TM 9-2330-294-14

TECHNICAL MANUAL

OPERATOR'S, ORGANIZATIONAL, DIRECT SUPPORT,

AND GENERAL SUPPORT MAINTENANCE MANUAL

SEMITRAILER, LOW BED, HEAVY

EQUIPMENT TRANSPORTER,

60 TON, M747

(NSN 2330-00-089-7265)

HEADQUARTERS, DEPARTMENT OF THE ARMY

MAY 1976

This copy is a reprint which includes current pages from Change 1 and 2.

WARNING

When stenciling, avoid excessive inhalation of vapors. All cleaning and stenciling procedures must be performed in well-ventilated room or outdoors. A $C0_2$ fire extinguisher must be positioned adjacent to the area where cleaning and stenciling procedures are performed. The use of diesel fuel oil, gasoline, or benzene for cleaning is prohibited.

OPERATOR'S DO'S

Ordinary deficiencies disclosed during preliminary inspection and servicing or during break-in period will be corrected by the using organization or a higher maintenance category.

Serious deficiencies, which appear to involve unsatisfactory design or material, will be reported in accordance with instructions in TM 38-750.

OPERATOR'S DON'TS

If tires are hot, do not reduce air pressure, but reduce road speed of towing vehicle.

Do not allow retractable clearance lights to extend beyond outermost limits of trailer when no payload is carried.

CAUTIONS

The gooseneck unloading roller must be in the travel position (secured inside gooseneck) before connecting or disconnecting semitrailer to towing vehicle and when vehicle is operated.

It is imperative that the approved practices and precautions be followed. A detailed study of TM's 21-300 and 21-305 is essential for use of this material under unusual conditions.

For operation of this vehicle under extreme cold conditions (0° and below), it is imperative that the approved practices and precautions be followed. TM 9-207 contains information which is specifically applicable to this vehicle as to all other vehicles. It must be considered an essential part of this technical manual, not merely an explanatory supplement to it.

This vehicle should not be operated with a load of 35 tons or greater if the air suspension pressure is less than 75 psi or greater than 95 psi.

Loading ramps, when in travel position, must be secured by the tiedown assemblies.

Prior to operating vehicle all precautions in paragraph 2-20 must be followed.

TM 9-2230-294-14
C2

CHANGE
NO. 2

HEADQUARTERS
DEPARTMENT OF THE ARMY
Washington, DC, *5 October 1984*

OPERATOR'S, ORGANIZATIONAL, DIRECT SUPPORT AND GENERAL SUPPORT MAINTENANCE MANUAL

SEMITRAILER, LOW-BED HEAVY EQUIPMENT TRANSPORTER, 60 TON, M747

(NSN 2330-00-089-7265)

TM 9-2330-294-14, 5 May 1976 is changed as follows:

1. Remove old pages and insert naw pages as indicated below.
2. New or changed material is indicated by a vertical bar in the margin of the page.
3. Added or revised illustrations ara indicated by a vertical bar adjacent to the illustration indentification number.

Remove Pages	*Insert Pages*	*Remove Pages*	*Insert Pages*
i and ii	i and ii	4-101 and 4-102	4-101 and 4-102
1-1 through 1-8	1-1 through 1-8	5-3 and 5-4	5-3 and 54
2-17 and 2-18	2-17 and 2-18	6-11 and 6-12	6-11 and 6-12
2-23 and 2-24	2-23 and 2-24	6-19 and 6-20	6-19 and 6-20
2-27 and 2-28	2-27 and 2-28	6-29	6-29 through 6-33/(6-34 blank)
3-6 through 3-6	3-5 through 3-6.2	A-1	A-1/(A-2 blank)
4-3 through 4-8	4-3 through 4-8	B-1 and B-2	8-1 and 8-2
4-45 and 4-46	4-45 and 4-46	E-7 and E-8	E-7 and E-6
4-91 and 4-92	4-91 and 4-92	Index 1 through Index 4	Index 1 through Index 4
4-97 and 4-98	4-97 end 4-98		

4. File this change sheet in front of the publication for referance purposes.

By Order of the Secretary of the Army:

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

Official:

ROBERT M. JOYCE
Major General, United States Army
The Adjutant General

Distribution:

To be distributed in accordance with DA Form 12-39, Operator Maintenance Requirements for Semi-trailer, Low Bed, Heavy Equipment Transporter, 60 Ton M747.

CHANGE
NO. 1

HEADQUARTERS
DEPARTMENT OF THE ARMY
Washington, DC, 3 January 1983

OPERATOR'S, ORGANIZATIONAL, DIRECT SUPPORT AND GENERAL SUPPORT MAINTENANCE MANUAL

SEMITRAILER, LOW-BED HEAVY EQUIPMENT TRANSPORTER, 60 TON, M747

(NSN 2330-00-089-7265)

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Remove pages	Insert pages
i and ii	i and ii
1-1 and 1-2	1-1 and 1-2
2-21 and 2-22	2-21 and 2-22
2-33 through 2-36	2-33 through 2-36
4-11 and 4-12	4-11 and 4-12
4-45 and 4-46	4-45 through 4-46
None	4-46.1/(4-46.2 Blank)
4-113/(4-114 Blank)	4-113/(4-114 Blank)
Index 5 and Index 6	Index 5 and Index 6

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E. C. MEYER
General, United States Army
Chief of Staff

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No. 9-2330-294-14

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SEMITRAILER, LOW-B ED HEAVY EQUIPMENT TRANSPORTER, 60 TON, M747

(NSN 2330-00-089-7265)

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***This manual supersedes TM 9-2330-294-14. 15 April 1970. including all changes.**

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CHAPTER 1

INTRODUCTION

Section I. GENERAL

1-1. Scope

This manual is for your use in operating and maintaining the semitrailer, low bed, heavy equipment transporter, 60 ton, M747.

1-2. Maintenance Forms and Records

Maintenance forms and records that you are required to use as explained in TM 38-750.

