U.S. ARMY TANK-AUTOMOTIVE COMMAND

SUPPLEMENTAL MAINTENANCE AND REPAIR PARTS INSTRUCTIONS

SMARPI 9-2320-209-14&P

SPLIT AIR-HYDRAULIC BRAKE SYSTEM (MODIFIED M44A2 2-1/2 TON SERIES TRUCK)

WARREN, MICHIGAN 48397-5000

WARNING SUMMARY

WARNING

EXHAUST GASES CAN KILL!

WARNING

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

1. Do not operate your vehicle engine in enclosed areas.
2. Do not idle vehicle engine with vehicle windows closed.
3. Be alert at all times for exhaust odors.
4. Be alert for exhaust poisoning symptoms. They are:
   - . headache
   - . dizziness
   - . sleepiness
   - . loss of muscular control
5. If you see another person with exhaust poisoning symptoms:
   - . remove person from area.
   - . expose to open air.
   - . keep person warm.
   - . do not permit physical exercise.
   - . administer artificial respiration, if necessary.*
   - . notify a medic.

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

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

THE BEST DEFENSE AGAINST EXHAUST POISONING IS ADEQUATE VENTILATION.

WARNING

HIGH INTENSITY NOISE

Hearing protection is required for the driver and co-driver. Hearing protection is also required for all personnel working in and around this vehicle while the engine is running (reference AR 40-5 and TB MED 501).

Do not touch hot exhaust pipes with bare hands.

WARNING SUMMARY (Continued)

- Do not let vehicle coast downhill with clutch pedal depressed. Vehicle can go out of control.
- After fording operations, do not rely on service brakes until they dry out.
- Pump brakes gradually when stopping vehicle on wet or slippery roads to avoid losing control of vehicle.
- If Brake Warning Lamp lights while vehicle is operating, parking brake OFF, it is a signal that pressure has been lost in a brake system circuit. Additional brake pedal travel, effort, and stopping distance will occur. Under these conditions, pull safely from the road, park vehicle properly, and call for assistance. If vehicle must be driven, allow at least twice the normal distance for stopping. Advise Organizational Maintenance as soon as possible.
- Compressed air used for cleaning purposes will not exceed 30 PSI. Use only with effective chip guarding and personal protective equipment (goggles/shield, gloves, etc.)
- Dry cleaning solvent P-D-680 is toxic and flammable. Wear protective goggles and gloves and use only in a well-ventilated area. Avoid contact with skin, eyes, and clothes and don't breath vapors. Do not use near open flame or excessive heat. The flash point is 100°F-138°F (38°-50°C). If you become dizzy while using cleaning solvent, get fresh air immediately and get medical aid. If contact with eyes is made, wash you eyes with water and get medical aid immediately.

SUPPLEMENTAL MAINTENANCE AND REPAIR PARTS INSTRUCTIONS

MODIFIED M44A2 2-1/2 TON SERIES TRUCK (M35A2, M35A2C, M36A2, M49A2C, M50A3) SPLIT AIR-HYDRAULIC BRAKE SYSTEM

REPORTING ERRORS AND RECOMMENDING IMPROVEMENTS

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

HOW TO USE THIS MANUAL

ABOUT YOUR MANUAL

a. Spend some time looking through this manual. You'll find that it has a new look, different than most manuals you've been using. New features added to improve convenience of this manual and increase your efficiency are:

(1) ILLUSTRATIONS--Many methods are used to make locating and fixing components much easier. Locator illustrations with keyed text, exploded views, and cut-away diagrams make information in this manual easier to understand.

(2) KEYING TEXT WITH ILLUSTRATIONS--Instructions are located together with figures that illustrate the specific task you are working on. In most cases, task steps and figures are located side by side making part identification and procedure sequence easier to follow.

The SMARPI is a means by which the Army provides soldiers with Supplemental Maintenance and Repair Parts Instructions for unique vehicles. This manual describes in detail: operator, organizational, direct support, and general support maintenance prescribed by the Maintenance Allocation Chart (appendix B) and Source, Maintenance, and Recoverability (SMR) codes.

b. GENERAL FEATURES. Your SMARPI is the best source available for providing the following information and data critical to unique vehicle operation and maintenance characteristics:

- Warning summary (warning page a)
- General information and equipment descriptions (chapter 1)
- Technical principles of operation (chapter 1, section III)
- Operator Preventive Maintenance Checks and Services--PMCS (chapter 2, section II)
- Systems Troubleshooting (chapter 2 and chapter 4, section III)
- Detailed maintenance procedures (chapters 3 through 5)
- Maintenance Allocation Chart--MAC (appendix B)
- Expendable/Durable Supplies and Materials List (appendix E)
- Organizational, Direct Support, and General Support Maintenance Repair Parts and Special Tools List (appendix F)
- Manufactured items (appendix G)
- Torque limits (appendix H)

CHAPTER 1
INTRODUCTION

SECTION I. GENERAL INFORMATION

1-1. SCOPE

a. This manual contains instructions for operating and servicing modified M44A2 2-1/2 Ton series trucks with a split air-hydraulic brake system.

b. The material presented here provides operators and maintenance personnel with information and procedures needed to provide the safest and most efficient operation and servicing of these vehicles. This information includes:

(1) Vehicle limitations.

(2) The function of unique controls.

(3) Unique operation instructions for vehicle.

(4) Cautions and warnings to operators regarding safety to personnel and equipment.

(5) Operator and organizational maintenance checks and services.

(6) Troubleshooting procedures to be followed by operators and organizational maintenance personnel if the vehicle malfunctions.

(7) Repair procedures to be followed by organizational, direct support, and general support maintenance personnel.

1-2. MAINTENANCE FORMS AND RECORDS

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

1-3. REPORTING EQUIPMENT IMPROVEMENT RECOMMENDATIONS (EIR)

If your modified M44A2 series truck needs improvement, let us know. Send us an EIR. You, the user, are the only one who can tell us what you don't like about your equipment. Let us know why you don't like the design or performance. Put it on an SF 368 (Quality Deficiency Report). Mail it to us at: Commander, U.S. Army Tank-Automotive Command, ATTN: AMSTA-Q, Warren, Michigan 48397-5000. We'll send you a reply.

1-4. PREPARATION FOR STORAGE AND SHIPMENT

Refer to TM 740-90-1, Administrative Storage of Equipment and TM 746-10, Marking, Packaging and Shipment of Supplies and Equipment: General Packaging Instructions for Field Use.

1-9. COMPONENT DESCRIPTION (Contd)

4. Brake warning lamp added to instrument panel.

5. New air and hydraulic routing (lines, tubes, fittings, valves) and wiring to facilitate interconnection of component items 1 thru 4.

* Additional information on related components may be found in TM9-2320-209-10,-20, and -34 series manuals.

Section III. TECHNICAL PRINCIPLES OF OPERATION

1-10. GENERAL

a. This section explains how the split air-hydraulic brake system on modified M44A2 2-1/2 Ton series trucks operates.

b. Refer to applicable paragraphs of this manual for further detailed instructions on the new brake system.

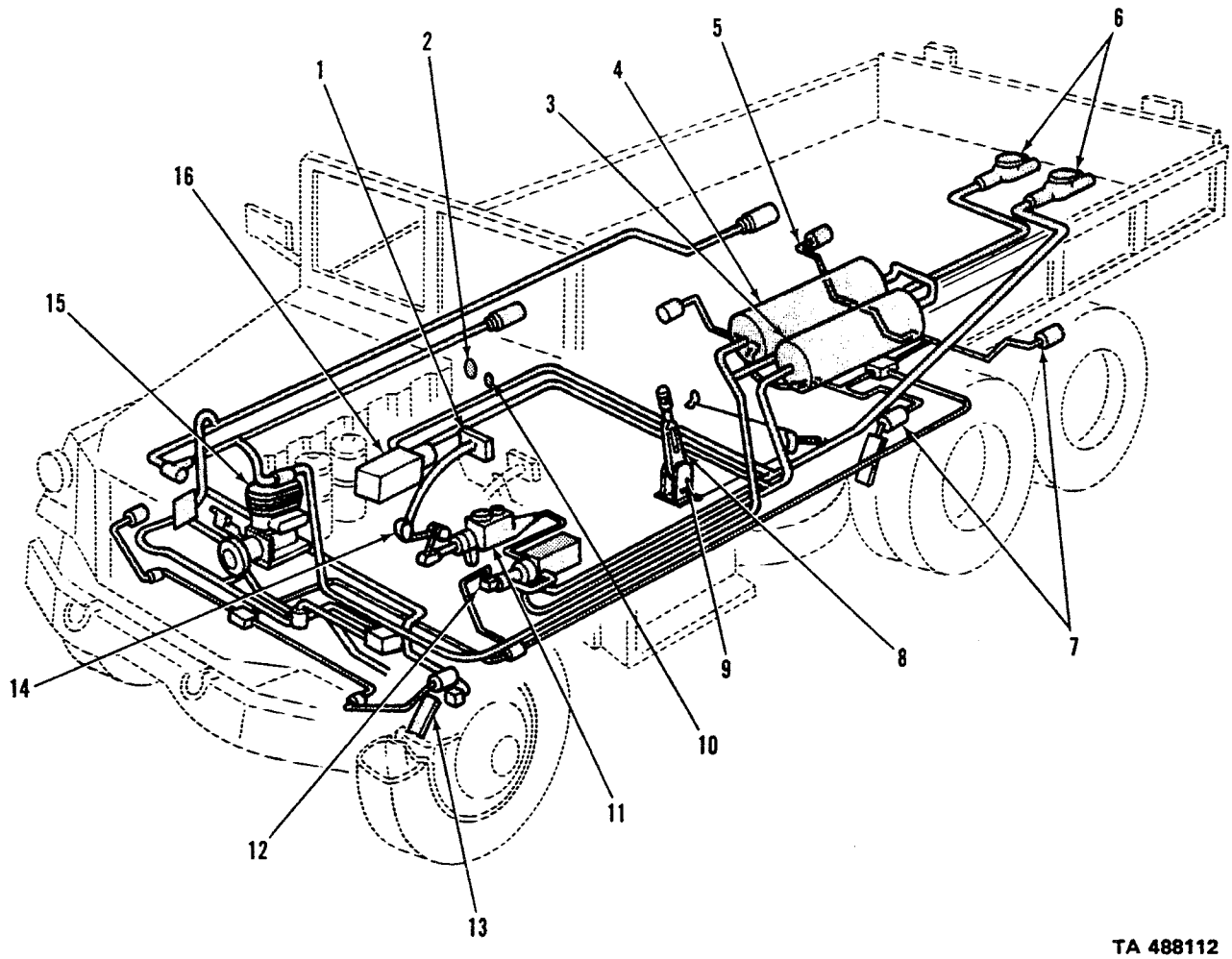
1-11. SPLIT AIR-HYDRAULIC BRAKE SYSTEM OPERATION

a. The split air-hydraulic brake system on modified M44A2 series trucks provides two independent air and hydraulic systems for actuation of the truck service brakes. One system actuates the front steering axle brakes, while the second system actuates the forward-rear and rear-rear axle brakes.

b. With the split system, under normal conditions, the two systems work together, actuating all six service brake positions concurrently as the brake pedal is depressed. The operator will notice no difference in brake actuation, "feel," or stopping distance compared to a single brake system.

c. Under unusual conditions, if one brake system fails and air or hydraulic pressure is lost, the second brake system will still function. This will allow the truck to be brought to a controlled stop. If a brake system fails, the instrument panel mounted brake warning lamp will light and the operator will experience increased brake pedal effort and stopping distance.

1-12. BRAKE SYSTEM COMPONENT LOCATION



1. Brake pedal
2. Air Pressure Gage
3. Dual Chamber Air Reservoir
4. Single Chamber Air Reservoir
5. Brake Hydraulic Lines
6. Trailer Brake Connection
7. Brake Hydraulic Wheel Cylinder
8. Park/Hand Brake Lever
*9. Park Brake Warning Switch
*10. Brake Warning Light
*11. Dual System/Reservoir Hydraulic Master Cylinder
12. Air-Hydraulic Booster-LH
13. Service Brake Shoe
*14. Brake Pedal Linkage
15. Air Compressor
*16. Air-Hydraulic Booster-RH

* Denotes new components required for split brake system.

CHAPTER 2

OPERATING INSTRUCTIONS

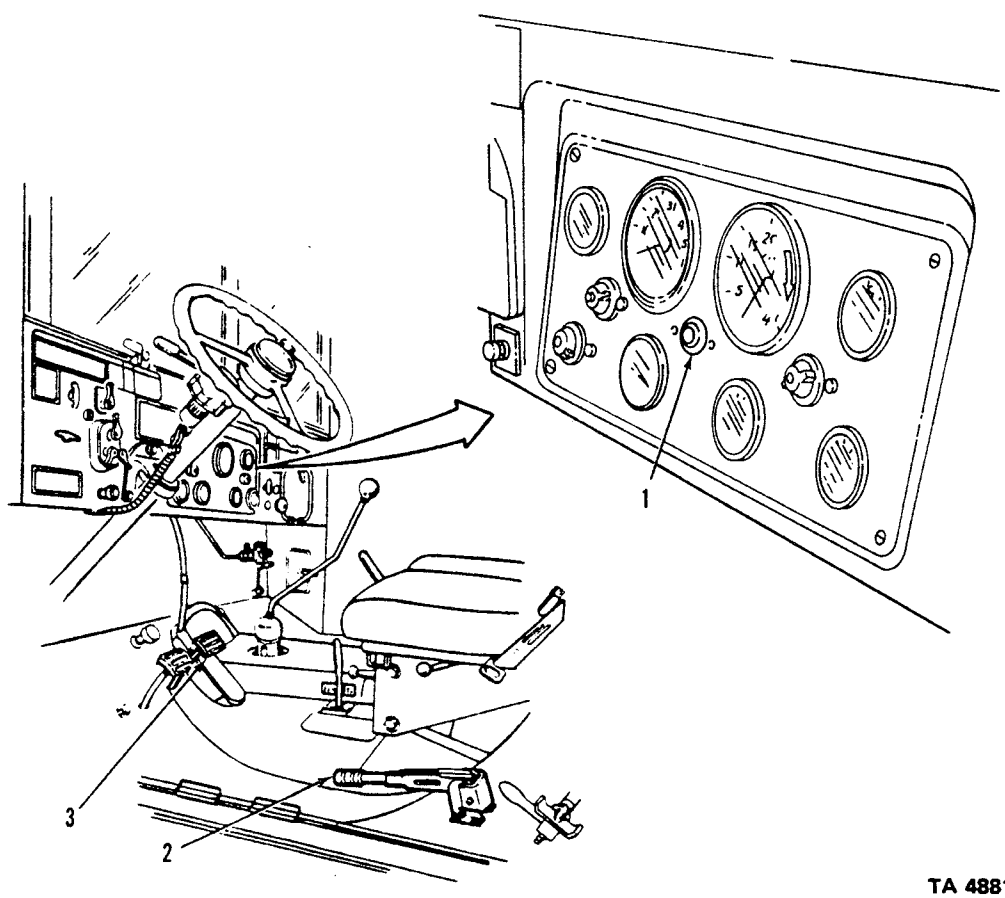
SECTION 1. DESCRIPTION AND USE OF OPERATOR CONTROLS

Key Item and Function

1. BRAKE WARNING LAMP - With engine running, this red lamp will light to alert the operator if the parking/hand brake is engaged, or if either service brake system loses normal pressure.

2. PARKING/HAND BRAKE SWITCH - If lever is in the engaged position and engine is operating, this switch will light the brake warning lamp.

3. SERVICE BRAKE PEDAL - If either service brake system loses pressure when pedal is depressed, with engine running, brake warning lamp will light.



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SECTION II. OPERATOR PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS)

Preventive maintenance checks and services found in this manual are in addition to those found in TM9-2320-209-10-2. All information related to PMCS found in TM9-2320-209-10-2 should be read carefully before proceeding with PMCS procedures found in this manual.

Table 2-1. Operator/Crew Preventive Maintenance Checks and Services

NOTE: These checks are to be made in the order listed, within designated interval.

B-Before operation D-During operation A-After operation W-Weekly M-Monthly

ITEM NO.	INTERVAL B	D	A	W	M	ITEM TO BE INSPECTED PROCEDURE: Check for and have repaired, filled, or adjusted as needed.	FOR READINESS REPORTING EQUIPMENT IS NOT READY/ AVAILABLE IF:
						NOTE: Perform the PMCS in TM9-2320-209-10-2 before starting these PMCS.	
						INTERIOR	
1						With engine running, transmission in neutral, check brake warning lamp operation as follows:	
	•					a. Brake warning lamp (1) lights when park/hand brake lever (2) is pulled up and back to the engaged position.	Brake warning lamp does not light.
	•					b. Brake warning lamp (1) goes off when park/hand brake lever (2) is pushed forward and down to the disengaged position.	Brake warning lamp does not go off.
	•					c. With park/hand brake lever (2) disengaged, apply pressure to service brake pedal (3), brake warning lamp (1) should remain OFF.	Brake warning lamp lights.

Table 2-1. Operator/Crew Preventive Maintenance Checks and Services (Continued)

NOTE: These checks are to be made in the order listed, within designated interval.

B-Before operation D-During operation A-After operation W-Weekly M-Monthly

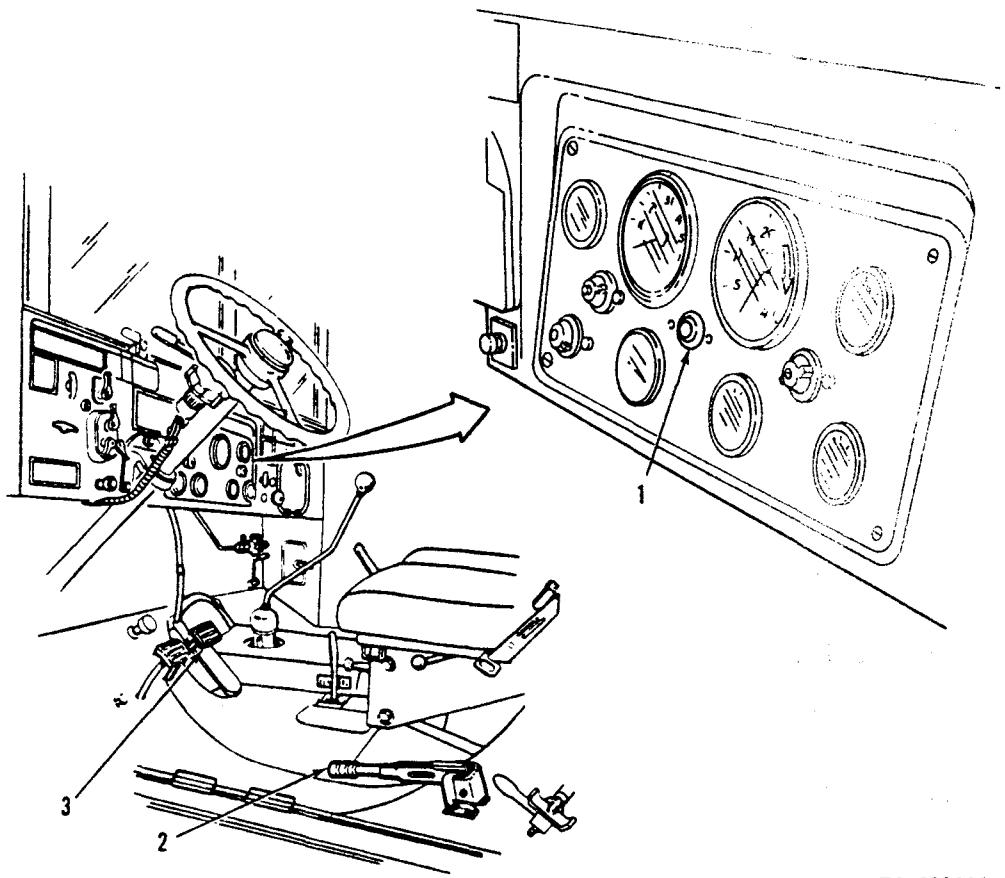
ITEM NO.	INTERVAL B	D	A	W	M	ITEM TO BE INSPECTED PROCEDURE: Check for and have repaired, filled, or adjusted as needed.	FOR READINESS REPORTING EQUIPMENT IS NOT READY/ AVAILABLE IF:
						INTERIOR (Continued)	
						 TA 488114	
2	•					Brake hydraulic master cylinder reservoir level: a. Open cab floor access door (1). b. Clean dirt from area and remove filler cap (2).	Silicone brake fluid level low.

Table 2-1. Operator/Crew Preventive Maintenance Checks and Services (Continued)

NOTE: These checks are to be made in the order listed, within designated interval.

B-Before operation D-During operation A-After operation W-Weekly M-Monthly

ITEM NO.	INTERVAL B	D	A	W	M	ITEM TO BE INSPECTED PROCEDURE: Check for and have repaired, filled, or adjusted as needed.	FOR READINESS REPORTING EQUIPMENT IS NOT READY/ AVAILABLE IF:
2	•					INTERIOR (Continued) c. After fluid level check, screw on filler cap (2) and close access door (1).	

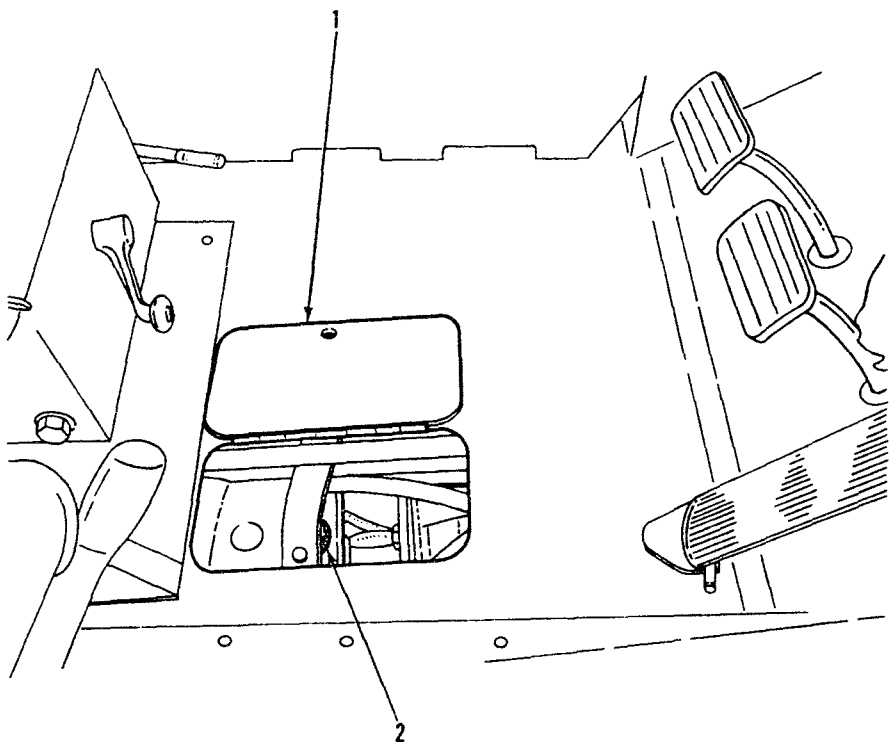


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Table 2-1. Operator/Crew Preventive Maintenance Checks and Services (Continued)

NOTE: These checks are to be made in the order listed, within designated interval.

