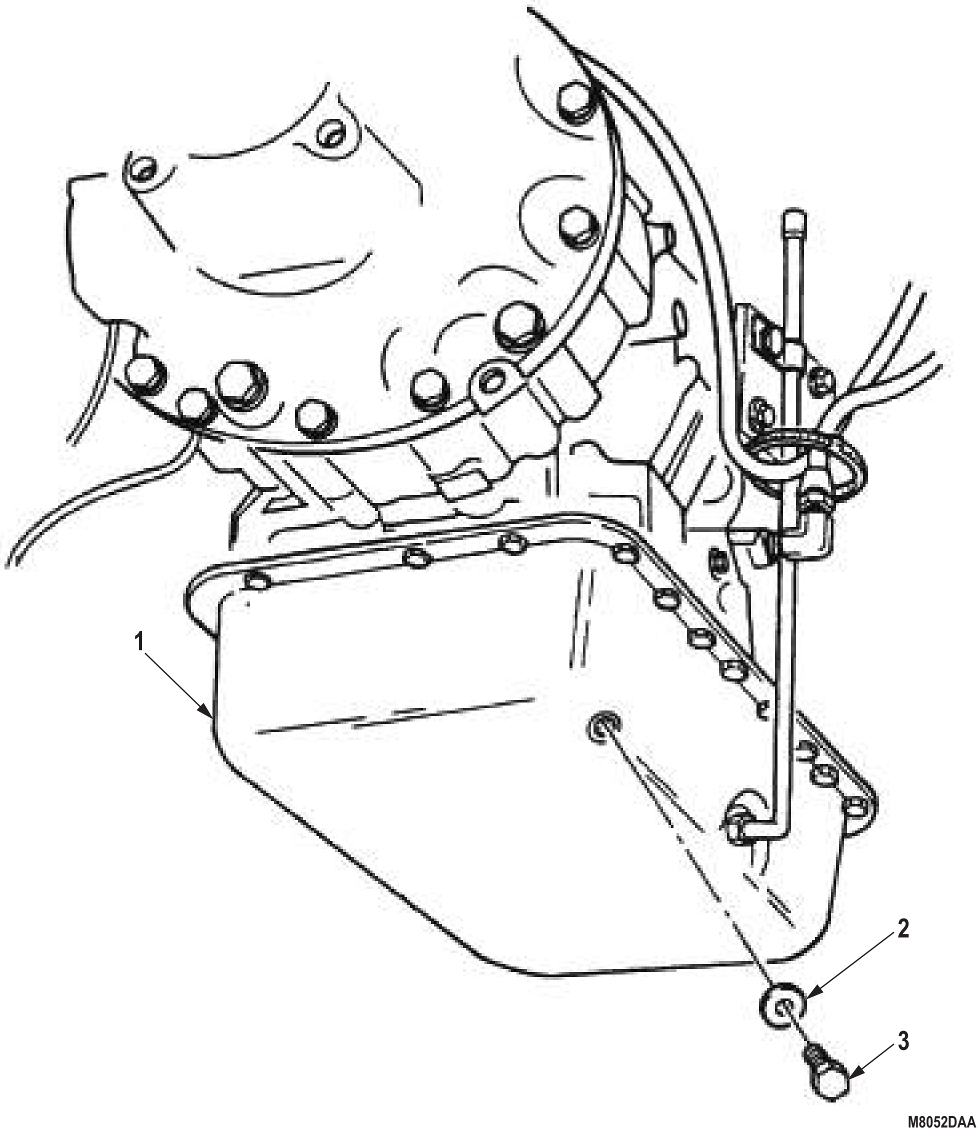


Figure 1. Oil Pan.

END OF TASK

OIL FILTER REMOVAL

NOTE

Removal of transmission oil filter is basically the same for M939, M939A1, and M939A2 series vehicles. This procedure covers M939 and M939A1 series vehicles only.

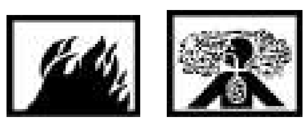
1. Open access door (Figure 2, Item 1) in cab floor.

CAUTION

Wipe area around dipstick tube before removal to prevent entry of dirt. Damage may occur if dirt or dust enters transmission.

2. Remove screw (Figure 2, Item 5) and washer (Figure 2, Item 4) from transmission (Figure 2, Item 2).
3. Remove tiedown strap (Figure 2, Item 7) from dipstick tube (Figure 2, Item 3) and tube (Figure 2, Item 6). Discard tiedown strap.
4. Loosen flare nut (Figure 2, Item 8) and remove dipstick tube (Figure 2, Item 3) from transmission oil pan (Figure 2, Item 12).
5. Remove 21 screws (Figure 2, Item 16) from transmission oil pan (Figure 2, Item 12).
6. Remove oil pan (Figure 2, Item 12) and oil pan gasket (Figure 2, Item 11) from transmission (Figure 2, Item 2). Discard gasket.
7. Remove screw (Figure 2, Item 17) and oil filter assembly (Figure 2, Item 18) from transmission (Figure 2, Item 2).
8. Remove oil filter assembly (Figure 2, Item 18) from suction tube (Figure 2, Item 10). Discard oil filter assembly.

WARNING



Solvent cleaning compound is flammable and will not be used near open flame. Use only in well-ventilated areas. Failure to comply may result in injury or death to personnel.

9. Remove suction tube (Figure 2, Item 10) and rubber o-ring (Figure 2, Item 9) from transmission (Figure 2, Item 2). Discard o-ring and clean suction tube thoroughly with solvent cleaning compound.
10. Remove transmission oil cooler filter (WP 0381).
11. Disconnect transmission oil cooler hoses (Figure 2, Items 13 and 15) from transmission oil filter base (Figure 2, Item 14).

CAUTION

Compressed air source will not exceed 60 psi (41 kPa). Doing so may cause damage to internal components of the transmission.

12. Using compressed air, drain remaining oil from transmission oil cooler hoses (Figure 2, Items 13 and 15).
13. Connect transmission oil cooler hoses (Figure 2, Items 13 and 15) to transmission oil filter base (Figure 2, Item 14).
14. Install transmission oil cooler filter (WP 0381).

OIL FILTER REMOVAL - Continued

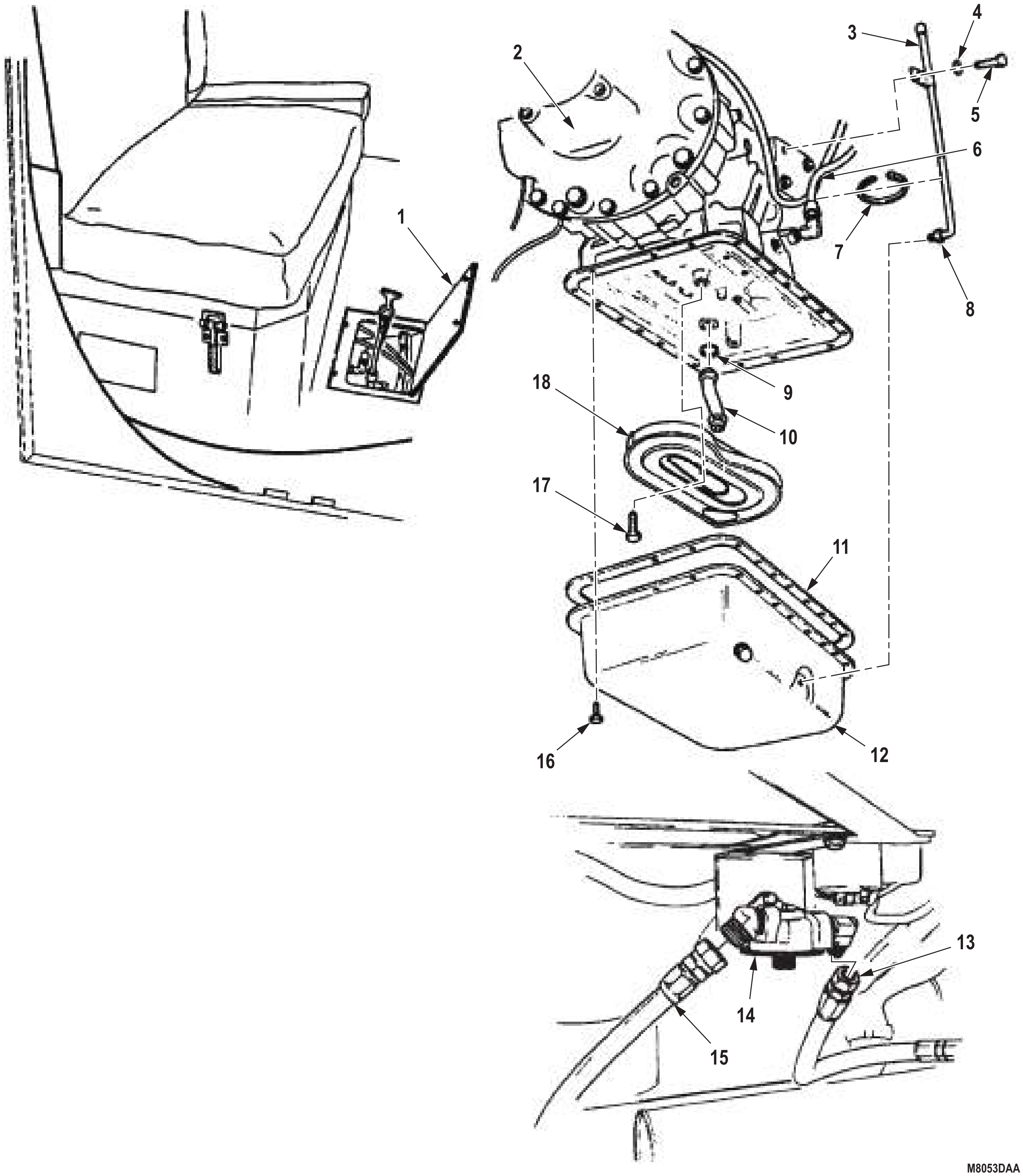


Figure 2. Oil Filter Removal.

END OF TASK

OIL FILTER INSTALLATION

NOTE

Installation of transmission oil filter is basically the same for M939, M939A1, and M939A2 series vehicles. This procedure covers M939 and M939A1 series vehicles only.

1. Position rubber o-ring (Figure 3, Item 3) on suction tube (Figure 3, Item 4) and slide downward until o-ring contacts suction tube lip (Figure 3, Item 7).
2. Install suction tube (Figure 3, Item 4) in transmission oil input port (Figure 3, Item 2), pressing until o-ring (Figure 3, Item 3) seats on oil input port.
3. Install oil filter assembly (Figure 3, Item 6) on suction tube (Figure 3, Item 4), pressing until oil filter assembly intake grommet (Figure 3, Item 8) contacts suction tube lip (Figure 3, Item 9).
4. Install oil filter assembly (Figure 3, Item 6) on transmission mounting boss (Figure 3, Item 1) with screw (Figure 3, Item 5). Tighten screw 10 to 15 lb-ft (14 to 20 N·m).

OIL FILTER INSTALLATION - Continued

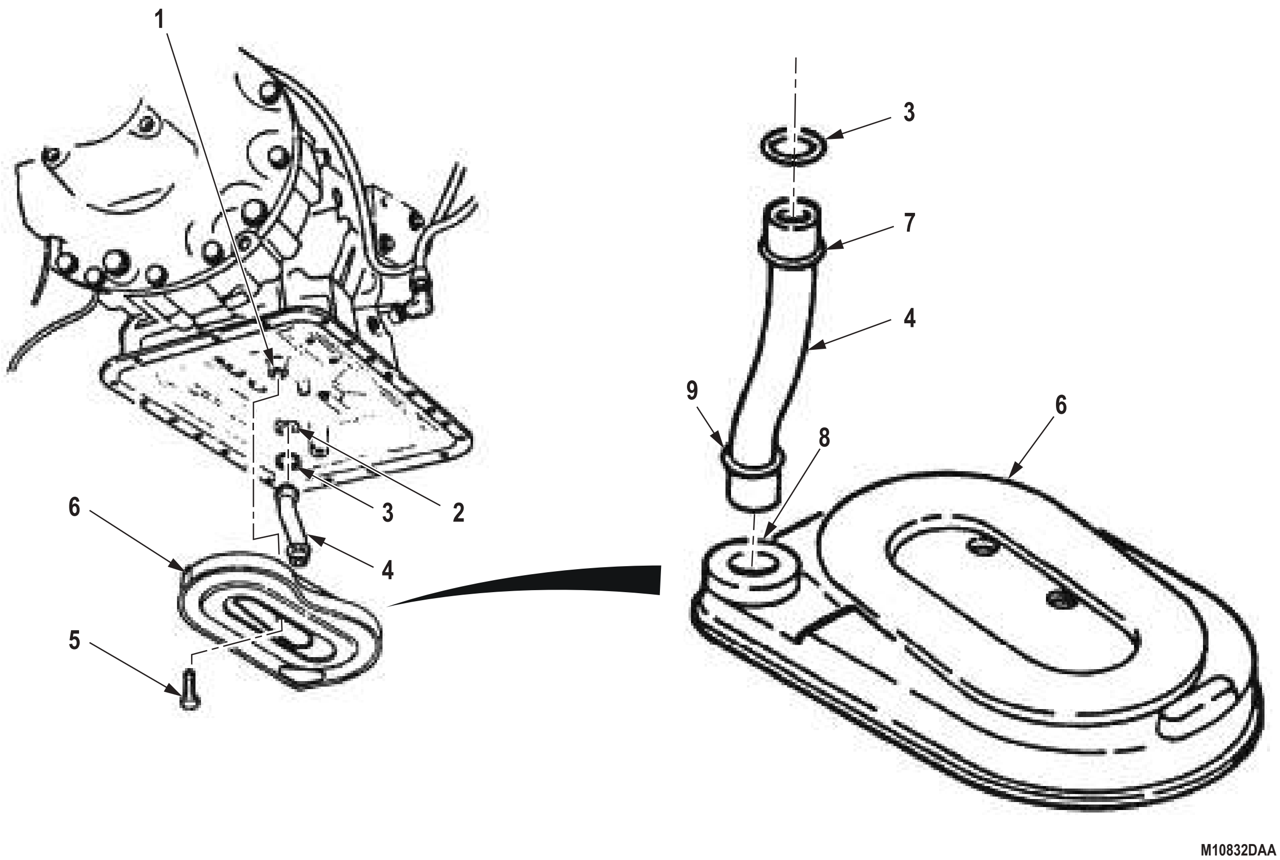


Figure 3. Oil Filter Installation.

OIL FILTER INSTALLATION - Continued

CAUTION

Do not use gasket sealing compound when installing oil pan gasket; oil leakage will result. If necessary, oil or light grease coating may be used to hold oil pan gasket in position during installation.

5. Install oil pan gasket (Figure 4, Item 2) and oil pan (Figure 4, Item 4) on transmission (Figure 4, Item 1) with 21 screws (Figure 4, Item 3).
6. Tighten 21 screws (Figure 4, Item 3) to 10 to 15 lb-ft (14 to 20 N·m) in sequence shown in Figure 4.

NOTE

Due to gasket compression, torque values will be lost and screws must be retightened.

7. After oil pan gasket (Figure 4, Item 2) is seated, loosen and retighten screws (Figure 4, Item 3) 5 lb-ft (7 N·m) in sequence shown.
8. Install dipstick tube (Figure 4, Item 5) on transmission (Figure 4, Item 1) with washer (Figure 4, Item 10), clamp (Figure 4, Item 11), and screw (Figure 4, Item 12).
9. Install dipstick tube (Figure 4, Item 5) in oil pan port (Figure 4, Item 9) with flare nut (Figure 4, Item 8). Tighten flare nut 10 to 25 lb-ft (14 to 34 N·m).
10. Install tiedown strap (Figure 4, Item 6) on dipstick tube (Figure 4, Item 5) and tube (Figure 4, Item 7).

OIL FILTER INSTALLATION - Continued

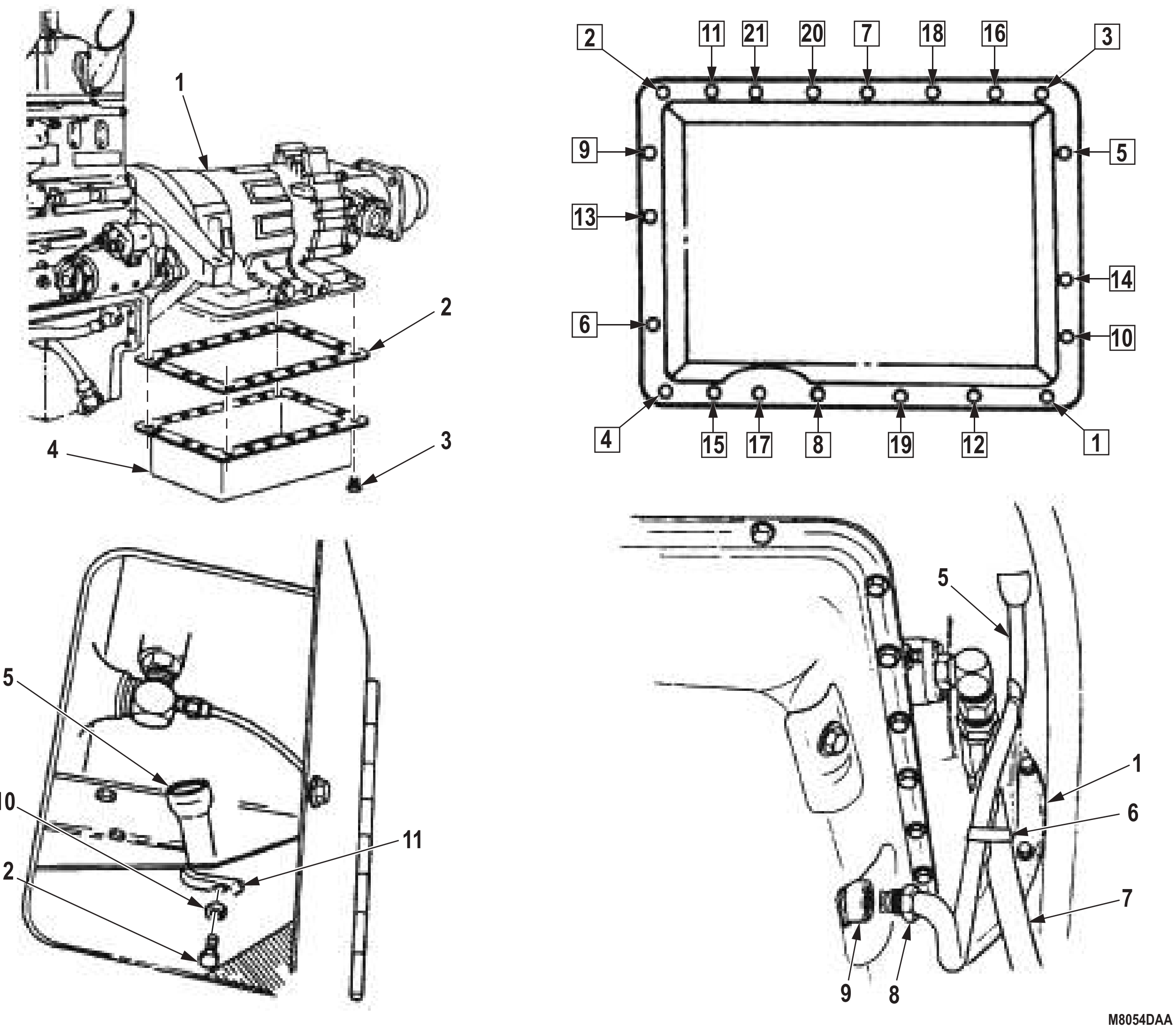
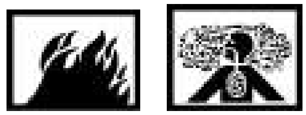


Figure 4. Oil Filter Installation.

END OF TASK

GOVERNOR FILTER REMOVAL

WARNING



Solvent cleaning compound is flammable and will not be used near open flame. Use only in well-ventilated areas. Failure to comply may result in injury or death to personnel.

1. Remove governor filter plug (Figure 5, Item 1) and o-ring (Figure 5, Item 2) from transmission (Figure 5, Item 3). Discard o-ring and clean plug thoroughly with solvent cleaning compound.

CAUTION

Do not pry governor filter from governor filter housing. Use thin, pliable wires as a hook to reach into the housing to slide out filter. Failure to do this will result in governor filter housing damage.

2. Remove governor filter (Figure 5, Item 4) from governor filter housing (Figure 5, Item 3). Discard filter.

GOVERNOR FILTER REMOVAL - Continued

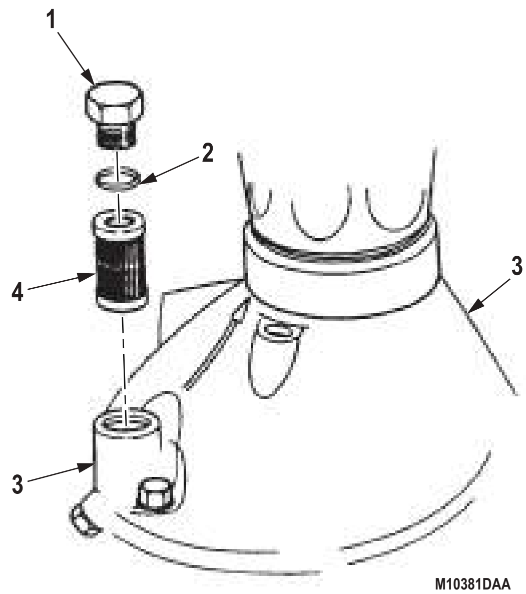


Figure 5. Governor Filter Removal.

END OF TASK

GOVERNOR FILTER INSTALLATION

NOTE

Failure to properly install governor filter into governor filter housing will greatly reduce its effectiveness.

1. Insert governor filter (Figure 6, Item 4), with open end inserted first, into governor filter housing (Figure 6, Item 3).
2. Install o-ring (Figure 6, Item 2) on governor filter plug (Figure 6, Item 1).
3. Install governor filter plug (Figure 6, Item 1) in filter housing (Figure 6, Item 3). Tighten governor filter plug to 15 lb-ft (20 N·m).

GOVERNOR FILTER INSTALLATION - Continued

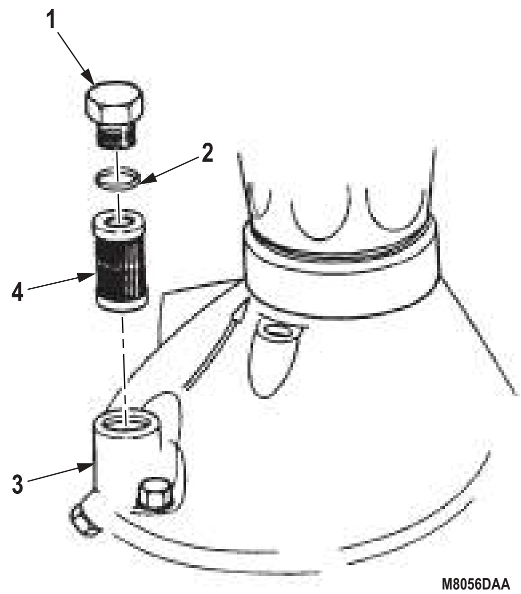


Figure 6. Governor Filter Installation.

END OF TASK

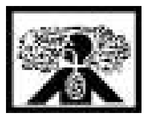
FILL TRANSMISSION OIL TO PROPER LEVEL

NOTE

Refer to (Volume 5, WP 0820) for drain and refill capacity and recommended grade of transmission oil.

1. Open access door (Figure 7, Item 2) inside vehicle cab and remove transmission oil dipstick (Figure 7, Item 1) from transmission oil dipstick tube (Figure 7, Item 3).
2. Add recommended quantity of transmission oil in transmission oil dipstick tube (Figure 7, Item 3).
3. Install transmission oil dipstick (Figure 7, Item 1) in dipstick tube (Figure 7, Item 3).

WARNING



Exhaust gases can kill. Operate vehicle only in a well-ventilated area. Do not operate vehicle with any type of exhaust leak. Failure to comply may result in injury or death to personnel.

4. Start engine (TM 9-2320-272-10), operate engine at 700 to 750 rpm until transmission oil reaches normal operating temperature of 120°F to 220°F (49°C to 105°C), then shut off engine.

NOTE

Begin shifting transmission through driving ranges only after transmission oil has reached normal operating temperature. Perform shifting procedure for approximately two minutes before returning transmission to neutral and shutting off engine.

5. Shift transmission (Figure 7, Item 4) through driving ranges to allow oil to circulate throughout transmission (Figure 7, Item 4).

FILL TRANSMISSION OIL TO PROPER LEVEL - Continued

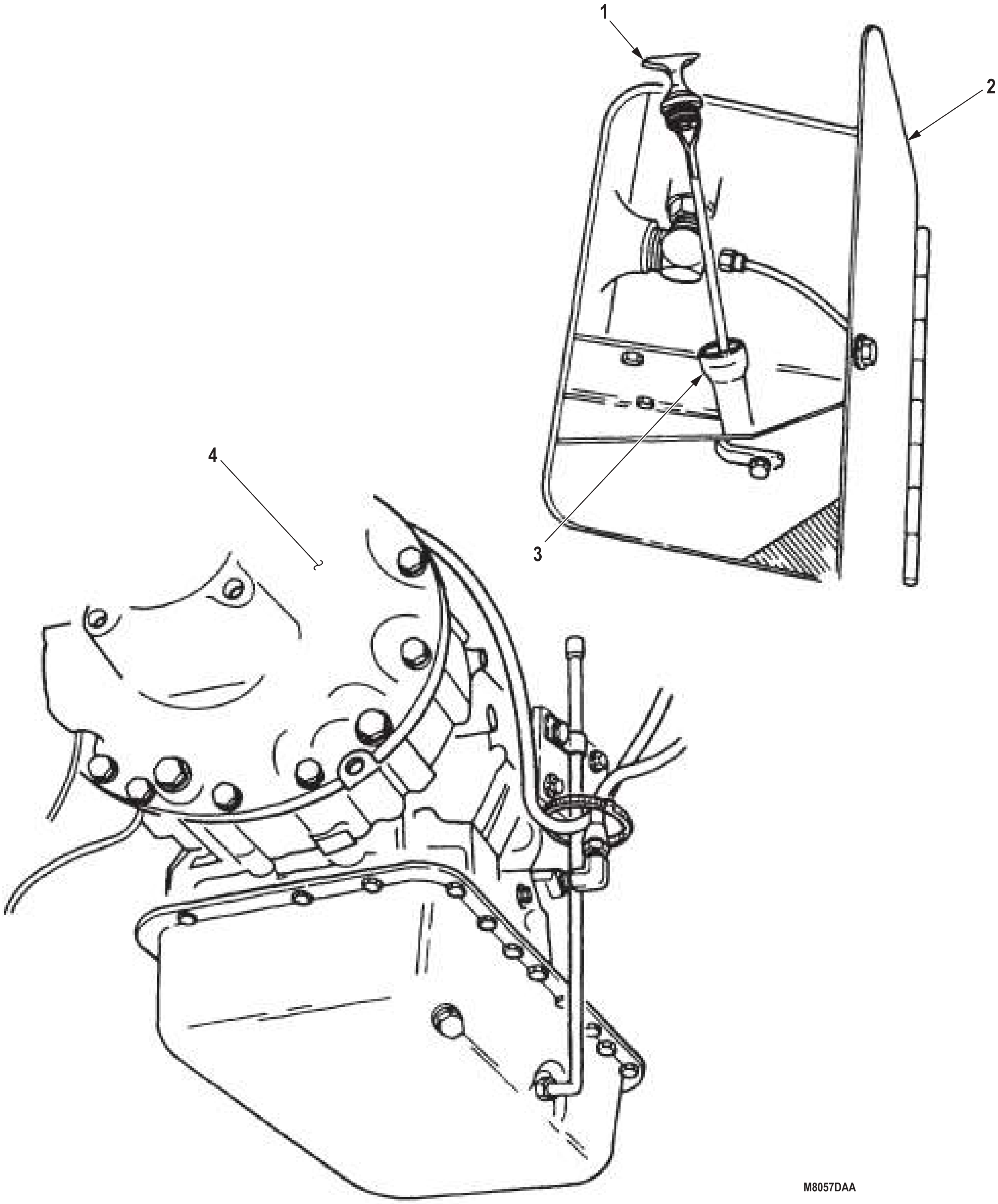


Figure 7. Replenishing Oil.

FILL TRANSMISSION OIL TO PROPER LEVEL - Continued

6. Check transmission oil and fill to proper level (Volume 5, WP 0820).

END OF TASK

FOLLOW-ON MAINTENANCE

Start engine, check for leaks, and road test vehicle. (TM 9-2320-272-10)

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
TRANSMISSION DIPSTICK TUBE AND DIPSTICK REPLACEMENT

INITIAL SETUP:

Tools and Special Tools

Tool Kit, General Mechanic's: Automotive
(Volume 5, WP 0826, Table 1, Item 56)
Wrench, Torque, Click, Ratcheting, 1/2" Drive, 250 Ft-Lb
(Volume 5, WP 0826, Table 1, Item 63)

Materials/Parts

Rag, Wiping
(Volume 5, WP 0825, Table 1, Item 53)
Tiedown Strap
(Volume 5, WP 0827, Table 1, Item 379)
Qty: 1

References

Volume 5, WP 0820

Equipment Condition

Parking brake set. (TM 9-2320-272-10)
Hood raised and secured. (TM 9-2320-272-10)
Transmission oil drained. (WP 0362)

REMOVAL

CAUTION

Wipe area around dipstick tube before removal to prevent entry of dirt. Damage may occur if dirt or dust enters transmission.

NOTE

Perform Steps (1) through (3) for M939/A1 model vehicles only.

1. Open access door (Figure 1, Item 3) in cab floor and remove transmission oil dipstick (Figure 1, Item 1) from transmission oil dipstick tube (Figure 1, Item 2).

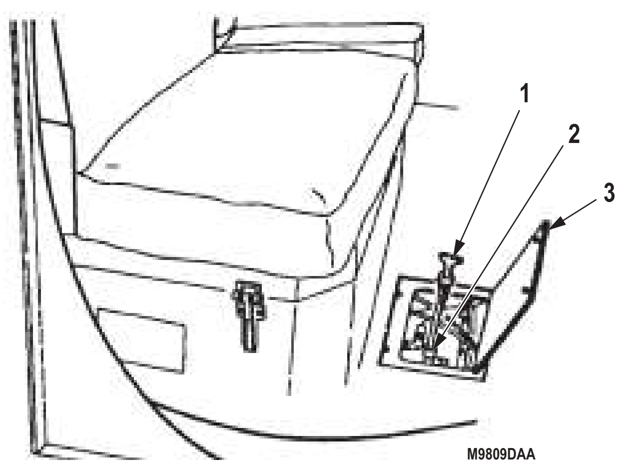


Figure 1. Dipstick Removal.

REMOVAL - Continued

2. Remove screw (Figure 2, Item 5), washer (Figure 2, Item 4), clip (Figure 2, Item 3), and dipstick tube (Figure 2, Item 6) from flywheel housing (Figure 2, Item 1).
3. Remove tiedown strap (Figure 2, Item 7) from dipstick tube (Figure 2, Item 6) and tube (Figure 2, Item 2). Discard tiedown strap.

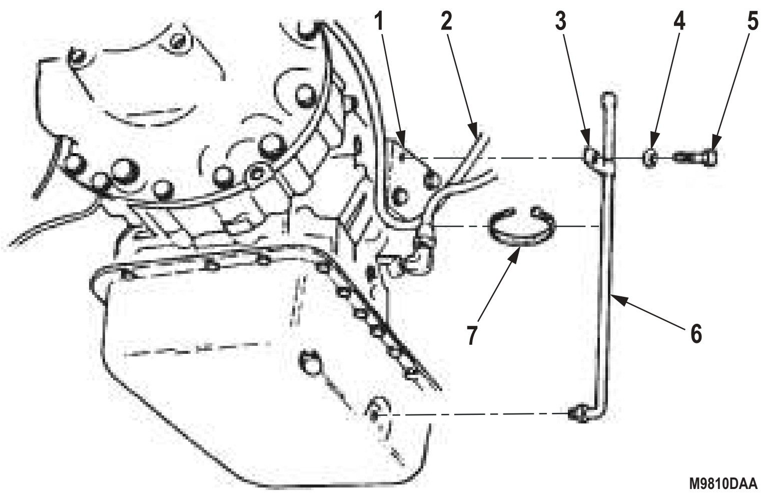


Figure 2. Dipstick Removal.

NOTE

Perform Steps (4) and (5) for M939A2 model vehicles only.

4. Remove transmission oil dipstick (Figure 3, Item 3) from transmission oil dipstick tube (Figure 3, Item 6).
5. Remove screw (Figure 3, Item 2), clip (Figure 3, Item 4), and dipstick tube (Figure 3, Item 6) from flywheel housing (Figure 3, Item 5).
6. Loosen flare nut (Figure 3, Item 7), and remove dipstick tube (Figure 3, Item 6) from transmission oil pan (Figure 3, Item 1).

REMOVAL - Continued

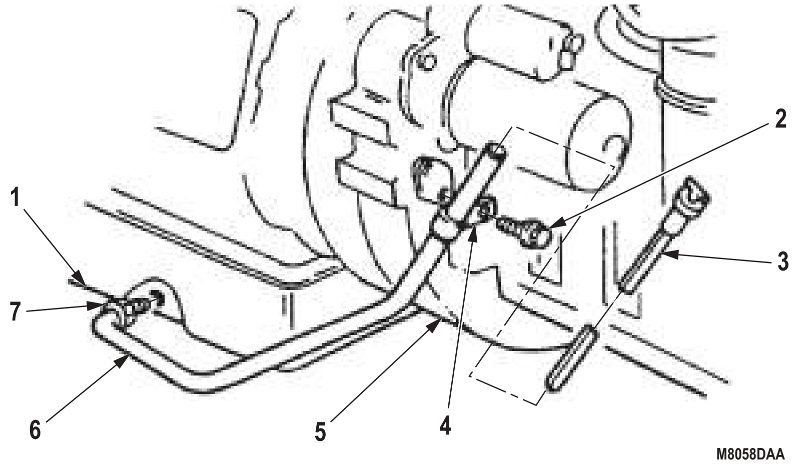


Figure 3. Dipstick Removal.

END OF TASK

INSPECTION

1. Inspect dipstick tube for cracks, blockage, weld damage at clip, and damage to flared end. If blocked, remove obstruction. If damaged, replace.
2. Inspect flare nut for cross-threading and burrs. If cross-threaded or burred, replace dipstick tube.
3. Inspect oil pan dipstick tube port for cracked or broken welds, burrs, and cross-threading. If cracked or broken, replace oil pan. If burred or cross-threaded, repair threads.

END OF TASK

INSTALLATION

1. Install dipstick tube (Figure 4, Item 6) on transmission oil pan (Figure 4, Item 1) with flare nut (Figure 4, Item 7). Tighten flare nut 10 to 25 lb-ft (14 to 34 N·m).

NOTE

Perform Steps (2) and (3) for M939A2 model vehicles only.

2. Install dipstick tube (Figure 4, Item 6) on flywheel housing (Figure 4, Item 5) with clip (Figure 4, Item 4) and screw (Figure 4, Item 2).
3. Install dipstick (Figure 4, Item 3) in dipstick tube (Figure 4, Item 6).

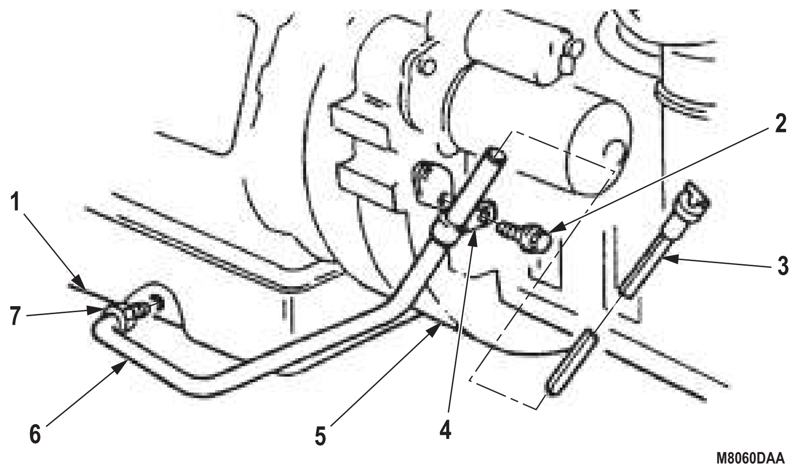


Figure 4. Dipstick Installation.

NOTE

Perform Steps (4) through (6) for M939/A1 model vehicles only.

4. Install dipstick tube (Figure 5, Item 6) and clip (Figure 5, Item 3) on flywheel housing (Figure 5, Item 1) with washer (Figure 5, Item 4) and screw (Figure 5, Item 5).
5. Install dipstick tube (Figure 5, Item 6) on tube (Figure 5, Item 2) with tiedown strap (Figure 5, Item 7).

INSTALLATION - Continued

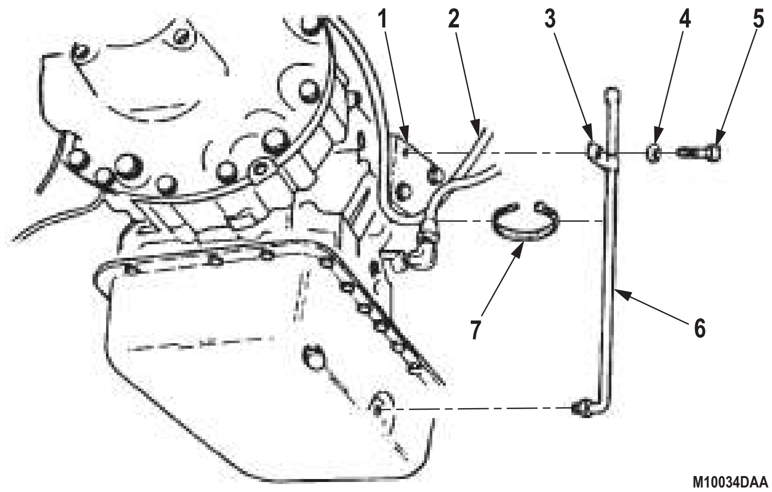


Figure 5. Dipstick Installation.

6. Install dipstick (Figure 6, Item 1) in dipstick tube (Figure 6, Item 2).
7. Close access door (Figure 6, Item 3) on cab floor.

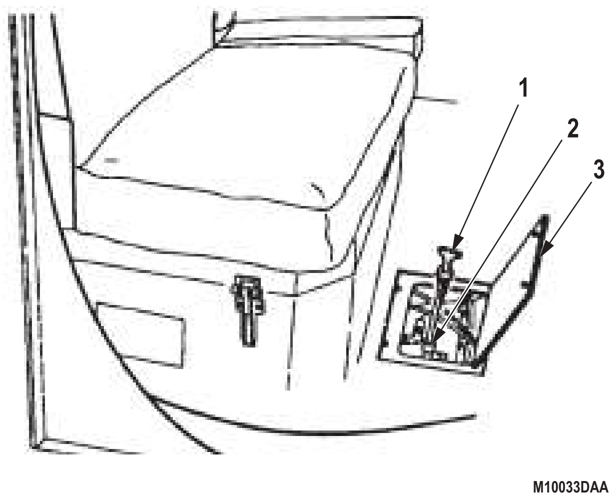


Figure 6. Dipstick Installation.

END OF TASK

FOLLOW-ON MAINTENANCE

Fill transmission. (Volume 5, WP 0820)

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
TRANSMISSION MOUNTING BRACKET AND ISOLATOR (M939A2) REPLACEMENT

INITIAL SETUP:

Tools and Special Tools

Tool Kit, General Mechanic's: Automotive
(Volume 5, WP 0826, Table 1, Item 56)

Lift, Transmission and Differential
(Volume 5, WP 0826, Table 1, Item 33)

Materials/Parts

Lockwasher

Materials/Parts (cont.)

(Volume 5, WP 0827, Table 1, Item 2)
Qty: 2

Lockwasher
(Volume 5, WP 0827, Table 1, Item 405)
Qty: 2

Equipment Condition

Parking brake set. (TM 9-2320-272-10)

REMOVAL

WARNING

Keep hands clear of transmission when removing bracket and isolator. Jack may slip. Failure to comply may result in damage to equipment, injury, or death to personnel.

1. Using a transmission jack, raise transmission (Figure 1, Item 7) and remove two screws (Figure 1, Item 5) and lockwashers (Figure 1, Item 6) from transmission mounting bracket (Figure 1, Item 8). Discard lockwashers.
2. Remove two screws (Figure 1, Item 2), lockwashers (Figure 1, Item 3), isolator (Figure 1, Item 4), and transmission mounting bracket (Figure 1, Item 8) from bracket (Figure 1, Item 1). Discard lockwashers.

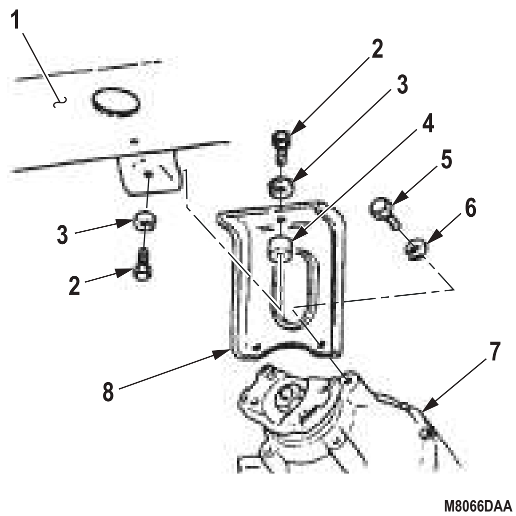


Figure 1. Mounting Bracket Removal.

END OF TASK

INSTALLATION

NOTE

It will be necessary to raise and lower transmission slightly to obtain proper alignment of screws.

1. Install transmission mounting bracket (Figure 2, Item 8) on bracket (Figure 2, Item 1) with isolator (Figure 2, Item 4), two lockwashers (Figure 2, Item 3), and screws (Figure 2, Item 2).
2. Using jack, position transmission (Figure 2, Item 7) on transmission mounting bracket (Figure 2, Item 8) and install with two lockwashers (Figure 2, Item 6) and screws (Figure 2, Item 5).

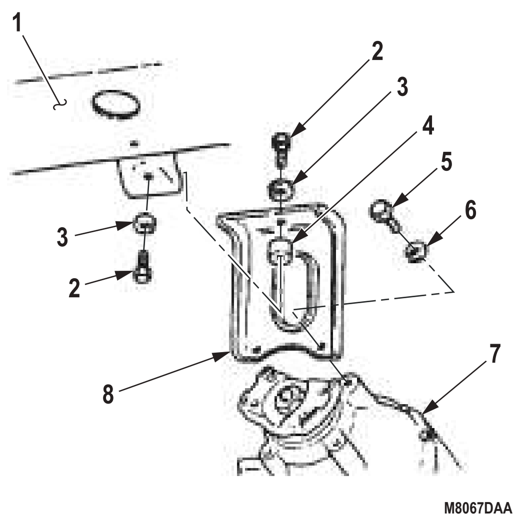


Figure 2. Mounting Bracket Installation.

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
TRANSMISSION MODULATOR AND CABLE REPLACEMENT

INITIAL SETUP:

Tools and Special Tools
Tool Kit, General Mechanic's: Automotive
(Volume 5, WP 0826, Table 1, Item 56)
Wrench, Torque, Click, Ratcheting, 1/2" Drive, 250 Ft-Lb
(Volume 5, WP 0826, Table 1, Item 63)

Materials/Parts
Locknut (Volume 5, WP 0827, Table 1, Item 275)
Qty: 1
Locknut (Volume 5, WP 0827, Table 1, Item 312)
Qty: 2

Materials/Parts (cont.)
Locknut (Volume 5, WP 0827, Table 1, Item 314)
Qty: 1
O-ring (Volume 5, WP 0827, Table 1, Item 369)
Qty: 1

Personnel Required
(2)

References
Volume 5, WP 0820

Equipment Condition
Parking brake set. (TM 9-2320-272-10)
Left splash shield removed. (TM 9-2320-272-10)

REMOVAL

NOTE

- Have drainage container ready to catch oil.
- Use drain pans to retain leaking/draining fluids. Refer to local procedures and plans for preventing and responding to fluid spills or leaks. Comply with local regulations when disposing of clean up material and leaked and spilled fluids.

1. Remove screw (Figure 1, Item 13), retaining bracket (Figure 1, Item 12), modulator (Figure 1, Item 15), and o-ring (Figure 1, Item 14) from transmission (Figure 1, Item 21). Discard o-ring.
2. Remove locknut (Figure 1, Item 20), screw (Figure 1, Item 17), speedometer cable clamp (Figure 1, Item 16), and modulator cable clamp (Figure 1, Item 18) from transmission bracket (Figure 1, Item 19). Discard locknut.
3. Remove modulator return spring (Figure 1, Item 10) from modulator link (Figure 1, Item 11) and bracket (Figure 1, Item 4).
4. Remove two locknuts (Figure 1, Item 5), screws (Figure 1, Item 9), clamp (Figure 1, Item 8), and shim (Figure 1, Item 7) from bracket (Figure 1, Item 4). Discard locknuts.
5. Remove locknut (Figure 1, Item 3), screw (Figure 1, Item 1), modulator link (Figure 1, Item 11), and modulator cable (Figure 1, Item 6) from throttle lever (Figure 1, Item 2) on fuel pump (Figure 1, Item 22). Discard locknut.
6. Remove modulator link (Figure 1, Item 11) from modulator cable (Figure 1, Item 6).

REMOVAL - Continued

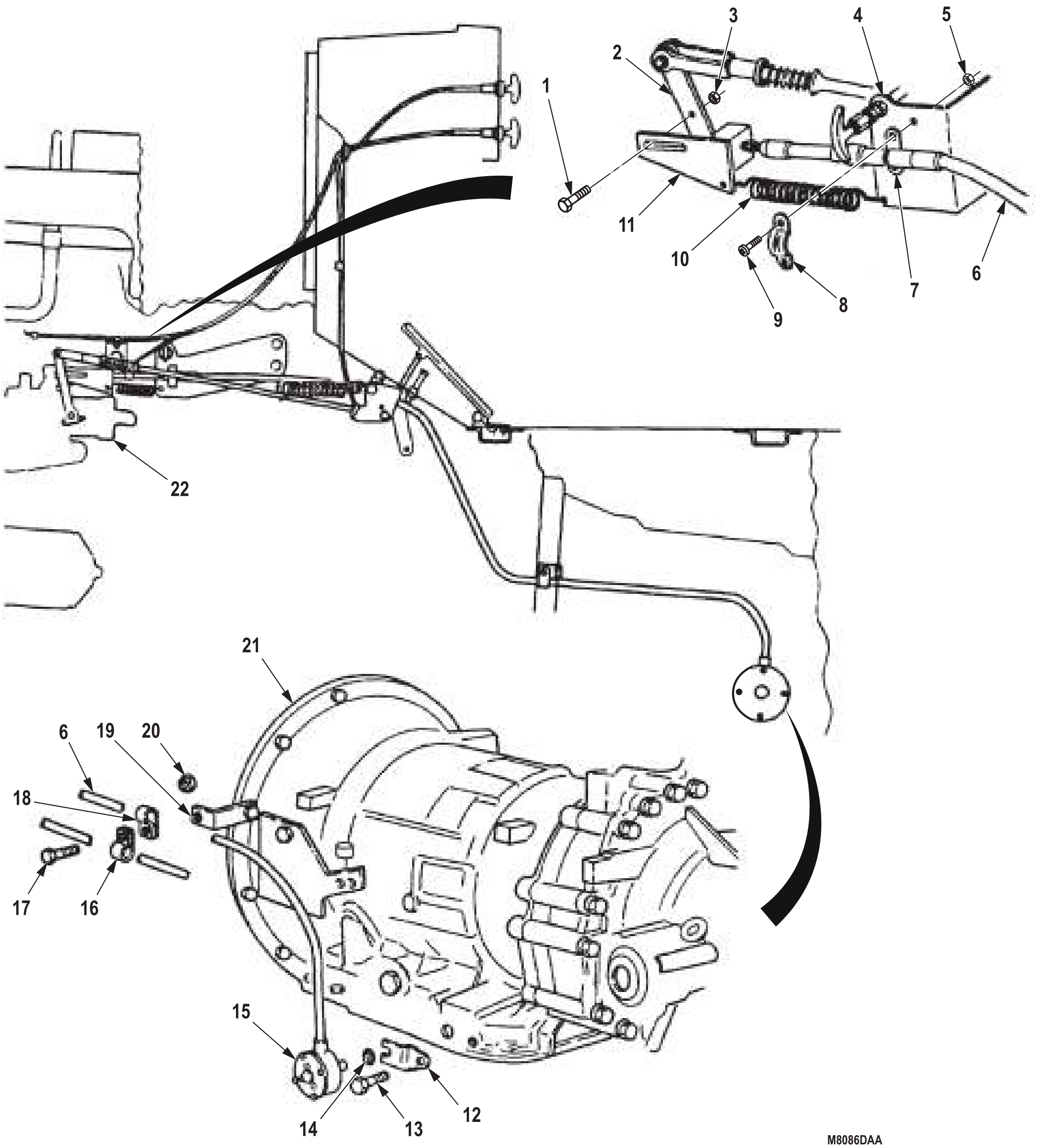


Figure 1. Modulator and Cable Removal.

END OF TASK

INSTALLATION

1. Install o-ring (Figure 2, Item 9) and modulator (Figure 2, Item 10) on transmission (Figure 2, Item 16) with retaining bracket (Figure 2, Item 7) and screw (Figure 2, Item 8). Tighten screw 16 to 20 lb-ft (22 to 27 N·m).

NOTE

Clamp and shim must align on modulator cable.

2. Install shim (Figure 2, Item 3) and modulator cable (Figure 2, Item 4) on bracket (Figure 2, Item 1) with clamp (Figure 2, Item 5), two screws (Figure 2, Item 6), and locknuts (Figure 2, Item 2).

NOTE

Locate modulator cable away from sharp edges and avoid sharp bends.

3. Install modulator cable (Figure 2, Item 4) on transmission bracket (Figure 2, Item 14) with modulator cable clamp (Figure 2, Item 13), speedometer cable clamp (Figure 2, Item 11), screw (Figure 2, Item 12), and locknut (Figure 2, Item 15).

INSTALLATION - Continued

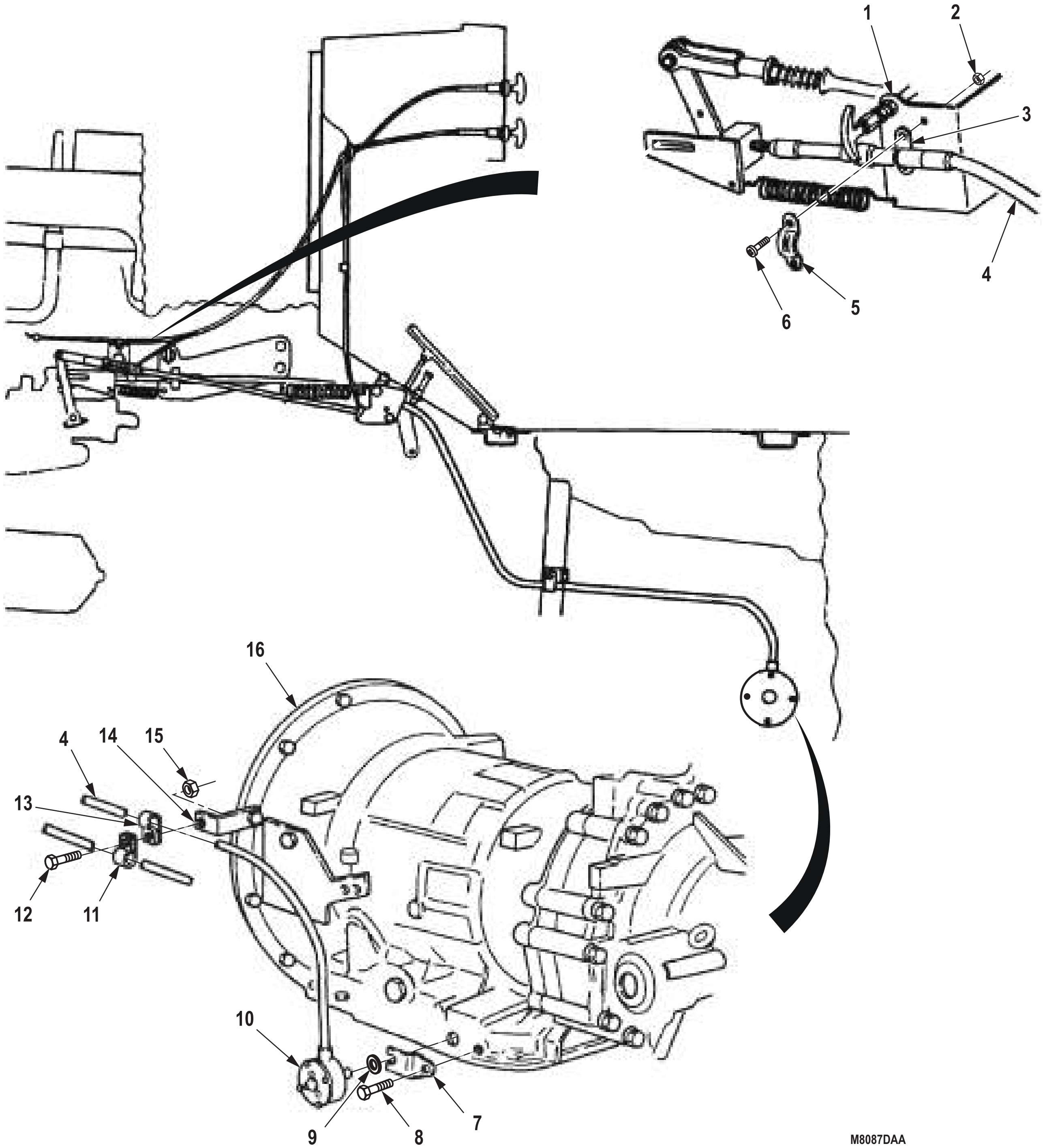


Figure 2. Modulator and Cable Installation.

END OF TASK

ADJUSTMENT

NOTE

Assistant will help with Steps (1) through (4).

1. Move throttle lever (Figure 3, Item 4) on fuel pump (Figure 3, Item 14) to FULLY OPEN position and hold.
2. Pull threaded end of modulator cable (Figure 3, Item 10) out to STOP position.
3. Loosen jamnut (Figure 3, Item 6) and thread modulator link (Figure 3, Item 10) onto modulator cable (Figure 3, Item 8) until front of slot aligns with hole in throttle lever (Figure 3, Item 4). Continue to loosen jamnut as needed to position modulator link.
4. Back off modulator link (Figure 3, Item 10) two turns to provide free pin clearance and tighten jamnut (Figure 3, Item 6).
5. Install modulator link (Figure 3, Item 10) on throttle lever (Figure 3, Item 4) with screw (Figure 3, Item 3) and locknut (Figure 3, Item 5).

NOTE

- Assistant will help with Steps (6) and (7).
- Ensure throttle lever is still in FULLY OPEN position.

6. Loosen throttle stopscrew (Figure 3, Item 11) and jamnut (Figure 3, Item 12) on cab floor (Figure 3, Item 1). Loosen nut (Figure 3, Item 13) as needed.
7. Adjust stopscrew (Figure 3, Item 11) to barely touch cab floor (Figure 3, Item 1) side of accelerator pedal (Figure 3, Item 2). Tighten jamnut (Figure 3, Item 12) and nut (Figure 3, Item 13).
8. Release throttle lever (Figure 3, Item 4) on fuel pump (Figure 3, Item 14).
9. Install modulator return spring (Figure 3, Item 9) on modulator link (Figure 3, Item 10) and bracket (Figure 3, Item 7).

ADJUSTMENT - Continued

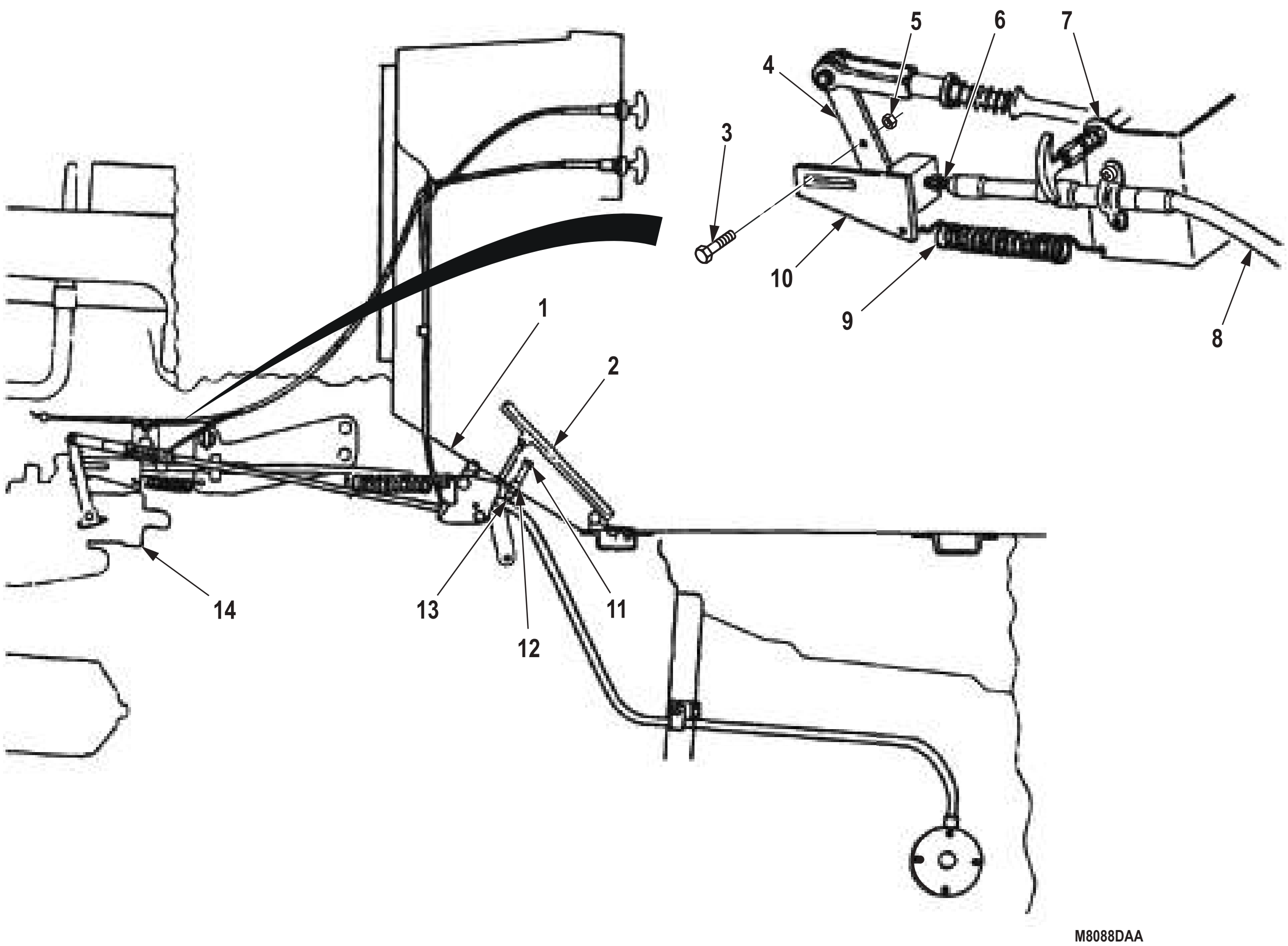


Figure 3. Modulator and Cable Adjustment.

END OF TASK

FOLLOW-ON MAINTENANCE

1. Fill transmission to proper level. (Volume 5, WP 0820)
2. Install left splash shield. (TM 9-2320-272-10)
3. Start engine and road test vehicle. (TM 9-2320-272-10)

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
TRANSMISSION NEUTRAL START SWITCH REPLACEMENT

INITIAL SETUP:

Tools and Special Tools
Tool Kit, General Mechanic's: Automotive (Volume 5, WP 0826, Table 1, Item 56)

Equipment Condition
Parking brake set. (TM 9-2320-272-10)
Battery ground cables disconnected. (Volume 2, WP 0350)

REMOVAL

1. Remove nut (Figure 1, Item 2) and retainer shift linkage (Figure 1, Item 3) from left side of transmission (Figure 1, Item 1).

NOTE

Tag wires for installation.

2. Disconnect wires (Figure 1, Items 5 and 6) from neutral start switch (Figure 1, Item 4).
3. Remove neutral start switch (Figure 1, Item 4) from left side of transmission (Figure 1, Item 1).

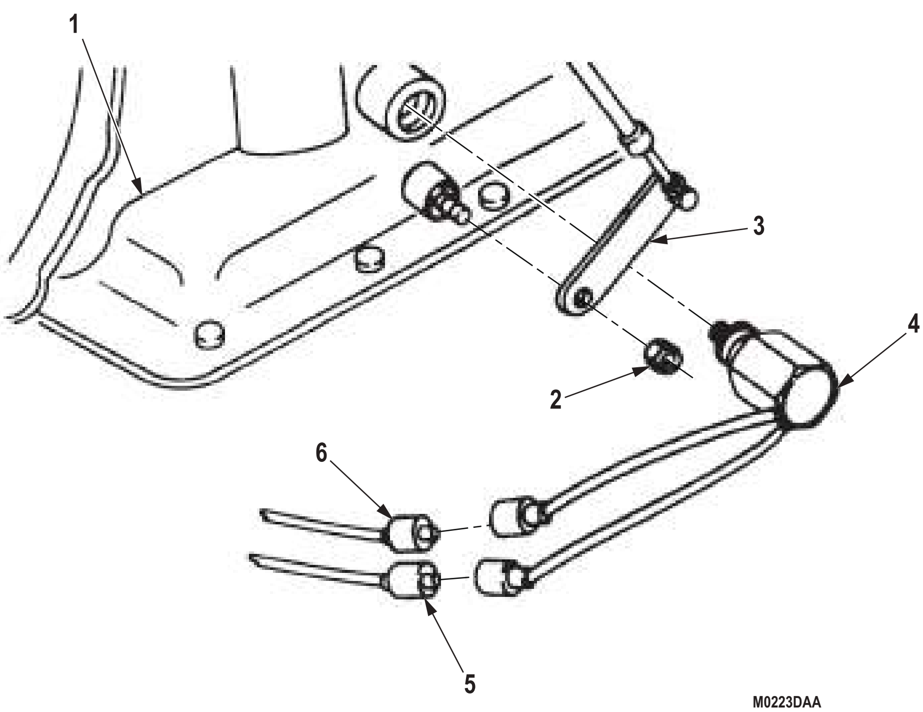


Figure 1. Transmission Neutral Start Switch Removal.

END OF TASK

INSTALLATION

1. Install neutral start switch (Figure 2, Item 4) on left side of transmission (Figure 2, Item 1). Do not overtighten.
2. Connect wires (Figure 2, Items 5 and 6) to neutral start switch (Figure 2, Item 4).
3. Install retainer shift linkage (Figure 2, Item 3) on left side of transmission (Figure 2, Item 1) with nut (Figure 2, Item 2).

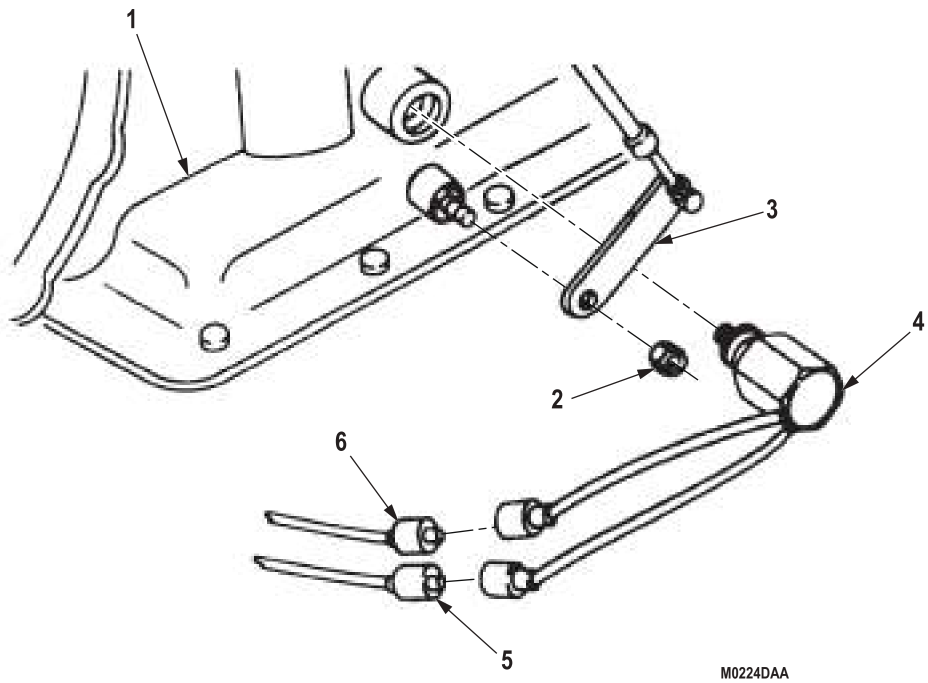


Figure 2. Transmission Neutral Start Switch Installation.

END OF TASK

FOLLOW-ON MAINTENANCE

1. Connect battery ground cables. (Volume 2, WP 0350)
2. Check operation of neutral start switch. (TM 9-2320-272-10)

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
GOVERNOR PIPING AND CAPACITOR REPLACEMENT

INITIAL SETUP:

Tools and Special Tools
Tool Kit, General Mechanic's: Automotive
(Volume 5, WP 0826, Table 1, Item 56)

Materials/Parts
Tape, Antiseizing
(Volume 5, WP 0825, Table 1, Item 65)
Cotter Pin
(Volume 5, WP 0827, Table 1, Item 331)
Qty: 2
Locknut (Volume 5, WP 0827, Table 1, Item 282)
Qty: 2

Materials/Parts (cont.)
Lockwasher
(Volume 5, WP 0827, Table 1, Item 405)
Qty: 1
Tiedown Strap
(Volume 5, WP 0827, Table 1, Item 370)
Qty: 3

Equipment Condition
Parking brake set. (TM 9-2320-272-10)
Air reservoir drained. (TM 9-2320-272-10)

REMOVAL

NOTE

- Perform Steps (1) and (2) for M936/A1 model vehicles only.
- Have drainage container ready to catch oil.
- Use drain pans to retain leaking/draining fluids. Refer to local procedures and plans for preventing and responding to fluid spills or leaks. Comply with local regulations when disposing of clean up material and leaked and spilled fluids.

1. Remove hose (Figure 1, Item 1) from elbow (Figure 1, Item 14) and tee (Figure 1, Item 2).
2. Remove elbow (Figure 1, Item 14) from governor (Figure 1, Item 15).
3. Remove cap (Figure 1, Item 13) from tee (Figure 1, Item 2).
4. Remove hose (Figure 1, Item 8) from tee (Figure 1, Item 2).
5. Remove tee (Figure 1, Item 2) from nipple (Figure 1, Item 12).
6. Remove nipple (Figure 1, Item 12) from adapter (Figure 1, Item 11).

NOTE

Note location of tiedown strap for installation.

7. Remove tiedown strap (Figure 1, Item 10) from hoses (Figure 1, Items 8 and 9). Discard tiedown strap.
8. Remove hose (Figure 1, Item 8) from adapter (Figure 1, Item 7).
9. Remove adapter (Figure 1, Item 7) from tee (Figure 1, Item 3).
10. Remove hose (Figure 1, Item 5) from elbows (Figure 1, Items 4 and 6).
11. Remove elbow (Figure 1, Item 6) from tee (Figure 1, Item 3).

REMOVAL - Continued

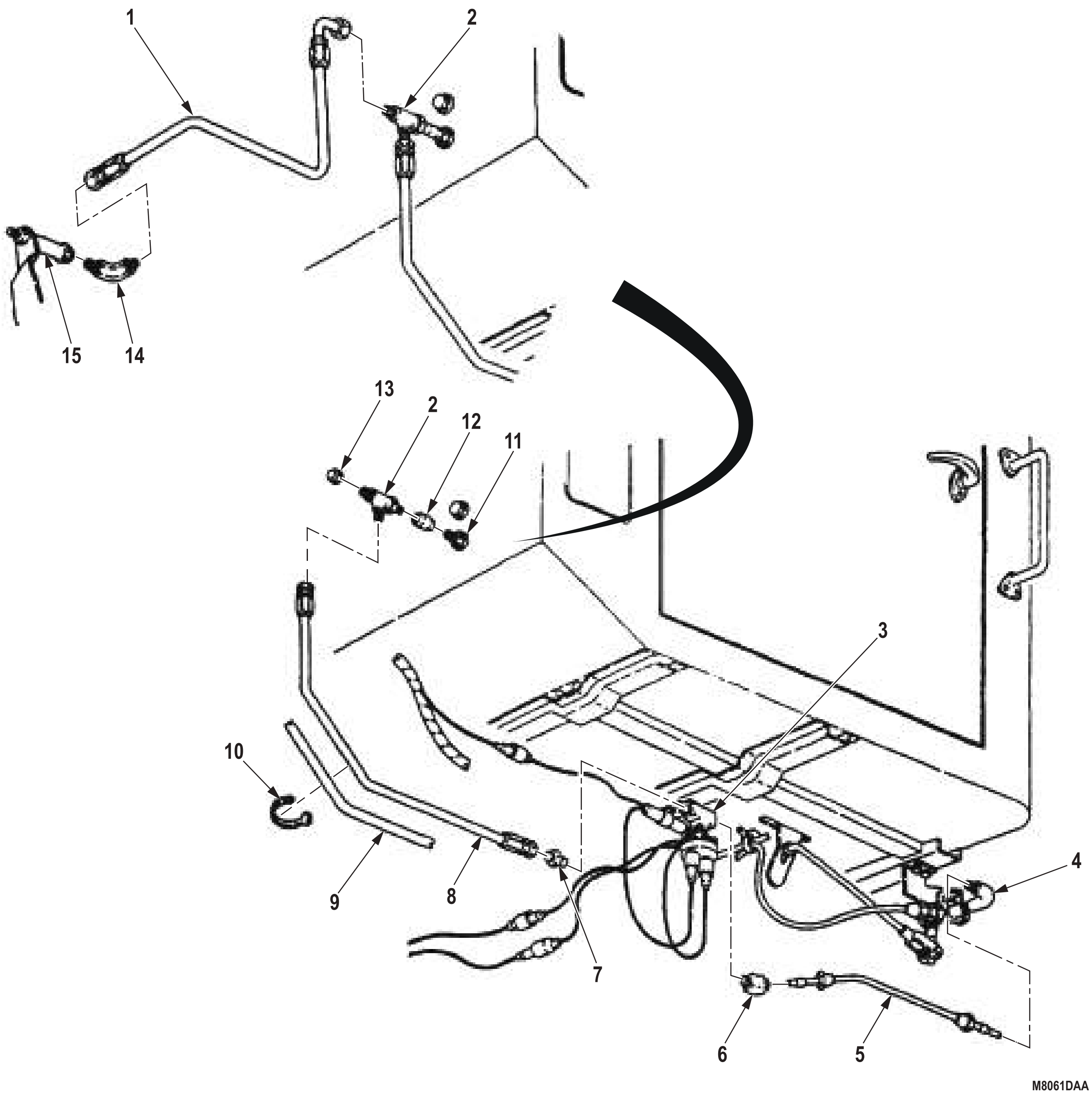


Figure 1. Governor Piping Removal.

REMOVAL - Continued

NOTE

Tag all leads for installation.

12. Disconnect capacitor leads (Figure 2, Items 8 and 9) from transmission 5th gear lock-up pressure switch (Figure 2, Item 7).
13. Remove pressure switch (Figure 2, Item 7) from tee (Figure 2, Item 6).
14. Disconnect capacitor leads (Figure 2, Items 2, 12, and 15) from leads (Figure 2, Items 1, 13, and 14).
15. Remove screw (Figure 2, Item 10), lockwasher (Figure 2, Item 11), tee (Figure 2, Item 6), and capacitor (Figure 2, Item 5) from body (Figure 2, Item 3). Discard lockwasher.
16. Remove clamp (Figure 2, Item 4) from capacitor (Figure 2, Item 5).

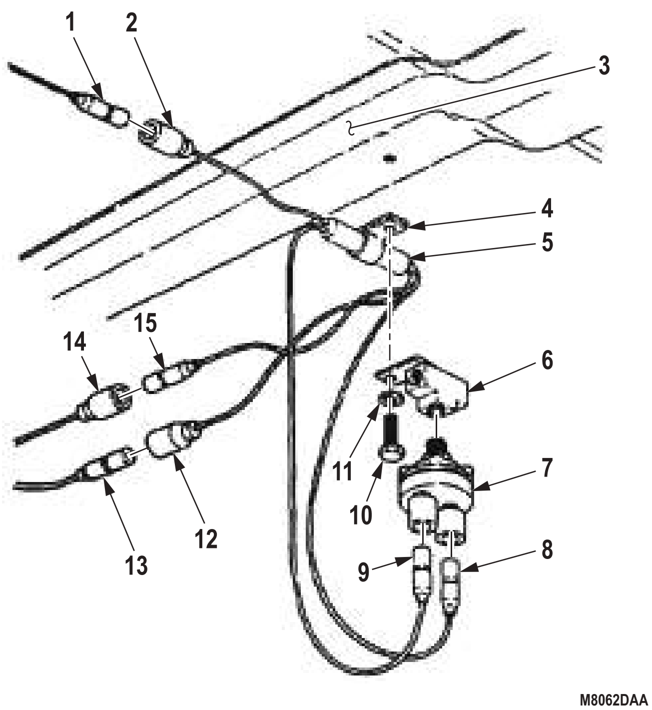


Figure 2. Capacitor Removal.

REMOVAL - Continued

NOTE

Note location of tiedown straps for installation.

17. Remove two tiedown straps (Figure 3, Item 17) from hoses (Figure 3, Items 16 and 21). Discard tiedown straps.
18. Remove hose (Figure 3, Item 16) from adapters (Figure 3, Items 15 and 23).
19. Remove adapters (Figure 3, Items 15 and 23) from valves (Figure 3, Items 4 and 22).
20. Remove cotter pin (Figure 3, Item 18), washer (Figure 3, Item 20), and rod (Figure 3, Item 19) from lever (Figure 3, Item 1). Discard cotter pin.
21. Remove cotter pin (Figure 3, Item 13), washer (Figure 3, Item 11), pin (Figure 3, Item 9), and clevis (Figure 3, Item 10) from valve (Figure 3, Item 4). Discard cotter pin.
22. Remove clevis (Figure 3, Item 10) from rod (Figure 3, Item 19).
23. Remove breather (Figure 3, Item 7) from adapter (Figure 3, Item 8).
24. Remove elbow (Figure 3, Item 6) and adapter (Figure 3, Item 8) from valve (Figure 3, Item 4).
25. Remove two locknuts (Figure 3, Item 12), screws (Figure 3, Item 5), and valve (Figure 3, Item 4) from bracket (Figure 3, Item 3). Discard locknuts.
26. Remove two screws (Figure 3, Item 14) and bracket (Figure 3, Item 3) from body (Figure 3, Item 2).

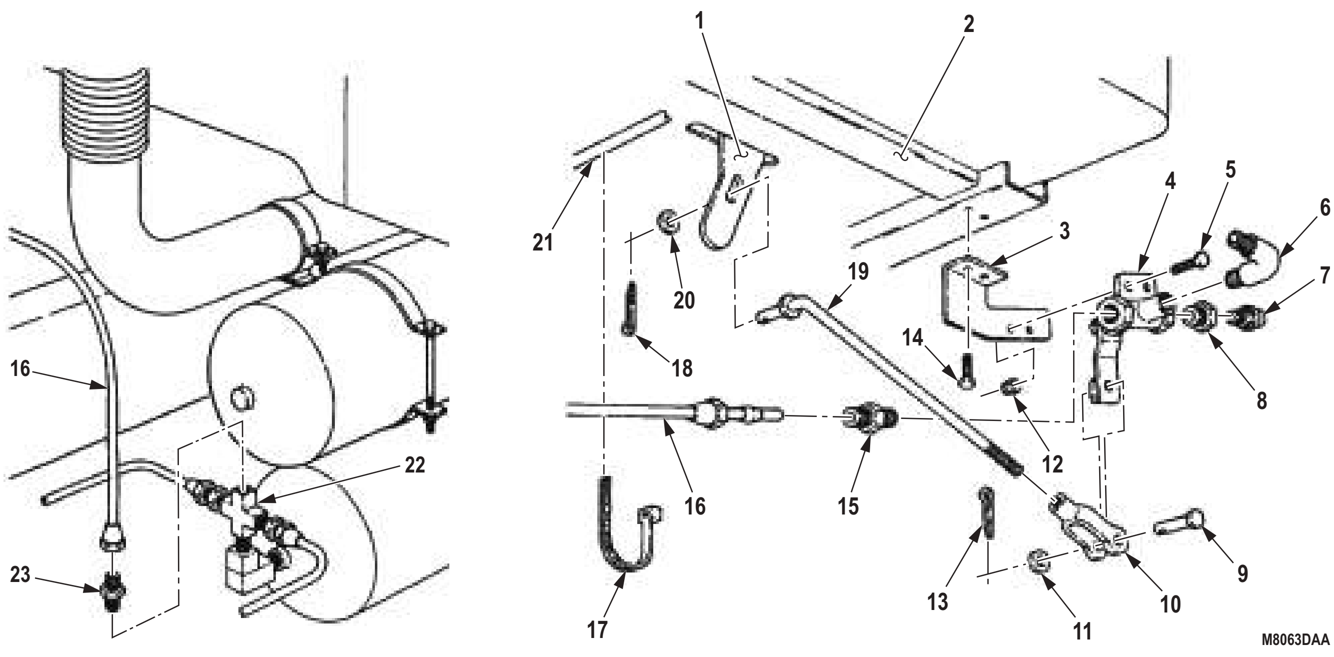


Figure 3. Governor Piping Removal.

END OF TASK

INSPECTION

Inspect hoses. Replace hoses if damaged.

END OF TASK

INSTALLATION

1. Install bracket (Figure 4, Item 3) on body (Figure 4, Item 2) with two screws (Figure 4, Item 14).
2. Install valve (Figure 4, Item 4) on bracket (Figure 4, Item 3) with two screws (Figure 4, Item 5) and locknuts (Figure 4, Item 12).

NOTE

Male pipe threads must be wrapped with antiseize tape before installation.

3. Install elbow (Figure 4, Item 6) and adapter (Figure 4, Item 8) on valve (Figure 4, Item 4).
4. Install breather (Figure 4, Item 7) on adapter (Figure 4, Item 8).
5. Install clevis (Figure 4, Item 10) on rod (Figure 4, Item 19).
6. Install clevis (Figure 4, Item 10) on valve (Figure 4, Item 4) with pin (Figure 4, Item 9), washer (Figure 4, Item 11), and cotter pin (Figure 4, Item 13).
7. Install rod (Figure 4, Item 19) on lever (Figure 4, Item 1) with washer (Figure 4, Item 20) and cotter pin (Figure 4, Item 18).
8. Install adapters (Figure 4, Items 15 and 23) on valves (Figure 4, Items 4 and 22).
9. Install hose (Figure 4, Item 16) on adapters (Figure 4, Items 15 and 23).
10. Install two tiedown straps (Figure 4, Item 17) on hoses (Figure 4, Items 16 and 21).

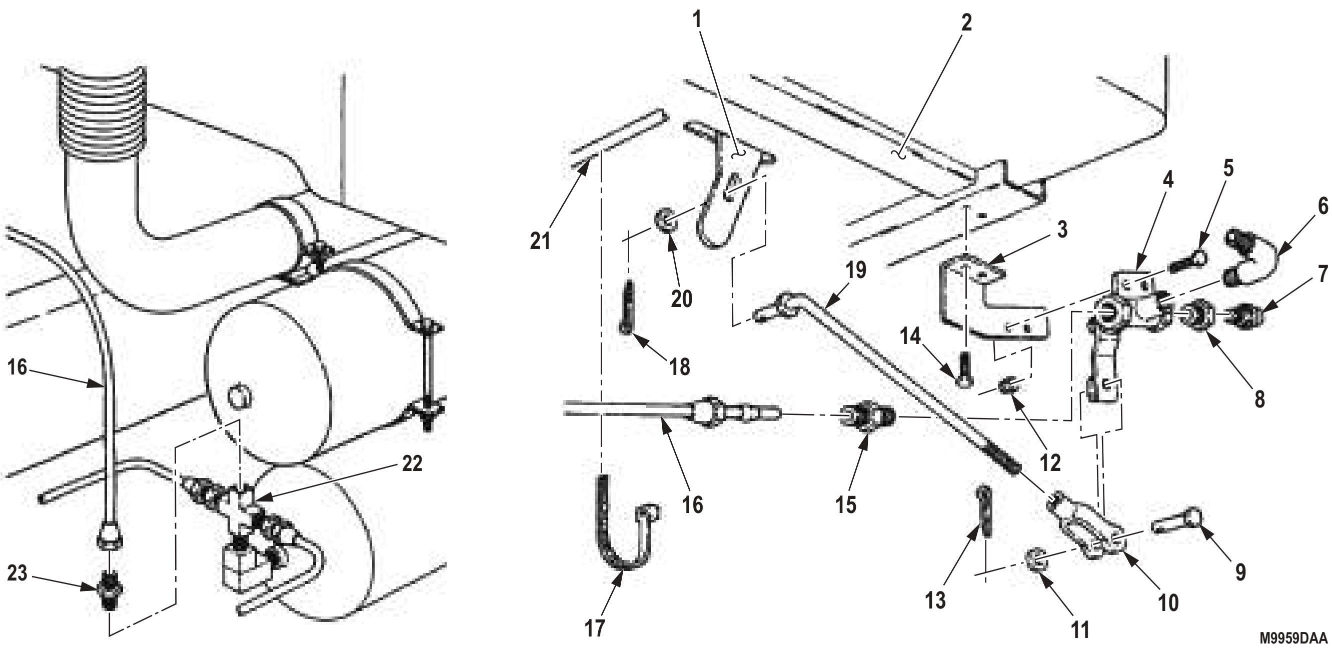


Figure 4. Governor Piping Installation.

INSTALLATION - Continued

11. Install clamp (Figure 5, Item 4) on capacitor (Figure 5, Item 5).
12. Install capacitor (Figure 5, Item 5) and tee (Figure 5, Item 6) on body (Figure 5, Item 3) with lockwasher (Figure 5, Item 11) and screw (Figure 5, Item 10).
13. Connect capacitor leads (Figure 5, Items 2, 12, and 15) to leads (Figure 5, Items 1, 13, and 14).
14. Install transmission 5th gear lock-up pressure switch (Figure 5, Item 7) on tee (Figure 5, Item 6).
15. Connect capacitor leads (Figure 5, Items 8 and 9) to pressure switch (Figure 5, Item 7).

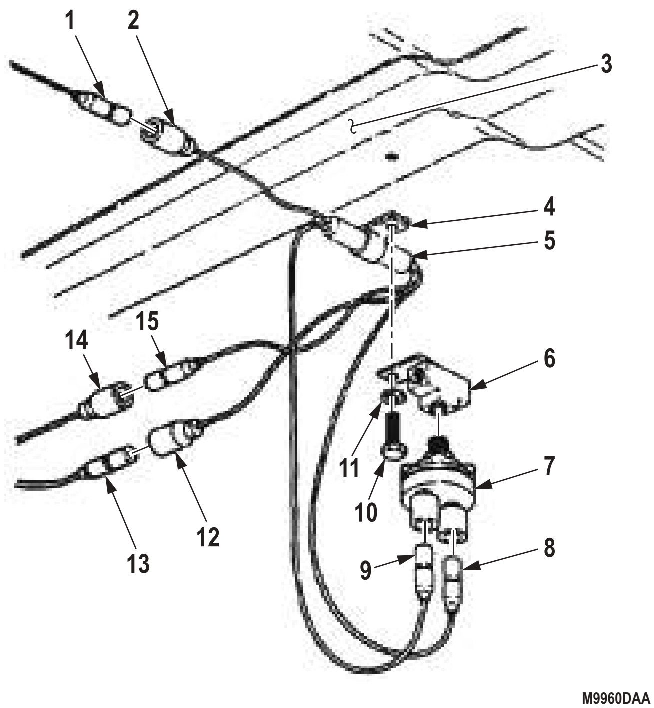


Figure 5. Capacitor Installation.

INSTALLATION - Continued

16. Install elbow (Figure 6, Item 6) on tee (Figure 6, Item 3).
17. Install hose (Figure 6, Item 5) on elbows (Figure 6, Items 4 and 6).
18. Install adapter (Figure 6, Item 7) on tee (Figure 6, Item 3).
19. Install hose (Figure 6, Item 8) on adapter (Figure 6, Item 7).
20. Install tiedown strap (Figure 6, Item 10) on hoses (Figure 6, Items 8 and 9).
21. Install nipple (Figure 6, Item 12) on adapter (Figure 6, Item 11).
22. Install tee (Figure 6, Item 2) on nipple (Figure 6, Item 12).
23. Install hose (Figure 6, Item 8) on tee (Figure 6, Item 2).

NOTE

Perform Steps (24) and (26) for M936/A1 series vehicles only.

24. Install elbow (Figure 6, Item 14) on governor (Figure 6, Item 15).
25. Install hose (Figure 6, Item 1) on elbow (Figure 6, Item 14) and tee (Figure 6, Item 2).
26. Install cap (Figure 6, Item 13) on tee (Figure 6, Item 2).

INSTALLATION - Continued

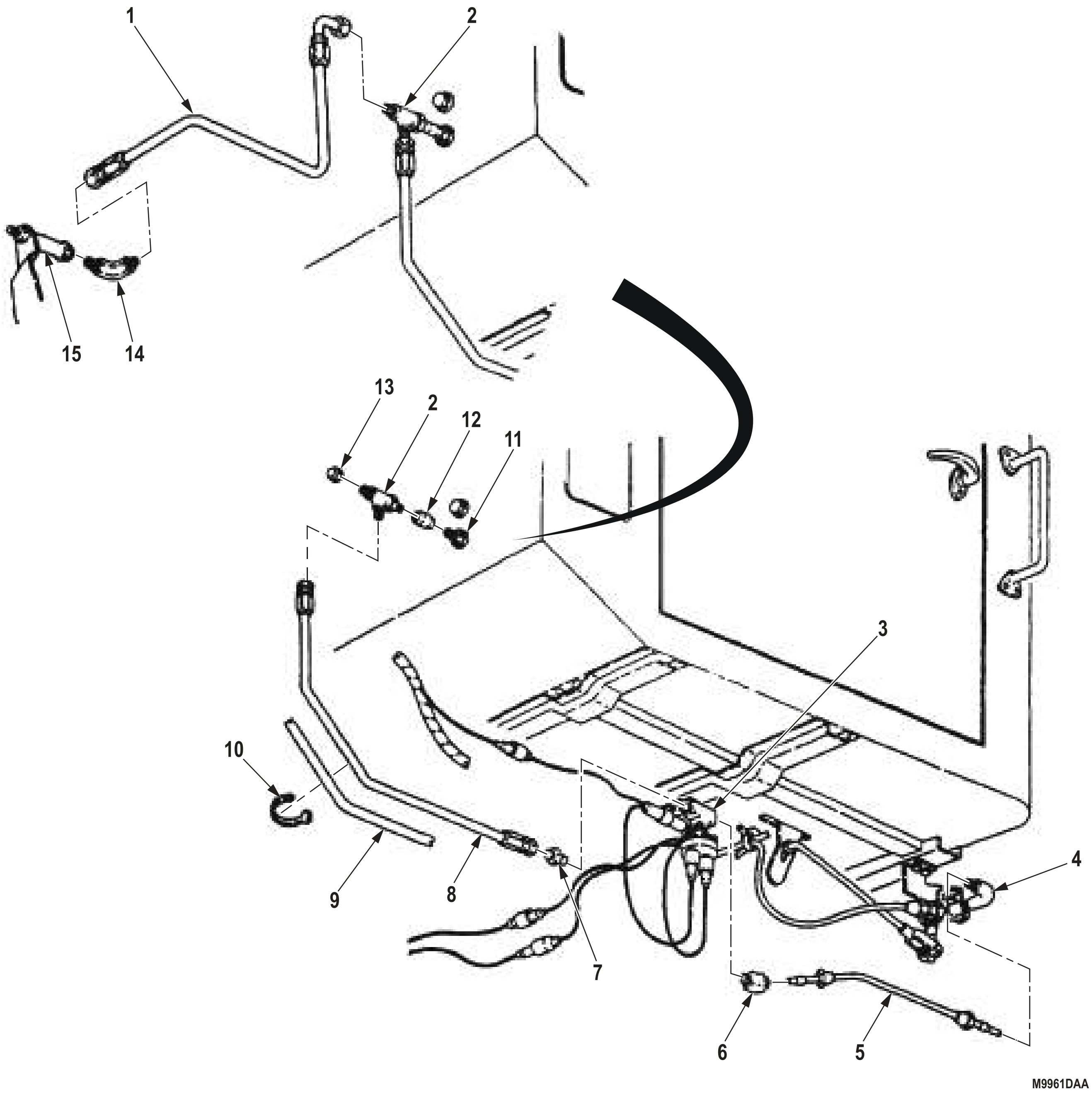


Figure 6. Governor Piping Installation.

END OF TASK

FOLLOW-ON MAINTENANCE

Start engine, allow air pressure to build up to normal operating range, and check for leaks. Road test vehicle. (TM 9-2320-272-10)

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
TRANSMISSION 5TH GEAR LOCK-UP PRESSURE SWITCH REPLACEMENT

INITIAL SETUP:

Tools and Special Tools
Tool Kit, General Mechanic's: Automotive (Volume 5, WP 0826, Table 1, Item 56)

Equipment Condition
Parking brake set. (TM 9-2320-272-10)

Equipment Condition (cont.)
Wheels chocked. (TM 9-2320-272-10)
Battery ground cable disconnected. (Volume 2, WP 0350)

REMOVAL

1. Disconnect two capacitor leads (Figure 1, Item 3) from pressure switch (Figure 1, Item 2).
2. Remove pressure switch (Figure 1, Item 2) from tee (Figure 1, Item 1).

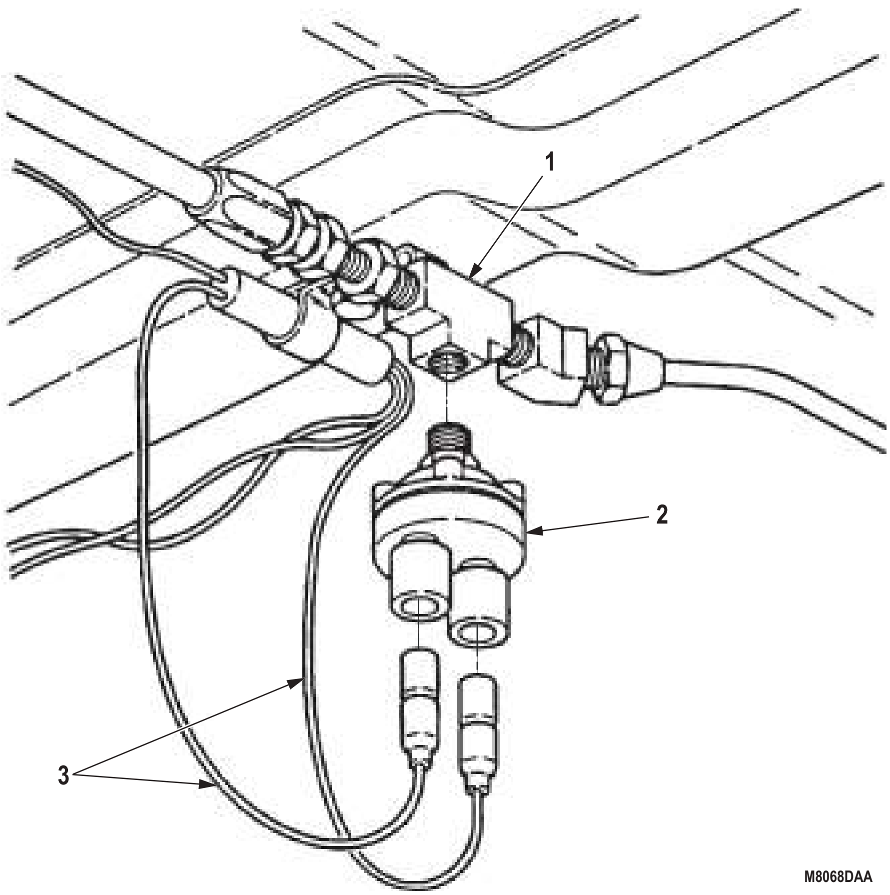


Figure 1. Pressure Switch Removal.

END OF TASK

INSTALLATION

1. Install pressure switch (Figure 2, Item 2) on tee (Figure 2, Item 1).
2. Connect two capacitor leads (Figure 2, Item 3) to pressure switch (Figure 2, Item 2).

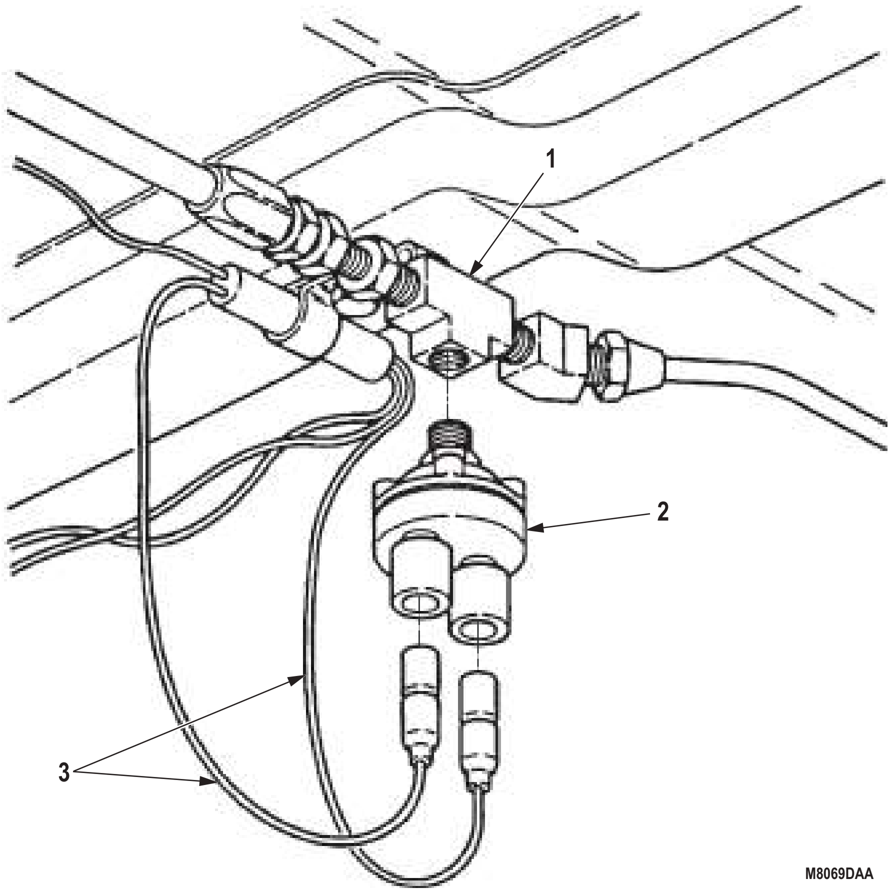


Figure 2. Pressure Switch Installation.

END OF TASK

FOLLOW-ON MAINTENANCE

Connect battery ground cable. (Volume 2, WP 0350)

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
TRANSMISSION SELECT LEVER REPLACEMENT

INITIAL SETUP:

Tools and Special Tools

Tool Kit, General Mechanic's: Automotive
(Volume 5, WP 0826, Table 1, Item 56)

Materials/Parts

Lockwasher
(Volume 5, WP 0827, Table 1, Item 394)
Qty: 1

Equipment Condition

Parking brake set. (TM 9-2320-272-10)

Equipment Condition (cont.)

Battery ground cables disconnected. (Volume 2, WP 0350)

REMOVAL

1. Remove four screws (Figure 1, Item 14) and lockwashers (Figure 1, Item 15) from control lever console (Figure 1, Item 16). Discard lockwashers.
2. Pull select lever assembly (Figure 1, Item 1) away from control lever console (Figure 1, Item 16).

NOTE

Tag leads for installation.

3. Disconnect three leads (Figure 1, Item 13) from harness leads (Figure 1, Item 12).
4. Remove two nuts (Figure 1, Item 11), cable clamp (Figure 1, Item 10), shim (Figure 1, Item 8), two screws (Figure 1, Item 6), and washers (Figure 1, Item 7) from hanger plate (Figure 1, Item 5).
5. Remove spring clip (Figure 1, Item 2) and pull trunnion (Figure 1, Item 3) and shift cable (Figure 1, Item 9) from selector lever plate (Figure 1, Item 4).
6. Remove selector lever assembly (Figure 1, Item 1) from vehicle.

REMOVAL - Continued

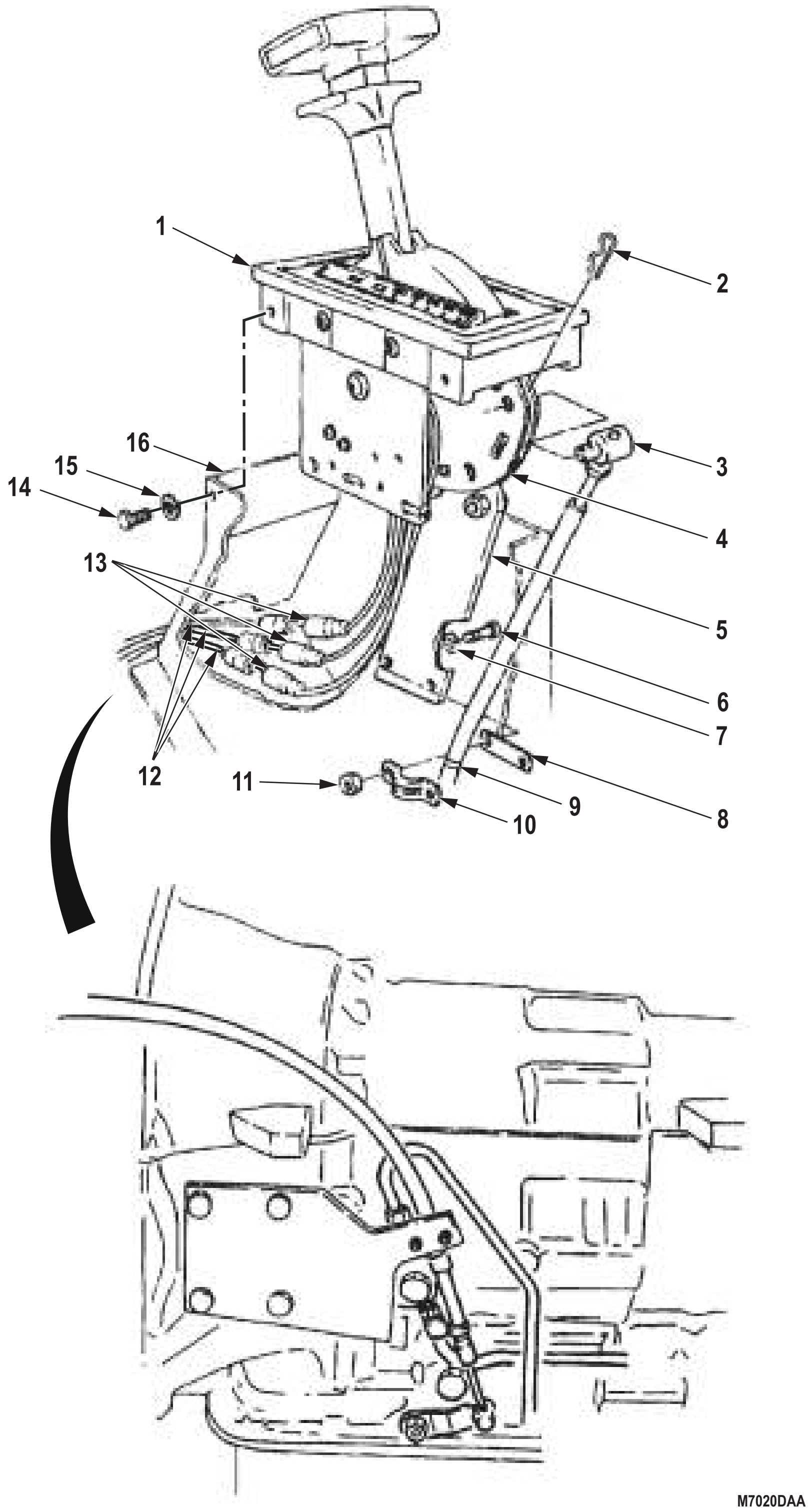


Figure 1. Transmission Select Lever Removal.

END OF TASK

INSTALLATION

NOTE

Vehicle must be started in N (neutral) to check selector lever assembly. Vehicle will start if installation is correct. Remove and reinstall selector lever assembly if vehicle fails to start in N (neutral).

1. Place selector lever (Figure 2, Item 1) in neutral position.
2. Place manual control linkage arm (Figure 2, Item 19) in neutral position. Linkage arm will be one detent down from full up position.
3. Install shim (Figure 2, Item 9), shift cable (Figure 2, Item 10), and cable clamp (Figure 2, Item 11) on hanger plate (Figure 2, Item 6) with two washers (Figure 2, Item 8), screws (Figure 2, Item 7), and nuts (Figure 2, Item 12). Ensure cable clamp seats in groove of shift cable housing.
4. Loosen jamnut (Figure 2, Item 4) and align cable trunnion (Figure 2, Item 3) with first hole above elongated slot in selector lever plate (Figure 2, Item 5). Cable trunnion is turned clockwise to shorten and counterclockwise to lengthen. Tighten jamnut and install in plate with spring clip (Figure 2, Item 2).
5. Connect three electrical leads (Figure 2, Item 14) to harness leads (Figure 2, Item 13).
6. Install selector lever assembly (Figure 2, Item 18) in control lever console (Figure 2, Item 17) with four lockwashers (Figure 2, Item 16) and screws (Figure 2, Item 15).

INSTALLATION - Continued

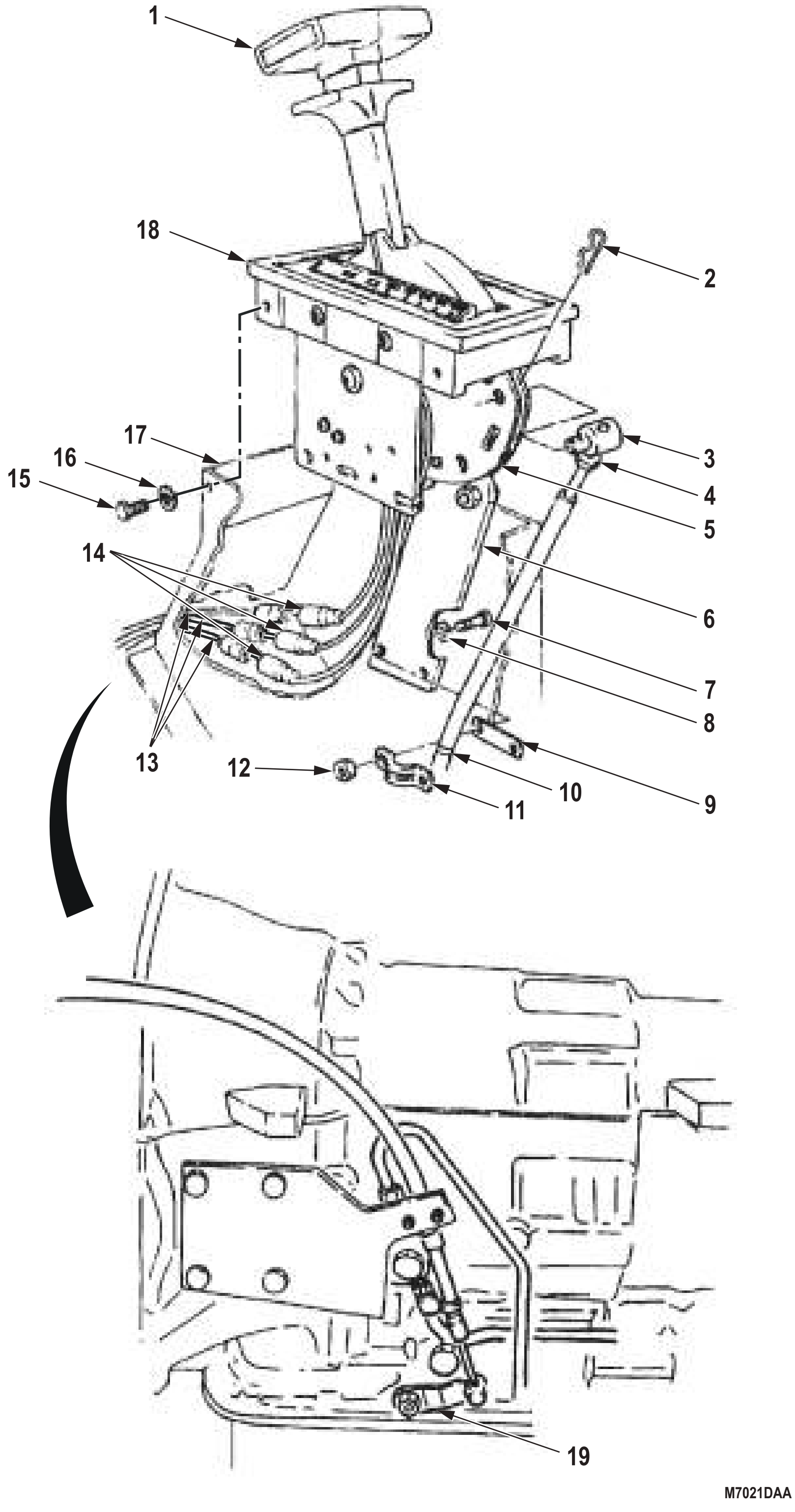


Figure 2. Transmission Select Lever Installation.

END OF TASK

FOLLOW-ON MAINTENANCE

1. Connect battery ground cables. (Volume 2, WP 0350)
2. Start engine and road test vehicle. (TM 9-2320-272-10)

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
TRANSMISSION SHIFT TOWER REPLACEMENT

INITIAL SETUP:

Tools and Special Tools
Tool Kit, General Mechanic's: Automotive
(Volume 5, WP 0826, Table 1, Item 56)

Materials/Parts
Gasket (Volume 5, WP 0827, Table 1, Item 175)
Qty: 1
Lockwasher
(Volume 5, WP 0827, Table 1, Item 394)
Qty: 11

Equipment Condition
CTIS ECU removed. (Volume 5, WP 0813)

Equipment Condition (cont.)
Transmission selector lever removed. (WP 0369)

REMOVAL

NOTE

Vehicles equipped with winch will have winch control tower attached to shift tower. Two screws and washers in Step (1) will be removed from winch control tower.

1. Remove four screws (Figure 1, Item 4), washers (Figure 1, Item 3), and shift tower (Figure 1, Item 2) from access cover (Figure 1, Item 1).

NOTE

Perform Steps (2) through (7) for M939A2 series vehicles.

2. Remove two screws (Figure 1, Item 5) and washers (Figure 1, Item 6) from bracket (Figure 1, Item 7) and front mount bracket (Figure 1, Item 12).
3. Remove screw (Figure 1, Item 15) and rear mount bracket (Figure 1, Item 14) from shift tower base (Figure 1, Item 13).
4. Remove screw (Figure 1, Item 10) and front mount bracket (Figure 1, Item 12) from shift tower base (Figure 1, Item 13).
5. Remove grommet (Figure 1, Item 11) from front mount bracket (Figure 1, Item 12).
6. Remove four screws (Figure 1, Item 9), lockwashers (Figure 1, Item 8), shift tower base (Figure 1, Item 13), and gasket (Figure 1, Item 16) from mounting bracket (Figure 1, Item 17). Discard lockwashers and gasket.
7. Remove seven screws (Figure 1, Item 18), lockwashers (Figure 1, Item 19), and mounting bracket (Figure 1, Item 17) from floor (Figure 1, Item 20). Discard lockwashers.

REMOVAL - Continued

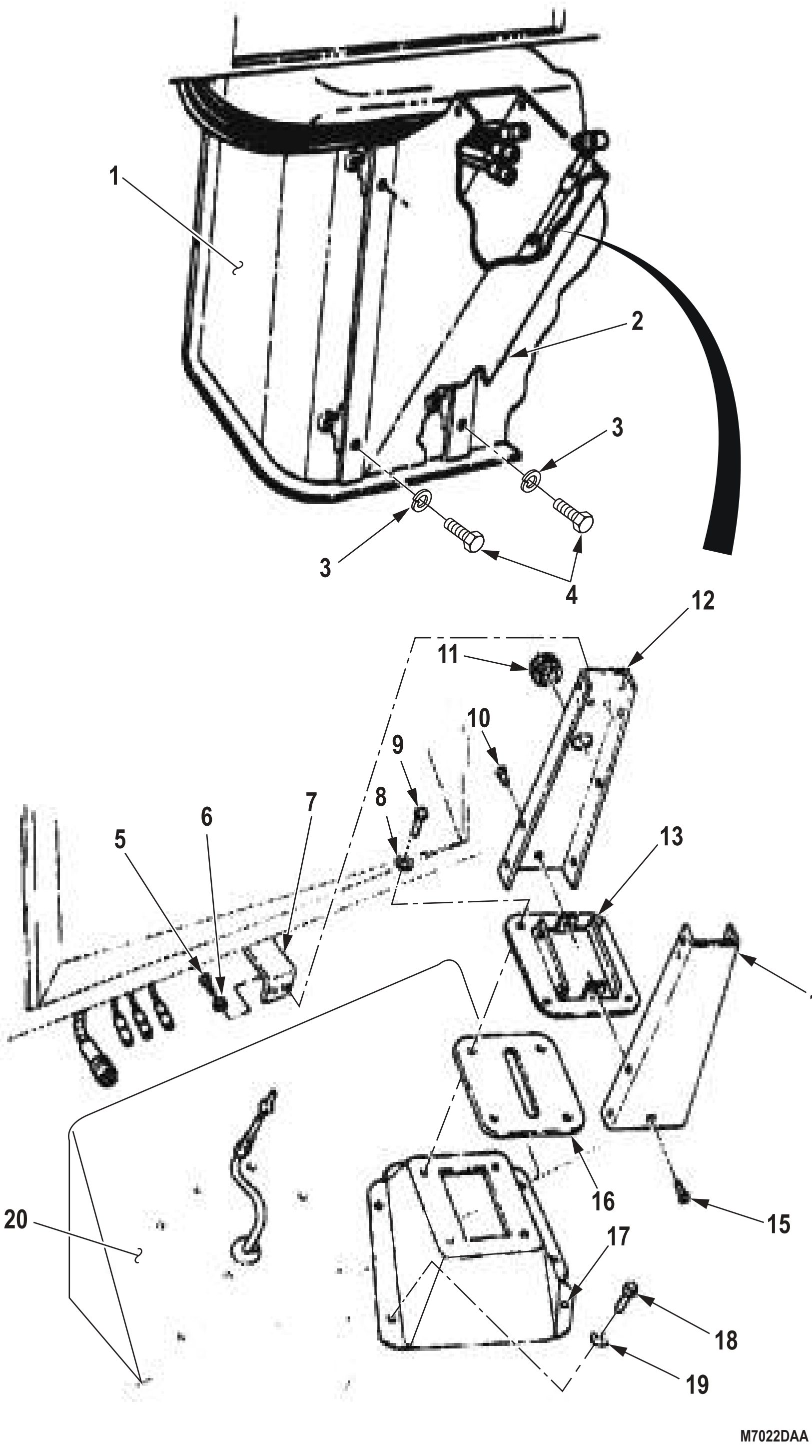


Figure 1. Transmission Shift Tower Removal.

END OF TASK

INSTALLATION

NOTE

- Perform Steps (1) through (7) for M939A2 series vehicles.
- Do not tighten screws until transmission shift tower is fully installed.

1. Install mounting bracket (Figure 2, Item 17) on floor (Figure 2, Item 20) with seven lockwashers (Figure 2, Item 19) and screws (Figure 2, Item 18).
2. Install gasket (Figure 2, Item 16) and shift tower base (Figure 2, Item 13) on mounting bracket (Figure 2, Item 17) with four lockwashers (Figure 2, Item 8) and screws (Figure 2, Item 9).
3. Install grommet (Figure 2, Item 11) on front mount bracket (Figure 2, Item 12).
4. Install front mount bracket (Figure 2, Item 12) on shift tower base (Figure 2, Item 13) with screw (Figure 2, Item 10). Finger-tighten screw.
5. Install rear mount bracket (Figure 2, Item 14) on shift tower base (Figure 2, Item 13) with screw (Figure 2, Item 15). Finger-tighten screw.
6. Install front mount bracket (Figure 2, Item 12) on bracket (Figure 2, Item 7) with two washers (Figure 2, Item 6) and screws (Figure 2, Item 5). Finger-tighten screws.
7. Tighten screws (Figure 2, Items 5, 10, and 15).

NOTE

- Vehicles equipped with winch will have winch control tower installed attached to shift tower.
- Two screws and washers in Step (8) will be installed in winch control tower.

8. Install shift tower (Figure 2, Item 2) on access cover (Figure 2, Item 1) with four washers (Figure 2, Item 3) and screws (Figure 2, Item 4).

INSTALLATION - Continued

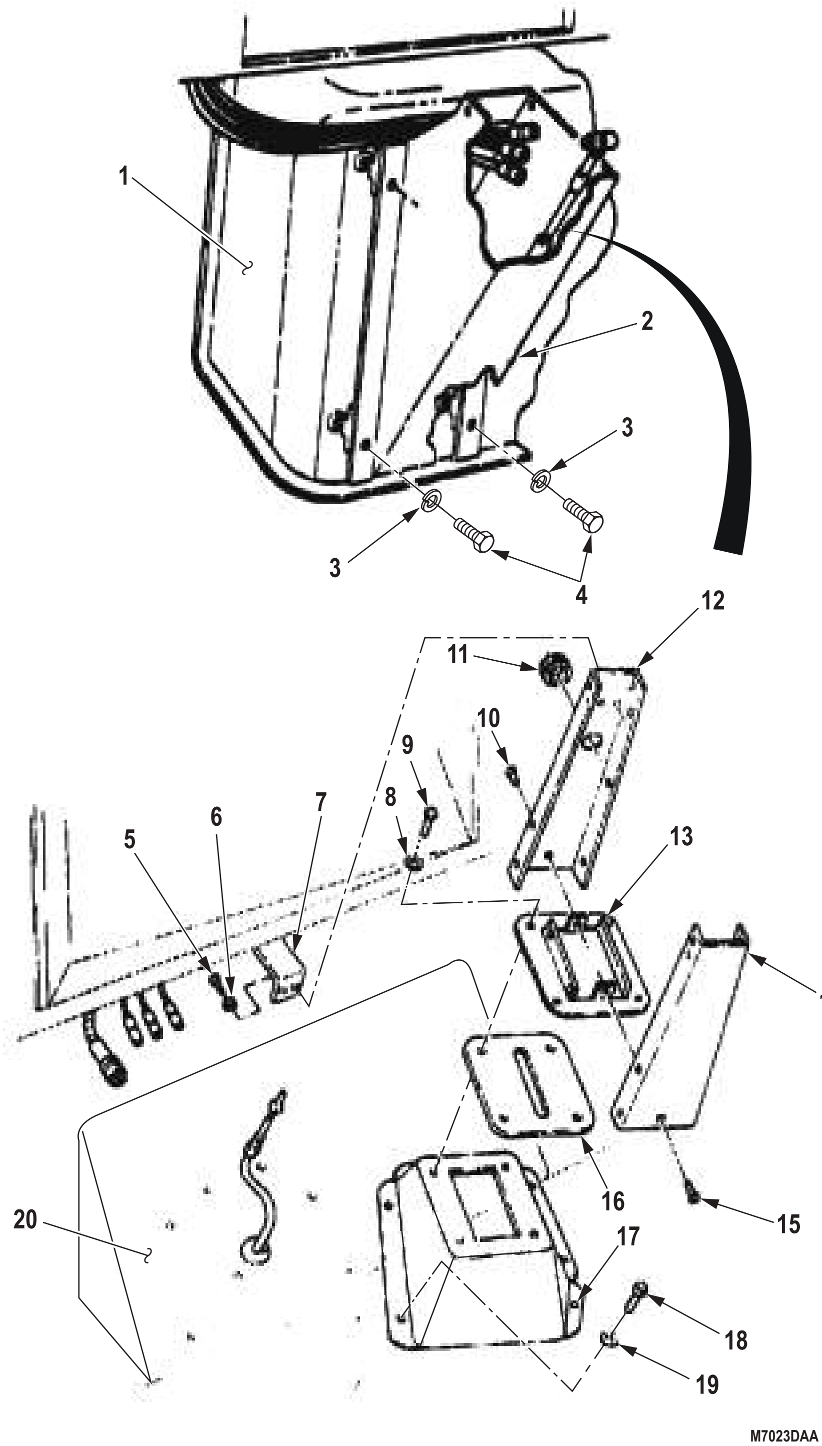


Figure 2. Transmission Shift Tower Installation.

END OF TASK

FOLLOW-ON MAINTENANCE

1. Install transmission selector lever. (WP 0369)
2. Install CTIS ECU (M939A2 only). (Volume 5, WP 0813)

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
TRANSMISSION SHIFT CABLE REPLACEMENT

INITIAL SETUP:

Tools and Special Tools
Tool Kit, General Mechanic's: Automotive
(Volume 5, WP 0826, Table 1, Item 56)

Materials/Parts
Locknut (M939/A1)
(Volume 5, WP 0827, Table 1, Item 312)
Qty: 2
Locknut (M939A2)
(Volume 5, WP 0827, Table 1, Item 61)
Qty: 2

Personnel Required
(2)

Equipment Condition
Parking brake set. (TM 9-2320-272-10)
Left splash shield removed. (TM 9-2320-272-10)
Transmission selector lever removed. (WP 0369)

REMOVAL

1. Remove two locknuts (Figure 1, Item 1), U-bolt (Figure 1, Item 4), clamp (Figure 1, Item 3), and shift cable (Figure 1, Item 2) from transmission lock-in solenoid bracket (Figure 1, Item 9). Discard locknuts.

NOTE

Perform Step (2) for M929/A1/A2 and M934/A1/A2 model vehicles.

2. Remove two locknuts (Figure 1, Item 1), screws (Figure 1, Item 10), clamp (Figure 1, Item 3), and shift cable (Figure 1, Item 2) from transmission lock-in solenoid bracket (Figure 1, Item 9). Discard locknuts.
3. Remove spring clip (Figure 1, Item 7) and shift cable (Figure 1, Item 2) from manual control linkage (Figure 1, Item 8).
4. Loosen jamnut (Figure 1, Item 5) and remove trunnion (Figure 1, Item 6) and jamnut from shift cable (Figure 1, Item 2).

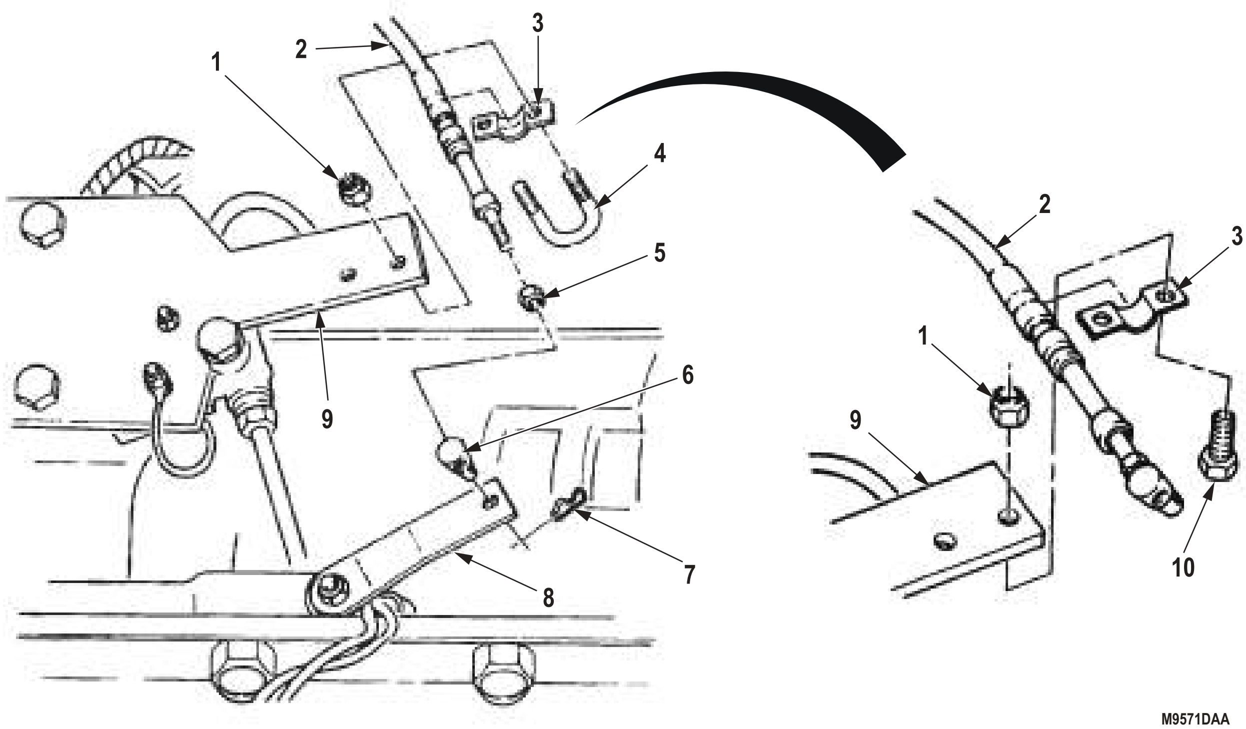


Figure 1. Transmission Shift Cable Removal.

REMOVAL - Continued

5. Loosen jamnut (Figure 2, Item 3) and remove trunnion (Figure 2, Item 2) and jamnut from shift cable (Figure 2, Item 4) at shift tower (Figure 2, Item 1).
6. Remove shift cable (Figure 2, Item 4) from vehicle.

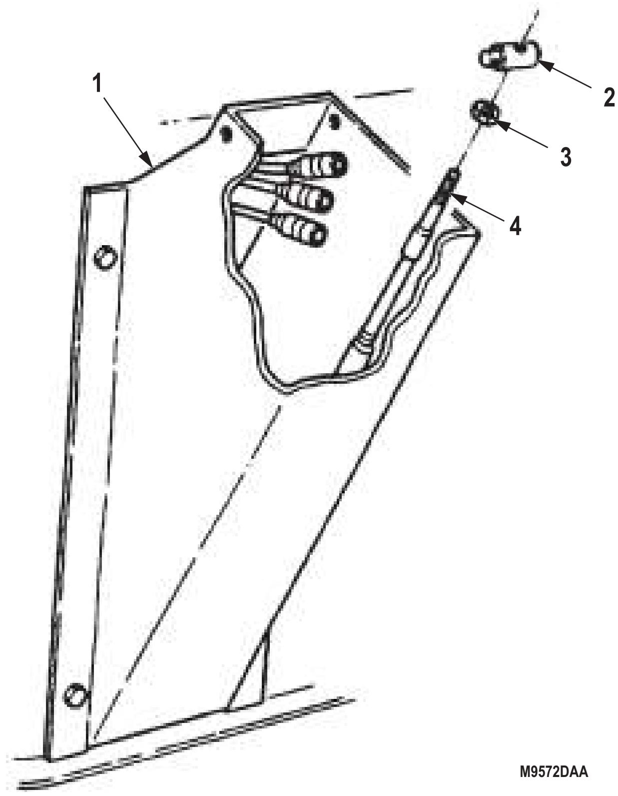


Figure 2. Shift Tower Removal.

REMOVAL - Continued

7. Remove grommet (Figure 3, Item 2) from engine cover (Figure 3, Item 1).

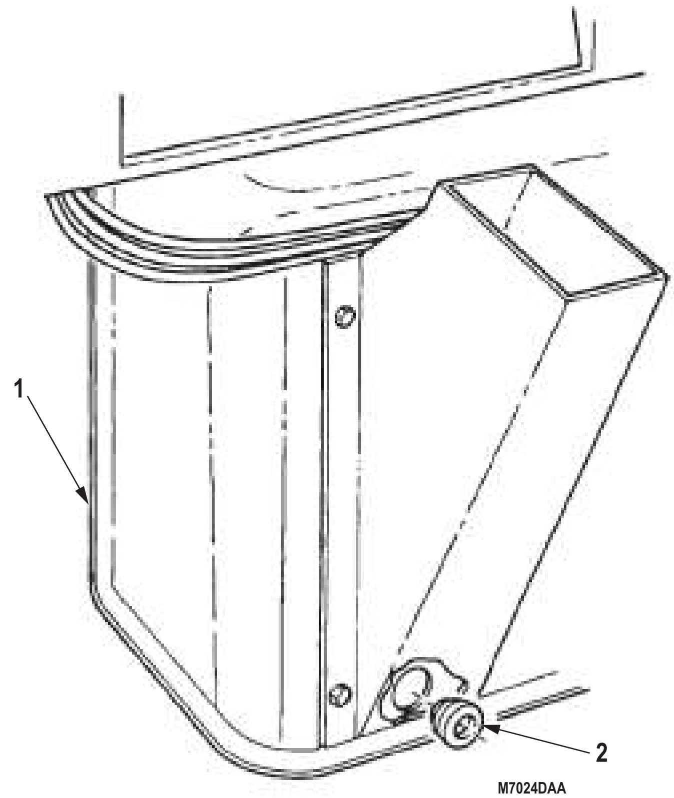


Figure 3. Engine Cover Removal.

END OF TASK

INSTALLATION

1. Install grommet (Figure 4, Item 2) on engine cover (Figure 4, Item 1).

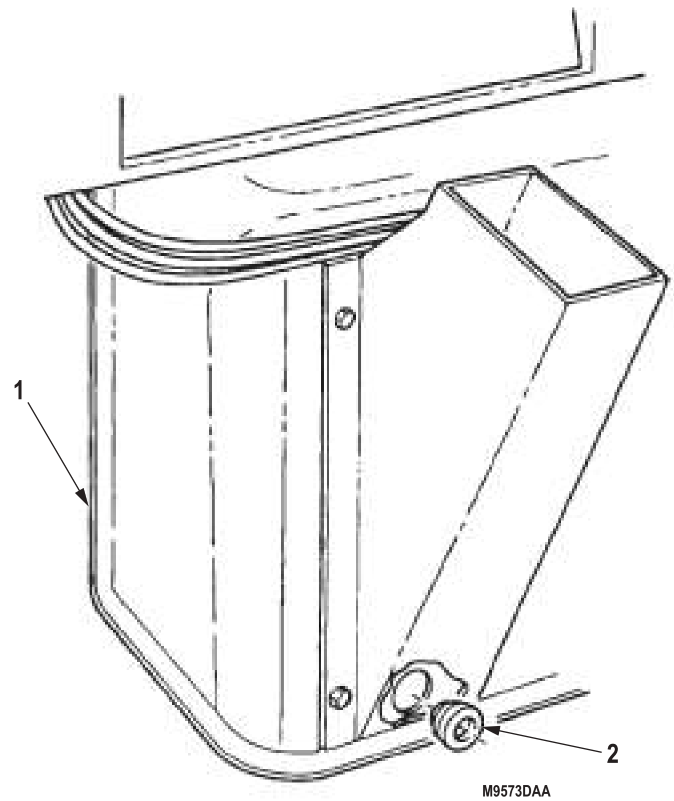


Figure 4. Engine Cover Installation.

INSTALLATION - Continued

NOTE

Assistant will help with Step (2).

2. Route shift cable (Figure 5, Item 4) from shift tower (Figure 5, Item 2), through shift tower (Figure 5, Item 1).
3. Install jamnut (Figure 5, Item 3) and trunnion (Figure 5, Item 2) on shift cable (Figure 5, Item 4) at shift tower (Figure 5, Item 1). Thread trunnion on shift cable until shift cable is flush with trunnion. Tighten jamnut.

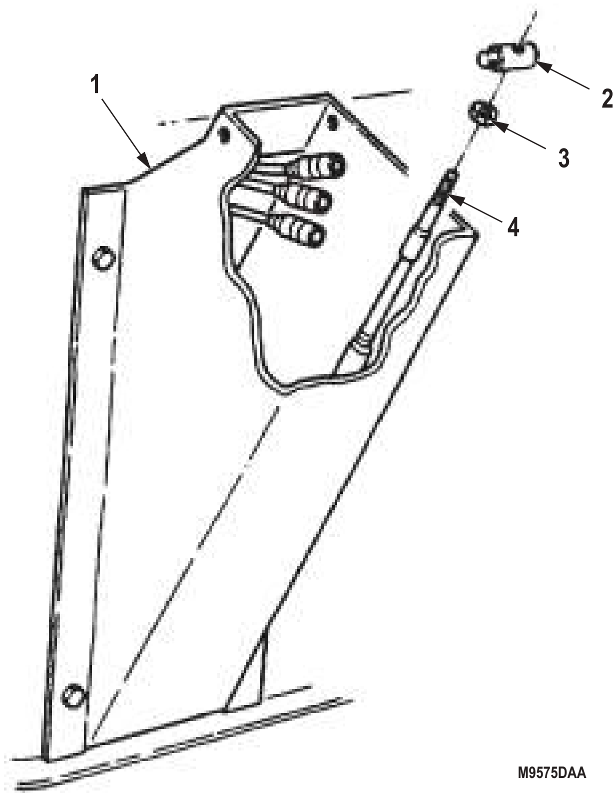


Figure 5. Shift Tower Installation.

INSTALLATION - Continued

4. Install jamnut (Figure 6, Item 5) and trunnion (Figure 6, Item 6) on shift cable (Figure 6, Item 2) at transmission (Figure 6, Item 9). Do not tighten jamnut.
5. Install shift cable (Figure 6, Item 2) on manual control linkage (Figure 6, Item 8) with spring clip (Figure 6, Item 7).

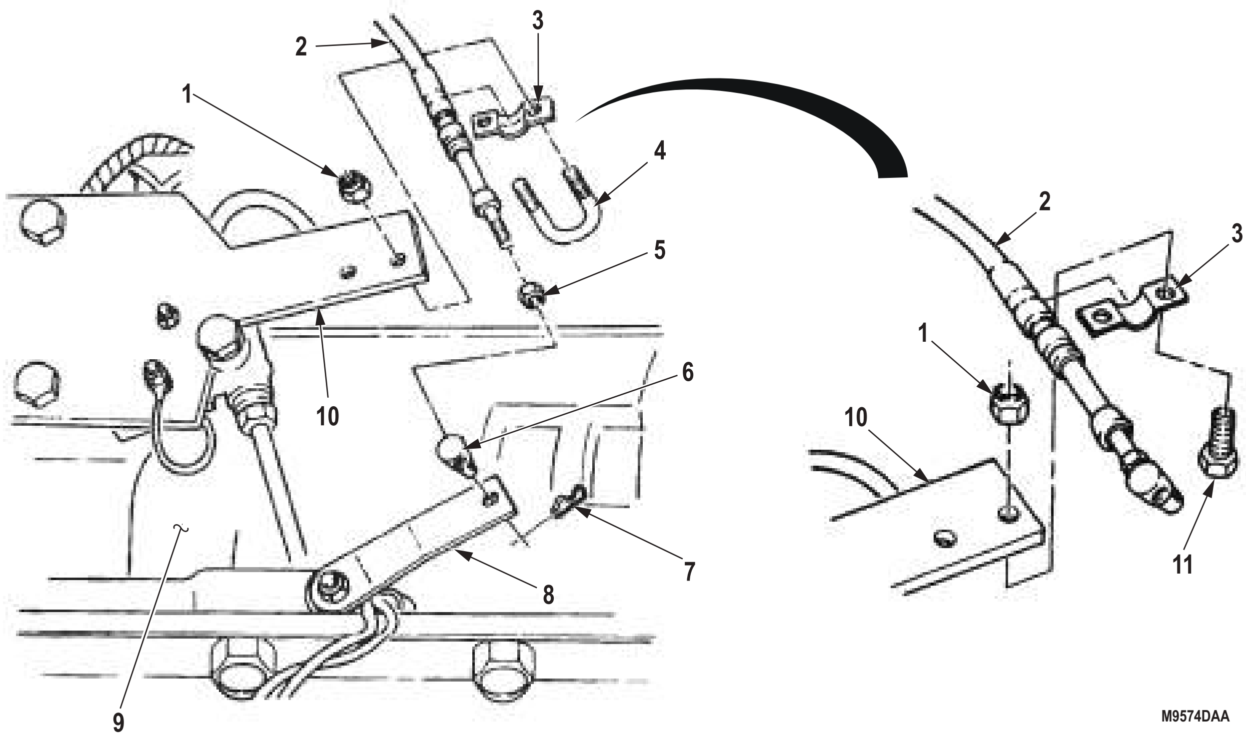


Figure 6. Shift Cable Installation.

INSTALLATION - Continued

NOTE

Perform Step (6) for M929/A1/A2 and M934/A1/A2 model vehicles.

6. Install shift cable (Figure 7, Item 1) on transmission lock-in solenoid bracket (Figure 7, Item 8) with clamp (Figure 7, Item 2), two screws (Figure 7, Item 10), and locknuts (Figure 7, Item 9), ensuring clamp seats in groove of shift cable.
7. Install shift cable (Figure 7, Item 1) on transmission lock-in solenoid bracket (Figure 7, Item 8) with clamp (Figure 7, Item 2), U-bolt (Figure 7, Item 3), and two locknuts (Figure 7, Item 9), ensuring clamp seats in groove of shift cable.

CAUTION

Ensure manual control linkage arm is in proper detent for each transmission selector position. Failure to do so may cause damage to transmission.

8. Remove spring clip (Figure 7, Item 6) and shift cable (Figure 7, Item 1) from manual control linkage (Figure 7, Item 7), if necessary.
9. Place manual control linkage (Figure 7, Item 7) and transmission selector lever in first gear position.
10. Align hole of manual control linkage (Figure 7, Item 7) with trunnion (Figure 7, Item 5). If trunnion does not align, loosen jamnut (Figure 7, Item 4), and turn trunnion clockwise to shorten or counterclockwise to lengthen. Tighten jamnut.
11. Install shift cable (Figure 7, Item 1) on manual control linkage (Figure 7, Item 7) with spring clip (Figure 7, Item 6).

INSTALLATION - Continued

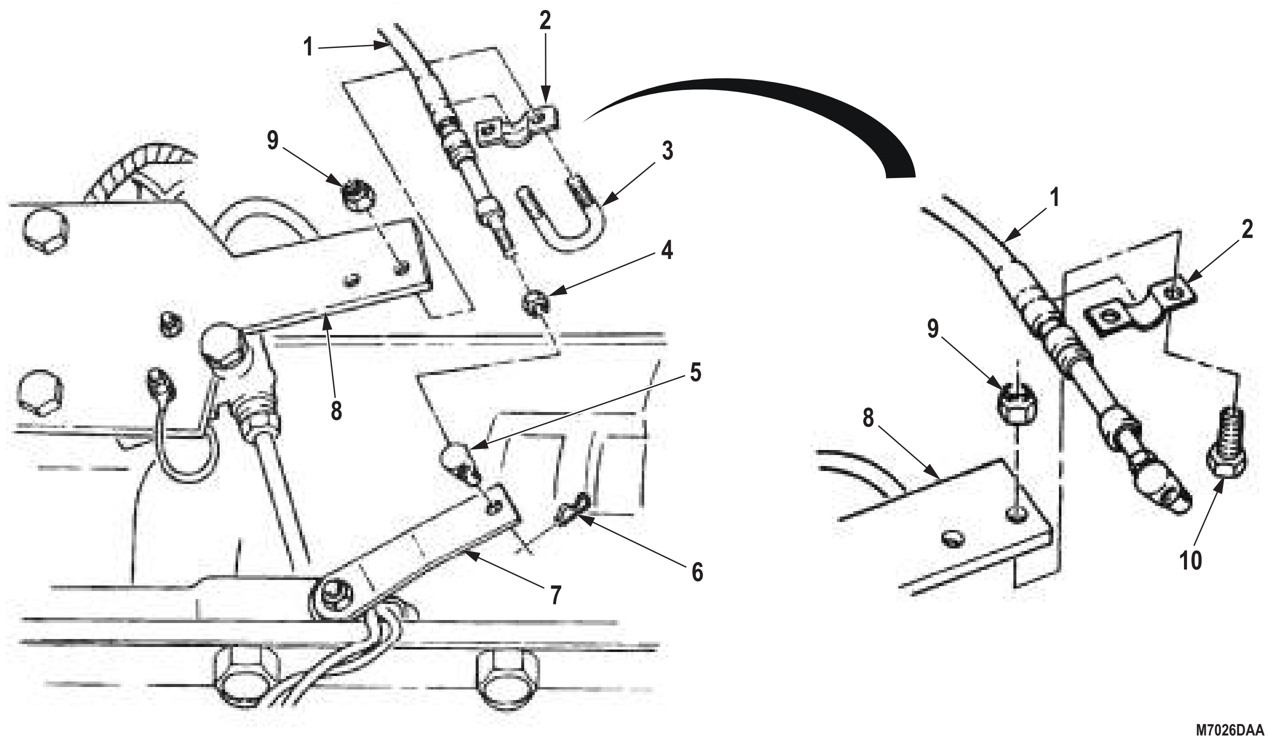


Figure 7. Shift Cable Installation.

END OF TASK

FOLLOW-ON MAINTENANCE

1. Install transmission selector lever. (WP 0369)
2. Install left splash shield. (TM 9-2320-272-10)
3. Start engine and road test vehicle. (TM 9-2320-272-10)

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
TRANSMISSION REPLACEMENT (OUT-OF-VEHICLE)

INITIAL SETUP:

Tools and Special Tools

Tool Kit, General Mechanic's: Automotive
(Volume 5, WP 0826, Table 1, Item 56)
Barring Tool, Engine
(Volume 5, WP 0826, Table 1, Item 7)
Lift, Transmission and Differential
(Volume 5, WP 0826, Table 1, Item 33)
Wrench, Torque, Click, Ratcheting, 1/2" Drive, 250 Ft-Lb
(Volume 5, WP 0826, Table 1, Item 63)

Materials/Parts

Gasket (Volume 5, WP 0827, Table 1, Item 111)
Qty: 1

Materials/Parts (cont.)

Gasket (Volume 5, WP 0827, Table 1, Item 208)
Qty: 1
Lockwasher
(Volume 5, WP 0827, Table 1, Item 186)
Qty: 12

Personnel Required

(2)

Equipment Condition

Power plant removed. (Volume 2, WP 0211) or (Volume 2, WP 0213)

REMOVAL

NOTE

- The use of shim stock tube in torque converter access hole prevents converter screw from falling down behind flywheel. A loose screw may cause a lockup condition, preventing crankshaft rotation required to remove remaining screws.
- Engine crankshaft may be turned using barring tool.

1. Remove two screws (Figure 1, Item 7), access cover (Figure 1, Item 6), and gasket (Figure 1, Item 5) from flywheel housing (Figure 1, Item 1). Discard gasket.
2. Using engine barring tool, rotate crankshaft until screw (Figure 1, Item 4) is visible in access hole (Figure 1, Item 3).
3. Roll shim stock (Figure 1, Item 3) into tube form and size to fit diameter of access hole (Figure 1, Item 2). Insert shim stock in access hole and position over screw (Figure 1, Item 4) and against flywheel (Figure 1, Item 13).
4. Remove remaining 12 screws (Figure 1, Item 4) from flywheel (Figure 1, Item 13) and converter (Figure 1, Item 12) in the same manner.
5. Remove four screws (Figure 1, Item 8), lockwashers (Figure 1, Item 9), and clamp (Figure 1, Item 10) from 9, 11, 1, and 3 o'clock positions on flywheel housing (Figure 1, Item 1) and transmission (Figure 1, Item 11). Discard lockwashers.

REMOVAL - Continued

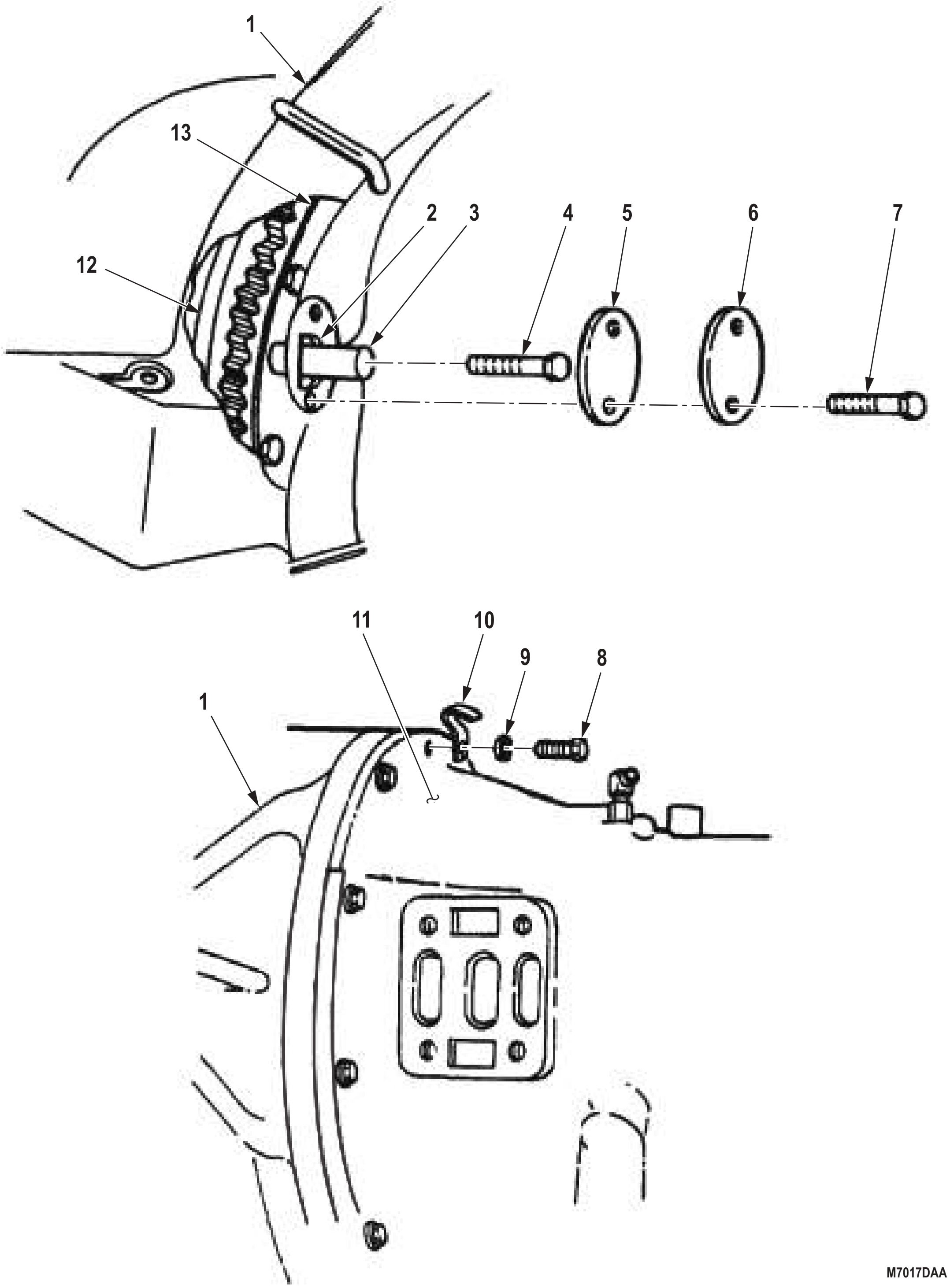


Figure 1. Flywheel Housing and Transmission Removal.

REMOVAL - Continued

NOTE

Guide or alignment screws can be made from extra screws that are longer and of the same thread size.

6. Install four guide screws (Figure 2, Item 14) at 9, 11, 1, and 3 o'clock positions on flywheel housing (Figure 2, Item 1).
7. Position transmission jack (Figure 2, Item 7) under transmission (Figure 2, Item 3) and raise until weight of transmission is supported by jack.
8. Remove eight remaining screws (Figure 2, Item 6) and lockwashers (Figure 2, Item 5) from flywheel housing (Figure 2, Item 1) and transmission (Figure 2, Item 3). Discard lockwashers.

WARNING

- Keep rear of transmission tilted slightly downward at all times to prevent converter from sliding off. Failure to comply may result in damage to equipment, injury, or death to personnel.
- Torque converter must be removed with transmission as an assembly. Failure to comply may result in damage to equipment, injury, or death to personnel.

9. Separate transmission (Figure 2, Item 3) from flywheel housing (Figure 2, Item 1), keep level until clear of guide screws (Figure 2, Item 14), then tilt rear of transmission downward slightly to prevent converter (Figure 2, Item 10) from separating from transmission.
10. Remove gasket (Figure 2, Item 2) from transmission (Figure 2, Item 3) or flywheel housing (Figure 2, Item 1). Discard gasket.
11. Install retaining strap (Figure 2, Item 8) on converter (Figure 2, Item 10) with two screws (Figure 2, Item 11).
12. Install retaining strap (Figure 2, Item 8) on transmission (Figure 2, Item 3) with four screws (Figure 2, Item 9), washers (Figure 2, Item 13), and nuts (Figure 2, Item 12).
13. Remove four guide screws (Figure 2, Item 14) from flywheel housing (Figure 2, Item 1).

REMOVAL - Continued

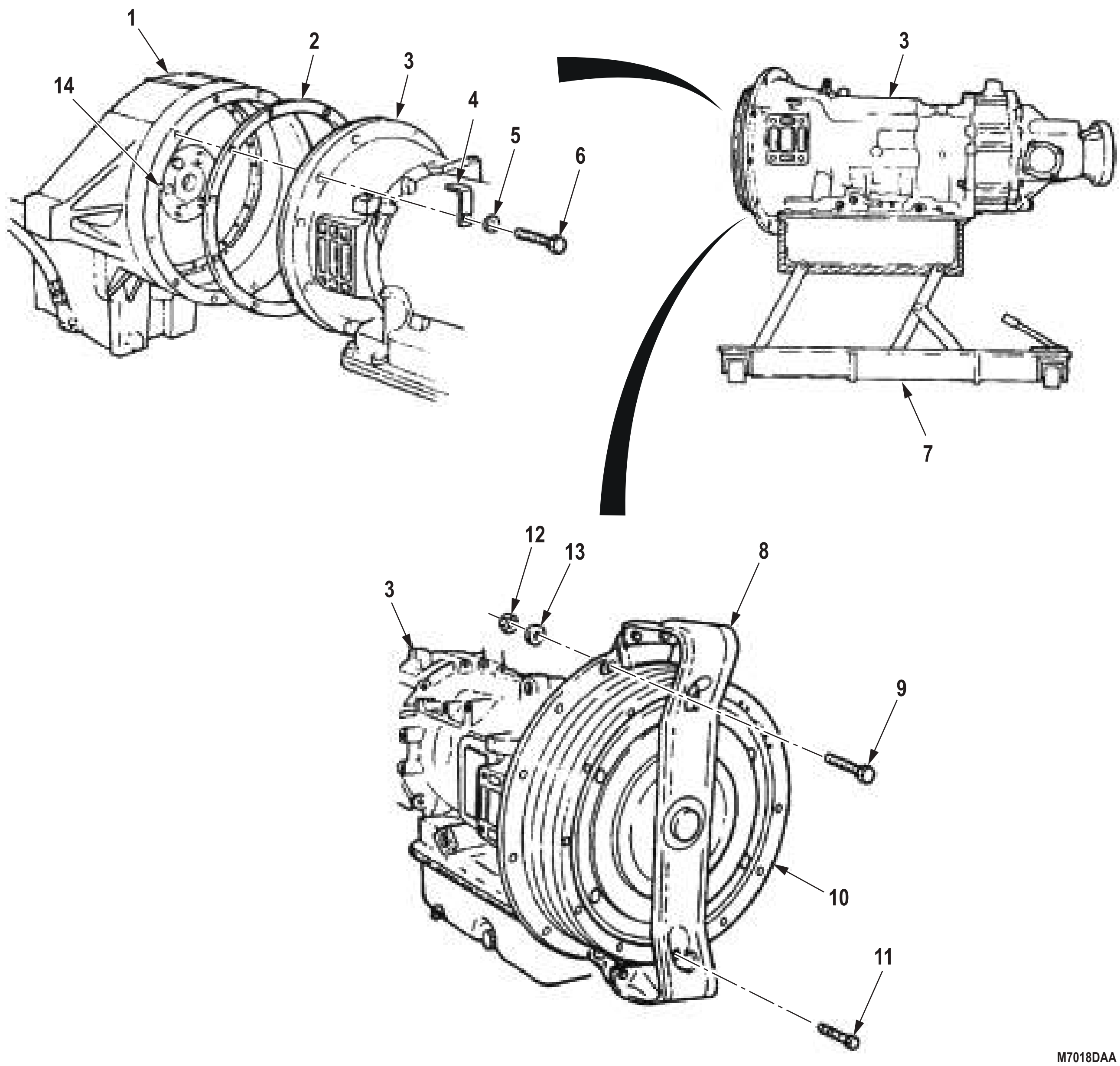


Figure 2. Transmission and Torque Convert Removal.

END OF TASK

INSTALLATION

WARNING

- Keep rear of transmission tilted slightly downward at all times to prevent converter from sliding off. Failure to comply may result in damage to equipment, injury, or death to personnel.
- Torque converter must be installed with transmission as an assembly. Failure to comply may result in damage to equipment, injury, or death to personnel.

1. Install four guide screws (Figure 3, Item 14) at 9, 11, 1, and 3 o'clock positions on flywheel housing (Figure 3, Item 1).
2. Place transmission (Figure 3, Item 3) on transmission jack (Figure 3, Item 7).
3. Remove four nuts (Figure 3, Item 2), washers (Figure 3, Item 13), and screws (Figure 3, Item 9) from retaining strap (Figure 3, Item 8) and transmission (Figure 3, Item 3).
4. Remove two screws (Figure 3, Item 11) and retaining strap (Figure 3, Item 8) from converter (Figure 3, Item 10).
5. Position gasket (Figure 3, Item 2) on guide screws (Figure 3, Item 14) and flywheel housing (Figure 3, Item 1).

CAUTION

Maintain transmission alignment to flywheel housing during installation to prevent damage to converter.

6. Raise transmission (Figure 3, Item 3), align with guide screws (Figure 3, Item 14), and seat against flywheel housing (Figure 3, Item 1).
7. Install transmission (Figure 3, Item 3) on flywheel housing (Figure 3, Item 1) with clamp (Figure 3, Item 4), eight lockwashers (Figure 3, Item 5), and screws (Figure 3, Item 6). Tighten screws to 36 to 40 lb-ft (49 to 54 N·m).
8. Remove four guide screws (Figure 3, Item 14) and install remaining four lockwashers (Figure 3, Item 5) and screws (Figure 3, Item 6). Tighten screws to 36 to 40 lb-ft (49 to 54 N·m).

INSTALLATION - Continued

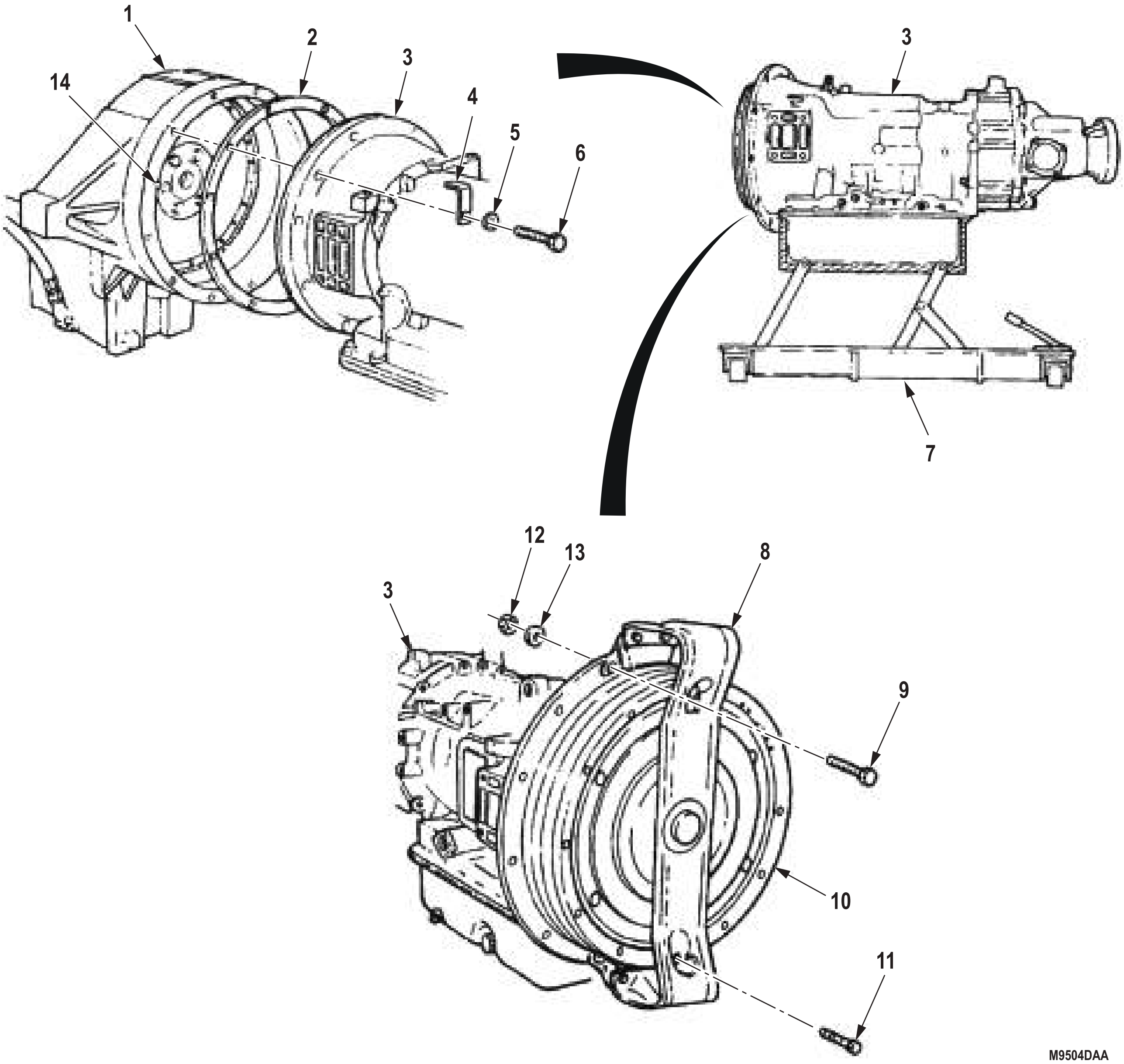


Figure 3. Transmission and Torque Converter Installation.

INSTALLATION - Continued

NOTE

- Use engine barring tool to rotate engine crankshaft when aligning flywheel to converter screw holes.
- The use of shim stock tube in torque converter access hole prevents converter screw from falling down behind flywheel. A loose screw may cause a lockup condition, preventing crankshaft rotation required to install remaining screws.

9. Using engine barring tool, rotate crankshaft until screw holes in converter (Figure 4, Item 9) and flywheel (Figure 4, Item 1) align with access hole (Figure 4, Item 3).
10. Roll shim stock (Figure 4, Item 4) into tube form and size to fit diameter of access hole (Figure 4, Item 3). Insert shim stock in access hole and position over screw hole and against flywheel (Figure 4, Item 1).
11. Install 12 screws (Figure 4, Item 5) on flywheel (Figure 4, Item 1) and converter (Figure 4, Item 9) in the same manner. Tighten screws to 41 to 49 lb-ft (56 to 66 N·m).
12. Remove shim stock (Figure 4, Item 4) from access hole (Figure 4, Item 3).
13. Install gasket (Figure 4, Item 6) and cover plate (Figure 4, Item 7) on flywheel housing (Figure 4, Item 2) with two screws (Figure 4, Item 8). Tighten screws to 5 to 8 lb-ft (7 to 11 N·m).

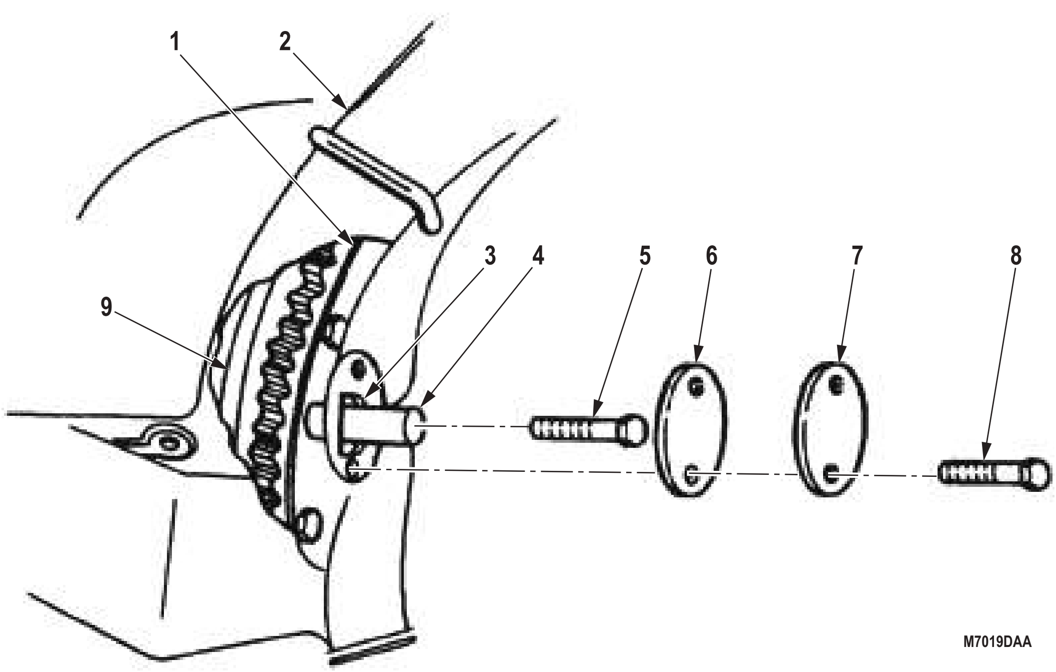


Figure 4. Flywheel and Flywheel Housing Cover Plate Installation.

END OF TASK

FOLLOW-ON MAINTENANCE

Install power plant. (Volume 2, WP 0211) or (Volume 2, WP 0213)

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
TRANSMISSION REPLACEMENT (IN-VEHICLE)

INITIAL SETUP:

Tools and Special Tools

Tool Kit, General Mechanic's: Automotive
(Volume 5, WP 0826, Table 1, Item 56)
Barring Tool, Engine
(Volume 5, WP 0826, Table 1, Item 7)
Lift, Transmission and Differential
(Volume 5, WP 0826, Table 1, Item 33)
Wrench, Torque, Click, Ratcheting, 1/2" Drive, 250 Ft-Lb
(Volume 5, WP 0826, Table 1, Item 63)

Materials/Parts

Cap Set, Protective, Dust and Moisture Seal
(Volume 5, WP 0825, Table 1, Item 13)
Cotter Pin
(Volume 5, WP 0827, Table 1, Item 331)
Qty: 1
Gasket (Volume 5, WP 0827, Table 1, Item 111)
Qty: 1
Gasket (Volume 5, WP 0827, Table 1, Item 208)
Qty: 1
Locknut (Volume 5, WP 0827, Table 1, Item 285)
Qty: 8
Lockwasher
(Volume 5, WP 0827, Table 1, Item 186)
Qty: 13
Lockwasher

Materials/Parts (cont.)

(Volume 5, WP 0827, Table 1, Item 408)
Qty: 2

Equipment Condition

Transmission oil drained. (WP 0362)
Transmission-to-transfer case propeller shaft removed. (WP 0403)
Transmission oil dipstick removed. (WP 0363)
Transmission breather removed. (WP 0384)
Transmission modulator removed. (WP 0365)
Transmission fifth gear lock-in solenoid valve and bracket removed. (WP 0379)
Transmission neutral start switch removed. (WP 0366)
Winch control valve removed (if so equipped). (Volume 4, WP 0721)
or (Volume 4, WP 0681)
Transmission power takeoff removed (if so equipped). (Volume 4, WP 0728)
Transmission oil cooler hoses replacement. (WP 0382)

REMOVAL

CAUTION

Plug all openings to prevent dirt from entering transmission. Damage may occur if dirt or dust enters transmission.

1. Disconnect wire (Figure 1, Item 1) from transmission oil temperature transmitter (Figure 1, Item 8).
2. Remove screw (Figure 1, Item 2), lockwasher (Figure 1, Item 3), and clamp (Figure 1, Item 4) with wire (Figure 1, Item 7) from transmission flange (Figure 1, Item 5). Discard lockwasher.
3. Tie wires (Figure 1, Items 1 and 7) clear of transmission (Figure 1, Item 6).

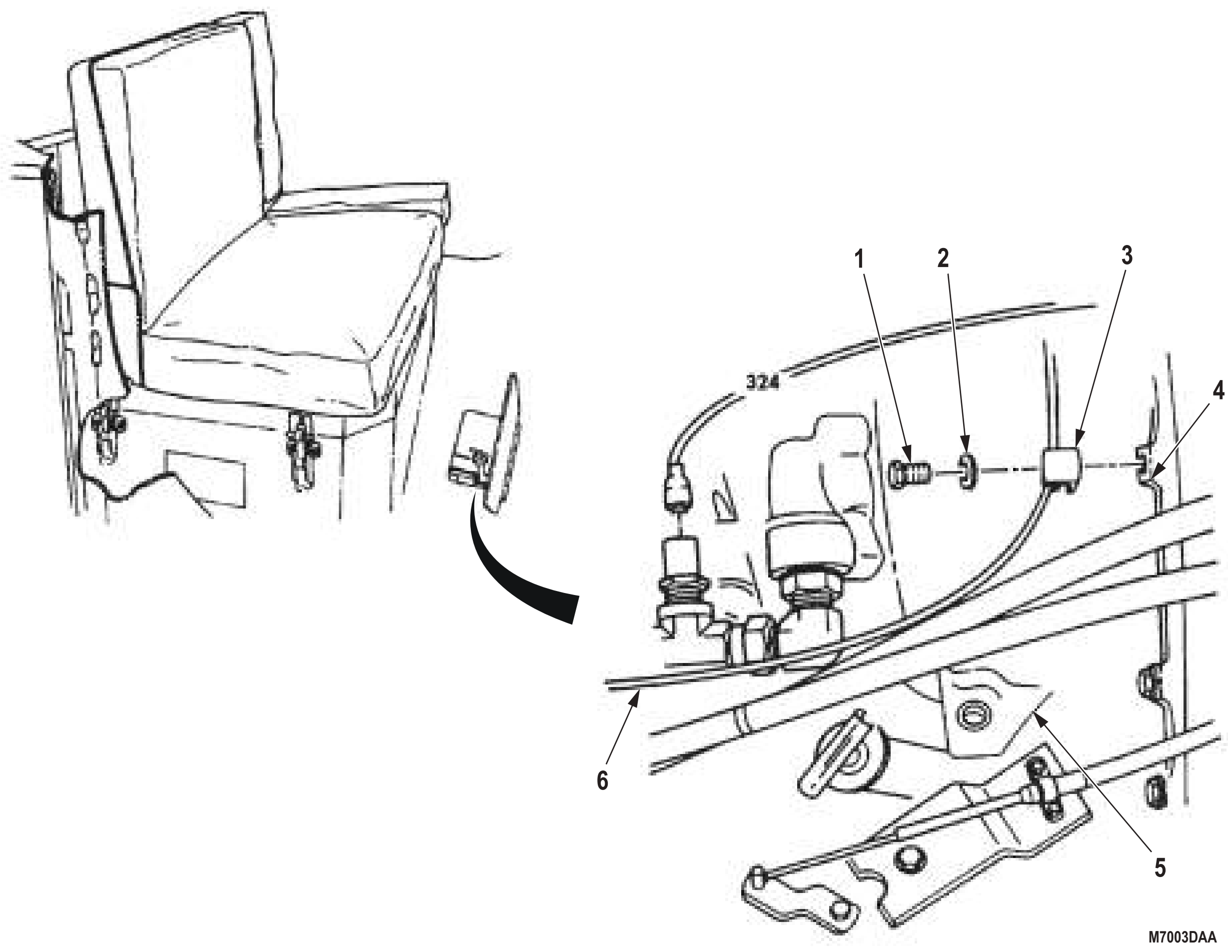


Figure 1. Transmission Flange Clamp and Wire Removal.

REMOVAL - Continued

4. Remove two screws (Figure 2, Item 8) and lockwashers (Figure 2, Item 7) from rear support bracket (Figure 2, Item 9) and transmission (Figure 2, Item 1). Discard lockwashers.

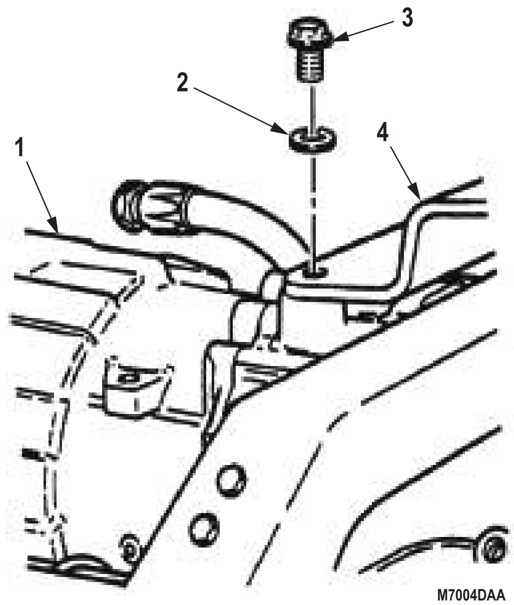


Figure 2. Transmission Support Bracket Removal.

REMOVAL - Continued

NOTE

- The use of shim stock tube in torque converter access hole prevents converter screw from falling down behind flywheel. A loose screw may cause a lockup condition, preventing crankshaft rotation required to remove remaining screws.
- Engine crankshaft may be turned using barring tool.

5. Remove two screws (Figure 3, Item 1), access cover (Figure 3, Item 14), and gasket (Figure 3, Item 13) from flywheel housing (Figure 3, Item 11). Discard gasket.
6. Using engine barring tool, rotate crankshaft until screw (Figure 3, Item 7) is visible in access hole (Figure 3, Item 9).
7. Roll shim stock (Figure 3, Item 8) into tube form and size to fit diameter of access hole (Figure 4, Item 9). Insert shim stock in access hole and position over screw (Figure 3, Item 7) against flywheel (Figure 3, Item 12).
8. Remove remaining 12 screws (Figure 3, Item 7) from flywheel (Figure 3, Item 12) and converter (Figure 3, Item 10) in the same manner.
9. Remove four screws (Figure 3, Item 6), lockwashers (Figure 3, Item 5), and clamp (Figure 3, Item 4) from 9, 11, 1, and 3 o'clock positions on flywheel housing (Figure 3, Item 2) and transmission (Figure 3, Item 3). Discard lockwashers.

REMOVAL - Continued

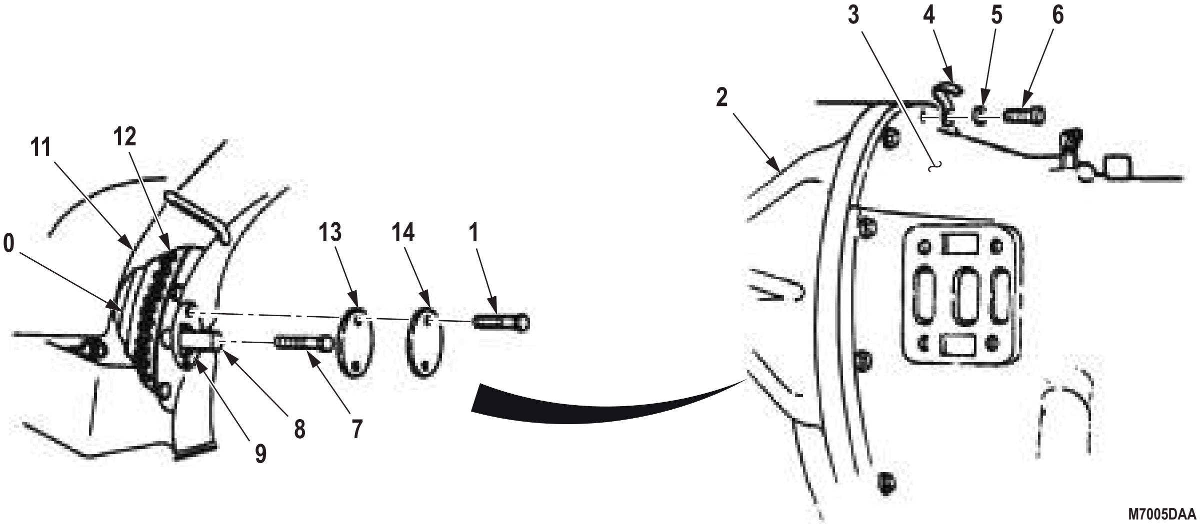


Figure 3. Transmission and Torque Converter Removal.

REMOVAL - Continued

NOTE

Guide or alignment screws can be made from extra screws that are longer and of the same thread size.

10. Install four guide screws (Figure 4, Item 14) at 9, 11, 1, and 3 o'clock positions on flywheel housing (Figure 4, Item 1).
11. Position transmission jack (Figure 4, Item 7) under transmission (Figure 4, Item 3) and raise until weight of transmission is supported by jack.
12. Remove eight remaining screws (Figure 4, Item 6) and lockwashers (Figure 4, Item 5) from flywheel housing (Figure 4, Item 1) and transmission (Figure 4, Item 3). Discard lockwashers.

WARNING

- Keep rear of transmission tilted slightly downward at all times to prevent converter from sliding off. Failure to comply may result in damage to equipment, injury, or death to personnel.
- Torque converter must be removed with transmission as an assembly. Failure to comply may result in damage to equipment, injury, or death to personnel.

13. Separate transmission (Figure 4, Item 3) from flywheel housing (Figure 4, Item 1), keep level until clear of guide screws (Figure 4, Item 14), then tilt rear of transmission downward slightly to prevent converter (Figure 4, Item 10) from separating from transmission.
14. Remove gasket (Figure 4, Item 2) from transmission (Figure 4, Item 3) or flywheel housing (Figure 4, Item 1). Discard gasket.
15. Install retaining strap (Figure 4, Item 8) on converter (Figure 4, Item 10) with two screws (Figure 4, Item 11).
16. Install retaining strap (Figure 4, Item 8) on transmission (Figure 4, Item 3) with four screws (Figure 4, Item 9), washers (Figure 4, Item 13), and nuts (Figure 4, Item 12).
17. Raise front of vehicle until clearance is provided for removal of transmission (Figure 4, Item 3) from under vehicle.
18. Remove transmission (Figure 4, Item 3) and transmission jack (Figure 4, Item 7) from vehicle.
19. Remove four guide screws (Figure 4, Item 14) from flywheel housing (Figure 4, Item 1).

REMOVAL - Continued

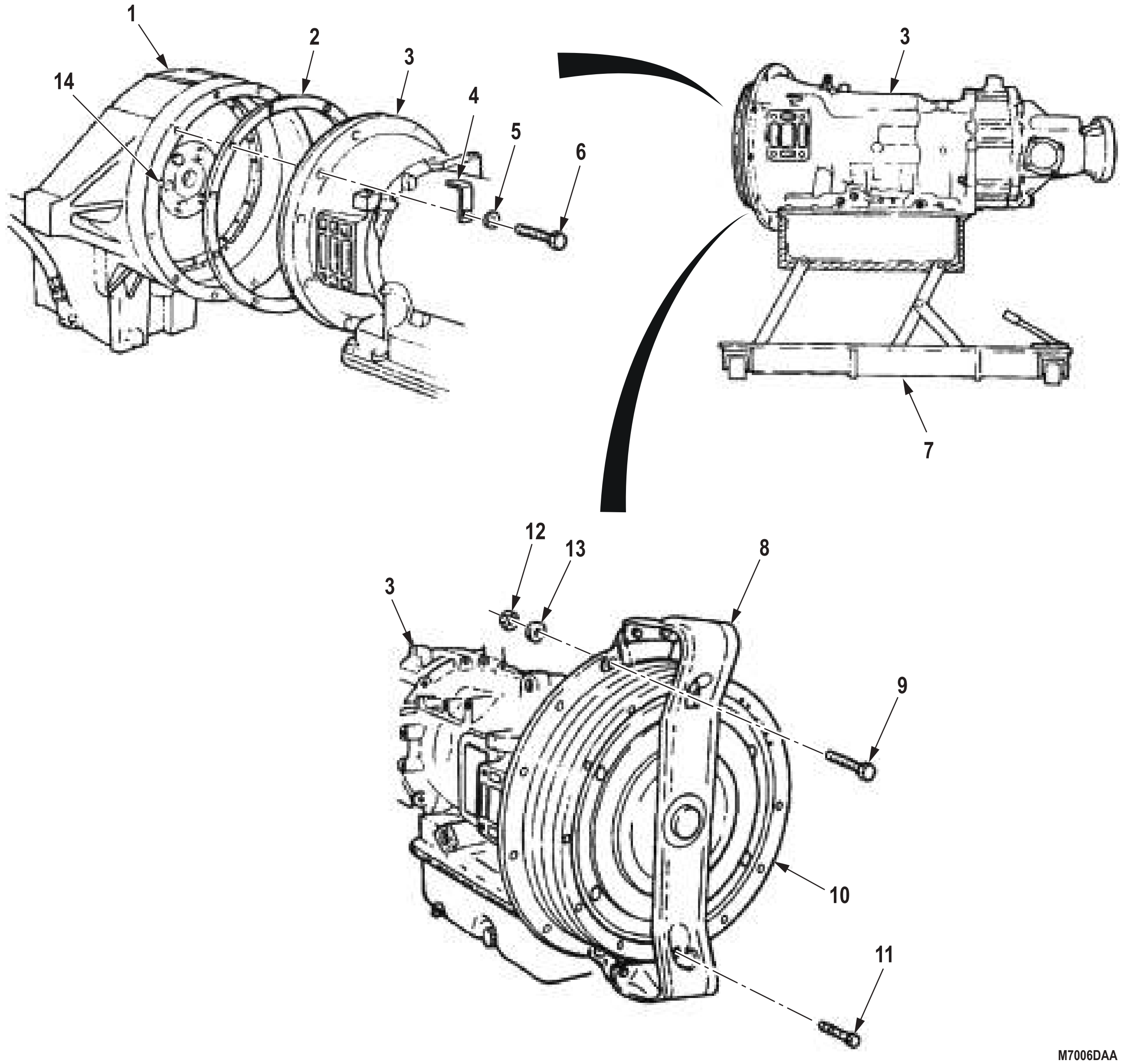


Figure 4. Transmission and Torque Converter Removal.

END OF TASK

INSTALLATION

WARNING

- Keep rear of transmission tilted slightly downward at all times to prevent converter from sliding off. Failure to comply may result in damage to equipment, injury, or death to personnel.
- Torque converter must be installed with transmission as an assembly. Failure to comply may result in damage to equipment, injury, or death to personnel.

1. Install four guide screws (Figure 5, Item 14) at 9, 11, 1, and 3 o'clock positions on flywheel housing (Figure 5, Item 1).
2. Place transmission (Figure 5, Item 3) on transmission jack.
3. Remove four nuts (Figure 5, Item 12), washers (Figure 5, Item 13), and screws (Figure 5, Item 9) from retaining strap (Figure 5, Item 8) and transmission (Figure 5, Item 3).
4. Remove two screws (Figure 5, Item 11) and retaining strap (Figure 5, Item 8) from converter (Figure 5, Item 10).
5. Position gasket (Figure 5, Item 2) on guide screws (Figure 5, Item 14) and flywheel housing (Figure 5, Item 1).
6. Raise front of vehicle until clearance is provided for installation of transmission (Figure 5, Item 3) under vehicle.

CAUTION

Maintain transmission alignment to flywheel housing during installation to prevent damage to converter.

7. Position transmission (Figure 5, Item 3) and transmission jack (Figure 5, Item 7) under vehicle.
8. Raise transmission (Figure 5, Item 3), align with guide screws (Figure 5, Item 14), and seat against flywheel housing (Figure 5, Item 1).
9. Install transmission (Figure 5, Item 3) on flywheel housing (Figure 5, Item 1) with clamp (Figure 5, Item 4), eight lockwashers (Figure 5, Item 5), and screws (Figure 5, Item 6). Tighten screws 36 to 40 lb-ft (49 to 54 N·m).
10. Remove four guide screws (Figure 5, Item 14) from flywheel housing (Figure 5, Item 1) and install four remaining lockwashers (Figure 5, Item 5) and screws (Figure 5, Item 6). Tighten screws 36 to 40 lb-ft (49 to 54 N·m).

INSTALLATION - Continued

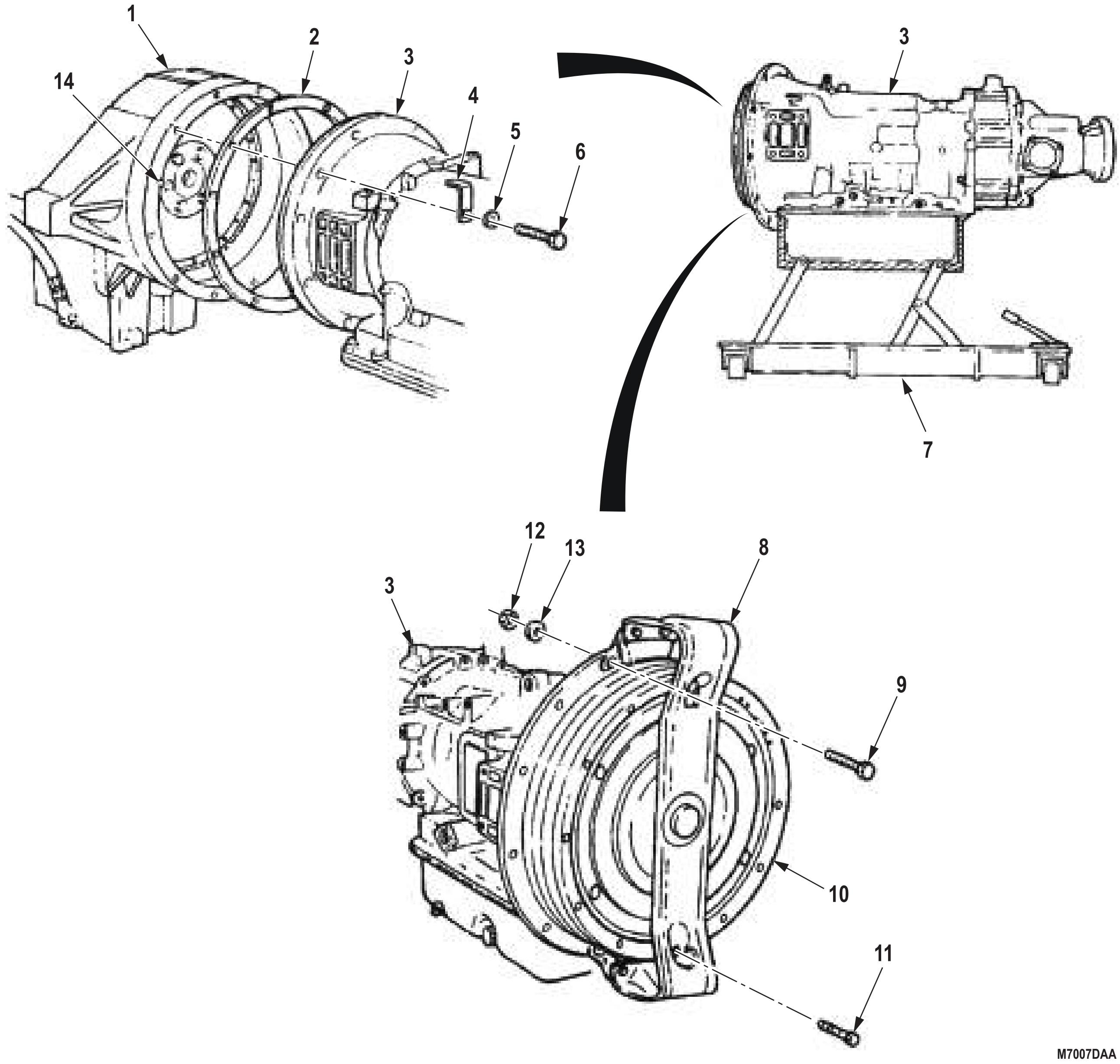


Figure 5. Transmission and Torque Converter Installation.

INSTALLATION - Continued

NOTE

- Use engine barring tool to rotate engine crankshaft when aligning flywheel to converter screw holes.
- The use of shim stock tube in torque converter access hole prevents converter screw from falling down behind flywheel. A loose screw may cause a lockup condition, preventing crankshaft rotation required to install remaining screws.

11. Using engine barring tool, rotate crankshaft until screw holes in converter (Figure 6, Item 8) and flywheel (Figure 6, Item 1) align with access hole (Figure 6, Item 2).
12. Roll shim stock (Figure 6, Item 3) into tube form and size to fit diameter of access hole (Figure 6, Item 2). Insert shim stock in access hole and position over screw hole against flywheel (Figure 6, Item 1).
13. Install 12 screws (Figure 6, Item 4) on flywheel (Figure 6, Item 1) and converter (Figure 6, Item 8) in the same manner. Tighten screws 41 to 49 lb-ft (56 to 66 N·m).
14. Remove shim stock (Figure 6, Item 3) from access hole (Figure 6, Item 2).
15. Install gasket (Figure 6, Item 5) and cover plate (Figure 6, Item 6) on flywheel housing (Figure 6, Item 9) with two screws (Figure 6, Item 7). Tighten screws 5 to 8 lb-ft (7 to 11 N·m).

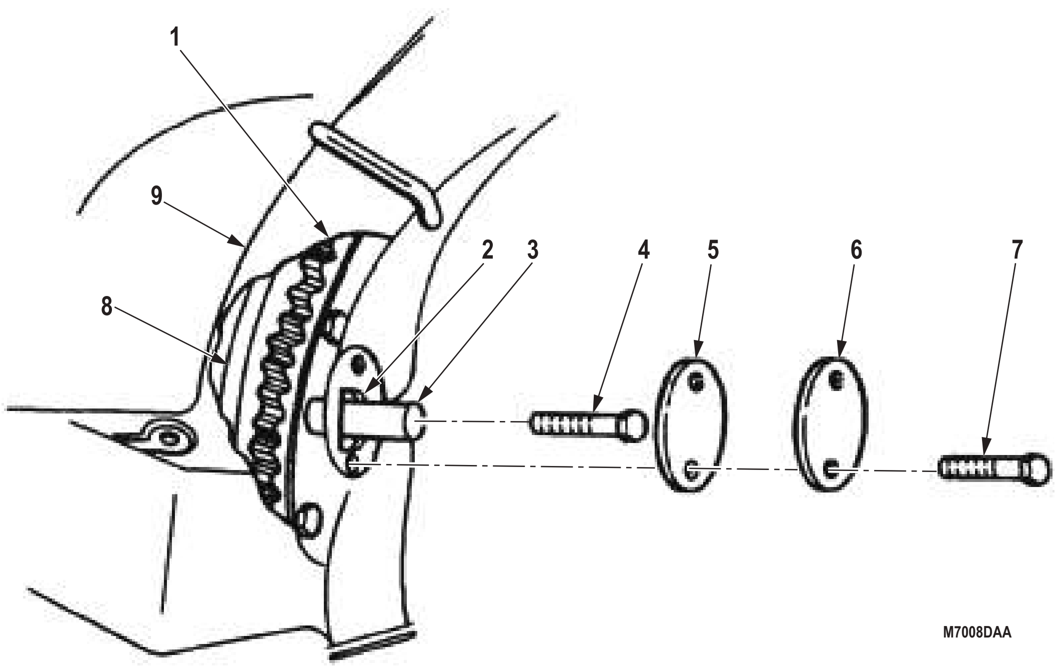


Figure 6. Torque Converter Installation.

INSTALLATION - Continued

16. Install two lockwashers (Figure 7, Item 3) and screws (Figure 7, Item 2) on rear support bracket (Figure 7, Item 4) and transmission (Figure 7, Item 1). Tighten screws 65 to 85 lb-ft (88 to 115 N·m).

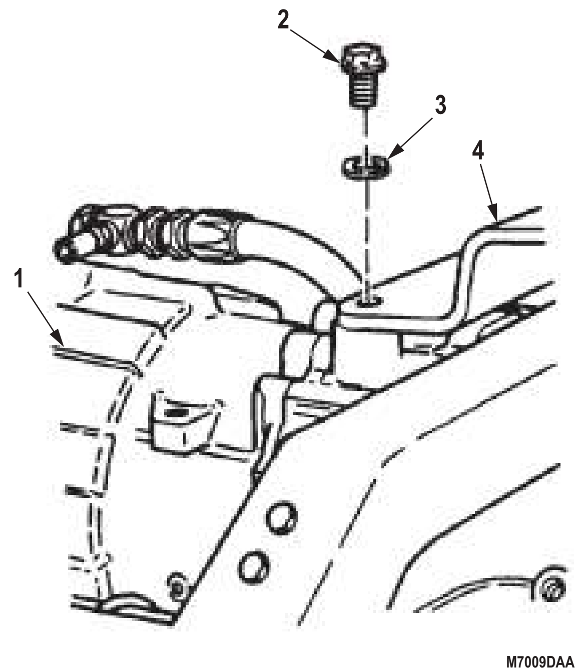


Figure 7. Transmission Power Takeoff Installation.

INSTALLATION - Continued

17. Install wire (Figure 8, Item 6) on transmission flange (Figure 8, Item 5) with clamp (Figure 8, Item 4), lockwasher (Figure 8, Item 3), and screw (Figure 8, Item 2).

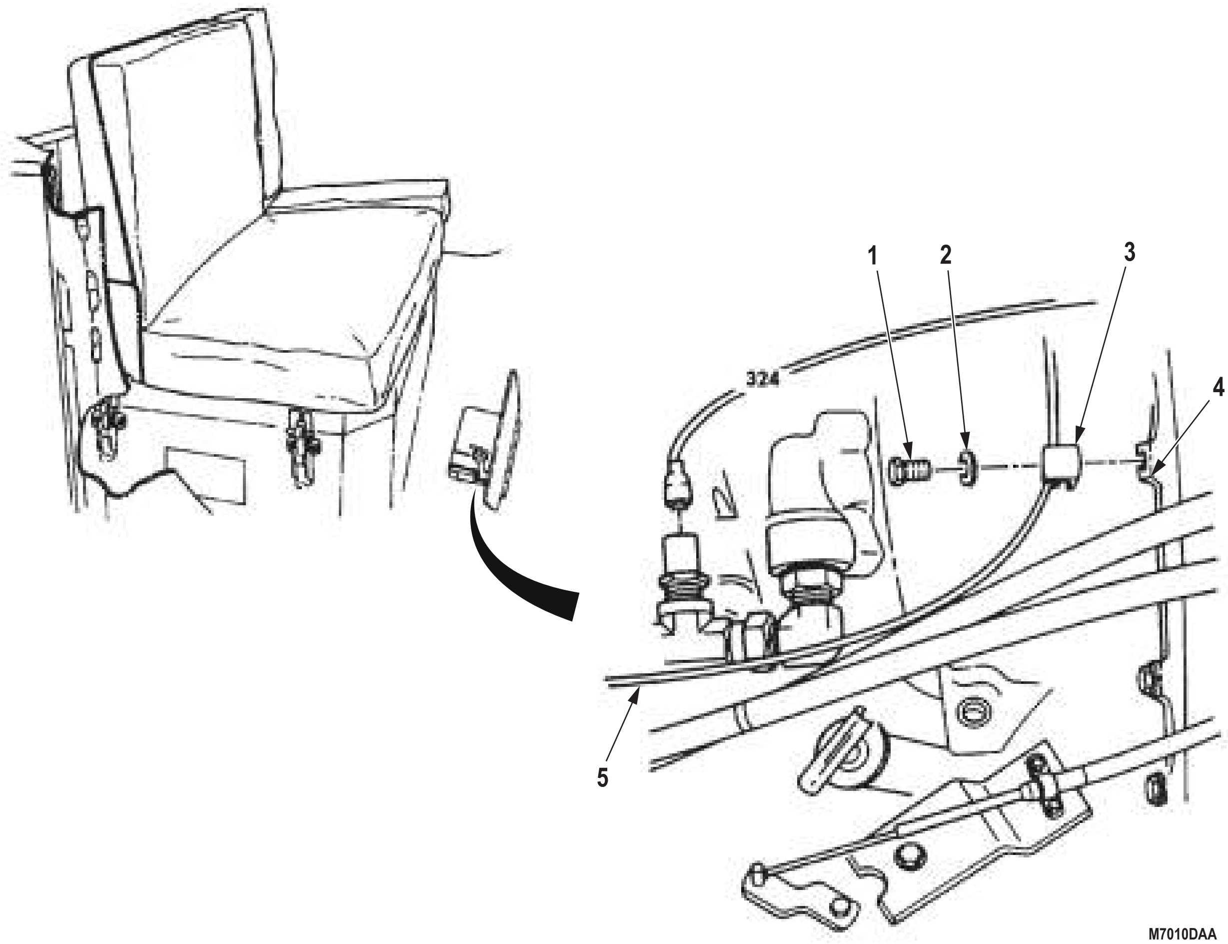


Figure 8. Transmission Flange Clamp and Wire Installation.

END OF TASK

FOLLOW-ON MAINTENANCE

1. Install transmission power takeoff (if so equipped). (Volume 4, WP 0728)
2. Install winch control valve (if so equipped). (Volume 4, WP 0721) or (Volume 4, WP 0681)
3. Install transmission neutral start switch. (WP 0366)
4. Install transmission fifth gear lock-in solenoid valve and bracket. (WP 0379)
5. Install transmission modulator. (WP 0365)
6. Install transmission breather. (WP 0384)
7. Install transmission oil dipstick. (WP 0363)
8. Install transmission oil cooler hose. (WP 0368)
9. Install transmission-to-transfer case propeller shaft. (WP 0403)
10. Fill transmission to proper oil level. (Volume 5, WP 0820)
11. Start engine and road test vehicle. (TM 9-2320-272-10)

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
TRANSMISSION OIL PRESSURE TESTING

INITIAL SETUP:

Tools and Special Tools

Tool Kit, General Mechanic's: Automotive
(Volume 5, WP 0826, Table 1, Item 56)
1/4-18 NPTF Tap
21/64 Drill Bit
(Volume 5, WP 0826, Table 1, Item 16)
Drill Press
Pipe Plug
Pressure Checking K
(Volume 5, WP 0826, Table 1, Item 40)
Two Pipe Plugs

Materials/Parts

Cap Set, Protective, Dust and Moisture Seal
(Volume 5, WP 0825, Table 1, Item 13)
O-ring (Volume 5, WP 0827, Table 1, Item 80)
Qty: 1

Personnel Required

(2)

References

WP 0403
Volume 5, WP 0820

Equipment Condition

Parking brake set. (TM 9-2320-272-10)
Transmission oil at proper level.
(TM 9-2320-272-10)
Vehicle at curb weight (empty).
(TM 9-2320-272-10)
Wheels blocked (chocked). (TM 9-2320-272-10)

TRANSMISSION OIL COOLER PRESSURE TEST

CAUTION

Before disconnecting transmission pressure lines, clean surrounding surfaces and plug all openings to prevent entry of dirt or debris into transmission. Damage will occur if dirt or debris enters transmission.

1. Disconnect oil cooler supply hose (Figure 1, Item 1) from elbow (Figure 1, Item 2) on top of oil cooler (Figure 1, Item 7).

NOTE

Note elbow alignment for connection.

2. Loosen nut (Figure 1, Item 3) and remove elbow (Figure 1, Item 2) and o-ring (Figure 1, Item 4) from oil cooler (Figure 1, Item 7). Discard o-ring.
3. Using drill press and 21/64 drill bit, drill hole in side of elbow (Figure 1, Item 2) opposite hose port.
4. Tap hole in elbow (Figure 1, Item 2) with 1/4-18 NPTF tap.

CAUTION

After tapping, elbow must be thoroughly cleaned and all burrs and shavings removed. Any shavings entering system will damage transmission.

5. Remove elbow (Figure 1, Item 2) from drill press and thoroughly clean.
6. Install o-ring (Figure 1, Item 4) and elbow (Figure 1, Item 2) in oil cooler (Figure 1, Item 7) until aligned as noted in Step (2).
7. Tighten nut (Figure 1, Item 3) until o-ring (Figure 1, Item 4) is seated.
8. Install pipe plug (Figure 1, Item 8) on elbow (Figure 1, Item 2).
9. Connect oil cooler supply hose (Figure 1, Item 1) to elbow (Figure 1, Item 2).
10. Remove oil sampling valve (Figure 1, Item 6) from elbow (Figure 1, Item 5).
11. Install pressure gauge (Figure 1, Item 10) and gauge hose (Figure 1, Item 9) on elbow (Figure 1, Item 5).

TRANSMISSION OIL COOLER PRESSURE TEST - Continued

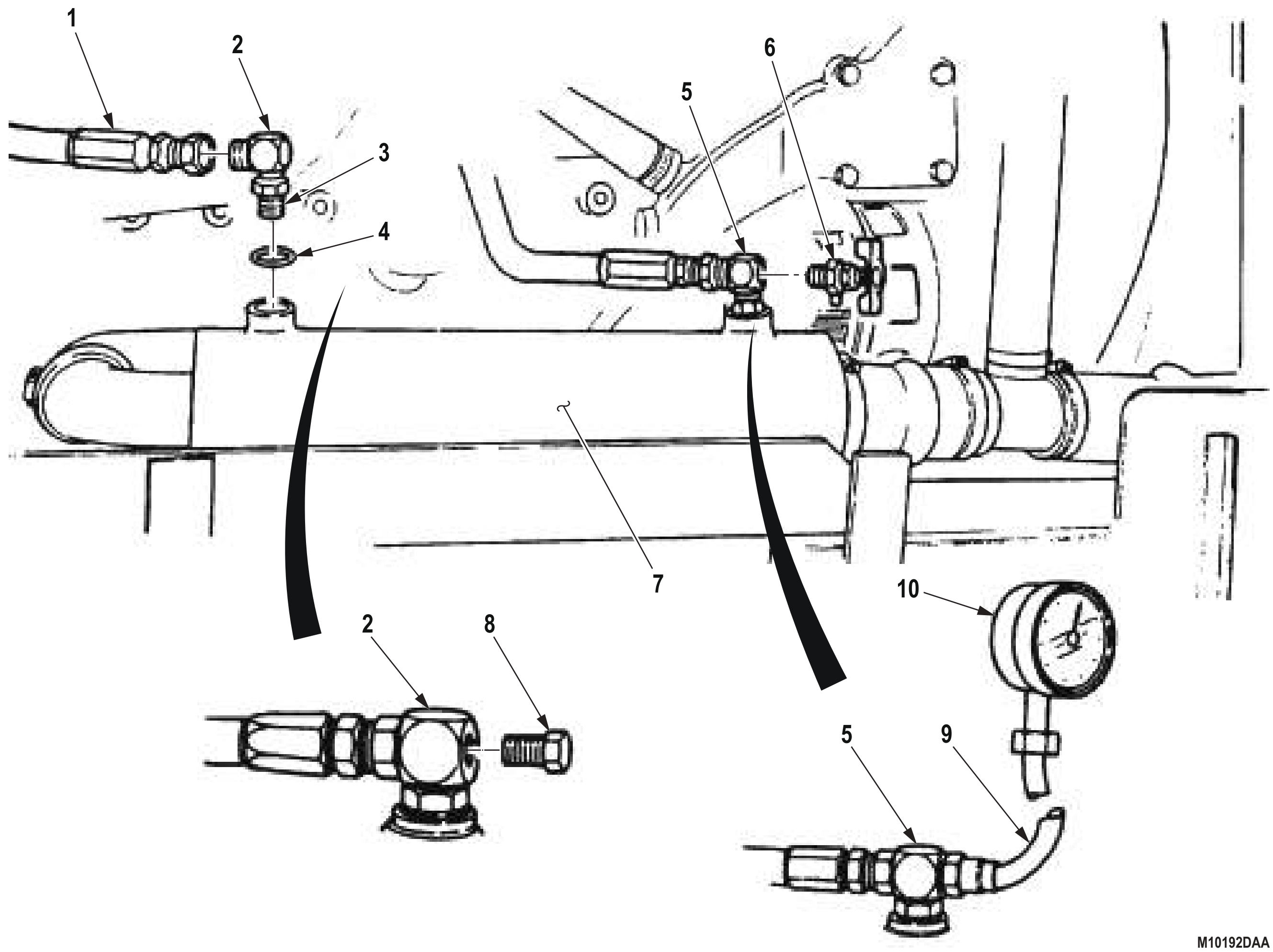


Figure 1. Oil Cooler Pressure Test.

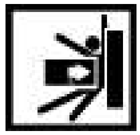
TRANSMISSION OIL COOLER PRESSURE TEST - Continued

NOTE

Refer to TM 9-2320-272-10 when performing Steps (12) through (20).

12. Set parking brake.

WARNING



Ensure all personnel are clear from underside and front of vehicle before starting engine. Transmission slipping into gear may cause vehicle to move. Failure to comply may result in injury or death to personnel.

13. Start engine and check oil cooler connections for leaks.

CAUTION

Do not maintain stalled condition for longer than 30-second intervals. Transmission oil may overheat and cause transmission damage.

14. Place transmission shift lever in 1-5 (drive) and operate engine at 1,200 rpm.
15. Place transmission shift lever in N (neutral) and operate engine at normal operating temperature.
16. Check transmission oil level.
17. Operate engine at 1,650 rpm with transmission shift lever in N (neutral) and parking brake set. Check pressure gauge and note reading.
18. If pressure is less than 26 psi (179.2 kPa), check for hose or internal oil cooler leakage.
19. If pressure exceeds 26 psi (179.2 kPa), check for cooler, cooler filter, or cooler hose restriction.
20. Stop engine and disconnect gauge (Figure 2, Item 4) and hose (Figure 2, Item 2) from elbow (Figure 2, Item 1).
21. Install oil sampling valve (Figure 2, Item 3) in elbow (Figure 2, Item 1).

TRANSMISSION OIL COOLER PRESSURE TEST - Continued

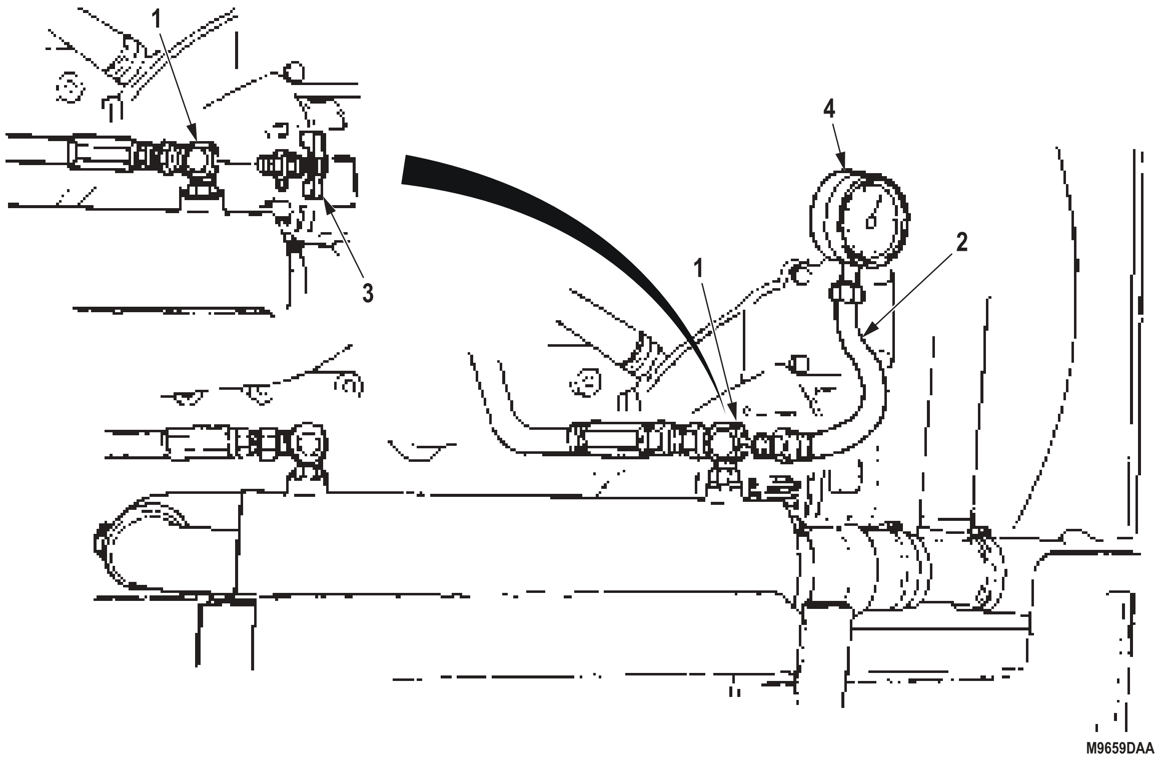
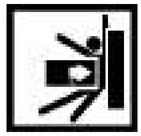


Figure 2. Oil Cooler Pressure Test.

TRANSMISSION OIL COOLER PRESSURE TEST - Continued

22. Remove pipe plug (Figure 3, Item 2) from supply hose elbow (Figure 3, Item 1).
23. Install pressure gauge (Figure 3, Item 3) and hose (Figure 3, Item 4) in supply hose elbow (Figure 3, Item 1).

WARNING



Ensure all personnel are clear from underside and front of vehicle before starting engine. Transmission slipping into gear may cause vehicle to move. Failure to comply may result in injury or death to personnel.

NOTE

Refer to TM 9-2320-272-10 when performing Steps (24) through (29).

24. Set parking brake.
25. Start engine and check oil cooler connections for leaks.
26. Operate engine at 1,650 rpm with transmission shift lever in N (neutral) and parking brake set. Check pressure gauge (Figure 3, Item 3) and note reading.
27. If pressure is below 30 psi (207 kPa), check for hose or internal oil cooler leakage.
28. If pressure exceeds 50 psi (345 kPa), check for cooler or cooler hose restriction.
29. Stop engine and disconnect gauge (Figure 3, Item 3) and hose (Figure 3, Item 4) from supply hose elbow (Figure 3, Item 1).
30. Install pipe plug (Figure 3, Item 2) in elbow (Figure 3, Item 1).

TRANSMISSION OIL COOLER PRESSURE TEST - Continued

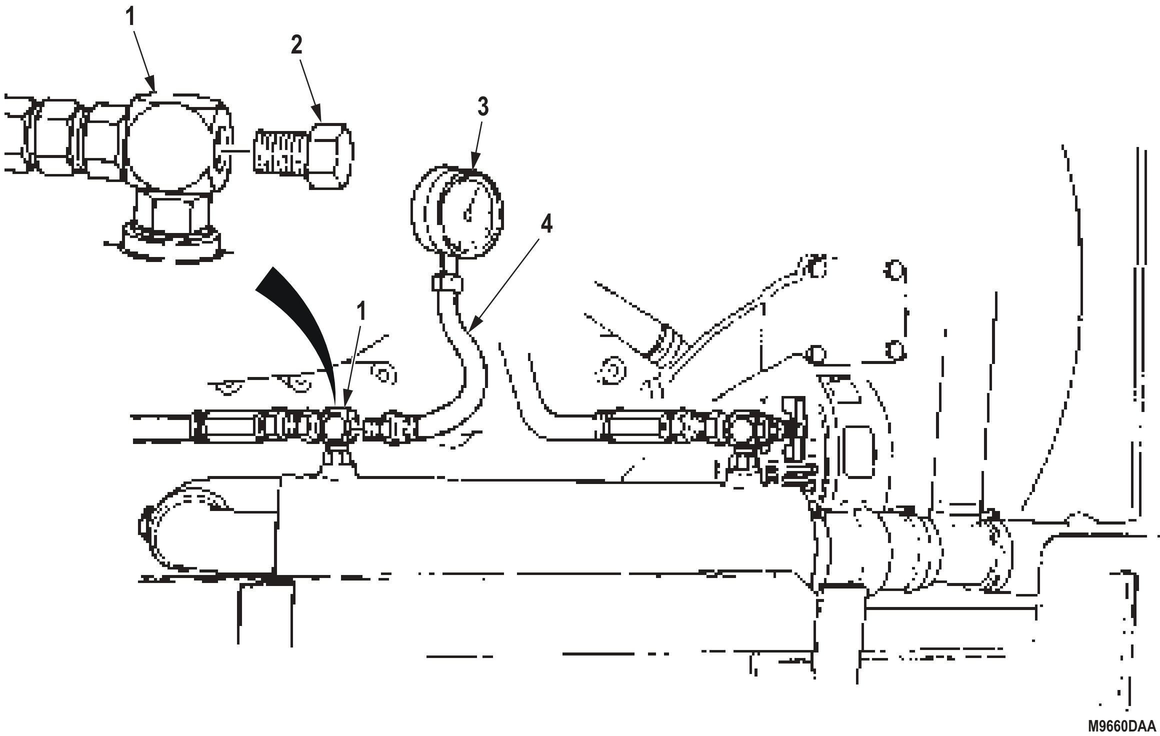
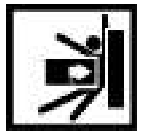


Figure 3. Oil Cooler Pressure Test.

END OF TASK

MAIN PRESSURE AND GOVERNOR PRESSURE TEST

WARNING



Ensure transmission-to-transfer case propeller shaft has been removed before performing this test. If test is performed with propeller shaft installed, wheel blocks (chocks) will not prevent vehicle from rolling. Failure to comply may result in injury or death to personnel.

1. Remove transmission-to-transfer case propeller shaft (WP 0403).

CAUTION

Before disconnecting transmission pressure lines, clean surrounding surfaces and plug all openings to prevent entry of dirt or debris into transmission. Damage will occur if dirt or debris enters transmission.

NOTE

- Transmission-to-transfer case propeller shaft removal allows transmission output shaft to rotate to build up governor oil pressure. Upshift will not occur without governor pressure.
- Have drainage container ready to catch oil.
- Use drain pans to retain leaking/draining fluids. Refer to local procedures and plans for preventing and responding to fluid spills or leaks. Comply with local regulations when disposing of clean up material and leaked and spilled fluids.

2. Disconnect main pressure line (Figure 4, Item 1) from adapter (Figure 4, Item 2).
3. Disconnect governor pressure line (Figure 4, Item 4) from adapter (Figure 4, Item 3).

MAIN PRESSURE AND GOVERNOR PRESSURE TEST - Continued

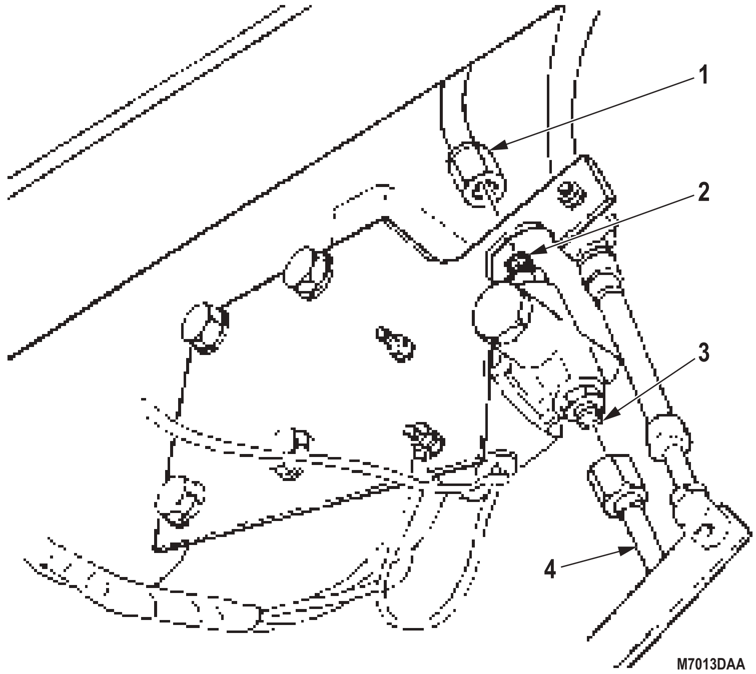


Figure 4. Main Pressure and Governor Pressure Test.

MAIN PRESSURE AND GOVERNOR PRESSURE TEST - Continued

4. Disconnect main pressure line (Figure 5, Item 6) from adapter (Figure 5, Item 7) and remove main pressure line.
5. Remove adapter (Figure 5, Item 7) from main pressure port (Figure 5, Item 1).
6. Disconnect governor pressure line (Figure 5, Item 5) from adapter (Figure 5, Item 4) and remove governor pressure line.

NOTE

Only M936/A1/A2 vehicles are equipped with check valve.

7. Remove adapter (Figure 5, Item 4) and check valve (Figure 5, Item 3) from transmission auxiliary governor pressure port (Figure 5, Item 2).

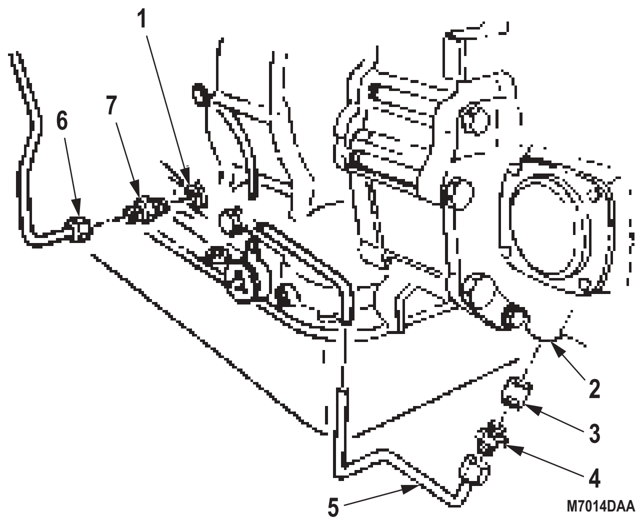


Figure 5. Main Pressure and Governor Pressure Test.

8. Install 1/8-27 NPTF Thd pipe plug (Figure 6, Item 6) in auxiliary governor pressure port (Figure 6, Item 5).
9. Connect pressure gauge (Figure 6, Item 3) and hose (Figure 6, Item 4) to main pressure port (Figure 6, Item 7) with 1/8-27 NPTF Thd hose fitting (Figure 6, Item 2).

NOTE

Refer to TM 9-2320-272-10 for Steps (8) through (28).

10. Start engine, check pressure port connections for leaks, and check oil.
11. Operate engine at 625 ± 25 rpm with transmission (Figure 6, Item 1) shift lever in N (neutral) and parking brake set.
12. Note pressure reading on pressure gauge. If pressure is not 125 psi (802 kPa), repair transmission (Figure 6, Item 1) as necessary.

NOTE

Do not maintain stalled condition for longer than 30-second intervals. Transmission oil may overheat and cause transmission damage.

13. Place transmission shift lever in 1-5 (drive) position.

MAIN PRESSURE AND GOVERNOR PRESSURE TEST - Continued

14. Operate engine at 1,200 ± 25 rpm and note pressure reading on pressure gauge (Figure 6, Item 3). If pressure is not 180 to 205 psi (1,241 to 1,413 kPa), repair transmission (Figure 6, Item 1) as necessary.
15. Stop engine and place transmission shift lever in N (neutral).
16. Disconnect pressure gauge (Figure 6, Item 3) and hose (Figure 6, Item 4) from main pressure port (Figure 6, Item 7) on left side of transmission (Figure 6, Item 1).

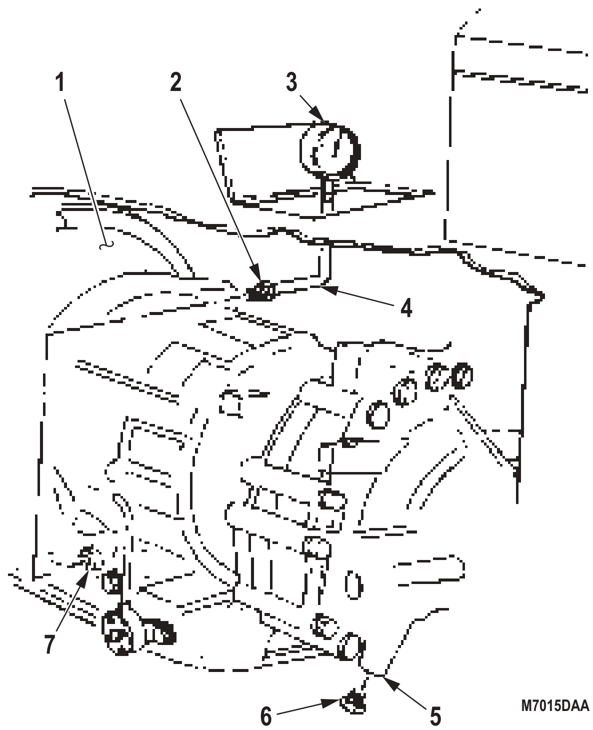


Figure 6. Main Pressure and Governor Pressure Test.

MAIN PRESSURE AND GOVERNOR PRESSURE TEST - Continued

17. Remove pipe plug (Figure 7, Item 5) from auxiliary governor pressure port (Figure 7, Item 4) and install in main pressure port (Figure 7, Item 6).
18. Install pressure gauge (Figure 7, Item 2) and hose (Figure 7, Item 3) in auxiliary governor pressure port (Figure 7, Item 4).
19. Start engine and check pressure port connection for leaks.
20. Check transmission oil level.
21. Place transmission shift lever in 1-5 (drive) position and operate engine at 1,650 rpm. Note reading on pressure gauge.
22. If pressure is not 82 to 91 psi (565 to 627 kPa), repair transmission (Figure 7, Item 1) as necessary.
23. Stop engine and disconnect pressure gauge (Figure 7, Item 2) and hose (Figure 7, Item 3) from auxiliary governor pressure port (Figure 7, Item 4).
24. Remove pipe plug (Figure 7, Item 5) from main pressure port (Figure 7, Item 6).

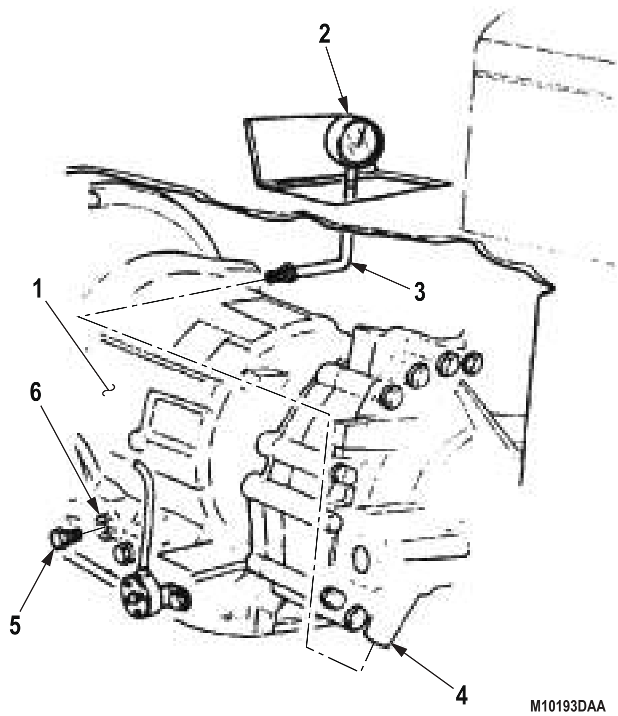


Figure 7. Main Pressure and Governor Pressure Test.

MAIN PRESSURE AND GOVERNOR PRESSURE TEST - Continued

NOTE

Only M936/A1/A2 vehicles are equipped with check valve.

25. Install check valve (Figure 8, Item 3) and adapter (Figure 8, Item 4) in auxiliary governor pressure port (Figure 8, Item 2). Ensure bleed hole end of check valve is inserted into pressure port first.
26. Install governor pressure line (Figure 8, Item 5) on adapter (Figure 8, Item 4).
27. Install adapter (Figure 8, Item 7) in main pressure port (Figure 8, Item 1).
28. Install main pressure line (Figure 8, Item 6) on adapter (Figure 8, Item 7).

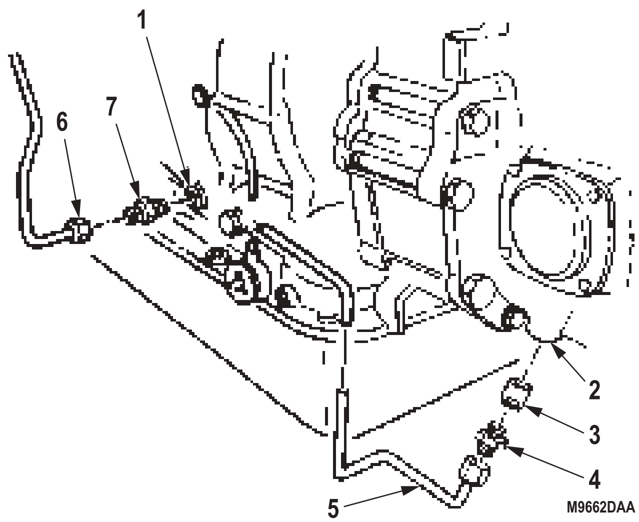


Figure 8. Main Pressure and Governor Pressure Test.

MAIN PRESSURE AND GOVERNOR PRESSURE TEST - Continued

29. Install governor pressure (Figure 9, Item 4) on adapter (Figure 9, Item 3).
30. Install main pressure line (Figure 9, Item 1) on adapter (Figure 9, Item 2).

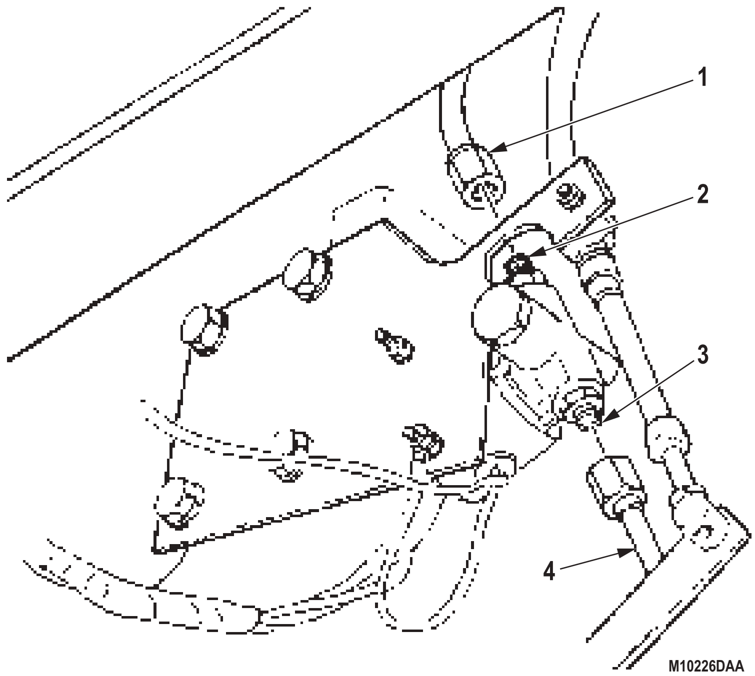


Figure 9. Main Pressure and Governor Pressure Test.

31. Start engine and check pressure port connections for leaks.
32. Check transmission oil level.
33. Install transmission-to-transfer case propeller shaft (WP 0403).

END OF TASK

AUTOMATIC SHIFT SPEED TEST

1. Road test vehicle and record engine rpm at shift points (TM 9-2320-272-10).
2. With vehicle in operation, shift transmission through the range sequence. See table for lever range sequence.
3. Check recorded engine shift point rpm with table.
4. If shift points are incorrect, check modulator adjustment. If modulator adjustment does not correct shift speed, repair transmission as necessary.

Table 1. Transmission Shift Point Check.

SELECTOR LEVER RANGE	THROTTLE	AUTOMATIC SHIFTING	ENGINE (RPM)
1-2	Fully open	1-2	1,900 to 2,050
		2-2	1,900 to 2,050 (before converter lock-in)
		2-2	1,600 to 1,825 (after converter lock-in)
1-3		2-3	2,000 to 2,150
1-4		3-4	2,030 to 2,140
1-5 (drive)		4-5	2,015 to 2,130

END OF TASK

ADJUSTMENT

NOTE

- Vehicle engine must be at normal operating temperature of 175°F to 195°F (79°C to 90°C) as indicated by temperature gauge. Transmission oil temperature must be at normal operating temperature of 120°F to 220°F (49°C to 104°C) as indicated by temperature gauge.
- Refer to TM 9-2320-272-10 for Steps (1) through (7).

1. Allow vehicle engine and transmission to reach normal operating temperatures with transmission shift lever in N (neutral) and parking brake set.
2. After warmup, depress accelerator pedal until engine reaches 2,100 rpm. If engine does not reach 2,100 rpm, troubleshoot. Proceed with testing if engine reaches 2,100 rpm.

NOTE

Assistant will operate vehicle as directed by mechanic. Mechanic will observe and record engine rpm indicated by tachometer during shift changes.

3. Place transmission shift lever in 1-2 (second) and road test vehicle.
4. Accelerate at full throttle, 1,900 to 2,050 rpm, and note shift change. Record engine rpm at moment of shift change.
5. Stop vehicle and repeat Steps (3) and (4) in 1-3 (third).
6. Stop vehicle and repeat Steps (3) and (4) in 1-4 (fourth).
7. Stop vehicle and repeat Steps (3) and (4) in 1-5 (drive).
8. Compare recorded engine rpm at shift points with correct shift point ranges given in Table 1. If all shift points are too high or too low by approximately same amount, adjust modulator (Figure 10, Item 2).
9. Inspect modulator (Figure 10, Item 2) and cable (Figure 10, Item 1) for looseness and improper installation.

NOTE

Modulator will be adjusted if properly installed. Refer to (WP 0365) for correct modulator and cable installation and adjustment instructions.

10. If looseness and/or improper installation are found, correct and retest modulator (Figure 10, Item 2) and cable (Figure 10, Item 1).

ADJUSTMENT - Continued

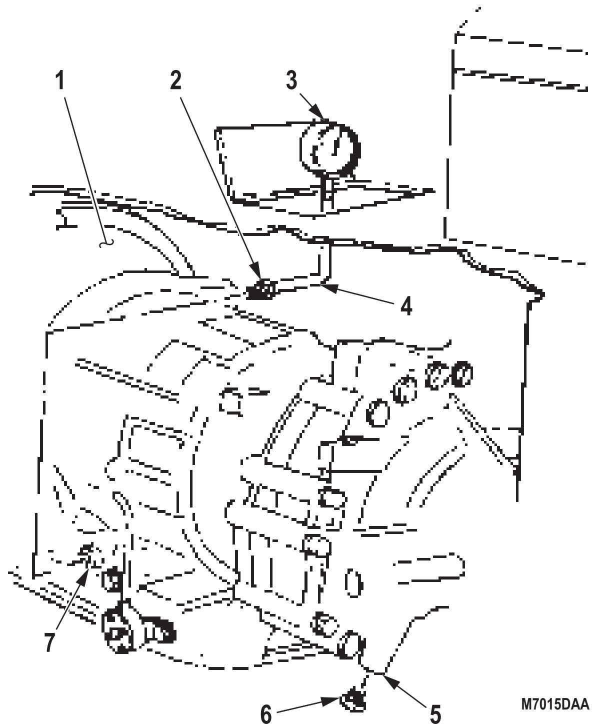


Figure 10. Main Pressure and Governor Pressure Adjustment.

11. Remove modulator link (Figure 11, Item 2) from throttle lever (Figure 11, Item 1) and reinstall modulator link.

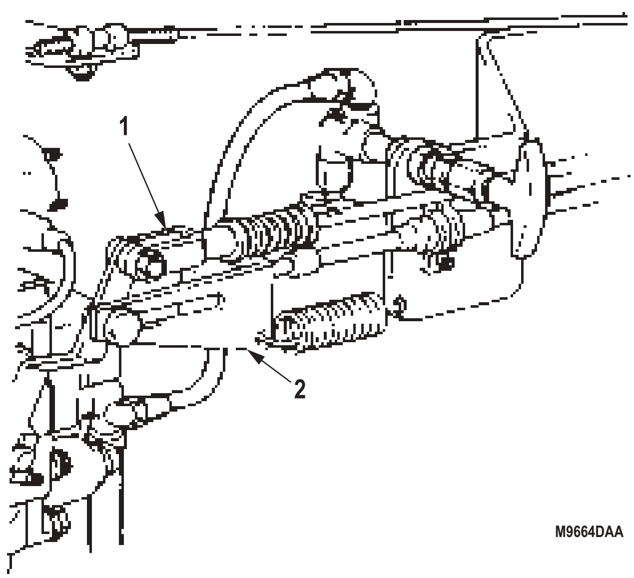


Figure 11. Transmission Oil Pressure Adjustment.

ADJUSTMENT - Continued

12. Retest modulator (Figure 12, Item 1). If retest indicates defective modulation, replace modulator.

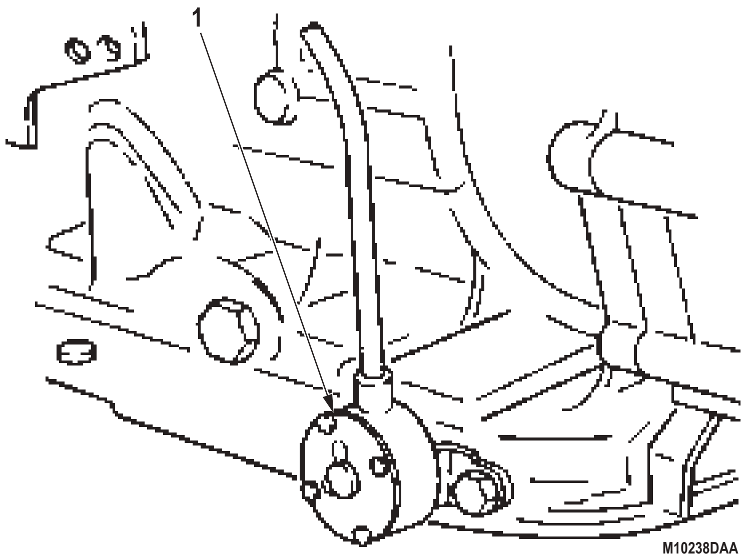
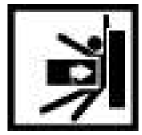


Figure 12. Transmission Module Testing and Adjustment.

ADJUSTMENT - Continued

WARNING



Do not allow anyone to stand in front of vehicle when conducting stall test. Vehicle may move. Failure to comply may result in injury or death to personnel.

CAUTION

- Do not maintain the stalled condition longer than 30-second intervals due to rapid heating of transmission oil. Observe transmission oil temperature gauge. Normal operating range is 120°F to 220°F (49°C to 104°C).
- Observe engine coolant temperature gauge. Operating temperature is 175°F to 195°F (79°C to 90°C).
- If oil temperature reaches 300°F (148°C), or if thirty seconds is insufficient time to complete needed tests, transmission oil temperature must be lowered or damage to transmission may result.
- Run engine at 1,200 to 1,500 rpm with transmission in neutral for two minutes to cool oil between tests.

NOTE

- The stall test is conducted when engine and/or transmission are not performing satisfactorily. The purpose of the stall test is to determine if transmission or engine is the malfunctioning unit.
- The vehicle's transmission will stay in first speed during the stall tests regardless of transmission 5-4-3-2 and 1 quadrant position. Transmission does not and cannot upshift because the internal mechanism, output shaft, and governor are not turning. The stall test checks the engine performance, converter clutch operation or installation, and holding ability of the converter one-way clutch.
- Refer to TM 9-2320-272-10 for the following steps.

13. Apply service brakes and place transmission shift lever in any forward drive position 5-4-3-2-1.
14. Accelerate engine to full throttle (1,900 to 2,050 rpm).

NOTE

Perform Step (15) only if engine speed exceeds 1,700 rpm.

15. If engine speed exceeds 1,700 rpm, check transmission oil level.
    a. If oil level is low, fill to proper level.
    b. If oil level is correct, repair transmission as necessary.

ADJUSTMENT - Continued

NOTE

- Perform Steps (16) and (17) only if engine speed is less than 1,900 rpm.
- Refer to Mechanical Troubleshooting.

16. If engine speed is less than 1,400 rpm, troubleshoot engine for loss of power.
17. If engine is performing satisfactorily, repair transmission torque converter.

END OF TASK

FOLLOW-ON MAINTENANCE

1. Fill transmission to proper oil level. (Volume 5, WP 0820)
2. Start engine and road test vehicle. (TM 9-2320-272-10)

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
TRANSMISSION SELECTOR SHAFT OIL SEAL REPLACEMENT

INITIAL SETUP:

Tools and Special Tools

Tool Kit, General Mechanic's: Automotive
(Volume 5, WP 0826, Table 1, Item 56)
Inserter, Seal
(Volume 5, WP 0826, Table 1, Item 30)
Remover, Seal
(Volume 5, WP 0826, Table 1, Item 48)
Wrench, Torque, Click, Ratcheting, 3/8" Drive, 75 Ft-Lb
(Volume 5, WP 0826, Table 1, Item 62)

Materials/Parts

Cloth, Cleaning
(Volume 5, WP 0825, Table 1, Item 19)
Lubricating Oil, Engine

Materials/Parts (cont.)

(Volume 5, WP 0825, Table 1, Item 36, 37, 38)
Sealing Compound
(Volume 5, WP 0825, Table 1, Item 60)
Locknut (Volume 5, WP 0827, Table 1, Item 99)
Qty: 1
Seal (Volume 5, WP 0827, Table 1, Item 94)
Qty: 1

References

Volume 5, WP 0820

Equipment Condition

Parking brake set. (TM 9-2320-272-10)

REMOVAL

CAUTION

Clean around seal area to prevent entry of dirt. Damage to transmission may occur if dirt or dust enters transmission.

NOTE

Manual selector shaft locknut has metric threads.

1. Remove locknut (Figure 1, Item 2) and manual control linkage (Figure 1, Item 3) from selector shaft (Figure 1, Item 1). Discard locknut.

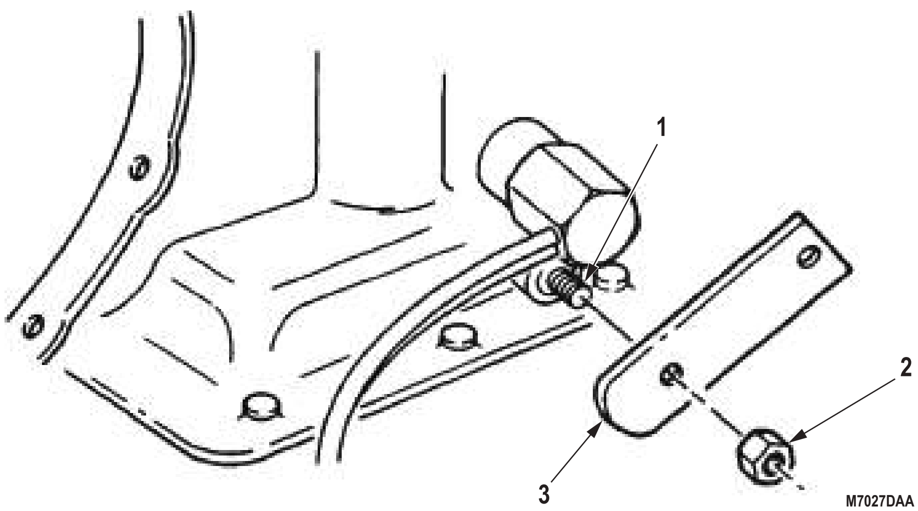


Figure 1. Manual Control Linkage Removal.

REMOVAL - Continued

2. Position tapered end (Figure 2, Item 4) of seal remover (Figure 2, Item 6) over selector shaft (Figure 2, Item 7). Turn seal remover clockwise to thread into seal (Figure 2, Item 3).
3. Finger-tighten bolt (Figure 2, Item 5) on seal remover until it cannot be turned by hand. At this point, bolt has contacted selector shaft (Figure 2, Item 7).

NOTE

- Have drainage container ready to catch oil.
- Use drain pans to retain leaking/draining fluids. Refer to local procedures and plans for preventing and responding to fluid spills or leaks. Comply with local regulations when disposing of clean up material and leaked and spilled fluids.

4. Turn square head of bolt (Figure 2, Item 5) until seal (Figure 2, Item 3) slides from bore (Figure 2, Item 2) of transmission housing (Figure 2, Item 1).
5. Remove seal (Figure 2, Item 3) from seal remover (Figure 2, Item 6). Discard seal.

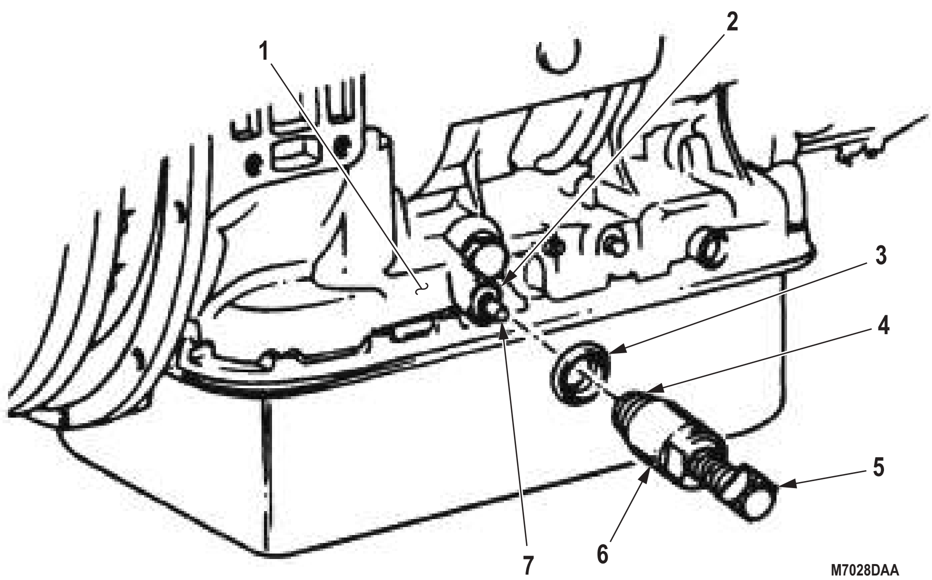


Figure 2. Seal Remover Removal.

END OF TASK

INSTALLATION

1. Apply lubricating oil to bore (Figure 3, Item 2) of transmission housing (Figure 3, Item 1) and selector shaft (Figure 3, Item 5).
2. Apply a thin coat of sealing compound to outer edge of seal (Figure 3, Item 3).
3. Position seal (Figure 3, Item 3) on seal inserter (Figure 3, Item 4) with lip of seal facing away from tool.

CAUTION

Use care when installing seal. Lip of seal may split on selector shaft.

4. Drive seal (Figure 3, Item 3) into bore (Figure 3, Item 2) of transmission housing (Figure 3, Item 1) until seal seats at counterbore position of bore.

CAUTION

When installing manual control linkage, a metric locknut must be used. Failure to do so will damage selector shaft.

5. Install manual control linkage (Figure 3, Item 6) on selector shaft (Figure 3, Item 5) with locknut (Figure 3, Item 7). Tighten locknut 22 to 30 lb-ft (30 to 41 N·m).

INSTALLATION - Continued

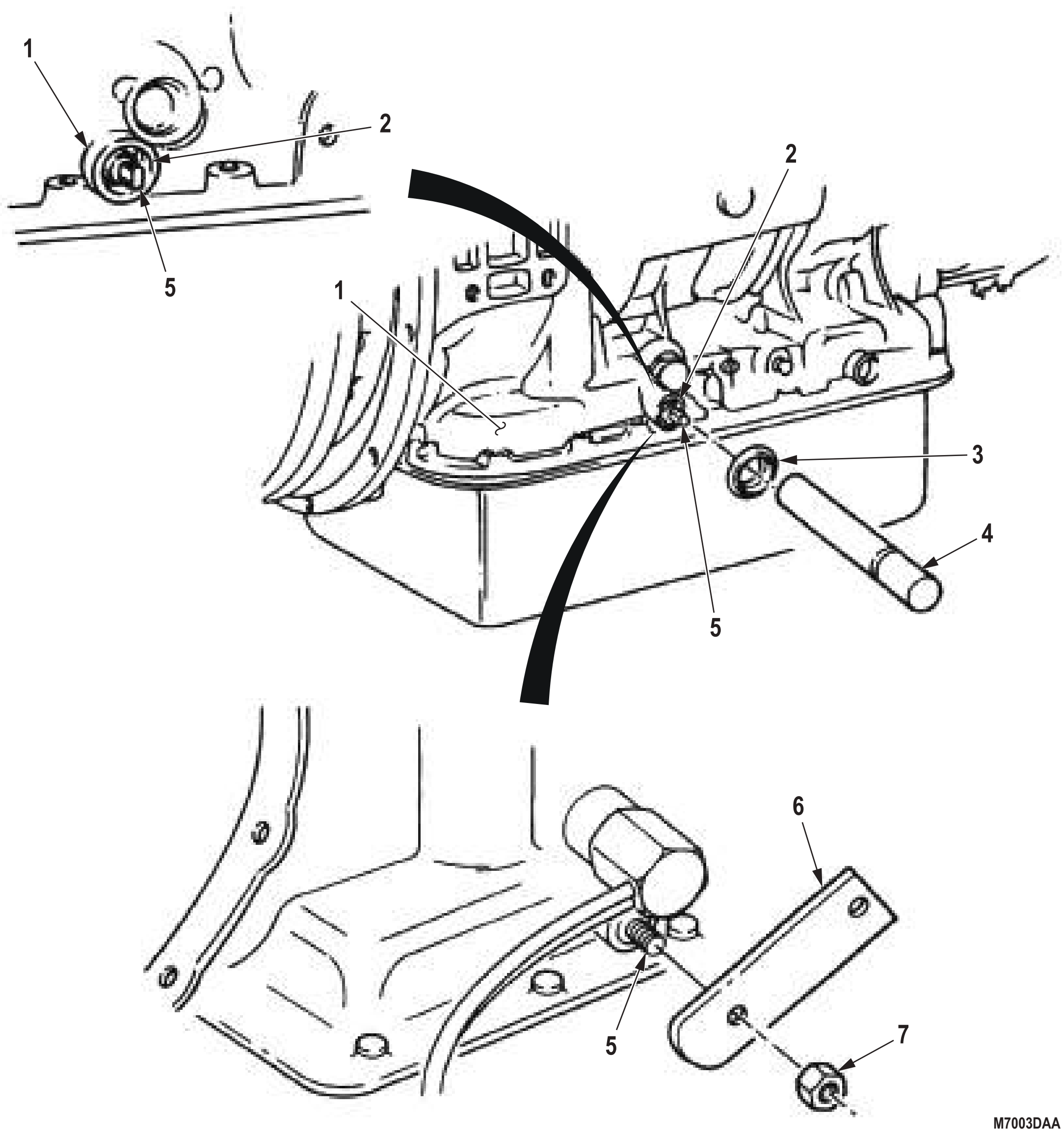


Figure 3. Manual Control Linkage Installation.

END OF TASK

FOLLOW-ON MAINTENANCE

Fill transmission oil to proper level. (Volume 5, WP 0820)

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
TRANSMISSION OUTPUT SHAFT YOKE AND OIL SEAL REPLACEMENT

INITIAL SETUP:

Tools and Special Tools

Tool Kit, General Mechanic's: Automotive
(Volume 5, WP 0826, Table 1, Item 56)
Inserter, Bearing and Bushing
(Volume 5, WP 0826, Table 1, Item 26)
Inserter, Seal
(Volume 5, WP 0826, Table 1, Item 28)
Multiplier, Torque
(Volume 5, WP 0826, Table 1, Item 35)
Puller Kit, Mechanical
(Volume 5, WP 0826, Table 1, Item 41)
Puller Kit, Universal
(Volume 5, WP 0826, Table 1, Item 42)

Materials/Parts

Lubricating Oil
(Volume 5, WP 0825, Table 1, Item 36, 37, 38)

Materials/Parts (cont.)

Locknut (Volume 5, WP 0827, Table 1, Item 243)
Qty: 1
Oil Seal (Volume 5, WP 0827, Table 1, Item 191)
Qty: 1

References

Volume 5, WP 0820

Equipment Condition

Parking brake set. (TM 9-2320-272-10)
Propeller shaft removed. (WP 0403)

REMOVAL

1. Remove locknut (Figure 1, Item 3) from output shaft (Figure 1, Item 1). Discard locknut.
2. Using mechanical puller, remove companion flange (Figure 1, Item 2) from output shaft (Figure 1, Item 1).

NOTE

- Have drainage container ready to catch oil.
- Use drain pans to retain leaking/draining fluids. Refer to local procedures and plans for preventing and responding to fluid spills or leaks. Comply with local regulations when disposing of clean up material and leaked and spilled fluids.

3. Using output shaft seal and dust shield remover, remove dust shield (Figure 1, Item 4) and oil seal (Figure 1, Item 5) from bore of transmission housing (Figure 1, Item 6). Discard oil seal.

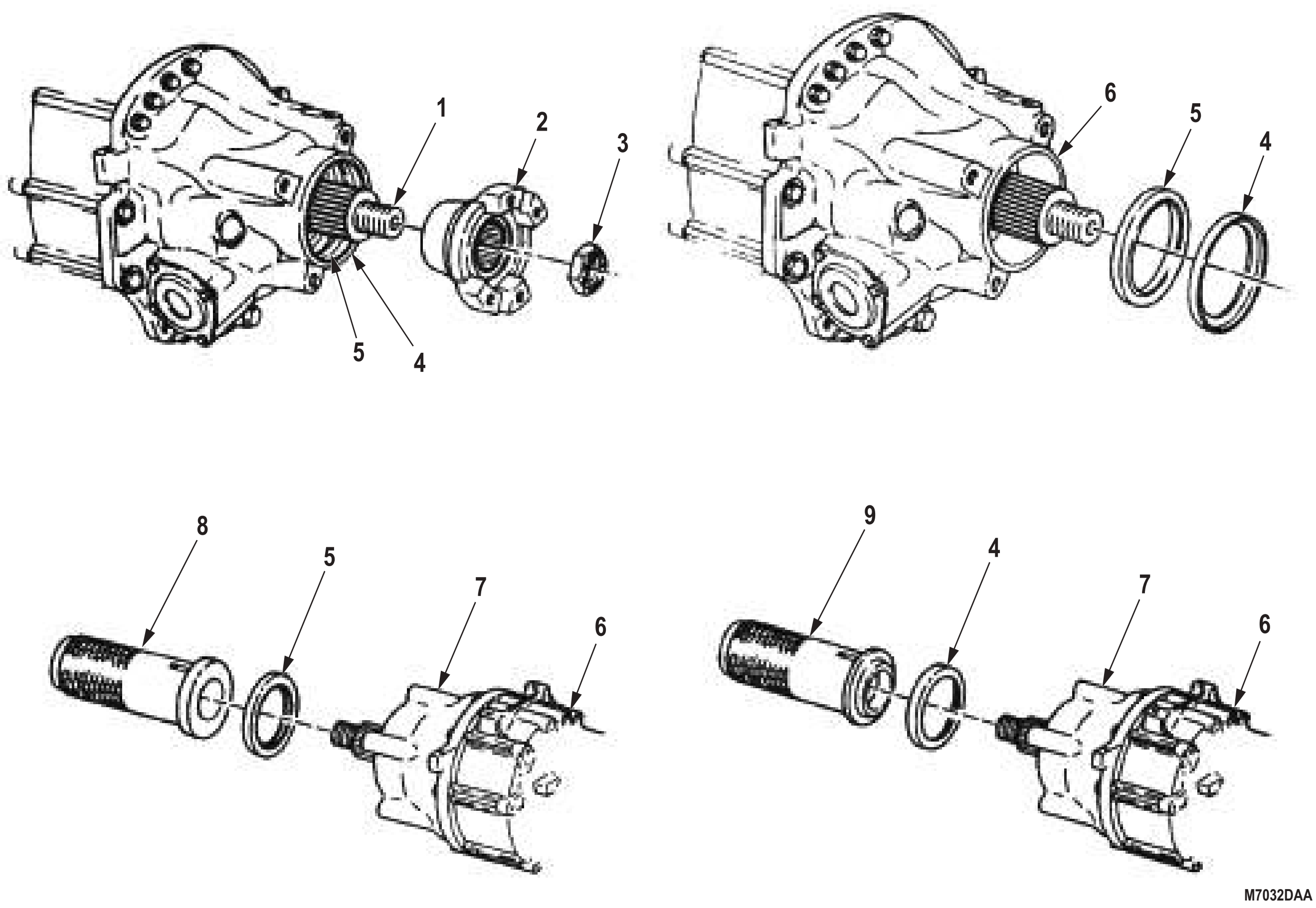


Figure 1. Transmission Output Shaft Yoke and Oil Seal Removal.

END OF TASK

INSTALLATION

1. Using oil seal installer and driver handle, install oil seal (Figure 2, Item 5) in bore of transmission housing (Figure 2, Item 6). Ensure rubber lip faces inside of rear cover (Figure 2, Item 7).
2. Apply lubricating oil to inside diameter of oil seal (Figure 2, Item 5).
3. Using dust shield installer and driver handle, install dust shield (Figure 2, Item 4) in bore of transmission housing (Figure 2, Item 6) with cupped side facing out until installer tool seats on face of rear cover (Figure 2, Item 7).
4. Slide companion flange (Figure 2, Item 2) on output shaft (Figure 2, Item 1) and install with locknut (Figure 2, Item 3). Using torque multiplier, tighten locknut 600 to 800 lb-ft (814 to 1,085 N·m).

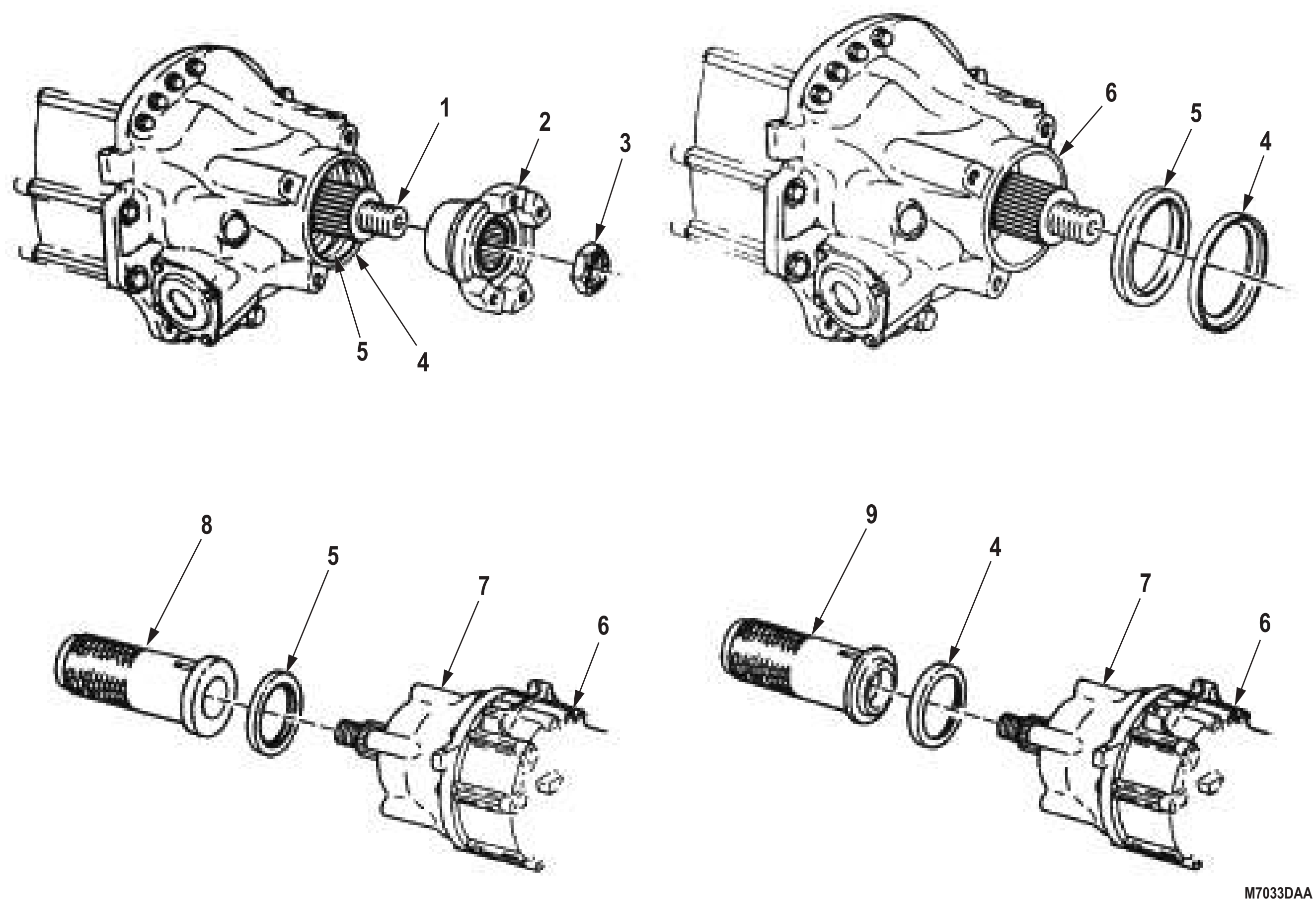


Figure 2. Transmission Output Shaft Yoke and Oil Seal Installation.

END OF TASK

FOLLOW-ON MAINTENANCE

1. Fill transmission oil to proper fluid level. (Volume 5, WP 0820)
2. Install propeller shaft. (WP 0403)
3. Start engine and road test vehicle. (TM 9-2320-272-10)

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
TRANSMISSION OIL PAN AND FILTER REPLACEMENT

INITIAL SETUP:

Tools and Special Tools

Tool Kit, General Mechanic's: Automotive
(Volume 5, WP 0826, Table 1, Item 56)
Suitable Container
Wrench, Torque, Click, Ratcheting, 3/8" Drive,
75 Ft-Lb
(Volume 5, WP 0826, Table 1, Item 62)

Materials/Parts

Gasket (Volume 5, WP 0827, Table 1, Item 98)
Qty: 1

Materials/Parts (cont.)

O-ring (Volume 5, WP 0827, Table 1, Item 190)
Qty: 1
Transmission Oil Filter
(Volume 5, WP 0827, Table 1, Item 197)
Qty: 1

References

Volume 5, WP 0819

REMOVAL

1. Remove 21 screws (Figure 1, Item 6), oil pan (Figure 1, Item 7), and gasket (Figure 1, Item 8) from transmission (Figure 1, Item 5). Discard gasket.
2. Rotate transmission (Figure 1, Item 5) in stand until oil pan (Figure 1, Item 7) mounting surface is horizontal and facing upward.
3. Remove oil filter screw (Figure 1, Item 1), oil filter (Figure 1, Item 2), and filter suction tube (Figure 1, Item 3) from transmission (Figure 1, Item 5).
4. Remove filter suction tube (Figure 1, Item 3) from oil filter (Figure 1, Item 2). Discard oil filter.
5. Remove o-ring (Figure 1, Item 4) from filter suction tube (Figure 1, Item 3). Discard o-ring.

REMOVAL - Continued

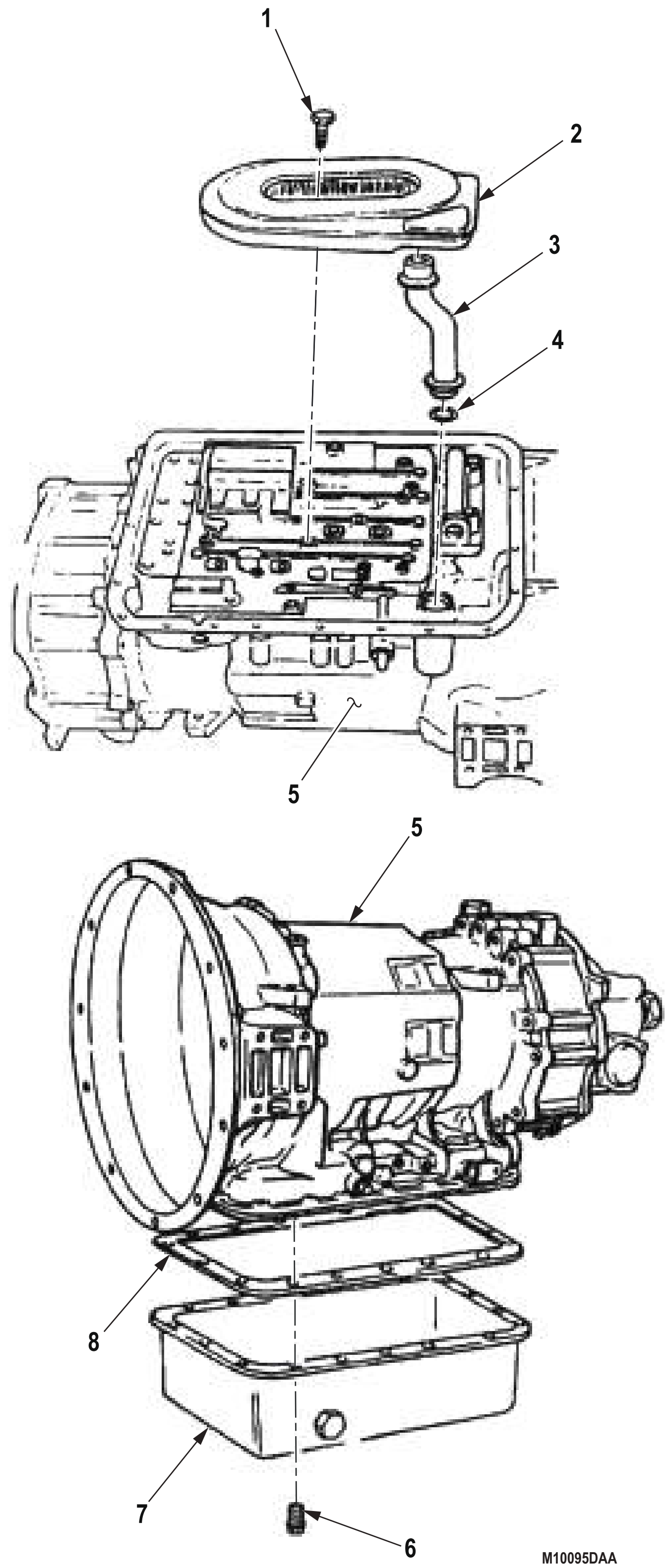


Figure 1. Transmission Oil Pan and Filter Removal.

END OF TASK

CLEANING AND INSPECTION

1. For General Cleaning Instructions, refer to (Volume 5, WP 0819).
2. For General Inspection Instructions, refer to (Volume 5, WP 0819).
3. Inspect oil pan (Figure 2, Item 1) for cracks. If cracked, replace oil pan.

NOTE

- New oil pan has a plug in left side fill port.
- If oil pan is defective, remove plug if present.

4. Remove oil plug (Figure 2, Item 2). Retain for installation in oil pan (Figure 2, Item 1).

CLEANING AND INSPECTION - Continued

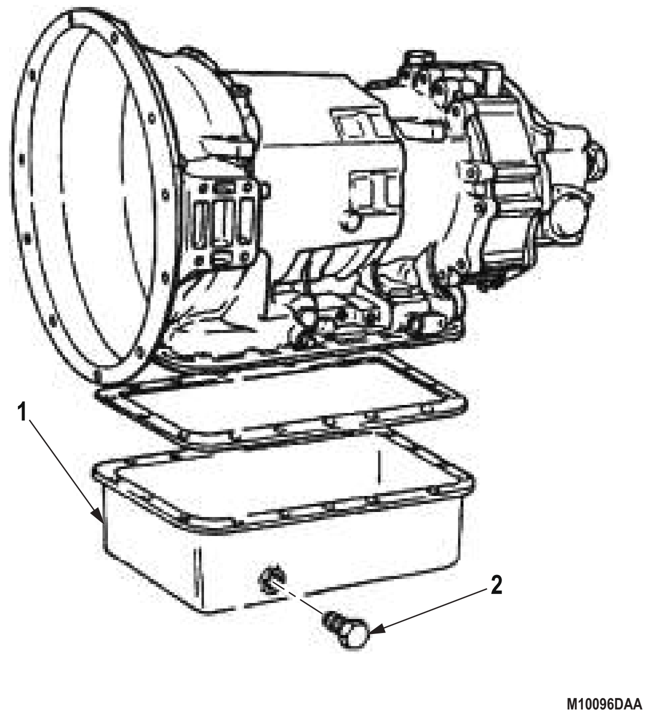


Figure 2. Transmission Oil Pan and Filter Removal.

END OF TASK

INSTALLATION

NOTE

- Keep oil pan mounting surface in horizontal position and facing upward.
- Filter suction tube ends are interchangeable.

1. Insert one end of filter suction tube (Figure 3, Item 3) into transmission oil filter assembly (Figure 3, Item 2).
2. Install o-ring (Figure 3, Item 4) onto opposite end of filter suction tube (Figure 3, Item 3).
3. Position transmission oil filter assembly (Figure 3, Item 2) on transmission (Figure 3, Item 6). Ensure filter suction tube (Figure 3, Item 3) is inserted into oil input port (Figure 3, Item 5).
4. Install transmission oil filter assembly (Figure 3, Item 2) on transmission (Figure 3, Item 6) with screw (Figure 3, Item 1). Tighten screw 10 to 15 lb-ft (14 to 20 N·m).

CAUTION

Do not use silicone-type gasket sealing compound when installing gasket, because oil leakage may result. Oil or light grease coating may be used to hold gasket in position during installation.

5. Position oil pan gasket (Figure 3, Item 7) against housing of transmission (Figure 3, Item 6) and align with holes of transmission.
6. Position transmission oil pan (Figure 3, Item 8) against oil pan gasket (Figure 3, Item 7) and install with 21 screws (Figure 3, Item 10). Tighten screws finger-tight.
7. Tighten 21 screws (Figure 3, Item 10) 10 to 15 lb-ft (14 to 20 N·m) following torque sequence shown in Figure 4.

INSTALLATION - Continued

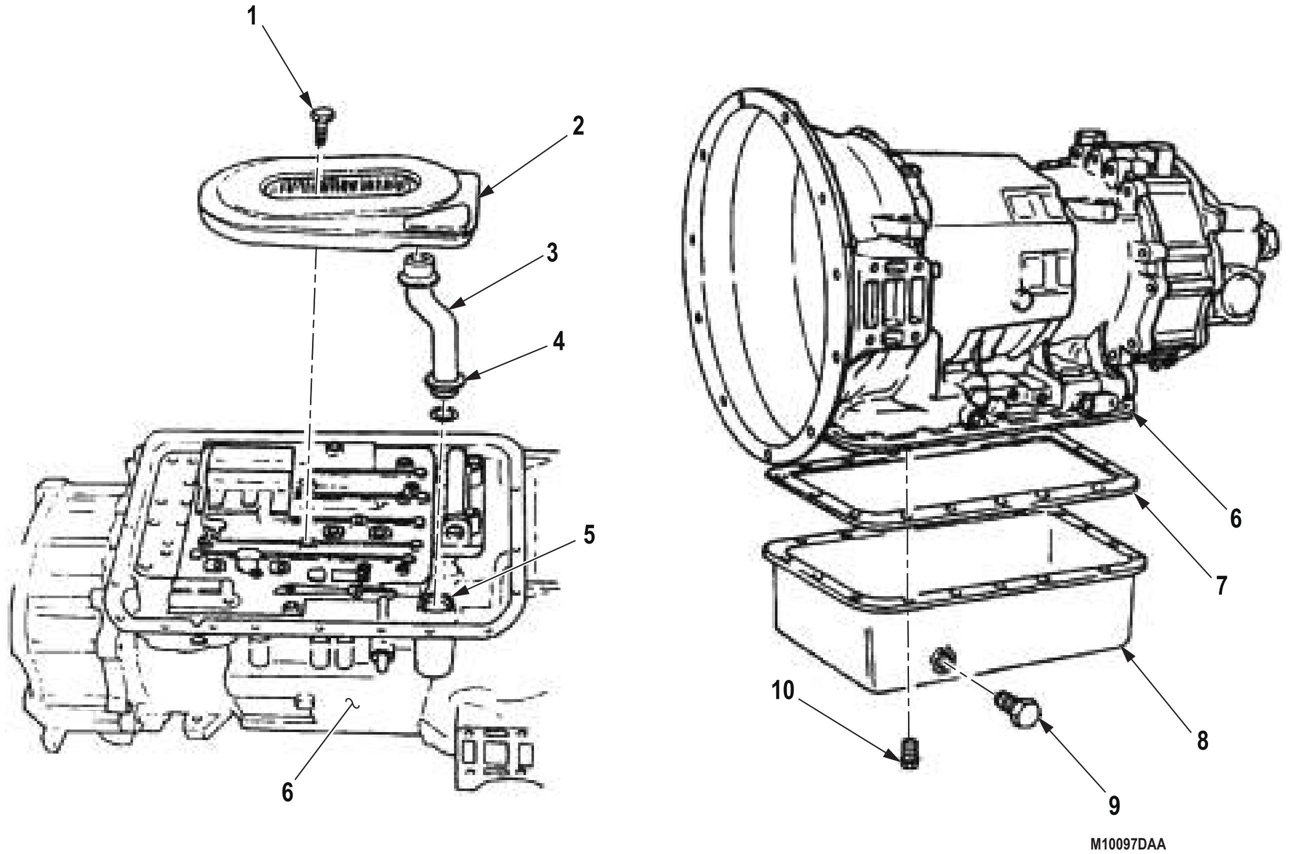


Figure 3. Transmission Oil Pan and Filter Installation.

INSTALLATION - Continued

NOTE

Due to gasket compression, torque values will be lost and screws must be retightened.

8. Tighten 21 screws (Figure 3, Item 10) 15 to 20 lb-ft (20 to 27 N·m) following torque sequence shown in Figure 4 to achieve final torque.

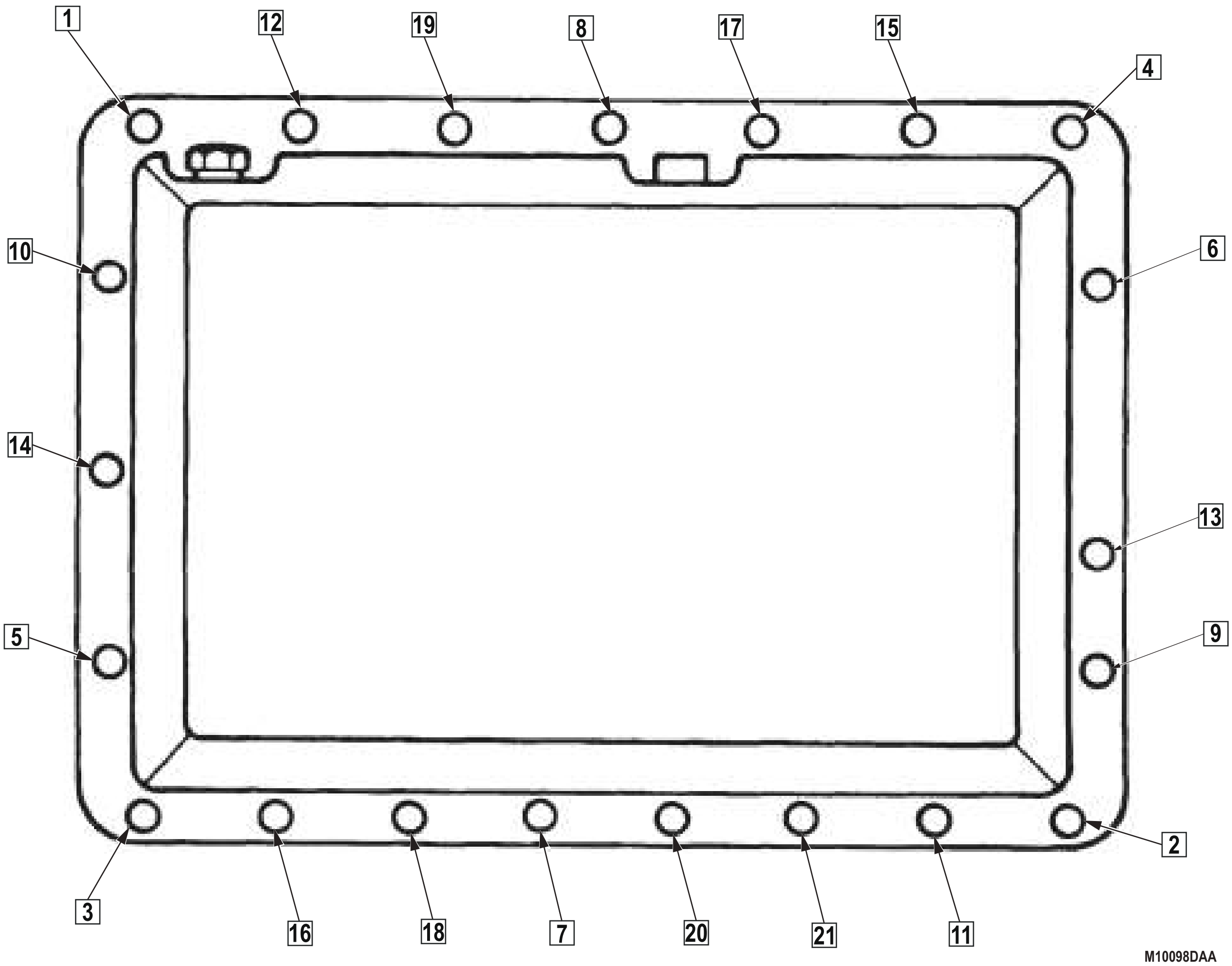


Figure 4. Transmission Oil Pan and Filter Installation.

NOTE

Perform Step (9) only if oil pan was installed.

9. Install plug (Figure 3, Item 9) in oil pan (Figure 3, Item 8). Ensure plug is installed opposite hole for dipstick.

END OF TASK

FOLLOW-ON MAINTENANCE

Install transmission torque converter.

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
TRANSMISSION LUBRICATION VALVE REPLACEMENT

INITIAL SETUP:

Tools and Special Tools

Tool Kit, General Mechanic's: Automotive
(Volume 5, WP 0826, Table 1, Item 56)
Wrench, Torque, Click, Ratcheting, 3/8" Drive, 75 Ft-Lb
(Volume 5, WP 0826, Table 1, Item 62)

Materials/Parts

Tape, Antiseizing
(Volume 5, WP 0825, Table 1, Item 65)
Gasket (Volume 5, WP 0827, Table 1, Item 198)
Qty: 1
Locknut (Volume 5, WP 0827, Table 1, Item 430)
Qty: 1
Lubrication Valve
(Volume 5, WP 0827, Table 1, Item 193)
Qty: 1
O-ring (Volume 5, WP 0827, Table 1, Item 258)
Qty: 1

Materials/Parts (cont.)

Tube, Valve Guide
(Volume 5, WP 0827, Table 1, Item 124)
Qty: 1
Valve Spring
(Volume 5, WP 0827, Table 1, Item 194)
Qty: 1

References

Volume 5, WP 0820

Equipment Condition

Parking brake set. (TM 9-2320-272-10)

REMOVAL

CAUTION

Clean around lubrication valve area to prevent entry of dirt. Damage to transmission may occur if dirt or dust enters transmission.

NOTE

- Perform Step (1) for vehicles equipped with front winch.
- Perform Step (2) for vehicles equipped with transmission power takeoff (PTO).
- Have container ready to catch oil.

1. Remove locknut (Figure 1, Item 6), screw (Figure 1, Item 5), two clamps (Figure 1, Item 3), and hoses (Figure 1, Items 1 and 4) from hanger strap (Figure 1, Item 2). Discard locknut.

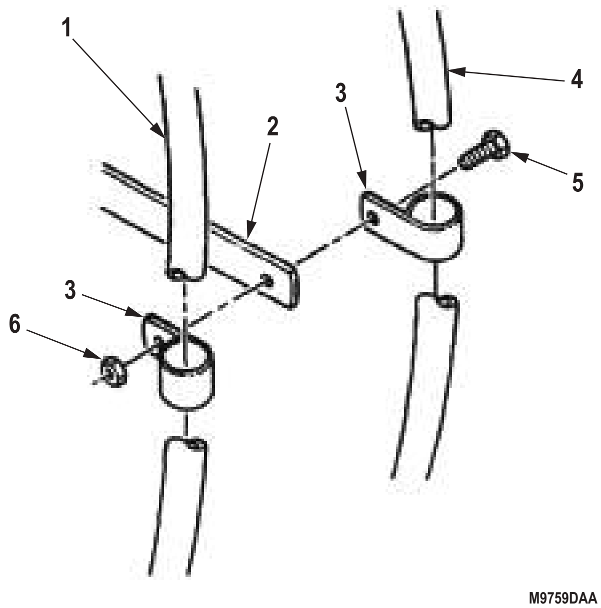


Figure 1. Front Winch Hoses Removal.

REMOVAL - Continued

2. Remove transmission-to-PTO supply hose (Figure 2, Item 1) and adapter (Figure 2, Item 2) from elbow (Figure 2, Item 3).
3. Disconnect transmission oil filter-to-transmission supply hose (Figure 2, Item 4) from elbow (Figure 2, Item 3).
4. Remove elbow (Figure 2, Item 3) and o-ring (Figure 2, Item 5) from lubrication valve housing (Figure 2, Item 6). Discard o-ring.
5. Remove two screws (Figure 2, Item 7), lubrication valve housing (Figure 2, Item 9), gasket (Figure 2, Item 10), valve guide tube (Figure 2, Item 11), lubrication valve (Figure 2, Item 12), and valve spring (Figure 2, Item 13) from transmission (Figure 2, Item 8). Discard gasket, spring guide, lubrication valve, and valve spring.

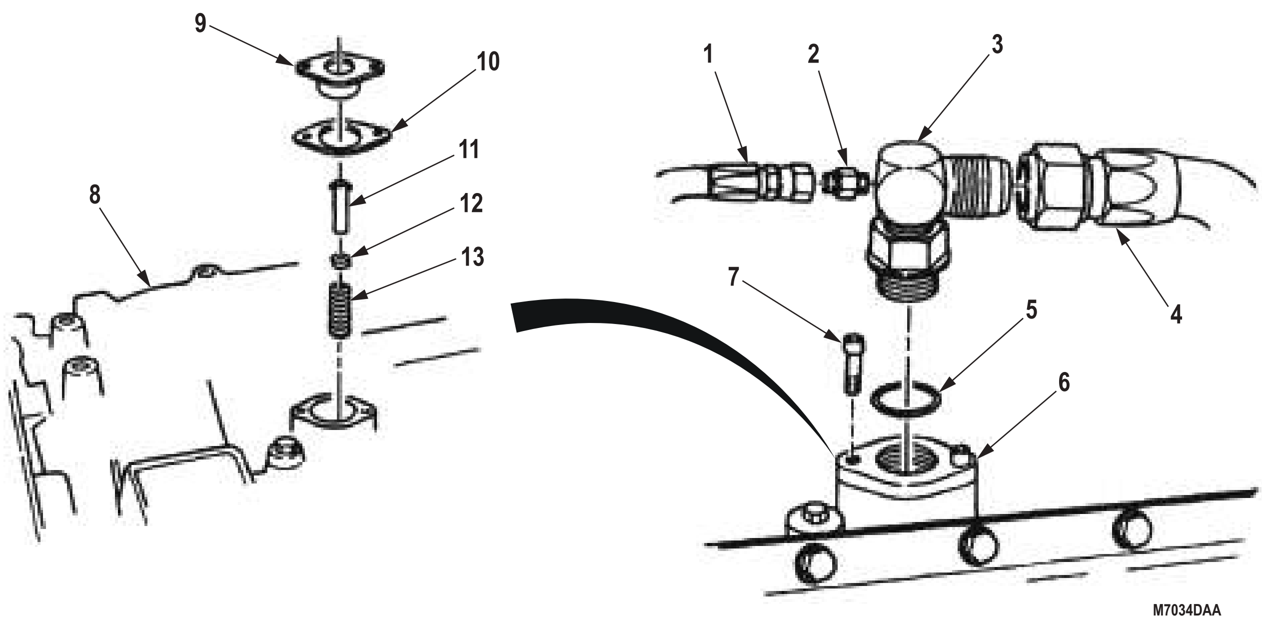


Figure 2. Transmission Lubrication Valve Removal.

END OF TASK

INSTALLATION

1. Install valve spring (Figure 3, Item 5), lubrication valve (Figure 3, Item 4), and valve guide tube (Figure 3, Item 3) in bore (Figure 3, Item 6) of transmission (Figure 3, Item 7). Ensure raised side of lubrication valve faces outward.
2. Install gasket (Figure 3, Item 2) and lubrication valve housing (Figure 3, Item 1) on transmission (Figure 3, Item 7) with two screws (Figure 4, Item 7). Tighten screws 9 to 11 lb-ft (12 to 15 N·m).

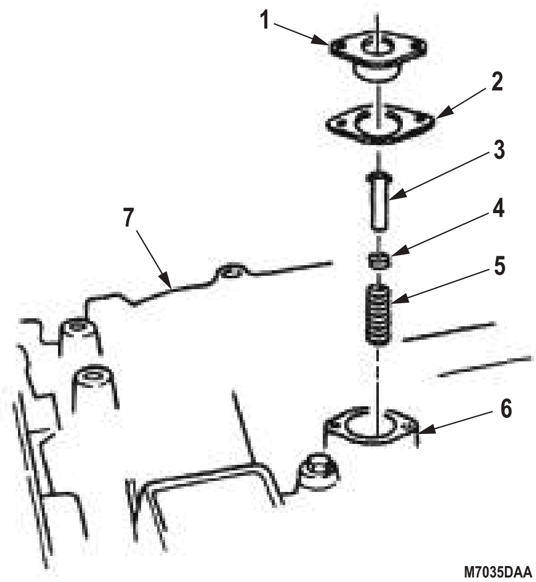


Figure 3. Transmission Lubrication Valve Installation.

3. Place o-ring (Figure 4, Item 5) on elbow (Figure 4, Item 3) and install elbow on lubrication valve housing (Figure 4, Item 6). Tighten elbow until aligned and jamnut (Figure 4, Item 8) seats, then tighten jamnut until o-ring seats.
4. Connect transmission oil filter-to-transmission supply hose (Figure 4, Item 4) on elbow (Figure 4, Item 3).

NOTE

- Perform Step (5) for vehicles equipped with transmission PTO.
- Perform Step (6) for vehicles equipped with front winch.
- Apply sealant to all male threads before installation.

5. Install adapter (Figure 4, Item 2) and transmission-to-PTO supply hose (Figure 4, Item 1) on elbow (Figure 4, Item 3).

INSTALLATION - Continued

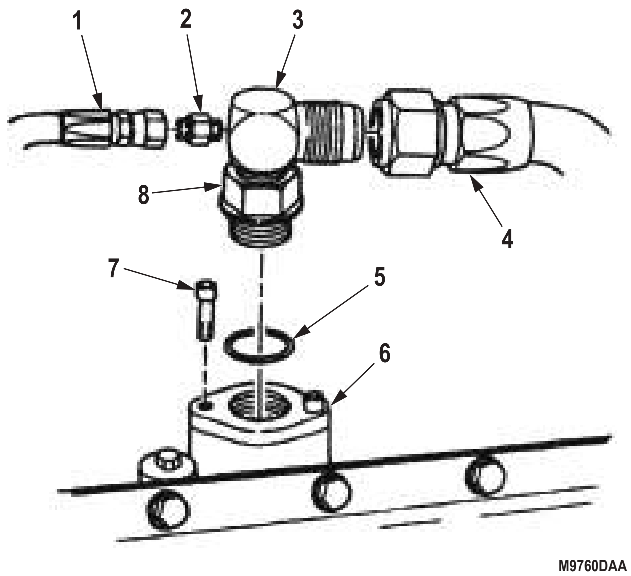


Figure 4. Transmission Lubrication Valve Installation.

6. Install hoses (Figure 5, Items 1 and 2) on hanger bracket (Figure 5, Item 5) with two clamps (Figure 5, Item 4), screw (Figure 5, Item 3), and locknut (Figure 5, Item 6).

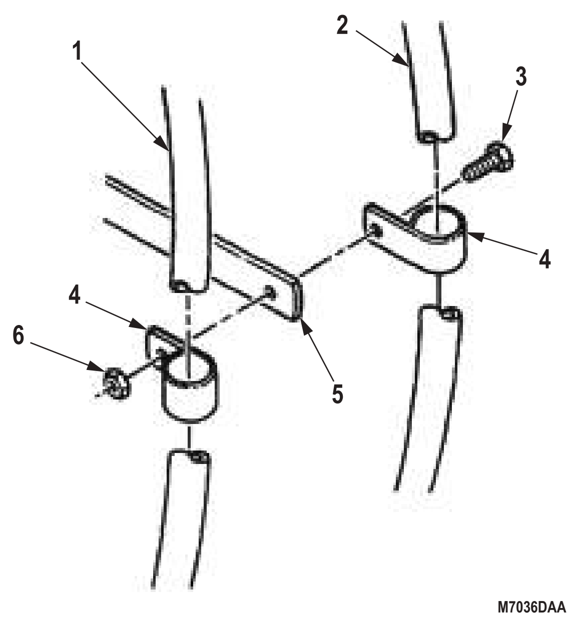


Figure 5. Front Winch Hoses Installation.

END OF TASK

FOLLOW-ON MAINTENANCE

1. Fill transmission to proper fluid level. (Volume 5, WP 0820)
2. Start engine and road test vehicle. (TM 9-2320-272-10)

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
TRANSMISSION FIFTH GEAR LOCK-IN SOLENOID REPLACEMENT

INITIAL SETUP:

Tools and Special Tools
Tool Kit, General Mechanic's: Automotive
(Volume 5, WP 0826, Table 1, Item 56)

Materials/Parts
Cap Set, Protective, Dust and Moisture Seal
(Volume 5, WP 0825, Table 1, Item 13)
Tape, Antiseizing
(Volume 5, WP 0825, Table 1, Item 65)
Locknut (Volume 5, WP 0827, Table 1, Item 319)
Qty: 2
Lockwasher

Materials/Parts (cont.)
(Volume 5, WP 0827, Table 1, Item 393)
Qty: 1
Tiedown Strap
(Volume 5, WP 0827, Table 1, Item 373)
Qty: 1

References
Volume 5, WP 0820

Equipment Condition
Parking brake set. (TM 9-2320-272-10)
Transmission shift cable removed. (WP 0371)

REMOVAL

CAUTION

Clean surrounding surface area and plug all open ports to prevent the entry of dirt. Damage to transmission may occur if dirt or dust enters transmission.

NOTE

- Have drainage container ready to catch oil.
- Use drain pans to retain leaking/draining fluids. Refer to local procedures and plans for preventing and responding to fluid spills or leaks. Comply with local regulations when disposing of clean up material and leaked and spilled fluids.

1. Disconnect main pressure line (Figure 1, Item 4) from adapters (Figure 1, Items 5 and 17).
2. Disconnect governor pressure line (Figure 1, Item 8) from adapters (Figure 1, Items 7 and 21).
3. Disconnect lead (Figure 1, Item 1) from connector (Figure 1, Item 16).
4. Remove tiedown strap (Figure 1, Item 12) from harness (Figure 1, Item 13) and ground lead (Figure 1, Item 10). Discard tiedown strap.
5. Remove two locknuts (Figure 1, Item 14), screws (Figure 1, Item 9), ground lead (Figure 1, Item 10), lockwasher (Figure 1, Item 11), and fifth gear lock-in solenoid (Figure 1, Item 6) from support bracket (Figure 1, Item 3). Discard locknuts and lockwasher.
6. Remove adapters (Figure 1, Items 5 and 7) from fifth gear lock-in solenoid (Figure 1, Item 6).
7. Remove four screws (Figure 1, Item 2) and support bracket (Figure 1, Item 3) from transmission (Figure 1, Item 15).
8. Remove adapter (Figure 1, Item 17) from transmission main pressure port (Figure 1, Item 18).

NOTE

Only M936/A1/A2 series vehicles are equipped with check valve.

9. Remove adapter (Figure 1, Item 21) and check valve (Figure 1, Item 20) from transmission governor pressure port (Figure 1, Item 19).

REMOVAL - Continued

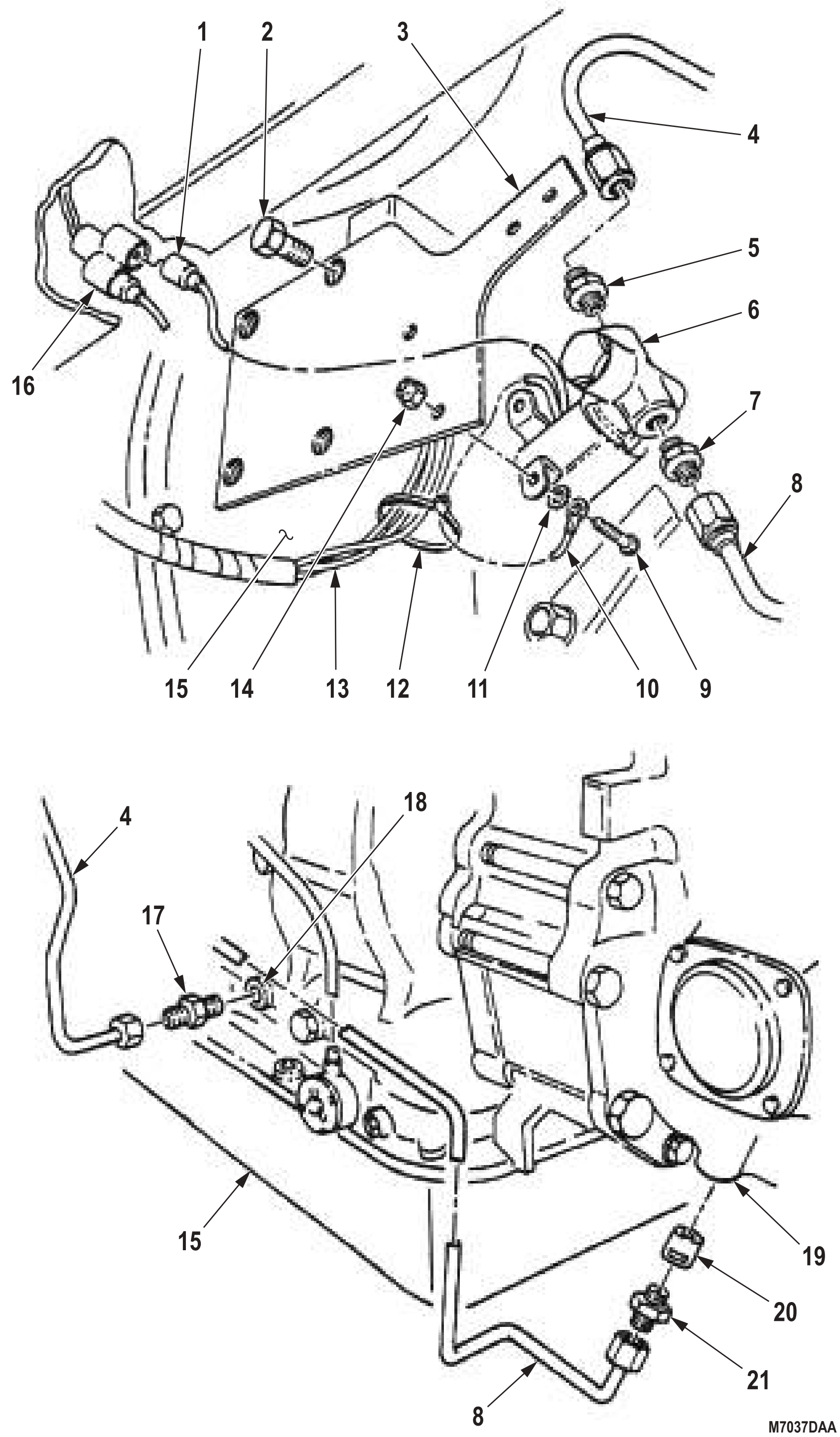


Figure 1. Transmission Fifth Gear Lock-in Solenoid Removal.

END OF TASK

INSTALLATION

NOTE

- Wrap all male threads with antiseize tape before installation.
- Only M936/A1/A2 series vehicles are equipped with check valve.
- When installing check valve, ensure end with small bleed holes is facing away from adapter.

1. Install check valve (Figure 2, Item 3) and adapter (Figure 2, Item 4) on transmission governor pressure port (Figure 2, Item 2).
2. Install adapter (Figure 2, Item 8) on transmission main pressure port (Figure 2, Item 1).
3. Install support bracket (Figure 2, Item 11) on transmission (Figure 2, Item 6) with four screws (Figure 2, Item 10).
4. Install adapters (Figure 2, Items 12 and 14) on fifth gear lock-in solenoid (Figure 2, Item 13).
5. Install fifth gear lock-in solenoid (Figure 2, Item 13) and ground lead (Figure 2, Item 16) on support bracket (Figure 2, Item 11) with two screws (Figure 2, Item 15), lockwasher (Figure 2, Item 17), and two locknuts (Figure 2, Item 20).
6. Install tiedown strap (Figure 2, Item 18) on harness (Figure 2, Item 19) and ground lead (Figure 2, Item 16).
7. Connect lead (Figure 2, Item 9) to connector (Figure 2, Item 21).
8. Connect governor pressure line (Figure 2, Item 5) to adapters (Figure 2, Items 4 and 14).
9. Connect main pressure line (Figure 2, Item 7) to adapters (Figure 2, Items 8 and 12).

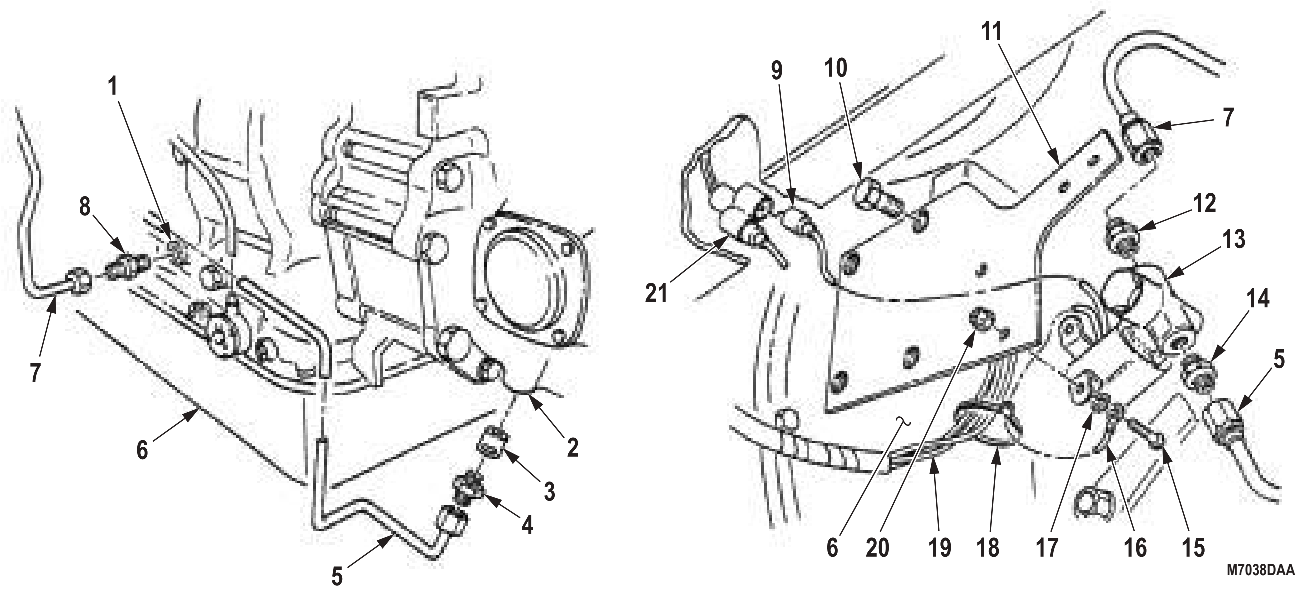


Figure 2. Governor and Main Pressure Lines Installation.

END OF TASK

FOLLOW-ON MAINTENANCE

1. Install transmission shift cable. (WP 0371)
2. Fill transmission to proper fluid level. (Volume 5, WP 0820)
3. Start engine and road test vehicle. (TM 9-2320-272-10)

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
TRANSMISSION OIL COOLER AND MOUNT REPLACEMENT (M939/A1)

INITIAL SETUP:

Tools and Special Tools

Tool Kit, General Mechanic's: Automotive
(Volume 5, WP 0826, Table 1, Item 56)

Materials/Parts

Cap Set, Protective, Dust and Moisture Seal
(Volume 5, WP 0825, Table 1, Item 13)
Rag, Wiping
(Volume 5, WP 0825, Table 1, Item 53)

Materials/Parts (cont.)

Locknut (Volume 5, WP 0827, Table 1, Item 285)
Qty: 4
Locknut (Volume 5, WP 0827, Table 1, Item 313)
Qty: 4

References

Volume 5, WP 0820

Equipment Condition

Parking brake set. (TM 9-2320-272-10)
Right splash shield removed. (TM 9-2320-272-10)
Cooling system drained. (Volume 2, WP 0287)

OIL COOLER REMOVAL

CAUTION

- Clean area around hoses before removal to prevent entry of dirt. Damage may occur if dirt or dust enters transmission.
- Cover or plug all open hoses and connections immediately after disconnection to prevent contamination. Failure to do this may result in transmission damage.

NOTE

- Have drainage container ready to catch oil and coolant.
- Tag hoses for installation.
- Use drain pans to retain leaking/draining fluids. Refer to local procedures and plans for preventing and responding to fluid spills or leaks. Comply with local regulations when disposing of clean up material and leaked and spilled fluids.

1. Loosen hose clamp (Figure 1, Item 6) and remove coolant supply hose (Figure 1, Item 7) from coolant inlet flange (Figure 1, Item 5) and clamp from hose.
2. Loosen hose clamp (Figure 1, Item 14) and remove coolant return hose (Figure1, Item 15) from coolant outlet flange (Figure 1, Item 13) and clamp from hose.
3. Disconnect oil cooler-to-cooler filter supply hose (Figure 1, Item 3) from elbow (Figure 1, Item 4).
4. Disconnect transmission-to-oil cooler supply hose (Figure 1, Item 2) from elbow (Figure 1, Item 1).
5. Remove four locknuts (Figure 1, Item 10), screws (Figure 1, Item 12), washers (Figure 1, Item 11), and oil cooler (Figure 1, Item 9) from two mounts (Figure1, Item 8). Discard locknuts and empty coolant from oil cooler.
6. Remove fitting (Figure 1, Item 1) from oil cooler (Figure 1, Item 9).
7. Remove fitting (Figure 1, Item 4) from oil cooler (Figure 1, Item 9).

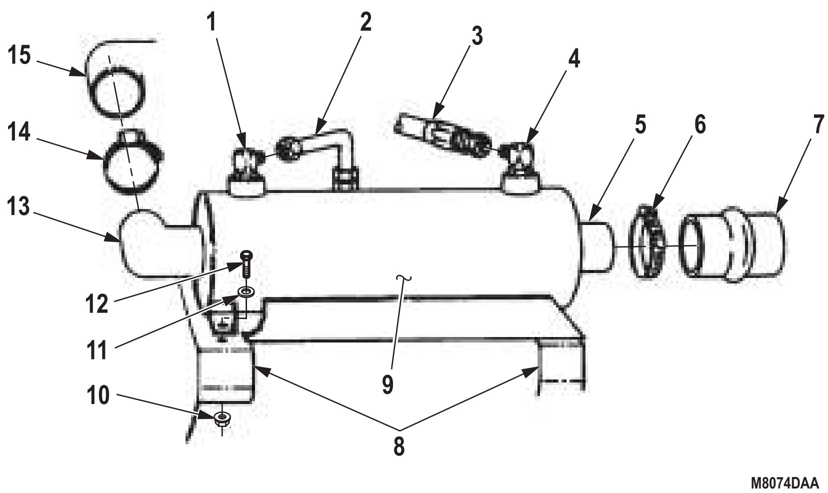


Figure 1. Oil Cooler Removal.

END OF TASK

OIL COOLER MOUNT REMOVAL

Remove four locknuts (Figure 2, Item 2), screws (Figure 2, Item 4), and two mounts (Figure 2, Item 1) from frame rail (Figure 2, Item 3). Discard locknuts.

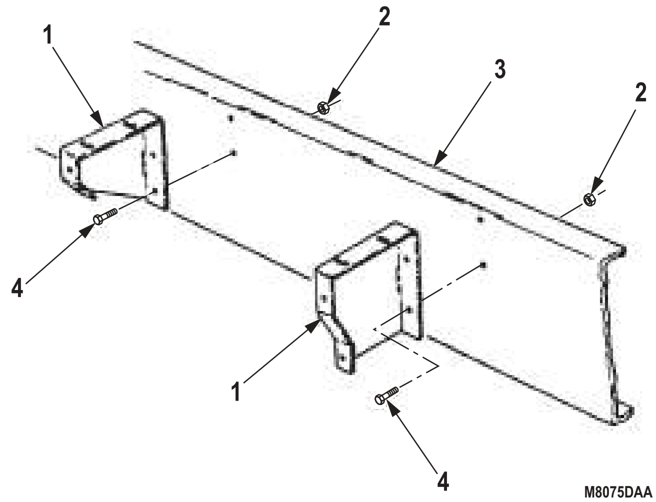


Figure 2. Oil Cooler Removal.

END OF TASK

OIL COOLER MOUNT INSTALLATION

Install two mounts (Figure 3, Item 1) on frame rail (Figure 3, Item 3) with four screws (Figure 3, Item 4) and locknuts (Figure 3, Item 2).

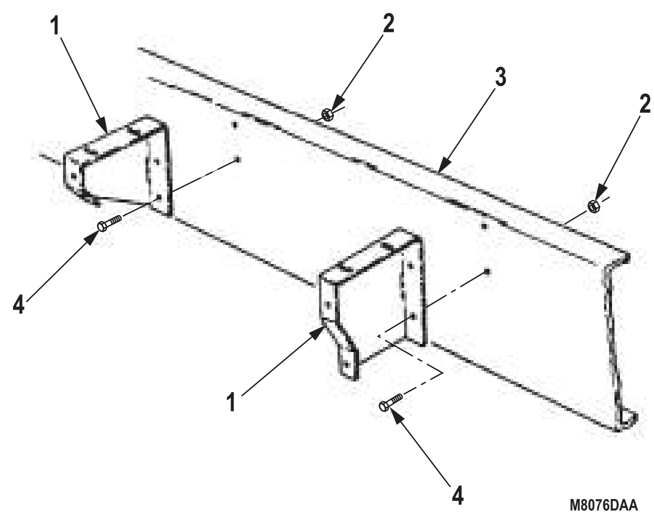


Figure 3. Oil Cooler Removal.

END OF TASK

OIL COOLER INSTALLATION

CAUTION

Ensure plugs or covers are completely removed from all hoses an connections. Failure to do this may result in transmission and oil cooler damage.

1. Install fitting (Figure 4, Item 4) to oil cooler (Figure 4, Item 9).
2. Install fitting (Figure 4, Item 1) to oil cooler (Figure 4, Item 9).
3. Install transmission oil cooler (Figure 4, Item 9) on two mounts (Figure 4, Item 8) with four washers (Figure 4, Item 11), screws (Figure 4, Item 12), and locknuts (Figure 4, Item 10).
4. Connect transmission-to-oil cooler supply hose (Figure 4, Item 2) on elbow (Figure 4, Item 1).
5. Connect oil cooler-to-cooler filter supply hose (Figure 4, Item 3) on elbow (Figure 4, Item 4).
6. Position hose clamp (Figure 4, Item 14) on hose (Figure 4, Item 15) and install hose on flange (Figure 4, Item 13) and tighten clamp.
7. Position clamp (Figure 4, Item 6) on hose (Figure 4, Item 7) and install hose on flange (Figure 4, Item 5) and tighten clamp.

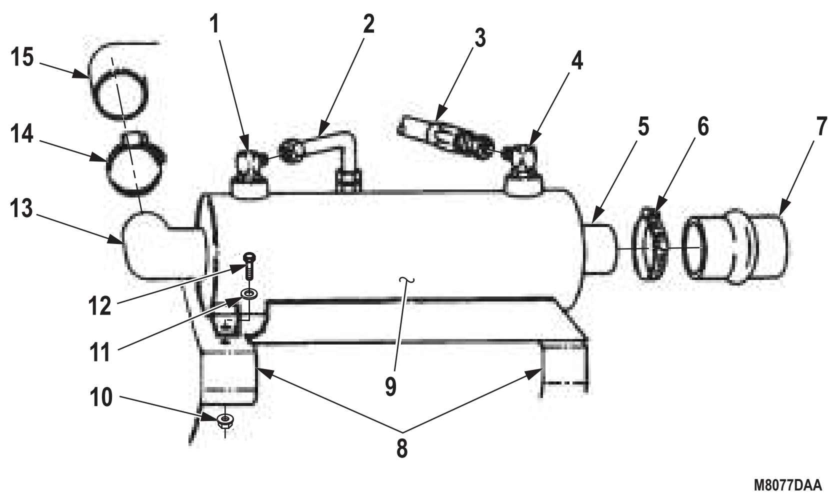


Figure 4. Oil Cooler Removal.

END OF TASK

FOLLOW-ON MAINTENANCE

1. Fill vehicle cooling system to proper operating level. (Volume 5, WP 0820)
2. Install right splash shield. (TM 9-2320-272-10)
3. Fill transmission oil reservoir to proper level. (Volume 5, WP 0820)
4. Start engine, check for leaks, and road test vehicle. (TM 9-232-272-10)

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
TRANSMISSION OIL COOLER FILTER AND HEAD REPAIR

INITIAL SETUP:

Tools and Special Tools
Tool Kit, General Mechanic's: Automotive
(Volume 5, WP 0826, Table 1, Item 56)

Materials/Parts
Cap Set, Protective, Dust and Moisture Seal
(Volume 5, WP 0825, Table 1, Item 13)
Lubricating Oil, Engine 10W
(Volume 5, WP 0825, Table 1, Item 36, 37, 38)
Rag, Wiping
(Volume 5, WP 0825, Table 1, Item 53)

Materials/Parts (cont.)
Locknut (Volume 5, WP 0827, Table 1, Item 283)
Qty: 3
Oil Filter (Volume 5, WP 0827, Table 1, Item 440)
Qty: 1

References
Volume 5, WP 0820

Equipment Condition
Parking brake set. (TM 9-2320-272-10)
Hood raised and secured. (TM 9-2320-272-10)

OIL COOLER FILTER REMOVAL

NOTE

- Have drainage container ready to catch oil.
- Use drain pans to retain leaking/draining fluids. Refer to local procedures and plans for preventing and responding to fluid spills or leaks. Comply with local regulations when disposing of clean up material and leaked and spilled fluids.

Remove oil filter (Figure 1, Item 3) and oil filter seal (Figure 1, Item 2) from oil filter head (Figure 1, Item 1). Drain oil and discard oil filter and oil filter seal.

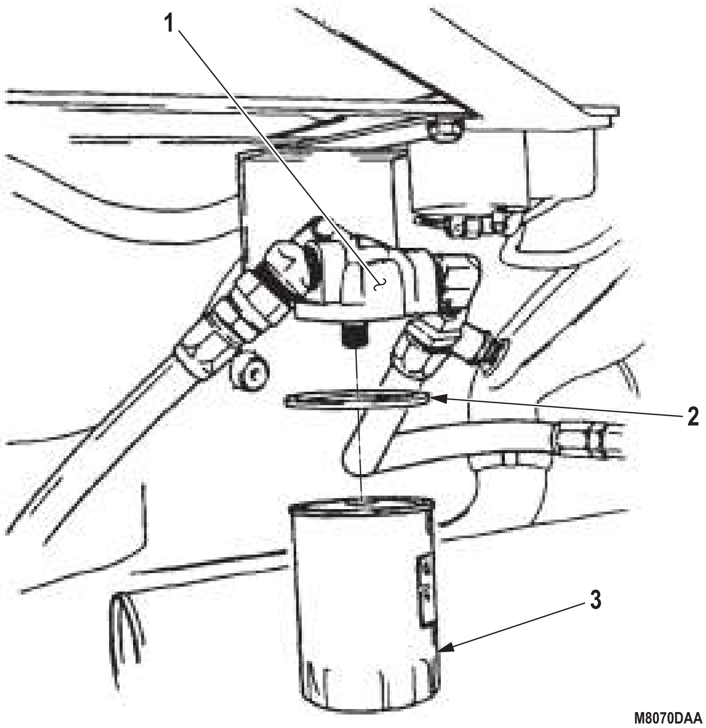


Figure 1. Oil Cooler Filter Removal.

END OF TASK

OIL COOLER FILTER HEAD REMOVAL

CAUTION

- Clean area around hoses before removal to prevent entry of dirt. Damage may occur if dirt or dust enters transmission.
- Cap or plug all open hoses and connections immediately after disconnection to prevent contamination. Failure to do this may result in transmission damage.

NOTE

- Have drainage container ready to catch oil.
- Tag hoses for installation.
- Use drain pans to retain leaking/draining fluids. Refer to local procedures and plans for preventing and responding to fluid spills or leaks. Comply with local regulations when disposing of clean up material and leaked and spilled fluids.

1. Remove oil filter supply hose (Figure 2, Item 5) from adapter elbow (Figure 2, Item 4).
2. Remove supply hose (Figure 2, Item 6) from adapter elbow (Figure 2, Item 7).
3. Remove three locknuts (Figure 2, Item 8), screws (Figure 2, Item 3), and oil filter head (Figure 2, Item 2) from oil filter bracket (Figure 2, Item 1). Discard locknuts.

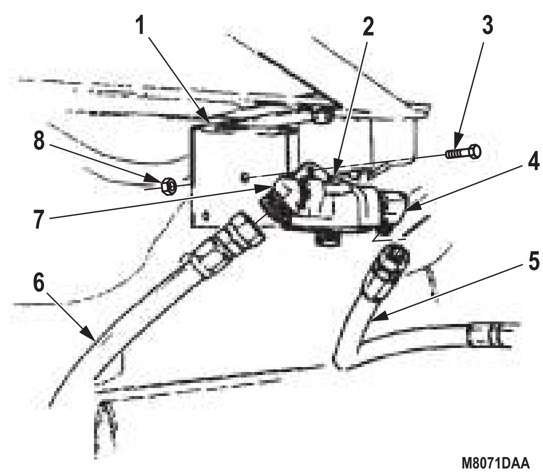


Figure 2. Oil Filter Cooler Head Removal.

END OF TASK

OIL COOLER FILTER HEAD INSTALLATION

CAUTION

Ensure plugs or cover are completely removed from al hoses and connections. Failure to do this may result in transmission damage.

NOTE

If new filter head is to be installed, use fittings from old filter head.

1. Install oil filter head (Figure 3, Item 2) on oil filter bracket (Figure 3, Item 1) with three screws (Figure 3, Item 3) and locknuts (Figure 3, Item 8).
2. Install supply hose (Figure 3, Item 6) on adapter elbow (Figure 3, Item 7).
3. Install oil filter supply hose (Figure 3, Item 5) on adapter elbow (Figure 3, Item 4).

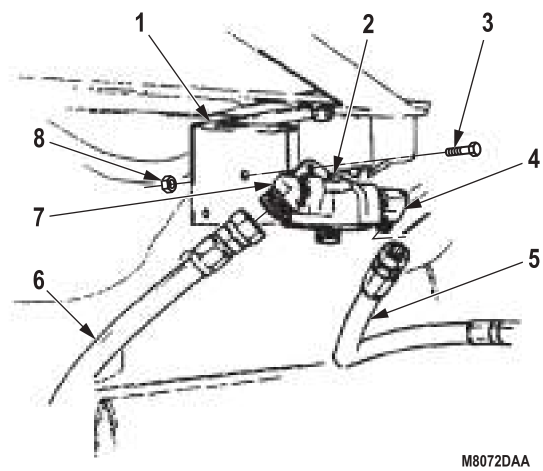


Figure 3. Oil Cooler Filter Head Installation.

END OF TASK

OIL COOLER FILTER INSTALLATION

1. Lightly coat oil filter seal (Figure 4, Item 2) with lubricating oil and position on oil filter head (Figure 4, Item 1).
2. Install oil filter (Figure 4, Item 3).

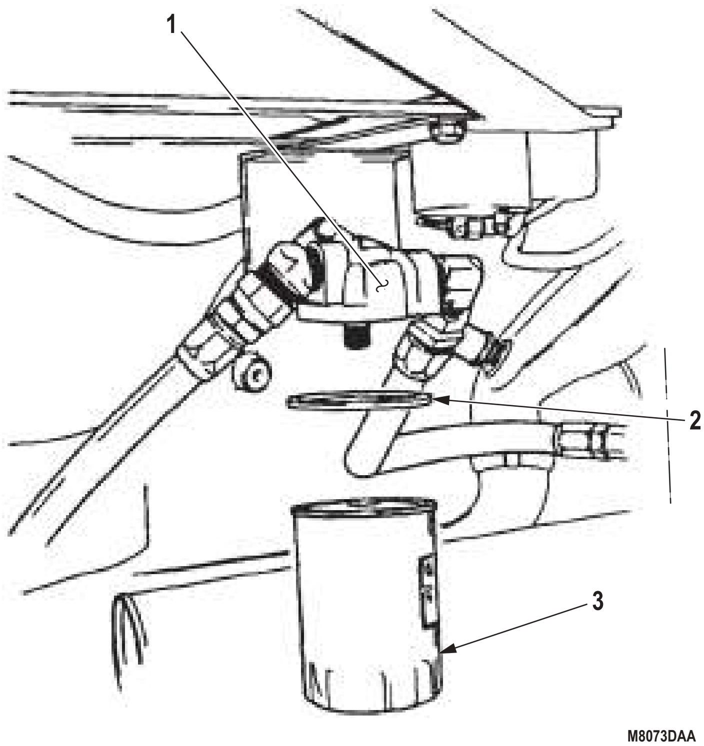


Figure 4. Oil Cooler Filter Installation.

END OF TASK

FOLLOW-ON MAINTENANCE

1. Fill transmission oil to proper level. (Volume 5, WP 0820)
2. Start engine, check for leaks, and road test vehicle. (TM 9-2320-272-10)

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
TRANSMISSION OIL COOLER HOSES REPLACEMENT

INITIAL SETUP:

Tools and Special Tools

Tool Kit, General Mechanic's: Automotive
(Volume 5, WP 0826, Table 1, Item 56)

Materials/Parts

Cap Set, Protective, Dust and Moisture Seal
(Volume 5, WP 0825, Table 1, Item 13)
Tape, Antiseizing
(Volume 5, WP 0825, Table 1, Item 65)
Lockwasher
(Volume 5, WP 0827, Table 1, Item 406)
Qty: 1
O-ring (Volume 5, WP 0827, Table 1, Item 80)
Qty: 2
O-ring (Volume 5, WP 0827, Table 1, Item 258)
Qty: 2
Tiedown Strap
(Volume 5, WP 0827, Table 1, Item 374)
Qty: 2

References

Volume 5, WP 0820

Equipment Condition

Parking brake set. (TM 9-2320-272-10)
Right splash shield removed. (TM 9-2320-272-10)
Transmission temperature transmitter unit
removed. (Volume 2, WP 0341)

REMOVAL

CAUTION

- Clean area around hoses before removal to prevent entry of dirt. Damage may occur if dirt or dust enters transmission.
- Cover or plug all open hoses and connections immediately after disconnection to prevent contamination. Failure to do this may result in transmission damage.

NOTE

- Have drainage container ready to catch oil.
- Use drain pans to retain leaking/draining fluids. Refer to local procedures and plans for preventing and responding to fluid spills or leaks. Comply with local regulations when disposing of clean up material and leaked and spilled fluids.
- Access to hose connection in Step (1) is gained through access door in cab floor.
- Tag hoses for installation.

1. Disconnect supply hose (Figure 1, Item 12) from adapter (Figure 1, Item 11).
2. Remove adapter (Figure 1, Item 11) and adapter (Figure 1, Item 10) from elbow (Figure 1, Item 9).
3. Remove elbow (Figure 1, Item 9) and o-ring (Figure 1, Item 8) from transmission (Figure 1, Item 1). Discard o-ring.