1-3. Reporting of Errors

You can help improve this manual. If you find any mistakes or if you know of a way to improve the procedures, please let us know. Mail your letter, DA Form 2028 (Recommended Changes to Publications and Blank Forms) direct to: US Army Tank-Automotive Command, ATTN: DRSTA-MB, Warren, MI 48090. A reply will be furnished to you.

1-4. Destruction of Army Materiel to Prevent Enemy Use

Refer to TM 750-244-6, Procedures for Destruction of Tank-Automotive Equipment.

1-5. Administrative Storage

Refer to TM 740-90-1, Administrative Storage.

Section II. DESCRIPTION AND DATA

1-6 Description

a. General. The semitrailer, low bed, heavy equipment transporter, 60 ton, M747 (figs. 1-1 and 1-2) is a 16-wheel vehicle designed for use as a heavy equipment transporter operating on highways and secondary roads. The semitrailer has off road capability to bypass road obstructions, to reach vehicle collecting points, and to reach areas for concealment. The M746 and M911 truck tractors are the prime movers for the M747 semitrailer. The semitrailer can also be towed by an M123E2, 10-ton tractor. Basically, the semitrailer consists of a frame assembly, with a gooseneck at the front and flat bed at the rear, loading and unloading ramps, walking beam suspension system, air suspension system, air brake system, a 24-volt electrical system, and a series of rollers used to guide winch cables during loading and unloading operations.

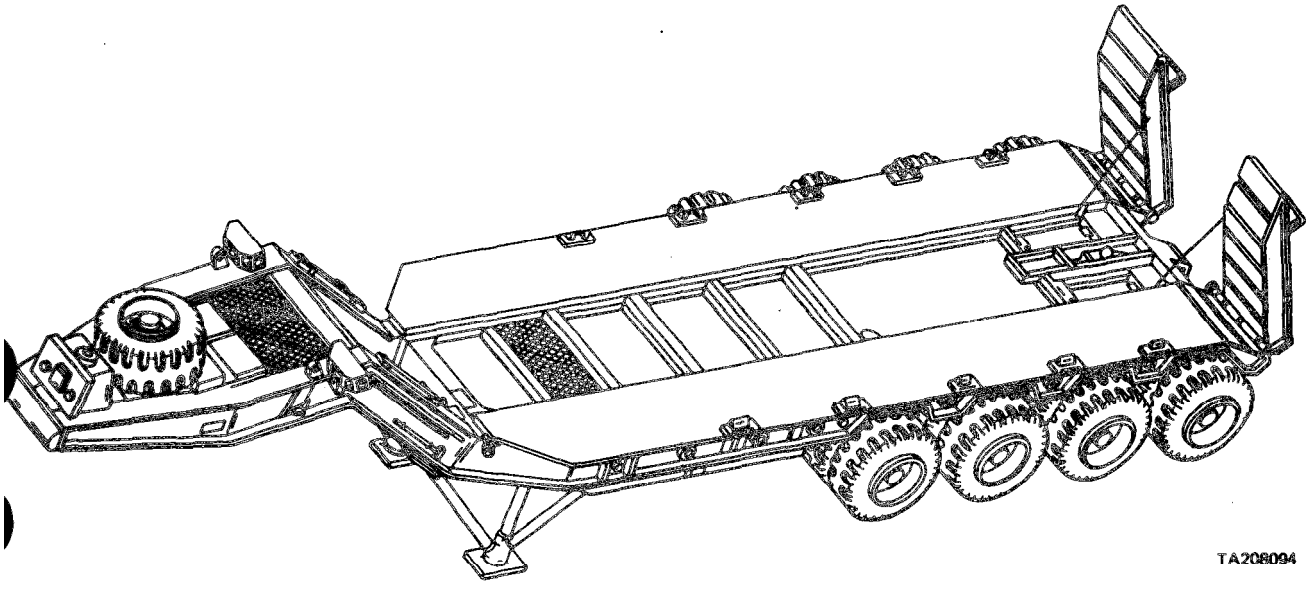


Figure 1-1. Semitrailer, low-bed, heavy-equipment transporter, 60-ton, M747 (left front view).

