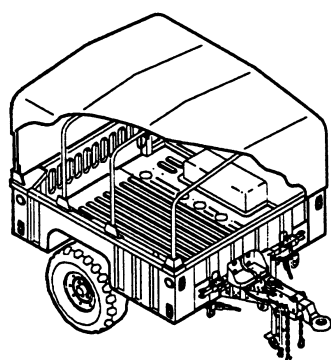
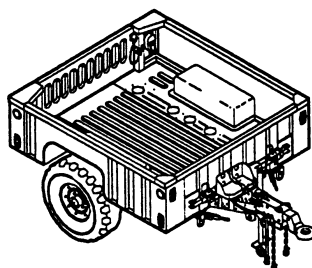


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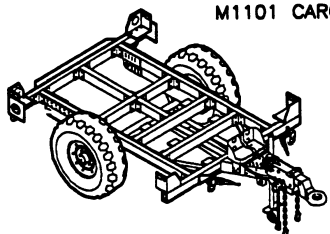
**OPERATOR'S, UNIT, DIRECT SUPPORT AND  
GENERAL SUPPORT MAINTENANCE MANUAL  
(INCLUDING REPAIR PARTS AND  
SPECIAL TOOLS LISTS)**



M1102 CARGO TRAILER



M1101 CARGO TRAILER



TRAILER CHASSIS

12572268

**TRAILER, CARGO: LIGHT,  
2-WHEEL M1101  
(2330-01-387-5443)  
EIC: CBC**

**TRAILER, CARGO: HEAVY,  
2-WHEEL M1102  
(2330-01-387-5426)  
EIC: CBB**

**CHASSIS, TRAILER:  
2-WHEEL  
(2330-01-387-5424)  
EIC: CCL**

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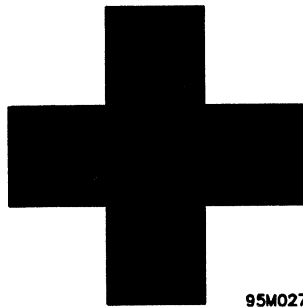
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## **FIRST AID DATA**

### **FIVE SAFETY STEPS TO FOLLOW IF SOMEONE IS THE VICTIM OF ELECTRICAL SHOCK**

1. Do not try to pull or grab the individual.
2. If possible, turn off the electrical power.
3. If you cannot turn off the electrical power, pull, push, or lift the person to safety using a wooden pole, a rope, or some other insulating material.
4. Send for help as soon as possible.
5. After the injured person is free of contact with the source of electrical shock, move the person a short distance away and immediately start resuscitation.

**Refer to FM 21-11 for first aid procedures.**



95M027

CHANGE  
NO. 2

**TECHNICAL MANUAL**

**OPERATOR'S, UNIT, DIRECT SUPPORT, AND  
GENERAL SUPPORT MAINTENANCE MANUAL  
(INCLUDING REPAIR PARTS AND SPECIAL TOOLS LIST)**

**FOR**

**TRAILER, CARGO: LIGHT, 2-WHEEL M1101 (2330-01-387-5443) EIC: CBC**

**TRAILER, CARGO: HEAVY, 2-WHEEL M1102 (2330-01-387-5426) EIC: CBB**

**CHASSIS, TRAILER: 2-WHEEL (2330-01-387-5424) EIC: CCL**

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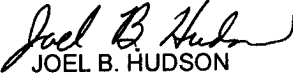
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CHANGE  
NO. 1

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WASHINGTON, D.C., 13 March 1998

TECHNICAL MANUAL  
OPERATOR'S, UNIT, DIRECT SUPPORT, AND  
GENERAL SUPPORT MAINTENANCE MANUAL  
(INCLUDING REPAIR PARTS AND SPECIAL TOOLS LIST)  
FOR

TRAILER, CARGO: 2040 POUNDS, 2-WHEEL M1101 (2330-01-387-5443) EIC: CBC  
TRAILER, CARGO: 2840 POUNDS, 2-WHEEL M1102 (2330-01-387-5426) EIC: CBB  
CHASSIS, TRAILER: 3072 POUNDS, 2-WHEEL (2330-01-387-5424) EIC: CCL

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## WARNING SUMMARY

### ASBESTOS HAZARD

DO NOT handle brakeshoes, brakedrums, or other brake components unless area has been properly cleaned. There may be asbestos dust on these components which can be dangerous if you touch it or breathe it. Wear an approved filter mask and gloves. NEVER use compressed air or a dry brush to clean brake components. Dust may be removed using an industrial-type vacuum cleaner. Clean dust or mud away from brake components with water and a wet, soft brush or cloth. Failure to follow this warning may result in serious illness or death to personnel.

### BRAKE SYSTEM

- DO NOT allow grease to contact brakeshoe linings. Wipe excess lubricant from the brakeshoe linings to prevent grease soaking into the materials. Brakeshoe linings can absorb grease and oil, causing early glazing of linings and very poor braking action. If brakeshoe linings become soaked, notify Direct Support (DS) maintenance shop for replacement. Failure to follow this warning may cause brakes to malfunction, resulting in injury or death to personnel or damage to equipment.
- If brakeshoe lining is replaced, replace all brakeshoe linings on axle. Combination of old brakeshoes with new will cause uneven braking. Accidents causing injury or death to personnel or damage to equipment may result.

### COMPRESSED AIR

Compressed air used for cleaning purposes should never exceed 30 psi (207 kPa). Wear protective clothing (goggles/shield, gloves, etc.) and use caution to avoid injury to personnel.

### COUPLING AND UNCOUPLING TRAILER

- Personnel must stand clear of towing vehicle and trailer during coupling and uncoupling operations. Failure to follow this warning may result in injury or death to personnel.
- If trailer is not coupled to towing vehicle, ensure that handbrakes are applied and wheels are chocked. Failure to follow this warning may cause trailer to roll, resulting in injury or death to personnel or damage to equipment.

### DRAWBAR

Drawbar is heavy - up to 420 lb (190.5 kg) loaded tongue weight. Use front support leg crank to raise and lower trailer drawbar. If support leg assembly is inoperative, remove load from trailer or use four or more persons to lift drawbar. Failure to follow this warning may result in serious injury to personnel or equipment damage.

### DRY CLEANING SOLVENT

Dry cleaning solvent, P-D-680, is toxic and flammable. Always wear goggles and gloves and use solvent only in a well-ventilated area. Avoid contact with skin, eyes, and clothes, and DO NOT breathe vapors. DO NOT use near open flame or excessive heat. The solvent's flash point is 100°F to 138°F (38°C to 59°C). If you become dizzy while using cleaning solvent, immediately get fresh air and medical help. If solvent contacts eyes, immediately wash your eyes and get medical aid.

**WARNING SUMMARY - Continued****HEAVY COMPONENTS**

Use caution when handling heavy parts. Lifting device is required when parts weigh over 50 pounds (23 kg) for a single-person lift, over 100 pounds (45 kg) for a two-person lift, and over 150 pounds (68 kg) for a three-or-more person lift. Keep clear of heavy parts supported only by lifting device. Failure to follow this warning may result in injury or death to personnel.

**EYE PROTECTION**

Wear eye protection when driving heads off rivets or driving screws. Failure to follow this warning may result in eye injury.

**IMPROPER CLEANING AGENTS**

Improper cleaning methods and use of unauthorized cleaning agents can injure personnel and damage equipment. To prevent this, refer to TM 9-247 for further instructions.

**INTERVEHICULAR CABLE**

Ensure that intervehicular cable is disconnected from towing vehicle before performing maintenance on electrical system. Failure to follow this warning may result in electrical shock or burns.

**REAR STABILIZER**

- Rear stabilizer must be used during loading and unloading when trailer is not coupled to towing vehicle. Failure to follow this warning may cause trailer to tip, resulting in injury to personnel or damage to equipment.
- Ensure that weight of trailer is on front support leg or trailer is coupled to towing vehicle before raising rear stabilizer. Failure to follow this warning may cause trailer to tip, resulting in injury to personnel or damage to equipment.

**TIRES**

Always use a tire inflation cage for inflation purposes. Stand on one side of the cage during inflation, never directly in front. Keep hands out of the cage during inflation. Inflate assembly to recommended pressure using a clip-on air chuck. Do not exceed 50 psi (345 kPa) cold inflation pressure. Failure to follow these instructions may result in injury or death.

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**OPERATOR'S, UNIT, DIRECT SUPPORT, AND GENERAL SUPPORT  
MAINTENANCE MANUAL (INCLUDING REPAIR PARTS  
AND SPECIAL TOOLS LIST)**

**FOR**

**TRAILER, CARGO: LIGHT, 2-WHEEL M1101  
(2330-01-387-5443)**

**TRAILER, CARGO: HEAVY, 2-WHEEL M1102  
(2330-01-387-5426)**

**CHASSIS, TRAILER: 2-WHEEL  
(2330-01-387-5424)**

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## HOW TO USE THIS MANUAL

### DESCRIPTION OF THE MANUAL.

**Manual Organization.** This manual is designed to help you operate and maintain the M1101 Cargo Trailer, M1102 Cargo Trailer, and Trailer Chassis, also called the High Mobility Trailer (HMT). Warning pages are located in the front of this manual. Read the warnings before operating or performing maintenance on the equipment.

The major elements of this manual are chapters and appendices. There are six chapters and ten appendices. The Table of Contents is provided for quick reference to the subjects covered by each chapter, section, and appendix. Most chapters contain a chapter index that lists the chapter sections and paragraphs.

The front cover of this manual has an index that lists the most important topics of the manual. Each item indicated on the front cover has a black mark at the edge of the cover. There is a corresponding black mark on the first text page for each subject listed on the cover index.

**Chapters.** Each chapter is divided into sections. Each section is divided into descriptive paragraphs. The paragraphs have specific information about the HMTs and their major components. Tables and illustrations are used to provide information in a concise form.

**Paragraphs, Tables, and Illustrations.** All major paragraphs are numbered and have a name (sidehead). All tables have table numbers and titles (names). Some illustrations have figure numbers and titles (names). Those illustrations that are used only to identify or locate equipment items do not have numbers or titles. The paragraph sideheads and table and figure titles are chosen to describe the information in that paragraph, table, or figure. The alphabetical index at the back of this technical manual lists all paragraphs, all tables, and all titled figures. This helps you to find specific information. The paragraph, table, and figure numbers consist of the chapter number, followed by a dash and a sequential number. For example:

Paragraph 4-4 is the fourth major paragraph in chapter 4.

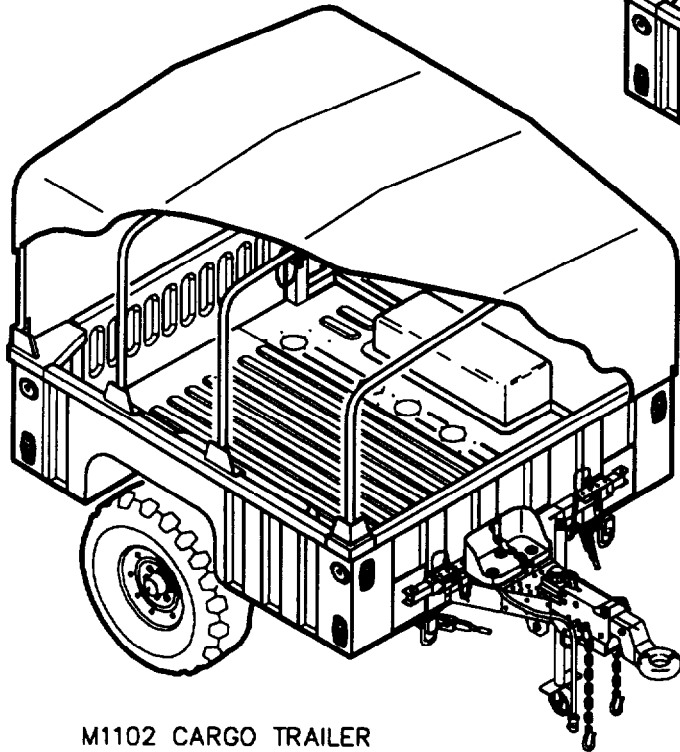
Figure 2-2 is the second numbered illustration in chapter 2.

Table 2-1 is the first table in chapter 2.

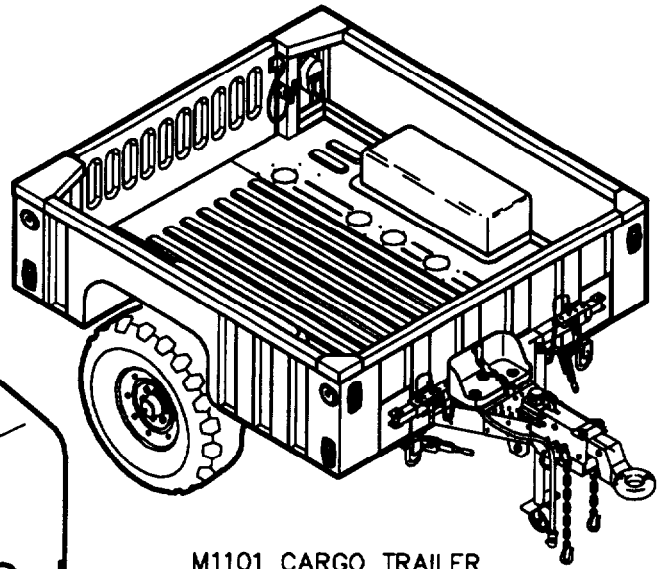
**Appendices.** Each appendix covers a specific subject, such as the Maintenance Allocation Chart in Appendix B, or detailed information, such as the Repair Parts and Special Tools List in Appendix F.

A glossary follows the last appendix. The glossary lists and defines the special or unique abbreviations and the unusual terms used in this manual.

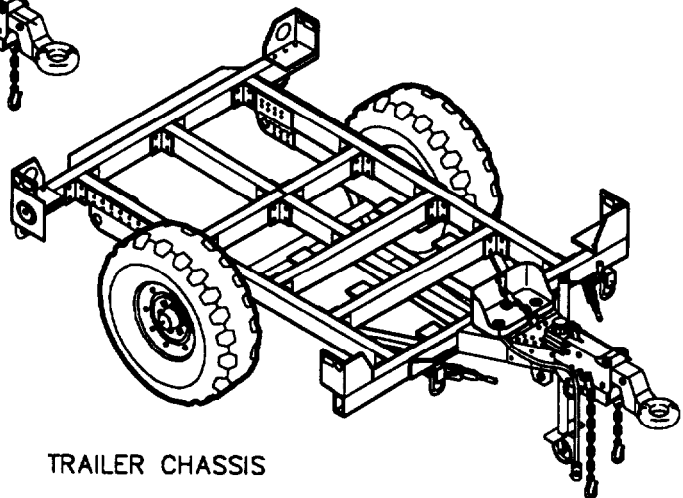
An alphabetical index follows the glossary. This index is for use in locating specific items of information.



M1102 CARGO TRAILER



M1101 CARGO TRAILER



TRAILER CHASSIS

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# CHAPTER 1 INTRODUCTION

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## Section I. GENERAL INFORMATION

### 1-1 SCOPE.

- a. Type of Manual: Operator’s, Unit, Direct Support, and General Support Maintenance Manual, including Repair Parts and Special Tools List.
- b. Model Numbers and Equipment Names:
  - Trailer, Cargo, 2-Wheel: Light, M1101
  - Trailer, Cargo, 2-Wheel: Heavy, M1102
  - Chassis, Trailer, 2-Wheel
- c. Purpose of Equipment: Used to carry payloads over primary, secondary, or cross-country roads.
  - M1101 Cargo Trailer - High Mobility Multipurpose Wheeled Vehicle (HMMWV) M998/M1038 Series or HMMWV M1097/M1114 Series
  - M1102 Cargo Trailer - HMMWV M1097/M1114 Series
  - Trailer Chassis - HMMWV M998/M1038 Series or HMMWV M1097/M1114 Series (depending on weight of installed equipment)

**1-1 SCOPE (Con't).**

- d. Location Terms: Throughout this manual, the terms “front,” “rear,” “curbside,” and “roadside” are used to describe views of the trailer. The trailer drawbar is located at front of the trailer. The stoplights and taillights are at the rear. As viewed from the rear, “curbside” is the right side and “road-side” is the left side.

**1-2 MAINTENANCE FORMS AND PROCEDURES.**

Department of the Army forms and procedures used for equipment maintenance will be those prescribed by DA Pam 738-750 as contained in the Maintenance Management Update.

**1-3 CORROSION PREVENTION AND CONTROL.**

Corrosion Prevention and Control (CPC) of Army materiel is a continuing concern. It is important that any corrosion problems with this item be reported so that the problem can be corrected and improvements can be made to prevent the problem in future items.

While corrosion is typically associated with rusting of metals, it can also include deterioration of other materials, such as rubber and plastic. Unusual cracking, softening, swelling, or braking of these materials may be a corrosion problem.

If a corrosion problem is identified, it can be reported using Standard Form 368, Product Quality Deficiency Report. Use of keywords such as “corrosion,” “rust,” “deterioration,” or “cracking” will ensure that the information is identified as a CPC problem.

The form should be submitted to the address specified in DA Pam 738-750.

**1-4 DESTRUCTION OF ARMY MATERIEL TO PREVENT ENEMY USE.**

For information on destruction of Army materiel to prevent enemy use, refer to TM 750-244-6.

**1-5 REPORTING EQUIPMENT IMPROVEMENT RECOMMENDATIONS (EIRS).**

If your trailer 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 what you don't like about the design or performance. Put it on an SF 368 (Product Quality Deficiency Report). Mail it to us at: Commander, U.S. Army Tank-automotive and Armaments Command, ATTN: AMSTA-LC-CIP-W, Rock Island, IL 61299-7630. We'll send you a reply.

**1-6 WARRANTY INFORMATION.**

No Warranty.

## Section II. EQUIPMENT DESCRIPTION AND DATA

### 1-7 EQUIPMENT CHARACTERISTICS, CAPABILITIES, AND FEATURES.

#### a. Characteristics.

- (1) All trailers are designed to be towed by a towing vehicle without airbrake connections. A handbrake lever and cable assembly located on each side of the trailer activate a service brake at each wheel. Control of each service brake is independent.
- (2) In addition to handbrake-activated service brakes, the trailers are equipped with an inertia-actuated hydraulic brake system. For technical principles of operation of this system, refer to section III of this chapter.
- (3) All trailers have a single axle with two wheels.
- (4) The trailer suspension consists of one shock absorber on each end of the axle.
- (5) Two stabilizers, stored in the front and installed in the rear, provide greater stability when loading or unloading cargo when the trailer is not coupled to the towing vehicle.

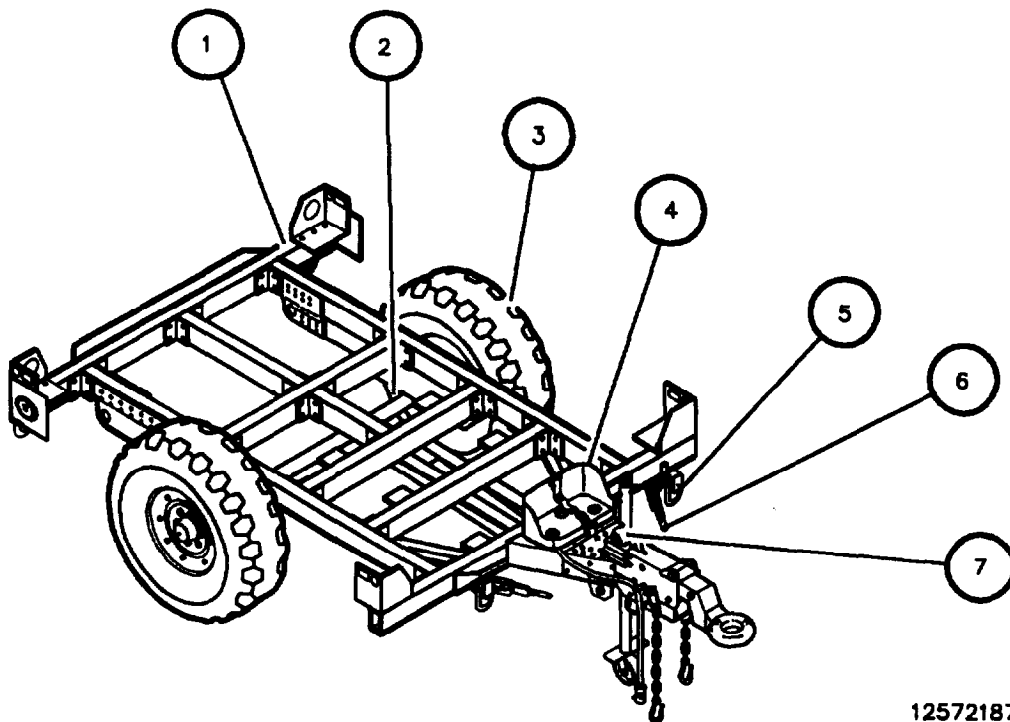
#### b. Capabilities and Features.

- (1) Maximum towing speeds with maximum payload evenly distributed are:

Highway	55 mph (66.5 km/h)
Secondary Roads	35 mph (56.3 km/h)
Cross-Country	20 mph (32.2 km/h)

- (2) Maximum payload varies with model designation. Refer to Paragraph 1-11, Equipment Data.

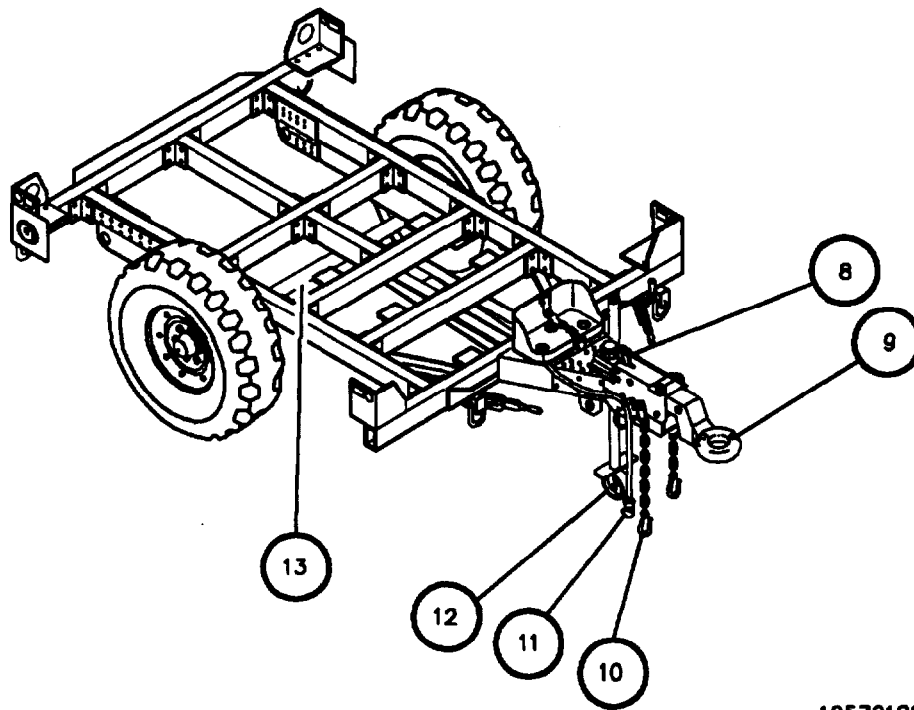
1-8 LOCATION AND DESCRIPTION OF MAJOR COMPONENTS.



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Key	Component	Description
1	Chassis	Provides mounting for cargo body of M1101 and M1102 trailers.
2	Shock Absorbers	Dampen chassis and axle movement.
3	Wheel and Tire Assemblies	Support trailer load. Attached to ends of axle.
4	Decontamination Bracket	Holds and secures NBC decontamination equipment.
5	Tiedown Shackles	Tie down trailer during shipment. Located at front and rear of chassis.
6	Handbrake Levers	Apply service brake when trailer is stopped or parked.
7	Hydraulic Brake Actuator Assembly	Transmits braking forces from towing vehicle to trailer and service brakes by means of a lunette ring, master cylinder, hydraulic brake tubes, and wheel cylinders.

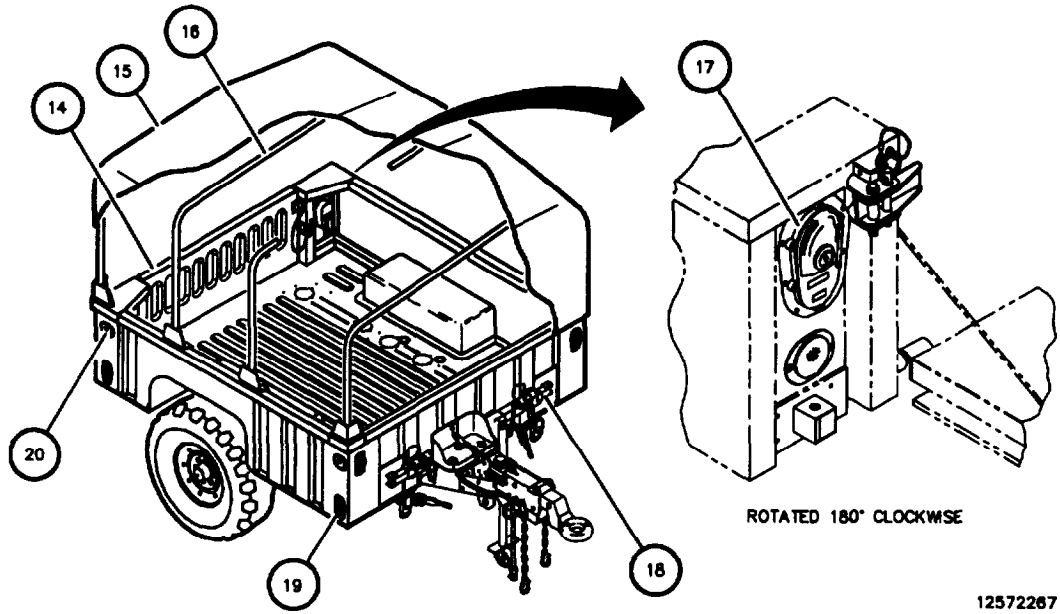
1-8 LOCATION AND DESCRIPTION OF MAJOR COMPONENTS - Continued



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Key	Component	Description
8	Breakaway Cable	Provides for emergency braking of trailer. Attaches to towing vehicle and applies brakes in the event trailer breaks away from towing vehicle.
9	Lunette Ring	Couples trailer to towing vehicle pintle.
10	Safety Chains	Prevent trailer from fully breaking away. Hook to towing vehicle shackles.
11	Intervehicular Cable	Provides electrical power from towing vehicle to trailer.
12	Front Support Leg	Adjustable leg supports trailer when uncoupled from towing vehicle.
13	Axle	Carries wheels and allows wheels to rotate.

1-8 LOCATION AND DESCRIPTION OF MAJOR COMPONENTS - Continued.

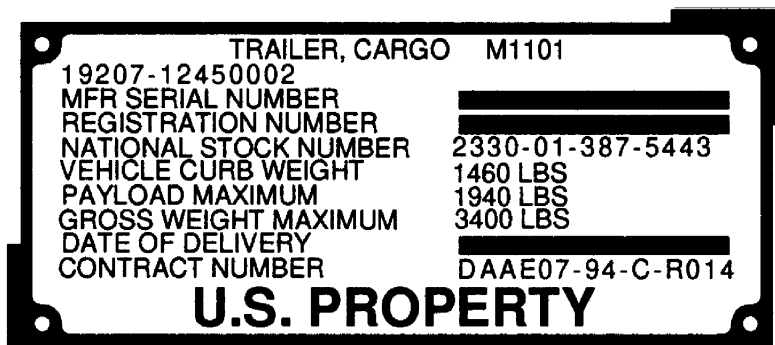
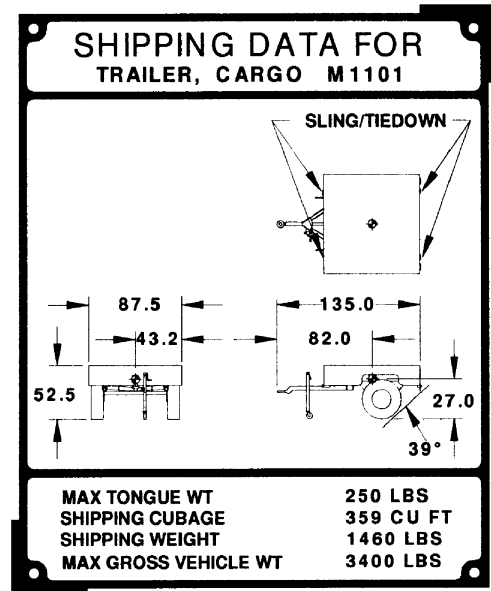
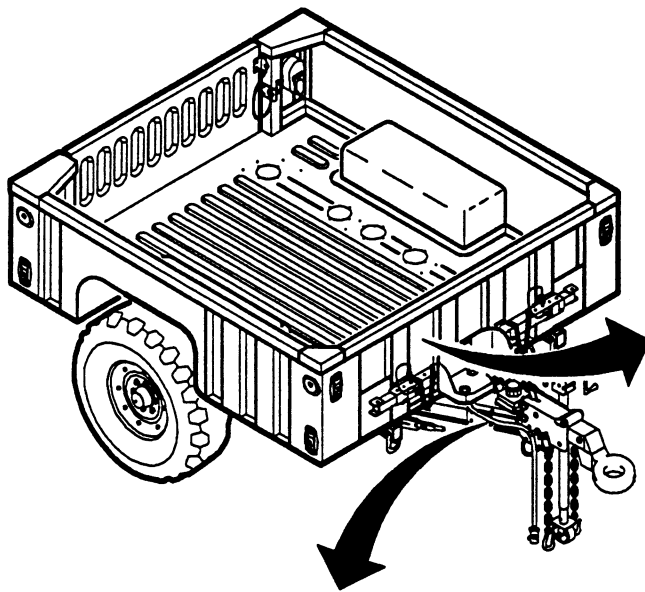


Key	Component	Description
14	Tailgate	Swings down for ease in loading and unloading cargo. Secured in position by two lanyard and pin assemblies.
15	Canvas Cover	Protects cargo from weather. Part of optional Soft Top Kit.
16	Bow Assemblies	Support the canvas cover. Part of optional Soft Top Kit.
17	Composite Lights	Indicate trailer presence to vehicles traveling behind. Consists of blackout lights, taillights, stoplights, and turn signals.
18	Rear Stabilizers	Prevent trailer from tipping over when loading and unloading cargo. Stored in position shown. Installed on rear of chassis.
19	Marker Lights	Indicate trailer presence to surrounding vehicles.
20	Reflectors	Indicate trailer presence to surrounding vehicles.



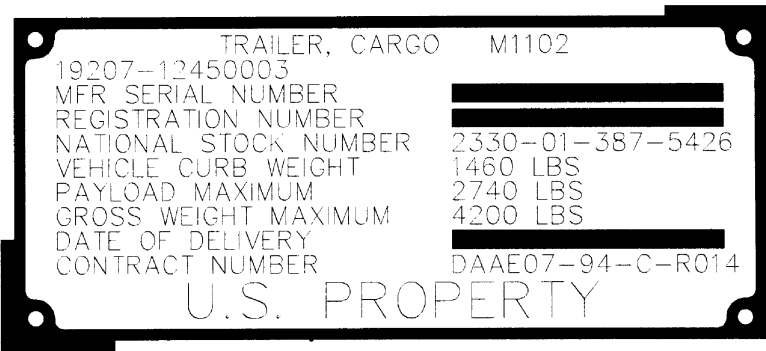
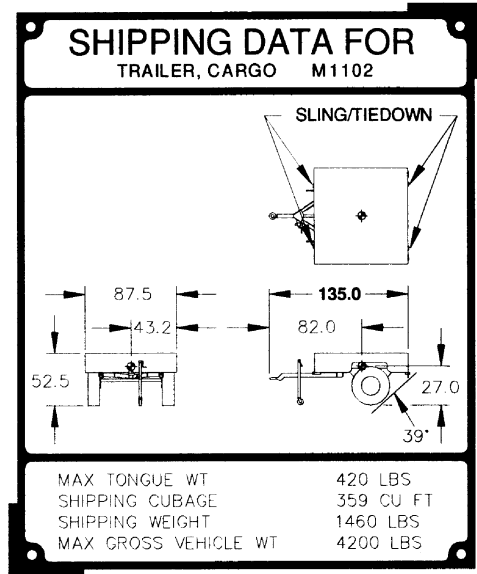
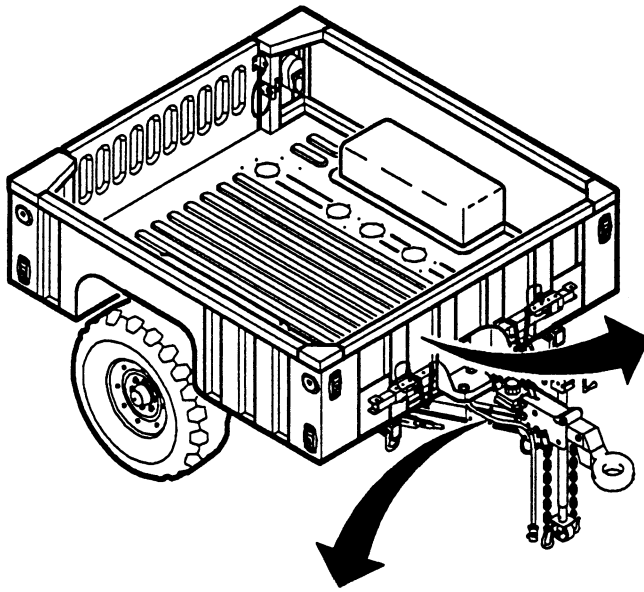
1-9 LOCATION AND CONTENTS OF DATA PLATES.

a. M1101 Cargo Trailer.



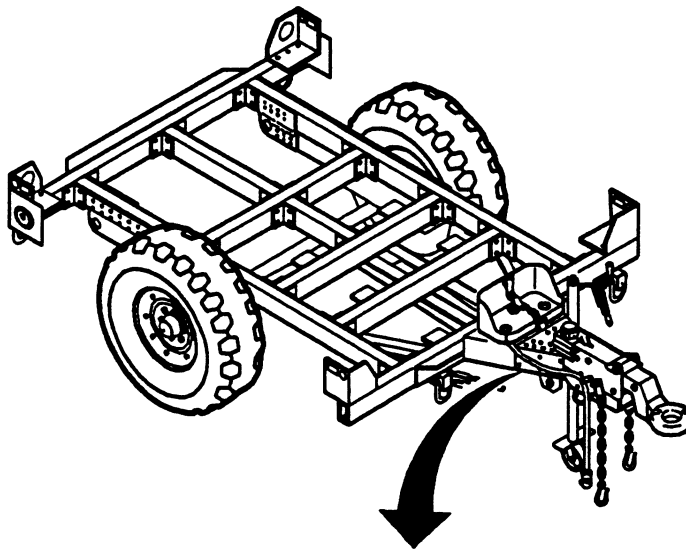
1-9 LOCATION AND CONTENTS OF DATA PLATES - Continued.

b. M1102 Cargo Trailer.



1-9 LOCATION AND CONTENTS OF DATA PLATES - Continued.

c. Trailer Chassis.



CHASSIS, TRAILER	
19207-12450001	
MFR SERIAL NUMBER	██████████
REGISTRATION NUMBER	██████████
NATIONAL STOCK NUMBER	2330-01-387-5424
VEHICLE CURB WEIGHT	1175 LBS
PAYLOAD MAXIMUM	3025 LBS
GROSS WEIGHT MAXIMUM	4200 LBS
DATE OF DELIVERY	██████████
CONTRACT NUMBER	DAAE07-94-C-R014
U.S. PROPERTY	

1-10 DIFFERENCES BETWEEN MODELS.

NOTE

- Light HMMWVs that have been modified have a decal on the rear crossmember where the pinle attaches that states: "AUTHORIZED TO TOW TRAILER WITH MAX GROSS WEIGHT OF 3400 LBS". An MWO tag should also be present on the driver's side reinforcement panel (just behind the seat) that identifies MWO 9-2320-280-20-7 has been applied.
  - Heavy HMMWVs that have been modified have a stencil on the rear bumper reinforcement plate that states: "AUTHORIZED TO TOW TRAILER WITH MAX GROSS WEIGHT OF 4200 LBS." An MWO tag should also be present on the driver's side reinforcement panel (just behind the seat) that identifies MWO 9-2320-280-20-6 has been applied.
- a. The difference between the M1101 and M1102 cargo trailers is listed on the Identification and Shipping Plates. The difference between the maximum Gross Vehicle Weight (GVW) is based solely on the towing vehicle. All trailer models can be towed by a HMMWV M1097/M1114 series in accordance with the identification plate. The M1101 cargo trailer and the trailer chassis can be towed by a HMMWV M998/M1038 series when the GVW does not exceed 3400 pounds. To determine which HMMWV can tow a chassis version of the HMT, look at the trailer data plate that identifies the total system weight. Use a modified light HMMWV if system weight is 3400 lbs or less. Use a modified heavy HMMWV if system weight is 3400-4200 lbs. There are no physical differences between the M1101 and M1102 trailers. Refer to table below for towing vehicle requirements.
  - b. The data listed on the Trailer Chassis Identification and Shipping Plates is different from both the M1101 and M1102 trailers. In addition, the trailer chassis has no cargo body.

HMMWV Model Number	HMMWV Vehicle Description	MWO Requirements				Remarks
		M1101	M1102	<3400 LBS	<4200 LBS	
M998/M998A1	Cargo/Troop	A		A		
M1038/M1038A1	Cargo/Troop	A		A		
M1097/M1097A1/M1097A2	Heavy Variant	B	B	B	B	
M966/M966A1	Tow Carrier	A		A		
M1036	Tow Carrier	A		A		
M1045/M1045A1	Tow Carrier	A		A		
M1045A2	Tow Carrier	B	B	B	B	
M1046/M1046A1	Tow Carrier	A		A		
M1046A2	Tow Carrier	B	B	B	B	
M1025/M1025A1	Armament Carrier	A		A		
M1025A2	Armament Carrier	B	B	B	B	
M1026/M1026A1	Armament Carrier	A		A		
M1043/M1043A1	Armament Carrier	A		A		
M1043A2	Armament Carrier	B	B	B	B	
M1044/M1044A1	Armament Carrier	A		A		
M1037	Shelter Carrier	B		B		See Note 1
M1042	Shelter Carrier	B		B		
M996/M996A1	Ambulance					
M997/M997A1	Ambulance					
M1035/M1035A1	Ambulance	A				
M1035A2	Ambulance	B	B	B	B	
M1113	S250 Shelter Carrier	B	B	B	B	See Note 1
M1114	UP-Armored	B	B	B	B	

Key:

A = MWO 9-2320-280-7

B = MWO 9-2320-280-6

<3400 LBS = Any system mounted on HMT chassis with GVW of 3400 lbs or less.

<4200 LBS = Any system mounted on HMT chassis with GVW of 4200 lbs or less.

Note 1. Pintle extensions are required with SICPS (M788) mounted. MWO 9-2320-280-6 not required in this case.

**1-11 EQUIPMENT DATA.**

Axle .....	Independent Rubber Torsion
Dimensions (overall):	
Length .....	.135 in. (343 cm)
Width .....	.87.5 in. (222.3 cm)
Height:	
M1101/M1102 .....	.52.5 in. (130.2 cm)
Trailer Chassis .....	.40.5 in. (102.9 cm)
M1101/M1102 With Soft Top .....	.99.5 in. (238.3 cm)
Weight Empty:	
M1101/M1102 .....	1460 lb (662 kg)
Trailer Chassis .....	1175 lb (533.5 kg)
Payload Weight (maximum):	
M1101 .....	1940 lb (879.9 kg)
M1102 .....	2740 lb (1242.8 kg)
Trailer Chassis .....	3025 lb (1373.4 kg)
Tongue Weight (maximum) .....	
M1101 .....	420 lb (190.5 kg)
M1102 .....	250 lb (113.4 kg)
Trailer Chassis .....	420 lb (190.5 kg)
Total Weight with Payload (maximum):	
M1101 .....	3400 lb (1522.1 kg)
M1102 .....	4200 lb (1905.1 kg)
Trailer Chassis .....	4200 lb (1905.1 kg)
Shipping Weight:	
M1101/M1102 .....	1460 lb (662 kg)
Trailer Chassis .....	1230 lb (557.9 kg)
Shipping Volume:	
M1101/M1102 .....	359 cu ft (9.8 cu m)
Trailer Chassis .....	288 cu ft (8.1 cu m)
Angle of Departure .....	39 degrees
Center of Gravity (measured from ground level):	
Empty:	
M1101/M1102 .....	27 in. (83.8 cm)
Trailer Chassis .....	24.4 in. (69.6 cm)
Loaded:	
M1101 .....	46 in. (116.8 cm)
M1102 .....	48 in. (121.9 cm)
Trailer Chassis .....	40 in. (101.6 cm)
Electrical System .....	24 volt
Fording Depth (maximum) .....	60 in. (152.4 cm)
Handbrakes:	
Quantity .....	2
Location .....	Front of frame
Actuation .....	Mechanical
Operating Temperature .....	-50°F (-45.6°C) to +120°F (48.9°C)

1-11 EQUIPMENT DATA - Continued.

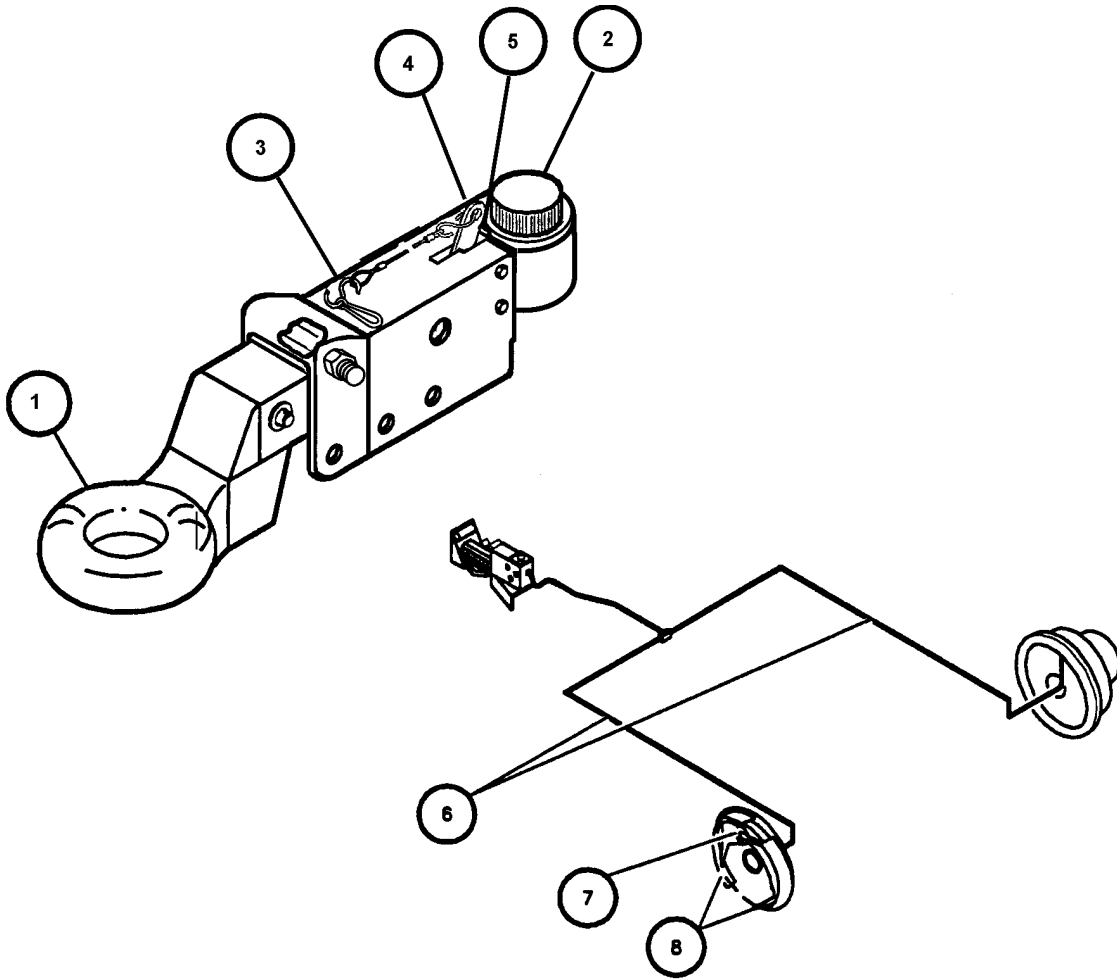
Suspension:	
Shock Absorbers.....	Hydraulic, double-acting
Tires:	
Quantity:.....	2
Size.....	37X12.50R16.5 LT
Ply.....	5-ply tread, 2-ply sidewall
Inflation.....	17 psi ± 2 psi (117 kPa ± 13.8 kPa)
Towing Attachment.....	Lunette Ring
Wheels:	
Rim Size.....	16.5 X 8.25 X 6.5 BC
Number of Lugs.....	8
Brakedrum:	
Maximum inside diameter.....	12.09 in. (30.7 cm)

**Section III. TECHNICAL PRINCIPLES OF OPERATION**

1-12 HYDRAULIC BRAKE SYSTEM.

- a. The hydraulic brake system applies the brakes automatically when the towing vehicle slows or stops, or when the trailer breaks away from the towing vehicle.
- b. The hydraulic brake system consists of a hydraulic brake actuator assembly, hydraulic brake tube assemblies, hose assembly, and wheel cylinders to activate the service brakes.
- c. The major components of the hydraulic brake system and their function are as follows:
  - (1) Lunette Ring. Attaches to towing vehicle pintle hook. The lunette ring controls the master cylinder assembly. When the towing vehicle goes forward, the lunette ring is pulled and the brakes are released. When the towing vehicle slows down, the weight of the trailer pushes the lunette ring into the towing vehicle and the brakes are applied.
  - (2) Master Cylinder Assembly. Changes mechanical motion of lunette ring and breakaway lever into hydraulic pressure. It has a built-in shock absorber to prevent jerky lunette ring movement. The damper also slows the rate of hydraulic pressure increase when the towing vehicle backs up, thus allowing the trailer to be slowly backed up for short distances on level terrain.
  - (3) Breakaway Chain. Attaches to towing vehicle. It will pull the breakaway lever up if the trailer and towing vehicle uncouple.
  - (4) Breakaway Lever. Controls the master cylinder. When the lever is up, the brakes are applied. When it is down, the lunette ring controls the master cylinder.
  - (5) Leaf Spring. Holds the breakaway lever up. The breakaway lever must be reset any time it has been pulled up.
  - (6) Hydraulic Brake Tubes and Hoses. Transfer hydraulic pressure from the master cylinder assembly to the wheel cylinder.
  - (7) Wheel Cylinder. Changes hydraulic pressure into mechanical motion. When the wheel cylinder is pressurized, it pushes the brake shoes against the brake drum.
  - (8) Brake Shoes. Are pushed against the brake drum by the wheel cylinder.

1-12 HYDRAULIC BRAKE SYSTEM - Continued.



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## CHAPTER 2

### OPERATING INSTRUCTIONS

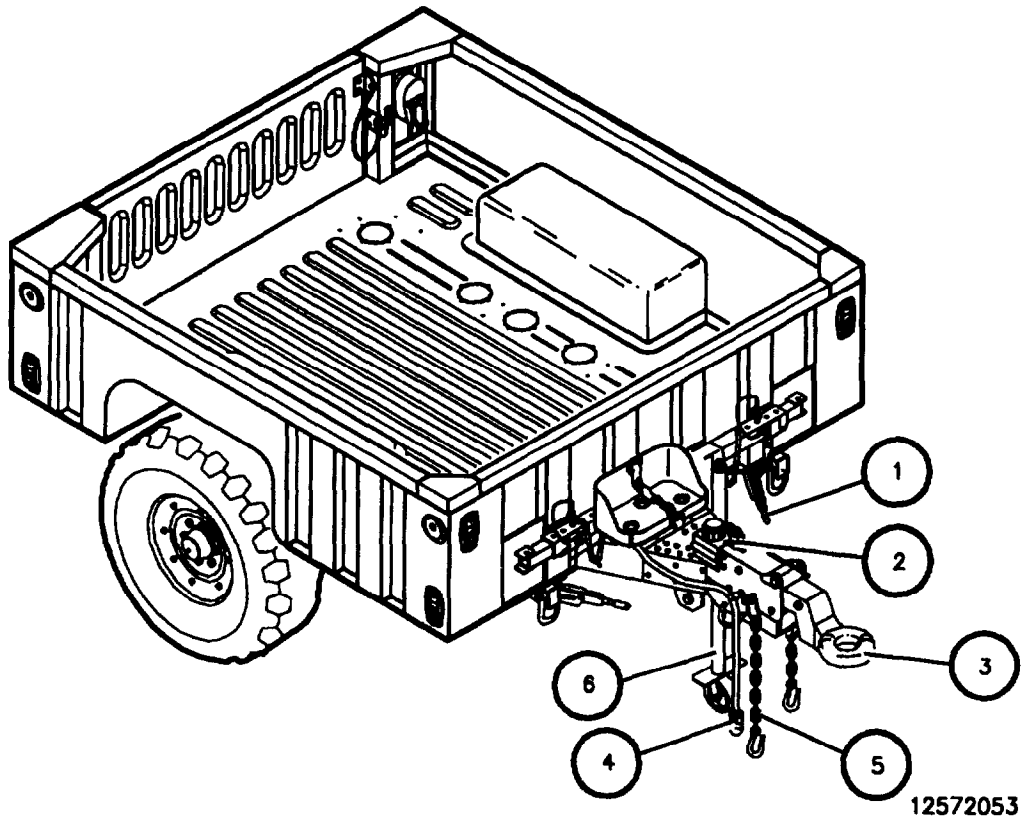
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### Section I. DESCRIPTION AND USE OF OPERATOR CONTROLS AND INDICATORS

#### 2-1 GENERAL.

This section shows the location and describes the function of all controls and indicators. Review this section thoroughly before operating the trailers.

2-2 CONTROLS AND INDICATORS.



Key	Component	Description
1	Handbrake Levers	Applies or releases parking brakes.
2	Breakaway Cable	Applies brakes if trailer accidentally uncouples from towing vehicle.
3	Lunette Ring	Couples trailer to towing vehicle.
4	Intervehicular Cable	Provides electrical power from towing vehicle to trailer.
5	Safety Chains	Couple trailer to towing vehicle to prevent runaway if lunette ring uncouples.
6	Front Support Leg	Supports trailer when it is uncoupled from towing vehicle.

## Section II. OPERATOR PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS)

### 2-3. GENERAL.

Preventive Maintenance Checks and Services (PMCS) means systematic caring, inspecting, and servicing of equipment to keep it in good condition and to prevent breakdowns. As the trailer's operator, your mission is to:

- a. Be sure to perform your PMCS each time you operate the trailer. Always do your PMCS in the same order, so it gets to be a habit. Once you've had some practice, you'll quickly spot anything wrong.
- b. Do your BEFORE PMCS just before you operate the trailer. Pay attention to WARNINGS, CAUTIONs, and NOTEs.
- c. Do your DURING PMCS while you operate the trailer. During operation means to monitor the trailer and its related components while it is actually being operated. Pay attention to WARNINGS, CAUTIONs, and NOTEs.
- d. Do your AFTER PMCS right after operating the trailer. Pay attention to WARNINGS, CAUTIONs, and NOTEs.
- e. Use DA Form 2404 (Equipment Inspection and Maintenance Worksheet) to record any faults that you discover before, during, or after operation, unless you can fix them. You DO NOT need to record faults that you fix.
- f. Be prepared to assist Unit maintenance when they lubricate the trailer. Perform any other services when required by Unit maintenance.

### 2-4. PMCS PROCEDURES.

- a. Table 2-1, Operator's Preventive Maintenance Checks and Services, lists inspections and care required to keep your trailer in good operating condition. It is set up so you can make your BEFORE operation checks as you walk around the trailer.
- b. The ITEM NO column provides a logical sequence for PMCS to be performed and is used as a source of item number for the TM ITEM NO. column when recording PMCS results on DA Form 2404.
- c. The INTERVAL column tells you when to do a certain check or service.
- d. The LOCATION column lists the item to check or service.
- e. The PROCEDURE column tells you how to do the required check or service. Carefully follow these instructions. When instructed to do so, notify Unit maintenance.

#### NOTE

The terms "ready/available" and "mission capable" refer to the same status: Equipment is on hand and ready to perform its combat missions. (See DA Pam 738-750.)

- f. The NOT FULLY MISSION CAPABLE IF column tells you when your trailer is nonmission capable and why the trailer cannot be used.
- g. When you do your PMCS, you will always need a rag or two. Following are checks that are common to the entire trailer:

**2-4. PMCS PROCEDURES (Con't).**

- (1) Keep It Clean. Dirt, grease, oil, and debris may cover up a serious problem. Clean as you work and as needed. Use detergent (Item 4, Appendix E) and water on rubber, plastic, and painted surfaces.
- (2) Rust and Corrosion. Check trailer body and frame for rust and corrosion. If any bare metal or corrosion exists, clean and apply a thin coat of light oil.
- (3) Bolts, Nuts, and Screws. Ensure that none are loose, missing, bent, or broken. Tighten any that are loose.
- (4) Welds. Look for loose or chipped paint, rust, or cracks where parts are welded together. If you find a bad weld, notify Unit maintenance.
- (5) Wiring Harness, Wires, and Connectors. Inspect for cracked or broken insulation, bare wires, and loose or broken connectors. Tighten loose connectors. If you find damaged wiring, notify Unit maintenance.
- (6) Hydraulic Brake Lines, Hoses, and Fittings. Inspect for wear, damage, and leaks. Ensure that fittings are tight. If a leak originates from a loose fitting, tighten it. If a component is broken or worn, correct problem if authorized by the Maintenance Allocation Chart (MAC) (Appendix B). If not authorized, notify Unit maintenance.

h. When you check for "operating condition," you look at the component to see if it is serviceable.

**2-5. CLEANING AGENTS.**

**CAUTION**

Do not allow water to enter the master cylinder. Damage to the brake system will result.

**NOTE**

Use only those authorized cleaning solvents or agents listed in Appendix E.

- a. Cleaning is an AFTER operation service performed by the operator to maintain the trailer in a state of readiness. Facilities and material available for cleaning may vary in different operating conditions. However, trailer must be kept as clean as possible as available cleaning equipment, materials, and tactical situations permit.

**2-5 CLEANING AGENTS (Con't).**

- b. Prior to using water to clean, ensure master cylinder fill cap is tightened.
- c. Allow wet brakes to dry before using trailer.

**2-6 LEAKAGE DEFINITIONS FOR OPERATOR PMCS.**

Wetness around seals, gaskets, fittings, or connections indicates leakage. A stain also denotes leakage. Use the following leakage classes to determine the status of the trailer. When in doubt, notify Unit maintenance.

**CAUTION**

Operation is allowable with Class I or II leakage except for brake systems. Any brake fluid leakage must be corrected. Any Class III leakage must be reported to Unit maintenance. Failure to do so may result in damage to the equipment.

- a. Class I. Leakage indicated by wetness or discoloration not great enough to form drops.
- b. Class II. Leakage great enough to form drops, but not enough to cause drops to drip from item being checked/inspected.
- c. Class III. Leakage great enough to cause drops that fall from the item being checked/inspected.

**Table 2-1. Operator’s Preventive Maintenance Checks and Services for M1101, M1102, and Trailer Chassis**

Item No.	Interval	Location	Procedure	Not Fully Mission Capable If:
		Item To Check/ Service		
			<b>NOTE</b>	
1	Before	Lunette Ring	<ul style="list-style-type: none"> <li>• Review all WARNINGS, CAUTIONS, and NOTES before performing PMCS.</li> <li>• Perform all PMCS checks if:                             <ul style="list-style-type: none"> <li>a. You are the assigned operator but have not operated the trailer since the last weekly checks.</li> <li>b. You are operating the trailer for the first time.</li> </ul> </li> </ul> Check lunette for secure mounting or obvious damage.	
2	Before	Brake Actuator Assembly	<ul style="list-style-type: none"> <li>a. Inspect area where front roller pin goes through brake actuator housing for damage and abnormal wear.</li> <li>b. Inspect master pin that goes through middle rear area of brake actuator for signs of wear or damage.</li> <li>c. Ensure that mounting nuts and bolts securely fasten brake actuator assembly to drawbar.</li> <li>d. Visually check brake breakaway cable and breakaway lever for damage and missing parts. Check that breakaway lever is in down position.</li> </ul>	<ul style="list-style-type: none"> <li>a. Damage is evident.</li> <li>b. Damage is evident.</li> <li>c. Nuts and bolts missing or damaged.</li> <li>d. Cable or lever is missing or damaged.</li> </ul>
			<div style="border: 1px solid black; padding: 5px; display: inline-block;"><b>WARNING</b></div> <p>Drawbar is heavy-up to 420 lb (190.5 kg) loaded tongue weight. Use the front support leg crank to raise and lower trailer drawbar when coupling and uncoupling trailer. If support leg assembly is inoperative, remove load from trailer or use four or more persons to lift drawbar.</p>	
3	Before	Front Support Leg	Check front support leg for damage, missing parts, and proper operation. Check that caster moves freely and handle can be cranked up and down to raise and lower trailer.	
4	Before	Handbrake Lever (Left)	Check handbrake lever for damage or missing parts. Check that the handle can be engaged and released. Adjust as necessary (para 2-14).	Damage is evident or handbrake fails to operate correctly.

**Table 2-1. Operator's Preventive Maintenance Checks and Services for M1101, M1102, and Trailer Chassis - Continued**

Item No.	Interval	Location	Procedure	Not Fully Mission Capable If:
		Item To Check/ Service		
5	Before	Tires (Left)	Visually check for underinflated and unserviceable tires. Check tires for leaks, cuts, gouges, cracks, and bulges. Remove all penetrating objects.	Any tire is missing or unserviceable. Tires have leaks, cuts, gouges, cracks, or bulges which would result in tire failure during operation.
6	Before	Tires (Right)	Visually check for underinflated and unserviceable tires. Check tires for leaks, cuts, gouges, cracks, and bulges. Remove all penetrating objects.	Any tire is missing or unserviceable. Tires have leaks, cuts, gouges, cracks, or bulges which would result in tire failure during operation.
7	Before	Handbrake Lever (Right)	Check handbrake lever for damage or missing parts. Check that the handle can be engaged and released. Adjust as necessary (para 2-14).	Damage is evident or handbrake fails to operate correctly.
8	Before	Intervehicular Cable	Connect intervehicular cable to towing vehicle (para 2-10). Operate towing vehicle light switch through all settings and check trailer lights.	Trailer lights do not operate properly.
9	After	Rear Stabilizers	Inspect rear stabilizers for damage. Ensure that hinge on flex plate can be rotated and sections slide up and down when pin is removed.	Damage is evident or parts are missing.
10	After	Shock Absorber	Inspect shock absorbers for leaks, missing nuts, and damage.	Any leaks are evident, mounting hardware missing, damage is evident.
11	After	Safety Chains	Inspect safety chains for damage or missing parts.	Damage is evident or parts are missing.
12	Weekly	Wheel Assemblies (Left)	Check lugnuts and stud nuts to make sure that they are not loose or missing. If any are loose, tighten.	Three or more lugnuts or stud nuts are missing.
13	Weekly	Brake Actuator Assembly	Inspect brake lines and hoses for missing clamps, cracks, leaks, loose connections, or broken lines. Tighten loose connections.	Any leaks are found.
<b>NOTE</b>				
14	Weekly	Lights, Reflectors, and Wiring	<p>Vehicle operation with damaged or inoperable trailer lights may violate AR 385-55.</p> <p>a. Visually inspect lights and reflectors for missing or broken parts and loose connectors. If any connectors are loose, tighten.</p> <p>b. Inspect wiring harness and intervehicular cable for exposed, frayed, or damaged wiring or missing mounting hardware.</p>	

**Table 2-1. Operator's Preventive Maintenance Checks and Services for M1101, M1102, and Trailer Chassis - Continued**

Item No.	Interval	Location	Procedure	Not Fully Mission Capable If:	
		Item To Check/Service			
15	Weekly	Wheel Assemblies (Right)	Check lugnuts and stud nuts to make sure that they are not loose or missing. If any are loose, tighten.	Three or more lugnuts or stud nuts are missing.	
16	Weekly	Cargo Body	<ul style="list-style-type: none"> <li>a. Inspect cargo body for missing rivets, missing cargo tiedowns, and damage to the box.</li> <li>b. Inspect tailgate for damage, missing or broken hardware, missing or broken lanyard cable, and missing or damaged pin. Check that tailgate rotates freely on hinges.</li> <li>c. Inspect decontamination bracket for damaged or missing hardware.</li> <li>d. Visually check that identification plate and shipping plate are firmly attached and readable.</li> <li>e. Inspect bows for damage.</li> </ul>		
17	Weekly	Soft Top Kit	Visually inspect canvas cover for rips, tears, or missing footman loops.		
18	Weekly	Frame and Cross-member	Inspect frame side rails for cracks, breaks, bends, wear, deterioration, and missing or loose fasteners.		Cracks, bends, or breaks in frame are present.
19	Monthly	Brake Actuator Assembly	Inspect the master cylinder assembly for damaged or missing cap, leaks, and proper fluid level. If cap is damaged or missing, replace it. Proper fluid level is 1/8 in. (3 mm) below top edge of reservoir. If not at specified level, add fluid (App G).		Any leaks are found.



## Section III. OPERATION UNDER USUAL CONDITIONS

### 2-7 ASSEMBLY AND PREPARATION FOR USE.

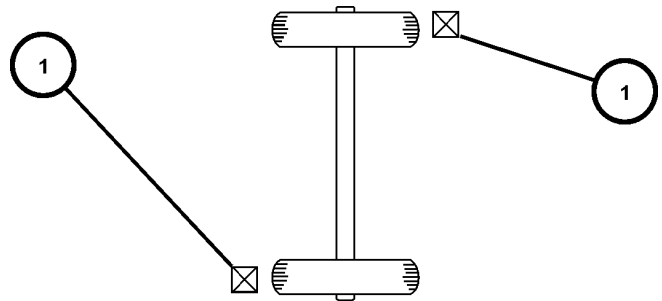
- a. There are no components to install.
- b. Perform all BEFORE PMCS in Table 2-1 before operating the trailer.
- c. Review all towing vehicle operating instructions before coupling or uncoupling the trailer.

### 2-8 INITIAL ADJUSTMENTS, CHECKS, AND SELF-TEST.

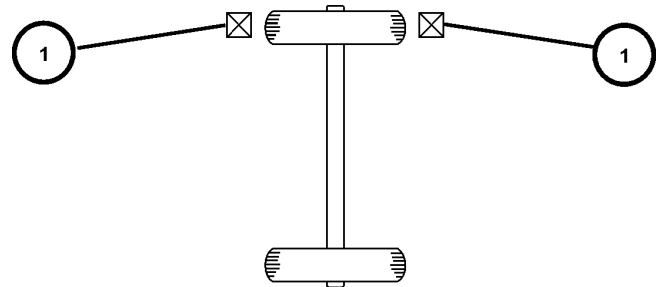
There are no initial adjustments, checks, or self-tests other than performing the BEFORE PMCS procedures listed in Table 2-1.

#### 2-8.1 USE OF CHOCK BLOCKS.

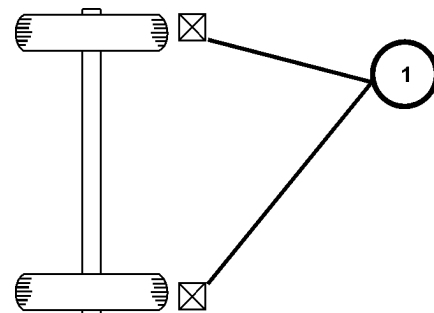
- a. If trailer is parked on level ground and neither side of trailer needs to be raised, place one chock block (1) in front of one tire and place another chock block in back of the other tire.



- b. If trailer is parked on level ground and one side of trailer needs to be raised, place chock blocks (1) in front and back of tire remaining on the ground.

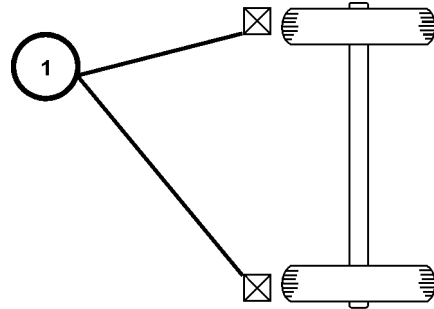


- c. If trailer is parked on an incline with front of trailer facing uphill, place chock blocks (1) in back of both tires.



**2-8.1 USE OF CHOCK BLOCKS (Con't).**

- d. If trailer is parked on an incline with front of trailer facing downhill, place chock blocks (1) in front of both tires.



**2-9 LOADING THE TRAILER.**

**WARNING**

If the trailer is not coupled to the towing vehicle, ensure that the front support leg is down and locked, the parking brakes are applied, the wheels are chocked, and the rear stabilizers are installed. Failure to follow this warning may cause trailer to roll or tilt, causing severe injury to personnel or damage to equipment.

- a. Apply both handbrakes.
- b. Securely chock both wheels (para 2-8.1).
- c. Remove both rear stabilizers from the front of the cargo body and install at the rear of the trailer. Lower stabilizer feet until they contact the ground.

**WARNING**

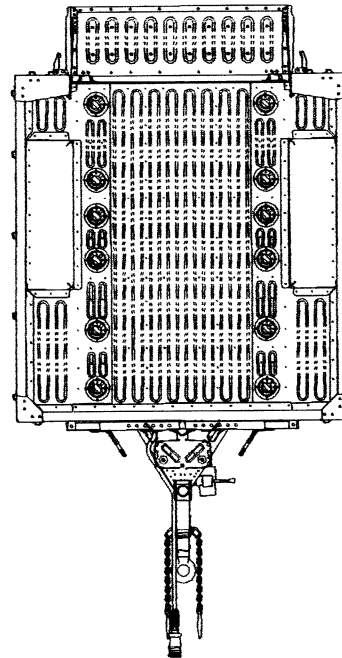
Ensure that weight of load is evenly distributed. Too much weight at the front will make the trailer difficult to raise with the front support leg. Too much weight at the rear will cause the trailer to tip backward. Failure to follow these warnings may result in injury to personnel or damage to equipment.

- d. Distribute load evenly over trailer starting between third and fourth cargo tiedown rings and working toward front and rear of trailer. Do not exceed maximum allowable payload (para 1-11).

**NOTE**

Distribute load evenly across floor of trailer before stacking.

- e. If stacking is necessary, begin additional row using same loading pattern as in step d.
- f. Secure load as required using tie down straps.



**2-10 COUPLING TRAILER TO TOWING VEHICLE.****NOTE**

Ensure that towing vehicle and trailer are on level ground before coupling.

- a. Apply trailer handbrakes.

**WARNING**

Make sure that the weight of the trailer is on the front support leg before raising rear stabilizer. Failure to follow this warning may cause trailer to tip, resulting in serious injury to personnel or damage to equipment.

- b. Fully retract rear stabilizers. Then remove and stow rear stabilizers on the front of the cargo body.

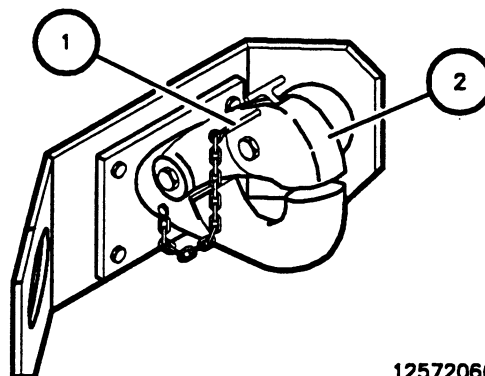
**WARNING**

Drawbar is heavy - up to 420 lb (190.5 kg) loaded tongue weight. Use front stabilizer crank to raise and lower trailer drawbar. If support leg assembly is inoperative, remove load from trailer or use four or more persons to lift drawbar. Failure to follow this warning may result in serious personnel injury or equipment damage.

**CAUTION**

When operating the crank handle, do not force the front stabilizer beyond the normal operating range, or permanent damage may occur.

- c. Use front stabilizer crank to raise trailer drawbar until lunette ring is higher than towing vehicle pintle hook.
- d. Remove the safety pin (1) from the pintle hitch (2) on the towing vehicle.



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**2-10 COUPLING TRAILER TO TOWING VEHICLE (Con't).**

- e. Open the pintle hitch (2) by pulling up on the locking latch (3).

**WARNING**

All personnel must stand clear of towing vehicle and trailer during coupling operation. Failure to follow this warning may result in serious injury or death to personnel.

- f. Back the towing vehicle in front of lunette ring (4).
- g. Use trailer front support leg crank to adjust height of lunette ring. Then place lunette ring on towing vehicle pintle hook (5).
- h. Close pintle hitch (2). Check that locking latch is locked by pulling up on pintle hitch. Pintle hitch should not come up. Install safety pin (1) into pintle hitch.

**CAUTION**

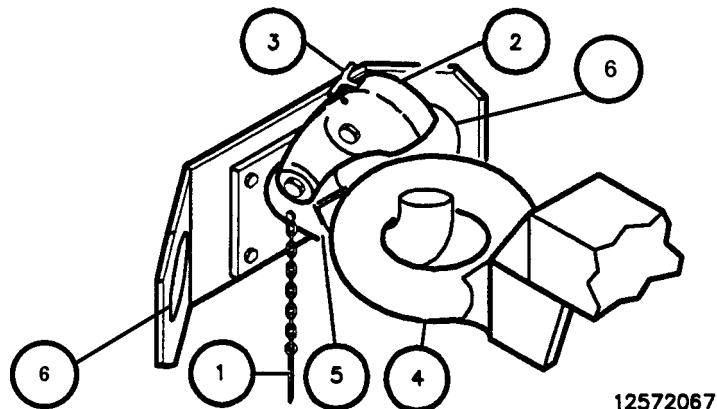
Safety chains must be attached on opposite sides of the trailer tongue or frame and crossed under the tongue when passed forward to the towing vehicle so as to cradle the tongue in the event of a breakaway. Slack should only be sufficient to permit full turns.

- i. Cross the two trailer safety chains under the drawbar and hook to towing vehicle eyebolts (6). If the safety chains are too long, they can be twisted to be shortened. It is recommended that wire be used across the hook openings to prevent accidental unhooking.

**CAUTION**

When operating the crank handle, do not force the front leg beyond the normal operating range, or permanent damage may occur.

- j. Crank the trailer front support leg up to the stowed position. Then remove locking pin, swing leg up parallel to the ground, and reinsert locking pin in the appropriate holes.



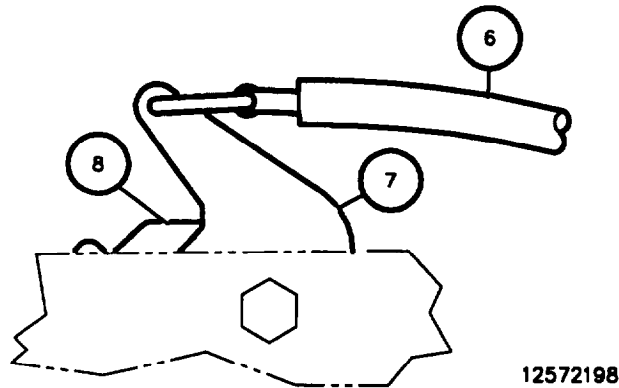
**2-10 COUPLING TRAILER TO TOWING VEHICLE (Con't).**

- k. Attach breakaway cable (6) to towing vehicle. Ensure that there is enough slack in cable to allow trailer to make full turns.

**CAUTION**

Ensure that breakaway lever is fully released. If lever is not fully released, brakes will drag, heat up, and burn out.

- l. Ensure that breakaway lever (7) is pushed all the way back toward trailer and that lever is not engaged in leaf spring (8).
- m. Connect the electrical plug on the inter-vehicular power cable to the receptacle of the towing vehicle.
- n. Check all towing vehicle and trailer lights for proper operation.
- o. Release trailer handbrakes.



## 2-11 TOWING INSTRUCTIONS.

### NOTE

Refer to FM 21-305 for further information on proper towing practices.

#### a. Driving.

### CAUTION

Sudden stops may cause drawbar to bend or buckle and may cause damage to hydraulic brake actuator assembly.

- (1) When the trailer is coupled, always start and stop the towed load slowly and gradually. Do this whether or not the trailer is loaded.
- (2) When driving a vehicle towing a trailer with a hydraulic brake actuator assembly, sudden and fast deceleration will cause the trailer hydraulic brakes to be applied.
- (3) Never exceed the maximum speed of 55 mph (88.5 km/h) highway or 20 mph (32.2 km/h) cross-country.
- (4) When driving the towing vehicle and trailer, the overall length of the unit must be kept in mind when turning and passing other vehicles. Because the unit is hinged in the middle, turning and backing are also affected. Heavier payloads will increase stopping distance and decrease off-road maneuverability.

#### b. Turning.

### CAUTION

Tight turns may cause damage to hydraulic brake actuator assembly.

- (1) When turning corners, allow for the fact that the trailer wheels may turn inside the turning radius of the towing vehicle.
- (2) To make a right turn at an intersection, drive the towing vehicle partway into the intersection, then cut sharply to the right. This will allow for the turning radius of the trailer to keep its wheels off the curb.

#### c. Backing.

### CAUTION

- (1) Always back the towing vehicle slowly and gradually.
- (2) Whenever possible, use an assistant driver or another person to act as a ground guide.
- (3) Adjust all towing vehicle rearview mirrors before backing.
- (4) When backing, the rear of the trailer will move in the opposite direction in which the towing vehicle is turned. When the towing vehicle is turned to the right, the rear of the trailer will go left. When the towing vehicle is turned and backing in a straight line is required, turn the towing vehicle in the direction the trailer is moving. This will slowly bring the towing vehicle and trailer into a straight line.

**2-11 TOWING INSTRUCTIONS (Con't).**

**CAUTION**

Sudden stops may cause drawbar to bend or buckle and may cause damage to hydraulic brake actuator assembly.

- d. Stopping. Always stop the towing vehicle by applying brakes gradually and smoothly. Do this whether or not the trailer is loaded.
- e. Parking.
  - (1) When the towing vehicle and the trailer are to be left unattended, set the towing vehicle parking brakes, turn off the engine, and set wheel chocks (para 2-8.1).
  - (2) Apply handbrakes.

**2-12 UNCOUPLING TRAILER FROM TOWING VEHICLE.**

**NOTE**

Park trailer on level ground if possible. Leave room at rear for loading or unloading of cargo if required.

- a. Apply handbrakes.
- b. Lower front support leg and lock into vertical position with locking pin.
- c. Disconnect intervehicular power cable, breakaway cable, and safety chains from towing vehicle.

**WARNING**

If trailer is loaded, rear stabilizers must be installed prior to opening HMMWV pintle hook. Failure to follow this warning may result in injury to personnel or damage to equipment.

- d. If trailer is loaded, install rear stabilizers.
- e. Open pintle hitch on towing vehicle by removing safety pin and lifting top locking latch.

**WARNING**

Drawbar is heavy-up to 420 lb (190.5 kg) loaded tongue weight. Use the front support leg crank to raise and lower trailer drawbar. If support leg assembly is inoperative, remove load from trailer or use four or more persons to lift drawbar. Failure to follow this warning may result in serious injury to personnel or equipment damage.

- f. Crank the front support leg to raise the drawbar so that the lunette ring is clear of the pintle hook.

**CAUTION**

When operating the crank handle, do not force the front support leg beyond the normal operating range, or permanent damage may occur.

- g. Close the pintle hitch and reinsert the safety pin.



**2-12.1 UNLOADING TRAILER.****WARNING**

Rear stabilizer must be used during unloading when trailer is not coupled to towing vehicle. Failure to follow this warning may cause trailer to tip, resulting in injury to personnel or damage to equipment.

- a. If trailer is not coupled to towing vehicle, ensure that rear stabilizers are in position.
- b. Remove cargo cover and tiedown straps as required.
- c. If possible, unload from trailer center of gravity working toward front and rear of trailer. This will keep the load evenly distributed.

**2-13 OPERATING AUXILIARY EQUIPMENT.**

There are no auxiliary equipment items requiring operation by the HMT operator.

**2-14 HANDBRAKE ADJUSTMENT.**

- a. Chock wheels (para 2-8.1) and release handbrake handle.
- b. Turn adjusting knob clockwise as tight as possible by hand.
- c. Apply handbrake handle.
- d. If handbrake cannot be applied, turn adjusting knob counterclockwise until parking brake can be applied.

**Section IV. OPERATION UNDER UNUSUAL CONDITIONS****2-15 OPERATION IN COLD CLIMATES.**

- a. Refer to Appendix G, Lubrication Instructions, for proper lubricants to use in cold weather.
- b. Refer to FM 9-207 and FM 21-305 for special instructions on driving hazards that may be found during cold weather conditions.
- c. Extreme cold can cause wires and cables to become stiff and brittle. Avoid excess bending of intervehicular cable when connecting to or disconnecting from towing vehicle and wiring harness when performing PMCS.
- d. Ensure that tires are properly inflated. Tires may freeze to the ground or have flat spots if underinflated.
- e. Brake shoes may freeze to the drum and require preheating to prevent damage (FM 9-207).

**2-16 OPERATION IN HOT CLIMATES.**

- a. Refer to Appendix G, Lubrication Instructions, for proper lubricants to use in hot weather.
- b. Do not park the trailer in sunlight for long periods of time. Heat and sunlight shorten tire life. Shelter or cover trailer to provide adequate protection.

**2-17 OPERATION IN RAINY OR HUMID CLIMATES.**

- a. Inspect, clean, and lubricate inactive equipment frequently to prevent rust and fungus accumulation.
- b. If installed, inspect canvas cover for fungus, rot, or standing water on top.
- c. Wet brakes increase stopping distances. Factor this increased distance into your driving.

**2-18. OPERATION IN SANDY OR DUSTY CLIMATES.**

- a. Clean, inspect, and lubricate more often in sandy or dusty conditions.
- b. If necessary, reduce tire pressure when driving over loose sand. When reduced tire pressure is no longer necessary, or when tactical situation permits, return tires to normal pressure.

**2-19. OPERATION IN SALTWATER AREAS.**

- a. Clean, inspect, and lubricate more often in saltwater areas.
- b. Saltwater immersion will cause rapid rusting and corrosion of metal parts. After operation in saltwater, or when tactical situation permits, wash the trailer with fresh water.

**2-20. OPERATION IN ROCKY TERRAIN.**

Use extreme caution when operating in rocky terrain. Ensure that tires are fully inflated to minimize damage to tires and tubes (para 1-11)

**2-21. AT HALT/PARKING.**

- a. For short shutdown periods, park in a sheltered spot out of the wind. For long shutdown periods, if high, dry ground is not available, prepare a footing of planks or brush
- b. Cover the trailer with canvas or tarpaulins, keeping the ends of the canvas off the ground to prevent freezing.

**2-22. FORDING AND SWIMMING.**

- a. Water obstacles can be forded up to a depth of 60 in. (152.4 cm).
- b. No special operation procedures are required for fording or swimming.

**2-23. EMERGENCY PROCEDURES.**

- a. The HMTs are equipped with runflat tires, allowing the trailer to be towed with one or both tires flat.
- b. Do not exceed 30 mph (48.3 km/h) during any runflat operation. Do not exceed 20 mph (32.2 km/h) for more than 30 miles (48.3 km) with both tires flat.
- c. A wheel assembly that has been run flat must be inspected and the tire replaced by Unit maintenance as soon as possible

**CHAPTER 3  
OPERATOR MAINTENANCE INSTRUCTIONS**

Paragraph	Title	Page Number
Section I -	LUBRICATION INSTRUCTIONS .....	3-1
Section II -	OPERATOR TROUBLESHOOTING PROCEDURES .....	3-1
3-1 -	GENERAL .....	3-1
3-2 -	EXPLANATION OF COLUMNS .....	3-2
3-3 -	MALFUNCTION INDEX .....	3-2

**Section I. LUBRICATION INSTRUCTIONS I**

Lubrication instructions are in Appendix G of this technical manual.  
All lubrication instructions are mandatory.

**Section II. OPERATOR TROUBLESHOOTING PROCEDURES**

**3-1. GENERAL.**

- a. This section provides information for identifying and correcting malfunctions that may develop while operating your trailer.
- b. The Malfunction Index in paragraph 3-3 lists common malfunctions that may occur and also refers you to the proper page in Table 3-1 for a troubleshooting procedure.
- c. If you are unsure of an item mentioned, refer to paragraph 1-8 or the maintenance task where the item is replaced.
- d. Before performing a troubleshooting procedure, read and follow all safety instructions found in the Warning pages at the front of this manual.
- e. This section cannot list all malfunctions that may occur or all tests, inspections, and corrective actions. If a malfunction is not listed or is not corrected by listed corrective actions, notify Unit maintenance.
- f. When troubleshooting a malfunction:
  - (1) Locate the malfunction in the Malfunction Index in paragraph 3-3 that best describes the malfunction.
  - (2) Turn to the page in Table 3-1 where the troubleshooting procedure for the malfunction in question is described. Headings at the top of each page show how each troubleshooting procedure is organized: Malfunction, Test or Inspection (in step number order), and Corrective Action.
  - (3) Perform each Test or Inspection step in the order listed until the malfunction is corrected. Do not perform any maintenance task unless the troubleshooting procedure tells you to do so.

**3-2. EXPLANATION OF COLUMNS.**

The columns in Table 3-1 are defined as follows:

- a. Malfunction. A visual or operational indication that something is wrong with the trailer.
- b. Test or Inspection. A procedure to isolate the problem in a component or system.
- c. Corrective Action. A procedure to correct the problem.

**3-3. MALFUNCTION INDEX.**

Troubleshooting Procedure Page

<b>ELECTRICAL SYSTEM</b>	
All Lamps Fail to Light .....	3-3
One or More Lamps Do Not Operate Properly.....	3-3
Dim or Flickering Lamps .....	3-4
<b>BRAKE SYSTEM</b>	
Brakes Will Not Release .....	3-4
Brakes Will Not Hold Trailer When Engaged .....	3-5
Hydraulic Brakes Will Not Operate .....	3-5
Parking Brake Lever Will Not Operate .....	3-5
<b>WHEELS AND TIRES</b>	
Abnormal or Uneven Tire Wear .....	3-5
Wobbly Wheel .....	3-6
<b>FRONT SUPPORT LEG</b>	
Front Support Leg Will Not Crank Up or Down .....	3-6
<b>SUSPENSION</b>	
Shock Absorber Leaking .....	3-6

Table 3-1. Operator Troubleshooting

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
<b><u>ELECTRICAL SYSTEM</u></b>		
1. ALL LAMPS FAIL TO LIGHT.		
	Step 1. Check light panel switch positions in towing vehicle.	Set light panel switches in towing vehicle to correct positions (refer to towing vehicle Operator's Manual).
		Check operation of towing vehicle lights.
	Step 2. Check for proper connection of intervehicular power cable connector at vehicle.	Pull connector out and reset fully into receptacle.
	Step 3. Check intervehicular power cable connector plug for dirty or corroded contacts.	Clean contacts as required.
	Step 4. Deleted.	
	Step 5. Check intervehicular cable and wiring harness for broken wires or loose connections.	Notify Unit maintenance.
2. ONE OR MORE LAMPS DO NOT OPERATE PROPERLY.		
	Step 1. Check intervehicular power cable connector for dirty or corroded contacts.	

Table 3-1. Operator Troubleshooting - Continued

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MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
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Clean contacts as required.

Step 2. Check for loose or broken wires or loose connection at affected light.

Notify Unit maintenance.

3. DIM OR FLICKERING LAMPS.

Step 1. Check intervehicular power cable connector for dirty or corroded contacts.

Clean contacts as required.

Step 2. Check for loose wires or connection at affected light.

Notify Unit maintenance.

**BRAKE SYSTEM**

4. BRAKES WILL NOT RELEASE.

Step 1. Ensure that handbrake levers are fully released (raised position).

Release handbrake levers.

Step 2. Check that breakaway lever is not engaged.

Reset breakaway lever.

Notify Unit maintenance.

Table 3-1. Operator Troubleshooting - Continued

**MALFUNCTION****TEST OR INSPECTION****CORRECTIVE ACTION**

## 5. BRAKES WILL NOT HOLD TRAILER WHEN ENGAGED.

Step 1. Ensure that handbrake levers are fully engaged (lowered position).

Fully engage handbrake levers.

Notify Unit maintenance.

## 6. HYDRAULIC BRAKES WILL NOT OPERATE.

Step 1. Check fluid level in hydraulic brake actuator.

Add fluid if low.

Step 2. Check brake tubes and hoses for leaks.

Notify Unit maintenance.

## 7. HANDBRAKE LEVER WILL NOT OPERATE.

Step 1. Check for seized lever.

Clean lever as required. Lubricate lever in accordance with Appendix G.

Step 2. Check handbrake lever for damage.

Notify Unit maintenance.

**WHEELS AND TIRES**

## 8. ABNORMAL OR UNEVEN TIRE WIRE.

Step 1. Check tire pressure.

Inflate tire to 17 psi  $\pm$  2 psi (117 kPa  $\pm$  13.8 kPa).

Notify Unit maintenance.

Table 3-1. Operator Troubleshooting - Continued.

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<b>MALFUNCTION</b>	<b>TEST OR INSPECTION</b>	<b>CORRECTIVE ACTION</b>
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9. WOBBLY WHEEL.

- Step 1. Check for missing or loose stud nuts or lugnuts.  
 Replace or tighten nuts.  
 Notify Unit maintenance to apply proper torque.

**FRONT SUPPORT LEG**

10. FRONT SUPPORT LEG WILL NOT CRANK UP OR DOWN.

- Step 1. Check for dents and damage.  
 Notify Unit maintenance.

**SUSPENSION**

11. TRAILER LEANS TO ONE SIDE.

- Step 1. Check tire pressure.  
 Inflate tire to 17 psi +/- 2 psi (117 kPa +/- 13.8 kPa).
- Step 2. Check for shock absorber leaks.  
 Notify Unit maintenance.
- Step 3. Visually check shock absorber extension rod on both sides of trailer.  
 Notify Unit maintenance if length of exposed extension rods are not even.
-



## CHAPTER 4 UNIT MAINTENANCE INSTRUCTIONS

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**Section I. REPAIR PARTS; TOOLS; SPECIAL TOOLS; TEST,  
MEASUREMENT, AND DIAGNOSTIC EQUIPMENT (TMDE);  
AND SUPPORT EQUIPMENT**

**4-1. COMMON TOOLS AND EQUIPMENT.**

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

**4-2. SPECIAL TOOLS; TEST, MEASUREMENT, AND DIAGNOSTIC EQUIPMENT (TMDE); AND SUPPORT EQUIPMENT.**

No special tools, TMDE, or support equipment is required to maintain the trailers.

**4-3. REPAIR PARTS.**

Repair parts are listed and illustrated in Appendix F of this manual.

**Section II. SERVICE UPON RECEIPT**

**4-4. GENERAL.**

When a new, used, or reconditioned trailer is first received, determine whether it has been properly prepared for service and is in condition to perform its mission. Follow the inspection instructions in paragraph 4-5 and servicing instructions in paragraph 4-7.

**4-5. SERVICE UPON RECEIPT OF MATERIAL.**

a. Unpacking.

- (1) Refer to DD Form 1397 for procedures on unpacking the trailer
- (2) Remove all straps, plywood, tape, seals, and wrappings

b. Checking Unpacked Equipment

- (1) Inspect the equipment for damage incurred during shipment. If the equipment has been damaged, report the damage on SF 364, Report of Discrepancy.
- (2) Check the equipment against the packing slip to see if shipment is complete. Report all discrepancies in accordance with the instructions in DA Pam 738-750.

c. Processing Unpacked Equipment.

- (1) No tools are required to process the equipment. All supplies required to service the equipment are listed in Appendix E.

**4-5. SERVICE UPON RECEIPT OF MATERIAL (Con't).****WARNING**

Dry cleaning solvent, P-D-680, is toxic and flammable. Always wear protective goggles and gloves and use solvent only in a well-ventilated area. Avoid contact with skin, eyes, and clothes, and DO NOT breathe vapors. DO NOT use near open flame or excessive heat. The solvent's flash point is 100°F to 138°F (38°C to 59°C). If you become dizzy while using cleaning solvent, immediately get fresh air and medical help. If solvent contacts eyes, immediately wash your eyes and get medical aid.

- (2) Remove rust preventive compound from coated exterior parts of the trailer using dry cleaning solvent (item 5, Appendix E) and a clean rag (item 10, Appendix E).

**4-6. INSTALLATION INSTRUCTIONS.**

The trailer is shipped complete and ready for use after completion of preliminary servicing and adjustment. No piece of equipment is shipped separately; therefore, no assembly is required.

**4-7. PRELIMINARY SERVICING AND ADJUSTMENT.**

- a. Perform all Operator and Unit PMCS procedures. Schedule the next PMCS on DD Form 314.
- b. Lubricate all lubrication points in accordance with Appendix G, regardless of interval.
- c. If any system of the trailer does not operate properly, refer to troubleshooting instructions in Chapter 3, Section II, or Chapter 4, Section IV
- d. Perform a break-in road test of 25 mi (40 km) at a maximum speed of 50 mph (80 km/h).
- e. Report all problems on DA Form 2404.