NOTE

Perform Step (4) for vehicles equipped with front winch.

4. Remove locknut (Figure 1, Item 2) and screw (Figure 1, Item 6) from hanger strap (Figure 1, Item 3), and move winch hydraulic hoses (Figure 1, Items 4 and 5) and two clamps (Figure 1, Item 7) aside. Discard locknut.

REMOVAL - Continued

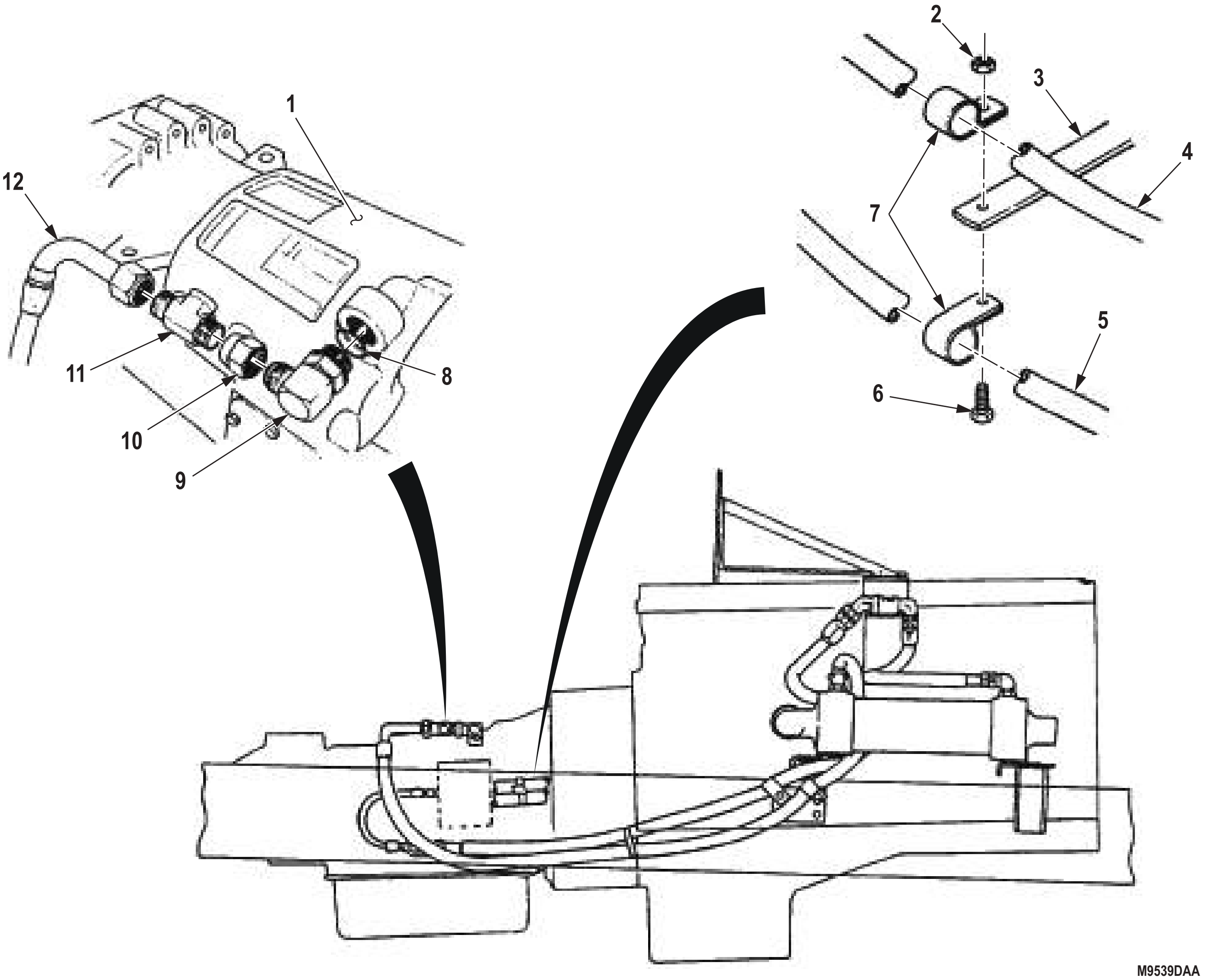


Figure 1. Oil Cooler Hoses Removal.

REMOVAL - Continued

NOTE

Perform Steps (5) through (10) for vehicles equipped with transmission Power Takeoff (PTO).

5. Disconnect hose (Figure 2, Item 10) from hose adapter (Figure 2, Item 11).
6. Remove adapter (Figure 2, Item 11) from adapter (Figure 2, Item 12).
7. Remove adapter (Figure 2, Item 12) from adapter (Figure 2, Item 2).
8. Disconnect hose (Figure 2, Item 10) from hose adapter (Figure 2, Item 9).
9. Remove adapter (Figure 2, Item 9) from adapter (Figure 2, Item 8).
10. Remove adapter (Figure 2, Item 8) from PTO (Figure 2, Item 7).
11. Disconnect hose (Figure 2, Item 1) from adapter (Figure 2, Item 2).
12. Remove adapter (Figure 2, Item 2) and o-ring (Figure 2, Item 4) from valve housing (Figure 2, Item 3). Discard o-ring.
13. Remove two tiedown straps (Figure 2, Item 6) from hoses (Figure 2, Item 1 and 5). Discard tiedown straps.

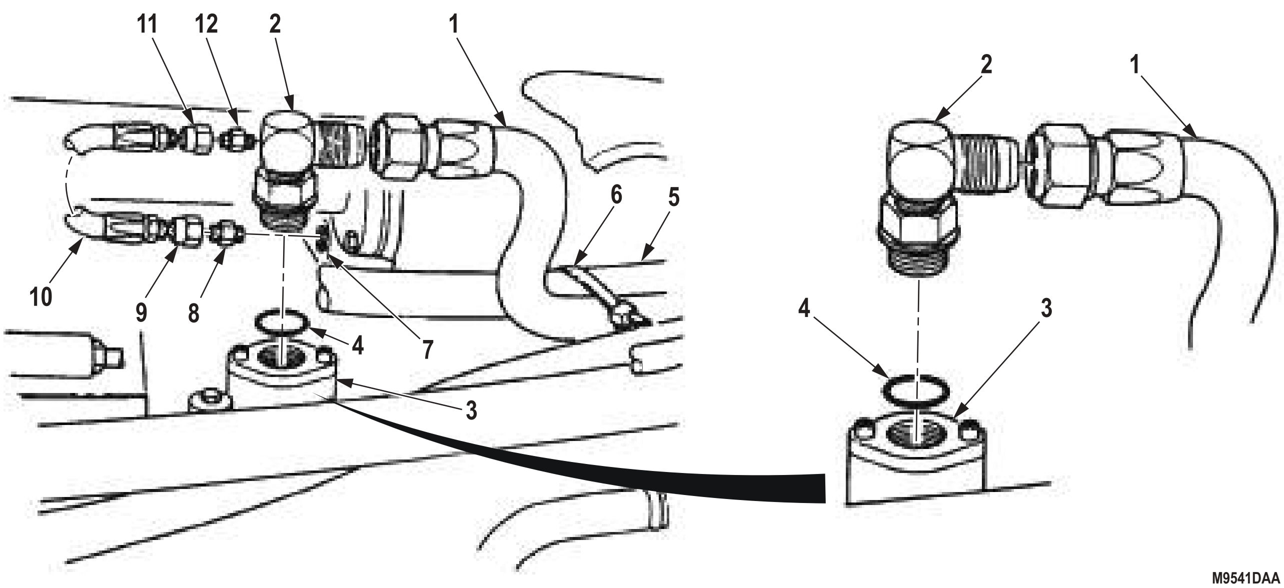


Figure 2. Oil Cooler Hoses Removal.

REMOVAL - Continued

14. Remove two screws (Figure 3, Item 2), washers (Figure 3, Item 4), lockwashers (Figure 3, Item 5), clamps (Figure 3, Item 6), and hoses (Figure 3, Items 3 and 7) from engine access cover (Figure 3, Item 1). Discard lockwashers.

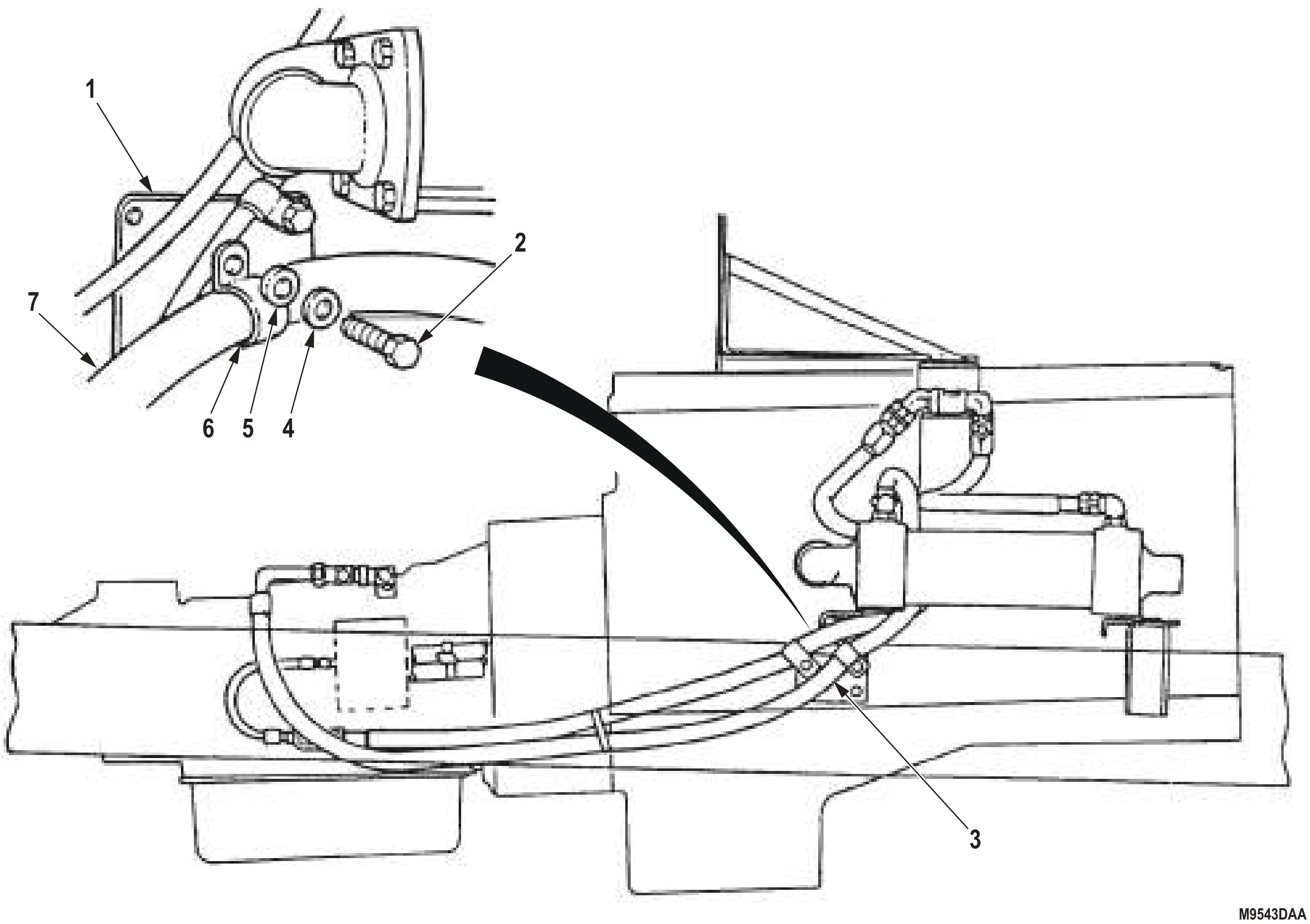


Figure 3. Oil Cooler Hoses Removal.

REMOVAL - Continued

15. Disconnect oil cooler supply hose (Figure 4, Item 7) from elbow (Figure 4, Item 10).
16. Remove elbow (Figure 4, Item 10) and o-ring (Figure 4, Item 9) from oil cooler (Figure 4, Item 8). Discard o-ring.
17. Disconnect supply hose (Figure 4, Item 4) from adapter elbow (Figure 4, Item 5).
18. Remove elbow (Figure 4, Item 5) and o-ring (Figure 4, Item 6) from oil cooler (Figure 4, Item 8). Discard o-ring.
19. Remove supply hose (Figure 4, Item 4) from adapter elbow (Figure 4, Item 3).
20. Remove adapter elbow (Figure 4, Item 3) from oil filter housing (Figure 4, Item 2).
21. Disconnect return hose (Figure 4, Item 11) from elbow (Figure 4, Item 1).
22. Remove elbow (Figure 4, Item 1) from oil filter housing (Figure 4, Item 2).

REMOVAL - Continued

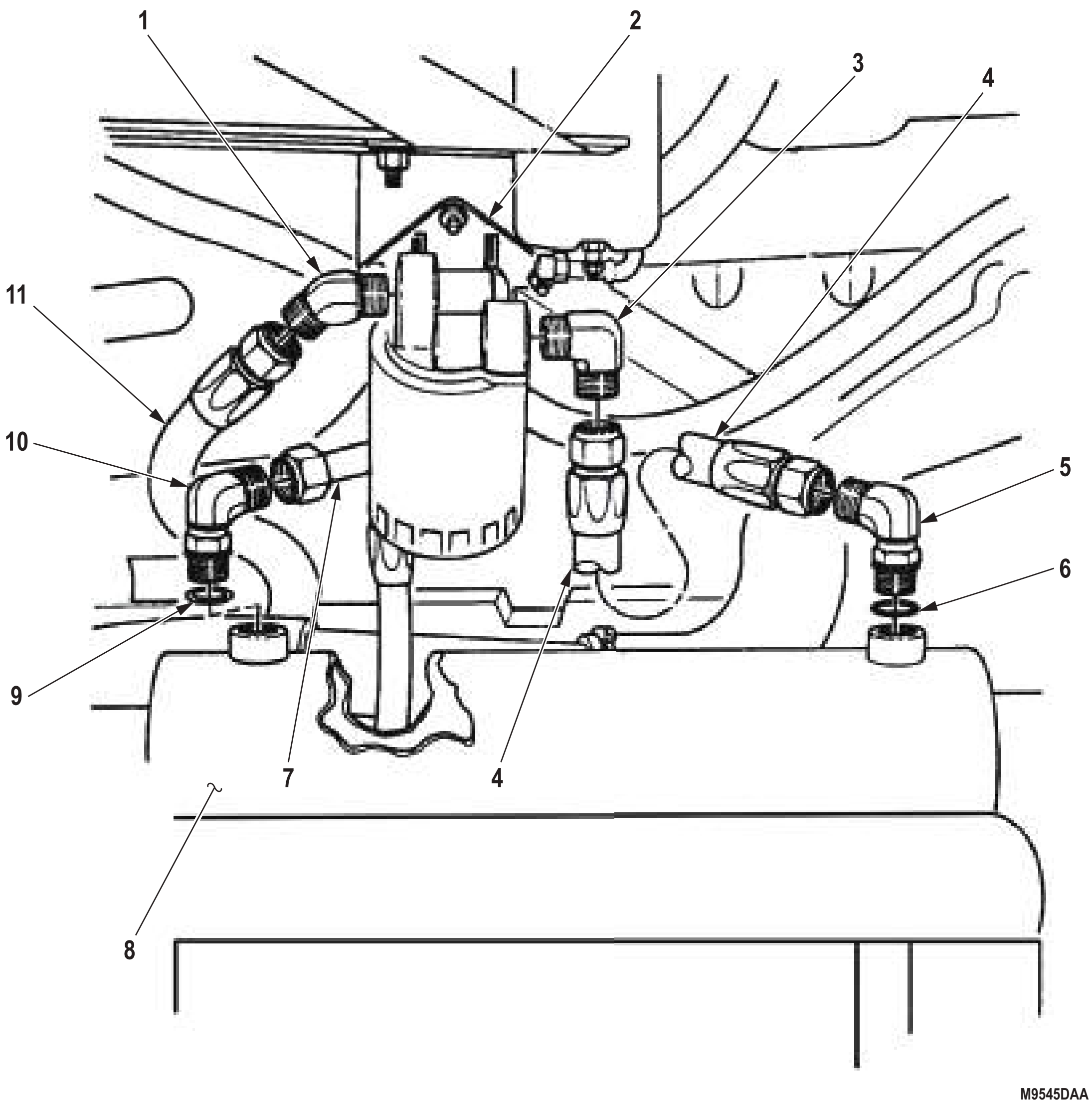


Figure 4. Oil Cooler Hoses Removal.

END OF TASK

INSTALLATION

CAUTION

Ensure plugs or covers are completely removed from all hoses and connections. Failure to do this may result in transmission and oil cooler damage.

NOTE

Male pipe threads must be wrapped with antiseize tape before installation.

1. Install elbow (Figure 5, Item 1) on housing (Figure 5, Item 2).
2. Connect return hose (Figure 5, Item 11) to elbow (Figure 5, Item 1).
3. Install elbow (Figure 5, Item 3) on housing (Figure 5, Item 2).
4. Connect supply hose (Figure 5, Item 4) to elbow (Figure 5, Item 3).
5. Install o-ring (Figure 5, Item 6) and elbow (Figure 5, Item 5) in oil cooler (Figure 5, Item 8).
6. Connect supply hose (Figure 5, Item 4) to elbow (Figure 5, Item 5).
7. Install o-ring (Figure 5, Item 9) and elbow (Figure 5, Item 10) in oil cooler (Figure 5, Item 8).
8. Connect oil cooler supply hose (Figure 5, Item 7) to elbow (Figure 5, Item 10).

INSTALLATION - Continued

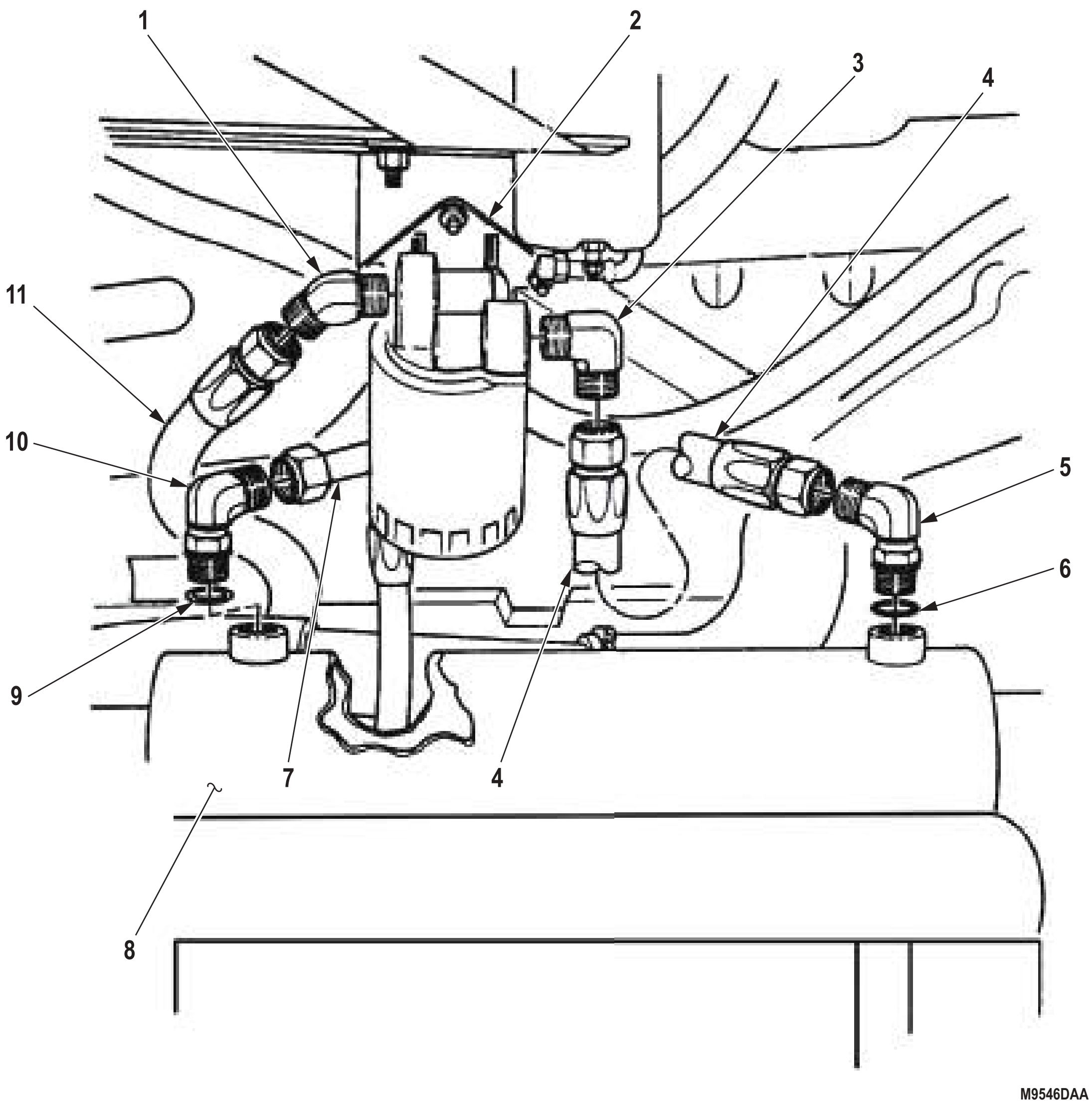


Figure 5. Oil Cooler Hoses Installation.

INSTALLATION - Continued

9. Install two clamps (Figure 6, Item 6) and hoses (Figure 6, Items 3 and 7) on engine access cover (Figure 6, Item 1) with two washers (Figure 6, Item 4), lockwashers (Figure 6, Item 5), and screws (Figure 6, Item 2).

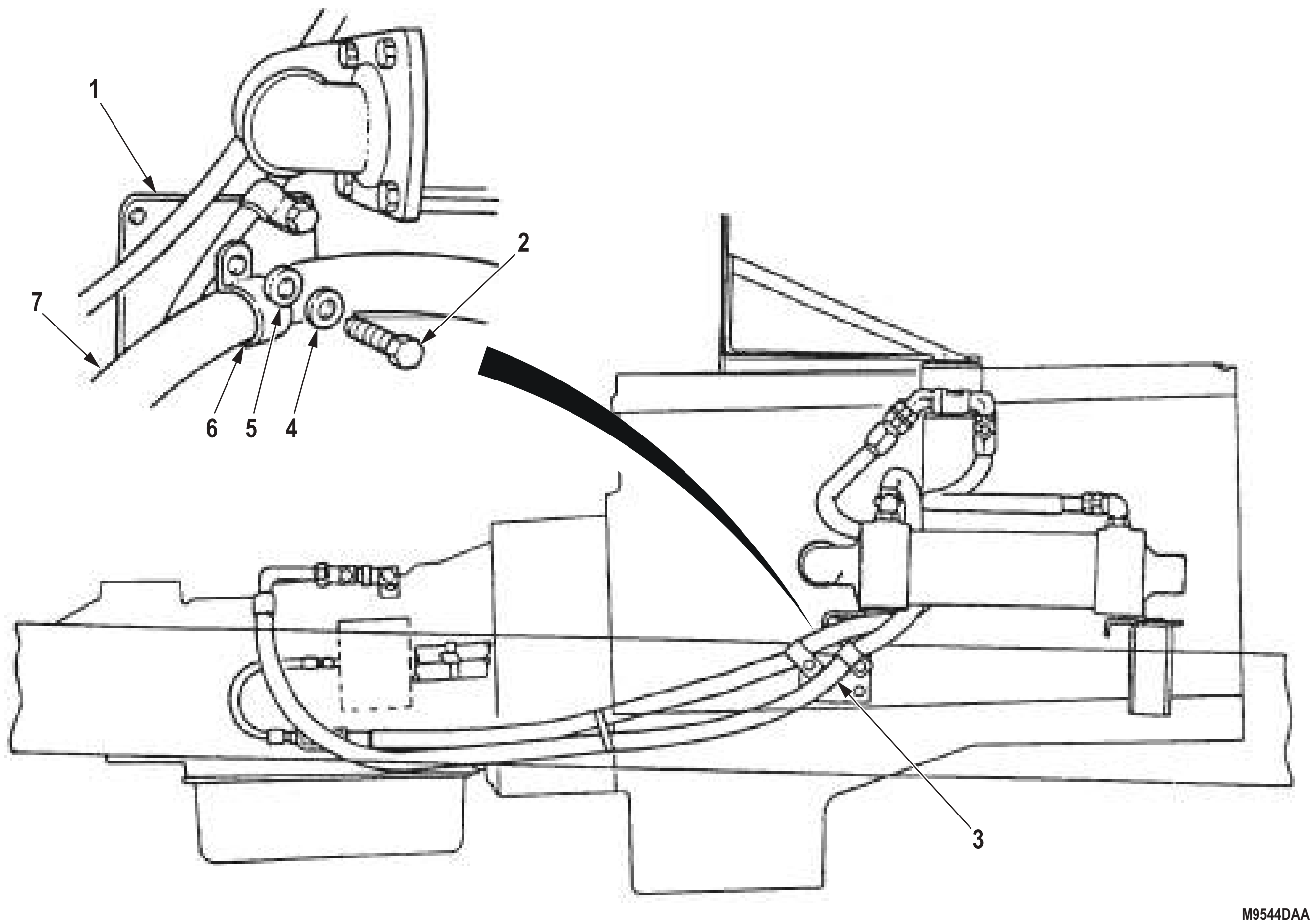


Figure 6. Oil Cooler Hoses Installation.

INSTALLATION - Continued

10. Install two tiedown straps (Figure 7, Item 6) on hoses (Figure 7, Items 1 and 5).
11. Install o-ring (Figure 7, Item 4) and adapter (Figure 7, Item 2) in valve housing (Figure 7, Item 3).
12. Connect hose (Figure 7, Item 1) to adapter (Figure 7, Item 2).

NOTE

Perform Steps (13) through (18) for vehicles equipped with transmission PTO.

13. Install adapter (Figure 7, Item 8) on PTO (Figure 7, Item 7).
14. Install adapter (Figure 7, Item 9) on adapter (Figure 7, Item 8).
15. Connect hose (Figure 7, Item 10) to adapter (Figure 7, Item 9).
16. Install adapter (Figure 7, Item 12) on adapter (Figure 7, Item 2).
17. Install adapter (Figure 7, Item 11) on adapter (Figure 7, Item 12).
18. Connect hose (Figure 7, Item 10) to adapter (Figure 7, Item 11).

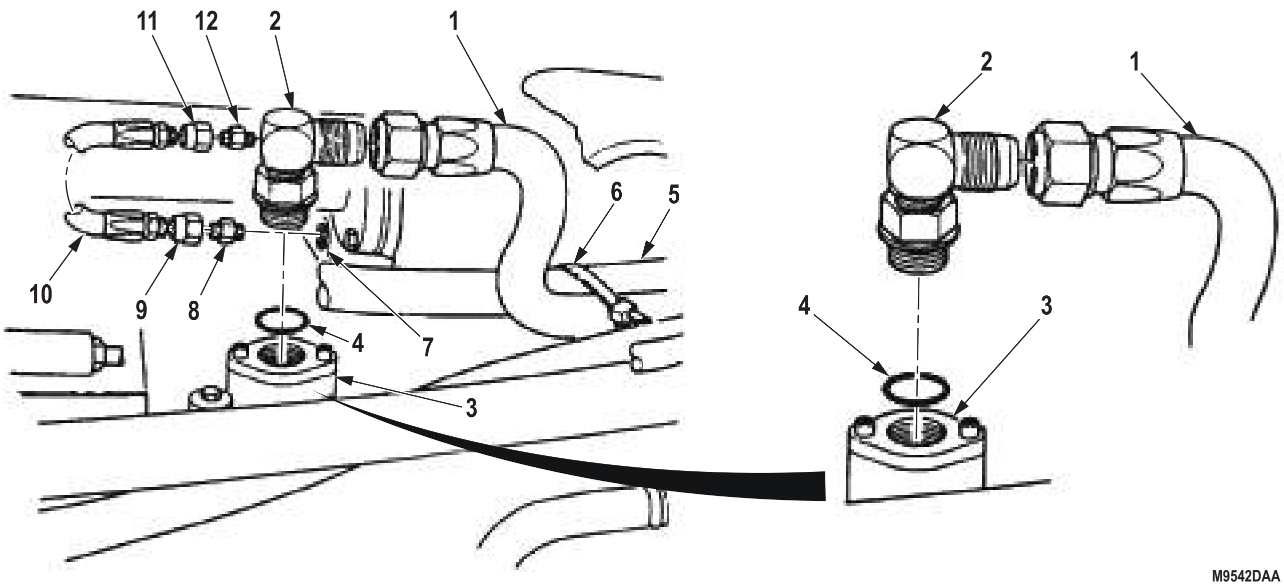


Figure 7. Oil Cooler Hoses Installation.

INSTALLATION - Continued

NOTE

Perform Step (19) for vehicles equipped with front winch.

19. Install hydraulic hoses (Figure 8, Items 4 and 5) on hanger strap (Figure 8, Item 3) with two clamps (Figure 8, Item 7), screw (Figure 8, Item 6), and locknut (Figure 8, Item 2).
20. Install o-ring (Figure 8, Item 8) and elbow (Figure 8, Item 9) on transmission (Figure 8, Item 1).
21. Install adapter (Figure 8, Item 10) on elbow (Figure 8, Item 9).
22. Install adapter (Figure 8, Item 11) on adapter (Figure 8, Item 10).
23. Connect supply hose (Figure 8, Item 12) to adapter (Figure 8, Item 11).

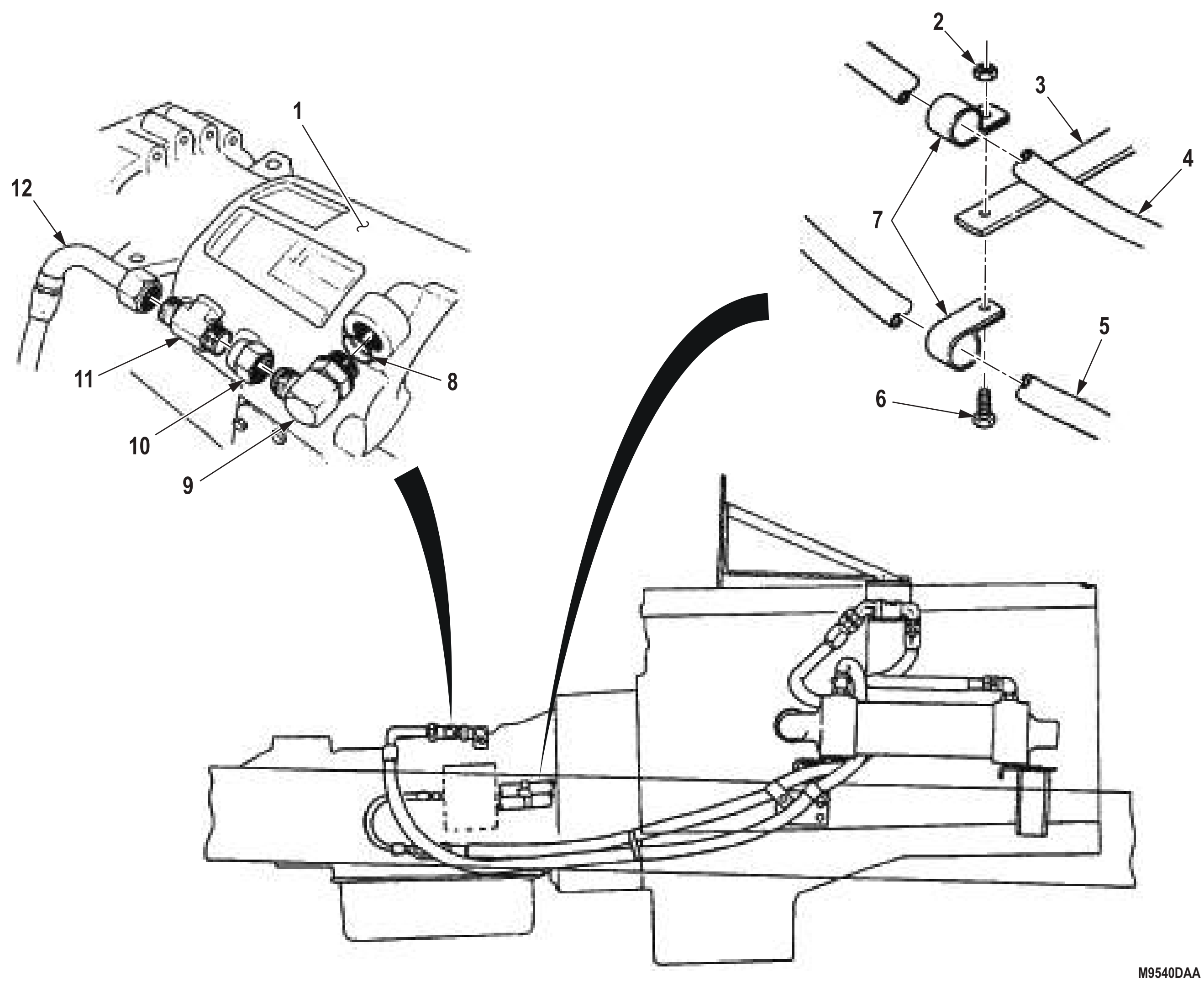


Figure 8. Oil Cooler Hoses Installation.

END OF TASK

FOLLOW-ON MAINTENANCE

1. Install transmission temperature transmitter unit. (Volume 2, WP 0341)
2. Fill transmission oil reservoir to proper level. (Volume 5, WP 0820)
3. Install right splash shield. (TM 9-2320-272-10)
4. Start engine, check for leaks, and road test vehicle. (TM 9-2320-272-10)

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
TRANSMISSION OIL COOLER AND MOUNT REPLACEMENT (M939A2)

INITIAL SETUP:

Tools and Special Tools

Tool Kit, General Mechanic's: Automotive
(Volume 5, WP 0826, Table 1, Item 56)

Materials/Parts

Cap Set, Protective, Dust and Moisture Seal
(Volume 5, WP 0825, Table 1, Item 13)
Tape, Antiseizing
(Volume 5, WP 0825, Table 1, Item 65)
Locknut (Volume 5, WP 0827, Table 1, Item 285)
Qty: 4

Materials/Parts (cont.)

Lockwasher
(Volume 5, WP 0827, Table 1, Item 186)
Qty: 4
O-ring (Volume 5, WP 0827, Table 1, Item 80)
Qty: 2

Equipment Condition

Parking brake set. (TM 9-2320-272-10)
Cooling system drained. (Volume 2, WP 0282)

REMOVAL

CAUTION

- Clean area around hoses before removal to prevent entry of dirt. Damage may occur if dirt or dust enters the transmission.
- Cover or plug all open hoses and connections immediately after disconnection to prevent contamination. Failure to do this may result in transmission damage.

NOTE

- Have drainage container ready to catch oil.
- Use drain pans to retain leaking/draining fluids. Refer to local procedures and plans for preventing and responding to fluid spills or leaks. Comply with local regulations when disposing of clean up material and leaked and spilled fluids.

1. Disconnect transmission oil lines (Figure 1, Items 2 and 13) from oil sampling valve (Figure 1, Item 3) and elbow (Figure 1, Item 7).
2. Loosen clamps (Figure 1, Items 9 and 24) and disconnect hoses (Figure 1, Items 8 and 25) from oil cooler (Figure 1, Item 16).
3. Remove four locknuts (Figure 1, Item 19), washers (Figure 1, Item 15), screws (Figure 1, Item 14), washers (Figure 1, Item 15), and oil cooler (Figure 1, Item 16) from bracket (Figure 1, Item 1) and splash panel extension (Figure 1, Item 20). Discard locknuts.
4. Remove oil sampling valve (Figure 1, Item 3), nut (Figure 1, Item 4), washer (Figure 1, Item 5), and o-ring (Figure 1, Item 6) from oil cooler (Figure 1, Item 16). Discard o-ring.
5. Remove elbow (Figure 1, Item 7), nut (Figure 1, Item 10), washer (Figure 1, Item 11), and o-ring (Figure 1, Item 12) from oil cooler (Figure 1, Item 16). Discard o-ring.
6. Remove four locknuts (Figure 1, Item 21), lockwashers (Figure 1, Item 22), screws (Figure 1, Item 18), and splash panel extension (Figure 1, Item 20) from bracket (Figure 1, Item 23) and frame rail (Figure 1, Item 17). Discard locknuts and lockwashers.

REMOVAL - Continued

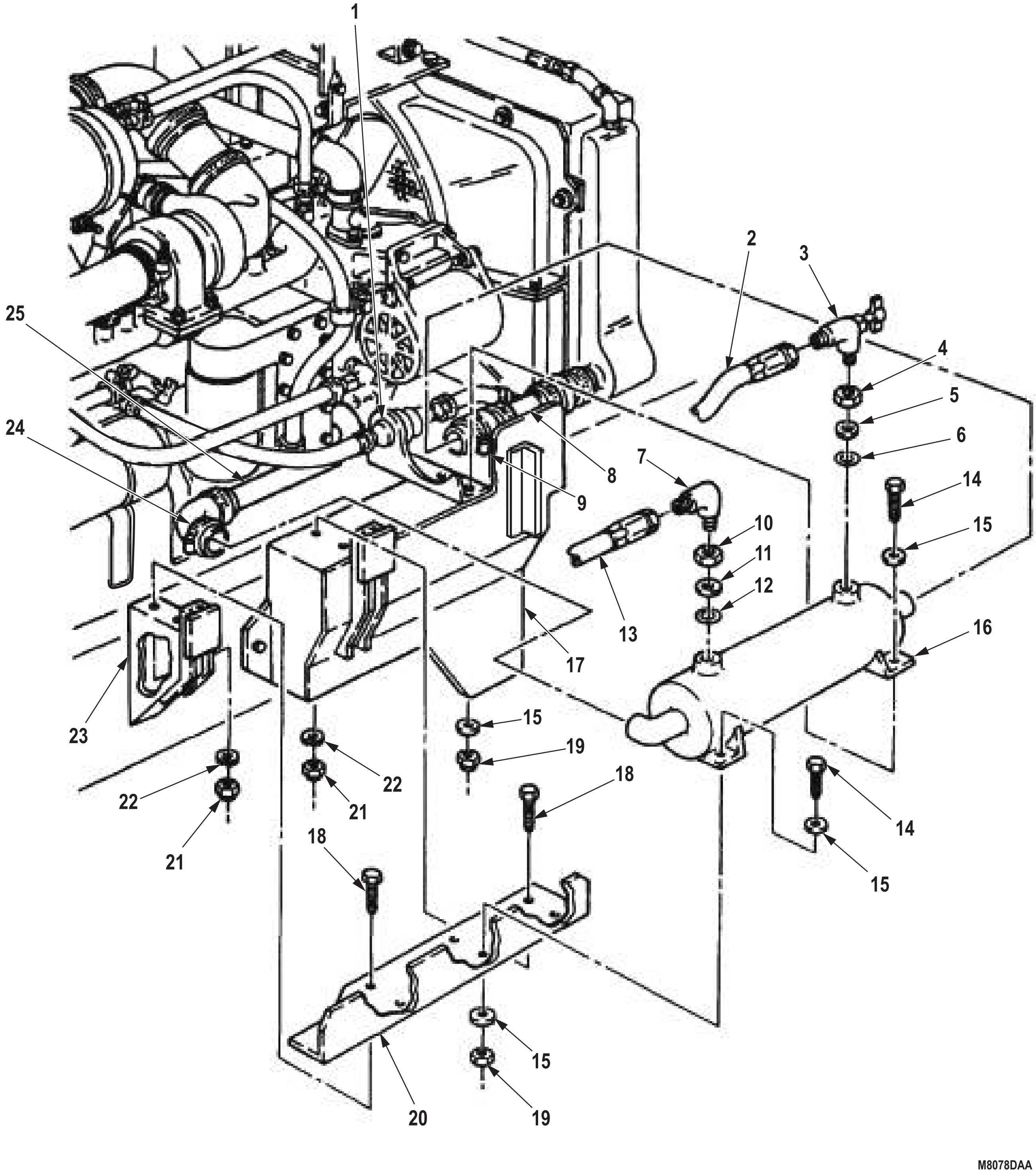


Figure 1. Oil Cooler and Mount Removal.

END OF TASK

INSTALLATION

1. Install splash panel extension (Figure 2, Item 20) on bracket (Figure 2, Item 23) and frame rail (Figure 2, Item 17) with four screws (Figure 2, Item 18), lockwashers (Figure 2, Item 22), and locknuts (Figure 2, Item 21).

NOTE

Male pipe threads must be wrapped with antiseize tape before installation.

2. Install o-ring (Figure 2, Item 12), washer (Figure 2, Item 11), nut (Figure 2, Item 10), and elbow (Figure 2, Item 7) on oil cooler (Figure 2, Item 16).
3. Install o-ring (Figure 2, Item 6), washer (Figure 2, Item 5), nut (Figure 2, Item 4), and oil sampling valve (Figure 2, Item 3) on oil cooler (Figure 2, Item 16).
4. Install oil cooler (Figure 2, Item 16) on bracket (Figure 2, Item 1) and splash panel extension (Figure 2, Item 20) with four washers (Figure 2, Item 15), screws (Figure 2, Item 14), washers (Figure 2, Item 15), and locknuts (Figure 2, Item 19).
5. Connect hoses (Figure 2, Items 8 and 25) to oil cooler (Figure 2, Item 16) and tighten clamps (Figure 2, Items 9 and 24).
6. Connect transmission oil lines (Figure 2, Items 2 and 13) to oil sampling valve (Figure 2, Item 3) and elbow (Figure 2, Item 7).

INSTALLATION - Continued

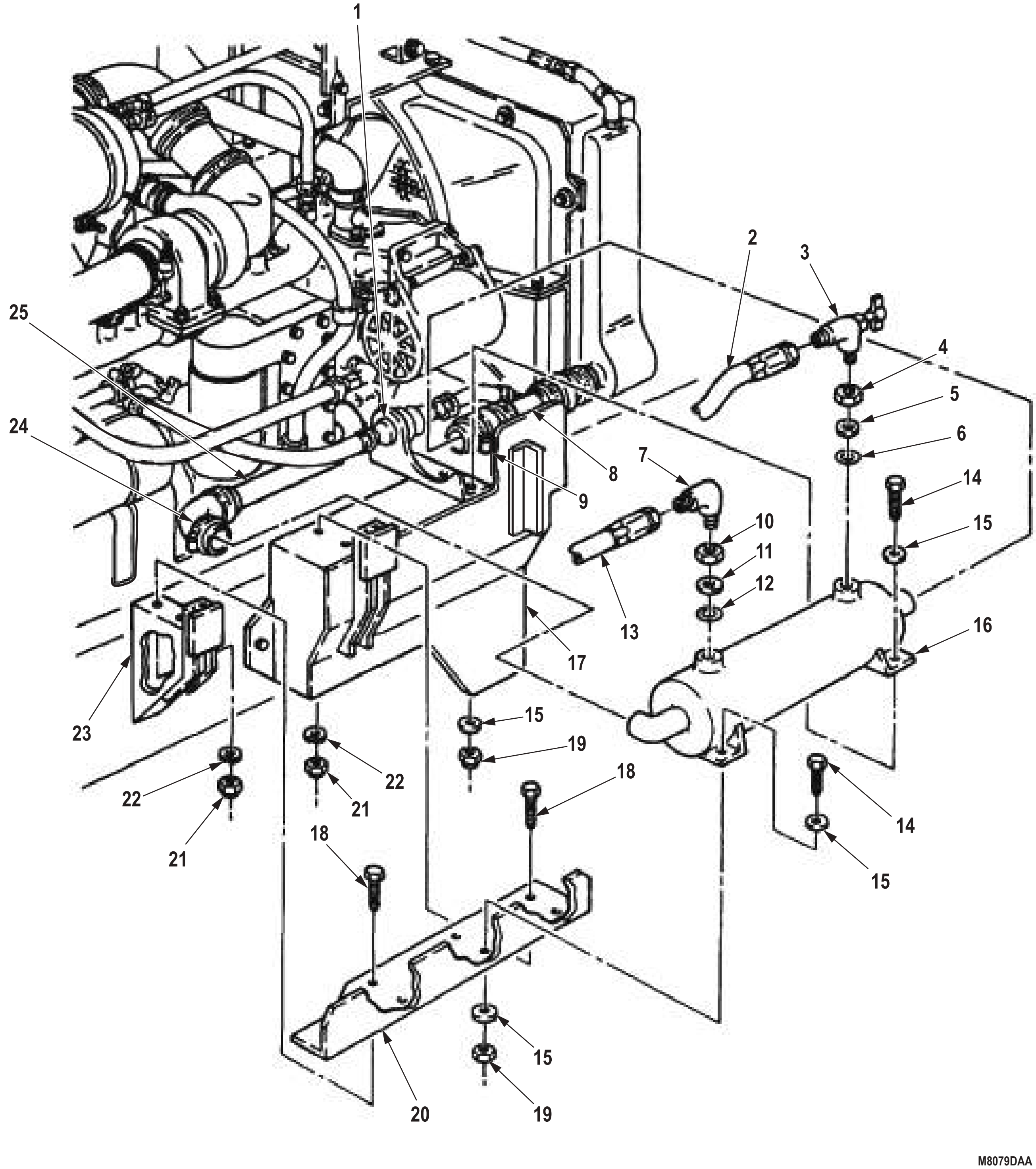


Figure 2. Oil Cooler and Mount Installation.

END OF TASK

FOLLOW-ON MAINTENANCE

1. Fill cooling system. (Volume 2, WP 0282)
2. Check transmission oil level. (TM 9-2320-272-10)
3. Start engine and check for leaks. (TM 9-2320-272-10)

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
TRANSMISSION BREATHER REPLACEMENT

INITIAL SETUP:

Tools and Special Tools

Tool Kit, General Mechanic's: Automotive
(Volume 5, WP 0826, Table 1, Item 56)

Materials/Parts

Rag, Wiping
(Volume 5, WP 0825, Table 1, Item 53)
Tape, Antiseizing
(Volume 5, WP 0825, Table 1, Item 65)

Equipment Condition

Parking brake set. (TM 9-2320-272-10)

REMOVAL

CAUTION

Clean area around breather before removal to prevent entry of dirt. Damage may occur if dirt or dust enters the transmission.

1. Disconnect vent line (Figure 1, Item 2) from transmission breather (Figure 1, Item 1).
2. Remove breather (Figure 1, Item 1) and adapter (Figure 1, Item 4) from transmission (Figure 1, Item 3). Discard breather and adapter if threads are stripped.

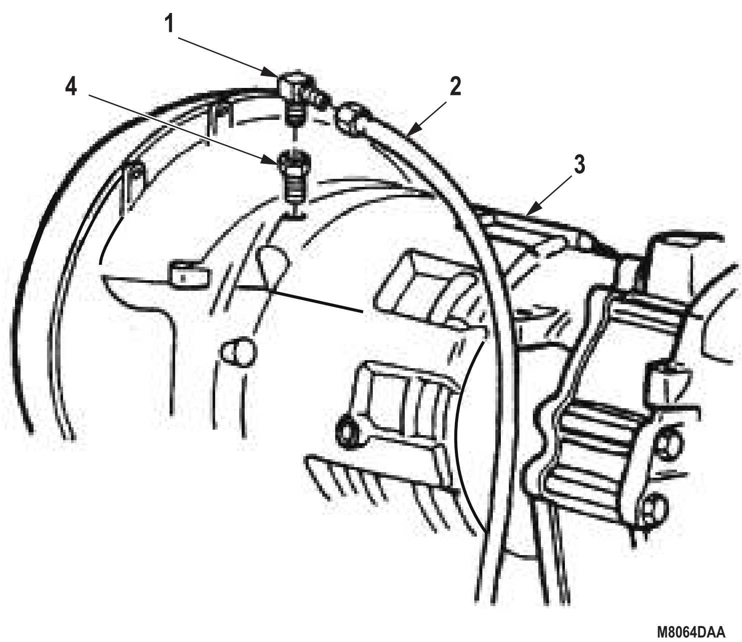


Figure 1. Transmission Breather Removal.

END OF TASK

INSTALLATION

NOTE

Male pipe threads must be wrapped with antiseize tape before installation.

1. Install adapter (Figure 2, Item 4) and breather (Figure 2, Item 1) on transmission (Figure 2, Item 3).
2. Connect vent line (Figure 2, Item 2) to transmission breather (Figure 2, Item 1).

INSTALLATION - Continued

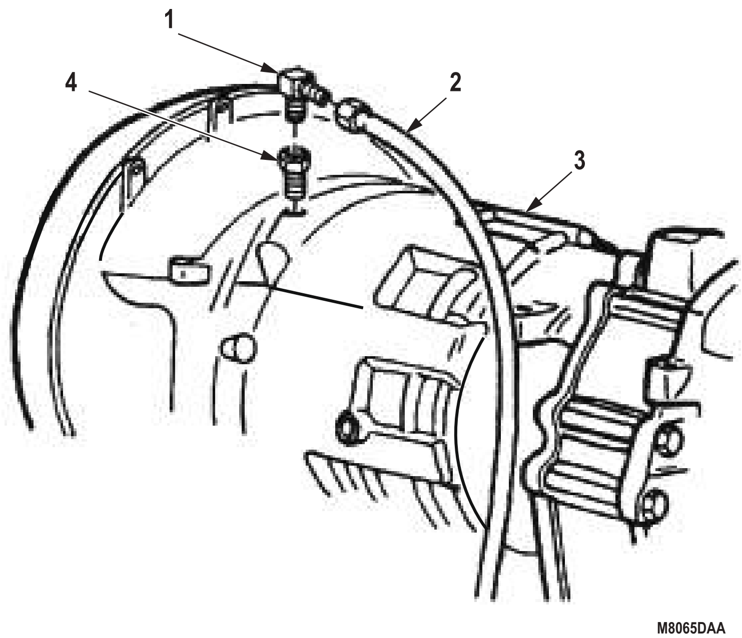


Figure 2. Transmission Breather Installation.

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
TRANSFER CASE REPLACEMENT (ALL EXCEPT M936/A1/A2)

INITIAL SETUP:

Tools and Special Tools

Tool Kit, General Mechanic's: Automotive
(Volume 5, WP 0826, Table 1, Item 56)
Jack Dolly Type Hydraulic
(Volume 5, WP 0826, Table 1, Item 32)
Lift, Transmission and Differential
(Volume 5, WP 0826, Table 1, Item 33)
Lifting Device
Wrench, Torque, Click, Ratcheting, 1/2" Drive, 250 Ft-Lb
(Volume 5, WP 0826, Table 1, Item 63)

Materials/Parts

Tape, Antiseizing
(Volume 5, WP 0825, Table 1, Item 65)
Locknut (Volume 5, WP 0827, Table 1, Item 206)
Qty: 1
Locknut (Volume 5, WP 0827, Table 1, Item 279)
Qty: 10
Locknut (Volume 5, WP 0827, Table 1, Item 285)
Qty: 10
Lockwasher
(Volume 5, WP 0827, Table 1, Item 445)
Qty: 4

Personnel Required

(2)

References

Volume 5, WP 0820

Equipment Condition

Parking brake set. (TM 9-2320-272-10)
Transfer case oil drained. (Volume 5, WP 0820)
Wet reservoir removed. (WP 0451)
Transfer case-to-forward rear axle propeller shaft removed. (WP 0402)
Spare tire removed (M923/A1/A2, M925/A1/A2, M929/A1/A2, and M930/A1/A2). (TM 9-2320-272-10)
Transfer case interlock valve removed. (WP 0394)
Transfer case front axle engagement control valve removed. (WP 0388)
Transfer case shift rod removed. (WP 0396)

REMOVAL

NOTE

Ensure transfer case shift lever is in HIGH position to prevent propeller shaft from turning when loosening screws.

1. Remove four screws (Figure 1, Item 8), lockwashers (Figure 1, Item 7), and propeller shaft (Figure 1, Item 1) from transfer case input flange (Figure 1, Item 2). Discard lockwashers.
2. Remove eight locknuts (Figure 1, Item 5), screws (Figure 1, Item 4), and propeller shaft (Figure 1, Item 6) from transfer case front output flange (Figure 1, Item 3). Discard locknuts.

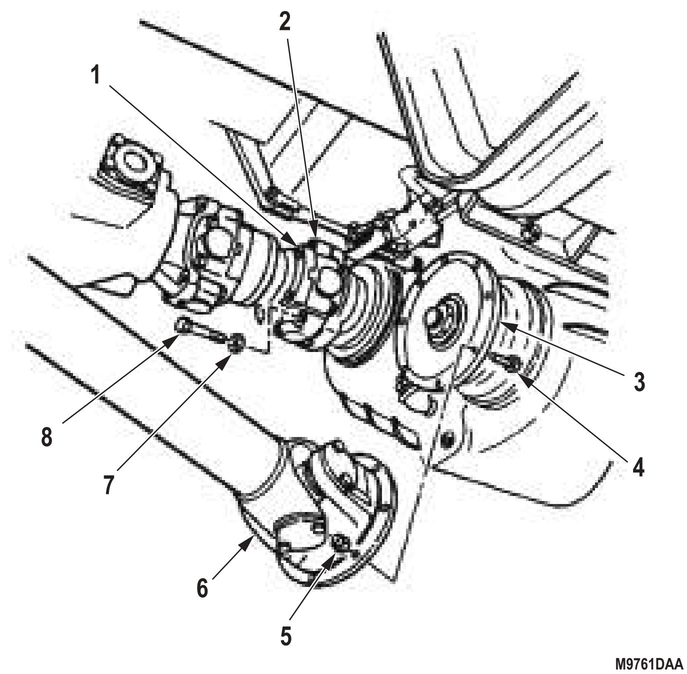


Figure 1. Transfer Case Components Removal.

REMOVAL - Continued

3. Remove two locknuts (Figure 2, Item 8), screws (Figure 2, Item 13), clamp (Figure 2, Item 14), parking brake cable (Figure 2, Item 1), and spacer (Figure 2, Item 10) from parking brake cable bracket (Figure 2, Item 9). Discard locknuts.
4. Remove locknut (Figure 2, Item 11) and parking brake cable (Figure 2, Item 1) from parking brake lever (Figure 2, Item 12). Discard locknut.
5. Disconnect speedometer driveshaft (Figure 2, Item 5) from speedometer drive adapter (Figure 2, Item 7).
6. Remove screw (Figure 2, Item 2), washer (Figure 2, Item 3), clamp (Figure 2, Item 4), and speedometer driveshaft (Figure 2, Item 5) from transfer case (Figure 2, Item 6).

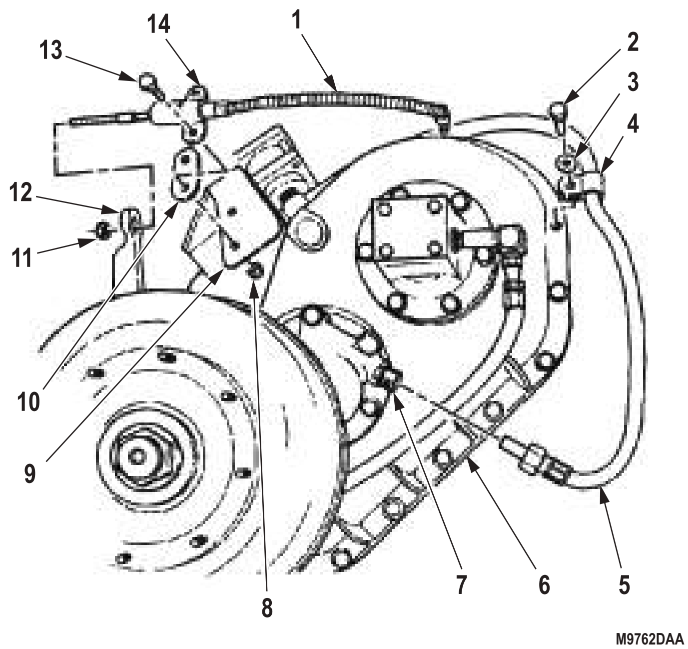


Figure 2. Transfer Case Brackets and Fittings Removal.

REMOVAL - Continued

7. Remove screw (Figure 3, Item 4), clamp (Figure 3, Item 3) with parking brake cable (Figure 3, Item 2), and clamp (Figure 3, Item 1) with speedometer driveshaft (Figure 3, Item 6) from transfer case (Figure 3, Item 5).

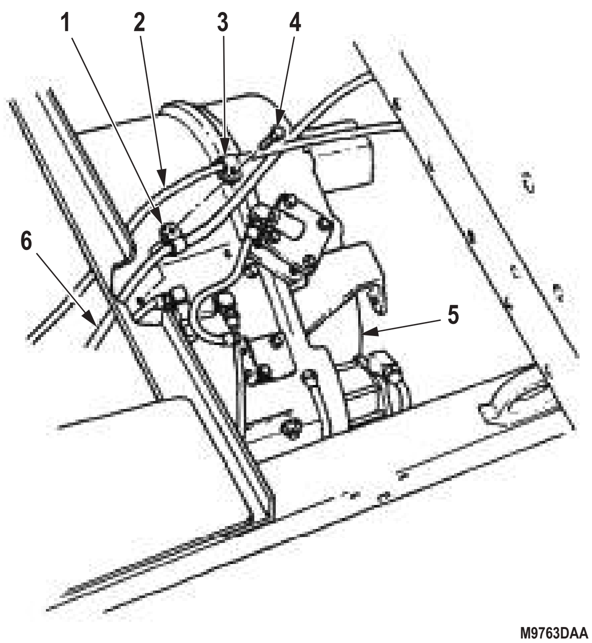


Figure 3. Transfer Case Brackets and Fittings Removal.

REMOVAL - Continued

NOTE

Tag all air lines for installation.

8. Disconnect two vent lines (Figure 4, Items 7 and 8) from elbows (Figure 4, Item 2).
9. Disconnect interlock vent line (Figure 4, Item 1) from elbow (Figure 4, Item 2).
10. Disconnect supply line (Figure 4, Item 6) from air cylinder elbow (Figure 4, Item 5).
11. Disconnect supply line (Figure 4, Item 4) from interlock air cylinder elbow (Figure 4, Item 3).

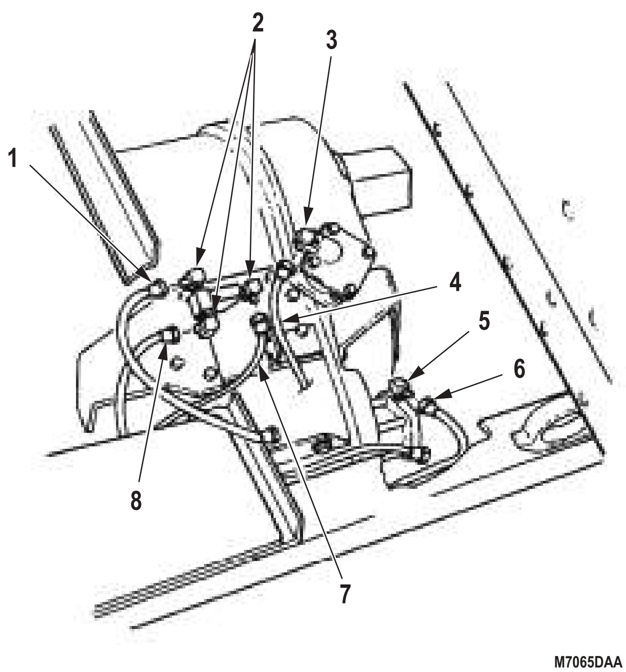


Figure 4. Transfer Case Components Removal.

REMOVAL - Continued

12. Remove three elbows (Figure 5, Item 1) from vent tees (Figure 5, Item 2) and (Figure 5, Item 9).
13. Remove vent tees (Figure 5, Items 2 and 9) and fitting (Figure 5, Item 8) from inspection cover (Figure 5, Item 7).
14. Remove elbow (Figure 5, Item 5) from air cylinder (Figure 5, Item 6).
15. Remove elbow (Figure 5, Item 3) from interlock air cylinder (Figure 5, Item 4).

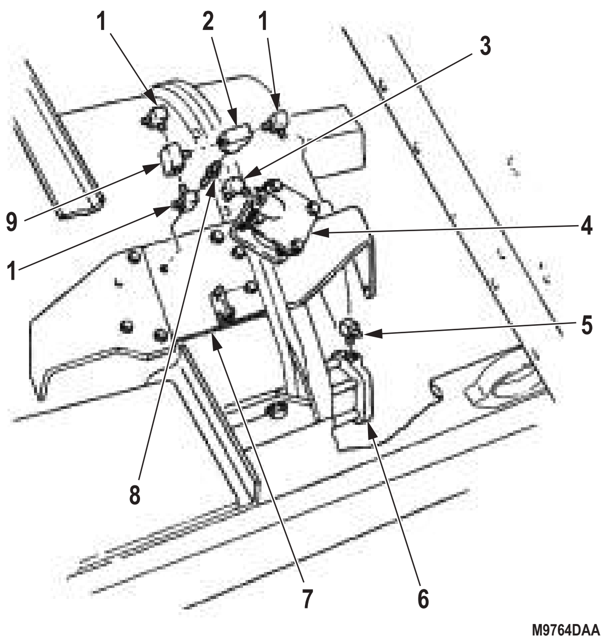


Figure 5. Transfer Case Components Removal.

REMOVAL - Continued

16. Remove two screws (Figure 6, Item 2) and interlock valve bracket (Figure 6, Item 3) from transfer case (Figure 6, Item 7).
17. Remove three screws (Figure 6, Item 1) and control valve bracket (Figure 6, Item 4) from transfer case (Figure 6, Item 7).
18. Remove two screws (Figure 6, Item 6), washers (Figure 6, Item 8), and parking brake cable bracket (Figure 6, Item 5) from transfer case (Figure 6, Item 7).
19. Position hydraulic jack under transfer case (Figure 6, Item 7).

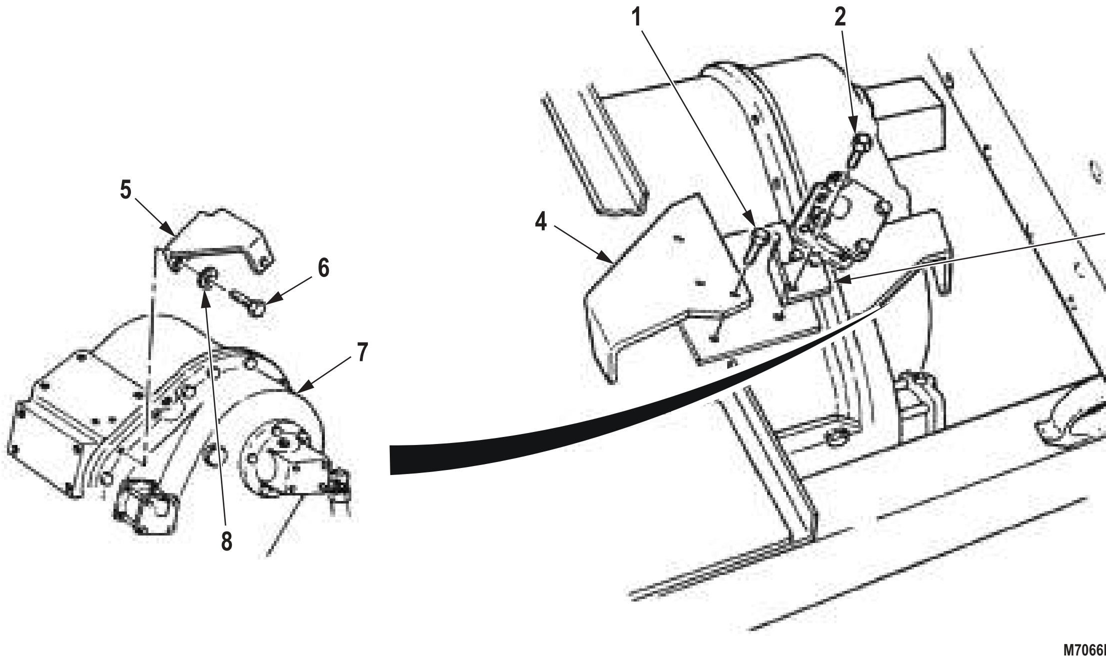


Figure 6. Transfer Case Brackets and Fittings Removal.

REMOVAL - Continued

20. Remove three locknuts (Figure 7, Item 7), screws (Figure 7, Item 2), washers (Figure 7, Item 1), and insulators (Figure 7, Item 3) from mounting brackets (Figure 7, Item 4) and frame (Figure 7, Item 6). Discard locknuts.
21. Raise transfer case (Figure 7, Item 8) high enough to remove three insulators (Figure 7, Item 5) from mounting brackets (Figure 7, Item 4) and frame (Figure 7, Item 6).
22. Remove seven locknuts (Figure 7, Item 9) and two mounting brackets (Figure 7, Item 4) from transfer case (Figure 7, Item 8). Discard locknuts.
23. Lower hydraulic jack (Figure 7, Item 11) and remove transfer case (Figure 7, Item 8) from vehicle.
24. Using lifting device, remove transfer case (Figure 7, Item 8) from hydraulic jack (Figure 7, Item 11).
25. Remove seven studs (Figure 7, Item 10) from transfer case (Figure 7, Item 8).

REMOVAL - Continued

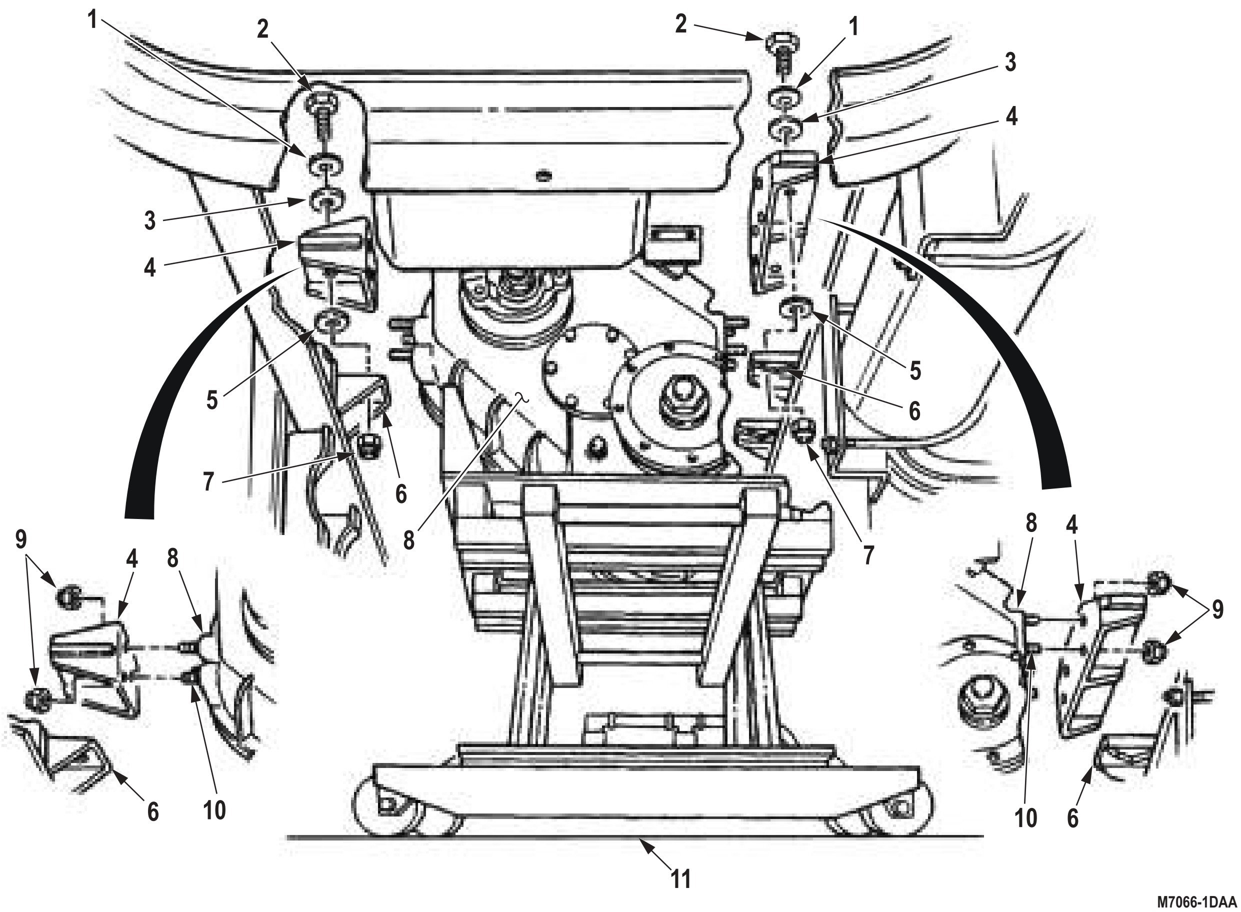


Figure 7. Transfer Case Brackets and Fittings Removal.

END OF TASK

INSTALLATION

1. Install seven studs (Figure 8, Item 1) on transfer case (Figure 8, Item 2).
2. Place transfer case (Figure 8, Item 2) on hydraulic jack (Figure 8, Item 11) and position under vehicle.
3. Raise transfer case (Figure 8, Item 2) in position high enough to allow for installation of mounting brackets (Figure 8, Item 6).
4. Install two mounting brackets (Figure 8, Item 6) on transfer case (Figure 8, Item 2) with seven locknuts (Figure 8, Item 10). Tighten locknuts 125 to 135 lb-ft (170 to 183 N·m).
5. Place three insulators (Figure 8, Item 7) between mounting brackets (Figure 8, Item 6) and frame (Figure 8, Item 8).
6. Slowly lower transfer case (Figure 8, Item 2) and align holes in mounting brackets (Figure 8, Item 6), insulators (Figure 8, Item 7), and frame (Figure 8, Item 8).
7. Install three insulators (Figure 8, Item 5), washers (Figure 8, Item 3), screws (Figure 8, Item 4), and locknuts (Figure 8, Item 9) on mounting brackets (Figure 8, Item 6) and frame (Figure 8, Item 8). Tighten locknuts 50 to 60 lb-ft (68 to 81 N·m).
8. Remove hydraulic jack (Figure 8, Item 11) from transfer case (Figure 8, Item 2).

INSTALLATION - Continued

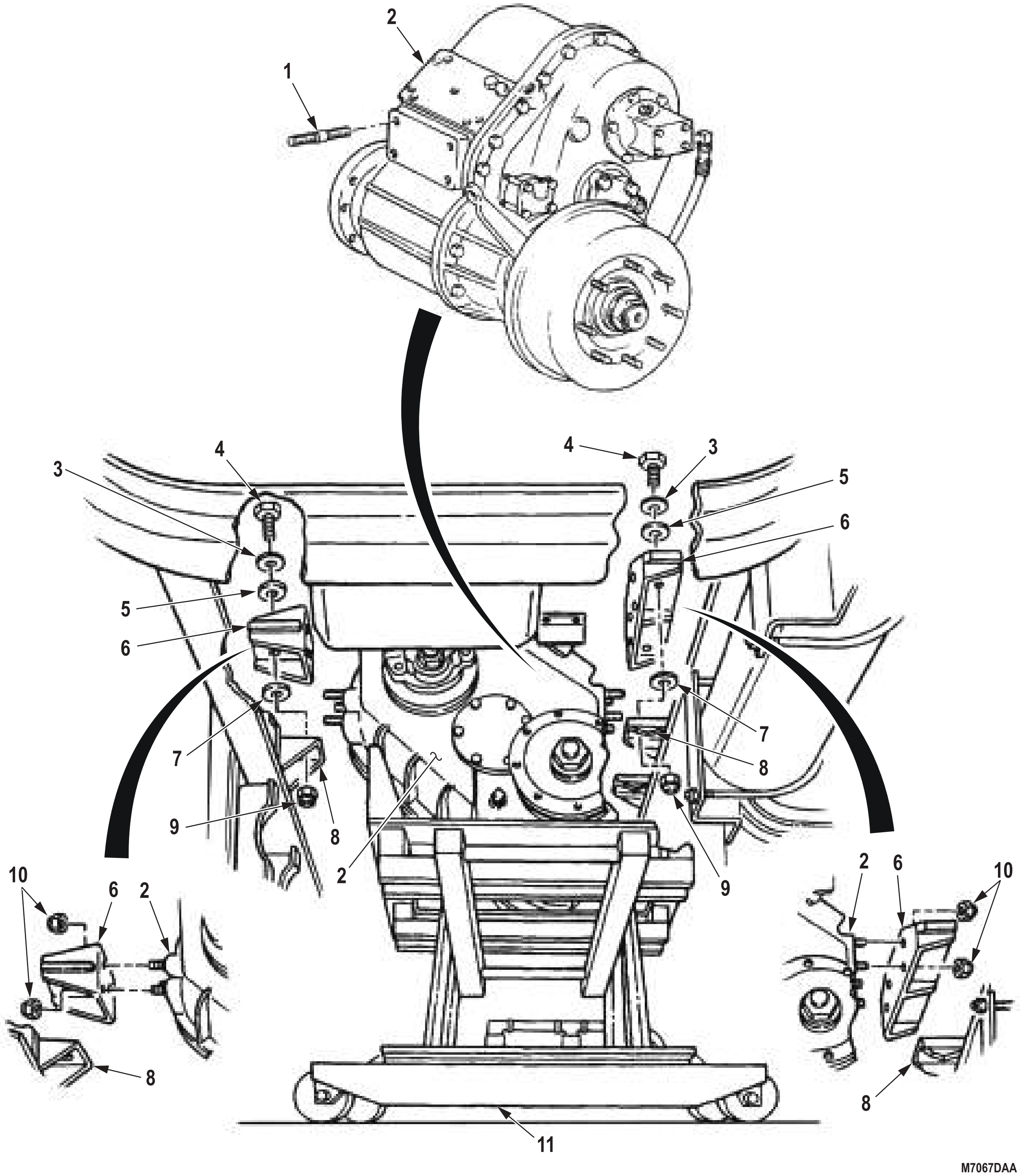


Figure 8. Transfer Case Brackets and Fittings Installation.

INSTALLATION - Continued

9. Install parking brake cable bracket (Figure 9, Item 6) on transfer case (Figure 9, Item 1) with two washers (Figure 9, Item 7) and screws (Figure 9, Item 8). Tighten screws 40 to 55 lb-ft (54 to 75 N·m).
10. Install control valve bracket (Figure 9, Item 5) on transfer case (Figure 9, Item 1) with three screws (Figure 9, Item 2). Finger-tighten screws.
11. Install interlock valve bracket (Figure 9, Item 4) on transfer case (Figure 9, Item 1) with two screws (Figure 9, Item 3). Finger-tighten screws.

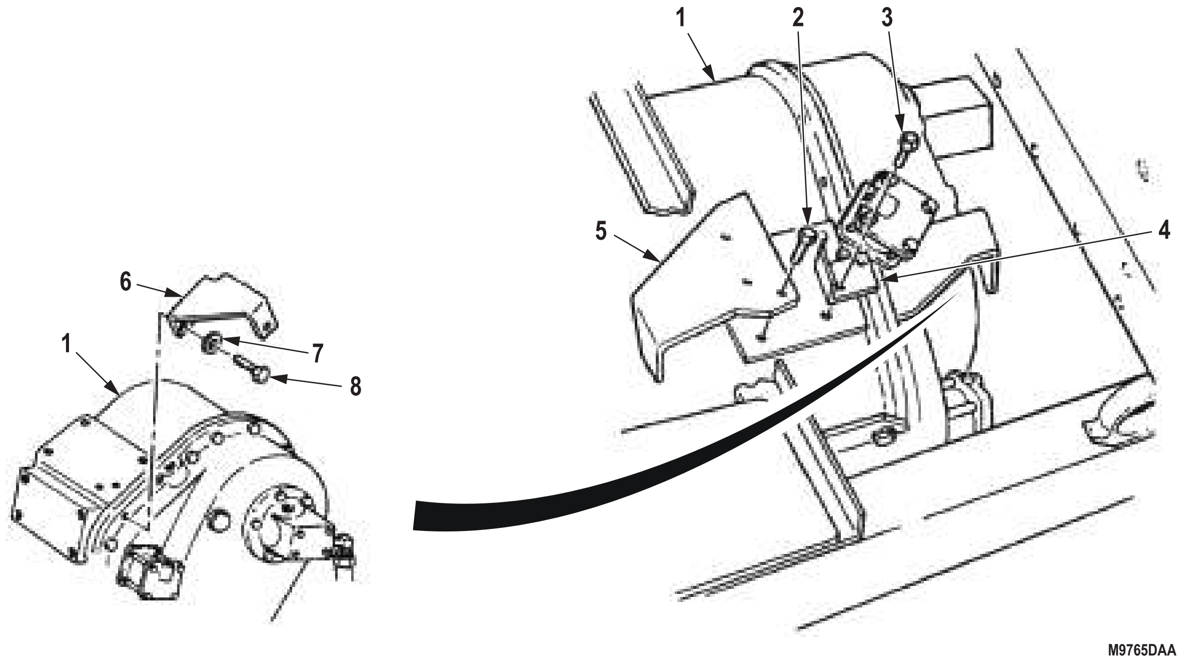


Figure 9. Transfer Case Components Installation.

INSTALLATION - Continued

NOTE

Wrap all male pipe threads with antiseize tape before installation.

12. Install elbow (Figure 10, Item 3) on interlock air cylinder (Figure 10, Item 4).
13. Install elbow (Figure 10, Item 5) on air cylinder (Figure 10, Item 6).
14. Install fitting (Figure 10, Item 8) and vent tees (Figure 10, Items 2 and 9) on inspection cover (Figure 10, Item 7).
15. Install three elbows (Figure 10, Item 1) on vent tees (Figure 10, Items 2 and 9).

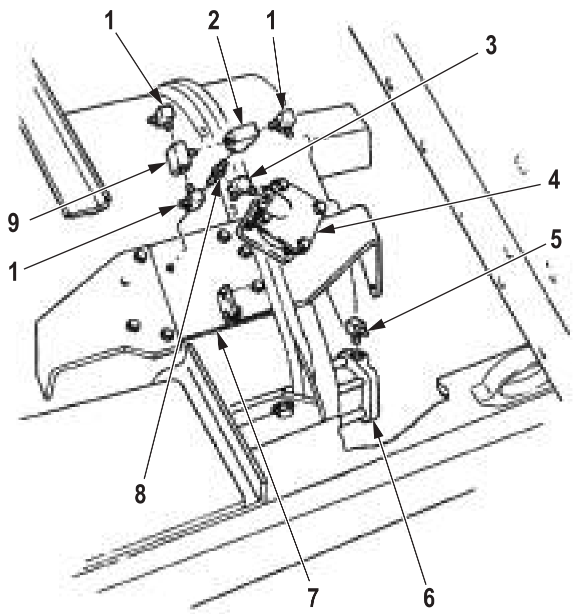


Figure 10. Transfer Case Components Installation.

INSTALLATION - Continued

16. Connect supply line (Figure 11, Item 3) to interlock air cylinder elbow (Figure 11, Item 2).
17. Connect supply line (Figure 11, Item 5) to air cylinder elbow (Figure 11, Item 4).
18. Connect interlock vent line (Figure 11, Item 7) to elbow (Figure 11, Item 1).
19. Connect two vent lines (Figure 11, Item 6) to elbows (Figure 11, Item 1).

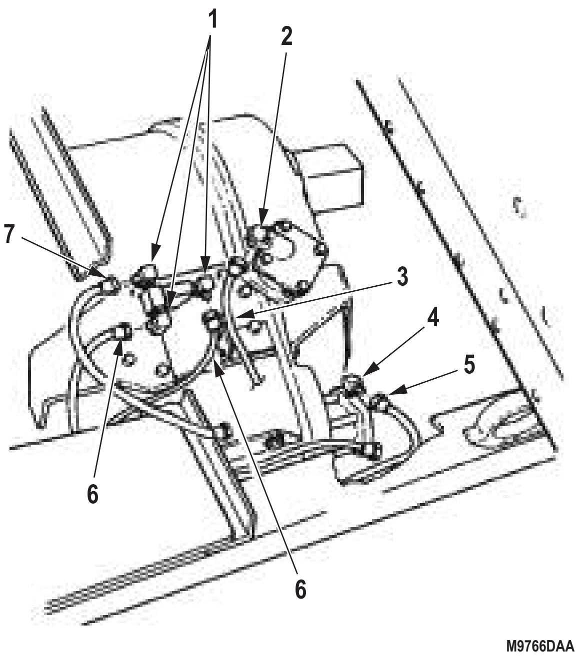


Figure 11. Transfer Case Components Installation.

INSTALLATION - Continued

20. Install clamp (Figure 12, Item 1) with parking brake cable (Figure 12, Item 5), and clamp (Figure 12, Item 3) with speedometer driveshaft (Figure 12, Item 2), on transfer case (Figure 12, Item 6) with screw (Figure 12, Item 4).

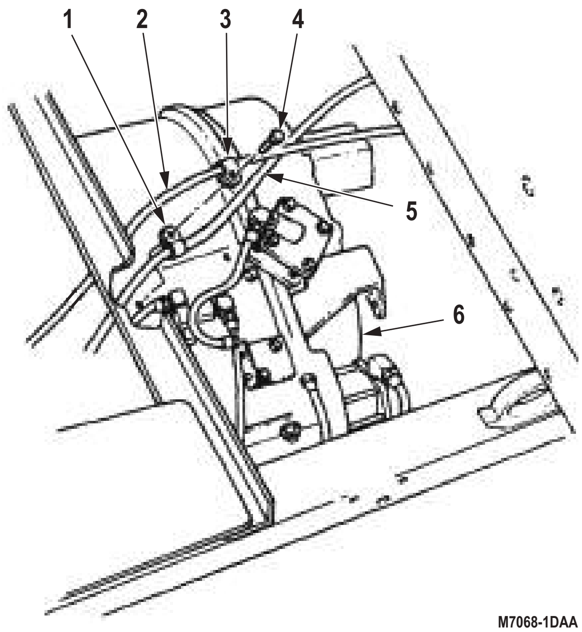


Figure 12. Transfer Case Components Installation.

INSTALLATION - Continued

21. Tighten screws (Figure 9, Items 2 and 3) 30 to 40 lb-ft (41 to 54 N·m).
22. Connect speedometer drive cable (Figure 13, Item 7) to speedometer drive adapter (Figure 13, Item 9).
23. Install clamp (Figure 13, Item 6) and speedometer drive cable (Figure 13, Item 7) on transfer case (Figure 13, Item 8) with washer (Figure 13, Item 5) and screw (Figure 13, Item 4).
24. Install parking brake cable (Figure 13, Item 3) on parking brake lever (Figure 13, Item 13) with locknut (Figure 13, Item 12).
25. Install parking brake cable (Figure 13, Item 3) and spacer (Figure 13, Item 14) on parking brake cable bracket (Figure 13, Item 11) with clamp (Figure 13, Item 2), two screws (Figure 13, Item 1), and locknuts (Figure 13, Item 10).

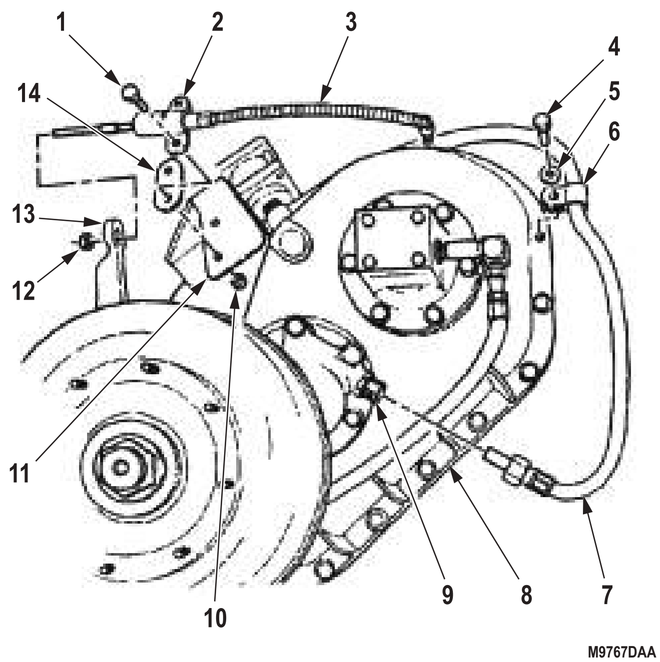


Figure 13. Transfer Case Components Installation.

INSTALLATION - Continued

26. Install propeller shaft (Figure 14, Item 6) on transfer case front output flange (Figure 14, Item 3) with eight screws (Figure 14, Item 4) and locknuts (Figure 14, Item 5). Tighten locknuts 32 to 40 lb-ft (43 to 54 N·m).
27. Install propeller shaft (Figure 14, Item 1) on transfer case input flange (Figure 14, Item 2) with four screws (Figure 14, Item 8) and lockwashers (Figure 14, Item 7).

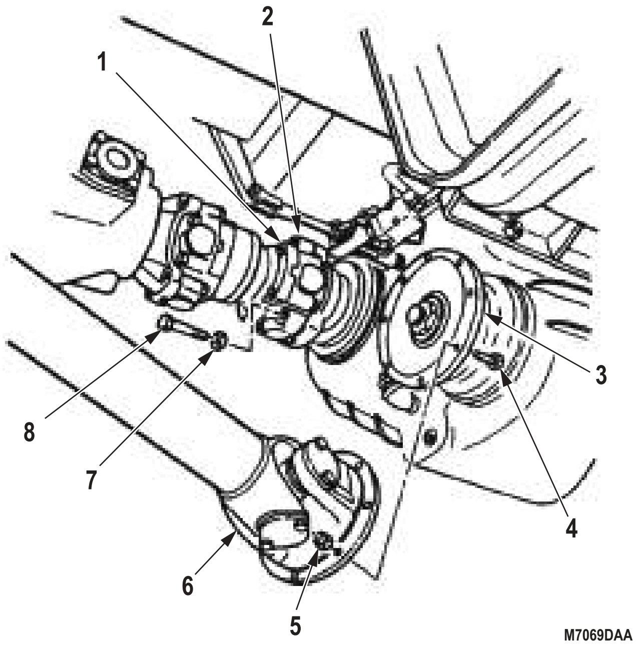


Figure 14. Transfer Case Cables Installation.

END OF TASK

FOLLOW-ON MAINTENANCE

1. Install transfer case shift rod. (WP 0396)
2. Install transfer case front axle engagement control valve. (WP 0388)
3. Install transfer case interlock valve. (WP 0394)
4. Install transfer case-to-forward rear axle propeller shaft. (WP 0402)
5. Install wet reservoir. (WP 0451)
6. Install spare tire (M923/A1/A2, M925/A1/A2, M929/A1/A2, and M930/A1/A2). (TM 9-2320-272-10)
7. Adjust parking brake. (TM 9-2320-272-10)
8. Fill transfer case to proper fluid level. (Volume 5, WP 0820)

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
TRANSFER CASE REPLACEMENT (M936/A1/A2)

INITIAL SETUP:

Tools and Special Tools

Tool Kit, General Mechanic's: Automotive
(Volume 5, WP 0826, Table 1, Item 56)
Lift, Transmission and Differential
(Volume 5, WP 0826, Table 1, Item 33)
Wrench, Torque, Click, Ratcheting, 1/2" Drive, 250 Ft-Lb
(Volume 5, WP 0826, Table 1, Item 63)

Materials/Parts

Tape, Antiseizing
(Volume 5, WP 0825, Table 1, Item 65)
Cotter Pin
(Volume 5, WP 0827, Table 1, Item 333)
Qty: 1
Locknut (Volume 5, WP 0827, Table 1, Item 97)
Qty: 1
Locknut (Volume 5, WP 0827, Table 1, Item 206)
Qty: 1
Locknut (Volume 5, WP 0827, Table 1, Item 256)
Qty: 1
Locknut (Volume 5, WP 0827, Table 1, Item 279)
Qty: 10
Locknut (Volume 5, WP 0827, Table 1, Item 282)
Qty: 1
Locknut (Volume 5, WP 0827, Table 1, Item 285)
Qty: 10

Materials/Parts (cont.)

Locknut (Volume 5, WP 0827, Table 1, Item 289)
Qty: 3
Lockwasher
(Volume 5, WP 0827, Table 1, Item 384)
Qty: 1

Personnel Required

(2)

References

WP 0432

Equipment Condition

Parking brake set. (TM 9-2320-272-10)
Transfer case oil drained. (Volume 5, WP 0820)
Transfer case to forward rear axle propeller shaft removed. (WP 0402)
Transmission to transfer case propeller shaft removed. (WP 0403)
Transfer case front axle engagement control valve removed. (WP 0388)
Transfer case shift rod removed. (WP 0396)

REMOVAL

1. Remove four nuts (Figure 1, Item 1), washers (Figure 1, Item 2), screws (Figure 1, Item 5), and propeller shaft (Figure 1, Item 4) from Power Takeoff (PTO) flange (Figure 1, Item 3).

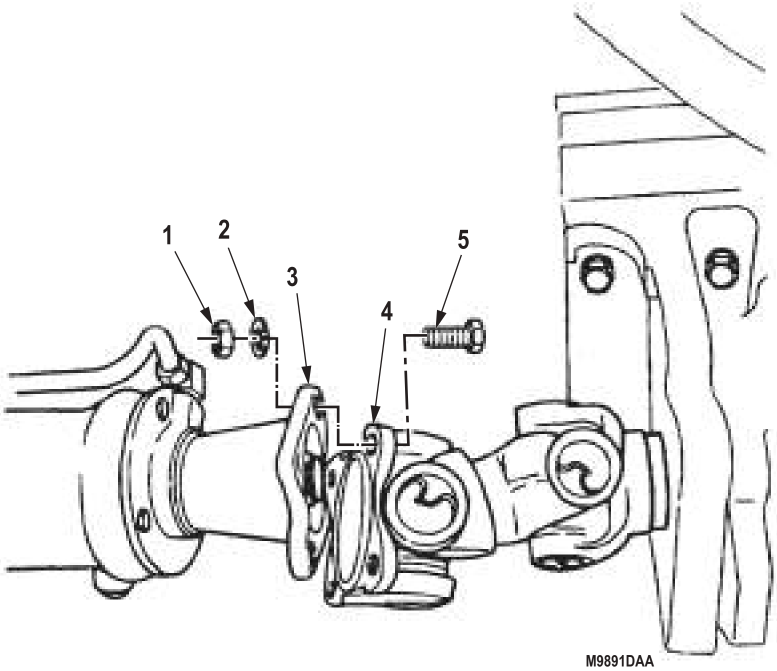


Figure 1. Transfer Case Power Takeoff Removal.

REMOVAL - Continued

2. Remove cotter pin (Figure 2, Item 7), pin (Figure 2, Item 9), and PTO cable (Figure 2, Item 1) from PTO select lever (Figure 2, Item 8). Discard cotter pin.
3. Remove two locknuts (Figure 2, Item 6), screws (Figure 2, Item 3), clamp (Figure 2, Item 2), PTO cable (Figure 2, Item 1), and spacer (Figure 2, Item 4) from PTO cable bracket (Figure 2, Item 5). Discard locknuts.

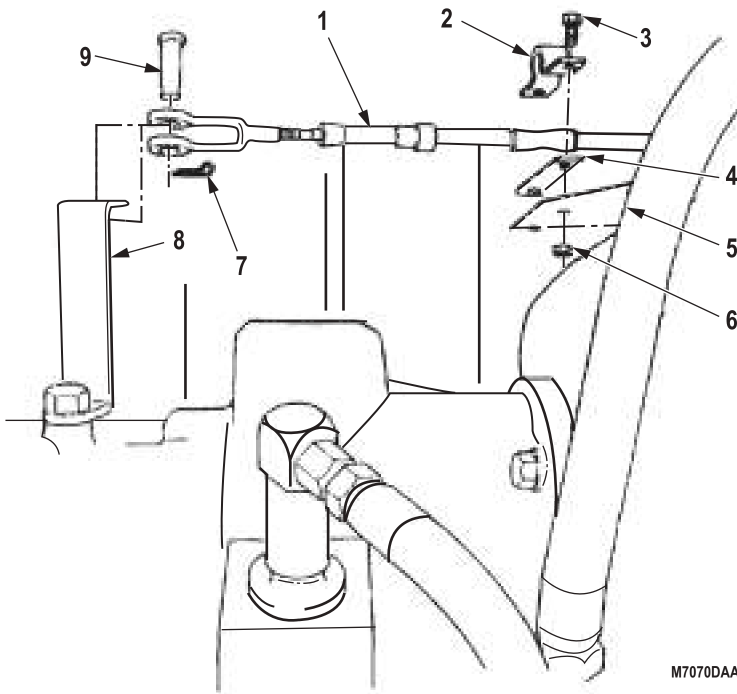


Figure 2. Transfer Case Power Takeoff Removal.

REMOVAL - Continued

4. Remove two screws (Figure 3, Item 8), washers (Figure 3, Item 9), and PTO cable bracket (Figure 3, Item 10) from transfer case (Figure 3, Item 12).
5. Remove locknut (Figure 3, Item 16) and parking brake cable (Figure 3, Item 4) from parking brake lever (Figure 3, Item 17). Discard locknut.
6. Remove two locknuts (Figure 3, Item 14), screws (Figure 3, Item 2), clamp (Figure 3, Item 3), parking brake cable (Figure 3, Item 4), and spacer (Figure 3, Item 1) from parking brake cable bracket (Figure 3, Item 15). Discard locknuts.
7. Disconnect speedometer driveshaft (Figure 3, Item 11) from speedometer drive adapter (Figure 3, Item 13).
8. Remove screw (Figure 3, Item 6), washer (Figure 3, Item 5), clamp (Figure 3, Item 7), and speedometer drive cable (Figure 3, Item 11) from transfer case (Figure 3, Item 12).

REMOVAL - Continued

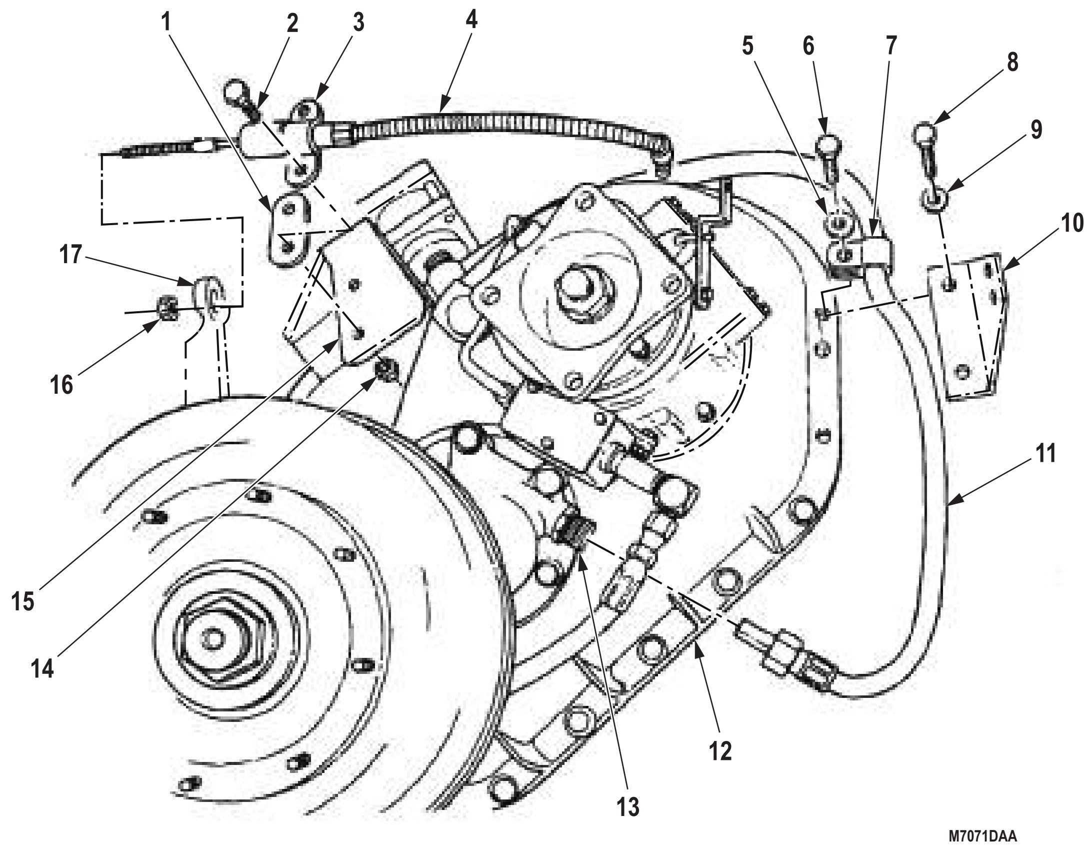


Figure 3. Transfer Case Power Takeoff Removal.

REMOVAL - Continued

9. Remove eight locknuts (Figure 4, Item 4), screws (Figure 4, Item 2), and propeller shaft (Figure 4, Item 5) from transfer case front output flange (Figure 4, Item 1) and transfer case (Figure 4, Item 3). Discard locknuts.

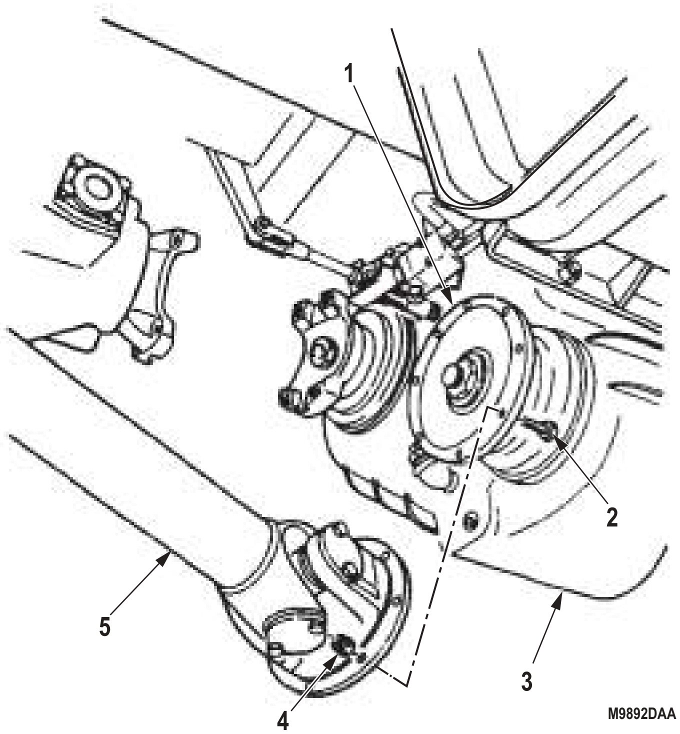


Figure 4. Transfer Case Power Takeoff Removal.

REMOVAL - Continued

10. Remove two screws (Figure 5, Item 7), washers (Figure 5, Item 8), and parking brake cable bracket (Figure 5, Item 6) from transfer case cover (Figure 5, Item 9).
11. Remove screw (Figure 5, Item 4), clamp (Figure 5, Item 3) with parking brake cable (Figure 5, Item 10), and clamp (Figure 5, Item 2) with speedometer drive cable (Figure 5, Item 5) from transfer case (Figure 5, Item 1).

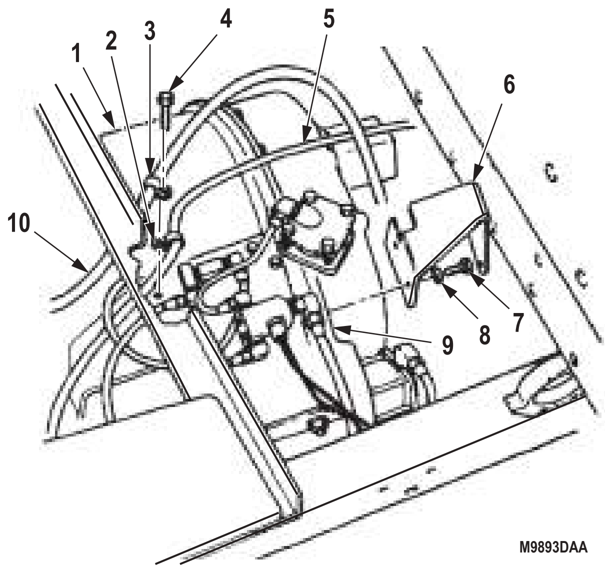


Figure 5. Transfer Case Power Takeoff Removal.

REMOVAL - Continued

NOTE

Tag all air lines and wires for installation.

12. Disconnect supply line (Figure 6, Item 6) from air cylinder elbow (Figure 6, Item 5).
13. Disconnect supply line (Figure 6, Item 6) from interlock air cylinder elbow (Figure 6, Item 2) and interlock valve elbow (Figure 6, Item 11).
14. Disconnect supply line (Figure 6, Item 4) from interlock valve elbow (Figure 6, Item 3).
15. Disconnect interlock vent line (Figure 6, Item 10) from elbows (Figure 6, Items 9 and 12).
16. Disconnect two vent lines (Figure 6, Item 14) from elbows (Figure 6, Item 13).
17. Disconnect interlock valve lead (Figure 6, Item 8) from connector (Figure 6, Item 7).

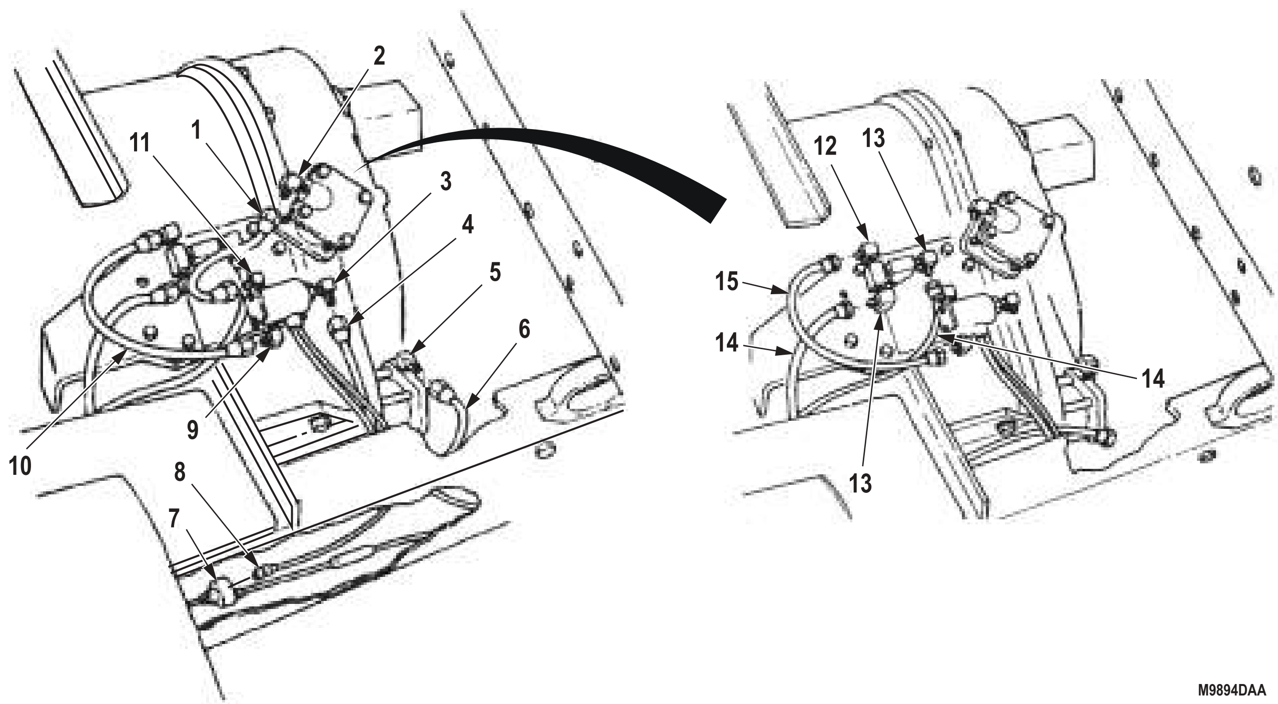


Figure 6. Transfer Case Power Takeoff Removal.

REMOVAL - Continued

18. Remove locknut (Figure 7, Item 3), washer (Figure 7, Item 2), transorb diode ground wire (Figure 7, Item 4), locknut (Figure 7, Item 5), ground wire (Figure 7, Item 6), lockwasher (Figure 7, Item 7), cable clamp (Figure 7, Item 8), and screw (Figure 7, Item 1) from frame (Figure 7, Item 9). Discard locknuts and lockwasher.

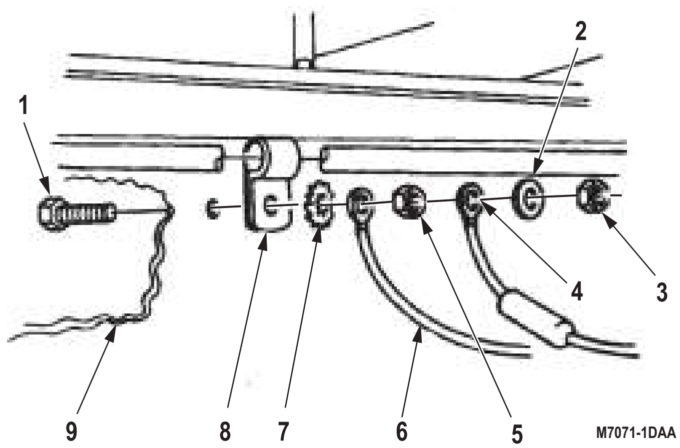


Figure 7. Transfer Case Lines and Cables Removal.

REMOVAL - Continued

19. Position transmission jack (Figure 8, Item 12) under transfer case (Figure 8, Item 13).
20. Remove three locknuts (Figure 8, Item 11), screws (Figure 8, Item 1), washers (Figure 8, Item 6), and insulators (Figure 8, Item 7) from mounting brackets (Figure 8, Item 8) and frame (Figure 8, Items 3 and 10). Discard locknuts.
21. Raise transfer case (Figure 8, Item 13) high enough to remove three insulators (Figure 8, Item 9) from mounting brackets (Figure 8, Item 8) and frame (Figure 8, Item 10).
22. Remove three locknuts (Figure 8, Item 2), screws (Figure 8, Item 5), and right frame bracket (Figure 8, Item 3) from frame (Figure 8, Item 4). Discard locknuts.
23. Remove seven locknuts (Figure 8, Item 14) and two mounting brackets (Figure 8, Item 8) from transfer case (Figure 8, Item 13). Discard locknuts.
24. Lower transmission jack (Figure 8, Item 12) and remove transfer case (Figure 8, Item 13) from vehicle.
25. Remove nut (Figure 8, Item 18), washer (Figure 8, Item 17), and flange (Figure 8, Item 16) from PTO shaft (Figure 8, Item 15).
26. Remove seven studs (Figure 8, Item 19) from transfer case (Figure 8, Item 13).
27. Using lifting device, remove transfer case (Figure 8, Item 13) from hydraulic jack (Figure 8, Item 12).

REMOVAL - Continued

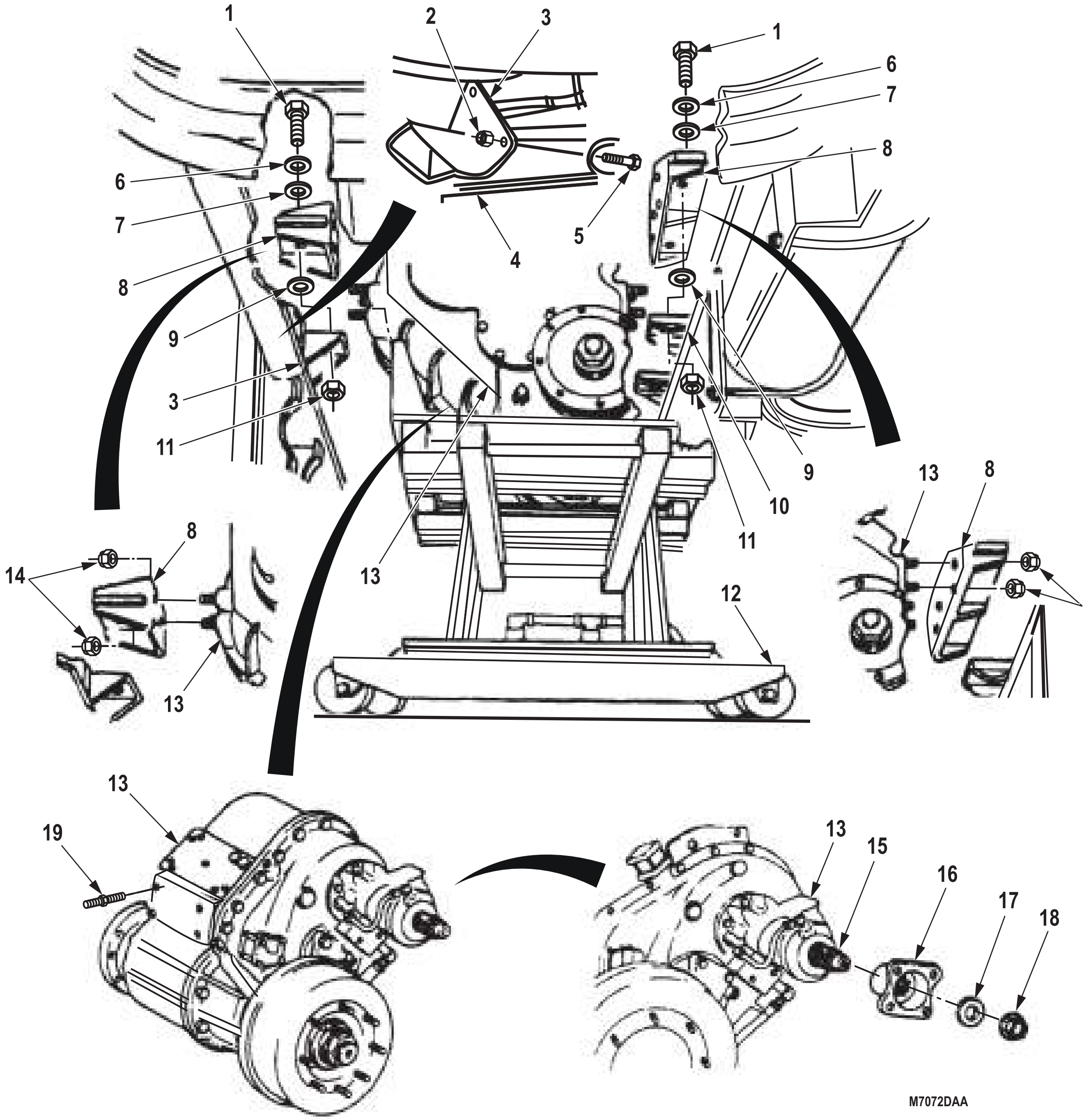


Figure 8. Transfer Case Brackets Removal.

REMOVAL - Continued

28. Remove three elbows (Figure 9, Item 6) from vent tees (Figure 9, Items 7 and 16).
29. Remove vent tees (Figure 9, Items 7 and 16) and fitting (Figure 9, Item 8) from inspection cover (Figure 9, Item 14).
30. Remove elbow (Figure 9, Item 9) from interlock air cylinder (Figure 9, Item 10).
31. Remove elbow (Figure 9, Item 12) from air cylinder cover (Figure 9, Item 13).
32. Remove two screws (Figure 9, Item 15) and interlock valve (Figure 9, Item 11) from interlock valve bracket (Figure 9, Item 4).
33. Remove two screws (Figure 9, Item 5) and interlock valve bracket (Figure 9, Item 4) from transfer case (Figure 9, Item 3).
34. Remove three screws (Figure 9, Item 2) and control valve bracket (Figure 9, Item 1) from transfer case (Figure 9, Item 3).

REMOVAL - Continued

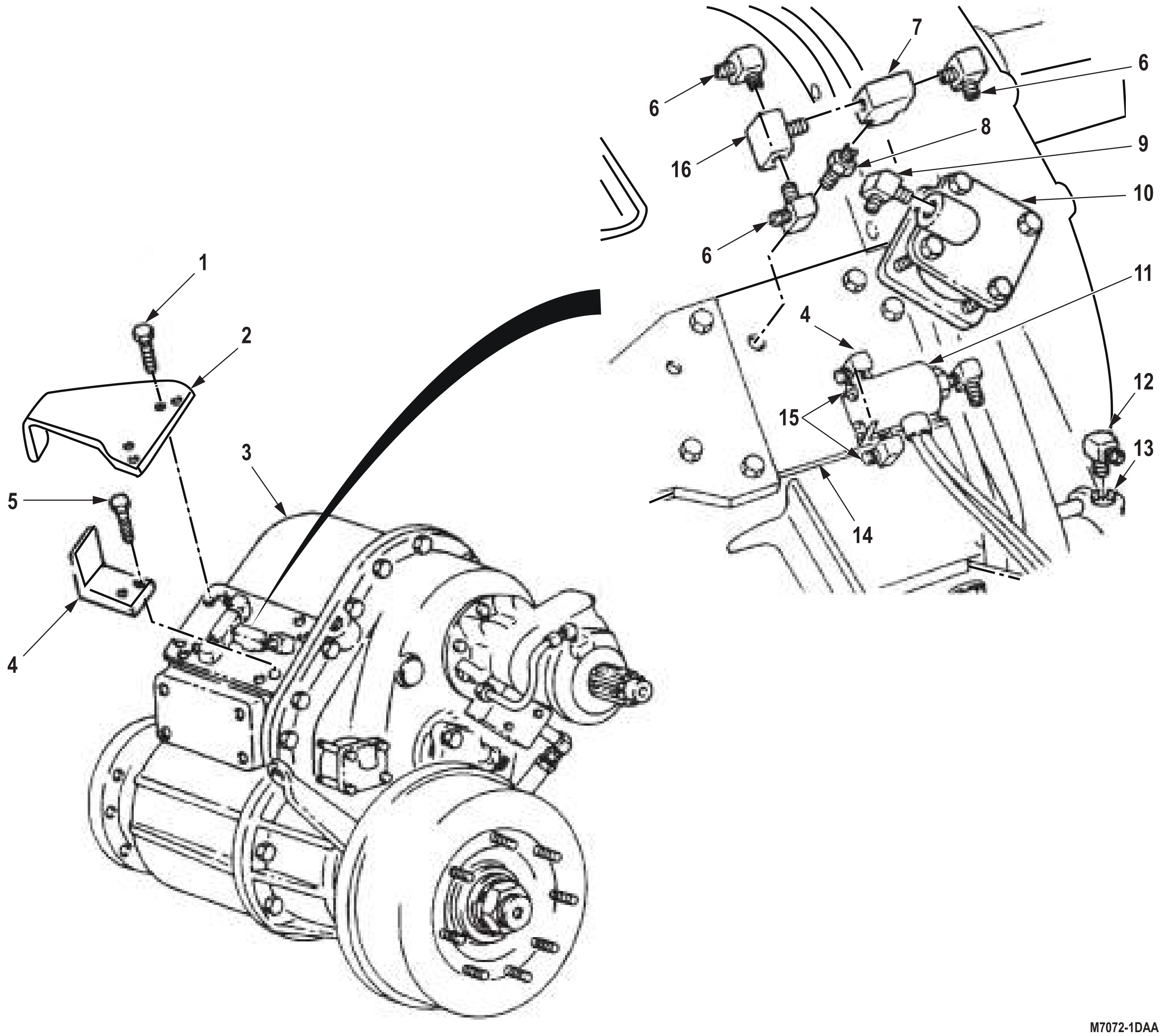


Figure 9. Transfer Case Brackets Removal.

END OF TASK

INSTALLATION

1. Install control valve bracket (Figure 10, Item 2) on transfer case (Figure 10, Item 3) with three screws (Figure 10, Item 1). Finger-tighten screws.
2. Install interlock valve bracket (Figure 10, Item 4) on transfer case (Figure 10, Item 3) with two screws (Figure 10, Item 5). Tighten screws (Figure 10, Items 1 and 5) 30 to 40 lb-ft (41 to 54 N·m).
3. Install interlock valve (Figure 10, Item 11) on interlock valve bracket (Figure 10, Item 4) with two screws (Figure 10, Item 15).
4. Install elbow (Figure 10, Item 12) on air cylinder cover (Figure 10, Item 13).
5. Install elbow (Figure 10, Item 9) on interlock air cylinder (Figure 10, Item 10).
6. Install vent tees (Figure 10, Items 7 and 16) and fitting (Figure 10, Item 8) on inspection cover (Figure 10, Item 14).
7. Install three elbows (Figure 10, Item 6) on vent tees (Figure 10, Items 7 and 16).
8. Using lifting device, position transfer case (Figure 10, Item 3) on hydraulic jack.

INSTALLATION - Continued

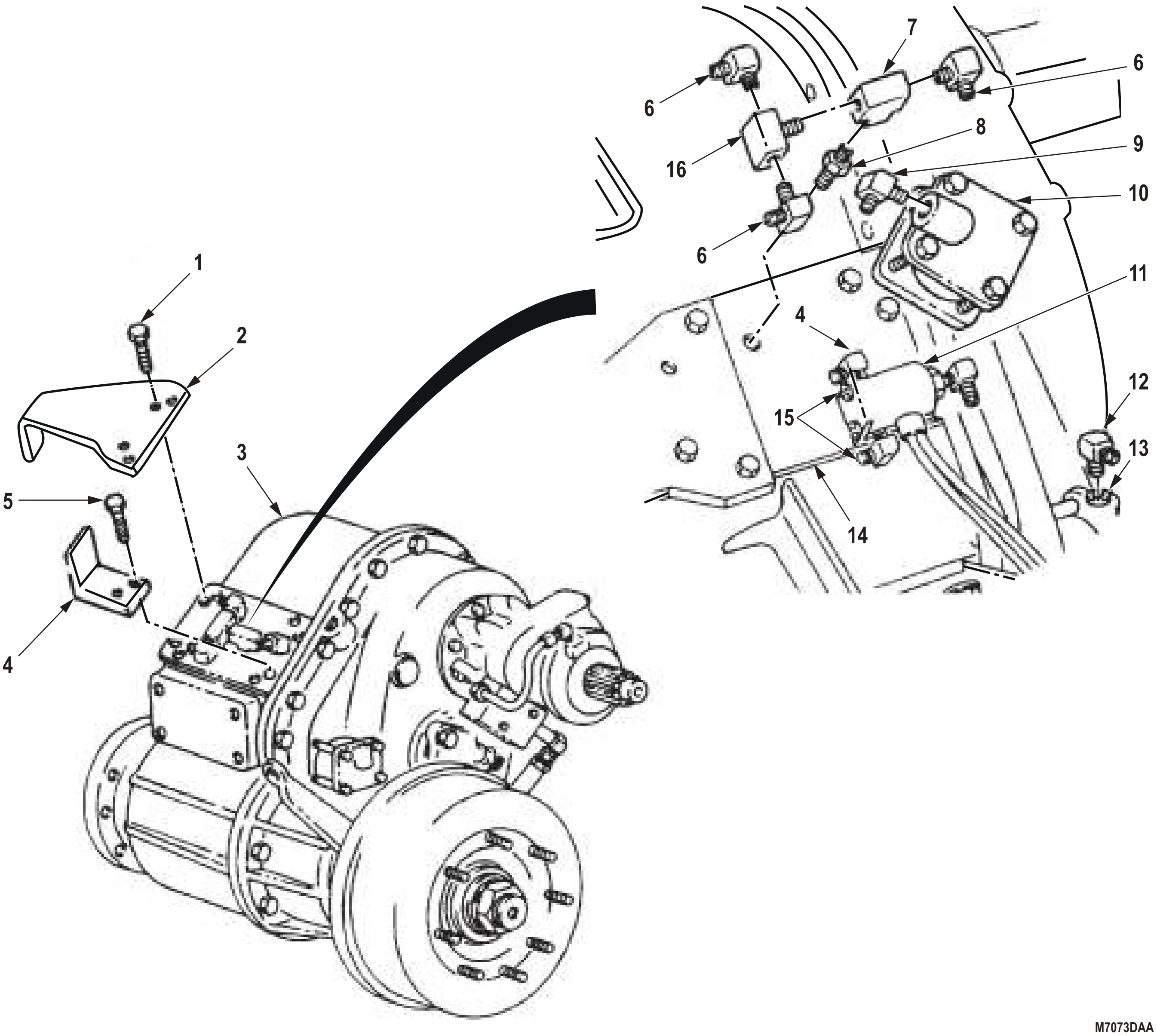


Figure 10. Transfer Case Brackets Installation.

INSTALLATION - Continued

9. Install flange (Figure 11, Item 3) on PTO shaft (Figure 11, Item 2) with washer (Figure 11, Item 4) and nut (Figure 11, Item 5).
10. Install seven studs (Figure 11, Item 6) on transfer case (Figure 11, Item 1).

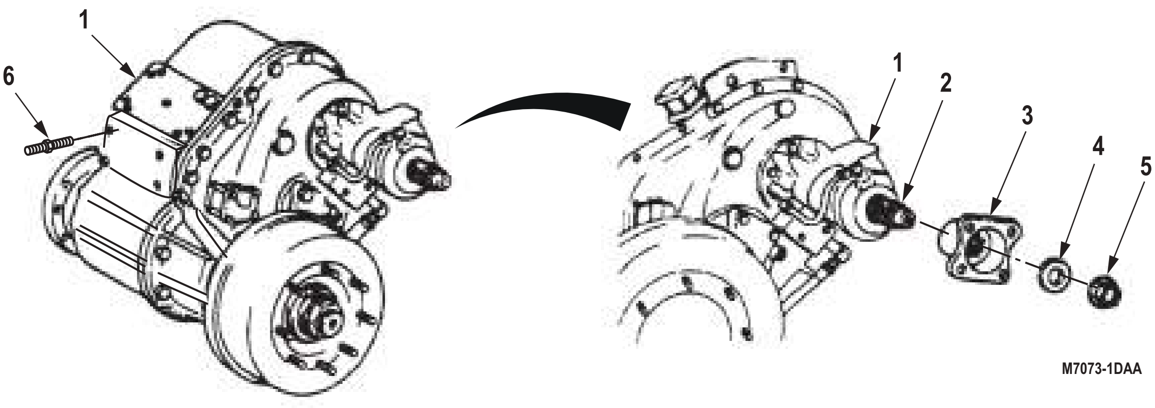


Figure 11. Transfer Case Brackets Installation.

INSTALLATION - Continued

11. Position hydraulic jack (Figure 12, Item 12) and transfer case (Figure 12, Item 13) under vehicle.
12. Raise transfer case (Figure 12, Item 13) in position high enough to allow for installation of mounting brackets (Figure 12, Item 8).
13. Install two mounting brackets (Figure 12, Item 8) on transfer case (Figure 12, Item 13) with seven locknuts (Figure 12, Item 14). Tighten locknuts 125 to 135 lb-ft (170 to 183 N·m).
14. Install right frame bracket (Figure 12, Item 3) on frame (Figure 12, Item 4) with three screws (Figure 12, Item 5) and locknuts (Figure 12, Item 2). Tighten locknuts 120 lb-ft (163 N·m).
15. Place three insulators (Figure 12, Item 9) between mounting brackets (Figure 12, Item 8) and frame brackets (Figure 12, Item 10).
16. Slowly lower transfer case (Figure 12, Item 13) and align holes in mounting brackets (Figure 12, Item 8), insulators (Figure 12, Item 9), and frame brackets (Figure 12, Item 10).
17. Install three insulators (Figure 12, Item 7), washers (Figure 12, Item 6), screws (Figure 12, Item 1), and locknuts (Figure 12, Item 11) on mounting brackets (Figure 12, Item 8) and frame brackets (Figure 12, Item 10). Tighten locknuts 50 to 60 lb-ft (68 to 81 N·m).
18. Remove hydraulic jack (Figure 12, Item 12) from transfer case (Figure 12, Item 13) and vehicle.

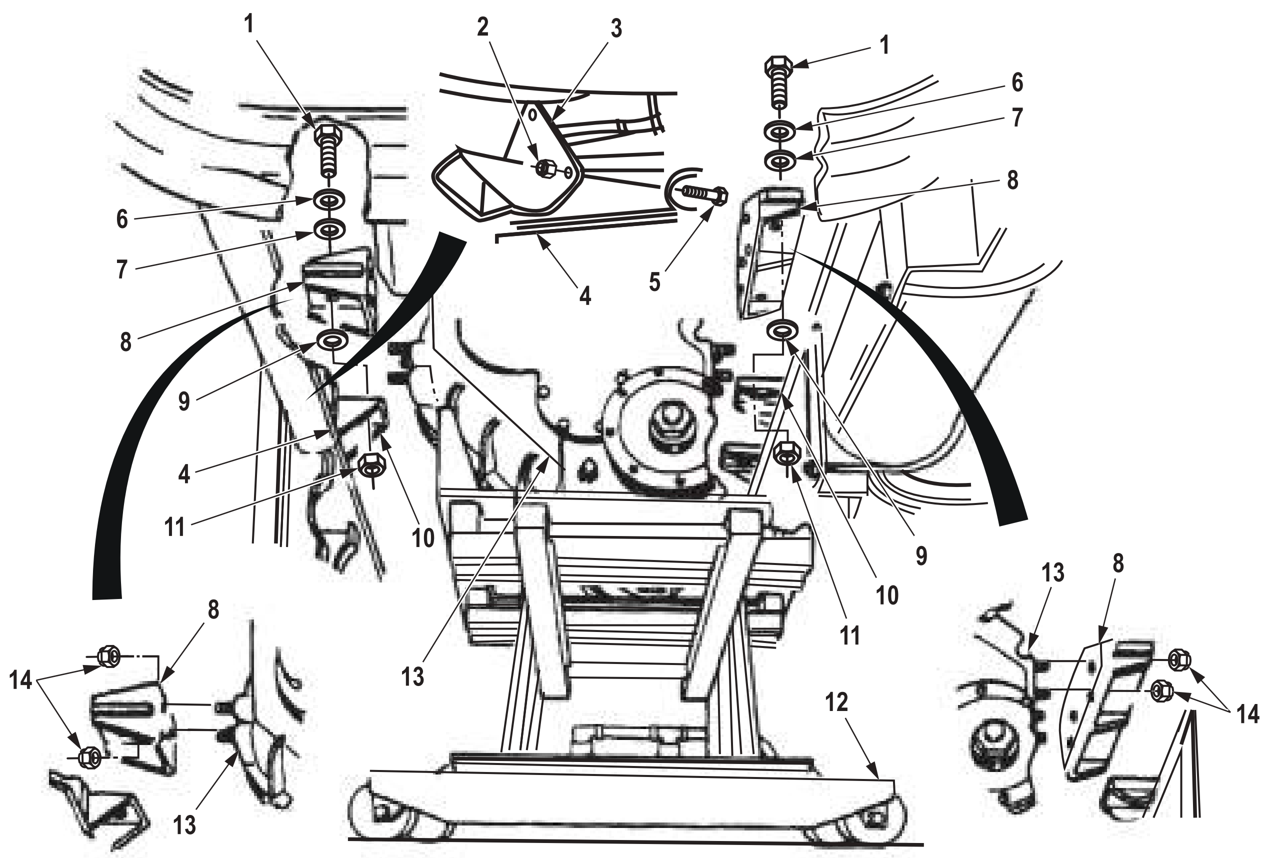


Figure 12. Transfer Case Lines and Cables Installation.

INSTALLATION - Continued

19. Install cable clamp (Figure 13, Item 8), lockwasher (Figure 13, Item 7), and ground wire (Figure 13, Item 6) on frame (Figure 13, Item 9) with screw (Figure 13, Item 1) and locknut (Figure 13, Item 5).

20. Install transorb diode ground (Figure 13, Item 4) on screw (Figure 13, Item 1) with washer (Figure 13, Item 2) and locknut (Figure 13, Item 3).

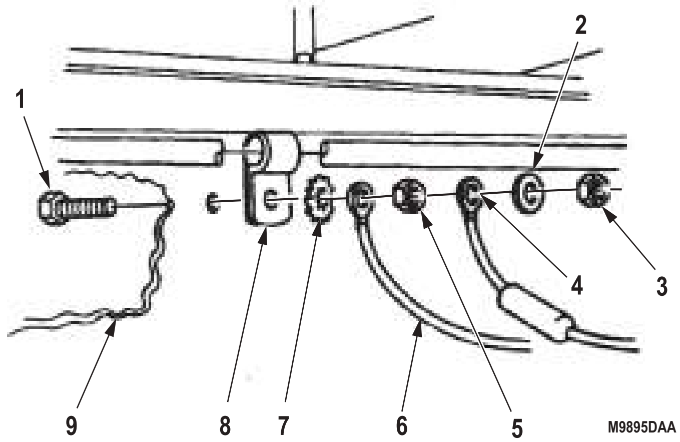


Figure 13. Transfer Case Lines and Cables Installation.

INSTALLATION - Continued

21. Connect two vent lines (Figure 14, Item 14) to elbows (Figure 14, Item 13).
22. Connect interlock vent line (Figure 14, Item 11) to elbow (Figure 14, Item 12) and elbow (Figure 14, Item 10).
23. Connect supply line (Figure 14, Item 5) to interlock valve elbow (Figure 14, Item 4).
24. Connect supply line (Figure 14, Item 2) to interlock air cylinder elbow (Figure 14, Item 3) and interlock valve elbow (Figure 14, Item 1).
25. Connect supply line (Figure 14, Item 7) to air cylinder elbow (Figure 14, Item 6).
26. Correct interlock valve lead (Figure 14, Item 9) to connector (Figure 14, Item 8).

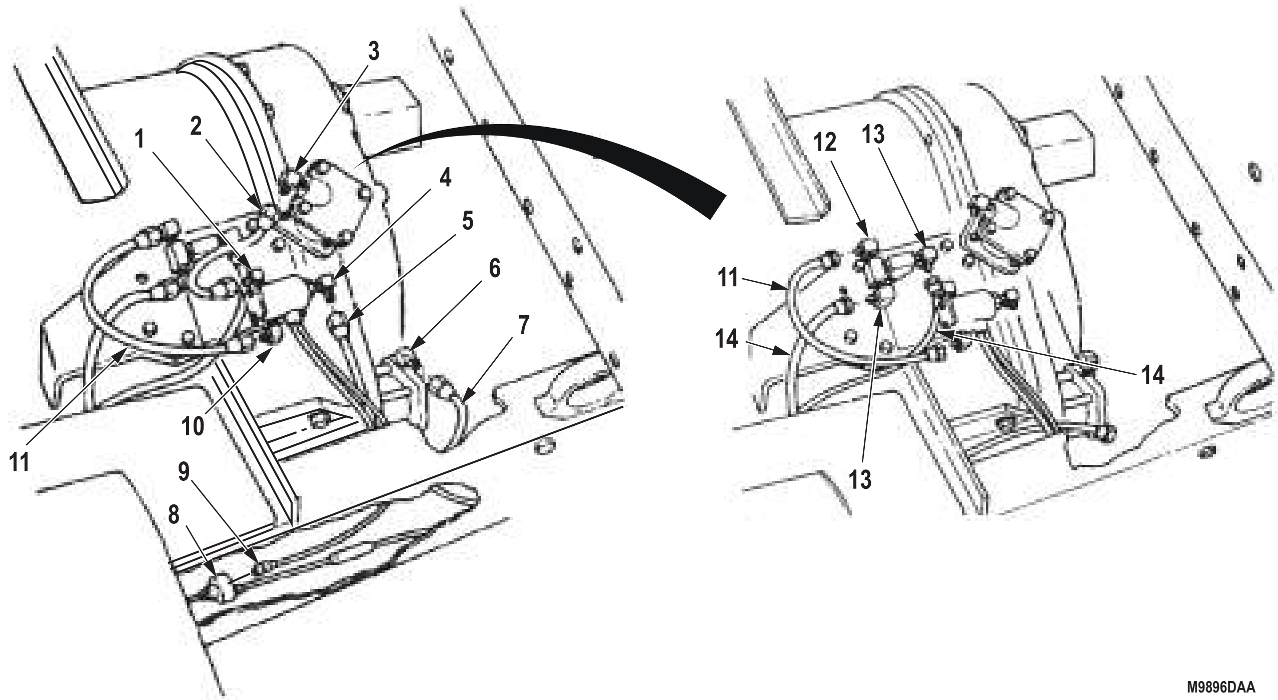


Figure 14. Transfer Case Lines and Cables Installation.

INSTALLATION - Continued

27. Install clamp (Figure 15, Item 2) with parking brake cable (Figure 15, Item 5) and clamp (Figure 15, Item 3) with speedometer drive cable (Figure 15, Item 10) on transfer case (Figure 15, Item 1) with screw (Figure 15, Item 4). Tighten screw 30 to 40 lb-ft (41 to 54 N·m).
28. Install parking brake cable bracket (Figure 15, Item 6) on transfer case cover (Figure 15, Item 9) with two washers (Figure 15, Item 8) and screws (Figure 15, Item 7). Tighten screws 40 to 55 lb-ft (54 to 75 N·m).

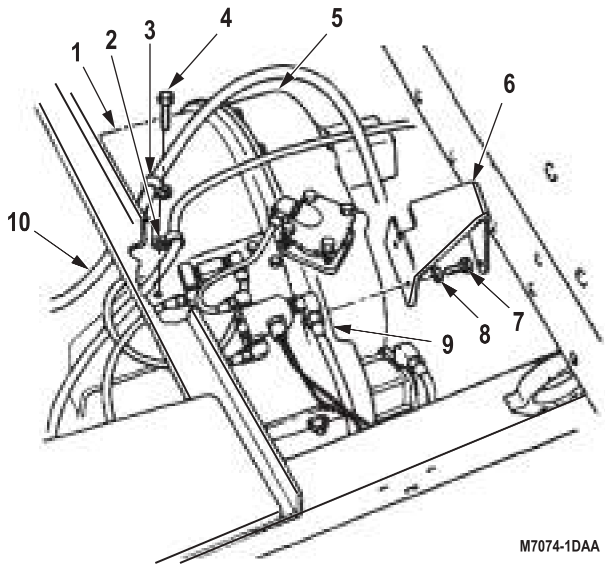


Figure 15. Transfer Case Lines and Cables Installation.

INSTALLATION - Continued

29. Install propeller shaft (Figure 16, Item 4) on transfer case front output flange (Figure 16, Item 1) with eight screws (Figure 16, Item 2) and locknuts (Figure 16, Item 3). Tighten locknuts 32 to 40 lb-ft (43 to 54 N·m).

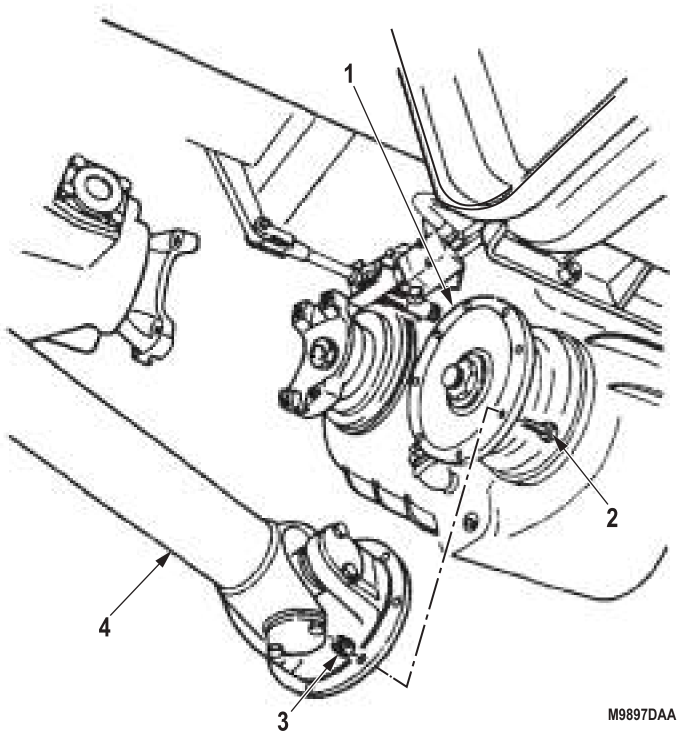


Figure 16. Transfer Case Lines and Cables Installation.

INSTALLATION - Continued

30. Connect speedometer driveshaft (Figure 17, Item 11) on speedometer drive adapter (Figure 17, Item 13).
31. Install clamp (Figure 17, Item 7) and speedometer driveshaft (Figure 17, Item 11) on transfer case (Figure 17, Item 12) with washer (Figure 17, Item 5) and screw (Figure 17, Item 6).
32. Install parking brake cable (Figure 17, Item 4) on parking brake lever (Figure 17, Item 17) with locknut (Figure 17, Item 16).
33. Install parking brake cable (Figure 17, Item 4) and spacer (Figure 17, Item 1) on parking brake cable bracket (Figure 17, Item 15) with clamp (Figure 17, Item 3), two screws (Figure 17, Item 2), and locknuts (Figure 17, Item 14).
34. Install PTO cable bracket (Figure 17, Item 10) on transfer case (Figure 17, Item 12) with two washers (Figure 17, Item 9) and screws (Figure 17, Item 8). Tighten screws 40 to 55 lb-ft (54 to 75 N·m).

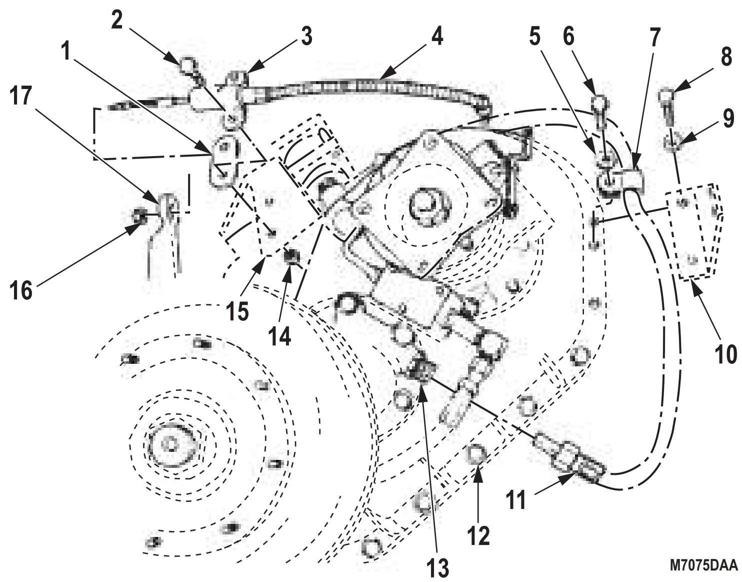


Figure 17. Transfer Case Power Takeoff Installation.

INSTALLATION - Continued

35. Install PTO cable (Figure 18, Item 1) on PTO selector lever (Figure 18, Item 7) with pin (Figure 18, Item 8) and cotter pin (Figure 18, Item 9).

36. Install PTO cable (Figure 18, Item 1) and spacer (Figure 18, Item 4) on PTO cable bracket (Figure 18, Item 5) with clamp (Figure 18, Item 2), two screws (Figure 18, Item 3), and locknuts (Figure 18, Item 6).

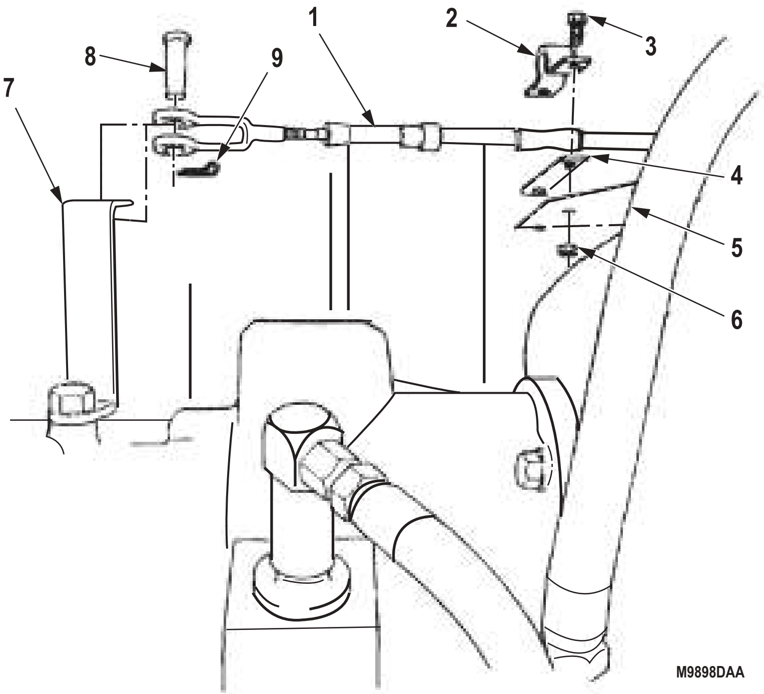


Figure 18. Transfer Case Power Takeoff Installation.

INSTALLATION - Continued

37. Install propeller shaft (Figure 19, Item 2) on PRO flange (Figure 19, Item 1) with four screws (Figure 19, Item 3), lockwashers (Figure 19, Item 5), and locknuts (Figure 19, Item 4). Tighten locknuts 32 to 40 lb-ft (43 to 54 N·m).

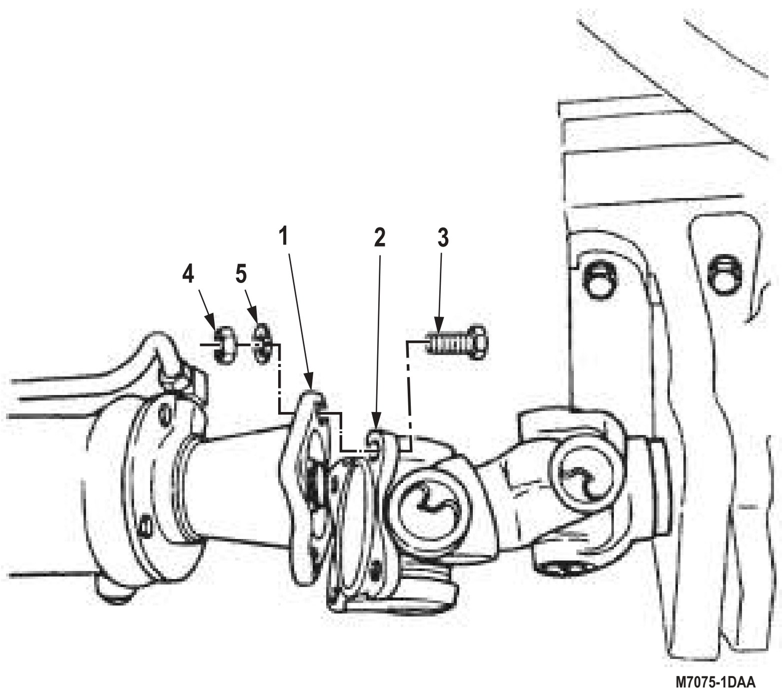


Figure 19. Transfer Case Power Takeoff Installation.

END OF TASK

FOLLOW-ON MAINTENANCE

1. Install transfer case shift rod. (WP 0396)
2. Install transfer case front axle engagement control valve. (WP 0388)
3. Check parking brake adjustment. (WP 0432)
4. Installation transmission to transfer propeller shaft. (WP 0403)
5. Install transfer case to forward rear axle propeller shaft. (WP 0402)
6. Fill transfer case to proper oil level. (Volume 5, WP 0820)

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
TRANSFER CASE SPEEDOMETER DRIVE GEAR AND DRIVEN SHAFT REPLACEMENT

INITIAL SETUP:

Tools and Special Tools

Tool Kit, General Mechanic's: Automotive
(Volume 5, WP 0826, Table 1, Item 56)
Vise, Machinist's
(Volume 5, WP 0826, Table 1, Item 59)

Materials/Parts

Adhesive, Silicone Rubber
(Volume 5, WP 0825, Table 1, Item 4)
Snapring (Volume 5, WP 0827, Table 1, Item 53)
Woodruff Key
(Volume 5, WP 0827, Table 1, Item 418)
Qty: 1

Equipment Condition

Chock wheels. (TM 9-2320-272-10)

Equipment Condition (cont.)

Transfer case oil drained. (Volume 5, WP 0820)
Parking brake shoes removed. (WP 0422)
Dust covers removed. (WP 0423)

REMOVAL

NOTE

Speedometer drive gear cover screws are different lengths. Note location and position for installation.

1. Disconnect speedometer driveshaft (Figure 1, Item 6) from drive adapter (Figure 1, Item 5).
2. Remove two screws (Figure 1, Item 1), washers (Figure 1, Item 2), four screws (Figure 1, Item 7), washers (Figure 1, Item 8), and speedometer drive gear cover (Figure 1, Item 9) from transfer case (Figure 1, Item 13).
3. Place speedometer drive gear cover (Figure 1, Item 9) in soft-jawed vise.
4. Remove drive adapter (Figure 1, Item 5), driven shaft (Figure 1, Item 4), and sleeve bushing (Figure 1, Item 3) from speedometer drive gear cover (Figure 1, Item 9).
5. Remove snapring (Figure 1, Item 10), speedometer drive gear (Figure 1, Item 11), and woodruff key (Figure 1, Item 12) from intermediate shaft (Figure 1, Item 14). Discard snapring and woodruff key.

REMOVAL - Continued

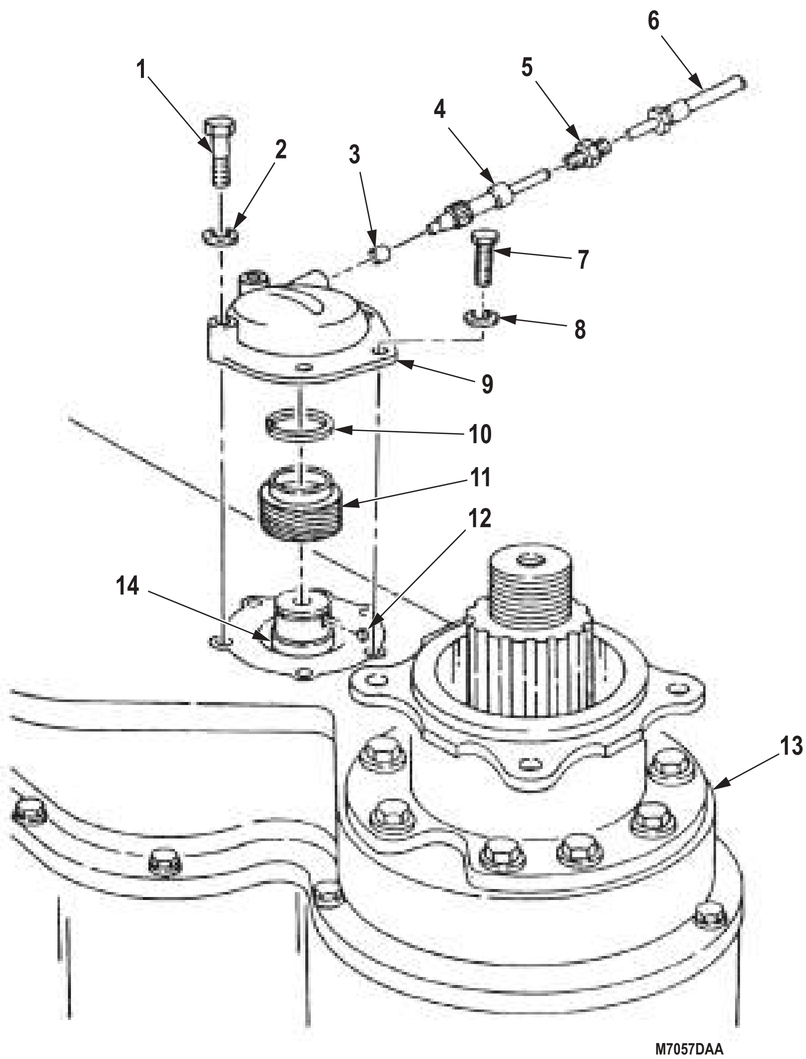


Figure 1. Transfer Case Speedometer Drive Gear and Driven Shaft Removal.

END OF TASK

INSTALLATION

1. Install woodruff key (Figure 2, Item 12) and speedometer drive gear (Figure 2, Item 11) on intermediate shaft (Figure 2, Item 14) with snapring (Figure 2, Item 10).
2. Install sleeve bushing (Figure 2, Item 3), driven shaft (Figure 2, Item 4), and drive adapter (Figure 2, Item 5) on speedometer drive gear cover (Figure 2, Item 9).
3. Apply adhesive on contact surface of speedometer drive gear cover (Figure 2, Item 9) and install on transfer case (Figure 2, Item 13) with four washers (Figure 2, Item 8), screws (Figure 2, Item 7), two washers (Figure 2, Item 2), and screws (Figure 2, Item 1).
4. Connect speedometer driveshaft (Figure 2, Item 6) on drive adapter (Figure 2, Item 5).

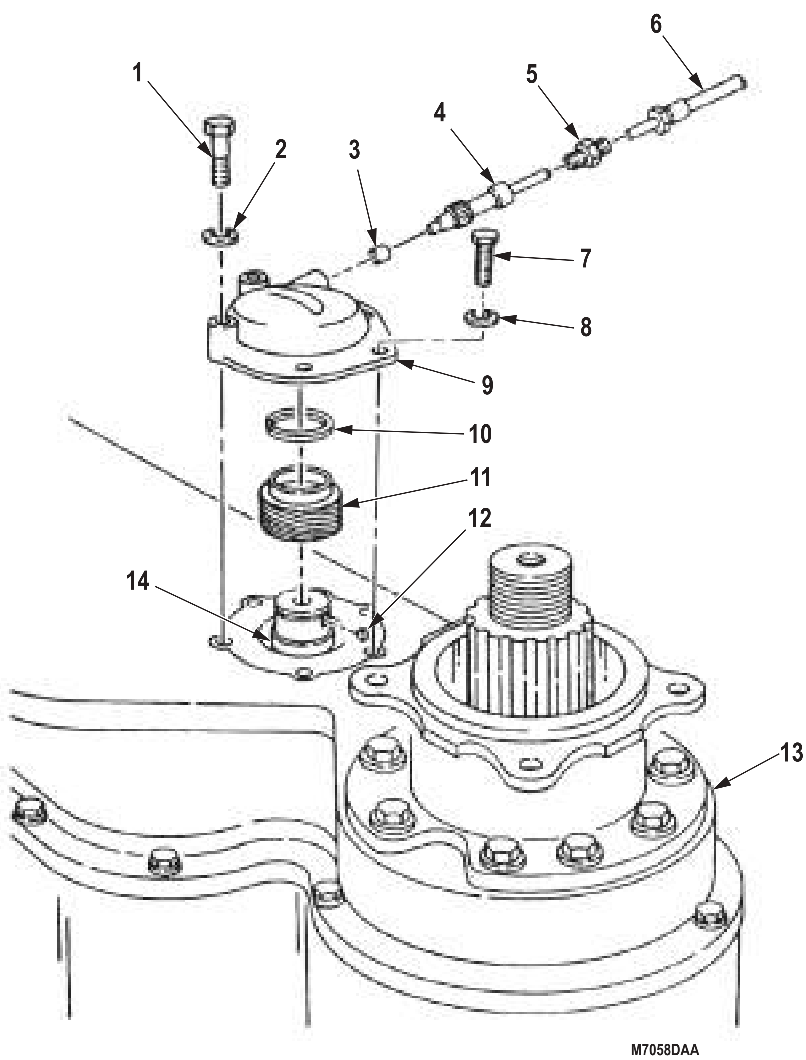


Figure 2. Transfer Case Speedometer Drive Gear and Driven Shaft Installation.

END OF TASK

FOLLOW-ON MAINTENANCE

1. Install parking brake shoes (WP 0422) and dust covers (WP 0423).
2. Fill transfer case to proper fluid level. (Volume 5, WP 0820)
3. Start engine and check for oil leaks. Road test vehicle. (TM 9-2320-272-10)

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
TRANSFER CASE FRONT AXLE ENGAGEMENT CONTROL VALVE REPLACEMENT

INITIAL SETUP:

Tools and Special Tools
Tool Kit, General Mechanic's: Automotive
(Volume 5, WP 0826, Table 1, Item 56)

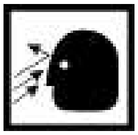
Materials/Parts
Tape, Antiseizing
(Volume 5, WP 0825, Table 1, Item 65)

Equipment Condition
Parking brake set. (TM 9-2320-272-10)

Equipment Condition (cont.)
Air reservoirs drained. (TM 9-2320-272-10)

REMOVAL

WARNING



Do not disconnect air lines or hoses before draining air reservoirs. Small parts under pressure may shoot out with high velocity. Failure to comply may result in injury or death to personnel.

NOTE

Tag air lines for installation.

1. Disconnect three air lines (Figure 1, Item 4) from elbows (Figure 1, Items 3, 6, and 7).
2. Remove elbows (Figure 1, Items 6 and 7) and pipes (Figure 1, Items 5 and 8) from control valve (Figure 1, Item 1).
3. Remove elbow (Figure 1, Item 3) from control valve (Figure 1, Item 1).
4. Remove two nuts (Figure 1, Item 10), screws (Figure 1, Item 2), and control valve (Figure 1, Item 1) from front transfer case bracket (Figure 1, Item 9).

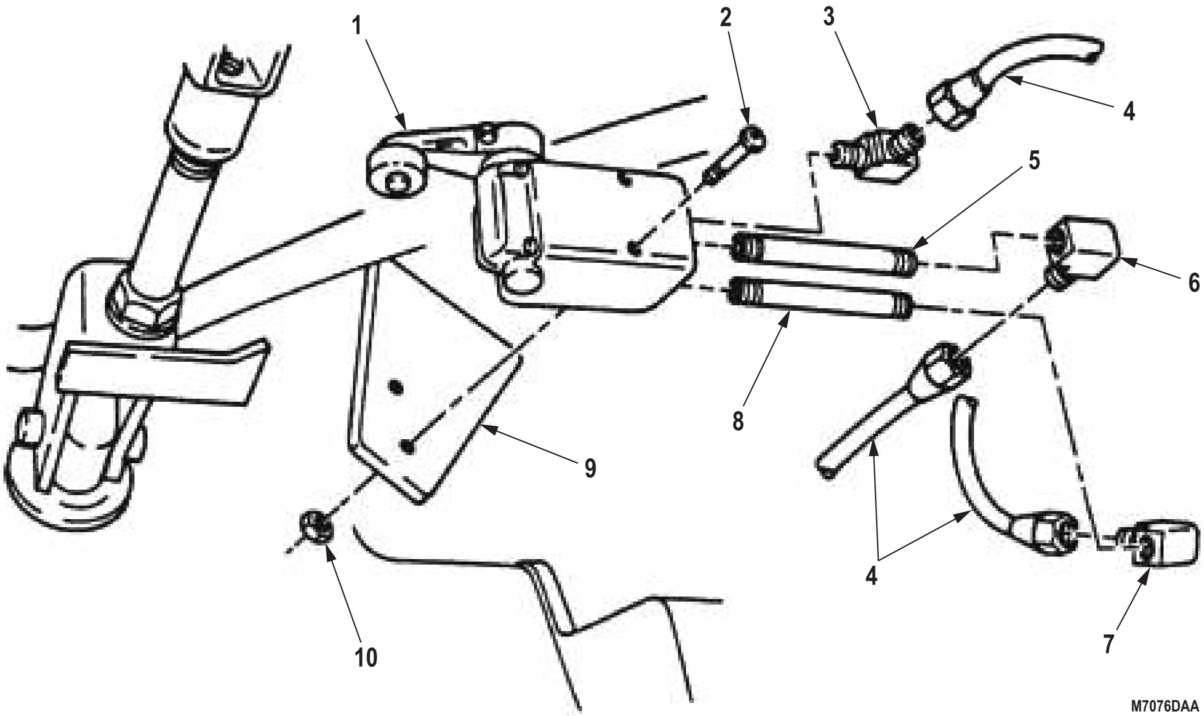


Figure 1. Transfer Case Front Axle Engagement Valve Removal.

END OF TASK

INSTALLATION

NOTE

Wrap all male pipe threads with antiseize tape before installation.

1. Install control valve (Figure 2, Item 1) on front transfer case bracket (Figure 2, Item 9) with two screws (Figure 2, Item 2) and nuts (Figure 2, Item 10).
2. Install elbow (Figure 2, Item 3) on control valve (Figure 2, Item 1).
3. Install pipes (Figure 2, Items 5 and 8) and elbows (Figure 2, Items 6 and 7) on control valve (Figure 2, Item 1).
4. Connect three air lines (Figure 2, Item 4) to elbows (Figure 2, Items 3, 6, and 7).

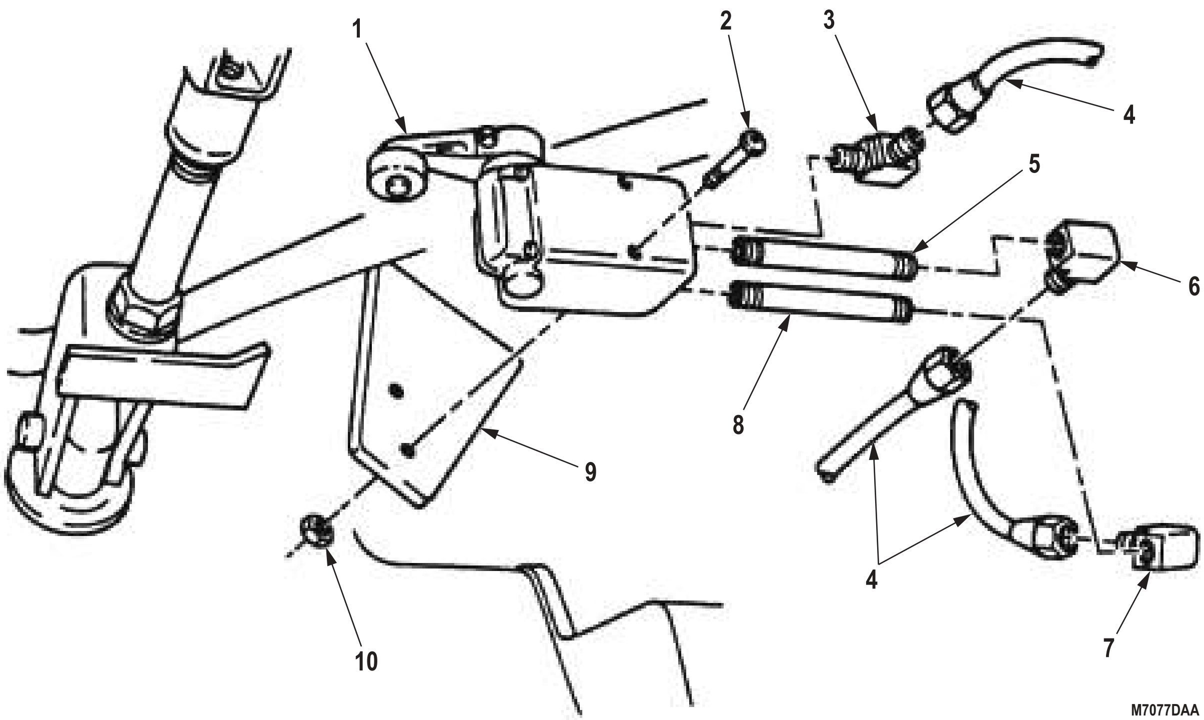


Figure 2. Transfer Case Front Axle Engagement Valve Installation.

END OF TASK

FOLLOW-ON MAINTENANCE

Start engine, allow air pressure to build to normal operating temperature, and check for air leaks and proper front axle engagement. Road test vehicle. (TM 9-2320-272-10)

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
TRANSFER CASE FRONT AXLE LOCK-IN CONTROL VALVE REPLACEMENT

INITIAL SETUP:

Tools and Special Tools
Tool Kit, General Mechanic's: Automotive
(Volume 5, WP 0826, Table 1, Item 56)

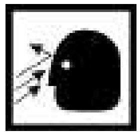
Materials/Parts
Tape, Antiseizing
(Volume 5, WP 0825, Table 1, Item 65)

Equipment Condition
Parking brake set. (TM 9-2320-272-10)

Equipment Condition (cont.)
Air reservoirs drained. (TM 9-2320-272-10)

REMOVAL

WARNING



Do not disconnect air lines or hoses before draining air reservoirs. Small parts under pressure may shoot out with high velocity. Failure to comply may result in injury or death to personnel.

NOTE

Tag air lines for installation.

1. Remove two screws (Figure 1, Item 6), instruction plate (Figure 1, Item 7), and control valve (Figure 1, Item 5) from instrument panel (Figure 1, Item 8).
2. Disconnect control line (Figure 1, Item 10) from elbow (Figure 1, Item 9).
3. Disconnect supply line (Figure 1, Item 1) from adapter fitting (Figure 1, Item 2).
4. Remove pressure switch (Figure 1, Item 3) from elbow (Figure 1, Item 4).
5. Remove elbows (Figure 1, Items 4 and 9) from valve (Figure 1, Item 5).

REMOVAL - Continued

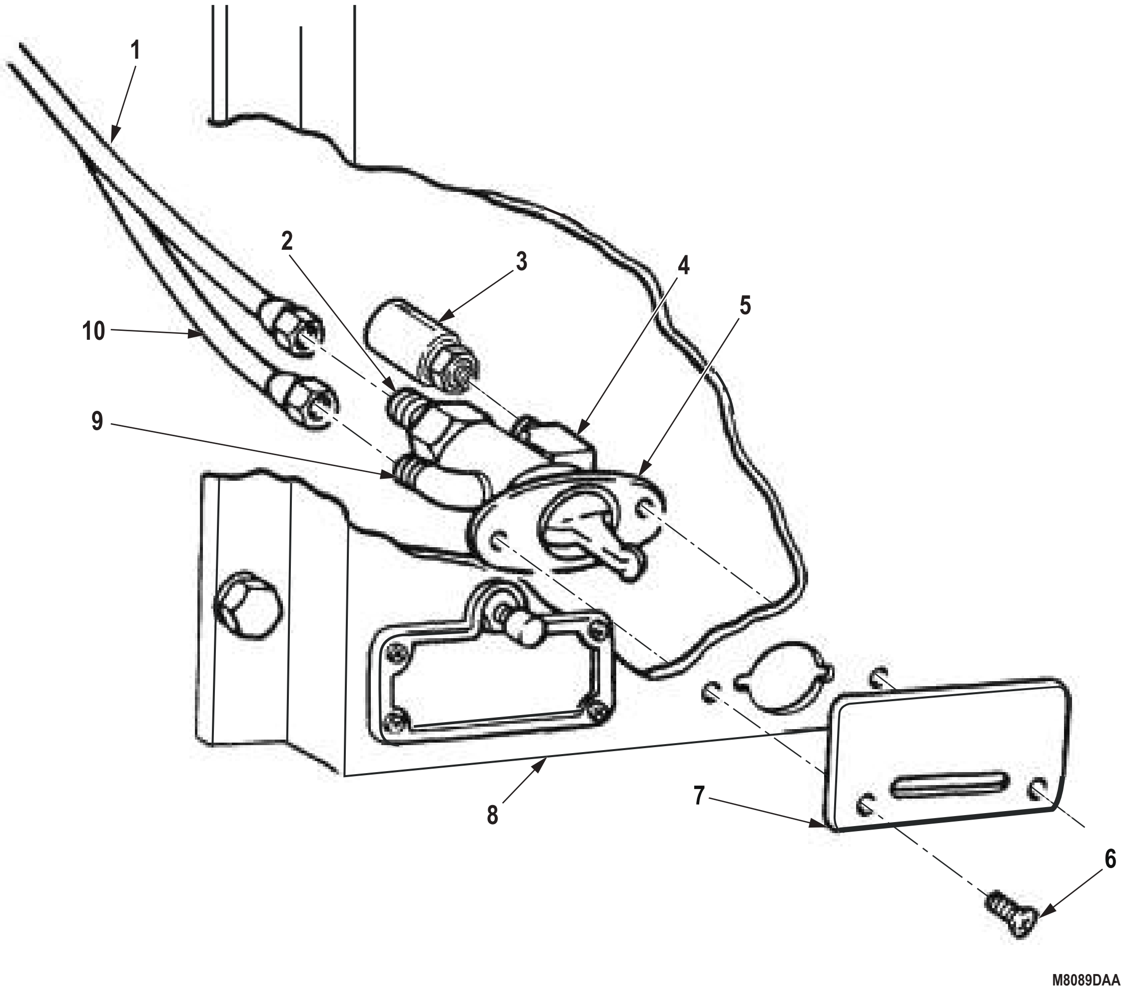


Figure 1. Control Valve Removal.

END OF TASK

INSTALLATION

NOTE

Apply sealant to all male pipe threads before installation.

1. Install elbows (Figure 2, Items 4 and 9) onto valve (Figure 2, Item 5).
2. Install pressure switch (Figure 2, Item 3) on elbow (Figure 2, Item 4).
3. Install control valve (Figure 2, Item 5) and instruction plate (Figure 2, Item 7) on instrument panel (Figure 2, Item 8) with two screws (Figure 2, Item 6).
4. Connect supply line (Figure 2, Item 1) to adapter fitting (Figure 2, Item 2).
5. Connect control line (Figure 2, Item 8) to elbow (Figure 2, Item 9).

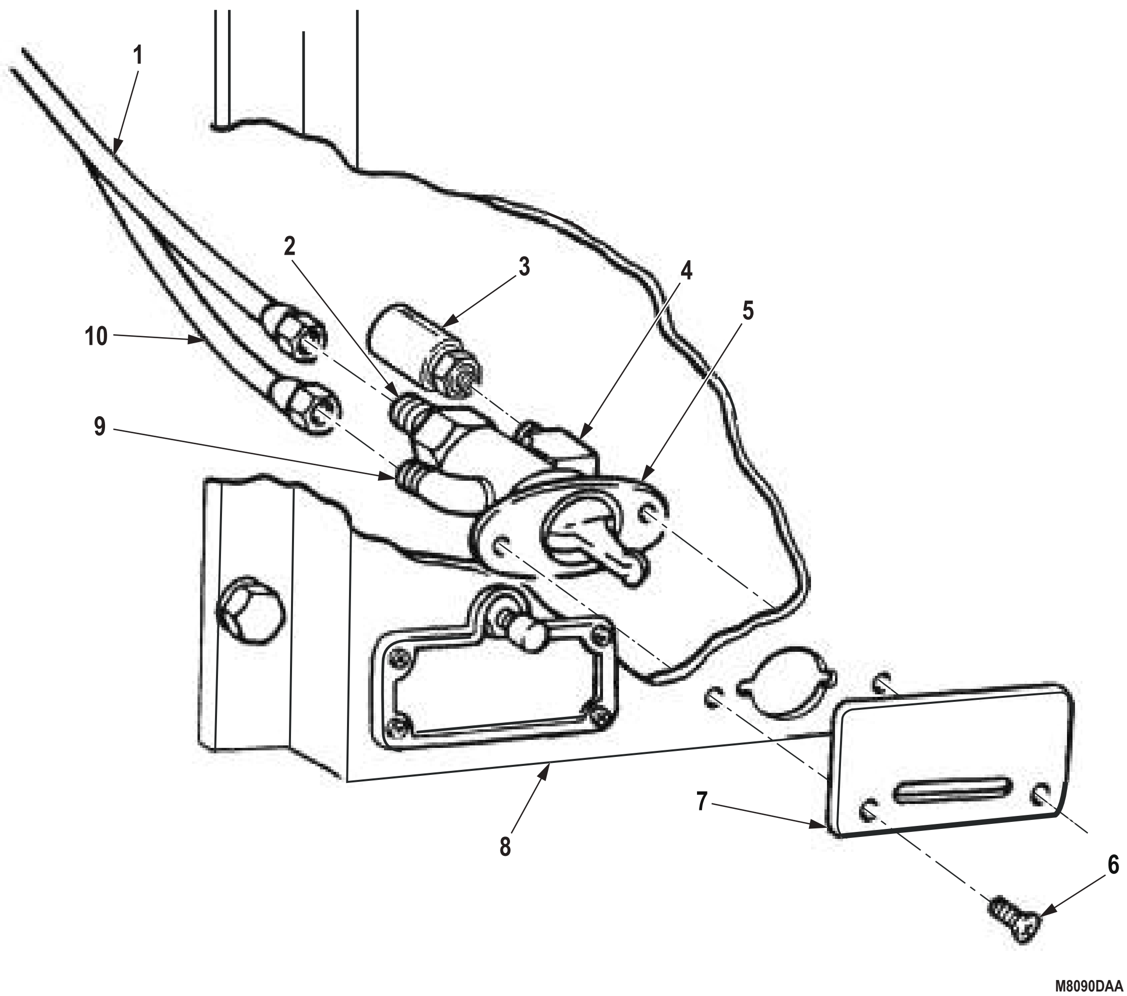


Figure 2. Control Valve Installation.

END OF TASK

FOLLOW-ON MAINTENANCE

1. Start engine and allow air pressure to build up to normal operating pressure. Check for air leaks at axle lock-in valve. (TM 9-2320-272-10)
2. Road test vehicle and check front axle lock-in valve for proper operation.

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
TRANSFER CASE INTERLOCK AIR CYLINDER REPLACEMENT

INITIAL SETUP:

Tools and Special Tools

Tool Kit, General Mechanic's: Automotive
(Volume 5, WP 0826, Table 1, Item 56)

Materials/Parts

Tape, Antiseizing
(Volume 5, WP 0825, Table 1, Item 65)
Lockwasher
(Volume 5, WP 0827, Table 1, Item 404)
Qty: 2

Equipment Condition

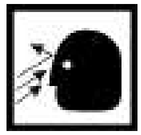
Parking brake set. (TM 9-2320-272-10)

Equipment Condition (cont.)

Air reservoirs drained. (TM 9-2320-272-10)
Spare tire removed (M923/A1/A2, M929/A1/A2). (TM 9-2320-272-10)
Dump body raised. (TM 9-2320-272-10)
Transfer case removed (M936/A1/A2). (WP 0386)

REMOVAL

WARNING



Do not disconnect air lines or hoses before draining air reservoirs. Small parts under pressure may shoot out with high velocity. Failure to comply may result in injury or death to personnel.

1. Disconnect supply line (Figure 1, Item 2) from elbow (Figure 1, Item 1).

NOTE

- Perform Step (2) for all vehicles except M936/A1/A2.
- Interlock air cylinder is threaded in transfer case housing.

2. Remove two screws (Figure 1, Item 6), lockwashers (Figure 1, Item 5), and parking brake cable bracket (Figure 1, Item 7) from transfer case (Figure 1, Item 4). Discard lockwashers.
3. Remove interlock air cylinder (Figure 1, Item 8) and push rod (Figure 1, Item 3) from transfer case (Figure 1, Item 4).
4. Remove elbow (Figure 1, Item 1) from interlock air cylinder (Figure 1, Item 8).

REMOVAL - Continued

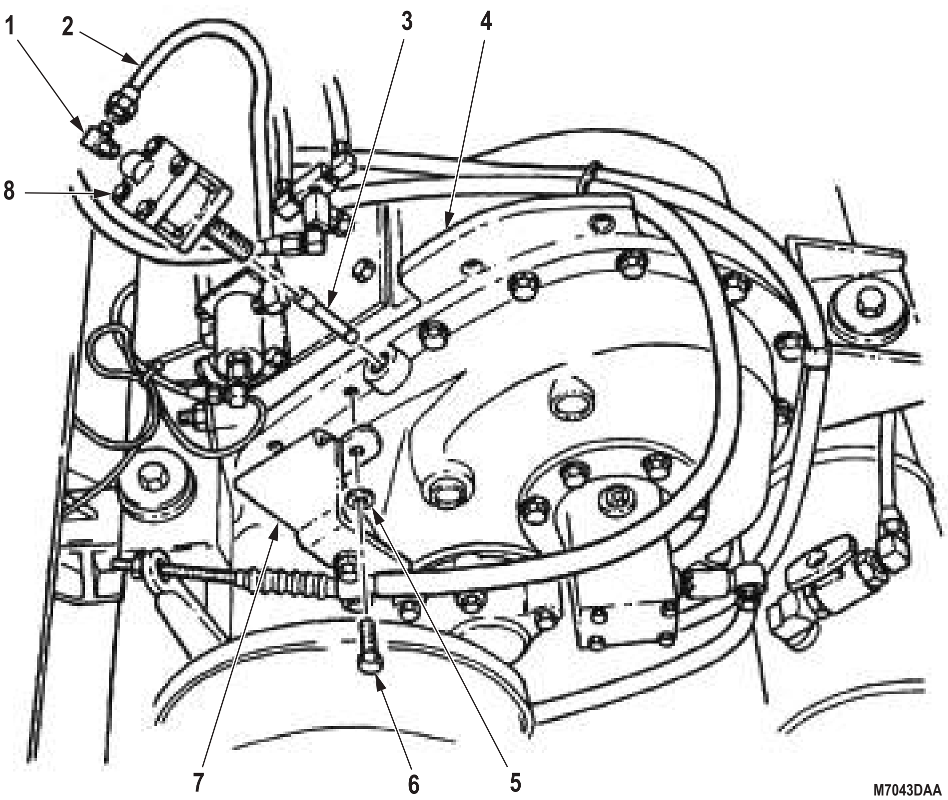


Figure 1. Transfer Case Interlock Air Cylinder Removal.

END OF TASK

INSTALLATION

NOTE

Wrap all male threads with antiseize tape before installation.

1. Install elbow (Figure 2, Item 1) on interlock air cylinder (Figure 2, Item 8).
2. Install push rod (Figure 2, Item 3) and interlock air cylinder (Figure 2, Item 8) on transfer case (Figure 2, Item 4).

NOTE

Perform Step (3) for all vehicles except M936/A1/A2.

3. Install parking brake cable bracket (Figure 2, Item 7) on transfer case (Figure 2, Item 4) with two lockwashers (Figure 2, Item 5) and screws (Figure 2, Item 6).
4. Connect supply line (Figure 2, Item 2) to elbow (Figure 2, Item 1).

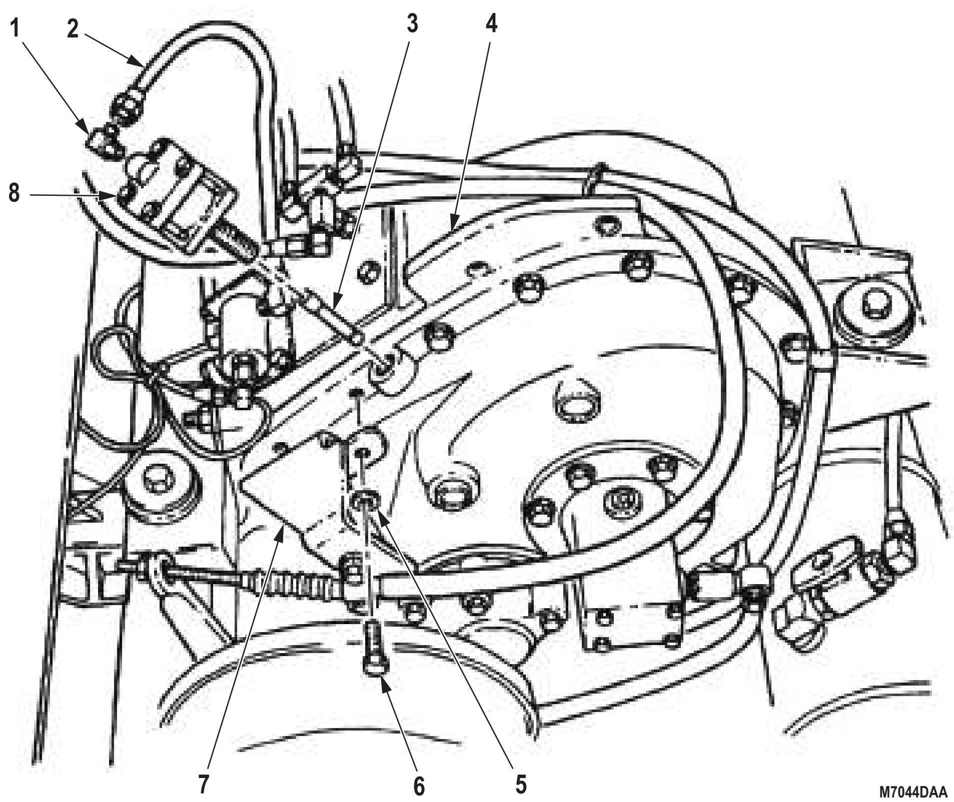


Figure 2. Transfer Case Interlock Air Cylinder Installation.

END OF TASK

FOLLOW-ON MAINTENANCE

1. Install transfer case (M939/A1/A2). (WP 0386)
2. Install spare tire (M923/A1/A2, M929/A1/A2). (TM 9-2320-272-10)
3. Lower dump body. (TM 9-2320-272-10)
4. Start engine, allow air pressure to build to normal operating pressure, and check for air leaks. Road test vehicle. (TM 9-2320-272-10)

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
TRANSFER CASE FRONT AXLE ENGAGEMENT AIR CYLINDER REPLACEMENT

INITIAL SETUP:

Tools and Special Tools

Tool Kit, General Mechanic's: Automotive
(Volume 5, WP 0826, Table 1, Item 56)
Wrench, Torque, Click, Ratcheting, 3/8" Drive, 75 Ft-Lb
(Volume 5, WP 0826, Table 1, Item 62)

Materials/Parts

Tape, Antiseizing
(Volume 5, WP 0825, Table 1, Item 65)

Equipment Condition

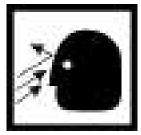
Parking brake set. (TM 9-2320-272-10)

Equipment Condition (cont.)

Air reservoirs drained. (TM 9-2320-272-10)
Transfer case-to-forward rear axle propeller shaft removed (M939/A1/A2). (WP 0401)

REMOVAL

WARNING



Do not disconnect air lines or hoses before draining air reservoirs. Small parts under pressure may shoot out with high velocity. Failure to comply may result in injury or death to personnel.

1. Remove air line (Figure 1, Item 2) and elbow (Figure 1, Item 1) from air cylinder cover (Figure 1, Item 3).
2. Bend tabs of locking washers (Figure 1, Item 11) away from heads of screws (Figure 1, Item 10).
3. Remove four screws (Figure 1, Item 10), locking washers (Figure 1, Item 11), air cylinder cover (Figure 1, Item 3), air cylinder (Figure 1, Item 8), and seal (Figure 1, Item 6) from transfer case (Figure 1, Item 4).
4. Remove washers (Figure 1, Items 5 and 9) from transfer case (Figure 1, Item 4) and air cylinder cover (Figure 1, Item 3).
5. Remove plunger (Figure 1, Item 7) from air cylinder (Figure 1, Item 8).

REMOVAL - Continued

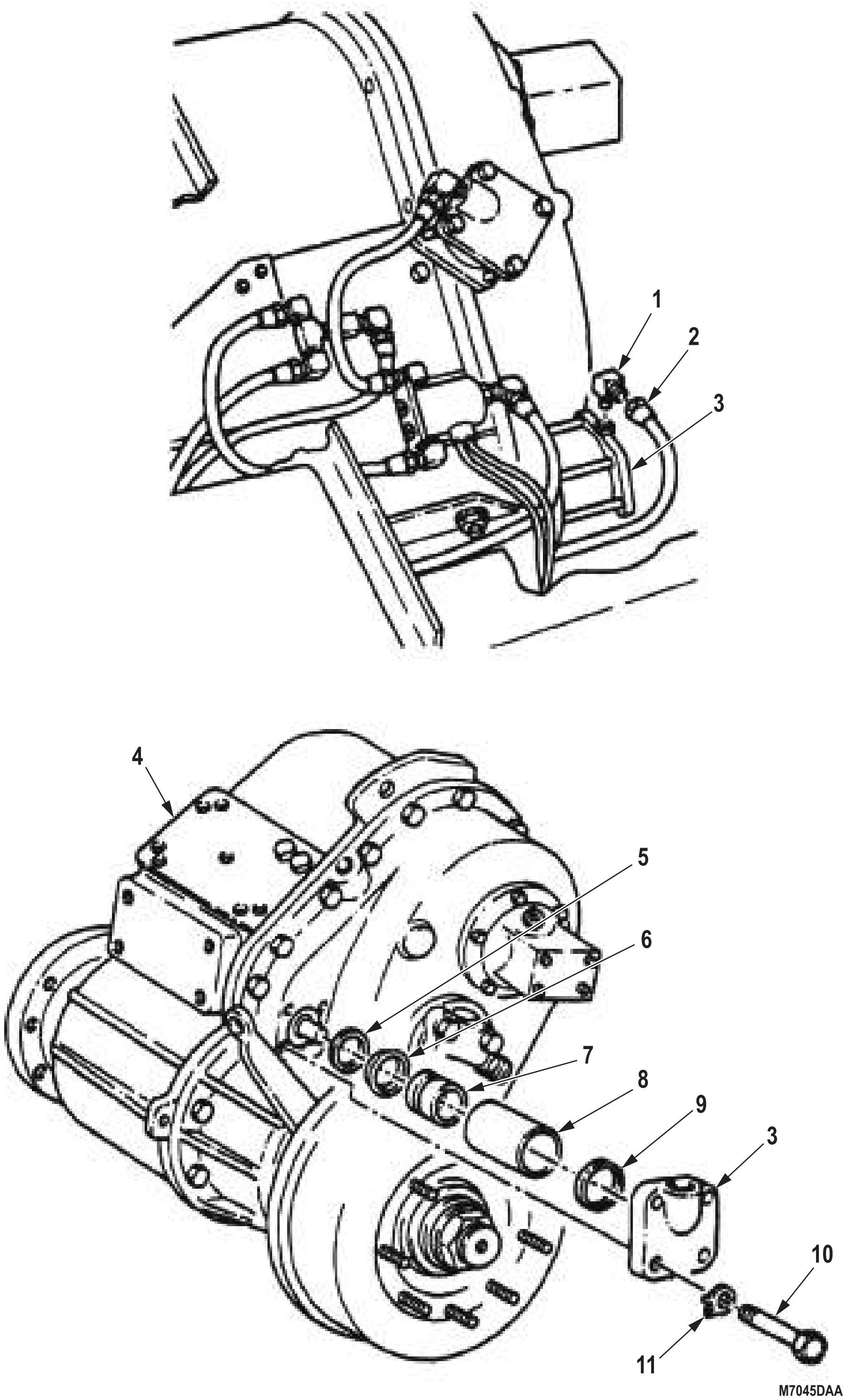


Figure 1. Transfer Case Front Axle Engagement Air Cylinder Removal.

END OF TASK

INSTALLATION

1. Install plunger (Figure 2, Item 7) in air cylinder (Figure 2, Item 8).
2. Install washers (Figure 2, Items 5 and 9) on transfer case (Figure 2, Item 4) and air cylinder cover (Figure 2, Item 3).
3. Install seal (Figure 2, Item 6), air cylinder (Figure 2, Item 8), and air cylinder cover (Figure 2, Item 3) on transfer case (Figure 2, Item 4) with four locking washers (Figure 2, Item 11) and screws (Figure 2, Item 10). Tighten screws 6 to 10 lb-ft (8 to 14 N·m).
4. Bend tabs of locking washers (Figure 2, Item 11) over heads of screws (Figure 2, Item 10).

NOTE

Wrap all male threads with antiseize tape before installation.

5. Install elbow (Figure 2, Item 1) and air line (Figure 2, Item 2) on air cylinder cover (Figure 2, Item 3).

INSTALLATION - Continued

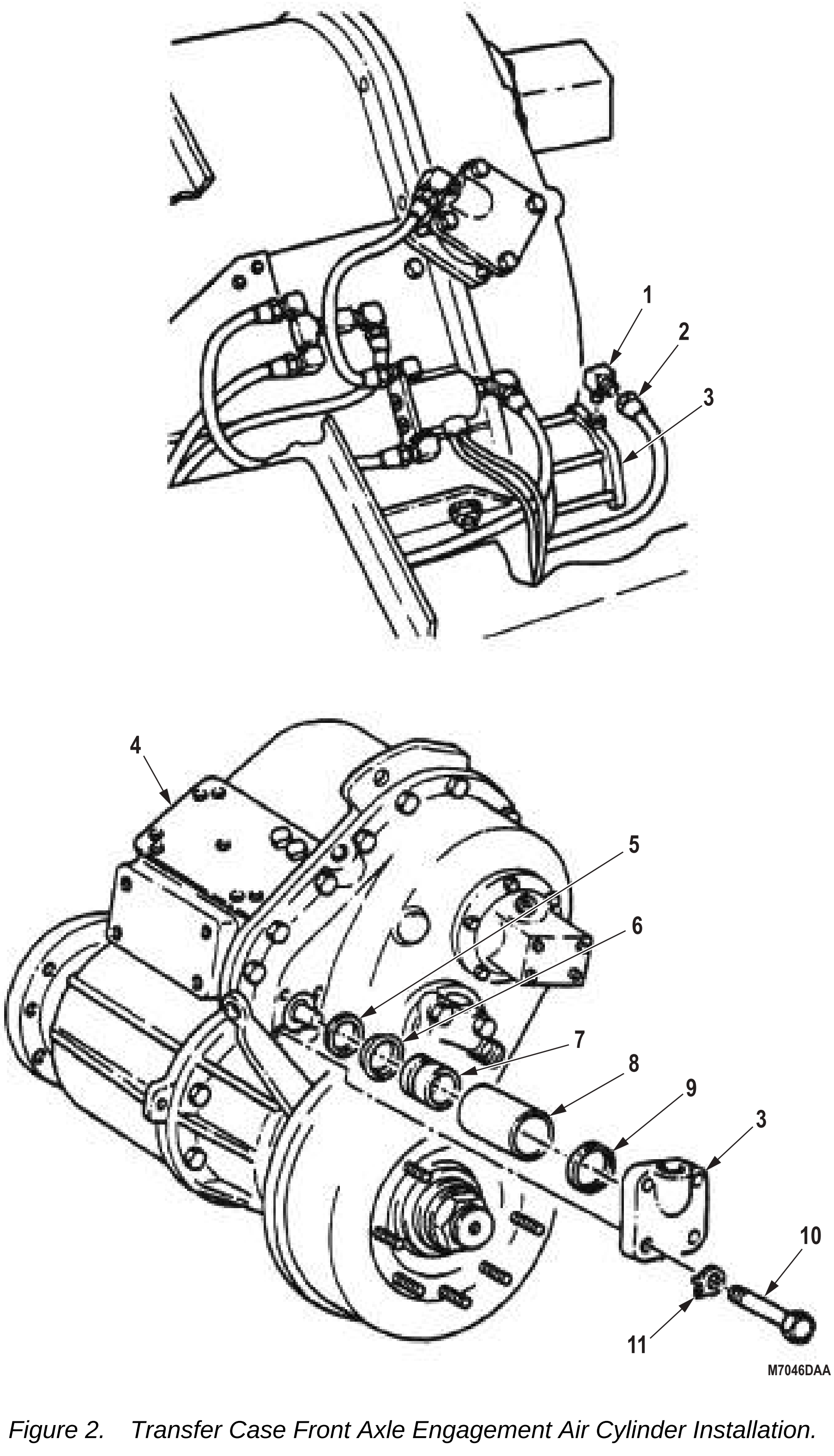


Figure 2. Transfer Case Front Axle Engagement Air Cylinder Installation.

END OF TASK

FOLLOW-ON MAINTENANCE

1. Install transfer case-to-forward rear axle propeller shaft. (WP 0401)
2. Start engine, allow air pressure to build to normal operating pressure, and check for air leaks. Road test vehicle. (TM 9-2320-272-10)

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
FRONT-WHEEL DRIVE LOCK-IN SWITCH REPLACEMENT

INITIAL SETUP:

Tools and Special Tools

Tool Kit, General Mechanic's: Automotive
(Volume 5, WP 0826, Table 1, Item 56)

Materials/Parts

Tape, Antiseizing
(Volume 5, WP 0825, Table 1, Item 65)

Equipment Condition

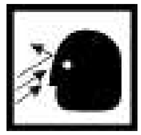
Parking brake set. (TM 9-2320-272-10)

Equipment Condition (cont.)

Air reservoirs drained. (TM 9-2320-272-10)
Battery ground cables disconnected.
(Volume 2, WP 0350)

REMOVAL

WARNING



Do not disconnect air lines or hoses before draining air reservoirs. Small parts under pressure may shoot out with high velocity. Failure to comply may result in injury or death to personnel.

1. Disconnect wire connector (Figure 1, Item 1) from front-wheel drive lock-in switch (Figure 1, Item 3).
2. Remove front-wheel drive lock-in switch (Figure 1, Item 3) from front-wheel drive lock-in valve elbow (Figure 1, Item 2).

REMOVAL - Continued

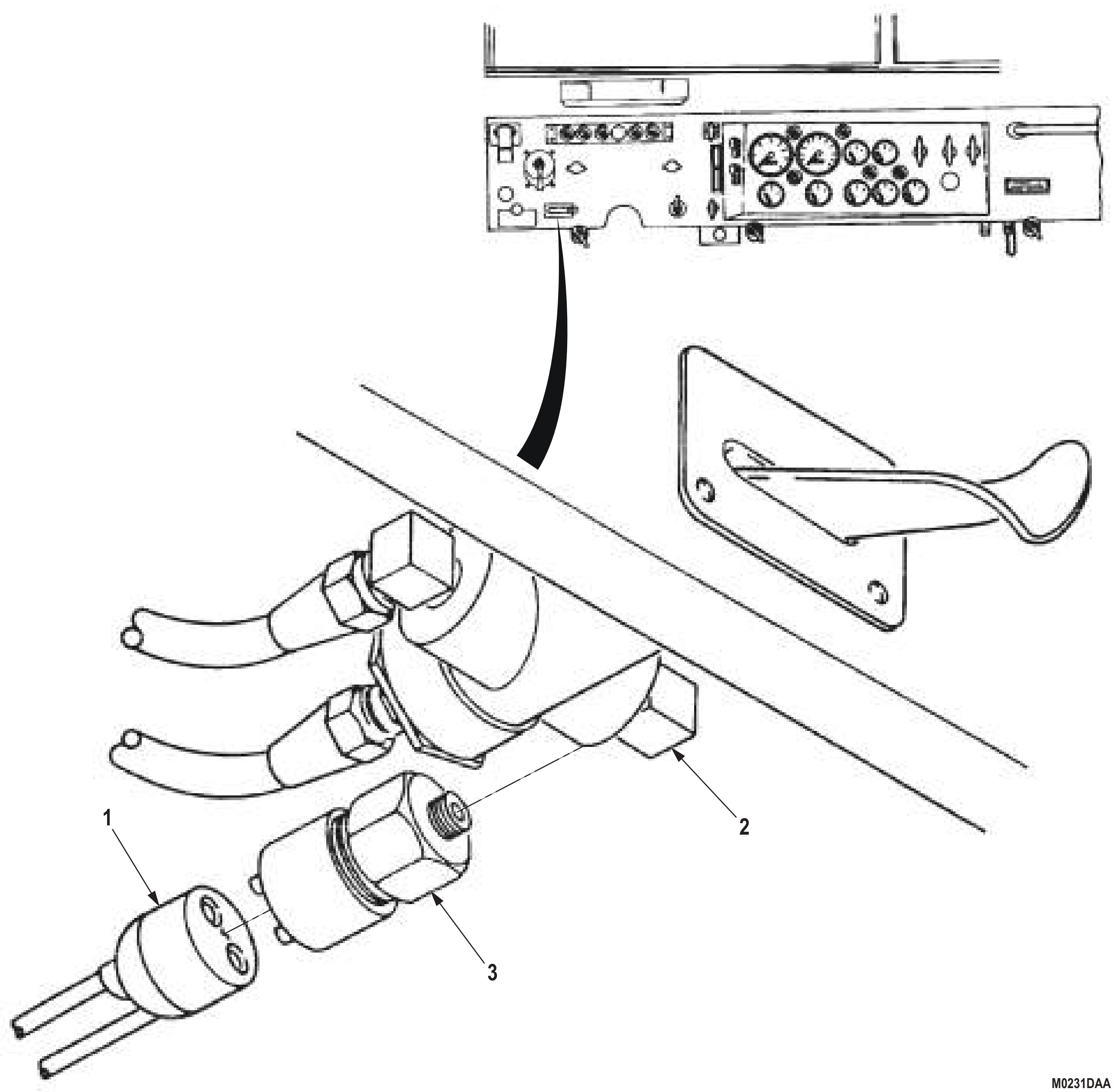


Figure 1. Front-Wheel Drive Lock-In Switch Removal.

END OF TASK

INSTALLATION

NOTE

Male pipe threads must be wrapped with antiseize tape before installation.

1. Install front-wheel lock-in switch (Figure 2, Item 3) on front wheel drive lock-in valve elbow (Figure 2, Item 2).
2. Connect wire connector (Figure 2, Item 1) to front-wheel drive lock-in switch (Figure 2, Item 3).

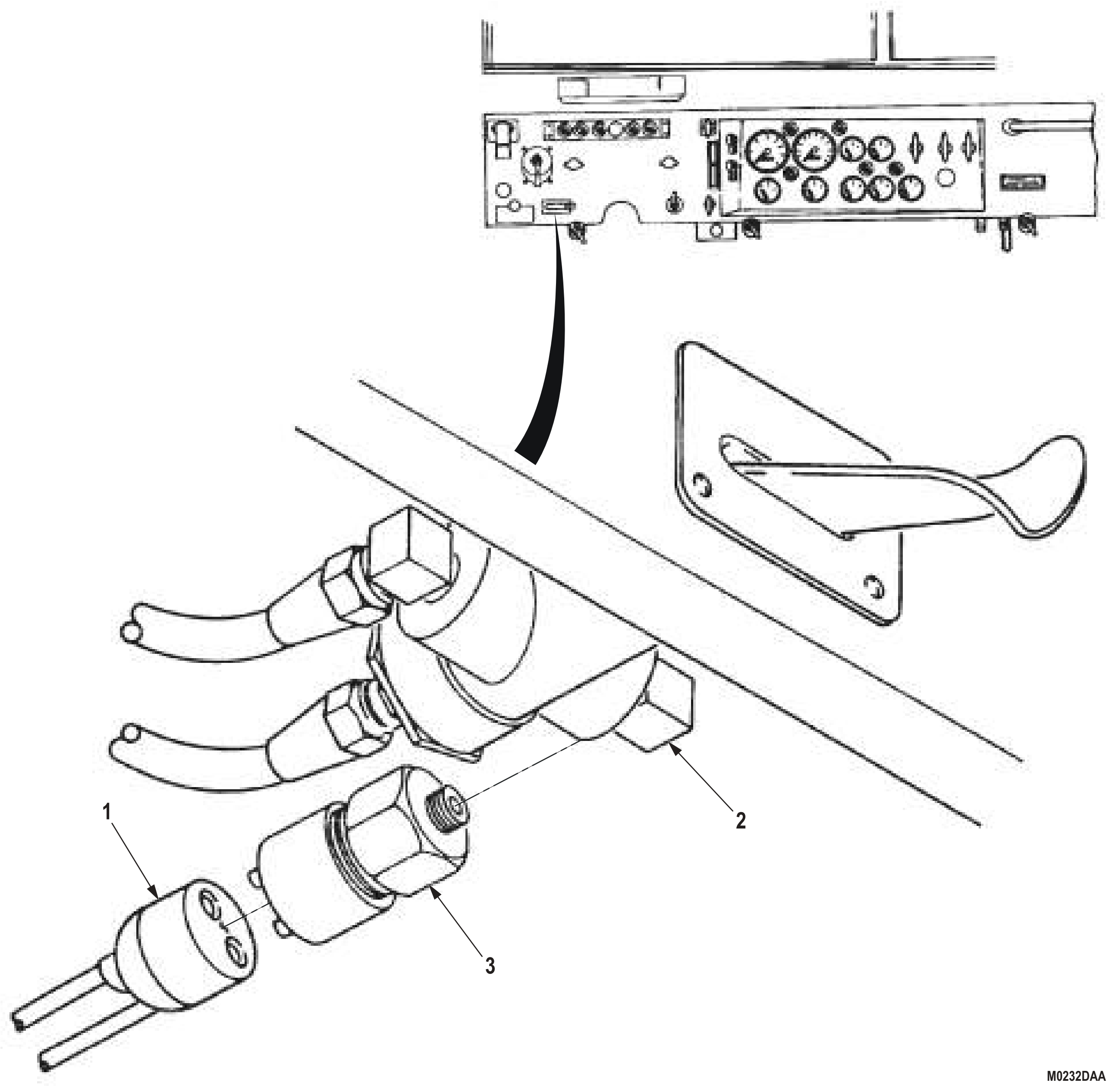


Figure 2. Front-Wheel Drive Lock-In Switch Installation.

END OF TASK

FOLLOW-ON MAINTENANCE

1. Connect battery ground cables. (Volume 2, WP 0350)
2. Start engine and allow air pressure to build up to normal operating range. Check for air leaks at switch. (TM 9-2320-272-10)
3. Engage front-wheel drive and check if axle lock-in indicator light is illuminated. (TM 9-2320-272-10)

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
FRONT WHEEL VALVE REPLACEMENT (M939A2)

INITIAL SETUP:

Tools and Special Tools

Tool Kit, General Mechanic's: Automotive
(Volume 5, WP 0826, Table 1, Item 56)

Materials/Parts

Tape, Antiseizing
(Volume 5, WP 0825, Table 1, Item 65)
Locknut (Volume 5, WP 0827, Table 1, Item 61)
Qty: 3
Locknut (Volume 5, WP 0827, Table 1, Item 280)
Qty: 4
Lockwasher
(Volume 5, WP 0827, Table 1, Item 403)
Qty: 3

Materials/Parts (cont.)

O-ring (Volume 5, WP 0827, Table 1, Item 359)
Qty: 1
O-ring (Volume 5, WP 0827, Table 1, Item 367)
Qty: 1

References

WP 0482
Volume 5, WP 0819

Equipment Condition

Parking brake set. (TM 9-2320-272-10)
Air reservoirs drained. (TM 9-2320-272-10)

REMOVAL

WARNING

Air system components are subject to high pressure. Always relieve pressure before loosening or removing air system components. Failure to comply may result in injury or death to personnel.

1. Remove cap (Figure 1, Item 26) and valve stem (Figure 1, Item 27) from tank valve (Figure 1, Item 28), and allow tire (Figure 1, Item 12) to deflate completely. Install valve stem (Figure 1, Item 27) and cap (Figure 1, Item 26) on tank valve (Figure 1, Item 28).
2. Remove two locknuts (Figure 1, Item 21), washers (Figure 1, Item 20), screws (Figure 1, Item 22), washers (Figure 1, Item 23), shield (Figure 1, Item 25), and spacer (Figure 1, Item 19) from studs (Figure 1, Item 9) and axle flange (Figure 1, Item 14). Discard locknuts.
3. Remove hose (Figure 1, Item 10) from elbow (Figure 1, Item 1) and turret valve (Figure 1, Item 11).
4. Loosen nut (Figure 1, Item 8) and remove air manifold (Figure 1, Item 16) from wheel valve (Figure 1, Item 24).
5. Remove screw (Figure 1, Item 18), washer (Figure 1, Item 17), air manifold (Figure 1, Item 16), and o-ring (Figure 1, Item 15) from axle flange (Figure 1, Item 14) and air tube (Figure 1, Item 13). Discard o-ring.
6. Remove two locknuts (Figure 1, Item 2), washers (Figure 1, Item 3), washers (Figure 1, Item 5), and wheel valve (Figure 1, Item 24) from studs (Figure 1, Item 9). Discard locknuts.
7. Remove three locknuts (Figure 1, Item 7), lockwashers (Figure 1, Item 4), and bracket (Figure 1, Item 6) from wheel valve (Figure 1, Item 24). Discard locknuts and lockwashers.
8. Remove elbow (Figure 1, Item 1) and o-ring (Figure 1, Item 29) from wheel valve (Figure 1, Item 24). Discard o-ring.

NOTE

For repair of wheel valves, refer to (WP 0482).

9. For General Cleaning Instructions, refer to (Volume 5, WP 0819).
10. For General Inspection Instructions, refer to (Volume 5, WP 0819).
11. Inspect wheel valve (Figure 1, Item 24) for cracks, leaks, and stripped threads. Replace or repair wheel valve (Figure 1, Item 24) if cracked, leaking, or threads are stripped.
12. Inspect bracket (Figure 1, Item 6), shield (Figure 1, Item 25), air manifold (Figure 1, Item 16), hose (Figure 1, Item 10), spacer (Figure 1, Item 19), elbow (Figure 1, Item 1), and turret valve (Figure 1, Item 11) for cracks, bends, or stripped threads. Replace parts if damaged.

REMOVAL - Continued

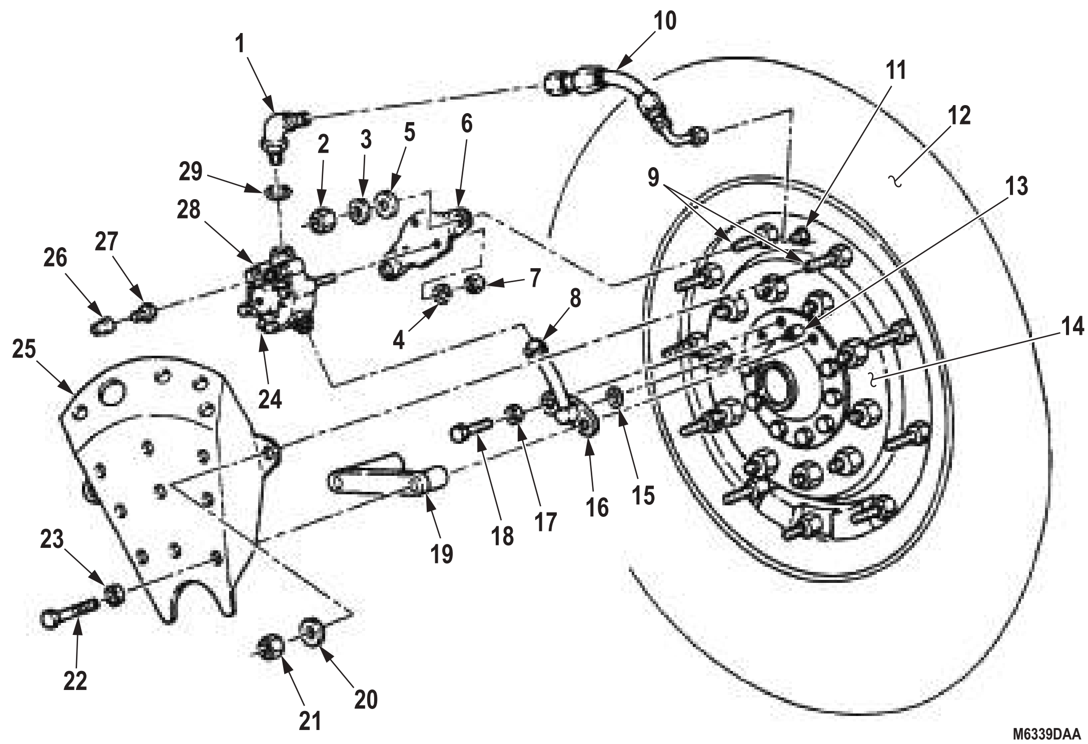


Figure 1. Front Wheel Valve Removal.

END OF TASK

INSTALLATION

NOTE

Wrap all male pipe threads with antiseize tape before installation.

1. Install hose (Figure 2, Item 10) on turret valve (Figure 2, Item 11).
2. Install o-ring (Figure 2, Item 15) on air tube (Figure 2, Item 13).
3. Install o-ring (Figure 2, Item 26) and elbow (Figure 2, Item 1) on wheel valve (Figure 2, Item 24). Finger tighten elbow (Figure 2, Item 1).
4. Install bracket (Figure 2, Item 6) on wheel valve (Figure 2, Item 24) with three lockwashers (Figure 2, Item 4) and locknuts (Figure 2, Item 7).

NOTE

Ensure air manifold is properly seated on wheel before tightening.

5. Connect air manifold (Figure 2, Item 16) on wheel valve (Figure 2, Item 24). Finger-tighten nut (Figure 2, Item 8), but allow for movement.
6. Install wheel valve (Figure 2, Item 24) with bracket (Figure 2, Item 6) on two studs (Figure 2, Item 9) with washers (Figure 2, Item 5), washers (Figure 2, Item 3), and locknuts (Figure 2, Item 2). Finger-tighten locknuts.
7. Install screw (Figure 2, Item 18) and washer (Figure 2, Item 17) on air manifold (Figure 2, Item 16) and axle flange (Figure 2, Item 14). Finger-tighten screw.
8. Tighten two locknuts (Figure 2, Item 2), screw (Figure 2, Item 18), and nut (Figure 2, Item 8).
9. Tighten elbow (Figure 2, Item 1) to align with hose (Figure 2, Item 10) and connect hose (Figure 2, Item 10) to elbow.

NOTE

Spacer has long and short end. Install short end of spacer on flange of air manifold.

10. Install spacer (Figure 2, Item 19) and shield (Figure 2, Item 25) on axle flange (Figure 2, Item 14) with two washers (Figure 2, Item 23) and screws (Figure 2, Item 22).
11. Install two washers (Figure 2, Item 20) and locknuts (Figure 2, Item 21) on studs (Figure 2, Item 9).

INSTALLATION - Continued

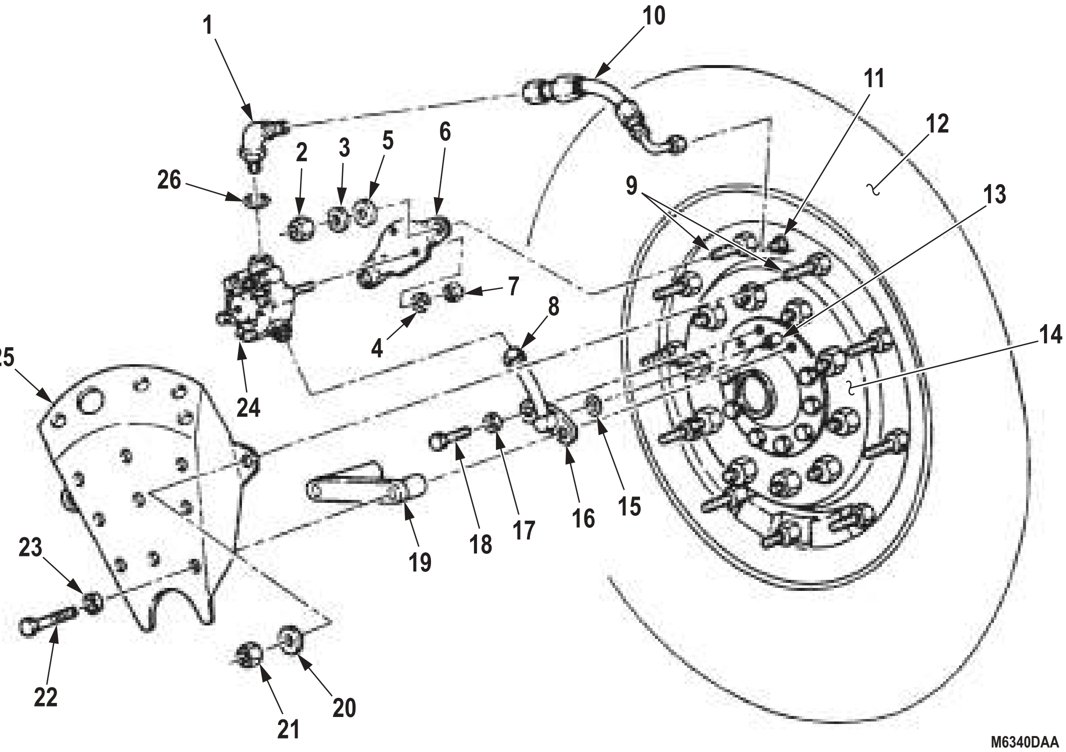


Figure 2. Front Wheel Valve Installation.

END OF TASK

FOLLOW-ON MAINTENANCE

Start engine, operate CTIS, allow tire to inflate, and check for leaks. (TM 9-2320-272-10)

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
TRANSFER CASE INTERLOCK VALVE REPLACEMENT (ALL EXCEPT M936/A1/A2)

INITIAL SETUP:

Tools and Special Tools
Tool Kit, General Mechanic's: Automotive
(Volume 5, WP 0826, Table 1, Item 56)

Materials/Parts
Tape, Antiseizing
(Volume 5, WP 0825, Table 1, Item 65)
Locknut (Volume 5, WP 0827, Table 1, Item 430)
Qty: 2
Lockwasher
(Volume 5, WP 0827, Table 1, Item 421)
Qty: 1

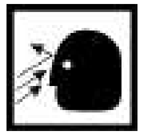
Personnel Required
(2)

Equipment Condition
Parking brake set. (TM 9-2320-272-10)

Equipment Condition (cont.)
Air reservoirs drained. (TM 9-2320-272-10)
Dump spare tire carrier removed (M929/A1/A2, M930/A1/A2). (WP 0526)

REMOVAL

WARNING



Do not disconnect air lines or hoses before draining air reservoirs. Small parts under pressure may shoot out with high velocity. Failure to comply may result in injury or death to personnel.

NOTE

Tag air lines and wires for installation.

1. Disconnect interlock valve supply line (Figure 1, Item 6) from elbow (Figure 1, Item 5).
2. Disconnect air cylinder supply line (Figure 1, Item 1) from elbow (Figure 1, Item 2).
3. Disconnect vent line (Figure 1, Item 12) from elbow (Figure 1, Item 11).
4. Disconnect wire (Figure 1, Item 8) from connector (Figure 1, Item 9).

NOTE

Assistant will help with Step (5).

5. Remove locknut (Figure 1, Item 17), washer (Figure 1, Item 18), diode ground wire (Figure 1, Item 19), locknut (Figure 1, Item 20), interlock valve ground wire (Figure 1, Item 16), lockwasher (Figure 1, Item 21), cable clamp (Figure 1, Item 15), and screw (Figure 1, Item 10) from frame (Figure 1, Item 7). Discard lockwasher and locknuts.
6. Remove two screws (Figure 1, Item 14) and interlock valve (Figure 1, Item 3) from bracket (Figure 1, Item 13).
7. Remove elbows (Figure 1, Items 2, 5, and 11) and adapter (Figure 1, Item 4) from interlock valve (Figure 1, Item 3).

REMOVAL - Continued

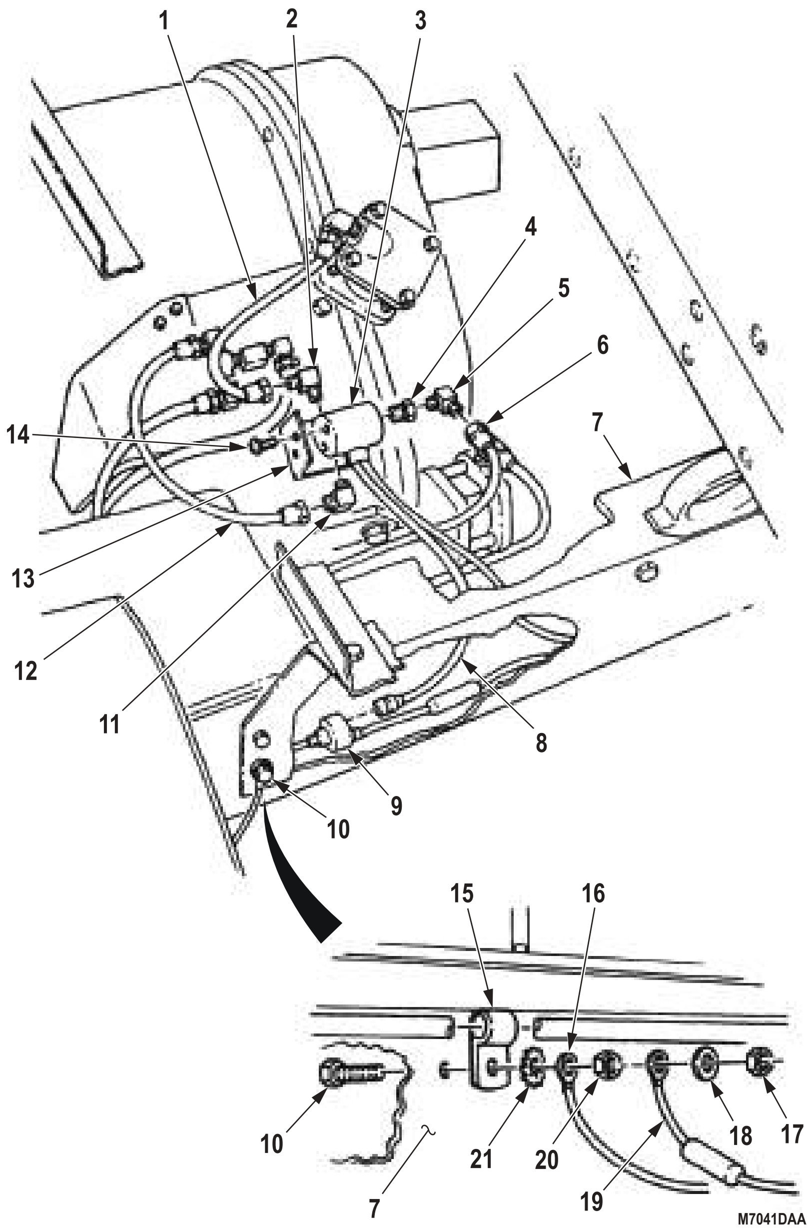


Figure 1. Transfer Case Interlock Valve Removal (Except M936/A1/A2).

END OF TASK

INSTALLATION

NOTE

Male pipe threads must be wrapped with antiseize tape before installation.

1. Install elbow (Figure 2, Item 2), adapter (Figure 2, Item 4), and two elbows (Figure 2, Items 5 and 11) on interlock valve (Figure 2, Item 3).
2. Install interlock valve (Figure 2, Item 3) on bracket (Figure 2, Item 13) with two screws (Figure 2, Item 14).

NOTE

Assistant will help with Step (3).

3. Install screw (Figure 2, Item 10) and cable clamp (Figure 2, Item 15) on frame (Figure 2, Item 7) with lockwasher (Figure 2, Item 21), interlock valve ground wire (Figure 2, Item 16), locknut (Figure 2, Item 20), diode ground wire (Figure 2, Item 19), washer (Figure 2, Item 18), and locknut (Figure 2, Item 17).
4. Connect wire (Figure 2, Item 8) to connector (Figure 2, Item 9).
5. Connect vent line (Figure 2, Item 12) to elbow (Figure 2, Item 11).
6. Connect air cylinder supply line (Figure 2, Item 1) to elbow (Figure 2, Item 2).
7. Connect interlock valve supply line (Figure 2, Item 6) to elbow (Figure 2, Item 5).

INSTALLATION - Continued

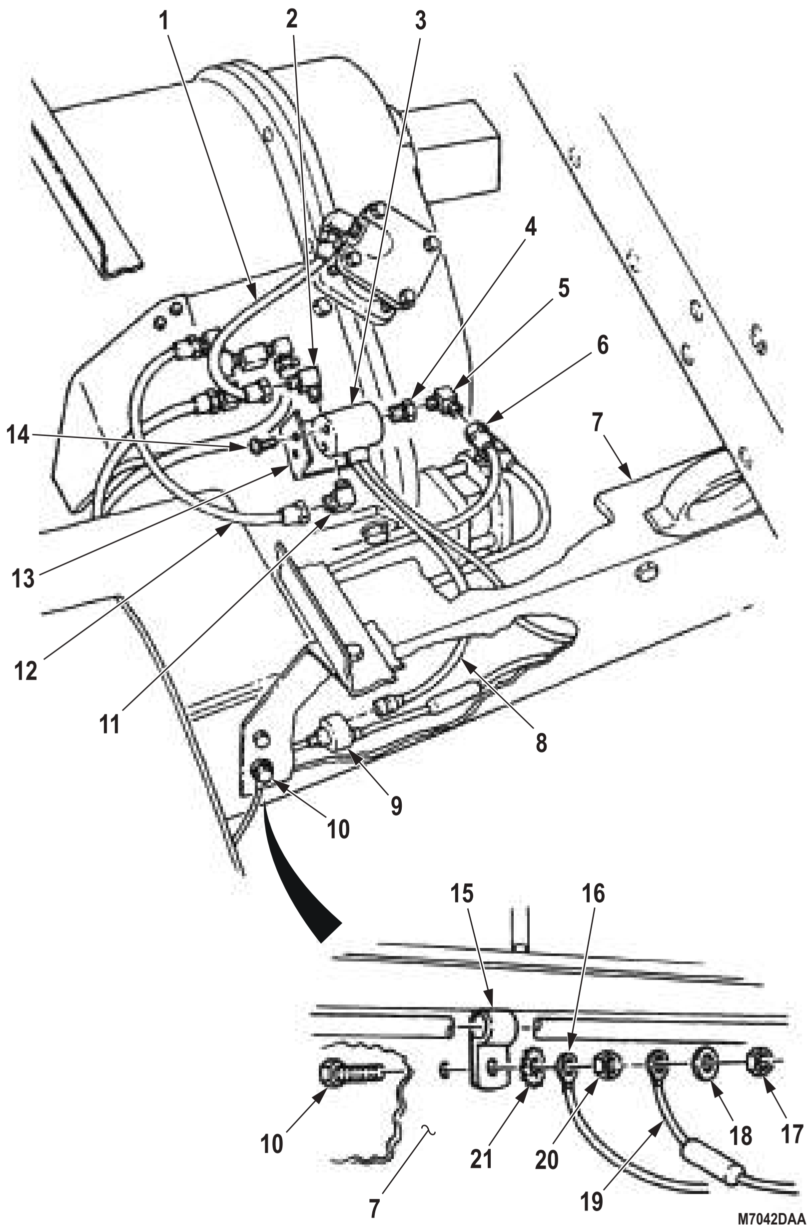


Figure 2. Transfer Case Interlock Valve Installation (Except M936/A1/A2).

END OF TASK

FOLLOW-ON MAINTENANCE

1. Install dump spare tire carrier (M929/A1/A2, M930/A1/A2). (WP 0526)
2. Start engine, allow air pressure to build to normal operating range, and check interlock valve for leaks. Road test vehicle. (TM 9-2320-272-10)

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
TRANSFER CASE INTERLOCK VALVE REPLACEMENT (M936/A1/A2)

INITIAL SETUP:

Tools and Special Tools
Tool Kit, General Mechanic's: Automotive
(Volume 5, WP 0826, Table 1, Item 56)

Materials/Parts
Tape, Antiseizing

Materials/Parts (cont.)
(Volume 5, WP 0825, Table 1, Item 65)

Equipment Condition
Transfer case removed (M936/A1/A2).
(WP 0386)

REMOVAL

1. Remove two screws (Figure 1, Item 5) and interlock valve (Figure 1, Item 1) from bracket (Figure 1, Item 4).
2. Remove three elbows (Figure 1, Item 2) and adapter (Figure 1, Item 3) from interlock valve (Figure 1, Item 1).

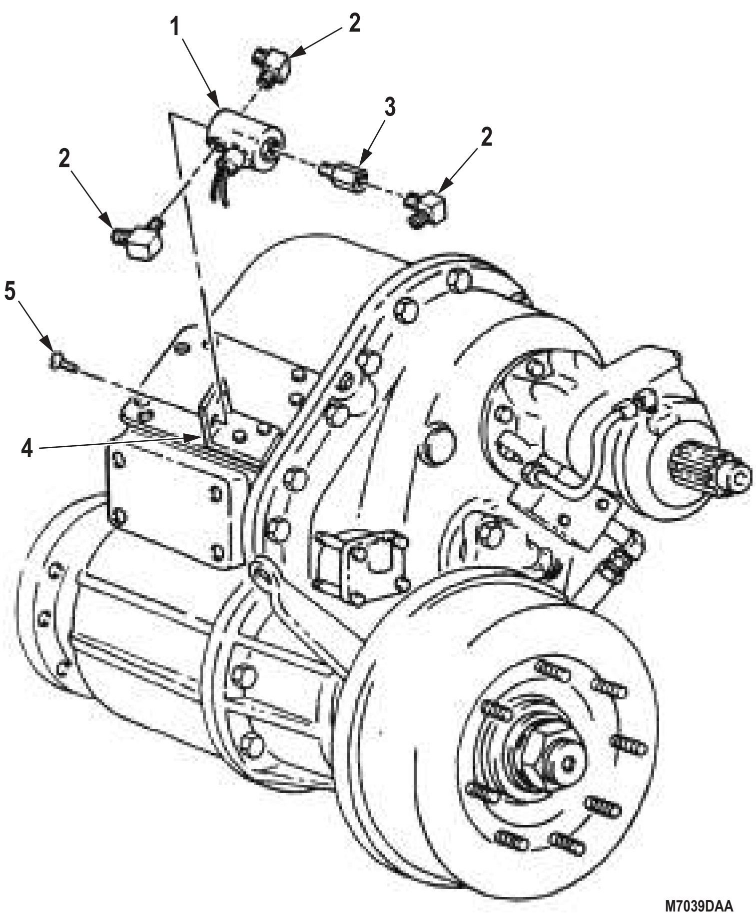


Figure 1. Transfer Case Interlock Valve Removal (M936/A1/A2).

END OF TASK

INSTALLATION

NOTE

Wrap all male threads with antiseize tape before installation.

1. Install adapter (Figure 2, Item 3) and three elbows (Figure 2, Item 2) on interlock valve (Figure 2, Item 1).
2. Install interlock valve (Figure 2, Item 1) on bracket (Figure 2, Item 4) with two screws (Figure 2, Item 5).

INSTALLATION - Continued

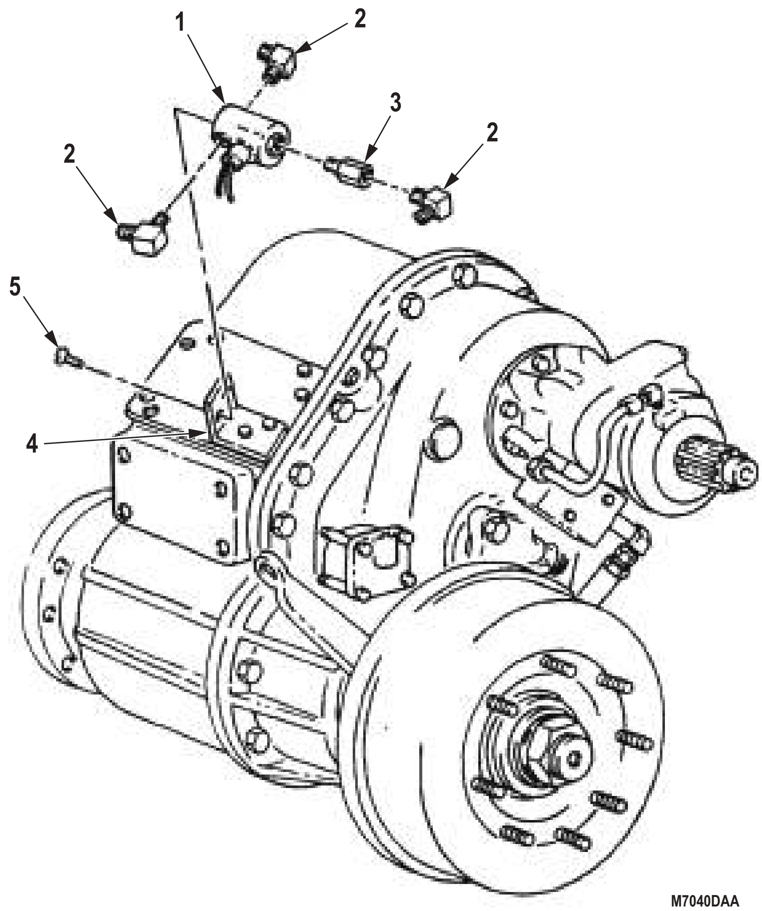


Figure 2. Transfer Case Interlock Valve Installation (M936/A1/A2).

END OF TASK

FOLLOW-ON MAINTENANCE

Install transfer case (M936/A1/A2). (WP 0386)

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
TRANSFER CASE CONTROLS AND LINKAGE REPAIR

INITIAL SETUP:

Tools and Special Tools

Tool Kit, General Mechanic's: Automotive
(Volume 5, WP 0826, Table 1, Item 56)
Caps, Vise Jaw
(Volume 5, WP 0826, Table 1, Item 14)
Press, Arbor, Hand Operated
(Volume 5, WP 0826, Table 1, Item 39)

Materials/Parts

Cleaning Compound, Solvent
(Volume 5, WP 0825, Table 1, Item 16, 17)
Cloth, Abrasive: Crocus
(Volume 5, WP 0825, Table 1, Item 18)
Cotter Pin
(Volume 5, WP 0827, Table 1, Item 343)
Qty: 4
Lockwasher
(Volume 5, WP 0827, Table 1, Item 399)
Qty: 4

Materials/Parts (cont.)

Lockwasher
(Volume 5, WP 0827, Table 1, Item 402)
Qty: 2
Woodruff Key
(Volume 5, WP 0827, Table 1, Item 416)
Qty: 4

Equipment Condition

Parking brake set. (TM 9-2320-272-10)

REMOVAL

1. Remove cotter pin (Figure 1, Item 5), pin (Figure 1, Item 7), and shift rod (Figure 1, Item 6) from shift lever (Figure 1, Item 2). Discard cotter pin.
2. Remove cotter pin (Figure 1, Item 4), washer (Figure 1, Item 3), pin (Figure 1, Item 8), and shift lever (Figure 1, Item 2) from shift lever bracket (Figure 1, Item 9). Discard cotter pin.

WARNING

Solvent cleaning compound is flammable and toxic. Do not use near an open flame and always have a fire extinguisher nearby when solvents are used. Use only in well-ventilated places, wear protective clothing, and dispose of cleaning rags in approved container. Failure to comply may result in damage to equipment, injury, or death to personnel.

3. Clean shift lever (Figure 1, Item 2) with cleaning compound solvent.
4. Inspect shift lever (Figure 1, Item 2) for cracks and breaks. Replace shift lever if cracked or broken.
5. Inspect shift lever bushing (Figure 1, Item 1) for cracks, breaks, and pits. Remove pits with crocus cloth. Replace shift lever bushing if cracked or broken.

NOTE

Perform Steps (4) and (5) if bushing requires replacement.

6. Using arbor press, remove bushing (Figure 1, Item 1) from shift lever (Figure 1, Item 2). Discard bushing.
7. Using arbor press, install bushing (Figure 1, Item 1) on shift lever (Figure 1, Item 2).

REMOVAL - Continued

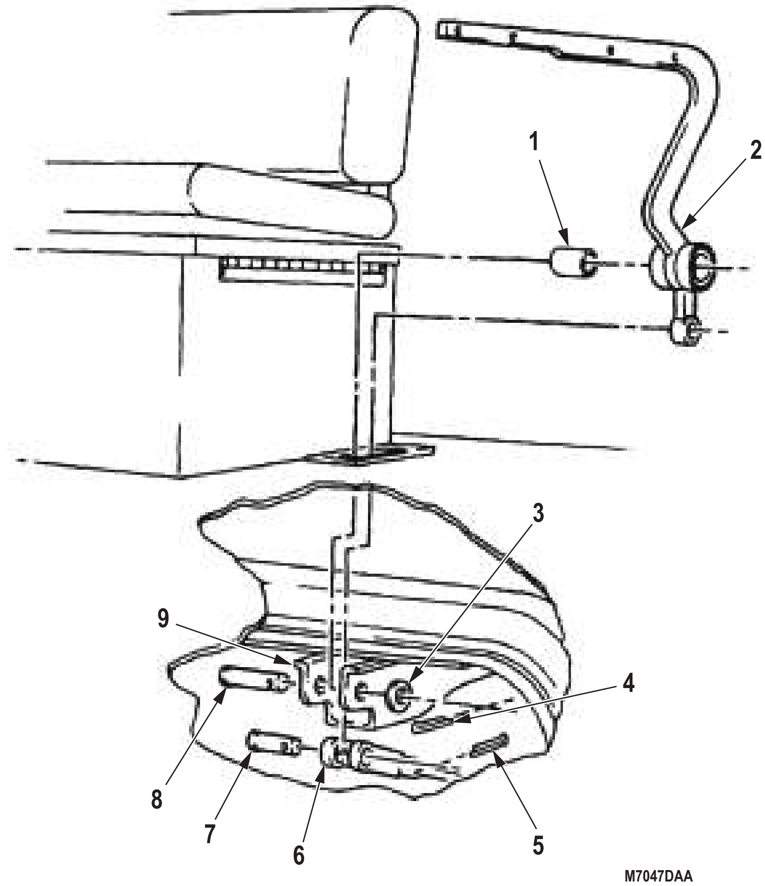


Figure 1. Transfer Case Shift Lever Removal.

END OF TASK

INSTALLATION

1. Install shift lever (Figure 2, Item 2) on shift lever bracket (Figure 2, Item 9) with pin (Figure 2, Item 8), washer (Figure 2, Item 3), and cotter pin (Figure 2, Item 4).
2. Install shift rod (Figure 2, Item 6) on shift lever (Figure 2, Item 2) with pin (Figure 2, Item 7) and cotter pin (Figure 2, Item 5).

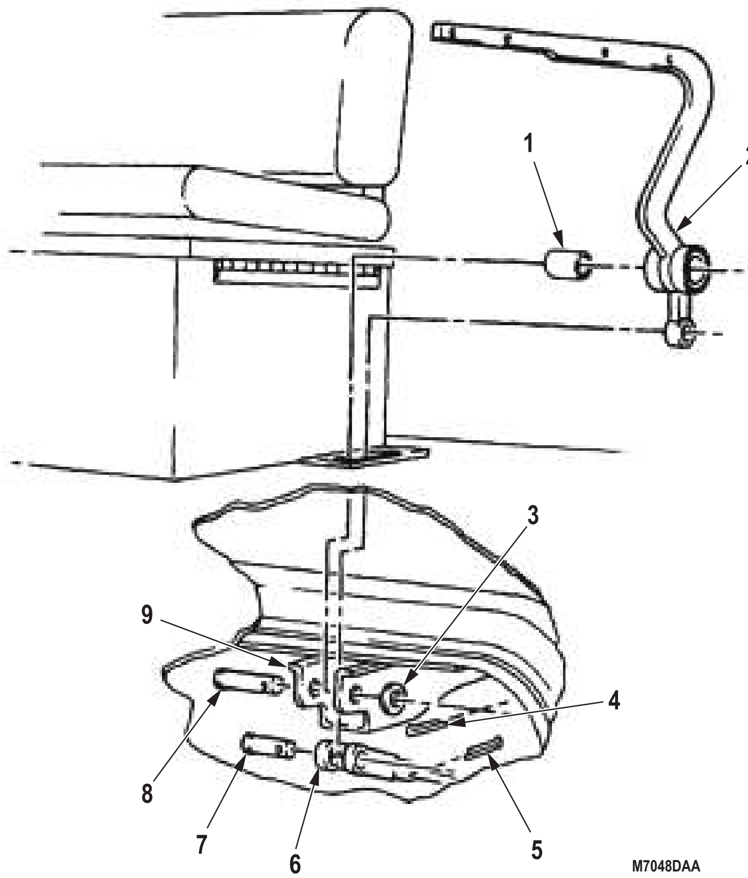


Figure 2. Transfer Case Shift Lever Installation.

END OF TASK

REMOVAL

1. Remove two cotter pins (Figure 3, Item 7), pins (Figure 3, Item 2), and shift lever shift rod (Figure 3, Item 4) from shift lever (Figure 3, Item 1) and cross shaft lever (Figure 3, Item 6). Discard cotter pins.
2. Loosen jamnut (Figure 3, Item 3) on shift lever shift rod (Figure 3, Item 4) and adjust clevis (Figure 3, Item 5) until distance between centers of holes in clevises (Figure 3, Item 5) is 9-5/8 in. (24.4 cm).
3. Tighten jamnut (Figure 3, Item 3).

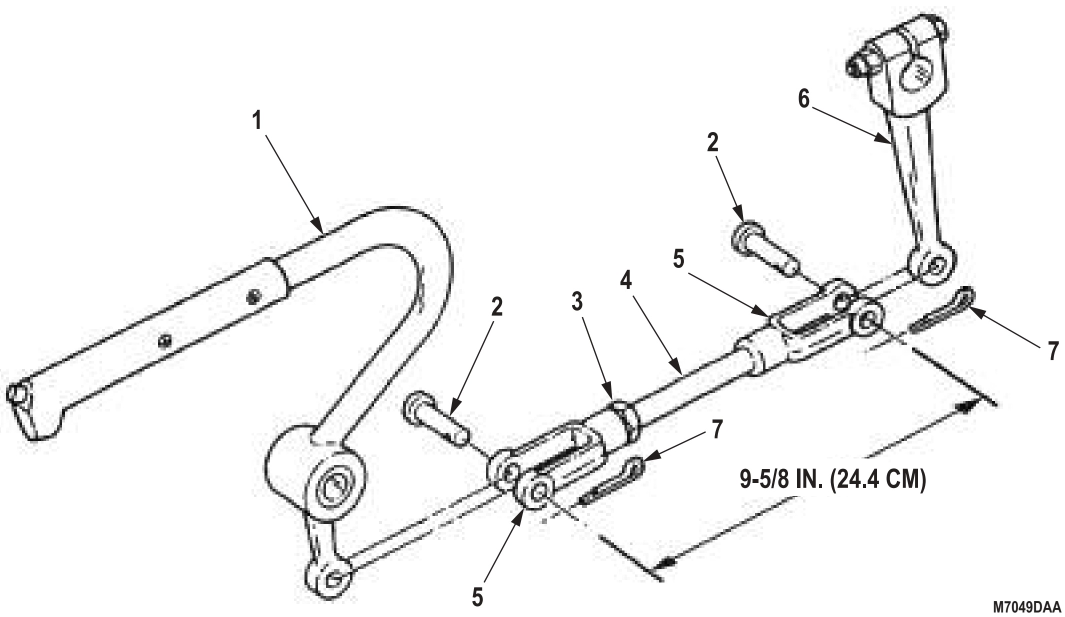


Figure 3. Transfer Case Shift Lever Shift Rod Removal.

END OF TASK

INSTALLATION

Install shift lever shift rod (Figure 4, Item 3) on shift lever (Figure 4, Item 1) and cross shaft lever (Figure 4, Item 5) with two pins (Figure 4, Item 2) and cotter pins (Figure 4, Item 6) installed through clevises (Figure 4, Item 4).

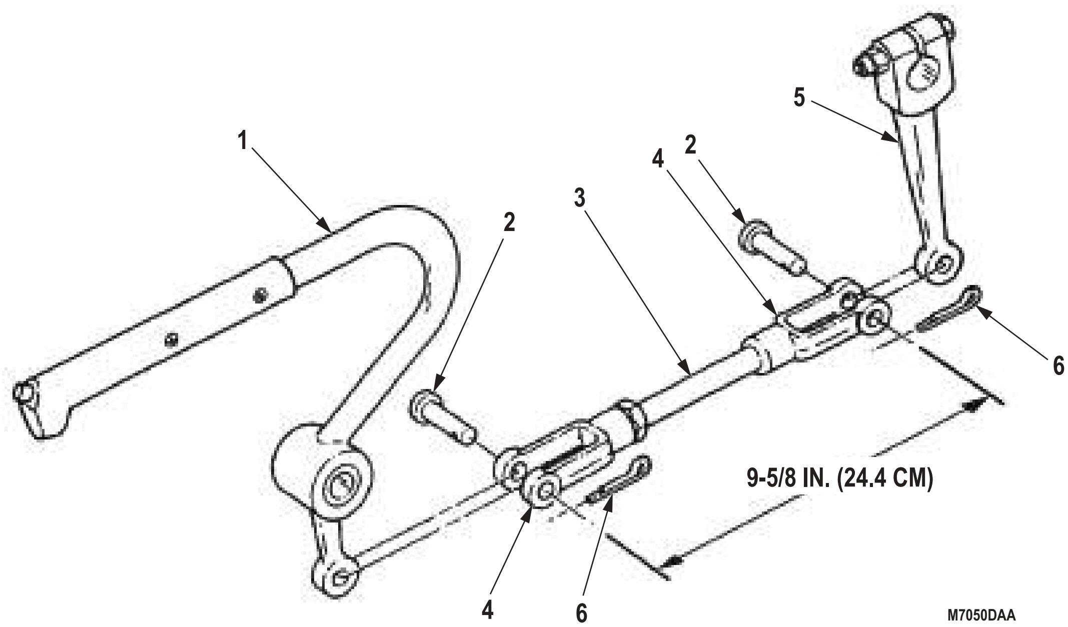


Figure 4. Transfer Case Shift Lever Shift Rod Installation.

END OF TASK

REMOVAL

1. Remove cotter pin (Figure 5, Item 15), pin (Figure 5, Item 13), and shift lever rod (Figure 5, Item 16) from cross shaft lever (Figure 5, Item 14). Discard cotter pin.
2. Remove cotter pin (Figure 5, Item 10), pin (Figure 5, Item 8), and transfer case shift rod (Figure 5, Item 9) from cross shaft lever (Figure 5, Item 7). Discard cotter pin.
3. Loosen nut (Figure 5, Item 1) and screw (Figure 5, Item 2) and remove cross shaft lever (Figure 5, Item 14) and woodruff key (Figure 5, Item 12) from cross shaft (Figure 5, Item 5). Discard woodruff key.
4. Remove cross shaft (Figure 5, Item 5) and cross shaft lever (Figure 5, Item 7) from shift lever bracket (Figure 5, Item 3).
5. Loosen nut (Figure 5, Item 4) and screw (Figure 5, Item 6) and remove cross shaft lever (Figure 5, Item 7) and woodruff key (Figure 5, Item 11) from cross shaft (Figure 5, Item 5). Discard woodruff key.

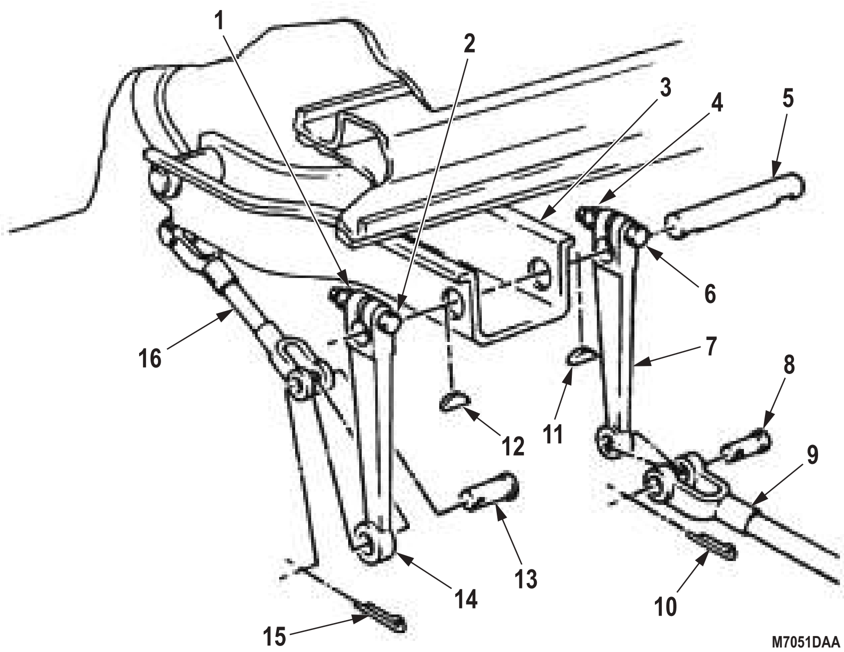


Figure 5. Transfer Case Cross Shaft Removal.

END OF TASK

INSTALLATION

1. Install woodruff key (Figure 6, Item 11) and cross shaft lever (Figure 6, Item 7) on cross shaft (Figure 6, Item 5). Do not tighten nut (Figure 6, Item 4).
2. Install cross shaft (Figure 6, Item 5) with cross shaft lever (Figure 6, Item 7) on shift lever bracket (Figure 6, Item 3).
3. Install woodruff key (Figure 6, Item 12) and cross shaft lever (Figure 6, Item 14) on cross shaft (Figure 6, Item 5) and tighten nut (Figure 6, Item 1) and screw (Figure 6, Item 2).
4. Tighten nut (Figure 6, Item 4) and screw (Figure 6, Item 6).
5. Install transfer case shift rod (Figure 6, Item 9) on cross shaft lever (Figure 6, Item 7) with pin (Figure 6, Item 8) and cotter pin (Figure 6, Item 10).
6. Install shift lever rod (Figure 6, Item 16) on cross shaft lever (Figure 6, Item 14) with pin (Figure 6, Item 13) and cotter pin (Figure 6, Item 15).

INSTALLATION - Continued

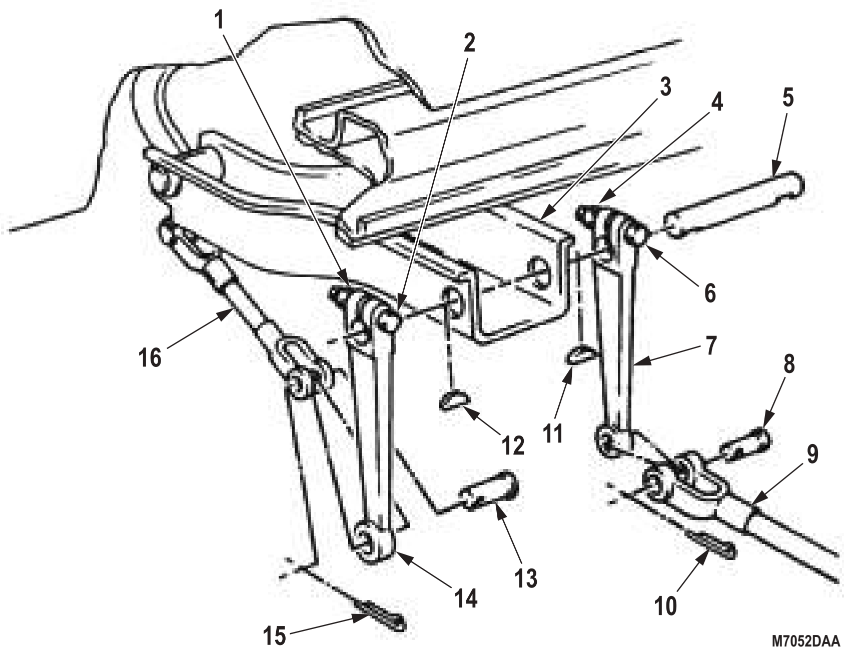


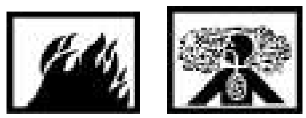
Figure 6. Transfer Case Cross Shaft Installation.

END OF TASK

REMOVAL

1. Remove cotter pin (Figure 7, Item 5), pin (Figure 7, Item 4), and transfer case shift rod (Figure 7, Item 6) from shift shaft (Figure 7, Item 3). Discard cotter pin.
2. Remove cotter pin (Figure 7, Item 7), pin (Figure 7, Item 2), and transfer case shift rod (Figure 7, Item 6) from cross shaft lever (Figure 7, Item 1). Discard cotter pin.

WARNING



Solvent cleaning compound is flammable and toxic. Do not use near an open flame and always have a fire extinguisher nearby when solvents are used. Use only in well-ventilated places, wear protective clothing, and dispose of cleaning rags in approved container. Failure to comply may result in damage to equipment, injury, or death to personnel.

3. Clean transfer case shift rod (Figure 7, Item 6) with cleaning compound solvent.
4. Inspect transfer case shift rod (Figure 7, Item 6) for cracks and breaks. Replace shift rod if cracked or broken.
5. Inspect valve cam (Figure 7, Item 8) for cracks, breaks, and bends. Replace valve cam if cracked, broken, or bent.

NOTE

Perform Steps (6) through (9) if valve cam requires replacement.

6. Place transfer case shift rod (Figure 7, Item 6) in vise.
7. Remove clevis (Figure 7, Item 9), valve cam (Figure 7, Item 8), washer (Figure 7, Item 10), and jamnut (Figure 7, Item 11) from shift rod (Figure 7, Item 6).
8. Install jamnut (Figure 7, Item 11), washer (Figure 7, Item 10), valve cam (Figure 7, Item 8), and clevis (Figure 7, Item 9) on shift rod (Figure 7, Item 6). Do not tighten jamnut.
9. Remove transfer case shift rod (Figure 7, Item 6) from vise.
10. Loosen jamnut (Figure 7, Item 11) if necessary.
11. Adjust clevis (Figure 7, Item 12) until distance between centers of holes is 9-17/32 in. (24.2 cm).
12. Tighten jamnut (Figure 7, Item 11).

REMOVAL - Continued

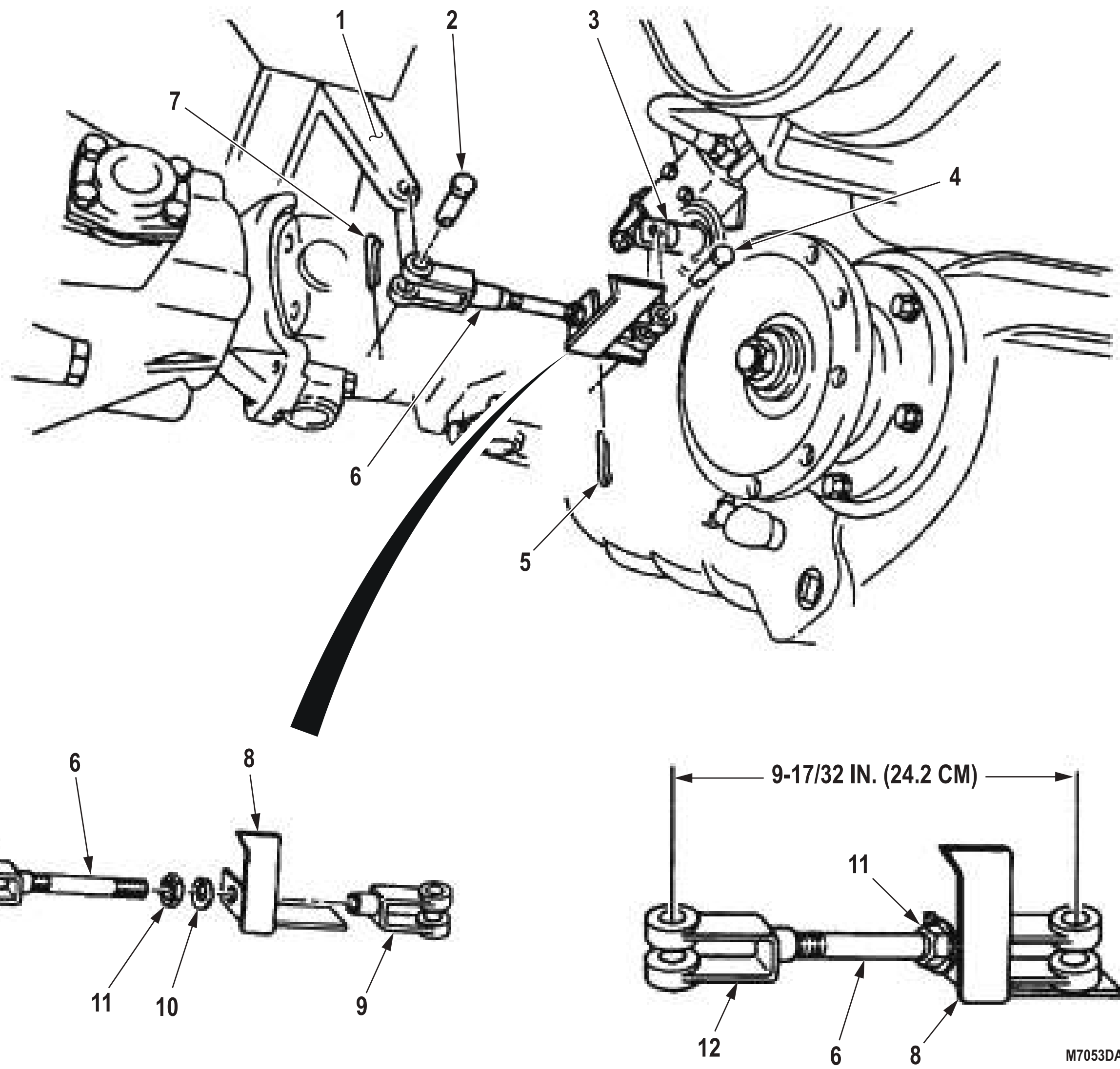


Figure 7. Transfer Case Shift Rod Removal.

END OF TASK

INSTALLATION

1. Install transfer case shift rod (Figure 8, Item 6) on cross shaft lever (Figure 8, Item 1) with pin (Figure 8, Item 2) and cotter pin (Figure 8, Item 7).
2. Install transfer case shift rod (Figure 8, Item 6) on shift shaft (Figure 8, Item 3) with pin (Figure 8, Item 4) and cotter pin (Figure 8, Item 5).

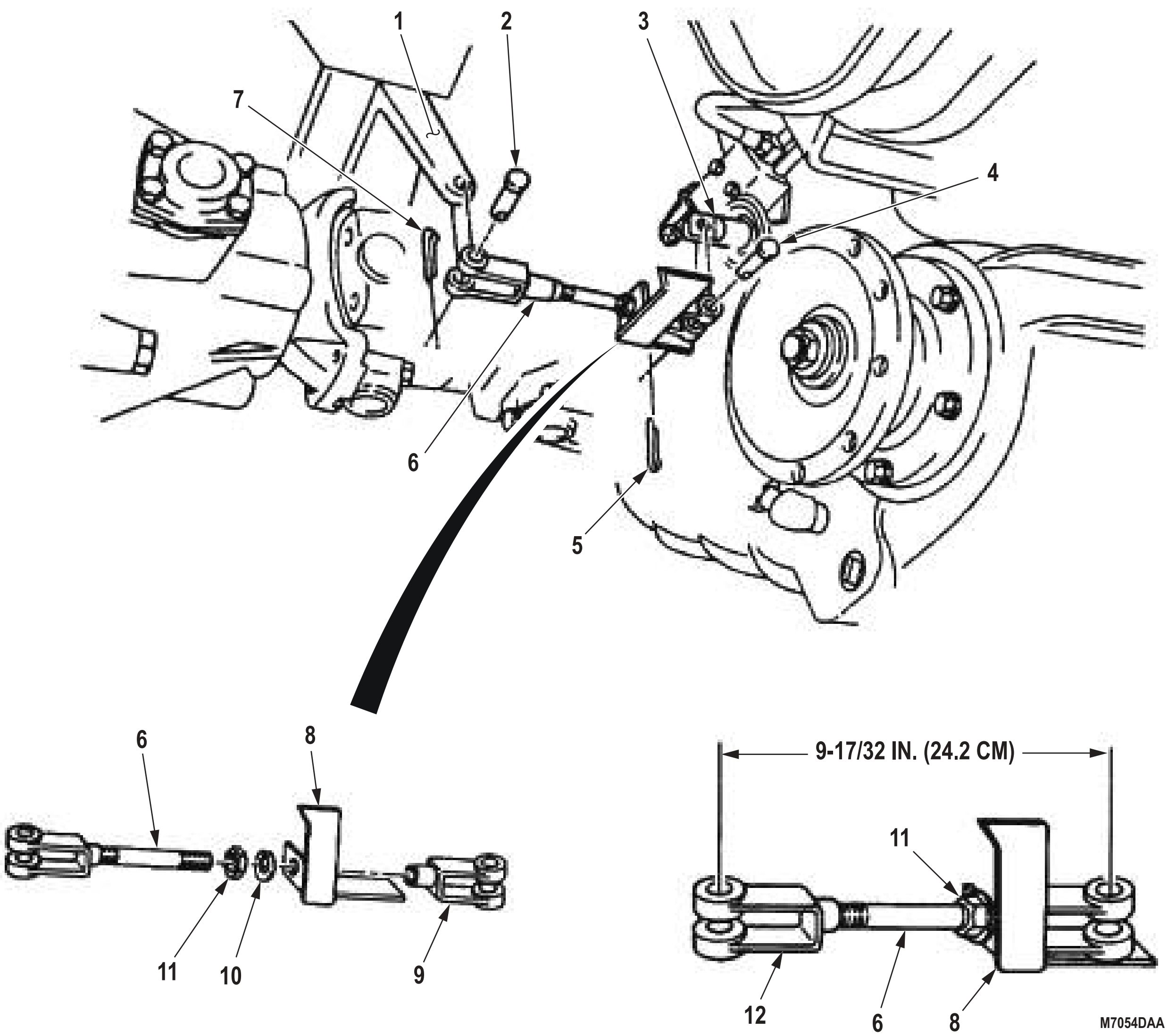


Figure 8. Transfer Case Shift Rod Installation.

END OF TASK

REMOVAL

NOTE

Tag all leads for installation.

1. Disconnect two switch leads (Figure 9, Item 8) from connectors (Figure 9, Item 9).
2. Remove grommet (Figure 9, Item 6) and switch leads (Figure 9, Item 8) from cab floor (Figure 9, Item 7).
3. Remove two screws (Figure 9, Item 5), lockwashers (Figure 9, Item 4), clamps (Figure 9, Item 3), and switch leads (Figure 9, Item 8) from transfer case shift lever (Figure 9, Item 2). Discard lockwashers.
4. Remove four screws (Figure 9, Item 1), lockwashers (Figure 9, Item 11), and switch (Figure 9, Item 10) from transfer case shift lever (Figure 9, Item 2). Discard lockwashers.

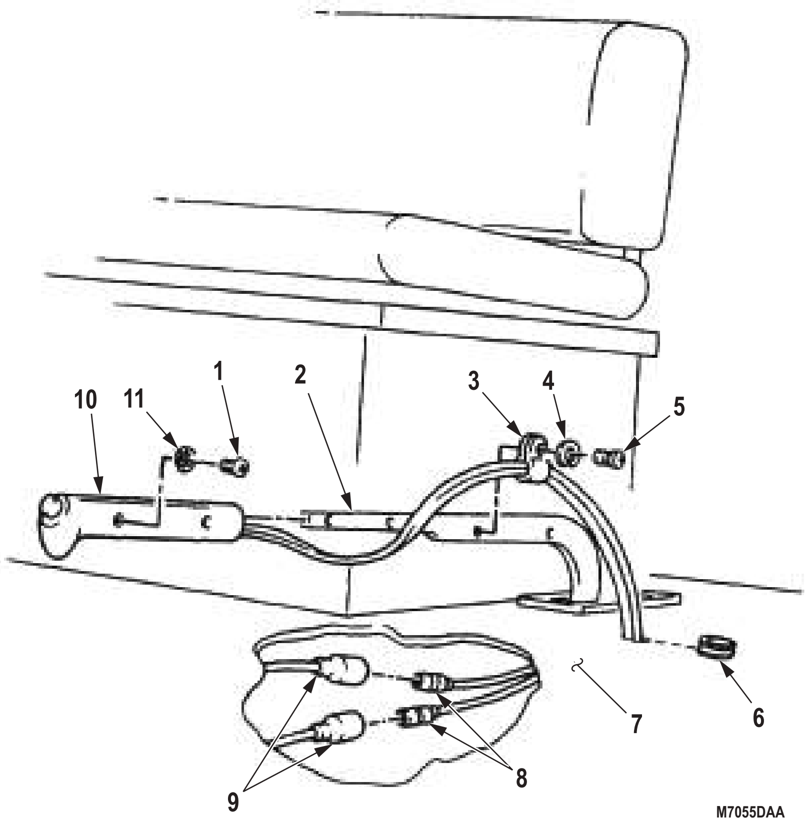


Figure 9. Transfer Case Switch Removal.

END OF TASK

INSTALLATION

1. Install switch (Figure 10, Item 10) on transfer case shift lever (Figure 10, Item 2) with four lockwashers (Figure 10, Item 11) and screws (Figure 10, Item 1).
2. Install two switch leads (Figure 10, Item 8) on transfer case shift lever (Figure 10, Item 2) with two clamps (Figure 10, Item 3), lockwashers (Figure 10, Item 4), and screws (Figure 10, Item 5).
3. Insert two switch leads (Figure 10, Item 8) through cab floor (Figure 10, Item 7) and connect to connectors (Figure 10, Item 9).
4. Install grommet (Figure 10, Item 6) around switch leads (Figure 10, Item 8) and install on cab floor (Figure 10, Item 7).

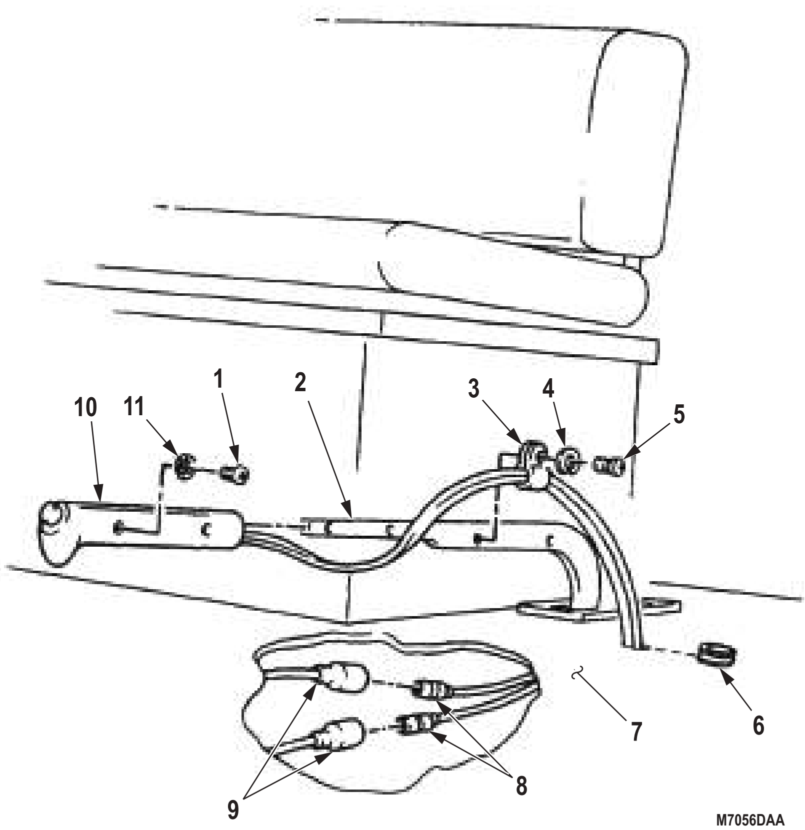


Figure 10. Transfer Case Switch Installation.

END OF TASK

FOLLOW-ON MAINTENANCE

Check transfer case shift lever for proper operation. Road test vehicle. (TM 9-2320-272-10)

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
TRANSFER CASE CAPACITOR REPLACEMENT

INITIAL SETUP:

Tools and Special Tools

Tool Kit, General Mechanic's: Automotive (Volume 5, WP 0826, Table 1, Item 56)

Equipment Condition

Parking brake set. (TM 9-2320-272-10)

Transfer case-to-front axle propeller shaft removed. (WP 0402)

REMOVAL

NOTE

Tag all leads for installation.

1. Disconnect capacitor leads (Figure 1, Items 4, 5, and 8) from transfer case switch connector (Figure 1, Item 3), transmission solenoid adapter (Figure 1, Item 6), and interlock valve adapter (Figure 1, Item 7).
2. Disconnect capacitor leads (Figure 1, Items 13 and 14) from transfer case switch connector (Figure 1, Item 2) and front wiring harness connector (Figure 1, Item 12).
3. Remove screw (Figure 1, Item 11), front wiring harness clamp (Figure 1, Item 10), and capacitor (Figure 1, Item 9) from crossmember (Figure 1, Item 1).

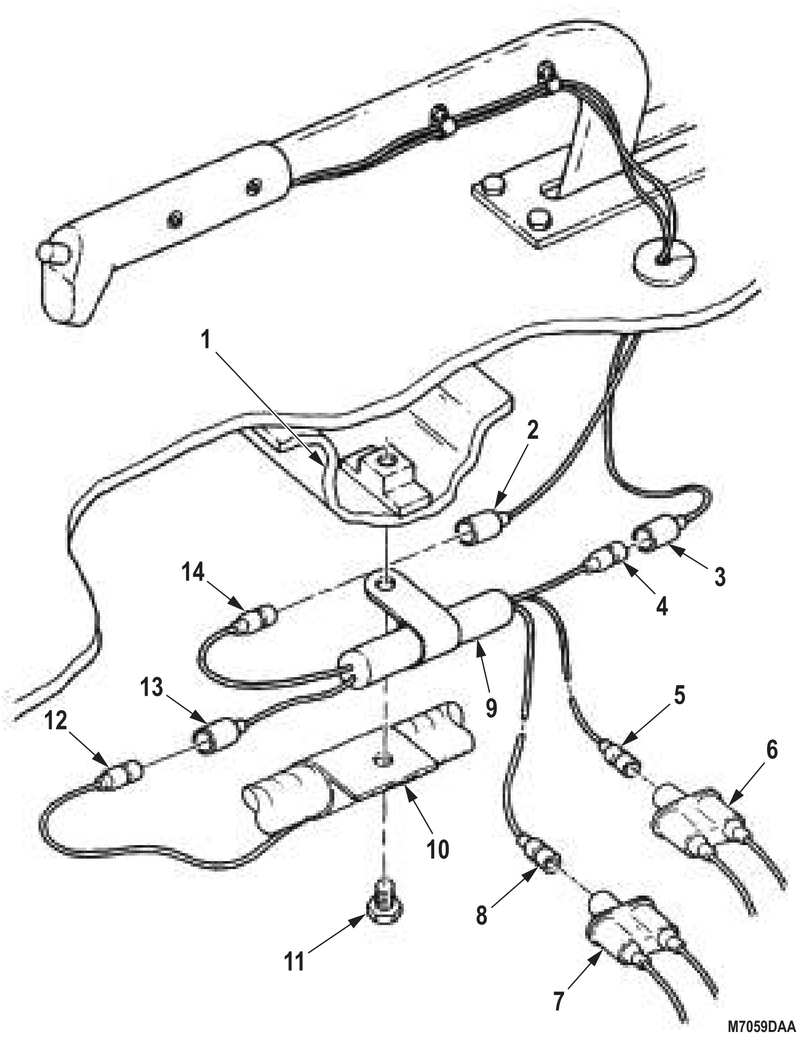


Figure 1. Transfer Case Capacitor Removal.

END OF TASK

INSTALLATION

1. Install capacitor (Figure 2, Item 9) and front wiring harness clamp (Figure 2, Item 10) on crossmember (Figure 2, Item 1) with screw (Figure 2, Item 11).
2. Connect capacitor leads (Figure 2, Items 4, 5, and 8) to transfer case switch connector (Figure 2, Item 3), transmission solenoid adapter (Figure 2, Item 6), and interlock valve adapter (Figure 2, Item 7).
3. Connect capacitor leads (Figure 2, Items 13 and 14) to transfer case switch connector (Figure 2, Item 2) and front wiring harness connector (Figure 2, Item 12).

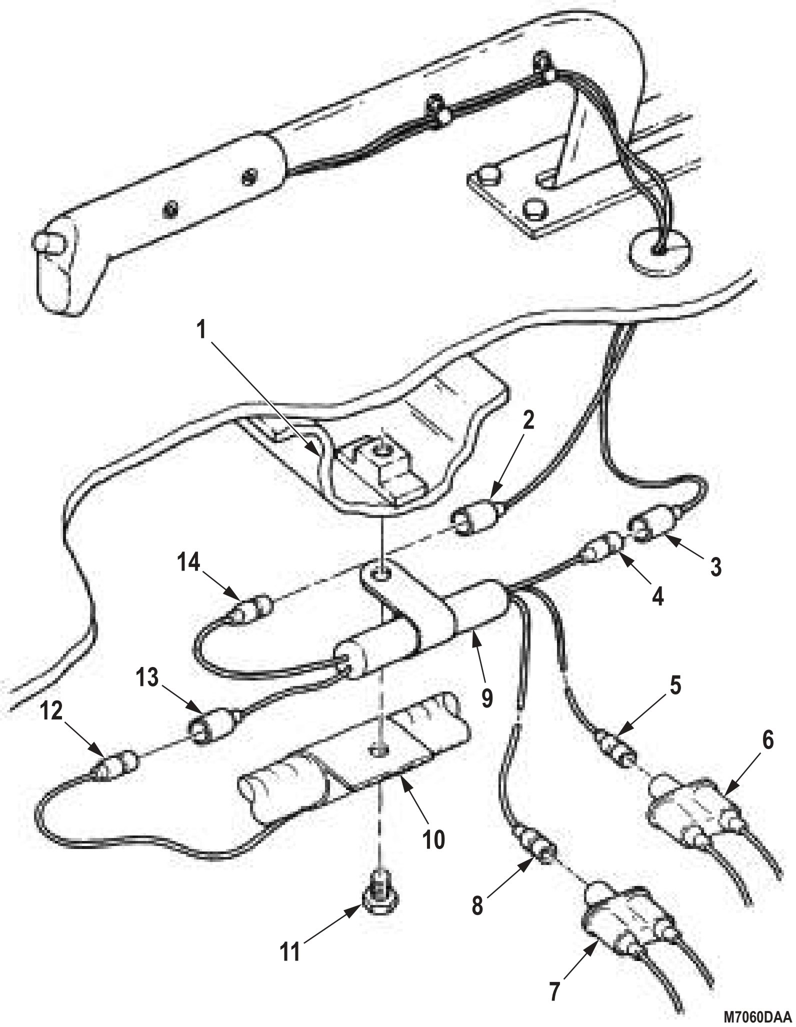


Figure 2. Transfer Case Capacitor Installation.

END OF TASK

FOLLOW-ON MAINTENANCE

1. Install transfer case-to-front axle propeller shaft. (WP 0402)
2. Check transfer case shift lever for proper operation. Road test vehicle. (TM 2320-272-10)

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
TRANSFER CASE TRANSORB DIODE REPLACEMENT

INITIAL SETUP:

Tools and Special Tools

Tool Kit, General Mechanic's: Automotive
(Volume 5, WP 0826, Table 1, Item 56)

Materials/Parts

Locknut (Volume 5, WP 0827, Table 1, Item 282)
Qty: 2
Lockwasher
(Volume 5, WP 0827, Table 1, Item 384)
Qty: 1

Personnel Required

(2)

Equipment Condition

Parking brake set. (TM 9-2320-272-10)

REMOVAL

NOTE

Assistant will help with Step (1).

1. Remove locknut (Figure 1, Item 9), washer (Figure 1, Item 10), transorb diode ground wire (Figure 1, Item 8), locknut (Figure 1, Item 11), ground wire (Figure 1, Item 7), lockwasher (Figure 1, Item 12), cable clamp (Figure 1, Item 6), and screw (Figure 1, Item 5) from frame (Figure 1, Item 4). Discard locknuts and lockwasher.
2. Disconnect transorb diode wire (Figure 1, Item 2) from front wiring harness connector (Figure 1, Item 1) and remove transorb diode (Figure 1, Item 3) from frame (Figure 1, Item 4).

REMOVAL - Continued

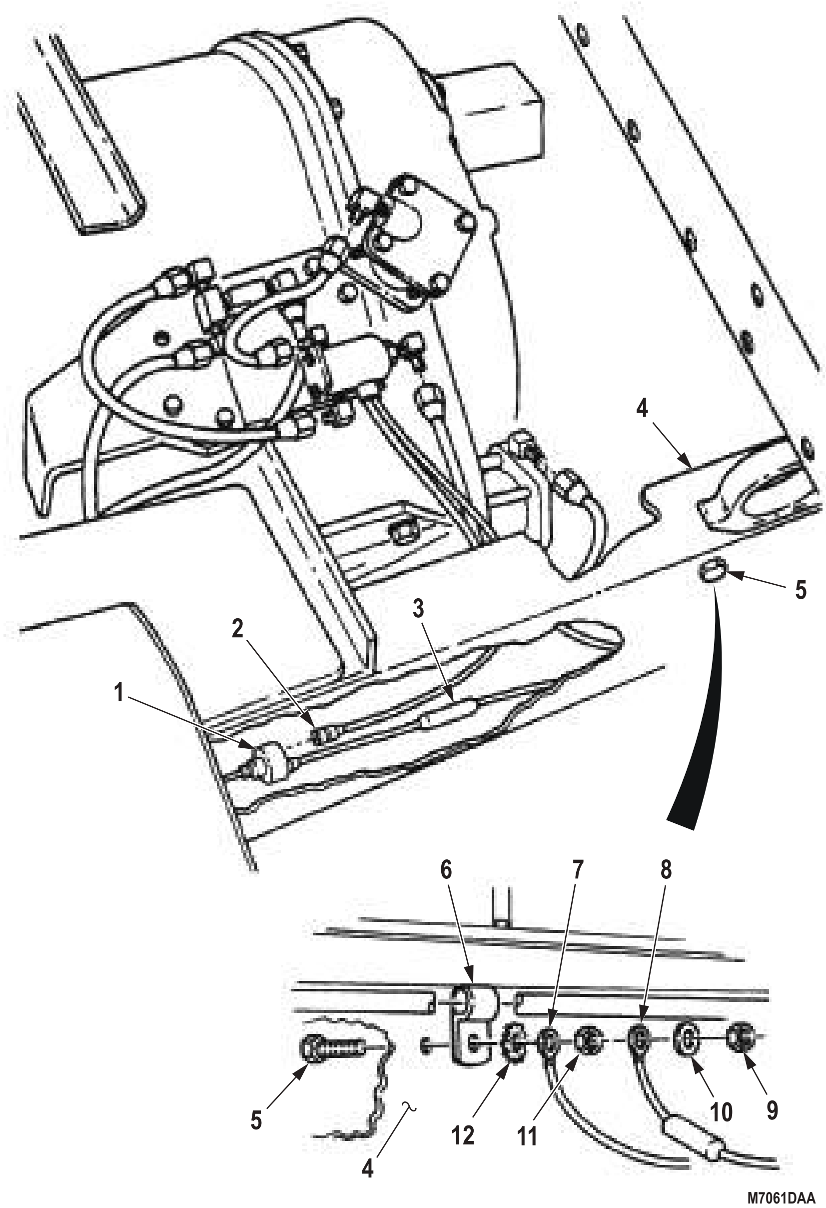


Figure 1. Transfer Case Transorb Diode Removal.

END OF TASK

INSTALLATION

1. Connect transorb diode wire (Figure 2, Item 2) and transorb diode (Figure 2, Item 3) to front wiring harness connector (Figure 2, Item 1) between frame (Figure 2, Item 4).
2. Install cable clamp (Figure 2, Item 6), lockwasher (Figure 2, Item 12), and ground wire (Figure 2, Item 7) on frame (Figure 2, Item 4) with screw (Figure 2, Item 5) and locknut (Figure 2, Item 11).
3. Install transorb diode ground wire (Figure 2, Item 8) on screw (Figure 2, Item 5) with washer (Figure 2, Item 10) and locknut (Figure 2, Item 9).

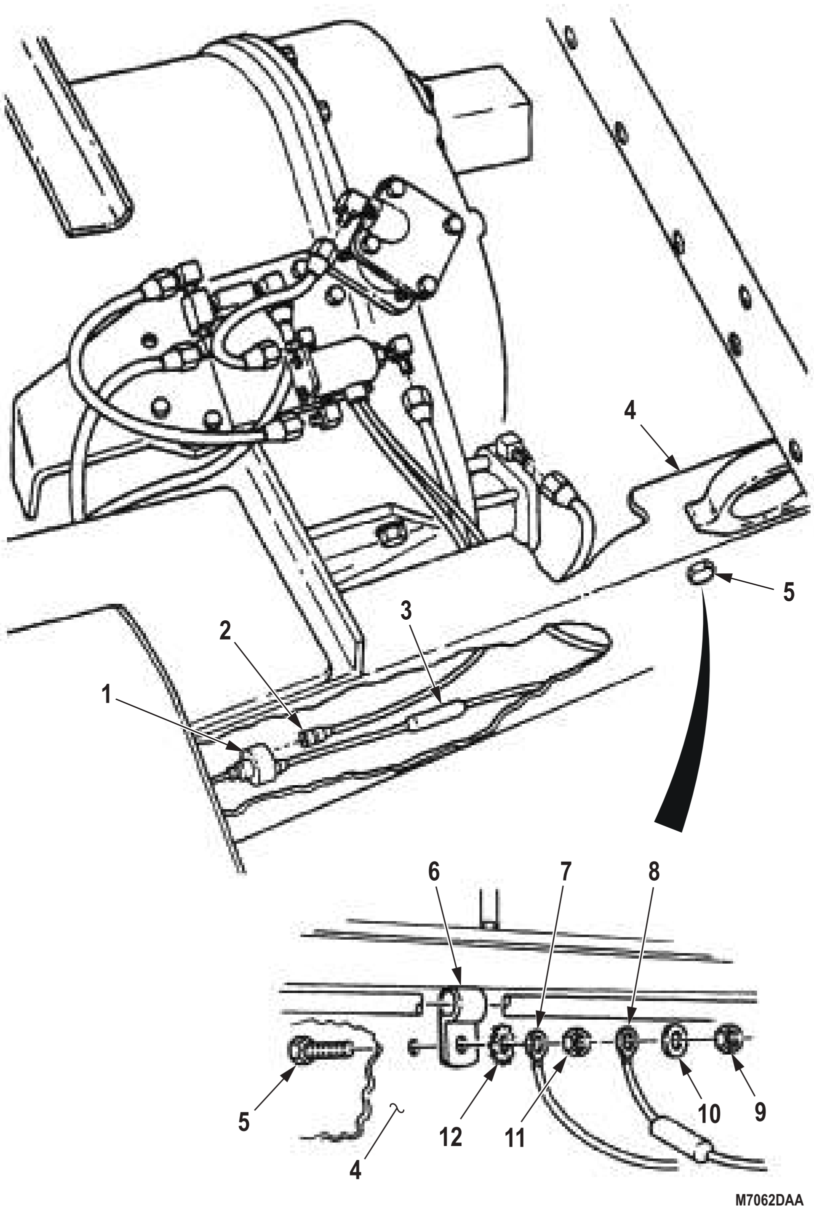


Figure 2. Transfer Case Transorb Diode Installation.

END OF TASK

FOLLOW-ON MAINTENANCE

Check transfer case shift lever for proper operation. Road test vehicle. (TM 9-2320-272-10)

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
TRANSFER CASE OIL PUMP REPLACEMENT

INITIAL SETUP:

Tools and Special Tools

Tool Kit, General Mechanic's: Automotive
(Volume 5, WP 0826, Table 1, Item 56)
Wrench, Torque, Click, Ratcheting, 1/2" Drive, 250 Ft-Lb
(Volume 5, WP 0826, Table 1, Item 63)

Materials/Parts

Adhesive, Silicone Rubber
(Volume 5, WP 0825, Table 1, Item 4)
Tape, Antiseizing
(Volume 5, WP 0825, Table 1, Item 65)

Equipment Condition

Parking brake set. (TM 9-2320-272-10)

Equipment Condition (cont.)

Transfer case oil drained. (Volume 5, WP 0820)

REMOVAL

NOTE

- Have drainage container ready to catch oil.
- Use drain pans to retain leaking/draining fluids. Refer to local procedures and plans for preventing and responding to fluid spills or leaks. Comply with local regulations when disposing of clean up material and leaked and spilled fluids.

1. Disconnect hose (Figure 1, Item 4) from elbow (Figure 1, Item 3).
2. Remove elbow (Figure 1, Item 3) from oil pump (Figure 1, Item 1).

NOTE

Mark position of oil pump for installation.

3. Remove six screws (Figure 1, Item 5), washers (Figure 1, Item 6), and oil pump (Figure 1, Item 1) from transfer case (Figure 1, Item 2).

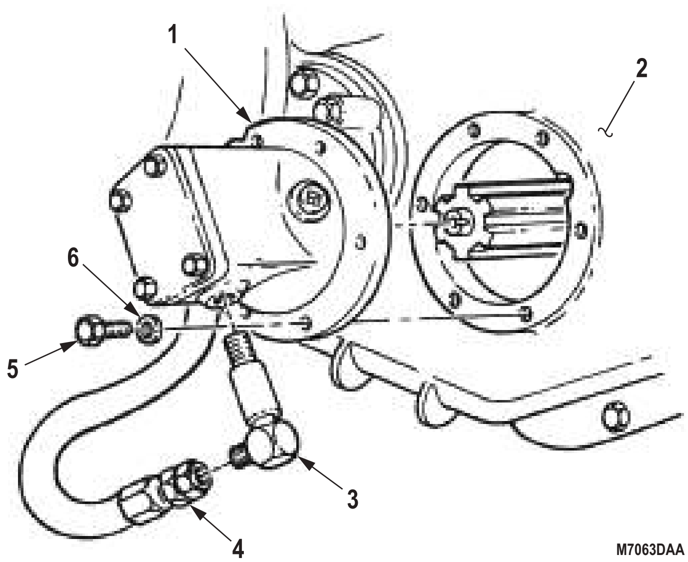


Figure 1. Transfer Case Oil Pump Removal.

END OF TASK

INSTALLATION

1. Apply adhesive to mating surfaces of oil pump (Figure 2, Item 1) and transfer case (Figure 2, Item 2).
2. Install oil pump (Figure 2, Item 1) on transfer case with six washers (Figure 2, Item 6) and screws (Figure 2, Item 5). Tighten screws (Figure 2, Item 5) 40 to 65 lb-ft (54 to 88 N·m).
3. Apply antiseize tape to male threads of elbow (Figure 2, Item 3) and install on oil pump (Figure 2, Item 1).
4. Connect hose (Figure 2, Item 4) to elbow (Figure 2, Item 3).

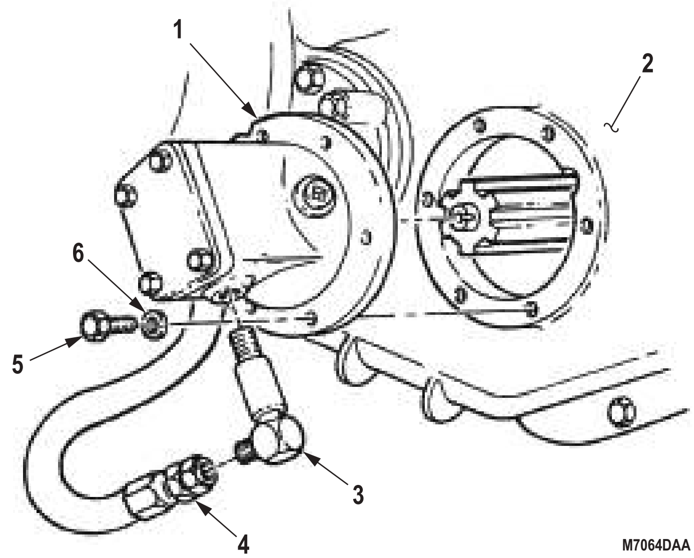


Figure 2. Transfer Case Oil Pump Installation.

END OF TASK

FOLLOW-ON MAINTENANCE

1. Fill transfer case to proper fluid level. (Volume 5, WP 0820)
2. Start engine and check for leaks. Road test vehicle. (TM 9-2320-272-10)

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
FORWARD-REAR TO REAR-REAR PROPELLER SHAFT REPLACEMENT

INITIAL SETUP:

Tools and Special Tools
Tool Kit, General Mechanic's: Automotive
(Volume 5, WP 0826, Table 1, Item 56)
Wrench, Torque, Click, Ratcheting, 3/8" Drive, 75 Ft-Lb
(Volume 5, WP 0826, Table 1, Item 62)

Materials/Parts
Locknut (Volume 5, WP 0827, Table 1, Item 285)
Qty: 16

Personnel Required
(2)

Equipment Condition
Parking brake set. (TM 9-2320-272-10)
Wheels chocked. (TM 9-2320-272-10)

REMOVAL

1. Remove eight locknuts (Figure 1, Item 3), screws (Figure 1, Item 2), and forward-rear to rear-rear axle propeller shaft (Figure 1, Item 1) from transfer case input flange (Figure 1, Item 4). Discard locknuts.
2. Remove eight locknuts (Figure 1, Item 6), screws (Figure 1, Item 7), and forward-rear to rear-rear axle propeller shaft (Figure 1, Item 1) from transmission output flange (Figure 1, Item 5). Discard locknuts.

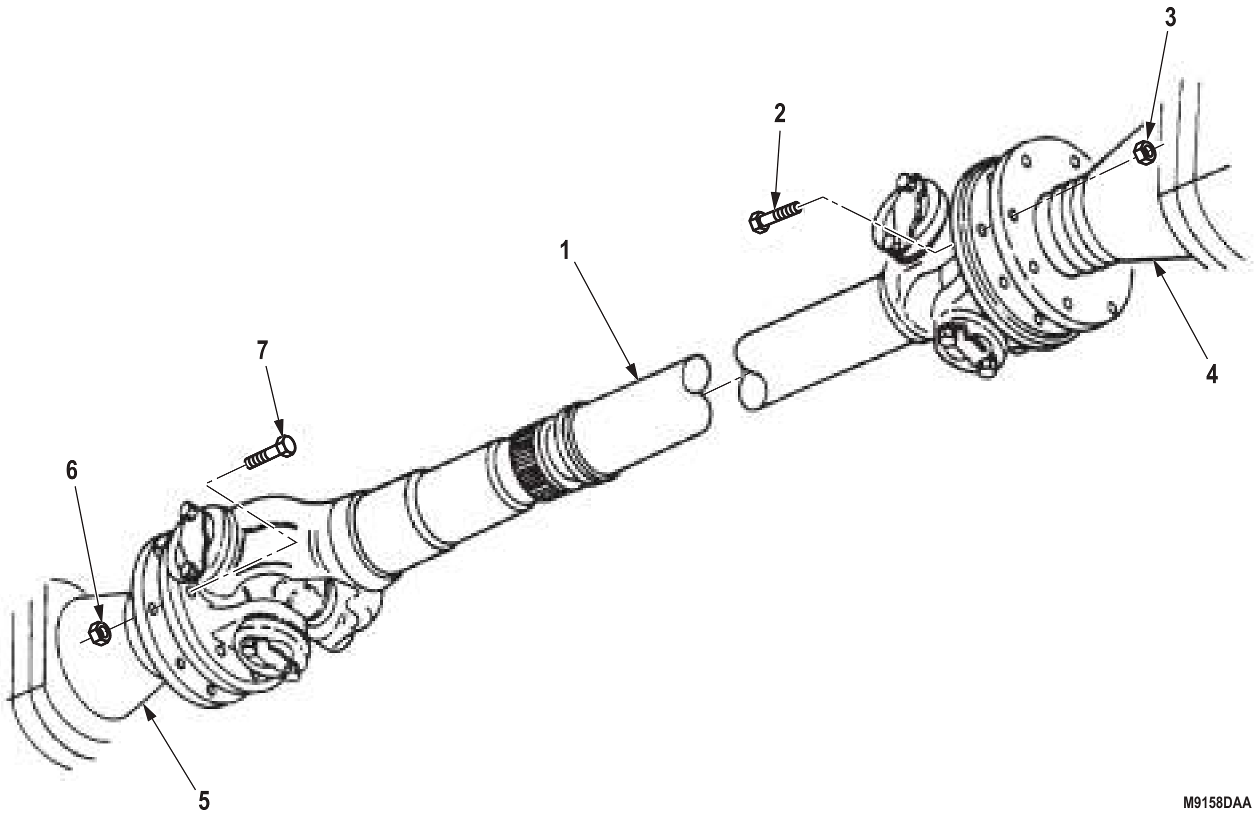


Figure 1. Rear Propeller Shaft Removal.

END OF TASK

INSTALLATION

1. Install forward-rear to rear-rear axle propeller shaft (Figure 2, Item 1) on transmission output flange (Figure 2, Item 5) with eight screws (Figure 2, Item 7) and locknuts (Figure 2, Item 6). Tighten locknuts 32 to 40 lb-ft (43 to 54 N·m).
2. Install forward-rear to rear-rear axle propeller shaft (Figure 2, Item 1) on transfer case input flange (Figure 2, Item 4) with eight screws (Figure 2, Item 2) and locknuts (Figure 2, Item 3). Tighten locknuts 32 to 40 lb-ft (43 to 54 N·m).

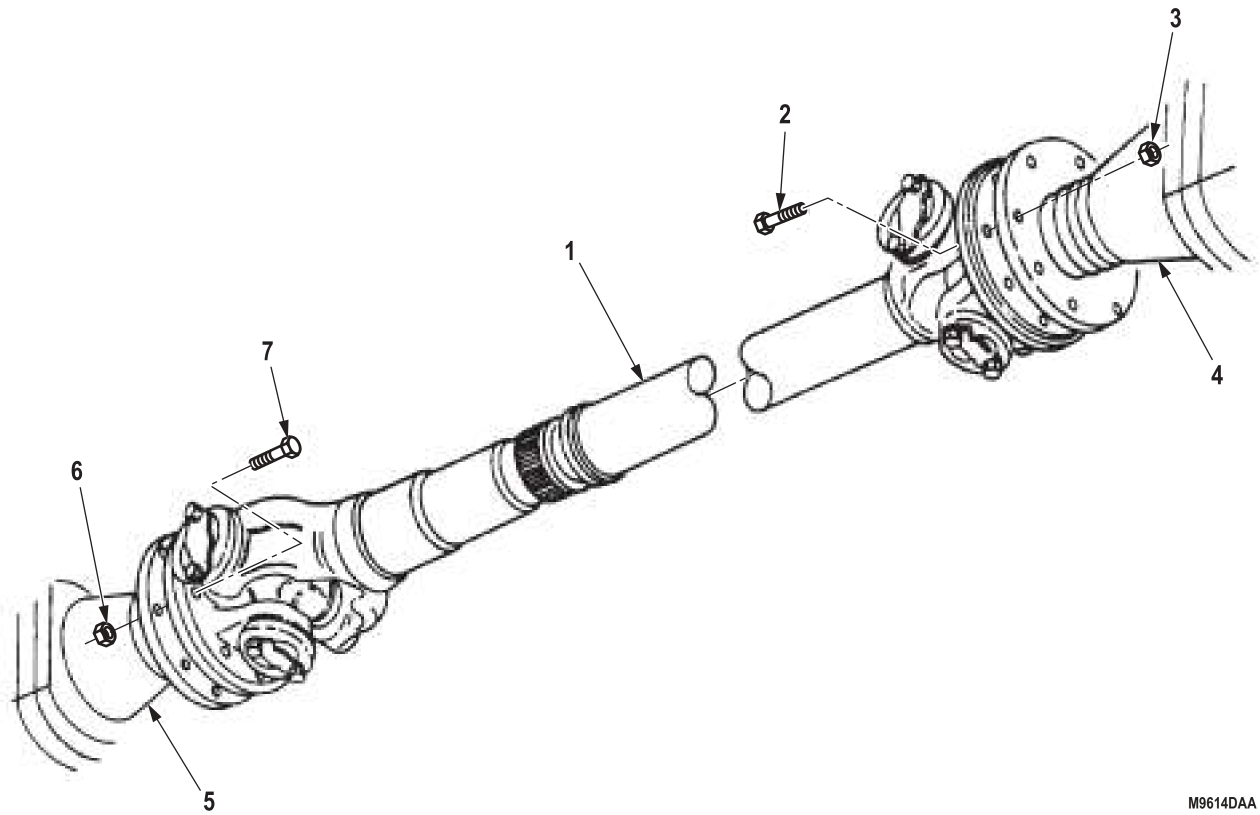


Figure 2. Rear Propeller Shaft Installation.

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
TRANSFER CASE TO FORWARD-REAR AXLE PROPELLER SHAFT REPAIR

INITIAL SETUP:

Tools and Special Tools
Tool Kit, General Mechanic's: Automotive
(Volume 5, WP 0826, Table 1, Item 56)
Wrench, Torque, Click, Ratcheting, 3/8" Drive, 75 Ft-Lb
(Volume 5, WP 0826, Table 1, Item 62)

Materials/Parts
Cleaning Compound, Solvent
(Volume 5, WP 0825, Table 1, Item 16, 17)
Grease, Automotive and Artillery
(Volume 5, WP 0825, Table 1, Item 28)
Cotter Pin (M939/A1 old configuration)
(Volume 5, WP 0827, Table 1, Item 260)
Qty: 1
Locknut (M939A2 old configuration)
(Volume 5, WP 0827, Table 1, Item 285)
Qty: 22
Locknut
(Volume 5, WP 0827, Table 1, Item 285)
Qty: 16

Materials/Parts (cont.)
Locknut (M939/A1 old configuration)
(Volume 5, WP 0827, Table 1, Item 285)
Qty: 12
Universal Plate
(Volume 5, WP 0827, Table 1, Item 204)
Qty: 2

Personnel Required
(2)

References
Volume 5, WP 0820

Equipment Condition
Parking brake set. (TM 9-2320-272-10)
Wheels chocked. (TM 9-2320-272-10)

REMOVAL

1. Remove eight locknuts (Figure 1, Item 3) from transfer case brake drum (Figure 1, Item 1) and transfer case shaft yoke flange (Figure 1, Item 2). Discard locknuts.
2. Remove eight screws (Figure 1, Item 13), locknuts (Figure 1, Item 12), and rear propeller shaft yoke flange (Figure 1, Item 14) from forward-rear axle yoke flange (Figure 1, Item 11). Discard locknuts.
3. Remove forward propeller shaft front section (Figure 1, Item 4) from forward propeller shaft aft section (Figure 1, Item 24).
4. Remove dust cover (Figure 1, Item 5) and spacer (Figure 1, Item 6) from forward propeller shaft front section (Figure 1, Item 4).

NOTE

- Perform Steps (5) through (14) only for vehicles equipped with old forward-rear axle propeller shaft.
- Perform Steps (5) through (9) for models M927/A1, M928/A1, M934/A1, and M935/A1 models only.

5. Remove eight screws (Figure 1, Item 17) and locknuts (Figure 1, Item 21) from rear propeller shaft companion flange (Figure 1, Item 16) and center bearing companion flange (Figure 1, Item 20). Discard locknuts.
6. Remove forward-rear axle propeller shaft (Figure 1, Item 15) and center bearing companion flange (Figure 1, Item 20) from center bearing bracket (Figure 1, Item 10).
7. Remove four screws (Figure 1, Item 8) and locknuts (Figure 1, Item 7) from center bearing mounting bracket (Figure 1, Item 10) and crossmember (Figure 1, Item 9). Discard locknuts.
8. Remove cotter pin (Figure 1, Item 18) and nut (Figure 1, Item 19) from forward propeller shaft (Figure 1, Item 4). Discard cotter pin.
9. Remove center bearing companion flange (Figure 1, Item 20), dust cover (Figure 1, Item 22), spacer (Figure 1, Item 23), center bearing mounting bracket (Figure 1, Item 10), spacer (Figure 1, Item 6), and dust cover (Figure 1, Item 5) from forward propeller shaft (Figure 1, Item 4).

REMOVAL - Continued

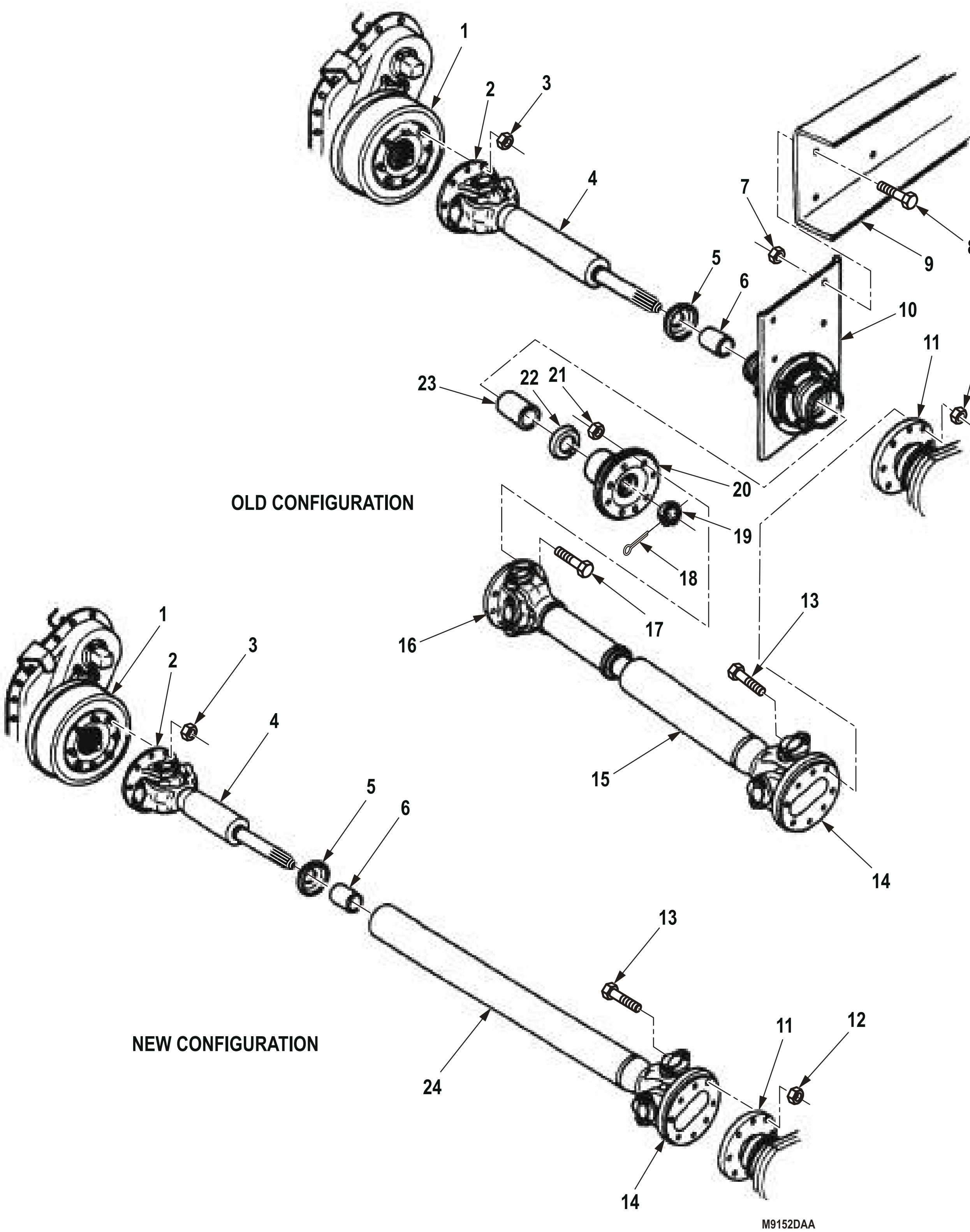


Figure 1. Forward-Rear Propeller Shaft Removal.

REMOVAL - Continued

NOTE

Perform Steps (10) through (14) for M927A2, M928A2, M934A2, and M935A2 models only.

10. Remove eight locknuts (Figure 2, Item 9), screws (Figure 2, Item 7), and rear axle flange (Figure 2, Item 8) from center bearing flange (Figure 2, Item 6). Discard locknuts.
11. Remove eight locknuts (Figure 2, Item 13) and flange (Figure 2, Item 14) from transfer case brake drum studs (Figure 2, Item 1). Discard locknuts.
12. Remove two locknuts (Figure 2, Item 12), screws (Figure 2, Item 4), washers (Figure 2, Item 3), center bearing (Figure 2, Item 11), forward-rear axle propeller shaft (Figure 2, Item 10), and vibration damper (Figure 2, Item 5) from bracket (Figure 2, Item 2). Discard locknuts.
13. Remove locknut (Figure 2, Item 15), washer (Figure 2, Item 16), clamp (Figure 2, Item 17), spacer (Figure 2, Item 18), screw (Figure 2, Item 20), and clamp (Figure 2, Item 19) from bracket (Figure 2, Item 2) and crossmember (Figure 2, Item 22). Discard locknut.
14. Remove three locknuts (Figure 2, Item 24), washers (Figure 2, Item 23), screws (Figure 2, Item 21), and bracket (Figure 2, Item 2) from crossmember (Figure 2, Item 22). Discard locknuts.

REMOVAL - Continued

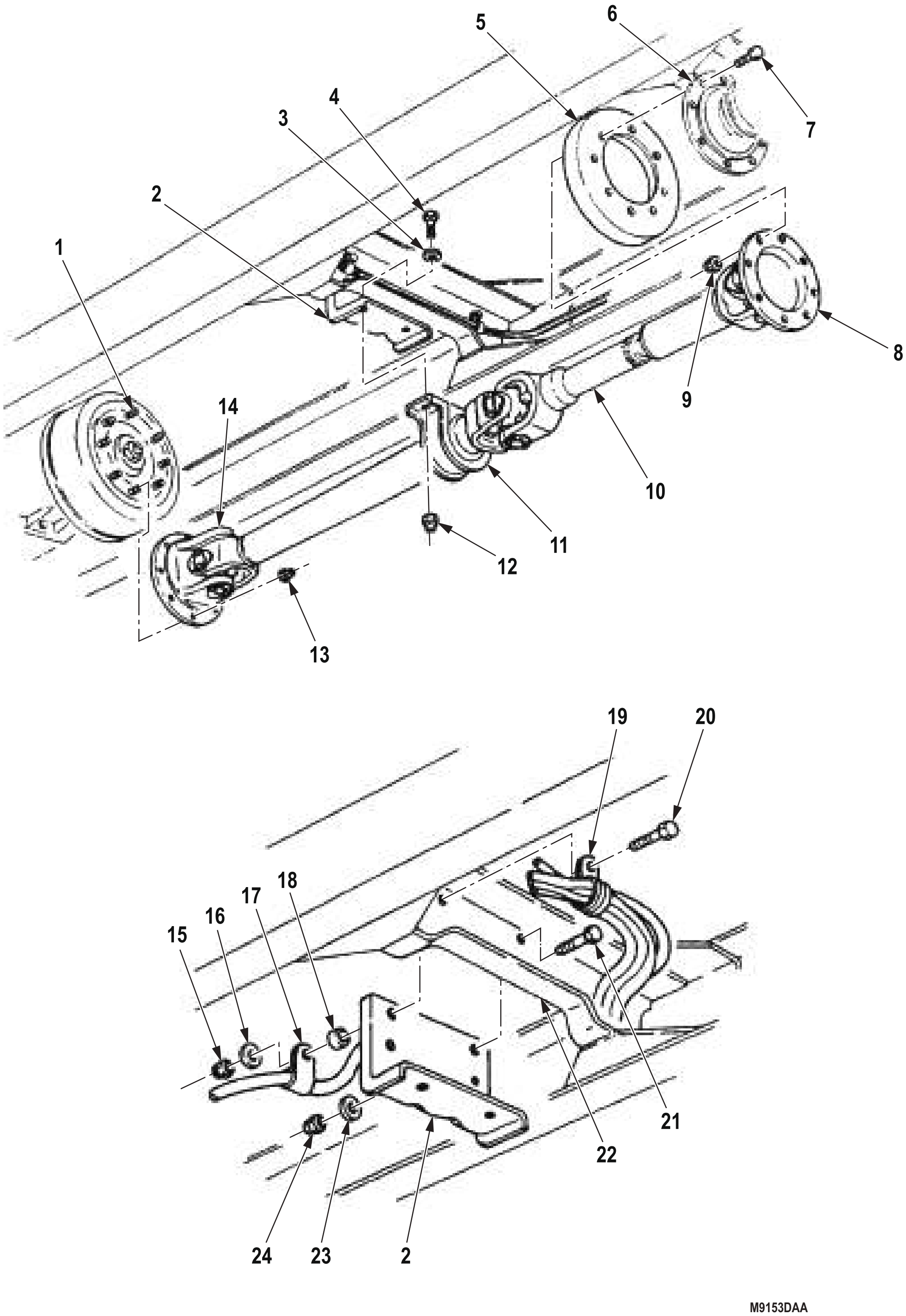


Figure 2. Propeller Shaft and Bracket Removal.

END OF TASK

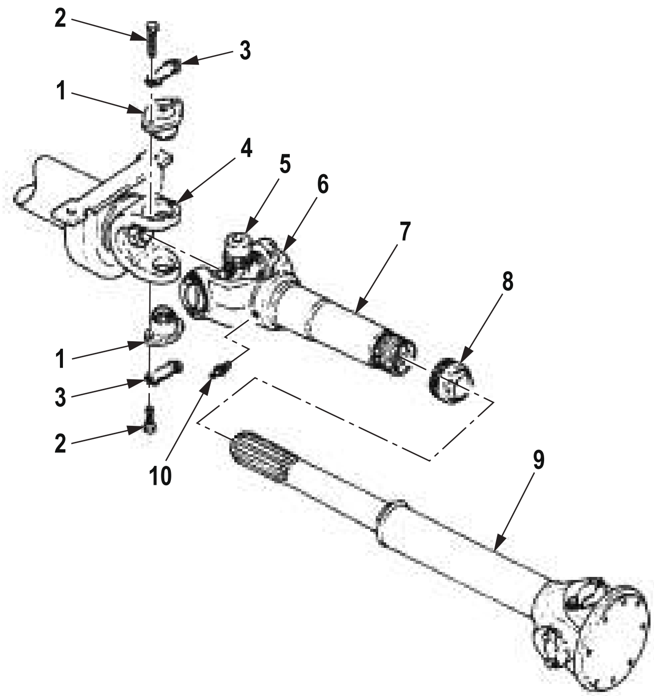
DISASSEMBLY

NOTE

Perform disassembly for M9272A2, M928A2, M934A2, and M935A2 models only.

1. Straighten tabs on two universal plates (Figure 3, Item 3).
2. Remove four screws (Figure 3, Item 2), two universal plates (Figure 3, Item 3), bearing caps (Figure 3, Item 1), and universal joint (Figure 3, Item 5) from center bearing propeller shaft (Figure 3, Item 4). Discard universal plates.
3. Loosen dust seal (Figure 3, Item 8) on shaft (Figure 3, Item 7).
4. Remove shaft (Figure 3, Item 7) from shaft (Figure 3, Item 9).
5. Remove dust seal (Figure 3, Item 8) from shaft (Figure 3, Item 9).
6. Remove grease fitting (Figure 3, Item 10) from yoke (Figure 3, Item 6).

DISASSEMBLY - Continued



M9154DAA

Figure 3. Propeller Shaft Disassembly.

END OF TASK

CLEANING AND INSPECTION

WARNING

Solvent cleaning compound is flammable and toxic. Do not use near an open flame and always have a fire extinguisher nearby when solvents are used. Use only in well-ventilated places, wear protective clothing, and dispose of cleaning rags in approved container. Failure to comply may result in damage to equipment, injury, or death to personnel.

1. Clean all parts in solvent cleaning compound and allow to dry.
2. Inspect all parts for cracks, fitting, or scoring. Replace parts as necessary if cracked, pitted, or scored.

END OF TASK

ASSEMBLY

NOTE

Perform assembly for M9272A2, M928A2, M934A2, and M935A2 models only.

1. Install grease fitting (Figure 4, Item 10) in yoke (Figure 4, Item 6).

NOTE

Apply light coat of GAA grease to dust seal and splines of shaft before installation.

2. Install dust seal (Figure 4, Item 8) on splines of shaft (Figure 4, Item 9).
3. Install shaft (Figure 4, Item 7) on shaft (Figure 4, Item 9).
4. Tighten dust seal (Figure 4, Item 8) on shaft (Figure 4, Item 7).
5. Install universal joint (Figure 4, Item 5) on center bearing propeller shaft (Figure 4, Item 4) with two bearing caps (Figure 4, Item 1), universal plates (Figure 4, Item 3), and four screws (Figure 4, Item 2). Tighten four screws to 32 to 40 lb-ft (43 to 54 N·m).
6. Bend tabs on two universal plates (Figure 4, Item 3) against four screws (Figure 4, Item 2).

ASSEMBLY - Continued

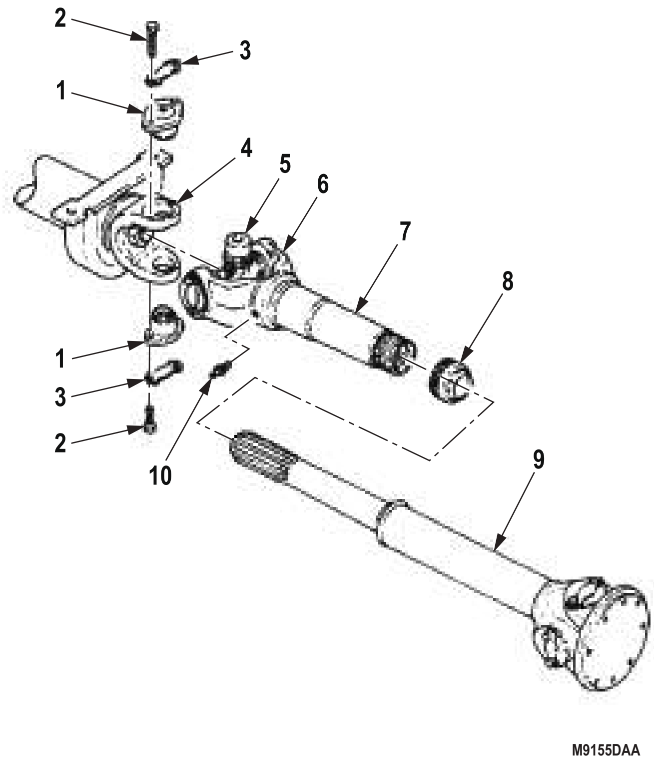


Figure 4. Propeller Shaft Assembly.

END OF TASK

INSTALLATION

NOTE

Perform Steps (1) through (5) for M927A2, M928A2, M934A2, and M935A2 models only.

1. Install bracket (Figure 5, Item 9) on crossmember (Figure 5, Item 8) with three screws (Figure 5, Item 7), washers (Figure 5, Item 10), and locknuts (Figure 5, Item 11).
2. Install clamps (Figure 5, Items 3 and 5) on bracket (Figure 5, Item 9) and crossmember (Figure 5, Item 8) with screw (Figure 5, Item 6), spacer (Figure 5, Item 4), washer (Figure 5, Item 2), and locknut (Figure 5, Item 1).

NOTE

Assistant will help with Steps (5) through (7).

3. Holding forward-rear axle propeller shaft (Figure 5, Item 17) on brake drum studs (Figure 5, Item 22) and forward-rear axle flange (Figure 5, Item 14), install center bearing (Figure 5, Item 18) on bracket (Figure 5, Item 9) with two washers (Figure 5, Item 23), screws (Figure 5, Item 24), and locknuts (Figure 5, Item 19).
4. Install flange (Figure 5, Item 21) on eight transfer case brake drum studs (Figure 5, Item 22) with locknuts (Figure 5, Item 20). Tighten locknuts 32 to 40 lb-ft (43 to 54 N·m) in alternate sequence.
5. Install vibration dampener (Figure 5, Item 12) and flange (Figure 5, Item 15) on forward-rear flange (Figure 5, Item 14) with eight screws (Figure 5, Item 13) and locknuts (Figure 5, Item 16). Tighten locknuts 30 to 40 lb-ft (43 to 54 N·m).

INSTALLATION - Continued

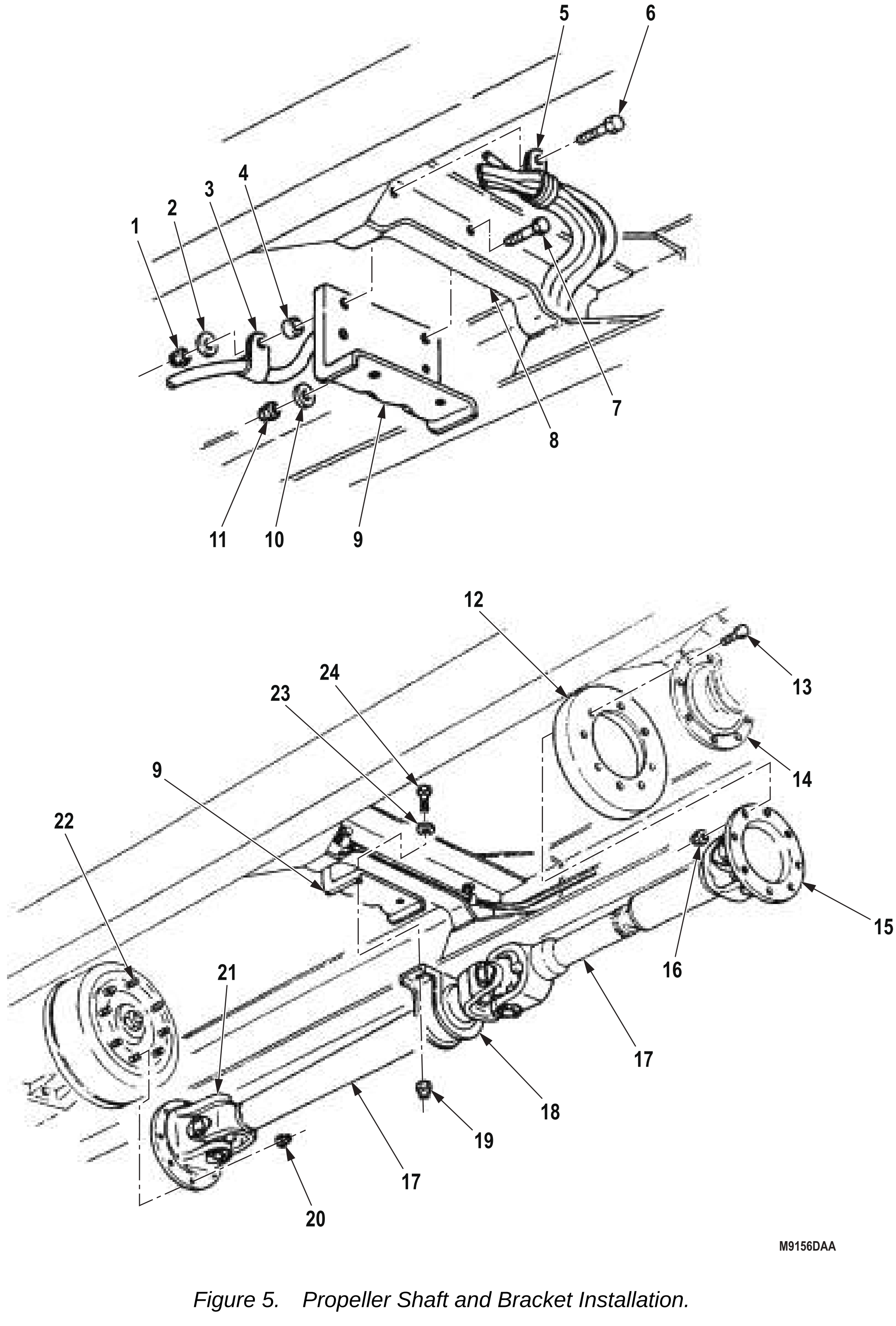


Figure 5. Propeller Shaft and Bracket Installation.