B-Before operation D-During operation A-After operation W-Weekly M-Monthly

ITEM NO.	INTERVAL B	D	A	W	M	ITEM TO BE INSPECTED PROCEDURE: Check for and have repaired, filled, or adjusted as needed.	FOR READINESS REPORTING EQUIPMENT IS NOT READY/ AVAILABLE IF:
3	•		•			EXTERIOR Drain air reservoirs as follows: a. Turn petcocks (1) on bottom of tanks (2) to opened position. b. Let air and condensation drain off. c. Turn petcocks (1) to closed position.	

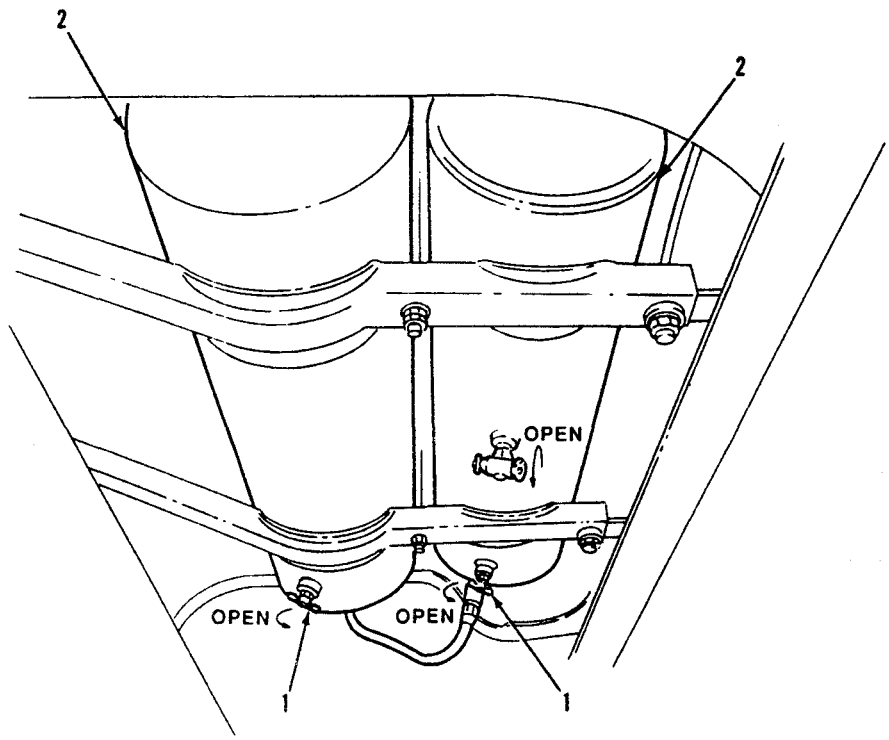

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Table 2-1. Operator/Crew Preventive Maintenance Checks and Services (Continued)

NOTE: These checks are to be made in the order listed, within designated interval.

B-Before operation D-During operation A-After operation W-Weekly M-Monthly

ITEM NO.	INTERVAL B	D	A	W	M	ITEM TO BE INSPECTED PROCEDURE: Check for and have repaired, filled, or adjusted as needed.	FOR READINESS REPORTING EQUIPMENT IS NOT READY/ AVAILABLE IF:
						EXTERIOR (Continued)	
4	•					Look under vehicle for evidence of brake hydraulic fluid leakage and listen for escaping air.	Class III hydraulic brake fluid leakage or sound of escaping air.

Section III. EQUIPMENT OPERATION

2-1. GENERAL

This section provides additional information for operating modified M44A2 series vehicles. All information related to operation of modified M44A2 series vehicles found in TM9-2320-209-10-1 should be read carefully before proceeding with operational procedures found in this manual.

2-2. OPERATION UNDER USUAL CONDITIONS

There are only two differences in operating the modified M44A2 series vehicles under usual conditions. The brake warning lamp, added to the instrument cluster, will light if the parking brake is set. Upon startup it should also light as a test while engaging the start button. All other parameters are the same as detailed in TM9-2320-209-10-1.

2-3. OPERATION UNDER UNUSUAL CONDITIONS

The dual air-hydraulic brake system on modified M44A2 series trucks provides two independent air and hydraulic systems for actuation of the truck service brakes. The loss of air or hydraulic pressure in one system still leaves the driver with the second system allowing a controlled stop. Increased brake pedal effort and stopping distance will be required. A system failure will result in the lighting of the brake warning lamp on the instrument cluster.

CHAPTER 3

ORGANIZATIONAL MAINTENANCE

SECTION 1. INTRODUCTION

3-1. REPAIR PARTS

Refer to APPENDIX F for Repair Parts and Special Tools List (RPSTL).

3-2. SERVICE UPON RECEIPT

Refer to TM9-2320-209-20 series for Service Upon Receipt Instructions.

Section II. PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS)

Refer to TM9-2320-209-20-1 for preventive maintenance checks and services (PMCS).

SECTION III. TROUBLESHOOTING

3-3. GENERAL

Refer to TM9-2320-209-20-2-1 and TM9-2320-209-20-2-2 for troubleshooting procedures. The steps outlined are still valid for modified M44A2 series vehicles. You will have to keep in mind that there may be minor differences. For example, Figure 44-1 addresses "brake pedal is spongy." You will have to adjust for differences in the master cylinder caps when checking brake fluid, and remember that there are two air-hydraulic units as well as additional lines and fittings when checking for leaks. These differences are well documented in the maintenance procedures in this SMARPI.

Section IV. ORGANIZATIONAL MAINTENANCE PROCEDURES

3-4. ORGANIZATIONAL MAINTENANCE TASK SUMMARY

3-5. CLUTCH PEDAL AND PEDAL SHAFT SUPPORT REMOVAL AND REPLACEMENT

INITIAL SETUP:

Manual References

TM9-2320-209-20-3-1

Refer to para 3-3. CLUTCH CONTROL AND LINKAGE REMOVAL, REPAIR, REPLACEMENT, AND ADJUSTMENT, pages 3-1 thru 3-15.

3-6. STARTER SWITCH REMOVAL AND REPLACEMENT

This task covers:

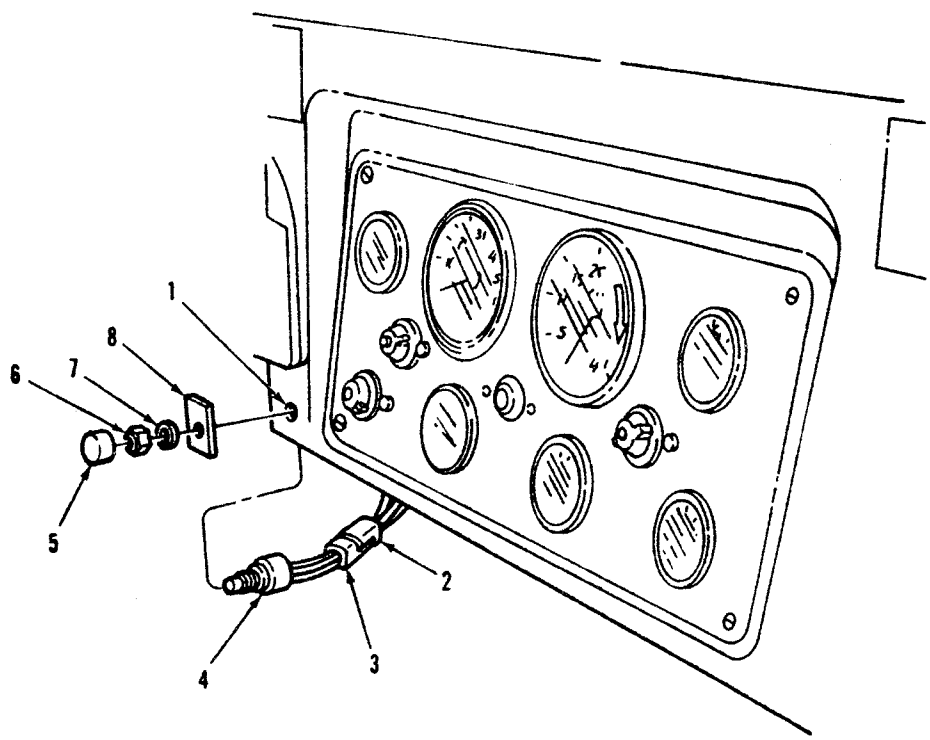
a. Removal b. Installation c. Troubleshooting

INITIAL SETUP:

Manual References	Equipment Condition
TM9-2320-209-20-3-1	Disconnect battery ground cable. Refer to para 7-58.

a. Removal

1. Remove button (5) from end of switch (4).
2. Hold back of switch (4) while removing nut (6) and washer (7).
3. Take off plate (8).
4. Push starter switch (4) thru instrument panel (1).
5. Pull connector halves (2) and (3) apart.



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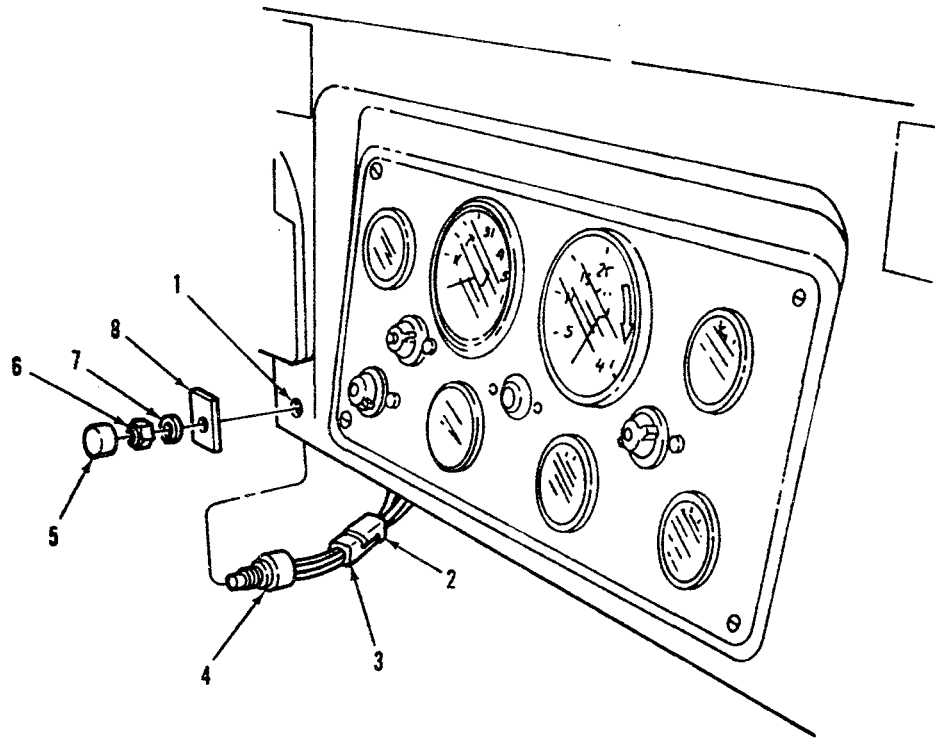
3-6. STARTER SWITCH REMOVAL AND REPLACEMENT (Contd)



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b. Installation

1. Plug connector halves (2) and (3) together.
2. Put starter switch (4) thru instrument panel (1).
3. Put plate (8) on switch (4).
4. Hold back of switch (4) while installing nut (6) and washer (7).

NOTE

Keep plate upright while tightening nut.

5. Install button (5) on switch (4). A "click" will be heard when it seats.

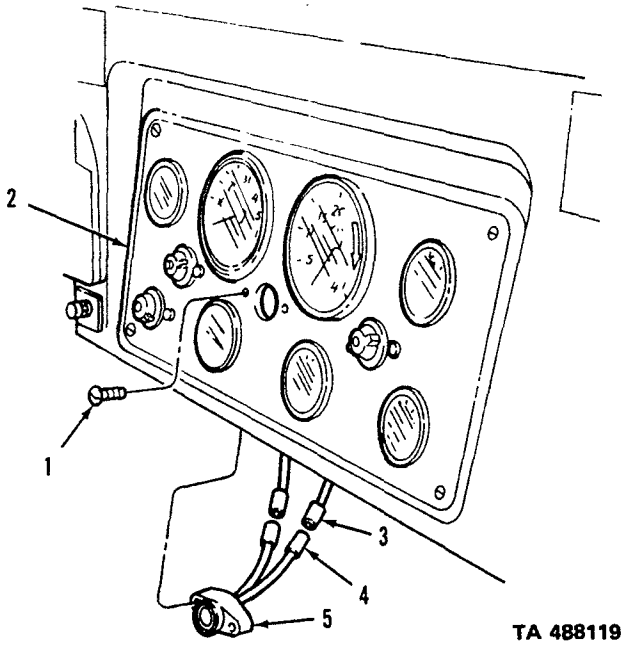
Follow-on maintenance action required.

Connect battery ground cable and check operation of starter switch.

3-6. STARTER SWITCH REMOVAL AND REPLACEMENT (Contd)

c. Troubleshooting

1. Set multimeter on high RX scale.
2. Fasten multimeter leads to pins 127 and 174. Press pushbutton. Meter indicator should show movement.
3. Fasten multimeter leads to pins 117 and 118. Press pushbutton. Meter indicator should show movement.
4. If no indicator movement is evident in steps 2 or 3, replace switch.



3-7. BRAKE WARNING LAMP REMOVAL AND REPLACEMENT

This task covers:

a. Removal b. Installation c. Troubleshooting

INITIAL SETUP:

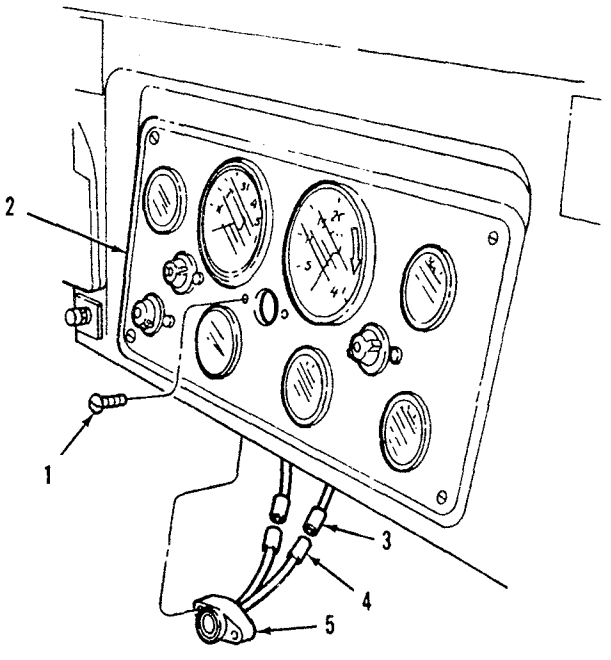
Manual References	Equipment Condition
TM9-2320-209-20-3-1	Disconnect battery ground cable. Refer to para 7-58.

a. Removal

NOTE

It is not necessary to disconnect the four 3/4-turn screws retaining the instrument cluster.

1. Remove two phillips head self-tapping screws (1) securing the brake warning lamp (5).
2. Push warning lamp (5) thru instrument cluster (2) and pull out from the bottom of the cluster.
3. Pull two connector halves (3) and (4) apart.



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3-7. BRAKE WARNING LAMP REMOVAL AND REPLACEMENT (contd)

b. Installation

1. Plug two connector halves (3) and (4) together securely.
2. Feed warning lamp (5) into position in instrument cluster (2) and hold in place.
3. Install two screws (1) and tighten.

c. Troubleshooting

1. Connect battery ground cable and check operation of brake warning lamp.
2. If lamp does not light:
   a. Set multimeter on high RX scale.
   b. Fasten test leads to lamp holder leads.
   c. If meter indicator moves, lamp is good.
   d. If no indicator movement, replace brake warning lamp.

3-8. STOPLAMP SWITCHES REMOVAL AND REPLACEMENT

This task covers:

a. Removal b. Installation c. Troubleshooting

INITIAL SETUP:

Materials/Parts	Equipment Condition
Drip pan.	Main light switch is set to OFF position.

---

a. Removal

NOTE

A switch is mounted at the forward end of the left-hand air-hydraulic unit and the rear end of the right-hand air-hydraulic unit.

1. Support and remove bracket (1) or (2) on underside of air-hydraulic unit by removing two bolts (3) on bracket (2) or two bolts (3), two bolts (4), and nuts (5) on bracket (1).
2. Pull connector halves (6) and (7) apart.
3. Position drip pan under switch to be removed and unscrew switch (8) from air-hydraulic unit.

b. Installation

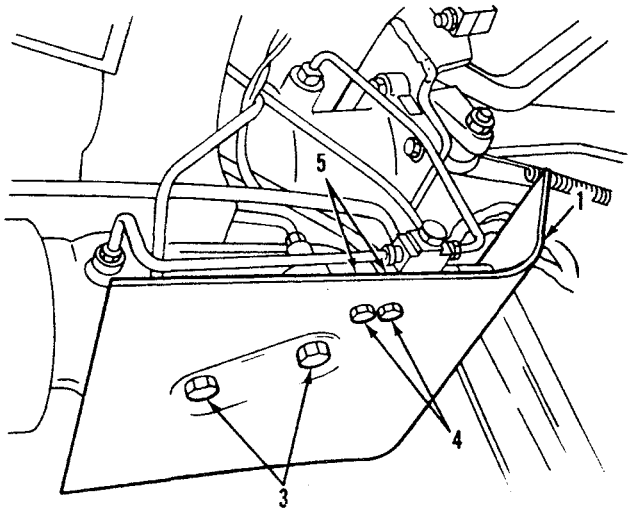
NOTE

Do not use thread sealant or tape on switch.

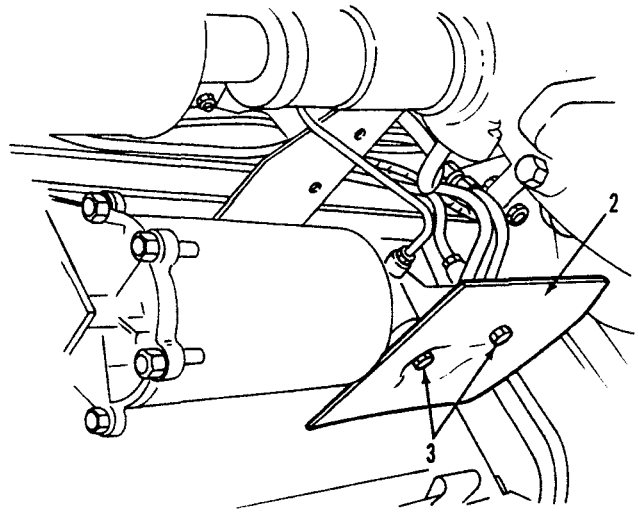
1. Install switch (8) in air-hydraulic unit and tighten.
2. Plug connector halves (6) and (7) together.
3. Install bracket (1) or (2) on underside of air-hydraulic unit with two bolts (3) on bracket (1) or (2), while supporting the bracket, and tighten bolts.
4. Install two bolts (4) and two nuts (5) and tighten, if installing bracket (1).
5. If required, bleed hydraulic system. Refer to paragraph 3.11.
6. Apply brake and verify that brake lamp lights.

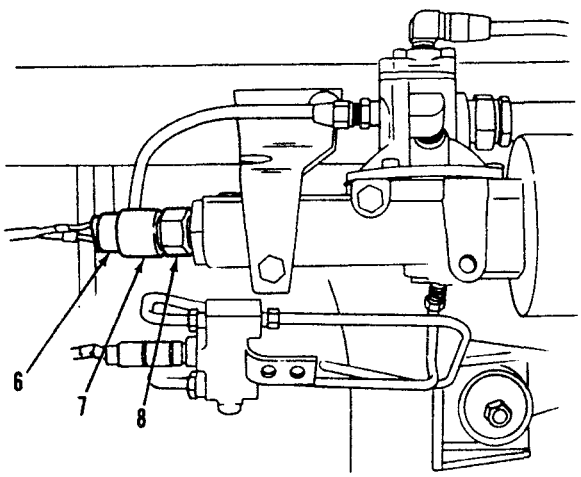
3-8. STOPLAMP SWITCHES REMOVAL AND REPLACEMENT (Contd)

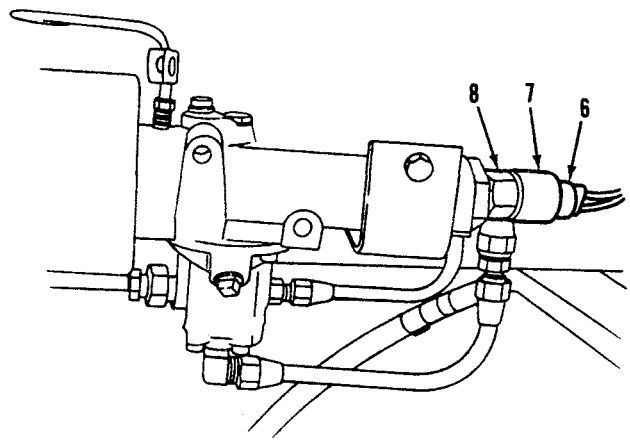
LEFT-HAND



RIGHT-HAND







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c. Troubleshooting

Refer to TM9-2320-209-20-2-1, page 25-120. Repeat procedure for both stoplamp switches.

3-9. PARKING BRAKE SWITCH REMOVAL AND REPLACEMENT

This task covers:

a. Removal b. Installation c. Troubleshooting

INITIAL SETUP:

Equipment Condition

Main light switch is set to OFF position.