### Section III. UNIT PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS)

#### 4-8. GENERAL.

Preventive Maintenance Checks and Services (PMCS) means systematic caring, inspecting, and servicing of equipment to keep it in good condition and to prevent breakdowns. As the provider of unit level checks and services, your mission is to:

- a. Perform your PMCS at the correct intervals as indicated in Table 4-1. Always do your PMCS in the same order, so it gets to be a habit. Once you've had some practice, you'll quickly spot anything wrong.
- b. Do your QUARTERLY PMCS every 3 months. Pay attention to WARNINGS, CAUTIONS, and **NOTES**
- c. Do your SEMIANNUAL PMCS every 6 months. Pay attention to WARNINGS, CAUTIONS, and **NOTES**
- d. Use DA Form 2404 (Equipment Inspection and Maintenance Worksheet) to record any faults that you discover during the quarterly and semiannual PMCS, unless you can fix them. You **DO NOT** need to record faults that you fix.

#### 4-9. PMCS PROCEDURES.

- a. Table 4-1, Unit Preventive Maintenance Checks and Services, lists inspections and care required to keep the trailer in good operating condition. It is set up so you can make your checks as you walk around the trailer.
- b. The ITEM NO. column provides a logical sequence for PMCS to be performed and is used as a source of item number for the TM ITEM NO. column when recording PMCS results on DA Form 2404.
- c. The INTERVAL column tells you when to do a certain check or service.
- d. The LOCATION column lists the item to check or service.
- e. The PROCEDURE column tells you how to do the required check or service. Carefully follow these instructions. When instructed to do so, notify Direct Support (DS) maintenance.

#### NOTE

The terms "ready/available" and "mission capable" refer to the same status: Equipment is on hand and ready to perform its combat missions. (See DA Pam 738-750.)

- f. The NOT FULLY MISSION CAPABLE IF column tells you when your trailer is nonmission capable and why the trailer cannot be used.
- g. When you do your PMCS, you will always need a rag or two. Following are checks that are common to the entire trailer:

**4-9. PMCS PROCEDURES (Con't).**

- (1) Keep It Clean. Dirt, grease, oil, and debris may cover up a serious problem. Clean as you work and as needed. Use dry cleaning solvent (item 5, Appendix E) on all metal surfaces. Use detergent (item 4, Appendix E) and water on rubber, plastic, and painted surfaces.
  - (2) Rust and Corrosion. Check trailer body and frame for rust and corrosion. If any bare metal or corrosion exists, clean and apply a thin coat of light oil.
  - (3) Bolts, Nuts, and Screws. Ensure that none are loose, missing, bent, or broken. Tighten any that are loose.
  - (4) Welds. Look for loose or chipped paint, rust, or cracks where parts are welded together. If you find a bad weld, notify DS maintenance.
  - (5) Wiring Harness, Wires, and Connectors. Inspect for cracked or broken insulation, bare wires, and loose or broken connectors. Tighten loose connectors. Replace as required.
  - (6) Hydraulic Brake Lines, Hoses, and Fittings. Inspect for wear, damage, and leaks. Ensure that fittings are tight. If a leak originates from a loose fitting, tighten it. If a component is broken or worn, correct problem.
- h. When you check for "operating condition," you look at the component to see if it is serviceable.

**4-10. CLEANING AGENTS.****WARNING**

Dry cleaning solvent, P-D-680, is toxic and flammable. Always wear goggles and gloves and use solvent only in a well-ventilated area. Avoid contact with skin, eyes, and clothes, and DO NOT breathe vapors. DO NOT use near open flame or excessive heat. The solvent's flash point is 100°F to 138°F (38°C to 59°C). If you become dizzy while using cleaning solvent, immediately get fresh air and medical help. If solvent contacts eyes, immediately wash your eyes and get medical aid.

**CAUTION**

- Do not allow cleaning compounds to come into contact with rubber, leather, vinyl, or canvas materials. Damage to equipment will result.
- Do not allow water to enter the master cylinder. Damage to the brake system will result.

**NOTE**

Use only those authorized cleaning solvents or agents listed in Appendix E.

- a. Cleaning is an AFTER operation service performed to maintain the trailer in a state of readiness. Facilities and material available for cleaning may vary in different operating conditions. However, trailer must be kept as clean as possible as available cleaning equipment, materials, and tactical situations permit

**4-10 CLEANING AGENTS (Con't).**

- b. Prior to using water to clean, ensure master cylinder fill cap is tightened.
- c. Allow wet brakes to dry before using trailer.

**4-11 LEAKAGE DEFINITIONS FOR UNIT PMCS.**

Wetness around seals, gaskets, fittings, or connections indicates leakage. A stain also denotes leakage. Use the following leakage classes to determine the status of the trailer. When in doubt, notify your supervisor.

**CAUTION**

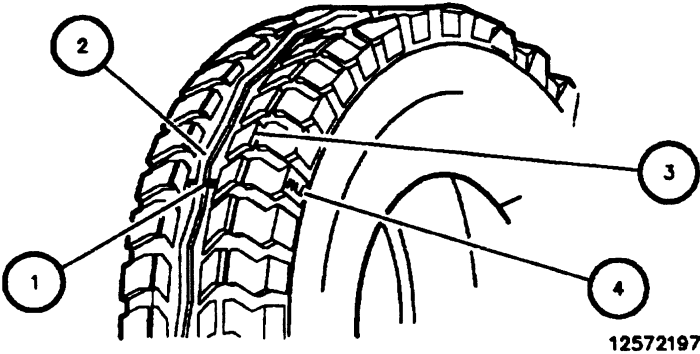
Operation is allowable with Class I or II leakage except for brake systems. Any brake fluid leakage must be corrected. Any Class III leakage must be corrected. Failure to do so may result in damage to the equipment.

- a. Class I. Leakage indicated by wetness or discoloration not great enough to form drops.
- b. Class II. Leakage great enough to form drops, but not enough to cause drops to drip from item being checked/inspected.
- c. Class III. Leakage great enough to cause drops that fall from the item being checked/inspected.

**Table 4-1. Unit Preventive Maintenance Checks and Services for M1101, M1102, and Trailer Chassis**

Item No.	Interval	Location	Procedure	Not Fully Mission Capable If:
		Item To Check/ Service		
1	Semi-annual	Lunette	<ul style="list-style-type: none"> <li>a. Measure lunette ring thickness. If measurement is less than 5/8", replace lunette (para 4-27).</li> <li>b. Inspect master pin slotted hole for wear. If hole length exceeds 2.313 inches or hole width exceeds 1.20 inches, replace lunette (para 4-28).</li> </ul>	<ul style="list-style-type: none"> <li>a. Lunette ring thickness is less than 5/8".</li> <li>b. Wear limits are exceeded.</li> </ul>
2	Semi-annual	Brake Actuator Assembly	<ul style="list-style-type: none"> <li>a. Inspect master pin hole for wear. If hole diameter exceeds 1.06 inches, replace outer case assembly (para 4-27).</li> <li>b. Inspect front roller pin hole for wear. If hole diameter exceeds 0.75 inch, replace outer case assembly (para 4-27).</li> <li>c. Remove and disassemble hydraulic brake actuator assembly (para 4-27).</li> </ul>	<ul style="list-style-type: none"> <li>a. Wear limits are exceeded.</li> <li>b. Wear limits are exceeded.</li> <li>c. Wear limits are exceeded.</li> </ul>
3	Semi-annual	Tires	<ul style="list-style-type: none"> <li>a. Visually check for underinflated and unserviceable tires. Check tires for leaks, cuts, gouges, cracks, or bulges. Remove all penetrating objects.</li> </ul>	<ul style="list-style-type: none"> <li>a. Any tire is missing or unserviceable. Tires have leaks, cuts, gouges, cracks, or bulges which would result in tire failure during operation.</li> </ul>

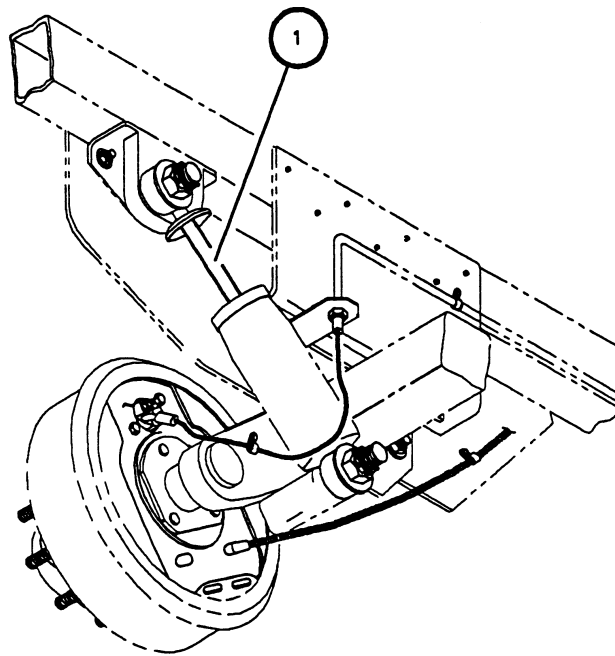
**Table 4-1. Unit Preventive Maintenance Checks and Services (PMCS)  
for M1101, M1102, and Trailer Chassis - Continued**

Item No.	Interval	Location	Procedure	Not Fully Mission Capable If:
		Item To Check/Service		
3 (Con't)	Semi-annual	Tires	b. Check tire tread depth. Tread should not be worn beyond level of wear bar (1). Wear bars (1) are molded across the tread pattern and are only noticeable in the valley between the center rib (2) and the lugs (3). The letters TWI (Tread Wear Indicator) are molded on the tire sidewall (4) to aid in locating the wear bar (1). If excessive wear, replace.	b. Tread is worn beyond level of wear bar.
 <p style="text-align: right;">12572197</p>				
4	Semi-annual	Wheel Assemblies	<p>a. Check stud nuts to make sure that they are not loose or missing. If any are loose, tighten. If any are missing, replace. Torque nuts in accordance with para 4-32.</p> <p>b. Inspect wheel bearings and races for damage. If any bearing needs replacing, replace all bearings on both sides (para 4-33). Repack wheel bearings in accordance with Appendix G.</p> <p>c. Inspect wheel cylinders for leaks or damage.</p> <p>d. Inspect inside of drum for scoring. If scored, notify DS maintenance.</p> <p>e. Inspect brake shoes for glazing or wear. If any shoe needs replacing, replace all shoes on both sides (para 4-24).</p> <p>f. Adjust service brakes (para 4-23).</p>	<p>a. Any stud nuts are missing.</p> <p>b. Any damage is found.</p> <p>c. Any leaks or damage is found.</p> <p>d. Any scoring is evident.</p> <p>e. Brakeshoe is glazed or thickness is less than 1/8 in. (3.2 mm).</p>



**Table 4-1. Unit Preventive Maintenance Checks and Services (PMCS)  
for M1101, M1102, and Trailer Chassis - Continued**

Item No.	Interval	Location	Procedure	Not Fully Mission Capable If:
		Item To Check/Service		
5	Semi-annual	Shock Absorbers	Inspect shock absorbers for leaks, missing nuts, and dents. Repair or replace as needed (para 4-37).	Any leaks are evident, mounting hardware missing, damage is evident.
6	Semi-annual	Axle	<p>a. Measure shock absorber extension rod (1). If the exposed extension rod on either absorber measures less than 2 1/4 in. or if difference between two extension rods is 3/4 in. or greater, axle requires replacement. Notify DS maintenance.</p> <p>b. Check axle mounting hardware for secure mounting. Tighten or replace hardware as required.</p>	Measurements not within specification.
7	Semi-annual	Handbrake	Lubricate handbrakes in accordance with Appendix G.	



**Table 4-1. Unit Preventive Maintenance Checks and Services (PMCS)  
for M1101, M1102, and Trailer Chassis - Continued**

Item No.	Interval	Location	Procedure	Not Fully Mission Capable If:
		Item To Check/ Service		
8	Semi-annual	Hydraulic Brake System	<ul style="list-style-type: none"> <li>a. Inspect brake lines and hoses for defects such as missing clamps, cracks, leaks, loose connections, or broken lines. Repair as needed (para 4-31).</li> <li>b. Inspect master cylinder assembly for damage or missing cap, leaks, and proper fluid level. If cap is damaged or missing, replace it. Proper fluid level is 1/8 in. (3 mm) below top of edge of reservoir. If not at specified level, add fluid in accordance with Appendix G.</li> <li>c. Visually check brake breakaway cable and breakaway lever for damage and missing parts. Check that breakaway lever is in down position. If damaged or missing parts, repair as needed (para 4-27).</li> </ul>	<ul style="list-style-type: none"> <li>a. Any leaks are found.</li> <li>b. Any leaks are found.</li> <li>c. Cable or lever is missing or damaged.</li> </ul>
9	Semi-annual	Lights, Reflectors, and Wiring	<ul style="list-style-type: none"> <li>a. Visually inspect lights and reflectors for missing or broken parts or loose connections. If any connectors are loose, tighten. If reflectors are missing or broken, replace.</li> <li>b. Inspect wiring harness and intervehicular cable for exposed, frayed, or damaged wiring or missing mounting hardware. If damaged, replace (para 4-19).</li> <li>c. Connect intervehicular cable to towing vehicle (para 2-10). Operate towing vehicle light switch through all settings and check trailer lights. If any are inoperative or unserviceable, repair as needed.</li> </ul>	<ul style="list-style-type: none"> <li>a. Any lights are missing or broken.</li> <li>b. Wiring harness or cable is exposed, frayed, or damaged. Mounting hardware is missing.</li> <li>c. Other than marker lights, one or more lights are inoperative or unserviceable.</li> </ul>
10	Semi-annual	Front Support Leg	<ul style="list-style-type: none"> <li>a. Check front support leg for damage, missing parts, and proper operation. Check that caster moves freely and handle can be cranked up and down to raise and lower trailer. Repair or replace as needed (para 4-44).</li> <li>b. Fully extend support leg and clean as necessary.</li> <li>c. Remove support leg cover and lubricate (App G).</li> </ul>	

**Table 4-1. Unit Preventive Maintenance Checks and Services (PMCS)  
for M1101, M1102, and Trailer Chassis - Continued**

Item No.	Interval	Location	Procedure	Not Fully Mission Capable If:
		Item To Check/Service		
11	Semi-annual	Rear Stabilizers	Inspect rear stabilizers for damage. Ensure that hinge on flex plate can be rotated and sections slide up and down when pin is removed. Repair as needed.	Damage is evident or parts are missing.
12	Semi-annual	Cargo Body	<ul style="list-style-type: none"> <li>a. Inspect cargo body for missing rivets, missing cargo tiedowns, and damage to the box.</li> <li>b. Inspect tailgate for damage, missing or broken hardware, missing or broken lanyard cable, and missing or damaged pin. Check that tailgate rotates freely on hinges. Repair or replace as needed (para 4-38).</li> <li>c. Inspect decontamination bracket for damage or missing hardware. Repair or replace as needed (para 4-42).</li> <li>d. Visually check that identification plate and shipping plate are firmly attached and readable. Replace as needed (para 4-41).</li> </ul>	
13	Semi-annual	Soft Top Kit	<ul style="list-style-type: none"> <li>a. Visually inspect canvas cover for rips, tears, or missing footman loops. Repair or replace as needed (para 4-43).</li> <li>b. Inspect bows for damage. Replace if damaged (para 4-43).</li> </ul>	



## Section IV. UNIT TROUBLESHOOTING

### 4-12. GENERAL.

- a. This section provides information for identifying and correcting malfunctions that may develop while operating or maintaining the trailer.
- b. The Malfunction Index in paragraph 4-14 lists common malfunctions that may occur and refers you to the proper page in Table 4-2 for a troubleshooting procedure.
- c. If you are unsure of an item mentioned, refer to paragraph 1-8 or the maintenance task where the item is replaced.
- d. Before performing a troubleshooting procedure, read and follow all safety instructions found in the Warning pages at the front of this manual.
- e. This section cannot list all malfunctions that may occur, or all tests, inspections, and corrective actions. If a malfunction is not listed, or is not corrected by listed corrective actions, notify DS maintenance.
- f. When troubleshooting a malfunction:
  - (1) Question the operator to obtain any information that might help determine the cause of the problem.
  - (2) Locate the malfunction in the Malfunction Index in paragraph 4-14 that best describes the malfunction.
  - (3) Turn to the page in Table 4-2 where the troubleshooting procedure for the malfunction in question is described. Headings at the top of each page show how each troubleshooting procedure is organized: Malfunction, Test or Inspection (in step number order), and Corrective Action.
  - (4) Perform each Test or Inspection step in the order listed until the malfunction is corrected. Do not perform any maintenance task unless the troubleshooting procedure tells you to do so.

### 4-13. EXPLANATION OF COLUMNS.

The columns in Table 4-2 are defined as follows

- a. Malfunction. A visual or operational indication that something is wrong with the trailer
- b. Test or Inspection. A procedure to isolate the problem in a component or system.
- c. Corrective Action. A procedure to correct the problem.

**4-14 MALFUNCTION INDEX.**

**Troubleshooting  
Procedure**

**Page**

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Table 4-2. Unit Troubleshooting

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
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**ELECTRICAL SYSTEM**

1. ALL LAMPS FAIL TO LIGHT.

Step 1. Deleted.

Step 2. Deleted.

Step 3. Check wiring at the connector for broken wires.

Tighten loose connections. Repair as necessary (para 4-15).

Step 4. Check chassis wiring harness for bare spots.

Repair chassis wiring harness as necessary (para 4-15).

Step 5. Deleted.

2. ONE OR MORE LAMPS DO NOT OPERATE PROPERLY.

Step 1. Check for defective lamp bulbs.

Replace defective lamp bulbs (para 4-16, 4-17, or 4-18).

Step 2. Check wiring at lamp connector for loose and broken wires.

Tighten loose connections. Repair as necessary (para 4-15).

Step 3. Check for loose, dirty, or corroded cable connectors.

Clean terminal assemblies and electrical contacts.

Step 4. Disconnect the intervehicular cable from the towing vehicle (para 2-10).

Step 5. Disconnect lamp housing (left, right, front, or rear).

Step 6. Use multimeter to check for continuity of each electrical wire in wiring harness and the intervehicular cable.

3. DIM OR FLICKERING LAMPS.

Step 1. Check wiring at lamp connector for loose and broken wires.

Tighten loose connections. Repair as necessary (para 4-15).

Step 2. Check for loose, dirty, or corroded cable connectors.

Clean terminal assemblies and electrical contacts.

Table 4-2. Unit Troubleshooting - Continued

---

**MALFUNCTION**

**TEST OR INSPECTION**

**CORRECTIVE ACTION**

---

Step 3. Use multimeter to check for continuity of each electrical wire in wiring harness and the intervehicular cable.

**AXLE**

4. WHEELS OUT OF LINE.

Step 1. Check for damaged trailing arm assembly.

If damaged, notify DS maintenance.

Step 2. Check for defective wheel bearing.

Replace wheel bearing (para 4-33).

Step 3. Check for damaged wheel.

Replace wheel (para 4-32).

**BRAKES**

5. HANDBRAKES WILL NOT OPERATE.

Step 1. Check for damaged handbrake lever.

Replace lever assembly (para 4-20).

Step 2. Check for missing, seized, or broken cable.

Replace brake cable and defective parts (para 4-21).

Step 3. Apply brakes and check brake action.

Perform service brake adjustment (para 4-23).

Adjust handbrake levers (para 2-14).

Step 4. Inspect service brake assembly (para 4-22).

Replace defective parts (para 4-24).

6. HYDRAULIC BRAKES WILL NOT OPERATE.

Step 1. Check brake tubes and hoses for leaks.

Tighten fittings or replace as required. Then bleed brake system (para 4-26).

Step 2. Check hydraulic brake operation.

Adjust service brakes (para 4-23).



Table 4-2. Unit Troubleshooting - Continued

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
	Step 3. Check brake assemblies.	Replace defective parts (para 4-24).
7. BRAKES WILL NOT RELEASE.	Step 1. Check parking brake cable tension.	Adjust handbrake (para 2-14).
	Step 2. Check brake assemblies and cables.	Replace defective parts (para 4-20, 4-21, or 4-24).
8. BRAKES WILL NOT HOLD TRAILER WHEN ENGAGED.	Step 1. Check brake adjustment.	Adjust brakes if required (para 2-14, 4-23).
	Step 2. Check brake cable tension.	Adjust handbrake (para 2-14).
9. Deleted.		
10. BRAKES OVERHEAT.	Step 1. Check for unreleased or sticking handbrake lever.	Release handbrake lever.
	Step 2. Check to see if breakaway brake lever is in up position.	Reset to down position.
	Step 3. Check brake adjustment.	Adjust brakes as required (para 2-14, 4-23).
<b><u>WHEELS AND TIRES</u></b>		
11. ABNORMAL OR UNEVEN TIRE WEAR.	Step 1. Check for damaged wheel.	Replace damaged wheel (para 4-32).

Table 4-2. Unit Troubleshooting - Continued

**MALFUNCTION**

**TEST OR INSPECTION**

**CORRECTIVE ACTION**

Step 2. Check wheel bearings for damage and adjustment.

Replace or adjust wheel bearings (para 4-33).

Step 3. Check for bent/misaligned trailing arm.

If damaged, notify DS maintenance.

12. **WOBBLY WHEEL.**

Step 1. Deleted.

Step 2. Check for damaged wheel.

Replace damaged wheel (para 4-32).

Step 3. Check wheel bearings for damage and adjustment.

Replace or adjust wheel bearings (para 4-33).

**FRONT SUPPORT LEG AND**

13. **FRONT SUPPORT LEG WILL NOT CRANK UP OR DOWN.**

Step 1. Check for dents and damage.

Replace support leg (para 4-44).

Step 2. Check gear box handcrank for free movement.

Clean and grease gear box (para 4-44).

Step 3. Check shaft and housing for obstructions that would prevent proper operation.

Remove support leg and clean shaft and housing (para 4-44).

Step 4. Deleted.

Step 5. Remove gear boxcover and inspect gears and shear pin for damage (para 4-44).

Replace damaged parts (para 4-44).

**SUSPENSION**

14. **TRAILER LEANS TO ONE SIDE.**

Step 1. Check shock absorber for leaks.

Replace shock absorber (para 4-37).

Step 2. Measure shock absorber extension rod on both shock absorbers.

If exposed extension rod on either absorber measures less than 2 1/4 in. or if difference between the two extension rods is 3/4 in. or greater, notify DS maintenance to replace axle.

**Section V. GENERAL MAINTENANCE INSTRUCTIONS****4-15. GENERAL.**

- a. These general maintenance instructions contain general shop practices and specific procedures you must be familiar with to properly maintain the trailer. You should read and understand these practices and procedures before performing any maintenance procedures.
- b. Before beginning a task, find out how much repair, modification, or replacement is needed to fix the equipment. Sometimes the reason for equipment failure can be seen right away, and complete tear-down is not necessary. Disassemble equipment only as far as necessary to repair or replace damaged parts.
- c. In some cases, a part may be damaged by removal. If the part appears to be good, and other parts behind it are not defective, leave it on and continue with the procedure. Here are a few simple rules:
  - (1) Do not remove dowel pins or studs unless loose, bent, broken, or otherwise damaged.
  - (2) Do not remove bearings or bushings unless damaged. If you need to remove them to access parts behind, carefully pull out bearings and bushings.
  - (3) Replace all gaskets, lockwashers, self-locking nuts, seals, cotter pins, and performed packings.
- d. The following 'Initial Setup' information applies to all procedures:
  - (1) "Equipment Conditions" must be performed prior to performing the maintenance task.
  - (2) Resources are not listed unless they apply to the procedure.
- e. All tags and forms attached to the equipment must be checked to learn the reason for removal of equipment from service. Modification Work Orders (MWOs) and Technical Bulletins (TBs) must be checked for equipment changes and updates.
- f. Work Safety
  - (1) Observe all WARNINGS and CAUTIONS.
  - (2) Before beginning a procedure, think about the safety risks and hazards to yourself and others. Wear protective gear such as safety goggles or lenses, safety shoes, rubber apron, gloves, and breathing mask when instructed to do so.
  - (3) Immediately clean up spilled fluids to avoid slipping.
  - (4) When lifting heavy objects, have someone help you. Ensure that lifting equipment or jack is working properly, that it meets weight requirements of part being lifted, and that it is securely fastened to part.
  - (5) Always use power tools carefully.

**4-15. GENERAL (Con't).**

## g. Cleaning Instructions.

**WARNING**

Improper cleaning methods and use of unauthorized cleaning agents can injure personnel or damage equipment. To prevent this, refer to TM 9-247 for further instructions

- (1) General. Cleaning instructions will be the same for the majority of parts and components that make up the trailer. The following applies to all cleaning operations:
  - (a) Clean all parts before inspection, after repair, and before disassembly.
  - (b) Keep hands free of grease that can collect dust, dirt, or grit.
  - (c) After cleaning, all parts should be covered or wrapped to protect them from dust and dirt. Parts that are subject to rust should be lightly oiled.

## (2) Steam Cleaning.

**WARNING**

Avoid contact with live steam. Live steam can burn skin, cause blindness, and cause other serious injury. Be sure to wear protective apron, gloves, and goggles when using live steam.

If trailer is to be steam cleaned, protect all electrical components that could be damaged by steam or moisture.

## (3) Castings, Forgings, and Machined Metal Parts.

**WARNING**

Dry cleaning solvent, P-D-680, is toxic and flammable. Always wear goggles and gloves and use solvent only in a well-ventilated area. Avoid contact with skin, eyes and clothes, and DO NOT breathe vapors. DO NOT use near open flame or excessive heat. The solvent's flash point is 100 °F to 138 °F (38 °C to 59 °C). If you become dizzy while using cleaning solvent, immediately get fresh air and medical help. If solvent contacts eyes, immediately wash your eyes and get medical aid.

- (a) Clean inner and outer surfaces with dry cleaning solvent (item 5, Appendix E)
- (b) Remove grease and accumulated deposits with a scrub brush (item 2, Appendix E)

## 4-15. GENERAL (Con't).

**WARNING**

Compressed air used for cleaning or drying purposes, or for clearing restrictions, should never exceed 30 psi (207 kPa). Wear protective goggles and use caution to avoid injury to personnel

**CAUTION**

Do not wash seals, electrical cables/wiring, and flexible hoses with dry cleaning solvent. Serious damage or destruction of material will result.

- (c) Clean all threaded holes with compressed air to remove dirt and cleaning fluids.
- (4) Electrical Cables and Flexible Hoses. Wash electrical cables and flexible hoses with a solution of detergent (item 4, Appendix E) and water and wipe dry.
- (5) Bearings. Clean bearings in accordance with TM 9-214
- (6) General Cleaning Covered by Other Manuals. Refer to TM 9-247, Materials Used for Cleaning, Preserving, Abrading, and Cementing Ordnance Materiel and Related Items Including Chemicals.
- h. Preservation of Parts. Unpainted metal parts that will not be installed immediately after cleaning may be covered with a thin coat of lubricating oil (item 9, Appendix E).
- i. Painting On painted areas where paint has been removed, paint in accordance with procedures out-lined in TM 43-0139 and TB 43-0209. For camouflage painting instructions, refer to FM 20-3.
- j. Inspection Instructions.

**NOTE**

All damaged areas should be marked for repair or replacement.

- (1) All components and parts must be carefully checked to determine if they are serviceable for use, can be repaired, or must be replaced.
- (2) Inspect drilled and tapped (threaded) holes for the following:
  - (a) Wear, distortion, cracks, and other damage in or around holes
  - (b) Threaded areas for wear distortion (stretching) and evidence of cross-threading.
- (3) Inspect metal and flexible lines, hoses, and metal fittings and connectors for the following.
  - (a) Metal lines for sharp kinks, cracks, bad bends, and dents.
  - (b) Flexible lines for fraying, evidence of leakage, and loose metal fittings or connectors.
  - (c) Metal fittings and connectors for thread damage and worn or round hex heads.
- (4) Inspect castings, forgings, and machined metal parts for the following;
  - (a) Machined surfaces for nicks, burrs, raised metal wear, and other damage.
  - (b) Inner and outer surfaces for breaks or cracks.
- (5) Inspect bearings in accordance with TM 9-214

**4-15. GENERAL (Con't).**

## k. Tagging Parts

- (1) Use marker tags (item 13, Appendix E) to identify all electrical parts and hydraulic lines, and any other parts that may be hard to identify or replace later. Fasten tags to parts during removal by wrapping wire fasteners around or through parts and twisting ends together. Position tags to be out of the way during cleaning, inspection, and repair. Mark tags with a pen, pencil, or marker
- (2) Whenever possible, identify electrical wires with number of terminal or wire to which it connects. If no markings can be found, tag both wires or wire and terminal, and use same identifying marks for both.
- (3) Identify and tag other parts as required by name and installed location.

## l. Electrical Ground Points. Many electrical problems are the result of poor ground connections. You can ensure that ground connections are good by performing the following steps:

- (1) Remove any rust at ground points with wire brush (item 3, Appendix E)
- (2) Check ground point mounting hardware for any loose or damaged parts and tighten or replace as necessary.
- (3) Clean ground point mounting hardware with dry cleaning solvent (item 5, Appendix E).

## m. Hydraulic Brake Lines and Ports. To keep dirt from contaminating the hydraulic brake system when removing and installing brake lines, perform the following:

- (1) Clean fittings and surrounding areas before disconnecting lines.
- (2) Cover lines and ports after disconnecting lines. Use wooden plugs, clean rags (item 10, Appendix E), duct tape, or other similar materials to prevent dirt from entering system.
- (3) Ensure that used and new parts are clean before connecting.
- (4) Wait to uncover lines and ports until Just before connecting lines.

## n. Fluid Disposal. Dispose of contaminated drained fluids in accordance with the Standard Operating Procedures (SOP) of your unit

## Section IV. ELECTRICAL SYSTEM MAINTENANCE

### 4-16 COMPOSITE STOPLIGHT-TAILLIGHT MAINTENANCE.

This task covers:      a. Lamp Bulb/LED Replacement                      c. Lamp Assembly Installation  
    b. Lamp Assembly Removal

#### Initial Setup:

#### Equipment Conditions:

- Intervehicular cable disconnected from towing vehicle (para 2-12).

#### Materials/Parts:

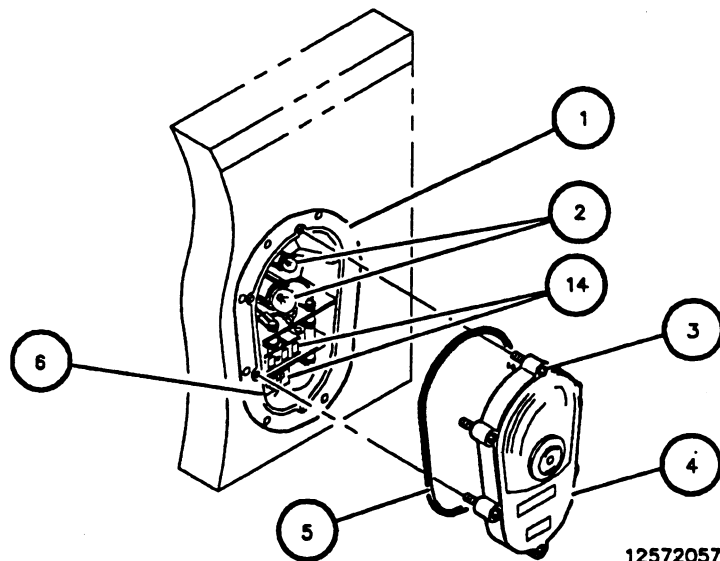
- Tie Wraps
- Marker Tags (Item 13, Appendix E)
- Packing

#### Tools/Test Equipment:

- General mechanics tool kit

#### a. LAMP BULB/LED REPLACEMENT

1. Loosen, but do not remove, six retaining screws (3) securing light door (4) to composite light (1).
2. Remove door (4) and packing (5) from groove (6) in composite light. Discard packing (5).
3. Remove defective lamp (2) by pushing in and turning counterclockwise.
4. Install new lamp (2) by pushing in and turning clockwise.
5. Remove defective LED (14) by pulling forward on printed circuit board; then at socket, push in and turn counterclockwise.
6. Install new LED (14) by pushing in and turning clockwise; then pushing printed circuit board onto socket.
7. Install new packing (5) into door groove (6).
8. Install light door (4) onto composite light (1) and tighten six screws (3) evenly.



**4-16 COMPOSITE STOPLIGHT-TAILLIGHT MAINTENANCE (Con't).**

**b. LAMP ASSEMBLY REMOVAL**

**NOTE**

Tag wires for installation if marker bands are missing or illegible.

1. Cut and remove wire ties from wiring harness shield and remove split wiring harness shield. Do not discard shield.
2. Disconnect four leads (11) from body wiring harness (12).
3. Remove two capscrews (7) securing plate (8), ground strap (13), and composite light (10) to composite light housing (9).
4. Remove composite light assembly (10) by feeding wires, one at a time, through composite light housing (9).

**c. LAMP ASSEMBLY INSTALLATION**

1. Install composite light assembly (10) in housing (9) by feeding wires, one at a time, through housing (9).

**CAUTION**

Housing is plastic material. Do not overtighten capscrews.

2. Install one capscrew (7) through ground strap (13), plate (8), and housing (9) into composite light assembly (10). Install other capscrew through plate (8) and housing (9) into composite light (10).
3. Tighten two capscrews (7).
4. Connect leads (11) to body wiring harness (12).
5. Install wiring harness shield to wiring harness and install tie wraps.

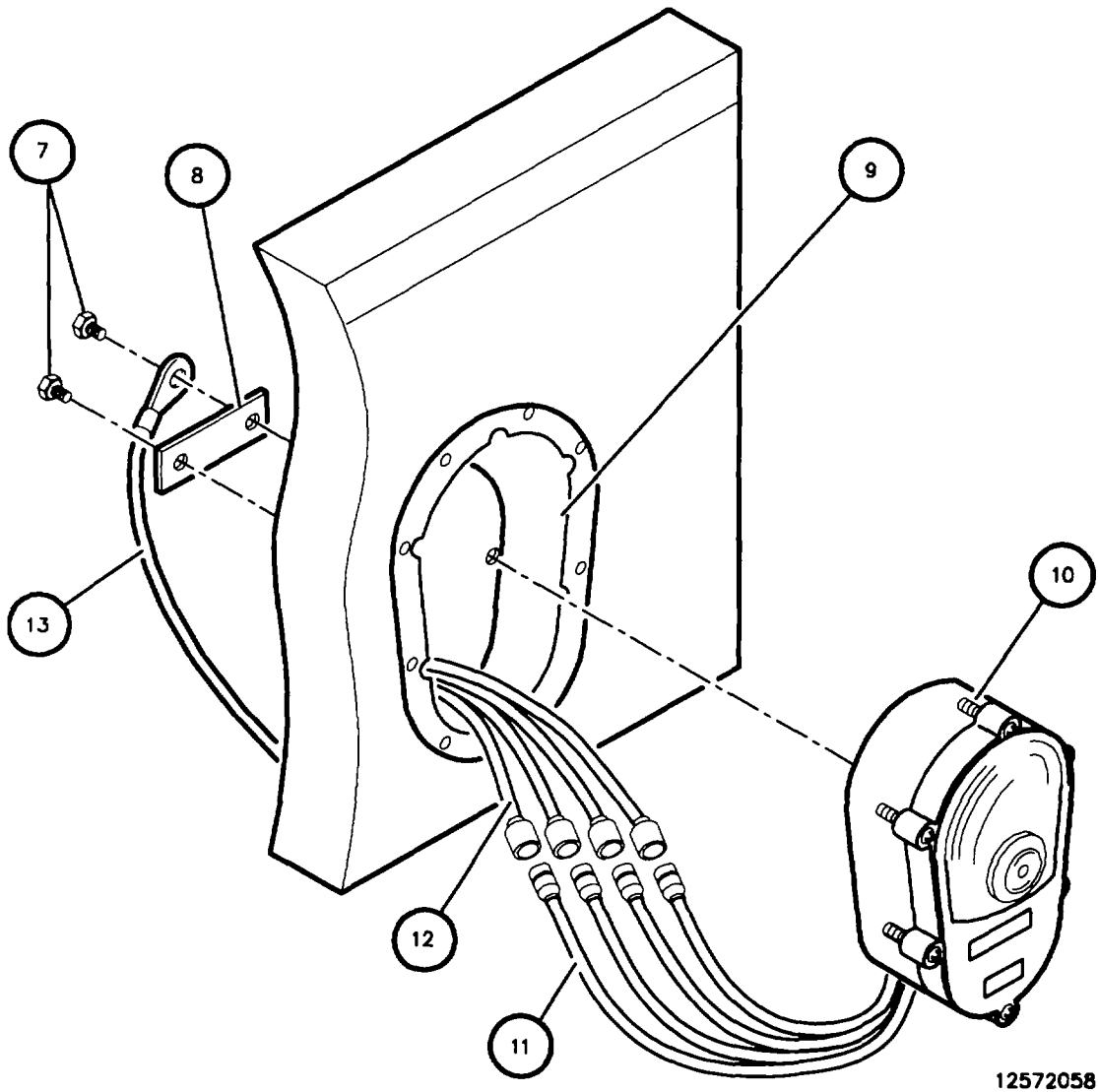
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**FOLLOW-ON TASKS:**

- Connect intervehicular cable to towing vehicle (para 2-10).
- Check operation of light (TM 9-2320-280-10).



4-16. COMPOSITE STOPLIGHT-TAILLIGHT MAINTENANCE (Con't).



4-23/(4-24 blank)



## 4-17. FRONT AND SIDE MARKER LIGHTS MAINTENANCE.

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This task covers:    a. Lamp Bulb Replacement                    c. Lamp Assembly Installation  
                               b. Lamp Assembly Removal

---

**Initial Setup:****Equipment Conditions:**

- Intervehicular cable disconnected from towing vehicle (para 2-12).

**Tools/Test Equipment:**

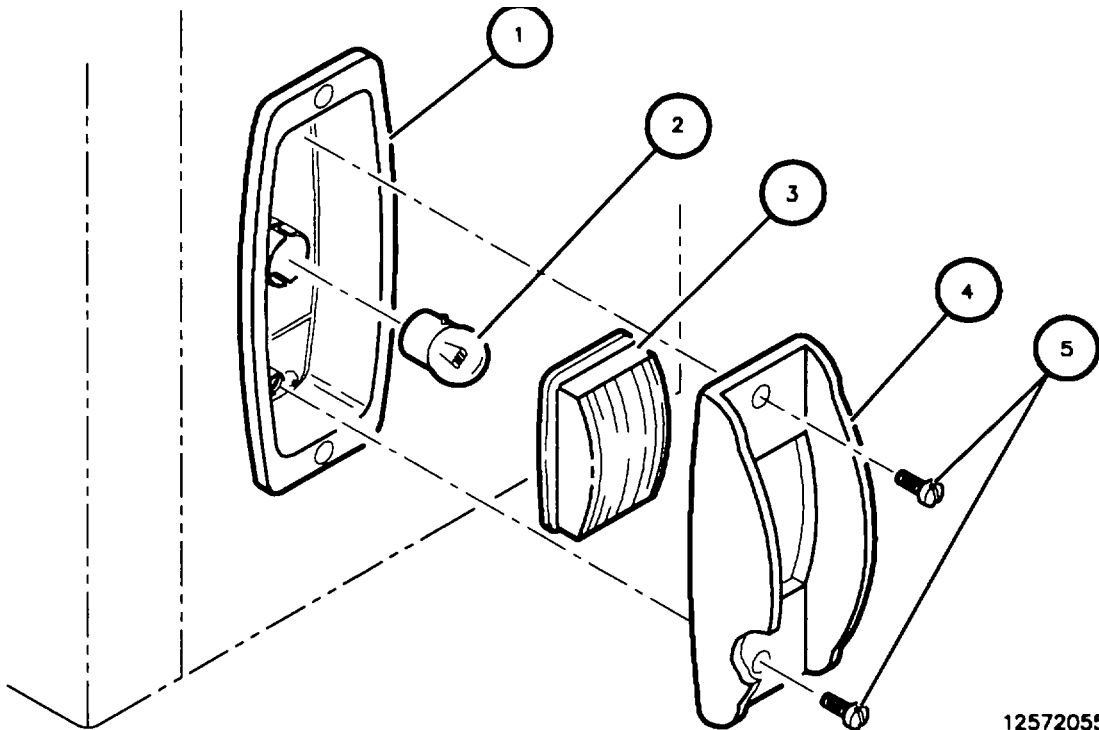
- General mechanics tool kit
- 

**Materials/Parts:**

- Marker Tags (Item 13, Appendix E)
- Four Rivets
- Two Rivets
- One Lockwasher

**a. LAMP BULB REPLACEMENT**

1. Remove two screws (5) securing door (4) and lens (3) to light assembly (1). Remove door (4) and lens (3).
2. Remove lamp (2) by pushing in and turning counterclockwise.
3. Install lamp (2) by pushing in and turning clockwise.
4. Install lens (3) and door (4) to light assembly (1) and secure with two screws (5).



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**4-17. FRONT AND SIDE MARKER LIGHTS MAINTENANCE (Con't).****b. LAMP ASSEMBLY REMOVAL****NOTE**

Tag wires for installation if marker bands are missing or illegible.

1. Remove two screws (5) securing door (4) and lens (3) to light assembly (1).
2. Remove door (4) and lens (3) from light assembly (1).
3. Remove two rivets (12) securing housing (13) to cargo body.
4. Remove housing (13) and light assembly (1) with attached lead (15) and ground wire (8) from cargo body
5. Disconnect lead (15) from wiring harness (14).
6. Remove nut (6), lockwasher (7), and capscrew (10) securing ground wire (8) to housing(13) Discard lock-washer.
7. Remove four rivets (9) securing light assembly (1) to housing (13).
8. Remove light assembly (1) and gasket (11) from housing (13).

**c. LAMP ASSEMBLY INSTALLATION**

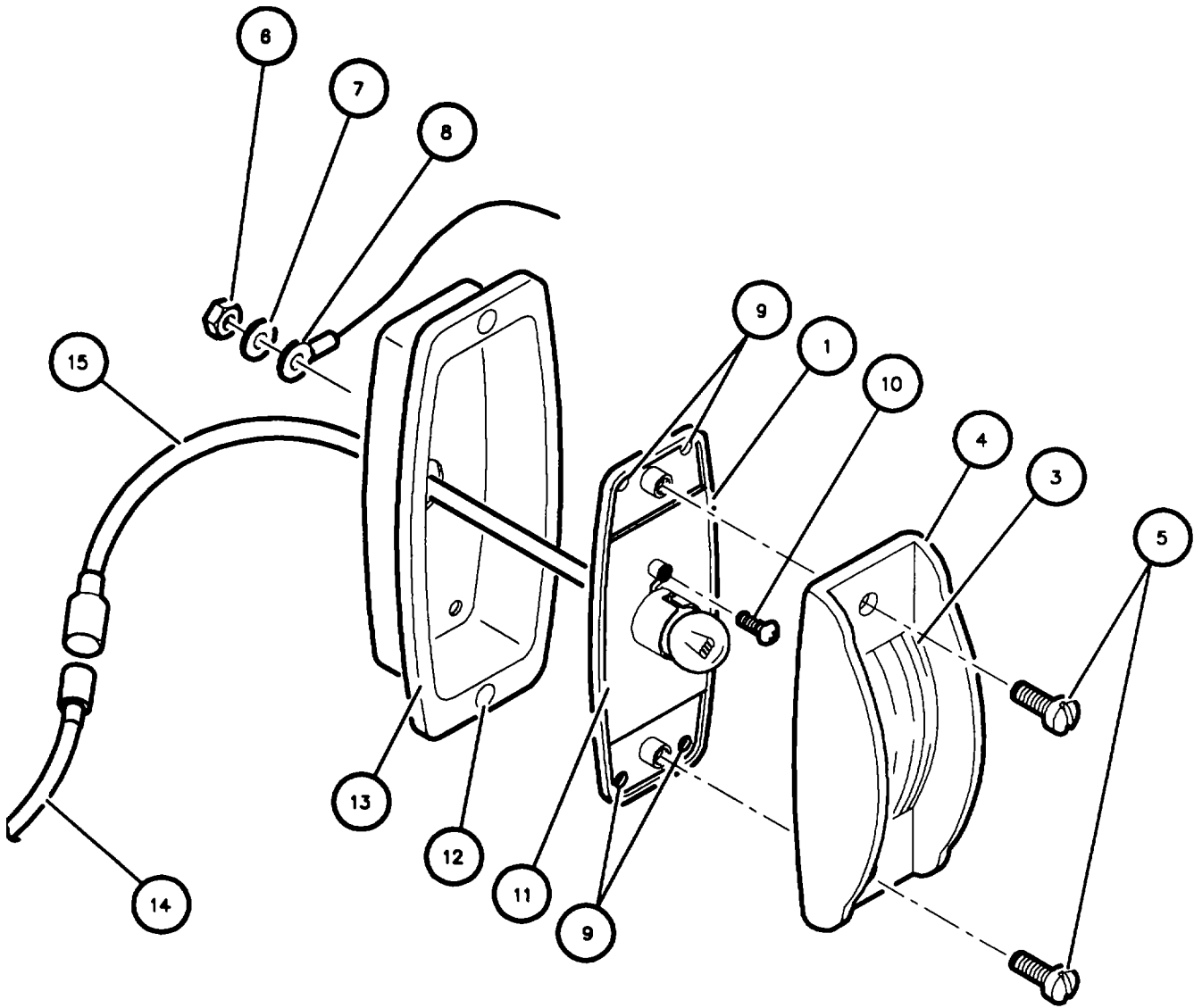
1. Install light assembly (1) and gasket (11) into housing (13).
2. Install four new rivets (9) securing light assembly (1) to housing (13).
3. Install capscrew (10), new lockwasher (7), and nut (6) securing ground wire (8) to light housing (13).
4. Connect lead (15) to wiring harness (14).
5. Install housing (13) into cargo body and install two new rivets (12) securing housing (13) to cargo body
6. Position lens (3) and door (4) on light assembly (1).
7. Install two screws (5) securing lens (3) and door (4) to light assembly (1).

---

**FOLLOW-ON TASKS:**

- Connect intervehicular cable to towing vehicle (para 2-10).
- Check operation of light (TM 9-2320-280-10).

4-17. FRONT AND SIDE MARKER LIGHTS MAINTNANCE (Con't)



12572056

**4-18. REAR MARKER LIGHTS MAINTENANCE.**


---

**This task covers:**    **a. Lens and Lamp Replacement**                      **c. Lamp Assembly Installation**  
                                  **b. Lamp Assembly Removal**

---

**Initial Setup:****Equipment Conditions:    Materials/Parts:**

- Intervehicular cable disconnected from towing vehicle (para 2-12)
- Marker Tags (Item 13, Appendix E)
- Four Rivets

**Tools/Test Equipment:**

- General mechanics tool kit
- 

**a. LENS AND LAMP REPLACEMENT**

1. Remove two screws (2) securing door (3) and lens (4) to light body (6). Remove door (3) and lens (4).
2. Remove lamp (5) from socket (7) by pushing in and turning counterclockwise
3. Install lamp (5) m socket (7) by pushing in and turning clockwise.
4. Install lens (4) and door (3) to light body (6) and secure with two screws (2).

**b. LAMP ASSEMBLY REMOVAL****NOTE**

Tag wires for installation if marker bands are missing or illegible.

1. Remove two screws (2) securing lens (4) and door (3) to light body (6) Remove lens (4) and door (3).
2. Remove four rivets (1) securing light body (6) to cargo body bracket (8)
3. Cut wire ties (10) and disconnect rear marker light connector (9) from main wiring harness (11)
4. Remove rear marker light body (6) from cargo body bracket (8)

**c. LAMP ASSEMBLY INSTALLATION****NOTE**

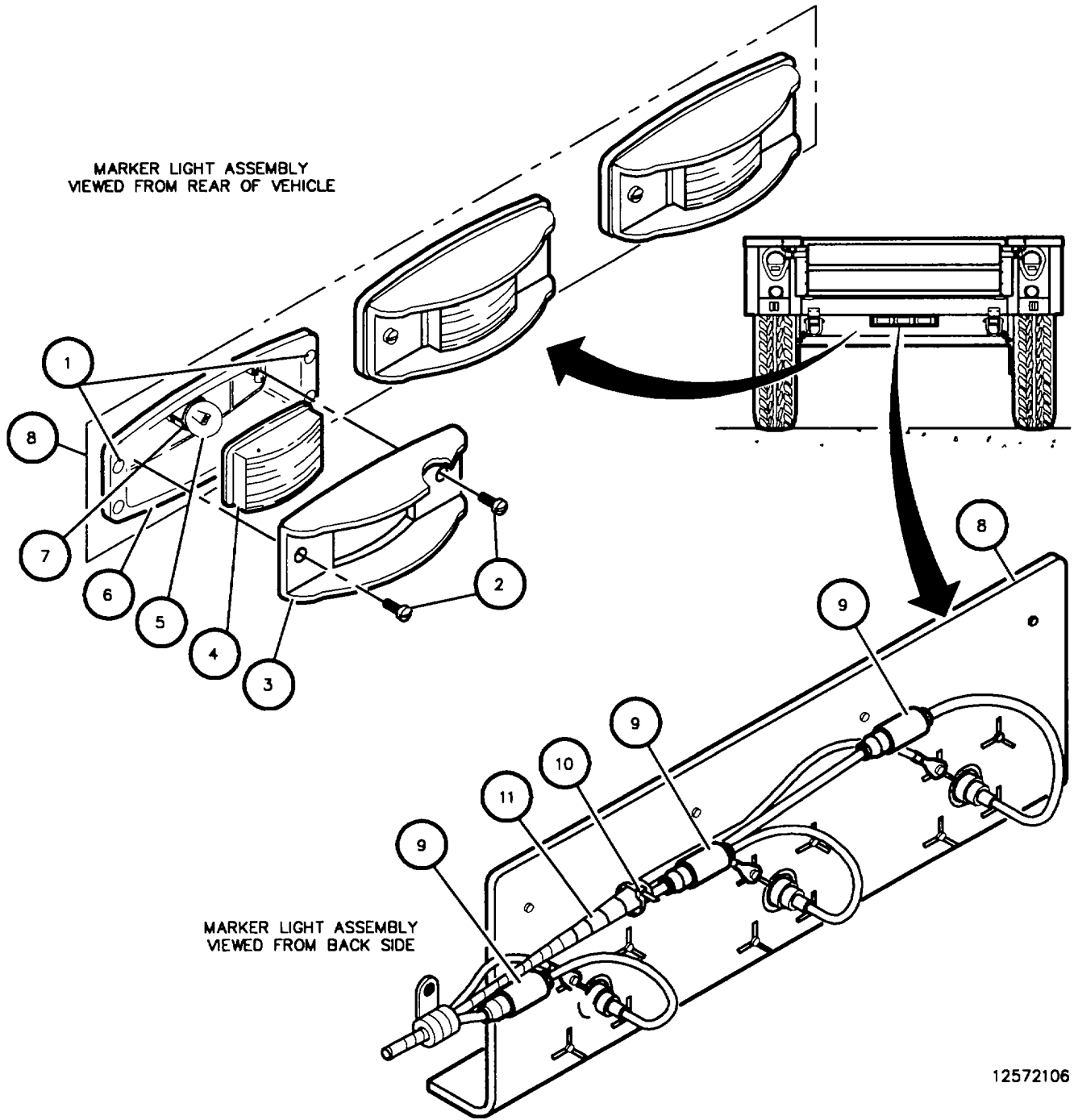
Ensure ground wire is installed to one of the attaching hardware

1. Install four rivets (1) securing marker light body (6) to cargo body bracket (8).
2. Connect connector (9) to main wiring harness (11) and install wire ties (10)
3. Install two screws (2) securing lens (4) and door (3) to high body (6)

**FOLLOW-ON TASKS:**

- Connect intervehicular cable to towing vehicle (para 2-10)
- Check operation of light (TM 9-2320-280-10)

4-18. REAR MARKER LIGHTS MAINTENANCE (Cont')



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**4-19. INTERVEHICULAR CABLE REPLACEMENT.**

---

**This task covers:**      **a. Removal**                                      **b. Installation**

---

**Initial Setup:****Equipment Conditions:**

- Intervehicular cable disconnected from towing vehicle (para 2-12).

**Materials/Parts:**

- One Rivet
- One Clamp

**Tools/Test Equipment:**

- General mechanics tool kit
- 

**a. REMOVAL****NOTE**

Tag wires for installation if marker bands are missing or illegible.

1. Remove rivet (2) securing cable clamp (3) to trailer frame. Discard rivet.
2. Remove cable clamp (3) securing intervehicular cable (1) to trailer frame. Discard clamp.
3. Tag and disconnect intervehicular cable (1) from wiring harness cable (4) junction and remove intervehicular cable (1) from trailer frame.

**b. INSTALLATION**

1. Connect intervehicular cable (1) to wiring harness cable (4) junction and install intervehicular cable (1) in trailer frame.
2. Install new rivet (2) and new cable clamp (3) securing intervehicular cable (1) to trailer frame.

**NOTE**

Ensure proper alignment of intervehicular cable to avoid damage to intervehicular cable as it passes through the trailer frame.

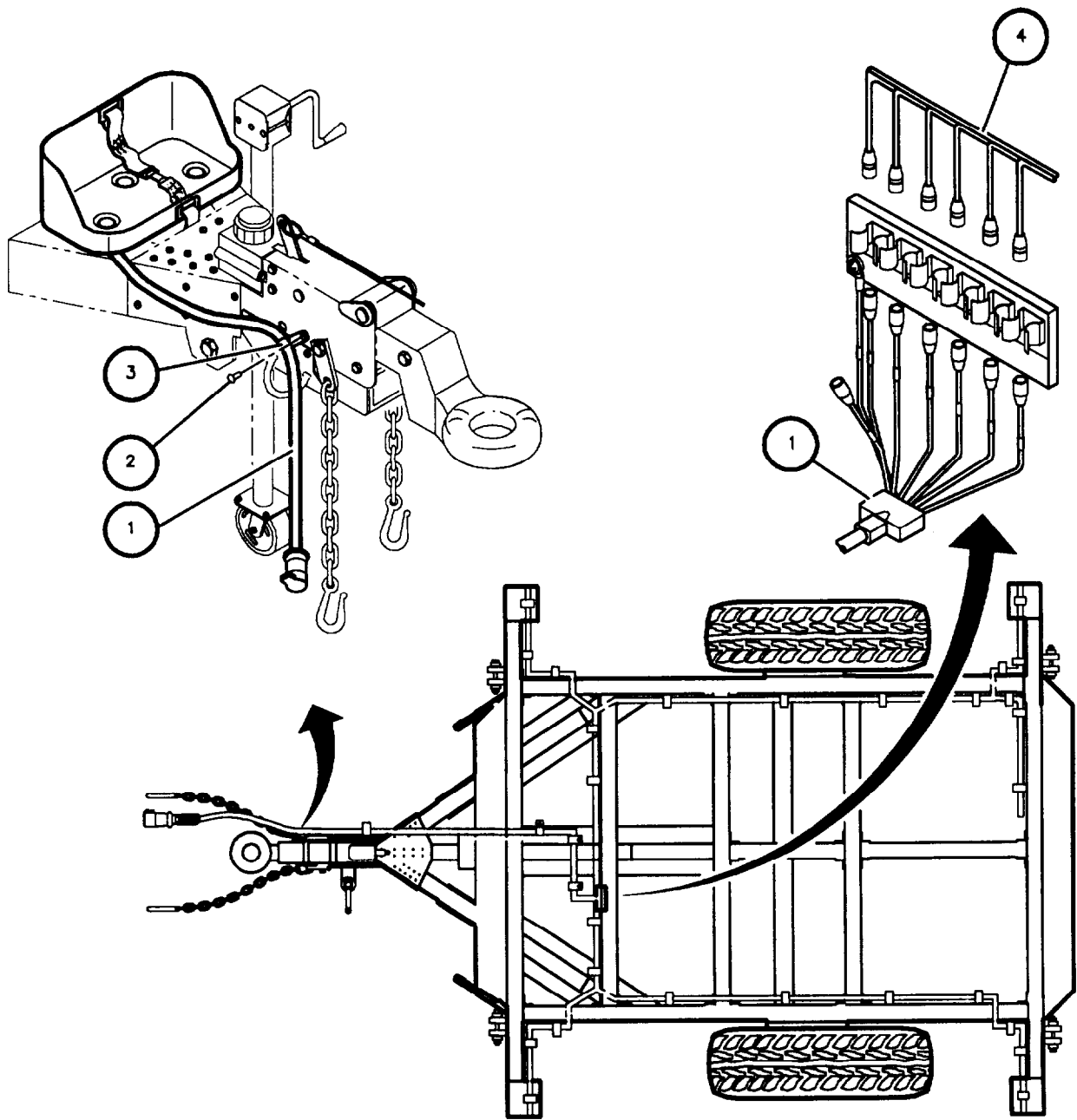
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**FOLLOW-ON TASKS:**

- Connect intervehicular cable to towing vehicle (para 2-10).
- Check operation of lights (TM 9-2320-280-10).



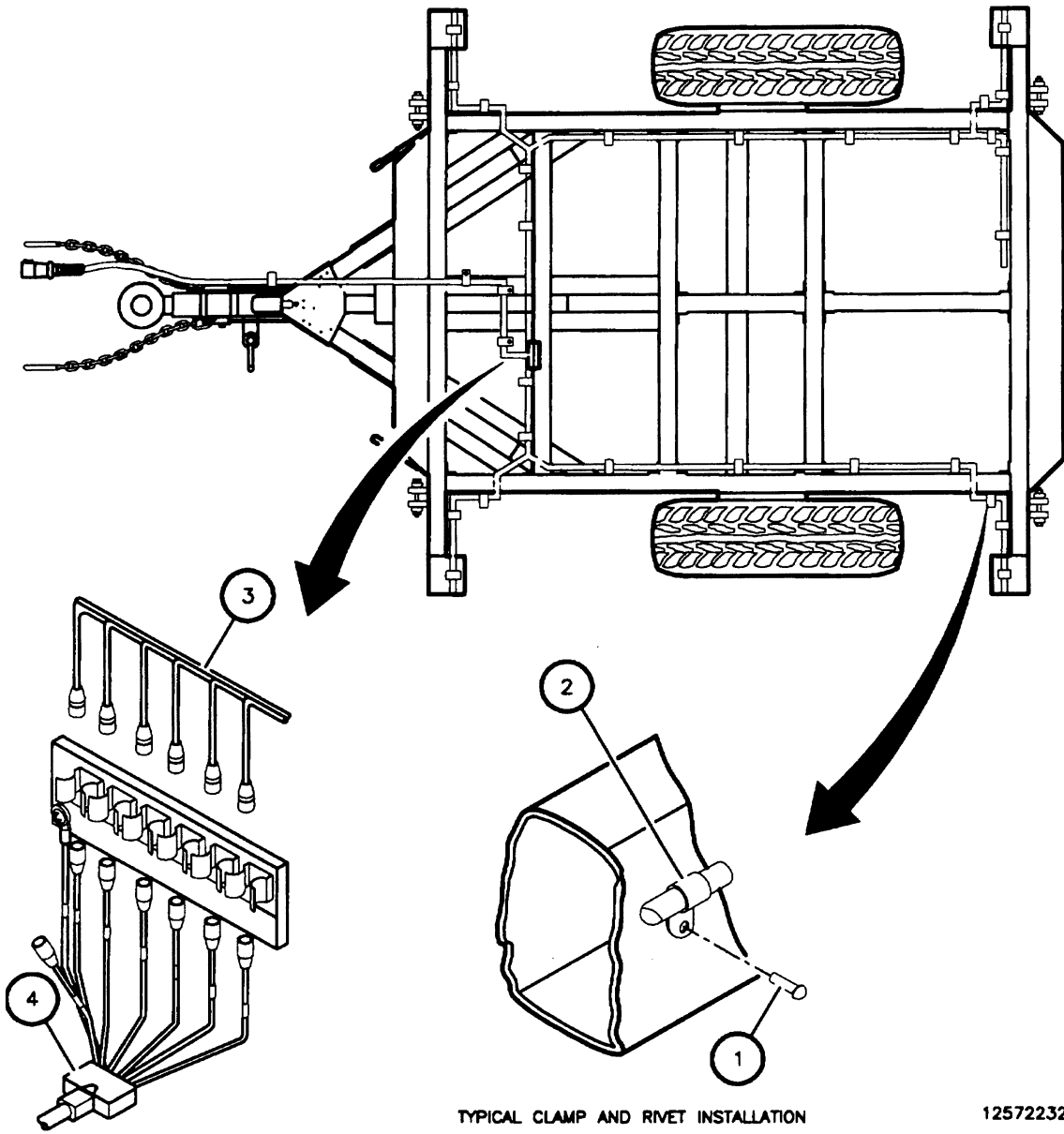
4-19 INTERVEHICULAR CABLE REPLACEMENT (Con't).



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4-19.1. BRANCHED WIRING HARNESS REPLACEMENT (Con't)



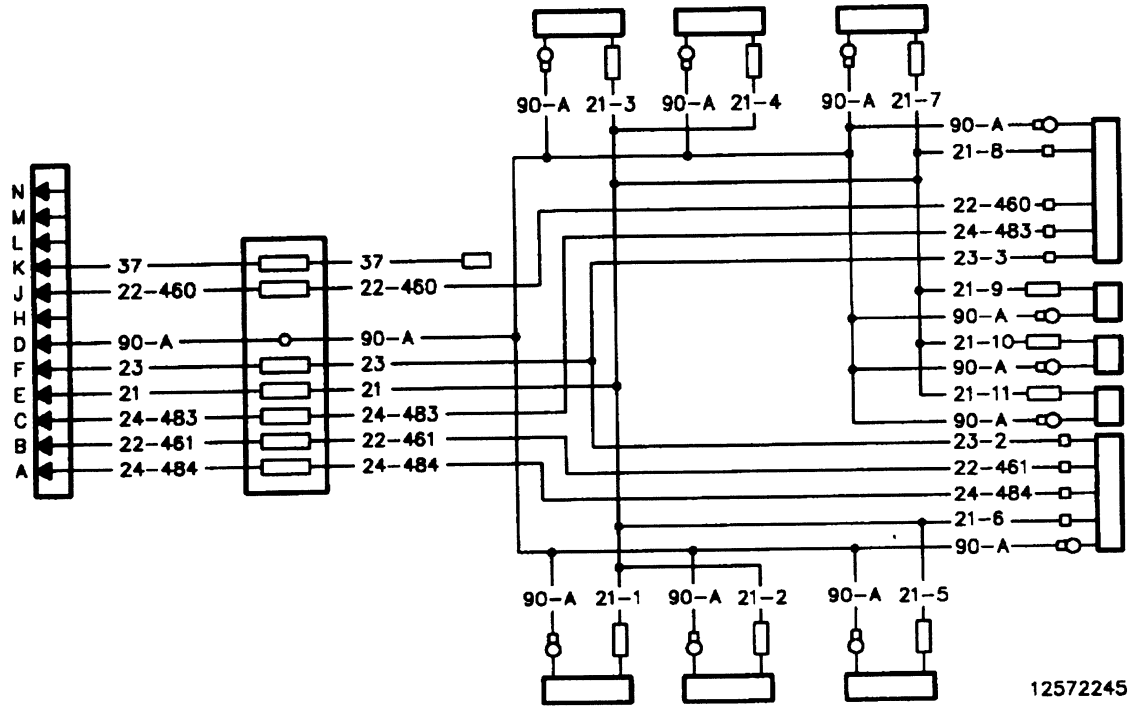
TYPICAL CLAMP AND RIVET INSTALLATION

12572232

4-19.2 WIRING DIAGRAM.

NOTE

- This paragraph contains the wiring diagram for the M1101 and M1102 trailers. Refer to this diagram when performing troubleshooting or maintenance on the trailer electrical system.
- Wiring lead (37) is not used in this application.



12572245

Trailer Lighting Configuration

Curbside Circuits		Roadside Circuits	
22-460	Service Stoplight and Turn Signal	22-461	Service Stoplight and Turn Signal
2A-483	Blackout Taillight and Turn Signal	24-484	Blackout Taillight and Turn Signal
23	Blacklight Stoplight	23	Blackout Stoplight
21	Service Taillight, Front, Side, and Rear Marker Lights	21	Service Taillight, Front and Side Marker Lights

**4-19.3 BRANCHED WIRING HARNESS REPAIR.**

---

**This task covers:**

- a. Typical Panel Mounting Receptacle Replacement
- b. Typical Plug Replacement
- c. Terminal-Type Cable Connector Replacement
- d. Male Cable Connector Replacement
- e. Female Cable Connector (With Washer) Replacement
- f. Female Cable Connector (With Sleeve) Replacement

---

**Initial Setup:****Equipment Conditions:**

- Parked on a level surface.
- Wheels chocked (para 2-8.1).
- Handbrakes applied.

**Materials/Parts:**

- None

**Tools/Test Equipment:**

- General mechanic's tool kit
  - Common No. 1 shop set
- 

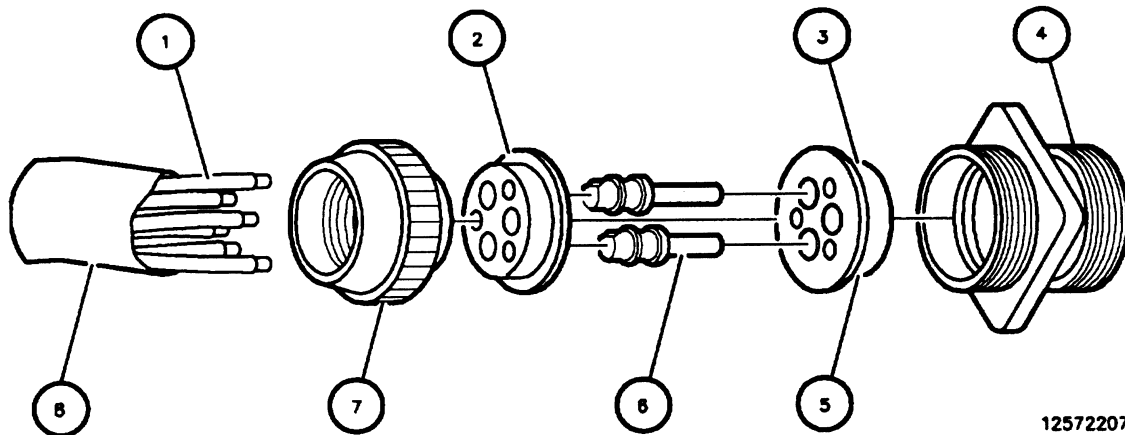
**NOTE**

This paragraph contains typical repair instructions for wiring harnesses and cables (leads). Repair of wiring harness and cables consists of replacement of defective connectors, shells, and terminals, or taping cut or worn insulation and exposed wire conductors. Exploded views are provided of typical harness and cable connectors used on the trailer and give procedures for disassembly and assembly of connectors. When soldering is required, procedures in TB SIG 222 must be followed. If multiple pin connectors are disassembled, tag or label all wires and cable to ensure that correct connections are made at time of assembly.

4-19.3 BRANCHED WIRING HARNESS REPAIR (Con't).

a. TYPICAL PANEL MOUNTING RECEPTACLE REPLACEMENT

1. Remove nut (7) from shell assembly (4) and slide back on cable (8).
2. Push grommet (2) back on cable leads (1).
3. Push contacts (6) out through rear of insert (5) with pin extractor.
4. Push insert (5) out through rear of shell (4).
5. Unsolder cable leads (1) from contacts (6).
6. Remove grommet (2) from cable leads (1).
7. Strip cable insulation from leads (1) equal to depth of solder wells of contacts (6).
8. Slide grommet (2) over cable leads (1).
9. Insert cable leads (1) into solder wells of contacts (6) and solder.
10. Push insert (5) into shell (4) from rear until seated. Groove (3) in insert (5) must be aligned with guide in shell (4) to ensure proper fit.
11. Push contacts (6) into insert (5) from rear until seated.
12. Push grommet (2) down cable leads (1) and over solder wells of contacts (6).
13. Install nut (7) on shell assembly (4).

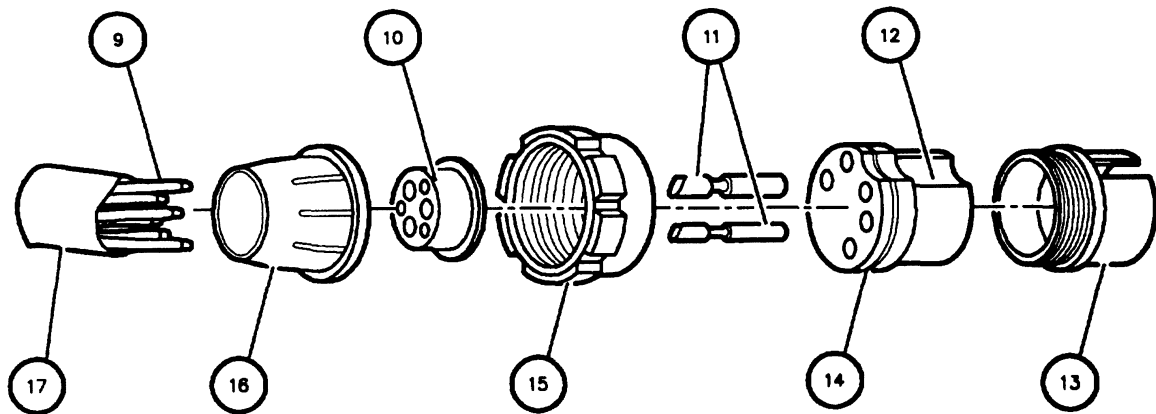


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### 4-19.3 BRANCHED WIRING HARNESS REPAIR (Con't).

#### b. TYPICAL PLUG REPLACEMENT

1. Remove nut (16) from shell assembly (13) and slide back on cable (17).
2. Push grommet (10) back on cable leads (9).
3. Slide coupling nut (15) off shell assembly (13).
4. Push contacts (11) out through rear of insert (14) with pin extractor.
5. Push insert (14) out through rear of shell (13).
6. Unsolder cable leads (9) from contacts (11).
7. Remove coupling nut (15) and grommet (10) from cable (17).
8. Strip cable insulation from leads (9) equal to depth of solder wells of contacts (11).
9. Slip grommet (10) over cable leads (9).
10. Insert cable leads (9) into solder wells of contacts (11) and solder.
11. Slide coupling nut (15) over contacts (11) at cable leads (9).
12. Push insert (14) into shell (13) from rear until seated. Groove (12) in insert (14) must be aligned with guide in shell (13) to ensure proper fit.
13. Push contacts (11) into insert (14) from rear until seated.
14. Slide coupling nut (15) onto shell assembly (13).
15. Push grommet (10) down cable leads (9) and over solder wells of contacts (11).
16. Install nut (16) on shell assembly (13).

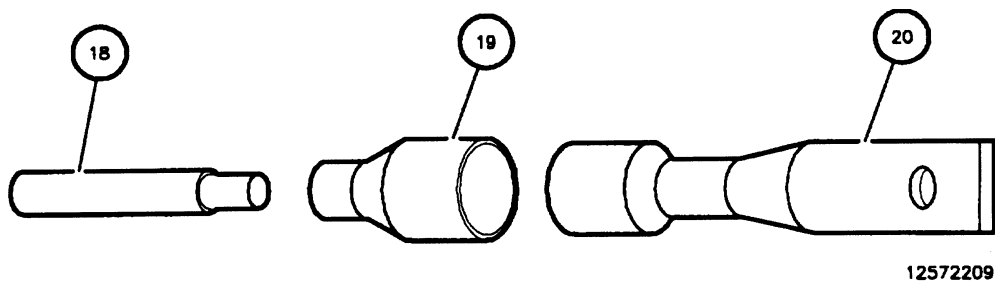


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4-19.3 BRANCHED WIRING HARNESS REPAIR (Con't).

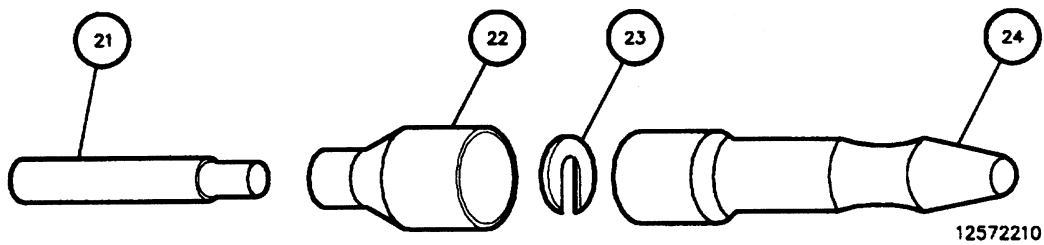
c. TERMINAL-TYPE CABLE CONNECTOR REPLACEMENT

1. Strip insulation from cable (18) equal to depth of terminal (20) well.
2. Slide insulator (19) over cable (18).
3. Insert cable (18) into terminal (20) well and crimp.
4. Slide insulator (19) over crimped end of terminal (20).



d. MALE CABLE CONNECTOR REPLACEMENT

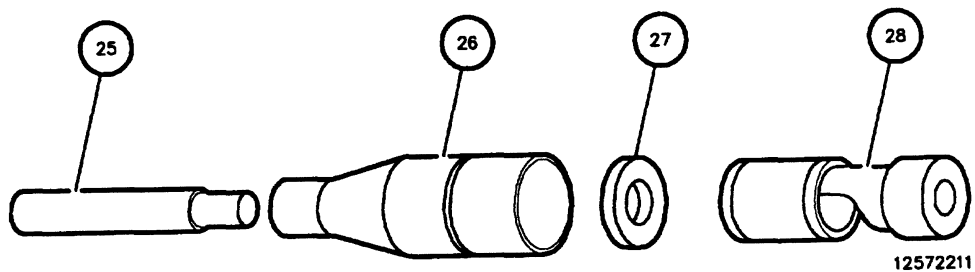
1. Strip insulation from cables (21) equal to depth of ferrule (24) well.
2. Slide shell (22) over cable (21) and remove C-washer (23).
3. Insert cable (21) into ferrule (24) well and crimp.
4. Place C-washer (23) over cable (21) at crimped junction and slide shell (22) over C-washer (23) and ferrule (24).



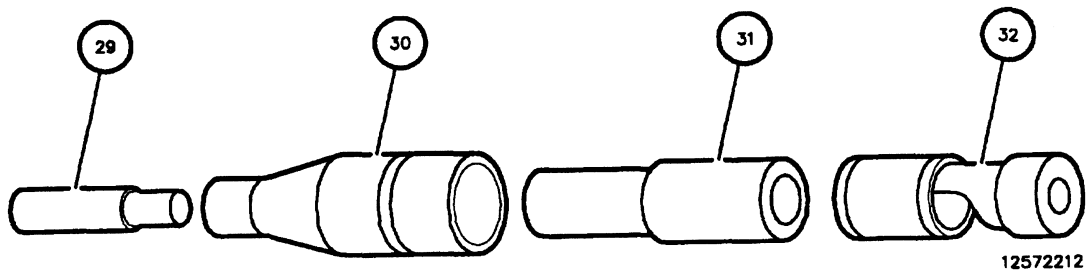


**4-19.3 BRANCHED WIRING HARNESS REPAIR (Con't).****e. FEMALE CABLE CONNECTOR (WITH WASHER) REPLACEMENT**

1. Strip insulation from cable (25) approximately 1/8 in. (3 mm).
2. Slide shell (26) and washer (27) over cable (25).
3. Place cable (25) into cylindrical end of terminal (28) and crimp.
4. Slide shell (26) and washer (27) over terminal (28).

**f. FEMALE CABLE CONNECTOR (WITH SLEEVE) REPLACEMENT**

1. Strip insulation from cable (29) approximately 1/8 in. (3 mm).
2. Slide shell (30) and sleeve (31) over cable (29).
3. Place cable (29) into cylindrical end of terminal (32) and crimp.
4. Slide shell (30) and sleeve (31) over terminal (32).



## Section VII. BRAKE SYSTEM MAINTENANCE

### 4-20 HANDBRAKE LEVER REPLACEMENT.

---

**This task covers:**      **a. Removal**                      **b. Cleaning and Inspection**                      **c. Installation**

---

#### Initial Setup:

#### Equipment Conditions:

- Handbrake released.
- Wheels chocked (para 2-8.1).

#### Tools/Test Equipment:

- General mechanics tool kit

#### Materials/Parts:

- Dry Cleaning Solvent (Item 5, Appendix E)
- Cotter Pin
- Two Locknuts

**WARNING**

When performing maintenance on brake system, ensure that wheels are securely chocked. Failure to follow this warning may cause trailer to roll, resulting in serious injury or death to personnel or damage to equipment.

#### a. REMOVAL

1. Chock wheel on side of trailer opposite side on which lever is being replaced.
2. Turn adjustment knob (9) on handbrake lever (8) to be removed to provide slack in cable.
3. Remove cotter pin (3) from clevis pin (6) and remove clevis pin (6) from handbrake lever assembly (7). Discard cotter pin.
4. Remove handbrake cable (4) and handbrake cable sheath (5) from handbrake assembly (7).
5. Remove two locknuts (2), four washers (1) and two capscrews (10) securing handbrake assembly (7) to frame. Discard locknuts.
6. Disconnect handbrake lever (8) from cable end (4).

#### b. CLEANING AND INSPECTION

**WARNING**

Dry cleaning solvent, P-D-680, is toxic and flammable. Always wear protective goggles and gloves and use solvent only in a well-ventilated area. Avoid contact with skin, eyes, and clothes, and DO NOT breathe vapors. DO NOT use near open flame or excessive heat. The solvent's flash point is 100°F to 138°F (38°C to 59°C). If you become dizzy while using cleaning solvent, immediately get fresh air and medical help. If solvent contacts eyes, immediately wash your eyes and get medical aid.

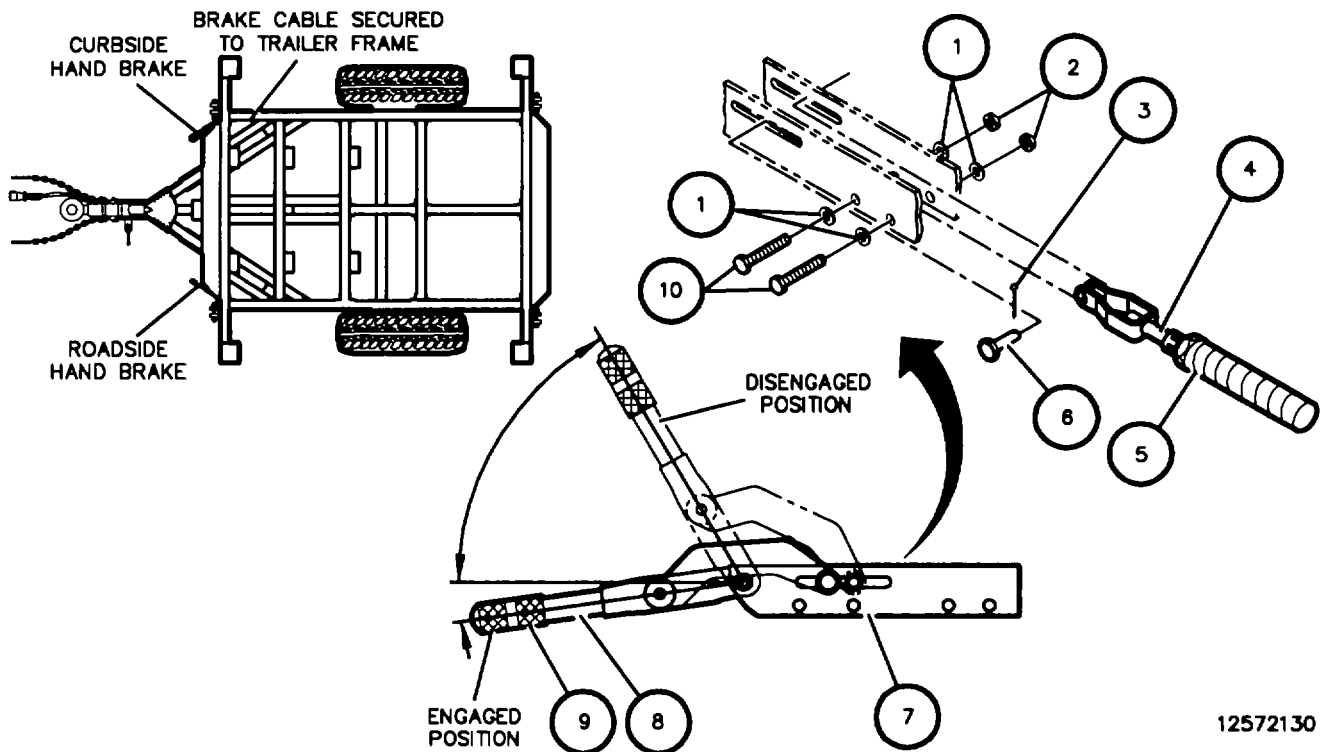
1. Clean all removed components with dry cleaning solvent (Item 5, Appendix E) and allow to dry.
2. Inspect handbrake cable end (4) for excessive wear or damage. Replace if defective (para 4-21).

**4-20. HANDBRAKE LEVER REPLACEMENT (Con't).**

3. Inspect clevis pin (6) for excessive wear or damage. Replace if defective.
4. Inspect cable assembly for frays, cracks, distortion, or seized cable in sheath. Replace cable assembly if damaged.
5. Inspect all threaded surfaces for damage. Replace any component with damaged threads.

**c. INSTALLATION**

1. Connect handbrake lever (8) to cable end (4).
2. Install two capscrews (10), four washers (1) and two new locknuts (2) securing handbrake assembly (7) to frame.
3. Install clevis pin (6) in handbrake assembly (7), securing handbrake cable (4) and handbrake cable sheath (5) to handbrake assembly (7).
4. Install new cotter pin (3) in clevis pin (6).
5. Turn adjustment knob (9) until handbrake lever (8) has one-third slack travel from the disengaged position to the engaged position.



**FOLLOW-ON TASKS:**

- Lubricate handbrake lever and linkage (Appendix G).
- Adjust handbrake (para 2-14).

4-21 HANDBRAKE CABLE AND SHEATH REPLACEMENT.

---

This task covers: **a. Removal**

**b. Installation**

---

**Initial Setup:**

**Equipment Conditions:**

- Wheel removed (para 4-32).
- Hub/drum removed (para 4-33).

**Materials/Parts:**

- Cotter Pin
- Rivet

**Tools/Test Equipment:**

- General mechanics tool kit
  - Common No 1 shop set
- 

**WARNING**

When performing maintenance on brake system, ensure that wheels are securely chocked. Failure to follow this warning may cause trailer to roll, resulting in serious injury or death to personnel or damage to equipment.

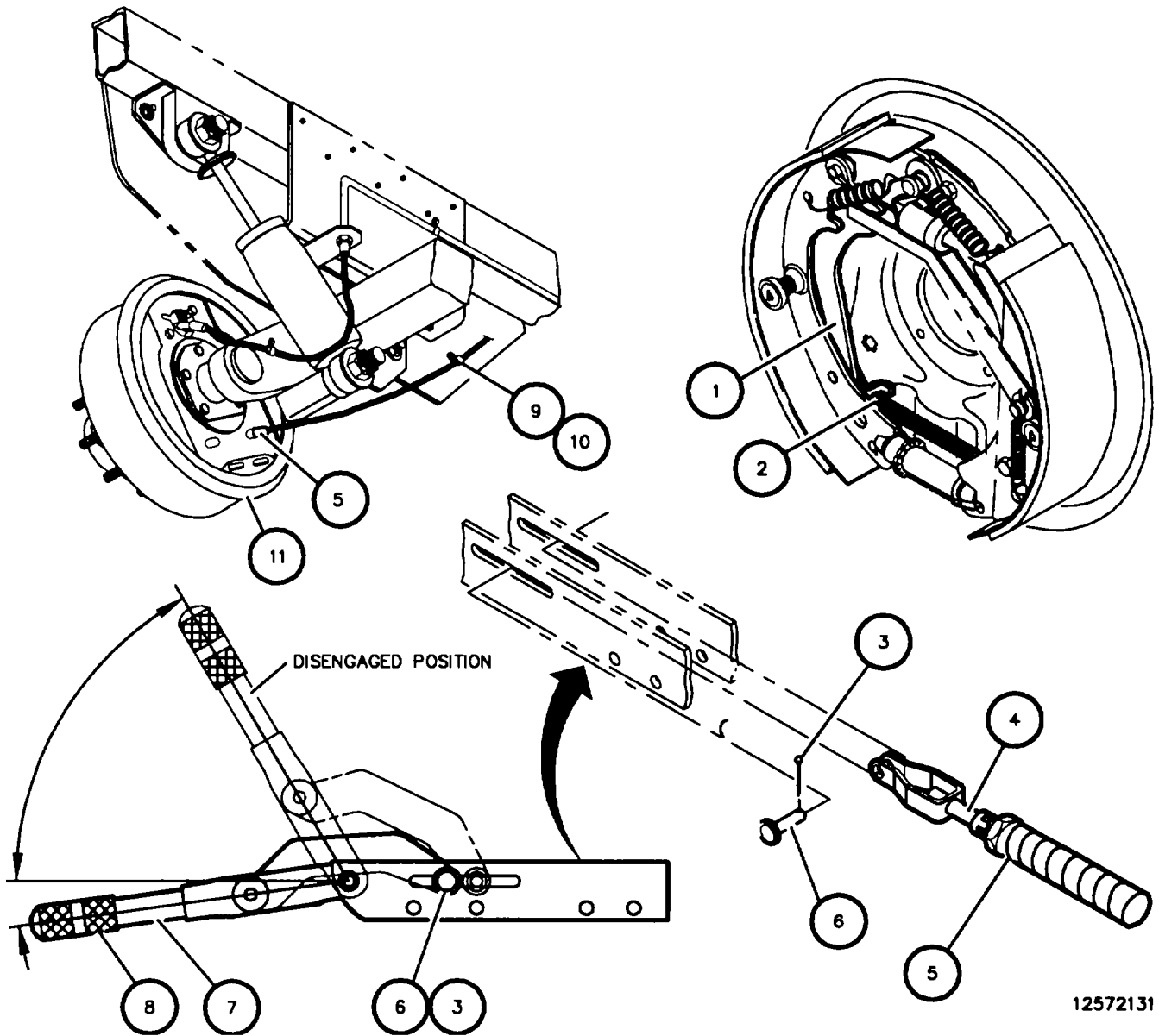
**a. REMOVAL**

1. Chock wheel on side of trailer opposite side on which brake cable is being replaced.
2. Turn adjustment knob (8) on handbrake lever (7) to loosen handbrake cable (4).
3. Remove cotter pin (3) and clevis pin (6) securing handbrake cable end (4) to handbrake lever (7). Discard cotter pin (3). Check clevis pin (6) for damage. Replace if defective.
4. Remove handbrake cable end (4) from handbrake lever (7).
5. Disconnect handbrake cable end (2) from parking brake link (1).
6. Disconnect handbrake cable sheath (5) from backing plate (11).
7. Remove rivet (10) and clamp (9) securing handbrake cable sheath (5) to frame. Remove clamp (9) from cable sheath (5). Discard rivet (10).
8. Remove handbrake cable end (4) and handbrake cable sheath (5) from frame.

**b. INSTALLATION**

1. Connect handbrake cable end (2) to parking brake link (1).
2. Install rivet (10) and clamp (9) securing handbrake cable sheath (5) to frame.
3. Install handbrake cable end (4) and handbrake cable sheath (5) to frame.
4. Connect handbrake cable sheath (5) to wheel backing plate (11).
5. Connect handbrake cable end (4) to handbrake lever (7) with clevis pin (6) and install cotter pin (3).

4-21. HANDBRAKE CABLE AND SHEATH REPLACEMENT (Con't)



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**FOLLOW-ON TASKS:**

- Install hub/drum (para 4-33).
- Install wheel and tire assembly (para 4-32).
- Lubricate handbrake lever and linkage (Appendix G).
- Adjust handbrake (para 2-14).

**4-22. SERVICE BRAKE INSPECTION.**


---

**This task covers:                    Inspection**


---

**Initial Setup:****Equipment Conditions:**

- Wheels removed (para 4-32).
- Hub/drum removed (para 4-33).