INSTALLATION - Continued

NOTE

Perform Steps (8) through (12) only for vehicles equipped with old propeller shaft.

6. Install dust cover (Figure 6, Item 5), spacer (Figure 6, Item 6), center bearing mounting bracket (Figure 6, Item 10), spacer (Figure 6, Item 23), dust cover (Figure 6, Item 22), and center bearing companion flange (Figure 6, Item 20) on forward propeller shaft (Figure 6, Item 4) with nut (Figure 6, Item 19). Tighten nut 100 to 115 lb-ft (136 to 156 N·m). If needed, turn nut clockwise to align nearest slot with hole in shaft to install cotter pin (Figure 6, Item 18).
7. Install cotter pin (Figure 6, Item 18) on nut (Figure 6, Item 19) and forward propeller shaft (Figure 6, Item 4).

NOTE

Assistant will help with Steps (10) through (14).

8. Install center bearing mounting bracket (Figure 6, Item 10) on crossmember (Figure 6, Item 9) with four screws (Figure 6, Item 8) and locknuts (Figure 6, Item 7).

NOTE

Position rear-rear propeller shaft so that grease fitting on U-joint faces downward. Refer to new configuration for Steps (13) and (14).

9. Install rear propeller shaft (Figure 6, Item 15) companion flange (Figure 6, Item 16) on center bearing companion flange (Figure 6, Item 20) with eight screws (Figure 6, Item 17) and locknuts (Figure 6, Item 21). Tighten locknuts 30 to 40 lb-ft (41 to 54 N·m).
10. Install spacer (Figure 6, Item 6) and dust cover (Figure 6, Item 5) on forward propeller shaft front section (Figure 6, Item 4).
11. Install forward propeller shaft front section (Figure 6, Item 4) on forward propeller shaft aft section (Figure 6, Item 24).
12. Install rear propeller shaft yoke flange (Figure 6, Item 14) on forward-rear axle yoke flange (Figure 6, Item 11) with eight screws (Figure 6, Item 13) and locknuts (Figure 6, Item 12).
13. Install transfer case shaft yoke flange (Figure 6, Item 2) on transfer case brake drum (Figure 6, Item 1) with eight locknuts (Figure 6, Item 3).

INSTALLATION - Continued

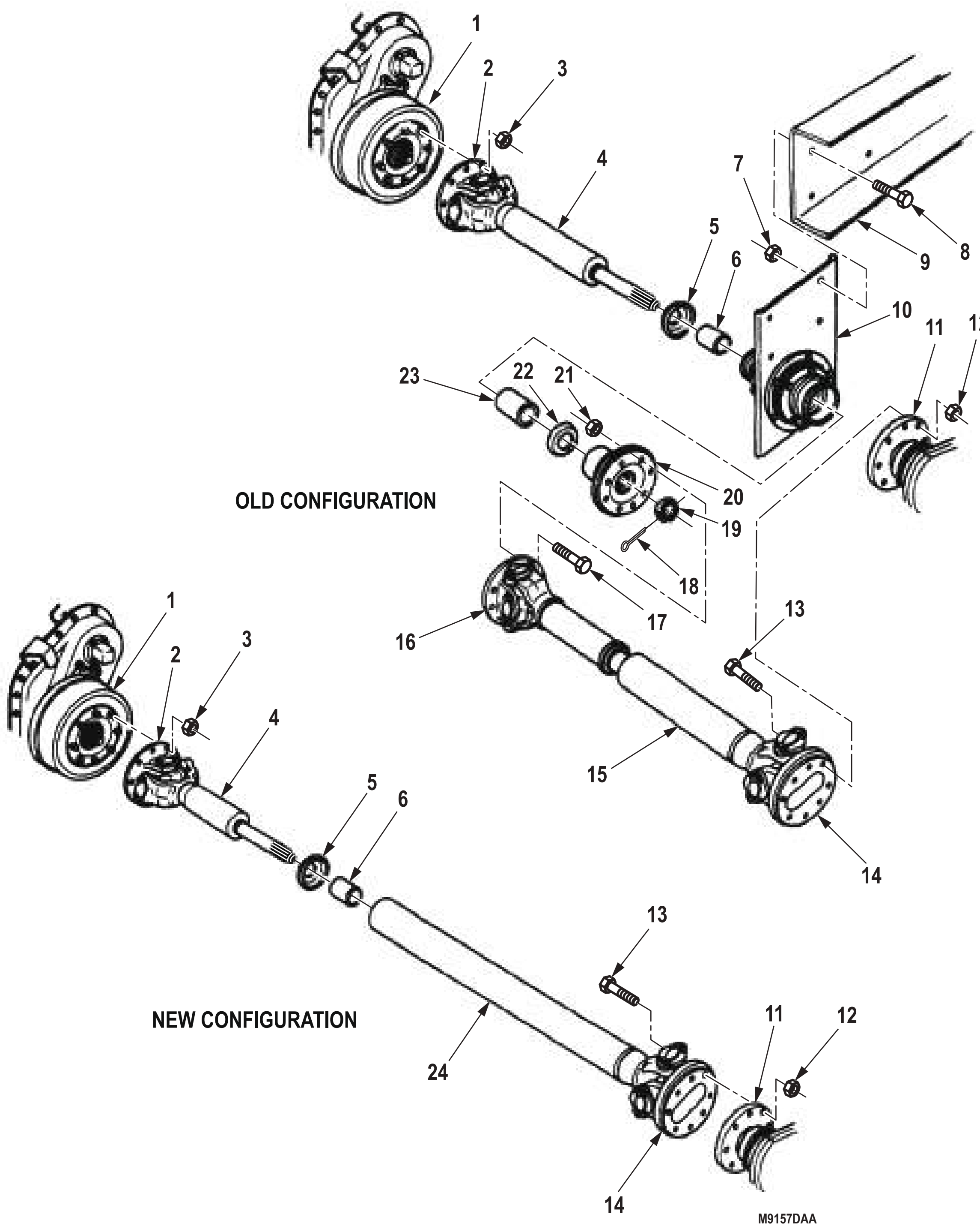


Figure 6. Propeller Shaft Installation.

END OF TASK

FOLLOW-ON MAINTENANCE

Lubricate propeller shaft universal joints. (Volume 5, WP 0820)

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
TRANSFER CASE TO FRONT AXLE PROPELLER SHAFT REPAIR

INITIAL SETUP:

Tools and Special Tools

Tool Kit, General Mechanic's: Automotive
(Volume 5, WP 0826, Table 1, Item 56)
Wrench, Torque, Click, Ratcheting, 3/8" Drive, 75 Ft-Lb
(Volume 5, WP 0826, Table 1, Item 62)

Materials/Parts

Locknut
(Volume 5, WP 0827, Table 1, Item 285)
Qty: 16
Lockwasher
(Volume 5, WP 0827, Table 1, Item 404)
Qty: 2

References

Volume 5, WP 0820

Equipment Condition

Parking brake set. (TM 9-2320-272-10)
Wheels chocked. (TM 9-2320-272-10)

REMOVAL

NOTE

Step (1) refers to M939/A1 vehicles only.

1. Remove two screws (Figure 1, Item 4), lockwashers (Figure 1, Item 5), and center bearing bracket (Figure 1, Item 6) from bracket (Figure 1, Item 7). Discard lockwashers.
2. Remove eight locknuts (Figure 1, Item 10) and screws (Figure 1, Item 8) from propeller shaft flange (Figure 1, Item 11) and differential flange (Figure 1, Item 9). Discard locknuts.
3. Remove eight locknuts (Figure 1, Item 1) and screws (Figure 1, Item 2) from propeller shaft flange (Figure 1, Item 12) and transfer case flange (Figure 1, Item 13). Discard locknuts.
4. Remove transfer case to front propeller shaft assembly (Figure 1, Item 3).

REMOVAL - Continued

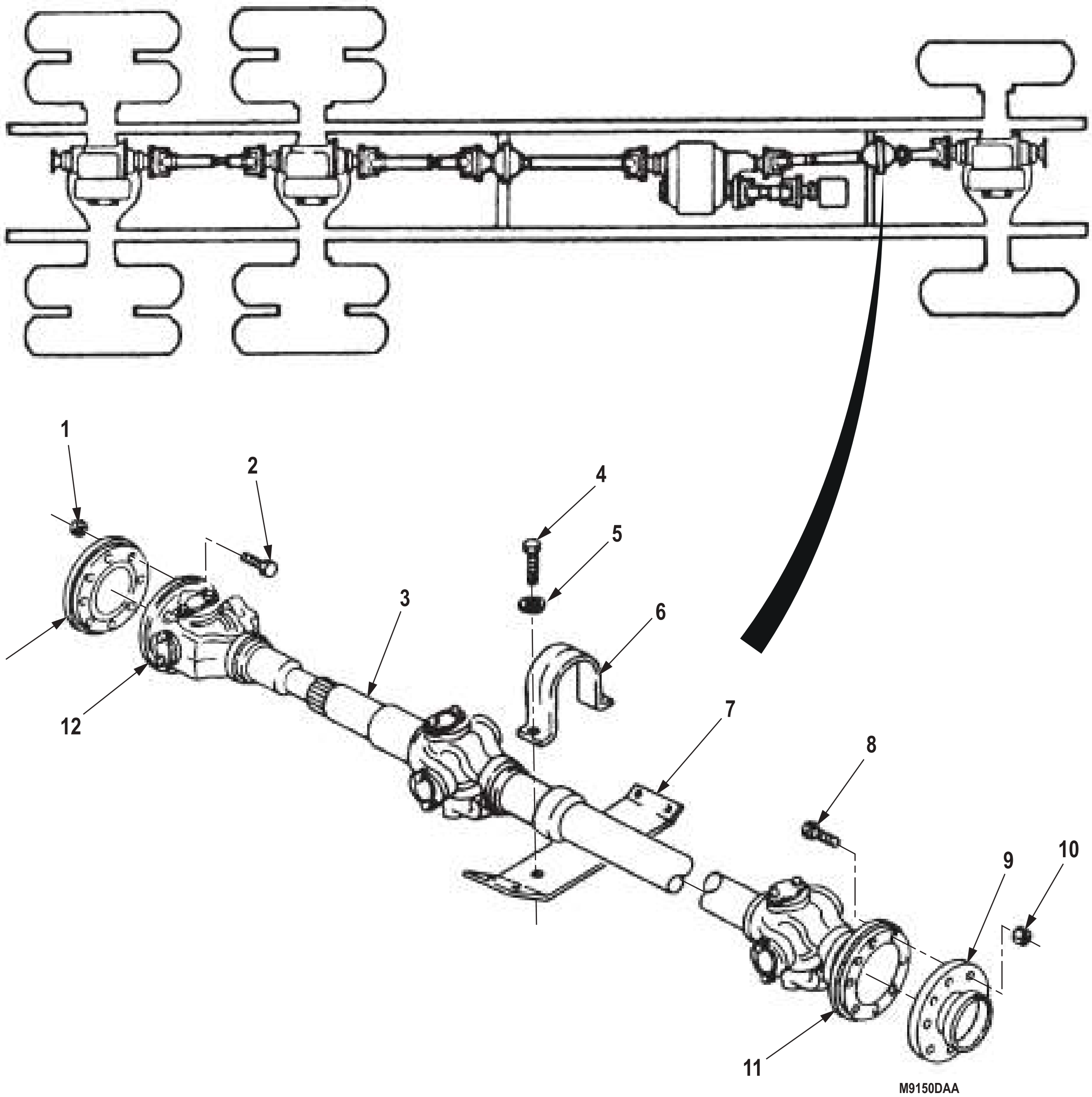


Figure 1. Propeller Shaft Removal.

END OF TASK

INSTALLATION

1. Install transfer case to front axle propeller shaft assembly (Figure 2, Item 3) on transfer case flange (Figure 2, Item 11) with eight screws (Figure 2, Item 2) and locknuts (Figure 2, Item 1). Tighten locknuts 32 to 40 lb-ft (43 to 54 N·m).
2. Install transfer case to front axle propeller shaft assembly (Figure 2, Item 3) on differential flange (Figure 2, Item 9) with eight screws (Figure 2, Item 8) and locknuts (Figure 2, Item 10). Tighten locknuts 32 to 40 lb-ft (43 to 54 N·m).

NOTE

Step (3) refers to M939/A1 vehicles only.

3. Install center bearing bracket (Figure 2, Item 6) on bracket (Figure 2, Item 7) with two lockwashers (Figure 2, Item 5) and screws (Figure 2, Item 4).

INSTALLATION - Continued

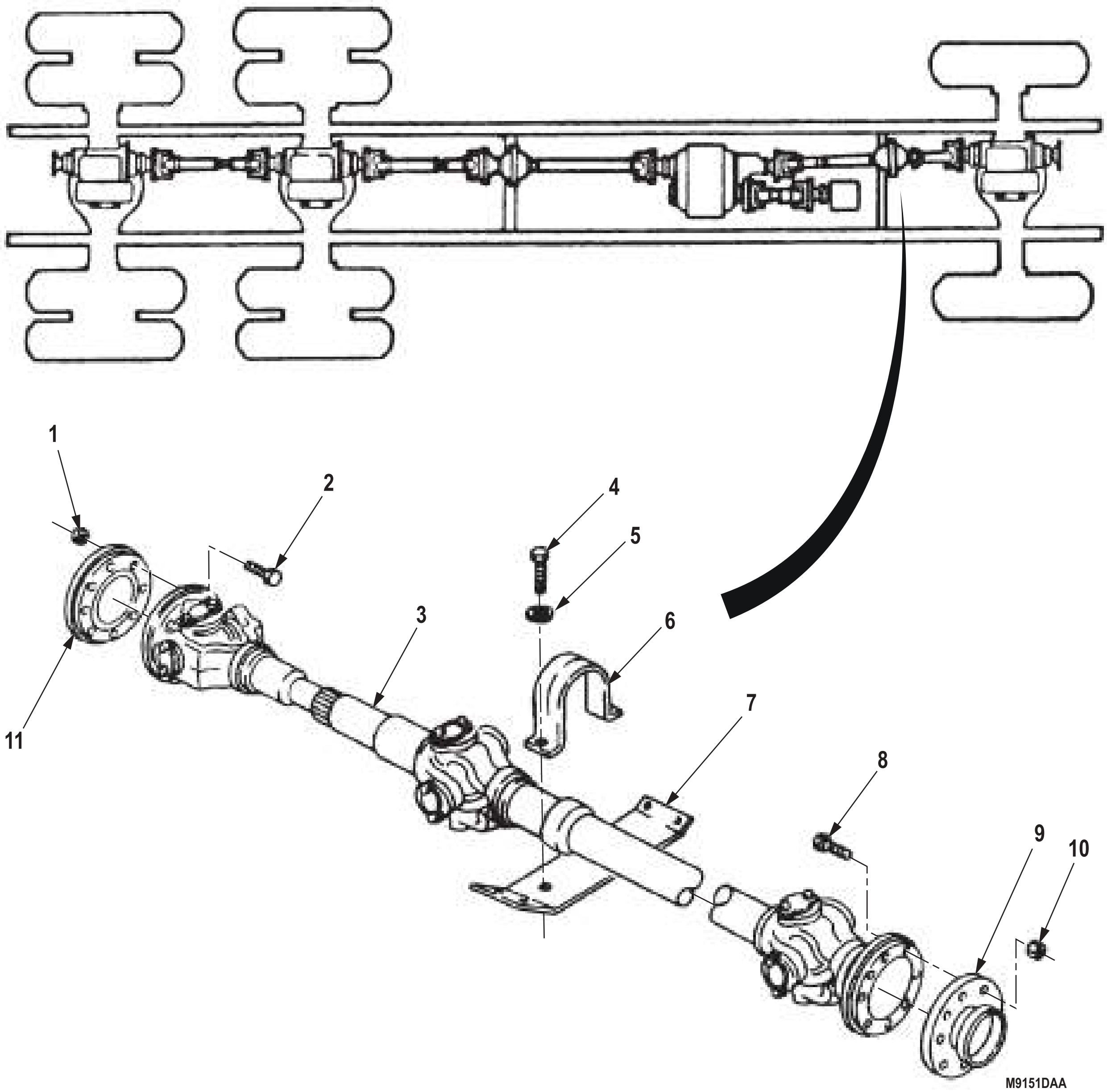


Figure 2. Propeller Shaft Installation.

END OF TASK

FOLLOW-ON MAINTENANCE

Lubricate propeller shaft universal joints. (Volume 5, WP 0820)

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
TRANSMISSION TO TRANSFER CASE PROPELLER SHAFT REPAIR

INITIAL SETUP:

Tools and Special Tools
Tool Kit, General Mechanic's: Automotive
(Volume 5, WP 0826, Table 1, Item 56)
Wrench, Torque, Click, Ratcheting, 1/2" Drive, 250 Ft-Lb
(Volume 5, WP 0826, Table 1, Item 63)

Materials/Parts
Lockwasher
(Volume 5, WP 0827, Table 1, Item 445)
Qty: 16
Universal Joint Kit
(Volume 5, WP 0827, Table 1, Item 261)

References
Volume 5, WP 0820

Equipment Condition
Parking brake set. (TM 9-2320-272-10)
Wheels chocked. (TM 9-2320-272-10)

REMOVAL

1. Place transfer case lever (Figure 1, Item 1) in high position.

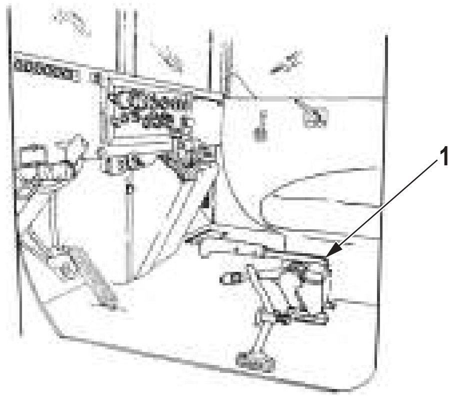


Figure 1. Transmission To Transfer Case Propeller Shaft Removal.

2. Remove four screws (Figure 2, Item 3) and lockwashers (Figure 2, Item 2) from transmission yoke (Figure 2, Item 1) and transfer case yoke (Figure 2, Item 4). Discard lockwashers.
3. Place transfer case lever (Figure 1, Item 1) in neutral position.
4. Turn propeller shaft (Figure 2, Item 5) until remaining screws (Figure 2, Item 3) can be seen.
5. Place transfer case lever (Figure 1, Item 1) in high position.
6. Remove four remaining screws (Figure 2, Item 3), lockwashers (Figure 2, Item 2), and propeller shaft (Figure 2, Item 5) from transmission yoke (Figure 2, Item 1) and transfer case yoke (Figure 2, Item 4). Discard lockwashers.

REMOVAL - Continued

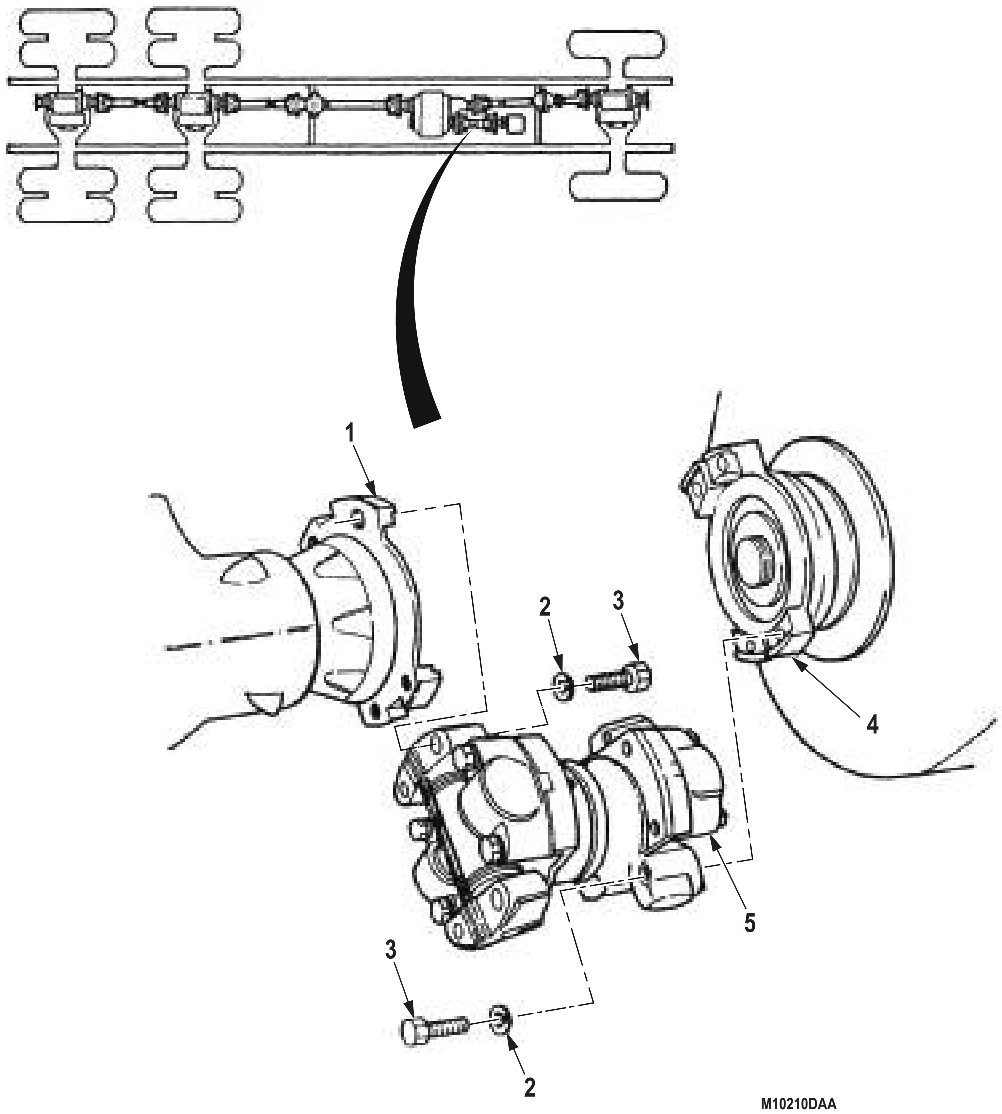


Figure 2. Propeller Shaft Removal.

END OF TASK

DISASSEMBLY

1. Remove grease fitting (Figure 3, Item 3) from input yoke (Figure 3, Item 2).
2. Remove eight screws (Figure 3, Item 4), lockwashers (Figure 3, Item 5), and two cross assemblies (Figure 3, Item 1) from input yoke (Figure 3, Item 2). Discard lockwashers.

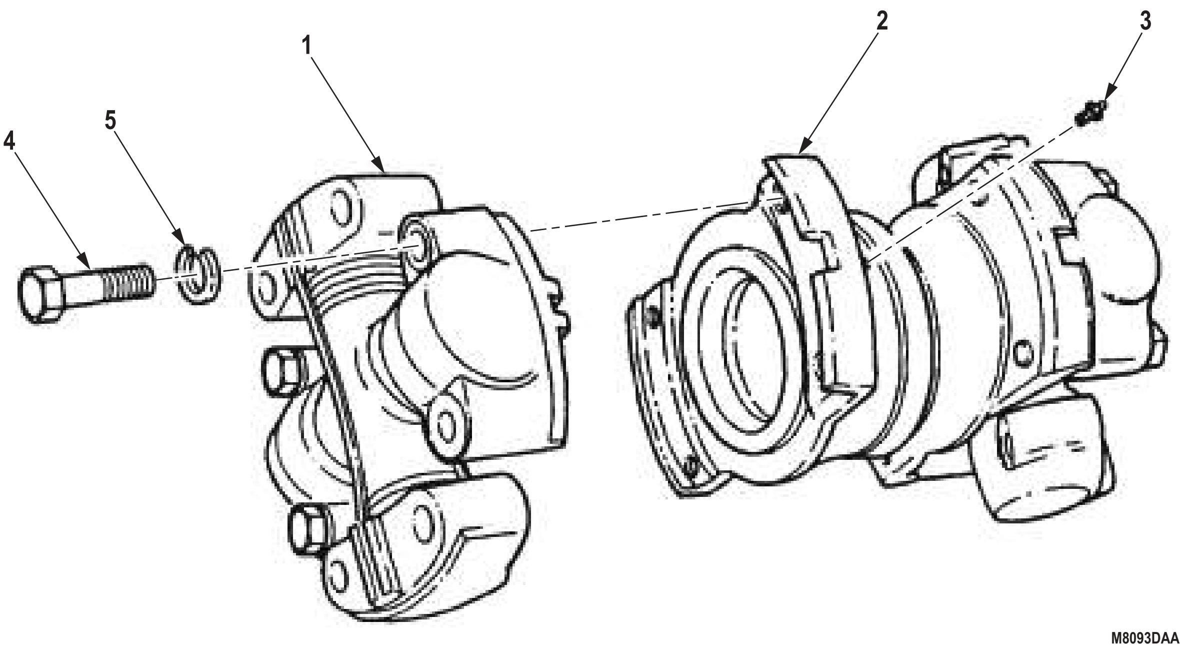


Figure 3. Yoke Disassembly.

3. Separate input yoke (Figure 4, Item 1) from output yoke (Figure 4, Item 3). Replace oil seal (Figure 4, Item 2) if damaged.

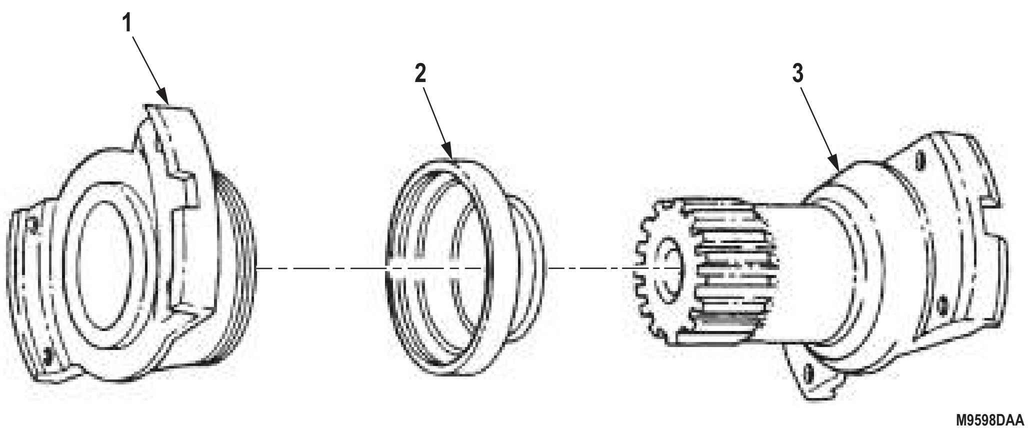


Figure 4. Yoke Disassembly.

END OF TASK

ASSEMBLY

NOTE

Perform Step (1) only if seal was removed.

1. Install seal assembly (Figure 5, Item 2) over splined output yoke (Figure 5, Item 3).
2. Install output yoke (Figure 5, Item 3) into input yoke (Figure 5, Item 1).

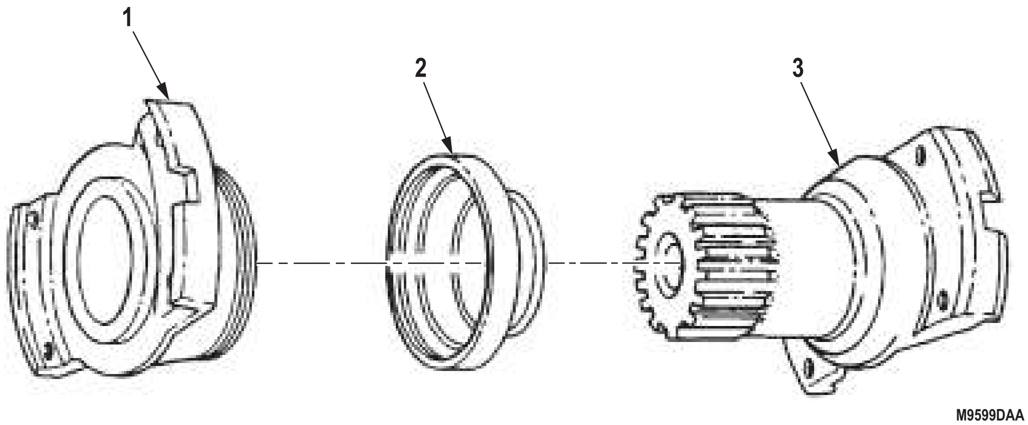


Figure 5. Yoke Assembly.

3. Install two cross assemblies (Figure 6, Item 1) on input yoke (Figure 6, Item 2) with eight lockwashers (Figure 6, Item 5) and screws (Figure 6, Item 4).
4. Install grease fitting (Figure 6, Item 3) on input yoke (Figure 6, Item 2).

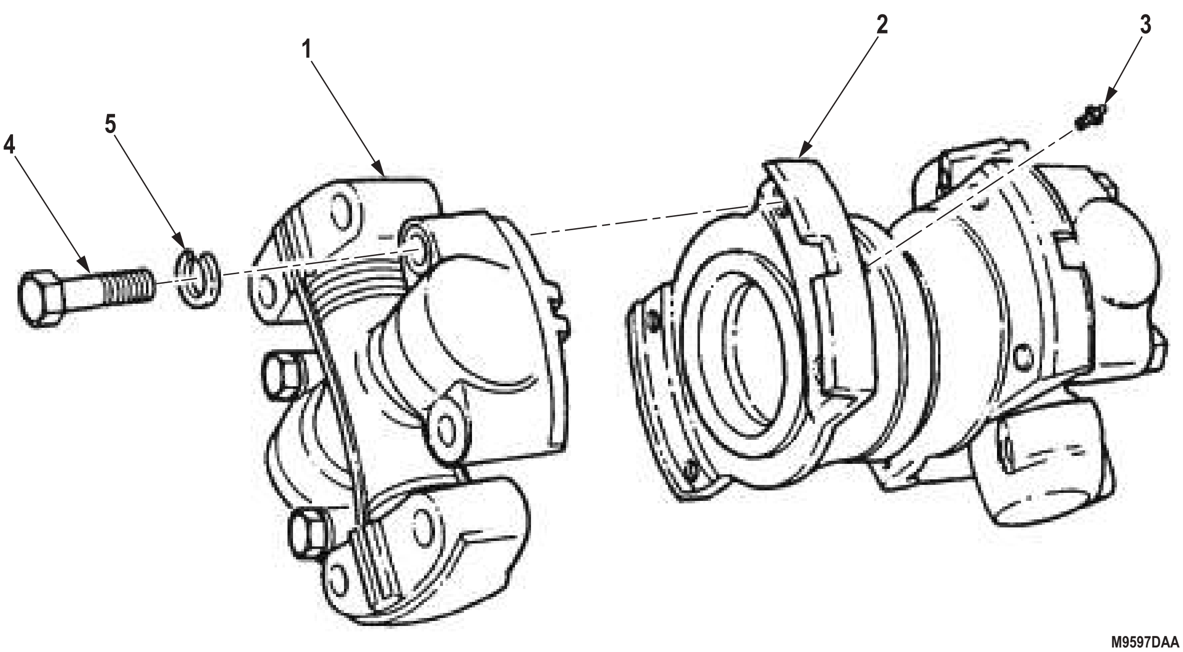


Figure 6. Yoke Assembly.

END OF TASK

INSTALLATION

1. Install propeller shaft (Figure 7, Item 5) between transmission yoke (Figure 7, Item 1) and transfer case yoke (Figure 7, Item 4) with four lockwashers (Figure 7, Item 2) and screws (Figure 7, Item 3). Tighten screws 90 to 110 lb-ft (122 to 149 N·m).

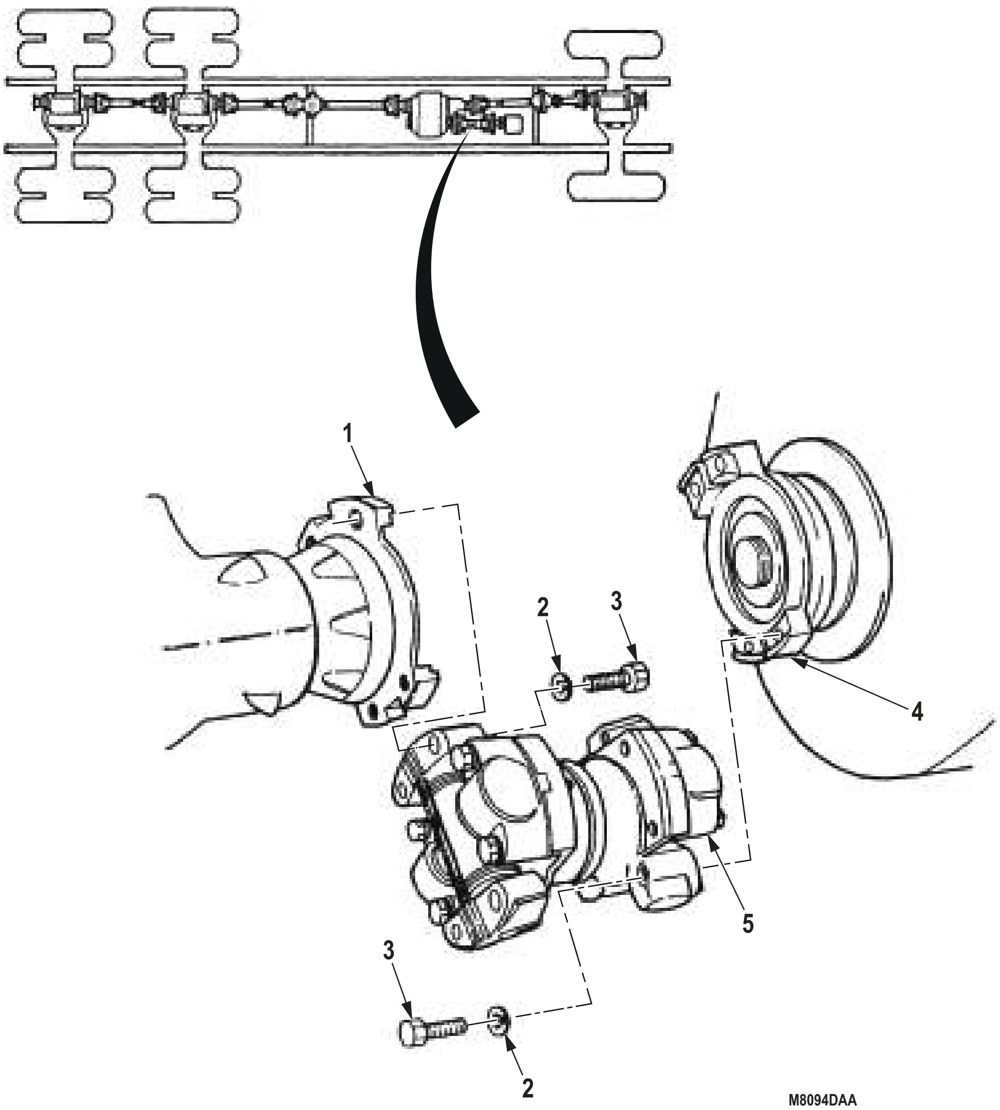


Figure 7. Propellor Shaft Installation.

2. Place transfer case lever (Figure 8, Item 1) in neutral position.

INSTALLATION - Continued

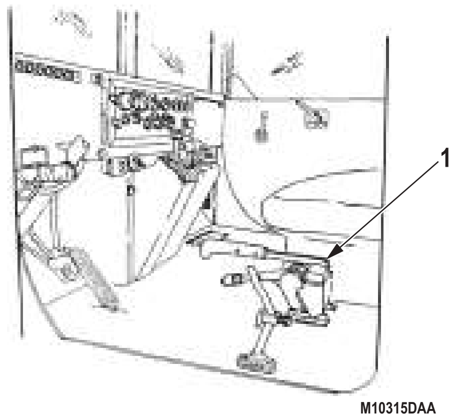


Figure 8. Propellor Shaft Installation.

3. Turn propeller shaft (Figure 7, Item 5) until remaining screws (Figure 7, Item 3) can be installed.
4. Place transfer case lever (Figure 8, Item 1) in high position.
5. Install propeller shaft (Figure 7, Item 5) between transmission yoke (Figure 7, Item 1) and transfer case yoke (Figure 7, Item 4) with four remaining lockwashers (Figure 7, Item 2) and screws (Figure 7, Item 3). Tighten screws 90 to 110 lb-ft (122 to 149 N·m).

END OF TASK

FOLLOW-ON MAINTENANCE

Lubricate propeller shaft universal joints. (Volume 5, WP 0820)

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
FRONT AXLE REPLACEMENT

INITIAL SETUP:

Tools and Special Tools

Tool Kit, General Mechanic's: Automotive
(Volume 5, WP 0826, Table 1, Item 56)
High Boy Jack Stands
(Volume 5, WP 0826, Table 1, Item 24)
Jack, Bottle
(Volume 5, WP 0826, Table 1, Item 31)
Wrench, Torque, Click, Ratcheting, 3/4" Drive, 600 Ft-Lb
(Volume 5, WP 0826, Table 1, Item 61)

Materials/Parts

Lubricating Oil, Gear, Multipurpose
(Volume 5, WP 0825, Table 1, Item 44, 45, 46, 47)
Tape, Antiseizing
(Volume 5, WP 0825, Table 1, Item 65)
Cotter Pin
(Volume 5, WP 0827, Table 1, Item 344)
Qty: 1
Cotter Pin
(Volume 5, WP 0827, Table 1, Item 347)
Qty: 1
Locknut (Volume 5, WP 0827, Table 1, Item 278)
Qty: 2

Materials/Parts (cont.)

Locknut (Volume 5, WP 0827, Table 1, Item 285)
Qty: 8
Lockwasher
(Volume 5, WP 0827, Table 1, Item 409)
Qty: 8

Personnel Required

(2)

References

WP 0510
Volume 5, WP 0820

Equipment Condition

Parking brake set. (TM 9-2320-272-10)
Rear wheels chocked. (TM 9-2320-272-10)
Air reservoirs drained. (TM 9-2320-272-10)
Front wheels removed. (WP 0484) (WP 0485)

REMOVAL

WARNING

Weight of vehicle must remain supported on jack stands at all times. Do not attempt to support weight of vehicle on hydraulic jack. Failure to comply may result in injury or death to personnel.

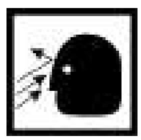
1. Position bottle jack (Figure 1, Item 4) under front axle differential housing (Figure 1, Item 5) and raise vehicle.
2. Position two jack stands (Figure 1, Item 3) under springs (Figure 1, Item 2), ahead of left and right spring hangers (Figure 1, Item 1).

NOTE

Do not fully lower bottle jack.

3. Lower bottle jack enough for springs (Figure 1, Item 2) to rest on jack stands.

WARNING



Do not disconnect air lines or hoses before draining air reservoirs. Small parts under pressure may shoot out with high velocity. Failure to comply may result in injury or death to personnel.

4. Disconnect primary line (Figure 1, Item 6) and vent line (Figure 1, Item 7) from left and right service brake chambers (Figure 1, Item 10).
5. Remove adapter (Figure 1, Item 8) and elbow (Figure 1, Item 9) from left and right service brake chambers (Figure 1, Item 10).

NOTE

- Perform Step (6) for M939A2 series vehicles.
- Perform Step (7) for left side of vehicle.
- Perform Steps (8) through (11) for right side of vehicle.

6. Disconnect two air lines (Figure 1, Item 21) from adapters (Figure 1, Item 22) on relief safety valve (Figure 1, Item 23).
7. Remove cotter pin (Figure 1, Item 12), nut (Figure 1, Item 11), and drag link (Figure 1, Item 14) from steering knuckle arm (Figure 1, Item 13). Discard cotter pin. Tie drag link away from steering knuckle arm.
8. Remove cotter pin (Figure 1, Item 15) from steering assist cylinder (Figure 1, Item 16). Discard cotter pin.
9. Bend tabs of clip (Figure 1, Item 17) away from felt pad (Figure 1, Item 18) and steering knuckle ball (Figure 1, Item 19).
10. Loosen adjustable plug (Figure 1, Item 20) and tap steering assist cylinder (Figure 1, Item 16) free from steering knuckle ball (Figure 1, Item 19). Tie steering assist cylinder away from steering knuckle ball.
11. Remove felt pad (Figure 1, Item 18) and clip (Figure 1, Item 17) from steering knuckle ball (Figure 1, Item 19).

REMOVAL - Continued

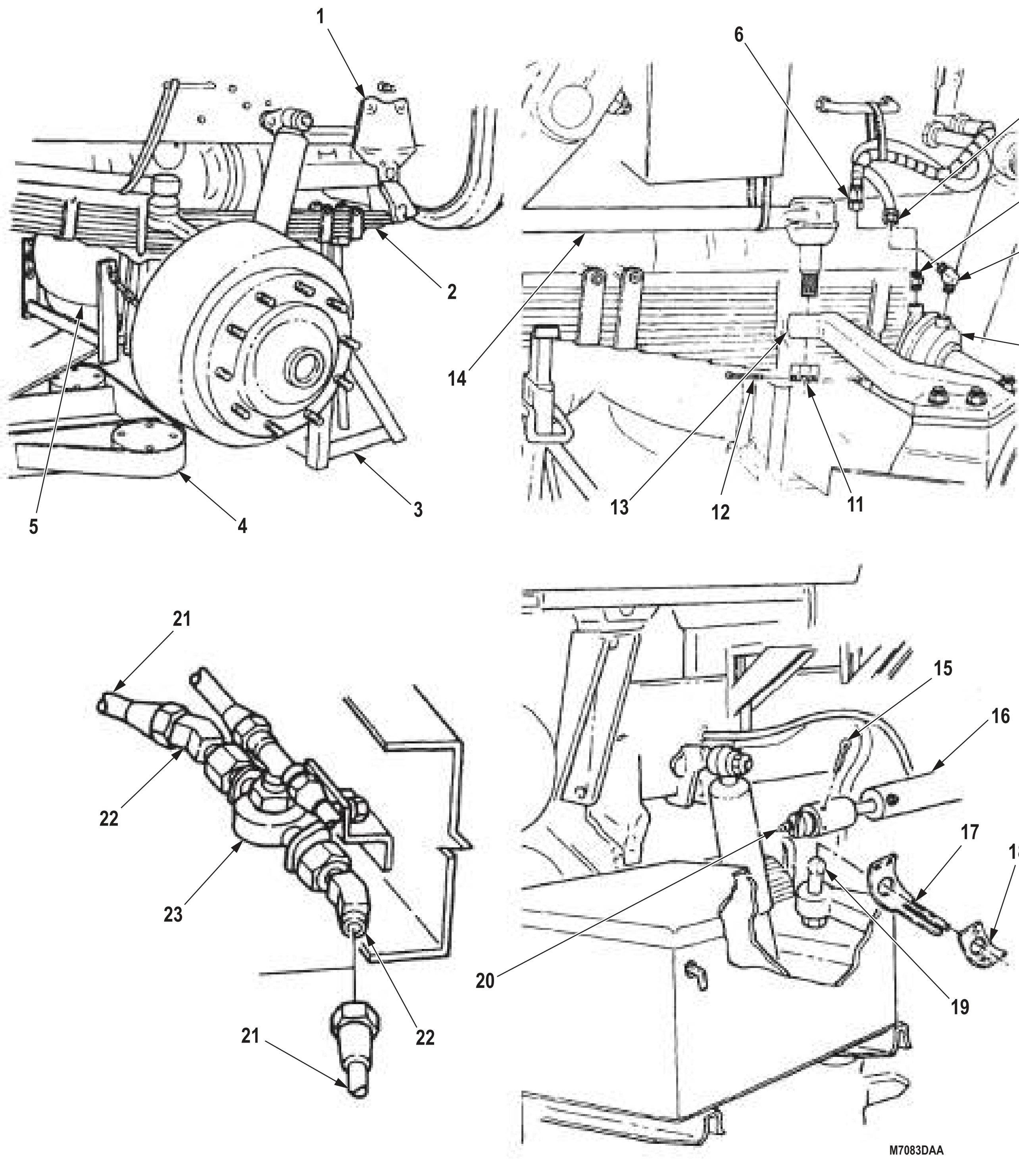


Figure 1. Front Axle Removal.

REMOVAL - Continued

12. Remove locknut (Figure 2, Item 12), washer (Figure 2, Item 11), and shock absorber (Figure 2, Item 2) from right and left lower spring seats (Figure 2, Item 8). Discard locknuts.
13. Remove eight locknuts (Figure 2, Item 3), screws (Figure 2, Item 6), and propeller shaft flange (Figure 2, Item 5) from differential flange (Figure 2, Item 4). Discard locknuts. Tie propeller shaft (Figure 2, Item 7) away from front axle (Figure 2, Item 13).
14. Remove eight nuts (Figure 2, Item 10), lockwashers (Figure 2, Item 9), and right and left lower spring seats (Figure 2, Item 8) from four spring U-bolts (Figure 2, Item 1). Discard lockwashers.
15. Lower bottle jack until front axle (Figure 2, Item 13) clears spring U-bolts (Figure 2, Item 1).
16. Remove right and left upper spring seats (Figure 2, Item 16) from front axle (Figure 2, Item 13) and anchor pins (Figure 2, Item 15).

NOTE

Assistant will help with Step (17).

17. Remove bottle jack and front axle (Figure 2, Item 13) from under vehicle.

REMOVAL - Continued

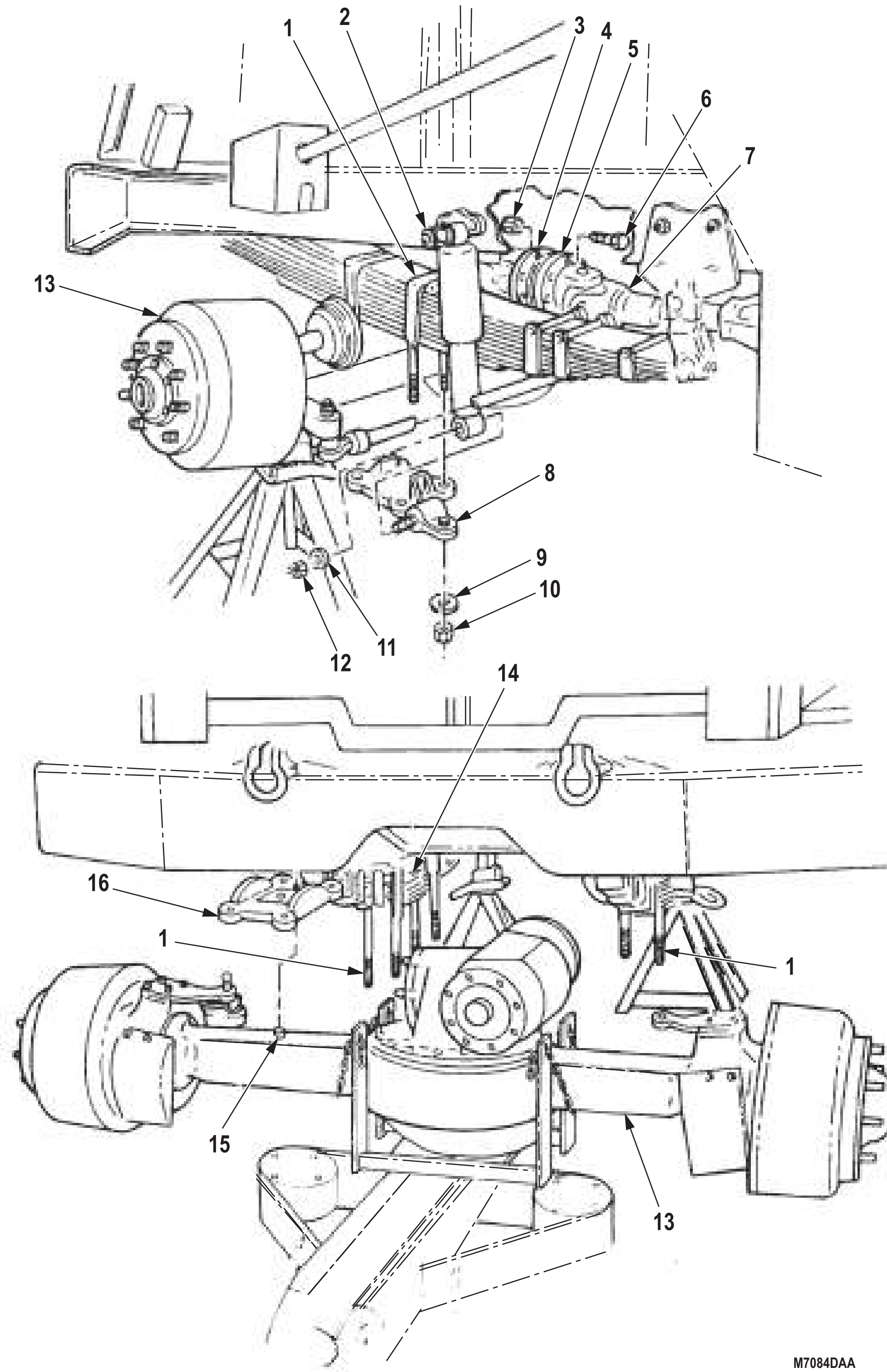


Figure 2. Front Axle Removal.

END OF TASK

INSTALLATION

CAUTION

When positioning front axle, ensure spring U-bolts are properly aligned so spring center bolt heads enter alignment holes in front axle spring seats. Axle anchor pins must align to upper spring seat brackets or damage to equipment will result.

1. Place front axle (Figure 3, Item 13) on bottle jack.
2. Position right and left upper spring seats (Figure 3, Item 16) over anchor pins (Figure 3, Item 15) on front axle (Figure 3, Item 13).

NOTE

Assistant will help with Step (3).

3. Raise bottle jack until spring U-bolts (Figure 3, Item 1) are through upper spring seats (Figure 3, Item 16) and springs (Figure 3, Item 14) rest on upper spring seats (Figure 3, Item 16).
4. Slide right and left lower spring seats (Figure 3, Item 8) through four U-bolts (Figure 3, Item 1) and install with eight lockwashers (Figure 3, Item 9) and nuts (Figure 3, Item 10). Tighten nuts (Figure 3, Item 10) 350 to 400 lb-ft (475 to 542 N·m).
5. Install propeller shaft (Figure 3, Item 7) and propeller shaft flange (Figure 3, Item 5) on differential flange (Figure 3, Item 4) with eight screws (Figure 3, Item 6) and locknuts (Figure 3, Item 3). Tighten locknuts (Figure 3, Item 3) 32 to 40 lb-ft (43 to 54 N·m).
6. Install shock absorber (Figure 3, Item 2) on right and left lower spring seats (Figure 3, Item 8) with washer (Figure 3, Item 11) and locknut (Figure 3, Item 12).

INSTALLATION - Continued

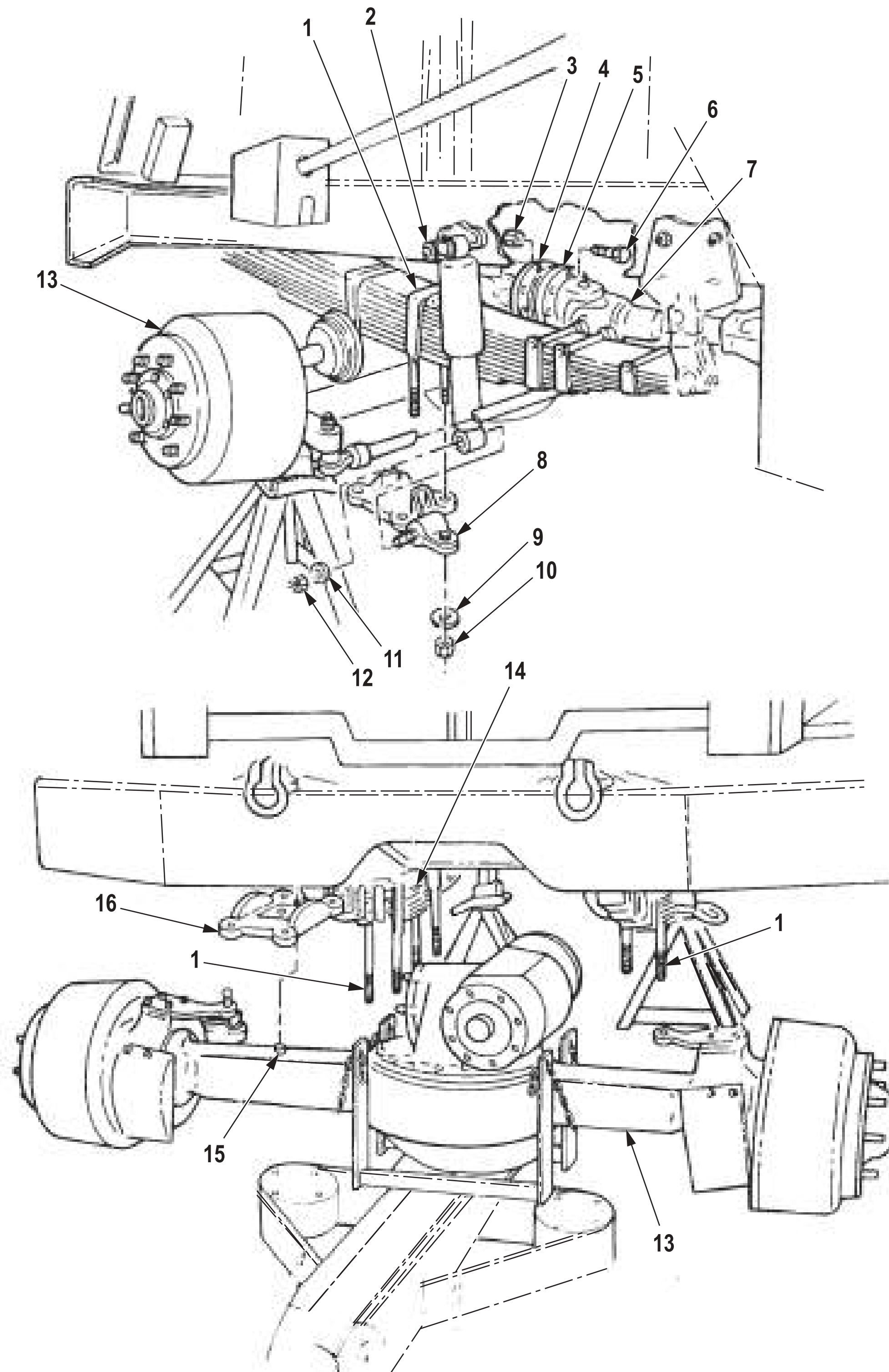


Figure 3. Front Axle Installation.

INSTALLATION - Continued

NOTE

- Perform Steps (7) through (10) for right side of vehicle.
- Soak felt pad in lubricating oil before installation.

7. Install clip (Figure 4, Item 4) and felt pad (Figure 4, Item 5) on steering knuckle ball (Figure 4, Item 6).
8. Install steering assist cylinder (Figure 4, Item 3) on steering knuckle ball (Figure 4, Item 6). Tighten adjustable plug (Figure 4, Item 7), then back off until slots align with holes (Figure 4, Item 1).
9. Install cotter pin (Figure 4, Item 2) on steering assist cylinder (Figure 4, Item 1).
10. Bend tabs of clip (Figure 4, Item 4) over felt pad (Figure 4, Item 5) and steering knuckle ball (Figure 4, Item 6).

NOTE

Perform Steps (11) and (12) for left side of vehicle.

11. Install drag link (Figure 4, Item 16) on steering knuckle arm (Figure 4, Item 15) with nut (Figure 4, Item 13). Tighten nut (Figure 4, Item 13) 140 to 180 lb-ft (190 to 244 N·m).
12. Install cotter pin (Figure 4, Item 14) in nut (Figure 4, Item 13) and drag link (Figure 4, Item 16).

NOTE

- Wrap all male pipe threads with antiseize tape before installation.
- Perform Step (13) for M939A2 series vehicles.

13. Connect two air lines (Figure 4, Item 17) to adapters (Figure 4, Item 18) on relief safety valve (Figure 4, Item 19).
14. Install elbow (Figure 4, Item 11) and adapter (Figure 4, Item 9) on left and right service brake chambers (Figure 4, Item 12).
15. Connect two primary lines (Figure 4, Item 8) and vent lines (Figure 4, Item 10) to elbows (Figure 4, Item 11) and adapters (Figure 4, Item 9).

INSTALLATION - Continued

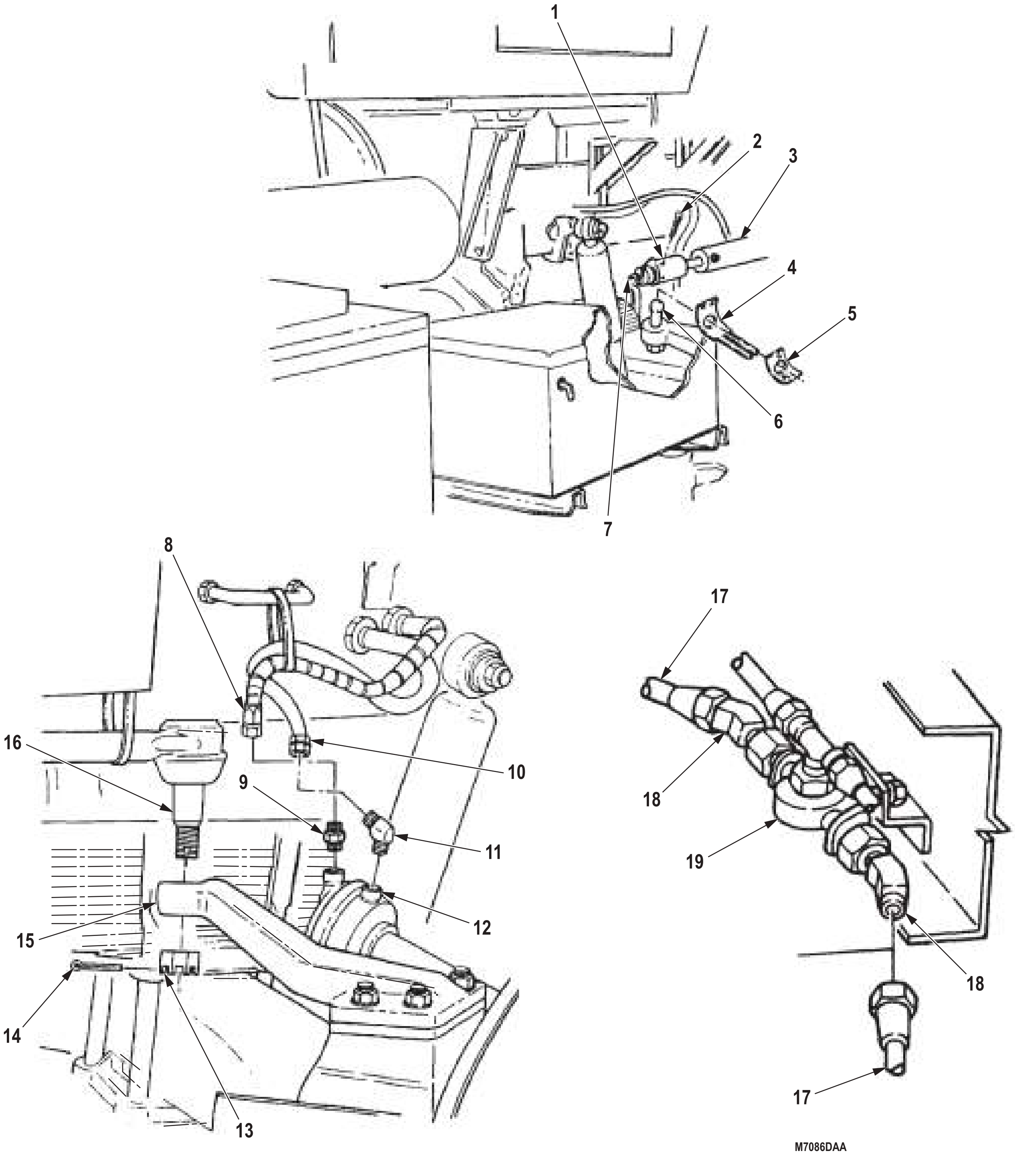


Figure 4. Front Axle Installation.

END OF TASK

FOLLOW-ON MAINTENANCE

1. Install front wheels. (WP 0484) or (WP 0485)
2. Lubricate front axle. (Volume 5, WP 0820)
3. Check and adjust steering assist cylinder travel. (WP 0510)
4. Start engine, check for air leaks, and road test vehicle. (TM 9-2320-272-10)

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
FRONT AXLE BREATHER REPLACEMENT

INITIAL SETUP:

Tools and Special Tools
Tool Kit, General Mechanic's: Automotive (Volume 5, WP 0826, Table 1, Item 56)

Equipment Condition
Parking brake set. (TM 9-2320-272-10)

REMOVAL

Remove breather assembly (Figure 1, Item 1) from axle housing (Figure 1, Item 2).

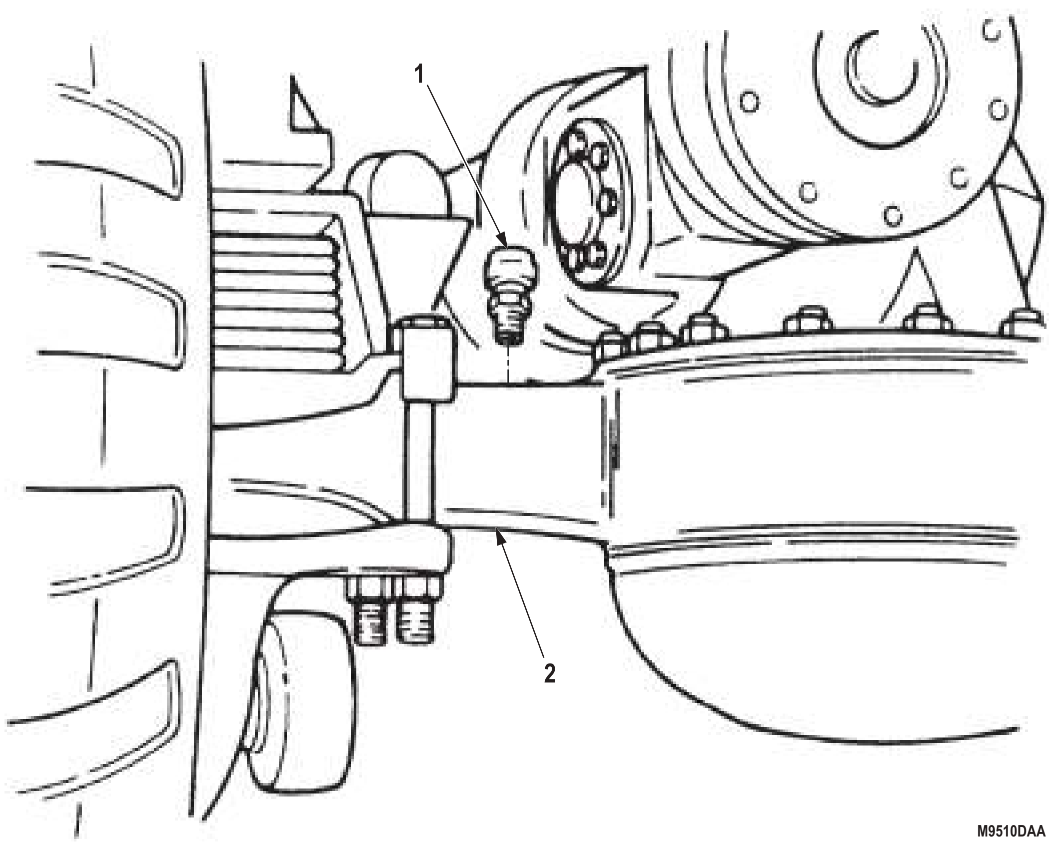


Figure 1. Front Axle Breather Removal.

END OF TASK

INSTALLATION

Install breather (Figure 2, Item 1) on axle housing (Figure 2, Item 2).

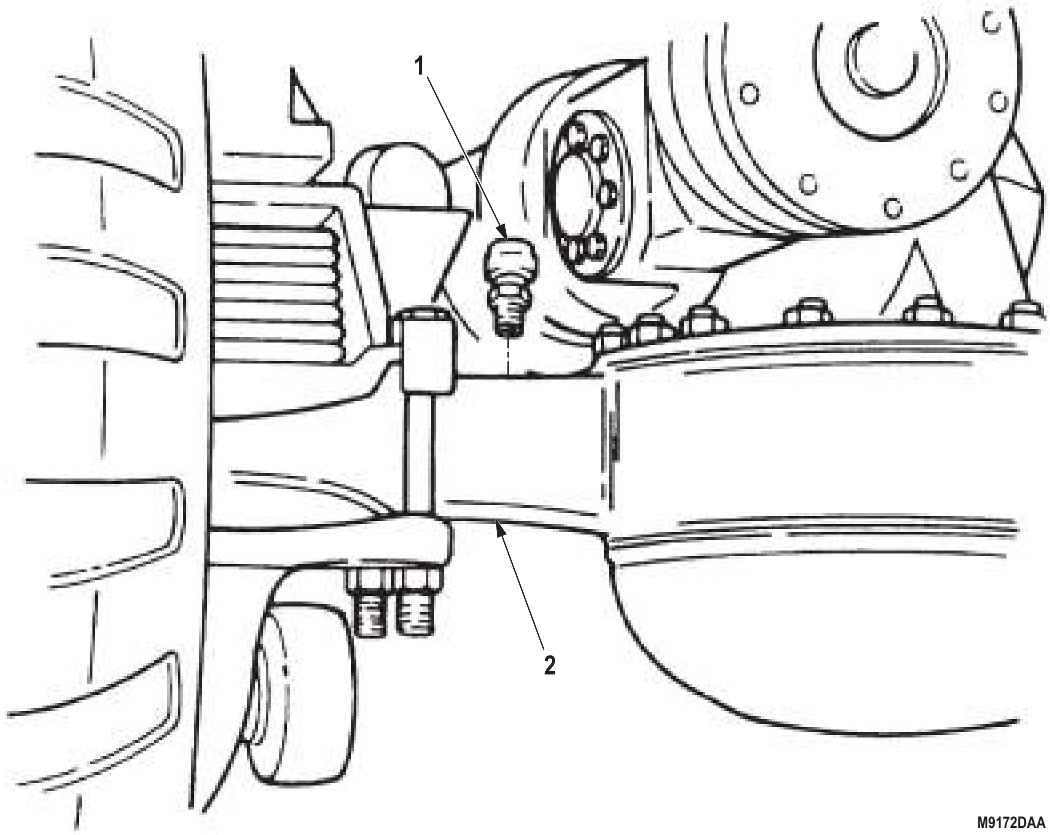


Figure 2. Front Axle Breather Installation.

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
FRONT AND REAR AXLE CARRIER DIFFERENTIAL REPLACEMENT

INITIAL SETUP:

Tools and Special Tools
Tool Kit, General Mechanic's: Automotive
(Volume 5, WP 0826, Table 1, Item 56)
Chain Assembly
(Volume 5, WP 0826, Table 1, Item 15)
Lifting Device
Wrench, Torque, Click, Ratcheting, 1/2" Drive,
250 Ft-Lb
(Volume 5, WP 0826, Table 1, Item 63)

Materials/Parts
Adhesive, Silicone Rubber
(Volume 5, WP 0825, Table 1, Item 4)
Cleaning Compound, Solvent
(Volume 5, WP 0825, Table 1, Item 16, 17)
Cloth, Abrasive: Crocus
(Volume 5, WP 0825, Table 1, Item 18)

Personnel Required
(2)

References
TM 9-2320-272-10
Volume 5, WP 0820

Equipment Condition
Front axle differential drained.
Front axle removed. (WP 0404)
Front axle shafts removed. (WP 0411)

REMOVAL

NOTE

Front and rear axle carrier differentials are replaced the same way. This procedure covers replacement of front axle carrier differential.

1. Remove 18 nuts (Figure 1, Item 4) and washers (Figure 1, Item 5) from carrier differential (Figure 1, Item 1) and axle housing (Figure 1, Item 6).
2. Attach chain (Figure 1, Item 3) and lifting device (Figure 1, Item 2) to carrier differential (Figure 1, Item 1).

WARNING

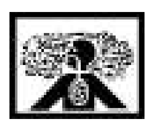
All personnel must stand clear during lifting operations. A shifting or swinging load may cause injury to personnel. Failure to comply may result in injury or death to personnel.

CAUTION

When lifting carrier differential out of axle housing, use care not to damage mounting studs. Direct assistant to guide carrier differential out of axle housing.

3. Remove carrier differential (Figure 1, Item 1) from axle housing (Figure 1, Item 6).

WARNING



Solvent cleaning compound is flammable and toxic. Do not use near an open flame and always have a fire extinguisher nearby when solvents are used. Use only in well-ventilated places, wear protective clothing, and dispose of cleaning rags in approved container. Failure to comply may result in damage to equipment, injury, or death to personnel.

4. Using wire brush and cleaning solvent, clean sealing compound from threads of mounting studs (Figure 1, Item 7).
5. Inspect mating surfaces of differential flange (Figure 1, Item 8) and axle housing (Figure 1, Item 6) for nicks, burrs, and cracks. Remove any light burring with crocus cloth. Replace differential flange or axle housing if cracked, nicked, or heavily burred.
6. Inspect mounting studs (Figure 1, Item 7) for bends or damaged threads. Replace mounting studs if bent or threads are damaged.

REMOVAL - Continued

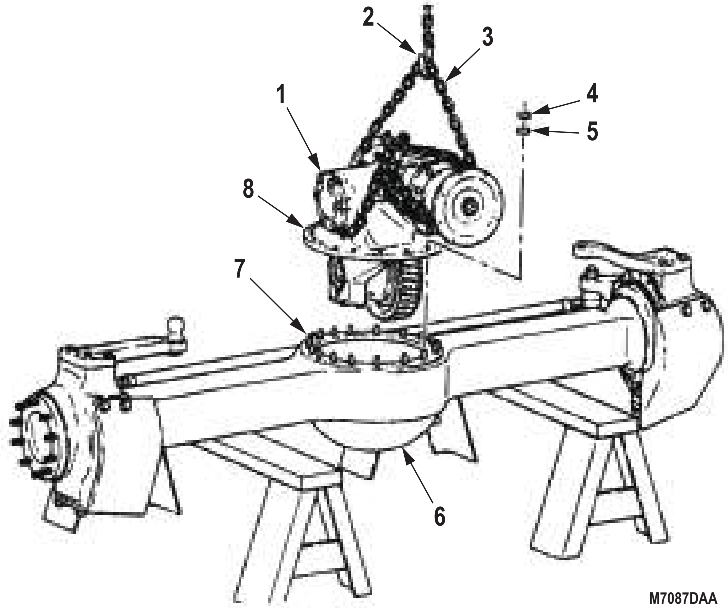


Figure 1. Front and Rear Axle Carrier Differential Removal.

END OF TASK

INSTALLATION

NOTE

Differential flange and axle housing mating surfaces must be absolutely clean before applying sealing compound.

1. Apply generous but even amount of sealing compound around mating surfaces of differential flange (Figure 2, Item 8), axle housing (Figure 2, Item 6), and threads of mounting studs (Figure 2, Item 7).
2. Attach chain (Figure 2, Item 3) and lifting device (Figure 2, Item 2) to carrier assembly (Figure 2, Item 1).

WARNING

All personnel must stand clear during lifting operations. A shifting or swinging load may cause injury to personnel. Failure to comply may result in injury or death to personnel.

CAUTION

When installing carrier differential on axle housing, use care not to damage mounting studs. Direct assistant to guide carrier differential into axle housing.

3. Position carrier assembly (Figure 2, Item 1) on axle housing (Figure 2, Item 6) and install 18 washers (Figure 2, Item 5) and nuts (Figure 2, Item 4). Tighten nuts 160 to 205 lb-ft (217 to 278 N·m).
4. Remove lifting device (Figure 2, Item 2) and chain (Figure 2, Item 3) from carrier assembly (Figure 2, Item 1).

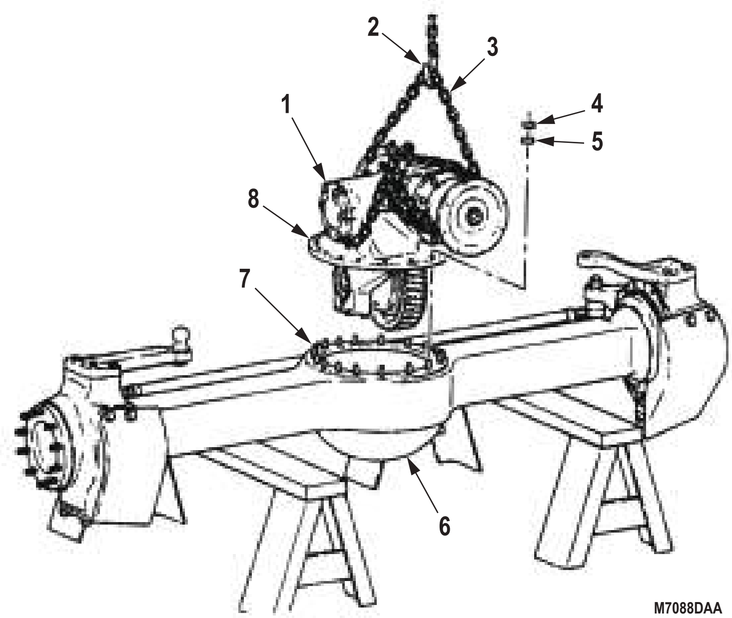


Figure 2. Front and Rear Axle Carrier Differential Installation.

END OF TASK

FOLLOW-ON MAINTENANCE

1. Install front axle shafts. (WP 0411)
2. Install front axle. (WP 0404)
3. Fill differential carrier to proper oil level. (Volume 5, WP 0820)
4. Start engine and road test vehicle. (TM 9-2320-272-10)

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
FRONT DIFFERENTIAL OIL SEAL REPLACEMENT

INITIAL SETUP:

Tools and Special Tools

Tool Kit, General Mechanic's: Automotive
(Volume 5, WP 0826, Table 1, Item 56)
Puller Kit, Mechanical
(Volume 5, WP 0826, Table 1, Item 41)
Wrench, Torque, Click, Ratcheting, 1/2" Drive, 250 Ft-Lb
(Volume 5, WP 0826, Table 1, Item 63)
Wrench, Torque, Click, Ratcheting, 3/4" Drive, 600 Ft-Lb
(Volume 5, WP 0826, Table 1, Item 61)

Materials/Parts

Grease, Automotive and Artillery
(Volume 5, WP 0825, Table 1, Item 29, 30, 31, 32, 33)
Sealing Compound
(Volume 5, WP 0825, Table 1, Item 61)

Materials/Parts (cont.)

Cotter Pin
(Volume 5, WP 0827, Table 1, Item 346)
Qty: 2
Gasket (Volume 5, WP 0827, Table 1, Item 5)
Qty: 1
Gasket (Volume 5, WP 0827, Table 1, Item 7)
Qty: 1
Oil Seal (Volume 5, WP 0827, Table 1, Item 33)
Qty: 1

Equipment Condition

Parking brake set. (TM 9-2320-272-10)
Rear wheels chocked. (TM 9-2320-272-10)
Propeller shaft removed. (WP 0402)

REMOVAL

1. Remove cotter pin (Figure 1, Item 9) and nut (Figure 1, Item 8) from driveshaft (Figure 1, Item 5). Discard cotter pin.
2. Using mechanical puller, remove companion flange (Figure 1, Item 10) from driveshaft (Figure 1, Item 5).

CAUTION

Do not jam any tool between differential and pinion shaft retainer when removing front bearing cover. Shims will be damaged.

3. Remove eight screws (Figure 1, Item 7), washers (Figure 1, Item 6), front bearing cover (Figure 1, Item 11), and gasket (Figure 1, Item 3) from differential carrier (Figure 1, Item 4). Discard gasket.
4. Remove oil seal (Figure 1, Item 2) and gasket (Figure 1, Item 1) from front bearing cover (Figure 1, Item 11). Discard oil seal and gasket.

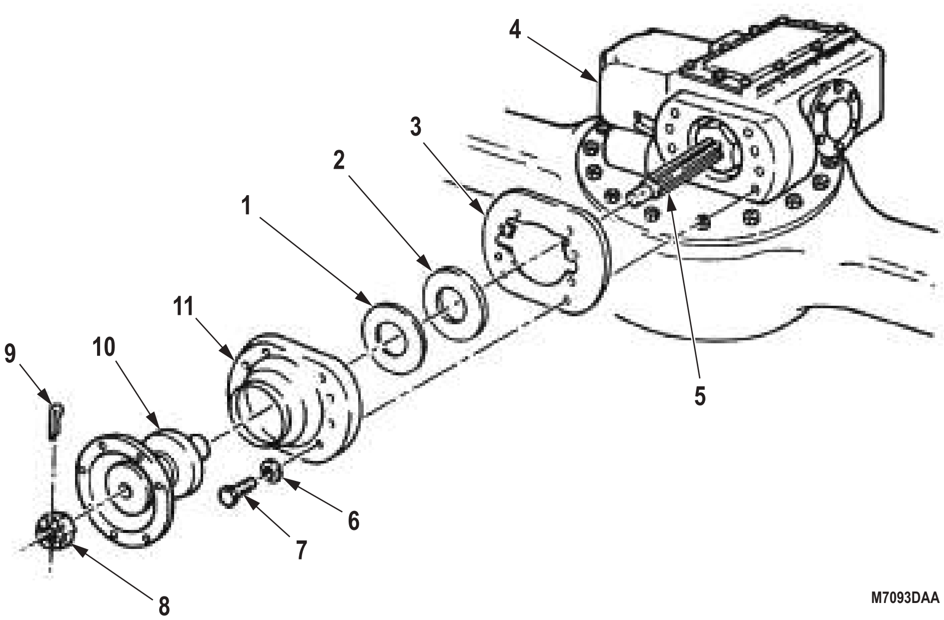


Figure 1. Front Differential Oil Seal Removal.

END OF TASK

INSTALLATION

1. Position gasket (Figure 2, Item 1) in front bearing cover (Figure 2, Item 11).
2. Apply GAA grease to inside diameter of oil seal (Figure 2, Item 2). Apply sealing compound to outside diameter of oil seal.
3. Install oil seal (Figure 2, Item 2) in front bearing cover (Figure 2, Item 11).
4. Apply sealing compound to mating surfaces of gasket (Figure 2, Item 3).
5. Install gasket (Figure 2, Item 3) and front bearing cover (Figure 2, Item 11) on differential carrier (Figure 2, Item 4) with eight washers (Figure 2, Item 6) and screws (Figure 2, Item 7). Tighten screws 93 to 120 lb-ft (126 to 163 N·m).
6. Install companion flange (Figure 2, Item 10) on driveshaft (Figure 2, Item 5) with nut (Figure 2, Item 8). Tighten nut 300 to 400 lb-ft (407 to 542 N·m).
7. Install cotter pin (Figure 2, Item 9) through nut (Figure 2, Item 8) and driveshaft (Figure 2, Item 5).

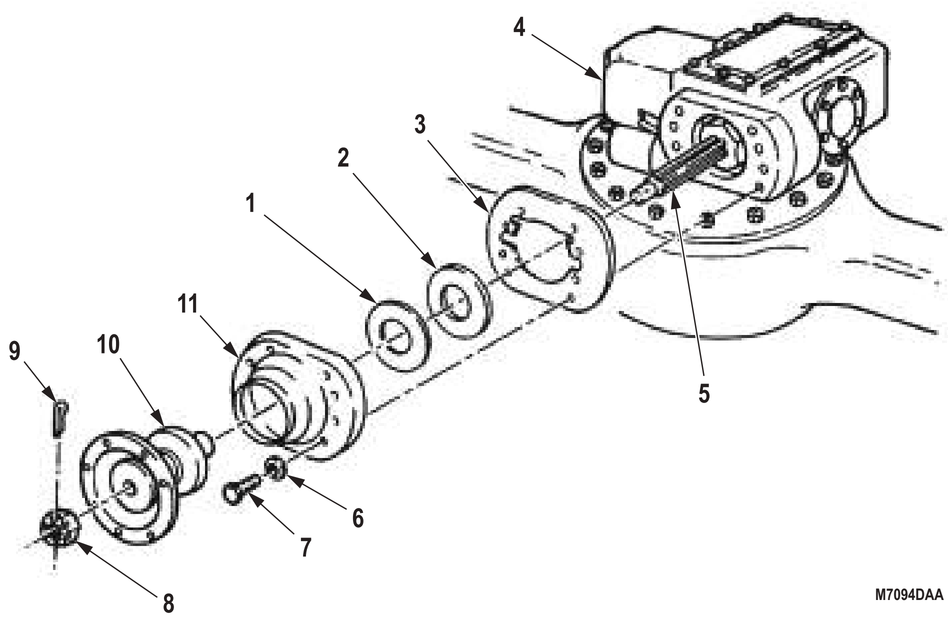


Figure 2. Front Differential Oil Seal Installation.

END OF TASK

FOLLOW-ON MAINTENANCE

1. Install propeller shaft. (WP 0402)
2. Start engine and road test vehicle. (TM 9-2320-272-10)
3. Check differential oil seal for leaks. (TM 9-2320-272-10)

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
FRONT AXLE DRIVE COMPANION FLANGE REPLACEMENT

INITIAL SETUP:

Tools and Special Tools
Tool Kit, General Mechanic's: Automotive
(Volume 5, WP 0826, Table 1, Item 56)
Wrench, Torque, Click, Ratcheting, 1/2" Drive, 250 Ft-Lb
(Volume 5, WP 0826, Table 1, Item 63)

Materials/Parts
Adhesive, Silicone Rubber
(Volume 5, WP 0825, Table 1, Item 4)

References
Volume 5, WP 0820

Equipment Condition
Parking brake set. (TM 9-2320-272-10)

REMOVAL

1. Remove ten screws (Figure 1, Item 4) and washers (Figure 1, Item 5) from axle drive flange (Figure 1, Item 6).
2. Install two screws (Figure 1, Item 4) in threaded holes (Figure 1, Item 3) and turn screws evenly until flange (Figure 1, Item 6) separates from hub (Figure 1, Item 1).
3. Remove two screws (Figure 1, Item 4) from axle drive flange (Figure 1, Item 6).
4. Remove gasket (Figure 1, Item 7) if present. Discard gasket and/or clean gasket sealant or sealant remains from mating surfaces.

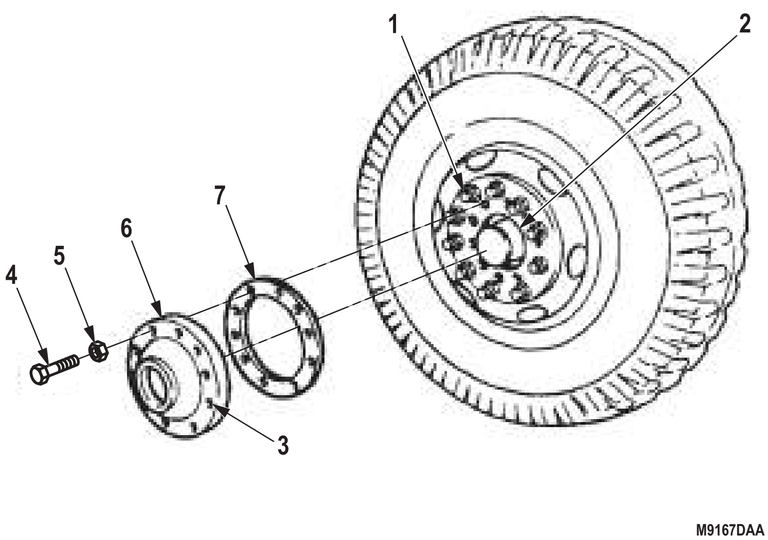


Figure 1. Front Axle Drive Companion Flange Removal.

END OF TASK

INSPECTION

1. Inspect mating surfaces of axle drive flange (Figure 2, Item 6) and hub (Figure 2, Item 1) for burrs, cracks, and gouges. File down surfaces having burrs. Replace axle drive flange or hub if cracked or gouged.
2. Inspect axle shaft (Figure 2, Item 2) for damaged splines. Notify your supervisor if splines are damaged.

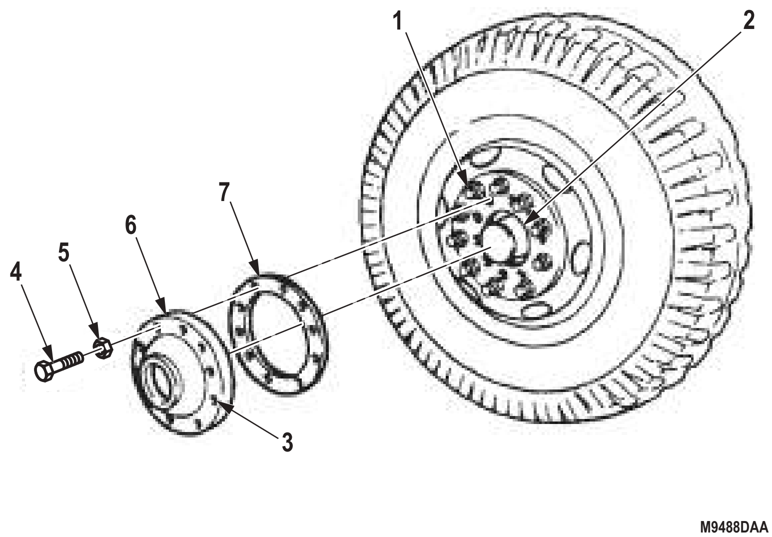


Figure 2. Front Axle Drive Companion Flange Inspection.

END OF TASK

INSTALLATION

1. Coat surface of axle drive flange (Figure 3, Item 6) with sealant and align with holes on hub (Figure 3, Item 1).
2. Install axle drive flange (Figure 3, Item 6) on hub (Figure 3, Item 1) with ten washers (Figure 3, Item 5) and screws (Figure 3, Item 4). Tighten screws 85 to 100 lb-ft (115 to 136 N·m).

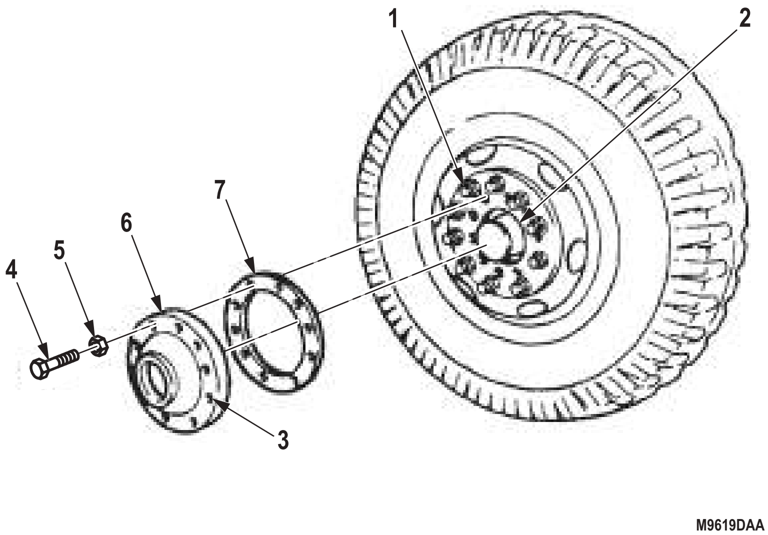


Figure 3. Front Axle Drive Companion Flange Installation.

END OF TASK

FOLLOW-ON MAINTENANCE

Lubricate axle assembly. (Volume 5, WP 0820)

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
STEERING KNUCKLE BOOT REPLACEMENT

INITIAL SETUP:

Tools and Special Tools
Tool Kit, General Mechanic's: Automotive
(Volume 5, WP 0826, Table 1, Item 56)
Wrench, Torque, Click, Ratcheting, 1/2" Drive, 250 Ft-Lb
(Volume 5, WP 0826, Table 1, Item 63)

Materials/Parts
Adhesive, Silicone Rubber: RTV102
(Volume 5, WP 0825, Table 1, Item 3)
Cloth, Cleaning: General Purpose, White
(Volume 5, WP 0825, Table 1, Item 19)

Materials/Parts (cont.)
Lockwasher
(Volume 5, WP 0827, Table 1, Item 408)
Qty: 4
Lockwire
(Volume 5, WP 0827, Table 1, Item 90)
Qty: 1

References
Volume 5, WP 0820

Equipment Condition
Parking brake set. (TM 9-2320-272-10)

REMOVAL

1. Remove four screws (Figure 1, Item 4), lockwashers (Figure 1, Item 3), and steering knuckle boot guard (Figure 1, Item 5) from steering knuckle (Figure 1, Item 2). Discard lockwashers.
2. Remove 12 screws (Figure 1, Item 7), safety wire (Figure 1, Item 1), and retaining plate (Figure 1, Item 6) from steering knuckle (Figure 1, Item 2). Discard safety wire.

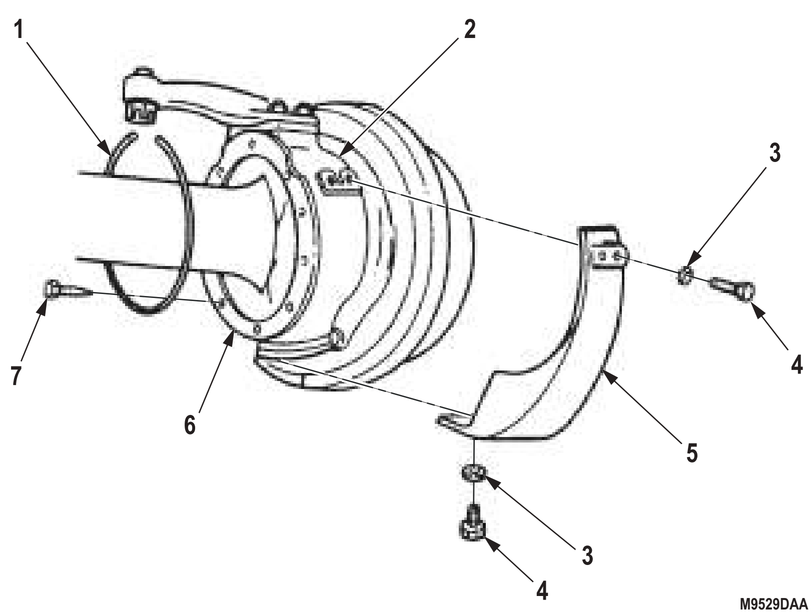


Figure 1. Steering Knuckle Boot Removal.

REMOVAL - Continued

3. Pull one side of steering knuckle boot (Figure 2, Item 6) aside to expose inner retaining clamp screw (Figure 2, Item 4).
4. Remove inner retaining clamp screw (Figure 2, Item 4) and spacer (Figure 2, Item 3) from inner retaining clamp (Figure 2, Item 5).
5. Remove steering knuckle boot (Figure 2, Item 6) and inner retaining clamp (Figure 2, Item 5) from steering knuckle (Figure 2, Item 2).

NOTE

Some seals may not have a zipper.

6. Open zipper (Figure 2, Item 1) or cut to remove steering knuckle boot (Figure 2, Item 6) from axle housing (Figure 2, Item 7).

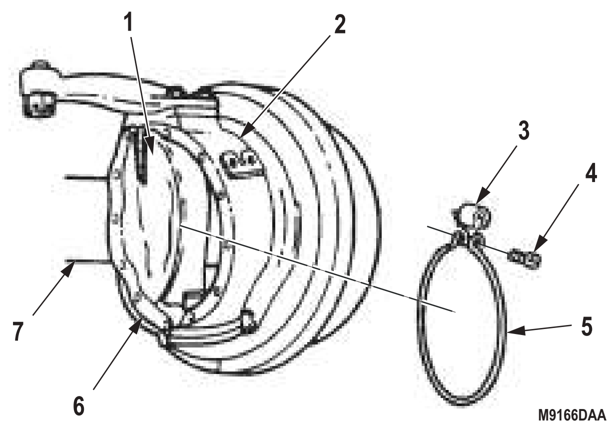


Figure 2. Steering Knuckle Boot Removal.

END OF TASK

CLEANING AND INSPECTION

1. Clean surface of steering knuckle, retaining plate, and steering knuckle seal with cleaning cloth. Ensure there is no dirt or dust inside steering knuckle.
2. Inspect steering knuckle seal for cracks, tears, and damaged zipper. Replace if cracked, torn, or zipper is damaged.

END OF TASK

INSTALLATION

1. Place steering knuckle boot (Figure 3, Item 6) on axle housing (Figure 3, Item 7), with fabric side of zipper (Figure 3, Item 1) facing steering knuckle (Figure 3, Item 2).
2. Close zipper (Figure 3, Item 1) and apply large amount of adhesive to locks and fabric of zipper. Allow adhesive to sit overnight.
3. Force inner lip of steering knuckle boot (Figure 3, Item 6) into groove on axle housing (Figure 3, Item 7). Ensure steering knuckle boot is aligned to holes in steering knuckle (Figure 3, Item 2).
4. Position inner retaining clamp (Figure 3, Item 5) to lip of steering knuckle boot (Figure 3, Item 6) and install clamp screw (Figure 3, Item 4) and spacer (Figure 3, Item 3).
5. Lace zipper (Figure 3, Item 1) locks with fine wire near edge of steering knuckle boot (Figure 3, Item 7) and twist together.
6. Cut off excess zipper (Figure 3, Item 1) and apply adhesive to exposed zipper and fabric. Allow adhesive to sit overnight.

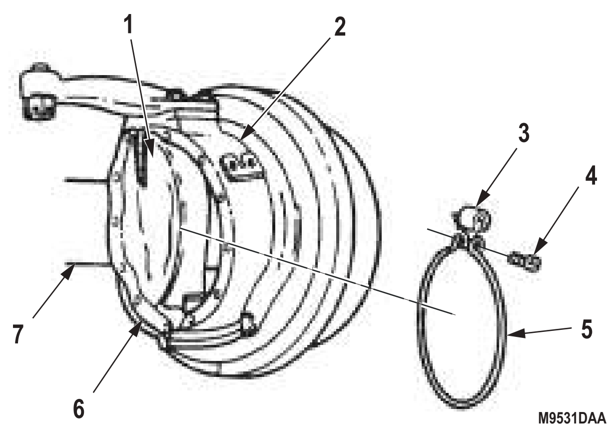


Figure 3. Steering Knuckle Boot Installation.

INSTALLATION - Continued

7. Align seal retaining plate (Figure 4, Item 6) to holes in steering knuckle (Figure 4, Item 2) and install 12 screws (Figure 4, Item 7). Ensure notches in screw heads are aligned so safety wire (Figure 4, Item 1) can be installed.
8. Thread safety wire (Figure 4, Item 1) around each screw (Figure 4, Item 7) and tie off.
9. Install steering knuckle boot guard (Figure 4, Item 5) on steering knuckle (Figure 4, Item 2) with four lockwashers (Figure 4, Item 3) and screws (Figure 4, Item 4). Tighten screws 130 to 170 lb-ft (176 to 231 N·m).

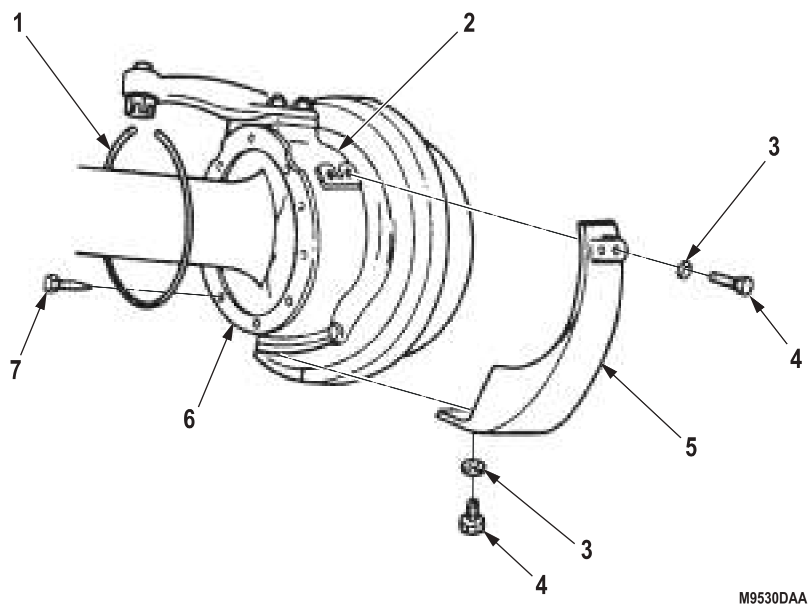


Figure 4. Steering Knuckle Boot Installation.

END OF TASK

FOLLOW-ON MAINTENANCE

Lubricate steering knuckle. (Volume 5, WP 0820)

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
FRONT AXLE SEAL REPLACEMENT

INITIAL SETUP:

Tools and Special Tools
Tool Kit, General Mechanic's: Automotive
(Volume 5, WP 0826, Table 1, Item 56)
Inserter, Seal
(Volume 5, WP 0826, Table 1, Item 28)

Materials/Parts
Oil Seal (M939/A1)
(Volume 5, WP 0827, Table 1, Item 18)
Qty: 1
Oil Seal (M939A2)
(Volume 5, WP 0827, Table 1, Item 251)
Qty: 1

Equipment Condition
Parking brake set. (TM 9-2320-272-10)

Equipment Condition (cont.)
Front axle shaft and universal joint removed.
(WP 0411)

REMOVAL

Remove oil seal (Figure 1, Item 1) from steering knuckle housing (Figure 1, Item 2). Discard oil seal.

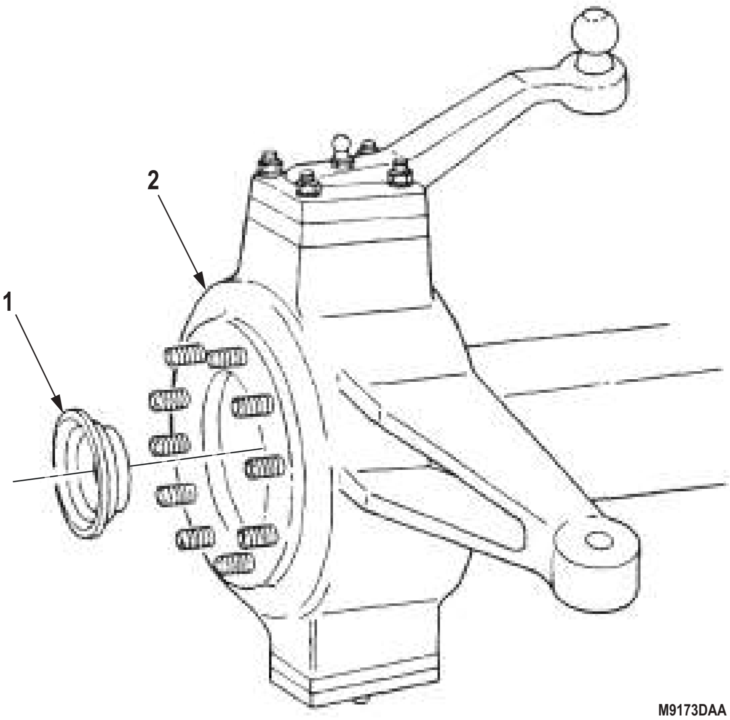


Figure 1. Front Axle Seal Removal.

END OF TASK

INSTALLATION

Using oil seal installer, install oil seal (Figure 2, Item 1) in steering knuckle housing (Figure 2, Item 2).

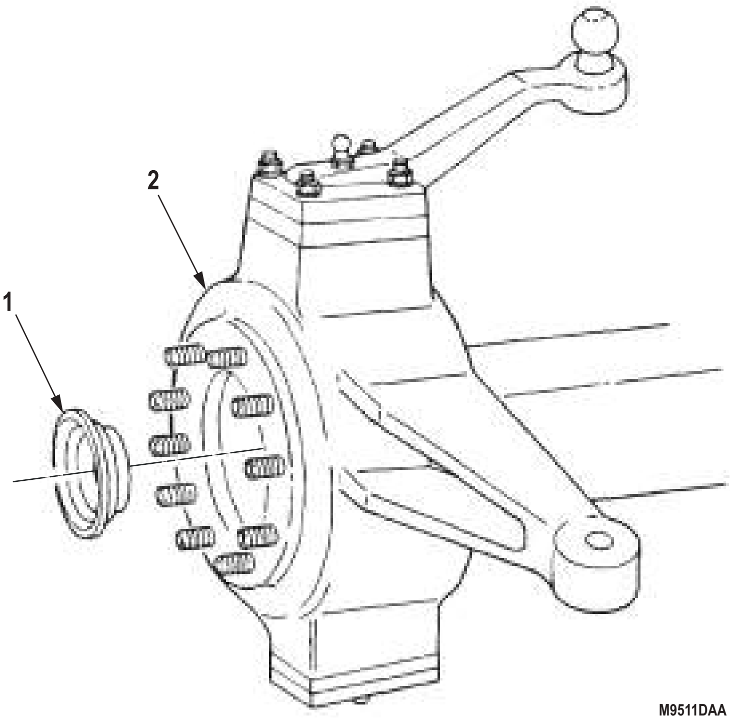


Figure 2. Front Axle Seal Installation.

END OF TASK

FOLLOW-ON MAINTENANCE

Install front axle shaft and universal joint. (WP 0411)

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
FRONT AXLE SHAFT AND UNIVERSAL JOINT REPLACEMENT

INITIAL SETUP:

Tools and Special Tools

Tool Kit, General Mechanic's: Automotive
(Volume 5, WP 0826, Table 1, Item 56)
Vise, Machinist's
(Volume 5, WP 0826, Table 1, Item 59)

Materials/Parts

Cap Set, Protective, Dust and Moisture Seal
(Volume 5, WP 0825, Table 1, Item 13)
Cleaning Compound, Solvent
(Volume 5, WP 0825, Table 1, Item 16, 17)
Grease, Automotive and Artillery
(Volume 5, WP 0825, Table 1, Item 29, 30, 31, 32, 33)

Materials/Parts (cont.)

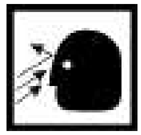
Sealing Compound
(Volume 5, WP 0825, Table 1, Item 62)
Tape, Antiseizing
(Volume 5, WP 0825, Table 1, Item 65)

Equipment Condition

Parking brake set. (TM 9-2320-272-10)
Air reservoir drained. (TM 9-2320-272-10)
Front hub and drum removed. (WP 0479)
Front hub and drum removed. (WP 0481)

REMOVAL

WARNING



Do not disconnect air lines or hoses before draining air reservoirs. Small parts under pressure may shoot out with high velocity. Failure to comply may result in injury or death to personnel.

CAUTION

Cap or plug all openings immediately after disconnecting lines and hoses to prevent contamination. Failure to do so may result in brake system damage.

NOTE

Tag all lines and hoses for installation.

1. Disconnect vent air line (Figure 1, Item 11) and service brake air line (Figure 1, Item 10) from front brake chamber (Figure 1, Item 1).
2. Remove ten nuts (Figure 1, Item 4), washers (Figure 1, Item 5), and brake spider (Figure 1, Item 3) from steering knuckle housing (Figure 1, Item 8).
3. Remove brake shoe spider and chamber assembly (Figure 1, Item 2) from steering knuckle housing (Figure 1, Item 8).
4. Remove spindle (Figure 1, Item 12) from steering knuckle housing (Figure 1, Item 8).
5. Remove axle shaft (Figure 1, Item 7) from axle housing (Figure 1, Item 9).
6. Remove washer (Figure 1, Item 6) from axle shaft (Figure 1, Item 7).

REMOVAL - Continued

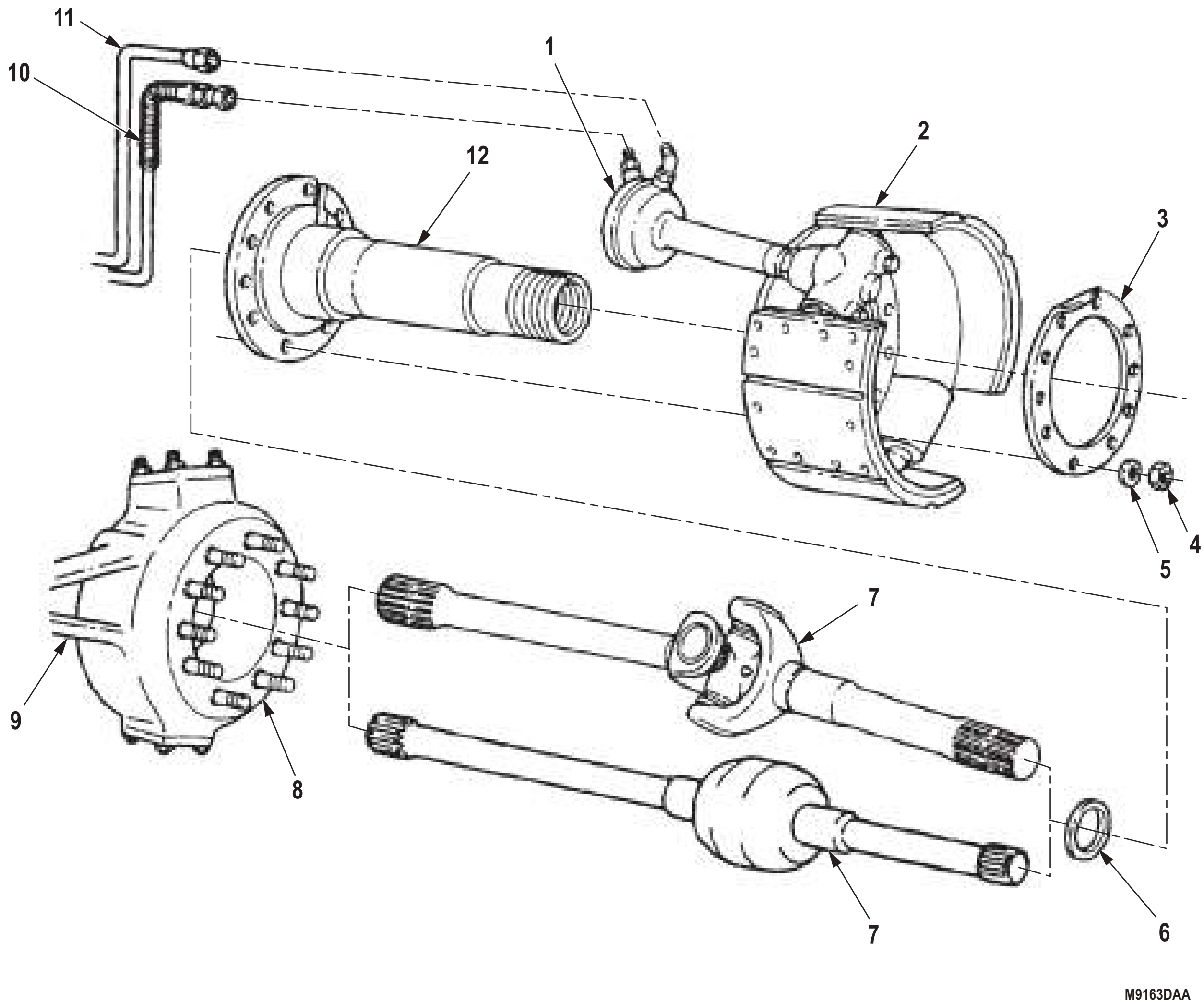
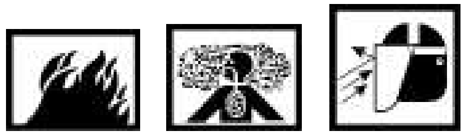


Figure 1. Front Axle Shaft Removal.

END OF TASK

CLEANING AND INSPECTION

WARNING



- Solvent cleaning compound is flammable and toxic. Do not use near an open flame and always have a fire extinguisher nearby when solvents are used. Use only in well-ventilated places, wear protective clothing, and dispose of cleaning rags in approved container. Failure to comply may result in damage to equipment, injury, or death to personnel.
- Eyeshields must be worn when cleaning with compressed air. Compressed air source will not exceed 30 psi (207 kPa). Failure to comply may result in injury or death to personnel.

NOTE

New configuration axle shafts have a CV joint in place of the universal joint. Axle shafts are no longer repairable and must be replaced if damaged.

1. Inspect axle shaft (Figure 2, Item 5) for cracks and nicks at shaft splines (Figure 2, Item 1). If shaft splines are cracked or nicked, replace axle shaft.
2. Place short end (Figure 2, Item 4) of axle shaft (Figure 2, Item 5) in soft-jawed vise. Pull and push up and down on inner shaft (Figure 2, Item 2) and twist inner shaft.

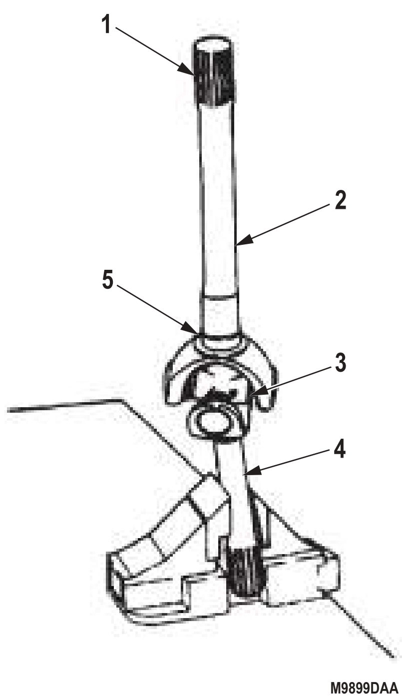


Figure 2. Front Axle Shaft Inspection.

CLEANING AND INSPECTION - Continued

3. Replace axle shaft (Figure 3, Item 1) if any free play in universal or CV joint (Figure 3, Item 2) is observed.

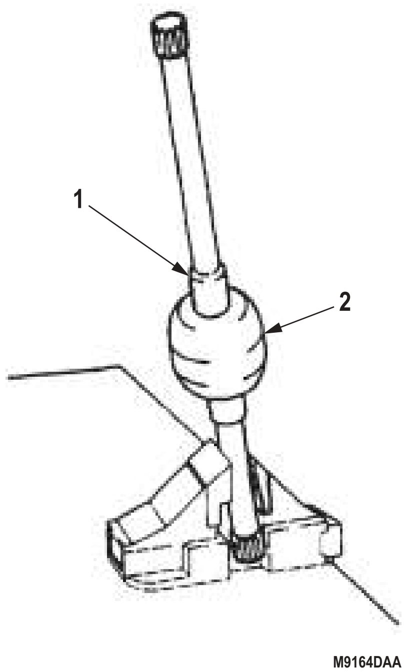


Figure 3. Front Axle Shaft Inspection.

END OF TASK

INSTALLATION

1. Install washer (Figure 4, Item 6) on axle shaft (Figure 4, Item 7).
2. Lubricate universal joint (Figure 4, Item 8) (if equipped), grease all bearing surfaces on axle shaft (Figure 4, Item 7), and fill steering knuckle cavity (Figure 4, Item 11) with GAA grease.
3. Support axle shaft (Figure 4, Item 7) and install in steering knuckle housing (Figure 4, Item 10).
4. Repack steering knuckle cavity (Figure 4, Item 11) with GAA grease.
5. Apply sealing compound to spindle (Figure 4, Item 12) and align with mounting studs (Figure 4, Item 9) on steering knuckle housing (Figure 4, Item 10). Ensure spindle is slot end up.
6. Install brake shoe spider and chamber assembly (Figure 4, Item 2) over spindle (Figure 4, Item 12) on steering knuckle housing (Figure 4, Item 10).
7. Install brake spider (Figure 4, Item 3) on steering knuckle housing (Figure 4, Item 10) with ten washers (Figure 4, Item 5) and nuts (Figure 4, Item 4).

NOTE

Male pipe threads must be wrapped with antiseize tape before installation.

8. Connect vent air line (Figure 4, Item 14) and service brake air line (Figure 4, Item 13) to front brake chamber (Figure 4, Item 1).

INSTALLATION - Continued

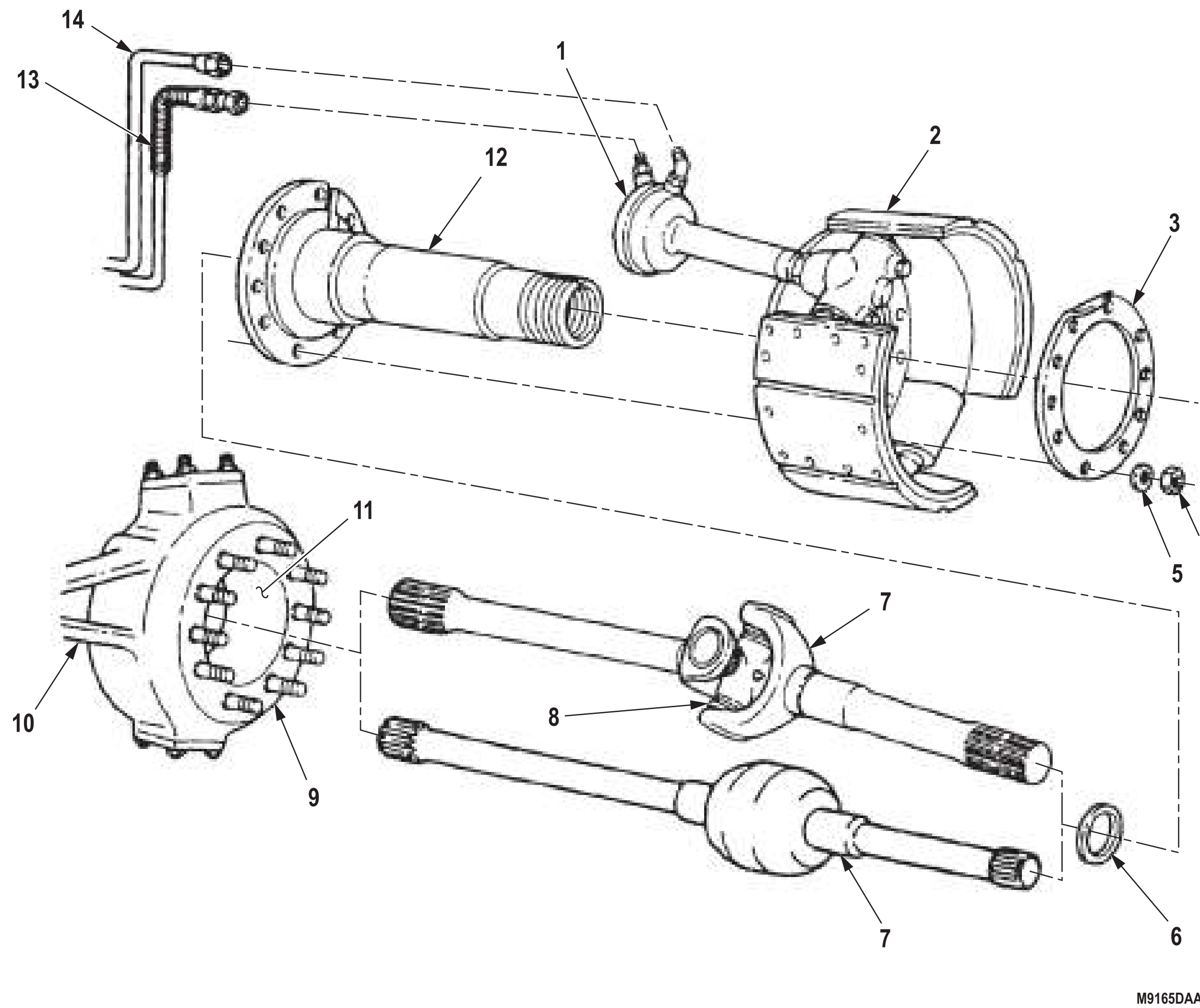


Figure 4. Front Axle Shaft Installation.

END OF TASK

FOLLOW-ON MAINTENANCE

1. Install front hub and drum. (WP 0479)
2. Install front hub and drum. (WP 0481)
3. Start engine and check for leaks at air lines and brake chambers. (TM 9-2320-272-10)

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
STEERING KNUCKLE REPAIR

INITIAL SETUP:

Tools and Special Tools

Tool Kit, General Mechanic's: Automotive
(Volume 5, WP 0826, Table 1, Item 56)
Burnisher, Injector Orifice
(Volume 5, WP 0826, Table 1, Item 10)
Caliper, Micrometer, Inside
(Volume 5, WP 0826, Table 1, Item 12)
High Boy Jack Stands
(Volume 5, WP 0826, Table 1, Item 24)
Indicator, Dial
(Volume 5, WP 0826, Table 1, Item 25)
Wrench, Torque, Click, Ratcheting, 3/4" Drive, 600 Ft-Lb
(Volume 5, WP 0826, Table 1, Item 61)

Materials/Parts

Grease, Automotive and Artillery
(Volume 5, WP 0825, Table 1, Item 28)
Sealing Compound
(Volume 5, WP 0825, Table 1, Item 60)
Bolt Machine
(Volume 5, WP 0827, Table 1, Item 177)
Qty: 1
Cotter Pin
(Volume 5, WP 0827, Table 1, Item 344)
Qty: 3
Lockwasher
(Volume 5, WP 0827, Table 1, Item 396)
Qty: 4

Materials/Parts (cont.)

Lockwire, 40 in.
(Volume 5, WP 0827, Table 1, Item 90)
Qty: 1
Nut, Plain, Hexagon
(Volume 5, WP 0827, Table 1, Item 431)
Qty: 1
Sleeve Bearing
(Volume 5, WP 0827, Table 1, Item 205)
Qty: 1

Personnel Required

(2)

References

TM 9-2320-272-10
Volume 5, WP 0820

Equipment Condition

Front axle shaft removed. (WP 0411)

REMOVAL

NOTE

- Perform Step (1) for left steering knuckle only.
- Perform Step (2) for right steering knuckle only.

1. Remove cotter pin (Figure 1, Item 6), nut (Figure 1, Item 5), and drag link (Figure 1, Item 4) from steering knuckle arm (Figure 1, Item 23). Discard cotter pin.
2. Remove cotter pin (Figure 1, Item 28), nut (Figure 1, Item 27), and socket assembly (Figure 1, Item 25) with ball stud (Figure 1, Item 26) from steering knuckle arm (Figure 1, Item 23). Discard cotter pin.
3. Remove cotter pin (Figure 1, Item 9), nut (Figure 1, Item 10), and tie rod (Figure 1, Item 11) from steering knuckle (Figure 1, Item 21). Discard cotter pin.
4. Remove four nuts (Figure 1, Item 2), lockwashers (Figure 1, Item 1), bushings (Figure 1, Item 24), and steering knuckle arm (Figure 1, Item 23) from steering knuckle (Figure 1, Item 21). Discard lockwashers.
5. Remove lubrication fitting (Figure 1, Item 3) from steering knuckle arm (Figure 1, Item 23).
6. Insert two puller screws into screw holes (Figure 1, Item 8) of upper sleeve (Figure 1, Item 22), and remove from steering knuckle (Figure 1, Item 21).
7. Remove spacer (Figure 1, Item 7) from upper sleeve (Figure 1, Item 22).
8. Remove two screws (Figure 1, Item 20) and washers (Figure 1, Item 19) from seal guard (Figure 1, Item 18) and steering knuckle (Figure 1, Item 21).
9. Remove grease fitting (Figure 1, Item 15), four screws (Figure 1, Item 16), lockwashers (Figure 1, Item 17), lower plate (Figure 1, Item 12), and seal guard (Figure 1, Item 18) from steering knuckle (Figure 1, Item 21). Discard lockwashers.
10. Insert two puller screws into screw holes (Figure 1, Item 12) of lower sleeve (Figure 1, Item 13), and remove from steering knuckle (Figure 1, Item 21).
11. Remove lockwire (Figure 1, Item 31) and twelve screws (Figure 1, Item 29) from dust seal plate (Figure 1, Item 30) and steering knuckle (Figure 1, Item 21). Discard lockwire.
12. Remove dust seal plate (Figure 1, Item 4) and seal (Figure 1, Item 3) from steering knuckle (Figure 1, Item 7).
13. Remove steering knuckle (Figure 1, Item 7) from axle kingpins (Figure 1, Items 2 and 5).

REMOVAL - Continued

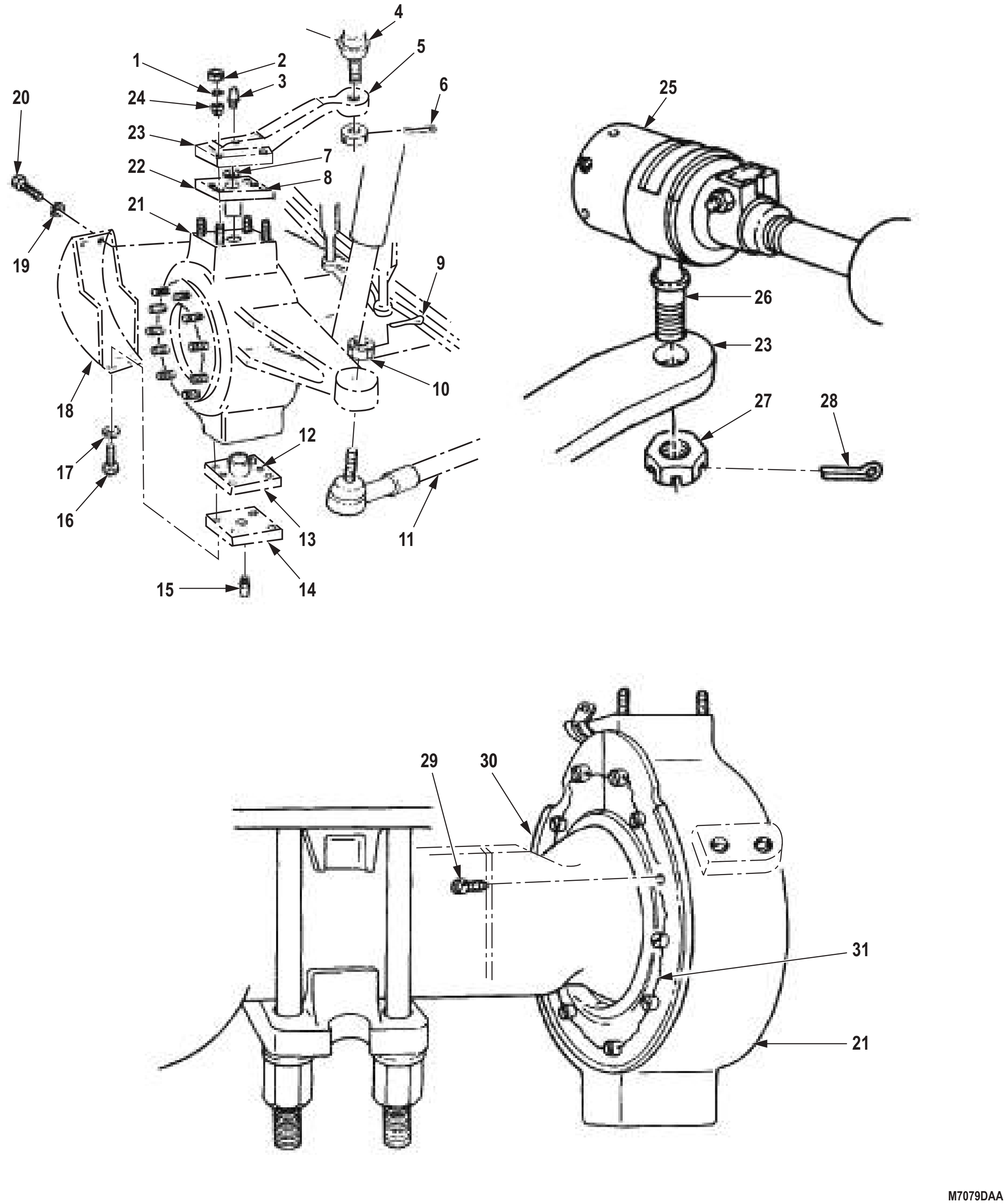


Figure 1. Steering Knuckle Removal.

END OF TASK

CLEANING AND INSPECTION

1. For General Cleaning Instructions, refer to (Volume 5, WP 0819).
2. For General Cleaning Instructions, refer to (Volume 5, WP 0819).
3. Inspect steering knuckle (Figure 2, Item 7), lower plate (Figure 2, Item 12), upper sleeve (Figure 2, Item 10), and lower sleeve (Figure 2, Item 11) for cracks and scores. Replace part(s) if cracked or scored.
4. Measure bearing inside diameter of upper and lower sleeves (Figure 2, Items 10 and 11) for wear. If inside diameter is more than 1.505 in. (38.23 mm), replace sleeve.
5. Inspect studs (Figure 2, Items 1 and 6) for stripped threads. Replace studs if threads are stripped.
6. Inspect machine bolt (Figure 2, Item 8) for bends. Replace machine bolt if bent.

NOTE

- Perform Steps (7) and (8) if replacing machine bolt.
- Perform Steps (9) through (11) if replacing sleeve bearings. Steps to replace sleeve bearings are the same for upper and lower sleeves.

7. Break weld and remove stop screw (Figure 2, Item 8) and jamnut (Figure 2, Item 9) from steering knuckle (Figure 2, Item 7). Discard machine bolt and plain hexagon nut.
8. Install machine bolt (Figure 2, Item 8) and plain hexagon nut (Figure 2, Item 9) on steering knuckle (Figure 2, Item 7). Do not weld.
9. Using arbor press (Figure 2, Item 15), remove sleeve bearing (Figure 2, Item 14) from sleeve (Figure 2, Item 13). Discard sleeve bearing.
10. Using arbor press (Figure 2, Item 15), install sleeve bearing (Figure 2, Item 14) in sleeve (Figure 2, Item 13).
11. Using burnisher (Figure 2, Item 16), burnish inside diameter of sleeve bearing (Figure 2, Item 14) to 1.500 in. (38.1 mm).

CLEANING AND INSPECTION - Continued

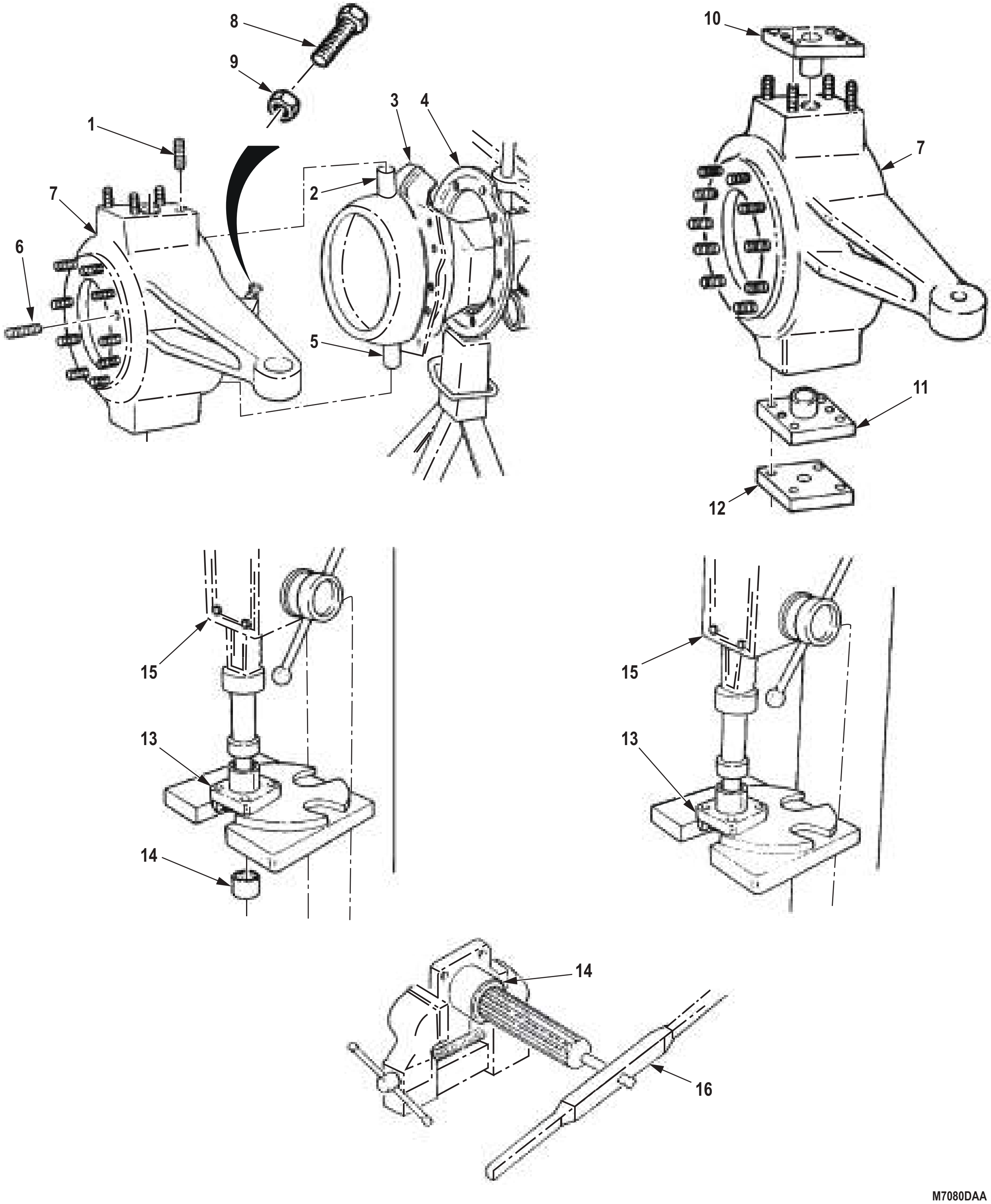


Figure 2. Steering Knuckle Cleaning/Inspection.

END OF TASK

INSTALLATION

1. Position steering knuckle (Figure 3, Item 5) on kingpins (Figure 3, Items 2 and 3) with studs (Figure 3, Item 6) facing upward.
2. Apply GAA grease to bore of upper sleeve (Figure 3, Item 7) and install on upper kingpin (Figure 3, Item 2). Coat mounting flange with sealing compound.
3. Install spacer (Figure 3, Item 1) on upper sleeve (Figure 3, Item 7).
4. Apply GAA grease to bore of lower sleeve (Figure 3, Item 4) and install on steering knuckle (Figure 3, Item 5). Coat mounting flange with sealing compound.
5. Apply sealing compound to threads of studs (Figure 3, Item 6).

INSTALLATION - Continued

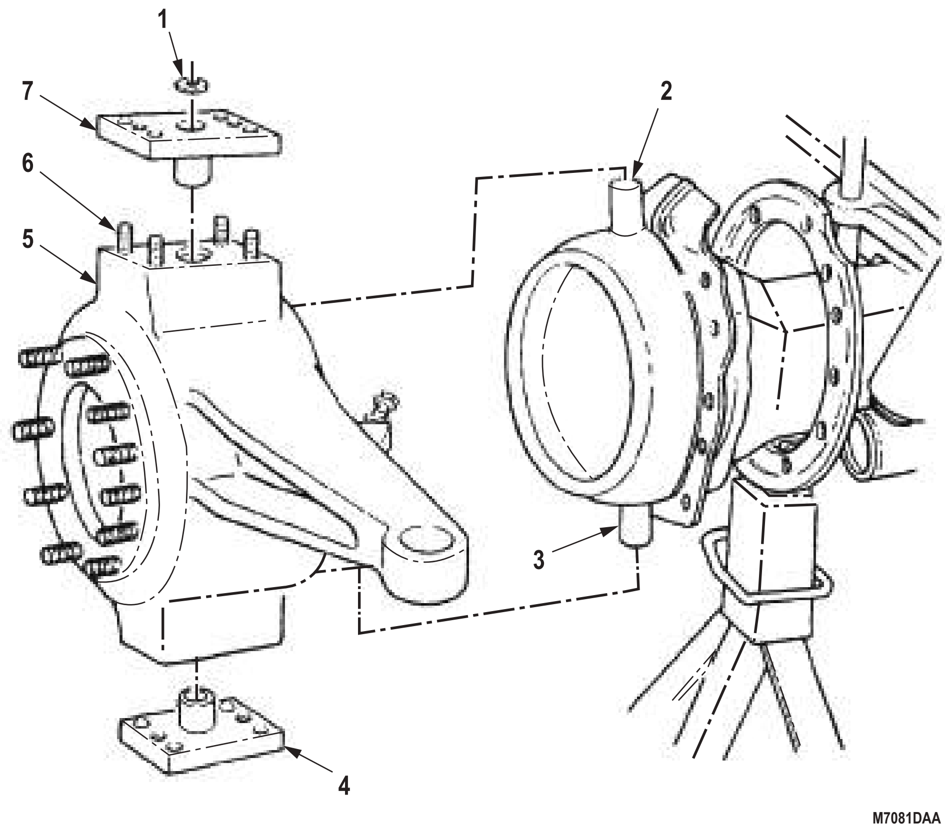


Figure 3. Steering Knuckle Installation.

INSTALLATION - Continued

6. Install steering knuckle arm (Figure 4, Item 7) on studs (Figure 4, Item 2) with four bushings (Figure 4, Item 8), lockwashers (Figure 4, Item 4), and nuts (Figure 4, Item 5). Tighten nuts 155 to 170 lb-ft (210 to 231 N·m).
7. Install grease fitting (Figure 4, Item 6) on steering knuckle arm (Figure 4, Item 7).
8. Install seal (Figure 4, Item 16) and dust seal plate (Figure 4, Item 19) on steering knuckle (Figure 4, Item 1) with twelve screws (Figure 4, Item 18) and lockwire (Figure 4, Item 17).

NOTE

Lower sleeve must be installed with words WHEEL END facing down.

9. Apply sealing compound to contact surface of lower plate (Figure 4, Item 8), and install lower plate (Figure 4, Item 9) and seal guard (Figure 4, Item 13) on steering knuckle (Figure 4, Item 1) with lockwashers (Figure 4, Item 12) and screws (Figure 4, Item 11). Ensure seal guard (Figure 4, Item 13) is installed in front two mounting holes. Tighten screws 105 to 135 lb-ft (142 to 183 N·m)
10. Install grease fitting (Figure 4, Item 10) on lower plate (Figure 4, Item 8).
11. Install two washers (Figure 4, Item 14) and screws (Figure 4, Item 15) on seal guard (Figure 4, Item 13) and steering knuckle (Figure 4, Item 1). Tighten screws 105 to 135 lb-ft (142 to 183 N·m).
12. Install tie rod (Figure 4, Item 29) on steering knuckle (Figure 4, Item 1) with nut (Figure 4, Item 28). Tighten nut 140 to 180 lb-ft (190 to 244 N·m).
13. Install cotter pin (Figure 4, Item 27) on nut (Figure 4, Item 28) and tie rod (Figure 4, Item 29).

NOTE

- Perform Step (14) for left steering knuckle.
- Assistant will help with Step (14).

14. Install drag link (Figure 4, Item 24) on steering knuckle arm (Figure 4, Item 7) with nut (Figure 4, Item 26). Tighten nut 140 to 180 lb-ft (190 to 244 N·m).
15. Install cotter pin (Figure 4, Item 25) on nut (Figure 4, Item 26) and drag link (Figure 4, Item 24).

NOTE

Perform Step (16) for right steering knuckle arm.

16. Install socket assembly (Figure 4, Item 20) with ball stud (Figure 4, Item 23) on steering knuckle arm (Figure 4, Item 7) with nut (Figure 4, Item 22). Tighten nut 140 to 180 lb-ft (190 to 244 N·m).
17. Install cotter pin (Figure 4, Item 21) on nut (Figure 4, Item 22) and socket assembly (Figure 4, Item 20).

INSTALLATION - Continued

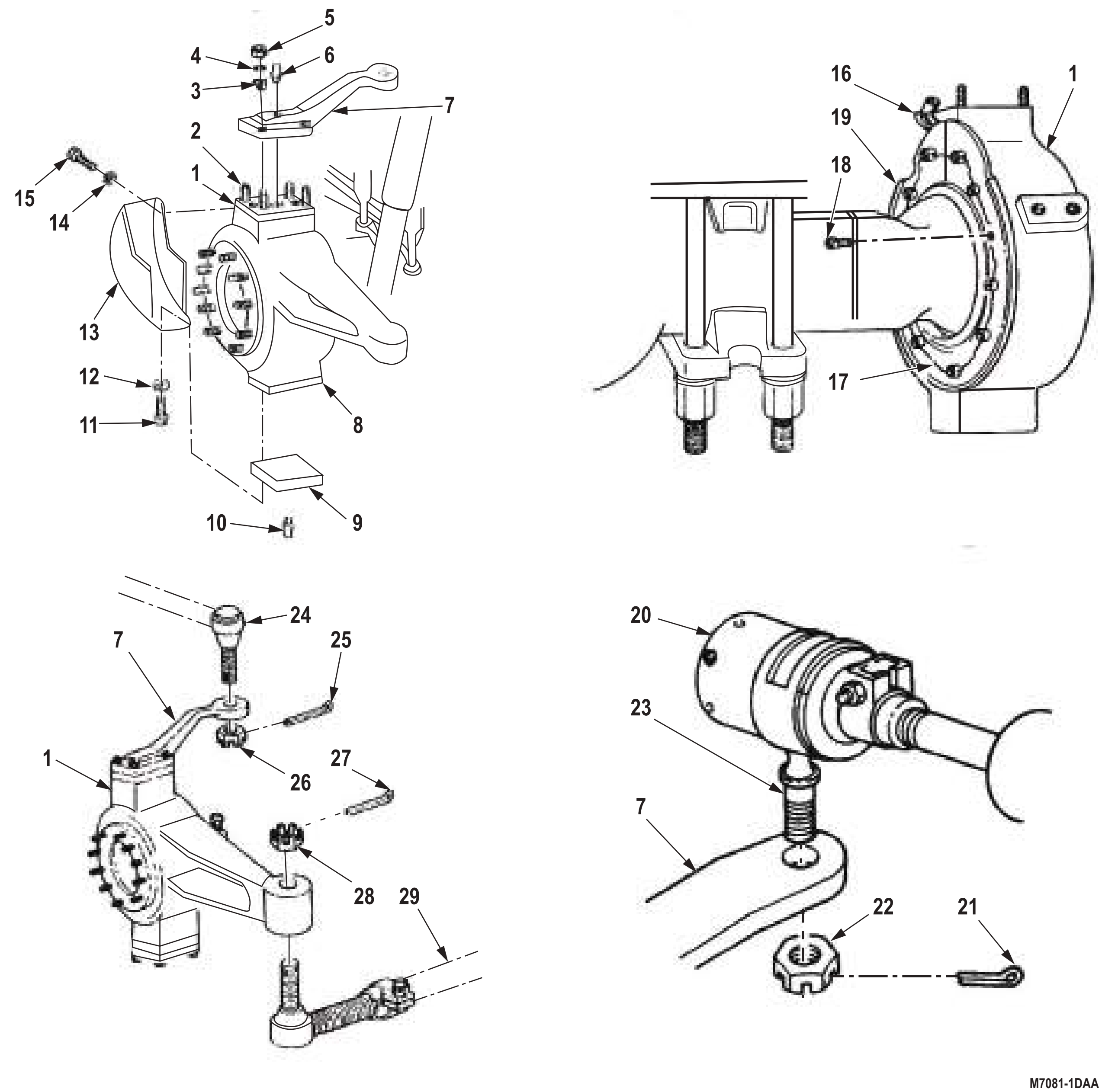


Figure 4. Steering Knuckle Installation.

END OF TASK

END PLAY TEST

1. Position dial indicator (Figure 5, Item 2) with magnetic stand on front axle housing (Figure 5, Item 4) next to steering arm (Figure 5, Item 3).
2. Adjust dial indicator (Figure 5, Item 2) until pointer touches center of steering arm mounting plate (Figure 5, Item 1). Note reading on dial indicator pointer.
3. Position prybar (Figure 5, Item 6) and jack stand (Figure 5, Item 5) under steering knuckle (Figure 5, Item 7).
4. Pry up on steering knuckle (Figure 5, Item 7) and observe dial indicator reading (Figure 5, Item 2).
   a. If dial indicator reading is 0.004 to 0.014 in. (0.1 to 0.36 mm), steering knuckle end play is within limits.
   b. If dial indicator reading is greater than 0.014 in. (0.36 mm), remove upper sleeve and install a thicker spacer.
   c. If dial indicator reading is less than 0.004 in. (0.1 mm), remove upper sleeve and install a thinner spacer.
5. Remove dial indicator (Figure 5, Item 2) from front axle housing (Figure 5, Item 4).
6. Remove prybar (Figure 5, Item 6) and jack stand (Figure 5, Item 5) from steering knuckle (Figure 5, Item 7).

END PLAY TEST - Continued

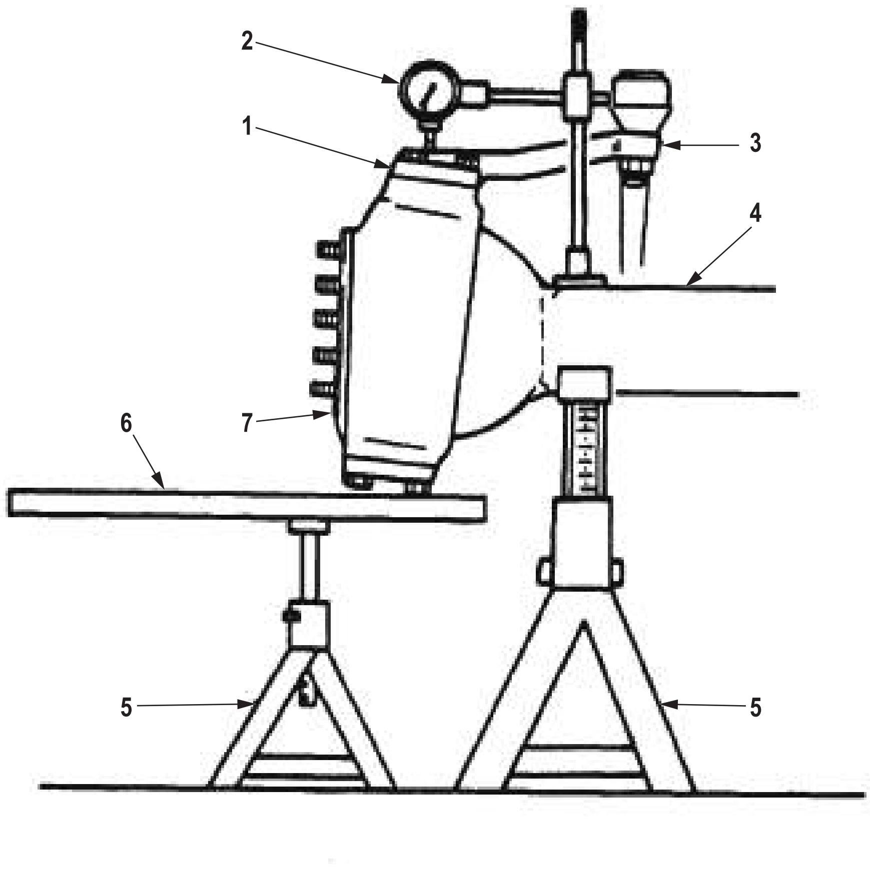


Figure 5. End Play Test.

END OF TASK

FOLLOW-ON MAINTENANCE

1. Install front axle shaft. (WP 0411)
2. Lubricate steering knuckle. (Volume 5, WP 0820)
3. Adjust steering knuckle turn angle. (WP 0497)
4. Start engine and road test vehicle. (TM 9-2320-272-10)

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
SPINDLE BEARING SLEEVE REPLACEMENT

INITIAL SETUP:

Tools and Special Tools

Tool Kit, General Mechanic's: Automotive
(Volume 5, WP 0826, Table 1, Item 56)
Burnisher, Injector Orifice
(Volume 5, WP 0826, Table 1, Item 10)
Caliper, Micrometer, Inside
(Volume 5, WP 0826, Table 1, Item 12)
Remover, Bearing and Bushing
(Volume 5, WP 0826, Table 1, Item 46)
Replacer, Bearing
(Volume 5, WP 0826, Table 1, Item 47)

Materials/Parts

Sleeve, Bearing
(Volume 5, WP 0827, Table 1, Item 205)
Qty: 1

Equipment Condition

Front axle shaft and universal joint removed.
(WP 0411)

REMOVAL

NOTE

Perform this procedure only if inspection of spindle bearing sleeve indicates replacement is required.

Using spindle bearing sleeve remover, remove spindle bearing sleeve (Figure 1, Item 1) from spindle (Figure 1, Item 2). Discard spindle bearing sleeve.

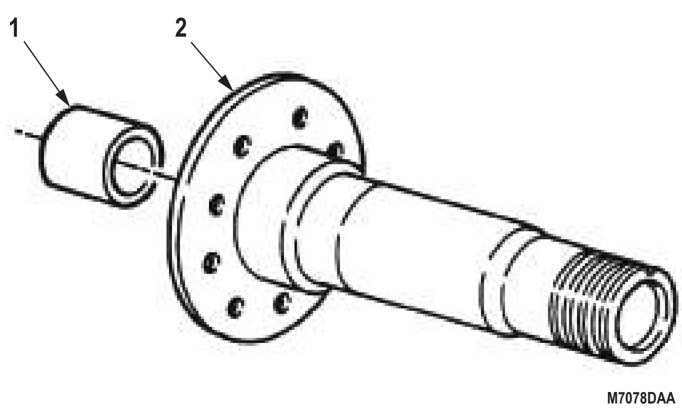


Figure 1. Spindle Bearing Sleeve Removal.

END OF TASK

INSTALLATION

1. Using spindle bearing sleeve replacer, install spindle bearing sleeve (Figure 2, Item 1) in spindle (Figure 2, Item 2).
2. Using burnishing tool, machine inside diameter of spindle bearing sleeve (Figure 2, Item 1) to 2.247 to 2.251 in. (57.074 to 57.176 mm).

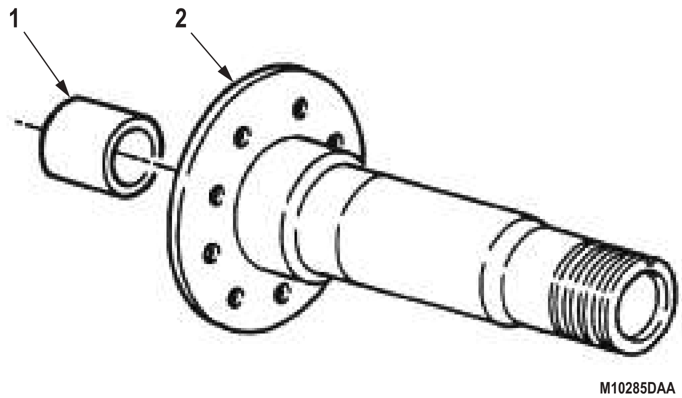


Figure 2. Spindle Bearing Sleeve Installation.

END OF TASK

FOLLOW-ON MAINTENANCE

Install front axle shaft and universal joint. (WP 0411)

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
FORWARD-REAR AND REAR-REAR AXLE REPLACEMENT

INITIAL SETUP:

Tools and Special Tools
Tool Kit, General Mechanic's: Automotive
(Volume 5, WP 0826, Table 1, Item 56)
High Boy Jack Stands
(Volume 5, WP 0826, Table 1, Item 24)
Jack, Bottle
(Volume 5, WP 0826, Table 1, Item 31)
Wrench, Torque, Click, Ratcheting, 3/4" Drive, 600 Ft-Lb
(Volume 5, WP 0826, Table 1, Item 61)

Materials/Parts
Lubricating Oil
(Volume 5, WP 0825, Table 1, Item 44, 45, 46, 47)
Tape, Antiseizing
(Volume 5, WP 0825, Table 1, Item 65)
Locknut
(Volume 5, WP 0827, Table 1, Item 285)
Qty: 8

Materials/Parts (cont.)
Lockwasher
(Volume 5, WP 0827, Table 1, Item 186)
Qty: 2
Lockwasher
(Volume 5, WP 0827, Table 1, Item 409)
Qty: 6

Personnel Required
(2)

References
Volume 5, WP 0820

Equipment Condition
Air reservoirs drained. (TM 9-2320-272-10)
Remove wheels. (WP 0484) (WP 0485)

REMOVAL

WARNING

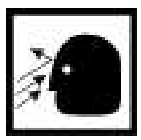
Weight of vehicle must remain supported on jack stands at all times. Do not attempt to support weight of vehicle on hydraulic jack. Failure to comply may result in injury or death to personnel.

NOTE

Forward-rear and rear-rear axles are replaced the same way. This procedure covers replacement of the rear-rear axle.

1. Position hydraulic jack (Figure 1, Item 16) under differential housing (Figure 1, Item 6) and raise vehicle.
2. Position jack stands (Figure 1, Item 17) under spring seats (Figure 1, Item 4) and rear axle (Figure 1, Item 5) and lower vehicle until spring seats and rear axle rest on jack stands.
3. Remove eight locknuts (Figure 1, Item 7), screws (Figure 1, Item 3), and propeller shaft (Figure 1, Item 2) from companion flange (Figure 1, Item 1). Discard locknuts.

WARNING



Do not disconnect air lines or hoses before draining air reservoirs. Small parts under pressure may shoot out with high velocity. Failure to comply may result in injury or death to personnel.

NOTE

- Perform Step (4) for M939A2 series vehicles only.
- Tag all air lines for installation.

4. Disconnect two air lines (Figure 1, Item 13) from elbows (Figure 1, Item 14) on relief valve (Figure 1, Item 15).
5. Disconnect primary line (Figure 1, Item 9) and vent line (Figure 1, Item 8) and remove elbows (Figure 1, Items 10 and 12) from right and left service brake chambers (Figure 1, Item 11).

REMOVAL - Continued

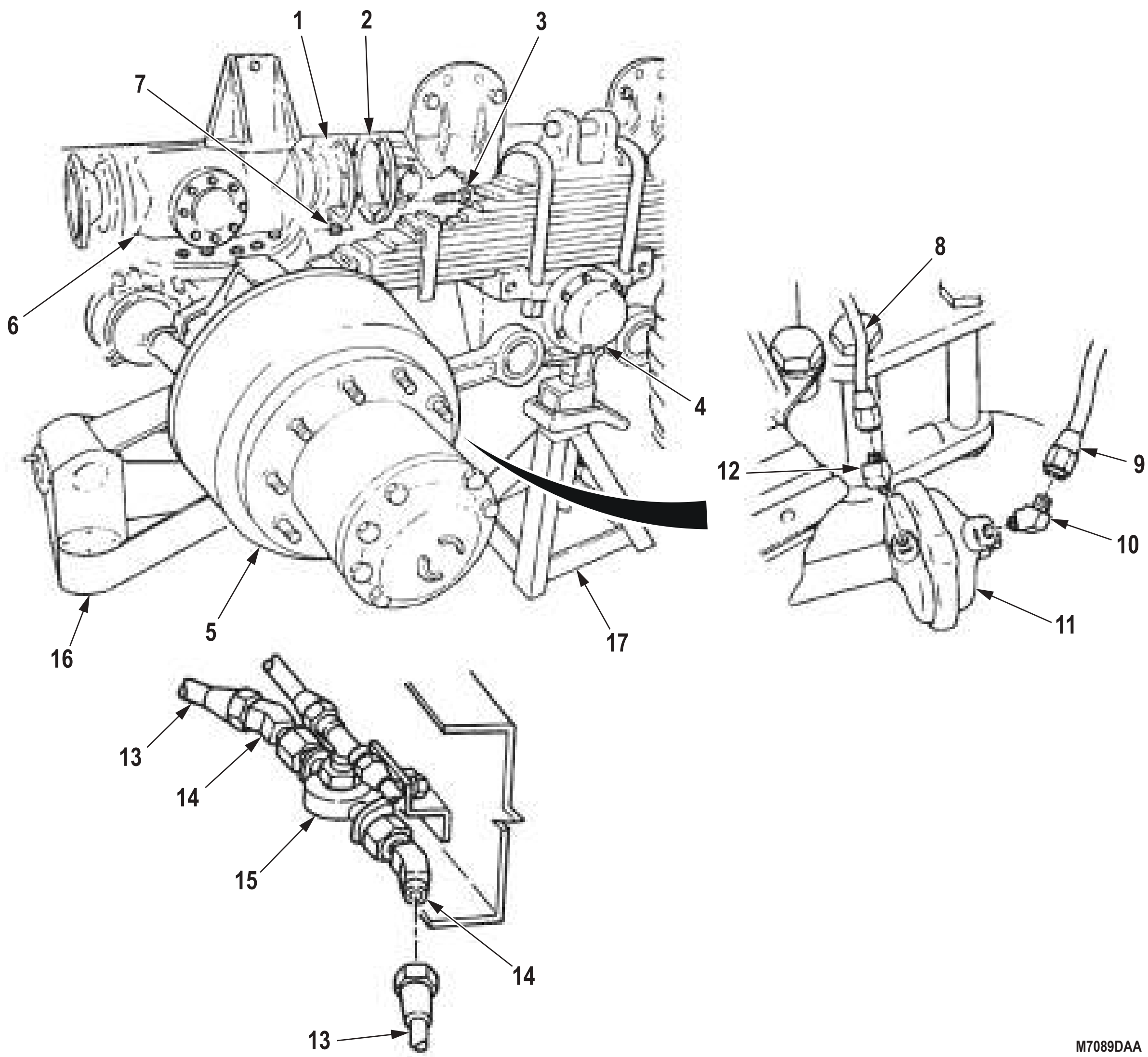


Figure 1. Forward-Rear and Rear-Rear Axle Removal.

REMOVAL - Continued

6. Disconnect vent lines (Figure 2, Items 1 and 2), secondary line (Figure 2, Item 11), and spring brake override line (Figure 2, Item 10) and remove two adapter elbows (Figure 2, Item 13), elbow (Figure 2, Item 14), and tee fitting (Figure 2, Item 15) from brake chamber bracket (Figure 2, Item 26).
7. Remove primary line (Figure 2, Item 6), secondary line (Figure 2, Item 8), and two adapter fittings (Figure 2, Item 5) from mounting plate (Figure 2, Item 9).
8. Remove two screws (Figure 2, Item 3), lockwashers (Figure 2, Item 4), and mounting plate (Figure 2, Item 9) from differential housing (Figure 2, Item 7). Discard lockwashers.
9. Remove two nuts (Figure 2, Item 16), washers (Figure 2, Item 17), U-bolt (Figure 2, Item 21), and U-bolt bracket (Figure 2, Item 22) from right and left spring brakes (Figure 2, Item 12).

NOTE

Assistant will help with Step (10).

10. Remove nut (Figure 2, Item 23), lockwasher (Figure 2, Item 24), washer (Figure 2, Item 25), screw (Figure 2, Item 18), washer (Figure 2, Item 19), and brake chamber bracket (Figure 2, Item 26) from right and left upper spring brackets (Figure 2, Item 20). Discard lockwashers.

REMOVAL - Continued

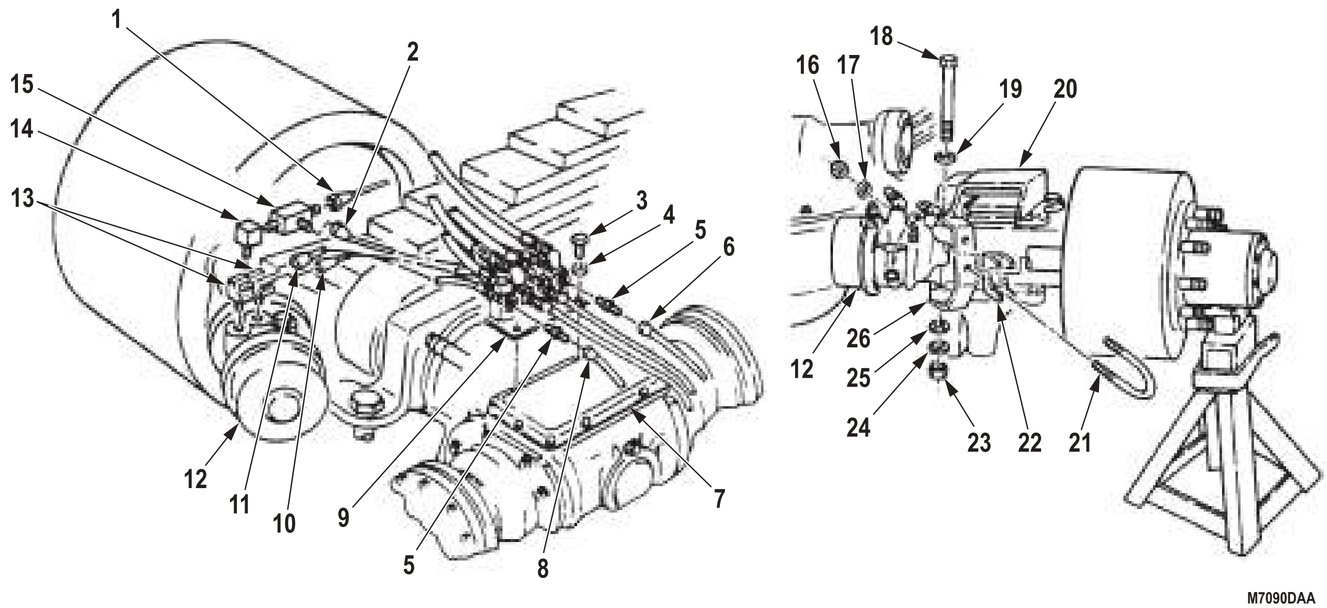


Figure 2. Axle on Jack Stand Removal.

REMOVAL - Continued

NOTE

Assistant will help with Steps (11) through (13).

11. Remove two nuts (Figure 3, Item 5), lockwashers (Figure 3, Item 4), and screws (Figure 3, Item 3) from two upper torque rod brackets (Figure 3, Item 1) and upper torque rod plates (Figure 3, Item 6). Upper torque rod brackets will remain attached to torque rods (Figure 3, Item 2). Discard lockwashers.
12. Remove two nuts (Figure 3, Item 14), lockwashers (Figure 3, Item 13), screws (Figure 3, Item 11), and right and left upper spring brackets (Figure 3, Item 18) from left and right lead springs (Figure 3, Item 15) and dowel pin (Figure 3, Item 16) on rear axle (Figure 3, Item 12). Discard lockwashers.
13. Remove spring seat wear pads (Figure 3, Item 17) from right and left upper spring brackets (Figure 3, Item 18).

NOTE

Assistant will help with Steps (14) through (15).

14. Raise hydraulic jack and remove jack stands (Figure 3, Item 6) from rear axle (Figure 3, Item 12).
15. Remove rear axle (Figure 3, Item 12) from vehicle.

REMOVAL - Continued

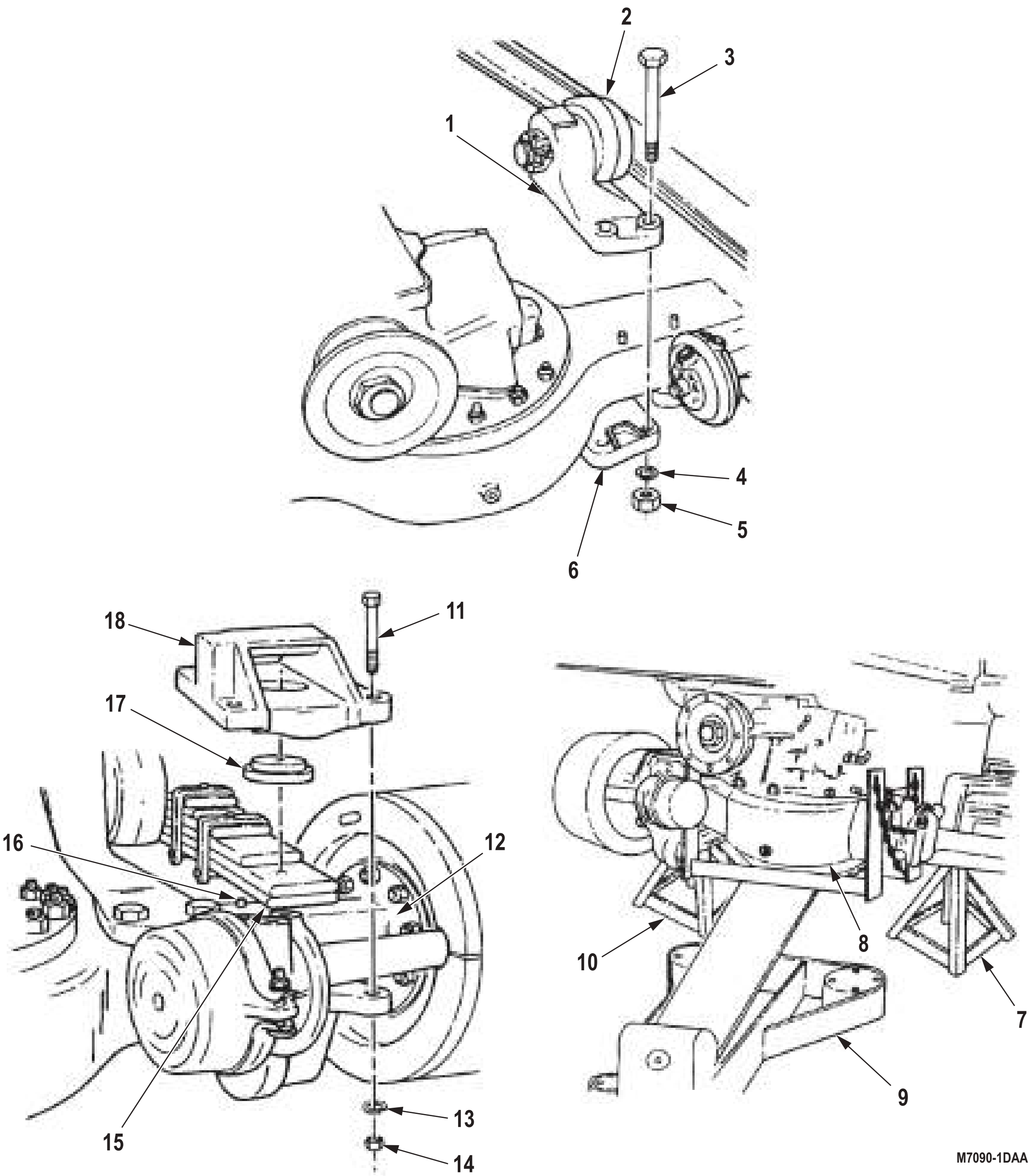


Figure 3. Axle on Jack Stand Removal.

END OF TASK

INSTALLATION

WARNING

Weight of vehicle must remain supported on jack stands at all times. Do not attempt to support weight of vehicle on hydraulic jack. Failure to comply may result in injury or death to personnel.

NOTE

Assistant will help with Steps (1) through (3).

1. Position rear axle (Figure 4, Item 3) on hydraulic jack (Figure 4, Item 7)
2. Raise rear axle (Figure 4, Item 3) and remove jack stands (Figure 4, Item 8) from under rear axle (Figure 4, Item 3).
3. Using hydraulic jack (Figure 4, Item 7) position rear axle (Figure 4, Item 3) under springs (Figure 4, Item 6).
4. Install spring seat wear pad (Figure 4, Item 10) on left and right upper spring brackets (Figure 4, Item 1).
5. Install upper spring bracket (Figure 4, Item 1) on left and right leaf springs (Figure 4, Item 6), position over rear axle (Figure 4, Item 3) and dowel pin (Figure 4, Item 9), and install two screws (Figure 4, Item 2), lockwashers (Figure 4, Item 4), and nuts (Figure 4, Item 5). Finger-tighten nuts.

INSTALLATION - Continued

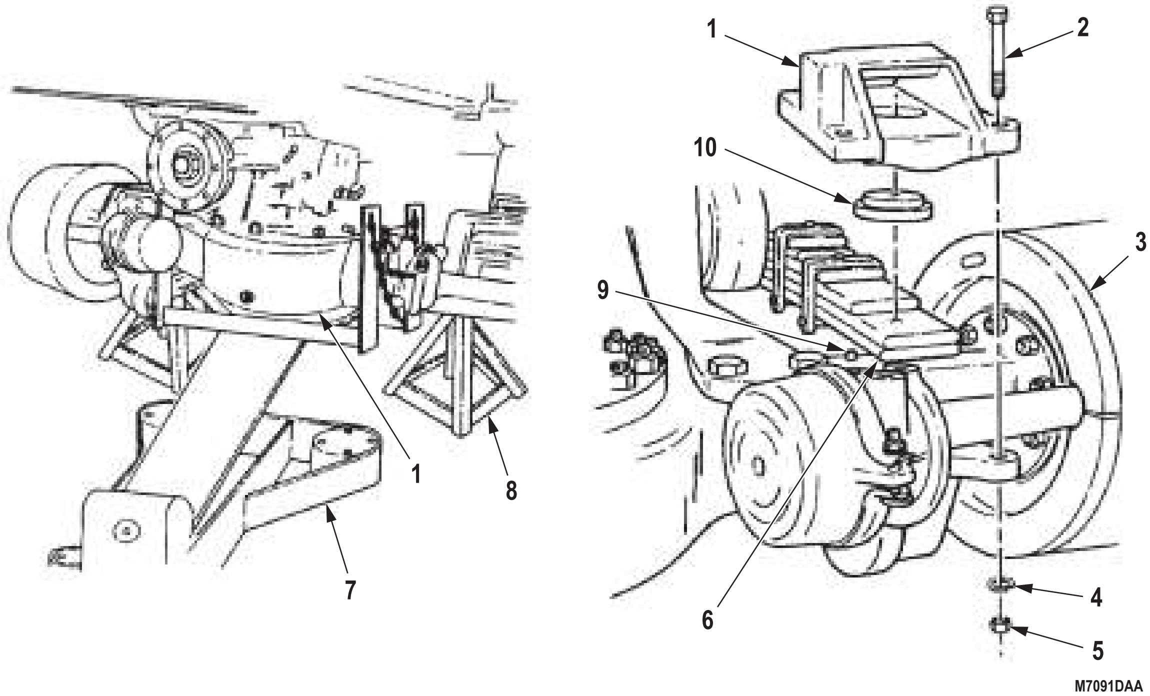


Figure 4. Forward-Rear and Rear-Rear Brackets Installation.

INSTALLATION - Continued

6. Install brake chamber bracket (Figure 5, Item 10) on left and right upper spring brackets (Figure 5, Item 5) with washer (Figure 5, Item 4), screw (Figure 5, Item 3), washer (Figure 5, Item 4), lockwasher (Figure 5, Item 8), and nut (Figure 5, Item 9). Finger-tighten nuts.
7. Position two upper torque rod brackets (Figure 5, Item 12) over dowel pins (Figure 5, Item 17) on rear axle (Figure 5, Item 18) and install on upper torque rod plates (Figure 5, Item 14) with four screws (Figure 5, Item 13), lockwashers (Figure 5, Item 15), and nuts (Figure 5, Item 16).
8. Install U-bolt bracket (Figure 5, Item 7) and U-bolt (Figure 5, Item 6) on left and right service brake chamber brackets (Figure 5, Item 10) with two washers (Figure 5, Item 2) and nuts (Figure 5, Item 1).

NOTE

Assistant will help with Step (9).

9. Install brake chamber bracket (Figure 5, Item 10) on left and right upper spring brackets (Figure 5, Item 5) with washer (Figure 3, Item 4), screw (Figure 5, Item 3), washer (Figure 5, Item 4), lockwasher (Figure 5, Item 9), and nut (Figure 5, Item 8). Tighten nuts (Figure 4, Item 5) and (Figure 5, Item 8) 350 to 375 lb-ft (475 to 509 N·m).
10. Install U-bolt bracket (Figure 5, Item 7) and U-bolt (Figure 5, Item 6) on left and right spring brakes (Figure 5, Item 11) with two washers (Figure 5, Item 2) and nuts (Figure 5, Item 1).

INSTALLATION - Continued

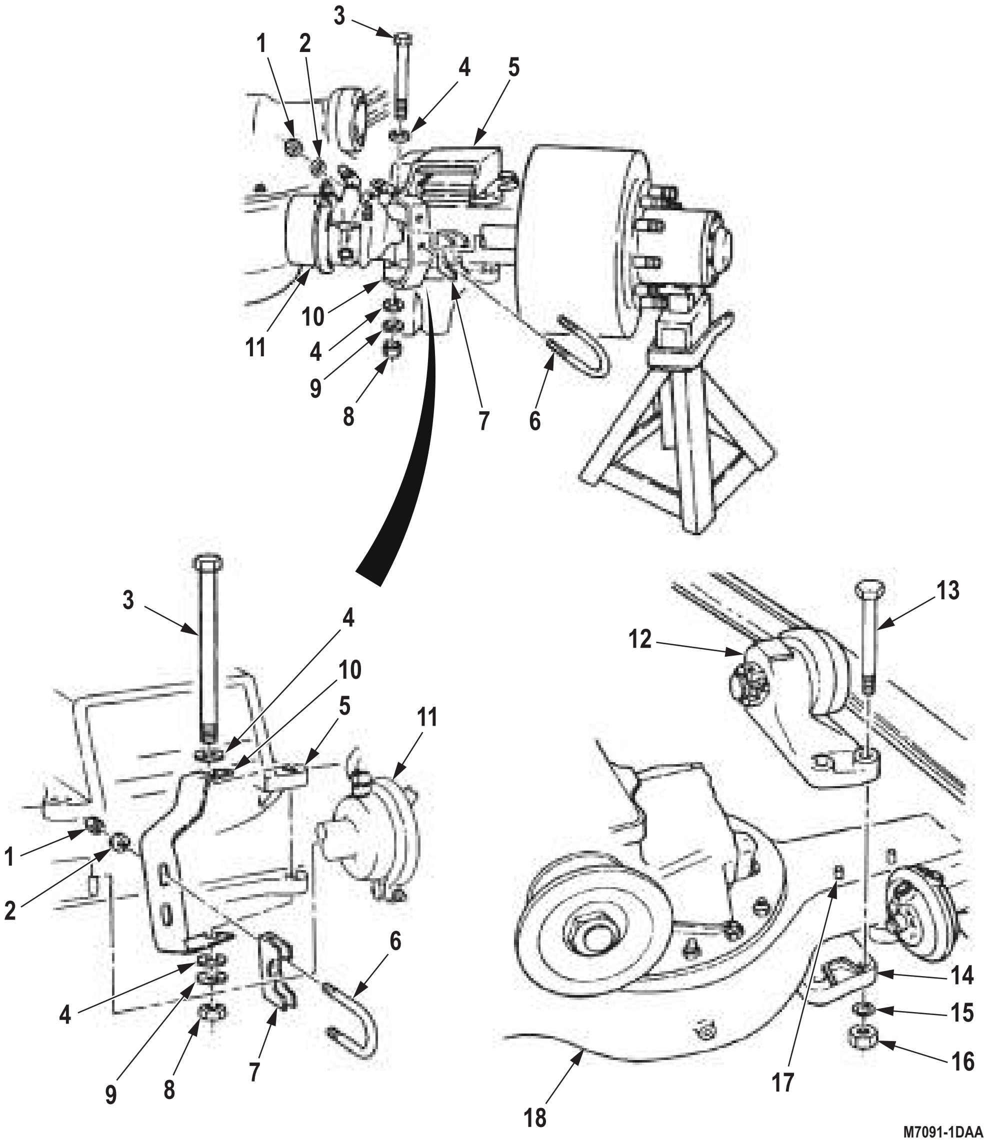


Figure 5. Forward-Rear and Rear-Rear Brackets Installation.

INSTALLATION - Continued

11. Install mounting plate (Figure 6, Item 9) on differential housing (Figure 6, Item 7) with two lockwashers (Figure 6, Item 4) and screws (Figure 6, Item 3).

NOTE

Wrap all male threads with antiseize before installation.

12. Install two adapter fittings (Figure 6, Item 5), secondary line (Figure 6, Item 8), and primary line (Figure 6, Item 6) on mounting plate (Figure 6, Item 9).

13. Install tee fitting (Figure 6, Item 15), elbow (Figure 6, Item 14), two adapter elbows (Figure 6, Item 13), spring brake override line (Figure 6, Item 10), secondary line (Figure 6, Item 11), and vent liner (Figure 6, Items 1 and 2) on left and right spring brakes (Figure 6, Item 12).

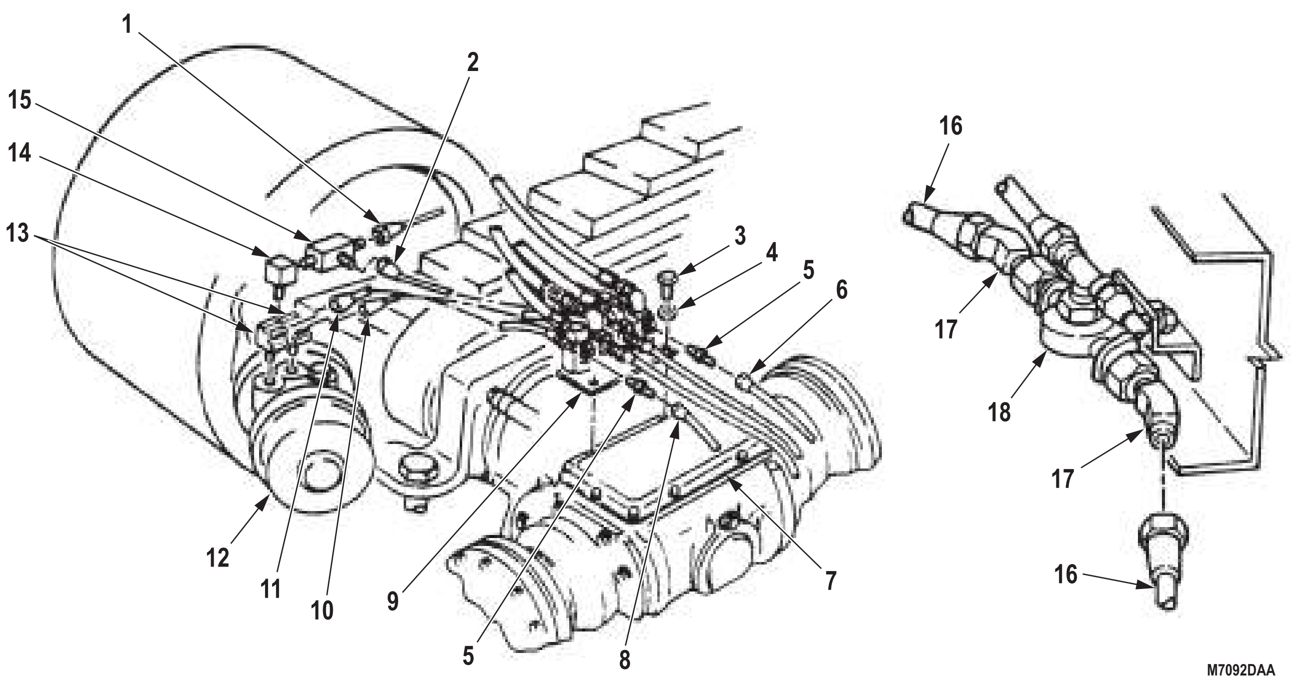


Figure 6. Axle Lines and Fittings Installation.

INSTALLATION - Continued

NOTE

Perform Step (14) for M939A2 series vehicles.

14. Install elbows (Figure 7, Items 8 and 10), vent line (Figure 7, Item 6), and primary line (Figure 7, Item 7) on right and left service brake chambers (Figure 7, Item 9).
15. Connect two air lines (Figure 6, Item 16) to elbows (Figure 6, Item 17) on relief valve (Figure 6, Item 18).
16. Install propeller shaft (Figure 7, Item 2) on companion flange (Figure 7, Item 1) with eight screws (Figure 7, Item 3) and locknuts (Figure 7, Item 4). Tighten locknuts 32 to 40 lb-ft (43 to 54 N·m).
17. Install wheels (WP 0484) or (WP 0485).
18. Remove hydraulic jack and jack stands from rear axle (Figure 7, Item 5).

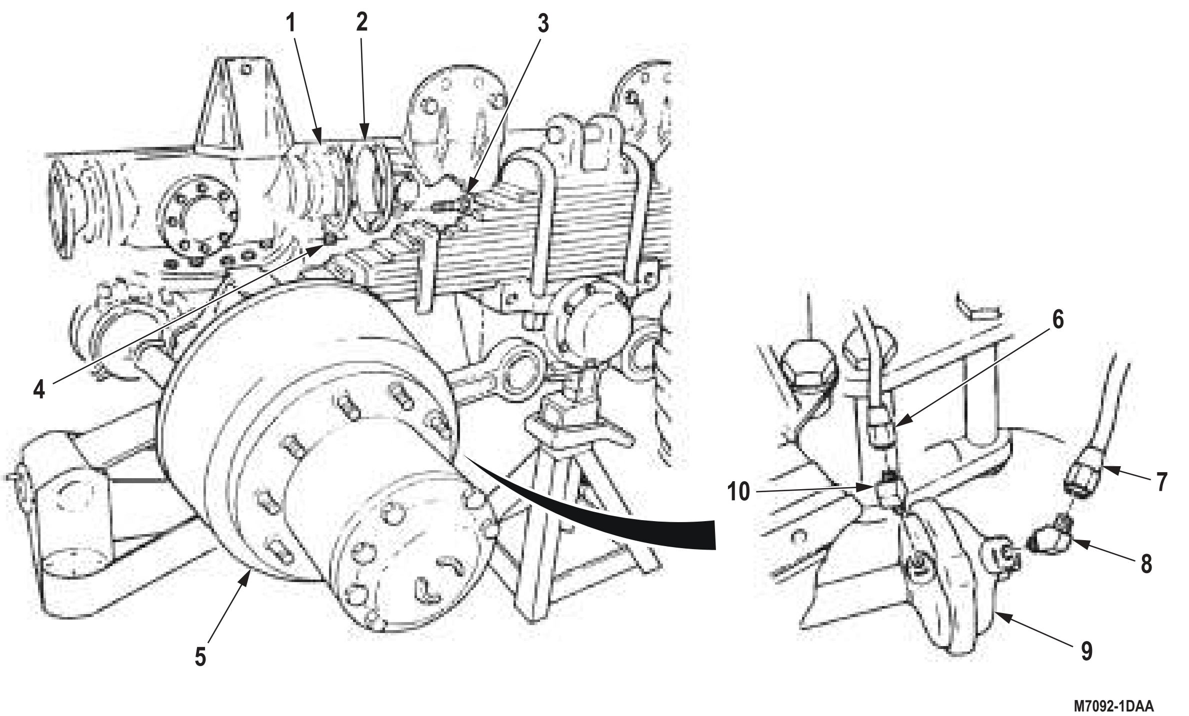


Figure 7. Axle Lines and Fittings Installation.

END OF TASK

FOLLOW-ON MAINTENANCE

1. Lubricate rear axle. (Volume 5, WP 0820)
2. Start engine and allow air system to build to normal operating pressure. Check air lines for leaks. Road test vehicle. (TM 9-2320-272-10)
3. Perform axle leakage test. (WP 0415)

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
FORWARD-REAR AND REAR-REAR AXLE LEAKAGE TEST

INITIAL SETUP:

Tools and Special Tools
Tool Kit, General Mechanic's: Automotive
(Volume 5, WP 0826, Table 1, Item 56)
Air Gauge Assembly
(Volume 5, WP 0826, Table 1, Item 4)

References
WP 0407

References (cont.)
WP 0418
WP 0419

Equipment Condition
Parking brake set. (TM 9-2320-272-10)
Rear wheels chocked. (TM 9-2320-272-10)

TEST

1. Remove breather (Figure 1, Item 5) from axle housing (Figure 1, Item 8).
2. Install nipple (Figure 1, Item 10) and tee (Figure 1, Item 2) on axle housing (Figure 1, Item 8).
3. Install air pressure gauge (Figure 1, Item 1) and quick-disconnect coupling (Figure 1, Item 3) on tee (Figure 1, Item 2).

CAUTION

Do not allow air pressure to exceed 15 psi (103 kPa). Seals will be damaged if air pressure exceeds 15 psi (103 kPa).

4. Connect air supply hose (Figure 1, Item 4) to quick-disconnect coupling (Figure 1, Item 3).
5. Turn on air supply and observe air pressure gauge (Figure 1, Item 1). When air pressure reaches 8 psi (55 kPa), disconnect air supply hose (Figure 1, Item 4). Begin timing for a period of 45 seconds. After 45 seconds, check air gauge reading.
6. If air gauge reading indicates leakage of 5 psi (35 kPa) or greater, perform corrective action.

NOTE

Perform Steps (7) through (11) if corrective action is required.

7. Tighten all axle housing (Figure 1, Item 8) and differential carrier (Figure 1, Item 9) nuts and screws.
8. Reconnect air supply hose (Figure 1, Item 4) to quick-disconnect coupling (Figure 1, Item 3) and turn on air supply. When air pressure reaches 8 psi (55 kPa), disconnect air supply hose.
9. Apply soapsuds around front oil seal cover (Figure 1, Item 6), rear oil seal cap (Figure 1, Item 7), base of differential carrier (Figure 1, Item 9), and axle housing (Figure 1, Item 8). Air bubbles indicate defective or missing sealing compound. Remove front oil seal cover, rear oil seal cap, or differential carrier and reseal (WP 0407) , (WP 0418) , or (WP 0419).
10. Remove quick-disconnect coupling (Figure 1, Item 3), air pressure gauge (Figure 1, Item 1), tee (Figure 1, Item 2), and nipple (Figure 1, Item 10) from axle housing (Figure 1, Item 8).
11. Install breather (Figure 1, Item 5) on axle housing (Figure 1, Item 8).

TEST - Continued

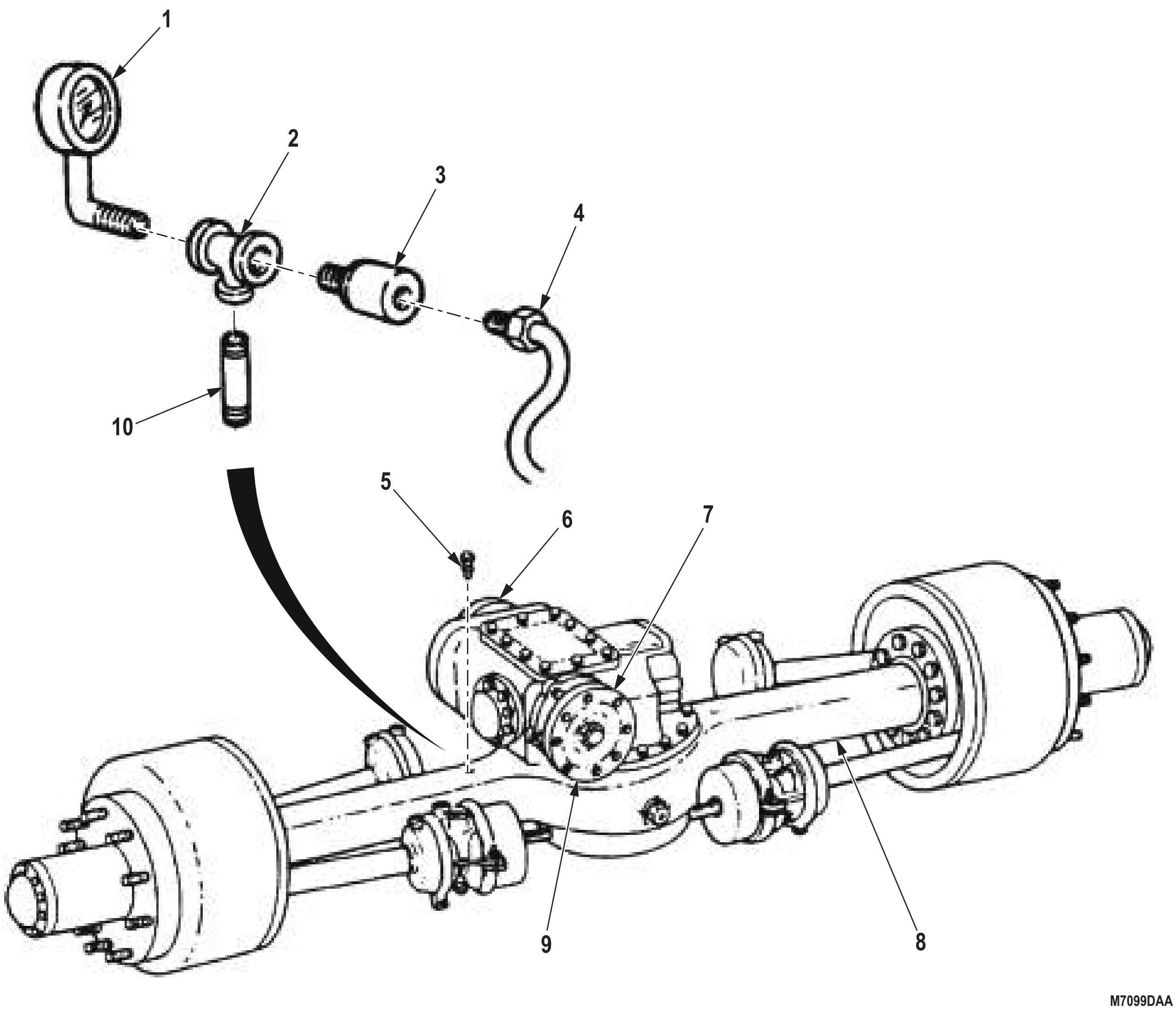


Figure 1. Axle Leakage Test.

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
REAR AXLE BREATHER REPLACEMENT

INITIAL SETUP:

Tools and Special Tools
Tool Kit, General Mechanic's: Automotive
(Volume 5, WP 0826, Table 1, Item 56)

Equipment Condition
Parking brake set. (TM 9-2320-272-10)

REMOVAL

Remove breather assembly (Figure 1, Item 1) from axle housing (Figure 1, Item 2).

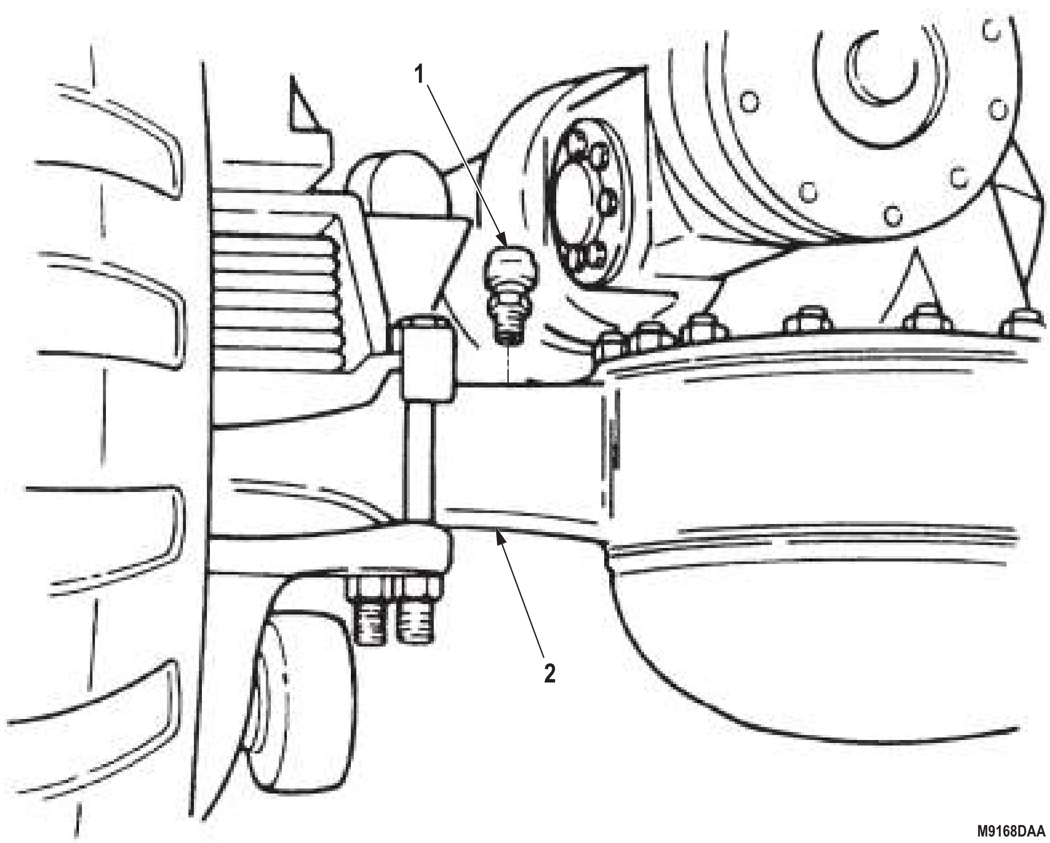


Figure 1. Rear Axle Breather Removal.

END OF TASK

INSTALLATION

Install breather (Figure 2, Item 1) on axle housing (Figure 2, Item 2).

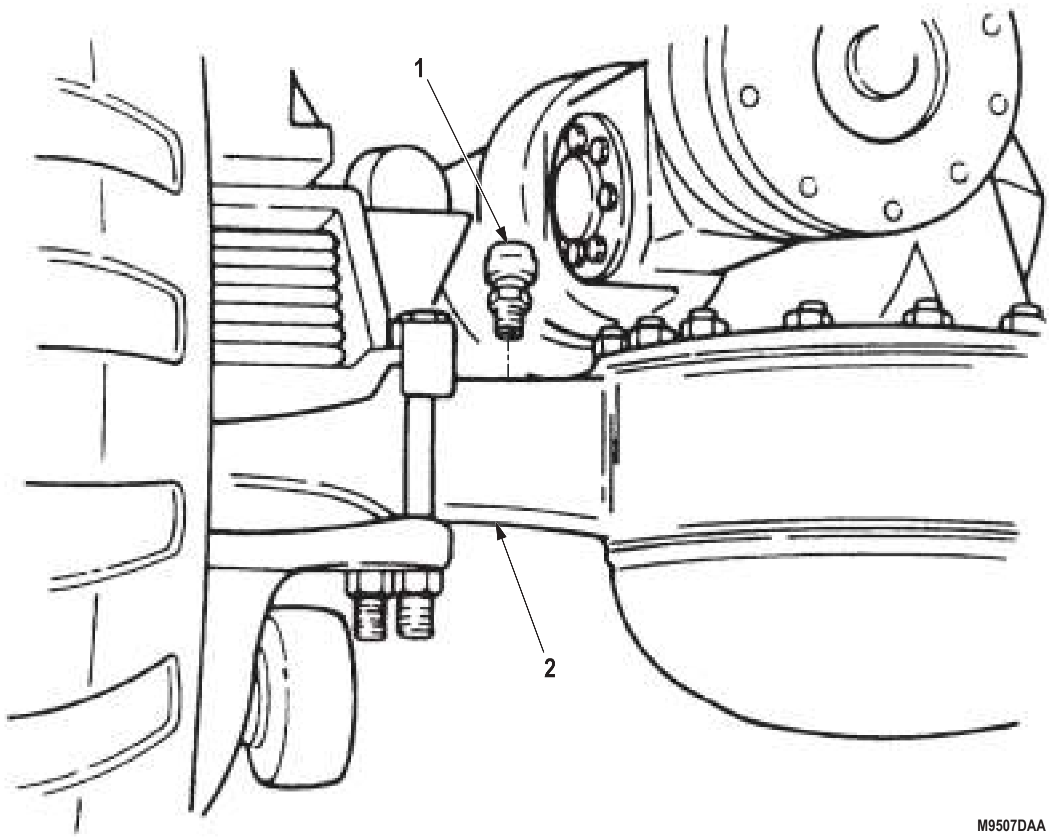


Figure 2. Rear Axle Breather Installation.

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
REAR AXLE SHAFT REPLACEMENT

INITIAL SETUP:

Tools and Special Tools
Tool Kit, General Mechanic's: Automotive
(Volume 5, WP 0826, Table 1, Item 56)
Wrench, Torque, Click, Ratcheting, 1/2" Drive, 250 Ft-Lb
(Volume 5, WP 0826, Table 1, Item 63)

Materials/Parts
Adhesive, Silicone Rubber
(Volume 5, WP 0825, Table 1, Item 4)

References
Volume 5, WP 0820

Equipment Condition
Parking brake set. (TM 9-2320-272-10)

REMOVAL

1. Remove 10 screws (Figure 1, Item 5) and washers (Figure 1, Item 6) from axle shaft flange (Figure 1, Item 7).
2. Tap shaft flange (Figure 1, Item 7) and remove axle shaft flange and axle shaft (Figure 1, Item 1) from axle housing (Figure 1, Item 3).
3. Remove gasket (Figure 1, Item 2), if present, from axle shaft flange (Figure 1, Item 7). Clean gasket or sealant from mating surfaces. Discard gasket.
4. Inspect axle shaft (Figure 1, Item 1) and axle housing (Figure 1, Item 3) for cracks, burrs, and damaged splines on shaft. Replace axle shaft or axle housing (Figure 1, Item 3) if cracked, burred, or shaft has damaged splines.

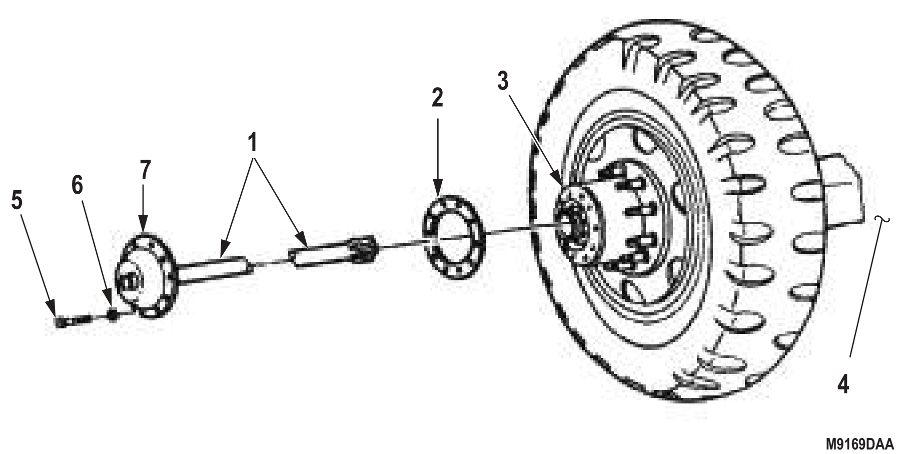


Figure 1. Rear Axle Shaft Removal.

END OF TASK

INSTALLATION

1. Coat surface of axle shaft flange (Figure 2, Item 7) with silicone rubber adhesive.
2. Position splined end of axle shaft (Figure 2, Item 1) into axle housing (Figure 2, Item 2). Ensure axle shaft slides into splined differential gear (Figure 2, Item 4).
3. Align axle shaft flange (Figure 2, Item 7) to hole in axle housing (Figure 2, Item 3).
4. Install axle shaft flange (Figure 2, Item 7) on axle housing (Figure 2, Item 3) with 10 washers (Figure 2, Item 6) and screws (Figure 2, Item 5). Tighten screws 80 to 105 lb-ft (108 to 142 N·m).

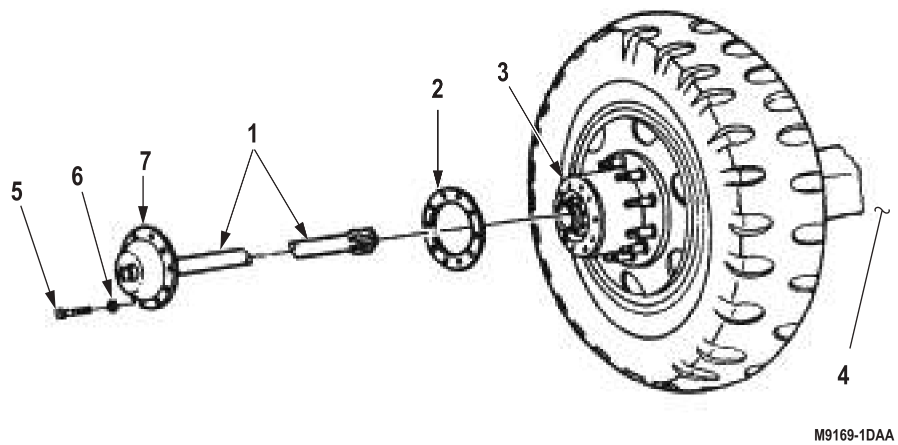


Figure 2. Rear Axle Shaft Installation.

END OF TASK

FOLLOW-ON MAINTENANCE

Lubricate axle assembly. (Volume 5, WP 0820)

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
REAR DIFFERENTIAL OIL SEAL REPLACEMENT

INITIAL SETUP:

Tools and Special Tools

Tool Kit, General Mechanic's: Automotive
(Volume 5, WP 0826, Table 1, Item 56)
Puller Kit, Mechanical
(Volume 5, WP 0826, Table 1, Item 41)
Wrench, Torque, Click, Ratcheting, 3/4" Drive, 600 Ft-Lb
(Volume 5, WP 0826, Table 1, Item 61)
Wrench, Torque, Click, Ratcheting, 3/8" Drive, 75 Ft-Lb
(Volume 5, WP 0826, Table 1, Item 62)

Materials/Parts

Grease, Automotive and Artillery
(Volume 5, WP 0825, Table 1, Item 29, 30, 31, 32, 33)
Sealing Compound
(Volume 5, WP 0825, Table 1, Item 61)

Materials/Parts (cont.)

Cotter Pin
(Volume 5, WP 0827, Table 1, Item 346)
Qty: 1
Gasket (Volume 5, WP 0827, Table 1, Item 95)
Qty: 1
Oil Seal (Volume 5, WP 0827, Table 1, Item 33)
Qty: 1

Equipment Condition

Parking brake set. (TM 9-2320-272-10)
Rear wheels chocked. (TM 9-2320-272-10)
Propeller shaft removed. (WP 0401)

REMOVAL

1. Remove cotter pin (Figure 1, Item 7) and nut (Figure 1, Item 8) from driveshaft (Figure 1, Item 2). Discard cotter pin.
2. Using mechanical puller, remove companion flange (Figure 1, Item 6) from driveshaft (Figure 1, Item 2).

CAUTION

Do not jam any tool between differential and pinion shaft retainer when removing front bearing cover. Shims will be damaged.

3. Remove six screws (Figure 1, Item 9), washers (Figure 1, Item 10), cap (Figure 1, Item 4), and gasket (Figure 1, Item 3) from differential carrier (Figure 1, Item 1). Discard gasket.
4. Remove oil seal (Figure 1, Item 5) from cap (Figure 1, Item 4). Discard oil seal.

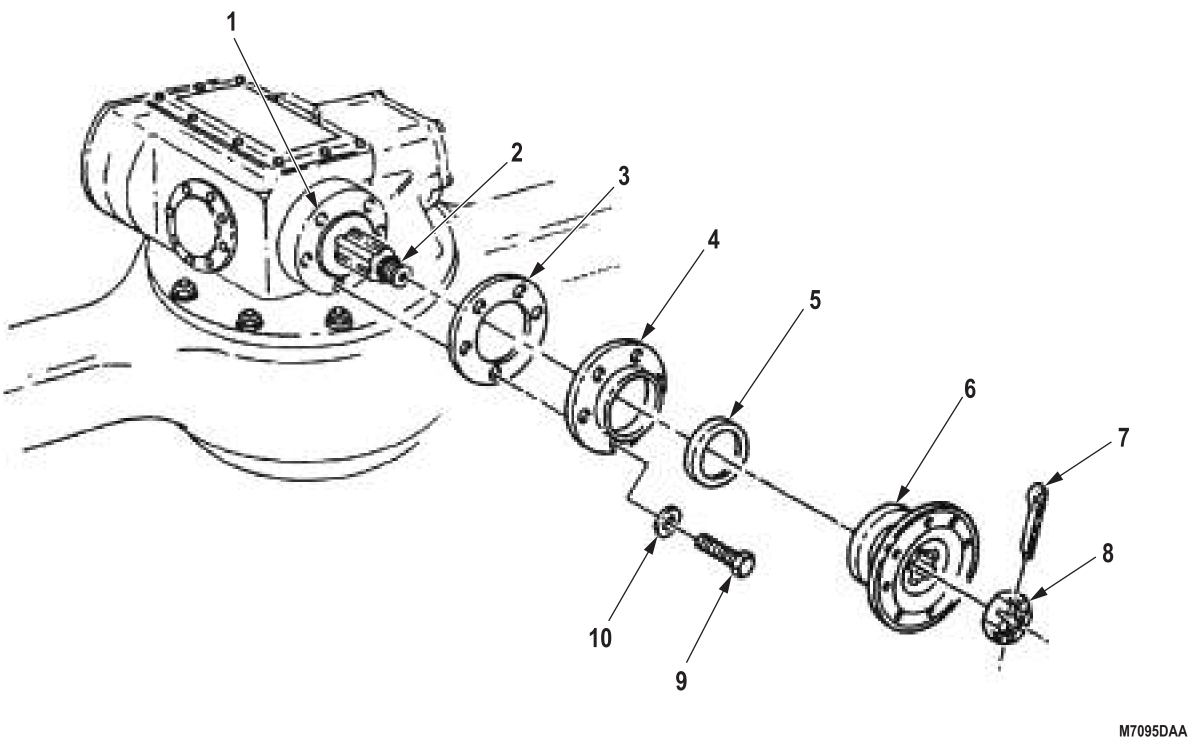


Figure 1. Rear Differential Oil Seal Removal.

END OF TASK

INSTALLATION

1. Apply GAA grease to inside diameter of oil seal (Figure 2, Item 5). Apply sealing compound to outside diameter of oil seal.
2. Install oil seal (Figure 2, Item 5) in cap (Figure 2, Item 4).
3. Apply sealing compound to mating surfaces of gasket (Figure 2, Item 3).
4. Install gasket (Figure 2, Item 3) and cap (Figure 2, Item 4) on differential carrier (Figure 2, Item 1) with six washers (Figure 2, Item 10) and screws (Figure 2, Item 9). Tighten screws 24 to 40 lb-ft (33 to 54 N·m).
5. Install companion flange (Figure 2, Item 6) on driveshaft (Figure 2, Item 2) with nut (Figure 2, Item 8). Tighten nut 300 to 400 lb-ft (407 to 542 N·m).
6. Install cotter pin (Figure 2, Item 7) through nut (Figure 2, Item 8) and driveshaft (Figure 2, Item 2).

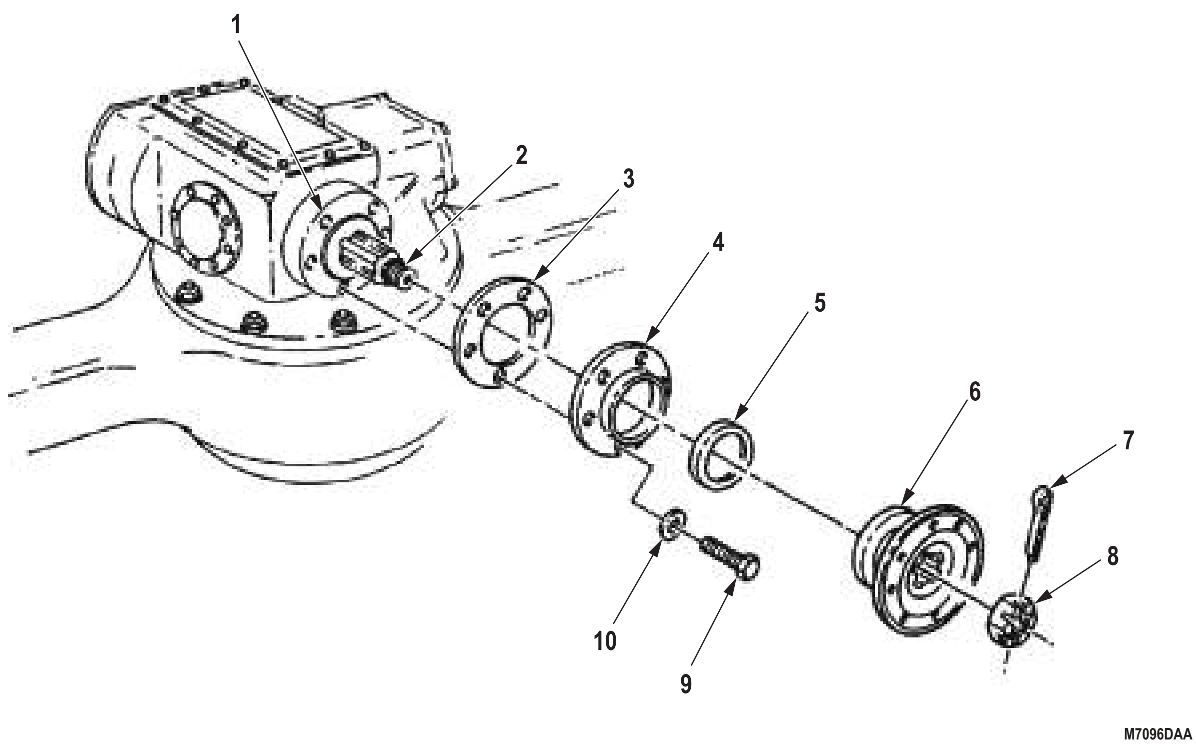


Figure 2. Rear Differential Oil Seal Installation.

END OF TASK

FOLLOW-ON MAINTENANCE

1. Install propeller shaft. (WP 0401)
2. Start engine and road test vehicle. (TM 9-2320-272-10)
3. Check front differential oil seal for leaks. (TM 9-2320-272-10)

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
CARRIER DIFFERENTIAL TOP COVER GASKET AND SIDE COVER GASKET REPLACEMENT

INITIAL SETUP:

Tools and Special Tools

Tool Kit, General Mechanic's: Automotive
(Volume 5, WP 0826, Table 1, Item 56)
Wrench, Torque, Click, Ratcheting, 3/8" Drive, 75 Ft-Lb
(Volume 5, WP 0826, Table 1, Item 62)

Materials/Parts

Adhesive, Silicone Rubber
(Volume 5, WP 0825, Table 1, Item 4)
Tape, Antiseizing
(Volume 5, WP 0825, Table 1, Item 65)

Materials/Parts (cont.)

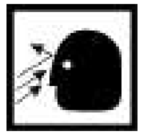
Side Cover Gasket
(Volume 5, WP 0827, Table 1, Item 4)
Qty: 1
Top Cover Gasket
(Volume 5, WP 0827, Table 1, Item 226)
Qty: 1

Equipment Condition

Parking brake set. (TM 9-2320-272-10)
Air reservoirs drained. (TM 9-2320-272-10)
Rear wheels chocked. (TM 9-2320-272-10)

TOP COVER GASKET REMOVAL

WARNING



Do not disconnect air lines or hoses before draining air reservoirs. Small parts under pressure may shoot out with high velocity. Failure to comply may result in injury or death to personnel.

NOTE

- Tag all air lines for installation.
- Perform Steps (1) through (4) for forward-rear and rear-rear axle carrier differential top cover.

1. Remove four air lines (Figure 1, Item 3) from adapters (Figure 1, Item 2).
2. Remove two adapters (Figure 1, Item 2) from manifolds (Figure 1, Item 1).
3. Remove two screws (Figure 1, Item 7), washers (Figure 1, Item 6), and bracket (Figure 1, Item 5) from carrier differential top cover (Figure 1, Item 4).

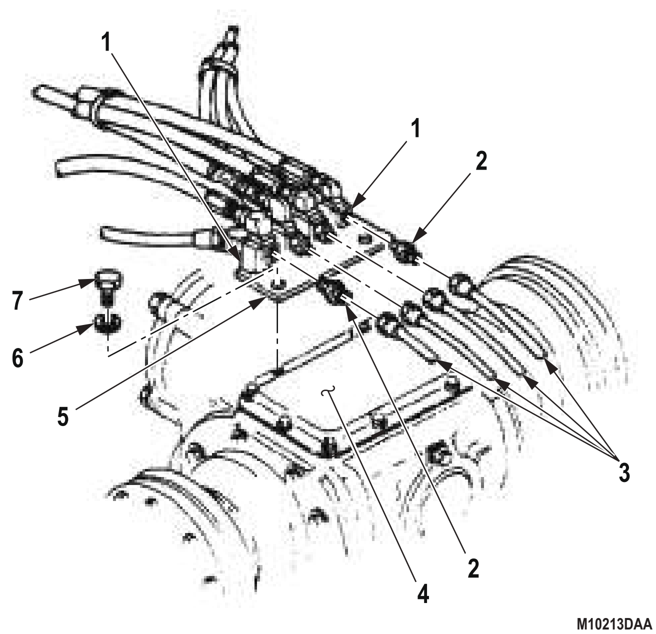


Figure 1. Top Cover Gasket Removal.

TOP COVER GASKET REMOVAL - Continued

4. Remove eight screws (Figure 2, Item 1), washers (Figure 2, Item 2), top cover (Figure 2, Item 3), and gasket (Figure 2, Item 4) from carrier differential housing (Figure 2, Item 5). Clean gasket remains from mating surfaces. Discard gasket.

NOTE

Perform Step (5) for front axle carrier differential top cover.

5. Remove ten screws (Figure 2, Item 1), washers (Figure 2, Item 2), top cover (Figure 2, Item 3), and gasket (Figure 2, Item 4) from carrier differential housing (Figure 2, Item 5). Discard gasket.

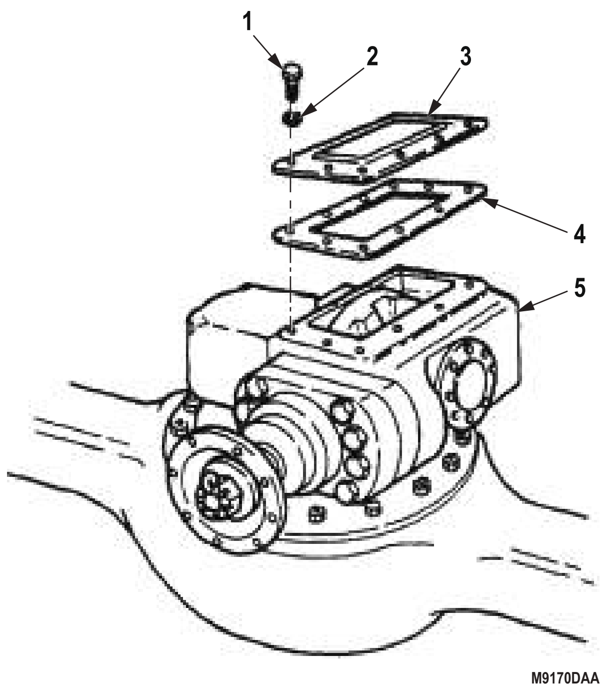


Figure 2. Top Cover Gasket Removal.

END OF TASK

TOP COVER GASKET INSTALLATION

NOTE

Perform Step (2) for front axle carrier differential top cover.

1. Apply silicone rubber adhesive to mating surfaces of top cover (Figure 3, Item 3).
2. Install gasket (Figure 3, Item 4) and top cover (Figure 3, Item 3) on front axle carrier differential housing (Figure 3, Item 5) with ten washers (Figure 3, Item 2) and screws (Figure 3, Item 1). Tighten screws (Figure 3, Item 1) 27 to 34 lb-ft (37 to 48 N·m).

NOTE

- Perform Steps (3) through (6) for forward-rear and rear-rear axle carrier differential top cover.
- Male pipe threads must be wrapped with antiseize tape prior to installation.

3. Install gasket (Figure 3, Item 4) and top cover (Figure 3, Item 3) on carrier differential housing (Figure 3, Item 5) with eight washers (Figure 3, Item 2) and screws (Figure 3, Item 1). Tighten screws 27 to 34 lb-ft (37 to 48 N·m).

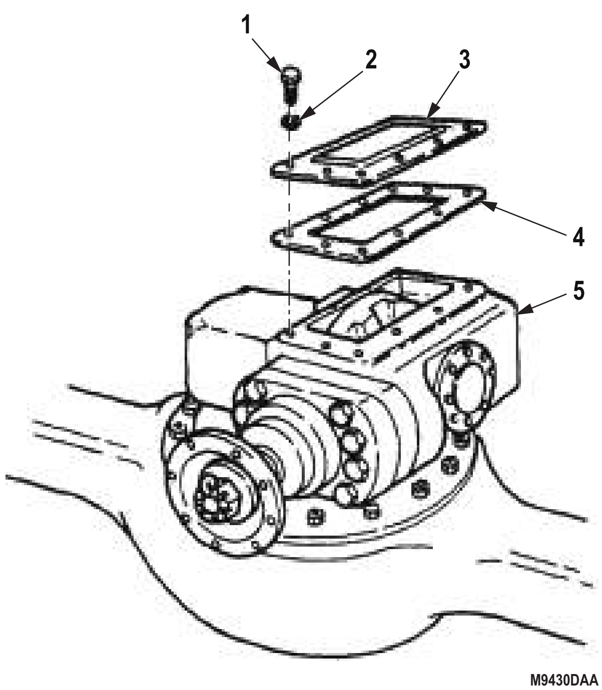


Figure 3. Top Cover Gasket Installation.

TOP COVER GASKET INSTALLATION - Continued

4. Install bracket (Figure 4, Item 5) on carrier differential top cover (Figure 4, Item 4) with two washers (Figure 4, Item 6) and screws (Figure 4, Item 7). Tighten screws 27 to 34 lb-ft (37 to 48 N·m).
5. Install two adapters (Figure 4, Item 2) on manifolds (Figure 4, Item 1).
6. Install four air lines (Figure 4, Item 3) on adapters (Figure 4, Item 2).

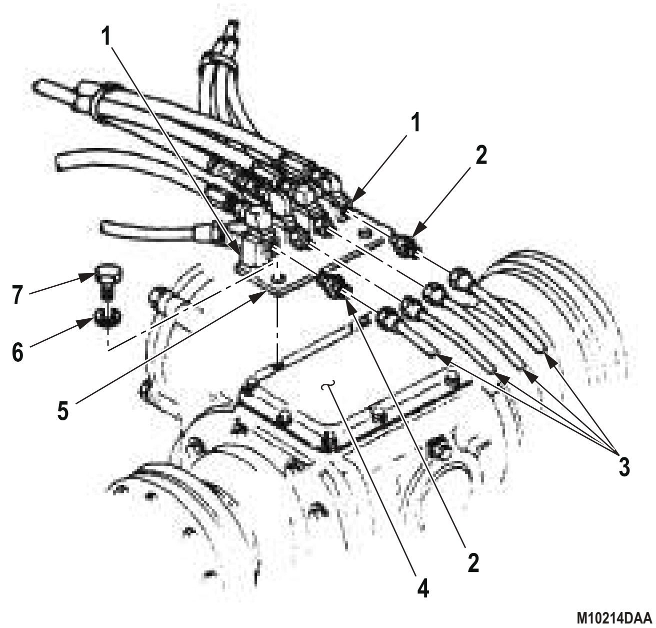


Figure 4. Top Cover Gasket Installation.

END OF TASK

SIDE COVER GASKET REMOVAL

1. Remove eight screws (Figure 5, Item 5), washers (Figure 5, Item 4), and side cover (Figure 5, Item 3) from differential housing (Figure 5, Item 1).
2. Remove gasket (Figure 5, Item 2) from differential housing (Figure 5, Item 1). Discard gasket. Clean gasket remains from side cover (Figure 5, Item 3) and differential housing.

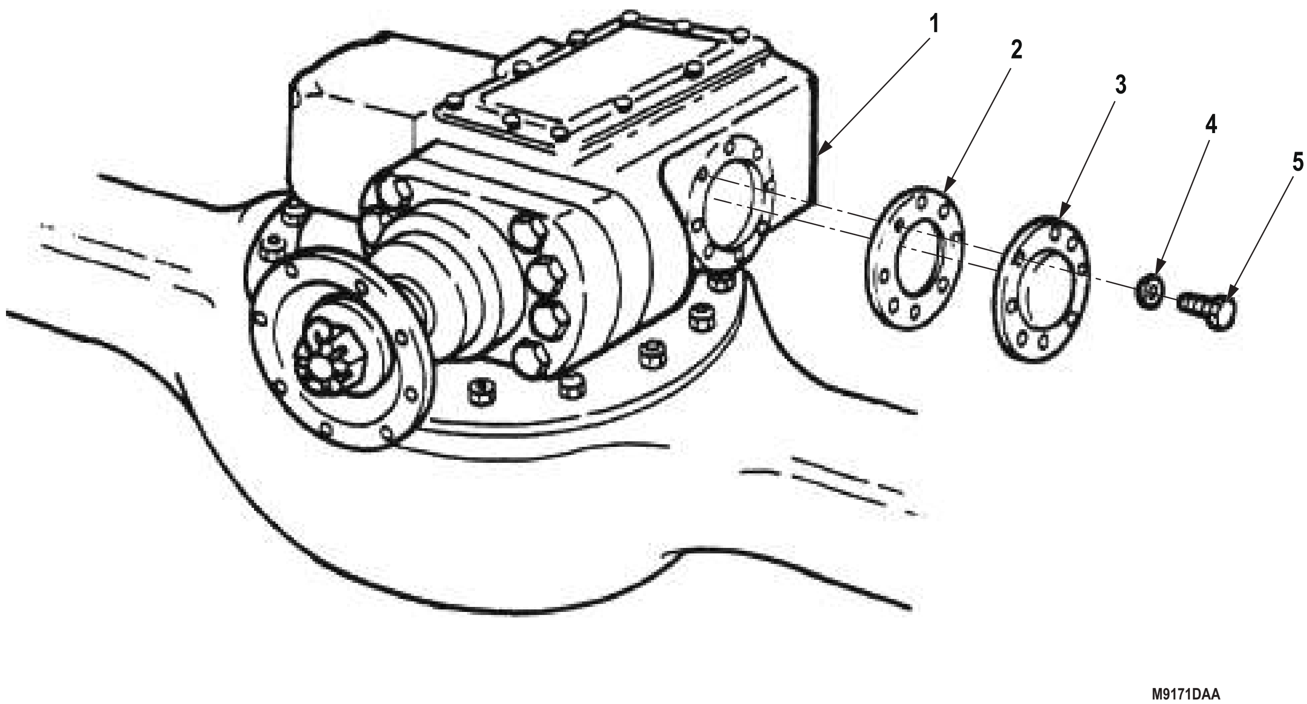


Figure 5. Side Cover Gasket Removal.

END OF TASK

SIDE COVER GASKET INSTALLATION

1. Apply silicone rubber adhesive to mating surface of side cover (Figure 6, Item 3) and differential housing (Figure 6, Item 1).
2. Install side cover gasket (Figure 6, Item 2) and side cover (Figure 6, Item 3) on differential housing (Figure 6, Item 1) with eight washers (Figure 6, Item 4) and screws (Figure 6, Item 5). Tighten screws 27 to 34 lb-ft (37 to 48 N·m).

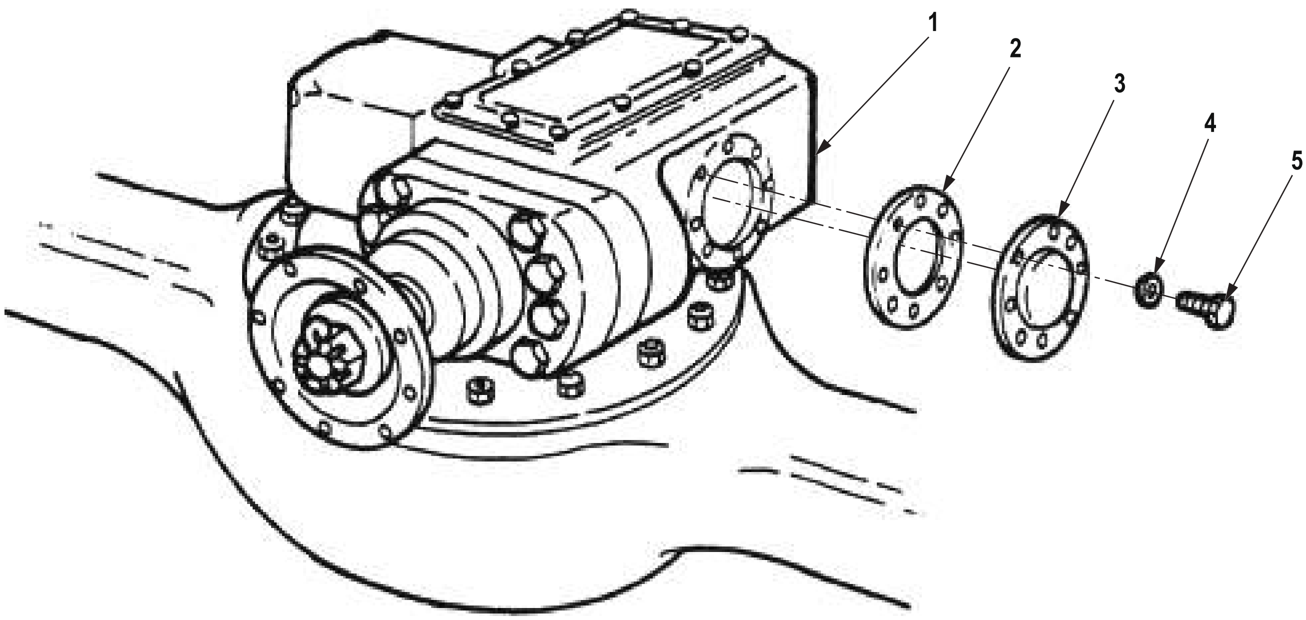


Figure 6. Side Cover Gasket Installation.

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
PARKING BRAKE ADJUSTMENT

INITIAL SETUP:

Tools and Special Tools
Tool Kit, General Mechanic's: Automotive
(Volume 5, WP 0826, Table 1, Item 56)

Personnel Required
(2)

Equipment Condition
Wheels chocked (task c. only).
(TM 9-2320-272-10)

Equipment Condition (cont.)
Parking brake disengaged. (TM 9-2320-272-10)
Transfer case shift lever in neutral.
(TM 9-2320-272-10)
Transmission in neutral. (TM 9-2320-272-10)

TEST

1. Start engine (TM 9-2320-272-10) and observe air pressure gauge (Figure 1, Item 1) located inside vehicle cab until air pressure builds to 90 psi (621 kPa).
2. Pull parking brake lever (Figure 1, Item 4) up to engage.
3. Push in spring brake release control (Figure 1, Item 2) on instrument panel (Figure 1, Item 3) to release spring brakes.
4. Place transmission selector lever (Figure 1, Item 5) in 1-5 (drive). If vehicle moves, perform MAJOR ADJUSTMENT.

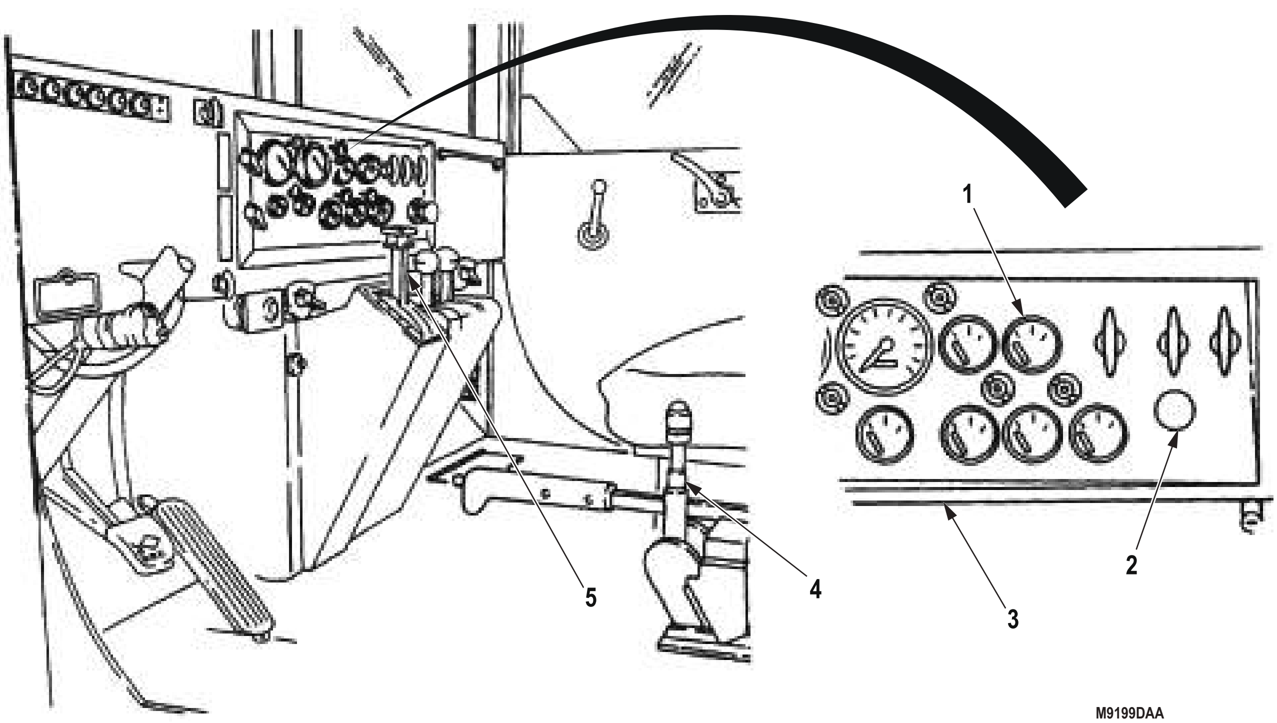


Figure 1. Parking Brake Test.

END OF TASK

MINOR ADJUSTMENT

Turn parking brake adjusting cap (Figure 2, Item 1) clockwise to increase; counterclockwise to decrease braking action.

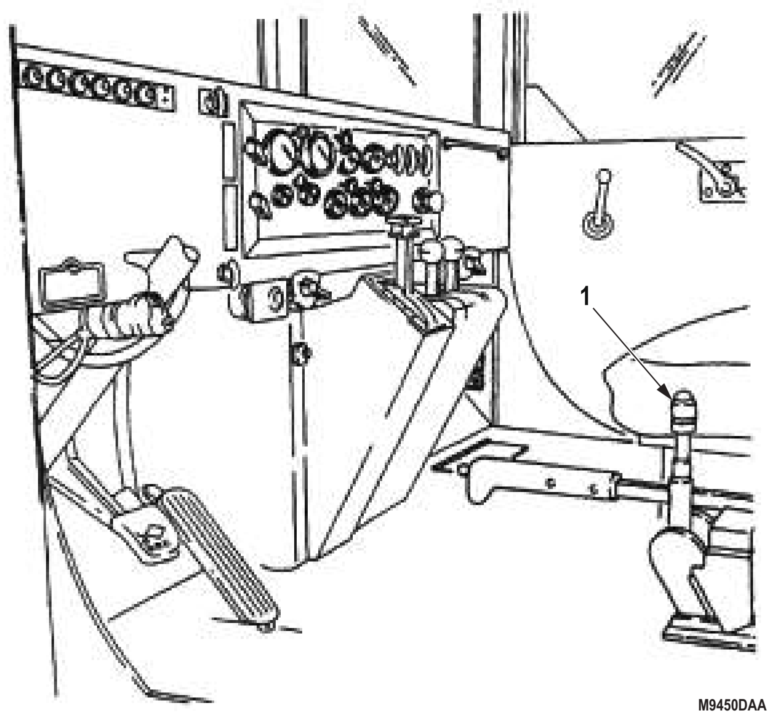


Figure 2. Parking Brake Minor Adjustment.

END OF TASK

MAJOR ADJUSTMENT

1. Remove transfer case to forward rear axle propeller shaft (WP 0401) or (WP 0400).
2. Loosen adjusting nut (Figure 3, Item 4) on parking brake cable (Figure 3, Item 1) until parking brake lever (Figure 3, Item 3) has free travel.
3. Push parking brake lever (Figure 3, Item 3) clockwise with one hand while turning drum (Figure 3, Item 2) clockwise with other hand. If drum turns freely when parking brake lever is pushed clockwise, replace parking brake shoes. If drum stops, go to Step (3).

NOTE

Assistant will help with Step (3).

4. Pull parking brake lever inside vehicle cab up to engage (Figure 2, Item 3).
5. Tighten adjusting nut (Figure 3, Item 4) on parking brake cable (Figure 3, Item 1) against parking brake lever (Figure 3, Item 3) until drum (Figure 3, Item 2) does not move, then back off counterclockwise 1/2 turn.
6. Repeat Step (1) until slight drag of brake shoes against drum (Figure 3, Item 2) is observed.
7. Install transfer case to forward rear axle propeller shaft (WP 0401) or (WP 0400).

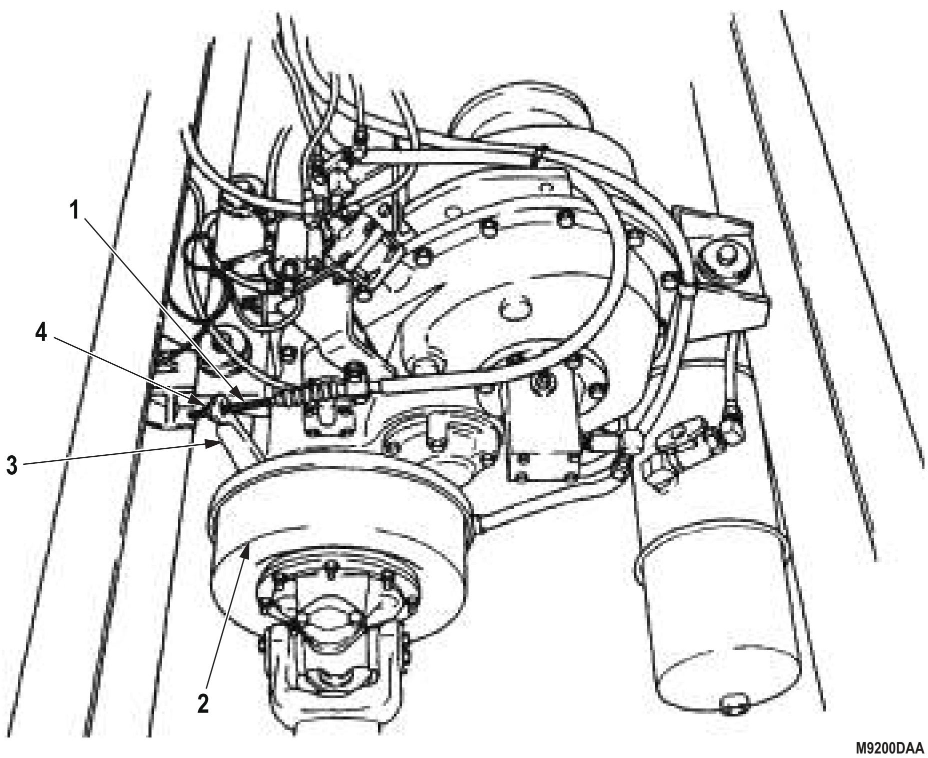


Figure 3. Parking Brake Major Adjustment.

END OF TASK

LEVER ARM ADJUSTMENT

1. Position lever arm (Figure 4, Item 3) horizontal to valve body (Figure 4, Item 8).
2. Remove two locknuts (Figure 4, Item 4), washers (Figure 4, Item 5), mounting screws (Figure 4, Item 1), and valve body (Figure 4, Item 8) from bracket (Figure 4, Item 2). Discard locknuts.
3. Loosen setscrew (Figure 4, Item 6), adjust lever (Figure 4, Item 7), and tighten setscrew.
4. Install valve body (Figure 4, Item 8) on bracket (Figure 4, Item 2) with two mounting screws (Figure 4, Item 1), washers (Figure 4, Item 5), and locknuts (Figure 4, Item 4).

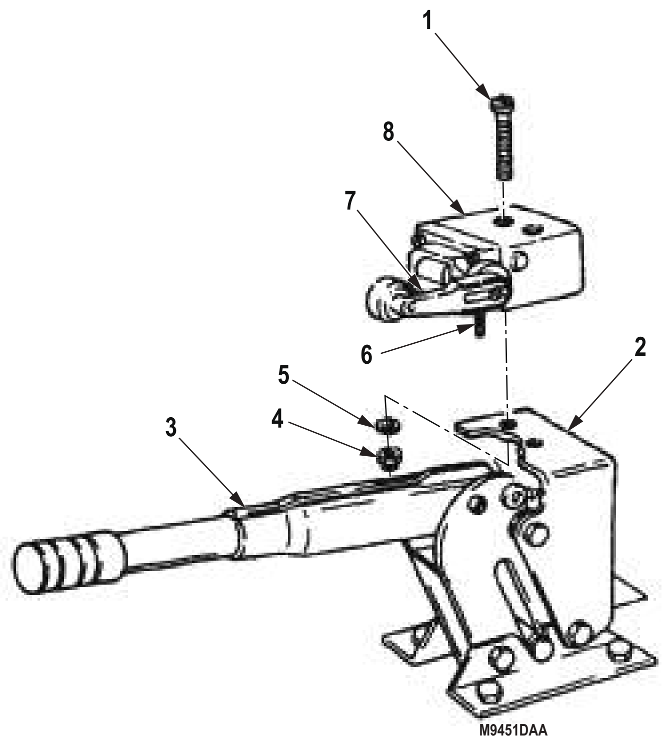


Figure 4. Parking Brake Lever Arm Adjustment.

END OF TASK

FOLLOW-ON MAINTENANCE

Remove chocks and road test vehicle. (TM 9-2320-272-10)

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
PARKING BRAKE CABLE AND BRACKET REPLACEMENT

INITIAL SETUP:

Tools and Special Tools
Tool Kit, General Mechanic's: Automotive
(Volume 5, WP 0826, Table 1, Item 56)

Materials/Parts
Cotter Pin
(Volume 5, WP 0827, Table 1, Item 337)
Qty: 1

Materials/Parts (cont.)
Locknut (Volume 5, WP 0827, Table 1, Item 285)
Qty: 8
Tiedown Strap
(Volume 5, WP 0827, Table 1, Item 373)
Qty: 4

Personnel Required
(2)

Equipment Condition
Wheels chocked. (TM 9-2320-272-10)

REMOVAL

1. Remove cotter pin (Figure 1, Item 1), washer (Figure 1, Item 2), clevis pin (Figure 1, Item 3), and parking brake cable (Figure 1, Item 6) from parking brake lever (Figure 1, Item 11). Discard cotter pin.

NOTE

Assistant will help with Step (2).

2. Remove four locknuts (Figure 1, Item 7), cable clamp bracket (Figure 1, Item 5), four screws (Figure 1, Item 10), and two parking lever brackets (Figure 1, Item 9) from cab floor (Figure 1, Item 8). Discard locknuts.
3. Remove grommet (Figure 1, Item 4) and parking brake cable (Figure 1, Item 6) from cab floor (Figure 1, Item 8).
4. Remove two locknuts (Figure 1, Item 15), screws (Figure 1, Item 13), cable clamp (Figure 1, Item 12), and spacer (Figure 1, Item 14) from cable clamp bracket (Figure 1, Item 5). Discard locknuts.

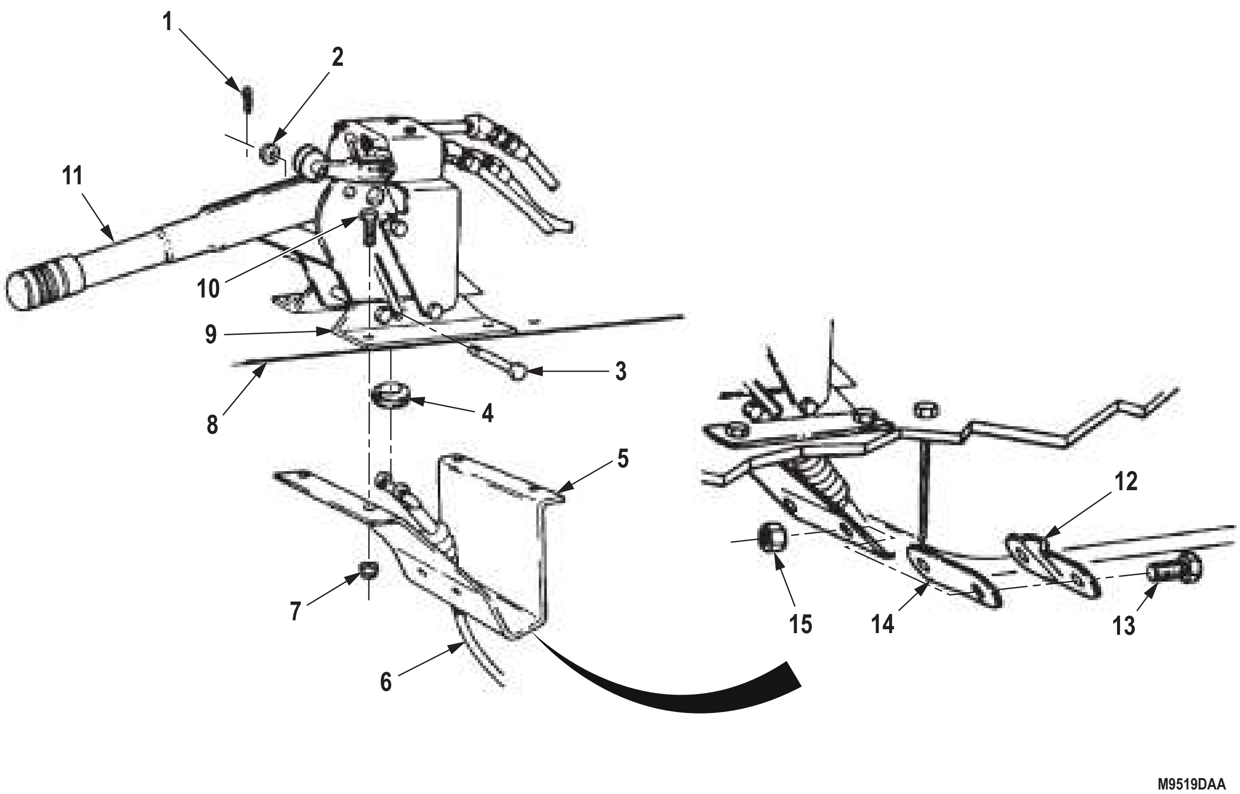


Figure 1. Parking Brake Cable and Bracket Removal.

REMOVAL - Continued

5. Remove four tiedown straps (Figure 2, Item 4), screw (Figure 2, Item 1), and two clamps (Figure 2, Item 3) from parking brake cable (Figure 2, Item 5).
6. Remove two locknuts (Figure 2, Item 9), screws (Figure 2, Item 6), cable clamp (Figure 2, Item 7), and spacer (Figure 2, Item 8) from transfer case bracket (Figure 2, Item 13) and parking brake cable (Figure 2, Item 5). Discard locknuts.
7. Remove nut (Figure 2, Item 10) and parking brake cable (Figure 2, Item 5) from brake drum lever (Figure 2, Item 11).
8. Remove two screws (Figure 2, Item 12), washers (Figure 2, Item 14), and transfer case bracket (Figure 2, Item 13) from transfer case (Figure 2, Item 3).

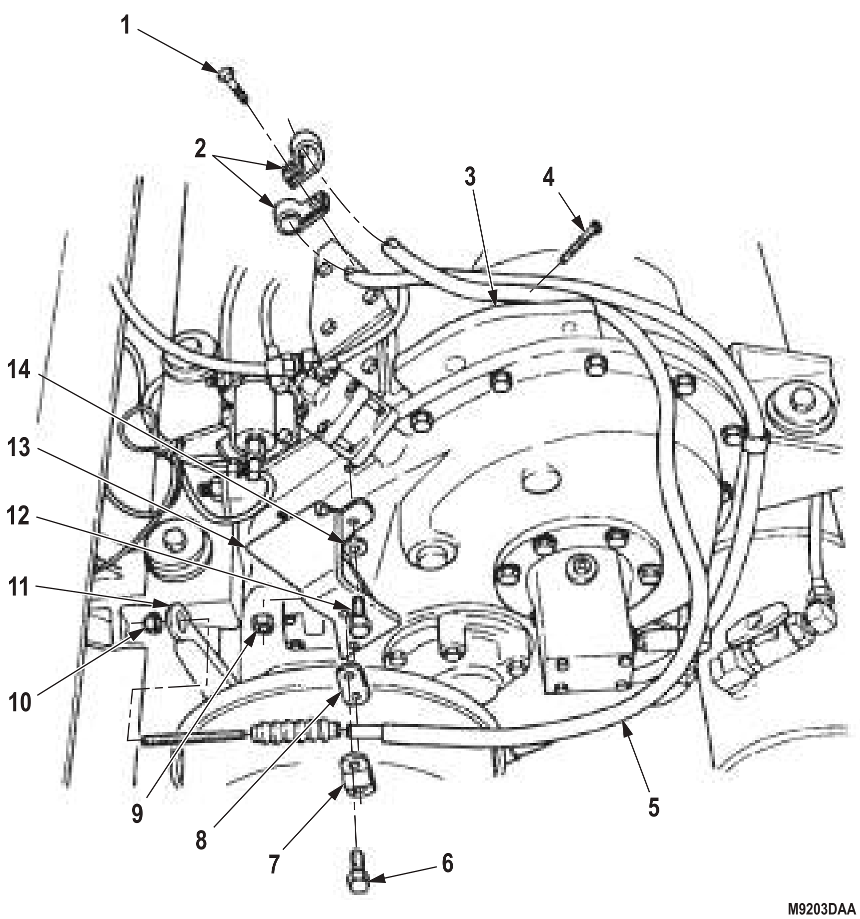


Figure 2. Parking Brake Cable and Bracket Removal.

END OF TASK

INSTALLATION

1. Install transfer case bracket (Figure 3, Item 13) on transfer case (Figure 3, Item 3) with two washers (Figure 3, Item 14) and screws (Figure 3, Item 12).
2. Install threaded end of parking brake cable (Figure 3, Item 5) on brake drum lever (Figure 3, Item 11) with nut (Figure 3, Item 10).
3. Position spacer (Figure 3, Item 8) between transfer case bracket (Figure 3, Item 13) and clamp (Figure 3, Item 7), and install parking brake cable (Figure 3, Item 5) on transfer case bracket with spacer, clamp, two screws (Figure 3, Item 6) and locknuts (Figure 3, Item 9).
4. Install two clamps (Figure 3, Item 2) on transfer case (Figure 3, Item 3) with screw (Figure 3, Item 1).
5. Install four tiedown straps (Figure 3, Item 4) on parking brake cable (Figure 3, Item 5).

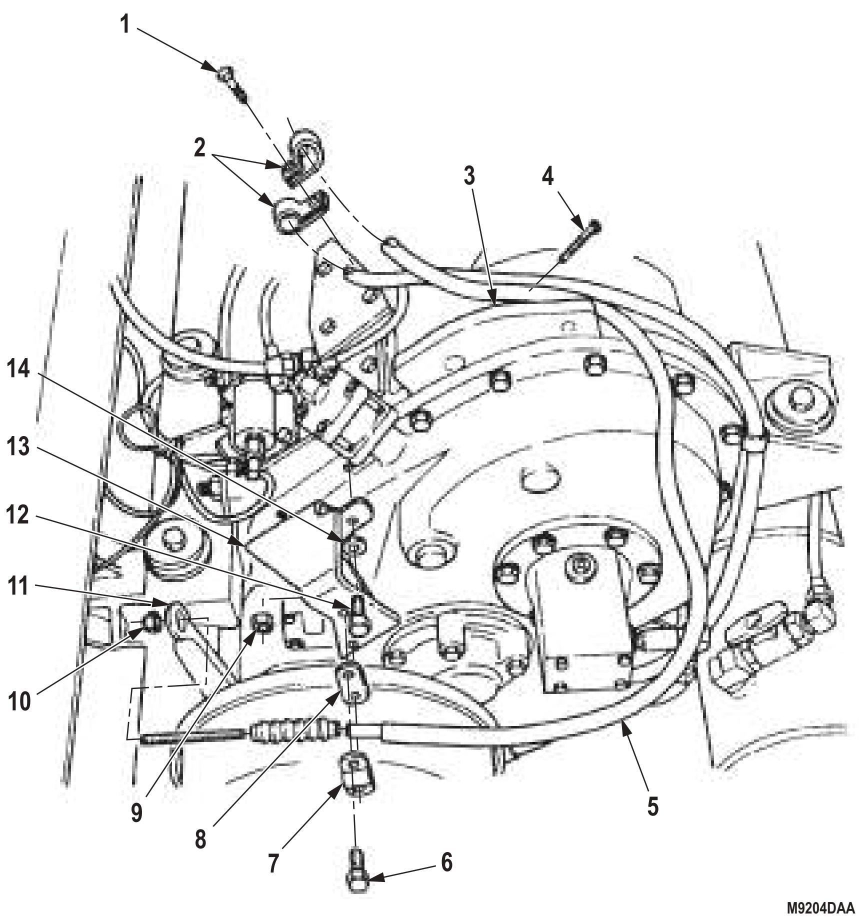


Figure 3. Parking Brake Cable and Bracket Installation.

INSTALLATION - Continued

6. Install parking brake cable (Figure 4, Item 6) on cable clamp bracket (Figure 4, Item 5) with clamp (Figure 4, Item 12), spacer (Figure 4, Item 14), two screws (Figure 4, Item 13), and locknuts (Figure 4, Item 15).
7. Install grommet (Figure 4, Item 4) around cable (Figure 4, Item 6) and in cab floor (Figure 4, Item 8).

NOTE

Assistant will help with Step (6).

8. Install cable clamp bracket (Figure 4, Item 5) and two parking lever brackets (Figure 4, Item 9) on cab floor (Figure 4, Item 8) with four screws (Figure 4, Item 10) and locknuts (Figure 4, Item 7).
9. Install parking brake cable (Figure 4, Item 6) on parking brake lever (Figure 4, Item 11) with clevis pin (Figure 4, Item 3), washer (Figure 4, Item 2), and cotter pin (Figure 4, Item 1).

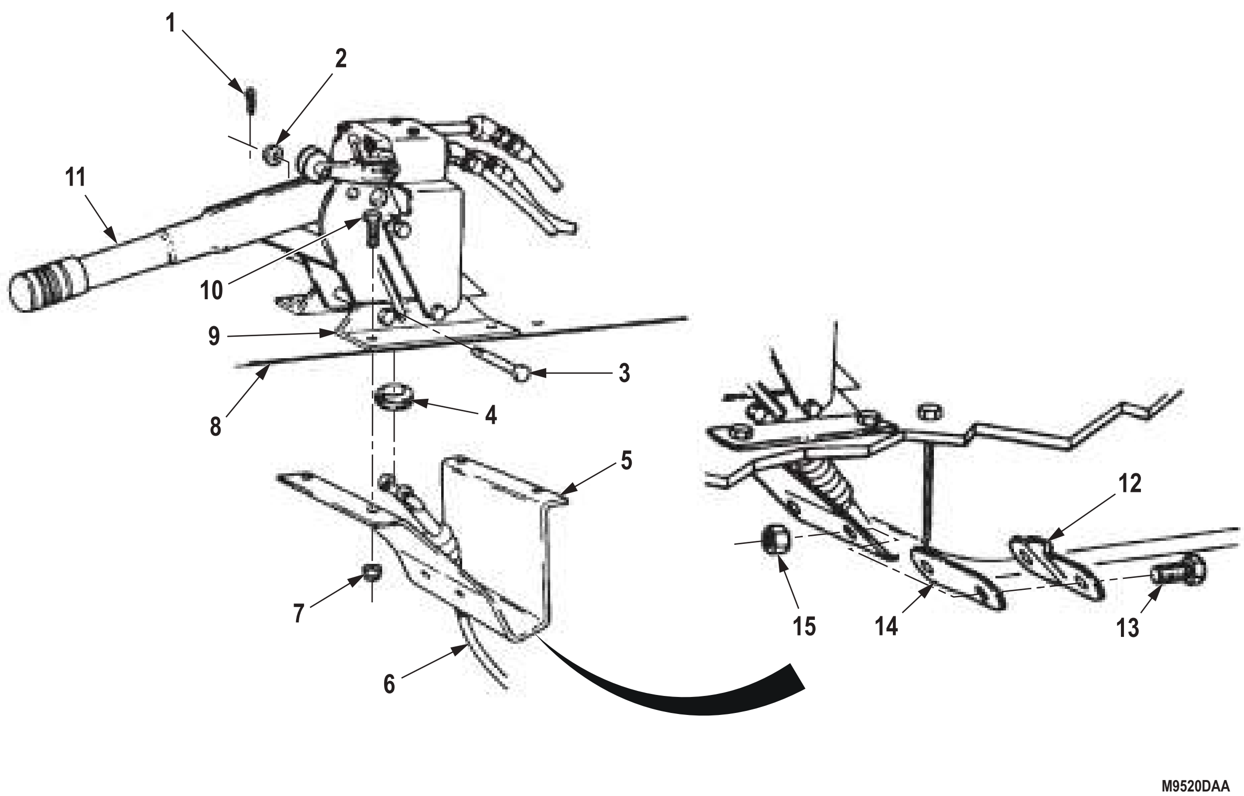


Figure 4. Parking Brake Cable and Bracket Installation.

END OF TASK

FOLLOW-ON MAINTENANCE

Adjust parking brake. (WP 0420)

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
PARKING BRAKE SHOES REPLACEMENT

INITIAL SETUP:

Tools and Special Tools

Tool Kit, General Mechanic's: Automotive
(Volume 5, WP 0826, Table 1, Item 56)
Pliers, Brake Repair
(Volume 5, WP 0826, Table 1, Item 38)
Wrench, Torque, Click, Ratcheting, 1/2" Drive, 250 Ft-Lb
(Volume 5, WP 0826, Table 1, Item 63)

Materials/Parts

Cleaning Compound, Solvent
(Volume 5, WP 0825, Table 1, Item 16, 17)

References

WP 0421

Equipment Condition

Wheels chocked. (TM 9-2320-272-10)

Equipment Condition (cont.)

Transfer case-to-forward rear axle propeller shaft removed. (WP 0400)
Transfer case-to-forward rear axle propeller shaft removed. (WP 0401)

REMOVAL

NOTE

Parking brake shoes should be replaced when parking brake lever full travel is over 2.0 in. (5.1 cm).

1. Remove thrust nut (Figure 1, Item 6) and washer (Figure 1, Item 5) from transfer output shaft (Figure 1, Item 1).
2. Remove parking brake drum (Figure 1, Item 3) and transfer output shaft flange (Figure 1, Item 4) from transfer output shaft (Figure 1, Item 1).
3. Remove transfer output shaft flange (Figure 1, Item 4) from parking brake drum (Figure 1, Item 3).
4. Remove eight studs (Figure 1, Item 2) from parking brake drum (Figure 1, Item 3).

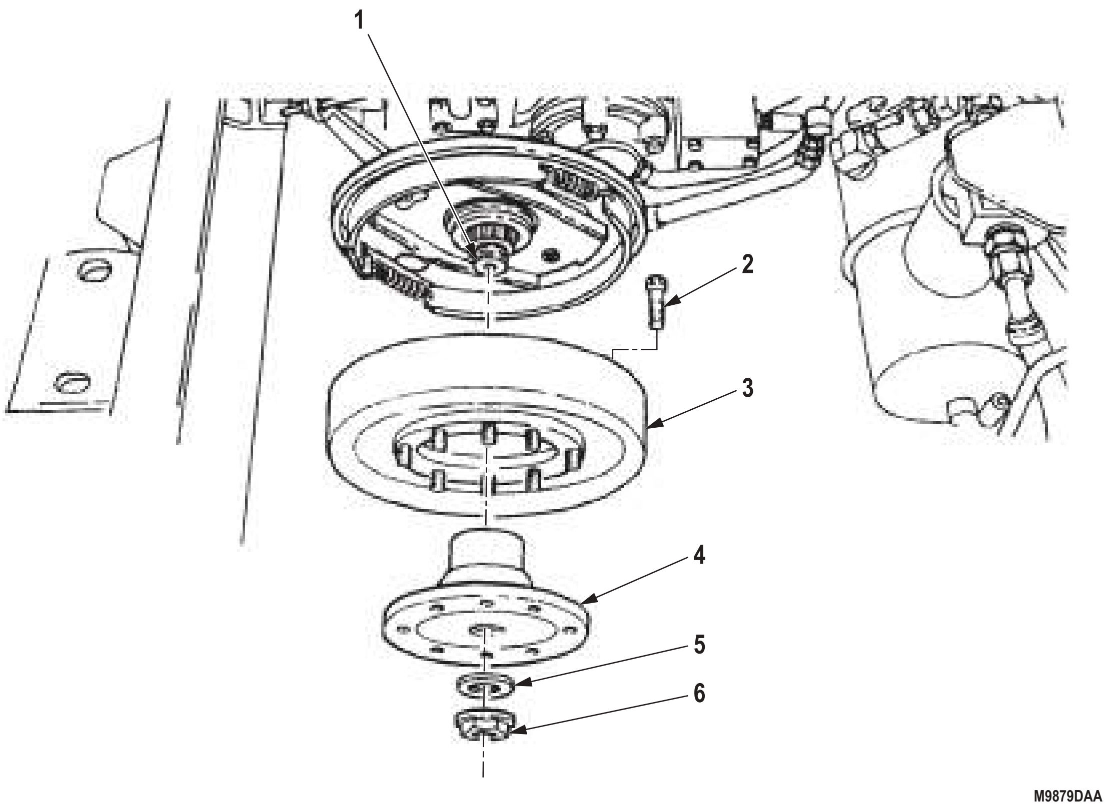


Figure 1. Parking Brake Shoe Removal.

REMOVAL - Continued

5. Using brake repair pliers, remove two brake shoe return springs (Figure 2, Item 2) from parking brake shoes (Figure 2, Item 3).
6. Remove two parking brake shoes (Figure 2, Item 3) and actuating plate (Figure 2, Item 4) from brake shoe backing plate (Figure 2, Item 1).

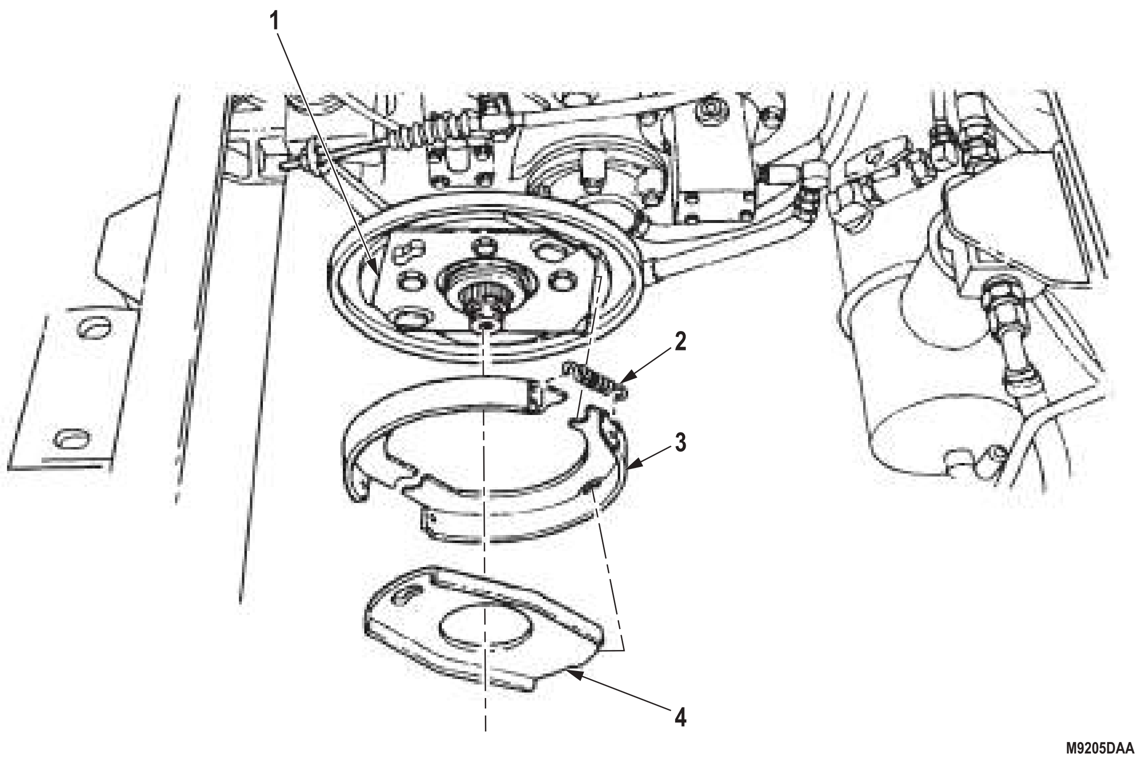


Figure 2. Parking Brake Shoe Removal.

END OF TASK

CLEANING AND INSPECTION

1. Clean all parts in solvent cleaning compound and allow to dry (TM 9-2320-272-10).
2. Inspect brake shoe (Figure 3, Item 2) for wear.
   a. Push brake shoe lever (Figure 3, Item 4) clockwise by hand and measure brake shoe lever travel.
   b. If travel is more than 2 in. (51 mm), replace parking brake shoe.
3. Inspect for actuating plate (Figure 3, Item 3).
   a. Move brake shoe lever (Figure 3, Item 4) back and forth.
   b. Observe operation of brake shoe lever (Figure 3, Item 4), spring (Figure 3, Item 1), and actuating plate (Figure 3, Item 3).
4. Inspect parking brake cable (Figure 3, Item 5) for binding or breaks. If needed replace cable (WP 0421).

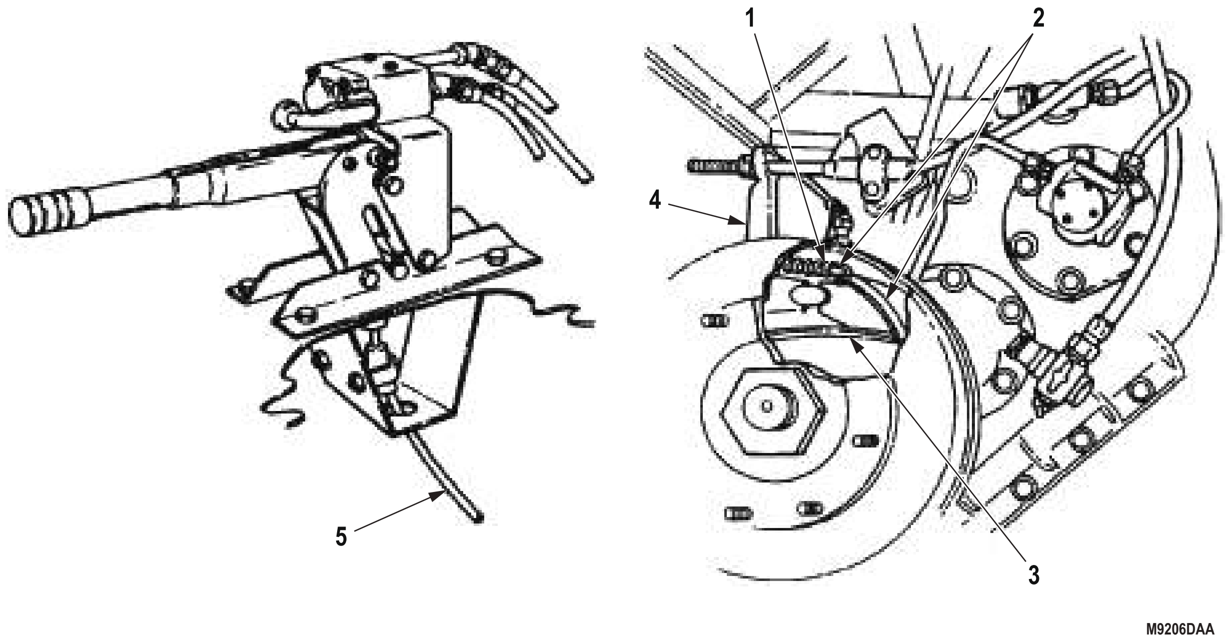


Figure 3. Parking Brake Shoe Cleaning and Inspection.

END OF TASK

INSTALLATION

1. Install actuating plate (Figure 4, Item 5) against brake shoe backing plate (Figure 4, Item 8) so retainer opening (Figure 4, Item 6) fits over retaining stud (Figure 4, Item 1) of backing plate.
2. Install two brake shoes (Figure 4, Item 4) on backing plate shoe studs (Figure 4, Item 7) with two shoe return springs (Figure 4, Item 2). Ensure springs are attached to inside holes (Figure 4, Item 3) of brake shoes.

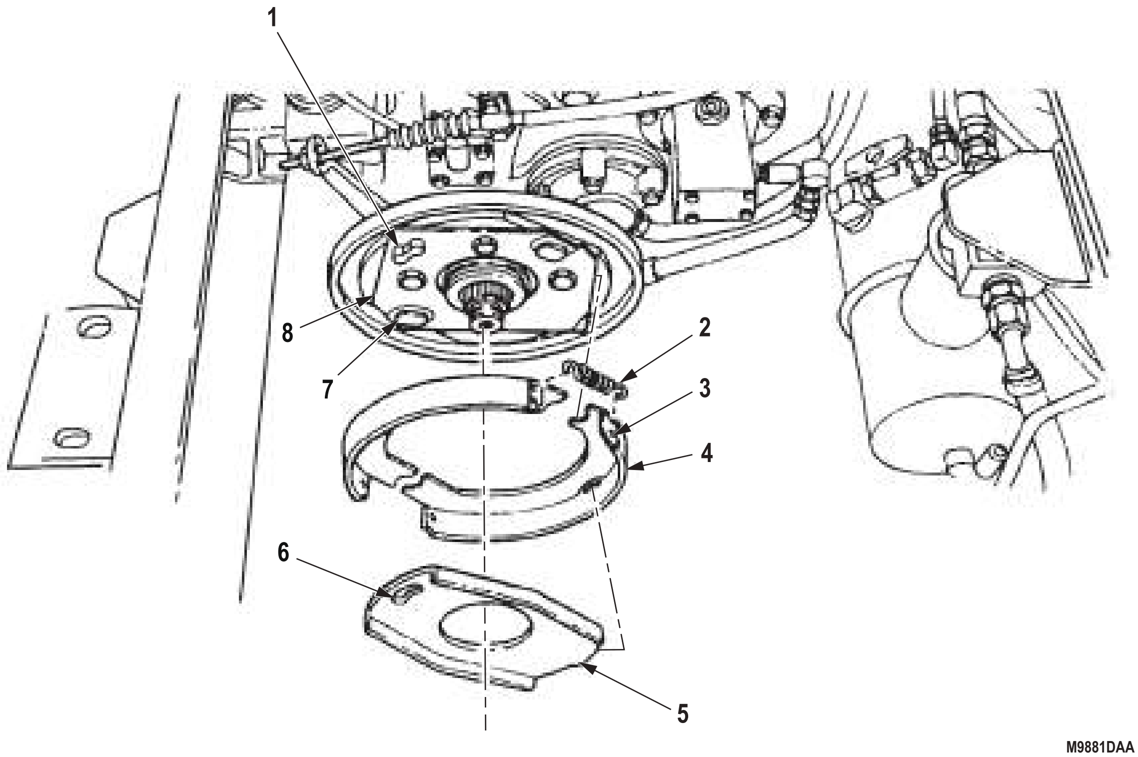


Figure 4. Parking Brake Shoe Installation.

INSTALLATION - Continued

3. Install eight studs (Figure 5, Item 2) on parking brake drum (Figure 5, Item 3).
4. Install parking brake drum (Figure 5, Item 3) and transfer output shaft flange (Figure 5, Item 4) on transfer output shaft (Figure 5, Item 1) with washer (Figure 5, Item 5) and thrust nut (Figure 5, Item 6). Tighten thrust nut 450 to 600 lb-ft (610 to 814 N·m).

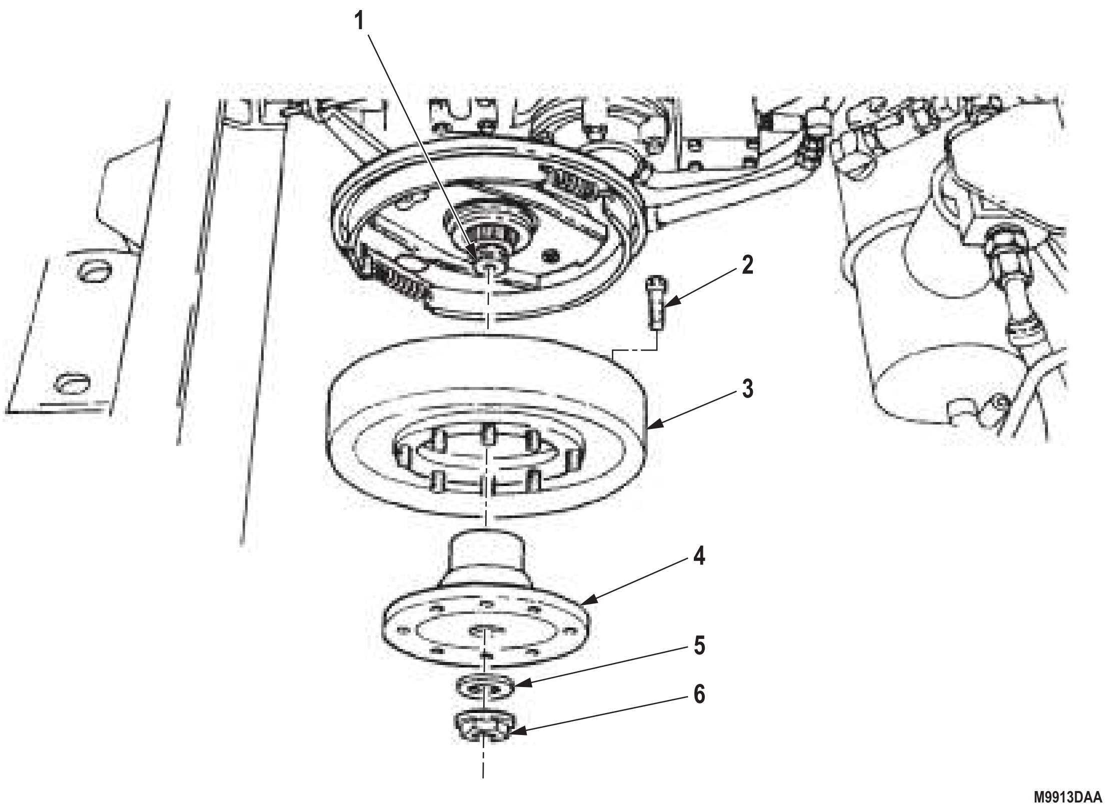


Figure 5. Parking Brake Shoe Installation.

END OF TASK

FOLLOW-ON MAINTENANCE

1. Install transfer case-to-forward rear axle propeller shaft. (WP 0400)
2. Install transfer case-to-forward rear axle propeller shaft. (WP 0401)

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
PARKING BRAKE DRUM DUST COVER REPLACEMENT

INITIAL SETUP:

Tools and Special Tools

Tool Kit, General Mechanic's: Automotive
(Volume 5, WP 0826, Table 1, Item 56)
Wrench, Torque, Click, Ratcheting, 3/4" Drive,
600 Ft-Lb
(Volume 5, WP 0826, Table 1, Item 61)

Materials/Parts

Locknut (Volume 5, WP 0827, Table 1, Item 49)
Qty: 1

Equipment Condition

Wheels chocked. (TM 9-2320-272-10)
Parking brake shoes removed. (WP 0422)

REMOVAL

1. Remove locknut (Figure 1, Item 1), washer (Figure 1, Item 2), brake lever (Figure 1, Item 8), and brake lever cam (Figure 1, Item 7) from parking brake drum dust cover (Figure 1, Item 4). Discard locknut.
2. Remove four screws (Figure 1, Item 6), backing plate (Figure 1, Item 5), and parking brake drum dust cover (Figure 1, Item 4) from backing plate companion flange (Figure 1, Item 3).

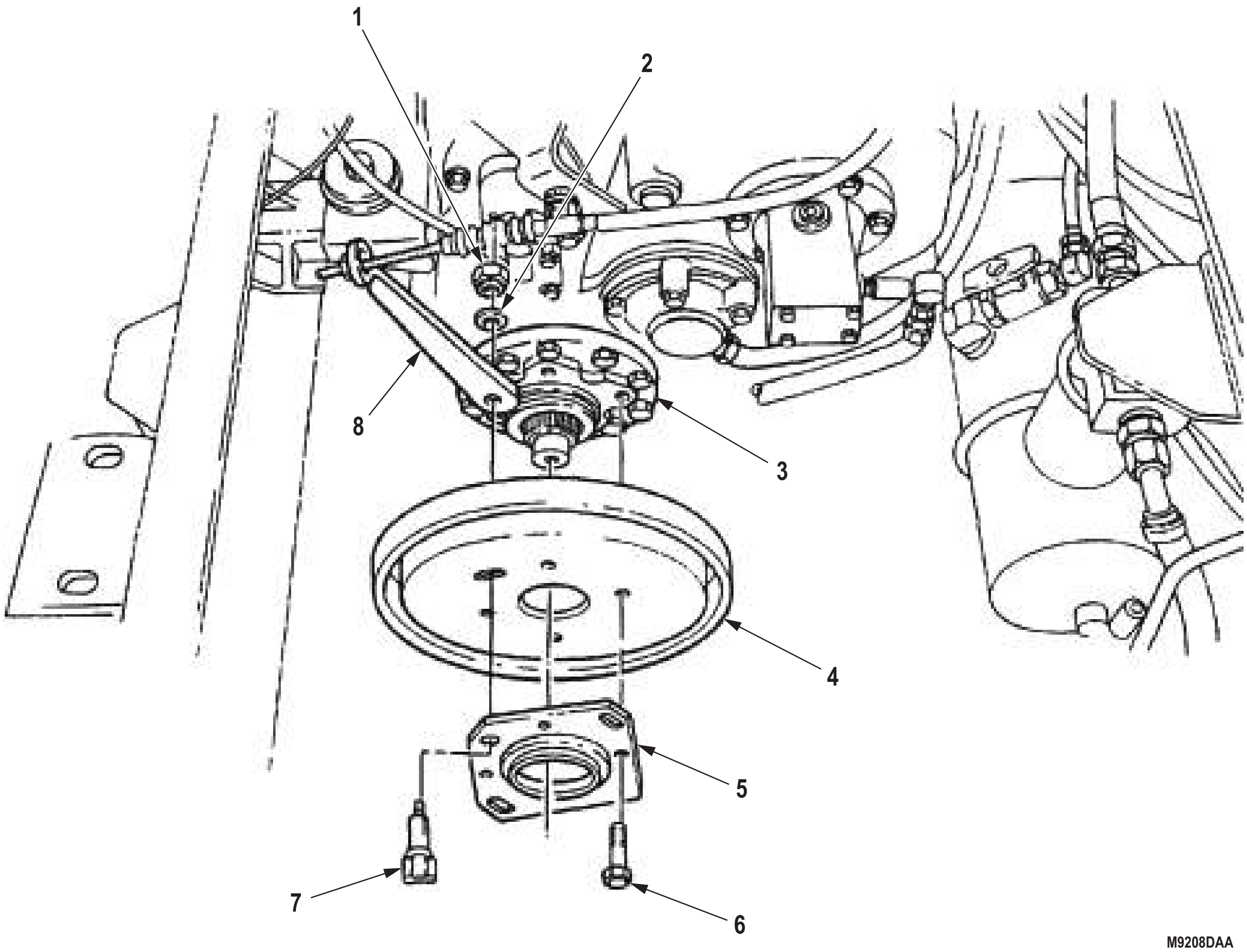


Figure 1. Parking Brake Drum Dust Cover Removal.

END OF TASK

INSTALLATION

1. Install parking brake drum dust cover (Figure 2, Item 4) and backing plate (Figure 2, Item 5) on backing plate companion flange (Figure 2, Item 3) with four screws (Figure 2, Item 6). Tighten screws 180 to 230 lb-ft (244 to 312 N·m).
2. Install brake lever (Figure 2, Item 8) on parking brake drum dust cover (Figure 2, Item 4) with brake lever cam (Figure 2, Item 7), washer (Figure 2, Item 2), and locknut (Figure 2, Item 1).

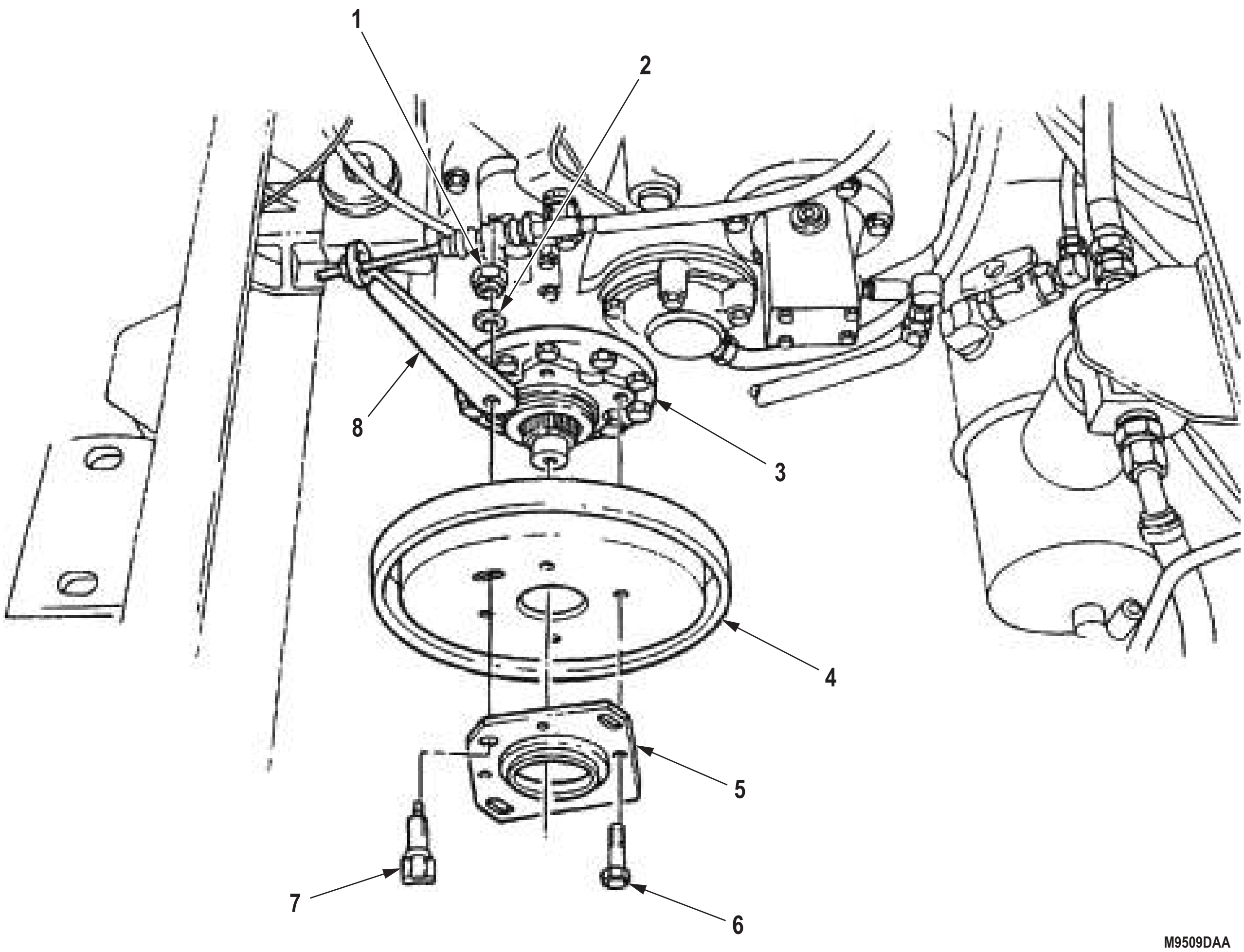


Figure 2. Parking Brake Drum Dust Cover Installation.

END OF TASK

FOLLOW-ON MAINTENANCE

Install parking brake shoes. (WP 0422)

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
WHEEL BRAKE DRUM DUST COVERS REPLACEMENT

INITIAL SETUP:

Tools and Special Tools
Tool Kit, General Mechanic's: Automotive
(Volume 5, WP 0826, Table 1, Item 56)

Materials/Parts
Lockwasher

Materials/Parts (cont.)
(Volume 5, WP 0827, Table 1, Item 52)
Qty: 8

Equipment Condition
Parking brake set. (TM 9-2320-272-10)

FRONT WHEEL DUST COVERS REMOVAL

NOTE

Left and right brake drum dust covers are replaced basically the same. This procedure covers left front and rear brake drum dust covers.

1. Remove four screws (Figure 1, Item 1), lockwashers (Figure 1, Item 2), and dust covers (Figure 1, Items 3 and 5) from left front brake assembly (Figure 1, Item 4). Discard lockwashers.
2. Remove four rubber plugs (Figure 1, Item 6) from dust covers (Figure 1, Items 3 and 5).

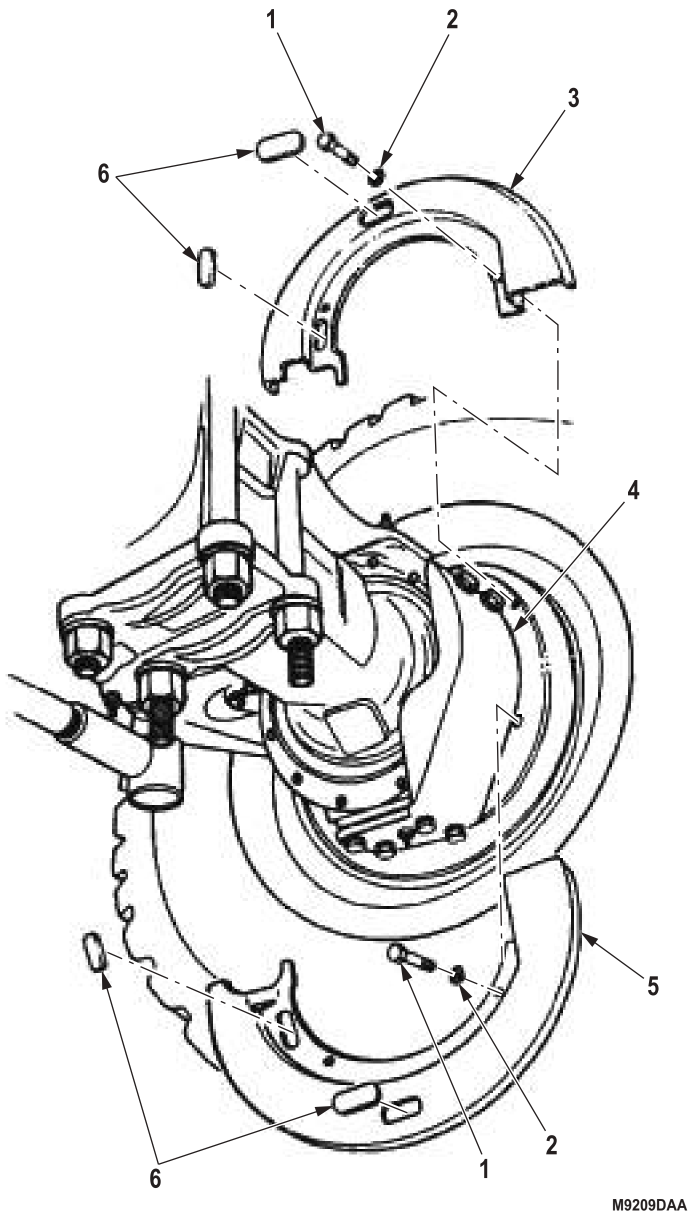


Figure 1. Wheel Dust Covers Removal.

END OF TASK

REAR WHEEL DUST COVERS REMOVAL

1. Remove two tiedown straps (Figure 2, Item 7) and ABS wheel sensor lead (Figure 2, Item 9) from 3-way clip (Figure 2, Item 11). Discard tiedown straps.
2. Disconnect ABS wheel sensor lead (Figure 2, Item 9) from ABS main wiring harness lead A2 blue (Figure 2, Item 10) and remove six tiedown straps (Figure 2, Item 7) from ABS wheel sensor lead.
3. Remove four screws (Figure 2, Item 5), lockwashers (Figure 2, Item 4), and two dust covers (Figure 2, Item 3) from rear brake assembly (Figure 2, Item 8). Discard lockwashers.
4. Remove three rubber plugs (Figure 2, Item 1), rubber plug (Figure 2, Item 6), ABS wheel sensor lead (Figure 2, Item 9), and two plastic plugs (Figure 2, Item 2) from dust covers (Figure 2, Item 3).

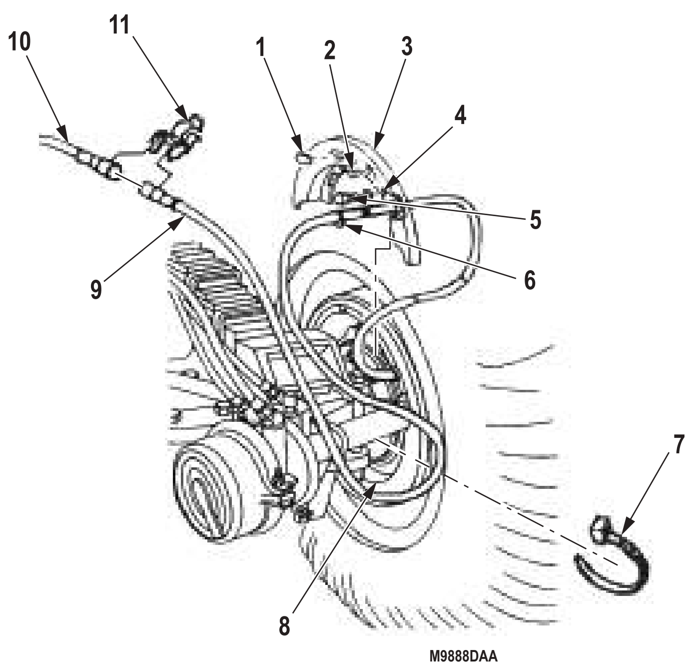


Figure 2. Wheel Dust Covers Removal.

END OF TASK

FRONT WHEEL DUST COVERS INSTALLATION

1. Install four rubber plugs (Figure 3, Item 6) on dust covers (Figure 3, Items 3 and 5).
2. Install dust covers (Figure 3, Items 3 and 5) on left front brake assembly (Figure 3, Item 4) with four lockwashers (Figure 3, Item 2) and screws (Figure 3, Item 1).

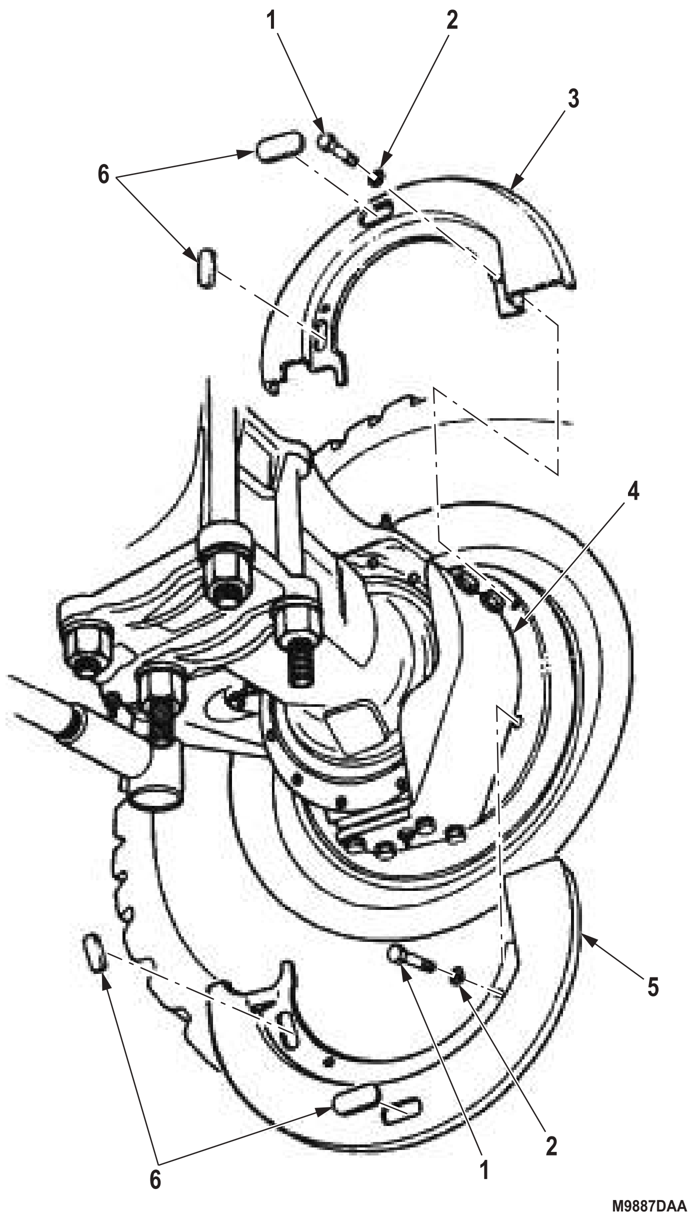


Figure 3. Wheel Dust Covers Installation.

END OF TASK

REAR WHEEL DUST COVERS INSTALLATION

1. Route ABS wheel sensor lead (Figure 4, Item 9) through upper dust cover (Figure 4, Item 3) and connect ABS wheel sensor lead (Figure 4, Item 9) to ABS main wiring harness 2A blue lead (Figure 4, Item 10). Secure ABS wheel sensor lead to 3-way clip (Figure 4, Item 11) and air line with eight tiedown straps (Figure 4, Item 7).
2. Install three rubber plugs (Figure 4, Item 1), rubber plug (Figure 4, Item 6), and two plastic plugs (Figure 4, Item 2) on dust covers (Figure 4, Item 3).
3. Install two dust covers (Figure 4, Item 3) on left rear brake assembly (Figure 4, Item 8) with four lockwashers (Figure 4, Item 4) and screws (Figure 4, Item 5).

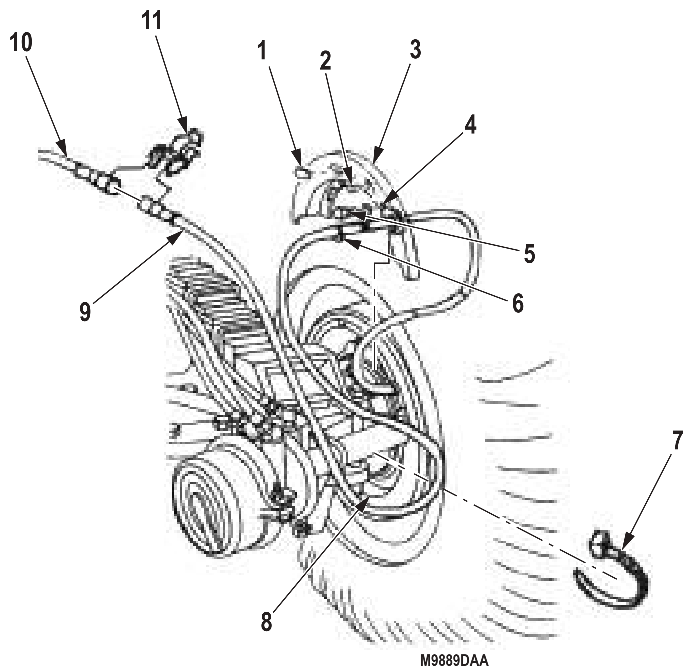


Figure 4. Wheel Dust Covers Installation.

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
PARKING BRAKE LEVER REPLACEMENT

INITIAL SETUP:

Tools and Special Tools

Tool Kit, General Mechanic's: Automotive
(Volume 5, WP 0826, Table 1, Item 56)

Materials/Parts

Cotter Pin
(Volume 5, WP 0827, Table 1, Item 337)
Qty: 1

Locknut (Volume 5, WP 0827, Table 1, Item 285)
Qty: 4

Personnel Required

(2)

References

WP 0420

Equipment Condition

Wheels chocked. (TM 9-2320-272-10)

Battery ground cable disconnected.
(Volume 2, WP 0350)

REMOVAL

1. Release parking brake lever (Figure 1, Item 2) (TM 9-2320-272-10).
2. Turn adjusting cap (Figure 1, Item 1) on parking brake lever (Figure 1, Item 2) completely out.
3. Remove cotter pin (Figure 1, Item 5), washer (Figure 1, Item 6), and clevis pin (Figure 1, Item 7) from cable clevis (Figure 1, Item 14). Discard cotter pin.
4. Remove three locknuts (Figure 1, Item 3), screws (Figure 1, Item 9), spacer washer (Figure 1, Item 10), and spring parking brake valve and bracket (Figure 1, Item 8) from parking brake housing (Figure 1, Item 4) and brackets (Figure 1, Item 13). Carefully set valve and bracket (Figure 1, Item 8) aside. Discard locknuts.
5. Remove parking brake housing (Figure 1, Item 4) from parking brake brackets (Figure 1, Item 11).
6. Disconnect wire (Figure 1, Item 11) from wire (Figure 1, Item 12) under cab.

NOTE

Assistant will help with Step (7).

7. Remove locknut (Figure 1, Item 18), wire (Figure 1, Item 17), and screw (Figure 1, Item 16) from cab floor (Figure 1, Item 19). Discard locknut.
8. Remove parking brake switch (Figure 1, Item 15) from brackets (Figure 1, Item 13).

REMOVAL - Continued

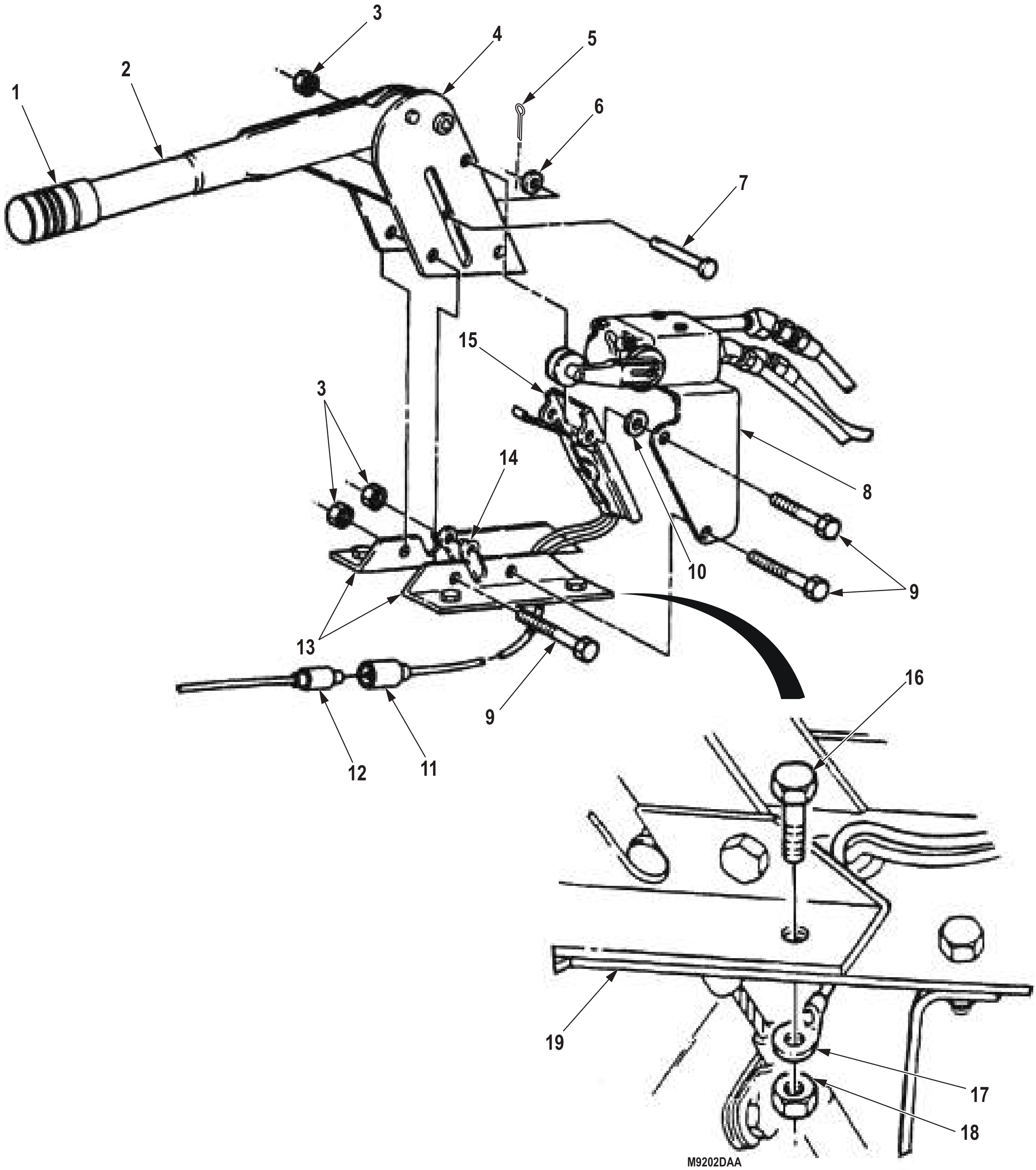


Figure 1. Parking Brake Lever Removal.

END OF TASK

INSTALLATION

NOTE

Assistant will assist with Step (1).

1. Install wire (Figure 2, Item 17) on cab floor (Figure 2, Item 19) with screw (Figure 2, Item 16) and locknut (Figure 2, Item 18).
2. Connect wire (Figure 2, Item 11) to wire (Figure 2, Item 12).
3. Install parking brake housing (Figure 2, Item 4) and spring parking brake valve and bracket (Figure 2, Item 8) on parking brake switch (Figure 2, Item 15) on brackets (Figure 2, Item 13) with three screws (Figure 2, Item 9), spacer washer (Figure 2, Item 10), and three locknuts (Figure 2, Item 3).
4. Install clevis pin (Figure 2, Item 7) on cable clevis (Figure 2, Item 14) with washer (Figure 2, Item 6) and cotter pin (Figure 2, Item 5).

INSTALLATION - Continued

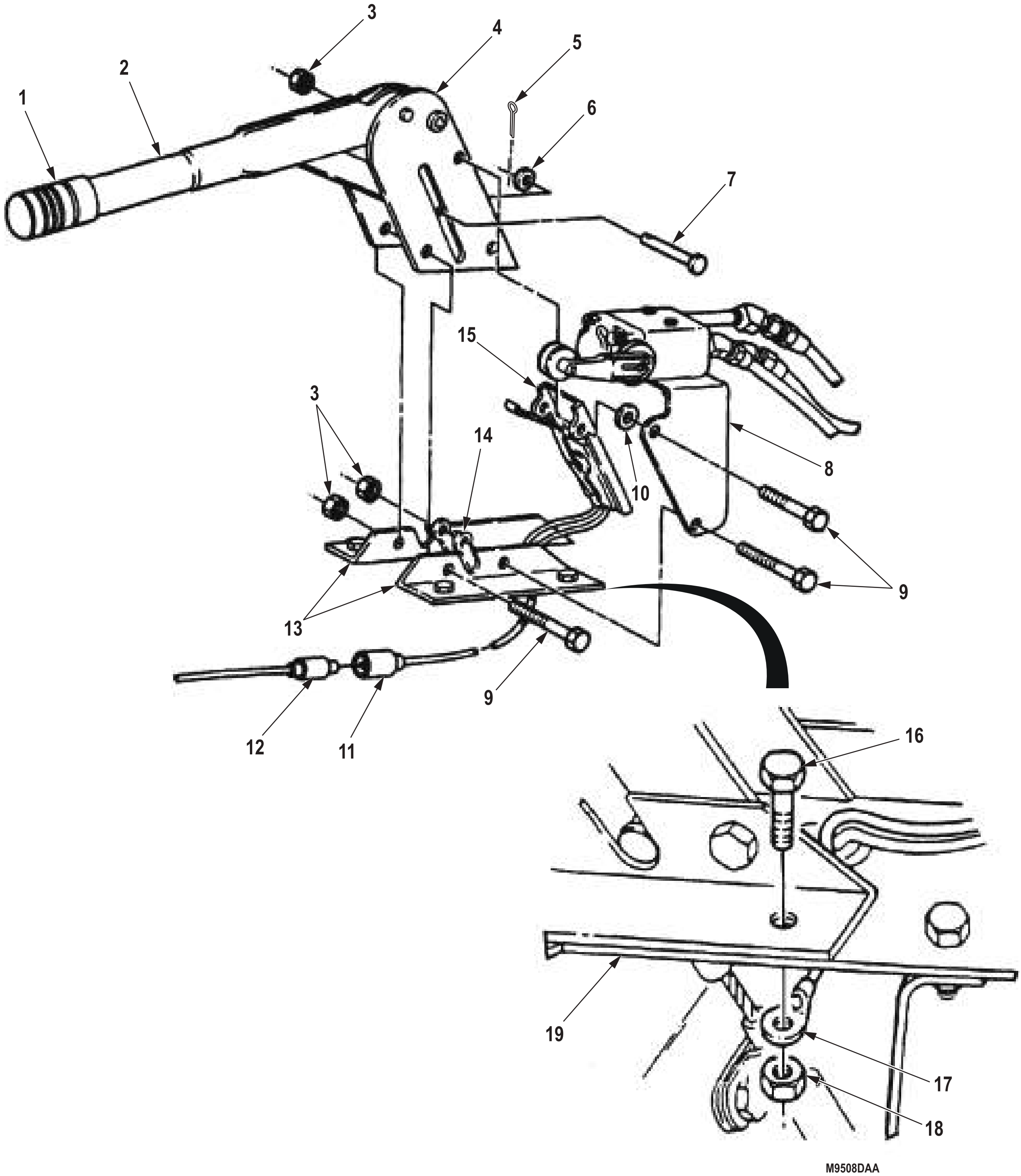


Figure 2. Parking Brake Lever Installation.

END OF TASK

FOLLOW-ON MAINTENANCE

1. Adjust parking brake. (WP 0420)
2. Connect battery ground cable. (Volume 2, WP 0350)
3. Remove chocks and road test vehicle. (TM 9-2320-272-10)

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
BRAKE SHOE REPLACEMENT

INITIAL SETUP:

Tools and Special Tools
Tool Kit, General Mechanic's: Automotive
(Volume 5, WP 0826, Table 1, Item 56)
Pliers, Brake Repair
(Volume 5, WP 0826, Table 1, Item 38)

Personnel Required
(2)

References
WP 0418

Equipment Condition
Spring (emergency) brake caged.
(TM 9-2320-272-10)

Equipment Condition (cont.)
Front hub and drum removed. (WP 0479) or (WP 0481)
Rear hub and drum removed. (WP 0480) or (WP 0482)

REMOVAL

1. Using brake repair pliers, remove two return springs (Figure 1, Item 4) from brake shoes (Figure 1, Item 2).
2. Remove two brake shoes (Figure 1, Item 2) from anchor plunger (Figure 1, Item 5), adjustable plunger (Figure 1, Item 1), and brake shoe retaining clips (Figure 1, Item 3).

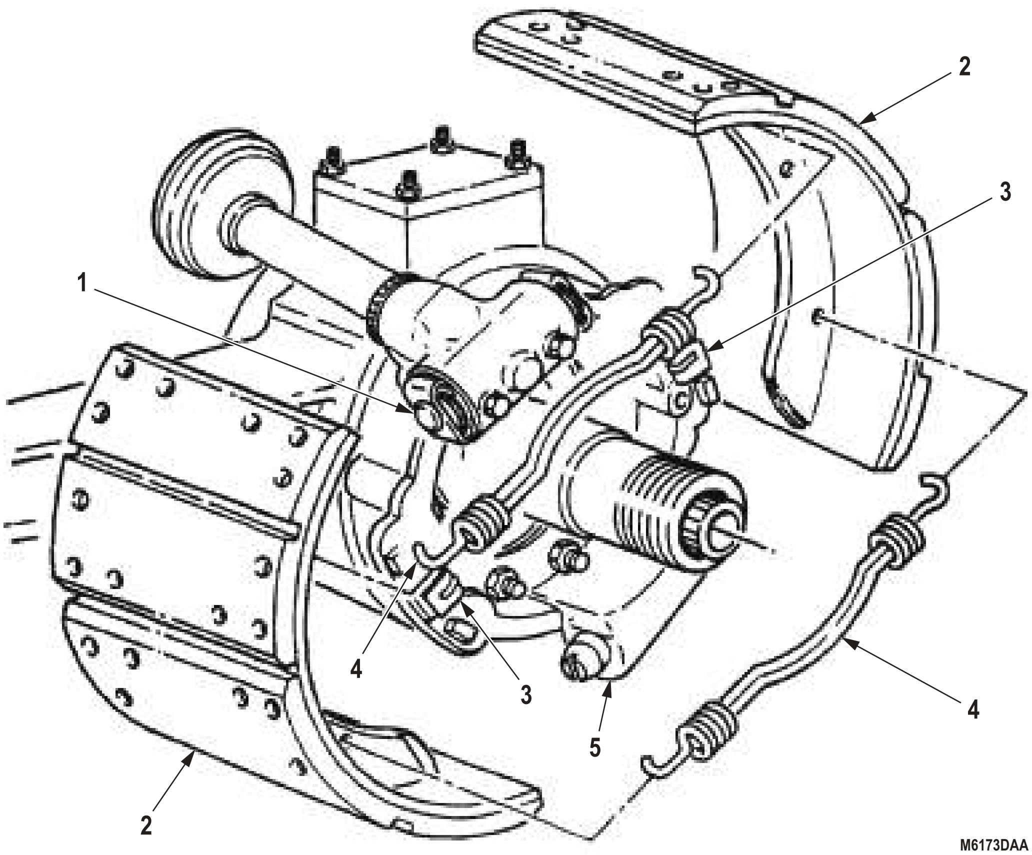


Figure 1. Brake Shoe Removal.

END OF TASK

INSTALLATION

NOTE

- Ensure arrow stamped on shoe web points to anchor plunger.
- Brake shoe and lining assemblies must be replaced in sets on both sides of axle with linings coded to the color and manufacturer.
- Rear brake mechanisms have one adjusting plunger in each plunger housing. Front brake mechanisms have two adjusting plungers in rear of plunger housing.

Position two brake shoes (Figure 2, Item 2) into each anchor plunger (Figure 2, Item 5), adjustable plunger (Figure 2, Item 1), and brake shoe retaining clips (Figure 2, Item 3) and secure with two return springs (Figure 2, Item 4).

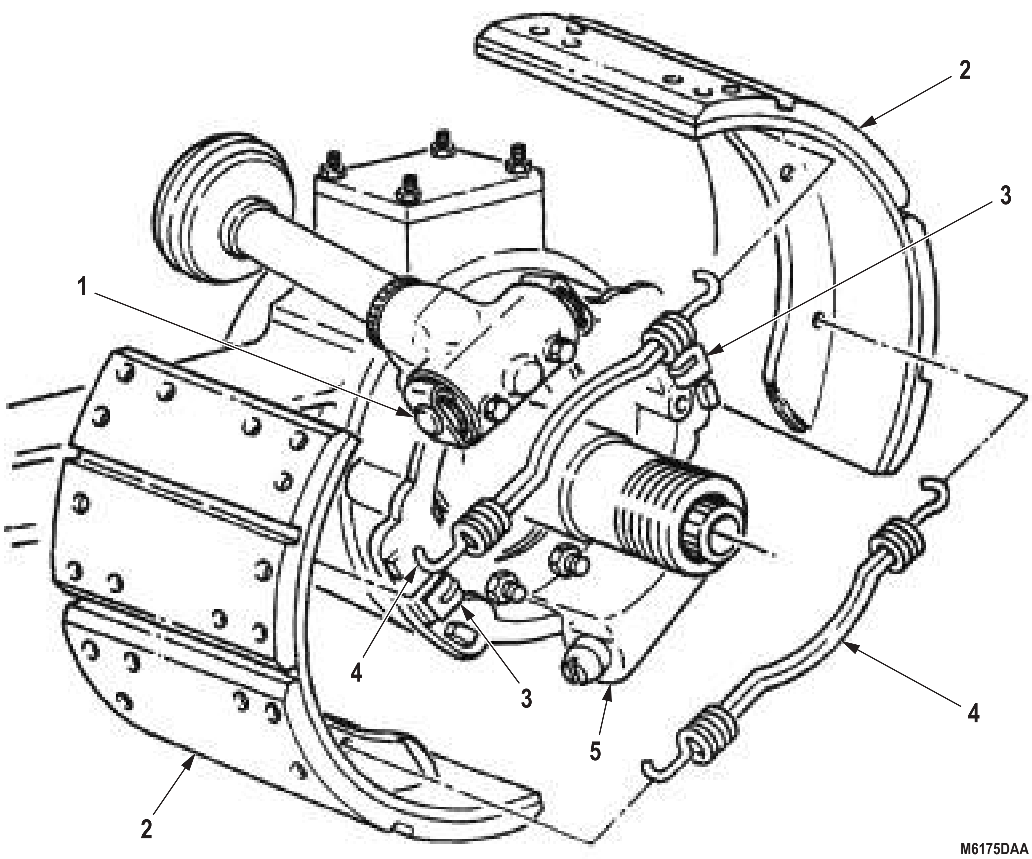


Figure 2. Brake Shoe Installation.

END OF TASK

FOLLOW-ON MAINTENANCE

1. Install front hub and drum. (WP 0479) or (WP 0481)
2. Install rear hub and drum. (WP 0480) or (WP 0482)
3. Check brake shoe-to-drum clearance and adjust if necessary. (WP 0432)

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
FRONT BRAKE SPIDER AND ACTUATOR REPAIR

INITIAL SETUP:

Tools and Special Tools

Tool Kit, General Mechanic's: Automotive
(Volume 5, WP 0826, Table 1, Item 56)
Hammer, Soft Face
(Volume 5, WP 0826, Table 1, Item 22)
Wrench, Torque, Click, Ratcheting, 3/8" Drive, 75 Ft-Lb
(Volume 5, WP 0826, Table 1, Item 62)

Materials/Parts

Adhesive, Silicone Rubber
(Volume 5, WP 0825, Table 1, Item 4)
Cloth, Cleaning
(Volume 5, WP 0825, Table 1, Item 19)
Grease, Automotive and Artillery
(Volume 5, WP 0825, Table 1, Item 28)
Tape, Pressure Sensitive Adhesive
(Volume 5, WP 0825, Table 1, Item 67)

Materials/Parts (cont.)

Adjuster Parts Kit
(Volume 5, WP 0827, Table 1, Item 28)
Anchor Plunger Kit (Right)
(Volume 5, WP 0827, Table 1, Item 267)
Anchor Plunger Kit (Left)
(Volume 5, WP 0827, Table 1, Item 268)
Lockwasher
(Volume 5, WP 0827, Table 1, Item 52)
Qty: 2

Equipment Condition

Brake shoes removed. (WP 0426)
Service brake chamber removed. (WP 0434)

REMOVAL

1. Remove nine nuts (Figure 1, Item 5), washers (Figure 1, Item 4), brake spider slinger (Figure 1, Item 3), and brake spider (Figure 1, Item 2) from studs (Figure 1, Item 1).
2. Remove two nuts (Figure 1, Item 9), lockwashers (Figure 1, Item 8), screws (Figure 1, Item 6), and clips (Figure 1, Item 7) from brake spider (Figure 1, Item 2). Discard lockwashers.