---

a. Removal

1. From under left hand rear corner of cab, remove nut (1) from left rear mounting bolt (2) and push bolt up into cab.
2. Pull connector halves (3) and (4) apart.
3. From inside cab, remove bolt (2), star washer (10), and ground wire (9).
4. Remove grommet (8) and pull connector half (3) thru opening.
5. Remove bolt (6), washer (11), and nut (12) from parking brake (5).
6. Remove parking brake switch (7).

b. Installation

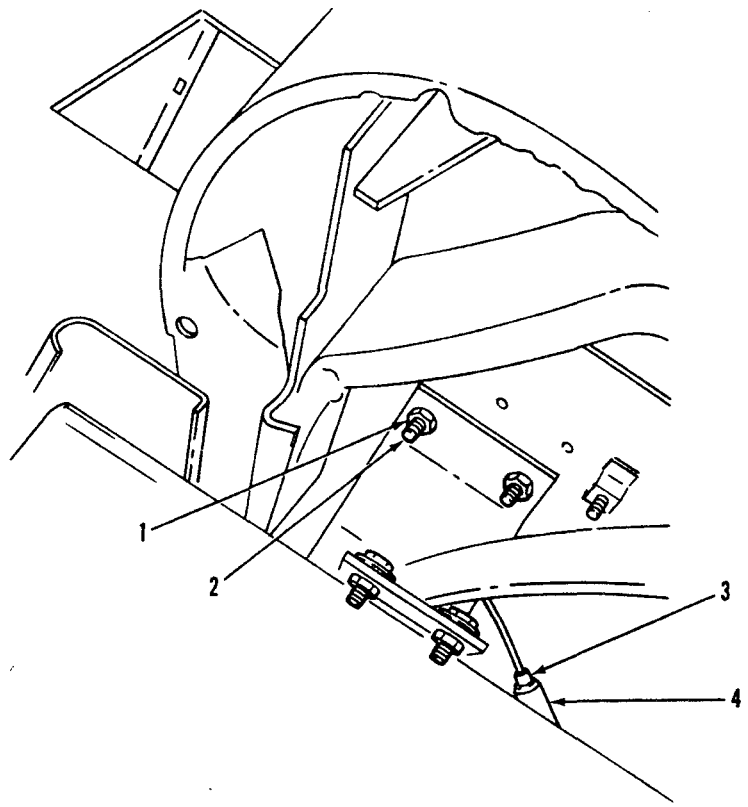
1. Position parking brake switch (7) on rear of parking brake (5) and install bolt (6), washer (11), and nut (12).
2. Push connector half (3) thru hole in floor.
3. Install grommet (8).
4. Plug connector halves (3) and (4) together.
5. Install star washer (10) and ground wire (9) on mounting bolt (2) and secure with nut (1).

c. Troubleshooting

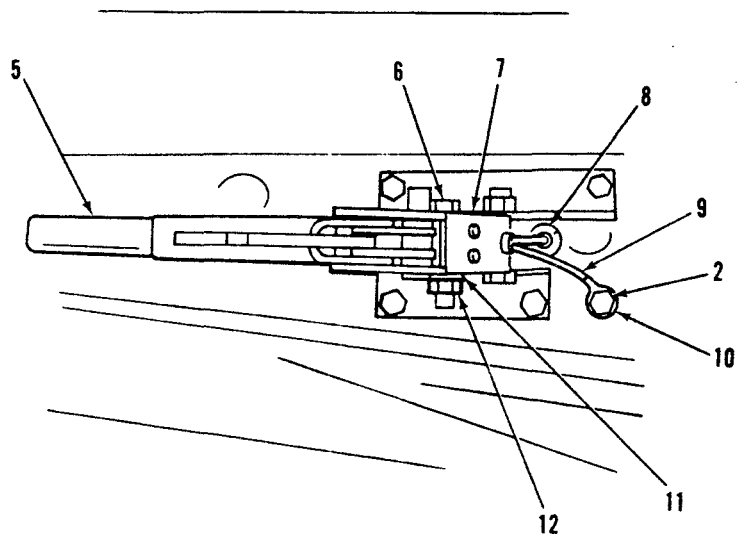
1. Apply parking brake, turn main light switch to ON position, and check for illumination of brake warning lamp.
2. If lamp does not light, check for secure connection of both switch leads.
3. If lamp still does not light, test warning lamp. See paragraph 3.7.
4. If warning lamp is good disconnect switch and perform the following test:
   a. Set multimeter on high RX scale.
   b. Fasten test leads to switch leads.
   c. Press switch.
   d. If meter indicator moves, switch is good.
   e. If no indicator movement replace switch.

3-9. PARKING BRAKE SWITCH REMOVAL AND REPLACEMENT (Contd)

UNDER CAB



IN CAB



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3-10. HYDRAULIC DUAL MASTER CYLINDER ASSEMBLY REMOVAL, REPLACEMENT, AND LINKAGE ADJUSTMENT.

This task covers:

a. Removal
b. Installation
c. Linkage Adjustment
d. Troubleshooting

INITIAL SETUP:

Equipment Condition	Materials/Parts
Truck parked, engine off, parking brake set.	1/2 gal. container

a. Removal

1. Remove two bolts (20) and nuts (22) securing differential valve (19) to bracket (17).
2. Support bracket (17) and remove two bolts (21).
3. Remove bracket (17).
4. Remove hose (3) by loosening two hose clamps (2). Remove elbow (4) if replacing master cylinder (6). Remove tube assembly (1) from tee (25) on frame crossmember, if required.
5. Place container under differential valve (19).
6. Disconnect two hydraulic lines (16) and (18) from differential valve (19). Allow fluid to drain.
7. Disconnect other end of lines (16) and (18) from master cylinder (6) and remove lines.
8. Using pliers, remove brake pedal return spring (9) from rod end (10).

NOTE

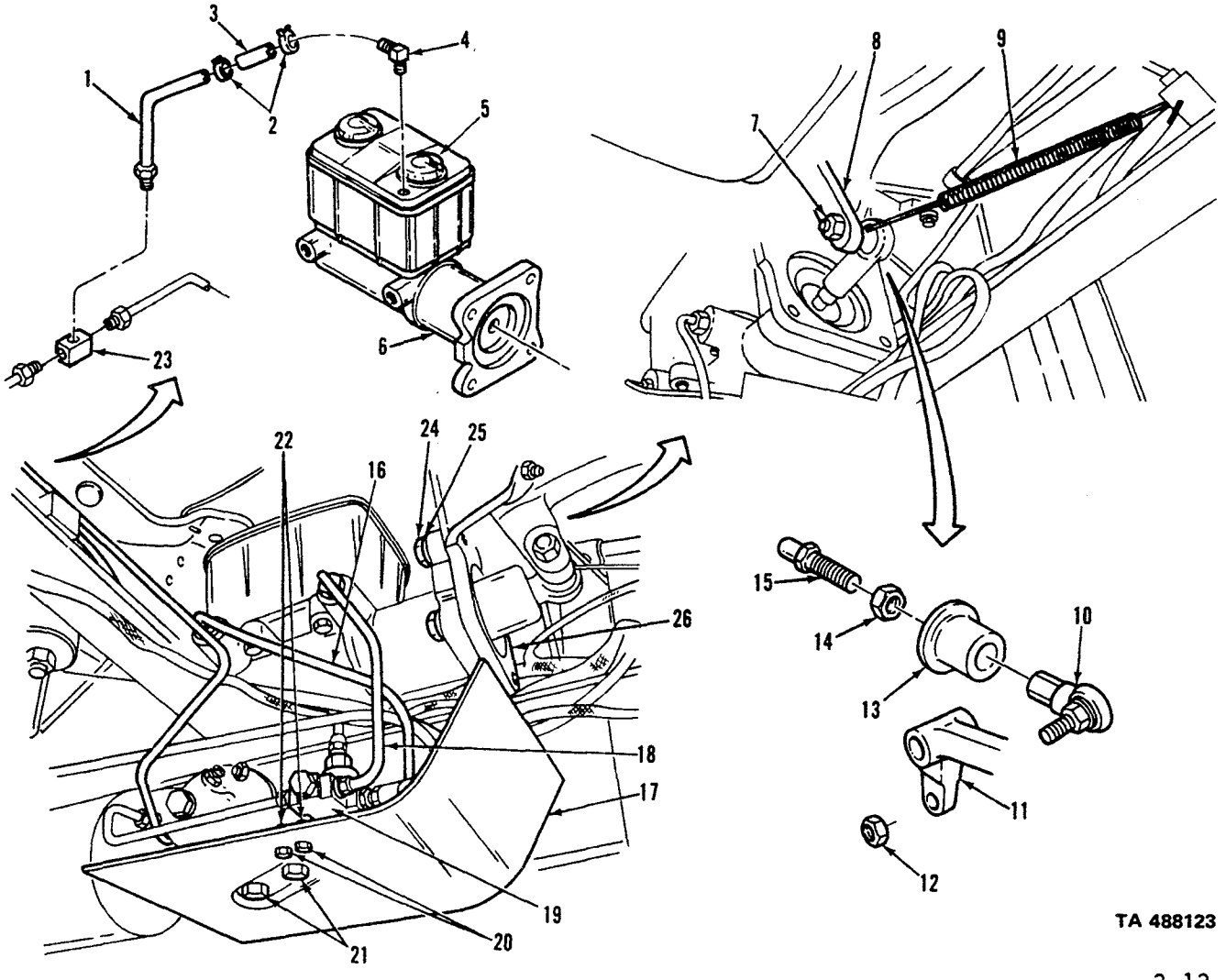
Master cylinder may have to be moved aside to remove rod end (10) from brake pedal linkage (11).

9. Support master cylinder (6) while removing four bolts (24) and washers (25) securing master cylinder (6) to pedal shaft support (26).
10. Remove nut (12) and rod end (10) from brake pedal linkage (11).
11. Push boot (13) back and remove rod end assembly from master cylinder (6).
12. Count and record the number of threads exposed beyond the locknut. Remove rod end (10), boot (13), and nut (14) from push rod (15) if necessary for repairs.
13. Slide master cylinder towards center of vehicle and tilt mounting flange downward to remove.

3-10. HYDRAULIC DUAL MASTER CYLINDER ASSEMBLY REMOVAL, REPLACEMENT, AND LINKAGE ADJUSTMENT (Contd)

b. Installation

1. If disassembled, install rod end (10), boot (13), and nut (14) on push rod (15). Adjust until previously recorded number of threads are exposed beyond nut (14) and install into master cylinder (6).
2. Raise master cylinder (6) into position and aline mounting holes.
3. Install rod end (10) to brake pedal linkage (11) with nut (12), fingertight.
4. Secure master cylinder (6) with four bolts (26) and washers (27). Secure nut (12).
5. Using pliers, install brake pedal return spring (9) to rod end (10).
6. Connect lines (16) and (18) to master cylinder (6) and differential valve (19). Do not tighten tube nuts in excess of 200 lb-in.
7. Install tube assembly (1) into tee (23) on frame crossmember, and elbow (4) to master cylinder (6), if removed.
8. Install hose (3) onto tube assembly (1) and elbow (4). Secure with two hose clamps (2).



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3-10. HYDRAULIC DUAL MASTER CYLINDER ASSEMBLY REMOVAL, REPLACEMENT, AND LINKAGE ADJUSTMENT (Contd)

c. Linkage Adjustment

NOTE

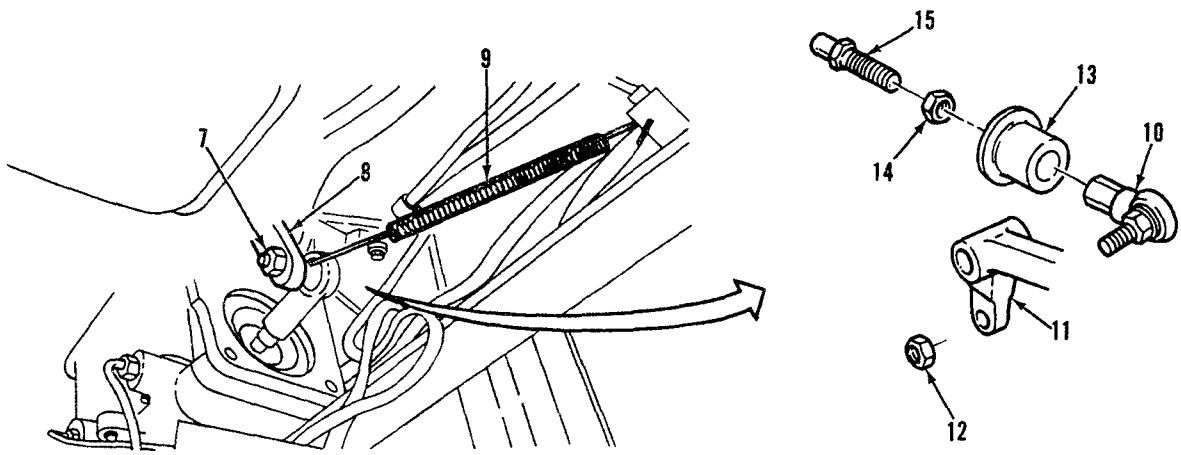
The length of the pushrod (15) is preset at the factory and in normal usage should not require any change. If proper care has been taken to reestablish the original setting during installation, farther adjustment should not be required.

1. Lightly depress the foot pad with one hand while observing the brake fluid in the master cylinder. The proper length setting should provide 1/4" to 1/2" travel from the fully released position to close the compensating ports. A spurt or movement of brake fluid in the reservoir indicates when the ports close.

2. If farther adjustment is necessary, disconnect rod end (10) from brake pedal linkage (11) by repeating removal steps 5 thru 11, readjust nut (14), reattach following installation steps 2 thru 6, and repeat step 1 until satisfactory results are obtained.

3. Secure boot (13) into seat on master cylinder (6).

4. Mount bracket (17) with two bolts (21) and secure differential valve (19) to bracket (17) with two bolts (20) and nuts (22).



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NOTE

Follow-on maintenance action required:

Bleed brake hydraulic system. Refer to para 3-11.

3-10. HYDRAULIC DUAL MASTER CYLINDER ASSEMBLY REMOVAL, REPLACEMENT, AND LINKAGE ADJUSTMENT (Contd)

c. Troubleshooting

1. Inspect for leakage at all fittings.
2. Tighten all fittings etc., as applicable, but do not tighten tube nuts in excess of 200 in. lb.
3. If unable to stop leakage, replace tube seats.
4. If no symptoms are detected in the system, and brakes do not respond properly, the master cylinder may not be functional. Loosen one fitting at master cylinder outlet.
5. Lightly depress brake pedal. If fluid does not flow, replace cylinder.

3-11. BLEEDING SERVICE BRAKE SYSTEM

This task covers:

a. Filling Master Cylinder
b. Bleeding Air-Hydraulic Cylinders
c. Bleeding Wheel Cylinders

INITIAL SETUP:

Equipment Condition	Materials/Parts
Truck parked, engine off, parking brake set.	Silicone® Brake Fluid, MIL-B-46176 Clean cloth.
Tools	**Personnel**
Bleeding hose Transparent container, 2 quart Flexible neck oil filler can	Two

---

a. Filling Master Cylinder

1. Remove screw (4) and open master cylinder access hatch (1).

WARNING

Clean filler cap and surrounding area before removing cap. System contamination can result in injury to personnel or equipment damage.

2. Remove cap (2).

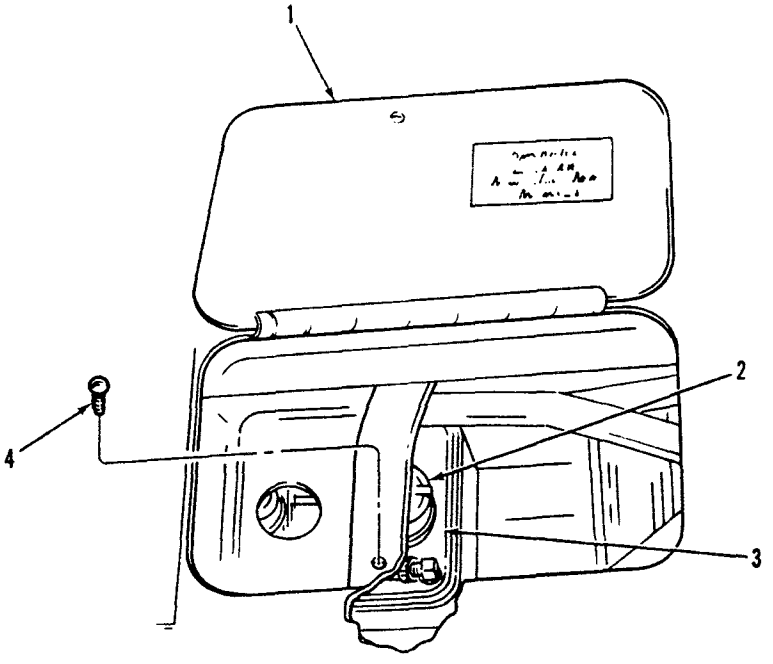
NOTE

Fluid added to primary port will also fill secondary port.

3-11. BLEEDING SERVICE BRAKE SYSTEM (Contd)

3. Fill master cylinder (3) to bottom of rings with silicone brake fluid, from a sealed container labeled SPEC MIL-B-46176, using a clean flexible neck oil filler can.

4. Install cap (2).



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b. Bleeding Air-Hydraulic Units

NOTE

Start with the left-hand air-hydraulic (5). Repeat all steps for the right-hand air-hydraulic unit after ensuring that master cylinder has been refilled.

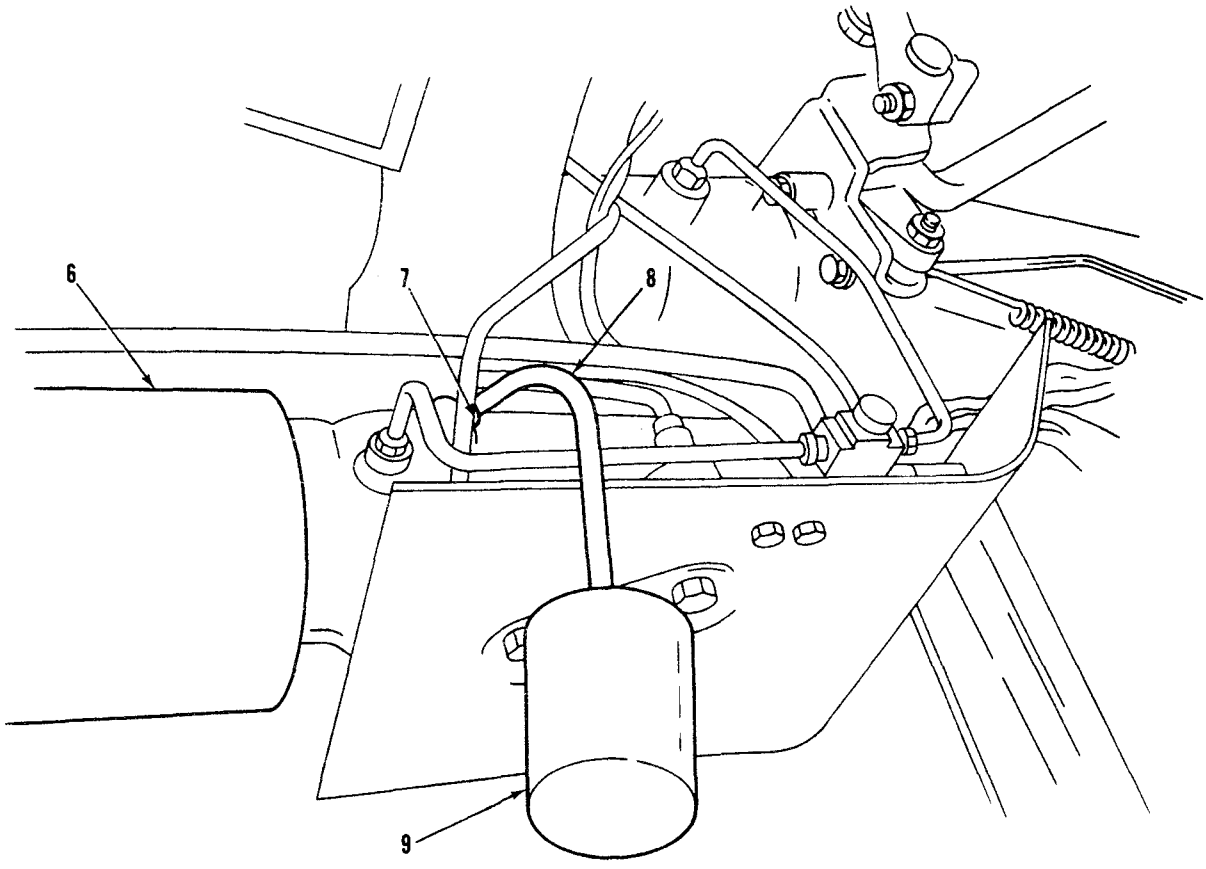
1. Using clean cloth, clean bleeding screw (6) on air-hydraulic unit (5).
2. Put one end of bleeding hose (7) on bleeding screw (6).
3. Put other end of bleeding hose (7) into transparent container (8). Put silicone brake fluid into container until container is 1/2 full. Make sure that end of bleeding hose (7) is below level of fluid in container (8).

3-11. BLEEDING SERVICE BRAKE SYSTEM (contd)

NOTE

Assistance is required for the following steps.

4. Unscrew bleeding screw (6) 3/4 turn.
5. Slowly pump brake pedal three times and hold pedal down after last pump until told to let pedal up.
6. Look for air bubbles in silicone fluid in container (8). Tighten bleeding screw (6) and have assistant release pedal and fill master cylinder (3).
7. Repeat steps 4 thru 6 as often as needed until there are no air bubbles.
8. Remove bleeding hose (7) from bleeding screw (6) and container (8). Ensure that bleeding screw (6) is tightened and master cylinder (3) is full.
9. Dump silicone brake fluid in container (8) in approved disposal area.
10. Repeat steps 1 through 9 for second air-hydraulic unit.



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3-11. BLEEDING SERVICE BRAKE SYSTEM (contd)

c. Bleeding Wheel Cylinders

CAUTION

The air-hydraulic units must be bled before bleeding wheel cylinders or brakes will not work properly.

NOTE

The left-hand air-hydraulic unit controls the rear axle brakes. The right-hand air-hydraulic unit controls brakes on the front axle.

When a brake line has been taken off at only one wheel, bleed the wheel cylinder at that wheel only.

When all wheel cylinders must be bled, start with the wheel cylinder farthest away from the master cylinder on that system.

1. Fill master cylinder. Refer to para 3-11a.
2. Using clean cloth, clean bleeding screw (9).
3. Put one end of bleeding hose (7) on bleeding screw (9).
4. Put other end of bleeding hose (7) into transparent container (8). Put silicone brake fluid into container until container is 1/2 full. Make sure that end of bleeding hose (7) is below level of fluid in container (8).

NOTE

Assistance is required for the following steps.

5. Unscrew bleeding screw (9) 3/4 turn.
6. Slowly pump brake pedal three times and hold pedal down after last pump until told to let pedal up.
7. Look for air bubbles in silicone fluid in container (8). Tighten bleeding screw (9) and have assistant release pedal and fill master cylinder.
8. Repeat steps 5 thru 7 as often as neded until there are no air bubbles.