**Materials/Parts:**

- Cotter Pin
- Sealant (Item 12, Appendix E)

**Tools/Test Equipment:**

- General mechanics tool kit
- 

**INSPECTION****WARNING**

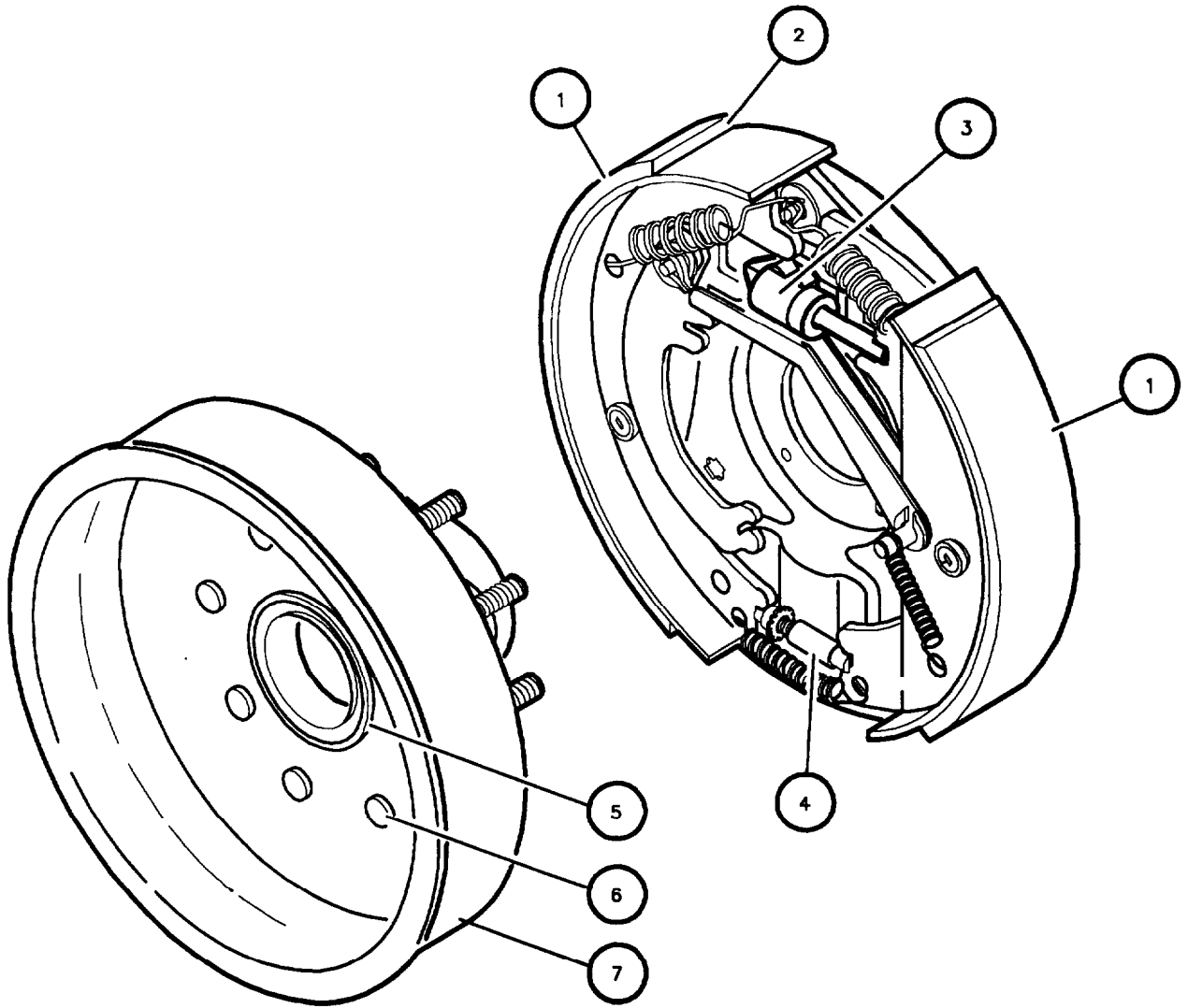
DO NOT handle brakeshoes, brakedrums, or other brake components unless area has been properly cleaned. There may be asbestos dust on these components which can be dangerous if you touch it or breathe it. Wear an approved filter mask and gloves. NEVER use compressed air or a dry brush to clean brake components. Dust may be removed using an industrial-type vacuum cleaner. Clean dust or mud away from brake components with water and a wet, soft brush or cloth. Failure to follow this warning may result in serious illness or death to personnel.

- 1 Disengage handbrake on side being worked on.
  2. Inspect hydraulic wheel cylinder (3) for leakage and corrosion. Replace if defective (para 4-25)
  3. Inspect brakeshoe linings (1) for cracks or signs of grease or brake fluid. Replace if defective (para 4-24).
  4. Measure brakeshoe lining thickness (2). Thickness must be 1/8 in. (3 mm) minimum Replace if defective (para 4-24).
  5. Inspect brake adjuster (4) for corrosion and for freedom of movement. Replace if defective (para 4-24).
  6. Inspect grease seal (5) for signs of leakage. Replace if defective (para 4-33).
  7. Inspect brakedrum (7) interior for signs of scoring. Replace if defective (para 4-33).
  8. Inspect eight studs (6) for damage Replace if defective (para 4-33).
- 

**FOLLOW-ON TASKS:**

- Install hub/drums (para 4-33).
- Install wheel and tire assemblies (para 4-32)

4-22 SERVICE BRAKE INSPECTION (Con't).



ROTATED 180°

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4-23 SERVICE BRAKE ADJUSTMENT.

---

**This task covers:**      **Adjustment**

---

**Initial Setup:**

**Equipment Conditions:**

- Parked on level ground.

**Materials/Parts:**

- None

**Tools/Test Equipment:**

- General mechanics tool kit
  - Common No. 1 shop set
  
  - Jack stands
- 

**ADJUSTMENT**

**WARNING**

When performing maintenance on brake system, ensure that wheels are securely chocked. Failure to follow this warning may cause trailer to roll, resulting in serious injury or death to personnel or damage to equipment.

1. Apply handbrakes. Chock wheel and tire assembly opposite side being adjusted (para 2-8.1).

**WARNING**

Ensure jack is positioned directly under the torsion arm, next to the wheel being worked on. DO NOT place jack at any other location such as frame rails. Failure to follow this warning may result in serious injury or death to personnel or damage to equipment.

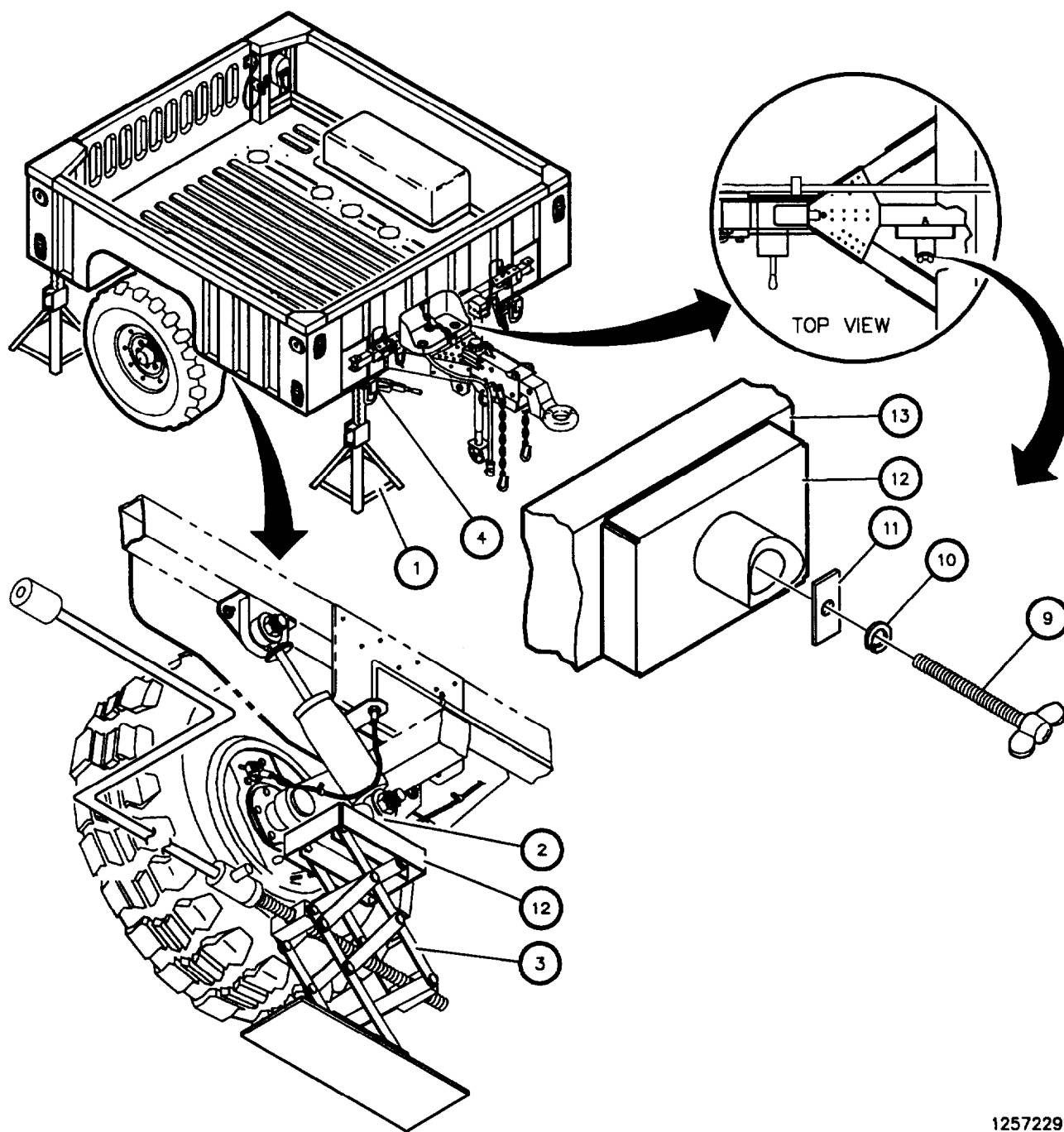
2. Remove wingscrew (9), lockwasher (10), rectangular washer (11), and jack spacer (12) from trailer frame (13).
3. Position jack spacer (12) and jack (3) under lower shock absorber mount (2).
4. Using jack (3) under torsion arm (2), raise wheel off ground.
5. Install jack stands (1) under sling frame (4) on both front and rear of side being worked on and lower trailer onto jack stands (1).
6. Release handbrake on side being adjusted.

**NOTE**

Both service brakes are adjusted in the same manner.



4-23 SERVICE BRAKE ADJUSTMENT (Con't).



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**4-23 SERVICE BRAKE ADJUSTMENT (Con't).**

7. Remove protective plug (6) in backing plate (5) adjusting slot (7).
8. Rotate star wheel (8) upward, 20 to 25 clicks, to tighten brakes.

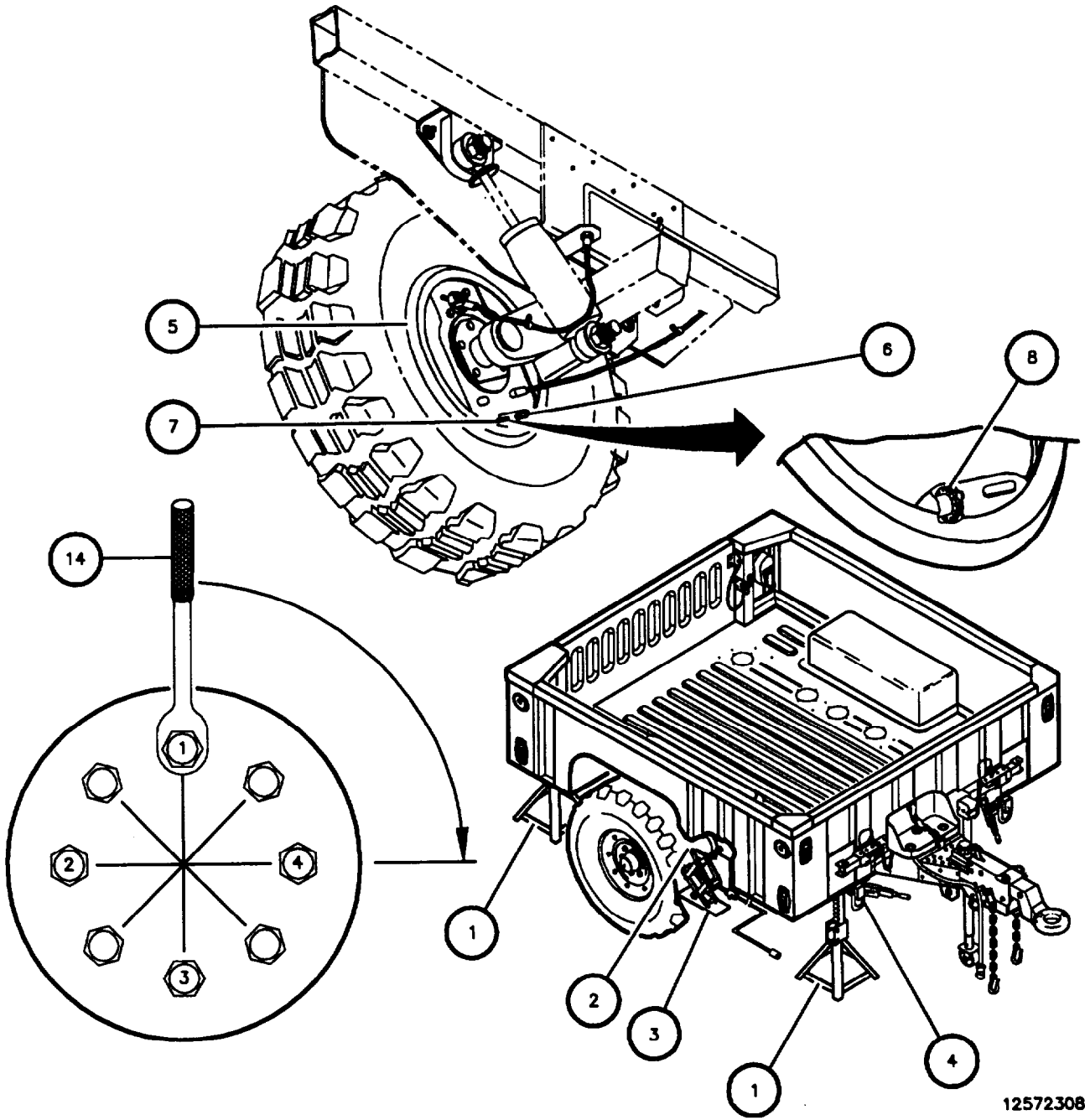
**NOTE**

- The brake adjustment is performed by rotating the wheel using a torque wrench and measuring the force required to turn the wheel. While checking the adjustment, the wheel must be turned in the forward direction to ensure correct adjustment. To rotate the wheel in the forward direction, place your hand on the side of the wheel towards the taillight and roll the wheel with your hand going over the top towards the tongue.
  - The torque wrench must be properly aligned on the wheel to ensure accurate measurement of force. Proper placement for the torque wrench is with the handle pointing away from the center of the wheel and in a straight line with the center of the grease cap.
  - If the wheel rotates in the reverse or backwards direction, the brake shoes must be aligned by starting the procedure again at step 9.
9. Rotate the wheel three or four revolutions in the forward direction and stop the wheel where two opposing lug nuts are directly above and below the center of the grease cap.
  10. Set torque wrench (14) to  $170 \pm 17$  in-lb ( $19 \pm 1.9$  N·m) and place on the top lug nut and turn the wheel 90 degrees, 1/4 rotation, in the forward direction checking whether the torque wrench (14) exceeded the setting.
  11. Move the torque wrench (14) back to the top, checking every other lug nut, and repeat step 10. Continue checking torque until four lug nuts have been checked, one full rotation of the wheel.
  12. Reset the torque wrench (14) to  $220 \pm 22$  in-lb ( $24 \pm 2.4$  N·m) and repeat steps 10 and 11. If the torque measurement at two or more lugs is less than 170 in-lb, tighten the brakes and repeat steps 10 through 12. If the torque measurement at two or more lugs is greater than 220 in-lb, loosen the brakes and repeat steps 10 through 12.
  13. The torque measurements at the four lugs must meet one of the following:

<u>Condition</u>	<u>Number of lugs less than 170 in-lb</u>	<u>Number of lugs greater than 170 in-lb and less than 220 in-lb</u>	<u>Number of lugs greater than 220 in-lb</u>
1	1	3	0
2	0	3	1
3	1	2	1

14. Loosen brakes by rotating star wheel (8) in the opposite direction 25 clicks.
15. Install protective plug (6) in backing plate (5) adjusting slot (7).

4-23 SERVICE BRAKE ADJUSTMENT (Con't).



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**4-23 SERVICE BRAKE ADJUSTMENT (Con?).**

16. Using jack (3) and jack spacer (12), raise trailer and remove two jack stands (1).
17. Using jack (3) and jack spacer (12), lower trailer. Apply handbrake on adjusted side,
18. Repeat steps 1 through 15 for other side.
19. Position jack spacer (12) on trailer frame (13) and secure with rectangular washer (11), lockwasher (10), and wingscrew (9).
20. Connect trailer to towing vehicle.
21. Engage service brake breakaway lever.

**WARNING**

Personnel must stand clear of towing vehicle and trailer during the following brake check. Failure to follow this warning may result in injury or death to personnel.

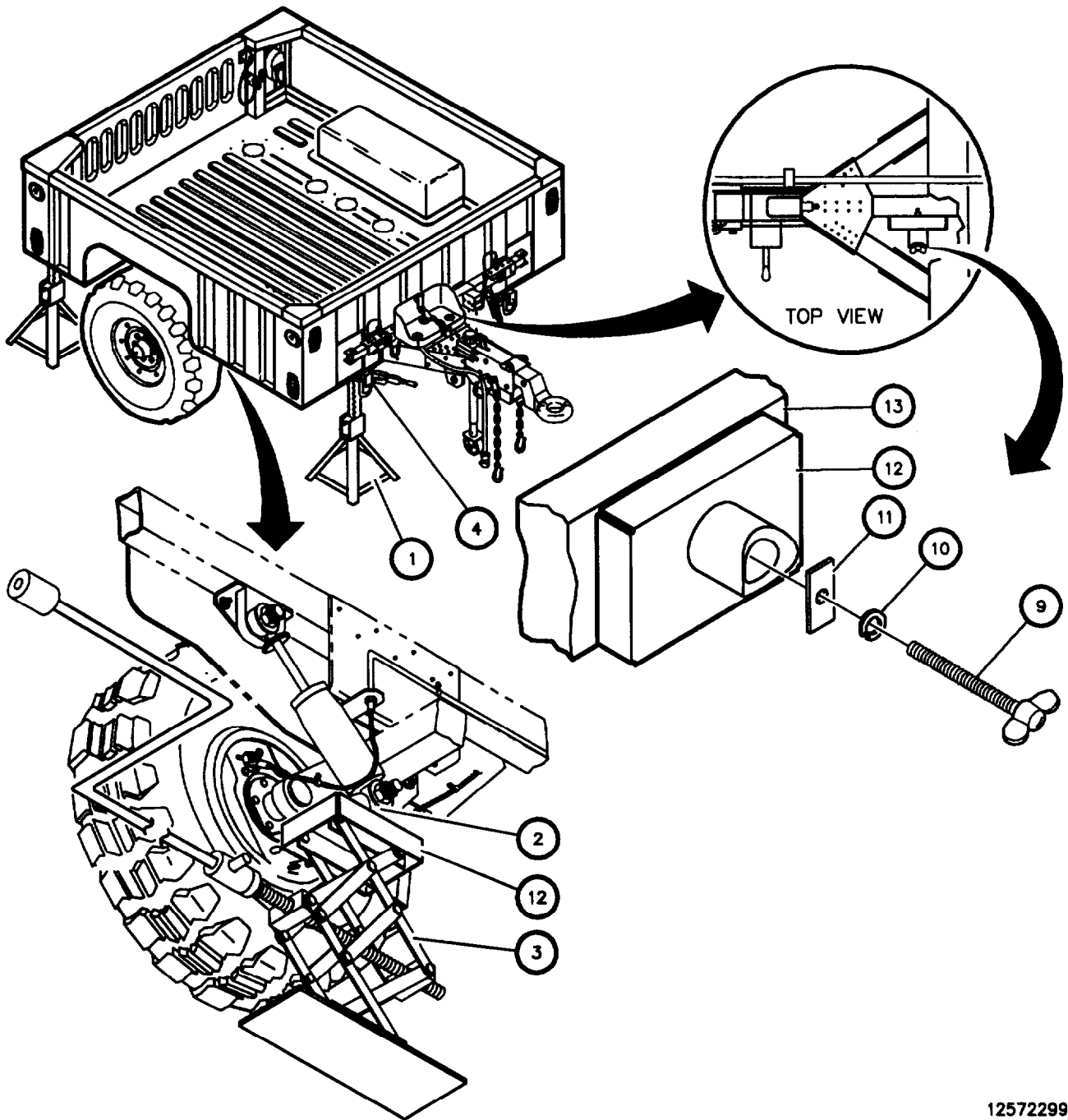
22. Attempt to move the trailer with the towing vehicle. Towing vehicle should be in drive, transfer case in high range, and engine at idle speed. If service brakes do not hold trailer, perform brake system troubleshooting (Table 4-2).
23. Reset service brake breakaway lever to disengaged position.
24. Disconnect trailer from towing vehicle.

---

**FOLLOW-ON TASKS:**

- Adjust handbrakes (para 2-14).

4-23 SERVICE BRAKE ADJUSTMENT (Con't).



4-24 SERVICE BRAKESHOE REPLACEMENT.

This task covers: a. Disassembly b. Cleaning and Inspection c. Assembly

Initial Setup:

Equipment Conditions:

- Wheel removed (para 4-32).
- Hub/drum removed (para 4-33).

Tools/Test Equipment:

- General mechanics tool kit
- Common No. 1 shop set

Materials/Parts:

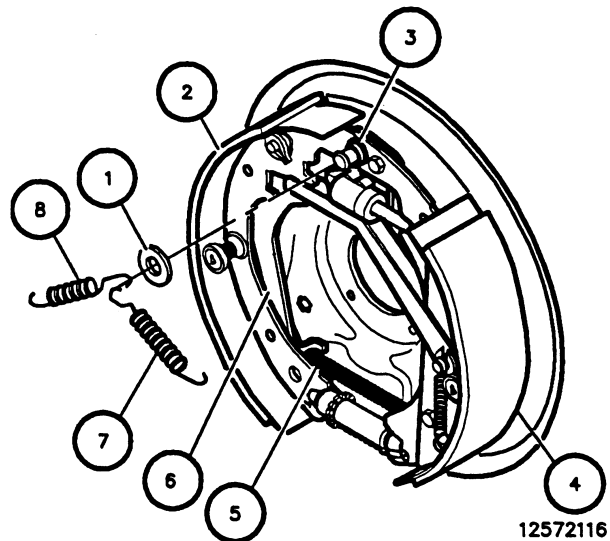
- Rags (Item 10, Appendix E)
- Dry Cleaning Solvent (Item 5, Appendix E)
- Front Brakeshoe
- Rear Brakeshoe
- Locknut

a. DISASSEMBLY



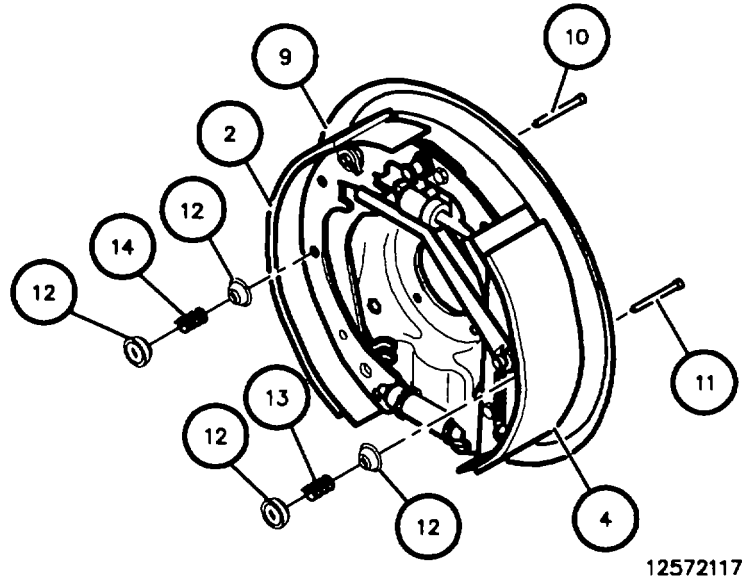
DO NOT handle brakeshoes, brakedrums, or other brake components unless area has been properly cleaned. There may be asbestos dust on these components which can be dangerous if you touch it or breathe it. Wear an approved filter mask and gloves. NEVER use compressed air or a dry brush to clean brake components. Dust may be removed using an industrial-type vacuum cleaner. Clean dust or mud away from brake components with water and a wet, soft brush or cloth. Failure to follow this warning may result in serious illness or death to personnel.

1. Remove front shoe spring (7) from front brake-shoe (4) and anchor pin (3).
2. Remove rear shoe spring (8) from rear brake-shoe (2) and anchor pin (3).
3. Remove washer (1) from anchor pin (3).
4. Remove handbrake cable (5) from parking brake link (6).

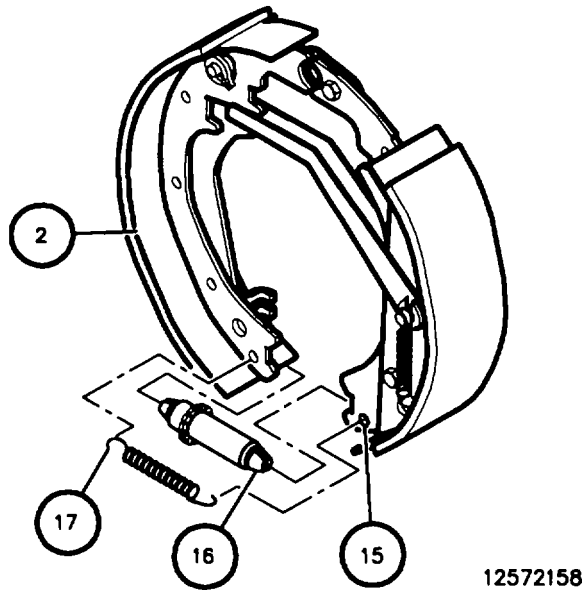


**4-24. SERVICE BRAKESHOE REPLACEMENT (Con't).**

5. Remove two retainers (12), spring (13), and pin (11) securing front brakeshoe (4) to backing plate (9)
6. Remove two retainers (12), spring (14), and pin (10) securing rear brakeshoe (2) to backing plate (9)



7. Remove spring (17) and adjuster (16) from rear brakeshoe (2) and backing shoe lever (15)



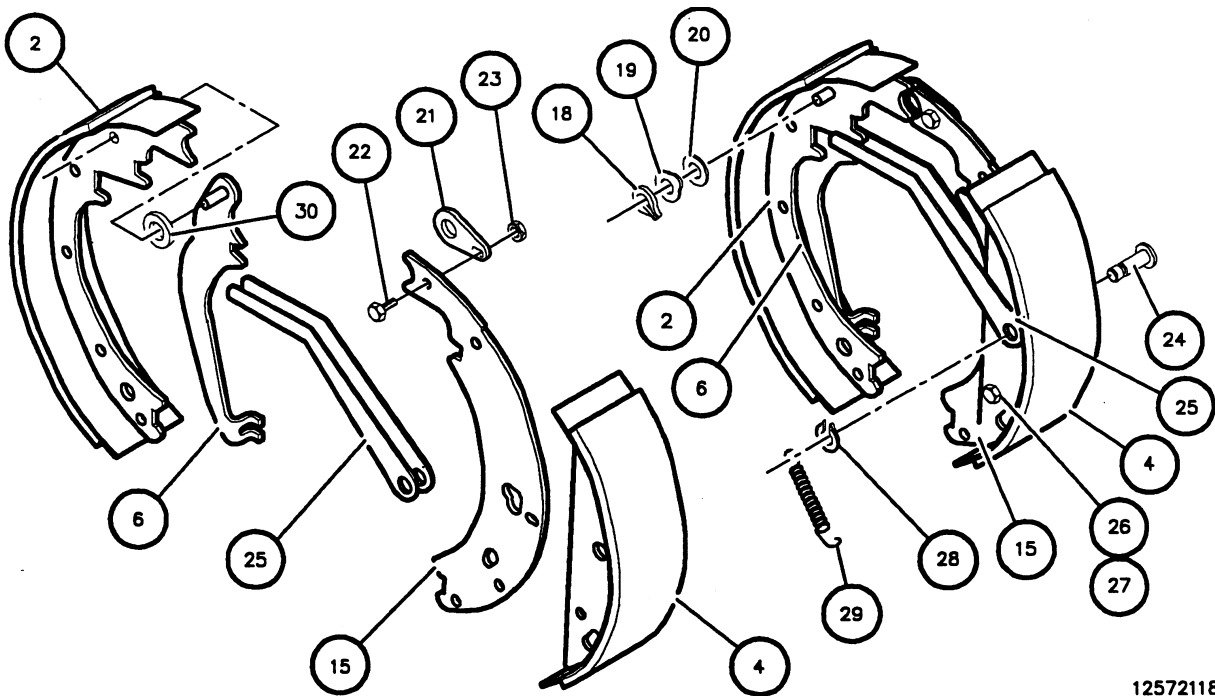
4-24 SERVICE BRAKESHOE REPLACEMENT (Con't).

8. Remove spring tension clip (18), lock washer (19), and transporter washer (20) securing parking brake link (6) to rear brakeshoe (2). Discard spring tension clip (18) and lock washer (19) if damaged.

**WARNING**

If one brakeshoe is being replaced, replace all brakeshoes. Combination of old brakeshoes with new will cause uneven braking. Accidents causing serious injury or death to personnel or damage to equipment may result.

9. Remove rear brakeshoe (2) and parking brake link (6). Remove rear brakeshoe (2) and washer (30) from parking brake link (6). Discard rear brakeshoe (2).
10. Remove spring (29), retaining ring (28), and pin (24) securing backing shoe lever (15) and parking shoe lever (25) to front brakeshoe (4). Discard retaining ring (28) if damaged.
11. Remove locknut (27) and capscrew (26) securing backing shoe lever (15) to front brakeshoe (4). Discard locknut (27) and front brakeshoe (4).
12. Remove locknut (23) and capscrew (22) securing travel link (21) to backing shoe lever (15). Remove travel link (21) from backing shoe lever (15). Discard locknut.



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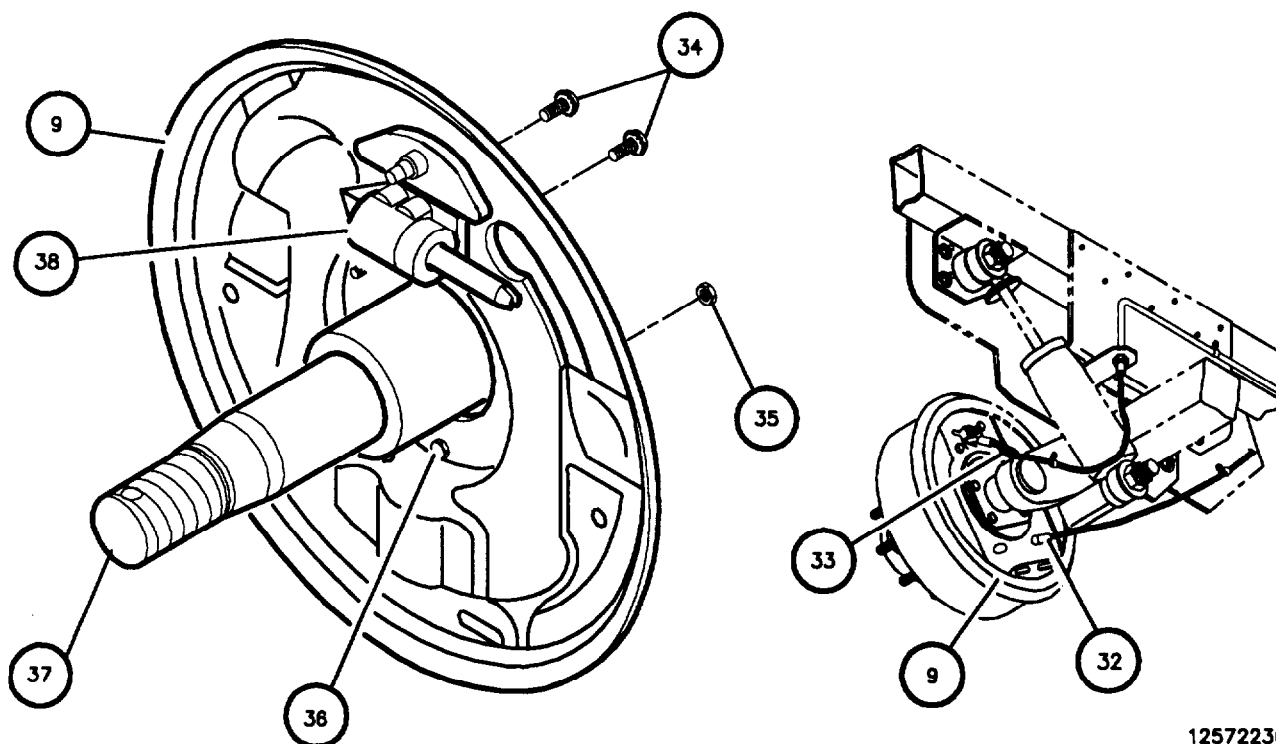
## 4-24 SERVICE BRAKESHOE REPLACEMENT (Con't).

## b. CLEANING AND INSPECTION

**WARNING**

Dry cleaning solvent, P-D-680, is toxic and flammable. Always wear goggles and gloves and use solvent only in a well-ventilated area. Avoid contact with skin, eyes, and clothes, and DO NOT breathe vapors. DO NOT use near open flame or excessive heat. The solvent's flash point is 100°F to 138°F (38°C to 69°C). If you become dizzy while using cleaning solvent, immediately get fresh air and medical help. If solvent contacts eyes, immediately wash your eyes and get medical aid.

1. Clean all removed components with dry cleaning solvent and allow to dry.
2. Inspect backing plate for cracks, breaks, corrosion, or other damage. If damaged, replace backing plate by performing steps 3 through 6.
3. Disconnect handbrake cable sheath (32) from backing plate (9).
4. Remove two capscrews (34) with integral lockwashers securing wheel cylinder (38) to backing plate (9). Pull wheel cylinder (38) loose from backing plate and disconnect flex brake line (33) from wheel cylinder. Install temporary plug in end of flex line. Remove wheel cylinder.
5. Remove five nuts (35) from mounting studs (36) securing backing plate (9) to axle spindle (37). Remove backing plate (9).



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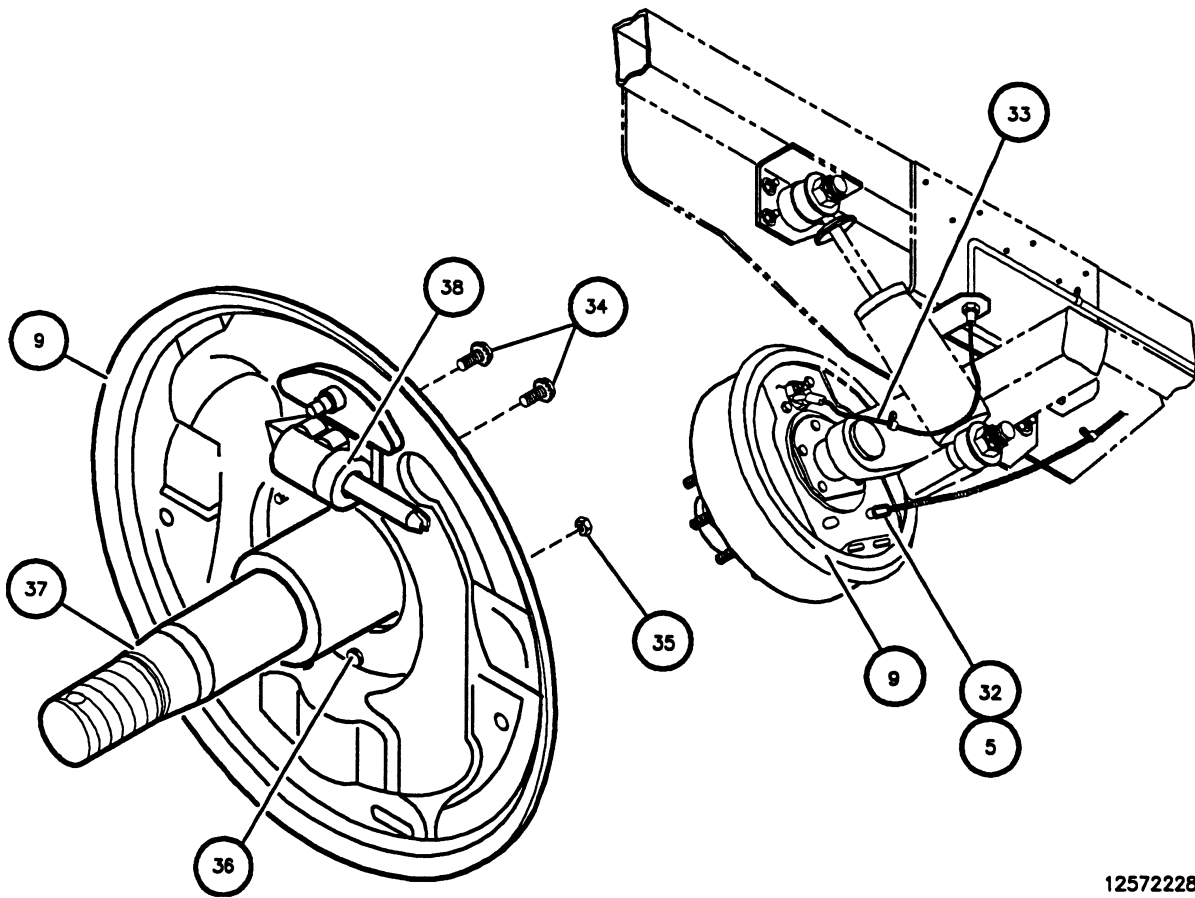
4-24 SERVICE BRAKESHOE REPLACEMENT (Con't).

c. ASSEMBLY

NOTE

Steps 1 through 4 are required only if backing plate was removed.

1. Install backing plate (9) on axle spindle (37) and secure with mounting studs (36) and nuts (35). Tighten nuts and torque to  $50 \pm 5$  ft-lb ( $69 \pm 7$  N• m).
2. Remove plug from flex brake line (33), then connect flex brake line (33) to wheel cylinder (38).
3. Install wheel cylinder (38) on backing plate (9) with new capscrews (34). Torque capscrews to  $168 \pm 17$  in-lb ( $19 \pm 1.9$  N• m).
4. Feed handbrake cable (5) through backing plate (9), then connect cable sheath (32) to backing plate (9).



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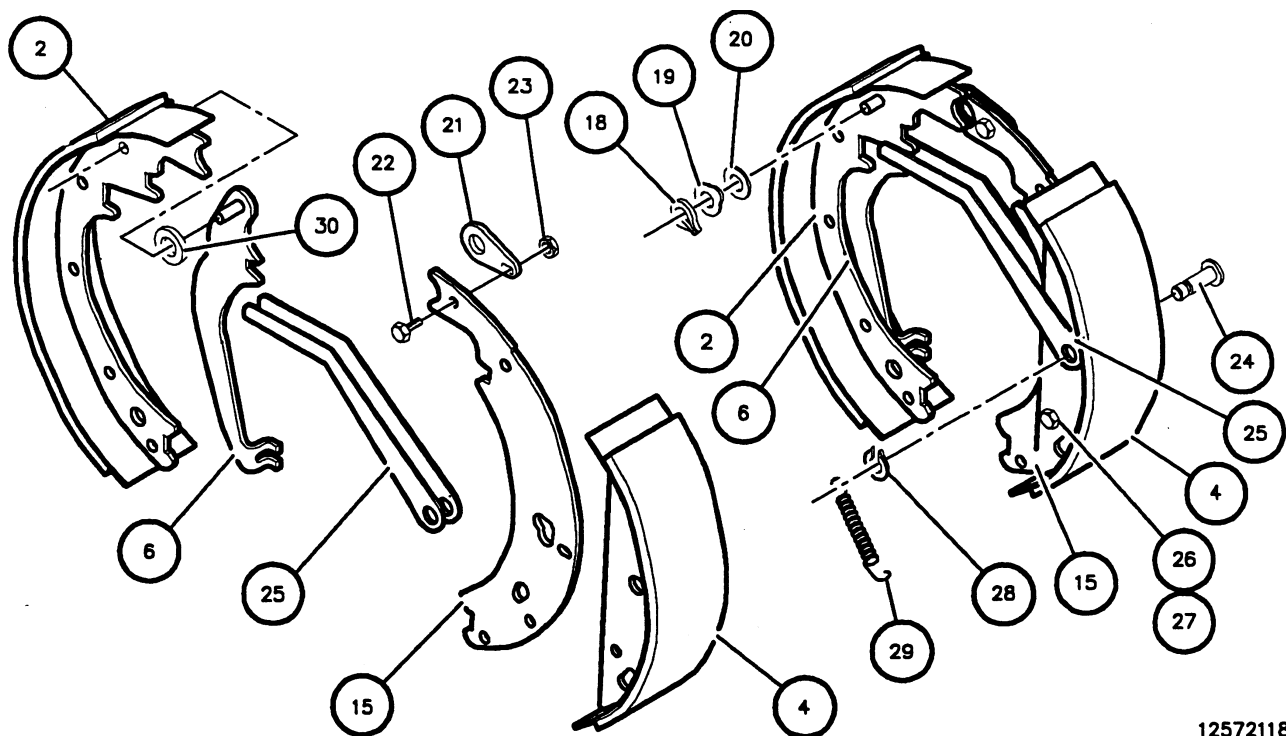
**4-24. SERVICE BRAKESHOE REPLACEMENT (Con't).**

5. Install travel link (21) to backing shoe lever (15) with capscrew (22) and locknut (23). Measure clearance between backing shoe lever (15) and travel link (21). Tighten locknut (23) and capscrew (22) to ensure 0.03-inch clearance.

**WARNING**

DO NOT allow grease to contact brakeshoe linings. Wipe excess lubricant from the brakeshoe linings to prevent grease soaking into the materials. Brakeshoe linings can absorb grease and oil, causing early glazing of linings and very poor breaking action. If brakeshoe linings become soaked, notify Direct Support (DS) maintenance shop for replacement. Failure to follow this warning may cause brakes to malfunction, resulting in injury or death to personnel or damage to equipment.

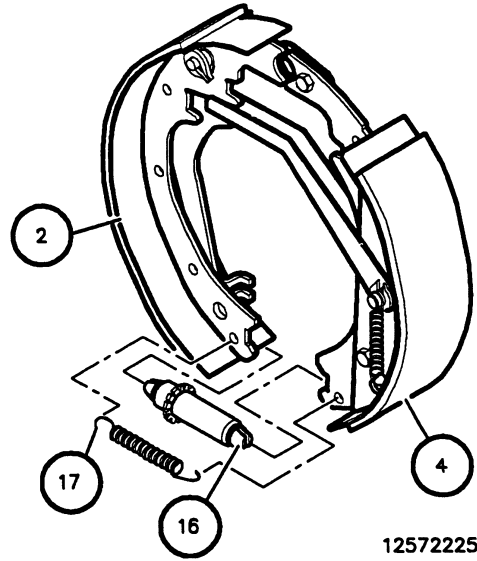
6. Install capscrew (26) and locknut (27) securing backing shoe lever (15) to front brakeshoe (4). Tighten locknut (27) and capscrew (26) to ensure 0.03-inch clearance between backing shoe lever (15) and front brakeshoe (4).
7. Install pin (24) and retaining ring (28) securing parking shoe lever (25) to front brakeshoe (4) and backing shoe lever (15).
8. Install spring (29) to front brakeshoe (4) and pin (24).
9. Install washer (30), transporter washer (20), new lockwasher (19), and spring tension clip (18) securing parking brake link (6) to rear brakeshoe (2).



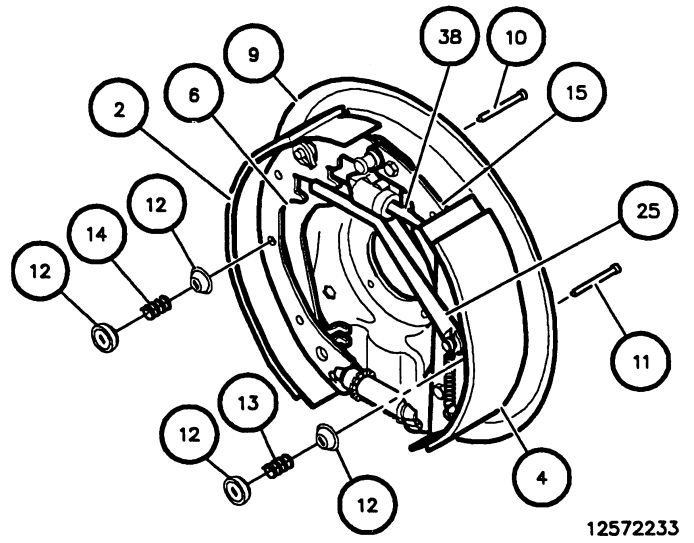
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**4-24 SERVICE BRAKESHOE REPLACEMENT (Con't).**

10. Install spring (17) and adjuster (16) securing front brakeshoe assembly (4) to rear brakeshoe assembly (2).

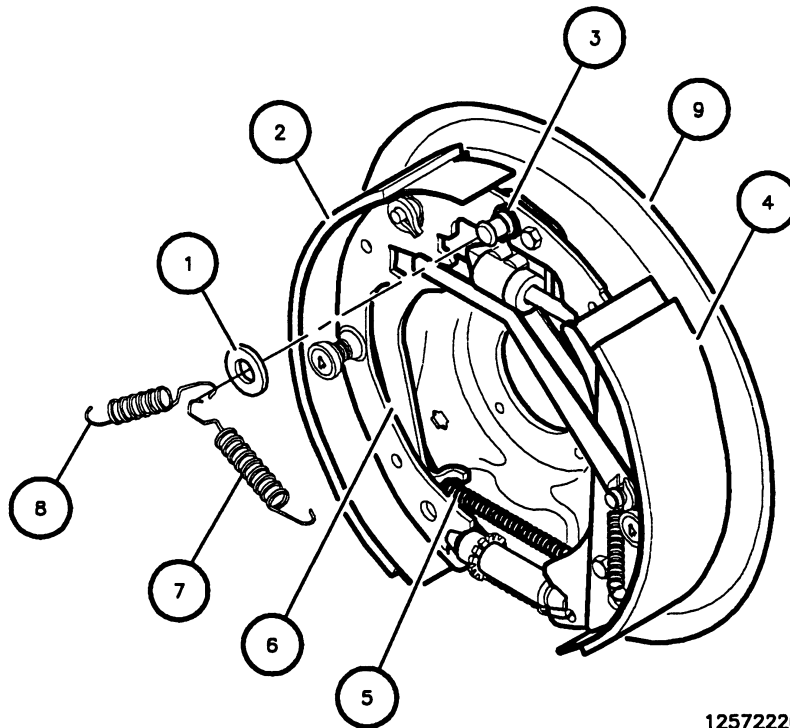


11. Install pin (10), retainers (12), and spring (14) securing rear brakeshoe (2) to backing plate (9).
12. Install pin (11), retainers (12), and spring (13) securing front brakeshoe (4) to backing plate (9).
13. Install wheel cylinder rod (38) into backing shoe lever (15).
14. Install parking shoe lever (25) into parking brake link (6).



**4-24 SERVICE BRAKESHOE REPLACEMENT (Con't).**

15. Install handbrake cable (5) to parking brake link (6).
16. Install washer (1) to backing plate (9) anchor pin (3).
17. Install front shoe spring (7) from front brakeshoe (4) to anchor pin (3).
18. Install rear shoe spring (8) from rear brakeshoe (2) to anchor pin (3).



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**FOLLOW-ON TASKS:**

- Install hub/drum (para 4-33).
- Install wheel and tire assembly (para 4-32).
- Bleed brakes (para 4-26).
- Adjust service brakes (para 4-23).

**4-25. WHEEL CYLINDER REPLACEMENT.**

<b>This task covers:</b>	<b>a. Removal</b>	<b>b. Cleaning and Inspection</b>	<b>c. Installation</b>
--------------------------	-------------------	-----------------------------------	------------------------

**initial Setup:****Equipment Conditions:**

- Wheel removed (para 4-32).
- Hub/drum removed (para 4-33).

**Materials/Parts:**

- Rags (Item 10, Appendix E)
- Dry Cleaning Solvent (Item 5, Appendix E)

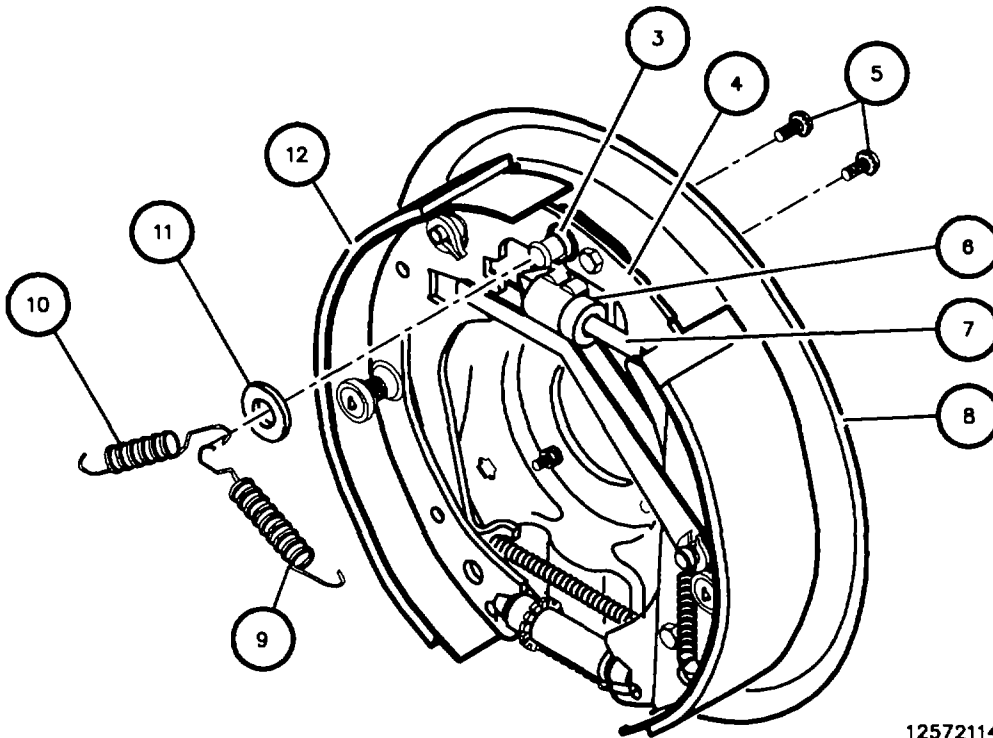
**Tools/Test Equipment:**

- General mechanics tool kit
- Common No. 1 shop set

**a. REMOVAL****NOTE**

Use a suitable container to catch any draining brake fluid. Ensure that all spills are cleaned up.

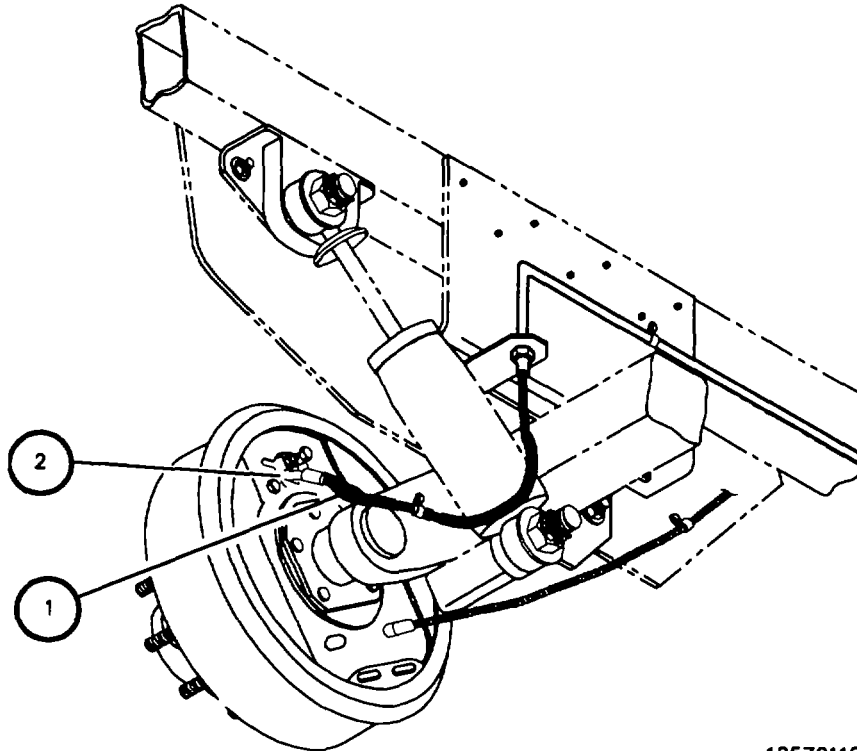
1. Remove front shoe spring (9) from front brakeshoe (4) and backing plate anchor pin (3).
2. Remove rear shoe spring (10) from rear brakeshoe (12) and backing plate anchor pin (3)
3. Remove washer (11) from backing plate anchor pin (3).



12572114

**4-25. WHEEL CYLINDER REPLACEMENT (Con't).**

4. Remove two capscrews (5) with integral lockwashers securing wheel cylinder (6) to backing plate (8).
5. Pull wheel cylinder (6) loose from backing plate (8) while compressing push rod (7); remove push rod from brakeshoe (4).
6. Disconnect flex brake line (1) from wheel cylinder (2).
7. Install temporary plug in flex brake line (1).



12572110

**4-25. WHEEL CYLINDER REPLACEMENT (Con't).****b. CLEANING AND INSPECTION****WARNING**

Dry cleaning solvent, P-D-680, is toxic and flammable. Always wear goggles and gloves and use solvent only in a well-ventilated area. Avoid contact with skin, eyes, and clothes, and DO NOT breathe vapors. DO NOT use near open flame or excessive heat. The solvent's flash point is 100 °F to 138 °F (38 °C to 59 °C). If you become dizzy while using cleaning solvent, immediately get fresh air and medical help. If solvent contacts eyes, immediately wash your eyes and get medical aid.

1. Clean all removed components except wheel cylinder with dry cleaning solvent and allow to dry.
2. Inspect components for cracks, breaks, corrosion, or damaged threads. Replace if damaged.

**c. INSTALLATION**

1. Remove temporary plug from flex brake line (1).
2. Connect flex brake line (1) to wheel cylinder (2) and tighten flare brake line fitting.
3. Install push rod (7) in brakeshoe (4) and wheel cylinder (6) onto backing plate (8).

**NOTE**

For ease of installation, install the rear capscrew first.

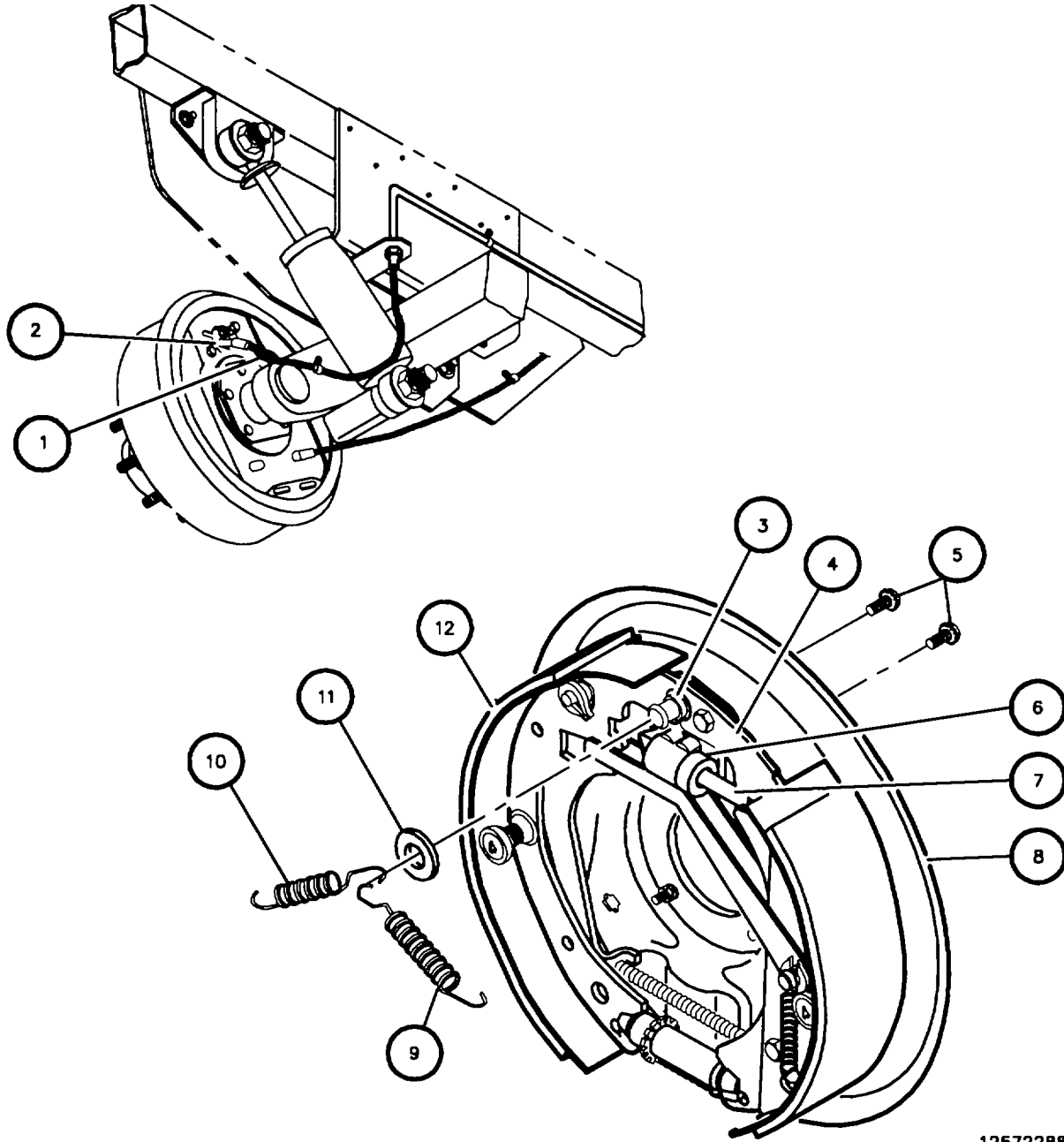
4. Install two capscrews (5) and tighten finger tight. Torque capscrews (5) to 168  $\pm$  17 lb-m. (226 Nom).
5. Install washer (11) to backing plate anchor pin (3).
6. Install rear shoe spring (10) to rear brakeshoe (12) and backing plate anchor pin (3).
7. Install front shoe spring (9) to front brakeshoe (4) and backing plate anchor pin (3).

**FOLLOW-ON TASKS:**

- Install hub/drum (para 4-33).
- Install wheel and tire assembly (para 4-32).
- Bleed hydraulic system (para 4-26)
- Adjust service brakes (para 4-23).



4-25. WHEEL CYLINDER REPLACEMENT (Con't).



12572288

4-26 BLEEDING HYDRAULIC BRAKE SYSTEM.

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This task covers: **Bleeding**

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**Initial Setup:**

**Equipment Conditions:**

- Handbrake released.
- Wheels chocked (para 2-8.1).

**Materials/Parts:**

- Rags (Item 10, Appendix E)
- Brake Fluid (Item 1, Appendix E)

**Tools/Test Equipment:**

- General mechanics tool kit
  - Common No. 1 shop set
- 

**WARNING**

When performing maintenance on brake system, ensure that wheels are securely chocked. Failure to follow this warning may cause trailer to roll, resulting in serious injury or death to personnel or damage to equipment.

**BLEEDING**

1. Install one end of bleeder hose (2) to wheel cylinder bleeder fitting (1) and other end of hose in clean container (3) three-fourths full of brake fluid (4).

**WARNING**

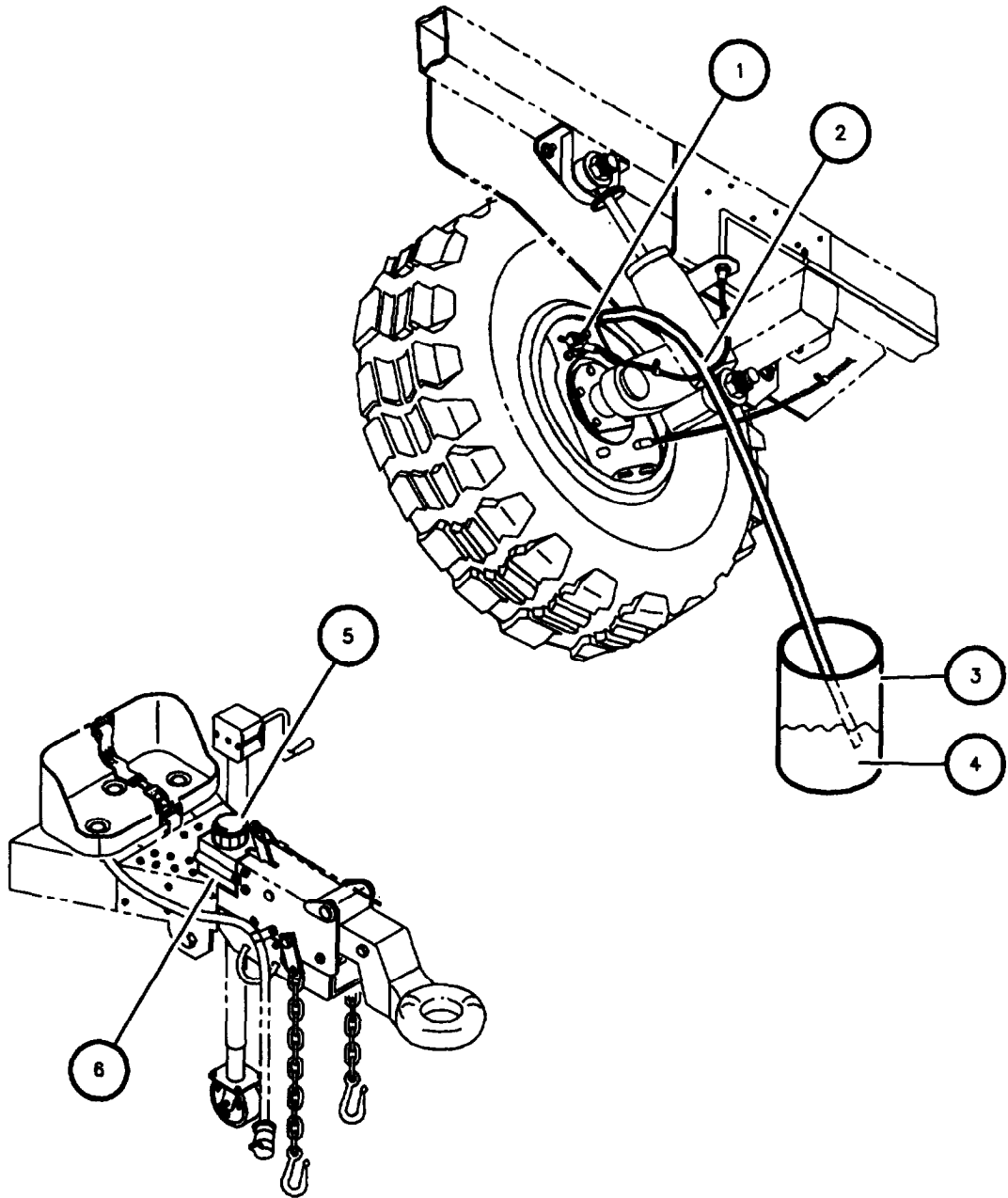
Eye injury may result if brake fluid comes in contact with eyes. Always wear eye protection when working with brake fluid. Failure to follow this warning may result in injury to personnel.

**CAUTION**

Dirt, water, or grease will contaminate brake fluid, causing brake system damage. Clean exterior of master cylinder and master cylinder cap before removing cover.

2. Remove cap (5) from master cylinder (6).
3. Fill master cylinder (6) to 1/8 inch from top of reservoir with brake fluid.

4-26 BLEEDING HYDRAULIC BRAKE SYSTEM (Con't).



12572270

**4-26 BLEEDING HYDRAULIC BRAKE SYSTEM (Con't).**

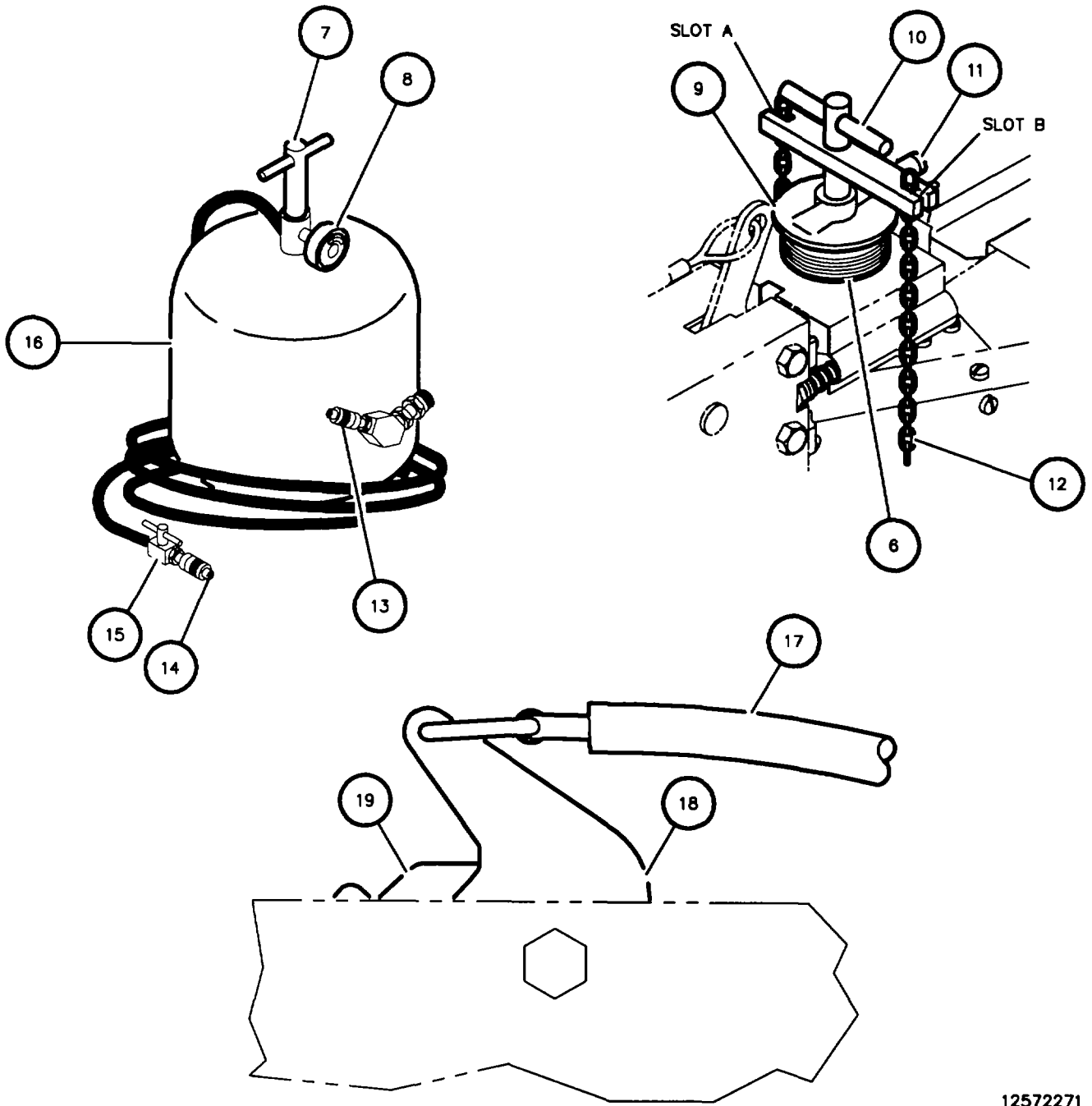
4. Secure brake bleeder adapter (9) on master cylinder (6).
5. Connect chain (12) to slot A. Pass other end under drawbar and connect it to slot B.
6. Tighten handle (10) to ensure seal of brake bleeder adapter (9) with master cylinder (6).
7. Ensure that valve (15) on quick disconnect is closed, then connect brake bleeder quick disconnect (14) to brake bleeder adapter fitting (11).
8. If pressure gauge (8) on canister (16) indicates positive pressure, bleed pressure through air passage valve (13).
9. Remove top (7) of canister (16) and add 1 gallon of brake fluid to canister (16). Install top (7) and tighten hand tight.

**WARNING**

Excessive air pressure could cause damage to equipment and injury to personnel. Care should be taken when using air pressure equipment. Failure to follow this warning may result in injury to personnel or damage to equipment.

10. Insert  $18 \pm 2$  psi ( $124 \pm 13$  kPa) of air into brake bleeder canister (16) through air passage valve (13) until gauge (8) indicates  $18 \pm 2$  psi ( $124 \pm 13$  kPa).
11. Pull breakaway cable (17) until breakaway lever (18) is in the locked position secured by leaf spring (19).
12. Open brake bleeder valve (15) two turns.

4-26. BLEEDING HYDRAULIC BRAKE SYSTEM (Con't).



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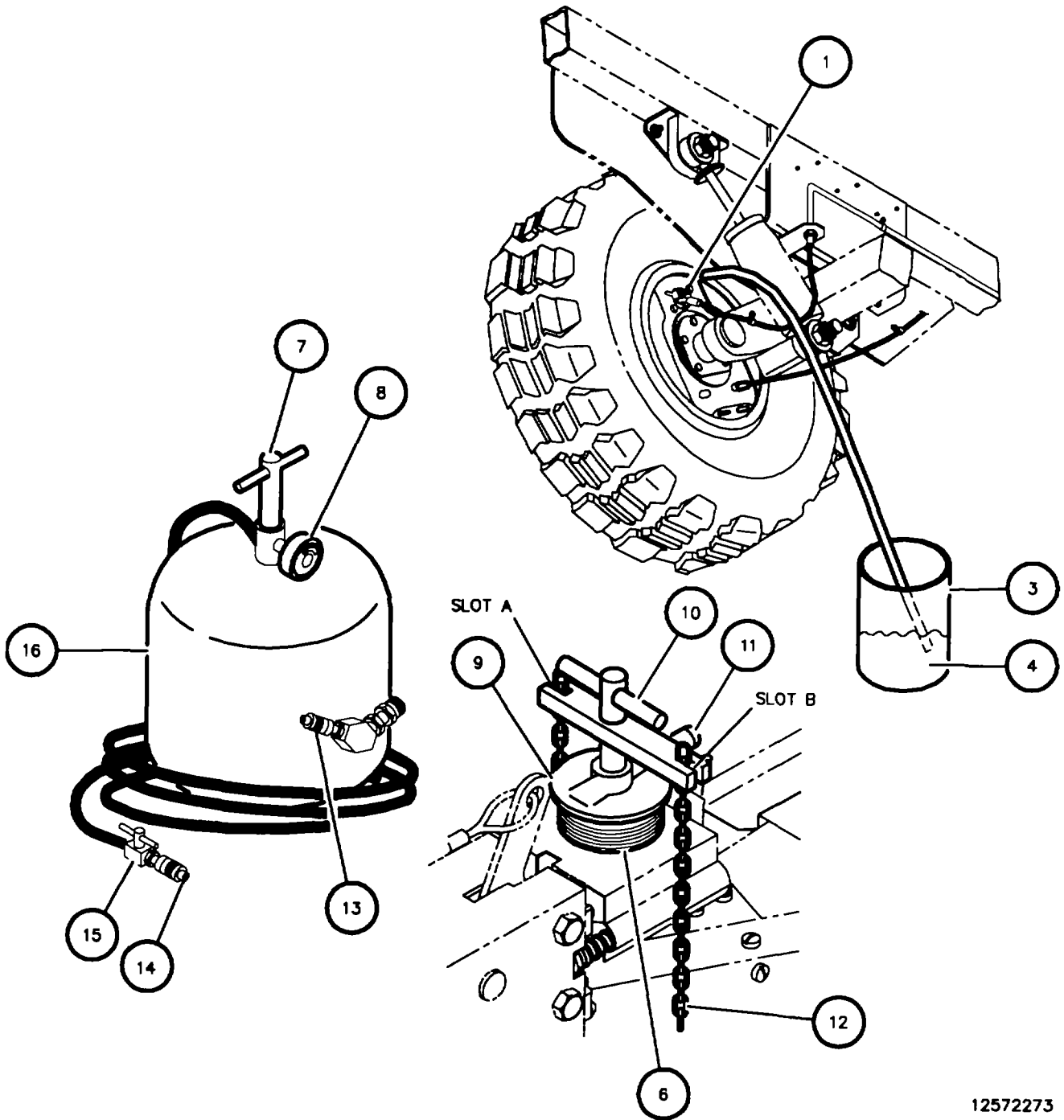
**4-26. BLEEDING HYDRAULIC BRAKE SYSTEM (Con't).**

**NOTE**

Bleeding of both wheel cylinders is performed in the same manner. Ensure both wheel cylinders are bled.

13. Carefully open wheel cylinder bleeder fitting (1) 1/2 to 3/4 turn and drain brake fluid (4) into container (3). Continue draining until brake fluid (4) is free of air bubbles.
14. Close wheel cylinder bleeder fitting (1).
15. Close brake bleeder valve (15).
16. Remove quick disconnect (14) from brake bleeder adapter fitting (11).
17. Bleed air from brake bleeder canister (16) at air passage valve (13).
18. Loosen brake bleeder adapter handle (10) and remove chain (12) from brake bleeder adapter (9). Remove brake bleeder adapter (9) from master cylinder (6).

4-26. BLEEDING HYDRAULIC BRAKE SYSTEM (Con't).



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**4-26. BLEEDING HYDRAULIC BRAKE SYSTEM (Con't).****CAUTION**

At times the rubber diaphragm may be distorted. Ensure that rubber diaphragm is completely compressed within master cylinder cover before installing cover on master cylinder

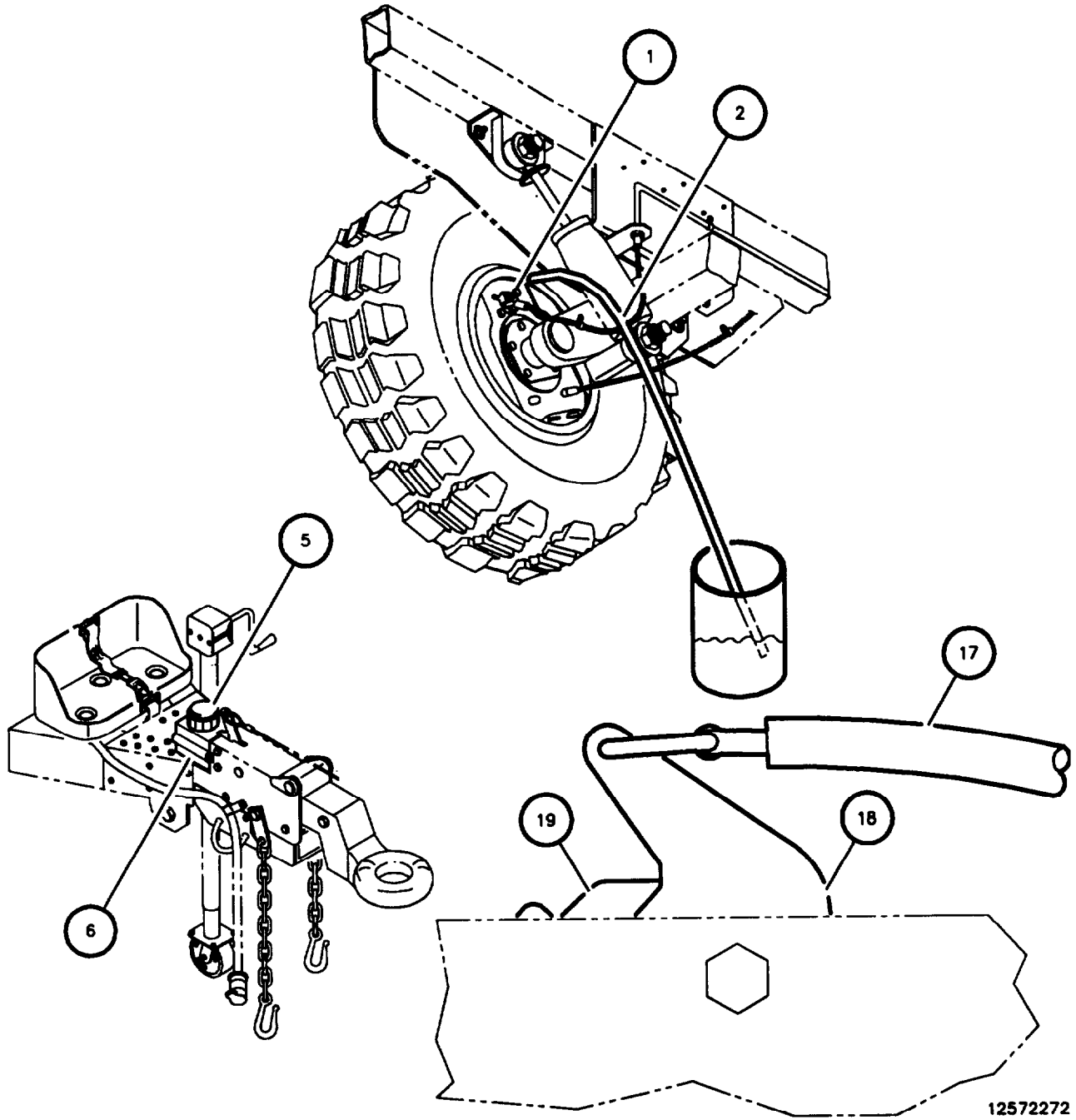
19. Install cap (5) on master cylinder (6).
20. Disengage breakaway lever (18) from leaf spring (19).
21. Remove bleeder hose (2) from wheel cylinder bleeder fitting (1).

**FOLLOW-ON TASKS:**

- Apply handbrakes.



4-26 BLEEDING HYDRAULIC BRAKE SYSTEM (Con't).



4-27 HYDRAULIC BRAKE ACTUATOR ASSEMBLY MAINTENANCE.

---

<b>This task covers:</b>	<b>a. Removal</b>	<b>c. Cleaning and Inspection</b>
	<b>b. Disassembly</b>	<b>d. Assembly</b>
		<b>e. Installation</b>

---

**Initial Setup:**

**Equipment Conditions:**

- Handbrakes applied.
- Wheels chocked (para 2-8.1).
- Safety chains removed (para 4-35).

**Tools/Test Equipment:**

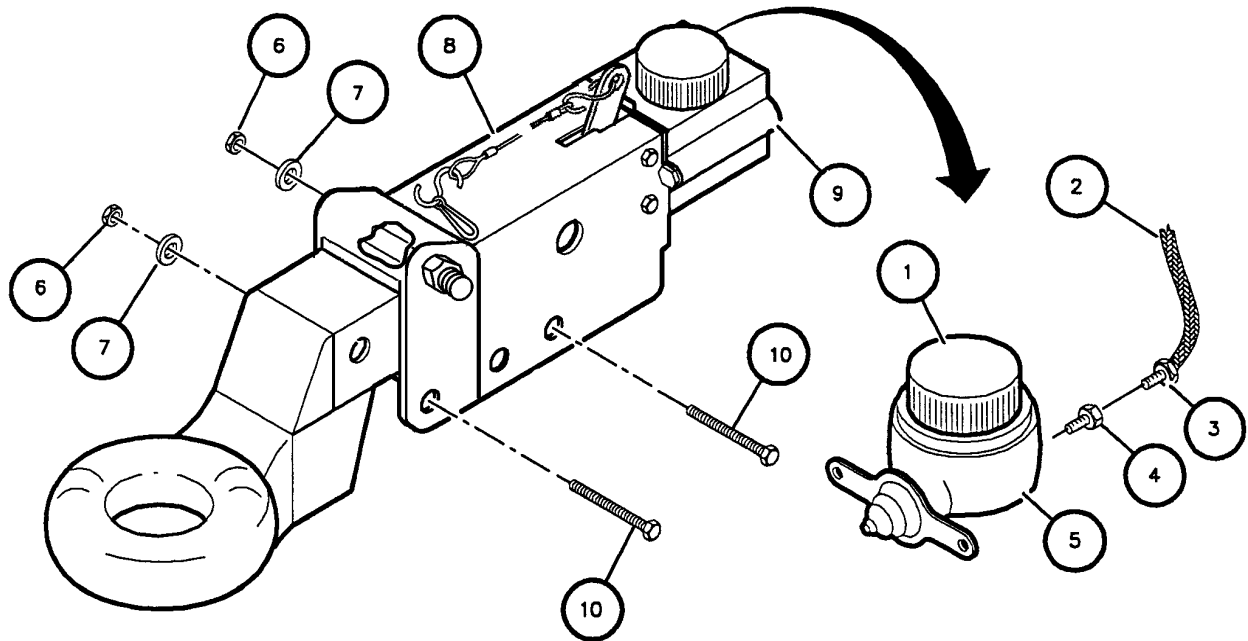
- General mechanics tool kit
- Common No. 1 shop set

**Materials/Parts:**

- Rags (Item 16, Appendix E)
- Dry cleaning solvent (Item 5, Appendix E)
- Wire brush (Item 3, Appendix E)
- Four locknuts
- Container
- Cotter pin
- Four capscrews

**a. REMOVAL**

1. Remove cap (1) from master cylinder (5).
2. Remove cover (9) from master cylinder (5). Then reinstall cap (1) on master cylinder (5).



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**NOTE**

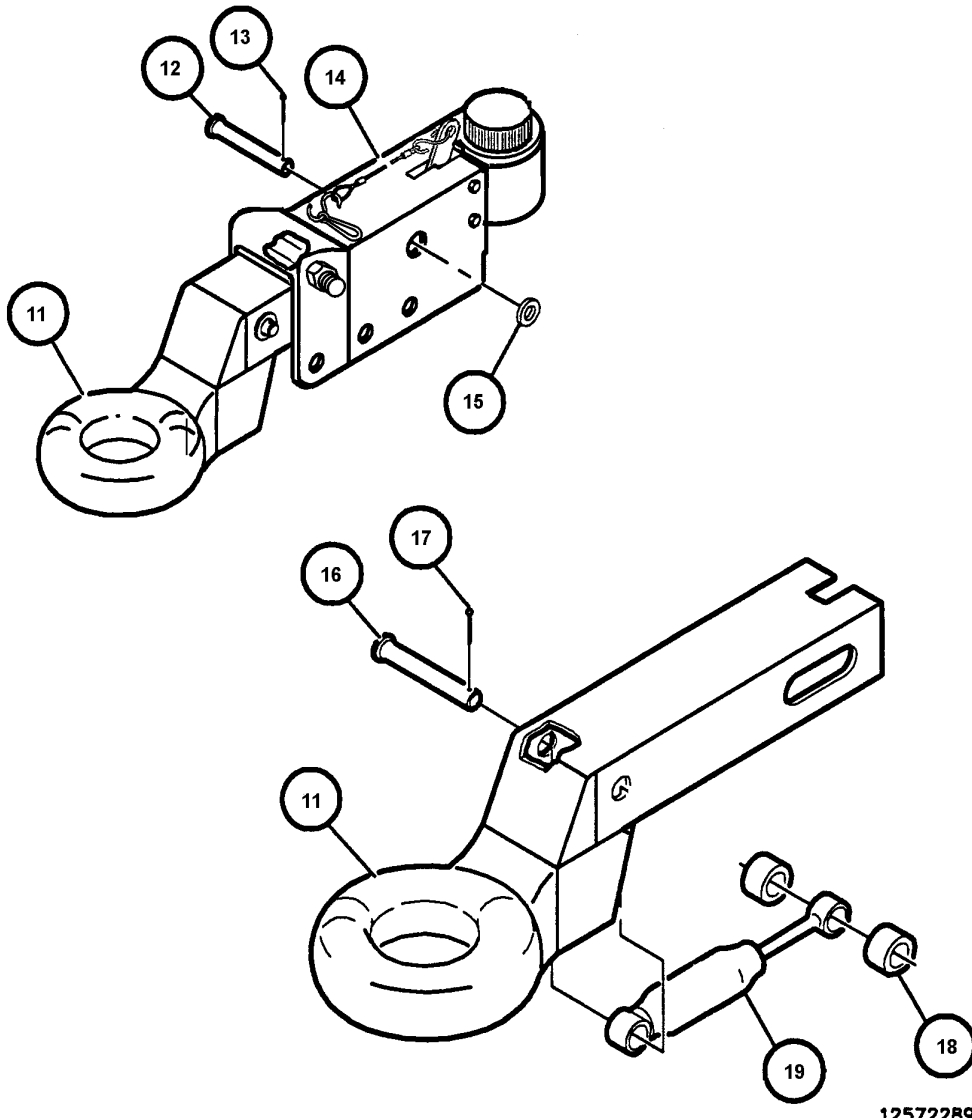
- Use a suitable container to catch any draining brake fluid. Ensure that all spills are cleaned up.
- Master cylinder orifice (4) requires a 12-mm wrench.

**4-27 HYDRAULIC BRAKE ACTUATOR ASSEMBLY MAINTENANCE (CONT).**

3. Disconnect flex brake line (2) from master cylinder orifice (4) and install temporary plug in flex brake line fitting end (3).
4. Remove two locknuts (6), two washers (7), and two capscrews (10) securing hydraulic actuator assembly (8) to trailer. Discard locknuts.
5. Remove hydraulic actuator assembly (8) from trailer.

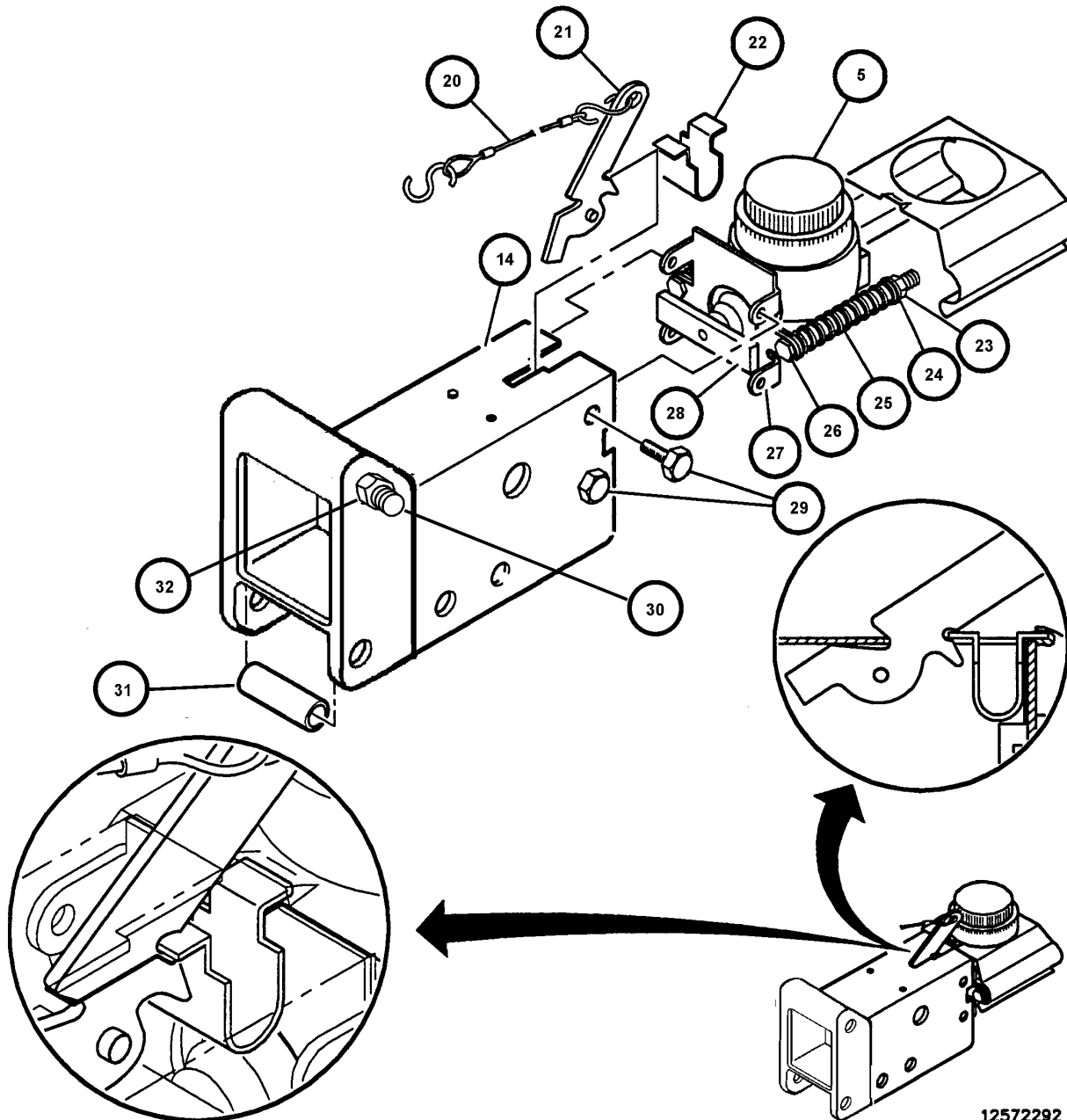
**b. DISASSEMBLY**

1. Remove cotter pin (13) from master pin (12). Remove master pin (12) and washer (15). Discard cotter pin.
2. Remove lunette (11), with damper pin (16) and two rollers (18) attached, from brake actuator (14).
3. Remove cotter pin (17) and damper pin (16) securing damper (19) to lunette (11). Discard cotter pin.



4-27 HYDRAULIC BRAKE ACTUATOR ASSEMBLY MAINTENANCE (CONT).