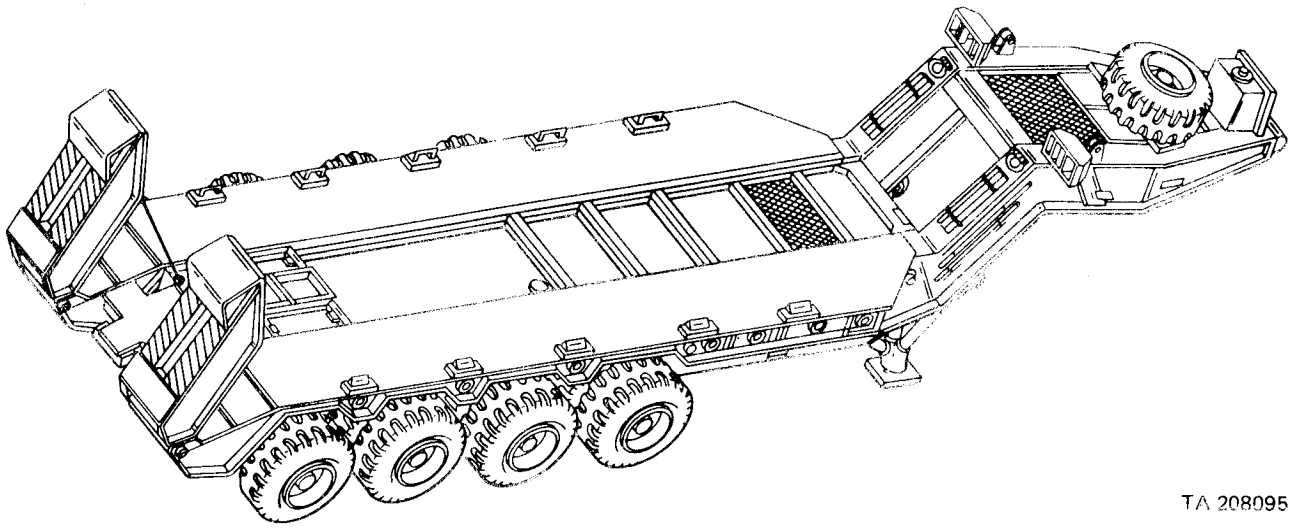


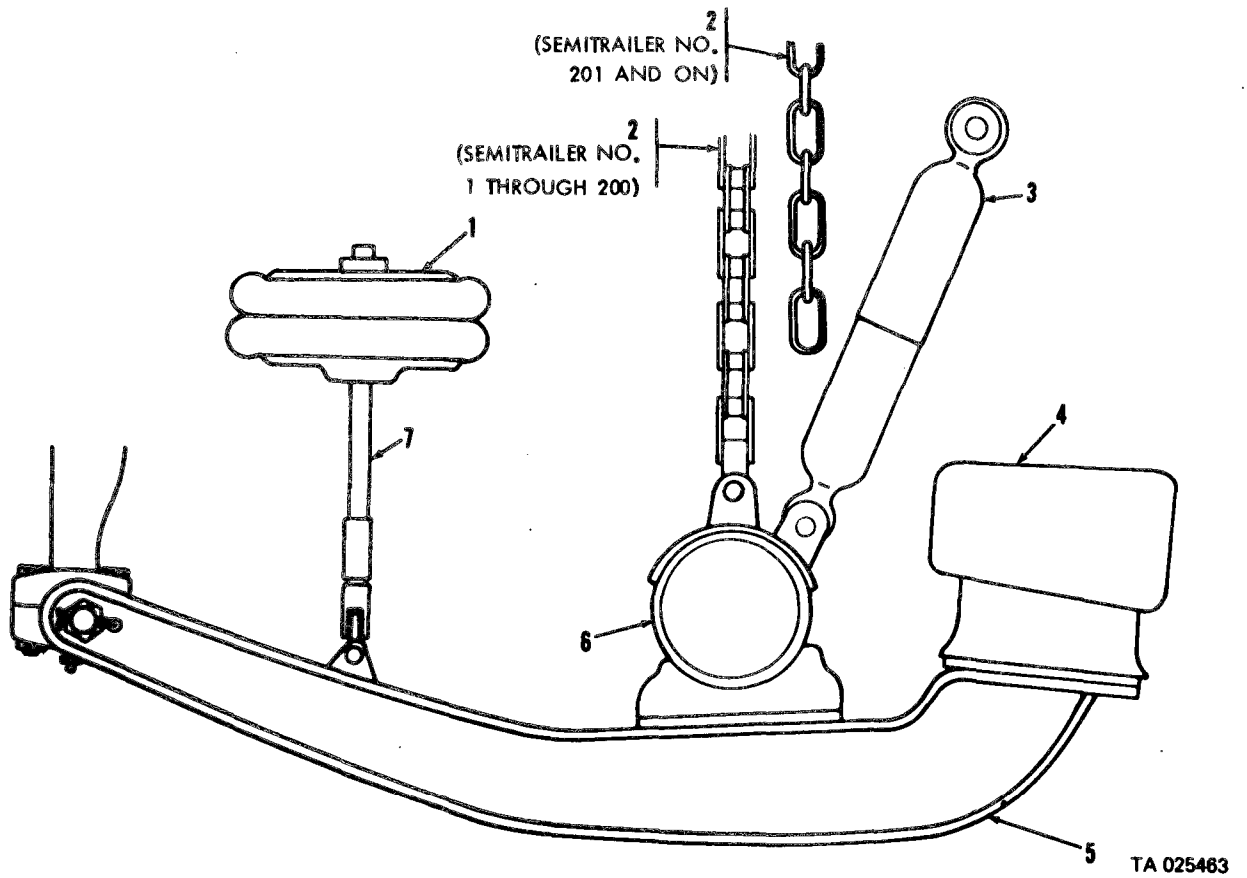
Figure 1-2. Semitrailer, low-bed, heavy-equipment transporter, 60-ton, M747 (right rear view **).**

b. Electrical System. The semitrailer is equipped with two composite taillights and 9 clearance marker lights. Each composite taillight is composed of a taillight, stoplight, turn light and marker light. In addition. one utility outlet is provided at the fear of semitrailers No. 201 and on for use with towing vehicles having floodlights or other auxiliary electrical equipment. Semitrailers no. 1 through 200 are equipped with 3 utility outlets, one on each side by the clearance lights and one at the rear of the vehicle. A military standard, 12-pin, intervehicular electrical receptacle located at the front of the semitrailer provides an electrical power inlet from the towing vehicle. Two circuit breakers are located at the front of the gooseneck: one provides protection for the rightside taillights and clearance marker lights and the other for the left side lights.

c. *Suspension System.* The two front axles utilize an unsprung walking-beam suspension system. The two rear axles use an air-suspension trailing-arm arrangement. They may be raised approximately three inches by a pneumatic lift system if the semitrailer is not loaded. This provides better maneuverability when turning corners, reduces tire wear when driving without a payload, and aids in changing wheels. The rear axles can also be raised while the semitrailer is loaded with lighter weight loads. The air suspension system (fig. 1.-3) performs two functions. It exerts a downward pressure to provide normal suspension system operation, and it equalizes axle loadings. During normal operation, the air suspension springs (4) exert downward pressure as required on the equalizer beam (5). This provides a smooth, even ride for the axles (6). T amount of air pressure exerted by the air suspensi springs can be adjusted to provide the varying pressure required for different payload weights. The air suspension system control lever is located midway on the left side of the semitrailer and has three settings to permit pressure selection for light, half or full loads, and a fourth pressure setting for lifting the rear axles. The rebound stop chain (2) limits the downward movement of the axle. The shock absorber (3) performs a normal shock. absorbing function. When the axles are being raised, air pressure supplied to the axle lift (1) causes the lift assembly to expand upward. This expansion raises the axle lift rod (7) which in turn raises the equalizer beam and axle. Refer to figure 4-59 and 4-60 for a schematic representation of the suspension air system.