3-11. BLEEDING SERVICE BRAKE SYSTEM (contd)

NOTE:

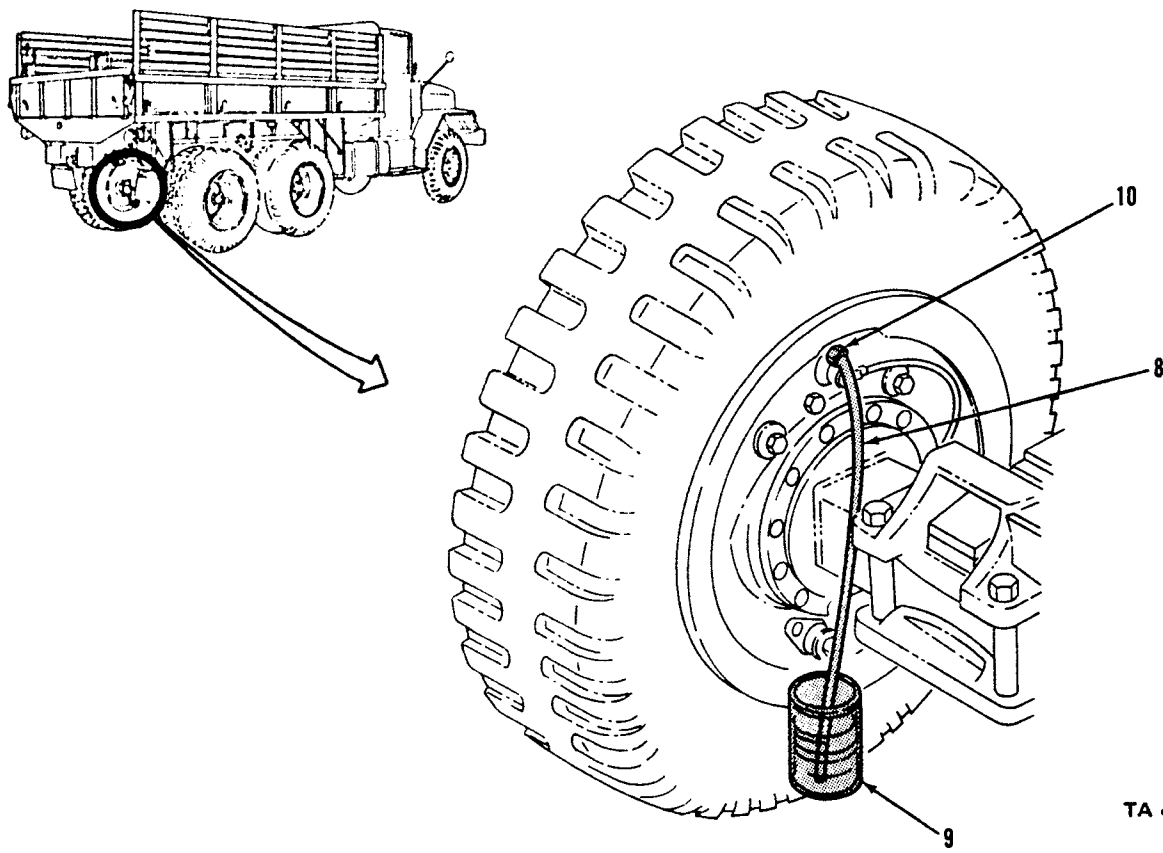
When replacing both air-hydraulic units bleed right front and right rear wheel cylinders to make sure no air is in line.

When replacing only one air-hydraulic unit, bleed the appropriate wheel cylinder to make sure no air is in line.

9. Remove bleeding hose (7) from bleeding screw (9) and container (8). Ensure that bleeding screw (9) is tightened and master cylinder is full.
10. Dump silicone brake fluid in container (8) in approved disposal area.
11. Repeat procedure, as required, for each wheel cylinder.
12. Close master cylinder access hatch (1) and secure with screw (4).

NOTE

Check pedal with engine running for sign of air still in system, rebleed system if needed.



3-12. RIGHT-HAND AIR-HYDRAULIC UNIT REMOVAL AND REPLACEMENT

This task covers:

a. Removal b. Installation c. Troubleshooting

INITIAL SETUP:

Equipment Condition	Materials/Parts
Air system drained	Drip pan

---

a. Removal

1. Support rear bracket (6) and remove two bolts (7). Remove rear bracket.
2. Disconnect air lines (15) and (16).
3. Disconnect vent line (10).
4. Position drip pan underneath and remove hydraulic lines (4) and (5).
5. Disconnect remaining end of vent line (10) from tee (1) on frame rail.
6. Unplug connector (13) from parking brake switch (14).
7. Support air-hydraulic unit (20) while removing bolt (9) from front bracket (8) and bolt (12) from bracket (11). Swing rear of unit clear of bracket (11) and remove.
8. Note the position of elbows for reinstallation. Remove elbow (18), connector (3) and gasket (2), elbow (19), switch (14), connector (17) and fitting (21) from air-hydraulic unit (20).

b. Installation

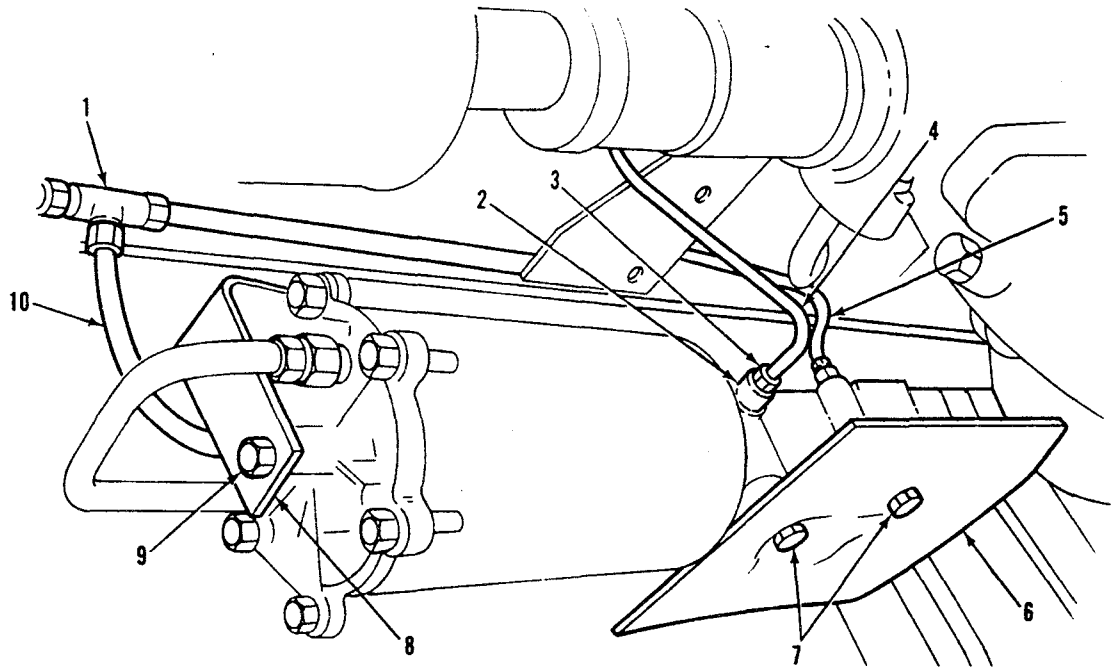
1. Install elbow (18), connector (3) and gasket (2), switch (14), fitting (21), elbow (19), and connector (17) in air-hydraulic unit (20). Set elbows to previously noted positions.
2. Swing air-hydraulic unit in place over bracket (11) and install bolt (9) finger tight into front bracket (8) followed by bolt (12) into bracket (11).
3. Plug connector (13) into parking brake switch (14).
4. Install vent line (10) to tee (1) on frame rail and cylinder (20).
5. Install hydraulic lines (4) and (5).
6. Install air lines (15) and (16).
7. Tighten bolt (9).
8. Support rear bracket (7), aline mounting holes, and install two bolts (7).

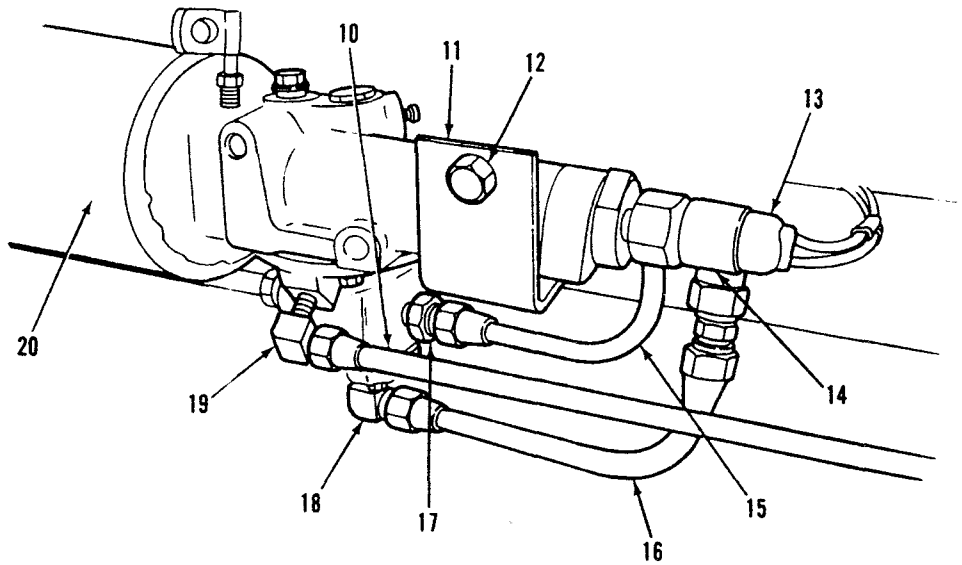
NOTE

Follow-on maintenance action required:

Fill and bleed brake hydraulic system. Refer to para 3-11.

3-12. RIGHT-HAND AIR-HYDRAULIC UNIT REMOVAL AND REPLACEMENT (Contd)





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c. Troubleshooting

Refer to TM9-2320-209-20-1, Chapter 2-115.

3-13. AIR RESERVOIRS REMOVAL AND REPLACEMENT

This task covers:

a. Removal b. Installation c. Troubleshooting

INITIAL SETUP:

Equipment Condition	Materials/Parts
Truck parked, engine off, parking brake set, air system pressure vented	Anti-seize tape, MIL-T-27730A

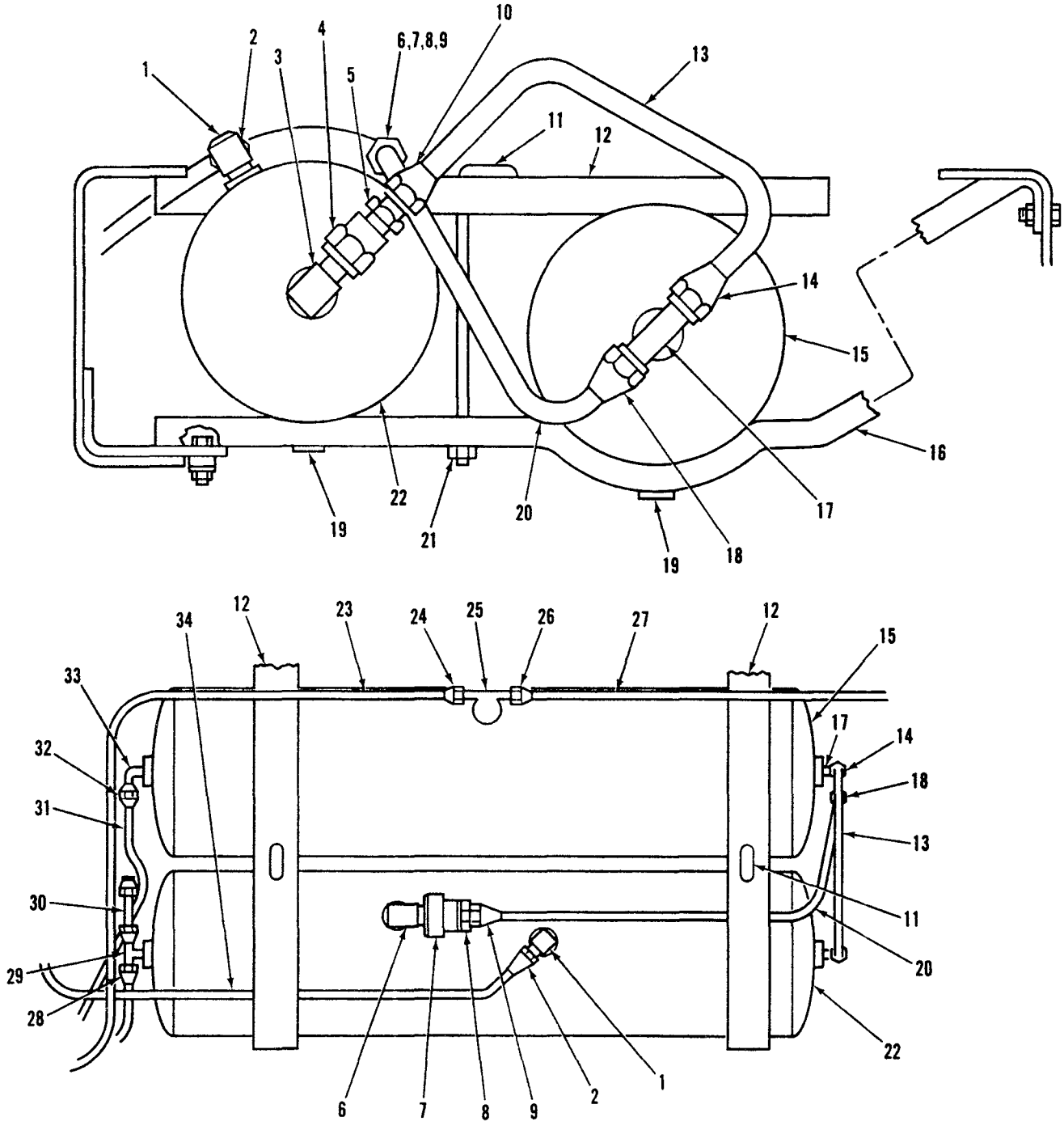
a. Removal

1. Disconnect all air lines by unscrewing nuts (2), (9), (10), (14), (18), (24), (26), (28), and (32).
2. Remove two nuts (21) securing hook bolts (11).
3. Remove two braces (12).
4. Raise one reservoir at a time, and carefully slide reservoir out toward rear of vehicle.

LEGEND

Item Number	Description	Item Number	Description
1	Elbow	18	Nut
2	Nut	19	Draincock (3)
3	Elbow	20	Tube, Reservoir
4	Valve	21	Nut (2)
5	Adapter	22	LH Air Reservoir
6	Elbow	23	Tube
7	Valve	24	Nut
8	Adapter	25	Tee
9	Nut	26	Nut
10	Nut	27	Tube
11	Hook Bolt (2)	28	Nut
12	Brace (2)	29	Tee
13	Tube	30	Valve
14	Nut	31	Tube
15	RH Reservoir	32	Nut
16	Support (2)	33	Elbow
17	Tee	34	Tube

3-13. AIR RESERVOIRS REMOVAL AND REPLACEMENT (Contd)



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3-13. AIR RESERVOIRS REMOVAL AND REPLACEMENT (Contd)

NOTE

Check position of fittings so that they can be put back facing the same way.

Only disassemble to the extent necessary. For example, if transferring from one tank to another, items (6), (7), and (8) can be left assembled.

7. Remove elbow (1), straight adapter (8), valve (7), elbow (6), straight adapter (5), valve (4), elbow (3), safety relief valve (30), tee (29), and two draincocks (19) from left-hand reservoir (22).
8. Remove tee (25), tee (17), elbow (33), and draincock (19) from right-hand reservoir (15).

b. INSTALLATION

NOTE

Put anti-seize tape around male threads on fittings before replacement.

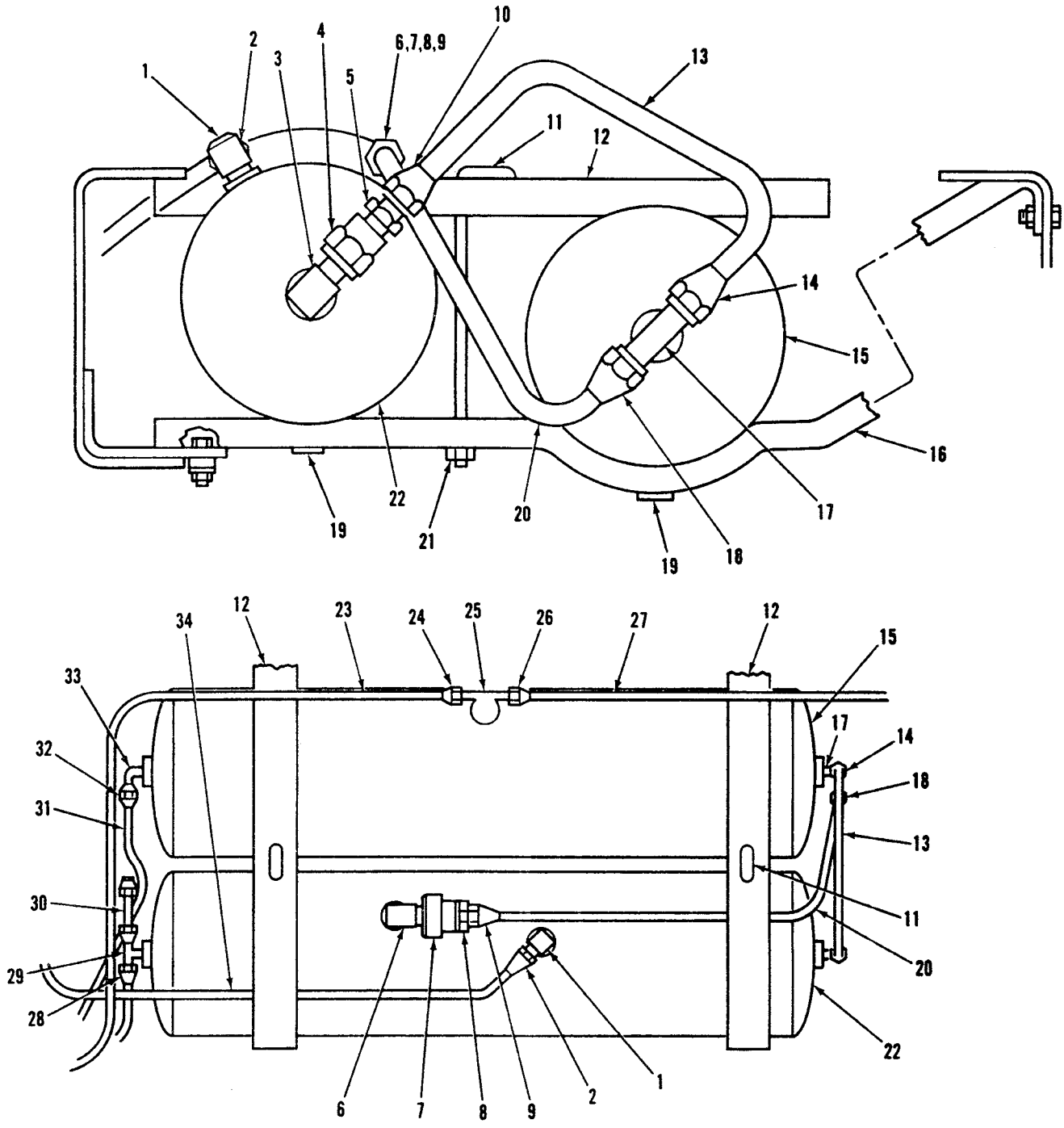
1. Install draincock (19), elbow (33), tee (17), and tee (25) into right-hand reservoir (15) to positions noted.
2. Install two draincocks (19), tee (29), safety relief valve (30), elbow (3), valve (4), straight adapter (5), elbow (6), valve (7), straight adapter (8), and elbow (1) into left-hand reservoir (22) to positions noted.

NOTE

Reservoir with two draincocks goes in the outboard position.

3. Slide one reservoir at a time onto supports until properly positioned.
4. Connect all air lines by installing nuts (2), (9), (10), (14), (18), (24), (26), (28), and (32) finger tight.
5. Put two braces (12) into position and secure with two hook bolts (11) and nuts (21).
6. Tighten all fittings.

3-13. AIR RESERVOIRS REMOVAL AND REPLACEMENT (Contd)



3-13. AIR RESERVOIRS REMOVAL AND REPLACEMENT (Contd)

c. Troubleshooting
   1. Start engine to build air pressure. Shut off engine.
   2. Check for leaks and make necessary adjustments.

   3. Check the dual chamber air reservoir for leakage from chamber to chamber through the internal baffle:
      a. Open drain valve on one end to relieve pressure.
      b. Close valve and wait 5 minutes.
      c. Open valve and listen for air leakage.

3-14. HYDRAULIC LINES, HOSES, AND FITTINGS REMOVAL AND REPLACEMENT

INITIAL SETUP:

Manual References

TM9-2320-209-20-3-2

Refer to para 13-13, HYDRAULIC LINES, HOSES, AND FITTINGS REMOVAL AND REPLACEMENT, pages 13-87 thru 3-106.

3-15. AIR SYSTEM AND VENT LINES AND FITTINGS REMOVAL AND REPLACEMENT

INITIAL SETUP:

Manual References

TM9-2320-209-20-3-2

Refer to para 13-21, AIR SYSTEM LINES AND FITTINGS REMOVAL AND REPLACEMENT, pages 13-149 thru 13-161.

3-16. CHECK VALVE REMOVAL AND REPLACEMENT

This task covers:

a. Removal b. Installation

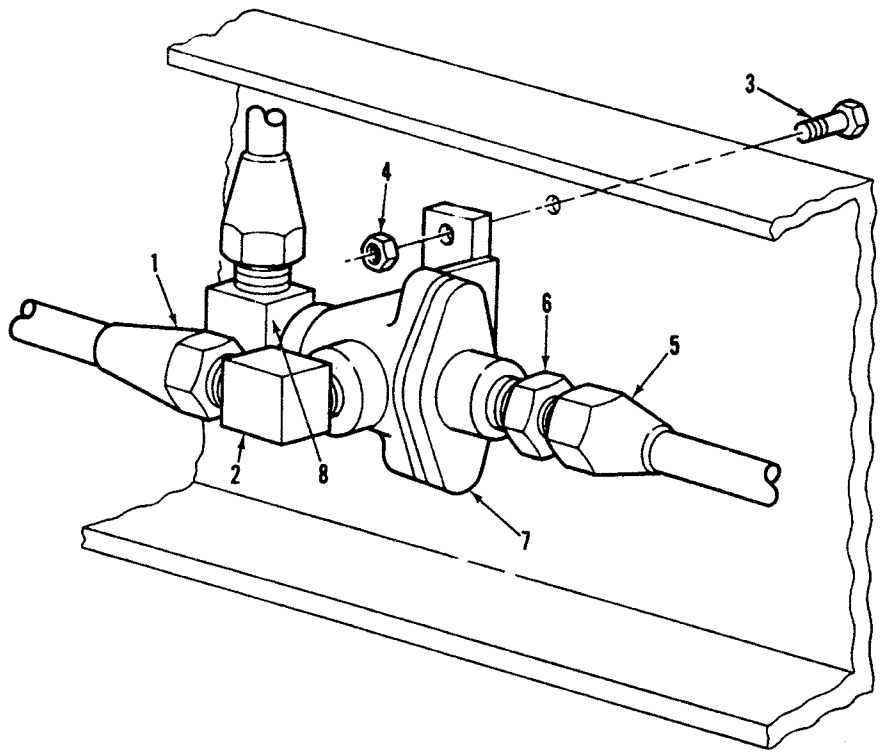
INITIAL SETUP:

Equipment Condition	Materials/Parts
Air system drained	Liquid teflon

3-16. CHECK VALVE REMOVAL AND REPLACEMENT (Contd)

a. Removal

1. Disconnect three air lines (1), (5), and (9) from check valve (7).
2. Remove bolt (3) and nut (4) from frame rail.
3. Note the position of elbows for replacement and remove elbow (2), connector (6), and elbow (8) from check valve (7).