4. Remove four capscrews (29) securing master cylinder mounting plate (27) to brake actuator housing (14). Remove master cylinder (5) with attached mounting plate (27) from actuator housing (14). Discard capscrews (29).
5. Remove hydraulic actuator breakaway spring lever (21) and attached breakaway cable (20) from actuator housing (14). Then remove breakaway lever spring (22).
6. Remove two capscrews (26), nuts (23), washer (24), and springs (25) securing master cylinder mounting plate (27) and push rod assembly (28) to master cylinder (5). Carefully remove push rod assembly (28) and mounting plate (27) from master cylinder (5).
7. Remove nut (30), upper bolt (32), and roller (31) from actuator housing (14).



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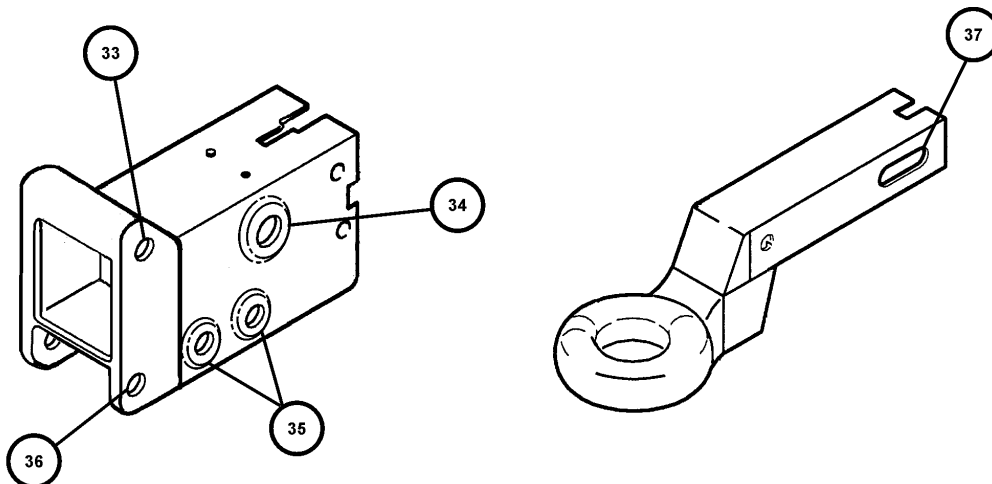
## 4-27 HYDRAULIC BRAKE ACTUATOR ASSEMBLY MAINTENANCE (CONT).

## c. CLEANING AND INSPECTION

**WARNING**

Dry cleaning solvent, P-D-680, is toxic and flammable. Always wear goggles and gloves and use solvent only in a well-ventilated area. Avoid contact with skin, eyes, and clothes, and DO NOT breathe vapors. DO NOT use near open flame or excessive heat. The solvent's flash point is 100°F to 138°F (38°C to 59°C). If you become dizzy while using cleaning solvent, immediately get fresh air and medical help. If solvent contacts eyes, immediately wash your eyes and get medical aid.

1. Clean all removed components except master cylinder with dry cleaning solvent and allow to dry.
2. Inspect components for wear, cracks, breaks, corrosion, or other damage. Replace if damaged.
3. Inspect master cylinder and damper for leakage. Replace if defective.
4. Remove any corrosion with a wire brush.
5. Inspect master pin hole (34) for wear. If hole diameter exceeds 1.06 in., replace outer case assembly.
6. Inspect front roller pin hole (33) for wear. If hole diameter exceeds 0.75 in., replace outer case assembly.
7. Inspect master pin for grooves. Replace master pin if depth of groove exceeds 3/32 in.
8. Inspect upper bolt for grooves. Replace upper bolt if depth of groove exceeds 3/32 in.
9. Measure inner and outer diameter of upper roller. Replace upper roller if outer diameter is less than 0.9 in. or 29/32 in. or if inner diameter is greater than 0.718 or 23/32 in.
10. Measure inner and outer diameter of master rollers. Replace master rollers if outer diameter is less than 1.78 in. or 1-25/32 in. or if inner diameter is greater than 15/16 in.
11. Inspect master rollers for dings and dents. Replace master roller if dings or dents are longer or wider than 1/2 in.
12. Measure inner slide slots (37) at height of lip. Maximum length allowable is 2.25 in. and maximum height allowable is 1.125 in. Replace hydraulic brake actuator assembly if distortion of slot exceeds limitations.
13. Measure grooves on top inner slide for distance from flat edge to depth of groove. Replace inner slide if groove depth is greater than 1/8 in. Check upper roller for proper operation.
14. Measure grooves on bottom bolts. Replace bolts if grooves exceed 1/16 in. or if thread distortion is greater than 1/32 in.
15. Measure bolt holes (35 and 36). Replace hydraulic brake actuator assembly if any bolt holes are more than 1/8 in. oversize.



4-27 HYDRAULIC BRAKE ACTUATOR ASSEMBLY MAINTENANCE (CONT).

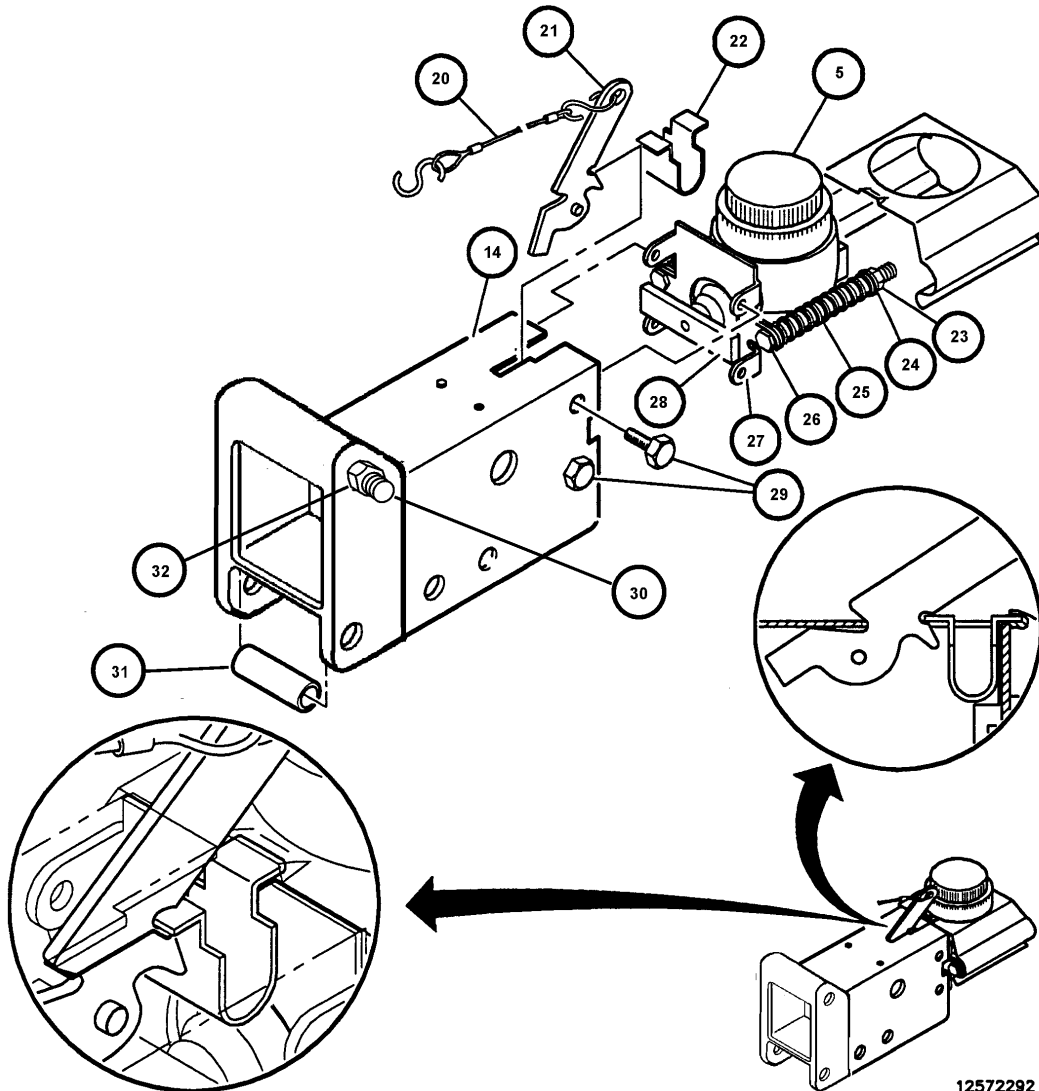
d. ASSEMBLY

1. Install upper bolt (32) and roller (31) into actuator housing (15) and secure with nut (30).
2. Carefully install push rod assembly (28) and mounting plate (27) onto master cylinder (5). Install two capscrews (26), nuts (23), washers (24), and springs (25) to secure master cylinder mounting plate (27) and push rod assembly (28) to master cylinder (5). Tighten bolts (26) and nuts (23) compressing springs (25) to a measurement of 3.25 in.  $\pm$  0.0625 in. (1/16 in.).

**WARNING**

When installing breakaway lever spring (22) onto breakaway spring lever (21) and actuator housing (14), you must hold the spring in place until master cylinder (5) is installed. If the spring is not physically held in place as defined, it can fall out of the actuator housing, resulting in no surge brake protection for the trailer.

3. Install breakaway lever spring (22) and breakaway spring lever (21) with attached breakaway cable (20) into actuator housing (14).



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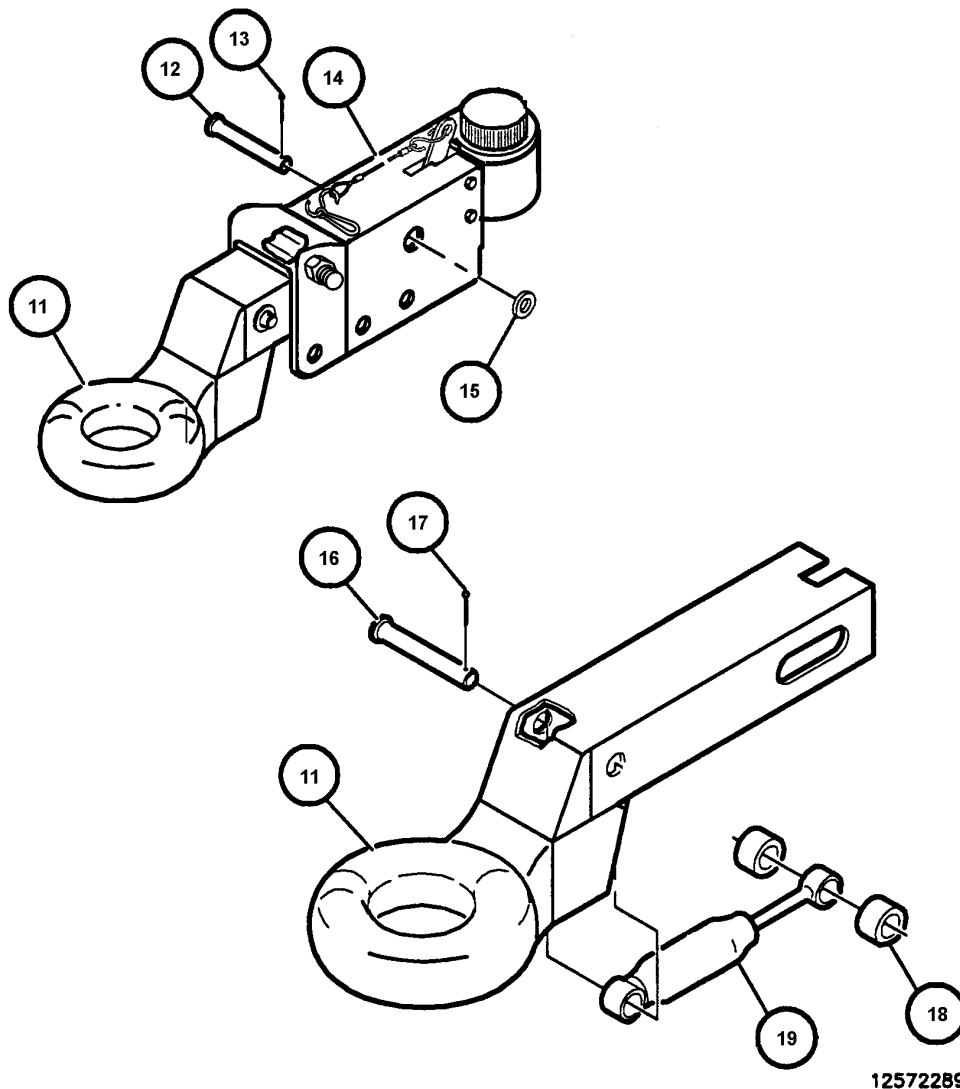
## 4-27 HYDRAULIC BRAKE ACTUATOR ASSEMBLY MAINTENANCE (CONT).

4. Install master cylinder (5) with attached mounting plate (27) into actuator housing (14). Install four new cap-screws (29) to secure master cylinder mounting plate (27) to brake actuator housing (14).
5. Install damper (19) on lunette (11) with damper pin (16) and new cotter pin (17).
6. Position two rollers (18), with beveled sides facing out, on either side of damper (19) inside lunette (11). Use 5/8" deep well socket to hold damper (19) and two rollers (18) in place.

**NOTE**

5/8" deep well socket will be pushed out as master pin is installed.

7. Install lunette (11) on brake actuator (14) with master pin (12), washer (15), and new cotter pin (13). Torque master pin (12) to 50 ft. lbs. (68 N•m), then back off 1/4 turn.



4-27 HYDRAULIC BRAKE ACTUATOR ASSEMBLY MAINTENANCE (CONT).

e. INSTALLATION

1. Position actuator assembly (8) on trailer.

**NOTE**

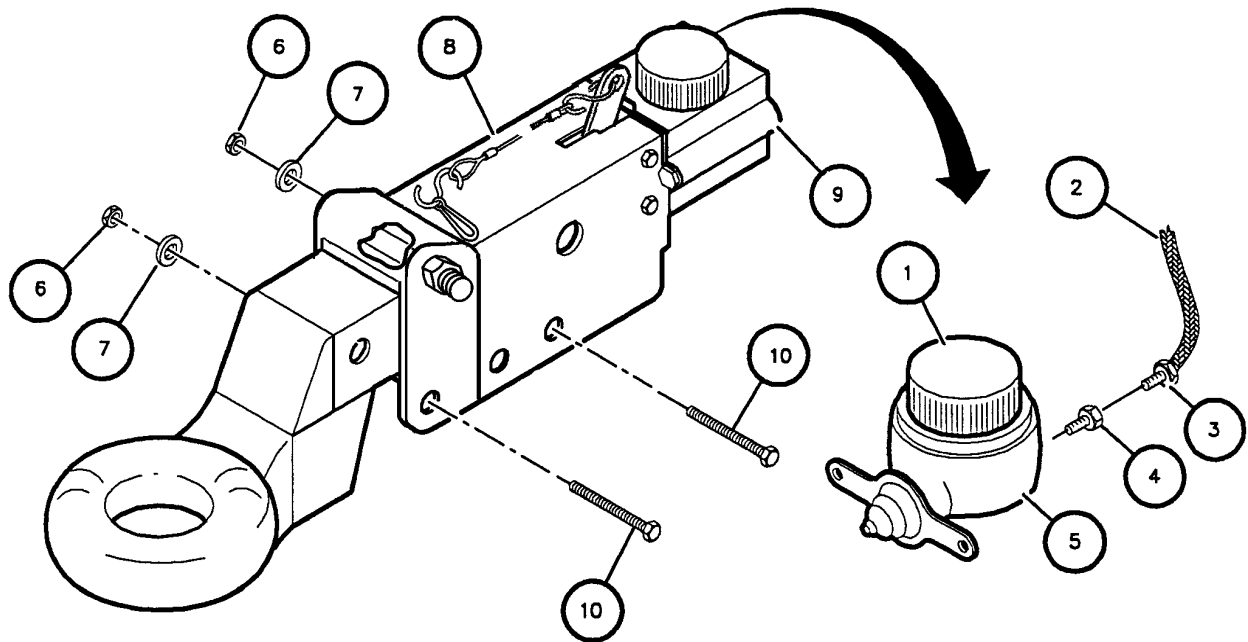
5/8" capscrew (10) is installed in rear bolt hole and 1/2" capscrew (10) is installed in front bolt hole.

2. Install two capscrews (10), two washers (7), and two locknuts (6) securing hydraulic actuator assembly to trailer. Torque capscrews to 105 ft-lb (142 N•m).

**NOTE**

Master cylinder orifice (4) requires a 12-mm wrench.

3. Remove temporary plug from flex brake line fitting end (3).
4. Install flex brake line (2) in master cylinder orifice (4). Tighten flare fitting (3).
5. Remove cap (1) from master cylinder (5).
6. Install cover (9) on master cylinder (5). Then reinstall cap (1) on master cylinder (5).



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**FOLLOW-ON TASKS:**

- Bleed hydraulic system (para 4-26).
- Install safety chains (para 4-35).

Paragraph 4-28 is now included in Paragraph 4-27.

Pages 4-69 and 4-70 have been deleted per Change 2.

Paragraph 4-28A, pages 4-70.1 through 4-70.8, is deleted per Change 2.





4-28A HYDRAULIC BRAKE ACTUATOR ASSEMBLY REPAIR. **4501** →

This task covers:      **a. Disassembly**      **b. Cleaning and Inspection**      **c. Assembly**

**Initial Setup:**

**Equipment Conditions:**

**Parts:**

- Handbrakes engaged.
- Safety chains removed (para 4-35).

**Tool/Test Equipment:**

- General mechanics tool kit
- Common No. 1 shop set

**Materials/**

- Rags (Item 10, Appendix E)
- Dry Cleaning Solvent (Item 5, Appendix E)
- Wire Brush (Item 3, Appendix E)
- Two Lock nuts
- Container
- Cotter Pin
- Four Capscrews

**a. DISASSEMBLY**

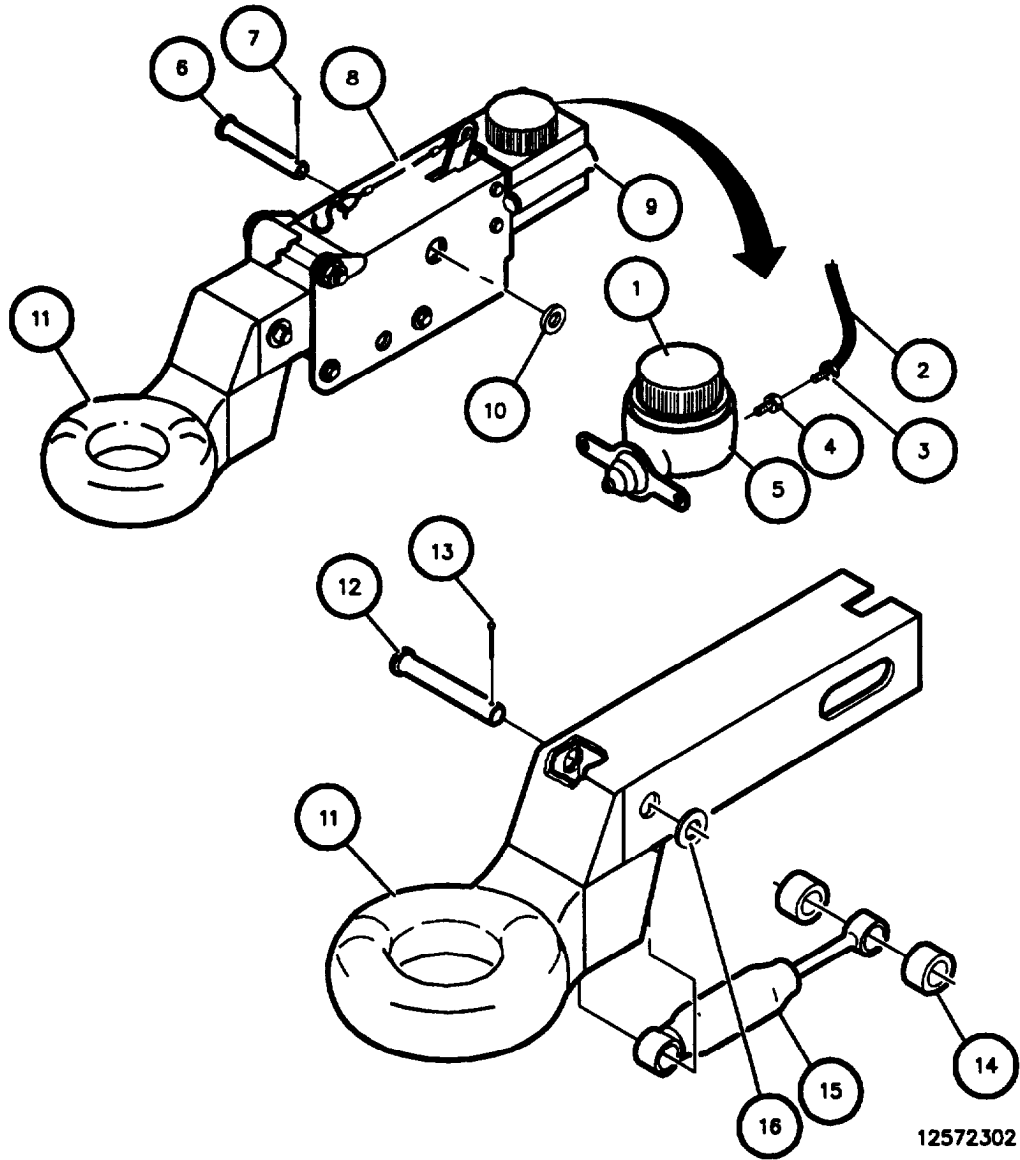
1. Remove cap (1) from master cylinder (5).
2. Remove cover (9) from master cylinder (5). Then reinstall cap (1) on master cylinder (5).

**NOTE**

- Use a suitable container to catch any draining brake fluid. Ensure that all spills are cleaned up.
- Master cylinder orifice (4) requires a 12-mm wrench.

3. Disconnect flex brake line (2) from master cylinder orifice (4) and install temporary plug in flex brake line fitting end (3).
4. Remove cotter pin (7) from master pin (6). Remove master pin (6) and washer (10). Discard cotter pin.
5. Remove lunette (11), with damper (15) and two rollers (14) attached, from brake actuator (8).
6. Remove cotter pin (13), damper pin (12), and washer (16) securing damper (15) to lunette (11). Discard cotter pin.

4-28A HYDRAULIC BRAKE ACTUATOR ASSEMBLY REPAIR (Con?). **4501** →



**4-28A HYDRAULIC BRAKE ACTUATOR ASSEMBLY REPAIR (Con't).** **4501** →

7. Remove two locknuts (17), two washers (18), and two capscrews (23) securing hydraulic actuator assembly (8) to trailer. Discard locknuts. Note that two spacers (24) remain with trailer tongue.
8. Remove hydraulic actuator assembly (8) from trailer tongue.
9. Remove two spacers (24) from trailer tongue.
10. Remove four capecrews (21) securing master cylinder mounting plate (26) to brake actuator housing (8). Remove master cylinder (5) with attached mounting plate (26) from actuator housing (8). Discard capscrews (21).
11. Remove hydraulic actuator breakaway lever (33) and attached breakaway cable (32) from actuator housing (8). Then remove breakaway leaf spring (34).
12. Remove two capscrews (27), nuts (30), washers (29), and springs (28) securing master cylinder mounting plate (26) and push rod assembly (31) to master cylinder (5). Carefully remove push rod assembly (31) and mounting plate (26) from master cylinder (5).
13. Remove nut (20) and washer (25) securing front roller bolt (22) and roller bolt cover (19) to actuator housing (8). Remove front roller bolt (22), front roller (36), and roller bolt cover (19) from actuator housing (8).

**b. CLEANING AND INSPECTION**

**WARNING**

Dry cleaning solvent, P-D-680, is toxic and flammable. Always wear goggles and gloves and use solvent only in a well-ventilated area. Avoid contact with shin, eyes, and clothes, and DO NOT breathe vapors. DO NOT use near open flame or excessive heat. The solvent's flash point is 100°F to 138°F (38°C to 59°C). If you become dizzy while using cleaning solvent, immediately get fresh air and medical help. If solvent contacts eyes, immediately wash your eyes and get medical aid.

1. Clean all removed components except master cylinder with dry cleaning solvent and allow to dry.
2. Inspect components for wear, cracks, breaks, corrosion, or other damage. Replace if damaged.
3. Inspect master cylinder and damper for leakage. Replace if defective.
4. Remove any corrosion with a wire brush.
5. Inspect Teflon bearings (35) in actuator housing (8). Replace if damaged.

**c. ASSEMBLY**

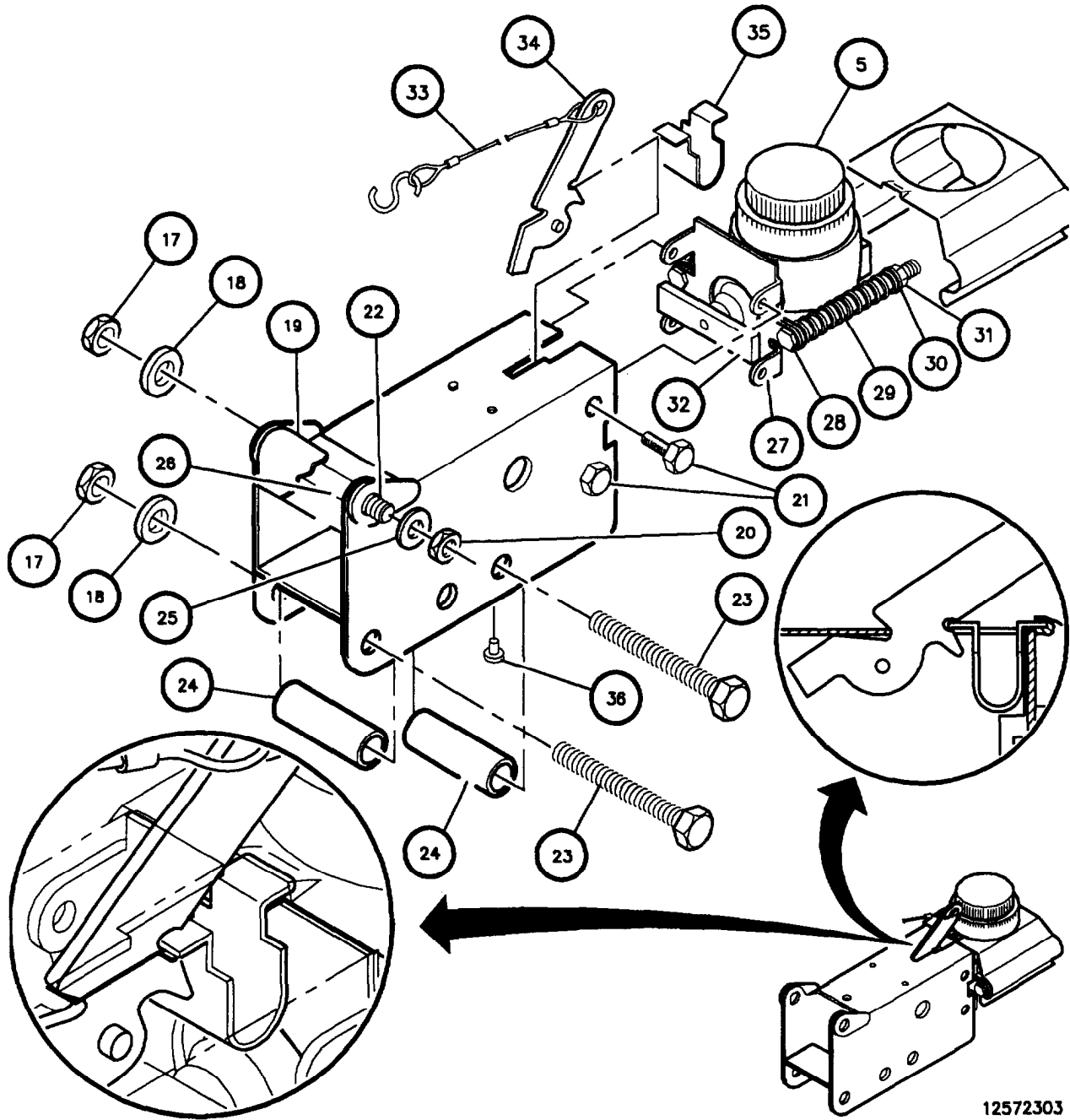
1. Install front roller bolt (22), front roller (36), and roller bolt cover (19) into actuator housing (8) and secure with washer (25) and nut (20).
2. Carefully install push rod assembly (31) and mounting plate (26) onto master cylinder (5). Install two capscrews (27), nuts (30), washers (29), and springs (28) to secure master cylinder mounting plate (26) and push rod assembly (31) to master cylinder (5).

**WARNING**

When installing breakaway lever spring (35) onto breakaway lever (34) and actuator housing (8), you must hold the spring in place until master cylinder (5) is installed. If the spring is not physically held in place as defined, it can fall out of the actuator housing, resulting in no surge brake protection for the trailer.

3. Install breakaway leaf spring (34) and breakaway lever (33) with attached breakaway cable (32) into actuator housing (8).

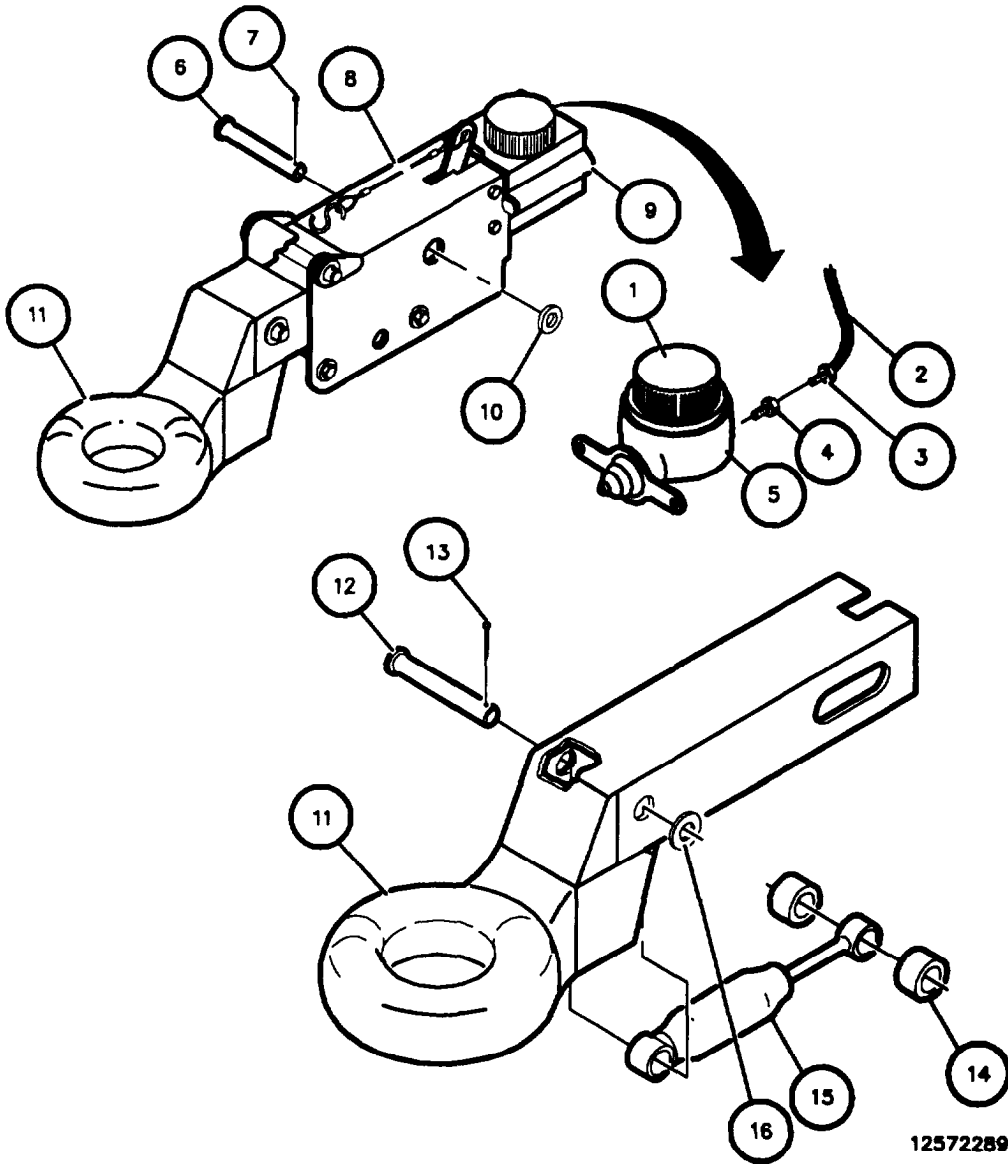
4-28A HYDRAULIC BRAKE ACTUATOR ASSEMBLY REPAIR (Con't).



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4-28A HYDRAULIC BRAKE ACTUATOR ASSEMBLY REPAIR (Con't). **4501** →

4. Install master cylinder (5) with attached mounting plate (26) into actuator housing (8). Install four new capscrews (21) to secure master cylinder mounting plate (26) to brake actuator housing (8).
5. Install damper (15) into lunette (11) and secure with damper pin (12), washer (16), and new cotter pin (13).
6. Install lunette (11), with attached damper (15) and two rollers (14), into brake actuator housing (8).
7. Install master pin (6), washer (10), and new cotter pin (7) securing lunette to actuator housing (8).
8. Install actuator assembly (8) on trailer tongue.



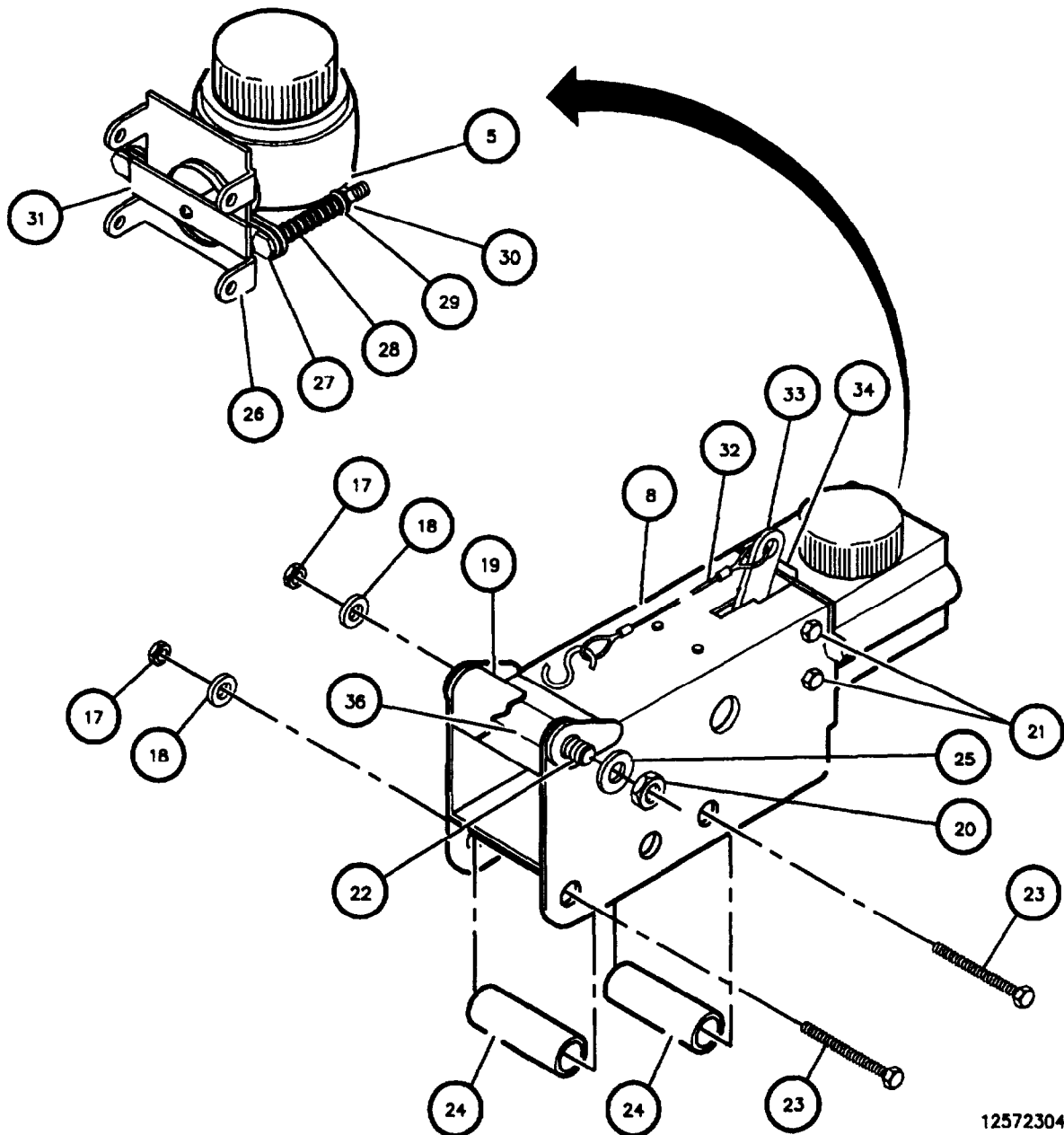
**4-28A HYDRAULIC BRAKE ACTUATOR ASSEMBLY REPAIR (Con't).**

9. Install two spacers (24) into trailer tongue.

**NOTE**

Ensure spacers remain aligned with mounting holes.

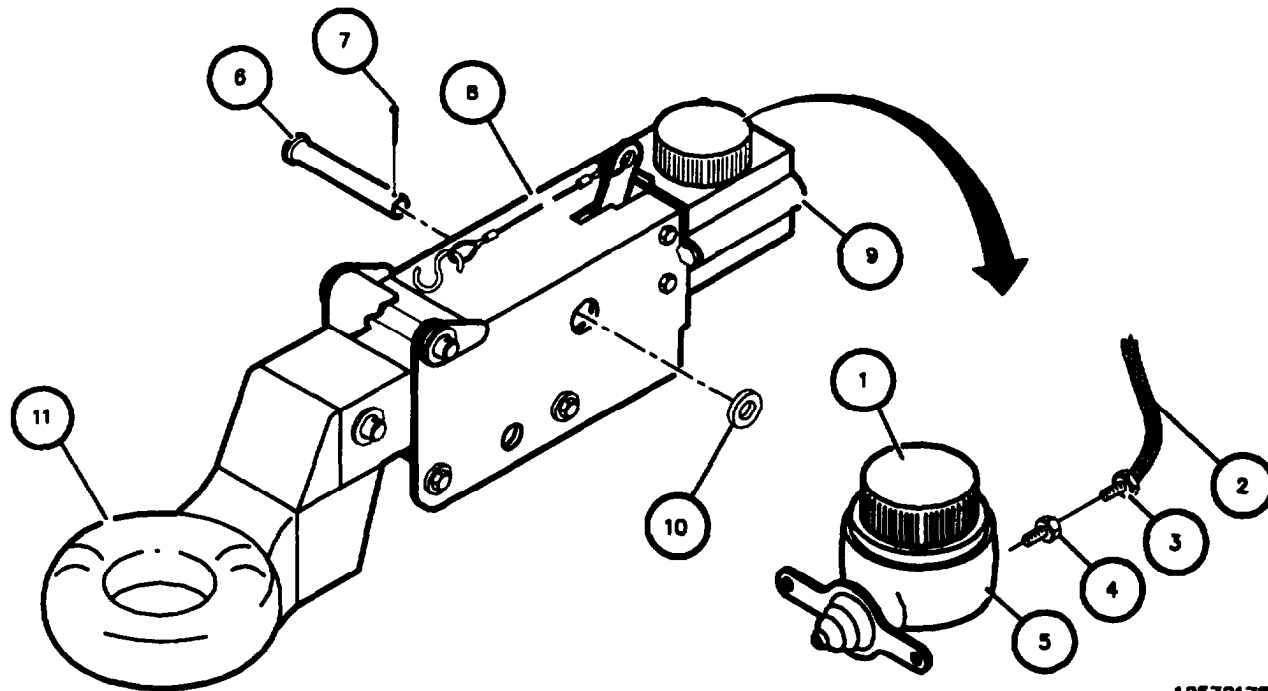
10. Align two spacers (24) with mounting holes.
11. Install two capscrews (23), two washers (18), and two locknuts (17) securing hydraulic actuator assembly (8) to trailer. Tighten nuts finger tight.
12. Tighten two locknuts (17) and torque to  $72 \pm 7$  ft•lb ( $98 \pm 9$  N•m).



12572304

4-28A HYDRAULIC BRAKE ACTUATOR ASSEMBLY REPAIR (Con't). **4501** →

13. Remove temporary plug from flex brake line fitting end (3).
14. Install flex brake line (2) in master cylinder orifice (4). Tighten flare fitting (3).
15. Remove cap (1) from master cylinder (6).
16. Install cover (9) on master cylinder (6). Then reinstall cap (1) on master cylinder (5).



12572178

**FOLLOW-ON TASKS:**

- Bleed hydraulic system (para 4-26).
- Install safety chains (para 4-35).



## 4-29 BREAKAWAY LEVER AND LEAF SPRING REPLACEMENT.

This task covers: a. Removal

b. Installation

**Initial Setup:****Equipment Conditions:**

- Handbrakes applied.
- Wheels chocked (para 2-8.1).

**Materials/Parts:**

- Tiedown strap (Item 12.1, Appendix E)

**Tools/Test Equipment:**

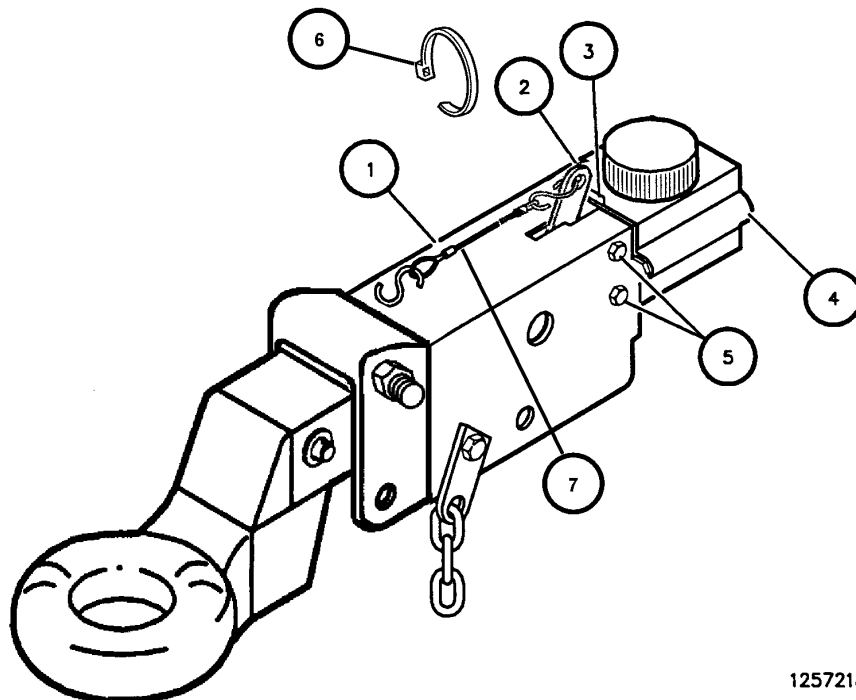
- General mechanics tool kit
- Common No. 1 shop set

**a. REMOVAL**

1. Remove four capscrews (5) from hydraulic actuator assembly (1).
2. Pry master cylinder assembly (4) 1/2 inch from hydraulic actuator assembly (1), providing access to breakaway lever (2) and leaf spring (3).
3. Remove hydraulic actuator breakaway lever (2) and leaf spring (3) from hydraulic actuator assembly (1).
4. If damaged, remove tiedown strap (6) from cable (7).

**b. INSTALLATION**

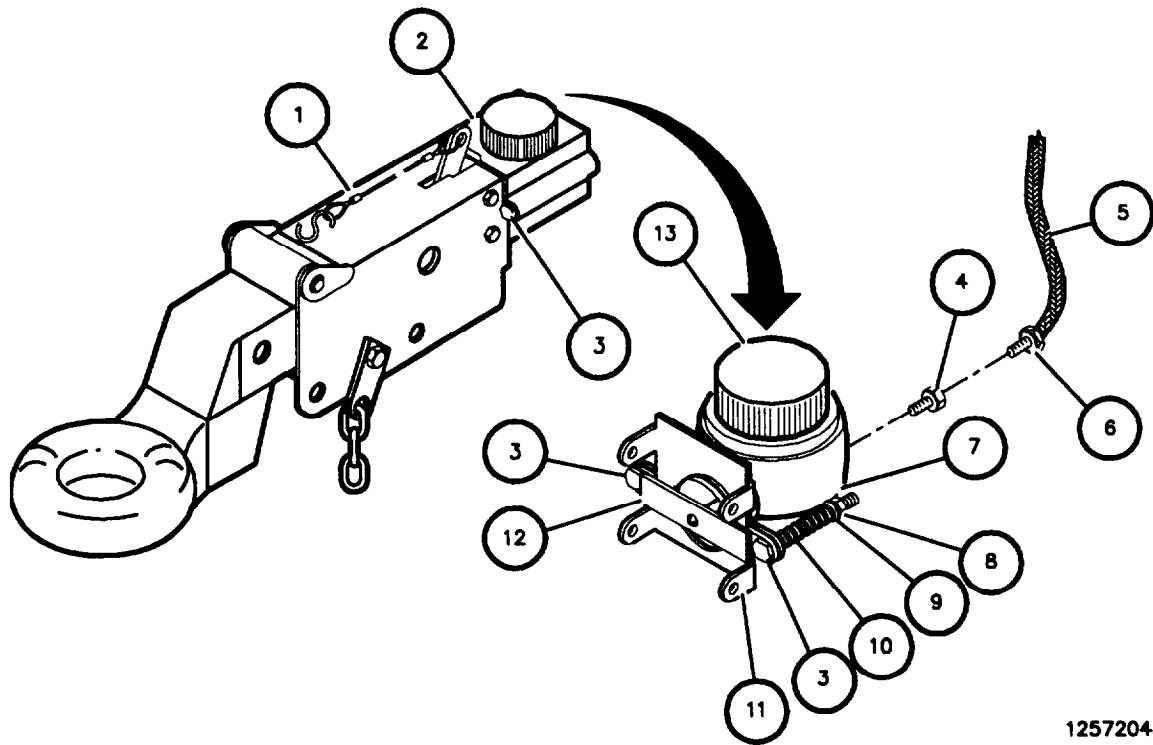
1. Install hydraulic actuator breakaway lever (2) and leaf spring (3) into hydraulic actuator assembly (1).
2. Install four capscrews (5) securing master cylinder assembly (4) in hydraulic actuator assembly (1). Torque capscrews (5) to  $30 \pm 3$  lb-ft ( $41 \pm 4$  N•m).
3. If removed, install tiedown strap (6) on cable (7).



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4-30 MASTER CYLINDER REPLACEMENT (Con't)



**FOLLOW-ON TASKS:**

- Bleed hydraulic system (para 4-26).
- Install safety chains (para 4-35).

4-31 HYDRAULIC BRAKE LINES REPLACEMENT.

---

<b>This task covers:</b>	<b>a. Front Flex Brake Line Removal</b>	<b>e. Rear Flex Brake Line Removal</b>
	<b>b. Front Flex Brake Line Installation</b>	<b>f. Rear Flex Brake Line Installation</b>
	<b>c. Front Solid Brake Line Removal</b>	<b>g. Rear Solid Brake Line Removal</b>
	<b>d. Front Solid Brake Line Installation</b>	<b>h. Rear Solid Brake Line Installation</b>

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**Initial Setup:**

**Equipment Conditions:**

- Handbrakes applied.
- Wheels chocked (para 2-8.1).

**Tool/Test Equipment:**

- General mechanics tool kit
- Common No. 1 shop set

**Materials/Parts:**

- Rags (Item 10, Appendix E)
  - Dry Cleaning Solvent (Item 5, Appendix E)
  - Wire Brush (Item 3, Appendix E)
  - Rivets
- 

**a. FRONT FLEX BRAKE LINE REMOVAL**

**NOTE**

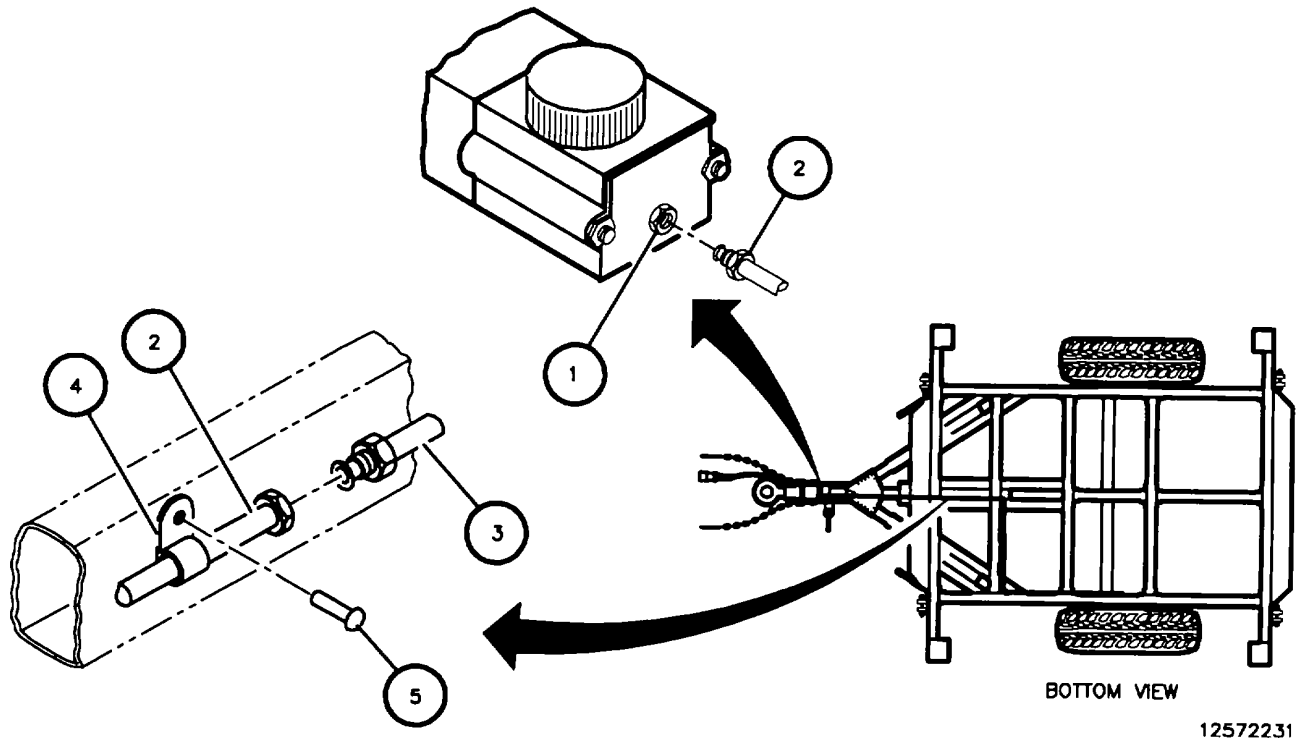
Master cylinder orifice requires a 12-mm wrench.

1. Disconnect flex brake line (2) from master cylinder orifice (1) and install temporary plug in master cylinder orifice (1).
2. Disconnect flex brake line (2) from solid brake line (3) and install temporary plug in solid brake line (3).
3. Remove rivet (5) and clamp (4) securing flex brake line (2) to frame. Remove flex brake line (2). Discard rivet.

**b. FRONT FLEX BRAKE LINE INSTALLATION**

1. Remove temporary plug from solid brake line (3) and connect flex brake line (2) to solid brake line (3). Tighten flare fitting.
2. Remove temporary plug from master cylinder orifice (1) and connect flex brake line (2) to master cylinder orifice (1). Tighten flare fitting.
3. Install new rivet (5) and clamp (4) securing flex brake line (2) to frame.

4-31. HYDRAULIC BRAKE LINES REPLACEMENT (Con't).



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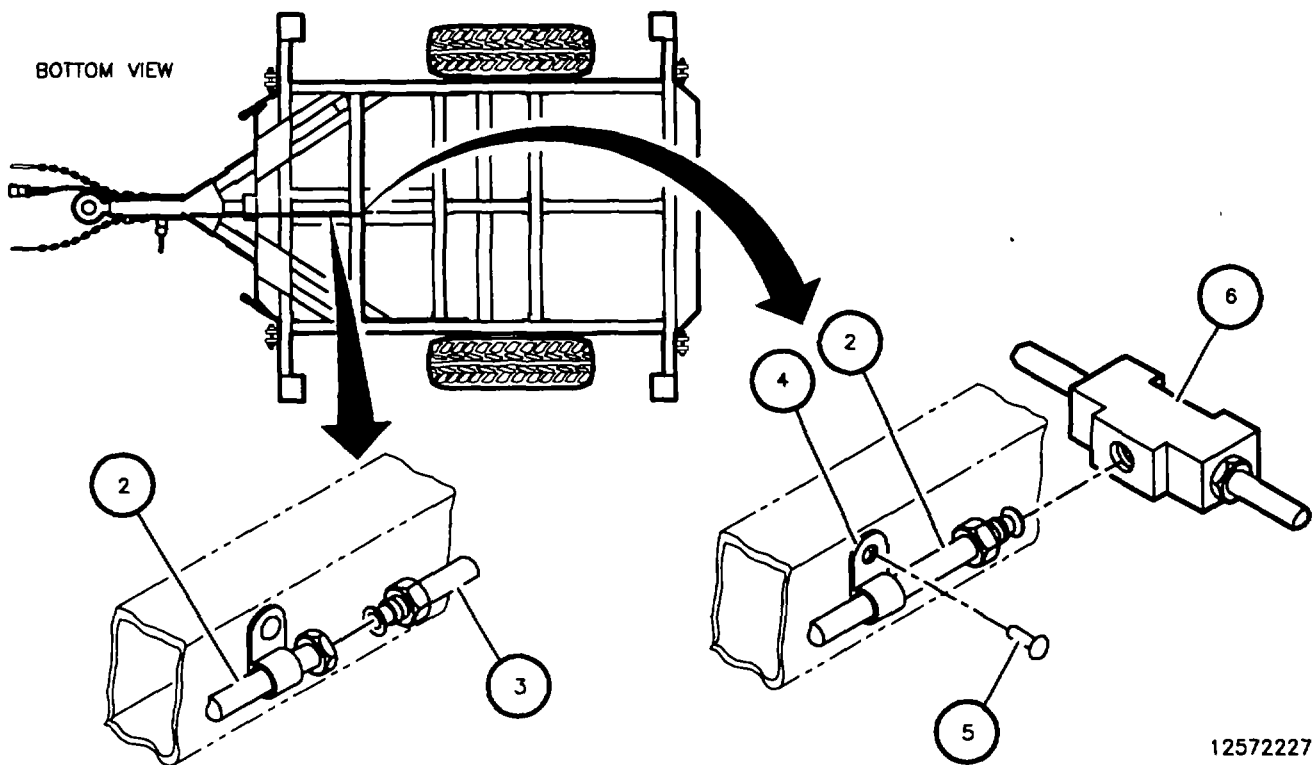
**4-31. HYDRAULIC BRAKE LINES REPLACEMENT (Con't).**

**c. FRONT SOLID BRAKE LINE REMOVAL**

1. Disconnect solid brake line (3) from flex brake line (2) and install temporary plug in flex brake line (2).
2. Disconnect solid brake line (3) from "tee" (6) and install temporary plug in "tee" (6)
3. Remove rivet (5) and clamp (4) securing solid brake line (3) to frame Remove solid brake line (3) Discard rivet

**d. FRONT SOLID BRAKE LINE INSTALLATION**

1. Remove temporary plug from "tee" (6) and connect solid brakeline (3) to "tee" (6). Tighten flare fitting.
2. Remove temporary plug from flex brake line (2) and connect solid brake line (3) to flex brake line (2). Tighten flare fitting
3. Install new rivet (5) and clamp (4) securing solid brake line (3) to frame.



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**4-31 HYDRAULIC BRAKE LINES REPLACEMENT (Con't).****e. REAR FLEX BRAKE LINE REMOVAL****NOTE**

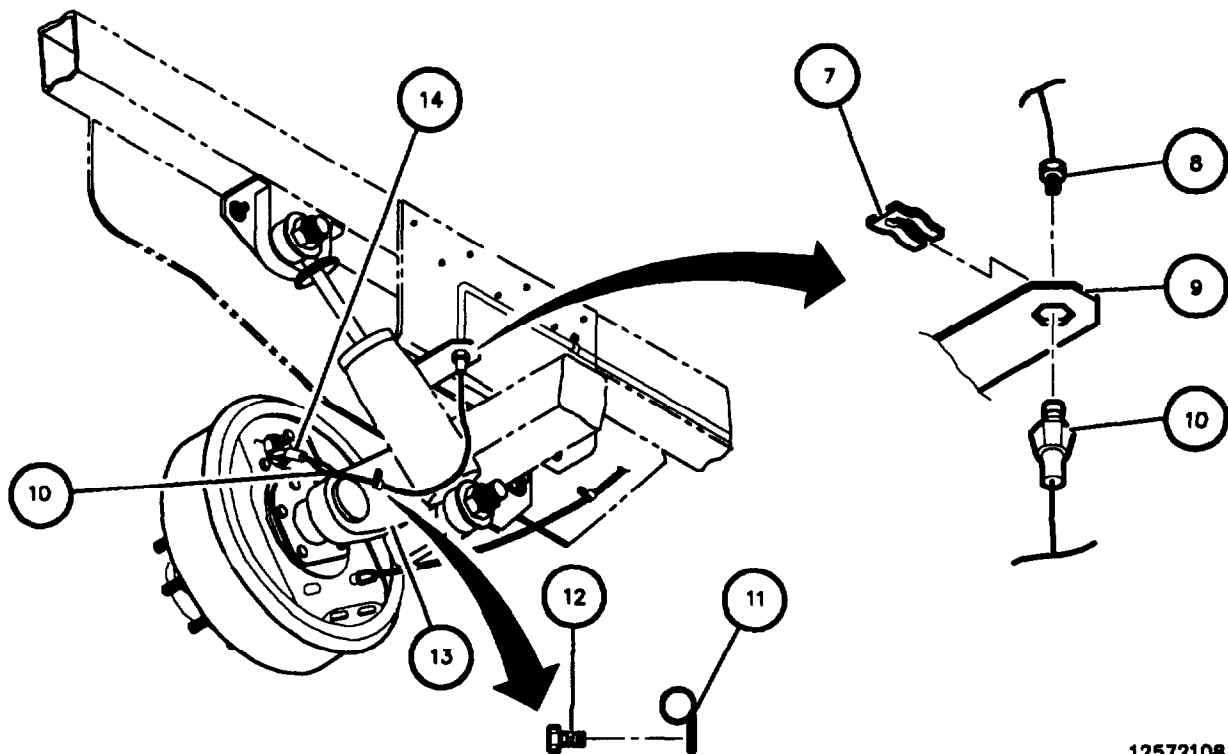
Both wheel hydraulic flex brake lines are removed in the same manner.

1. Remove clip (7) from bracket (9) securing flex brake line (10) and solid brake line (8).
2. Remove capscrew (12) and clamp (11) securing flex brake line (10) to torsion arm (13).
3. Disconnect flex brake line (10) from solid brake line (8) and install temporary plug in solid brake line (8).
4. Disconnect flex brake line (10) from wheel cylinder (14) and install temporary wheel plug in cylinder (14).

**f. REAR FLEX BRAKE LINE INSTALLATION****NOTE**

Both flex brake lines are replaced in the same manner.

1. Remove temporary plug from wheel cylinder (14) and connect flex brake line (10) to wheel cylinder (14). Tighten flare fitting.
2. Remove temporary plug from solid brake line (8) and connect solid brake line (8) to flex brake line (10). Tighten flare fitting.
3. Install clip (7) securing flex brake line (10) and solid brake line (8) to bracket (9).
4. Install capscrew (12) and clamp (11) securing flex brake line (10) to torsion arm (13).



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**4-31 HYDRAULIC BRAKE LINES REPLACEMENT (Con't).**

**g. REAR SOLID BRAKE LINE REMOVAL**

**NOTE**

Both rear solid brake lines are removed in the same manner.

1. Remove clip (7) securing flex brake line (10) and solid brake line (8) to bracket (9).
2. Disconnect flex brake line (10) from solid brake line (8) and install temporary plug in flex brake line (10).
3. Disconnect solid brake line (8) from "tee" (6) and install temporary plug in "tee" (6).
4. Remove rivet (5) and clamp (4) securing solid brake line (8) to frame. Remove solid brake line (8). Discard rivets.

**h. REAR SOLID BRAKE LINE INSTALLATION**

**NOTE**

Both solid brake lines are replaced in the same manner.

1. Remove temporary plug from "tee" (6) and connect solid brake line (8) to "tee" (6). Tighten flare fitting.
2. Remove temporary plug from flex brake line (10) and connect solid brake line (8) to flex brake line (10). Tighten flare fitting.
3. Install clip (7) securing flex brake line (10) and solid brake line (8) to bracket (9).
4. Install new rivets (5) and clamps (4) securing solid brake line (8) to frame.

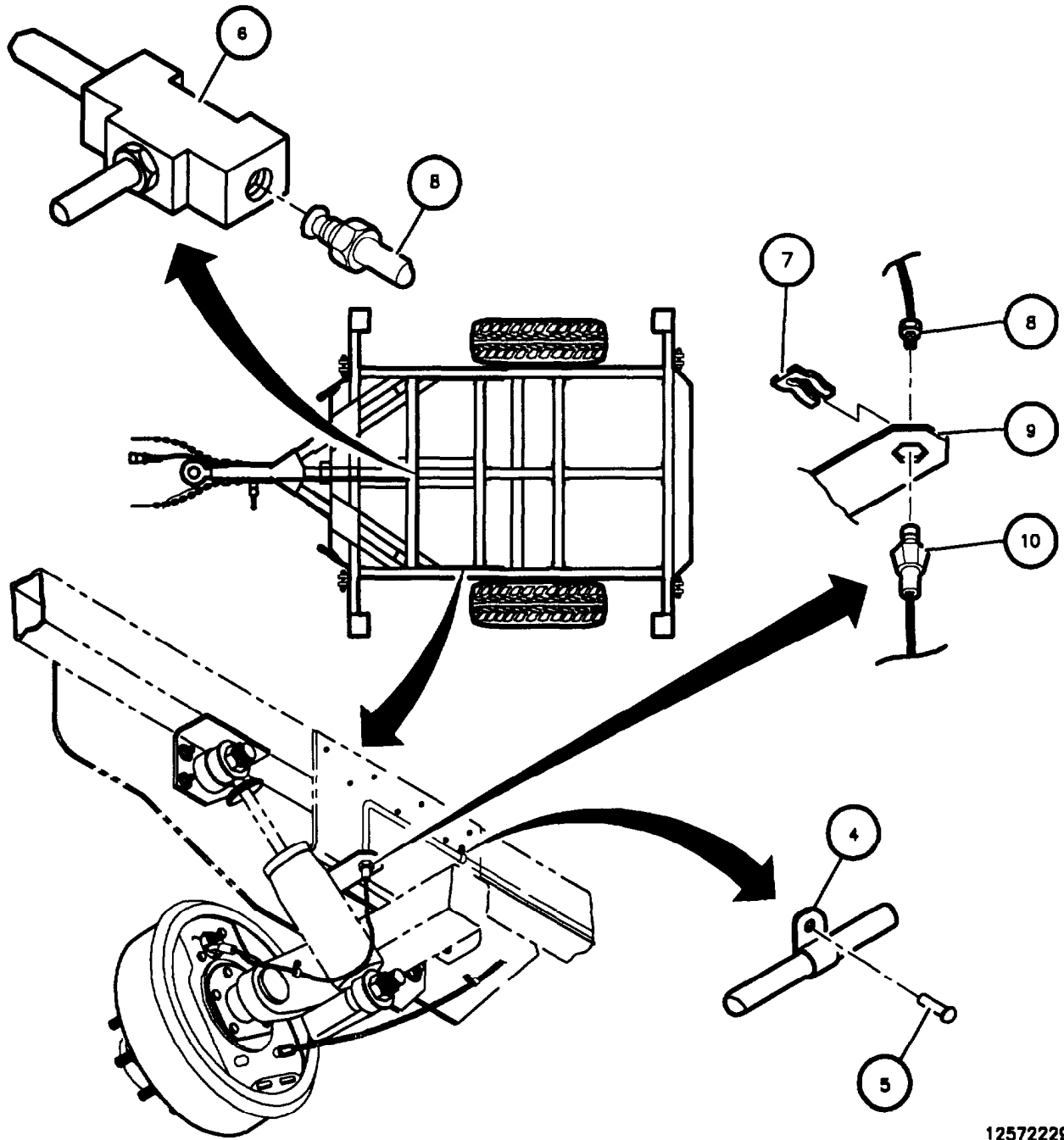
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**FOLLOW-ON TASKS:**

- Bleed hydraulic system (para 4-26).



4-31 HYDRAULIC BRAKE LINES REPLACEMENT (Con't)



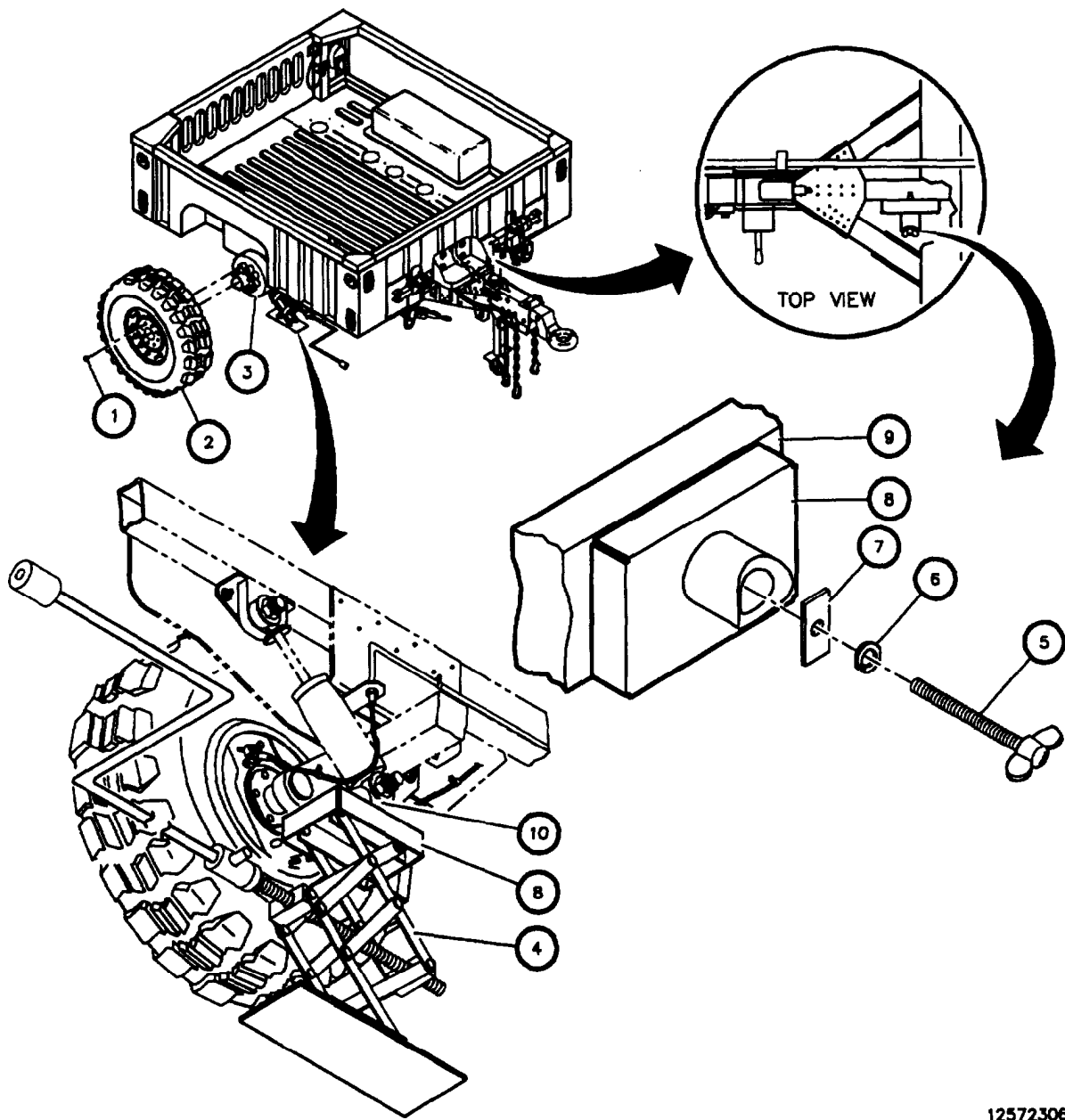
12572229



## 4-32 WHEEL AND TIRE ASSEMBLY REPLACEMENT (Con't).

## b. INSTALLATION

1. Install wheel and tire assembly (2) on hub/drum (3).
2. Install eight wheel lug nuts (1) securing wheel (2) on hub/drum (3) and tighten finger tight.
3. Lower (trailer) wheel (2). Remove jack (4) and jack spacer (8).
4. Tighten eight wheel lug nuts (1). Torque eight lug nuts (1) alternately and evenly to  $95$  to  $105 \pm 5$  lb-ft ( $129$  to  $143$  N•m).
5. Position jack spacer (8) on trailer frame (9) and secure with rectangular washer (7), lockwasher (6), and wingscrew (5).



12572306

**4-33 HUB/DRUM, RACE, AND BEARING SEAL MAINTENANCE.**

**This task covers:** a. Removal  
 b. Disassembly  
 c. Cleaning and Inspection

d. Assembly  
 e. Installation

**Initial Setup:**

**Equipment Conditions:**

- Wheel removed (para 4-32).

**Tools/Test Equipment:**

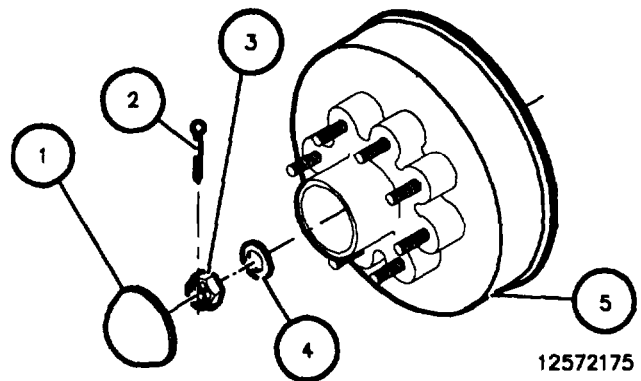
- General mechanics tool kit
- Common No. 1 shop set

**Materials/Parts:**

- Rags (Item 10, Appendix E)
- Dry Cleaning Solvent (Item 5, Appendix E)
- Wire Brush (Item 3, Appendix E)
- Lubricant (Item 6, Appendix E)
- Sealant (Item 12, Appendix E)
- Cotter Pin
- Grease Seal

**a. REMOVAL**

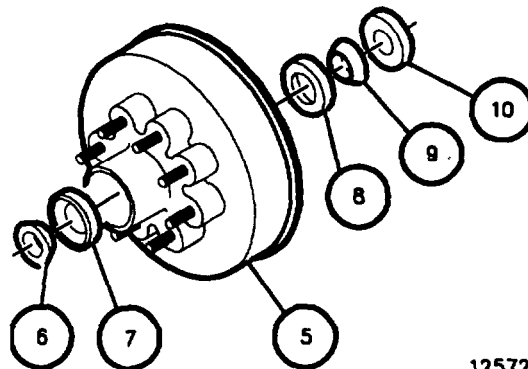
1. Remove grease cap (1).
2. Remove cotter pin (2) and discard.
3. Remove spindle nut (3) and washer (4).
4. Remove hub/drum (5) with bearings and grease seal installed.



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**b. DISASSEMBLY**

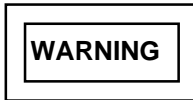
1. Remove grease seal (10) from hub/drum (5). Discard grease seal.
2. Remove inner bearing (9) and inner race (8) from hub/drum (5). Discard bearing (9) and race (8).
3. Remove outer bearing (6) and outer race (7) from hub/drum (6). Discard bearing (6) and race (7).



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4-33. HUB/DRUM, RACE, AND BEARING SEAL MAINTENANCE (Con't).

c. CLEANING AND INSPECTION

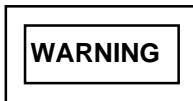


Dry cleaning solvent, P-D-680, is toxic and flammable. Always wear goggles and gloves and use solvent only in a well-ventilated area. Avoid contact with skin, eyes, and clothes, and DO NOT breathe vapors. DO NOT use near open flame or excessive heat. The solvent's flash point is 100 °F to 138 °F (38 °C to 59 °C). If you become dizzy while using cleaning solvent, immediately get fresh air and medical help. If solvent contacts eyes, immediately wash your eyes and get medical aid.

1. Clean all removed components with dry cleaning solvent and allow to dry.
2. Inspect components (11, 13) for wear, cracks, breaks, corrosion, or other damage. Replace if damaged.
3. Remove any corrosion with a wire brush.

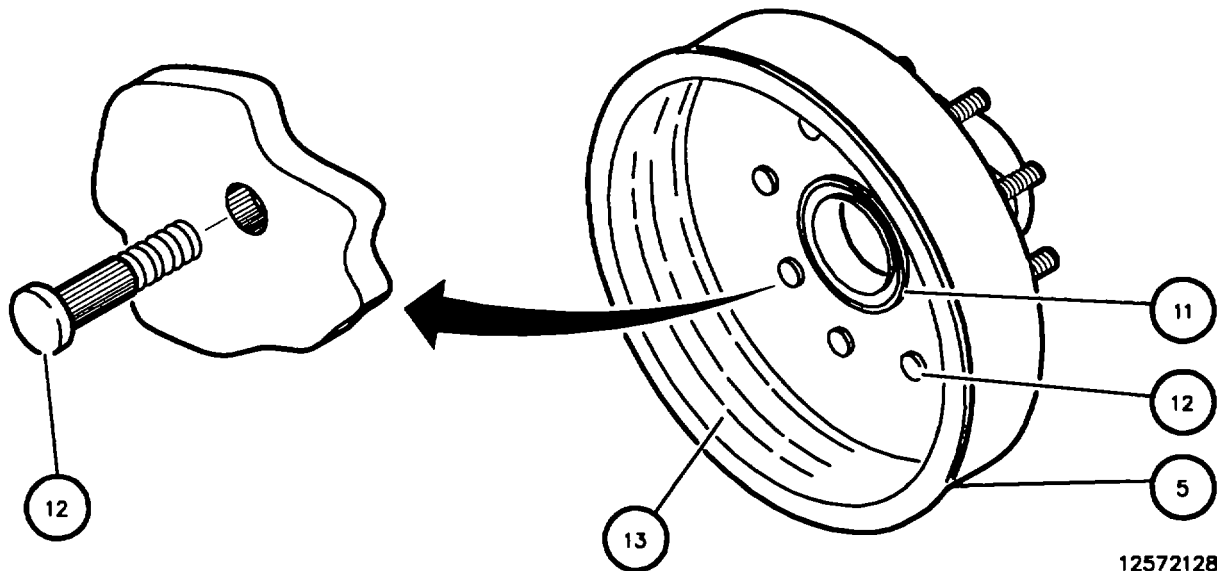
NOTE

Perform steps 4 and 5 only if any studs are found to be damaged.



Removing metal parts could be dangerous to personnel. Injury may result if metal chips contact eyes. Always wear eye protection when replacing wheel stud. Failure to follow this warning may result in injury to personnel

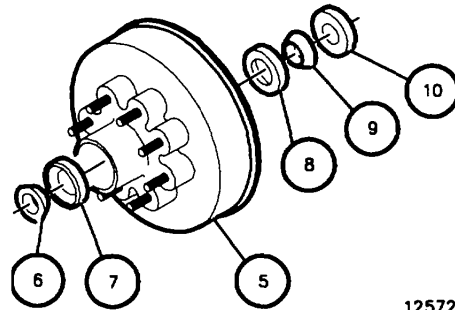
4. Drive stud (12) out of hub/drum (5). Discard stud.
5. Align splines on stud (12) with splines in hub/drum (5) and press stud (12) into hub/drum (5) until stud shoulder seats against hub/drum.



**4-33. HUB/DRUM, RACE, AND BEARING SEAL MAINTENANCE (Con't).**

**d. ASSEMBLY**

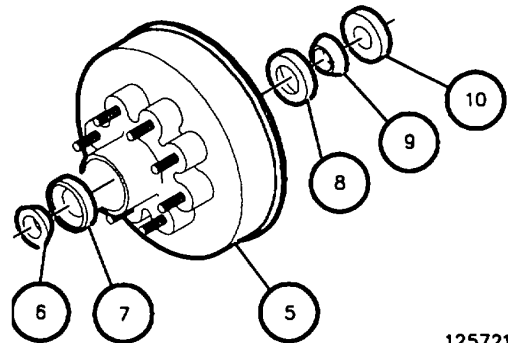
1. Install outer bearing race (7) and apply a thin film of lubricant to surface of outer bearing race (7).
2. Install inner bearing race (8) and apply a thin film of lubricant to surface of inner bearing race (8).
3. Pack two bearings (6 and 9) with lubricant by pressing fresh bearing grease into bearing roller area.
4. Install inner bearing (9) in hub/drum (5)
5. Apply a thin film of lubricant to the outer edge of grease seal (10) and install grease seal (10) in hub/drum (5). Wipe excessive lubricant from outer surface of seal (10).



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**e. INSTALLATION**

1. Install hub/drum (5), with inner bearing and seal, on axle (14).
2. Install outer bearing (6), washer (4), and spindle nut (3).
3. Make sure that the spindle nut (3) turns freely on the spindle (14) and the brakes are not dragging
4. While turning the hub/drum slowly, tighten the spindle nut (3) to seat bearings.
5. Back off the spindle nut as required to align the cotter pin hole.
6. Install a cotter pin (2) and bend ends to secure the spindle nut (3).
7. Apply sealant to surface of grease cap (1).
8. Install grease cap (1) on hub/drum (5).



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**FOLLOW-ON TASKS:**

- Install wheel (para 4-32).

**4-34. RADIAL TIRE, WHEEL, AND RUNFLAT REPAIR.****This task covers:**

- |  |  |
|--|--|
| <ul style="list-style-type: none"> <li>a. Disassembly</li> <li>b. Inspection and Cleaning</li> </ul> | <ul style="list-style-type: none"> <li>b. Installation</li> <li>d. Assembly</li> </ul> |
|--|--|

**INITIAL SETUP:**

## Equipment Conditions: Materials/Parts:

- Wheel removed (para 4-32).
- Twelve Locknuts
- O-Ring Seal

## Tools/Test Equipment:

- Detergent (Item 4, Appendix E)
- General mechanics tool kit
- Common No. 1 shop set
- J39250 (TM 9-2320-280-20-2)
- 528236 (TM 9-2320-280-20-2) Appendix E)
- Two Lubricant Packets
- Adhesive Tape (Appendix F, J)
- Sealing Compound, if required (Item 12,

## General Safety Instructions:

- Do not use tire machine.
- Ensure tire is totally deflated before removing wheel locknuts.
- Never use tubes in wheel assemblies.
- Rim surfaces must be kept clean and free of rust and dirt.
- Never use wheel assemblies with damaged studs.
- Never inflate a wheel assembly with the wheel locknuts removed.
- Never inflate a wheel assembly without first checking wheel locknut torques.
- Do not exceed recommended tire inflation pressure.
- Always use a tire inflation cage and a clip-on air chuck for tire inflation.
- Ensure runflat compressor strap is centered around runflat.

**4-34. RADIAL TIRE, WHEEL, AND RUNFLAT REPAIR (Con't).**

**WARNING**

DO NOT use tire machine. Injury to personnel or damage to equipment may result.

**a. DISASSEMBLY**

1. Place wheel assembly in a tire inflation cage.

**WARNING**

In all disassembly operations, ensure the tire is totally deflated before removing wheel locknuts. Failure to follow proper safety precautions could cause injury or death.

2. Remove valve core (8) from valve bore (9) and deflate tire (6) Run a piece of wire through valve bore (9) to make sure it is not plugged
3. When tire (6) is fully deflated, use a circular pattern and loosen 12 wheel locknuts (2) securing rim halves (1) and (4) together. If you hear escaping air, do not proceed. Wait until the sound stops and recheck valve bore (9). When you are certain the tire (6) is fully deflated, proceed to remove wheel locknuts (2). Discard locknuts (2).

**WARNING**

Never inflate a wheel assembly with the wheel locknuts removed in an attempt to separate inner and outer rim halves. The assembly will separate under pressure, resulting in serious injury or death.

4. Remove outer rim half (1) from tire (6).

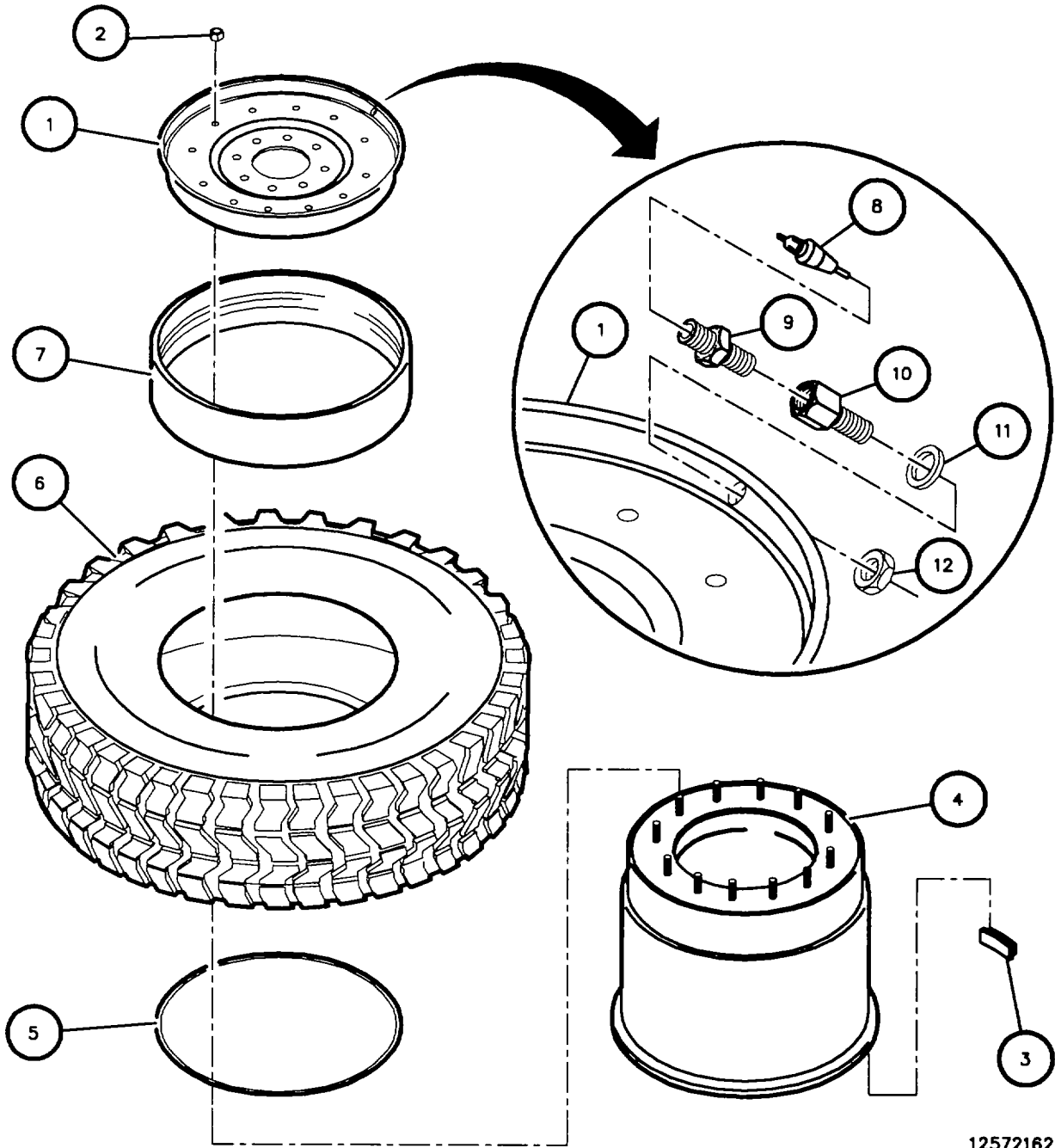
**NOTE**

Perform steps 5 and 6 only if damage to valve bore, insert, or O-ring is evident.

5. Remove valve bore (9) from insert (10). Remove insert (10) and locknut (12) from outer rim (1). Discard locknut (12)
6. Remove O-ring (11) from insert (10) Discard O-ring (11).
7. Remove O-ring seal (5) from inner rim half (4). Cut O-ring seal (5) in two to make sure that it cannot be reused. Discard O-ring seal (5).
8. Remove tire (6) from rim half (4).
9. Remove balance weights (3) from rim halves (1) and (4), if present. Discard balance weights (3).
10. Remove runflat spacer (7) from tire (6)
11. Lay tire (6) flat.

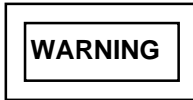


4-34. RADIAL TIRE, WHEEL, AND RUNFLAT REPAIR (Con't).



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4-34. RADIAL TIRE, WHEEL, AND RUNFLAT REPAIR (Con't).



Ensure runflat compressor strap is centered around runflat. Failure to do so could cause injury to personnel

NOTE

Perform steps 12 and 13 when using runflat compressor P/N J39250. Perform steps 14 and 15 when using runflat compressor P/N 528236.

12. Position runflat compressor (14) on runflat (13) so that runflat compressor hex drive (15) is facing up and strap (16) is centered around runflat (13).

NOTE

Compress runflat by rotating hex drive in either direction. Rotate hex drive opposite to loosen.

13. Using runflat compressor (14), compress runflat (13).
14. Position runflat compressor (17) on an outer edge of runflat (13) with handle assembly (18) facing up and strap (19) centered around runflat (13).

NOTE

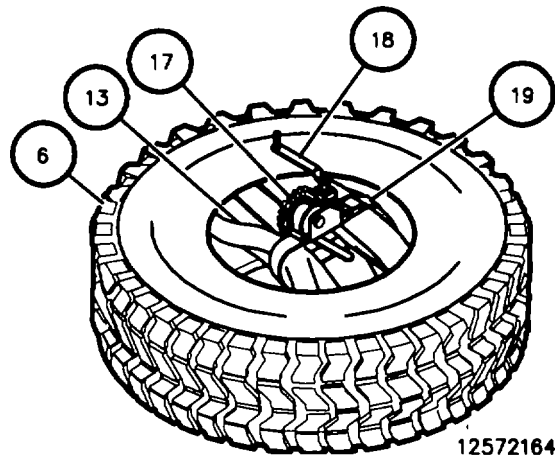
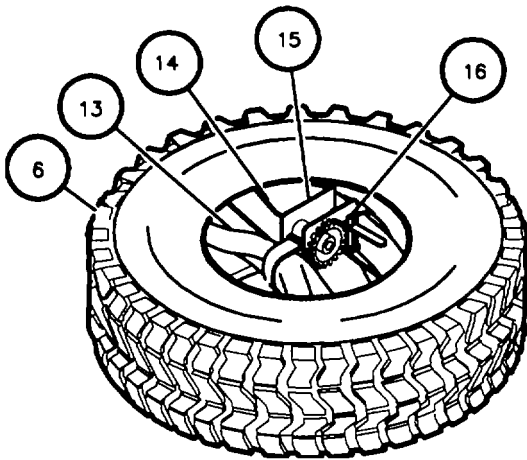
Compress runflat by rotating the handle assembly in a clockwise direction. Rotate handle assembly counterclockwise to loosen.

15. Using runflat compressor (17), compress runflat (13).

NOTE

- It may be necessary to use a tire spoon and detergent to remove runflat from tire.
- When using runflat compressor P/N 528236, handle may need to be removed before removing runflat

16. Remove runflat (13) from tire (6) and remove runflat compressor (14) or (17) from runflat (13).



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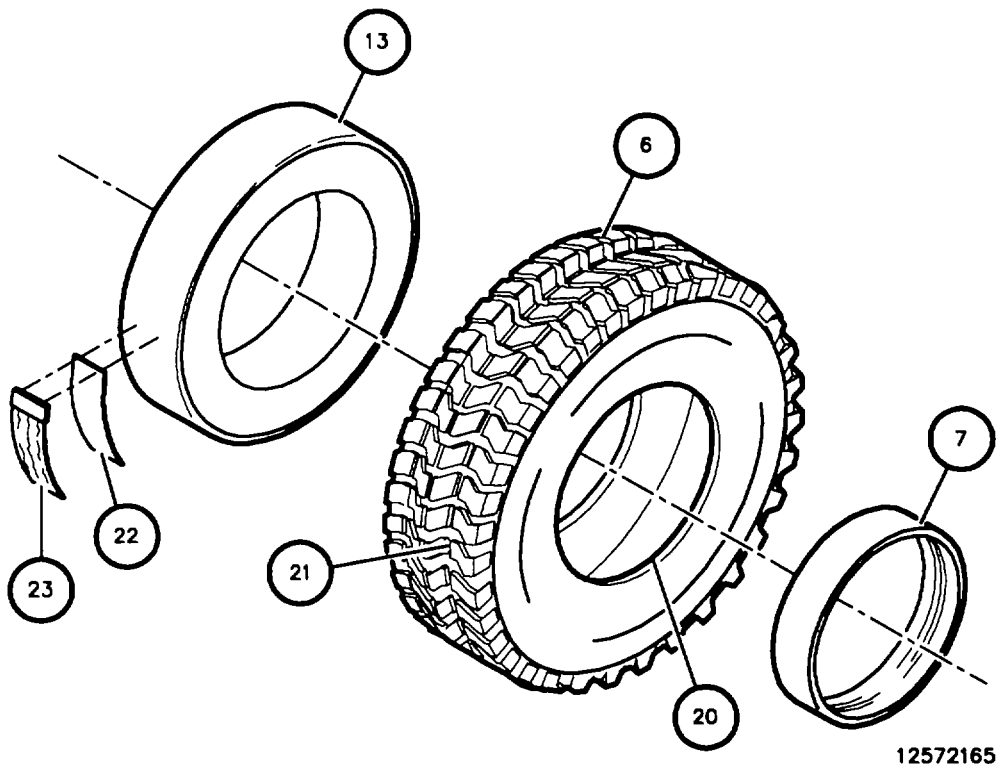
**4-34. RADIAL TIRE, WHEEL, AND RUNFLAT REPAIR (Con't).**

17. Remove two lubricant packets (23) and adhesive tape (22) from runflat (13).

**b. INSPECTION AND CLEANING****CAUTION**

Do not reuse a tire that has been run flat without thoroughly inspecting for damage. Failure to follow these instructions may result in damage to equipment.