NOTE

The four semitrailer axles are herein designated as number 5, 6, 7 and 8 in accord with the concept of the towing vehicle. semitrailer as a road unit. However, number of towing vehicle axles may vary.



1 Axle lift
2 Chain, axle rebound stop
3 Absorber, shock
4 Spring, air suspension
5 Beam equalizer
6 Axle
7 Rod, axle lift

Figure *1-3. Air suspension system.*

CAUTION

Retread tires are not authorized for use on the M747 semitrailer.

d. Wheels and Tires. **The 16 dual-mounted, low-profile tires are size 15 x 19.5, 14-ply, and should be inflated to 65 psi. One spare tire and wheel assembly is carried on the front top of the semitrailer gooseneck.**

e. Brakes and Air System.

(1) *General.* When the semitrailer brake system is connected to the towing vehicle air brake system, the towing vehicle air brake system controls the brakes on both vehicles. The system will hold the semitrailer loaded with rated payload on a 30-percent grade with the towing vehicle and semitrailer brakes applied. The self-adjusting, internal-expanding brakes are of a dual-actuating, wedge-type brake shoe design. Each wheel has two identical brake **shoes and plunger housing assemblies. An air chamber is mounted to each plunger housing assembly. A fail-safe unit is mounted on one air chamber on each axle end.**

(2) Service *brakes.* The service brakes are applied when air pressure is routed to the two air chambers on each wheel. The service brakes are normally activated by a sequence of manual and automatic operations. When the towing vehicle operator applies the brake treadle in the cab, an air pressure signal is transmitted through the semitrailer service air line to the emergency relay valves. The emergency relay valves then operate automatically to route reservoir air through the service brake air supply lines to the air chambers to apply the brakes. The service brakes will also apply automatically if the semitrailer breaks away from the towing vehicle, if a severe leak occurs in the emergency air line, or when the towing vehicle parking brake is set. When the service brakes are applied as a result of a severe leak or uncoupling from the towing vehicle, the brakes can be released by pushing the service brake release knob on the semitrailer. Refer to figures 4-27 and 4-28 for a schematic representation of the brake air system lines and components.

(3) *Fail-safe brake unit.* Each axle end is

equipped with one fail-safe brake unit. If reservoir air pressure falls below 65 psi these units will automatically apply the brakes. After being activated, these units must be reset by pushing the fail-safe brake release knob to restore air pressure (see (9) below) or by manually compressing the unit power springs before the semitrailer can be operated again.

CAUTION

Semitrailer should not be operated in normal service with the fail-safe unit springs in the manually compressed position as the semitrailer will have no emergency brakes if the reservoir air line fails.

(4) *Service air line.* The service air line extends from the air hose coupling tagged "service" at the front of the semitrailer gooseneck along the chassis frame rail to the emergency relay valves. It transmits actuating air pressure from the towing vehicle, which then causes the emergency relay valves to activate the service brakes. Refer to figures 4-27 and 4-28 for a schematic representation of the brake air system lines and components.

(5) *Emergency air line.* The emergency air line extends from the air hose coupling tagged "emergency" at the front of the semitrailer along the chassis frame rail through the normally opened service brake release control valve to the two emergency relay valves. The emergency air line is the main air supply line on the semitrailer and transmits compressed air from the towing vehicle through the emergency relay valves to the reservoirs.

(6) *Reservoir air line.* The reservoir air line extends from the emergency relay valves to the air tanks and continues through the normally opened fail-safe brake release control valve to the fail-safe units. Captive air from the reservoir air line applies the service brakes when the emergency air line becomes uncoupled from the towing vehicle, or when application of the towing vehicle parking brake exhausts air from the emergency air line. Air from the reservoir air line holds off the fail-safe power springs until air pressure drops below 65 psi.

(7) *Emergency relay valves.* Two emergency relay valves are mounted on brackets secured to frame crossmembers between the axles. These valves speed brake action by releasing air from the air reservoirs to the brake air chambers when a pressure signal is transmitted via the service line from the towing vehicle. The valves also automatically apply the service brakes if the semitrailer breaks away from the towing vehicle or if a severe leak occurs in the emergency air line.

(8) Air tank reservoirs are located between semitrailer crossmembers. Semitrailers No. 1 through 200 have three main reservoirs and no. 201 and on have two main reservoirs to collect emergency line air. These reservoirs are connected to emergency relay valves to provide air to speed application of the brakes. A smaller, forward air tank reservoir normally receives emergency air line air which is released only upon activating the fail-safe release control to unlock the fail-safe units. The smaller reservoir is independently rechargeable and can supply temporary air pressure to unlock the fail-safe units if the main air system becomes depressurized.

(9) Brake release controls. Controls for releasing both the service brakes and the fail-safe units are provided for brief maneuvering of the semitrailer when it is detached from the towing vehicle or when the air system is disabled.

f. *Landing Gear.* The landing gear is located at the front of the semitrailer. It consists of two leg assemblies, one at each corner. It is secured in the stowed (raised) position during travel. When the semitrailer is parked, the landing gear is lowered to the ground to provide support for the front of the semitrailer. The landing gear can be set in four position to accommdate various terrain.

g. Loading and Unloading Ramps, The adjustable loading and unloading ramps, located at the rear of the semitrailer, can easily be raised and lowered by two men. When in the travel (raised) position each ramp is secured in position by a tiedown chain assembly. Each ramp is adjustable and can be moved to two positions on semitrailers No. 1 through 200 and three positions on semitrailers No. 201 and on, to accommodate different width payload vehicles. A hinged flap on each ramp serves as a bridge between the main frame platform and the ramp when in the loading position.

h. *Rollers, Snatch Block, Shackles and Tiedown Equipment.* Four roller assemblies and a snatch block are provided on the semitrailer for use during loading and unloading (winching) operations. A second snatch block, eight chain assemblies, six load binders, ½-inch rope and 16 shackles are included in the vehicle basic issue items for use during winching operations and for payload tiedown. See paragraph 2-21 for using this equipment. Permanent installation tiedowm eyes and shackles used for lifting the semitrailer, for tiedown during vehicle shipment, and for cargo tiedown, are found at the rear, along the sides and at the front of the semitrailer bed.