REMOVAL - Continued

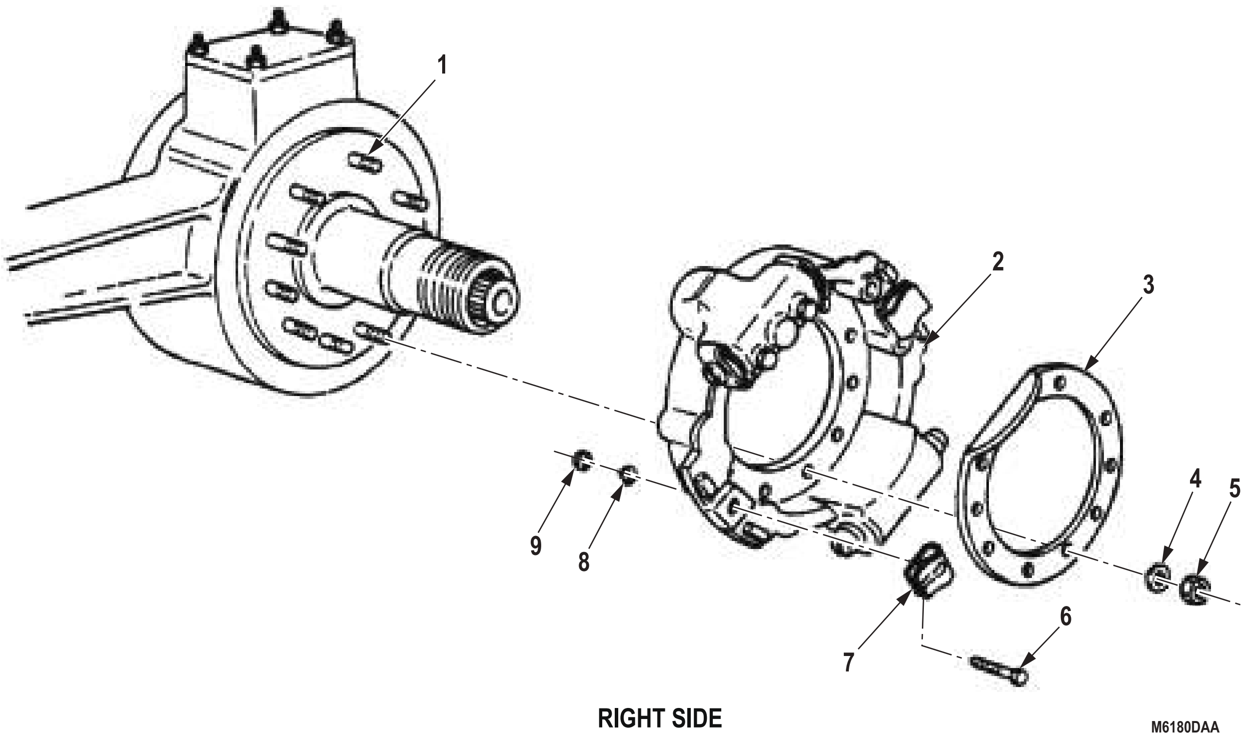


Figure 1. Front Brake Spider Removal.

END OF TASK

DISASSEMBLY

NOTE

- Twelve-degree wedge assembly should also be replaced when repairing front brake actuator. It is not offered in any of these Rockwell kits (TM 9-2320-272-23P).
- Do not perform this procedure unless repair kit is available.
- Rockwell does not make a repair kit for the front spider wedge brake. The entire spider must be replaced. Individual parts are available under a separate NSN.

1. Remove wedge assembly (Figure 2, Item 14) from back of adjusting plunger housing (Figure 2, Item 10). Discard wedge assembly.
2. Remove two hollow screws (Figure 2, Item 9), gaskets (Figure 2, Item 8), springs (Figure 2, Item 7), and adjusting pawls (Figure 2, Item 6) from adjusting plunger housing (Figure 2, Item 10). Discard adjusting bolts, plunger seals, adjusting sleeves, and adjusting plungers.
3. Remove two adjusting bolts (Figure 2, Item 2), plunger seals (Figure 2, Item 3), adjusting sleeves (Figure 2, Item 4), and adjusting plungers (Figure 2, Item 5) from adjusting plunger housing (Figure 2, Item 10). Discard adjusting bolts, plunger seals, adjusting sleeves, and adjusting plungers.
4. Remove two guide screws (Figure 2, Item 11) and gaskets (Figure 2, Item 12) from anchor plunger housing (Figure 2, Item 13). Discard guide screws and gaskets.
5. Remove two anchor plungers (Figure 2, Item 15) and seals (Figure 2, Item 1) from anchor plunger housing (Figure 2, Item 13). Discard anchor plungers and seals.

DISASSEMBLY - Continued

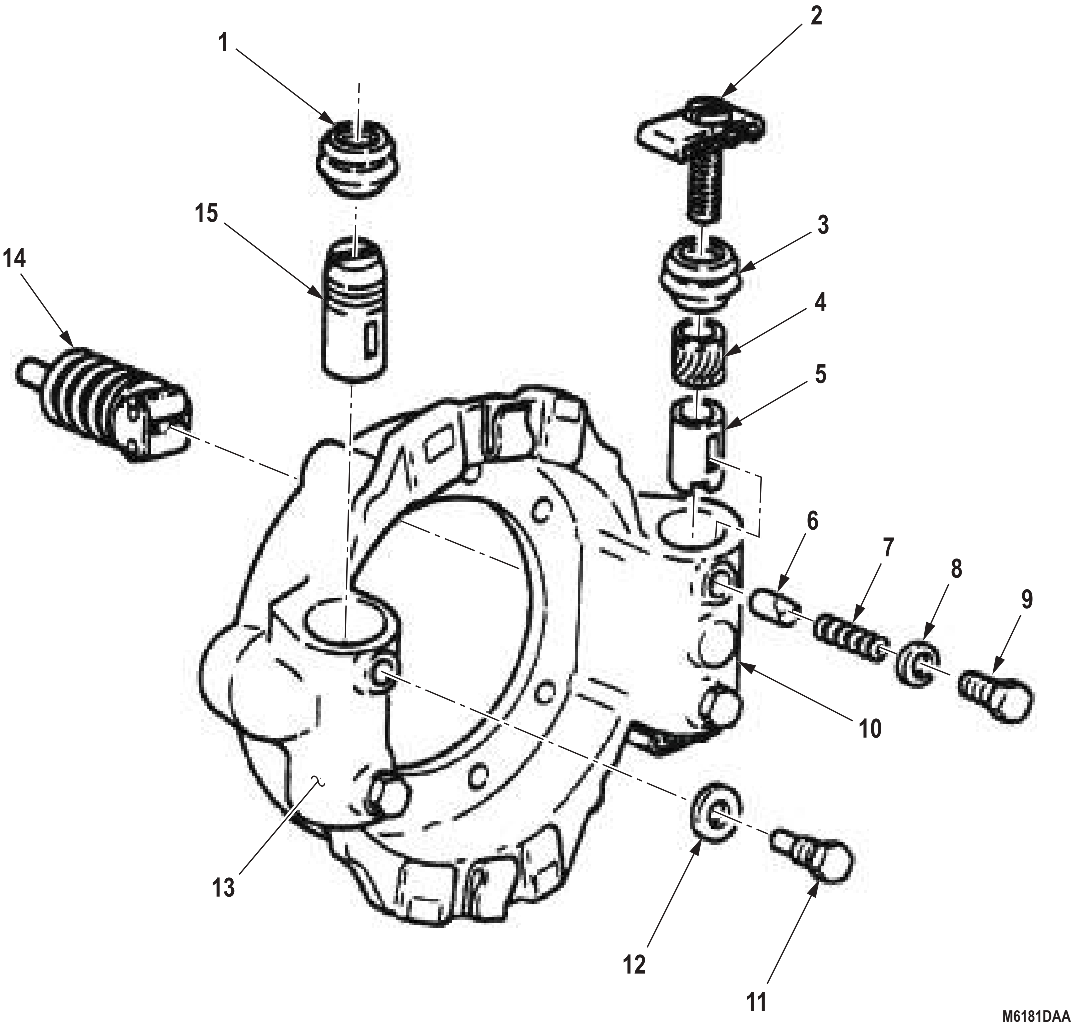


Figure 2. Actuators Disassembly.

END OF TASK

CLEANING AND INSPECTION

Wipe adjusting plunger housing and anchor plunger housing with lint-free cloth and inspect for cracks, breaks, chips, and pitting. Replace entire spider assembly if adjusting plunger housing or anchor plunger housing is cracked, broken, chipped, or pitted.

END OF TASK

ASSEMBLY

CAUTION

Keep all anchor parts together. Intermixing right and left plunger parts will cause brake system damage.

NOTE

Apply a light film of grease, included with new parts kit, to all metal parts, lips of seals, and plunger housing bores.

1. Place a piece of tape over slots of two anchor plungers (Figure 3, Item 2) to protect lips of seals (Figure 3, Item 1).
2. Install two seals (Figure 3, Item 1) in double grooves of anchor plungers (Figure 3, Item 2).

NOTE

Ensure correct anchor plunger, L or R, is installed in bore of anchor housing.

3. Align guide grooves (Figure 3, Item 19) of anchor plungers (Figure 3, Item 2) with guide screw holes (Figure 3, Item 17) of anchor plunger housing (Figure 3, Item 16).
4. Install anchor plungers (Figure 3, Item 2) in anchor plunger housing (Figure 3, Item 16). Using hammer and 1-3/4 in. (44.45-mm) wrench socket, seat seals (Figure 3, Item 1) in anchor plunger housing.
5. Remove tape from anchor plungers (Figure 3, Item 2).
6. Install two gaskets (Figure 3, Item 15) and guide screws (Figure 3, Item 14) in anchor plunger housing (Figure 3, Item 16) and anchor plunger (Figure 3, Item 2). Tighten guide screws 15 to 20 lb-ft (20 to 27 N·m).

ASSEMBLY - Continued

NOTE

Apply a light film of GAA grease to all parts prior to assembly.

7. Align guide groove (Figure 3, Item 3) of two adjusting plungers (Figure 3, Item 7) with adjusting pawl holes (Figure 3, Item 8) of adjusting plunger housing (Figure 3, Item 13).
8. Install adjusting plungers (Figure 3, Item 7) in adjusting plunger housing (Figure 3, Item 13).
9. Position two adjusting sleeves (Figure 3, Item 6) on adjusting plunger (Figure 3, Item 7).

NOTE

Adjusting pawls have teeth and flats on one end and chamfered edge on the other end. When performing Step (4), ensure adjusting pawl is positioned with chamfer toward sleeve to align pawl and sleeve teeth.

10. Install two adjusting pawls (Figure 3, Item 9) and springs (Figure 3, Item 10) in adjusting plunger housing (Figure 3, Item 13) with two gaskets (Figure 3, Item 11) and hollow screws (Figure 3, Item 12). Tighten hollow screws 15 to 20 lb-ft (20 to 27 N·m).
11. Using adjusting bolt (Figure 3, Item 4), rotate adjusting sleeve (Figure 3, Item 6) and check for proper teeth meshing. If teeth are properly meshing, a clicking sound and ratchet feel will be indicated. Remove adjusting bolt.
12. Position inner lip of two plunger seals (Figure 3, Item 5) over adjusting sleeves (Figure 3, Item 6). Using hammer and 1-3/4 in. (44.45-mm) wrench socket, seat outer ring of plunger seals in adjusting plunger housing (Figure 3, Item 13).

ASSEMBLY - Continued

CAUTION

Do not bottom adjusting bolt against seal. Seal will be damaged.

13. Install two adjusting bolts (Figure 3, Item 4) in adjusting sleeve (Figure 3, Item 6). Tighten adjusting bolts until heads are showing above plunger seal (Figure 3, Item 5).
14. Install wedge assembly (Figure 3, Item 18) in back of adjusting plunger housing (Figure 3, Item 13). Check for proper operation of wedge assembly and adjusting plungers (Figure 3, Item 7).

ASSEMBLY - Continued

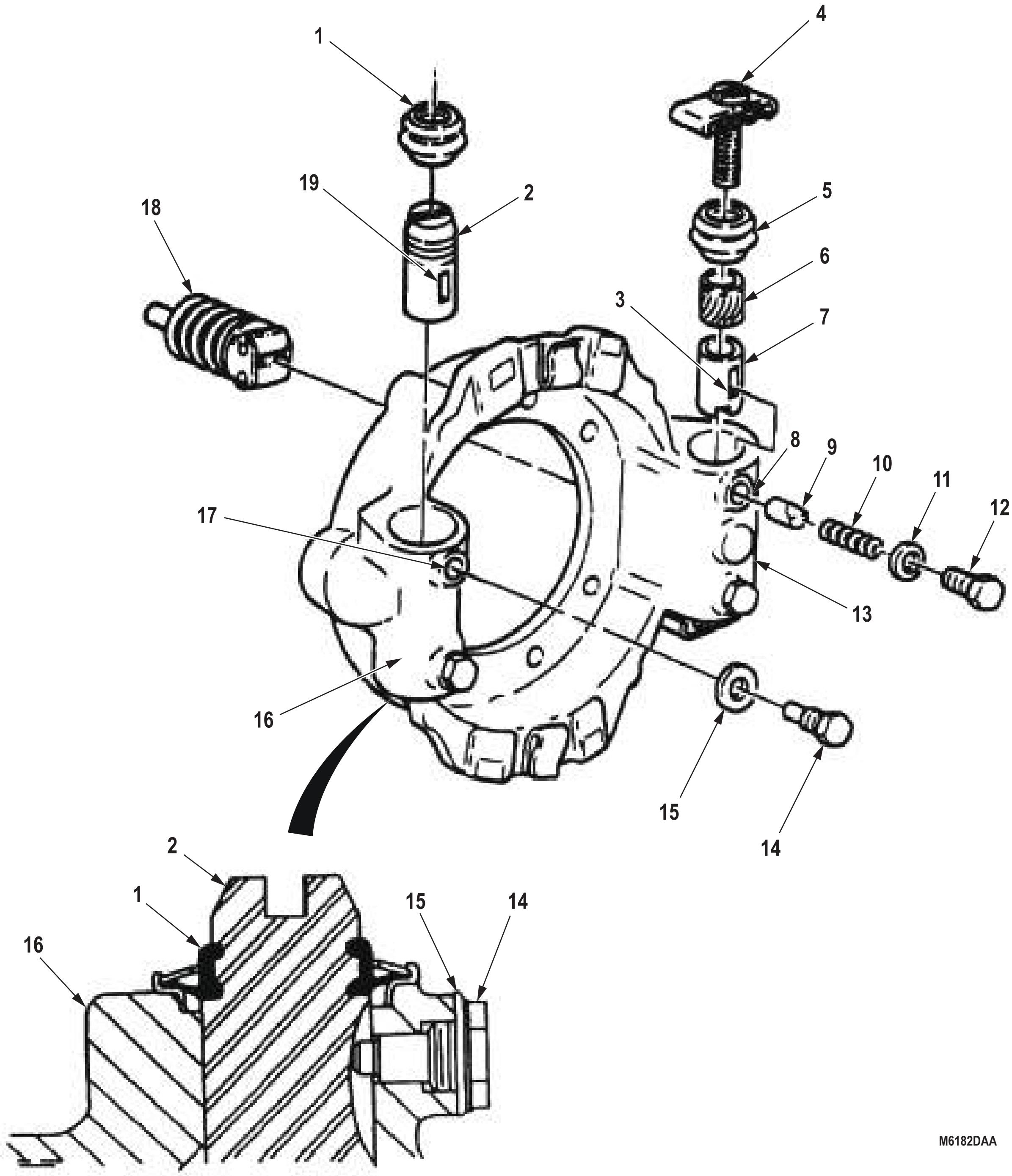


Figure 3. Actuators Assembly.

END OF TASK

INSTALLATION

1. Install two clips (Figure 4, Item 8) on brake spider (Figure 4, Item 1) with two screws (Figure 4, Item 7), lockwashers (Figure 4, Item 9), and nuts (Figure 4, Item 10).
2. Apply gasket sealant to spindle (Figure 4, Item 11) and brake spider (Figure 4, Item 1) mating surfaces.

CAUTION

Failure to tighten nuts in proper sequence can crack brake spider.

NOTE

Tighten front brake spider after installing front wheel dust covers.

3. Install brake spider (Figure 4, Item 1) and brake spider slinger (Figure 4, Item 4) on studs (Figure 4, Item 12) with adjustable anchor plunger (Figure 4, Item 2) at 1 o'clock position (left side) and adjustable anchor plunger (Figure 4, Item 3) at 11 o'clock position (right side) with nine washers (Figure 4, Item 5) and nuts (Figure 4, Item 6). Tighten nuts to 110 to 145 lb-ft (149 to 196 N·m) in sequence shown.

INSTALLATION - Continued

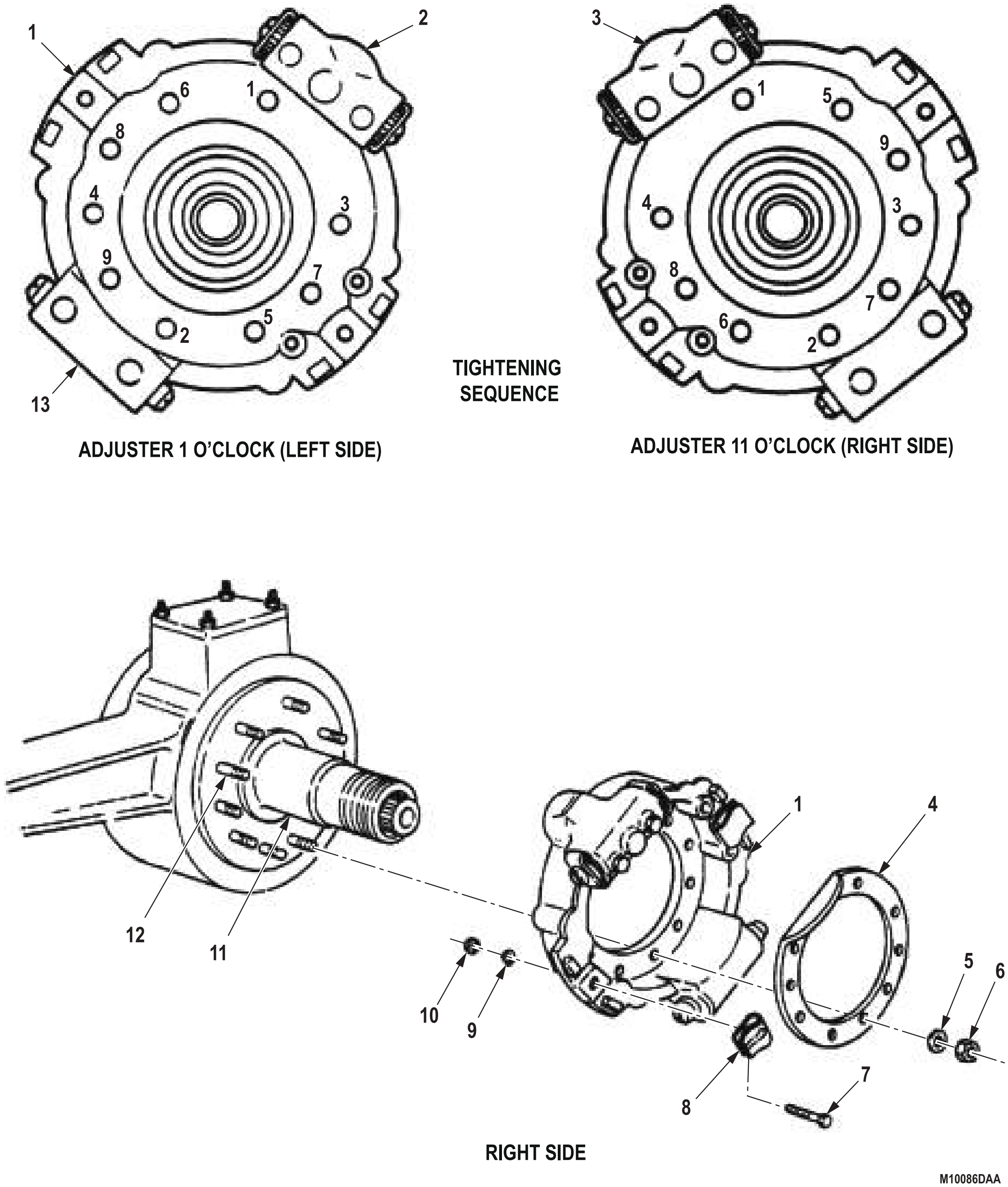


Figure 4. Front Brake Spider Installation.

END OF TASK

FOLLOW-ON MAINTENANCE

1. Install service brake chamber. (WP 0434)
2. Install brake shoes. (WP 0426)
3. Start engine and allow air pressure to build up to normal operating range. Check brakes for proper operation. Road test vehicle. (TM 9-2320-272-10)

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
REAR BRAKE SPIDER AND ACTUATOR REPAIR

INITIAL SETUP:

Tools and Special Tools
Tool Kit, General Mechanic's: Automotive
(Volume 5, WP 0826, Table 1, Item 56)
Hammer, Soft Face
(Volume 5, WP 0826, Table 1, Item 22)
Wrench, Torque, Click, Ratcheting, 1/2" Drive, 250 Ft-Lb
(Volume 5, WP 0826, Table 1, Item 63)
Wrench, Torque, Click, Ratcheting, 3/8" Drive, 75 Ft-Lb
(Volume 5, WP 0826, Table 1, Item 62)

Materials/Parts
Adhesive, Silicone Rubber
(Volume 5, WP 0825, Table 1, Item 4)
Cloth, Cleaning
(Volume 5, WP 0825, Table 1, Item 19)
Grease, Automotive and Artillery
(Volume 5, WP 0825, Table 1, Item 28)
Tape, Pressure Sensitive Adhesive
(Volume 5, WP 0825, Table 1, Item 67)

Materials/Parts (cont.)
Adjuster Parts Kit
(Volume 5, WP 0827, Table 1, Item 28)
Lockwasher
(Volume 5, WP 0827, Table 1, Item 52)
Qty: 4

Personnel Required
(2)

Equipment Condition
Brake shoes removed. (WP 0426)
Service brake chamber removed. (WP 0434)
Combination spring (emergency) and service brake chamber removed. (WP 0435)
ABS wheel sensor removed. (WP 0468)

REMOVAL

NOTE

All rear brake spiders are replaced basically the same. This procedure covers right forward-rear axle.

1. Remove eight nuts (Figure 1, Item 10), washers (Figure 1, Item 11), screws (Figure 1, Item 3), and washers (Figure 1, Item 2) from brake spider (Figure 1, Item 1).
2. Remove two screws (Figure 1, Item 12) and washers (Figure 1, Item 13) from inner side of rear axle housing flange (Figure 1, Item 9).
3. Remove brake spider (Figure 1, Item 1) from axle housing assembly (Figure 1, Item 8).
4. Remove two nuts (Figure 1, Item 7), lockwashers (Figure 1, Item 6), screws (Figure 1, Item 4), and clips (Figure 1, Item 5) from brake spider (Figure 1, Item 1). Discard lockwashers.

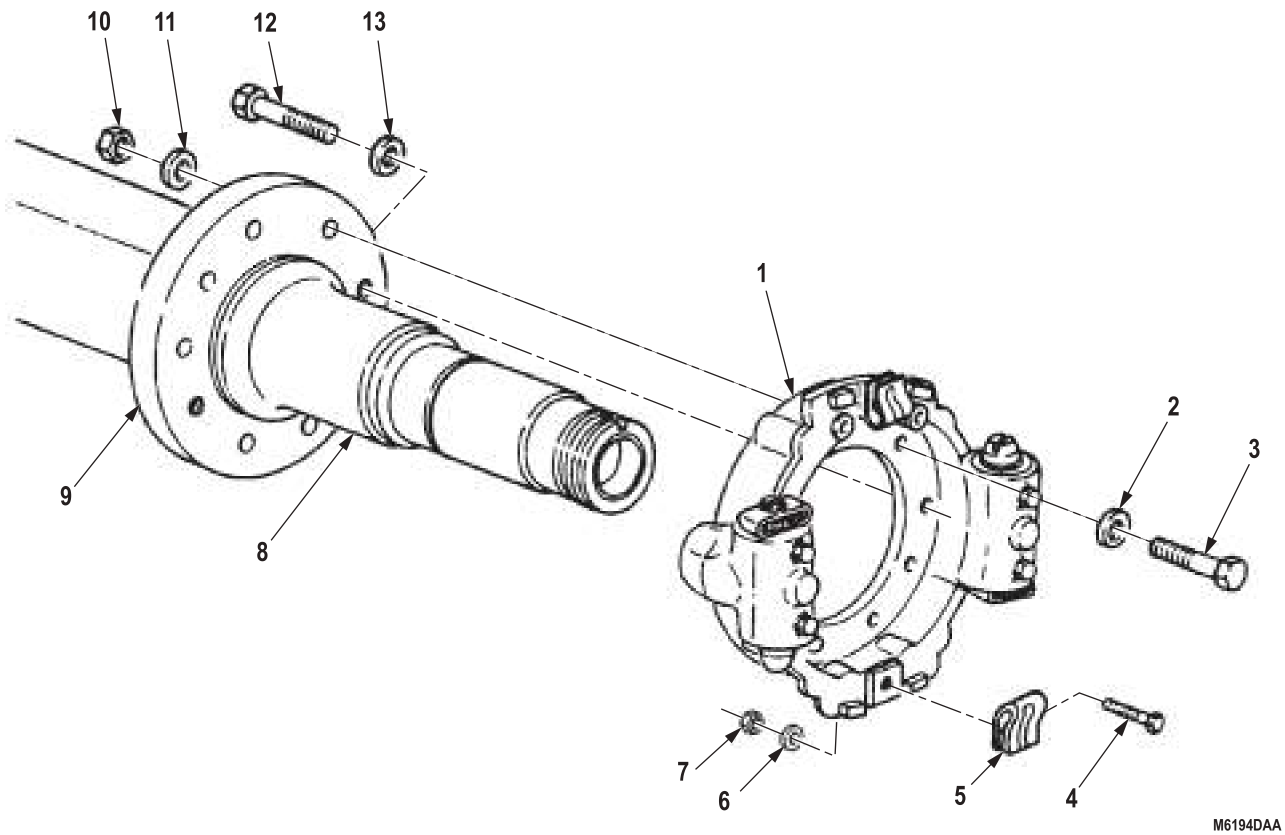


Figure 1. Rear Brake Spider Removal.

END OF TASK

DISASSEMBLY

NOTE

Do not perform this procedure unless repair kit is available.

1. Remove wedge assembly (Figure 2, Item 14) from back of plunger housing (Figure 2, Item 5). Discard wedge assembly.

DISASSEMBLY - Continued

2. Remove guide screw (Figure 2, Item 10) and gasket (Figure 2, Item 11) from plunger housing (Figure 2, Item 5). Discard guide screw and gasket.
3. Remove hollow screw (Figure 2, Item 9), gasket (Figure 2, Item 8), spring (Figure 2, Item 7), and adjusting pawl (Figure 2, Item 6) from plunger housing (Figure 2, Item 5). Discard hollow screw, gasket, spring, and adjusting pawl.
4. Remove anchor plunger (Figure 2, Item 12) and seal (Figure 2, Item 13) from plunger housing (Figure 2, Item 5). Discard anchor plunger and seal.
5. Remove adjusting bolt (Figure 2, Item 1) from plunger housing (Figure 2, Item 5). Discard adjusting bolt.
6. Remove adjusting plunger seal (Figure 2, Item 2), adjusting sleeve (Figure 2, Item 3), and adjusting plunger (Figure 2, Item 4) from plunger housing (Figure 2, Item 5). Discard adjusting seal, adjusting sleeve, and adjusting plunger.

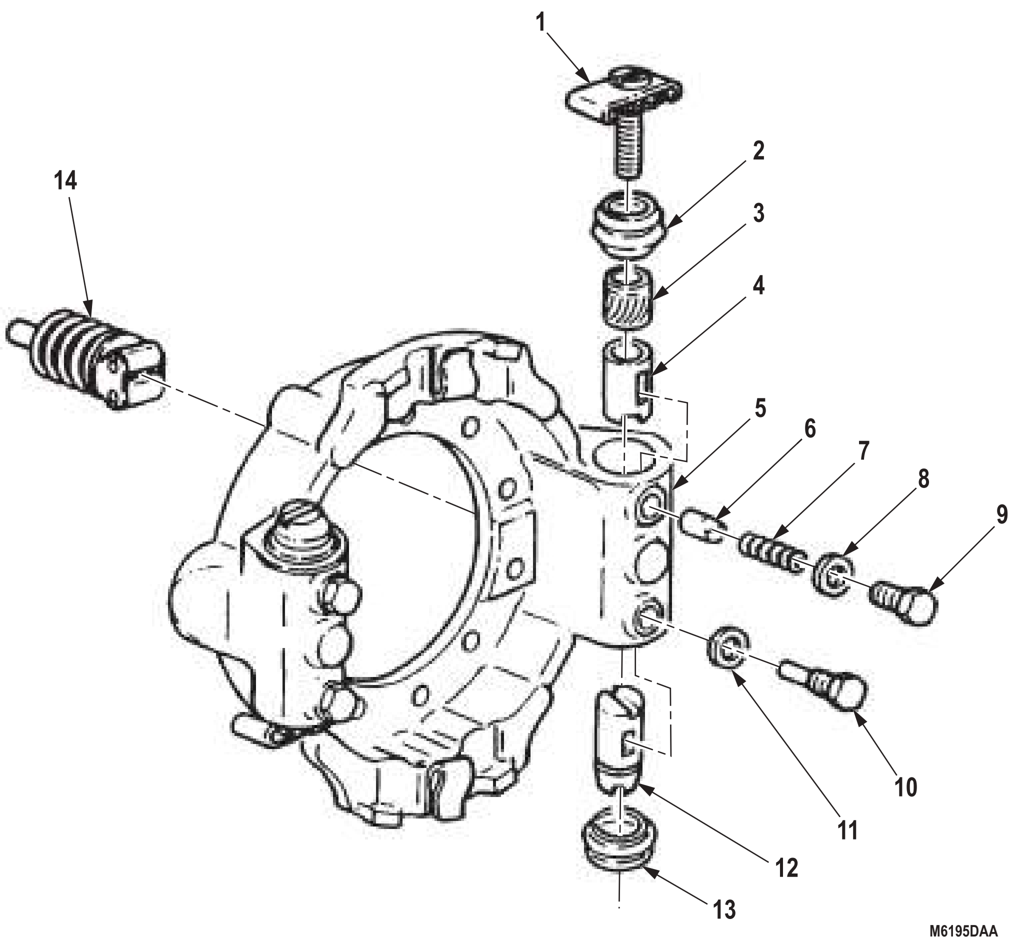


Figure 2. Rear Brake Actuator Disassembly.

END OF TASK

CLEANING AND INSPECTION

Clean plunger housing with lint-free cloth and inspect for cracks, breaks, chips, and pitting. Replace entire spider if cracked, broken, chipped, or pitted.

END OF TASK

ASSEMBLY

NOTE

Apply a light film of GAA grease to all metal parts, lips of seals, and plunger housing bores prior to assembly.

1. Place a piece of tape (Figure 3, Item 3) over slot of anchor plunger (Figure 3, Item 1) to protect lips of seal (Figure 3, Item 4).
2. Slide seal (Figure 3, Item 4) on anchor plunger (Figure 3, Item 1) until inner seal lip is in second plunger groove (Figure 3, Item 5) and outer seal lip is in first plunger groove (Figure 3, Item 2) of anchor plunger (Figure 3, Item 1).

CAUTION

Anchor plungers and adjusting plungers are located vertically, opposite one another. Incorrect location will prevent automatic adjuster from working properly.

3. Remove tape (Figure 3, Item 3) from anchor plungers (Figure 3, Item 1).

ASSEMBLY - Continued

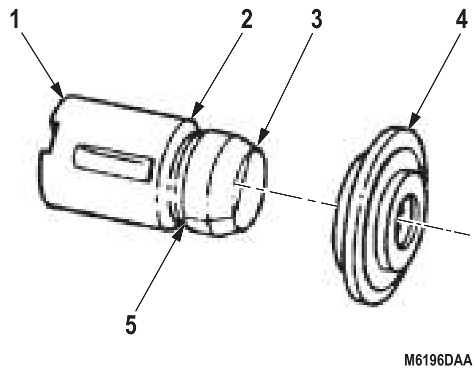


Figure 3. Seal Assembly.

ASSEMBLY - Continued

4. Align guide groove (Figure 4, Item 7) of anchor plunger (Figure 4, Item 5) with guide screw hole (Figure 4, Item 6) of plunger housing (Figure 4, Item 1).
5. Install anchor plunger (Figure 4, Item 5) in plunger housing (Figure 4, Item 1). Use hammer and 1-3/4 in. (44.45 mm) wrench socket to seat seal (Figure 4, Item 4).
6. Install gasket (Figure 4, Item 2) and guide screw (Figure 4, Item 3) on plunger housing (Figure 4, Item 1). Tighten guide screw 15 to 20 lb-ft (20 to 27 N·m).

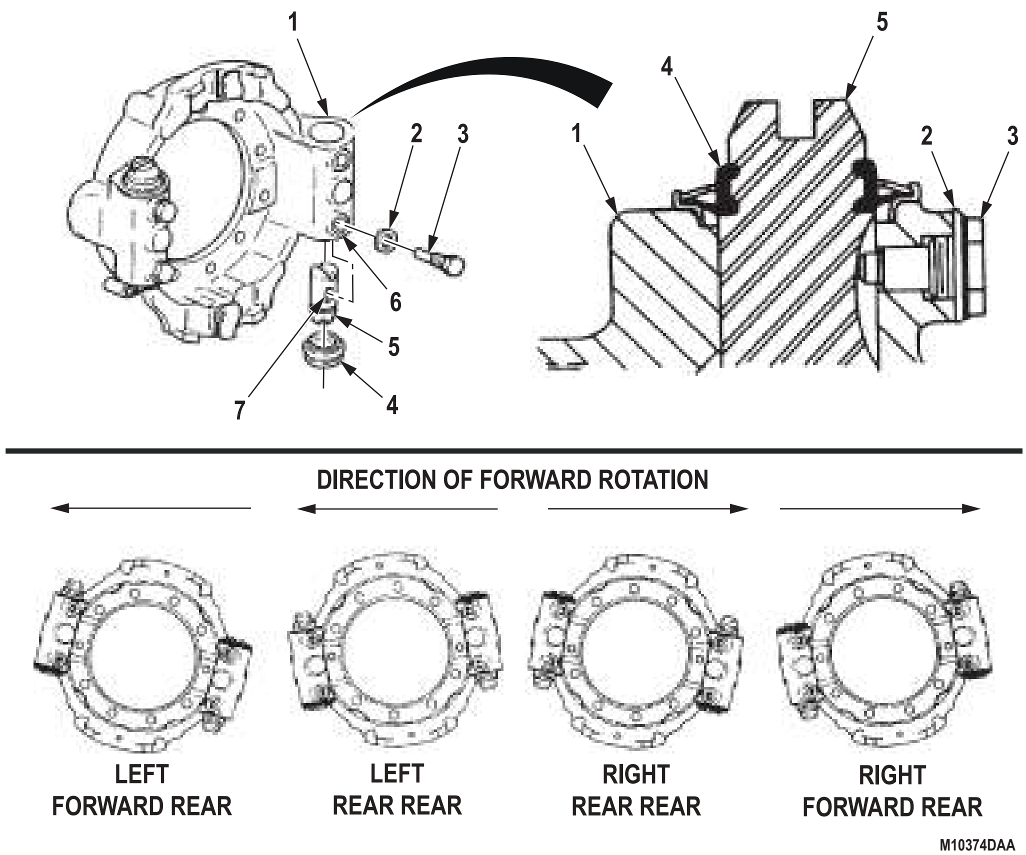


Figure 4. Seal Assembly.

7. Align guide groove (Figure 5, Item 5) of adjusting plunger (Figure 5, Item 4) with adjusting pawl hole (Figure 5, Item 6) of plunger housing (Figure 5, Item 11).
8. Install adjusting plunger (Figure 5, Item 4) in plunger housing (Figure 5, Item 11).

NOTE

Adjusting pawls have teeth and flats on one end and chamfered edge on the other end. When performing Step (9), ensure adjusting pawl is positioned with chamber toward sleeve to align pawl and sleeve teeth.

9. Install adjusting pawl (Figure 5, Item 7) and spring (Figure 5, Item 8) in plunger housing (Figure 5, Item 11) with gasket (Figure 5, Item 9) and hollow screw (Figure 5, Item 10). Tighten hollow screw to 15 to 20 lb-ft (20 to 27 N·m).
10. Using adjusting bolt (Figure 5, Item 1), rotate adjusting sleeve (Figure 5, Item 3) and check for proper teeth meshing. If teeth are properly meshing, a clicking sound and ratchet feel will be indicated.

ASSEMBLY - Continued

11. Remove adjusting bolt (Figure 5, Item 1).
12. Position inner lip of adjusting plunger seal (Figure 5, Item 2) in plunger housing (Figure 5, Item 11). Using hammer and 1-3/4 in. (44.45 mm) wrench socket, seat adjusting plunger seal.

CAUTION

Do not bottom adjusting bolt against seal. Seal will be damaged.

13. Install adjusting bolt (Figure 5, Item 1) in adjusting sleeve (Figure 5, Item 3). Tighten adjusting bolt until head is showing above adjusting plunger seal (Figure 5, Item 2).
14. Install wedge assembly (Figure 5, Item 12) in back of adjusting plunger housing (Figure 5, Item 11). Check for proper operation of wedge assembly and adjusting plungers.

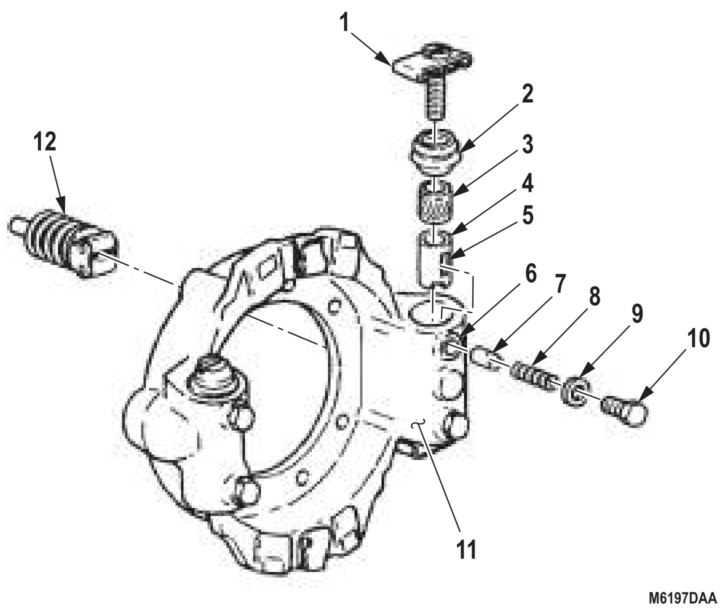


Figure 5. Rear Brake Actuator Assembly.

END OF TASK

INSTALLATION

CAUTION

Failure to tighten nuts in proper sequence can crack brake spider.

1. Install two clips (Figure 6, Item 5) on brake spider (Figure 6, Item 1) with screws (Figure 6, Item 4), lockwashers (Figure 6, Item 6), and nuts (Figure 6, Item 7).
2. Apply adhesive on rear axle housing (Figure 6, Item 8) and brake spider (Figure 6, Item 1) mating surfaces.

NOTE

Assistant will help with Step (3).

3. Position threaded holes 3 and 4 of brake spider (Figure 6, Item 1) on axle housing mating surface at 3 and 9 o'clock positions, and install two washers (Figure 6, Item 13) and screws (Figure 6, Item 12) through back of flange (Figure 6, Item 9) into threaded holes 3 and 4 of brake spider (Figure 6, Item 1).
4. Install eight washers (Figure 6, Item 2), screws (Figure 6, Item 3), washers (Figure 6, Item 11), and nuts (Figure 6, Item 10) through brake spider (Figure 6, Item 1) and flange (Figure 6, Item 9). Tighten nuts 110 to 145 lb-ft (149 to 196 N·m) in sequence shown.

INSTALLATION - Continued

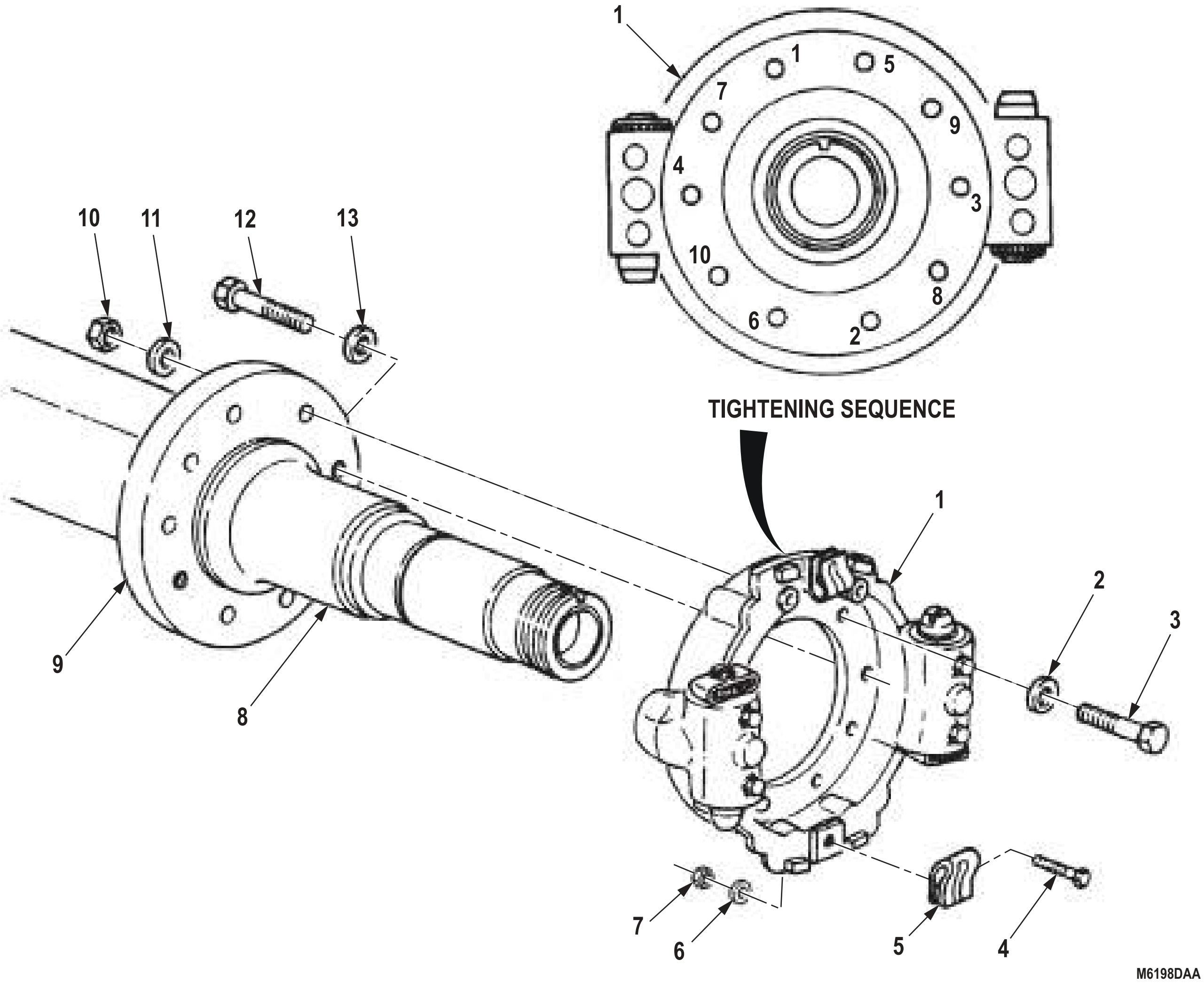


Figure 6. Rear Brake Spider Installation.

END OF TASK

FOLLOW-ON MAINTENANCE

1. Install ABS wheel sensor. (WP 0468)
2. Install combination spring (emergency) and service brake chamber. (WP 0435)
3. Install service brake chamber. (WP 0434)
4. Install brake shoes. (WP 0426)
5. Check and adjust brake. (WP 0432)
6. Start engine and allow air pressure to build to normal operating range. Check brake system for proper operation. Road test vehicle. (TM 2320-272-10)

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
BRAKE PEDAL (TREADLE) VALVE REPLACEMENT (ALL EXCEPT M936/A1/A2)

INITIAL SETUP:

Tools and Special Tools
Tool Kit, General Mechanic's: Automotive
(Volume 5, WP 0826, Table 1, Item 56)

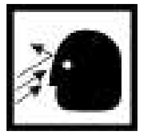
Materials/Parts
Tape, Antiseizing
(Volume 5, WP 0825, Table 1, Item 65)
Locknut (Volume 5, WP 0827, Table 1, Item 277)
Qty: 3

Equipment Condition
Air reservoirs drained. (TM 9-2320-272-10)

Equipment Condition (cont.)
Brake pedal removed. (WP 0433)
Protective control box removed.
(Volume 2, WP 0319)

REMOVAL

WARNING



Do not disconnect air lines or hoses before draining air reservoirs. Small parts under pressure may shoot out with high velocity. Failure to comply may result in injury or death to personnel.

NOTE

- Tag air lines for installation.
- All models except M936/A1/A2.

1. Disconnect two air lines (Figure 1, Item 2) from brake pedal valve adapters (Figure 1, Item 1).

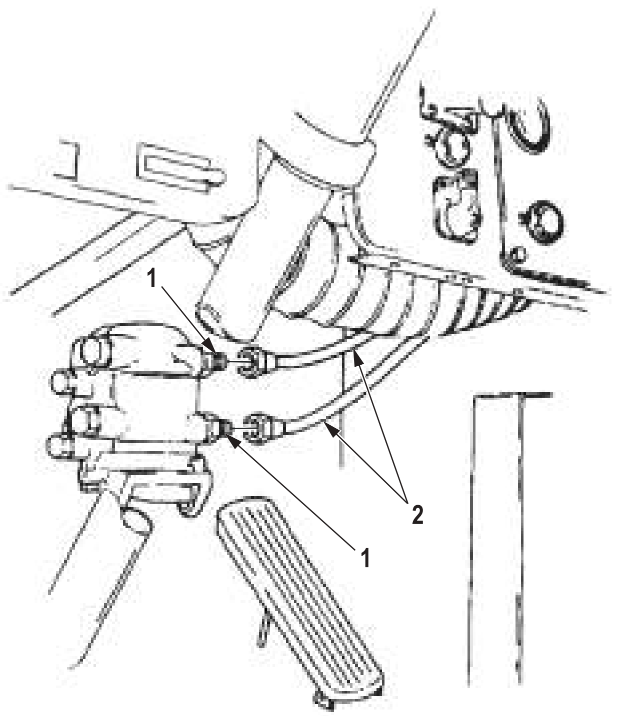


Figure 1. Brake Pedal Removal.

REMOVAL - Continued

2. Disconnect air hoses (Figure 2, Items 2 and 6) from adapters (Figure 2, Items 5 and 7).
3. Remove adapters (Figure 2, Items 5 and 7) from tee (Figure 2, Item 8).
4. Disconnect air hose (Figure 2, Item 4) from adapter (Figure 2, Item 3).
5. Remove adapter (Figure 2, Item 3) from firewall (Figure 2, Item 1).
6. Remove tee (Figure 2, Item 8) and pipe (Figure 2, Item 9) from firewall (Figure 2, Item 1).

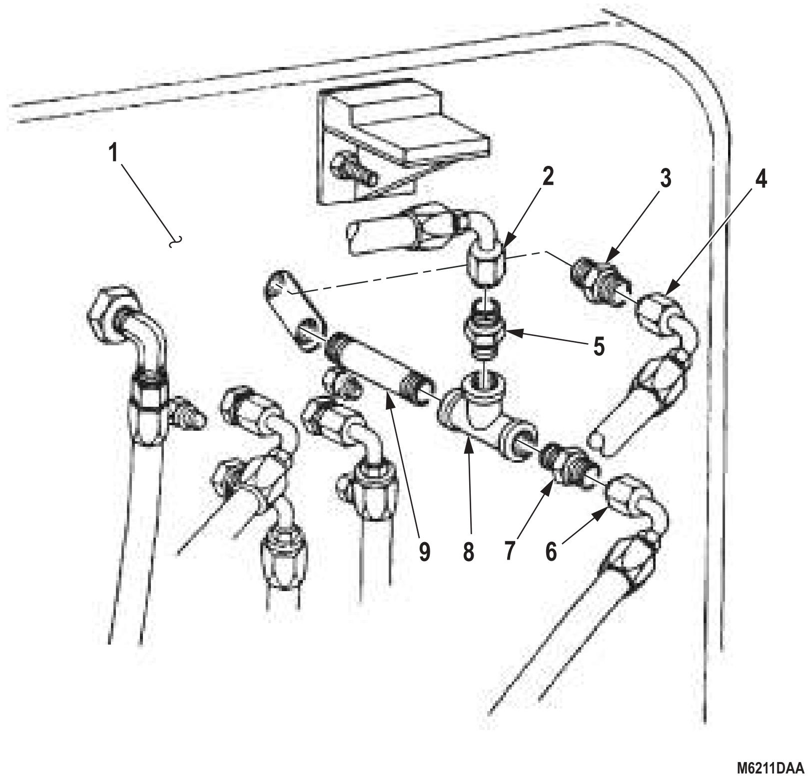


Figure 2. Brake Pedal Removal.

REMOVAL - Continued

7. Remove air hoses (Figure 3, Items 3, 4, and 6) from adapters (Figure 3, Items 2, 5, and 7).
8. Remove adapters (Figure 3, Items 2, 5, and 7) from firewall (Figure 3, Item 8).
9. Remove three locknuts (Figure 3, Item 1) and brake pedal valve (Figure 4, Item 1) from firewall (Figure 3, Item 8). Discard locknuts.

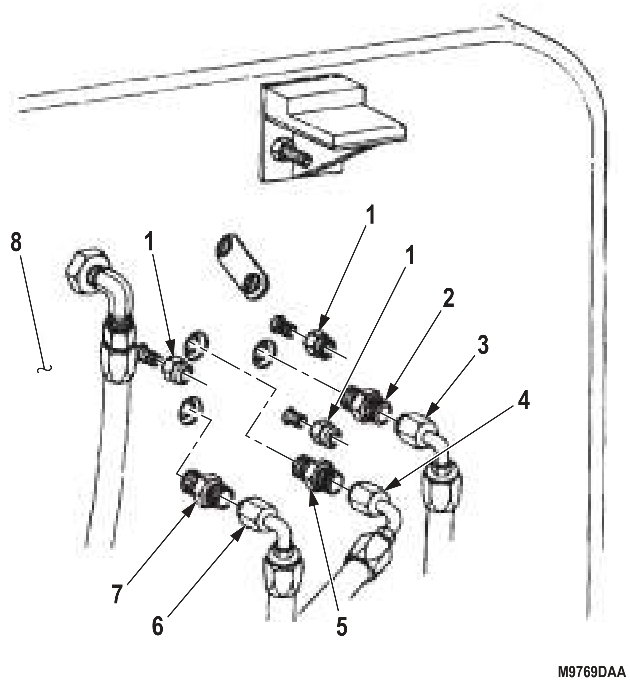


Figure 3. Brake Pedal Removal.

REMOVAL - Continued

10. Remove three studs (Figure 4, Item 2) from brake pedal valve (Figure 4, Item 1).
11. Remove two brake pedal valve adapters (Figure 4, Item 4) from brake pedal valve (Figure 4, Item 1).
12. Remove pressure relief valve (Figure 4, Item 3) from brake pedal valve (Figure 4, Item 1).

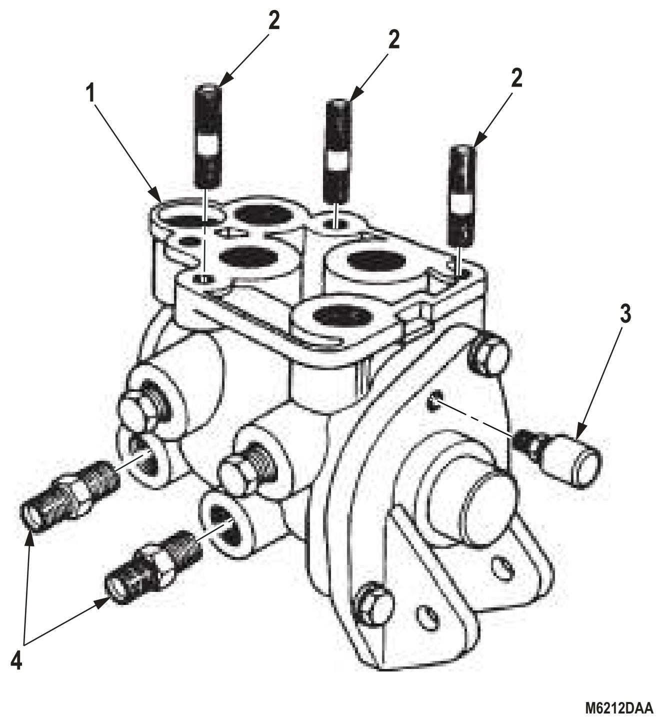


Figure 4. Brake Pedal Removal.

END OF TASK

INSTALLATION

NOTE

- If new brake pedal valve is being installed, use attaching parts and fittings from old brake pedal valve.
- Fittings must be cleaned and inspected from cracks and stripped threads.
- Wrap all male pipe threads with antiseize tape before installation.

1. Install pressure relief valve (Figure 5, Item 3) in brake pedal valve (Figure 5, Item 1).
2. Install two brake pedal valve adapters (Figure 5, Item 4) in brake pedal valve (Figure 5, Item 1).
3. Install three studs (Figure 5, Item 2) in brake pedal valve (Figure 5, Item 1).

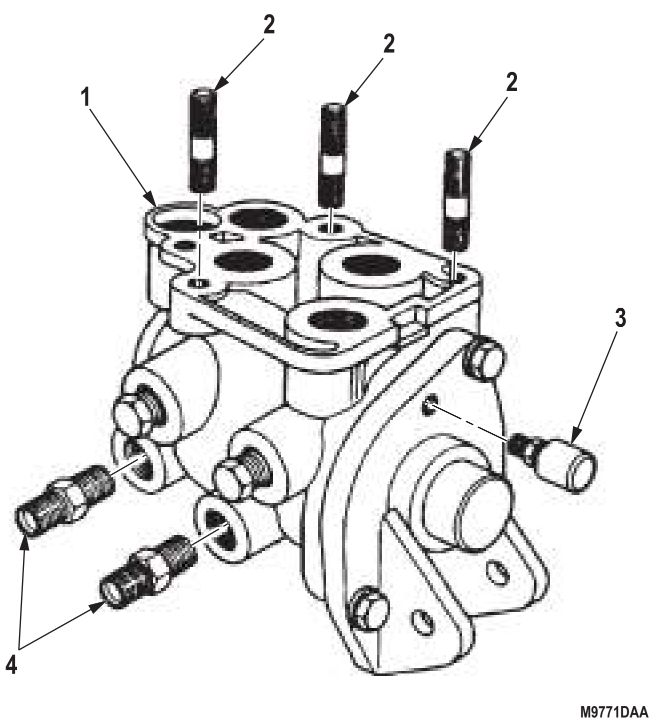


Figure 5. Brake Pedal Installation.

INSTALLATION - Continued

4. Install brake pedal valve (Figure 5, Item 1) on firewall (Figure 6, Item 8) with three locknuts (Figure 6, Item 1).
5. Install adapters (Figure 6, Items 2, 5, and 7) on firewall (Figure 6, Item 8).
6. Install air hoses (Figure 6, Items 3, 4, and 6) on adapters (Figure 6, Items 2, 5, and 7).

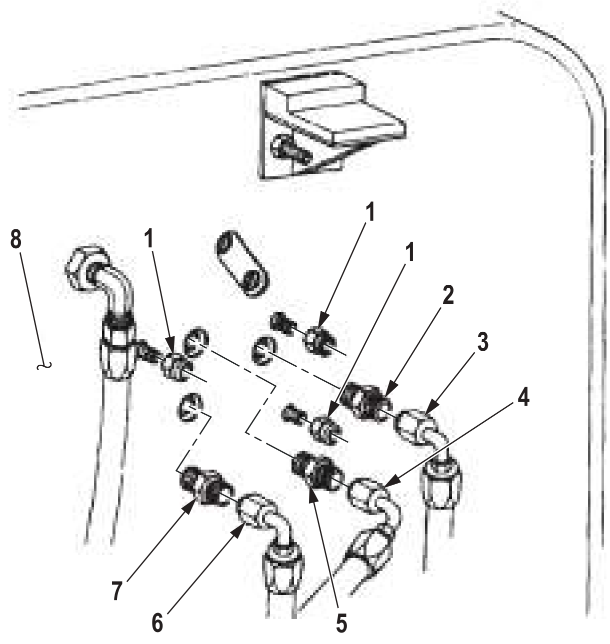


Figure 6. Brake Pedal Installation.

INSTALLATION - Continued

7. Install pipe (Figure 7, Item 8) and tee (Figure 7, Item 7) on firewall (Figure 7, Item 9).
8. Install adapter (Figure 7, Item 3) on firewall (Figure 7, Item 9).
9. Connect air hose (Figure 7, Item 4) to adapter (Figure 7, Item 3).
10. Install adapters (Figure 7, Items 2 and 6) on tee (Figure 7, Item 7).
11. Connect air hoses (Figure 7, Items 1 and 5) to adapters (Figure 7, Items 2 and 6).

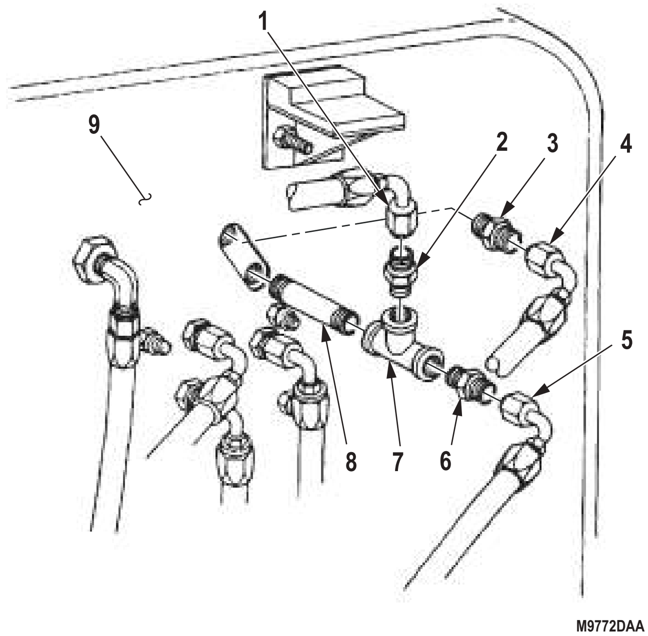


Figure 7. Brake Pedal Installation.

INSTALLATION - Continued

12. Connect two air lines (Figure 8, Item 1) to brake pedal valve adapters (Figure 8, Item 2).

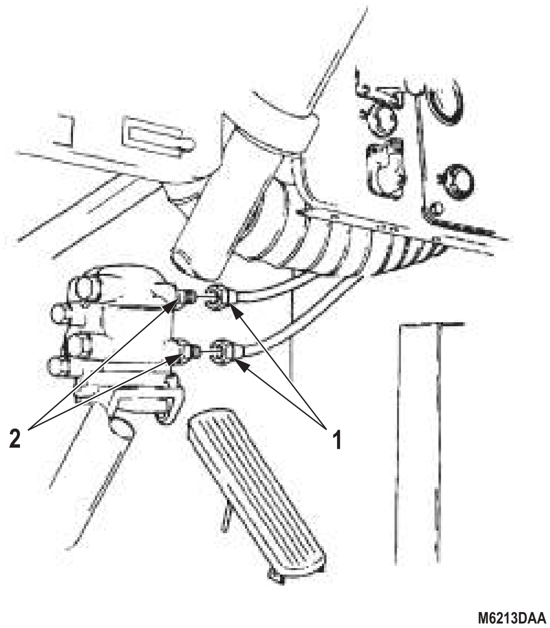


Figure 8. Brake Pedal Installation.

END OF TASK

FOLLOW-ON MAINTENANCE

1. Install protective control box. (Volume 2, WP 0319)
2. Install brake pedal. (WP 0433)
3. Start engine and allow air pressure to build to normal operating range. Check for air leaks and proper brake operation. Road test vehicle. (TM 9-2320-272-10)

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
BRAKE PEDAL (TREADLE) VALVE REPLACEMENT (M936/A1/A2)

INITIAL SETUP:

Tools and Special Tools
Tool Kit, General Mechanic's: Automotive
(Volume 5, WP 0826, Table 1, Item 56)

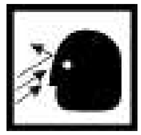
Materials/Parts
Tape, Antiseizing
(Volume 5, WP 0825, Table 1, Item 65)
Locknut (Volume 5, WP 0827, Table 1, Item 277)
Qty: 3

Equipment Condition
Parking brake set. (TM 9-2320-272-10)

Equipment Condition (cont.)
Air reservoirs drained. (TM 9-2320-272-10)
Brake pedal removed. (WP 0433)
Protective control box removed.
(Volume 2, WP 0319)

REMOVAL

WARNING



Do not disconnect air lines or hoses before draining air reservoirs. Small parts under pressure may shoot out with high velocity. Failure to comply may result in injury or death to personnel.

1. Disconnect two air lines (Figure 1, Item 2) from brake pedal valve adapters (Figure 1, Item 1).

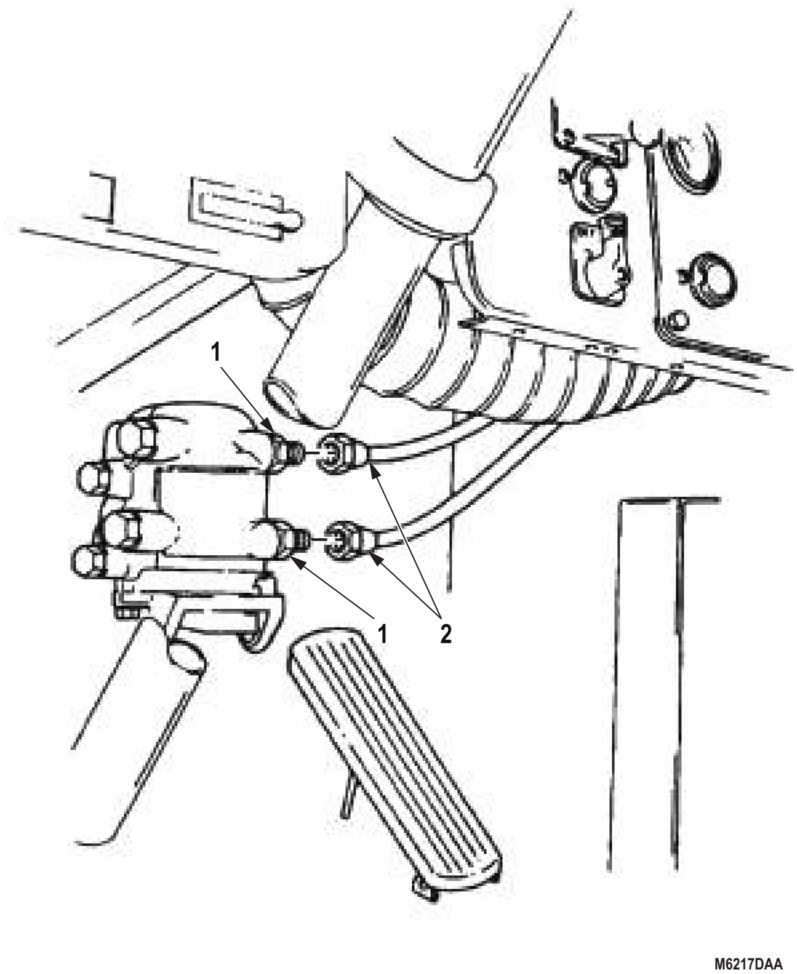


Figure 1. Cab Air Lines Removal.

REMOVAL - Continued

2. Disconnect two air hoses (Figure 2, Items 2 and 8) from adapters (Figure 2, Items 5 and 7).
3. Remove adapters (Figure 2, Items 5 and 7) from tee (Figure 2, Item 6).
4. Remove air hose (Figure 2, Item 4) and adapter (Figure 2, Item 3) from firewall (Figure 2, Item 1).
5. Remove tee (Figure 2, Item 6) and pipe (Figure 2, Item 11) from firewall (Figure 2, Item 1).
6. Remove air hose (Figure 2, Item 9) and adapter (Figure 2, Item 10) from firewall (Figure 2, Item 1).

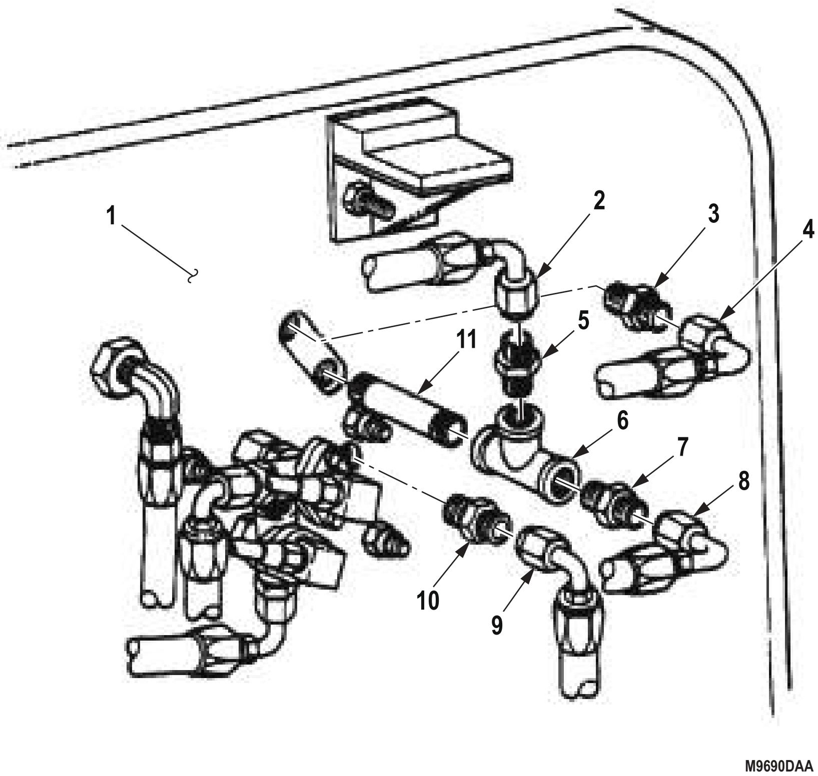


Figure 2. Air Lines Removal.

REMOVAL - Continued

7. Disconnect two air hoses (Figure 3, Item 5) from elbows (Figure 3, Item 4).
8. Remove two elbows (Figure 3, Item 4) from control valves (Figure 3, Item 3).
9. Disconnect air hoses (Figure 3, Items 7 and 8) from adapters (Figure 3, Item 6).
10. Remove two adapters (Figure 3, Item 6) from control valves (Figure 3, Item 3).
11. Remove two control valves (Figure 3, Item 3) and adapter (Figure 3, Item 2) from firewall (Figure 3, Item 10).
12. Remove three locknuts (Figure 3, Item 1) from studs (Figure 3, Item 9). Discard locknuts.

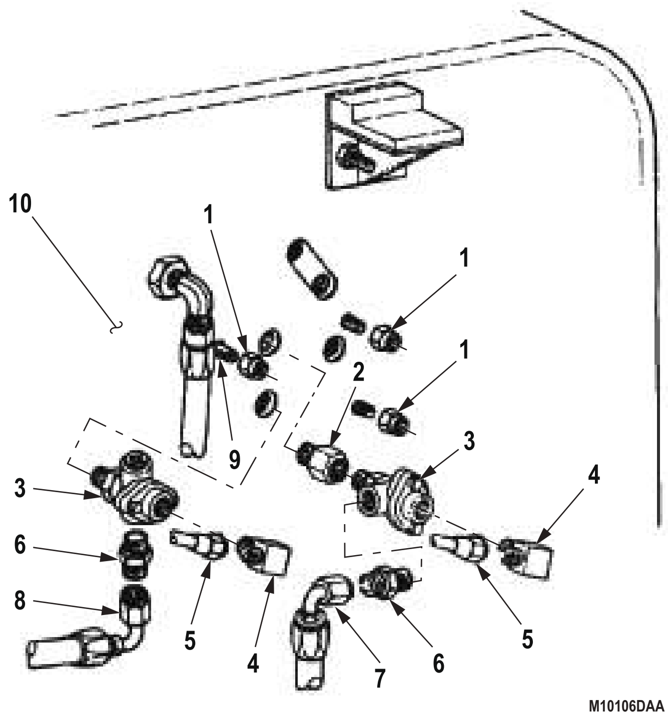


Figure 3. Brake Valve Removal.

REMOVAL - Continued

13. Remove three studs (Figure 4, Item 1) from brake pedal valve (Figure 4, Item 4).
14. Remove two brake pedal valve adapters (Figure 4, Item 3) from brake valve (Figure 4, Item 4).
15. Remove pressure relief valve (Figure 4, Item 2) from brake valve (Figure 4, Item 4).

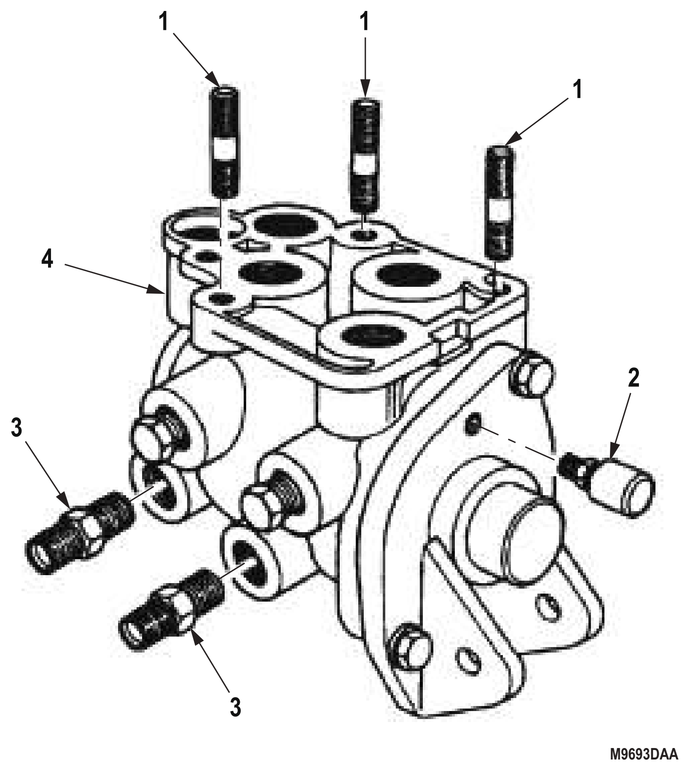


Figure 4. Valve Removal.

END OF TASK

INSTALLATION

NOTE

- If new brake pedal valve is being installed, use attaching parts and fittings from old brake pedal valve.
- Fittings must be cleaned and inspected for cracks and stripped threads.
- Wrap all male pipe threads with antiseize tape before installation.

1. Install pressure relief valve (Figure 5, Item 2) on brake pedal valve (Figure 5, Item 4).
2. Install two brake pedal valve adapters (Figure 5, Item 3) on brake valve (Figure 5, Item 4).
3. Install three studs (Figure 5, Item 1) on brake valve (Figure 5, Item 4).

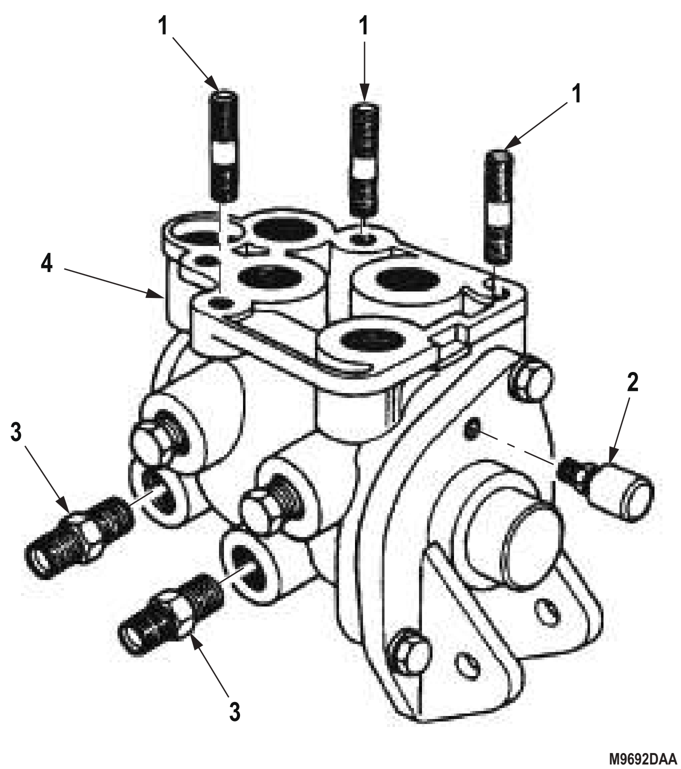


Figure 5. Brake Valve Installation.

INSTALLATION - Continued

4. Install brake valve (Figure 5, Item 4) on firewall (Figure 6, Item 10) with three new locknuts (Figure 6, Item 1).
5. Install adapter (Figure 6, Item 2) and two control valves (Figure 6, Item 3) on firewall (Figure 6, Item 10).
6. Install two adapters (Figure 6, Item 6) on control valves (Figure 6, Item 3).
7. Connect air hoses (Figure 6, Items 7 and 8) to adapters (Figure 6, Item 6).
8. Install two elbows (Figure 6, Item 4) on control valves (Figure 6, Item 3).
9. Connect two air hoses (Figure 6, Item 5) to elbows (Figure 6, Item 4).

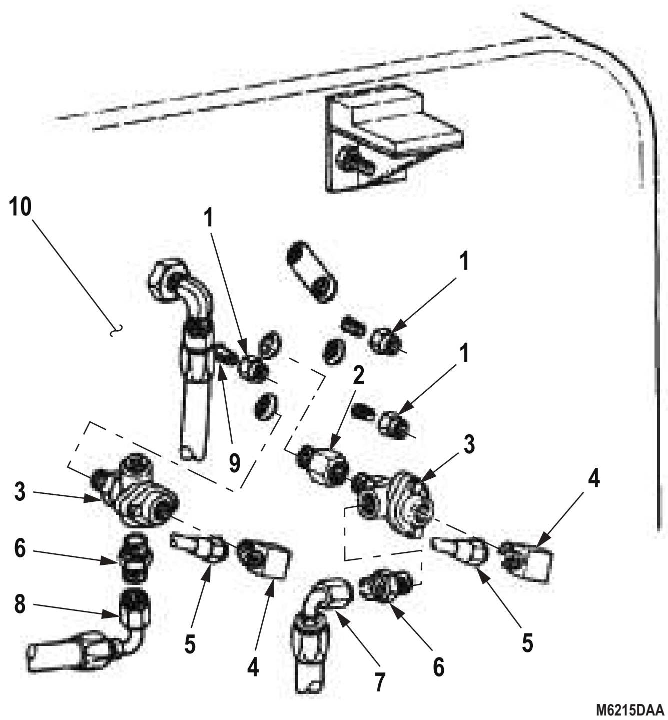


Figure 6. Brake Valve Installation.

INSTALLATION - Continued

10. Install adapter (Figure 7, Item 10) and air hose (Figure 7, Item 9) on firewall (Figure 7, Item 1).
11. Install pipe (Figure 7, Item 11) and tee (Figure 7, Item 6) on firewall (Figure 7, Item 1).
12. Install adapter (Figure 7, Item 3) and air hose (Figure 7, Item 4) on firewall (Figure 7, Item 1).
13. Install adapters (Figure 7, Items 5 and 7) on tee (Figure 7, Item 6).
14. Connect air hoses (Figure 7, Items 2 and 8) to adapters (Figure 7, Items 5 and 7).

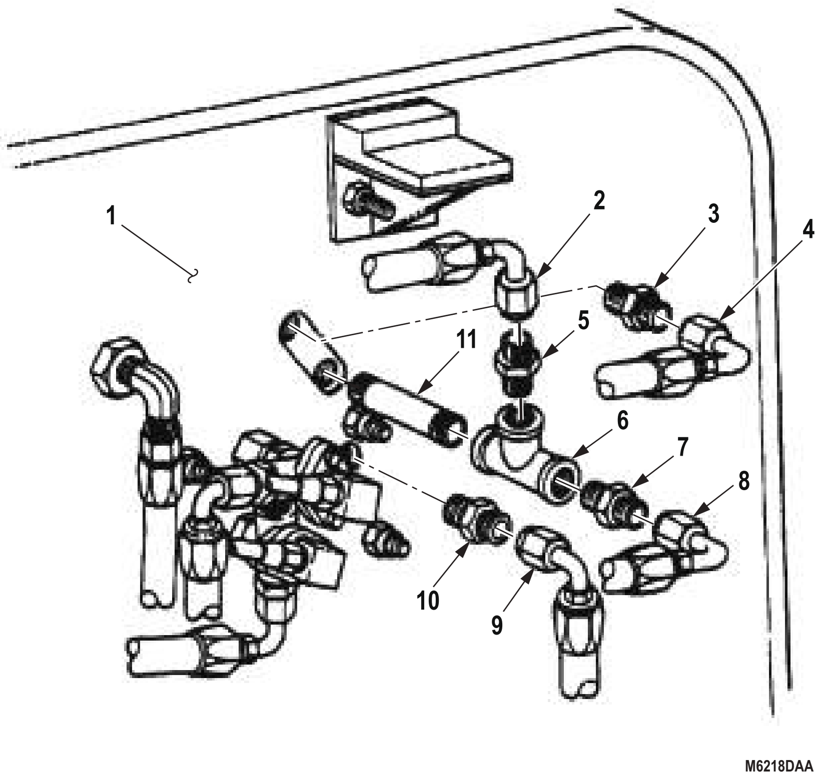


Figure 7. Brake Valve Installation.

INSTALLATION - Continued

15. Connect two air lines (Figure 8, Item 2) to brake pedal valve adapters (Figure 8, Item 1).

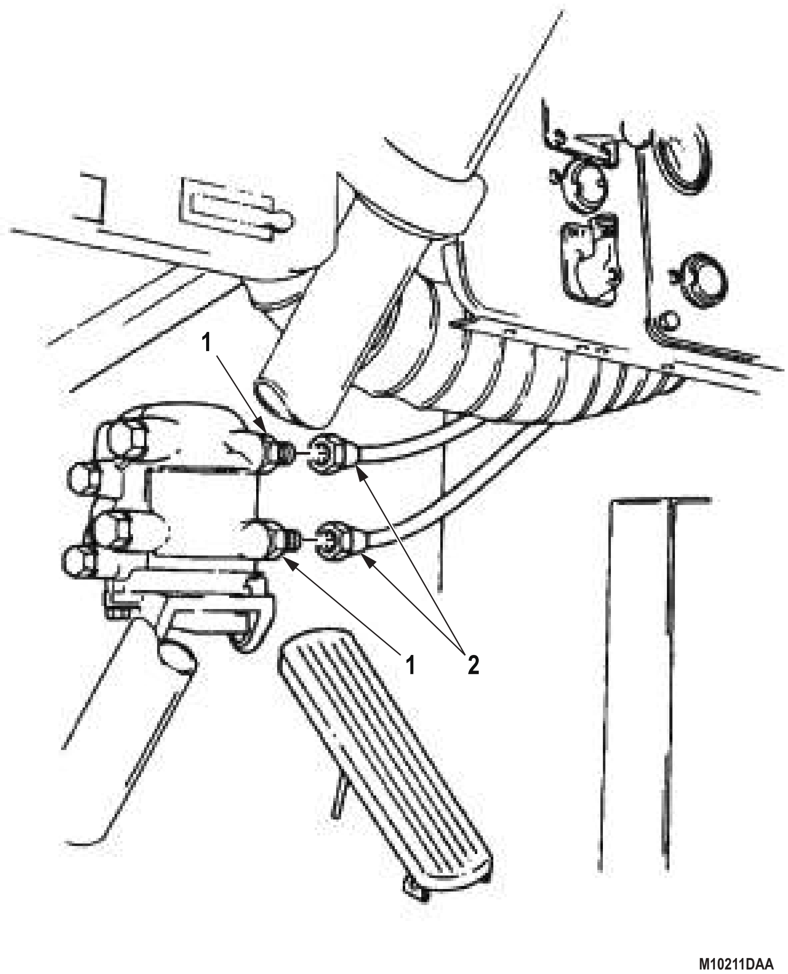


Figure 8. Brake Pedal Installation.

END OF TASK

FOLLOW-ON MAINTENANCE

1. Install protective control box. (Volume 2, WP 0319)
2. Install brake pedal. (WP 0433)
3. Start engine and allow air pressure to build to normal operating range. Check for air leaks and proper brake operation. Road test vehicle. (TM 9-2320-272-10)

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
SPRING PARKING BRAKE VALVE REPAIR

INITIAL SETUP:

Tools and Special Tools
Tool Kit, General Mechanic's: Automotive
(Volume 5, WP 0826, Table 1, Item 56)

Materials/Parts
Adhesive, Silicone Rubber
(Volume 5, WP 0825, Table 1, Item 4)
Tape, Antiseizing
(Volume 5, WP 0825, Table 1, Item 65)
Locknut (Volume 5, WP 0827, Table 1, Item 312)
Qty: 2

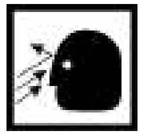
Equipment Condition
Parking brake set. (TM 9-2320-272-10)

Equipment Condition (cont.)
Wheels chocked. (TM 9-2320-272-10)
Air reservoirs drained. (TM 9-2320-272-10)

REMOVAL

1. Release parking brake lever (Figure 1, Item 8).

WARNING



Do not disconnect air lines or hoses before draining air reservoirs. Small parts under pressure may shoot out with high velocity. Failure to comply may result in injury or death to personnel.

CAUTION

Use care to prevent excessive twisting when removing air lines.

NOTE

Tag air lines for installation.

2. Disconnect three air lines (Figure 1, Item 4) from adapter assemblies (Figure 1, Items 3, 5, and 6).
3. Remove adapter assemblies (Figure 1, Items 3, 5, and 6) from valve body (Figure 1, Item 1).
4. Remove two locknuts (Figure 1, Item 9), washers (Figure 1, Item 10), screws (Figure 1, Item 2), and valve body (Figure 1, Item 1) from parking brake bracket (Figure 1, Item 7). Discard locknuts.

REMOVAL - Continued

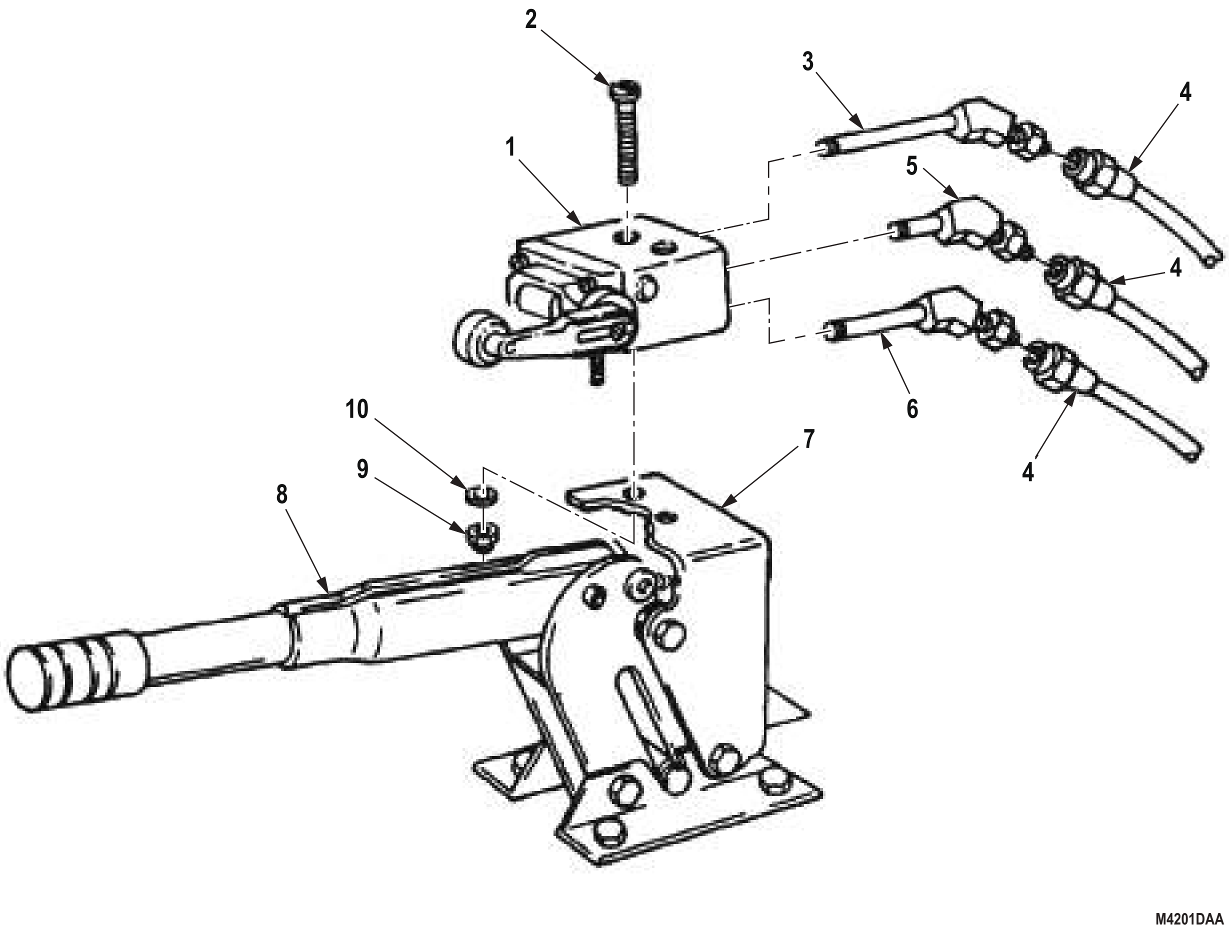


Figure 1. Spring Parking Brake Valve Removal.

END OF TASK

ADJUSTMENT

1. Loosen setscrew (Figure 2, Item 4) on valve lever (Figure 2, Item 1) and position valve lever parallel with valve body (Figure 2, Item 2). Tighten setscrew.
2. Position valve body (Figure 2, Item 2) on parking brake bracket (Figure 2, Item 3). Valve lever (Figure 2, Item 1) must be parallel with cab floor. If not, repeat Step (1).

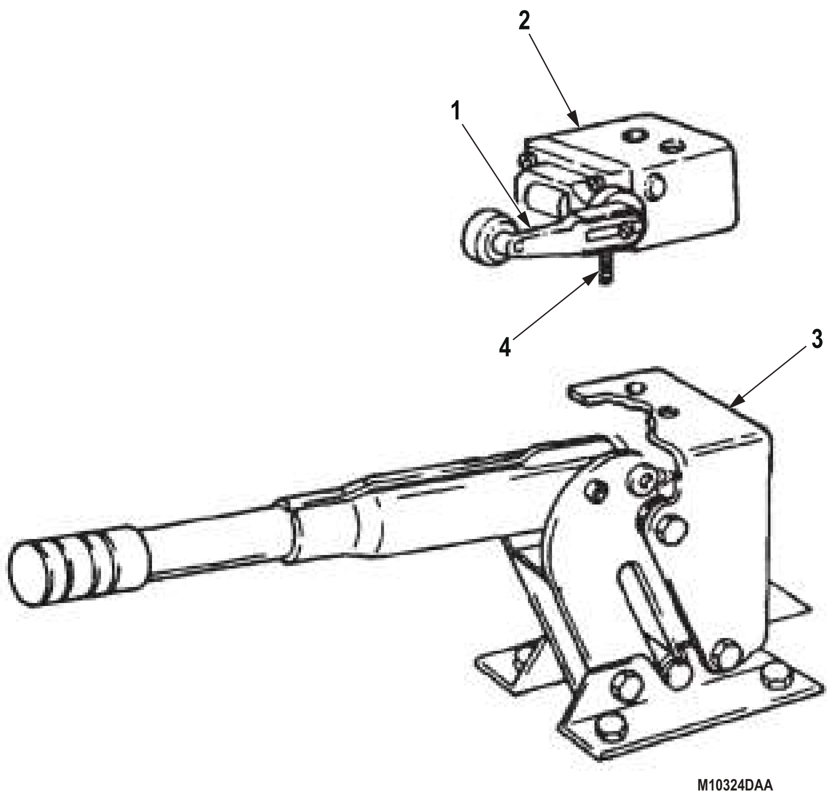


Figure 2. Spring Parking Brake Valve Adjustment.

END OF TASK

INSTALLATION

NOTE

- If new spring parking brake valve is being installed, use fittings from old valve.
- Wrap all male pipe threads with antiseize tape before installation.

1. Install valve body (Figure 3, Item 1) on parking brake bracket (Figure 3, Item 7) with two screws (Figure 3, Item 2), washers (Figure 3, Item 10), and locknuts (Figure 3, Item 9). Valve lever roller (Figure 3, Item 11) must be aligned with parking brake lever (Figure 3, Item 8).
2. Lift up parking brake lever (Figure 3, Item 8). Ensure parking brake lever (Figure 3, Item 8) contacts valve lever roller (Figure 3, Item 11) properly and release parking brake lever (Figure 3, Item 8).

INSTALLATION - Continued

CAUTION

Do not twist air lines. Twisted air lines will restrict air flow.

NOTE

Male pipe threads must be coated with gasket sealant before installation.

3. Install adapter assemblies (Figure 3, Item 3, 5, and 6) on valve body (Figure 3, Item 1).
4. Connect three air lines (Figure 3, Item 4) to adapter assemblies (Figure 3, Items 3, 5, and 6).

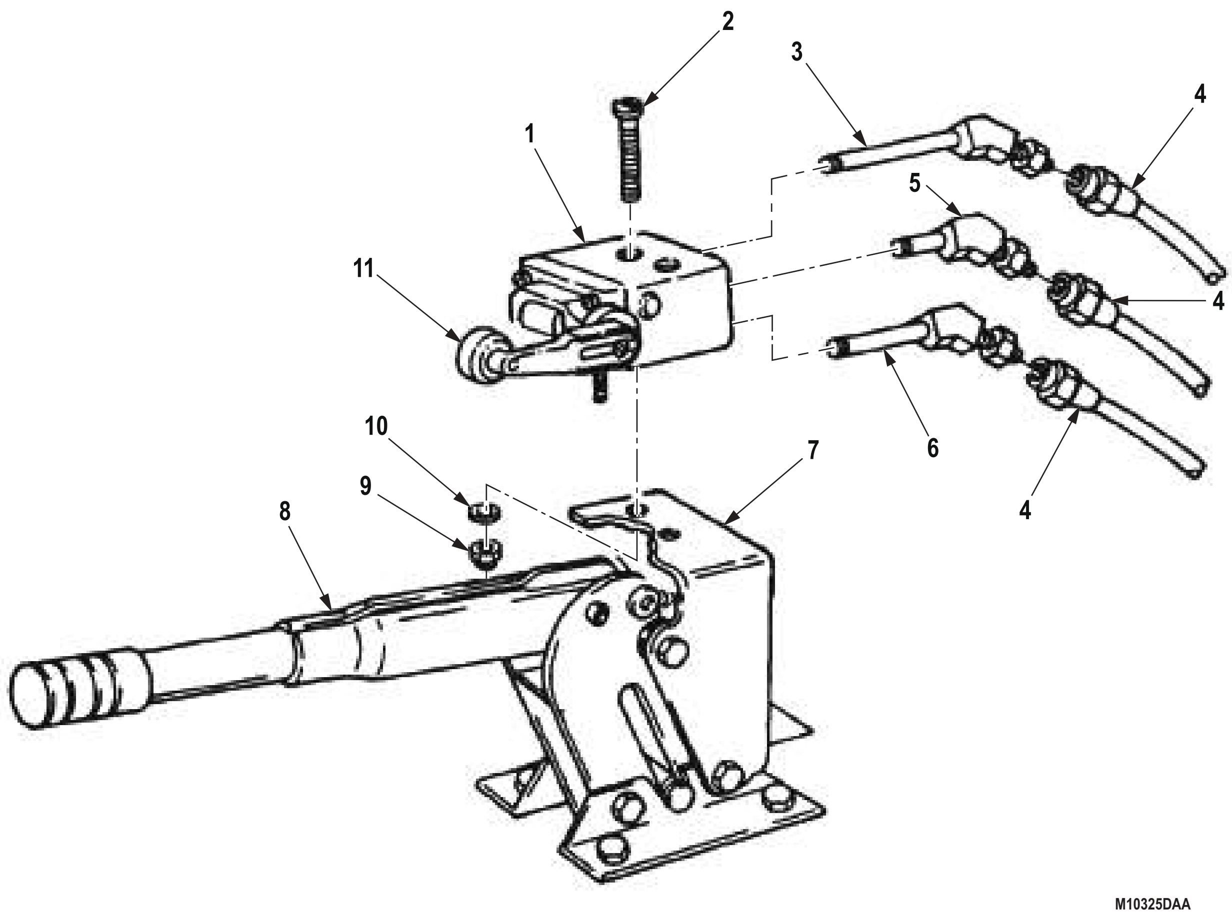


Figure 3. Spring Parking Brake Valve Installation.

END OF TASK

FOLLOW-ON MAINTENANCE

1. Start engine and allow air pressure to build to normal operating range. Check for air leaks at spring brake valve. (TM 9-2320-272-10)
2. Set parking brake and ensure spring brakes engage properly. (TM 9-2320-272-10)
3. Remove chocks and road test vehicle. (TM 9-2320-272-10)

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
BRAKE MECHANISM ADJUSTMENTS

INITIAL SETUP:

Tools and Special Tools
Tool Kit, General Mechanic's: Automotive (Volume 5, WP 0826, Table 1, Item 56)
Adjusting Tool, Brake Shoe (Volume 5, WP 0826, Table 1, Item 3)

References
WP 0426

Equipment Condition
Parking brake set. (TM 9-2320-272-10)

Equipment Condition (cont.)
Spring (emergency) brake caged. (TM 9-2320-272-10)
Front hub and drum removed. (WP 0479) or (WP 0481)
Rear hub and drum removed. (WP 0480) or (WP 0482)

FRONT BRAKE SHOE CHECK AND ADJUSTMENT

1. Remove two rubber inspection hole covers (Figure 1, Item 1) from brake drum dust covers (Figure 1, Item 4).
2. Check brake shoe lining (Figure 1, Item 8) to brake drum (Figure 1, Item 7) clearance through inspection hole (Figure 1, Item 5). Clearance should be 0.020 to 0.040 in. (0.508 to 1.016 mm).
3. Remove two rubber adjusting hole covers (Figure 1, Item 2) from brake drum dust cover (Figure 1, Item 4).
4. Using brake shoe adjusting tool through adjusting holes (Figure 1, Item 3), rotate star wheel (Figure 1, Item 6) until proper clearance is obtained.
5. Install two rubber inspection hole covers (Figure 1, Item 1) and two rubber adjusting hole covers (Figure 1, Item 2) on brake drum dust covers (Figure 1, Item 4).

FRONT BRAKE SHOE CHECK AND ADJUSTMENT - Continued

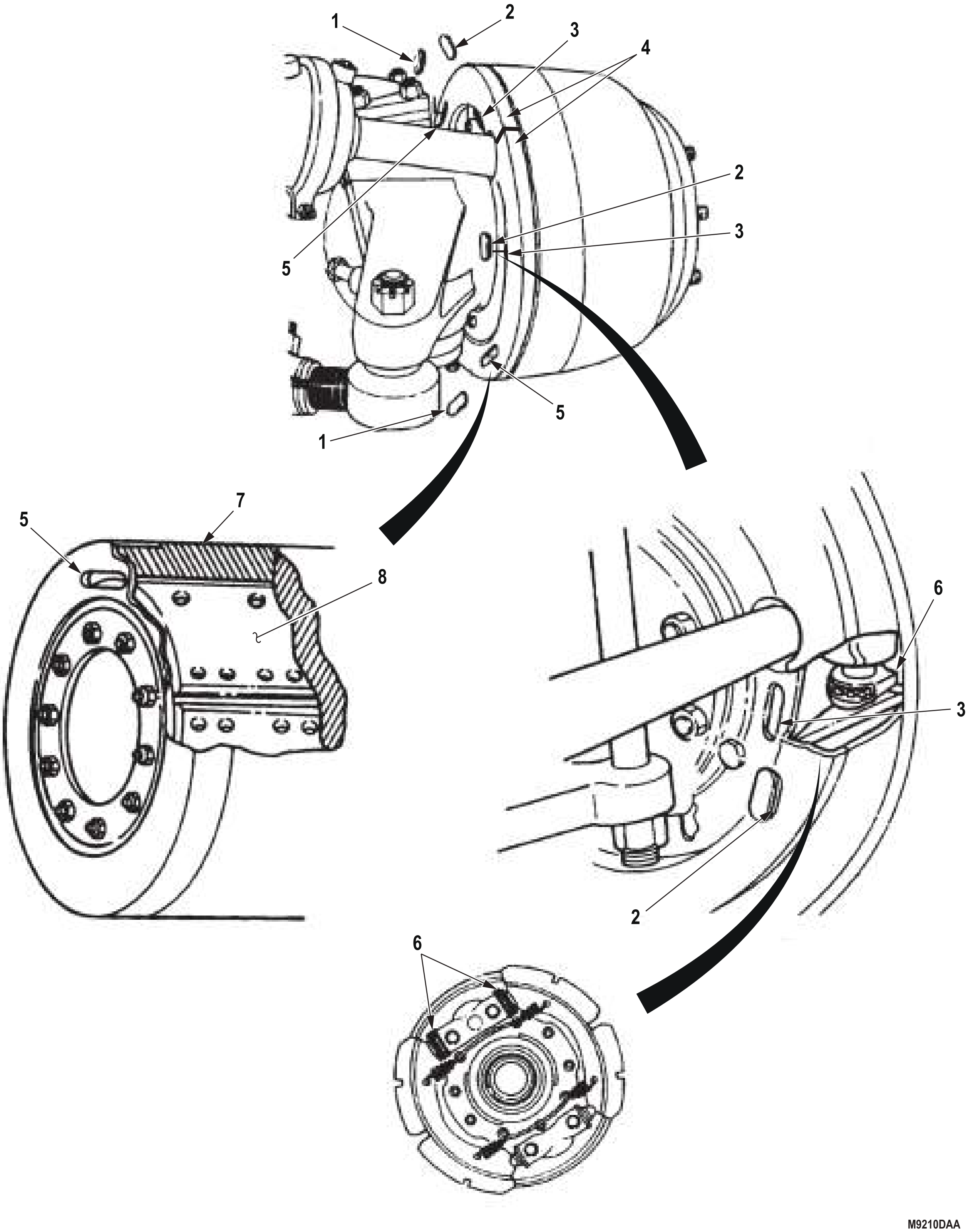


Figure 1. Front Brake Check and Adjustment.

END OF TASK

REAR BRAKE SHOE CHECK AND ADJUSTMENT

1. Remove two rubber inspection hole covers (Figure 2, Item 3) from brake drum dust covers (Figure 2, Item 8).
2. Check brake shoe lining (Figure 2, Item 6) to brake drum (Figure 2, Item 5) clearance through inspection hole (Figure 2, Item 2). Clearance should be 0.020 to 0.040 in. (0.508 to 1.016 mm).
3. Remove two rubber adjusting hole covers (Figure 2, Item 1) from brake drum dust cover (Figure 2, Item 8).
4. Using brake shoe adjusting tool through adjusting holes (Figure 2, Item 4), rotate star wheel (Figure 2, Item 7) until proper clearance is obtained.
5. Install two rubber inspection hole covers (Figure 2, Item 3) and two rubber adjusting hole covers (Figure 2, Item 1) on brake drum dust covers (Figure 2, Item 8).

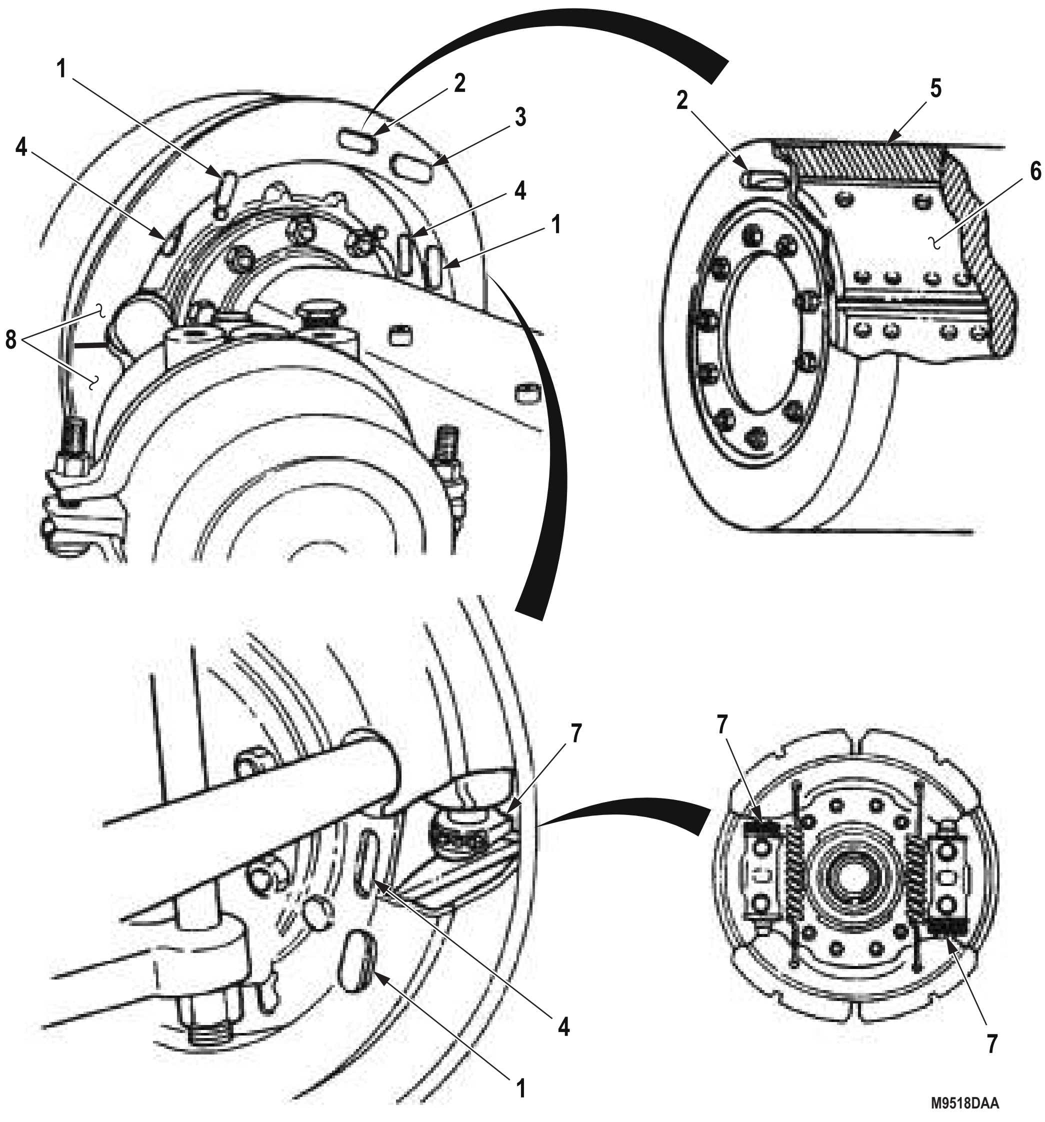


Figure 2. Rear Brake Check and Adjustment.

END OF TASK

CHECKING BRAKE SHOE AND MECHANISM WEAR

1. Remove two rubber inspection hole covers (Figure 3, Item 1) from brake drum dust cover (Figure 3, Item 3).
2. Inspect chamfer (Figure 3, Item 4) on brake shoe lining (Figure 3, Item 5) through inspection hole (Figure 3, Item 2). If brake shoe lining is worn to depth of chamfer, replace brake shoes (Figure 3, Item 6) (WP 0426).
3. Install two rubber inspection hole covers (Figure 3, Item 1) on brake drum dust cover (Figure 3, Item 3).

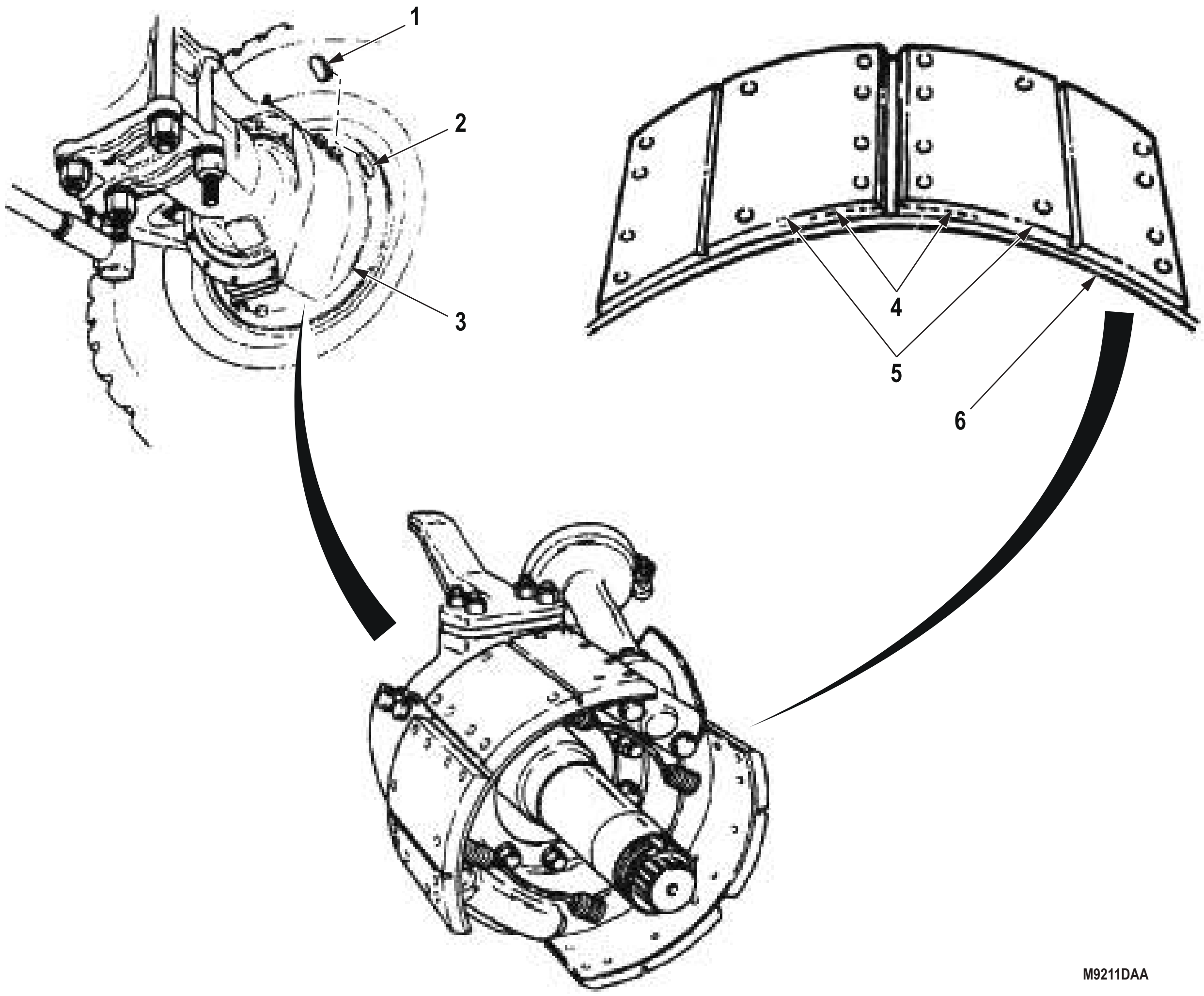


Figure 3. Brake Shoe Check.

CHECKING BRAKE SHOE AND MECHANISM WEAR - Continued

4. Inspect brake shoe linings (Figure 4, Item 1) for cracks, chips, and oil contamination. If cracked, chipped, or contaminated, replace brake shoes (Figure 4, Item 4) (WP 0426).
5. Inspect plunger seals (Figure 4, Item 6). Notify Field Maintenance if rotted or torn.
6. Inspect shoe return springs (Figure 4, Item 5) for stretching, bluing, cracks, and uneven coils. Replace return springs showing any of these defects.
7. Inspect brake chambers (Figure 4, Item 2) for cracks and bends at point where chamber enters plunger (Figure 4, Item 3). Replace chamber(s) if cracked or bent.

END OF TASK

FOLLOW-ON MAINTENANCE

1. Install front hub and drum. (WP 0479) or (WP 0481)
2. Install rear hub and drum. (WP 0480) or (WP 0482)

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
BRAKE PEDAL REPLACEMENT

INITIAL SETUP:

Tools and Special Tools
Tool Kit, General Mechanic's: Automotive
(Volume 5, WP 0826, Table 1, Item 56)

Materials/Parts
Cotter Pin

Materials/Parts (cont.)
(Volume 5, WP 0827, Table 1, Item 89)
Qty: 2

Equipment Condition
Parking brake set. (TM 9-2320-272-10)

REMOVAL

1. Remove return spring (Figure 1, Item 5) from brake pedal (Figure 1, Item 9) and cab (Figure 1, Item 2).
2. Remove cotter pin (Figure 1, Item 11), fulcrum pin (Figure 1, Item 12), and brake pedal (Figure 1, Item 9) from brake pedal valve (Figure 1, Item 1). Discard cotter pin.
3. Remove jamnut (Figure 1, Item 3) and pedal stop (Figure 1, Item 4) from brake pedal valve (Figure 1, Item 1).
4. Remove cotter pin (Figure 1, Item 7), roller pin (Figure 1, Item 10), and two rollers (Figure 1, Item 6) from brake pedal (Figure 1, Item 9). Discard cotter pin.
5. Remove rubber pad (Figure 1, Item 8) from brake pedal (Figure 1, Item 9).

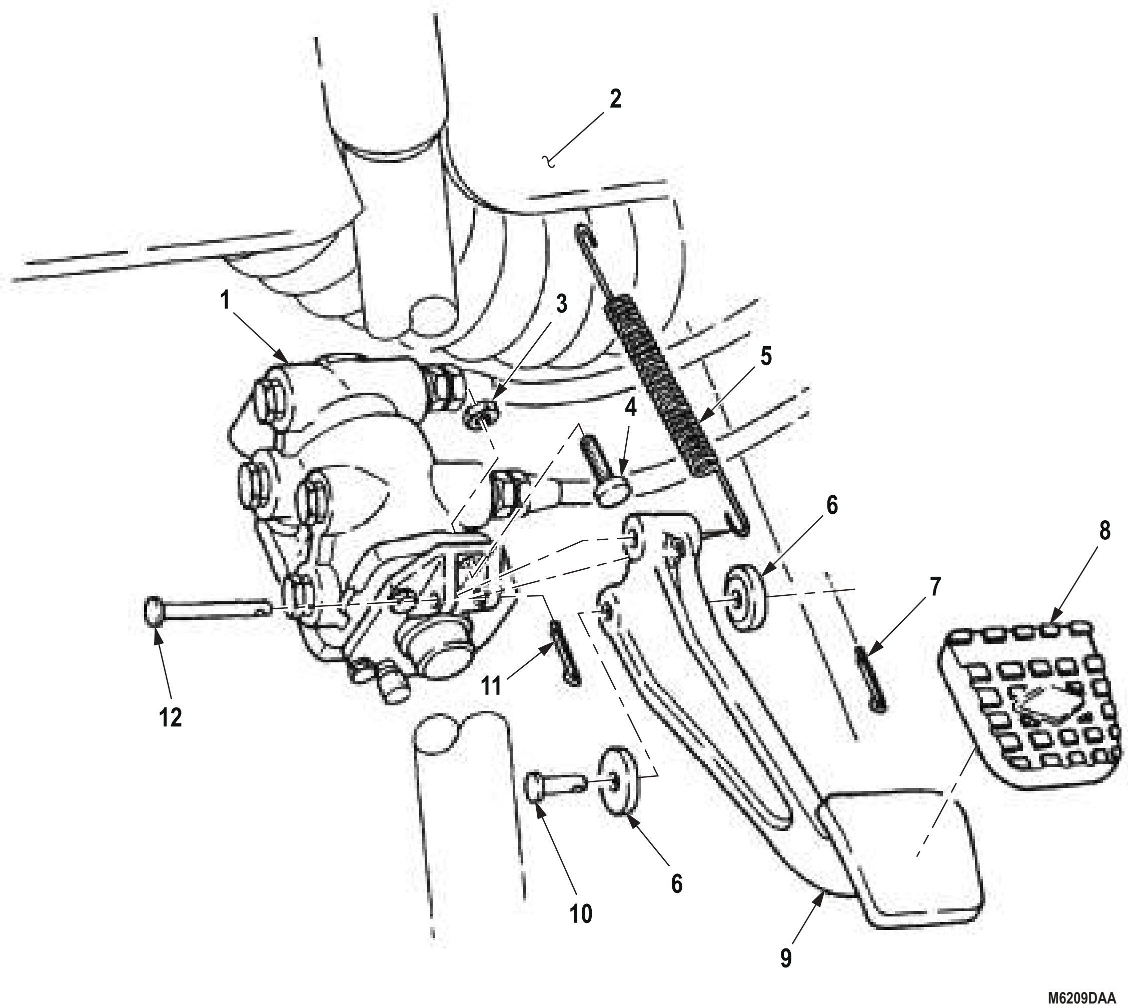


Figure 1. Brake Pedal Removal.

END OF TASK

INSTALLATION

1. Install rubber pad (Figure 2, Item 8) on brake pedal (Figure 2, Item 9).
2. Install two rollers (Figure 2, Item 6) on brake pedal (Figure 2, Item 9) with roller pin (Figure 2, Item 10) and cotter pin (Figure 2, Item 7).
3. Install pedal stop (Figure 2, Item 4) on brake pedal valve (Figure 2, Item 1) with jamnut (Figure 2, Item 3). Do not tighten jamnut.
4. Install brake pedal (Figure 2, Item 9) on brake pedal valve (Figure 2, Item 1) with fulcrum pin (Figure 2, Item 12) and cotter pin (Figure 2, Item 11).
5. Install return spring (Figure 2, Item 5) on brake pedal (Figure 2, Item 9) and cab (Figure 2, Item 2).

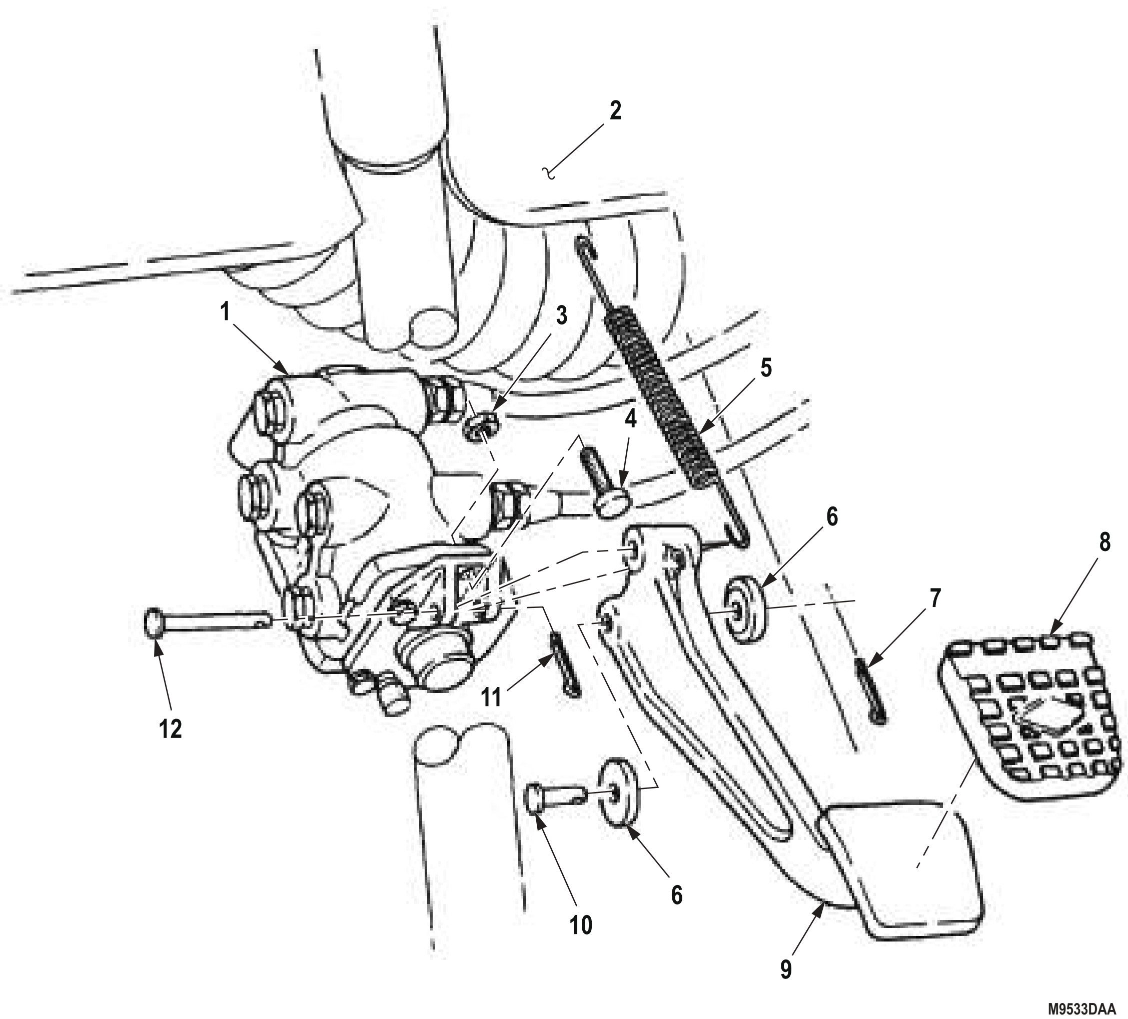


Figure 2. Brake Pedal Installation.

END OF TASK

ADJUSTMENT

Use hand pressure to depress brake pedal (Figure 3, Item 4) only until rollers (Figure 3, Item 3), contact plunger (Figure 3, Item 5), and position pedal stop (Figure 3, Item 2) against brake pedal. Tighten jamnut (Figure 3, Item 1).

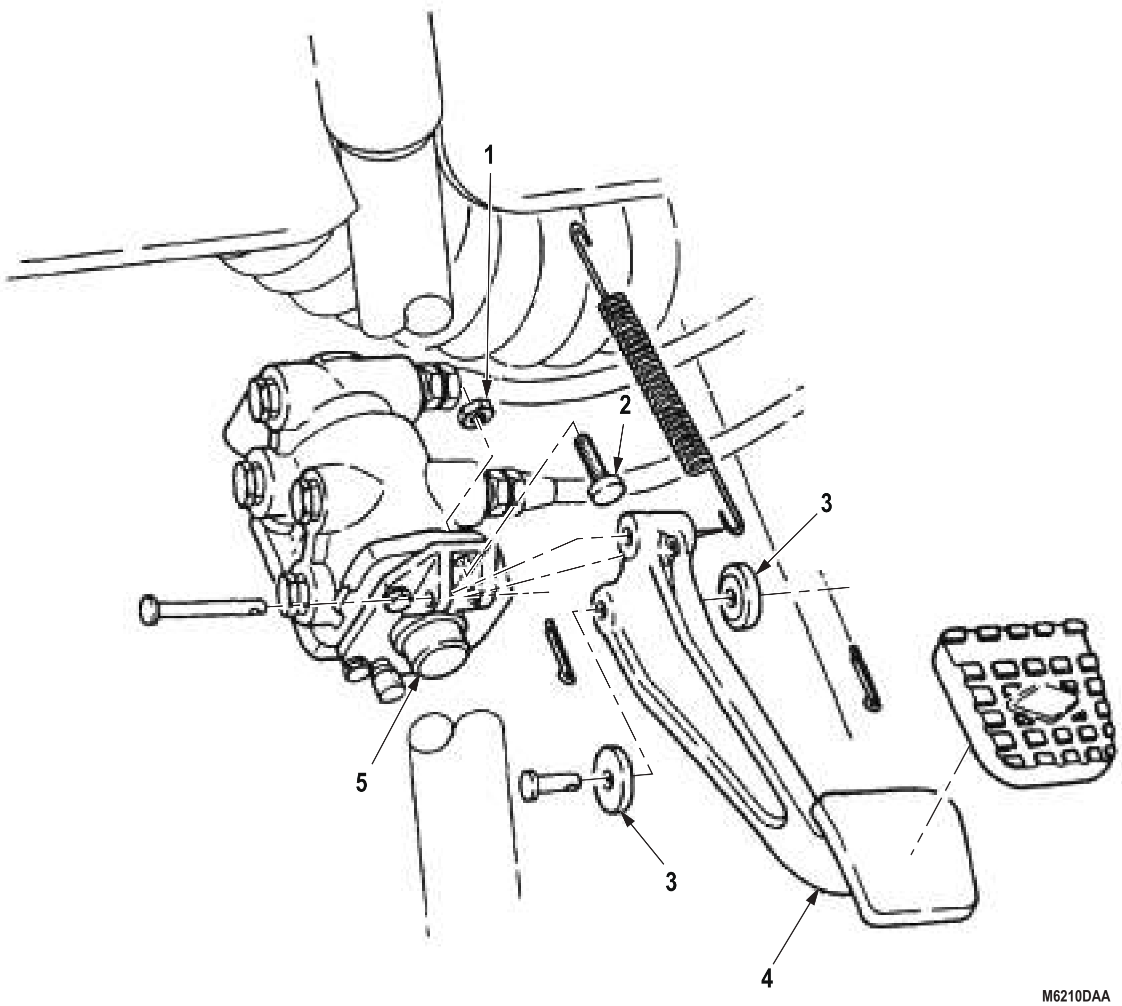


Figure 3. Brake Pedal Adjustment.

END OF TASK

FOLLOW-ON MAINTENANCE

Road test vehicle. (TM 9-2320-272-10)

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
SERVICE BRAKE CHAMBER REPLACEMENT

INITIAL SETUP:

Tools and Special Tools
Tool Kit, General Mechanic's: Automotive
(Volume 5, WP 0826, Table 1, Item 56)

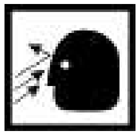
Materials/Parts
Tape, Antiseizing
(Volume 5, WP 0825, Table 1, Item 65)

Equipment Condition
Parking brake set. (TM 9-2320-272-10)

Equipment Condition (cont.)
Air reservoirs drained. (TM 9-2320-272-10)
Wheel brake drum dust covers removed.
(WP 0424)

REMOVAL

WARNING



Do not disconnect air lines or hoses before draining air reservoirs. Small parts under pressure may shoot out with high velocity. Failure to comply may result in injury or death to personnel.

NOTE

Tag all lines for installation.

1. Disconnect service brake control line (Figure 1, Item 2) from brake adapter (Figure 1, Item 3).
2. Remove brake adapter (Figure 1, Item 3) from service brake chamber (Figure 1, Item 4).
3. Disconnect vent line (Figure 1, Item 1) from elbow (Figure 1, Item 5).
4. Remove elbow (Figure 1, Item 5) from service brake chamber (Figure 1, Item 4).

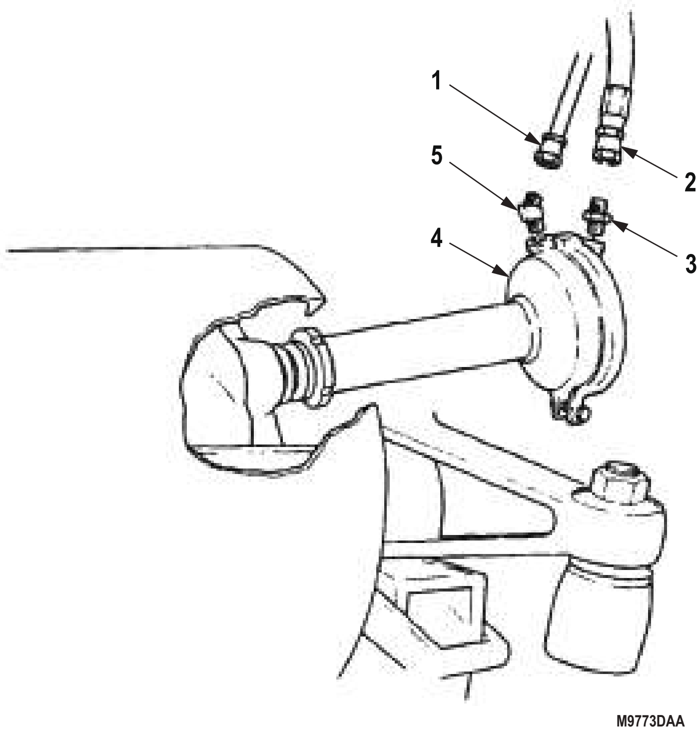


Figure 1. Service Brake Chamber Removal.

NOTE

Perform Step (5) for rear service brake only.

5. Remove two nuts (Figure 2, Item 2), washers (Figure 2, Item 3), U-bolt (Figure 2, Item 5), and clamp (Figure 2, Item 4) from service brake chamber (Figure 2, Item 1).

REMOVAL - Continued

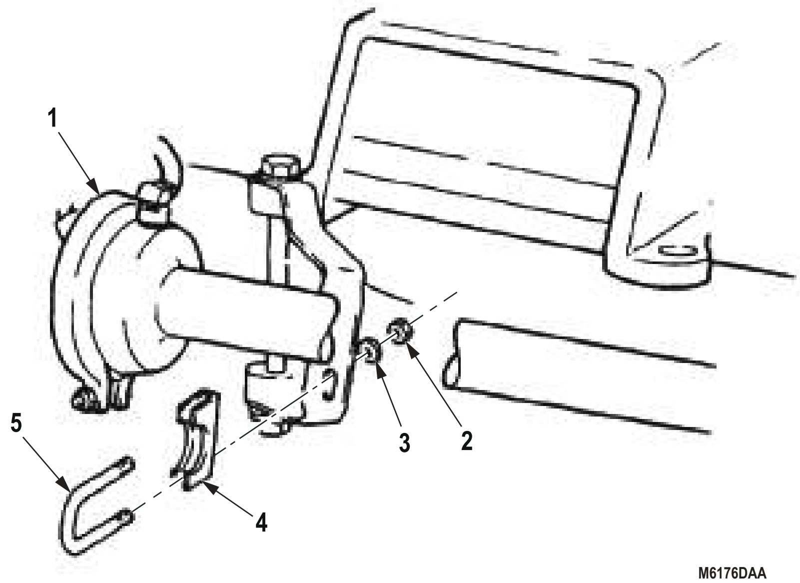


Figure 2. Service Brake Chamber Removal.

6. Loosen collet nut (Figure 3, Item 1) and remove service brake chamber (Figure 3, Item 2) from actuator housing (Figure 3, Item 3). Record position for installation.
7. Remove collet nut (Figure 3, Item 1) from service brake chamber (Figure 3, Item 2).

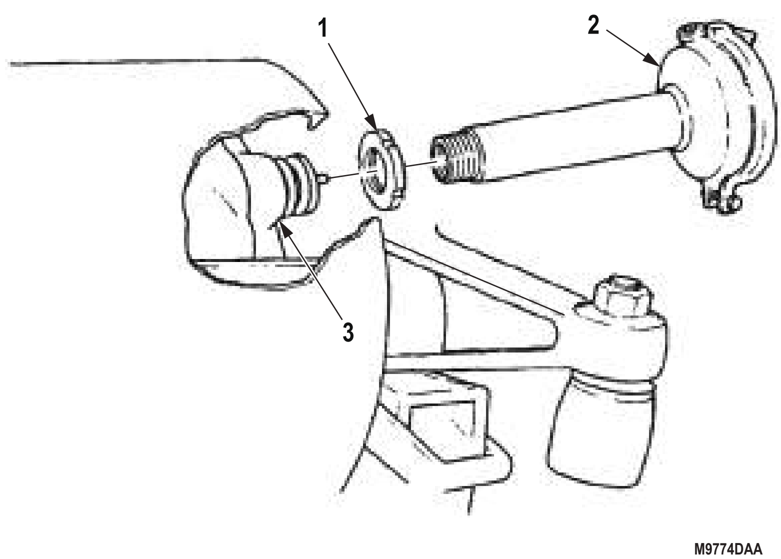


Figure 3. Service Brake Chamber Removal.

END OF TASK

INSTALLATION

NOTE

Wrap all male pipe threads with antiseize tape before installation.

1. Install collet nut (Figure 4, Item 2) on brake chamber (Figure 4, Item 3).
2. Ensuring collet nut (Figure 4, Item 2) is loose, install brake chamber (Figure 4, Item 3) over wedge assembly (Figure 4, Item 1) and into actuator housing (Figure 4, Item 4), with brake chamber positioned for air line connection. Thread collet nut to bottom of brake chamber and tighten 3/16 in. (4.8 mm) or 1-1/2 teeth.

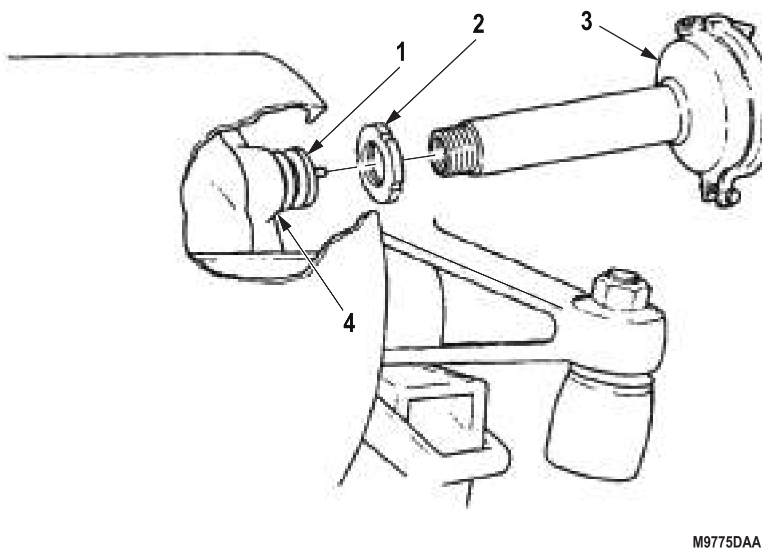


Figure 4. Service Brake Chamber Installation.

INSTALLATION - Continued

NOTE

Perform Step (3) for rear service brake only.

3. Install U-bolt (Figure 5, Item 5) and clamp (Figure 5, Item 4) on brake chamber (Figure 5, Item 1) with two washers (Figure 5, Item 3) and nuts (Figure 5, Item 2).

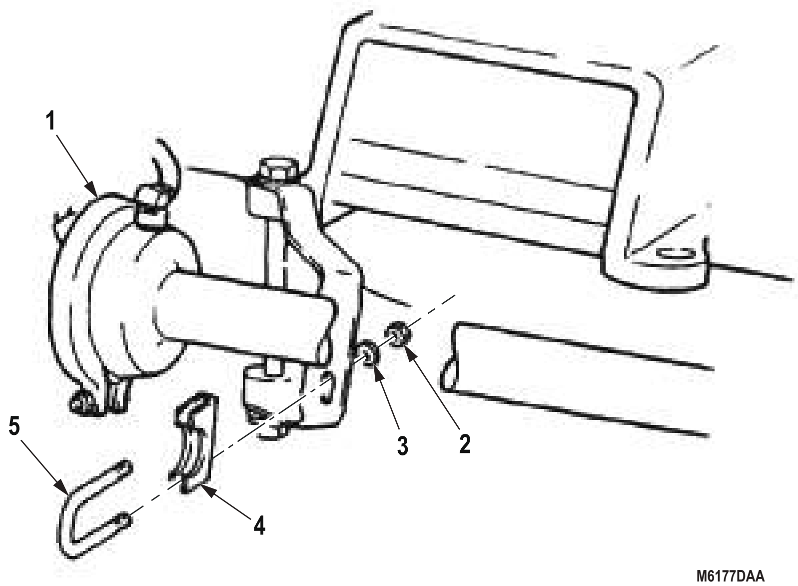


Figure 5. Service Brake Chamber Installation.

INSTALLATION - Continued

4. Install elbow (Figure 6, Item 5) on brake chamber (Figure 6, Item 4).
5. Connect vent line (Figure 6, Item 1) to elbow (Figure 6, Item 5).
6. Install brake adapter (Figure 6, Item 3) on brake chamber (Figure 6, Item 4).
7. Connect service brake control line (Figure 6, Item 2) to adapter (Figure 6, Item 3).

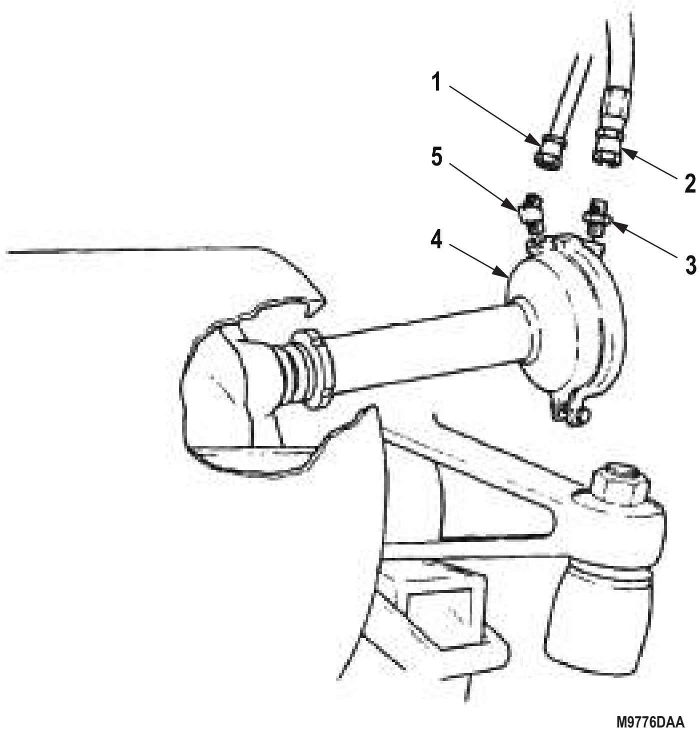


Figure 6. Service Brake Chamber Installation.

END OF TASK

FOLLOW-ON MAINTENANCE

Install wheel brake drum dust covers. (WP 0424)

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
COMBINATION SPRING (EMERGENCY) AND SERVICE BRAKE CHAMBER REPLACEMENT

INITIAL SETUP:

Tools and Special Tools

Tool Kit, General Mechanic's: Automotive
(Volume 5, WP 0826, Table 1, Item 56)
Wrench, Torque, Click, Ratcheting, 3/8" Drive, 75 Ft-Lb
(Volume 5, WP 0826, Table 1, Item 62)

Materials/Parts

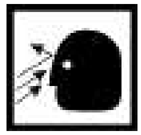
Tape, Antiseizing
(Volume 5, WP 0825, Table 1, Item 65)

Equipment Condition

Air reservoirs drained. (TM 9-2320-272-10)
Spring (emergency) brake caged.
(TM 9-2320-272-10)

BRAKE CHAMBER REMOVAL

WARNING



Do not disconnect air lines or hoses before draining air reservoirs. Small parts under pressure may shoot out with high velocity. Failure to comply may result in injury or death to personnel.

NOTE

Tag lines for installation.

1. Disconnect two vent lines (Figure 1, Item 3) from tee (Figure 1, Item 4).
2. Disconnect supply line (Figure 1, Item 13) from elbow (Figure 1, Item 2).
3. Disconnect control line (Figure 1, Item 1) from elbow (Figure 1, Item 12).
4. Loosen collet nut (Figure 1, Item 9) and remove two nuts (Figure 1, Item 5), washers (Figure 1, Item 6), U-bolt (Figure 1, Item 10), and bracket (Figure 1, Item 7) from combination spring and service brake chamber (Figure 1, Item 11).

CAUTION

Ensure wedge assembly does not fall out of plunger housing. Failure to comply may result in damage to the equipment.

5. Remove combination spring and service brake chamber (Figure 1, Item 11) from plunger housing (Figure 1, Item 8) and pull straight away from plunger.

BRAKE CHAMBER REMOVAL - Continued

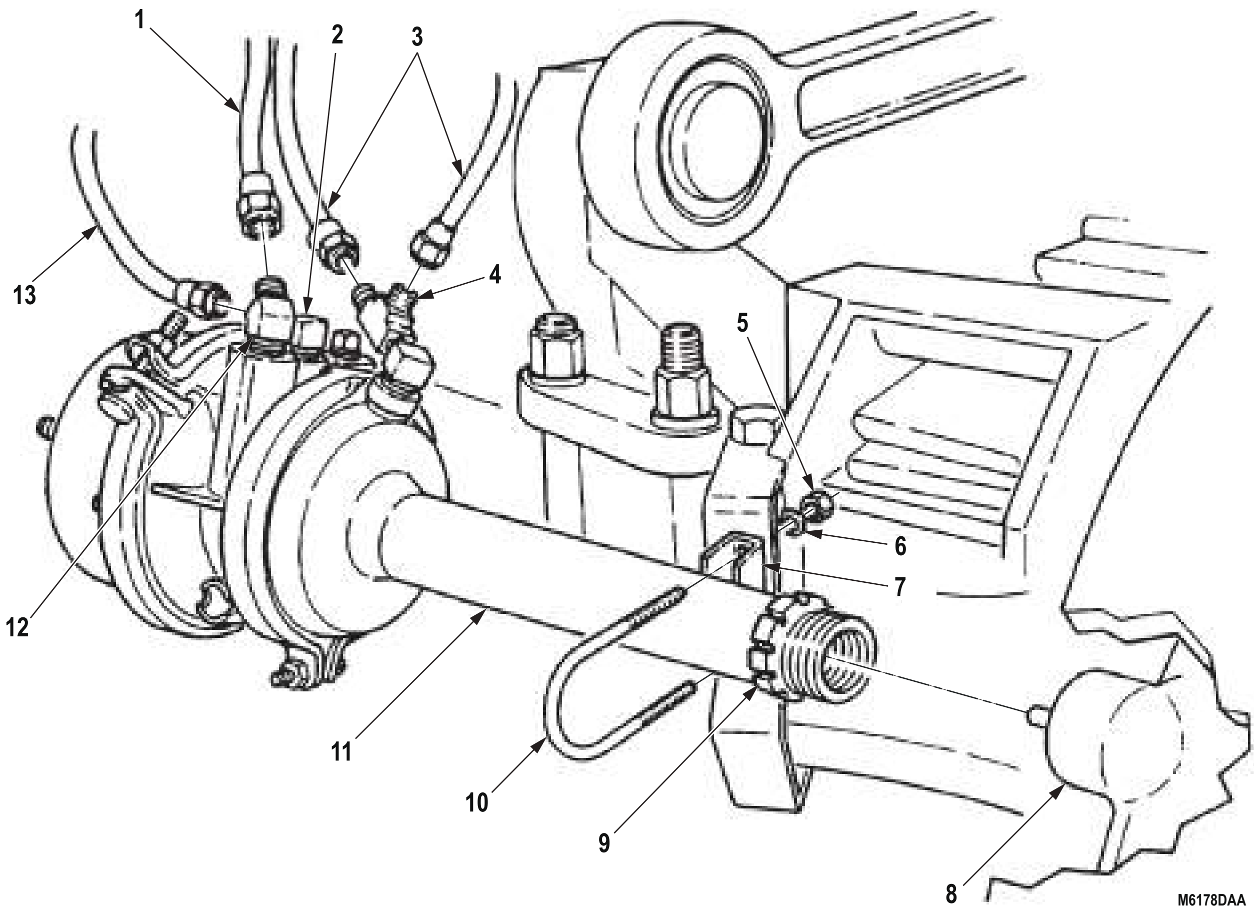


Figure 1. Service Brake Chamber Removal.

END OF TASK

BRAKE CHAMBER DISASSEMBLY

1. Remove nut (Figure 2, Item 6), screw (Figure 2, Item 5), clamp (Figure 2, Item 2), and housing assembly (Figure 2, Item 1) from non-pressure housing (Figure 2, Item 4).
2. Inspect brake chamber diaphragm (Figure 2, Item 3). Replace if cracked, torn, or split.

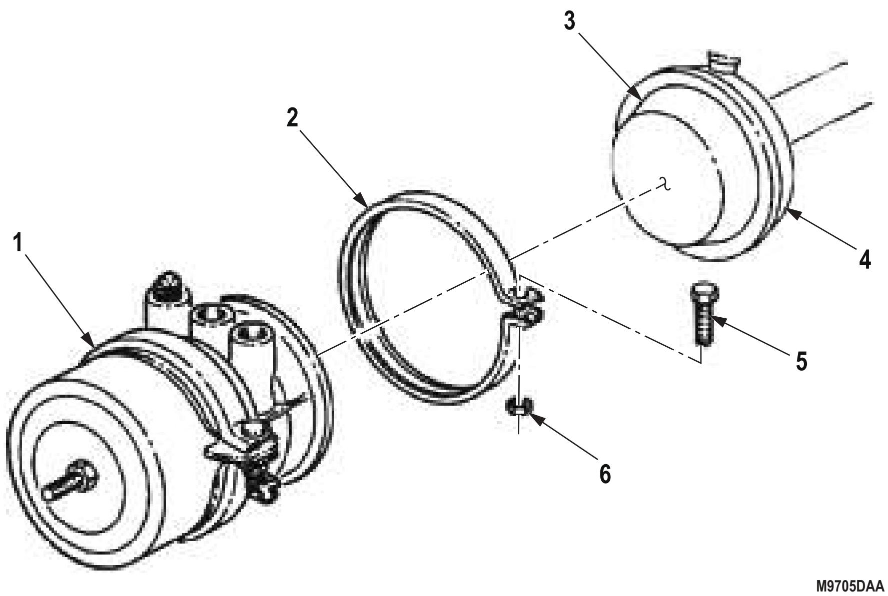


Figure 2. Brake Chamber Disassembly.

END OF TASK

BRAKE CHAMBER ASSEMBLY

1. Install brake chamber diaphragm (Figure 3, Item 3) to non-pressure housing (Figure 3, Item 4).
2. Install housing assembly (Figure 3, Item 1) on non-pressure housing (Figure 3, Item 4) with clamp (Figure 3, Item 2), screw (Figure 3, Item 5), and nut (Figure 3, Item 6). Tighten nut to 18 to 25 lb-ft (24 to 34 N·m).

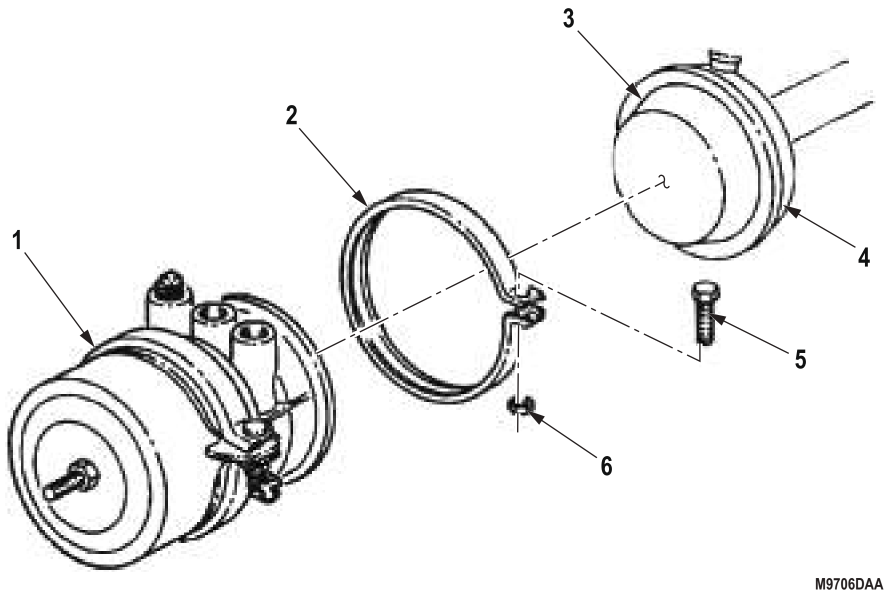


Figure 3. Brake Chamber Assembly.

END OF TASK

BRAKE CHAMBER INSTALLATION

NOTE

Wrap all male pipe threads with antiseize tape before installation.

1. Ensure collet nut (Figure 4, Item 9) is loose, install combination spring and brake service chamber (Figure 4, Item 11) in plunger housing (Figure 4, Item 8) until secure, with service brake chamber positioned for air line connections. Thread collet nut to bottom of service brake chamber and tighten 3/16 in. (4.8 mm) or 1-1/2 teeth.
2. Connect control line (Figure 4, Item 1) to elbow (Figure 4, Item 12).
3. Connect supply line (Figure 4, Item 13) to elbow (Figure 4, Item 2).
4. Connect two vent lines (Figure 4, Item 3) to tee (Figure 4, Item 4).
5. Install U-bolt (Figure 4, Item 10) and bracket (Figure 4, Item 7) on service brake chamber (Figure 4, Item 11) with two washers (Figure 4, Item 6) and nuts (Figure 4, Item 5).

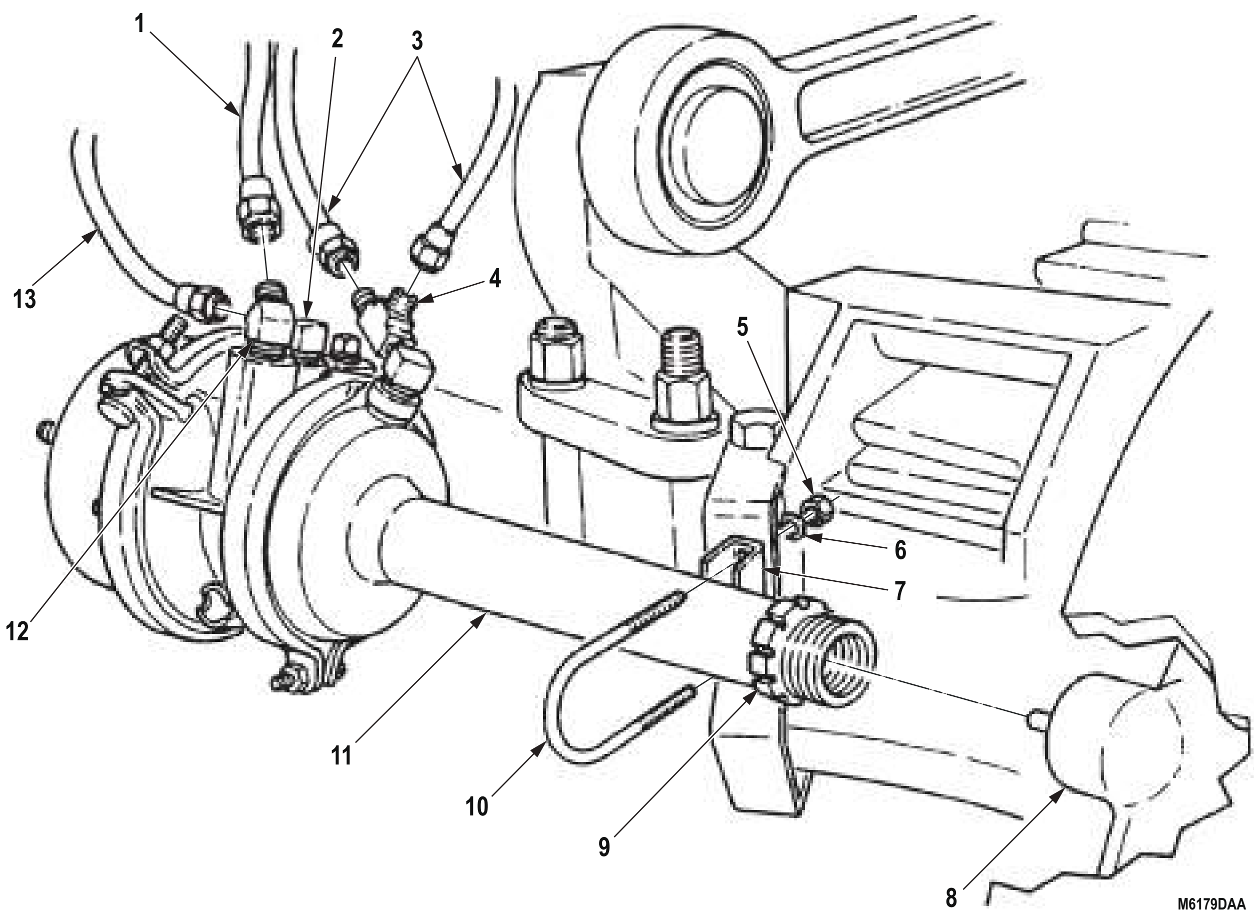


Figure 4. Service Brake Chamber Installation.

END OF TASK

FOLLOW-ON MAINTENANCE

1. Uncage spring brake chamber. (TM 9-2320-272-10)
2. Start engine and allow air pressure to build up to normal operating range. Check for air leaks at combination spring brake chamber. Road test vehicle. (TM 9-2320-272-10)

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
AIR GOVERNOR REPLACEMENT

INITIAL SETUP:

Tools and Special Tools
Tool Kit, General Mechanic's: Automotive
(Volume 5, WP 0826, Table 1, Item 56)

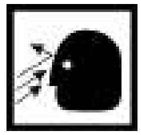
Materials/Parts
Tape, Antiseizing
(Volume 5, WP 0825, Table 1, Item 65)

Equipment Condition
Parking brake set. (TM 9-2320-272-10)

Equipment Condition (cont.)
Air reservoirs drained. (TM 9-2320-272-10)
Right splash shield removed. (TM 9-2320-272-10)

REMOVAL

WARNING



Do not disconnect air lines or hoses before draining air reservoirs. Small parts under pressure may shoot out with high velocity. Failure to comply may result in injury or death to personnel.

1. Disconnect governor supply air line (Figure 1, Item 2) and governor-to-horn supply line (Figure 1, Item 8) from tee (Figure 1, Item 7).
2. Disconnect governor-to-compressor unloader line (Figure 1, Item 4) from adapter (Figure 1, Item 3).
3. Remove two screws (Figure 1, Item 6), washers (Figure 1, Item 5), and air governor (Figure 1, Item 1) from cab cowl (Figure 1, Item 9).

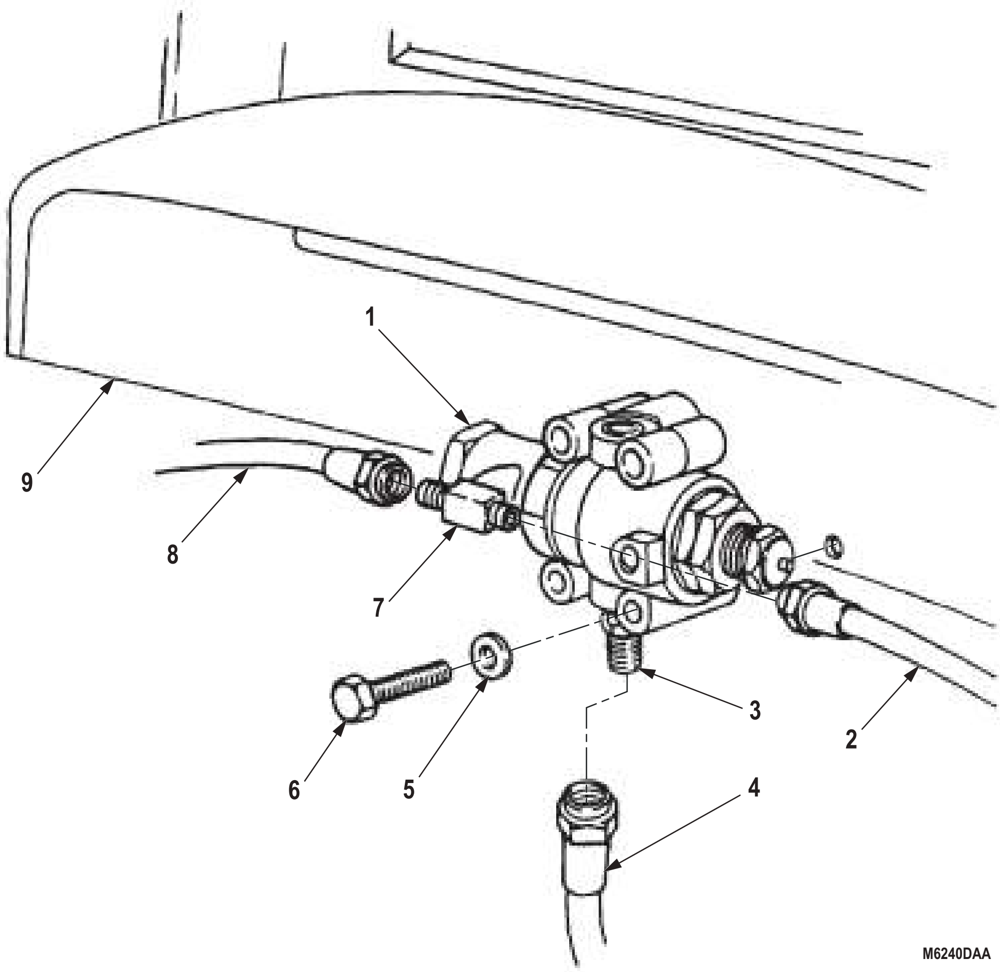


Figure 1. Air Governor Removal.

END OF TASK

INSTALLATION

NOTE

- If installing new governor, use fitting from old governor.
- Wrap all male pipe threads with antiseize tape before installation.

1. Install air governor (Figure 2, Item 1) on cab cowl (Figure 2, Item 9) with two washers (Figure 2, Item 5) and screws (Figure 2, Item 6).
2. Connect governor-to-compressor unloader line (Figure 2, Item 4) to adapter (Figure 2, Item 3).
3. Connect governor supply air line (Figure 2, Item 2) and governor-to-horn supply line (Figure 2, Item 8) to tee (Figure 2, Item 7).

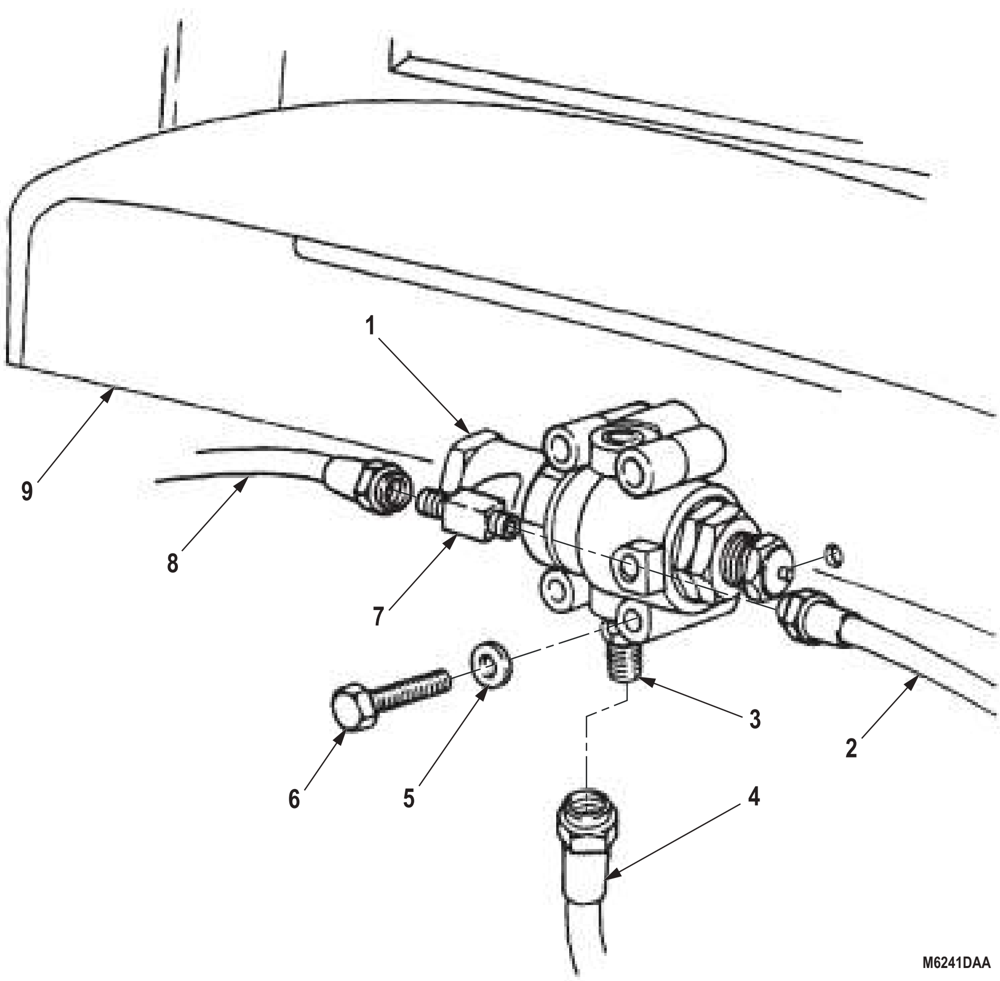


Figure 2. Air Governor Installation.

END OF TASK

TESTING

NOTE

Whenever governor is tested, instrument panel primary air gauge is used.

1. Start engine (TM 9-2320-272-10) and allow air pressure to build to normal operating range.

NOTE

Engine speed must be adjusted to 1,275 rpm before performing Step (2).

2. Check air pressure gauge (Figure 3, Item 1) for air compressor cut-out pressure.

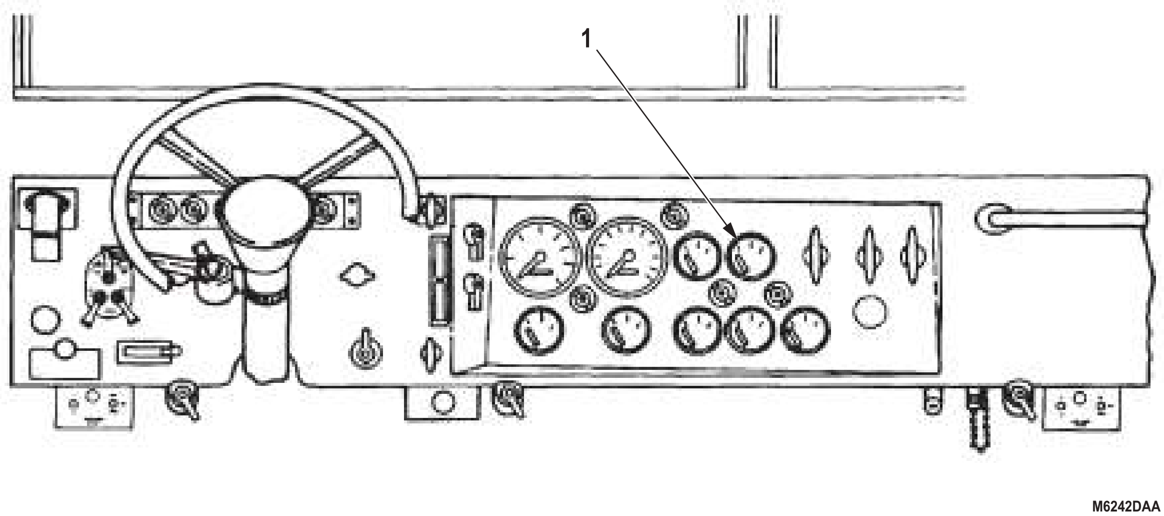


Figure 3. Air Governor Testing.

TESTING - Continued

3. Air governor (Figure 4, Item 1) should stop pressure buildup at 120 psi (827 kPa). If not, perform adjustment.

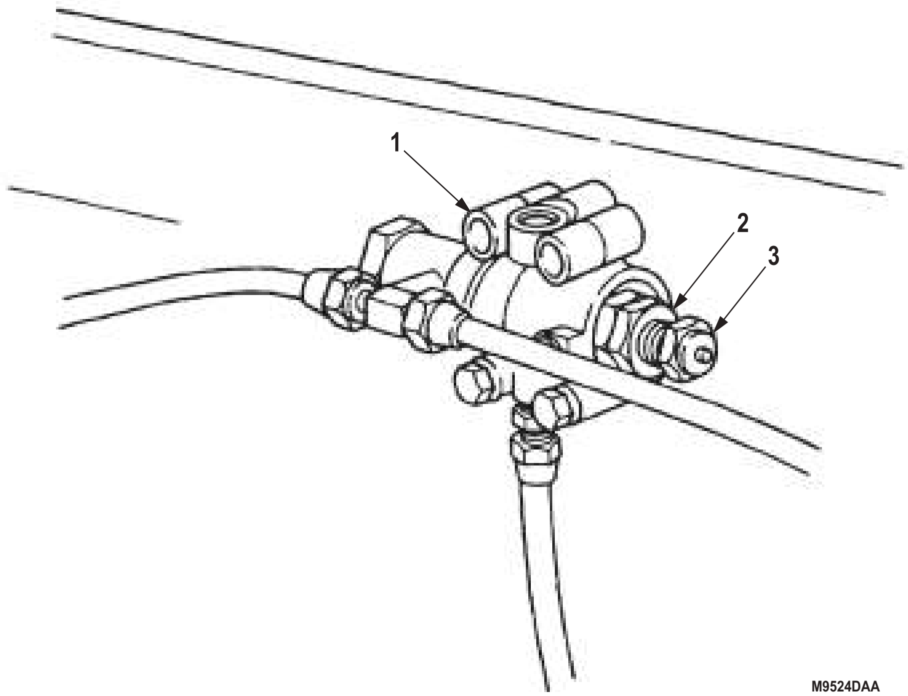


Figure 4. Air Governor Testing.

END OF TASK

ADJUSTMENT

NOTE

Whenever governor is adjusted, instrument panel primary air gauge is used.

1. Loosen locknut (Figure 5, Item 2) and turn adapter (Figure 5, Item 3) clockwise to raise pressure; counterclockwise to lower pressure.
2. Depress brake pedal until pressure drops and air compression starts to build up pressure. Air governor (Figure 5, Item 1) should stop pressure buildup at 120 psi (827 kPa). If not, repeat Step (1).
3. Tighten locknut (Figure 5, Item 2) when correct air pressure is reached.

NOTE

After compression cut-out pressure is adjusted, perform Step (4).

4. Check air pressure gauge (Figure 3, Item 1) for air compressor cut-in pressure by depressing brake pedal repeatedly. Air governor (Figure 5, Item 1) should start pressure buildup between 100 and 110 psi (690 to 758 kPa). If not, replace air governor (Figure 5, Item 1).

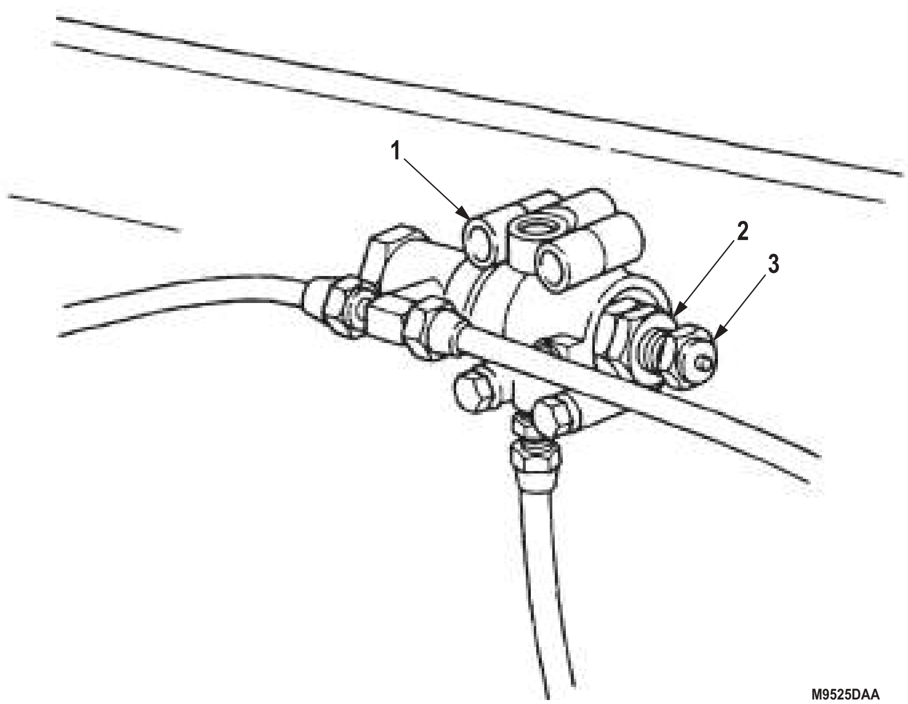


Figure 5. Air Governor Adjustment.

END OF TASK

FOLLOW-ON MAINTENANCE

1. Install right splash shield. (TM 9-2320-272-10)
2. Road test vehicle. (TM 9-2320-272-10)

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
AIR RESERVOIR ONE-WAY CHECK VALVE REPLACEMENT

INITIAL SETUP:

Tools and Special Tools
Tool Kit, General Mechanic's: Automotive
(Volume 5, WP 0826, Table 1, Item 56)

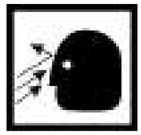
Materials/Parts
Tape, Antiseizing
(Volume 5, WP 0825, Table 1, Item 65)

Equipment Condition
Parking brake set. (TM 9-2320-272-10)

Equipment Condition (cont.)
Air reservoirs drained. (TM 9-2320-272-10)

REMOVAL

WARNING



Do not disconnect air lines or hoses before draining air reservoirs. Small parts under pressure may shoot out with high velocity. Failure to comply may result in injury or death to personnel.

NOTE

There is a one-way check valve mounted at inlet side of each reservoir. All three check valves are replaced basically the same. This procedure covers the spring brake one-way check.

1. Disconnect air line (Figure 1, Item 1) from check valve adapter (Figure 1, Item 2).
2. Remove check valve adapter (Figure 1, Item 2) from check valve (Figure 1, Item 3).
3. Remove check valve (Figure 1, Item 3) from tee (Figure 1, Item 4).

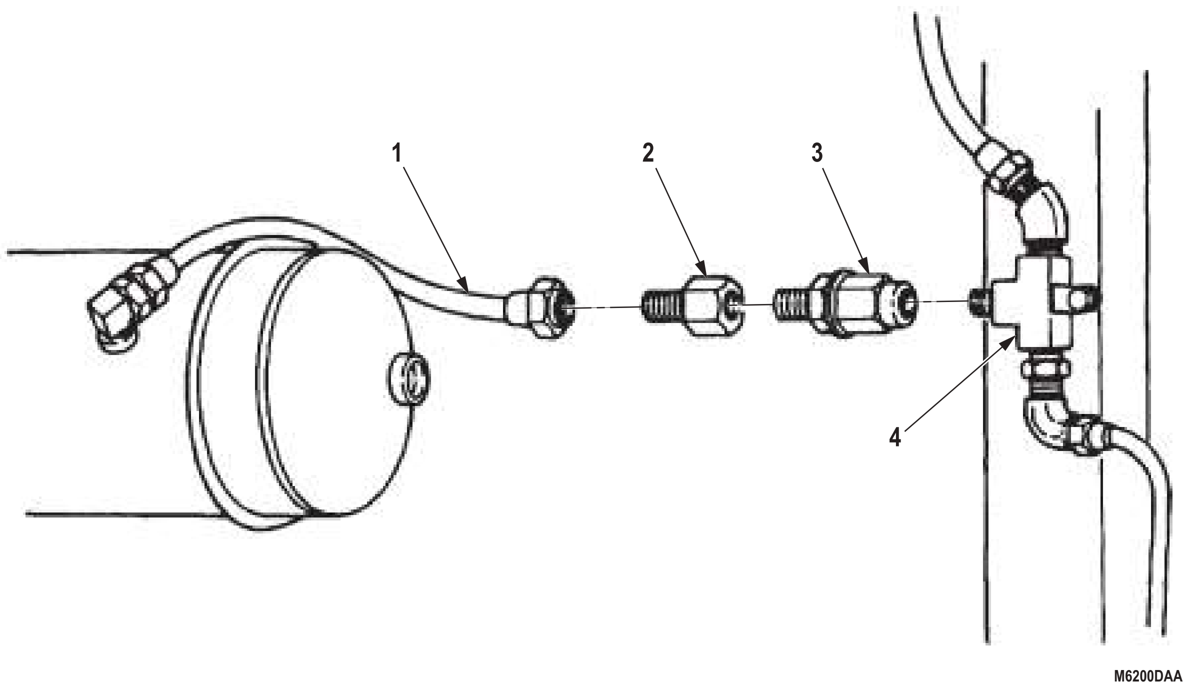


Figure 1. Air Reservoir One-Way Check Valve Removal.

END OF TASK

INSTALLATION

NOTE

Wrap all male pipe threads with antiseize tape before installation.

1. Install check valve (Figure 2, Item 3) on tee (Figure 2, Item 4).
2. Install check valve adapter (Figure 2, Item 2) on check valve (Figure 2, Item 3).
3. Connect air line (Figure 2, Item 1) to check valve adapter (Figure 2, Item 2).

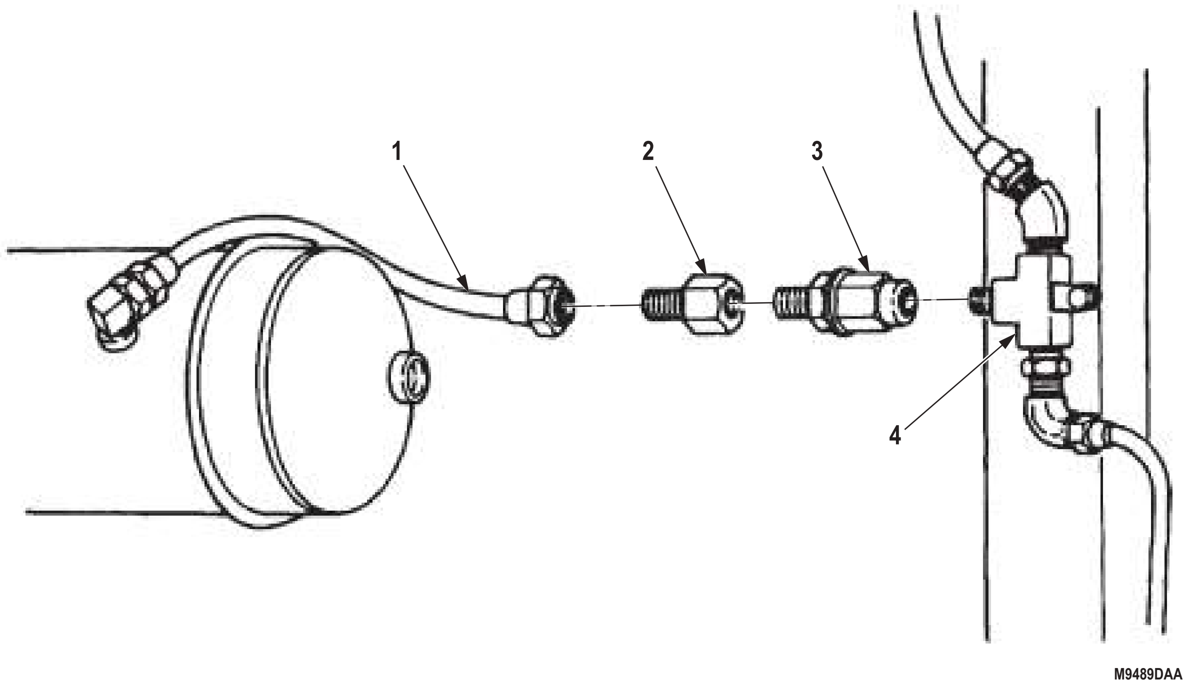


Figure 2. Air Reservoir One-Way Check Valve Installation.

END OF TASK

FOLLOW-ON MAINTENANCE

Start engine and allow air pressure to build up to normal operating range. Check for air leaks at check valve. Road test vehicle. (TM 9-2320-272-10)

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
BRAKE CHAMBER AIR MANIFOLD TEE REPLACEMENT

INITIAL SETUP:

Tools and Special Tools
Tool Kit, General Mechanic's: Automotive
(Volume 5, WP 0826, Table 1, Item 56)

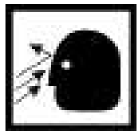
Materials/Parts
Tape, Antiseizing
(Volume 5, WP 0825, Table 1, Item 65)
Lockwasher
(Volume 5, WP 0827, Table 1, Item 186)
Qty: 3

Equipment Condition
Parking brake set. (TM 9-2320-272-10)

Equipment Condition (cont.)
Air reservoirs drained. (TM 9-2320-272-10)

REMOVAL

WARNING



Do not disconnect air lines or hoses before draining air reservoirs. Small parts under pressure may shoot out with high velocity. Failure to comply may result in injury or death to personnel.

NOTE

- All air manifold tees are replaced basically the same. This procedure covers the rear primary relay tee. Notice that only the two primary relay tees use a 45-degree elbow in addition to a 90-degree elbow.
- Tag air lines for installation.
- Scribe fitting directions for installation.

1. Disconnect right service brake chamber air line (Figure 1, Item 10) from elbow (Figure 1, Item 9).
2. Disconnect relay valve line (Figure 1, Item 1) from adapter (Figure 1, Item 2).
3. Disconnect left service brake chamber air line (Figure 1, Item 4) from adapter (Figure 1, Item 3).
4. Remove screw (Figure 1, Item 6), lockwasher (Figure 1, Item 7), and air manifold tee (Figure 1, Item 8) from mounting bracket (Figure 1, Item 5). Discard lockwasher.

REMOVAL - Continued

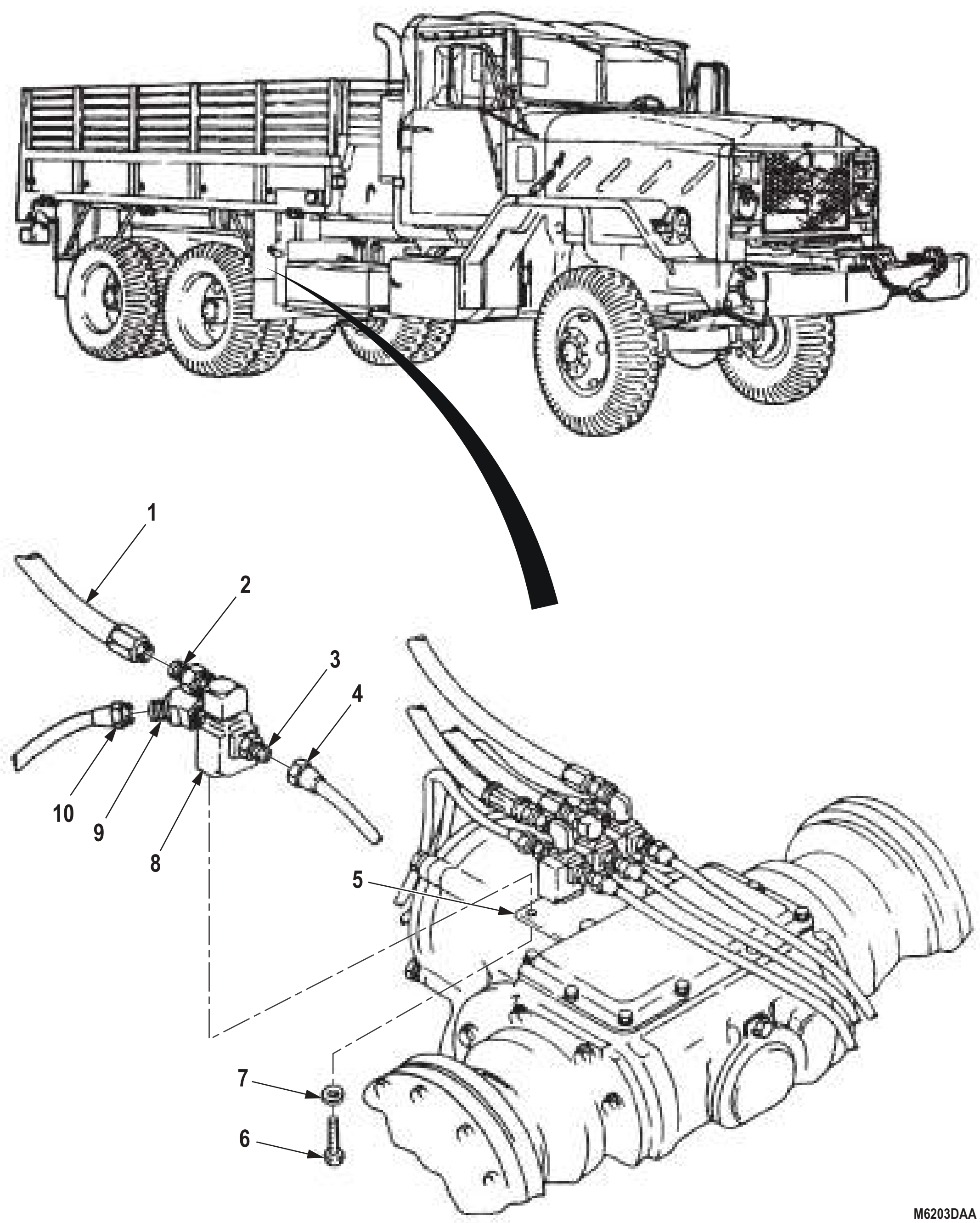


Figure 1. Brake Chamber Air Manifold Tee Replacement Removal.

END OF TASK

INSTALLATION

NOTE

- If new tee is being installed, use fittings from old tee.
- Apply sealant to all male threads before installation.

1. Install air manifold tee (Figure 2, Item 8) on mounting bracket (Figure 2, Item 5) with lockwasher (Figure 2, Item 7) and screw (Figure 2, Item 6).
2. Connect left service brake chamber air line (Figure 2, Item 4) to adapter (Figure 2, Item 3).
3. Connect relay valve line (Figure 2, Item 1) to adapter (Figure 2, Item 2).
4. Connect right service brake chamber air line (Figure 2, Item 10) to elbow (Figure 2, Item 9).

INSTALLATION - Continued

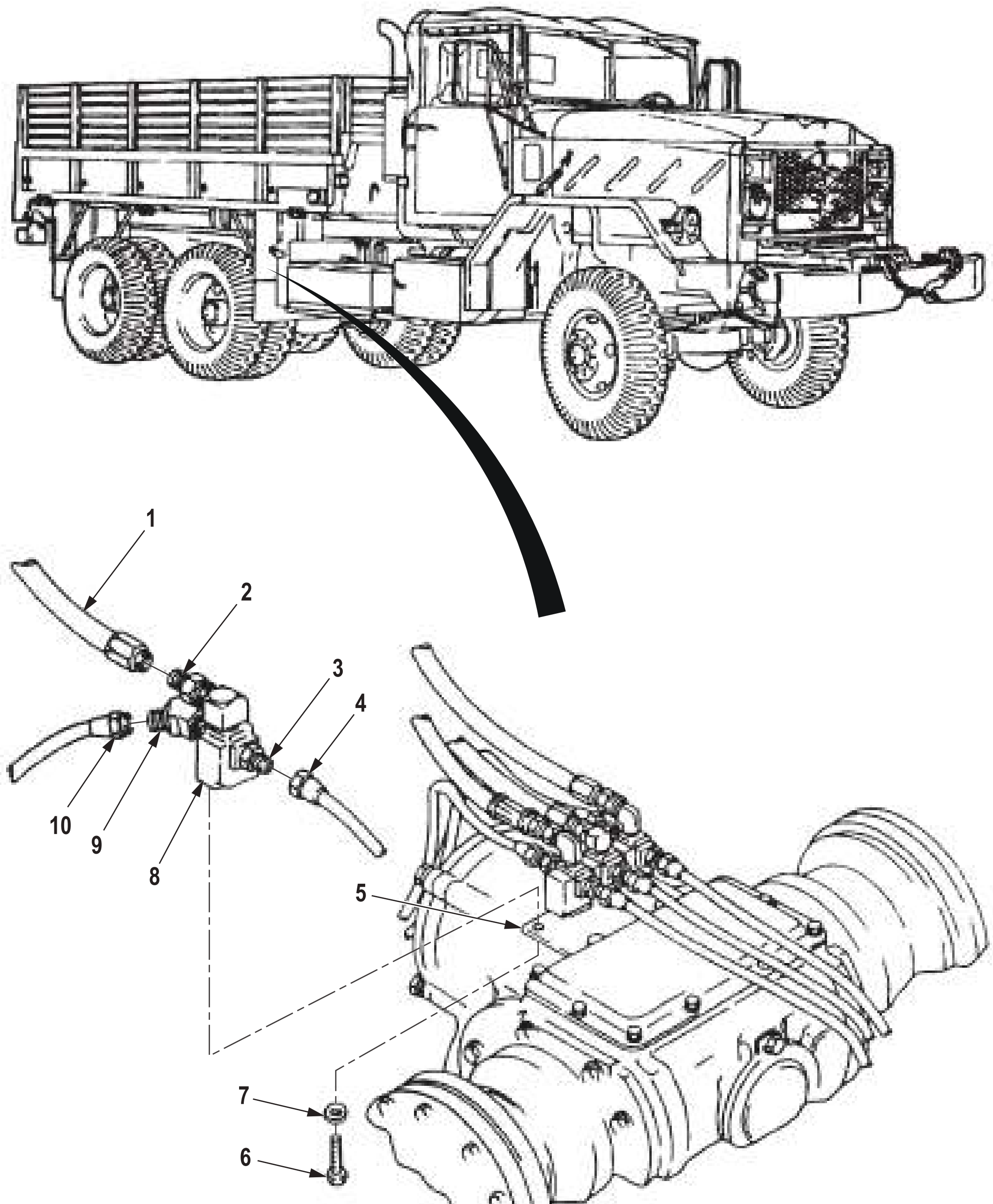


Figure 2. Brake Chamber Air Manifold Tee Replacement Installation.

END OF TASK

FOLLOW-ON MAINTENANCE

Start engine and allow air pressure to build to normal operating range. Check for air leaks at tee. Road test vehicle. (TM 9-2320-272-10)

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
FRONT LIMITING VALVE REPLACEMENT

INITIAL SETUP:

Tools and Special Tools
Tool Kit, General Mechanic's: Automotive
(Volume 5, WP 0826, Table 1, Item 56)

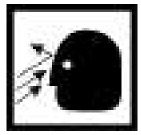
Materials/Parts
Tape, Antiseizing
(Volume 5, WP 0825, Table 1, Item 65)
Locknut (Volume 5, WP 0827, Table 1, Item 283)
Qty: 2

Equipment Condition
Parking brake set. (TM 9-2320-272-10)

Equipment Condition (cont.)
Air reservoirs drained. (TM 9-2320-272-10)

REMOVAL

WARNING



Do not disconnect air lines or hoses before draining air reservoirs. Small parts under pressure may shoot out with high velocity. Failure to comply may result in injury or death to personnel.

NOTE

- Tag air lines for installation.
- Scribe fitting directions for installation.

1. Disconnect two front service brake control lines (Figure 1, Item 4) from tee (Figure 1, Item 5).
2. Disconnect double check valve No. 1 control line (Figure 1, Item 1) from adapter (Figure 1, Item 2).
3. Disconnect vent line (Figure 1, Item 11) from elbow (Figure 1, Item 6).
4. Remove two locknuts (Figure 1, Item 9), screws (Figure 1, Item 7), and limiting valve (Figure 1, Item 10) from mounting bracket (Figure 1, Item 8). Discard locknuts.
5. Remove tee (Figure 1, Item 5), elbow (Figure 1, Item 6), and adapters (Figure 1, Items 2 and 3) from limiting valve (Figure 1, Item 10).

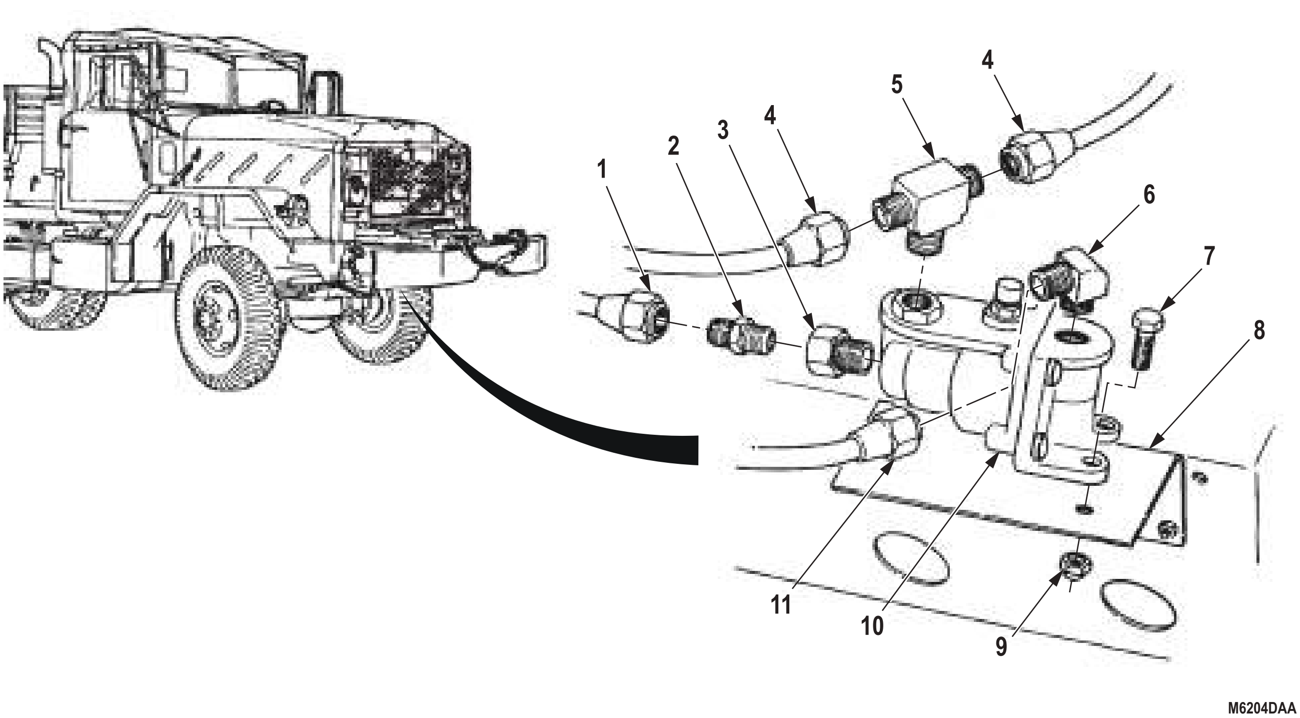


Figure 1. Front Limiting Valve Replacement Removal.

END OF TASK

INSTALLATION

NOTE

Ensure that after applying pipe sealant to all male fittings that the first two starter threads are clear.

1. Install adapters (Figure 2, Items 2 and 3), tee (Figure 2, Item 5), and elbow (Figure 2, Item 6) on limiting valve (Figure 2, Item 10).
2. Install limiting valve (Figure 2, Item 10) on mounting bracket (Figure 2, Item 8) with two screws (Figure 2, Item 7) and locknuts (Figure 2, Item 9).
3. Connect vent line (Figure 2, Item 11) to elbow (Figure 2, Item 6).
4. Connect double check valve No. 1 control line (Figure 2, Item 1) to adapter (Figure 2, Item 2).
5. Connect two front service brake control lines (Figure 2, Item 4) to tee (Figure 2, Item 5).

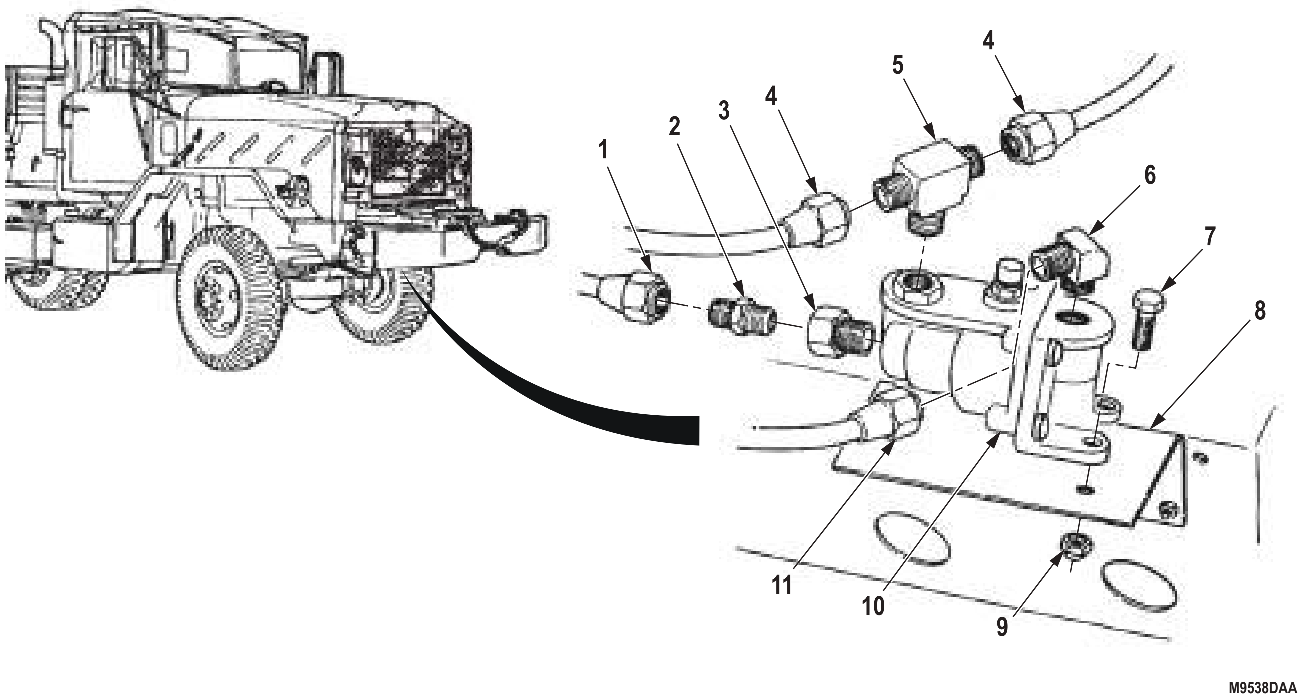


Figure 2. Front Limiting Valve Replacement Installation.

END OF TASK

FOLLOW-ON MAINTENANCE

Start engine and allow air pressure to build up to normal operating range. Check for air leaks at front limiting valve. (TM 9-2320-272-10)

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
PRIMARY AIR RESERVOIR (SUPPLY TANK) REPLACEMENT

INITIAL SETUP:

Tools and Special Tools
Tool Kit, General Mechanic's: Automotive
(Volume 5, WP 0826, Table 1, Item 56)

Materials/Parts
Tape, Antiseizing
(Volume 5, WP 0825, Table 1, Item 65)
Locknut (Volume 5, WP 0827, Table 1, Item 285)
Qty: 4

Personnel Required
(2)

Equipment Condition
Parking brake set. (TM 9-2320-272-10)
Air reservoirs drained. (TM 9-2320-272-10)
Toolbox and step removed. (Volume 4, WP 0586)
Primary low air pressure switch removed.
(Volume 2, WP 0342)

REMOVAL

WARNING

- Do not disconnect air lines before draining air reservoirs. Small parts under pressure may shoot out with high velocity. Failure to comply may result in injury or death to personnel.
- Do not touch hot exhaust system components with bare hands. Failure to comply may result in injury or death to personnel.

NOTE

- Primary reservoir is located below the cab on right side frame rail above secondary reservoir.
- Tag air lines for installation.

1. Disconnect wet reservoir supply line (Figure 1, Item 6) from elbow (Figure 1, Item 7).
2. Disconnect drain line (Figure 1, Item 8) from elbow (Figure 1, Item 9).
3. Disconnect primary relay valve suply line (Figure 1, Item 1) from elbow (Figure 1, Item 10).
4. Disconnect supply line (Figure 1, Item 2) from adapter (Figure 1, Item 4).
5. Disconnect treadle valve supply line (Figure 1, Item 3) from adapter (Figure 1, Item 4).

NOTE

Assistant will help with Steps (6) and (7).

6. Remove two locknuts (Figure 1, Item 11) and screws (Figure 1, Item 13) from clamps (Figure 1, Item 12). Discard locknuts.
7. Remove two locknuts (Figure 1, Item 11), screws (Figure 1, Item 13), clamps (Figure 1, Item 12), and reservoir (Figure 1, Item 5) from clamps (Figure 1, Item 14). Discard locknuts.

REMOVAL - Continued

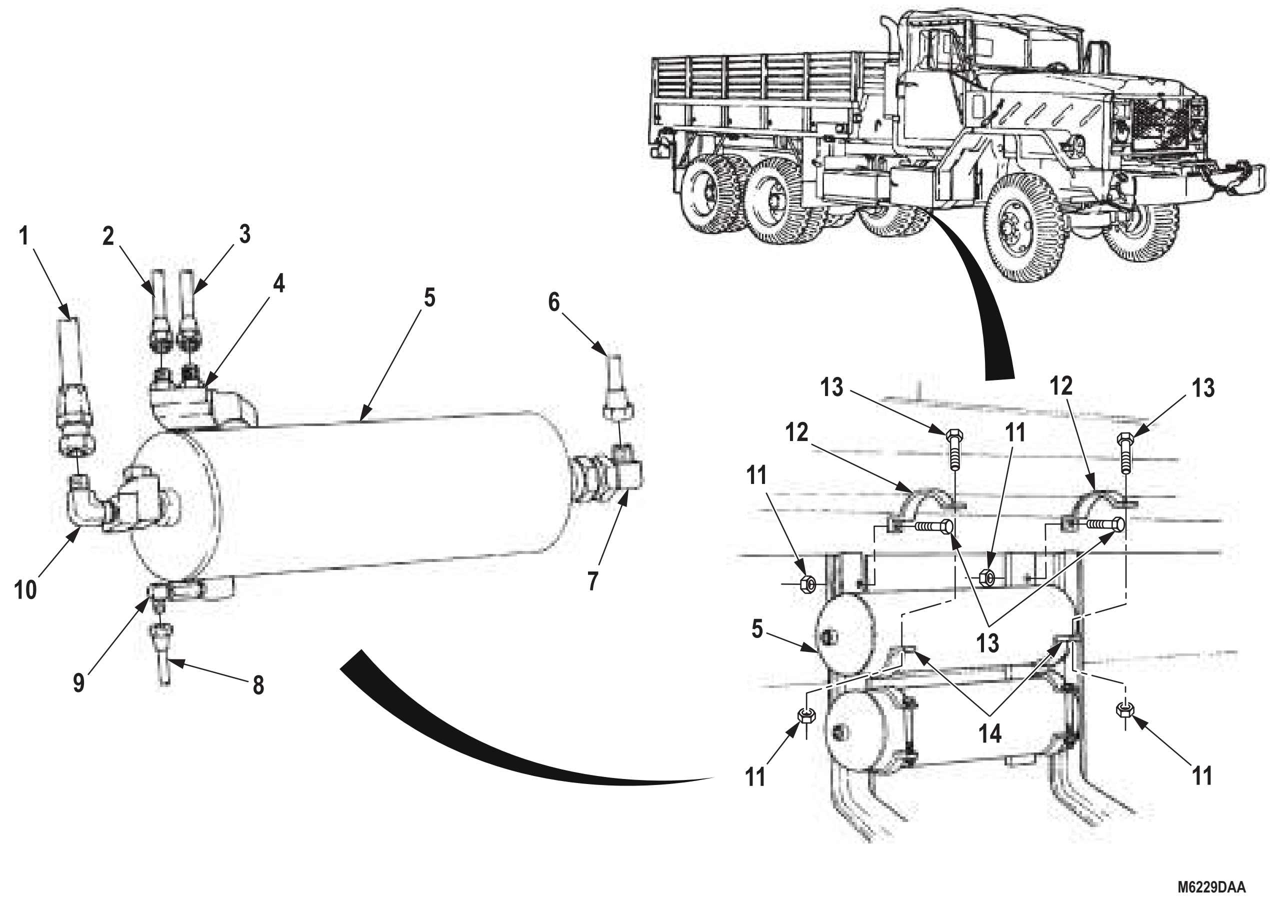


Figure 1. Air Reservoir Removal.

END OF TASK

INSTALLATION

NOTE

- If installing new reservoir, use old reservoir fittings.
- Wrap all male pipe threads with antiseize tape before installation.

1. Install reservoir (Figure 2, Item 5) on two clamps (Figure 2, Item 14) with clamps (Figure 2, Item 12), screws (Figure 2, Item 11), and locknuts (Figure 2, Item 13).
2. Install two screws (Figure 2, Item 11) and locknuts (Figure 2, Item 13) on clamps (Figure 2, Item 12).
3. Connect treadle valve supply line (Figure 2, Item 3) to adapter (Figure 2, Item 4).
4. Connect supply line (Figure 2, Item 2) to adapter (Figure 2, Item 4).
5. Connect primary relay valve supply line (Figure 2, Item 1) to elbow (Figure 2, Item 10).
6. Connect drain line (Figure 2, Item 8) to elbow (Figure 2, Item 9).
7. Connect wet reservoir supply line (Figure 2, Item 6) to elbow (Figure 2, Item 7).

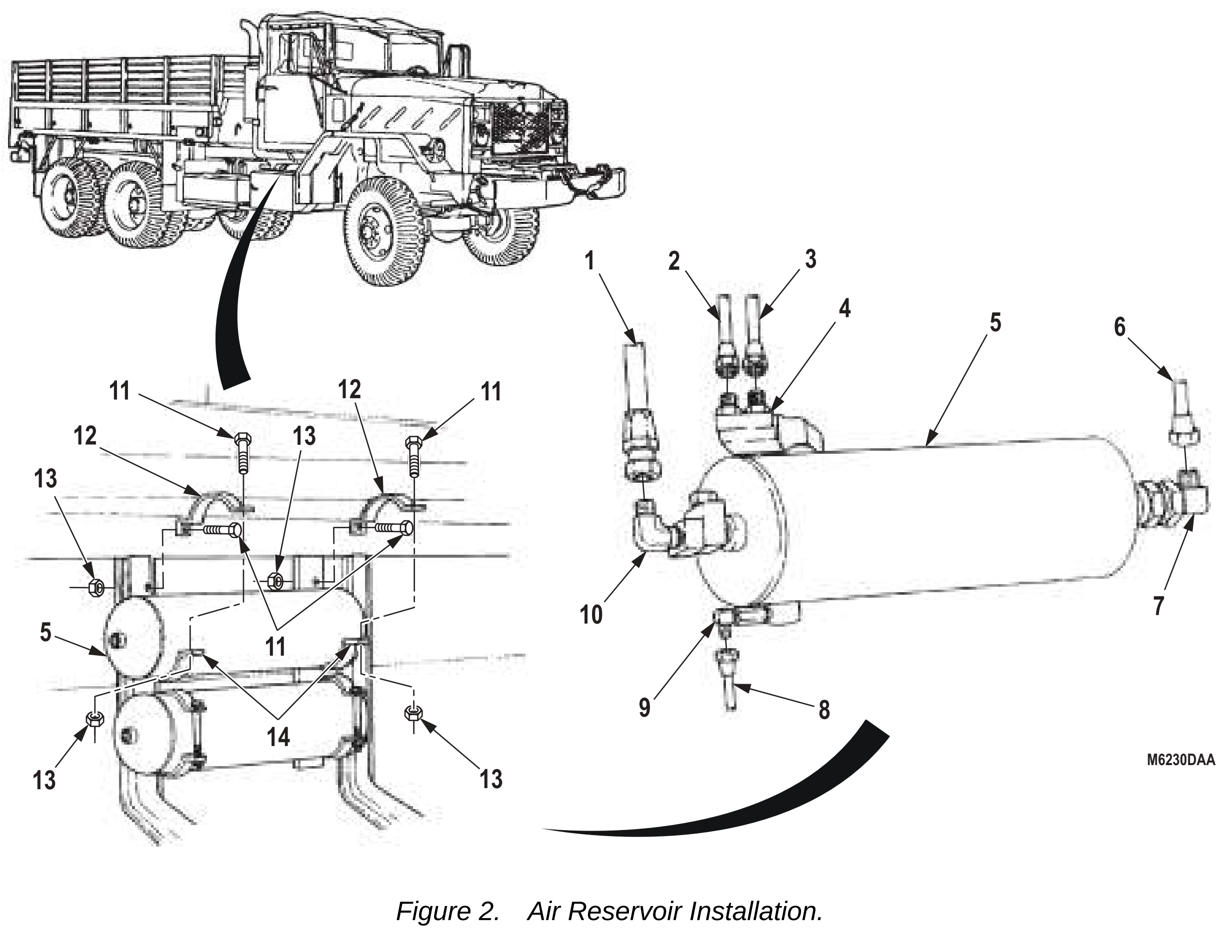


Figure 2. Air Reservoir Installation.

END OF TASK

FOLLOW-ON MAINTENANCE

1. Install primary low air pressure switch. (Volume 2, WP 0342)
2. Install toolbox and step. (Volume 4, WP 0586)
3. Start engine and allow air pressure to build to normal operating range. Check for air leaks at primary air reservoir. Road test vehicle. (TM 9-2320-272-10)

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
SECONDARY AIR RESERVOIR (SUPPLY TANK) REPLACEMENT

INITIAL SETUP:

Tools and Special Tools
- Tool Kit, General Mechanic's: Automotive (Volume 5, WP 0826, Table 1, Item 56)
- Vise, Machinist's (Volume 5, WP 0826, Table 1, Item 59)

Materials/Parts
- Tape, Antiseizing (Volume 5, WP 0825, Table 1, Item 65)
- Locknut (Volume 5, WP 0827, Table 1, Item 285) Qty: 4

Personnel Required
(2)

Equipment Condition
- Parking brake set. (TM 9-2320-272-10)

Equipment Condition (cont.)
- Air reservoirs drained. (TM 9-2320-272-10)
- Toolbox and step removed. (Volume 4, WP 0586)

REMOVAL

WARNING

- Do not disconnect air lines before draining air reservoirs. Small parts under pressure may shoot out with high velocity. Failure to comply may result in injury or death to personnel.
- Do not touch hot exhaust system components with bare hands. Failure to comply may result in injury or death to personnel.

NOTE

- Secondary reservoir is located below the cab on the right side frame rail below primary reservoir.
- Tag air lines for installation.

1. Disconnect wet reservoir supply line (Figure 1, Item 8) from elbow (Figure 1, Item 7).
2. Disconnect drain valve line (Figure 1, Item 11) from adapter (Figure 1, Item 10).
3. Disconnect supply line (Figure 1, Item 14) from elbow (Figure 1, Item 13).
4. Disconnect supply line (Figure 1, Item 15) from adapter (Figure 1, Item 16).
5. Disconnect two wires (Figure 1, Item 1) from secondary low-air pressure switch (Figure 1, Item 2).

NOTE

Assistant will support reservoir during Steps (6) and (7).

6. Remove four locknuts (Figure 1, Item 20), screws (Figure 1, Item 18), and two support clamps (Figure 1, Item 19) from hangers (Figure 1, Item 17). Discard locknuts.
7. Remove secondary reservoir (Figure 1, Item 5) from two hangers (Figure 1, Item 17) and place in soft-jawed vise.
8. Remove secondary low-air pressure switch (Figure 1, Item 2), adapter (Figure 1, Item 3), and fitting (Figure 1, Item 4) from secondary reservoir (Figure 1, Item 5).
9. Remove elbow (Figure 1, Item 7) and check valve (Figure 1, Item 6) from secondary reservoir (Figure 1, Item 5).
10. Remove adapters (Figure 1, Items 9 and 10) from secondary reservoir (Figure 1, Item 5).
11. Remove elbow (Figure 1, Item 13), adapter (Figure 1, Item 16), and fitting (Figure 1, Item 12) from secondary reservoir (Figure 1, Item 5).
12. Remove secondary reservoir (Figure 1, Item 5) from vise.

REMOVAL - Continued

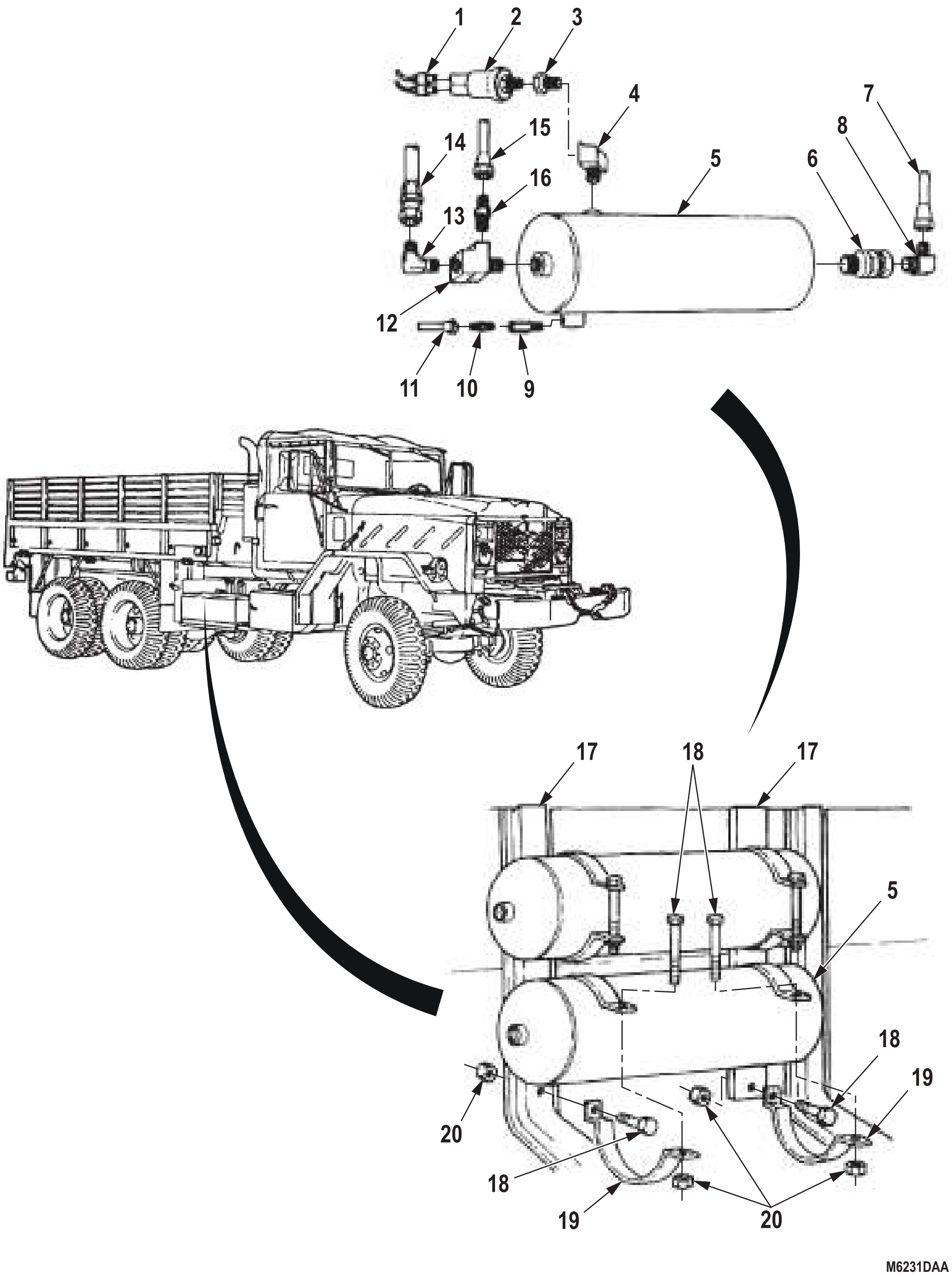


Figure 1. Secondary Air Reservoir Removal.

END OF TASK

INSTALLATION

NOTE

- If installing new reservoir, use old reservoir fittings.
- Wrap all male pipe threads with antiseize tape before installation.

1. Place secondary reservoir (Figure 2, Item 5) in soft-jawed vise.
2. Install fitting (Figure 2, Item 12), adapter (Figure 2, Item 16), and elbow (Figure 2, Item 13) on secondary reservoir (Figure 2, Item 5).
3. Install adapters (Figure 2, Items 9 and 10) on secondary reservoir (Figure 2, Item 5).
4. Install check valve (Figure 2, Item 6) and elbow (Figure 2, Item 8) on secondary reservoir (Figure 2, Item 5).
5. Install fitting (Figure 2, Item 4), adapter (Figure 2, Item 3), and secondary low-air pressure switch (Figure 2, Item 2) on secondary reservoir (Figure 2, Item 5).
6. Remove secondary reservoir (Figure 2, Item 5) from soft-jawed vise.

NOTE

Assistant will support reservoir during Step (7).

7. Install secondary reservoir (Figure 2, Item 5) on two hangers (Figure 2, Item 17) with support clamps (Figure 2, Item 19), four screws (Figure 2, Item 18), and locknuts (Figure 2, Item 20).
8. Connect two wires (Figure 2, Item 1) to secondary low-air pressure switch (Figure 2, Item 2).
9. Connect supply line (Figure 2, Item 15) to adapter (Figure 2, Item 16).
10. Connect supply line (Figure 2, Item 14) to elbow (Figure 2, Item 13).
11. Connect drain valve line (Figure 2, Item 11) to adapter (Figure 2, Item 10).
12. Connect wet reservoir supply line (Figure 2, Item 7) to elbow (Figure 2, Item 8).

INSTALLATION - Continued

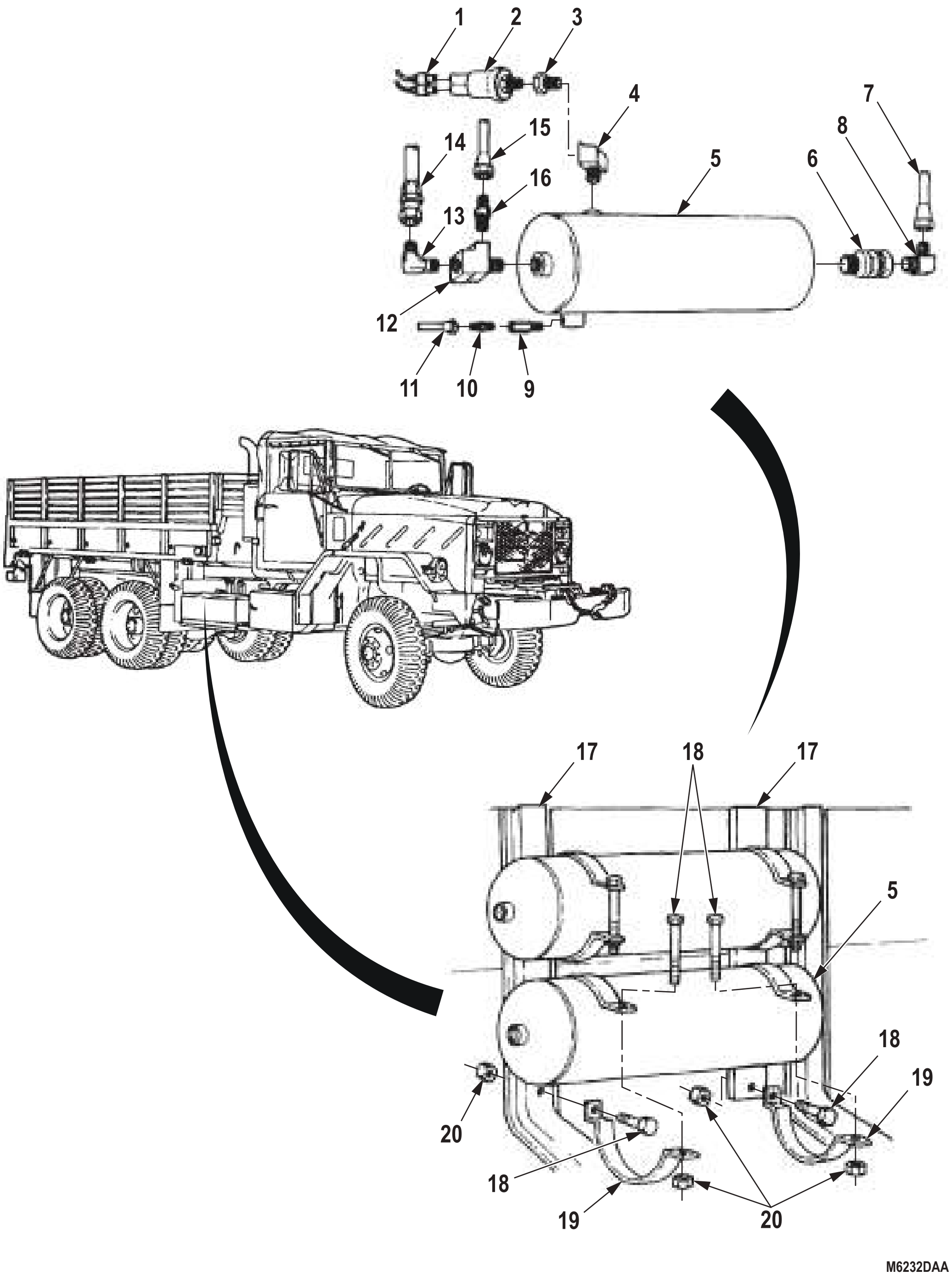


Figure 2. Secondary Air Reservoir Installation.

END OF TASK

FOLLOW-ON MAINTENANCE

1. Install toolbox and step. (Volume 4, WP 0586)
2. Start engine and allow air pressure to build to normal operating range. Check for air leaks at secondary air reservoir. Road test vehicle. (TM 9-2320-272-10)

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
WET AIR RESERVOIR (SUPPLY TANK) AND BRACKET REPLACEMENT

INITIAL SETUP:

Tools and Special Tools
Tool Kit, General Mechanic's: Automotive
(Volume 5, WP 0826, Table 1, Item 56)

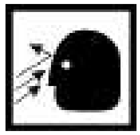
Materials/Parts
Tape, Antiseizing
(Volume 5, WP 0825, Table 1, Item 65)
Locknut (Volume 5, WP 0827, Table 1, Item 285)
Qty: 8

Equipment Condition
Parking brake set. (TM 9-2320-272-10)

Equipment Condition (cont.)
Air reservoirs drained. (TM 9-2320-272-10)

REMOVAL

WARNING



Do not disconnect air lines or hoses before draining air reservoirs. Small parts under pressure may shoot out with high velocity. Failure to comply may result in injury or death to personnel.

NOTE

Tag air lines for installation.

1. Disconnect drain line (Figure 1, Item 12) from adapter (Figure 1, Item 11).
2. Disconnect primary tank air line (Figure 1, Item 14) from elbow (Figure 1, Item 13).
3. Disconnect auxiliary air line (Figure 1, Item 1) from elbow (Figure 1, Item 2).
4. Disconnect trailer emergency air line (Figure 1, Item 6) from elbow (Figure 1, Item 3).
5. Disconnect secondary tank air line (Figure 1, Item 4) from adapter (Figure 1, Item 5).
6. Disconnect supply tank input air line (Figure 1, Item 15) from elbow (Figure 1, Item 16).
7. Remove four locknuts (Figure 1, Item 8), two U-bolts (Figure 1, Item 7), and supply tank (Figure 1, Item 9) from two support brackets (Figure 1, Item 10). Discard locknuts.
8. Remove four locknuts (Figure 1, Item 18), screws (Figure 1, Item 17), and two support brackets (Figure 1, Item 10) from frame braces (Figure 1, Item 19). Discard locknuts.

REMOVAL - Continued

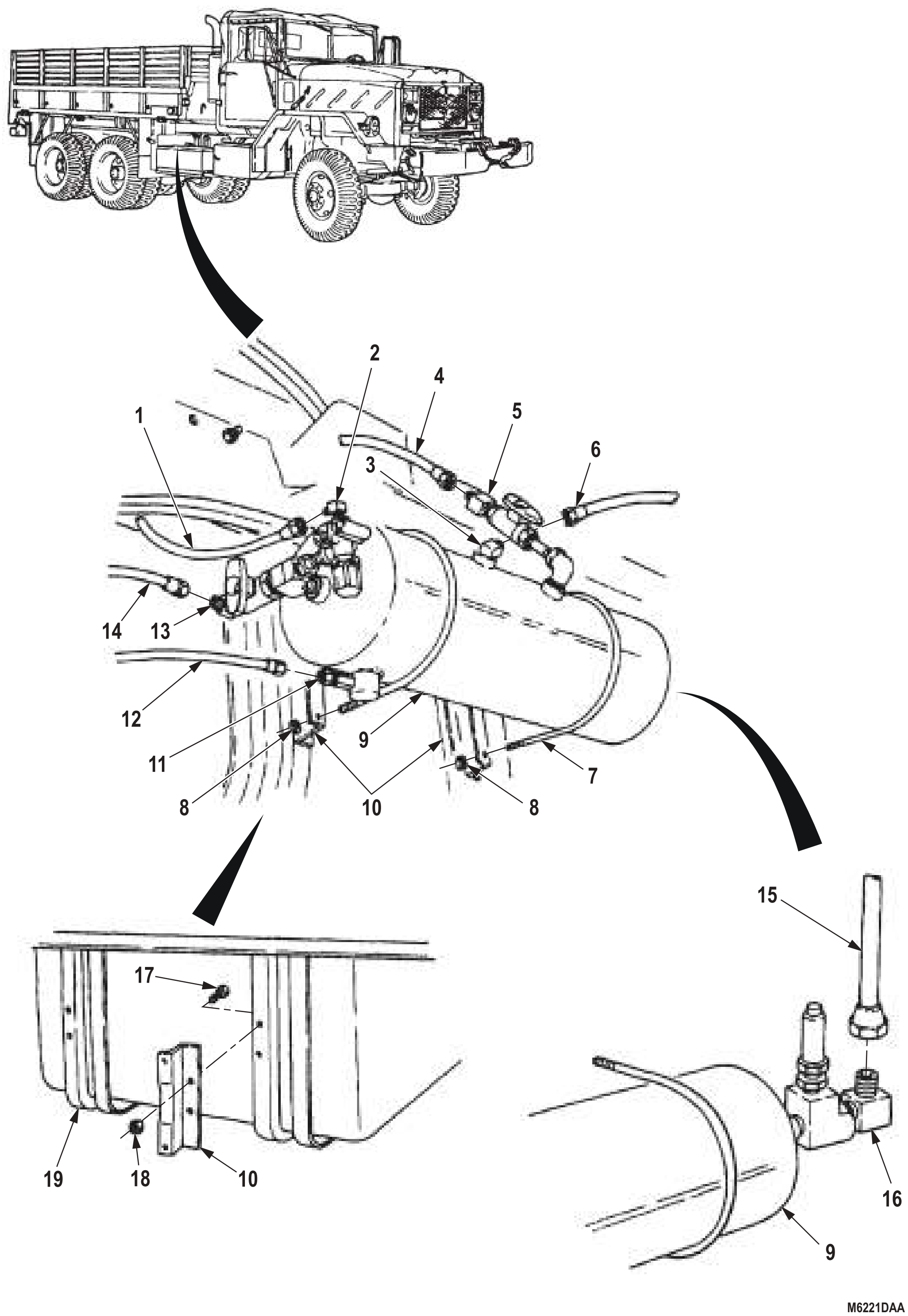


Figure 1. Air Tank Removal.

REMOVAL - Continued

NOTE

Perform Steps (9) through (14) for M934/A1/A2 vehicles.

9. Disconnect secondary tank air line (Figure 2, Item 1) from adapter (Figure 2, Item 2).
10. Disconnect trailer emergency air lines (Figure 2, Item 5) from elbow (Figure 2, Item 6).
11. Remove four screws (Figure 2, Item 11) and support plate (Figure 2, Item 9) from frame (Figure 2, Item 12).
12. Remove four locknuts (Figure 2, Item 10), two U-bolt (Figure 2, Item 8), and supply tank (Figure 2, Item 7) from support plate (Figure 2, Item 9). Discard locknuts.

CAUTION

Open-end wrench must be used to anchor tank boss fittings when connecting or disconnecting associated fittings. Damage to tank bosses may result if open-end wrench is not used.

13. Remove adapters (Figure 2, Item 2), shutoff valve (Figure 2, Item 3), and elbow (Figure 2, Item 4) from supply tank (Figure 2, Item 7).
14. Remove elbow (Figure 2, Item 6) from supply tank (Figure 2, Item 7).
15. Remove adapters (Figure 2, Items 25 and 26) from supply tank (Figure 2, Item 7).
16. Remove elbow (Figure 2, Item 18), relief valve (Figure 2, Item 19), nipple (Figure 2, Item 17), and reducer (Figure 2, Item 16) from tee (Figure 2, Item 15).
17. Remove elbow (Figure 2, Item 13), shutoff valve (Figure 2, Item 14), tee (Figure 2, Item 15), and nipple (Figure 2, Item 27) from supply tank (Figure 2, Item 7).
18. Remove adapter (Figure 2, Item 21), shutoff valve (Figure 2, Item 22), nipple (Figure 2, Item 23), and elbow (Figure 2, Item 24) from supply tank (Figure 2, Item 7).
19. Remove elbow (Figure 2, Item 20) from supply tank (Figure 2, Item 7).
20. Remove elbow (Figure 2, Item 30), safety valve (Figure 2, Item 28), reducer (Figure 2, Item 29), and tee (Figure 2, Item 31) from supply tank (Figure 2, Item 7).

REMOVAL - Continued

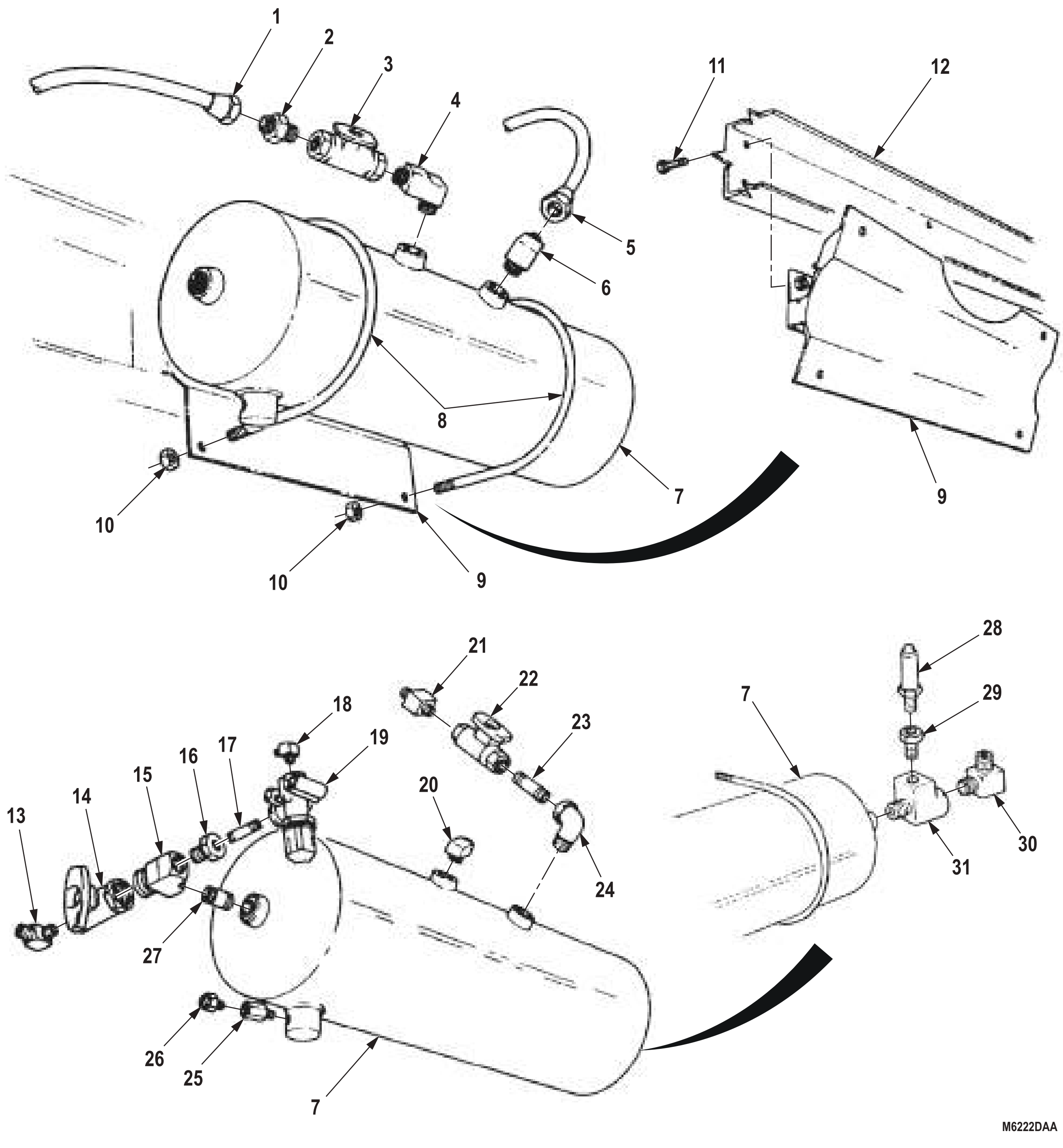


Figure 2. Air Tank Removal.

END OF TASK

INSTALLATION

CAUTION

Open-end wrench must be used to anchor tank boss fittings when connecting or disconnecting associated fittings. Damage to tank bosses may result if open-end wrench is not used.

NOTE

- If new reservoir is being installed, fittings from oil reservoir may be used. Fittings must be cleaned and inspected for cracks and stripped threads.
- Apply sealant to all male pipe threads before installation.

1. Install adapters (Figure 3, Item 18) and (Figure 3, Item 19) on supply tank (Figure 3, Item 17).
2. Install nipple (Figure 3, Item 20), tee (Figure 3, Item 7), reducer (Figure 3, Item 8), nipple (Figure 3, Item 9), relief valve (Figure 3, Item 11), elbow (Figure 3, Item 10), shutoff valve (Figure 3, Item 6), and elbow (Figure 3, Item 5) on supply tank (Figure 3, Item 17).
3. Install elbow (Figure 3, Item 16), nipple (Figure 3, Item 15), shutoff valve (Figure 3, Item 14), and adapter (Figure 3, Item 13) on supply tank (Figure 3, Item 17).
4. Install elbow (Figure 3, Item 12) on supply tank (Figure 3, Item 17).
5. Install tee (Figure 3, Item 26), reducer (Figure 3, Item 24), safety valve (Figure 3, Item 23), and elbow (Figure 3, Item 25) on supply tank (Figure 3, Item 17).
6. Install two support brackets (Figure 3, Item 4) on frame braces (Figure 3, Item 1) with four screws (Figure 3, Item 2) and locknuts (Figure 3, Item 3).
7. Install supply tank (Figure 3, Item 17) on two support brackets (Figure 3, Item 4) with two U-bolts (Figure 3, Item 22) and four locknuts (Figure 3, Item 21).

NOTE

Perform Steps (8) through (11) for M934/A1/A2 vehicles.

8. Install elbow (Figure 3, Item 30) on supply tank (Figure 3, Item 17).
9. Install elbow (Figure 3, Item 29), shutoff valve (Figure 3, Item 28), and adapter (Figure 3, Item 27) on supply tank (Figure 3, Item 17).
10. Install support plate (Figure 3, Item 31) on frame (Figure 3, Item 35) with four screws (Figure 3, Item 34).
11. Install supply tank (Figure 3, Item 17) on support plate (Figure 3, Item 31) with two U-bolts (Figure 3, Item 33) and four locknuts (Figure 3, Item 32).

INSTALLATION - Continued

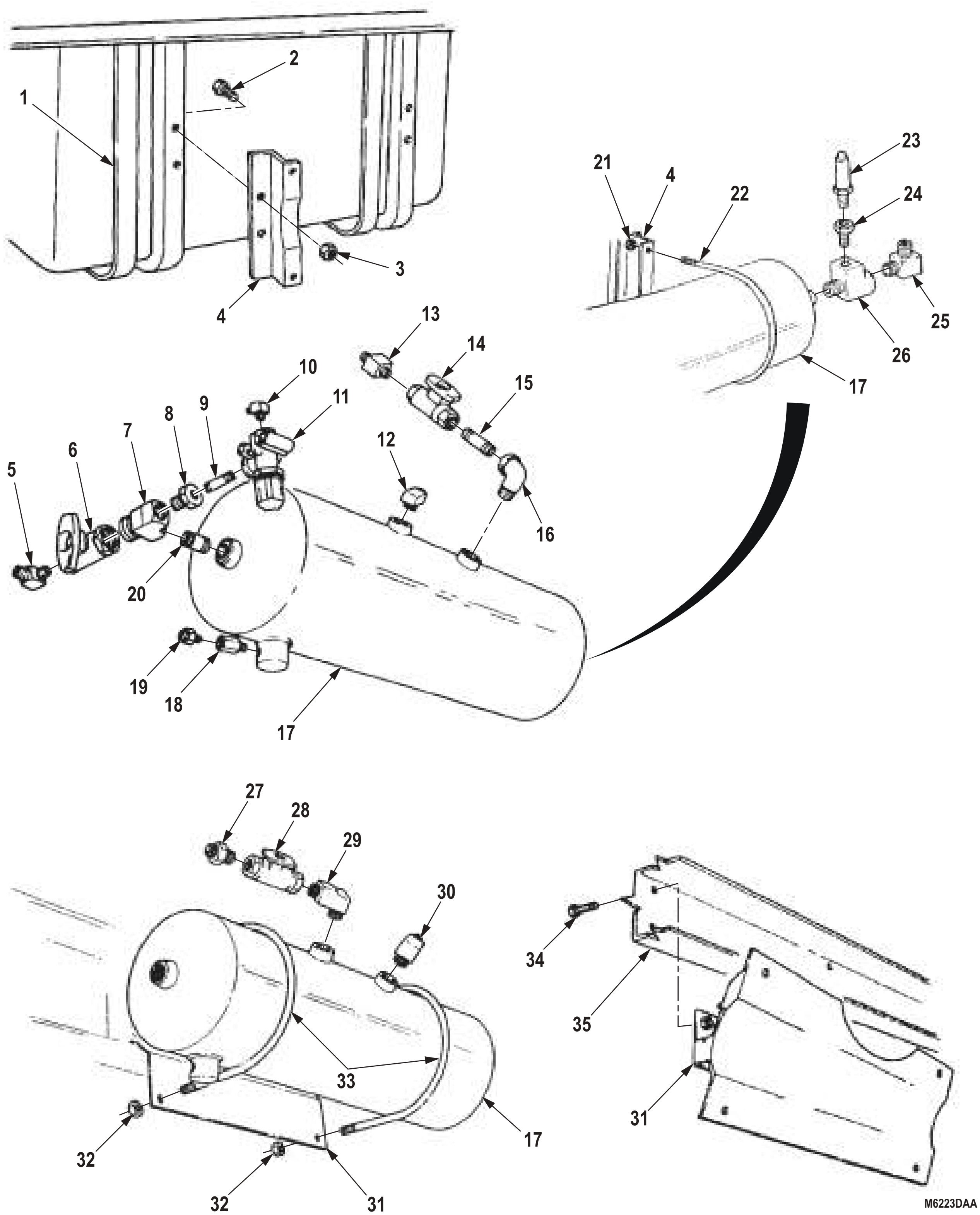


Figure 3. Air Tank Installation.

INSTALLATION - Continued

12. Connect supply tank input air line (Figure 4, Item 11) to elbow (Figure 4, Item 12).
13. Connect secondary tank air line (Figure 4, Item 3) to adapter (Figure 4, Item 5).
14. Connect trailer emergency air line (Figure 4, Item 6) to elbow (Figure 4, Item 4).
15. Connect auxiliary air line (Figure 4, Item 1) to elbow (Figure 4, Item 2).
16. Connect primary tank air line (Figure 4, Item 10) to elbow (Figure 4, Item 9).
17. Connect drain line (Figure 4, Item 8) to adapter (Figure 4, Item 7).
18. Connect trailer emergency air line (Figure 4, Item 16) to elbow (Figure 4, Item 15).
19. Connect secondary tank air line (Figure 4, Item 13) to adapter (Figure 4, Item 14).

INSTALLATION - Continued

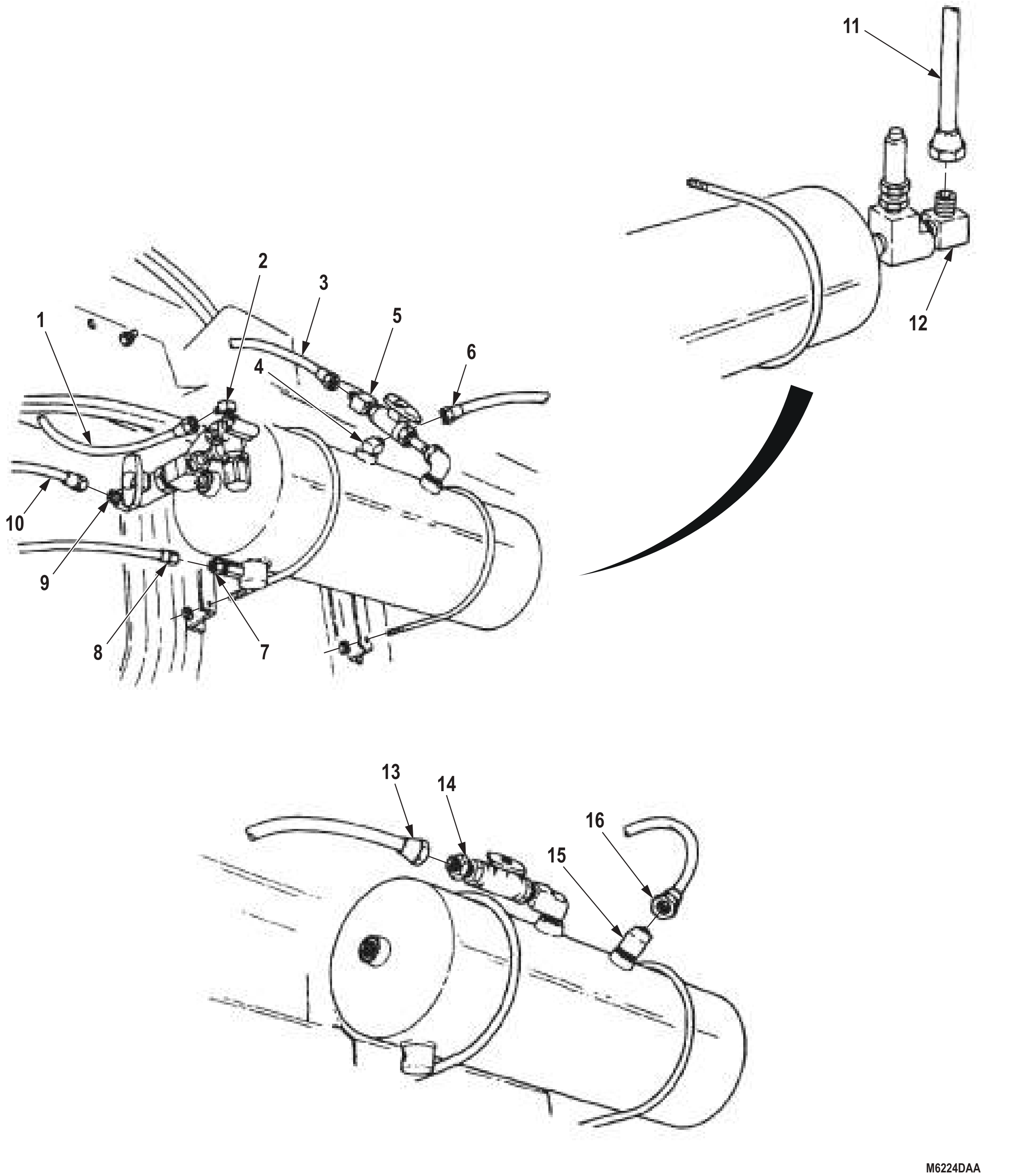


Figure 4. Air Line Installation.

END OF TASK

FOLLOW-ON MAINTENANCE

Start engine and allow air pressure to build to normal operating range. Check for air leaks. Road test vehicle. (TM-9-2320-272-10)

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
WET AIR RESERVOIR (SUPPLY TANK) AND MOUNTING PLATE REPLACEMENT (M936/A1/A2)

INITIAL SETUP:

Tools and Special Tools
Tool Kit, General Mechanic's: Automotive
(Volume 5, WP 0826, Table 1, Item 56)

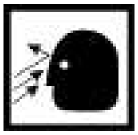
Materials/Parts
Tape, Antiseizing
(Volume 5, WP 0825, Table 1, Item 65)
Locknut
(Volume 5, WP 0827, Table 1, Item 285)
Qty: 4

Equipment Condition
Parking brake set. (TM 9-2320-272-10)

Equipment Condition (cont.)
Air reservoirs drained. (TM 9-2320-272-10)

REMOVAL

WARNING



Do not disconnect air lines or hoses before draining air reservoirs. Small parts under pressure may shoot out with high velocity. Failure to comply may result in injury or death to personnel.

CAUTION

Anchor tank boss fittings with an open-end wrench before removing connecting fittings. Failure to do so may result in damage to equipment.

1. Disconnect primary tank air line (Figure 1, Item 1) from elbow (Figure 1, Item 2).
2. Disconnect trailer emergency air line (Figure 1, Item 5) from elbow (Figure 1, Item 6).
3. Disconnect auxiliary air line (Figure 1, Item 3) from elbow (Figure 1, Item 4).
4. Disconnect supply tank input air line (Figure 1, Item 16) from adapter (Figure 1, Item 15).
5. Disconnect secondary tank air line (Figure 1, Item 14) from adapter (Figure 1, Item 13).
6. Disconnect drain line (Figure 1, Item 12) from adapter (Figure 1, Item 11).
7. Remove four locknuts (Figure 1, Item 9), two U-bolts (Figure 1, Item 8), and supply tank (Figure 1, Item 7) from support plate (Figure 1, Item 10). Discard locknuts.

REMOVAL - Continued

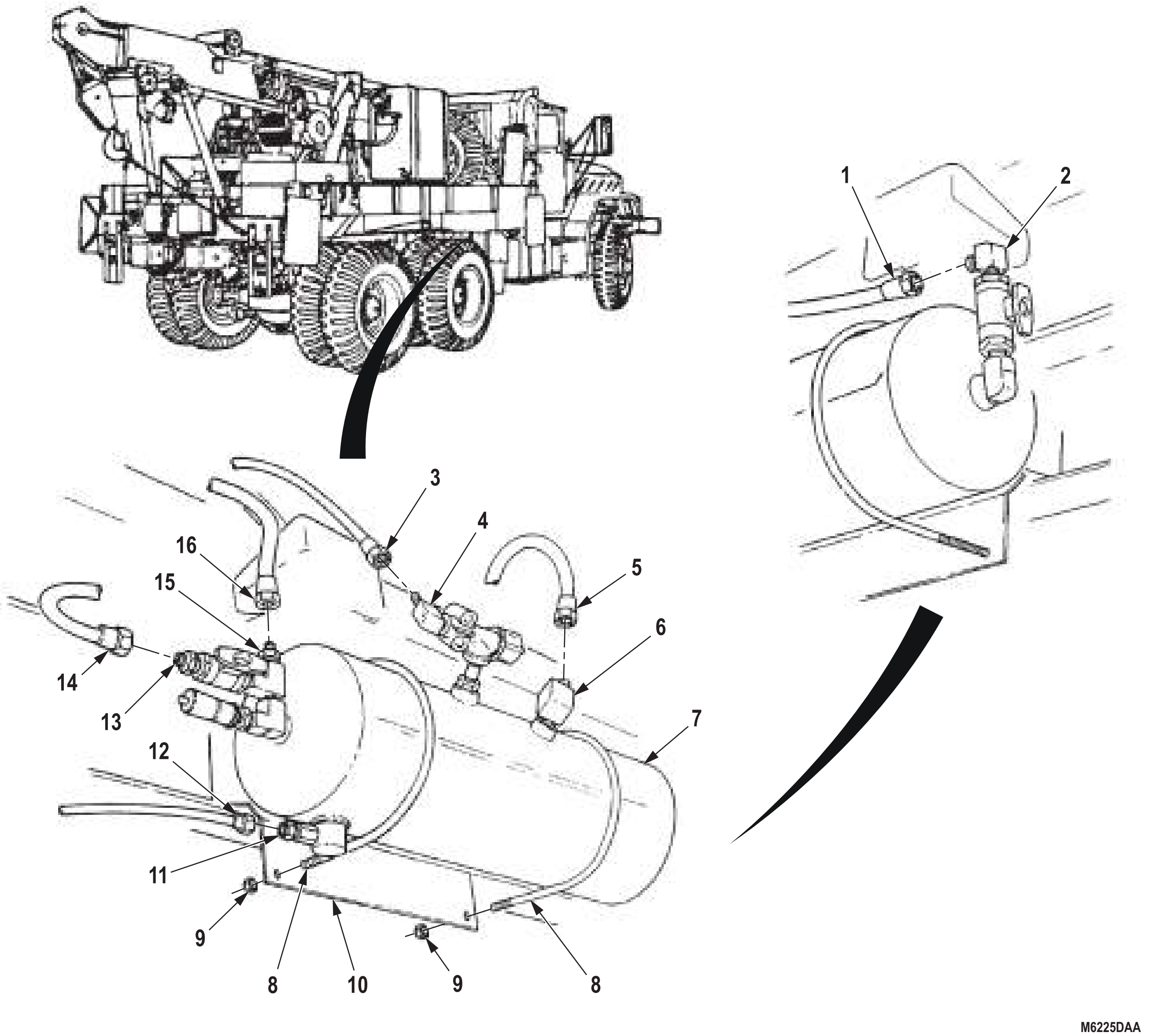


Figure 1. Wet Air Reservoir Removal.

REMOVAL - Continued

8. Remove four screws (Figure 2, Item 1) and support plate (Figure 2, Item 3) from frame (Figure 2, Item 2).
9. Remove elbow (Figure 2, Item 20), shutoff valve (Figure 2, Item 21), and elbow (Figure 2, Item 22) from supply tank (Figure 2, Item 14).
10. Remove elbow (Figure 2, Item 13) from supply tank (Figure 2, Item 14).
11. Remove elbow (Figure 2, Item 9), relief valve (Figure 2, Item 10), nipple (Figure 2, Item 11), and reducer (Figure 2, Item 12) from supply tank (Figure 2, Item 14).
12. Remove adapters (Figure 2, Items 15 and 16) from supply tank (Figure 2, Item 14).
13. Remove adapters (Figure 2, Items 4 and 7), safety valve (Figure 2, Item 19), reducer (Figure 2, Item 18), shutoff valve (Figure 2, Item 5), tees (Figure 2, Items 8 and 17), and nipple (Figure 2, Item 6) from supply tank (Figure 2, Item 14).

REMOVAL - Continued

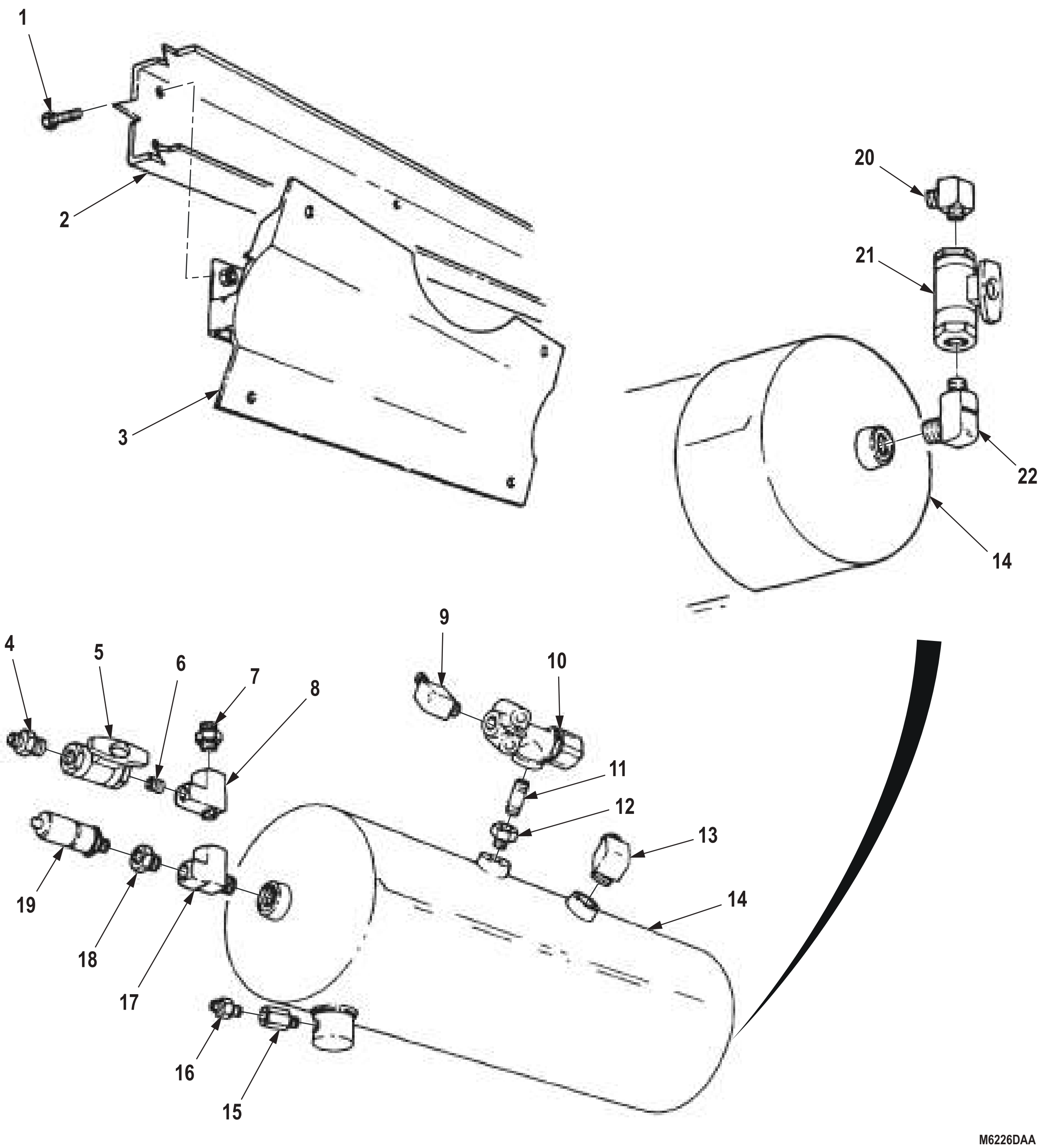


Figure 2. Wet Air Reservoir Removal.

END OF TASK

INSTALLATION

NOTE

- If new reservoir is being installed, fittings from old reservoir may be used. Fittings must be cleaned and inspected for cracks and stripped threads.
- Wrap male pipe threads with antiseize tape before installation.

1. Install nipple (Figure 3, Item 6), tees (Figure 3, Items 8 and 17), shutoff valve (Figure 3, Item 5), reducer (Figure 3, Item 18), safety valve (Figure 3, Item 19), and adapters (Figure 3, Items 4 and 7) on supply tank (Figure 3, Item 14).
2. Install adapters (Figure 3, Items 15 and 16) on supply tank (Figure 3, Item 14).
3. Install reducer (Figure 3, Item 12), nipple (Figure 3, Item 11), relief valve (Figure 3, Item 10), and elbow (Figure 3, Item 9) on supply tank (Figure 3, Item 14).
4. Install elbow (Figure 3, Item 13) on supply tank (Figure 3, Item 14).
5. Install elbow (Figure 3, Item 22), shutoff valve (Figure 3, Item 21), and elbow (Figure 3, Item 20) on supply tank (Figure 3, Item 14).
6. Install support plate (Figure 3, Item 3) on frame (Figure 3, Item 2) with four screws (Figure 3, Item 1).

INSTALLATION - Continued

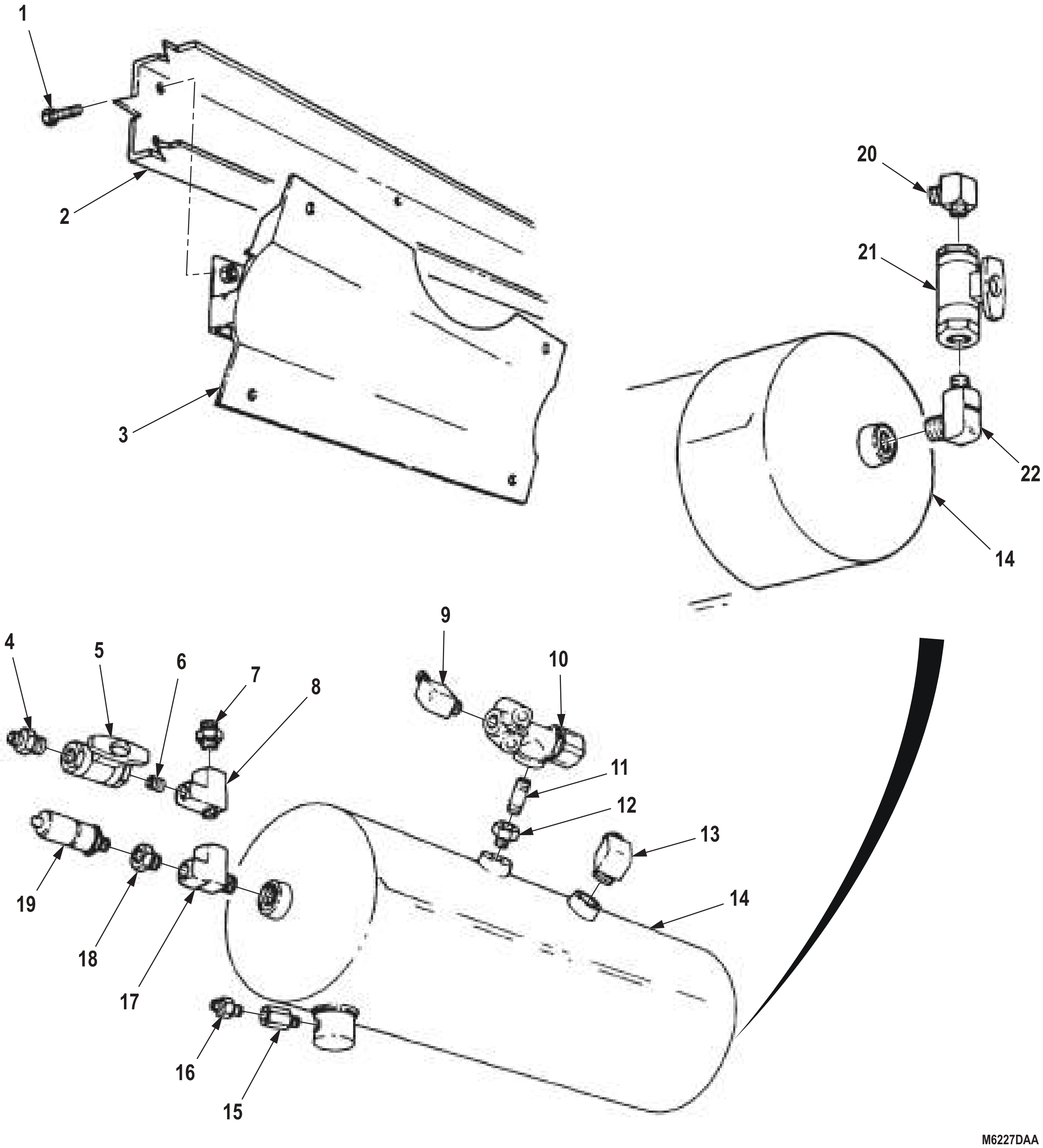


Figure 3. Wet Air Reservoir Installation.

INSTALLATION - Continued

7. Install supply tank (Figure 4, Item 6) on support plate (Figure 4, Item 9) with two U-bolts (Figure 4, Item 7) and four locknuts (Figure 4, Item 8).
8. Connect drain line (Figure 4, Item 11) to adapter (Figure 4, Item 10).
9. Connect secondary tank air line (Figure 4, Item 13) to adapter (Figure 4, Item 12).
10. Connect supply tank input air line (Figure 4, Item 1) to adapter (Figure 4, Item 14).
11. Connect auxiliary air line (Figure 4, Item 2) to elbow (Figure 4, Item 3).
12. Connect trailer emergency air line (Figure 4, Item 4) to elbow (Figure 4, Item 5).
13. Connect primary tank air line (Figure 4, Item 15) to elbow (Figure 4, Item 16).

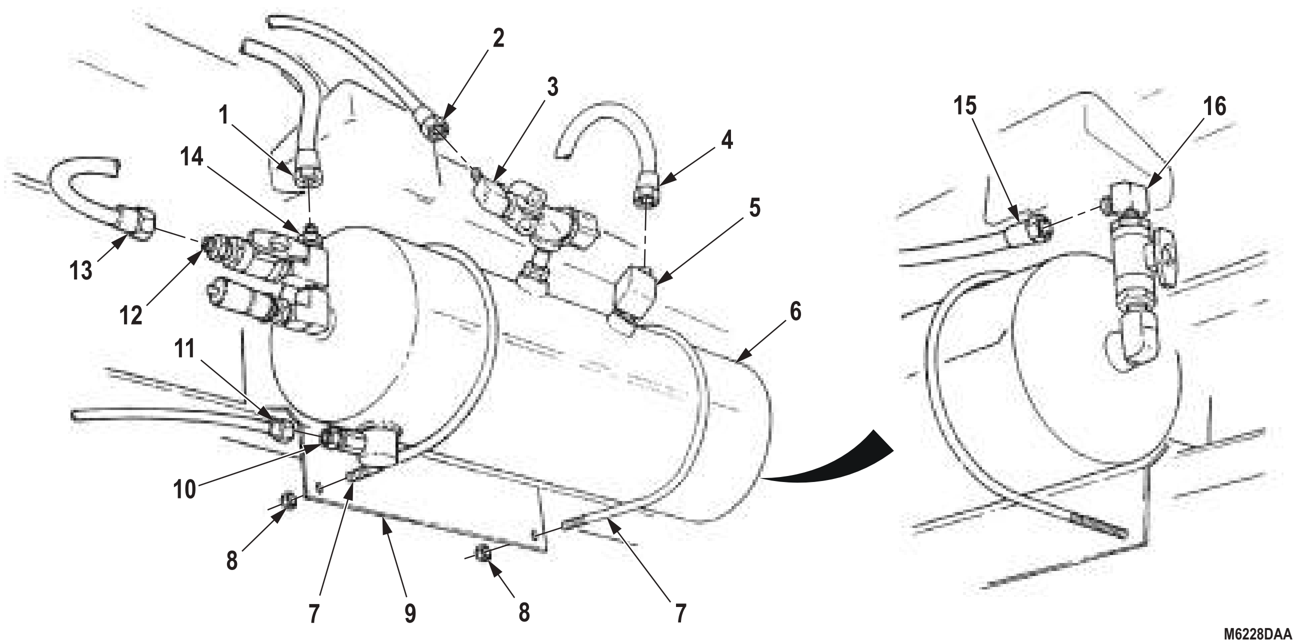


Figure 4. Wet Air Reservoir Installation.

END OF TASK

FOLLOW-ON MAINTENANCE

Start engine and allow air pressure to build to normal operating range. Check for air leaks. Road test vehicle. (TM 9-2320-272-10)

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
EMERGENCY SPRING BRAKE (SUPPLY TANK) AIR RESERVOIR REPLACEMENT

INITIAL SETUP:

Tools and Special Tools
Tool Kit, General Mechanic's: Automotive
(Volume 5, WP 0826, Table 1, Item 56)

Materials/Parts
Tape, Antiseizing
(Volume 5, WP 0825, Table 1, Item 65)
Locknut
(Volume 5, WP 0827, Table 1, Item 314)
Qty: 4

Equipment Condition
Parking brake set. (TM 9-2320-272-10)

Equipment Condition (cont.)
Air reservoirs drained. (TM 9-2320-272-10)
Toolbox and step removed. (Volume 4, WP 0586)

REMOVAL

WARNING

- Do not disconnect air lines before draining air reservoirs. Small parts under pressure may shoot out with high velocity. Failure to comply may result in injury or death to personnel.
- Do not touch hot exhaust system components with bare hands. Failure to comply may result in injury or death to personnel.

NOTE

- Spring brake reservoir is located on the left frame rail next to the air cleaner.
- Tag air lines for installation.

1. Disconnect air lines (Figure 1, Items 5, 6, and 7) from elbows (Figure 1, Items 8, 9, and 10).
2. Remove four locknuts (Figure 1, Item 4), washers (Figure 1, Item 3), two U-bolts (Figure 1, Item 11), and emergency reservoir (Figure 1, Item 1) from two support brackets (Figure 1, Item 2). Discard locknuts.

REMOVAL - Continued

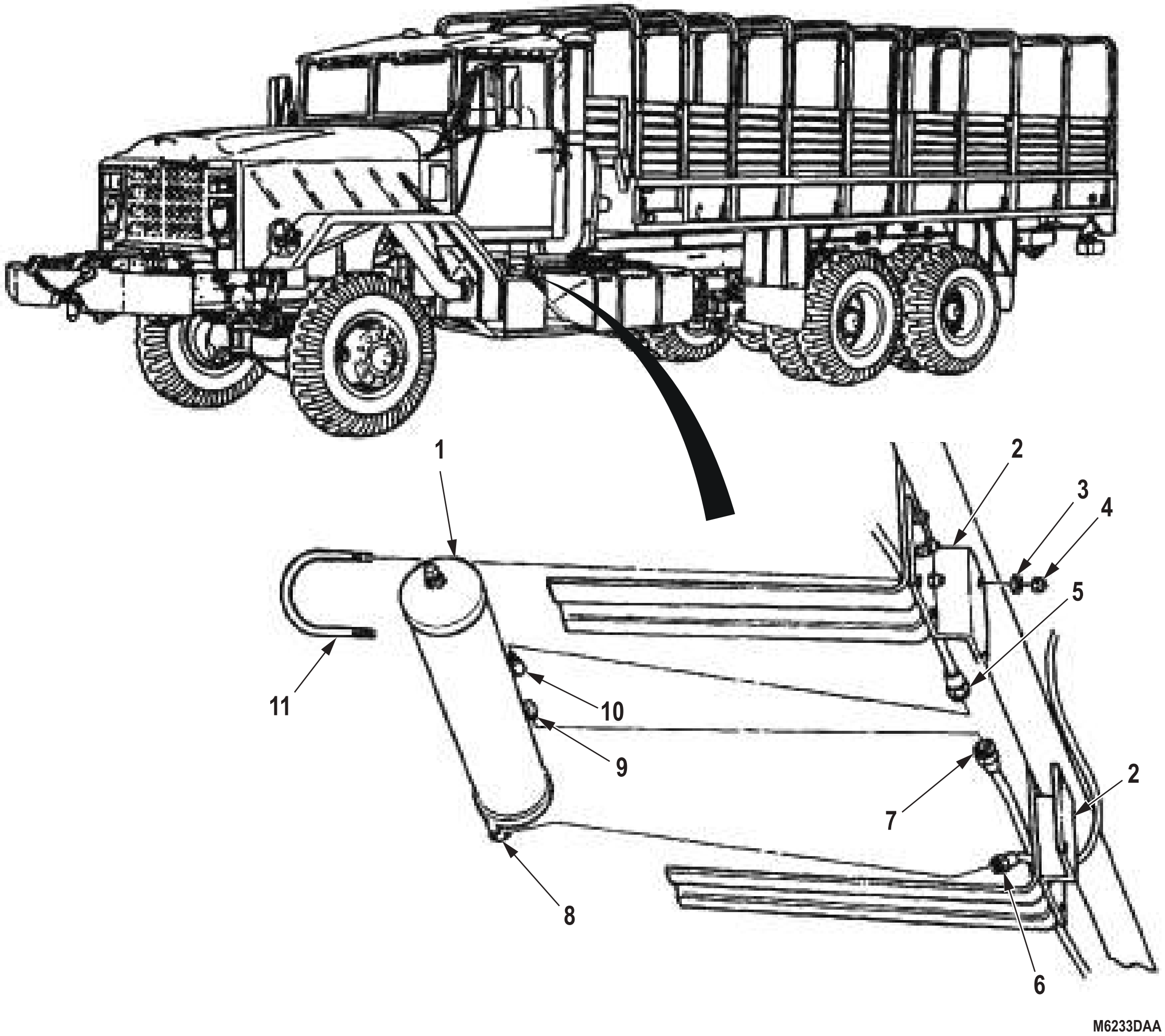


Figure 1. Air Reservoir Removal.

END OF TASK

INSTALLATION

NOTE

- If installing new reservoir, use old reservoir fittings. Wrap all male pipe threads with antiseize tape before installation.
- When installing emergency tank, ensure emergency tank drain valve port faces downward and toward front of vehicle.

1. Install emergency reservoir (Figure 2, Item 1) on two support brackets (Figure 2, Item 2) with two U-bolts (Figure 2, Item 11), four washers (Figure 2, Item 3), and locknuts (Figure 2, Item 4).
2. Connect air lines (Figure 2, Items 5, 6, and 7) to elbows (Figure 2, Items 8, 9, and 10).

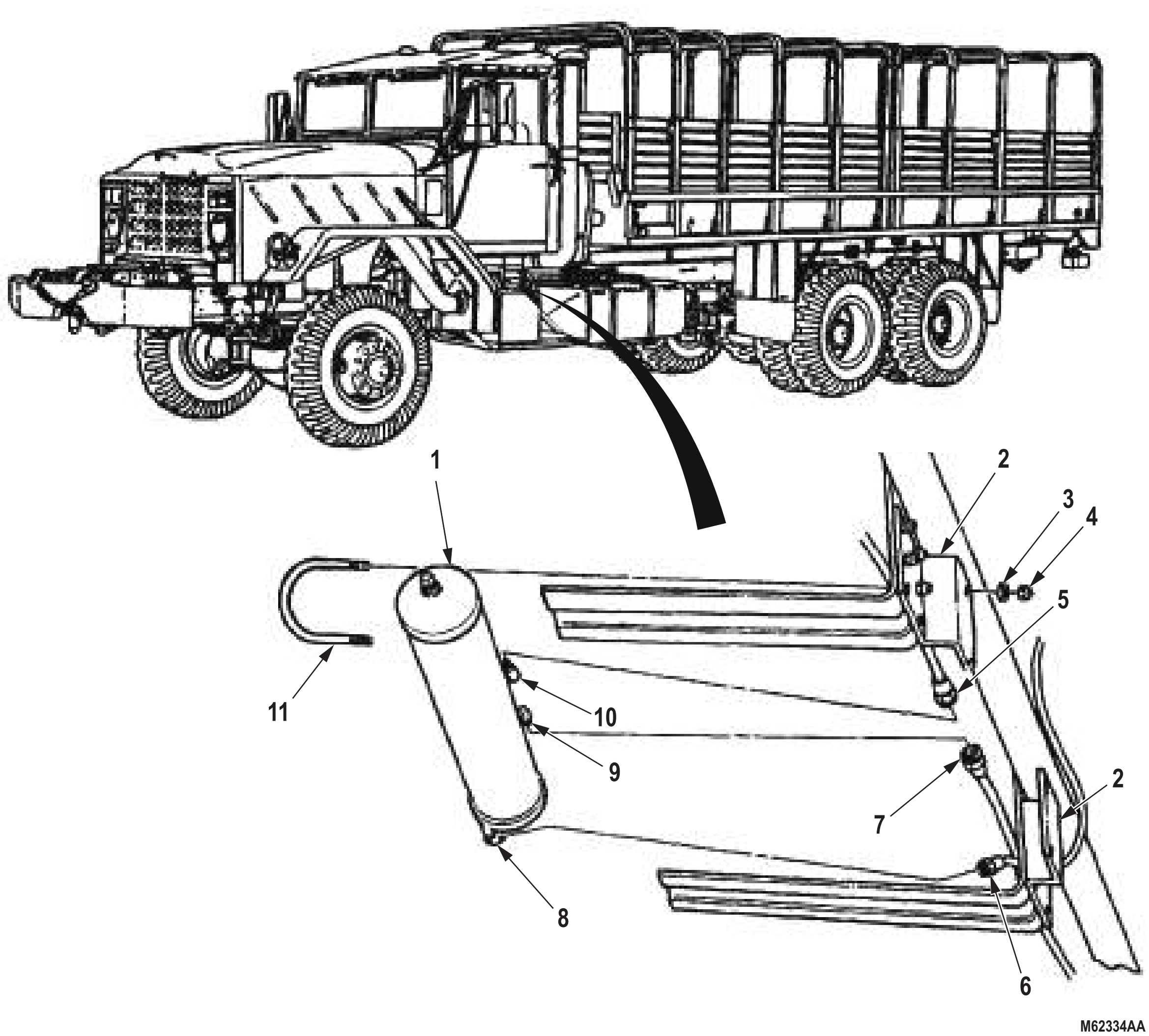


Figure 2. Air Reservoir Installation.

END OF TASK

FOLLOW-ON MAINTENANCE

1. Install toolbox and step. (Volume 4, WP 0586)
2. Start engine and allow air pressure to build to normal operating range. Check for air leaks. Road test vehicle. (TM 9-2320-272-10)

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
BRAKE PROPORTIONING VALVE REPLACEMENT

INITIAL SETUP:

Tools and Special Tools

Tool Kit, General Mechanic's: Automotive
(Volume 5, WP 0826, Table 1, Item 56)

Materials/Parts

Sealing Compound
(Volume 5, WP 0825, Table 1, Item 56)

Materials/Parts (cont.)

Locknut (Volume 5, WP 0827, Table 1, Item 283)
Qty: 2

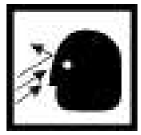
Tiedown Strap
(Volume 5, WP 0827, Table 1, Item 370)
Qty: 2

Equipment Condition

Parking brake set. (TM 9-2320-272-10)
Air reservoirs drained. (TM 9-2320-272-10)

REMOVAL

WARNING



Do not disconnect air lines or hoses before draining air reservoirs. Small parts under pressure may shoot out with high velocity. Failure to comply may result in injury or death to personnel.

NOTE

Tag air lines and fittings for installation.

1. Remove two tiedown straps (Figure 1, Item 8) from air lines (Figure 1, Items 1, 7, and 9). Discard tiedown straps.
2. Disconnect air lines (Figure 1, Items 1, 3, 7, and 9) from elbow (Figure 1, Item 10), adapter (Figure 1, Item 4), elbow (Figure 1, Item 5), and adapter (Figure 1, Item 6).
3. Remove elbows (Figure 1, Items 5 and 10) and adapters (Figure 1, Items 4 and 6) from brake proportioning valve (Figure 1, Item 2).
4. Remove two locknuts (Figure 1, Item 11), screws (Figure 1, Item 12), and brake proportioning valve (Figure 1, Item 2) from bracket (Figure 1, Item 13). Discard locknuts.

REMOVAL - Continued

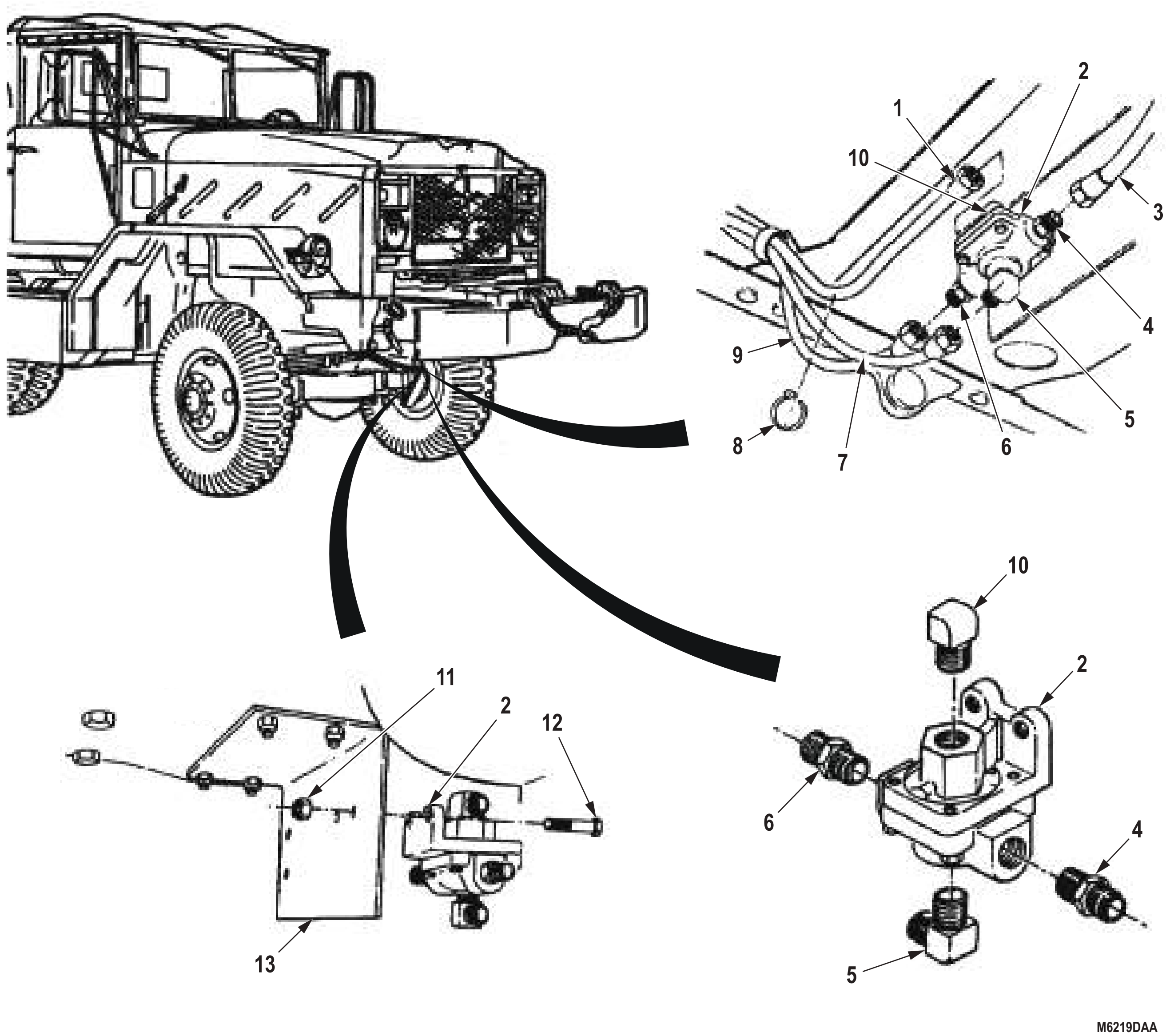


Figure 1. Brake Proportioning Valve Removal.

END OF TASK

INSTALLATION

NOTE

- If new brake proportioning valve is being installed, use attaching parts and fittings from old brake proportioning valve.
- Fittings must be cleaned and inspected for cracks and stripped threads.
- Apply adhesive sealant to all male pipe threads before installation.

1. Install brake proportioning valve (Figure 2, Item 2) on bracket (Figure 2, Item 13) with two screws (Figure 2, Item 12) and locknuts (Figure 2, Item 11).
2. Install elbows (Figure 2, Items 5 and 10) and adapters (Figure 2, Items 4 and 6) on brake proportioning valve (Figure 2, Item 2).
3. Connect air lines (Figure 2, Items 1, 3, 7, and 9) to elbow (Figure 2, Item 10), adapter (Figure 2, Item 4), elbow (Figure 2, Item 5), and adapter (Figure 2, Item 6).
4. Install two tiedown straps (Figure 2, Item 8) on air lines (Figure 2, Items 1, 7, and 9).

INSTALLATION - Continued

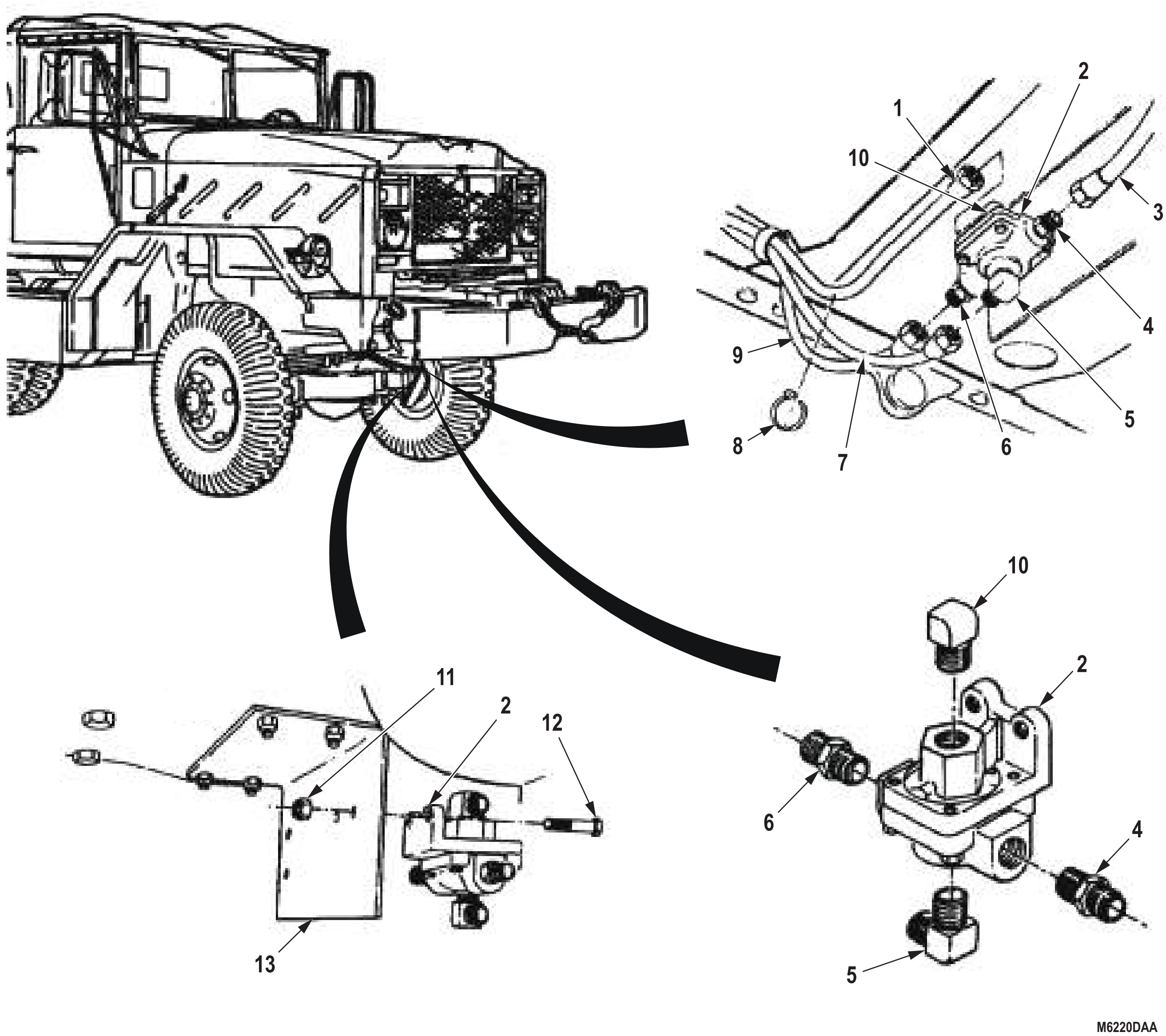


Figure 2. Brake Proportioning Valve Installation.

END OF TASK

FOLLOW-ON MAINTENANCE

Start engine and allow air pressure to build to normal operating range. Check for air leaks and proper brake operation. Road test vehicle. (TM 9-2320-272-10)

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
AIR RESERVOIR DRAIN VALVES REPLACEMENT

INITIAL SETUP:

Tools and Special Tools
Tool Kit, General Mechanic's: Automotive
(Volume 5, WP 0826, Table 1, Item 56)

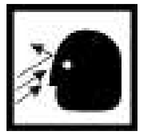
Materials/Parts
Tape, Antiseizing
(Volume 5, WP 0825, Table 1, Item 65)
Locknut
(Volume 5, WP 0827, Table 1, Item 319)
Qty: 2

Equipment Condition
Parking brake set. (TM 9-2320-272-10)

Equipment Condition (cont.)
Air reservoirs drained. (TM 9-2320-272-10)

REMOVAL

WARNING



Do not disconnect air lines or hoses before draining air reservoirs. Small parts under pressure may shoot out with high velocity. Failure to comply may result in injury or death to personnel.

NOTE

If removing more than one drain valve, tag air lines for installation.

1. Disconnect air drain line (Figure 1, Item 8) from coupling adapter (Figure 1, Item 7).
2. Remove two locknuts (Figure 1, Item 2), U-bolt (Figure 1, Item 6), and drain valve coupling (Figure 1, Item 5) from bracket (Figure 1, Item 1) at rear of right cab access step (Figure 1, Item 4). Discard locknuts.
3. Remove coupling adapter (Figure 1, Item 7) and drain valve (Figure 1, Item 3) from drain valve coupling (Figure 1, Item 5).

REMOVAL - Continued

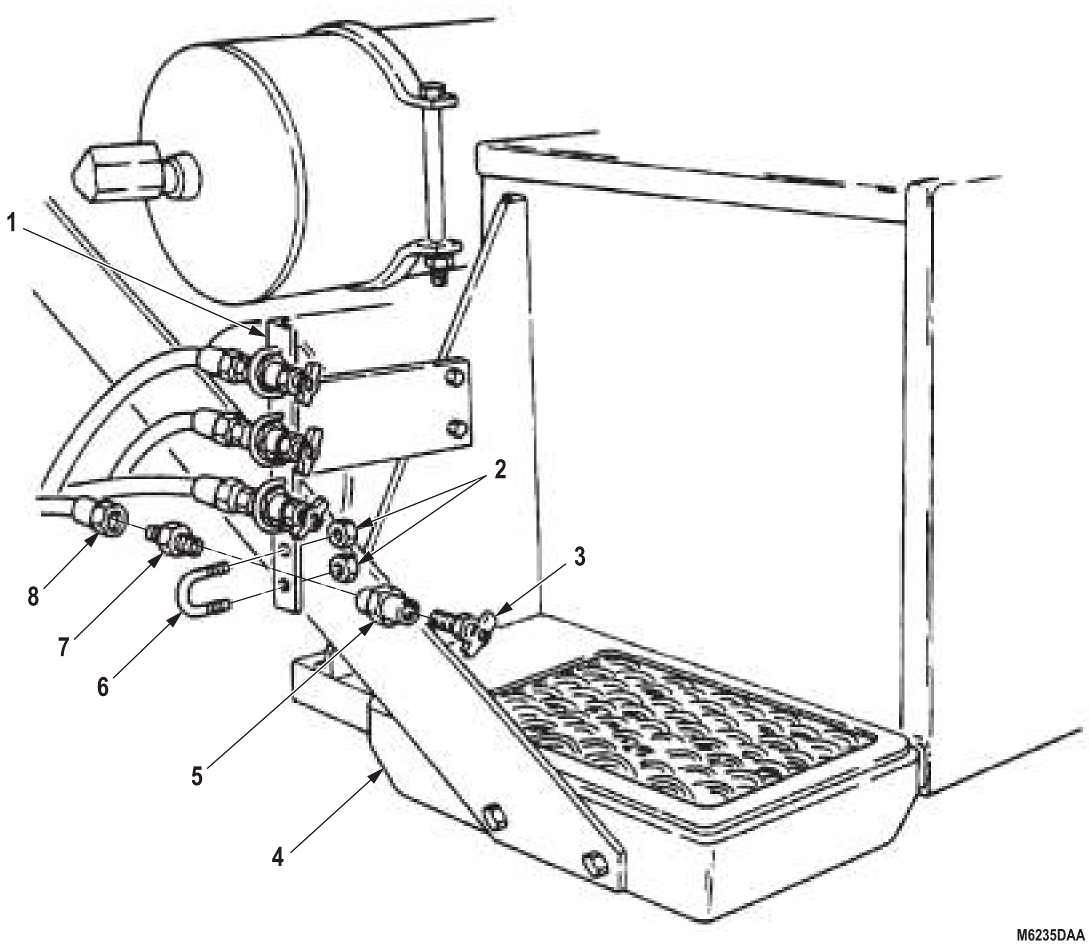


Figure 1. Air Reservoir Drain Valves Removal.

END OF TASK

INSTALLATION

NOTE

Wrap all male pipe threads with antiseize tape before installation.

1. Install drain valve (Figure 2, Item 3) and coupling adapter (Figure 2, Item 7) in drain valve coupling (Figure 2, Item 5).
2. Install drain valve coupling (Figure 2, Item 5) on bracket (Figure 2, Item 1) of right cab access step (Figure 2, Item 4) with U-bolt (Figure 2, Item 6) and two locknuts (Figure 2, Item 2).
3. Connect air drain line (Figure 2, Item 8) to coupling adapter (Figure 2, Item 7).

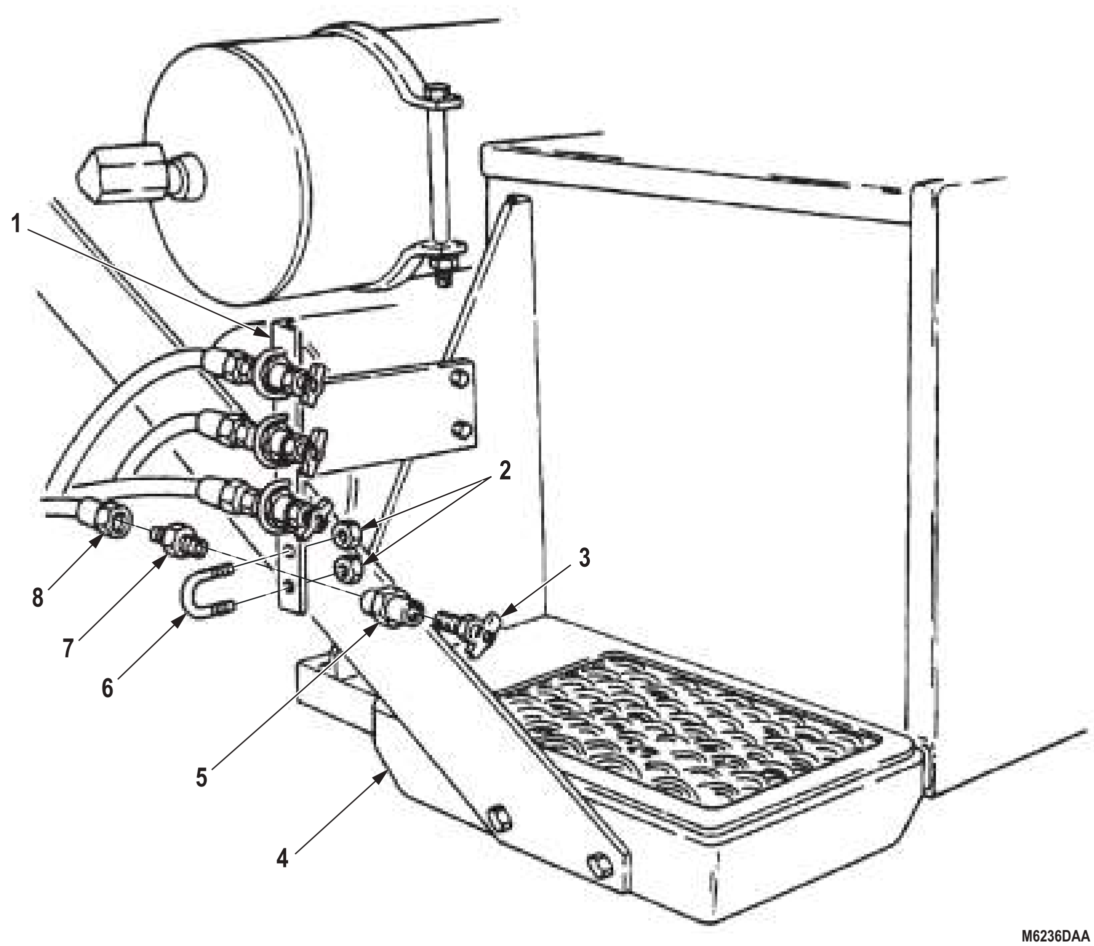


Figure 2. Air Reservoir Drain Valves Installation.

END OF TASK

FOLLOW-ON MAINTENANCE

Start engine and allow air pressure to build to normal operating range. Check for air leaks at drain valve. Road test vehicle. (TM 9-2320-272-10)

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
FAN DRIVE CLUTCH ACTUATOR REPLACEMENT (M939/A1)

INITIAL SETUP:

Tools and Special Tools

Tool Kit, General Mechanic's: Automotive
(Volume 5, WP 0826, Table 1, Item 56)

Materials/Parts

Cap Set, Protective, Dust and Moisture Seal
(Volume 5, WP 0825, Table 1, Item 13)
Tape, Antiseizing
(Volume 5, WP 0825, Table 1, Item 65)

Equipment Condition

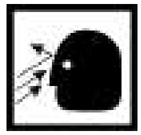
Parking brake set. (TM 9-2320-272-10)

Equipment Condition (cont.)

Primary and secondary air tanks drained.
(TM 9-2320-272-10)
Hood raised and secured. (TM 9-2320-272-10)
Coolant drained below water manifold level.
(Volume 2, WP 0287)

REMOVAL

WARNING



Do not disconnect air lines or hoses before draining air reservoirs. Small parts under pressure may shoot out with high velocity. Failure to comply may result in injury or death to personnel.

1. Disconnect air hose (Figure 1, Item 2) from adapter (Figure 1, Item 3) on fan drive clutch actuator (Figure 1, Item 4).
2. Remove adapter (Figure 1, Item 3) from fan drive actuator (Figure 1, Item 4).
3. Remove actuator-to-fan hose (Figure 1, Item 6) from adapter (Figure 1, Item 5).
4. Remove adapter (Figure 1, Item 5) from actuator (Figure 1, Item 4).
5. Remove actuator (Figure 1, Item 4) from water manifold (Figure 1, Item 1).

END OF TASK

INSPECTION

Inspect all connections for cracks and stripped threads. Replace any parts with cracks, or stripped or damaged threads.

INSPECTION - Continued

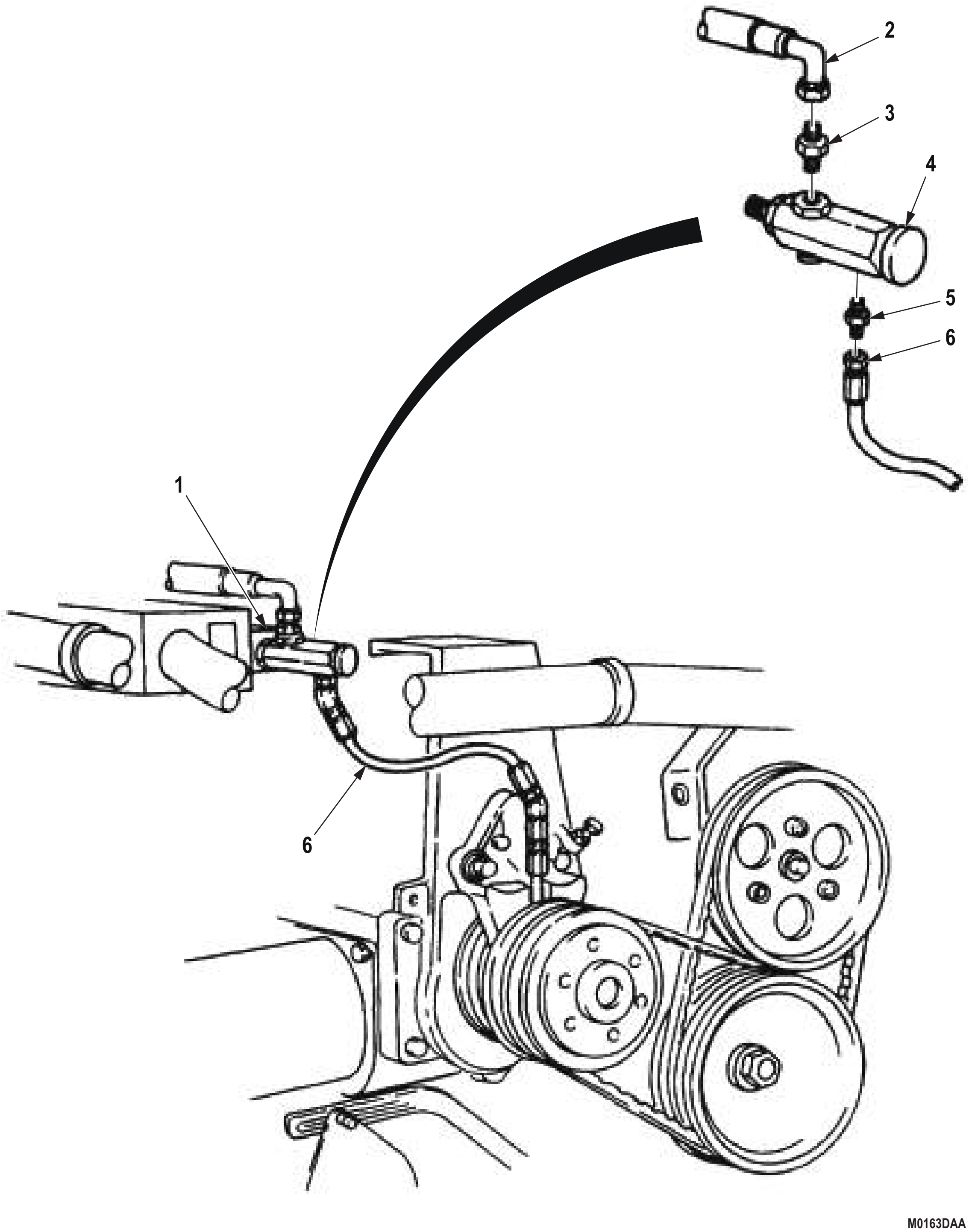


Figure 1. Fan Drive Actuator Removal.

END OF TASK

INSTALLATION

NOTE

Male pipe threads must be wrapped with antiseize tape before installation.

1. Install actuator (Figure 2, Item 4) on water manifold (Figure 2, Item 1).
2. Install adapter (Figure 2, Item 5) on actuator (Figure 2, Item 4).
3. Connect actuator-to-fan hose (Figure 2, Item 6) on adapter (Figure 2, Item 5).
4. Install adapter (Figure 2, Item 3) in actuator (Figure 2, Item 4).
5. Connect air hose (Figure 2, Item 2) to adapter (Figure 2, Item 3).

INSTALLATION - Continued

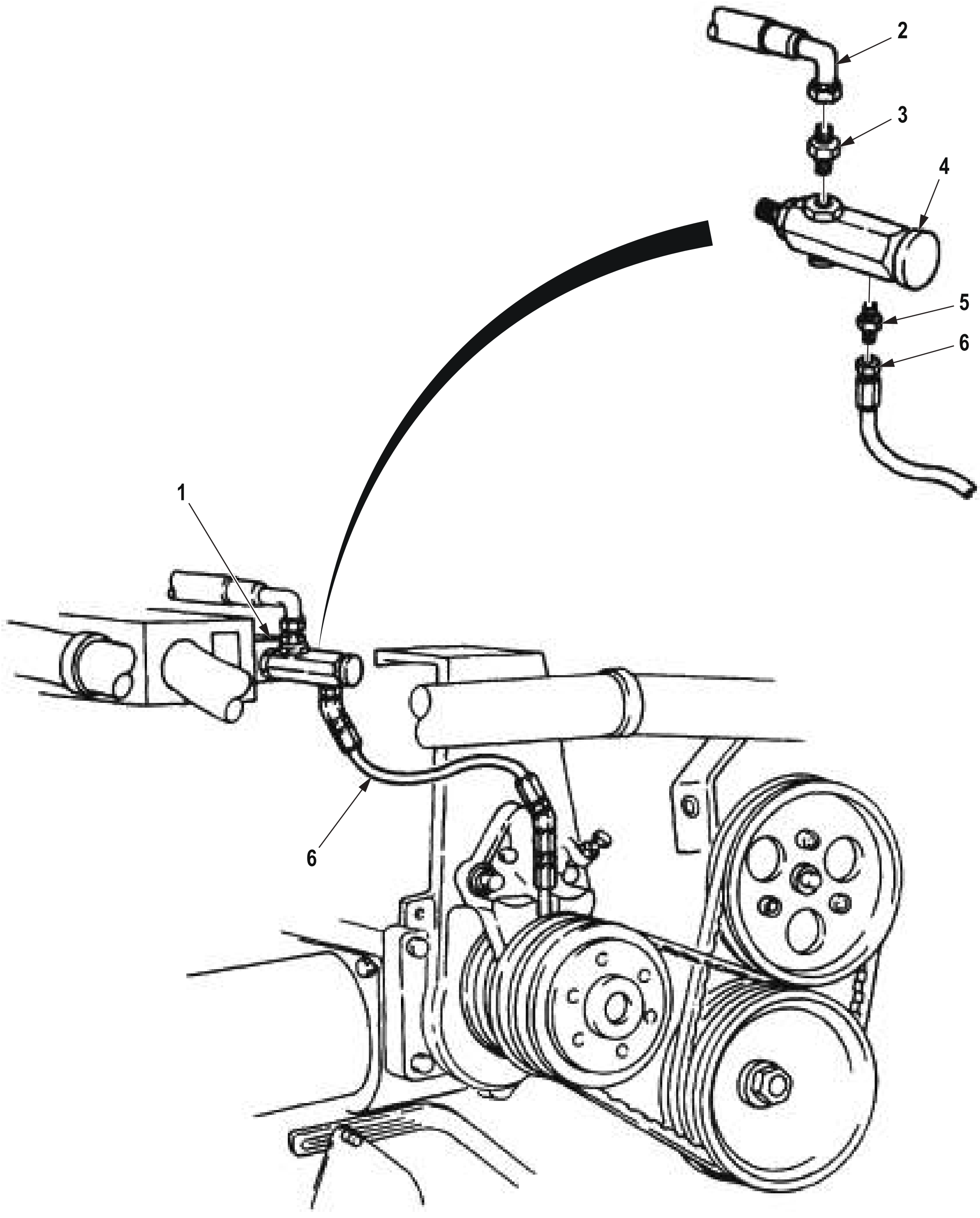


Figure 2. Fan Drive Actuator Installation.

END OF TASK

FOLLOW-ON MAINTENANCE

1. Fill cooling system to proper level. (Volume 2, WP 0287)
2. Start engine and check for air and coolant leaks. (TM 9-2320-272-10)
3. Check for proper operation of actuator. (TM 9-2320-272-10)

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
FAN CLUTCH ACTUATOR REPLACEMENT

INITIAL SETUP:

Tools and Special Tools
Tool Kit, General Mechanic's: Automotive
(Volume 5, WP 0826, Table 1, Item 56)

Materials/Parts
Cap Set, Protective, Dust and Moisture Seal
(Volume 5, WP 0825, Table 1, Item 13)
Tape, Antiseizing
(Volume 5, WP 0825, Table 1, Item 65)

References
Volume 5, WP 0819

Equipment Condition
Parking brake set. (TM 9-2320-272-10)

Equipment Condition (cont.)
Hood raised and secured. (TM 9-2320-272-10)
Coolant drained below water manifold level.
(Volume 2, WP 0287)
Fan and fan shroud removed.
(Volume 2, WP 0283)
Drivebelt removed. (Volume 2, WP 0296)

REMOVAL

1. Disconnect air line (Figure 1, Item 5) and elbow (Figure 1, Item 1) from actuator (Figure 1, Item 2).
2. Disconnect air line (Figure 1, Item 4) and elbow (Figure 1, Item 3) from actuator (Figure 1, Item 2).

NOTE

Note position of actuator for installation.

3. Remove actuator (Figure 1, Item 2) from radiator inlet tube (Figure 1, Item 6).

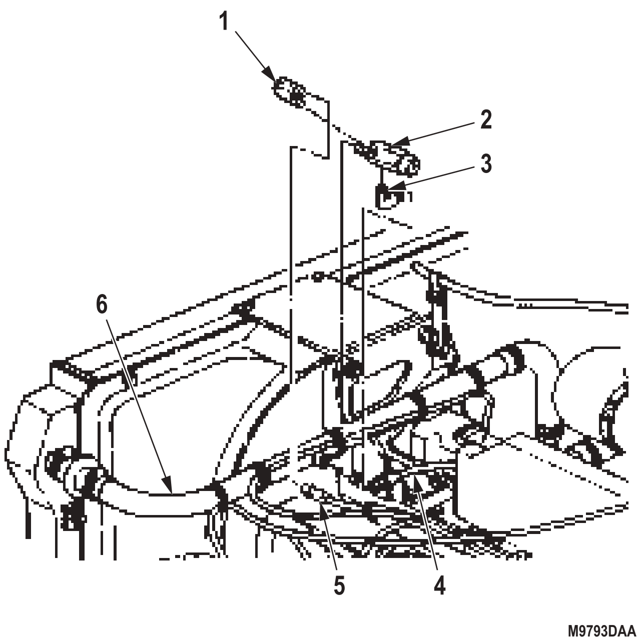


Figure 1. Fan Clutch Actuator Removal.

4. Disconnect air line (Figure 2, Item 1) from elbow (Figure 2, Item 3).
5. Remove elbow (Figure 2, Item 3) from fan clutch (Figure 2, Item 2).

REMOVAL - Continued

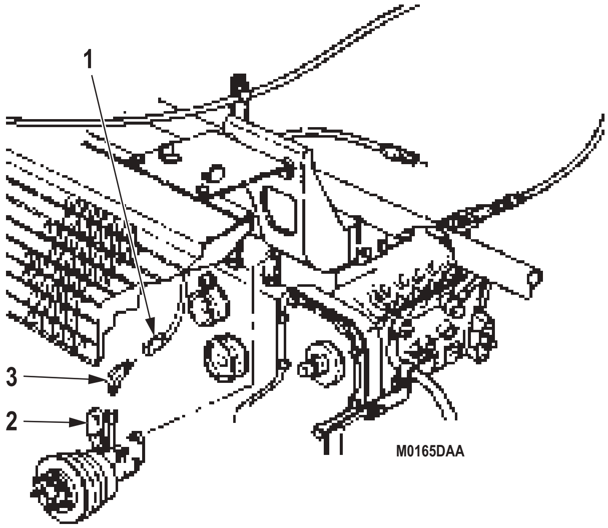


Figure 2. Fan Clutch Actuator Removal.

END OF TASK

CLEANING AND INSPECTION

1. Clean all parts (Volume 5, WP 0819).
2. Inspect air lines (Figure 1, Items 4 and 5) for cracks, kinks, and wear.
3. Inspect other parts (Volume 5, WP 0819).
4. Replace all parts failing inspection.

END OF TASK

INSTALLATION

NOTE

All male threads must be wrapped with antiseize tape before installation.

1. Install elbow (Figure 3, Item 3) on fan clutch (Figure 3, Item 2).
2. Connect air line (Figure 3, Item 1) to elbow (Figure 3, Item 3).

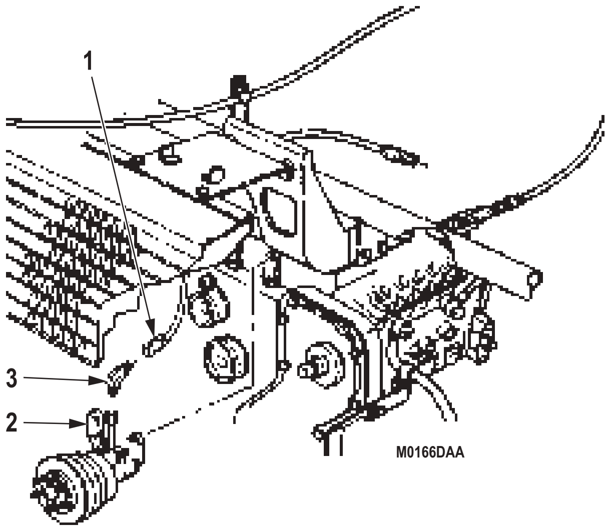


Figure 3. Fan Clutch Actuator Installation.

3. Wrap male pipe threads of actuator (Figure 4, Item 2) with antiseize tape and install in radiator inlet tube (Figure 4, Item 6).
4. Install air line (Figure 4, Item 5) and elbow (Figure 4, Item 1) on actuator (Figure 4, Item 2).
5. Install air line (Figure 4, Item 4) and elbow (Figure 4, Item 3) on actuator (Figure 4, Item 2).

INSTALLATION - Continued

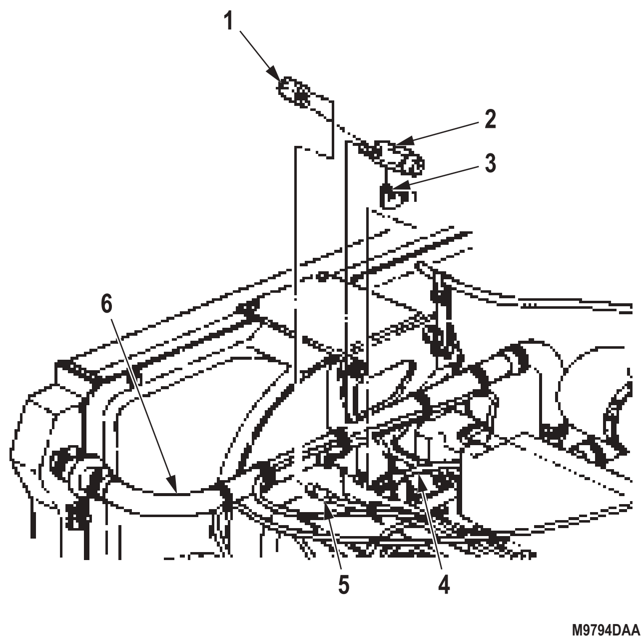


Figure 4. Fan Clutch Actuator Installation.

END OF TASK

FOLLOW-ON MAINTENANCE

1. Fill cooling system to proper level. (Volume 2, WP 0287)
2. Install drivebelt. (Volume 2, WP 0296)
3. Install fan and fan shroud. (Volume 2, WP 0283)
4. Start engine, check for leaks, and tighten any loose fittings. (TM 9-2320-272-10)

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
SPRING BRAKE DASH CONTROL VALVE REPLACEMENT

INITIAL SETUP:

Tools and Special Tools

Tool Kit, General Mechanic's: Automotive
(Volume 5, WP 0826, Table 1, Item 56)
Wrench, Torque, Click, Ratcheting, 3/8" Drive, 75 Ft-Lb
(Volume 5, WP 0826, Table 1, Item 62)

Materials/Parts

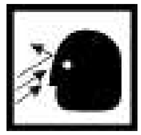
Tape, Antiseizing
(Volume 5, WP 0825, Table 1, Item 65)

Equipment Condition

Parking brake set. (TM 9-2320-272-10)
Spring brake pressure switch removed.
(Volume 2, WP 0308)

REMOVAL

WARNING



Do not disconnect air lines or hoses before draining air reservoirs. Small parts under pressure may shoot out with high velocity. Failure to comply may result in injury or death to personnel.

NOTE

Tag air lines for installation.

1. Disconnect double check valve air line (Figure 1, Item 5) from elbow (Figure 1, Item 4).
2. Disconnect air line (Figure 1, Item 3) from elbow (Figure 1, Item 2).
3. Remove pin (Figure 1, Item 7) and valve knob (Figure 1, Item 9) from dash control valve assembly (Figure 1, Item 6).
4. Remove nut (Figure 1, Item 8) and dash control valve assembly (Figure 1, Item 6) from instrument cluster (Figure 1, Item 1).
5. Remove elbows (Figure 1, Item 2) and (Figure 1, Item 4) from dash control valve assembly (Figure 1, Item 6).

REMOVAL - Continued

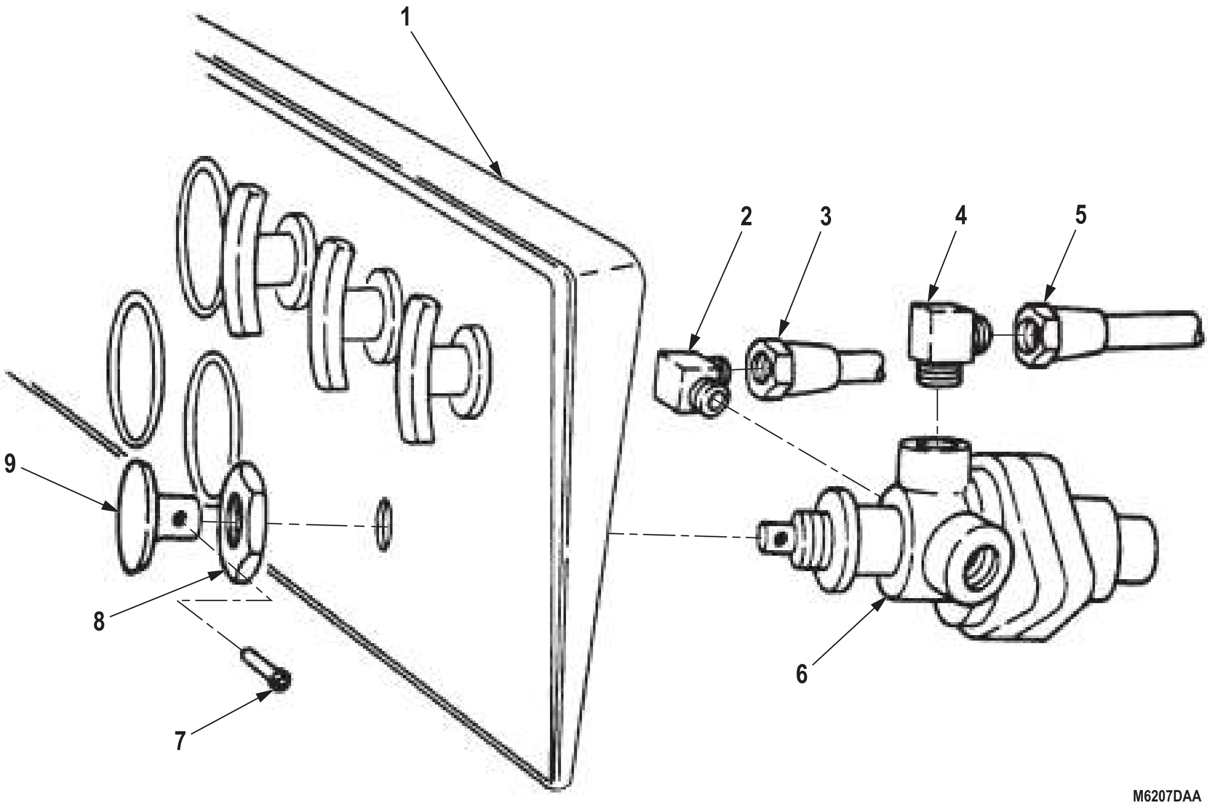


Figure 1. Spring Brake Dash Control Valve Removal.

END OF TASK

INSTALLATION

NOTE

Apply sealant to all male pipe threads before installation.

1. Install elbows (Figure 2, Item 2) and (Figure 2, Item 4) on dash control valve assembly (Figure 2, Item 6).
2. Install dash control valve assembly (Figure 2, Item 6) on instrument cluster (Figure 2, Item 1) with nut (Figure 2, Item 8). Tighten nut 150 to 300 lb-in (17 to 34 N·m).
3. Install valve knob (Figure 2, Item 9) on dash control valve assembly (Figure 2, Item 6) with pin (Figure 2, Item 7).
4. Connect air line (Figure 2, Item 3) to elbow (Figure 2, Item 2).
5. Connect double check valve air line (Figure 2, Item 5) to elbow (Figure 2, Item 4).

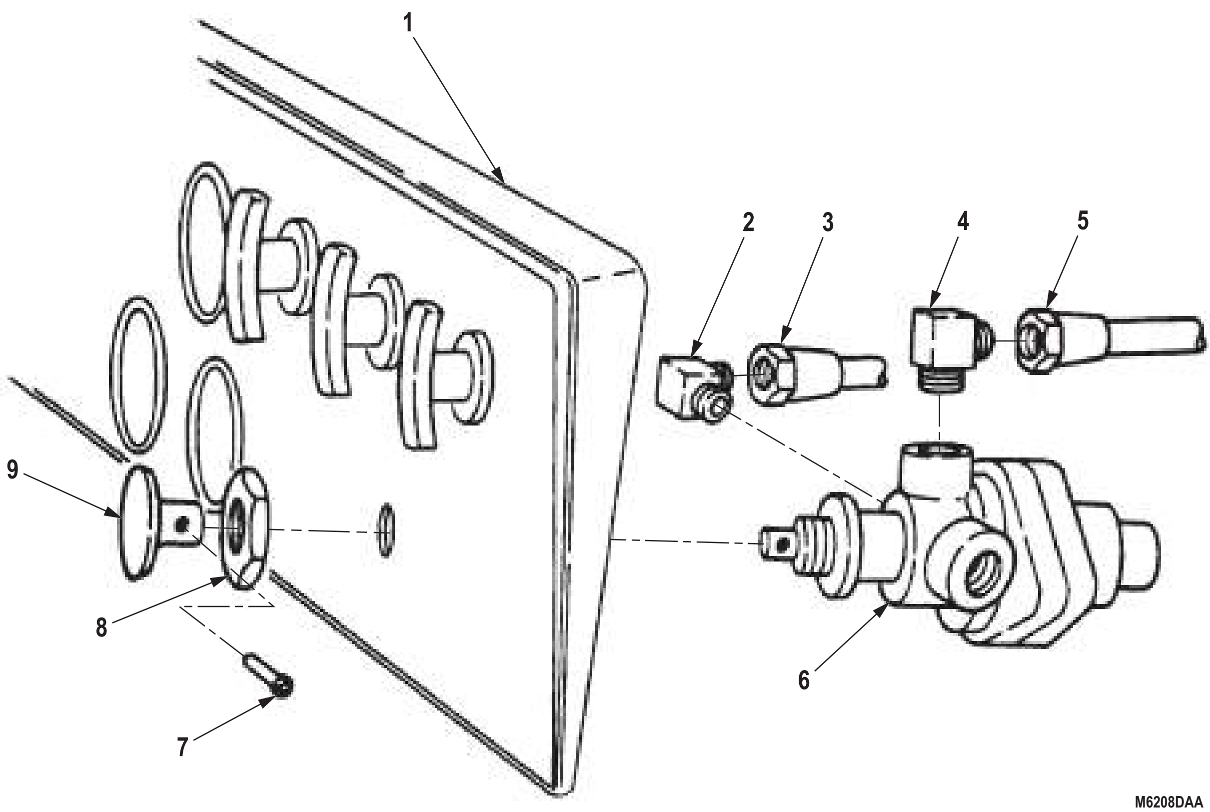


Figure 2. Spring Brake Dash Control Valve Installation.