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b. Installation

1. Apply liquid teflon to threads and install elbow (2), connector (6), and elbow (8) into check valve (7).
2. Connect three lines (1), (5), and (9) to check valve (7) finger tight.
3. Mount check valve (7) to frame rail with bolt (3) and nut (4).
4. Tighten three lines (1), (5), and (9).

c. Troubleshooting

1. Start engine and charge air tanks to normal pressure.
2. With engine off loosen fitting from supply line to valve.
3. After wet tank is relieved of pressure, listen for leakage at check valve.
4. If leakage, replace valve.
5. If no leakage, tighten fitting.

3-17. DIFFERENTIAL VALVE REMOVAL AND REPLACEMENT

This task covers:

a. Removal b. Installation c. Troubleshooting

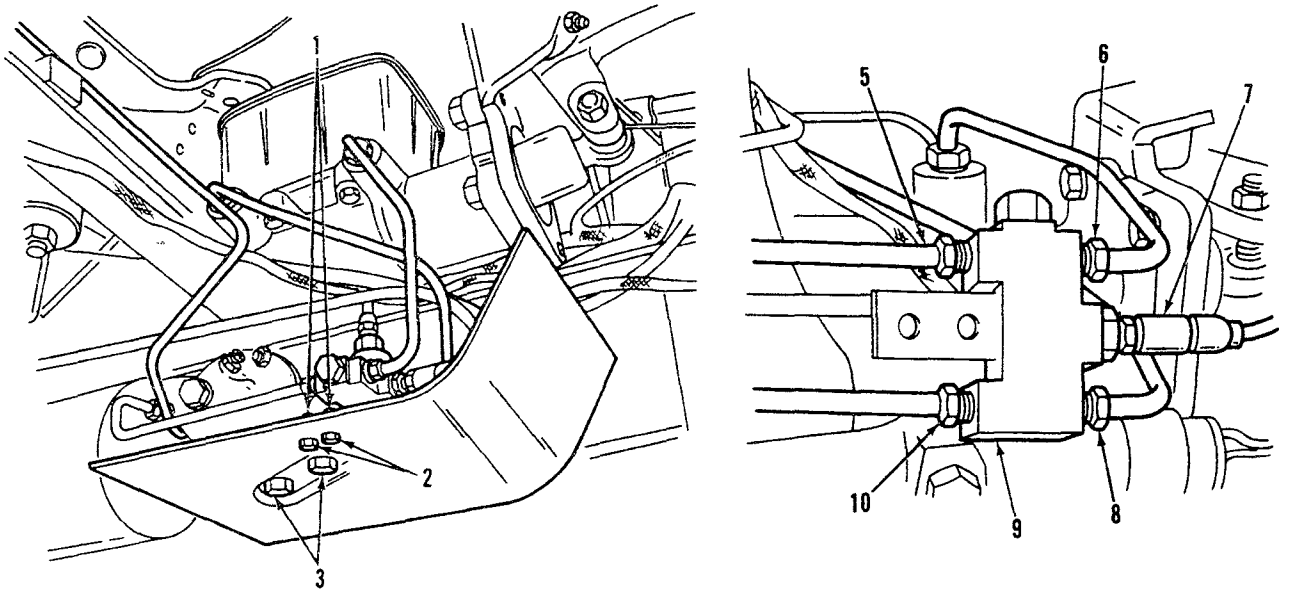
INITIAL SETUP:

Equipment Condition	Materials/Parts
Truck parked, engine off, parking brake set	1/2 gal. container

---

a. Removal

1. Remove two bolts (1) and locknuts (2) securing differential valve (9) to bracket (4).
2. Support bracket (4) and remove two bolts (3).
3. Remove bracket (4).
4. Place container under differential valve (9).
5. Disconnect two hydraulic lines (6) and (8) from differential valve (9). Allow fluid to drain.
6. Pull connector (7) from pin on differential valve (9).
7. Remove hydraulic lines (5) and (10) from differential valve (9).



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3-17. DIFFERENTIAL VALVE REMOVAL AND REPLACEMENT (Contd)

b. Installation

1. Connect hydraulic lines (5), (6), (8), and (10) to differential valve (9).
2. Plug connector (7) onto pin on differential valve (9).
3. Position bracket (4) and secure with two bolts (3).
4. Secure differential valve (9) to bracket (4) with two bolts (1) and locknuts (2).

NOTE

Follow-on maintenance action required:

Bleed brake hydraulic system. Refer to para 3-11.

c. Troubleshooting

NOTE

Dashboard warning lamp is common to handbrake and differential valve switch.

1. To check bulb:

   a. Engage handbrake.
   b. If lamp lights, disengage handbrake.
   c. If no light occurs, see paragraph 3.7 Brake Warning Lamp Replacement.

2. To check differential valve switch:

   a. Set multimeter on high RX scale.
   b. Put one test lead on valve body and the other on switch plunger.
   c. Press plunger. If there is no needle movement, replace valve assembly.

CHAPTER 4

DIRECT SUPPORT AND GENERAL SUPPORT MAINTENANCE

SECTION 1. REPAIR PARTS AND SPECIAL TOOLS LIST (RPSTL)

Refer to Appendix F for repair parts and special tools list (RPSTL).

SECTION II. DIRECT SUPPORT AND GENERAL SUPPORT MAINTENANCE PROCEDURES

4-1. DIRECT SUPPORT AND GENERAL SUPPORT MAINTENANCE TASK SUMMARY

4-2. AIR-HYDRAULIC CYLINDER ASSEMBLY REPAIR

INITIAL SETUP:

Manual References

TM9-2320-209-34-2-1

Refer to para 12-5. AIR-HYDRAULIC CYLINDER REPAIR, pages 12-7 thru 12-46.

APPENDIX A

REFERENCES

A-1. GENERAL

The following publications contain information pertinent to major item material and associated equipment.

A-2. OPERATOR, MAINTENANCE, AND REPAIR PUBLICATIONS

The Army Maintenance Management System (TAMMS). . . . . .DA PAM 738-750
Operator's Manual, Truck, 2-1/2 Ton, 6x6, M44A1 and M44A2 Series (Multifuel)

Operation, Installation, and Reference Data. TM9-2320-209-10-1
Scheduled Maintenance. TM9-2320-209-10-2
Troubleshooting. TM9-2320-209-10-3
Maintenance. TM9-2320-209-10-4
Lubrication Order, 2-1/2 Ton, 6x6, M44A1 and M44A2 Series (Multifuel). LO9-2320-209-12/1

Maintenance, Organizational Level, 2-1/2 Ton, 6x6, M44A1 and M44A2 Series (Multifuel)

Scheduled Maintenance TM9-2320-209-20-1
Troubleshooting (Volume 1 of 2). TM9-2320-209-20-2-1
Troubleshooting (Volume 2 of 2). TM9-2320-209-20-2-2
Maintenance (Volume 1 of 4). TM9-2320-209-20-3-1
Maintenance (Volume 2 of 4). TM9-2320-209-20-3-2
Maintenance (Volume 3 of 4). TM9-2320-209-20-3-3
Maintenance (Volume 4 of 4). TM9-2320-209-20-3-4

Repair Parts and Special Tools List, Organizational Level, 2-1/2 Ton, 6x6, M44A1 and M44A2 Series (Multifuel) TM9-2320-209-20P

Maintenance, Direct Support and General Support Level, 2-1/2 Ton, 6x6, M44A1 and M44A2 Series (Multifuel)

Troubleshooting. TM9-2320-209-34-1
Maintenance (Volume 1 of 3). TM9-2320-209-34-2-1
Maintenance (Volume 2 of 3). TM9-2320-209-20-2-2
Maintenance (Volume 3 of 3). TM9-2320-209-20-3-3

Repair Parts and Special Tools List, Direct and General Support Level, 2-1/2 Ton, 6x6, M44A1 and M44A2 Series (Multifuel) (Volume 1 of 2). . . .TM9-2320-209-34P1

Repair Parts and Special Tools List, Direct and General Support Level, 2-1/2 Ton, 6x6, M44A1 and M44A2 Series (Multifuel) (Volume 2 of 2). . . .TM9-2320-209-34P2

APPENDIX B
MAINTENANCE ALLOCATION CHART
Section I. INTRODUCTION

B-1. GENERAL

a. This section provides a general explanation of all maintenance and repair functions authorized at various maintenance categories.

b. The Maintenance Allocation Chart (MAC) in section II designates overall authority and responsibility for performance of maintenance functions on identified end item or component. Application of maintenance functions to end item or component will be consistent with capacities and capabilities of designated maintenance categories.

c. Section III lists the tools and test equipment (both special tools and common tool sets) required for each maintenance function as referenced from section II.

B-2. MAINTENANCE FUNCTIONS

Maintenance functions will be limited to the following:

a. Inspect. To determine serviceability of an item by comparing its physical, mechanical, and/or electrical characteristics with established standards through examination.

b. Test. To inspect using test equipment.

c. Adjust. To change as necessary in order to bring into proper position.

d. Replace. To remove unserviceable item and install serviceable counterpart in its place.

e. Repair. To restore serviceability to an item by correcting specific damage, fault, malfunction, or failure.

B-3. EXPLANATION OF COLUMNS IN MAINTENANCE ALLOCATION CHART, SECTION II

a. Column(1)-Group Number. Lists functional group code numbers, the purpose of which is to identify components, assemblies, subassemblies, and modules with next higher assembly.

b. Column(2)-Component/Assembly. Contains names of components, assemblies, subassemblies, and modules for which maintenance is authorized.

c. Column(3)-Maintenance Function. Lists functions to be performed on item listed in Column (2). (For detailed explanation of these functions, refer to para. B-2).

d. Column(4)-Maintenance Category. Specifies lowest maintenance category and approximate number of hours needed to perform indicated operation. Symbol designations for various maintenance categories are as follows:

B-3. EXPLANATION OF COLUMNS IN MAINTENANCE ALLOCATION CHART, SECTION II (Cont.)

C - Operator/Crew
O - Organizational maintenance
F - Direct Support maintenance
H - General Support maintenance
D - Depot Maintenance

e. Column(5)-Tools and Equipment. Specifies, by code, those tools and test equipment required to perform designated function. These codes reference to tools and test equipment found in section III.

B-4. EXPLANATION OF COLUMNS IN TOOL AND TEST EQUIPMENT REQUIREMENTS, SECTION III

a. Column(1)-Reference Code. Contains code numbers corresponding to numbers listed in section II, column (5).

b. Column(2)-Maintenance Category. Specifies lowest maintenance category authorized to use indicated tool or test equipment. Refer to B-3d. for symbol designations.

c. Column(3)-Nomenclature. Lists name or identification of tool or test equipment.

d. Column(4)-National Stock Number. Lists National stock number of tool or test equipment.

e. Column(5)-Tool Number. Lists manufacturer's part number.

Section II. MAINTENANCE ALLOCATION CHART

(1) Group Number	(2) Component/Assembly	(3) Maintenance Function	(4) Maintenance Category					(5) Tools and Equipment
			C	O	F	H	D	
03	Fuel System							
0304	Air Cleaner	Replace		0.9				
06	Electrical System							
0607	Instrument or Engine Control Panel Instruments	Replace		0.3				
0608	Miscellaneous Items Switches, Light	Replace		0.3				

Section II. MAINTENANCE ALLOCATION CHART (Contd)

(1) Group Number	(2) Component/Assembly	(3) Maintenance Function	(4) Maintenance Category					(5) Tools and Equipment
			C	O	F	H	D	
0613	Hull or Chassis Wiring Harness	Test		0.3				
		Inspect		0.6				
		Replace		2.5	4.0			
		Repair		2.7				
12	Brakes							
1201	Hand Brakes							
	Linkage, Parking	Service	0.1					
		Adjust		0.1				
		Replace		0.6				
1204	Hydraulic Brake System							
	Cylinder, Master	Service		0.1				
		Replace		2.5				
	Cylinder, Air-Hydraulic, RH	Replace		0.8				
		Repair			1.5			53
		Overhaul				3.0		50,51,52
	Lines, Hydraulic	Replace		0.2				
	Valve, Differential	Replace		0.2				
1208	Air Brake System							
	Lines and Fittings	Replace		0.2				
	Reservoir, Air	Service	0.1					
		Replace		1.8				
	Valve, Check	Replace		0.2				

Section III. TOOL AND TEST EQUIPMENT REQUIREMENTS

Refer to TM9-2320-209-20-1, for a complete listing of tool and test equipment requirements.

APPENDIX C

COMPONENTS OF END ITEM
AND BASIC ISSUE ITEMS LISTS

Refer to TM9-2320-209-10-1

APPENDIX D

ADDITIONAL AUTHORIZATION LIST

Refer to TM9-2320-209-10-1

APPENDIX E

EXPENDABLE/DURABLE SUPPLIES

AND MATERIALS LIST

Section I. INTRODUCTION

E-1. SCOPE

This appendix lists expendable/durable supplies and materials you will need to operate and maintain modified M44A2 vehicles. This listing is for informational purposes only and is not authority to requisition the listed items. These items are authorized to you by CTA 50-970, Expendable/Durable Items (except Medical, Class V, Repair Parts, and Heraldic Items), or CTA 8-100, Army Medical Department Expendable/Durable Items.

E-2. EXPLANATION OF COLUMNS

a. Column(1)-Item Number. This number is assigned to each entry in the listing and is referenced in the "Initial Setup" of applicable tasks under the heading of "Material/Parts."

b. Column(2)-Level. This column identifies the lowest level of maintenance that requires the listed item.

F - Direct Support Maintenance

c. Column(3)-National Stock Number. This is the national stock number assigned to the item; use it to request or requisition the item.

d. Column(4)-Description. Indicates the federal item name and, if required, a description to identify the item. The last line of each item listing indicates the Federal Supply Code for Manufacturer (FSCM) in parenthesis followed by the part number.

e. Column(5)-Unit of Measure(U/M). Indicates the measure used in performing the actual maintenance function. This measure is expressed by an alphabetical abbreviation (QT, GAL.). If the unit of measure differs from the unit of issue, requisition the lowest unit of issue that will satisfy your requirements.

Section II. EXPENDABLE/DURABLE SUPPLIES AND MATERIALS LIST

(1) Item Number	(2) Level	(3) National Stock Number	(4) Description	(5) U/M
1	O	7920-00-044-9281	CLOTH: cleaning, lint-free, general purpose, white, 10 lb box (81349) MIL-C-85043	LB
2	O	8030-00-889-3535	TAPE: antiseizing, white, MIL-T-27730A, 1/2 in. wide x 260 in. long x 0.0035 in. thick, snap-on shell (81755) P5025-2R	EA
3	O	8030-00-009-5023	SEALING COMPOUND: pipe, anaerobic, with teflon (05972) 59231	EA
4	C		BRAKE FLUID: silicone, automotive, all weather, operational and preservative (81349) MIL-B-46176	
		9150-01-102-9455	1 Gallon Can	Gal.
		9150-01-123-3152	5 Gallon Can	Gal.

APPENDIX F
ORGANIZATIONAL, DIRECT SUPPORT, AND GENERAL SUPPORT MAINTENANCE REPAIR PARTS AND SPECIAL TOOLS LIST (RPSTL)

Section I. INTRODUCTION

F-1. SCOPE

This Repair Parts and Special Tools List (RPSTL) lists and authorizes spares and repair parts; special tools; special test, measurement, and diagnostic equipment (TMDE); and other special support equipment required for performance of organizational, direct support, and general support maintenance of modified M44A2 series vehicles. It authorizes the requisitioning, issue, and disposition of spares, repair parts, and special tools as indicated by the Source, Maintenance, and Recoverability (SMR) codes.

F-2. GENERAL

In addition to Section I, Introduction, this Repair Parts and Special Tools List is divided into the following sections.

a. Section II. Repair Parts List. A list of spare and repair parts authorized by this RPSTL for use in performance of maintenance. The list also includes parts which must be removed for replacement of authorized parts. Parts lists are composed of functional groups in ascending alphanumeric sequence, with parts in each group listed in ascending figure and item number sequence.

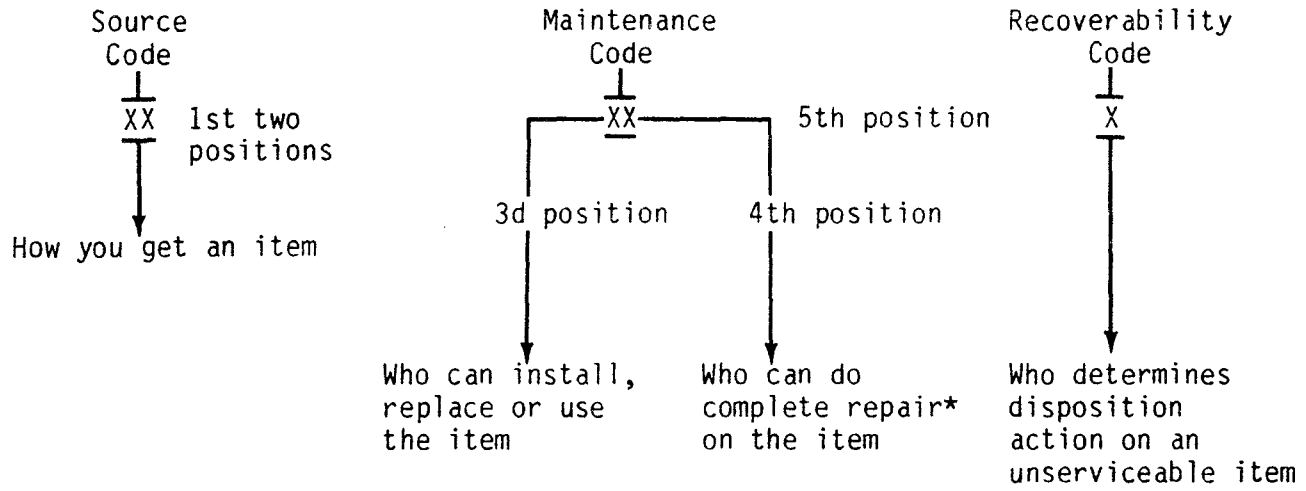
b. Section III. Special Tools List. A list of special tools, special TMDE, and other special support equipment authorized by this RPSTL (as indicated by Basis of Issue (BOI) information in DESCRIPTION AND USABLE ON CODE (UOC) column) for performance of maintenance.

c. Section IV. National Stock Number. National stock numbers will be listed in this SMARPI.

F-3. EXPLANATION OF COLUMNS (SECTIONS II AND III)

a. Column(1) - Item No. Indicates number used to identify items called out in the illustration.

b. Column(2) - SMR Code. The Source, Maintenance, and Recoverability (SMR) code is a 5-position code containing supply/requisitioning information, maintenance category authorization criteria, and disposition instructions, as shown in the following breakout:



*Complete Repair: Maintenance capacity, capability, and authority to perform all corrective maintenance tasks of "Repair" function in use/user environment in order to restore serviceability to failed item.

1. Source Code. The source code tells you how to get item needed for maintenance, repair, or overhaul of end item/equipment. Explanations of source codes follows:

Code	Explanation
PA PB PF	Stocked items; use applicable NSN to request/requistion items with these source codes. They are authorized to category indicated by code entered in 3d position of SMR code.
MO (Made at Org Level)	Items with these codes are not to be requested/requisitioned individually. They must be made from bulk material which is identified by the part number in the DESCRIPTION AND USABLE ON CODE (UOC) column and listed in appendix G. If item is authorized to you by 3d position code of the SMR code, but source code indicates it is made at a higher level, order item from higher level of maintenance.
KF	Items with these codes are not to be requested/requisitioned individually. They are part of a kit which is authorized to the maintenance category indicated in the 3d position of the SMR code. The complete kit must be requisitioned and applied.

NOTE

Cannibalization or controlled exchange, when authorized, may be used as source of supply for items with the above source codes.

2. Mainenance Code. Maintenance codes tell you level(s) of maintenance authorized to USE and REPAIR support items. Maintenance codes are entered in third and fourth positions of SMR code as follows:

a. Maintenance code entered in third position tells you lowest maintenance level authorized to remove, replace, and use an item. The maintenance code entered in the third position will indicate authorization to one of the following levels of maintenance:

Code	Application/Explanation
O	Organizational level can remove, replace, and use item.

b. The maintenance code entered in the fourth position tells whether or not the item is to be repaired and identifies lowest maintenance level with capability to do complete repair (i.e., perform all authorized repair functions). NOTE: Some limited repair may be done on item at lower level of maintenance if authorized by Maintenance Allocation Chart (MAC) and SMR codes.) This position will contain one of the following maintenance codes:

Code	Application/Explanation
O	Organizational is the lowest level that can do complete repair of the item.
F	Direct support is the lowest level that can do complete repair of the item.
Z	Nonreparable. No repair is authorized.

3. Recoverability Code. Recoverability codes are assigned to items to indicate disposition action on unserviceable items. Recoverability code is entered in fifth position of SMR code as follows:

Recoverability Code	Application/Explanation
Z	Nonreparable item. When unserviceable, condemn and dispose of item at level of maintenance shown in 3d position of SMR code.

Recoverability Code	Application/Explanation
O	Reparable item. When uneconomically reparable, condemn and dispose of the item at the organizational level.
F	Reparable item. When uneconomically reparable, condemn and dispose of the item at the direct support level.

c. Column(3)-NSN. Indicates the national stock number assigned to the item and which will be used for requisitionng.

d. Column(4)-FSCM. The Federal Supply Code for Manufacturer (FSCM) is a 5-digit numeric code used to identify manufacturer, distributor, or Government agency, etc., that supplies the item.

e. Column(5)-Part Number. Indicates primary number used by the manufacturer (individual, company, firm, corporation, or Government activity), which controls design and characteristics of the item by means of its engineering drawings, specifications standards, and inspection requirements to identify an item or range of items.

f. Column(6)-Description and Usable on Code (UOC). This column includes the following information:

1. Federal item name and, when required, minimum description to identify the item.
2. Items that are included in kits and sets are listed below name of kit or set.
3. Spare/repair parts that make up assembled item are listed immediately following assembled item line entry.
4. Part numbers for bulk materials are referenced in this column in line item entry for item to be manufactured/fabricated.
5. The usable on code, when applicable (refer to F-4, Special information).
6. In the Special Tools List section, Basis of Issue (BOI) appears as last line(s) in entry for each special tool, special TMDE, and other special support equipment. When amount of equipment supported exceeds ratio indicated in basis of issue, total authorization is increased proportionately.
7. The statement "END OF FIGURE" appears just below last item description in column (5) for figure in both Section II and Section III.

g. Column(7)-QTY. The QTY (quantity per figure column) indicates quantity of item used. A "V" appearing in this column indicates that quantity is variable and may vary from application to application. If column is blank, refer to BOI in column (5).

F-4. SPECIAL INFORMATION

a. Usable on Code. All parts found in this manual will be used on modified M44A2 series vehicles. Usable on codes are shown in the description column. Uncoded items are applicable to all models. Identification of the usable on codes used in this publication are:

438 - M35A2 w/winch
445 - M35A2C w/o winch
446 - M35A2C w/winch
455 - M36A2 w/o winch
503 - M49A2C w/o winch
B95 - M50A3 w/o winch

b. Fabrication Instructions. Detailed fabrication instructions are found in appendix G.