i. *Planks and Curbing.* Two removable planks are mounted cm the gooseneck of the semitrailer as bumpers for the payload vehicles. These planks are removed when loading two M113 or M114 payload vehicles. Eight removable curbs are installed on top

of the semitrailer bed, four on each side. The curbs prevent the payload from shifting sideways and provide guidance when loading tracked vehicles. Multiple curbing locations permit adjusting the curbs for the various track widths found on M1, M2, M3, M44, M48, M51, M60, M88, M103, M113, M114 and M551 vehicles (fig. 2-13).

j. Stowage Provisions. Basic issue items (appendix B) are stowed on various parts of the frame. Stowage provisions include a stowage box on the gooseneck, a stowage compartment with cover at the front of the semitrailer bed, and several open stowage compartments, one on the gooseneck, one behind the covered bed compartment, and two at the rear of the semitrailer. Various attaching devices are also provided on the frame for specific items.

k. Data and Identification Plates. The applicable data and identification plates are illustrated in figure 1-4 and described below.

(1) *Semitrailer data plate.* The semitrailer data plate is located on the gooseneck left side member and includes the name and national stock number of the semitrailer, the manufacturer's name and serial number, and weight and dimension data.

(2) *Suspension control instruction plate.* The suspension control instruction plate is located on the semitrailer left side and contains operating instructions for the air suspension control valve.

(3) *Service brake release control identification plate.* The service brake release control identification plate is located on the semitrailer left side forward of the suspension control valve.

(4) *Fad-safe brake release control identification plate.* The fail-safe brake release control identification plate is located on the semitrailer left side forward of the service brake release control.

(5) *Air tank fill identification plate.* The air tank identification plate is located on the semitrailer left side between the brake release controls.

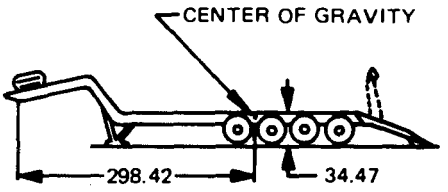
SEMI-TRAILER, LOW BED, HEAVY EQUIPMENT TRANSPORTER 52.5 TON XM747

FSN 2330-089-7265 SER NO	MFR SER NO. MFD BY	MO & YR OF MFR CONTRACT NO	INSPECTED

WEIGHT & DIMENSION DATA

OVERALL LG	51300 IN.	REDUCIBLE WIDTH	120.00 IN.
OVERALL W	13700 IN.	SHIPPING CUBAGE	4595.9 CU FT.
OVERALL HGT	11300 IN.	SHIPPING WEIGHT	31,100 LBS

WEIGHT	EMPTY	LOADED
PAYLOAD		105,000
AXLES 5 THRU 8	6,300/AXLE	23,853/AXLE
KING PIN LOAD	5,576	40,364
TOTAL LBS	30,776	135,776



SEMITRAILER NO. 1 THROUGH 200

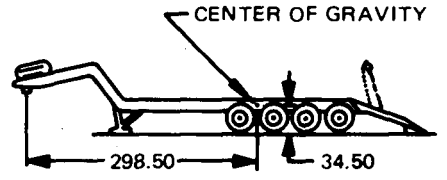
SEMI-TRAILER, LOW BED, HEAVY EQUIPMENT TRANSPORTER, 60 TON, M747

NSN2330-00-089-7265	MFD BY	
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WEIGHT AND DIMENSION DATA — TECHNICAL MANUALS TM9-2330-294-14-24P

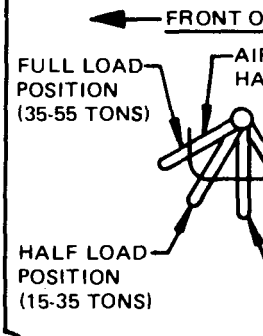
OVERALL LG	510 IN	REDUCIBLE WIDTH	120.00 IN
OVERALL WD	137 IN	SHIPPING CUBAGE	4323.5 CU FT
OVERALL HGT	107 IN	SHIPPING WEIGHT	32,000 LB

WEIGHT	EMPTY	LOADED
PAYLOAD		105,000
AXLES 5 THRU 8	6,500/AXLE	24,000/AXLE
KING PIN LOAD	6,000	41,000
TOTAL PIN LOAD	32,000	137,000



SEMITRAILER NO. 201 AND ON

TRAILER AIR SUSPENSION CONTROL OPERATION



FULLY LOADED TRAILER MAY BE OPERATED WITH HANDLE IN LIFT POSTION ONLY IF NECESSARY TO NEGOTIATE A TIGHT TURN AT SPEEDS BELOW 5 MPH. AFTER COMPLETING TURN, RETURN HANDLE TO CORRECT POSTION FOR CARGO LOAD.

WARNING

EXTENDED OPERATION OF LOADED TRAILER WITH AXLES 7 & 8 RAISED AND AT SPEEDS EXCEEDING 5 MPH CAN RESULT IN DAMAGE TO SUSPENSION, WHEELS AND TIRES OF FORWARD TRAILER AXLES

FAIL SAFE BRAKE RELEASE SYSTEM
AIR TANK FILL

SERVICE BRAKE RELEASE CONTROL

CAUTION

DO NOT OPERATE UNLESS FAMILIAR WITH AIR BRAKE SYSTEM OPERATION (SEE OPERATOR'S MANUAL)

FAIL SAFE BRAKE RELEASE CONTROL

CAUTION

DO NOT OPERATE UNLESS FAMILIAR WITH AIR BRAKE SYSTEM OPERATION (SEE OPERATOR'S MANUAL)

TA222158

Figure 1-4. Data and identification plates.

1.7. Tabulated Data

Dimensions.