END OF TASK

FOLLOW-ON MAINTENANCE

1. Install spring brake pressure switch. (Volume 2, WP 0308)
2. Start engine and allow pressure to build to normal operating range. Check for air leaks at dash control valve. Check valve for proper operation. Road test vehicle. (TM 9-2320-272-10)

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
AIR COUPLINGS REPLACEMENT

INITIAL SETUP:

Tools and Special Tools

Tool Kit, General Mechanic's: Automotive
(Volume 5, WP 0826, Table 1, Item 56)
Caps, Vise Jaw
(Volume 5, WP 0826, Table 1, Item 14)

Materials/Parts

Tape, Antiseizing
(Volume 5, WP 0825, Table 1, Item 65)
Locknut (Volume 5, WP 0827, Table 1, Item 282)
Qty: 12
Lockwasher
(Volume 5, WP 0827, Table 1, Item 388)
Qty: 6

Equipment Condition

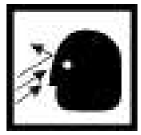
Parking brake set. (TM 9-2320-272-10)

Equipment Condition (cont.)

Air reservoirs drained. (TM 9-2320-272-10)
Right and left splash shields removed.
(TM 9-2320-272-10)

FRONT AIR COUPLINGS REMOVAL

WARNING



Do not disconnect air lines or hoses before draining air reservoirs. Small parts under pressure may shoot out with high velocity. Failure to comply may result in injury or death to personnel.

1. Remove dummy couplings (Figure 1, Items 1 and 15) and S-hook (Figure 1, Item 12) from air coupling (Figure 1, Item 2) and bracket (Figure 1, Item 5). Dummy coupling (Figure 1, Item 1) has a built-in check valve.

NOTE

Perform Steps (2) and (3) for emergency coupling on left side of vehicle.

2. Remove air coupling (Figure 1, Item 2) from pipe nipple (Figure 1, Item 14).
3. Remove pipe nipple (Figure 1, Item 14) from valve (Figure 1, Item 13).
4. Disconnect air line (Figure 1, Item 11) from elbow (Figure 1, Item 10).
5. Remove elbow (Figure 1, Item 10) from adapter (Figure 1, Item 4).
6. Remove nut (Figure 1, Item 9), lockwasher (Figure 1, Item 8), adapter (Figure 1, Item 4), identification plate (Figure 1, Item 6), and bracket (Figure 1, Item 5) from frame rail (Figure 1, Item 7). Discard lockwasher.
7. Remove adapter (Figure 1, Item 4) from elbow (Figure 1, Item 3).

NOTE

Perform Step (8) for service coupling on right side of vehicle.

8. Remove elbow (Figure 1, Item 3) from air coupling (Figure 1, Item 2).

NOTE

Perform Step (9) for emergency coupling on left side of vehicle.

9. Remove elbow (Figure 1, Item 3) from valve (Figure 1, Item 13).

FRONT AIR COUPLINGS REMOVAL - Continued

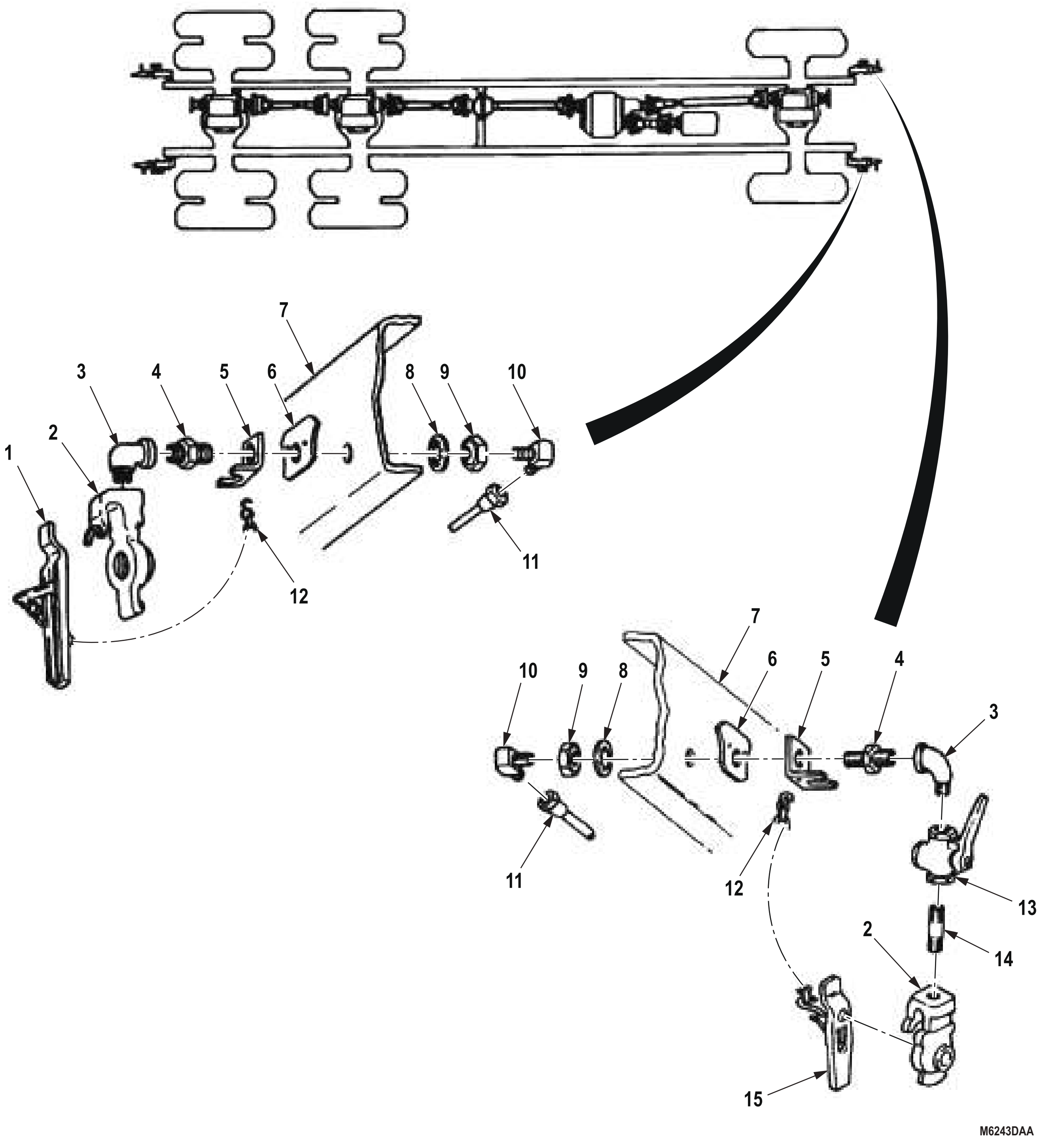


Figure 1. Front Air Coupling Removal.

END OF TASK

REAR AIR COUPLINGS REMOVAL (M923/A1/A2)

1. Remove dummy coupling (Figure 2, Item 9) and S-hook (Figure 2, Item 8) from air coupling (Figure 2, Item 10) and bracket (Figure 2, Item 11).
2. Remove air coupling (Figure 2, Item 10) and pipe nipple (Figure 2, Item 7) from valve (Figure 2, Item 12).
3. Disconnect air line (Figure 2, Item 1) from elbow (Figure 2, Item 2).
4. Remove elbow (Figure 2, Item 2) from pipe coupling (Figure 2, Item 3).
5. Remove pipe coupling (Figure 2, Item 3) from adapter (Figure 2, Item 4).
6. Remove four locknuts (Figure 2, Item 15), washers (Figure 2, Item 14), screws (Figure 2, Item 6), bracket (Figure 2, Item 11), and plate (Figure 2, Item 13) from frame rail (Figure 2, Item 5). Discard locknuts.

NOTE

Perform Step (7) for emergency coupling on right side of vehicle.

7. Loosen nut (Figure 2, Item 18) from adapter (Figure 2, Item 4).
8. Remove valve (Figure 2, Item 12) from elbow (Figure 2, Item 16).

NOTE

Perform Step (9) for service coupling on left side of vehicle.

9. Remove elbow (Figure 2, Item 16) and pipe coupling (Figure 2, Item 17) from adapter (Figure 2, Item 4).
10. Remove elbow (Figure 2, Item 16) from adapter (Figure 2, Item 4).
11. Remove nut (Figure 2, Item 18), lockwasher (Figure 2, Item 19), identification plate (Figure 2, Item 20), and adapter (Figure 2, Item 4) from frame rail (Figure 2, Item 5). Discard lockwasher.

REAR AIR COUPLINGS REMOVAL (M923/A1/A2) - Continued

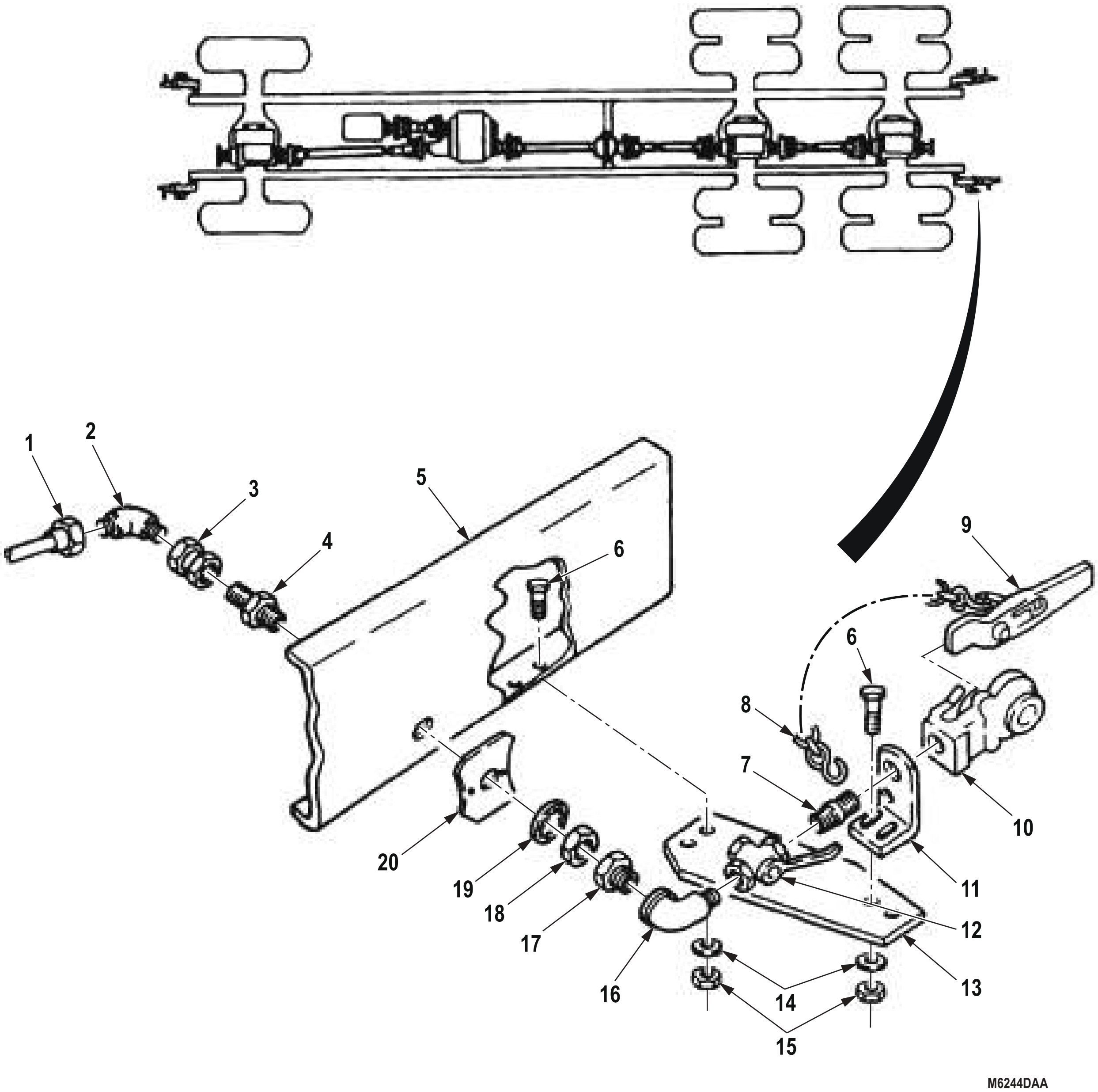


Figure 2. Rear Air Couplings Removal (M923/A1/A2).

END OF TASK

REAR AIR COUPLINGS REMOVAL (M929/A1/A2, M931/A1/A2, M934/A1/A2, M936/A1/A2)

NOTE

Left and right (service and emergency) rear couplings are removed the same way.

1. Remove dummy coupling (Figure 3, Item 10) and S-hook (Figure 3, Item 13) from air coupling (Figure 3, Item 9) and bracket (Figure 3, Item 14).
2. Remove air coupling (Figure 3, Item 9) from pipe nipple (Figure 3, Item 11).
3. Disconnect air line (Figure 3, Item 1) from adapter (Figure 3, Item 2).
4. Remove adapter (Figure 3, Item 2) from connector (Figure 3, Item 21).
5. Remove nut (Figure 3, Item 3) and lockwasher (Figure 3, Item 4) from connector (Figure 3, Item 21). Discard lockwasher.
6. Remove two screws (Figure 3, Item 8) and identification plate (Figure 3, Item 12) from bracket (Figure 3, Item 14).
7. Remove two locknuts (Figure 3, Item 17), washers (Figure 3, Item 16), screws (Figure 3, Item 5), plate (Figure 3, Item 6), and bracket (Figure 3, Item 14) from frame rail (Figure 3, Item 7). Discard locknuts.
8. Remove pipe nipple (Figure 3, Item 11) from elbow (Figure 3, Item 15).
9. Place valve (Figure 3, Item 18) in soft-jawed vise and remove elbow (Figure 3, Item 15) from valve.
10. Remove connector (Figure 3, Item 21) from elbow (Figure 3, Item 20).
11. Remove elbow (Figure 3, Item 20) from pipe nipple (Figure 3, Item 19).
12. Remove pipe nipple (Figure 3, Item 19) from valve (Figure 3, Item 18).
13. Remove valve (Figure 3, Item 18) from soft-jawed vise.

REAR AIR COUPLINGS REMOVAL (M929/A1/A2, M931/A1/A2, M934/A1/A2, M936/A1/A2) - Continued

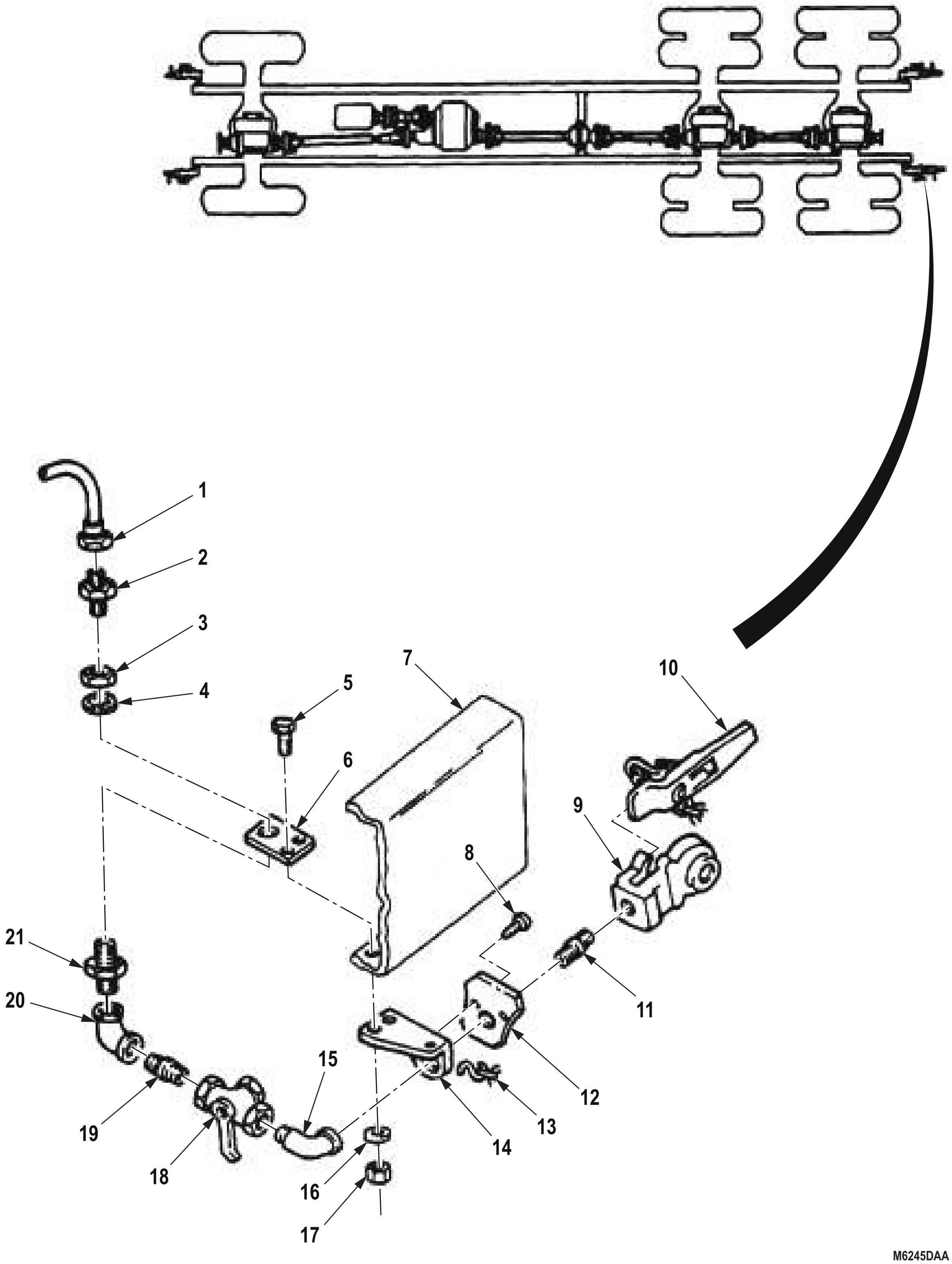


Figure 3. Rear Air Couplings Removal (M929/A1/A2, M931/A1/A2, M934/A1/A2, M936/A1/A2).

END OF TASK

FRONT AIR COUPLINGS INSTALLATION

NOTE

- Fittings must be cleaned and inspected for cracks and stripped threads.
- Apply sealant to all male pipe threads before installation.
- Perform Step (1) for emergency coupling on left side of vehicle.

1. Install elbow (Figure 4, Item 3) in valve (Figure 4, Item 13).

NOTE

Perform Step (2) for service coupling on right side of vehicle.

2. Install elbow (Figure 4, Item 3) in air coupling (Figure 4, Item 2) and place air coupling in soft-jawed vise.
3. Install adapter (Figure 4, Item 4) in elbow (Figure 4, Item 3) and remove air coupling (Figure 4, Item 2) from vise.
4. Install identification plate (Figure 4, Item 6), bracket (Figure 4, Item 5), and adapter (Figure 4, Item 4) in frame rail (Figure 4, Item 7) with lockwasher (Figure 4, Item 8) and nut (Figure 4, Item 9).
5. Install elbow (Figure 4, Item 10) on adapter (Figure 4, Item 4).
6. Connect air line (Figure 4, Item 11) to elbow (Figure 4, Item 10).

NOTE

Perform Steps (7) and (8) for emergency coupling on left side of vehicle.

7. Install pipe nipple (Figure 4, Item 14) in valve (Figure 4, Item 13).
8. Install air coupling (Figure 4, Item 2) on pipe nipple (Figure 4, Item 14).
9. Install dummy couplings (Figure 4, Item 15) and (Figure 4, Item 4) and S-hook (Figure 4, Item 12) on air coupling (Figure 4, Item 2) and bracket (Figure 4, Item 5).

FRONT AIR COUPLINGS INSTALLATION - Continued

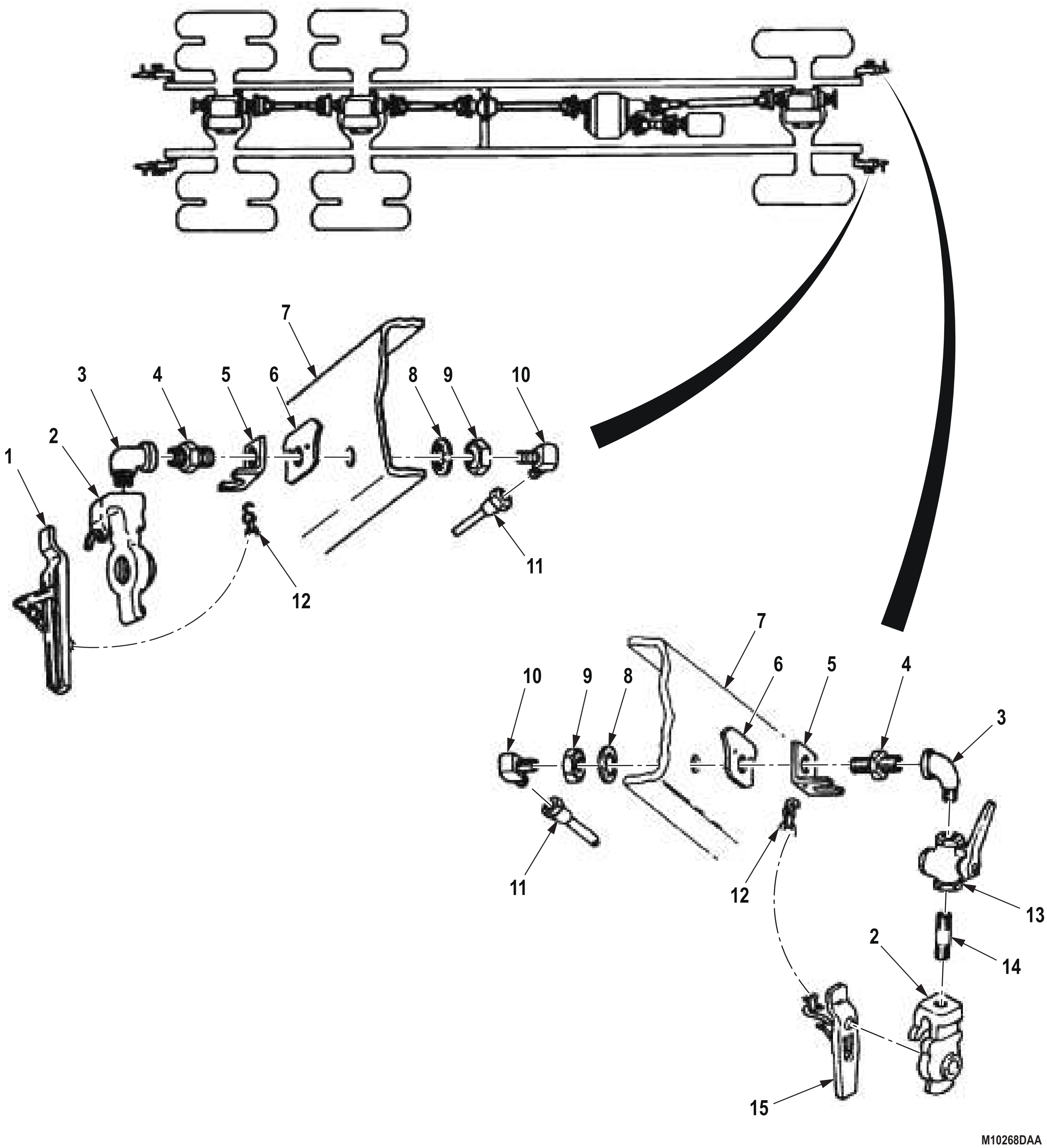


Figure 4. Front Air Coupling Installation.

END OF TASK

REAR AIR COUPLINGS INSTALLATION (M923/A1/A2)

NOTE

- Fittings must be cleaned and inspected for cracks and stripped threads.
- Apply sealant to all male pipe threads before installation.

1. Install adapter (Figure 5, Item 4) and identification plate (Figure 5, Item 20) in frame rail (Figure 5, Item 5) with lockwasher (Figure 5, Item 19) and nut (Figure 5, Item 18). Do not tighten nut.

NOTE

Perform Steps (2) and (3) for service coupling on left side of vehicle.

2. Install pipe coupling (Figure 5, Item 17) on adapter (Figure 5, Item 4).
3. Install elbow (Figure 5, Item 16) on pipe coupling (Figure 5, Item 17).
4. Install valve (Figure 5, Item 12) and pipe nipple (Figure 5, Item 7) on elbow (Figure 5, Item 16).
5. Install plate (Figure 5, Item 13) and bracket (Figure 5, Item 11) to frame rail (Figure 5, Item 5) with four screws (Figure 5, Item 6), washers (Figure 5, Item 14), and locknuts (Figure 5, Item 15).

NOTE

Perform Step (6) for emergency coupling on right side of vehicle.

6. Tighten nut (Figure 5, Item 18).
7. Install pipe coupling (Figure 5, Item 3) on adapter (Figure 5, Item 4).
8. Install elbow (Figure 5, Item 2) in pipe coupling (Figure 5, Item 3).
9. Connect air line (Figure 5, Item 1) to elbow (Figure 5, Item 2).
10. Install air coupling (Figure 5, Item 10) on pipe nipple (Figure 5, Item 7).
11. Install dummy coupling (Figure 5, Item 9) and S-hook (Figure 5, Item 8) on air coupling (Figure 5, Item 10) and bracket (Figure 5, Item 11).

REAR AIR COUPLINGS INSTALLATION (M923/A1/A2) - Continued

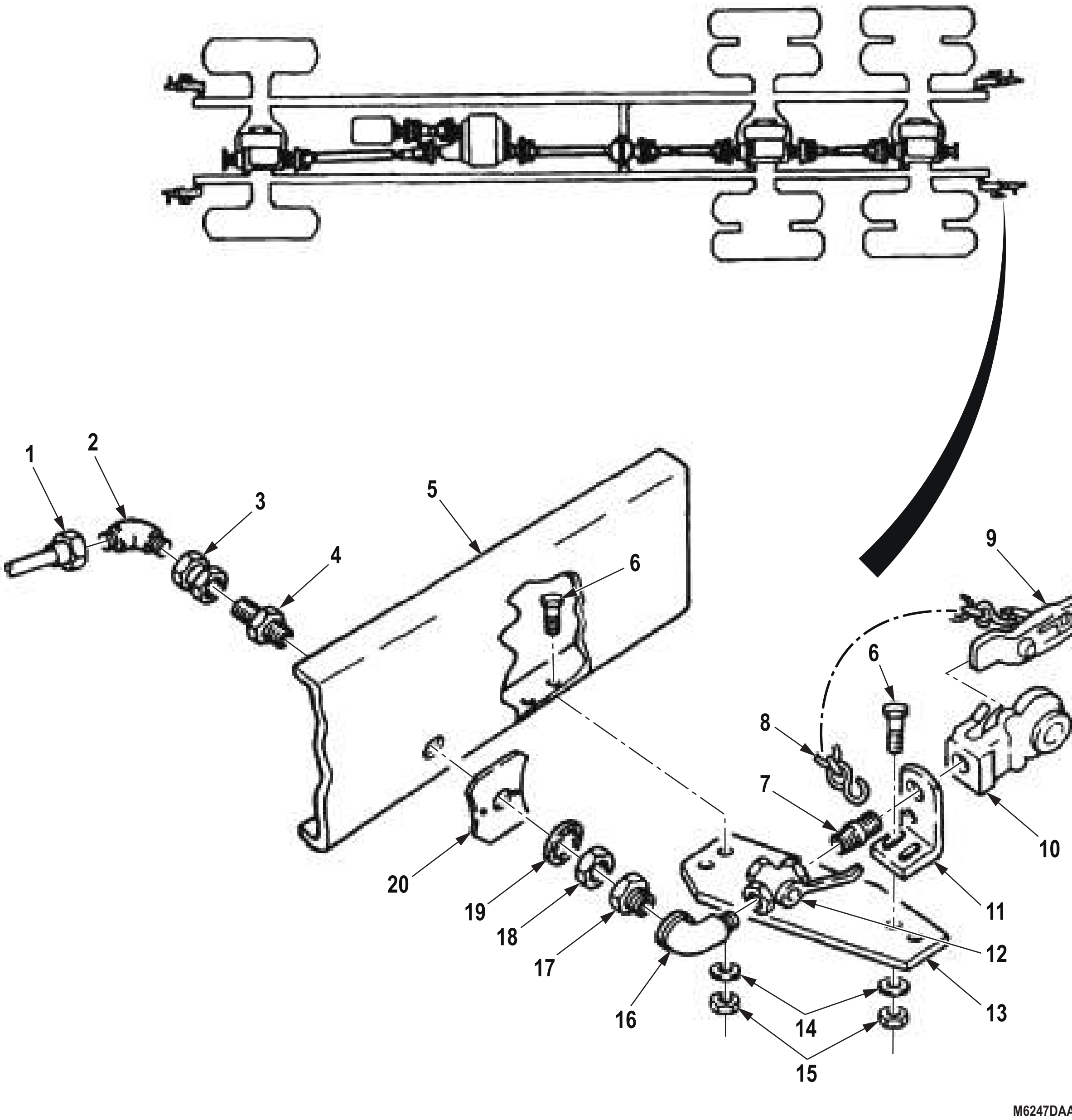


Figure 5. Rear Air Couplings Installation (M923/A1/A2).

END OF TASK

REAR AIR COUPLINGS INSTALLATION (M929/A1/A2, M931/A1,A2, M934/A1/A2, M936/A1/A2)

NOTE

- Left and right (service and emergency) rear couplings are installed the same way.
- Fittings must be cleaned and inspected for cracks and stripped threads.
- Apply sealant to all male pipe threads before installation.

1. Install bracket (Figure 6, Item 14) and plate (Figure 6, Item 6) on frame rail (Figure 6, Item 7) with two screws (Figure 6, Item 5), washers (Figure 6, Item 16), and locknuts (Figure 6, Item 17).
2. Install identification plate (Figure 6, Item 12) on bracket (Figure 6, Item 14) with two screws (Figure 6, Item 8).
3. Install valve (Figure 6, Item 18), pipe nipple (Figure 6, Item 19), elbow (Figure 6, Item 20), connector (Figure 6, Item 21), elbow (Figure 6, Item 15), and pipe nipple (Figure 6, Item 11) on bracket (Figure 6, Item 14) and plate (Figure 6, Item 6) with lockwasher (Figure 6, Item 4) and nut (Figure 6, Item 3).
4. Install adapter (Figure 6, Item 2) in connector (Figure 6, Item 21).
5. Connect air line (Figure 6, Item 1) to adapter (Figure 6, Item 2).
6. Install air coupling (Figure 6, Item 9) on pipe nipple (Figure 6, Item 11).
7. Install dummy coupling (Figure 6, Item 10) and S-hook (Figure 6, Item 13) on air coupling (Figure 6, Item 9) and bracket (Figure 6, Item 14).

REAR AIR COUPLINGS INSTALLATION (M929/A1/A2, M931/A1,A2, M934/A1/A2, M936/A1/A2) - Continued

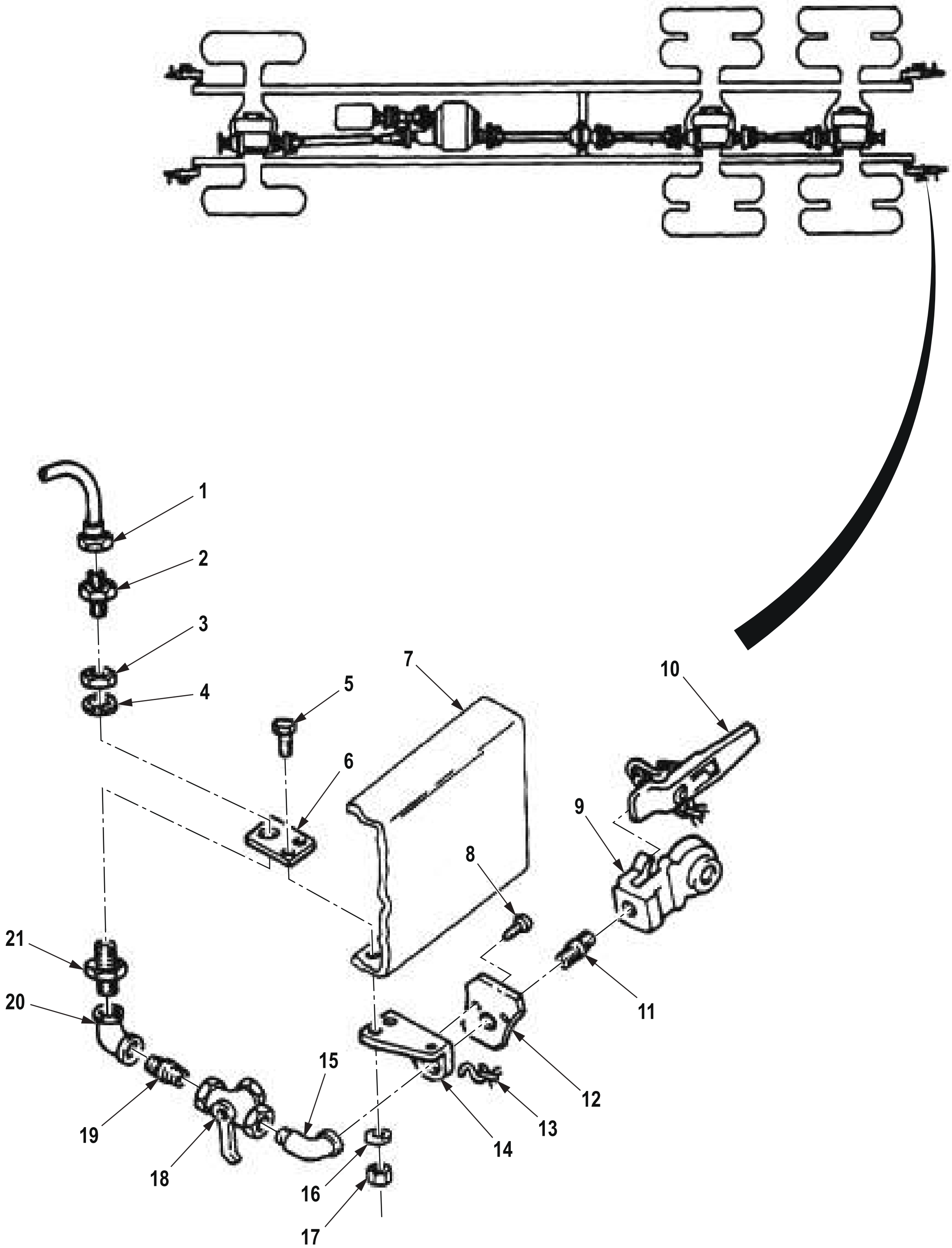


Figure 6. Rear Air Couplings Installation (M929/A1/A2, M931/A1,A2, M934/A1/A2, M936/A1/A2).

END OF TASK

FOLLOW-ON MAINTENANCE

1. Install right and left splash shields. (TM 9-2320-272-10)
2. Start engine and allow air pressure to build to normal operating range. Check for air leaks and road test vehicle. (TM 9-2320-272-10)

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
WET RESERVOIR (SUPPLY TANK) SAFETY VALVE REPLACEMENT

INITIAL SETUP:

Tools and Special Tools
Tool Kit, General Mechanic's: Automotive
(Volume 5, WP 0826, Table 1, Item 56)

Materials/Parts
Tape, Antiseizing
(Volume 5, WP 0825, Table 1, Item 65)

Equipment Condition
Parking brake set. (TM 9-2320-272-10)

Equipment Condition (cont.)
Air reservoirs drained. (TM 9-2320-272-10)

REMOVAL

WARNING

When performing battery maintenance, ensure batteries are seated and clamped down, all rubber boots are installed, clamps are well down on battery posts, and all battery cables lie flat against top of batteries. Failure to comply may result in damage to equipment, injury, or death to personnel.

Remove safety valve (Figure 1, Item 1) from adapter fitting (Figure 1, Item 2) at inlet side of reservoir (Figure 1, Item 3).

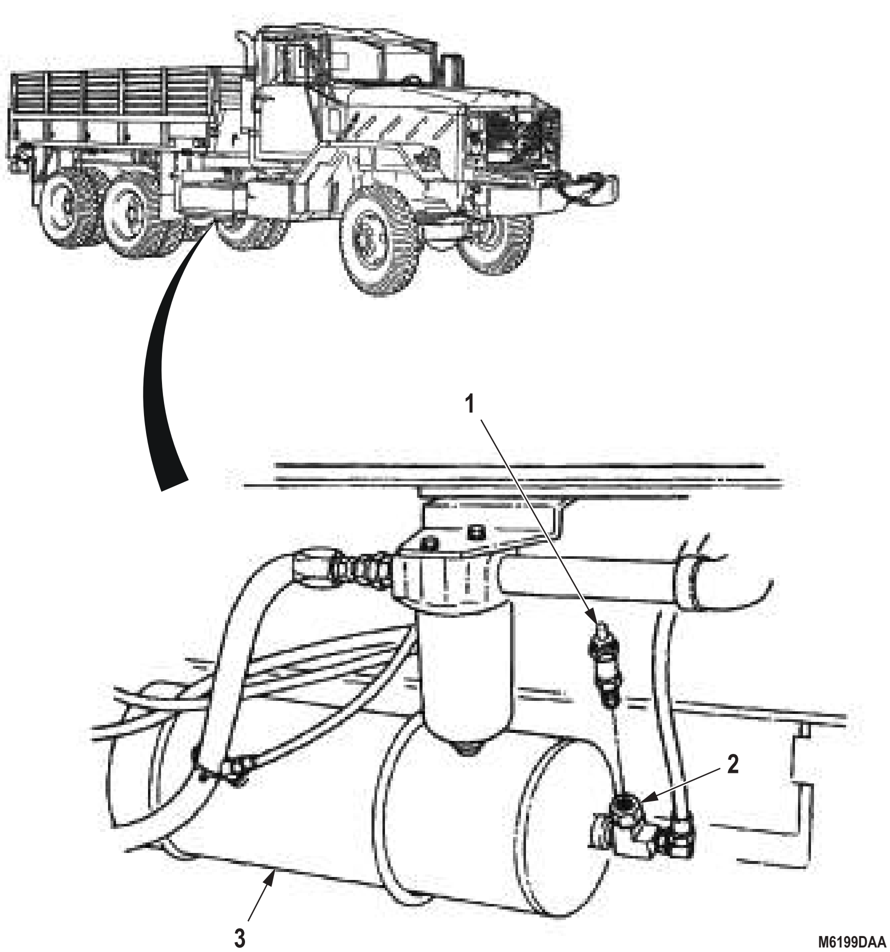


Figure 1. Safety Valve Removal.

END OF TASK

INSTALLATION

NOTE

Wrap male pipe threads with antiseize tape before installation.

Install safety valve (Figure 2, Item 1) in adapter fitting (Figure 2, Item 2) at inlet side of reservoir (Figure 2, Item 3).

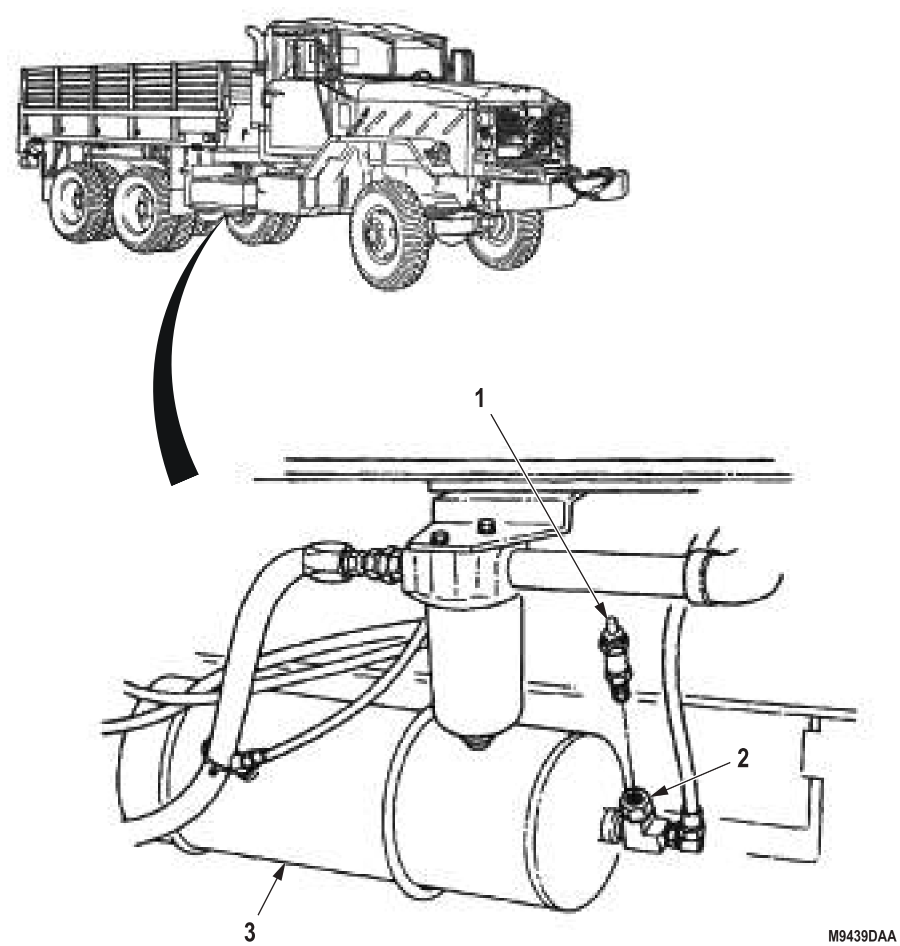


Figure 2. Safety Valve Installation.

END OF TASK

FOLLOW-ON MAINTENANCE

Start engine and allow air pressure to build up to normal operating range. Check for air leaks at safety valve. Road test vehicle. (TM 9-2320-272-10)

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
ABS ELECTRONIC CONTROL UNIT (ECU) REPLACEMENT

INITIAL SETUP:

Tools and Special Tools

Tool Kit, General Mechanic's: Automotive
(Volume 5, WP 0826, Table 1, Item 56)

Equipment Condition

Parking brake set. (TM 9-2320-272-10)
Battery ground cables disconnected.
(Volume 2, WP 0350)

REMOVAL

1. Unlock and open harness support clip (Figure 1, Item 8) on ECU mounting bracket (Figure 1, Item 7).
2. Unlock spring clip (Figure 1, Item 4) and move to side, press down on locking tabs (Figure 1, Item 3) and remove ABS wiring harness connector (Figure 1, Item 5) from ECU connector (Figure 1, Item 6).
3. Remove three screws (Figure 1, Item 2) and ECU (Figure 1, Item 1) from ECU mounting bracket (Figure 1, Item 7) on forward ABS relay valve (Figure 1, Item 9).

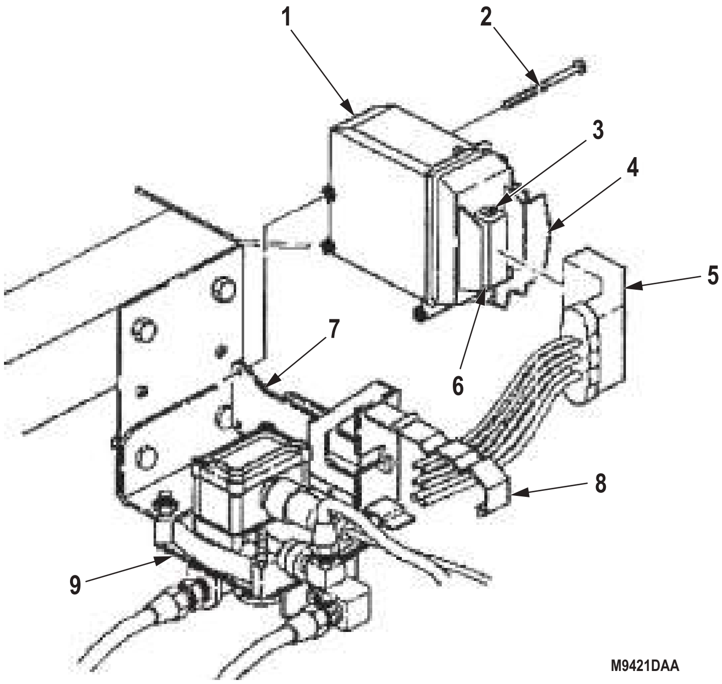


Figure 1. ABS Electronic Control Unit Removal.

END OF TASK

INSTALLATION

1. Install ECU (Figure 2, Item 1) on ECU mounting bracket (Figure 2, Item 7) with three screws (Figure 2, Item 2).
2. Connect ABS wiring harness connector (Figure 2, Item 5) on ECU connector (Figure 2, Item 6) and listen for the locking tabs (Figure 2, Item 3) to click as ABS wiring harness connector is pushed into ECU connector.
3. Lock spring clip (Figure 2, Item 4) over ABS wiring harness connector (Figure 2, Item 5).
4. Close and lock harness support clip (Figure 2, Item 8) on ECU mounting bracket (Figure 2, Item 7) over ABS wiring harness connector (Figure 2, Item 5).

INSTALLATION - Continued

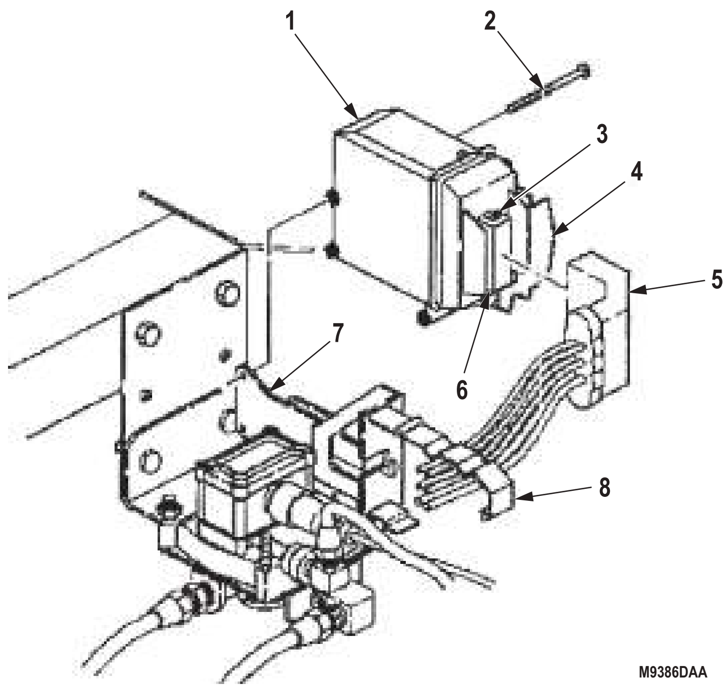


Figure 2. ABS Electronic Control Unit Installation.

END OF TASK

FOLLOW-ON MAINTENANCE

Connect battery ground cables. (Volume 2, WP 0350)

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
ABS DOUBLE CHECK VALVE NO. 5 REPLACEMENT

INITIAL SETUP:

Tools and Special Tools
Tool Kit, General Mechanic's: Automotive
(Volume 5, WP 0826, Table 1, Item 56)

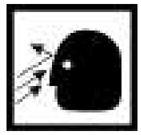
Materials/Parts
Tape, Antiseizing
(Volume 5, WP 0825, Table 1, Item 65)
Locknut (Volume 5, WP 0827, Table 1, Item 286)
Qty: 1

Equipment Condition
Parking brake set. (TM 9-2320-272-10)

Equipment Condition (cont.)
Air reservoirs drained. (TM 9-2320-272-10)

REMOVAL

WARNING



Do not disconnect air lines or hoses before draining air reservoirs. Small parts under pressure may shoot out with high velocity. Failure to comply may result in injury or death to personnel.

NOTE

- Valve located on inside of left frame rail, forward of the front rear axle housing.
- Tag lines and fittings for installation.
- Mark fitting direction for installation.

1. Disconnect two wires (Figure 1, Item 4) from stoplight switch (Figure 1, Item 3).
2. Loosen nut (Figure 1, Item 7) and remove cross fitting air line (Figure 1, Item 8) from elbow (Figure 1, Item 6) on double check valve No. 5 (Figure 1, Item 13).
3. Loosen nut (Figure 1, Item 11) and remove air line (Figure 1, Item 10) from elbow (Figure 1, Item 12) on tee (Figure 1, Item 13).
4. Loosen nut (Figure 1, Item 15) and remove air line (Figure 1, Item 14) from tee (Figure 1, Item 13).
5. Remove locknut (Figure 1, Item 2), screw (Figure 1, Item 6), washer (Figure 1, Item 17), and double check valve (Figure 1, Item 9) from frame rail (Figure 1, Item 1). Discard locknut.
6. Remove elbow (Figure 1, Item 12) from tee (Figure 1, Item 13).
7. Remove tee (Figure 1, Item 13) from double check valve (Figure 1, Item 9).
8. Remove elbow (Figure 1, Item 6) from end of double check valve (Figure 1, Item 9).
9. Remove stoplight switch (Figure 1, Item 3) from elbow (Figure 1, Item 5).
10. Remove elbow (Figure 1, Item 5) from double check valve (Figure 1, Item 9).

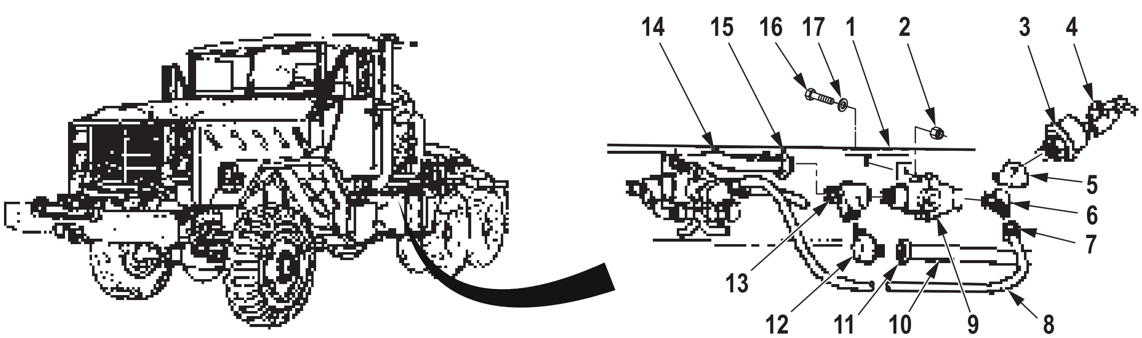


Figure 1. Double Check Valve No. 5 Removal.

END OF TASK

INSTALLATION

NOTE

- If double check valve is being installed, use fittings from old double check valve.
- Apply sealant to all male pipe threads before installation.

1. Install elbow (Figure 2, Item 5) on double check valve (Figure 2, Item 9).
2. Install stoplight switch (Figure 2, Item 3) on elbow (Figure 2, Item 5).
3. Install elbow (Figure 2, Item 6) on end of double check valve (Figure 2, Item 9).
4. Install tee (Figure 2, Item 13) on double check valve (Figure 2, Item 9).
5. Install elbow (Figure 2, Item 12) on tee (Figure 2, Item 13).
6. Install double check valve (Figure 2, Item 9) on frame rail (Figure 2, Item 1) with screw (Figure 2, Item 16), washer (Figure 2, Item 17), and locknut (Figure 2, Item 2).
7. Install air line (Figure 2, Item 14) on tee (Figure 2, Item 13) and tighten nut (Figure 2, Item 15).
8. Install air line (Figure 2, Item 10) on elbow (Figure 2, Item 12) and tighten nut (Figure 2, Item 11).
9. Install cross fitting air line (Figure 1, Item 8) on elbow (Figure 2, Item 6) and tighten nut (Figure 2, Item 7).
10. Connect two wires (Figure 2, Item 4) to stoplight switch (Figure 2, Item 3).

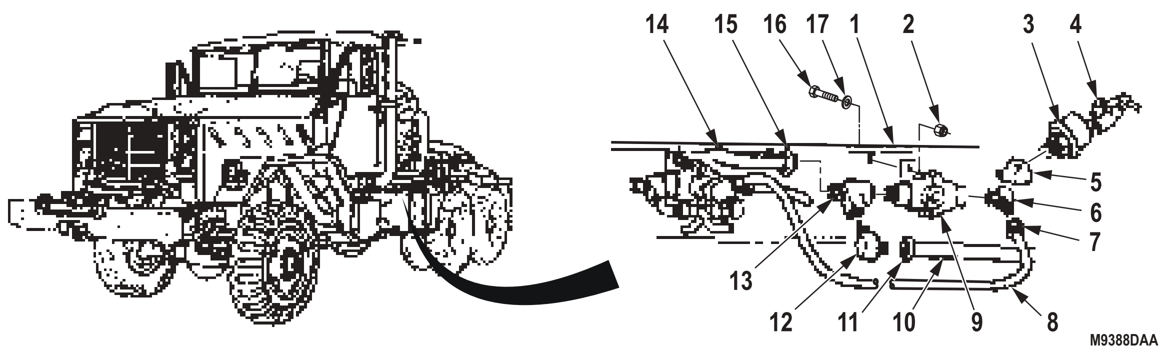


Figure 2. Double Check Valve No. 5 Installation.

END OF TASK

FOLLOW-ON MAINTENANCE

1. Start engine and allow air pressure to build to normal operating range. (TM 9-2320-272-10)
2. Check for air leaks at double check valve No. 5. (TM 9-2320-272-10)
3. Road test vehicle. (TM 9-2320-272-10)

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
ABS DOUBLE CHECK VALVE NO. 6 REPLACEMENT

INITIAL SETUP:

Tools and Special Tools
Tool Kit, General Mechanic's: Automotive
(Volume 5, WP 0826, Table 1, Item 56)

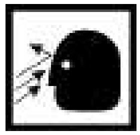
Materials/Parts
Sealing Compound
(Volume 5, WP 0825, Table 1, Item 61)
Locknut (Volume 5, WP 0827, Table 1, Item 284)
Qty: 1

Equipment Condition
Parking brake set. (TM 9-2320-272-10)

Equipment Condition (cont.)
Air reservoirs drained. (TM 9-2320-272-10)

REMOVAL

WARNING



Do not disconnect air lines or hoses before draining air reservoirs. Small parts under pressure may shoot out with high velocity. Failure to comply may result in injury or death to personnel.

NOTE

- Double check valve No. 6 is located inside the left frame rail and rearward of the front axle differential.
- Tag air lines for installation.

1. Loosen nut (Figure 1, Item 7) and remove primary delivery air line (Figure 1, Item 8) from adapter (Figure 1, Item 9) on double check valve No. 6 (Figure 1, Item 5).
2. Loosen nut (Figure 1, Item 15) and remove inversion valve air line (Figure 1, Item 16) from tee fitting (Figure 1, Item 12) on double check valve (Figure 1, Item 5).
3. Loosen nut (Figure 1, Item 13) and remove air line (Figure 1, Item 14) from tee fitting (Figure 1, Item 12) on double check valve (Figure 1, Item 5).
4. Loosen nut (Figure 1, Item 2) and remove service air line (Figure 1, Item 1) from elbow (Figure 1, Item 3) on double check valve (Figure 1, Item 5).
5. Remove locknut (Figure 1, Item 10), screw (Figure 1, Item 6), and double check valve (Figure 1, Item 5) from frame rail (Figure 1, Item 4). Discard locknut.
6. Remove elbow (Figure 1, Item 11) with tee fitting (Figure 1, Item 12) from double check valve (Figure 1, Item 5).
7. Remove tee fitting (Figure 1, Item 12) from elbow (Figure 1, Item 11).
8. Remove elbow (Figure 1, Item 3) from double check valve (Figure 1, Item 5).
9. Remove adapter (Figure 1, Item 9) from double check valve (Figure 1, Item 5).

REMOVAL - Continued

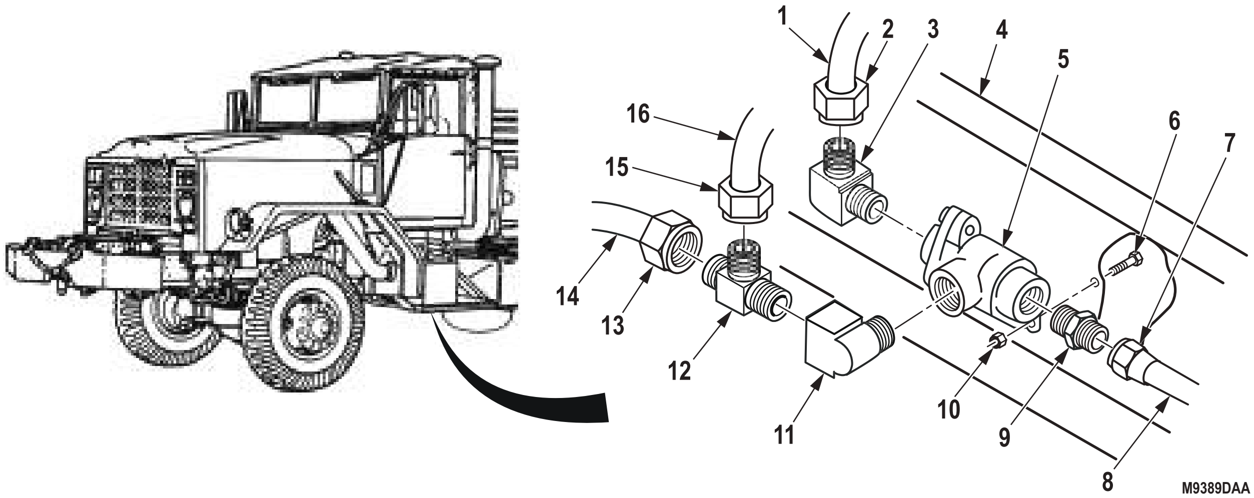


Figure 1. Double Check Valve No. 6 Removal.

END OF TASK

INSTALLATION

NOTE

- If new double check valve is being installed, use fittings from old double check valve.
- Apply sealing compound to all male pipe threads before installation.

1. Install adapter (Figure 2, Item 9) on double check valve No. 6 (Figure 2, Item 5).
2. Install elbow (Figure 2, Item 3) on double check valve (Figure 2, Item 5).
3. Install tee fitting (Figure 2, Item 12) on elbow (Figure 2, Item 11).
4. Install elbow (Figure 2, Item 11) with tee fitting (Figure 2, Item 12) on double check valve (Figure 2, Item 5).
5. Install double check valve (Figure 2, Item 5) on frame rail (Figure 2, Item 4) with screw (Figure 2, Item 6) and locknut (Figure 2, Item 10).
6. Install service air line (Figure 2, Item 1) on elbow (Figure 2, Item 3) and tighten nut (Figure 2, Item 2).
7. Install air line (Figure 2, Item 14) on tee fitting (Figure 2, Item 12) and tighten nut (Figure 2, Item 13).
8. Install inversion valve air line (Figure 2, Item 16) on tee fitting (Figure 2, Item 12) and tighten nut (Figure 2, Item 15).
9. Install primary delivery air line (Figure 2, Item 8) on adapter (Figure 2, Item 9) and tighten nut (Figure 2, Item 7).

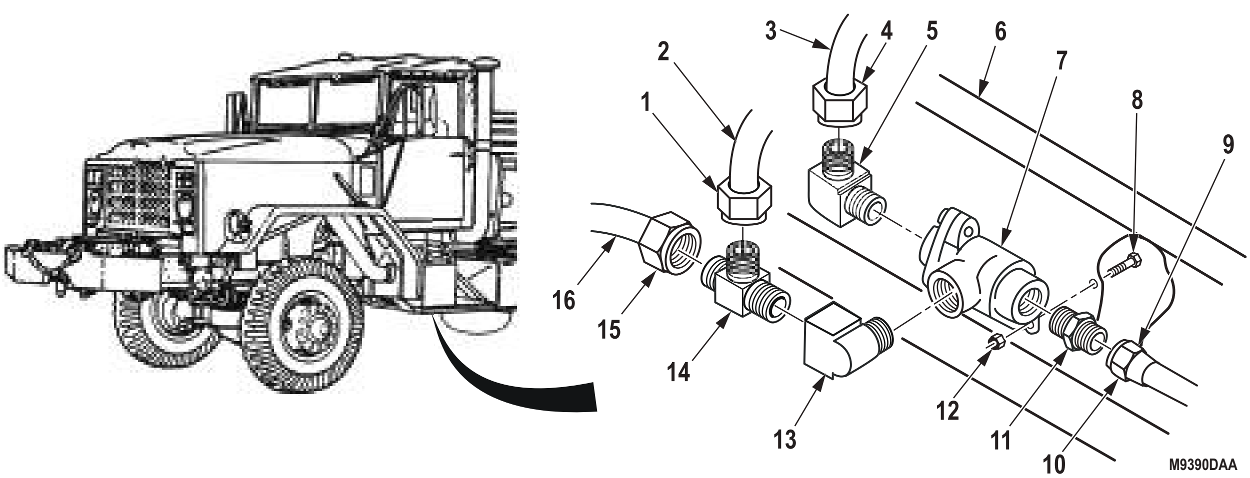


Figure 2. Double Check Valve No. 6 Installation.

END OF TASK

FOLLOW-ON MAINTENANCE

1. Start engine and allow air pressure to build to normal operating range. Check for air leaks at double check valve No. 6. (TM 9-2320-272-10)
2. Road test vehicle. (TM 9-2320-272-10)

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
ABS DOUBLE CHECK VALVE NO. 7 REPLACEMENT

INITIAL SETUP:

Tools and Special Tools
Tool Kit, General Mechanic's: Automotive
(Volume 5, WP 0826, Table 1, Item 56)

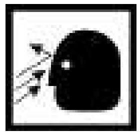
Materials/Parts
Sealing Compound
(Volume 5, WP 0825, Table 1, Item 61)

Equipment Condition
Parking brake set. (TM 9-2320-272-10)

Equipment Condition (cont.)
Air reservoirs drained. (TM 9-2320-272-10)

REMOVAL

WARNING



Do not disconnect air lines or hoses before draining air reservoirs. Small parts under pressure may shoot out with high velocity. Failure to comply may result in injury or death to personnel.

NOTE

- Valve located on drivers (left) side step rail, forward of the front rear axle housing.
- Tag air lines for installation.
- Mark fitting direction for installation.

1. Loosen nut (Figure 1, Item 3) and remove secondary tank jumper air line (Figure 1, Item 2) from adapter (Figure 1, Item 4) on double check valve No. 7 (Figure 1, Item 5).
2. Loosen nut (Figure 1, Item 7) and remove air line (Figure 1, Item 8) from elbow (Figure 1, Item 6) on double check valve (Figure 1, Item 5).
3. Remove elbow (Figure 1, Item 6) from double check valve Figure 1, Item (5).
4. Remove double check valve (Figure 1, Item 5) and reducer (Figure 1, Item 1) from tee (Figure 1, Item 9) on step support bracket (Figure 1, Item 10).
5. Remove adapter (Figure 1, Item 4) from double check valve (Figure 1, Item 5).
6. If reducer (Figure 1, Item 1) comes out of tee (Figure 1, Item 9), remove reducer from double check valve (Figure 1, Item 5).

REMOVAL - Continued

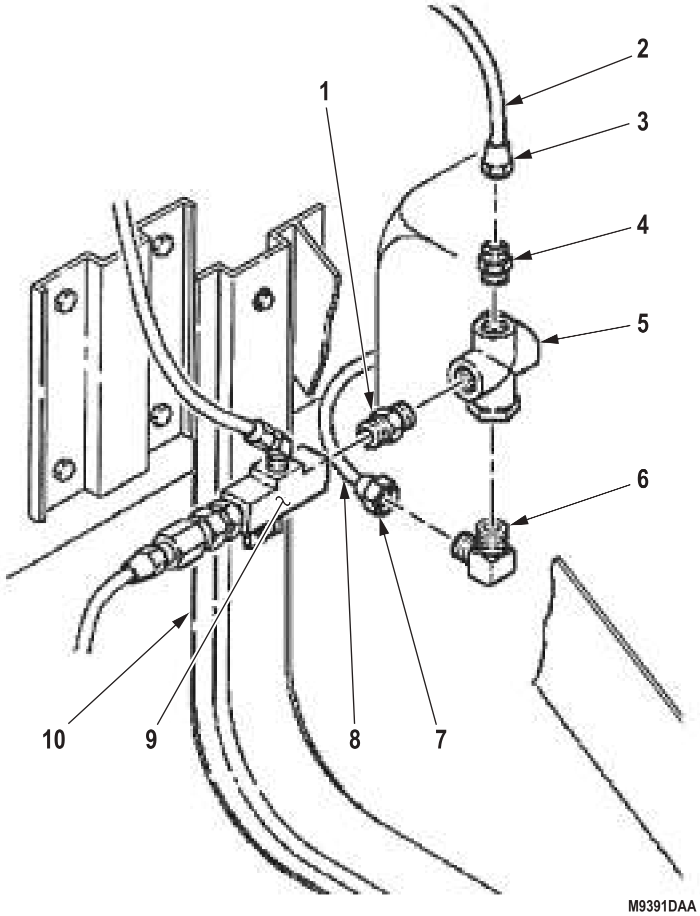


Figure 1. Double Check Valve No. 7 Removal.

END OF TASK

INSTALLATION

NOTE

- If new double check valve is being installed, use fittings from old double check valve.
- Apply sealing compound to all male pipe threads before installation.

1. If removed, install reducer (Figure 2, Item 1) on double check valve No. 7 (Figure 2, Item 5).
2. Install adapter (Figure 2, Item 4) on double check valve (Figure 2, Item 5).
3. Install double check valve (Figure 2, Item 5) on tee (Figure 2, Item 9) mounted on step support bracket (Figure 2, Item 10).
4. Install elbow (Figure 2, Item 6) on double check valve (Figure 2, Item 5).
5. Install air line (Figure 2, Item 8) on elbow (Figure 2, Item 6) and tighten nut (Figure 2, Item 7).
6. Install secondary tank jumper air line (Figure 2, Item 2) on adapter (Figure 2, Item 4) and tighten nut (Figure 2, Item 3).

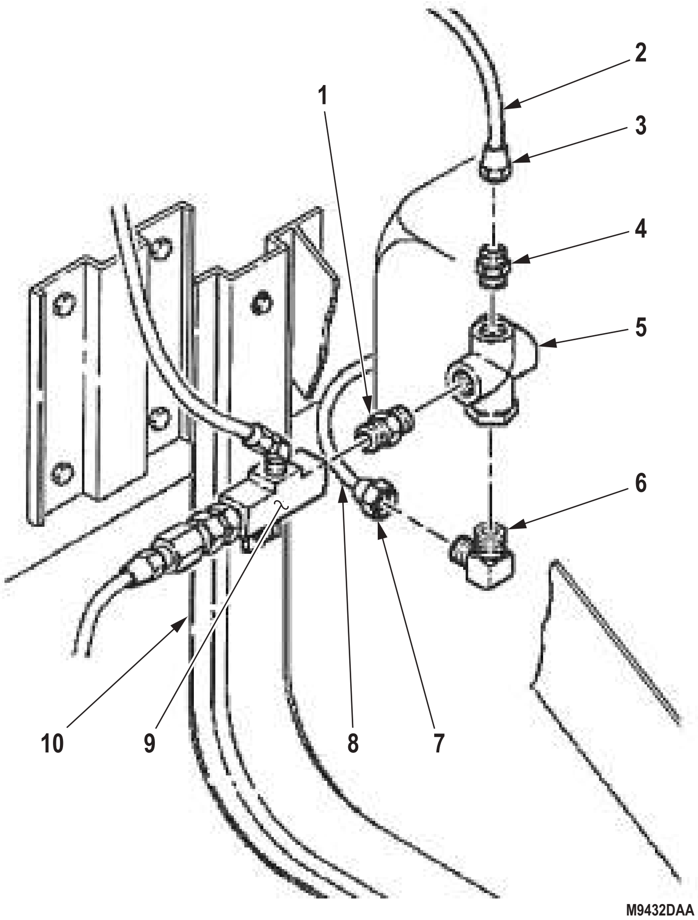


Figure 2. Double Check Valve No. 7 Installation.

END OF TASK

FOLLOW-ON MAINTENANCE

Start engine, allow air pressure to build to normal operating range. Check for air leaks. Road test vehicle. (TM 9-2320-272-10)

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
BRAKE LQ-2 VALVE REPLACEMENT

INITIAL SETUP:

Tools and Special Tools

Tool Kit, General Mechanic's: Automotive
(Volume 5, WP 0826, Table 1, Item 56)

Materials/Parts

Sealing Compound
(Volume 5, WP 0825, Table 1, Item 61)

Materials/Parts (cont.)

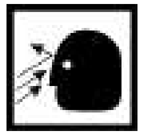
Locknut (Volume 5, WP 0827, Table 1, Item 284)
Qty: 1
Tiedown Strap
(Volume 5, WP 0827, Table 1, Item 298)
Qty: 1

Equipment Condition

Parking brake set. (TM 9-2320-272-10)
Air reservoirs drained. (TM 9-2320-272-10)

REMOVAL

WARNING



Do not disconnect air lines or hoses before draining air reservoirs. Small parts under pressure may shoot out with high velocity. Failure to comply may result in injury or death to personnel.

NOTE

- Tag air lines for installation.
- Mark fitting direction for installation.
- Optional Front Limiting Valve is supplied with all necessary hardware. Removal of fittings is not necessary.
- Perform Steps (3, 8, and 11) only if an early LQ-2 valve is being removed and installed.

1. Remove two tiedown straps (Figure 1, Item 19) from air lines (Figure 1, Items 17, 18, and 22). Discard tiedown straps.
2. Loosen nut (Figure 1, Item 23) and remove air line (Figure 1, Item 22) from elbow (Figure 1, Item 1) on top of brake LQ-2 valve (Figure 1, Item 20).
3. Loosen nuts (Figure 1, Items 10 and 24) and remove air line (Figure 1, Item 7) from elbow (Figure 1, Item 21) and adapter (Figure 1, Item 11) on tee fitting (Figure 1, Item 12).
4. Loosen nut (Figure 1, Item 14) and remove air line (Figure 1, Item 18) from adapter (Figure 1, Item 13) on tee fitting (Figure 1, Item 12).
5. Loosen nut (Figure 1, Item 16) and remove air line (Figure 1, Item 17) from adapter (Figure 1, Item 15) on brake LQ-2 valve (Figure 1, Item 20).
6. Loosen nut (Figure 1, Item 5) and remove air line (Figure 1, Item 6) from adapter (Figure 1, Item 4) on brake LQ-2 valve (Figure 1, Item 20).
7. Remove two locknuts (Figure 1, Item 8), screws (Figure 1, Item 2), washers (Figure 1, Item 3), and brake LQ-2 valve (Figure 1, Item 20) from bracket (Figure 1, Item 9).
8. Remove elbows (Figure 1, Items 1 and 21) from top of brake LQ-2 valve (Figure 1, Item 20).
9. Remove adapters (Figure 1, Items 4 and 16) from sides of brake LQ-2 valve (Figure 1, Item 20).
10. Remove adapters (Figure 1, Items 11 and 13) from tee fitting (Figure 1, Item 12).
11. Remove tee fitting (Figure 1, Item 12) from bottom of brake LQ-2 valve (Figure 1, Item 20).

REMOVAL - Continued

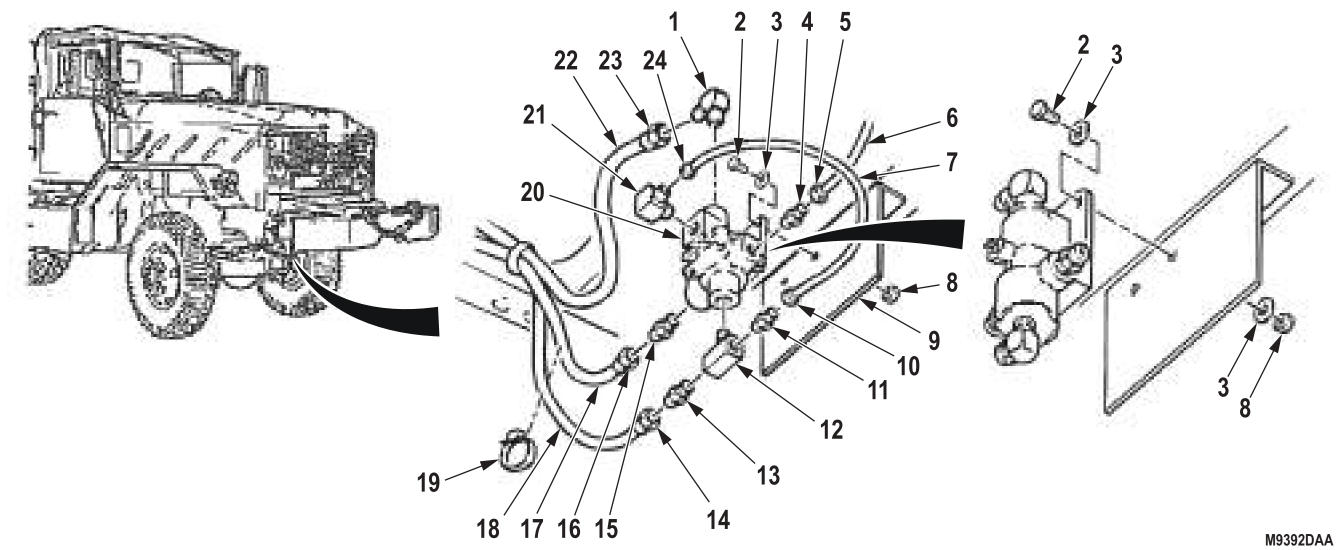


Figure 1. Brake LQ-2 Valve Removal.

END OF TASK

INSTALLATION

NOTE

- If new brake LQ-2 valve is being installed, use attaching parts and fittings from old brake valve.
- Perform Steps (1, 2, and 9) only if an early LQ-2 valve is being installed.
- Optional Front Limiting Valve is supplied with all necessary hardware. Discard all unused hardware if an optional Front Limiting Valve is used to replace an LQ-2 valve.
- Fittings must be cleaned and inspected for cracks and stripped threads.
- Apply sealant to all male pipe threads before installation.

1. Install tee fitting (Figure 2, Item 12) on bottom of brake LQ-2 valve (Figure 2, Item 20).
2. Install adapters (Figure 2, Items 11 and 13) on tee fitting (Figure 2, Item 12).
3. Install adapters (Figure 2, Items 4 and 15) on sides of brake LQ-2 valve (Figure 2, Item 20).
4. Install elbows (Figure 2, Items 1 and 21) on top of brake LQ-2 valve (Figure 2, Item 20).
5. Install brake LQ-2 valve (Figure 2, Item 20) on bracket (Figure 2, Item 9) with two screws (Figure 2, Item 2), washers (Figure 2, Item 3), and locknuts (Figure 2, Item 8).
6. Install air line (Figure 2, Item 6) on adapter (Figure 2, Item 4) of brake LQ-2 valve (Figure 2, Item 20) and tighten nut (Figure 2, Item 5).
7. Install air line (Figure 2, Item 17) on adapter (Figure 2, Item 15) of brake LQ-2 valve (Figure 2, Item 20) and tighten nut (Figure 2, Item 16).
8. Install air line (Figure 2, Item 18) on adapter (Figure 2, Item 13) of tee fitting (Figure 2, Item 12) and tighten nut (Figure 2, Item 14).
9. Install air line (Figure 2, Item 7) on adapter (Figure 2, Item 11) of tee fitting (Figure 2, Item 12) and elbow (Figure 2, Item 21) on brake LQ-2 valve (Figure 2, Item 20) and tighten nuts (Figure 2, Items 10 and 24).
10. Install air line (Figure 2, Item 22) on top elbow (Figure 2, Item 1) of brake LQ-2 valve (Figure 2, Item 20) and tighten nut (Figure 2, Item 23).
11. Install two tiedown straps (Figure 2, Item 19) on air lines (Figure 2, Items 17, 18, and 22).

INSTALLATION - Continued

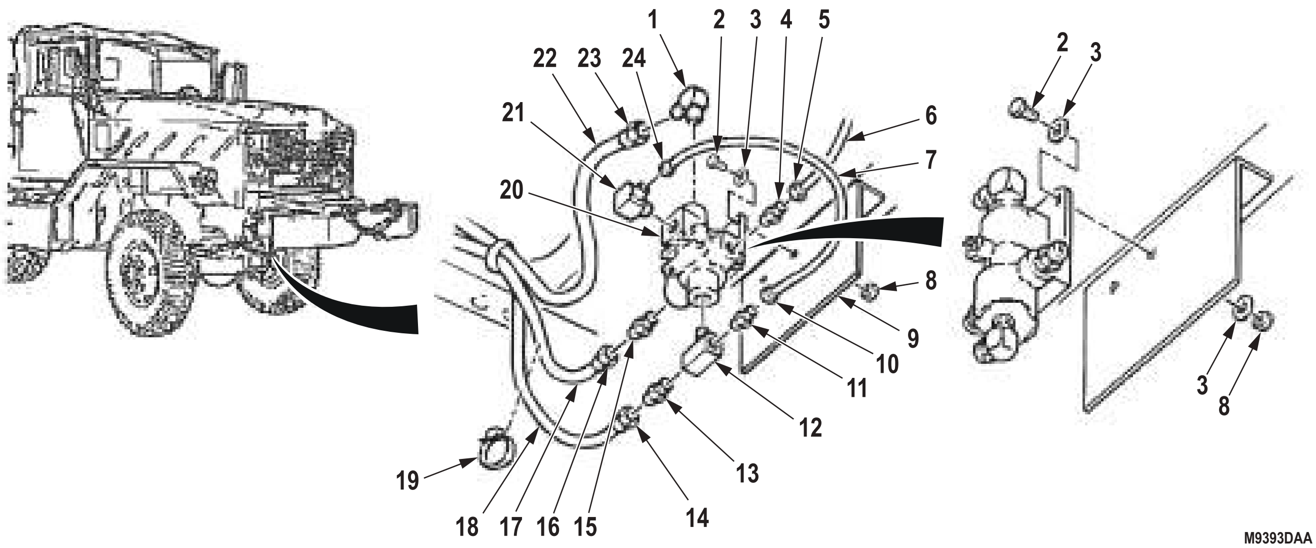


Figure 2. Brake LQ-2 Valve Installation.

END OF TASK

FOLLOW-ON MAINTENANCE

Start engine, allow air pressure to build to normal operating temperature, and check for air leaks and proper front axle engagement. Road test vehicle. (TM 9-2320-272-10)

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
REAR ABS RELAY VALVE REPLACEMENT

INITIAL SETUP:

Tools and Special Tools
Tool Kit, General Mechanic's: Automotive
(Volume 5, WP 0826, Table 1, Item 56)

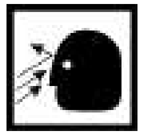
Materials/Parts
Cap Set, Protective, Dust and Moisture Seal
(Volume 5, WP 0825, Table 1, Item 13)
Sealing Compound
(Volume 5, WP 0825, Table 1, Item 61)
Locknut (Volume 5, WP 0827, Table 1, Item 286)
Qty: 2

Equipment Condition
Parking brake set. (TM 9-2320-272-10)

Equipment Condition (cont.)
Air reservoirs drained. (TM 9-2320-272-10)

REMOVAL

WARNING



Do not disconnect air lines or hoses before draining air reservoirs. Small parts under pressure may shoot out with high velocity. Failure to comply may result in injury or death to personnel.

CAUTION

When disconnecting air lines and hoses, plug all openings to prevent dirt from entering and causing damage to internal parts. Remove all plugs prior to installation.

NOTE

- Tag lines and fittings for installation.
- Mark fitting direction for installation.

1. Loosen nut (Figure 1, Item 10) and disconnect yellow channel connector (Figure 1, Item 11) from rear ABS relay valve (Figure 1, Item 1).
2. Loosen nut (Figure 1, Item 13) and remove air line (Figure 1, Item 12) from elbow (Figure 1, Item 14) on control port (Figure 1, Item 2).
3. Loosen nut (Figure 1, Item 16) and remove air line (Figure 1, Item 15) from adapter (Figure 1, Item 17) on supply port (Figure 1, Item 18).
4. Loosen nut (Figure 1, Item 20) and remove air line (Figure 1, Item 21) from adapter (Figure 1, Item 19) on delivery port (Figure 1, Item 22).
5. Loosen nut (Figure 1, Item 7) and remove air line (Figure 1, Item 8) from elbow (Figure 1, Item 6) on delivery port (Figure 1, Item 9).
6. Remove two locknuts (Figure 1, Item 4), washers (Figure 1, Item 5), and rear ABS relay valve (Figure 1, Item 1) from bracket (Figure 1, Item 3). Discard locknuts.
7. Remove adapter (Figure 1, Item 17) from supply port (Figure 1, Item 18) on rear ABS relay valve (Figure 1, Item 1).
8. Remove adapter (Figure 1, Item 19) from delivery port (Figure 1, Item 22) on rear ABS relay valve (Figure 1, Item 1).
9. Remove elbow (Figure 1, Item 6) from delivery port (Figure 1, Item 9) on rear ABS relay valve (Figure 1, Item 1).
10. Remove elbow (Figure 1, Item 14) from control port (Figure 1, Item 2) on rear ABS relay valve (Figure 1, Item 1).

REMOVAL - Continued

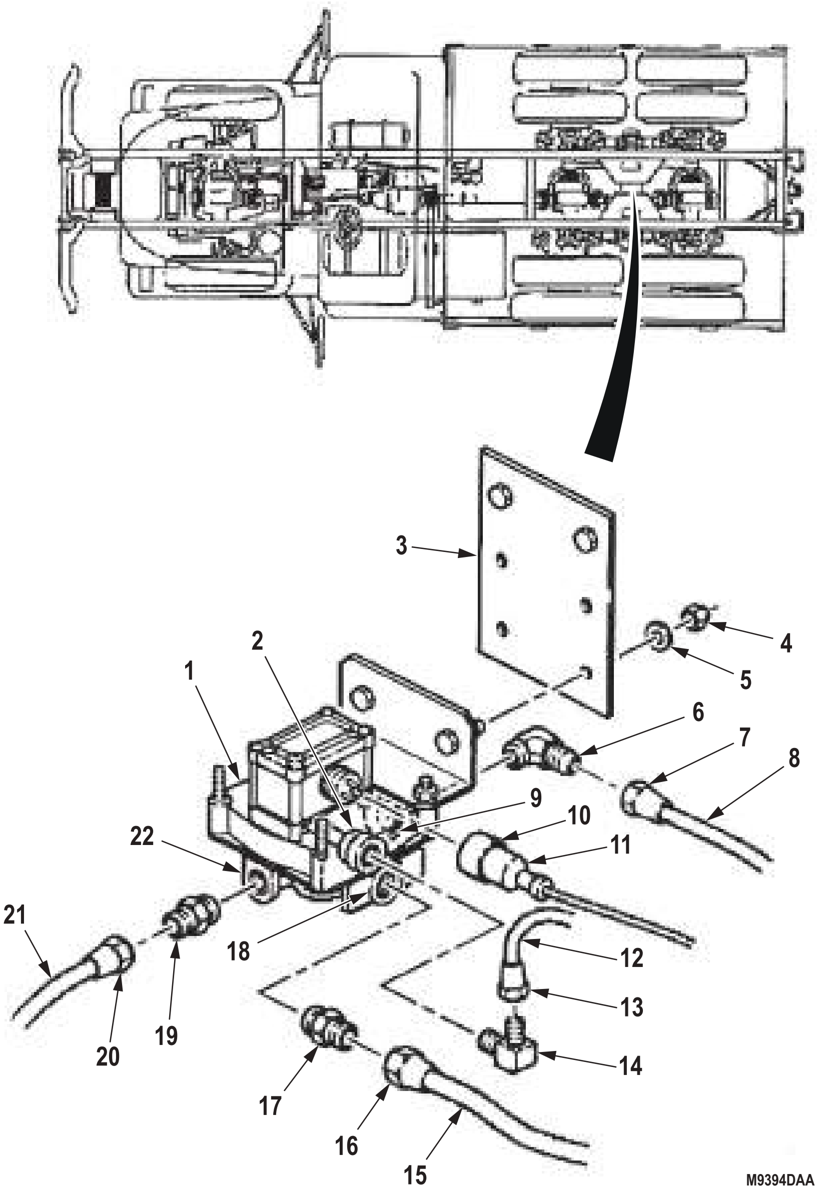


Figure 1. Rear ABS Relay Valve Removal.

END OF TASK

INSTALLATION

NOTE

- If new relay valve is being installed, use fittings from old valve.
- Apply sealant to all male pipe threads before installation.

1. Install elbow (Figure 2, Item 14) in control port (Figure 2, Item 2) on rear ABS relay valve (Figure 2, Item 1).
2. Install elbow (Figure 2, Item 6) in delivery port (Figure 2, Item 9) on rear ABS relay valve (Figure 2, Item 1).
3. Install adapter (Figure 2, Item 19) in delivery port (Figure 2, Item 22) on rear ABS relay valve (Figure 2, Item 1).
4. Install adapter (Figure 2, Item 17) in supply port (Figure 2, Item 18) on rear ABS relay valve (Figure 2, Item 1).
5. Install rear ABS relay valve (Figure 2, Item 1) on bracket (Figure 2, Item 3) with two washers (Figure 2, Item 5) and locknuts (Figure 2, Item 4). Tighten locknuts 33 lb-ft (45 N·m).
6. Install air line (Figure 2, Item 8) on elbow (Figure 2, Item 6) and tighten nut (Figure 2, Item 7).
7. Install air line (Figure 2, Item 21) on adapter (Figure 2, Item 19) and tighten nut (Figure 2, Item 20).
8. Install air line (Figure 2, Item 15) on adapter (Figure 2, Item 17) and tighten nut (Figure 2, Item 16).
9. Install air line (Figure 2, Item 12) on elbow (Figure 2, Item 14) and tighten nut (Figure 2, Item 13).
10. Connect yellow channel connector (Figure 2, Item 11) to rear ABS relay valve (Figure 2, Item 1) and tighten nut (Figure 2, Item 10) finger tight.

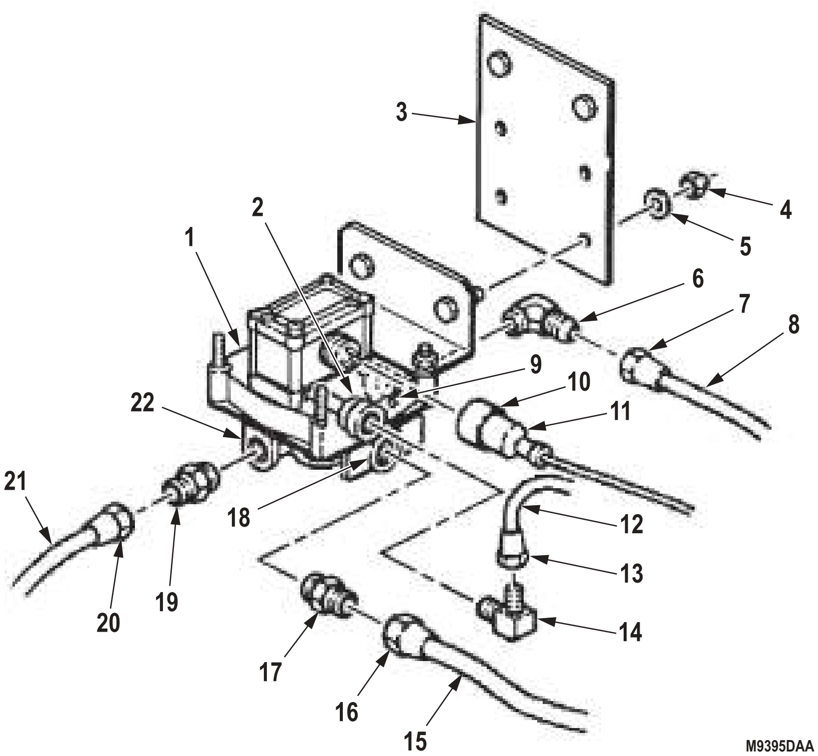


Figure 2. Rear ABS Relay Valve Installation.

END OF TASK

FOLLOW-ON MAINTENANCE

Start engine, allow air pressure to build to normal operating range, and check for air leaks at rear ABS relay valve. Road test vehicle. (TM 9-2320-272-10)

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
FORWARD ABS RELAY VALVE WITH ECU REPLACEMENT

INITIAL SETUP:

Tools and Special Tools

Tool Kit, General Mechanic's: Automotive
(Volume 5, WP 0826, Table 1, Item 56)

Materials/Parts

Cap Set, Protective, Dust and Moisture Seal
(Volume 5, WP 0825, Table 1, Item 13)
Sealing Compound
(Volume 5, WP 0825, Table 1, Item 61)

Materials/Parts (cont.)

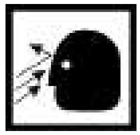
Locknut (Volume 5, WP 0827, Table 1, Item 286)
Qty: 2
Locknut (Volume 5, WP 0827, Table 1, Item 293)
Qty: 2

Equipment Condition

Parking brake set. (TM 9-2320-272-10)
Air reservoirs drained. (TM 9-2320-272-10)

REMOVAL

WARNING



Do not disconnect air lines or hoses before draining air reservoirs. Small parts under pressure may shoot out with high velocity. Failure to comply may result in injury or death to personnel.

CAUTION

When disconnecting air lines and hoses, plug all openings to prevent dirt from entering and causing damage to internal parts. Remove all plugs prior to installation.

NOTE

- Tag lines and fittings for installation.
- Mark fitting direction for installation.

1. Unlock and open harness support clip (Figure 1, Item 10) on ECU mounting bracket (Figure 1, Item 1).
2. Unlock spring clip (Figure 1, Item 5) and move to side, press down on two locking tabs (Figure 1, Item 4) and remove ABS wiring harness connector (Figure 1, Item 7) from ECU connector (Figure 1, Item 6).
3. Loosen nut (Figure 1, Item 17) and disconnect blue channel connector (Figure 1, Item 18) from forward ABS relay valve (Figure 1, Item 31).
4. Loosen nut (Figure 1, Item 20) and remove air line (Figure 1, Item 19) from elbow (Figure 1, Item 21) on control port (Figure 1, Item 26).
5. Loosen nut (Figure 1, Item 23) and remove air line (Figure 1, Item 24) from elbow (Figure 1, Item 22) on supply port (Figure 1, Item 25).
6. Loosen nut (Figure 1, Item 14) and remove air line (Figure 1, Item 15) from elbow (Figure 1, Item 13) on delivery port (Figure 1, Item 16).
7. Loosen nut (Figure 1, Item 28) and remove air line (Figure 1, Item 29) from adapter (Figure 1, Item 27) on delivery port (Figure 1, Item 30).
8. Remove two locknuts (Figure 1, Item 34), washers (Figure 1, Item 33), and forward ABS relay valve (Figure 1, Item 31) from bracket (Figure 1, Item 32). Discard locknuts.
9. Remove adapter (Figure 1, Item 27) from delivery port (Figure 1, Item 30) on forward ABS relay valve (Figure 1, Item 31).
10. Remove elbow (Figure 1, Item 13) from delivery port (Figure 1, Item 16) on forward ABS relay valve (Figure 1, Item 31).
11. Remove elbow (Figure 1, Item 22) from supply port (Figure 1, Item 25) on forward ABS relay valve (Figure 1, Item 31).
12. Remove elbow (Figure 1, Item 21) from control port (Figure 1, Item 26) on forward ABS relay valve (Figure 1, Item 31).
13. Remove three screws (Figure 1, Item 3) and ECU (Figure 1, Item 2) from ECU mounting bracket (Figure 1, Item 1) on forward ABS relay valve (Figure 1, Item 31).

REMOVAL - Continued

14. Remove two locknuts (Figure 1, Item 8), ECU mounting bracket (Figure 1, Item 1), and two spacer washers (Figure 1, Item 11) from screws (Figure 1, Item 12) on forward ABS relay valve (Figure 1, Item 31). Discard locknuts.
15. Bend two tabs (Figure 1, Item 9) in and remove harness support clip (Figure 1, Item 10) from ECU mounting bracket (Figure 1, Item 1) if damaged.

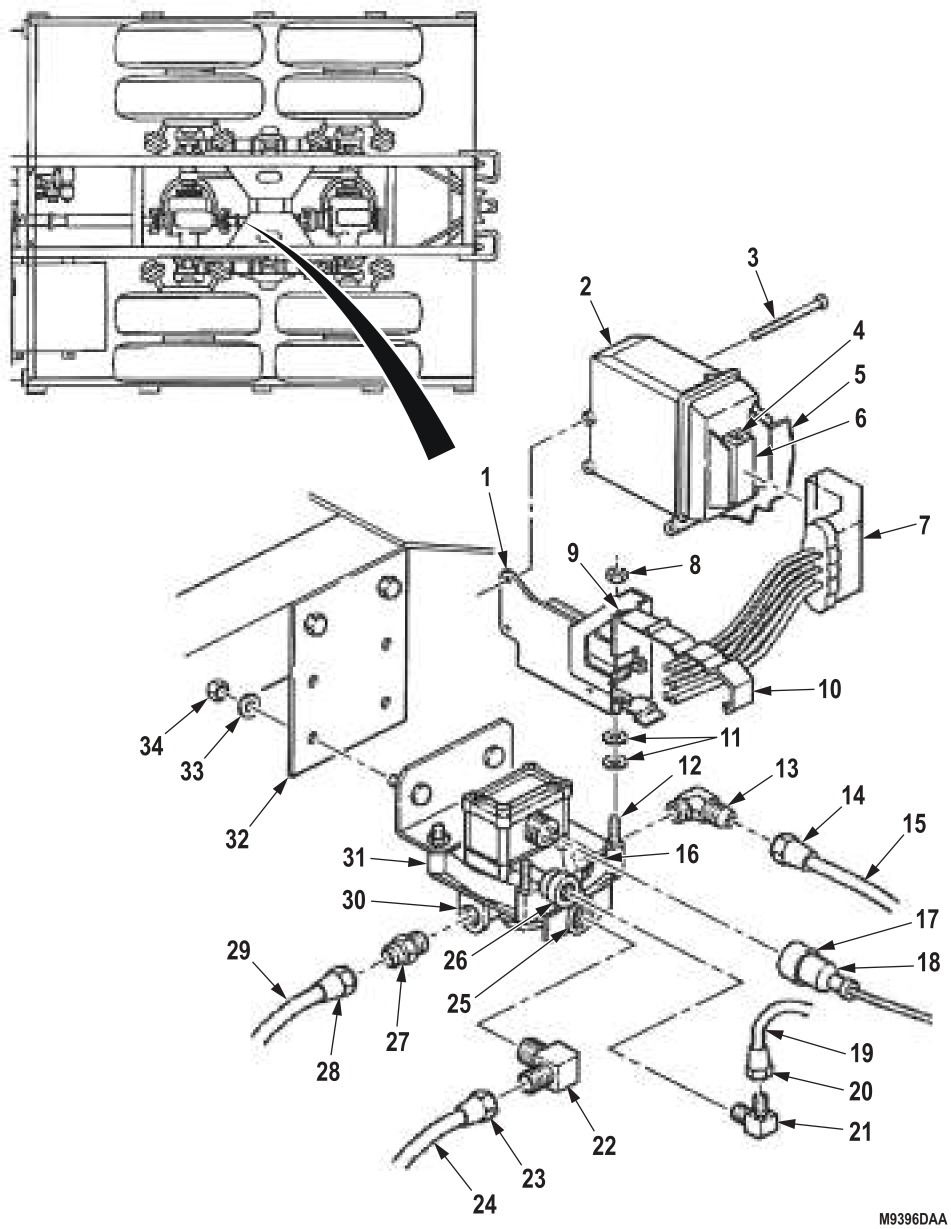


Figure 1. Forward ABS Relay Valve Removal.

END OF TASK

INSTALLATION

1. If removed, install harness support clip (Figure 2, Item 10) on ECU mounting bracket (Figure 2, Item 1) and bend out two tabs (Figure 2, Item 9).
2. Install two spacer washers (Figure 2, Item 11) and ECU mounting bracket (Figure 2, Item 1) on screws (Figure 2, Item 12) on forward ABS relay valve (Figure 2, Item 31) with two locknuts (Figure 2, Item 8).
3. Install ECU (Figure 2, Item 2) on ECU mounting bracket (Figure 2, Item 1) with three screws (Figure 2, Item 3).

NOTE

- If new relay valve is being installed, use fittings from old valve.
- Apply sealant to all male pipe threads before installation.

4. Install elbow (Figure 2, Item 21) in control port (Figure 2, Item 26) on forward ABS relay valve (Figure 2, Item 31).
5. Install elbow (Figure 2, Item 22) in supply port (Figure 2, Item 25) on forward ABS relay valve (Figure 2, Item 31).
6. Install elbow (Figure 2, Item 13) in delivery port (Figure 2, Item 16) on forward ABS relay valve (Figure 2, Item 31).
7. Install adapter (Figure 2, Item 27) in delivery port (Figure 2, Item 30) on forward ABS relay valve (Figure 2, Item 31).
8. Install forward ABS relay valve (Figure 2, Item 31) on bracket (Figure 2, Item 32) with two washers (Figure 2, Item 33) and locknuts (Figure 2, Item 34). Tighten locknuts 33 lb-ft (45 N·m).
9. Install air line (Figure 2, Item 29) on adapter (Figure 2, Item 27) and tighten nut (Figure 2, Item 28).
10. Install air line (Figure 2, Item 15) on elbow (Figure 2, Item 13) and tighten nut (Figure 2, Item 14).
11. Install air line (Figure 2, Item 24) on elbow (Figure 2, Item 22) and tighten nut (Figure 2, Item 23).
12. Install air line (Figure 2, Item 19) on elbow (Figure 2, Item 21) and tighten nut (Figure 2, Item 20).
13. Connect blue channel connector (Figure 2, Item 18) on forward ABS relay valve (Figure 2, Item 31) and tighten nut (Figure 2, Item 17) finger tight.
14. Connect ABS wiring harness connector (Figure 2, Item 7) on ECU connector (Figure 2, Item 6) and listen for the locking tabs (Figure 2, Item 4) to click as connector is pushed into ECU connector. Lock spring clip (Figure 2, Item 5) over connector.
15. Close and lock harness support clip (Figure 2, Item 10) over connector (Figure 2, Item 7).

INSTALLATION - Continued

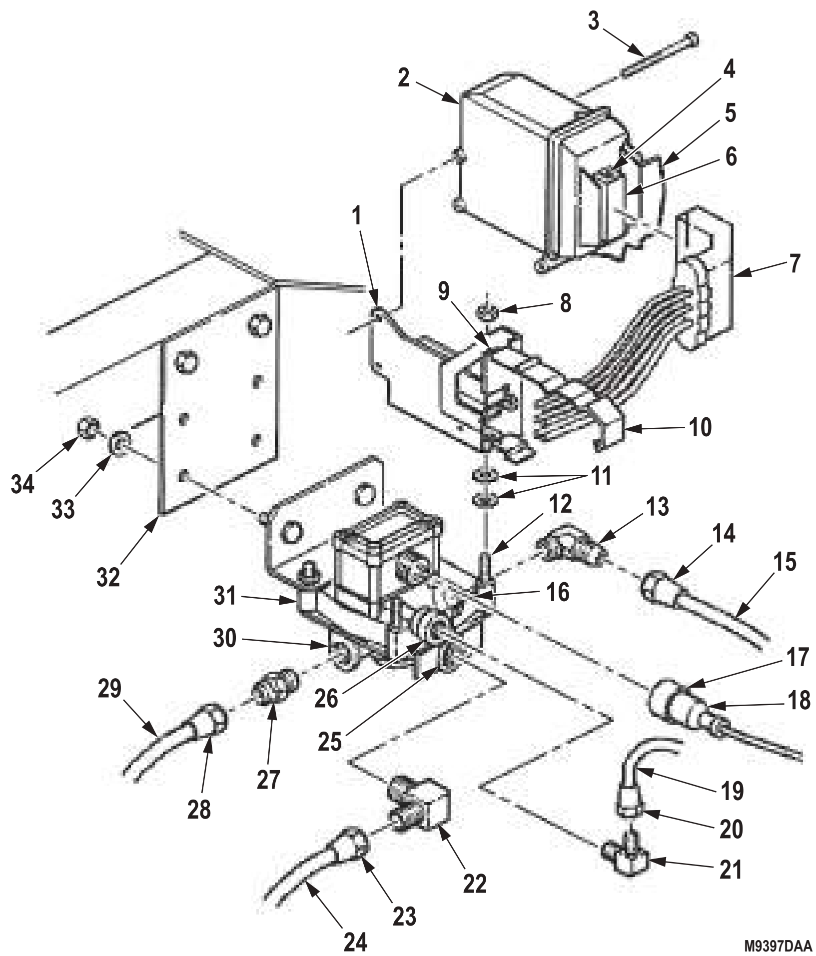


Figure 2. Forward ABS Relay Valve Installation.

END OF TASK

FOLLOW-ON MAINTENANCE

Start engine, allow air pressure to build to normal operating range, and check for air leaks at forward ABS relay valve. Road test vehicle. (TM 9-2320-272-10)

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
INVERSION VALVE REPLACEMENT

INITIAL SETUP:

Tools and Special Tools

Tool Kit, General Mechanic's: Automotive
(Volume 5, WP 0826, Table 1, Item 56)

Materials/Parts

Cap Set, Protective, Dust and Moisture Seal
(Volume 5, WP 0825, Table 1, Item 13)
Sealing Compound
(Volume 5, WP 0825, Table 1, Item 61)
Locknut (Volume 5, WP 0827, Table 1, Item 286)
Qty: 3

Materials/Parts (cont.)

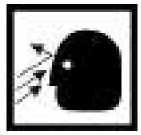
Lockwasher
(Volume 5, WP 0827, Table 1, Item 62)
Qty: 8
Tiedown Strap
(Volume 5, WP 0827, Table 1, Item 298)
Qty: 1

Equipment Condition

Parking brake set. (TM 9-2320-272-10)
Air reservoirs drained. (TM 9-2320-272-10)

REMOVAL

WARNING



Do not disconnect air lines or hoses before draining air reservoirs. Small parts under pressure may shoot out with high velocity. Failure to comply may result in injury or death to personnel.

CAUTION

When disconnecting air lines and hoses, plug all openings to prevent dirt from entering and causing damage to internal parts. Remove all plugs prior to installation.

NOTE

- Tag lines and fittings for installation.
- Mark fitting direction for installation.

1. Remove locknut (Figure 1, Item 23), screw (Figure 1, Item 26), and clamp (Figure 1, Item 25) from front step brace (Figure 1, Item 24). Discard locknut.
2. Remove tiedown straps (Figure 1, Item 29) from air lines as necessary. Discard tiedown straps.
3. Remove eight screws (Figure 1, Item 14), lockwashers (Figure 1, Item 15), and access box cover (Figure 1, Item 13) from step box access (Figure 1, Item 8). Discard lockwashers.
4. Loosen nut (Figure 1, Item 28) and remove primary balance air line (Figure 1, Item 27) from top adapter (Figure 1, Item 1) on inversion valve (Figure 1, Item 7).
5. Loosen nut (Figure 1, Item 16) and remove delivery air line (Figure 1, Item 17) from right side elbow (Figure 1, Item 12) on inversion valve (Figure 1, Item 7).
6. Loosen nut (Figure 1, Item 31) and remove secondary control air line (Figure 1, Item 30) from left side top elbow (Figure 1, Item 2) on inversion valve (Figure 1, Item 7).
7. Loosen nut (Figure 1, Item 21) and remove supply air line (Figure 1, Item 22) from left side bottom elbow (Figure 1, Item 3) on inversion valve (Figure 1, Item 7).
8. Remove two locknuts (Figure 1, Item 5), washers (Figure 1, Item 6), screws (Figure 1, Item 10), washers (Figure 1, Item 9), and inversion valve (Figure 1, Item 7) from inside of step box access (Figure 1, Item 8). Discard locknuts.
9. Remove elbow (Figure 1, Item 12) from delivery port (Figure 1, Item 18) on right side of inversion valve (Figure 1, Item 7).
10. Remove bottom elbow (Figure 1, Item 3) from supply port (Figure 1, Item 19) on left side of inversion valve (Figure 1, Item 7).
11. Remove top elbow (Figure 1, Item 2) from secondary control port (Figure 1, Item 4) on left side of inversion valve (Figure 1, Item 7).
12. Remove adapter (Figure 1, Item 1) from primary balance port (Figure 1, Item 11) on top of inversion valve (Figure 1, Item 7).
13. Remove exhaust checkvalve (Figure 1, Item 20) from inversion valve (Figure 1, Item 7).

REMOVAL - Continued

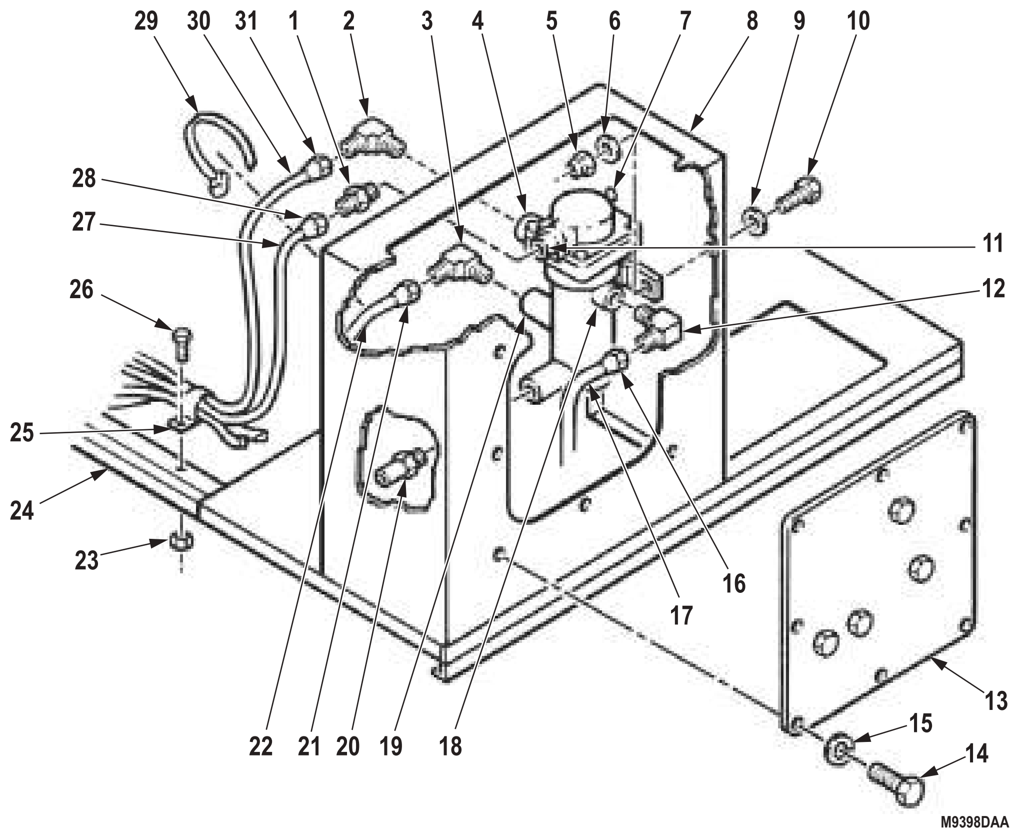


Figure 1. Immersion Valve Removal.

END OF TASK

INSTALLATION

NOTE

- If new inversion valve is being installed, use fittings from old inversion valve.
- Apply sealing compound to all male pipe threads before installation.

1. Install exhaust checkvalve (Figure 2, Item 20) in inversion valve (Figure 2, Item 7).
2. Install adapter (Figure 2, Item 1) in primary balance port (Figure 2, Item 11) on top of inversion valve (Figure 2, Item 7).
3. Install elbow (Figure 2, Item 2) in secondary control port (Figure 2, Item 4) on top left side of inversion valve (Figure 2, Item 7).
4. Install elbow (Figure 2, Item 3) in supply port (Figure 2, Item 19) on bottom left side of inversion valve (Figure 2, Item 7).
5. Install elbow (Figure 2, Item 12) in delivery port (Figure 2, Item 18) on right side of inversion valve (Figure 2, Item 7).
6. Install inversion valve (Figure 2, Item 7) on inside of step box access (Figure 2, Item 8) with two washers (Figure 2, Item 9), screws (Figure 2, Item 10), washers (Figure 2, Item 6), and locknuts (Figure 2, Item 5).
7. Install supply air line (Figure 2, Item 22) on bottom left side elbow (Figure 2, Item 3) and tighten nut (Figure 2, Item 21).
8. Install secondary control air line (Figure 2, Item 30) on top left side elbow (Figure 2, Item 2) and tighten nut (Figure 2, Item 31).
9. Install delivery air line (Figure 2, Item 17) on right side elbow (Figure 2, Item 12) and tighten nut (Figure 2, Item 16).
10. Install primary balance air line (Figure 2, Item 27) on top adapter (Figure 2, Item 1) and tighten nut (Figure 2, Item 28).
11. Install access box cover (Figure 2, Item 13) on step box access (Figure 2, Item 8) with eight lockwashers (Figure 2, Item 15) and screws (Figure 2, Item 14).
12. Install tiedown straps (Figure 2, Item 29) to secure air lines as necessary.
13. Install clamp (Figure 2, Item 25) with air lines on step brace (Figure 2, Item 24) with screw (Figure 2, Item 26) and locknut (Figure 2, Item 23).

INSTALLATION - Continued

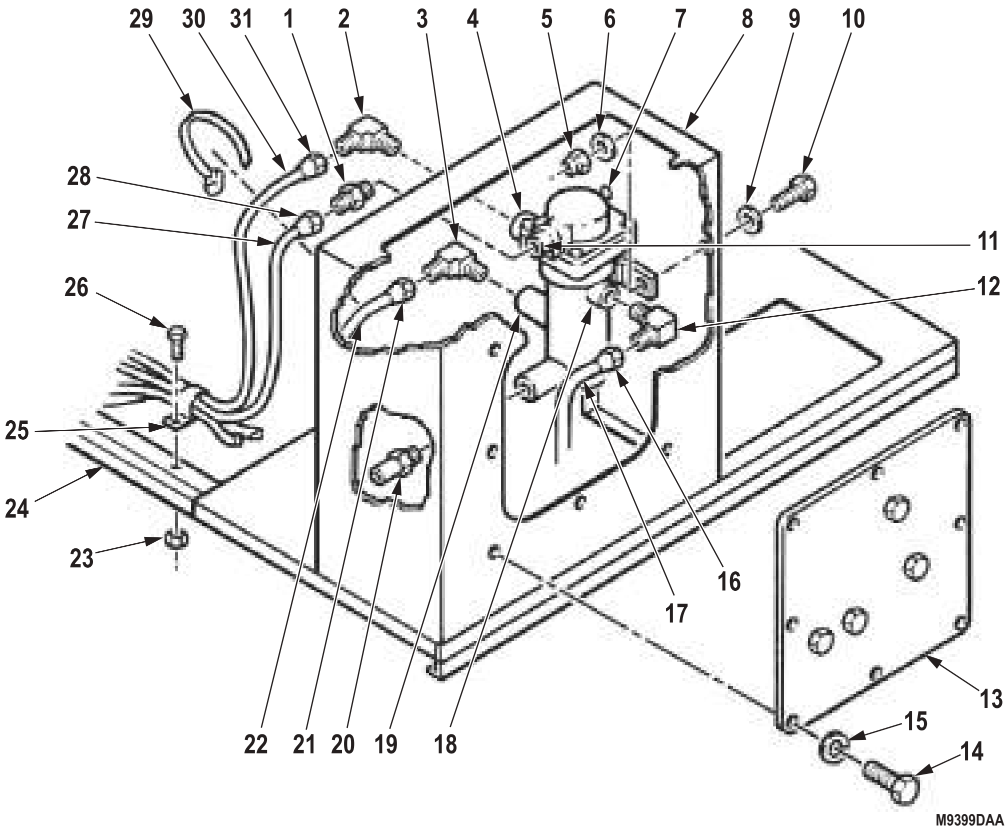


Figure 2. Inversion Valve Installation.

END OF TASK

FOLLOW-ON MAINTENANCE

Start engine and allow air pressure to build to normal operating range. Check for air leaks. Road test vehicle. (TM 9-2320-272-10)

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
AIR SUPPLY LINE SAFETY VALVE REPLACEMENT

INITIAL SETUP:

Tools and Special Tools
Tool Kit, General Mechanic's: Automotive
(Volume 5, WP 0826, Table 1, Item 56)

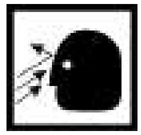
Materials/Parts
Sealing Compound
(Volume 5, WP 0825, Table 1, Item 61)

Equipment Condition
Parking brake set. (TM 9-2320-272-10)

Equipment Condition (cont.)
Air reservoirs drained. (TM 9-2320-272-10)

REMOVAL

WARNING



Do not disconnect air lines or hoses before draining air reservoirs. Small parts under pressure may shoot out with high velocity. Failure to comply may result in injury or death to personnel.

NOTE

Tag lines and fittings for installation.

1. Remove safety valve (Figure 1, Item 3) from reducing bushing (Figure 1, Item 2).
2. Remove reducing bushing (Figure 1, Item 2) from tee fitting (Figure 1, Item 1).

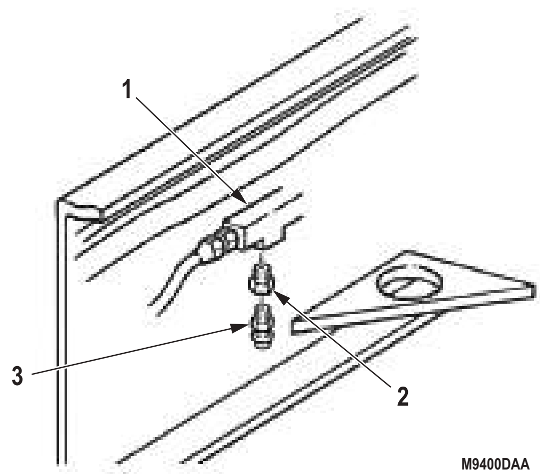


Figure 1. Air Supply Line Safety Valve Removal.

END OF TASK

INSTALLATION

NOTE

Apply sealing compound to all male pipe threads before installation.

1. Install reducing bushing (Figure 2, Item 2) on tee fitting (Figure 2, Item 1).
2. Install safety valve (Figure 2, Item 3) on reducing bushing (Figure 2, Item 2).

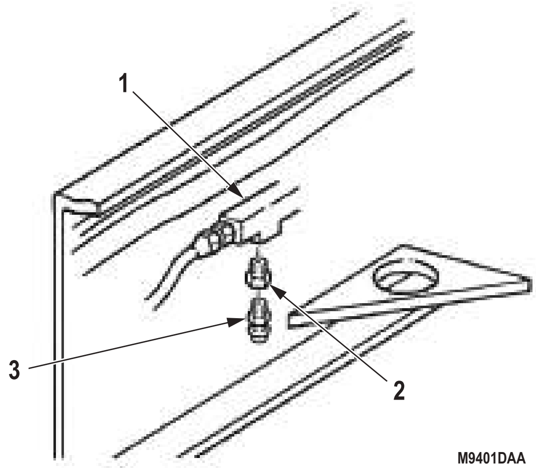


Figure 2. Air Supply Line Safety Valve Installation.

END OF TASK

FOLLOW-ON MAINTENANCE

Start engine and allow air pressure to build to normal operating range. Check for air leaks. Road Test vehicle. (TM 9-2320-272-10)

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
GOVERNOR CONTROL AIR LINE REPLACEMENT

INITIAL SETUP:

Tools and Special Tools
Tool Kit, General Mechanic's: Automotive
(Volume 5, WP 0826, Table 1, Item 56)

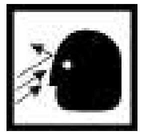
Materials/Parts
Sealing Compound
(Volume 5, WP 0825, Table 1, Item 61)
Tiedown Strap
(Volume 5, WP 0827, Table 1, Item 298)
Qty: 1

Equipment Condition
Parking brake set. (TM 9-2320-272-10)

Equipment Condition (cont.)
Hood raised and secured. (TM 9-2320-272-10)
Air reservoirs drained. (TM 9-2320-272-10)

REMOVAL

WARNING



Do not disconnect air lines or hoses before draining air reservoirs. Small parts under pressure may shoot out with high velocity. Failure to comply may result in injury or death to personnel.

NOTE

- Tag lines and fittings for installation.
- Mark fitting direction for installation.

1. Loosen nut (Figure 1, Item 3) and remove control air line (Figure 1, Item 4) from adapter (Figure 1, Item 2) on center unloader port elbow (Figure 1, Item 1) of air governor (Figure 1, Item 5).
2. Remove adapter (Figure 1, Item 2) from elbow (Figure 1, Item 1) on air governor (Figure 1, Item 5).
3. Remove elbow (Figure 1, Item 1) from center unloader port (Figure 1, Item 6) on air governor (Figure 1, Item 5).

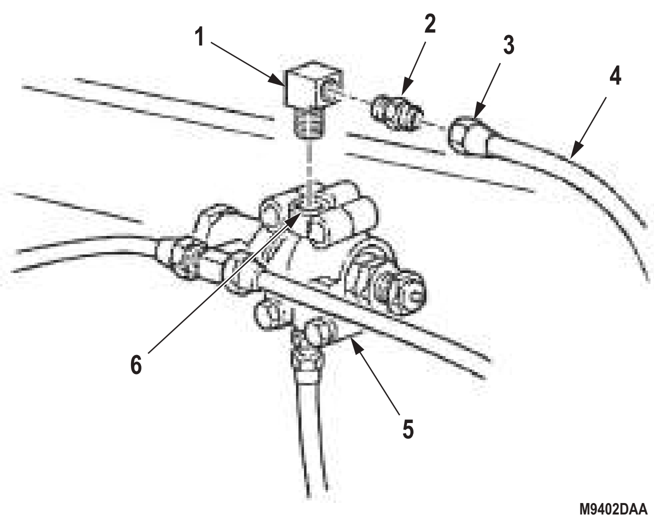


Figure 1. Governor Control Air Line Removal.

REMOVAL - Continued

4. Loosen nut (Figure 2, Item 1) and remove control air line (Figure 2, Item 7) from elbow (Figure 2, Item 4) on air dryer (Figure 2, Item 2), and remove control air line from vehicle.
5. Remove tiedown straps (Figure 2, Item 5) as necessary, and control air line (Figure 2, Item 7) from frame rail (Figure 2, Item 6). Discard tiedown straps.
6. Remove elbow (Figure 2, Item 4) and adapter (Figure 2, Item 3) from air dryer (Figure 2, Item 2).

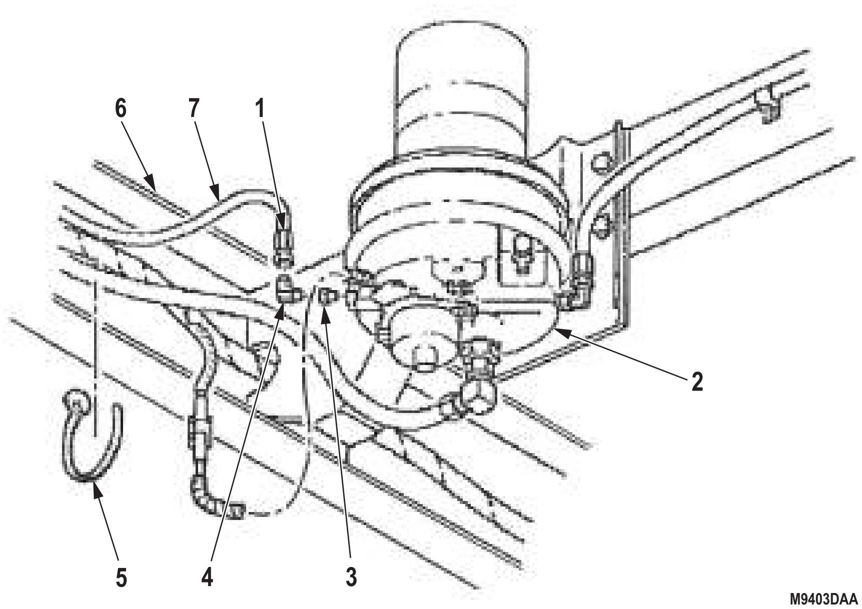


Figure 2. Governor Control Air Line Removal.

END OF TASK

INSTALLATION

NOTE

Apply sealing compound to all male pipe threads before installation.

1. Install adapter (Figure 3, Item 3) and elbow (Figure 3, Item 4) on air dryer (Figure 3, Item 2).
2. Route control air line (Figure 3, Item 7) from air dryer (Figure 3, Item 2) forward, install on air dryer elbow (Figure 3, Item 4), and tighten nut (Figure 3, Item 1).
3. Install tiedown straps (Figure 3, Item 5) on control air line (Figure 3, Item 7) as necessary.
4. Install tiedown straps (Figure 3, Item 5) on control air line (Figure 3, Item 7) along frame rail (Figure 3, Item 6) as necessary.

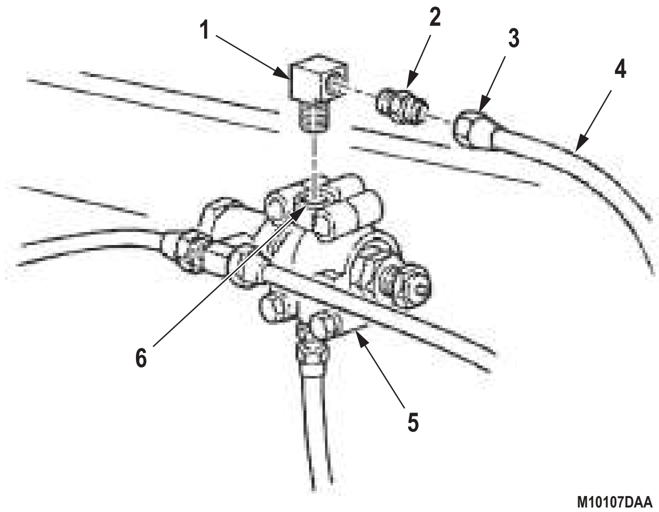


Figure 3. Governor Control Air Line Installation.

INSTALLATION - Continued

5. Install elbow (Figure 4, Item 1) on center unloader port (Figure 4, Item 6) on air governor (Figure 4, Item 5).
6. Install adapter (Figure 4, Item 2) on elbow (Figure 4, Item 1) of air governor (Figure 4, Item 5).
7. Install control air line (Figure 4, Item 4) on adapter (Figure 4, Item 2) of center unloader port elbow (Figure 4, Item 1) and tighten nut (Figure 4, Item 3).

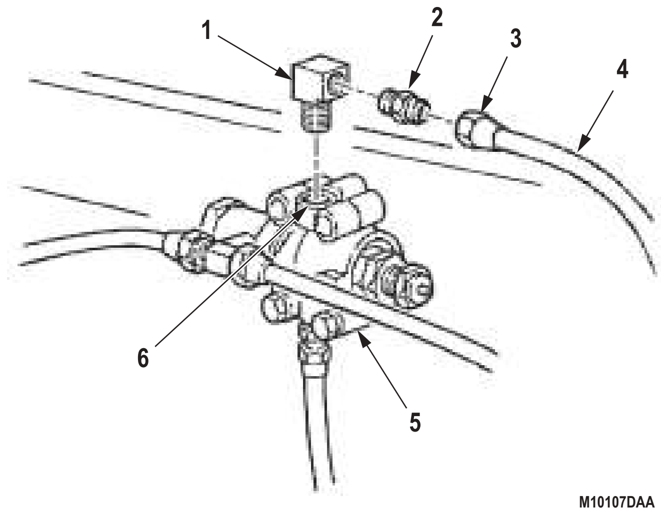


Figure 4. Governor Control Air Line Installation.

END OF TASK

FOLLOW-ON MAINTENANCE

Start engine and allow air pressure to build to normal operating range. Check for air leaks at control air line fittings. Road test vehicle. (TM 9-2320-272-10)

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
AIR LINE CROSS FITTING REPLACEMENT

INITIAL SETUP:

Tools and Special Tools
Tool Kit, General Mechanic's: Automotive
(Volume 5, WP 0826, Table 1, Item 56)

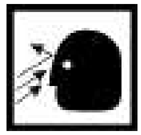
Materials/Parts
Sealing Compound
(Volume 5, WP 0825, Table 1, Item 61)
Tiedown Strap
(Volume 5, WP 0827, Table 1, Item 298)
Qty: 4

Equipment Condition
Parking brake set. (TM 9-2320-272-10)

Equipment Condition (cont.)
Air reservoirs drained. (TM 9-2320-272-10)

REMOVAL

WARNING



Do not disconnect air lines or hoses before draining air reservoirs. Small parts under pressure may shoot out with high velocity. Failure to comply may result in injury or death to personnel.

NOTE

- Cross fitting located on inside of left frame rail above the front axle housing.
- Tag lines and fittings for installation.
- Mark fitting direction for installation.

1. Remove four tiedown straps (Figure 1, Item 11) from air lines (Figure 1, Items 1, 7, 10, and 14). Discard tiedown straps.
2. Loosen nut (Figure 1, Item 9) and remove inversion air line (Figure 1, Item 10) from elbow (Figure 1, Item 8) on cross fitting (Figure 1, Item 4).
3. Loosen nut (Figure 1, Item 2) and remove double check valve No. 6 air line (Figure 1, Item 1) from elbow (Figure 1, Item 3) on cross fitting (Figure 1, Item 4).
4. Loosen nut (Figure 1, Item 13) and remove secondary delivery air line (Figure 1, Item 14) from adapter (Figure 1, Item 12) on cross fitting (Figure 1, Item 4).
5. Loosen nut (Figure 1, Item 6) and remove LQ-2 valve air line (Figure 1, Item 7) from adapter (Figure 1, Item 5) on cross fitting (Figure 1, Item 4).
6. Remove elbows (Figure 1, Items 3 and 8) and adapters (Figure 1, Items 5 and 12) from cross fitting (Figure 1, Item 4).

REMOVAL - Continued

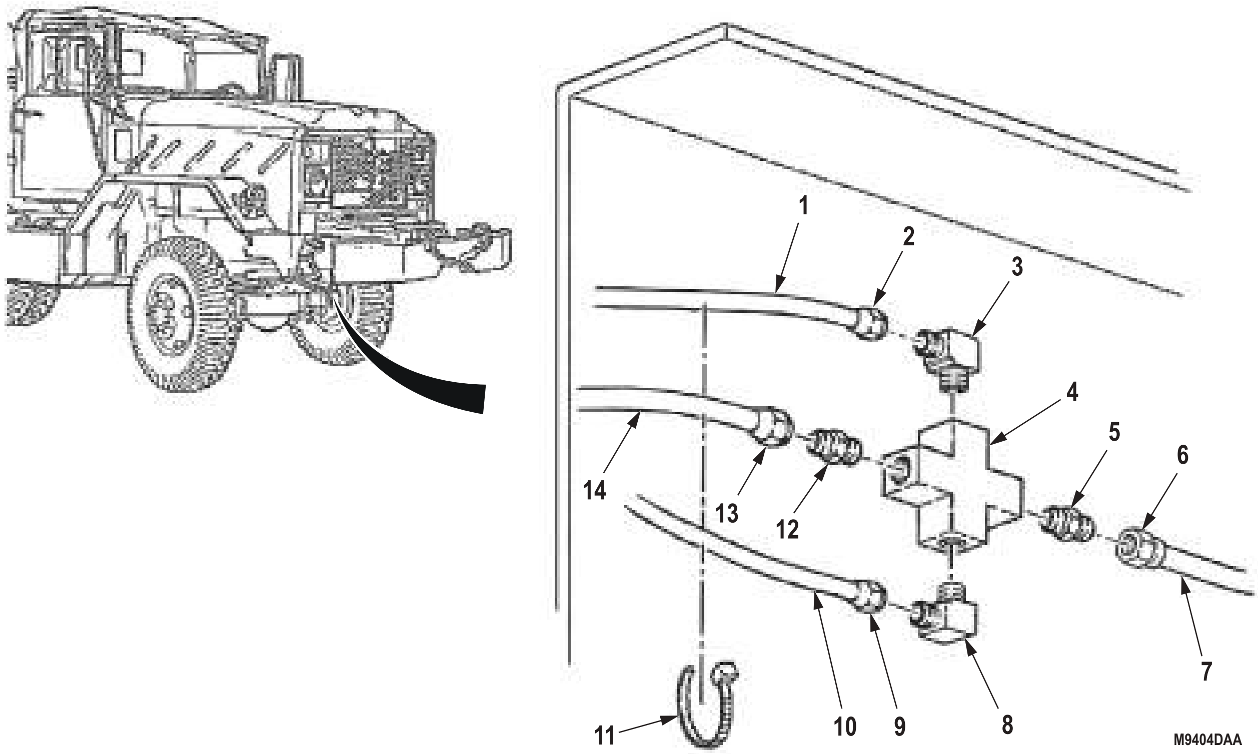


Figure 1. Air Line Cross Fitting Removal.

END OF TASK

INSTALLATION

NOTE

- If new cross fitting is being installed, use elbows and adapters from old cross fitting.
- Apply sealing compound to all male pipe threads before installation.

1. Install adapters (Figure 2, Items 5 and 12) and elbows (Figure 2, Items 3 and 8) on cross fitting (Figure 2, Item 4).
2. Install LQ-2 valve air line (Figure 2, Item 7) on adapter (Figure 2, Item 5) and tighten nut (Figure 2, Item 6).
3. Install secondary delivery air line (Figure 2, Item 14) on adapter (Figure 2, Item 12) and tighten nut (Figure 2, Item 13).
4. Install double check valve No. 6 air line (Figure 2, Item 1) and elbow (Figure 2, Item 3) and tighten nut (Figure 2, Item 2).
5. Install inversion valve air line (Figure 2, Item 10) on elbow (Figure 2, Item 8) and tighten nut (Figure 2, Item 9).
6. Install four tiedown straps (Figure 2, Item 11) on air lines (Figure 2, Items 1, 7, 10, and 14).

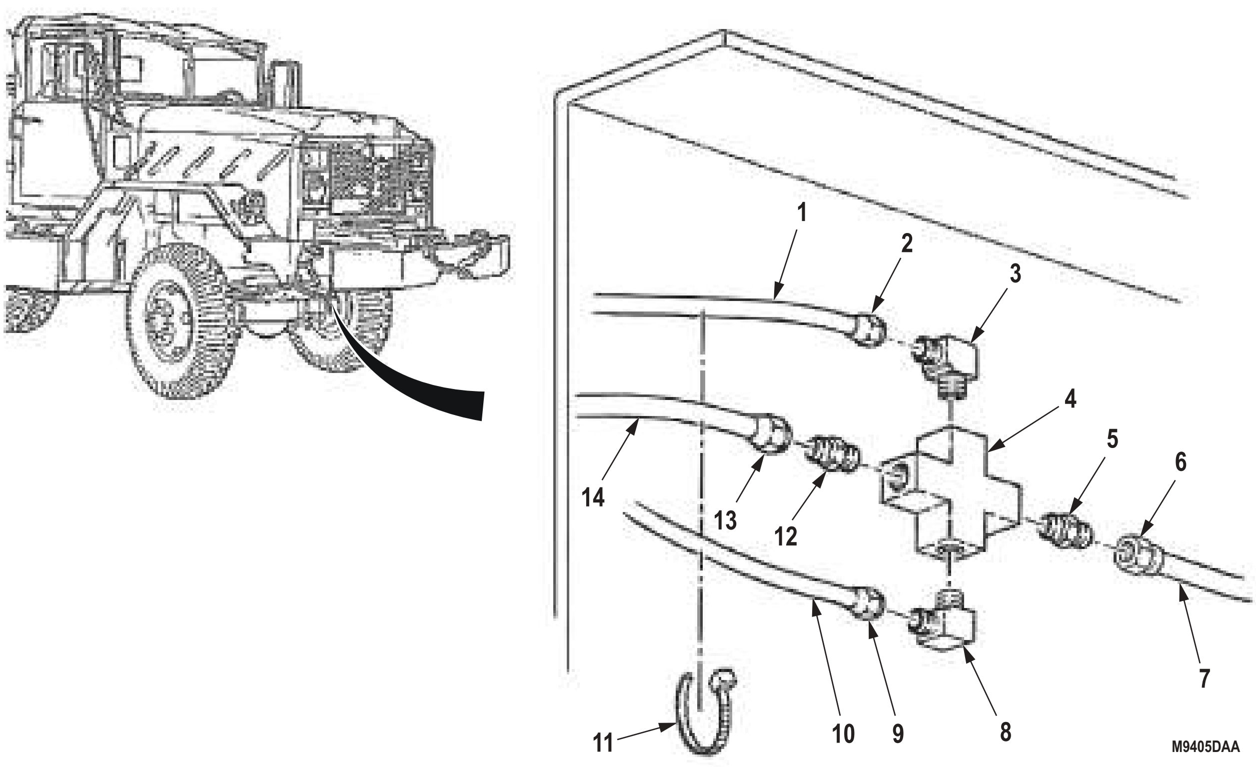


Figure 2. Air Line Cross Fitting Installation.

END OF TASK

FOLLOW-ON MAINTENANCE

Start engine and allow air pressure to build to normal operating range. Check for air leaks at cross fitting. Road test vehicle. (TM 9-2320-272-10)

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
ABS 3-AMP FUSE AND Y LEAD CONNECTOR REPLACEMENT

INITIAL SETUP:

Tools and Special Tools
Tool Kit, General Mechanic's: Automotive
(Volume 5, WP 0826, Table 1, Item 56)

Materials/Parts
Lockwasher
(Volume 5, WP 0827, Table 1, Item 387)
Qty: 1
Tiedown Strap
(Volume 5, WP 0827, Table 1, Item 298)
Qty: 3

Equipment Condition
Parking brake set. (TM 9-2320-272-10)

Equipment Condition (cont.)
Battery ground cables disconnected.
(Volume 2, WP 0350)
Instrument cluster removed.
(Volume 2, WP 0310)

REMOVAL

1. Lift cover (Figure 1, Item 3) on fuse holder (Figure 1, Item 14) and pull out 3-AMP fuse (Figure 1, Item 2) from fuse holder.

NOTE

Tag leads for installation.

2. Disconnect Y-connector lead (Figure 1, Item 4) from harness connector lead 54 (Figure 1, Item 1).
3. Remove screw (Figure 1, Item 6) and lever (Figure 1, Item 7) from starter switch (Figure 1, Item 11).
4. Remove nut (Figure 1, Item 8), lockwasher (Figure 1, Item 9), and starter switch (Figure 1, Item 11) from instrument cluster (Figure 1, Item 6). Discard lockwasher.
5. Remove Y-connector lead (Figure 1, Item 13) from R position (Figure 1, Item 12) on starter switch (Figure 1, Item 11).
6. Disconnect Y-connector lead (Figure 1, Item 15) from yellow ABS main wiring harness lead (Figure 1, Item 17).
7. Disconnect Y-connector lead (Figure 1, Item 16) from ABS lamp lead No. 4 (Figure 1, Item 10).
8. Remove three tiedown straps (Figure 1, Item 18) and remove Y-connector assembly. Discard tiedown straps.

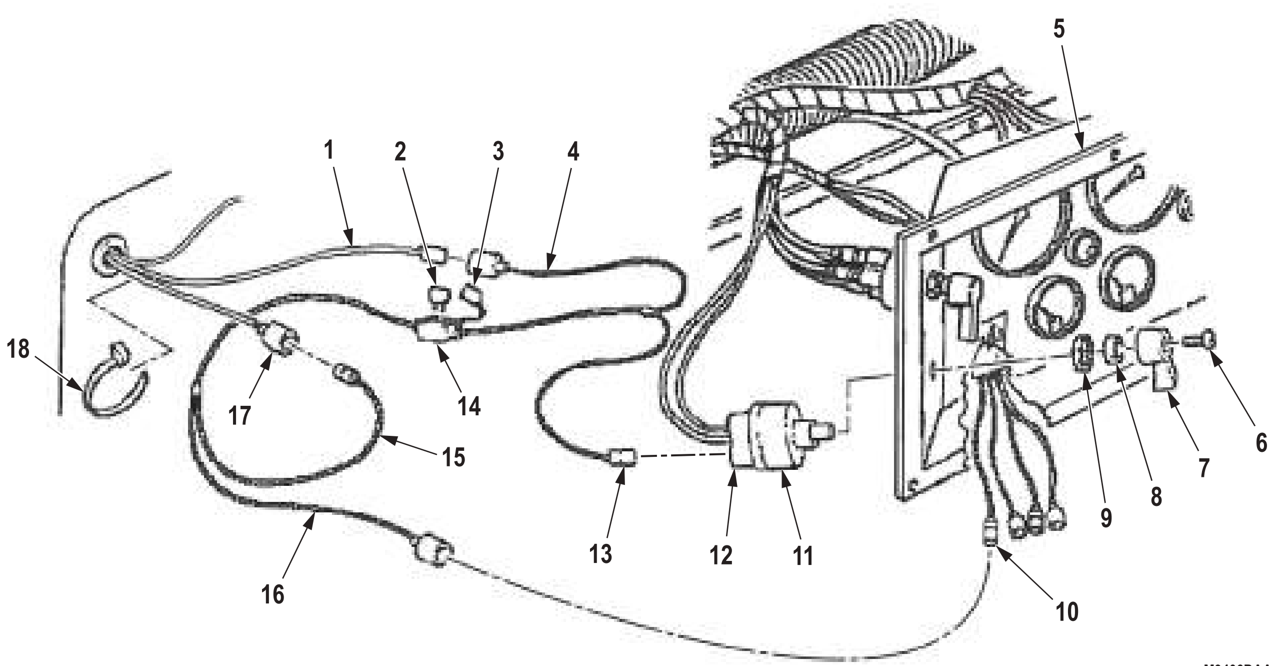


Figure 1. ABS 3-AMP Fuse and Y-Connector Lead Removal.

END OF TASK

INSTALLATION

1. Connect Y-connector lead (Figure 2, Item 16) to ABS lamp lead No. 4 (Figure 2, Item 10).
2. Connect Y-connector lead (Figure 2, Item 15) to yellow ABS main wiring harness lead (Figure 2, Item 17).
3. Install Y-connector lead (Figure 2, Item 13) to R position (Figure 2, Item 12) on starter switch (Figure 2, Item 11).
4. Connect Y-connector lead (Figure 2, Item 4) to harness connector lead 54 (Figure 2, Item 1).
5. Install starter switch (Figure 2, Item 11) on instrument cluster (Figure 2, Item 5) with lockwasher (Figure 2, Item 9) and nut (Figure 2, Item 8).
6. Install lever (Figure 2, Item 7) on starter switch (Figure 2, Item 11) with screw (Figure 2, Item 6).
7. Install 3-AMP fuse (Figure 2, Item 2) in fuse holder (Figure 2, Item 14) and close cover (Figure 2, Item 3).

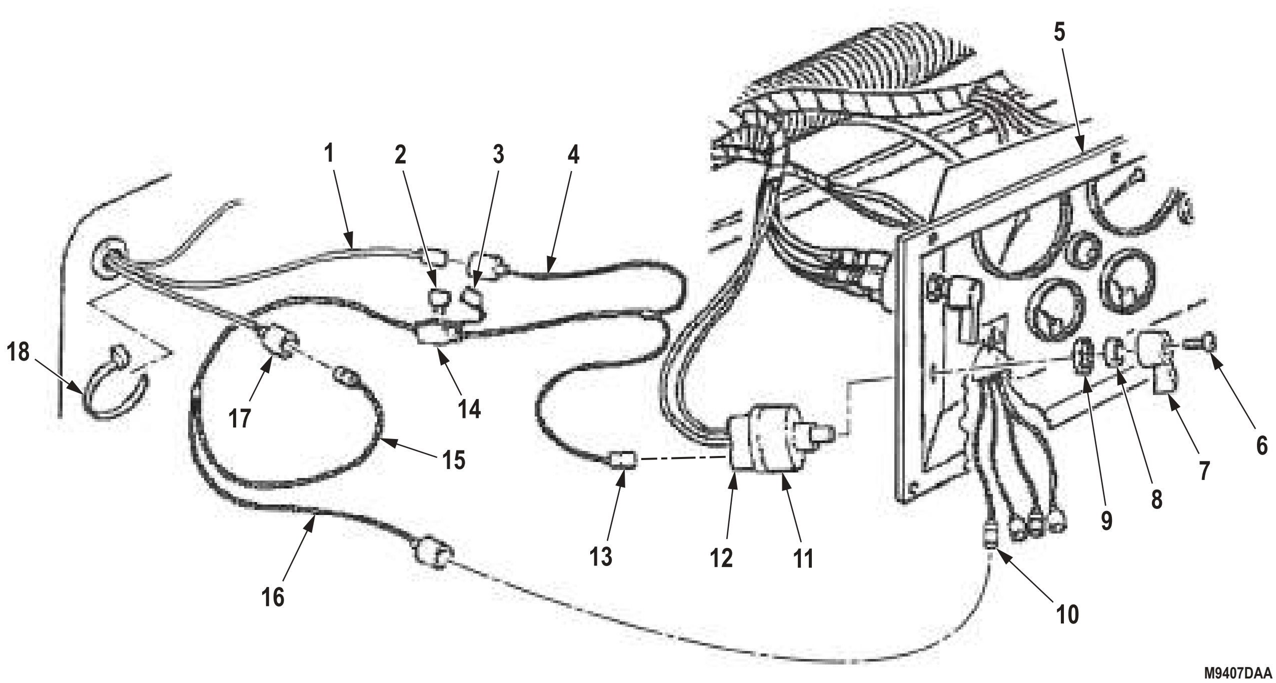


Figure 2. ABS 3-AMP Fuse and Y-Connector Lead Installation.

END OF TASK

FOLLOW-ON MAINTENANCE

1. Install instrument cluster. (Volume 2, WP 0310)
2. Connect battery ground cables. (Volume 2, WP 0350)

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
ABS 15-AMP FUSE AND JUMPER LEAD REPLACEMENT

INITIAL SETUP:

Tools and Special Tools
Tool Kit, General Mechanic's: Automotive
(Volume 5, WP 0826, Table 1, Item 56)

Materials/Parts
Tiedown Strap
(Volume 5, WP 0827, Table 1, Item 298)
Qty: 1

Equipment Condition
Parking brake set. (TM 9-2320-272-10)

Equipment Condition (cont.)
Hood raised and secured. (TM 9-2320-272-10)
Battery ground cables disconnected.
(Volume 2, WP 0350)
Instrument cluster removed.
(Volume 2, WP 0310)

REMOVAL

1. Lift cover (Figure 1, Item 3) on fuse holder (Figure 1, Item 4) and pull out 15-AMP fuse (Figure 1, Item 2) from fuse holder (Figure 1, Item 4).
2. Disconnect jumper lead connector (Figure 1, Item 6) from red lead connector (Figure 1, Item 1) on ABS main wiring harness (Figure 1, Item 7).
3. Remove tiedown straps (Figure 1, Item 8) from jumper lead (Figure 1, Item 5) and harness lead (Figure 1, Item 11). Discard tiedown straps.
4. Disconnect jumper lead connector (Figure 1, Item 13) from power lead connector (Figure 1, Item 12) on firewall (Figure 1, Item 10).
5. Remove grommet (Figure 1, Item 9) and route jumper lead (Figure 1, Item 5) through firewall (Figure 1, Item 10).

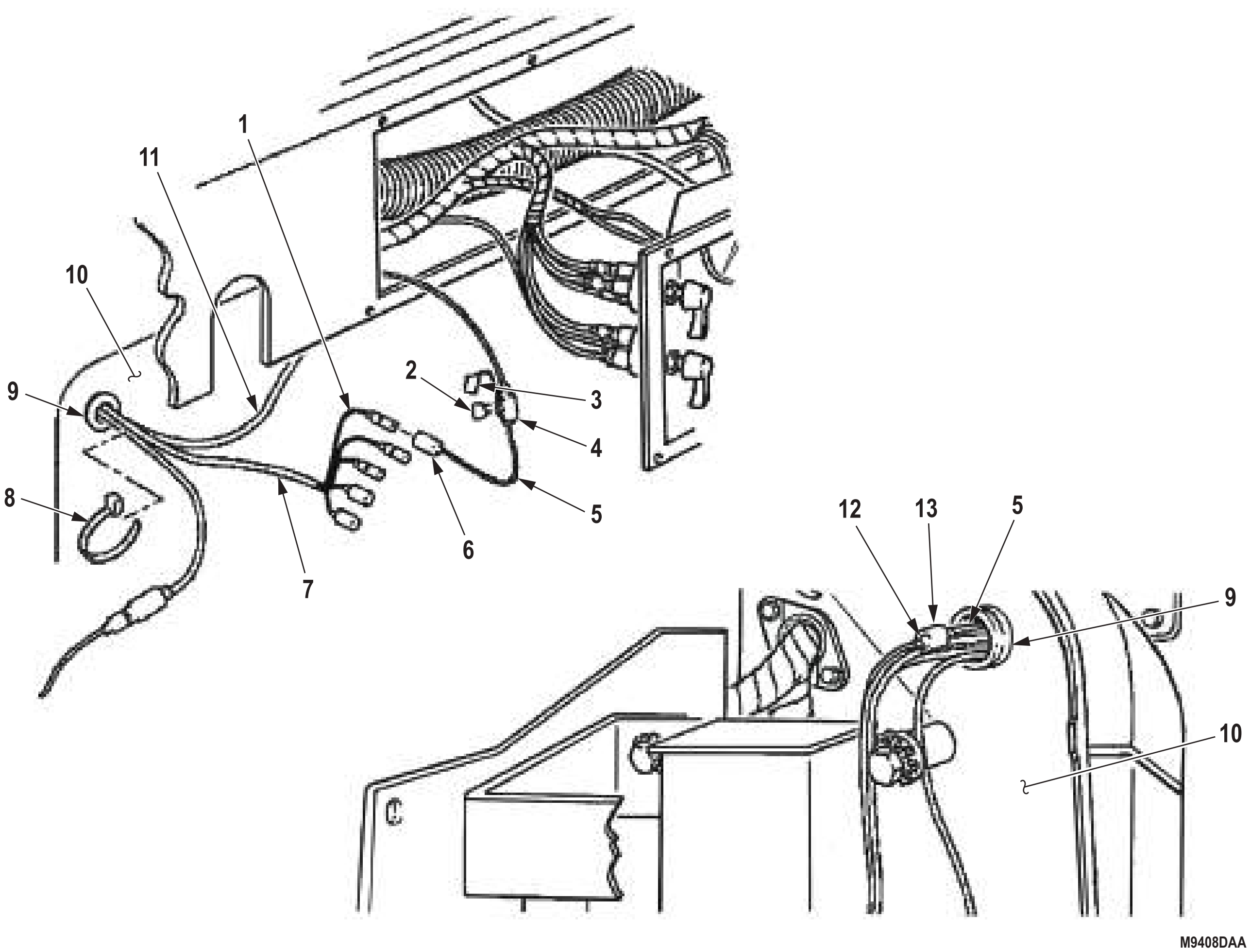


Figure 1. 15-AMP Fuse and Jumper Lead Removal.

END OF TASK

INSTALLATION

1. Connect jumper lead connector (Figure 2, Item 13) to power lead connector (Figure 2, Item 12) on firewall (Figure 2, Item 10).
2. Route jumper lead (Figure 2, Item 5) through firewall (Figure 2, Item 10), install grommet (Figure 2, Item 9) and secure to harness lead (Figure 2, Item 11) with tiedown straps (Figure 2, Item 8) as necessary.
3. Connect jumper lead connector (Figure 2, Item 6) to red lead connector (Figure 2, Item 1) on ABS main wiring harness (Figure 2, Item 7).
4. Install 15-AMP fuse (Figure 2, Item 2) in fuse holder (Figure 2, Item 4) and close cover (Figure 2, Item 3).

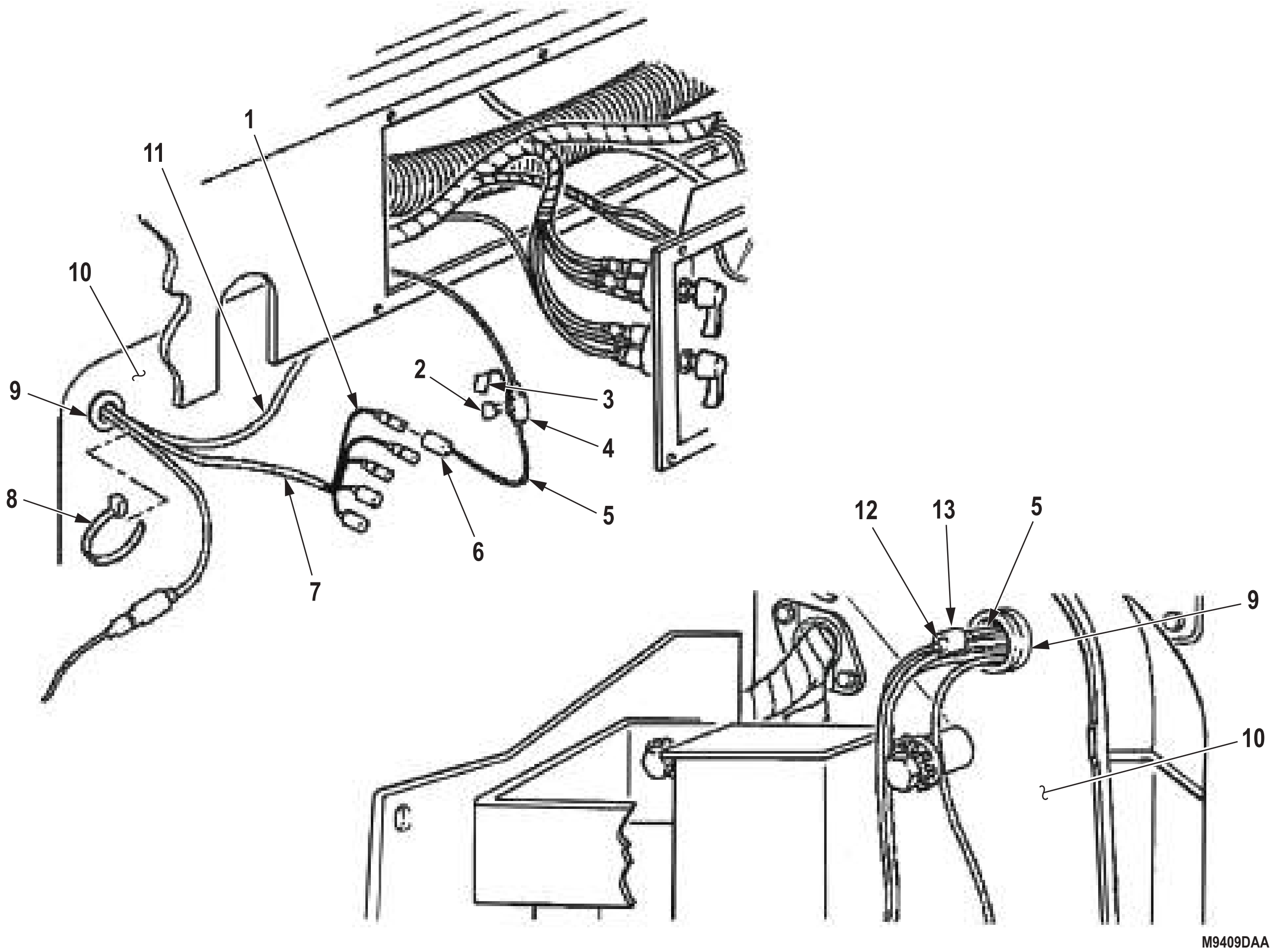


Figure 2. 15-AMP Fuse and Jumper Lead Installation.

END OF TASK

FOLLOW-ON MAINTENANCE

1. Install instrument cluster. (Volume 2, WP 0310)
2. Connect battery ground cables. (Volume 2, WP 0350)

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
ABS GROUND JUMPER LEAD REPLACEMENT

INITIAL SETUP:

Tools and Special Tools
Tool Kit, General Mechanic's: Automotive
(Volume 5, WP 0826, Table 1, Item 56)

Materials/Parts
Lockwasher
(Volume 5, WP 0827, Table 1, Item 423)
Qty: 1
Tiedown Strap
(Volume 5, WP 0827, Table 1, Item 298)
Qty: 1

Equipment Condition
Parking brake set. (TM 9-2320-272-10)

Equipment Condition (cont.)
Hood raised and secured. (TM 9-2320-272-10)
Battery ground cables disconnected.
(Volume 2, WP 0350)
Instrument cluster removed.
(Volume 2, WP 0310)

REMOVAL

1. Remove screw (Figure 1, Item 8), lockwasher (Figure 1, Item 6), protective control box ground lead (Figure 1, Item 5), and ground jumper lead (Figure 1, Item 4) from protective control box (Figure 1, Item 1) and route ground jumper lead (Figure 1, Item 4) through grommet (Figure 1, Item 2) on firewall (Figure 1, Item 3). Discard lockwasher.
2. Disconnect ground jumper Y-connector leads (Figure 1, Item 10) from ABS main wiring harness white ground lead (Figure 1, Item 11) and ABS indicator lamp ground lead connector No. 3 (Figure 1, Item 9).
3. Remove tiedown straps (Figure 1, Item 7) and ground jumper Y-connector lead (Figure 1, Item 4) from under instrument panel (Figure 1, Item 12). Discard tiedown straps.

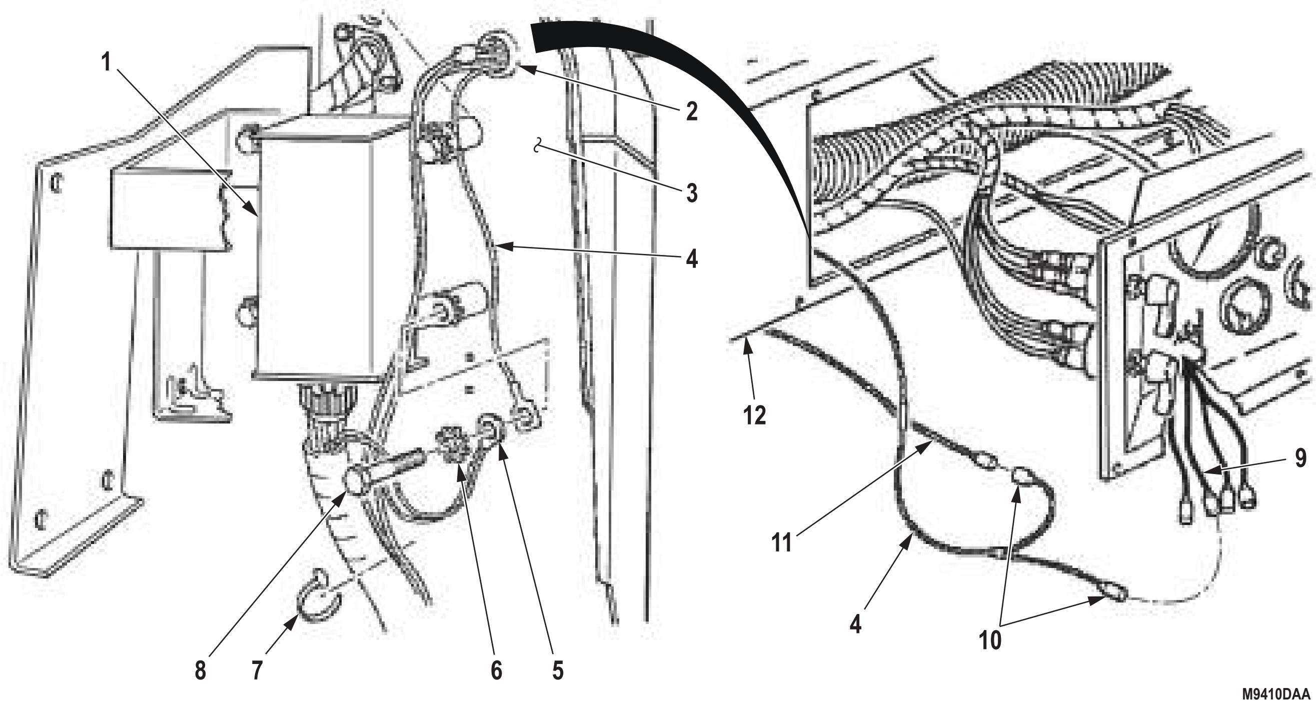


Figure 1. ABS Ground Jumper Lead Removal.

END OF TASK

INSTALLATION

1. Route ground jumper lead (Figure 2, Item 4) through grommet (Figure 2, Item 2) on firewall (Figure 2, Item 3), under instrument panel (Figure 2, Item 12), and secure with tiedown straps (Figure 2, Item 7) as necessary.
2. Connect ground jumper Y-connector leads (Figure 2, Item 10) to ABS main wiring harness white ground lead (Figure 2, Item 11) and ABS indicator lamp ground lead connector No. 3 (Figure 2, Item 9).
3. Install ground jumper lead (Figure 2, Item 4) and protective control box ground lead (Figure 2, Item 5) on protective control box (Figure 2, Item 1) with lockwasher (Figure 2, Item 6) and screw (Figure 2, Item 8).

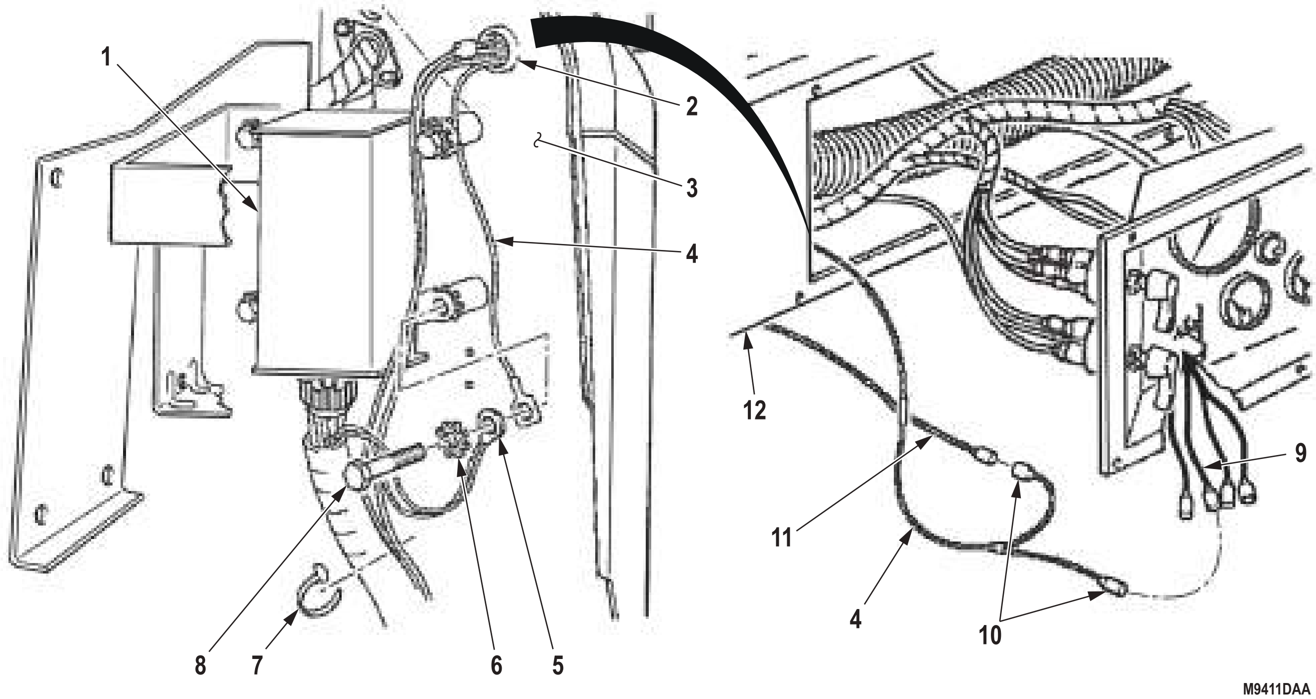


Figure 2. ABS Ground Jumper Lead Installation.

END OF TASK

FOLLOW-ON MAINTENANCE

1. Install instrument cluster. (Volume 2, WP 0310)
2. Connect battery ground cables. (Volume 2, WP 0350)

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
ABS INDICATOR LAMP REPLACEMENT

INITIAL SETUP:

Tools and Special Tools
Tool Kit, General Mechanic's: Automotive
(Volume 5, WP 0826, Table 1, Item 56)

Materials/Parts
Nut, Plain, Assembled
(Volume 5, WP 0827, Table 1, Item 64)
Qty: 2
Tiedown Strap
(Volume 5, WP 0827, Table 1, Item 298)
Qty: 1

Equipment Condition
Parking brake set. (TM 9-2320-272-10)

Equipment Condition (cont.)
Battery ground cables disconnected.
(Volume 2, WP 0350)
Instrument cluster removed.
(Volume 2, WP 0310)

REMOVAL

NOTE

Tag leads for installation.

1. Remove tiedown strap (Figure 1, Item 9) from leads. Discard tiedown strap.
2. Disconnect ABS lamp lead No. 1 (Figure 1, Item 6) from main harness black lead (Figure 1, Item 7).
3. Disconnect ABS lamp lead No. 2 (Figure 1, Item 5) from main harness purple lead (Figure 1, Item 8).
4. Disconnect ABS lamp lead No. 3 (Figure 1, Item 4) from ground Y lead (Figure 1, Item 10).
5. Disconnect ABS lamp lead No. 4 (Figure 1, Item 12) from 3 amp fuse Y lead (Figure 1, Item 11).
6. Remove two nut and lockwasher assemblies (Figure 1, Item 13), screws (Figure 1, Item 2), ABS plate (Figure 1, Item 3), and ABS indicator lamp (Figure 1, Item 14) from instrument cluster (Figure 1, Item 1). Discard nut and lockwasher assemblies.

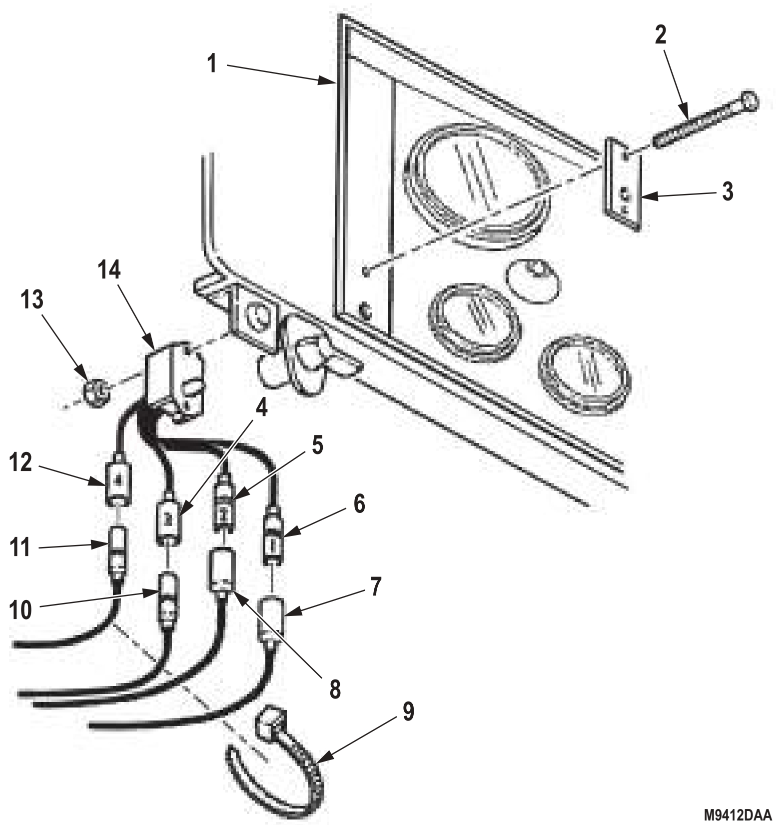


Figure 1. ABS Indicator Lamp Removal.

END OF TASK

INSTALLATION

1. Install ABS indicator lamp (Figure 2, Item 14) on instrument cluster (Figure 2, Item 1) with ABS plate (Figure 2, Item 3), two screws (Figure 2, Item 2), and nut and lockwasher assemblies (Figure 2, Item 13).
2. Connect ABS lamp lead No. 4 (Figure 2, Item 12) to 2 amp fuse Y lead (Figure 2, Item 11).
3. Connect ABS lamp lead No. 3 (Figure 2, Item 4) to ground Y lead (Figure 2, Item 10).
4. Connect ABS lamp lead No. 2 (Figure 2, Item 5) to main harness purple lead (Figure 2, Item 8).
5. Connect ABS lamp lead No. 1 (Figure 2, Item 6) to main harness black lead (Figure 2, Item 7).
6. Install tiedown strap (Figure 2, Item 9) to secure leads.

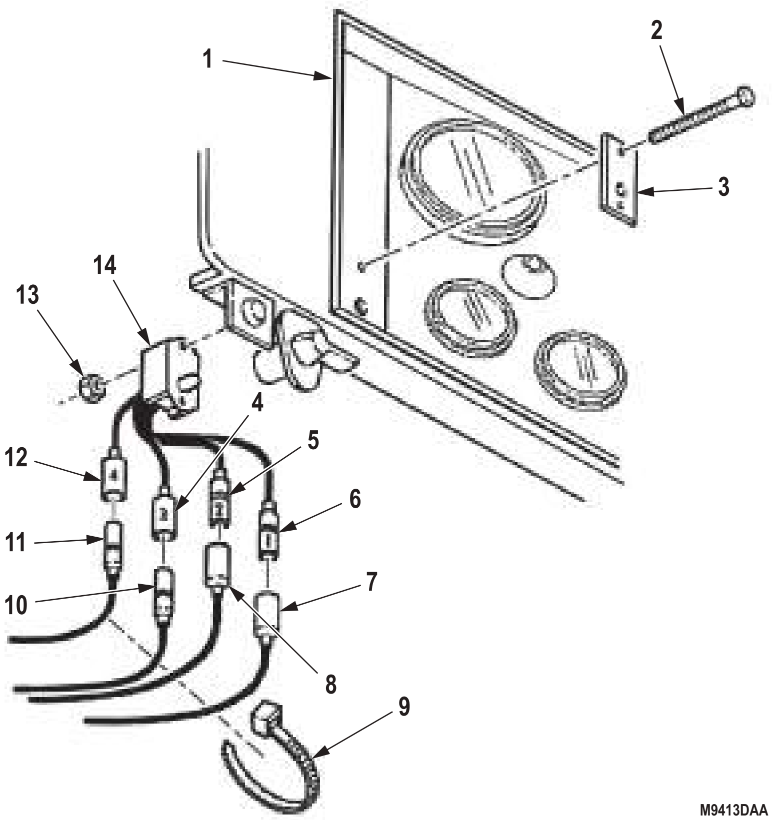


Figure 2. ABS Indicator Lamp Installation.

END OF TASK

FOLLOW-ON MAINTENANCE

1. Install instrument cluster. (Volume 2, WP 0310)
2. Connect battery ground cables. (Volume 2, WP 0350)

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
ABS ECU MAIN WIRING HARNESS REPLACEMENT

INITIAL SETUP:

Tools and Special Tools
Tool Kit, General Mechanic's: Automotive
(Volume 5, WP 0826, Table 1, Item 56)

Materials/Parts
Tiedown Strap
(Volume 5, WP 0827, Table 1, Item 298)
Qty: 8

Equipment Condition
Parking brake set. (TM 9-2320-272-10)

Equipment Condition (cont.)
Hood raised and secured. (TM 9-2320-272-10)
Battery ground cables disconnected.
(Volume 2, WP 0350)
Instrument cluster removed.
(Volume 2, WP 0310)
Starter switch removed from instrument cluster.
(Volume 2, WP 0310)
Battery switch removed from instrument cluster.
(Volume 2, WP 0310)

REMOVAL

NOTE

Tag leads for installation.

1. Remove cap (Figure 1, Item 6) and nut (Figure 1, Item 5) from diagnostic connector (Figure 1, Item 3).
2. Remove tiedown straps (Figure 1, Item 14), then remove diagnostic connector (Figure 1, Item 3) from diagnostic connector bracket (Figure 1, Item 4) and route harness lead (Figure 1, Item 2) over to driver's side of vehicle. Discard tiedown straps.
3. Disconnect red lead (Figure 1, Item 12) on ABS main wiring harness (Figure 1, Item 15) from 15-AMP fuse and jumper lead (Figure 1, Item 10).
4. Disconnect yellow lead (Figure 1, Item 11) on ABS main wiring harness (Figure 1, Item 15) from 3-AMP fuse and Y-connector lead (Figure 1, Item 9).
5. Disconnect black lead (Figure 1, Item 20) on ABS main wiring harness (Figure 1, Item 15) from ABS indicator lamp lead No. 1 (Figure 1, Item 1).
6. Disconnect purple lead (Figure 1, Item 19) on ABS main wiring harness (Figure 1, Item 15) from ABS indicator lamp lead No. 2 (Figure 1, Item 7).
7. Disconnect white ground lead (Figure 1, Item 13) on ABS main wiring harness (Figure 1, Item 15) from ground jumper lead (Figure 1, Item 8).
8. Remove rubber grommet (Figure 1, Item 17), harness lead (Figure 1, Item 2), diagnostic connector (Figure 1, Item 3), and ABS main wiring harness (Figure 1, Item 15) with leads (Figure 1, Items 11, 12, 13, 19, and 20) from hole (Figure 1, Item 16) in firewall (Figure 1, Item 18).
9. Remove tiedown straps as necessary, and route ABS main wiring harness (Figure 1, Item 15), harness lead (Figure 1, Item 2), and diagnostic connector (Figure 1, Item 3) to front and rear ABS relay valves (Figure 1, Items 30 and 21). Discard tiedown straps.

REMOVAL - Continued

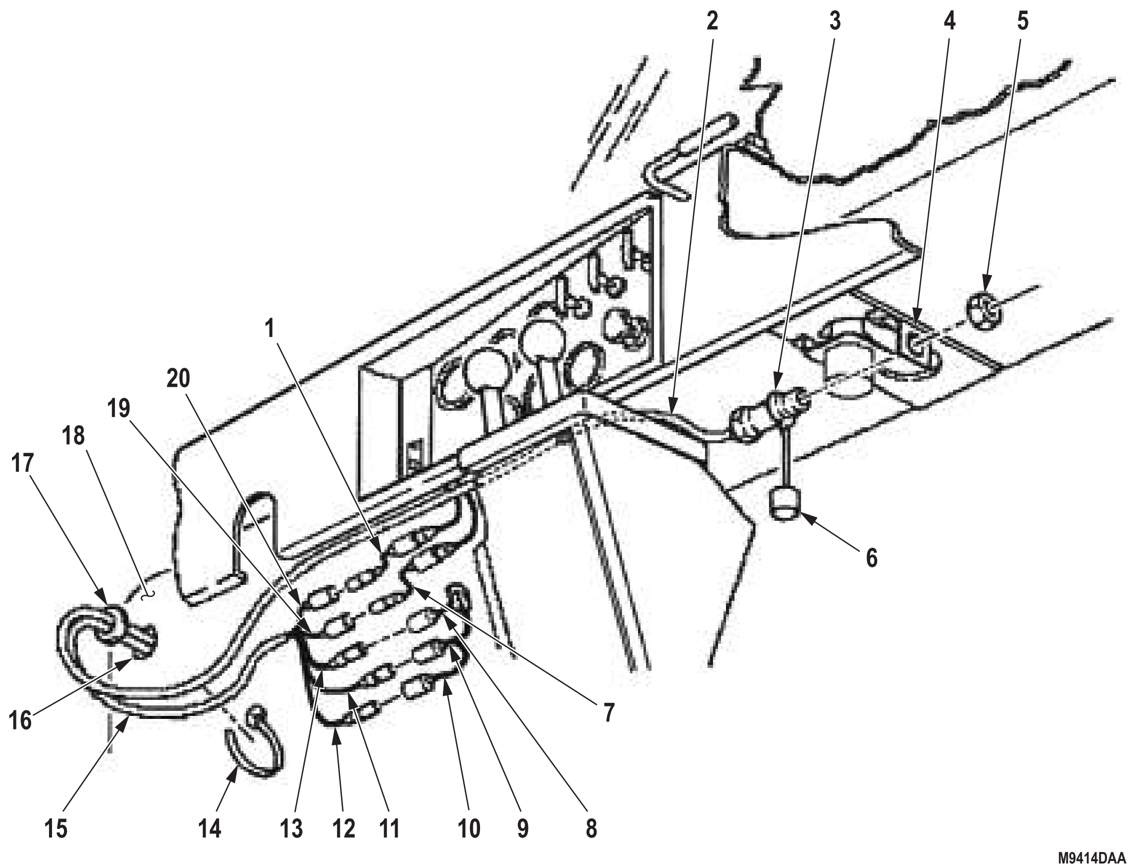


Figure 1. ABS ECU Main Wiring Harness Removal.

REMOVAL - Continued

NOTE

Left side and right side are the same. Only right side shown.

10. Remove blue 2A harness lead (left side) and yellow 2B harness lead (Figure 2, Item 1) (right side) from three-way clips (Figure 2, Item 2).
11. Disconnect blue 2A harness lead from left wheel sensor lead (not shown) and yellow 2B harness lead (Figure 2, Item 1) from right wheel sensor lead (Figure 2, Item 3) (shown).

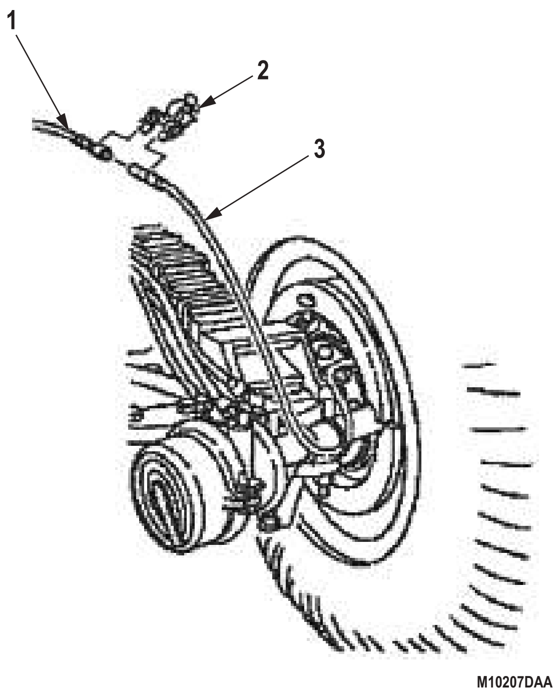


Figure 2. ABS ECU Main Wiring Harness Removal.

REMOVAL - Continued

12. Loosen nut (Figure 3, Item 8) and disconnect blue channel connector (Figure 3, Item 7) from front ABS relay valve (Figure 3, Item 10).
13. Loosen nut (Figure 3, Item 12) and disconnect yellow channel connector (Figure 3, Item 11) from rear ABS relay valve (Figure 3, Item 1).
14. Unlock and open harness support clip (Figure 3, Item 9) on ECU (Figure 3, Item 2).
15. Unlock spring clip (Figure 3, Item 4) and move to side, press down on two locking tabs (Figure 3, Item 5) and remove wiring harness connector (Figure 3, Item 6) from ECU connector (Figure 3, Item 3).

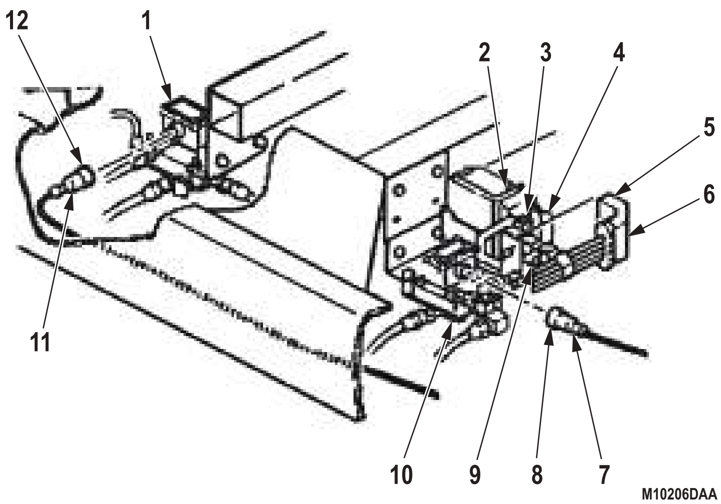


Figure 3. ABS ECU Main Wiring Harness Removal.

16. Remove tiedown straps and ABS ECU main wiring harness assembly from vehicle. Discard tiedown straps.

END OF TASK

INSTALLATION

NOTE

- Connect all leads as tagged at removal.
- Install tiedown straps every 6 to 12 in. (152 to 305 mm) as necessary to secure ABS ECU main wiring harness.

1. Install ABS ECU wiring harness in position under vehicle.
2. Install ABS wiring harness connector (Figure 4, Item 6) on ECU connector (Figure 4, Item 3) and listen for the locking tabs (Figure 4, Item 5) to click as connector is pushed into ECU connector. Lock spring clip (Figure 4, Item 4) over connector.
3. Close harness support clip (Figure 4, Item 9) over connector (Figure 4, Item 6) and lock in place under connector.
4. Connect blue channel connector (Figure 4, Item 7) to front ABS relay valve (Figure 4, Item 10) and tighten nut (Figure 4, Item 8) finger tight.
5. Route yellow channel connector (Figure 4, Item 11) to rear and connect to rear ABS relay valve (Figure 4, Item 1). Tighten nut (Figure 4, Item 12) finger tight.

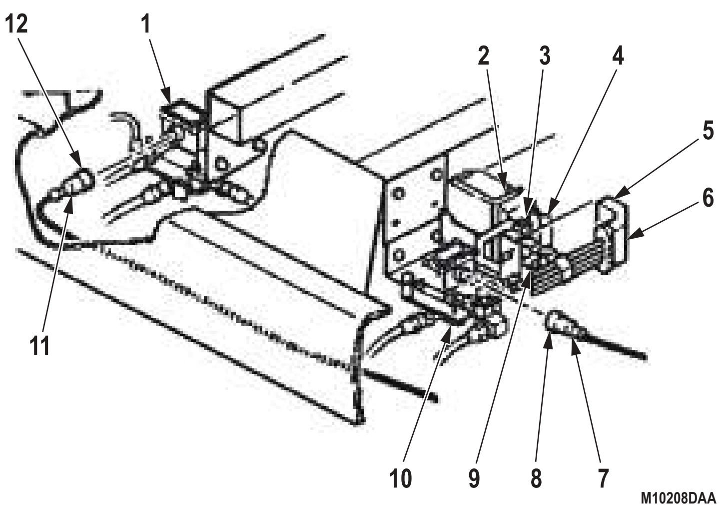


Figure 4. ABS ECU Main Wiring Harness Installation.

INSTALLATION - Continued

6. Route yellow 2B harness lead (Figure 5, Item 1) over to right side and connect to right wheel sensor lead (Figure 5, Item 3) (shown) and route blue 2A harness lead over to left side and connect to left wheel sensor lead (not shown).

NOTE

Left side and right side are the same. Only right side shown.

7. Install blue 2A harness lead on left wheel sensor lead (not shown) and yellow 2B harness lead (Figure 5, Item 1) on right wheel sensor lead (Figure 5, Item 3) (shown) on three-way clip (Figure 5, Item 2) with four tiedown straps.

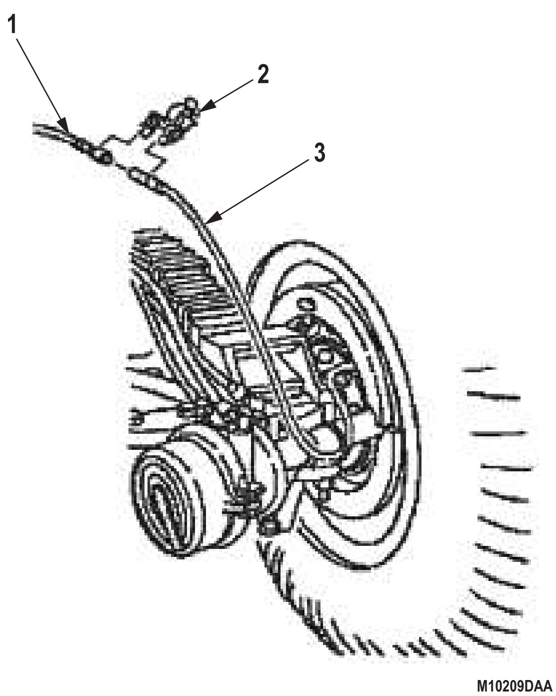


Figure 5. ABS ECU Main Wiring Harness Installation.

INSTALLATION - Continued

8. Route harness lead (Figure 6, Item 2), diagnostic connector (Figure 6, Item 3), and ABS main wiring harness (Figure 6, Item 14) up to front of vehicle and install tiedown straps as necessary.
9. Route harness lead (Figure 6, Item 2), diagnostic connector (Figure 6, Item 3), and ABS main wiring harness (Figure 6, Item 14) with leads (10, 11, 12, 18, and 19) through hole (Figure 6, Item 15) in firewall (Figure 6, Item 17) and install rubber grommet (Figure 6, Item 6) in hole.
10. Connect white ground lead (Figure 6, Item 12) from ABS main wiring harness (Figure 6, Item 14) to ground jumper lead (Figure 6, Item 7).
11. Connect purple lead (Figure 6, Item 18) from ABS main wiring harness (Figure 6, Item 14) to ABS indicator lamp lead No. 2 (Figure 6, Item 1).
12. Connect black lead (Figure 6, Item 19) from ABS main wiring harness (Figure 6, Item 14) to ABS indicator lamp lead No. 1 (Figure 6, Item 20).
13. Connect yellow lead (Figure 6, Item 10) from ABS main wiring harness (Figure 6, Item 14) to 3-AMP fuse and Y-connector lead (Figure 6, Item 8).
14. Connect red lead (Figure 6, Item 11) from ABS main wiring harness (Figure 6, Item 14) to 15-AMP fuse and jumper lead (Figure 6, Item 9).
15. Route harness lead (Figure 6, Item 2) and diagnostic connector (Figure 6, Item 3) over to right side of vehicle and install diagnostic connector in diagnostic connector bracket (Figure 6, Item 4) with nut (Figure 6, Item 5).
16. Install cap (Figure 6, Item 6) on diagnostic connector (Figure 6, Item 3).
17. Secure ABS main wiring harness (Figure 6, Item 14) and harness lead (Figure 6, Item 2) with tiedown straps (Figure 6, Item 13) as necessary.

INSTALLATION - Continued

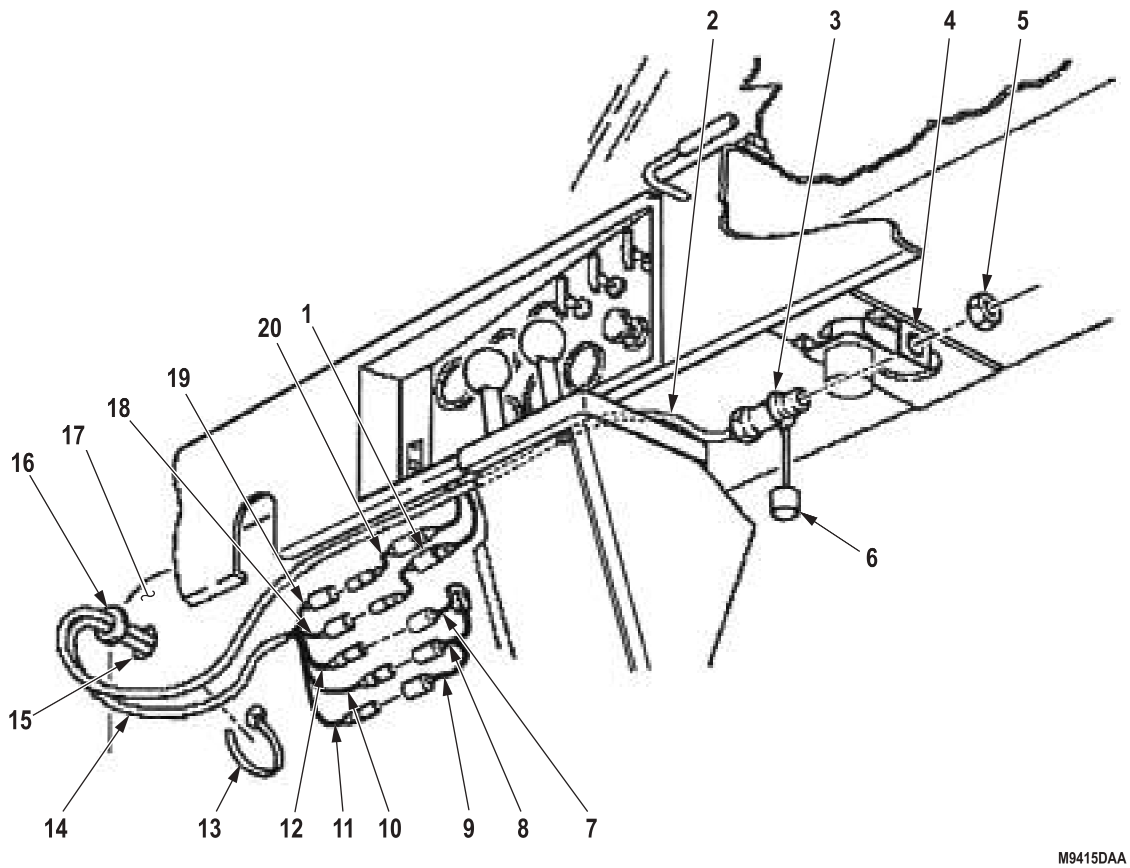


Figure 6. ABS ECU Main Wiring Harness Installation.

END OF TASK

FOLLOW-ON MAINTENANCE

1. Install battery switch. (Volume 2, WP 0310)
2. Install starter switch. (Volume 2, WP 0310)
3. Install instrument cluster. (Volume 2, WP 0310)
4. Connect battery ground cables. (Volume 2, WP 0350)
5. Start engine and allow air pressure to build to normal operating range. Road test vehicle and check operation of ABS. (TM 9-2320-272-10)

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
ABS WHEEL SENSOR AND BRACKET REPLACEMENT

INITIAL SETUP:

Tools and Special Tools

Tool Kit, General Mechanic's: Automotive
(Volume 5, WP 0826, Table 1, Item 56)

Materials/Parts

Locknut (Volume 5, WP 0827, Table 1, Item 290)
Qty: 3

Tiedown Strap
(Volume 5, WP 0827, Table 1, Item 298)
Qty: 10

Equipment Condition

Rear-rear axle spring brake(s) caged.
(TM 9-2320-272-10)

Equipment Condition (cont.)

Rear-rear axle wheel(s) removed.
(TM 9-2320-272-10)

Rear-rear axle hub(s) removed. (WP 0482)

Rear-rear axle brake shoe(s) removed.
(WP 0426)

REMOVAL

NOTE

ABS wheel sensor(s) are installed only on right and left rear-rear axle wheels and are replaced basically the same. This procedure covers the left ABS wheel sensor and ABS wheel sensor bracket.

1. Remove two tiedown straps (Figure 1, Item 15), ABS wheel sensor lead (Figure 1, Item 18), and ABS main wiring harness A2 blue lead (Figure 1, Item 16) from 3-way clip (Figure 1, Item 17). Discard tiedown straps.
2. Disconnect ABS wheel sensor lead (Figure 1, Item 18) from ABS wiring harness lead A2 blue lead (Figure 1, Item 16).
3. Remove tiedown straps (Figure 1, Item 15) from ABS wheel sensor lead (Figure 1, Item 18). Discard tiedown straps.
4. Remove locknut (Figure 1, Item 13), washer (Figure 1, Item 10), screw (Figure 1, Item 9), washer (Figure 1, Item 10), and clamp (Figure 1, Item 11) with ABS wheel sensor lead (Figure 1, Item 18) from rear brake spider (Figure 1, Item 2). Discard locknut.
5. Remove rubber plug (Figure 1, Item 12) and ABS wheel sensor lead (Figure 1, Item 18) from dust cover (Figure 1, Item 1).
6. Remove two locknuts (Figure 1, Item 14), washers (Figure 1, Item 5), screws (Figure 1, Item 4), washers (Figure 1, Item 5), and ABS wheel sensor bracket (Figure 1, Item 3) with ABS wheel sensor (Figure 1,Item 8) from rear brake spider (Figure 1, Item 2). Discard locknuts.
7. Remove ABS wheel sensor (Figure 1, Item 8) and sensor clip (Figure 1, Item 6) from ABS wheel sensor bracket (Figure 1, Item 3).
8. Relax tension of clip tabs (Figure 1, Item 7) and remove ABS wheel sensor (Figure 1, Item 8) from sensor clip (Figure 1, Item 6).
9. Remove clamp (Figure 1, Item 11) from ABS wheel sensor lead (Figure 1, Item 18).

REMOVAL - Continued

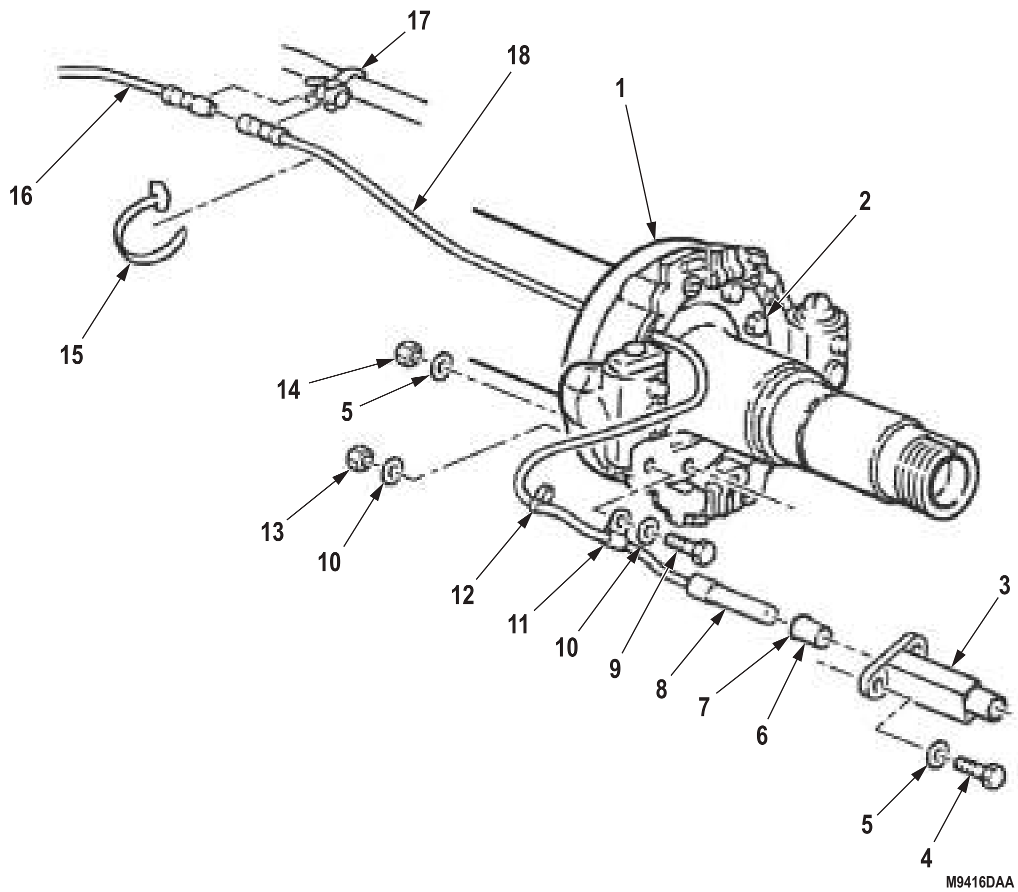


Figure 1. ABS Wheel Sensor and Bracket Removal.

END OF TASK

INSTALLATION

1. Position clamp (Figure 2, Item 11) on ABS wheel sensor lead (Figure 2, Item 18).
2. Push sensor clip (Figure 2, Item 6) into ABS wheel sensor bracket (Figure 2, Item 3) until clip tabs (Figure 2, Item 7) make contact with inner edge of ABS wheel sensor bracket.
3. Push ABS wheel sensor (Figure 2, Item 8) into sensor clip (Figure 2, Item 6) until shoulder on sensor makes contact with clip tabs (Figure 2, Item 7).

NOTE

Position ABS wheel sensor bracket on brake spider with ABS wheel sensor lead coming out the groove at the top of sensor bracket.

4. Position ABS wheel sensor lead (Figure 2, Item 18) in groove on ABS wheel sensor bracket (Figure 2, Item 3) and install bracket on rear brake spider (Figure 2, Item 2) with two washers (Figure 2, Item 5), screws (Figure 2, Item 4), washers (Figure 2, Item 5), and locknuts (Figure 2, Item 14). Tighten screws 110 to 145 lb-ft (149 to 196 N·m).
5. Install rubber plug (Figure 2, Item 12) on ABS wheel sensor lead (Figure 2, Item 18).
6. Route ABS wheel sensor lead (Figure 2, Item 18) through hole in dust cover (Figure 2, Item 1) and install clamp (Figure 2, Item 11) on rear brake spider (Figure 2, Item 2) with washer (Figure 2, Item 10), screw (Figure 2, Item 9), washer (Figure 2, Item 10), and locknut (Figure 2, Item 13). Tighten screw 110 to 145 lb-ft (149 to 196 N·m).
7. Route ABS wheel sensor lead (Figure 2, Item 18) over to ABS wiring harness A2 blue lead (Figure 2, Item 16), positioning lead on rear side of axle housing, and secure with tiedown straps (Figure 2, Item 15).
8. Connect ABS wheel sensor lead (Figure 2, Item 18) to ABS wiring harness A2 blue lead (Figure 2, Item 16) and install leads in 3-way clip (Figure 2, Item 17) with two tiedown straps (Figure 2, Item 15).

INSTALLATION - Continued

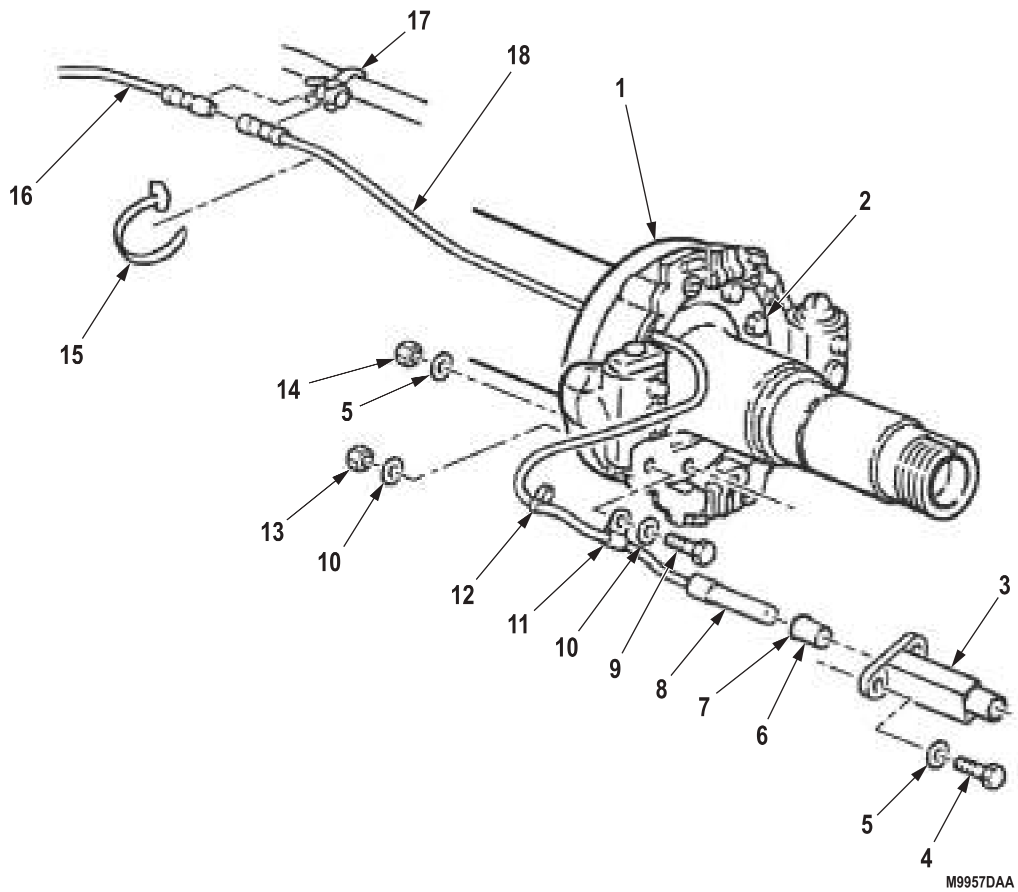


Figure 2. ABS Wheel Sensor and Bracket Installation.

END OF TASK

FOLLOW-ON MAINTENANCE

1. Install rear-rear axle brake shoe(s). (WP 0426)
2. Install rear-rear axle hub(s). (WP 0482)
3. Install rear-rear axle wheel(s). (TM 9-2320-272-10)
4. Uncage spring brake(s). (TM 9-2320-272-10)
5. Check and adjust brakes. (WP 0432)
6. Start engine and allow air pressure to build to normal operating range. (TM 9-2320-272-10)
7. Road test vehicle. (TM 9-2320-272-10)
8. Check operation of ABS. (TM 9-2320-272-10)

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
REAR ABS RELAY EXCITER RING REPLACEMENT

INITIAL SETUP:

Tools and Special Tools

Tool Kit, General Mechanic's: Automotive
(Volume 5, WP 0826, Table 1, Item 56)

Press, Arbor, Hand Operated
(Volume 5, WP 0826, Table 1, Item 39)

Equipment Condition

Spring brake(s) caged. (TM 9-2320-272-10)

Equipment Condition (cont.)

Rear hub(s) and brake drum(s) removed.
(WP 0480)

Rear hub(s) and brake drum(s) removed.
(WP 0482)

Wheel(s) removed. (WP 0485)

REMOVAL

1. Press alternating wheel studs (Figure 1, Item 3) .125 to .250 in. (3.5 to 7 mm) out of hub (Figure 1, Item 1).
2. Rotate exciter ring (Figure 1, Item 2) counter clockwise and remove from hub (Figure 1, Item 1).

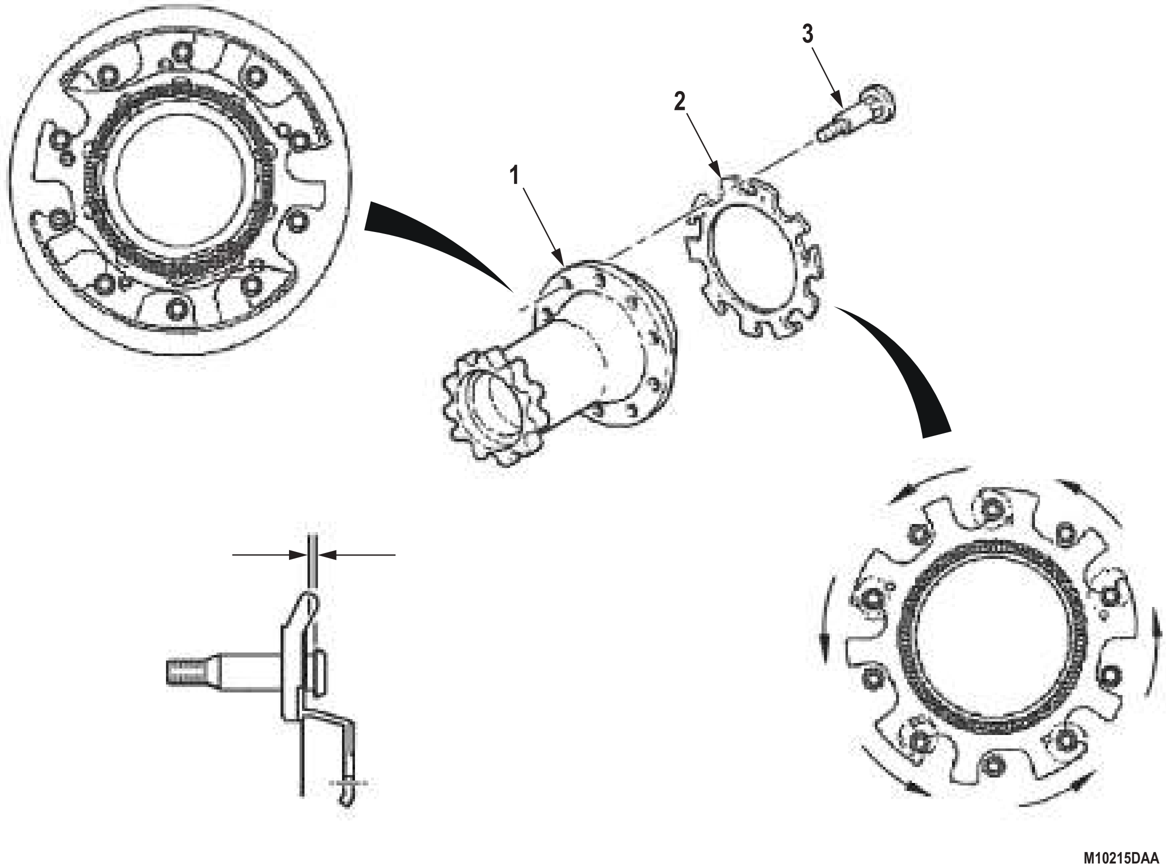


Figure 1. Rear ABS Exciter Ring Removal.

END OF TASK

INSTALLATION

1. Position exciter ring (Figure 2, Item 2) on hub (Figure 2, Item 1) and rotate clockwise to seat exciter ring under wheel studs (Figure 2, Item 3).
2. Press wheel studs (Figure 2, Item 3) into hub (Figure 2, Item 1) capturing exciter ring (Figure 2, Item 2) between hub and wheel studs. Ensure studs are seated.

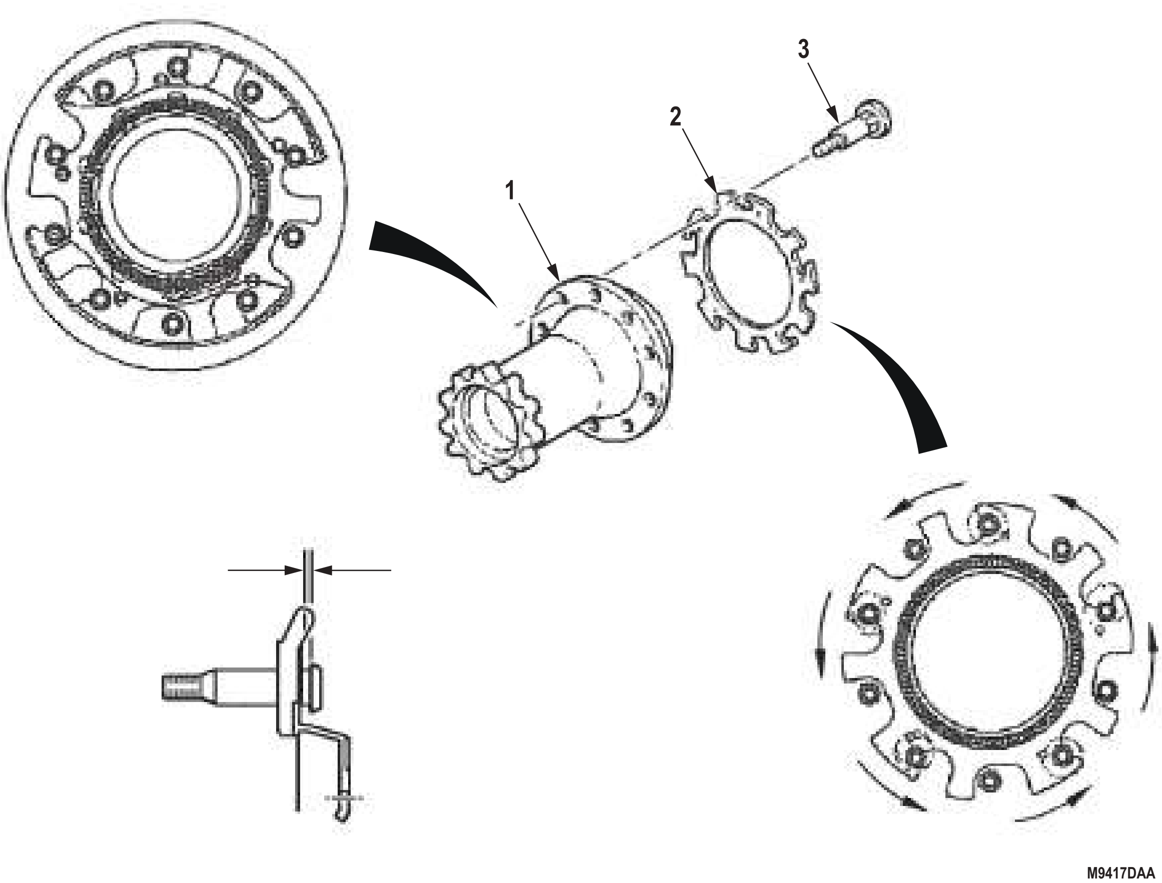


Figure 2. Rear ABS Exciter Ring Installation.

END OF TASK

FOLLOW-ON MAINTENANCE

1. Install rear hub(s) and brake drum(s). (WP 0482)
2. Install wheel(s). (WP 0485)
3. Uncage spring brake(s). (TM 9-2320-272-10)
4. Adjust brakes if necessary. (WP 0432)
5. Start engine and allow air pressure to build to normal operating range. Check brake system for proper operation. (TM 9-2320-272-10)
6. Road test vehicle. (TM 9-2320-272-10)

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
AIR COMPRESSOR AND LINES REPLACEMENT (M939A2)

INITIAL SETUP:

Tools and Special Tools

Tool Kit, General Mechanic's: Automotive
(Volume 5, WP 0826, Table 1, Item 56)
Wrench, Torque, Click, Ratcheting, 1/2" Drive,
250 Ft-Lb
(Volume 5, WP 0826, Table 1, Item 63)

Materials/Parts

Tape, Antiseizing
(Volume 5, WP 0825, Table 1, Item 65)
Bushing (Volume 5, WP 0827, Table 1, Item 118)
Qty: 4
Gasket (Volume 5, WP 0827, Table 1, Item 34)
Qty: 1

Materials/Parts (cont.)

Gasket (Volume 5, WP 0827, Table 1, Item 151)
Qty: 1
Locknut (Volume 5, WP 0827, Table 1, Item 143)
Qty: 2

Personnel Required

(2)

Equipment Condition

Air reservoirs drained. (TM 9-2320-272-10)
Coolant drained. (Volume 2, WP 0287)
Power steering pump removed. (WP 0502)

REMOVAL

1. Remove clamp (Figure 1, Item 5) and hose (Figure 1, Item 6) from power steering pump (Figure 1, Item 3).
2. Disconnect supply line (Figure 1, Item 4) from power steering pump (Figure 1, Item 3).
3. Remove two screws (Figure 1, Item 2), washers (Figure 1, Item 1), power steering pump (Figure 1, Item 3), and gasket (Figure 1, Item 8) from air compressor (Figure 1, Item 7). Discard gasket.

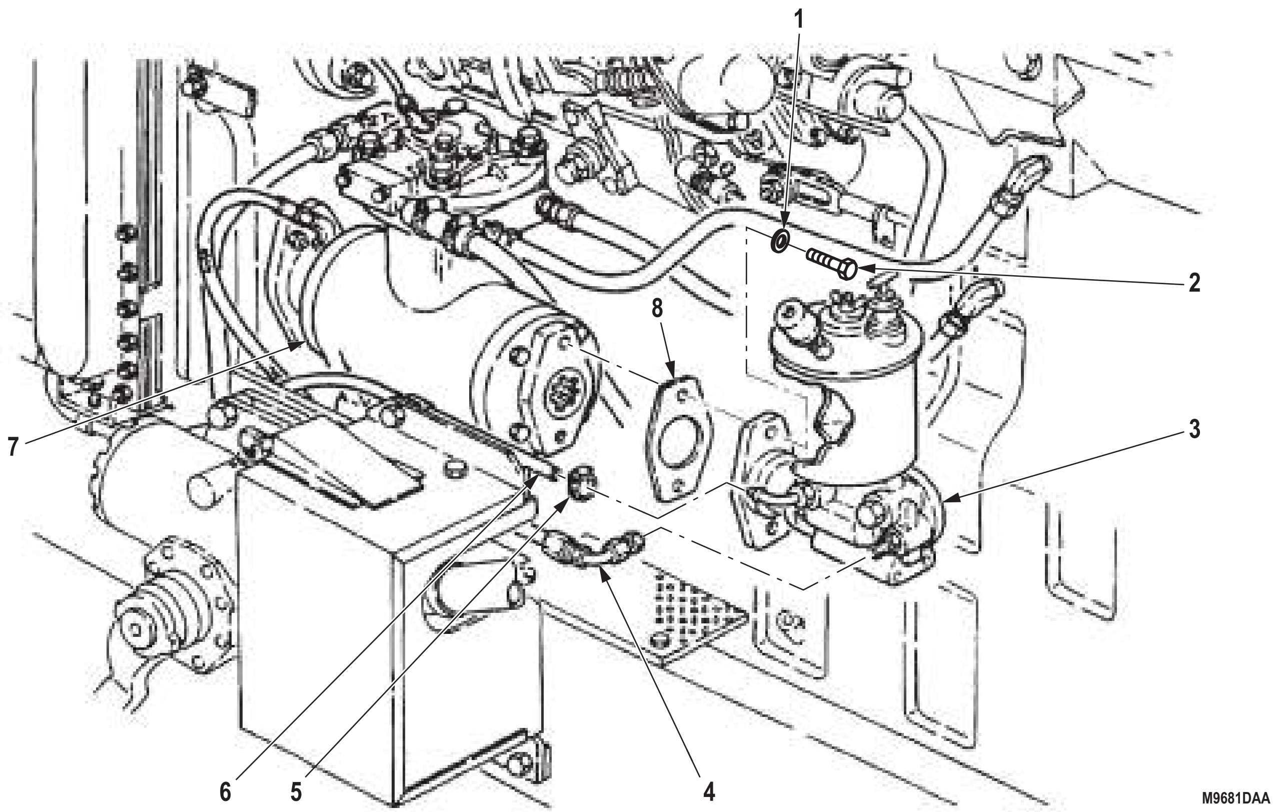


Figure 1. Power Steering Pump Removal.

REMOVAL - Continued

4. Disconnect air outlet tube (Figure 2, Item 20) from elbow (Figure 2, Item 21).
5. Remove air governor tube (Figure 2, Item 23) from elbow (Figure 2, Item 22).
6. Remove water outlet tube (Figure 2, Item 10) and two bushings (Figure 2, Items 5 and 16) from elbow (Figure 2, Item 6) and air compressor (Figure 2, Item 17). Discard bushings.
7. Remove water inlet tube (Figure 2, Item 9) and two bushings (Figure 2, Items 8 and 15) from elbow (Figure 2, Item 7) and air compressor (Figure 2, Item 17). Discard bushings.
8. Remove elbows (Figure 2, Items 6 and 7) from engine block (Figure 2, Item 11).
9. Remove screw (Figure 2, Item 12) and air inlet tube (Figure 2, Item 4) from engine block (Figure 2, Item 11).
10. Loosen two hose clamps (Figure 2, Item 1) and remove air inlet tube (Figure 2, Item 4) from air inlet connector (Figure 2, Item 18).
11. Loosen clamp (Figure 2, Item 3) and remove air inlet tube (Figure 2, Item 4) from adapter (Figure 2, Item 2).
12. Remove adapter (Figure 2, Item 2) from engine block (Figure 2, Item 11).
13. Remove oil supply hose (Figure 2, Item 14) from fitting (Figure 2, Item 19) and elbow (Figure 2, Item 13).
14. Remove elbow (Figure 2, Item 13) from engine block (Figure 2, Item 11).

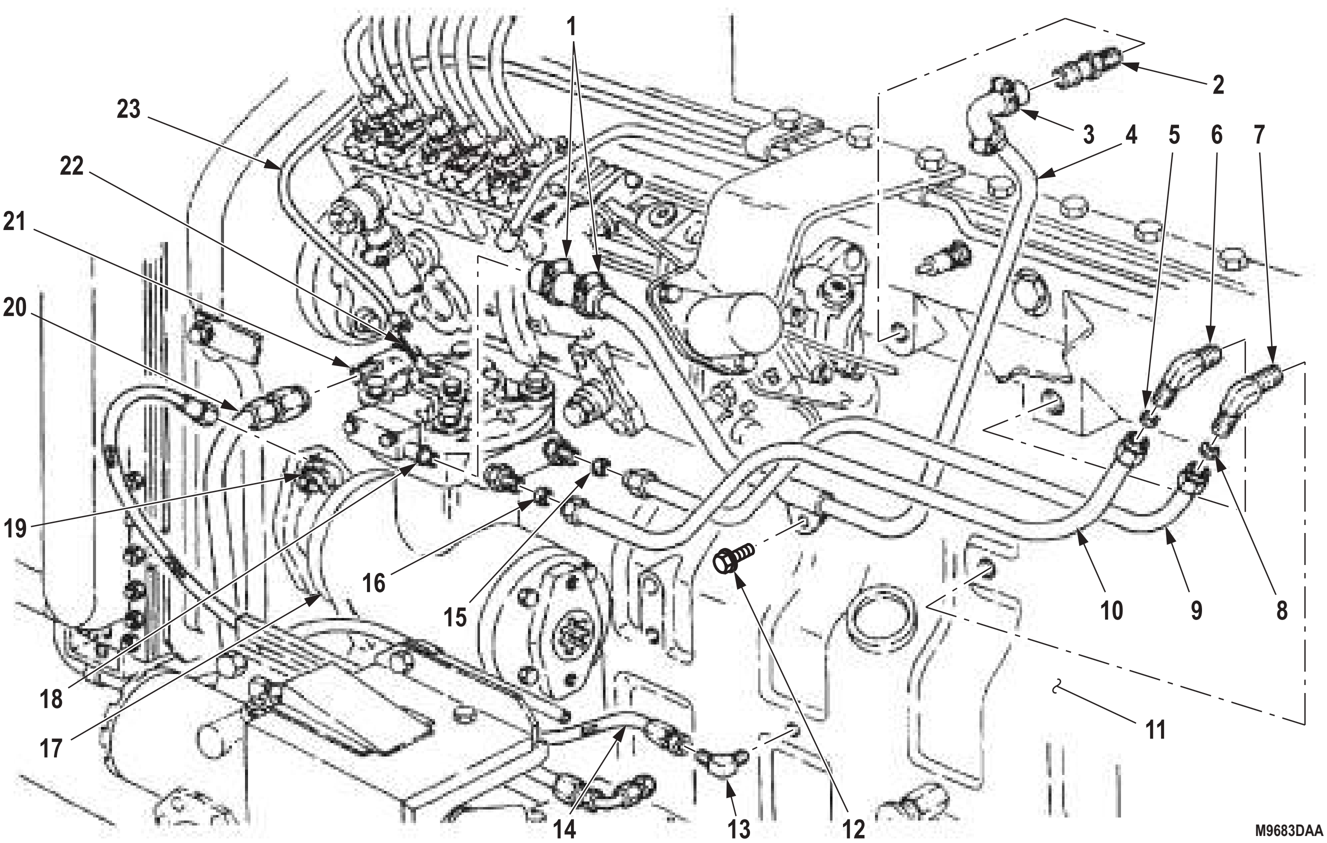


Figure 2. Power Steering Pump Removal.

REMOVAL - Continued

15. Remove two screws (Figure 3, Item 12), clamp (Figure 3, Item 11), and air outlet tube (Figure 3, Item 10) from spacer (Figure 3, Item 8).
16. Remove two screws (Figure 3, Item 9) and spacer (Figure 3, Item 8) from engine block (Figure 3, Item 7) and brace (Figure 3, Item 5).
17. Remove two screws (Figure 3, Item 6) and brace (Figure 3, Item 5) from air compressor (Figure 3, Item 4).
18. Remove two locknuts (Figure 3, Item 3), washers (Figure 3, Item 2), air compressor (Figure 3, Item 4), and gasket (Figure 3, Item 1) from gear housing (Figure 3, Item 13). Discard locknuts and gasket.

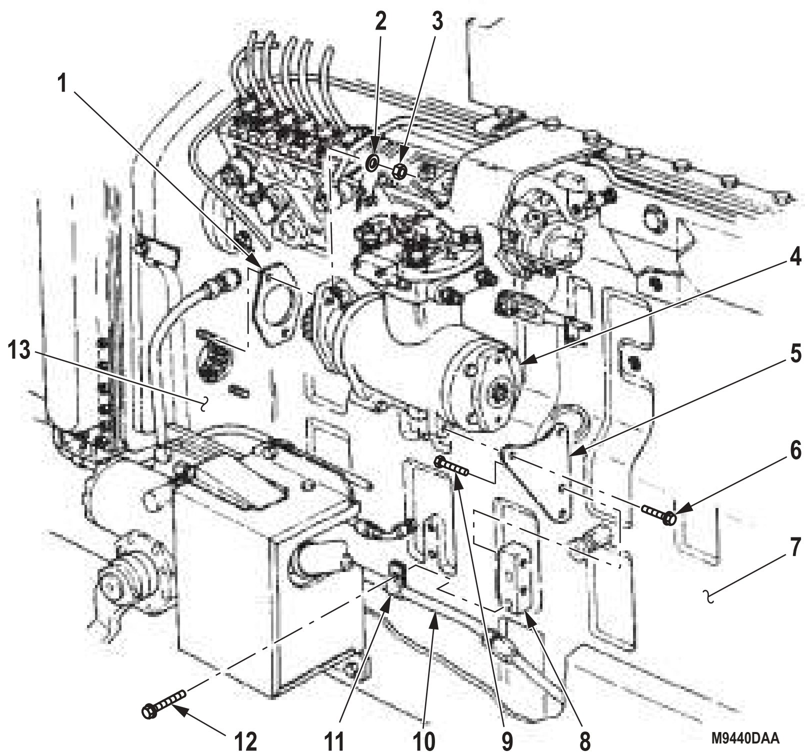


Figure 3. Power Steering Pump Removal.

END OF TASK

INSTALLATION

1. Install gasket (Figure 4, Item 1) and air compressor (Figure 4, Item 4) on gear housing (Figure 4, Item 13) with two washers (Figure 4, Item 2) and locknuts (Figure 4, Item 3). Tighten locknuts 55 lb-ft (75 N·m).
2. Install brace (Figure 4, Item 5) on air compressor (Figure 4, Item 4) with two screws (Figure 4, Item 6).
3. Install spacer (Figure 4, Item 8) on engine block (Figure 4, Item 7) and brace (Figure 4, Item 5) with two screws (Figure 4, Item 9).
4. Install air outlet tube (Figure 4, Item 10) on spacer (Figure 4, Item 8) with clamp (Figure 4, Item 11) and two screws (Figure 4, Item 12).

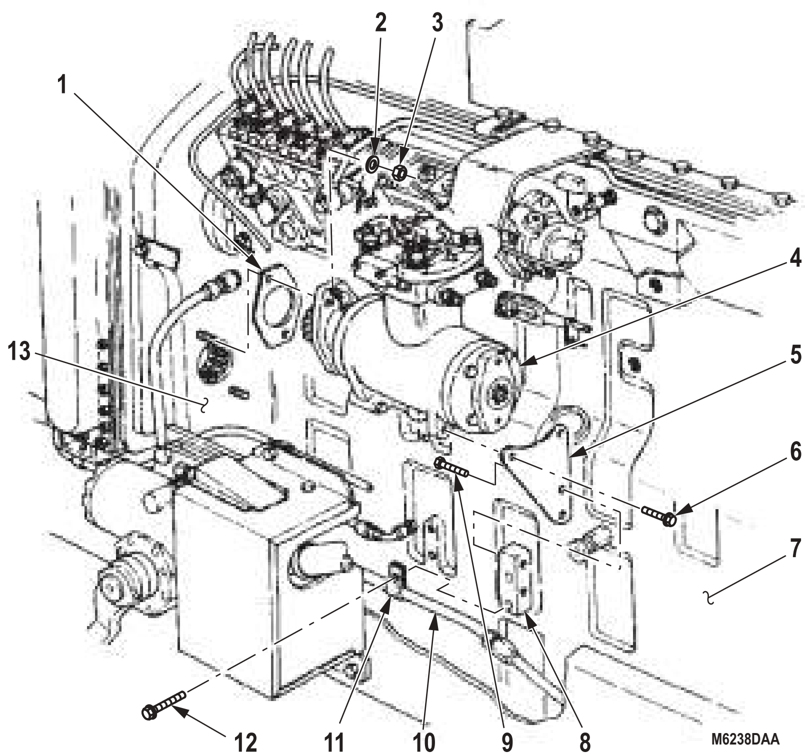


Figure 4. Air Compressor Installation.

INSTALLATION - Continued

NOTE

Wrap all male pipe threads with antiseize tape before installation.

5. Install elbow (Figure 5, Item 13) on engine block (Figure 5, Item 11).
6. Install oil supply hose (Figure 5, Item 14) on fitting (Figure 5, Item 19) and elbow (Figure 5, Item 13).
7. Install adapter (Figure 5, Item 2) on engine block (Figure 5, Item 11).
8. Install air inlet tube (Figure 5, Item 4) on adapter (Figure 5, Item 2) with clamp (Figure 5, Item 3). Tighten clamp.
9. Install air inlet tube (Figure 5, Item 4) on air inlet connector (Figure 2, Item 18) with two hose clamps (Figure 2, Item 1). Tighten hose clamps.
10. Install air inlet tube (Figure 5, Item 4) on engine block (Figure 5, Item 11) with screw (Figure 5, Item 12).
11. Install elbows (Figure 5, Items 6 and 7) on engine block (Figure 5, Item 11).
12. Install two bushings (Figure 5, Items 8 and 15) and water inlet tube (Figure 5, Item 9) on elbow (Figure 5, Item 7) and air compressor (Figure 5, Item 17).
13. Install two bushings (Figure 5, Items 5 and 16) and water outlet tube (Figure 5, Item 10) on elbow (Figure 5, Item 6) and air compressor (Figure 5, Item 17).
14. Install air governor tube (Figure 5, Item 23) on elbow (Figure 5, Item 22).
15. Connect air outlet tube (Figure 5, Item 20) to elbow (Figure 5, Item 21).

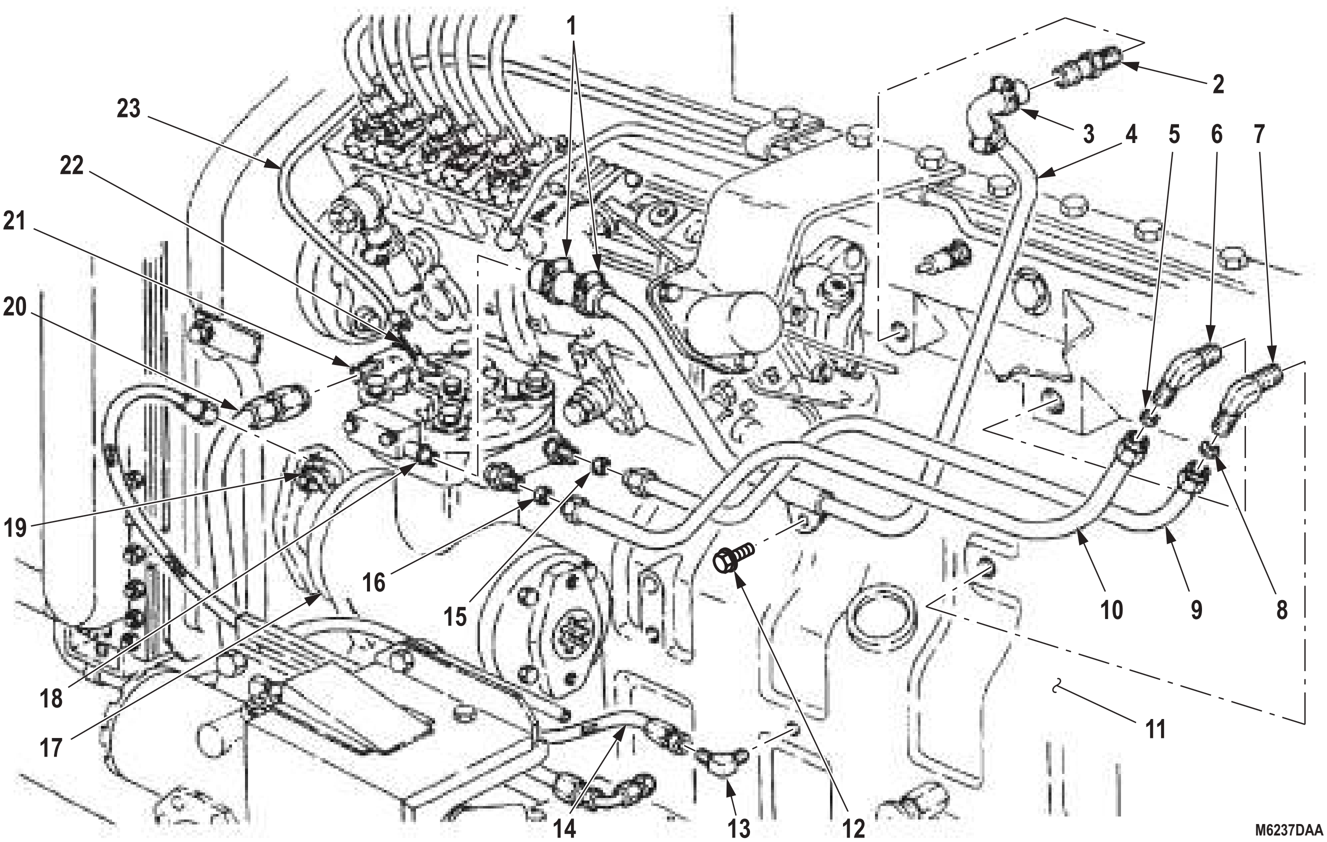


Figure 5. Air Compressor Installation.

INSTALLATION - Continued

16. Install gasket (Figure 6, Item 8) and power steering pump (Figure 6, Item 3) on air compressor (Figure 6, Item 7) with two washers (Figure 6, Item 1) and screws (Figure 6, Item 2).
17. Connect supply line (Figure 6, Item 4) to power steering pump (Figure 6, Item 3).

CAUTION

When filling cooling system, ensure drain valve on aftercooler is open. Failure to do so may result in damage to equipment.

18. Install hose (Figure 6, Item 6) on power steering pump (Figure 6, Item 3) with clamp (Figure 6, Item 5).

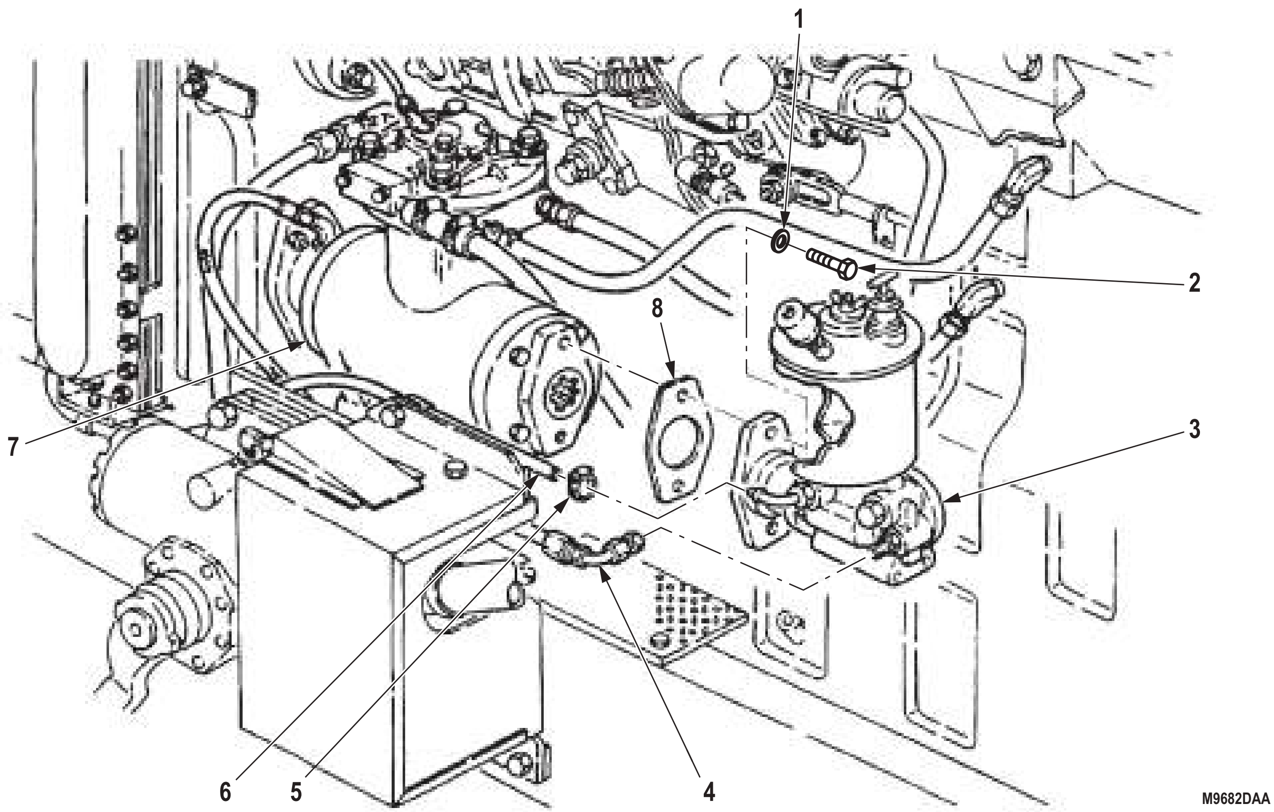


Figure 6. Air Compressor Installation.

END OF TASK

FOLLOW-ON MAINTENANCE

Fill cooling system. (Volume 2, WP 0287)

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
AIR COMPRESSOR COOLANT LINES REPLACEMENT (M939A2)

INITIAL SETUP:

Tools and Special Tools
Tool Kit, General Mechanic's: Automotive
(Volume 5, WP 0826, Table 1, Item 56)

Materials/Parts
Cap Set, Protective, Dust and Moisture Seal
(Volume 5, WP 0825, Table 1, Item 13)
Tape, Antiseizing
(Volume 5, WP 0825, Table 1, Item 65)
Seal (Volume 5, WP 0827, Table 1, Item 174)
Qty: 4

References
Volume 5, WP 0819

Equipment Condition
Hood raised and secured. (TM 9-2320-272-10)

Equipment Condition (cont.)
Right splash shield removed. (TM 9-2320-272-10)
Coolant system drained. (Volume 2, WP 0287)

REMOVAL

NOTE

When disconnecting water lines or hoses, plug ends and tag for identification during installation.

1. Disconnect two tubing nuts (Figure 1, Item 10) and remove water outlet tube (Figure 1, Item 7) and two seals (Figure 1, Item 5) from air compressor (Figure 1, Item 11) and elbow (Figure 1, Item 2) in cylinder head (Figure 1, Item 1). Discard seals.
2. Disconnect two tubing nuts (Figure 1, Item 9) and remove water inlet tube (Figure 1, Item 6) and two seals (Figure 1, Item 4) from air compressor (Figure 1, Item 11) and elbow (Figure 1, Item 3) in engine block (Figure 1, Item 8). Discard seals.
3. Remove elbow (Figure 1, Item 2) from cylinder head (Figure 1, Item 1) and elbow (Figure 1, Item 3) from engine block (Figure 1, Item 8).

REMOVAL - Continued

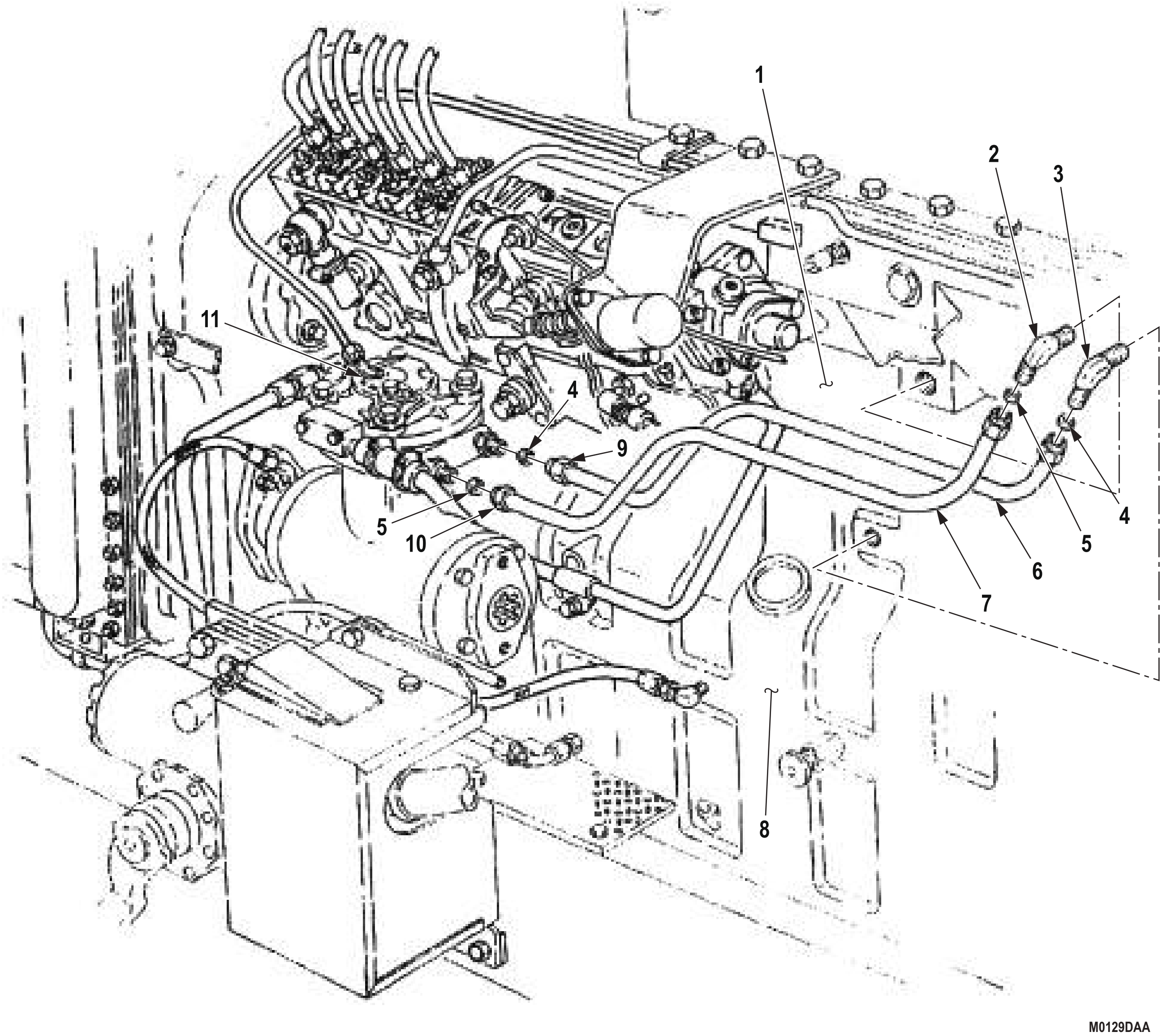


Figure 1. Air Compressor Coolant Lines Removal.

END OF TASK

CLEANING AND INSPECTION

1. For General Cleaning Instructions, refer to (Volume 5, WP 0819).
2. For General Inspection Instructions, refer to (Volume 5, WP 0819).
3. Inspect tubes for kinks, cracks, and bends.
4. Replace all parts failing inspection.

END OF TASK

INSTALLATION

NOTE

Male pipe threads must be wrapped with antiseize tape before installation.

1. Install elbow (Figure 2, Item 3) on engine block (Figure 2, Item 8) and elbow (Figure 2, Item 2) on cylinder head (Figure 2, Item 1).
2. Install water inlet tube (Figure 2, Item 6) and two seals (Figure 2, Item 4) on air compressor (Figure 2, Item 11) and elbow (Figure 2, Item 3) on engine block (Figure 2, Item 8).
3. Install water outlet tube (Figure 2, Item 7) and two seals (Figure 2, Item 5) on air compressor (Figure 2, Item 11) and elbow (Figure 2, Item 2) on cylinder head (Figure 2, Item 1).

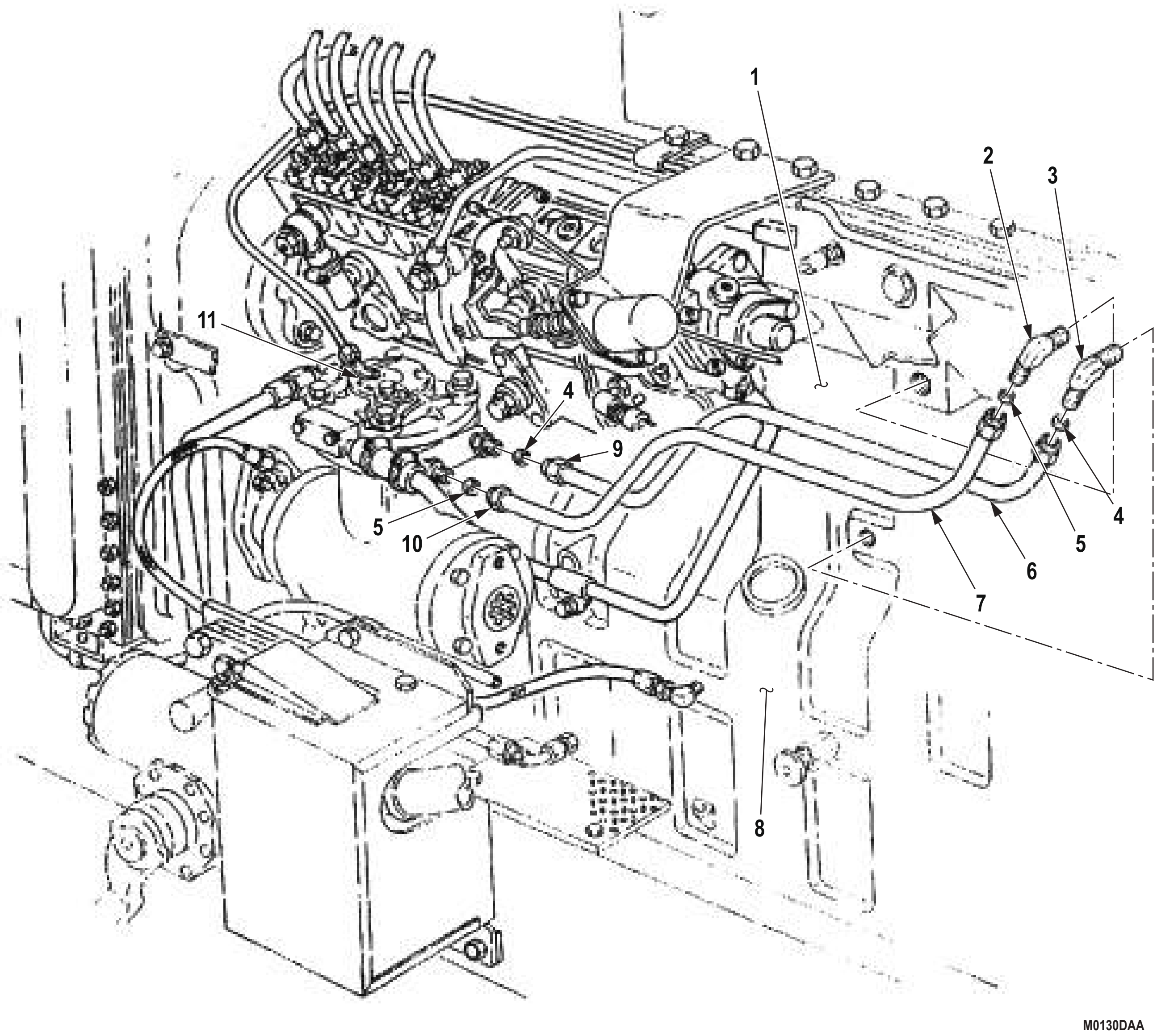


Figure 2. Air Compressor Coolant Lines Installation.

END OF TASK

FOLLOW-ON MAINTENANCE

1. Fill cooling system to proper level. (Volume 2, WP 0287)
2. Install right splash shield. (TM 9-2320-272-10)
3. Start engine and check for coolant leaks. (TM 9-2320-272-10)

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
TRAILER AIRBRAKE HAND CONTROL VALVE REPLACEMENT (M931/A1/A2, M932/A1/A2)

INITIAL SETUP:

Tools and Special Tools
Tool Kit, General Mechanic's: Automotive
(Volume 5, WP 0826, Table 1, Item 56)

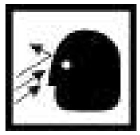
Materials/Parts
Tape, Antiseizing
(Volume 5, WP 0825, Table 1, Item 65)

Equipment Condition
Parking brake set. (TM 9-2320-272-10)

Equipment Condition (cont.)
Air reservoirs drained. (TM 9-2320-272-10)

REMOVAL

WARNING



Do not disconnect air lines or hoses before draining air reservoirs. Small parts under pressure may shoot out with high velocity. Failure to comply may result in injury or death to personnel.

NOTE

- The airbrake hand control valve is mounted on the upper steering column opposite the turn signal control.
- Tag air lines for installation.

1. Disconnect vent line (Figure 1, Item 10) from adapter fitting (Figure 1, Item 9).
2. Disconnect delivery line (Figure 1, Item 11) from adapter fitting (Figure 1, Item 12).
3. Disconnect line (Figure 1, Item 8) from adapter fitting (Figure 1, Item 7).
4. Remove two screws (Figure 1, Item 4), washers (Figure 1, Item 3), tab (Figure 1, Item 2), clamp (Figure 1, Item 5), and control valve (Figure 1, Item 1) from upper steering column (Figure 1, Item 6).
5. Remove adapter fittings (Figure 1, Items 7, 9, and 12) from control valve (Figure 1, Item 1).

REMOVAL - Continued

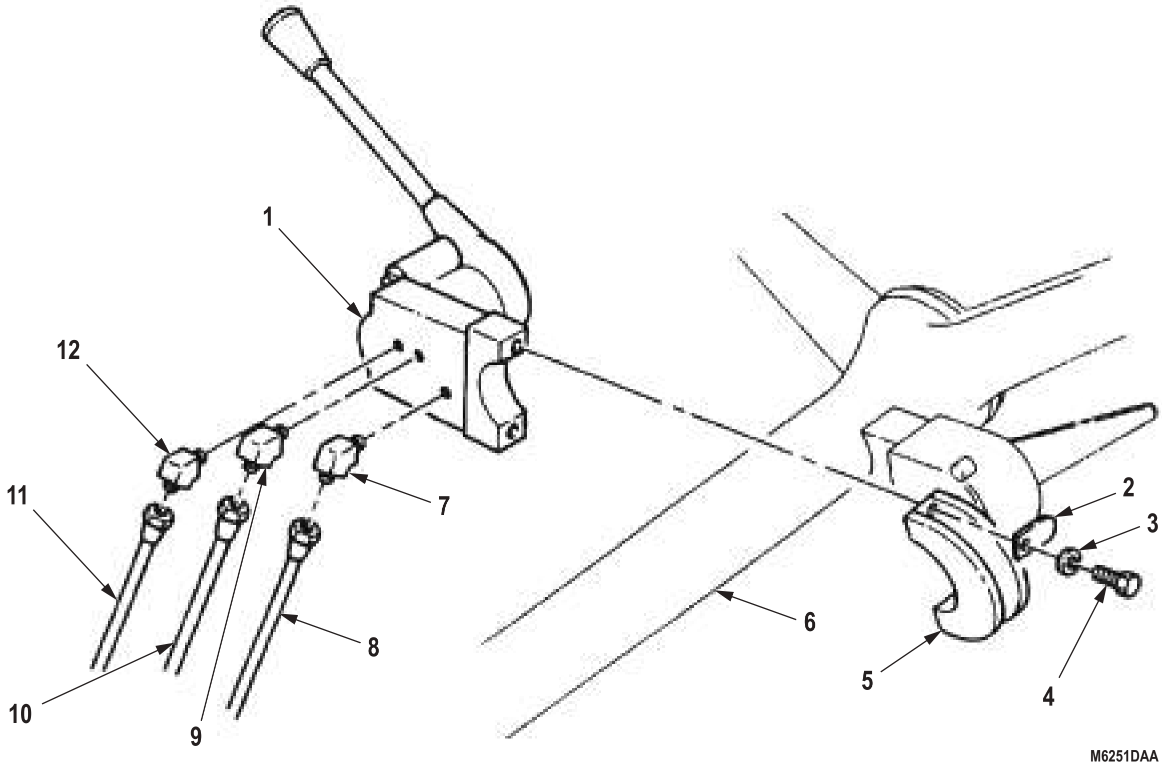


Figure 1. Trailer Airbrake Hand Control Valve Removal.

END OF TASK

INSTALLATION

NOTE

- If new valve is being installed, use fittings from old valve.
- Wrap all male pipe threads with antiseize tape before installation.

1. Install three adapter fittings (Figure 2, Items 7, 9, and 12) on control valve (Figure 2, Item 1).
2. Install control valve (Figure 2, Item 1) on upper steering column (Figure 2, Item 6) with clamp (Figure 2, Item 5), tab (Figure 2, Item 2), two washers (Figure 2, Item 3), and screws (Figure 2, Item 4).
3. Connect line (Figure 2, Item 8) to adapter fitting (Figure 2, Item 7).
4. Connect delivery line (Figure 2, Item 11) to adapter fitting (Figure 2, Item 12).
5. Connect vent line (Figure 2, Item 10) to adapter fitting (Figure 2, Item 9).

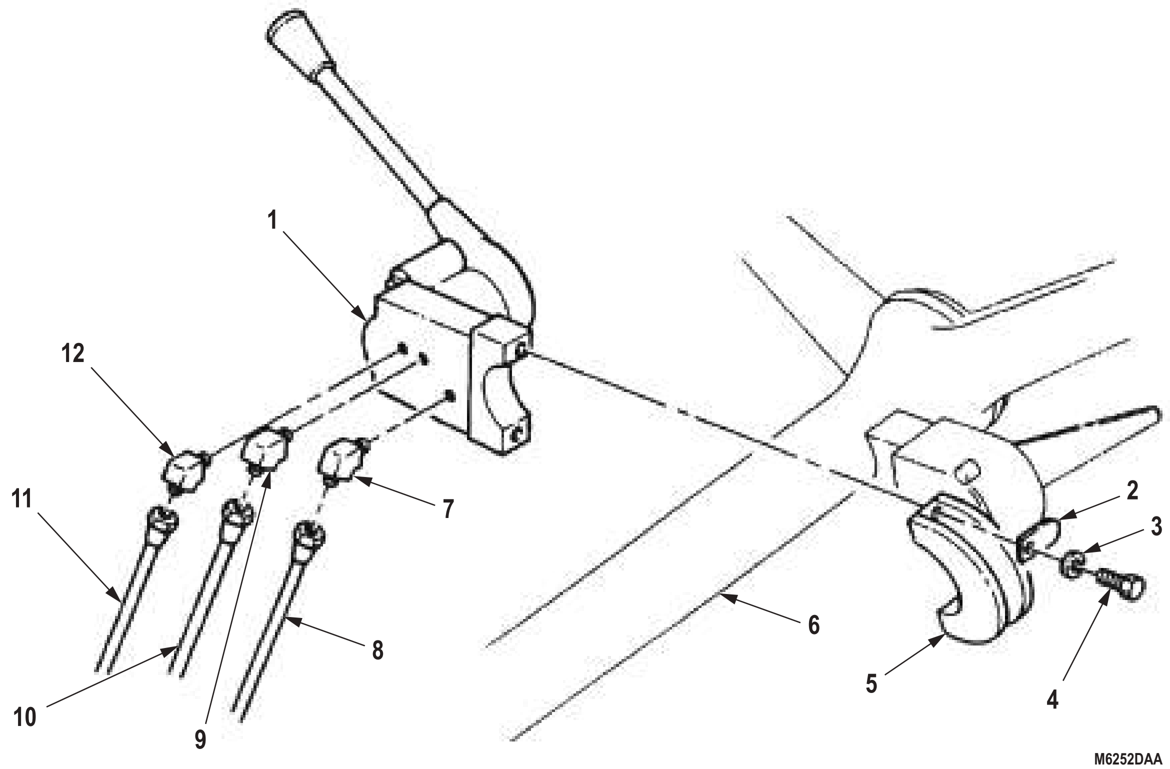


Figure 2. Trailer Airbrake Hand Control Valve Installation.

END OF TASK

FOLLOW-ON MAINTENANCE

Start engine and allow air pressure to build to normal operating range. Check for air leaks at hand control valve. Road test vehicle. (TM 9-2320-272-10)

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
DOUBLE CHECK VALVE NO. 1 REPLACEMENT

INITIAL SETUP:

Tools and Special Tools
Tool Kit, General Mechanic's: Automotive
(Volume 5, WP 0826, Table 1, Item 56)

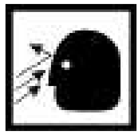
Materials/Parts
Tape, Antiseizing
(Volume 5, WP 0825, Table 1, Item 65)
Locknut (Volume 5, WP 0827, Table 1, Item 283)
Qty: 1

Equipment Condition
Parking brake set. (TM 9-2320-272-10)

Equipment Condition (cont.)
Air reservoirs drained. (TM 9-2320-272-10)

REMOVAL

WARNING



Do not disconnect air lines or hoses before draining air reservoirs. Small parts under pressure may shoot out with high velocity. Failure to comply may result in injury or death to personnel.

NOTE

- Double check valve No. 1 is located inside the front left frame rail and left of the front axle differential.
- Tag air lines for installation.

1. Disconnect line (Figure 1, Item 1) from double check valve No.1 adapter (Figure 1, Item 2).
2. Disconnect line (Figure 1, Item 12) from valve adapter (Figure 1, Item 11).
3. Disconnect line (Figure 1, Item 9) from tee (Figure 1, Item 10).
4. Remove tee (Figure 1, Item 10) from double check valve No. 1 (Figure 1, Item 3).
5. Disconnect line (Figure 1, Item 5) from valve adapter (Figure 1, Item 7).
6. Remove locknut (Figure 1, Item 8), screw (Figure 1, Item 4), and double check valve No. 1 (Figure 1, Item 3) from frame rail (Figure 1, Item 6). Discard locknut.

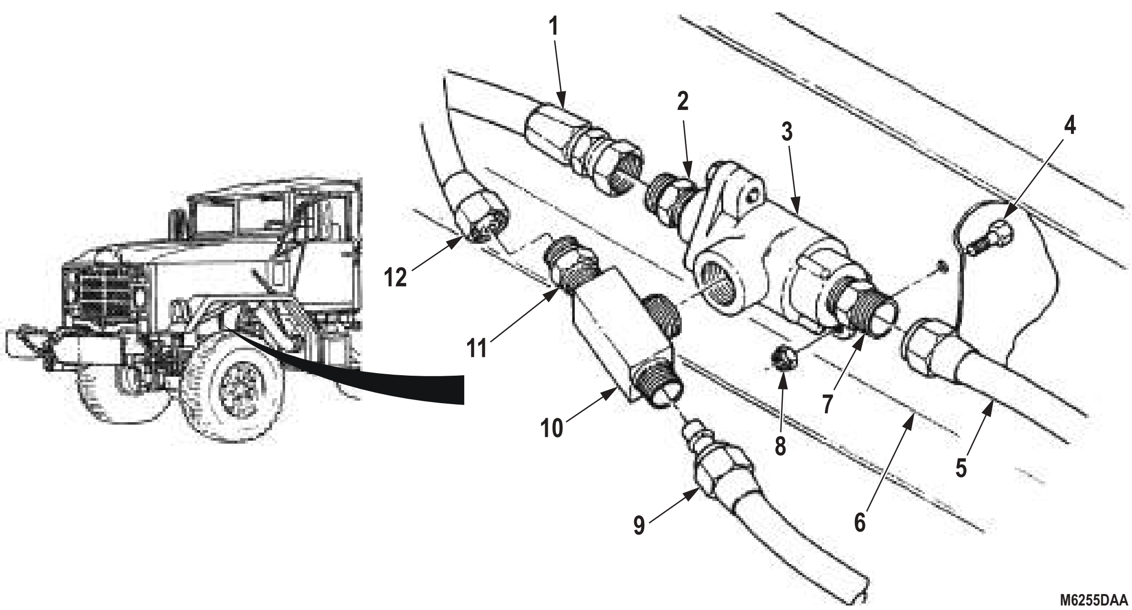


Figure 1. Double Check Valve No. 1 Removal.

END OF TASK

INSTALLATION

NOTE

- If new double check valve is being installed, use fittings from old double check valve.
- Wrap all male pipe threads with antiseize tape before installation.

1. Position double check valve No. 1 (Figure 2, Item 3) against frame rail (Figure 2, Item 6) and install with screw (Figure 2, Item 4) and locknut (Figure 2, Item 8).
2. Connect line (Figure 2, Item 5) to valve adapter (Figure 2, Item 7).
3. Install tee (Figure 2, Item 10) on double check valve No. 1 (Figure 2, Item 3).
4. Connect line (Figure 2, Item 9) to tee (Figure 2, Item 10).
5. Connect line (Figure 2, Item 12) to valve adapter (Figure 2, Item 11).
6. Connect line (Figure 2, Item 1) to double check valve No. 1 adapter (Figure 2, Item 2).

INSTALLATION - Continued

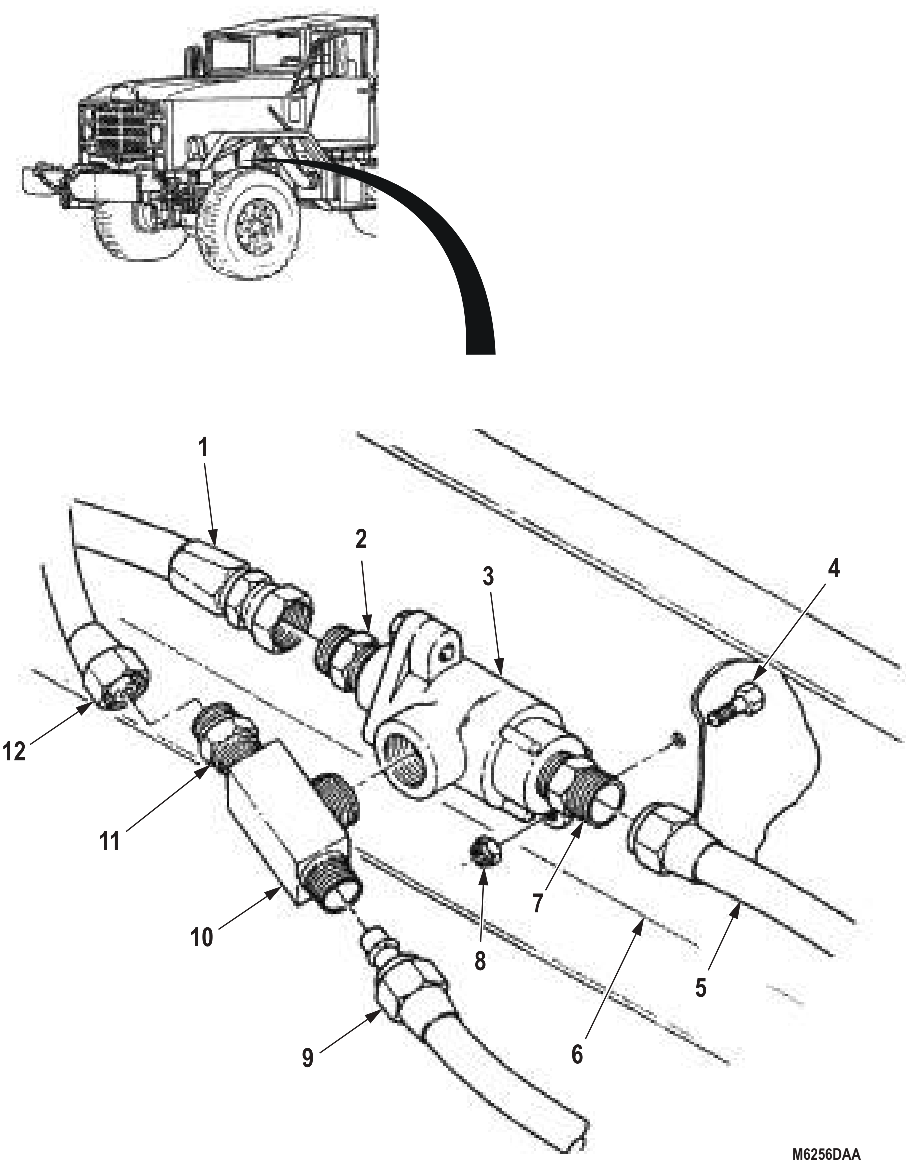


Figure 2. Double Check Valve No. 1 Installation.

END OF TASK

FOLLOW-ON MAINTENANCE

Start engine and allow air pressure to build to normal operating range. Check for air leaks at double check valve No. 1. Road test vehicle. (TM 9-2320-272-10)

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
DOUBLE CHECK VALVE NO. 2 REPLACEMENT

INITIAL SETUP:

Tools and Special Tools

Tool Kit, General Mechanic's: Automotive
(Volume 5, WP 0826, Table 1, Item 56)

Materials/Parts

Tape, Antiseizing
(Volume 5, WP 0825, Table 1, Item 65)
Locknut (Volume 5, WP 0827, Table 1, Item 283)
Qty: 1

Equipment Condition

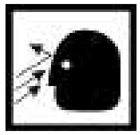
Parking brake set. (TM 9-2320-272-10)

Equipment Condition (cont.)

Air reservoirs drained. (TM 9-2320-272-10)

REMOVAL

WARNING



Do not disconnect air lines or hoses before draining air reservoirs. Small parts under pressure may shoot out with high velocity. Failure to comply may result in injury or death to personnel.

NOTE

- Double check valve No. 5 is located inside the left frame rail in back of the stoplight switch.
- Tag air lines for installation.

1. Disconnect two wires (Figure 1, Item 6) from stoplight switch (Figure 1, Item 5).
2. Disconnect treadle valve control line (Figure 1, Item 7) from double check valve No.2 (Figure 1, Item 3).
3. Disconnect secondary relay valve control line (Figure 1, Item 9) from elbow (Figure 1, Item 8).
4. Disconnect double check valve No. 1 output line (Figure 1, Item 10) from elbow (Figure 1, Item 11).
5. Disconnect primary relay valve control line (Figure 1, Item 13) from valve adapter tee (Figure 1, Item 12).
6. Remove locknut (Figure 1, Item 2), screw (Figure 1, Item 1), and double check valve No. 2 (Figure 1, Item 3) from left frame rail (Figure 1, Item 4). Discard locknut.

REMOVAL - Continued

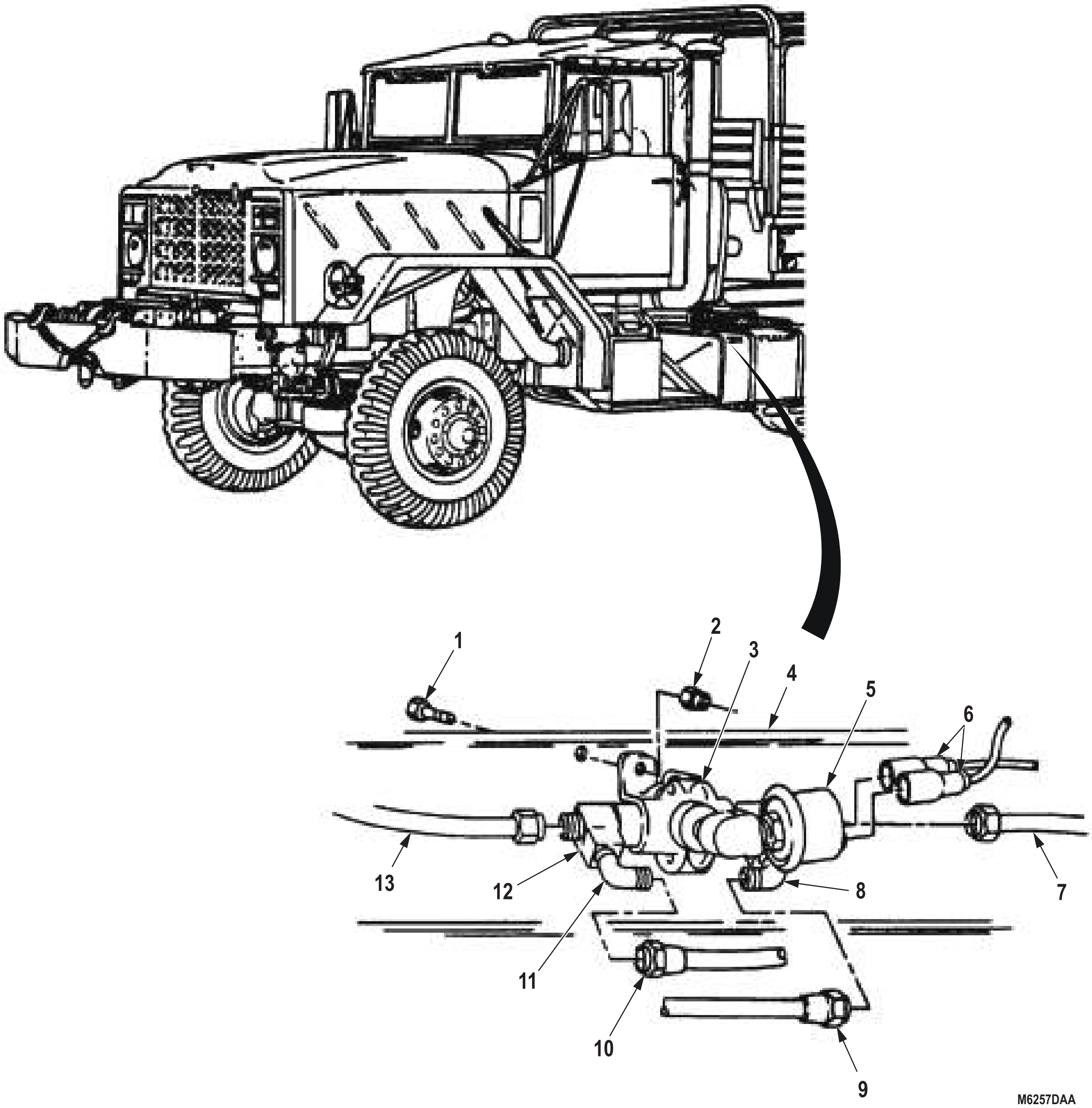


Figure 1. Double Check Valve No. 2 Installation.

END OF TASK

INSTALLATION

NOTE

- If new double check valve is being installed, use fittings from old check valve.
- Wrap all male pipe threads with antiseize tape before installation.

1. Position double check valve No. 2 (Figure 2, Item 3) against left frame rail (Figure 2, Item 4) and install with screw (Figure 2, Item 1) and locknut (Figure 2, Item 2).
2. Connect treadle valve control line (Figure 2, Item 7) to double check valve No. 2 (Figure 2, Item 3).
3. Connect secondary relay valve control line (Figure 2, Item 9) to elbow (Figure 2, Item 8).
4. Connect double check valve No. 1 output line (Figure 2, Item 10) to elbow (Figure 2, Item 11).
5. Connect primary relay valve control line (Figure 2, Item 13) to valve adapter tee (Figure 2, Item 12).
6. Connect two wires (Figure 2, Item 6) to stoplight switch (Figure 2, Item 5).

INSTALLATION - Continued

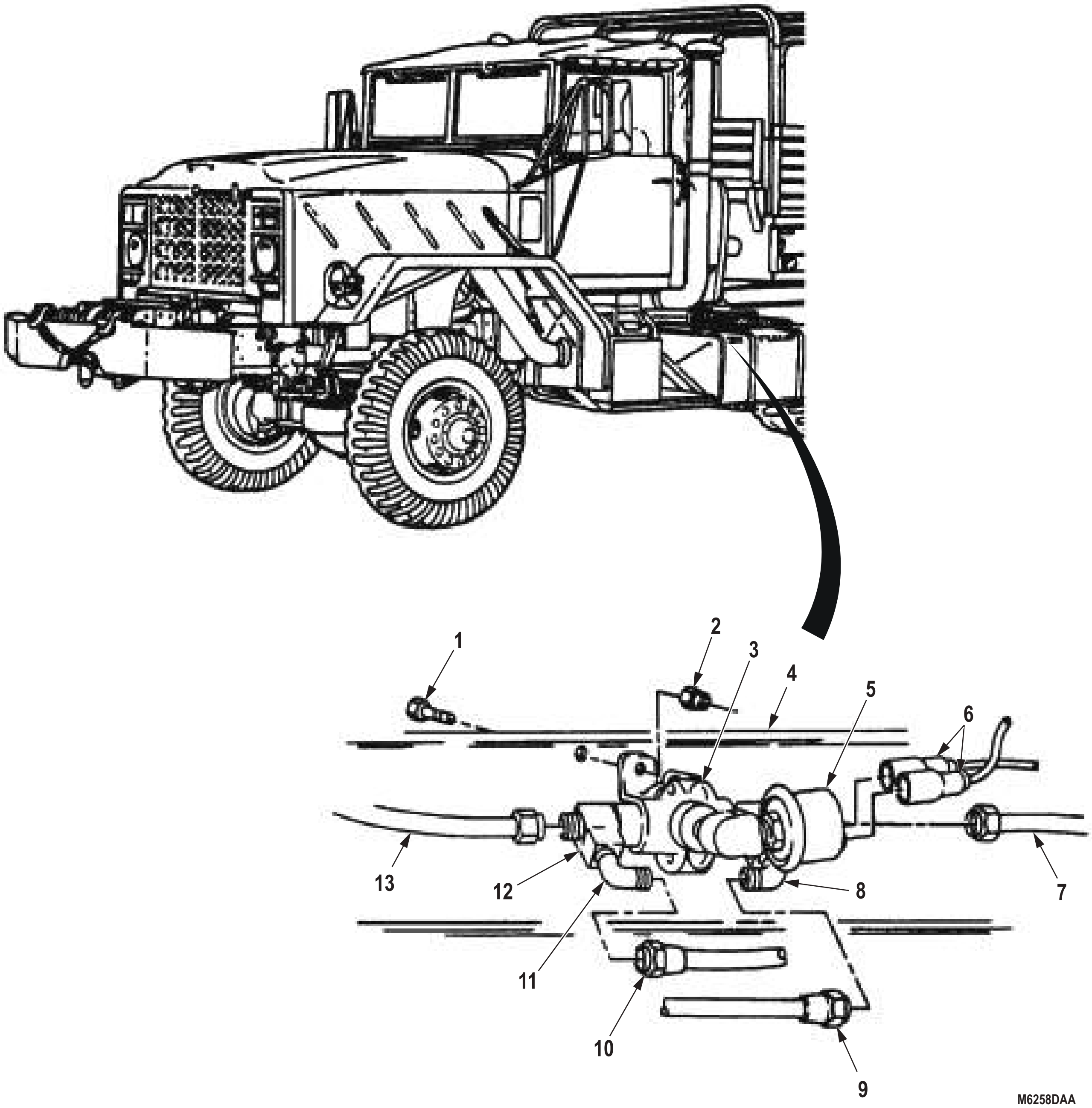


Figure 2. Double Check Valve No. 2 Installation.

END OF TASK

FOLLOW-ON MAINTENANCE

Start engine and allow air pressure to build to normal operating range. Check for air leaks at double check valve No. 2. Road test vehicle. (TM 9-2320-272-10)

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
DOUBLE CHECK VALVE NO. 2 REPLACEMENT (M931/A1/A2, AND M932/A1/A2)

INITIAL SETUP:

Tools and Special Tools
Tool Kit, General Mechanic's: Automotive
(Volume 5, WP 0826, Table 1, Item 56)

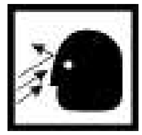
Materials/Parts
Tape, Antiseizing
(Volume 5, WP 0825, Table 1, Item 65)
Locknut (Volume 5, WP 0827, Table 1, Item 283)
Qty: 1

Equipment Condition
Parking brake set. (TM 9-2320-272-10)

Equipment Condition (cont.)
Air reservoirs drained. (TM 9-2320-272-10)

REMOVAL

WARNING



Do not disconnect air lines or hoses before draining air reservoirs. Small parts under pressure may shoot out with high velocity. Failure to comply may result in injury or death to personnel.

NOTE

- Double check valve No. 5 is used with airbrake kits on M931/A1/A2 and M932/A1/A2 model vehicles. It is located inside the left frame rail in back of the stoplight switch.
- Tag air lines for installation.

1. Disconnect two wires (Figure 1, Item 6) from stoplight switch (Figure 1, Item 5).
2. Disconnect double check valve No. 5 control line (Figure 1, Item 8) from adapter tee (Figure 1, Item 9).
3. Disconnect protection valve control line (Figure 1, Item 10) and trailer handbrake control line (Figure 1, Item 7) from double check valve No. 2 (Figure 1, Item 3).
4. Remove locknut (Figure 1, Item 2), screw (Figure 1, Item 1), and double check valve No. 2 (Figure 1, Item 3) from left frame rail (Figure 1, Item 4). Discard locknut.

REMOVAL - Continued

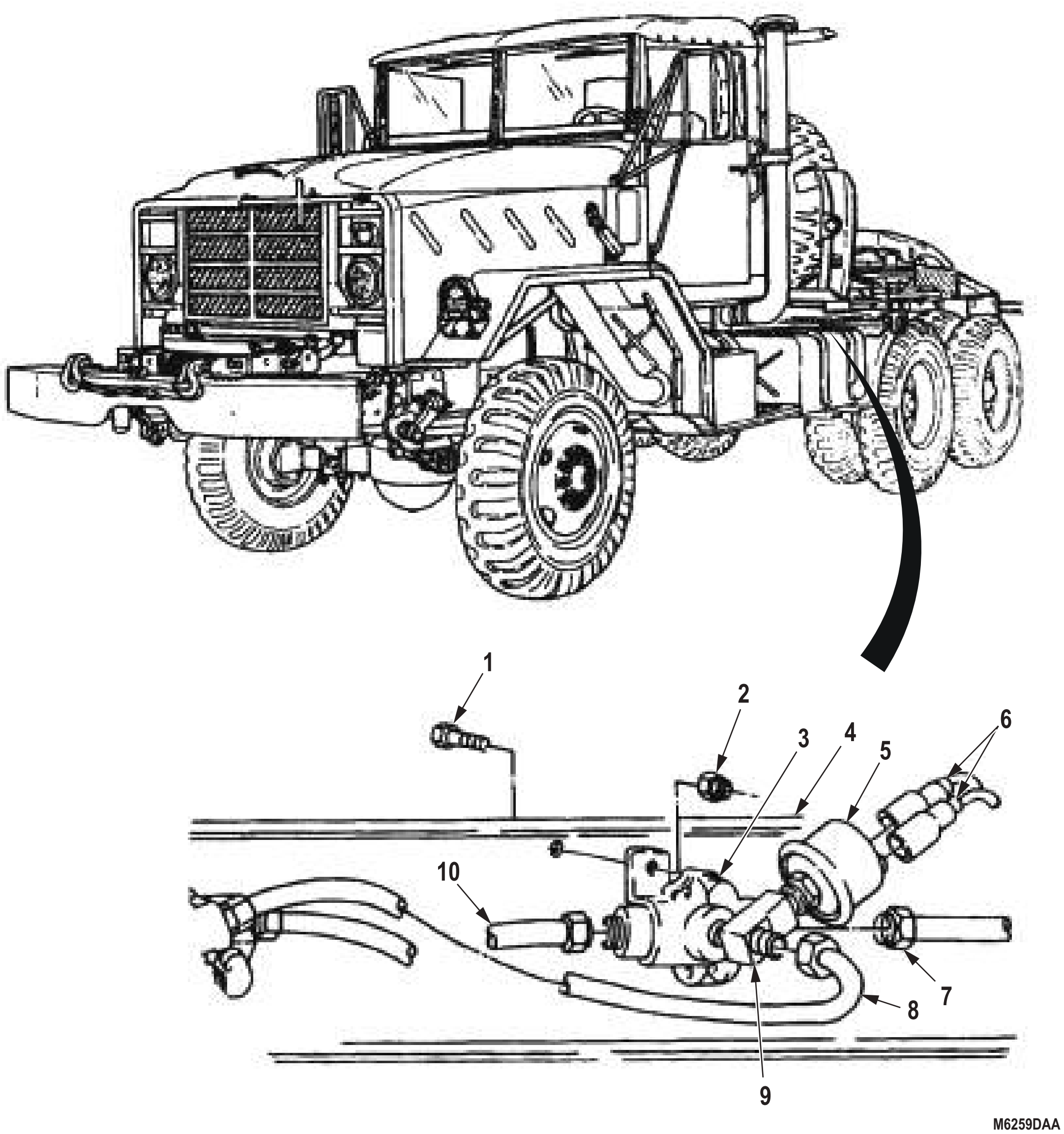


Figure 1. Double Check Valve No. 2 Removal.

END OF TASK

INSTALLATION

NOTE

- If new double check valve is being installed, use fittings from old check valve.
- Wrap all male pipe threads with antiseize tape before installation.

1. Position double check valve No. 2 (Figure 2, Item 3) against left frame rail (Figure 2, Item 4) and install with screw (Figure 2, Item 1) and locknut (Figure 2, Item 2).
2. Connect protection valve control line (Figure 2, Item 10) and trailer handbrake control line (Figure 2, Item 7) to double check valve No. 2 (Figure 2, Item 3).
3. Connect double check valve No. 5 control line (Figure 2, Item 8) to adapter tee (Figure 2, Item 9).
4. Connect two wires (Figure 2, Item 6) to stoplight switch (Figure 2, Item 5).

INSTALLATION - Continued

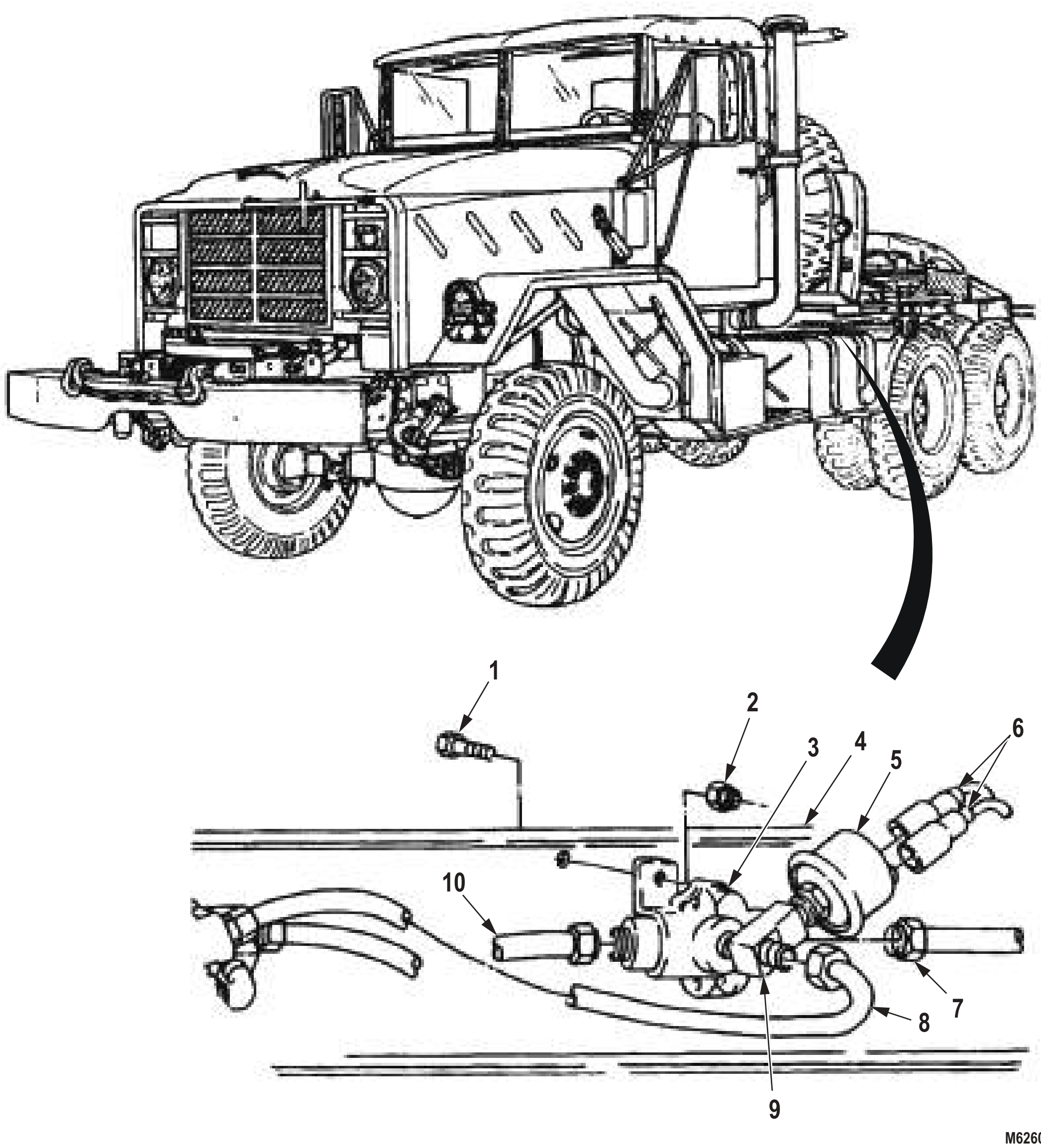


Figure 2. Double Check Valve No. 2 Installation.

END OF TASK

FOLLOW-ON MAINTENANCE

Start engine and allow air pressure to build to normal operating range. Check for air leaks at double check valve No. 2. Road test vehicle. (TM 9-2320-272-10)

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
DOUBLE CHECK VALVE NO. 5 REPLACEMENT (M931/A1/A2, AND M932/A1/A2)

INITIAL SETUP:

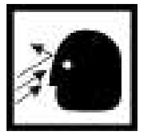
Tools and Special Tools
Tool Kit, General Mechanic's: Automotive (Volume 5, WP 0826, Table 1, Item 56)

Materials/Parts
Tape, Antiseizing (Volume 5, WP 0825, Table 1, Item 65)
Locknut (Volume 5, WP 0827, Table 1, Item 285) Qty: 1

Equipment Condition
Air reservoirs drained. (TM 9-2320-272-10)

REMOVAL

WARNING



Do not disconnect air lines or hoses before draining air reservoirs. Small parts under pressure may shoot out with high velocity. Failure to comply may result in injury or death to personnel.

NOTE

- Double check valve No. 5 is used with airbrake kits on M931/A1/A2 and M932/A1/A2 model vehicles. It is located inside the left frame rail in back of the stoplight switch.
- Tag air lines for installation.

1. Disconnect primary relay valve control line (Figure 1, Item 14) from valve adapter tee (Figure 1, Item 13).
2. Disconnect double check valve No. 1 output line (Figure 1, Item 11) from valve elbow (Figure 1, Item 12).
3. Disconnect secondary relay valve control line (Figure 1, Item 10) from valve elbow (Figure 1, Item 9).
4. Disconnect double check valve No. 2 control line (Figure 1, Item 6) from bushing (Figure 1, Item 5).
5. Disconnect treadle valve control line (Figure 1, Item 7) from valve adapter tee (Figure 1, Item 8).
6. Remove locknut (Figure 1, Item 3), screw (Figure 1, Item 1), and double check valve No. 5 (Figure 1, Item 4) from frame rail (Figure 1, Item 2). Discard locknut.

REMOVAL - Continued

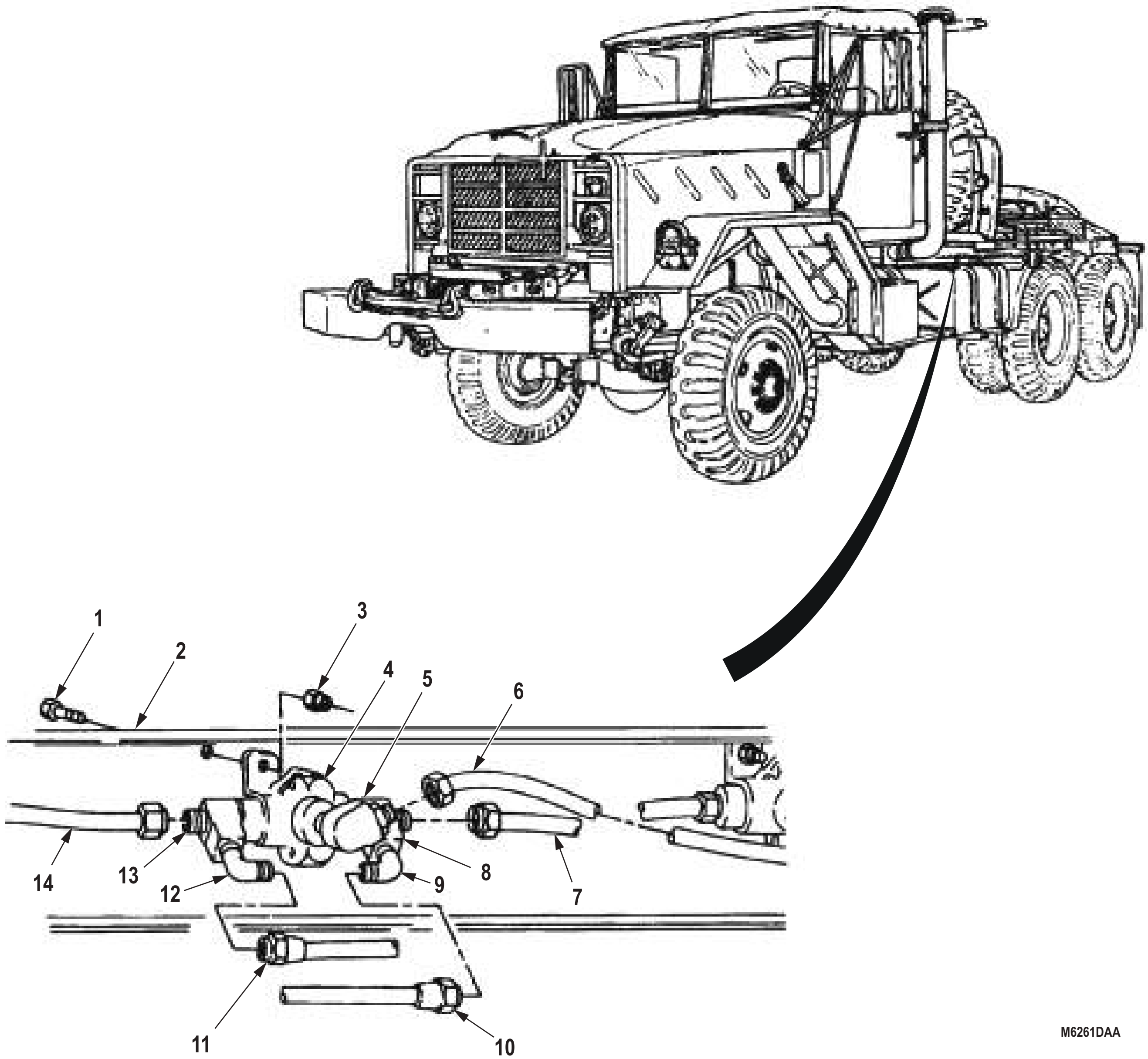


Figure 1. Double Check Valve No. 5 Removal.

END OF TASK

INSTALLATION

NOTE

- If new valve is being installed, use fittings from old valve.
- Wrap all male pipe threads with antiseize tape before installation.

1. Position double check valve No. 5 (Figure 2, Item 4) against frame rail (Figure 2, Item 2) and install with screw (Figure 2, Item 1) and locknut (Figure 2, Item 3).
2. Connect treadle valve control line (Figure 2, Item 7) to valve adapter tee (Figure 2, Item 8).
3. Connect double check valve No. 2 control line (Figure 2, Item 6) to bushing (Figure 2, Item 5).
4. Connect secondary relay valve control line (Figure 2, Item 10) to valve elbow (Figure 2, Item 9).
5. Connect double check valve No. 1 output line (Figure 2, Item 11) to valve elbow (Figure 2, Item 12).
6. Connect primary relay valve control line (Figure 2, Item 14) to valve adapter tee (Figure 2, Item 13).

INSTALLATION - Continued

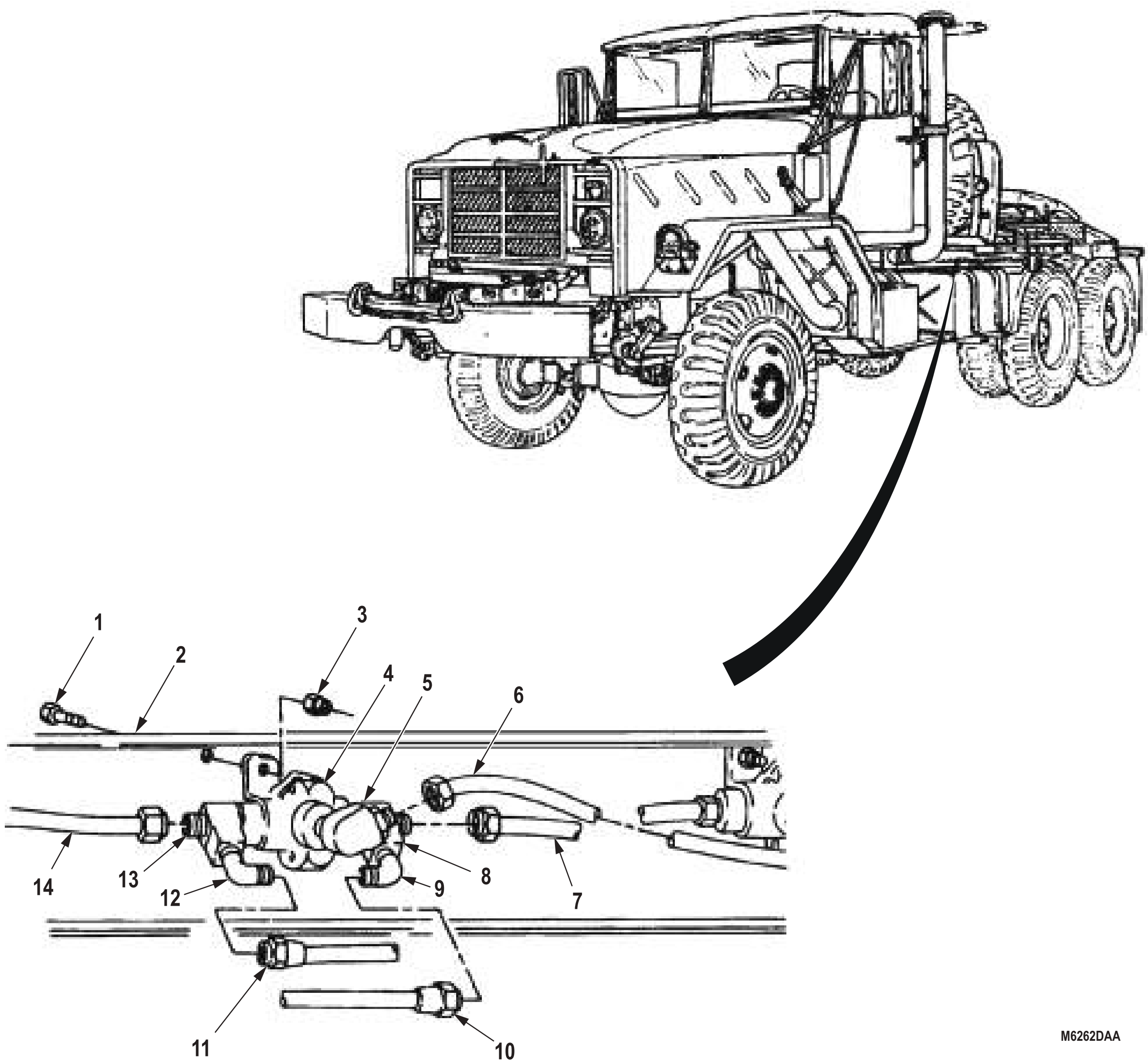


Figure 2. Double Check Valve No. 5 Installation.

END OF TASK

FOLLOW-ON MAINTENANCE

Start engine and allow air pressure to build to normal operating range. Check for air leaks at double check valve No. 5. Road test vehicle. (TM 9-2320-272-10)

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
DOUBLE CHECK VALVE NO. 3, NO. 4, AND QUICK-RELEASE VALVE REPLACEMENT

INITIAL SETUP:

Tools and Special Tools

Tool Kit, General Mechanic's: Automotive
(Volume 5, WP 0826, Table 1, Item 56)

Materials/Parts

Tape, Antiseizing
(Volume 5, WP 0825, Table 1, Item 65)
Locknut (Volume 5, WP 0827, Table 1, Item 283)
Qty: 5
Lockwasher

Materials/Parts (cont.)

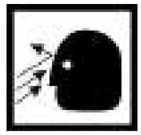
(Volume 5, WP 0827, Table 1, Item 186)
Qty: 8
Tiedown Strap
(Volume 5, WP 0827, Table 1, Item 377)
Qty: 1

Equipment Condition

Parking brake set. (TM 9-2320-272-10)
Air reservoirs drained. (TM 9-2320-272-10)

REMOVAL

WARNING



Do not disconnect air lines or hoses before draining air reservoirs. Small parts under pressure may shoot out with high velocity. Failure to comply may result in injury or death to personnel.

NOTE

Tag air lines for installation.

1. Remove locknut (Figure 1, Item 5), screw (Figure 1, Item 3), and clamp (Figure 1, Item 4) from front step brace (Figure 1, Item 1). Discard locknut.
2. Remove and discard tiedown strap (Figure 1, Item 2).

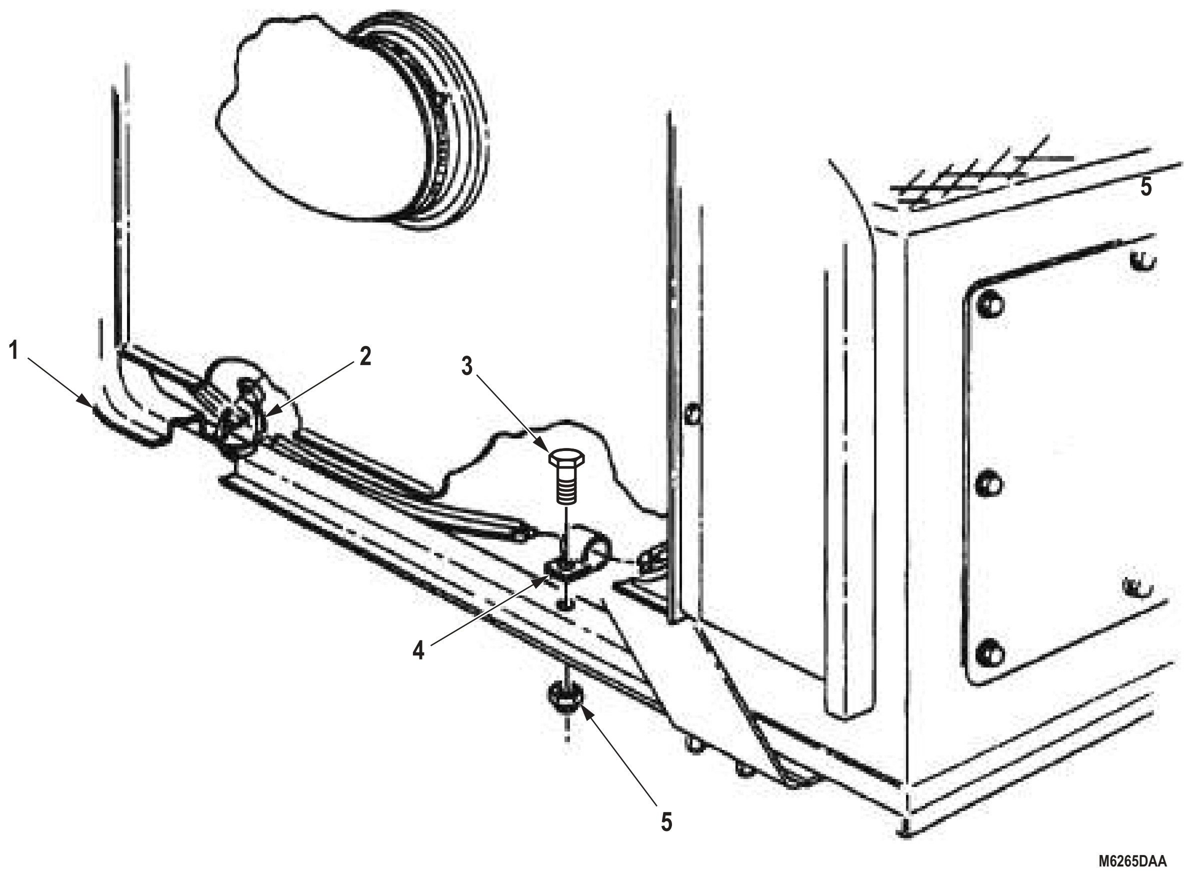


Figure 1. Double Check Valve Removal.

3. Remove eight screws (Figure 2, Item 19), lockwashers (Figure 2, Item 18), and access box cover (Figure 2, Item 16) from step box access (Figure 2, Item 11). Discard lockwashers.
4. Disconnect air lines (Figure 2, Items 8, 9, and 10) from double check valve No. 4 (Figure 2, Item 12).
5. Disconnect air lines (Figure 2, Items 3, 7, and 8) from double check valve No. 3 (Figure 2, Item 15).

REMOVAL - Continued

6. Disconnect air lines (Figure 2, Items 4, 6, and 7) from quick-release valve (Figure 2, Item 1).
7. Remove locknut (Figure 2, Item 13), washer (Figure 2, Item 14), screw (Figure 2, Item 17), and double check valve No. 4 (Figure 2, Item 12) from access box cover (Figure 2, Item 16). Discard locknut.
8. Remove locknut (Figure 2, Item 13), washer (Figure 2, Item 14), screw (Figure 2, Item 17), and double check valve No. 3 (Figure 2, Item 15) from access box cover (Figure 2, Item 16). Discard locknut.
9. Remove two locknuts (Figure 2, Item 13), screws (Figure 2, Item 14), and quick-release valve (Figure 2, Item 1) from access box cover (Figure 2, Item 16). Discard locknuts.

NOTE

Position valves in soft-jawed vise to remove fittings.

10. Remove two fittings (Figure 2, Item 2) and fitting (Figure 2, Item 5) from double check valve No. 4 (Figure 2, Item 12).
11. Remove two fittings (Figure 2, Item 2) and fitting (Figure 2, Item 5) from double check valve No. 3 (Figure 2, Item 15).
12. Remove three fittings (Figure 2, Item 2) from quick-release valve (Figure 2, Item 1).

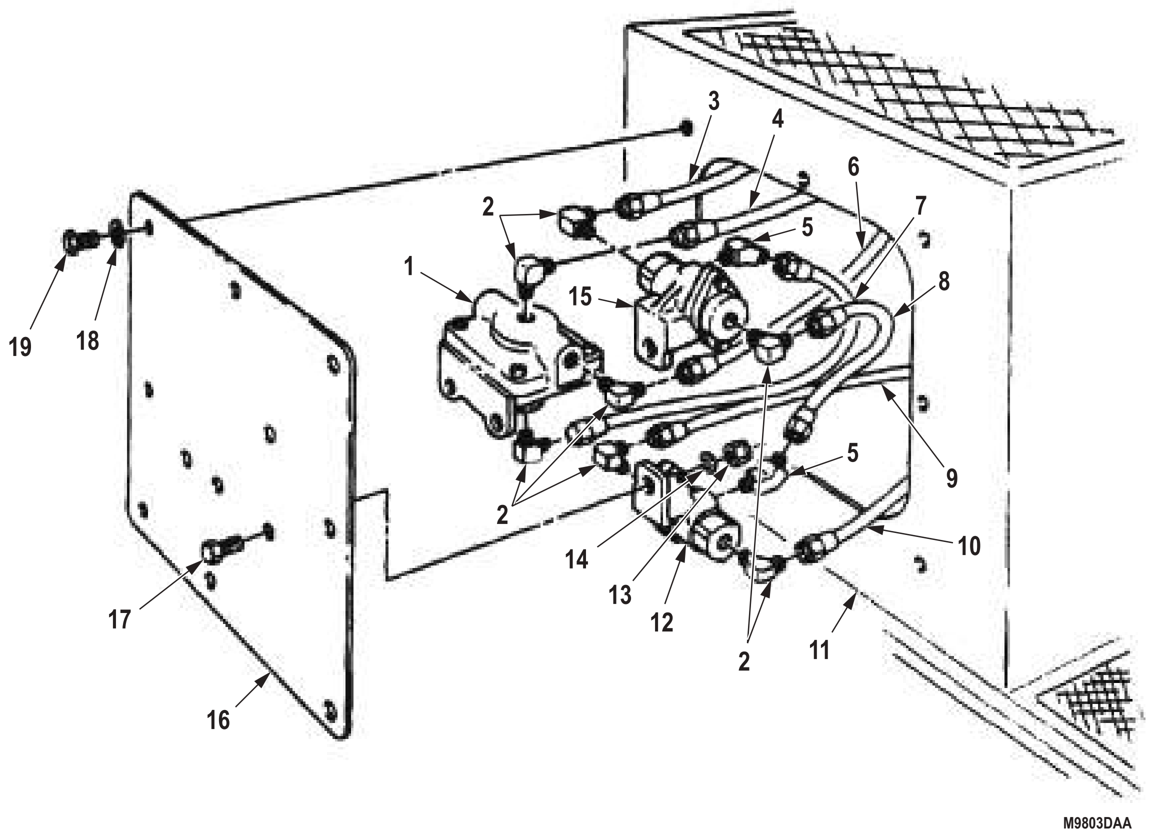


Figure 2. Double Check Valve Removal.

END OF TASK

INSTALLATION

1. Install three fittings (Figure 3, Item 2) on quick-release valve (Figure 3, Item 1).
2. Install two fittings (Figure 3, Item 2) and fitting (Figure 3, Item 5) on double check valve No. 3 (Figure 3, Item 15).
3. Install two fittings (Figure 3, Item 2) and fitting (Figure 3, Item 5) on double check valve No. 4 (Figure 3, Item 12).
4. Install quick-release valve (Figure 3, Item 1) on access box cover (Figure 3, Item 16) with two screws (Figure 3, Item 17), washers (Figure 3, Item 14), and locknuts (Figure 3, Item 13).
5. Install double check valve No. 3 (Figure 3, Item 15) on access box cover (Figure 3, Item 16) with screw (Figure 3, Item 17), washer (Figure 3, Item 14), and locknut (Figure 3, Item 13).
6. Install double check valve No. 4 (Figure 3, Item 12) on access box cover (Figure 3, Item 16) with screw (Figure 3, Item 17), washer (Figure 3, Item 14), and locknut (Figure 3, Item 13).
7. Connect air lines (Figure 3, Items 4, 6, and 7) to quick-release valve (Figure 3, Item 1).
8. Connect air lines (Figure 3, Items 3, 7, and 8) to double check valve No. 3 (Figure 3, Item 15).
9. Connect air lines (Figure 3, Items 8, 9, and 10) to double check valve No. 4 (Figure 3, Item 12).
10. Install access box cover (Figure 3, Item 16) on step box access (Figure 3, Item 11) with eight lockwashers (Figure 3, Item 18) and screws (Figure 3, Item 19).

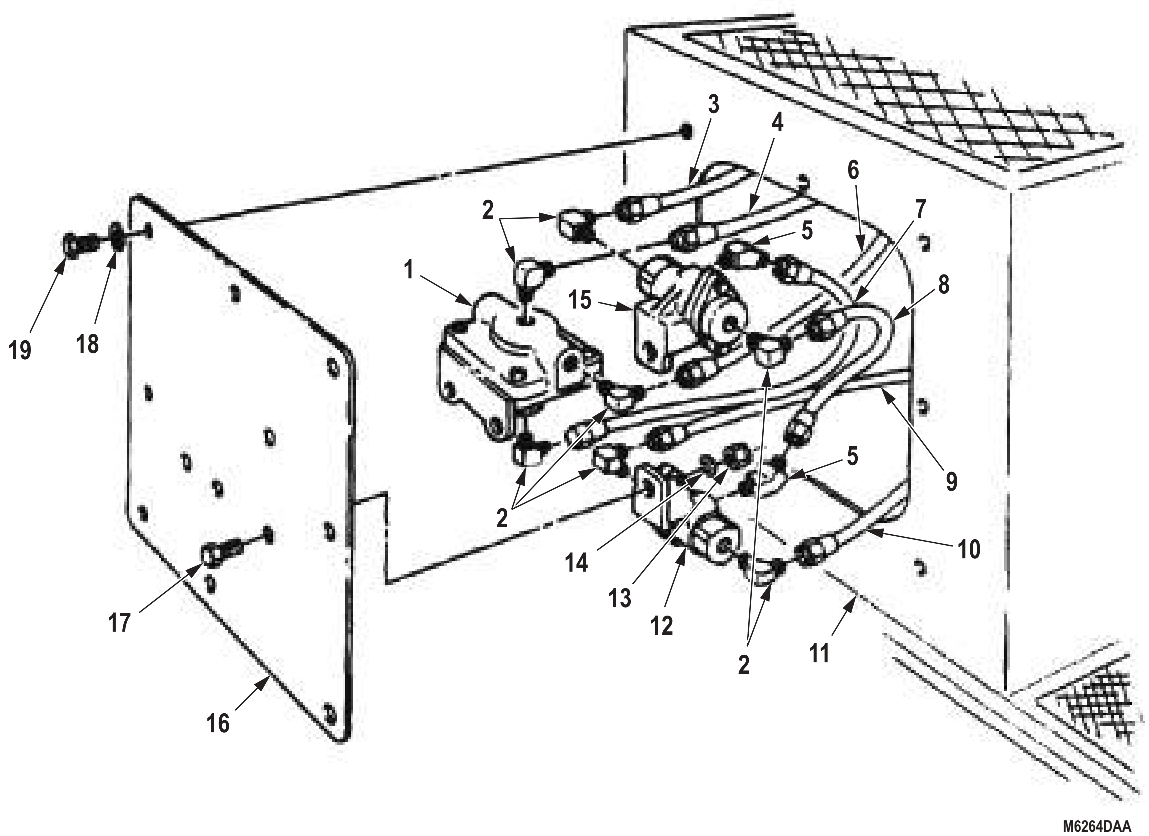


Figure 3. Double Check Valve Installation.

INSTALLATION - Continued

11. Install tiedown strap (Figure 4, Item 2).
12. Install clamp (Figure 4, Item 4) on front step brace (Figure 4, Item 1) with screw (Figure 4, Item 3) and locknut (Figure 4, Item 5).

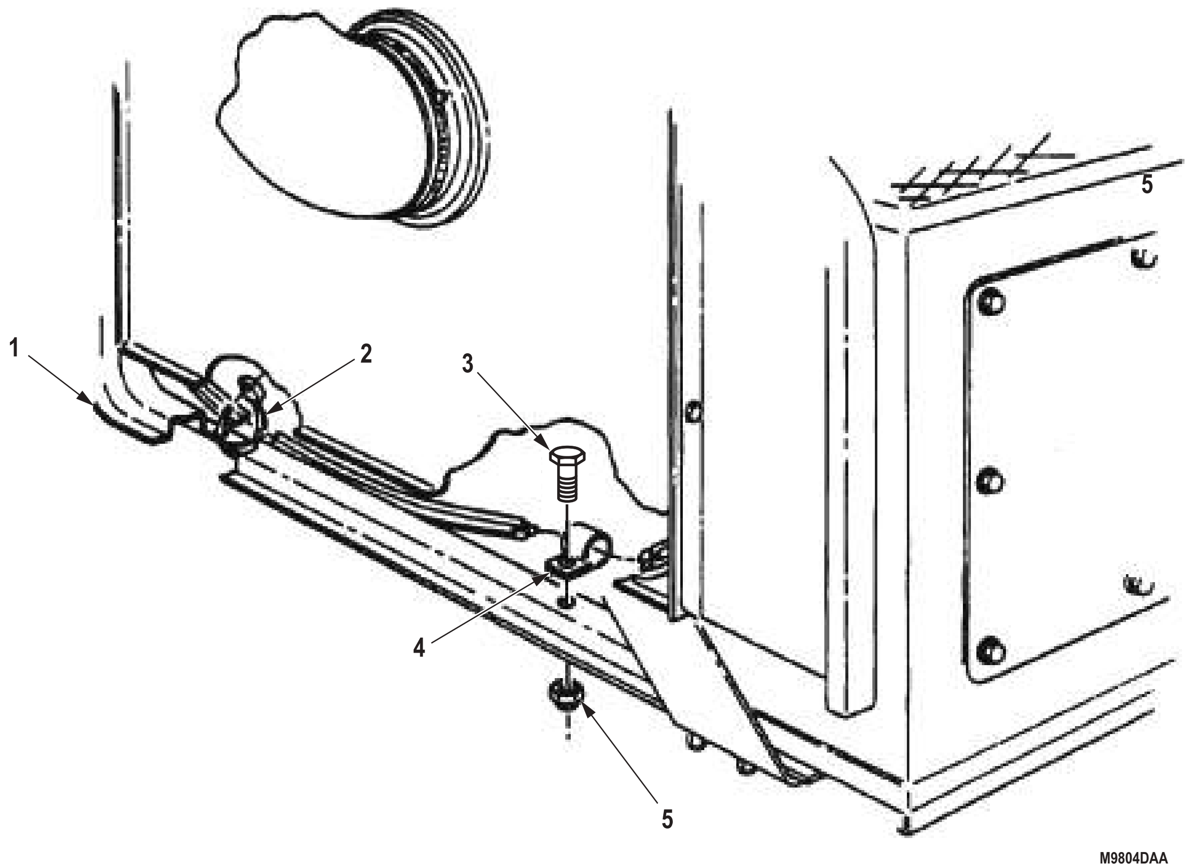


Figure 4. Double Check Valve Installation.

END OF TASK

FOLLOW-ON MAINTENANCE

Start engine and allow air pressure to build to normal operating range. Check for air leaks at double check valve No. 3, No. 4, and quick-release valve. Road test vehicle. (TM 9-2320-272-10)

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
EMERGENCY AND TRAILER COUPLING HOSES REPLACEMENT (M931/A1/A2, M932/A1/A2)

INITIAL SETUP:

Tools and Special Tools

Tool Kit, General Mechanic's: Automotive
(Volume 5, WP 0826, Table 1, Item 56)

Materials/Parts

Tape, Antiseizing
(Volume 5, WP 0825, Table 1, Item 65)
Lockwasher
(Volume 5, WP 0827, Table 1, Item 388)
Qty: 1

Equipment Condition

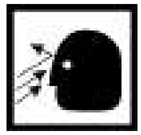
Parking brake set. (TM 9-2320-272-10)

Equipment Condition (cont.)

Air reservoirs drained. (TM 9-2320-272-10)

REMOVAL

WARNING



Do not disconnect air lines or hoses before draining air reservoirs. Small parts under pressure may shoot out with high velocity. Failure to comply may result in injury or death to personnel.

1. Remove coupling (Figure 1, Item 1) from adapter (Figure 1, Item 2).
2. Remove adapter (Figure 1, Item 2) from coupling hose (Figure 1, Item 3).
3. Remove coupling hose (Figure 1, Item 3) from adapter (Figure 1, Item 12).
4. Remove adapter (Figure 1, Item 12) from cutoff valve (Figure 1, Item 4).
5. Remove cutoff valve (Figure 1, Item 4) from adapter (Figure 1, Item 11).
6. Remove air line (Figure 1, Item 9) from elbow (Figure 1, Item 8).
7. Remove elbow (Figure 1, Item 8) from adapter (Figure 1, Item 11).
8. Remove nut (Figure 1, Item 7), lockwasher (Figure 1, Item 6), adapter (Figure 1, Item 11), and identification plate (Figure 1, Item 5) from frame hole (Figure 1, Item 10). Discard lockwasher.