1. Inspect inside of tire (6) for cord or belt separation and inner liner damage. Replace tire (6) if damaged.
2. Inspect tire bead (20) for abrasions caused from runflat (13). Replace tire (6) if damaged.
3. Check for protruding objects inside tire (6) that may not be visible from outside. Repair tire (6) if damaged.
4. Check tread depth on tire (6). Tread should not be worn below level of wear bars (21). Replace tire (6) if tread is worn below wear bars (21) or 3/32 in. (2.38 mm).
5. Inspect runflat spacer (7) for splitting, wear, or excessive chafing. Replace runflat spacer (7) if damaged.
6. Inspect runflat (13) for splitting, wear, or excessive chafing. Replace runflat (13) if damaged.



4-34. RADIAL TIRE, WHEEL, AND RUNFLAT REPAIR (Con't).

**WARNING**

O-ring sealing surfaces and pressure relief grooves must be kept clean and free of rust and dirt. Failure to do so could cause the wheel assembly to separate under pressure, causing serious injury or death.

7. Using wire brush, clean studs (24). Clean all dirt and foreign material from rim halves (1) and (4) with detergent and water and allow to air dry. Ensure O-ring sealing surfaces (25) and pressure relief grooves (26) on rim halves (1) and (4) are smooth and clean.
8. Inspect rim halves (1) and (4) for cracks, damaged sealing surfaces (25), or oversized mounting holes. Replace rim halves (1) or (4) if cracked, bent, or if mounting holes are oversized.

**WARNING**

Never use wheel assemblies with studs that are damaged, loose, or have damaged threads. Damaged studs can cause improper assembly, which could cause individual fasteners to fail. Any of these situations could cause serious injury or death.

9. Inspect inner rim half(4) for cracked, broken, rusted, pitted, bent, or loose studs (24) and studs (24) with damaged, mutilated, or deformed threads. Replace studs (24) if damaged, loose, or threads are damaged.
10. Inspect valve core (8) for cracks or deterioration. Replace valve core (8) if cracked or deteriorated.

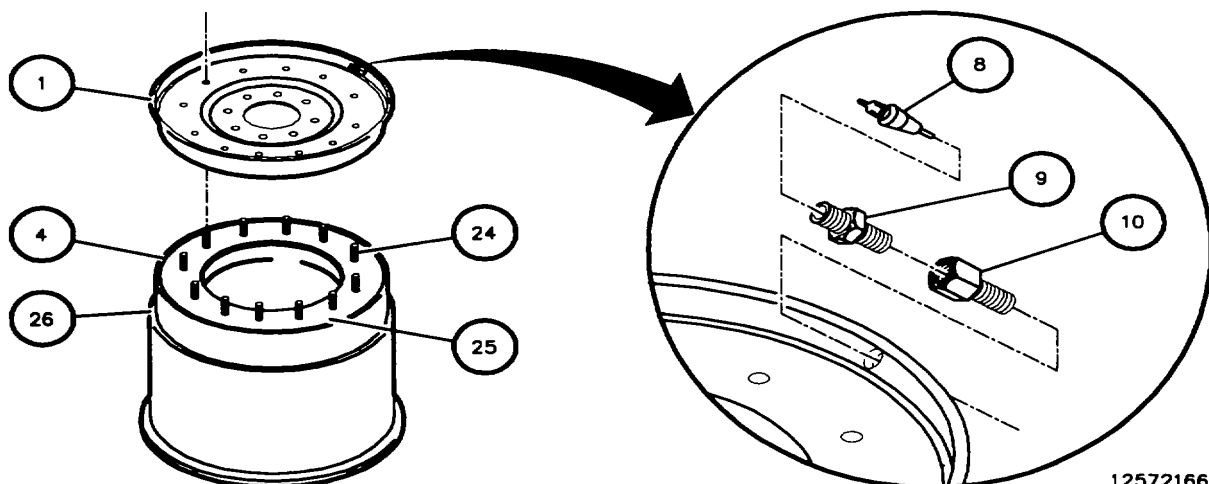
**NOTE**

Perform steps 11 and 12 only if valve bore and insert were removed

11. Inspect valve bore (9) for cracks or deterioration. Replace valve bore (9) if cracked or deteriorated
12. Inspect insert (10) for damage Replace insert (10) if damaged.

c. REPAIR

Refer to TM 9-2610-200-14 for maintenance and repair of tires



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**4-34. RADIAL TIRE, WHEEL, AND RUNFLAT REPAIR (Con't).****d. ASSEMBLY****WARNING**

- Never use tubes in wheel assemblies. Use of a tube defeats built-in safety features, and could allow the wheel to come apart under pressure, resulting in serious injury or death.
- Use only replacement parts specified in Appendix F. Wheels assembled with components that do not meet specifications could cause the assembly to separate under pressure, resulting in serious injury or death.
- Ensure runflat compressor strap is centered on runflat Failure to do so could cause injury to personnel.

**NOTE**

Perform steps 1 and 2 when using runflat compressor P/N J39250. Perform steps 3 and 4 when using runflat compressor P/N 528236.

1. Position runflat compressor (27) on runflat(13) so that runflat compressor hex drive (28) is facing up and strap (32) is centered around runflat (13).

**NOTE**

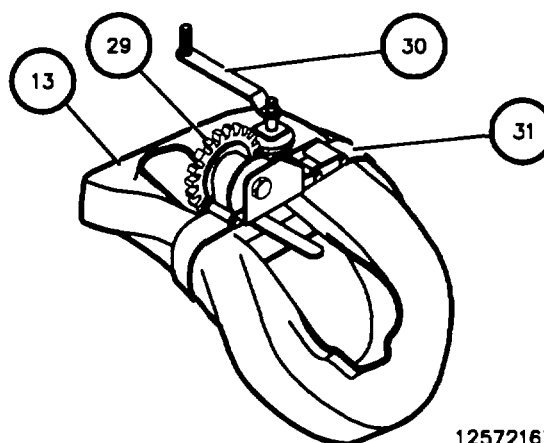
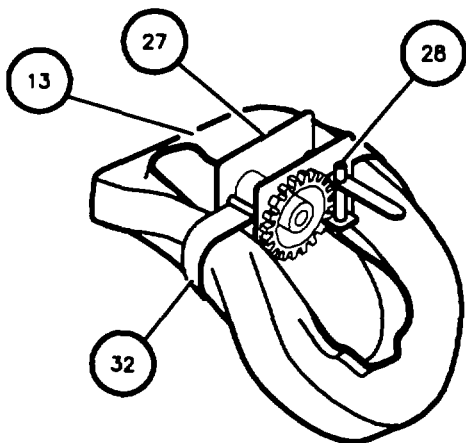
Compress runflat by rotating hex drive in either direction. Rotate hex drive opposite to loosen.

2. Using runflat compressor (27), compress runflat (13).
3. Position runflat compressor (29) on an outer edge of runflat (13) with handle assembly (30) facing up and strap (31) centered around runflat (13).

**NOTE**

Compress runflat by rotating the handle assembly in a clockwise direction. Rotate handle assembly counterclockwise to loosen.

4. Using runflat compressor (29), compress runflat (13).



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**4-34. RADIAL TIRE, WHEEL, AND RUNFLAT REPAIR (Con't).**

5. Stand tire (6) up and lubricate tire bead (20) with detergent.

NOTE

It may be necessary to remove the handle assembly on runflat compressor P/N 528236 before inserting runflat into tire.

6. Insert runflat (13), compressor side first, as far as possible into tire (6).
7. Lay tire (6) flat on protruding runflat side. Loosen compressor (30). Runflat (13) should insert itself inside tire (6). If not, repeat steps 4 through 6 and/or use a tire spoon to assist in installation.

NOTE

If required, clean and lubricate bearing assembly on runflat compressor P/N 528236 after removal.

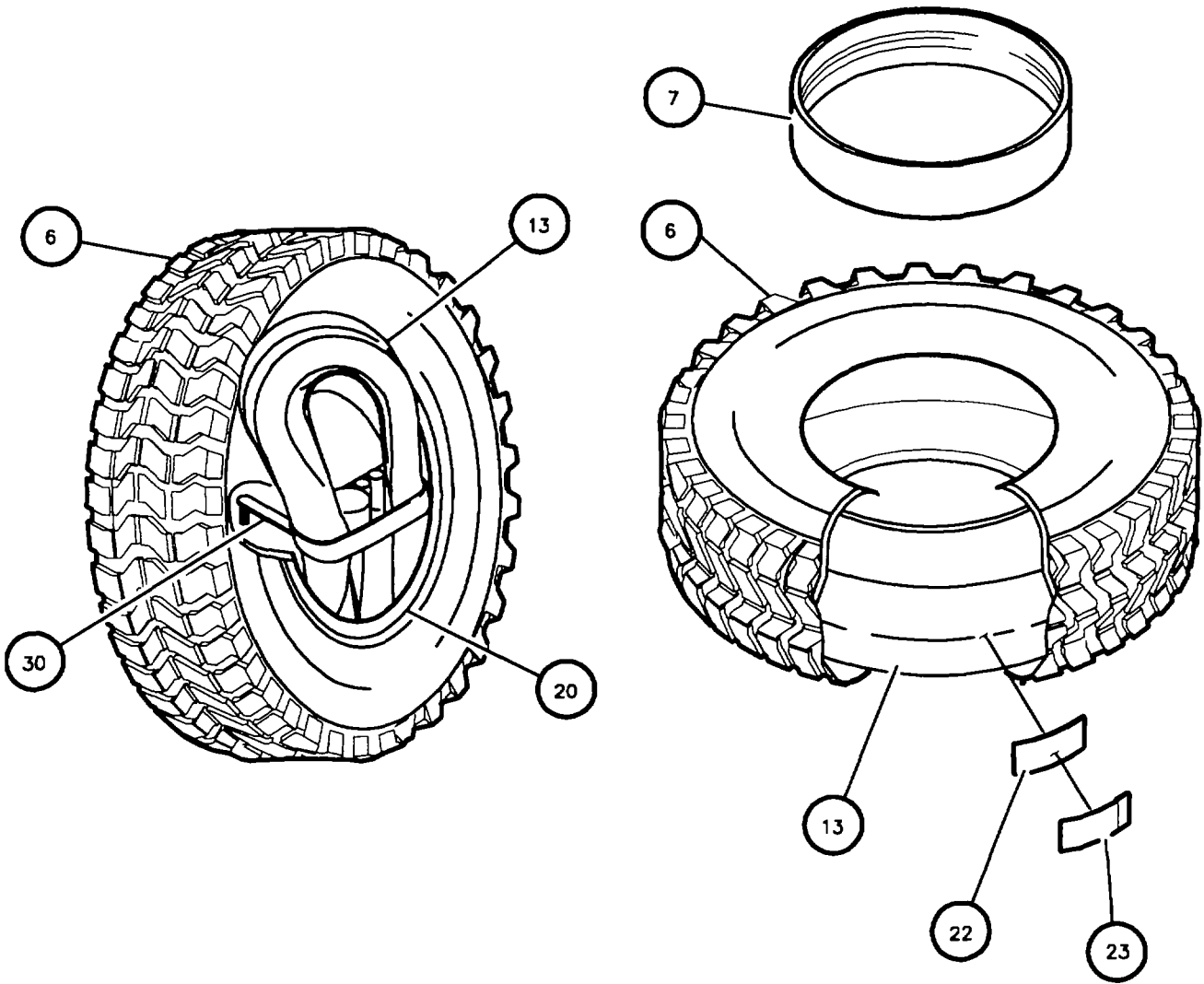
8. Loosen runflat compressor (30) and remove from tire (6).
9. Position strip of double-sided adhesive tape (23) on each side of runflat (13).
10. Position two packets of lubricant (22) on adhesive tape (23) and runflat (13).

NOTE

- Ensure longer lip of runflat faces the inner rim of tire.
- Ensure runflat spacer butts up against flat side of runflat.

11. Install runflat spacer (7) inside tire (6) and position on valve side of tire (6).

4-34. RADIAL TIRE, WHEEL, AND RUNFLAT REPAIR (Con't).



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**4-34. RADIAL TIRE, WHEEL, AND RUNFLAT REPAIR (Con't).**

12. Lubricate O-ring seal (5) with detergent and install O-ring seal (5) in first ledge of inner rim half (4). Make sure O-ring seal (5) is not twisted and is uniformly positioned 1 in. (25.4 mm) below studs (24). Do not overstretch O-ring seal (5).
13. Lubricate tire bead (20) and rim bead seat areas with detergent.

**WARNING**

Never install radial tire on eight-bolt wheel. Damage to equipment may result, causing injury to personnel.

**NOTE**

Before installing tire on inner rim half, inspect tire sidewalls for a "paint dot." Paint dots are often painted on tires to indicate the tire's light spot, for balancing purposes. If paint dot is present, position tire on rim halves so that paint dot is aligned with insert hole on outer rim half.

14. Center runflat (13) and runflat spacer (7) in tire (6). Carefully lower tire (6) over inner rim half (4). Check to ensure O-ring seal (5) has not been disturbed.
15. Ensure runflat (13) and runflat spacer (7) are not binding on flat portion of inner rim half (4). Runflat (13) and runflat spacer (7) should clear inner rim half (4).
16. Install valve core (8) in valve bore (9).

**NOTE**

Perform step 17 only if valve bore and insert were removed.

17. Install insert (10), O-ring (11), and locknut (12) on outer rim (1). Apply sealing compound to valve bore (9) and install valve bore (9) on insert (10). Tighten locknut (12) to 40 to 60 lb-in. (5 to 7 Nom). Tighten valve bore (9) to 25 to 30 lb-ft (34 to 41 Norm).

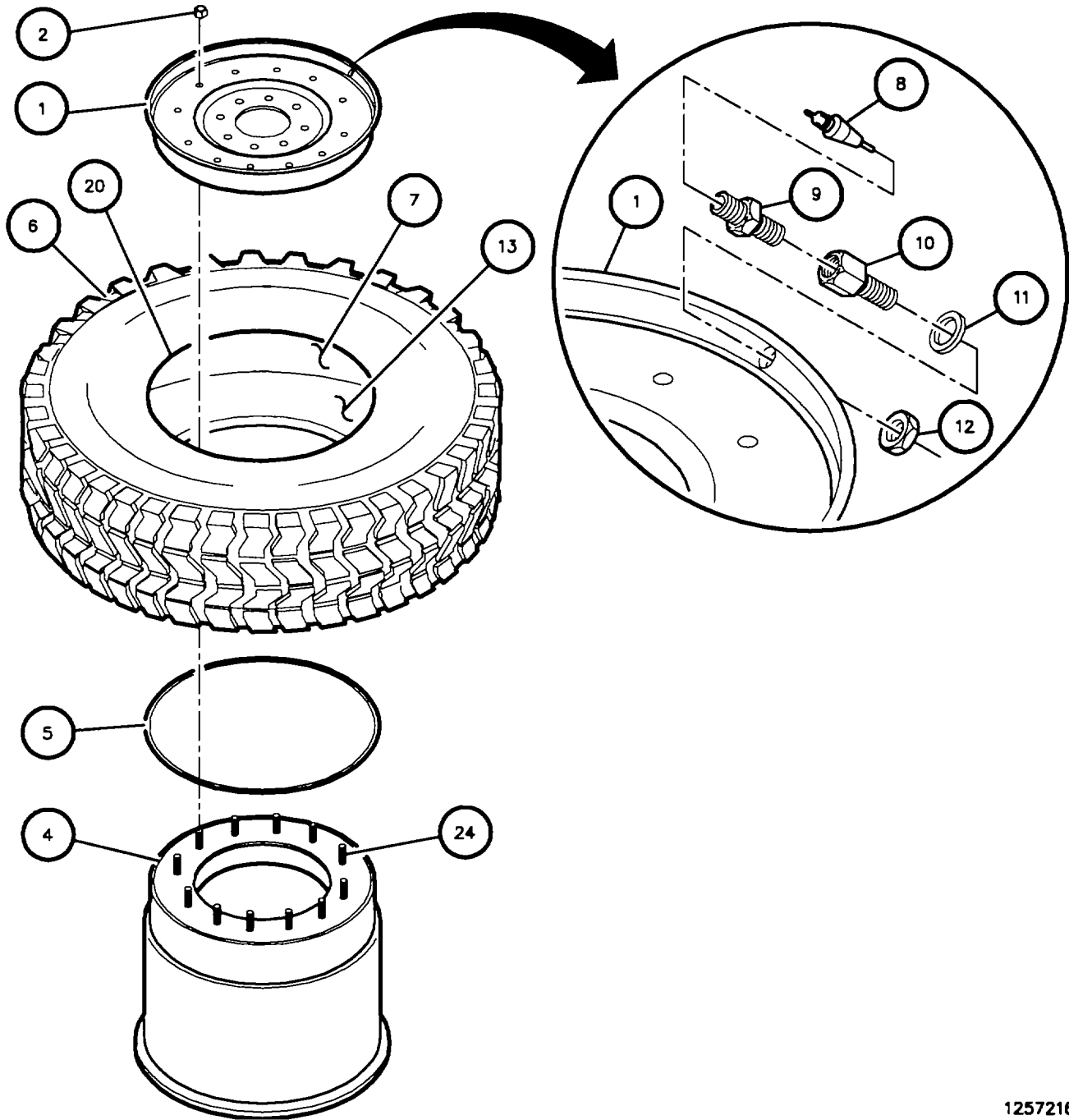
**CAUTION**

Tighten locknuts gradually to avoid bent and broken studs or damage to wheel components

18. Secure outer rim half (1) to inner rim half (4) with 12 locknuts (2).



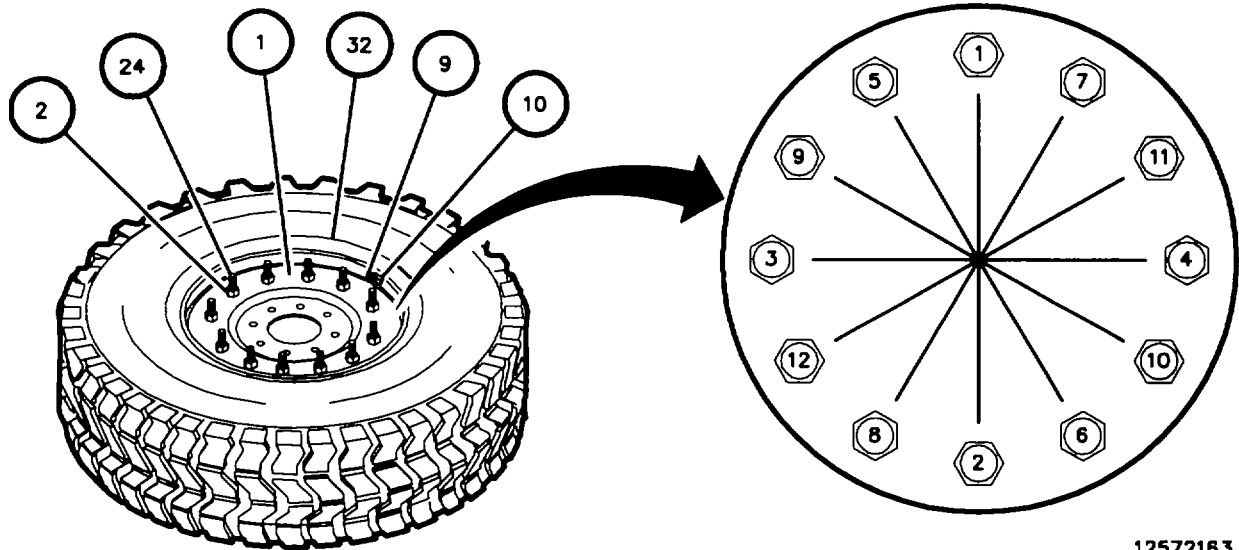
4-34. RADIAL TIRE, WHEEL, AND RUNFLAT REPAIR (Con't).



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**4-34. RADIAL TIRE, WHEEL, AND RUNFLAT REPAIR (Con't).**

19. Tighten locknuts (2) to 85 lb-ft (115 N-m) in tightening sequence shown.
20. Tighten locknuts (2) to 125 lb-ft (170 Nom) in sequence shown.
21. Check wheel assembly for gaps at each stud (24). Use a 0.0015-in. (0.038 mm) thickness gauge to detect gaps. If gaps are detected, disassemble and reassemble wheel assembly and recheck for gaps. If gaps are still detected, replace outer rim half (1).



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**WARNING**

- Never inflate a wheel assembly without having checked wheel locknut torques to ensure the wheel locknuts are tightened to specifications. An assembly with improperly tightened locknuts could separate under pressure, resulting in injury or death.
- Always use a tire inflation cage for inflation purposes. Stand on one side of the cage during inflation, never directly in front. Keep hands out of the cage during inflation. Inflate assembly to recommended pressure using a clip-on air chuck. Do not exceed 50 psi (345 kPa) cold inflation pressure. Failure to follow these instructions may result in injury or death.

22. Place assembly in safety cage and inflate tire to recommended tire pressure (para 1-11).
23. Check for leaks around rim edges (32), insert (10), and valve bore (9) with soapy solution.

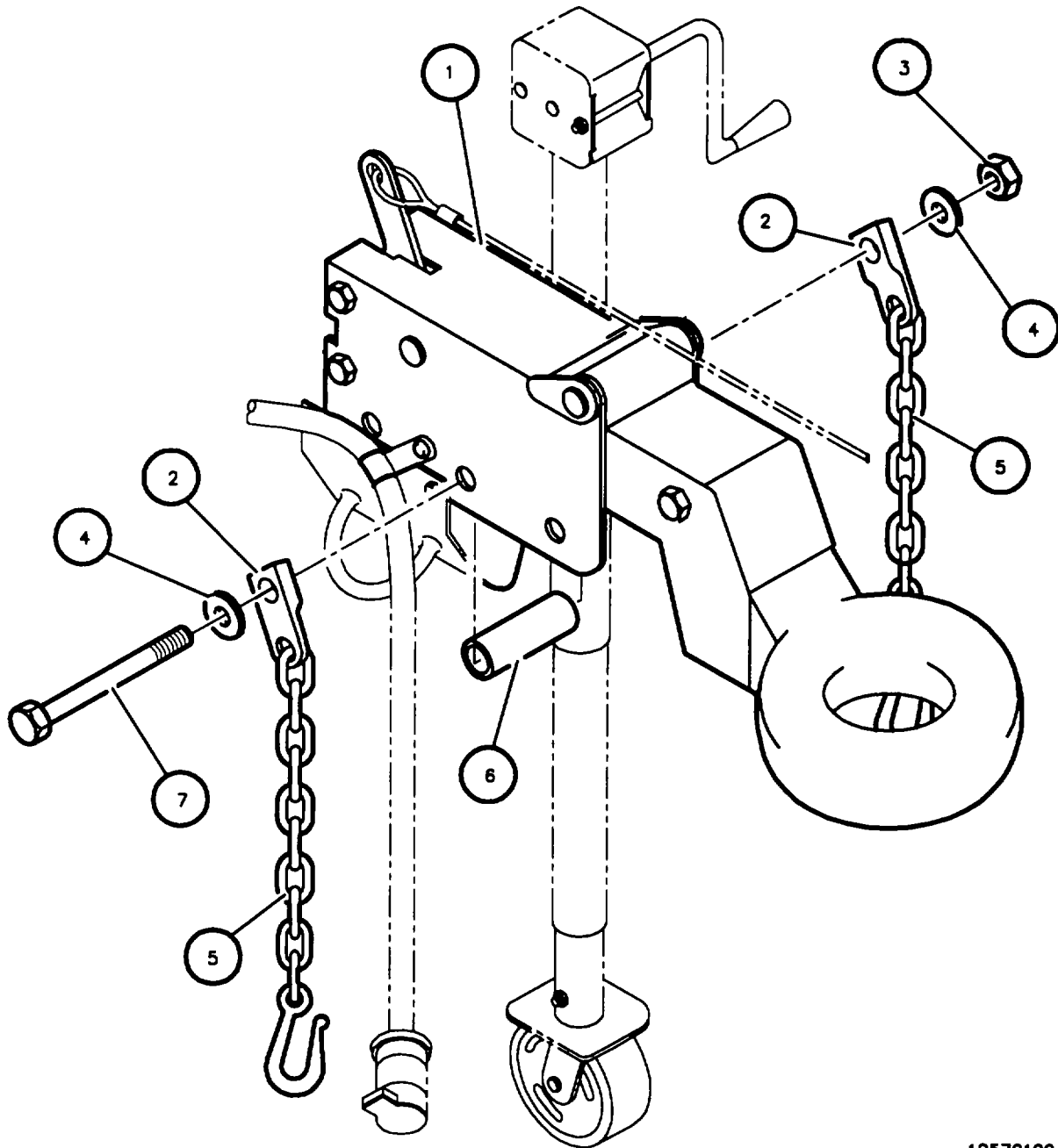
**FOLLOW-ON TASKS:**

- Balance wheel (TM 9-2320-280-20-2).
- Install wheel (para 4-32).

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4-35. SAFETY CHAIN REPLACEMENT (Con't).



4-36 LUNETTE REPLACEMENT.

---

<b>This task covers:</b>	<b>a. Removal</b>	<b>d. Assembly</b>
	<b>b. Disassembly</b>	<b>e. Installation</b>
	<b>c. Cleaning and Inspection</b>	

---

**Initial Setup:**

**Equipment Conditions:**

- Handbrakes applied.
- Wheels chocked (para 2-8.1).

**Tools/Test Equipment:**

- General mechanics tool kit

**Materials/Parts**

- Cotter Pin
  - Wire Brush (Item 3, Appendix E)
  - Dry Cleaning Solvent (Item 5, Appendix E)
- 

**a. REMOVAL**

1. Remove cotter pin (2) and washer (4) from master pin (1). Discard cotter pin.
2. Remove master pin (1) from actuator assembly (3).
3. Remove lunette assembly (5) with attached damper (9) and spacers (8) from brake actuator (3) by pulling lunette assembly (5) straight forward.

**b. DISASSEMBLY**

1. Remove cotter pin (7) from pin (6) securing damper (9) to lunette (5). Discard cotter pin.
2. Remove damper (9) and spacers (8) from lunette (5).

**c. CLEANING AND INSPECTION**

**WARNING**

Dry cleaning solvent, P-D-680, is toxic and flammable. Always wear goggles and gloves and use solvent only in a well-ventilated area. Avoid contact with skin, eyes, and clothes, and DO NOT breathe vapors. DO NOT use near open flame or excessive heat. The solvent's flash point is 100°F to 138°F (38°C to 59°C). If you become dizzy while using cleaning solvent, immediately get fresh air and medical help. If solvent contacts eyes, immediately wash your eyes and get medical aid.

1. Clean all removed components with dry cleaning solvent and allow to dry.
2. Inspect components for wear, cracks, breaks, corrosion, or other damage. Replace if damaged.
3. Inspect damper for leaks. Replace if leaking is evident.
4. Remove any corrosion with a wire brush

**d. ASSEMBLY**

1. Install damper (9) on lunette (5) with pin (6) and new cotter pin (7).
2. Position two rollers (8), with beveled sides facing out, on either side of damper (9) inside lunette (5). Use 5/8" deep well socket to hold damper (9) and two rollers (8) in place in lunette.

4-36 LUNETTE REPLACEMENT (Con't).

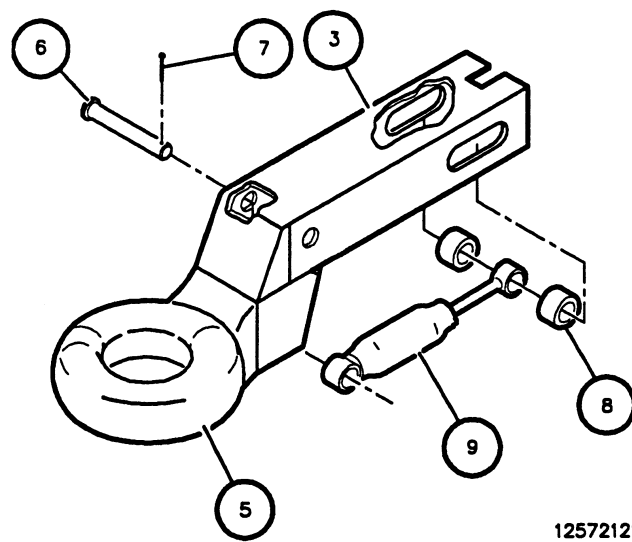
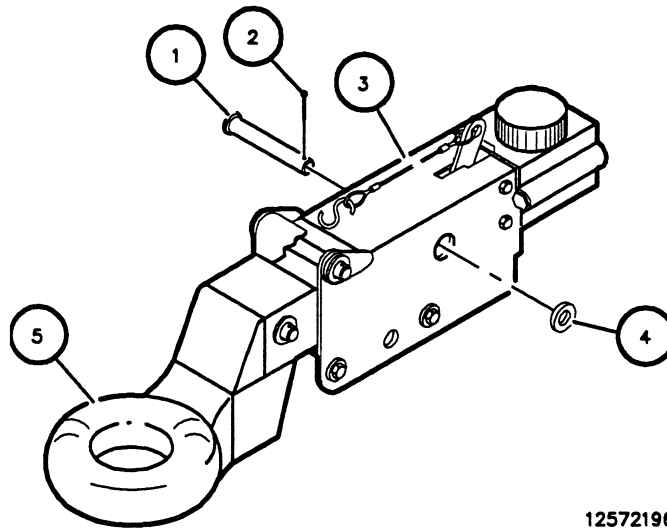
e. INSTALLATION

1. Install lunette assembly (5) with attached damper (9) and spacers (8) into actuator housing (3).

**NOTE**

5/8" deep well socket will be pushed out as master pin is installed.

2. Install master pin (1) through lunette assembly (5), damper (9), spacers (8), and actuator (3). Torque master pin (1) to 50 ft-lbs. (68 N•m), then back off 1/4 turn.
3. Secure master pin (1) with washer (4) and new cotter pin (2).



## Section X. SHOCK ABSORBER MAINTENANCE

### 4-37 SHOCK ABSORBER REPLACEMENT.

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**This task covers:**

- a. Shock Absorber Removal
- b. Shock Absorber Mount Bracket Removal
- c. Shock Absorber Mount Bracket Installation
- d. Shock Absorber Installation

---

#### Initial Setup:

#### Equipment Conditions:

- Parked on a level surface
- Wheels chocked (para 2-8.1).
- Handbrakes applied.

#### Materials/Parts

- Cotter Pin
- Locknuts
- Antiseize (Item 14, Appendix E)

#### Tools/Test Equipment:

- General mechanics tool kit
  - Shop equipment, automotive maintenance and repair: organizational maintenance
- 

#### a. SHOCK ABSORBER REMOVAL

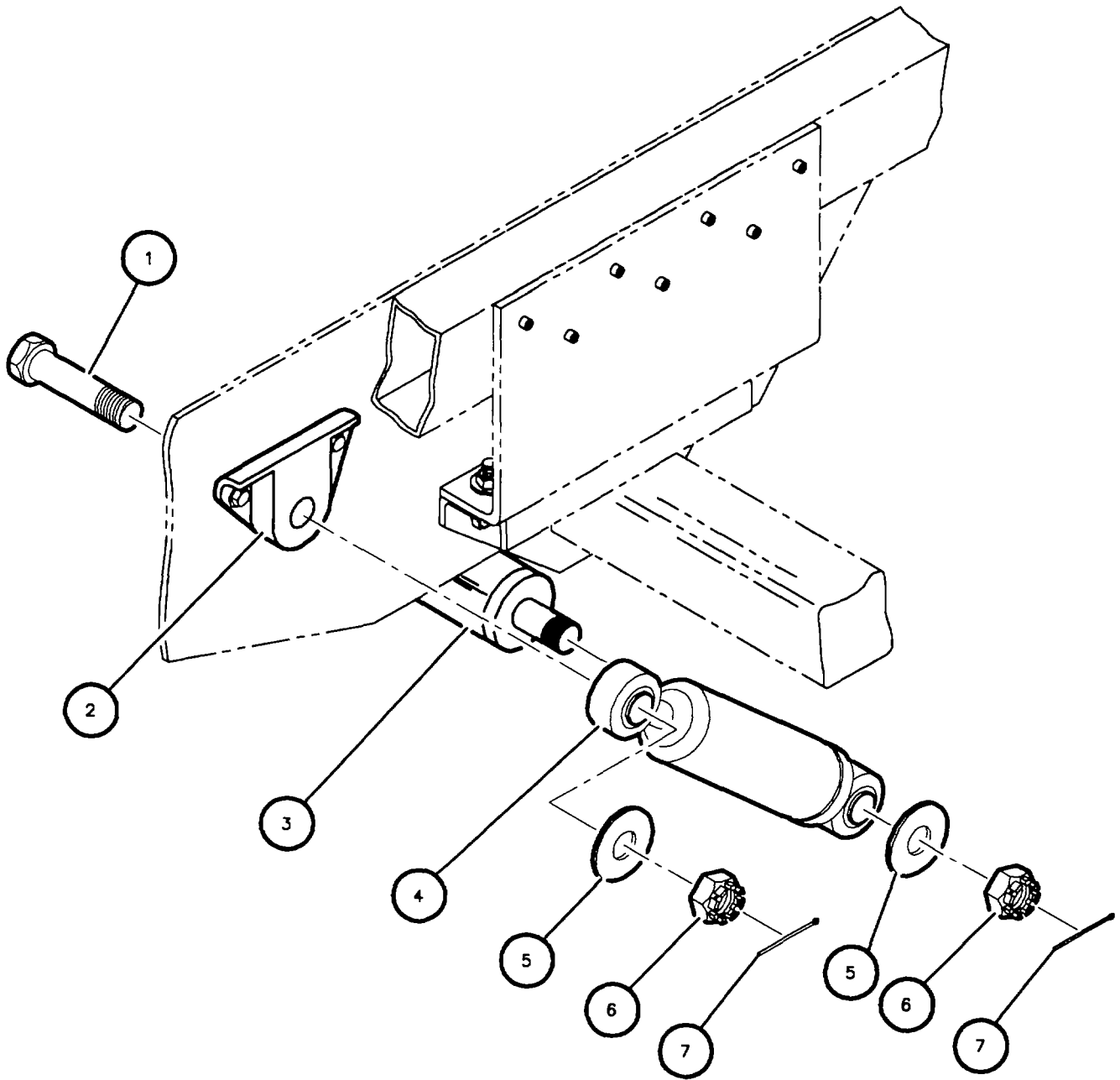
#### NOTE

Both shock absorbers are removed in the same manner.

1. Remove upper shock absorber cotter pin (7), slotted nut (6), flat washer (5), and bolt (1). Discard cotter pin.
2. Inspect shock absorber mounting bolt (1) for damage. Replace if defective.
3. Remove shock absorber bottom cotter pin (7), slotted nut (6), and flat washer (5). Discard cotter pin.



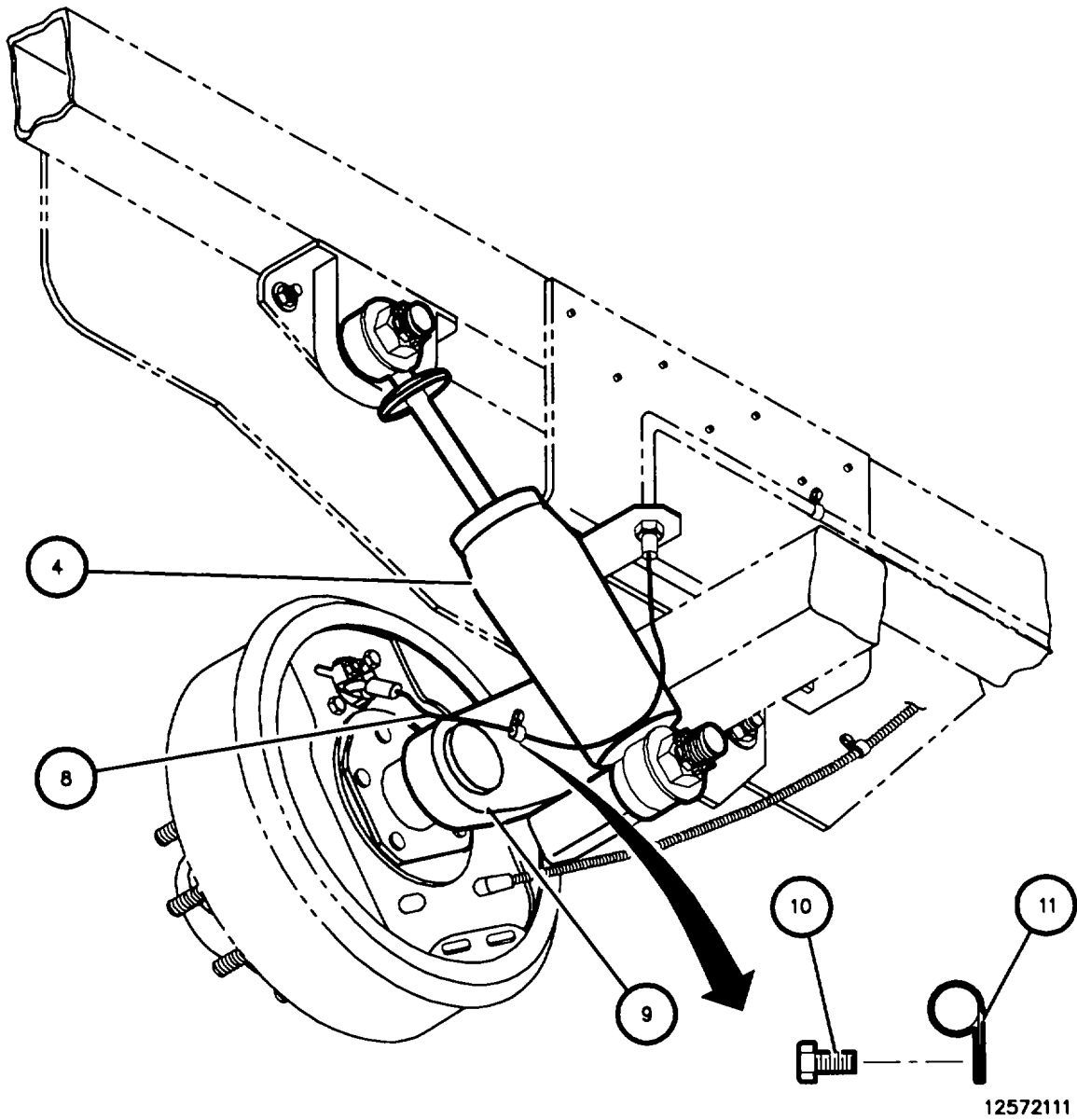
4-37. SHOCK ABSORBER REPLACEMENT (Con't).



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**4-37. SHOCK ABSORBER REPLACEMENT (Con't).**

4. Remove capscrew (10) from clamp (11) securing flex brake line (8) to torsion arm (9).
5. Remove shock absorber (4).



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**4-37 SHOCK ABSORBER REPLACEMENT (Con't).****b. SHOCK ABSORBER MOUNT BRACKET REMOVAL****NOTE**

Both shock absorber mount brackets are removed in the same manner.

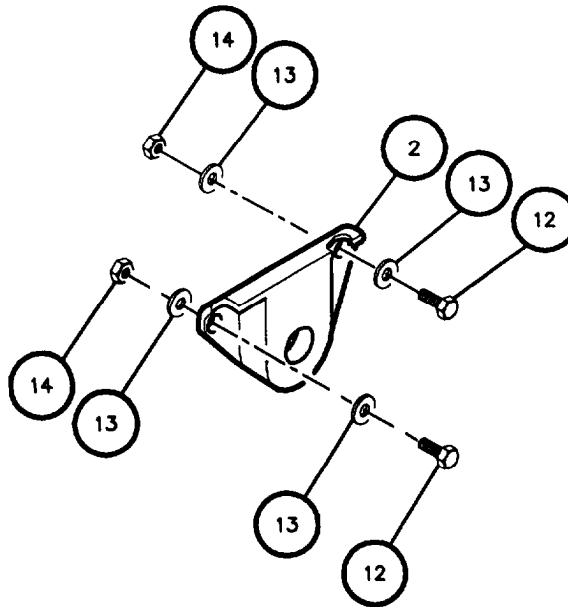
Perform steps 1 and 2 if mount is defective.

1. Remove two locknuts (14), four flat washers (13), and two capscrews (12) securing shock absorber mount bracket (2) to frame. Discard locknuts.
2. Remove shock absorber mount bracket (2) from frame.

**c. SHOCK ABSORBER MOUNT BRACKET INSTALLATION****NOTE**

Both shock absorber mount brackets are installed in the same manner.

1. Install shock absorber mount bracket (2) on frame.
2. Install two capscrews (12), four washers (13), and two locknuts (14) securing shock absorber mount bracket (2) on frame. Tighten locknuts and torque to  $72 \pm 7$  ft-lb ( $98 \pm 9$  N•m).



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## 4-37 SHOCK ABSORBER REPLACEMENT (Con't)

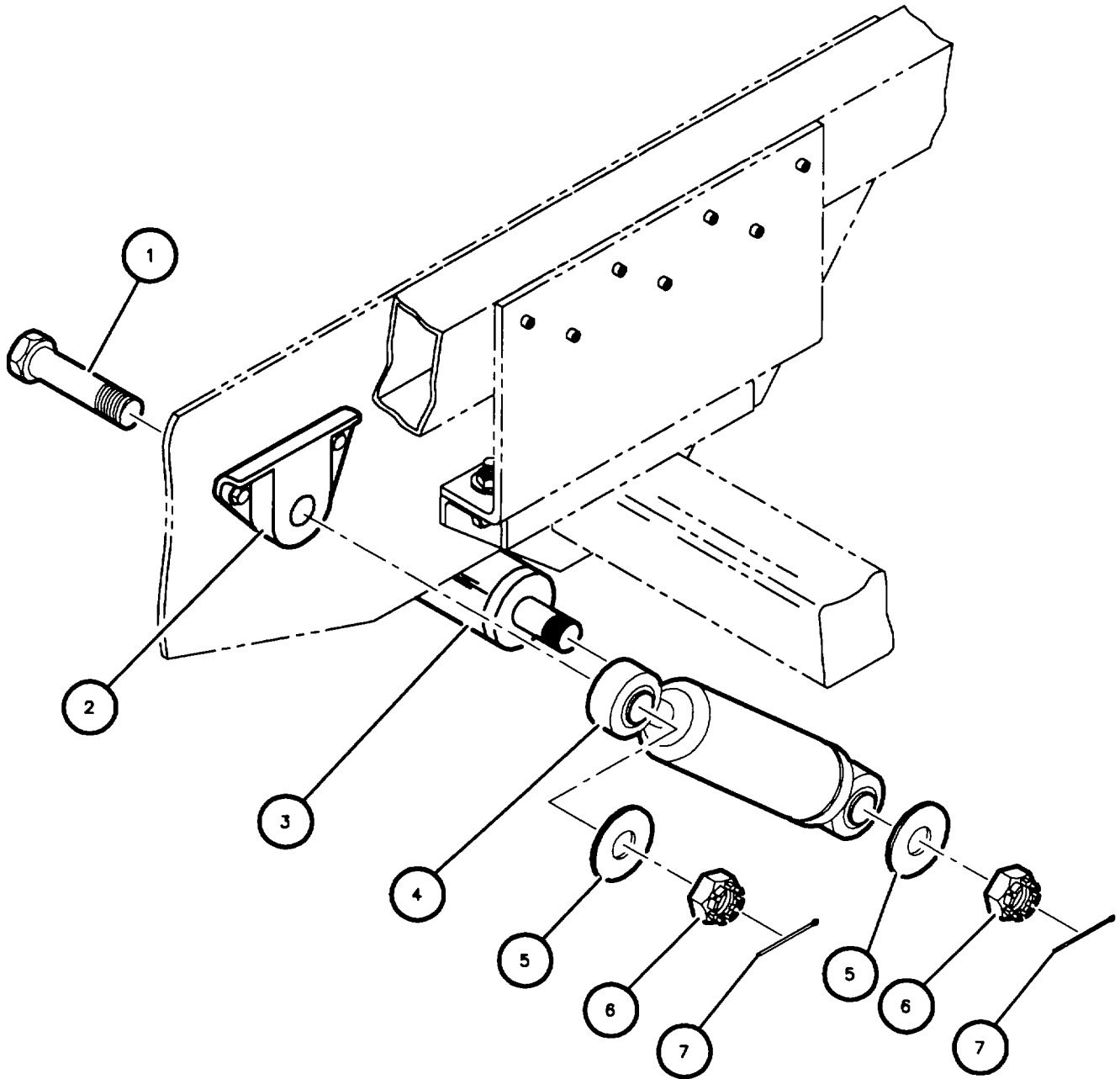
### d. SHOCK ABSORBER INSTALLATION

#### NOTE

- Both shock absorbers are installed in the same manner.
- Shock absorber rod is positioned at top end of shock absorber.
- Antiseize compound must be applied to threads before starting nuts.

1. Install shock absorber (4) to torsion arm mount (3) and top mounting bracket (2).
2. Install washer (5) and slotted nut (6) to torsion arm mount (3), securing shock absorber (4). Tighten nut (6) and torque to  $185 \pm 18$  lb-ft ( $251 \pm 25$  N•m), ensuring slotted nut (6) and hole in torsion arm mount (3) align. Install new cotter pin (7).
3. Install mounting bolt (1) through top mounting bracket (2) and upper shock absorber (4) mounting ring.
4. Install washer (5) and slotted nut (6) to frame mounting bolt (1), securing shock absorber (4). Tighten nut (6) and torque to  $185 \pm 18$  lb-ft ( $251 \pm 25$  N•m), ensuring slotted nut (6) and hole in frame mounting bolt (1) align. Install new cotter pin (7).

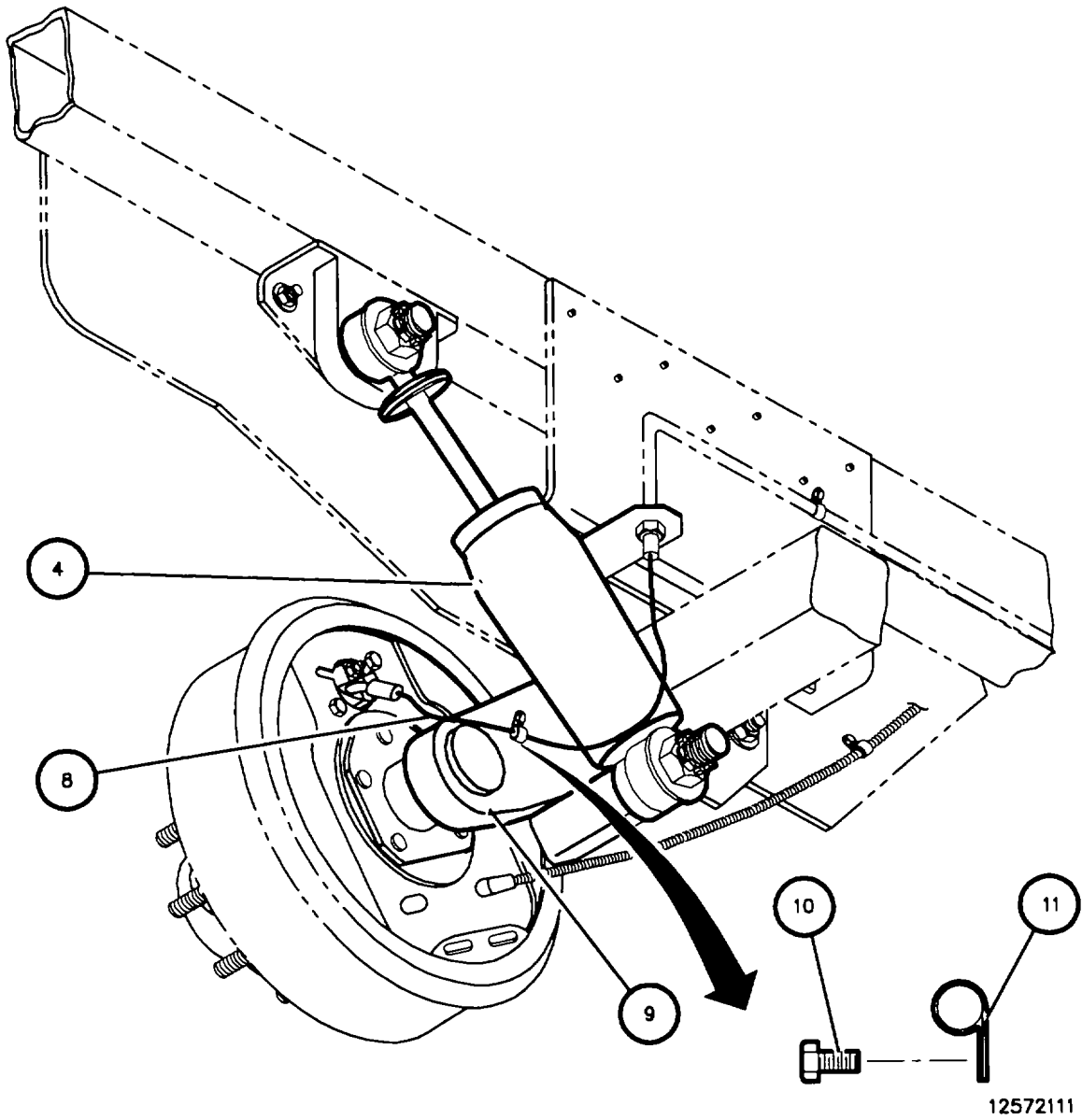
4-37. SHOCK ABSORBER REPLACEMENT (Con't).



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4-37. SHOCK ABSORBER REPLACEMENT (Con't).

5. Install capscrew (10) in clamp (11), securing flex brake line (8) to torsion arm (9).



## Section XI. BODY MAINTENANCE

### 4-38 CARGO BODY REPAIR.

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<b>This task covers:</b>	<ul style="list-style-type: none"> <li>a. Tailgate Removal</li> <li>b. Tailgate Installation</li> <li>c. Tailgate Lanyard and Mount Removal</li> <li>d. Tailgate Lanyard and Mount Installation</li> <li>e. Tailgate Latch Assembly Removal</li> <li>f. Tailgate Latch Assembly Installation</li> <li>g. Tailgate Latch Assembly Pin Removal</li> <li>h. Tailgate Latch Assembly Pin Installation</li> <li>i. Cargo Tiedown Removal</li> </ul>	<ul style="list-style-type: none"> <li>j. Cargo Tiedown Installation</li> <li>k. Shackle Removal</li> <li>l. Shackle Installation</li> <li>m. Tailgate Hinge Removal</li> <li>n. Tailgate Hinge Installation</li> <li>o. Tailgate Latching Pin Lanyard Removal</li> <li>p. Tailgate Latching Pin Lanyard Installation</li> </ul>
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#### Initial Setup:

##### Equipment Conditions:

- Parked on a level surface
- Wheels chocked (para 2-8.1).
- Handbrakes applied.

##### Materials/Parts

- Rivet
- Locknut
- Cotter Pin

##### Tools/Test Equipment:

- General mechanics tool kit
  - Common No. 1 shop set
-

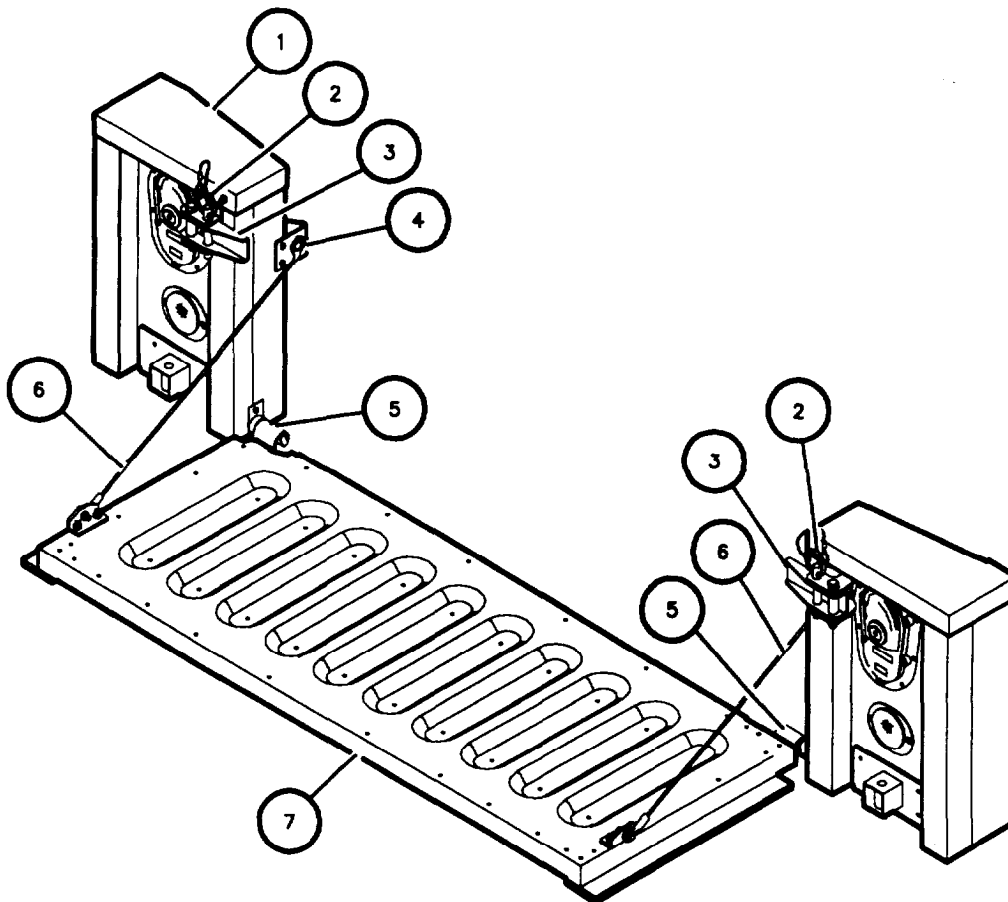
**4-38 CARGO BODY REPAIR (Con't).**

**a. TAILGATE REMOVAL**

1. Remove two pins (2) from latch assemblies (3) securing tailgate (7) to cargo body (1). Release latch handles (3).
2. Lower tailgate (7) until supported by two lanyards (6).
3. Remove two lanyards (6) from cargo body bosses (4).
4. Remove tailgate (7) by lowering to 25 degrees and lifting tailgate off hinges (5).

**b. TAILGATE INSTALLATION**

1. Install tailgate (7) on tailgate hinges (5) by tilting tailgate (7) to 25 degrees and lowering tailgate onto hinges (5).
2. Fasten two lanyards (6) on cargo body mounting bosses (4).
3. Raise tailgate (7), close latches (3), and install one pin (2) into each latch assembly (3).



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4-38. CARGO BODY REPAIR (Con't).

**NOTE**

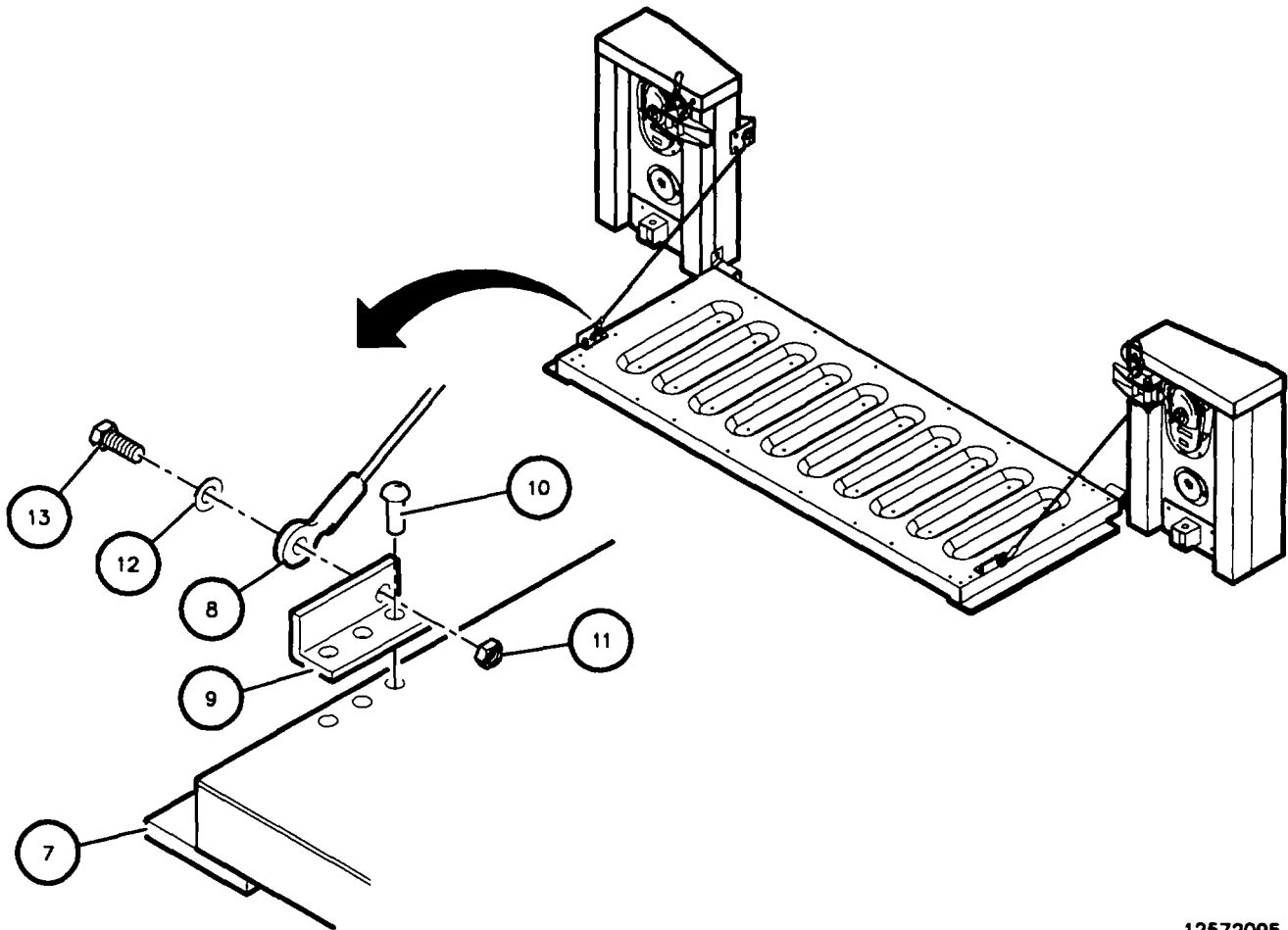
Tailgate mounting hardware replacement procedures are the same for both sides.

**c. TAILGATE LANYARD AND MOUNT REMOVAL**

1. Remove locknut (11), shoulder screw (13), flat washer(12), and lanyard end (8) to tailgate lanyard mount (9). Discard locknut (11).
2. Remove three rivets (10) securing tailgate lanyard mount (9) to tailgate (7). Remove lanyard mount. Discard rivets (10).

**d. TAILGATE LANYARD AND MOUNT INSTALLATION**

1. Install three rivets (10) securing tailgate lanyard mount (9) to tailgate (7).
2. Install shoulder screw (13), flat washer (12), new locknut (11), and end (8) of lanyard to tailgate lanyard mount (9).



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**4-38. CARGO BODY REPAIR (Con't).****e. TAILGATE LATCH ASSEMBLY REMOVAL**

1. Remove tailgate latch pin (2) with retaining ring (15) and lanyard (14).
2. Remove four rivets (17) securing tailgate latch (18) to cargo body (1). Discard rivets (17).
3. Remove tailgate latch (18) from cargo body (1).

**f. TAILGATE LATCH ASSEMBLY INSTALLATION**

1. Install four rivets (17) securing tailgate latch (18) to cargo body (1).
2. Install tailgate latch pin (2) into latch assembly (18).

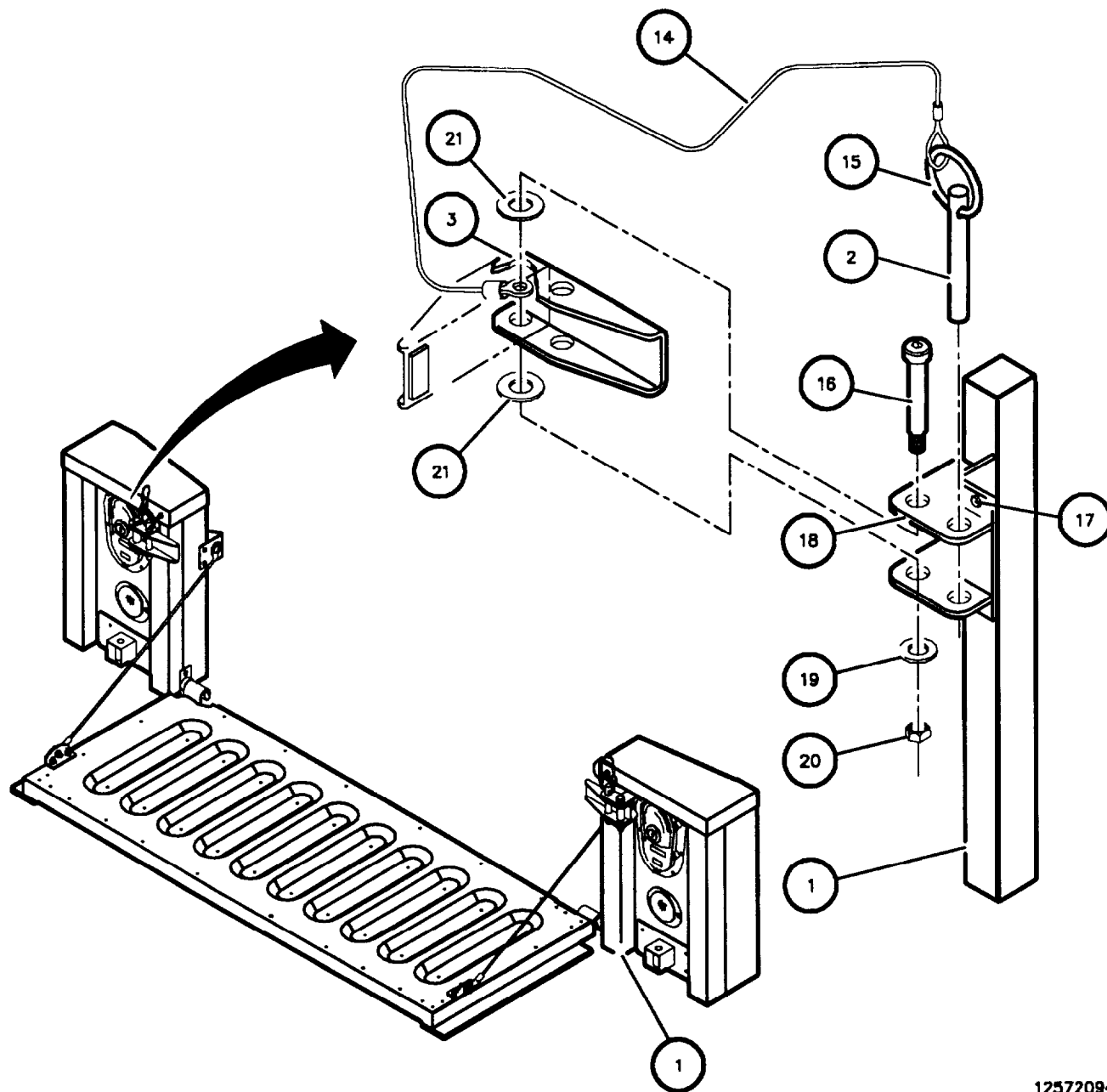
**g. TAILGATE LATCH ASSEMBLY PIN REMOVAL**

1. Remove locknut (20), flat washer (19), and capscrew (16) securing tailgate latch (3) to cargo body latch assembly (18). Discard locknut (20). Check capscrew (16) for damage. Replace if defective.
2. Remove tailgate latch (3) and flat washers (21). Check tailgate latch for damage.

**h. TAILGATE LATCH ASSEMBLY PIN INSTALLATION**

1. Install tailgate latch (3) and two flat washers (21) into tailgate latch assembly (18)
2. Install capscrew (16), flat washer (19), and locknut(20). Tighten locknut, allowing latch (3) to move freely.

4-38 CARGO BODY REPAIR (Con't).



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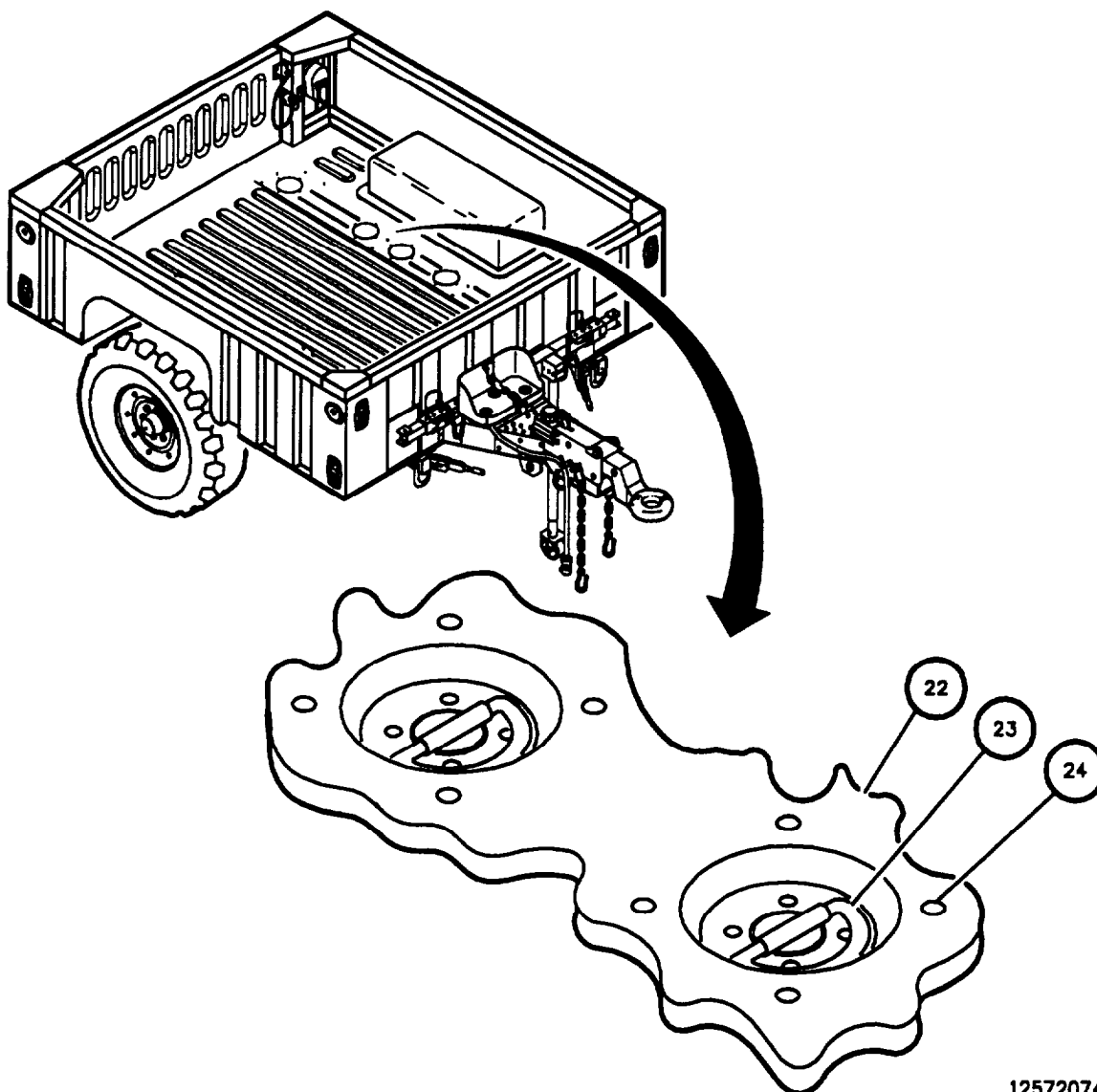
**4-38 CARGO BODY REPAIR (Con't).**

**i. CARGO TIEDOWN REMOVAL**

1. Remove four rivets (24) securing cargo tiedown (23) to cargo body floor (22). Discard rivets (24).
2. Remove cargo tiedown (23) from cargo body (22).

**j. CARGO TIEDOWN INSTALLATION**

1. Position cargo tiedown (23) in cargo body (22) and align holes.
2. Install four rivets (24) securing cargo tiedown (23) to cargo body (22).



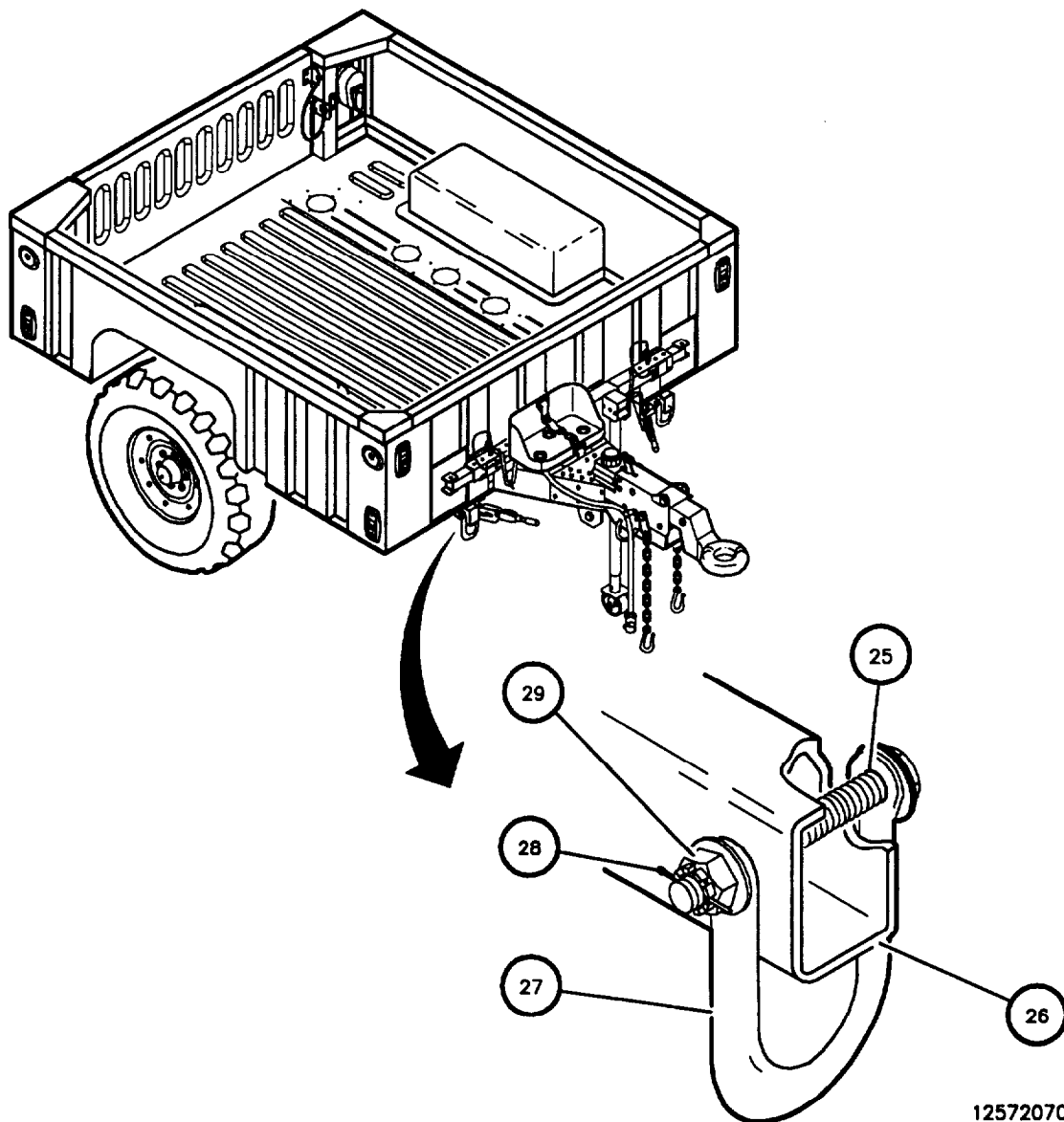
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**4-38 CARGO BODY REPAIR (Con't).****k. SHACKLE REMOVAL**

Remove cotter pin (28), slotted nut (29), and capscrew (25) securing shackle (27) to frame (26). Discard cotter pin (28).

**l. SHACKLE INSTALLATION**

1. Install shackle (27) on frame (26).
2. Install capscrew (25) and slotted nut (29). Tighten slotted nut (29) until slight binding occurs during shackle (27) movement.
3. Install new cotter pin (28).



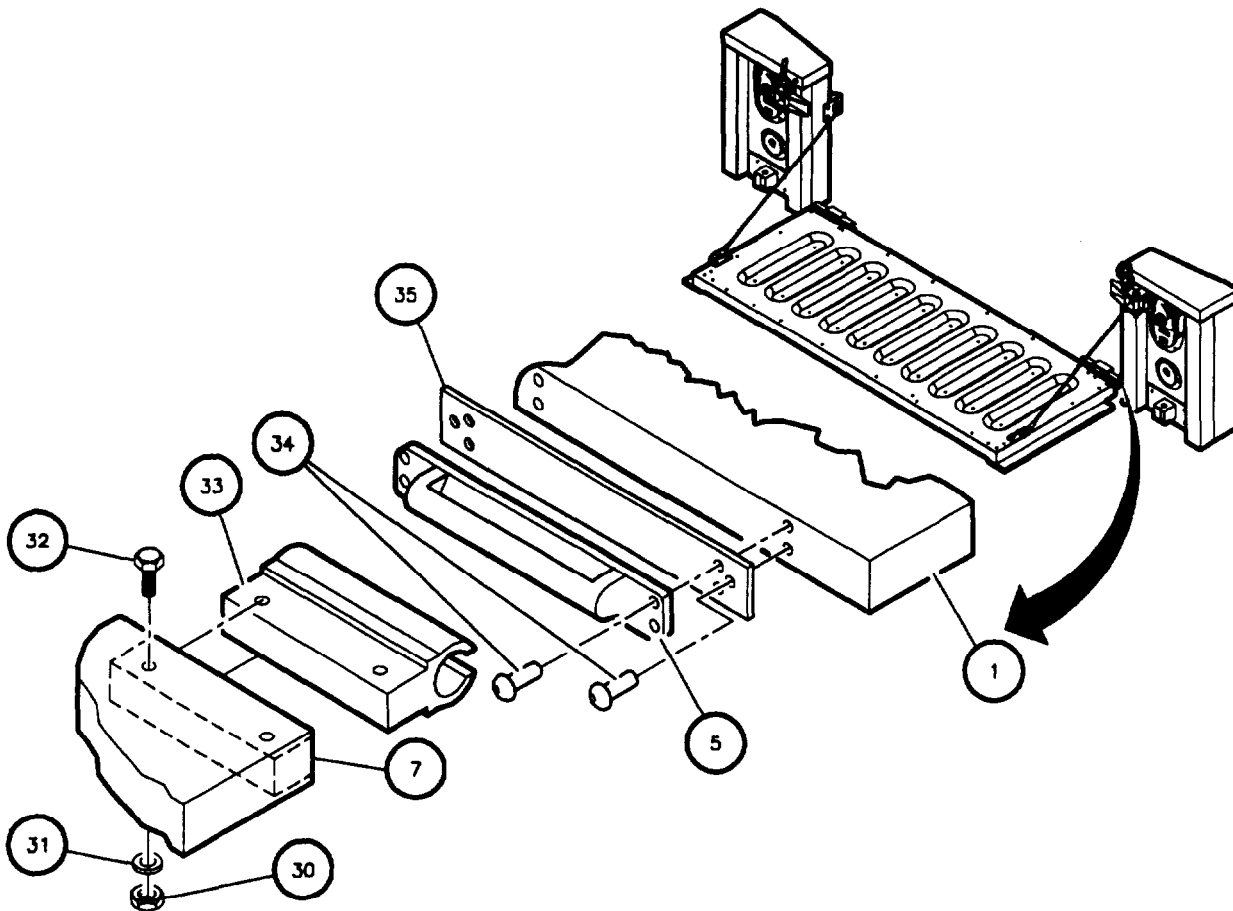
4-38 CARGO BODY REPAIR (Con't).

m. TAILGATE HINGE REMOVAL

1. Remove tailgate (7).
2. Remove two nuts (30), two washers (31), and two capscrews (32) securing tailgate hinge (33) to tailgate (7).
3. Remove tailgate hinge (33) from tailgate (7).
4. Remove four rivets (34) securing tailgate hinge (5) to cargo body (1). Discard rivets (34).
5. Remove two rivets (34) securing hinge shim (35) to cargo body (1). Discard rivets (34).
6. Remove tailgate hinge (5) from cargo body (1).

n. TAILGATE HINGE INSTALLATION

1. Install two rivets (34) securing hinge shim (35) to cargo body and four rivets (34) securing tailgate hinge (5) to cargo body (1).
2. Install two capscrews (32), two washers (31), and two nuts (30) securing tailgate hinge (33) to tailgate (7).
3. Tighten capscrews (32) and torque to  $168 \pm 17$  in-lb ( $19 \pm 1.9$  N•m).
4. Install tailgate (7).



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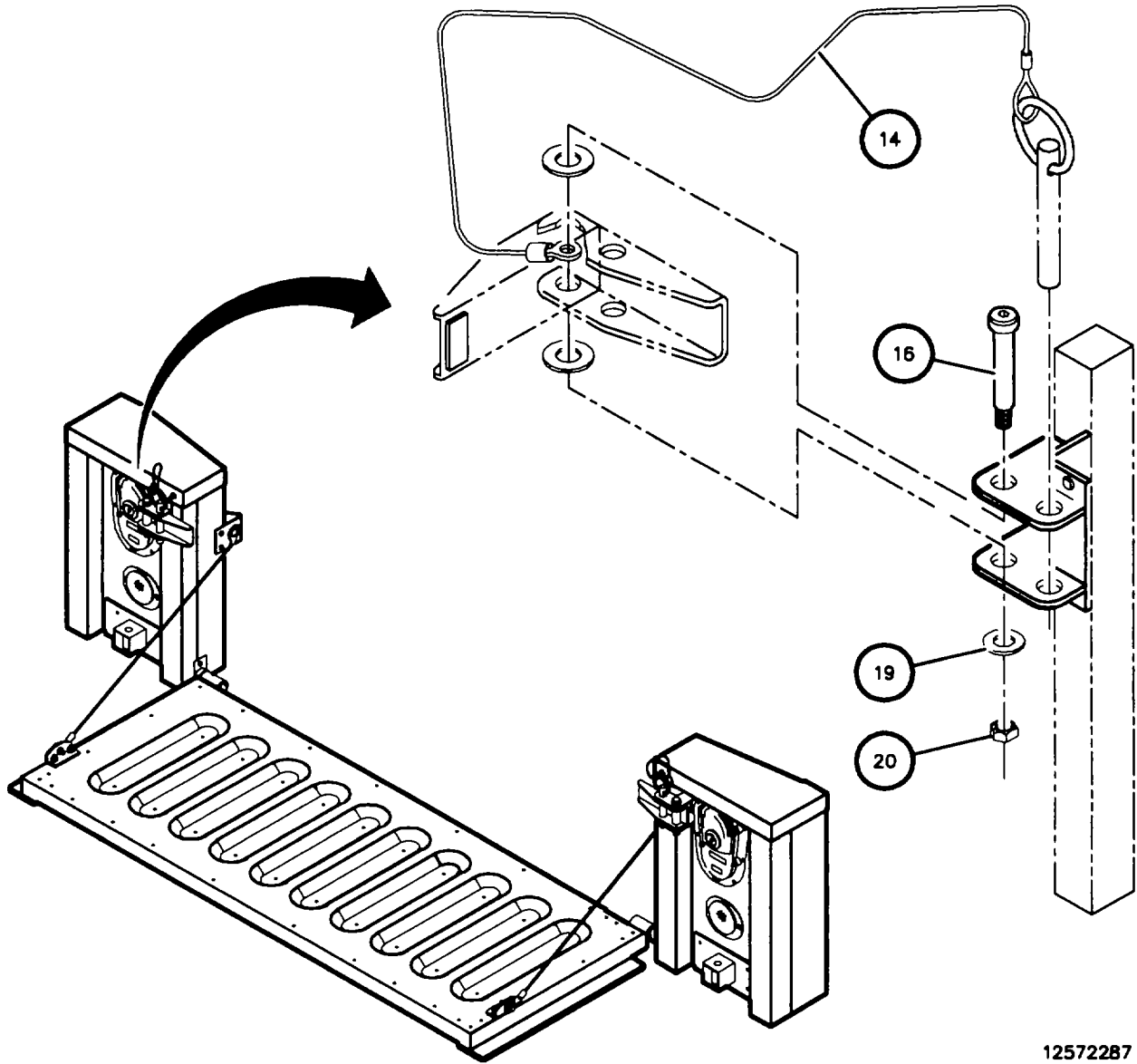
**4-38. CARGO BODY REPAIR (Con't).**

**o. TAILGATE LATCHING PIN LANYARD REMOVAL**

1. Remove nut (20) and washer (19) from bolt (16).
2. Remove bolt (16) far enough to remove lanyard end (14).

**p. TAILGATE LATCHING PIN LANYARD INSTALLATION**

1. Install lanyard end (14) onto bolt (16).
2. Install bolt (16), washer (19), and nut (20).

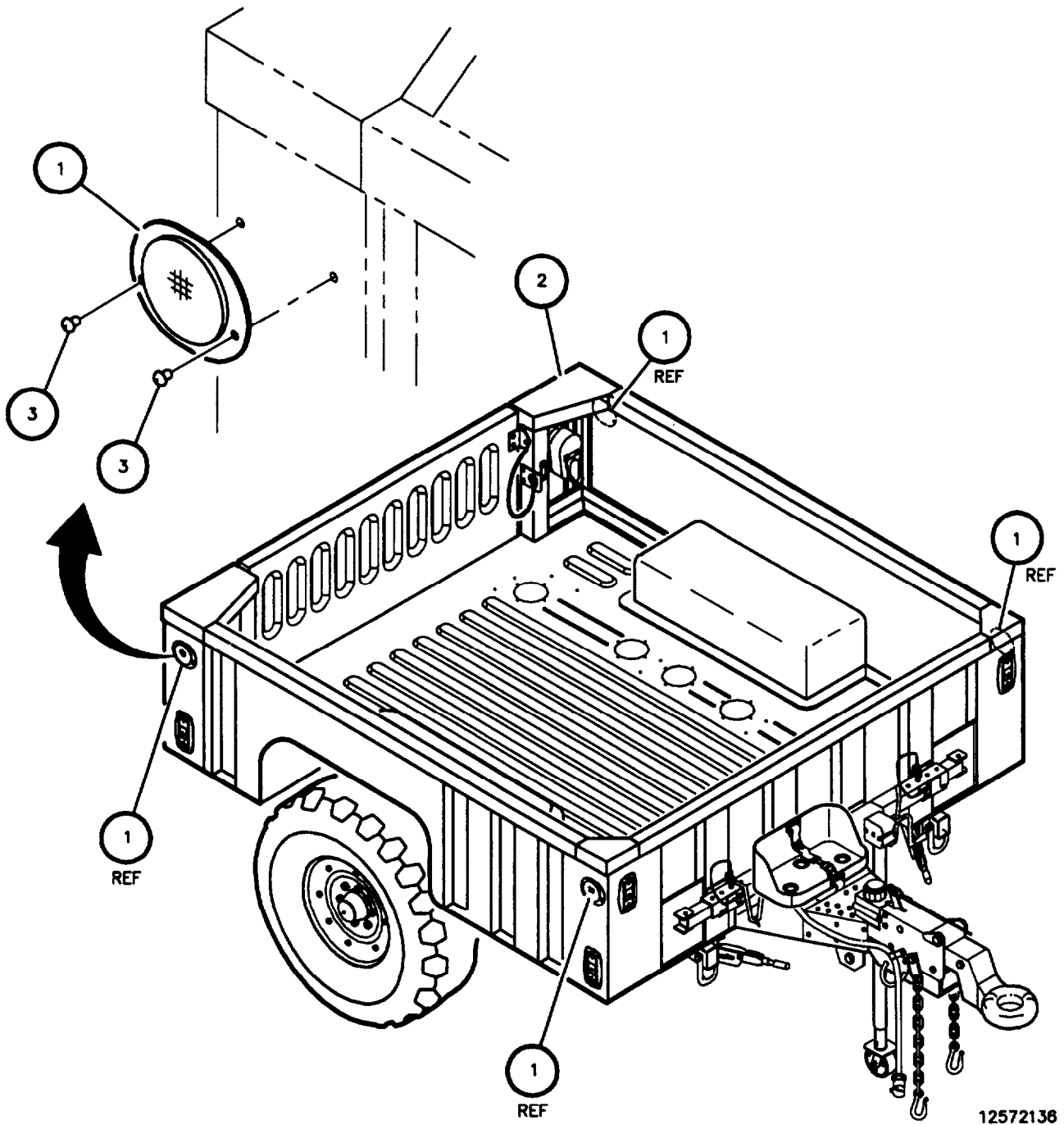


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4-39 REFLECTOR REPLACEMENT (Con't).



4-40 DATA PLATE REPLACEMENT.

---

This task covers:

a. Removal

b. Installation

---

**Initial Setup:**

**Equipment Conditions:**

- Parked on a level surface.
- Wheels chocked (para 2-8.1).
- Handbrakes applied.

**Materials/Parts**

- Four Rivets

**Tools/Test Equipment:**

- General mechanics tool kit
  - Common No. 1 shop set
  - Metal stamping die sets
- 

**a. REMOVAL**

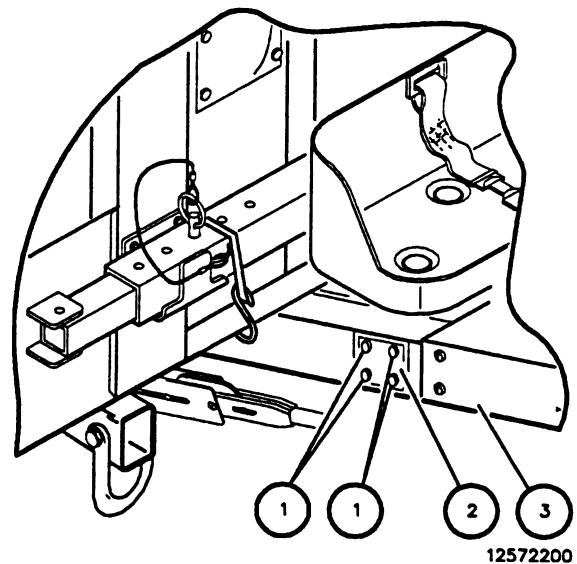
**WARNING**

Wear eye protection when driving heads off rivets. Failure to follow this warning may result in eye injury or loss of vision.

1. Drive heads of four rivets (1) securing data plate (2) to trailer frame (3).
2. Remove rivets (1) and data plate (2) from trailer frame (3). Discard rivets (1).