	Vehicle 1-200	*Vehicle* 201 and on
Length	513 inches	510 inches
Rear bumper to centerline of kingpin	492 inches	469 inches
Width, maximum	137 inches	137 inches
Width, reducible	120 inches	120 inches
Height, overall	105 inches	107 inches
Height, upper fifth wheel	61 inches	63 inches
Bed height	44 inches	44 inches
Bed width	120 inches	120 inches
Bed length	317 inches	317 inches
Distance between axles	48 inches	46 inches
Tread	102 inches	102 inches
Ground clearance, minimum	9 inches	9 inches
Ground clearance, under frame	27 inches	27 inches
Angle of departure	27 degrees	27 degrees

b. Weights.

Curb:		
Kingpin	5,576 pounds	6,000 pounda
Axles (each)	6,300 pounds	6,500 pounds
Semitrailer	30,776 pounds	32,000 pounds
Loaded (52½ ton payload):		
Kingpin	40,364 pounds	41,000 pounds
Landing gear	67,700 pounds	68,000 pounds
Axles (each)	23,853 pounds	24,000 pounds
Semitrailer	135,776 pounds	137,000 pounds
Payload, maximum	60 ton	60 ton

c. *Axles.*

Number	4	4
Capacity (each)	25,000 pounds	25,000 pounds

d. Suspension.

Front two axles	Walking beam	Walking beam
Rear two axles	Trailing arm with air springs and air lift	Trailing arm with air springs and air lift

e. Brakes.

Service	Eight, air actuated 15 in. x 7 in.	Eight, air actuated 15 in. x 7 in.
Failsafe/parking	Eight, spring actuated	Eight, spring actuated

f. Wheels and Tires.

Number	16	16
Wheel size	15 deg. drop center 12.25 x 19.5 or 11.75 x 19.5	15 deg. drop center 12.25 x 19.5 or 11.75 x 19.5
Tire size	15 x 19.5/14 ply	15 x 19.5/14 ply
Inflation pressure	65 psi	65 psi

g. Fording Depth. (Dependent on Prime Mover)

h. 90 Degree Intersection Capability.

M746	28.8 ft wall to wall	28,8 ft wall to wall
Ml23E2	35 ft wall to wall	35 ft wall to wall

i. Bridge Classification.

M747/M746 (caution crossing)	Class 60	Class 60
M747/M123E2	Class 79	class 79
M747/M911	Class 82	Class 82

143. Expendable and Consumable Supplies

The items listed below in table 1-1 are not issued with the semitrailer, but are available through the Depot Stock System upon normal requisition. These consumable supplies and materials are essential for the operation and maintenance of your semitrailer.

Table 1-1. Expendable and Consumable Operating Supplies

NATIONAL STOCK NUMBER	DESCRIPTION Part Number & FSCM	U M
9150-00-190-0905	GREASE, AUTOMOTIVE AND ARTILLERY: Lubricating (GAA) MIL-G-10924 (81349) 5-lb can	ea
9150-00-141-6770	GREASE, BALL AND ROLLER BEARING: Lubricating (BRH) MIL-G-25013 (81349) 1-lb can	ea
9150-00-231-2361	LUBRICATING OIL, GENERAL PURPOSE, Medium preservative (PL-MED) MIL-L-3150 (81349) 1-qt can	ea
9150-00-263-3490	LUBRICATING OIL, GENERAL PURPOSE, Low Temperature (PL-S) MIL-L-7870 (81349) 1-qt can	ea
8030-00-889-3534	TAPE, ANTI SEIZE: Polytetrafluoroethy lene (PTFE) with dispenser MIL-T-27730 (81349) Size I - ¼ in. wide	ea
8030-00-889-3534	TAPE, ANTISEIZE: Polytetrafluoroethylene (PTFE) with dispenser MIL-T-27730 (81349) Size I I - ½ in. wide	ea

CHAPTER 2

OPERATING INSTRUCTIONS

WARNING
If equipment fails to operate, refer to troubleshooting procedures in chapter 3.

Section I. OPERATING PROCEDURES

2-1. General

This section furnishes operating information pertaining to the various systems and controls which comprise the semitrailer. Refer to figure 2-1 for the location of controls and components.

The semitrailer, a low bed, heavy equipment transporter, 60 ton, M747, is capable of operating on highways, secondary and unimproved roads that are in varying states of repair. It is capable of operating to a limited extent off-roads in order to reach collecting points to load and unload vehicles of cargo and to reach areas for concealment when required.