REMOVAL - Continued

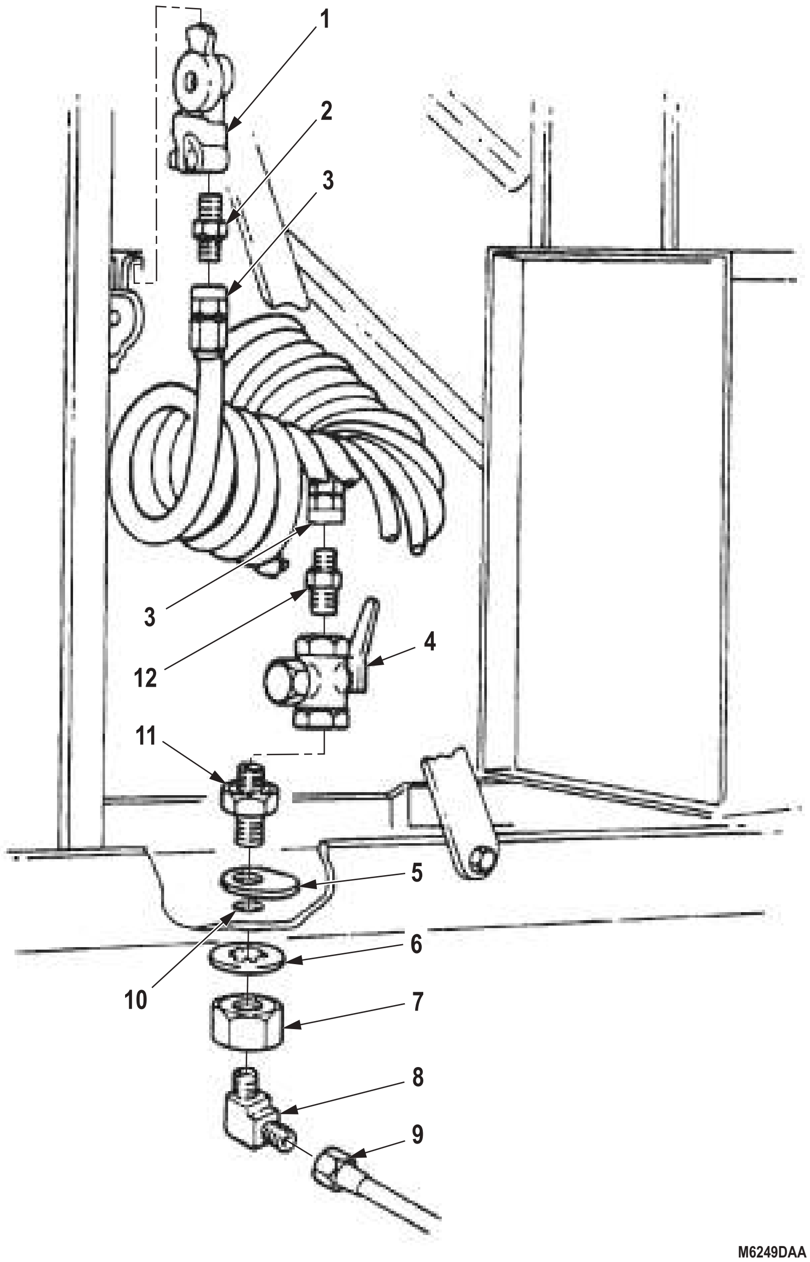


Figure 1. Emergency and Trailer Coupling Hoses Removal.

END OF TASK

INSTALLATION

NOTE

Wrap all male pipe threads with antiseize tape before installation.

1. Insert adapter (Figure 2, Item 11) through identification plate (Figure 2, Item 5) and frame hole (Figure 2, Item 10) and install with lockwasher (Figure 2, Item 6) and nut (Figure 2, Item 7).
2. Install elbow (Figure 2, Item 8) on adapter (Figure 2, Item 11).
3. Install air line (Figure 2, Item 9) on elbow (Figure 2, Item 8).
4. Install cutoff valve (Figure 2, Item 4) on adapter (Figure 2, Item 11).
5. Install adapter (Figure 2, Item 12) on cutoff valve (Figure 2, Item 4).
6. Install coupling hose (Figure 2, Item 3) on adapter (Figure 2, Item 12).
7. Install adapter (Figure 2, Item 2) on coupling hose (Figure 2, Item 3).
8. Install coupling (Figure 2, Item 1) on adapter (Figure 2, Item 2).

INSTALLATION - Continued

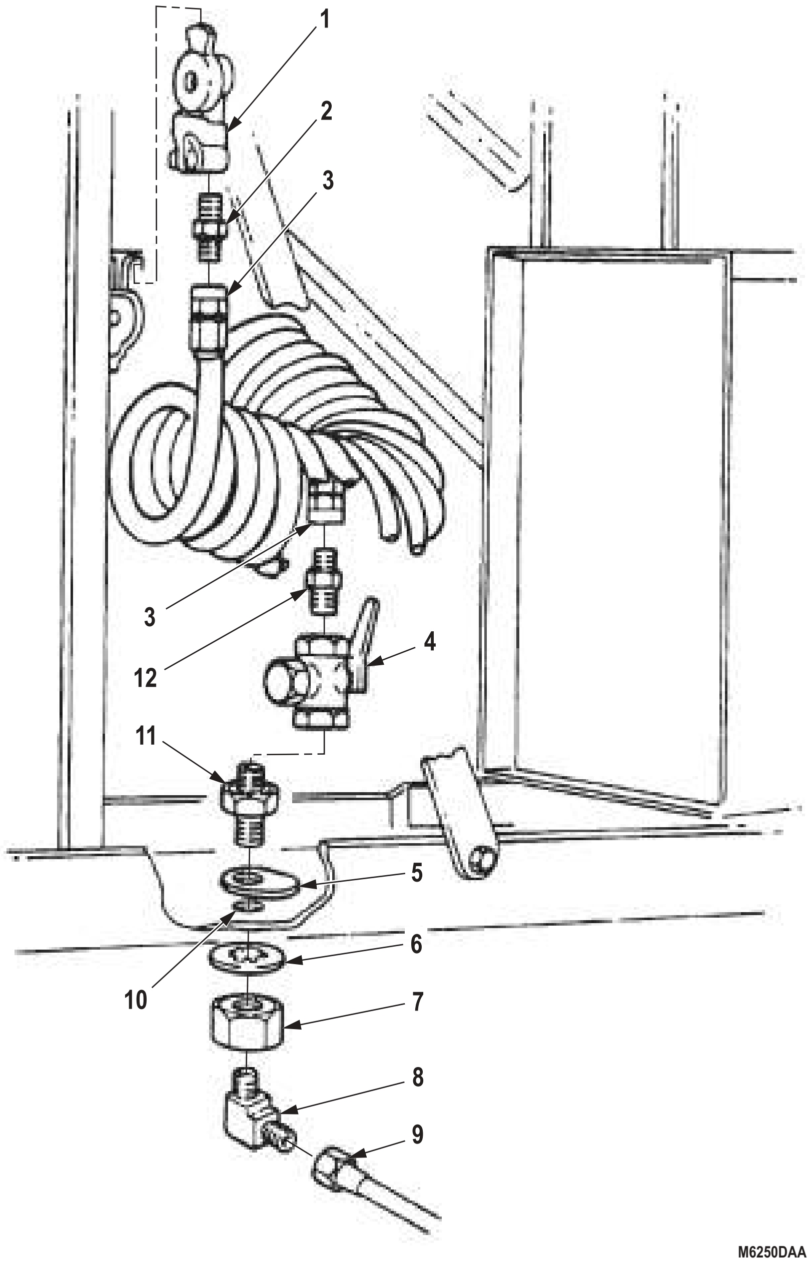


Figure 2. Emergency and Trailer Coupling Hoses Installation.

END OF TASK

FOLLOW-ON MAINTENANCE

Start engine and allow air pressure to build to normal operating range. Check for air leaks and road test vehicle. (TM 9-2320-272-10)

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
FRONT HUB AND DRUM REPLACEMENT (M939/A1)

INITIAL SETUP:

Tools and Special Tools

Tool Kit, General Mechanic's: Automotive
(Volume 5, WP 0826, Table 1, Item 56)
Wrench, Torque, Click, Ratcheting, 3/4" Drive, 600 Ft-Lb
(Volume 5, WP 0826, Table 1, Item 61)

Materials/Parts

Adhesive, Silicone Rubber
(Volume 5, WP 0825, Table 1, Item 4)
Cleaning Compound, Solvent
(Volume 5, WP 0825, Table 1, Item 16, 17)
Grease, Automotive and Artillery
(Volume 5, WP 0825, Table 1, Item 28)
Gasket (Volume 5, WP 0827, Table 1, Item 3)
Qty: 1

Materials/Parts (cont.)

Lockwasher
(Volume 5, WP 0827, Table 1, Item 405)
Qty: 10
Oil Seal (Volume 5, WP 0827, Table 1, Item 173)
Qty: 1

Personnel Required

(2)

References

TM 9-214

Equipment Condition

Wheel(s) removed. (TM 9-2320-272-10)

REMOVAL

1. Remove ten screws (Figure 1, Item 11) and lockwashers (Figure 1, Item 12) from drive flange (Figure 1, Item 10) and hub (Figure 1, Item 2). Discard lockwashers.
2. Install two screws (Figure 1, Item 11) in two threaded holes (Figure 1, Item 13) to separate drive flange (Figure 1, Item 10) from hub (Figure 1, Item 2).
3. Remove drive flange (Figure 1, Item 10) and gasket (Figure 1, Item 9), if present, from hub (Figure 1, Item 2). Discard gasket.
4. Remove two screws (Figure 1, Item 11) from drive flange (Figure 1, Item 10).
5. Remove outer bearing locknut (Figure 1, Item 8), bearing nut washer (Figure 1, Item 7), bearing adjusting nut (Figure 1, Item 6), and outer bearing (Figure 1, Item 5) from spindle (Figure 1, Item 4).
6. Remove hub (Figure 1, Item 2) and drum (Figure 1, Item 1) from spindle (Figure 1, Item 4).

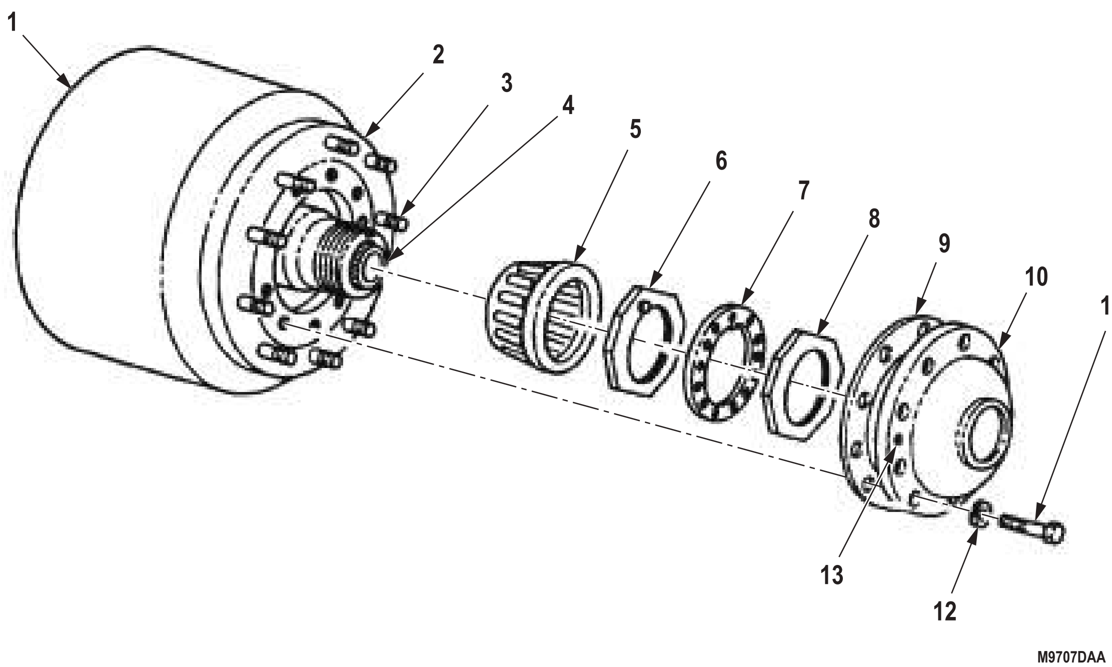


Figure 1. Front Hub Drum Removal.

7. Remove inner bearing oil seal (Figure 2, Item 1) and inner bearing (Figure 2, Item 2) from hub (Figure 2, Item 3). Discard inner bearing oil seal.

REMOVAL - Continued

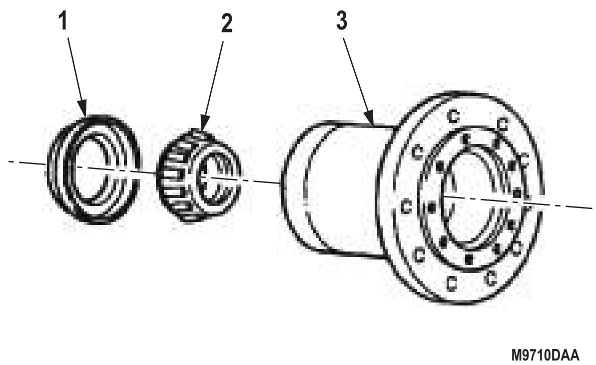


Figure 2. Front Hub and Drum Replacement.

8. Remove ten wheel studs (Figure 3, Item 1) and hub (Figure 3, Item 3) from drum (Figure 3, Item 2).

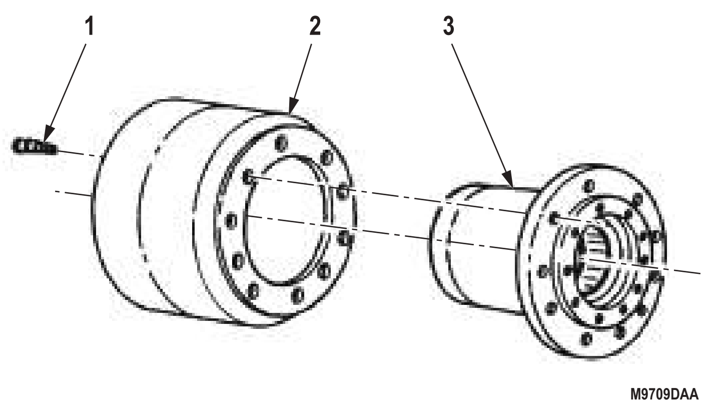
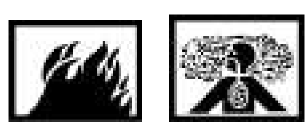


Figure 3. Front Hub and Drum Replacement.

END OF TASK

CLEANING AND INSPECTION

WARNING



Solvent cleaning compound is flammable and will not be used near an open flame. A fire extinguisher will be kept nearby when solvent is used. Use only in well-ventilated places. Failure to comply may result in damage to equipment, injury, or death to personnel.

1. Clean gasket or sealant remains from mating surfaces of driveshaft flange and hub.

NOTE

Do not use compressed air to dry bearings.

2. Clean all hub and drum components in cleaning compound.
3. Inspect hub for cracks and breaks. Replace hub if cracked or broken.

CLEANING AND INSPECTION - Continued

4. Inspect inner and outer bearings (TM 9-214). Replace if damaged.
5. Inspect inner and outer bearing cups (TM 9-214). Replace if damaged.

NOTE

Perform Steps (6) and (7) only if bearing cups are to be replaced.

6. Remove bearing cups from hub by tapping alternately on outer edge.
7. Press inner bearing cup and outer bearing cup into hub. Ensure bearing cups are seated.
8. Inspect drum for deep grooves. Replace drum if grooves are deeper than 1/32 in. (0.79 mm).

END OF TASK

INSTALLATION

1. Pack inner and outer bearings (Figure 4, Items 4 and 7) with automotive and artillery grease (TM 9-214).
2. Pack inner rubber section of inner oil seal (Figure 4, Item 3) with automotive and artillery grease (TM 9-214).
3. Install hub (Figure 4, Item 2) in drum (Figure 4, Item 1).
4. Press wheel studs (Figure 4, Item 8) through drum (Figure 4, Item 1) and into hub (Figure 4, Item 2). Ensure studs are seated.
5. Install inner bearing (Figure 4, Item 4) and inner bearing oil seal (Figure 4, Item 3) into hub (Figure 4, Item 2). Ensure inner bearing oil seal is seated.

NOTE

Assistant will help with Step (4).

6. Install hub (Figure 4, Item 2) and drum (Figure 4, Item 1) on spindle (Figure 4, Item 9).
7. Install outer bearing (Figure 4, Item 7) on spindle (Figure 4, Item 9) with nut (Figure 4, Item 10). While rotating hub (Figure 4, Item 2), tighten nut 50 lb-ft (68 N·m).
8. Back out nut (Figure 4, Item 10) 1/6 to 1/4 turn so washer (Figure 4, Item 12) can be positioned to spindle (Figure 4, Item 9) and adjusting pin (Figure 4, Item 11).
9. Install washer (Figure 4, Item 12) and locknut (Figure 4, Item 13) on spindle (Figure 4, Item 9). Tighten locknut 250 to 400 lb-ft (339 to 542 N·m).
10. Apply silicone rubber adhesive to mating surfaces of driveshaft flange (Figure 4, Item 14).
11. Install gasket (Figure 4, Item 17) and driveshaft flange (Figure 4, Item 14) on hub (Figure 4, Item 2) with ten lockwashers (Figure 4, Item 16) and screws (Figure 4, Item 15). Tighten screws 60 to 100 lb-ft (81 to 136 N·m).

INSTALLATION - Continued

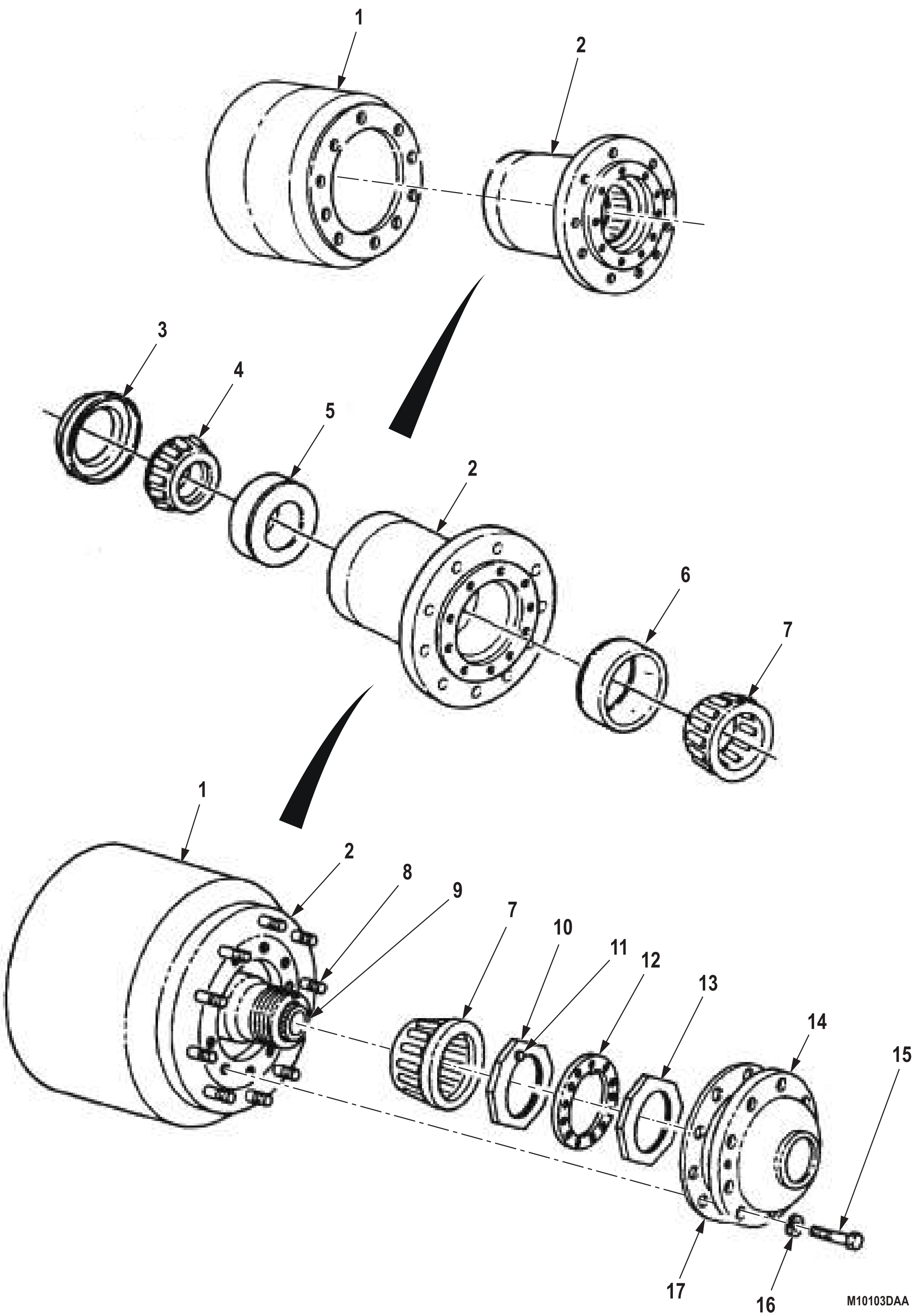


Figure 4. Front Hub Drum Installation.

END OF TASK

FOLLOW-ON MAINTENANCE

1. Install wheel(s). (TM 9-2320-272-10)
2. Road test vehicle. (TM 9-2320-272-10)

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
REAR HUB AND DRUM REPLACEMENT (M939/A1)

INITIAL SETUP:

Tools and Special Tools

Tool Kit, General Mechanic's: Automotive
(Volume 5, WP 0826, Table 1, Item 56)
Inserter, Seal
(Volume 5, WP 0826, Table 1, Item 29)
Wrench, Torque, Click, Ratcheting, 3/4" Drive, 600 Ft-Lb
(Volume 5, WP 0826, Table 1, Item 61)

Materials/Parts

Adhesive, Silicone Rubber
(Volume 5, WP 0825, Table 1, Item 4)
Cleaning Compound, Solvent
(Volume 5, WP 0825, Table 1, Item 16, 17)
Grease, Automotive and Artillery
(Volume 5, WP 0825, Table 1, Item 28)
Gasket (Volume 5, WP 0827, Table 1, Item 3)
Qty: 1
Key Washer
(Volume 5, WP 0827, Table 1, Item 22)
Qty: 1
Outer Bearing Oil Seal
(Volume 5, WP 0827, Table 1, Item 220)
Qty: 1

Materials/Parts (cont.)

Seal Assembly
(Volume 5, WP 0827, Table 1, Item 188)
Qty: 1
Wiper (Volume 5, WP 0827, Table 1, Item 210)
Qty: 1

Personnel Required

(2)

References

TM 9-214

Equipment Condition

Wheels chocked. (TM 9-2320-272-10)
Spring brake(s) caged. (TM 9-2320-272-10)

REMOVAL

1. Remove ten screws (Figure 1, Item 4) and washers (Figure 1, Item 3) from axle shaft (Figure 1, Item 2).
2. Remove axle shaft (Figure 1, Item 2) and gasket (Figure 1, Item 1), if present, from hub (Figure 1, Item 11). Discard gasket.
3. Remove outer bearing locknut (Figure 1, Item 5), bearing nut washer (Figure 1, Item 6), and adjusting nut (Figure 1, Item 7) from axle housing (Figure 1, Item 10).
4. Remove outer bearing oil seal (Figure 1, Item 8) and outer bearing (Figure 1, Item 9) from hub (Figure 1, Item 11). Discard oil seal.

NOTE

Assistant will help with Step (5).

5. Remove hub (Figure 1, Item 11) and drum (Figure 1, Item 12) from axle housing (Figure 1, Item 10). It may be necessary to back off brake adjustment to remove drum.

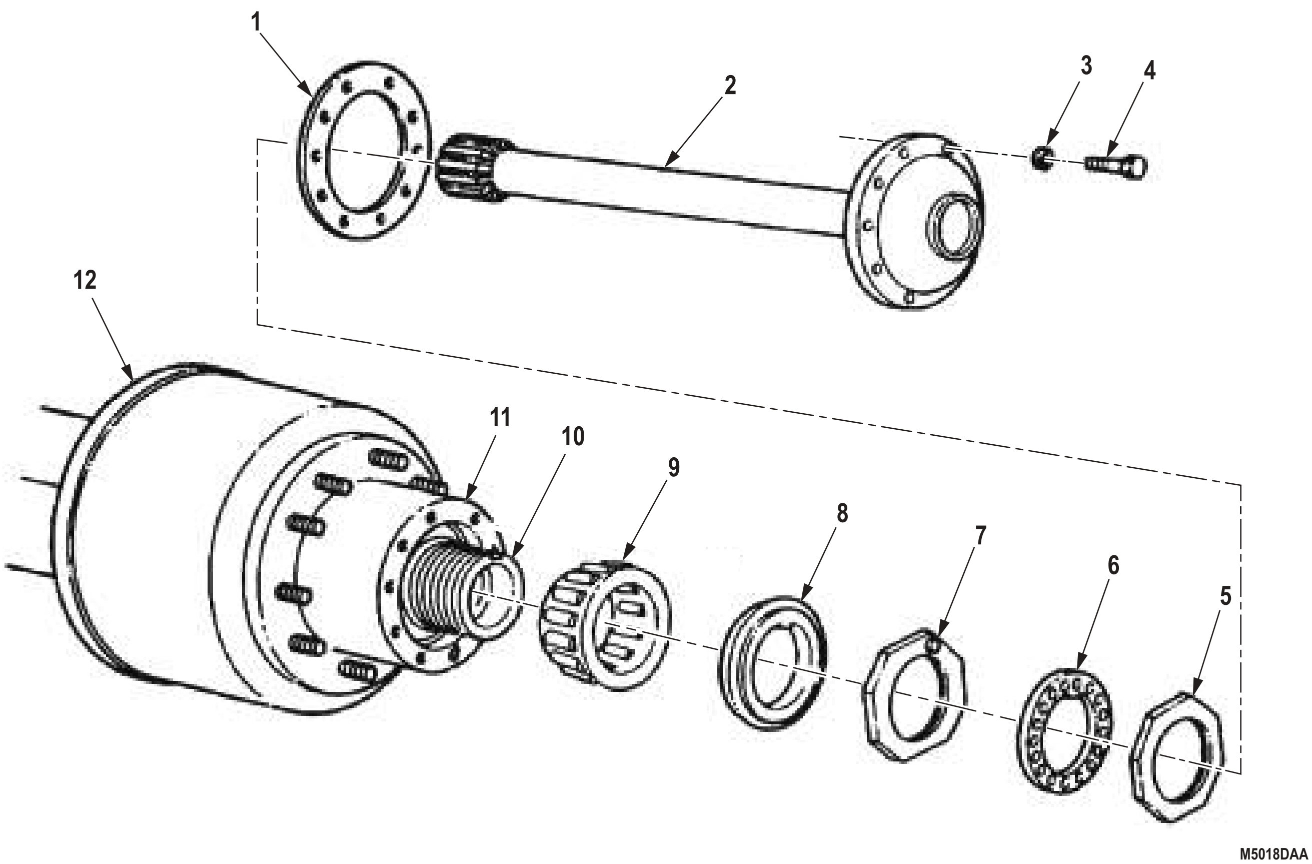


Figure 1. Rear Hub and Drum Removal.

REMOVAL - Continued

6. Remove inner bearing oil seal (Figure 2, Item 3) and inner bearing (Figure 2, Item 4) from hub (Figure 2, Item 7). Discard oil seal.
7. Remove wiper (Figure 2, Item 2) from axle housing (Figure 2, Item 1). Discard wiper.
8. Remove ten wheel studs (Figure 2, Item 6) and hub (Figure 2, Item 7) from drum (Figure 2, Item 5).

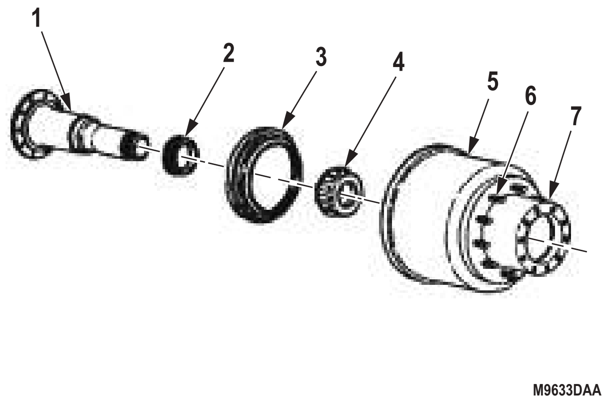


Figure 2. Rear Hub and Drum Removal.

9. Remove five screws (Figure 3, Item 4), washers (Figure 3, Item 3), and dust shield (Figure 3, Item 2) from inside drum (Figure 3, Item 1).

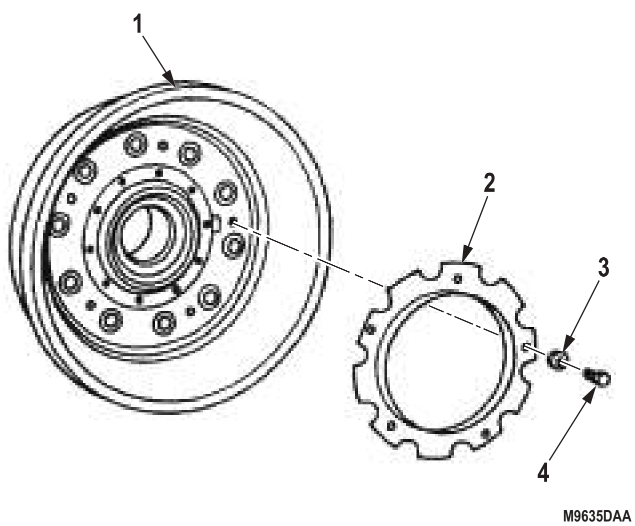
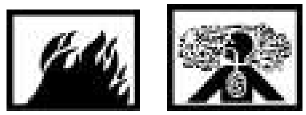


Figure 3. Dust Shield Removal.

END OF TASK

CLEANING AND INSPECTION

WARNING



Solvent cleaning compound is flammable and will not be used near an open flame. A fire extinguisher will be kept nearby when solvent is used. Use only in well-ventilated places. Failure to comply may result in damage to equipment, injury, or death to personnel.

1. Clean gasket or sealant remains from mating surfaces of axle shaft and hub.

NOTE

Do not use compressed air to dry bearings.

2. Clean all hub and drum components in cleaning compound and allow to air-dry.
3. Inspect hub for cracks and breaks. Replace hub if cracked or broken.
4. Inspect inner bearing and outer bearing (TM 9-214). Replace if damaged.
5. Inspect inner bearing cup and outer bearing cup (TM 9-214). Replace if damaged.

NOTE

Perform Steps (6) and (7) only if bearing, bearing cups, or hub are to be replaced.

6. Remove bearing cups from hub by tapping alternately on outer edge.
7. Press inner bearing cup and outer bearing cup into hub. Ensure bearing cups are seated.
8. Inspect drum for deep grooves. Replace drum if grooves are deeper than 1/32 in. (0.79 mm).

END OF TASK

INSTALLATION

1. Install dust shield (Figure 4, Item 2) on inside of drum (Figure 4, Item 1) with five washers (Figure 4, Item 3) and screws (Figure 4, Item 4).

INSTALLATION - Continued

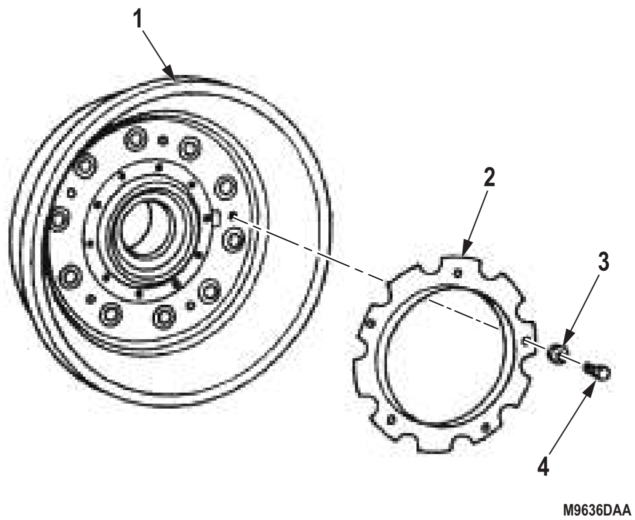


Figure 4. Dust Shield Installation.

INSTALLATION - Continued

2. Pack inner bearing (Figure 5, Item 4) and outer bearing (Figure 6, Item 8) with automotive and artillery grease (TM 9-214).
3. Pack inner rubber section of inner bearing oil seal (Figure 5, Item 3) with automotive and artillery grease (TM 9-214).
4. Position hub (Figure 5, Item 7) on drum (Figure 5, Item 5).
5. Press wheel studs (Figure 5, Item 6) through drum (Figure 5, Item 5) and hub (Figure 5, Item 7). Ensure studs are seated.
6. Install inner bearing (Figure 5, Item 4) and inner bearing oil seal (Figure 5, Item 3) in hub (Figure 5, Item 7).
7. Using seal inserter, install wiper (Figure 5, Item 2) on axle housing (Figure 5, Item 1).

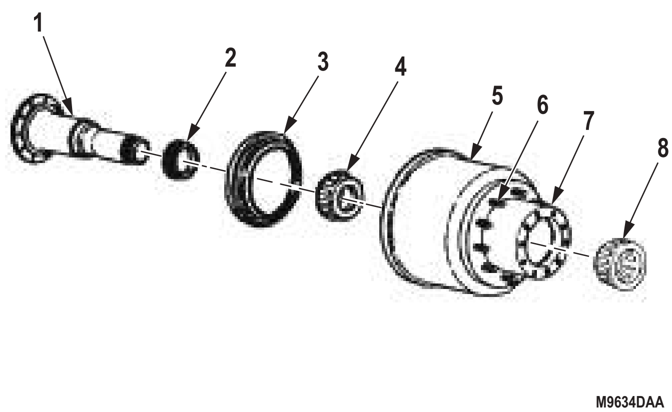


Figure 5. Rear Hub and Drum Installation.

INSTALLATION - Continued

NOTE

Assistant will help with Step (8).

8. Install hub (Figure 6, Item 11), drum (Figure 6, Item 12), outer bearing (Figure 6, Item 9), and outer bearing oil seal (Figure 6, Item 8) on axle housing (Figure 6, Item 10) with bearing adjusting nut (Figure 6, Item 7).
9. Tighten bearing adjusting nut (Figure 6, Item 7) while turning hub (Figure 6, Item 11). Tighten bearing adjustment nut 50 lb-ft (68 N·m).
10. Loosen bearing adjusting nut (Figure 6, Item 7) 1/6 to 1/4 turn. Install washer (Figure 6, Item 6) on axle housing (Figure 6, Item 11) and adjusting nut.
11. Install outer bearing locknut (Figure 6, Item 5) on axle housing (Figure 6, Item 10). Tighten outer bearing locknut 250 to 400 lb-ft (339 to 542 N·m).
12. Apply silicone rubber adhesive to mating surfaces of axle shaft (Figure 6, Item 2) flange.
13. Install axle shaft (Figure 6, Item 2) on hub (Figure 6, Item 11) with ten washers (Figure 6, Item 3) and screws (Figure 6, Item 4). Tighten screws 60 to 100 lb-ft (81 to 136 N·m).

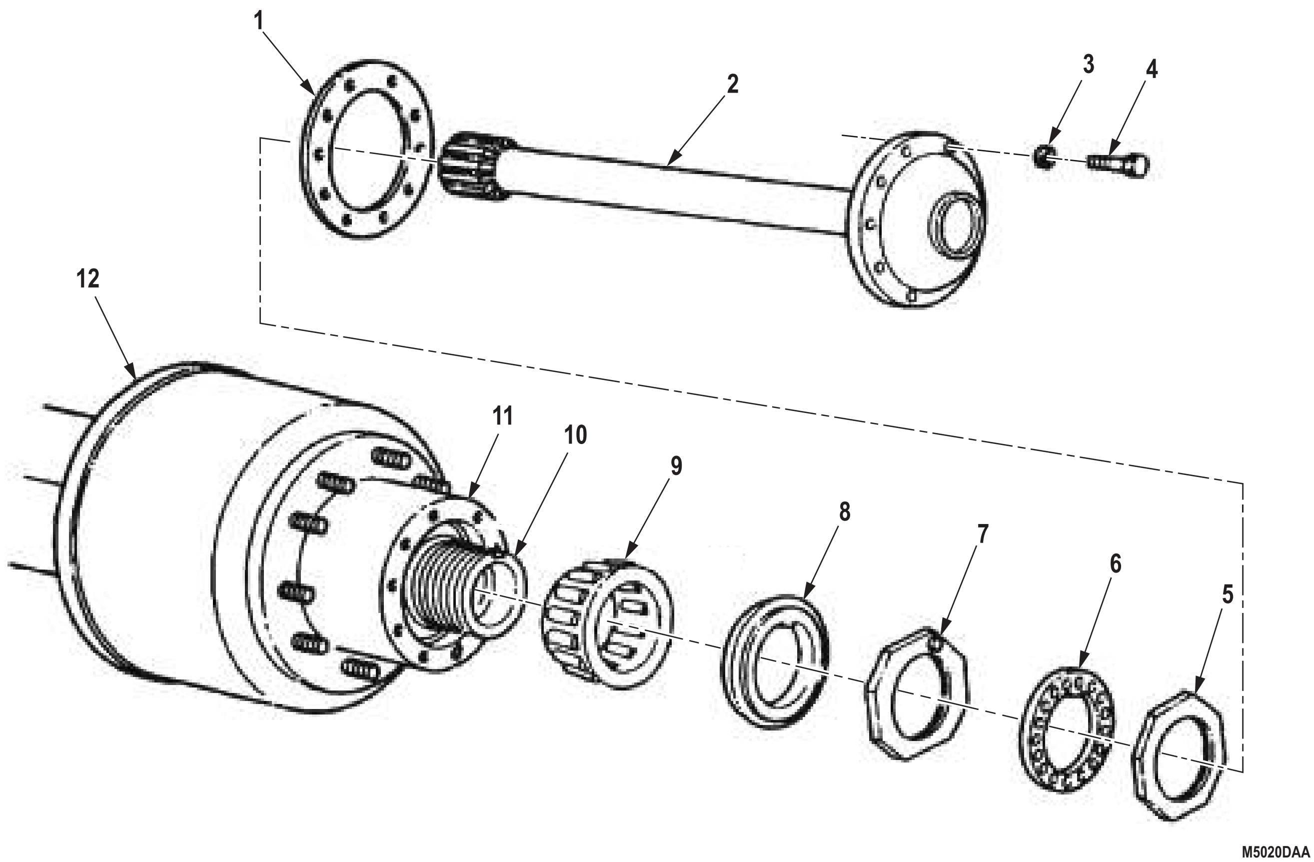


Figure 6. Rear Hub and Drum Installation.

END OF TASK

FOLLOW-ON MAINTENANCE

1. Release caged spring brake(s). (TM 9-2320-272-10)
2. Road test vehicle. (TM 9-2320-272-10)

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
FRONT HUBS REPLACEMENT

INITIAL SETUP:

Tools and Special Tools

Tool Kit, General Mechanic's: Automotive
(Volume 5, WP 0826, Table 1, Item 56)
Inserter, Seal
(Volume 5, WP 0826, Table 1, Item 27)
Punch, Bearing
(Volume 5, WP 0826, Table 1, Item 45)
Wrench, Torque, Click, Ratcheting, 1/2" Drive, 250 Ft-Lb
(Volume 5, WP 0826, Table 1, Item 63)

Materials/Parts

Adhesive, Silicone Rubber
(Volume 5, WP 0825, Table 1, Item 4)
Cleaning Compound, Solvent
(Volume 5, WP 0825, Table 1, Item 16, 17)
Cloth, Abrasive: Crocus
(Volume 5, WP 0825, Table 1, Item 18)
Grease, Automotive and Artillery
(Volume 5, WP 0825, Table 1, Item 28)
Ferrule (Volume 5, WP 0827, Table 1, Item 93)
Qty: 1
Gasket (Volume 5, WP 0827, Table 1, Item 91)
Qty: 1

Materials/Parts (cont.)

Oil Seal (Volume 5, WP 0827, Table 1, Item 173)
Qty: 1
Seal (Volume 5, WP 0827, Table 1, Item 122)
Qty: 1
Seal (Volume 5, WP 0827, Table 1, Item 250)
Qty: 1

Personnel Required

(2)

References

TM 9-214
WP 0487
Volume 5, WP 0819

Equipment Condition

Rear wheels chocked. (TM 9-2320-272-10)
Front wheel removed. (TM 9-2320-272-10)
Front wheel valve removed. (WP 0393)

REMOVAL

1. Remove brake drum (Figure 1, Item 11) from hub (Figure 1, Item 2).
2. Remove ten screws (Figure 1, Item 12) and washers (Figure 1, Item 13) from drive flange (Figure 1, Item 9).
3. Install two screws (Figure 1, Item 12) on threaded holes (Figure 1, Item 10) of drive flange (Figure 1, Item 9). Tighten screws (Figure 1, Item 12) until drive flange (Figure 1, Item 9) separates from hub (Figure 1, Item 2).
4. Remove drive flange (Figure 1, Item 9) from hub (Figure 1, Item 2) and remove two screws (Figure 1, Item 12) from drive flange.

NOTE

Tag inner and outer bearings for installation.

5. Remove outer bearing nut (Figure 1, Item 6) and washer (Figure 1, Item 5) from spindle (Figure 1, Item 1).
6. Remove nut (Figure 1, Item 4) and outer bearing (Figure 1, Item 3) from spindle (Figure 1, Item 1).

NOTE

Assistant will help with Step (7).

7. Remove hub (Figure 1, Item 2) from spindle (Figure 1, Item 1).
8. Remove snapring (Figure 1, Item 8) and two air seals (Figure 1, Item 7) from hub (Figure 1, Item 2). Discard air seals.
9. Remove screw (Figure 1, Item 20), ferrule (Figure 1, Item 19), tee (Figure 1, Item 18), and gasket (Figure 1, Item 17) from hub (Figure 1, Item 2). Discard ferrule and gasket.
10. Remove hub seal (Figure 1, Item 16) and inner bearing (Figure 1, Item 15) from rear of hub (Figure 1, Item 2). Discard hub seal.
11. For General Cleaning Instructions, refer to (Volume 5, WP 0819).
12. For General Inspection Instructions, refer to (Volume 5, WP 0819).
13. Inspect inner (Figure 1, Item 15) and outer (Figure 1, Item 3) bearings in accordance with TM 9-214. Replace bearings and bearings cups if either is damaged.
14. Inspect hub (Figure 1, Item 2), drive flange (Figure 1, Item 9), and plastic sleeving (Figure 1, Item 14) for cracks, grooves, scores, and elongated holes. Replace part(s) if cracked or holes are elongated. Notify your supervisor if grooved or scored.
15. Inspect seal surface of spindle (Figure 1, Item 1) for extensive rust, scratches, and grooves. Repair spindle if rusted, scratched, or grooved.

REMOVAL - Continued

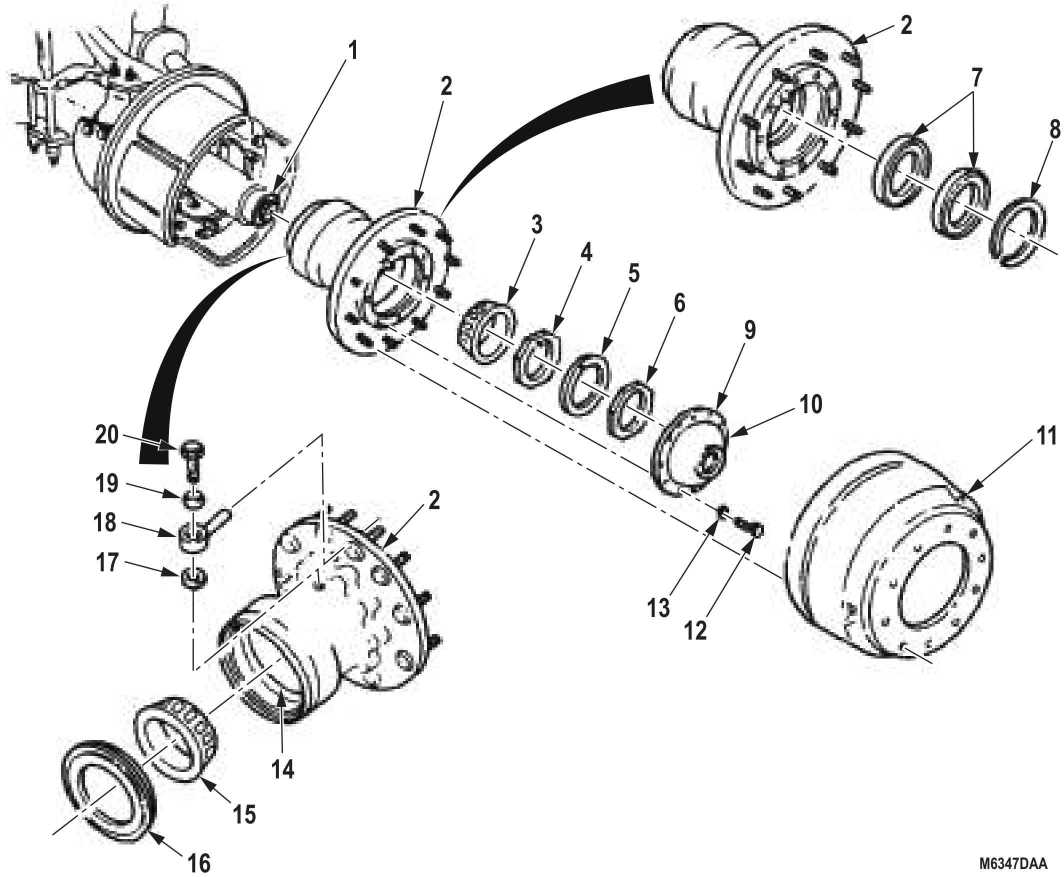


Figure 1. Front Hubs Removal.

END OF TASK

REPAIR

1. Using bearing punch, remove outer bearing cup (Figure 2, Item 4) from hub (Figure 2, Item 5) by tapping alternately on outer edges of cup (Figure 2, Item 4). Discard outer bearing cup.
2. Using bearing punch, remove inner bearing cup (Figure 2, Item 1) from hub (Figure 2, Item 5) by tapping alternately on outer edges of cup (Figure 2, Item 1). Discard inner bearing cup.
3. Remove plastic sleeve (Figure 2, Item 2) from hub (Figure 2, Item 5) by splitting and prying out of hub. Discard sleeve.

NOTE

Bearing and bearing cup must be replaced as a matched set.

4. Install outer bearing cup (Figure 2, Item 4) in hub (Figure 2, Item 5). Ensure outer bearing cup is seated properly.
5. Install plastic sleeve (Figure 2, Item 2) on hub (Figure 2, Item 5).
6. Install inner bearing cup (Figure 2, Item 1) in hub (Figure 2, Item 5). Ensure inner bearing cup is seated properly.

NOTE

- Perform Steps (7) and (8) if stud failed inspection.
- Use left-hand threaded studs for hubs mounted on the left-hand side of the vehicle, and right-hand threaded studs for hubs mounted on the right side of the vehicle.

7. Remove damaged studs (Figure 2, Item 3) from hub (Figure 2, Item 5). Discard studs.
8. Install studs (Figure 2, Item 3) on hub (Figure 2, Item 5), as required.

REPAIR - Continued

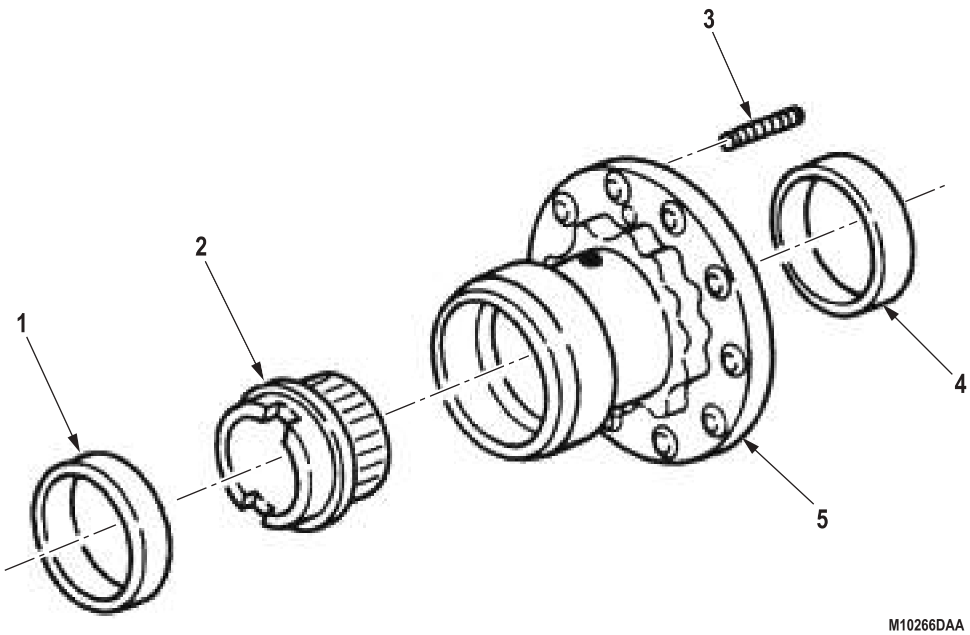
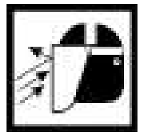


Figure 2. Front Hubs Repair.

REPAIR - Continued

9. Using abrasive cloth, remove rust from seal surface of spindle (Figure 3, Item 2).
10. Disconnect air line (Figure 3, Item 1) from steering knuckle (Figure 3, Item 3).

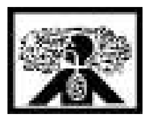
WARNING



Eyeshields must be worn when cleaning with compressed air. Compressed air source will not exceed 30 psi (207 kPa). Failure to comply may result in injury or death to personnel.

11. Using external air source, blow dirt and debris from surface of spindle (Figure 3, Item 2) by forcing air through steering knuckle (Figure 3, Item 3).

WARNING

Solvent cleaning compound is flammable and toxic. Do not use near an open flame and always have a fire extinguisher nearby when solvents are used. Use only in well-ventilated places, wear protective clothing, and dispose of cleaning rags in approved container. Failure to comply may result in damage to equipment, injury, or death to personnel.

12. Clean entire surface of spindle (Figure 3, Item 2) with cleaning compound.
13. Connect air line (Figure 3, Item 1) to steering knuckle (Figure 3, Item 3).

CAUTION

Avoid filing too deeply into seal surface of spindle. Excessive filing may result in permanent damage to spindle.

14. Remove deep scratches by carefully filing seal surface of spindle (Figure 3, Item 2) in a circular motion.

NOTE

It is unnecessary to remove the circular depression of a groove, only the raised portion or lip.

15. Using abrasive cloth, remove light surface scratches from seal surface of spindle (Figure 3, Item 2).

REPAIR - Continued

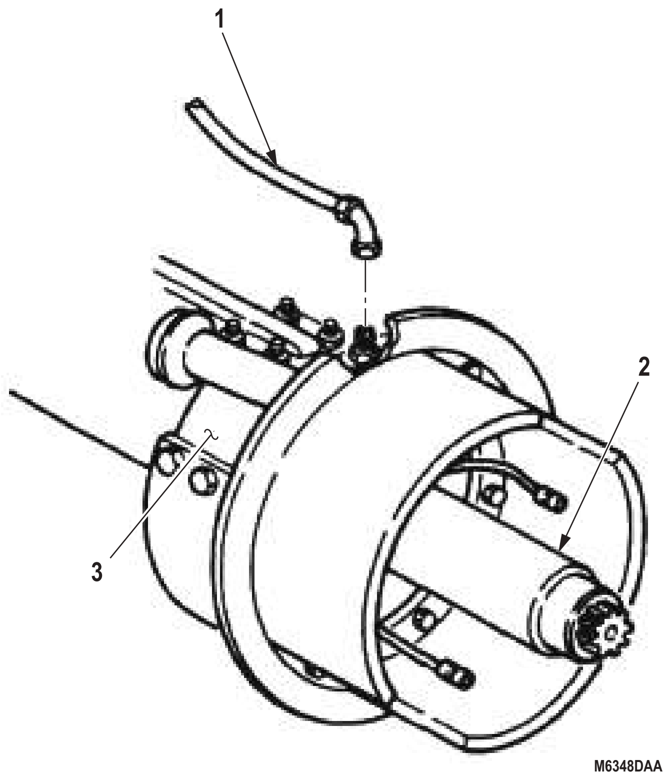


Figure 3. Front Hubs Repair.

END OF TASK

INSTALLATION

1. Using long end of seal inserter, install air seal (Figure 4, Item 7) on hub (Figure 4, Item 2) with spring facing out. Ensure air seal is seated properly in hub.
2. Using short end of seal inserter, install air seal (Figure 4, Item 8) on hub (Figure 4, Item 2) with spring facing out. Ensure air seal is seated properly in hub.
3. Install snapring (Figure 4, Item 10) on hub (Figure 4, Item 2).
4. Install gasket (Figure 4, Item 18), tee (Figure 4, Item 19), ferrule (Figure 4, Item 20), and screw (Figure 4, Item 21) on hub (Figure 4, Item 2). Finger-tighten screw.
5. Align drive flange (Figure 4, Item 12) with tee (Figure 4, Item 19) and install drive flange on hub (Figure 4, Item 2) with two screws (Figure 4, Item 14).
6. Tighten screw (Figure 4, Item 21) 35 lb-ft (48 N·m).
7. Install two screws (Figure 4, Item 14) in threaded holes (Figure 4, Item 11) of drive flange (Figure 4, Item 12).
8. Remove two screws (Figure 4, Item 14) and drive flange (Figure 4, Item 12) from hub (Figure 4, Item 2).

CAUTION

Ensure bearings are matched with bearing cups before installation. Damage to bearings and/or bearing cups may result.

NOTE

- Pack inner and outer bearings with automotive and artillery grease prior to installation.
- Pack inner rubber section of hub seal with automotive and artillery grease.

9. Install inner bearing (Figure 4, Item 16) and hub seal (Figure 4, Item 17) on hub (Figure 4, Item 2).

CAUTION

Do not allow hub assembly to slide directly over threaded end of spindle. Damage to air seals may result.

NOTE

Assistant will help with Step (10).

10. Install hub (Figure 4, Item 2), outer bearing (Figure 4, Item 3), and bearing adjusting nut (Figure 4, Item 5) on spindle (Figure 4, Item 22).
11. While rotating hub (Figure 4, Item 2), tighten bearing adjusting nut (Figure 4, Item 5) 50 lb-ft (68 N·m).
12. Back out bearing adjusting nut (Figure 4, Item 5) 1/8 to 1/4 turn so washer (Figure 4, Item 6) can be aligned with slot in spindle (Figure 4, Item 22) and adjusting nut locking pin (Figure 4, Item 4).
13. Install washer (Figure 4, Item 6) and nut (Figure 4, Item 9) on spindle (Figure 4, Item 22). Tighten nut 250 to 400 lb-ft (339 to 542 N·m).
14. Apply silicone rubber adhesive to sealing surfaces of hub (Figure 4, Item 2) and drive flange (Figure 4, Item 9).
15. Align drive flange (Figure 4, Item 12) with tee (Figure 4, Item 19), and install drive flange on driveshaft (Figure 4, Item 1) and hub (Figure 4, Item 2) with ten washers (Figure 4, Item 13) and screws (Figure 4, Item 14). Tighten screws 60 to 100 lb-ft (81 to 136 N·m).
16. Install brake drum (Figure 4, Item 15) on hub (Figure 4, Item 2).

INSTALLATION - Continued

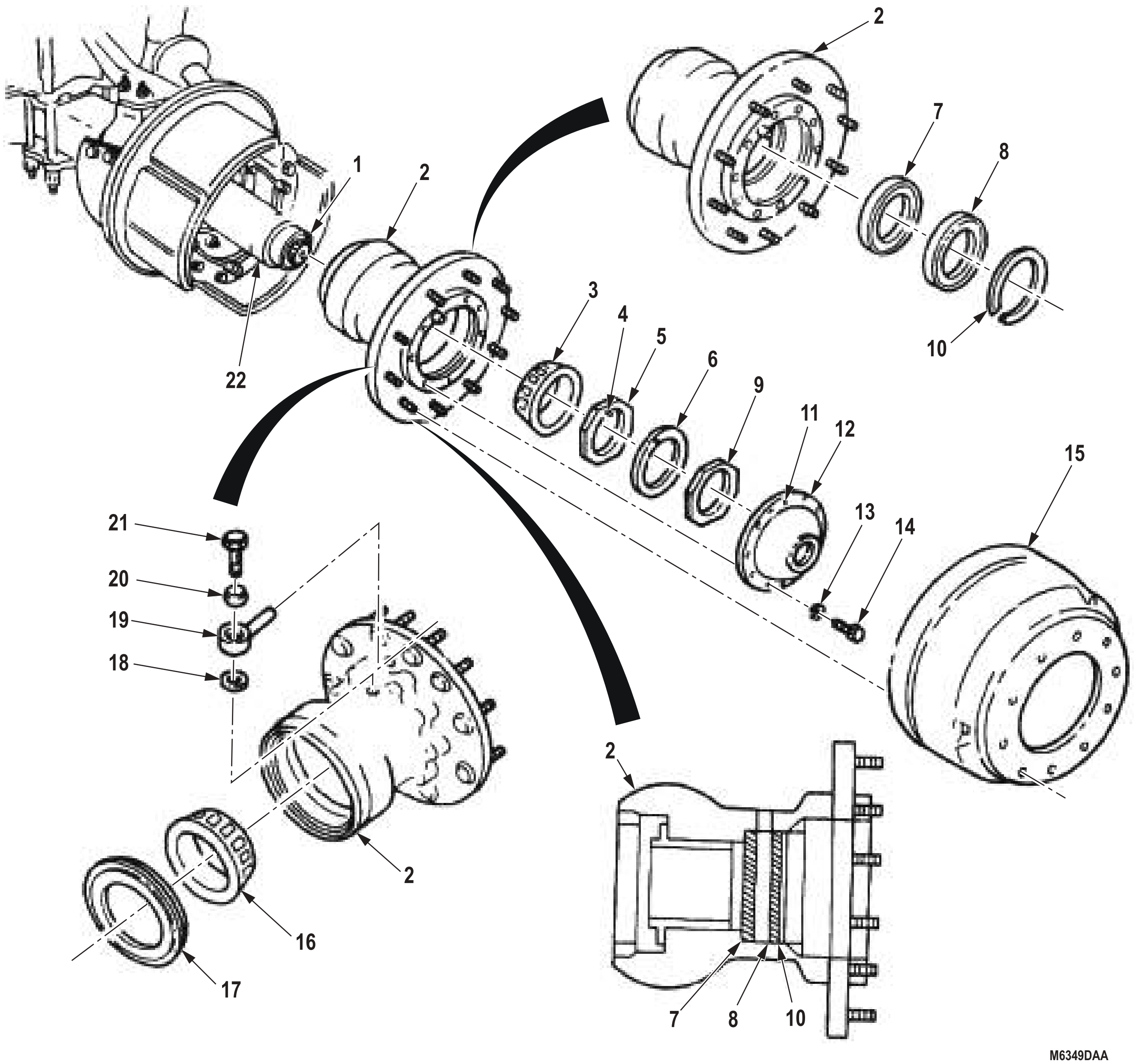


Figure 4. Front Hub Installation.

END OF TASK

FOLLOW-ON MAINTENANCE

1. Install front wheel. (TM 9-2320-272-10)
2. Install front wheel valve. (WP 0393)
3. Perform hub air seal leak test. (WP 0487)

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
REAR HUBS REPLACEMENT (M939A2)

INITIAL SETUP:

Tools and Special Tools
Tool Kit, General Mechanic's: Automotive
(Volume 5, WP 0826, Table 1, Item 56)
Inserter, Seal
(Volume 5, WP 0826, Table 1, Item 27)
Punch, Bearing
(Volume 5, WP 0826, Table 1, Item 45)

Materials/Parts
Adhesive, Silicone Rubber
(Volume 5, WP 0825, Table 1, Item 4)
Cleaning Compound, Solvent
(Volume 5, WP 0825, Table 1, Item 16, 17)
Cloth, Abrasive: Crocus
(Volume 5, WP 0825, Table 1, Item 18)
Grease, Automotive and Artillery
(Volume 5, WP 0825, Table 1, Item 28)
Lockwasher
(Volume 5, WP 0827, Table 1, Item 405)
Qty: 10
Oil Seal
(Volume 5, WP 0827, Table 1, Item 173)
Qty: 1

Materials/Parts (cont.)
Seal (Volume 5, WP 0827, Table 1, Item 122)
Qty: 1
Seal (Volume 5, WP 0827, Table 1, Item 250)
Qty: 1

Personnel Required
(2)

References
WP 0414
WP 0487
Volume 5, WP 0819

Equipment Condition
Front wheels chocked. (TM 9-2320-272-10)
Spring brake caged. (TM 9-2320-272-10)
Rear wheel(s) removed. (TM 9-2320-272-10)

REMOVAL

1. Remove brake drum (Figure 1, Item 9) from hub (Figure 1, Item 3).
2. Remove ten screws (Figure 1, Item 8), lockwashers (Figure 1, Item 7), and axle shaft (Figure 1, Item 6) from hub (Figure 1, Item 3). Discard lockwashers.

NOTE

Tag inner and outer bearings for installation.

3. Remove outer bearing nut (Figure 1, Item 10) and washer (Figure 1, Item 11) from spindle (Figure 1, Item 5).
4. Remove bearing adjusting nut (Figure 1, Item 12) and outer bearing (Figure 1, Item 13) from spindle (Figure 1, Item 5).

CAUTION

Do not allow hub assembly to slide directly over threaded end of spindle. Damage to air seals may result.

NOTE

Assistant will help with Step (5).

5. Remove hub (Figure 1, Item 3) from spindle (Figure 1, Item 5).
6. Remove oil seal (Figure 1, Item 4) and inner bearing (Figure 1, Item 14) from hub (Figure 1, Item 3). Discard oil seal.
7. Remove snapring (Figure 1, Item 1) and two air seals (Figure 1, Item 2) from hub (Figure 1, Item 3). Discard air seals.

REMOVAL - Continued

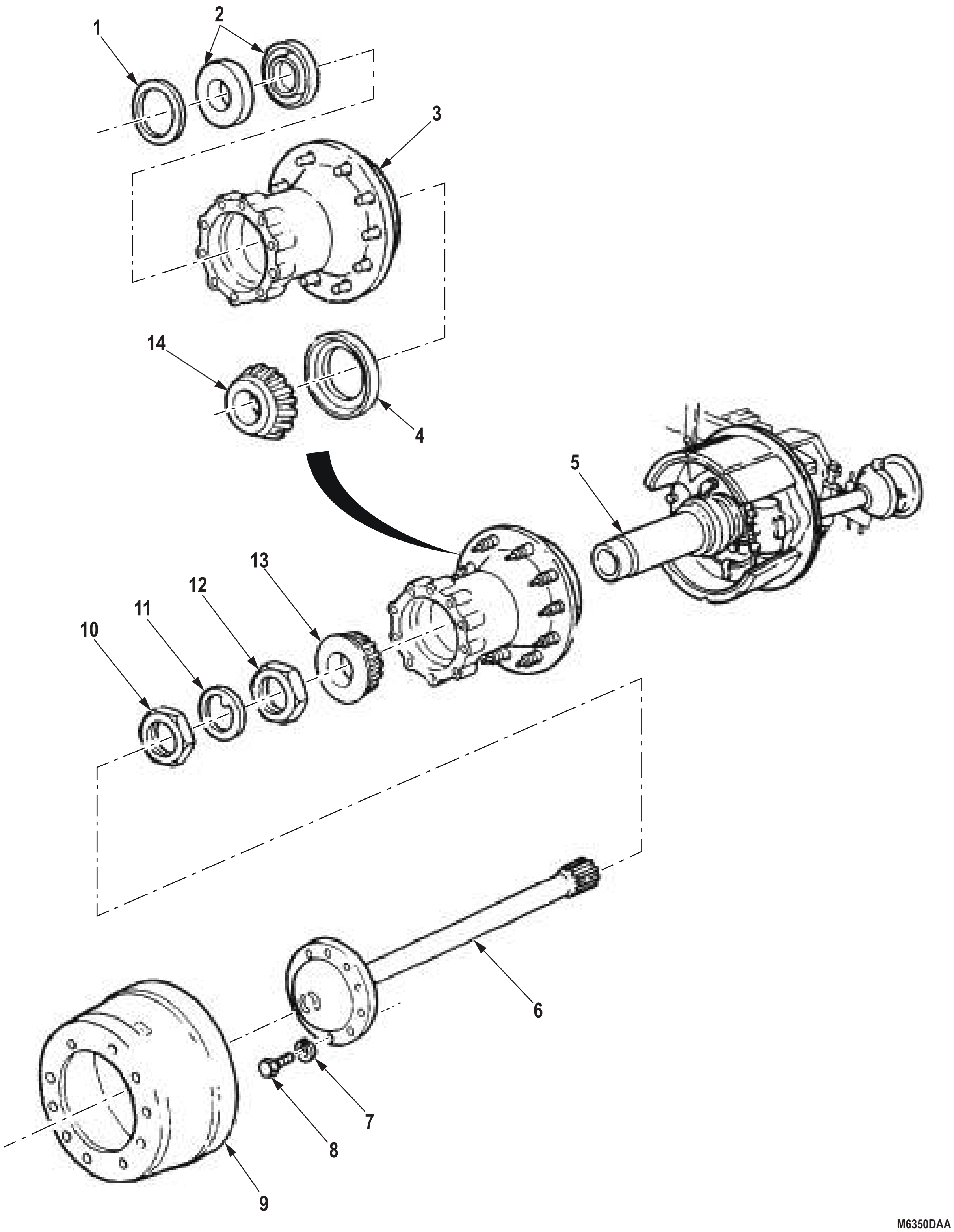


Figure 1. Rear Hubs Removal.

END OF TASK

CLEANING AND INSPECTION

1. For General Cleaning Instructions, refer to (Volume 5, WP 0819).
2. For General Inspection Instructions, refer to (Volume 5, WP 0819).

NOTE

Bearings and bearing cups must be replaced as a matched set.

3. Inspect inner bearing cup (Figure 2, Item 1) and outer bearing cup (Figure 2, Item 4), for cracks, chips, or excessive wear. Replace bearing(s) and bearing cup(s) if damaged.
4. Inspect plastic sleeve (Figure 2, Item 6) for excessive wear. Replace plastic sleeve (Figure 2, Item 6) if worn.
5. Inspect studs (Figure 2, Item 2), oil slinger (Figure 2, Item 3), and hub (Figure 2, Item 5) for stripped threads, chips, and cracks. Replace damaged parts.

CLEANING AND INSPECTION - Continued

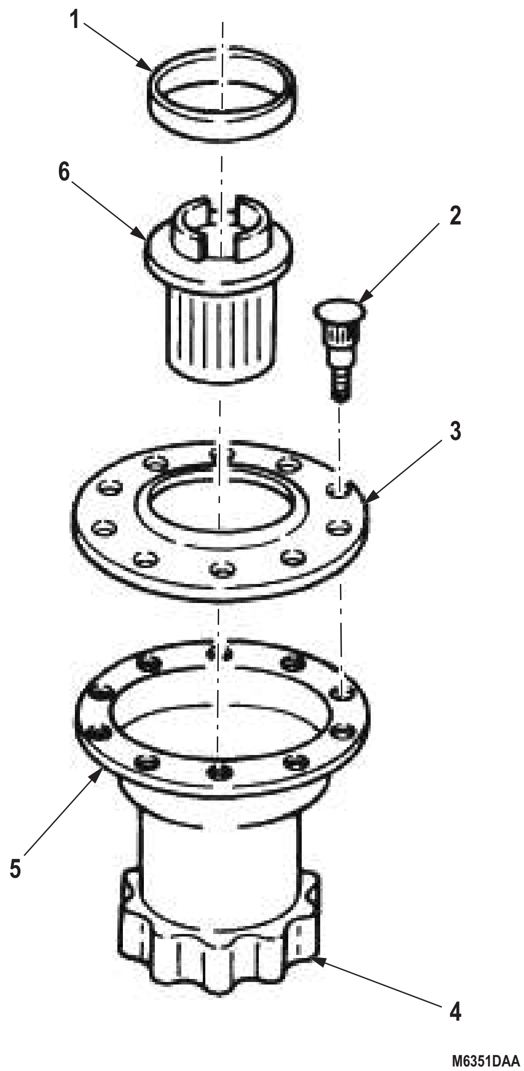


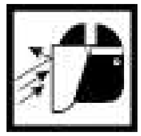
Figure 2. Rear Hubs Cleaning and Inspection.

CLEANING AND INSPECTION - Continued

6. Inspect seal surface of spindle (Figure 3, Item 3) for rust, scratches, and grooves.

   a. If rusted, disconnect air line (Figure 3, Item 2) from air manifold fitting (Figure 3, Item 1).

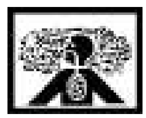
WARNING



Eyeshields must be worn when cleaning with compressed air. Compressed air source will not exceed 30 psi (207 kPa). Failure to comply may result in injury or death to personnel.

   b. Using external air source, blow dirt and debris from seal surface of spindle (Figure 3, Item 3) by forcing air through air manifold fitting (Figure 3, Item 1).

WARNING

Solvent cleaning compound is flammable and toxic. Do not use near an open flame and always have a fire extinguisher nearby when solvents are used. Use only in well-ventilated places, wear protective clothing, and dispose of cleaning rags in approved container. Failure to comply may result in damage to equipment, injury, or death to personnel.

   c. Thoroughly clean entire surface of spindle (Figure 3, Item 3) with solvent cleaning compound.

   d. Connect air line (Figure 3, Item 2) to air manifold fitting (Figure 3, Item 1).

CAUTION

Avoid filing too deeply in seal surface of spindle. Excessive filing may result in permanent damage to spindle.

   e. Remove deep scratches by carefully filing seal surface of spindle (Figure 3, Item 3) in circular motion.

NOTE

It is unnecessary to remove the circular depression of a groove; only the raised portion or lip.

   f. Using abrasive cloth, remove light surface scratches from seal surface of spindle (Figure 3, Item 3).

CLEANING AND INSPECTION - Continued

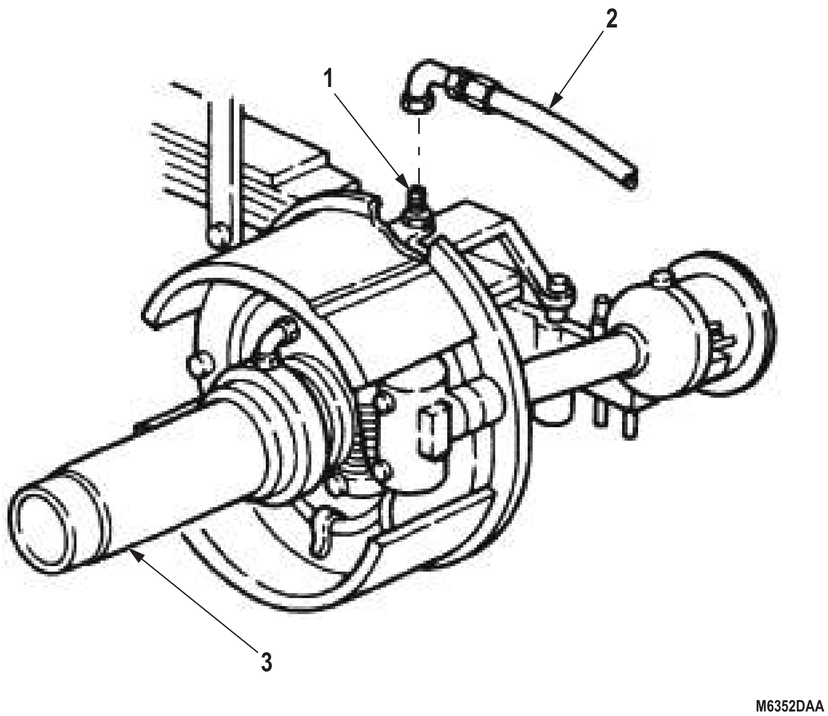


Figure 3. Rear Hubs Cleaning and Inspection.

g. If excessively rusted, scratched, or grooved, Replace rear axle, refer to (WP 0414).

END OF TASK

REPAIR

1. Using bearing punch, remove outer bearing cup (Figure 4, Item 4) from hub (Figure 4, Item 5) by tapping alternately on outer edges of bearing cup. Discard outer bearing cup.
2. Using bearing punch, remove inner bearing cup (Figure 4, Item 1) from hub (Figure 4, Item 5) by tapping alternately on outer edges of inner bearing cup.
3. Remove plastic sleeve (Figure 4, Item 6) from hub (Figure 4, Item 5) by splitting and prying plastic sleeve from hub. Discard plastic sleeve.

NOTE

Bearings and bearing cups must be replaced as a matched set.

4. Install outer bearing cup (Figure 4, Item 4) on hub (Figure 4, Item 5). Ensure outer bearing cup is properly seated on hub.
5. Install plastic sleeve (Figure 4, Item 6) on hub (Figure 4, Item 5).
6. Install inner bearing cup (Figure 4, Item 1) on hub (Figure 4, Item 5). Ensure inner bearing cup is seated properly on hub.

NOTE

- Perform Steps (7) through (9) if slinger or studs failed inspection.
- Use left-hand threaded studs for hub mounted on the left side of vehicle, and right-hand threaded studs for hubs mounted on the right side of vehicle.

7. Remove studs (Figure 4, Item 2) and slinger (Figure 4, Item 3) from hub (Figure 4, Item 5).
8. Remove damaged studs (Figure 4, Item 2) from slinger (Figure 4, Item 3) and hub (Figure 4, Item 5). Discard studs and slinger.
9. Position slinger (Figure 4, Item 3) on hub (Figure 4, Item 5), and install with studs (Figure 4, Item 2).

REPAIR - Continued

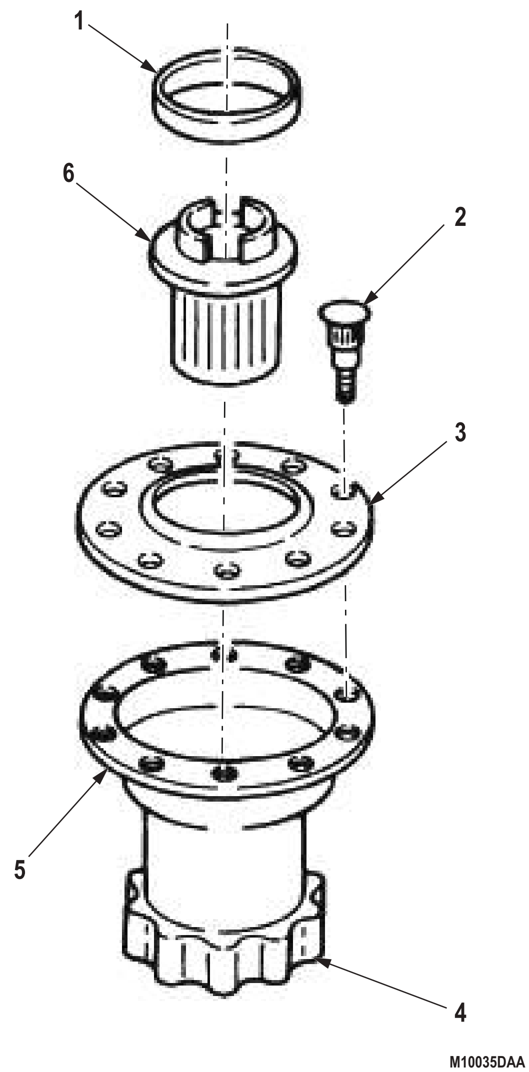


Figure 4. Rear Hubs Repair.

END OF TASK

INSTALLATION

NOTE

Ensure double-lip seal is placed outward.

1. Using long end of seal inserter, install air seal (Figure 5, Item 2) on hub (Figure 5, Item 3), with spring facing out, until seated in hub.
2. Using short end of seal inserter, install air seal (Figure 5, Item 2) on hub (Figure 5, Item 3), with spring facing inward, until seated in hub.
3. Install snapring (Figure 5, Item 1) on hub (Figure 5, Item 3).

CAUTION

Ensure bearings are matched with bearing cups before installation, or damage to bearings may result.

NOTE

- Pack inner and outer bearings with automotive and artillery grease prior to installation.
- Pack inner rubber section of hub seal with automotive and artillery grease.

4. Install inner bearing (Figure 5, Item 14) and oil seal (Figure 5, Item 4) on hub (Figure 5, Item 3).

CAUTION

Do not allow hub assembly to slide directly over threaded end of spindle. Damage to air seals may result.

NOTE

Assistant will help with Step (5).

5. Install hub (Figure 5, Item 3), outer bearing (Figure 5, Item 13), and bearing adjusting nut (Figure 5, Item 12) on spindle (Figure 5, Item 5).
6. While rotating hub (Figure 5, Item 3), tighten bearing adjusting nut (Figure 5, Item 12) 50 lb-ft (68 N·m).
7. Back out bearing adjusting nut (Figure 5, Item 12) 1/8 to 1/4 turn so washer (Figure 5, Item 11) can be aligned with slot on spindle (Figure 5, Item 5) and locking pin on adjusting nut.
8. Install washer (Figure 5, Item 11) and outer bearing nut (Figure 5, Item 10) on spindle (Figure 5, Item 5). Tighten outer bearing nut 250 to 400 lb-ft (339 to 542 N·m).
9. Apply silicone rubber adhesive to mating surface of hub (Figure 5, Item 3) and inside of flange on axle shaft (Figure 5, Item 6).
10. Install axle shaft (Figure 5, Item 6) on hub (Figure 5, Item 3) with ten lockwashers (Figure 5, Item 7) and screws (Figure 5, Item 8). Tighten screws 60 to 100 lb-ft (81 to 136 N·m).
11. Install brake drum (Figure 5, Item 9) on hub (Figure 5, Item 3).

INSTALLATION - Continued

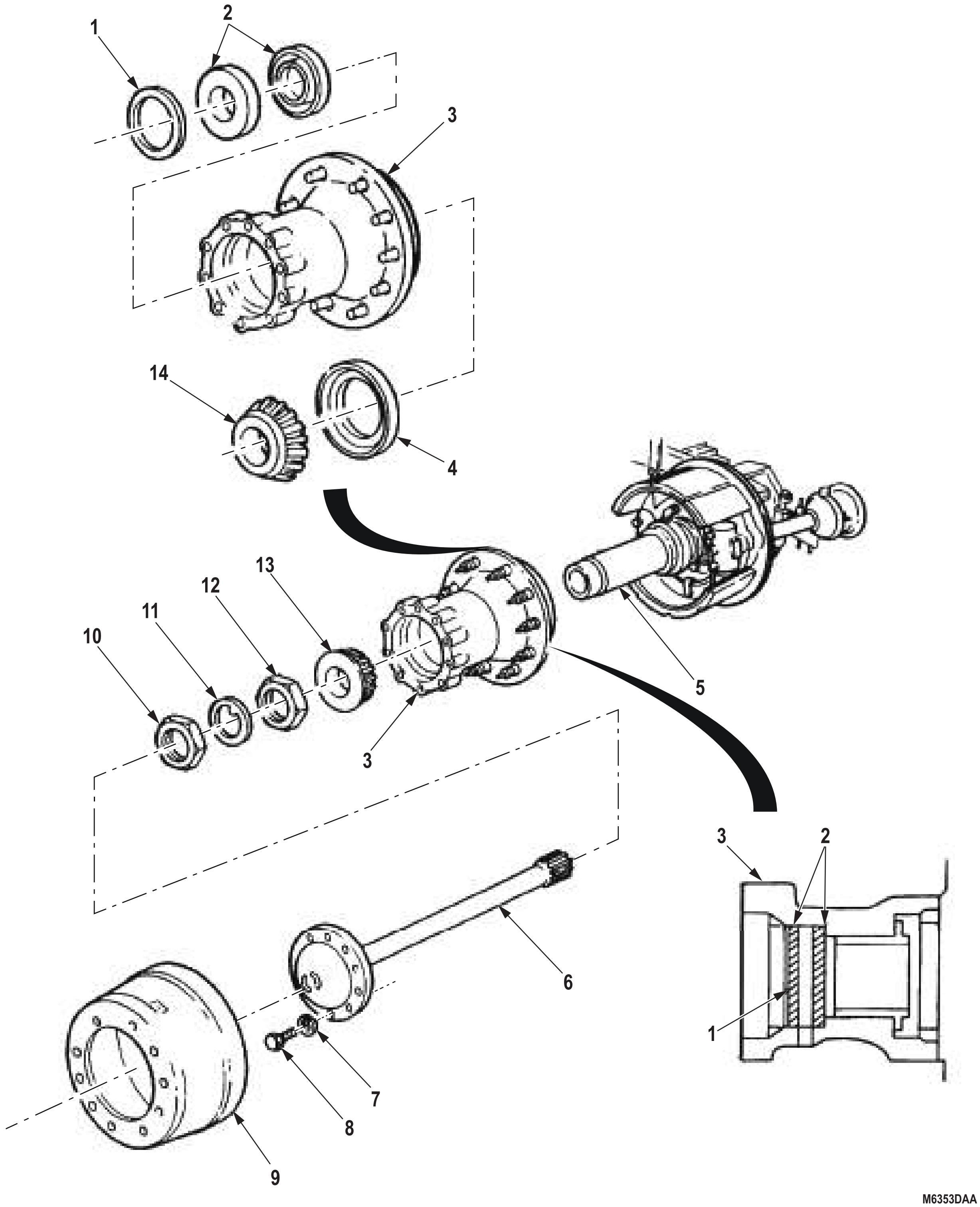


Figure 5. Rear Hubs Installation.

END OF TASK

FOLLOW-ON MAINTENANCE

1. Install rear wheels. (TM 9-2320-272-10)
2. Perform hub air seal leak test for rear axle. (WP 0487)
3. Uncage spring brake. (TM 9-2320-272-10)

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
WHEEL BEARING ADJUSTMENT

INITIAL SETUP:

Tools and Special Tools

Tool Kit, General Mechanic's: Automotive
(Volume 5, WP 0826, Table 1, Item 56)
Wrench, Torque, Click, Ratcheting, 1/2" Drive, 250 Ft-Lb
(Volume 5, WP 0826, Table 1, Item 63)
Wrench, Torque, Click, Ratcheting, 3/4" Drive, 600 Ft-Lb
(Volume 5, WP 0826, Table 1, Item 61)

Materials/Parts

Adhesive, Silicone Rubber
(Volume 5, WP 0825, Table 1, Item 4)

Materials/Parts (cont.)

Gasket (Volume 5, WP 0827, Table 1, Item 3)
Qty: 2
Lockwasher
(Volume 5, WP 0827, Table 1, Item 405)
Qty: 10

Equipment Condition

Wheels chocked. (TM 9-2320-272-10)
Spring brake(s) caged. (TM 9-2320-272-10)

FRONT WHEEL BEARING ADJUSTMENT

1. Raise vehicle until tire (Figure 1, Item 1) is clear off the ground.
2. Remove ten screws (Figure 1, Item 7) and lockwashers (Figure 1, Item 6) from drive flange (Figure 1, Item 5) and hub (Figure 1, Item 9). Discard lockwashers.
3. Install two screws (Figure 1, Item 7) into two threaded holes (Figure 1, Item 8) to separate drive flange (Figure 1, Item 5) from hub (Figure 1, Item 9).
4. Remove drive flange (Figure 1, Item 5) and gasket (Figure 1, Item 4) from hub (Figure 1, Item 9). Discard gasket.
5. Remove two screws (Figure 1, Item 7) from drive flange (Figure 1, Item 5).
6. Remove outer bearing locknut (Figure 1, Item 3) and bearing nut washer (Figure 1, Item 2) from spindle (Figure 1, Item 11).
7. While rotating hub (Figure 1, Item 9), tighten outer bearing adjusting nut (Figure 1, Item 12) 50 lb-ft (68 N·m) to set preload.
8. Back outer bearing adjustment nut (Figure 1, Item 12) 1/6 to 1/4 turn so bearing nut washer (Figure 1, Item 2) can be positioned to spindle (Figure 1, Item 11) and adjusting nut insert (Figure 1, Item 10).
9. Install bearing nut washer (Figure 1, Item 2) and outer bearing locknut (Figure 1, Item 3) on spindle (Figure 1, Item 11). Tighten outer bearing locknut 250 to 400 lb-ft (339 to 542 N·m).
10. Install gasket (Figure 1, Item 4) and drive flange (Figure 1, Item 5) on hub (Figure 1, Item 9) with ten lockwashers (Figure 1, Item 6) and screws (Figure 1, Item 7). Tighten screws 60 to 100 lb-ft (81 to 136 N·m).
11. Lower vehicle to ground.

FRONT WHEEL BEARING ADJUSTMENT - Continued

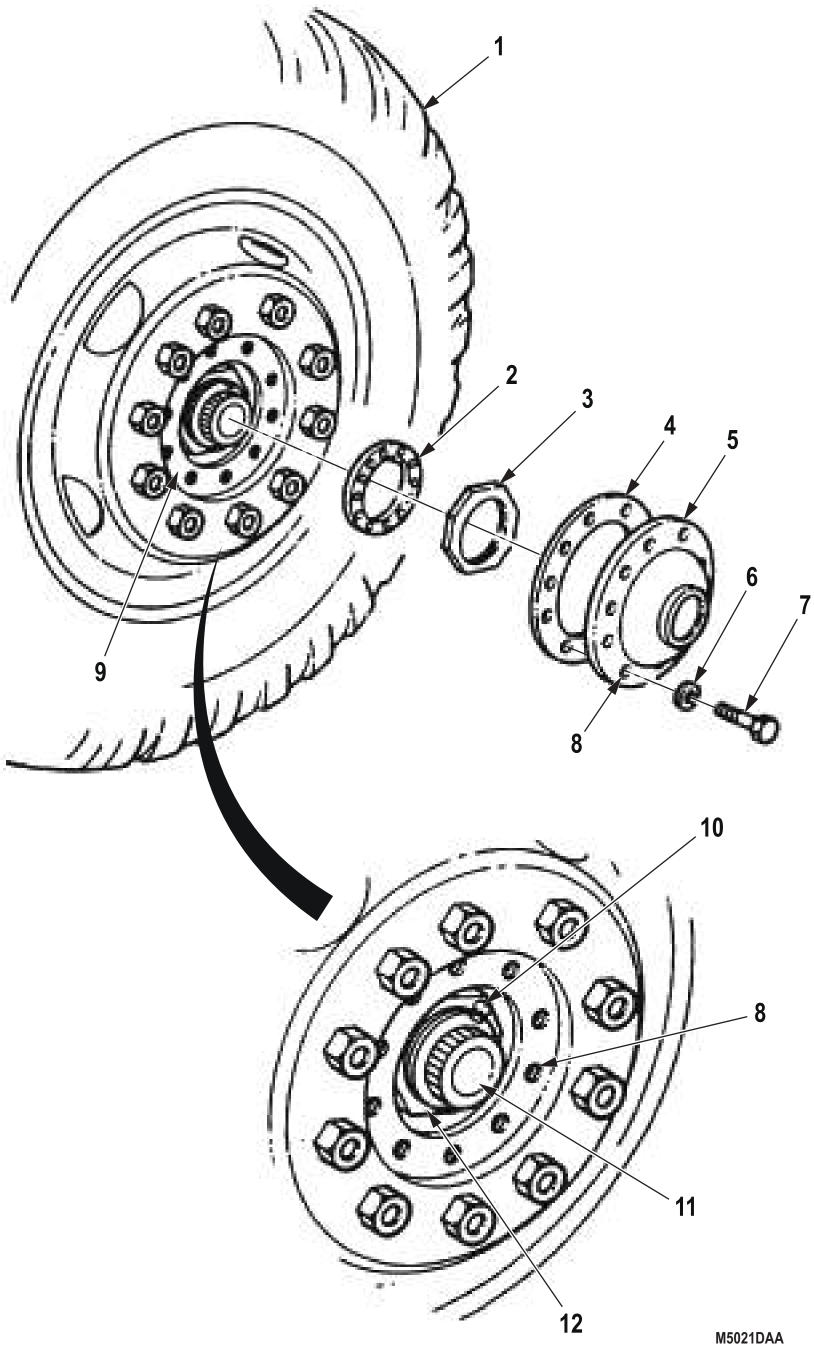


Figure 1. Front Wheel Bearing Adjustment.

END OF TASK

REAR WHEEL BEARING ADJUSTMENT

1. Raise vehicle until tires (Figure 2, Item 1) are clear off the ground.
2. Remove ten screws (Figure 2, Item 7) and washers (Figure 2, Item 6) from axle shaft (Figure 2, Item 5).
3. Install two screws (Figure 2, Item 7) into threaded holes (Figure 2, Item 8) and remove axle shaft (Figure 2, Item 5) and gasket (Figure 2, Item 4) from hub (Figure 2, Item 1). Discard gasket.
4. Remove two screws (Figure 2, Item 7) from axle shaft (Figure 2, Item 5).
5. Remove outer bearing locknut (Figure 2, Item 3) and outer bearing washer (Figure 2, Item 2) from axle housing (Figure 2, Item 9).
6. While turning hub (Figure 2, Item 11), tighten bearing adjusting nut (Figure 2, Item 10) 50 lb-ft (68 N·m).
7. Back out bearing adjusting nut (Figure 2, Item 10) 1/6 to 1/4 turn so outer bearing washer (Figure 2, Item 2) can be positioned to axle housing (Figure 2, Item 9) and adjusting nut insert (Figure 2, Item 12).
8. Install outer bearing washer (Figure 2, Item 2) and outer bearing locknut (Figure 2, Item 3) on hub (Figure 2, Item 11). Tighten outer bearing locknut 250 to 400 lb-ft (339 to 542 N·m).
9. Apply sealant to mating surfaces of axle shaft (Figure 2, Item 5).
10. Install gasket (Figure 2, Item 4) and axle shaft (Figure 2, Item 5) on hub (Figure 2, Item 11) with ten washers (Figure 2, Item 6) and screws (Figure 2, Item 7). Tighten screws 60 to 100 lb-ft (81 to 136 N·m).
11. Lower vehicle until tire is on ground.

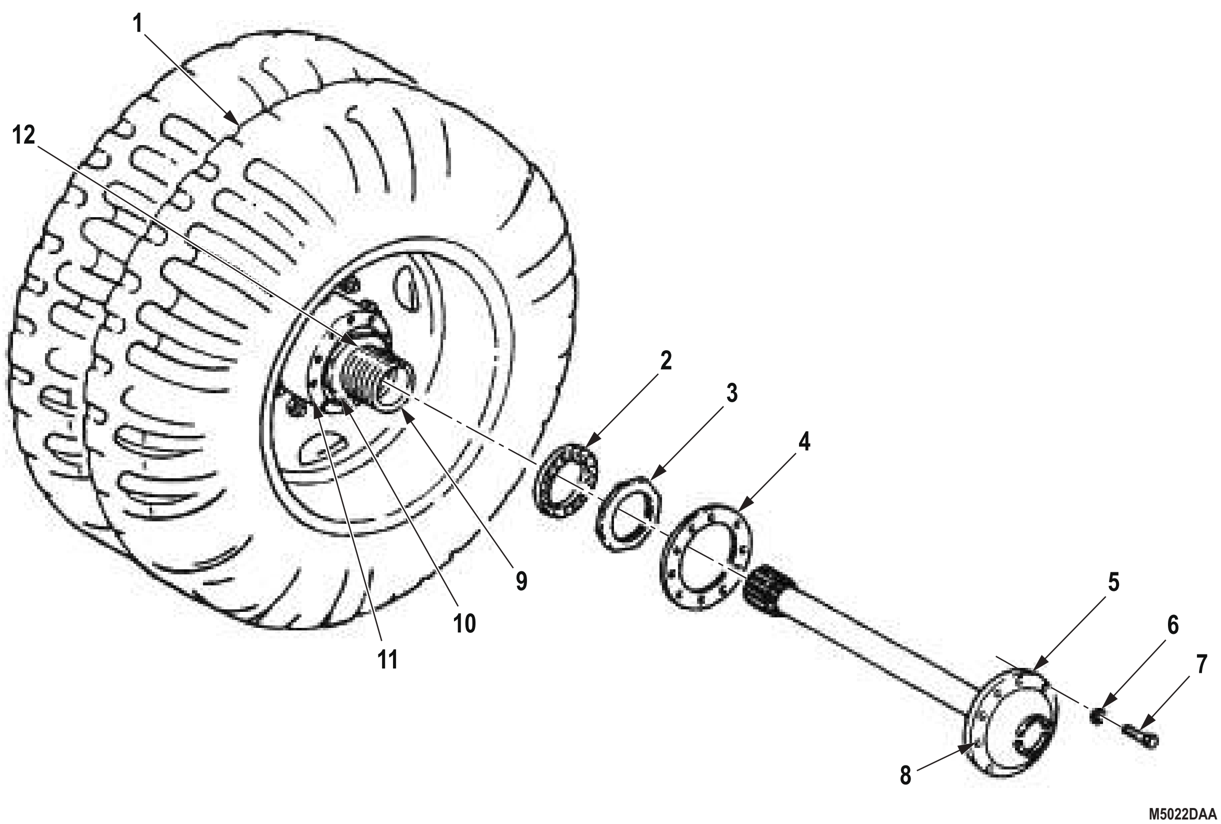


Figure 2. Rear Wheel Bearing Adjustment.

END OF TASK

FOLLOW-ON MAINTENANCE

1. Release caged spring brake(s). (TM 9-2320-272-10)
2. Road test vehicle. (TM 9-2320-272-10)

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
WHEEL AND TIRE ROTATION/REPLACEMENT (M939)

INITIAL SETUP:

Tools and Special Tools

Tool Kit, General Mechanic's: Automotive
(Volume 5, WP 0826, Table 1, Item 56)
Multiplier, Torque
(Volume 5, WP 0826, Table 1, Item 35)
Wrench, Torque, Click, Ratcheting, 3/4" Drive, 600 Ft-Lb
(Volume 5, WP 0826, Table 1, Item 61)
Wrench, Wheel Stud Nut, Geared Socket
(Volume 5, WP 0826, Table 1, Item 64)

References

TM 9-2610-200-14

Equipment Condition

Parking brake set. (TM 9-2320-272-10)
Spare tire removed. (TM 9-2320-272-10)

WHEEL AND TIRE REMOVAL

NOTE

For Individual Tire Replacement refer to: TM 9-2320-272-10.

1. Loosen 60 stud nuts (Figure 1, Item 4) on four outside rear wheels (Figure 1, Item 2) and two front wheels (Figure 1, Item 5).
2. Using hydraulic jack, raise vehicle and place two jack stands under rear-rear axle (Figure 1, Item 1), two jack stands under forward-rear axle (Figure 1, Item 3), and two jack stands under front axle (Figure 1, Item 6).

NOTE

Tag wheels for rotation.

3. Remove 60 stud nuts (Figure 1, Item 4), two front wheels (Figure 1, Item 5), and four outside rear wheels (Figure 1, Item 2) from vehicle.
4. Using inner wheel socket, remove 40 inner wheel spacer nuts (Figure 1, Item 8) and four inside rear wheels (Figure 1, Item 7) from vehicle.

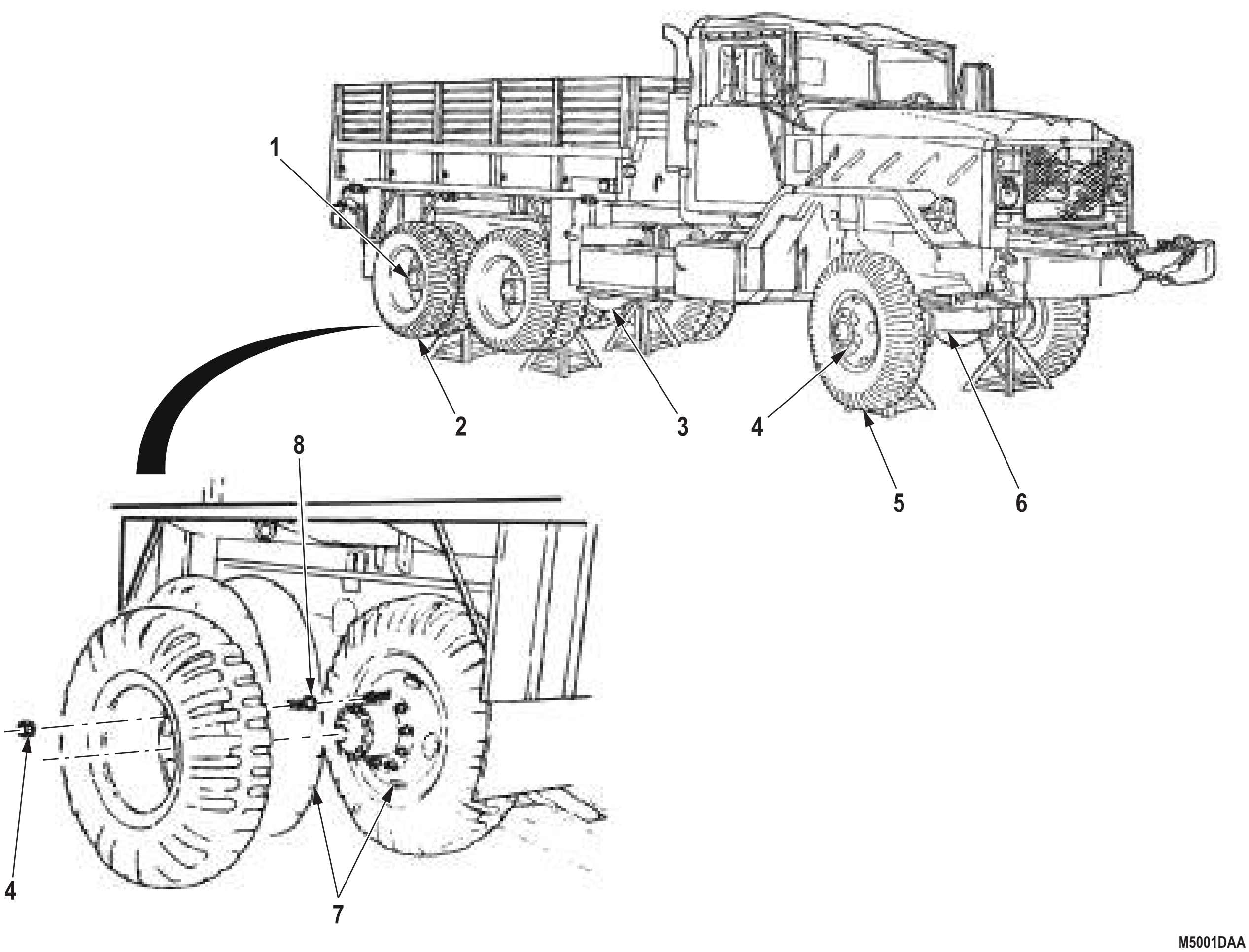


Figure 1. Wheel and Tire Removal.

END OF TASK

INSPECTION

1. Inspect all tire assembly (Figure 2, Item 1) for cracks, stud hole damage, and bends. Replace tire assembly if cracked, damaged, or bent.
2. Inspect tires (Figure 2, Item 2) for tread wear (TM 9-2610-200-14).

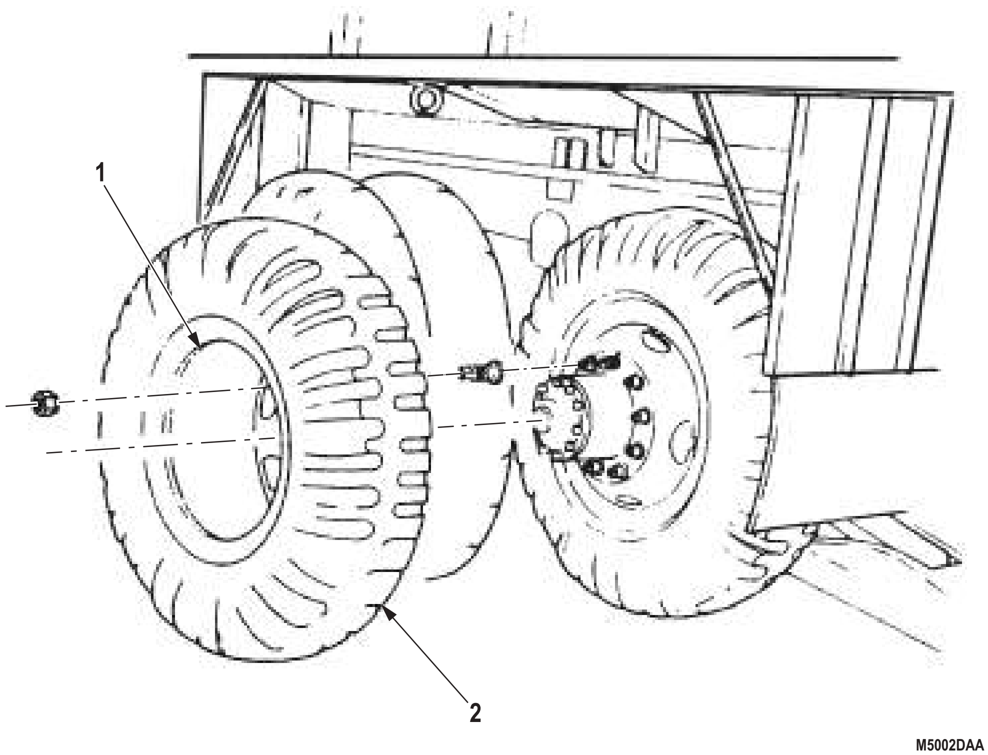


Figure 2. Wheel and Tire Inspection.

END OF TASK

WHEEL AND TIRE ROTATION

NOTE

- Wheels and tires are rotated the same for all M939 series vehicles.
- To maintain tread depth and pattern of dual tires, tires must be rotated to match tread wear as closely as possible (TM 9-2610-200-14).

Rotate wheels and tires as shown, according to Figure 3.

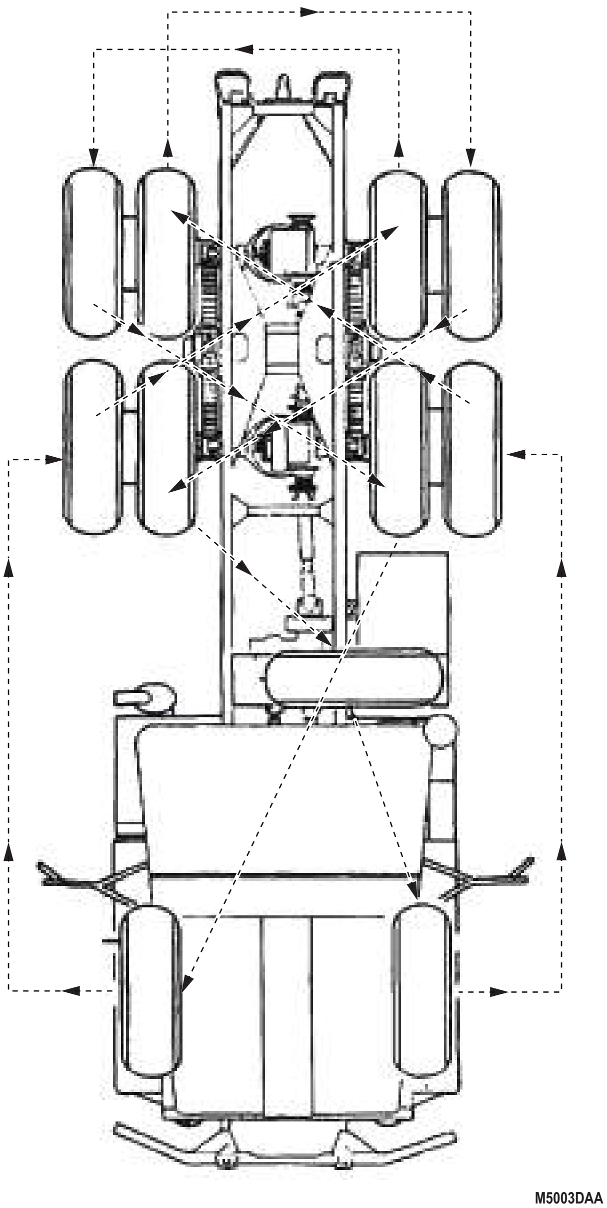


Figure 3. Wheel and Tire Rotation.

END OF TASK

INNER REAR WHEEL INSTALLATION

NOTE

- Ensure inner rear wheels are installed so valve stems to both rear wheels are accessible.
- Start all threaded nuts by hand to prevent cross-threading. Left wheels have left-hand threaded wheel studs and right wheels have right-hand threaded wheel studs.

1. Position four rear inner dual wheels (Figure 4, Item 1) on wheel hubs (Figure 4, Item 2).

WARNING

Apply proper torque to inner lug nuts. Failure to comply may result in damage to equipment, injury, or death to personnel.

2. Using inner wheel socket, install four rear inner dual wheels (Figure 4, Item 1) on wheel hub (Figure 4, Item 2) with 40 inner wheel spacer nuts (Figure 4, Item 3).

WARNING

Apply proper torque to inner lug nuts. Failure to comply may result in damage to equipment, injury, or death to personnel.

3. Tighten spacer nuts (Figure 4, Item 3) 325 to 355 lb-ft (441 to 481 N·m) in sequence shown.

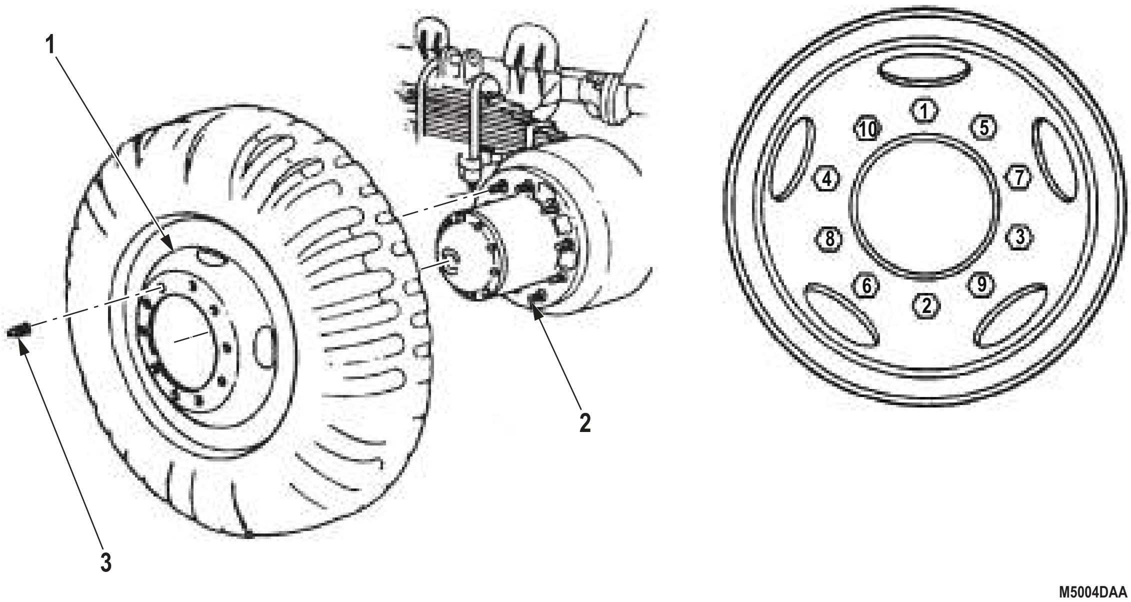


Figure 4. Wheel and Tire Installation.

END OF TASK

OUTER REAR WHEEL INSTALLATION

1. Position four rear outer dual wheels (Figure 5, Item 2) on wheel adapter spacer nuts (Figure 5, Item 1).
2. Install four rear outer dual wheels (Figure 5, Item 2) on vehicle with 40 stud nuts (Figure 5, Item 3). Hand-tighten stud nuts.
3. Raise rear of vehicle, remove jack stands, and lower vehicle.
4. Tighten 40 stud nuts (Figure 5, Item 3) 325 to 355 lb-ft (441 to 481 N·m) in sequence shown.

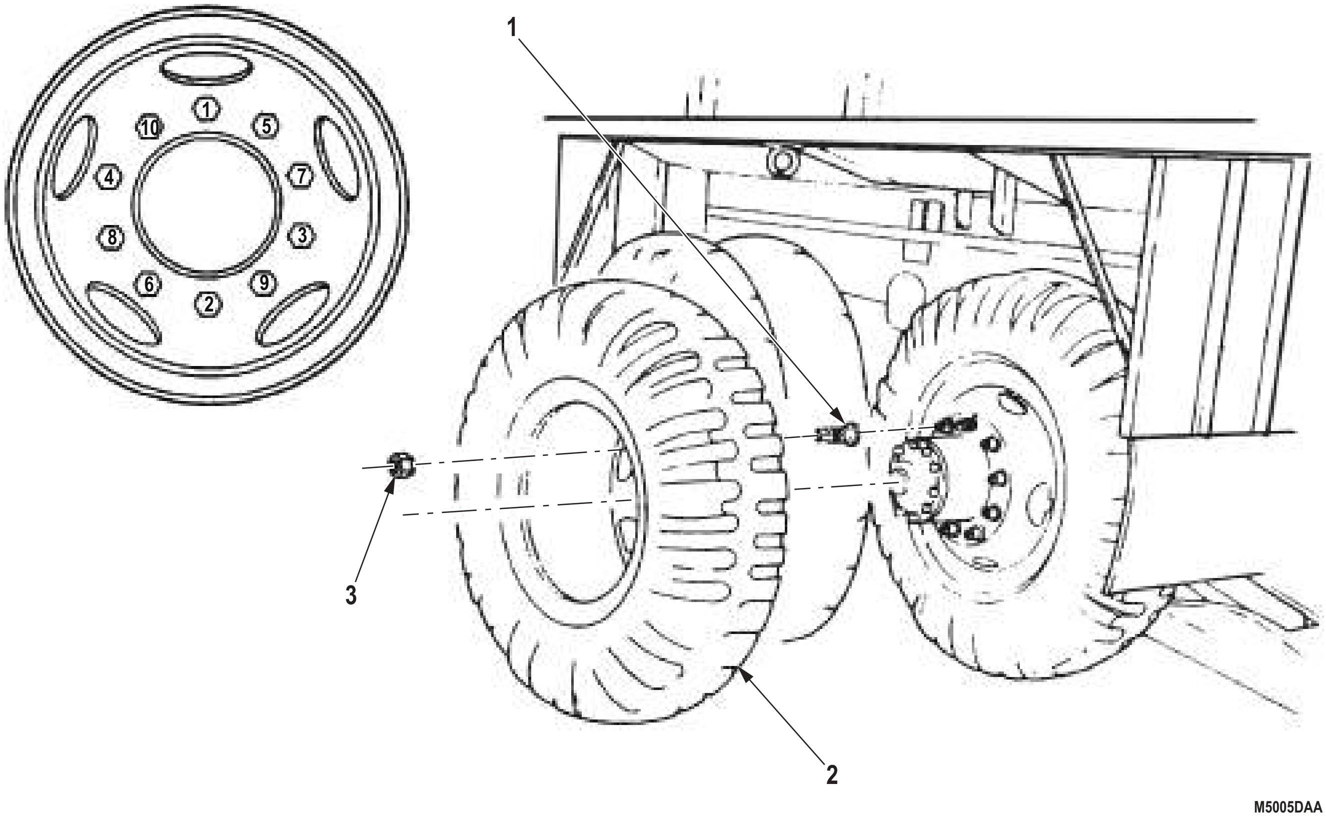


Figure 5. Wheel and Tire Installation.

END OF TASK

FRONT WHEEL INSTALLATION

1. Install two front wheels (Figure 6, Item 2) on wheel hub studs (Figure 6, Item 1) with 20 wheel stud nuts (Figure 6, Item 3). Hand-tighten stud nuts.
2. Raise front of vehicle clear of jack stands, remove jack stands, and lower vehicle.
3. Tighten 20 wheel stud nuts (Figure 6, Item 3) 325 to 355 lb-ft (441 to 481 N·m) in sequence shown.

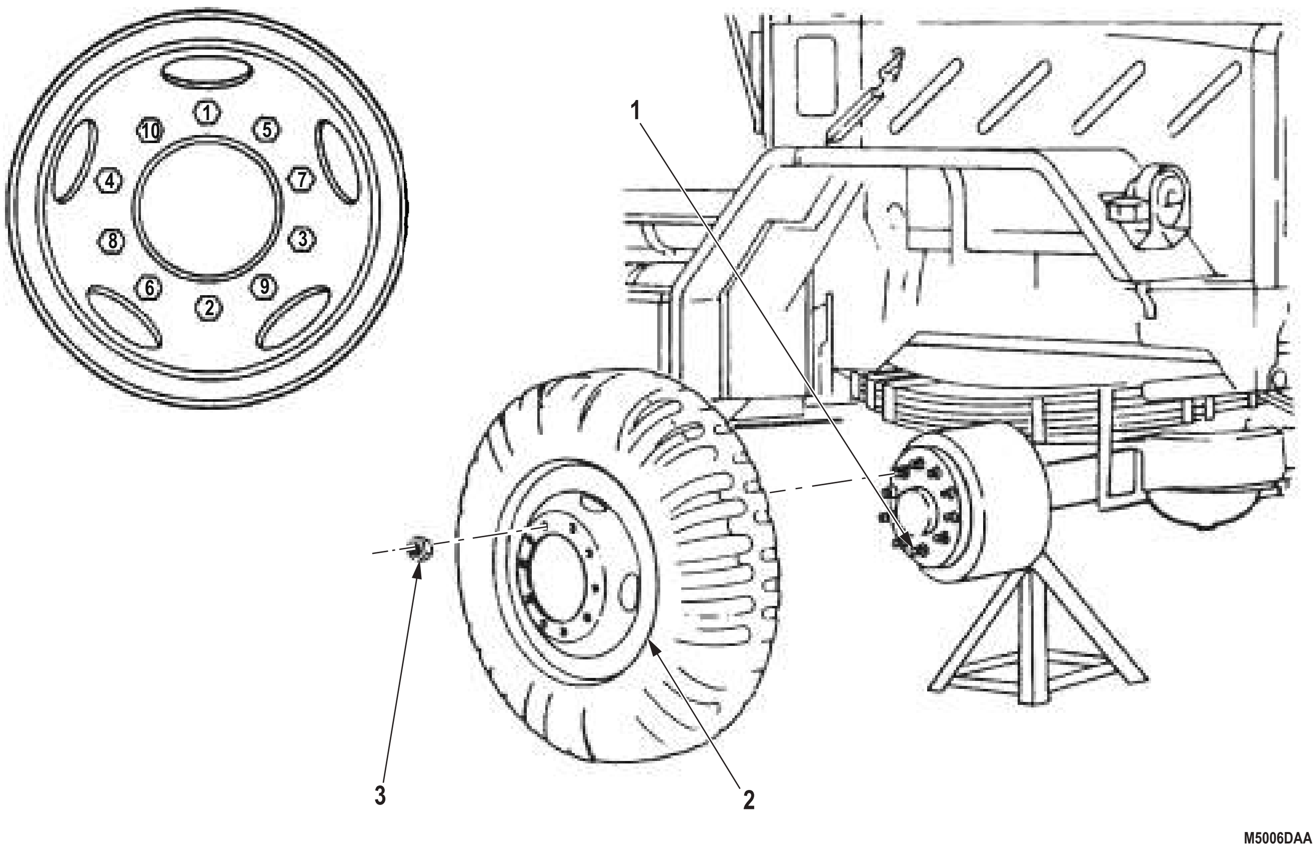


Figure 6. Wheel and Tire Installation.

END OF TASK

FOLLOW-ON MAINTENANCE

Spare tire installed. (TM 9-2320-272-10)

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
WHEEL AND TIRE ROTATION/REPLACEMENT (M939A1/A2)

INITIAL SETUP:

Tools and Special Tools
Tool Kit, General Mechanic's: Automotive
(Volume 5, WP 0826, Table 1, Item 56)
Wrench, Torque, Click, Ratcheting, 1/2" Drive, 250 Ft-Lb
(Volume 5, WP 0826, Table 1, Item 63)
Wrench, Torque, Click, Ratcheting, 3/4" Drive, 600 Ft-Lb
(Volume 5, WP 0826, Table 1, Item 61)

References
TM 9-2610-200-14

Equipment Condition
Parking brake set. (TM 9-2320-272-10)
Front wheel valve removed. (WP 0393)
Rear wheel valve removed. (WP 0490)

WHEEL AND TIRE REMOVAL

NOTE

- Perform Step (1) for M939A2 vehicles only.
- For individual wheel replacement refer to (TM 9-2320-272-10).

1. Remove two nuts (Figure 1, Item 9) and wheel weights (Figure 1, Item 8) from two front wheels (Figure 1, Item 1) and studs (Figure 1, Item 7).
2. Loosen 60 stud nuts (Figure 1, Item 3) on four rear wheels (Figure 1, Item 2) and two front wheels (Figure 1, Item 1).
3. Raise vehicle and place two jack stands under rear-rear axle, two jack stands under forward-rear axle (Figure 1, Item 5), and two jack stands under front axle (Figure 1, Item 6).

NOTE

Tag wheels for installation.

4. Remove 60 stud nuts (Figure 1, Item 3), two front wheels (Figure 1, Item 2), and four rear wheels (Figure 1, Item 1) from vehicle.
5. Inspect tire assembly (Figure 1, Item 4) for cracks, stud hole damage, and bends. Replace tire assembly if cracked, stud holes damaged or bent.

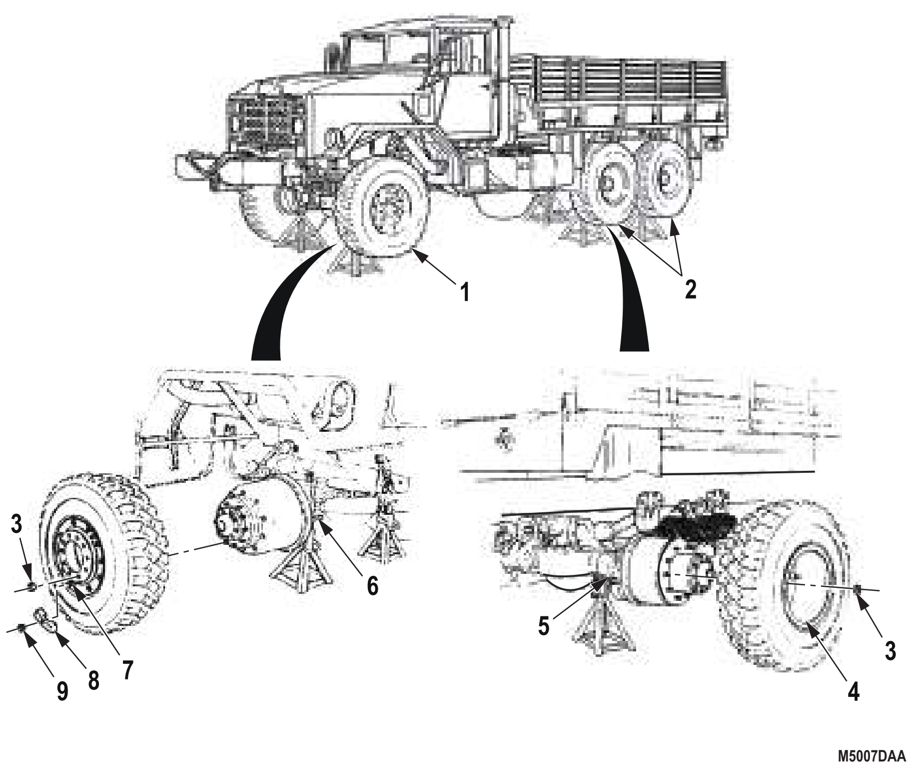


Figure 1. Wheel and Tire Removal.

6. Inspect tires for tread wear (TM 9-2610-200-14).

END OF TASK

WHEEL AND TIRE ROTATION

NOTE

- Wheels and tires are rotated the same for all M939A1/A2 series vehicles.
- To maintain tread depth, tires must be rotated to match tread wear as closely as possible (TM 9-2610-200-14).
- Tires (14.00R20) have unidirectional tread design and can be installed in either direction.

Rotate wheels and tires as shown.

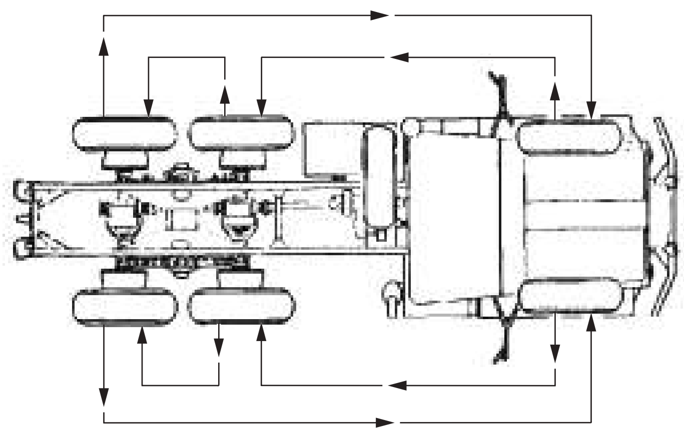


Figure 2. Wheel and Tire Rotation.

END OF TASK

REAR WHEEL INSTALLATION

1. Install four rear wheels (Figure 3, Item 1) on studs (Figure 3, Item 3) with 40 stud nuts (Figure 3, Item 2). Hand-tighten stud nuts (Figure 3, Item 2).
2. Raise rear of vehicle, remove jack stands, and lower vehicle.
3. Tighten 40 stud nuts (Figure 3, Item 2) 450 to 500 lb-ft (610 to 678 N·m) in sequence shown.

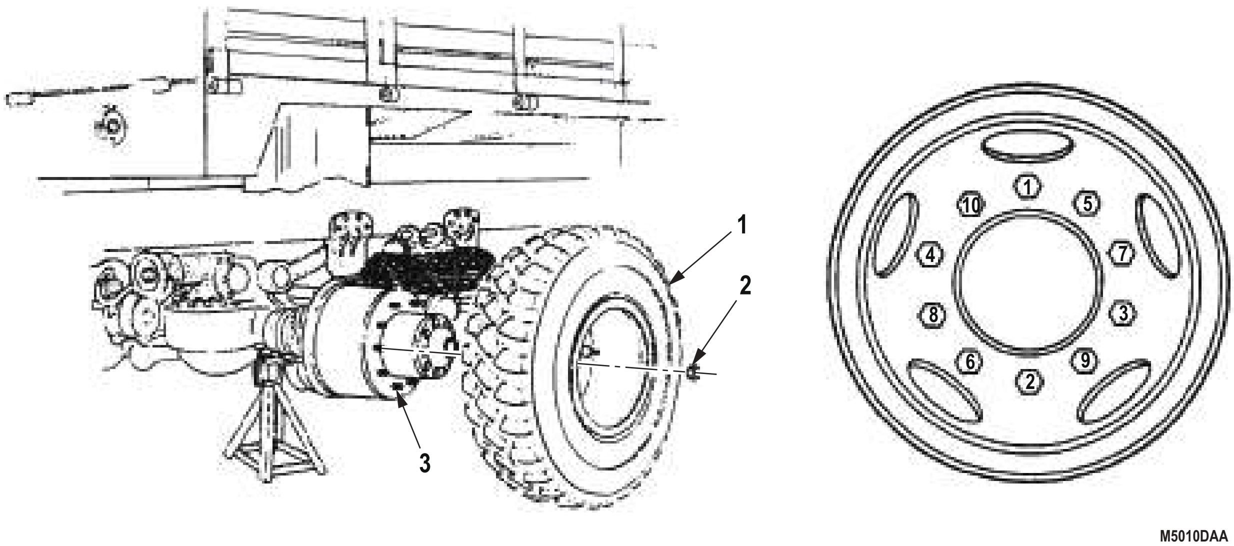


Figure 3. Rear Wheel Installation.

END OF TASK

FRONT WHEEL INSTALLATION

1. Install two front wheels (Figure 4, Item 1) on studs (Figure 4, Item 2) with 20 stud nuts (Figure 4, Item 6). Hand-tighten stud nuts.
2. Raise front of vehicle, remove jack stands, and lower vehicle.
3. Tighten 20 stud nuts (Figure 4, Item 6) 450 to 500 lb-ft (610 to 678 N·m) in sequence shown.

NOTE

- Perform Step (4) for M939A2 vehicles only.
- Install wheel weight with slot flush against rim nut.

4. Install wheel weights (Figure 4, Item 4) on two front wheels (Figure 4, Item 1) and studs (Figure 4, Item 3) with two nuts (Figure 4, Item 5). Tighten nuts 40 lb-ft (54 N·m).

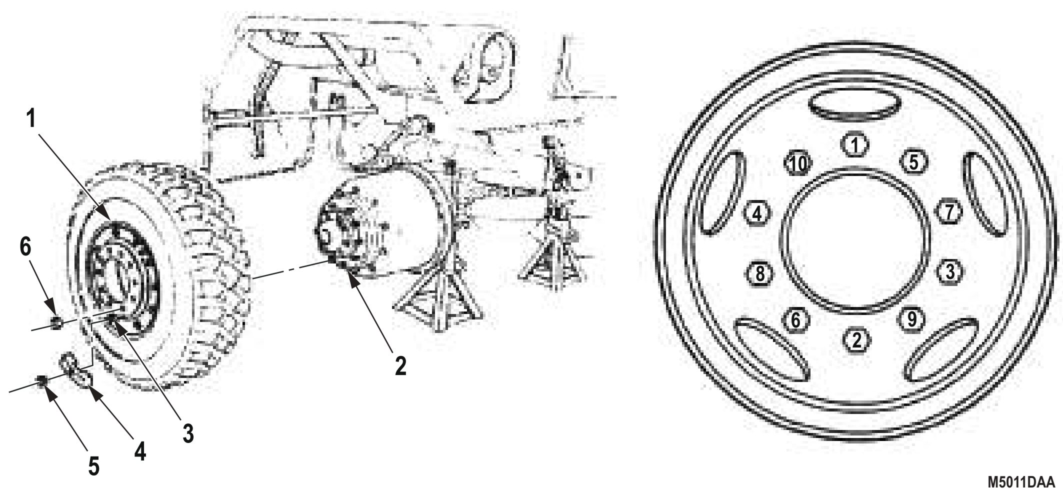


Figure 4. Front Wheel Installation.

END OF TASK

FOLLOW-ON MAINTENANCE

1. Install front wheel valve. (WP 0393)
2. Install rear wheel valve. (WP 0490)

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
WHEEL VALVE FILTER REPLACEMENT (M939A2)

INITIAL SETUP:

Tools and Special Tools
Tool Kit, General Mechanic's: Automotive (Volume 5, WP 0826, Table 1, Item 56)

Materials/Parts
Filter (Volume 5, WP 0827, Table 1, Item 183)
Qty: 1

Materials/Parts (cont.)
Locknut (Volume 5, WP 0827, Table 1, Item 61)
Qty: 2
O-ring (Volume 5, WP 0827, Table 1, Item 367)
Qty: 1

Equipment Condition
Parking brake set. (TM 9-2320-272-10)
Air reservoirs drained. (TM 9-2320-272-10)

REMOVAL

WARNING

Air system components are subject to high pressure. Always relieve pressure before loosening or removing air system components. Failure to comply may result in injury or death to personnel.

NOTE

Replacement of wheel valve filter is the same for front and rear wheel valves. This procedure is for front wheel valves.

1. Remove cap (Figure 1, Item 15) and valve stem (Figure 1, Item 16) from wheel valve (Figure 1, Item 1) and allow tire (Figure 1, Item 7) to deflate completely.
2. Remove two locknuts (Figure 1, Item 11), washers (Figure 1, Item 10), screws (Figure 1, Item 12), washers (Figure 1, Item 13), shield (Figure 1, Item 14), and spacer (Figure 1, Item 9) from studs (Figure 1, Item 6) and axle flange (Figure 1, Item 8).
3. Disconnect hose (Figure 1, Item 5) from elbow (Figure 1, Item 4).
4. Remove elbow (Figure 1, Item 4), o-ring (Figure 1, Item 3), and filter (Figure 1, Item 2) from wheel valve (Figure 1, Item 1). Discard o-ring and filter.

REMOVAL - Continued

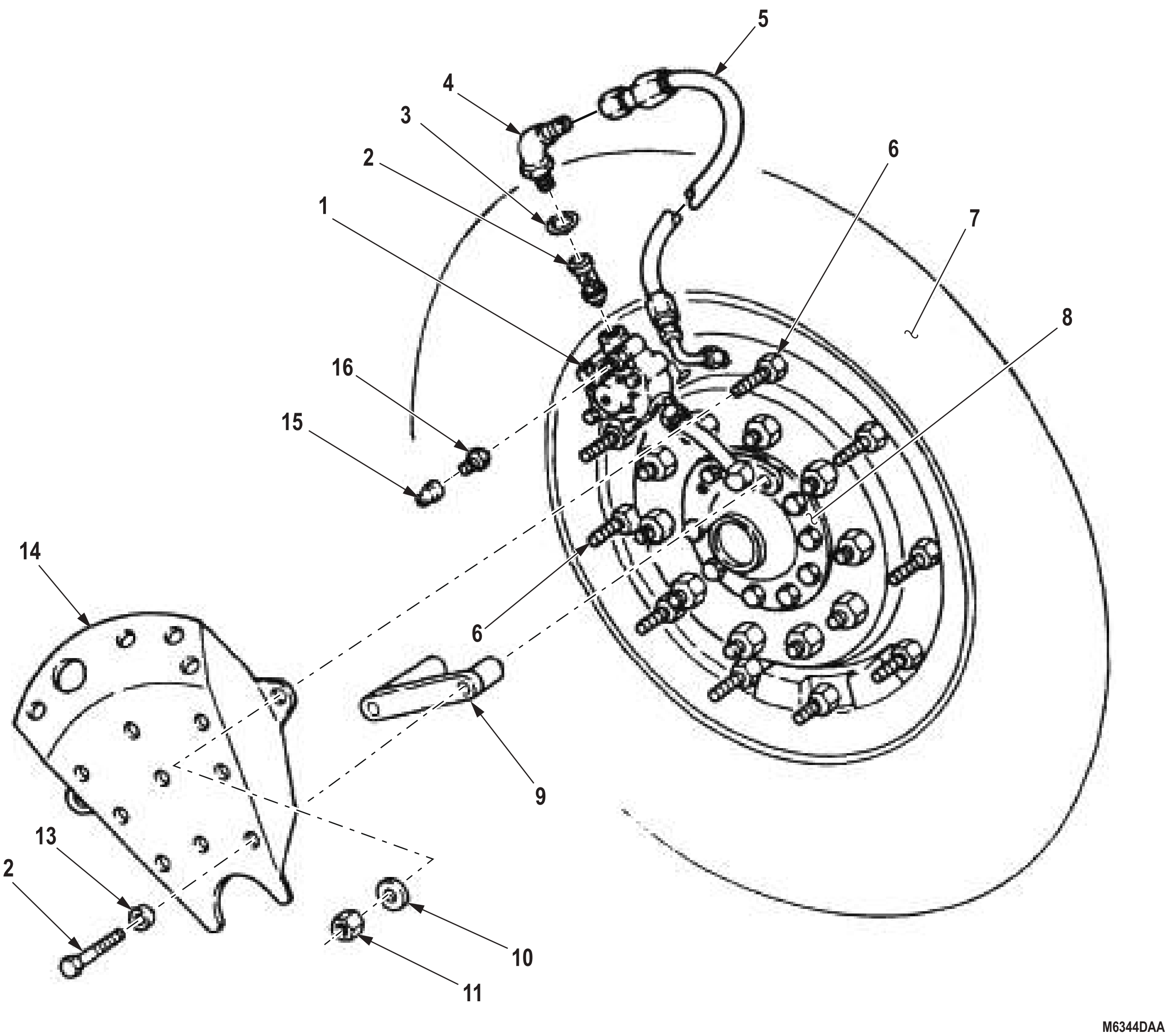


Figure 1. Wheel Valve Filter Removal.

END OF TASK

INSTALLATION

1. Install filter (Figure 2, Item 2), o-ring (Figure 2, Item 3), and elbow (Figure 2, Item 4) on wheel valve (Figure 2, Item 1).
2. Connect hose (Figure 2, Item 5) to elbow (Figure 2, Item 4).
3. Install spacer (Figure 2, Item 8) and shield (Figure 2, Item 13) on studs (Figure 2, Item 6) and axle flange (Figure 2, Item 7) with two washers (Figure 2, Item 12), screws (Figure 2, Item 11), washers (Figure 2, Item 9), and locknuts (Figure 2, Item 10).
4. Install valve stem (Figure 2, Item 15) and cap (Figure 2, Item 14) on wheel valve (Figure 2, Item 1).

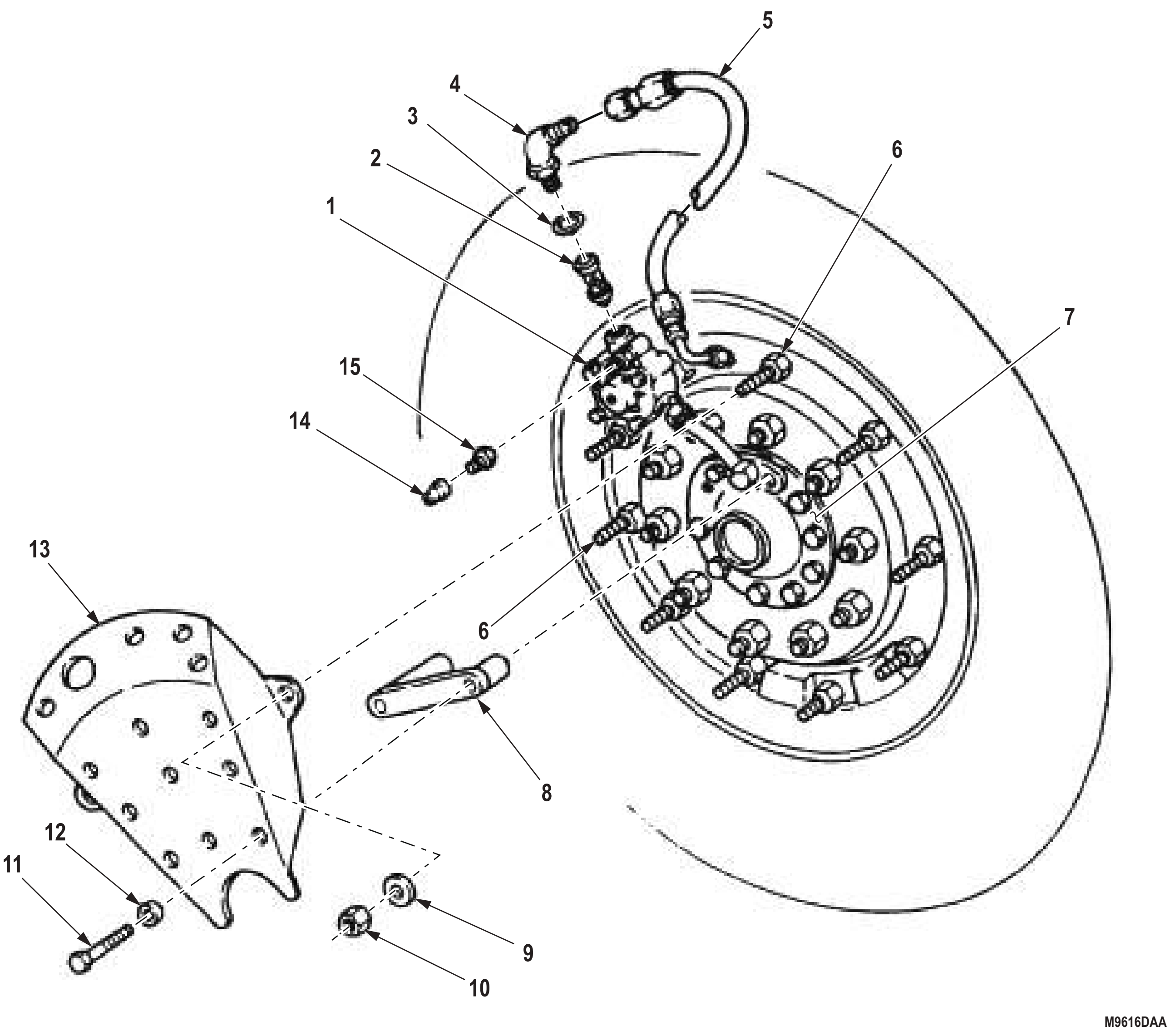


Figure 2. Wheel Valve Filter Installation.

END OF TASK

FOLLOW-ON MAINTENANCE

Start engine, operate CTIS, allow tire to inflate, and check for leaks. (TM 9-2320-272-10)

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
HUB AIR SEAL LEAK TEST

INITIAL SETUP:

Tools and Special Tools
Tool Kit, General Mechanic's: Automotive
(Volume 5, WP 0826, Table 1, Item 56)
Air Gauge Assembly
(Volume 5, WP 0826, Table 1, Item 4)
Tester, Cylinder Compression
(Volume 5, WP 0826, Table 1, Item 52)

Materials/Parts
Tape, Antiseizing
(Volume 5, WP 0825, Table 1, Item 65)

References
WP 0481
WP 0482

Equipment Condition
Front wheel valve removed. (WP 0393)
Rear wheel valve removed. (WP 0491)

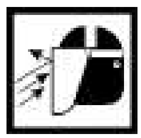
FRONT HUB LEAK TEST

NOTE

Air seals may not retain prescribed pressure immediately after installation. Pressure will be maintained after seals have been in operation and have seated on spindle.

1. Install o-ring (Figure 1, Item 5) and air manifold (Figure 1, Item 6) on drive flange (Figure 1, Item 4) with washer (Figure 1, Item 11) and screw (Figure 1, Item 10).
2. Install short end of spacer (Figure 1, Item 9) on air manifold (Figure 1, Item 6) with washer (Figure 1, Item 8) and screw (Figure 1, Item 7).
3. Install plug (Figure 1, Item 12) on air manifold (Figure 1, Item 6).
4. Remove hose (Figure 1, Item 3) from bulkhead fitting (Figure 1, Item 2) and install air pressure gauge (Figure 1, Item 1) on hose.

WARNING



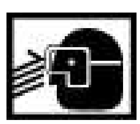
Eyeshields must be worn when cleaning with compressed air. Compressed air source will not exceed 30 psi (207 kPa). Failure to comply may result in injury or death to personnel.

CAUTION

Ensure external air source is know to be as clean and dry as air supplied by vehicle. If in doubt, use the vehicle's air supply. Contamination may cause damage to CTIS.

5. Apply air pressure to front hub until air pressure gauge (Figure 1, Item 1) reads 80 psi (552 kPa).
6. Observe air pressure gauge (Figure 1, Item 1) for one minute. Pressure should not drop below 70 psi (483 kPa). If air pressure dropped below 70 psi (483 kPa), check connections using soapsud method.
7. If connections are tight, replace hub air seals (WP 0481) or (WP 0482).

WARNING



Air pressure may create airborne debris. Use eye protection. Failure to comply may result in injury or death to personnel.

8. If air pressure remained at 70 psi (483 kPa) or above, release air pressure through valve on air pressure gauge (Figure 1, Item 1).
9. Remove air pressure gauge (Figure 1, Item 1) from hose (Figure 1, Item 3) and connect hose to bulkhead fitting (Figure 1, Item 2).

FRONT HUB LEAK TEST - Continued

NOTE

Wrap all male threads with antiseize tape before installation.

10. Remove screw (Figure 1, Item 10), washer (Figure 1, Item 11), air manifold (Figure 1, Item 6), and o-ring (Figure 1, Item 5) from drive flange (Figure 1, Item 4).
11. Remove plug (Figure 1, Item 12) from air manifold (Figure 1, Item 6).
12. Remove screw (Figure 1, Item 7), washer (Figure 1, Item 8), and spacer (Figure 1, Item 9) from air manifold (Figure 1, Item 6).

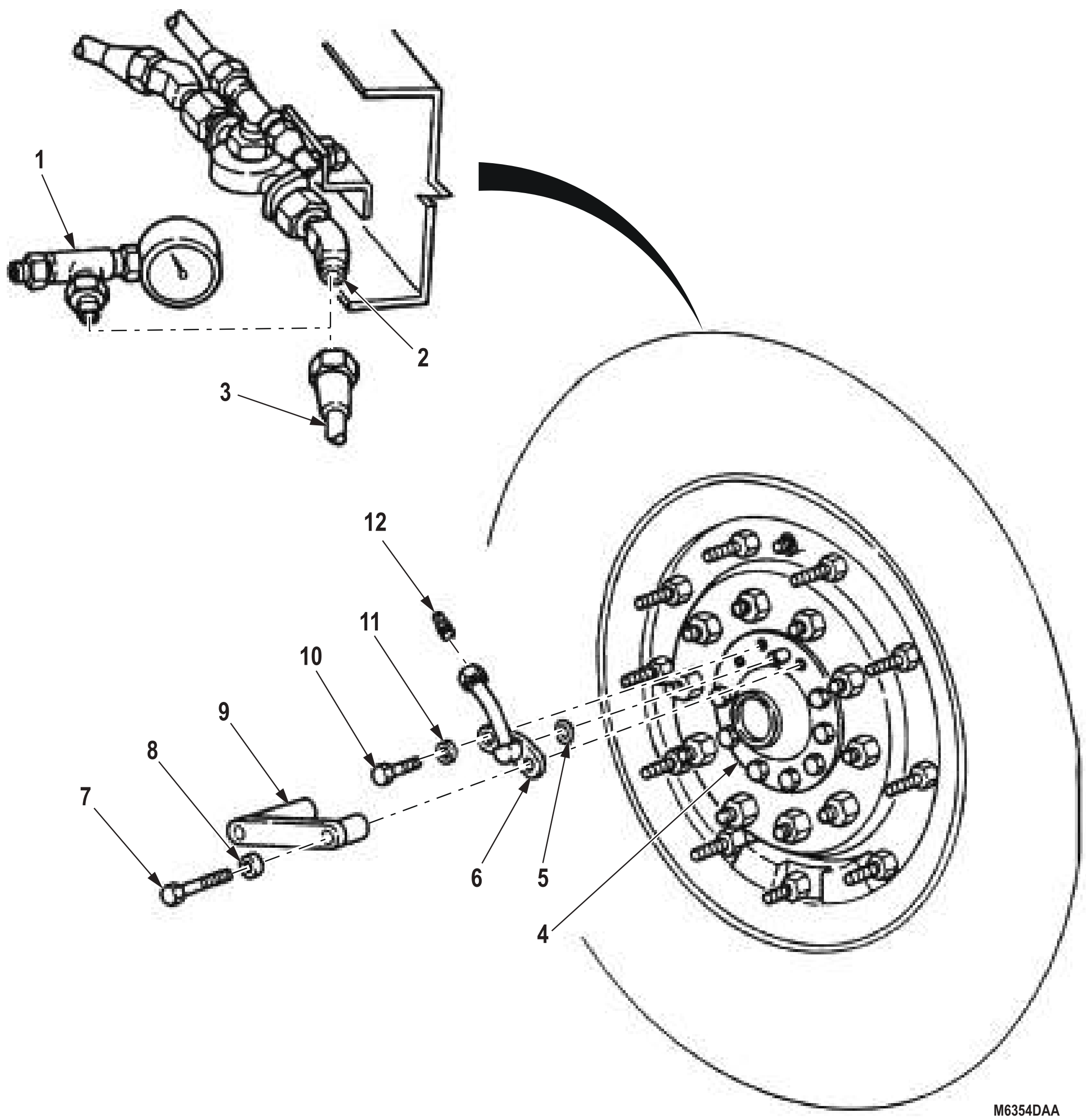


Figure 1. Front Hub Air Seal Test.

END OF TASK

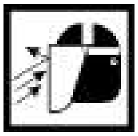
REAR HUB LEAK TEST

NOTE

Air seals may not retain prescribed pressure immediately after installation. Pressure will be maintained after seals have been in operation and have seated on spindle.

1. Install washer (Figure 2, Item 6), o-ring (Figure 2, Item 5), and rear hub connector (Figure 2, Item 4) on hub (Figure 2, Item 7).
2. Install plug (Figure 2, Item 3) on rear hub connector (Figure 2, Item 4).
3. Disconnect hose (Figure 2, Item 2) from quick-exhaust valve elbow (Figure 2, Item 1) and install pressure gauge on hose.

WARNING



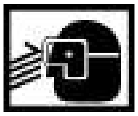
Eyeshields must be worn when cleaning with compressed air. Compressed air source will not exceed 30 psi (207 kPa). Failure to comply may result in injury or death to personnel.

CAUTION

Ensure external air source is known to be as clean and dry as air supplied by vehicle. If in doubt, use the vehicle's air supply. Contamination may cause damage to CTIS.

4. Apply air pressure to rear hub (Figure 2, Item 7) until air pressure gauge (Figure 2, Item 8) reads 80 psi (552 kPa).
5. Observe air pressure gauge (Figure 2, Item 8) for one minute. Pressure gauge should not drop below 70 psi (483 kPa). If air dropped below 70 psi (483 kPa), check connections for leaks using soapsud method.
6. If connections are tight, replace hub air seals (WP 0481) or (WP 0482).

WARNING



Air pressure may create airborne debris. Use eye protection. Failure to comply may result in injury or death to personnel.

7. If air pressure remained at 70 psi (483 kPa) or above, release air pressure through valve on air pressure gauge (Figure 2, Item 8).

NOTE

Wrap all male threads with antiseize tape before installation.

8. Remove air pressure gauge (Figure 2, Item 8) from hose (Figure 2, Item 2), and connect hose to quick-exhaust valve elbow (Figure 2, Item 1).
9. Remove plug (Figure 2, Item 3) from rear hub connector (Figure 2, Item 4).
10. Remove rear hub connector (Figure 2, Item 4), o-ring (Figure 2, Item 5), and washer (Figure 2, Item 6) from hub (Figure 2, Item 7).

REAR HUB LEAK TEST - Continued

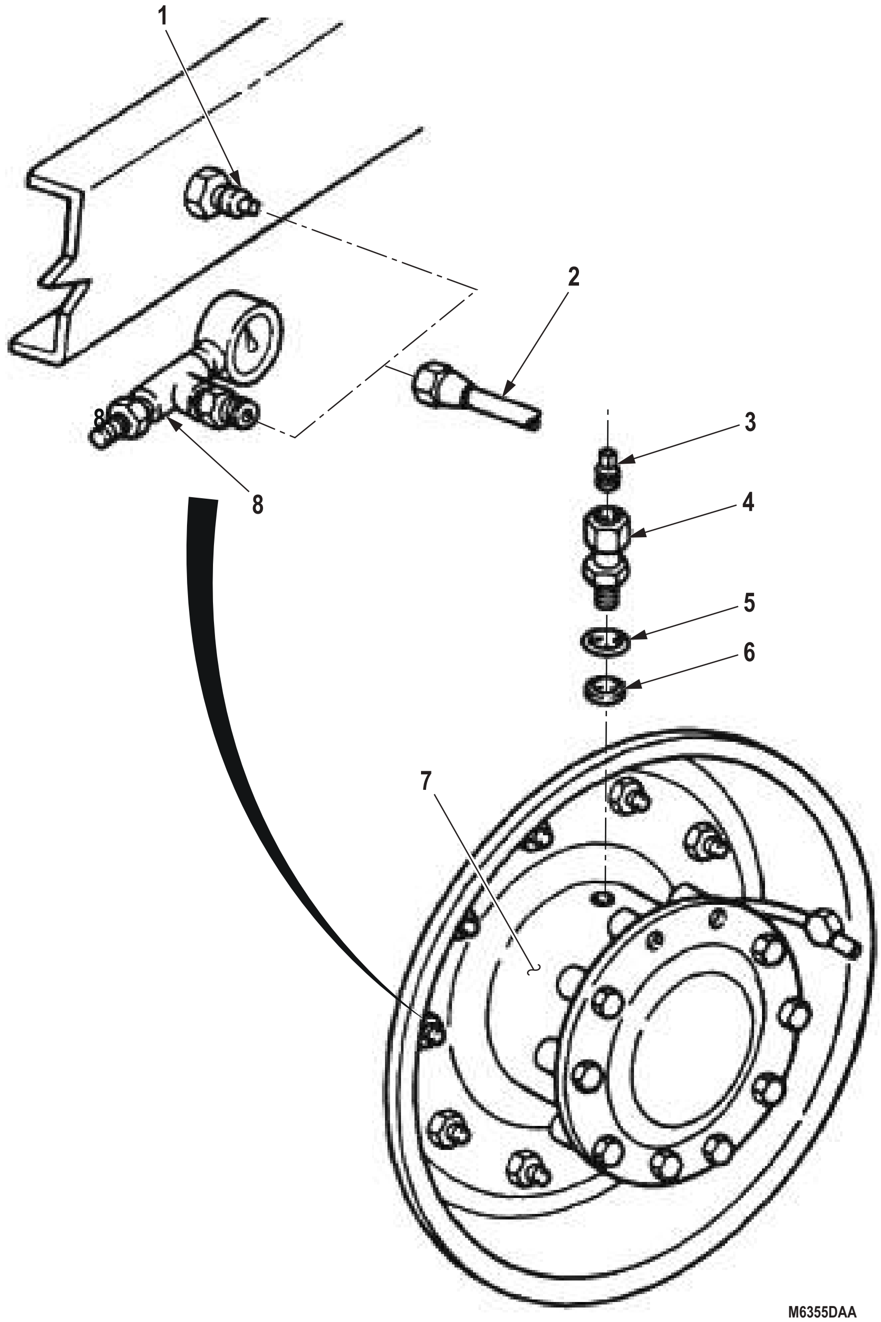


Figure 2. Rear Hub Air Seal Test.

END OF TASK

FOLLOW-ON MAINTENANCE

1. Install front wheel valve. (WP 0393)
2. Install rear wheel valve. (WP 0491)

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
REAR AXLE AIR MANIFOLD REPLACEMENT

INITIAL SETUP:

Tools and Special Tools
Tool Kit, General Mechanic's: Automotive
(Volume 5, WP 0826, Table 1, Item 56)

Materials/Parts
Sealing Compound
(Volume 5, WP 0825, Table 1, Item 55)
Tape, Antiseizing
(Volume 5, WP 0825, Table 1, Item 65)
O-ring (Volume 5, WP 0827, Table 1, Item 96)
Qty: 2

References
Volume 5, WP 0819

Equipment Condition
Rear hub removed. (WP 0482)

REMOVAL

1. Disconnect air line (Figure 1, Item 5) from fitting (Figure 1, Item 6), and remove fitting from air manifold (Figure 1, Item 7).
2. Remove two screws (Figure 1, Item 1), washers (Figure 1, Item 2), air manifold (Figure 1, Item 7), and o-ring (Figure 1, Item 4) from dust shield (Figure 1, Item 3). Discard o-ring.
3. Disconnect nut (Figure 1, Item 13) and tube (Figure 1, Item 8) from elbow (Figure 1, Item 12) and dust shield (Figure 1, Item 3).
4. Remove elbow (Figure 1, Item 12) and o-ring (Figure 1, Item 11) from adapter ring (Figure 1, Item 10). Discard o-ring.
5. Remove adapter ring (Figure 1, Item 10) from spindle (Figure 1, Item 9).
6. For General Cleaning Instructions, refer to (Volume 5, WP 0819).
7. For General Inspection Instructions, refer to (Volume 5, WP 0819).
8. Inspect fitting (Figure 1, Item 6), air manifold (Figure 1, Item 7), tube (Figure 1, Item 8), elbow (Figure 1, Item 12), and adapter ring (Figure 1, Item 10) for stripped threads, cracks, bends, or excessive wear. Replace parts if damaged.

REMOVAL - Continued

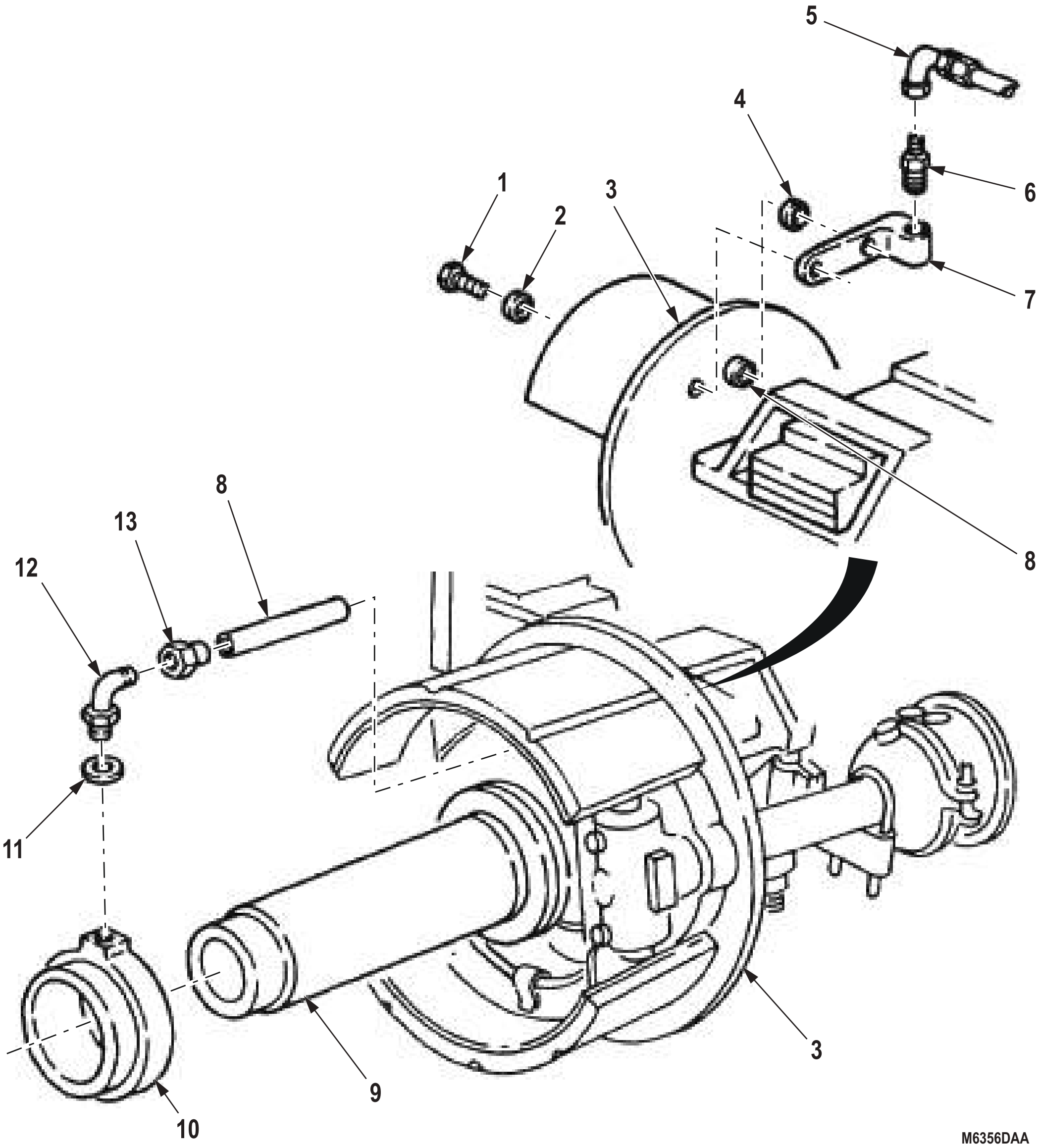


Figure 1. Rear Axle Air Manifold Removal.

END OF TASK

INSTALLATION

1. Apply a thin coat of sealing compound to mating surfaces of spindle (Figure 2, Item 9) and adapter ring (Figure 2, Item 10), and install adapter ring on spindle.

NOTE

Wrap all male threads with antiseize tape before installation.

2. Install o-ring (Figure 2, Item 11) and elbow (Figure 2, Item 12) on adapter ring (Figure 2, Item 10).
3. Insert tube (Figure 2, Item 8) through hole in dust shield (Figure 2, Item 3) and install tube on elbow (Figure 2, Item 12) with nut (Figure 2, Item 13).
4. Install o-ring (Figure 2, Item 4) and air manifold (Figure 2, Item 7) on dust shield (Figure 2, Item 3) with two washers (Figure 2, Item 2) and screws (Figure 2, Item 1).
5. Install fitting (Figure 2, Item 6) on air manifold (Figure 2, Item 7).
6. Connect air line (Figure 2, Item 5) to fitting (Figure 2, Item 6).

INSTALLATION - Continued

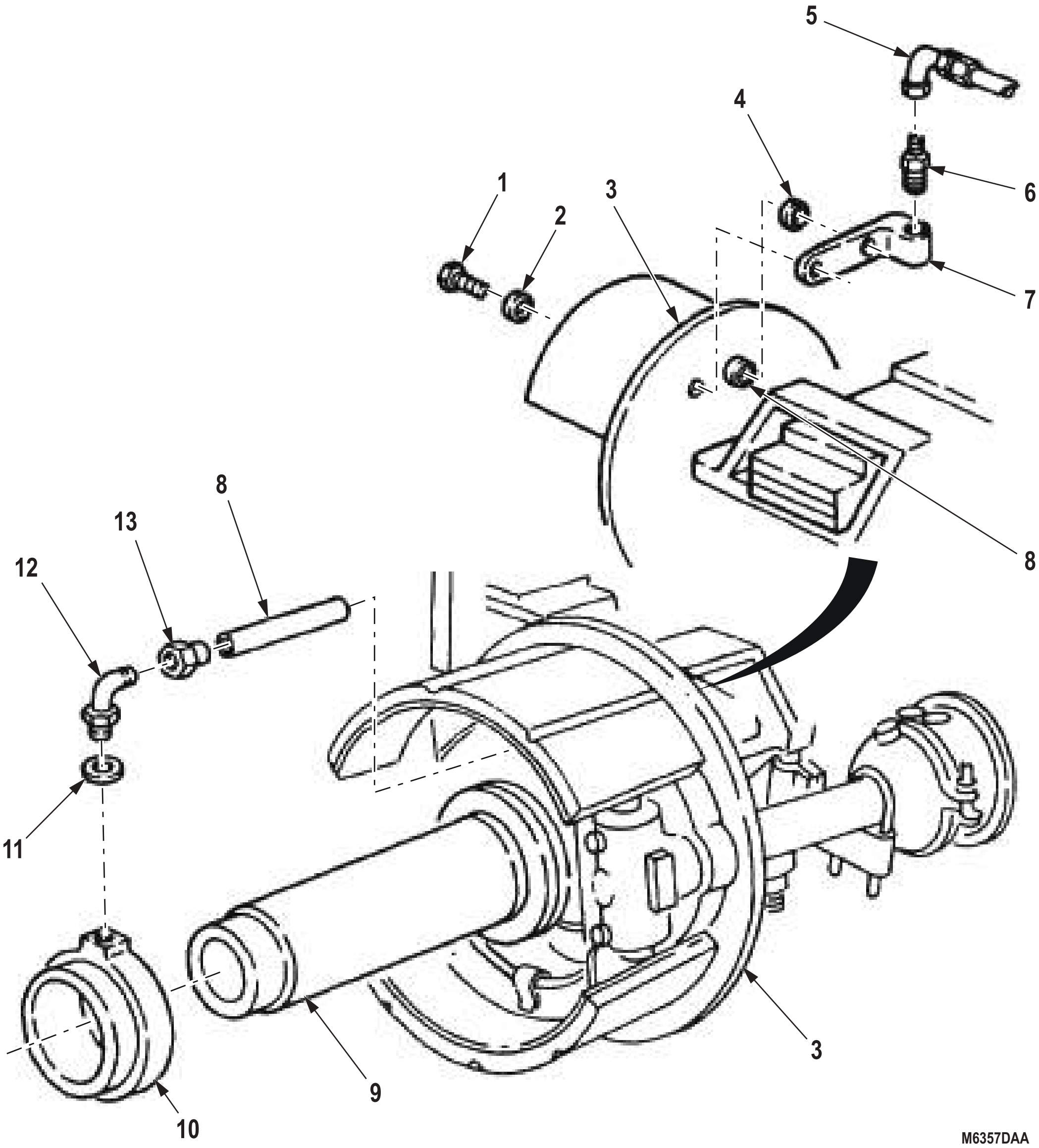


Figure 2. Rear Axle Air Manifold Installation.

END OF TASK

FOLLOW-ON MAINTENANCE

Install rear hub. (WP 0482)

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
WHEEL VALVE REPAIR (70 PSI M939A2)

INITIAL SETUP:

Tools and Special Tools
Tool Kit, General Mechanic's: Automotive
(Volume 5, WP 0826, Table 1, Item 56)

Materials/Parts
Tape, Antiseizing
(Volume 5, WP 0825, Table 1, Item 65)
Filter (Volume 5, WP 0827, Table 1, Item 183)
Qty: 1
Relay Valve Kit
(Volume 5, WP 0827, Table 1, Item 185)

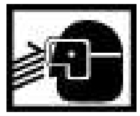
References
Volume 5, WP 0819

Equipment Condition
Wheel valve removed. (WP 0393)
or (WP 0491)

DISASSEMBLY

1. Remove filter (Figure 1, Item 9) from valve body (Figure 1, Item 10). Discard filter.

WARNING



Wheel valve cover is under spring tension. Wear eye protection when disassembling wheel valve. Failure to comply may result in injury or death to personnel.

2. Holding cover (Figure 1, Item 4) in place, remove four nuts (Figure 1, Item 12), screw assembled lockwasher (Figure 1, Item 1), and three screw assembled lockwashers (Figure 1, Item 2) from base (Figure 1, Item 11), valve body (Figure 1, Item 10), and cover. Discard screw assembled lockwashers.
3. Carefully remove cover (Figure 1, Item 4), spring (Figure 1, Item 5), plug (Figure 1, Item 6), diaphragm (Figure 1, Item 7), and base (Figure 1, Item 11) from valve body (Figure 1, Item 10). Discard spring and diaphragm.
4. Remove ball (Figure 1, Item 3) from cover (Figure 1, Item 4). Discard ball.
5. Remove tank valve (Figure 1, Item 8) from valve body (Figure 1, Item 10).
6. For General Cleaning Instructions, refer to (Volume 5, WP 0819).
7. For General Inspection Instructions, refer to (Volume 5, WP 0819).
8. Inspect base (Figure 1, Item 11), valve body (Figure 1, Item 10), cover (Figure 1, Item 4), and tank valve (Figure 1, Item 8) for cracks and stripped threads. Replace part(s) if damaged.

DISASSEMBLY - Continued

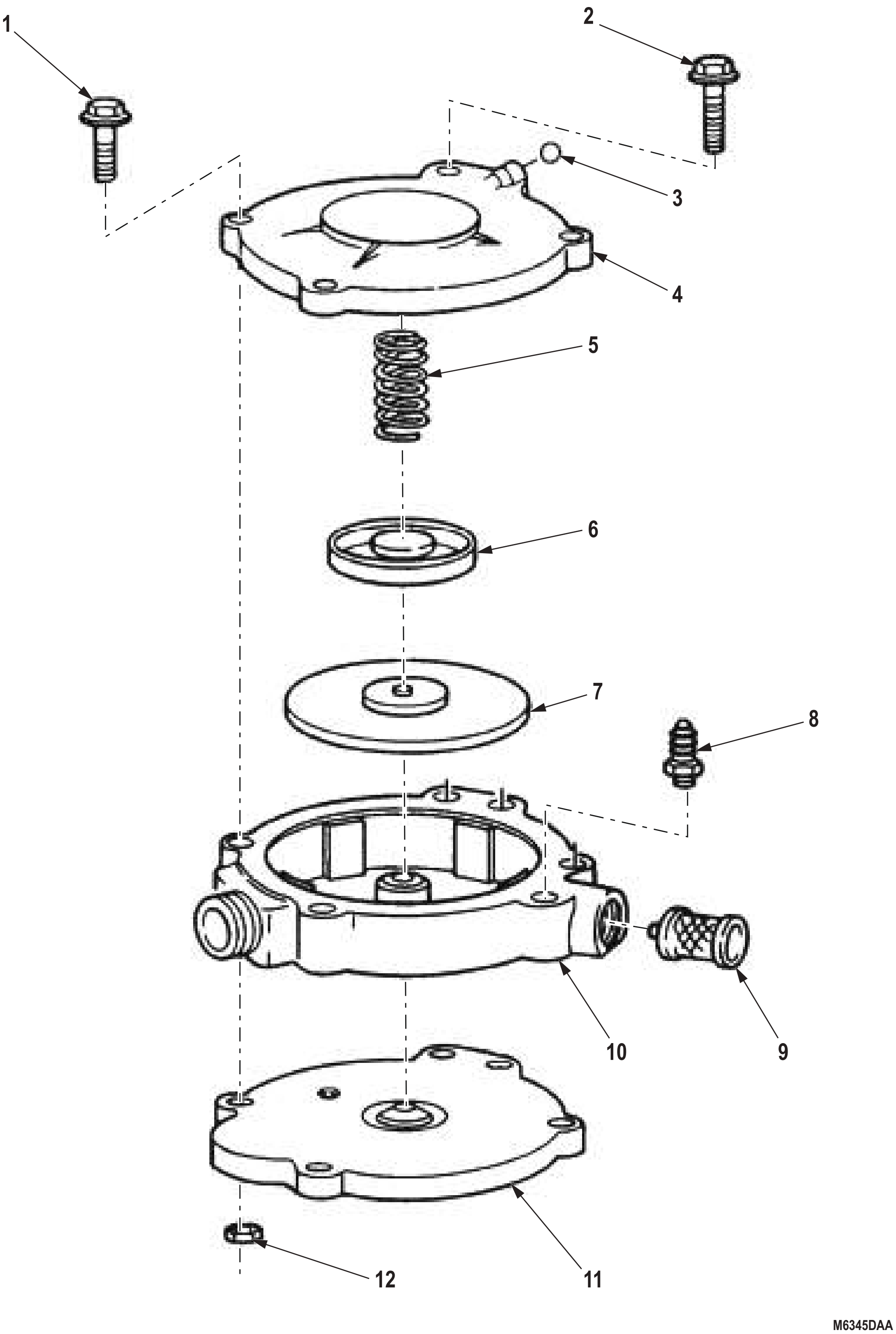


Figure 1. Wheel Valve Disassembly.

END OF TASK

ASSEMBLY

NOTE

Wrap male threads with antiseize tape before installation.

1. Install tank valve (Figure 2, Item 8) on valve body (Figure 2, Item 10).
2. Install ball (Figure 2, Item 3) in cover (Figure 2, Item 4).
3. Position base (Figure 2, Item 11), diaphragm (Figure 2, Item 7), plug (Figure 2, Item 6), spring (Figure 2, Item 5) and cover (Figure 2, Item 4) on valve body (Figure 2, Item 10). Carefully hold in place.
4. Install three screw assembled lockwashers (Figure 2, Item 2), screw assembled lockwasher (Figure 2, Item 1), and four nuts (Figure 2, Item 12) on cover (Figure 2, Item 4), valve body (Figure 2, Item 10), and base.
5. Install filter (Figure 2, Item 9) in valve body (Figure 2, Item 10).

ASSEMBLY - Continued

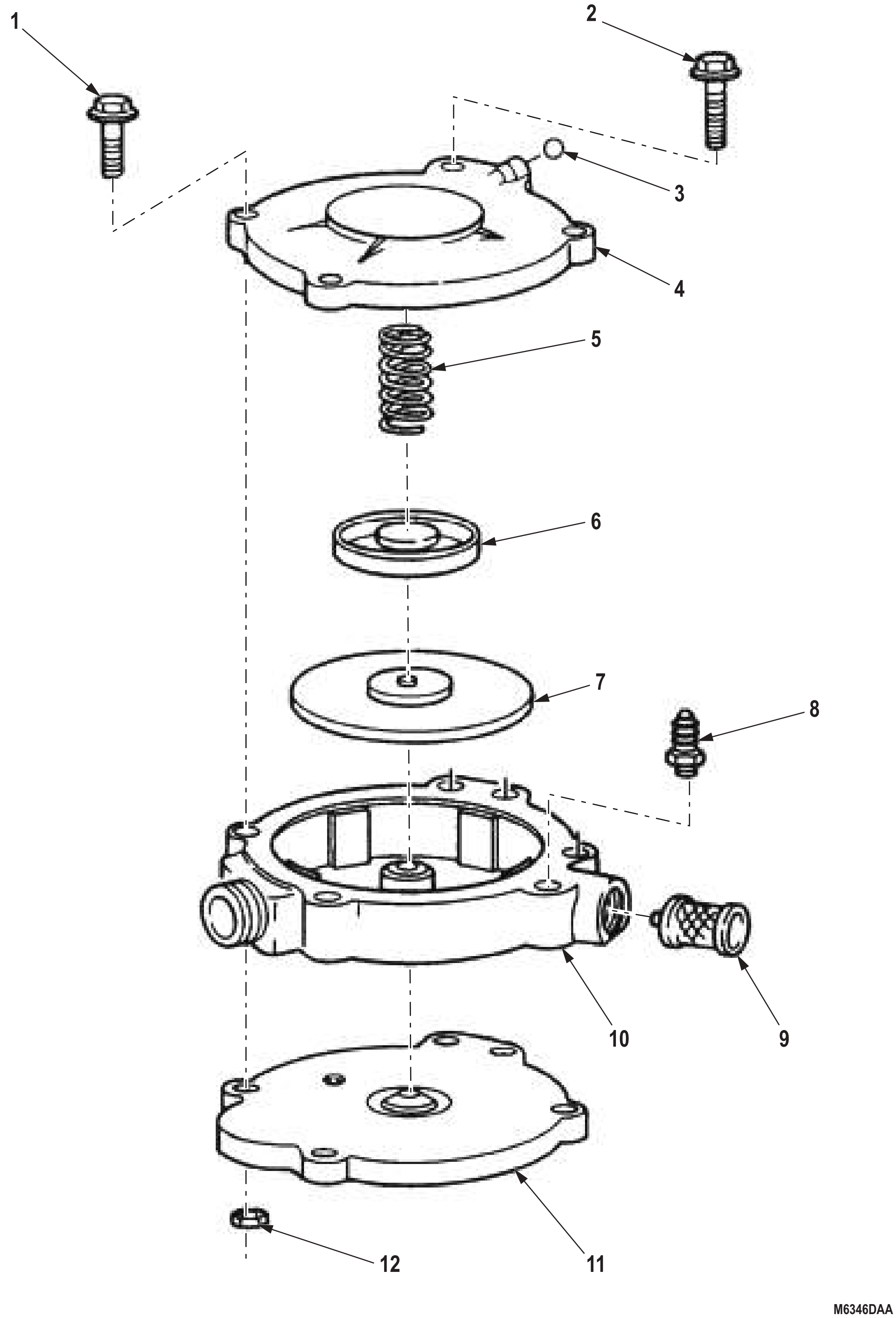


Figure 2. Wheel Valve Assembly.

END OF TASK

FOLLOW-ON MAINTENANCE

Install front wheel valve. (WP 0393) or (WP 0491)

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
FRONT WHEEL VALVE MAINTENANCE (M939A2)

INITIAL SETUP:

Tools and Special Tools

Tool Kit, General Mechanic's: Automotive
(Volume 5, WP 0826, Table 1, Item 56)

Materials/Parts

Cap Set, Protective, Dust and Moisture Seal
(Volume 5, WP 0825, Table 1, Item 13)
Locknut (Volume 5, WP 0827, Table 1, Item 61)
Qty: 3
Lockwasher
(Volume 5, WP 0827, Table 1, Item 403)
Qty: 3

Materials/Parts (cont.)

O-ring (Volume 5, WP 0827, Table 1, Item 359)
Qty: 1
O-ring (Volume 5, WP 0827, Table 1, Item 367)
Qty: 1

Equipment Condition

Parking brake set. (TM 9-2320-272-10)
Air reservoirs drained. (TM 9-2320-272-10)

REMOVAL

WARNING

Air system components are subject to high pressure. Always relieve pressure before loosening or removing air system components. Failure to comply may result in injury or death to personnel.

1. Remove cap (Figure 1, Item 2) and valve stem (Figure 1, Item 3) from tank valve (Figure 1, Item 5), and allow tire (Figure 1, Item 18) to deflate completely. Install valve stem and cap on tank valve.
2. Remove two locknuts (Figure 1, Item 27), washers (Figure 1, Item 26), screws (Figure 1, Item 28), washers (Figure 1, Item 29), shield (Figure 1, Item 1), and spacer (Figure 1, Item 25) from studs (Figure 1, Item 16) and axle flange (Figure 1, Item 20). Discard locknuts.
3. Remove hose (Figure 1, Item 15) from elbow (Figure 1, Item 7) and turret valve (Figure 1, Item 17).
4. Loosen nut (Figure 1, Item 14) and remove air manifold (Figure 1, Item 22) from wheel valve (Figure 1, Item 4).
5. Remove screw (Figure 1, Item 24), washer (Figure 1, Item 23), air manifold (Figure 1, Item 22), and o-ring (Figure 1, Item 21) from axle flange (Figure 1, Item 20) and air tube (Figure 1, Item 19). Discard o-ring.
6. Remove two locknuts (Figure 1, Item 8), washers (Figure 1, Item 9), washers (Figure 1, Item 10), and wheel valve (Figure 1, Item 4) from studs (Figure 1, Item 16). Discard locknuts.
7. Remove three locknuts (Figure 1, Item 13), lockwashers (Figure 1, Item 12), and bracket (Figure 1, Item 11) from wheel valve (Figure 1, Item 4). Discard locknuts and lockwashers.

NOTE

For repair of wheel valves, refer to (WP 0393).

8. Remove elbow (Figure 1, Item 7) and o-ring (Figure 1, Item 6) from wheel valve (Figure 1, Item 4). Discard o-ring.

REMOVAL - Continued

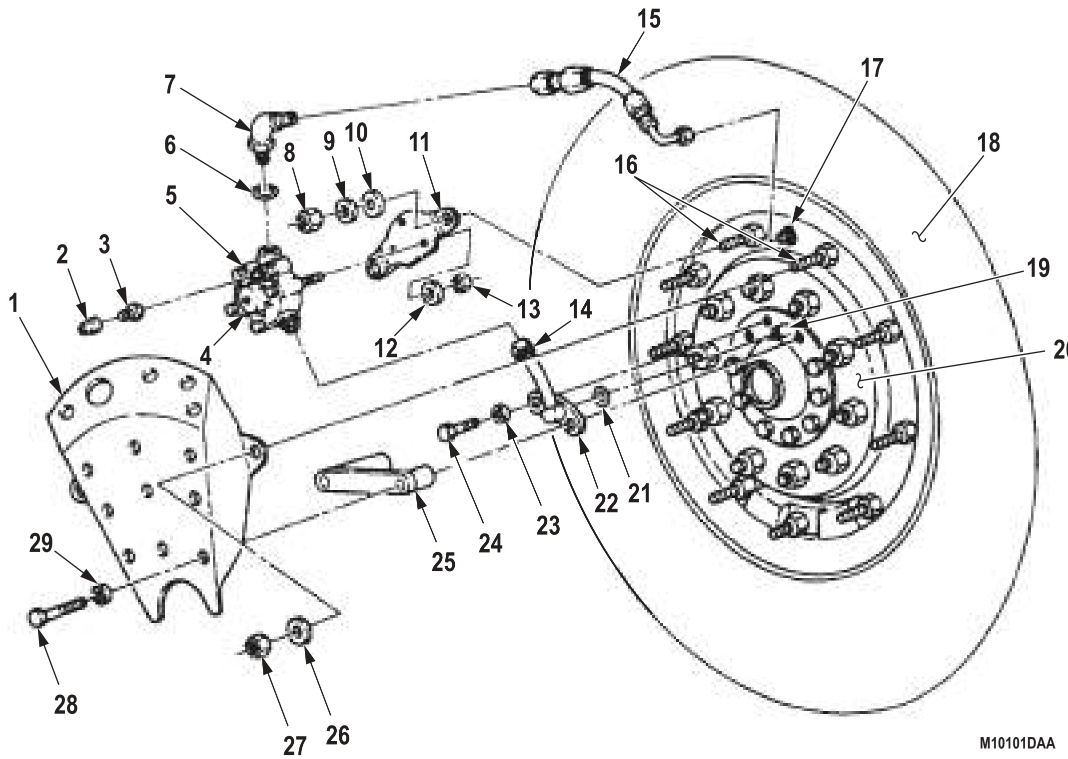


Figure 1. Front Wheel Valve Removal.

END OF TASK

CLEANING AND INSPECTION

1. For General Cleaning Instructions, refer to (Volume 5, WP 0819).
2. For General Inspection Instructions, refer to (Volume 5, WP 0819).
3. Inspect wheel valve for cracks, leaks, and stripped threads. Replace or repair wheel valve if cracked, leaking, or threads are stripped.
4. Inspect bracket, shield, air manifold, hose, spacer, elbow, and turret valve for cracks, bends, or stripped threads. Replace parts if damaged.

END OF TASK

INSTALLATION

NOTE

Wrap all male pipe threads with antiseize tape before installation.

1. Install hose (Figure 2, Item 15) on turret valve (Figure 2, Item 17).
2. Install o-ring (Figure 2, Item 21) on air tube (Figure 2, Item 19).
3. Install o-ring (Figure 2, Item 6) and elbow (Figure 2, Item 7) on wheel valve (Figure 2, Item 4). Finger-tighten elbow.
4. Install bracket (Figure 2, Item 11) on wheel valve (Figure 2, Item 4) with three lockwashers (Figure 2, Item 12) and locknuts (Figure 2, Item 13).

NOTE

Ensure air manifold is properly seated on wheel before tightening.

5. Connect air manifold (Figure 2, Item 22) on wheel valve (Figure 2, Item 4). Finger-tighten nut (Figure 2, Item 14), but allow for movement.
6. Install wheel valve (Figure 2, Item 4) with bracket (Figure 2, Item 11) on two studs (Figure 2, Item 16) with washers (Figure 2, Item 10), washers (Figure 2, Item 9), and locknuts (Figure 2, Item 8). Finger-tighten locknuts.
7. Install screw (Figure 2, Item 24) and washer (Figure 2, Item 23) on air manifold (Figure 2, Item 22) and axle flange (Figure 2, Item 20). Finger-tighten screw.
8. Tighten two locknuts (Figure 2, Item 8), screw (Figure 2, Item 24), and nut (Figure 2, Item 14).
9. Tighten elbow (Figure 2, Item 7) to align with hose (Figure 2, Item 15) and connect hose to elbow.

NOTE

Spacer has long and short end. Install short end of spacer on flange of air manifold.

10. Install spacer (Figure 2, Item 25) and shield (Figure 2, Item 1) on axle flange (Figure 2, Item 20) with two washers (Figure 2, Item 29) and screws (Figure 2, Item 28).
11. Install two washers (Figure 2, Item 26) and locknuts (Figure 2, Item 27) on studs (Figure 2, Item 16).

INSTALLATION - Continued

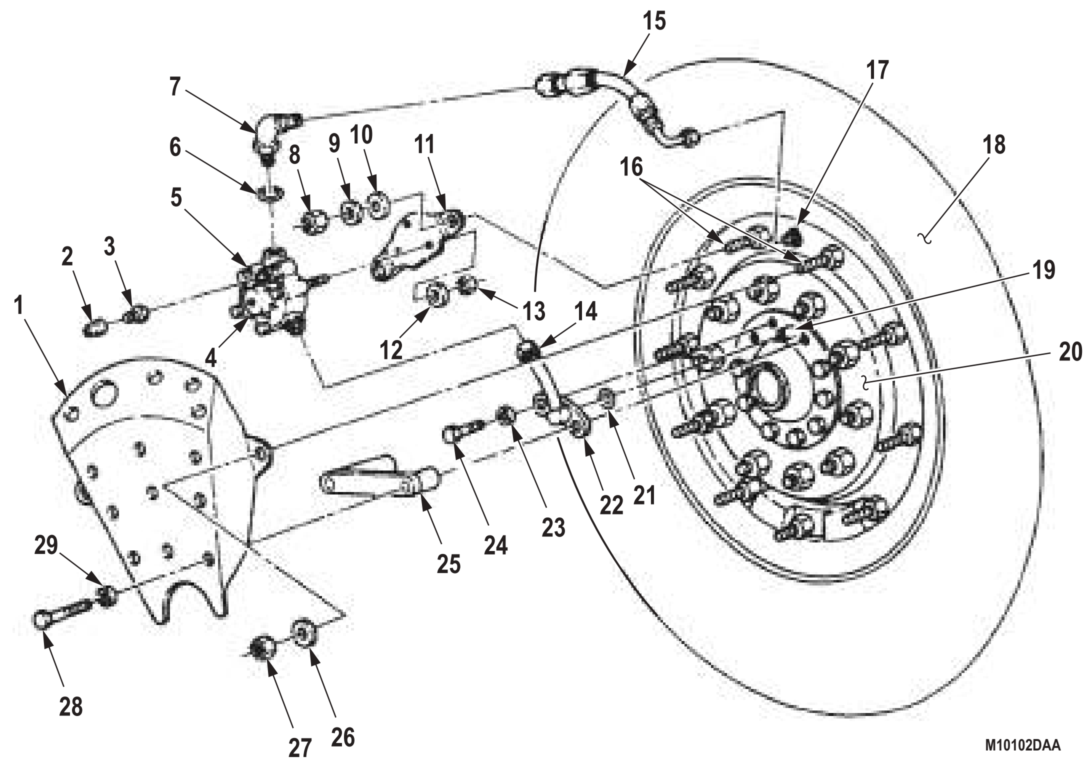


Figure 2. Front Wheel Valve Installation.

END OF TASK

FOLLOW-ON MAINTENANCE

Start engine, operate CTIS, allow tire to inflate, and check for leaks. (TM 9-2320-272-10)

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
REAR WHEEL VALVE REPAIR (M939A2)

INITIAL SETUP:

Tools and Special Tools

Tool Kit, General Mechanic's: Automotive
(Volume 5, WP 0826, Table 1, Item 56)

Materials/Parts

Tape, Antiseizing
(Volume 5, WP 0825, Table 1, Item 65)

Materials/Parts (cont.)

Locknut (Volume 5, WP 0827, Table 1, Item 61)
Qty: 2
O-ring (Volume 5, WP 0827, Table 1, Item 367)
Qty: 1

References

Volume 5, WP 0819

Equipment Condition

Parking brake set. (TM 9-2320-272-10)
Air reservoirs drained. (TM 9-2320-272-10)

REMOVAL

WARNING

Air system components are subject to high pressure. Always relieve pressure before loosening or removing air system components. Failure to comply may result in injury or death to personnel.

1. Remove cap (Figure 1, Item 11) and valve stem (Figure 1, Item 12) from tank valve (Figure 1, Item 13) and allow tire (Figure 1, Item 17) to deflate completely.
2. Remove two nuts (Figure 1, Item 6), washers (Figure 1, Item 7), screws (Figure 1, Item 10), washers (Figure 1, Item 9), and support bracket (Figure 1, Item 8) from bracket (Figure 1, Item 3) and axle flange (Figure 1, Item 14).
3. Remove hose (Figure 1, Item 5) from connector (Figure 1, Item 4) and tube (Figure 1, Item 15).
4. Remove wheel valve (Figure 1, Item 21) from connector (Figure 1, Item 20).
5. Remove connector (Figure 1, Item 20), o-ring (Figure 1, Item 19), and washer (Figure 1, Item 18) from hub (Figure 1, Item 16). Discard o-ring.
6. Remove connector (Figure 1, Item 4) from wheel valve (Figure 1, Item 21).
7. Remove two locknuts (Figure 1, Item 1), washers (Figure 1, Item 2), and bracket (Figure 1, Item 3) from wheel valve (Figure 1, Item 21). Discard locknuts.
8. For General Cleaning Instructions, refer to (Volume 5, WP 0819).
9. For General Inspection Instructions, refer to (Volume 5, WP 0819).
10. Inspect wheel valve (Figure 1, Item 21) for cracks, leaks, and stripped threads. Replace wheel valve if cracked or leaking. Repair stripped threads.
11. Inspect bracket (Figure 1, Item 3), support bracket (Figure 1, Item 8), connectors (Figure 1, Items 4 and 20), hose (Figure 1, Item 5), tube (Figure 1, Item 15), and hub (Figure 1, Item 16) for cracks, bends, and stripped threads. Replace part(s) if damaged.

REMOVAL - Continued

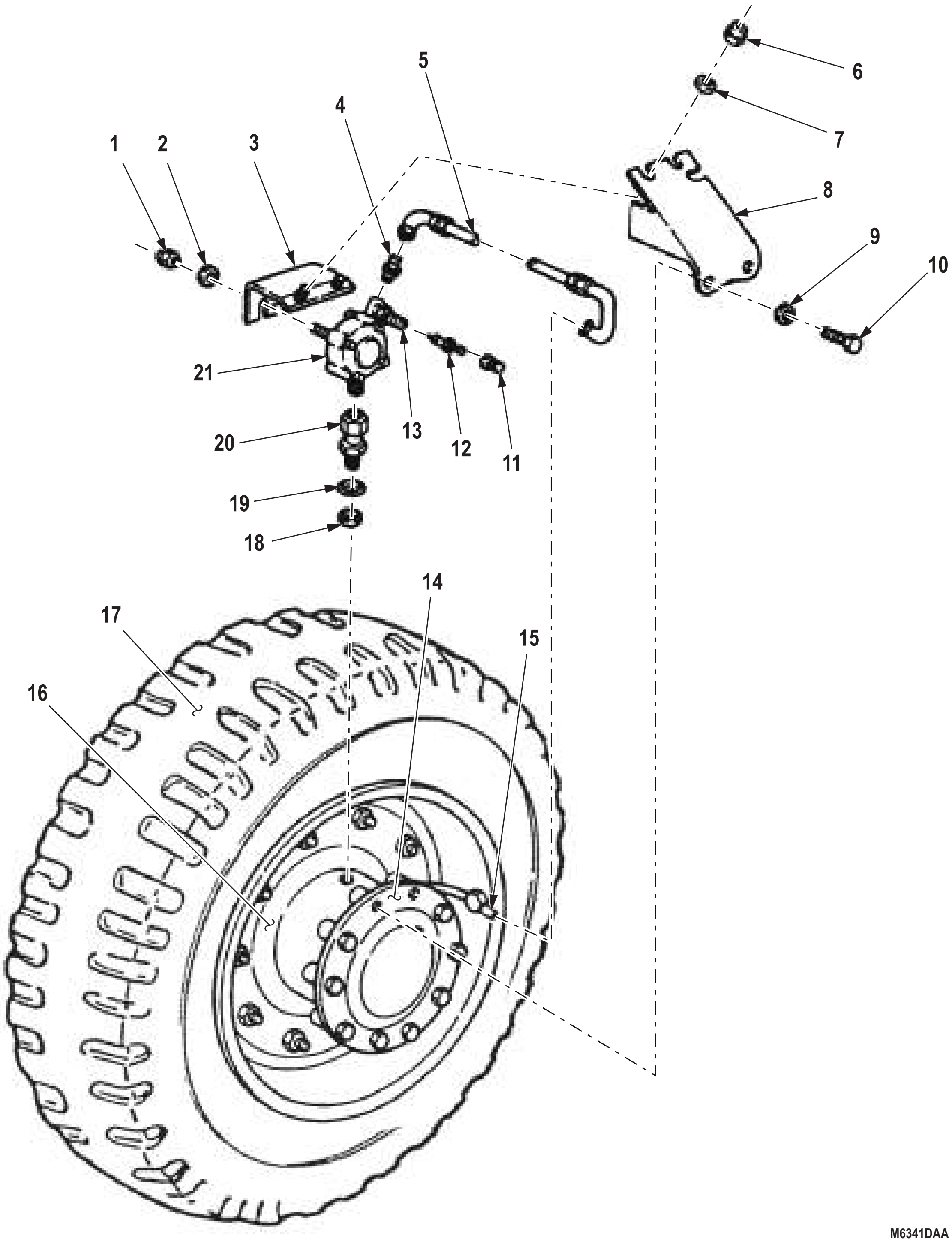


Figure 1. Rear Wheel Valve Removal.

END OF TASK

INSTALLATION

1. Install bracket (Figure 2, Item 3) on wheel valve (Figure 2, Item 20) with two washers (Figure 2, Item 2) and locknuts (Figure 2, Item 1).

NOTE

Wrap all male pipe threads with antiseize tape before installation.

2. Install connector (Figure 2, Item 4) on wheel valve (Figure 2, Item 20).
3. Install washer (Figure 2, Item 17), o-ring (Figure 2, Item 18), and connector (Figure 2, Item 19) on hub (Figure 2, Item 16).
4. Install wheel valve (Figure 2, Item 20) on connector (Figure 2, Item 19).
5. Install hose (Figure 2, Item 5) on connector (Figure 2, Item 4) and tube (Figure 2, Item 15).
6. Install support bracket (Figure 2, Item 8) on axle flange (Figure 2, Item 14) and bracket (Figure 2, Item 3) with two washers (Figure 2, Item 9), screws (Figure 2, Item 10), washers (Figure 2, Item 7), and nuts (Figure 2, Item 6).
7. Install valve stem (Figure 2, Item 12) and cap (Figure 2, Item 11) on tank valve (Figure 2, Item 13).

INSTALLATION - Continued

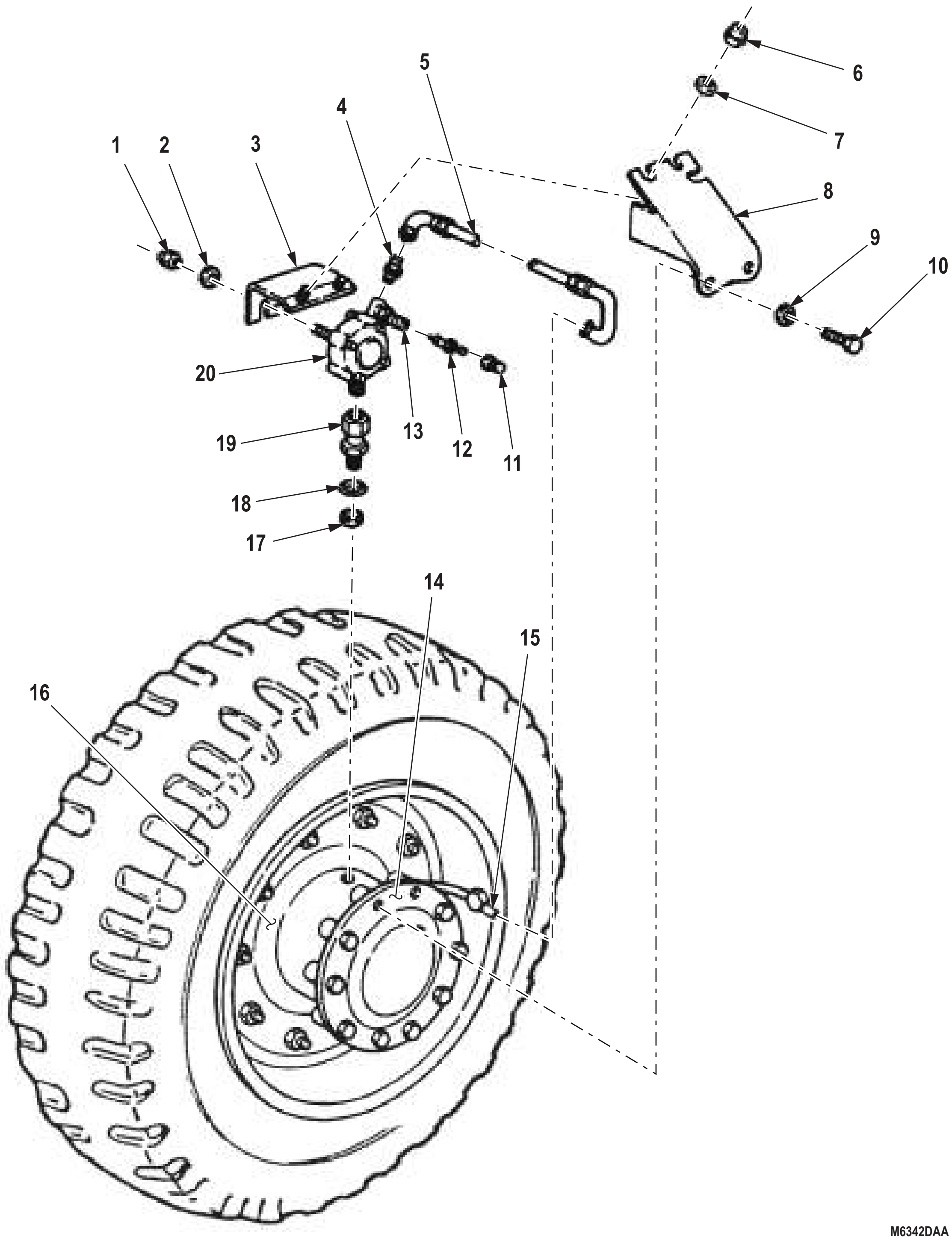


Figure 2. Rear Wheel Valve Installation.

END OF TASK

FOLLOW-ON MAINTENANCE

Start engine, operate CTIS, allow tire to inflate, and check for leaks. (TM 9-2320-272-10)

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
DRAG LINK REPLACEMENT

INITIAL SETUP:

Tools and Special Tools
Tool Kit, General Mechanic's: Automotive
(Volume 5, WP 0826, Table 1, Item 56)

Materials/Parts
Cotter Pin

Materials/Parts (cont.)
(Volume 5, WP 0827, Table 1, Item 344)
Qty: 2

Equipment Condition
Parking brake set. (TM 9-2320-272-10)

REMOVAL

1. Remove two cotter pins (Figure 1, Item 5) from slotted nuts (Figure 1, Item 6) and drag link (Figure 1, Item 2). Discard cotter pins.
2. Remove two slotted nuts (Figure 1, Item 6) from drag link (Figure 1, Item 2).
3. Remove drag link (Figure 1, Item 2) from pitman arm (Figure 1, Item 7) and steering knuckle arm (Figure 1, Item 4).
4. Remove two rubber boots (Figure 1, Item 3) from drag link (Figure 1, Item 2).
5. Remove two grease fittings (Figure 1, Item 1) from drag link (Figure 1, Item 2).

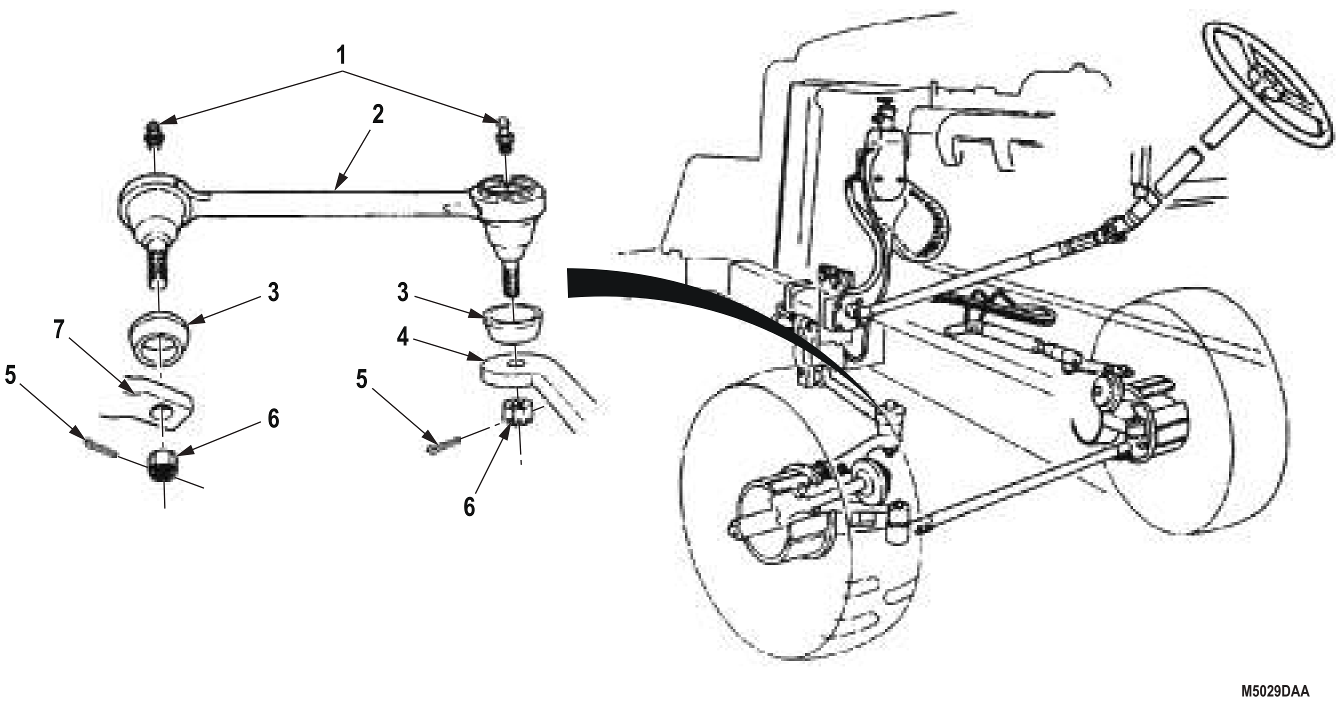


Figure 1. Drag Link Removal.

END OF TASK

INSTALLATION

1. Install two grease fittings (Figure 2, Item 1) on drag link (Figure 2, Item 2).
2. Install two rubber boots (Figure 2, Item 3) on drag link (Figure 2, Item 2).
3. Install drag link (Figure 2, Item 2) on steering knuckle arm (Figure 2, Item 4) and pitman arm (Figure 2, Item 7) with two slotted nuts (Figure 2, Item 6). Tighten slotted nuts 140 lb-ft (190 N·m).
4. Install two cotter pins (Figure 2, Item 5) in slotted nuts (Figure 2, Item 6) and drag link (Figure 2, Item 2).

INSTALLATION - Continued

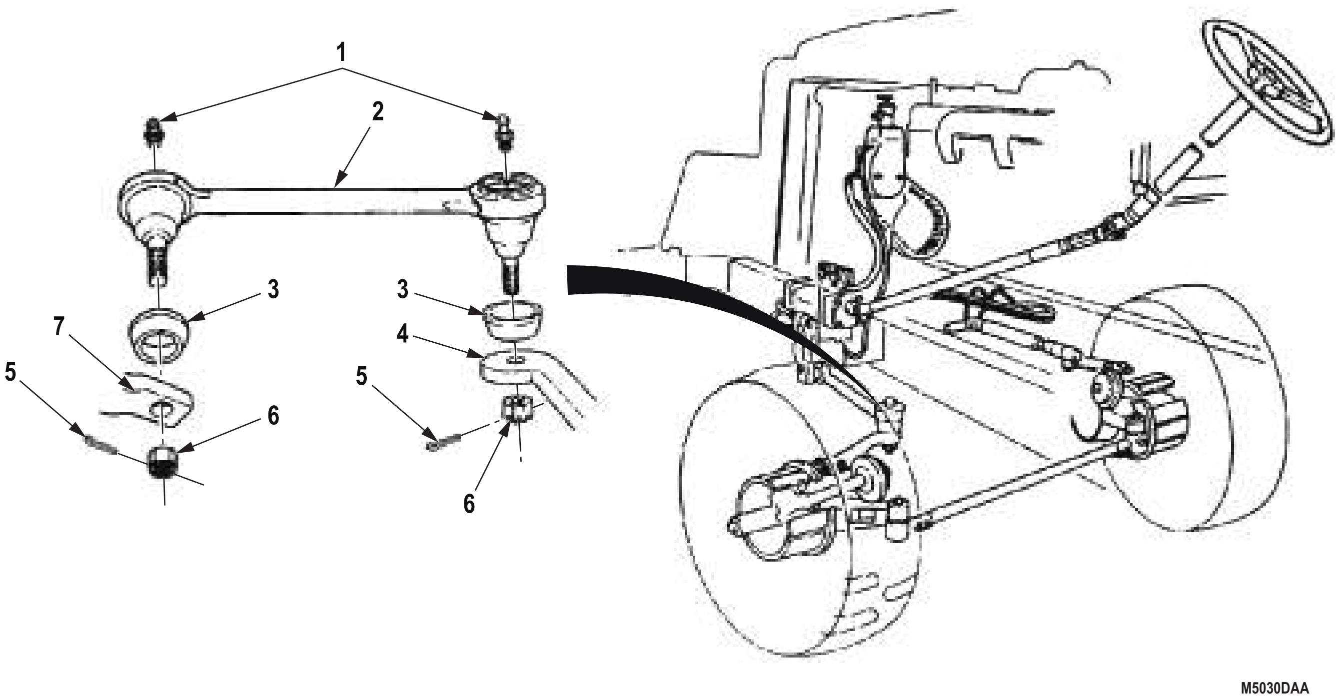


Figure 2. Drag Link Installation.

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
TIE ROD AND TOE-IN CHECK/REPAIR

INITIAL SETUP:

Tools and Special Tools

Tool Kit, General Mechanic's: Automotive
(Volume 5, WP 0826, Table 1, Item 56)
Gage, Wheel Alignment
(Volume 5, WP 0826, Table 1, Item 18)
Wrench, Torque, Click, Ratcheting, 3/4" Drive, 600 Ft-Lb
(Volume 5, WP 0826, Table 1, Item 61)
Wrench, Torque, Click, Ratcheting, 3/8" Drive, 75 Ft-Lb
(Volume 5, WP 0826, Table 1, Item 62)

Materials/Parts

Cotter Pin
(Volume 5, WP 0827, Table 1, Item 344)
Qty: 2

Personnel Required

(2)

Equipment Condition

Vehicle parked on level ground. (TM 9-2320-272-10)
Engine off. (TM 9-2320-272-10)
Parking brake set. (TM 9-2320-272-10)
Tires properly inflated. (TM 9-2320-272-10)
Wheels chocked. (TM 9-2320-272-10)
Wheel bearings adjusted. (WP 0483)

TOE-IN CHECK

1. Place front wheels (Figure 1, Item 5) in straight-ahead position.
2. Place toe-in gauge between front wheels (Figure 1, Item 5) at middle of tires (Figure 1, Item 3) as far in front of axle (Figure 1, Item 1) as possible.
3. Move toe-in gauge (Figure 1, Item 4) until chains (Figure 1, Item 2) just touch the ground.
4. Move scale so pointer reads 0.

NOTE

Assistant will help with Steps (5) through (7).

5. Start engine (TM 9-2320-272-10).
6. With toe-in gauge in place, move vehicle forward until toe-in gauge (Figure 1, Item 4) is in back of axle (Figure 1, Item 1) and chains just touch ground.
7. Stop engine (TM 9-2320-272-10).
8. Read position of pointer (Figure 1, Item 6) on scale. Pointer should read 1/16-3/16 in. toe-in.

TOE-IN CHECK - Continued

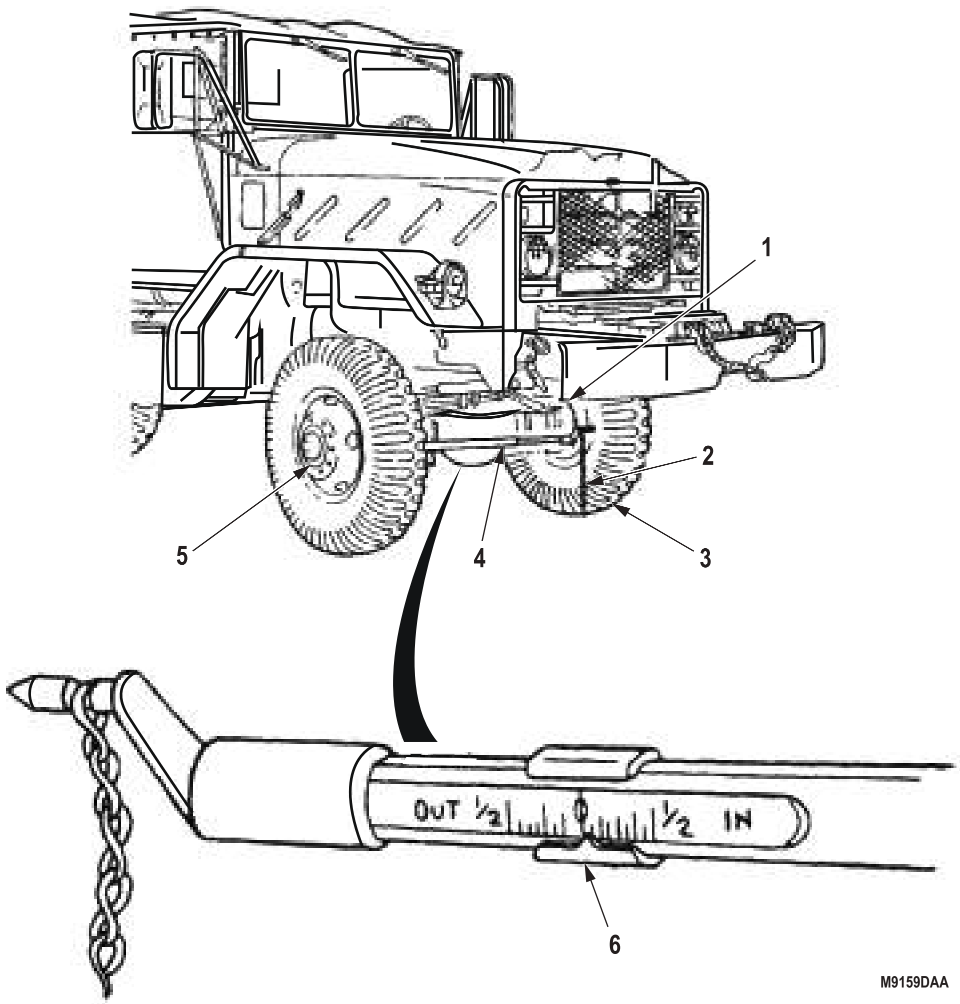


Figure 1. Toe-In Check.

9. If reading is not within limits given, leave toe-in gauge in place and proceed to TOE-IN ADJUSTMENT.

END OF TASK

TOE-IN ADJUSTMENT

1. Loosen two nuts (Figure 2, Item 2) on tie rod (Figure 2, Item 1).
2. Turn tie rod (Figure 2, Item 1) until pointer reads 1/16-3/16 in. toe-in on scale.
3. Tighten nuts (Figure 2, Item 2) 60 to 80 lb-ft (81 to 109 N·m).

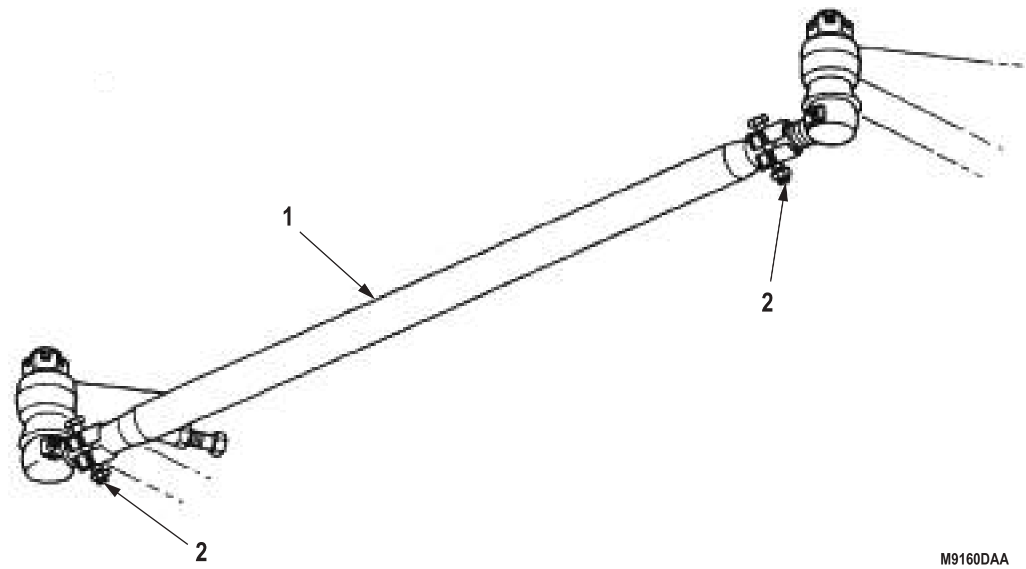


Figure 2. Toe-In Adjustment.

4. Remove toe-in gauge.

END OF TASK

REMOVAL

1. Remove two cotter pins (Figure 3, Item 6) from tie rod ends (Figure 3, Item 7) and nuts (Figure 3, Item 1). Discard cotter pins.
2. Remove two nuts (Figure 3, Item 1) from tie rod ends (Figure 3, Item 7). Mark tie rod ends left and right.
3. Remove tie rod (Figure 3, Item 10) from left and right steering knuckle arms (Figure 3, Item 2).
4. Loosen two screws (Figure 3, Item 4), nuts (Figure 3, Item 8), and clamps (Figure 3, Item 9) on tie rod (Figure 3, Item 10).

NOTE

Record number of turns required to remove tie rod ends.

5. Remove two tie rod ends (Figure 3, Item 7) from tie rod (Figure 3, Item 10).
6. Remove two tie rod boots (Figure 3, Item 3) and grease fittings (Figure 3, Item 5) from tie rod ends (Figure 3, Item 7).
7. Inspect tie rod (Figure 3, Item 10) and tie rod ends (Figure 3, Item 7) for cracks, bends, and stripped threads. Replace tie rod and/or tie rod ends if bent, cracked, or stripped.

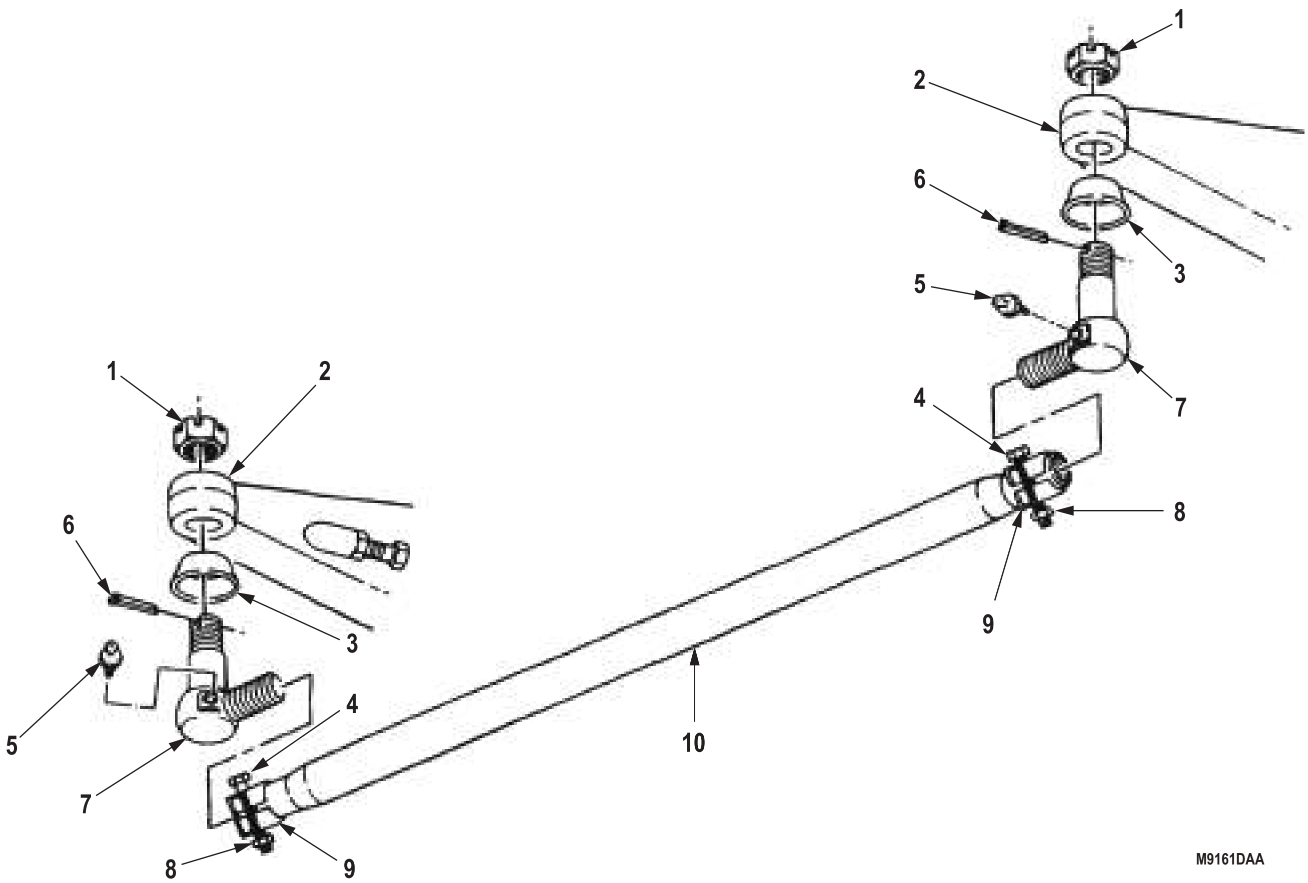


Figure 3. Tie Rod Removal.

END OF TASK

INSTALLATION

1. Install two tie rod boots (Figure 4, Item 3) and grease fittings (Figure 4, Item 5) on tie rod ends (Figure 4, Item 7).

NOTE

Use same number of turns recorded during removal of tie rod ends.

2. Install two tie rod ends (Figure 4, Item 7) on tie rod (Figure 4, Item 10).
3. Tighten two screws (Figure 4, Item 4) and nuts (Figure 4, Item 8) on clamps (Figure 4, Item 9). Tighten nuts 60 to 80 lb-ft (81 to 109 N·m).
4. Install tie rod ends (Figure 4, Item 7) on left and right steering knuckle arms (Figure 4, Item 2) with two nuts (Figure 4, Item 1). Tighten two nuts 160 to 180 lb-ft (217 to 244 N·m).
5. Install two cotter pins (Figure 4, Item 6) on tie rod ends (Figure 4, Item 7) and nuts (Figure 4, Item 1).

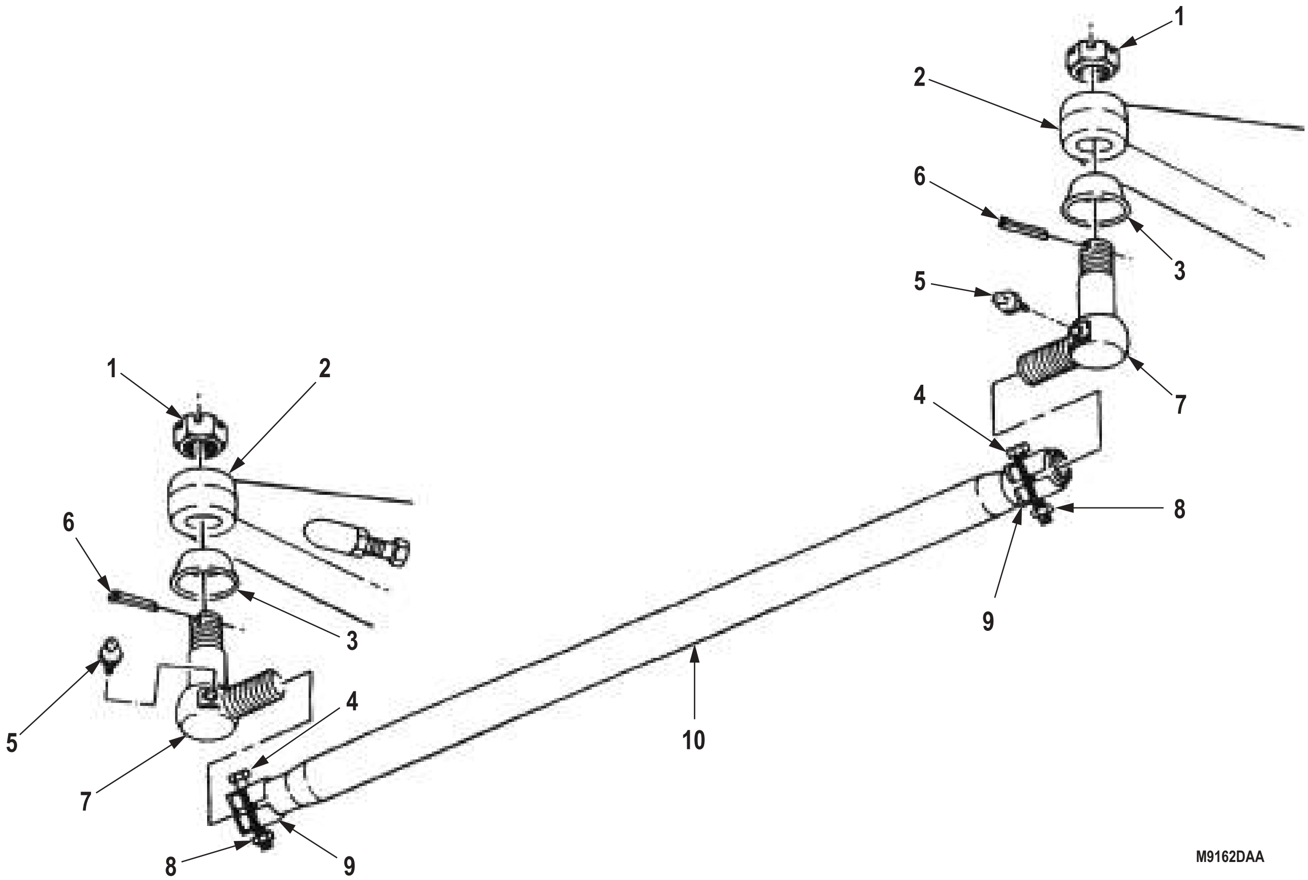


Figure 4. Tie Rod Installation.

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
UPPER AND LOWER STEERING COLUMN REPAIR

INITIAL SETUP:

Tools and Special Tools

Tool Kit, General Mechanic's: Automotive
(Volume 5, WP 0826, Table 1, Item 56)
Wrench, Torque, Click, Ratcheting, 3/8" Drive,
75 Ft-Lb
(Volume 5, WP 0826, Table 1, Item 62)

Materials/Parts

Cleaning Compound, Solvent
(Volume 5, WP 0825, Table 1, Item 16, 17)
Locknut (Volume 5, WP 0827, Table 1, Item 285)
Qty: 2
Lockwasher
(Volume 5, WP 0827, Table 1, Item 186)
Qty: 1

Personnel Required

(2)

Equipment Condition

Parking brake set. (TM 9-2320-272-10)
Steering wheel removed. (WP 0495)
Horn wire disconnected. (Volume 2, WP 0344)
Turn signal indicator switch removed.
(Volume 2, WP 0317)
Trailer airbrake hand control valve removed.
(WP 0472)
Horn contact brush removed.
(Volume 2, WP 0345)

REMOVAL

NOTE

Before removing steering wheel columns, make sure front wheels are straight ahead for proper steering wheel alignment.

1. Remove nut (Figure 1, Item 9), lockwasher (Figure 1, Item 10), and screw (Figure 1, Item 12) from universal joint (Figure 1, Item 11). Discard lockwasher.
2. Remove two locknuts (Figure 1, Item 14), screws (Figure 1, Item 7), washers (Figure 1, Item 8), and lower mounting clamp (Figure 1, Item 6) from upper steering column (Figure 1, Item 3) and firewall (Figure 1, Item 13). Discard locknuts.

NOTE

Mark upper support clamp location on steering column for installation.

3. Remove two screws (Figure 1, Item 5) and upper support clamp (Figure 1, Item 4) from upper steering column (Figure 1, Item 3) and instrument panel (Figure 1, Item 1).
4. Remove upper steering column (Figure 1, Item 3) from universal joint (Figure 1, Item 11) and lift out through floorboard (Figure 1, Item 15).
5. Slide two clamp bushings (Figure 1, Item 2) off upper steering column (Figure 1, Item 3).
6. Remove nut (Figure 1, Item 16), lockwasher (Figure 1, Item 17), screw (Figure 1, Item 19), and U-joint (Figure 1, Item 18) from steering gear input shaft (Figure 1, Item 20). Discard lockwasher.

REMOVAL - Continued

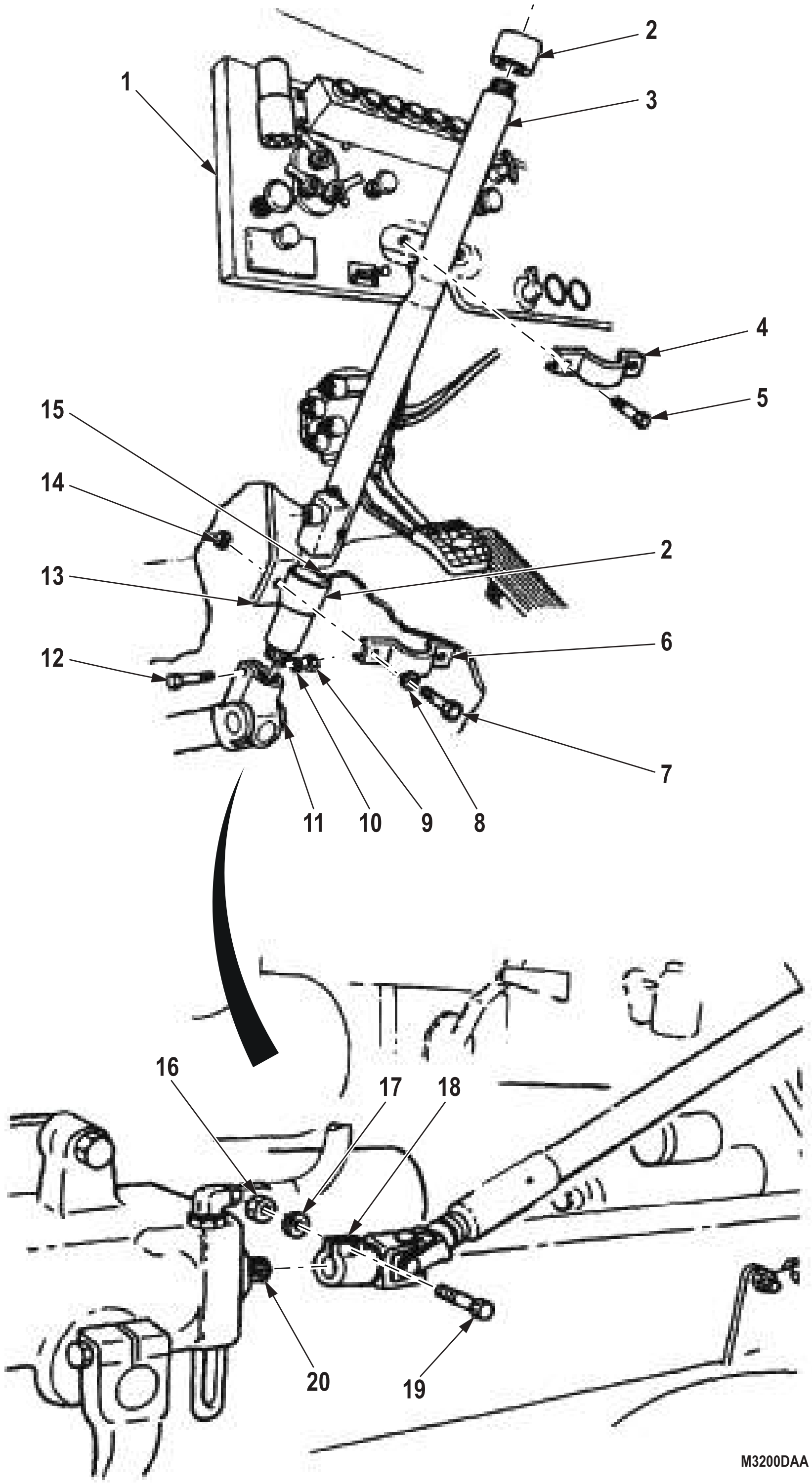


Figure 1. Steering Column Removal.

END OF TASK

DISASSEMBLY

1. Bend tabs (Figure 2, Item 2) and slide retainer (Figure 2, Item 1) and felt seal (Figure 2, Item 3) back on lower section (Figure 2, Item 7).
2. Remove lower steering column lower section (Figure 2, Item 7) from lower steering column upper section (Figure 2, Item 4).
3. Remove felt seal (Figure 2, Item 3) and retainer (Figure 2, Item 1) from lower steering column lower section (Figure 2, Item 7). Discard retainer and felt seal.
4. Remove grease fitting (Figure 2, Item 6) from lower steering column upper section (Figure 2, Item 7).
5. Remove two grease fittings (Figure 2, Item 6) from universal joints (Figure 2, Item 5).

NOTE

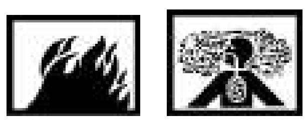
Procedures to dissemble both universal joints are the same. Steps (6) through (8) are for the lower universal joint.

6. Remove four snaprings (Figure 2, Item 9) from universal joint bearing caps (Figure 2, Items 10 and 12).
7. Remove two universal joint bearing caps (Figure 2, Item 10) and universal joint (Figure 2, Item 11) from lower steering column end (Figure 2, Item 8).
8. Remove two universal joint bearing caps (Figure 2, Item 12) and universal joint (Figure 2, Item 11) from lower steering column lower section (Figure 2, Item 7).

END OF TASK

CLEANING, INSPECTION, AND REPAIR

WARNING



- Solvent cleaning compound is flammable and toxic. Do not use near an open flame and always have a fire extinguisher nearby when solvents are used. Use only in well-ventilated places, wear protective clothing, and dispose of cleaning rags in approved container. Failure to comply may result in damage to equipment, injury, or death to personnel.
- Compressed air source will not exceed 30 psi (207 kPa). When cleaning with compressed air, eyeshields must be worn. Failure to comply may result in injury or death to personnel.

1. Clean all steering column components with solvent cleaning compound and dry with compressed air.
2. Inspect for cracks and burrs on splines. Repair small nicks or burrs. Replace lower section (Figure 2, Item 7) and upper section (Figure 2, Item 4) if cracked or minor repairs cannot be made.
3. Inspect bearing caps (Figure 2, Item 12) for damage. Replace bearing caps if damaged.
4. Inspect universal joint (Figure 2, Item 11) for rough or uneven bearing surfaces. Replace universal joint if surfaces are rough or uneven.

CLEANING, INSPECTION, AND REPAIR - Continued

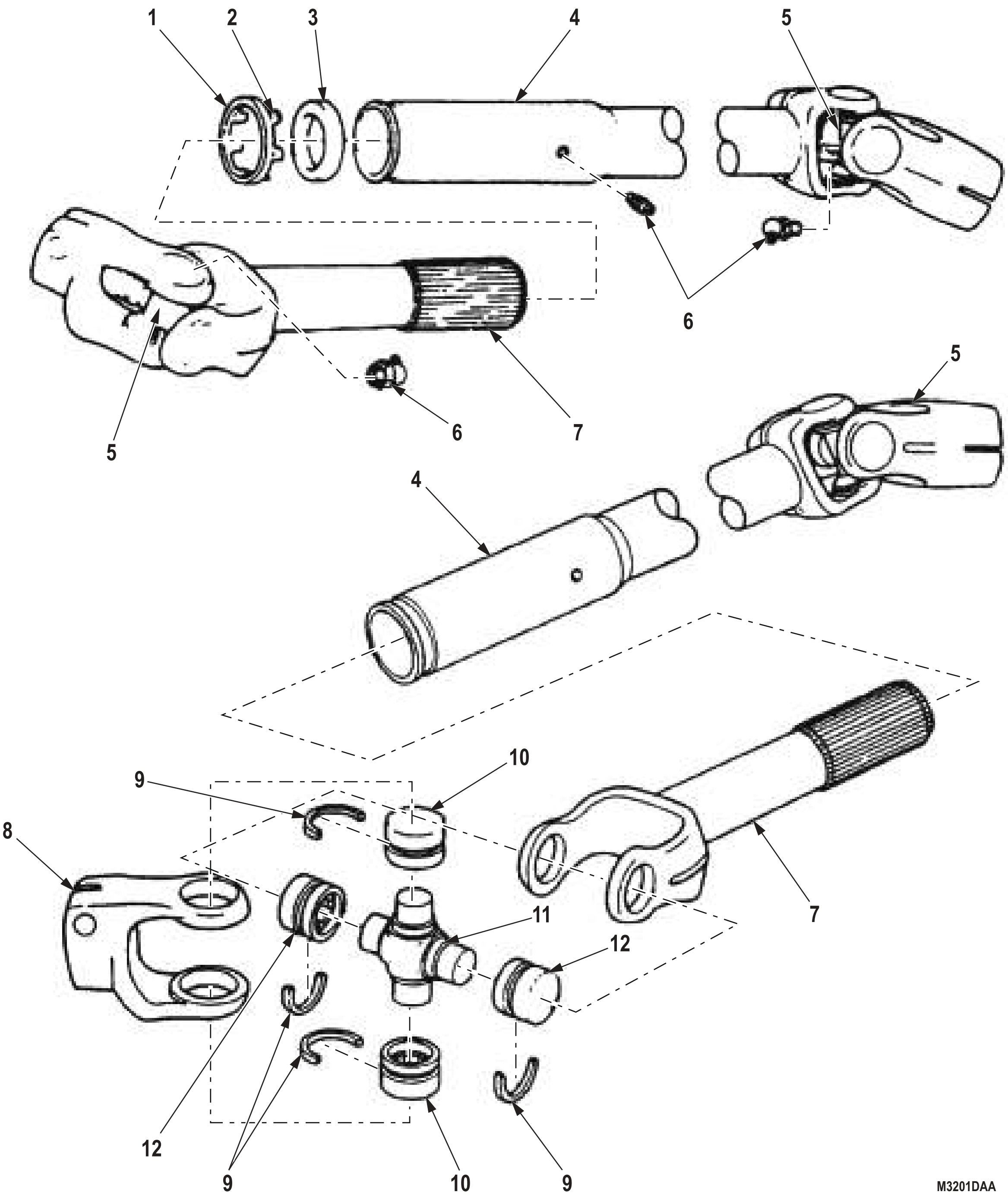


Figure 2. Upper and Lower Steering Column Repair.

END OF TASK

REASSEMBLY

1. Install two universal joint bearing caps (Figure 3, Item 6) and universal joint (Figure 3, Item 5) on lower steering column lower section (Figure 3, Item 4).
2. Install two universal joint bearing caps (Figure 3, Item 3) and universal joint (Figure 3, Item 5) on lower steering column end (Figure 3, Item 8).
3. Install four snaprings (Figure 3, Item 7) on four universal joint bearing caps (Figure 3, Items 3 and 6).
4. Install two grease fittings (Figure 3, Item 12) on universal joints (Figure 3, Item 2).
5. Install grease fitting (Figure 3, Item 13) on lower steering column upper section (Figure 3, Item 1).
6. Install felt seal (Figure 3, Item 11) and retainer (Figure 3, Item 9) on lower steering column lower section (Figure 3, Item 4).
7. Install lower steering column lower section (Figure 3, Item 4) on lower steering column upper section (Figure 3, Item 1).
8. Slide felt seal (Figure 3, Item 11) and retainer (Figure 3, Item 9) forward to steering column upper section (Figure 3, Item 1) and bend tabs (Figure 3, Item 10).

REASSEMBLY - Continued

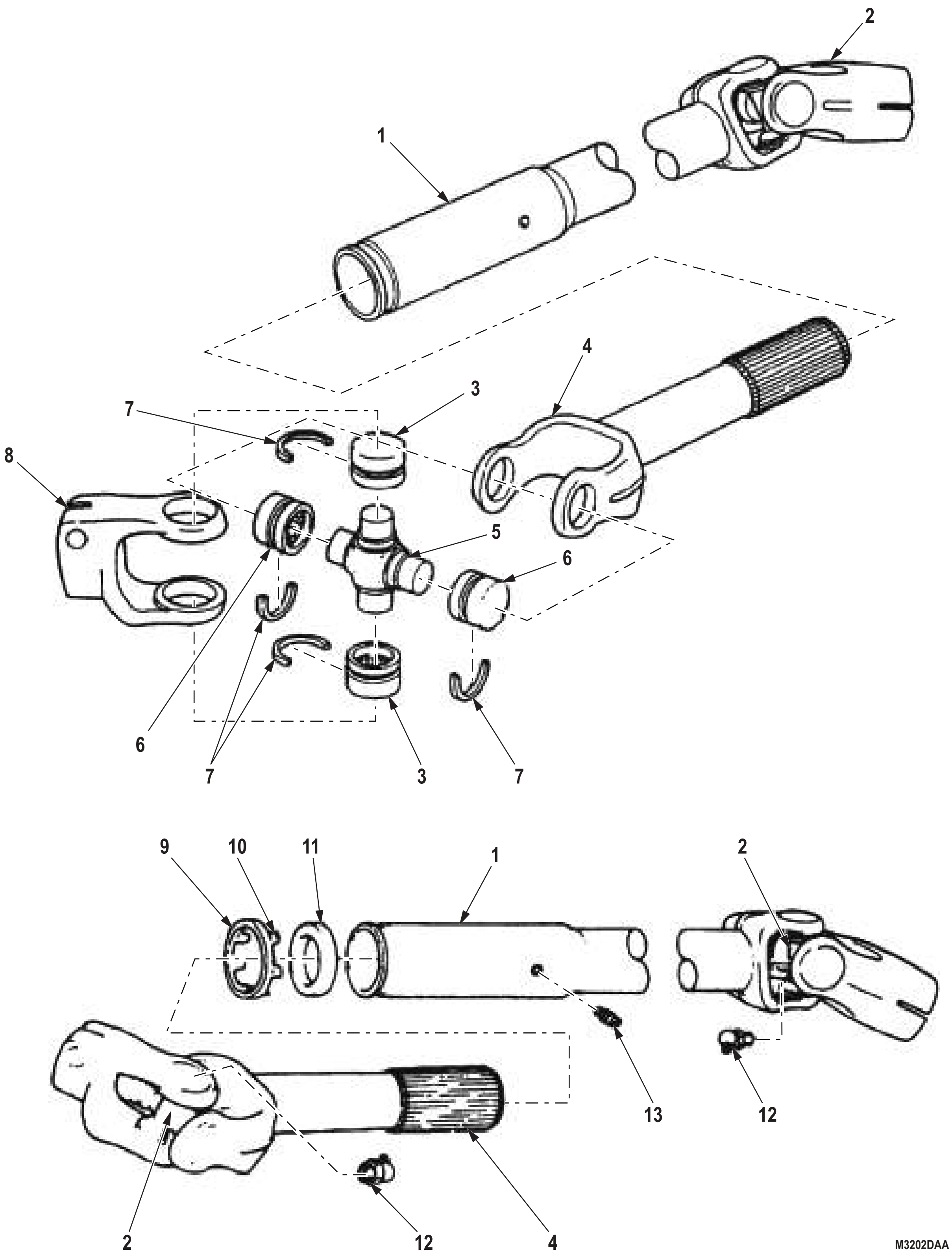


Figure 3. Upper and Lower Steering Column Reassembly.

END OF TASK

INSTALLATION

1. Install U-joint (Figure 4, Item 18) on steering gear input shaft (Figure 4, Item 20) with screw (Figure 4, Item 19), lockwasher (Figure 4, Item 17), and nut (Figure 4, Item 16).
2. Install two clamp bushings (Figure 4, Item 2) on upper steering column (Figure 4, Item 3).

NOTE

Position horn contact brush next to firewall.

3. Lower upper steering column (Figure 4, Item 3) through hole in floorboard (Figure 4, Item 15) and insert splined end of upper steering column into universal joint (Figure 4, Item 11).
4. Install upper steering column (Figure 4, Item 3) on universal joint (Figure 4, Item 11) with screw (Figure 4, Item 12), lockwasher (Figure 4, Item 10), and nut (Figure 4, Item 9). Do not tighten nut.

NOTE

If installing a steering column, mark clamp position on column the same as on old column.

5. Install upper steering column (Figure 4, Item 3) on instrument panel (Figure 4, Item 1) with upper support clamp (Figure 4, Item 4) and two screws (Figure 4, Item 5). Ensure clamp is positioned over clamp bushing (Figure 4, Item 2) at marked position.
6. Attach upper steering column (Figure 4, Item 3) to firewall (Figure 4, Item 13) with lower mounting clamp (Figure 4, Item 6), two washers (Figure 4, Item 8), screws (Figure 4, Item 7), and locknuts (Figure 4, Item 14).
7. Tighten nut (Figure 4, Item 9) 28 to 34 lb-ft (38 to 46 N·m).

INSTALLATION - Continued

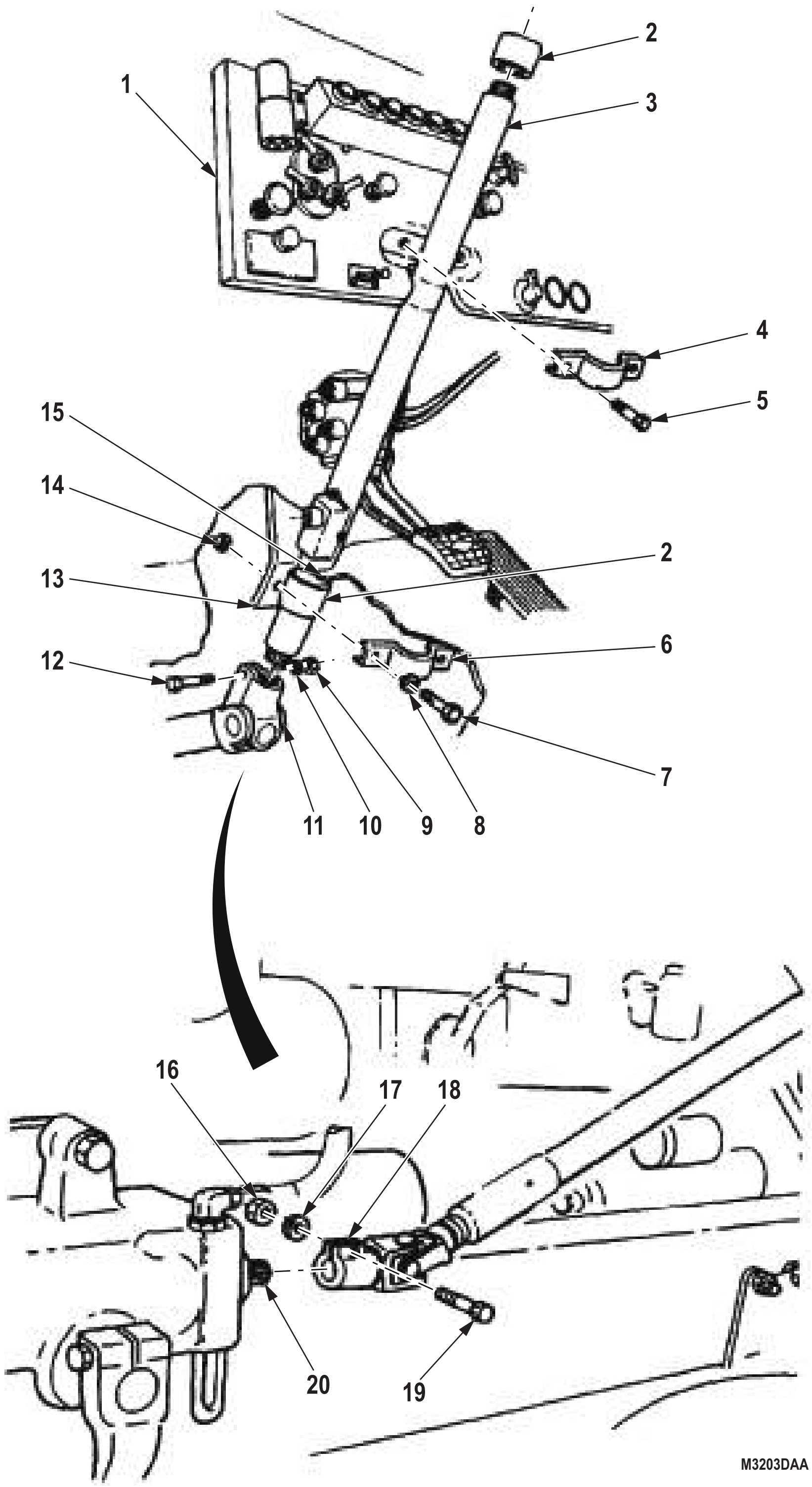


Figure 4. Steering Column Installation.

END OF TASK

FOLLOW-ON MAINTENANCE

1. Install trailer airbrake hand control valve. (WP 0472)
2. Install turn signal indicator switch. (Volume 2, WP 0317)
3. Connect horn wire. (Volume 2, WP 0344)
4. Install horn contact brush. (Volume 2, WP 0345)
5. Install steering wheel. (WP 0495)
6. Start engine and road test vehicle.

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
STEERING WHEEL REPLACEMENT

INITIAL SETUP:

Tools and Special Tools

Tool Kit, General Mechanic's: Automotive
(Volume 5, WP 0826, Table 1, Item 56)

Puller Kit, Mechanical
(Volume 5, WP 0826, Table 1, Item 41)

Wrench, Torque, Click, Ratcheting, 1/2" Drive, 250 Ft-Lb
(Volume 5, WP 0826, Table 1, Item 63)

Equipment Condition

Parking brake set. (TM 9-2320-272-10)

Equipment Condition (cont.)

Wheels straight. (TM 9-2320-272-10)

Horn switch removed. (Volume 2, WP 0344)

REMOVAL

1. Loosen clamp (Figure 1, Item 6) and slide turn signal control (Figure 1, Item 8) down steering column (Figure 1, Item 7).

NOTE

Perform Step (2) only if vehicle is equipped with hand airbrake control lever.

2. Loosen two screws (Figure 1, Item 5) and slide hand airbrake control lever (Figure 1, Item 4) down steering column (Figure 1, Item 7).
3. Loosen nut (Figure 1, Item 2) until flush with top of steering wheel shaft (Figure 1, Item 3).
4. Install two adapters (Figure 1, Items 13 and 14) on steering column (Figure 1, Item 7) and steering wheel shaft (Figure 1, Item 3).
5. Install puller (Figure 1, Item 13) on adapters (Figure 1, Items 15 and 16) and tighten puller screw (Figure 1, Item 14) until steering wheel (Figure 1, Item 1) is loose.
6. Remove puller (Figure 1, Item 13), nut (Figure 1, Item 2), two adapters (Figure 1, Items 15 and 16), and steering wheel (Figure 1, Item 1) from steering column (Figure 1, Item 7).

NOTE

Perform Steps (7) and (8) on vehicles equipped with turn signal canceling ring.

7. Remove spring (Figure 1, Item 12) from steering wheel shaft (Figure 1, Item 3).
8. Remove three screws (Figure 1, Item 11), turn signal canceling ring (Figure 1, Item 10), and steering wheel ring (Figure 1, Item 9) from steering wheel (Figure 1, Item 1).

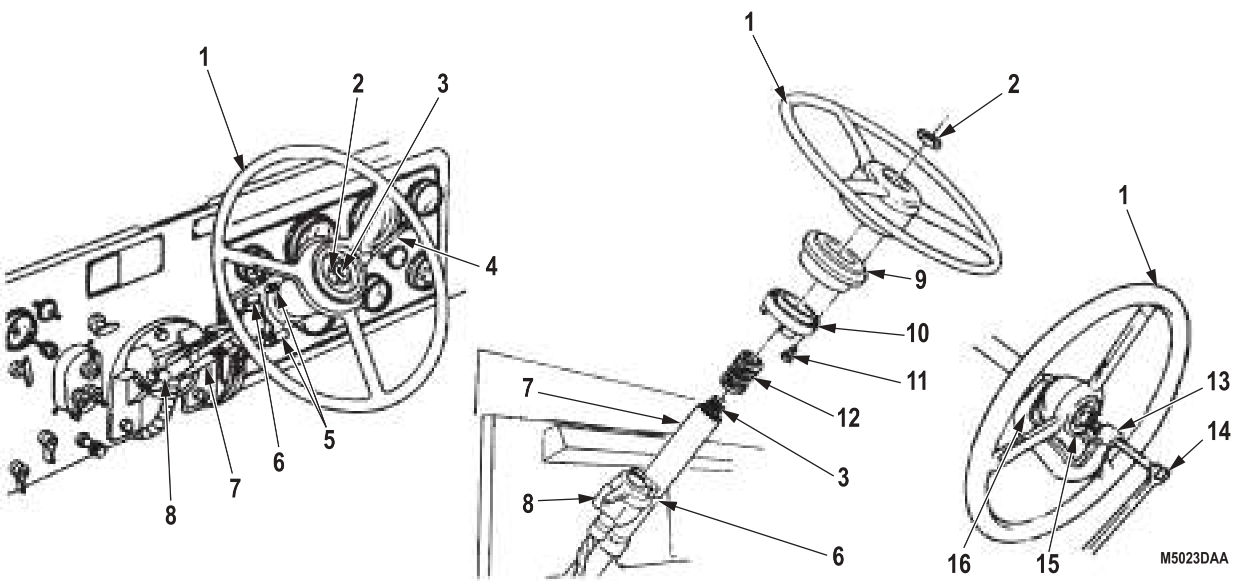


Figure 1. Steering Wheel Removal.

END OF TASK

INSTALLATION

NOTE

Perform Steps (1) and (2) on vehicles equipped with turn signal canceling ring only.

1. Install spring (Figure 2, Item 6) on steering column (Figure 2, Item 10).
2. Install turn signal canceling ring (Figure 2, Item 4) and steering wheel ring (Figure 2, Item 3) on steering wheel (Figure 2, Item 1) with three screws (Figure 2, Item 5).
3. Install steering wheel (Figure 2, Item 1) on steering column (Figure 2, Item 10) by evenly tapping until nut (Figure 2, Item 2) can be installed on steering shaft (Figure 2, Item 7). Tighten nut to 55 to 60 lb-ft (75 to 81 N·m).

NOTE

Perform Step (4) on vehicles equipped with hand airbrake control lever.

4. Slide hand airbrake control lever (Figure 2, Item 11) up steering column (Figure 2, Item 10) and tighten two screws (Figure 2, Item 12).
5. Slide turn signal control (Figure 2, Item 9) up steering column (Figure 2, Item 10) and tighten clamp (Figure 2, Item 8).

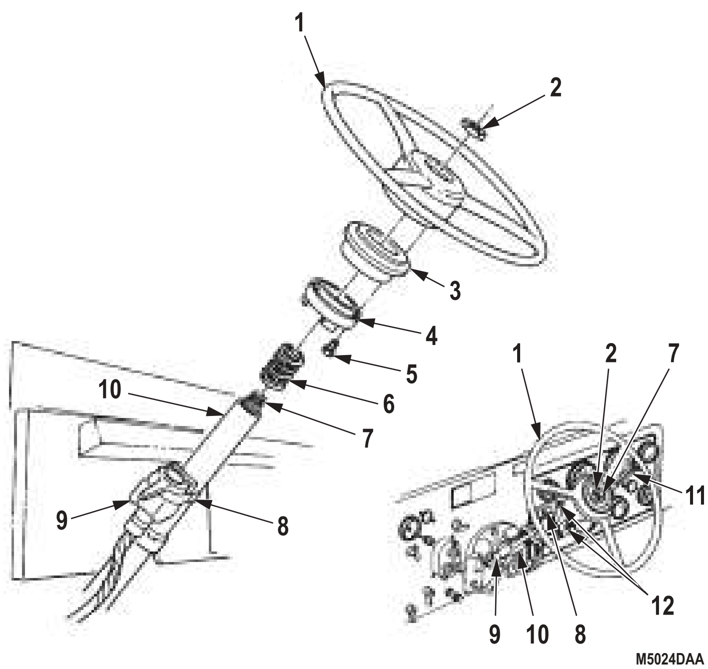


Figure 2. Steering Wheel Installation.

END OF TASK

FOLLOW-ON MAINTENANCE

Install horn switch. (Volume 2, WP 0344)

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
PITMAN ARM REPLACEMENT (ROSS)

INITIAL SETUP:

Tools and Special Tools
Tool Kit, General Mechanic's: Automotive
(Volume 5, WP 0826, Table 1, Item 56)

Materials/Parts
Cotter Pin
(Volume 5, WP 0827, Table 1, Item 344)
Qty: 1
Locknut (Volume 5, WP 0827, Table 1, Item 280)
Qty: 1

References
TM 9-2320-272-24P

Equipment Condition
Parking brake set. (TM 9-2320-272-10)

REMOVAL

1. Remove cotter pin (Figure 1, Item 6) from slotted nut (Figure 1, Item 5). Discard cotter pin.
2. Remove slotted nut (Figure 1, Item 5) from drag link (Figure 1, Item 4).
3. Remove locknut (Figure 1, Item 3) and screw (Figure 1, Item 1) from pitman arm (Figure 1, Item 7). Discard locknut.
4. Remove pitman arm (Figure 1, Item 7) from steering gear shaft (Figure 1, Item 2) and drag link (Figure 1, Item 4).

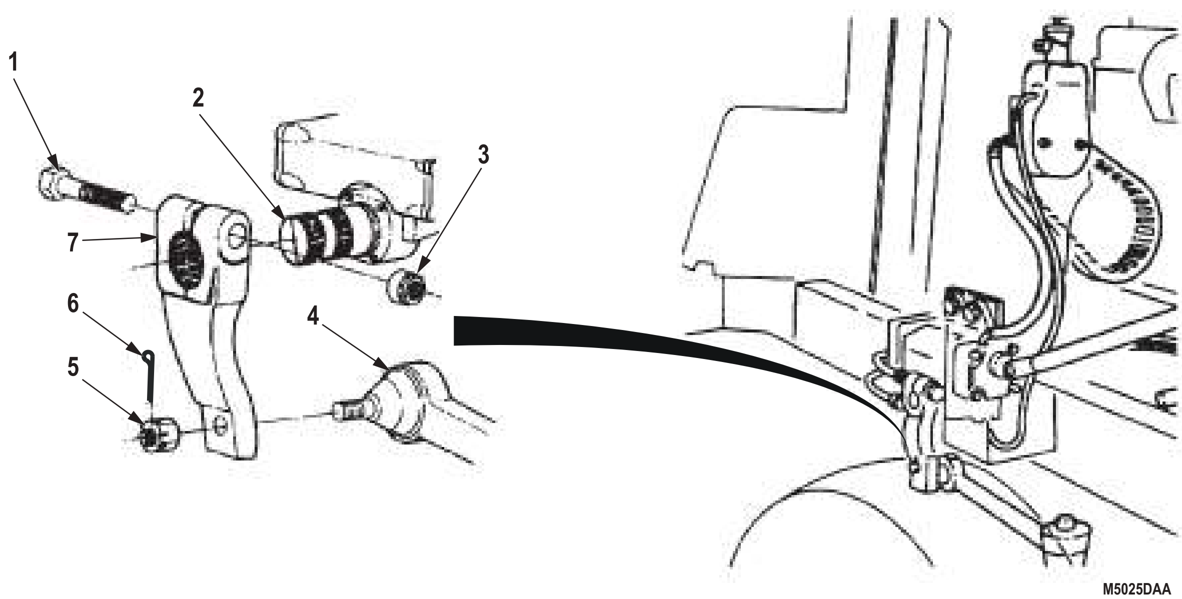


Figure 1. Pitman Arm Removal.

END OF TASK

INSTALLATION

NOTE

Ensure pitman arm and steering gear shaft alignment marks match.

1. Install pitman arm (Figure 2, Item 7) on steering gear shaft (Figure 2, Item 2) and drag link (Figure 2, Item 4).
2. Install pitman arm (Figure 2, Item 7) on steering gear shaft (Figure 2, Item 2) with screw (Figure 2, Item 1) and locknut (Figure 2, Item 3).
3. Install pitman arm (Figure 2, Item 7) on drag link (Figure 2, Item 4) with slotted nut (Figure 2, Item 5). Tighten slotted nut 140 lb-ft (190 N·m).
4. Install cotter pin (Figure 2, Item 6) on slotted nut (Figure 2, Item 5) and drag link (Figure 2, Item 4).

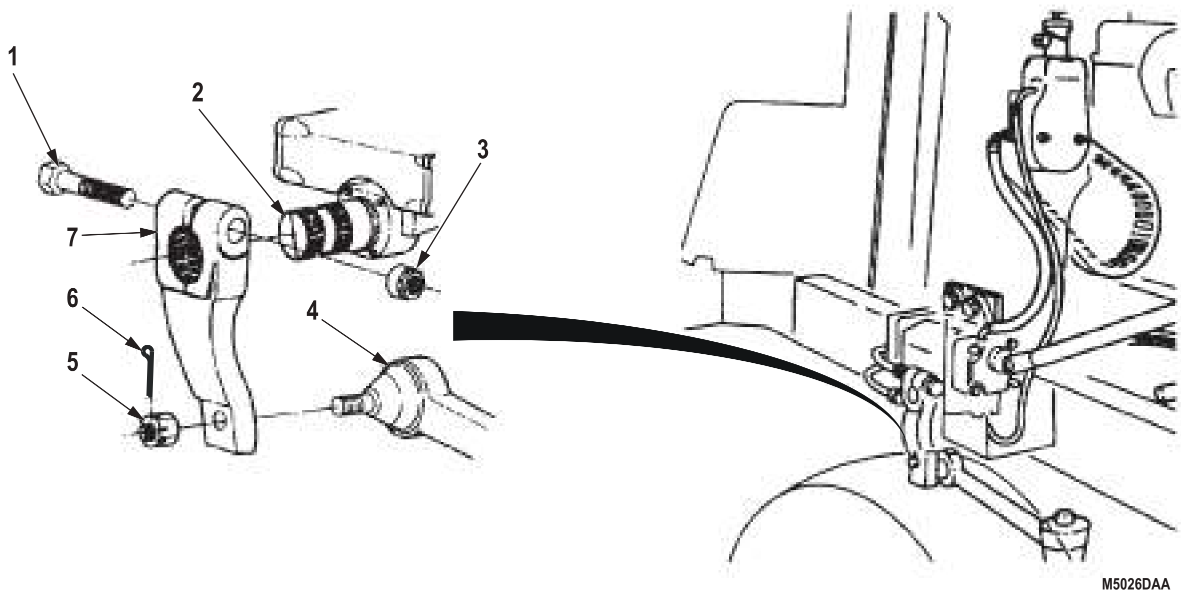


Figure 2. Pitman Arm Installation.

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
STEERING STOP ADJUSTMENT

INITIAL SETUP:

Tools and Special Tools

Tool Kit, General Mechanic's: Automotive
(Volume 5, WP 0826, Table 1, Item 56)
Wheel Adjusting Tools
Wrench, Torque, Click, Ratcheting, 1/2" Drive,
250 Ft-Lb
(Volume 5, WP 0826, Table 1, Item 63)

Materials/Parts

Nut, Plain, Hexagon
(Volume 5, WP 0827, Table 1, Item 431)
Qty: 2
Screw (Volume 5, WP 0827, Table 1, Item 178)
Qty: 2

Equipment Condition

Parking brake set. (TM 9-2320-272-10)
Tires properly inflated. (TM 9-2320-272-10)

ADJUSTMENT

1. Position front wheels straight ahead.
2. Place alignment device (Figure 1, Item 2) 3 in. (7.6 mm) from outer tire surface of left front wheel (Figure 1, Item 1).
3. Place turning radius gauge (Figure 1, Item 5) against outer tire surface.
4. Center pointer (Figure 1, Item 4) with wheel (Figure 1, Item 1) and align to 0 degree mark on base scale (Figure 1, Item 3).
5. Turn left front wheel (Figure 1, Item 1) to outward stop and read degrees of travel on base scale (Figure 1, Item 3). Scale reading should be 28 degrees. If scale reading is not correct, perform turning angle adjustment.
6. Break welds and remove screw (Figure 1, Item 7) and jamnut (Figure 1, Item 9) from left steering knuckle (Figure 1, Item 6). Discard screw and jamnut.
7. Thread nut (Figure 1, Item 9) all the way on screw (Figure 1, Item 7).
8. Thread screw (Figure 1, Item 7) all the way into tie rod arm (Figure 1, Item 10), then all the way out, until screw contacts axle housing (Figure 1, Item 8). Screw now becomes turn angle stop.
9. While holding screw (Figure 1, Item 7), turn jamnut (Figure 1, Item 9) until it contacts tie rod arm (Figure 1, Item 10). Tighten nut 66 to 86 lb-ft (88 to 116 N·m).

NOTE

Repeat task to check right front wheel turning angle adjustment.

10. Tack-weld nut (Figure 1, Item 9) to screw (Figure 1, Item 7) and back of tie rod arm (Figure 1, Item 10).

ADJUSTMENT - Continued

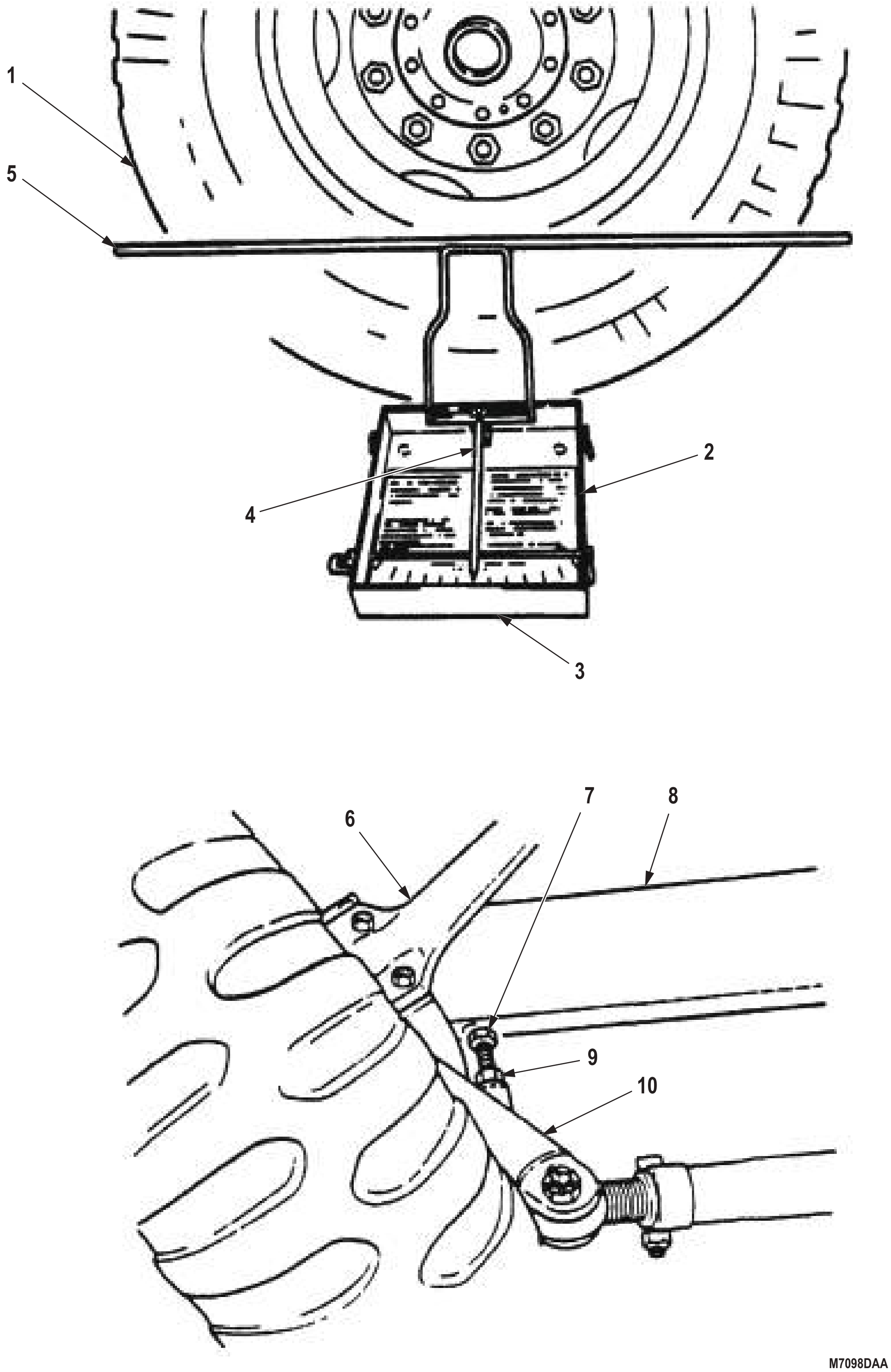


Figure 1. Steering Stop Adjustment.

END OF TASK

FOLLOW-ON MAINTENANCE

Start engine and road test vehicle. (TM 9-2320-272-10)

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
STEERING GEAR STONE SHIELD REPLACEMENT

INITIAL SETUP:

Tools and Special Tools
Tool Kit, General Mechanic's: Automotive
(Volume 5, WP 0826, Table 1, Item 56)

Equipment Condition
Parking brake set. (TM 9-2320-272-10)

Materials/Parts
Locknut (Volume 5, WP 0827, Table 1, Item 285)
Qty: 2
Lockwasher
(Volume 5, WP 0827, Table 1, Item 186)
Qty: 1

REMOVAL

1. Remove two locknuts (Figure 1, Item 4), washer (Figure 1, Item 5), three screws (Figure 1, Item 8), and lockwasher (Figure 1, Item 1) from stone shield (Figure 1, Item 9) and air check valve (Figure 1, Item 7). Discard locknuts and lockwasher.
2. Remove stone shield (Figure 1, Item 9) from splash shield (Figure 1, Item 3) and frame rail (Figure 1, Item 6).

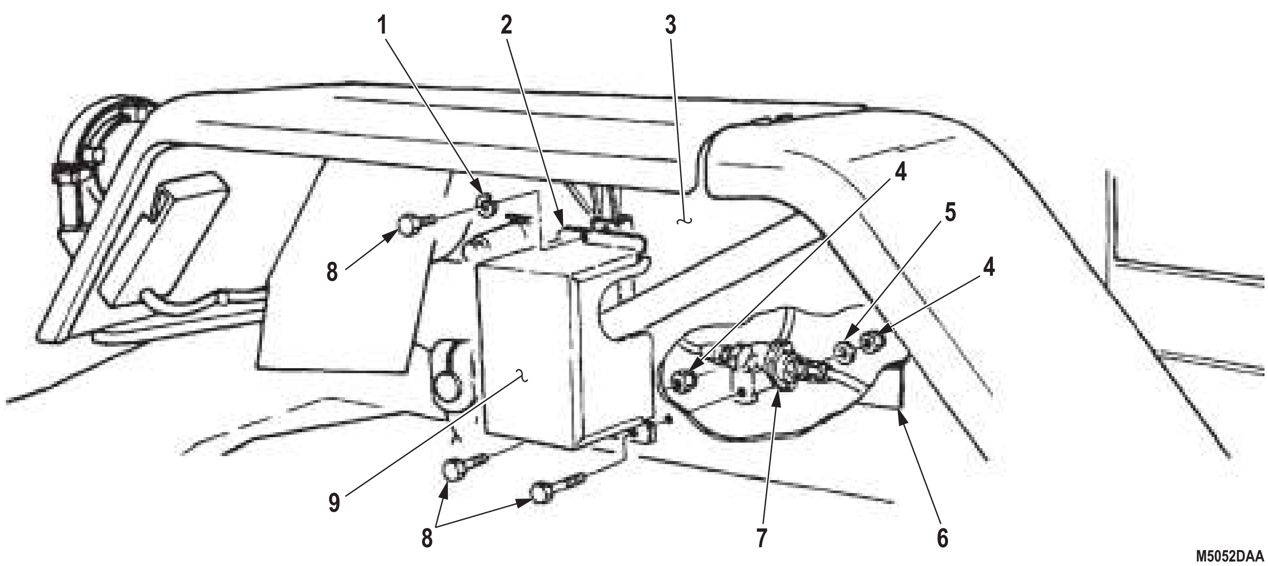


Figure 1. Steering Gear Stone Shield Removal.

END OF TASK

INSTALLATION

1. Align stone shield (Figure 2, Item 9) with holes in frame rail (Figure 2, Item 6) and splash shield (Figure 2, Item 3).
2. Install stone shield (Figure 2, Item 9) and air check valve (Figure 2, Item 7) on splash shield (Figure 2, Item 3) and frame rail (Figure 2, Item 6) with lockwasher (Figure 2, Item 1), three screws (Figure 2, Item 8), washer (Figure 2, Item 5), and two locknuts (Figure 2, Item 4).

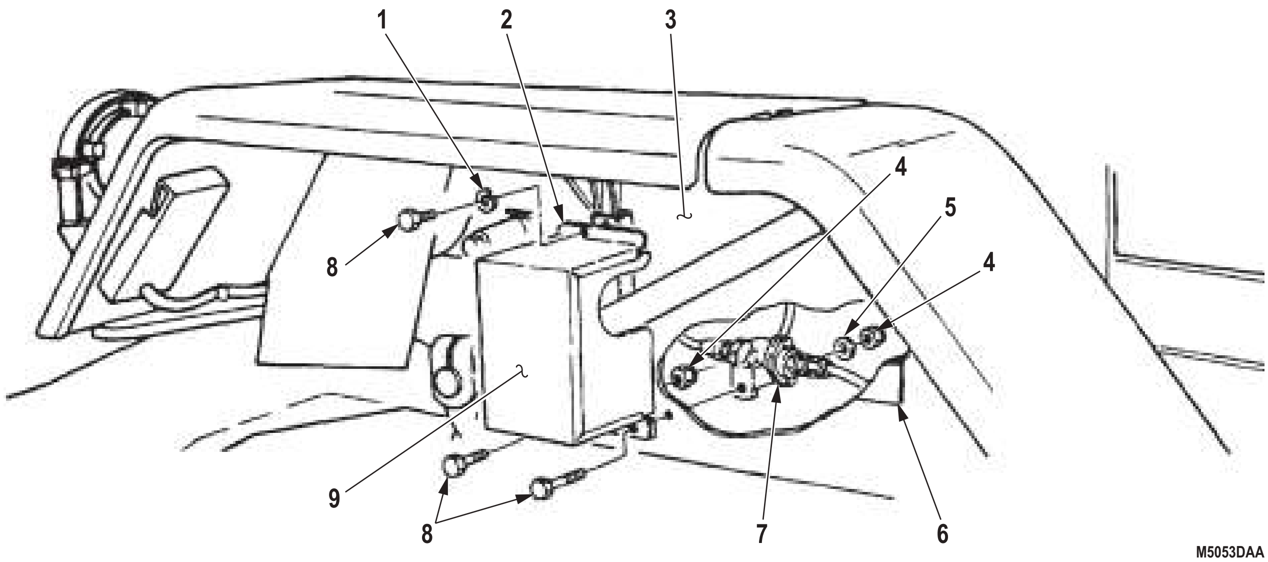


Figure 2. Steering Gear Stone Shield Installation.

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
STEERING GEAR AND MOUNTING BRACKET REPLACEMENT (ROSS)

INITIAL SETUP:

Tools and Special Tools
Tool Kit, General Mechanic's: Automotive
(Volume 5, WP 0826, Table 1, Item 56)
Puller Kit, Mechanical
(Volume 5, WP 0826, Table 1, Item 41)
Wrench, Torque, Click, Ratcheting, 3/4" Drive, 600 Ft-Lb
(Volume 5, WP 0826, Table 1, Item 61)

Materials/Parts
Cap Set, Protective, Dust and Moisture Seal
(Volume 5, WP 0825, Table 1, Item 13)
Tape, Antiseizing
(Volume 5, WP 0825, Table 1, Item 65)
Locknut (Volume 5, WP 0827, Table 1, Item 280)
Qty: 1
Locknut (Volume 5, WP 0827, Table 1, Item 289)
Qty: 4
Lockwasher
(Volume 5, WP 0827, Table 1, Item 404)
Qty: 1

Materials/Parts (cont.)
O-ring (Volume 5, WP 0827, Table 1, Item 367)
Qty: 2
O-ring (Volume 5, WP 0827, Table 1, Item 368)
Qty: 1

Personnel Required
(2)

References
Volume 5, WP 0820

Equipment Condition
Parking brake set. (TM 9-2320-272-10)
Left splash shield removed. (Volume 4, WP 0575)
Steering gear stone shield removed. (WP 0498)
Drag link removed. (WP 0492)

REMOVAL

CAUTION

Cap or plug all openings immediately after disconnecting lines and hoses to prevent contamination. Failure to do so may result in power steering gear damage.

NOTE

- Identify type of power steering gear. Removal and installation are different for the two steering gears.
- Ensure front wheels are straight ahead.

1. Remove nut (Figure 1, Item 1), lockwasher (Figure 1, Item 2), and screw (Figure 1, Item 4) from U-joint (Figure 1, Item 5) and steering gear input shaft (Figure 1, Item 6). Discard lockwasher.
2. Open slot (Figure 1, Item 3) in U-joint (Figure 1, Item 5) and separate steering gear input shaft (Figure 1, Item 6) and U-joint.

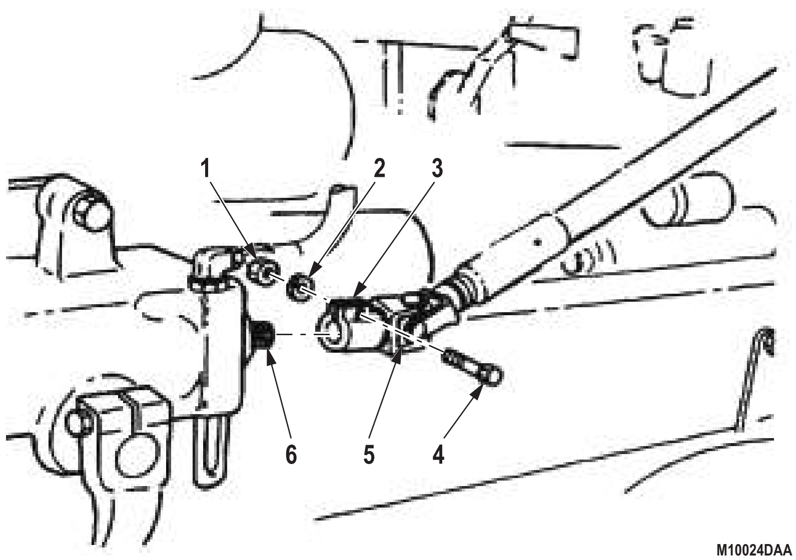


Figure 1. Steering Gear Input Shaft Removal.

REMOVAL - Continued

3. Remove locknut (Figure 2, Item 3) and screw (Figure 2, Item 1) from pitman arm (Figure 2, Item 4). Discard locknut.

NOTE

Punch alignment marks on pitman arm and sector shaft.

4. Using a chisel, spread slot in top of pitman arm (Figure 2, Item 4).
5. Using a puller, remove pitman arm (Figure 2, Item 4) from sector shaft (Figure 2, Item 2).

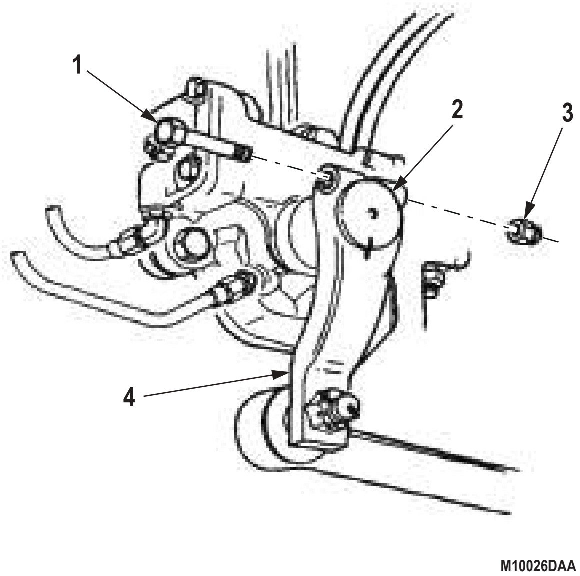


Figure 2. Pitman Arm Removal.

REMOVAL - Continued

NOTE

- Have container ready to catch oil from disconnected lines.
- Tag lines and fittings for installation

6. Disconnect oil pressure line (Figure 3, Item 3) and oil return line (Figure 3, Item 6) from adapter elbow (Figure 3, Item 2) and adapter (Figure 3, Item 5).
7. Disconnect assist cylinder pressure lines (Figure 3, Items 9 and 11) from adapter (Figure 3, Item 8) and adapter elbow (Figure 3, Item 10).
8. Remove adapter elbows (Figure 3, Items 2 and 10), adapters (Figure 3, Items 5 and 8), and o-rings (Figure 3, Items 4, 7, and 12) from steering gear housing (Figure 3, Item 1). Discard o-rings.

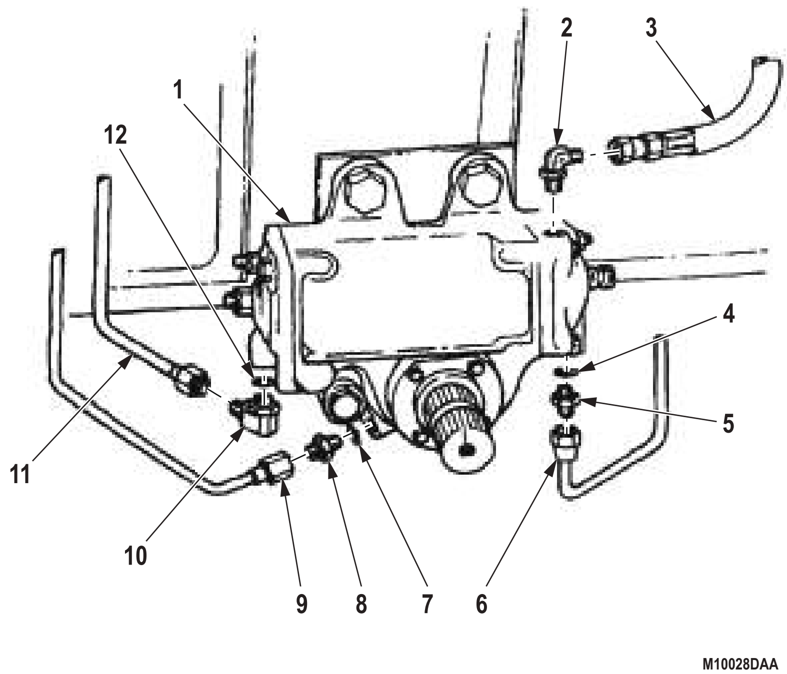


Figure 3. Power Steering Lines Removal.

REMOVAL - Continued

NOTE

Assistant will help with Step (9).

9. Remove four nuts (Figure 4, Item 2), washers (Figure 4, Item 3), screws (Figure 4, Item 7), steering gear (Figure 4, Item 6), and mounting plate (Figure 4, Item 5) from left frame rail (Figure 4, Item 9).
10. Remove four locknuts (Figure 4, Item 1), screws (Figure 4, Item 8), and bracket (Figure 4, Item 4) from left frame rail (Figure 4, Item 9). Discard locknuts.

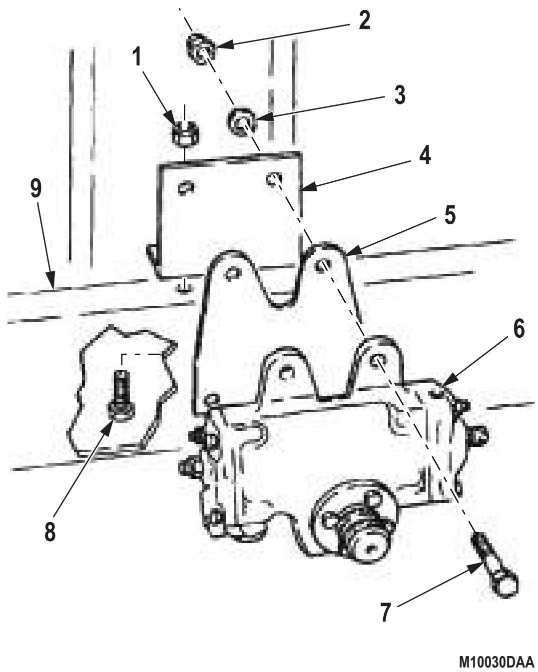


Figure 4. Steering Geer (Ross) and Mounting Bracket Removal.

END OF TASK

INSTALLATION

NOTE

Assistant will help with Steps (1) and (2).

1. Install mounting bracket (Figure 5, Item 4) on left frame rail (Figure 5, Item 9) with four screws (Figure 5, Item 8) and locknuts (Figure 5, Item 1). Do not tighten locknuts.
2. Install mounting plate (Figure 5, Item 5) and steering gear (Figure 5, Item 6) on left frame rail (Figure 5, Item 9) with four screws (Figure 5, Item 7), washers (Figure 5, Item 3), and nuts (Figure 5, Item 2). Tighten nuts 260 to 280 lb-ft (353 to 380 N·m).
3. Tighten locknuts (Figure 5, Item 1) 69 to 70 lb-ft (81 to 95 N·m).

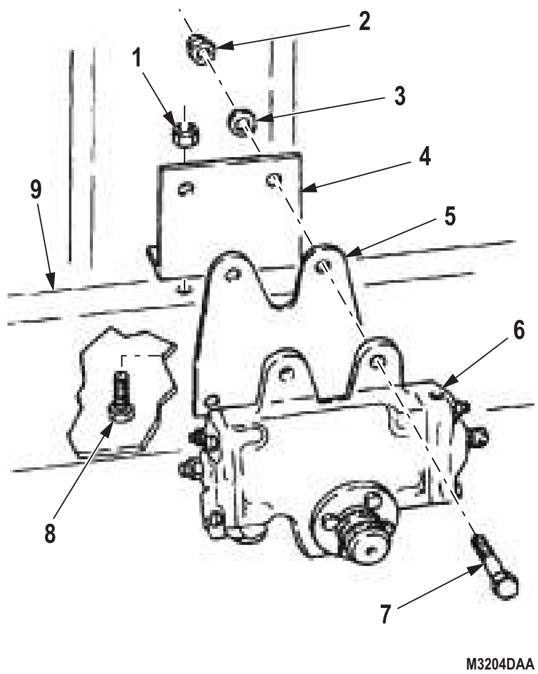


Figure 5. Steering Gear Installation.

INSTALLATION - Continued

NOTE

Wrap male pipe threads with antiseize tape before installation.

4. Install o-rings (Figure 6, Items 4, 7, and 12), adapter elbows (Figure 2, Items 2 and 10), and adapters (Figure 6, Items 5 and 8) on steering gear housing (Figure 6, Item 1).
5. Connect assist cylinder pressure lines (Figure 6, Items 9 and 11) to adapter elbow (Figure 6, Item 10) and adapter (Figure 6, Item 8).
6. Connect oil return line (Figure 6, Item 6) and oil pressure line (Figure 6, Item 3) to steering gear housing adapter (Figure 6, Item 1) and adapter elbow (Figure 6, Item 2).

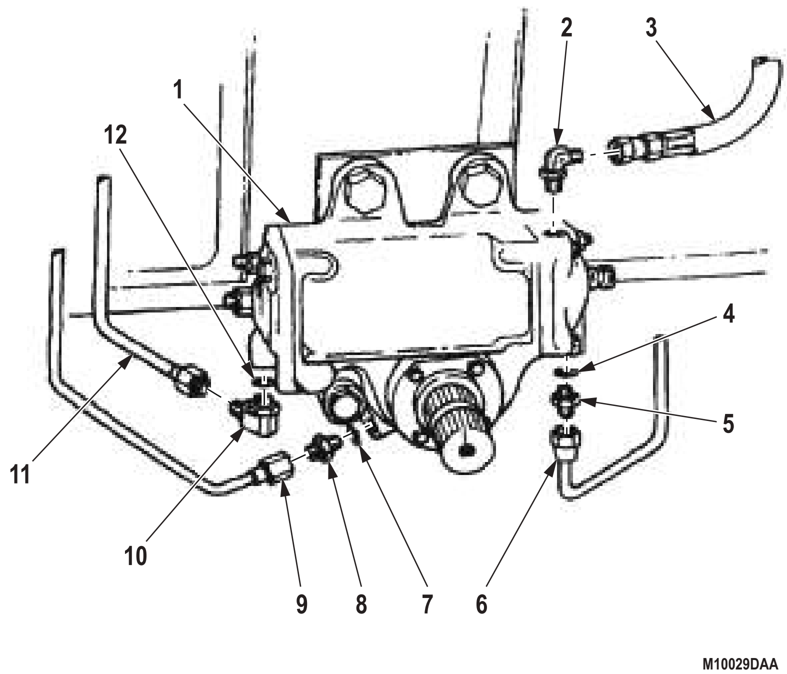


Figure 6. Power Steering Lines Installation.

INSTALLATION - Continued

7. Using alignment marks, install pitman arm (Figure 7, Item 4) on sector shaft (Figure 7, Item 2) with screw (Figure 7, Item 1) and locknut (Figure 7, Item 3). Tighten locknut 330 to 370 lb-ft (447 to 502 N·m).

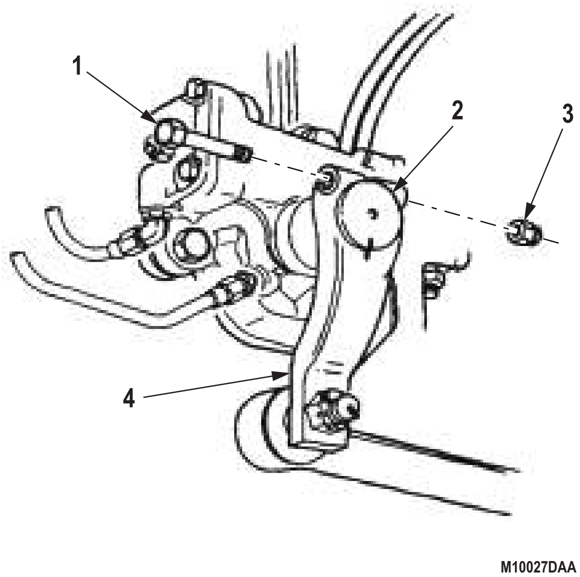


Figure 7. Pitman Arm Installation.

INSTALLATION - Continued

NOTE

Before connecting lower steering column, ensure steering wheel spokes form a Y. Assistant will steady steering wheel during installation.

8. Position lower steering column U-joint (Figure 8, Item 5) on steering gear input shaft (Figure 8, Item 6), ensuring that screw holes in U-joint (Figure 8, Item 3) align with groove in shaft (Figure 8, Item 6).
9. Install screw (Figure 8, Item 4) in sleeve (Figure 8, Item 3) and shaft (Figure 8, Item 6) and secure sleeve (Figure 8, Item 3) on shaft (Figure 8, Item 6) with lockwasher (Figure 8, Item 2) and nut (Figure 8, Item 1). Tighten nut 28 to 34 lb-ft (38 to 46 N·m).

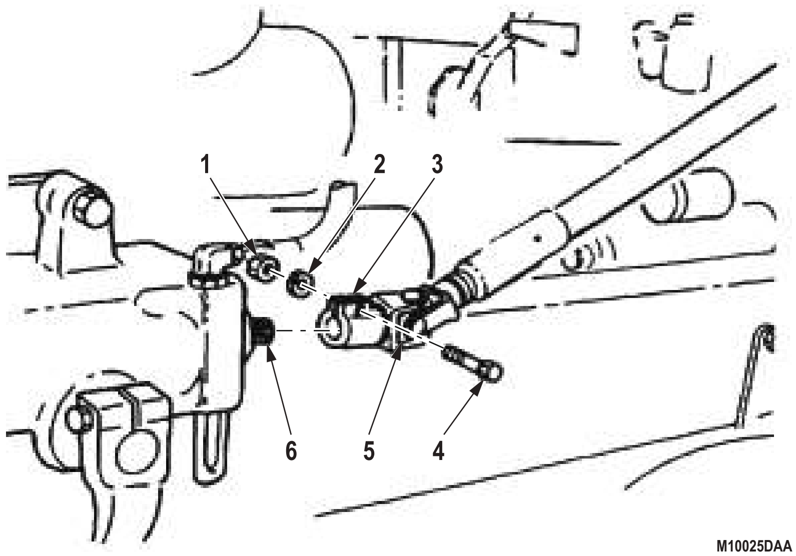


Figure 8. Steering Geer (Ross) Installation.

END OF TASK

FOLLOW-ON MAINTENANCE

1. Install steering gear stone shield. (WP 0498)
2. Install left splash shield. (Volume 4, WP 0575)
3. Install drag link. (WP 0492)
4. Fill steering gear to proper oil level. (Volume 5, WP 0820)
5. Start engine and road test vehicle. (TM 9-2320-272-10)

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
STEERING GEAR (SHEPPARD) AND MOUNTING BRACKET REPLACEMENT (M939A2 ONLY)

INITIAL SETUP:

Tools and Special Tools

Tool Kit, General Mechanic's: Automotive
(Volume 5, WP 0826, Table 1, Item 56)
Wrench, Torque, Click, Ratcheting, 3/4" Drive, 600 Ft-Lb
(Volume 5, WP 0826, Table 1, Item 61)

Materials/Parts

Cap Set, Protective, Dust and Moisture Seal
(Volume 5, WP 0825, Table 1, Item 13)
Tape, Antiseizing
(Volume 5, WP 0825, Table 1, Item 65)
Gasket and Seal Set
(Volume 5, WP 0827, Table 1, Item 179)
Locknut (Volume 5, WP 0827, Table 1, Item 289)
Qty: 4
Locknut (Volume 5, WP 0827, Table 1, Item 317)
Qty: 4

Materials/Parts (cont.)

Lockwasher
(Volume 5, WP 0827, Table 1, Item 404)
Qty: 1
O-ring (Volume 5, WP 0827, Table 1, Item 367)
Qty: 4
Steering Parts Kit
(Volume 5, WP 0827, Table 1, Item 78)

Personnel Required

(2)

Equipment Condition

Parking brake set. (TM 9-2320-272-10)
Left splash shield removed. (Volume 4, WP 0575)
Steering gear stone shield removed. (WP 0498)
Drag link disconnected. (WP 0492)

REMOVAL

NOTE

Ensure front wheels are aligned straight ahead.

1. Remove nut (Figure 1, Item 1), lockwasher (Figure 1, Item 2), and screw (Figure 1, Item 6) from sleeve (Figure 1, Item 7) of universal joint (Figure 1, Item 5). Discard lockwasher.
2. Using a chisel, open slot (Figure 1, Item 3) in sleeve (Figure 1, Item 7) of universal joint (Figure 1, Item 5) and pull lower steering column (Figure 1, Item 4) off steering gear input shaft (Figure 1, Item 8).
3. Bend two long tabs (Figure 1, Item 12) of retainer (Figure 1, Item 11) out of notches in pitman arm (Figure 1, Item 10).
4. Bend two short tabs (Figure 1, Item 13) out of retainer (Figure 1, Item 11) and remove retainer from sector shaft (Figure 1, Item 15). Discard retainer.

NOTE

Punch alignment marks on sector shaft and pitman arm.

5. Using puller, remove pitman arm (Figure 1, Item 10) and seal (Figure 1, Item 14) from sector shaft (Figure 1, Item 15) of steering gear (Figure 1, Item 9). Discard seal.

REMOVAL - Continued

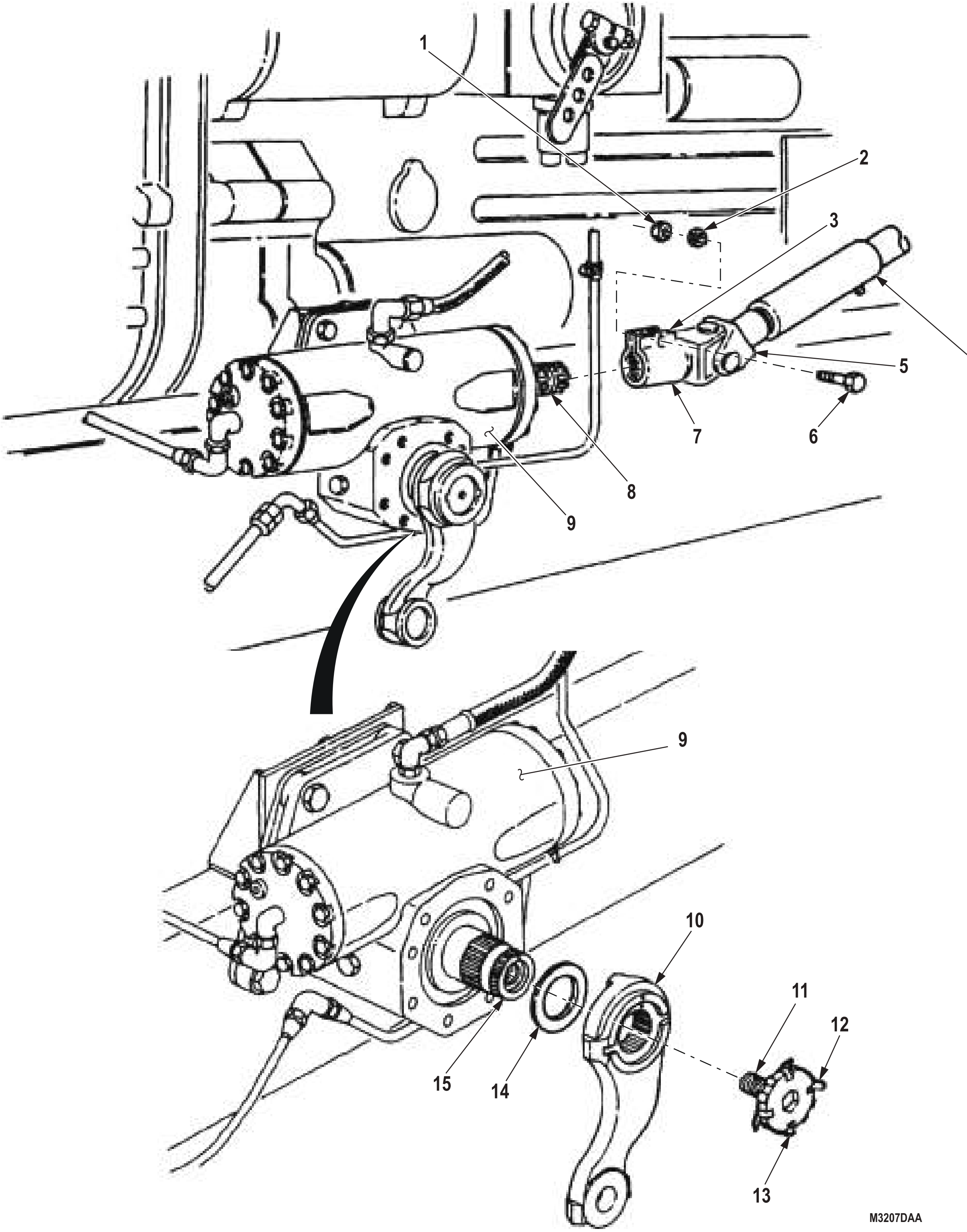


Figure 1. Steering Gear (Sheppard) Removal (M939A2).

REMOVAL - Continued

CAUTION

Cap or plug all openings immediately after disconnecting lines and hoses to prevent contamination. Failure to do so may result in steering system damage.

NOTE

- Have container ready to catch oil from disconnected lines.
- Tag all hydraulic lines and fittings for installation.

6. Disconnect oil pressure line (Figure 2, Item 4) and oil return line (Figure 2, Item 9) from adapter elbow (Figure 2, Item 3) and adapter (Figure 2, Item 8).
7. Disconnect assist cylinder pressure lines (Figure 2, Items 14 and16) from adapter elbow (Figure 2, Item 15) and elbow (Figure 2, Item 13).
8. Remove adapter elbow (Figure 2, Item 3) and adapter (Figure 2, Item 8) from steering gear (Figure 2, Item 6).
9. Remove o-rings (Figure 2, Items 5 and 7) from adapter elbow (Figure 2, Item 3) and adapter (Figure 2, Item 8). Discard o-rings.

NOTE

Perform Steps (10) through (12) if old steering gear is to be reused.

10. Remove elbow (Figure 2, Item 1) and adapter elbow (Figure 2, Item 15) from front of steering gear (Figure 2, Item 6).
11. Remove elbow (Figure 2, Item 13), line (Figure 2, Item 12), and adapter (Figure 2, Item 11) from bottom rear of steering gear (Figure 2, Item 6).
12. Remove o-rings (Figure 2, Items 2 and 10) from elbow (Figure 2, Item 1) and adapter (Figure 2, Item 11). Discard o-rings.

NOTE

Assistant will help with Step (13).

13. Remove four locknuts (Figure 2, Item 17), washers (Figure 2, Item 18), screws (Figure 2, Item 21), steering gear (Figure 2, Item 6), and mounting plate (Figure 2, Item 20) from left frame rail (Figure 2, Item 23). Discard locknuts.
14. Remove four locknuts (Figure 2, Item 24), screws (Figure 2, Item 22), and mounting bracket (Figure 2, Item 19) from left frame rail (Figure 2, Item 23). Discard locknuts.

REMOVAL - Continued

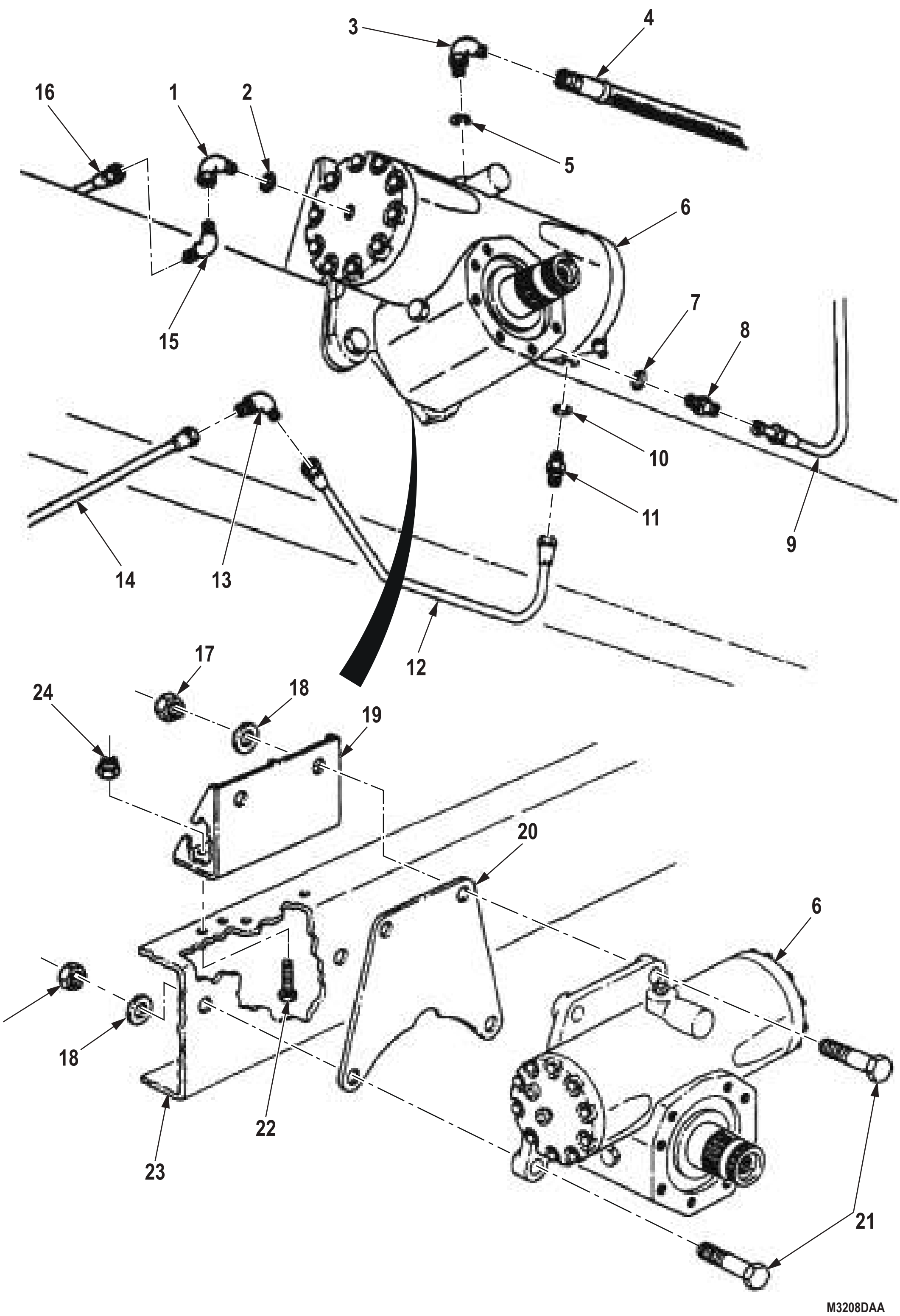


Figure 2. Steering Gear (Sheppard) and Mounting Bracket Installation (M939A2).

END OF TASK

INSTALLATION

1. Install mounting bracket (Figure 3, Item 19) on left frame rail (Figure 3, Item 23) with four screws (Figure 3, Item 22) and locknuts (Figure 3, Item 24). Do not tighten locknuts.
2. Install mounting plate (Figure 3, Item 20) and steering gear (Figure 3, Item 6) housing on left frame rail (Figure 3, Item 23) and mounting bracket (Figure 3, Item 19) with four screws (Figure 3, Item 21), washers (Figure 3, Item 18), and locknuts (Figure 3, Item 17). Tighten locknuts 260 to 280 lb-ft (353 to 380 N·m).
3. Tighten locknuts (Figure 3, Item 24) 60 to 70 lb-ft (81 to 95 N·m).

NOTE

Perform Steps (4), (5), and (6) if old steering gear is to be installed.

4. Install o-rings (Figure 3, Items 2 and 10) on elbow (Figure 3, Item 1) and adapter (Figure 3, Item 11).
5. Install elbow (Figure 3, Item 1) and adapter elbow (Figure 3, Item 15) on steering gear (Figure 3, Item 6).
6. Install adapter (Figure 3, Item 11), line (Figure 3, Item 12), and elbow (Figure 3, Item 13) on steering gear (Figure 3, Item 6).
7. Install o-rings (Figure 3, Items 5 and 7) on adapter elbow (Figure 3, Item 3) and adapter (Figure 3, Item 8).
8. Install adapter elbow (Figure 3, Item 3) and adapter (Figure 3, Item 8) on steering gear (Figure 3, Item 6).

NOTE

Wrap male pipe threads with antiseize tape before installation.

9. Connect assist cylinder pressure lines (Figure 3, Items 14 and 16) to elbow (Figure 3, Item 13) and adapter elbow (Figure 3, Item 15).
10. Connect oil return line (Figure 3, Item 9) and oil pressure line (Figure 3, Item 4) to adapter (Figure 3, Item 8) and adapter elbow (Figure 3, Item 3).

INSTALLATION - Continued

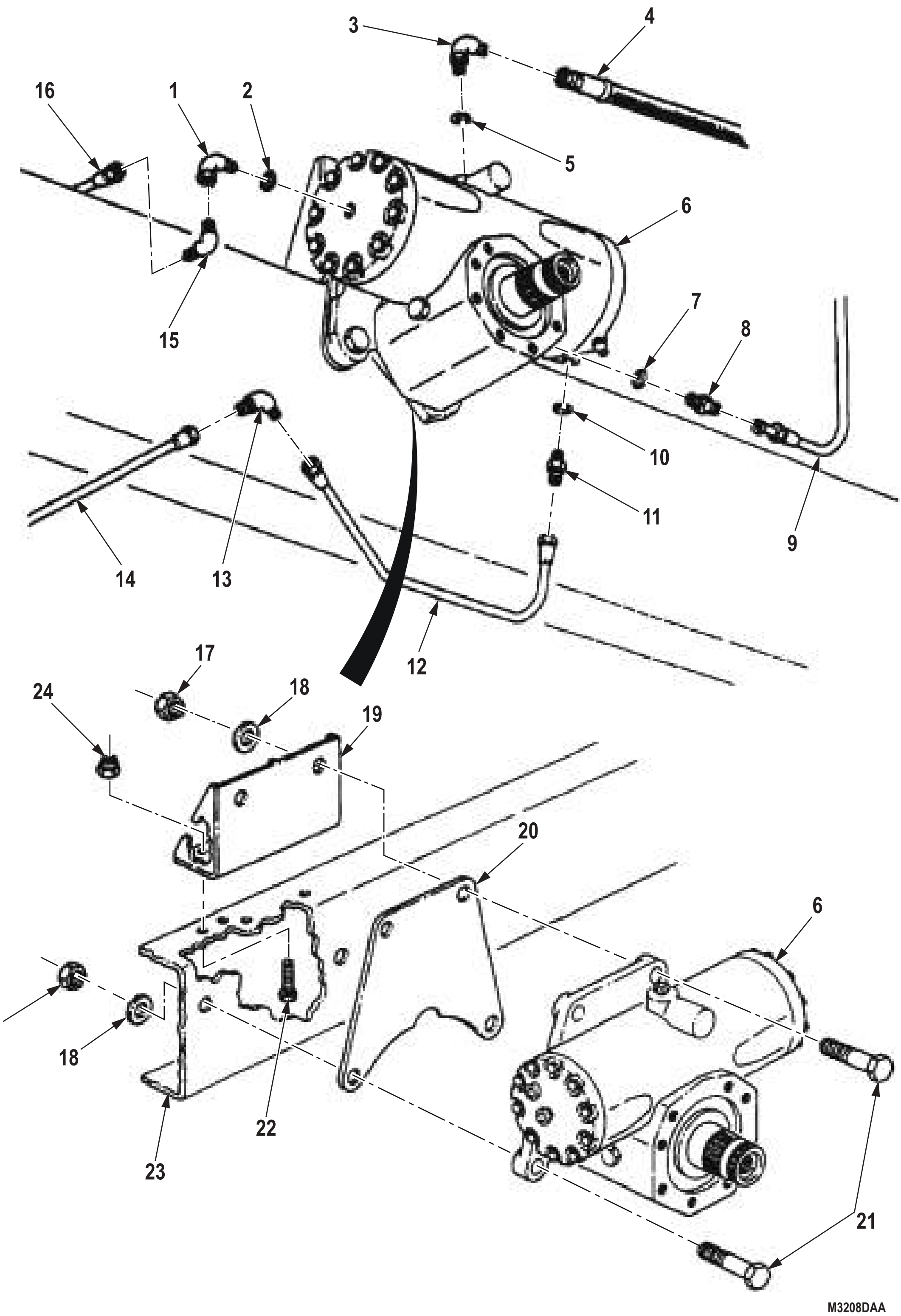


Figure 3. Steering Gear (Sheppard) and Mounting Bracket Installation (M939A2).

INSTALLATION - Continued

11. Press friction washer (Figure 4, Item 9) and lockwasher (Figure 4, Item 11) into slot on retainer (Figure 4, Item 4).
12. Press three nylon balls (Figure 4, Item 10) into indentations on retainer (Figure 4, Item 4).
13. Aligning timing marks (Figure 4, Items 1 and 2), position seal (Figure 4, Item 7) and pitman arm (Figure 4, Item 3) on output shaft (Figure 4, Item 8).
14. Install retainer (Figure 4, Item 4) into output shaft (Figure 4, Item 8) until drag of friction washer (Figure 4, Item 9) is felt.
15. Align long tabs (Figure 4, Item 5) to notches in pitman arm (Figure 4, Item 3) and bend tabs in notches. Back out retainer (Figure 4, Item 4) up to 1/2 turn as necessary for tabs alignment.
16. Tighten retainer (Figure 4, Item 4) 225 lb-ft (305 N·m).
17. Bend two short tabs (Figure 4, Item 6) into notches on retainer (Figure 4, Item 4). Tighten retainer if necessary to align tabs with notches of retainer.

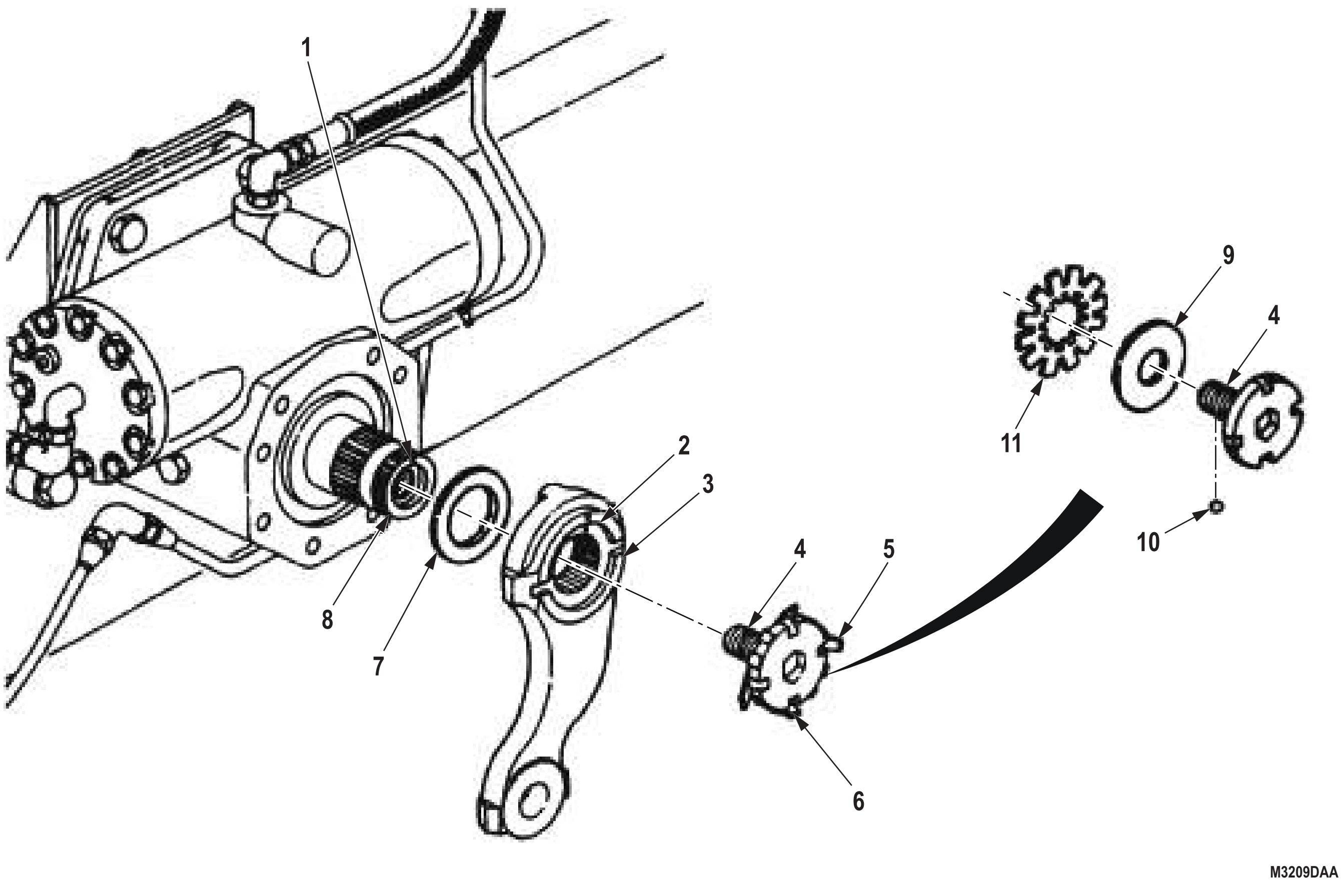


Figure 4. Steering Gear (Sheppard) Assembly (M939A2).

INSTALLATION - Continued

NOTE

- Before installing lower steering column, ensure steering wheel spokes form a Y.
- Assistant will steady steering wheel while universal joint is connected to steering gear.

18. Position universal joint (Figure 5, Item 4) onto steering gear input shaft (Figure 5, Item 5). Ensure screw holes in sleeve of universal joint align with groove in shaft.
19. Install universal joint (Figure 5, Item 4) on input shaft (Figure 5, Item 5) with screw (Figure 5, Item 3), lockwasher (Figure 5, Item 2), and nut (Figure 5, Item 1). Tighten nut 28 to 34 lb-ft (38 to 46 N·m).