F-5. HOW TO LOCATE REPAIR PARTS

NOTE

This publication covers only items unique to modified M44A2 2-1/2 Ton series trucks with a split air-hydraulic system. Refer to TM9-2320-209-34P1 and TM9-2320-209-34P2 or TM9-2320-209-20P for all standard components.

a. First. Using the table of contents, determine the assembly group or subassembly group to which the item belongs. This is necessary since figures are prepared for assembly groups and subassembly groups, and listings are divided into the same groups.

b. Second. Find the figure covering the assembly group or subassembly group to which the item belongs.

c. Third. Identify the item on the figure and note the item number.

d. Fourth. Refer to the Repair Parts List to find the part number for the item number noted on the figure.

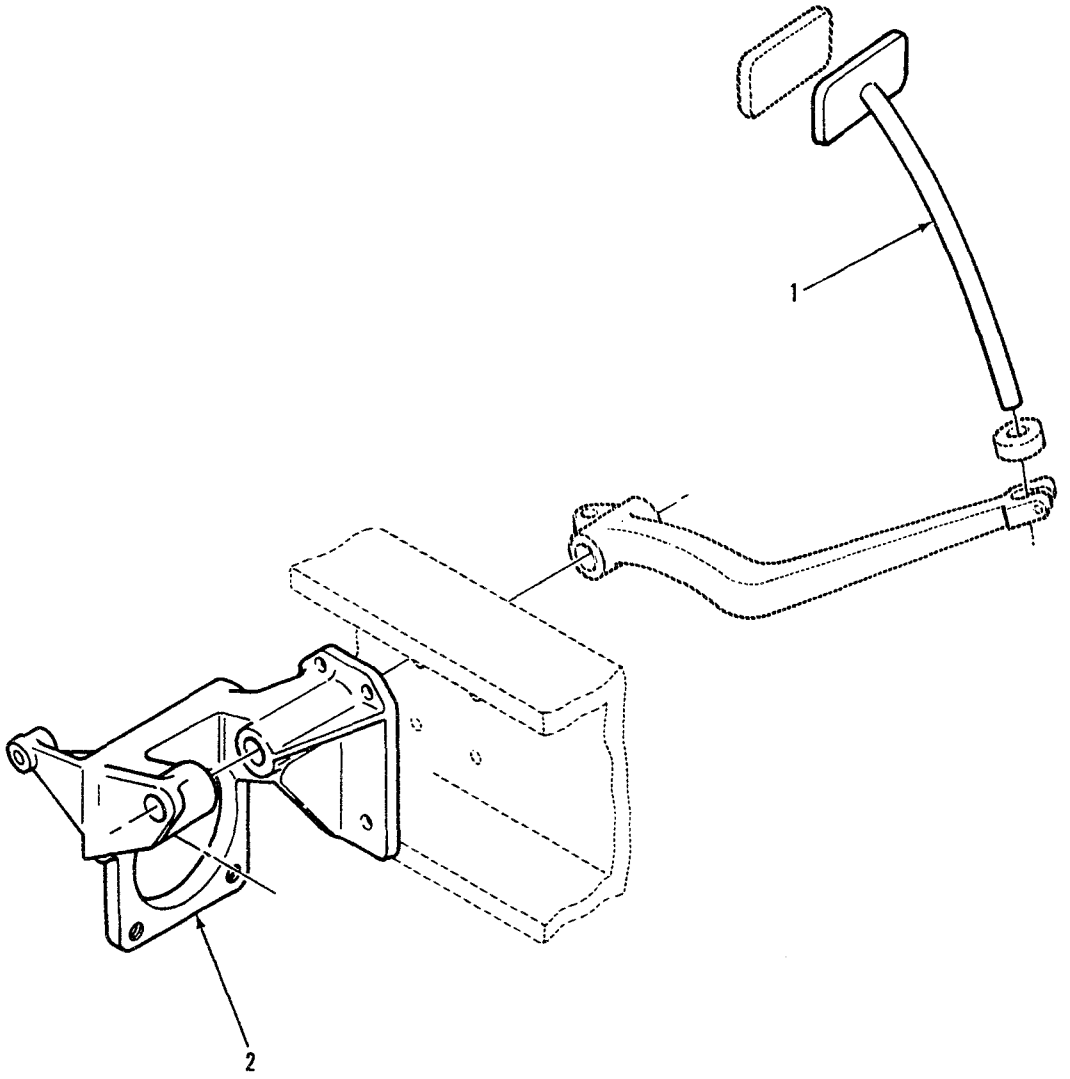


Figure 1. Clutch Pedal and Pedal Shaft Support

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(1) ITEM NO.	(2) SMR CODE	(3) NATIONAL STOCK NUMBER (NSN)	(4) FSCM	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY.
					GROUP 02 CLUTCH 0202 CLUTCH RELEASE MECHANISM FIGURE 1. CLUTCH PEDAL AND PEDAL SHAFT SUPPORT	
1	PAOZZ		34623	5934078	PEDAL	1
2	PFOZZ		34623	5934072	SUPPORT	1
					END OF FIGURE	

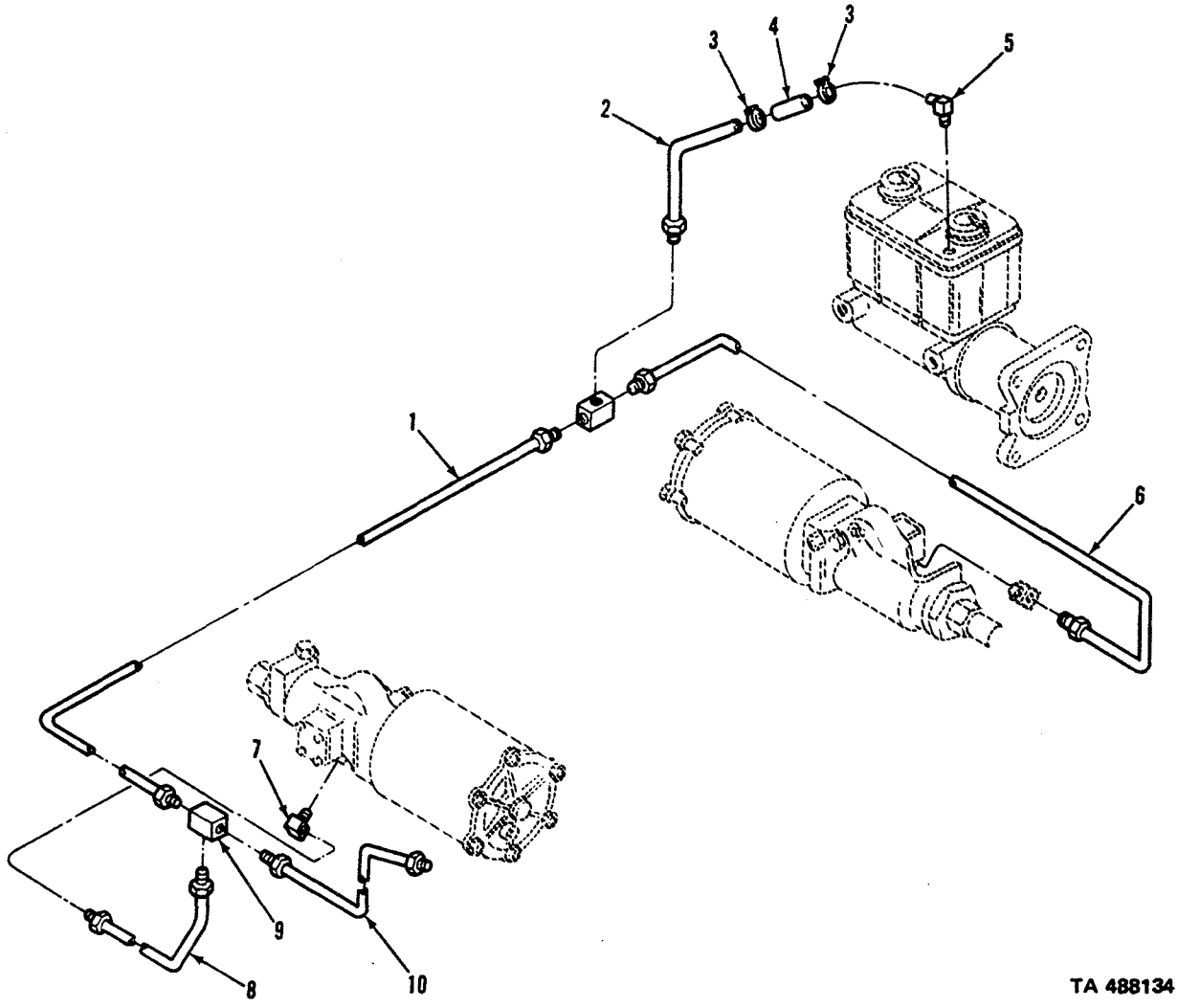
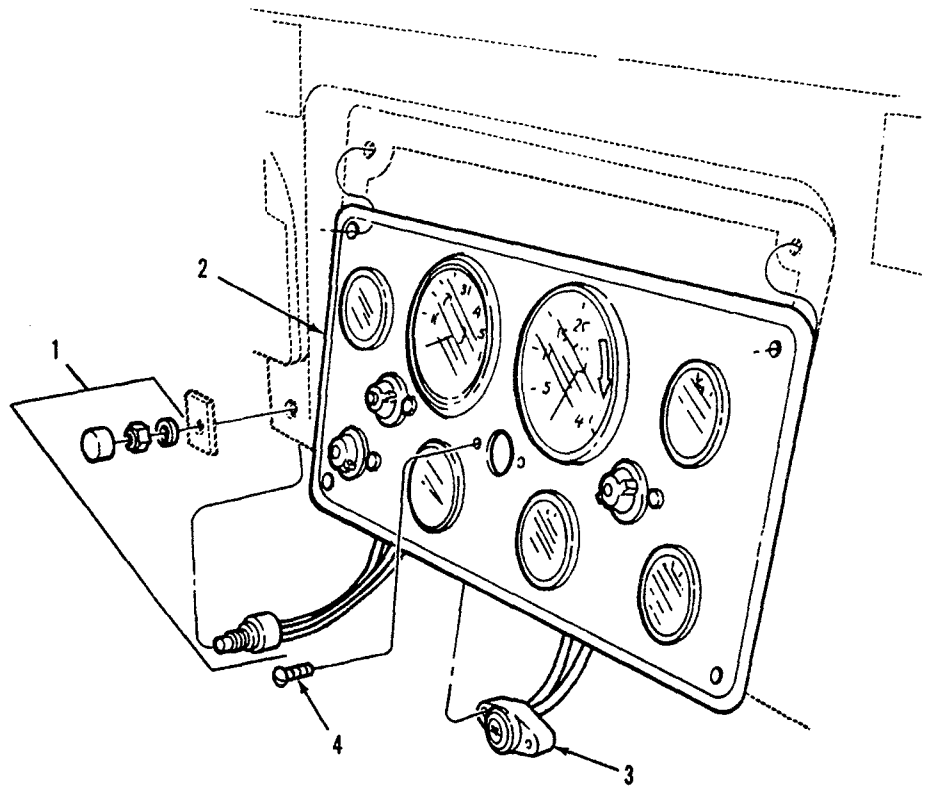


Figure 2. Vent Lines

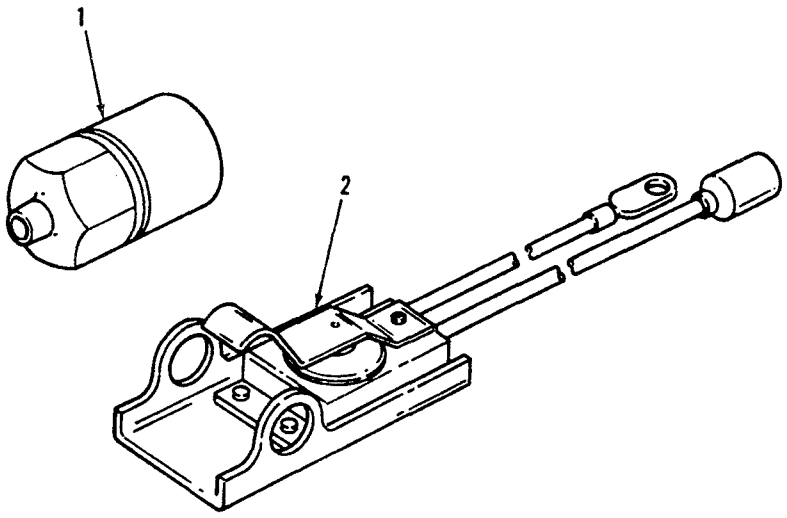
(1) ITEM NO.	(2) SMR CODE	(3) NATIONAL STOCK NUMBER (NSN)	(4) FSCM	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY.
					GROUP 03 FUEL SYSTEM 0304 AIR CLEANER	
					FIGURE 2. VENT LINES	
1	MOOZZ		34623	5934179	TUBE ASSEMBLY, MAKE FROM 31.88 INCHES OF 8689208 COPPER TUBE AND TWO 142433 INVERTED FLARE NUTS	1
2	PAOZZ		34623	5934103	TUBE ASSEMBLY	1
3	PAOZZ		09788	UM3173	CLAMP	2
4	MOOZZ		34623	5591161	TUBE, MAKE FROM 10 INCHES OF NB-4-035	1
5	PBOZZ		01989	1069X4X1	ELBOW	1
6	MOOZZ		34623	5934110	TUBE ASSEMBLY, MAKE FROM 26 INCHES of 8689208 COPPER TUBE AND TWO 137399 INVERTED FLARE NUTS	1
7	PAOZZ		19207	7373366	ELBOW	1
8	MOOZZ		34623	5934109	TUBE ASSEMBLY, MAKE FROM 21 INCHES of 8689208 COPPER TUBE AND TWO 137399 INVERTED FLARE NUTS	1
9	PAOZZ		24617	178661	TEE, 3/8 INCH	1
10	MOOZZ		34623	5934180	HOSE, MAKE FROM 55.12 INCHES OF 8689208 COPPER TUBE AND TWO 142433 INVERTED FLARE NUTS	1
					END OF FIGURE	



TA 488135

Figure 3. Instrument Panel

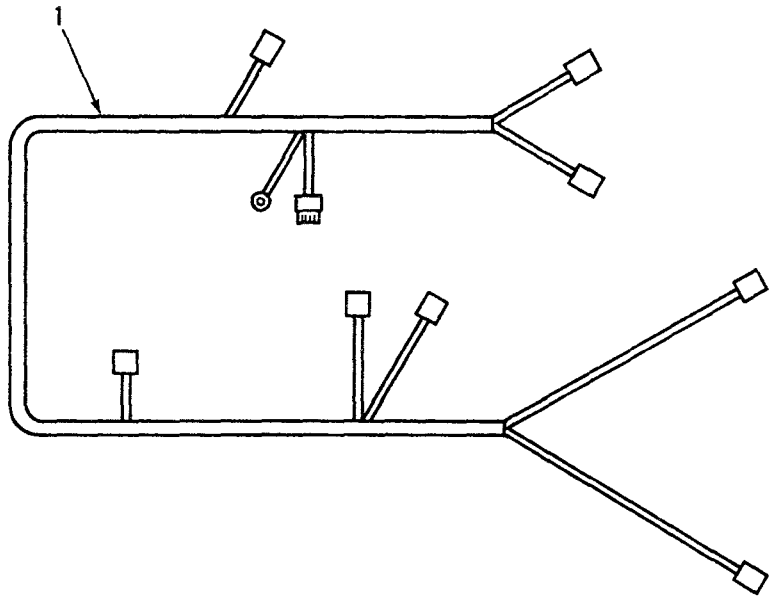
(1) ITEM NO.	(2) SMR CODE	(3) NATIONAL STOCK NUMBER (NSN)	(4) FSCM	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY.
					GROUP 06 ELECTRICAL SYSTEM 0607 INSTRUMENT OF ENGINE Control Panel	
					FIGURE 3. INSTRUMENT PANEL	
1	PAOZZ		34623	5934089	SWITCH, START	1
2	PF000		34623	5934088	CLUSTER, INSTRUMENT	1
3	PAOZZ		34623	SF5583394	LAMP, BRAKE	1
4	PAOZZ		96906	MS24629-37	SCREW, #8-32 X 5/8 INCH	2
					END OF FIGURE	



TA 488136

Figure 4. Stoplamp Switch and Parking Brake Switch

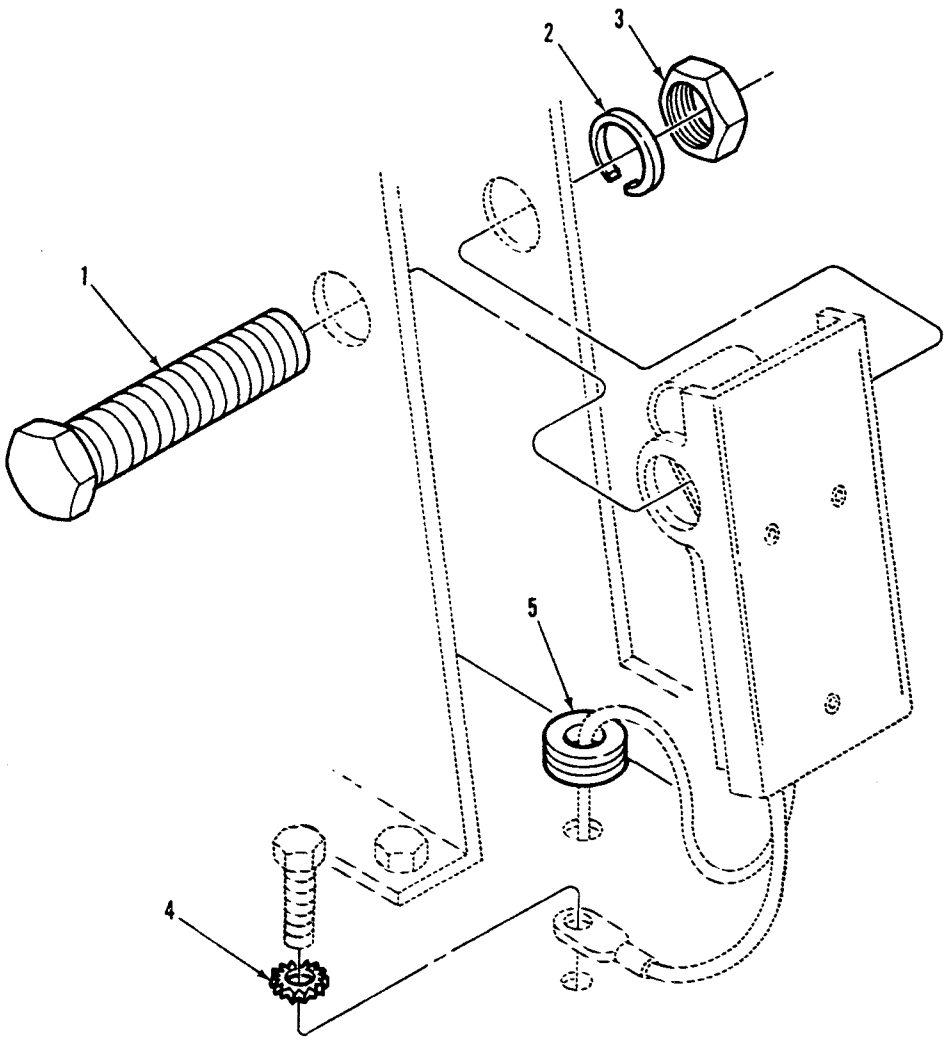
(1) ITEM NO.	(2) SMR CODE	(3) NATIONAL STOCK NUMBER (NSN)	(4) FSCM	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY.
					GROUP 06 ELECTRICAL SYSTEM 0608 MISCELLANEOUS ITEMS	
					FIGURE 4. STOPLAMP SWITCH AND PARKING BRAKE SWITCH	
1	PAOZZ		19207	7064588	SWITCH, STOPLAMP	1
2	PAOZZ		19207	11669094-1	SWITCH, PARKING BRAKE	1
					END OF FIGURE	



TA 488137

Figure 5. Brake Circuit Harness

(1) ITEM NO.	(2) SMR CODE	(3) NATIONAL STOCK NUMBER (NSN)	(4) FSCM	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY.
					GROUP 06 ELECTRICAL SYSTEM 0613 HULL OR CHASSIS WIRING HARNESS FIGURE 5. BRAKE CIRCUIT HARNESS	
1	PF0ZZ		34623	5934093	HARNESS	1
					END OF FIGURE	



TA 488138

Figure 6. Handbrake Controls

(1) ITEM NO.	(2) SMR CODE	(3) NATIONAL STOCK NUMBER (NSN)	(4) FSCM	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY.
					GROUP 12 BRAKES 1201 HAND BRAKES FIGURE 6. HANDBRAKE CONTROLS	
1	PAOZZ		96906	MS35292-66	SCREW	1
2	PAOZZ		96906	MS27183-14	WASHER	1
3	PAOZZ		96906	MS51922-21	NUT	1
4	PAOZZ		96906	MS35333-42	LOCKWASHER	1
5	PAOZZ		96906	MS35490-30	GROMMET	1
					END OF FIGURE	