**b. INSTALLATION**

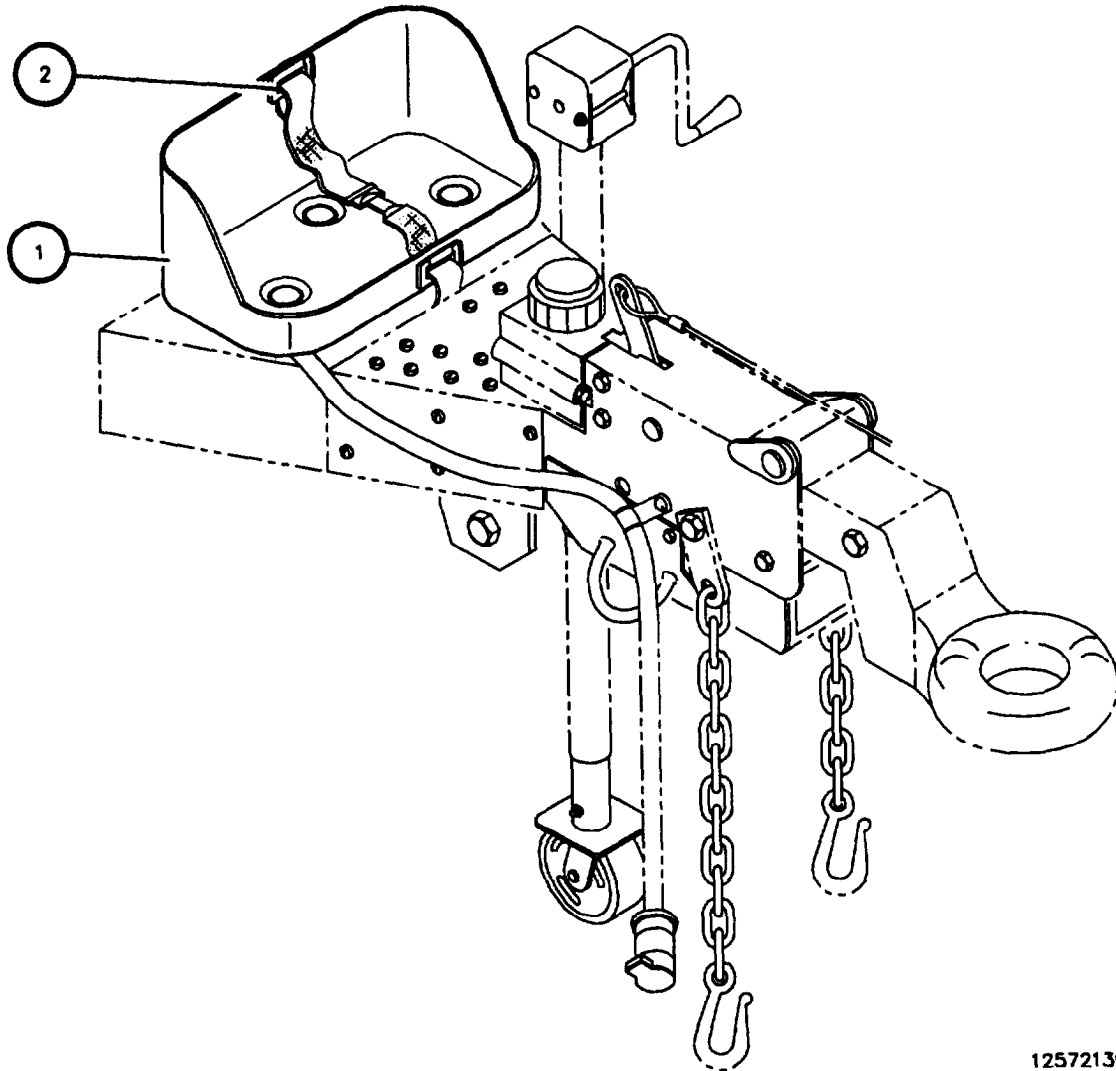
1. If serial number is missing, add to data plate (2) using metal stamping die sets.
2. Install data plate (2) to trailer frame (3) with four new rivets (1).







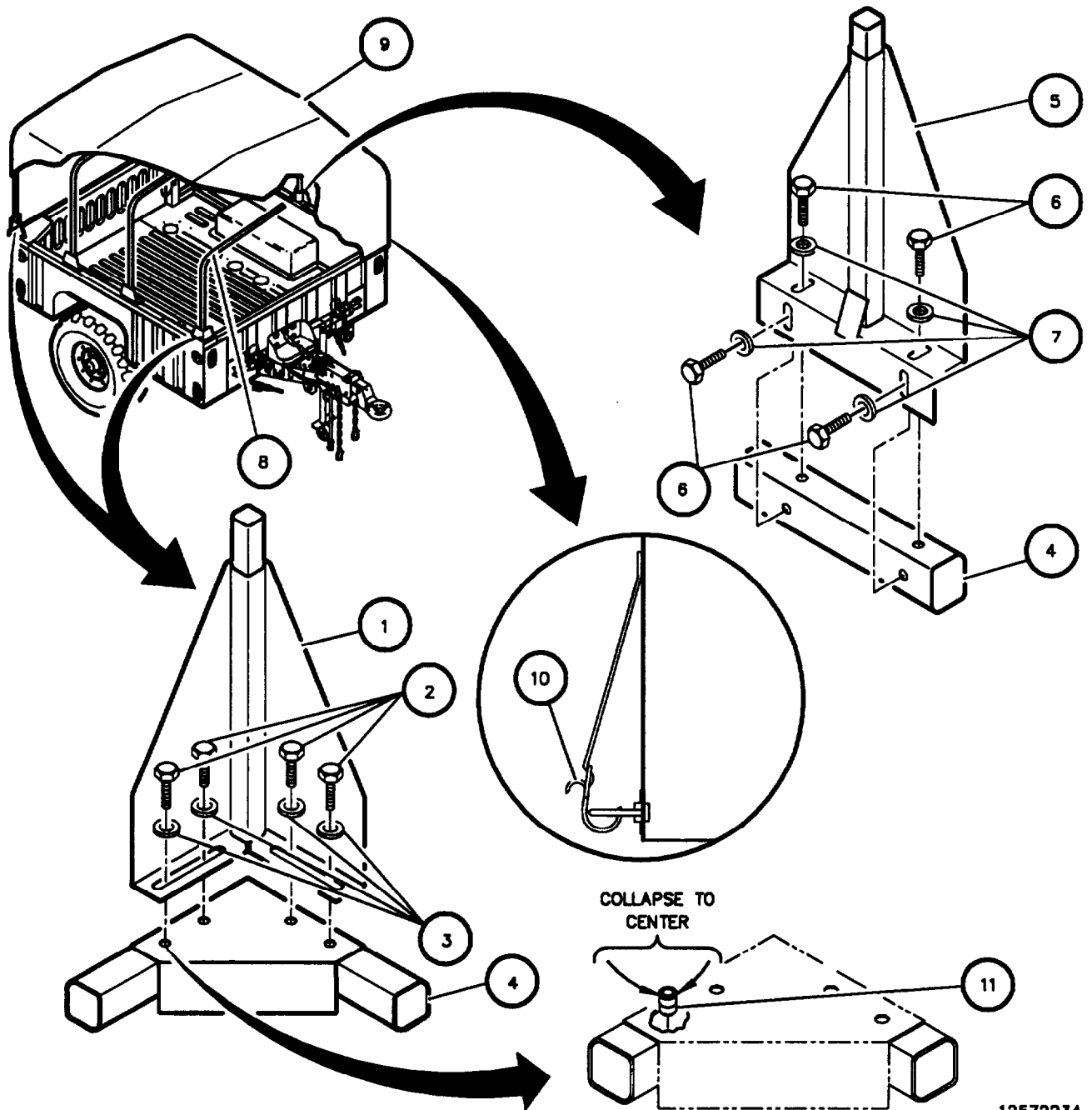
4-42 DECONTAMINATION BRACKET REPLACEMENT (Con't).



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4-43 SOFT TOP KIT (Con't).



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4-44 FRONT SUPPORT LEG AND PIVOT REPAIR.

- This task covers:
- |                                  |                                   |
|----------------------------------|-----------------------------------|
| a. Front Support Leg Removal     | e. Front Support Leg Assembly     |
| b. Pivot Removal                 | f. Pivot Installation             |
| c. Front Support Leg Disassembly | g. Front Support Leg Installation |
| d. Cleaning and Inspection       |                                   |

Initial Setup:

Equipment Condition:

- Parked on a level surface.
- Wheels chocked (para 2-8.1).
- Handbrakes applied.

Materials/Parts

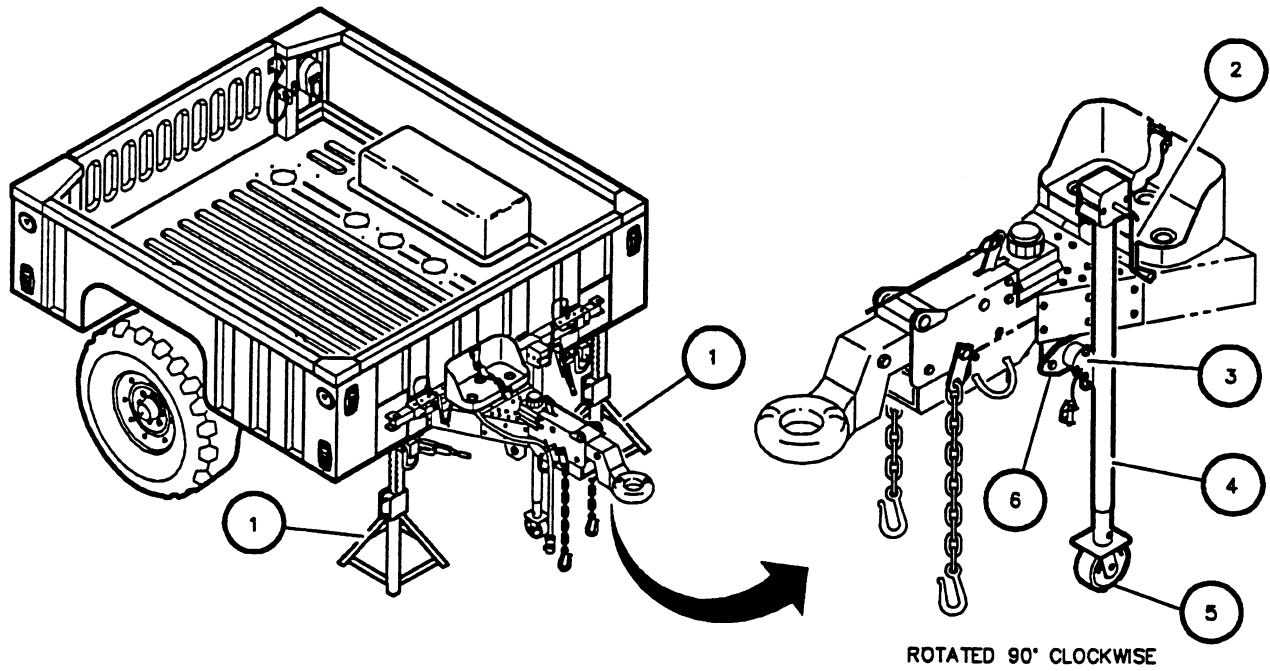
- Lockwasher
- Cotter Pin
- Two Locknuts
- GAA Grease (Item 6, Appendix E)
- Cleaning Solvent (Item 10, Appendix E)

Tools/Test Equipment:

- General mechanics tool kit

a. FRONT SUPPORT LEG REMOVAL

1. Place a jackstand (1) under each front trailer corner.
2. Using front support leg handle (2), lower trailer onto jackstands (1) and continue retracting support leg until wheel (5) is off ground.
3. Remove pin assembly (3) securing front support leg to pivot (6). Remove front support leg (4) from pivot (6).

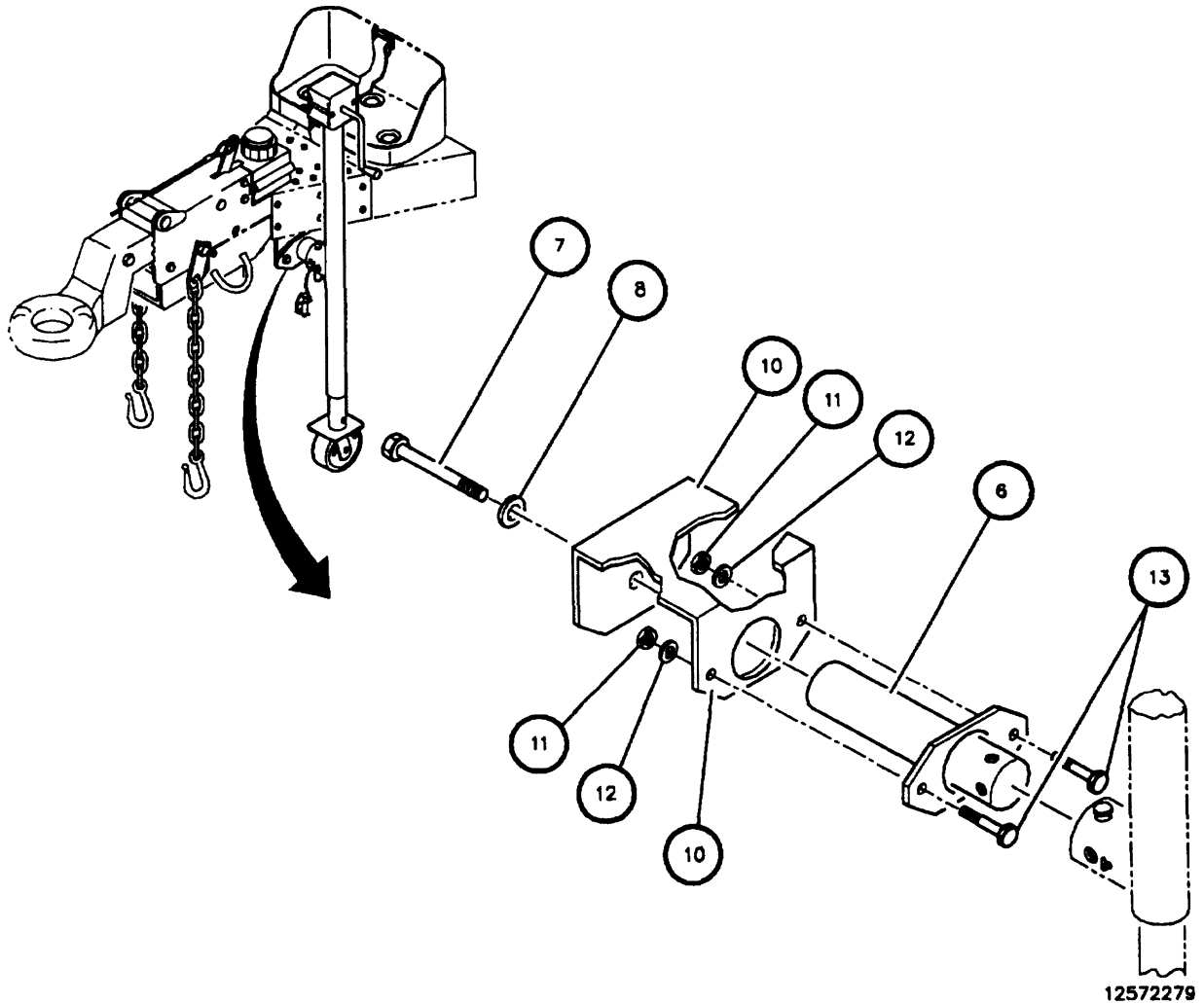


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**4-44 FRONT SUPPORT LEG AND PIVOT REPAIR (Con't).****b. PIVOT REMOVAL**

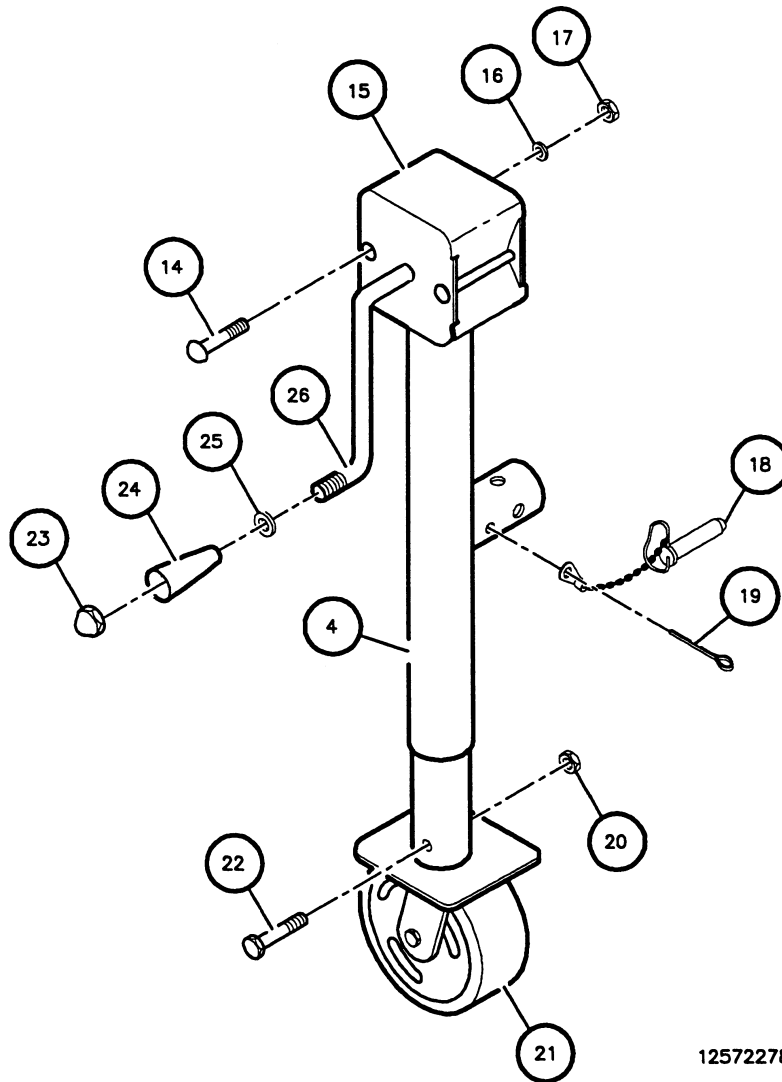
1. Remove two locknuts (11), washers (12), and capscrews (13) securing pivot (6) to near side of drawbar frame (10). Discard locknuts (11).
2. Remove capscrew (7) and lockwasher (8) securing pivot (6) to far side of drawbar frame (10). Discard lockwasher.
3. Remove pivot (6) from drawbar frame (10).



4-44 FRONT SUPPORT LEG AND PIVOT REPAIR (Con't).

c. FRONT SUPPORT LEG DISASSEMBLY

1. Remove locknut (20) and bolt (22) from front support leg (4). Discard locknut (20).
2. Remove caster assembly (21) from front support leg (4).
3. Remove cotter pin (19) from pin assembly (18) and front support leg (4). Discard cotter pin (19).
4. Remove locknut (23), handle (24), and washer (25) from side wind crank (26). Discard locknut (23).
5. Remove two nuts (17), washers (16), and bolts (14) from front support leg (4). Remove top cover (15).



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6. Remove pin (30) from gear (28).

**NOTE**

Number of spacers may vary.

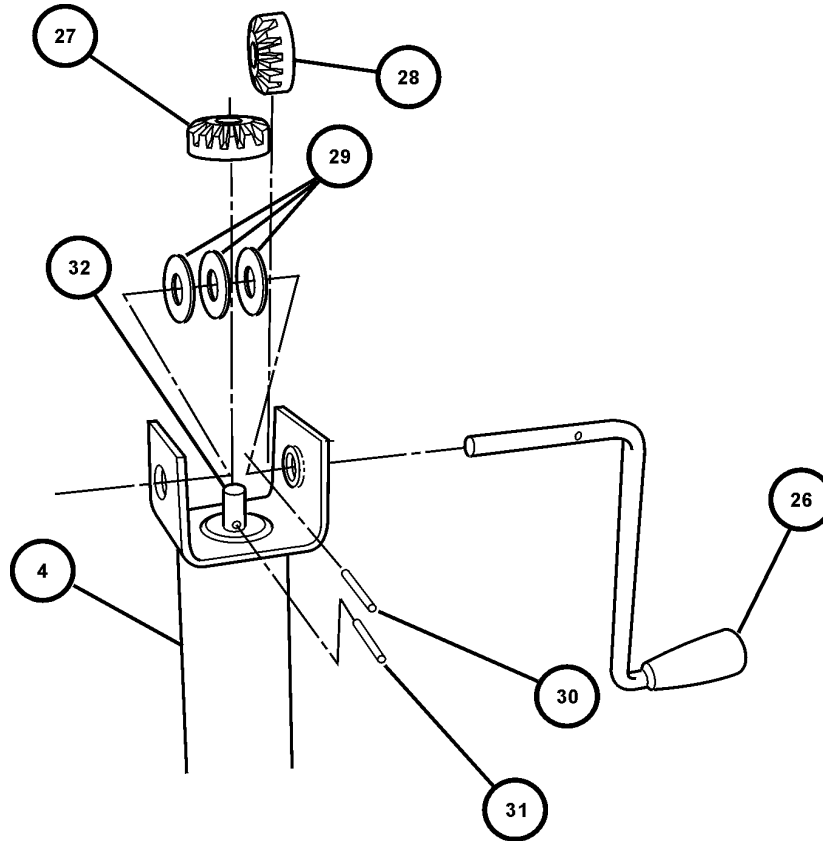
7. Remove side wind crank (26), gear (28), and spacer(s) (29), from front support leg (4).
8. Remove gear (27) from front support leg (4).

4-44 FRONT SUPPORT LEG AND PIVOT REPAIR (Con't).

**NOTE**

Ensure lower support leg is supported before removing pin.

9. Remove pin (31) and lower support leg (32) from front support leg (4).



4-44 FRONT SUPPORT LEG AND PIVOT REPAIR (Con't).

d. CLEANING AND INSPECTION

**WARNING**

Dry cleaning solvent, P-D-680, is toxic and flammable. Always wear goggles and gloves and use solvent only in a well-ventilated area. Avoid contact with skin, eyes, and clothe, and DO NOT breathe vapors. DO NOT use near open flame or excessive heat. The solvent's flash point is 100°F to 138°F (38°C to 59°C). If you become dizzy while using cleaning solvent, immediately get fresh air and medical help. If solvent contacts eyes, immediately wash your eyes and get medical aid.

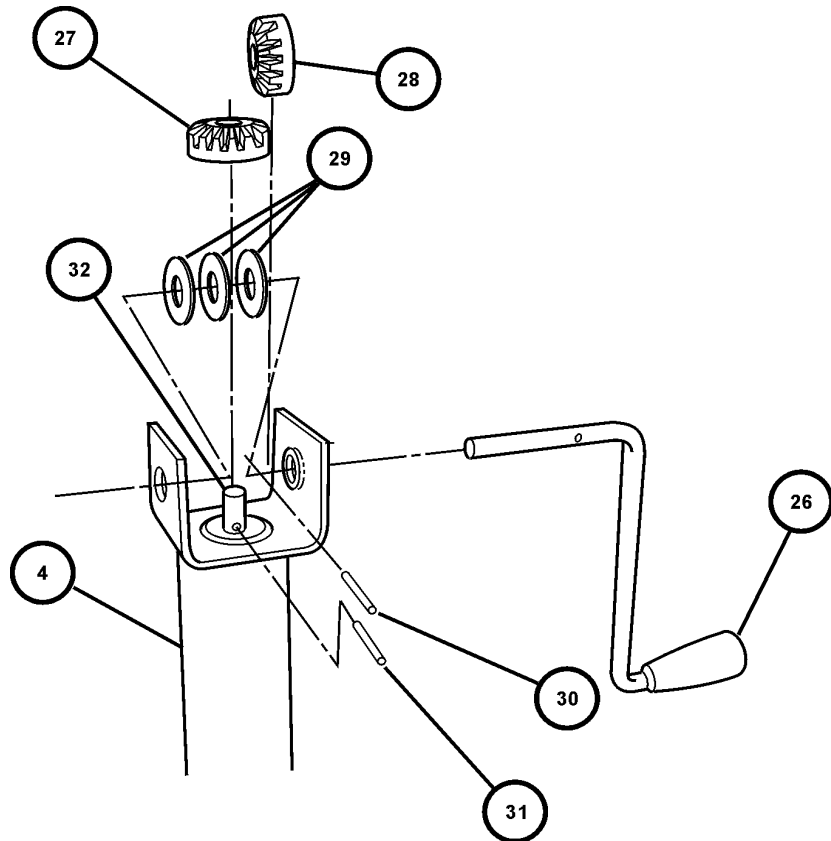
1. Clean all removed components with dry cleaning solvent and allow to dry.
2. Inspect all components for wear, cracks, broken welds, or corrosion. Replace if damaged.

e. FRONT SUPPORT LEG ASSEMBLY

**NOTE**

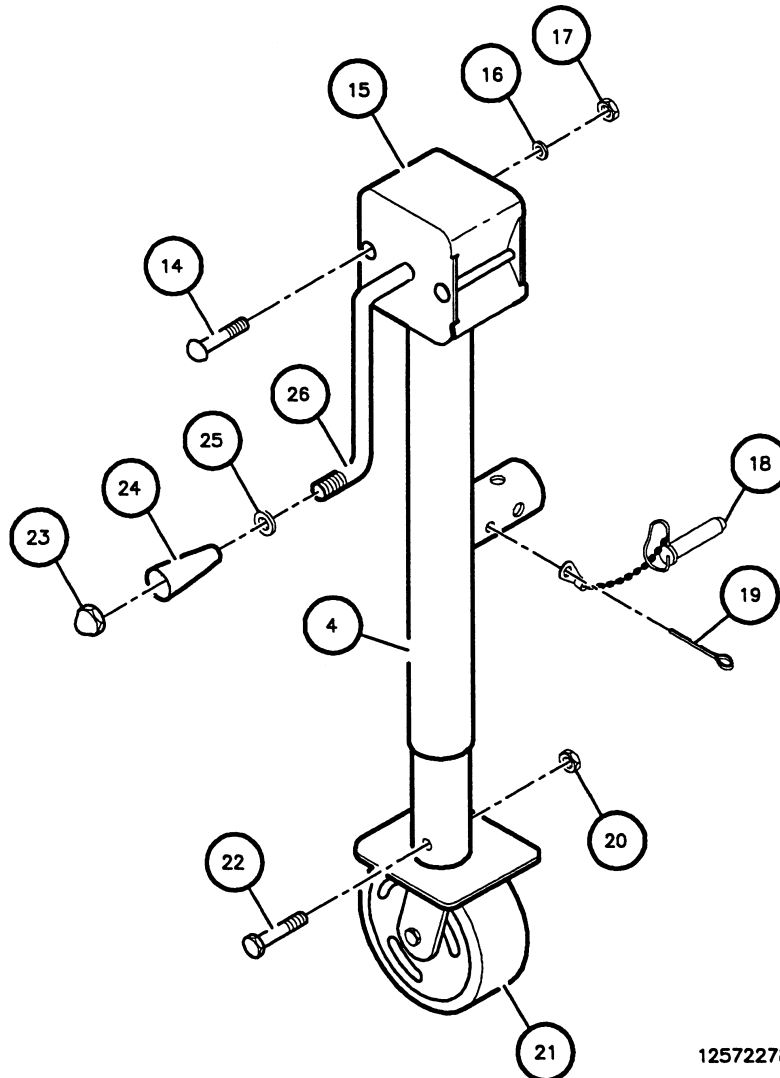
Ensure pin is centered in lower support leg or groove gear will not aline properly.

1. Install lower support leg (32) on front support leg (4) with pin (31).
2. Apply GAA grease to gear (27) and install gear on front support leg (4).
3. Apply GAA grease to gear (28) and position side wind crank (26) through first part of front support leg (4). Position spacers (29) and gear (28) on side wind crank (26).
4. Install side wind crank (26) through rest of front support leg (4) and rotate until pin hole in side wind crank (6) is aligned with pin hole in gear (28). Install pin (30).



**4-44 FRONT SUPPORT LEG AND PIVOT REPAIR (Con't).**

5. Install washer (25), handle (24), and new locknut (23) on side wind crank (26).
6. Install top cover (15) on front support leg (4) with two bolts (14), washers (16), and nuts (17).
7. Install pin assembly (18) to front support leg (4) with new cotter pin (19).
8. Install new caster (21) into front support leg (4) and secure with bolt (22) and new locknut (20).

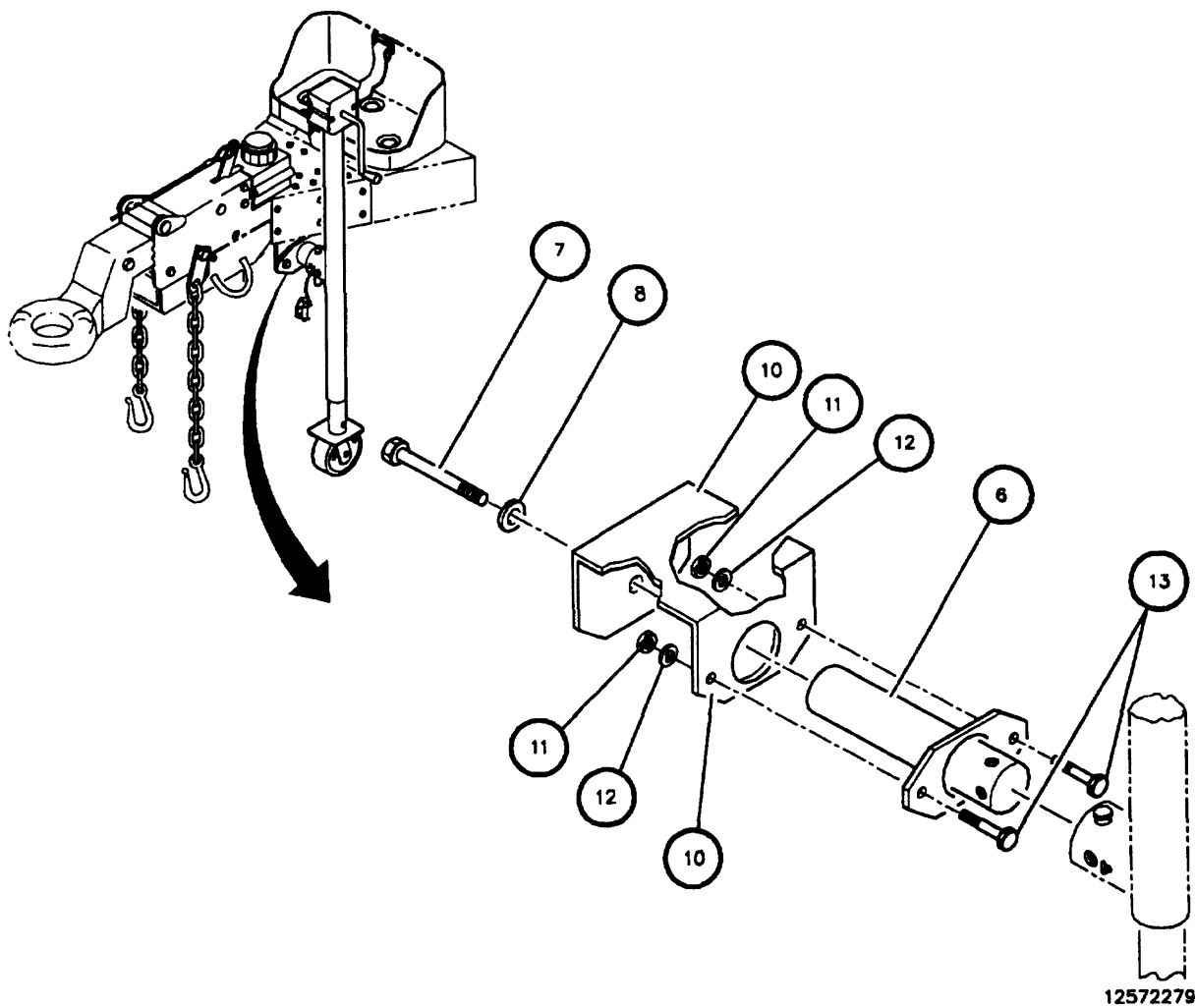


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4-44 FRONT SUPPORT LEG AND PIVOT REPAIR (Con't).

f. PIVOT INSTALLATION

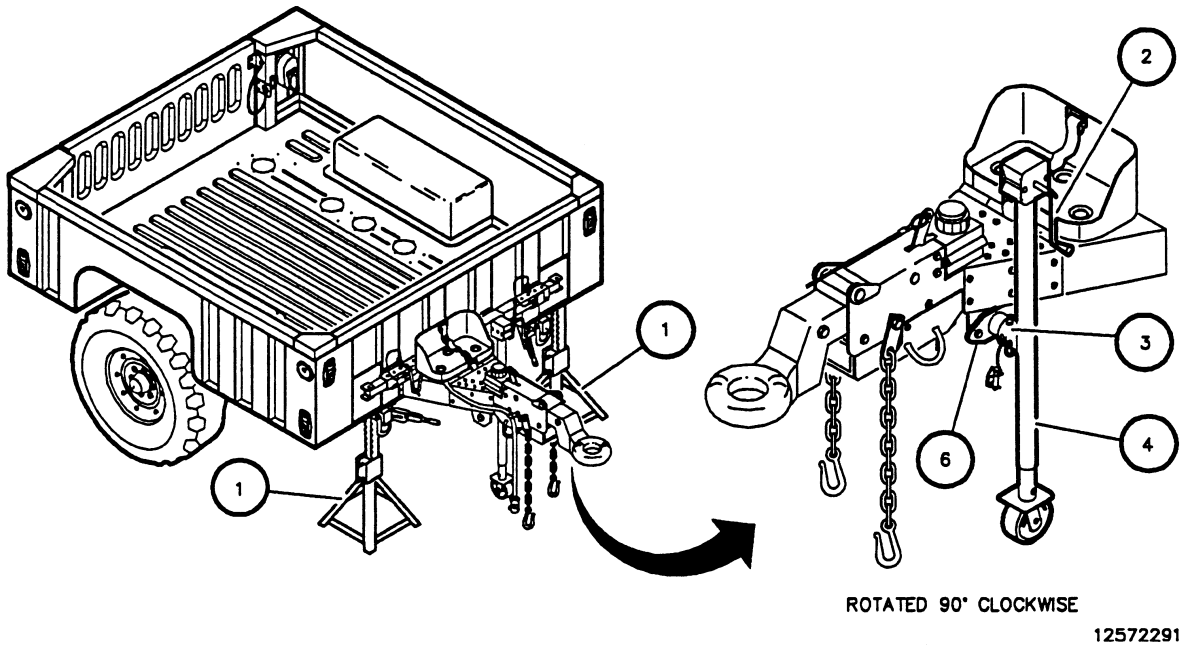
1. Install pivot (6) onto drawbar frame (10) and secure with capscrews (7) and lockwasher (8).
2. Install two capscrews (13), washers (12), and new locknuts (11).



4-44 FRONT SUPPORT LEG AND PIVOT REPAIR (Con't)

g. FRONT SUPPORT LEG INSTALLATION

1. Install front support leg (4) onto pivot (6) with the front support leg in the down position and secure with pin assembly (3).
2. Using front support leg handle (2), raise trailer until jackstands (1) can be removed from under trailer.
3. Remove jackstands (1).



**FOLLOW-ON TASKS:**

- Check for smooth operation of landing leg. If binding occurs, add or remove spacers.

## Section XIII. PAINTING AND IDENTIFICATION MARKING

### 4-45 PAINTING.

- a. Instructions for the preparation of material for painting, methods of painting, and materials to be used are contained in TM 43-0139, Painting Instructions for Army Materiel.
- b. Instructions for camouflage painting are contained in PM 20-3, Camouflage, and TB 43-0209, Color, Marking and Camouflage Painting of Military Vehicles, Construction Equipment, and Materials Handling Equipment.

### 4-46 STENCILING.

Refer to TB 43-0209 for instructions on application of stencils.

## Section XIV. PREPARATION FOR STORAGE AND SHIPMENT

### 4-47 GENERAL.

- a. This section contains requirements and procedures for administrative storage of equipment that is issued to and in use by Army activities worldwide.
- b. The requirements specified herein are necessary to maintain equipment in administrative storage in such a way as to achieve the maximum readiness condition.
- c. Equipment that is placed in administrative storage should be capable of being readied to perform its mission within a 24-hour period, or as otherwise prescribed by the approving authority. Before equipment is placed in administrative storage, a current PMCS should be completed and deficiencies corrected.
- d. Report equipment in administrative storage as prescribed for all reportable equipment.
- e. Perform inspections, maintenance services, and lubrication as specified herein.
- f. Records and reports to be maintained for equipment in administrative storage are those prescribed by DA Pam 738-750.
- g. A 10% variance is acceptable on time, running hours, or mileage used to determine the required maintenance actions.

### 4-48 DEFINITION OF ADMINISTRATIVE STORAGE.

The placement of equipment in administrative storage can be for short periods of time when a shortage of maintenance effort exists. Equipment should be ready for use within the time factors as determined by the directing authority. During the storage period, appropriate maintenance records will be kept.

### 4-49 PREPARATION OF EQUIPMENT FOR ADMINISTRATIVE STORAGE.

- a. Storage Site.
  - (1) Select the best available site for administrative storage. Separate stored equipment from equipment in use. Conspicuously mark the area "Administrative Storage."
  - (2) Covered space is preferred.



**4-49. PREPARATION OF EQUIPMENT FOR ADMINISTRATIVE STORAGE (Con't).**

- (3) Open sites should be improved hardstand, if available. Unimproved sites should be firm, well drained, and free of excessive vegetation.
- b. Storage Plan.
    - (1) Store equipment so as to provide maximum protection from the elements and to provide access for inspection, maintenance, and exercising. Anticipate removal or deployment problems and take suitable precautions.
    - (2) Take into consideration environmental conditions, such as extreme heat and cold; high humidity; blowing sand, dust, or loose debris; soft ground; mud; heavy snows; or combinations thereof, and take adequate precautions.
    - (3) Establish a fire plan and provide for adequate fire fighting equipment and personnel.
  - c. Maintenance Services and Inspection.
    - (1) Maintenance Services. Prior to storage, perform the next scheduled Unit PMCS.
    - (2) Inspection. Inspect and approve the equipment prior to storage. Do not place equipment in storage if it is in a nonmission-capable condition.
  - d. Correction of Shortcomings and Deficiencies. Correct all shortcomings and deficiencies prior to storage, or obtain a deferment from the approving authority.
  - e. Lubrication. Lubricate equipment in accordance with instructions in Appendix G.
  - f. General Cleaning, Painting, and Preservation.

**WARNING**

Dry cleaning solvent, P-D-680, is toxic and flammable. Always wear protective goggles and gloves and use solvent only in a well-ventilated area. Avoid contact with skin, eyes, and clothes, and DO NOT breathe vapors. DO NOT use near open flame or excessive heat. The solvent's flash point is 100 °F to 138 °F (38 °C to 59 °C). If you become dizzy while using cleaning solvent, immediately get fresh air and medical help. If solvent contacts eyes, immediately wash your eyes with water and get medical help.

**CAUTION**

Do not direct water or steam under pressure against unsealed electrical components, master cylinder fill cap, or any exterior opening. Failure to follow this caution may result in damage to the equipment.

- (1) Cleaning. Clean the equipment of dirt, grease, and other contaminants, but do not use vapor degreasing.
- (2) Painting. Prepare and paint equipment in accordance with instructions in Section XIII.
- (3) Preservation. After cleaning and drying, immediately coat unpainted metal surfaces with oil or grease, as appropriate, in accordance with instructions in Appendix G.

**4-50. CARE OF EQUIPMENT IN ADMINISTRATIVE STORAGE.**

- a. Maintenance Service. After equipment has been placed in administrative storage, inspect, service, and exercise as specified herein.
- b. Inspection. Inspection will usually be visual and must consist of at least a walk around examination of all equipment to detect any deficiencies. Inspect equipment in open storage weekly and equipment in covered storage monthly. Inspect equipment immediately after any severe storm or environmental change. The following are examples of things to look for during a visual inspection:
  - (1) Low or fiat tires.
  - (2) Condition of preservatives, seals, and wraps.
  - (3) Corrosion or deterioration.
  - (4) Missing or damaged parts.
  - (5) Standing water.
  - (6) Any other readily recognizable shortcomings or deficiencies.
- c. Repair During Administrative Storage. Keep equipment in an optimum state of readiness. Accomplish the required services and repairs as quickly as possible. Whenever possible, perform all maintenance on-site.
- d. Exercising Exercise equipment in accordance with the table below and the following instructions:
  - (1) Vehicle Major Exercise. Depreserve equipment by removing only that material restricting exercise. Remove blocks and perform all before-operation checks. Couple trailer to towing vehicle and drive for at least 25 mi (40 km). Make several left and right 90-degree turns. Make several hard braking stops without skidding. Operate all other functional components and perform all during- and after-operation checks
  - (2) Scheduled Services. Scheduled services will include inspection per subparagraph b above and will be conducted in accordance with the table below. Lubricate in accordance with Appendix G.

<b>Weeks</b>	<b>2</b>	<b>4</b>	<b>6</b>	<b>8</b>	<b>10</b>	<b>12</b>	<b>14</b>	<b>16</b>	<b>18</b>	<b>20</b>	<b>22</b>	<b>24</b>
PMCS						X						X
Scheduled Services		X		X		X		X		X		X
Major Exercise												X

- (3) Corrective Action. Immediately take action to correct shortcomings and deficiencies noted. Record inspection and exercise results on DA Form 2404. Record and report all maintenance actions on DA Form 2407. After exercising, restore the preservation to the original condition. Replenish lubricants used during exercising and note the amount on DA Form 2408.
- e. Rotation. Rotate items in accordance with any rotational plan that will keep the equipment in an operational condition and reduce the maintenance effort.

**4-51. PROCEDURES FOR COMMON COMPONENTS AND MISCELLANEOUS ITEMS.**

- a. Tires. Visually inspect tires during each walkaround inspection. This inspection includes checking tires with a tire gauge. Inflate, repair, or replace as necessary those tires found to be low, damaged, or excessively worn. Mark inflated and repaired tires for checking at the next inspection.
- b. Seals. Seals may develop leaks during storage, or shortly thereafter. If leaking persists, refer to the applicable maintenance section in this manual for corrective maintenance procedures.

**4-52. REMOVAL OF EQUIPMENT FROM ADMINISTRATIVE STORAGE.**

- a. Activation. Restore the equipment to normal operating condition in accordance with the instructions contained in Chapter 4, Section II.
- b. Servicing. Resume the maintenance service schedule in effect at the commencement of storage, or service the equipment before the scheduled dates in order to produce a staggered workload.

**4-53. PREPARATION OF EQUIPMENT FOR SHIPMENT.**

- a. Height and width of vehicles prepared for rail transportation must not exceed the limitations of AR 700-15. Whenever possible, local transportation personnel must be consulted about limitations of particular railroad lines to be used for movement in order to avoid delays, dangerous conditions, or damage to equipment.
- b. Loading and blocking procedures for flatcar shipment must be in accordance with pamphlet number MD-7, Rules Governing the Loading of Defense Material on Open-Top Cars of Association of American Railroads.
- c. Loading and blocking of vehicles for highway shipment must be in accordance with Interstate Commerce Commission Publication "Motor Carrier Safety Regulations."
- d. Refer to FM 55-21, TM 55-601, and TM 743-200-1 for additional instructions on processing, storage, and shipment of material.

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## CHAPTER 5 DIRECT SUPPORT MAINTENANCE INSTRUCTIONS

Paragraph	Title	Page Number
5-1.	BRANCHED WIRING HARNESS REPLACEMENT* .....	5-2
5-2.	WIRING DIAGRAM* .....	5-4
5-3.	BRANCHED WIRING HARNESS REPAIR* .....	5-5
5-4.	AXLE ASSEMBLY INSPECTION AND REPLACEMENT.....	5-10
5-5.	CARGO BODY REPAIR .....	5-16

\* These procedures are now performed by Unit Maintenance personnel and have been moved to Chapter 4, Section 6.

5-1 BRANCHED WIRING HARNESS REPLACEMENT.

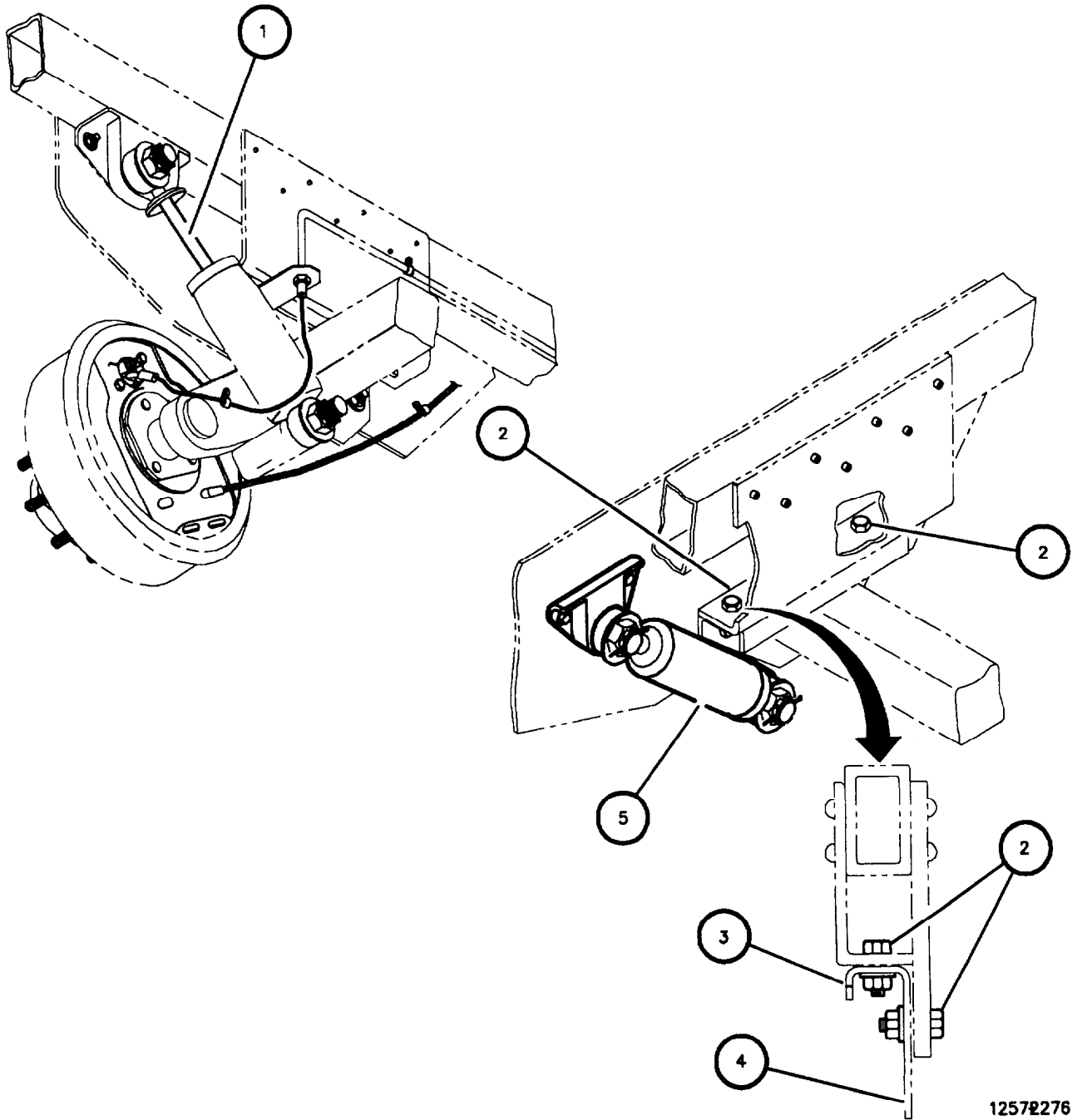
Pages 5-2 thru 5-9 Deleted per Change 2. This includes paragraphs 5-1 thru 5-3.

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5-4 AXLE ASSEMBLY INSPECTION AND REPLACEMENT (Con't).



5-4 AXLE ASSEMBLY INSPECTION AND REPLACEMENT (Con't).

b. REMOVAL

**WARNING**

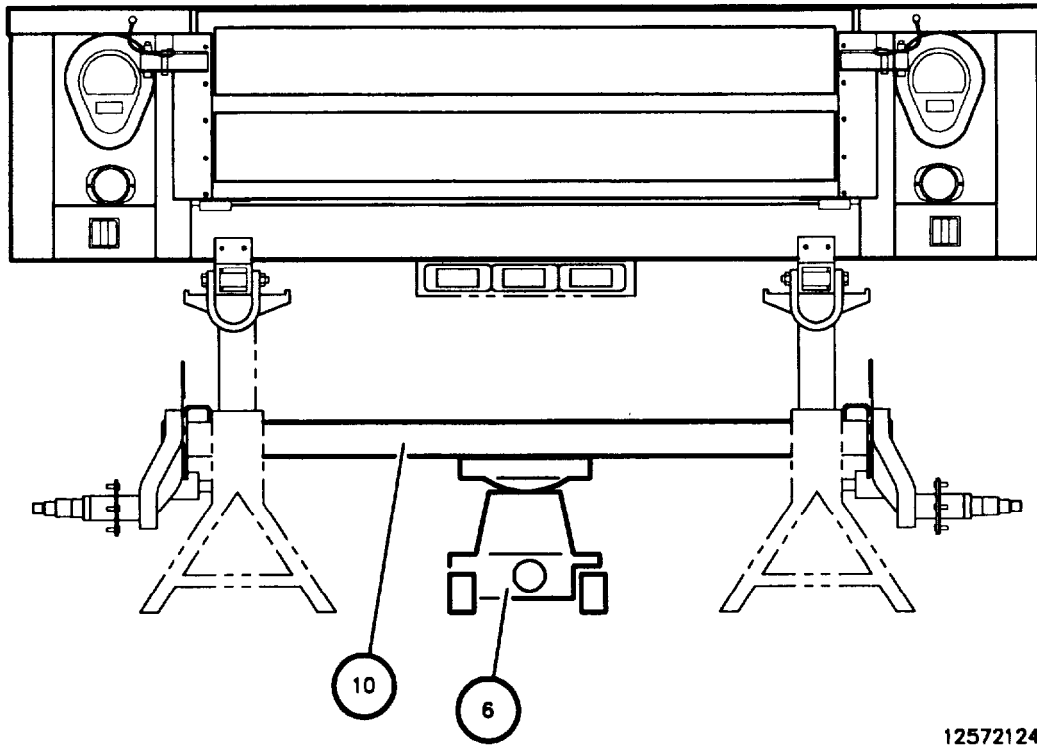
- DO NOT handle brakeshoes, brakedrums, or other brake components unless area has been properly cleaned. There maybe asbestos dust on these components that can be dangerous if you touch it or breathe it. Wear an approved filter mask and gloves. NEVER use compressed air or a dry brush to clean brake components. Dust may be removed using an industrial-type vacuum cleaner. Clean dust or mud away from brake components with water and a wet, soft brush or cloth. Failure to follow this warning may result in serious illness or death to personnel.
- A scissor jack is used for raising and lowering and is NOT used to support the vehicle. Never work under vehicle unless wheels are chocked and it is properly supported. Failure to follow this warning may result in injury to personnel or damage to equipment if vehicle suddenly shifts or moves.

1. Place trailer on jack stands on all four corners.
2. Remove wheels (para 4-32).
3. Remove hubs/drums (para 4-33).
4. Remove brakeshoes and backing plates (para 4-24).
5. Remove shock absorbers (para 4-37).
6. Position floor jack (6) under rear of trailer and place jack saddle under middle of axle (10).

**WARNING**

Axle handling is normally a two-person task. A third person may be required. The axle weight is 190 pounds. Use caution when handling the axle. Failure to follow this warning could result in injury to personnel or damage to equipment.

5-4 AXLE ASSEMBLY INSPECTION AND REPLACEMENT (Con't).



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**5-4 AXLE ASSEMBLY INSPECTION AND REPLACEMENT (Con't).**

7. Remove four locknuts (2), four flat washers (7), and four capscrews (8) from top axle mounts. Discard locknuts.
8. Remove four locknuts (2), four flat washers (7), and four capscrews (8) from side axle mounts. Discard locknuts.
9. Carefully lower axle (10) and remove from trailer.
10. Check eight frame/axle mounting holes (9) for damage. If damaged, notify GS maintenance.

**c. INSTALLATION**

**WARNING**

Axle handling is normally a two-person task. A third person may be required. The axle weight is 190 pounds. Use caution when handling the axle. Failure to follow this warning could result in injury to personnel or damage to equipment.

1. Place axle (10) on hydraulic jack (6) and roll jack (axle) under trailer.
2. Raise axle (10) to frame and align eight axle mounting holes (9).

**NOTE**

Before torquing top axle mount locknuts, ensure holes align in side axle mounts.

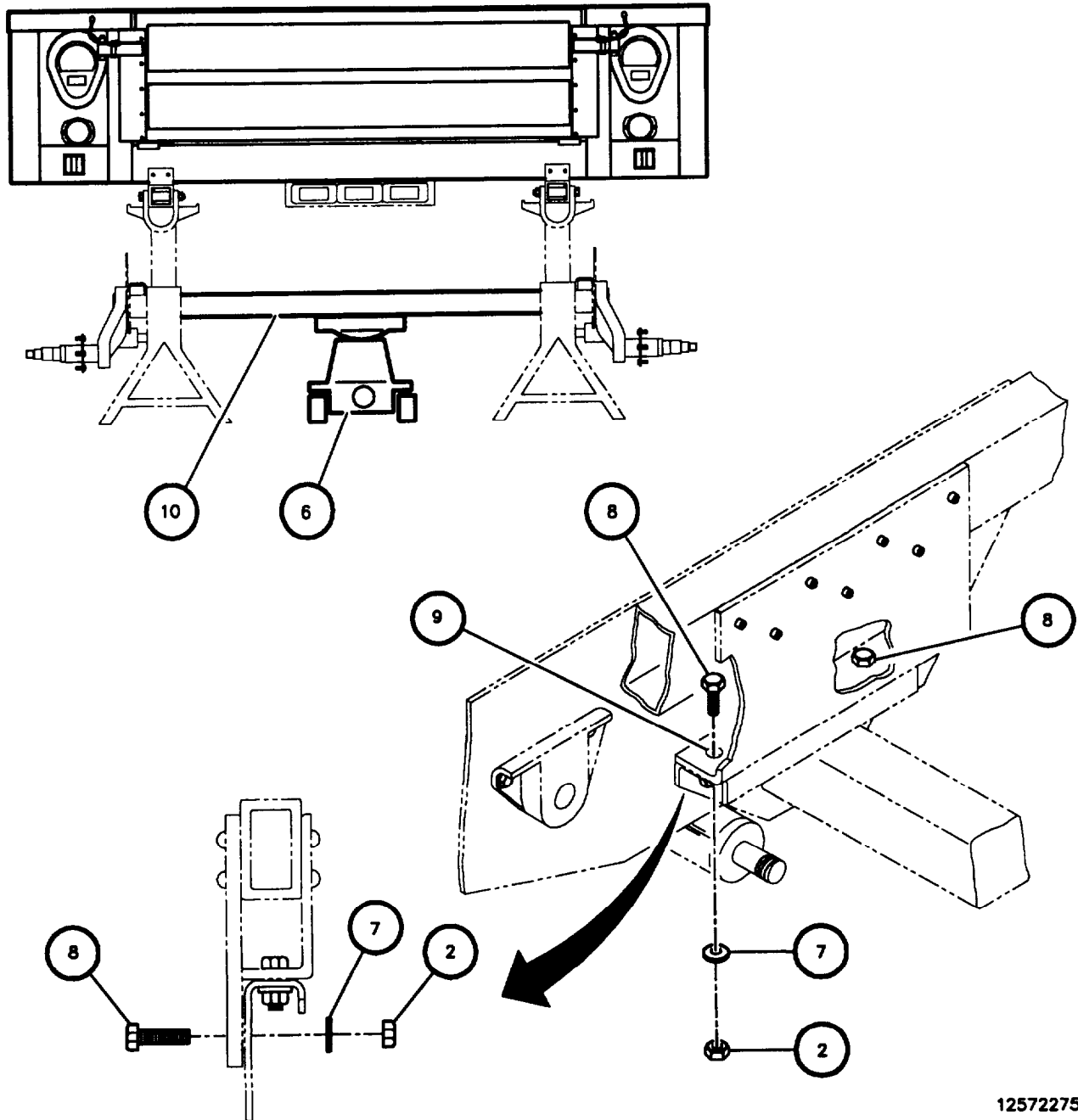
3. Install four capscrews (8), four flat washers (7), and four new locknuts (2) to top axle mounts. Tighten nuts and torque to  $130 \pm 13$  ft-lb ( $176 \pm 18$  N•m).
4. Install four capecrews (8), four flat washers (7), and four new locknuts (2) to side axle mounts. Tighten nuts and torque to  $142 \pm 14$  ft-lb ( $192 \pm 19$  N•m).

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**FOLLOW-ON TASKS:**

- Install brakeshoes and backing plates (para 4-24).
- Install hub/drum on axle (para 4-33).
- Install wheel on hub/drum (para 4-32).
- Install shock absorber (para 4-37).
- Bleed hydraulic system (para 4-26).
- Adjust service brakes (para 4-23).
- Adjust handbrakes (para 2-14).

5-4 AXLE ASSEMBLY INSPECTION AND REPLACEMENT (Con't).



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5-5 CARGO BODY REPAIR.

---

**This task covers:** Aluminum repair of negligible damage, by patching and by insertion

---

**Initial Setup:**

**Equipment Conditions:**

- Parked on level surface.
- Wheels chocked (para 2-8.1).
- Handbrakes applied.

**Materials/Parts:**

- Rivets

**Tools/Test Equipment:**

- General mechanics tool kit Locknut
  - Common No. 1 shop set
- 

**CAUTION**

Repairs should not be made on the body using welding or heat for forming. Heat will only weaken material and cause further problems.

**a. MATERIAL**

1. Aluminum material used for repair should be of the same alloy and temper as original, if possible. In general, 6061-T6 aluminum alloy should be used. Material thickness must be the same or thicker. This alloy will work well with flat repairs, but is not well suited to bending because it is quite hard and cracks easily when bent sharply.
2. When bends must be made, use softer 6061-T4 aluminum alloy and increase material thickness by at least 50 percent. As a general rule, 6061-T4 alloy should be bent with a minimum bend radius of one to two times material thickness, whereas 6061-T6 alloy requires at least three times material thickness radius for bends.
3. In all cases, bends should be closely inspected for cracks. A suitable method for avoiding cracks during bending is to obtain angles that are extruded from 6061-T6 alloy or use preformed angles for repairs.

**b. EPOXY ADHESIVE**

Where it is necessary to remove parts, note that epoxy adhesive is used in joints. Use care in parts removal to avoid unnecessary distortion. Parts should be separated by peeling them apart, using a knife or chisel to start the peeling action. Before parts are reassembled, it will be necessary to remove any remaining cured epoxy from joints so parts will fit together with good, even contact. Use of epoxy requires special storage and application procedures that do not lend themselves to field repair. For this reason, epoxy will not be used for repair. To compensate for the lack of epoxy, additional rivets should be used when making repairs to existing joints.

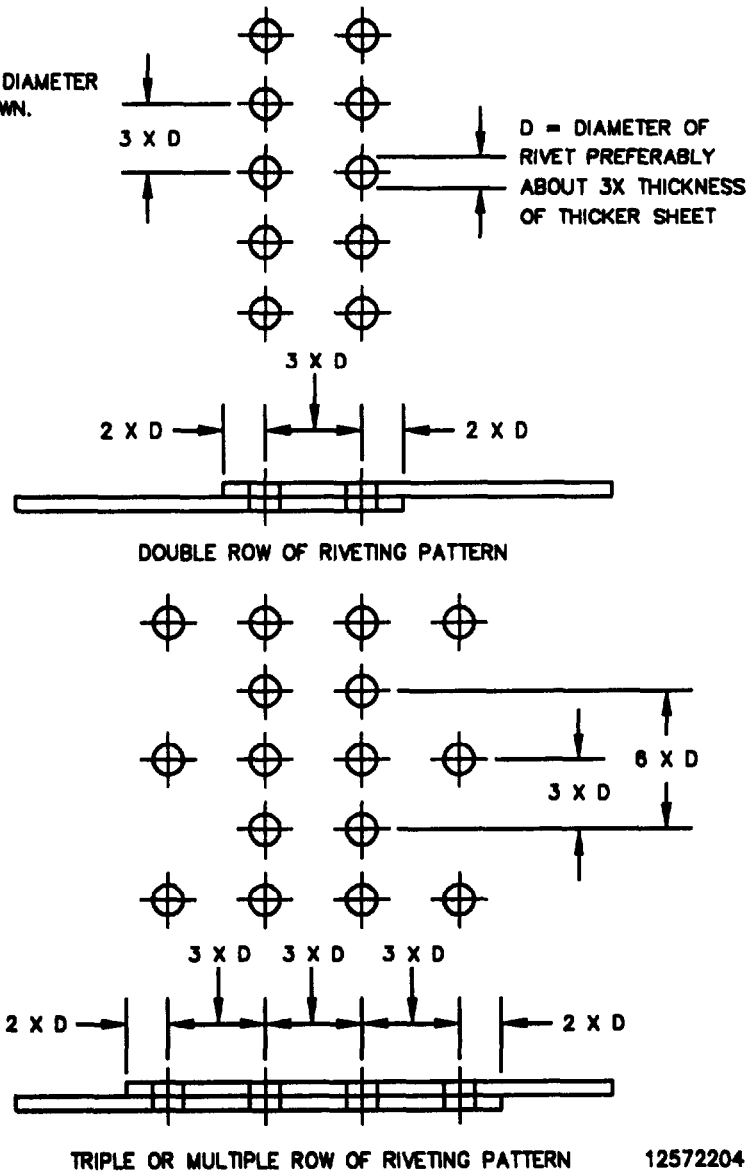
**c. RIVET PATTERNS**

1. Rivet patterns are denoted by rivet spacing and rivet edge distance. Rivet edge distance is the distance from center of rivet to nearest edge of sheet. Rivet spacing is defined as the distance from center of rivet to center of adjacent rivet.

5-5 CARGO BODY REPAIR (Con't).

2. Required rivet spacing is determined by strength needed in the joint. A general feel for strength required can be obtained by inspecting rivet patterns in surrounding areas. Body repairs made using single rows of rivets should be performed using rivet spacing not greater than 1.5 in. (4 cm) and not less than 0.625 in. (16 mm). Use 1-inch rivet spacing as a general practice for repairs. Rivet spacing used in original construction may be greater due to additional strength obtained by using epoxy adhesive. Do not use rivet edge distances less than 0.375 in. (9.5 mm).
3. High-strength joints or large patches may require use of double or multiple rows of rivets to obtain sufficient strength.

**NOTE:**  
TO SET RIVET SPACING, MULTIPLY THE DIAMETER OF THE RIVET TIMES THE NUMBER SHOWN.

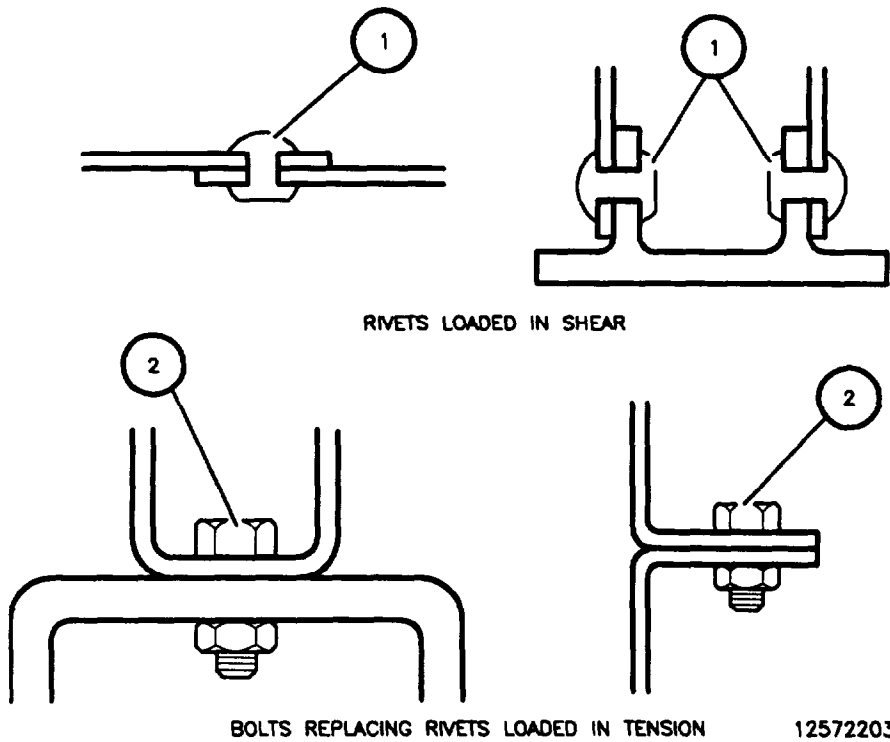


5-5 CARGO, BODY REPAIR (Con't).

4. Care must be taken to assure rivet hole patterns are transferred accurately in the case where a part with no holes is mated to one that already has rivet holes. Hole patterns must be transferred using one of the following methods:
  - (a) Lay a new part in place and use holes in mating part as a drill template. This requires new part be underneath the mating part. Care must be taken not to distort original hole.
  - (b) Use removed part as a drill template by clamping the new and old parts together. This requires that parts nest flat and rivet flange be undistorted.
  - (c) For repair of huc rivets, punch damaged rivet out and replace rivet with self-tapping screw (see page F-35, item 38 for parts information).

d. JOINT DESIGN

1. Loads are applied through a joint to fasteners that hold the joint together. These loads are applied to fasteners in the form of shear loads or tension loads. If load is perpendicular to axis of fastener, the fastener is loaded in shear. If load is along axis of fastener, causing a pull on each end of fastener, the fastener is loaded in tension.
2. Rivets (1) are designed to be loaded in shear. Do not create any new joints during repairs that cause rivets to be used in a tension application. Bolts (2) should be used for tension applications or substituted for rivets in very high shear load applications.





**5-5. CARGO BODY REPAIR (Con't).**

**e. REPAIR PARTS PREPARATION**

1. Repair parts or patches should be painted with epoxy primer before installation.
2. Apply sealing compound (item 12, Appendix E) to mating surfaces to prevent corrosion.
3. Install part as detailed in Subparagraph g, Repair by Patching, or Subparagraph h, Repair by Insertion.
4. Refer to Section XIH, Chapter 4, for instructions on painting.

**f. REPAIR OF NEGUGIBLE DAMAGE**

1. Negligible cracks are repaired by drilling a small hole at each end of crack to stop crack propagation. This is called "stop drilling." Table 5-1 gives proper drill sizes for 'stop drilling" cracks.
2. Negligible holes are repaired by rounding and smoothing edges of hole to alleviate stress risers caused by sharp notches.

**CAUTION**

Heat should never be used to reform parts because it greatly reduces part strength.

3. Small dents and distorted areas may be repaired by bending or hammering, as long as the operation does not cause materials to crack or tear. Sharp bends should not be attempted.

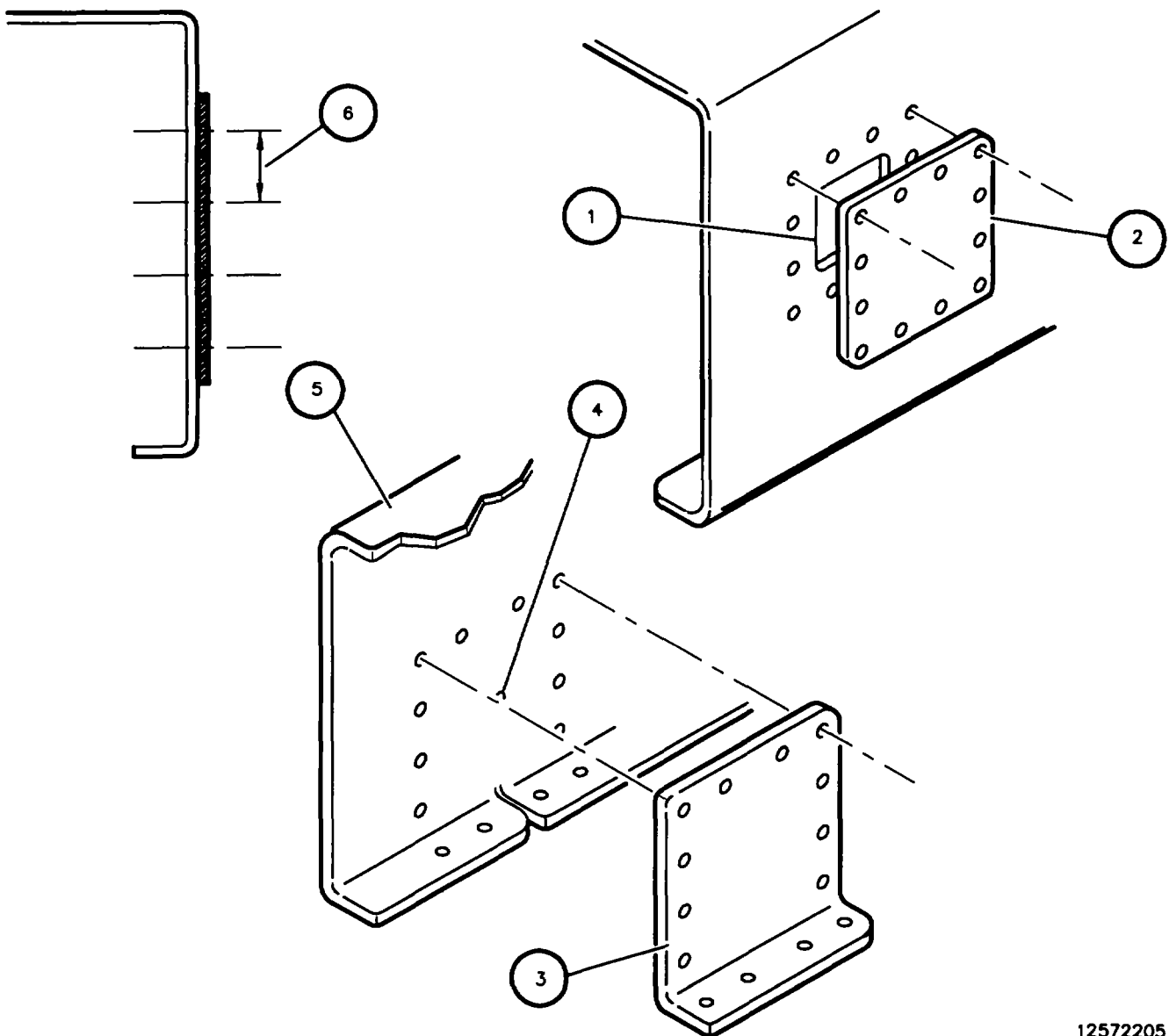
*Table 5-1. Stop Drill Sizes for Negligible Cracks*

Sheet Thickness (in.)	Minimum Stop Drill Size No.
0 to .032	40
0.033 and thicker	30

5-5. CARGO BODY REPAIR (Con't).f

g. REPAIR BY PATCHING

1. Most body panel damage that exceeds the limits of negligible damage may be repaired by patching. This procedure involves removal of damaged area (1) and application of a patch (2) to cover the area. The damaged area is prepared by removal of the damage by rounding or smoothing of all corners and edges. This helps assure that cracks will not spread into undamaged areas.
2. In the case of a large crack (4), it may be desirable to stop drill the crack rather than cut out a portion of the panel (5) or structural member. Repair is completed by applying a large overlapping patch (3) over the area that was damaged. The overlap must be sufficient to allow the observance of proper rivet edge distance (6). Large areas of damage are best repaired using a patch that is attached with multiple rows of rivets.

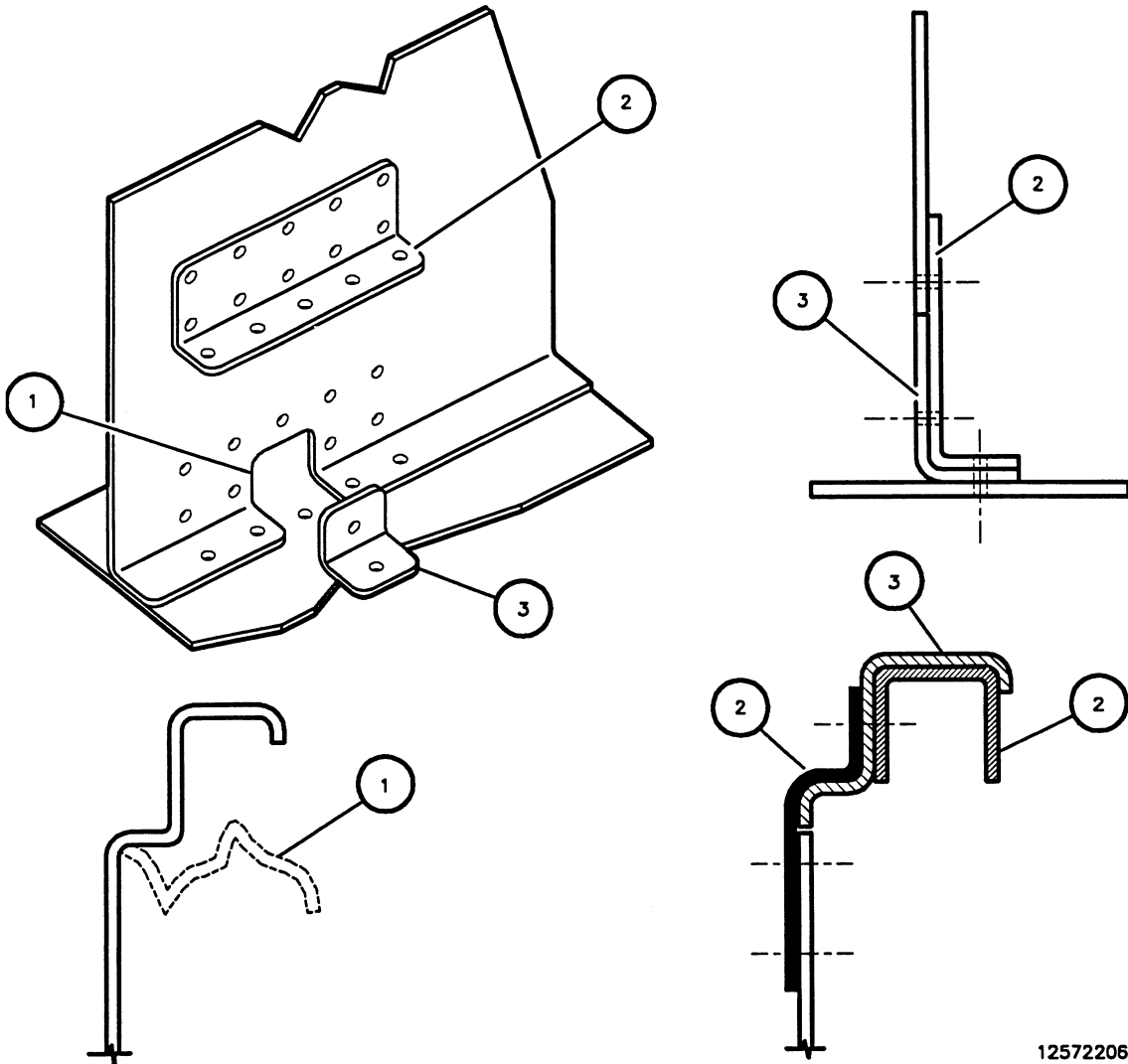


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5-5 CARGO BODY REPAIR (Con't).

h. REPAIR BY INSERTION

For damage that is large or more severe in nature than a crack or hole, it is often desirable to remove damaged area (1), insert a piece of material (3) into removed area, and reinforce this with a doubler (2). This method of repair is typically stronger and stiffer than an added patch.



5-6 BRAKE INSPECTION.

---

This task covers: Inspection

---

**Initial Setup:**

**Equipment Conditions:**

- Brakedrum removed (para 4-33).

**Tools/Test Equipment:**

- General mechanics tool kit
  - Field automotive shop set
  - Dial indicator
  - Inside micrometer, with extension
- 

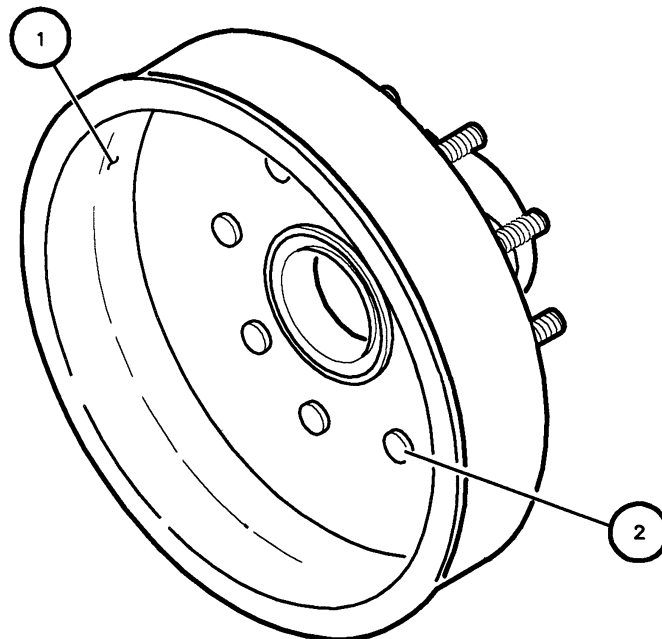
**INSPECTION**

1. Inspect stud holes (2) for cracks. Discard brakedrum if cracks are present.

**WARNING**

DO NOT use a brakedrum that exceeds maximum wear specifications. Failure to follow this warning may result in brake failure and serious injury or death to personnel.

2. Inspect braking surface (1) for cracks, heat checking, and scoring. Discard brakedrum if surface is damaged.
3. Inspect braking surface (1) for out-of-round condition. Discard brakedrum if out-of-round.
4. Measure inside diameter of brakedrum. Discard brakedrum if inside diameter exceeds 12.09 in. (30.7 cm).



**CHAPTER 6**

**GENERAL SUPPORT MAINTENANCE INSTRUCTIONS**

There is no General Support Maintenance for the M1101, M1102, and Trailer Chassis.



**APPENDIX A  
REFERENCES**

**A-1. SCOPE.**

This appendix lists forms, field manuals, technical manuals, and other publications that are referenced in this manual and that apply to the operation and the Organizational, Direct Support, and General Support maintenance of the M1101, M1102, and Trailer Chassis.

**A-2. PUBLICATION INDEX.**

DA Pam 25-30, Consolidated Index of Army Publications and Blank Forms, should be consulted frequently for changes or revisions and for new publications relating to material covered in this technical manual.

**A-3. FORMS.**

Refer to DA Pam 738-750, The Army Maintenance Management System (TAMMS), for instructions on the use of maintenance forms.

Equipment Inspection and Maintenance Worksheet .....	DA Form 2404
Equipment Log Assembly (Records) .....	DA Form 2408
Maintenance Request .....	DA Form 2407
Preventive Maintenance Schedule and Record.....	DD Form 314
Processing and Deprocessing Record for Shipment, Storage and Issue of Vehicles and Spare Engine .....	DD Form 1397
Product Quality Deficiency Report .....	SF 368
Recommended Changes to Equipment Technical Publications .....	DA Form 2028-2
Recommended Changes to Publications and Blank Forms .....	DA Form 2028
Report of Discrepancy (ROD) .....	SF 364

**A-4. FIELD MANUALS.**

Camouflage .....	FM 20-3
First Aid for Soldiers .....	FM 21-11
Manual for the Wheeled Vehicle Driver .....	FM 21-305
Operation and Maintenance of Ordnance Material in Cold Weather ( <sup>0°</sup> to -65 °F).....	FM 9-207
Railway Operating and Safety Rules .....	FM 55-21

**A-5. TECHNICAL BULLETINS.**

Color, Marking, and Camouflage Painting of Military Vehicles, Construction Equipment, and Materials Handling Equipment .....	TB 43-0209
Solder and Soldering .....	TB SIG 222

**A-6. TECHNICAL MANUALS.**

Inspection, Care, and Maintenance of Antifriction Bearings .....	TM 9-214
Materials Used for Cleaning, Preserving, Abrading, and Cementing Ordnance Material and Related Items Including Chemicals .....	TM 9-247

Operator's, Unit, Direct Support, and General Support Maintenance Manual  
for Care, Maintenance, Repair and Inspection of Pneumatic Tires and  
Inner Tubes ..... TM 9-2610-200-14  
Painting Instructions for Army Materiel ..... TM 43-0139  
Procedures for Destruction of Tank-Automotive Equipment to Prevent  
Enemy Use . ..... TM 750-244-6  
Railcar Loading Procedures ..... TM 55-601  
Storage and Materials Handling ..... TM 743-200-1

**A-7. OTHER PUBLICATIONS.**

Army Medical Department Expendable/Durable Items .....CTA 8-100  
Classification, Reclassification, Issuance, and Reporting of Maintenance  
Training Aircraft ..... AR 700-42  
Expendable/Durable Items (Except Medical, Class V, Repair Parts, and  
Heraldic Items) .....CTA 50-970  
Packaging of Materials ..... AR 700-15  
Rules Governing the Loading of Defense Material on Open-Top Cars of  
Association of American Railroads ..... MD-7  
The Army Maintenance Management System (TAMMS) ..... DA Pam 738-750



**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 levels.
- (b) The Maintenance Allocation Chart (MAC) in Section II designates overall authority and responsibility for the performance of maintenance functions on the identified end item or component. The application of the maintenance functions to the end item or component will be consistent with the capacities and capabilities of the designated maintenance levels.
- (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.
- (d) Section IV contains supplemental instructions and explanatory notes for a particular maintenance function.

**B-2. MAINTENANCE FUNCTIONS.**

Maintenance functions will be limited to and defined as follows:

- (a) Inspect. To determine the serviceability of an item by comparing its physical, mechanical, and/or electrical characteristics with established standards through examination (e.g., by sight, sound, or feel).
- (b) Adjust. To maintain or regulate, within prescribed limits, by bringing into proper or exact position, or by setting the operating characteristics to specified parameters.
- (c) Replace. To remove an unserviceable item and install a serviceable counterpart in its place. "Replace" is authorized by the MAC and is shown as the third position code of the SMR code.
- (d) Repair. The application of maintenance services, including fault location/troubleshooting, removal/ installation, and disassembly/assembly procedures, and maintenance actions to identify troubles and restore serviceability to an item by correcting specific damage, fault, malfunction, or failure in a part, subassembly, module (component or assembly), end item, or system.
- (e) Remove/Install. To remove and install the same item when required to perform service or other maintenance functions. Install may be the act of replacing, seating, or fixing into position a spare, repair part, or module (component or assembly) in a manner to allow the proper functioning of an equipment or system.
- (f) Service. Operations required periodically to keep an item in proper operating condition, i.e., to clean (includes decontaminate, when required), to preserve, to drain, to paint, or to replenish fuel, lubricants, chemical fluids, or gases

**B-3. EXPLANATION OF COLUMNS IN THE MAC, SECTION II.**

- (a) Column (1), Group Number. Column 1 lists functional group code numbers, the purpose of which is to identify maintenance significant components, assemblies, subassemblies, and modules with the next higher assembly. End item group number shall be "00."
- (b) Column (2), Component/Assembly. Column 2 contains the names of components, assemblies, subassemblies, and modules for which maintenance is authorized.
- (c) Column (3), Maintenance Function. Column 3 lists the functions to be performed on the item listed in Column 2. See paragraph B-2 for detailed explanation of these functions.
- (d) Column (4), Maintenance Level. Column 4 specifies, by the listing of a work time figure in the appropriate sub-column(s), the level of maintenance authorized to perform the function listed in Column 3. This figure represents the active time required to perform that maintenance function at the indicated level of maintenance. If the number or complexity of the tasks within the listed maintenance function varies at different maintenance levels, appropriate work time figures will be shown for each level. The work time figure represents the average time required to restore an item (assembly, subassembly, component, module, end item, or system) to a serviceable condition under typical field operating conditions. This time includes preparation time (including any necessary disassembly/assembly time), troubleshooting/fault location time, and quality assurance/quality control time in addition to the time required to perform the specific tasks identified for the maintenance functions authorized in the MAC. The symbol designations for the various maintenance levels are as follows:

C.....	Operator or Crew
O.....	Unit Maintenance
F.....	Direct Support Maintenance
H.....	General Support Maintenance
D.....	Depot Support Maintenance

- (e) Column (5), Tools and Equipment. Column 5 specifies, by code, those common tool sets (not individual tools) and special tools; Test, Measurement and Diagnostic Equipment (TMDE); and support equipment required to perform the designated function.
- (f) Column (6), Remarks. This column shall, when applicable, contain a letter code, in alphabetic order, which shall be keyed to the remarks contained in Section IV.

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

- (a) Column (1), Reference Code. The tool and test equipment reference code correlates with a code used in the MAC, Section II, Column 5.
- (b) Column (2), Maintenance Level. The lowest level of maintenance authorized to use the tool or test equipment.
- (c) Column (3), Nomenclature. Name or identification of the tool or test equipment.
- (d) Column (4), National Stock Number. The National Stock Number of the tool or test equipment.
- (e) Column (5), Tool Number. The manufacturer's part number.

**B-5 EXPLANATION OF COLUMNS IN REMARKS, SECTION IV.**

- a. **Column (1), Reference Code.** The code recorded in Column 6, Section II.
- b. **Column (2), Remarks.** This column lists information pertinent to the maintenance function being performed as indicated in the MAC, Section II.

### Section II. MAINTENANCE ALLOCATION CHART

(1)  Group Number	(2)  Component/ Assembly	(3)  Maintenance Function	(4) Maintenance Level				(5)  Tools and Equipment	(6)  Remarks	
			Unit		DS	GS			Depot
			C	O	F	H			D
<b>06</b>	<b>ELECTRICAL SYSTEM</b>								
0609	Lights	Inspect Replace Repair	0.1	0.5 0.5			1 1 1	(A)	
	Lamps	Replace		0.5			1		
0613	Hull or Chassis Wiring Harness								
	Wiring Harness, Branched	Inspect Replace Repair	0.1	2.0 0.5			1,2 1 1,2	(B)	
	Cable, Intervehicular	Inspect Replace	0.1	0.5					
<b>10</b>	<b>AXLE</b>								
1000	Axle Assembly	Inspect Replace			1.0 5.5		1,2		
<b>12</b>	<b>BRAKES</b>								
1201	Handbrakes	Inspect Adjust Replace Repair	0.1 0.1	0.1 0.1 2.0 2.0			1,2 1 1,2	(C)	
1202	Service Brakes								
	Brake Assemblies	Inspect Adjust Replace Repair	0.1	0.5 0.5 2.0 1.5			1,2 1,2,6 1,2 1,2	(D) (E)	
1204	Hydraulic Brake System	Inspect	0.1						
	Actuator Assembly, Brake	Inspect Replace Repair		0.2 2.0 2.0			1,2 1,2	(F)	
	Cylinder Assembly, Master	Inspect Service Replace	0.1 0.1	1.0			1,2 1,2		
	Brake Lines, Hydraulic	Inspect Replace	0.1	1.0			1,2		

**Section II. MAINTENANCE ALLOCATION CHART - Continued**

(1) Group Number	(2) Component/ Assembly	(3) Maintenance Function	(4) Maintenance Level				(5) Tools and Equipment	(6) Remarks	
			Unit		DS	GS			Depot
			C	O	F	H			D
<b>13</b>	<b>WHEELS AND TIRES</b>								
1311	Wheel Assembly								
	Drum, Brake	Inspect		0.5				1,2	
		Replace		1.0				1,2	
		Repair			2.0			5 (E)	
	Hub Bearings, Wheel	Service		1.0				1,2	
		Adjust		0.2				1,2	
		Replace		1.0				1,2	
		Repair		1.0				1,2 (G)	
	Wheel	Inspect	0.1					1,2	
		Replace		1.0				1,2	
		Repair		1.0				1,2 (H)	
	Wheel and Tire Assembly	Inspect	0.1						
		Replace		0.5				1,2	
1313	Tires, Tubes, Tire Chains								
	Tire	Inspect	0.1	1.0					
		Replace		1.0				1,5	
		Repair		1.0				1,2 (N)	
<b>15</b>	<b>FRAME, TOWING ATTACHMENTS, DRAWBARS, AND ARTICULATION SYSTEMS</b>								
1501	Frame Assembly (Chassis)	Inspect	0.1						
		Repair		2.0				1,2 (I)	
1503	Pintles and Towing Attachments								
	Chains, Safety	Inspect	0.1						
		Replace		0.5				1,2	
	Lunette	Inspect	0.1	0.1					
		Replace		0.5				1,2	
1507	Landing Gear, Leveling Jacks								
	Leg, Support, Front (Adjustable)	Inspect	0.1						
		Replace		1.0				1,2	
		Repair		1.0				1,2 (J)	

**Section II. MAINTENANCE ALLOCATION CHART - Continued**

(1) Group Number	(2) Component/ Assembly	(3) Maintenance Function	(4) Maintenance Level				(5) Tools and Equipment	(6) Remarks	
			Unit		DS	GS			Depot
			C	O	F	H			D
16	Leg, Support, Rear (Adjustable)  <b>SPRINGS AND SHOCK ABSORBERS</b>	Inspect	0.1					(K)	
		Replace		1.0			1,2		
		Repair		1.0			1,2		
1604	Shock Absorber Equip- ment								
18	Absorber, Shock  <b>BODY, CAB, HOOD, AND HULL</b>	Inspect	0.1					1,2	
		Replace		0.5					
1810	Cargo Body	Inspect	0.1					1,2 (L)	
		Repair			(L)				
	Tiedowns	Replace		0.5			1,2		
22	Tailgate  <b>BODY, CHASSIS, AND HULL ACCESSORY ITEMS</b>	Inspect	0.1					1,2 (M)	
		Replace		0.1					
		Repair		0.5					
2202	Accessory Items								
2210	Reflectors	Inspect	0.1					1,2	
		Replace		0.5					
		Bracket, Decontamination	Inspect	0.1					1
	Replace		0.2						
33	Data Plates and Instruc- tion Holders  <b>SPECIAL PURPOSE KITS</b>	Inspect	0.1					1,2,3,4	
		Replace		1.0					
		Plate, Identification	Inspect	0.1					
	Replace		1.0						
3307	Plate, Shipping Data  Special Purpose Kits	Inspect	0.1					1,2,3	
		Replace		1.0					
	Soft Top Kit Option	Inspect	0.1						
		Replace	0.5						

Section III. TOOL AND TEST EQUIPMENT REQUIREMENTS (TTER)

(1) TOOL OR TEST EQUIPMENT REF CODE	(2) MAINTENANCE LEVEL	(3) NOMENCLATURE	(4) NATIONAL/NATO STOCK NUMBER	(5) TOOL NUMBER
1	O	Tool Kit, General Mechanics's:	5180-00-177-7033	
2	O	Automotive Shop Equipment Automotive Maintenance and Repair: Organizational	4910-00-754-0654	
3	O	Maintenance, Common No. 1, Less Power Die Set, Metal Stamping, Hand:	5110-00-289-0003	
4	O	With 1/4 in. Numbers Die Set, Metal Stamping, Hand: With 1/4 in. Uppercase Letters, Ampersand, and Period	5110-00-289-0007	
5	F	Shop Equipment Automotive Maintenance and Repair: Field Maintenance, Basic Less Power	4910-00-754-0705	
6	O	No. 2 Common Tool Set	4910-00-754-0650	
<b>B-7</b>				

Section IV. REMARKS

REFERENCE  CODE	REMARKS
A	Repair consists of replacing lens, gasket, and lamp units.
B	Repair consists of splicing wire connectors and replacing clamps.
C	Repair consists of replacing handbrake, cable assembly.
D	Repair consists of replacing brakeshoes, springs, adjuster, wheel cylinder
E	Repair consists of turning brakedrum.
F	Repair consists of replacing shock, shock bolt/nut, nylon bearings, push rod, push rod spring, ring, links, breakaway lever, breakaway chain, breakaway bolt/nut, shafts, nuts.
G	Repair consists of replacing inner bearing, outer bearing, grease seal, zerk fitting, end cap.
H	Repair consists of replacing tire, rim, valve stem, seal, outer rim, inner rim, runflat.
I	Repair to frame consists of replacement of miscellaneous frame-mounted components.
J	Repair consists of replacing caster, pin, lanyard, crank.
K	Repair consists of replacing locking pin, locking pin ring, and flex plate.
L	Repair to body consists of straightening, patching, and riveting. In this category no specific times can be established. Time required for repair will depend on the extent of repair required for damaged components.
M	Repair consists of replacing capscrews, washers, locknuts, tailgate lanyard mount, lanyards, pins, latch assemblies, and tailgate hinges.
N	Refer to TM 9-2320-280-20-2 Appendix B P/N J39250 and 528236.