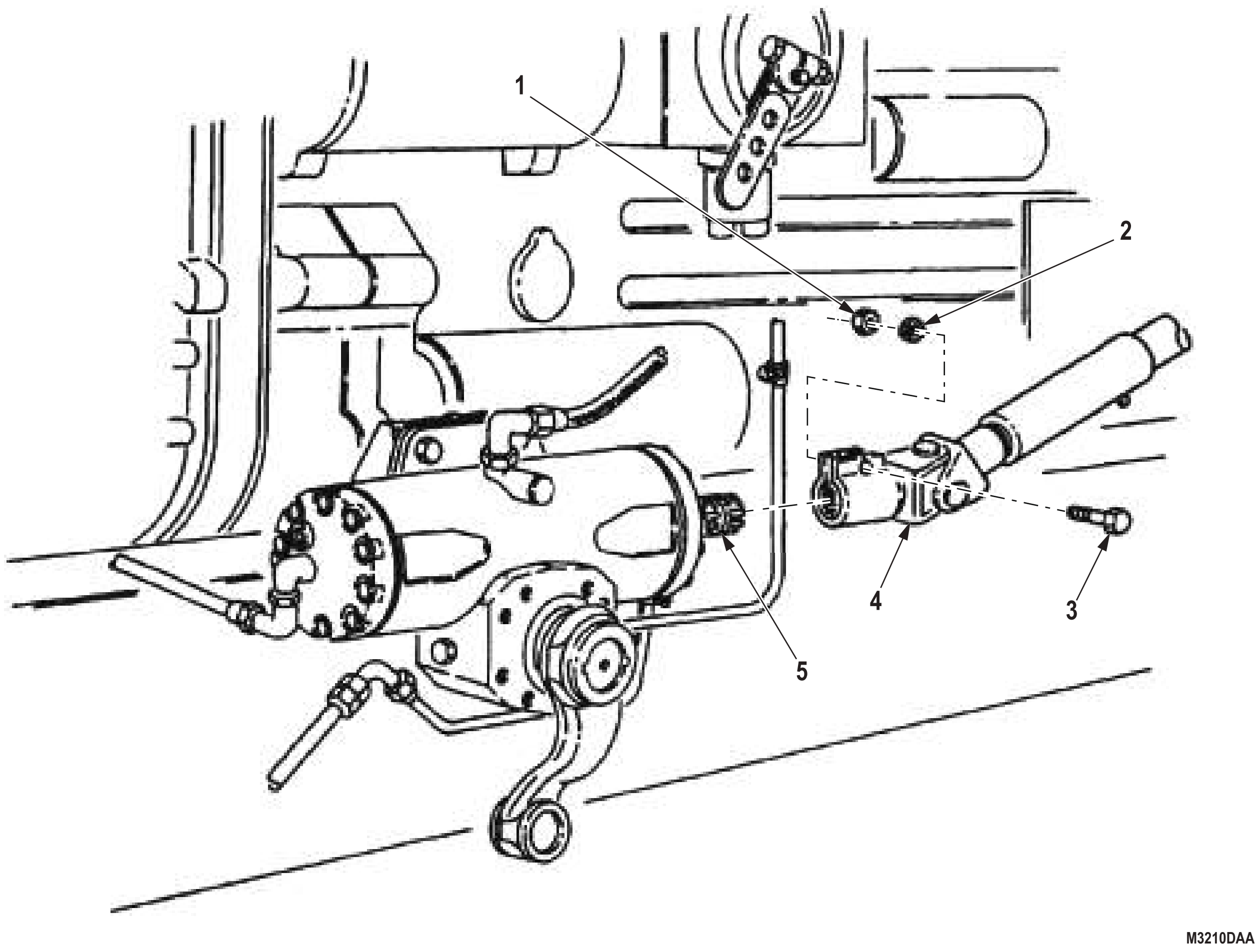


Figure 5. Steering Gear Installation (M939A2).

END OF TASK

FOLLOW-ON MAINTENANCE

1. Install steering gear stone shield. (WP 0498)
2. Install left splash shield. (Volume 4, WP 0575)
3. Install drag link. (WP 0492)
4. Fill steering gear to proper oil level. (Volume 4, WP 0742)
5. Start engine and road test vehicle. (TM 9-2320-272-10)

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
PITMAN ARM REPLACEMENT (SHEPPARD)

INITIAL SETUP:

Tools and Special Tools

Tool Kit, General Mechanic's: Automotive
(Volume 5, WP 0826, Table 1, Item 56)
Wrench, Torque, Click, Ratcheting, 1/2" Drive, 250 Ft-Lb
(Volume 5, WP 0826, Table 1, Item 63)

Materials/Parts

Steering Parts Kit
(Volume 5, WP 0827, Table 1, Item 78)

Equipment Condition

Parking brake set. (TM 9-2320-272-10)

Equipment Condition (cont.)

Left splash shield removed. (TM 9-2320-272-10)
Drag link disconnected. (WP 0492)

REMOVAL

1. Bend two long tabs (Figure 1, Item 9) of retainer (Figure 1, Item 5) out of notches in pitman arm (Figure 1, Item 10).
2. Bend two short tabs (Figure 1, Item 4) out of notches in retainer (Figure 1, Item 5).
3. Remove retainer (Figure 1, Item 5) and pitman arm (Figure 1, Item 10) from shaft (Figure 1, Item 11) of steering gear (Figure 1, Item 1). Discard retainer, tab lockwasher, and friction washer.
4. Remove friction washer (Figure 1, Item 6), tab lockwasher (Figure 1, Item 7), and three nylon balls (Figure 1, Item 8) from retainer (Figure 1, Item 5).

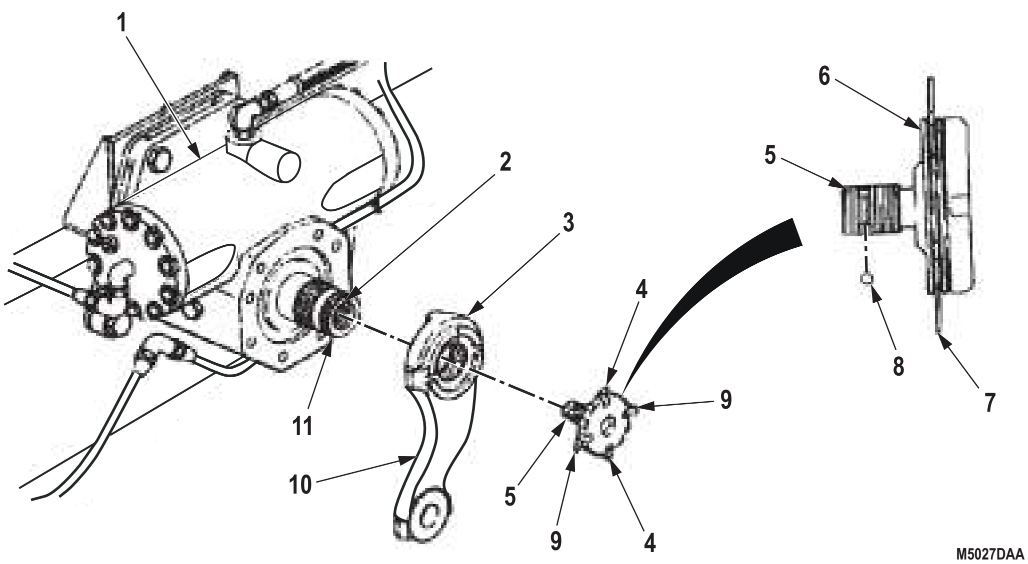


Figure 1. Pitman Arm Removal.

END OF TASK

INSTALLATION

1. Press friction washer (Figure 2, Item 6) and tab lockwasher (Figure 2, Item 7) into slot on retainer (Figure 2, Item 5).
2. Press three nylon balls (Figure 2, Item 8) into indentations on retainer (Figure 2, Item 5).
3. Align marks (Figure 2, Items 2 and 3), and position pitman arm (Figure 2, Item 10) on output shaft (Figure 2, Item 11).
4. Install retainer (Figure 2, Item 5) into shaft (Figure 2, Item 11) until drag is felt on friction washer (Figure 2, Item 6).
5. Align long tabs (Figure 2, Item 9) to notches on pitman arm (Figure 2, Item 10) and bend tabs into notches.
6. Tighten retainer (Figure 2, Item 5) 225 lb-ft (305 N·m).
7. Bend two short tabs (Figure 2, Item 4) into notches on retainer (Figure 2, Item 5). Tighten retainer, if necessary, to align notches.

INSTALLATION - Continued

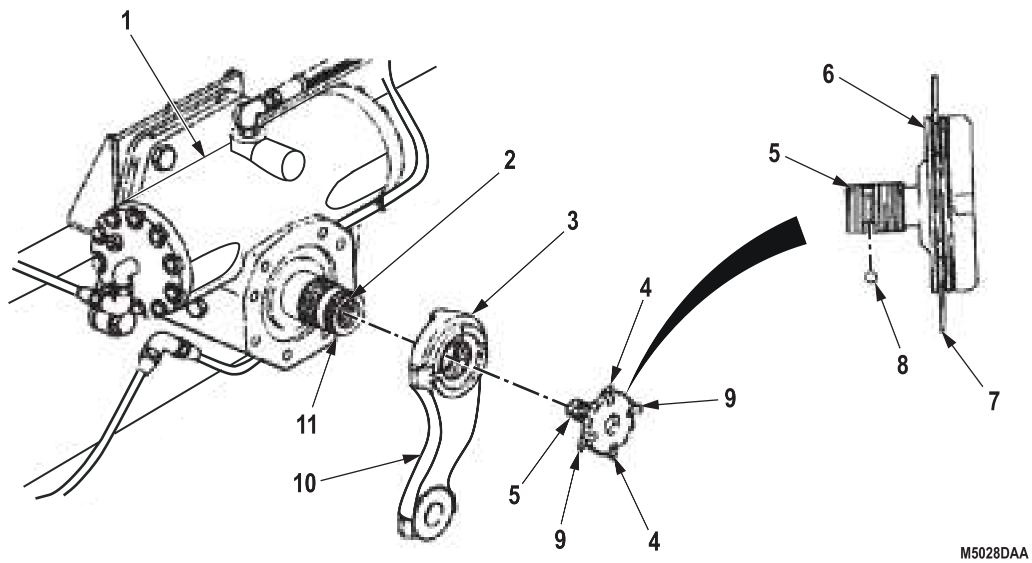


Figure 2. Pitman Arm Installation.

END OF TASK

FOLLOW-ON MAINTENANCE

1. Connect drag link. (WP 0492)
2. Install left splash shield. (TM 9-2320-272-10)

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
POWER STEERING PUMP FILTER AND RESERVOIR REPLACEMENT (M939A2)

INITIAL SETUP:

Tools and Special Tools
Tool Kit, General Mechanic's: Automotive
(Volume 5, WP 0826, Table 1, Item 56)

Materials/Parts
Cloth, Abrasive: Crocus
(Volume 5, WP 0825, Table 1, Item 18)
Filter Element Kit
(Volume 5, WP 0827, Table 1, Item 88)

References
Volume 5, WP 0820

Equipment Condition
Parking brake set. (TM 9-2320-272-10)
Hood raised and secured. (TM 9-2320-272-10)
Left splash shield removed. (TM 9-2320-272-10)

REMOVAL

NOTE

Have container ready to catch hydraulic fluid.

1. Loosen clamp (Figure 1, Item 17) and remove hose (Figure 1, Item 18) from tube (Figure 1, Item 16).
2. Remove wing nut (Figure 1, Item 4), washer (Figure 1, Item 5), gasket (Figure 1, Item 3), lid (Figure 1, Item 2), and gasket (Figure 1, Item 1) from stud (Figure 1, Item 6) and reservoir (Figure 1, Item 12). Discard gaskets.
3. Remove spring (Figure 1, Item 21), filter cap (Figure 1, Item 20), filter (Figure 1, Item 19), and packing (Figure 1, Item 7) from stud (Figure 1, Item 6) and reservoir (Figure 1, Item 12). Discard filter and packing.
4. Remove stud (Figure 1, Item 6) and valve (Figure 1, Item 8) from plate (Figure 1, Item 11).
5. Remove two screws (Figure 1, Item 9), lockwashers (Figure 1, Item 10), plate (Figure 1, Item 11), and reservoir (Figure 1, Item 12) from power steering pump (Figure 1, Item 15). Discard lockwashers.
6. Remove gaskets (Figure 1, Items 13 and 14) from power steering pump (Figure 1, Item 15). Discard gaskets.
7. Clean inside of reservoir (Figure 1, Item 12) with crocus cloth.

REMOVAL - Continued

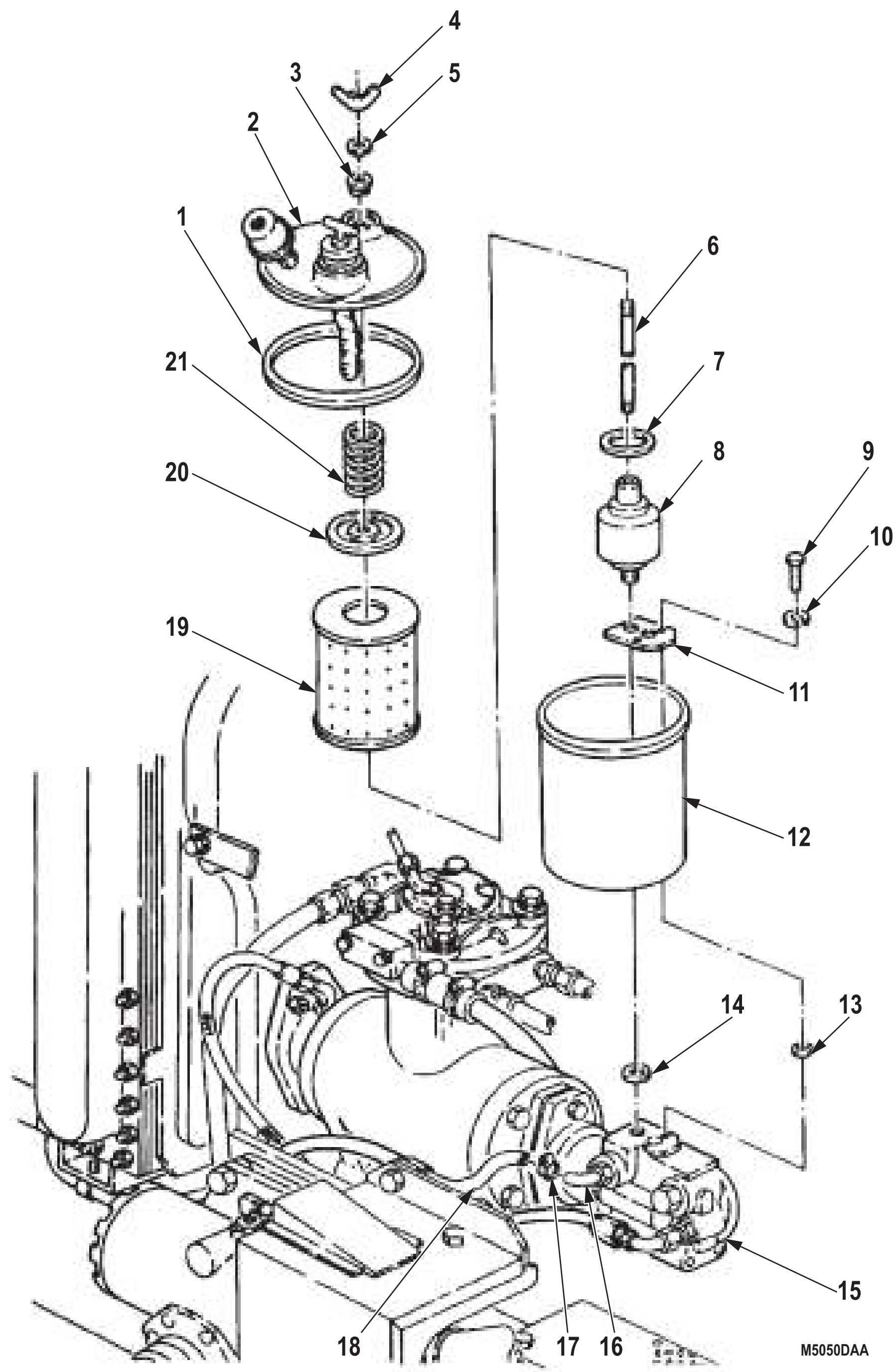


Figure 1. Power Steering Pump Filter and Reservoir Removal.

END OF TASK

INSTALLATION

1. Install gaskets (Figure 2, Items 13 and 14) on power steering pump (Figure 2, Item 15).
2. Install reservoir (Figure 2, Item 12) and plate (Figure 2, Item 11) on power steering pump (Figure 2, Item 15) with two lockwashers (Figure 2, Item 10) and screws (Figure 2, Item 9).
3. Install valve (Figure 2, Item 8) and stud (Figure 2, Item 6) on plate (Figure 2, Item 11).
4. Install packing (Figure 2, Item 7), filter (Figure 2, Item 19), filter cap (Figure 2, Item 20), and spring (Figure 2, Item 21) on stud (Figure 2, Item 6) and reservoir (Figure 2, Item 12).
5. Install gasket (Figure 2, Item 1), lid (Figure 2, Item 2), and gasket (Figure 2, Item 3) on stud (Figure 2, Item 6) and reservoir (Figure 2, Item 12) with washer (Figure 2, Item 5) and wing nut (Figure 2, Item 4).
6. Install hose (Figure 2, Item 18) on tube (Figure 2, Item 16) with clamp (Figure 2, Item 17).

INSTALLATION - Continued

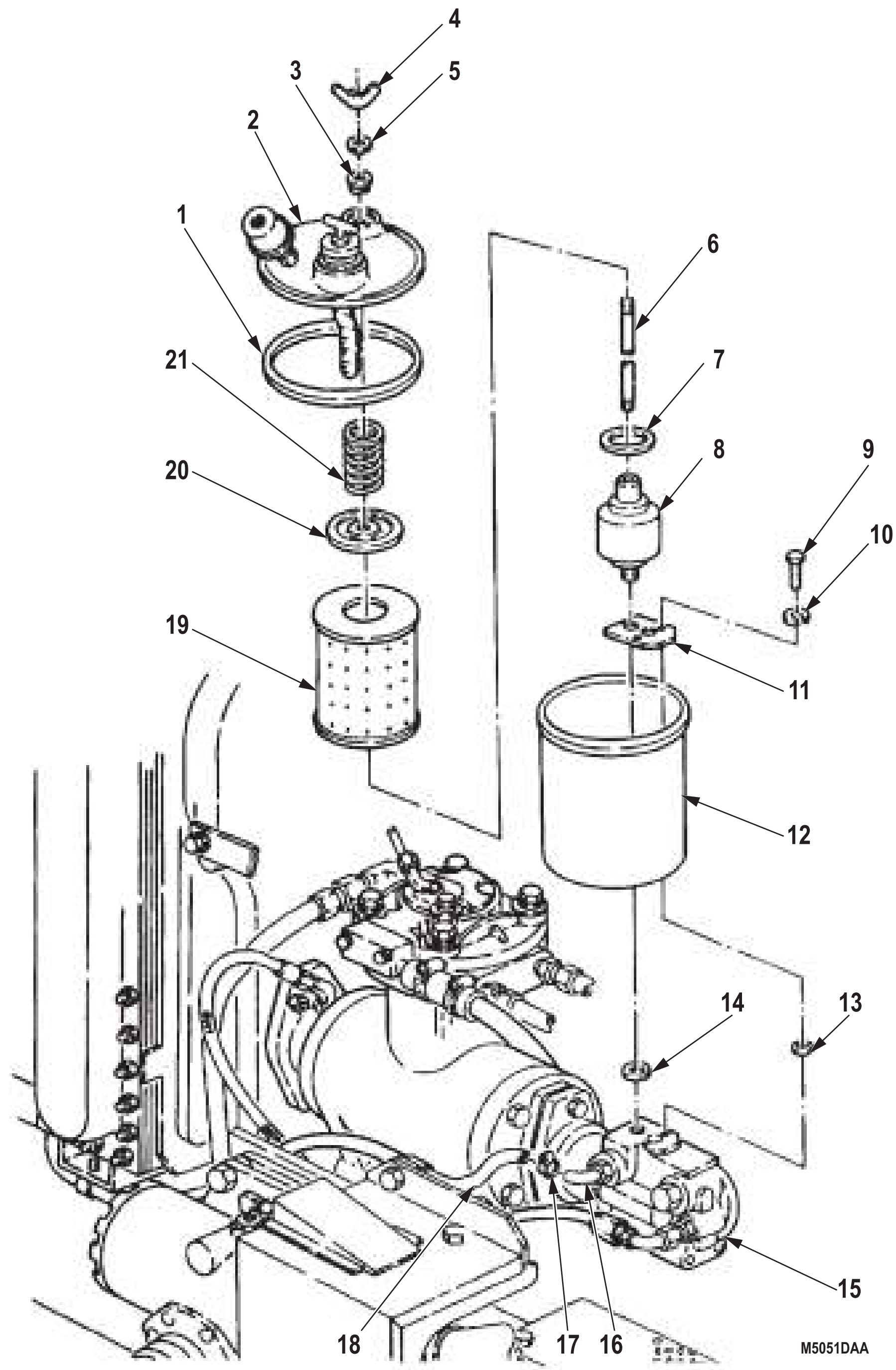


Figure 2. Power Steering Pump Filter and Reservoir Installation.

END OF TASK

FOLLOW-ON MAINTENANCE

1. Fill power steering reservoir. (Volume 5, WP 0820)
2. Start engine and check for filter leaks and steering for proper operation. (TM 9-2320-272-10)
3. Install left splash shield. (TM 9-2320-272-10)

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
POWER STEERING PUMP REPLACEMENT (M939/A1)

INITIAL SETUP:

Tools and Special Tools
Tool Kit, General Mechanic's: Automotive
(Volume 5, WP 0826, Table 1, Item 56)

Materials/Parts
Cap Set, Protective, Dust and Moisture Seal
(Volume 5, WP 0825, Table 1, Item 13)
Locknut (Volume 5, WP 0827, Table 1, Item 322)
Qty: 1
Lockwasher
(Volume 5, WP 0827, Table 1, Item 186)
Qty: 2
Lockwasher
(Volume 5, WP 0827, Table 1, Item 404)
Qty: 3

Materials/Parts (cont.)
Springtite Assembly
(Volume 5, WP 0827, Table 1, Item 29)
Qty: 1
Woodruff Key
(Volume 5, WP 0827, Table 1, Item 418)
Qty: 2

References
Volume 5, WP 0820

Equipment Condition
Parking brake set. (TM 9-2320-272-10)
Hood raised and secured. (TM 9-2320-272-10)
Steering pump drivebelts removed (M939/A1).
(WP 0504)

REMOVAL

WARNING

Do not start engine when steering assist cylinder hoses are disconnected. Pressure may whip hoses. Failure to comply may result in injury or death to personnel.

CAUTION

Cap or plug all openings after disconnecting hydraulic lines and hoses to prevent contamination. Failure to do so may result in steering system damage.

NOTE

- Have drainage container ready to catch hydraulic oil.
- Use drain pans to retain leaking/draining fluids. Refer to local procedures and plans for preventing and responding to fluid spills or leaks. Comply with local regulations when disposing of clean up material and leaked and spilled fluids.
- Tag all hydraulic lines and hoses for installation.

1. Loosen clamp (Figure 1, Item 4) and remove hose (Figure 1, Item 5) from steering pump return tube (Figure 1, Item 3).
2. Loosen nut (Figure 1, Item 7) and remove high-pressure hose (Figure 1, Item 6) from steering pump high-pressure fitting (Figure 1, Item 8).
3. Remove three screws (Figure 1, Item 17), lockwashers (Figure 1, Item 18), and steering pump (Figure 1, Item 2) from mounting bracket (Figure 1, Item 16). Discard lockwashers.
4. Remove locknut (Figure 1, Item 9), washer (Figure 1, Item 10), screw (Figure 1, Item 13), washer (Figure 1, Item 12), screw (Figure 1, Item 14), washer (Figure 1, Item 15), and adjusting link (Figure 1, Item 11) from mounting bracket (Figure 1, Item 16) and engine (Figure 1, Item 19). Discard locknut.

REMOVAL - Continued

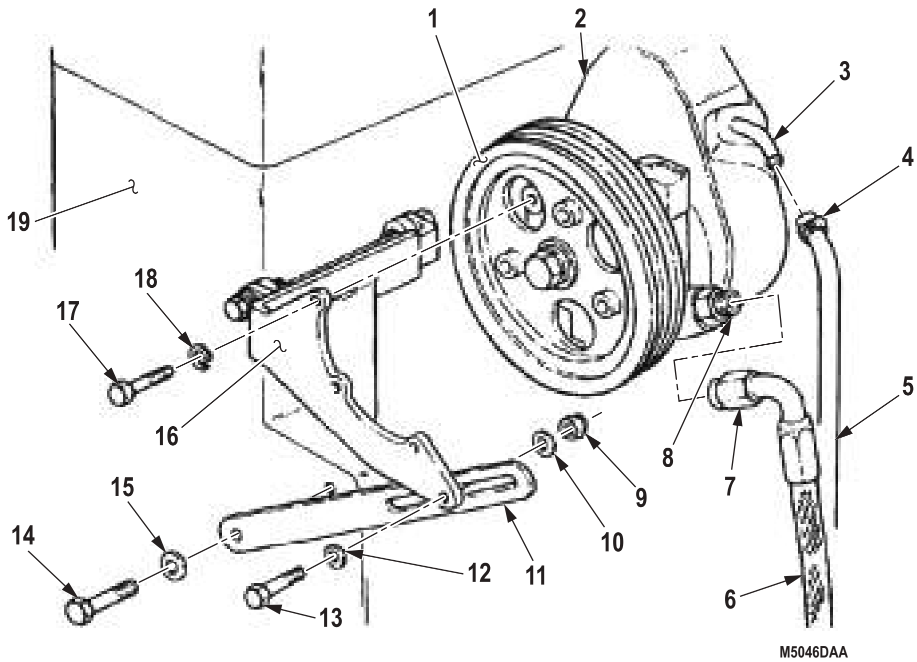


Figure 1. Power Steering Pump Removal.

END OF TASK

DISASSEMBLY

1. Remove two screws (Figure 2, Item 5), lockwashers (Figure 2, Item 4), washers (Figure 2, Item 3), and mounting bracket (Figure 2, Item 2) from engine mounting bracket (Figure 2, Item 1). Discard lockwashers.

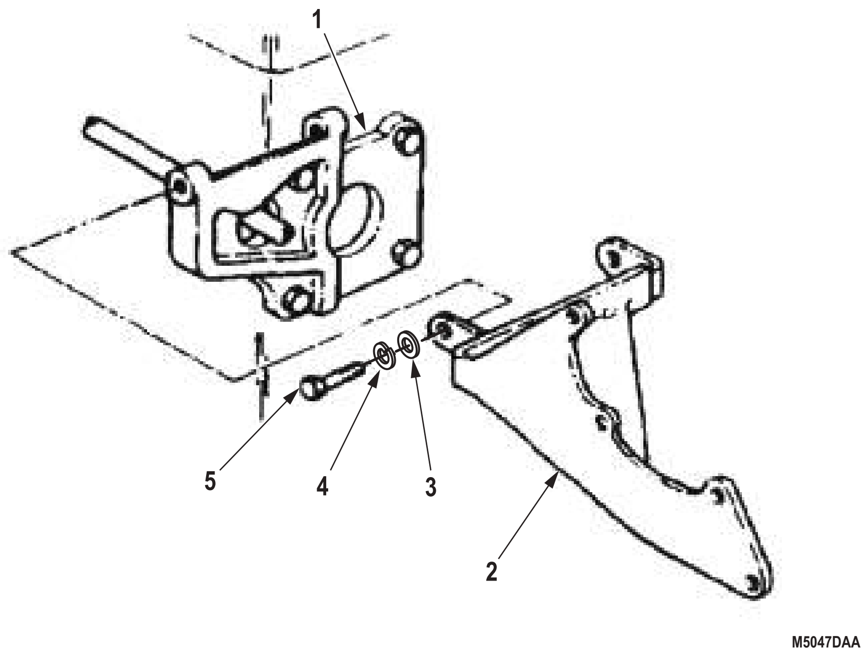


Figure 2. Power Steering Pump Disassembly.

DISASSEMBLY - Continued

2. Remove springtite (Figure 3, Item 6), washer (Figure 3, Item 5), pulley (Figure 3, Item 4), and woodruff key (Figure 3, Item 3) from steering pump shaft (Figure 3, Item 7). Discard woodruff key and springtite.
3. Remove breather (Figure 3, Item 1) from steering pump (Figure 3, Item 2).

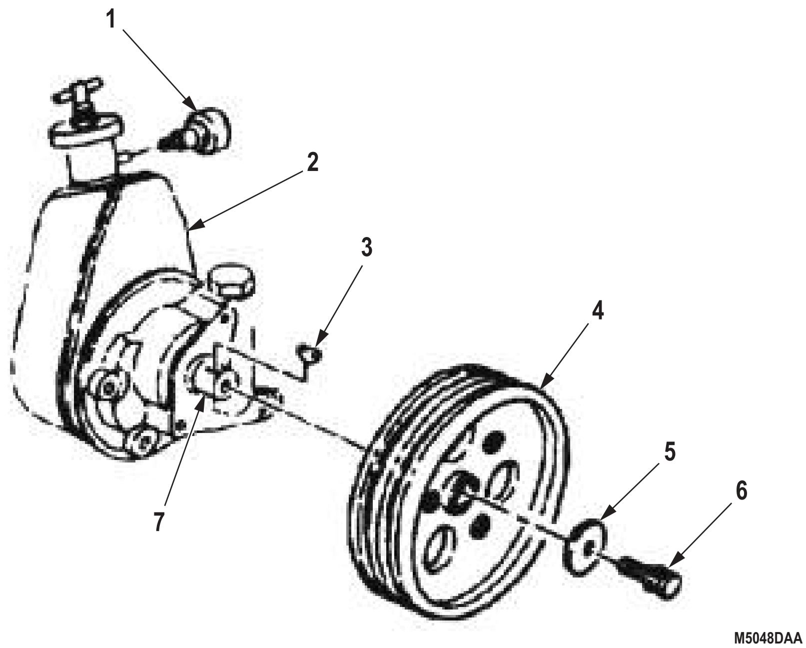


Figure 3. Power Steering Pump Disassembly.

END OF TASK

ASSEMBLY

1. Install breather (Figure 4, Item 1) on steering pump (Figure 4, Item 2).
2. Install woodruff key (Figure 4, Item 3). Press pulley (Figure 4, Item 4) on pump shaft (Figure 4, Item 7) and install washer (Figure 4, Item 5) and springtite (Figure 4, Item 6).

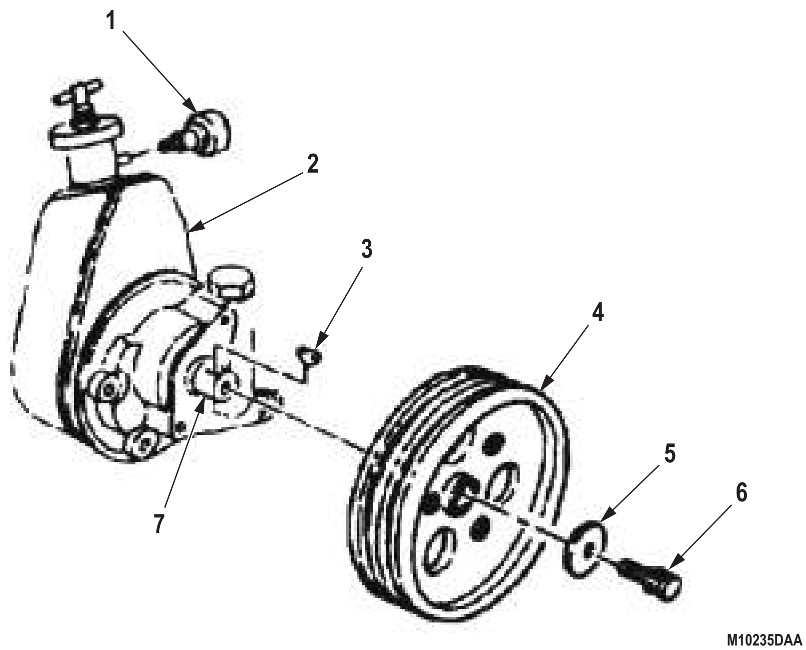


Figure 4. Power Steering Pump Assembly.

ASSEMBLY - Continued

3. Install mounting bracket (Figure 5, Item 2) on engine bracket (Figure 5, Item 1) with two washers (Figure 5, Item 3), lockwashers (Figure 5, Item 4), and screws (Figure 5, Item 5).

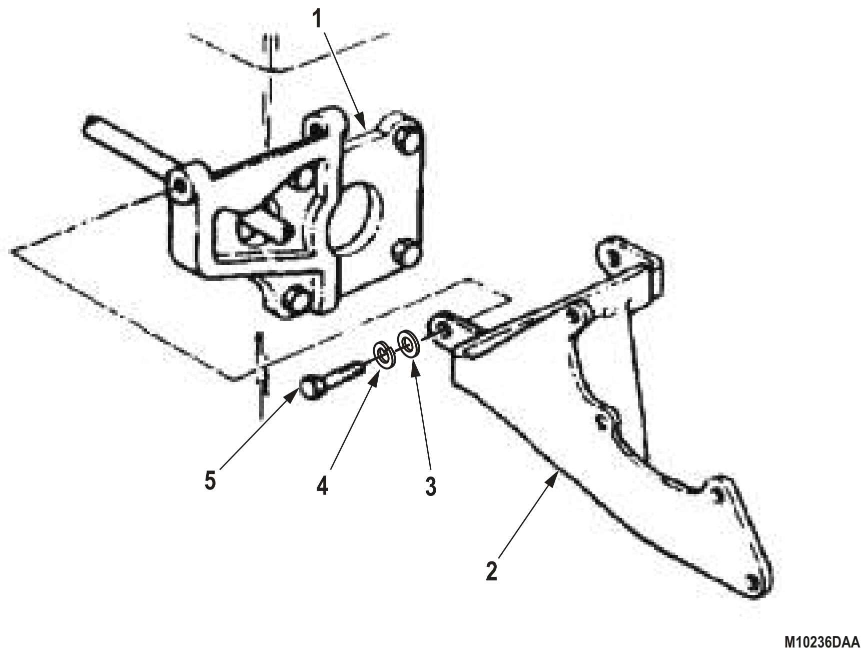


Figure 5. Power Steering Pump Assembly.

ASSEMBLY - Continued

END OF TASK

INSTALLATION

1. Install adjusting link (Figure 6, Item 11) on mounting bracket (Figure 6, Item 16) with washer (Figure 6, Item 12), screw (Figure 6, Item 13), washer (Figure 6, Item 10), and locknut (Figure 6, Item 9).
2. Install adjusting link (Figure 6, Item 11) on engine (Figure 6, Item 19) with washer (Figure 6, Item 15) and screw (Figure 6, Item 14).
3. Install steering pump (Figure 6, Item 2) on mounting bracket (Figure 6, Item 16) with three lockwashers (Figure 6, Item 18) and screws (Figure 6, Item 17).

NOTE

- Do not reuse hydraulic oil.
- Remove all caps and plugs prior to installation.

4. Install return hose (Figure 6, Item 5) on return tube (Figure 6, Item 3) with clamp (Figure 6, Item 4).
5. Install high-pressure return hose (Figure 6, Item 6) on high-pressure fitting (Figure 6, Item 8) and tighten nut (Figure 6, Item 7).

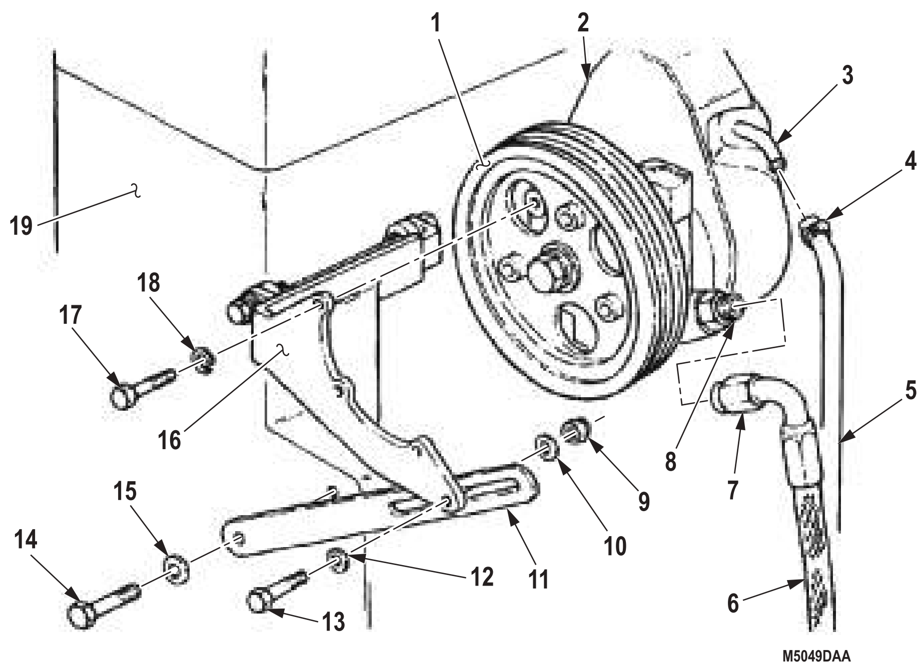


Figure 6. Power Steering Pump Installation.

END OF TASK

FOLLOW-ON MAINTENANCE

1. Install and adjust steering pump drivebelts. (WP 0504)
2. Fill power steering pump reservoir to proper level. (Volume 5, WP 0820)
3. Start engine, check hoses for leaks and steering for proper operation. (TM 9-2320-272-10)

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
STEERING PUMP DRIVEBELTS REPLACEMENT (M939/A1)

INITIAL SETUP:

Tools and Special Tools

Tool Kit, General Mechanic's: Automotive
(Volume 5, WP 0826, Table 1, Item 56)
Belt, Tension Gauge
(Volume 5, WP 0826, Table 1, Item 9)
Prybar
Wrench, Torque, Click, Ratcheting, 1/2" Drive,
250 Ft-Lb
(Volume 5, WP 0826, Table 1, Item 63)

Equipment Condition

Parking brake set. (TM 9-2320-272-10)

Equipment Condition (cont.)

Left splash shield removed. (TM 9-2320-272-10)
Fan drivebelts removed. (Volume 2, WP 0297)

REMOVAL

1. Loosen nut (Figure 1, Item 5) on pump adjusting link (Figure 1, Item 4) and pump bracket (Figure 1, Item 7).
2. Loosen two screws (Figure 1, Items 1 and 6) on pump bracket (Figure 1, Item 7) and mounting bracket (Figure 1, Item 11).
3. While pushing downward on power steering pump (Figure 1, Item 2), remove two drivebelts (Figure 1, Item 8).

NOTE

Pump drivebelts must be replaced in matched sets.

4. Inspect two pump drivebelts (Figure 1, Item 8) for cracks, splits, breaks, and wear. Replace both drivebelts if either is cracked, split, broken, or worn.

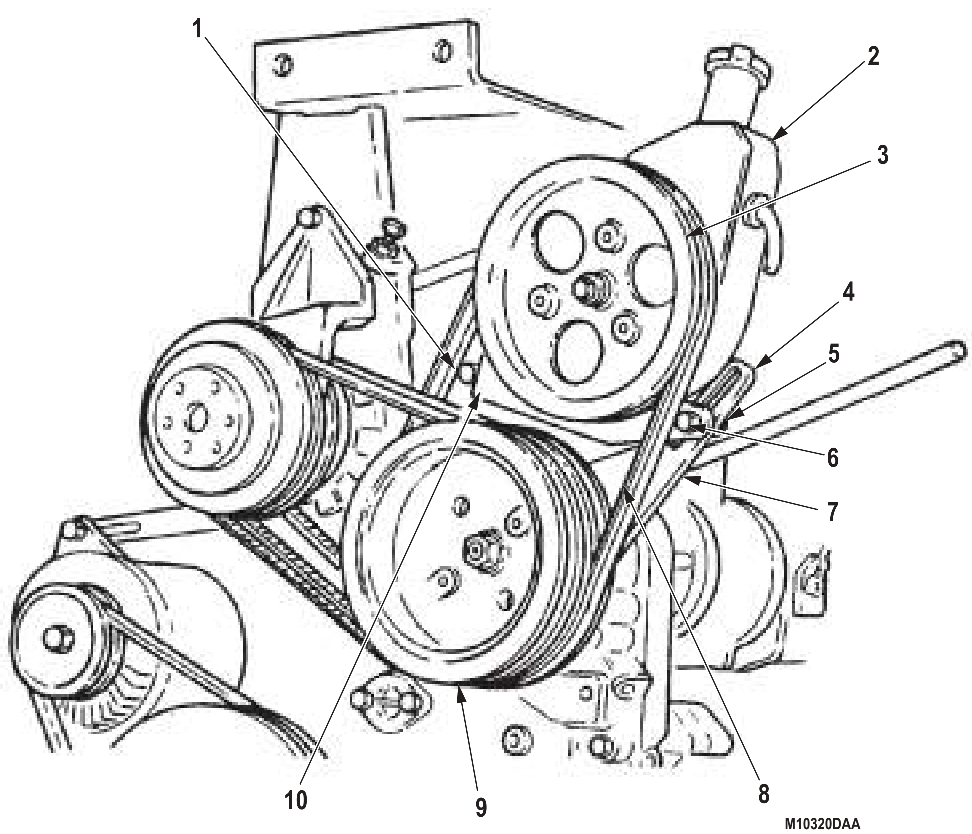


Figure 1. Steering Pump Drivebelts Removal.

END OF TASK

INSTALLATION

1. Place two drivebelts (Figure 2, Item 1) over pump pulley (Figure 2, Item 2) and third and fourth slots of accessory drive pulley (Figure 2, Item 3).

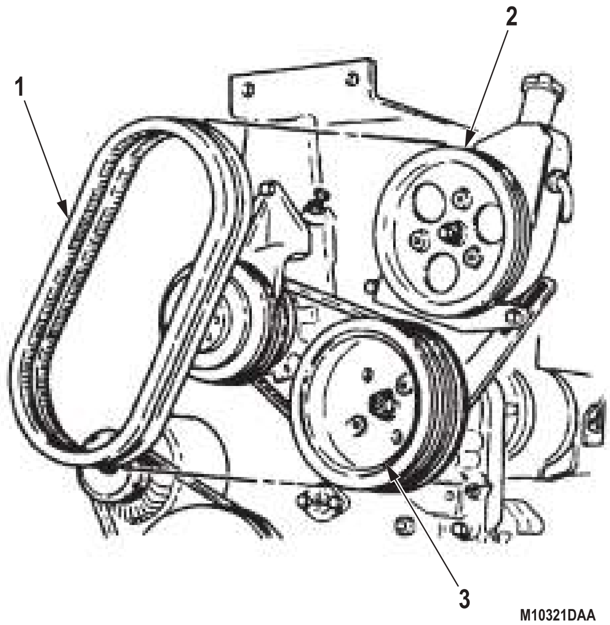


Figure 2. Steering Pump Drivebelts Installation.

2. Perform Adjustment.

END OF TASK

ADJUSTMENT

1. Loosen screw (Figure 3, Item 6) and nut (Figure 3, Item 5) from pump adjusting link (Figure 3, Item 4) and pump bracket (Figure 3, Item 7).
2. Loosen two screws (Figure 3, Item 1) from pump bracket (Figure 3, Item 7) and mounting bracket (Figure 3, Item 10).
3. Place prybar beneath steering pump (Figure 3, Item 2) so end rests on engine (Figure 3, Item 9).
4. Using engine (Figure 3, Item 9) for leverage, push prybar upward until drivebelts (Figure 3, Item 11) appear tight.
5. Tighten screw (Figure 3, Item 6) and nut (Figure 3, Item 5).
6. Tighten two screws (Figure 3, Item 1) 30 to 40 lb-ft (41 to 54 N·m).

NOTE

If belt tension cannot be properly adjusted, replace drivebelts.

7. Position belt tension gauge on drivebelt (Figure 3, Item 11) between pump pulley (Figure 3, Item 3) and accessory drive pulley (Figure 3, Item 8).
   a. New drivebelt (Figure 3, Item 11) tension should be 95 to 105 lb-ft (418 to 462 N·m).
   b. Used drivebelt (Figure 3, Item 11) tension should be 85 to 95 lb-ft (378 to 422 N·m).

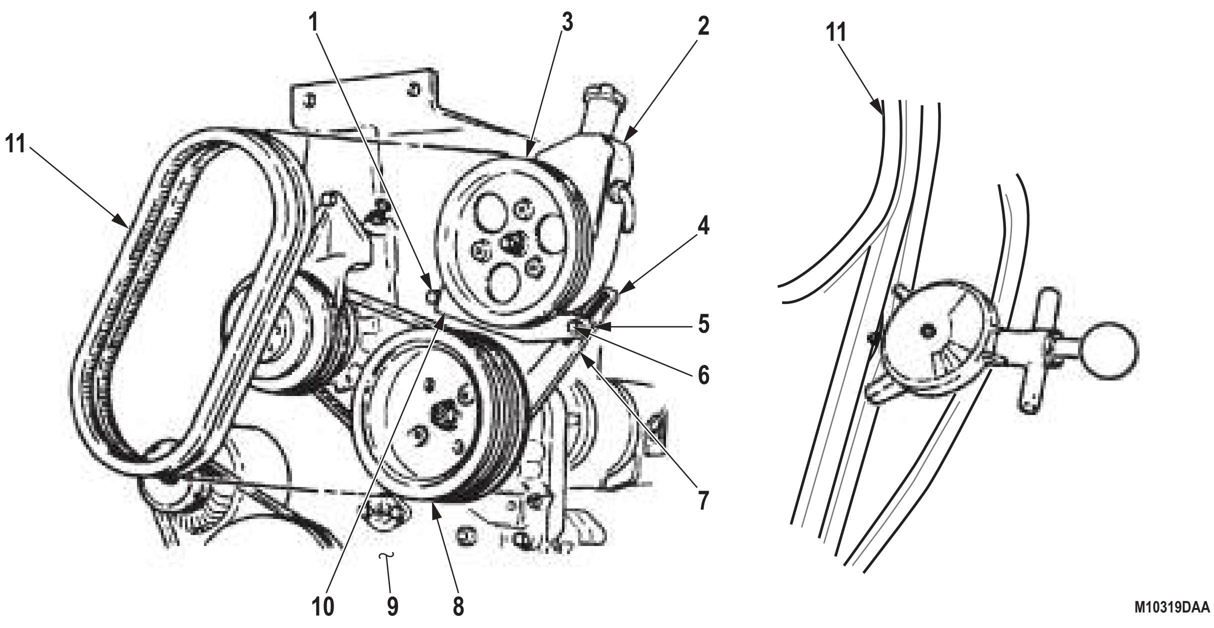


Figure 3. Steering Pump Drivebelts Adjustment.

END OF TASK

FOLLOW-ON MAINTENANCE

1. Install fan drivebelts. (Volume 2, WP 0297)
2. Install left splash shield. (TM 9-2320-272-10)

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
POWER STEERING PUMP PRESSURE AND RETURN HOSES REPLACEMENT (ROSS) (M939/A1)

INITIAL SETUP:

Tools and Special Tools
Tool Kit, General Mechanic's: Automotive
(Volume 5, WP 0826, Table 1, Item 56)

Materials/Parts
Cap Set, Protective, Dust and Moisture Seal
(Volume 5, WP 0825, Table 1, Item 13)
Tape, Antiseizing
(Volume 5, WP 0825, Table 1, Item 65)
O-ring (Volume 5, WP 0827, Table 1, Item 367)
Qty: 1

References
TM 9-2320-272-10
Volume 5, WP 0820

Equipment Condition
Steering assist cylinder stone shield removed.
(WP 0510)

REMOVAL

WARNING

Do not start engine when steering assist cylinder hoses are disconnected. Pressure may whip hoses. Failure to comply may result in injury or death to personnel.

CAUTION

Cap or plug all openings immediately after disconnecting hydraulic lines and hoses to prevent contamination. Failure to do so may result in damage to steering system.

1. Remove nut (Figure 1, Item 13), screw (Figure 1, Item 12), and retaining strap (Figure 1, Item 4) from pump return hose (Figure 1, Item 3) and return tube (Figure 1, Item 5).

NOTE

Have container ready to catch hydraulic oil.

2. Loosen two hose clamps (Figure 1, Item 2) and remove pump return hose (Figure 1, Item 3) from pump nozzle (Figure 1, Item 1) and return tube (Figure 1, Item 5).
3. Disconnect pump return tube (Figure 1, Item 5) from steering gear adapter (Figure 1, Item 6).
4. Disconnect pump pressure hose (Figure 1, Item 11) from pump adapter (Figure 1, Item 14) and steering gear adapter elbow (Figure 1, Item 10).
5. Remove adapter (Figure 1, Item 6) from steering gear (Figure 1, Item 7).
6. Loosen jamnut (Figure 1, Item 9) and remove elbow (Figure 1, Item 10) and o-ring (Figure 1, Item 8) from steering gear (Figure 1, Item 7). Discard o-ring.

REMOVAL - Continued

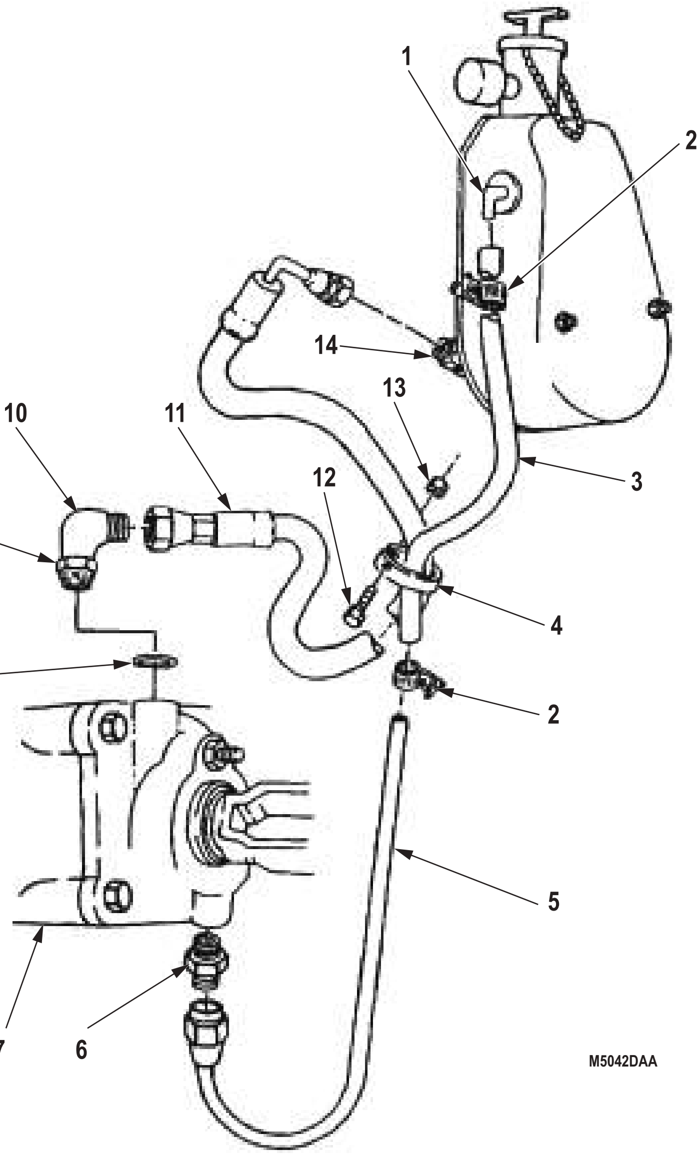


Figure 1. Power Steering Pump Removal.

END OF TASK

INSTALLATION

NOTE

- Do not reuse hydraulic oil.
- Remove all caps and plugs prior to installation.

1. Install o-ring (Figure 2, Item 8) and elbow (Figure 2, Item 10) on steering gear (Figure 2, Item 7). Tighten jamnut (Figure 2, Item 9) until o-ring seats.
2. Wrap male pipe threads of steering gear adapter (Figure 2, Item 6) with antiseize tape and install on steering gear (Figure 2, Item 7).
3. Install pump return tube (Figure 2, Item 5) on adapter (Figure 2, Item 6).

NOTE

Do not slide more than 1 in. (25.4 mm) of return hose onto return tube.

4. Install pump return hose (Figure 2, Item 3) on pump nozzle (Figure 2, Item 1) and return tube (Figure 2, Item 5) with two clamps (Figure 2, Item 2).
5. Install pump pressure hose (Figure 2, Item 11) on pump adapter (Figure 2, Item 14) and steering gear adapter elbow (Figure 2, Item 10).
6. Install retaining strap (Figure 2, Item 4) on hoses (Figure 2, Items 3 and 11) with screw (Figure 2, Item 12) and nut (Figure 2, Item 13).

INSTALLATION - Continued

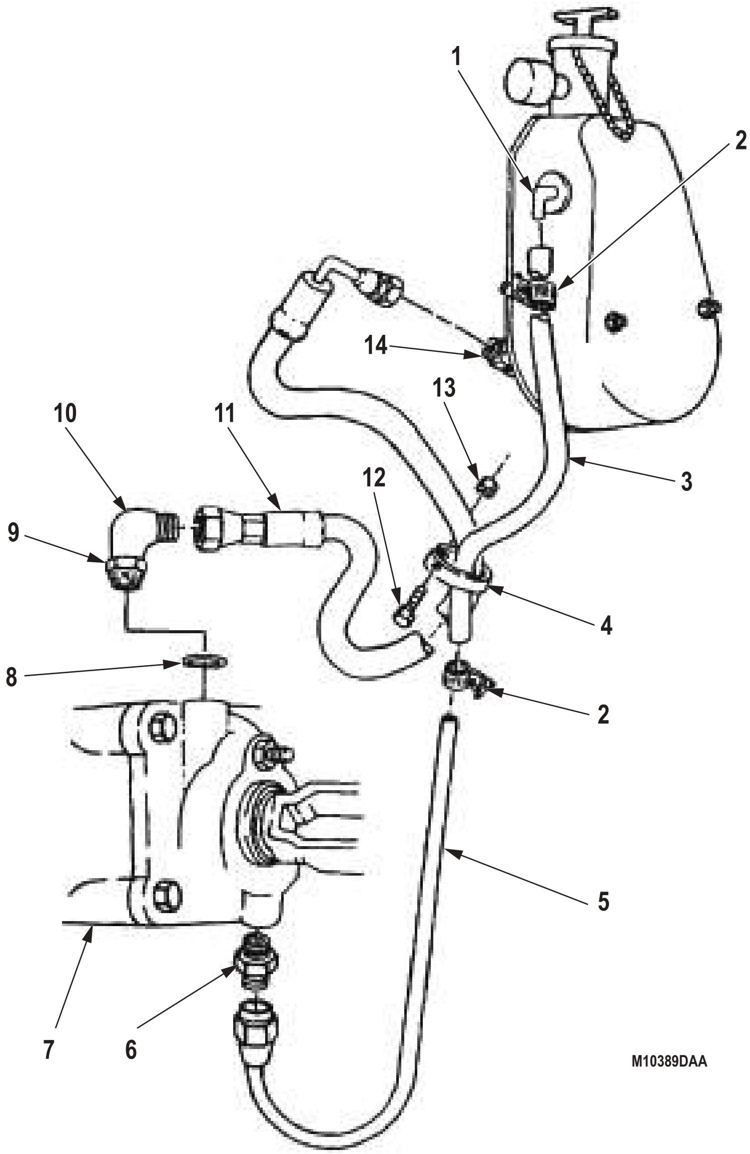


Figure 2. Power Steering Pump Installation.

END OF TASK

FOLLOW-ON MAINTENANCE

1. Fill power steering reservoir to proper level. (Volume 5, WP 0820)
2. Start engine, check hoses for leaks, and steering for operation. (TM 9-2320-272-10)
3. Install steering assist cylinder stone shield. (WP 0510)

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
POWER STEERING PUMP PRESSURE AND RETURN HOSES REPLACEMENT (SHEPPARD) (M939/A1)

INITIAL SETUP:

Tools and Special Tools
Tool Kit, General Mechanic's: Automotive
(Volume 5, WP 0826, Table 1, Item 56)

Materials/Parts
Cap Set, Protective, Dust and Moisture Seal
(Volume 5, WP 0825, Table 1, Item 13)
Tape, Antiseizing
(Volume 5, WP 0825, Table 1, Item 65)
O-ring (Volume 5, WP 0827, Table 1, Item 367)
Qty: 2

Equipment Condition
Parking brake set. (TM 9-2320-272-10)

Equipment Condition (cont.)
Steering assist cylinder stone shield removed.
(WP 0510)

REMOVAL

WARNING

Do not start engine when steering assist cylinder hoses are disconnected. Pressure may whip hoses. Failure to comply may result in injury or death to personnel.

CAUTION

Cap or plug all openings immediately after disconnecting lines and hoses to prevent contamination. Failure to do so may result in steering system damage.

NOTE

- Have container ready to catch hydraulic oil.
- Tag all hydraulic lines and hoses for installation.

1. Remove nut (Figure 1, Item 5), screw (Figure 1, Item 13), and retaining strap (Figure 1, Item 4) from pump return hose (Figure 1, Item 3) and return tube (Figure 1, Item 6).
2. Loosen two hose clamps (Figure 1, Item 2) and remove pump return hose (Figure 1, Item 3) from pump nozzle (Figure 1, Item 1) and return tube (Figure 1, Item 6).
3. Disconnect pump return tube (Figure 1, Item 6) from steering gear adapter (Figure 1, Item 7).
4. Disconnect pump pressure hose (Figure 1, Item 12) from pump adapter (Figure 1, Item 14) and steering gear adapter elbow (Figure 1, Item 11).
5. Remove adapter (Figure 1, Item 7) and o-ring (Figure 1, Item 8) from steering gear (Figure 1, Item 9). Discard o-ring.
6. Remove adapter elbow (Figure 1, Item 11) and o-ring (Figure 1, Item 10) from steering gear (Figure 1, Item 9). Discard o-ring.

REMOVAL - Continued

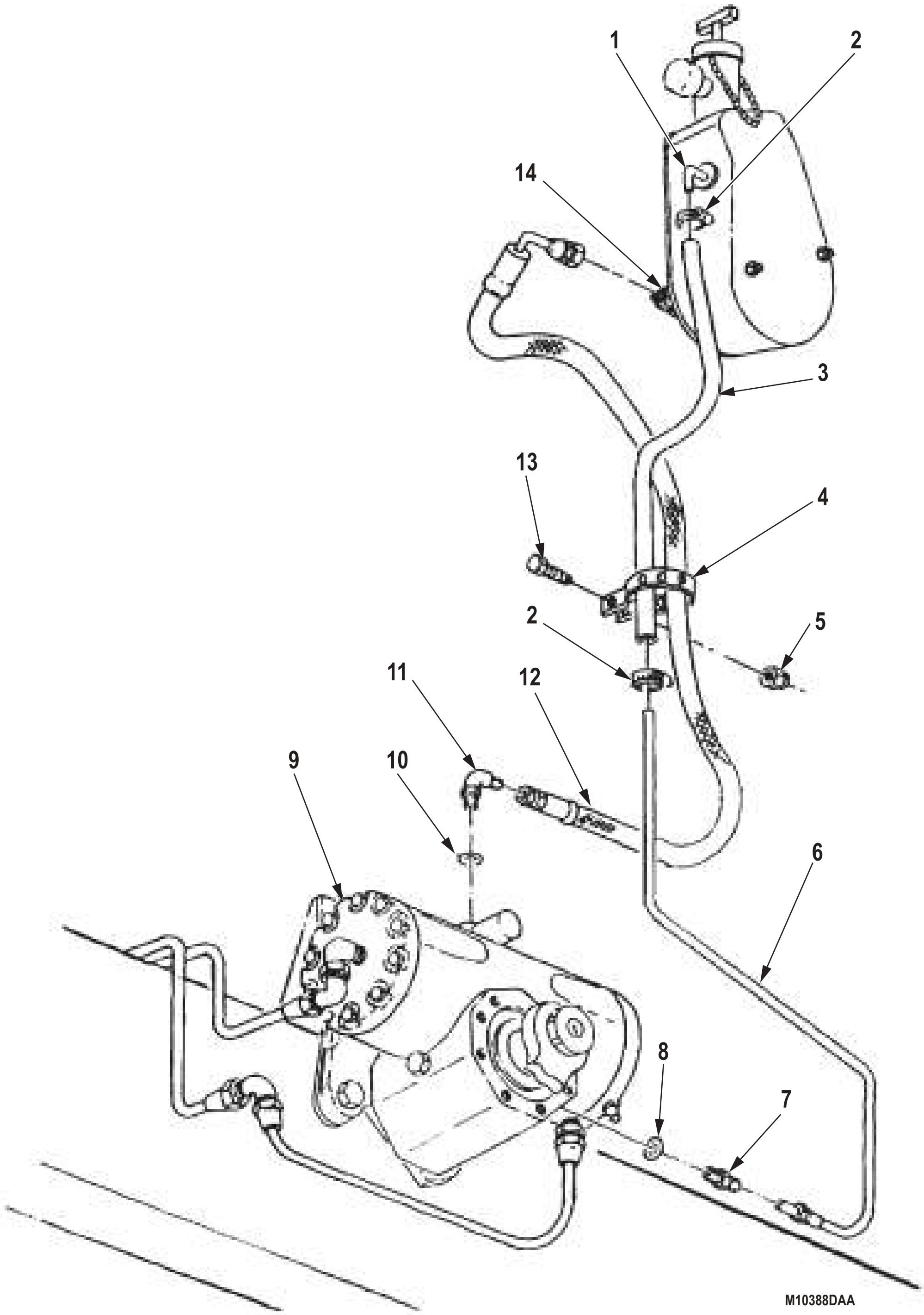


Figure 1. Power Steering Pump Pressure and Return Hose Removal.

END OF TASK

INSTALLATION

NOTE

- Do not reuse hydraulic oil.
- Remove all caps and plugs prior to removal.

1. Install o-ring (Figure 2, Item 10) and steering gear adapter elbow (Figure 2, Item 11) on steering gear (Figure 2, Item 9).
2. Install o-ring (Figure 2, Item 8) and steering gear adapter (Figure 2, Item 7) on steering gear (Figure 2, Item 9).

NOTE

Do not slide more than 1 in. (25.4 mm) of return hose onto return tube.

3. Install pump return hose (Figure 2, Item 3) on pump nozzle (Figure 2, Item 1) and return tube (Figure 2, Item 6) with two hose clamps (Figure 2, Item 2).
4. Install pump pressure hose (Figure 2, Item 12) on pump adapter (Figure 2, Item 14) and elbow (Figure 2, Item 11).
5. Install hose retaining strap (Figure 2, Item 4) on hoses (Figure 2, Items 3 and 6) with screw (Figure 2, Item 13) and nut (Figure 2, Item 5).

INSTALLATION - Continued

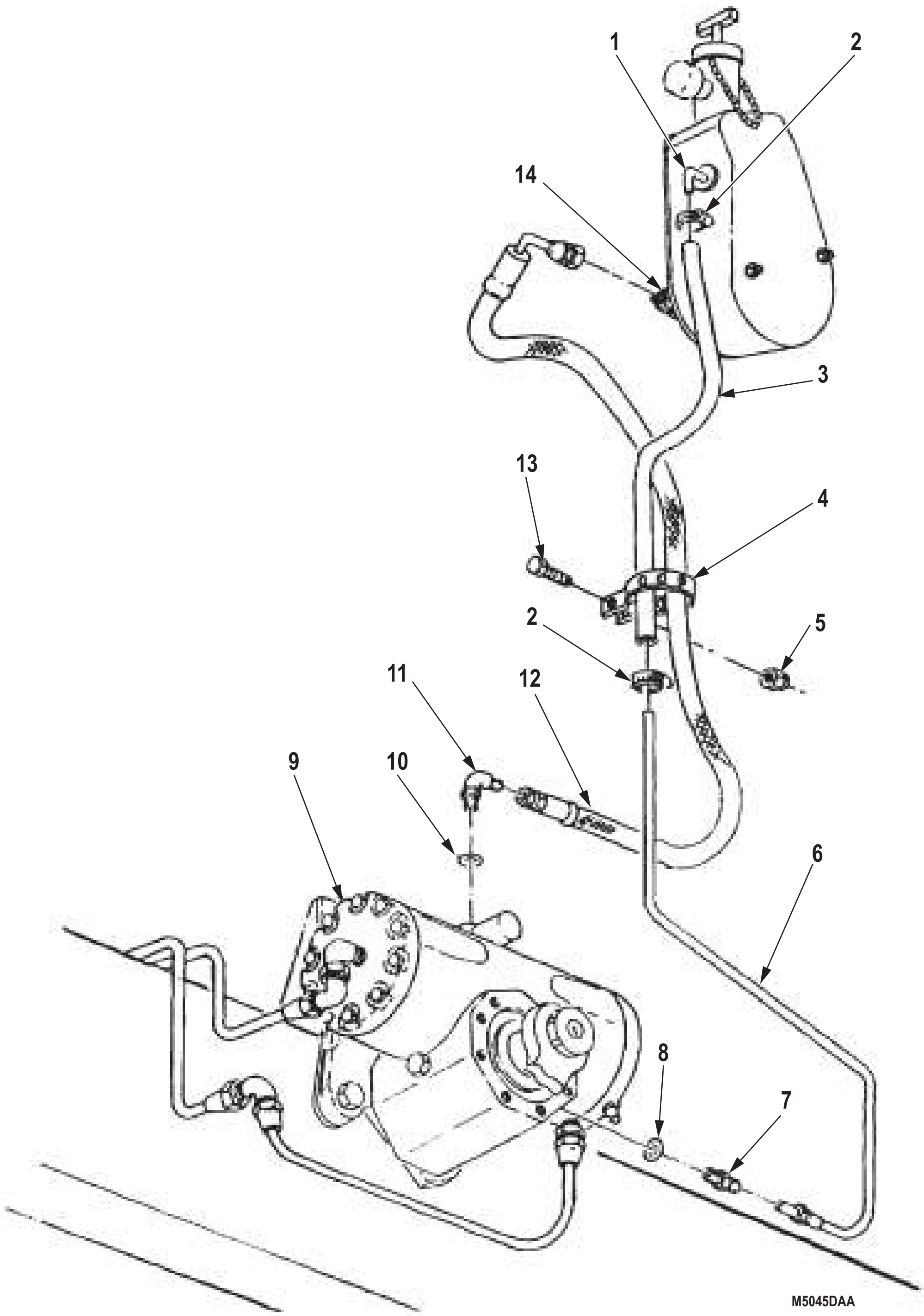


Figure 2. Power Steering Pump Pressure and Return Hose Installation.

END OF TASK

FOLLOW-ON MAINTENANCE

1. Install steering assist cylinder stone shield. (WP 0510)
2. Check hydraulic oil level. (TM 9-2320-272-10)
3. Check for oil leaks. (TM 9-2320-272-10)

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
STEERING ASSIST CYLINDER HOSES REPLACEMENT

INITIAL SETUP:

Tools and Special Tools
Tool Kit, General Mechanic's: Automotive
(Volume 5, WP 0826, Table 1, Item 56)

Materials/Parts
Cap Set, Protective, Dust and Moisture Seal
(Volume 5, WP 0825, Table 1, Item 13)

References
TM 9-2320-272-10
Volume 5, WP 0820

Equipment Condition
Steering assist cylinder stone shield removed.
(WP 0510)

REPLACE

WARNING

Do not start engine when steering assist cylinder hoses are disconnected. Pressure may whip hoses. Failure to comply may result in injury or death to personnel.

CAUTION

Cap or plug all openings immediately after disconnecting lines and hoses to prevent contamination. Failure to do so may result in steering system damage.

NOTE

- Have container ready to catch hydraulic oil.
- Tag all hydraulic lines and hoses for installation.

1. Disconnect hoses (Figure 1, Items 1 and 2) from elbows (Figure 1, Items 5 and 6) and adapters (Figure 1, Items 3 and 4).

NOTE

- Do not reuse hydraulic oil.
- Remove all caps and plugs prior to installation.

2. Install hoses (Figure 1, Items 1 and 2) on adapters (Figure 1, Items 3 and 4) and elbows (Figure 1, Items 5 and 6).

REPLACE - Continued

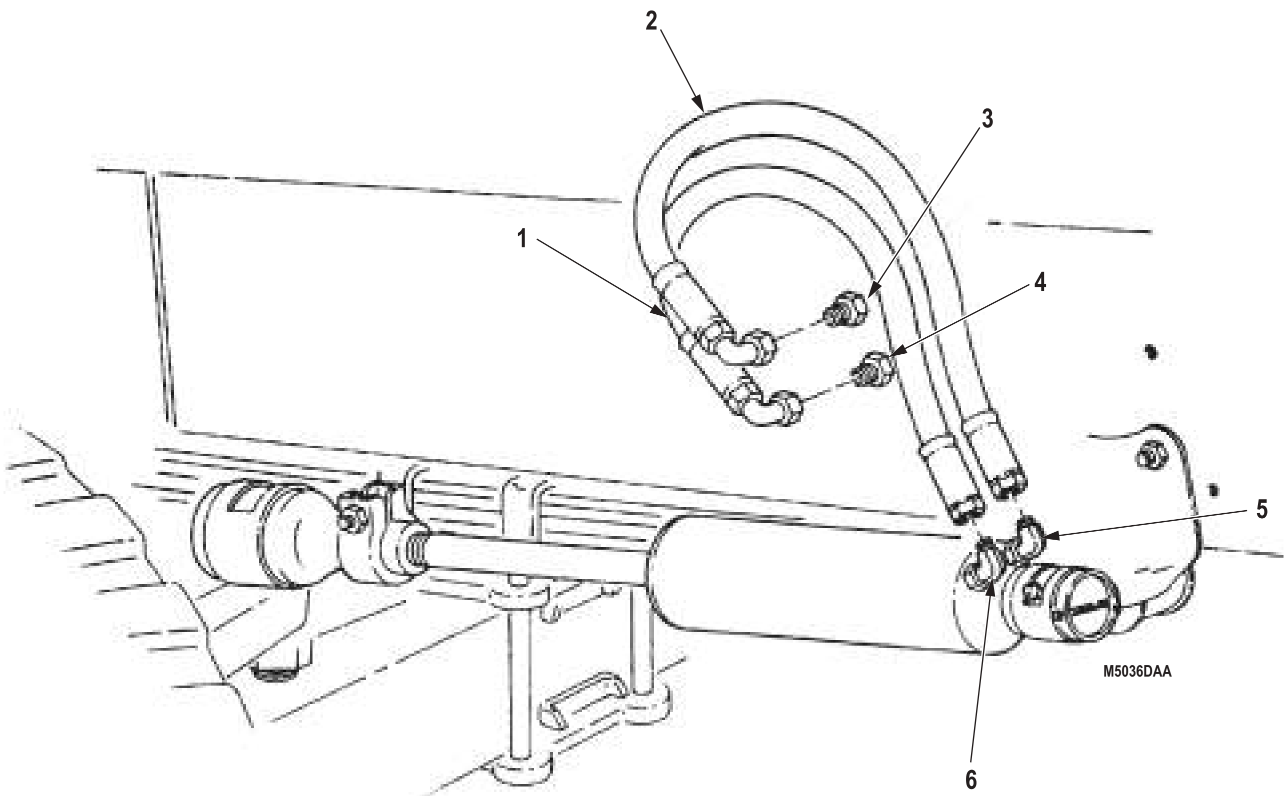


Figure 1. Steering Assist Cylinder Hoses Replacement.

END OF TASK

FOLLOW-ON MAINTENANCE

1. Fill power steering reservoir to proper level. (Volume 5, WP 0820)
2. Start engine. Check hoses for leaks and check steering for proper operation. (TM 9-2320-272-10)
3. Install steering assist cylinder stone shield. (WP 0510)

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
STEERING GEAR-TO-ASSIST CYLINDER PRESSURE LINES REPLACEMENT

INITIAL SETUP:

Tools and Special Tools

Tool Kit, General Mechanic's: Automotive
(Volume 5, WP 0826, Table 1, Item 56)

Materials/Parts

Cap Set, Protective, Dust and Moisture Seal
(Volume 5, WP 0825, Table 1, Item 13)
Tape, Antiseizing
(Volume 5, WP 0825, Table 1, Item 65)
Locknut (Volume 5, WP 0827, Table 1, Item 282)
Qty: 2

Materials/Parts (cont.)

Packing, Preformed
(Volume 5, WP 0827, Table 1, Item 436)
Qty: 2
Tiedown Strap
(Volume 5, WP 0827, Table 1, Item 379)
Qty: 1

Equipment Condition

Parking brake set. (TM 9-2320-272-10)
Left splash shield removed. (TM 9-2320-272-10)

REMOVAL

WARNING

Do not start engine when steering assist cylinder hoses are disconnected. Pressure may whip hoses. Failure to comply may result in injury or death to personnel.

CAUTION

Cap or plug all openings immediately after disconnecting lines and hoses to prevent contamination. Failure to do so may result in damage to equipment.

1. Remove two locknuts (Figure 1, Item 16), screws (Figure 1, Item 5), spacers (Figure 1, Item 4), and four clamps (Figure 1, Item 3) from crossmember (Figure 1, Item 15). Discard locknuts.

NOTE

- Have drainage container ready to catch hydraulic oil.
- Use drain pans to retain leaking/draining fluids. Refer to local procedures and plans for preventing and responding to fluid spills or leaks. Comply with local regulations when disposing of clean up material and leaked and spilled fluids.
- Step (2) applies to Ross steering gears only.
- Steps (3), (4), and (5) apply to Sheppard steering gears only.

2. Loosen nuts (Figure 1, Items 10 and 13) and remove pressure lines (Figure 1, Items 11 and 14) from elbow (Figure 1, Item 12) and adapter (Figure 1, Item 9).
3. Loosen nuts (Figure 1, Items 22 and 23) and remove pressure lines (Figure 1, Items 11 and 14) from elbows (Figure 1, Items 21 and 24).
4. Loosen nut (Figure 1, Item 20) and remove elbows (Figure 1, Items 21 and 24) from extension line (Figure 1, Item 19) and elbow (Figure 1, Item 12).
5. Loosen nut (Figure 1, Item 18) and remove extension line (Figure 1, Item 19) from adapter (Figure 1, Item 9).
6. Remove adapter (Figure 1, Item 9) and preformed packing (Figure 1, Item 8) from steering gear (Figure 1, Item 6). Discard preformed packing.
7. Remove elbow (Figure 1, Item 12) and preformed packing (Figure 1, Item 7) from steering gear (Figure 1, Item 6). Discard preformed packing.
8. Remove tiedown strap (Figure 1, Item 1) from pressure lines (Figure 1, Items 11 and 14). Discard tiedown straps.
9. Loosen two nuts (Figure 1, Item 17) and disconnect pressure lines (Figure 1, Items 11 and 14) from two elbows (Figure 1, Item 2).
10. Disconnect two hoses (Figure 1, Item 26) from elbows (Figure 1, Item 27).
11. Remove two nuts (Figure 1, Item 28) and elbows (Figure 1, Item 27) from frame rail (Figure 1, Item 25).

REMOVAL - Continued

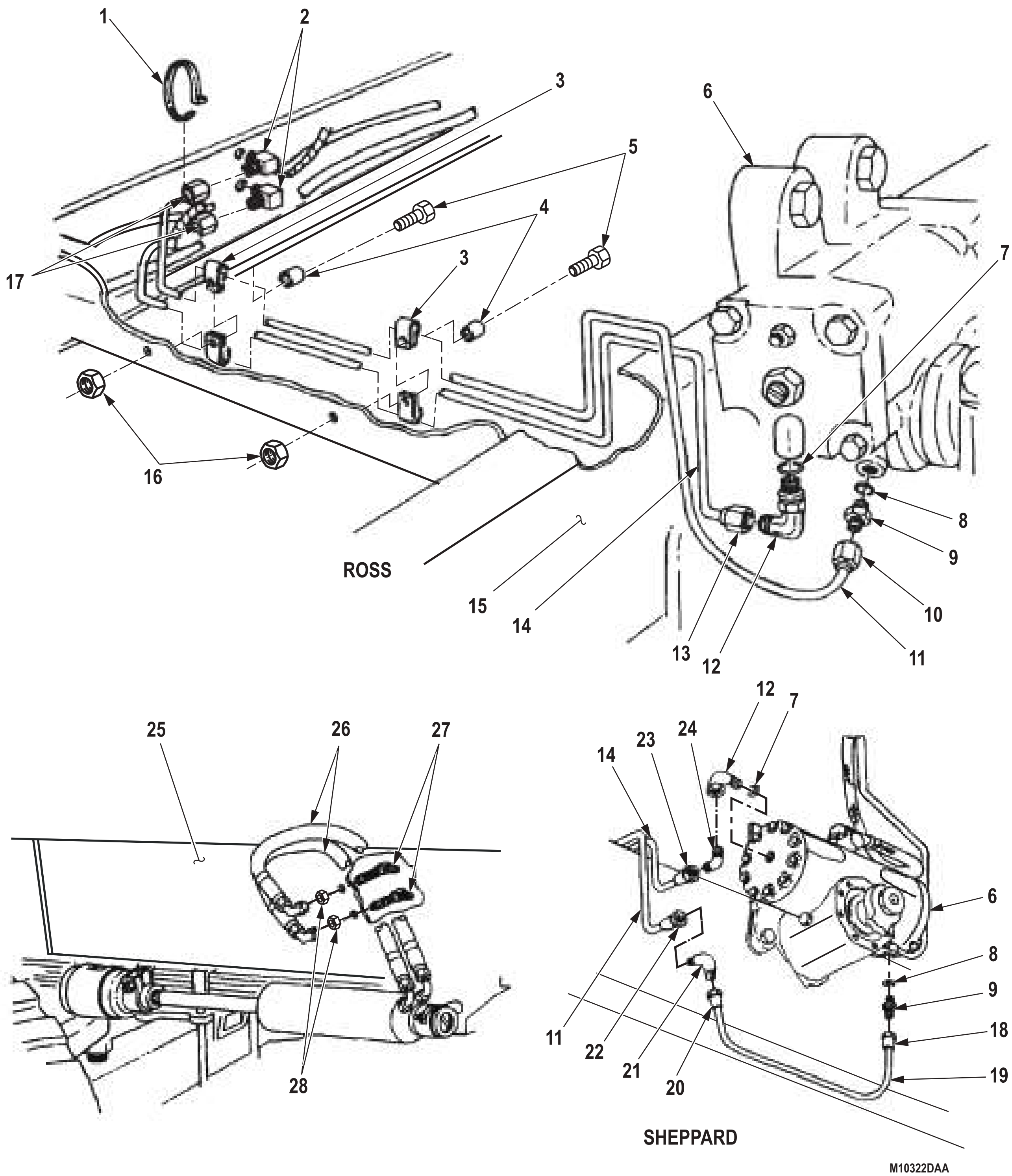


Figure 1. Pressure Lines Removal.

END OF TASK

INSTALLATION

NOTE

- Remove all caps and plugs prior to installation.
- Fittings must be cleaned and inspected for cracks or stripped threads before installation.
- Male pipe threads must be wrapped with antiseize tape before installation.
- Do not reuse hydraulic oil.

1. Install preformed packing (Figure 2, Item 7) and elbow (Figure 2, Item 12) on steering gear (Figure 2, Item 6), with opening of elbow facing down.
2. Install preformed packing (Figure 2, Item 8) and adapter (Figure 2, Item 9) on steering gear (Figure 2, Item 6).

NOTE

Steps (3) through (5) apply to Sheppard steering gears only.

3. Install extension line (Figure 2, Item 19) on adapter (Figure 2, Item 9) and tighten nut (Figure 2, Item 18).
4. Install elbows (Figure 2, Items 21 and 24) on extension line (Figure 2, Item 19) and elbow (Figure 2, Item 21) and tighten nut (Figure 2, Item 20).
5. Install pressure lines (Figure 2, Items 11 and 14) on elbows (Figure 2, Items 21 and 24) and tighten nuts (Figure 2, Items 22 and 23).
6. Install two elbows (Figure 2, Item 27) on frame rail (Figure 2, Item 25) with two nuts (Figure 2, Item 28).
7. Connect two hoses (Figure 2, Item 26) to elbows (Figure 2, Item 27).
8. Connect pressure lines (Figure 2, Items 11 and 14) to elbows (Figure 2, Item 2) and tighten nuts (Figure 2, Item 17).

NOTE

Steps (9) through (11) apply to Ross steering gears only.

9. Install preformed packing (Figure 2, Item 7) and elbow (Figure 2, Item 12) on steering gear (Figure 2, Item 6).
10. Install preformed packing (Figure 2, Item 8) and adapter (Figure 2, Item 9) on steering gear (Figure 2, Item 6).
11. Connect pressure lines (Figure 2, Items 11 and 14) to elbow (Figure 2, Item 12) and adapter (Figure 2, Item 9) and tighten nuts (Figure 2, Items 10 and 13).
12. Install tiedown strap (Figure 2, Item 1) on pressure lines (Figure 2, Items 11 and 14).
13. Install pressure lines (Figure 2, Items 11 and 14) on crossmember (Figure 2, Item 15) with four clamps (Figure 2, Item 3), two spacers (Figure 2, Item 4), screws (Figure 2, Item 5), and locknuts (Figure 2, Item 16).

INSTALLATION - Continued

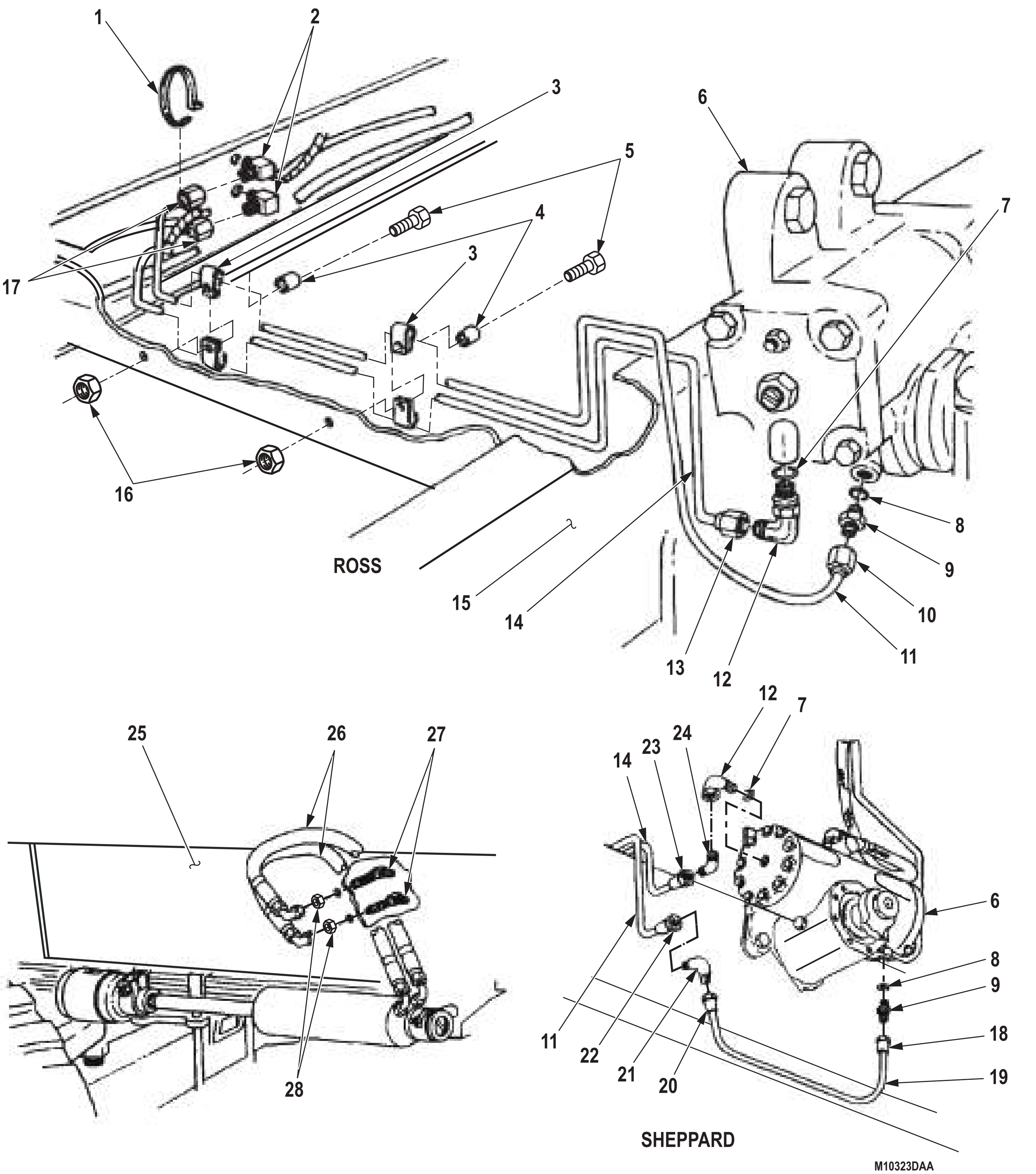


Figure 2. Pressure Lines Installation.

END OF TASK

FOLLOW-ON MAINTENANCE

Install left splash shield. (TM 9-2320-272-10)

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
POWER STEERING GEAR STOP ADJUSTMENT (ON-VEHICLE)

INITIAL SETUP:

Tools and Special Tools
Tool Kit, General Mechanic's: Automotive
(Volume 5, WP 0826, Table 1, Item 56)
Wrench, Torque, Click, Ratcheting, 1/2" Drive, 250 Ft-Lb
(Volume 5, WP 0826, Table 1, Item 63)

Personnel Required
(2)

Equipment Condition
Parking brake set. (TM 9-2320-272-10)

Equipment Condition (cont.)
Left splash shield removed. (Volume 4, WP 0575)
Drag link removed. (WP 0492)

SECTOR SHAFT ADJUSTMENT

NOTE

Assistant will rotate steering wheel.

1. Rotate steering wheel (Figure 1, Item 1) full travel in both directions and note halfway point.
2. Position steering wheel (Figure 1, Item 1) at halfway point.

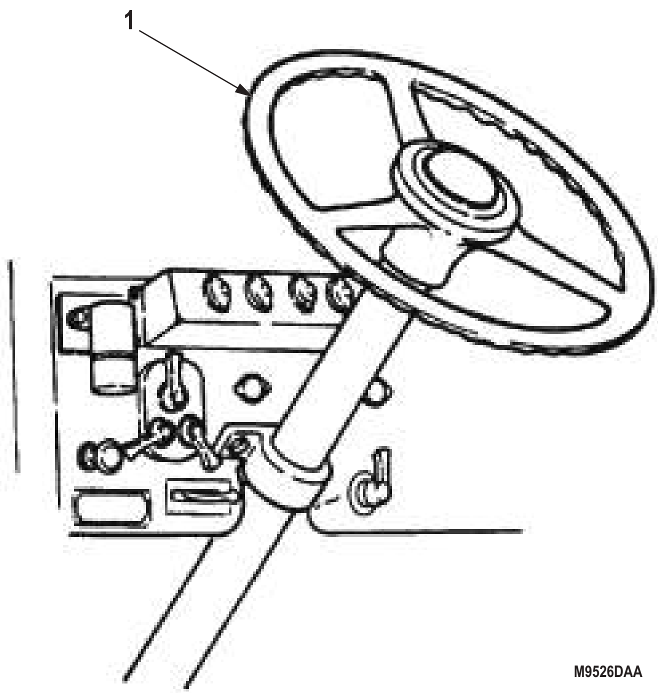


Figure 1. Steering Wheel.

SECTOR SHAFT ADJUSTMENT - Continued

3. Loosen jamnut (Figure 2, Item 5) on right side of steering gear (Figure 2, Item 2).
4. Tighten sector shaft adjusting screw (Figure 2, Item 1) 10 lb-ft (14 N·m).
5. Turn sector shaft adjusting screw (Figure 2, Item 1) counterclockwise one full turn.
6. Holding adjusting screw (Figure 2, Item 1), tighten jamnut (Figure 2, Item 5) 40 to 45 lb-ft (54 to 61 N·m).

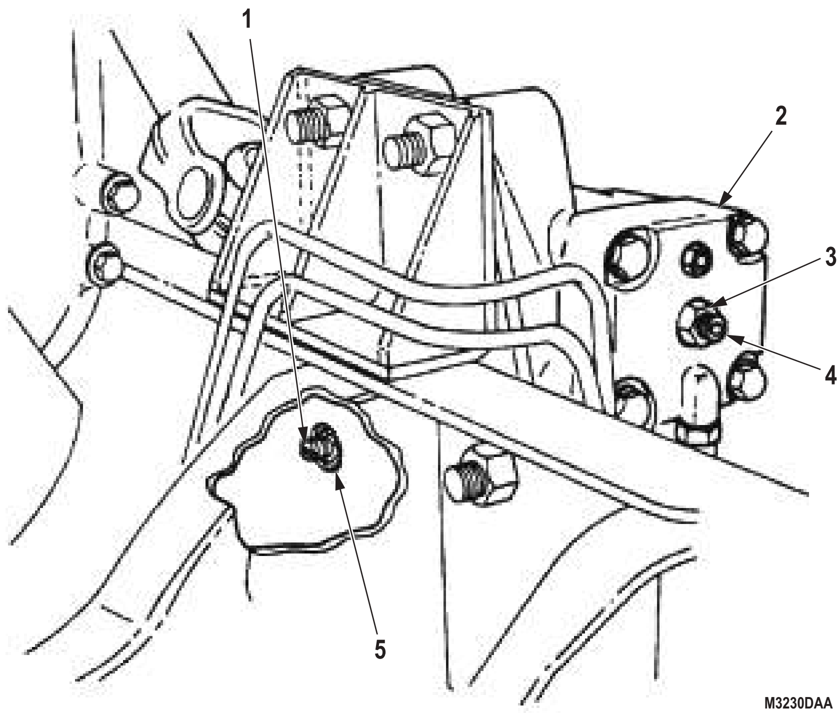


Figure 2. Sector Shaft Adjustment (On-Vehicle).

END OF TASK

WORM SHAFT ADJUSTMENT

1. Loosen jamnut (Figure 3, Item 3) on worm shaft adjusting screw (Figure 3, Item 4) on front of steering gear (Figure 3, Item 2).
2. Loosen worm shaft adjusting screw (Figure 3, Item 4) one full turn counterclockwise.
3. Tighten worm shaft adjusting screw (Figure 3, Item 4) 5 to 6 lb-ft (7 to 8 N·m).
4. Holding adjusting screw (Figure 3, Item 4), tighten jamnut (Figure 3, Item 3) 70 to 80 lb-ft (95 to 109 N·m).

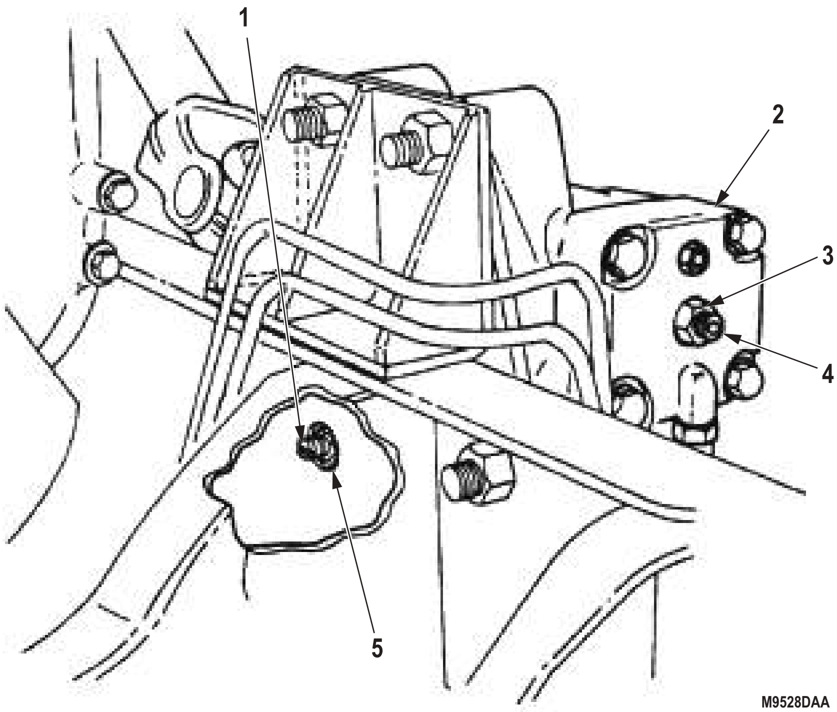


Figure 3. Worm Shaft Adjustment (On-Vehicle).

NOTE

Assistant will rotate steering wheel.

5. Rotate steering wheel (Figure 4, Item 1) slightly in both directions and check for pulsations. If pulsations are felt, repeat Steps (1) through (5).

WORM SHAFT ADJUSTMENT - Continued

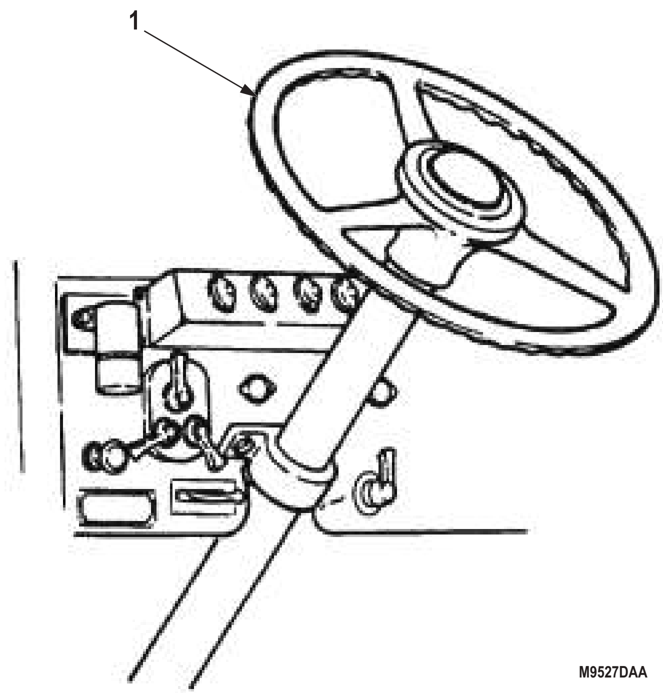


Figure 4. Steering Wheel.

END OF TASK

FOLLOW-ON MAINTENANCE

1. Install drag link. (WP 0492)
2. Install left splash shield. (Volume 4, WP 0575)
3. Start engine and road test vehicle. (TM 9-2320-272-10)

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
STEERING ASSIST CYLINDER REPLACEMENT

INITIAL SETUP:

Tools and Special Tools

Tool Kit, General Mechanic's: Automotive
(Volume 5, WP 0826, Table 1, Item 56)
Wrench, Torque, Click, Ratcheting, 3/8" Drive, 75 Ft-Lb
(Volume 5, WP 0826, Table 1, Item 62)

Materials/Parts

Cap Set, Protective, Dust and Moisture Seal
(Volume 5, WP 0825, Table 1, Item 13)
Cotter Pin

Materials/Parts (cont.)

(Volume 5, WP 0827, Table 1, Item 344)
Qty: 1
Cotter Pin
(Volume 5, WP 0827, Table 1, Item 347)
Qty: 2

Equipment Condition

Parking brake set. (TM 9-2320-272-10)
Steering assist cylinder stone shield removed.
(WP 0510)

REMOVAL

WARNING

Do not start engine when steering assist cylinder hoses are disconnected. Pressure may whip hoses. Failure to comply may result in injury or death to personnel.

CAUTION

Cap or plug all openings immediately after disconnecting hydraulic lines and hoses to prevent contamination. Failure to do so may result in steering system damage.

NOTE

- Have container ready to catch hydraulic oil.
- Tag all lines and hoses for installation.

1. Disconnect return hoses (Figure 1, Items 4 and 5) from elbows (Figure 1, Item 6).
2. Remove two grease fittings (Figure 1, Item 2) from steering assist cylinder (Figure 1, Item 11).
3. Remove two cotter pins (Figure 1, Item 1) from steering assist cylinder (Figure 1, Item 11). Discard cotter pins.
4. Loosen adjustable plugs (Figure 1, Items 10 and 3) as far as possible without removing, and loosen two dust covers (Figure 1, Item 8).
5. Tap on adjustable plugs (Figure 1, Items 10 and 3) to loosen steering assist cylinder (Figure 1, Item 11) from spring shackle ball stud (Figure 1, Item 7) and steering knuckle ball stud (Figure 1, Item 12).
6. Remove steering assist cylinder (Figure 1, Item 11) from ball studs (Figure 1, Items 7 and 12).
7. Remove two dust covers (Figure 1, Item 8) and felt pads (Figure 1, Item 9) from ball studs (Figure 1, Items 7 and 12).
8. Remove cotter pin (Figure 1, Item 13) and nut (Figure 1, Item 14) from steering knuckle ball stud (Figure 1, Item 12). Discard cotter pin.

REMOVAL - Continued

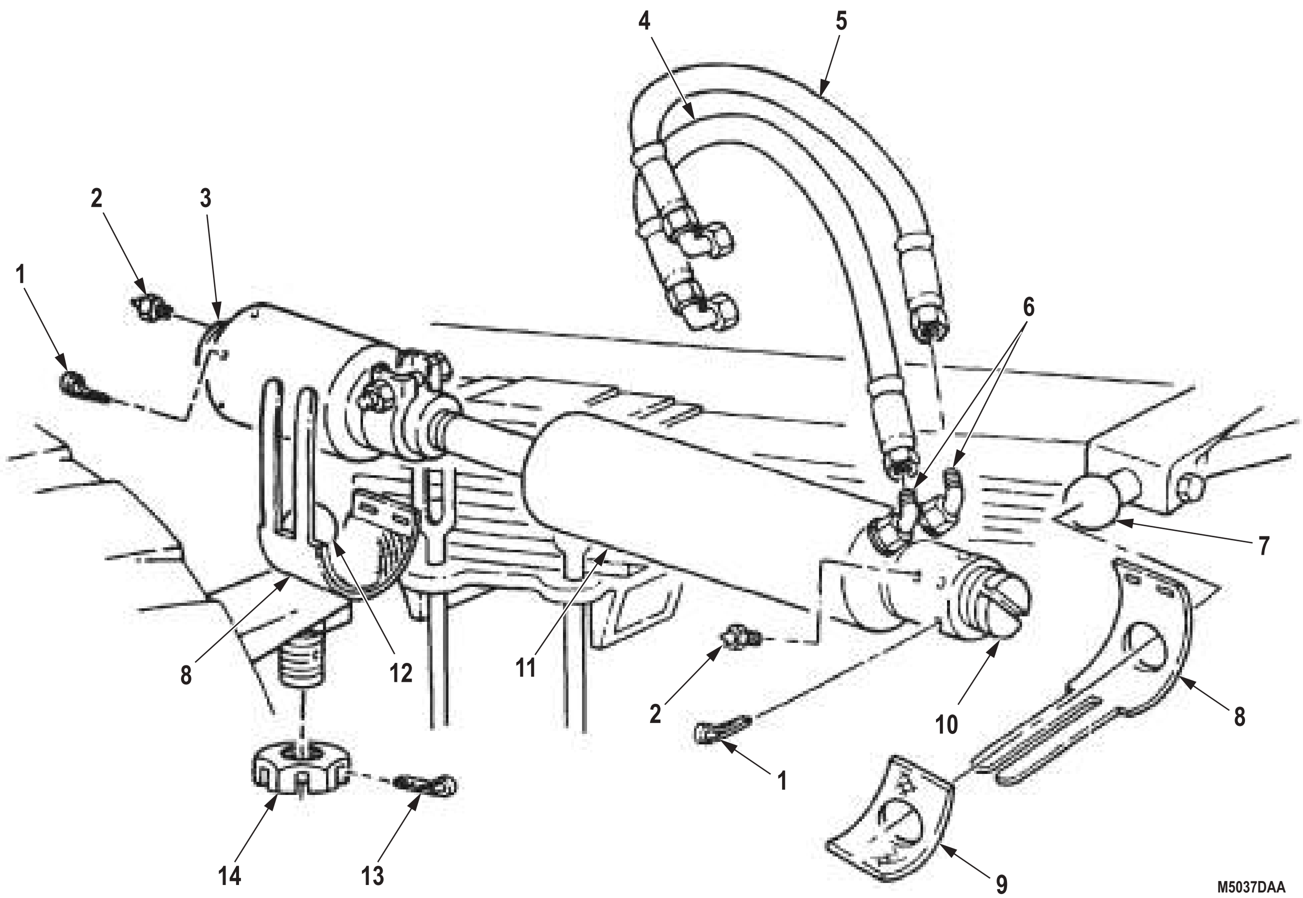


Figure 1. Steering Assist Cylinder Removal.

END OF TASK

DISASSEMBLY

NOTE

Mark direction of adapter elbows.

1. Remove two adapter elbows (Figure 2, Item 9) from steering assist cylinder (Figure 2, Item 8).

NOTE

Mark direction of seat valves.

2. Remove two adjustable plugs (Figure 2, Item 1), seat valves (Figure 2, Item 2), spring (Figure 2, Item 3), and ring (Figure 2, Item 4) from socket assembly (Figure 2, Item 5).

NOTE

Mark socket assembly location on shaft with chalk before removing.

3. Remove nut (Figure 2, Item 11), screw (Figure 2, Item 7), clamp (Figure 2, Item 6), and socket assembly (Figure 2, Item 5) from shaft (Figure 2, Item 10).

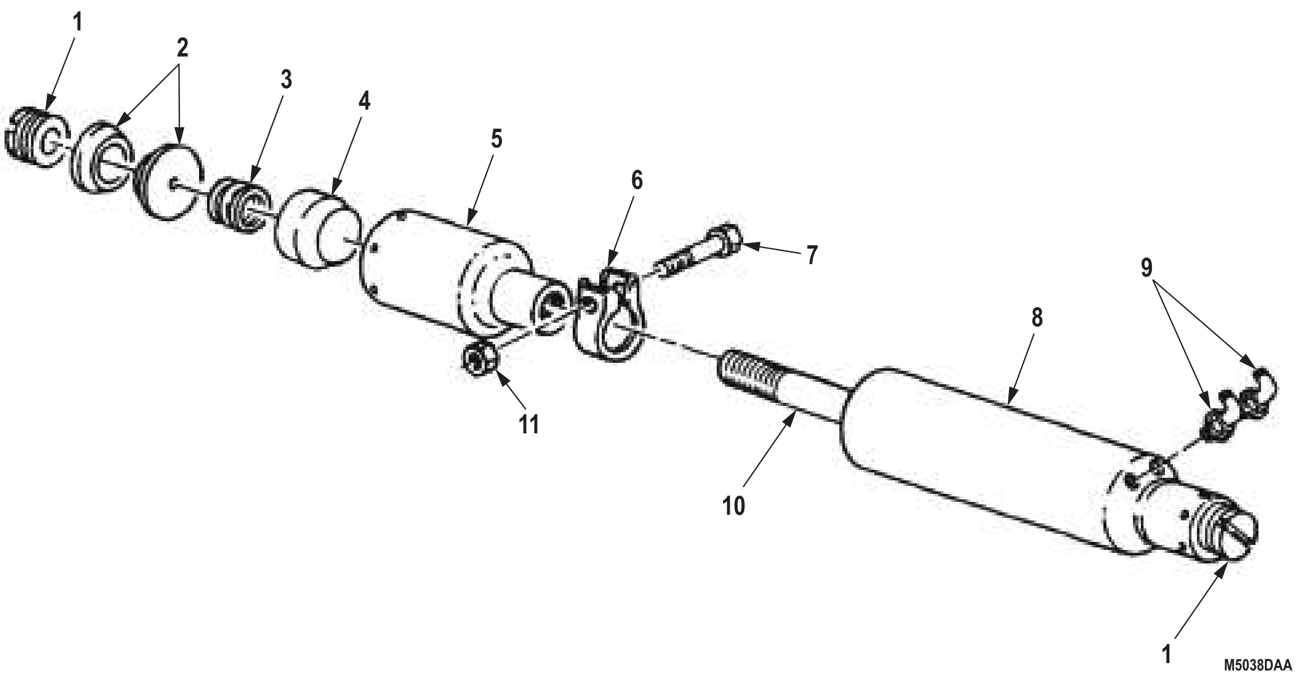


Figure 2. Steering Assist Cylinder Disassembly.

END OF TASK

ASSEMBLY

1. Install clamp (Figure 3, Item 6) loosely on socket assembly (Figure 3, Item 5) with screw (Figure 3, Item 7) and nut (Figure 3, Item 11).
2. Install socket assembly (Figure 3, Item 5) on shaft (Figure 3, Item 10).
3. Tighten nut (Figure 3, Item 11) on clamp (Figure 3, Item 6) 30 to 40 lb-ft (41 to 54 N·m).
4. Install ring (Figure 3, Item 4), spring (Figure 3, Item 3), and two seat valves (Figure 3, Item 2) in socket assembly (Figure 3, Item 5).
5. Install adjustable plugs (Figure 3, Item 1) loosely on steering assist cylinder (Figure 3, Item 8) and socket assembly (Figure 3, Item 5).
6. Install two adapter elbows (Figure 3, Item 9) on steering assist cylinder (Figure 3, Item 8).

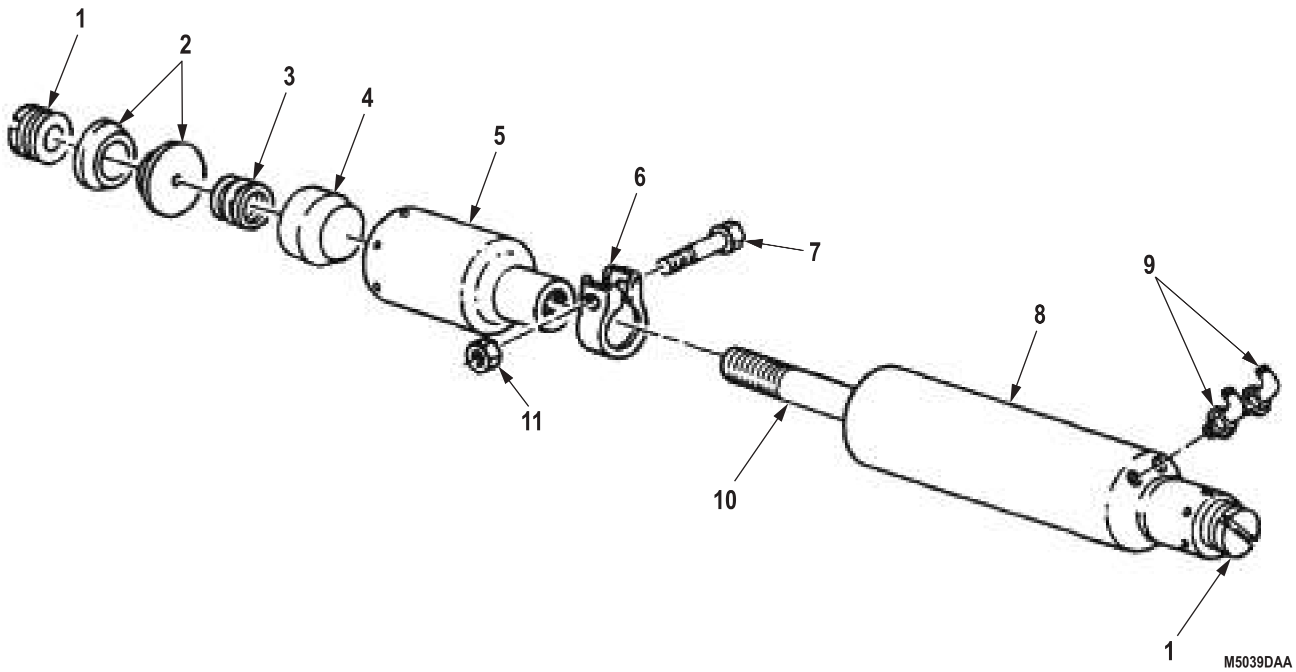


Figure 3. Steering Assist Cylinder Assembly.

END OF TASK

INSTALLATION

NOTE

- Do not reuse hydraulic oil.
- Remove all caps and plugs prior to installation.

1. Install nut (Figure 4, Item 14) and cotter pin (Figure 4, Item 13) on ball stud (Figure 4, Item 12).
2. Install dust covers (Figure 4, Item 8) and felt pads (Figure 4, Item 9) on ball studs (Figure 4, Items 7 and 12).
3. Position power steering assist cylinder (Figure 4, Item 11) on steering knuckle ball stud (Figure 4, Item 12) and spring shackle ball stud (Figure 4, Item 7).
4. Tighten adjustable plugs (Figure 4, Items 3 and 10) until they bottom out, back out one turn, align and install cotter pins (Figure 4, Item 1).
5. Install pressure return hoses (Figure 4, Items 4 and 5) on elbows (Figure 4, Item 6).
6. Fasten dust covers (Figure 4, Item 8) around steering assist cylinder (Figure 4, Item 11) and socket assembly.
7. Install grease fittings (Figure 4, Item 2) on steering assist cylinder (Figure 4, Item 11).

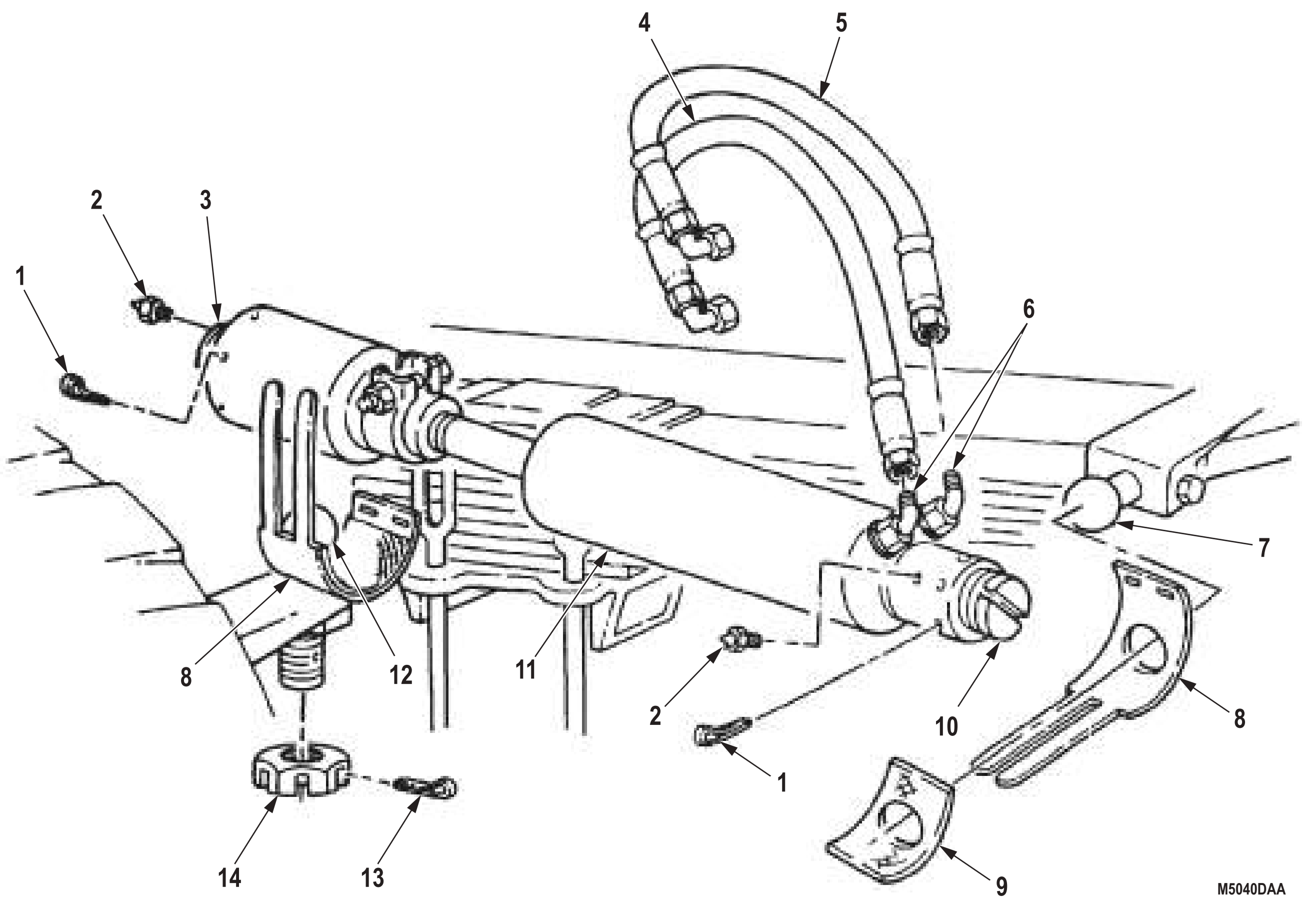


Figure 4. Steering Assist Cylinder Installation.

END OF TASK

TRAVEL ADJUSTMENT

NOTE

To check for proper travel adjustment, measure the distance from center of ball stud to center of ball stud for a distance of 25.50 in. (64.8 cm). If adjustment is incorrect, the front wheels must be raised prior to performing the following steps.

1. Loosen nut (Figure 5, Item 1), screw (Figure 5, Item 2), and clamp (Figure 5, Item 4) from socket assembly (Figure 5, Item 5).
2. Turn socket assembly (Figure 5, Item 5) counterclockwise to increase steering assist cylinder (Figure 5, Item 3); clockwise to decrease cylinder travel.
3. Tighten nut (Figure 5, Item 1) 30 to 40 lb-ft (41 to 54 N·m).

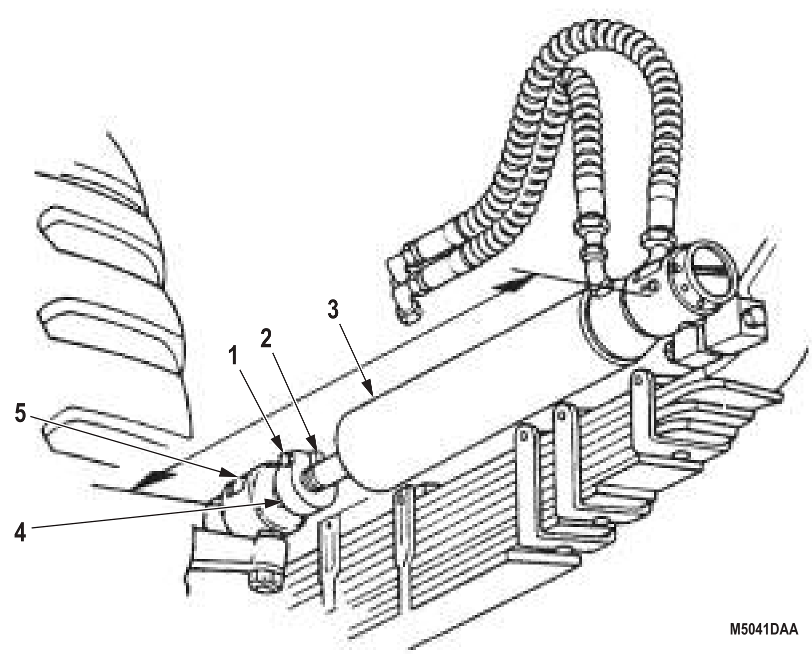


Figure 5. Steering Assist Cylinder Travel Adjustment.

END OF TASK

FOLLOW-ON MAINTENANCE

Install steering assist cylinder stone shield. (WP 0510)

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
STEERING ASSIST CYLINDER STONE SHIELD REPLACEMENT

INITIAL SETUP:

Tools and Special Tools
Tool Kit, General Mechanic's: Automotive
(Volume 5, WP 0826, Table 1, Item 56)

Materials/Parts
Locknut (Volume 5, WP 0827, Table 1, Item 285)
Qty: 5

Equipment Condition
Parking brake set. (TM 9-2320-272-10)
Right splash shield removed. (TM 9-2320-272-10)

REMOVAL

1. Remove three locknuts (Figure 1, Item 5), screws (Figure 1, Item 1), and washers (Figure 1, Item 2) from stone shield (Figure 1, Item 11), frame rail (Figure 1, Item 13), and transmission oil cooler support (Figure 1, Item 12). Discard locknuts.
2. Remove locknut (Figure 1, Item 4), cable clamp (Figure 1, Item 3), screw (Figure 1, Item 8), and washer (Figure 1, Item 9) from stone shield (Figure 1, Item 11) and transmission oil cooler support (Figure 1, Item 12). Discard locknut.
3. Remove locknut (Figure 1, Item 4), screw (Figure 1, Item 7), and washer (Figure 1, Item 6) from stone shield (Figure 1, Item 11). Discard locknut.
4. Remove two screws (Figure 1, Item 7), washers (Figure 1, Item 6), splash shield guide (Figure 1, Item 10), and stone shield (Figure 1, Item 11) from transmission oil cooler support (Figure 1, Item 12).

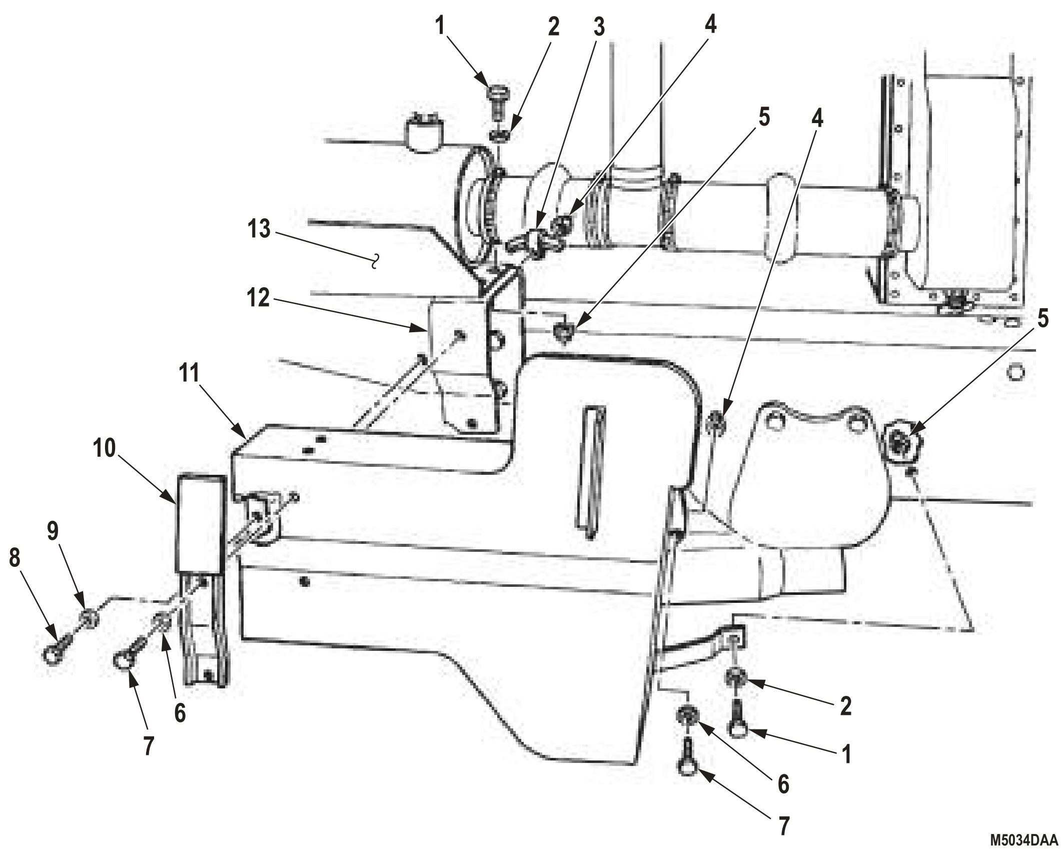


Figure 1. Steering Assist Cylinder Stone Shield Removal.

END OF TASK

INSTALLATION

1. Install stone shield (Figure 2, Item 11) on frame rail (Figure 2, Item 13) and transmission oil cooler support (Figure 2, Item 12) with three washers (Figure 2, Item 2), screws (Figure 2, Item 1), and locknuts (Figure 2, Item 5).
2. Install cable clamp (Figure 2, Item 3) and stone shield (Figure 2, Item 11) on transmission oil cooler support (Figure 2, Item 12) with washer (Figure 2, Item 9), screw (Figure 2, Item 8), and locknut (Figure 2, Item 4).
3. Secure stone shield (Figure 2, Item 11) with washer (Figure 2, Item 6), screw (Figure 2, Item 7), and locknut (Figure 2, Item 4).
4. Install stone shield (Figure 2, Item 11) and splash shield guide (Figure 2, Item 10) on transmission oil cooler support (Figure 2, Item 12) with two washers (Figure 2, Item 6) and screws (Figure 2, Item 7).

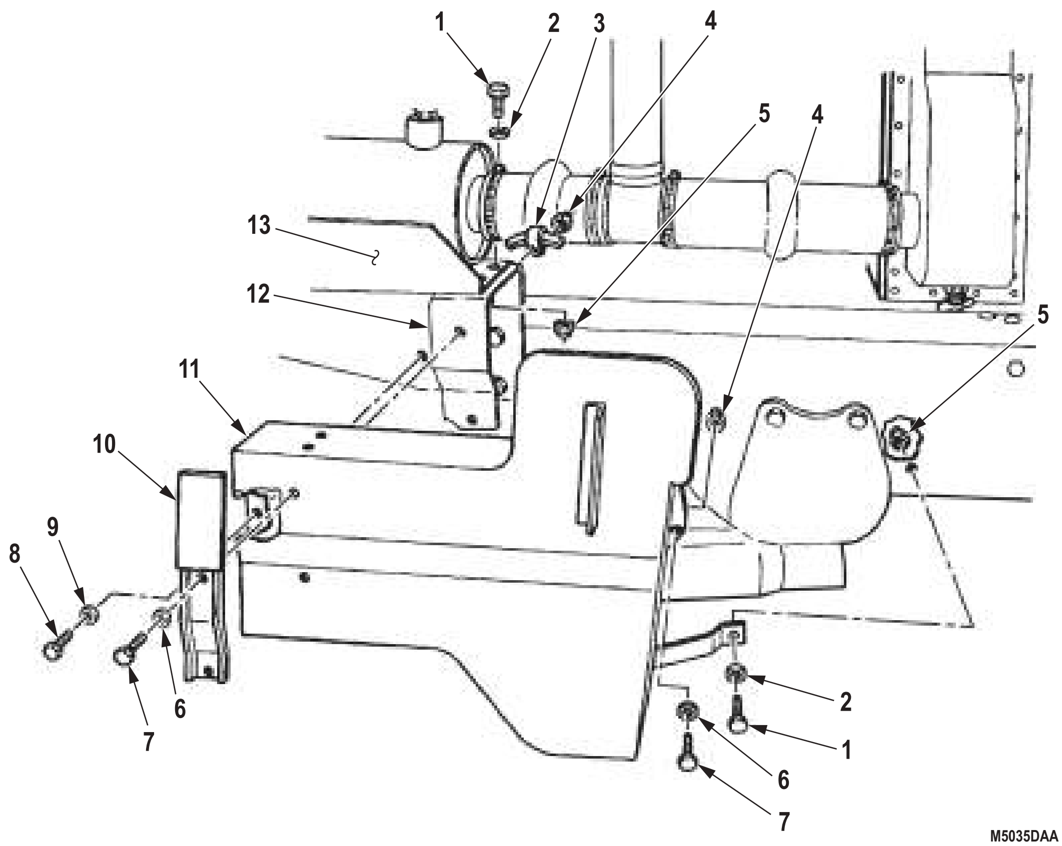


Figure 2. Steering Assist Cylinder Stone Shield Installation.

END OF TASK

FOLLOW-ON MAINTENANCE

Install right splash shield. (TM 9-2320-272-10)

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
FRONT AND REAR LIFTING SHACKLE AND BRACKET REPLACEMENT

INITIAL SETUP:

Tools and Special Tools

Tool Kit, General Mechanic's: Automotive (Volume 5, WP 0826, Table 1, Item 56)

Materials/Parts

Locknut (Volume 5, WP 0827, Table 1, Item 279)
Qty: 3

Equipment Condition

Parking brake set. (TM 9-2320-272-10)

Winch chain and hook removed from front shackles (winch models only). (TM 9-2320-272-10)

REMOVAL

NOTE

- Replacement of front and rear shackles are the same, except rear shackles do not use washers. This procedure covers the front shackle.
- On M936/A1 model vehicles the long screw attaching each front shackle has an additional washer between anchor and locknut.

1. Remove retaining clip (Figure 1, Item 12), S-hooks (Figure 1, Items 1 and 13), and chain (Figure 1, Item 14) from shackle pin (Figure 1, Item 2).
2. Remove shackle pin (Figure 1, Item 2) and shackle (Figure 1, Item 3) from shackle bracket (Figure 1, Item 6).
3. Remove two locknuts (Figure 1, Item 10), screws (Figure 1, Item 4), locknut (Figure 1, Item 9), long screw (Figure 1, Item 5), pipe coupling (Figure 1, Item 8), shackle bracket (Figure 1, Item 6), and washer (Figure 1, Item 7) from bumper (Figure 1, Item 11). Discard locknuts.

REMOVAL - Continued

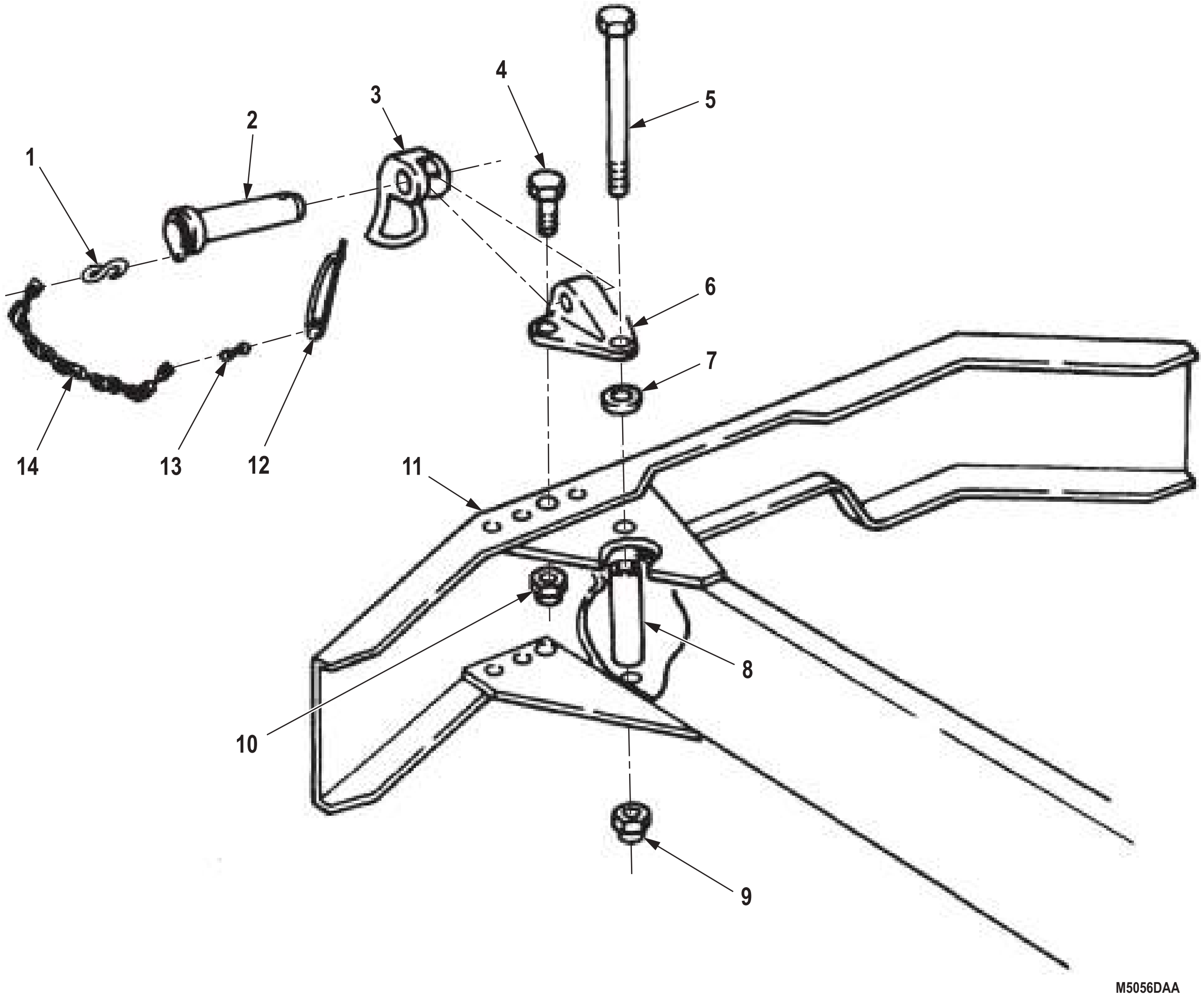


Figure 1. Shackle and Bracket Removal.

END OF TASK

INSTALLATION

1. Install washer (Figure 2, Item 7) and shackle bracket (Figure 2, Item 6) on bumper (Figure 2, Item 11) with long screw (Figure 2, Item 5), pipe coupling (Figure 2, Item 8), locknut (Figure 2, Item 9), two screws (Figure 2, Item 4), and locknuts (Figure 2, Item 10).
2. Install shackle (Figure 2, Item 3) on shackle bracket (Figure 2, Item 6) with shackle pin (Figure 2, Item 2).
3. Install retaining clip (Figure 2, Item 12), S-hooks (Figure 2, Items 1 and 13), and chain (Figure 2, Item 14) on shackle pin (Figure 2, Item 2).

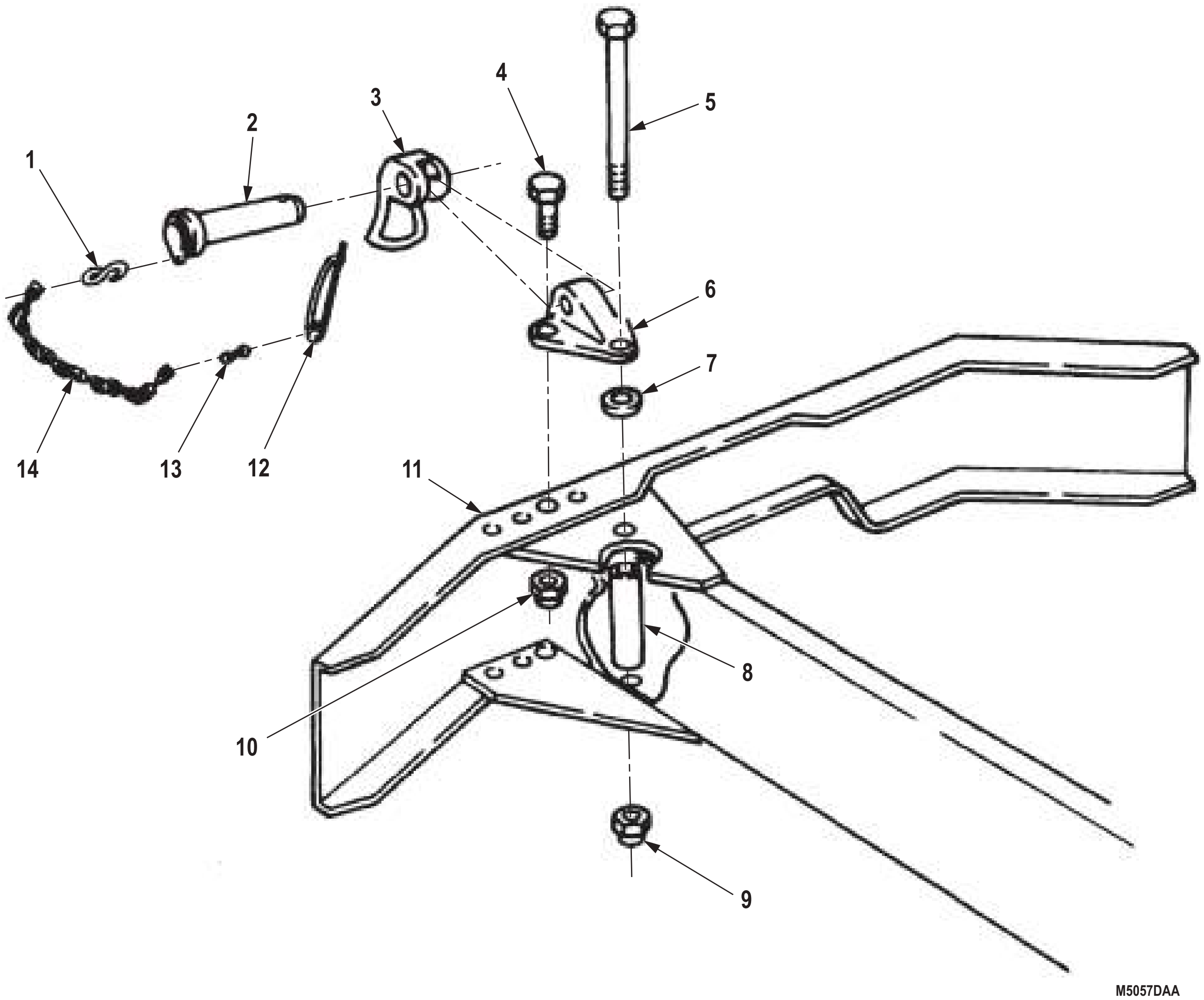


Figure 2. Shackle and Bracket Installation.

END OF TASK

FOLLOW-ON MAINTENANCE

Stow winch chain and hook on front shackles (winch models only). (TM 9-2320-272-10)

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
REAR CAB IMPROVED CROSSMEMBER REPLACEMENT

INITIAL SETUP:

Tools and Special Tools

Tool Kit, General Mechanic's: Automotive
(Volume 5, WP 0826, Table 1, Item 56)
Chain Assembly
(Volume 5, WP 0826, Table 1, Item 15)
Overhead Lifting Device
Wrench, Torque, Click, Ratcheting, 3/4" Drive, 600 Ft-Lb
(Volume 5, WP 0826, Table 1, Item 61)

Materials/Parts

Locknut (Volume 5, WP 0827, Table 1, Item 281)
Qty: 2
Locknut (Volume 5, WP 0827, Table 1, Item 286)
Qty: 13
Locknut (Volume 5, WP 0827, Table 1, Item 288)
Qty: 14
Lockwasher
(Volume 5, WP 0827, Table 1, Item 405)
Qty: 4

References

TB 9-2320-272-13

References (cont.)

WP 0361
WP 0385
WP 0386
WP 0429
WP 0430
WP 0440
WP 0444
WP 0522
WP 0523
Volume 4, WP 0593

Equipment Condition

Hood raised and secured. (TM 9-2320-272-10)
Engine splash guards removed.
(TM 9-2320-272-10)
Air tanks drained. (TM 9-2320-272-10)
Battery box removed. (Volume 2, WP 0347)
Rear exhaust pipe and clamp removed.
(Volume 2, WP 0275)

REMOVAL

1. Secure overhead lifting device (Figure 1, Item 1) to muffler (Figure 1, Item 2) and spare tire carrier (Figure 1, Item 5).
2. If exhaust support bar (Figure 1, Item 3) is attached, remove support bar mounting hardware before removal of muffler (Figure 1, Item 2) and spare tire carrier bracket (Figure 1, Item 4) as an assembly.

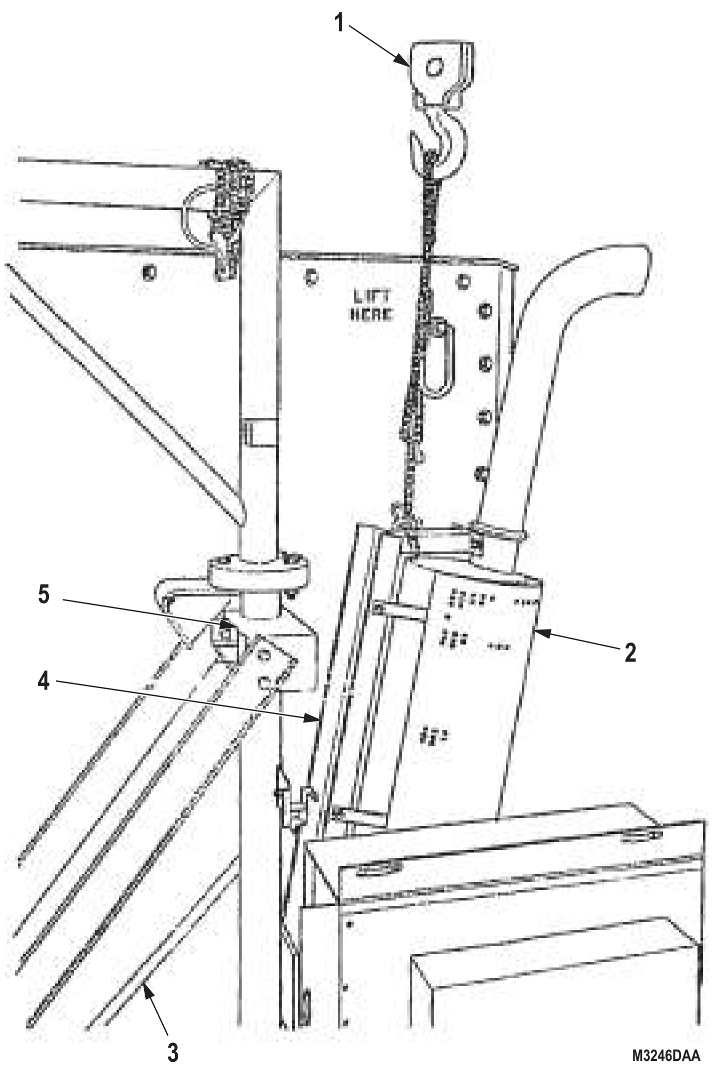


Figure 1. Muffler and Spare Tire Carrier Removal.

REMOVAL - Continued

3. Remove four bolts (Figure 2, Item 3) and nuts (Figure 2, Item 7) securing spare tire carrier bracket (Figure 2, Item 1) to spare tire carrier (Figure 2, Item 8).
4. Remove nine bolts (Figure 2, Item 4) and nuts (Figure 2, Item 5) securing spare tire carrier bracket (Figure 2, Item 1) to right side frame rail (Figure 2, Item 6).
5. Remove muffler (Figure 2, Item 2) and spare tire carrier bracket (Figure 2, Item 1) as an assembly.

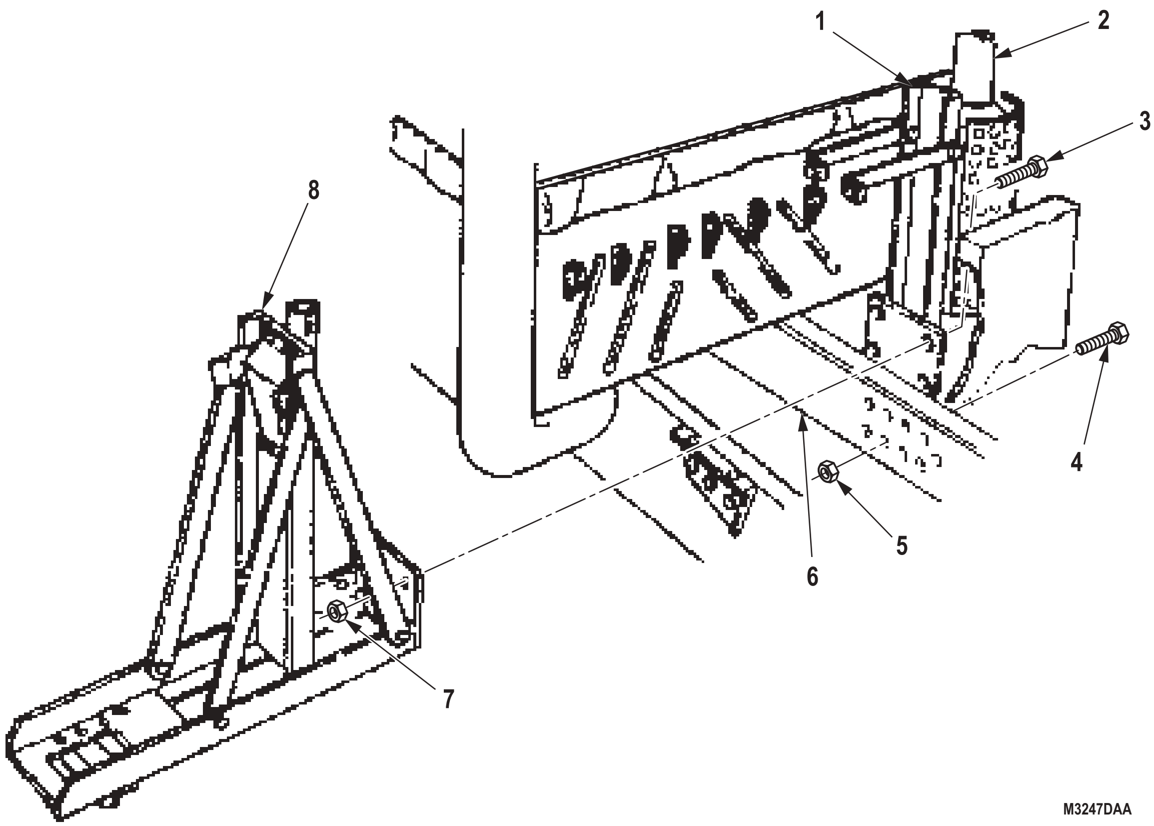


Figure 2. Spare Tire Carrier Removal.

REMOVAL - Continued

6. Remove spare tire carrier (WP 0522) or (WP 0523).
7. Disconnect air line (Figure 3, Item 1) from elbow (Figure 3, Item 2) on check valve tee (Figure 3, Item 5) between fuel tank (Figure 3, Item 4) and left frame rail (Figure 3, Item 3).

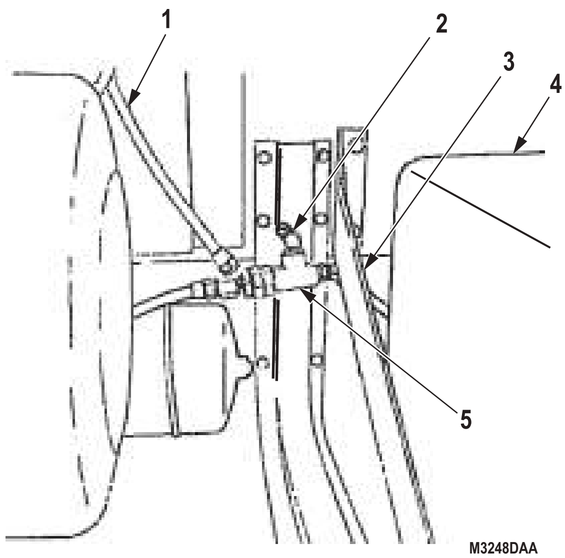


Figure 3. Air Lines and Fuel Tank Removal.

REMOVAL - Continued

8. Remove primary air tank (WP 0440).
9. Remove two screws (Figure 4, Item 2) and primary air tank rear retaining strap (Figure 4, Item 3) from crossmember (Figure 4, Item 1).

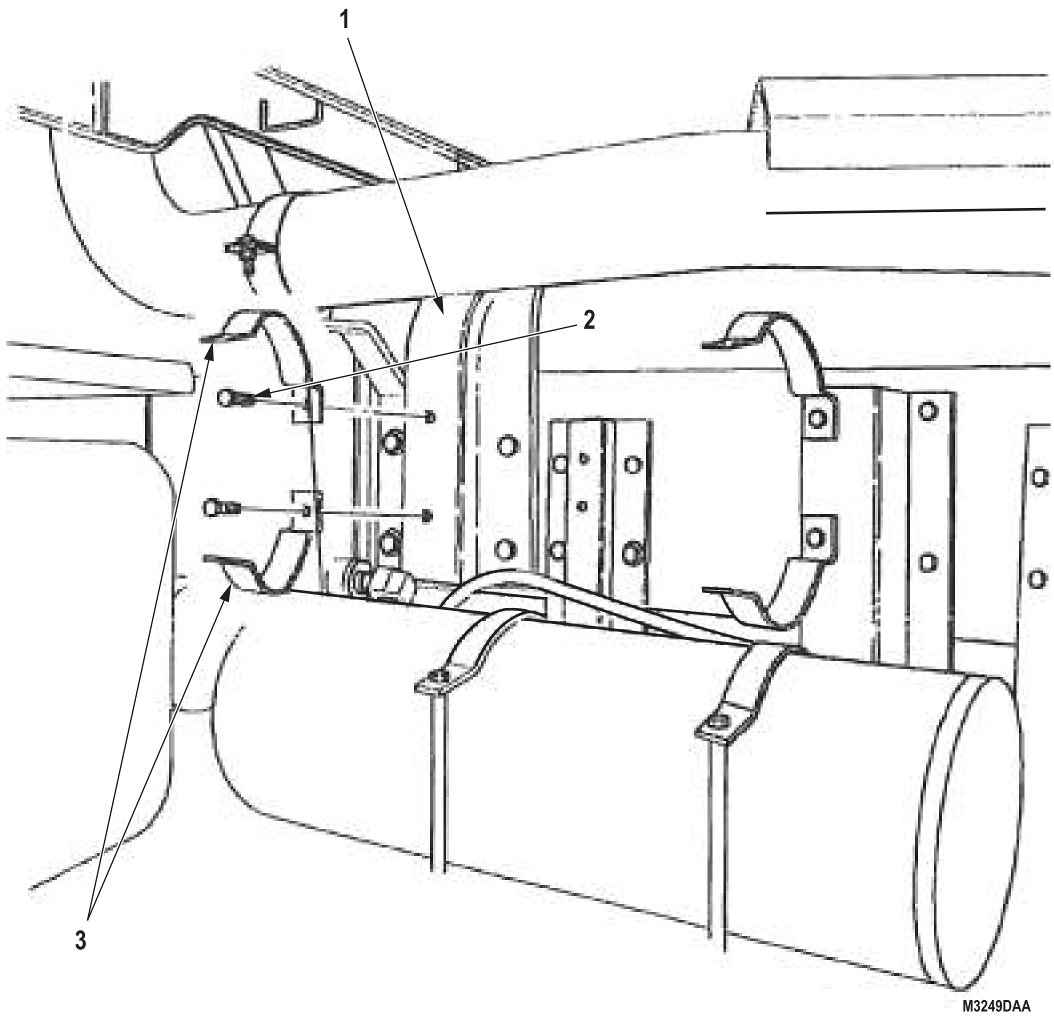


Figure 4. Primary Air Tank Removal.

10. Disconnect cross shaft lever from transfer case shift rod (WP 0385) or (WP 0386).

REMOVAL - Continued

NOTE

M936A1/A2, M929A1/A2, M930A1/A2, M931A1/A2, and M932A1/A2 models have fuel line clamps on left and right sides of crossmember. Both sets of clamps must be removed.

11. Remove nut (Figure 5, Item 1), screw (Figure 5, Item 4), and fuel line clamps (Figure 5, Item 2) from left side of crossmember assembly (Figure 5, Item 3).

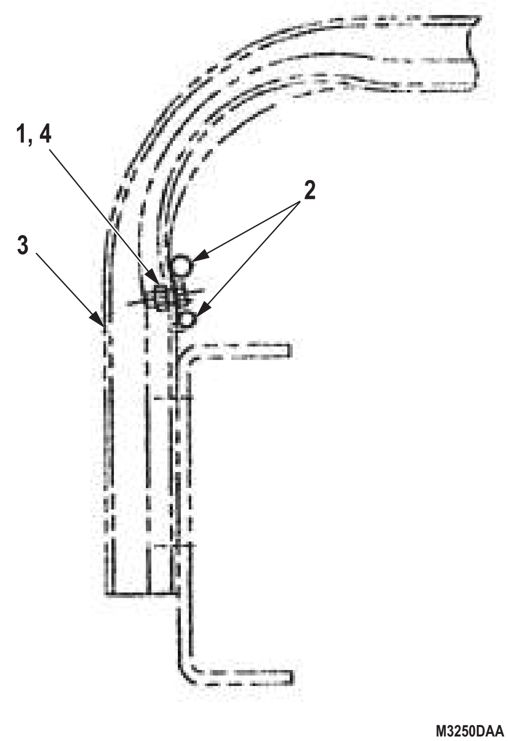


Figure 5. Fuel Line Clamps Removal.

12. Remove primary and treadle valve supply lines from primary air reservoir right side (WP 0429) or (WP 0430).
13. Remove screw (Figure 6, Item 1), nut (Figure 6, Item 5), and air lines clamp (Figure 6, Item 2) from air lines (Figure 6, Item 4) on right side of cab crossmember (Figure 6, Item 3).

REMOVAL - Continued

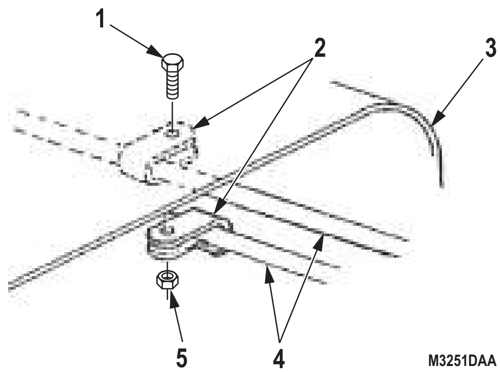


Figure 6. Fuel Lines and Clamps Removal.

14. Remove air cleaner cover (TM 9-2320-272-10).

REMOVAL - Continued

15. Disconnect emergency spring brake air line from primary reservoir right side (WP 0444).

NOTE

Step (16) is for M932A1/A2 tractors with winch only. All other models proceed to Step (17).

16. Remove bracket (Figure 7, Item 1) from left frame rail (Figure 7, Item 2).

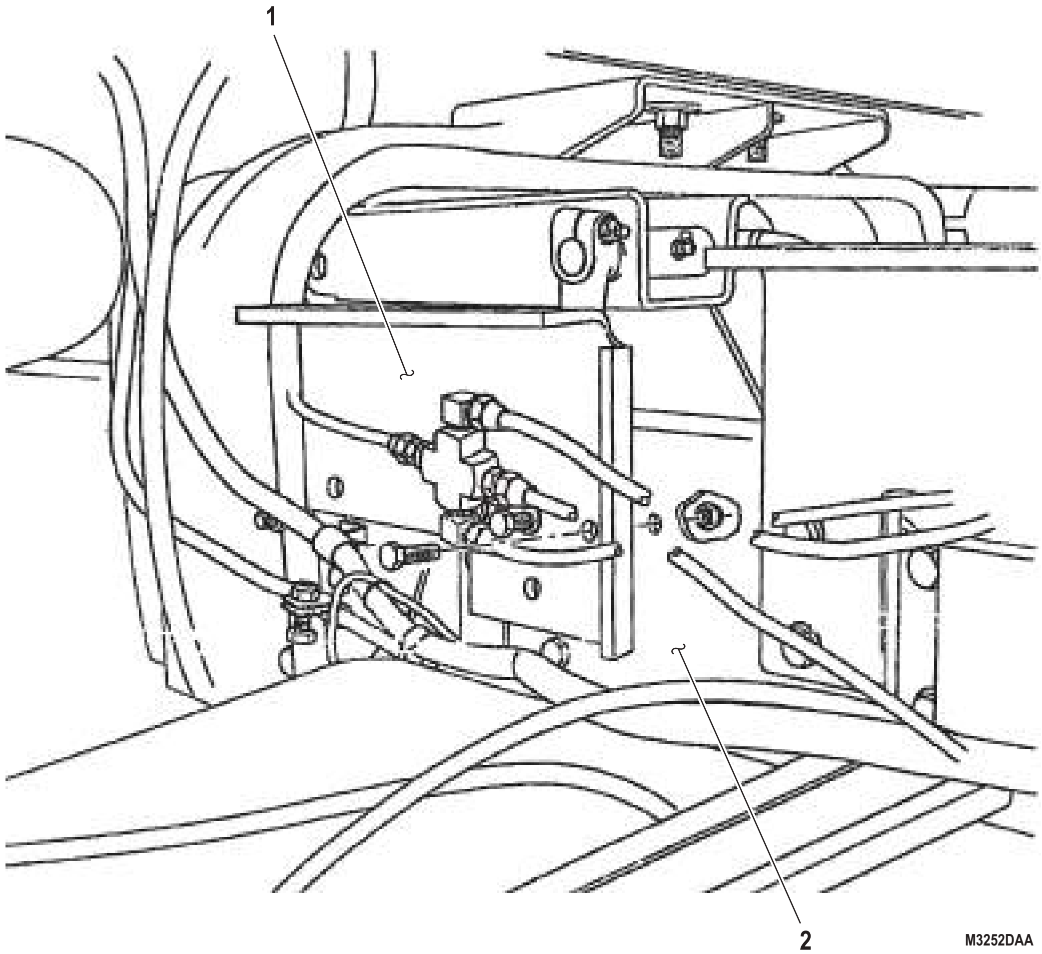


Figure 7. Bracket Removal.

REMOVAL - Continued

17. Remove electrical lead ground bolt from right side frame rail (Volume 4, WP 0593).
18. Remove two locknuts (Figure 8, Item 4), washers (Figure 8, Item 3), screws (Figure 8, Item 2), and exhaust support bracket (Figure 8, Item 6) from crossmember right side (Figure 8, Item 5). Discard locknuts.

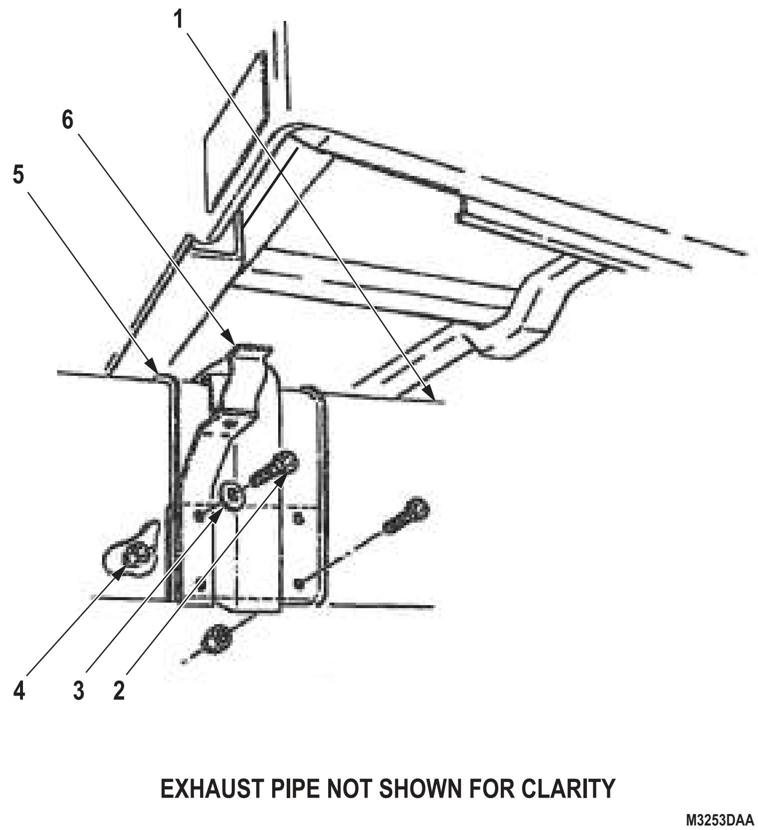


Figure 8. Crossmember and Exhaust Support Bracket Removal.

REMOVAL - Continued

NOTE

Dump models M929A1/A2 and M930A1/A2 must have dump bed raised before performing Steps (20) through (28).

19. If dump model M929A1/A2 or M930A1/A2 raise dump bed.
20. Secure approved overhead lifting device (Figure 9, Item 1) on rear of cab (Figure 9, Item 2). Support weight of cab.

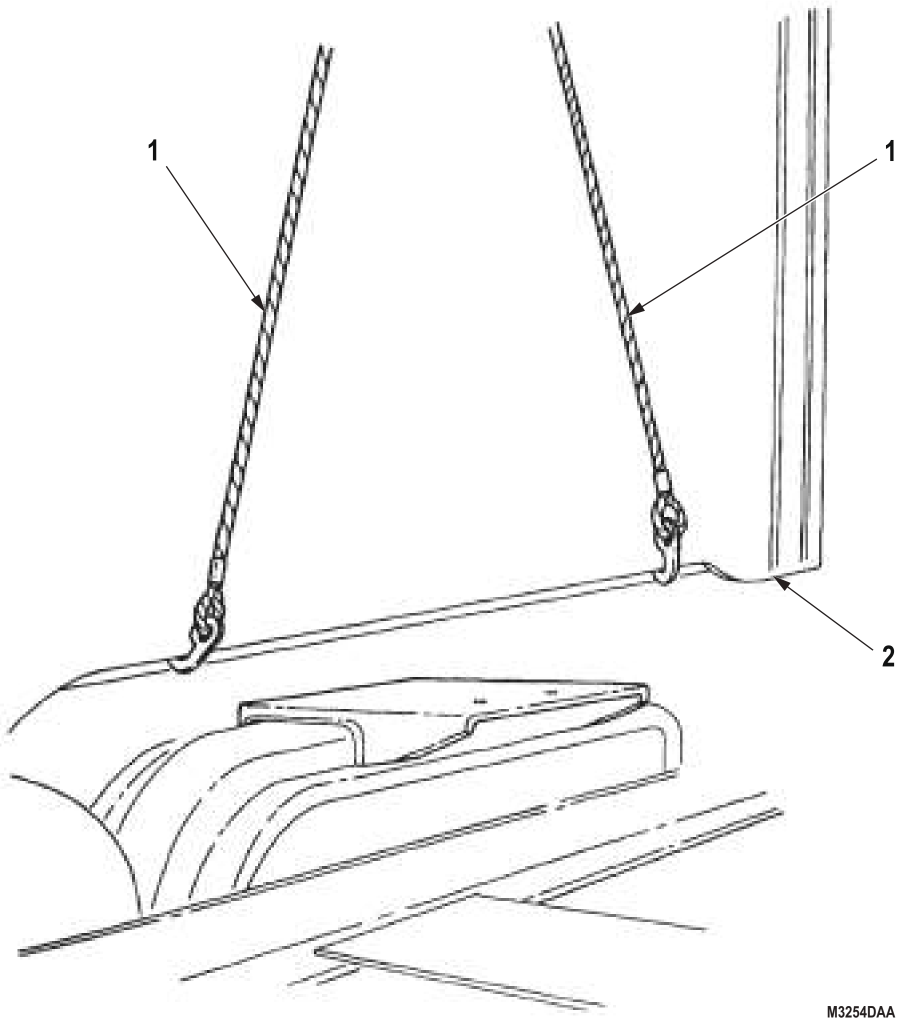


Figure 9. Rear Mount Cab Removal.

REMOVAL - Continued

21. Remove two cab rear mounts (Figure 10, Item 3).
22. Enlarge two existing holes (Figure 10, Item 2) in rear cab (Figure 10, Item 1) to 0.765 in. (19.2 mm) diameter if crossmember is the old type.

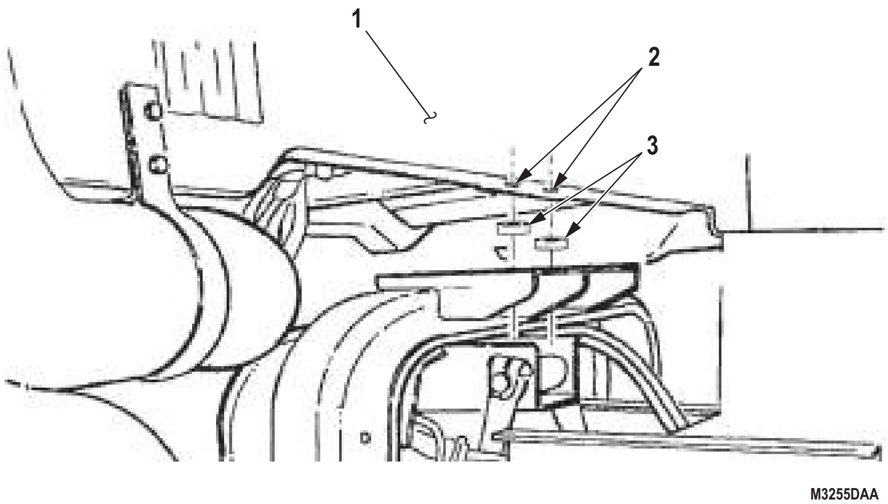


Figure 10. Hole Location Removal.

23. Install interior rear armor cab support plate (TB 9-2320-272-13) if required.

REMOVAL - Continued

WARNING

Damage to equipment and or serious injury could occur if an unapproved overhead lifting device is used. Failure to comply may result in damage to equipment, injury, or death to personnel.

24. Raise rear of cab (Figure 11, Item 1) no more than 12 in. (30.4 cm) by measuring from top of frame rail (Figure 11, Item 4) to bottom of cab rear wall. Use support (Figure 11, Item 3) under cab (Figure 11, Item 2) for crossmember removal.

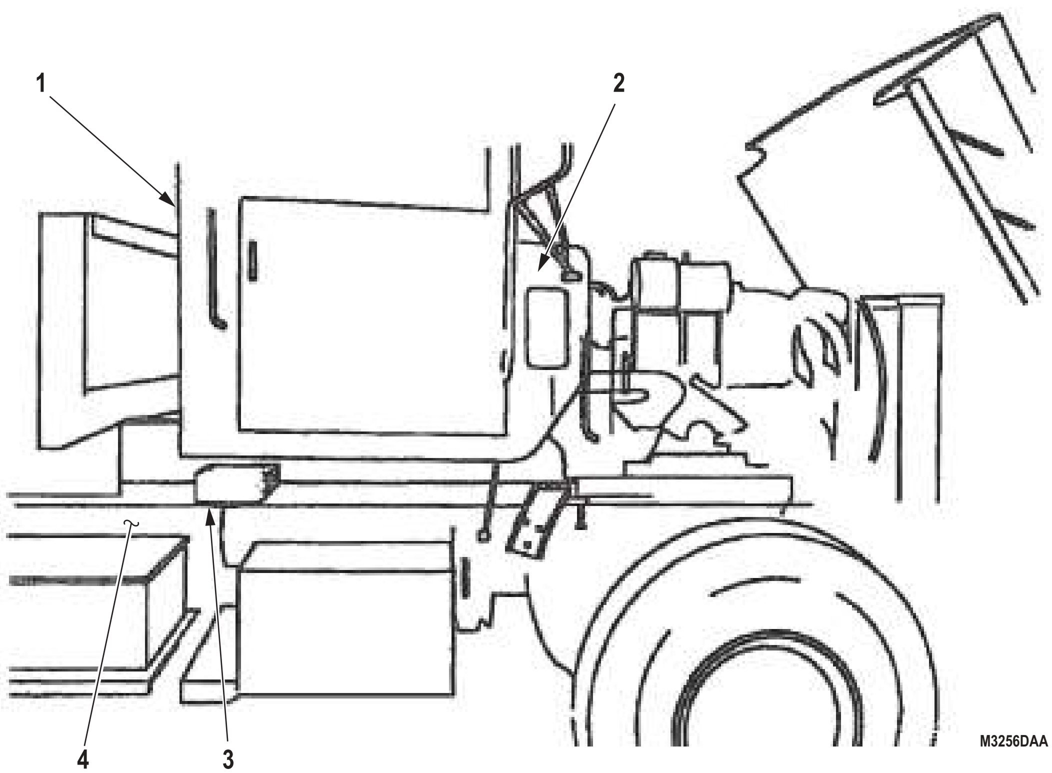


Figure 11. Raising the Cab Removal.

REMOVAL - Continued

WARNING

Use extreme caution while working under a suspended load. Secondary supports should be used while suspending a load. Failure to comply may result in injury or death to personnel.

25. Remove transmission mount (bushing) (WP 0361).
26. Remove remaining six screws (Figure 12, Item 3), locknuts (Figure 12, Item 2), and crossmember assembly (Figure 12, Item 1). Discard locknuts.

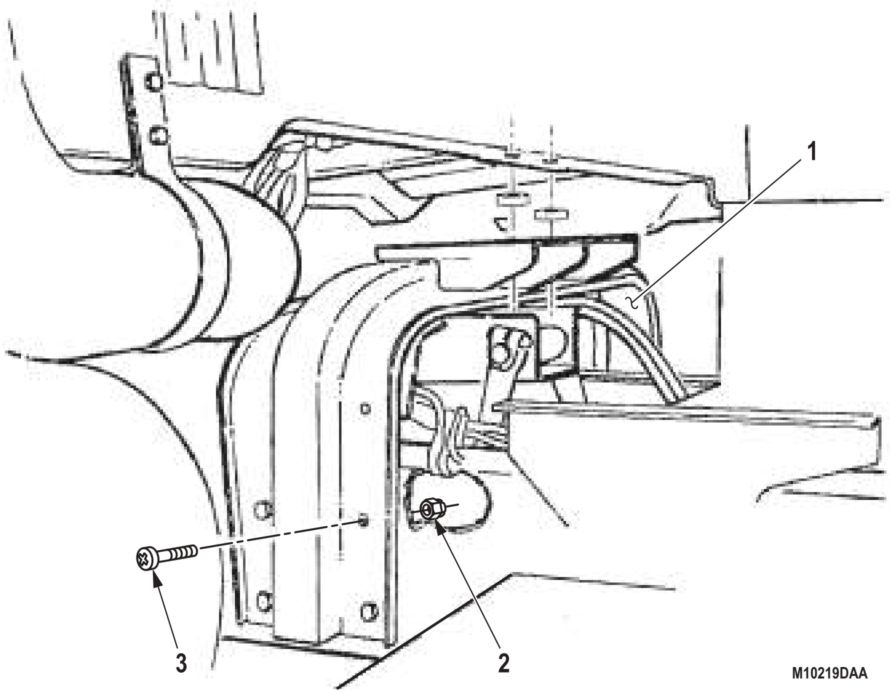


Figure 12. Crossmember Removal.

REMOVAL - Continued

27. Remove screw (Figure 13, Item 6), locknut (Figure 13, Item 4), cross shaft lever (Figure 13, Item 5), and woodruff key (Figure 13, Item 3) from cross shaft (Figure 13, Item 2). Discard locknut.
28. Remove cross shaft lever assembly and cross shaft (assembled as a unit) (Figure 13, Item 2) from crossmember assembly (Figure 13, Item 1).

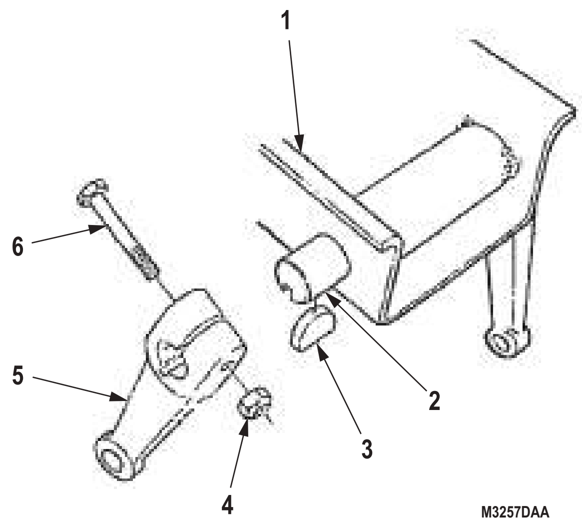


Figure 13. Cross Shaft Lever and Cross Shaft Removal.

END OF TASK

INSTALLATION

1. Install cross shaft and cross shaft lever (Figure 14, Item 2) (assembled as a unit) on crossmember assembly (Figure 14, Item 1).
2. Install woodruff key (Figure 14, Item 3) in cross shaft (Figure 14, Item 2).
3. Install cross shaft lever (Figure 14, Item 5) on cross shaft (Figure 14, Item 2) and secure with screw (Figure 14, Item 6) and locknut (Figure 14, Item 4).

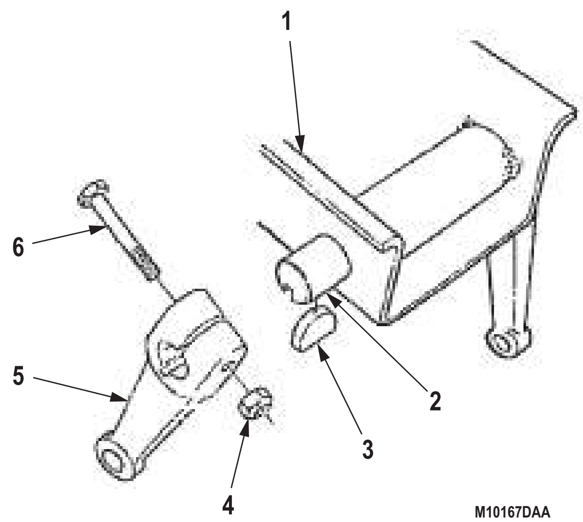


Figure 14. Cross Shaft Lever and Cross Shaft Installation.

INSTALLATION - Continued

NOTE

Long wheel base cargo models M927/A1/A2 and M928/A1/A2 do not use plates.

4. Install crossmember assembly (Figure 15, Item 1) with two plates (Figure 15, Item 6) between frame rail (Figure 15, Item 5) and crossmember assembly and secure with six screws (Figure 15, Item 7) and locknuts (Figure 15, Item 4).
5. Install bushing to transmission support bracket and crossmember and secure with lockwashers and nuts (WP 0361).
6. Secure transmission support bracket to transmission (WP 0361).
7. Align hole in fuel line bracket (Figure 15, Item 3) with hole marked A on left side of crossmember (Figure 15, Item 1) and secure with screw (Figure 15, Item 8) and locknut (Figure 15, Item 4).
8. Install five screws (Figure 15, Item 7) and locknuts (Figure 15, Item 4) in left and right sides of crossmember assembly (Figure 15, Item 1).

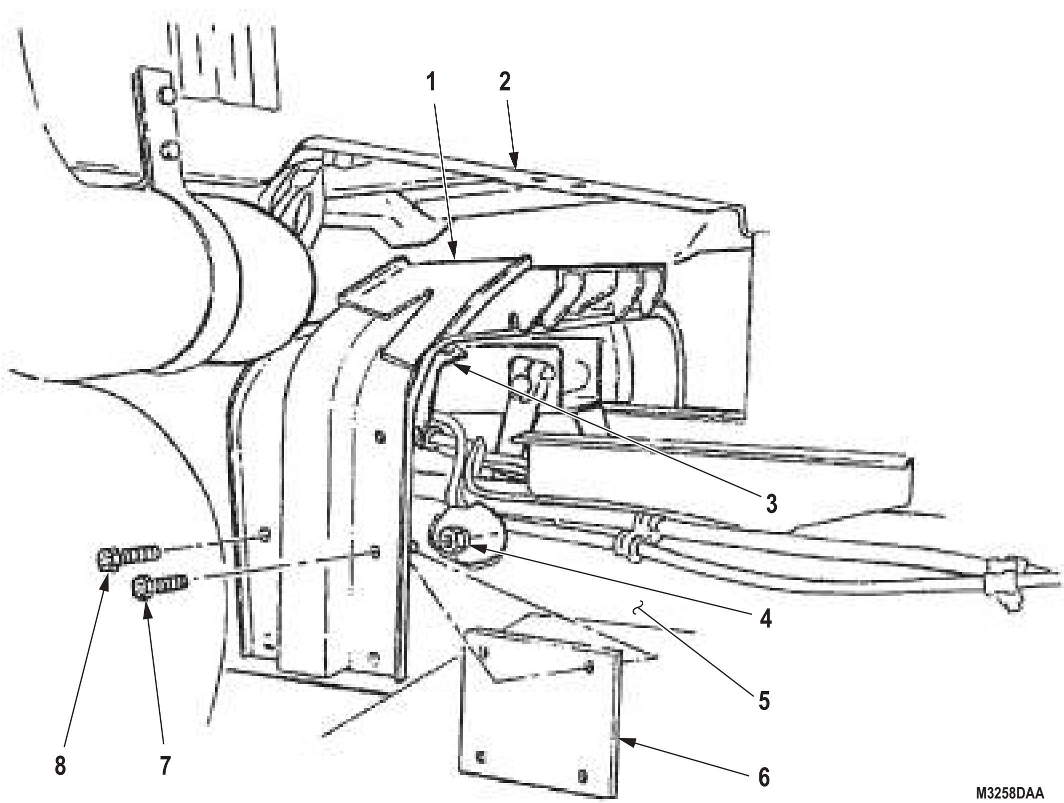


Figure 15. Crossmember Assembly and Plates Installation.

INSTALLATION - Continued

9. Align exhaust support bracket (Figure 16, Item 6) on right side of crossmember assembly (Figure 16, Item 5) and frame rail (Figure 16, Item 1) and secure with two screws (Figure 16, Item 2), washers (Figure 16, Item 3), and locknuts (Figure 16, Item 4). Tighten eight nuts to 110 to 120 lb-ft (149 to 153 N·m).

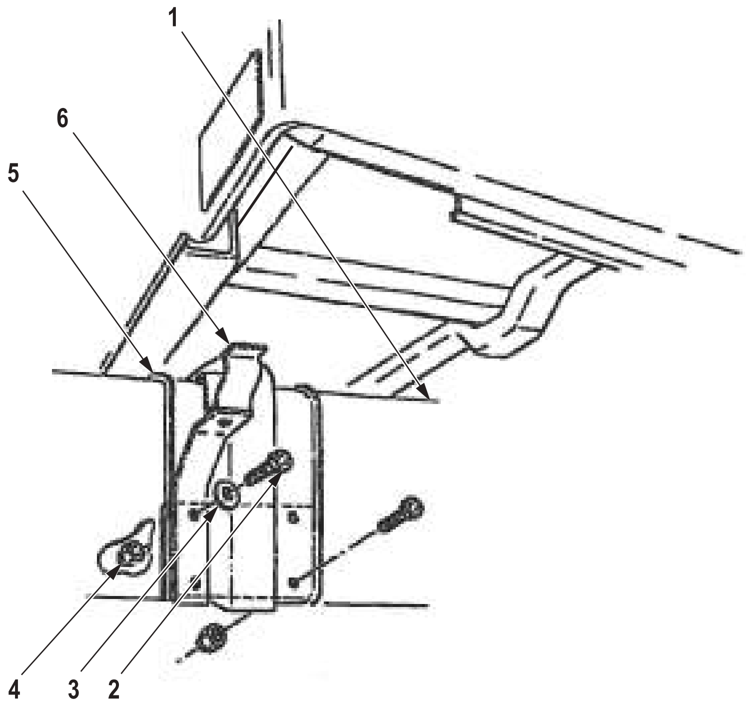


Figure 16. Crossmember Installation.

INSTALLATION - Continued

10. Place two mounts (Figure 17, Item 4) and washers (Figure 17, Item 3) between cab (Figure 17, Item 1) and crossmember assembly and align holes.

WARNING

Do not remove overhead lifting device. Failure to comply may result in injury or death to personnel.

11. Lower cab (Figure 17, Item 1) on crossmember while maintaining hole alignment. Remove any safety support equipment from underneath cab.
12. Insert two screws (Figure 17, Item 2) through cab (Figure 17, Item 1), washers (Figure 17, Item 7), mounts (Figure 17, Item 4), and crossmember assembly.
13. Tighten rear cab mounting bolts (Figure 17, Item 2) to 400 to 420 lb-ft (542 to 569 N·m).
14. Install two spacers (Figure 17, Item 5), mounts (Figure 17, Item 6), washers (Figure 17, Item 7), and locknuts (Figure 17, Item 8).

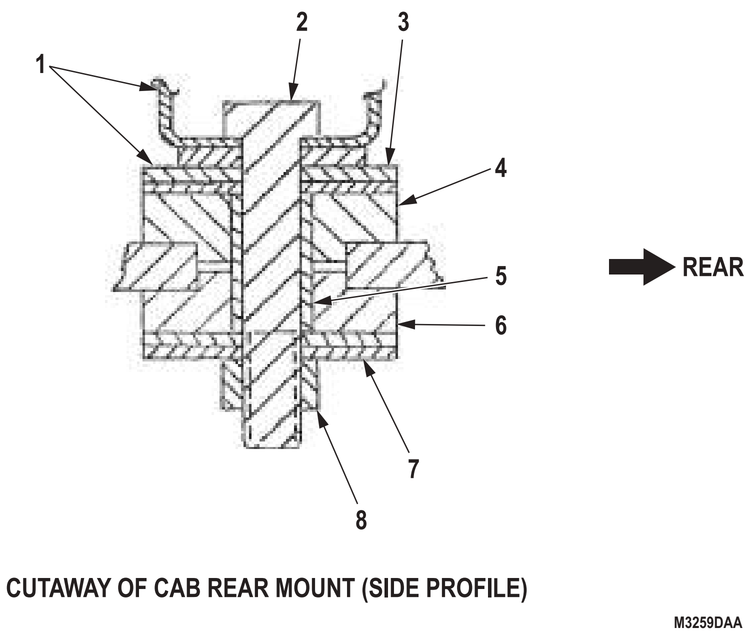


Figure 17. Rear Cab Mount (Side Profile) Installation.

INSTALLATION - Continued

15. Remove overhead lifting device.
16. Connect fuel line bracket to left side of crossmember assembly.

NOTE

M936A1/A2, M929A1/A2, M930A1/A2, M931A1/A2, and M932A1/A2 models have fuel line clamps on left and right sides of crossmember. Both sets of clamps must be installed.

17. Route air drain line through crossmember assembly and connect air drain line to emergency spring brake air reservoir (WP 0444).

NOTE

Step (19) is for M932A1/A2 model tractors with winch only. All other models proceed to Step (20).

18. Install bracket (Figure 18, Item 1) onto left frame rail (Figure 18, Item 2).

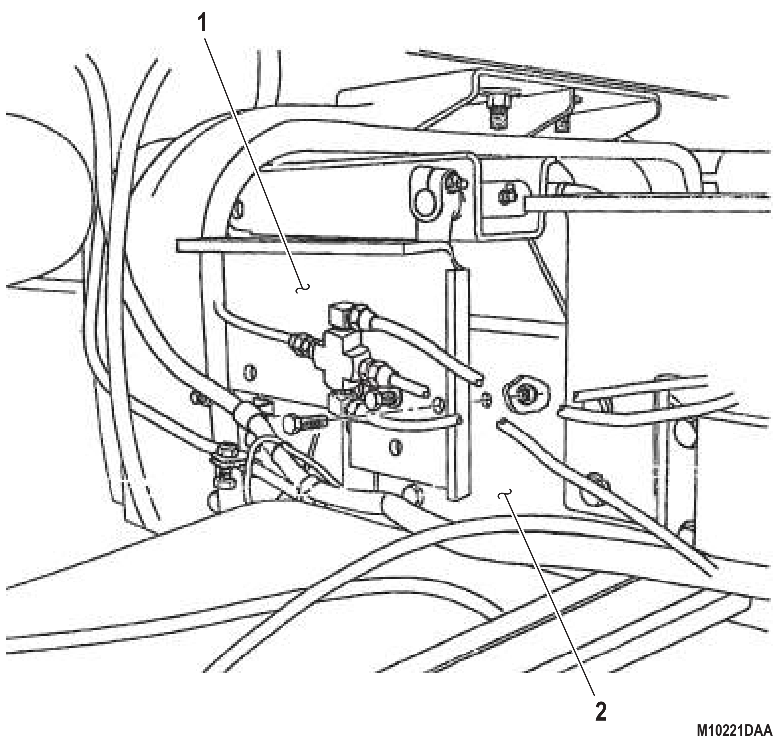


Figure 18. Bracket Installation.

INSTALLATION - Continued

19. Install electrical lead ground bolt to right side frame rail (Volume 4, WP 0593).
20. Install spare tire carrier (WP 0522) or (WP 0523).
21. Install primary air tank rear strap (Figure 19, Item 3) with two screws (Figure 19, Item 2) on crossmember (Figure 19, Item 1).

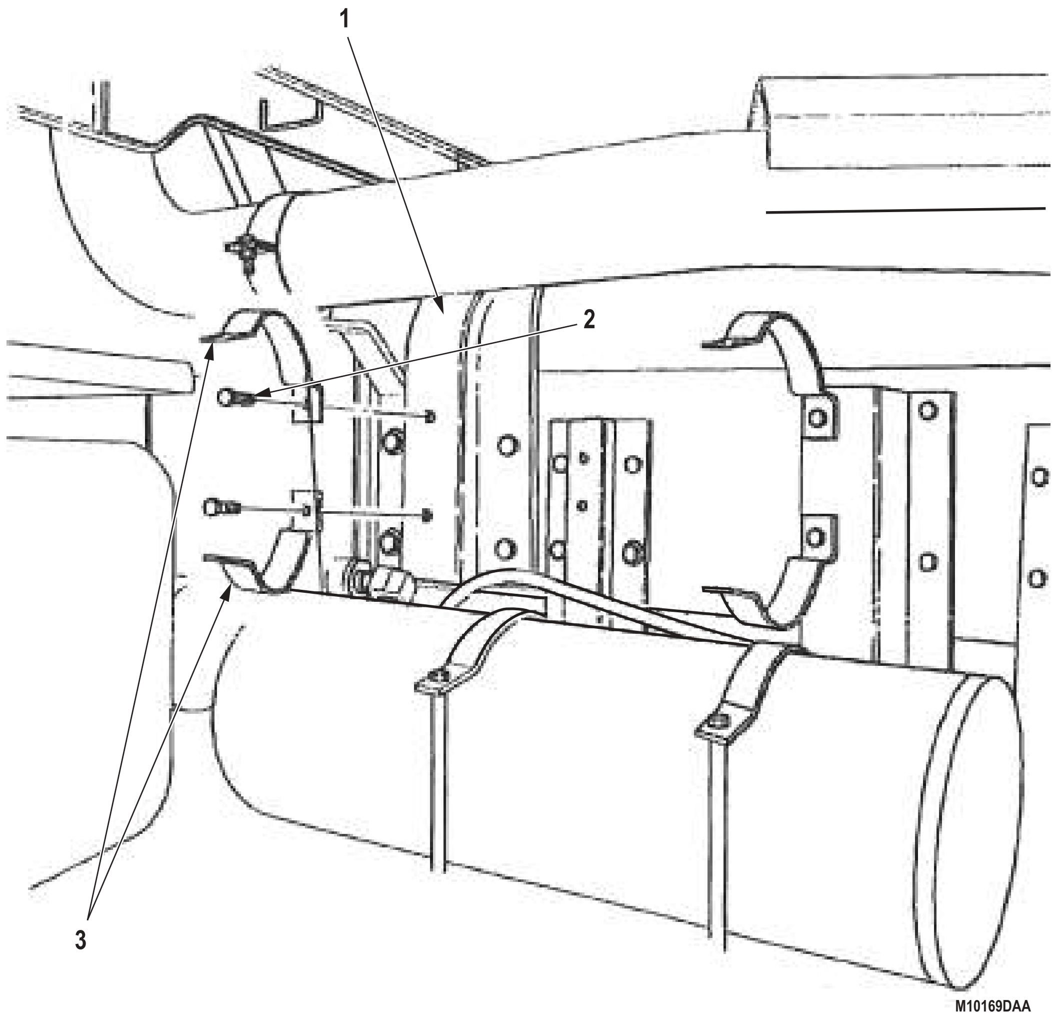


Figure 19. Primary Air Tank Installation.

22. Install primary air tank (WP 0440).
23. Connect cross shaft lever (Figure 19, Item 1) to transfer case shift rod (WP 0385) or (WP 0386).

INSTALLATION - Continued

24. Install muffler (Figure 20, Item 2) and spare tire carrier bracket (Figure 20, Item 1) as an assembly. Use overhead lifting device to lower assembly into position.

25. Secure muffler (Figure 20, Item 2) and spare tire carrier bracket (Figure 20, Item 1) to right side frame rail (Figure 20, Item 6) and spare tire carrier (Figure 20, Item 8) with nine bolts (Figure 20, Item 4) and nuts (Figure 20, Item 5) to frame and four bolts (Figure 20, Item 3) and nuts (Figure 20, Item 7) to spare tire carrier (Figure 20, Item 8).

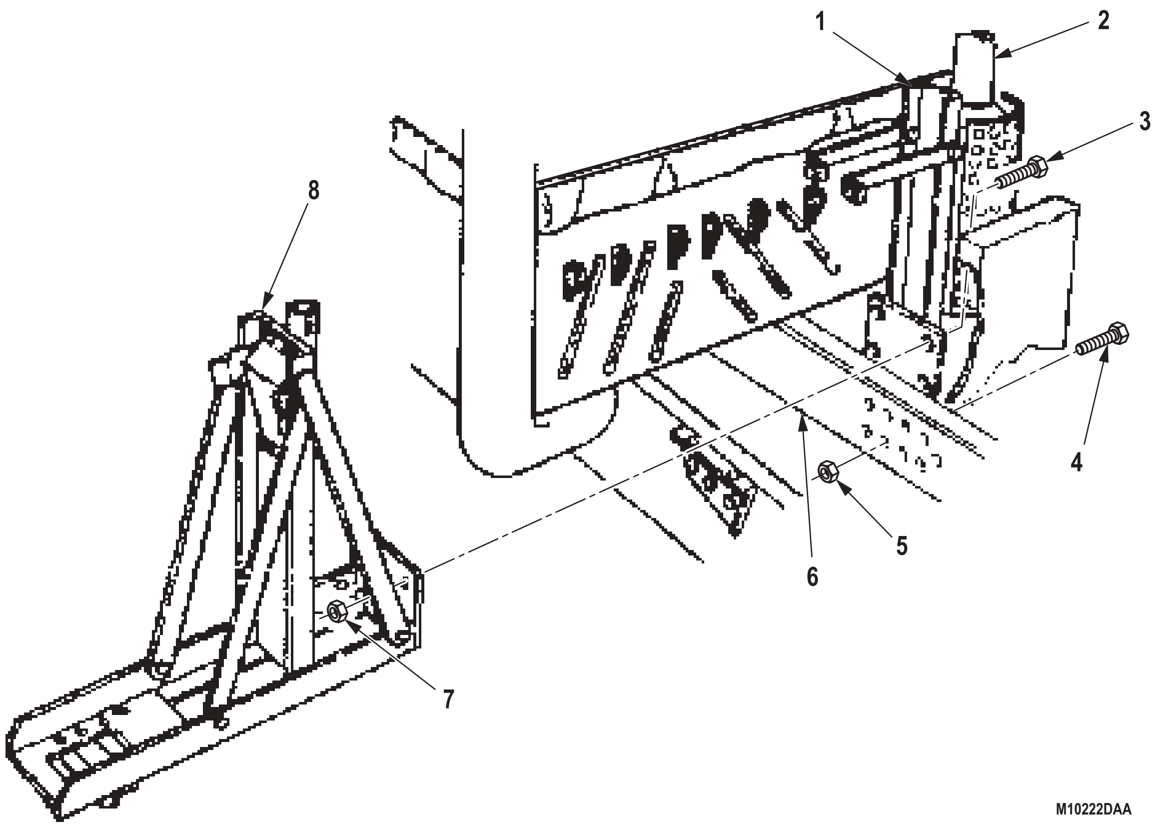


Figure 20. Spare Tire Carrier Installation.

END OF TASK

FOLLOW-ON MAINTENANCE

1. Secure muffler to rear exhaust pipe with exhaust pipe clamp. (Volume 2, WP 0275)
2. Install battery box. (Volume 2, WP 0347)
3. Install air cleaner cover. (TM 9-2320-272-10)
4. Lower hood and secure. (TM 9-2320-272-10)

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
FRONT AND REAR FIELD CHOCK ANCHORS REPLACEMENT (M936/A1 WRECKER)

INITIAL SETUP:

Tools and Special Tools

Tool Kit, General Mechanic's: Automotive
(Volume 5, WP 0826, Table 1, Item 56)

Materials/Parts

Locknut (Volume 5, WP 0827, Table 1, Item 279)
Qty: 16

Materials/Parts (cont.)

Locknut (Volume 5, WP 0827, Table 1, Item 289)
Qty: 4

Lockwasher
(Volume 5, WP 0827, Table 1, Item 411)
Qty: 2

Equipment Condition

Parking brake set. (TM 9-2320-272-10)

REMOVAL

1. Remove two locknuts (Figure 1, Item 16) and screws (Figure 1, Item 1) from front anchors (Figure 1, Item 12), shackles (Figure 1, Item 17), and frame (Figure 1, Item 3). Discard locknuts.
2. Remove four locknuts (Figure 1, Item 2), two screws (Figure 1, Items 14 and 15), lockwashers (Figure 1, Item 13), and front anchors (Figure 1, Item 12) from frame (Figure 1, Item 3). Discard lockwashers and locknuts.
3. Remove eight locknuts (Figure 1, Item 6), screws (Figure 1, Item 11), and two side anchors (Figure 1, Item 10) from frame (Figure 1, Item 3). Discard locknuts.
4. Remove two locknuts (Figure 1, Item 6), screws (Figure 1, Item 7), four locknuts (Figure 1, Item 8), screws (Figure 1, Item 4), and two rear anchors (Figure 1, Item 9) from frame (Figure 1, Item 3). Discard locknuts.

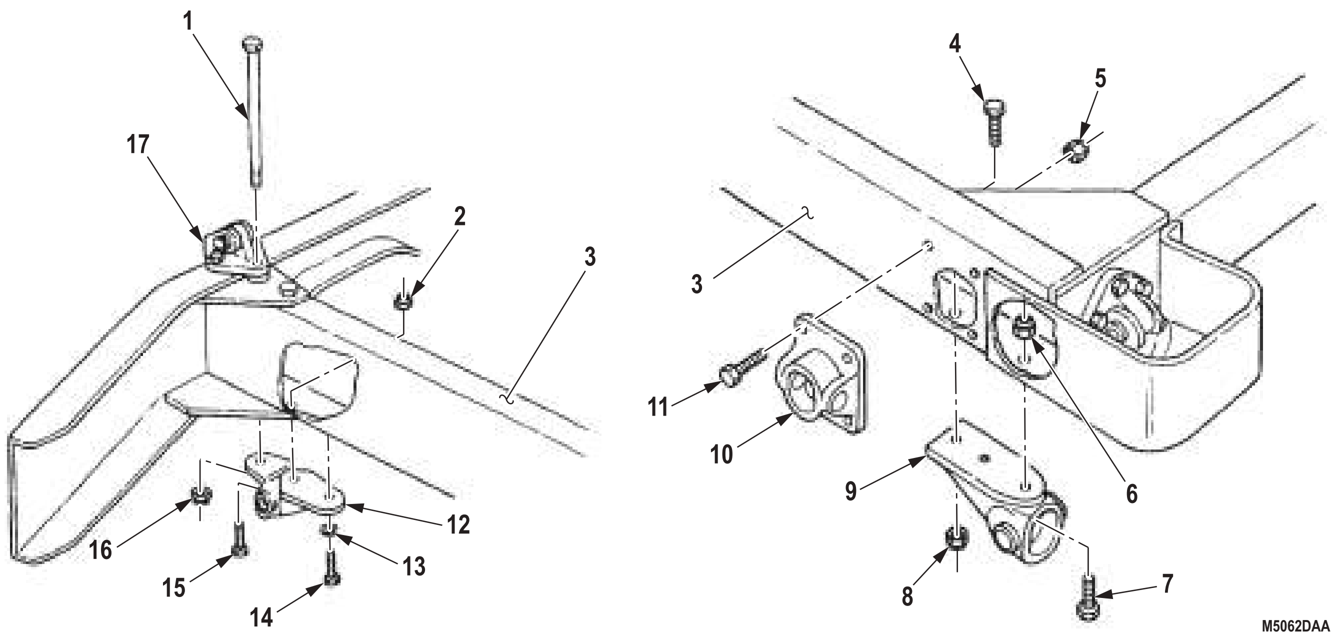


Figure 1. Front and Rear Field Chock Anchors Removal (M936/A1).

END OF TASK

INSTALLATION

1. Install two rear anchors (Figure 2, Item 9) on frame (Figure 2, Item 3) with two screws (Figure 2, Item 7), locknuts (Figure 2, Item 6), four screws (Figure 2, Item 4), and locknuts (Figure 2, Item 8).
2. Install two side anchors (Figure 2, Item 10) on frame (Figure 2, Item 3) with eight screws (Figure 2, Item 11) and locknuts (Figure 2, Item 5).
3. Install two front anchors (Figure 2, Item 12) on frame (Figure 2, Item 3) with two lockwashers (Figure 2, Item 13), screws (Figure 2, Items 14 and 15), and four locknuts (Figure 2, Item 2).
4. Install two screws (Figure 2, Item 1) on front anchors (Figure 2, Item 12), shackles (Figure 2, Item 17), and frame (Figure 2, Item 3) with two locknuts (Figure 2, Item 16).

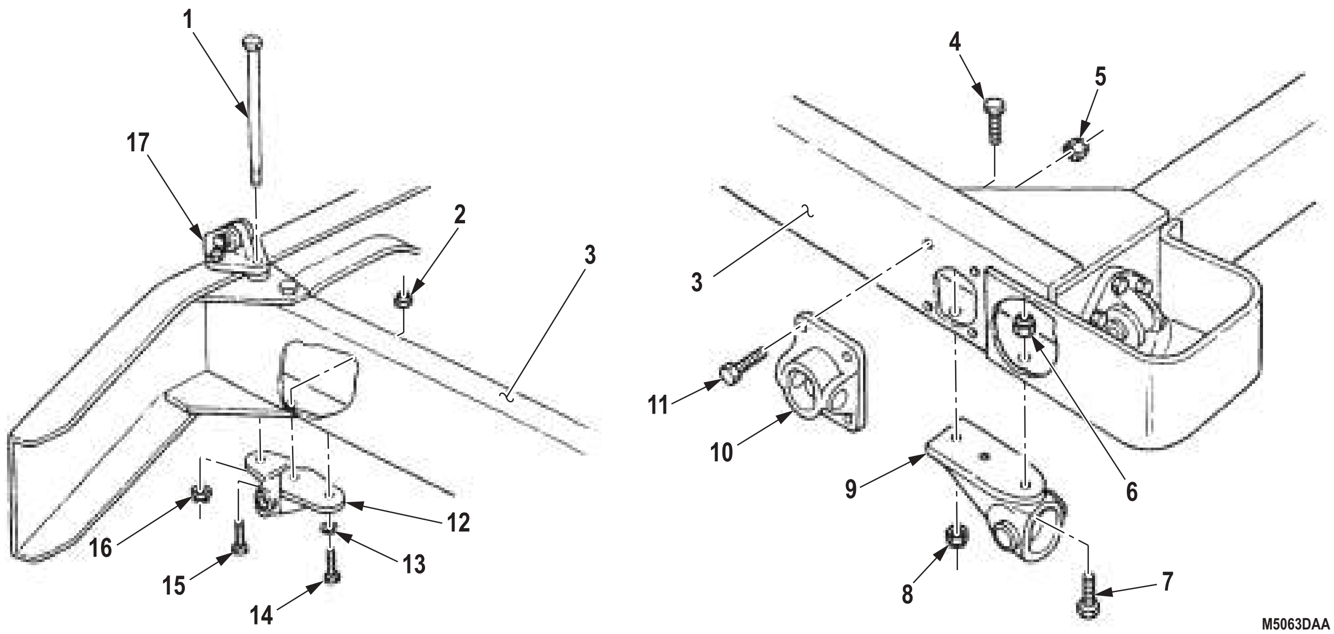


Figure 2. Front and Rear Field Chock Anchors Installation (M936/A1).

END OF TASK

FOLLOW-ON MAINTENANCE

Lubricate anchors. (Volume 5, WP 0820)

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
BUMPERETTE REPLACEMENT

INITIAL SETUP:

Tools and Special Tools
Tool Kit, General Mechanic's: Automotive (Volume 5, WP 0826, Table 1, Item 56)

Equipment Condition
Parking brake set. (TM 9-2320-272-10)

Materials/Parts
Locknut (Volume 5, WP 0827, Table 1, Item 289)
Qty: 6

REMOVAL

NOTE

Left and right bumperettes are replaced in the same way. Left bumperette shown.

1. Remove four locknuts (Figure 1, Item 2) and screws (Figure 1, Item 7) from left hand frame rail (Figure 1, Item 1) and bumperette (Figure 1, Item 6). Discard locknuts.
2. Remove two locknuts (Figure 1, Item 3), screws (Figure 1, Item 5), and bumperette (Figure 1, Item 6) from rear crossmember (Figure 1, Item 4). Discard locknuts.

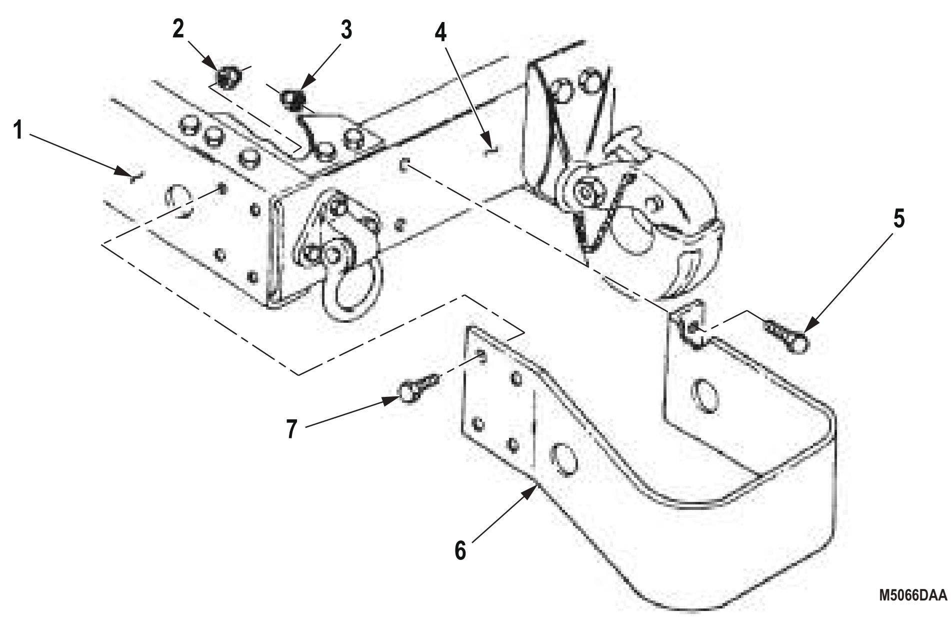


Figure 1. Bumperette Removal.

END OF TASK

INSTALLATION

1. Install bumperette (Figure 2, Item 6) on rear crossmember (Figure 2, Item 4) with two screws (Figure 2, Item 5) and locknuts (Figure 2, Item 3).
2. Install bumperette (Figure 2, Item 6) on left hand frame rail (Figure 2, Item 1) with four screws (Figure 2, Item 7) and locknuts (Figure 2, Item 2).

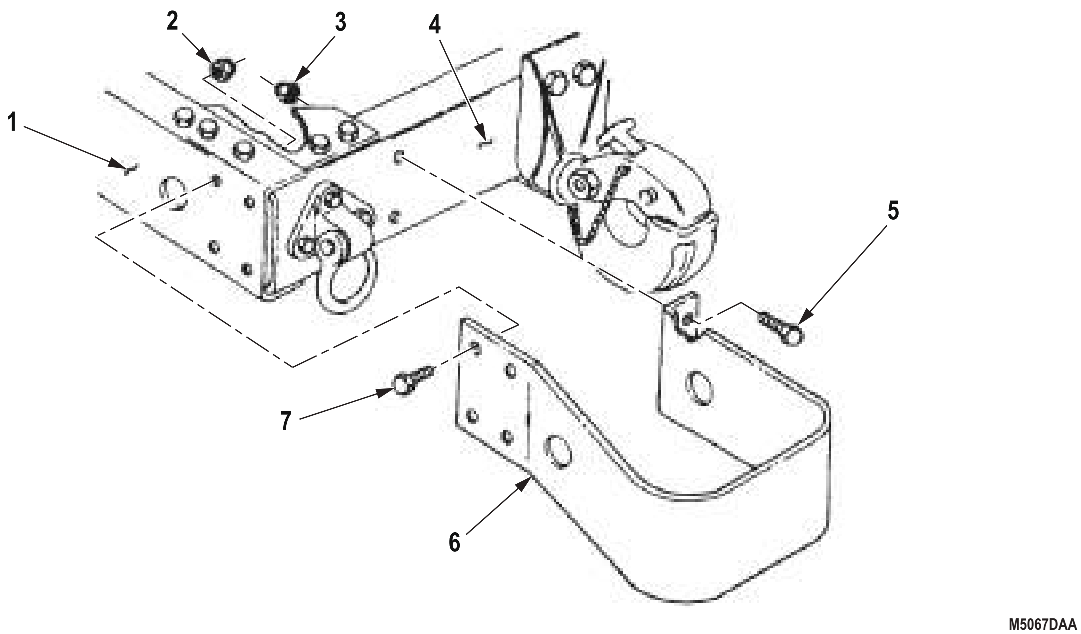


Figure 2. Bumperette Installation.

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
FRONT BUMPER AND PLATES REPLACEMENT

INITIAL SETUP:

Tools and Special Tools

Tool Kit, General Mechanic's: Automotive
(Volume 5, WP 0826, Table 1, Item 56)

Materials/Parts

Locknut (Volume 5, WP 0827, Table 1, Item 249)
Qty: 8
Locknut (Volume 5, WP 0827, Table 1, Item 289)
Qty: 10
Locknut (M936/A1)
(Volume 5, WP 0827, Table 1, Item 289)
Qty: 12
Lockwasher (M936/A1)
(Volume 5, WP 0827, Table 1, Item 405)
Qty: 4

Equipment Condition

Front lifting shackle brackets removed. (Volume 4, WP 0559)
Hood retaining bracket removed. (Volume 4, WP 0559)

REMOVAL

1. Remove four locknuts (Figure 1, Items 17 and 18) and screws (Figure 1, Items 3 and 4) from front bumper (Figure 1, Item 1) and two lower plates (Figure 1, Item 16). Discard locknuts.

NOTE

Perform Step (2) for M936/A1 model vehicles.

2. Remove six locknuts (Figure 1, Items 11, 19, and 20), screws (Figure 1, Items 5, 6, and 7), four lockwashers (Figure 1, Item 8), two chock anchors (Figure 1, Item 9) and lower plates (Figure 1, Item 16) from front bumper (Figure 1, Item 1) and frame (Figure 1, Item 10). Discard lockwashers and locknuts.
3. Remove two locknuts (Figure 1, Items 19 and 20), screws (Figure 1, Items 5 and 6), and two lower plats (Figure 1, Item 16) from front bumper (Figure 1, Item 1) and frame (Figure 1, Item 10). Discard locknuts.
4. Remove four locknuts (Figure 1, Item 15), screws (Figure 1, Item 2), and bumper (Figure 1, Item 1) from two upper plates (Figure 1, Item 12). Discard locknuts.
5. Remove four locknuts (Figure 1, Item 14), screws (Figure 1, Item 13), and upper plates (Figure 1, Item 12) from frame (Figure 1, Item 10). Discard locknuts.

REMOVAL - Continued

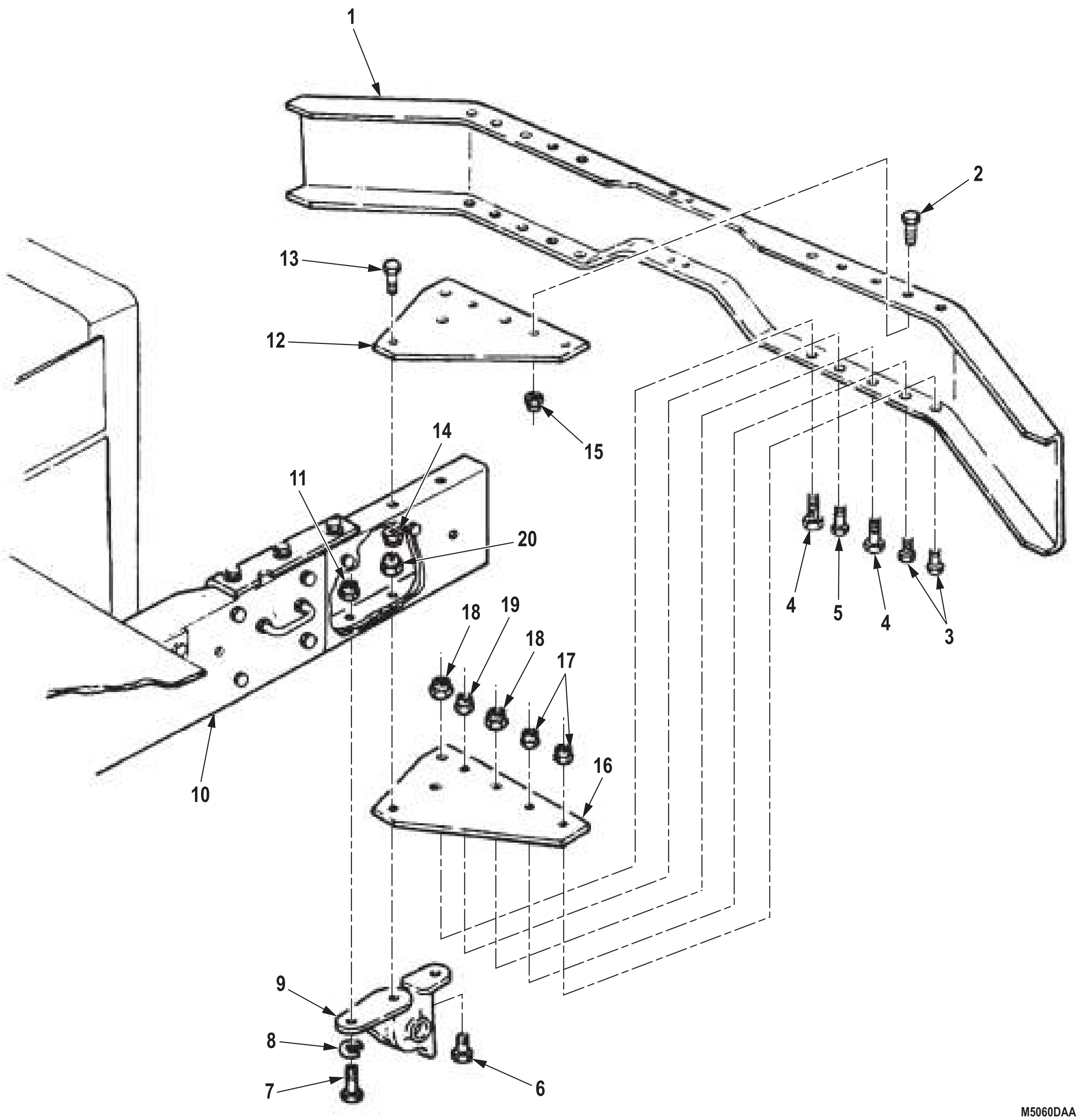


Figure 1. Front Bumper and Plates Removal.

END OF TASK

INSTALLATION

1. Install two upper plates (Figure 2, Item 12) on frame (Figure 2, Item 10) with two screws (Figure 2, Item 13) and locknuts (Figure 2, Item 14).

NOTE

The bumper is inverted on winch model vehicles.

2. Install bumper (Figure 2, Item 1) on two upper plates (Figure 2, Item 12) with four screws (Figure 2, Item 2) and locknuts (Figure 2, Item 15).

NOTE

Perform Step (3) for M936/A1 model vehicles.

3. Install two chock anchors (Figure 2, Item 9) and lower plates (Figure 2, Item 16) on front bumper (Figure 2, Item 1) and frame (Figure 2, Item 10) with four lockwashers (Figure 2, Item 8), six screws (Figure 2, Items 5, 6, and 7), and locknuts (Figure 2, Items 11, 19, and 20).
4. Install two lower plates (Figure 2, Item 16) on front bumper (Figure 2, Item 1) and frame (Figure 2, Item 10) with two screws (Figure 2, Items 5 and 6) and locknuts (Figure 2, Items 19 and 20).
5. Install four screws (Figure 2, Items 3 and 4) in front bumper (Figure 2, Item 1) and two lower plates (Figure 2, Item 16) with four locknuts (Figure 2, Items 17 and 18).

INSTALLATION - Continued

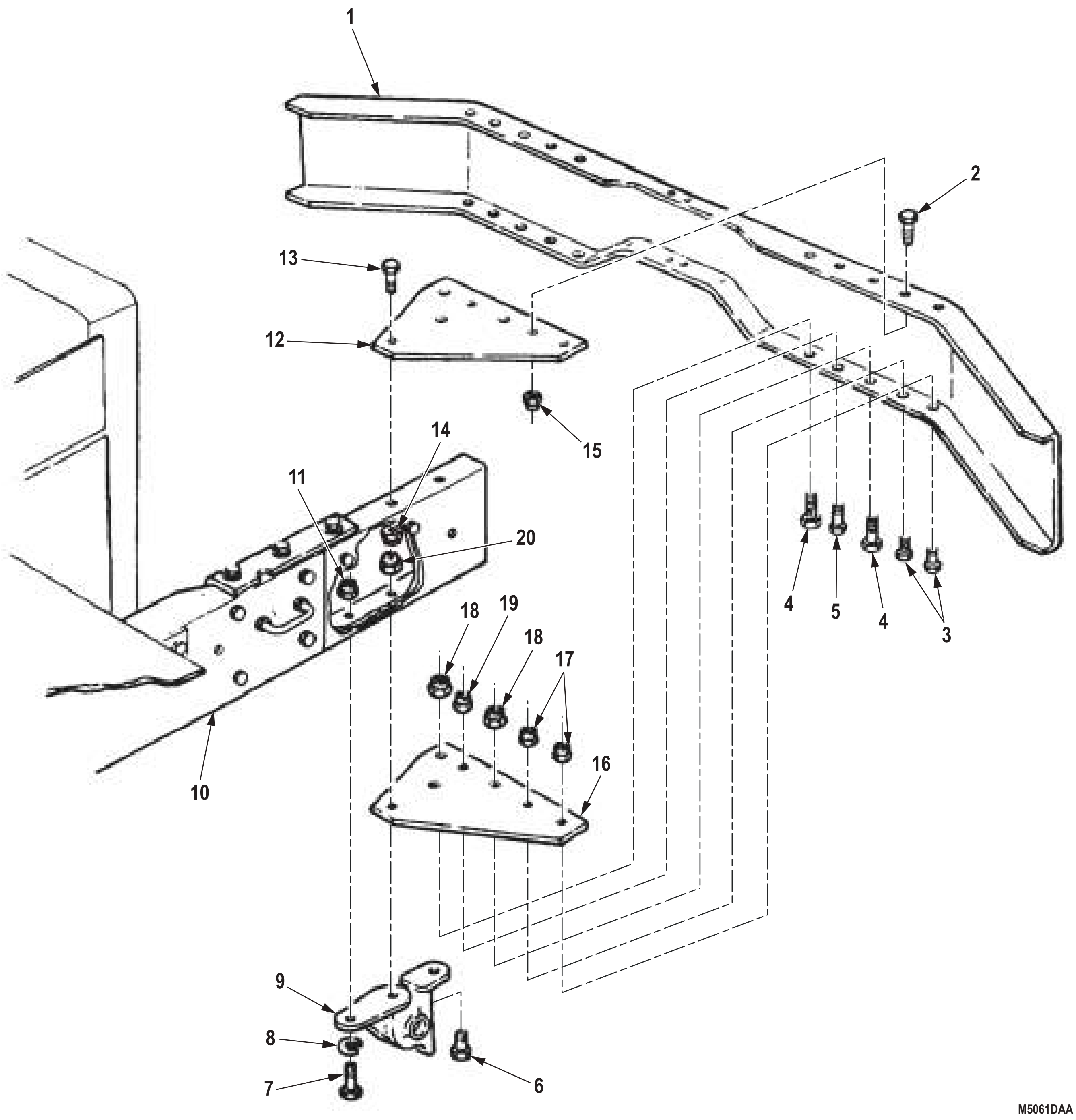


Figure 2. Front Bumper and Plates Installation.

END OF TASK

FOLLOW-ON MAINTENANCE

1. Install front lifting shackle bracket. (Volume 4, WP 0559)
2. Install hood retaining bracket. (Volume 4, WP 0559)

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
VEHICLE TIEDOWN COMPONENT REPLACEMENT

INITIAL SETUP:

Tools and Special Tools

Tool Kit, General Mechanic's: Automotive
(Volume 5, WP 0826, Table 1, Item 56)

Materials/Parts

Locknut (M923, M924, M929, M931, M936)
(Volume 5, WP 0827, Table 1, Item 313)
Qty: 24

Locknut (M925, M926, M930, M932)
(Volume 5, WP 0827, Table 1, Item 313)
Qty: 28

Materials/Parts (cont.)

Locknut (M927, M934)
(Volume 5, WP 0827, Table 1, Item 313)
Qty: 32

Locknut (M928)
(Volume 5, WP 0827, Table 1, Item 313)
Qty: 36

Equipment Condition

Parking brake set. (TM 9-2320-272-10)

REMOVAL

NOTE

- Left and right side tiedowns are replaced the same. This procedure covers left-side tiedowns.
- Depending on vehicle model, as few as 12 or as many as 18 tiedowns may exist.
- Tiedowns are located alongside vehicle frame rail.
- All vehicles have two tiedowns installed with spacers. Mark position for installation.

Remove nine locknuts (Figure 1, Item 1), washers (Figure 1, Item 4), screws (Figure 1, Item 3), spacers (Figure 1, Item 5), and tiedowns (Figure 1, Item 2) from left side frame rail (Figure 1, Item 6). Discard locknuts and remove spacer as required.

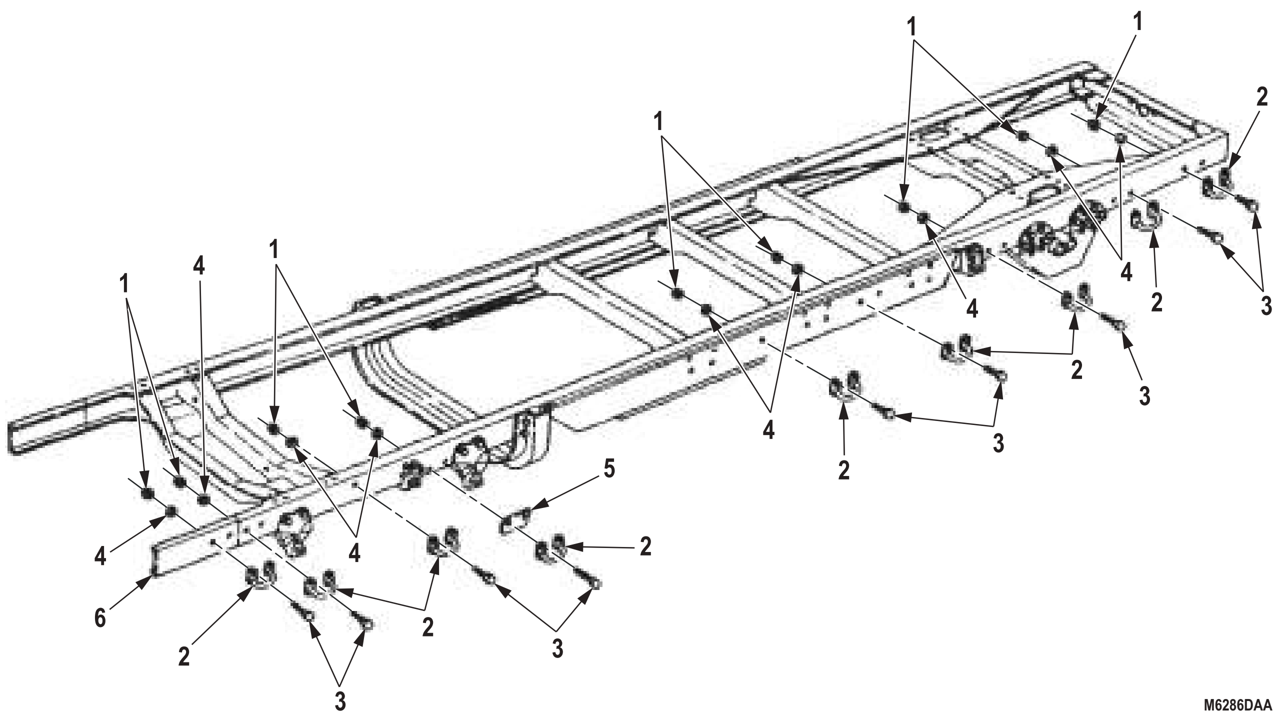


Figure 1. Vehicle Tiedown Component Removal.

END OF TASK

INSTALLATION

Install spacers (Figure 2, Item 5) as required and tiedowns (Figure 2, Item 2) on left side frame rail (Figure 2, Item 6) with two screws (Figure 2, Item 3), washers (Figure 2, Item 4), and locknuts (Figure 2, Item 1).

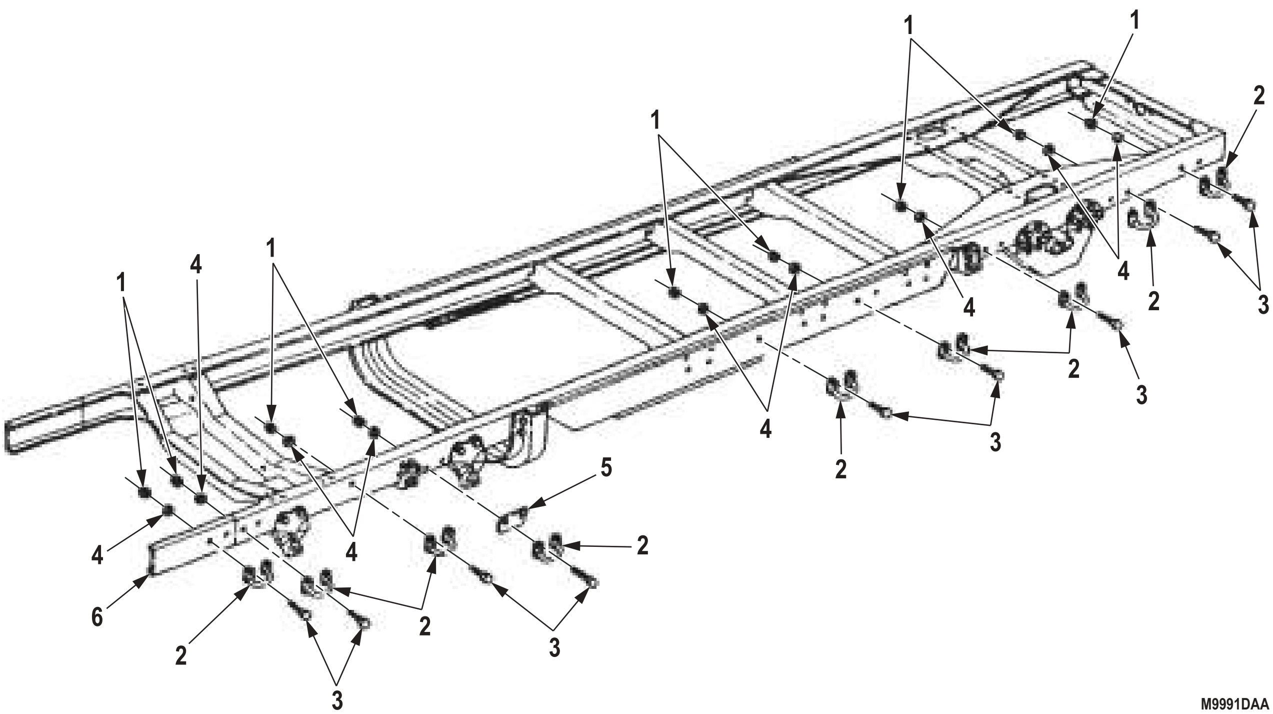


Figure 2. Vehicle Tiedown Component Installation.

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
PINTLE HOOK REPAIR

INITIAL SETUP:

Tools and Special Tools
Tool Kit, General Mechanic's: Automotive
(Volume 5, WP 0826, Table 1, Item 56)

Materials/Parts
Cleaning Compound, Solvent
(Volume 5, WP 0825, Table 1, Item 16, 17)
Grease, Automotive and Artillery
(Volume 5, WP 0825, Table 1, Item 28)
Cotter Pin
(Volume 5, WP 0827, Table 1, Item 345)
Qty: 1

Materials/Parts (cont.)
Cotter Pin
(Volume 5, WP 0827, Table 1, Item 354)
Qty: 1
Cotter Pin
(Volume 5, WP 0827, Table 1, Item 355)
Qty: 1

References
Volume 5, WP 0820

Equipment Condition
Parking brake set. (TM 9-2320-272-10)

REMOVAL

1. Remove cotter pin (Figure 1, Item 2) from slotted nut (Figure 1, Item 3). Discard cotter pin.
2. Remove slotted nut (Figure 1, Item 3), washer (Figure 1, Item 4), and pintle hook (Figure 1, Item 1) from mounting bracket (Figure 1, Item 5).

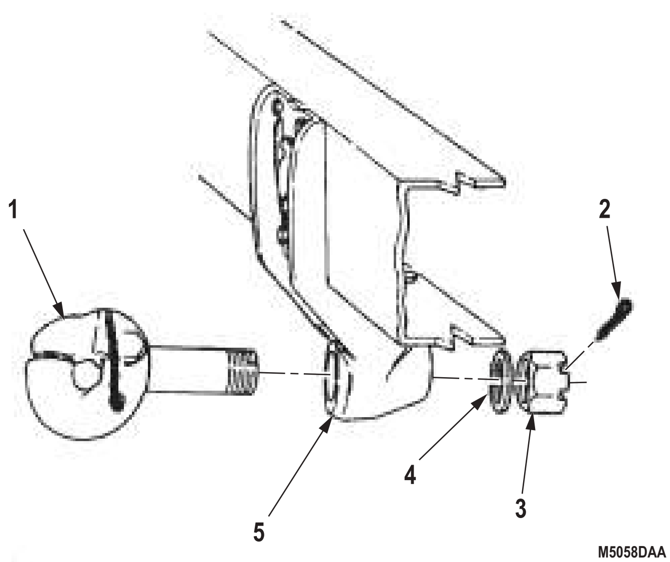


Figure 1. Pintle Hook Removal.

END OF TASK

DISASSEMBLY

1. Remove two grease fittings (Figure 2, Item 5) from screw (Figure 2, Item 7) and latch shaft (Figure 2, Item 4).
2. Remove drive pin (Figure 2, Item 8), chain (Figure 2, Item 9), and cotter pin (Figure 2, Item 6) from pintle hook (Figure 2, Item 10) and latch (Figure 2, Item 3). Discard cotter pin.
3. Remove cotter pin (Figure 2, Item 11), slotted nut (Figure 2, Item 12), screw (Figure 2, Item 7), and latch (Figure 2, Item 3) from pintle hook (Figure 2, Item 10). Discard cotter pin.
4. Remove latch shaft (Figure 2, Item 4), latch lock (Figure 2, Item 1), and spring (Figure 2, Item 2) from latch (Figure 2, Item 3).

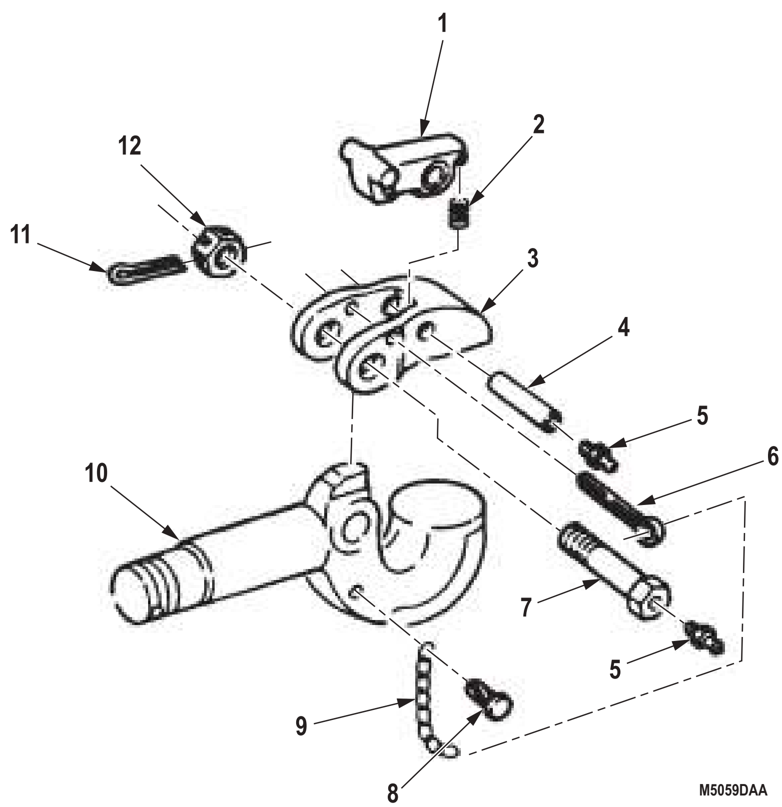
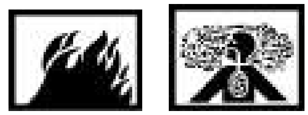


Figure 2. Pintle Hook Disassembly.

END OF TASK

CLEANING AND INSPECTION

WARNING



Solvent cleaning compound is flammable and will not be used near an open flame. A fire extinguisher will be kept nearby when solvent is used. Use only in well-ventilated places. Failure to comply may result in damage to equipment, injury, or death to personnel.

1. Clean pintle hook (Figure 3, Item 5), latch (Figure 3, Item 2), latch lock (Figure 3, Item 1), latch shaft (Figure 3, Item 3), and screw (Figure 3, Item 4) with solvent cleaning compound.
2. Inspect pintle hook (Figure 3, Item 5), latch (Figure 3, Item 2), latch lock (Figure 3, Item 1), latch shaft (Figure 3, Item 3), and screw (Figure 3, Item 4) for bends, cracks, or breaks. Replace any damaged parts.

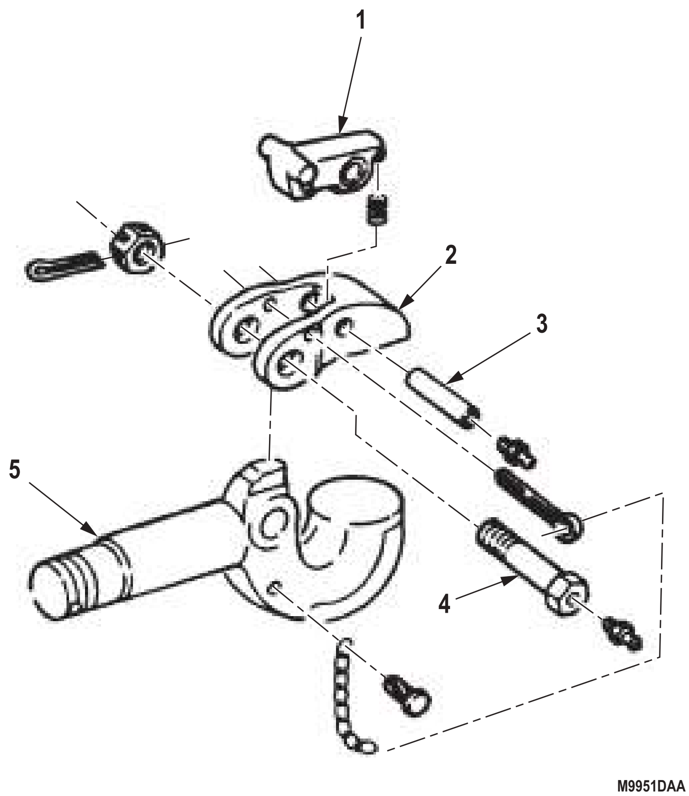


Figure 3. Pintle Hook Cleaning and Inspection.

END OF TASK

ASSEMBLY

1. Install latch lock (Figure 4, Item 1) and spring (Figure 4, Item 2) on latch (Figure 4, Item 3) with latch shaft (Figure 4, Item 4).
2. Install latch (Figure 4, Item 3) on pintle hook (Figure 4, Item 10) with screw (Figure 4, Item 7), slotted nut (Figure 4, Item 12), and cotter pin (Figure 4, Item 11).
3. Install cotter pin (Figure 4, Item 6) and chain (Figure 4, Item 9) on latch (Figure 4, Item 3) and pintle hook (Figure 4, Item 10) with drive pin (Figure 4, Item 8).
4. Install two grease fittings (Figure 4, Item 5) on screw (Figure 4, Item 7) and latch shaft (Figure 4, Item 4).

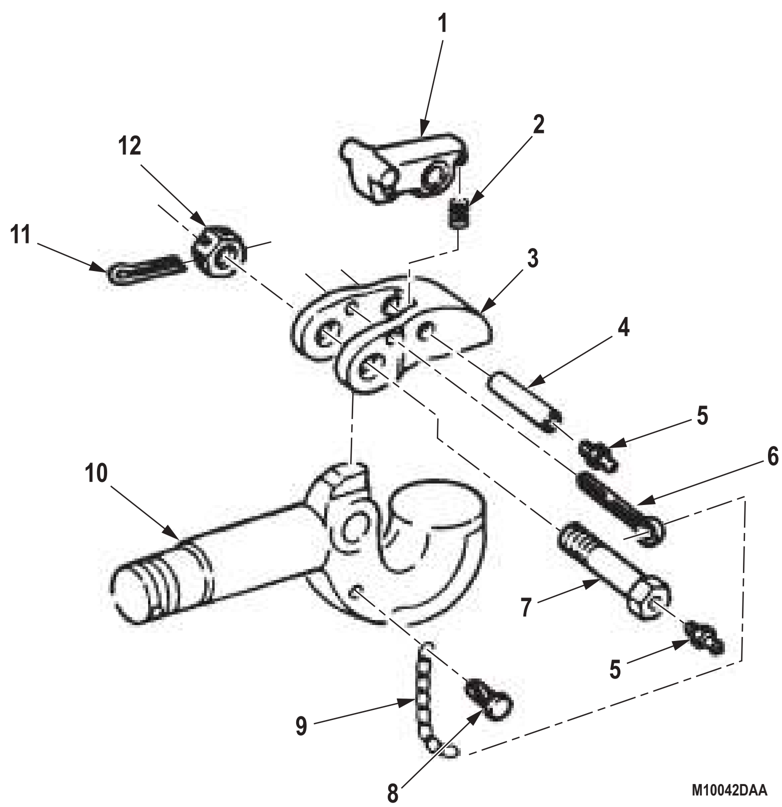


Figure 4. Pintle Hook Assembly.

END OF TASK

INSTALLATION

1. Install pintle hook (Figure 5, Item 1) on mounting bracket (Figure 5, Item 5) with washer (Figure 5, Item 4) and slotted nut (Figure 5, Item 3).
2. Install cotter pin (Figure 5, Item 2) through pintle hook (Figure 5, Item 1) and slotted nut (Figure 5, Item 3).

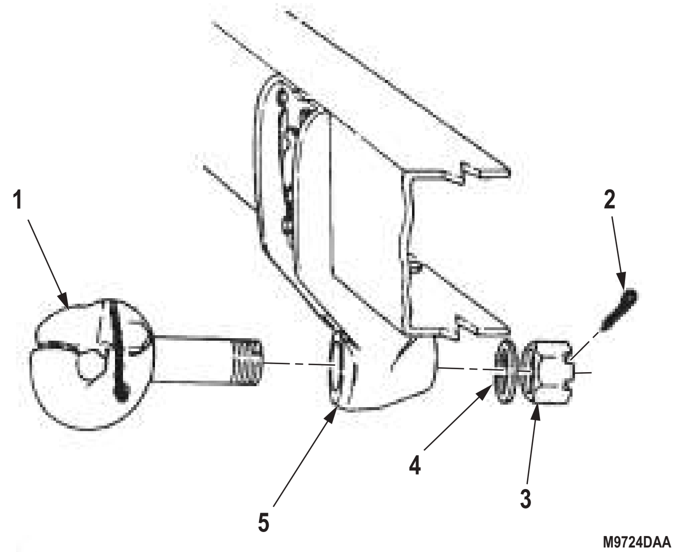


Figure 5. Pintle Hook Installation.

END OF TASK

FOLLOW-ON MAINTENANCE

Lubricate Pintle Hook. (Volume 5, WP 0820)

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
VAN DAVIT CHAIN AND WIRE ROPE REPLACEMENT

INITIAL SETUP:

Tools and Special Tools
Tool Kit, General Mechanic's: Automotive
(Volume 5, WP 0826, Table 1, Item 56)

Materials/Parts
Cotter Pin
(Volume 5, WP 0827, Table 1, Item 332)
Qty: 2
Locknut (Volume 5, WP 0827, Table 1, Item 283)
Qty: 1

References
Volume 5, WP 0820

Equipment Condition
Parking brake set. (TM 9-2320-272-10)

REMOVAL

WARNING

Wear hand protection when handling wire rope. Broken wires may be sharp. Failure to comply may result in injury or death to personnel.

NOTE

Davit chain must be removed from spare tire before performing Step (1).

1. Remove four nuts (Figure 1, Item 6), two U-bolts (Figure 1, Item 2), clamps (Figure 1, Item 1), chain link (Figure 1, Item 3), and thimble (Figure 1, Item 4) from wire rope (Figure 1, Item 5).

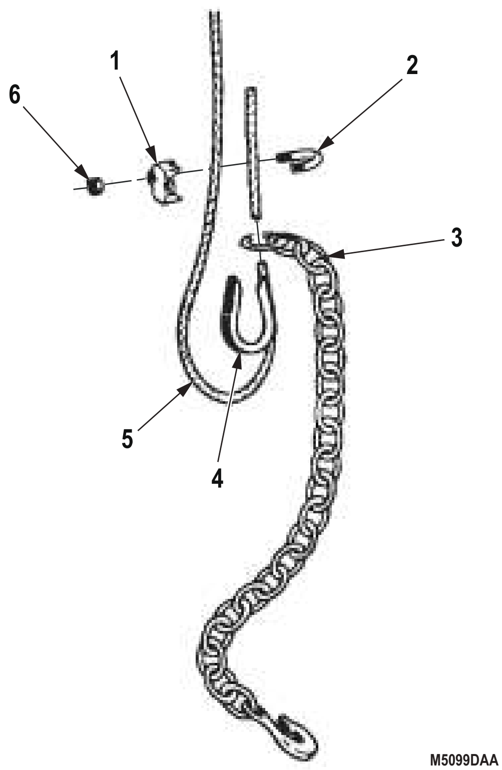


Figure 1. Van Davit Chain and Wire Rope Removal.

REMOVAL - Continued

2. Remove screw (Figure 2, Item 3) and wire rope (Figure 2, Item 2) from winch barrel (Figure 2, Item 1).

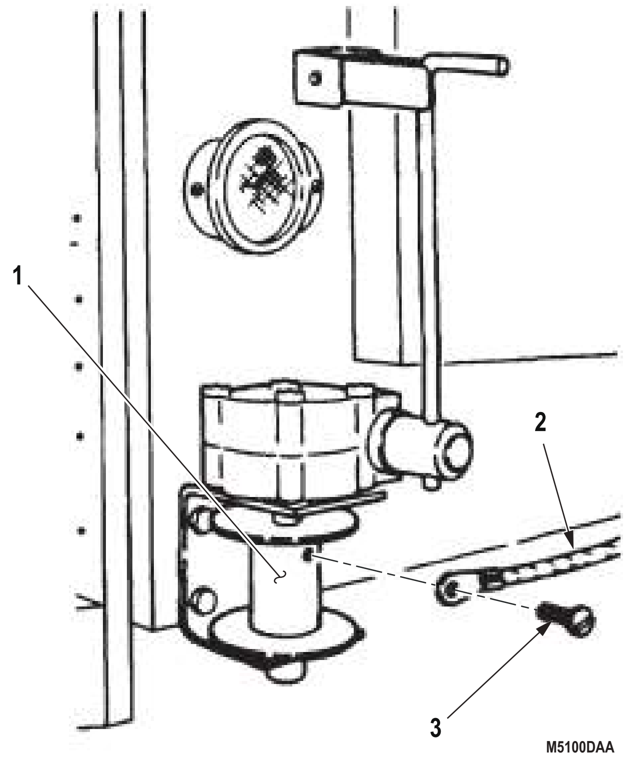


Figure 2. Van Davit Chain and Wire Rope Removal.

REMOVAL - Continued

3. Remove wire rope (Figure 3, Item 3) from swing davit (Figure 3, Item 1) and pulleys (Figure 3, Items 2 and 4).

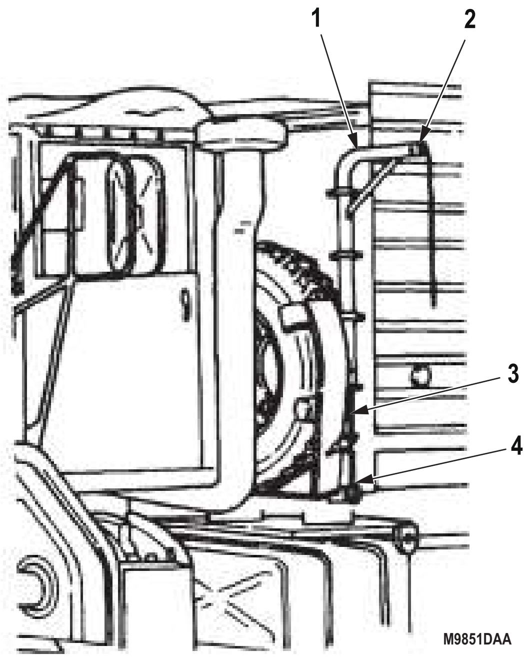


Figure 3. Van Davit Chain and Wire Rope Removal.

END OF TASK

INSTALLATION

NOTE

Inspect wire rope for cracks, frays, and abrasions, and lubricate as necessary (Volume 5, WP 0820).

1. Install wire rope (Figure 4, Item 2) on winch barrel (Figure 4, Item 1) with screw (Figure 4, Item 3).
2. Wind wire rope (Figure 4, Item 2) evenly on winch barrel (Figure 4, Item 1).

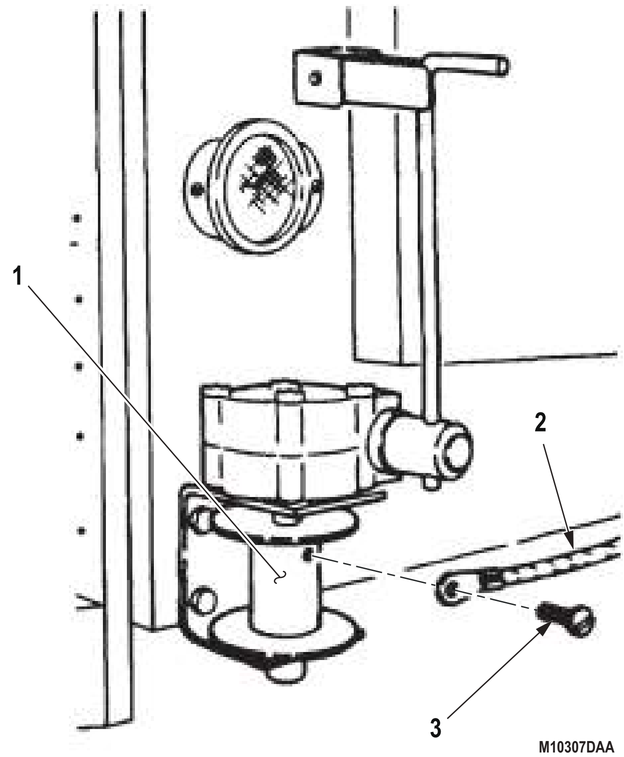


Figure 4. Van Davit Chain and Wire Rope Installation.

INSTALLATION - Continued

3. Remove two cotter pins (Figure 5, Item 12) and davit pin (Figure 5, Item 13) from bracket (Figure 5, Item 14). Discard cotter pins.
4. Remove two spacers (Figure 5, Item 11) and pulley (Figure 5, Item 4) from bracket (Figure 5, Item 14).
5. Loop wire rope (Figure 5, Item 3) under pulley (Figure 5, Item 4) while installing pulley in bracket (Figure 5, Item 14) with spacers (Figure 5, Item 11), davit pin (Figure 5, Item 13), and two cotter pins (Figure 5, Item 12).
6. Feed wire through swing davit (Figure 5, Item 1).
7. Remove two cotter pins (Figure 5, Item 10) and davit pin (Figure 5, Item 9) from swing davit (Figure 5, Item 1). Discard cotter pins.
8. Remove locknut (Figure 5, Item 8), washer (Figure 5, Item 7), two spacers (Figure 5, Item 6), pulley (Figure 5, Item 2), and screw (Figure 5, Item 5) from swing davit (Figure 5, Item 1). Discard locknut.
9. Install davit pin (Figure 5, Item 9) in swing davit (Figure 5, Item 1) with two cotter pins (Figure 5, Item 10).
10. Loop wire rope (Figure 5, Item 3) over pulley (Figure 5, Item 2) while installing pulley in swing davit (Figure 5, Item 1) with screw (Figure 5, Item 5), two spacers (Figure 5, Item 6), washer (Figure 5, Item 7), and locknut (Figure 5, Item 8).

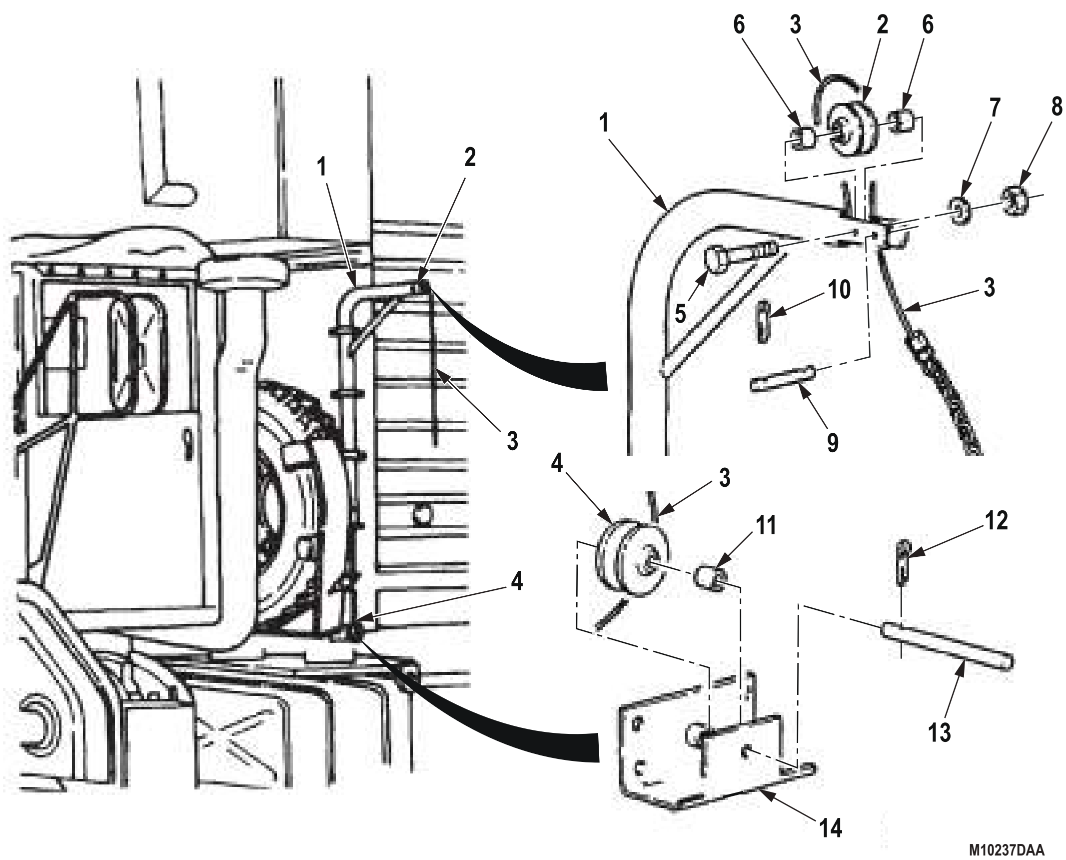


Figure 5. Van Davit Chain and Wire Rope Installation.

INSTALLATION - Continued

11. Install wire rope (Figure 6, Item 5) on chain link (Figure 6, Item 3) and thimble (Figure 6, Item 4) with two U-bolts (Figure 6, Item 2), clamps (Figure 6, Item 1), and four nuts (Figure 6, Item 6).
12. Secure chain (Figure 6, Item 3) to spare tire.

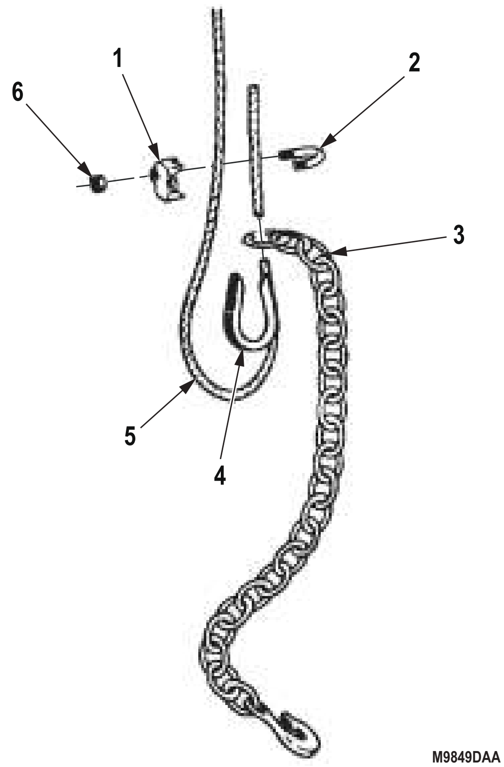


Figure 6. Van Davit Chain and Wire Rope Installation.

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
VAN SWING DAVIT AND PULLEY REPLACEMENT

INITIAL SETUP:

Tools and Special Tools

Tool Kit, General Mechanic's: Automotive
(Volume 5, WP 0826, Table 1, Item 56)

Materials/Parts

Cotter Pin
(Volume 5, WP 0827, Table 1, Item 332)
Qty: 2

Cotter Pin
(Volume 5, WP 0827, Table 1, Item 338)
Qty: 1

Locknut (Volume 5, WP 0827, Table 1, Item 283)
Qty: 1

Equipment Condition

Parking brake set. (TM 9-2320-272-10)

Davit chain and wire rope removed. (WP 0519)

REMOVAL

1. Remove six screws (Figure 1, Item 16), three clamps (Figure 1, Item 15), and swing davit (Figure 1, Item 5) from van body (Figure 1, Item 6) and base (Figure 1, Item 7).
2. Remove two cotter pins (Figure 1, Item 18) and davit pin (Figure 1, Item 17) from swing davit (Figure 1, Item 5). Discard cotter pins.
3. Remove locknut (Figure 1, Item 4), washer (Figure 1, Item 3), screw (Figure 1, Item 19), two spacers (Figure 1, Item 1), and davit pulley (Figure 1, Item 2) from swing davit (Figure 1, Item 5). Discard locknut.
4. Remove three screws (Figure 1, Item 14) and base (Figure 1, Item 7) from van body (Figure 1, Item 6).
5. Remove cotter pin (Figure 1, Item 11), shaft (Figure 1, Item 10), spacer (Figure 1, Item 12), and pulley (Figure 1, Item 13) from pulley bracket (Figure 1, Item 8). Discard cotter pin.
6. Remove four screws (Figure 1, Item 9) and pulley bracket (Figure 1, Item 8) from van body (Figure 1, Item 6).

REMOVAL - Continued

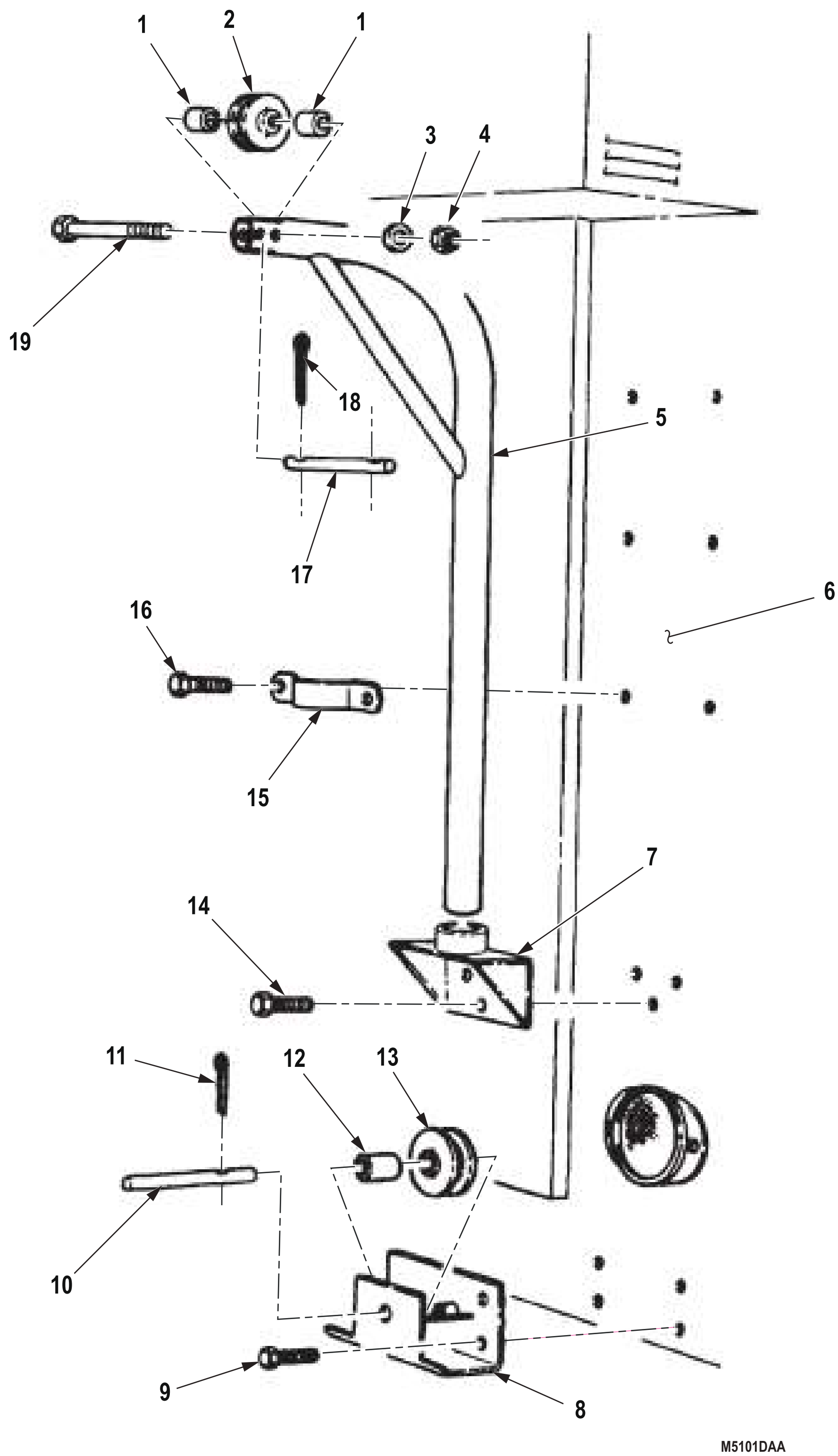


Figure 1. Van Swing Davit and Pulley Removal.

END OF TASK

INSTALLATION

1. Install pulley bracket (Figure 2, Item 8) on van body (Figure 2, Item 6) with four screws (Figure 2, Item 9).
2. Install spacer (Figure 2, Item 12) and pulley (Figure 2, Item 13) on pulley bracket (Figure 2, Item 8) with shaft (Figure 2, Item 10) and cotter pin (Figure 2, Item 11).
3. Install base (Figure 2, Item 7) on van body (Figure 2, Item 6) with three screws (Figure 2, Item 14).
4. Install davit pulley (Figure 2, Item 2) and two spacers (Figure 2, Item 1) on swing davit (Figure 2, Item 5) with screw (Figure 2, Item 19), washer (Figure 2, Item 3), and locknut (Figure 2, Item 4).
5. Install davit pin (Figure 2, Item 17) in swing davit (Figure 2, Item 5) with two cotter pins (Figure 2, Item 18).
6. Install swing davit (Figure 2, Item 5) on van body (Figure 2, Item 6) and base (Figure 2, Item 7) with three clamps (Figure 2, Item 15) and six screws (Figure 2, Item 16).

INSTALLATION - Continued

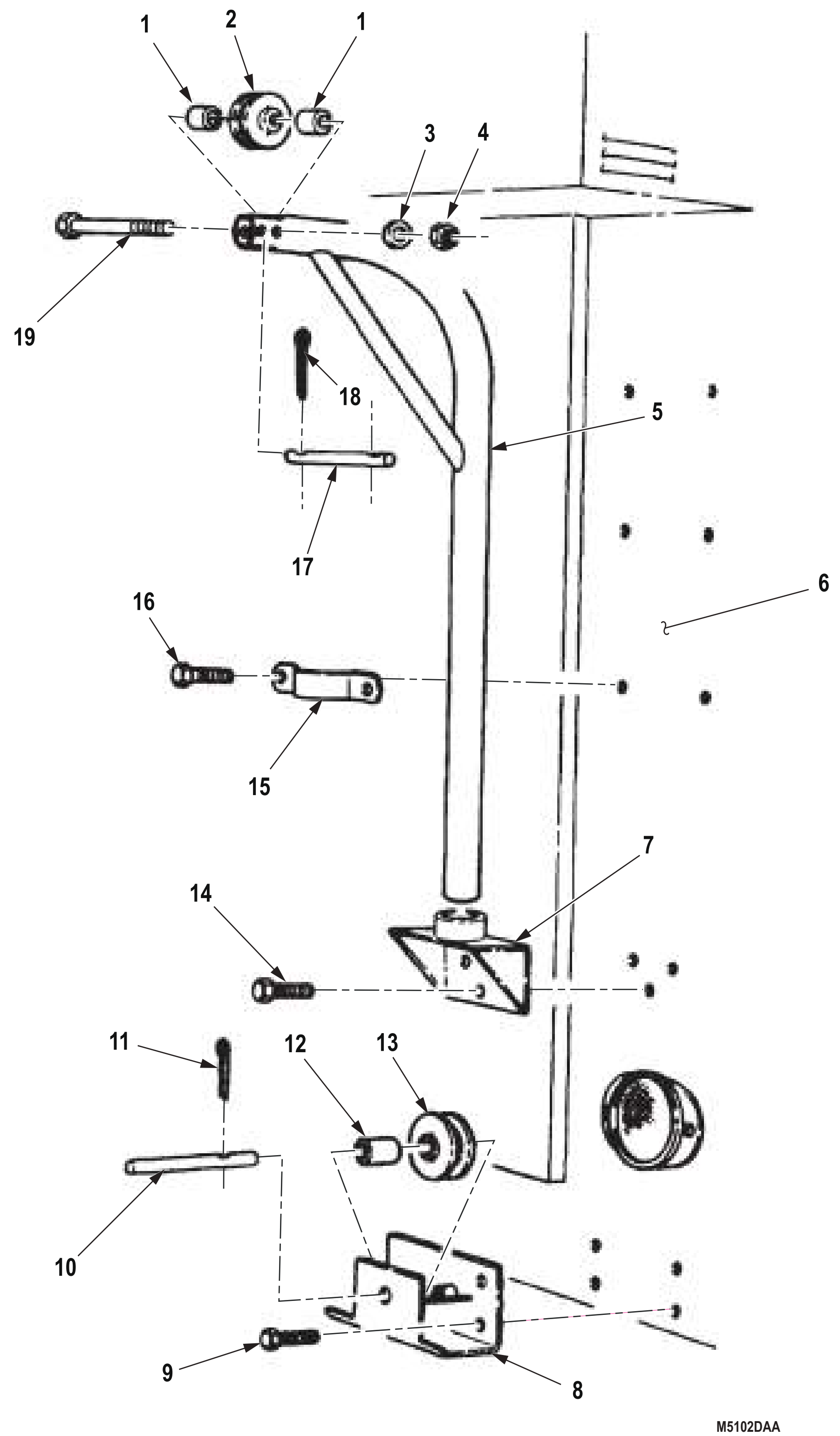


Figure 2. Van Swing Davit and Pulley Installation.

END OF TASK

FOLLOW-ON MAINTENANCE

Install davit chain and wire rope. (WP 0519)

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
VAN DAVIT WINCH REPLACEMENT (M934A1/A2)

INITIAL SETUP:

Tools and Special Tools
Tool Kit, General Mechanic's: Automotive
(Volume 5, WP 0826, Table 1, Item 56)

Materials/Parts
Cotter Pin
(Volume 5, WP 0827, Table 1, Item 332)
Qty: 1

Equipment Condition
Parking brake set. (TM 9-2320-272-10)

Equipment Condition (cont.)
Davit chain and wire rope removed. (WP 0519)

REMOVAL

1. Remove four screws (Figure 1, Item 7) and winch (Figure 1, Item 8) from van body (Figure 1, Item 9).
2. Push button (Figure 1, Item 10) and remove retaining pin (Figure 1, Item 11) from brace (Figure 1, Item 1).
3. Remove cotter pin (Figure 1, Item 2), pin (Figure 1, Item 12), spacer (Figure 1, Item 4), handle lock (Figure 1, Item 5), and spacer (Figure 1, Item 6) from brace (Figure 1, Item 1). Discard cotter pin.
4. Remove two screws (Figure 1, Item 3) and brace (Figure 1, Item 1) from van body (Figure 1, Item 9).

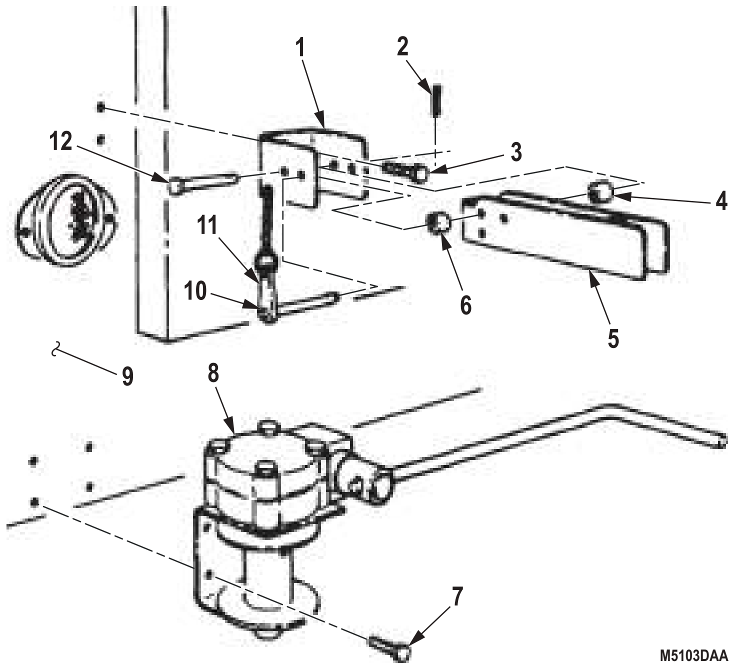


Figure 1. Van Davit Winch Removal.

END OF TASK

INSTALLATION

1. Install brace (Figure 2, Item 1) on van body (Figure 2, Item 9) with two screws (Figure 2, Item 3).
2. Install spacer (Figure 2, Item 4), handle lock (Figure 2, Item 5), and spacer (Figure 2, Item 6) on brace (Figure 2, Item 1) with pin (Figure 2, Item 12) and cotter pin (Figure 2, Item 2).
3. Install winch (Figure 2, Item 8) on van body (Figure 2, Item 9) with four screws (Figure 2, Item 7).
4. Push button (Figure 2, Item 10) and install retaining pin (Figure 2, Item 11) on brace (Figure 2, Item 1).

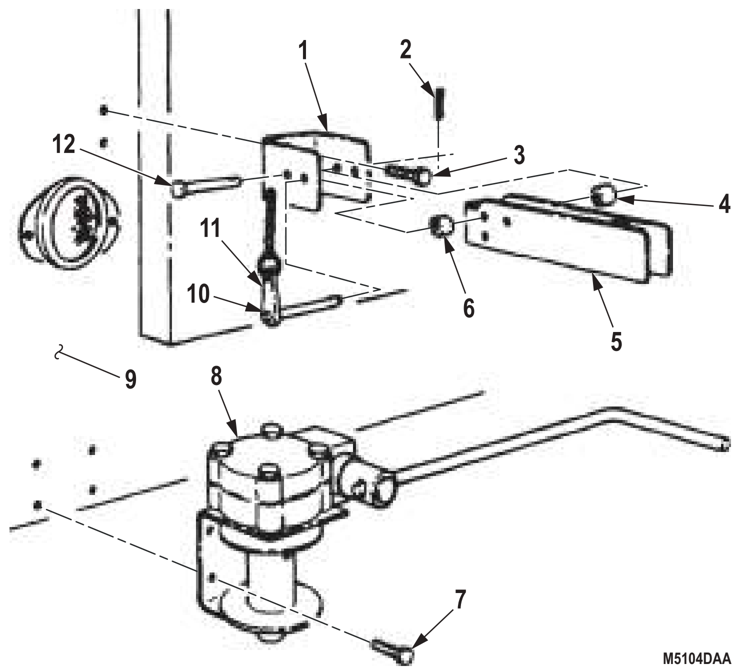


Figure 2. Van Davit Winch Installation.

END OF TASK

FOLLOW-ON MAINTENANCE

Install davit chain and wire rope. (WP 0519)

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
TRACTOR SPARE TIRE CARRIER REPLACEMENT (M931 AND M932)

INITIAL SETUP:

Tools and Special Tools
Tool Kit, General Mechanic's: Automotive (Volume 5, WP 0826, Table 1, Item 56)

Materials/Parts
Locknut (Volume 5, WP 0827, Table 1, Item 289)
Qty: 4

Personnel Required
(2)

Equipment Condition
Parking brake set. (TM 9-2320-272-10)

Equipment Condition (cont.)
Spare tire removed. (TM 9-2320-272-10)
Toolbox removed. (WP 0522)
Carrier access steps removed. (WP 0523)

REMOVAL

1. Loosen retaining pin (Figure 1, Item 2) and remove boom extension (Figure 1, Item 1) from boom (Figure 1, Item 3).
2. Loosen screw (Figure 1, Item 4) and remove boom (Figure 1, Item 3) from boom support (Figure 1, Item 5).
3. Remove two locknuts (Figure 1, Items 8 and 11) and screws (Figure 1, Items 6 and 12) from frame rail brackets (Figure 1, Items 9 and 10) and carrier base (Figure 1, Item 7). Discard locknuts.
4. Remove carrier base (Figure 1, Item 7) from frame rail brackets (Figure 1, Items 9 and 10).

REMOVAL - Continued

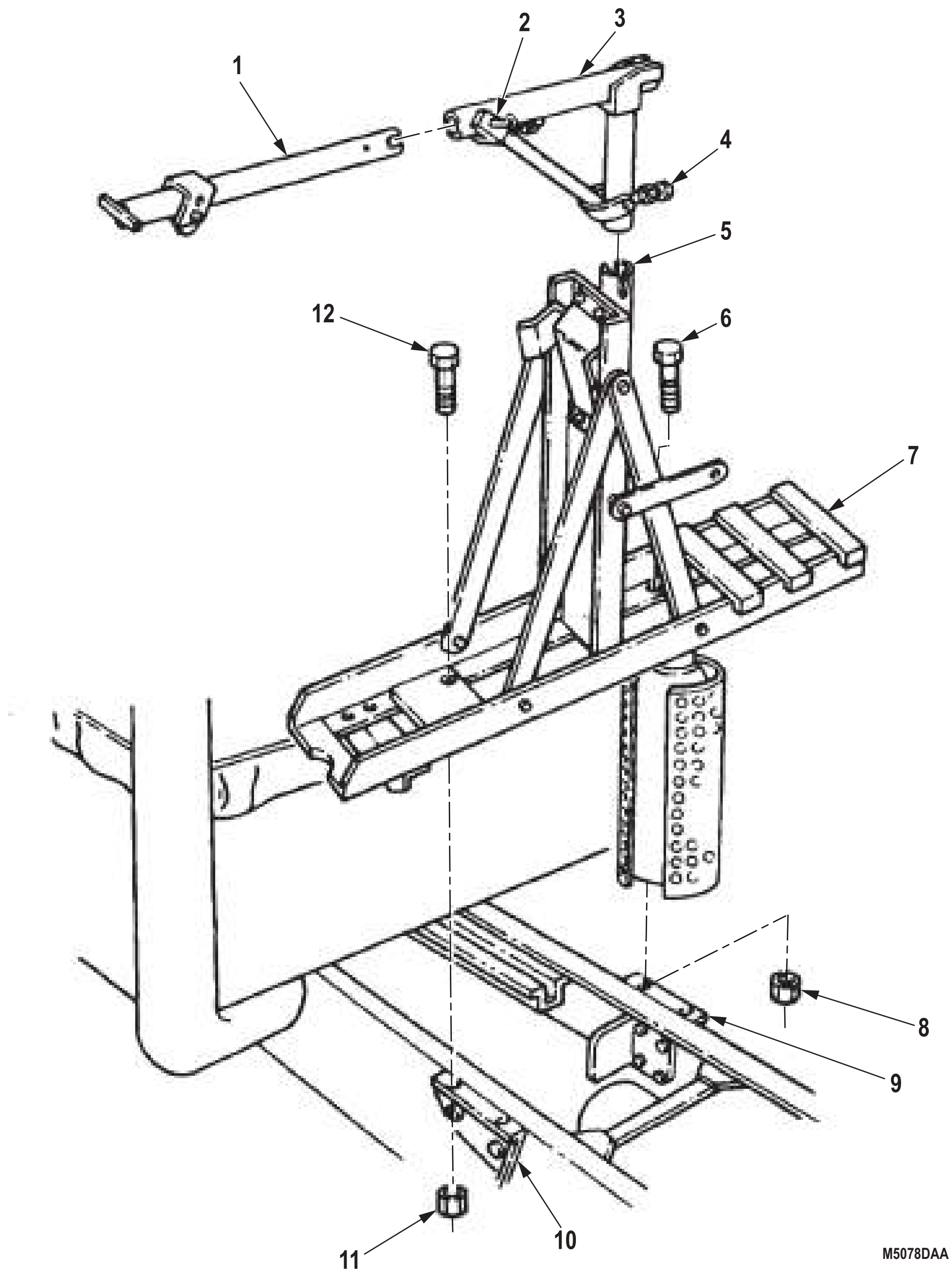


Figure 1. Tractor Spare Tire Carrier Removal (M931 and M932).

END OF TASK

INSTALLATION

1. Position carrier base (Figure 2, Item 7) on frame rail brackets (Figure 2, Items 9 and 10).
2. Align carrier base (Figure 2, Item 7) with frame rail brackets (Figure 2, Items 9 and 10) and install two screws (Figure 2, Items 6 and 12) and locknuts (Figure 2, Items 8 and 11).
3. Install boom (Figure 2, Item 3) onto boom support (Figure 2, Item 5).

NOTE

Ensure screw is tightened against preset groove in boom support.

4. Tighten screw (Figure 2, Item 4) on boom (Figure 2, Item 3).
5. Install boom extension (Figure 2, Item 1) on boom (Figure 2, Item 3).
6. Tighten retaining pin (Figure 2, Item 2) in boom extension (Figure 2, Item 1) and boom (Figure 2, Item 3).

INSTALLATION - Continued

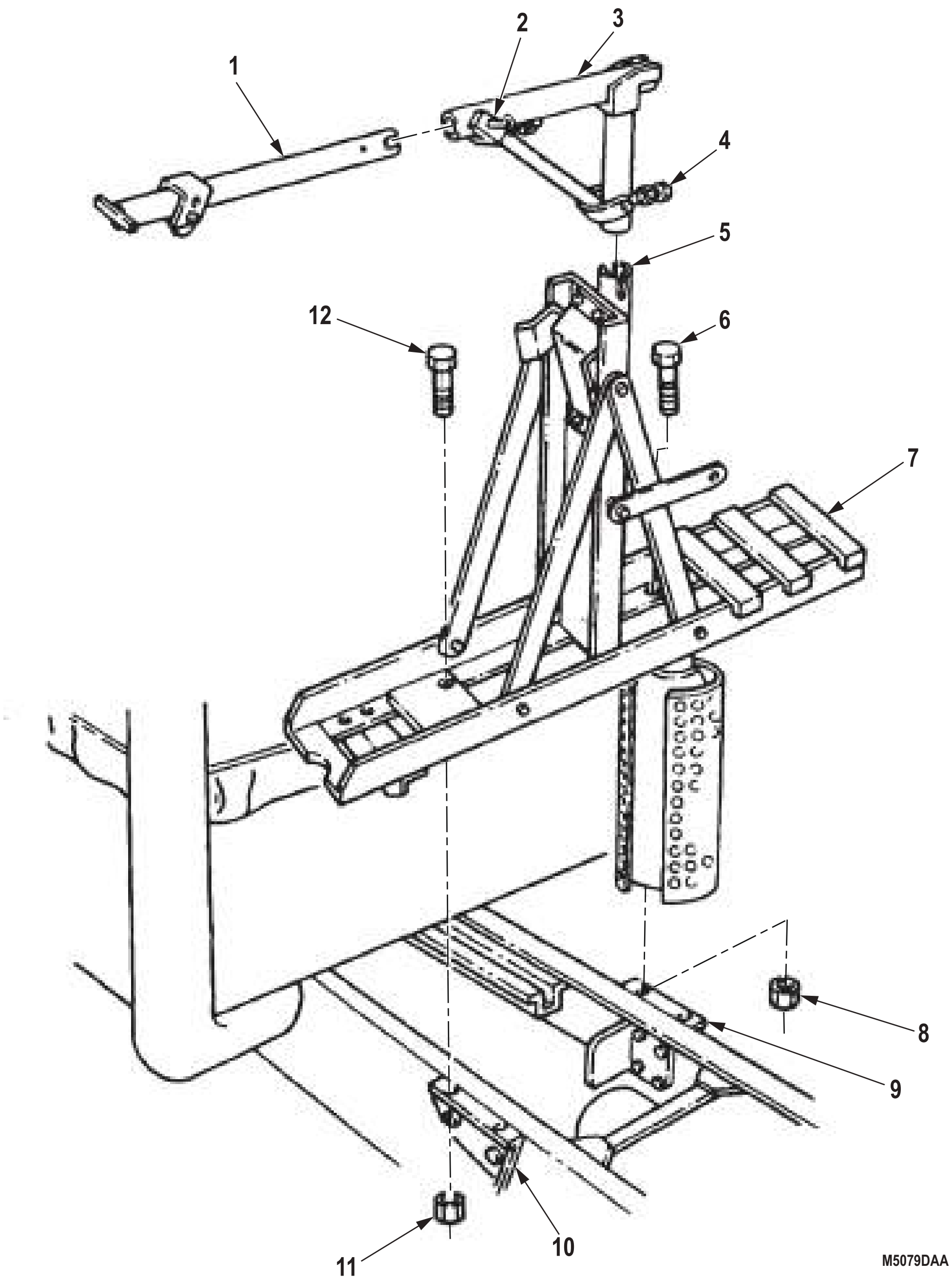


Figure 2. Tractor Spare Tire Carrier Installation (M931 and M932).

END OF TASK

FOLLOW-ON MAINTENANCE

1. Install carrier access steps. (WP 0523)
2. Install toolbox. (WP 0522)
3. Install spare tire. (TM 9-2320-272-10)

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
TRACTOR SPARE TIRE CARRIER AND TOOLBOX REPLACEMENT (M931A1/A2 AND M932A1/A2)

INITIAL SETUP:

Tools and Special Tools

Tool Kit, General Mechanic's: Automotive
(Volume 5, WP 0826, Table 1, Item 56)
Bar
Chain Assembly
(Volume 5, WP 0826, Table 1, Item 15)
High Boy Jack Stands
(Volume 5, WP 0826, Table 1, Item 24)
Hoist Assembly

Materials/Parts

Locknut (Volume 5, WP 0827, Table 1, Item 272)
Qty: 4
Locknut (Volume 5, WP 0827, Table 1, Item 277)
Qty: 1
Locknut (Volume 5, WP 0827, Table 1, Item 285)
Qty: 20
Locknut (Volume 5, WP 0827, Table 1, Item 289)
Qty: 8

Materials/Parts (cont.)

Locknut (Volume 5, WP 0827, Table 1, Item 319)
Qty: 6
Lockwasher
(Volume 5, WP 0827, Table 1, Item 394)
Qty: 2
Lockwasher
(Volume 5, WP 0827, Table 1, Item 420)
Qty: 1

Personnel Required

(2)

Equipment Condition

Parking brake set. (TM 9-2320-272-10)
Spare tire removed. (TM 9-2320-272-10)
Trailer coupling hoses removed. (WP 0430)

REMOVAL

1. Remove two locknuts (Figure 1, Item 16), screws (Figure 1, Item 13), and reflector bracket (Figure 1, Item 14) from carrier base (Figure 1, Item 15). Discard locknuts.
2. Remove three locknuts (Figure 1, Item 8), washers (Figure 1, Item 7), and screws (Figure 1, Item 5) from trailer harness plug (Figure 1, Item 4) and carrier base (Figure 1, Item 15). Discard locknuts.
3. Remove locknut (Figure 1, Item 34), washer (Figure 1, Item 33), lockwashers (Figure 1, Items 30 through 32), and two ground straps (Figure 1, Item 6), screw (Figure 1, Item 28), and trailer harness plug (Figure 1, Item 4) from harness base (Figure 1, Item 29). Discard locknut and lockwashers.
4. Remove locknut (Figure 1, Item 37), screw (Figure 1, Item 35), and two clamps (Figure 1, Item 36) from fuel lines (Figure 1, Item 38) and carrier base (Figure 1, Item 15). Discard locknut.
5. Remove locking pin (Figure 1, Item 23) and retaining pin (Figure 1, Item 22) from boom extension (Figure 1, Item 1).
6. Remove boom extension (Figure 1, Item 1) from boom (Figure 1, Item 21).
7. Remove four locknuts (Figure 1, Item 3), screws (Figure 1, Item 2), and boom (Figure 1, Item 21) from boom support (Figure 1, Item 20). Discard locknuts.
8. Remove four locknuts (Figure 1, Item 26), screws (Figure 1, Item 24), and two reflector brackets (Figure 1, Item 27) from carrier access steps (Figure 1, Item 25). Discard locknuts.
9. Remove locknut (Figure 1, Item 10), screw (Figure 1, Item 19), three locknuts (Figure 1, Item 12), screws (Figure 1, Item 18), and washers (Figure 1, Item 17) from frame brackets (Figure 1, Items 9 and 11) and carrier base (Figure 1, Item 15). Discard locknuts.

REMOVAL - Continued

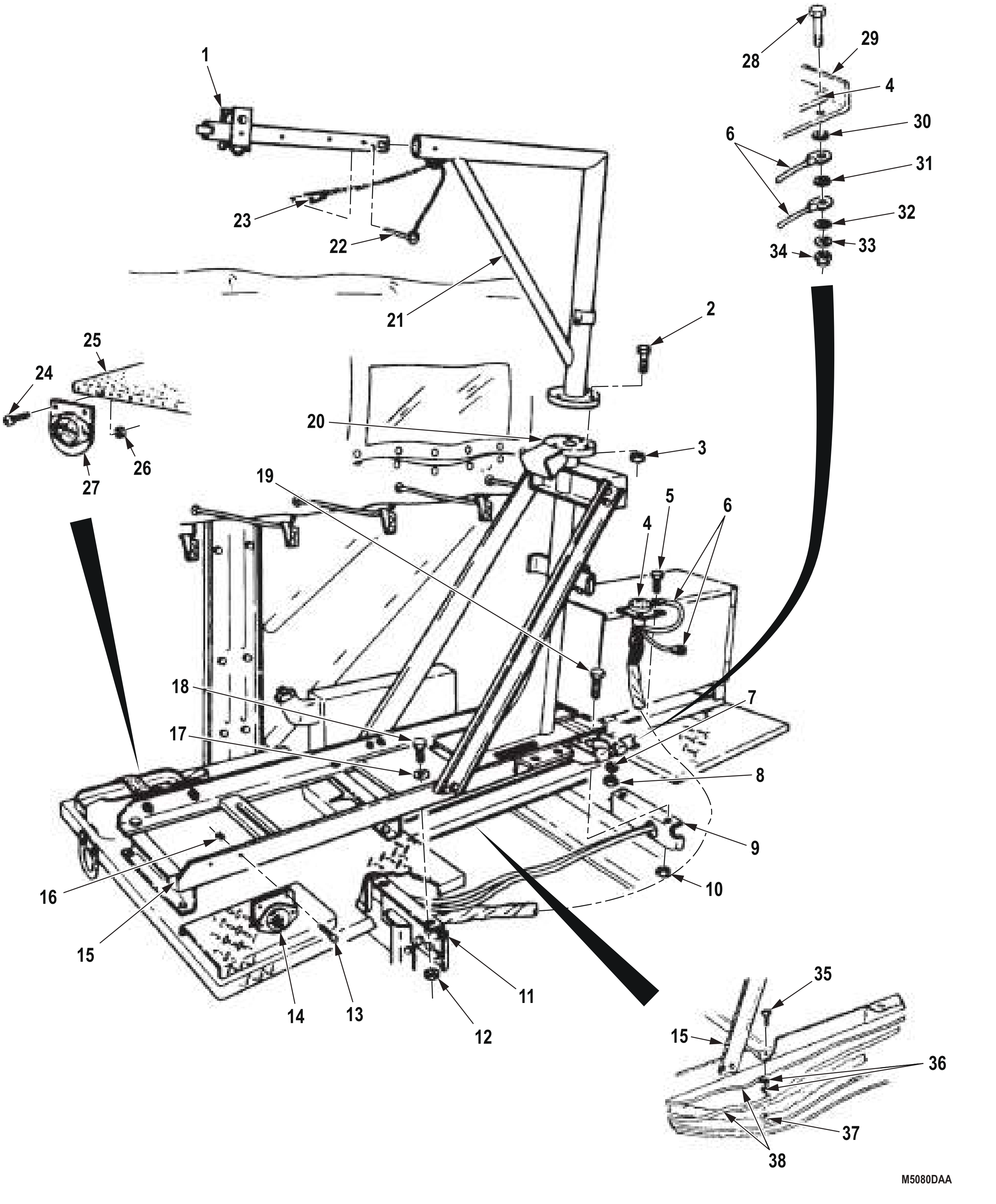


Figure 1. Spare Tire Carrier and Toolbox Removal.

REMOVAL - Continued

10. Install utility chain (Figure 2, Item 2) around upper carrier (Figure 2, Item 1) and attach to suitable lifting device.
11. Lift carrier base (Figure 2, Item 3) from vehicle and position on four jack stands (Figure 2, Item 4).
12. Remove utility chain (Figure 2, Item 2) from upper carrier (Figure 2, Item 1).
13. Remove six locknuts (Figure 2, Item 7), washers (Figure 2, Item 8), screws (Figure 2, Item 11), and bracket assembly (Figure 2, Item 10) from carrier step (Figure 2, Item 9) and carrier base (Figure 2, Item 3). Discard locknuts.

NOTE

Assistant will support access steps during Step (15).

14. Remove eight locknuts (Figure 2, Item 6), screws (Figure 2, Item 5), and two carrier steps (Figure 2, Item 9) from carrier base (Figure 2, Item 3). Discard locknuts.

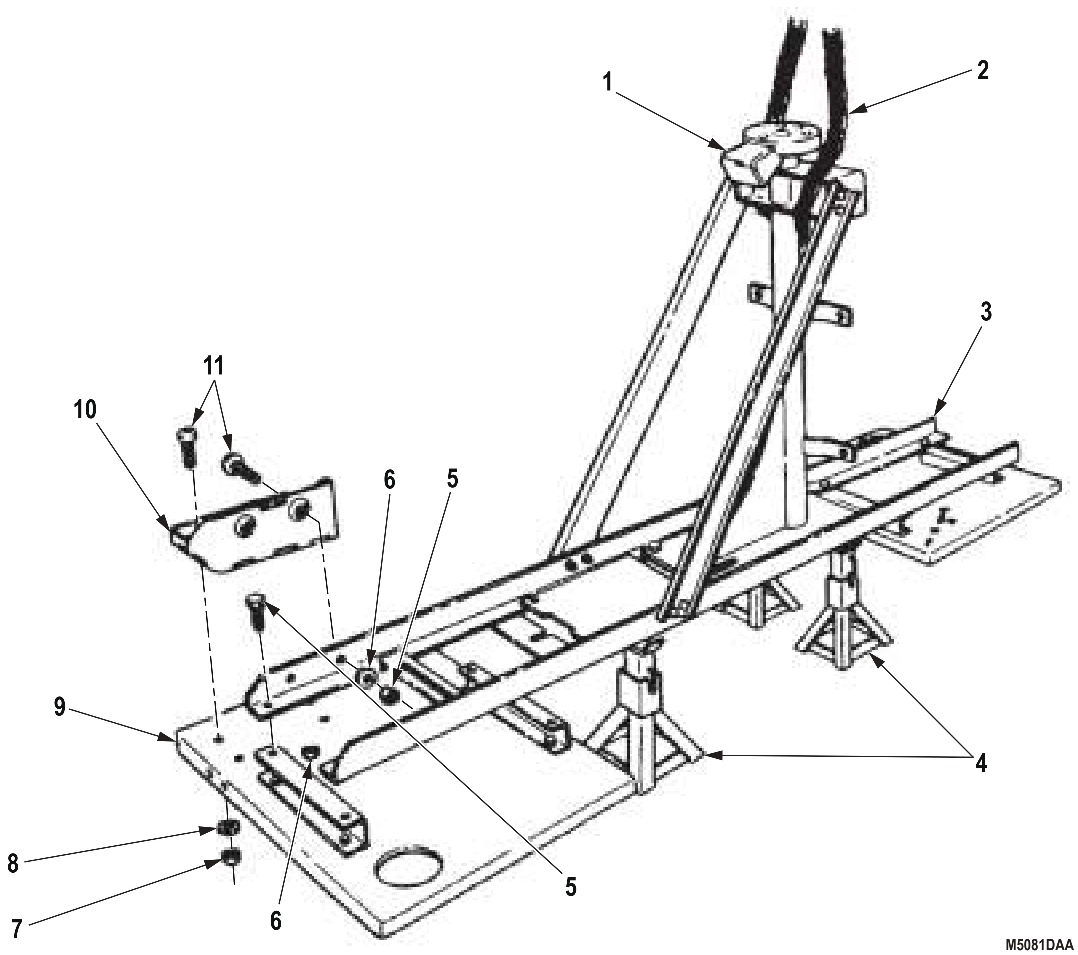


Figure 2. Spare Tire Carrier and Toolbox Removal.

REMOVAL - Continued

15. Remove six locknuts (Figure 3, Item 5), screws (Figure 3, Item 2), washers (Figure 3, Item 3), and toolbox (Figure 3, Item 1) from carrier base (Figure 3, Item 4). Discard locknuts.

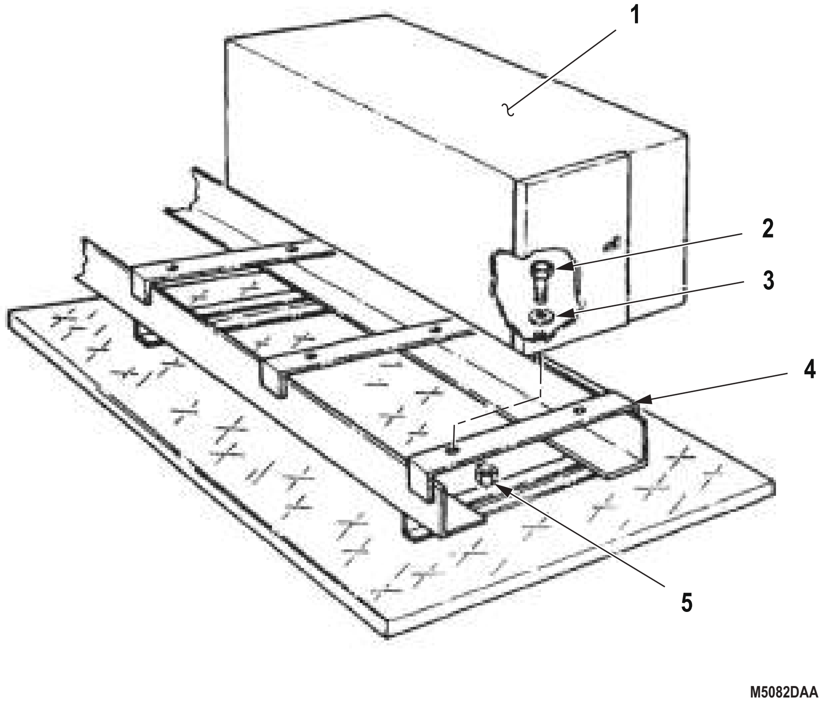


Figure 3. Spare Tire Carrier and Toolbox Removal.

END OF TASK

INSTALLATION

NOTE

Assistant will support access steps during Step (1).

1. Install two carrier steps (Figure 4, Item 9) on carrier base (Figure 4, Item 3) with eight screws (Figure 4, Item 5) and locknuts (Figure 4, Item 6).
2. Install bracket assembly (Figure 4, Item 10) on carrier step (Figure 4, Item 9) and carrier base (Figure 4, Item 3) with six screws (Figure 4, Item 11), washers (Figure 4, Item 8), and locknuts (Figure 4, Item 5).
3. Install utility chain (Figure 4, Item 2) around upper carrier (Figure 4, Item 1) and attach to suitable lifting device.
4. Lift carrier base (Figure 4, Item 3) from four jack stands (Figure 4, Item 4) and position on vehicle.

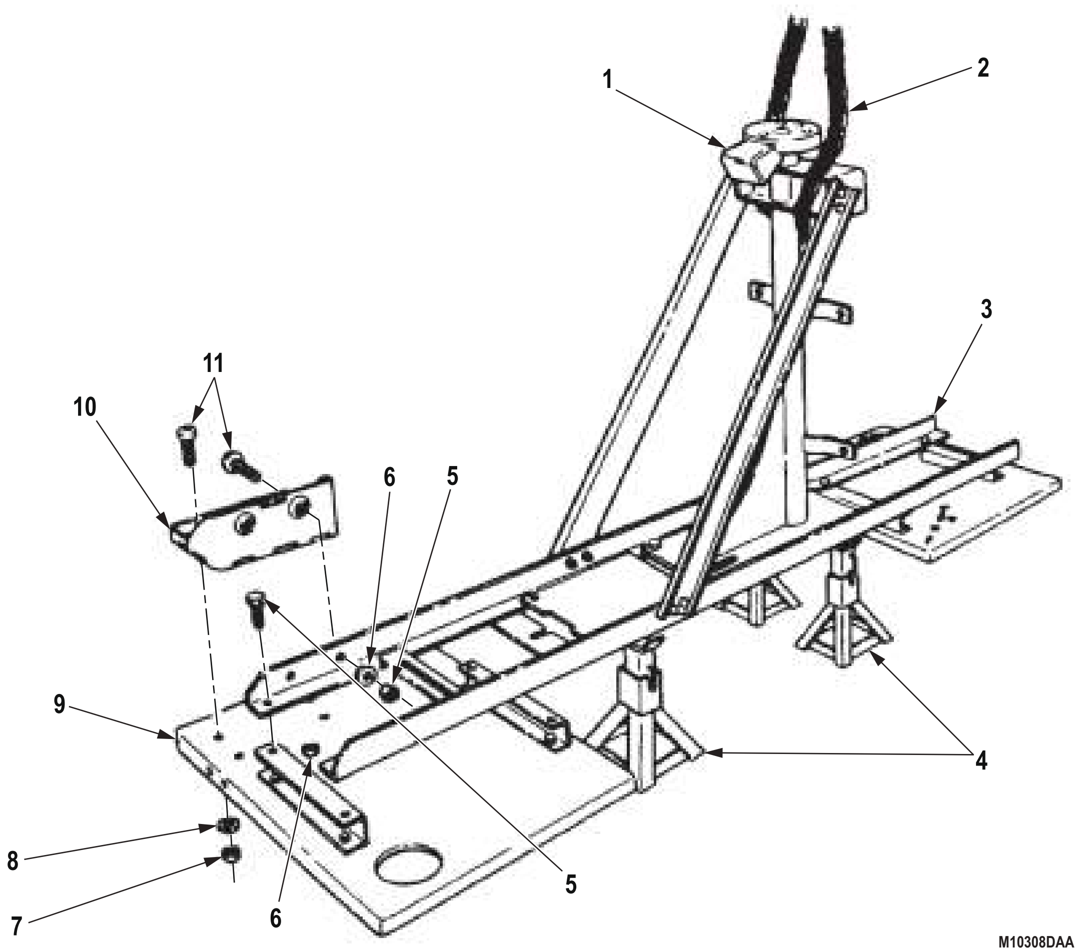


Figure 4. Spare Tire Carrier and Toolbox Installation.

INSTALLATION - Continued

5. Install toolbox (Figure 5, Item 1) on carrier base (Figure 5, Item 4) with six washers (Figure 5, Item 3), screws (Figure 5, Item 2), and locknuts (Figure 5, Item 5).

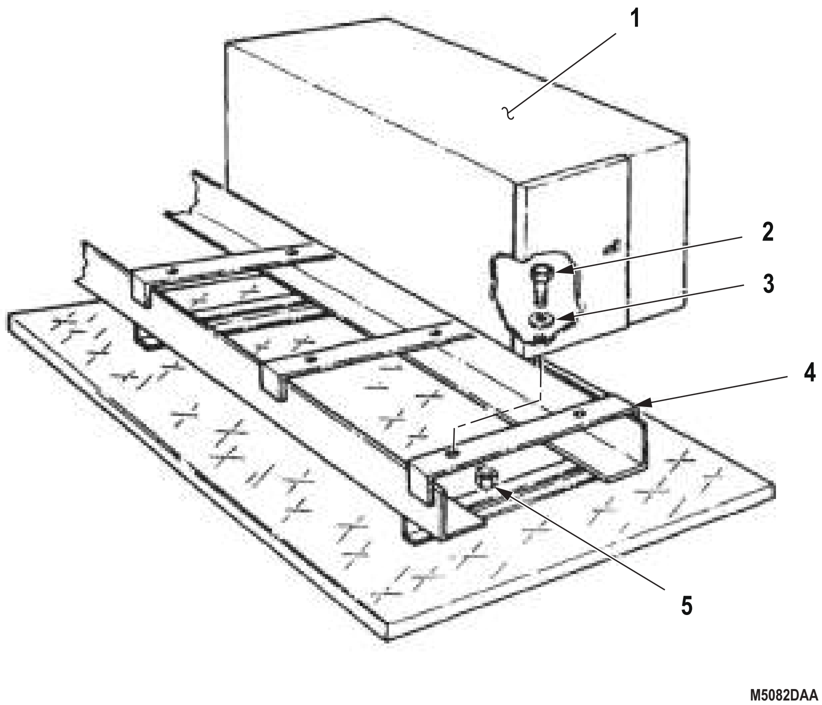


Figure 5. Spare Tire Carrier and Toolbox Installation.

INSTALLATION - Continued

6. Align carrier base (Figure 6, Item 15) on frame brackets (Figure 6, Items 9 and 11) and install screw (Figure 6, Item 19), three washers (Figure 6, Item 17), and screws (Figure 6, Item 18).
7. Remove lifting device and utility chain (Figure 4, Item 2) from carrier base (Figure 6, Item 15).
8. Install locknut (Figure 6, Item 10) on screw (Figure 6, Item 19) and three locknuts (Figure 6, Item 12) on screws (Figure 6, Item 18).
9. Install two reflector brackets (Figure 6, Item 27) on carrier access steps (Figure 6, Item 25) with four screws (Figure 6, Item 24) and locknuts (Figure 6, Item 26).
10. Install boom (Figure 6, Item 21) on boom support (Figure 6, Item 20) with four screws (Figure 6, Item 2) and locknuts (Figure 6, Item 3).
11. Install boom extension (Figure 6, Item 1) on boom (Figure 6, Item 21).
12. Install retaining pin (Figure 6, Item 22) and locking pin (Figure 6, Item 23) in boom extension (Figure 6, Item 1).
13. Install two fuel lines (Figure 6, Item 38) on carrier base (Figure 6, Item 15) with two clamps (Figure 6, Item 36), screw (Figure 6, Item 35), and locknut (Figure 6, Item 37).
14. Install trailer harness plug (Figure 6, Item 4) on carrier base (Figure 6, Item 15) with three screws (Figure 6, Item 5), washers (Figure 6, Item 7), and locknuts (Figure 6, Item 8).
15. Install two ground straps (Figure 6, Item 6) on harness base (Figure 6, Item 29) and trailer harness plug (Figure 6, Item 4) with screw (Figure 6, Item 28), lockwashers (Figure 6, Items 30 through 32), washer (Figure 6, Item 33), and locknut (Figure 6, Item 34).
16. Install reflector bracket (Figure 6, Item 14) on carrier base (Figure 6, Item 15) with two screws (Figure 6, Item 13) and locknuts (Figure 6, Item 16).

INSTALLATION - Continued

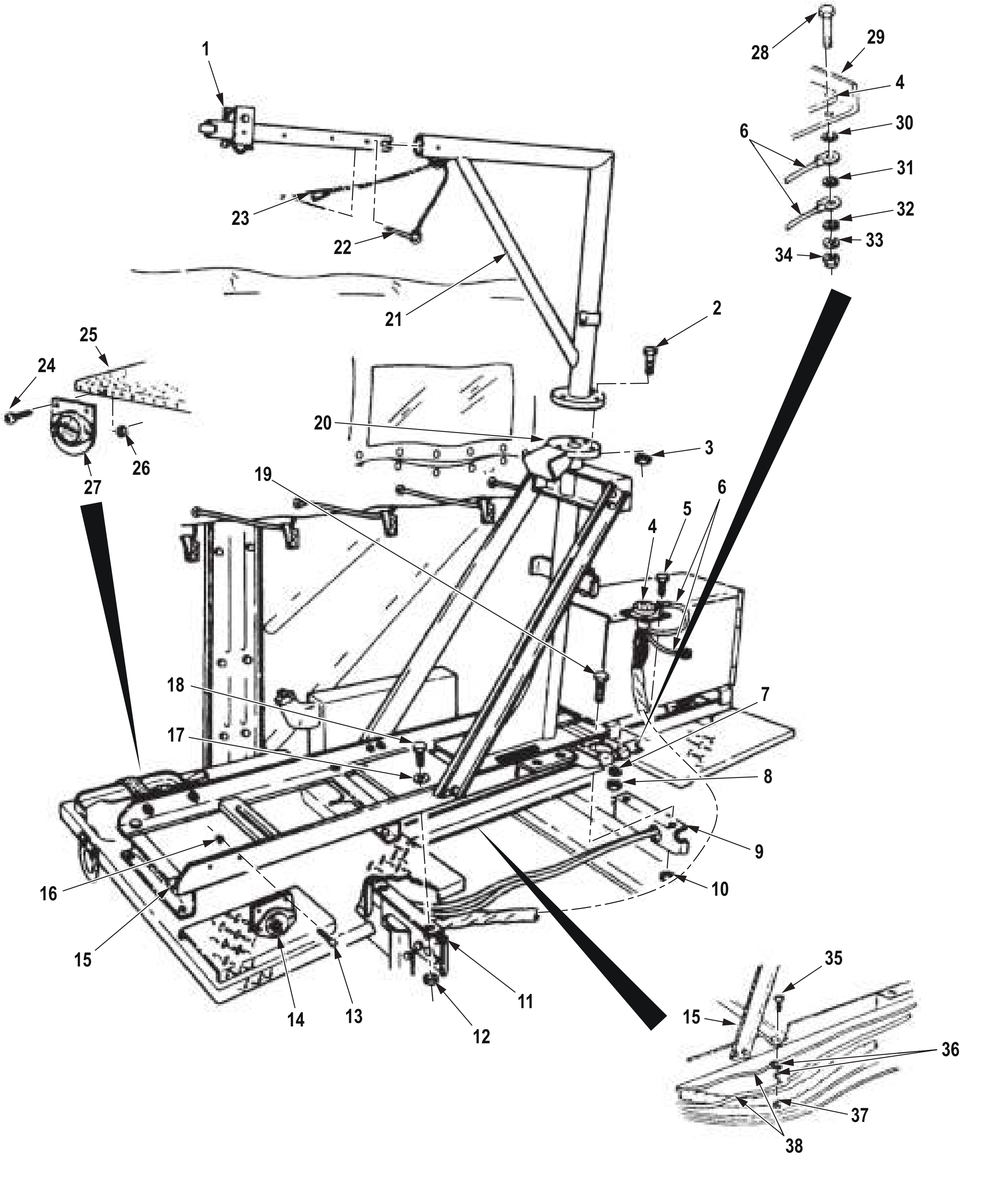


Figure 6. Spare Tire Carrier and Toolbox Installation.

END OF TASK

FOLLOW-ON MAINTENANCE

1. Install trailer coupling hoses. (WP 0477)
2. Install spare tire. (TM 9-2320-272-10)

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
DUMP AND TRACTOR SPARE TIRE CARRIER ACCESS STEP REPLACEMENT

INITIAL SETUP:

Tools and Special Tools
Tool Kit, General Mechanic's: Automotive
(Volume 5, WP 0826, Table 1, Item 56)

Materials/Parts
Rag, Wiping
(Volume 5, WP 0825, Table 1, Item 53)

Materials/Parts (cont.)
Locknut (Volume 5, WP 0827, Table 1, Item 282)
Qty: 2
Locknut (Volume 5, WP 0827, Table 1, Item 285)
Qty: 16

Equipment Condition
Parking brake set. (TM 9-2320-272-10)
Toolbox removed if required for access.
(WP 0522)

REMOVAL

WARNING

Diesel fuel is flammable. Do not perform this procedure near open flames. Failure to comply may result in injury or death to personnel.

NOTE

This procedure is the same for right and left spare tire carrier access steps.

1. Remove two locknuts (Figure 1, Item 16), screws (Figure 1, Item 18), and reflector bracket (Figure 1, Item 17) from carrier access step (Figure 1, Item 6). Discard locknuts.
2. Remove six locknuts (Figure 1, Item 4), washers (Figure 1, Item 3), screws (Figure 1, Item 2), and fuel can bracket (Figure 1, Item 1) from carrier base (Figure 1, Item 5) and step (Figure 1, Item 6). Discard locknuts.

NOTE

- Perform Step (3) for vehicles with top fill tank.
- Vehicles may have one or two fuel cap covers. Perform Step (3) for both fuel cap covers.

3. Lift fuel cap cover (Figure 1, Item 9) and remove fuel cap (Figure 1, Item 7) and chain and strainer assembly (Figure 1, Item 8) from fuel tank (Figure 1, Item 12). Wrap chain and strainer assembly with rag. Cover fuel tank opening with rags.
4. Remove four locknuts (Figure 1, Item 15), screws (Figure 1, Item 20), two step brackets (Figure 1, Item 19), and carrier access step (Figure 1, Item 6) from carrier base (Figure 1, Item 5). Discard locknuts.
5. Remove four locknuts (Figure 1, Item 13), screws (Figure 1, Item 14), and two step brackets (Figure 1, Item 19) from carrier access step (Figure 1, Item 6). Discard locknuts.

NOTE

Perform Step (6) for M931/A1/A2 and M932/A1/A2 models.

6. Remove two locknuts (Figure 1, Item 21), screws (Figure 1, Item 10), washers (Figure 1, Item 11), and fuel tank cap cover (Figure 1, Item 9) from carrier access step (Figure 1, Item 6). Discard locknuts.

REMOVAL - Continued

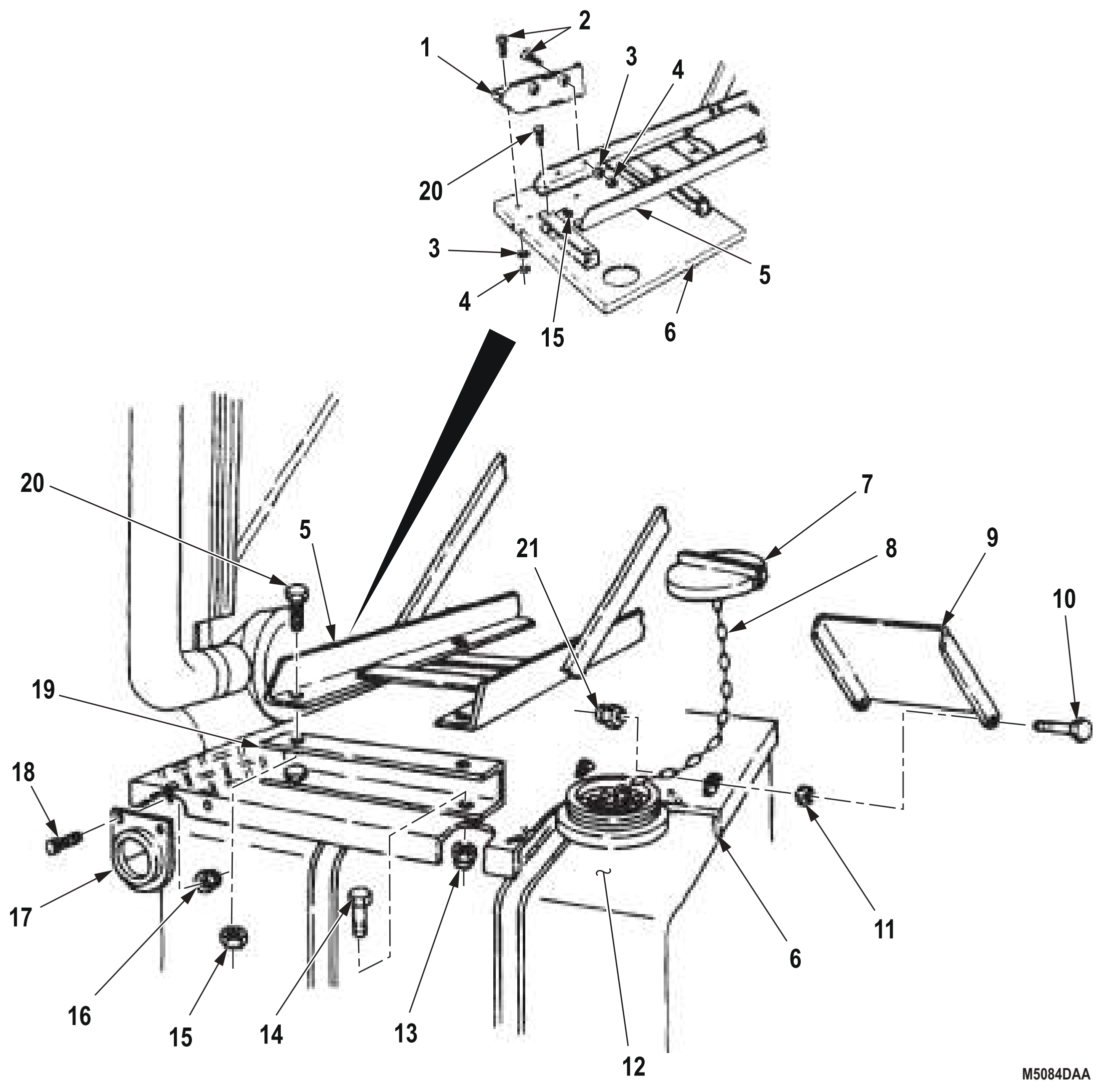


Figure 1. Dump and Tractor Spare Tire Carrier Access Step Removal.

END OF TASK

INSTALLATION

NOTE

Perform Step (1) for M931/A1/A2 and M932/A1/A2 models.

1. Install fuel tank cap cover (Figure 2, Item 9) on carrier access step (Figure 2, Item 6) with two screws (Figure 2, Item 10), washers (Figure 2, Item 11), and locknuts (Figure 2, Item 21).
2. Install two step brackets (Figure 2, Item 19) on carrier access step (Figure 2, Item 6) with four screws (Figure 2, Item 14) and locknuts (Figure 2, Item 13).
3. Install carrier access step (Figure 2, Item 6) and two step brackets (Figure 2, Item 19) on carrier base (Figure 2, Item 5) with four screws (Figure 2, Item 20) and locknuts (Figure 2, Item 15).

NOTE

- Perform Step (4) for vehicles with top fill tank.
- Vehicles may have one or two fuel cap covers. Perform Step (4) for both fuel cap covers.

4. Lift fuel cap cover (Figure 2, Item 9), remove rags from fuel tank opening, and install chain and strainer assembly (Figure 2, Item 8) and fuel cap (Figure 2, Item 7) on fuel tank (Figure 2, Item 12).
5. Install fuel can bracket (Figure 2, Item 1) on carrier access step (Figure 2, Item 6) and carrier base (Figure 2, Item 5) with six screws (Figure 2, Item 2), washers (Figure 2, Item 3), and locknuts (Figure 2, Item 4).
6. Install reflector bracket (Figure 2, Item 17) on carrier access step (Figure 2, Item 6) with two screws (Figure 2, Item 18) and locknuts (Figure 2, Item 16).

INSTALLATION - Continued

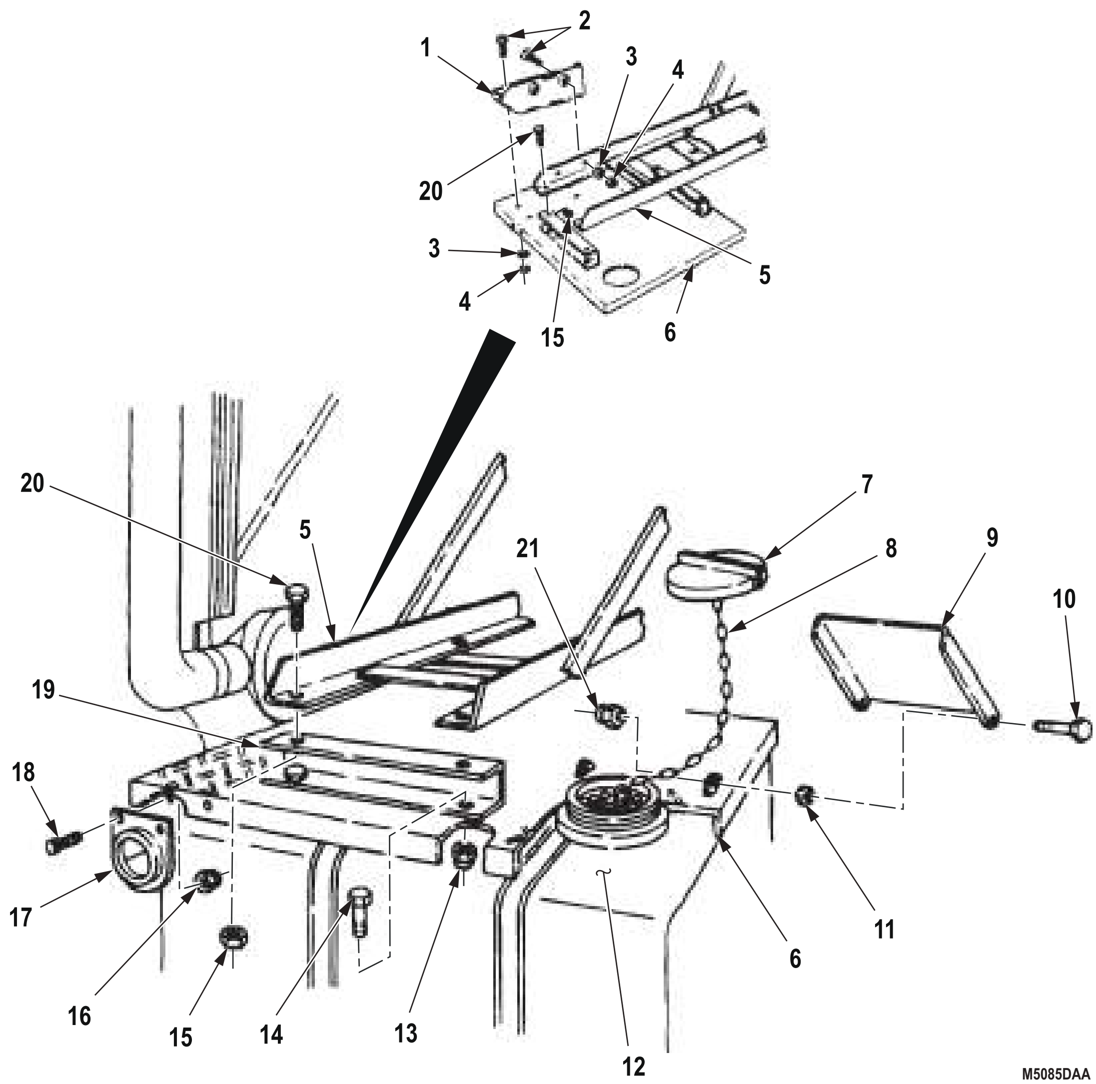


Figure 2. Dump and Tractor Spare Tire Carrier Access Step Installation.

END OF TASK

FOLLOW-ON MAINTENANCE

Install toolbox if removed. (WP 0522)

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
DUMP AND VAN SPARE TIRE CARRIER REPLACEMENT (M929, M930, M934)

INITIAL SETUP:

Tools and Special Tools
Tool Kit, General Mechanic's: Automotive (Volume 5, WP 0826, Table 1, Item 56)

Materials/Parts
Locknut (Volume 5, WP 0827, Table 1, Item 289)
Qty: 4

Personnel Required
(2)

Equipment Condition
Parking brake set. (TM 9-2320-272-10)

Equipment Condition (cont.)
Spare tire removed. (TM 9-2320-272-10)
Spare tire carrier access steps removed. (WP 0524)

REMOVAL

1. Remove two locknuts (Figure 1, Item 6), screws (Figure 1, Item 3), and washers (Figure 1, Item 4) from carrier base (Figure 1, Item 1) and frame bracket (Figure 1, Item 5). Discard locknuts.
2. Remove two locknuts (Figure 1, Item 8), screws (Figure 1, Item 2), and carrier base (Figure 1, Item 1) from frame brackets (Figure 1, Items 5 and 7). Discard locknuts.