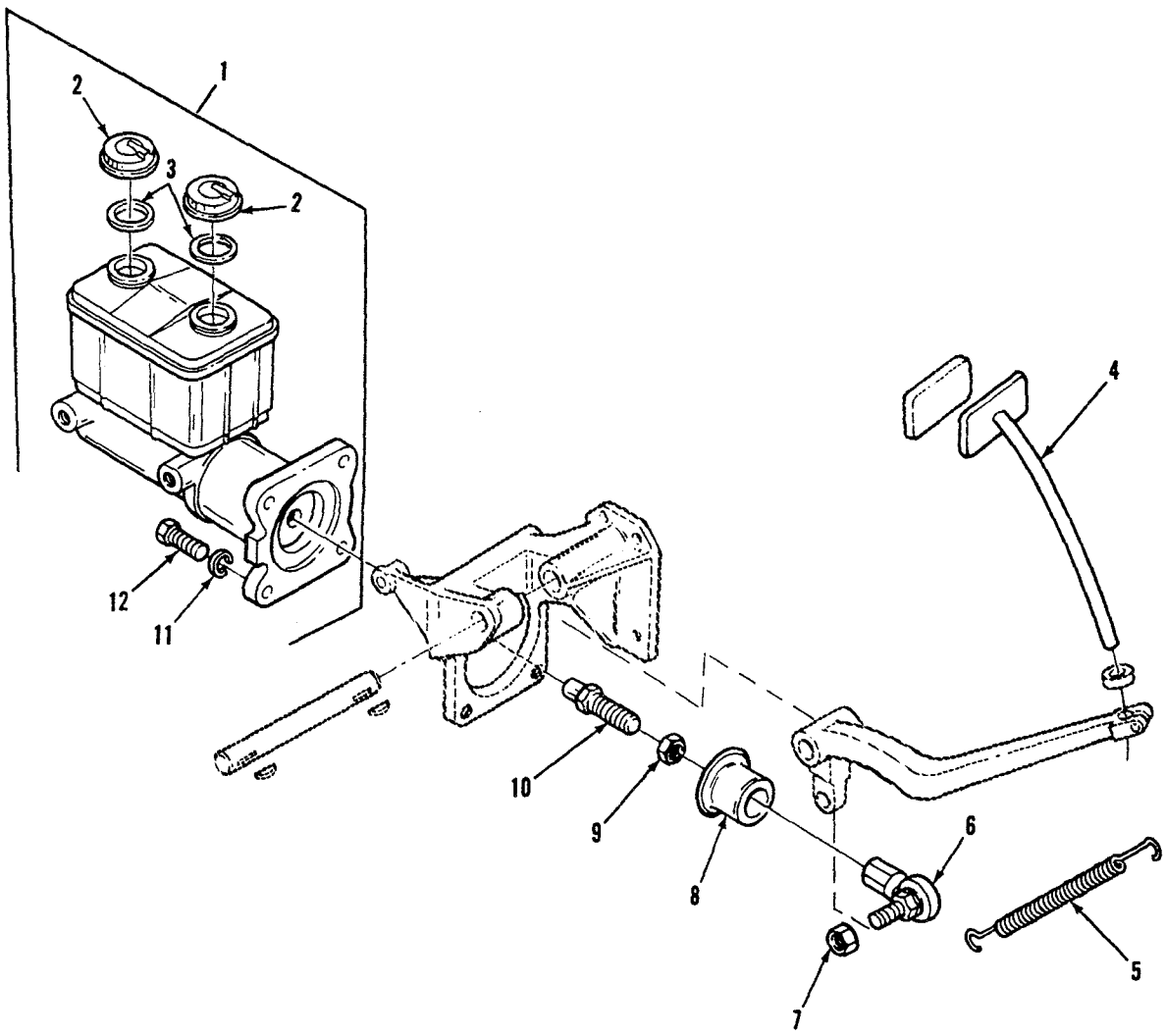
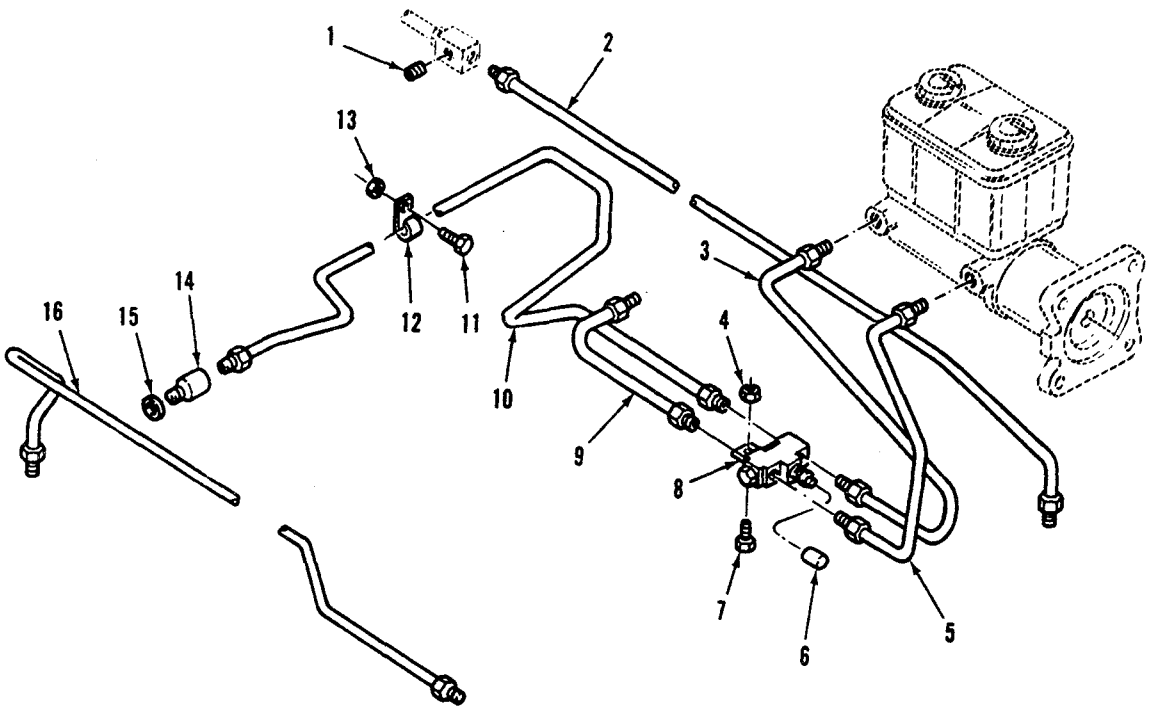


Figure 7. Master Cylinder and Pedal Linkage TA 488139

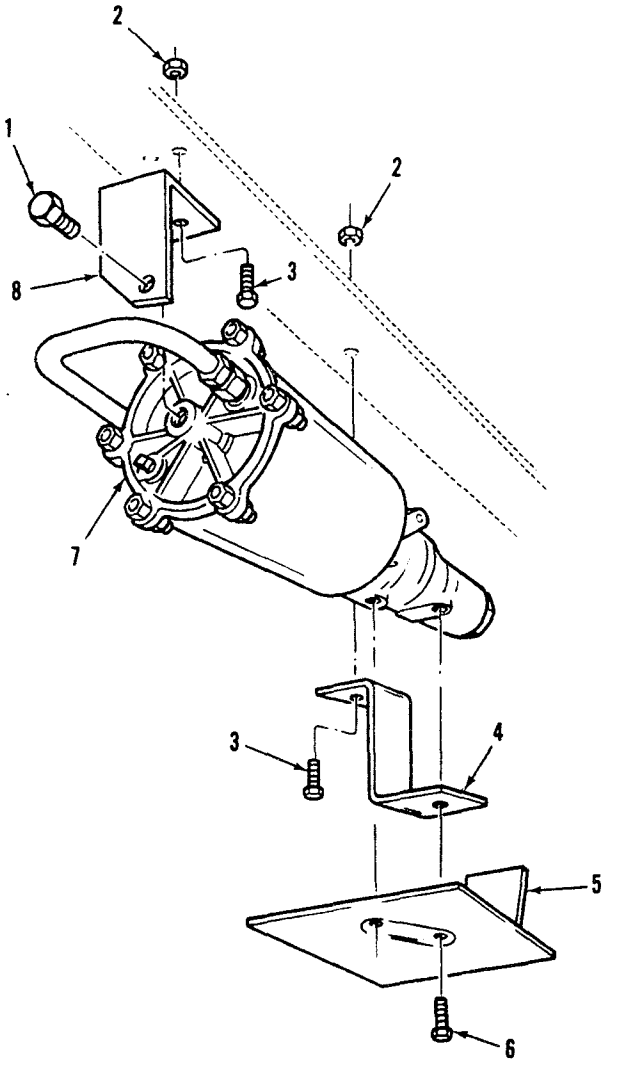
(1) ITEM NO.	(2) SMR CODE	(3) NATIONAL STOCK NUMBER (NSN)	(4) FSCM	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY.
					GROUP 12 BRAKES 1204 HYDRAULIC BRAKE SYSTEM FIGURE 7. MASTER CYLINDER AND PEDAL LINKAGE	
1	PAOZZ		34623	5934071	CYLINDER, MASTER	1
2	PAOZZ		14892	2231936	·CAP	2
3	PAOZZ		34623	5934199	·SEAL	2
4	PAOZZ		19207	5934078	PEDAL	1
5	PAOZZ		19207	7520981-1	SPRING	1
6	KFOZZ		34623	5934084	END, ROD, PART OF KIT GROUP 94, ITEM 1	1
7	PAOZZ		96906	MS21245-L8	NUT, PART OF KIT GROUP 94, ITEM 1	1
8	PBOZZ		34623	5934086	BOOT	1
9	PBOZZ		96906	MS35691-37	NUT	1
10	PBOZZ		34623	5934083	ROD, PUSH	1
11	PAOZZ		96906	MS35338-46	LOCKWASHER	4
12	PAOZZ		96906	MS90725-62	BOLT	4
					END OF FIGURE	



TA 488140

Figure 8. Hydraulic Lines

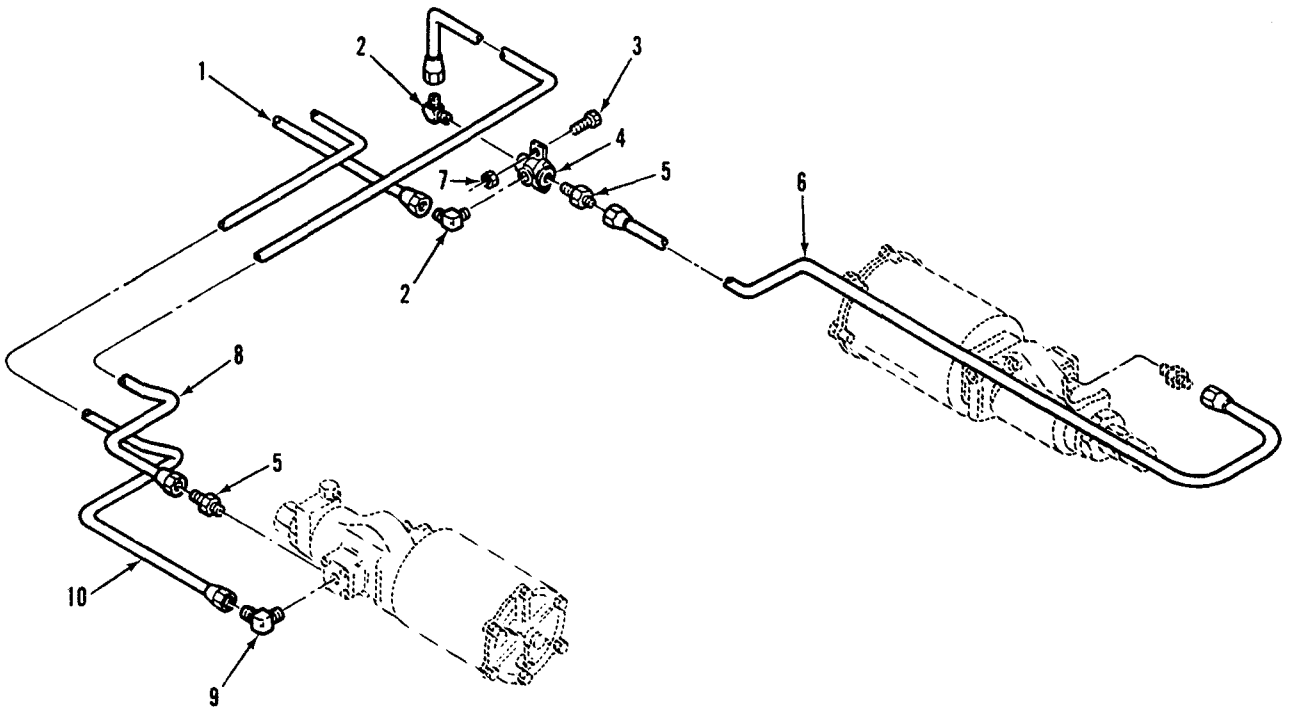
(1) ITEM NO.	(2) SMR CODE	(3) NATIONAL STOCK NUMBER (NSN)	(4) FSCM	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY.
					GROUP 12 BRAKES 1204 HYDRAULIC BRAKE SYSTEM FIGURE 8. HYDRAULIC LINES	
1	PAOZZ		24617	147711	PLUG	1
2	PBOZZ		34623	5934090	LINE	1
3	PBOZZ		34623	5934102	LINE	1
4	PBOZZ		96906	MS51922-1	NUT	2
5	PBOZZ		34623	5934101	LINE	1
6	PAOZZ		34623	5934191	SHELL	1
7	PBOZZ		96906	MS35291-5	SCREW	2
8	PAOZZ		34623	5934092	VALVE	1
9	PBOZZ		34623	5934104	LINE	1
10	PBOZZ		34623	5934105	LINE	1
11	PBOZZ		96906	MS90726-60	SCREW	1
12	PBOZZ		96906	MS21333-119	CLAMP	1
13	PBOZZ		96906	MS51922-21	NUT	1
14	PBOZZ		19207	5186963-1	CONNECTOR	2
15	PBOZZ		19207	5156636	GASKET	1
16	PBOZZ		34623	5934091	LINE	1
					END OF FIGURE	



TA 488141

Figure 9. Right-Hand Air-Hydraulic Unit

(1) ITEM NO.	(2) SMR CODE	(3) NATIONAL STOCK NUMBER (NSN)	(4) FSCM	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY.
					GROUP 12 BRAKES 1204 HYDRAULIC BRAKE SYSTEM FIGURE 9. RIGHT-HAND AIR-HYDRAULIC UNIT	
1	PAOZZ		96906	MS35763-865	BOLT	1
2	PAOZZ		96906	MS51943-36	NUT	3
3	PAOZZ		96906	MS90726-62	BOLT	3
4	PFOZZ		34623	5934081	BRACKET, REAR	1
5	PBOZZ		34623	5934100	SHIELD	1
6	PAOZZ		19207	7373223	BOLT	2
7	PAOFF		19207	8345003	UNIT ASSEMBLY, AIR-HYDRAULIC	1
8	PBOZZ		34623	5934080	BRACKET, FRONT	1
					END OF FIGURE	



TA 488142

Figure 10. Air Lines

(1) ITEM NO.	(2) SMR CODE	(3) NATIONAL STOCK NUMBER (NSN)	(4) FSCM	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY.
					GROUP 12 BRAKES 1208 AIR BRAKE SYSTEM FIGURE 10. AIR LINES	
1	MOOZZ		34623	5934096	TUBE ASSEMBLY, 438, 445, 446, MAKE FROM 114 INCHES OF 8689208 COPPER TUBE	1
1	MOOZZ		34623	5934115	TUBE ASSEMBLY, 455, MAKE FROM 180 INCHES OF 8689208 COPPER TUBE	1
1	MOOZZ		34623	5934224	TUBE ASSEMBLY, 503, B95, MAKE FROM 77.63 INCHES OF 8689208 COPPER TUBE	1
2	PBOZZ		96906	MS39182-5	ELBOW	2
3	PBOZZ		96906	MS90726-34	SCREW	1
4	PBOZZ		06853	278614	VALVE, CHECK	1
5	PBOZZ		96906	MS39179-6	ADAPTER	2
6	MOOZZ		34623	5934094	TUBE ASSEMBLY, 438, 445, 446, 455 MAKE FROM 72 INCHES OF 8689208 COPPER TUBE	1
6	MOOZZ		34623	5934222	TUBE ASSEMBLY, 503, B95, MAKE FROM 108.38 INCHES OF 8689208 COPPER TUBE	1
7	PBOZZ		96906	MS51943-34	NUT	1
8	MOOZZ		34623	5934095	TUBE ASSEMBLY, 438, 445, 446, 455 MAKE FROM 105 INCHES OF 8689208 COPPER TUBE	1
8	MOOZZ		34623	5934223	TUBE ASSEMBLY, 503, B95, MAKE FROM 141.38 INCHES OF 8689208 COPPER TUBE	1
9	PBOZZ		96906	MS39182-6	ELBOW	1
10	MOOZZ		34623	5934097	TUBE ASSEMBLY, 438, 445, 446, 503, 895, MAKE FROM 107 INCHES OF 8689210 COPPER TUBE	1
10	MOOZZ		34623	5934116	TUBE ASSEMBLY, 455, MAKE FROM 140 INCHES OF 8689210 COPPER TUBE	1
					END OF FIGURE	

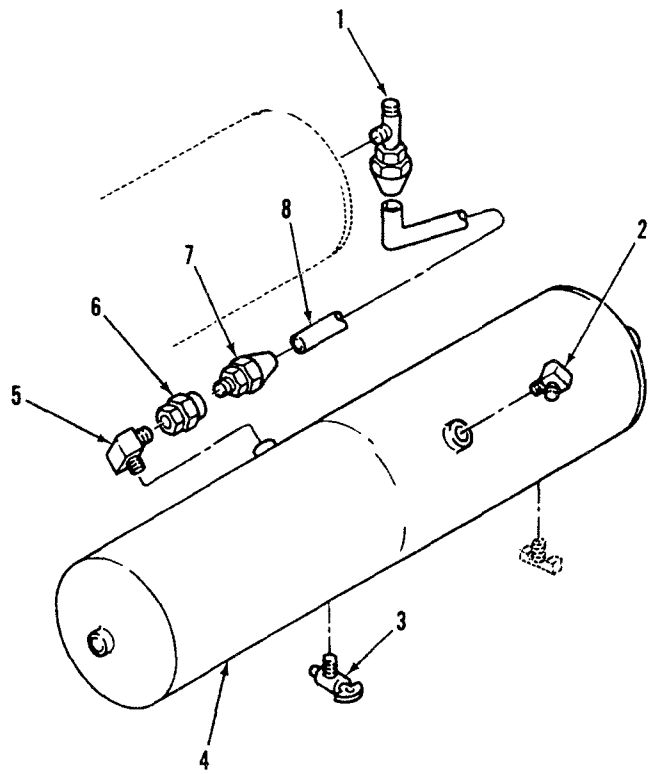


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Figure 11. Air Reservoirs

(1) ITEM NO.	(2) SMR CODE	(3) NATIONAL STOCK NUMBER (NSN)	(4) FSCM	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY.
					GROUP 12 BRAKES 1208 AIR BRAKE SYSTEM FIGURE 11. AIR RESERVOIRS	
1	PB0ZZ		96906	MS39190-5	TEE	1
2	PB0ZZ		96906	MS39182-6	ELBOW	1
3	PA0ZZ		19204	5159378	DRAINCOCK	1
4	PF0ZZ		34623	5934082	RESERVOIR	1
5	PB0ZZ		19207	10896324	ELBOW	1
6	PB0ZZ		40342	N13526H	VALVE	1
7	PB0ZZ		96906	MS39179-10	ADAPTER	1
8	M00ZZ		34623	5934098	TUBE, MAKE FROM 26 INCHES OF 8689210 COPPER TUBE	1
					END OF FIGURE	

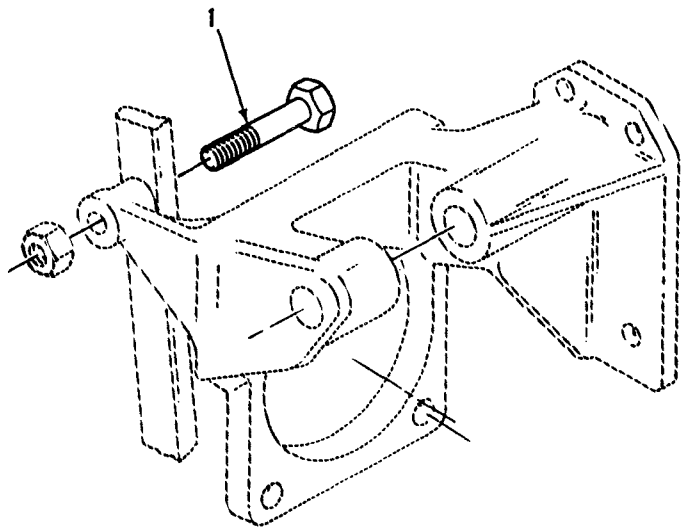

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Figure 12. Power Takeoff Controls - Transmission

(1) ITEM NO.	(2) SMR CODE	(3) NATIONAL STOCK NUMBER (NSN)	(4) FSCM	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY.
					GROUP 20 HOIST, WINCH, CAPSTAN, WINDLASS, POWER CONTROL UNIT AND POWER TAKEOFF	
					2004 POWER TAKEOFF ASSEMBLY	
					FIGURE 12. POWER TAKEOFF CONTROLS - TRANSMISSION	
1	PAOZZ		96906	MS90726-117	SCREW, 438, 446	1
					END OF FIGURE	

Figure 13. Repair Kits

(1) ITEM NO.	(2) SMR CODE	(3) NATIONAL STOCK NUMBER (NSN)	(4) FSCM	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY.
					GROUP 94 KITS	
					9401 SERVICE KITS	
					FIGURE 13. REPAIR KITS	
1	PAOZZ		34623	5730788	PARTS KIT, ROD END	V
	PAOZZ				..NUT, FIGURE 7, ITEM 6	1
	KFOZZ				..END, ROD, FIGURE 7, ITEM 5	1
					END OF FIGURE	

Figure 14. Bulk Material

(1) ITEM NO.	(2) SMR CODE	(3) NATIONAL STOCK NUMBER (NSN)	(4) FSCM	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY.
					GROUP 95 GENERAL USE STANDARDIZED PARTS	
					9501 HARDWARE SUPPLIES AND BULK MATERIAL, COMMON	
					FIGURE 14. BULK MATERIAL	
1	PAOZZ		19207	8689208	TUBE, COPPER	V
2	PAOZZ		24617	137399	NUT, INVERTED FLARE, 3/8 INCH	V
3	PAOZZ		61424	NB-4-035	HOSE	V
4	PAOZZ		19207	8689210	TUBE, COPPER	V
5	PAOZZ		21450	142433	NUT, INVERTED FLARE, 1/2 INCH	V
					END OF FIGURE	

APPENDIX G

ILLUSTRATED LIST OF MANUFACTURED ITEMS

Section I. INTRODUCTION

G-1. SCOPE

This appendix includes complete instructions for making items authorized to be manufactured or fabricated by organizational, direct support, and general support maintenance.

G-2. GENERAL

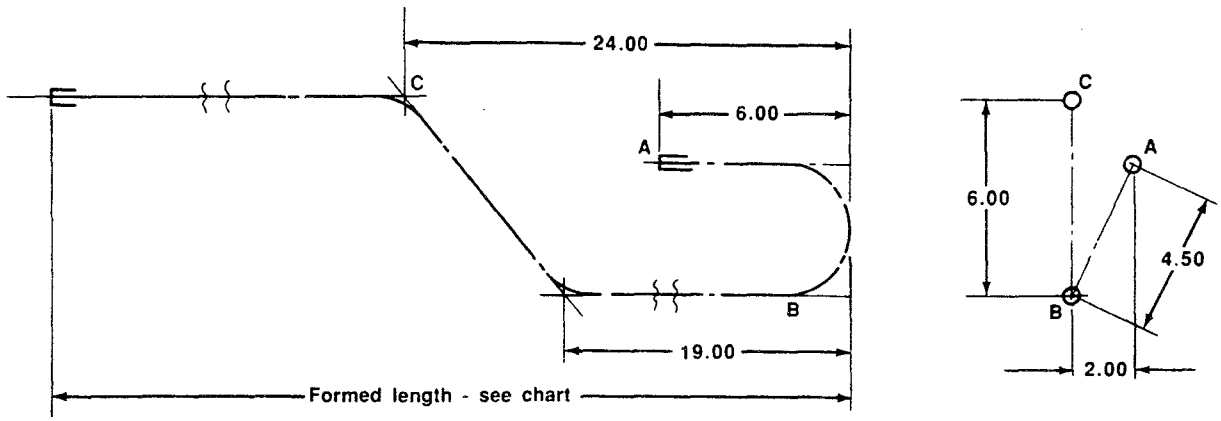
a. A part number index in numeric order is provided for cross-referencing the part number of the item to be manufactured to the figure which covers fabrication requirements.

b. All bulk materials needed for manufacture of an item are listed by part number or specification number.