## **APPENDIX C COMPONENTS OF END ITEM (COEI) AND BASIC ISSUE ITEMS (BII) LISTS**

### **Section I. INTRODUCTION**

#### **C-1 SCOPE.**

This appendix lists components of the end item and basic issue items for cargo trailers M1101 and M1102 and the trailer chassis to help you inventory the items for safe and efficient operation of the equipment.

#### **C-2 GENERAL.**

The Components of End Item (COEI) and Basic Issue Items (BII) Lists are divided into the following sections:

### **Section II. COMPONENTS OF END ITEM**

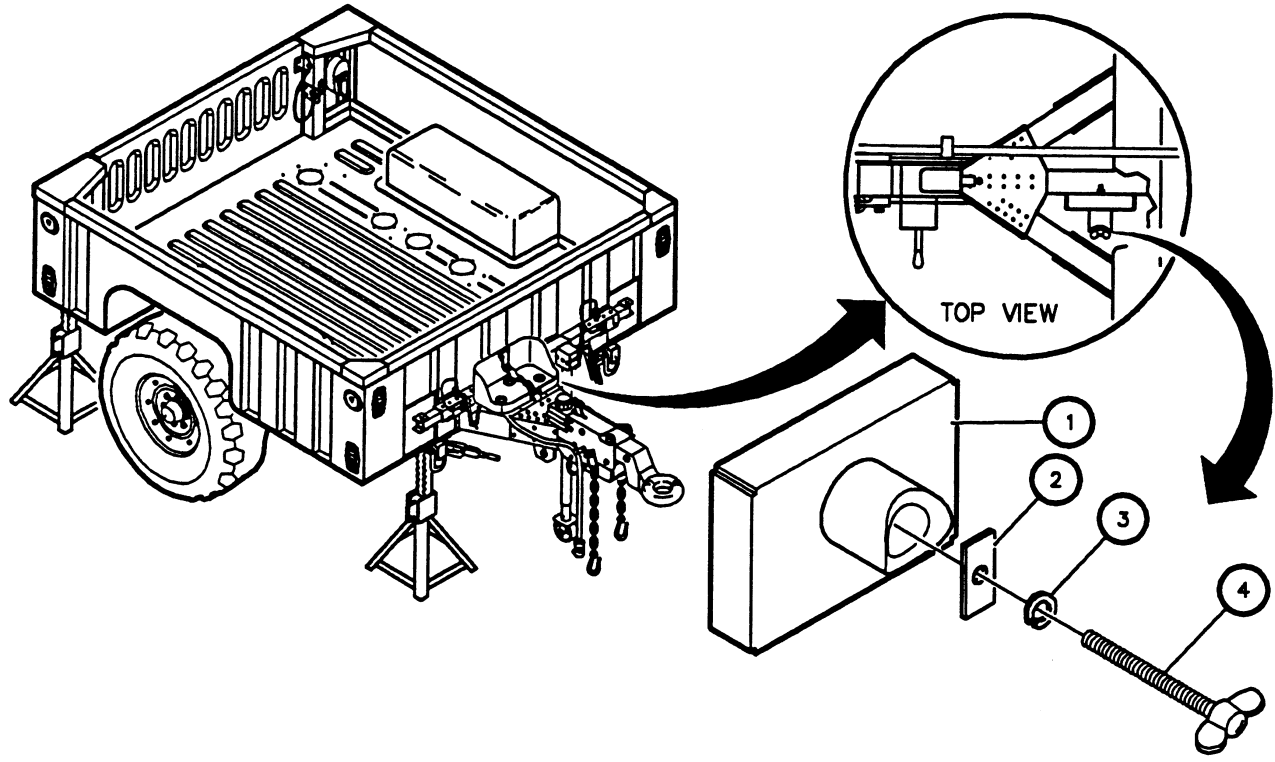
Cargo trailers M1101 and M1102 and trailer chassis do not have Components of End Item.

### **Section III. BASIC ISSUE ITEMS**

These essential items are required to place the cargo trailers and trailer chassis in operation, operate it, and to do emergency repairs. Although shipped separately packaged, BII must be with the cargo trailers and trailer chassis during operation and when it is transferred between property accounts. This list is your authority to request/requisition them for replacement based on authorization of the end item by the TOE/MTOE. Illustrations are furnished to help you find and identify the items.

#### **C-3 EXPLANATION OF COLUMNS.**

- a. Column (1), Illus Number, gives you the number of the item illustrated.
- b. Column (2), National Stock Number, identifies the stock number of the item to be used for requisitioning purposes.
- c. Column (3), Description and Usable On Code, identifies the Federal item name (in all capital letters) followed by a minimum description when needed. The last line below the description is the Commercial and Government Entity Code (CAGEC) (in parentheses) and the part number.
- d. Column (4), U/I (unit of issue), indicates how the item is issued for the National Stock Number shown in column two.
- e. Column (5), Qty Rqd, indicates the quantity required.



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**BASIC ISSUE ITEMS**

(1) Illus Number	(2) National Stock Number	(3) Description and Usable On Code	(4) U/I	(5) Qty Rqd
1		SPACER, Jack (19207) 12449995	EA	1
2		WASHER, Rectangular (19207) 12449994	EA	1
3		WASHER, Lock (19207) 12449387-4	EA	1
4		SCREW, Wing (19207) 12449993	EA	1

## APPENDIX D ADDITIONAL AUTHORIZATION LIST

### Section I. INTRODUCTION

**D-1 SCOPE.**

This appendix lists additional items you are authorized for the support of the M1101 and M1102 trailers and the Trailer Chassis.

**D-2 GENERAL.**

This list identifies items that do not have to accompany the trailer and that do not have to be turned in with it. These items are all authorized to you by CTA, MTOE, TDA, or JTA.

**D-3 EXPLANATION OF COLUMNS.**

National stock numbers, descriptions, and quantities are provided to help you identify and request the additional items you require to support this equipment. The items are listed in alphabetical sequence by item name under the type document (i.e., CTA, MTOE, TDA, or JTA) which authorizes the item(s) to you.

### Section II. ADDITIONAL AUTHORIZED ITEMS LIST

(1) National Stock Number	(2) Description  CAGEC and Part Number      Usable on Code	(3) U/I	(4) Qty Recommended
2540-00-678-3469	Chock, Wheel-Track (19207) 7979235	EA	2
2540-01-413-6985	Soft Top Installation Kit, Cargo Body (30076) 12449608	EA	1
3990-01-204-3009	Tie Down, Cargo, Vehicle (19200) 9392419	EA	As Rqd



## APPENDIX E EXPENDABLE AND DURABLE ITEMS LIST

### Section I. INTRODUCTION

#### E-1 SCOPE.

This appendix lists expendable and durable items you will need to operate and maintain the M1101, M1102, and Trailer Chassis. 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 the entry in the listing and is referenced in the “Initial Setup” of maintenance paragraphs or narrative instructions to identify the material needed (e.g, dry cleaning solvent, item 5, Appendix E).
- b. Column (2), Level. This column identifies the lowest level of maintenance that requires the listed item.
  - C - Operator/Crew
  - O - Unit Maintenance
  - F - Direct Support Maintenance
  - H - General Support Maintenance
- c. Column (3), National Stock Number. This is the National Stock Number assigned to the item. Use it to request or requisition the item.
- d. Column (4), Item Name, Description, CAGEC, Part Number. Indicates the Federal item name and, if required, a description to identify the item. The last line for each item indicates the Commercial and Government Entity Code (CAGEC) in parentheses followed by the part number, if applicable.
- e. Column (5), Unit of Measure (U/M). Indicates the measure used in performing the actual maintenance function. This measure is expressed by a two-character alphabetical abbreviation (e.g., EA, IN, PR). If the unit of measure differs from the unit of issue as shown in the Army Master Data File (AMDF), requisition the lowest unit of issue that will satisfy your requirements.

**Section II. EXPENDABLE AND DURABLE ITEMS LIST**

(1) Item Number	(2) Level	(3) National Stock Number	(4) Item Name, Description CAGEC, Part Number	(5) U/M
1	C	9150-01-102-9455 9150-01-123-3152	BRAKE FLUID: Silicone, Automotive, All Weather, Operational and Preservative (81349) MIL-B-46176 1 Gallon Can 5 Gallon Can	GL GL
2	C	7920-00-061-0038	BRUSH: Scrub (81349) H-B-1490	EA
3	C	7920-00-900-3577	BRUSH: Wire (17987) 15SS	EA
4	O	7930-00-282-9699	DETERGENT: General Purpose, Liquid (81349) MIL-D-16791 1 Gallon Can	GL
5	O	6850-00-110-4498 6850-00-664-5685 6850-00-281-1985 6850-00-274-5421 6850-00-285-8011	DRY CLEANING SOLVENT: (81348) P-D-680, Type II 1 Pint Can 1 Quart Can 1 Gallon Can 5 Gallon Can 55 Gallon Drum	PT QT GL GL GL
6	O	9150-01-197-7693 9150-01-197-7690 9150-01-197-7689 9150-01-197-7692	GREASE: Automotive and Artillery, GAA (81348) MIL-G-10924 14 Ounce Cartridge 1 3/4 Pound Can 6 1/2 Pound Can 35 Pound Can	OZ LB LB LB
7	O	9150-00-402-4478 9150-00-402-2372 9150-00-491-7197	OIL: Lubricating, Internal Combustion Engine, Arctic, OEA (81349) MIL-L-46167 1 Quart Can 5 Gallon Can 55 Gallon Drum	QT GL GL

**Section II. EXPENDABLE AND DURABLE ITEMS LIST - Continued**

(1) Item Number	(2) Level	(3) National Stock Number	(4) Item Name, Description CAGEC, Part Number	(5) U/M
8	O	9150-00-189-6727 9150-00-186-6668 9150-00-191-2772	OIL: Lubricating, Internal Combustion Engine, Tactical Service, OE/HDO 10 (81349) MIL-L-2104  1 Quart Can 1 Gallon Can 55 Gallon Drum	QT GL GL
9	O	9150-00-186-6681 9150-00-188-9858 9150-00-189-6729	OIL: Lubricating, Internal Combustion Engine, Tactical Service, OE/HDO 30 (81349) MIL-L-2104  1 Quart Can 5 Gallon Can 55 Gallon Drum	QT GL GL
10	C	7920-00-205-1711	RAG: Wiping, Cotton and Cotton-Synthetic (58536) A-A-531  50 Pound Bale	LB
11	O	9330-01-345-0507	TAPE: Adhesive, Rubber (30076) 353191  60 Yard Roll	YD
12	O	8030-00-009-5023	SEALING COMPOUND: Corrosion-Resistant (81349) MIL-S-81733, type II  Kit	EA
12.1	O	5975-00-984-6582	STRAP, Tiedown, Electrical (96906) MS3367-1-0  100 Each	EA
13	O	9905-00-537-8954	TAG, Marker (81349) MIL-T-12755  50 Each	EA
14	O	8030-00-251-3980	ANTISEIZE COMPOUND (81349) MIL-A-907	EA





**APPENDIX F**  
**REPAIR PARTS AND SPECIAL TOOLS LIST**  
**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 the M 1101, M1102, and the Trailer Chassis. It authorizes the requisition, issue, and disposition of spares, repair parts, and special tools as indicated by the Source, Maintenance, and Recoverability (SMR) codes.

**F-2. GENERAL.**

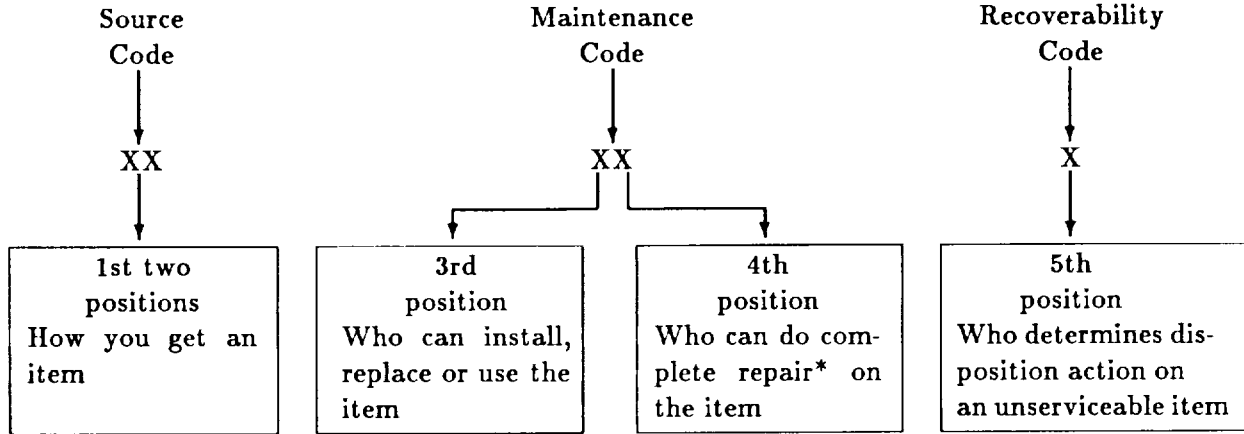
In addition to Section I, Introduction, this RPSTL is divided into the following sections:

- a. Section II - Repair Parts List. A list of spares and repair parts authorized by this RPSTL for use in the performance of maintenance. Parts lists are composed of functional groups in ascending alphanumeric sequence, with the 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.
- c. Section IV - Cross-Reference Indexes. A list, in National Item Identification Number (NIIN) sequence, of all National Stock Numbers (NSN) appearing in the listings, followed by a list in alphanumeric sequence of all part numbers appearing in the listings. NSNs and part numbers are cross-referenced to each illustration figure and item number appearance. The figure and item number index lists figure and item number in alphanumeric sequence and cross-references NSN, Commercial and Government Entity (CAGE), and part number.

**F-3. EXPLANATION OF COLUMNS (SECTION II).**

- a. Column (1), Item No. Indicates the number used to identify items called out in the illustration.
- b. Column (2), SMR Code. The SMR code is a five-position code containing supply/requisitioning information, maintenance category authorization criteria, and disposition instructions, as shown in the following breakout

F-3. EXPLANATION OF COLUMNS (SECTION II) (Con't).



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

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

Code

Explanation

PA  
PB  
PC  
PD  
PE  
PF  
PG

Stocked items; use the applicable NSN to request/requisition items with these source codes. They are authorized to the category indicated by the code entered in the third position of the SMR code.

\*\*NOTE: Items coded PC are subject to deterioration.

KD  
KF  
KB

Items with these codes are not to be requested/requisitioned individually. They are part of a kit that is authorized to the maintenance category indicated in the third position of the SMR code. The complete kit must be requisitioned and applied.

MO—Made at org/  
AVUM category  
MF—Made at DS/  
AVUM category  
MH—Made at GS  
category  
ML—Made at  
Specialized  
Repair Activity  
(SRA)  
MD—Made at Depot

Items with these codes are not to be requested/requisitioned individually. They must be made from bulk material that is identified by the part number in the DESCRIPTION AND USABLE ON CODE (UOC) column and listed in the Bulk Material group of the repair parts list. If the item is authorized to you by the third position code of the SMR code, but the source code indicates it is made at a higher level, order the item from the higher level of maintenance.

**F-3. EXPLANATION OF COLUMNS (SECTION II) (Con't).**

Code Explanation

AO –Assembled by org/AVUM category  
 AF –Assembled by DS/AVUM category  
 AH –Assembled by GS category  
 AL –Assembled by SRA  
 AD –Assembled by Depot

Items with these codes are not to be requested/requisitioned individually. The parts that make up the assembled item must be requisitioned or fabricated and assembled at the level of maintenance indicated by the source code. If the third position code of the SMR code authorizes you to replace the item, but the source code indicates the item is assembled at a higher level, order the item from the higher level of maintenance.

<u>Code</u>	<u>Application/Explanation</u>
XA -	Do not requisition an XA-coded item. Order its next higher assembly. (Also, refer to the NOTE below.)
XB -	If an XB item is not available from salvage, order it using the Commercial and Government Entity (CAGE) code and part number given.
XC -	Installation drawing, diagram, instruction sheet, field service drawing, that is identified by the manufacturer's part number.
XD -	Item is not stocked. Order an XD-coded item through normal supply channels using the CAGE code and part number given, if no NSN is available.

**NOTE**

Cannibalization or controlled exchange, when authorized, may be used as a source of supply for items with the above source codes, except for those coded "XA" or those support items restricted by requirements of AR 700-42.

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

<u>Code</u>	<u>Application/Explanation</u>
C	Crew or operator maintenance done within organizational or aviation unit maintenance
O	Organizational or aviation unit category can remove, replace, and use the item.
F	Direct support or aviation intermediate level can remove, replace, and use the item.
H	General support level can remove, replace, and use the item.
L	Specialized repair activity can remove, replace, and use the item.
D	Depot level can remove, replace, and use the item.

**F-3. EXPLANATION OF COLUMNS (SECTION II) (Con't).**

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

<u>Code</u>	<u>Application/Explanation</u>
0	Organizational or aviation unit is the lowest level that can do complete repair of the item.
F	Direct support or aviation intermediate is the lowest level that can do complete repair of the item.
H	General support is the lowest level that can do complete repair of the item.
L	Specialized repair activity U.S. Army Intelligence Material Management Center USAIMMC) is the lowest level that can do complete repair of the item.
D	Depot is the lowest level that can do complete repair of the item.
Z	Nonrepairable. No repair is authorized
B	No repair is authorized. (No parts or special tools are authorized for the maintenance of a B-coded item.) However, the item may be reconditioned by adjusting, lubricating, etc., at the user level.

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

<u>Code</u>	<u>Application/Explanation</u>
Z	Nonrepairable item. When unserviceable, condemn and dispose of the item at the level of maintenance shown in the third position of the SMR code.
0	Repairable item. When uneconomically repairable, condemn and dispose of the item at organizational or aviation unit level
F	Repairable item. When uneconomically repairable, condemn and dispose of the item at the direct support or aviation intermediate level.
H	Repairable item. When uneconomically repairable, condemn and dispose of the item at the general support level.
D	Repairable item. When beyond lower level repair capability, return to depot. Condemnation and disposal of item not authorized below depot level.
L	Repairable item. Condemnation and disposal not authorized below Specialized Repair Activity (SRA).
A	Item requires special handling or condemnation procedures because of specific reasons (e.g., precious metal content, high dollar value, critical material, or hazardous material). Refer to appropriate manuals and directives for specific instructions.

c. Column (3), CAGE. The Commercial and Government Entity (CAGE) is a five-digit numeric code that is used to identify the manufacturer, distributor, or Government agency, etc , that supplies the item.

**F-3. EXPLANATION OF COLUMNS (SECTION II) (Con't).**

Code Application/Explanation

- d. Column (4), Part Number. Indicates the primary number used by the manufacturer (individual, company, firm, corporation, or Government activity) that controls the 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.

**NOTE**

When you use an NSN to requisition an item, the item you receive may have a different part number from the part ordered

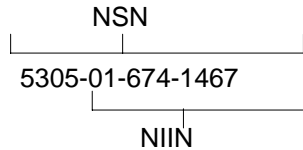
- e. Column (5), Description and Usable On Code (UOC). This column includes the following information:

- (1) The Federal item name and, when required, a minimum description to identify the item.
  - (2) The physical security classification of the item is indicated by the parenthetical entry (insert applicable physical security classification abbreviation; e.g., Phy Sec C1 (C) - Confidential, Phy Sec C1 (S) - Secret, Phy Sec C1 (T) - Top Secret).
  - (3) Items that are included in kits and sets are listed below the name of the kit or set.
  - (4) Spare/repair parts that make up an assembled item are listed immediately following the assembled item line entry.
  - (5) Part numbers for bulk materials are referenced in this column in the line item entry for the item to be manufactured/fabricated
  - (6) When the item is not used with all serial numbers of the same model, the effective serial numbers are shown on the last line(s) of the description (before UOC).
  - (7) The usable on code, when applicable (paragraph F-5, Special Information).
  - (8) In the Special Tools List section, the Basis of Issue (BOI) appears as the last line(s) in the entry for each special tool, special TMDE, and other special support equipment. When density of equipment supported exceeds density spread indicated in the BOI, the total authorization is increased proportionately.
  - (9) The statement "END OF FIGURE" appears just below the last item description in Column (5) for a given figure in both section II and section III.
- f. Column (6), QTY. The QTY (quantity per figure column) indicates the quantity of the item used in the breakout shown on the illustration figure, which is prepared for a functional group, sub-functional group, or an assembly A "V" appearing in this column in lieu of a quantity indicates that the quantity is variable, i e, the quantity may vary from application to application.

**F-4. EXPLANATION OF COLUMNS (SECTION IV).**

a. National Stock Number Index

- (1) **STOCK NUMBER Column.** This column lists the NSN by NIIN sequence. The NIIN consists of the last nine digits of the NSN.



When using this column to locate an item, ignore the first four digits of the NSN. However, the complete NSN should be used when ordering items by stock number.

- (2) **FIG. Column.** This column lists the number of the figure where the item is identified/located. The figures are in numerical order in sections II and III.
- (3) **ITEM Column.** The item number identifies the item associated with the figure listed in the adjacent FIG column. This item is also identified by the NSN listed on the same line.

b. **Part Number Index.** Part numbers in this index are listed by part number in ascending alpha-numeric sequence (i.e., vertical arrangement of letter and number combination that places the first letter or digit of each group in order A through Z, followed by the numbers 0 through 9 and each following letter or digit in like order).

- (1) **CAGE Column.** The Commercial and Government Entity is a five-digit numeric code used to identify the manufacturer, distributor, or Government agency, etc that supplies the item.
- (2) **PART NUMBER Column.** Indicates the primary number used by the manufacturer (individual, firm, corporation, or Government activity) that controls the 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.
- (3) **STOCK NUMBER Column.** This column lists the NSN for the associated part number and manufacturer identified in the PART NUMBER and CAGE columns to the left.
- (4) **FIG. Column.** This column lists the number of the figure where the item is identified/located in sections II and III.
- (5) **ITEM Column.** The item number is that number assigned to the item as it appears in the figure referenced in the adjacent figure number column.

c. **Figure and Item Number Index**

- (1) **FIG. Column.** This column lists the number of the figure where the item is identified/ located in Section II and III.
- (2) **ITEM Column.** The item number is that number assigned to the item as it appears in the figure referenced in the adjacent figure number column.
- (3) **STOCK NUMBER Column.** This column lists the NSN for the item.

**F-4. EXPLANATION OF COLUMNS (SECTION IV) (Con't).**

- (4) CAGE Column. The Commercial and Government Entity (CAGE) code is a 5-digit numeric code used to identify the manufacturer, distributor, or Government agency, etc., that supplies the item.
- (5) PART NUMRER Column. Indicates the primary number used by the manufacturer (individual, firm, corporation, or Government activity), which controls the 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-5. SPECIAL INFORMATION.**

- a. Usable On Code. The usable on code appears in the lower left corner of the Description column heading. Usable on codes are shown as "UOC: "in the Description column (justified left) on the first line applicable item description/ nomenclature. Uncoded items are applicable to all models. Identification of the usable on codes used in the RPSTL are.

<u>Code</u>	<u>Used On</u>
CMT	Chassis, Trailer
HMT	M1102
LMT	M1101

- b. Kits. Line item entries for repair parts kits appear in a group in section II.

**F-6. HOW TO LOCATE REPAIR PARTS.**

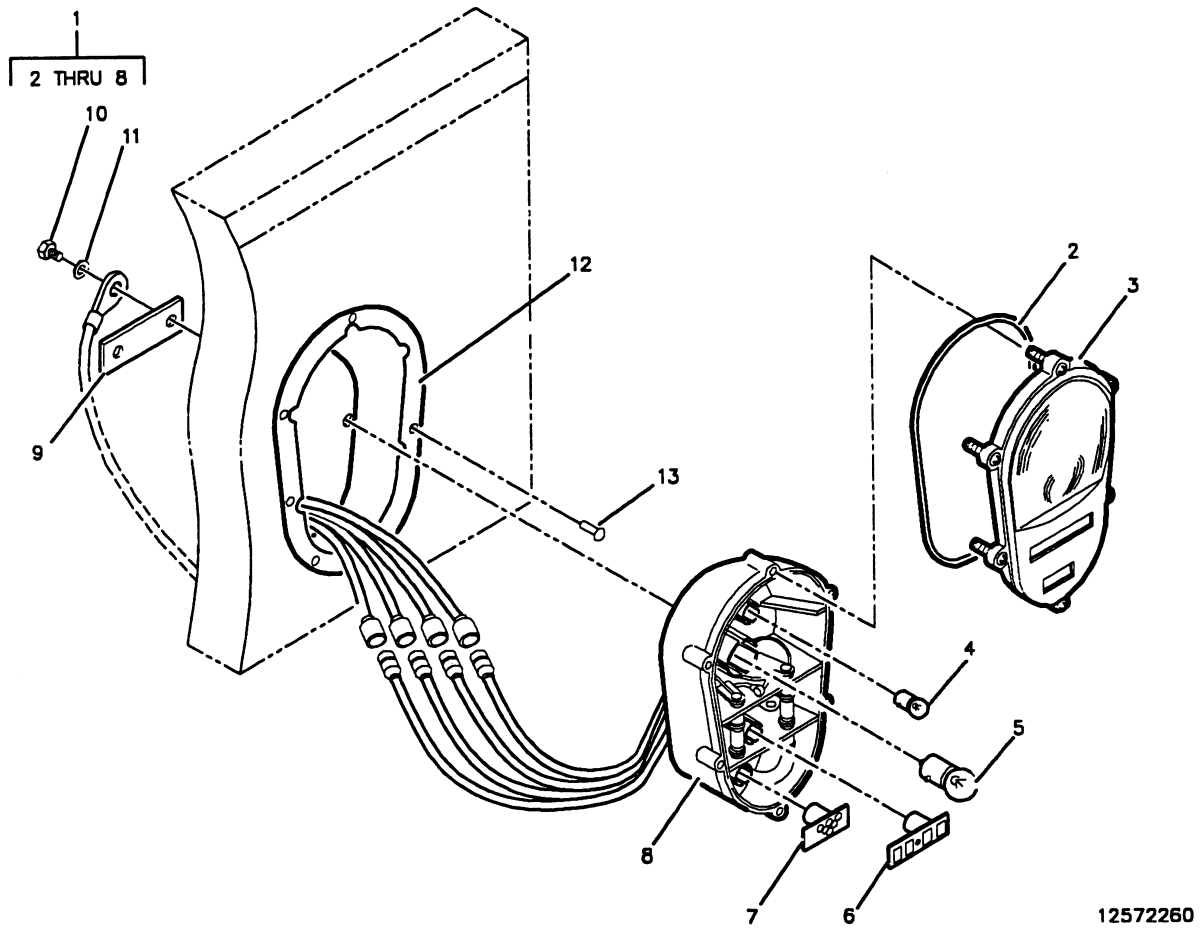
- a. When National Stock Number or Part Number Is Not Known.
  - (1) First. Using the List of Illustrations, find the figure covering the assembly group or subassembly group to which the item belongs.
  - (2) Second. Identify the item on the figure and note the item number.
  - (3) Third. Refer to the repair parts list for the figure to find the part number for the item noted on the figure.
  - (4) Fourth. Refer to the part number index to find the NSN, if assigned.
- b. When National Stock Number or Part Number Is Known.
  - (1) First. Using the index of national stock numbers and part numbers (section IV), find the pertinent national stock number or part number. The NSN index is in NIIN sequence [F-4.a.(1)]. The part numbers in the part number index are listed in ascending alphanumeric sequence (F-4.b.). Both indexes cross-reference you to the illustration/figure and item number of the item you are looking for.
  - (2) Second. After finding the figure and item number, verify that the item is the one you are looking for; then locate the item number in the repair parts list for the figure.

**F-7/(F-8 blank)**





## Section II. REPAIR PARTS LIST



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Figure 1. Trailer Lights (Sheet 1 of 2)

## Section II. REPAIR PARTS LIST - Continued

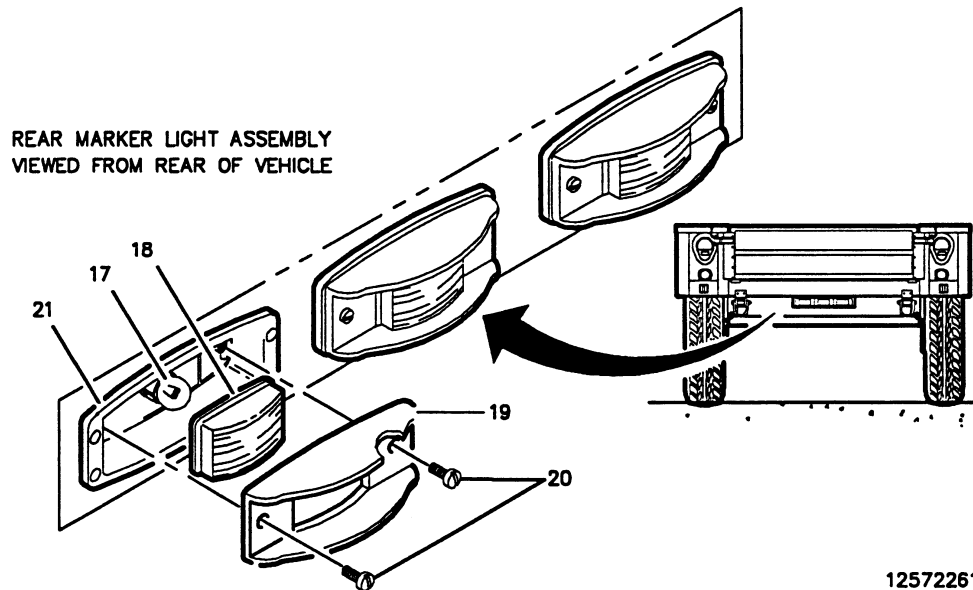
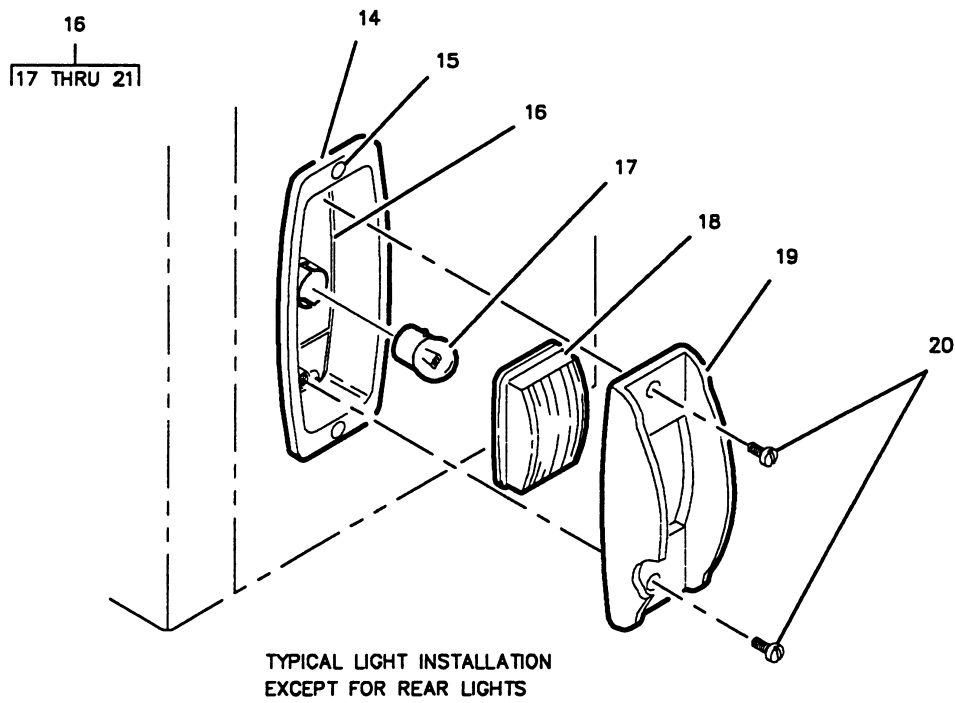
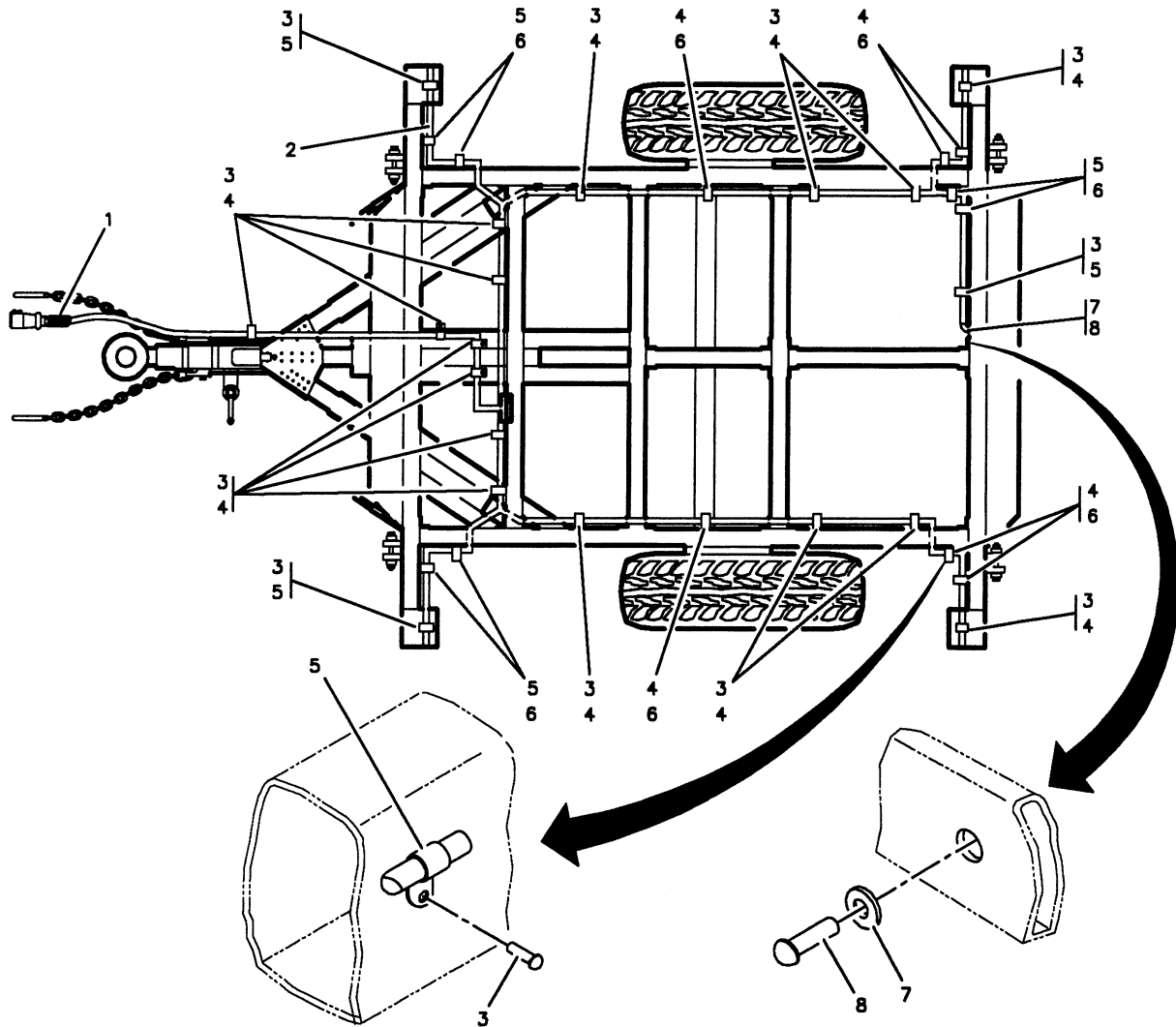


Figure 1. Trailer Lights (Sheets 2 of 2)

**Section II. REPAIR PART LIST - Continued**

(1) ITEM NO	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODES (UOC)	(7) QTY
GROUP 06 ELECTRICAL SYSTEM						
GROUP 0609 ELECTRICAL SYSTEM						
FIG. 1 TRAILER LIGHTS						
1	PAOOO	6220013723883	19207	12375837	TAILLIGHT,VEHICULAR .....	2
2	PAOZZ	5331004620907	19207	11639519-2	.O-RING .....	2
3	PAOZZ	6220013592870	19207	12375841	.LENS,LIGHT .....	2
4	PAOZZ	6240000193093	96787	A6324	.LAMP,INCANDESCENT .....	2
5	PAOZZ	6240000446914	08806	GE1683	.LAMP,INCANDESCENT .....	2
6	PAOZZ	6220012842709	19207	12360850-1	.LIGHT,MARKER,CLEARA .....	2
7	PAOZZ	6220012973217	19207	12360870-2	.STOP LIGHT,VEHICULA .....	2
8	XAOZZ		19207	12375838	.BODY ASSEMBLY .....	2
9	PAOZZ	6150014177502	33875	12449511	BUS,CONDUCTOR .....	2
10	PAOZZ	5305005434372	80204	B1821BH038C0 75N	SCREW,CAP,HEXAGON H .....	4
11	PAOZZ	5310010558817	06853	204235	WASHER,FLAT .....	4
12	PAOZZ	5342011943128	34623	5575569	BRACKET .....	2
13	PAOZZ	5320014142171	11815	BAPK-69	RIVET,BLIND .....	16
14	PAOZZ	6220012000897	19207	12338709	HOUSING,LIGHT .....	6
15	PAOZZ	5320014142171	11815	BAPK-69	RIVET,BLIND .....	12
16	PAOZZ	6220005773434	96906	MS35423-1	LIGHT,MARKER,CLEARA .....	5
16	PAOZZ	6220007261916	96906	MS35423-2	LIGHT,MARKER,CLEARA .....	4
17	PAOZZ	6240000190877	46717	LA-361-9	.LAMP,INCANDESCENT .....	9
18	PAOZZ	6220002997425	96906	MS35421-1	.LENS,LIGHT USED ON P/N MS35423-1 ONLY	5
18	PAOZZ	6220002997426	96906	MS35421-2	.LENS,LIGHT USED ON P/N MS35423-2 ONLY4	
19	PAOZZ	6220007526516	73331	5939830	RETAINER,LENS .....	9
20	PAOZZ	5305007015071	96906	MS51959-61	SCREW,MACHINE .....	18
21	PAOZZ	6220007299295	96906	MS35422-1	.LIGHT,MARKER,CLEARA .....	9
END OF FIGURE						

### Section II. REPAIR PARTS LIST - Continued



TYPICAL CLAMP AND RIVET INSTALLATION

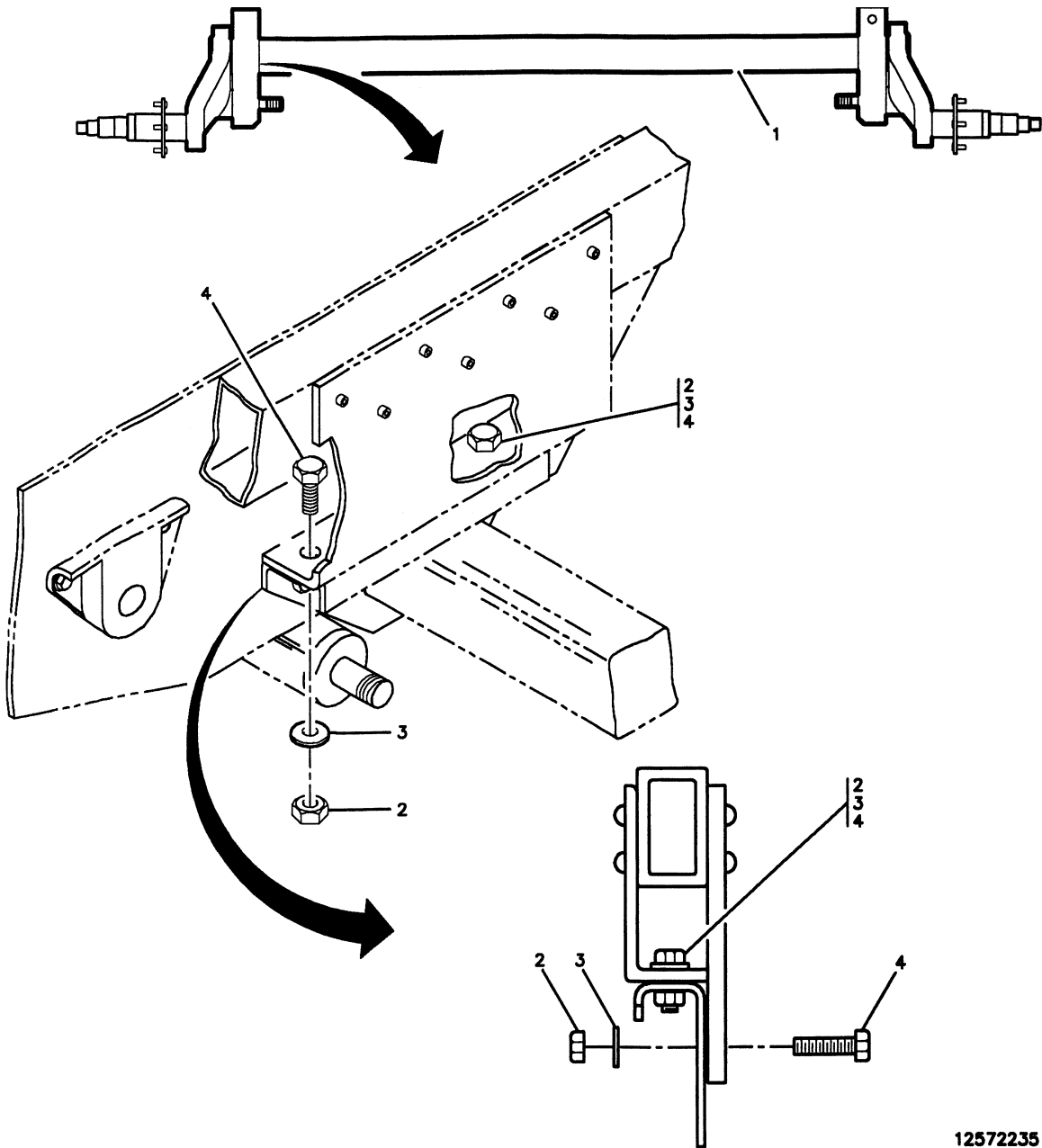
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Figure 2. Wiring Harness, Branched

**Section II. REPAIR PARTS LIST - Continued**

(1) ITEM NO	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODES (UOC)	(7) QTY
					GROUP 0613 HULL OR CHASSIS WIRING HARNESS	
					FIG. 2 WIRING HARNESS, BRANCHED	
1	PAOZZ	6150011676522	19207	10891263-1	CABLE ASSEMBLY,SPEC .....	1
2	PFFZZ		19207	12449997	WIRING HARNESS,BRAN CHASSIS .....	1
2	PFFZZ	6150014133481	33875	12449998	WIRING HARNESS,BRAN CARGO .....	1
3	PAOZZ	5320014141459	17446	12449500-3	RIVET,BLIND .250 DIA X .110-.189 . GRIP	19
4	PAOZZ	5340014142172	18076	12449366-3	CLAMP,LOOP 3/4 DIA .....	22
5	PAOZZ	5340014141453	18076	12449366-2	CLAMP,LOOP 1/2 DIA .....	9
6	PAOZZ	5320014128088	9K475	BOM-R8-9	RIVET,BLIND .250 DIA X .532-.594 . GRIP	12
7	PAOZZ	5325002766056	94135	MS35489-106	GROMMET,NONMETALLIC .....	1
8	PAOZZ		9K475	BOM-R8-10	RIVET,BLIND .250 DIA X .595-.656 . GRIP	1
					END OF FIGURE	

### Section II. REPAIR PARTS LIST - Continued



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Figure 3. Axle Assembly

## Section II. REPAIR PARTS LIST - Continued

(1) ITEM NO	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODES (UOC)	(7) QTY
					GROUP 10 FRONT AXLE	
					GROUP 1000 FRONT AXLE ASSEMBLY	
					FIG. 3 AXLE ASSEMBLY	
1	PAFZZ	2530014209983	0Z890	094231	AXLE,VEHICULAR,NOND .....	1
2	PAFZZ	5310014121777	19207	12449377-1	NUT,SELF-LOCKING,HE .....	8
3	PAFZZ	5310014166520	19207	12449379-6	WASHER,FLAT .....	8
4	PAFZZ	5305007247220	80204	B1821BH063C1 50N	SCREW,CAP,HEXAGON H .....	8
					END OF FIGURE	

## Section II. REPAIR PARTS LIST - Continued

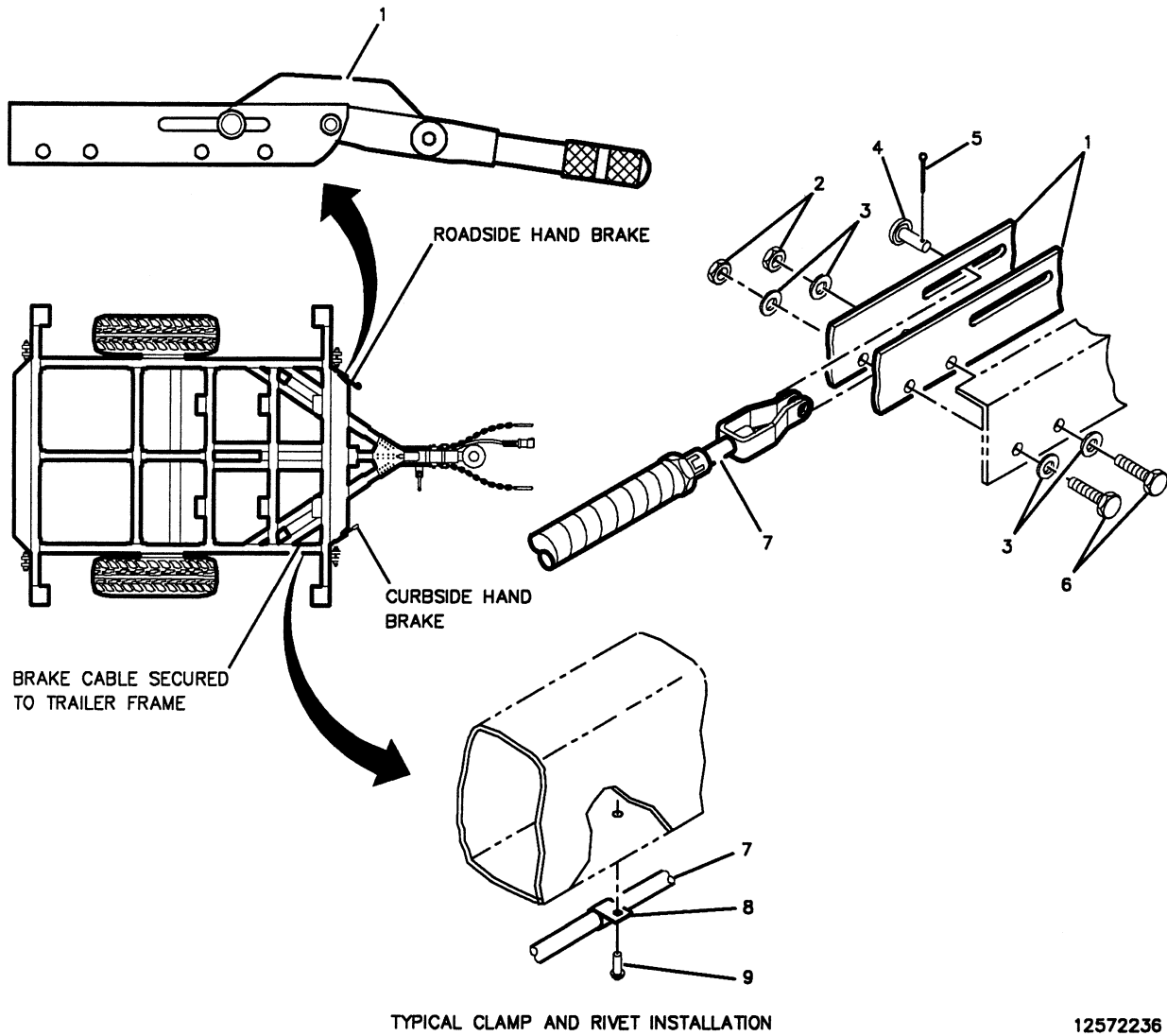


Figure 4. Handbrakes



**Section II. REPAIR PARTS LIST - Continued**

(1) ITEM NO	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODES (UOC)	(7) QTY
					GROUP 12 BRAKES	
					GROUP 1201 HANDBRAKES	
					FIG. 4 HANDBRAKES	
1	PAOZZ	2510014152636	92867	01191510	LEVER,ACCELERATOR .....	2
2	PAOZZ	5310014121774	19207	12449377-9	NUT,SELF-LOCKING,HE .....	4
3	PAOZZ	5310000814219	96906	MS27183-12	WASHER,FLAT .....	8
4	PAOZZ	5315005849053	92867	81000129	PIN,STRAIGHT,HEADED .....	2
5	PAOZZ	5315013728923	92867	84000139	PIN,COTTER .....	2
6	PAOZZ	5306002264832	80204	B1821BH031C1 75N	BOLT,MACHINE .....	4
7	PAOZZ	2530014149307	92867	15642901	CABLE AND CONDUIT A .....	2
8	PAOZZ	5340014142173	18076	12449366-1	CLAMP,LOOP 1/4 DIA .....	4
9	PAOZZ	5320014141459	17446	12449500-3	RIVET,BLIND .250 DIA X .308-.387 . GRIP	4
					END OF FIGURE	

## Section II. REPAIR PARTS LIST - Continued

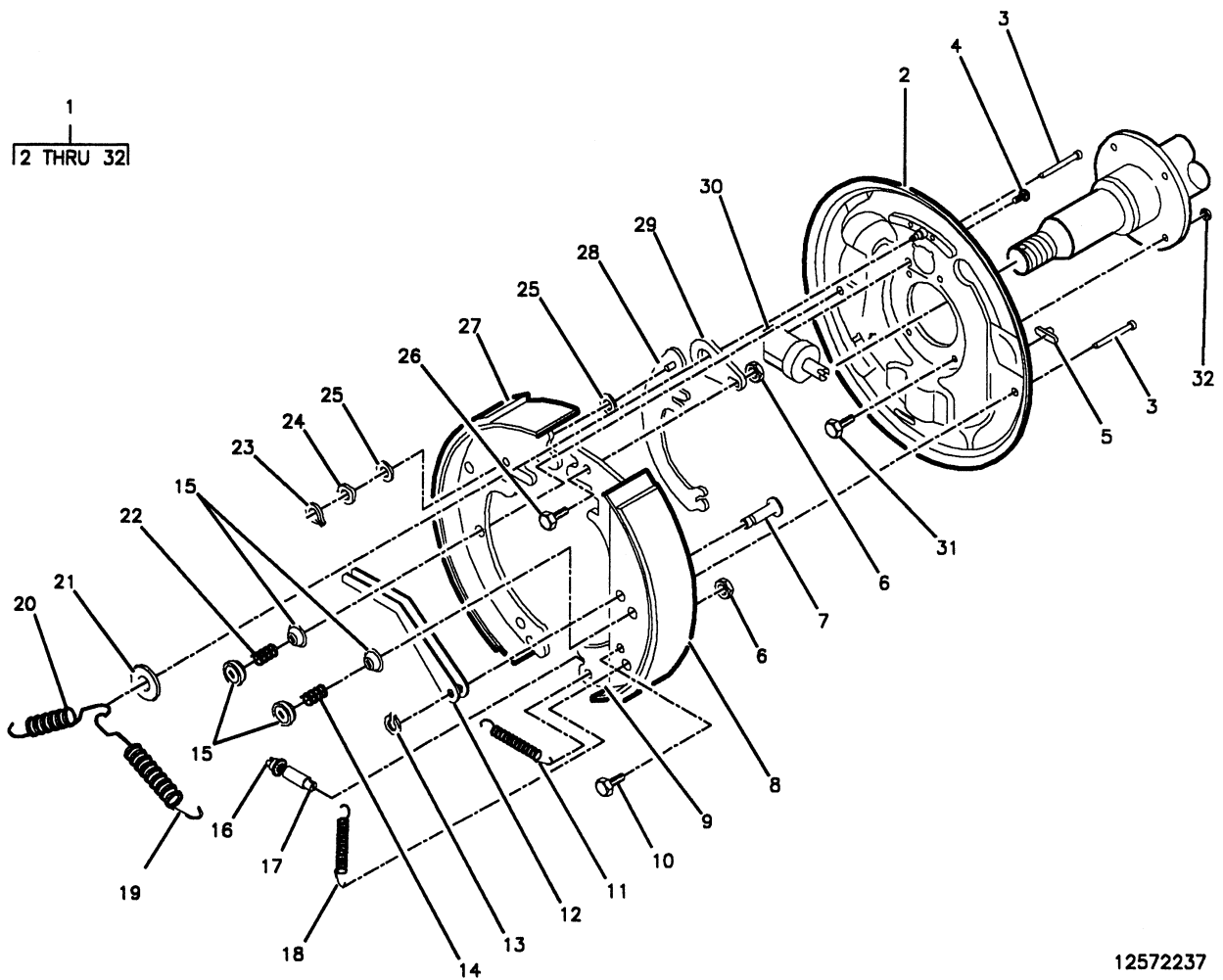


Figure 5. Service Brakes

Section II. REPAIR PARTS LIST - Continued

(1) ITEM NO	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODES (UOC)	(7) QTY
GROUP 1202 SERVICE BRAKES						
FIG. 5 SERVICE BRAKES						
1	PFOOO	2530014149317	94189	42030	BRAKE,SHOE TYPE RH .....	1
1	PFOOO	2530014149314	94189	42031	BRAKE,SHOE TYPE LH .....	1
2	PFOZZ	2530012876869	94189	18496	.PLATE,BACKING,BRAKE .....	2
3	PAOZZ	5315012878770	94189	18508	.PIN,TOGGLE,HEADED .....	4
4	PAOZZ	5305013213522	94189	23457	.SCREW ASSEMBLY,PANE .....	4
5	PAOZZ	5340007143113	80724	W1368	.COVER,ACCESS .....	2
6	PAOZZ	5310013201980	94189	17406	.NUT,SELF-LOCKING,HE .....	4
7	PAOZZ	5315013199194	94189	9796	.PIN,STRAIGHT,HEADLE .....	2
8	PAOZZ	2530013260768	94189	18497	.BRAKE SHOE .....	2
9	PAOZZ	5340014121285	94189	18502	.LEVER,MANUAL CONTRO .....	2
10	PAOZZ	5305014126287	94189	12972	.SCREW,CAP,HEXAGON H .....	2
11	PAOZZ	5360013205815	94189	9784	.SPRING,HELICAL,COMP .....	2
12	PAOZZ	2530014125210	94189	24668	.LINK,ACTUATING BRAK USED ON .....	1
P/N 42030 ONLY						
12	PAOZZ	2530014125211	94189	24669	.LINK,ACTUATING BRAK USED ON .....	1
P/N 42031 ONLY						
13	PAOZZ	5325014125998	94189	7778	.RING,RETAINING .....	2
14	PAOZZ	5360013205819	94189	9790	.SPRING,HELICAL,EXTE .....	2
15	PAOZZ	2530012637061	94189	9789	.CUP,HYDRAULIC BRAKE .....	8
16	PAOZZ	2530012879409	94189	18836	.SOCKET,BRAKE ADJUST .....	2
17	PAOZZ	2530012883979	94189	23323	.ADJUSTING SCREW ASS .....	2
18	PAOZZ	5360013205820	94189	6814	.SPRING,HELICAL,EXTE .....	2
19	PAOZZ	5360013205818	94189	9785	.SPRING,HELICAL,EXTE .....	2
20	PAOZZ	5360012885870	94189	9786	.SPRING,HELICAL,EXTE .....	2
21	PAOZZ	5310014120861	94189	18950	.WASHER,FLAT .....	2
22	PAOZZ	5360012877297	94189	9791	.SPRING,HELICAL,COMP .....	2
23	PAOZZ	5340012770300	94189	9795	.CLIP,SPRING TENSION .....	2
24	PAOZZ	5310013201987	94189	9794	.WASHER,LOCK .....	2
25	PAOZA	5330012697265	94189	7820	.WASHER,TRANSPORTER .....	4
26	PAOZZ	5306011005113	94189	7949	.BOLT .....	2
27	PAOZZ	2530012874451	94189	18503	.BRAKE,SHOE TYPE .....	2
28	PAOZZ	2530013201686	94189	9792	.LINK,PARKING BRAKE USED ON .....	1
P/N 42030 ONLY						
28	PAOZZ	2530013201687	94189	9793	.LINK,PARKING BRAKE USED ON .....	1
P/N 42031 ONLY						
29	PAOZZ	2530014125209	94189	17917	.LINK,ACTUATING BRAK .....	2
30	PAOZZ	2530001617575	94189	9776	.CYLINDER ASSEMBLY,H RH USED ON ..	
P/N 42030 ONLY						
30	PAOZZ	2530001617576	94189	9777	.CYLINDER ASSEMBLY,H LH USED ON ..	1
P/N 42031 ONLY						
31	XDOZZ		33875	12449392	.STUD,CONTINUOUS THR .....	10
32	PAOZZ		19207	12449377-5	.NUT,SELF-LOCKING,HE .....	10
END OF FIGURE						

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Section II. REPAIR PARTS LIST - Continued

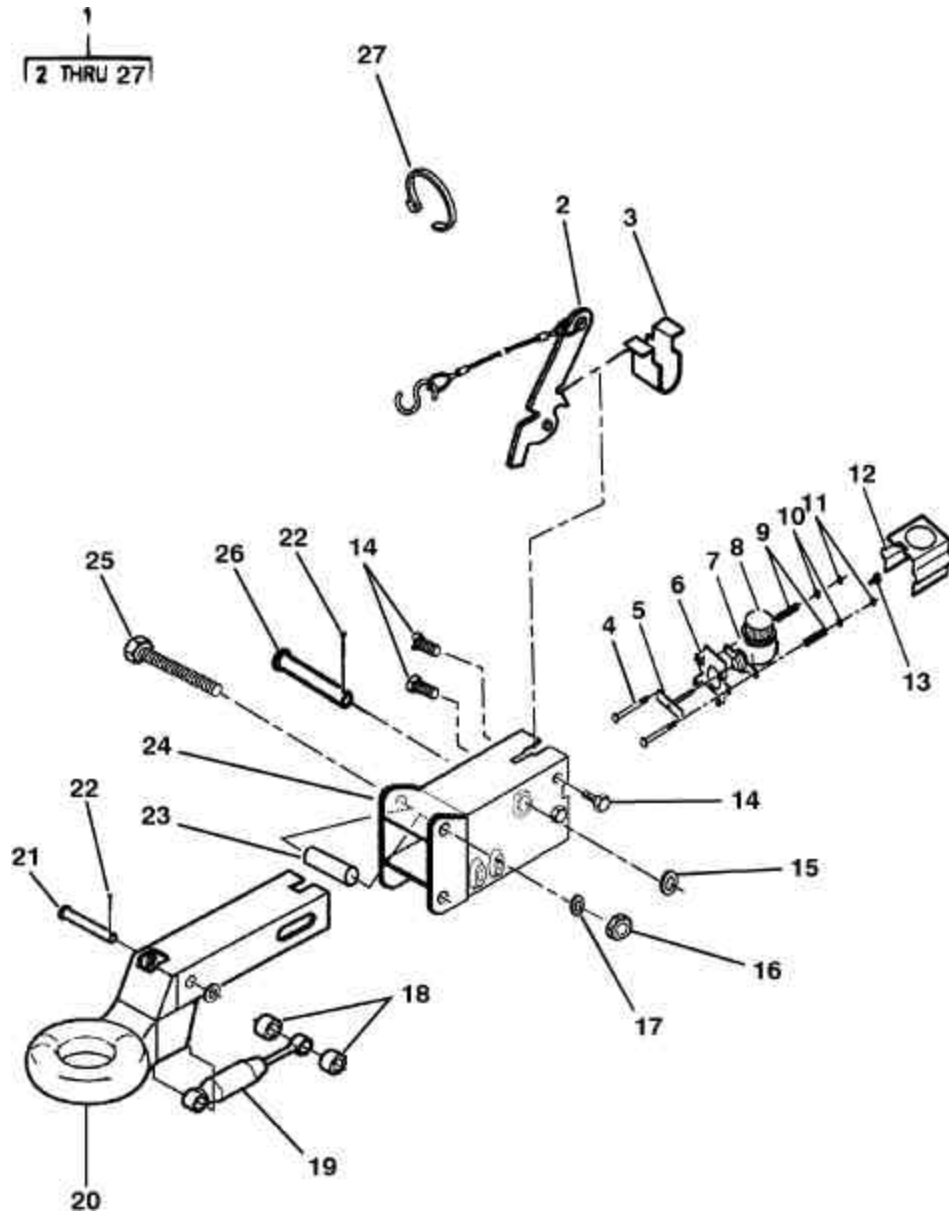


Figure 6. Brake Actuator Assembly (Sheet 1 of 2)

## Section II. REPAIR PARTS LIST - Continued

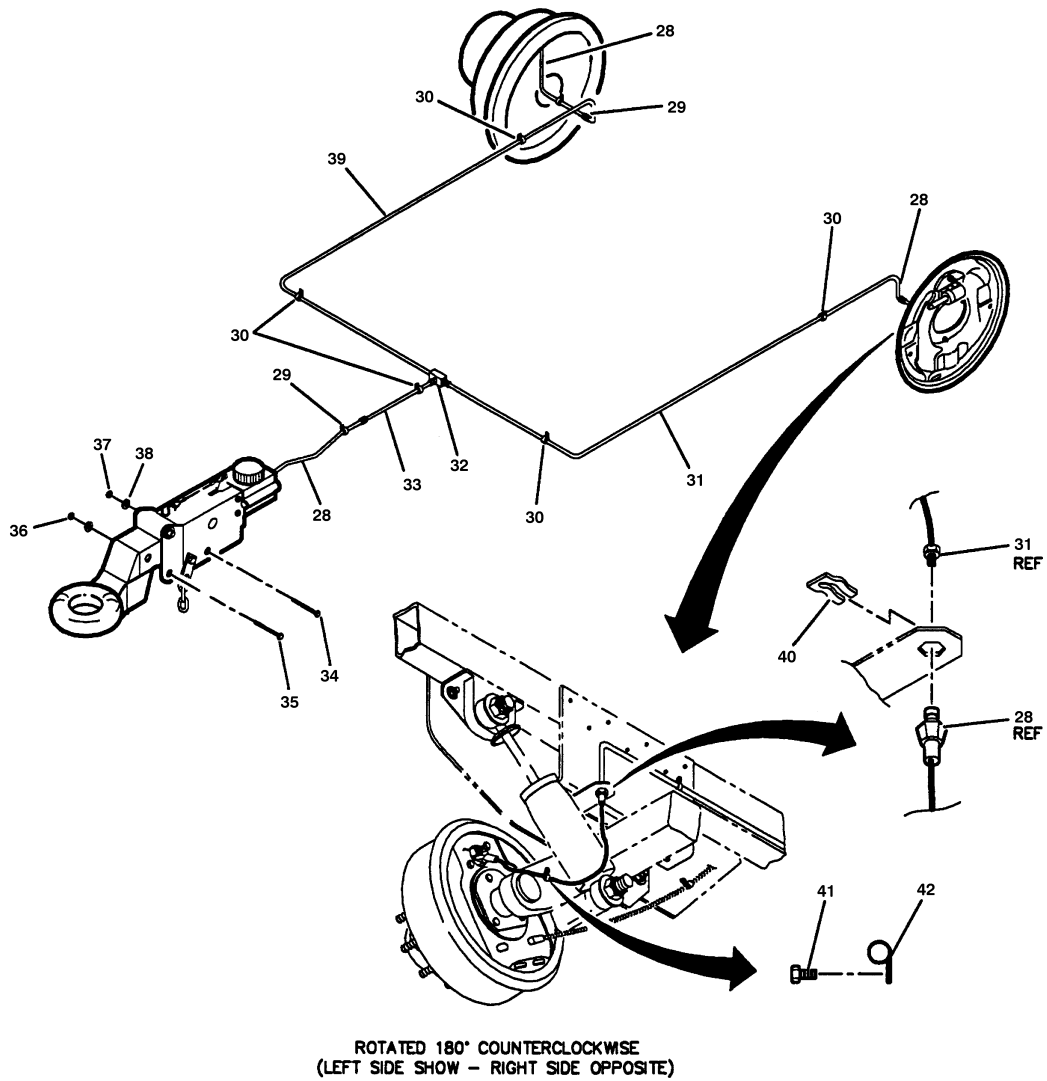
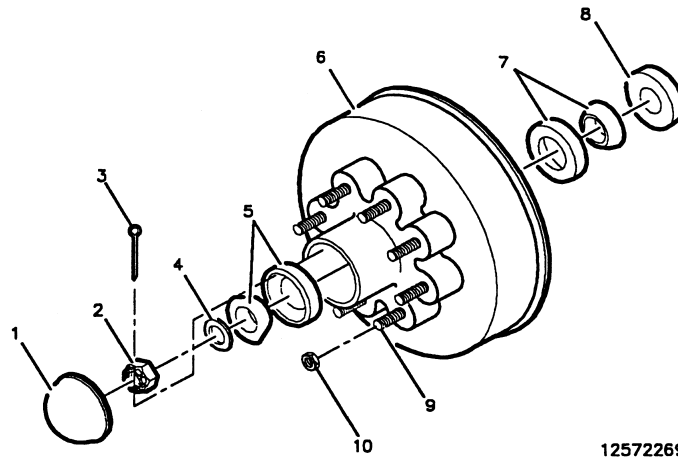


Figure 6. Brake Actuator Assembly (Sheet 2 of 2)

Section II. REPAIR PARTS LIST - Continued

(1) ITEM NO	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODES (UOC)	(7) QTY
GROUP 1204 HYDRAULIC BRAKE SYSTEM						
FIG. 6 BRAKE ACTUATOR ASSEMBLY						
1	XDOOO		19207	12449800	ACTUATOR, HYDRAULIC- . . . . .	1
2	PAOZZ	5340014121278	94189	43593	. LEVER, LOCK-RELEASE . . . . .	1
3	PFOZZ	5360012697266	81996	17803	. SPRING, BREAKAWAY TR . . . . .	1
4	PAOZZ	5306012580830	94189	10273	. BOLT, MACHINE . . . . .	2
5	PAOZZ	2530014123863	94189	4390500	. PUSH ROD, HYDRAULIC . . . . .	1
6	PAOZZ	5340014121281	94189	17762	. PLATE, MOUNTING . . . . .	1
7	PAOZZ	2530011210786	94189	10271	. CYLINDER ASSEMBLY, H . . . . .	1
8	PAOZZ	2530013496920	94189	17556	. MASTER CYLINDER POW . . . . .	1
9	PAOZZ	5360012697264	8X093	10274	. SPRING, TRANSPORTER . . . . .	2
10	PAOZA	5330012697265	94189	7820	. WASHER, TRANSPORTER . . . . .	2
11	PAOZZ	5310011005112	94189	7976	. NUT . . . . .	2
12	PAOZZ	5340014121284	94189	18066	. COVER, ACCESS . . . . .	1
13	PAOZZ	4730014126769	5P512	12098	. RESTRICTOR, FLUID FL . . . . .	1
14	PAOZZ		80204	S630NA84CAG123	. BOLT, MACHINE, ASEMBL 5/16-18 X 5/8" 54BNBA3	4
15	PAOZZ		80204	W221NAAW087NN0	. WASHER, FLAT 7/8" ID . . . . .	1
16	PAOZZ	5310002694040	81349	M45913/1-	. NUT, SELF-LOCKING, HE 5/8-13UNC . . . . .	1
17	PAOZZ		80204	W221NAAW062NN0	. WASHER, FLAT 5/8" ID, USE ON TOP... 39NNBA1 BOLT ONLY	1
18	PAOZZ		19207	12479776	. ROLLER, LINEAR-ROTAR . . . . .	2
19	PAOZZ	3040013496927	94189	12426	. DAMPER, INERTIA . . . . .	1
20	PFOZZ		19207	12479774	. COUPLER, DRAWBAR, RIN . . . . .	1
21	PAOZZ	1740012697270	94189	17772	. PIN, DAMPER TRANSPOR . . . . .	1
22	PAOZZ	5315000120123	80059	AN380-4-5	. PIN, COTTER . . . . .	2
23	PAOZZ		19207	12479775	. ROLLER ASSEMBLY, TRA . . . . .	1
24	PFOZZ		19207	12479772	. HOUSING . . . . .	1
25	PAOZZ		80204	B210NA00CAP393	. SCREW, CAP, HEXAGON H 5/8-13 X 5.25, 54BNBA GR 8	1
26	PAOZZ		19207	12479777	. PIN, TRANSPORTER AIR . . . . .	1
27	PAOZZ	5975009846582	96906	MS3367-1-0	. STRAP, TIEDOWN, ELECT . . . . .	1
28	PAOZZ	4720014165916	0Z899	18024-MF	HOSE ASSEMBLY, NONME . . . . .	3
29	PAOZZ	5340014141453	18076	12449366-2	CLAMP, LOOP . . . . .	3
30	PAOZZ		19207	12449366-5	CLAMP, LOOP . . . . .	5
31	PAOZZ	4710014134029	33875	12449602	TUBE ASSEMBLY, METAL . . . . .	1
32	PAOZZ	4730002871706	44940	502-0373	TEE, TUBE . . . . .	1
33	PAOZZ	4710014126770	33875	12449603	TUBE ASSEMBLY, METAL . . . . .	1
34	PAOZZ		80204	B210NA00CAM363	SCREW, CAP, HEXAGON H . . . . .	1
35	PAOZZ		80204	B210NA00CAP393	SCREW, CAP, HEXAGON H 5/8-13 X 5.25, . 54BNBA GR 8	1
36	PAOZZ	5310002694040	81349	M45913/1-	NUT, SELF-LOCKING, HE 5/8-13UNC . . . . .	1
37	PAOZZ	5310014121773	19207	12449377-3	NUT, SELF-LOCKING, HE . . . . .	2
38	PAOZZ	5310008095998	96906	MS27183-18	WASHER, FLAT . . . . .	1
39	PAOZZ	4710014134031	33875	12449601	TUBE ASSEMBLY, METAL . . . . .	1
40	PAOZZ	5340014151896	33875	12449371	CLIP, SPRING TENSION . . . . .	2
41	PAOZZ	5305014145631	33875	12449499	SETSCREW . . . . .	2
42	PAOZZ	5340014142178	18076	12449366-4	CLAMP, LOOP . . . . .	2
END OF FIGURE						

## Section II. REPAIR PARTS LIST - Continued



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Figure 7. Brake Drum



**Section II. REPAIR PARTS LIST - Continued**

(1) ITEM NO	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODES (UOC)	(7) QTY
					GROUP 13 WHEELS AND TRACKS	
					GROUP 1311 WHEEL ASSEMBLY	
					FIG. 7 BRAKE DRUM	
1	PAOZZ	2530014129564	19207	12449384	CAP,GREASE .....	2
2	PAOZZ	5310001768117	74080	A63-45-16	NUT,PLAIN,SLOTTED,H .....	2
3	PAOZZ	5315014171051	0Z890	91901	PIN,COTTER .....	2
4	PAOZZ	5310014172927	0Z890	90509	WASHER,FLAT .....	2
5	PAOZZ	3110001424355	08162	14125A	CONE AND ROLLERS,TA .....	2
6	PAOZZ	2530014127571	0Z890	9089324	BRAKE DRUM .....	2
7	PAOZZ	3110001003541	24617	25580	CONE AND ROLLERS,TA .....	2
8	PAOZZ	5330014124447	80201	22532	SEAL,PLAIN ENCASED .....	2
9	PAOZZ	5306014189086	0Z890	9251100	BOLT,SHOULDER .....	16
10	PAOZZ	5310014146476	0Z890	90640	NUT,PLAIN,CAP .....	16
					END OF FIGURE	

## Section II. REPAIR PARTS LIST - Continued

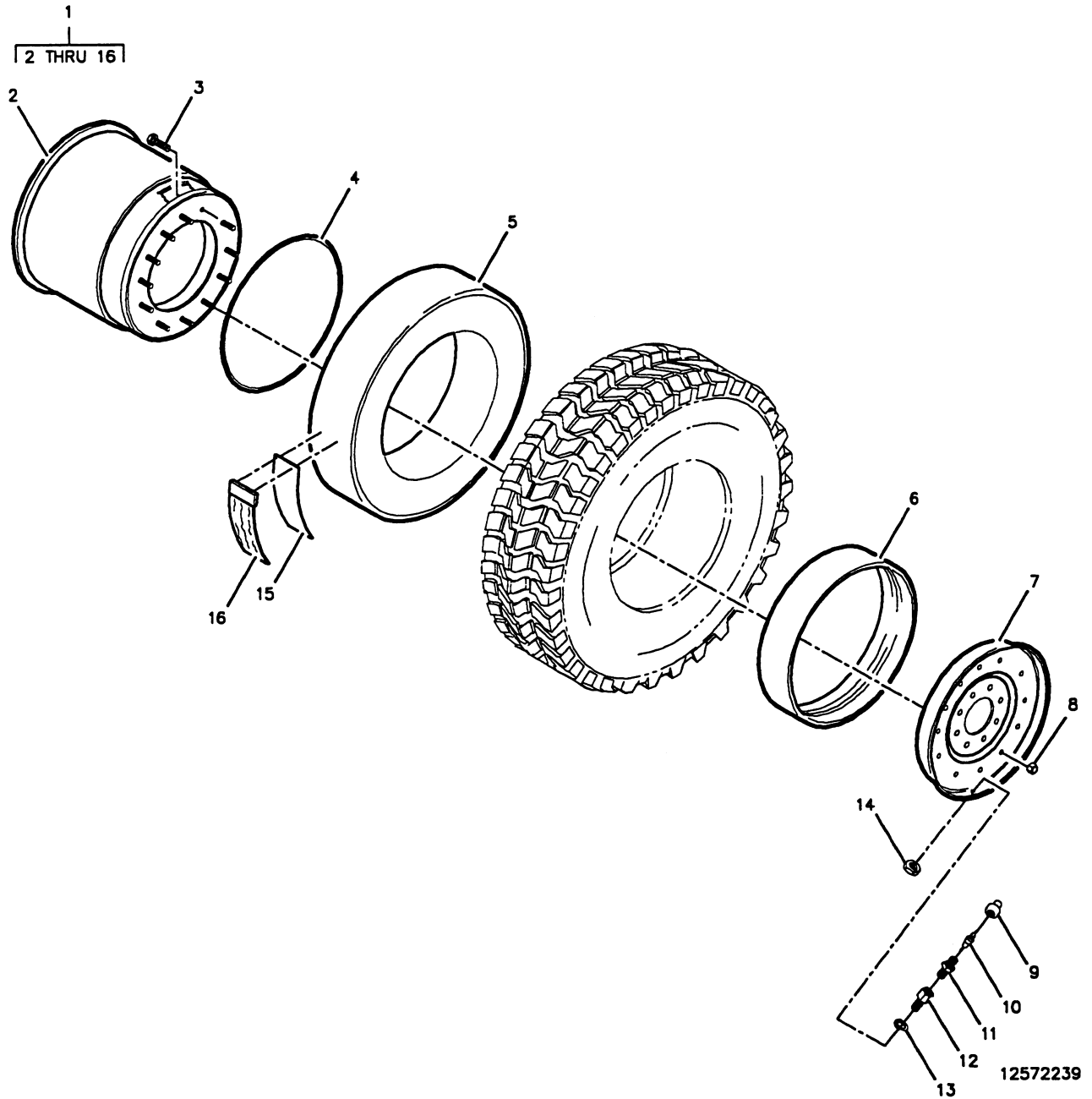


Figure 8. Wheel and Runflat Assembly

**Section II. REPAIR PARTS LIST - Continued**

(1) ITEM NO	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODES (UOC)	(7) QTY
					GROUP 1311 WHEEL ASSEMBLY	
					FIG. 8 WHEEL AND RUNFLAT ASSEMBLY	
1	A0000		19207	12342641	WHEEL AND RUNFLAT .....	1
2	PAOOO	2530013365740	19207	12342642	.RIM,WHEEL,PNEUMATIC .....	1
3	PAOZZ	5306013367175	19207	12342758	..BOLT,RIBBED NECK .....	12
4	PAOZZ	5331013358878	19207	12342633	.O-RING .....	1
5	PAOZZ	2640013349453	19207	12342638	.RUNFLAT,INSERT .....	1
6	PAOZZ	2530013382730	34623	12342639	.BEADLOCK,TIRE RIM .....	1
7	PAOZZ	2530013363127	19207	12342640	.RIM,WHEEL,PNEUMATIC .....	1
8	PAOZZ	5310011987585	19207	12339501	.NUT,SELF-LOCKING,HE .....	12
9	PAOZZ	2640010982029	81348	TYIV/CL1/ TRVC8	.CAP,PNEUMATIC VALVE .....	1
10	PAOZA	4820000870323	73842	TRC1	.VALVE CORE .....	1
11	PAOZZ	2640013354583	19207	12342634	.VALVE,PNEUMATIC TIR .....	1
12	PAOZZ	4730013461063	41885	90619	.ADAPTER,STRAIGHT,PI .....	1
13	PAOZZ	5331013463806	19207	12342794	.O-RING .....	1
14	PAOZZ	5310004492376	96906	MS21245-8	.NUT,SELF-LOCKING,HE .....	1
15	MOOZZ		34623	5588618-13	.TAPE,ADHESIVE,ACRYL MAKE FROM P/N 353191, CAGE 30076	1
16	PAOZZ	2640012629517	19207	12339497	.LUBRICANT,RUN FLAT .....	1
					END OF FIGURE	

## Section II. REPAIR PARTS LIST - Continued



12572240

Figure 9. Pneumatic Tire

## Section II. REPAIR PARTS LIST - Continued

(1) ITEM NO	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODES (UOC)	(7) QTY
					GROUP 1313 TIRES, TUBES, TIRE CHAINS	
					FIG. 9 PNEUMATIC TIRE	
1	PCOHH	2610013337632	19207	12342644	TIRE,PNEUMATIC,VEHI .....	1
					END OF FIGURE	

## Section II. REPAIR PARTS LIST - Continued

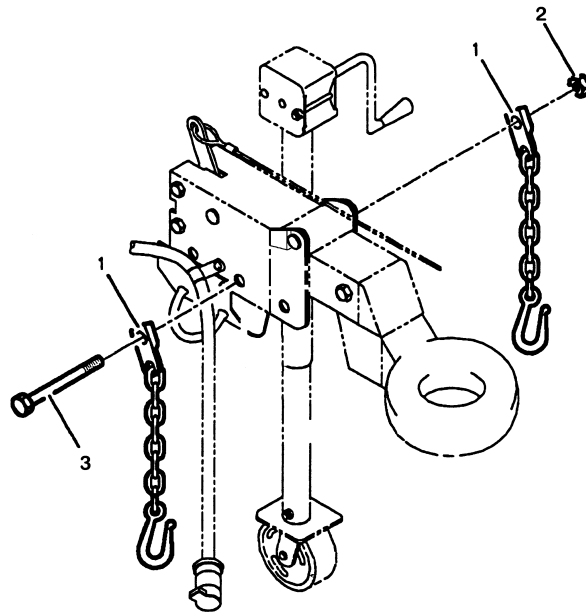


Figure 10. Safety Chains

**Section II. REPAIR PARTS LIST - Continued**

(1) ITEM NO	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODES (UOC)	(7) QTY
					GROUP 15 FRAME, TOWING, ATTACHMENTS, DRAWBARS, AND ARTICULATION SYSTEMS	
					GROUP 1503 PINTLES AND TOWING ATTACHMENTS	
					FIG. 10 SAFETY CHAINS	
1	PAOZZ	4010014121282	33875	12449501	CHAIN ASSEMBLY, SING .....	2
2	PAOZZ	5310014121773	19207	12449377-3	NUT, SELF-LOCKING, HE .....	1
3	PAOZZ	5305000712084	80204	B1821BH050C5 50N	SCREW, CAP, HEXAGON H .....	1
					END OF FIGURE	

## Section II. REPAIR PARTS LIST - Continued

2	23	28
3-22	24-27	29-32

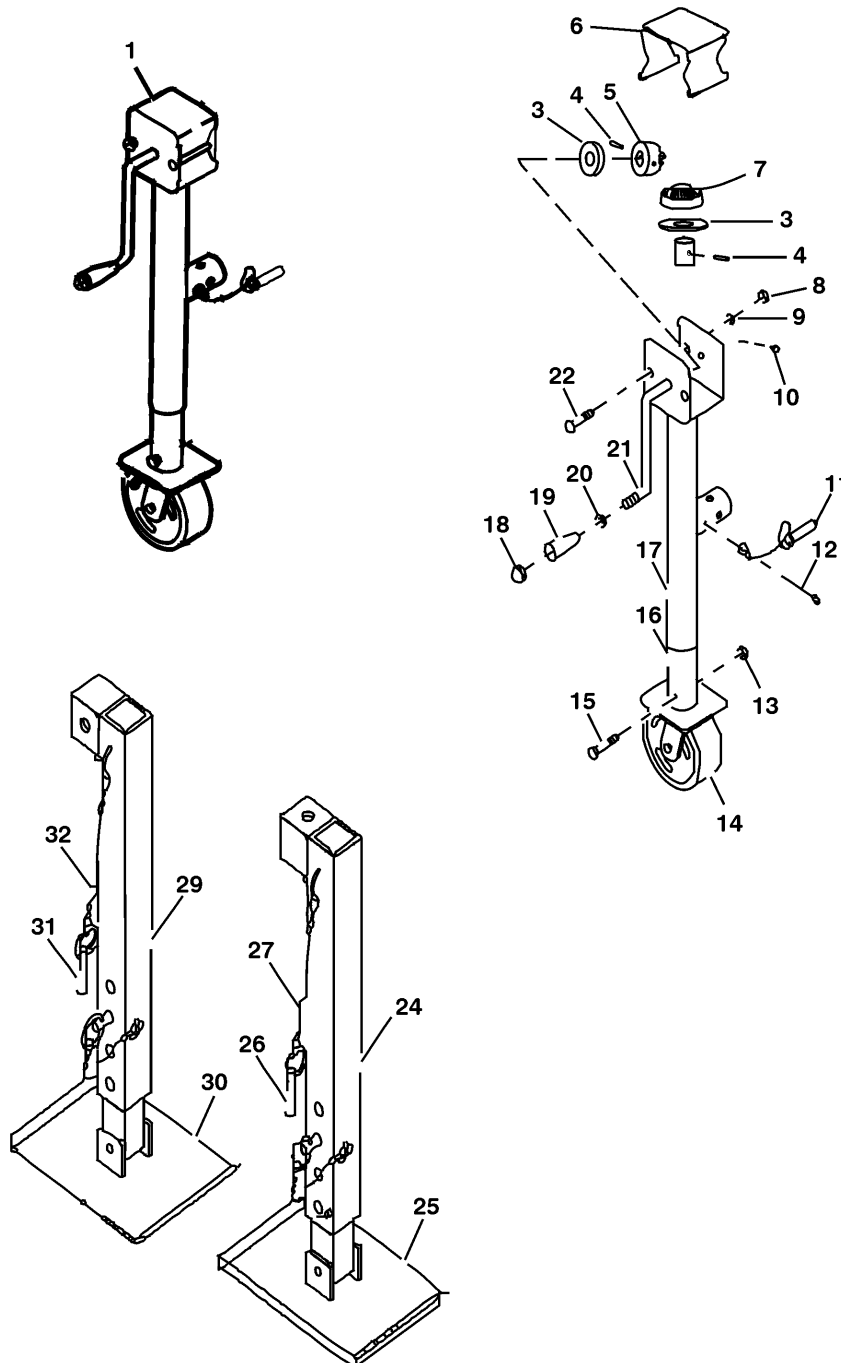


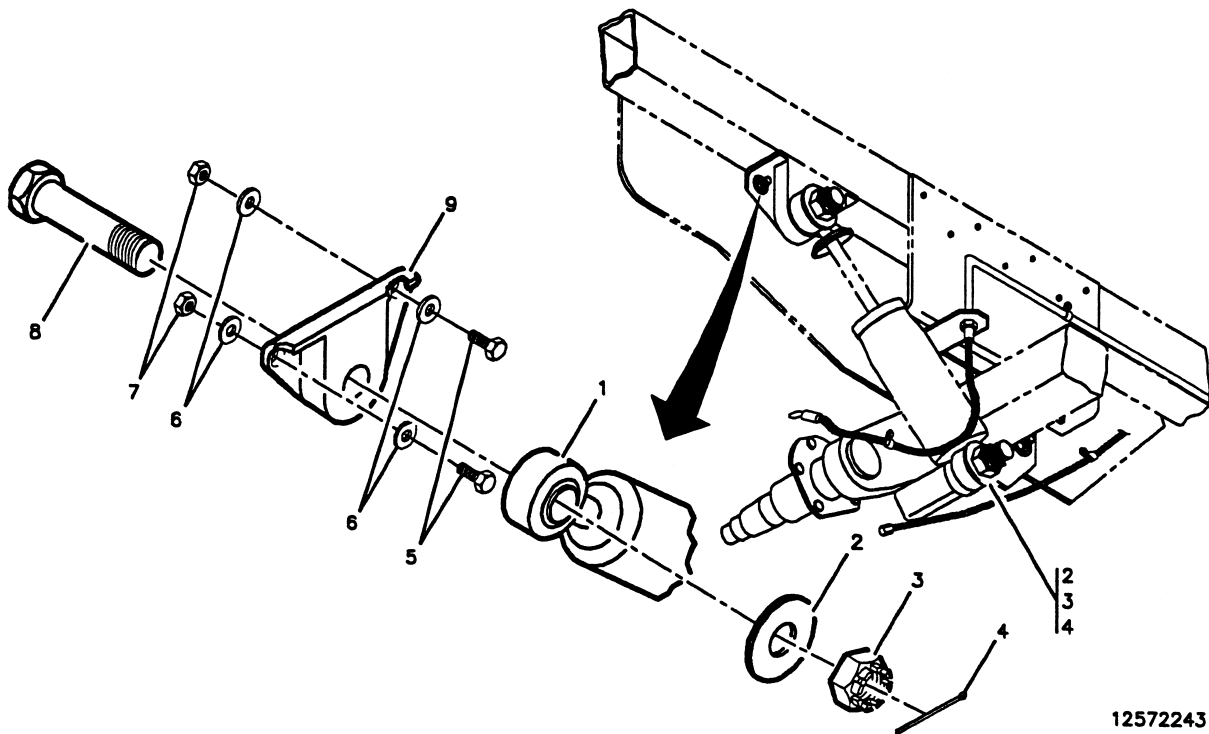
Figure 11. Landing Gear, Leveling Jacks



## Section II. REPAIR PARTS LIST - Continued

(1) ITEM NO	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODES (UOC)	(7) QTY
					GROUP 1507 LANDING GEAR, LEVELING JACKS	
					FIG. 11 LANDING GEAR, LEVELING JACKS	
1	PAOOO		01084	10182	SUPPORT,RETRACTABLE (5000 LB) . . . .	1
2	PBOOO	2590014145547	19207	12449368	SUPPORT,RETRACTABLE . . . . .	1
3	PAOZZ		60153	090091	.SHIM . . . . .	V
4	PAOZZ		60153	100026	.PIN,HOLLOW . . . . .	2
5	PAOZZ		60153	030465	.GEAR,BEVEL . . . . .	1
6	PAOZZ	3040014129566	0Z894	280104-5	.COVER,FITTED,HOUSIN . . . . .	1
7	PAOZZ		60153	030464	.GEAR,BEVEL . . . . .	1
8	PAOZZ	5310014120864	0Z894	120044	.NUT,PLAIN,ASSEMBLED . . . . .	2
9	PAOZZ	5310014121890	0Z894	130051	.WASHER,LOCK . . . . .	2
10	PAOZZ		60153	140032	.FITTING,LUBRICATION M6 . . . . .	1
11	PAOZZ	5315014120585	0Z894	280302-18	.PIN,SPRING . . . . .	1
12	PAOZZ	5315014119955	0Z894	100025	.PIN,COTTER . . . . .	1
13	PAOZZ	5310014121886	0Z894	120054	.NUT,SELF-LOCKING,EX . . . . .	1
14	PAOZZ	5340014219828	0Z894	280064	.CASTER,SWIVEL . . . . .	1
15	PAOZA	5306004022581	0Z894	110116	.BOLT,MACHINE . . . . .	1
16	PAOZZ	5120014125649	0Z894	280532-2	.TUBE ASSEMBLY,JACK . . . . .	1
17	PAOZZ	5120014128034	0Z894	280532-1	.TUBE ASSEMBLY,JACK . . . . .	1
18	PAOZZ	5310014120859	0Z894	120064	.NUT,SELF-LOCKING,RO . . . . .	1
19	PAOZZ	5340014121885	0Z894	280300-8	.HANDLE,CRANK . . . . .	1
20	PAOZZ	5310014121889	0Z894	130052	.WASHER,FLAT . . . . .	1
21	PAOZZ	5340014121883	0Z894	280304-7	.HANDLE,CRANK . . . . .	1
22	PAOZZ	5340014128073	0Z894	110085	.BOLT,BARREL . . . . .	2
23	PAOOO	2590014163276	33875	12449506	LEG,INNER,SHOE,JACK . . . . .	2
24	PAOZZ	4710014140328	33875	12449566	.TUBE,METALLIC . . . . .	1
25	PAOZZ	2590014128175	33875	12449567	.SHOE,JACK-SUPPORT . . . . .	1
26	XDOZZ		39428	98320A625	.PIN,QUICK,RELEASE . . . . .	2
27	PAOZZ	4010014130269	33875	12449510	.WIRE ROPE ASSEMBLY, . . . . .	2
28	PAOOO		19207	12449591	LEG,INNER,SHOE,JACK . . . . . UOC:CMT	2
29	PAOZZ		19207	12449592	.TUBE,METALLIC . . . . . UOC:CMT	1
30	PAOZZ		19207	12449596	.SHOE,JACK-SUPPORT . . . . . UOC:CMT	1
31	XDOZZ		80205	MS17985C1085	.PIN,QUICK,RELEASE . . . . . UOC:CMT	2
32	PAOZZ	4010014130269	33875	12449510	.WIRE ROPE ASSEMBLY, . . . . . UOC:CMT	2
					END OF FIGURE	