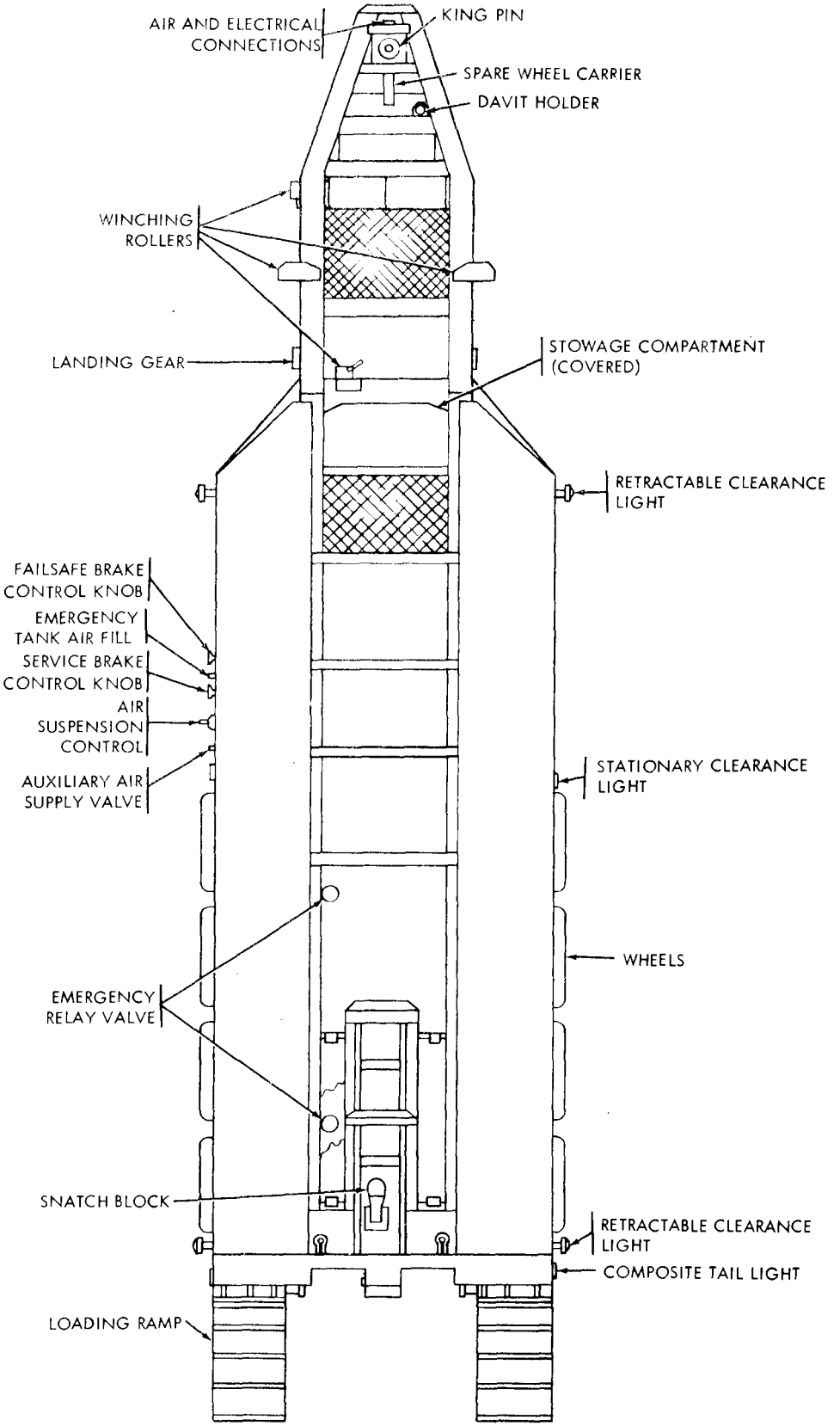


Figure 2-1. Controls and components location

2-2. Service Brakes

The service brakes are actuatd by the semitrailer air system which is maintained at 90-120 psi air pressure by the towing vehicle. The controls are located in, and are a part of, the towing vehicle. The service brakes are activated when the towing vehicle brake pedal is depressed and an air pressure signal is transmitted through the semitrailer service air line to the emergency relay valves. The emergency relay valves then operate automatically to route reservoir air through the service brake air supply lines to the air chambers to apply the brakes. Conversely, when the towing vehicle brake pedal is released, the pressure signal ceases and the emergency relay valves vent air pressure and release the brakes. The semitrailer service brakes will also activate automatically if the semitrailer breaks away from the towing vehicle. When the towing vehicle parking brake is applied, the semitrailer emergency air line is exhausted and the emergency relay valves route captive air to apply the service brakes. When the service brakes are applied as a result of a severe leak or uncoupling from the towing vehicle, the brakes can be released by pushing the service brake release knob on the semitrailer left side. Refer to paragraph 2-4 for operating instructions of the brake release controls.

2-3. Fail-safe Brake Unit

(fig. 2-2)

One brake air chamber on each axle end is equipped with a fail-safe unit. These units will automatically apply the semitrailer brakes in the event air pressure in the reservoir air line falls below 65 psi. When air pressure has been restored to 65 psi or more the fail-safe units will automatically unlock and release the brakes. When the semitrailer is parked and uncoupled, the fail-safe units will gradually become applied as the air pressure will eventually drop below 65 psi which is required to hold back the fail-safe springs. When parked, or when the air system is disabled, the semitrailer can be moved without charging the whole air system by utilizing air from the fail-safe release air tank (para 2-4b). If the fail-safe release system is inoperative, the fail-safe unit springs must be compressed manually, as follows, before moving the semitrailer:

WARNING

Block wheels to prevent semitrailer from rolling free when fail-safe brakes are released.

CAUTION

Stripping of the release bolt threads may result if the release bolt is forced beyond its natural strep when being turned in either direction.

Turn release bolt approximately 25 full turns clockwise on each fail-safe unit. The 25 full turns should provide sufficient travel of the spring loaded piston within the fail-safe unit to release the brake, After moving semitrailer, block wheels and release the fail-safe power springs by turning release bolt approximately 25 full turns counterclockwise on each fail-safe unit. The 25 full turns should provide sufficient travel of the springs loaded piston within the fail-safe unit to apply the brake. Refer to figure 4-25 and 4-26 for a schematic representation of the fail-safe unit.