Table G-1. Manufactured Items Part Number Index

PART NUMBER	FIGURE NUMBER
5591161	G-10
5934094	G-1
5934095	G-2
5934096	G-3
5934097	G-4
5934098	G-5
5934109	G-6
5934110	G-7
5934115	G-3
5934116	G-4
5934179	G-8
5934180	G-9
5934222	G-1
5934223	G-2
5934224	G-3

Section II. ILLUSTRATED MANUFACTURING INSTRUCTIONS



Item No.	Part Number	Free Length Inches	Formed Length Inches
1	5934094	72.0	53.12
2	5934222	108.38	89.50

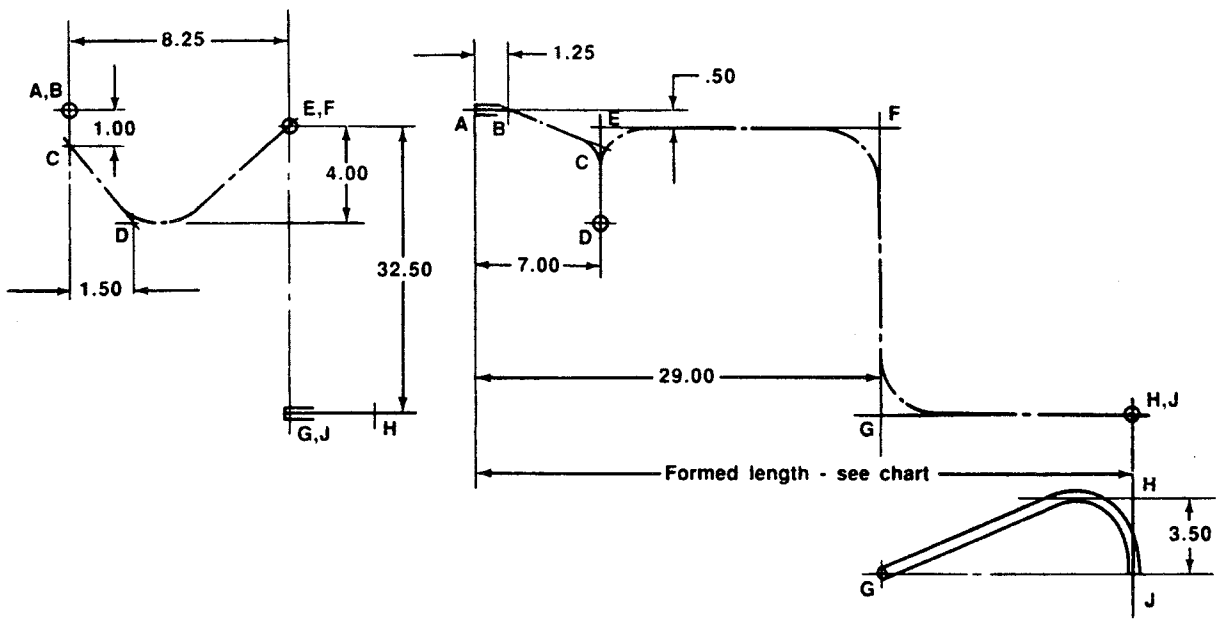
Figure G-1. Tube Assembly, Air, Left-Hand Air-Hydraulic Unit to Check Valve

Instructions:

1. Form to dimensions shown in chart from 8689208 copper tube.

2. All bend radii should be 2.25 inches.

Section II. ILLUSTRATED MANUFACTURING INSTRUCTIONS (Contd)



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Item No.	Part Number	Free Length Inches	Formed Length Inches
1	5934095	105.00	48.25
2	5934223	141.38	84.63

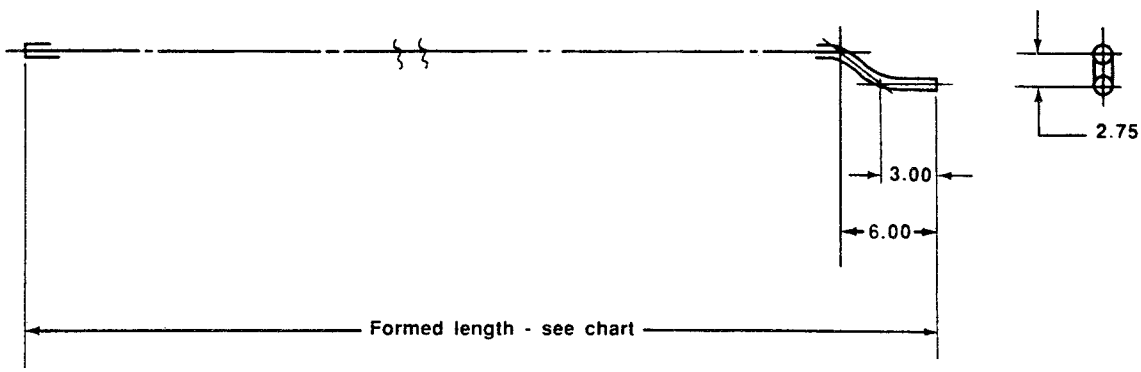
Figure G-2. Tube Assembly, Air, Right-Hand Air-Hydraulic Unit to Check Valve

Instructions:

1. Form to dimensions shown in chart from 8689208 copper tube.

2. All bend radii should be 2.25 inches.

Section II. ILLUSTRATED MANUFACTURING INSTRUCTIONS (Contd)



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Item No.	Part Number	Free Length Inches	Formed Length Inches
1	5934096	114.00	111.75
2	5934115	180.00	177.75
3	5934224	77.63	75.38

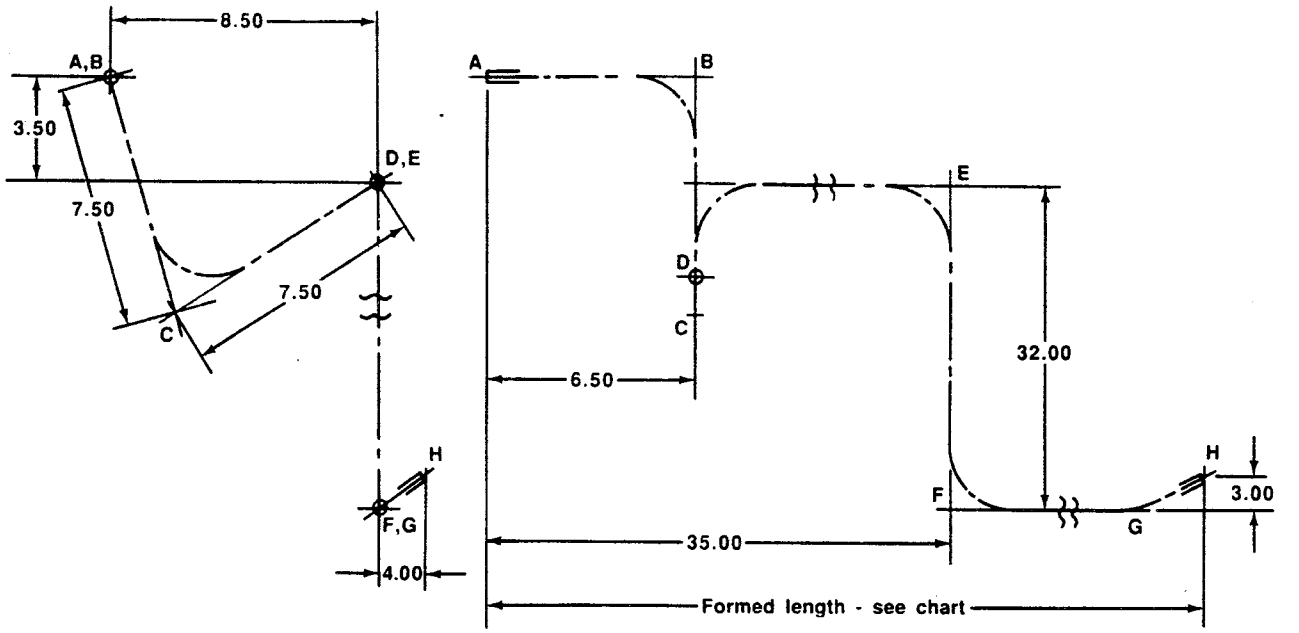
Figure G-3. Tube Assembly, Air, Check Valve to Left Gladhand

Instructions:

1. Form to dimensions shown in chart from 8689208 copper tube.

2. All bend radii should be 2.25 inches.

Section II. ILLUSTRATED MANUFACTURING INSTRUCTIONS (Contd)



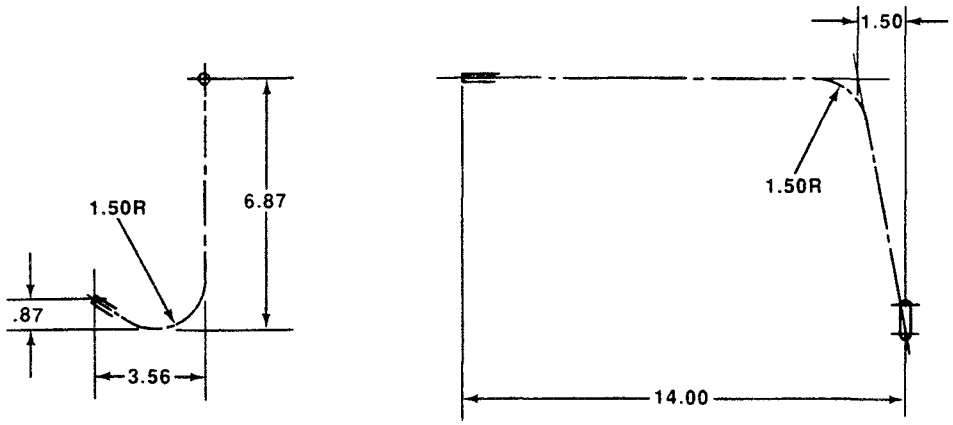
Item No.	Part Number	Free Length Inches	Formed Length Inches
1	5934097	107	56.00
2	5934116	140	88.75

Figure G-4. Tube Assembly, Air, Right-Hand Air-Hydraulic Unit to Left-Hand Air Reservoir

Instructions:

1. Form to dimensions shown in chart from 8689210 copper tube.

2. All bend radii should be 2.25 inches.



TA 488149

Figure G-5. Tube, Air, Left-Hand Air Reservoir to Right-Hand Air Reservoir Check Valve

Instructions:

1. Form to dimensions shown using 26 inches of 8689210 copper tube.

Section II. ILLUSTRATED MANUFACTURING INSTRUCTIONS (Contd)

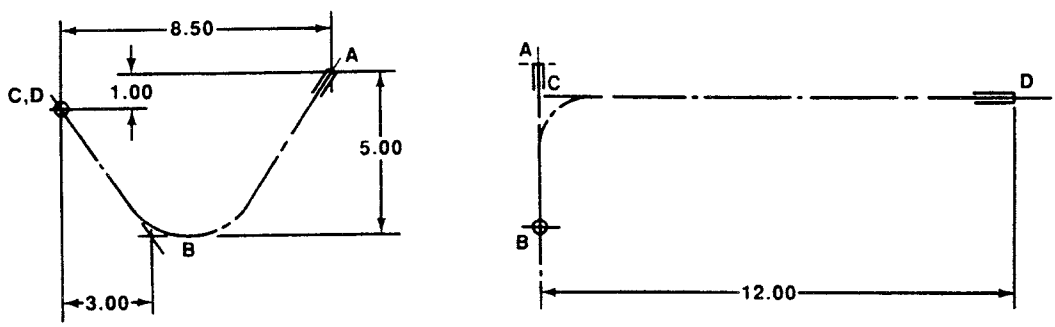
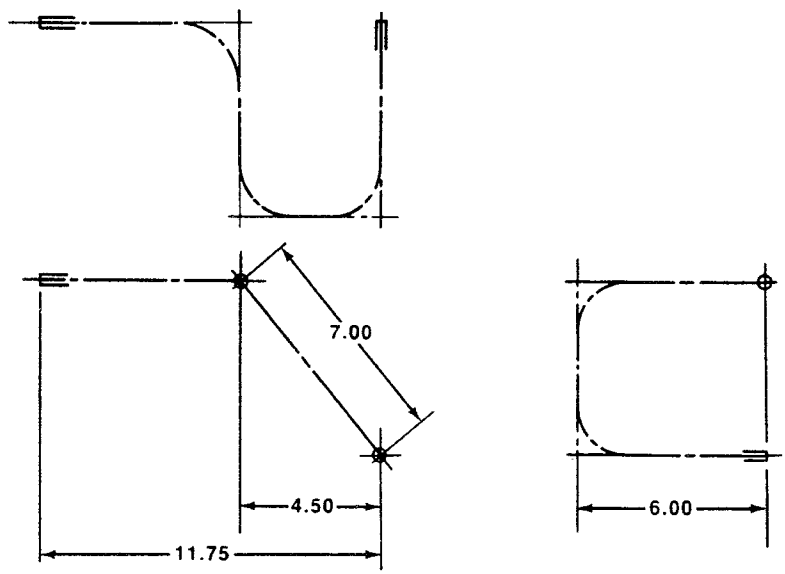


Figure G-6. Tube Assembly, Vent, Right-Hand Air-Hydraulic Unit to Tee

Instructions:

1. Form to dimensions shown using 21 inches of 8689208 copper tube.
2. Install two 13799 inverted flare nuts, one on each end of tube.
3. Double flare tube ends.
4. All bend radii should be 2.25 inches.



TA 488151

Figure G-7. Tube Assembly, Vent, Left-Hand Air-Hydraulic Unit to Tee

Instructions:

1. Form to dimensions shown using 26 inches of 8689208 copper tube.
2. Install two 137399 inverted flare nuts, one on each end of tube.
3. Double flare tube ends.
4. All bend radii should be 2.25 inches.

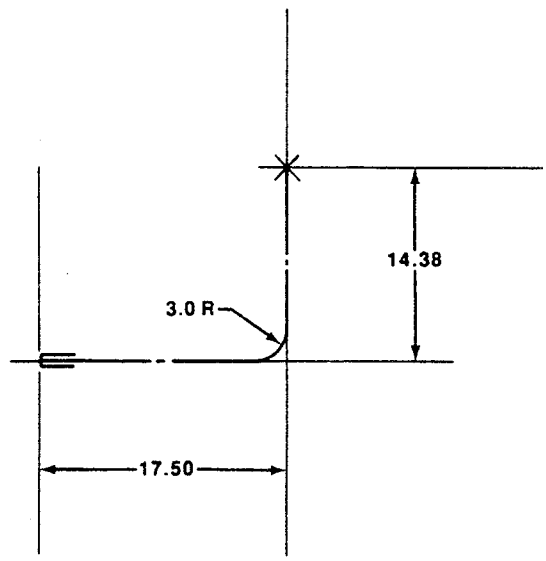


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Figure G-8. Tube Assembly, Vent, Tee on Crossmember to Tee on Right-Hand Frame Rail.

Instructions:

1. Form to dimensions shown using 31.88 inches of 8689208 copper tube.
2. Install two 142433 inverted flare nuts, one on each end of tube.
3. Double flare tube ends.
4. All bend radii should be 2.25 inches.

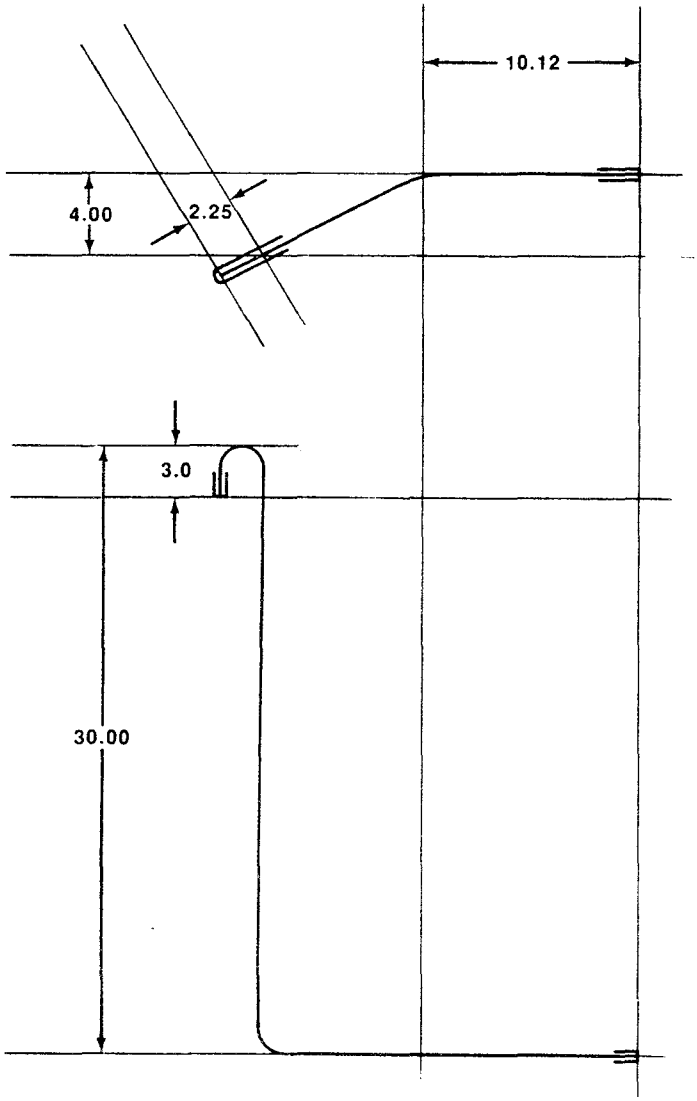

Figure G-9. Tube Assembly, Vent, Tee on Right-Hand Frame Rail to Firewall

Instructions:

1. Form to dimensions shown using 55.12 inches of 8689208 copper tube.
2. Install two 142433 inverted flare nuts, one on each end of tube.
3. Double flare tube ends.
4. All bend radii should be 2.25 inches.

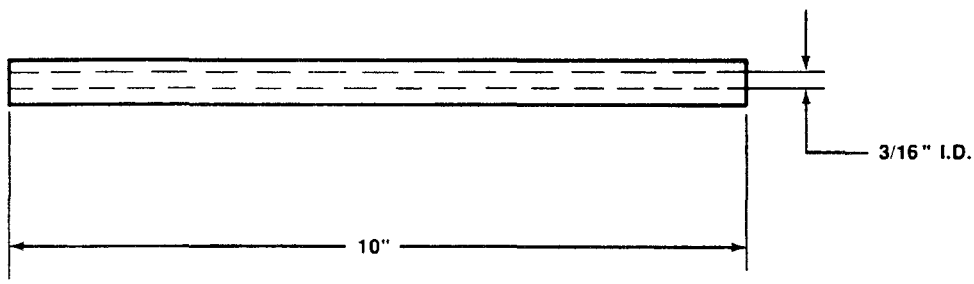

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Figure G-10. Hose, Vent, Tee on Crossmember to Vented Cap on Master Cylinder

Instructions:

1. Cut as shown from NB-4-035, Type II.

APPENDIX H

TORQUE LIMITS

BOLT OR SCREW SIZE	THREADS PER INCH	DIAMETER (INCH)	SAE GRADE 5 TORQUE		SAE GRADE 8 TORQUE	
			DRY	WET	DRY	WET
			POUND-INCH			
#10	32	.1900	49	36	68	51
1/4	28	.2500	120	86	168	120
			POUND-FEET			
3/8	16	.3750	30	23	45	35
1/2	13	.5000	75	55	110	80

THE METRIC SYSTEM AND EQUIVALENTS

LINEAR MEASURE

1 Centimeter = 10 Millimeters = 0.01 Meters = 0.3937 Inches
1 Meter = 100 Centimeters = 1,000 Millimeters = 39.37 Inches
1 Kilometer = 1,000 Meters = 0.621 Miles

WEIGHTS

1 Gram = 0.001 Kilograms = 1,000 Milligrams = 0.035 Ounces
1 Kilogram = 1,000 Grams = 2.2 Lb
1 Metric Ton = 1,000 Kilograms = 1 Megagram = 1.1 Short Tons

LIQUID MEASURE

1 Milliliter = 0.001 Liters = 0.0338 Fluid Ounces
1 Liter = 1,000 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 = 1,000 Cu Millimeters = 0.06 Cu Inches
1 Cu Meter = 1,000,000 Cu Centimeters = 35.31 Cu Feet

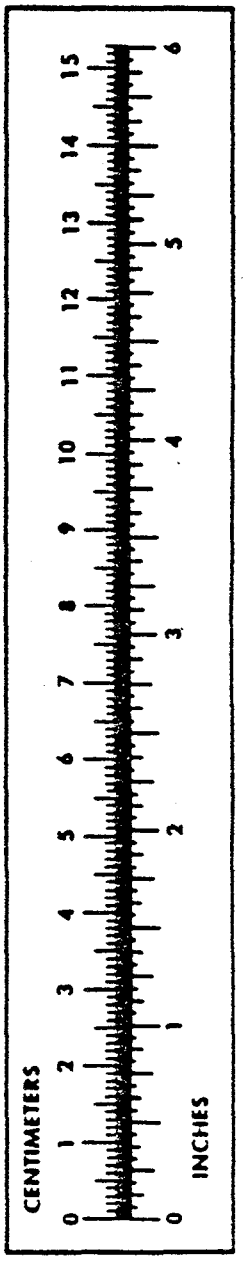
TEMPERATURE

5/9 (°F -32) = °C
212° Fahrenheit is equivalent to 100° Celsius
90° Fahrenheit is equivalent to 32.2° Cesius
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 Per Square Inch	Kilopascals	6.895
Miles Per Gallon	Kilometers Per Liter	0.425
Miles Per Hour	Kilometers Per Hour	1.609

TO CHANGE	TO	MULTIPLY BY
Centimeters	Inches	0.394
Meters	Feet	3.280
Meters	Yards	1.094
Kilometers	Miles	0.621
Square Centimeters	Square Inches	0.155
Square Meters	Square Feet	10.764
Square Meters	Square Yards	1.196
Square Kilometers	Square Miles	0.386
Square Hectometers	Acres	2.471
Cubic Meters	Cubic Feet	35.315
Cubic Meters	Cubic Yards	1.308
Milliliters	Fluid Ounces	0.034
Liters	Pints	2.113
Liters	Quarts	1.057
Liters	Gallons	0.264
Grams	Ounces	0.035
Kilograms	Pounds	2.205
Metric Tons	Short Tons	1.102
Newton-Meters	Pound-Feet	0.738
Kilopascals	Pounds Per Square Inch	0.145
Kilometers Per Liter	Miles Per Gallon	2.354
Kilometers Per Hour	Miles Per Hour	0.621



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