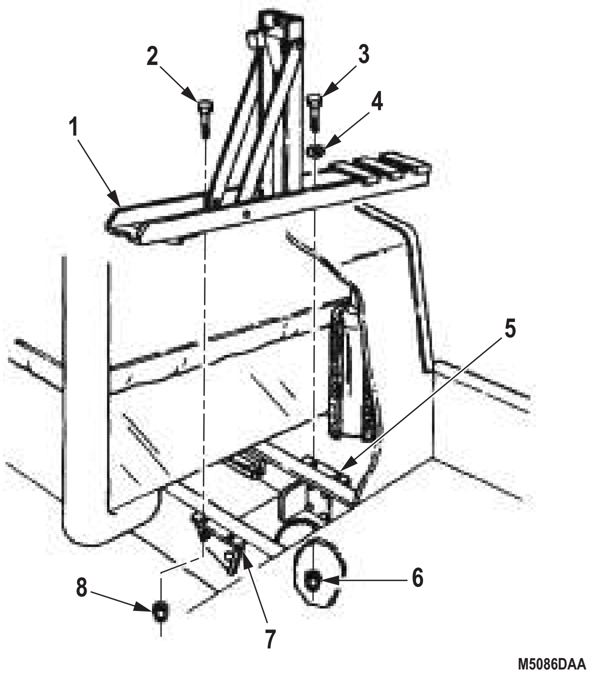


Figure 1. Spare Tire Carrier Removal.

END OF TASK

INSTALLATION

1. Position carrier base (Figure 2, Item 1) on frame brackets (Figure 2, Items 5 and 7).
2. Install carrier base (Figure 2, Item 1) on frame brackets (Figure 2, Items 5 and 7) with two screws (Figure 2, Item 2), locknuts (Figure 2, Item 8), washers (Figure 2, Item 4), screws (Figure 2, Item 3), and locknuts (Figure 2, Item 6).

INSTALLATION - Continued

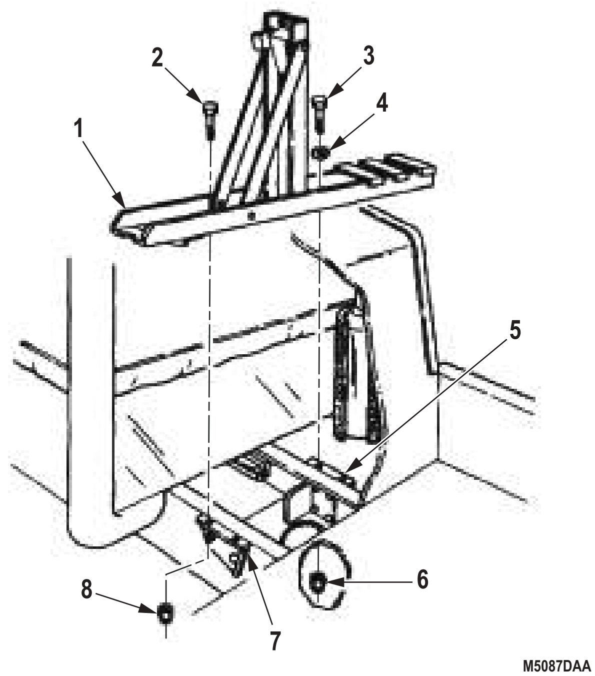


Figure 2. Spare Tire Carrier Installation.

END OF TASK

FOLLOW-ON MAINTENANCE

1. Install spare tire carrier access steps. (WP 0524)
2. Install spare tire. (TM 9-2320-272-10)

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
DUMP AND VAN SPARE TIRE CARRIER REPLACEMENT (M929A1/A2, M930A1/A2, M934A1/A2)

INITIAL SETUP:

Tools and Special Tools

Tool Kit, General Mechanic's: Automotive
(Volume 5, WP 0826, Table 1, Item 56)
Bar, Wrecking
(Volume 5, WP 0826, Table 1, Item 6)
Chain Assembly
(Volume 5, WP 0826, Table 1, Item 15)
High Boy Jack Stands
(Volume 5, WP 0826, Table 1, Item 24)
Hoist Assembly

Materials/Parts

Locknut (Volume 5, WP 0827, Table 1, Item 270)
Qty: 2

Materials/Parts (cont.)

Locknut (Volume 5, WP 0827, Table 1, Item 285)
Qty: 14
Locknut (Volume 5, WP 0827, Table 1, Item 289)
Qty: 14

Personnel Required

(2)

Equipment Condition

Parking brake set. (TM 9-2320-272-10)
Raise and secure dump body. (TM 9-2320-272-10)
Spare tire removed. (TM 9-2320-272-10)

DUMP SPARE TIRE CARRIER REMOVAL

WARNING

Dump body must be raised and secured with safety braces before removal and installation of dump spare tire carrier. Failure to comply may result in injury or death to personnel.

1. Remove two locknuts (Figure 1, Item 10), screws (Figure 1, Item 12), and reflector bracket (Figure 1, Item 11) from carrier access step (Figure 1, Item 8). Discard locknuts.
2. Remove locknut (Figure 1, Item 4), screw (Figure 1, Item 2), three locknuts (Figure 1, Item 7), screws (Figure 1, Item 1), and washers (Figure 1, Item 9) from frame brackets (Figure 1, Items 3 and 6) and carrier base (Figure 1, Item 5). Discard locknuts.

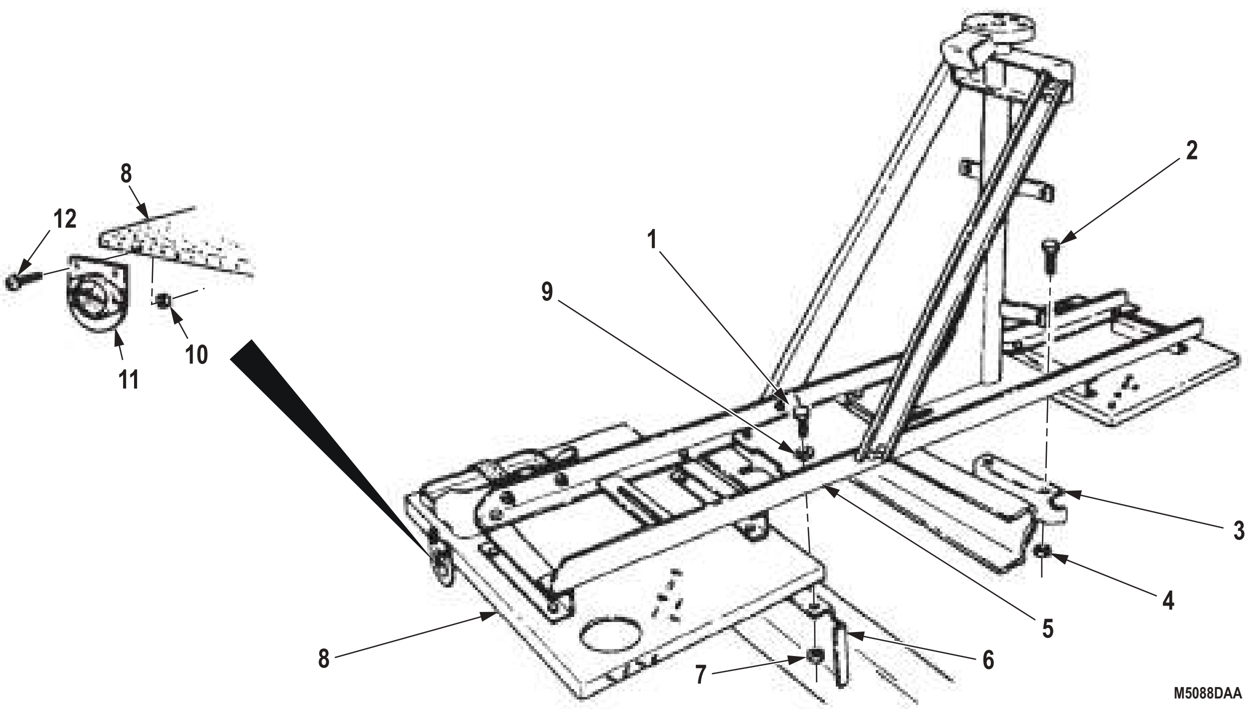


Figure 1. Dump Spare Tire Carrier Removal.

DUMP SPARE TIRE CARRIER REMOVAL - Continued

3. Attach utility chain (Figure 2, Item 2) to upper tire carrier (Figure 2, Item 1) and a suitable lifting device.
4. Lift carrier base (Figure 2, Item 3) from vehicle and position on four jack stands (Figure 2, Item 4).
5. Remove utility chain (Figure 2, Item 2) from upper tire carrier (Figure 2, Item 1).
6. Remove six locknuts (Figure 2, Item 6), washers (Figure 2, Item 9), screws (Figure 2, Item 10), and bracket assembly (Figure 2, Item 11) from carrier step (Figure 2, Item 5) and carrier base (Figure 2, Item 3). Discard locknuts.

NOTE

Assistant will support access steps during Step (7).

7. Remove eight locknuts (Figure 2, Item 8), screws (Figure 2, Item 7), and two carrier steps (Figure 2, Item 5) from carrier base (Figure 2, Item 3). Discard locknuts.

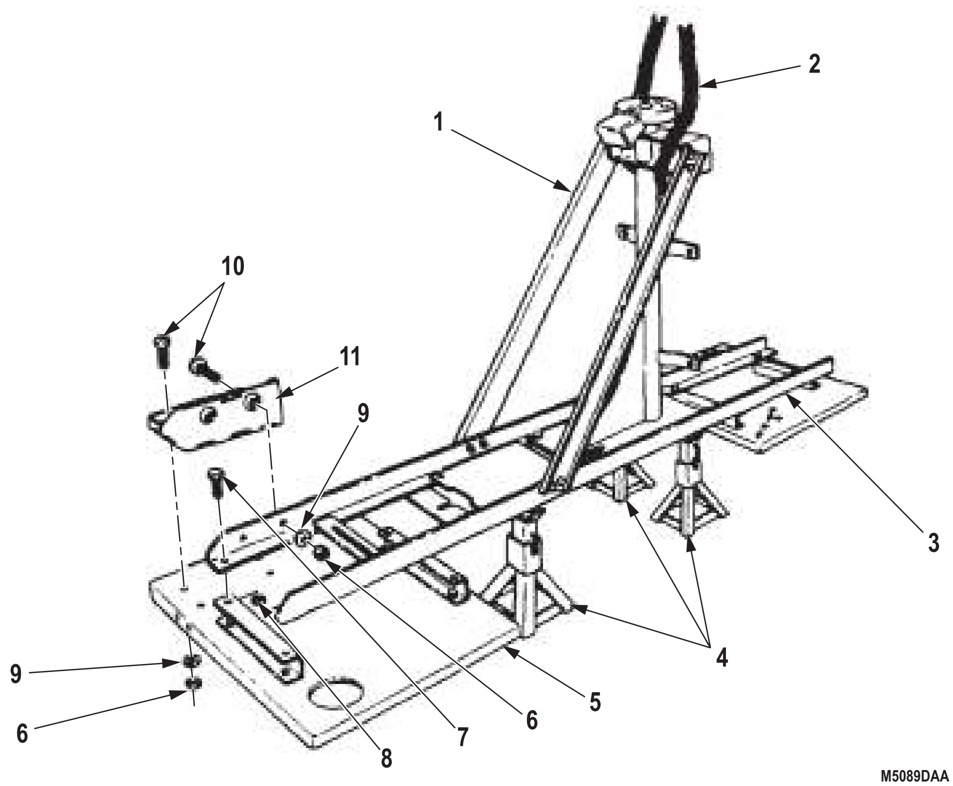


Figure 2. Dump Spare Tire Carrier Removal.

END OF TASK

DUMP SPARE TIRE CARRIER INSTALLATION

NOTE

Assistant will support access steps during Step (1).

1. Install two carrier steps (Figure 3, Item 5) on carrier base (Figure 3, Item 3) with eight screws (Figure 3, Item 7) and locknuts (Figure 3, Item 8).
2. Install bracket assembly (Figure 3, Item 11) on carrier step (Figure 3, Item 5) and carrier base (Figure 3, Item 3) with six screws (Figure 3, Item 10), washers (Figure 3, Item 9), and locknuts (Figure 3, Item 6).
3. Install utility chain (Figure 3, Item 2) to upper tire carrier (Figure 3, Item 1) and a suitable lifting device.
4. Lift carrier base (Figure 3, Item 3) from four jack stands (Figure 3, Item 4) and position on vehicle.

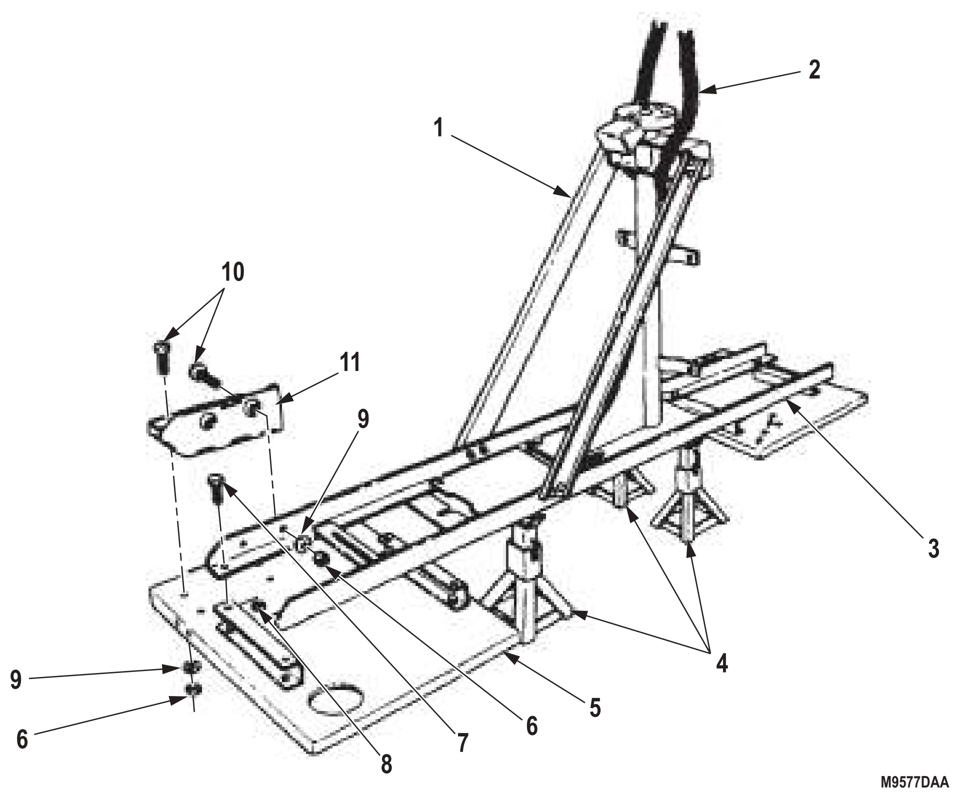


Figure 3. Dump Spare Tire Carrier Installation.

DUMP SPARE TIRE CARRIER INSTALLATION - Continued

5. Using lifting device and prybar, align carrier base (Figure 4, Item 5) on frame brackets (Figure 4, Items 3 and 6) and install screw (Figure 4, Item 2), three washers (Figure 4, Item 9), and screws (Figure 4, Item 10).
6. Remove lifting device and utility chain from upper tire carrier (Figure 4, Item 1).
7. Install locknut (Figure 4, Item 4) and three locknuts (Figure 4, Item 7) on screw (Figure 4, Item 2) and three screws (Figure 4, Item 10).
8. Install reflector bracket (Figure 4, Item 12) on carrier access step (Figure 4, Item 8) with two screws (Figure 4, Item 13) and locknuts (Figure 4, Item 11).

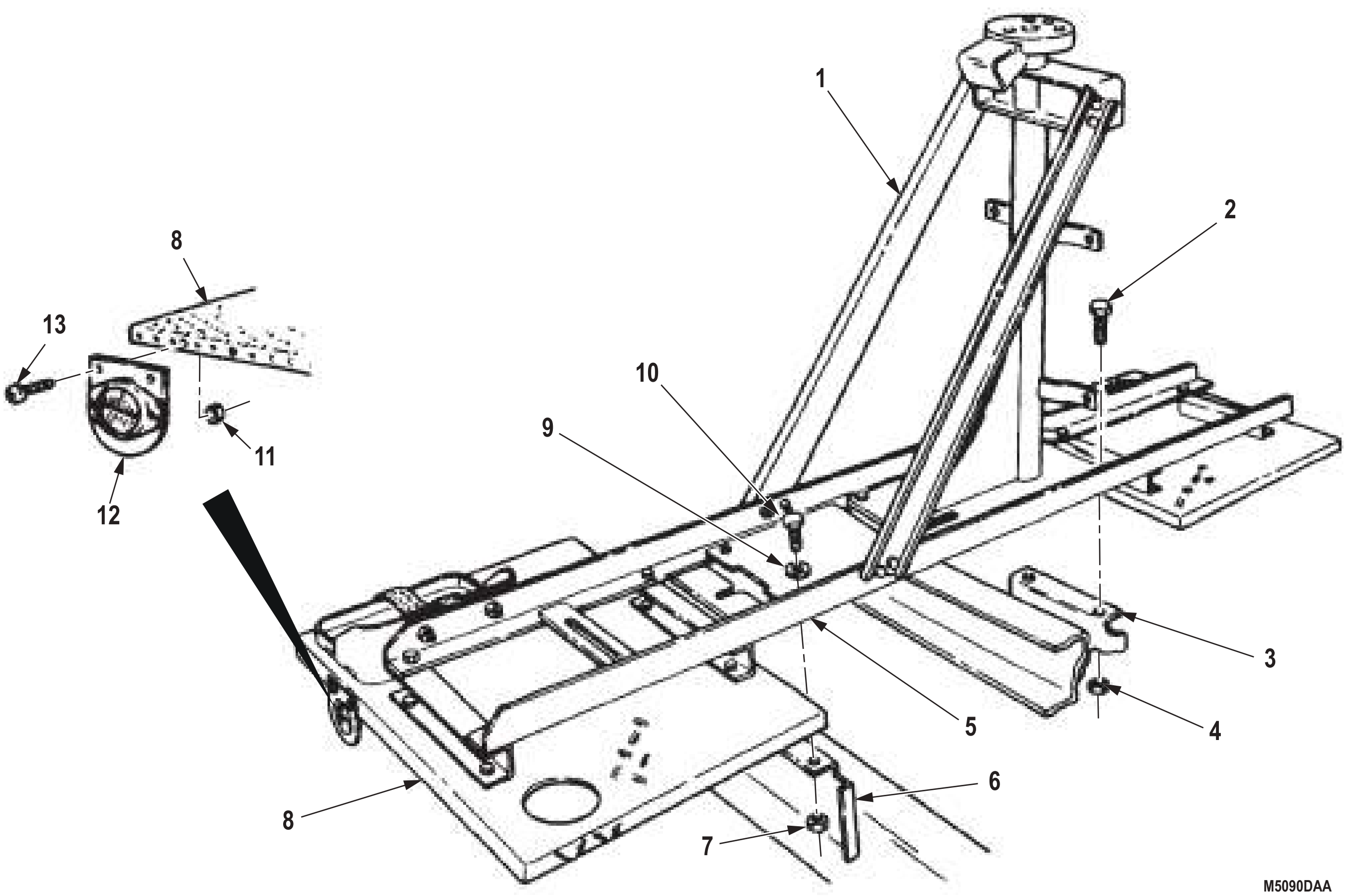


Figure 4. Dump Spare Tire Carrier Installation.

END OF TASK

VAN SPARE TIRE CARRIER REMOVAL

1. Remove two locknuts (Figure 5, Item 4), washers (Figure 5, Item 2), screws (Figure 5, Item 1), and washers (Figure 5, Item 2) from muffler support brace (Figure 5, Item 3) and carrier base (Figure 5, Item 11). Discard locknuts.
2. Attach davit chain (Figure 5, Item 15) to carrier base (Figure 5, Item 11).
3. Remove four locknuts (Figure 5, Item 12) and screws (Figure 5, Item 5) from muffler support (Figure 5, Item 6) and carrier base (Figure 5, Item 11). Discard locknuts.
4. Remove two locknuts (Figure 5, Item 8), screws (Figure 5, Item 10), and washers (Figure 5, Item 9) from carrier base (Figure 5, Item 11) and frame rail bracket (Figure 5, Item 7). Discard locknuts.
5. Using davit (Figure 5, Item 14), remove carrier base (Figure 5, Item 11) from frame rail bracket (Figure 5, Item 7), position on jack stands (Figure 5, Item 13), and remove davit chain (Figure 5, Item 15) from carrier base (Figure 5, Item 11).
6. Remove four locknuts (Figure 5, Item 20), screws (Figure 5, Item 16), washers (Figure 5, Item 17), and carrier access step (Figure 5, Item 19) with step brackets (Figure 5, Item 18) from carrier base (Figure 5, Item 11). Discard locknuts.

VAN SPARE TIRE CARRIER REMOVAL - Continued

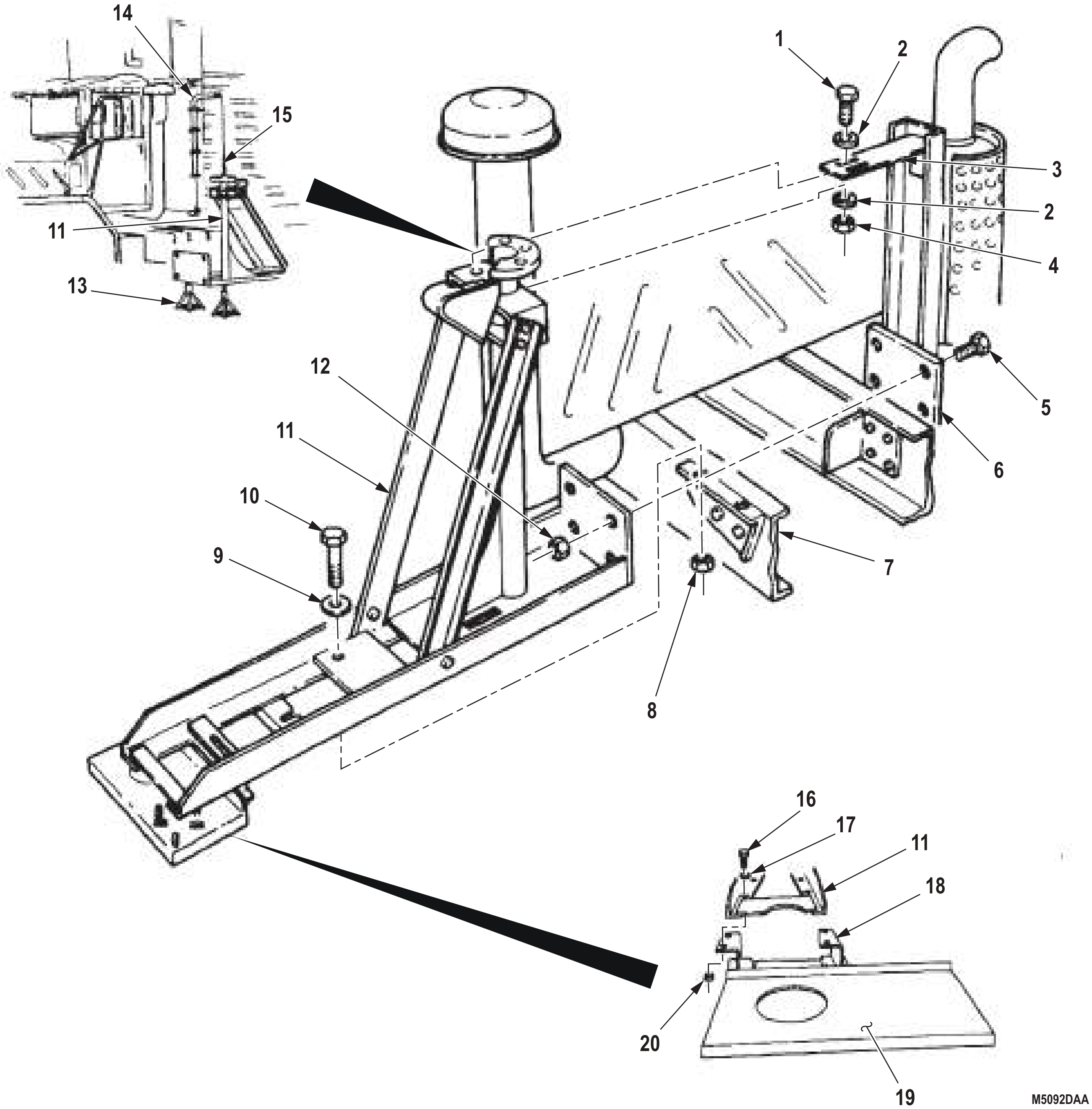


Figure 5. Van Spare Tire Carrier Removal.

END OF TASK

VAN SPARE TIRE CARRIER INSTALLATION

1. Position step brackets (Figure 6, Item 18) under carrier base (Figure 6, Item 11) with holes aligned and install carrier access step (Figure 6, Item 19) on carrier base (Figure 6, Item 11) with four washers (Figure 6, Item 17), screws (Figure 6, Item 16), and locknuts (Figure 6, Item 20).
2. Attach davit chain (Figure 6, Item 15) to carrier base (Figure 6, Item 11), and using davit (Figure 6, Item 14), position carrier base (Figure 6, Item 11) on vehicle.
3. Using two washers (Figure 6, Item 9) and screws (Figure 6, Item 10), align carrier base (Figure 6, Item 11) with frame rail bracket (Figure 6, Item 7), and install carrier base (Figure 6, Item 11) on muffler support (Figure 6, Item 6) with four screws (Figure 6, Item 5) and locknuts (Figure 6, Item 12).
4. Remove davit chain (Figure 6, Item 15) from carrier base (Figure 6, Item 11).
5. Install two locknuts (Figure 6, Item 8) on screws (Figure 6, Item 10).
6. Install carrier base (Figure 6, Item 11) on muffler support brace (Figure 6, Item 3) with two washers (Figure 6, Item 2), screws (Figure 6, Item 1), washers (Figure 6, Item 2), and locknuts (Figure 6, Item 4).

VAN SPARE TIRE CARRIER INSTALLATION - Continued

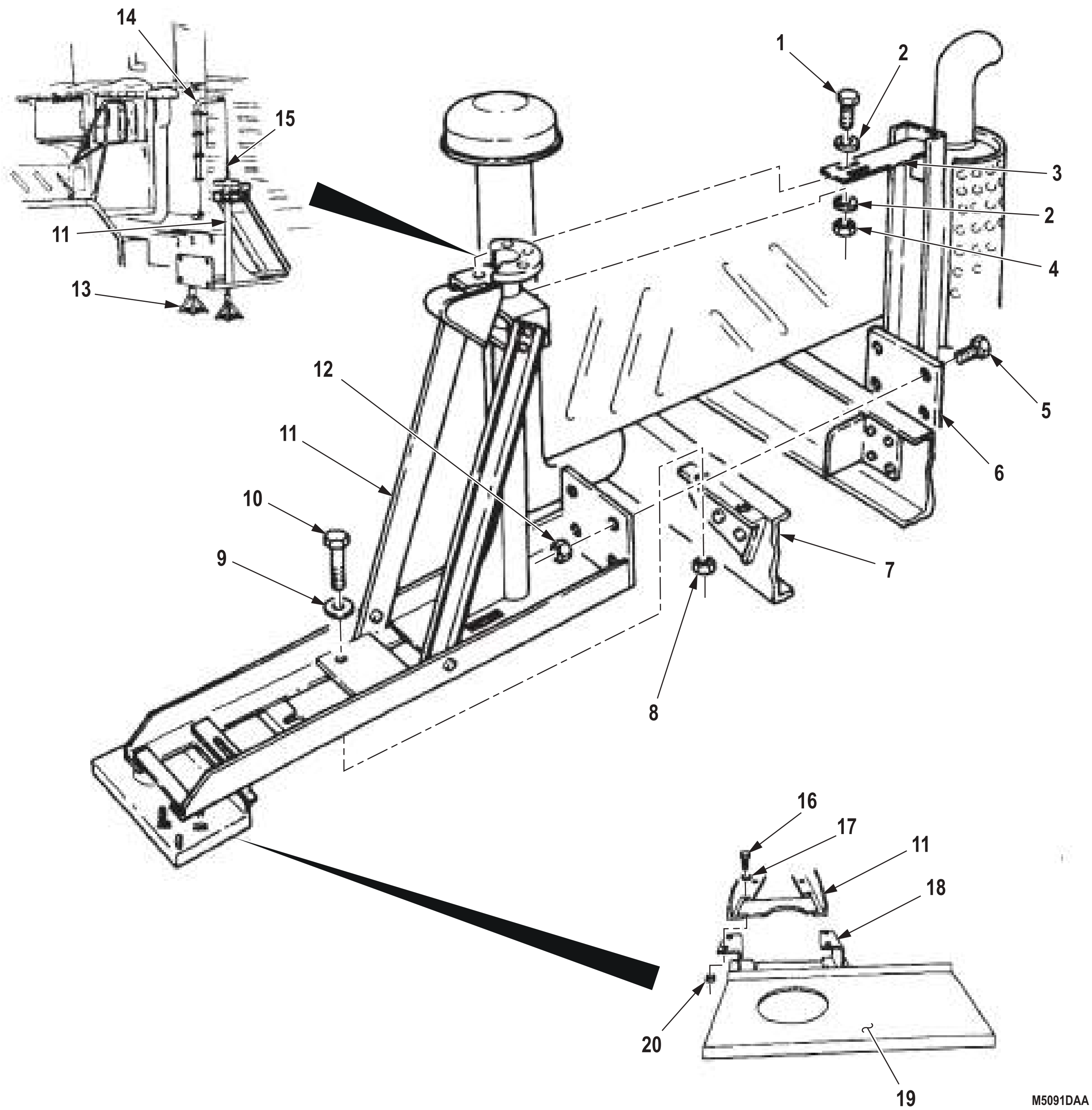


Figure 6. Van Spare Tire Carrier Installation.

END OF TASK

FOLLOW-ON MAINTENANCE

Install spare tire. (TM 9-2320-272-10)

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
CARGO SPARE TIRE CARRIER REPLACEMENT (M923, M925, M927, M928)

INITIAL SETUP:

Tools and Special Tools
Tool Kit, General Mechanic's: Automotive
(Volume 5, WP 0826, Table 1, Item 56)

Materials/Parts
Locknut (Volume 5, WP 0827, Table 1, Item 285)
Qty: 4
Locknut (Volume 5, WP 0827, Table 1, Item 289)
Qty: 4

Equipment Condition
Parking brake set. (TM 9-2320-272-10)
Spare tire removed. (TM 9-2320-272-10)

REMOVAL

1. Remove retaining pin (Figure 1, Item 16) from boom extension (Figure 1, Item 15) and boom (Figure 1, Item 1).
2. Remove boom extension (Figure 1, Item 15) from boom (Figure 1, Item 1).
3. Loosen screw (Figure 1, Item 2) on boom (Figure 1, Item 1).
4. Remove boom (Figure 1, Item 1) from boom support (Figure 1, Item 3).
5. Remove two locknuts (Figure 1, Item 6), washers (Figure 1, Item 5), and screws (Figure 1, Item 14) from muffler support braces (Figure 1, Item 4) and carrier base (Figure 1, Item 11). Discard locknuts.
6. Remove four locknuts (Figure 1, Item 12) and screws (Figure 1, Item 8) from muffler support (Figure 1, Item 7) and carrier base (Figure 1, Item 11). Discard locknuts.
7. Remove two locknuts (Figure 1, Item 10) and screws (Figure 1, Item 13) from frame rail bracket (Figure 1, Item 9) and carrier base (Figure 1, Item 11). Discard locknuts.
8. Remove carrier base (Figure 1, Item 11) from vehicle.

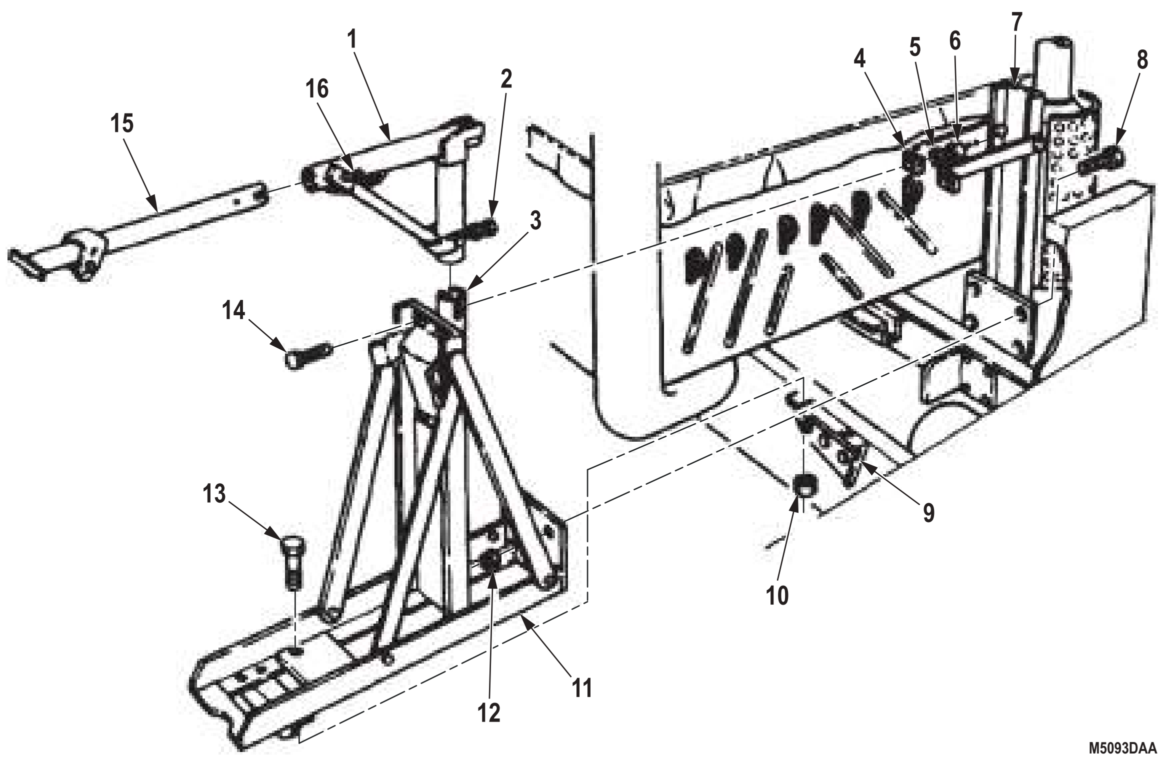


Figure 1. Cargo Spare Tire Carrier Removal.

END OF TASK

INSTALLATION

1. Install carrier base (Figure 2, Item 11) on frame rail bracket (Figure 2, Item 9) with two screws (Figure 2, Item 13) and locknuts (Figure 2, Item 10).
2. Install carrier base (Figure 2, Item 11) on muffler support (Figure 2, Item 7) with four screws (Figure 2, Item 8) and locknuts (Figure 2, Item 12).

INSTALLATION - Continued

3. Install muffler support braces (Figure 2, Item 4) on carrier base (Figure 2, Item 11) with two screws (Figure 2, Item 14), washers (Figure 2, Item 5), and locknuts (Figure 2, Item 6).
4. Install boom (Figure 2, Item 1) on boom support (Figure 2, Item 3).

NOTE

Ensure screw is tightened against preset groove in boom support.

5. Tighten screw (Figure 2, Item 2) on boom (Figure 2, Item 1).
6. Install boom extension (Figure 2, Item 15) on boom (Figure 2, Item 1).
7. Install retaining pin (Figure 2, Item 16) in boom extension (Figure 2, Item 15) and boom (Figure 2, Item 1).

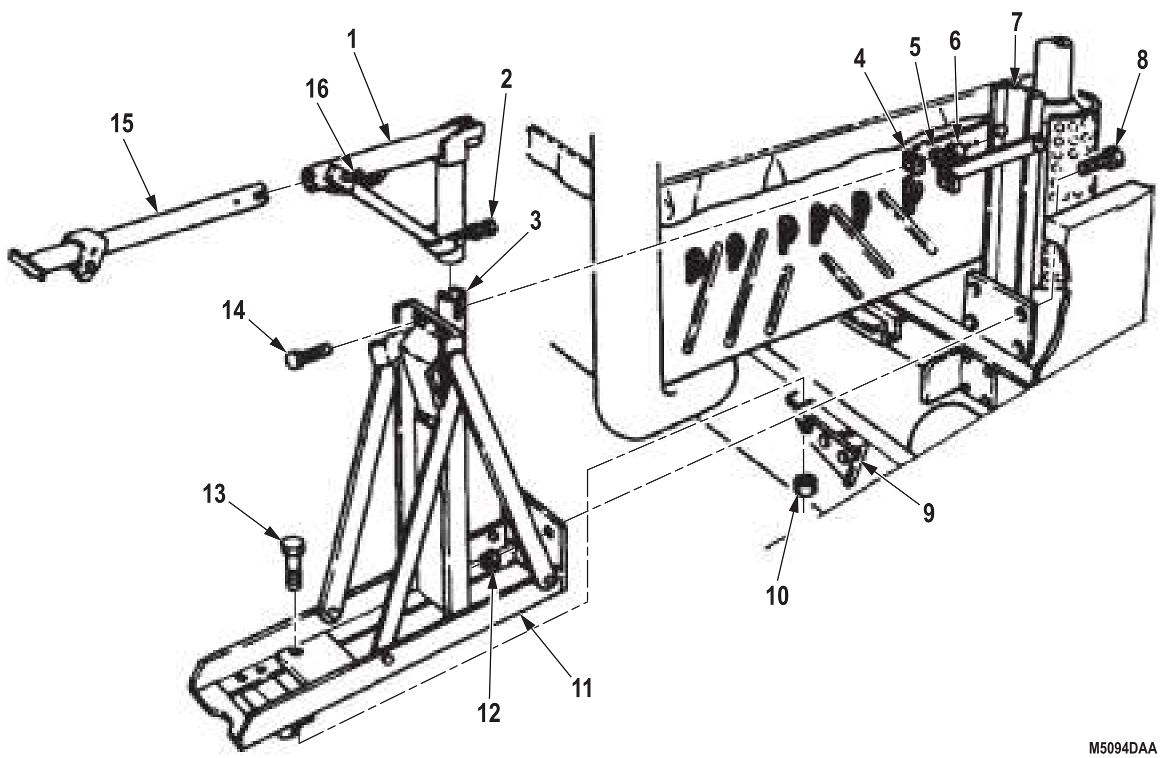


Figure 2. Cargo Spare Tire Carrier Installation.

END OF TASK

FOLLOW-ON MAINTENANCE

Install spare tire. (TM 9-2320-272-10)

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
CARGO SPARE TIRE CARRIER REPLACEMENT (M923A1/A2, M925A1/A2, M927A1/A2, M928A1/A2)

INITIAL SETUP:

Tools and Special Tools

Tool Kit, General Mechanic's: Automotive
(Volume 5, WP 0826, Table 1, Item 56)
Bar, Pinch, 26 in.
(Volume 5, WP 0826, Table 1, Item 5)
Chain Assembly
(Volume 5, WP 0826, Table 1, Item 15)
Hoist Assembly

Materials/Parts

Locknut (Volume 5, WP 0827, Table 1, Item 285)
Qty: 2
Locknut (Volume 5, WP 0827, Table 1, Item 289)
Qty: 10

Personnel Required

(2)

Equipment Condition

Parking brake set. (TM 9-2320-272-10)
Spare tire removed. (TM 9-2320-272-10)
Carrier access step removed. (WP 0529)
Forward cargo rack removed. (TM 9-2320-272-10)

REMOVAL

1. Remove locking pin (Figure 1, Item 12) and retaining pin (Figure 1, Item 13) from boom extension (Figure 1, Item 14).
2. Remove boom extension (Figure 1, Item 14) from boom (Figure 1, Item 1).
3. Remove four locknuts (Figure 1, Item 19), screws (Figure 1, Item 2), and boom (Figure 1, Item 1) from boom support (Figure 1, Item 11). Discard locknuts.
4. Remove two locknuts (Figure 1, Item 15), washers (Figure 1, Item 4), screws (Figure 1, Item 3), and washers (Figure 1, Item 4) from muffler support bracket (Figure 1, Item 5) and carrier base (Figure 1, Item 8). Discard locknuts.
5. Install utility chain around upper part of carrier base (Figure 1, Item 8) and attach to a suitable lifting device.
6. Remove four locknuts (Figure 1, Item 18) and screws (Figure 1, Item 7) from muffler support (Figure 1, Item 6) and carrier base (Figure 1, Item 8). Discard locknuts.
7. Remove two locknuts (Figure 1, Item 17), screws (Figure 1, Item 10), washers (Figure 1, Item 9), and carrier base (Figure 1, Item 8) from left frame rail bracket (Figure 1, Item 16). Discard locknuts.
8. Remove utility chain from the carrier base (Figure 1, Item 8).

REMOVAL - Continued

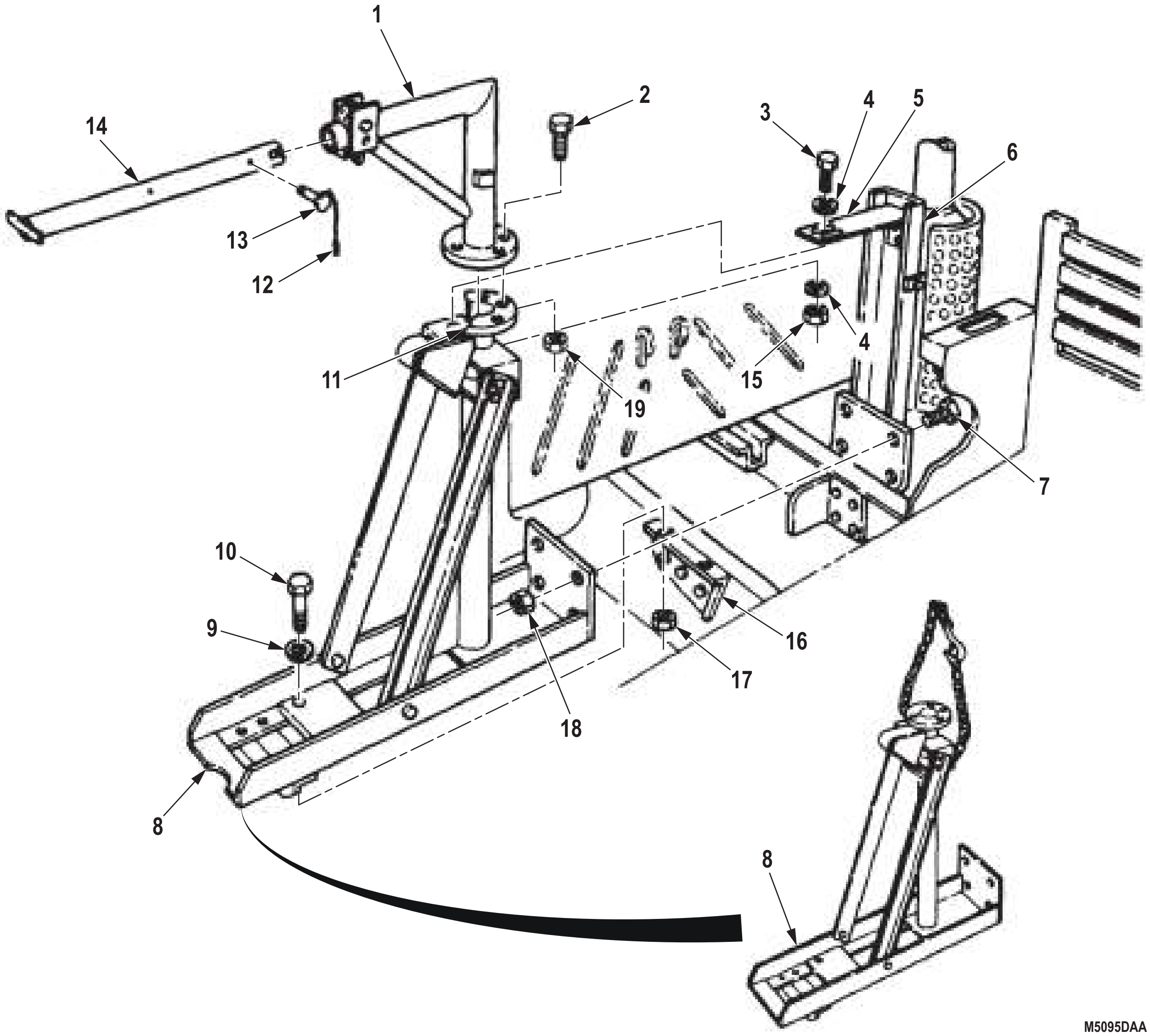


Figure 1. Cargo Spare Tire Carrier Removal.

END OF TASK

INSTALLATION

1. Install utility chain around upper part of carrier base (Figure 2, Item 8) and attach to a suitable lifting device.
2. Using lifting device, lift carrier base (Figure 2, Item 8), lower onto vehicle, and align carrier base with muffler support (Figure 2, Item 6) while installing four screws (Figure 2, Item 7) and locknuts (Figure 2, Item 18).
3. Using a prybar to align carrier base (Figure 2, Item 8) with left frame rail bracket (Figure 2, Item 16), install two washers (Figure 2, Item 9), screws (Figure 2, Item 10), and locknuts (Figure 2, Item 17).
4. Remove lifting device and utility chain from carrier base (Figure 2, Item 8).
5. Install two washers (Figure 2, Item 4), screws (Figure 2, Item 3), washers (Figure 2, Item 4), and locknuts (Figure 2, Item 15) on muffler support bracket (Figure 2, Item 5) and carrier base (Figure 2, Item 8).
6. Install boom (Figure 2, Item 1) on boom support (Figure 2, Item 11) with four screws (Figure 2, Item 2) and locknuts (Figure 2, Item 19).
7. Install boom extension (Figure 2, Item 14) on boom (Figure 2, Item 1).
8. Install retaining pin (Figure 2, Item 13) and locking pin (Figure 2, Item 12) in boom extension (Figure 2, Item 14) and boom (Figure 2, Item 1).

INSTALLATION - Continued

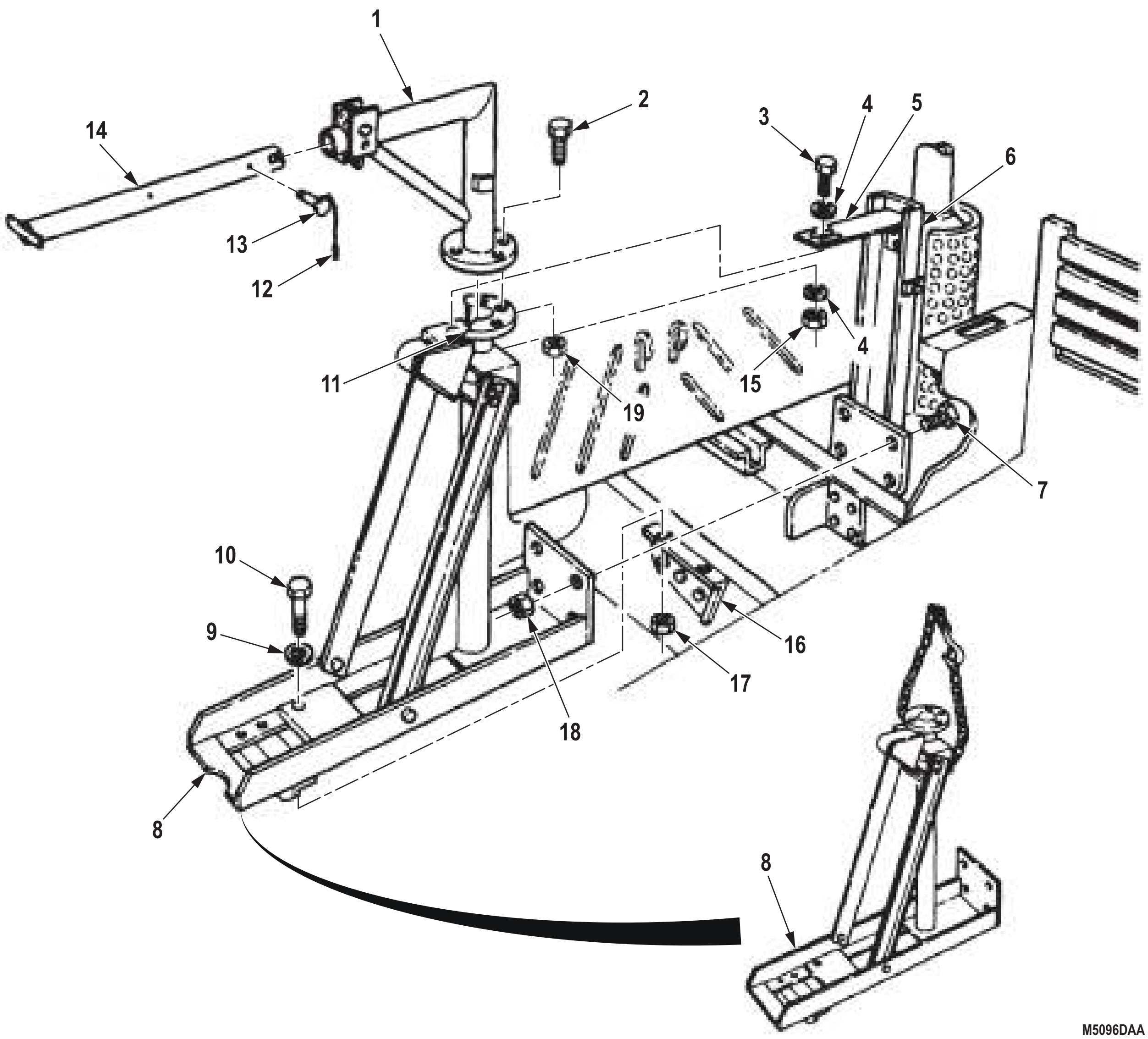


Figure 2. Cargo Spare Tire Carrier Installation.

END OF TASK

FOLLOW-ON MAINTENANCE

1. Install carrier access step. (WP 0529)
2. Install spare tire. (TM 9-2320-272-10)
3. Install forward cargo rack. (TM 9-2320-272-10)

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
CARGO SPARE TIRE CARRIER ACCESS STEP REPLACEMENT

INITIAL SETUP:

Tools and Special Tools
Tool Kit, General Mechanic's: Automotive
(Volume 5, WP 0826, Table 1, Item 56)

Materials/Parts
Rag, Wiping
(Volume 5, WP 0825, Table 1, Item 53)
Locknut (Volume 5, WP 0827, Table 1, Item 269)
Qty: 4

Equipment Condition
Parking brake set. (TM 9-2320-272-10)

REMOVAL

WARNING

Diesel fuel is flammable. Do not perform fuel system procedures near open flame. Failure to comply may result in injury or death to personnel.

1. Remove fuel cap (Figure 1, Item 2), chain (Figure 1, Item 3), and strainer (Figure 1, Item 5) from fuel tank (Figure 1, Item 6). Wrap strainer with rags.
2. Remove four locknuts (Figure 1, Item 7), screws (Figure 1, Item 1), washers (Figure 1, Item 9), and step bracket (Figure 1, Item 4) from carrier base (Figure 1, Item 8). Discard locknuts.

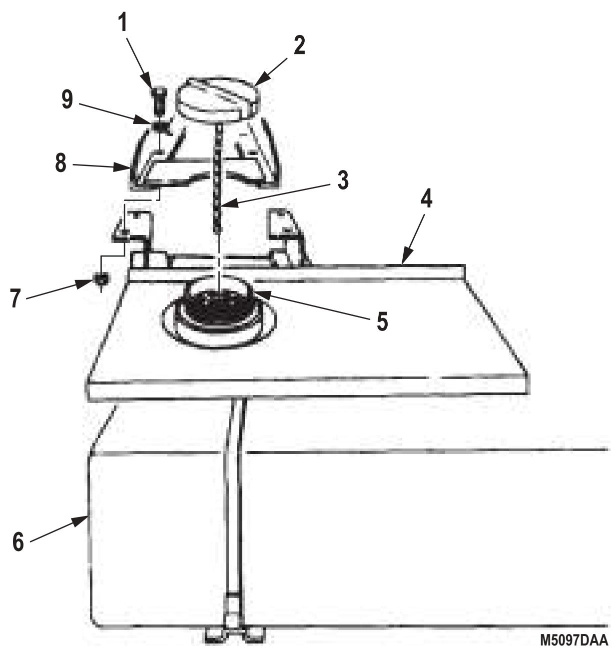


Figure 1. Cargo Spare Tire Carrier Access Step Removal.

END OF TASK

INSTALLATION

1. Install step bracket (Figure 2, Item 4) on carrier base (Figure 2, Item 8) with four screws (Figure 2, Item 1), washers (Figure 2, Item 9), and locknuts (Figure 2, Item 7).
2. Install strainer (Figure 2, Item 5), chain (Figure 2, Item 3), and fuel cap (Figure 2, Item 2) in fuel tank (Figure 2, Item 6).

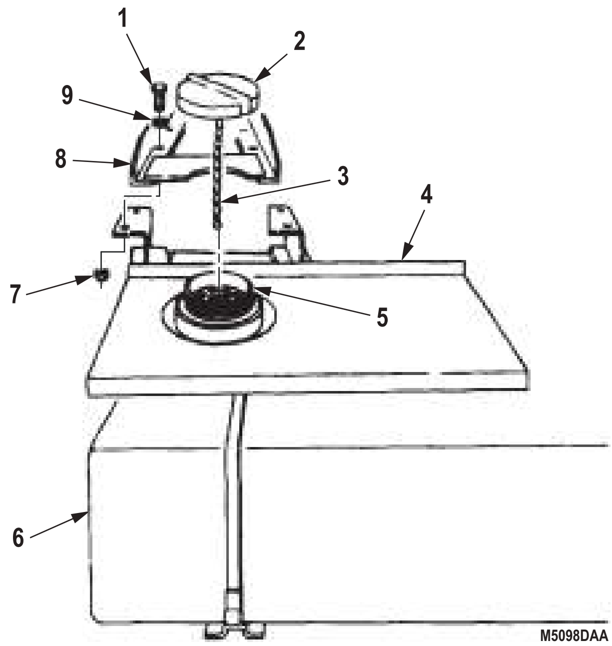


Figure 2. Cargo Spare Tire Carrier Access Step Installation.

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
TRACTOR FIFTH WHEEL (DAYTON/WALTER) REMOVAL

INITIAL SETUP:

Tools and Special Tools

Tool Kit, General Mechanic's: Automotive
(Volume 5, WP 0826, Table 1, Item 56)
Chain Assembly
(Volume 5, WP 0826, Table 1, Item 15)
Hoist Assembly
Wrench, Torque, Click, Ratcheting, 1/2" Drive, 250 Ft-Lb
(Volume 5, WP 0826, Table 1, Item 63)

Materials/Parts

Lockwasher
(Volume 5, WP 0827, Table 1, Item 396)
Qty: 10

Personnel Required

(2)

Equipment Condition

Parking brake set. (TM 9-2320-272-10)

REMOVAL

WARNING

All personnel must stand clear during lifting operations. A shifting or swinging load may cause injury to personnel. Failure to comply may result in injury or death to personnel.

1. Remove ten screws (Figure 1, Item 7) and lockwashers (Figure 1, Item 6) from fifth wheel (Figure 1, Item 3) and base support (Figure 1, Item 5). Discard lockwashers.

NOTE

Ensure washers are between head of screws and fifth wheel, and chain link and nuts.

2. Attach utility chain on fifth wheel (Figure 1, Item 3) with two screws (Figure 1, Item 4), four washers (Figure 1, Item 1), and two nuts (Figure 1, Item 2).

NOTE

Assistant will help with Step (3).

3. Attach lifting device to chain and remove fifth wheel (Figure 1, Item 3) from base support (Figure 1, Item 5).
4. Remove lifting device from chain.
5. Remove two nuts (Figure 1, Item 2), four washers (Figure 1, Item 1), two screws (Figure 1, Item 4), and utility chain from fifth wheel (Figure 1, Item 3).

REMOVAL - Continued

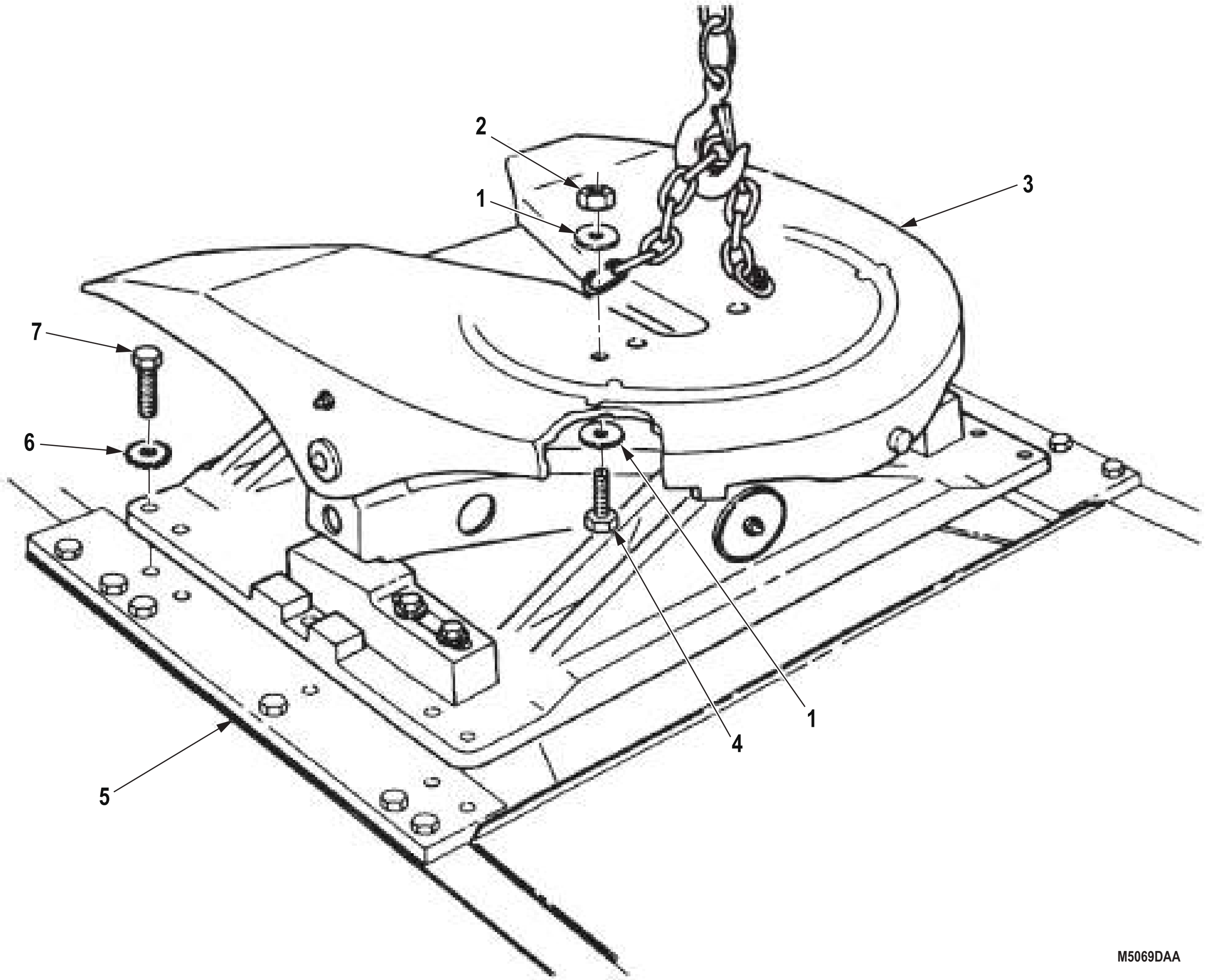


Figure 1. Fifth Wheel Removal.

END OF TASK

FOLLOW-ON MAINTENANCE

Lubricate fifth wheel. (Volume 5, WP 0820)

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
FIFTH WHEEL APPROACH PLATES REPLACEMENT

INITIAL SETUP:

Tools and Special Tools
Tool Kit, General Mechanic's: Automotive
(Volume 5, WP 0826, Table 1, Item 56)

Materials/Parts
Locknut (Volume 5, WP 0827, Table 1, Item 279)
Qty: 16
Lockwasher
(Volume 5, WP 0827, Table 1, Item 403)
Qty: 4

Equipment Condition
Parking brake set. (TM 9-2320-272-10)
Fifth wheel removed. (WP 0530)

REMOVAL

1. Remove four locknuts (Figure 1, Items 2, 9, and 10) and screws (Figure 1, Items 4, 13, and 14) from two approach plates (Figure 1, Item 3), channel (Figure 1, Item 1), and frame (Figure 1, Item 8). Discard locknuts.
2. Remove four locknuts (Figure 1, Item 11), screws (Figure 1, Item 12), two approach plates (Figure 1, Item 3), and channel (Figure 1, Item 8) from frame (Figure 1, Item 14). Discard locknuts.
3. Remove four screws (Figure 1, Item 5), lockwashers (Figure 1, Item 6), and two reflectors (Figure 1, Item 7) from approach plates (Figure 1, Item 3). Discard lockwashers.

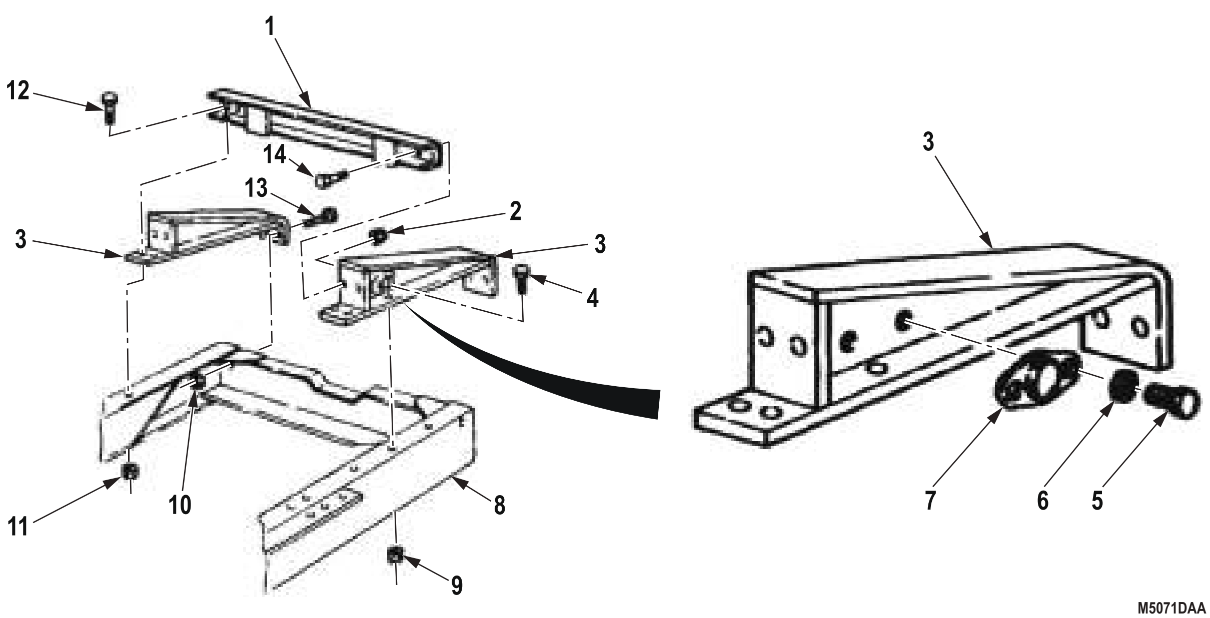


Figure 1. Fifth Wheel Approach Plates Removal.

END OF TASK

INSTALLATION

1. Install two reflectors (Figure 2, Item 7) on approach plates (Figure 2, Item 3) with four lockwashers (Figure 2, Item 6) and screws (Figure 2, Item 5).
2. Install two approach plates (Figure 2, Item 3) and channel (Figure 2, Item 1) on frame (Figure 2, Item 8) with four screws (Figure 2, Items 4, 13, and 14) and locknuts (Figure 2, Items 2, 9, and 10).
3. Install channel (Figure 2, Item 1) on two approach plates (Figure 2, Item 3) and frame (Figure 2, Item 8) with four screws (Figure 2, Item 12) and locknuts (Figure 2, Item 11).

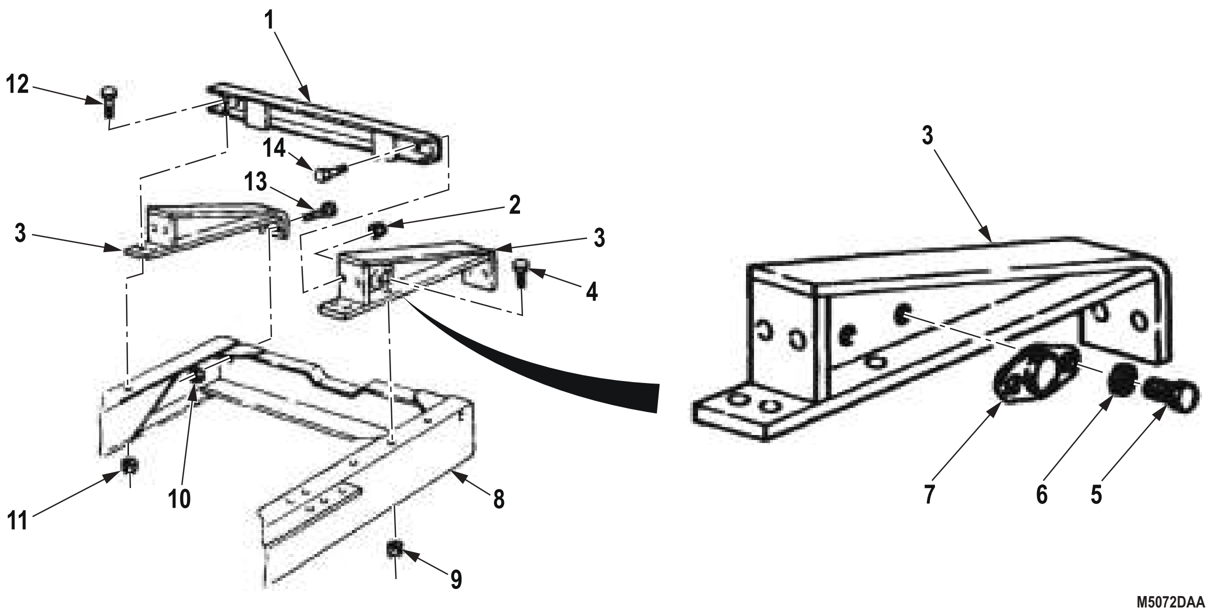


Figure 2. Fifth Wheel Approach Plates Installation.

END OF TASK

FOLLOW-ON MAINTENANCE

Install fifth wheel. (WP 0530)

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
FIFTH WHEEL DECK PLATE REPLACEMENT

INITIAL SETUP:

Tools and Special Tools
Tool Kit, General Mechanic's: Automotive
(Volume 5, WP 0826, Table 1, Item 56)

Materials/Parts
Locknut (Volume 5, WP 0827, Table 1, Item 285)
Qty: 6

Equipment Condition
Parking brake set. (TM 9-2320-272-10)

REMOVAL

1. Remove four locknuts (Figure 1, Item 7), screws (Figure 1, Item 9), and plate retainers (Figure 1, Item 6) from frame (Figure 1, Item 4) and deck plate (Figure 1, Item 3). Discard locknuts.
2. Remove two locknuts (Figure 1, Item 5), screws (Figure 1, Item 2), washers (Figure 1, Item 1), deck plate (Figure 1, Item 3), and two spacers (Figure 1, Item 8) from frame (Figure 1, Item 4). Discard locknuts.

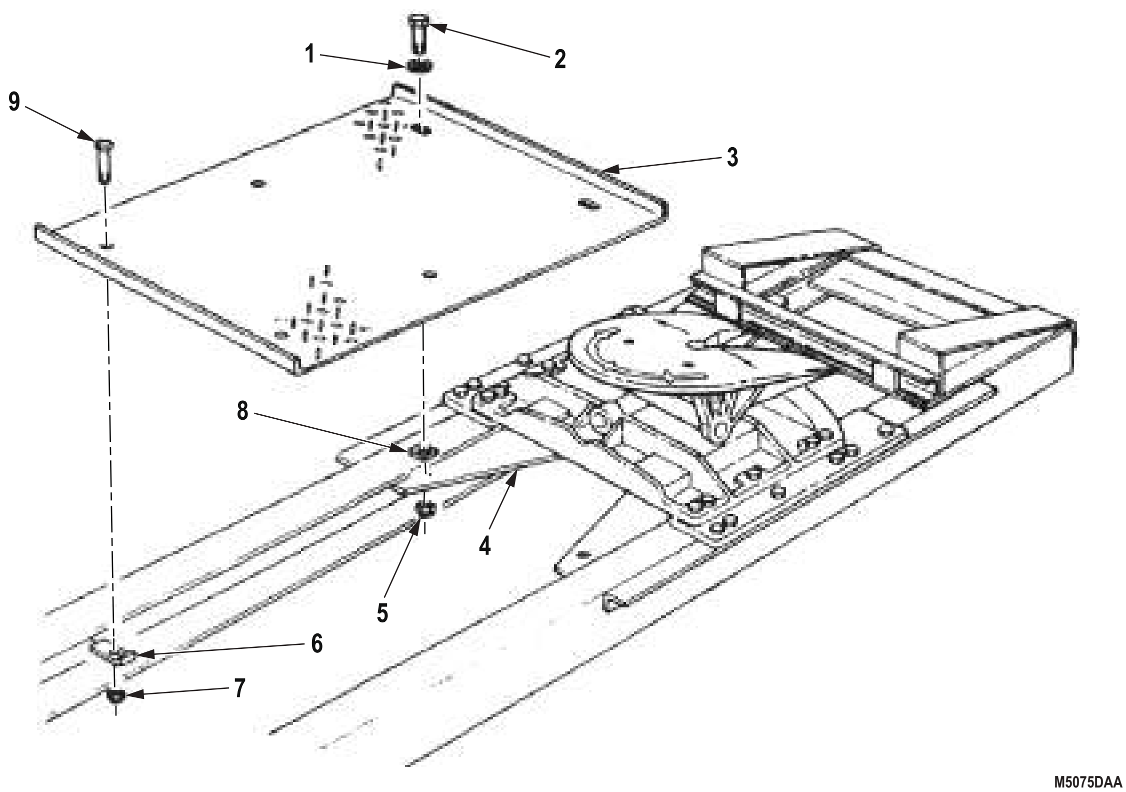


Figure 1. Fifth Wheel Deck Plate Removal.

END OF TASK

INSTALLATION

1. Install two spacers (Figure 2, Item 8) and deck plate (Figure 2, Item 3) on frame (Figure 2, Item 4) with two washers (Figure 2, Item 1), screws (Figure 2, Item 2), and locknuts (Figure 2, Item 5).
2. Install four plate retainers (Figure 2, Item 6) on deck plate (Figure 2, Item 3) and frame (Figure 2, Item 4) with four screws (Figure 2, Item 9) and locknuts (Figure 2, Item 7).

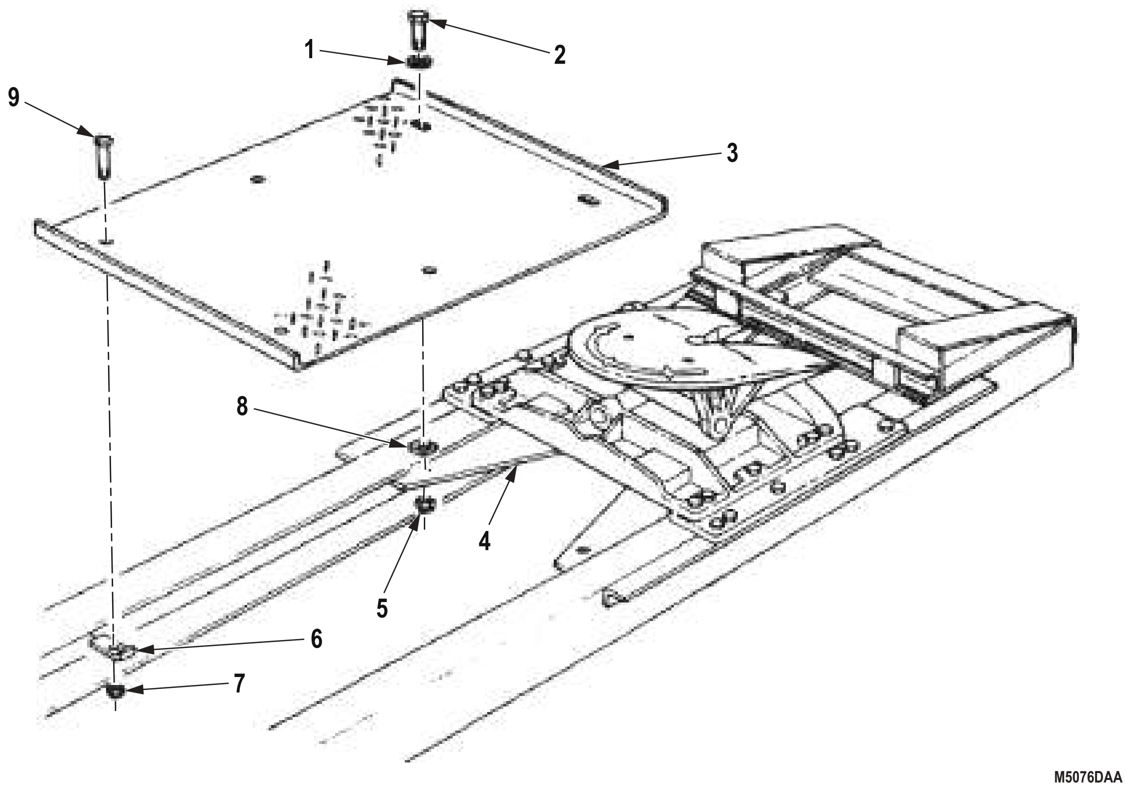


Figure 2. Fifth Wheel Deck Plate Installation.

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
FIFTH WHEEL SPACERS REPLACEMENT

INITIAL SETUP:

Tools and Special Tools
Tool Kit, General Mechanic's: Automotive (Volume 5, WP 0826, Table 1, Item 56)

Materials/Parts
Locknut (Volume 5, WP 0827, Table 1, Item 279)
Qty: 12

Equipment Condition
Parking brake set. (TM 9-2320-272-10)
Fifth wheel removed. (WP 0530)

REMOVAL

Remove 12 locknuts (Figure 1, Item 4), screws (Figure 1, Item 2), and two spacers (Figure 1, Item 1) from frame (Figure 1, Item 3). Discard locknuts.

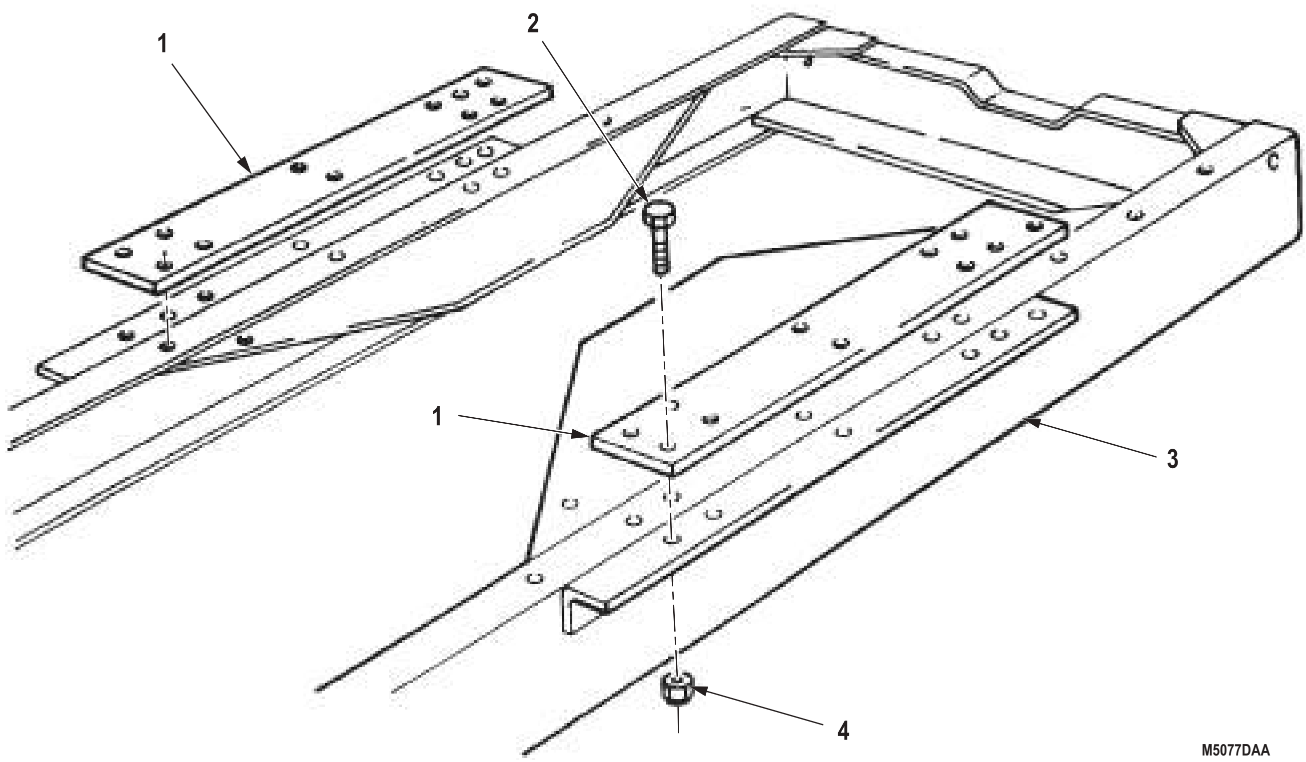


Figure 1. Fifth Wheel Spacers Removal.

END OF TASK

INSTALLATION

Install two spacers (Figure 2, Item 1) on frame (Figure 2, Item 3) with 12 screws (Figure 2, Item 2) and locknuts (Figure 2, Item 4).

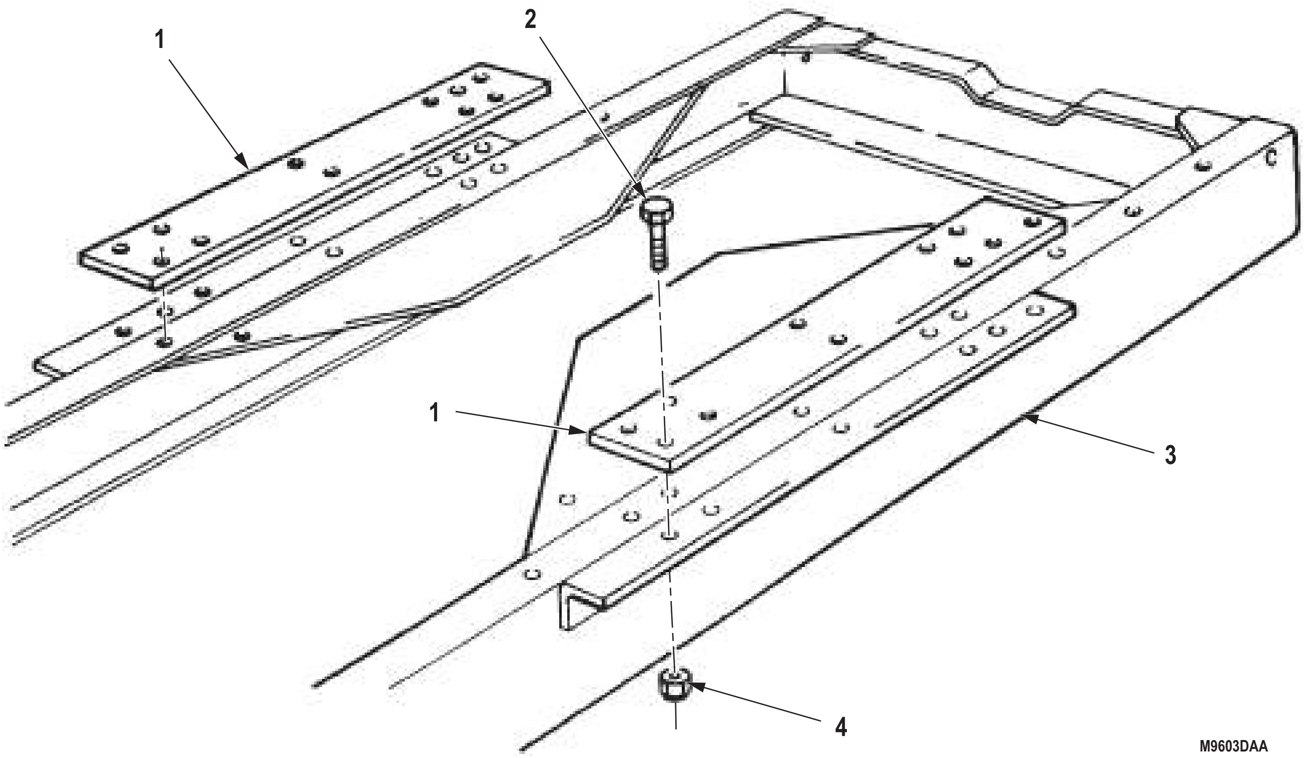


Figure 2. Fifth Wheel Spacers Installation.

END OF TASK

FOLLOW-ON MAINTENANCE

Install fifth wheel. (WP 0530)

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
FRONT SPRING AND MAIN LEAF REPAIR

INITIAL SETUP:

Tools and Special Tools

Tool Kit, General Mechanic's: Automotive
(Volume 5, WP 0826, Table 1, Item 56)
C-Clamp
Wrench, Torque, Click, Ratcheting, 3/4" Drive, 600 Ft-Lb
(Volume 5, WP 0826, Table 1, Item 61)

Materials/Parts

Cap Set, Protective, Dust and Moisture Seal
(Volume 5, WP 0825, Table 1, Item 13)
Graphite, Dry
(Volume 5, WP 0825, Table 1, Item 27)
Tape, Antiseizing
(Volume 5, WP 0825, Table 1, Item 65)
Cotter Pin
(Volume 5, WP 0827, Table 1, Item 347)
Qty: 1
Locknut (Volume 5, WP 0827, Table 1, Item 324)
Qty: 2

Materials/Parts (cont.)

Lockwasher
(Volume 5, WP 0827, Table 1, Item 409)
Qty: 4
Spring Center Bolt
(Volume 5, WP 0827, Table 1, Item 13)
Qty: 1
Spring Center Nut
(Volume 5, WP 0827, Table 1, Item 432)
Qty: 1

Equipment Condition

Parking brake set. (TM 9-2320-272-10)
Air reservoirs drained. (TM 9-2320-272-10)
Right splash shield removed. (TM 9-2320-272-10)
Shock absorber removed. (WP 0543)
Front wheels removed. (TM 9-2320-272-10)

FRONT SPRING REMOVAL

NOTE

Steps (1) through (5) apply to right side of spring only.

1. Bend tabs (Figure 1, Item 4) of steering cylinder dust cover (Figure 1, Item 3) clear of steering cylinder (Figure 1, Item 7) and right side spring hanger (Figure 1, Item 1).
2. Remove cotter pin (Figure 1, Item 6) from steering cylinder (Figure 1, Item 7). Discard cotter pin.
3. Back out cylinder adjusting plug (Figure 1, Item 5).
4. Remove steering cylinder (Figure 1, Item 7) from ball stud (Figure 1, Item 2).
5. Remove steering cylinder dust cover (Figure 1, Item 3) from ball stud (Figure 1, Item 2).

FRONT SPRING REMOVAL - Continued

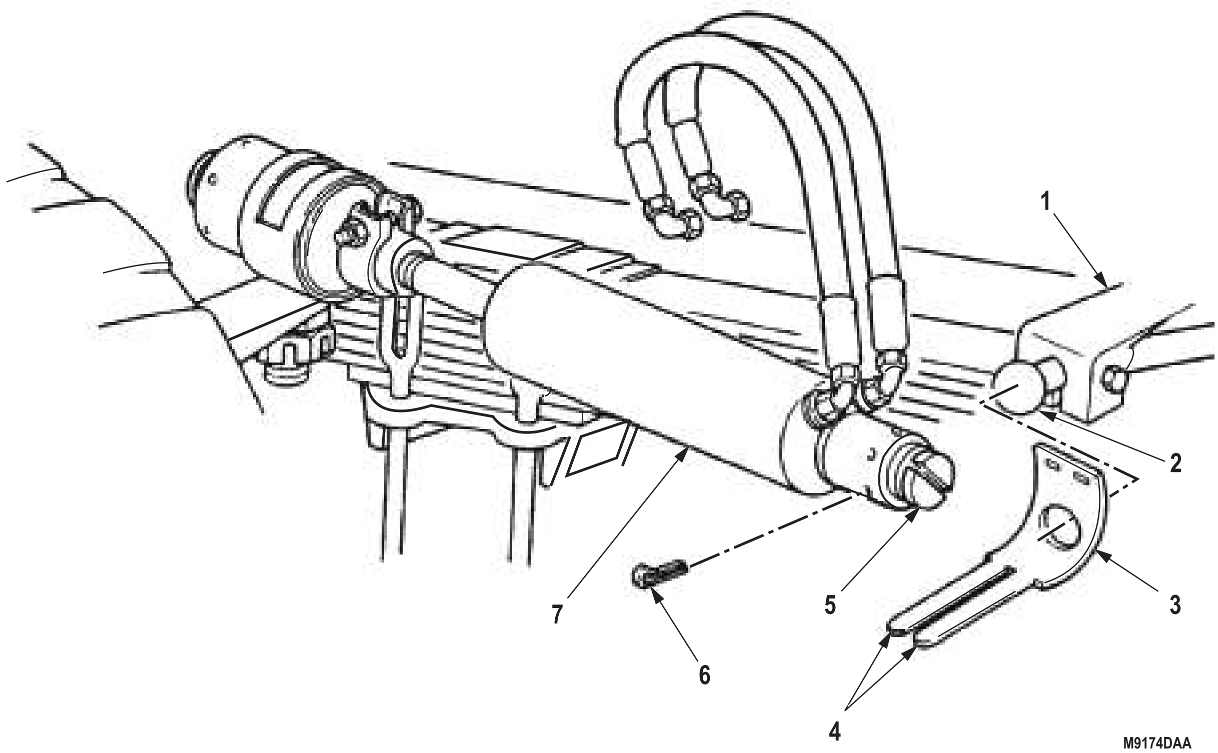


Figure 1. Steering Cylinder Removal.

FRONT SPRING REMOVAL - Continued

CAUTION

Cap or plug all openings immediately after disconnecting lines or hoses to prevent contamination. Failure to do so may result in brake system damage.

6. Disconnect two air lines (Figure 2, Item 7) from service brake chamber (Figure 2, Item 6).
7. Place jack stands under frame (Figure 2, Item 9) at rear of hanger (Figure 2, Item 2).

NOTE

Support axle when removing U-bolts.

8. Remove four nuts (Figure 2, Item 5), lockwashers (Figure 2, Item 4), and shock absorber mounting plate (Figure 2, Item 3) from two U-bolts (Figure 2, Item 1). Discard lockwashers.

NOTE

- Frame may have to be raised further to provide clearance for U-bolts removal.
- If U-bolts must be forced, place a piece of wood between hammer and bolt to prevent damage.

9. Remove two U-bolts (Figure 2, Item 1) and upper spring seat (Figure 2, Item 10) from springs (Figure 2, Item 8).

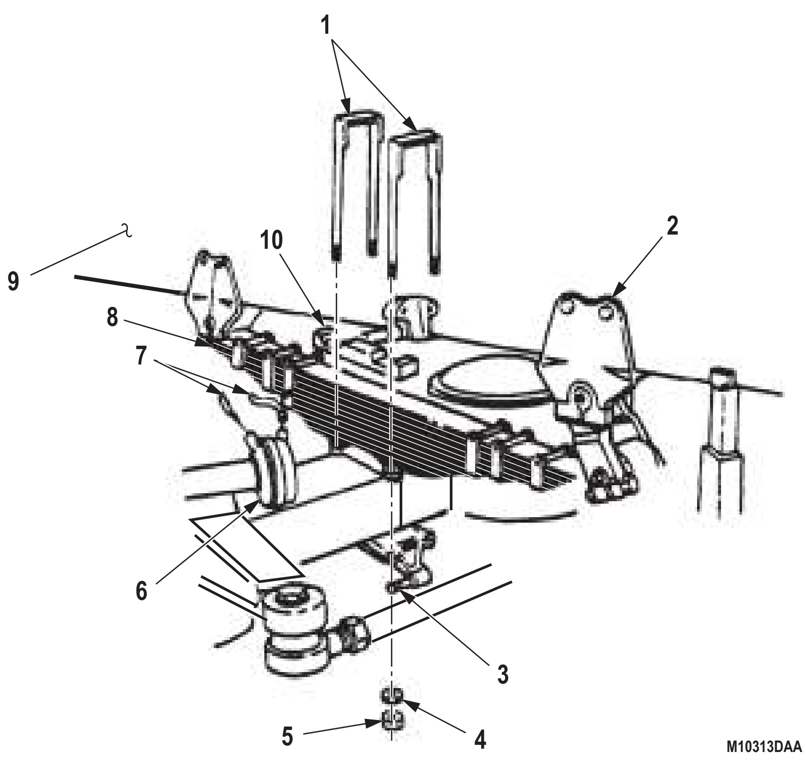


Figure 2. Steering Cylinder Removal.

FRONT SPRING REMOVAL - Continued

NOTE

The spring pins in right spring hanger and left spring shackle must be driven out from the inside. The remaining two pins can be driven out from either side.

10. Remove pin retaining locknut (Figure 3, Item 5) and screw (Figure 3, Item 2) from spring hanger (Figure 3, Item 1). Discard locknut.
11. Drive pin (Figure 3, Item 4) out of spring hanger (Figure 3, Item 1) and leaf spring eye (Figure 3, Item 3).
12. Remove pin retaining locknut (Figure 3, Item 9) and screw (Figure 3, Item 7) from spring shackle (Figure 3, Item 6). Discard locknut.
13. Drive pin (Figure 3, Item 10) out of spring shackle (Figure 3, Item 6) and leaf spring eye (Figure 3, Item 8).
14. Lift spring assembly (Figure 3, Item 14) from lower spring seat (Figure 3, Item 11) and carefully move over front axle (Figure 3, Item 13) and tie rod (Figure 3, Item 12) to the ground.

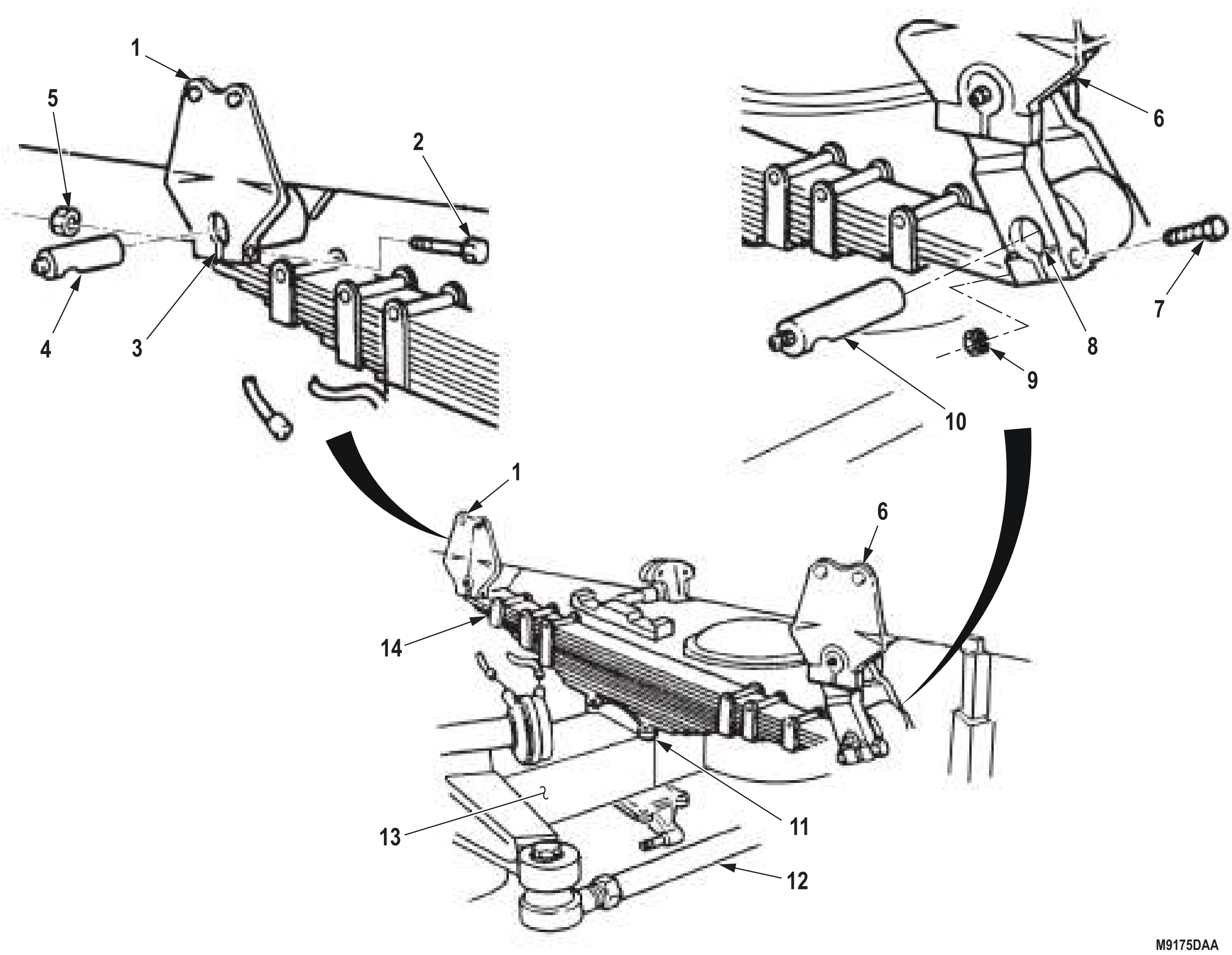


Figure 3. Spring Assembly Removal.

END OF TASK

FRONT SPRING MAIN LEAF REMOVAL

1. Compress spring assembly (Figure 4, Item 7) with C-clamps and remove six nuts (Figure 4, Item 3), screws (Figure 4, Item 6), and spacers (Figure 4, Item 4) from six clips (Figure 4, Item 5).
2. Remove nut (Figure 4, Item 2) and spring center bolt (Figure 4, Item 8) from spring assembly (Figure 4, Item 7). Discard bolt and nut.
3. Remove C-clamps from spring assembly (Figure 4, Item 7).
4. Remove rebound leaf (Figure 4, Item 1) from spring assembly (Figure 4, Item 7), upper main leaf (Figure 4, Item 10), and lower main leaf (Figure 4, Item 9) from spring assembly. Separate upper main leaf and lower main leaf.

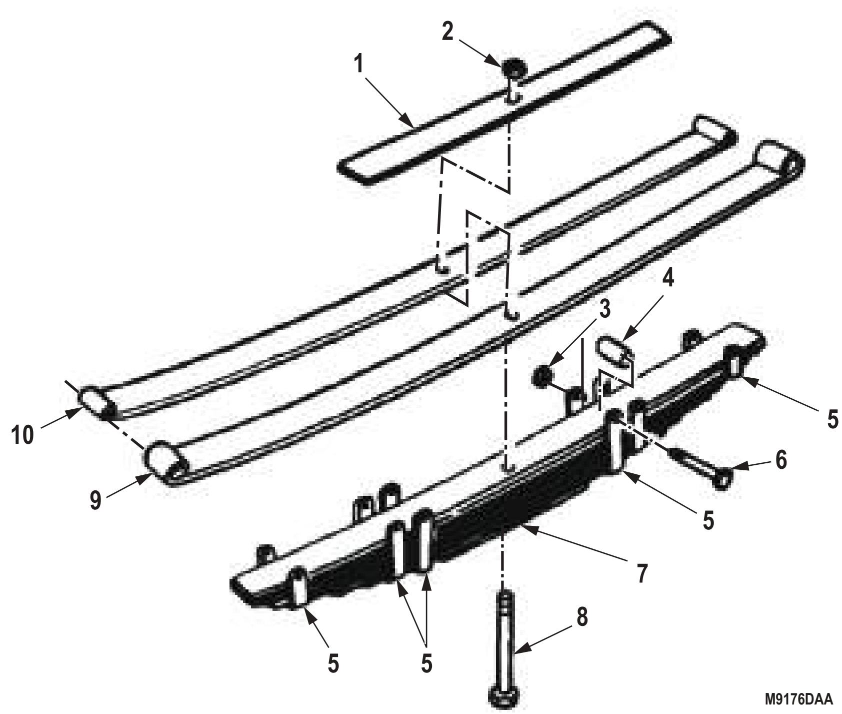


Figure 4. Front Spring Main Leaf Removal.

END OF TASK

FRONT SPRING MAIN LEAF INSTALLATION

1. Position upper main leaf (Figure 5, Item 10) into lower main leaf (Figure 5, Item 9) and position both on spring assembly (Figure 5, Item 7). Ensure rounded spring eye ends face upward.
2. Position rebound leaf (Figure 5, Item 1) over upper main leaf (Figure 5, Item 10).
3. Compress spring assembly (Figure 5, Item 7) with C-clamps and align center bolt holes on spring assembly (Figure 5, Item 7) leaves.
4. Install spring center bolt (Figure 5, Item 8) and nut (Figure 5, Item 2) through center holes in leaves and peen end of bolt over nut.
5. Install six spacers (Figure 5, Item 4) between ends of spring leaf clips (Figure 5, Item 5) with six screws (Figure 5, Item 6) and nuts (Figure 5, Item 3).

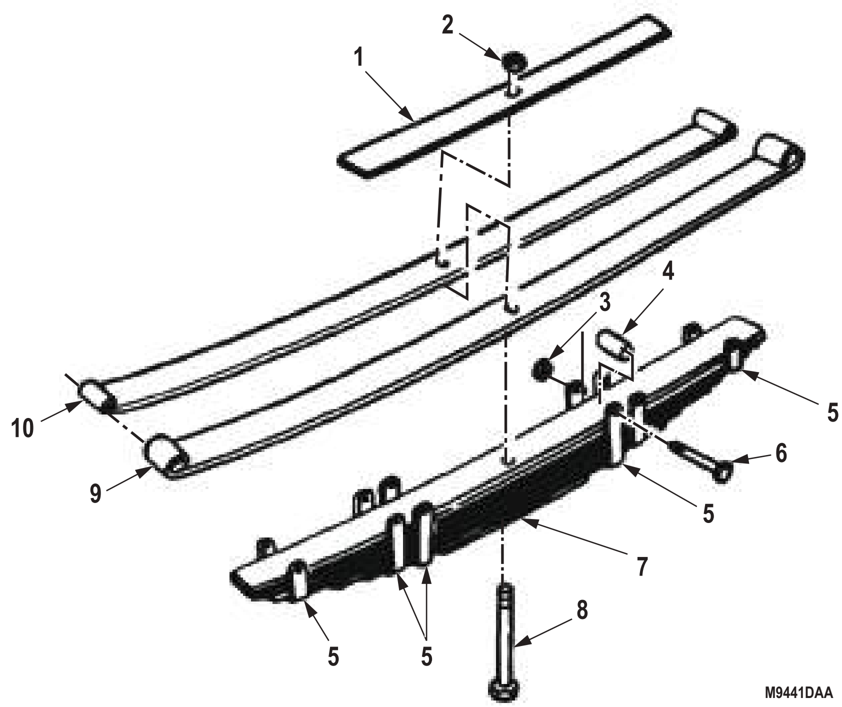


Figure 5. Front Spring Main Leaf Installation.

END OF TASK

FRONT SPRING INSTALLATION

1. Raise one end of spring (Figure 6, Item 1) over tie rod (Figure 6, Item 13) and axle (Figure 6, Item 17).
2. Edge spring (Figure 6, Item 1) forward until spring center bolt (Figure 6, Item 22) enters hole in center of lower spring seat (Figure 6, Item 12).
3. Position upper spring seat (Figure 6, Item 21) over top of spring (Figure 6, Item 1).
4. Place two U-bolts (Figure 6, Item 11) over upper spring seat (Figure 6, Item 23) and through holes in lower spring seat (Figure 6, Item 12), with long end toward wheel.
5. Install two U-bolts (Figure 6, Item 11) on shock absorber mounting plate (Figure 6, Item 14) with four lockwashers (Figure 6, Item 15) and nuts (Figure 6, Item 16). Tighten nuts to 350 to 400 lb-ft (475 to 542 N·m).
6. Raise spring (Figure 6, Item 1) to frame (Figure 6, Item 20) until spring eyes (Figure 6, Item 8) and (Figure 6, Item 3) align with holes in hanger (Figure 6, Item 1) and shackle (Figure 6, Item 6).
7. Install pin (Figure 6, Item 4) through front spring eye (Figure 6, Item 3) and hanger (Figure 6, Item 1) with screw (Figure 6, Item 2) and locknut (Figure 6, Item 5). Groove in pin must be in position to angle of screw holes before screw can be installed.
8. Install pin (Figure 6, Item 10) through spring eye (Figure 6, Item 8) and shackle (Figure 6, Item 6) with screw (Figure 6, Item 7) and locknut (Figure 6, Item 9). Groove in pin must be in position to angle of screw holes before screw can be installed.

NOTE

All male pipe threads must be wrapped with antiseize tape prior to installation.

9. Connect two air lines (Figure 6, Item 19) to service brake chamber (Figure 6, Item 18).

FRONT SPRING INSTALLATION - Continued

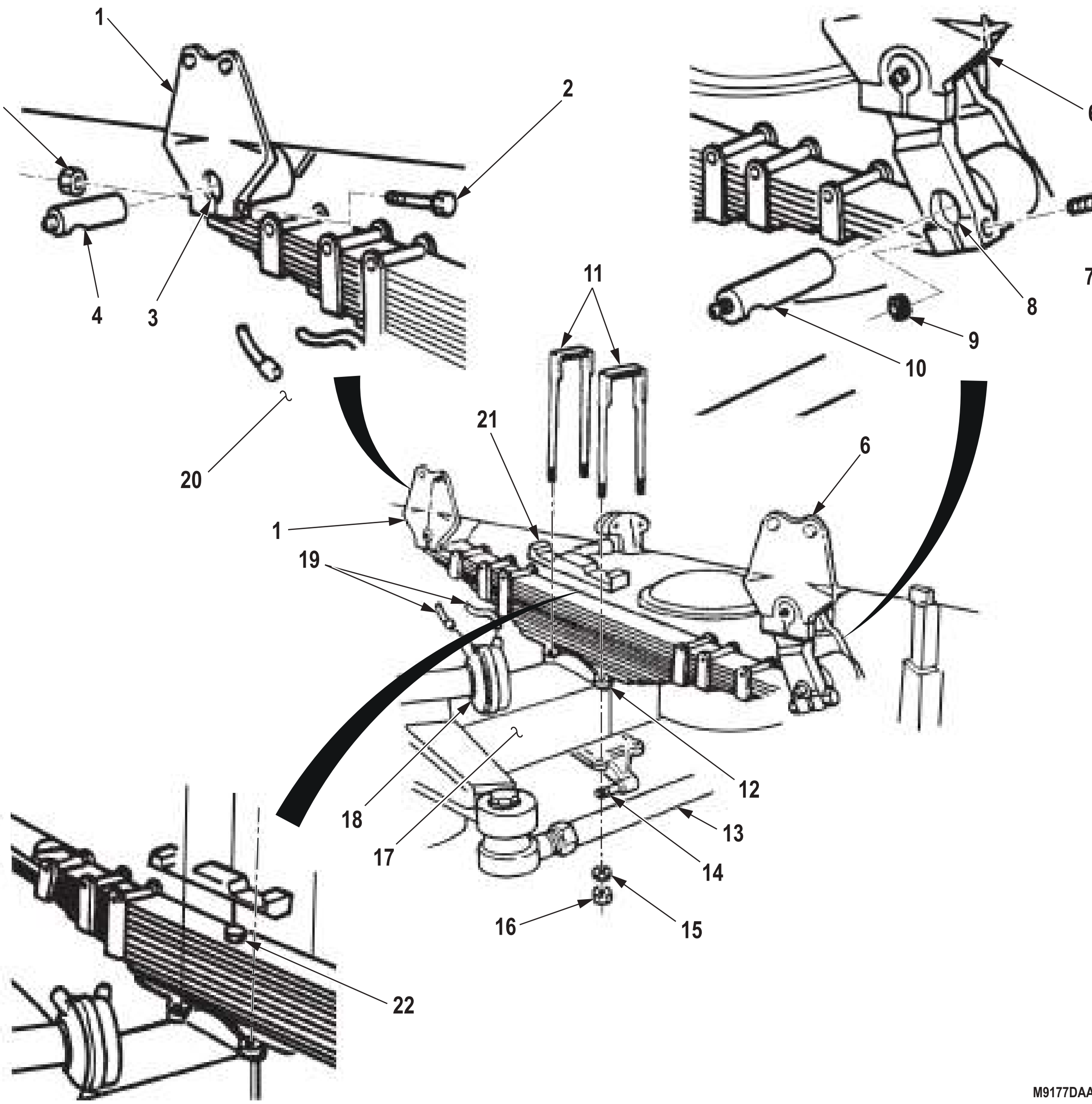


Figure 6. Front Spring Installation.

10. Remove jack stands.

FRONT SPRING INSTALLATION - Continued

NOTE

Steps (11) through (16) apply to right side of spring only.

11. Install steering cylinder dust cover (Figure 7, Item 3) on ball stud (Figure 7, Item 2).
12. Position steering cylinder (Figure 7, Item 7) over ball stud (Figure 7, Item 2).
13. Tighten cylinder adjusting plug (Figure 7, Item 5) until cylinder (Figure 7, Item 7) does not move on ball stud (Figure 7, Item 2).
14. Tighten cylinder adjusting plug (Figure 7, Item 5) slightly more if necessary to align slot with hole in cylinder (Figure 7, Item 7).
15. Install cotter pin (Figure 7, Item 6) in steering cylinder (Figure 7, Item 7).
16. Bend tabs (Figure 7, Item 4) of steering cylinder dust cover (Figure 7, Item 3) around steering cylinder (Figure 7, Item 7) and spring hanger (Figure 7, Item 1).

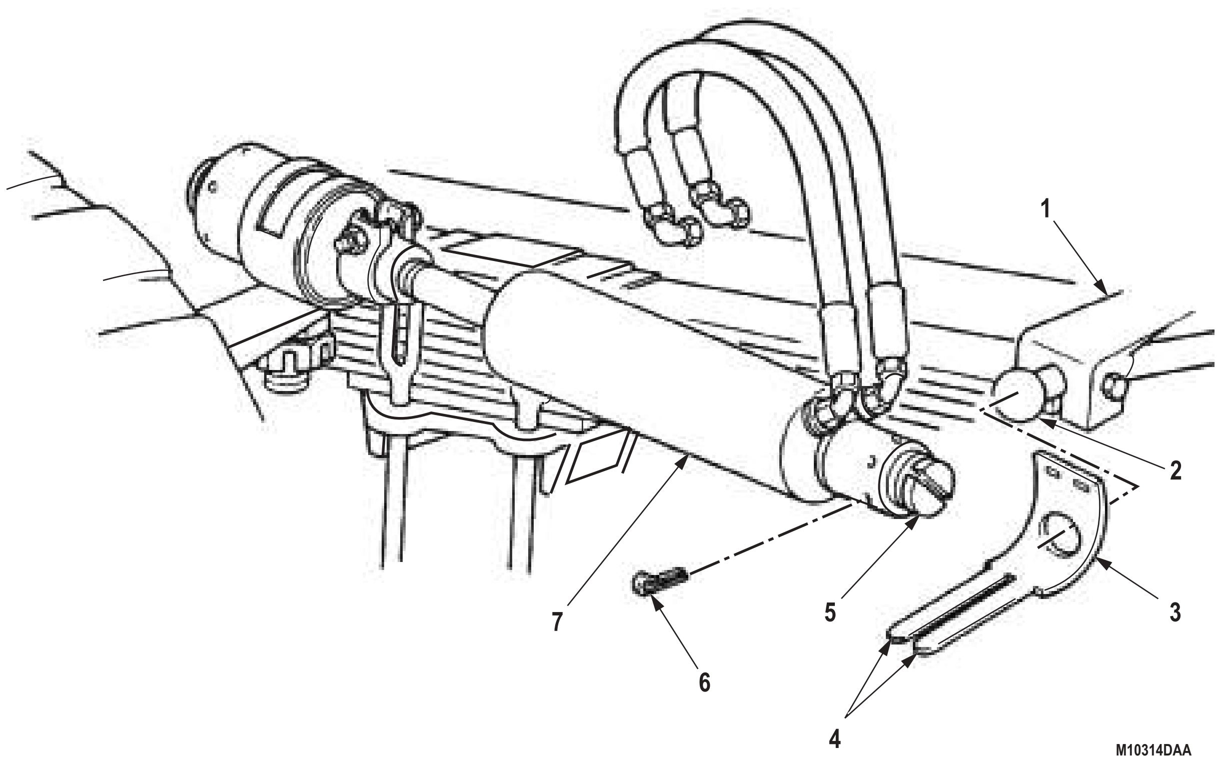


Figure 7. Steering Cylinder Installation.

END OF TASK

FOLLOW-ON MAINTENANCE

1. Install shock absorber. (WP 0543)
2. Install front wheels. (TM 9-2320-272-10)
3. Install right splash shield. (TM 9-2320-272-10)

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
FRONT SPRING SHACKLE AND SHACKLE HANGER REPLACEMENT

INITIAL SETUP:

Tools and Special Tools

Tool Kit, General Mechanic's: Automotive
(Volume 5, WP 0826, Table 1, Item 56)

Materials/Parts

Locknut (Volume 5, WP 0827, Table 1, Item 273)
Qty: 16

Equipment Condition

Parking brake set. (TM 9-2320-272-10)
Front wheels removed. (TM 9-2320-272-10)

REMOVAL

NOTE

- Install 2 in. bolt in front of each front spring shackle hanger. Install 1.75 in. bolt in all other mounting holes.
- Replace all grade 5 spring shackle hanger mounting bolts with grade 8 bolts.

1. Raise vehicle to remove load from spring (Figure 1, Item 12). Place jack stands under frame (Figure 1, Item 17).
2. Remove locknut (Figure 1, Item 1) and screw (Figure 1, Item 3) from hanger (Figure 1, Item 2). Discard locknut.
3. Remove locknut (Figure 1, Item 6) from shackle (Figure 1, Item 4). Discard locknut.
4. Loosen screw (Figure 1, Item 7) in shackle (Figure 1, Item 4).
5. Remove grease fitting (Figure 1, Item 10) and lower shackle pin (Figure 1, Item 9) from shackle (Figure 1, Item 4) and spring eye (Figure 1, Item 11). Push pin out from inside.
6. Remove grease fitting (Figure 1, Item 15) and upper shackle pin (Figure 1, Item 14) from shackle (Figure 1, Item 4) and hanger (Figure 1, Item 2). Push pin out from inside.
7. Remove shackle (Figure 1, Item 4) from hanger (Figure 1, Item 2).
8. Remove screw (Figure 1, Item 3) from hanger (Figure 1, Item 2). Discard screw.
9. Remove bushing (Figure 1, Item 5) from shackle (Figure 1, Item 4).
10. Remove locknuts (Figure 1, Item 16), bolts (Figure 1, Item 18), and hanger (Figure 1, Item 2). Discard locknuts.

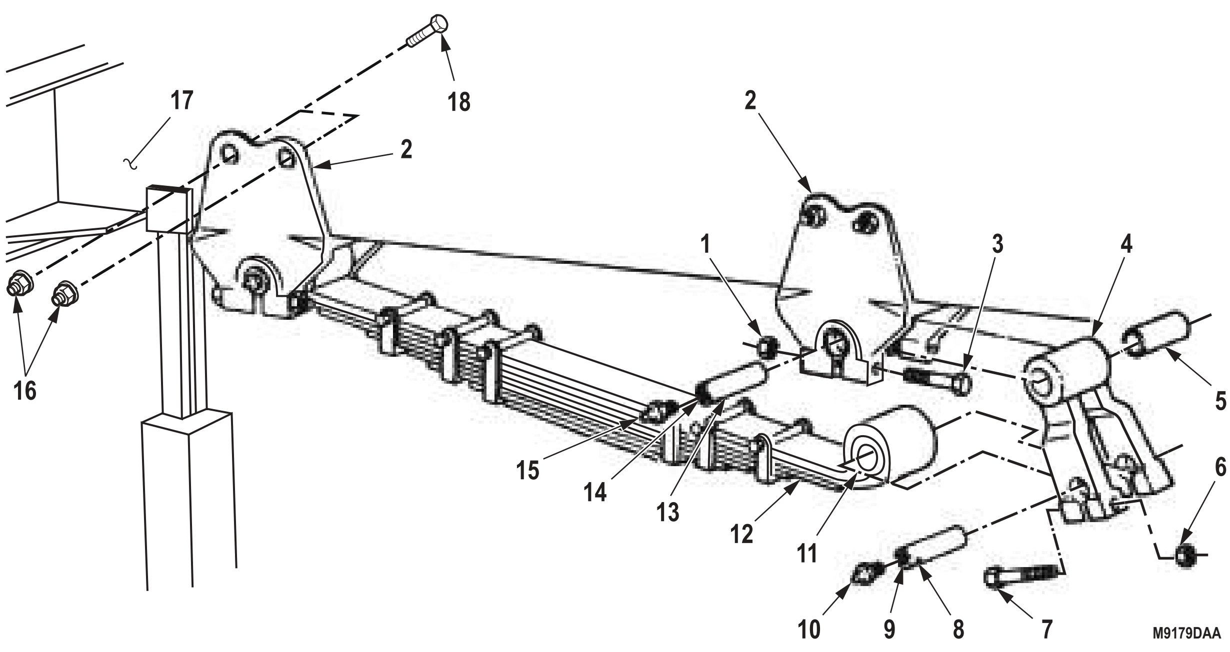


Figure 1. Front Spring Shackle and Shackle Hanger Removal.

END OF TASK

INSTALLATION

1. Install hanger (Figure 2, Item 2) on spring (Figure 2, Item 12) with bolts (Figure 2, Item 18) and locknuts (Figure 2, Item 16). Torque locknuts to 150 to 170 lb-ft (203.4 to 230.5 N·m).
2. Install bushing (Figure 2, Item 5) in shackle (Figure 2, Item 4).
3. Loosely thread screw (Figure 2, Item 7) on shackle (Figure 2, Item 4).
4. Install shackle (Figure 2, Item 4) on hanger (Figure 2, Item 2).
5. Install shackle pin (Figure 2, Item 14) in shackle (Figure 2, Item 4) and hanger (Figure 2, Item 2). Ensure pin slot (Figure 2, Item 13) is positioned downward to allow installation of screw (Figure 2, Item 3).
6. Install grease fitting (Figure 2, Item 15) in shackle pin (Figure 2, Item 14).
7. Install screw (Figure 2, Item 3) and locknut (Figure 2, Item 1) on shackle (Figure 2, Item 4) and hanger (Figure 2, Item 2).
8. Lower vehicle until spring eye (Figure 2, Item 11) aligns with holes in shackle (Figure 2, Item 4).
9. Install shackle pin (Figure 2, Item 9) in shackle (Figure 2, Item 4) and spring eye (Figure 2, Item 11). Ensure pin slot (Figure 2, Item 8) is positioned downward to allow installation of screw (Figure 2, Item 7).
10. Install grease fitting (Figure 2, Item 10) on shackle pin (Figure 2, Item 9) and hanger (Figure 2, Item 2).
11. Tighten screw (Figure 2, Item 7) and install locknut (Figure 2, Item 6) on shackle (Figure 2, Item 4).
12. Remove jack stands from under frame (Figure 2, Item 17).

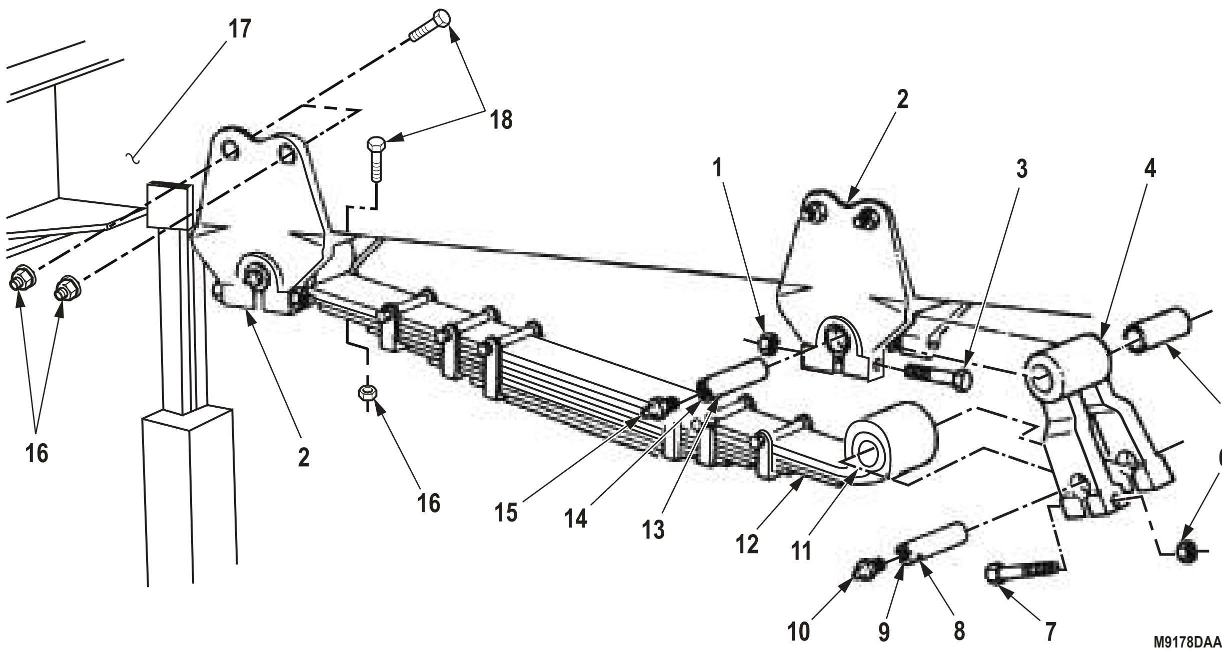


Figure 2. Front Spring Shackle and Shackle Hanger Installation.

END OF TASK

FOLLOW-ON MAINTENANCE

1. Lubricate shackle. (Volume 5, WP 0820)
2. Install front wheel. (TM 9-2320-272-10)

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
FRONT SPRING BUSHING REPLACEMENT

INITIAL SETUP:

Tools and Special Tools
Tool Kit, General Mechanic's: Automotive
(Volume 5, WP 0826, Table 1, Item 56)
High Boy Jack Stand
(Volume 5, WP 0826, Table 1, Item 24)

Materials/Parts
Bushing (Volume 5, WP 0827, Table 1, Item 180)
Qty: 1

Materials/Parts (cont.)
Locknut (Volume 5, WP 0827, Table 1, Item 324)
Qty: 2
Pin (Volume 5, WP 0827, Table 1, Item 219)
Qty: 1

Equipment Condition
Parking brake set. (TM 9-2320-272-10)
Front wheels removed. (WP 0484)

INSPECTION

1. Insert prybar (Figure 1, Item 1) between spring hanger (Figure 1, Item 2) and front spring shackle (Figure 1, Item 4).
2. Press down on front spring shackle (Figure 1, Item 4). If movement is evident between front spring shackle and pin (Figure 1, Item 3), refer to REMOVAL.

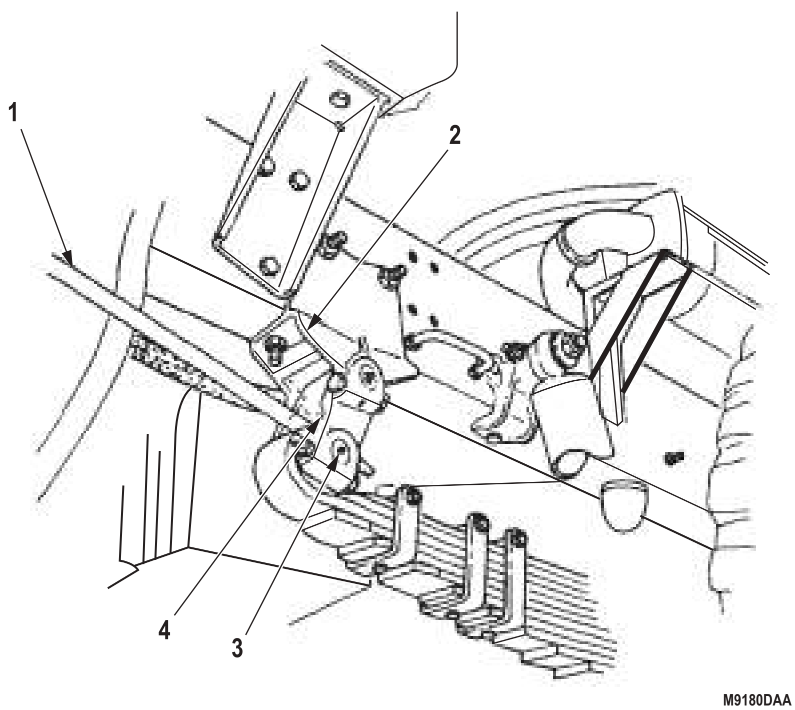


Figure 1. Front Spring Bushing Inspection.

END OF TASK

REMOVAL

1. Raise frame (Figure 2, Item 1) to remove load from spring (Figure 2, Item 8) and support with jackstands (Figure 2, Item 10).
2. Remove locknut (Figure 2, Item 4) and screw (Figure 2, Item 5) from shackle (Figure 2, Item 2). Discard locknut.
3. Remove grease fitting (Figure 2, Item 7) from pin (Figure 2, Item 6).
4. Remove pin (Figure 2, Item 6) from shackle (Figure 2, Item 2) and spring eye (Figure 2, Item 9). Discard pin.
5. Remove spring (Figure 2, Item 8) from shackle (Figure 2, Item 2).
6. Remove bushing (Figure 2, Item 3) from spring eye (Figure 2, Item 9). Discard bushing.

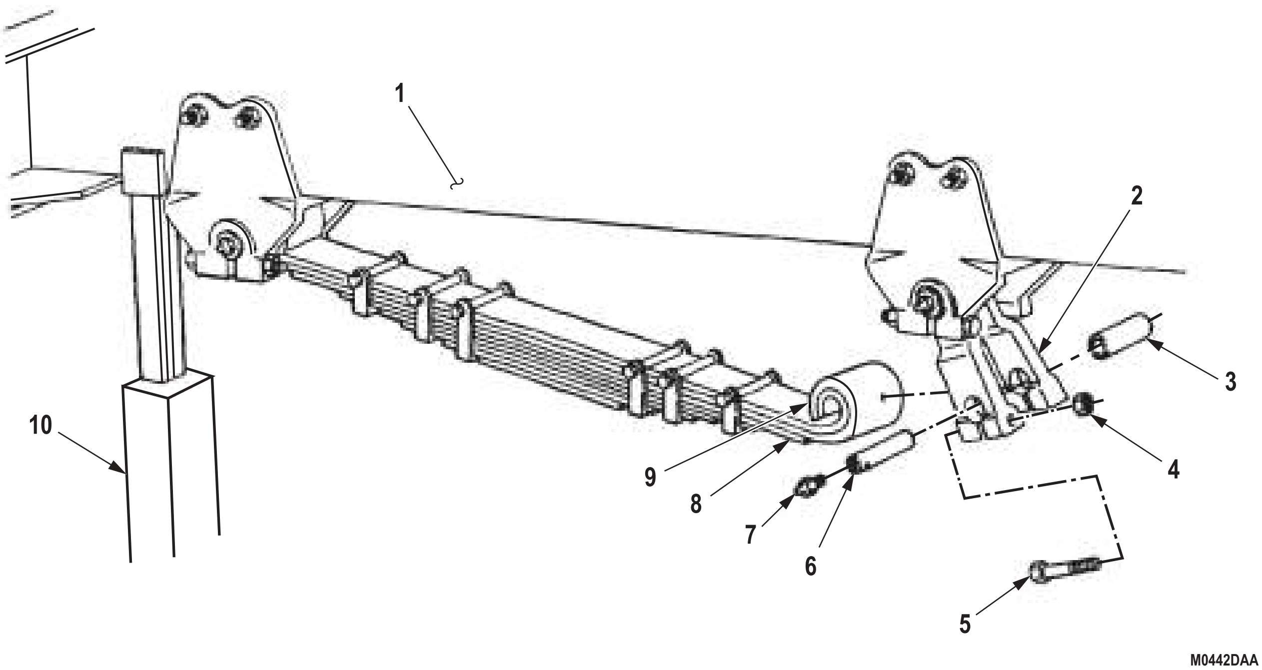


Figure 2. Front Spring Bushing Removal.

END OF TASK

INSTALLATION

1. Install bushing (Figure 3, Item 3) in spring eye (Figure 3, Item 9).
2. Align spring eye (Figure 3, Item 9) with holes in shackle (Figure 3, Item 2).
3. Install pin (Figure 3, Item 7) in shackle (Figure 3, Item 2) and spring eye (Figure 3, Item 9). Make sure pin slot (Figure 3, Item 6) is positioned downward to allow installation of screw (Figure 3, Item 5).
4. Install grease fitting (Figure 3, Item 8) in pin (Figure 3, Item 7).
5. Install screw (Figure 3, Item 5) and locknut (Figure 3, Item 4) in shackle (Figure 3, Item 2).
6. Remove jackstands (Figure 3, Item 10) from frame (Figure 3, Item 1).

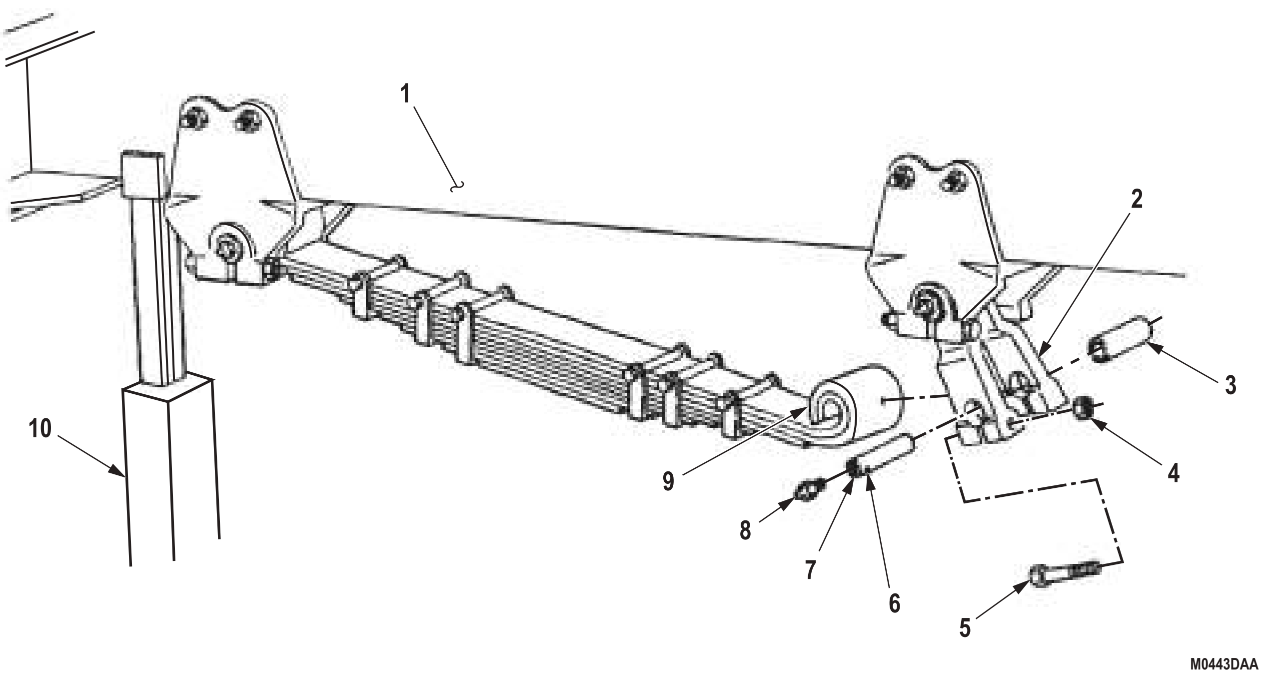


Figure 3. Front Spring Bushing Installation.

END OF TASK

FOLLOW-ON MAINTENANCE

1. Lubricate shackle. (Volume 5, WP 0820)
2. Install front wheels. (WP 0484)

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
FRONT SPRING BUMPER REPLACEMENT

INITIAL SETUP:

Tools and Special Tools
Tool Kit, General Mechanic's: Automotive (Volume 5, WP 0826, Table 1, Item 56)

Materials/Parts
Locknut (Volume 5, WP 0827, Table 1, Item 273)
Qty: 2

Equipment Condition
Parking brake set. (TM 9-2320-272-10)

REMOVAL

Remove two locknuts (Figure 1, Item 1) and front spring bumper (Figure 1, Item 2) from frame rail (Figure 1, Item 3). Discard locknuts.

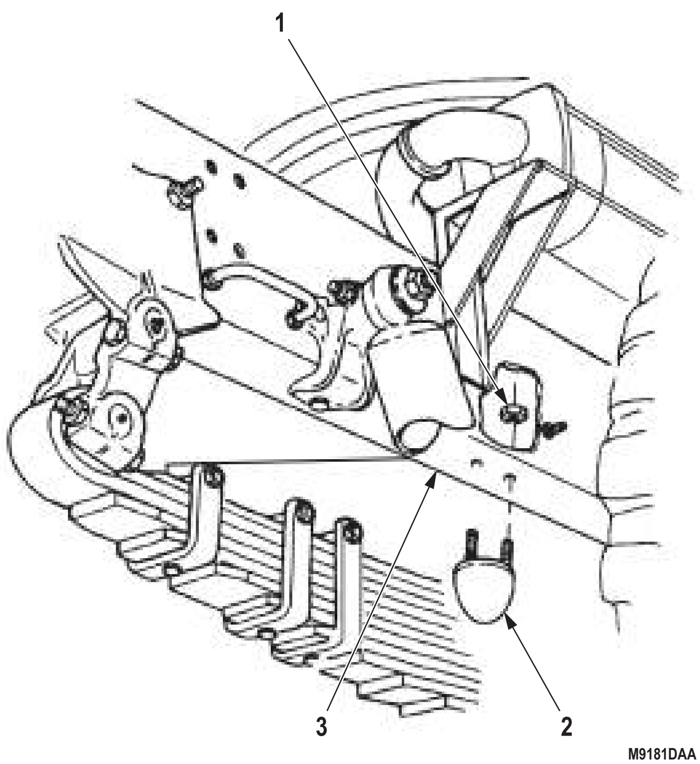


Figure 1. Front Spring Bumper Removal.

END OF TASK

INSTALLATION

Install front spring bumper (Figure 2, Item 2) on frame rail (Figure 2, Item 3) with two locknuts (Figure 2, Item 1).

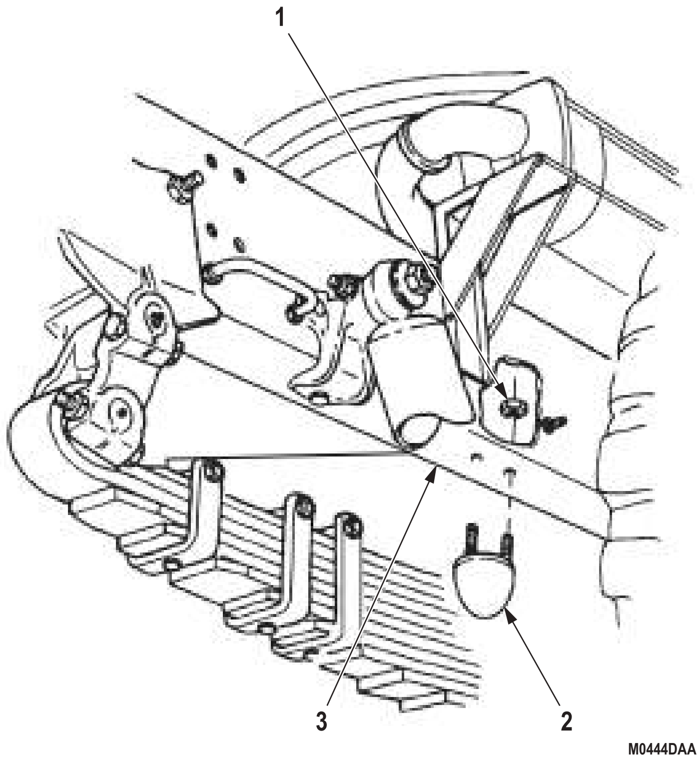


Figure 2. Front Spring Bumper Installation.

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
REAR SPRING BUMPER REPLACEMENT

INITIAL SETUP:

Tools and Special Tools
Tool Kit, General Mechanic's: Automotive
(Volume 5, WP 0826, Table 1, Item 56)

Materials/Parts
Locknut (Volume 5, WP 0827, Table 1, Item 273)
Qty: 2

Equipment Condition
Parking brake set. (TM 9-2320-272-10)

REMOVAL

Remove two locknuts (Figure 1, Item 1) and bumper (Figure 1, Item 2) from bumper bracket (Figure 1, Item 3). Discard locknuts.

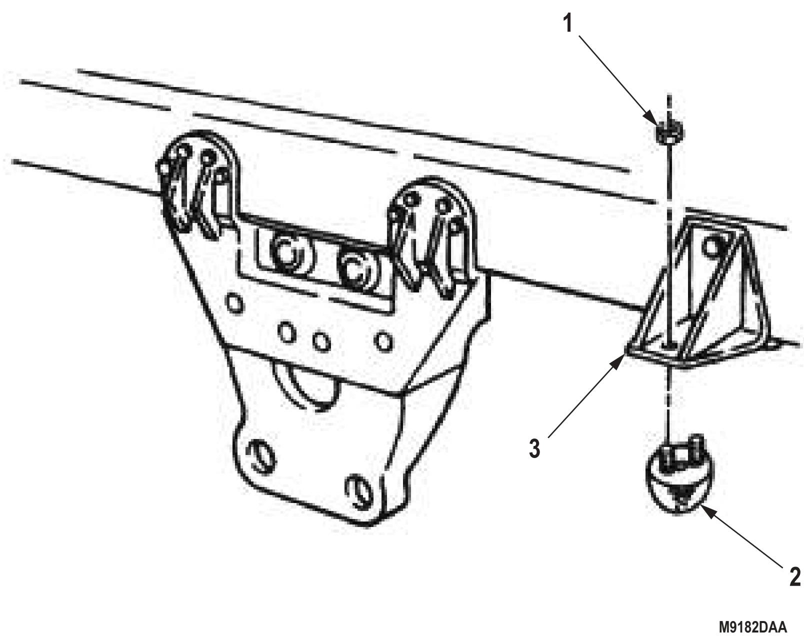


Figure 1. Rear Spring Bumper Removal.

END OF TASK

INSTALLATION

Install bumper (Figure 2, Item 2) on bumper bracket (Figure 2, Item 3) with two locknuts (Figure 2, Item 1).

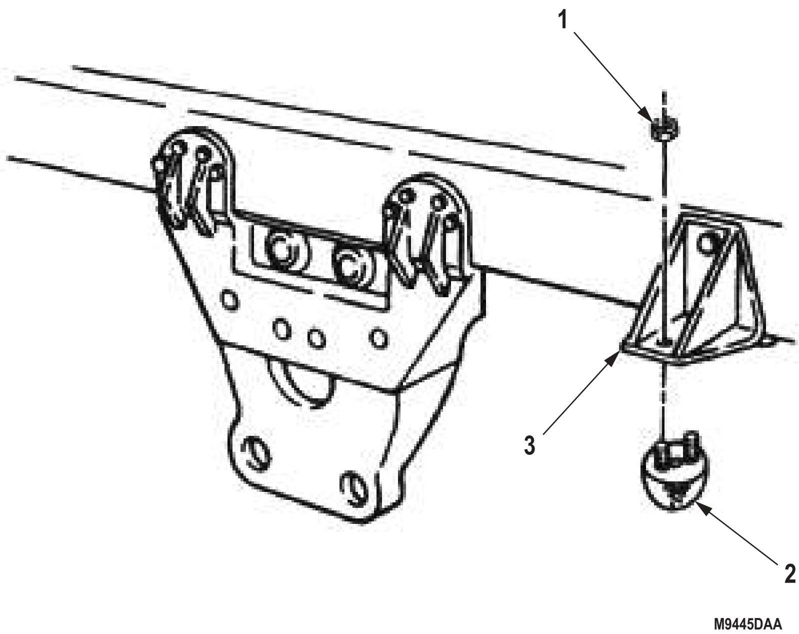


Figure 2. Rear Spring Bumper Installation.

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
REAR SPRING REPAIR

INITIAL SETUP:

Tools and Special Tools
Tool Kit, General Mechanic's: Automotive
(Volume 5, WP 0826, Table 1, Item 56)
Wrench, Torque, Click, Ratcheting, 3/4" Drive, 600 Ft-Lb
(Volume 5, WP 0826, Table 1, Item 61)

Materials/Parts
Lockwasher
(Volume 5, WP 0827, Table 1, Item 381)
Qty: 8

Personnel Required
(2)

Equipment Condition
Parking brake set. (TM 9-2320-272-10)
Front wheels chocked. (TM 9-2320-272-10)
Rear wheels removed. (WP 0485)
or (WP 0484)

REMOVAL

1. Raise vehicle and place two jack stands (Figure 1, Item 2) under cross tube (Figure 1, Item 1). Position tops of jack stands under cross tube (Figure 1, Item 1) four inches above tops of jack stands to relieve pressure on rear springs.

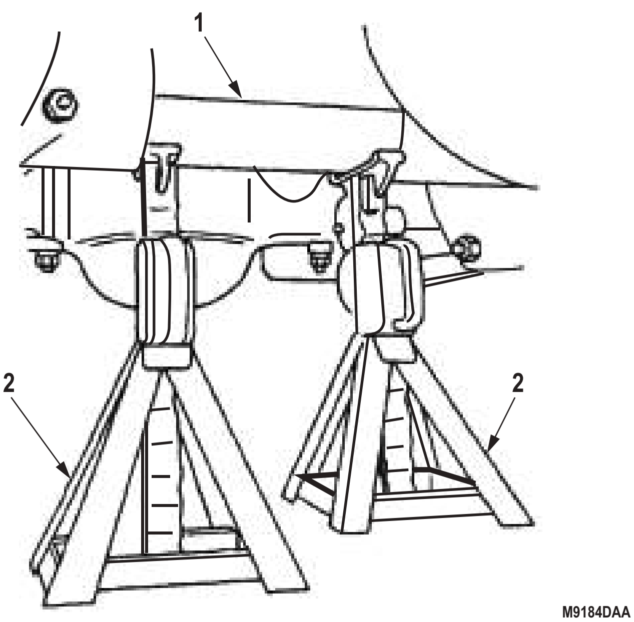


Figure 1. Rear Spring Removal.

REMOVAL - Continued

2. Place two jack stands (Figure 2, Item 5) under both forward-rear hubs (Figure 2, Item 9) and two jack stands under both rear-rear hubs (Figure 2, Item 3).
3. Loosen two bolt clamps (Figure 2, Item 8) on spring seat (Figure 2, Item 7).
4. Remove four nuts (Figure 2, Item 4) and lockwashers (Figure 2, Item 6) from two U-bolts (Figure 2, Item 1). Discard lockwashers.

NOTE

Step (5) applies to all models except M936 wrecker.

5. Remove two U-bolts (Figure 2, Item 1) and upper spring saddle (Figure 2, Item 2) from rear springs (Figure 2, Item 10). It may be necessary to raise frame to remove U-bolts.

NOTE

Step (6) applies to M936 wrecker only.

6. Remove two U-bolts (Figure 2, Item 1) and stabilizer beam (Figure 2, Item 11) from rear springs (Figure 2, Item 10).

REMOVAL - Continued

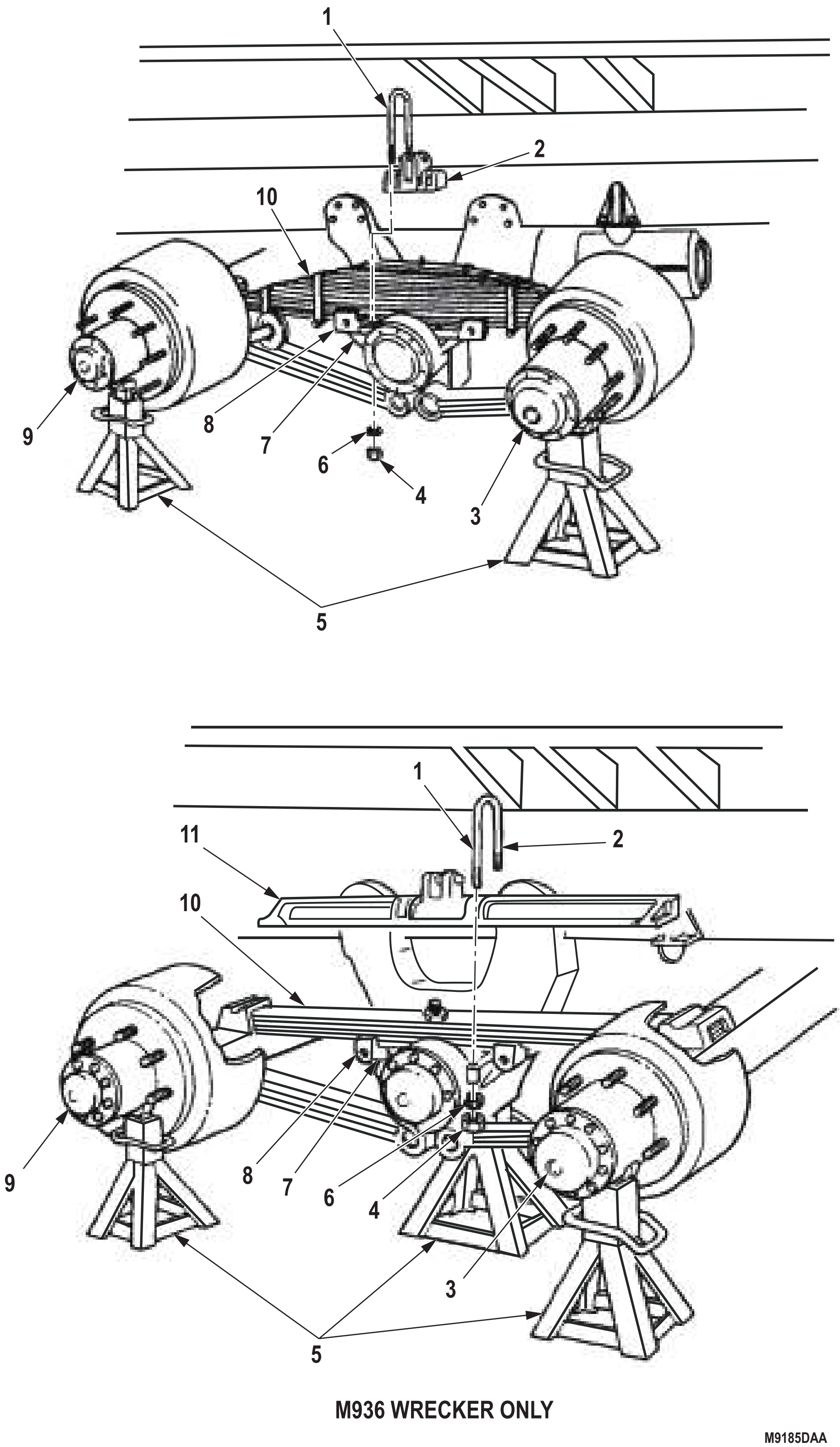


Figure 2. Rear Spring Removal.

REMOVAL - Continued

NOTE

Assistants will help with Steps (7) through (10).

7. Remove two nuts (Figure 3, Item 15), washers (Figure 3, Item 14), U-bolt (Figure 3, Item 5), and U-bolt bracket (Figure 3, Item 8) from spring brake chamber (Figure 3, Item 13).
8. Remove nut (Figure 3, Item 9), lockwasher (Figure 3, Item 10), washer (Figure 3, Item 11), screw (Figure 3, Item 1), washer (Figure 3, Item 2), and spring brake chamber bracket (Figure 3, Item 12) from upper spring bracket and wear pad (Figure 3, Item 4). Discard lockwasher.
9. Remove two nuts (Figure 3, Item 7), lockwashers (Figure 3, Item 6), and screws (Figure 3, Item 3) from upper spring bracket and wear pad (Figure 3, Item 4). Discard lockwashers.

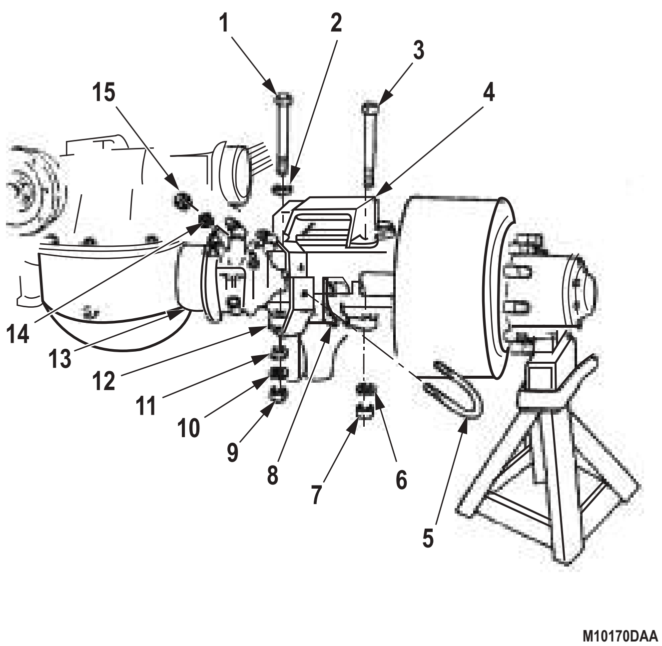


Figure 3. Rear Spring Removal.

REMOVAL - Continued

10. Remove two nuts (Figure 4, Item 11), washers (Figure 4, Item 10), U-bolt (Figure 4, Item 4), and U-bolt bracket (Figure 4, Item 5) from service brake chamber (Figure 4, Item 3).
11. Remove nut (Figure 4, Item 6), lockwasher (Figure 4, Item 7), two washers (Figure 4, Item 8), screw (Figure 4, Item 1), and service brake chamber bracket (Figure 4, Item 9) from upper spring bracket and wear pad (Figure 4, Item 2). Discard lockwasher.

NOTE

Assistant will help with Steps (12) and (13).

12. Remove upper spring bracket and wear pad (Figure 4, Item 2) from axle housing (Figure 4, Item 12).

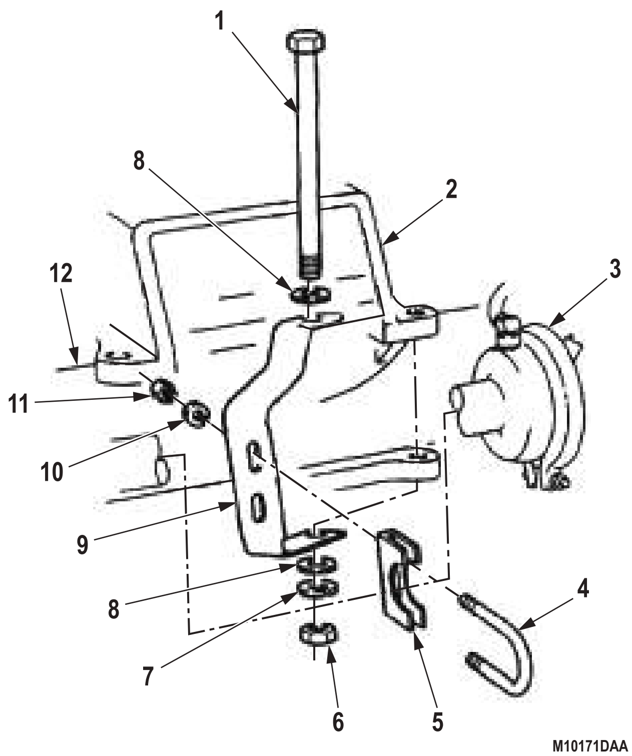


Figure 4. Rear Spring Removal.

REMOVAL - Continued

NOTE

Step (13) applies to M939 wrecker only.

13. Remove spring assembly (Figure 5, Item 1) from spring seat (Figure 5, Item 2).

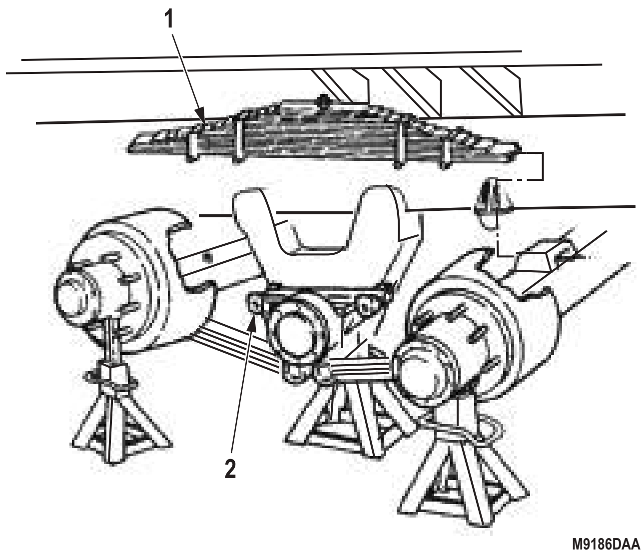
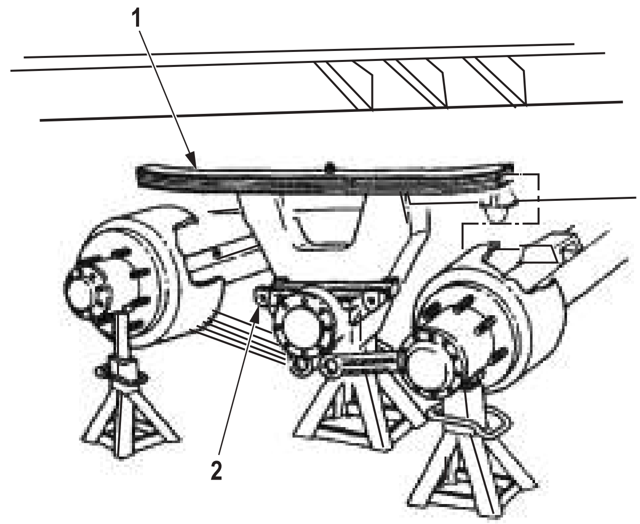


Figure 5. Rear Spring Removal.

REMOVAL - Continued

14. Remove spring assembly (Figure 6, Item 1) from spring seat (Figure 6, Item 2).



M936 WRECKER ONLY

M10172DAA

Figure 6. Rear Spring Removal.

END OF TASK

INSTALLATION

NOTE

- Assistants will help with Steps (1) and (2).
- Step (1) applies to M936 wrecker only.

1. Position spring assembly (Figure 7, Item 1) on spring seat (Figure 7, Item 2).

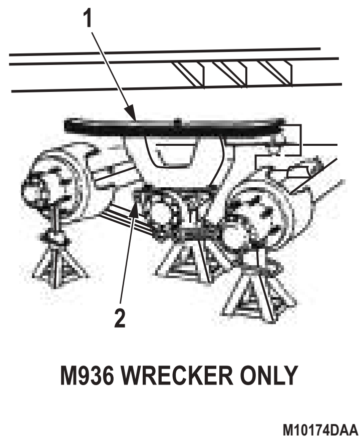


Figure 7. Rear Spring Installation.

2. Position spring assembly (Figure 8, Item 1) on spring seat (Figure 8, Item 2).

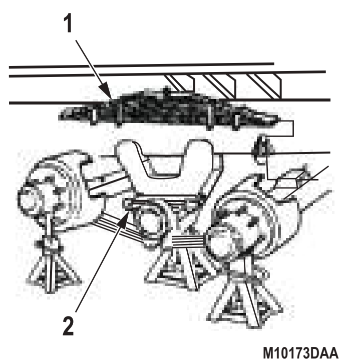


Figure 8. Rear Spring Installation.

INSTALLATION - Continued

3. Slide upper spring bracket and wear pad (Figure 9, Item 1) on main leaves (Figure 9, Item 3), and position on axle housing (Figure 9, Item 2) over dowel pin (Figure 9, Item 4).

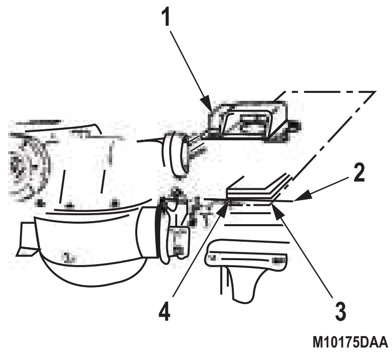


Figure 9. Rear Spring Installation.

4. Install service brake chamber bracket (Figure 10, Item 8) on upper spring bracket and wear pad (Figure 10, Item 2) with screw (Figure 10, Item 1), two washers (Figure 10, Item 3), lockwasher (Figure 10, Item 7), and nut (Figure 10, Item 6). Do not tighten nut.

5. Install U-bolt bracket (Figure 10, Item 5) on service brake chamber bracket (Figure 10, Item 8) with U-bolt (Figure 10, Item 4), two washers (Figure 10, Item 9), and nuts (Figure 10, Item 10). Tighten nuts 120 to 160 lb-ft (163 to 217 N·m).

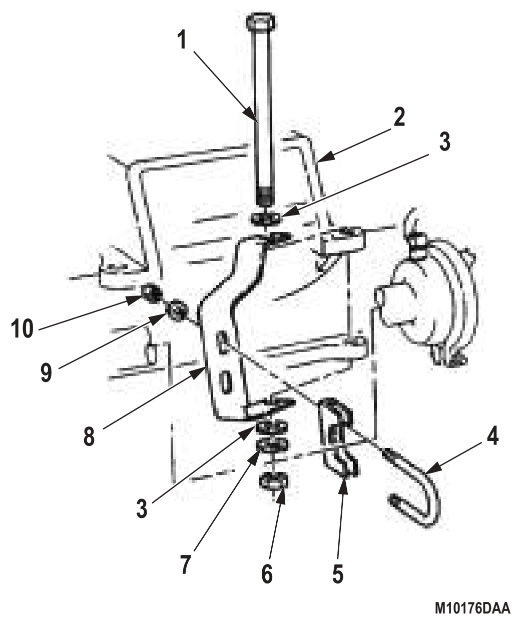


Figure 10. Rear Spring Installation.

INSTALLATION - Continued

6. Install spring brake chamber bracket (Figure 11, Item 11) on upper spring bracket and wear pad (Figure 11, Item 4) with screw (Figure 11, Item 1), two washers (Figure 11, Item 2), lockwasher (Figure 11, Item 10), and nut (Figure 11, Item 9). Do not tighten nut.
7. Install U-bolt bracket (Figure 11, Item 8) on spring brake chamber (Figure 11, Item 12) with U-bolt (Figure 11, Item 5), two washers (Figure 11, Item 13), and nuts (Figure 11, Item 14). Tighten nuts 120 to 160 lb-ft (163 to 217 N·m).

NOTE

Assistants will help with Steps (8) and (9).

8. Install two screws (Figure 11, Item 3), lockwashers (Figure 11, Item 6), and nuts (Figure 11, Item 7) on upper spring bracket and wear pad (Figure 11, Item 4). Tighten nuts (Figure 11, Items 7 and 9) and (Figure 10, Item 6) 280 to 360 lb-ft (380 to 488 N·m).

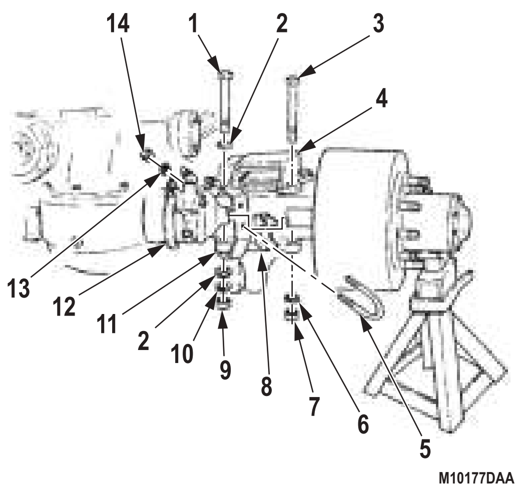


Figure 11. Rear Spring Installation.

9. Install upper spring saddle (Figure 12, Item 2) on spring seat (Figure 12, Item 5) with two U-bolts (Figure 12, Item 1), four lockwashers (Figure 12, Item 4), and nuts (Figure 12, Item 3). Tighten nuts 300 to 400 lb-ft (407 to 542 N·m).

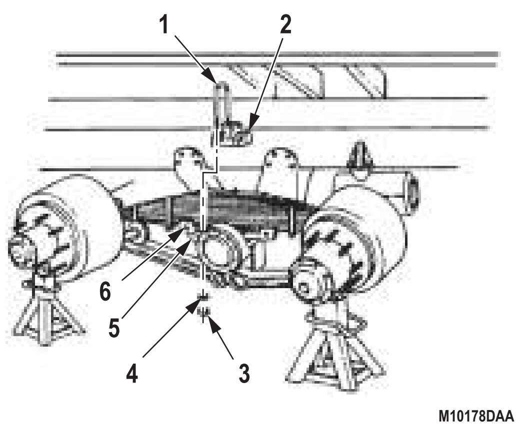


Figure 12. Rear Spring Installation.

INSTALLATION - Continued

NOTE

Step (10) applies to M936 wrecker only.

10. Install stabilizer beam (Figure 13, Item 6) on spring seat (Figure 13, Item 4) with two U-bolts (Figure 13, Item 1), four lockwashers (Figure 13, Item 3), and nuts (Figure 13, Item 2). Tighten nuts 300 to 400 lb-ft (407 to 542 N·m).
11. Tighten two bolt clamps (Figures 12, Item 6) and (Figure 13, Item 5) on rear spring seat (Figure 12, Item 5) and (Figure 13, Item 4).

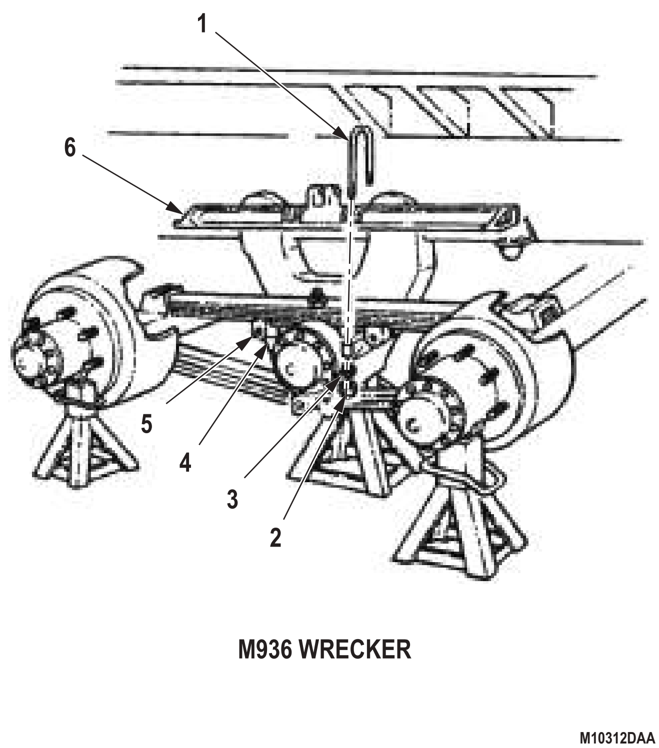


Figure 13. Rear Spring Installation.

END OF TASK

FOLLOW-ON MAINTENANCE

1. Install rear wheels. (WP 0485) or (WP 0484)
2. Start engine and road test vehicle. (TM 9-2320-272-10)
3. Check U-bolts for tightness after road test.

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
REAR SPRING SEAT REPAIR

INITIAL SETUP:

Tools and Special Tools

Tool Kit, General Mechanic's: Automotive
(Volume 5, WP 0826, Table 1, Item 56)
Tester, Spring Resiliency
(Volume 5, WP 0826, Table 1, Item 53)
Wrench, Torque, Click, Ratcheting, 1/2" Drive, 250 Ft-Lb
(Volume 5, WP 0826, Table 1, Item 63)

Materials/Parts

Cleaning Compound, Solvent
(Volume 5, WP 0825, Table 1, Item 16, 17)
Grease, Automotive and Artillery
(Volume 5, WP 0825, Table 1, Item 28)
Lubricating Oil, Engine 30W
(Volume 5, WP 0825, Table 1, Item 39, 40, 41, 42)
Felt Washer
(Volume 5, WP 0827, Table 1, Item 209)
Qty: 2

Materials/Parts (cont.)

Gasket (Volume 5, WP 0827, Table 1, Item 233)
Qty: 1
Lockwasher
(Volume 5, WP 0827, Table 1, Item 215)
Qty: 6
Seal Assembly
(Volume 5, WP 0827, Table 1, Item 188)
Qty: 2

References

TM 9-2320-272-10

Equipment Condition

Rear spring assembly removed. (WP 0539)

REMOVAL

1. Remove six screws (Figure 1, Item 8) and lockwashers (Figure 1, Item 7) from spring seat cap (Figure 1, Item 9). Discard lockwashers.
2. Remove spring seat cap (Figure 1, Item 9) and gasket (Figure 1, Item 10) from spring seat (Figure 1, Item 15). Discard gasket. Clean gasket remains from mating surfaces.
3. Remove locking nut (Figure 1, Item 11) and key washer (Figure 1, Item 12) from crosstube (Figure 1, Item 1).
4. Remove bearing adjusting nut (Figure 1, Item 13) and outer bearing (Figure 1, Item 14) from crosstube (Figure 1, Item 1).
5. Remove spring seat (Figure 1, Item 15) from crosstube (Figure 1, Item 1).
6. Remove wiper ring (Figure 1, Item 2), washer (Figure 1, Item 3), two felt washers (Figure 1, Item 4), packing retainer (Figure 1, Item 5), grease seal assembly (Figure 1, Item 6), and inner bearing (Figure 1, Item 16) from spring seat (Figure 1, Item 15). Discard felt washers and grease seal assembly.

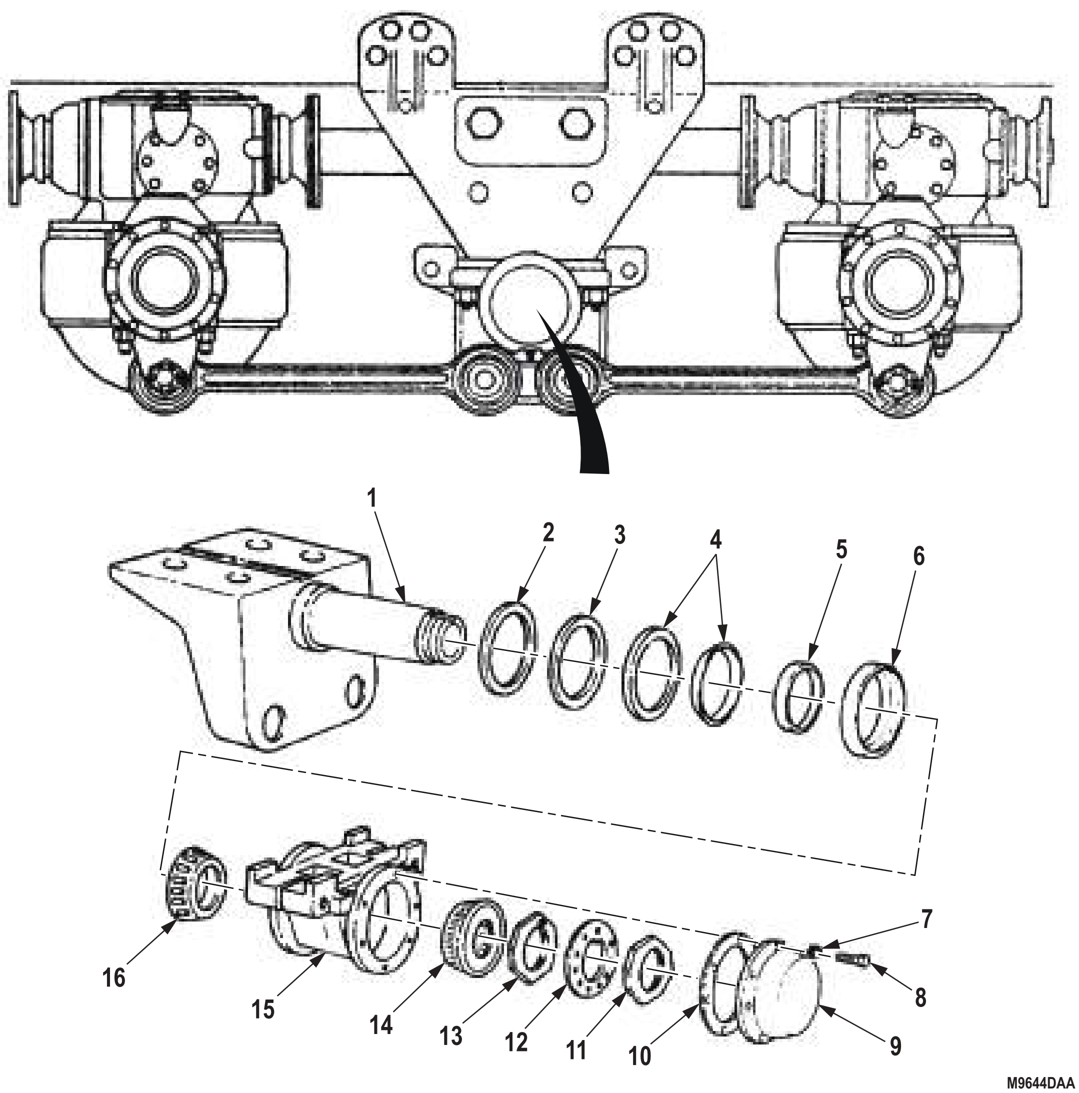


Figure 1. Rear Spring Seat Removal.

REMOVAL - Continued

NOTE

Perform Step (7) only when bearing races must be removed because of cracked, pitted, or scored condition, or if bearings are to be installed.

7. Remove bearing races (Figure 2, Item 2) and (Figure 2, Item 3) from spring seat (Figure 2, Item 1).

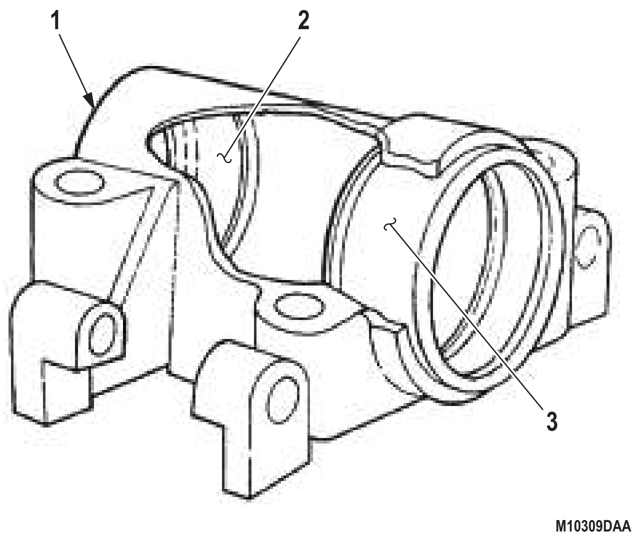
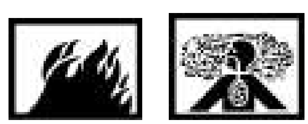


Figure 2. Rear Spring Seat Removal.

END OF TASK

CLEANING AND INSPECTION

WARNING



Solvent cleaning compound is flammable and toxic. Do not use near an open flame and always have a fire extinguisher nearby when solvents are used. Use only in well-ventilated places, wear protective clothing, and dispose of cleaning rags in approved container. Failure to comply may result in damage to equipment, injury, or death to personnel.

1. Clean all parts in solvent cleaning compound and allow to dry.
2. Inspect all parts for cracks, pitting, or scoring. Replace parts as necessary if cracked, pitted, or scored.

END OF TASK

LUBRICATION

Pack grease on inside of spring seat (Figure 3, Item 3) and repack inner bearings (Figure 3, Item 1) and outer bearing (Figure 3, Item 2) with GAA grease (Volume 5, WP 0820).

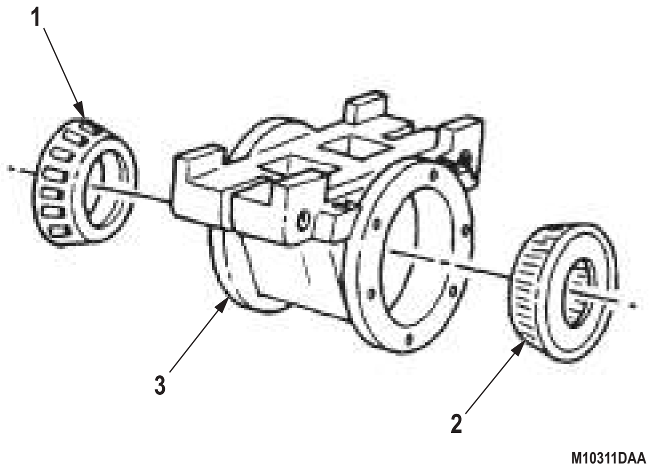


Figure 3. Rear Spring Seat Lubrication.

END OF TASK

INSTALLATION

NOTE

Perform Step (1) if bearing races were removed.

1. Install bearing races (Figure 4, Items 2 and 3) on spring seat (Figure 4, Item 1).

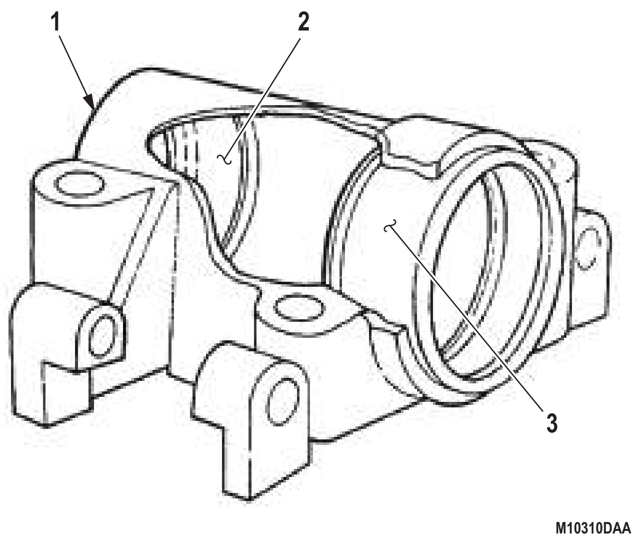


Figure 4. Rear Spring Seat Installation.

INSTALLATION - Continued

NOTE

Soak felt washers with oil before installation.

2. Install wiper ring (Figure 5, Item 2), washer (Figure 5, Item 3), two felt washers (Figure 5, Item 4), and packing retainer (Figure 5, Item 5) on crosstube (Figure 5, Item 1).
3. Install inner bearing (Figure 5, Item 16) in spring seat (Figure 5, Item 15).
4. Install grease seal assembly (Figure 5, Item 6) over inner bearing (Figure 5, Item 16) side of spring seat (Figure 5, Item 15).
5. Install spring seat (Figure 5, Item 15) on crosstube (Figure 5, Item 1).
6. Install outer bearing (Figure 5, Item 14) in spring seat (Figure 5, Item 15).
7. Install bearing adjusting nut (Figure 5, Item 13) on crosstube (Figure 5, Item 1).

INSTALLATION - Continued

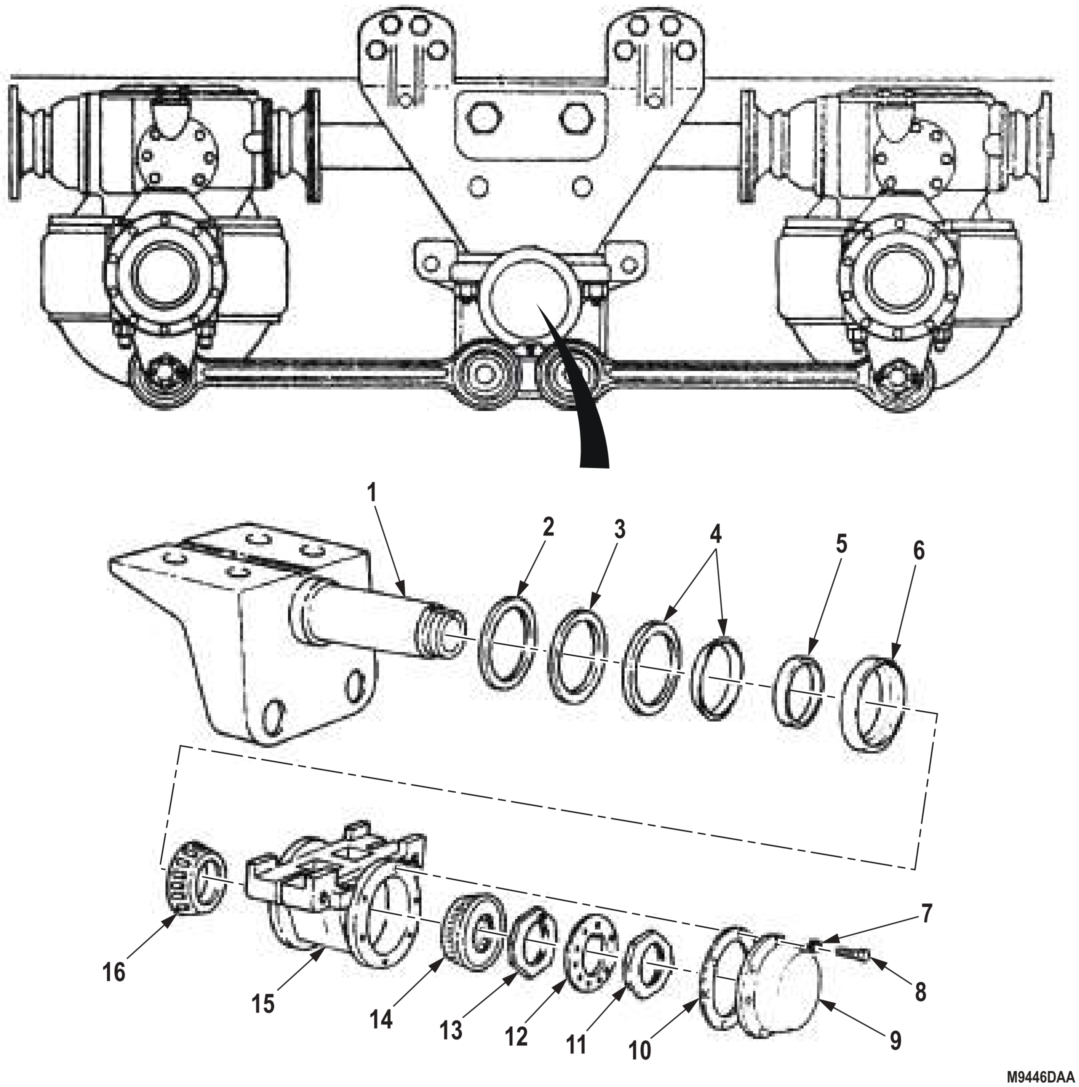


Figure 5. Rear Spring Seat Installation.

END OF TASK

ADJUSTMENT

1. Connect hook tester scale (Figure 6, Item 3) in bolt hole (Figure 6, Item 2).
2. Tighten adjusting nut (Figure 6, Item 4) and pull tester scale downward.

NOTE

Bearings are correctly adjusted when pull on scale required to rotate seat is 25 to 33 lb (11 to 15 kg). This is equal to 15 to 20 lb-ft (20 to 27 N·m) preload on bearings.

3. Note pull required to rotate spring seat (Figure 6, Item 1) around cross tube (Figure 5, Item 1).

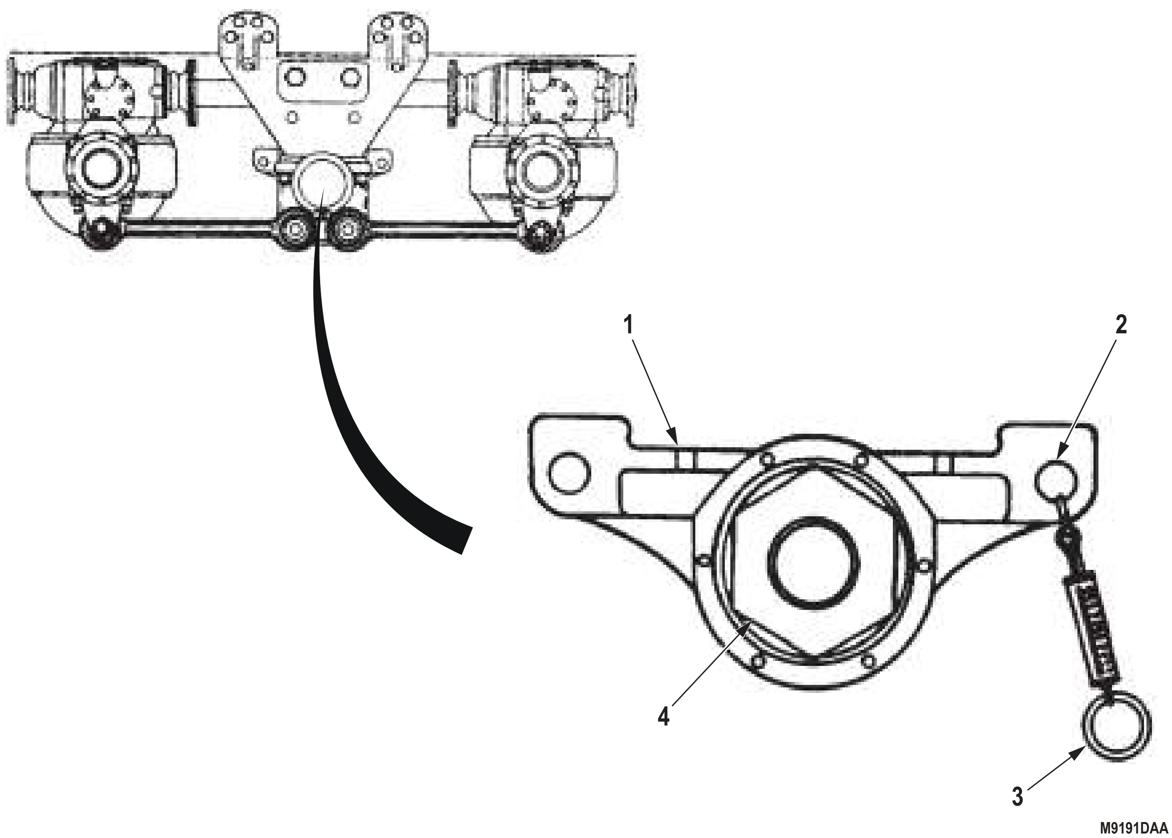


Figure 6. Rear Spring Seat Adjustment.

4. Install key washer (Figure 5, Item 12) and locking nut (Figure 5, Item 11). Repeat Steps (2) and (3) to ensure bearing adjustment does not change. Tighten locking nut 150 to 160 lb-ft (203 to 217 N·m).
5. Install gasket (Figure 5, Item 10) and spring seat cap (Figure 5, Item 9) on spring seat (Figure 5, Item 15) with six lockwashers (Figure 5, Item 7) and screws (Figure 5, Item 8). Tighten screw 16 to 20 lb-ft (22 to 27 N·m).

END OF TASK

FOLLOW-ON MAINTENANCE

1. Install rear spring assembly. (WP 0539)
2. Lubricate spring seat. (Volume 5, WP 0820)

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
REAR AXLES SPRING SEAT WEAR PADS AND UPPER BRACKET REPLACEMENT

INITIAL SETUP:

Tools and Special Tools

Tool Kit, General Mechanic's: Automotive
(Volume 5, WP 0826, Table 1, Item 56)
Wrench, Torque, Click, Ratcheting, 3/4" Drive, 600 Ft-Lb
(Volume 5, WP 0826, Table 1, Item 61)

Materials/Parts

Lockwasher
(Volume 5, WP 0827, Table 1, Item 381)
Qty: 4

Equipment Condition

Parking brake set. (TM 9-2320-272-10)
Real wheels removed. (TM 9-2320-272-10)

REMOVAL

1. Using hydraulic jack, raise vehicle at rear-rear axle differential housing (Figure 1, Item 14) and place jack stands under wheel hubs (Figure 1, Item 5).
2. Remove two nuts (Figure 1, Item 16), washers (Figure 1, Item 15), U-bolt (Figure 1, Item 6), and U-bolt bracket (Figure 1, Item 9) from spring brake chamber (Figure 1, Item 13).
3. Remove nut (Figure 1, Item 10), lockwasher (Figure 1, Item 11), two washers (Figure 1, Item 2), screw (Figure 1, Item 1), and spring brake chamber bracket (Figure 1, Item 12) from upper spring bracket (Figure 1, Item 4). Discard lockwasher.
4. Remove two nuts (Figure 1, Item 26), washers (Figure 1, Item 25), U-bolt (Figure 1, Item 21), and U-bolt bracket (Figure 1, Item 22) from service brake chamber (Figure 1, Item 20).
5. Remove nut (Figure 1, Item 23), lockwasher (Figure 1, Item 24), two washers (Figure 1, Item 18), screw (Figure 1, Item 17), and service brake chamber bracket (Figure 1, Item 19) from upper spring bracket (Figure 1, Item 4). Discard lockwasher.
6. Remove two nuts (Figure 1, Item 8), lockwashers (Figure 1, Item 7), and screws (Figure 1, Item 3) from upper spring bracket (Figure 1, Item 4). Discard lockwashers.

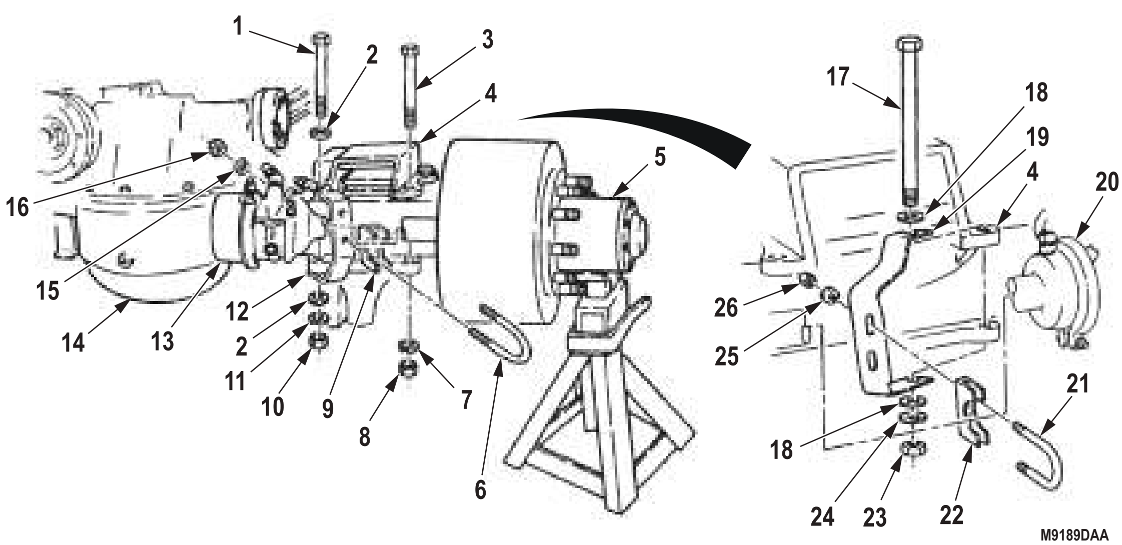


Figure 1. Rear Axle Spring Seat Wear Pads and Upper Bracket Removal.

7. Place hydraulic jack under spring seat (Figure 2, Item 6) and raise leaf spring assembly (Figure 2, Item 7) until upper spring bracket (Figure 2, Item 1) is clear of axle housing (Figure 2, Item 3) and dowel pin (Figure 2, Item 5).
8. Slide upper spring bracket (Figure 2, Item 1) from bottom leaf (Figure 2, Item 4) and remove from leaf spring assembly (Figure 2, Item 7).
9. Remove spring seat wear pad (Figure 2, Item 2) from upper spring bracket.
10. Inspect spring seat wear pad (Figure 2, Item 2) for cracks. Replace spring seat wear pad if cracked.
11. Inspect upper spring bracket (Figure 2, Item 1) for cracks. Replace upper spring bracket if cracked.

REMOVAL - Continued

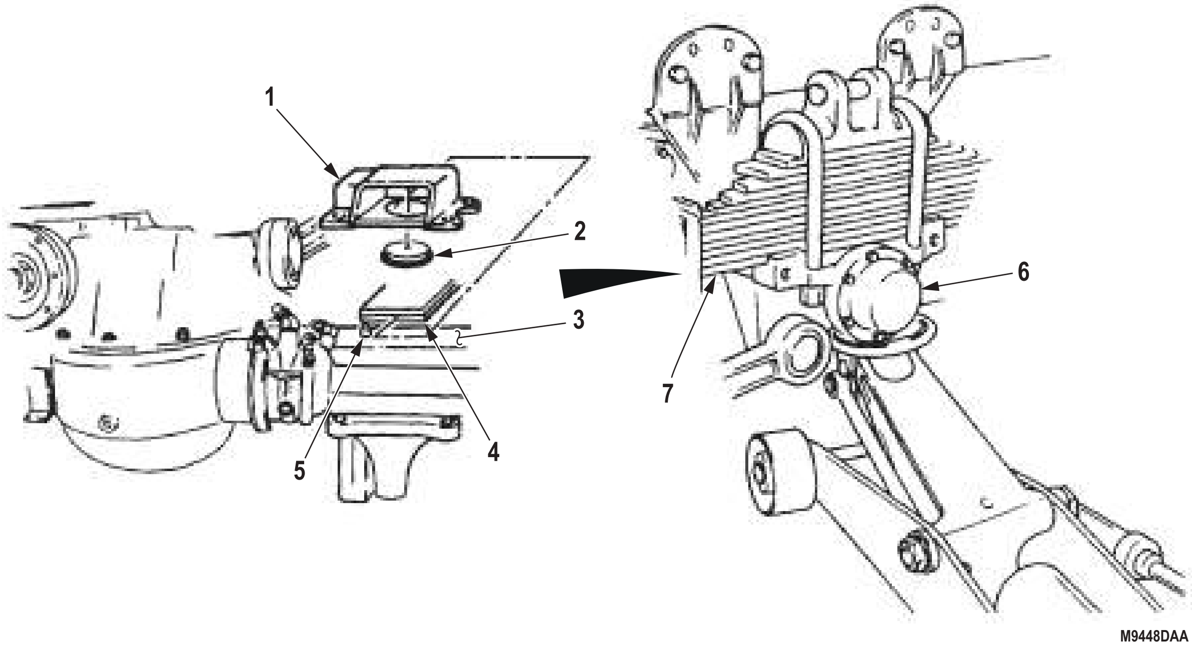


Figure 2. Rear Axle Spring Seat Wear Pads and Upper Bracket Removal.

END OF TASK

INSTALLATION

1. Install spring seat wear pad (Figure 3, Item 2) in upper spring bracket (Figure 3, Item 1).
2. Slide upper spring bracket (Figure 3, Item 1) on bottom leaf (Figure 3, Item 4) and install on axle housing (Figure 3, Item 3) over dowel pin (Figure 3, Item 5).
3. Lower hydraulic jack until leaf spring assembly (Figure 3, Item 7) seats in upper spring bracket (Figure 3, Item 1) and remove hydraulic jack from spring seat (Figure 3, Item 6).

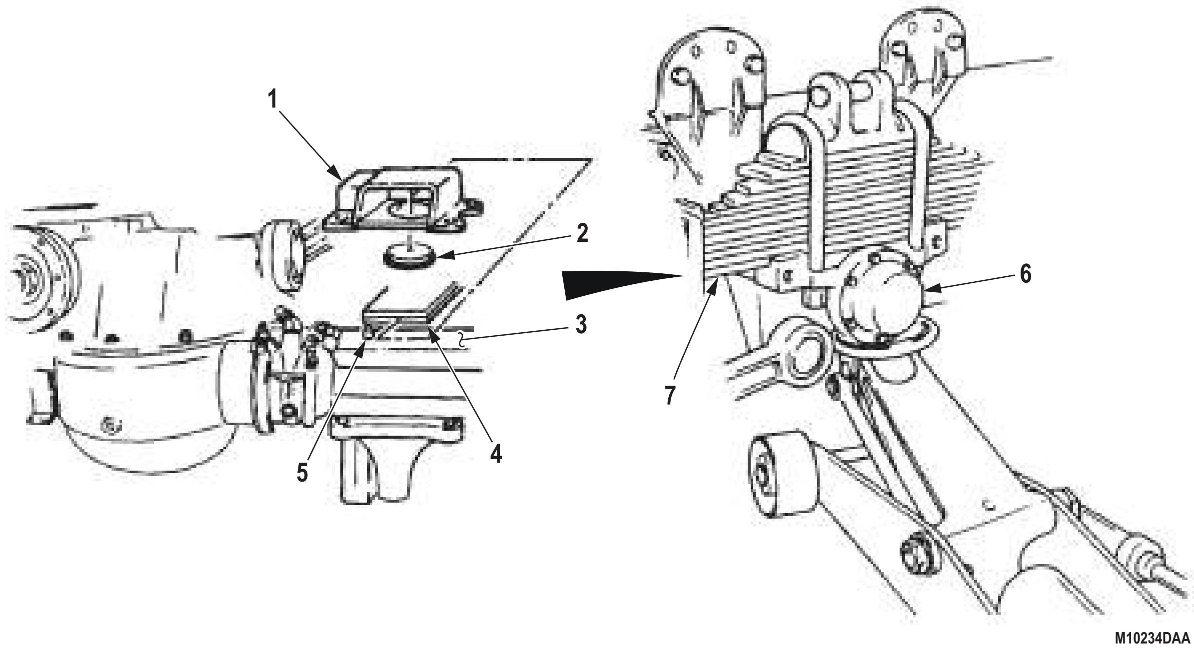


Figure 3. Rear Axle Spring Seat Wear Pads and Upper Bracket Installation.

4. Position spring brake chamber bracket (Figure 4, Item 12) over upper spring bracket (Figure 4, Item 4) and install with screw (Figure 4, Item 1), two washers (Figure 4, Item 2), lockwasher (Figure 4, Item 11), and nut (Figure 4, Item 10). Do not tighten nut.
5. Install spring brake U-bolt bracket (Figure 4, Item 9) between brake chamber (Figure 4, Item 13) and brake chamber bracket (Figure 4, Item 12) with U-bolt (Figure 4, Item 6), two washers (Figure 4, Item 15), and nuts (Figure 4, Item 16). Tighten nuts 120 to 160 lb-ft (163 to 217 N·m).
6. Position service brake chamber bracket (Figure 4, Item 19) over upper spring bracket (Figure 4, Item 4) and install with screw (Figure 4, Item 17), two washers (Figure 4, Item 18), lockwasher (Figure 4, Item 24), and nut (Figure 4, Item 23). Do not tighten nut.
7. Install service brake U-bolt bracket (Figure 4, Item 22) between service brake chamber (Figure 4, Item 20) and brake chamber bracket (Figure 4, Item 19) with U-bolt (Figure 4, Item 21), two washers (Figure 4, Item 25), and nuts (Figure 4, Item 26). Tighten nuts 120 to 160 lb-ft (163 to 217 N·m).
8. Install upper spring bracket (Figure 4, Item 4) with two screws (Figure 4, Item 3), lockwashers (Figure 4, Item 7), and nuts (Figure 4, Item 8). Tighten nuts 280 to 360 lb-ft (380 to 488 N·m).
9. Tighten nuts (Figure 4, Items 10 and 23) 280 to 360 lb-ft (380 to 488 N·m).

INSTALLATION - Continued

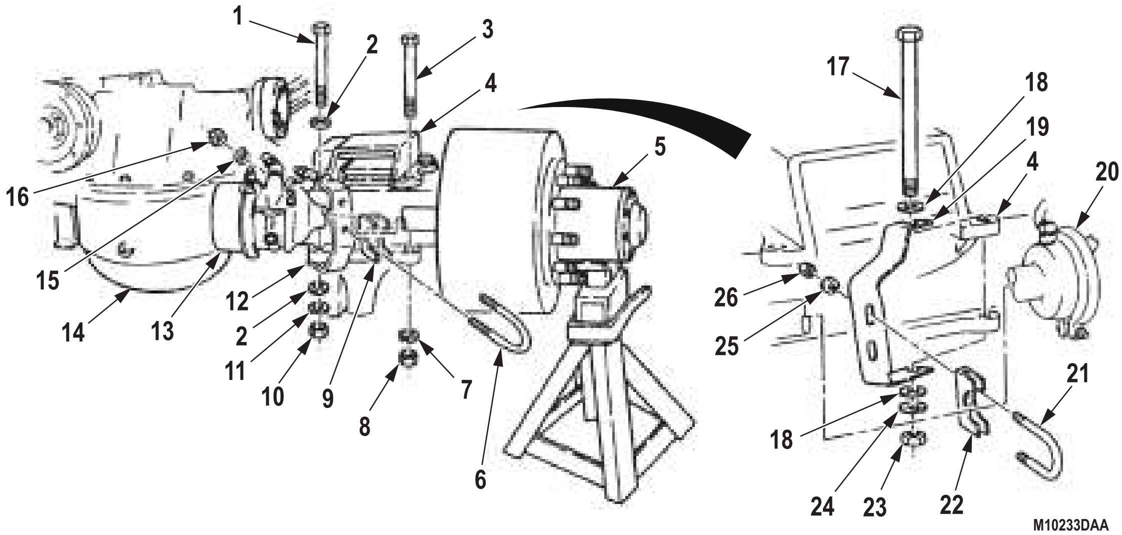


Figure 4. Rear Axle Spring Seat Wear Pads and Upper Bracket Installation.

END OF TASK

FOLLOW-ON MAINTENANCE

Install rear wheels. (TM 9-2320-272-10)

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
CROSS TUBE REPLACEMENT

INITIAL SETUP:

Tools and Special Tools

Tool Kit, General Mechanic's: Automotive
(Volume 5, WP 0826, Table 1, Item 56)
Jack Dolly Type Hydraulic
(Volume 5, WP 0826, Table 1, Item 32)
Multiplier, Torque
(Volume 5, WP 0826, Table 1, Item 35)
Trestle, Jackstand
(Volume 5, WP 0826, Table 1, Item 58)

Materials/Parts

Locknut (Volume 5, WP 0827, Table 1, Item 318)
Qty: 8

Personnel Required

(2)

Equipment Condition

Torque rods (lower) removed. (WP 0544)
Rear springs removed. (WP 0539)
Spring seat removed. (WP 0540)

REMOVAL

WARNING

Weight of vehicle must remain supported on jack stands at all times. Do not attempt to support weight of vehicle on hydraulic jack. Failure to comply may result in injury or death to personnel.

Remove eight locknuts (Figure 1, Item 4), screws (Figure 1, Item 2), and cross tube (Figure 1, Item 3) from two rear axle bogie supports (Figure 1, Item 1). Discard locknuts.

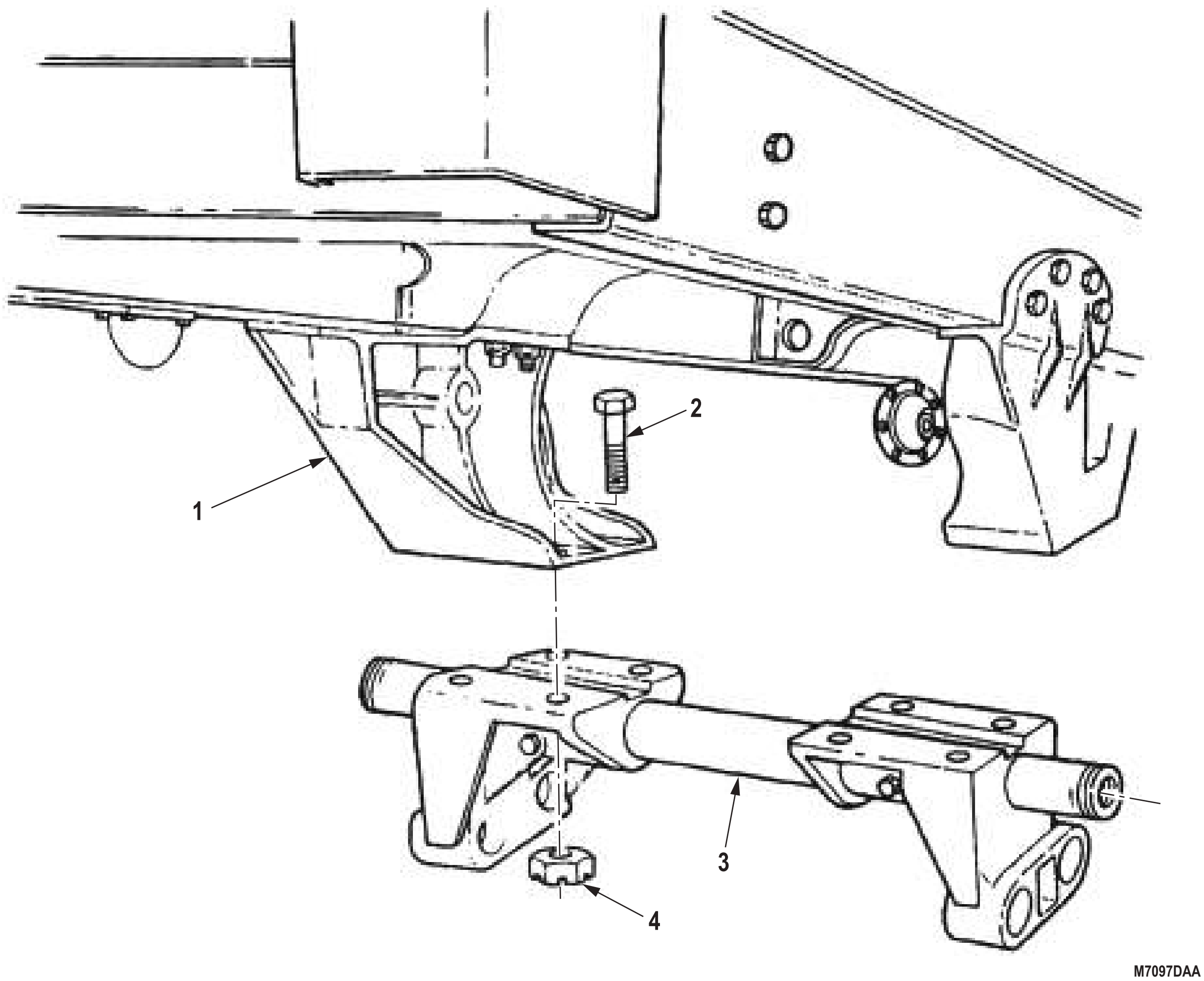


Figure 1. Cross Tube Removal.

END OF TASK

INSTALLATION

Install cross tube (Figure 2, Item 3) on two rear axle bogie supports (Figure 2, Item 1) with eight screws (Figure 2, Item 2) and locknuts (Figure 2, Item 4). Tighten locknuts 1,200 to 1,300 lb-ft (1,627 to 1,763 N·m).

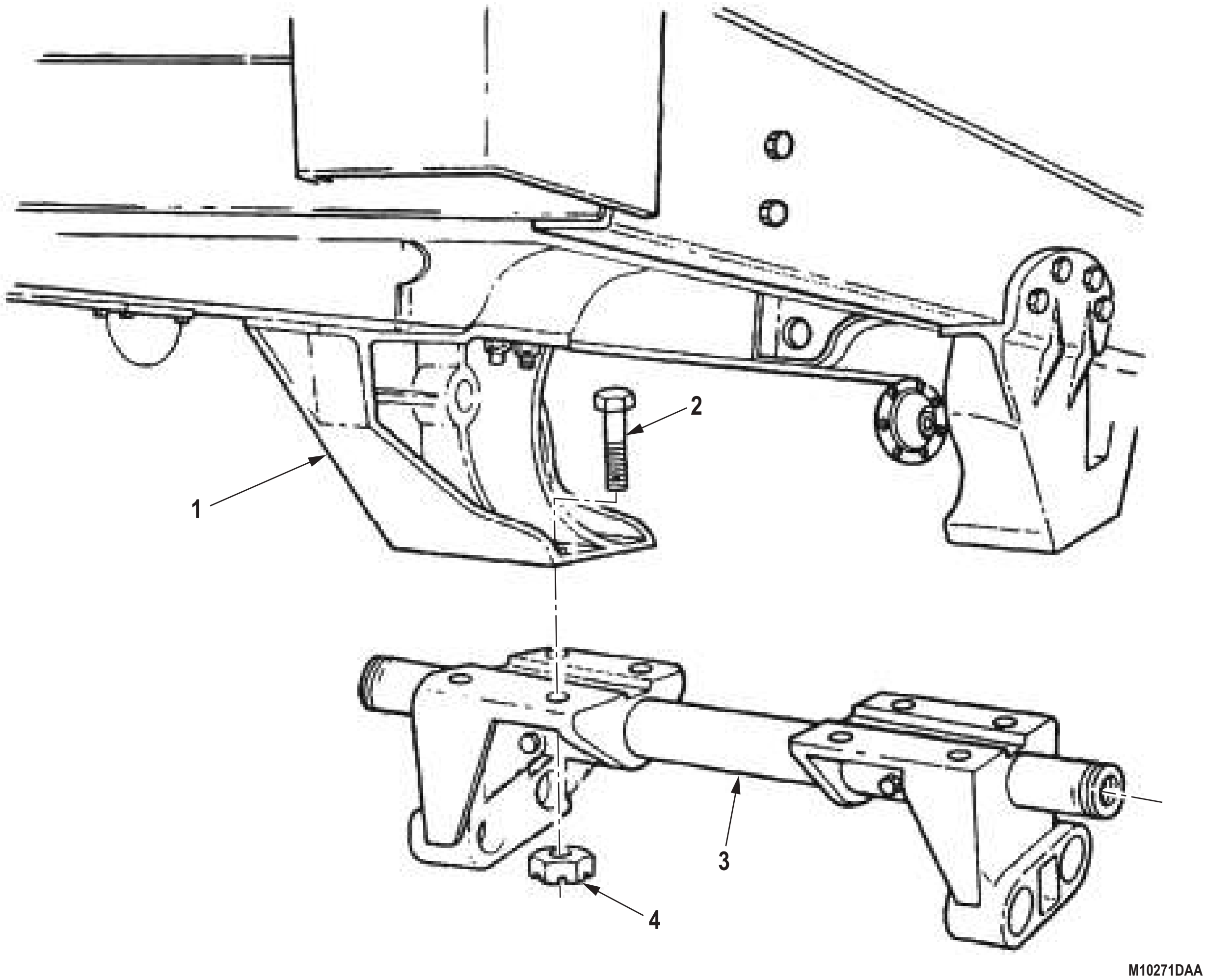


Figure 2. Cross Tube Installation

END OF TASK

FOLLOW-ON MAINTENANCE

1. Install spring seat. (WP 0540)
2. Install rear springs. (WP 0539)
3. Install torque rods (lower). (WP 0544)

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
SHOCK ABSORBER AND MOUNTING PINS REPLACEMENT

INITIAL SETUP:

Tools and Special Tools
Tool Kit, General Mechanic's: Automotive
(Volume 5, WP 0826, Table 1, Item 56)

Materials/Parts
Locknut (Volume 5, WP 0827, Table 1, Item 278)
Qty: 2

Materials/Parts (cont.)
Locknut (Volume 5, WP 0827, Table 1, Item 289)
Qty: 2
Rubber Bushing
(Volume 5, WP 0827, Table 1, Item 211)
Qty: 4

Equipment Condition
Parking brake set. (TM 9-2320-272-10)

REMOVAL

1. Remove two locknuts (Figure 1, Item 1) and washers (Figure 1, Item 2) from mounting pins (Figure 1, Item 4). Discard locknuts.
2. Remove two rubber bushings (Figure 1, Item 3), shock absorber (Figure 1, Item 5), and two rubber bushings (Figure 1, Item 3) from mounting studs (Figure 1, Item 4). Discard rubber bushings.

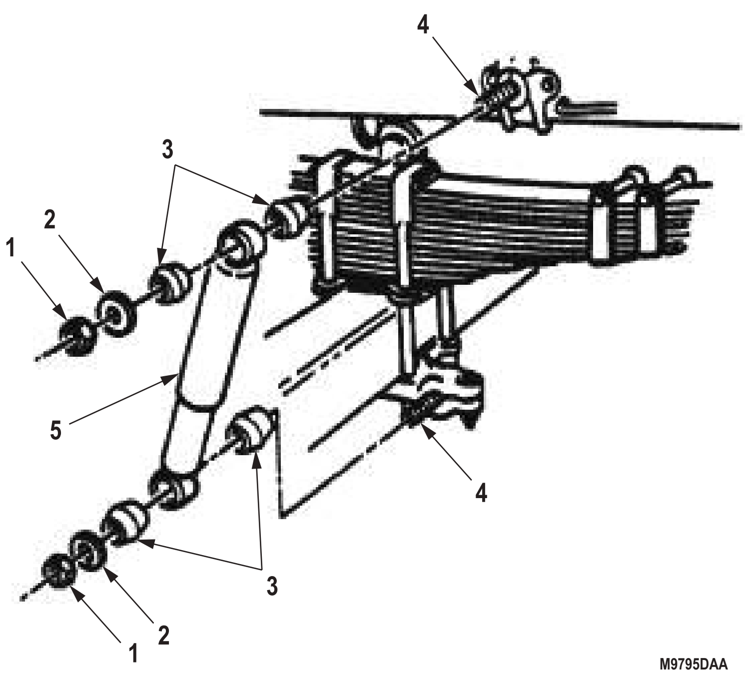


Figure 1. Shock Absorber and Mounting Pins Removal.

REMOVAL - Continued

3. Remove two locknuts (Figure 2, Item 3) and screws (Figure 2, Item 1) from mounting brackets (Figure 2, Item 2). Discard locknuts.
4. Spread two mounting brackets (Figure 2, Item 2) and remove mounting pins (Figure 2, Item 4).

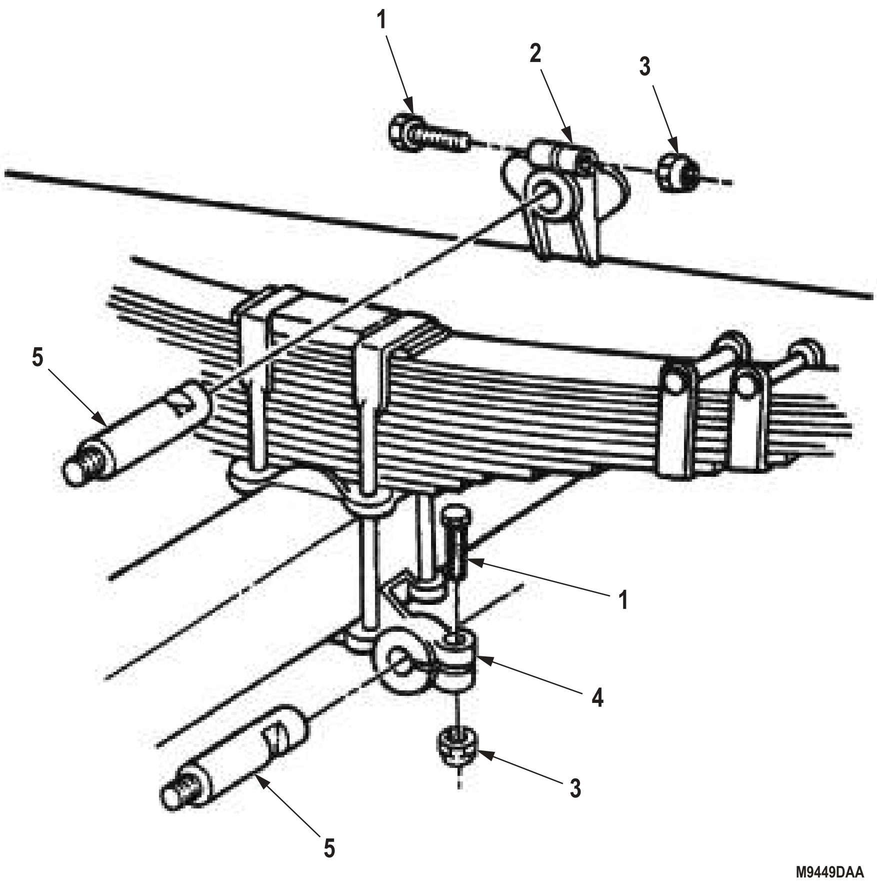


Figure 2. Shock Absorber and Mounting Pins Removal.

END OF TASK

INSTALLATION

NOTE

Ensure pin slots are positioned to allow installation of screw.

1. Install two mounting pins (Figure 3, Item 4) on mounting brackets (Figure 3, Item 2) with two screws (Figure 3, Item 1) and locknuts (Figure 3, Item 3).

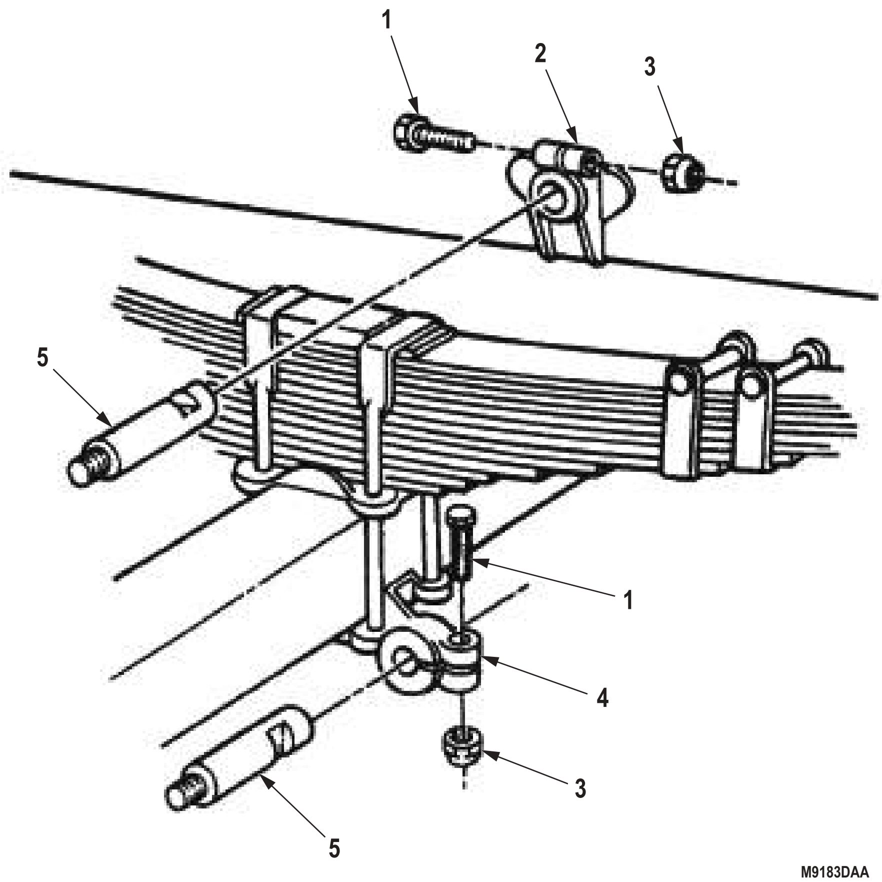


Figure 3. Shock Absorber and Mounting Pins Installation.

INSTALLATION - Continued

2. Position four rubber bushings (Figure 4, Item 3) and shock absorber (Figure 4, Item 5) on two mounting pins (Figure 4, Item 4).
3. Install four rubber bushings (Figure 4, Item 3) and shock absorber (Figure 4, Item 5) on two mounting pins (Figure 4, Item 4) with washers (Figure 4, Item 2) and locknuts (Figure 4, Item 1). Tighten locknuts until seated and rubber bushings are compressed.

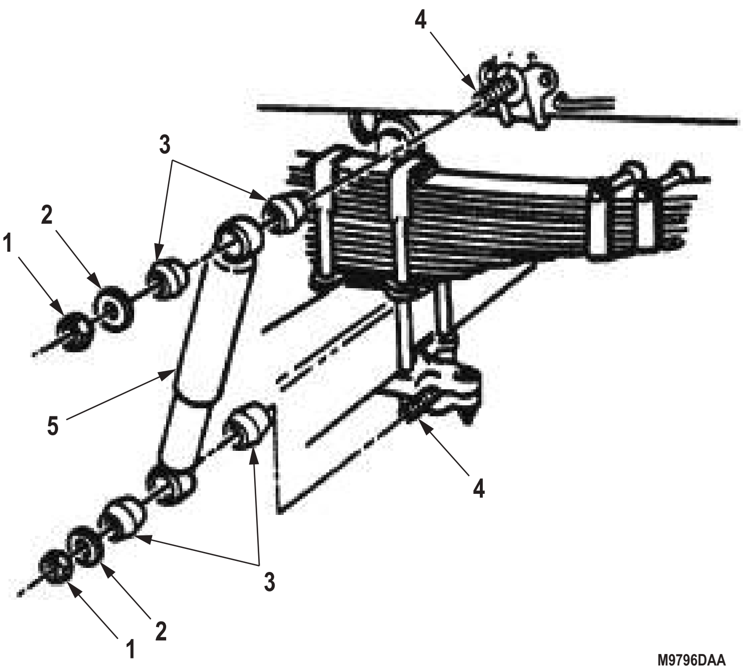


Figure 4. Shock Absorber and Mounting Pins Installation.

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
UPPER AND LOWER TORQUE ROD REPLACEMENT

INITIAL SETUP:

Tools and Special Tools

Tool Kit, General Mechanic's: Automotive
(Volume 5, WP 0826, Table 1, Item 56)
Wrench, Torque, Click, Ratcheting, 3/4" Drive, 600 Ft-Lb
(Volume 5, WP 0826, Table 1, Item 61)

Materials/Parts

Cotter Pin
(Volume 5, WP 0827, Table 1, Item 353)
Qty: 4
Lockwasher
(Volume 5, WP 0827, Table 1, Item 409)
Qty: 8
Slotted Nut
(Volume 5, WP 0827, Table 1, Item 232)
Qty: 4

References

TM 9-237

Equipment Condition

Parking brake set. (TM 9-2320-272-10)
Right rear spring assembly removed (for upper torque rods only). (WP 0539)
Two front rear wheels removed (for lower torque rods only). (WP 0484)

UPPER TORQUE ROD REMOVAL

1. Remove four nuts (Figure 1, Item 4), lockwashers (Figure 1, Item 3), screws (Figure 1, Item 2), and torque rod plate (Figure 1, Item 5) from torque rod bracket (Figure 1, Item 1). Discard lockwashers.

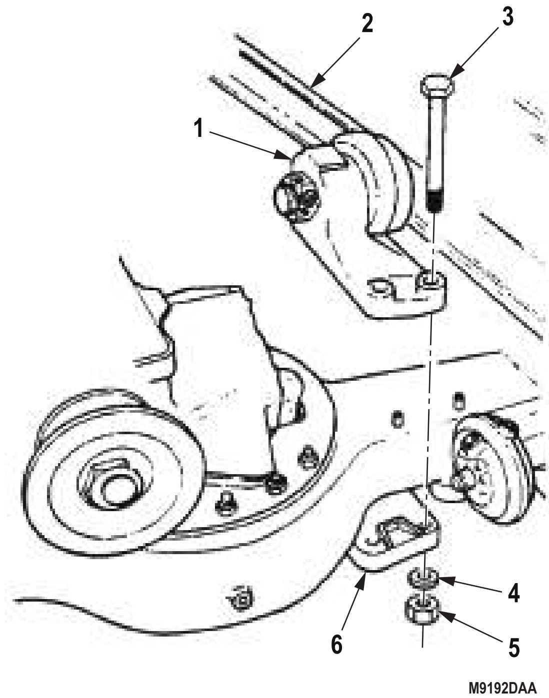


Figure 1. Upper Torque Rod Removal.

UPPER TORQUE ROD REMOVAL - Continued

2. Remove cotter pin (Figure 2, Item 2) from upper torque rod (Figure 2, Item 4) and spring seat bracket (Figure 2, Item 3). Discard cotter pin.
3. Back off slotted nut (Figure 2, Item 1) until even with ball shaft (Figure 2, Item 5) and use slotted nut (Figure 2, Item 1) as a striking surface.
4. Drive torque rod ball shaft (Figure 2, Item 5) out of spring seat bracket (Figure 2, Item 3).
5. Remove slotted nut (Figure 2, Item 1) from ball shaft (Figure 2, Item 5). Discard slotted nut.
6. Remove upper torque rod (Figure 2, Item 4) with upper torque rod bracket (Figure 2, Item 1) from spring seat bracket (Figure 2, Item 3).

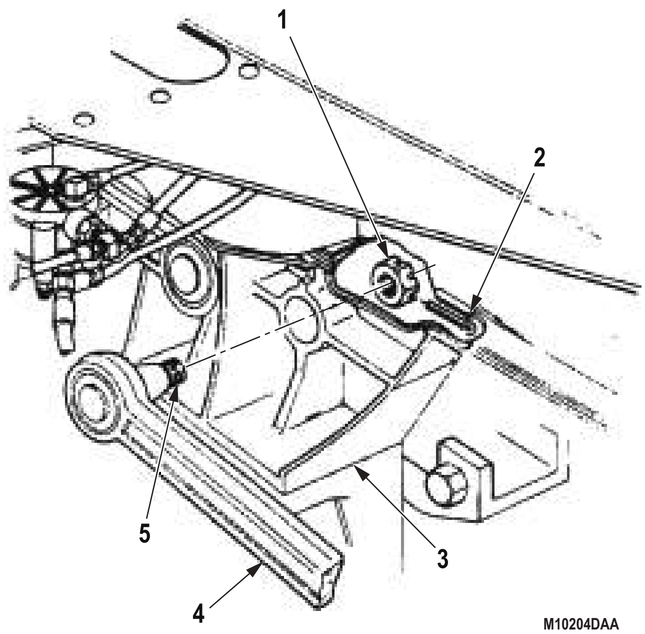


Figure 2. Upper Torque Rod Removal.

UPPER TORQUE ROD REMOVAL - Continued

7. Place upper torque rod (Figure 3, Item 2) and bracket (Figure 3, Item 3) in vise (Figure 3, Item 5).
8. Remove cotter pin (Figure 3, Item 1) and back off slotted nut (Figure 3, Item 6) until even with end of ball shaft (Figure 3, Item 4). Discard cotter pin.
9. Using nut (Figure 3, Item 6) as striking surface, drive torque rod ball shaft (Figure 3, Item 4) out of upper bracket (Figure 3, Item 3).
10. Remove slotted nut (Figure 3, Item 6) from ball shaft (Figure 3, Item 4). Discard slotted nut.

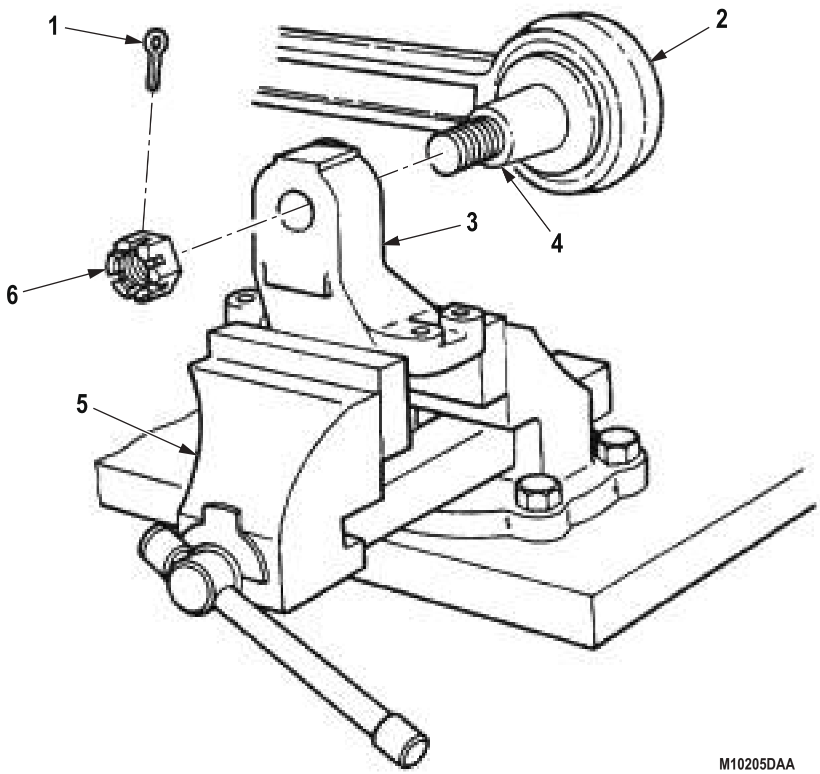


Figure 3. Upper Torque Rod Removal.

END OF TASK

LOWER TORQUE ROD REMOVAL

1. Remove four nuts (Figure 4, Item 8), lockwashers (Figure 4, Item 9), screws (Figure 4, Item 1), and upper spring bracket (Figure 4, Item 14) from lower torque rod bracket (Figure 4, Item 10). Discard lockwashers.
2. Remove cotter pin (Figure 4, Item 5) from lower torque rod (Figure 4, Item 7) and slotted nut (Figure 4, Item 4). Discard cotter pin.
3. Back off slotted nut (Figure 4, Item 4) until even with end of torque rod ball shaft (Figure 4, Item 6).
4. Using slotted nut (Figure 4, Item 4) as striking surface, drive torque rod ball shaft (Figure 4, Item 6) out of spring seat bracket (Figure 4, Item 3).
5. Remove slotted nut (Figure 4, Item 4) and lower torque rod (Figure 4, Item 7) from spring seat bracket (Figure 4, Item 3) and rear axle (Figure 4, Item 2). Discard slotted nut.
6. Place lower torque rod bracket (Figure 4, Item 7) in vise.
7. Remove cotter pin (Figure 4, Item 13) from lower torque rod (Figure 4, Item 7) and slotted nut (Figure 4, Item 12). Discard cotter pin.
8. Back off slotted nut (Figure 4, Item 12) until even with end of torque rod ball shaft (Figure 4, Item 11).
9. Using slotted nut (Figure 4, Item 12) as striking surface, drive torque rod ball shaft (Figure 4, Item 11) out of lower torque rod bracket (Figure 4, Item 10).
10. Remove slotted nut (Figure 4, Item 12) from lower torque rod bracket (Figure 4, Item 10). Discard slotted nut.

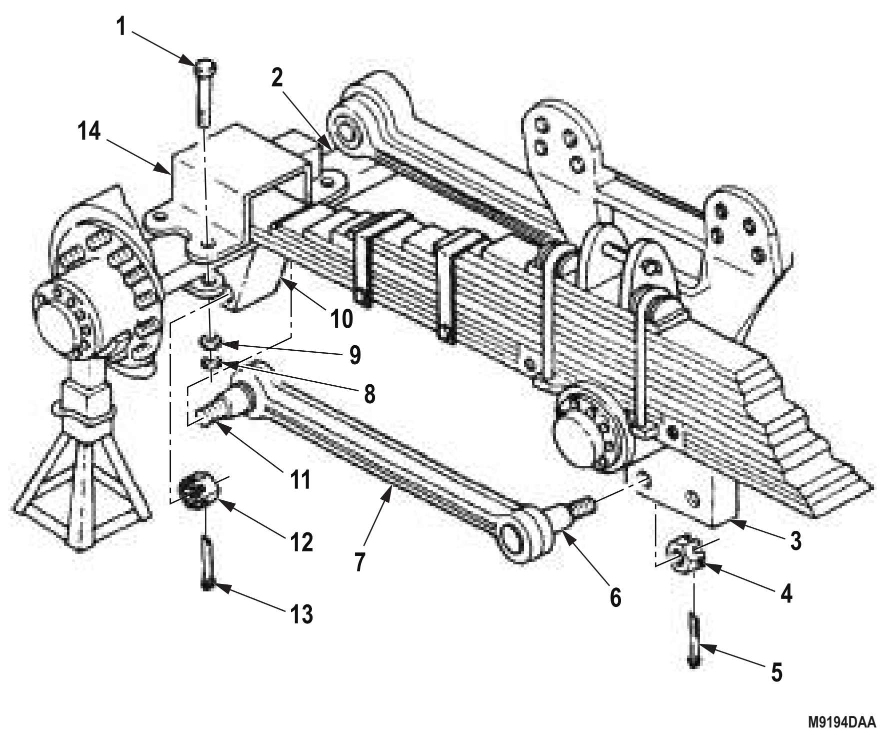
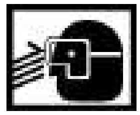


Figure 4. Lower Torque Rod Removal.

END OF TASK

CLEANING AND INSPECTION

WARNING



Eyeshields must be worn when cleaning with a wire brush. Flying rust and metal particles may cause injury to personnel. Failure to comply may result in injury or death to personnel.

NOTE

Perform Steps (1) through (8) for upper torque rod.

1. Clean rust from upper torque rod bracket axle mating surface and dowel holes.
2. Inspect upper torque rod bracket for breaks and cracks. Replace if broken or cracked.
3. Inspect upper torque rod plate for breaks and cracks. Replace if broken or cracked.
4. Clean rear axle and upper torque rod dowel and upper spring bracket dowel.
5. Inspect upper torque rod dowel and upper spring bracket dowel for flat, broken, or out-of-round condition. Replace if flat, broken, or out-of-round.

NOTE

Perform Steps (6) and (7) only if dowels are to be replaced.

6. File weld securing upper torque rod bracket and upper spring bracket dowels to rear axle and remove dowels.
7. Tap in upper torque rod bracket dowel and upper spring bracket dowel in rear axle and spot-weld (TM 9-237). Dowel height must be 3/8 in. (9.53 mm).
8. Inspect upper and lower torque rods around ball shafts for breaks, cracks, and separation of rubber from torque rods.
9. Clean and inspect lower torque rod bracket for breaks and cracks. Replace if broken or cracked.

END OF TASK

SETTING PRELOAD FOR UPPER TORQUE ROD

1. Position upper spring bracket (Figure 5, Item 6) over upper spring bracket dowel (Figure 5, Item 7).

NOTE

Perform Step (2) for all models except M936/A1/A2 model vehicles.

2. Raise rear axle (Figure 5, Item 8) until 6 in. (15.24 cm) is obtained between bottom of frame rail (Figure 5, Item 5) and top of spring bracket (Figure 5, Item 6).

NOTE

Perform Step (3) for M936/A1/A2 model vehicles only.

3. Raise rear axle (Figure 5, Item 8) until 7-1/4 in. (18.4 cm) is obtained between bottom of frame rail (Figure 5, Item 5) and top of spring bracket (Figure 5, Item 6).
4. Place ball shaft (Figure 5, Item 2) on upper torque rod (Figure 5, Item 3) in upper torque rod bracket (Figure 5, Item 4) and install with slotted nut (Figure 5, Item 1). Finger-tighten slotted nut.
5. Place upper torque rod (Figure 5, Item 3) with upper torque rod bracket (Figure 5, Item 4) over dowel (Figure 5, Item 9) on rear axle (Figure 5, Item 8) and position torque rod ball shaft (Figure 5, Item 2) in spring bracket (Figure 5, Item 6).

NOTE

Ensure upper torque rod bracket is seated over dowel pin and ball shaft is in spring seat bracket before alignment is made.

6. Scribe an alignment mark from upper torque rod bracket (Figure 5, Item 4) to torque rod (Figure 5, Item 3).
7. Remove upper torque rod (Figure 5, Item 3) and upper torque rod bracket (Figure 5, Item 4) from rear axle (Figure 5, Item 8) and spring bracket (Figure 5, Item 6).
8. Place upper torque rod bracket (Figure 5, Item 4) in vise (Figure 5, Item 10) with alignment marks aligned.
9. Tighten slotted nut (Figure 5, Item 1) 350 to 400 lb-ft (475 to 542 N·m) and install cotter pin (Figure 5, Item 11).

SETTING PRELOAD FOR UPPER TORQUE ROD - Continued

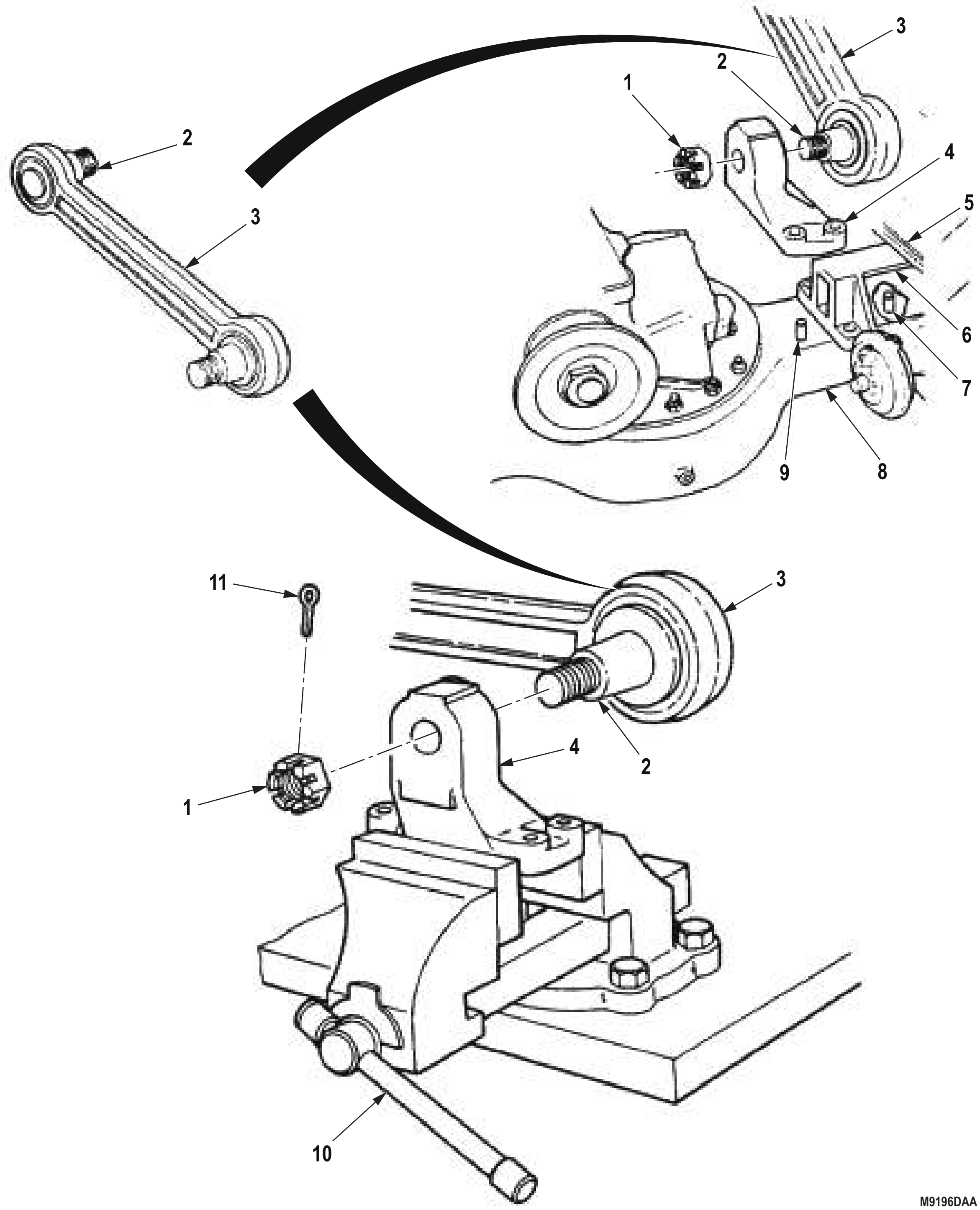


Figure 5. Preload for Upper Torque Rod.

END OF TASK

UPPER TORQUE ROD INSTALLATION

1. Place upper torque rod (Figure 6, Item 4) with attached bracket (Figure 6, Item 12) over inner dowel pin (Figure 6, Item 11) on rear axle (Figure 6, Item 7) and torque rod ball shaft (Figure 6, Item 5) in spring seat bracket (Figure 6, Item 3).

CAUTION

Ensure upper bracket is seated over dowel pin before torque rod plate is installed. If not, dowel pin will be damaged.

2. Install upper torque rod plate (Figure 6, Item 10) and bracket (Figure 6, Item 12) on axle (Figure 6, Item 7) with four screws (Figure 6, Item 6), lockwashers (Figure 6, Item 8), and nuts (Figure 6, Item 9). Tighten nuts 280 to 360 lb-ft (380 to 488 N·m).
3. Install upper torque rod ball shaft (Figure 6, Item 5) on spring seat bracket (Figure 6, Item 3) with slotted nut (Figure 6, Item 1). Tighten slotted nut 350 to 400 lb-ft (475 to 542 N·m) and install cotter pin (Figure 6, Item 2).

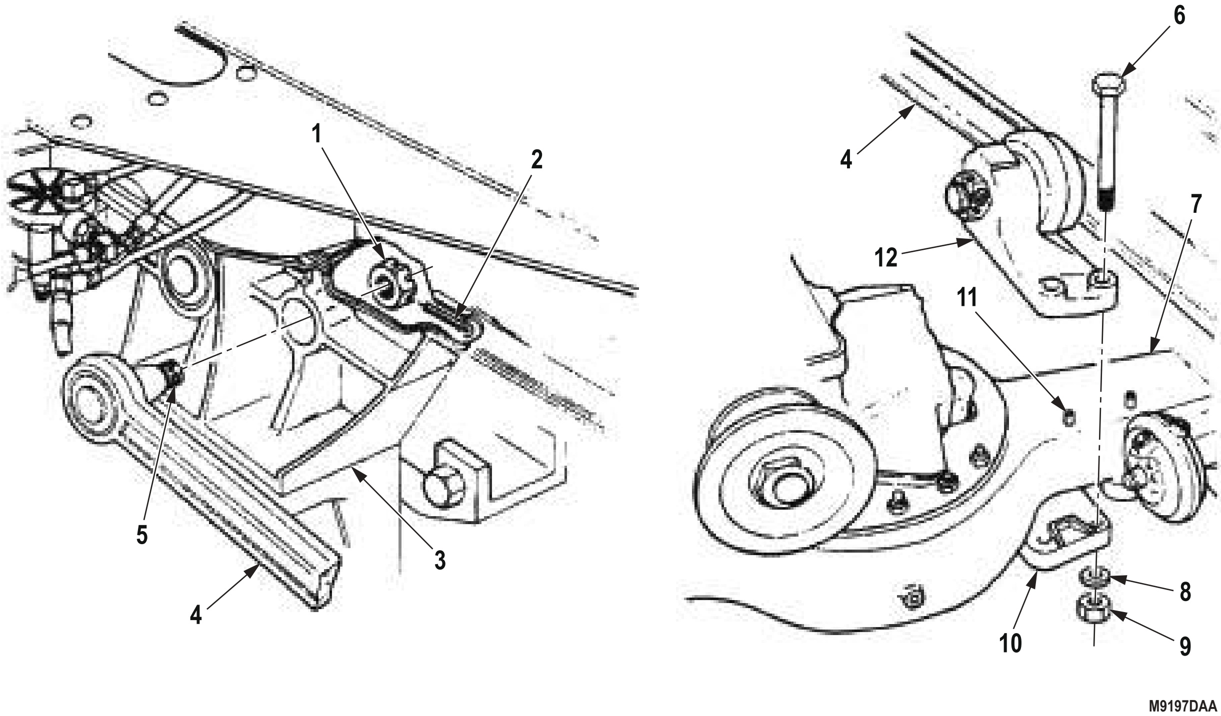


Figure 6. Upper Torque Rod Installation.

END OF TASK

LOWER TORQUE ROD INSTALLATION

CAUTION

Ensure 6 in. (15.24 cm) clearance remains between top of upper spring bracket and bottom of frame rail for all vehicles except M936/A1/A2 model vehicles. For the M936/A1/A2 model vehicles, this clearance is 7-1/4 in. (18.4 cm). If clearance is not correct, torque rods will be damaged.

1. Install lower torque rod (Figure 7, Item 7) ball shaft (Figure 7, Item 11) to lower torque rod bracket (Figure 7, Item 8) with slotted nut (Figure 7, Item 12).
2. Install torque rod ball shaft (Figure 7, Item 6) on spring seat bracket (Figure 7, Item 3) with slotted nut (Figure 7, Item 4).
3. Tighten slotted nuts (Figure 7, Items 4 and 12) 350 to 400 lb-ft (475 to 542 N·m), and install cotter pins (Figure 7, Items 5 and 13).
4. Install lower torque rod bracket (Figure 7, Item 8) and upper spring bracket (Figure 7, Item 14) on rear axle (Figure 7, Item 2) with four screws (Figure 7, Item 1), lockwashers (Figure 7, Item 9), and nuts (Figure 7, Item 10). Tighten nuts 280 to 360 lb-ft (380 to 488 N·m). For M936/A1/A2 model vehicles tighten nuts 320 to 425 lb-ft (434 to 576 N·m).

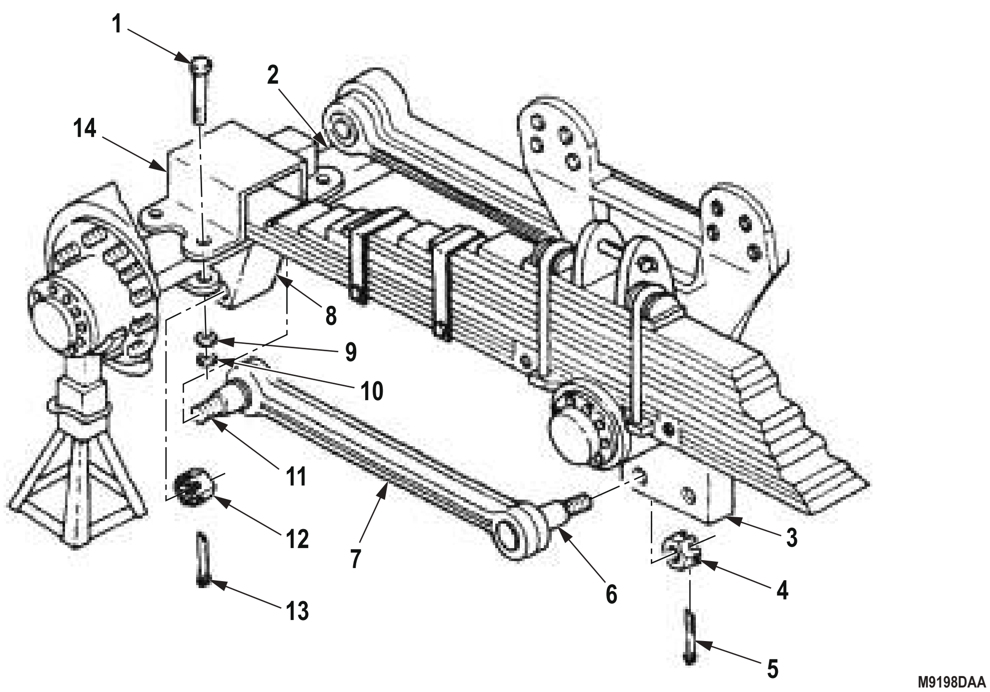


Figure 7. Lower Torque Rod Installation.

END OF TASK

FOLLOW-ON MAINTENANCE

1. If upper torque rod was replaced, install right rear spring assembly. (WP 0539)
2. If lower torque rod was replaced, install two front-rear tires. (WP 0484)

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
CAB DOOR REPLACEMENT

INITIAL SETUP:

Tools and Special Tools

Tool Kit, General Mechanic's: Automotive
(Volume 5, WP 0826, Table 1, Item 56)

Materials/Parts

Locknut (Volume 5, WP 0827, Table 1, Item 320)
Qty: 2

Equipment Condition

Parking brake set. (TM 9-2320-272-10)

Equipment Condition (cont.)

Cab door lock removed. (WP 0551)
Cab door dovetail wedge removed. (WP 0547)
Window weather stripping (cab door) removed. (WP 0553)
Cab door window regulator removed. (Volume 4, WP 0608)
Cab door check rod removed. (Volume 4, WP 0555)
Cab door weather seal removed. (WP 0549)

REMOVAL

1. Remove two locknuts (Figure 1, Item 6), washers (Figure 1, Item 5), and screws (Figure 1, Item 1) from three mirror braces (Figure 1, Item 2) and two door hinges (Figure 1, Item 7). Discard two locknuts.
2. Remove cab door (Figure 1, Item 4) from two door hinges (Figure 1, Item 3).

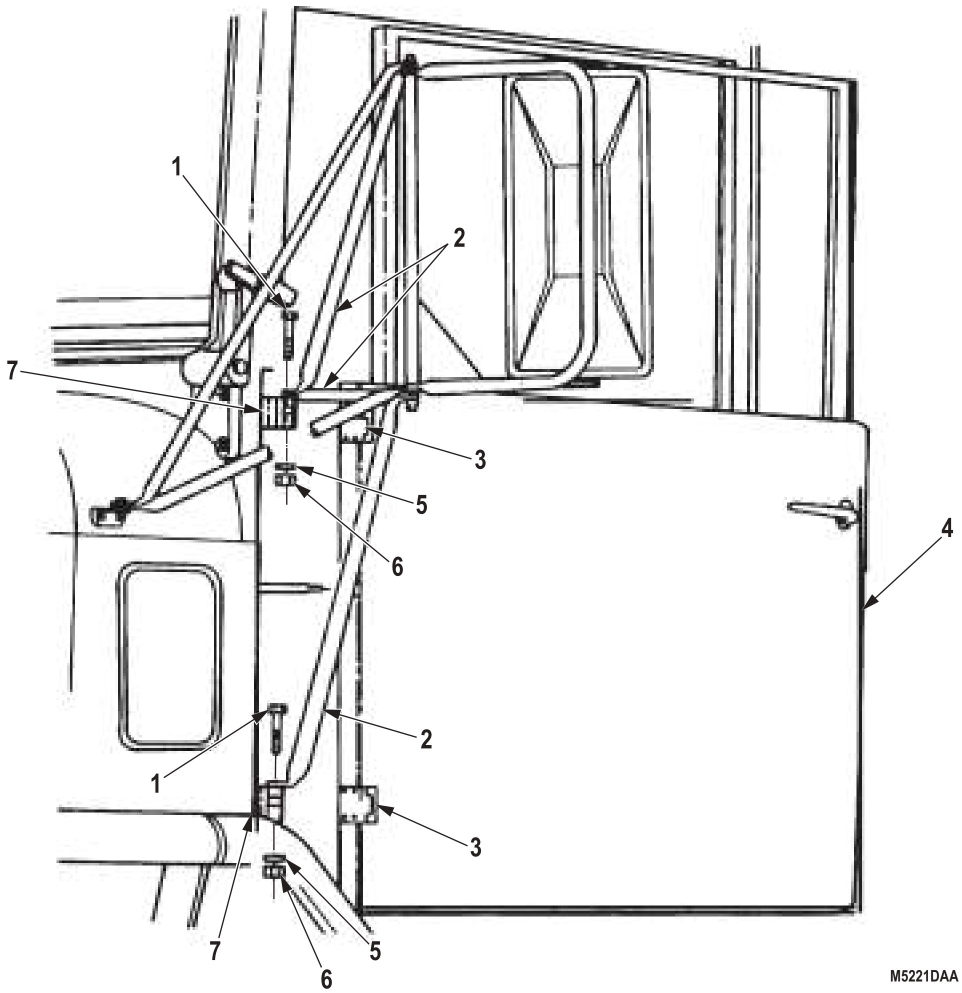


Figure 1. Cab Door Removal.

END OF TASK

INSTALLATION

1. Position cab door (Figure 2, Item 4) and two door hinges (Figure 2, Item 3) on three mirror braces (Figure 2, Item 2) and two door hinges (Figure 2, Item 7).
2. Install cab door (Figure 2, Item 4) on three mirror braces (Figure 2, Item 2) and two door hinges (Figure 2, Item 7) with two screws (Figure 2, Item 1), washers (Figure 2, Item 5), and locknuts (Figure 2, Item 6).

INSTALLATION - Continued

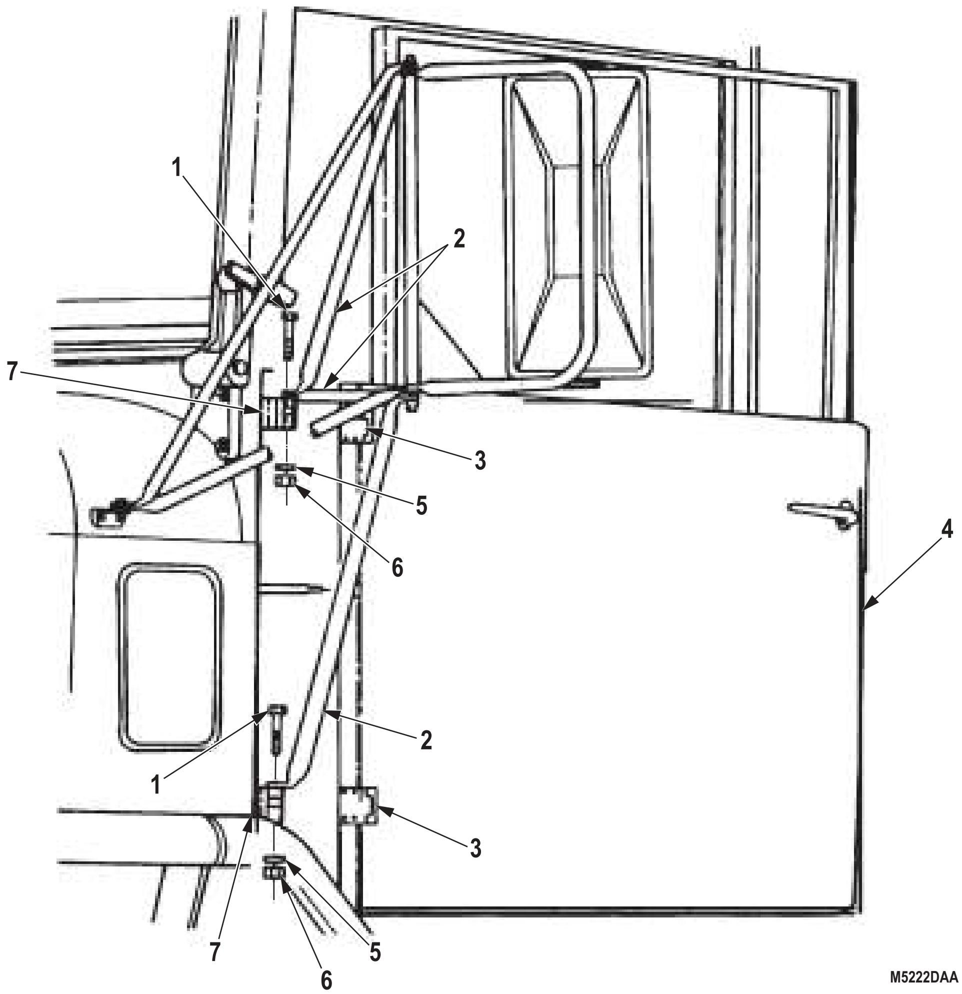


Figure 2. Cab Door Installation.

END OF TASK

FOLLOW-ON MAINTENANCE

1. Install cab door weather seal. (WP 0549)
2. Install cab door check rod. (Volume 4, WP 0555)
3. Install cab door regulator assembly. (Volume 4, WP 0608)
4. Install window weather stripping (cab door). (WP 0553)
5. Install cab door dovetail wedge removed. (WP 0547)
6. Install cab door lock. (WP 0551)

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
OUTSIDE DOOR HANDLE REPLACEMENT

INITIAL SETUP:

Tools and Special Tools
Tool Kit, General Mechanic's: Automotive
(Volume 5, WP 0826, Table 1, Item 56)

Equipment Condition
Parking brake set. (TM 9-2320-272-10)

REMOVAL

1. Remove two screws (Figure 1, Item 1) from door handle bracket (Figure 1, Item 2) and cab door (Figure 1, Item 3).
2. Remove door handle (Figure 1, Item 4) and bracket (Figure 1, Item 2) from cab door (Figure 1, Item 3) by rotating door handle (Figure 1, Item 4) 1/4-turn counterclockwise and pulling out at the same time.

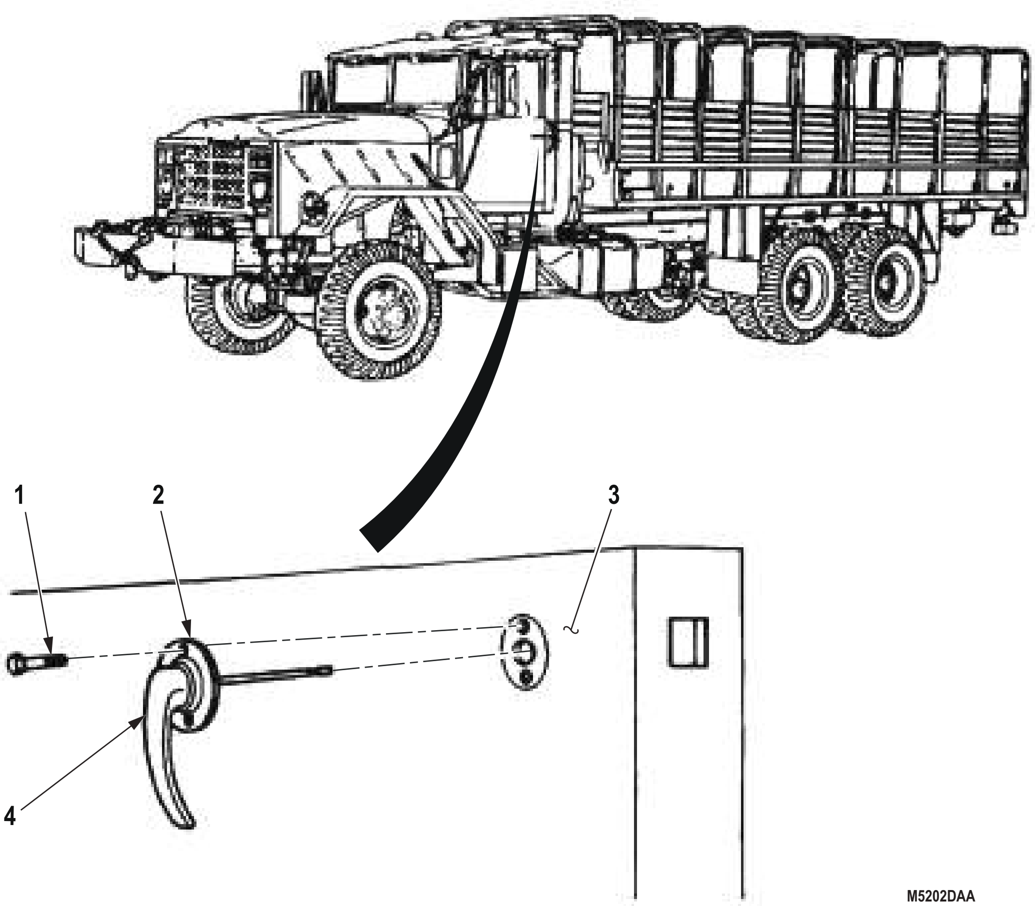


Figure 1. Outside Door Handles Removal.

END OF TASK

INSTALLATION

1. Install door handle (Figure 2, Item 5) by rotating 1/4-turn clockwise to insert shaft (Figure 2, Item 4) in cab door (Figure 2, Item 3).
2. Install door handle bracket (Figure 2, Item 2) on cab door (Figure 2, Item 3) with two screws (Figure 2, Item 1).

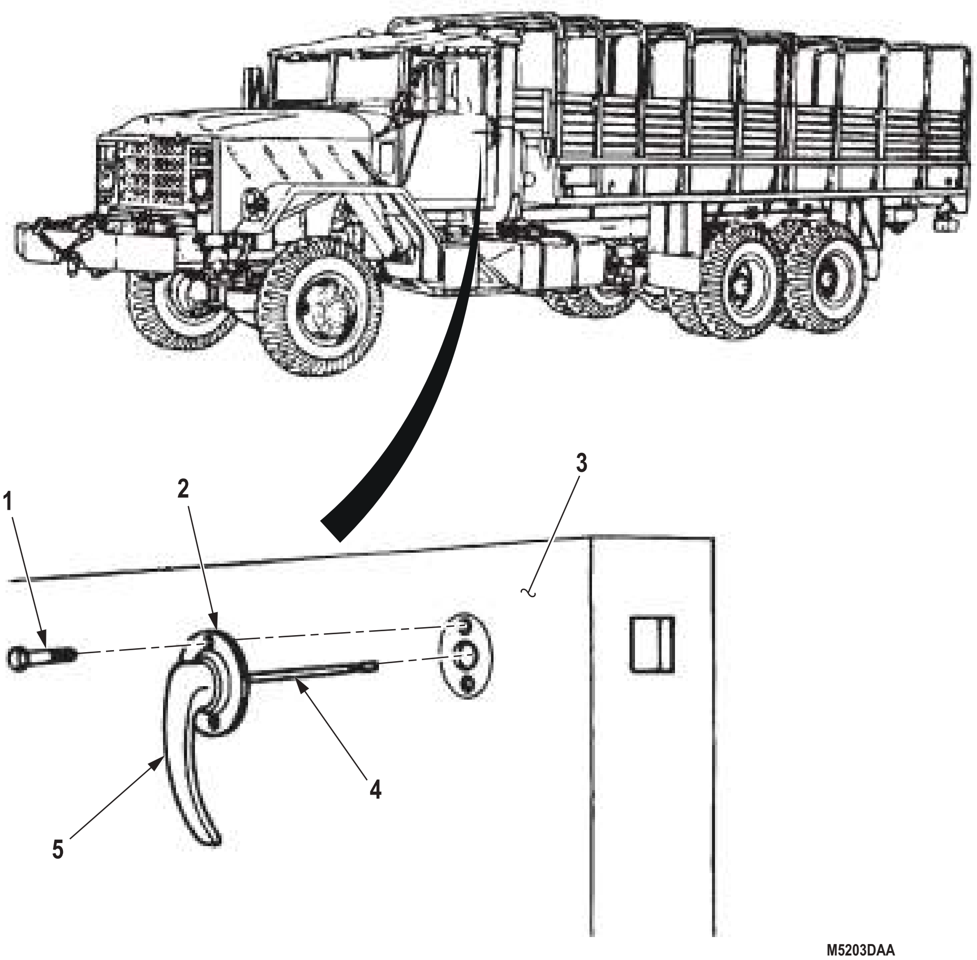


Figure 2. Outside Door Handles Installation.

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
CAB DOOR DOVETAIL WEDGE REPLACEMENT

INITIAL SETUP:

Tools and Special Tools

Tool Kit, General Mechanic's: Automotive
(Volume 5, WP 0826, Table 1, Item 56)

Materials/Parts

Screw Assembled Lockwasher
(Volume 5, WP 0827, Table 1, Item 84)
Qty: 2

Spacer Plate
(Volume 5, WP 0827, Table 1, Item 224)
Qty: 1

Equipment Condition

Parking brake set. (TM 9-2320-272-10)

REMOVAL

Remove two screw assembled lockwashers (Figure 1, Item 4), dovetail wedge (Figure 1, Item 3), and spacer plate (Figure 1, Item 2) from door (Figure 1, Item 1). Discard spacer plate and screw assembled lockwashers.

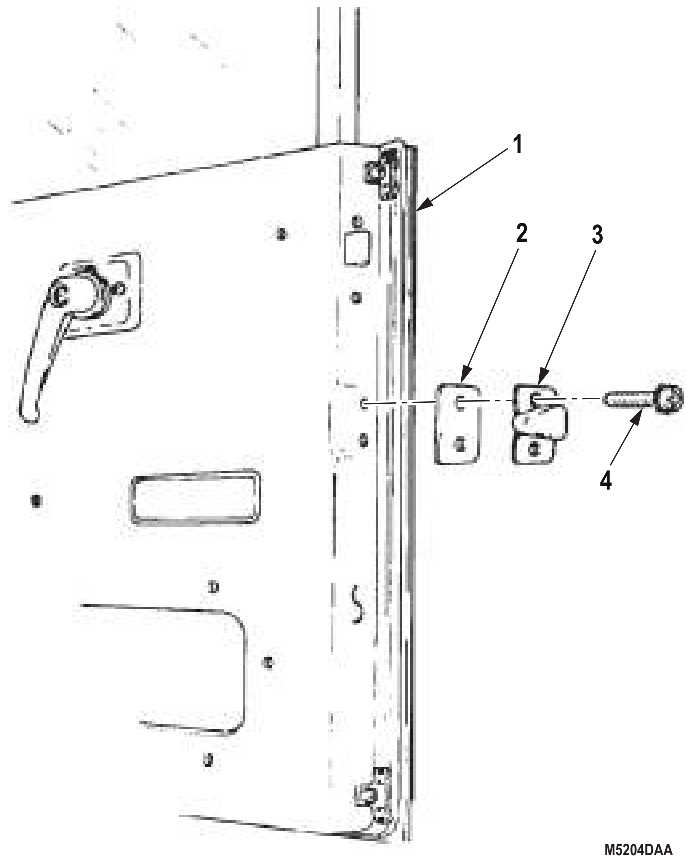


Figure 1. Cab Door Dovetail Wedge Removal.

END OF TASK

INSTALLATION

Install spacer plate (Figure 2, Item 2) and dovetail wedge (Figure 2, Item 3) on door (Figure 2, Item 1) with two screw assembled lockwashers (Figure 2, Item 4).

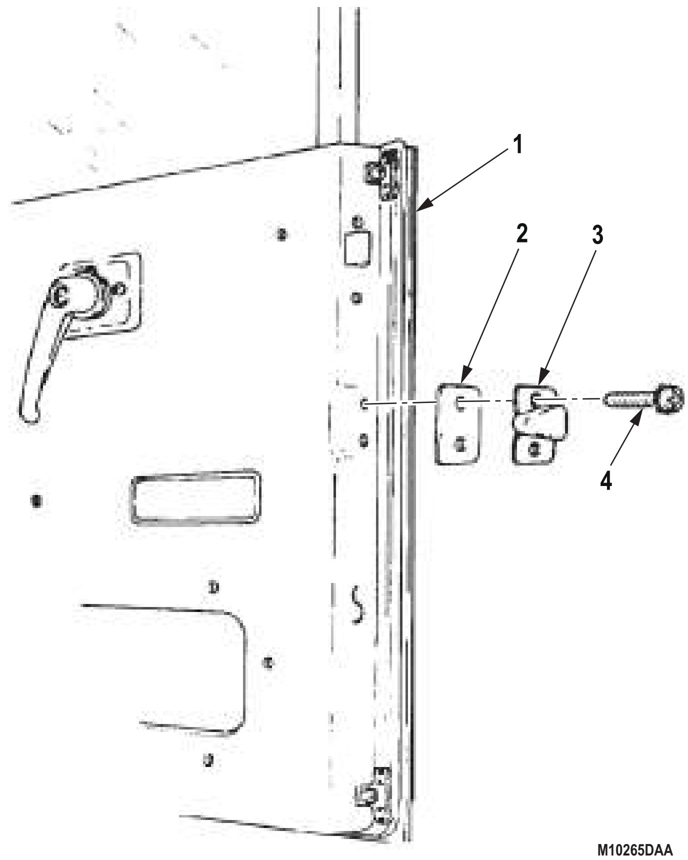


Figure 2. Cab Door Dovetail Wedge Installation.

END OF TASK

FOLLOW-ON MAINTENANCE

Check cab door for proper operation. (TM 9-2320-272-10)

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
CAB DOOR DOVETAIL REPLACEMENT

INITIAL SETUP:

Tools and Special Tools
Tool Kit, General Mechanic's: Automotive
(Volume 5, WP 0826, Table 1, Item 56)

Equipment Condition
Parking brake set. (TM 9-2320-272-10)

REMOVAL

Remove dovetail (Figure 1, Item 3) and spring (Figure 1, Item 4) from door post (Figure 1, Item 1) by inserting screwdriver in notch (Figure 1, Item 2) at end of dovetail (Figure 1, Item 3) and push in and up.

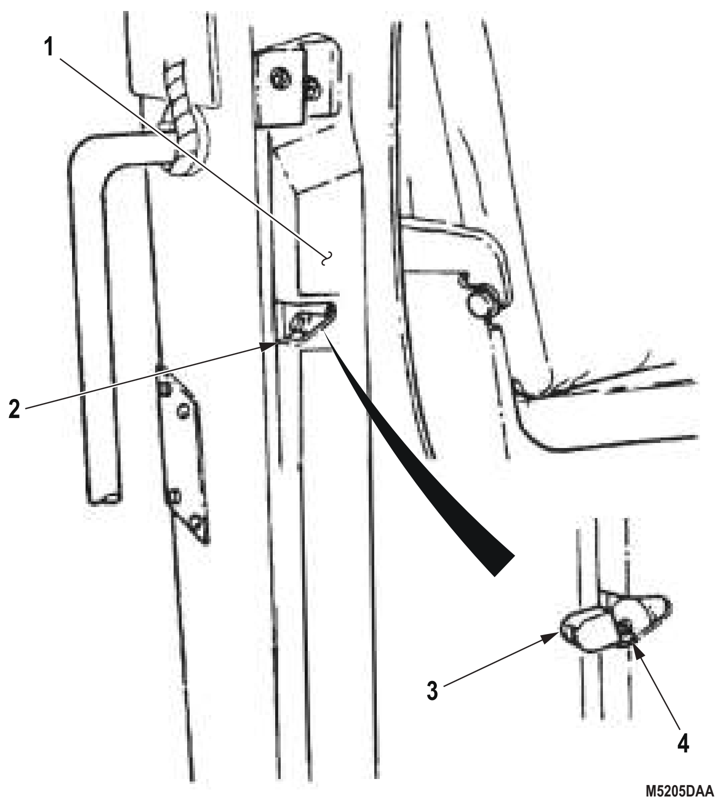


Figure 1. Cab Door Dovetail Removal.

END OF TASK

INSTALLATION

Install spring (Figure 2, Item 4) and dovetail (Figure 2, Item 3) in door post (Figure 2, Item 1) by inserting screwdriver in notch (Figure 2, Item 2) of dovetail (Figure 2, Item 3) and pushing down. Release pressure to snap dovetail (Figure 2, Item 3) in place.

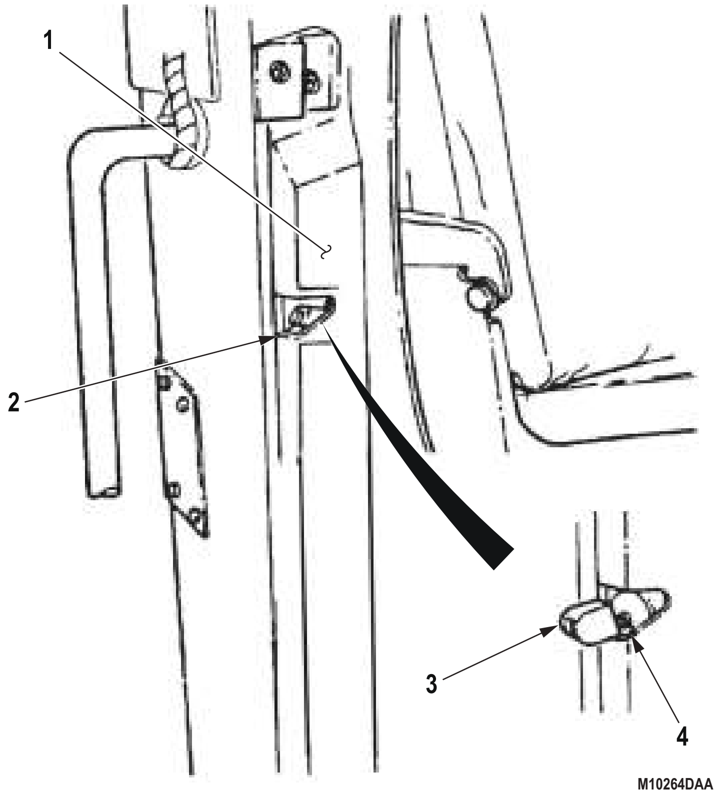


Figure 2. Cab Door Dovetail Installation.

END OF TASK

FOLLOW-ON MAINTENANCE

Check cab door for proper operation. (TM 9-2320-272-10)

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
CAB DOOR WEATHER SEAL REPLACEMENT

INITIAL SETUP:

Tools and Special Tools
Tool Kit, General Mechanic's: Automotive
(Volume 5, WP 0826, Table 1, Item 56)

Equipment Condition
Parking brake set. (TM 9-2320-272-10)

Materials/Parts
Adhesive, Silicone Rubber
(Volume 5, WP 0825, Table 1, Item 2)

REMOVAL

1. Remove five screws (Figure 1, Item 3) and retainers (Figure 1, Item 2) from weather seal (Figure 1, Item 4) and door (Figure 1, Item 1).
2. Remove two weather seals (Figure 1, Items 4 and 5) from cab door (Figure 1, Item 1).

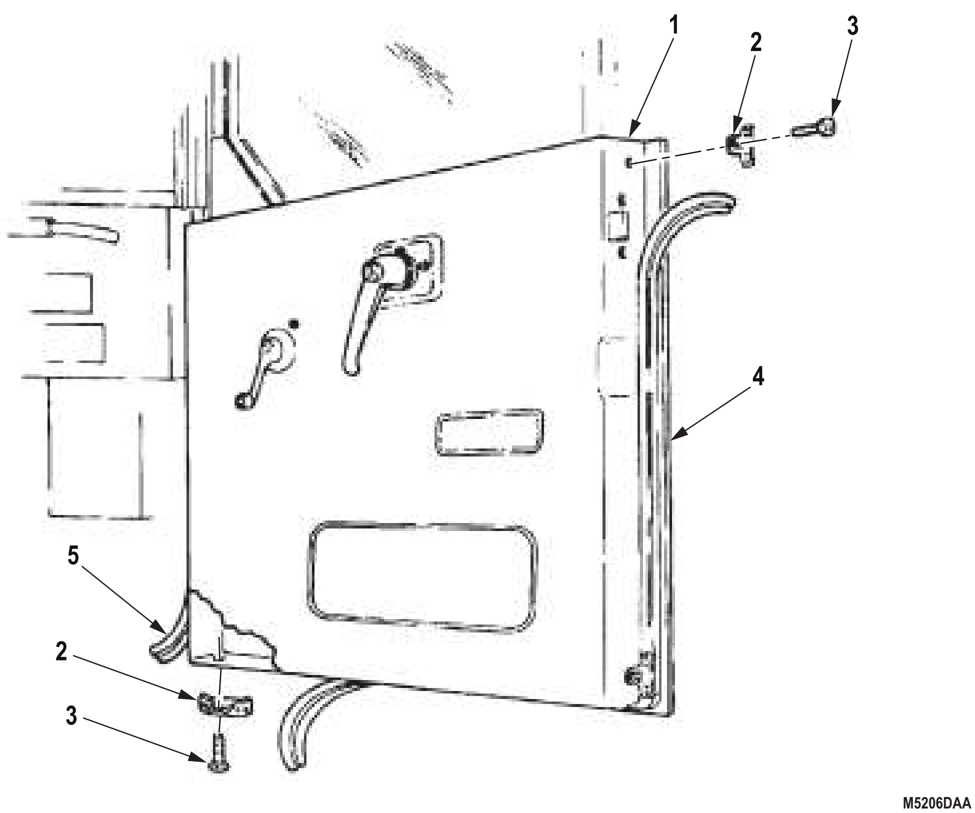


Figure 1. Cab Door Weather Seal Removal.

END OF TASK

INSTALLATION

1. Apply light coat of adhesive to weather seals (Figure 2, Items 4 and 5) and door (Figure 2, Item 1).
2. Position weather seals (Figure 2, Items 4 and 5) in place and install with five retainers (Figure 2, Item 2) and screws (Figure 2, Item 3).
3. Keep door (Figure 2, Item 1) open until adhesive dries.

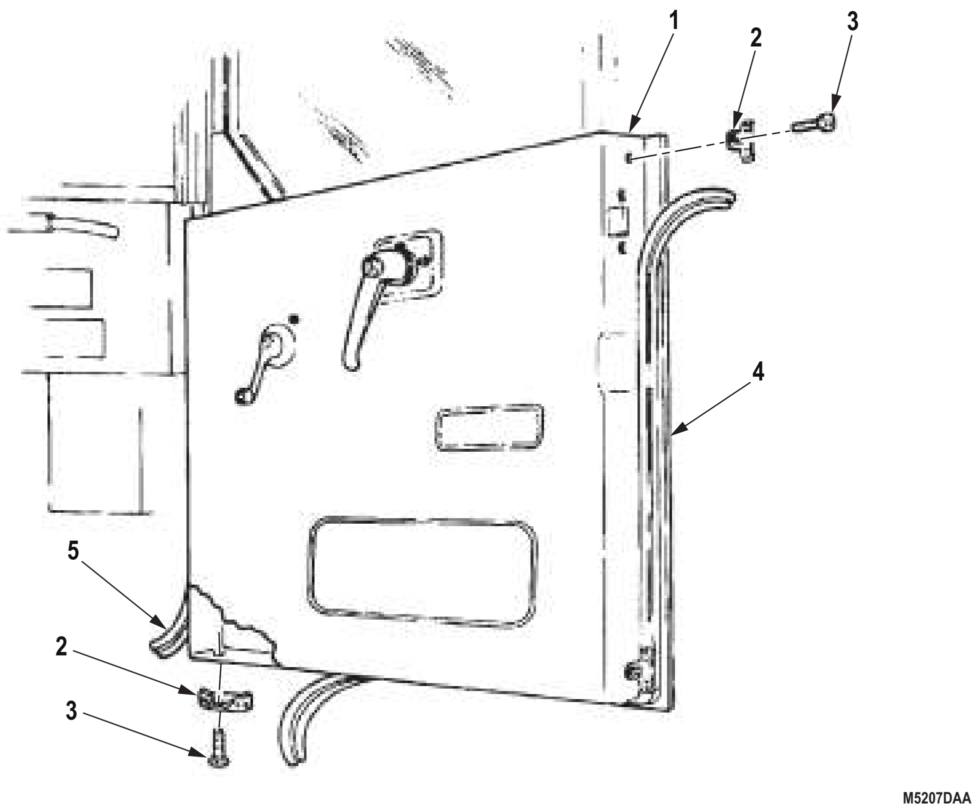


Figure 2. Cab Door Weather Seal Installation.

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
CAB DOOR INSPECTION HOLE COVER REPLACEMENT

INITIAL SETUP:

Tools and Special Tools
Tool Kit, General Mechanic's: Automotive (Volume 5, WP 0826, Table 1, Item 56)

Equipment Condition
Parking brake set. (TM 9-2320-272-10)

REMOVAL

Remove six screws (Figure 1, Item 2) and inspection hole cover (Figure 1, Item 3) from door (Figure 1, Item 1).

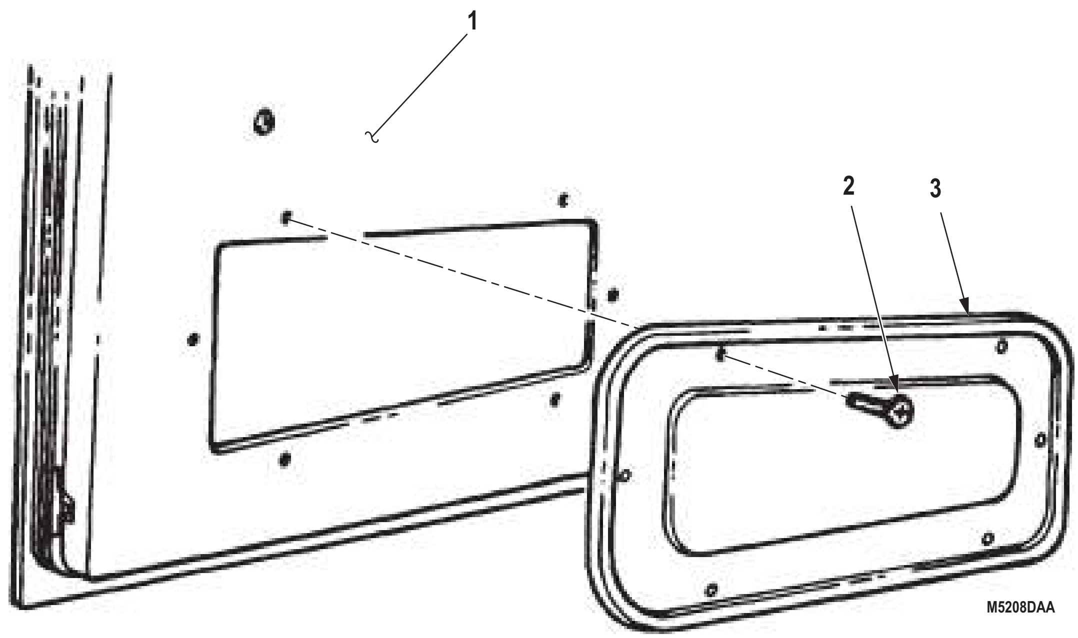


Figure 1. Cab Door Inspection Hole Cover Removal.

END OF TASK

INSTALLATION

Install inspection hole cover (Figure 2, Item 3) on door (Figure 2, Item 1) with six screws (Figure 2, Item 2).

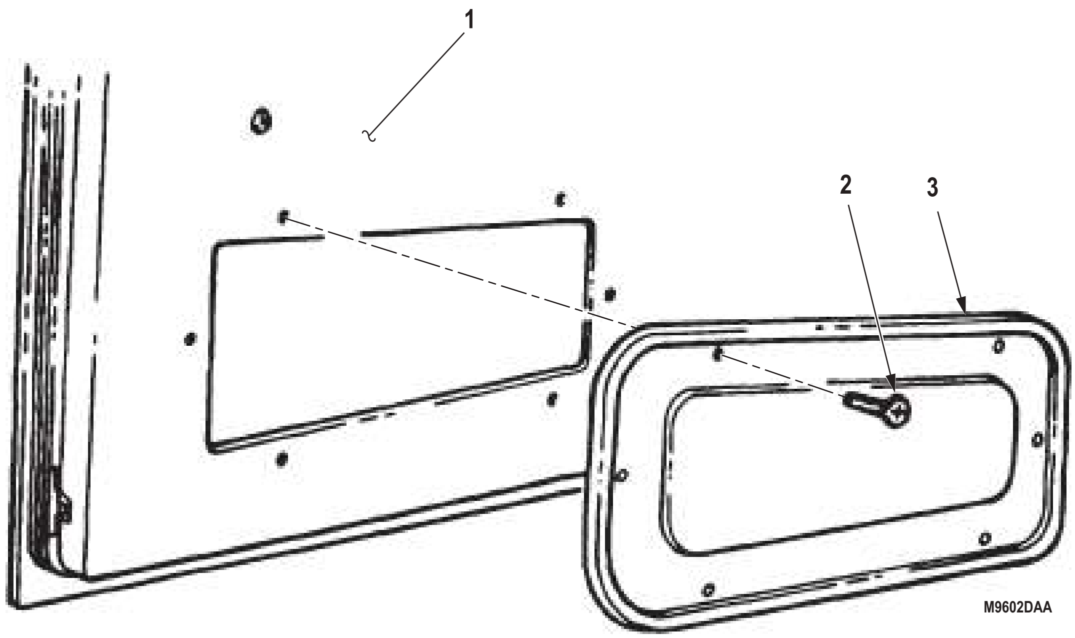


Figure 2. Cab Door Inspection Hole Cover Installation.

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
CAB DOOR LOCK REPLACEMENT

INITIAL SETUP:

Tools and Special Tools
Tool Kit, General Mechanic's: Automotive
(Volume 5, WP 0826, Table 1, Item 56)

Materials/Parts
Screw Assembled Lockwasher
(Volume 5, WP 0827, Table 1, Item 172)
Qty: 6

Equipment Condition
Parking brake set. (TM 9-2320-272-10)

Equipment Condition (cont.)
Outside door handle removed. (WP 0546)
Cab door inspection hole cover removed. (WP 0550)
Inside door handle removed. (Volume 4, WP 0608)

REMOVAL

1. Remove three screw assembled lockwashers (Figure 1, Item 2) from cab door (Figure 1, Item 3). Discard screw assembled lockwashers.
2. Remove three screw assembled lockwashers (Figure 1, Item 1) from cab door (Figure 1, Item 3). Discard screw assembled lockwashers.
3. Remove door lock assembly (Figure 1, Item 4) through door inspection hole (Figure 1, Item 5).

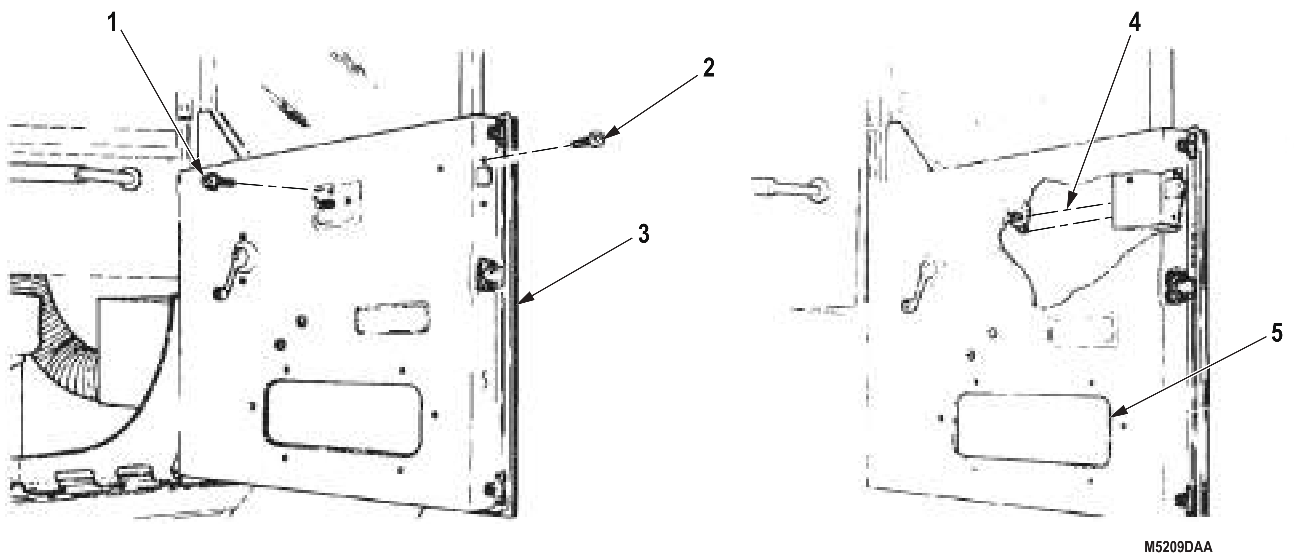


Figure 1. Cab Door Lock Removal.

END OF TASK

INSTALLATION

1. Position door lock assembly (Figure 2, Item 6) with latch (Figure 2, Item 7) inserted through hole (Figure 2, Item 8) in cab door (Figure 2, Item 3) and lock shaft (Figure 2, Item 5) through inner door panel (Figure 2, Item 4).
2. Install door lock assembly (Figure 2, Item 6) on cab door (Figure 2, Item 3) with three screw assembled lockwashers (Figure 2, Items 1 and 2).

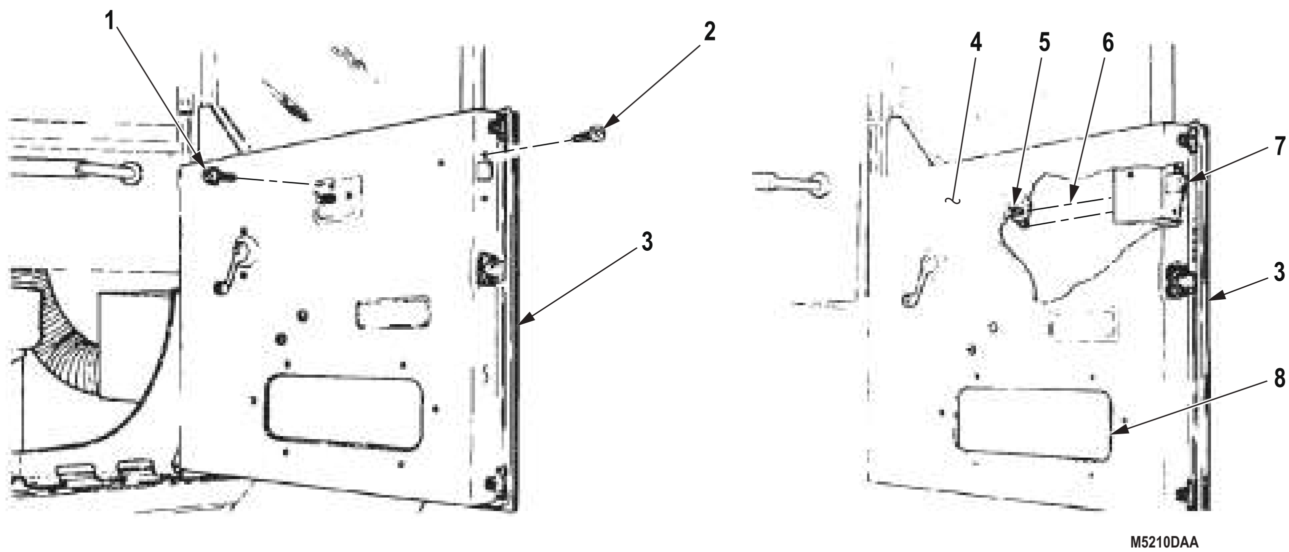


Figure 2. Cab Door Lock Installation.

END OF TASK

FOLLOW-ON MAINTENANCE

1. Install door inspection hole cover. (WP 0550)
2. Install outside door handle. (WP 0546)
3. Install inside door handle. (Volume 4, WP 0608)
4. Check cab door lock for proper operation. (TM 9-2320-272-10)

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
CAB DOOR GLASS REPLACEMENT

INITIAL SETUP:

Tools and Special Tools
Tool Kit, General Mechanic's: Automotive
(Volume 5, WP 0826, Table 1, Item 56)

Materials/Parts
Fastener
(Volume 5, WP 0827, Table 1, Item 225)
Qty: 2
Lockwasher

Materials/Parts (cont.)
(Volume 5, WP 0827, Table 1, Item 391)
Qty: 4

Equipment Condition
Parking brake set. (TM 9-2320-272-10)
Cab door inspection hole cover removed.
(WP 0550)

REMOVAL

1. Position door glass (Figure 1, Item 7) in cab door (Figure 1, Item 4) so regulator channel (Figure 1, Item 6) is accessible through door inspection hole (Figure 1, Item 5) on cab door (Figure 1, Item 4).
2. Remove four screws (Figure 1, Item 1), lockwashers (Figure 1, Item 2), and two window regulator stop brackets (Figure 1, Item 3) from regulator channel (Figure 1, Item 6). Discard lockwashers.
3. Remove two fasteners (Figure 1, Item 8) and arm studs (Figure 1, Item 9) from regulator channel (Figure 1, Item 6). Discard fasteners.
4. Pull door glass (Figure 1, Item 7) up and out of cab door (Figure 1, Item 4).

REMOVAL - Continued

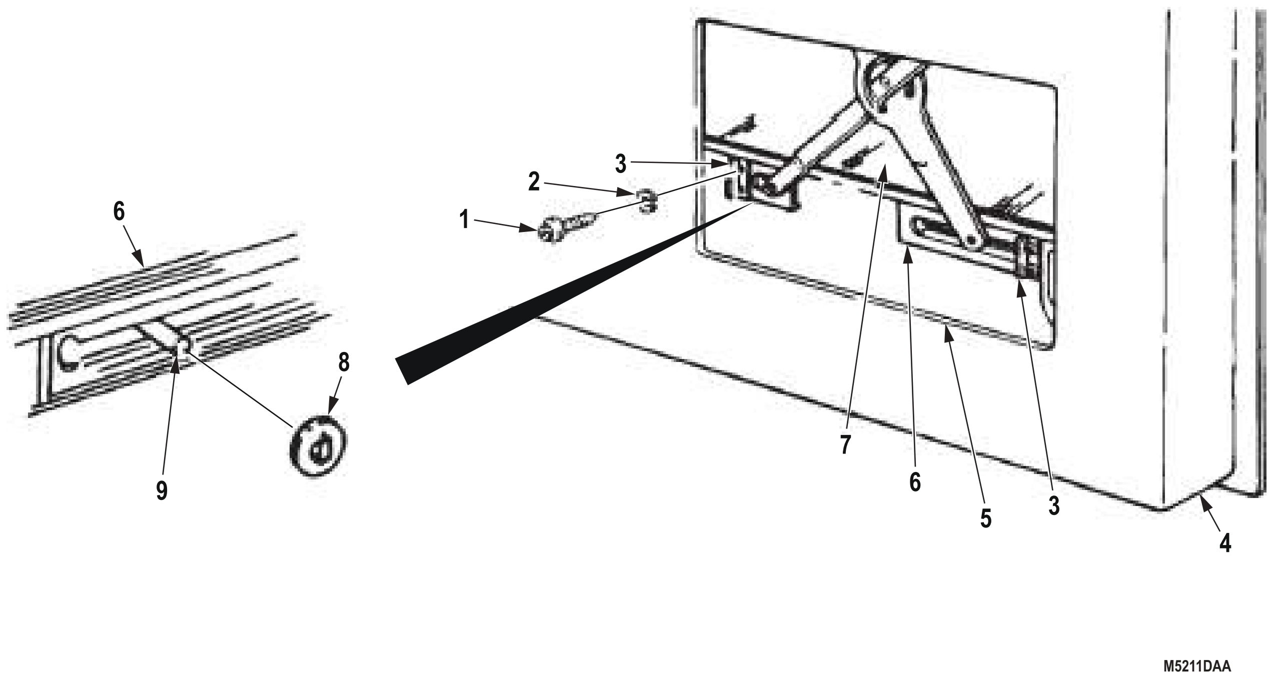
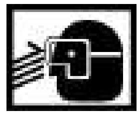


Figure 1. Cab Door Glass Removal.

END OF TASK

DISASSEMBLY

WARNING



Use eyeshields when replacing glass. Glass could shatter. Failure to comply may result in injury or death to personnel.

1. Remove four screws (Figure 2, Item 3), regulator channel (Figure 2, Item 4), regulator channel filler (Figure 2, Item 5), and regulator channel seal (Figure 2, Item 6) from frame (Figure 2, Item 2). Discard regulator channel filler and regulator channel seal.
2. Carefully slide glass (Figure 2, Item 7) from frame (Figure 2, Item 2).
3. Remove frame seal (Figure 2, Item 1) from frame (Figure 2, Item 2). Discard frame seal.

DISASSEMBLY - Continued

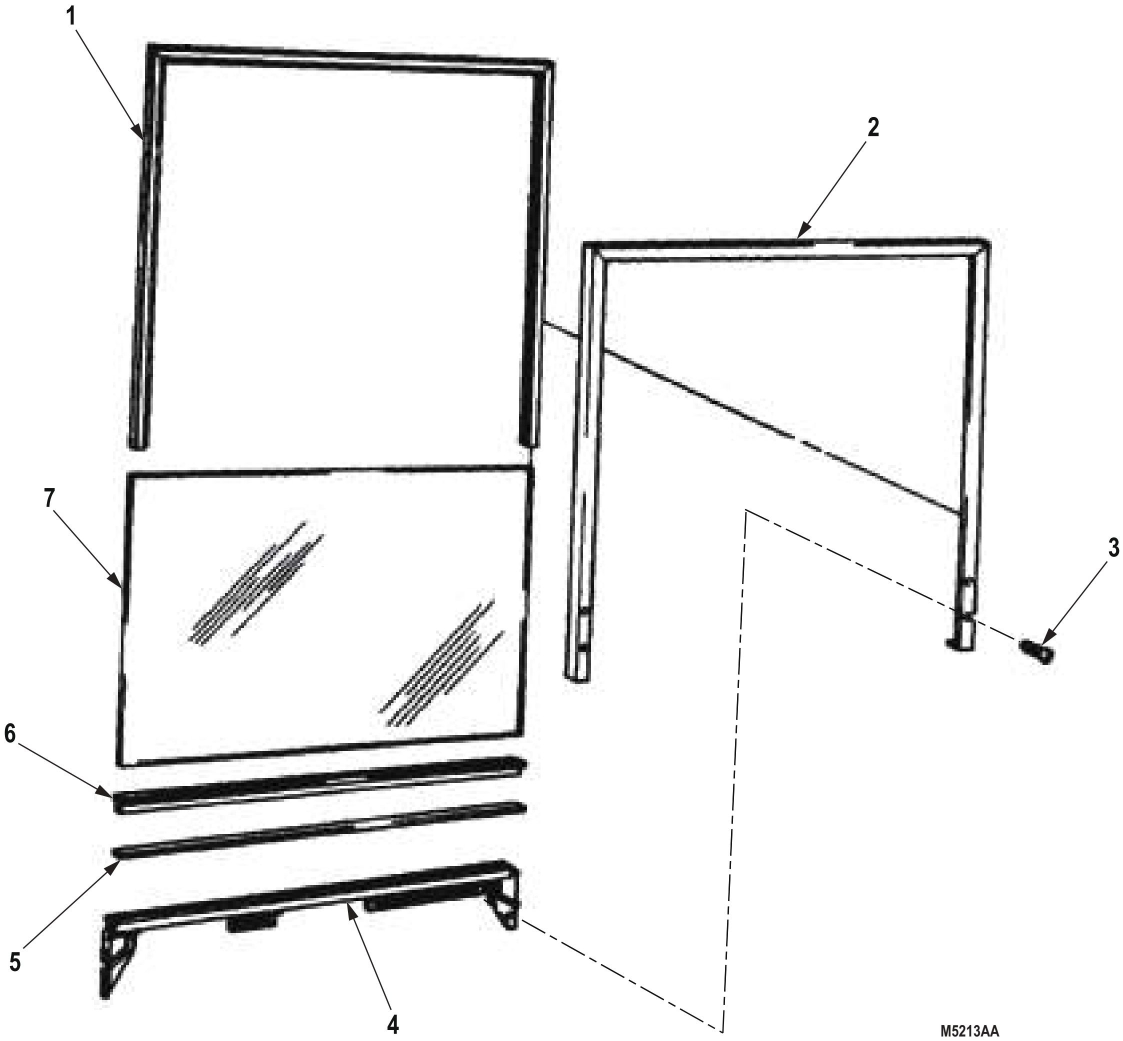


Figure 2. Cab Door Glass Disassembly.

END OF TASK

ASSEMBLY

1. Position frame seal (Figure 3, Item 1) on top and sides of glass (Figure 3, Item 7).
2. Position glass (Figure 3, Item 7) with frame seal (Figure 1, Item 1) in frame (Figure 1, Item 2).
3. Install regulator channel seal (Figure 3, Item 6), regulator channel filler (Figure 3, Item 5), and regulator channel (Figure 3, Item 4) on glass (Figure 3, Item 7) and frame (Figure 3, Item 2) with four screws (Figure 3, Item 3).

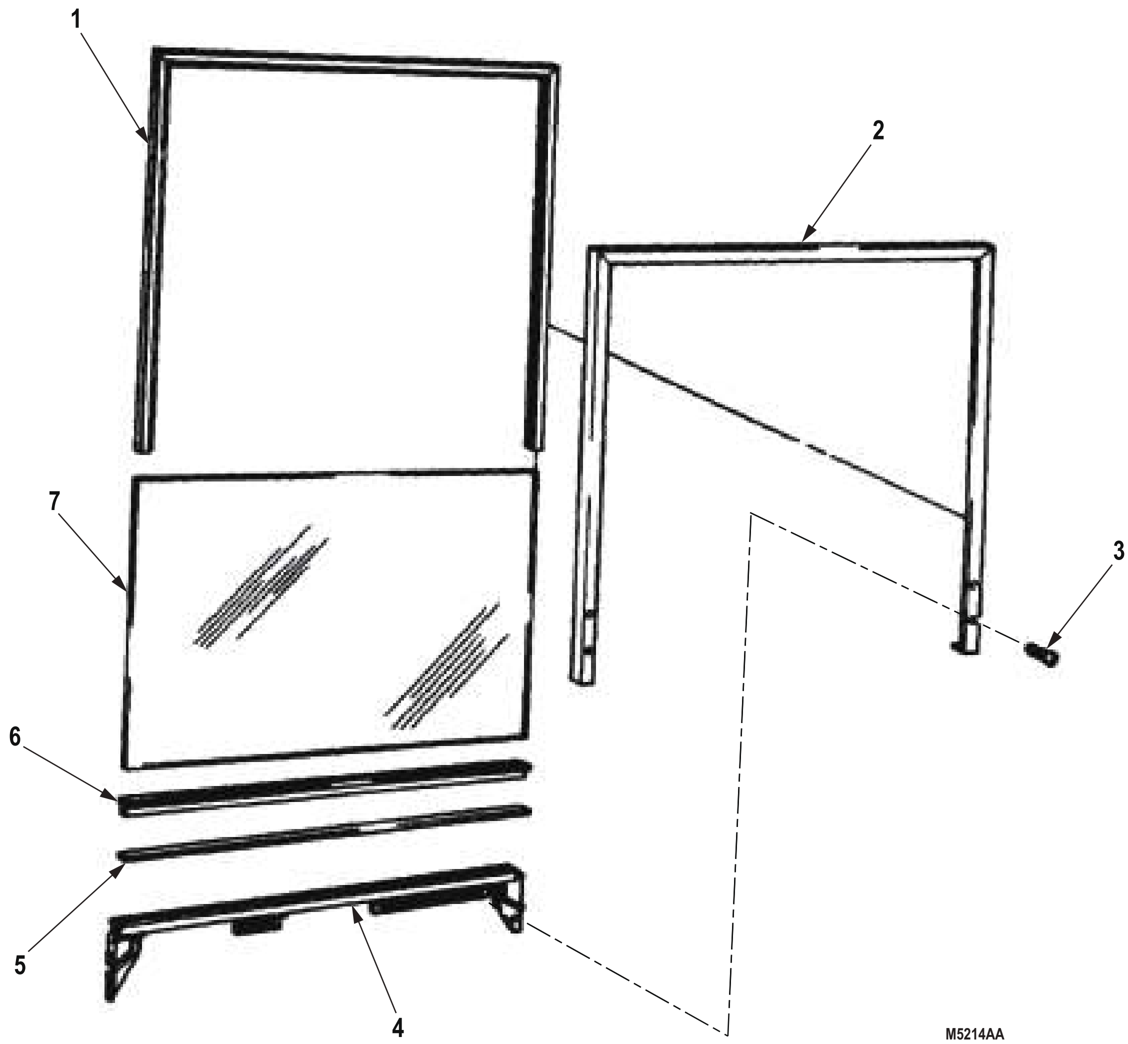


Figure 3. Cab Door Glass Assembly.

END OF TASK

INSTALLATION

1. Position door glass (Figure 4, Item 7) in cab door (Figure 4, Item 4) so regulator channel (Figure 4, Item 6) is accessible through door inspection hole (Figure 4, Item 5).
2. Place two window regulator arm studs (Figure 4, Item 9) in regulator channel (Figure 4, Item 6) and install with two fasteners (Figure 4, Item 8).
3. Install two window regulator stop brackets (Figure 4, Item 3) on regulator channel (Figure 4, Item 6) with four lockwashers (Figure 4, Item 2) and screws (Figure 4, Item 1).

NOTE

If adjustment is not required, skip Steps (4) and (5).

4. To adjust, raise door glass (Figure 4, Item 7) to full up position.
5. Lower door glass (Figure 4, Item 7) and tighten four screws (Figure 4, Item 1).

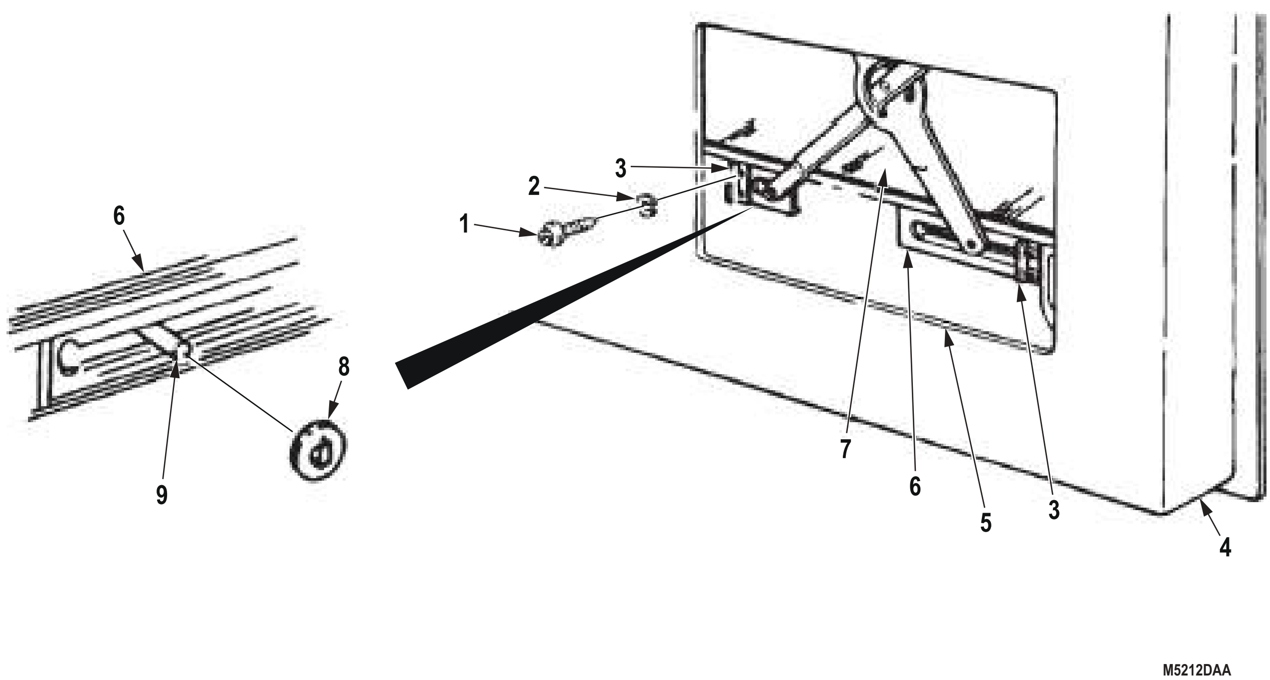


Figure 4. Cab Door Glass Installation.

END OF TASK

FOLLOW-ON MAINTENANCE

Install cab door inspection hole cover. (WP 0550)

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
WINDOW WEATHER STRIPPING (CAB DOOR) REPLACEMENT

INITIAL SETUP:

Tools and Special Tools
Tool Kit, General Mechanic's: Automotive
(Volume 5, WP 0826, Table 1, Item 56)

Materials/Parts
Rivet (Volume 5, WP 0827, Table 1, Item 303)
Qty: 2

Equipment Condition
Parking brake set. (TM 9-2320-272-10)
Cab door glass removed. (WP 0552)

REMOVAL

1. Remove screw (Figure 1, Item 6) and channel (Figure 1, Item 4) from cab door (Figure 1, Item 5).
2. Remove rivet (Figure 1, Item 1) and channel (Figure 1, Item 2) from cab door (Figure 1, Item 5). Discard rivet.
3. Remove weather stripping (Figure 1, Item 3) from cab door (Figure 1, Item 5).

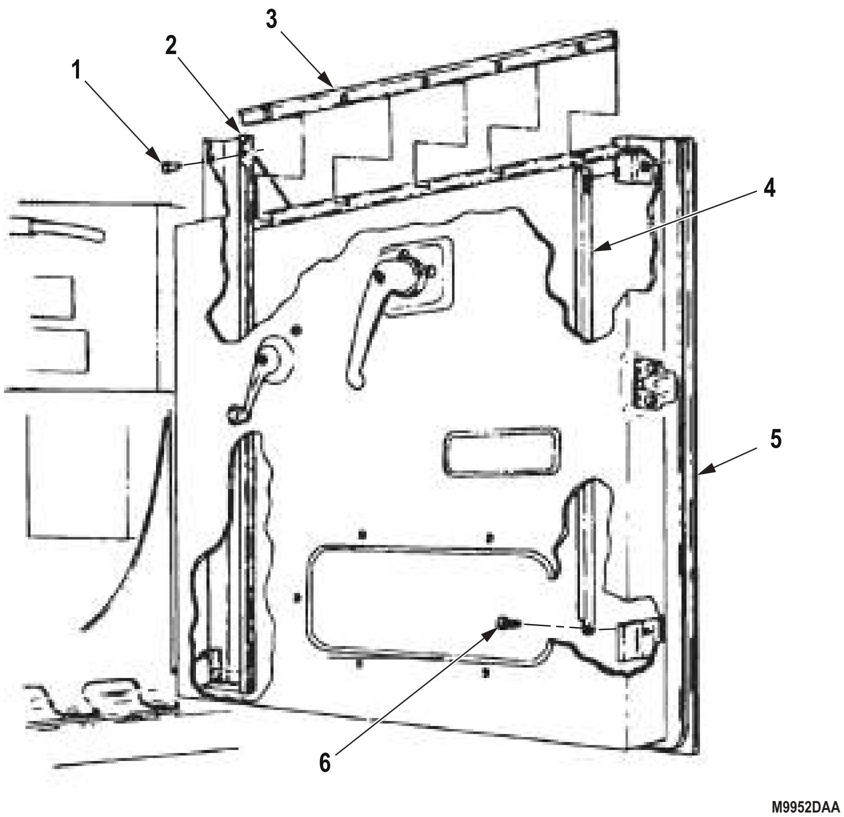


Figure 1. Window Weather Stripping Removal.

END OF TASK

INSTALLATION

1. Position weather stripping (Figure 2, Item 3) on cab door (Figure 2, Item 5).
2. Install channels (Figure 2, Items 2 and 4) with screw (Figure 2, Item 6) and rivet (Figure 2, Item 1).

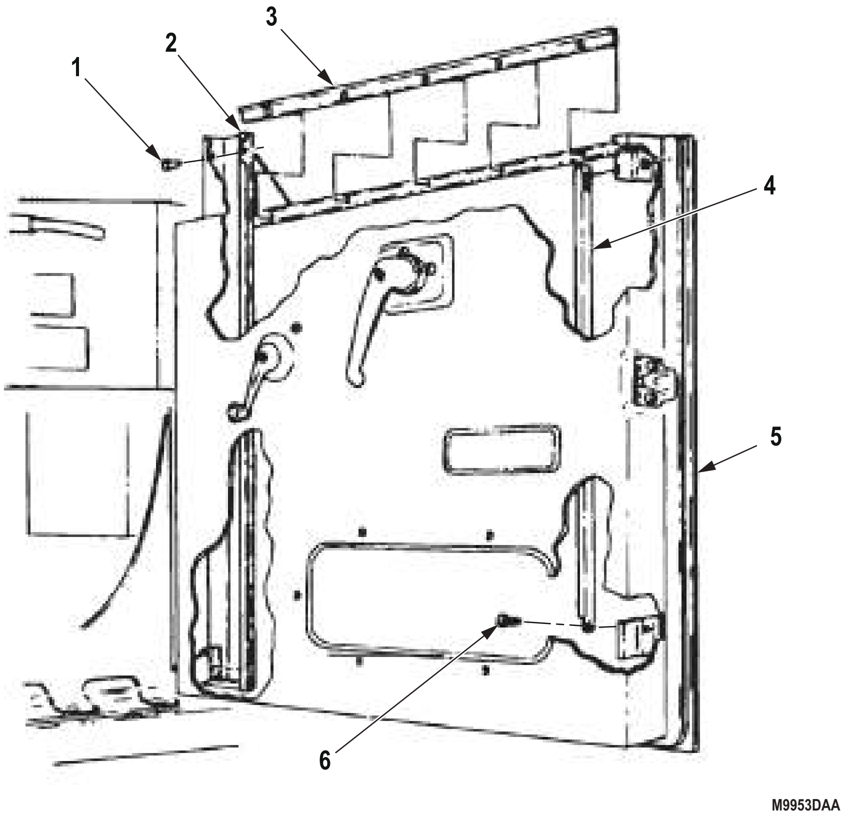


Figure 2. Window Weather Stripping Installation.

END OF TASK

FOLLOW-ON MAINTENANCE

Install cab door glass. (WP 0552)

END OF TASK

END OF WORK PACKAGE

INDEX

Subject — **WP Sequence No.-Page No.**

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TO *(Forward to proponent of publication or form) (Include ZIP Code)*	**FROM** *(Activity and location) (Include ZIP Code)*
U.S. Army TACOM Life Cycle Management Command ATTN: AMSTA-LCL-MPP/TECH PUBS 6501 E. 11 Mile Road, Warren, MI 48397-5000	*Your mailing address*

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TM Number	*Date of the TM*	*Title of the TM*

ITEM	PAGE	PARA-GRAPH	LINE	FIGURE NO.	TABLE	RECOMMENDED CHANGES AND REASON (Exact wording of recommended change must be given)
	0007-3					*Figure 2, Item 9 should show a lockwasher. Currently shows a flat washer.*
	0018-2					*Cleaning and inspection, Step 6, reference to governor support pin (14) is wrong reference. Reference should be change to (12).*

SAMPLE

TYPED NAME, GRADE OR TITLE	TELEPHONE EXCHANGE/AUTOVON, PLUS EXTENSION	SIGNATURE
Your Name	*Your Phone Number*	*Your Signature*

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PAGE NO.	COLM NO.	LINE NO.	NATIONAL STOCK NUMBER	REFERENCE NO.	FIGURE NO.	ITEM NO.	TOTAL NO. OF MAJOR ITEMS SUPPORTED	RECOMMENDED ACTION

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APD V4.00

By Order of the Secretary of the Army:

RAYMOND T. ODIERNO
General, United States Army
Chief of Staff

Official:

Joyce E. Morrow

JOYCE E. MORROW
Administrative Assistant to the
Secretary of the Army
1220211

By Order of the Secretary of the Air Force:

DONALD J. HOFFMAN
General, United States Air Force
Commander, AFMC

NORTON A. SCHWARTZ
General, United States Air Force
Chief of Staff

Distribution:

To be distributed in accordance with the initial distribution number (IDN) 386968 requirements for TM 9-2320-272-23-3 .

THE METRIC SYSTEM AND EQUIVALENTS

LINEAR MEASURE

1 Centimeter=10 Millimeters=0.01 Meters=0.3937 Inches
1 Meter=100 Centimeters=1000 Millimeters=39.37 Inches
1 Kilometer=1000 Meters=0.621 Miles

WEIGHTS

1 Gram=0.001 Kilograms=1000 Milligrams=0.035 Ounces
1 Kilogram=1000 Grams=2.2 Lb
1 Metric Ton=1000 Kilograms=1 Megagram=1.1 Short Tons

LIQUID MEASURE

1 Milliliter=0.001 Liters=0.0338 Fluid Ounces
1 Liter=1000 Milliliters=33.82 Fluid Ounces

SQUARE MEASURE

1 Sq Centimeter=100 Sq Millimeters=0.155 Sq Inches
1 Sq Meter=10,000 Sq Centimeters=10.76 Sq Feet
1 Sq Kilometer=1,000,000 Sq Meters=0.386 Sq Miles

CUBIC MEASURE

1 Cu Centimeter=1000 Cu Millimeters=0.06 Cu Inches
1 Cu Meter=1,000,000 Cu Centimeters=35.31 Cu Feet

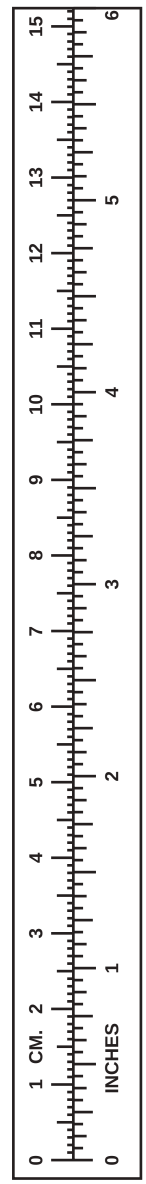
TEMPERATURE

5/9 (°F – 32) = °C
212°Fahrenheit is equivalent to 100°Celsius
90°Fahrenheit is equivalent to 32.2°Celsius
32°Fahrenheit is equivalent to 0°Celsius
9/5 (°C + 32) = °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/Sq 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
Sq Centimeters	Square Inches	0.155
Square Meters	Square Feet	10.764
Square Meters	Square Yards	1.196
Square Kilometers	Square Miles	0.386
Sq 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 Sq Inch	0.145
Km per Liter	Miles per Gallon	2.354
Km per Hour	Miles per Hour	0.621



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