## Section II. REPAIR PARTS LIST - Continued



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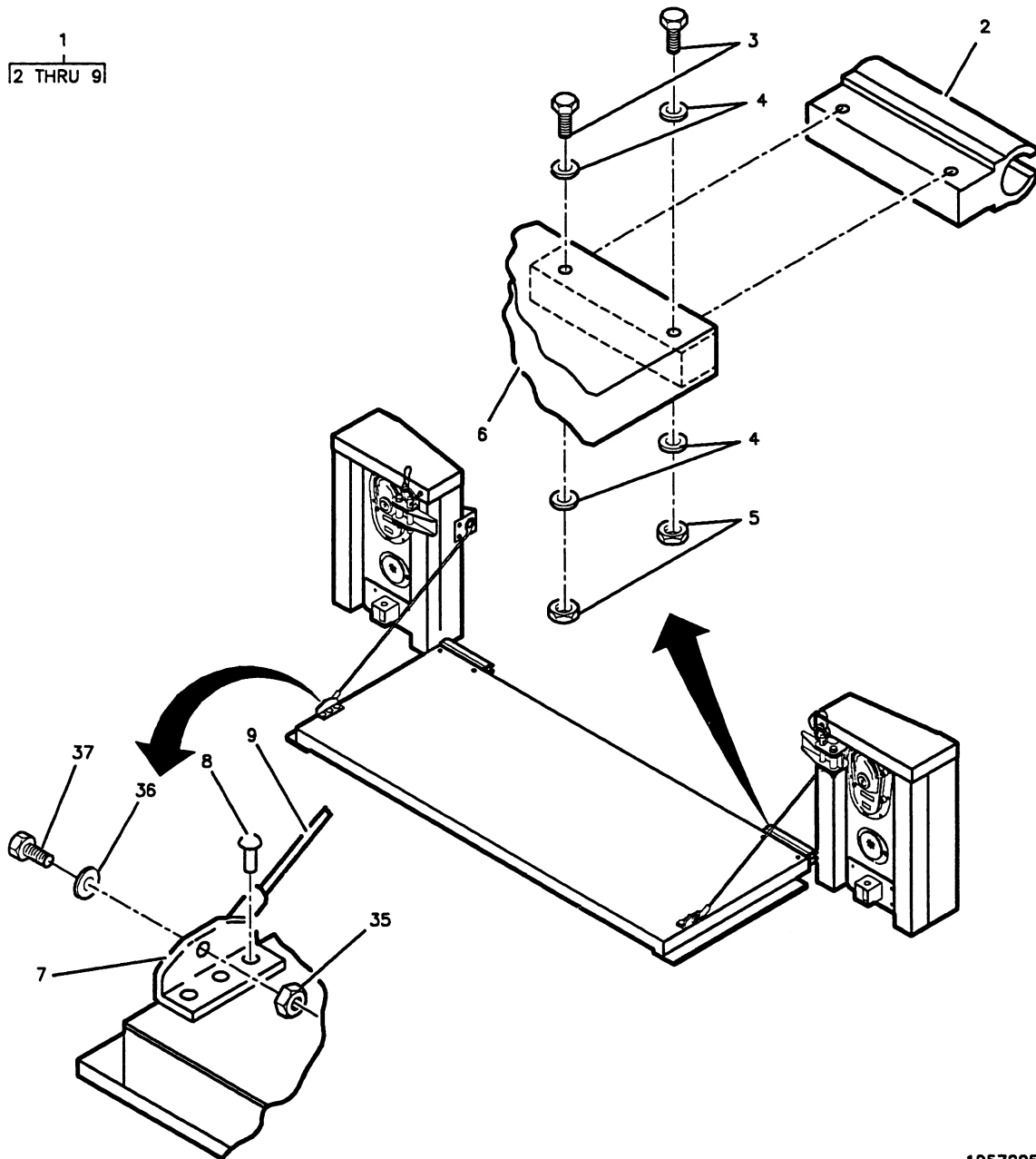
Figure 12. Shock Absorber

**Section II. REPAIR PARTS LIST - Continued**

(1) ITEM NO	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODES (UOC)	(7) QTY
					GROUP 16 SPRING AND SHOCK ABSORBERS	
					GROUP 1604 SHOCK ABSORBER EQUIPMENT	
					FIG. 12 SHOCK ABSORBER	
1	PAOZZ	2510011903862	76445	70113	SHOCK ABSORBER,DIRE .....	1
2	PAOZZ	5310014120863	19207	12449379-8	WASHER,FLAT .....	2
3	PAOZZ	5310014143664	19207	12449398-2	NUT,PLAIN,CASTELLAT .....	2
4	PAOZZ	5315014165358	19207	12449364-3	PIN,COTTER .....	2
5	PAOZZ	5305000712067	80204	B1821BH050C1 25N	SCREW,CAP,HEXAGON H .....	2
6	PAOZZ	5310008095998	96906	MS27183-18	WASHER,FLAT .....	4
7	PAOZZ	5310014121773	19207	12449377-3	NUT,SELF-LOCKING,HE .....	2
8	PAOZZ	5305014154725	12128	590832B	SCREW,CAP,HEXAGON H .....	1
9	PAOZZ	2590014175816	19207	12449996	BRACKET,VEHICULAR C .....	1
					END OF FIGURE	

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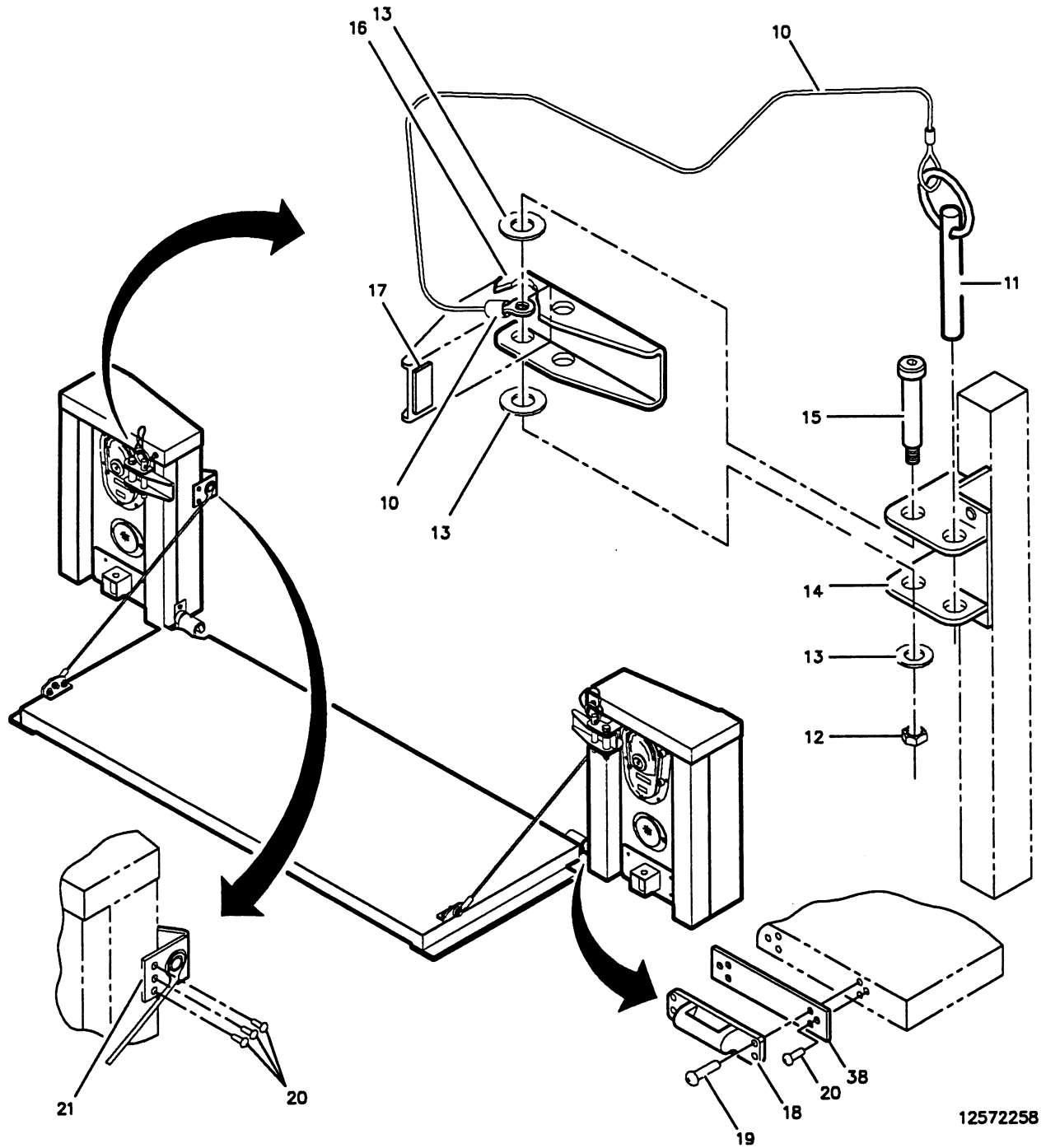
## Section II. REPAIR PARTS LIST - Continued



12572259

Figure 13. Tailgate (Sheet 1 of 4)

### Section II. REPAIR PARTS LIST - Continued



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Figure 13. Tailgate (Sheet 2 of 4)

## Section II. REPAIR PARTS LIST - Continued

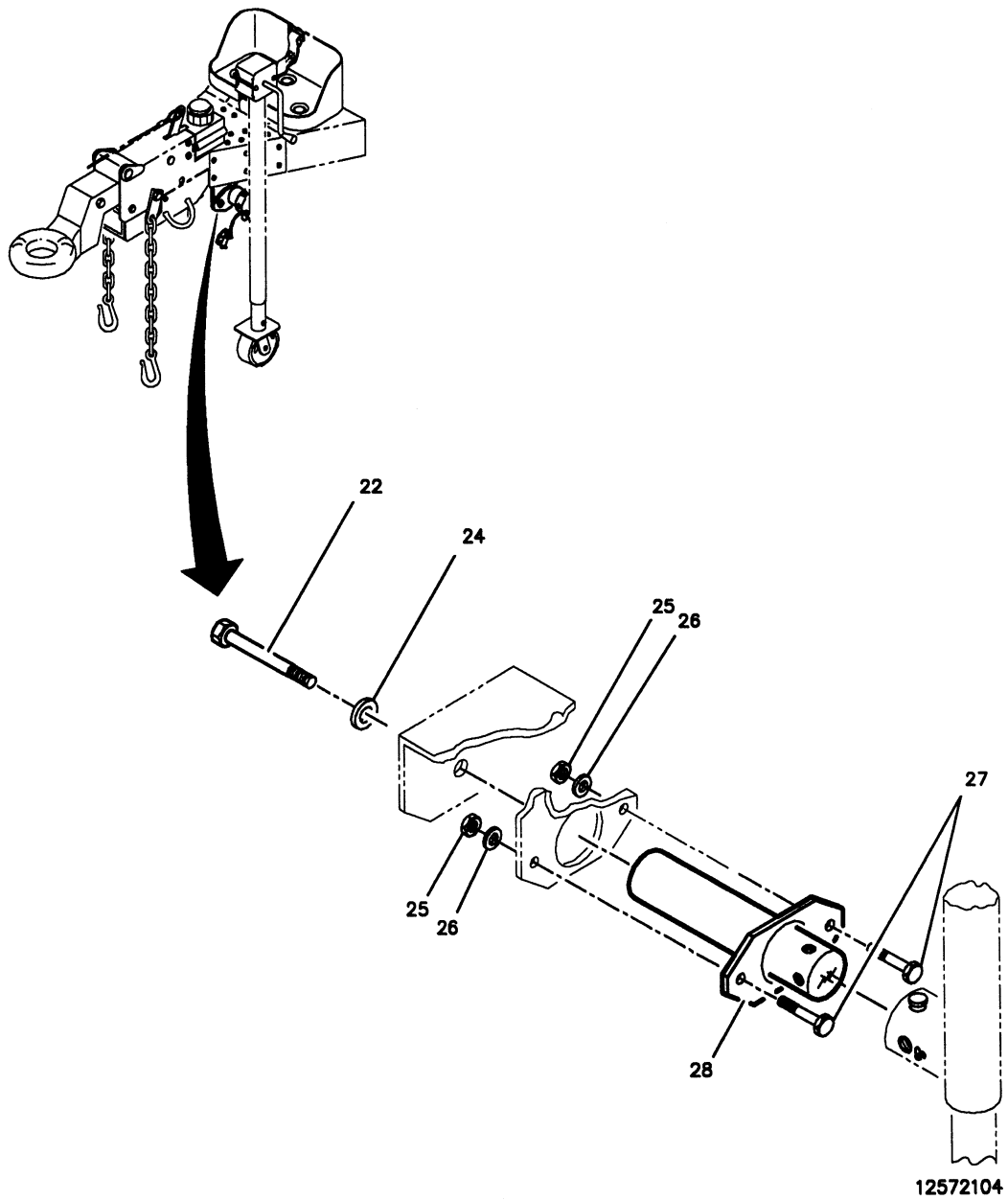


Figure 13. Tailgate (Sheet 3 of 4)

## Section II. REPAIR PARTS LIST - Continued

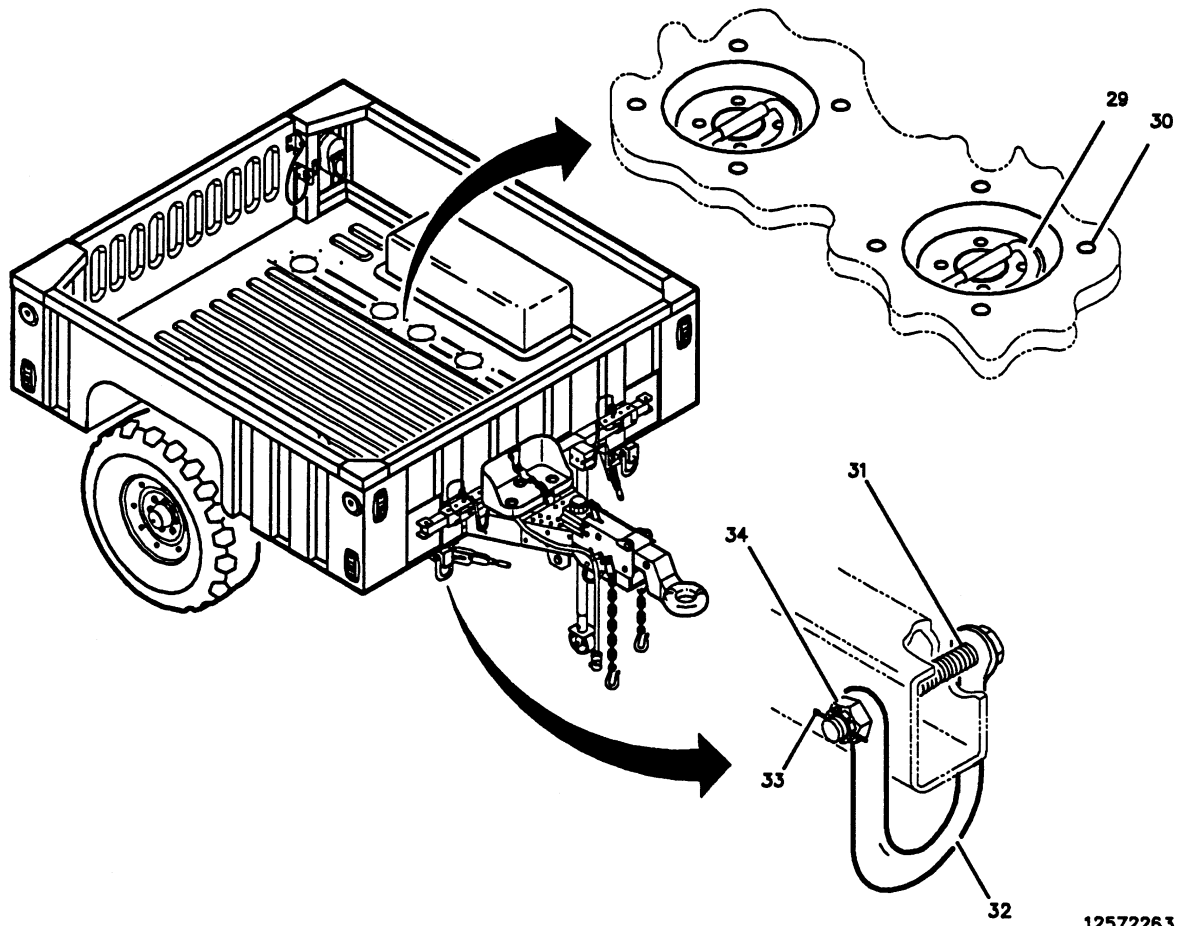


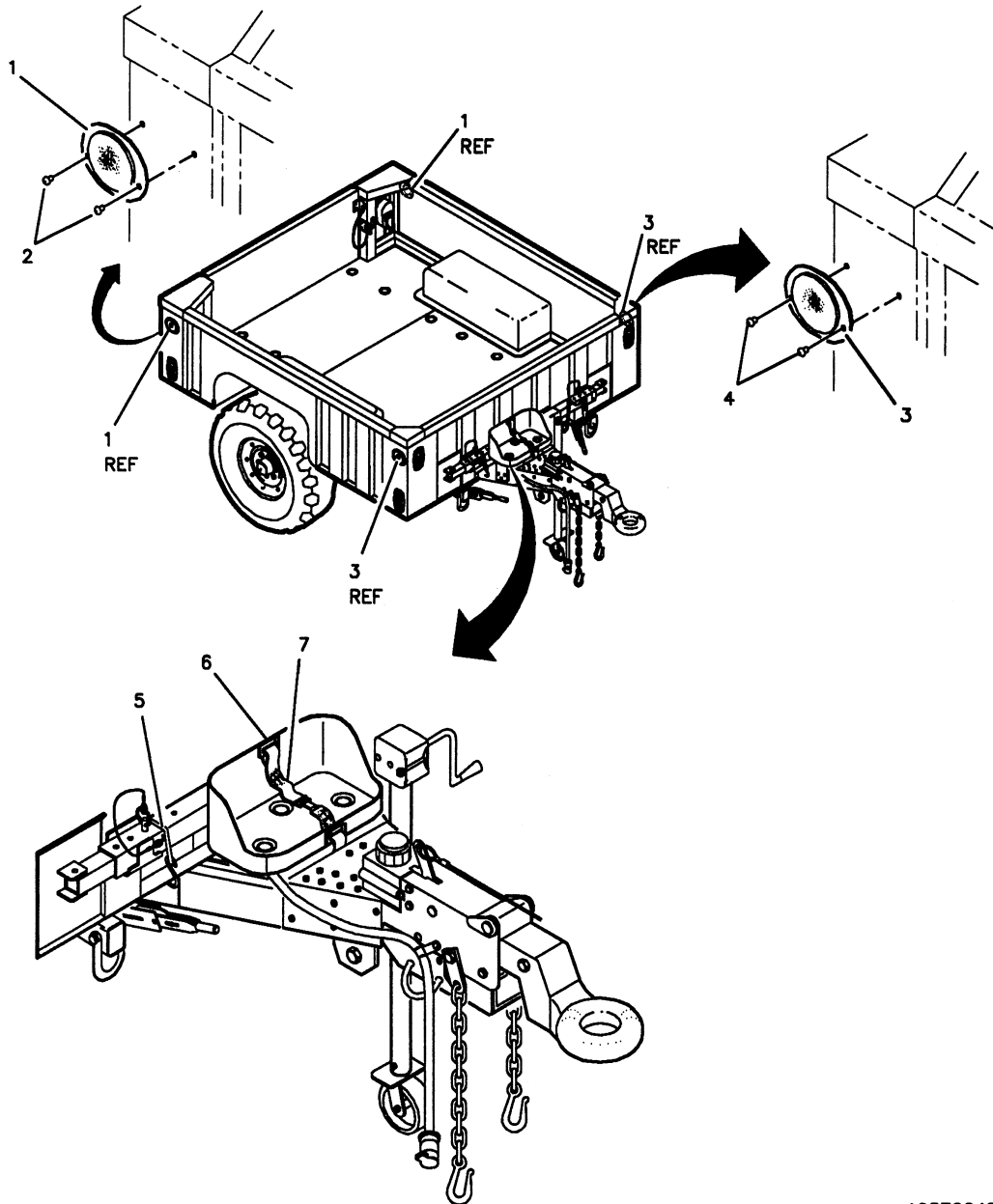
Figure 13. Tailgate (Sheet 4 of 4)



Section II. REPAIR PARTS LIST - Continued

(1) ITEM NO	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODES (UOC)	(7) QTY
					GROUP 18 BODY, CAB, HOOD, AND HULL	
					GROUP 1810 CARGO BODY	
					FIG. 13 TAILGATE	
1	PAOOO	2510014142264	33875	12449549	TAILGATE,VEHICLE BO .....	1
2	PAOZZ	2510014161427	33875	12449579	.HINGE,DOOR,VEHICULA .....	2
3	PAOZZ	5306002264833	80204	B1821BH031C200	.BOLT,MACHINE .....	4
				N		
4	PAOZZ	5310000814219	96906	MS27183-12	.WASHER,FLAT .....	8
5	PAOZZ		19207	12449377-4	.NUT,HEXAGON .....	2
6	PAOZZ	2510014163272	33875	12449550	.TAILGATE,VEHICLE BO .....	1
7	PAOZZ	5340014150637	33875	12449553-1	.BRACKET,ANGLE RH .....	2
7	PAOZZ	5340014151274	33875	12449553-2	.BRACKET,ANGLE LH .....	2
8	PAOZZ	5320014161794	17446	12449374-1	.RIVET,BLIND .250 DIA X .345-.406 ..	6
					GRIP	
9	PAOZZ	2590014164526	33875	12449554-1	.CONTROL ASSEMBLY,PU RH .....	1
9	PAOZZ	4010014168873	33875	12449554-2	.WIRE ROPE ASSEMBLY, LH .....	1
10	PAOZZ	4010014130269	33875	12449510	WIRE ROPE ASSEMBLY, .....	2
11	XDOZZ		39428	98320A625	PIN,QUICK,RELEASE .....	2
12	PAOZZ	5310014121773	19207	12449377-3	NUT,SELF-LOCKING,HE .....	2
13	PAOZZ	5310006143505	96906	MS15795-820	WASHER,FLAT .....	6
					UOC:HMT,LMT	
14	PAOZZ	5340014121891	33875	12449534	STRIKE,CATCH .....	2
15	PAOZZ	5305014161793	39428	12449564	SCREW,SHOULDER .....	2
16	PAOZZ	2910014128976	33875	12449535	LATCH,TAILGATE .....	2
17	PAOZZ	2590014153162	70485	12449521	PAD,CUSHIONING .....	2
18	PAOZZ	2510014161426	33875	12449578	HINGE,DOOR,VEHICULA .....	2
19	PAOZZ		17446	12449374-2	RIVET,BLIND .250 DIA X .470-.531 ...	8
					GRIP	
19	PAOZZ		17446	BOM-R8-10	RIVET,BLIND .250 DIA X .595-.656 ...	8
					GRIP (USED WITH HINGE SHIM)	
20	PAOZZ		17446	MBP-R8-M5	RIVET,BLIND .250 DIA X .268-.346 ...	6
					GRIP	
21	PAOZZ	5340014121288	33875	12449555	BRACKET,MOUNTING .....	2
22	PAOZZ	5305009480749	80204	B1821BH075F225	SCREW,CAP,HEXAGON H .....	1
				N		
24	PAOZZ	5310014121779	19207	12449387-2	WASHER,LOCK .....	1
25	PAOZZ	5310014121777	19207	12449377-1	NUT,SELF-LOCKING,HE .....	2
26	PAOZZ	5310014166520	19207	12449379-6	WASHER,FLAT .....	2
27	PAOZZ	5305007247220	80204	B1821BH063C150	SCREW,CAP,HEXAGON H .....	2
				N		
28	PAOZZ	4910014138722	33875	12449580	PIVOT JACK .....	1
29	PAOZZ	5340014121286	27182	S10-41XXZN01	COVER,ACCESS .....	12
30	PAOZZ	5320014141459	17446	12449500-3	RIVET,BLIND .250 DIA X .308-.387 ...	48
					GRIP	
31	PAOZZ		19207	12449378-2	SCREW,CAP,HEXAGON H .....	4
32	PAOZZ	4030013161551	19207	12342354	SHACKLE .....	4
33	PAOZZ	5315014121771	19207	12449364-1	PIN,COTTER .....	4
34	PAOZZ		19207	12449398-1	NUT,HEXAGON .....	4
35	PAOZZ		19207	12449377-11	NUT,SELF-LOCKING,HE .....	2
36	PAOZZ	5310010558817	06853	204235	WASHER,FLAT .....	2
37	PAOZZ	5305014151924	19207	12449528	SCREW,SHOULDER .....	2
38	PAOZZ		19207	12449495	SHIM,HINGE .....	V
					END OF FIGURE	

## Section II. REPAIR PARTS LIST - Continued



12572248

Figure 14. Accessory Items

**Section II. REPAIR PARTS LIST - Continued**

(1) ITEM NO	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODES (UOC)	(7) QTY
					GROUP 22 BODY, CHASSIS, AND HULL ACCESSORY ITEMS	
					GROUP 2202 ACCESSORY ITEMS	
					FIG. 14 ACCESSORY ITEMS	
1	PAOZZ	9905002052795	96906	MS35387-1	REFLECTOR,INDICATIN .....	4
2	PAOZZ	5320014142171	11815	BAPK-69	RIVET,BLIND .198 DIA X .562-.575 . GRIP	8
3	PAOZZ	9905002023639	96906	MS35387-2	REFLECTOR,INDICATIN .....	2
4	PAOZZ	5320014142171	11815	BAPK-69	RIVET,BLIND .198 DIA X .562-.575 . GRIP	4
5	PAOZZ		3D536	4448	BRACKET,VEHICULAR C .....	1
6	PAOZZ	2590011681489	19207	7064504	.BRACKET,ASSEMBLY LI .....	1
7	PAOZZ	5340009684060	19207	8690527	.STRAP,WEBBING .....	1
					END OF FIGURE	

## Section II. REPAIR PARTS LIST - Continued

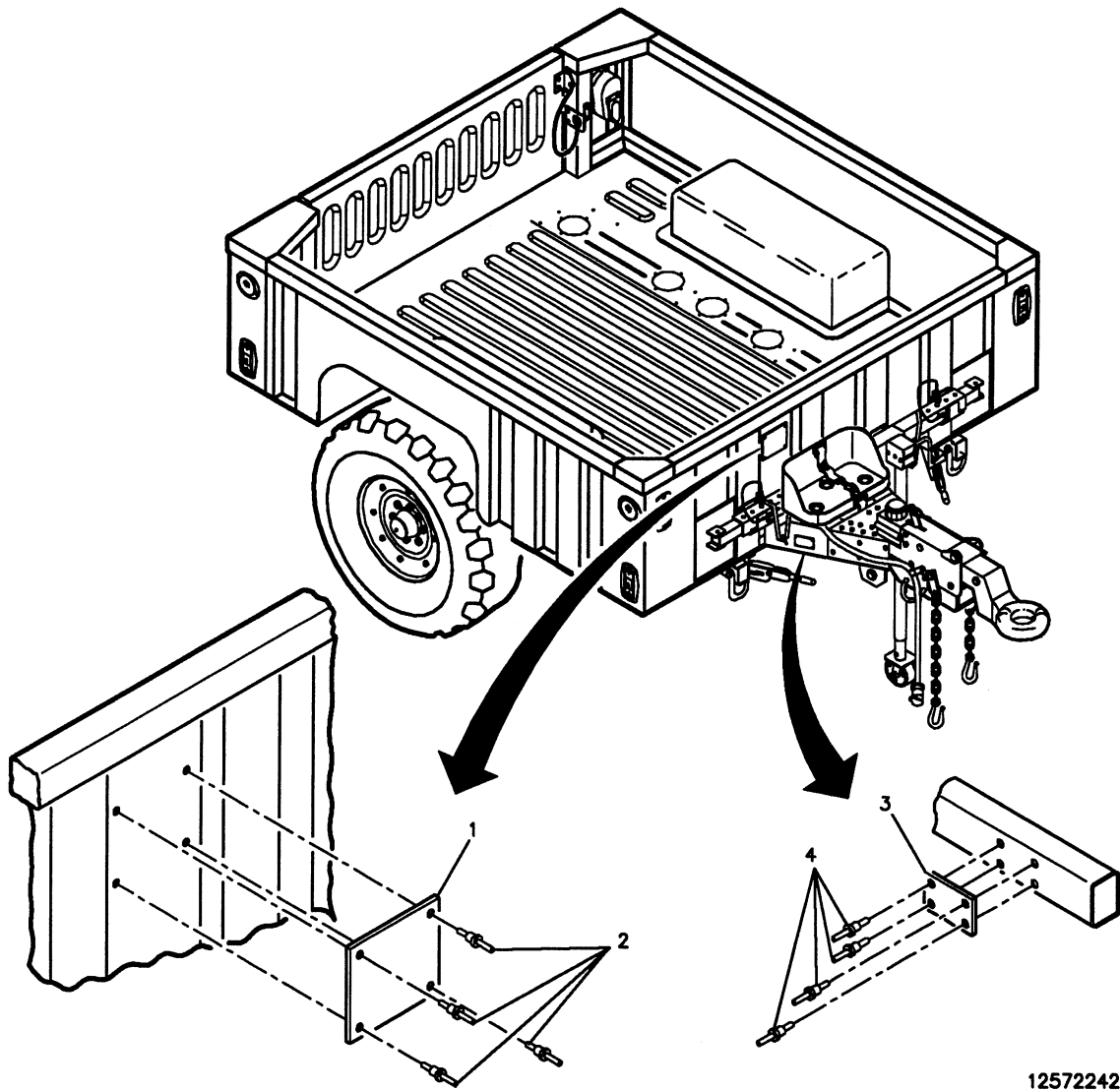


Figure 15. Data Plates

**Section II. REPAIR PARTS LIST - Continued**

(1) ITEM NO	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODES (UOC)	(7) QTY
					GROUP 2210 DATA PLATES AND INSTRUCTION HOLDERS FIG. 15 DATA PLATES	
1	PFOZZ		19207	12449616-1	PLATE, IDENTIFICATIO (HMT) . . . . . UOC:HMT	1
1	PAOZZ		19207	12449616-2	PLATE, IDENTIFICATIO (LMT) . . . . . UOC:LMT	1
2	PAOZZ	5320014163092	07707	12449496-1	RIVET, BLIND .125 DIA X .126-.187 . GRIP	4
3	PFOZZ		19207	12449610-1	PLATE, IDENTIFICATIO (HMT) . . . . . UOC:HMT	1
3	PAOZZ		19207	12449610-2	PLATE, INSTRUCTION (CMT) . . . . . UOC:CMT	1
3	PAOZZ		19207	12449610-3	PLATE, INSTRUCTION (LMT) . . . . . UOC:LMT	1
4	PAOZZ	5320014163091	07707	12449496-2	RIVET, BLIND .125 DIA X .251-.312 . END OF FIGURE	4

## Section II. REPAIR PARTS LIST - Continued

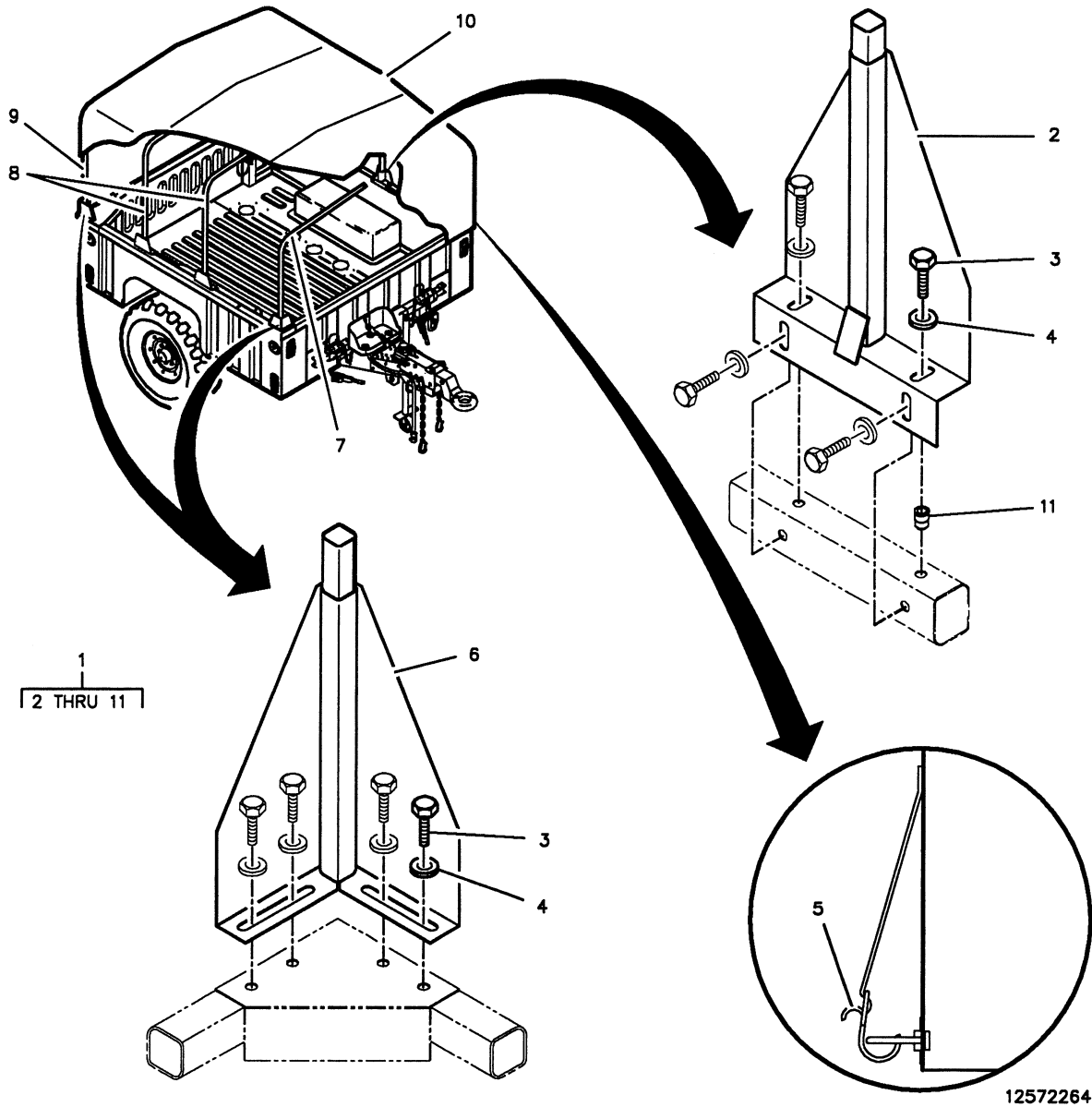


Figure 16. Cargo Body Soft Top Installation Kit

**Section II. REPAIR PARTS LIST - Continued**

(1) ITEM NO	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODES (UOC)	(7) QTY
					GROUP 33 SPECIAL PURPOSE KITS	
					GROUP 3307 SPECIAL PURPOSE KITS	
					FIG. 16 CARGO BODY SOFT TOP INSTALLATION KIT	
1	PFOOO	2540014136985	30076	12449608	COVER, FITTED, VEHICU .....	1
2	PAOZZ		30076	12449606	.BRACKET, CENTER .....	4
3	PAOZZ	5305005434372	80204	B1821BH038C0 75N	.SCREW, CAP, HEXAGON H .....	32
4	PAOZZ	5310010558817	06853	204235	.WASHER, FLAT .....	32
5	XDOZZ	5340014141454	19207	12340517-1	.STRAP, RETAINING .....	21
6	PAOZZ		30076	12449605	.BRACKET, FRONT/REAR .....	4
7	PAOZZ	2540012006611	19207	12340764-2	.BOW, VEHICULAR TOP .....	1
8	PAOZZ	2540011996760	19207	12340747	.BOW, VEHICULAR TOP .....	2
9	PAOZZ	2540011996761	19207	12340764-1	.BOW, VEHICULAR TOP .....	1
10	PAOZZ		19207	12470989-1	.COVER, CARGO CAMO .....	1
11	PAOZZ		78276	ALS4-616-150	.RIVNUT .....	32
					END OF FIGURE	

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### Section III. SPECIAL TOOLS LIST

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## Section IV. CROSS-REFERENCE INDEXES

## NATIONAL STOCK NUMBER INDEX

STOCK NUMBER	FIG.	ITEM	STOCK NUMBER	FIG.	ITEM
5315-00-012-0123	6	22		12	6
6240-00-019-0877	1	17	5305-00-948-0749	13	22
6240-00-019-3093	1	4	5340-00-968-4060	14	7
6240-00-044-6914	1	5	5975-00-984-6582	6	27
5305-00-071-2067	12	5	5310-01-055-8817	1	11
5305-00-071-2084	10	3		13	36
5310-00-081-4219	4	3		16	4
4820-00-087-0323	8	10	2640-01-098-2029	8	9
3110-00-100-3541	7	7	5310-01-100-5112	6	11
2530-00-161-7575	5	30	5306-01-100-5113	5	26
2530-00-161-7576	5	30	2530-01-121-0786	6	7
5310-00-176-8117	7	2	5320-01-140-1479	2	8
9905-00-202-3639	14	3	6150-01-167-6522	2	1
9905-00-205-2795	14	1	2590-01-168-1489	14	6
5306-00-226-4832	4	6	2510-01-190-3862	12	1
5306-00-226-4833	13	3	5342-01-194-3128	1	12
5310-00-269-4040	6	16	5310-01-198-7585	8	8
	6	36	2540-01-199-6760	16	8
5325-00-276-6056	2	7	2540-01-199-6761	16	9
4730-00-287-1706	6	32	6220-01-200-0897	1	14
6220-00-299-7425	1	18	2540-01-200-6611	16	7
6220-00-299-7426	1	18	5306-01-258-0830	6	4
5306-00-402-2581	11	15	2640-01-262-9517	8	16
5310-00-449-2376	8	14	2530-01-263-7061	5	15
5331-00-462-0907	1	2	5360-01-269-7264	6	9
5305-00-543-4372	1	10	5330-01-269-7265	5	25
	16	3		6	10
6220-00-577-3434	1	16	5360-01-269-7266	6	3
5315-00-584-9053	4	4	1740-01-269-7270	6	21
5310-00-614-3505	13	13	5340-01-277-0300	5	23
5305-00-701-5071	1	20	6220-01-284-2709	1	6
5340-00-714-3113	5	5	2530-01-287-4451	5	27
5305-00-724-7220	3	4	2530-01-287-6869	5	2
	13	27	5360-01-287-7297	5	22
6220-00-726-1916	1	16	5315-01-287-8770	5	3
6220-00-729-9295	1	21	2530-01-287-9409	5	16
6220-00-752-6516	1	19	2530-01-288-3979	5	17
5310-00-809-5998	6	38	5360-01-288-5870	5	20

## Section IV. CROSS-REFERENCE INDEXES - Continued

### NATIONAL STOCK NUMBER INDEX

STOCK NUMBER	FIG.	ITEM	STOCK NUMBER	FIG.	ITEM
6220-01-297-3217	1	7	5340-01-412-1285	5	9
4030-01-316-1551	13	32	5340-01-412-1286	13	29
5315-01-319-9194	5	7	5340-01-412-1288	13	21
2530-01-320-1686	5	28	5315-01-412-1771	13	33
2530-01-320-1687	5	28	5310-01-412-1773	6	37
5310-01-320-1980	5	6		10	2
5310-01-320-1987	5	24		12	7
5360-01-320-5815	5	11		13	12
5360-01-320-5818	5	19	5310-01-412-1774	4	2
5360-01-320-5819	5	14	5310-01-412-1777	3	2
5360-01-320-5820	5	18		13	25
5305-01-321-3522	5	4	5310-01-412-1779	13	24
2530-01-326-0768	5	8	5340-01-412-1883	11	21
2610-01-333-7632	9	1	5340-01-412-1885	11	19
2640-01-334-9453	8	5	5310-01-412-1886	11	13
2640-01-335-4583	8	11	5310-01-412-1889	11	20
5331-01-335-8878	8	4	5310-01-412-1890	11	9
2530-01-336-3127	8	7	5340-01-412-1891	13	14
2530-01-336-5740	8	2	2530-01-412-3863	6	5
5306-01-336-7175	8	3	5330-01-412-4447	7	8
2530-01-338-2730	8	6	2530-01-412-5209	5	29
4730-01-346-1063	8	12	2530-01-412-5210	5	12
5331-01-346-3806	8	13	2530-01-412-5211	5	12
2530-01-349-6920	6	8	5120-01-412-5649	11	16
3040-01-349-6927	6	19	5325-01-412-5998	5	13
6220-01-359-2870	13		5305-01-412-6287	5	10
6220-01-372-3883	1	1	4730-01-412-6769	6	13
5315-01-372-8923	4	5	4710-01-412-6770	6	33
5315-01-411-9955	11	12	2530-01-412-7571	7	6
5315-01-412-0585	11	11	5120-01-412-8034	11	17
5310-01-412-0859	11	18	5340-01-412-8073	11	22
5310-01-412-0861	5	21	5320-01-412-8088	2	6
5310-01-412-0863	12	2	2590-01-412-8175	11	25
5310-01-412-0864	11	8	2910-01-412-8976	13	16
5340-01-412-1278	6	2	2530-01-412-9564	7	1
5340-01-412-1281	6	6	3040-01-412-9566	11	6
4010-01-412-1282	10	1	4010-01-413-0269	11	27
5340-01-412-1284	6	12		11	32

## Section IV. CROSS-REFERENCE INDEXES - Continued

## NATIONAL STOCK NUMBER INDEX

STOCK NUMBER	FIG.	ITEM	STOCK NUMBER	FIG.	ITEM
4010-01-413-0269	13	10	2590-01-416-4526	13	9
6150-01-413-3481	2	2	5315-01-416-5358	12	4
4710-01-413-4029	6	31	5310-01-416-6520	3	3
4710-01-413-4031	6	39		13	26
2540-01-413-6985	16	1	4010-01-416-8873	13	9
4910-01-413-8722	13	28	5315-01-417-1051	7	3
4710-01-414-0328	11	24	5310-01-417-2927	7	4
5340-01-414-1453	2	5	2590-01-417-5816	12	9
	6	29	6150-01-417-7502	1	9
5320-01-414-2171	1	13	5306-01-418-9086	7	9
	1	15	5340-01-421-9828	11	14
	14	2			
	14	4			
5340-01-414-2172	2	4			
5340-01-414-2173	4	8			
5340-01-414-2178	6	42			
2510-01-414-2264	13	1			
5310-01-414-3664	12	3			
2590-01-414-5547	11	2			
5305-01-414-5631	6	41			
5310-01-414-6476	7	10			
2530-01-414-9307	4	7			
2530-01-414-9314	5	1			
2530-01-414-9317	5	1			
5340-01-415-0637	13	7			
5340-01-415-1274	13	7			
5340-01-415-1896	6	40			
5305-01-415-1924	13	37			
2510-01-415-2636	4	1			
2590-01-415-3162	13	17			
5305-01-415-4725	12	8			
2510-01-416-1426	13	18			
2510-01-416-1427	13	2			
5305-01-416-1793	13	15			
5320-01-416-3091	15	4			
5320-01-416-3092	15	2			
2510-01-416-3272	13	6			
2590-01-416-3276	11	23			

**Section IV. CROSS-REFERENCE INDEXES - Continued**

PART NUMBER INDEX				
CAGE	P/N	NSN	FIG.	ITEM
78276	ALS4-616-150		16	11
80059	AN380-4-5	5315-00-012-0123	6	22
74080	A63-45-16	5310-00-176-8117	7	2
96787	A6324	6240-00-019-3093	1	4
11815	BAPK-69	5320-01-414-2171	1	13
			1	15
			14	2
			14	4
9K475	BOM-R8-10	5320-01-140-1479	2	8
			13	19
9K475	BOM-R8-9	5320-01-412-8088	2	6
80204	B1821BH031C175N	5306-00-226-4832	4	6
80204	B1821BH031C200N	5306-00-226-4833	13	3
80204	B1821BH038C075N	5305-00-543-4372	1	10
			16	3
80204	B1821BH050C125N	5305-00-071-2067	12	5
80204	B1821BH050C550N	5305-00-071-2084	10	3
80204	B1821BH063C150N	5305-00-724-7220	3	4
			13	27
80204	B1821BH075F225N	5305-00-948-0749	13	22
80204	B210NA00CAM36354		6	34
	BNBA1			
80204	B210NA00CAP39354		6	25
	BNBA			
			6	35
08806	GE1683	6240-00-044-6914	1	5
46717	LA-361-9	6240-00-019-0877	1	17
17446	MBP-R8-M5		13	20
96906	MS15795-820	5310-00-614-3505	13	13
80205	MS17985C1085		11	31
96906	MS21245-8	5310-00-449-2376	8	14
96906	MS27183-12	5310-00-081-4219	4	3
			13	4
96906	MS27183-18	5310-00-809-5998	6	38
			12	6
96906	MS3367-1-0	5975-00-984-6582	6	27
96906	MS35387-1	9905-00-205-2795	14	1
96906	MS35387-2	9905-00-202-3639	14	3

## Section IV. CROSS-REFERENCE INDEXES - Continued

PART NUMBER INDEX				
CAGE	P/N	NSN	FIG.	ITEM
96906	MS35421-1	6220-00-299-7425	1	18
96906	MS35421-2	6220-00-299-7426	1	18
96906	MS35422-1	6220-00-729-9295	1	21
96906	MS35423-1	6220-00-577-3434	1	16
96906	MS35423-2	6220-00-726-1916	1	16
94135	MS35489-106	5325-00-276-6056	2	7
96906	MS51959-61	5305-00-701-5071	1	20
81349	M45913/1-10CG5C	5310-00-269-4040	6	16
			6	36
27182	S10-41XXZN01	5340-01-412-1286	13	29
80204	S630NA84CAG12354		6	14
	BNBA3			
73842	TRC1	4820-00-087-0323	8	10
81348	TYIV/CL1/TRVC8	2640-01-098-2029	8	9
80724	W1368	5340-00-714-3113	5	5
80204	W221NAAW062NN039		6	17
	NNBA1			
80204	W221NAAW087NN039		6	15
	NNBA1			
92867	01191510	2510-01-415-2636	4	1
60153	030464		11	7
60153	030465		11	5
60153	090091		11	3
0Z890	094231		3	1
0Z894	100025	5315-01-411-9955	11	12
60153	100026		11	4
01084	10182		11	1
94189	10271	2530-01-121-0786	6	7
94189	10273	5306-01-258-0830	6	4
8X093	10274	5360-01-269-7264	6	9
19207	10891263-1	6150-01-167-6522	2	1
0Z894	110085	5340-01-412-8073	11	22
0Z894	110116	5306-00-402-2581	11	15
19207	11639519-2	5331-00-462-0907	1	2
0Z894	120044	5310-01-412-0864	11	8
0Z894	120054	5310-01-412-1886	11	13
0Z894	120064	5310-01-412-0859	11	18
5P512	12098	4730-01-412-6769	6	13

**Section IV. CROSS-REFERENCE INDEXES - Continued**

PART NUMBER INDEX				
CAGE	P/N	NSN	FIG.	ITEM
19207	12338709	6220-01-200-0897	1	14
19207	12339497	2640-01-262-9517	8	16
19207	12339501	5310-01-198-7585	8	8
19207	12340517-1		16	5
19207	12340747	2540-01-199-6760	16	8
19207	12340748		16	7
19207	12340751		16	9
19207	12340764-1	2540-01-199-6761	16	9
19207	12340764-2	2540-01-200-6611	16	7
19207	12342354	4030-01-316-1551	13	32
19207	12342633	5331-01-335-8878	8	4
19207	12342634	2640-01-335-4583	8	11
19207	12342638	2640-01-334-9453	8	5
34623	12342639	2530-01-338-2730	8	6
19207	12342640	2530-01-336-3127	8	7
19207	12342641		8	1
19207	12342642	2530-01-336-5740	8	2
19207	12342644	2610-01-333-7632	9	1
19207	12342758	5306-01-336-7175	8	3
19207	12342794	5331-01-346-3806	8	13
19207	12360850-1	6220-01-284-2709	1	6
19207	12360870-2	6220-01-297-3217	1	7
19207	12375837	6220-01-372-3883	1	1
19207	12375838		1	8
19207	12375841	6220-01-359-2870	1	3
94189	12426	3040-01-349-6927	6	19
19207	12449364-1	5315-01-412-1771	13	33
19207	12449364-3	5315-01-416-5358	12	4
18076	12449366-1	5340-01-414-2173	4	8
18076	12449366-2	5340-01-414-1453	2	5
			6	29
18076	12449366-3	5340-01-414-2172	2	4
18076	12449366-4	5340-01-414-2178	6	42
19207	12449366-5		6	30
19207	12449368	2590-01-414-5547	11	2
33875	12449371	5340-01-415-1896	6	40
17446	12449374-1		13	8



## Section IV. CROSS-REFERENCE INDEXES - Continued

PART NUMBER INDEX				
CAGE	P/N	NSN	FIG.	ITEM
17446	12449374-2		13	19
19207	12449377-1	5310-01-412-1777	3	2
			13	25
19207	12449377-11		13	35
19207	12449377-3	5310-01-412-1773	6	37
			10	2
			12	7
			13	12
19207	12449377-4		13	5
19207	12449377-5		5	32
19207	12449377-9	5310-01-412-1774	4	2
19207	12449378-2		13	31
19207	12449379-6	5310-01-416-6520	3	3
			13	26
19207	12449379-8	5310-01-412-0863	12	2
19207	12449384	2530-01-412-9564	7	1
19207	12449387-2	5310-01-412-1779	13	24
33875	12449392		5	31
19207	12449398-1		13	34
19207	12449398-2	5310-01-414-3664	12	3
19207	12449495		13	38
07707	12449496-1	5320-01-416-3092	15	2
07707	12449496-2	5320-01-416-3091	15	4
33875	12449499	5305-01-414-5631	6	41
17446	12449500-3		2	3
			4	9
			13	30
33875	12449501	4010-01-412-1282	10	1
33875	12449506	2590-01-416-3276	11	23
33875	12449510	4010-01-413-0269	11	27
			11	32
			13	10
33875	12449511	6150-01-417-7502	1	9
70485	12449521	2590-01-415-3162	13	17
19207	12449528	5305-01-415-1924	13	37
33875	12449534	5340-01-412-1891	13	14
33875	12449535	2910-01-412-8976	13	16
33875	12449549	2510-01-414-2264	13	1

## Section IV. CROSS-REFERENCE INDEXES - Continued

PART NUMBER INDEX				
CAGE	P/N	NSN	FIG.	ITEM
33875	12449550	2510-01-416-3272	13	6
33875	12449553-1	5340-01-415-0637	13	7
33875	12449553-2	5340-01-415-1274	13	7
33875	12449554-1	2590-01-416-4526	13	9
33875	12449554-2	4010-01-416-8873	13	9
33875	12449555	5340-01-412-1288	13	21
39428	12449564	5305-01-416-1793	13	15
33875	12449566	4710-01-414-0328	11	24
33875	12449567	2590-01-412-8175	11	25
33875	12449578	2510-01-416-1426	13	18
33875	12449579	2510-01-416-1427	13	2
33875	12449580	4910-01-413-8722	13	28
19207	12449591		11	28
19207	12449592		11	29
19207	12449596		11	30
33875	12449601	4710-01-413-4031	6	39
33875	12449602	4710-01-413-4029	6	31
33875	12449603	4710-01-412-6770	6	33
30076	12449605		16	6
30076	12449606		16	2
19207	12449607		16	10
30076	12449608	2540-01-413-6985	16	1
19207	12449610-1		15	3
19207	12449610-2		15	3
19207	12449610-3		15	3
19207	12449616-1		15	1
19207	12449616-2		15	1
19207	12449800		6	1
19207	12449996	2590-01-417-5816	12	9
19207	12449997		2	2
33875	12449998	6150-01-413-3481	2	2
19207	12470989-1		16	10
19207	12479772		6	24
19207	12479774		6	20
19207	12479775		6	23
19207	12479776		6	18
19207	12479777		6	26
94189	12972	5305-01-412-6287	5	10

## Section IV. CROSS-REFERENCE INDEXES - Continued

PART NUMBER INDEX				
CAGE	P/N	NSN	FIG.	ITEM
0Z894	130051	5310-01-412-1890	11	9
0Z894	130052	5310-01-412-1889	11	20
60153	140032		11	10
08162	14125A		7	5
92867	15642901	2530-01-414-9307	4	7
94189	17406	5310-01-320-1980	5	6
94189	17556	2530-01-349-6920	6	8
94189	17762	5340-01-412-1281	6	6
94189	17772	1740-01-269-7270	6	21
81996	17803	5360-01-269-7266	6	3
94189	17917	2530-01-412-5209	5	29
0Z899	18024-MF		6	28
94189	18066	5340-01-412-1284	6	12
94189	18496	2530-01-287-6869	5	2
94189	18497	2530-01-326-0768	5	8
94189	18502	5340-01-412-1285	5	9
94189	18503	2530-01-287-4451	5	27
94189	18508	5315-01-287-8770	5	3
94189	18836	2530-01-287-9409	5	16
94189	18950	5310-01-412-0861	5	21
06853	204235	5310-01-055-8817	1	11
			13	36
			16	4
80201	22532	5330-01-412-4447	7	8
94189	23323	2530-01-288-3979	5	17
94189	23457	5305-01-321-3522	5	4
94189	24668	2530-01-412-5210	5	12
94189	24669	2530-01-412-5211	5	12
24617	25580	3110-00-100-3541	7	7
0Z894	280064	5340-01-421-9828	11	14
0Z894	280104-5	3040-01-412-9566	11	6
0Z894	280300-8	5340-01-412-1885	11	19
0Z894	280302-18	5315-01-412-0585	11	11
0Z894	280304-7	5340-01-412-1883	11	21
0Z894	280532-1	5120-01-412-8034	11	17
0Z894	280532-2	5120-01-412-5649	11	16
94189	42030	2530-01-414-9317	5	1
94189	42031	2530-01-414-9314	5	1

## Section IV. CROSS-REFERENCE INDEXES - Continued

PART NUMBER INDEX				
CAGE	P/N	NSN	FIG.	ITEM
94189	43593	5340-01-412-1278	6	2
94189	4390500	2530-01-412-3863	6	5
3D536	4448		14	5
44940	502-0373	4730-00-287-1706	6	32
34623	5575569	5342-01-194-3128	1	12
34623	5588618-13		8	15
12128	590832B	5305-01-415-4725	12	8
73331	5939830	6220-00-752-6516	1	19
94189	6814	5360-01-320-5820	5	18
76445	70113	2510-01-190-3862	12	1
19207	7064504	2590-01-168-1489	14	6
94189	7778	5325-01-412-5998	5	13
94189	7820	5330-01-269-7265	5	25
			6	10
94189	7949	5306-01-100-5113	5	26
94189	7976	5310-01-100-5112	6	11
92867	81000129	5315-00-584-9053	4	4
92867	84000139	5315-01-372-8923	4	5
19207	8690527	5340-00-968-4060	14	7
0Z890	90509	5310-01-417-2927	7	4
41885	90619	4730-01-346-1063	8	12
0Z890	90640	5310-01-414-6476	7	10
0Z890	9089324	2530-01-412-7571	7	6
0Z890	91901	5315-01-417-1051	7	3
0Z890	9251100	5306-01-418-9086	7	9
94189	9776	2530-00-161-7575	5	30
94189	9777	2530-00-161-7576	5	30
94189	9784	5360-01-320-5815	5	11
94189	9785	5360-01-320-5818	5	19
94189	9786	5360-01-288-5870	5	20
94189	9789	2530-01-263-7061	5	15
94189	9790	5360-01-320-5819	5	14
94189	9791	5360-01-287-7297	5	22
94189	9792	2530-01-320-1686	5	28
94189	9793	2530-01-320-1687	5	28
94189	9794	5310-01-320-1987	5	24
94189	9795	5340-01-277-0300	5	23
94189	9796	5315-01-319-9194	5	7
39428	98320A625		11	26
			13	11

## APPENDIX G

### LUBRICATION INSTRUCTIONS

#### G-1 GENERAL.

##### NOTE

These instructions are MANDATORY.

- a. The trailer must receive lubrication with approved lubricants at recommended intervals in order to be mission-ready at all times.
- b. The LUBRICATION CHART shows the lubrication points, names items to be lubricated, the required lubricants, and the recommended interval for lubrication. Any special lubricating instructions required for specific components are in the NOTES section of the chart.
- c. The KEY lists lubricants to be used in all temperature ranges and shows the intervals.
- d. Recommended intervals are based on normal conditions of operation, temperature, and humidity. When operating under extreme conditions, lubricants should always be changed more frequently. When in doubt, notify your supervisor.

#### G-2 SPECIFIC LUBRICATION INSTRUCTIONS.

- a. Keep all lubricants in closed containers and stored in a clean, dry place away from extreme heat. Keep container covers clean and do not allow dust, dirt, or other foreign material to mix with lubricants. Keep all lubrication equipment clean and ready to use.
- b. Maintain a record of lubrication performed and report any problems noted during lubrication. Refer to DA Pam 738-750 for applicable forms and procedures to record and report any findings.

**WARNING**

Dry cleaning solvent, P-D-680, is toxic and flammable. Always wear protective goggles and gloves and use solvent only in a well-ventilated area. Avoid contact with skin, eyes, and clothes, and DO NOT breathe vapors. DO NOT use near open flame or excessive heat. The solvent's flash point is 100 °F to 138 °F (38 °C to 59 °C). If you become dizzy while using cleaning solvent, immediately get fresh air and medical help. If solvent contacts eyes, immediately wash your eyes with water and get medical help.

- c. Use dry cleaning solvent (Appendix E, item 5) to clean grease fittings, lubrication points, and surrounding areas before lubricating.

**WARNING**

Wipe excess lubricant from the area of brakeshoe linings to avoid grease soaking the linings. If brakeshoe linings become soaked, replace them. Failure to follow this warning may cause brakes to malfunction, resulting in serious injury or death to personnel.

- d. After lubrication, wipe off excess oil or grease to prevent accumulation of foreign matter.

- e. Refer to FM 9-207 for lubrication instructions in cold weather.
- f. After operation in muddy, sandy, or dusty conditions, clean and inspect all lubrication points for fouled lubricants. Change lubricants as required.

**-LUBRICATION CHART-**

**TRAILER, CARGO: LIGHT, 2-WHEEL  
M1101 (2330-01-387-5443)**

**TRAILER, CARGO: HEAVY, 2-WHEEL  
M1102 (2330-01-387-5426)**

**CHASSIS, TRAILER: 2-WHEEL  
(2330-01-387-5424)**

Intervals (on-condition or hard time) and related man-hours are based on normal operation. The man-hour time specified is the time you need to do all services prescribed for a particular interval. Decrease the intervals if your lubricants are contaminated, or if you are operating equipment under adverse conditions, including longer-than-usual operating hours. The intervals may be extended during periods of low activity. If extended, adequate preservation precautions must be taken.

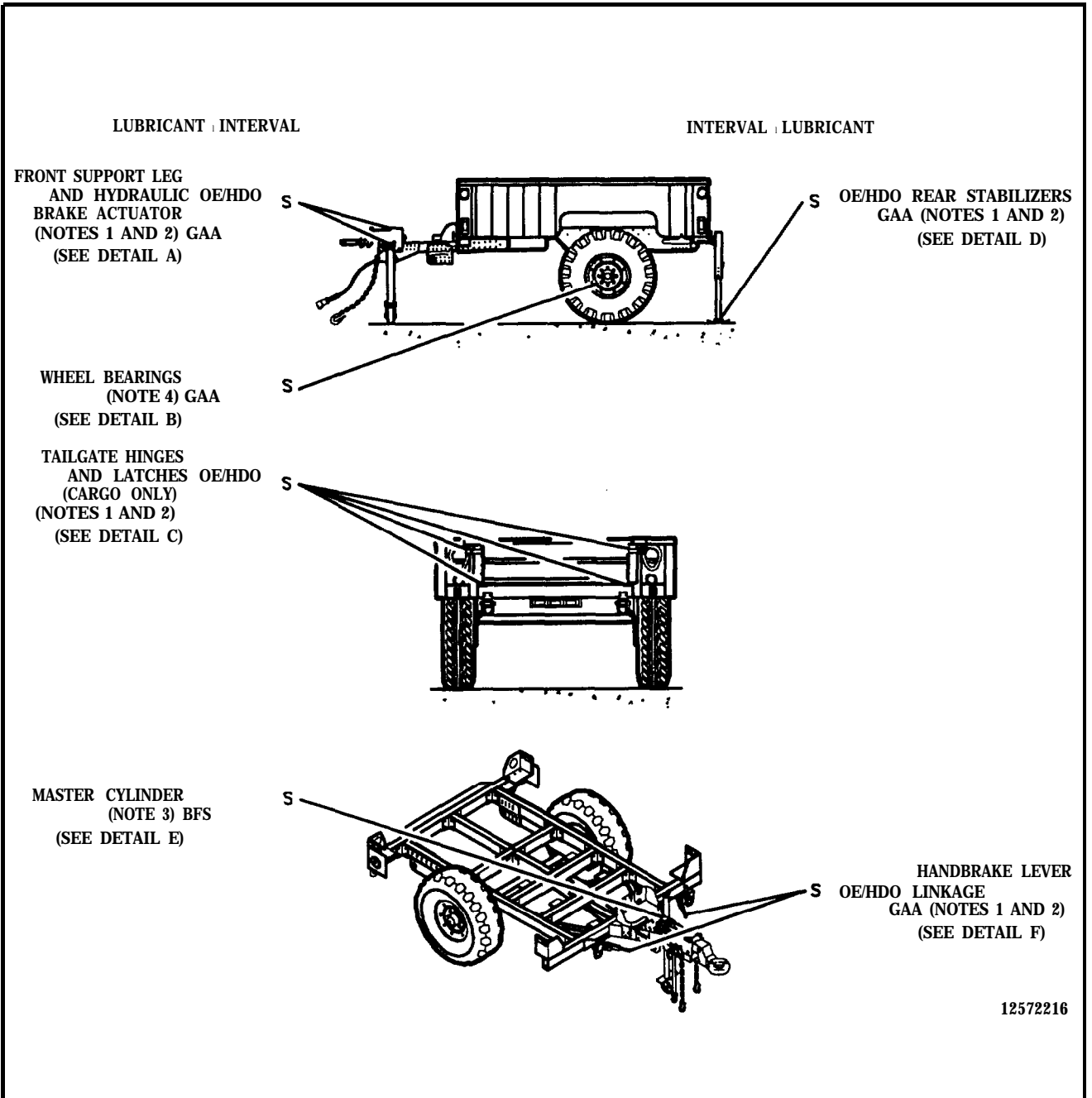
Dotted leader lines indicate lubrication is required on both sides of the equipment.

**WARNING**

Dry cleaning solvent, P-D-680, is toxic and flammable. Always wear protective goggles and gloves, and use solvent only in a well-ventilated area. Avoid contact with skin, eyes, and clothes, and DO NOT breathe vapors. DO NOT use near open flames or excessive heat. The solvent's flash point is 100°F to 138°F (38°C to 59°C). If you become dizzy while using cleaning solvent, immediately get fresh air and medical help. If solvent contacts eyes, immediately wash your eyes with water and get medical help.

Clean all fittings and area around lubrication points with dry cleaning solvent (Appendix E, item 5) before lubricating equipment. After lubrication, wipe off excess oil or grease to prevent accumulation of foreign matter.

The lowest level of maintenance authorized to lubricate a point is indicated in parentheses by use of the following: (C) Operator/Crew; or (O) Organizational maintenance.



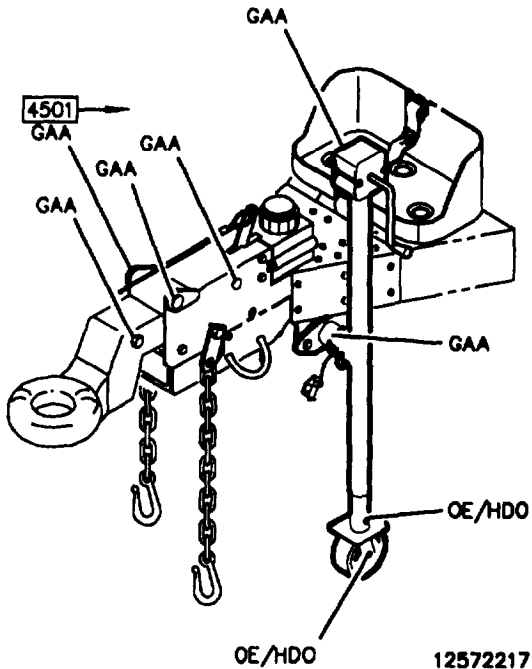
12572216

TOTAL MAN-HOURS*	
INTERVAL	MAN-HOUR
S	3.0

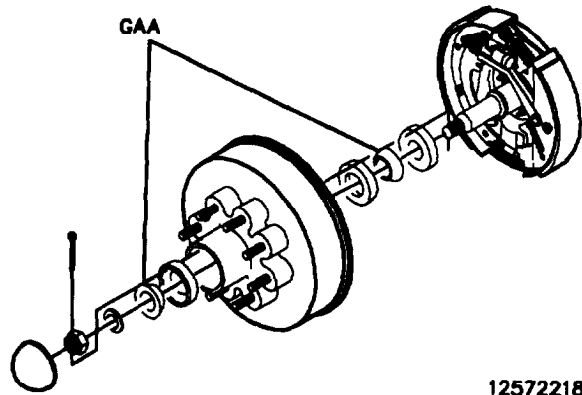
\* The man-hour time specified is the time you need to do all services prescribed for a particular interval.

-KEY-				
LUBRICANTS	EXPECTED TEMPERATURES			INTERVALS
	ABOVE +32 °F ABOVE 0 °C	+40 °F to -10 °F (+4 °C to -23 °C)	0 °F to -65 °F (-18 °C to -54 °C)	
OE/HDO (MIL-L-2104) Lubricating Oil, Internal Combustion Engine, Tactical Service	OE/HDO-30	OE/HDO-10	-	S- Semiannual
OEA (MIL-L-46167) Lubricating Oil, Internal Combustion Engine, Arctic	-	-	OEA	
BFS (MIL-B-46176) Brake Fluid Silicone, Automotive	All Temperatures			
GAA (MIL-G-10924) Grease, Automotive and Artillery	All Temperatures			

**A** FRONT SUPPORT LEG AND HYDRAULIC BRAKE ACTUATOR

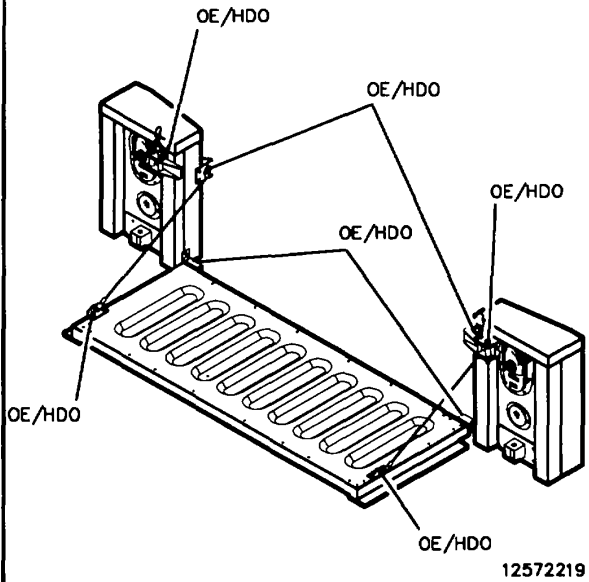


**B** WHEEL BEARINGS

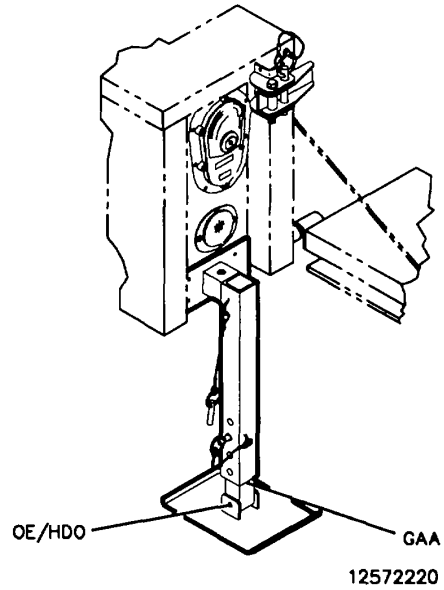




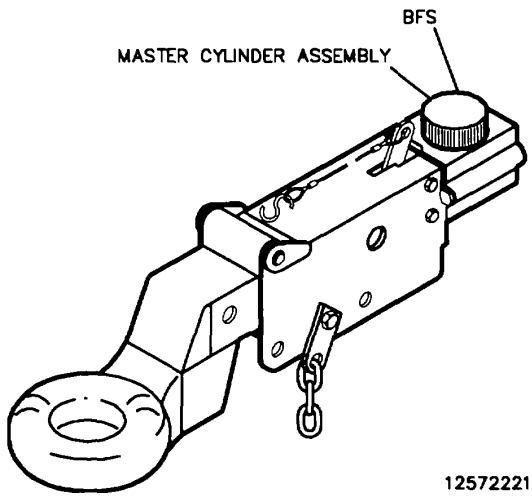
**Ⓒ TAILGATE HINGES AND LATCHES**  
(Cargo Only)



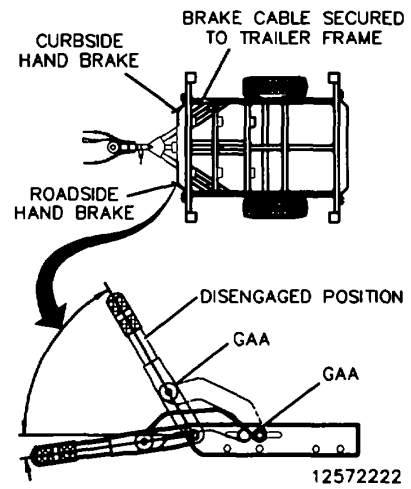
**Ⓓ REAR STABILIZERS**



**Ⓔ MASTER CYLINDER**



**Ⓕ HANDBRAKE LEVER LINKAGE**



**- NOTES -****WARNING**

Dry cleaning solvent, P-D-680, is toxic and flammable. Always wear protective goggles and gloves and use solvent only in a well-ventilated area. Avoid contact with skin, eyes, and clothes, and DO NOT breathe vapors. DO NOT use near open flame or excessive heat. The solvent's flash point is 100 °F to 138 °F (38 °C to 59 °C). If you become dizzy while using cleaning solvent, immediately get fresh air and medical help. If solvent contacts eyes, immediately wash your eyes with water and get medical help.

1. FOR OPERATION OF EQUIPMENT IN PROTRACTED COLD TEMPERATURES BELOW - 10 °F (- 23 °C). Remove lubricants prescribed in the KEY for temperatures above - 10 °F (- 23 °C). Clean parts with dry cleaning solvent (Appendix E, item 5). Lubricate with lubricants specified in the KEY for temperature 0 °F (- 18 °C) to - 65 °F (- 54 °C).
2. OIL CAN POINTS. Semiannually, or as required, lubricate handbrake levers and linkage, hydraulic brake actuator assembly, shock strut pivot and slide points, front support leg pivot points and hand-crank, rear stabilizer pivot points and latches, and tailgate hinges and latches.
3. MASTER CYLINDER. Semiannually, or as required, fill to within 1/8 inch (3 mm) of top edge of reservoir.
4. WHEEL BEARINGS. Semiannually, or as required, remove, clean, inspect, pack with GAA, and install. Refer to TM 9-214, Inspection, Care, and Maintenance of Antifriction Bearings.

## APPENDIX H TORQUE LIMITS


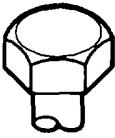
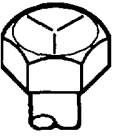

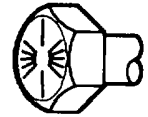
### H-1. SCOPE.

This appendix contains standard torque values in Table H-1 and M1101, M1102, and Trailer Chassis torque values in Table H-2 and provides general information for applying torque. Special torque values and tightening sequences are identified in the maintenance procedures for applicable components.

### H-2. GENERAL.

- (a) Always use the torque values listed in Table H-1 when the maintenance procedure does not give a specific torque value.
- (b) Unless otherwise indicated, standard torque tolerances are  $\pm 10\%$ .
- (c) Torque values listed are based on clean, dry threads. Reduce torque by 10% when engine oil is used as a lubricant. Reduce torque values by 20% if new plated capscrews are used.
- (d) Capscrews threaded into aluminum may require reductions in torque of 30% or more of Grade 5 capscrew torque. Capscrew threaded into aluminum must also attain two capscrew diameters of thread engagement.

Table H-1. Torque limits.

SAE Grade Number	1 or 2	5	6 or 7	8
Current Usage	Much Used	Much Used	Used at Times	Used at Times
Quality of Material	Indeterminate	Minimum Commercial	Medium Commercial	Best Commercial
Capscrew Head Markings				
Manufacturer's marks may vary				
Capscrew Body Size Inches - Thread	Torque lb-ft (N•m)	Torque lb-ft (N•m)	Torque lb-ft (N•m)	Torque lb-ft (N•m)
1/4      20	5      (7)	8      (11)	10     (14)	12     (16)
28	6      (8)	10     (14)		14     (19)
5/16      18	11     (15)	17     (23)	19     (26)	24     (33)
24	13     (18)	19     (26)		27     (37)
3/8        16	18     (24)	31     (42)	34     (46)	44     (60)
24	20     (27)	35     (47)		49     (66)
7/16      14	28     (38)	49     (66)	55     (75)	70     (95)
20	30     (41)	55     (75)		78     (106)
1/2        13	39     (53)	75     (102)	85     (115)	105    (142)
20	41     (56)	85     (115)		120    (163)
9/16      12	51     (69)	110    (149)	120    (163)	155    (210)
18	55     (75)	120    (163)		170    (231)
5/8        11	83     (113)	150    (203)	167    (226)	210    (285)
18	95     (129)	170    (231)		240    (325)
3/4        10	105    (142)	270    (366)	280    (380)	375    (508)
16	115    (156)	295    (400)		420    (569)
7/8        9	160    (217)	395    (536)	440    (597)	605    (820)
14	175    (237)	435    (590)		675    (915)
1           8	235    (319)	590    (800)	660    (895)	910    (1234)
14	250    (339)	660    (895)		990    (1342)

**H-3 M1101, M1102, AND TRAILER CHASSIS TORQUE VALUES.**

Table H-2 lists the torque values for the trailer components that require torque when being tightend.

**Table H-2. M1101, M1102, and Trailer Chassis Torque Values.**

Component Location	Torque (N•m) +/- 10%	
Axle Mounting Nuts	142 ft-lb	(192 N•m)
Shock Absorber Nuts	185 ft-lb	(251 N•m)
Backing Plate Nuts	50 ft-lb	(69 N•m)
Backing Plate Capscrews	168 ft-lb	(19 N•m)
Wheel Lug Nuts	100 ft-lb	(136 N•m)
Wheel Cylinder Capscrews	168 ft-lb	(19 N•m)
Hydraulic Actuator Assembly Nuts	105 ft-lb	(98 N•m)
Tarp bow Bracket Capscrews	6 ft-lb	(19 N•m)
Master Cylinder Assembly Nuts	30 ft-lb	(41 N•m)
Wheel Rim Locknuts	125 ft-lb	(170 N•m)
Shock Absorber Mount Nuts	72 ft-lb	(98 N•m)
Tailgate Hinge Capscrews	168 ft-lb	(19 N•m)
Service Brake Adjustment	220 ft-lb	(25 N•m)
Tire Air Valve Locknut	50 ft-lb	(6 N•m)
Air Valve Bore	30 ft-lb	(41 N•m)



## APPENDIX I

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**APPENDIX J  
MANUFACTURED ITEMS  
Section I. INTRODUCTION**

**J-1. SCOPE**

This appendix includes complete instructions for making items authorized to be manufactured or fabricated.

**J-2. GENERAL**

All bulk materials needed for manufacture of an item are listed by National Stock Number (NSN), part number, and Commercial and Government Entity Code (CAGEC) in the manufacturing instructions. All dimensions are given in inches.

**Section II. MANUFACTURING INSTRUCTIONS**

<b>Material Block</b>		
<b>Stock Size</b>	<b>Description</b>	<b>National Stock Number</b>
3.0 Inches Wide	Tape, Adhesive, Rubber	9330-01-345-0507

<b>Runflat Lube Package Tape</b>		
<b>Tape Part Number</b>	<b>Cut Length (Inches)</b>	<b>Manufactured From Part Number (CAGEC)</b>
5588618-13	13	353191(30076)

Instructions. Cut tape to length shown.

**J-1/(J-2 blank)**



## GLOSSARY

AM DF	Army Master Data File
BII	Basic Issue Items
BOI	Basis Of Issue
cm	Centimeter
C	Celsius
CAGE	Commercial And Government Entity
CAGEC	Commercial And Government Entity Code
COEI	Component Of End Items
CPC	Corrosion Prevention and Control
DS	Direct Support
EIR	Equipment Improvement Recommendation
F	Fahrenheit
GS	General Support
HMMWV	High Mobility Multipurpose Wheeled Vehicle
HMT	High Mobility Trailer
kg	Kilogram
km/h	Kilometers per Hour
kPa	Kilopascal
MAC	Maintenance Allocation Chart
mm	Millimeter
NIIN	National Item Identification Number
NSN	National Stock Number
Nom	Newton Meter
PMCS	Preventive Maintenance Checks and Services
ROD	Report Of Discrepancy
RPSTL	Repair Parts and Special Tools List
SMR	Source, Maintenance, and Recoverability
SOP	Standard Operating Procedures
TAMMS	The Army Maintenance Management System
TMDE	Test, Measurement and Diagnostic Equipment
TTER	Tool and Test Equipment Requirements
UOC	Usable On Code
USAIMMC	US Army Intelligence Material Management Center

**Glossary 1/(Glossary 2 blank)**



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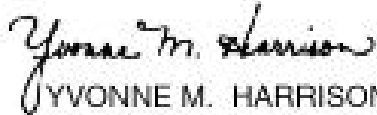
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By Order of the Secretary of the Army:



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*Administrative Assistant to the  
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TM 9-2330-392-14&P

DATE

01 OCT 95

TITLE

CARGO TRAILER M1101, M1102, TRAILER CHASSIS

ITEM	PAGE	PARA-	LINE	FIGURE NO.	TABLE
------	------	-------	------	------------	-------

RECOMMENDED CHANGES AND REASON

6	3-1			3	
---	-----	--	--	---	--

The part number listed for the washer is incorrect. P/N 138569 should read P/N 467598.

**SAMPLE**

\* Reference to line numbers within the paragraph or subparagraph.

TYPED NAME, GRADE OR TITLE

Johnny Wilson, E-5, MOTOR SGT

TELEPHONE EXCHANGE/AUTOVON,  
PLUS EXTENSION

DSN 867-7967

SIGNATURE



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 Rock Island, IL 61299-7630

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**PART I - ALL PUBLICATIONS (EXCEPT RPSTL AND SC/SM) AND BLANK FORMS**

PUBLICATION/FORM NUMBER

TM 9-2330-392-14&P

DATE

01 OCT 95

TITLE

CARGO TRAILER M1101, M1102, TRAILER CHASSIS

ITEM	PAGE	PARA-	LINE	FIGURE NO.	TABLE	RECOMMENDED CHANGES AND REASON

*\* Reference to line numbers within the paragraph or subparagraph.*

TYPED NAME, GRADE OR TITLE

TELEPHONE EXCHANGE/AUTOVON,  
PLUS EXTENSION

SIGNATURE





**RECOMMENDED CHANGES TO PUBLICATIONS AND  
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For use of this form, see AR 25-30; the proponent agency is ODISC4.

Use Part II (*reverse*) for Repair Parts and Special Tool Lists (RPSTL) and Supply Catalogs/Supply Manuals (SC/SM).

DATE

TO: (*Forward to proponent of publication or form*) (*Include ZIP Code*)  
AMSTA-LC-CI/TECH PUBS, TACOM-RI  
1 Rock Island Arsenal  
Rock Island, IL 61299-7630

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## Inch to Millimetre Conversions

### Inch to Millimetre

in	mm	in	mm
1	25.4	51	1 295.4
2	50.8	52	1 320.8
3	76.2	53	1 346.2
4	101.6	54	1 371.6
5	127.0	55	1 397.0
6	152.4	56	1 422.4
7	177.8	57	1 447.8
8	203.2	58	1 473.2
9	228.6	59	1 498.6
10	254.0	60	1 524.0
11	279.4	61	1 549.4
12	304.8	62	1 574.8
13	330.2	63	1 600.2
14	355.6	64	1 625.6
15	381.0	65	1 651.0
16	406.4	66	1 676.4
17	431.8	67	1 701.8
18	457.2	68	1 727.2
19	482.6	69	1 752.6
20	508.0	70	1 778.0
21	533.4	71	1 803.4
22	558.8	72	1 828.8
23	584.2	73	1 854.2
24	609.6	74	1 879.6
25	635.0	75	1 905.0
26	660.4	76	1 930.4
27	685.8	77	1 955.8
28	711.2	78	1 981.2
29	736.6	79	2 006.6
30	762.0	80	2 032.0
31	787.4	81	2 057.4
32	812.8	82	2 082.8
33	838.2	83	2 108.2
34	863.6	84	2 133.6
35	889.0	85	2 159.0
36	914.4	86	2 184.4
37	939.8	87	2 209.8
38	965.2	88	2 235.2
39	990.6	89	2 260.6
40	1 016.0	90	2 286.0
41	1 041.4	91	2 311.4
42	1 066.8	92	2 336.8
43	1 092.2	93	2 362.2
44	1 117.6	94	2 387.6
45	1 143.0	95	2 413.0
46	1 168.4	96	2 438.4
47	1 193.8	97	2 463.8
48	1 219.2	98	2 489.2
49	1 244.6	99	2 514.6
50	1 270.0	100	2 540.0

### 0.1 Inch to Millimetre

in	mm
0.1	2.54
0.2	5.08
0.3	7.62
0.4	10.16
0.5	12.70
0.6	15.24
0.7	17.78
0.8	20.32
0.9	22.86

### 0.01 Inch to Millimetre

in	mm
0.01	0.254
0.02	0.508
0.03	0.762
0.04	1.016
0.05	1.270
0.06	1.524
0.07	1.778
0.08	2.032
0.09	2.286

### 0.001 Inch to Millimetre

in	mm
0.001	0.254
0.002	0.508
0.003	0.762
0.004	1.016
0.005	1.270
0.006	1.524
0.007	1.778
0.008	2.032
0.009	2.286

## Common Conversion Factors

To Convert From	To	Multiply by
<b>Acceleration</b>		
foot per second squared	metre per second squared	$3.048\ 000 \times 10^{-1}$
inch per second squared	metre per second squared	$2.540\ 000 \times 10^{-2}$
standard acceleration of free fall	metre per second squared	9.806 650
<b>Area</b>		
circular mil	square metre	$5.067\ 075 \times 10^{-10}$
square foot	square metre	$9.290\ 304 \times 10^{-2}$
square inch	square metre	$6.451\ 600 \times 10^{-4}$
<b>Energy</b>		
BTU (international table)	joule	$1.055\ 056 \times 10^3$
calorie (thermo-chemical)	joule	4.184 000
foot-poundal	joule	$4.214\ 011 \times 10^{-2}$
kilowatt-hour	joule	$3.600\ 000 \times 10^6$
foot pound-force	joule	1.355 818
<b>Force</b>		
ounce-force	newton	$2.780\ 139 \times 10^{-1}$
pound-force	newton	4.448 222
poundal	newton	$1.382\ 550 \times 10^{-1}$
kilogram force	newton	9.806 650
<b>Length</b>		
foot	metre	$3.048\ 000 \times 10^{-1}$
inch	millimetre	$2.540\ 000 \times 10^{-1}$
mile	kilometres	1.609 344
<b>Light</b>		
footcandle	lux	$1.076\ 391 \times 10^1$
<b>Mass</b>		
ounce (avoirdupois)	kilogram	$2.834\ 952 \times 10^{-2}$
pound (avoirdupois)	kilogram	$4.535\ 924 \times 10^{-1}$
ounce (troy)	kilogram	$3.110\ 348 \times 10^{-2}$
<b>Power</b>		
BTU per hour (international table)	watt	$2.930\ 711 \times 10^{-1}$
horsepower (electric)	watt	$7.460\ 000 \times 10^2$
horsepower (550 foot pound-force per second)	watt	$7.456\ 999 \times 10^2$
<b>Pressure</b>		
pound-force per square inch (PSI)	pascal	$6.894\ 757 \times 10^3$
normal atmosphere	pascal	$1.013\ 25 \times 10^5$
<b>Temperature</b>		
degree Fahrenheit	degree Celsius	$(t_f - 32)/1.8$
<b>Torque</b>		
ounce-force inch	newton metre	$7.061\ 552 \times 10^{-3}$
pound-force foot	newton metre	1.355 818
<b>Velocity</b>		
foot per second	metre per second	$3.048\ 000 \times 10^{-1}$
mile per hour	metre per second	$4.470\ 400 \times 10^{-1}$
mile per hour	kilometre per hour	1.609 344
<b>Volume</b>		
cubic foot	cubic metre	$2.831\ 685 \times 10^{-2}$
cubic inch	cubic metre	$1.638\ 706 \times 10^{-5}$
gallon (U.S. liquid)	cubic metre	$3.785\ 412 \times 10^{-3}$
quart (U.S. liquid)	litre	$9.463\ 529 \times 10^{-1}$
gallon (U.K. liquid)	cubic metre	$4.546\ 092 \times 10^{-3}$