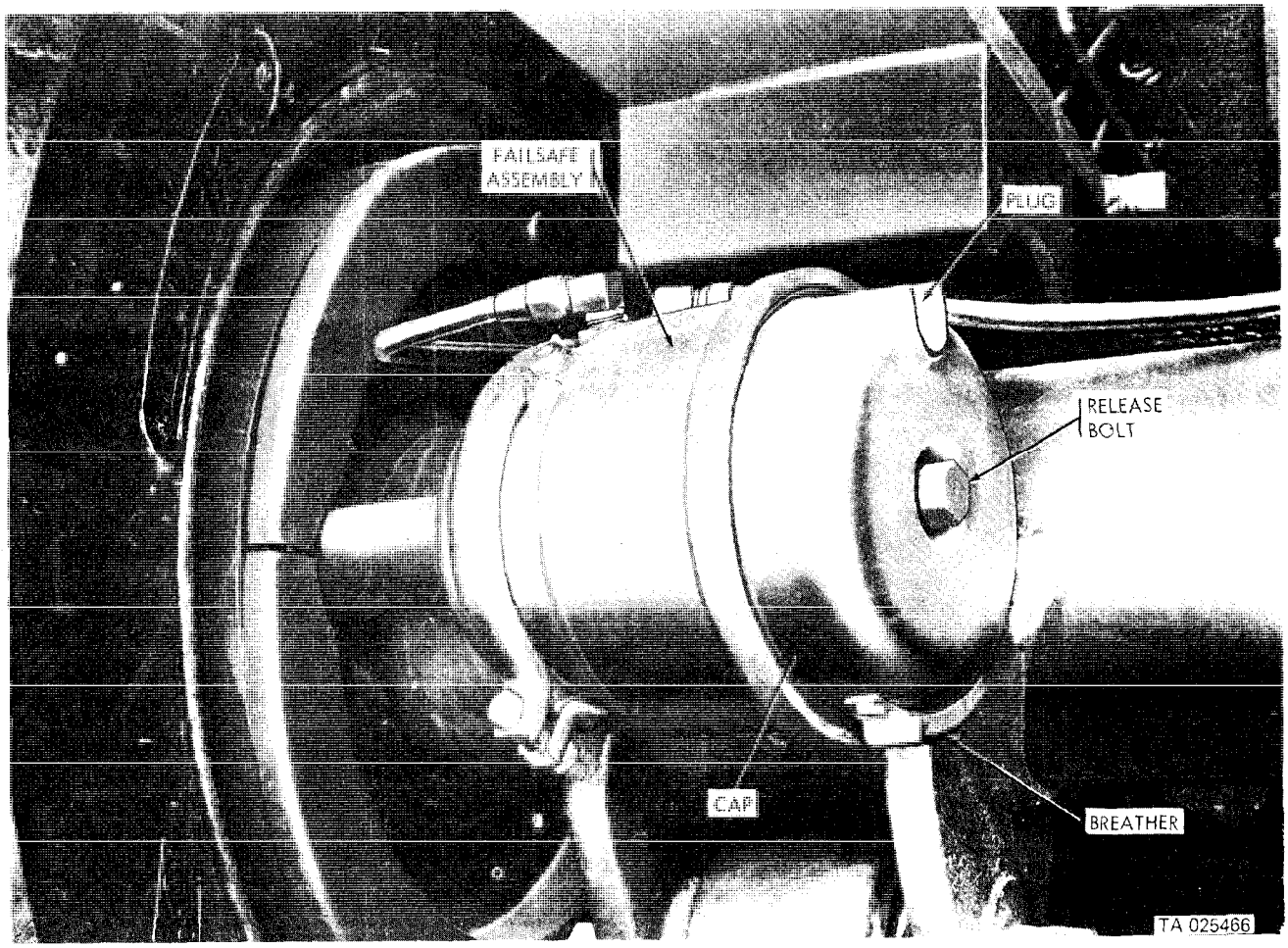


Figure 2-2. Fail-safe chamber assembly.

2-4. Brake Release Controls

(fig. 2-3)

a. Service Brake Release Control Knob. The service brake release control knob is located on the frame left side member forward of the air suspension controls and is identified by an identification plate. When the semitrailer becomes detached from the towing vehicle or when a severe air leak occurs in the emergency air line, the service brakes are automatically applied by captive air from the reservoirs, Pushing in the service brake release control knob isolates the semitrailer emergency air line and uses stored air to pressurize the emergency port of the emergency relay valve and thus releases the service brakes, This knob is automatically reset to the "out" position when the air pressure is restored to the emergency air line.

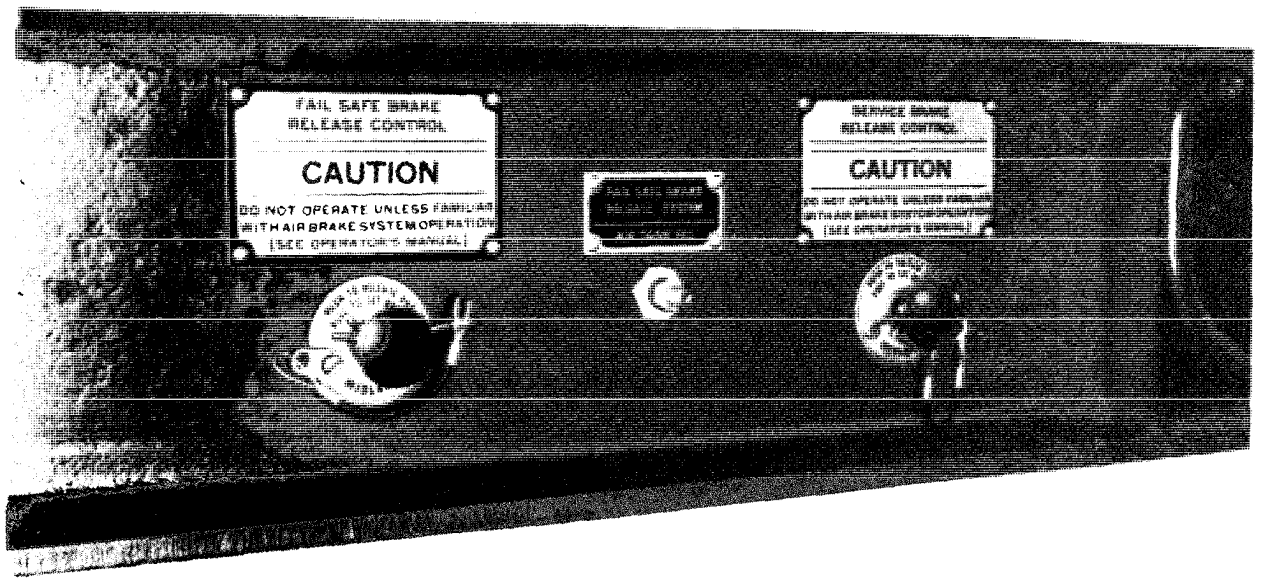


Figure 2-3. Brake release controls and tank air fill.

b. Fail-safe Brake Release Control Knob. The fail-safe brake release control knob is located on the frame left side member forward of the service brake release knob and is identified by an identification plate. Pushing in the fail-safe release control knob routes air from the fail-safe release system reservoir to the fail-safe units and forces the power springa to retract from the applied position. This allows the semitrailer to be moved in an emergency when the hake air system is disabled. When captive air pressure is insufficient to unlock the fail-safe units, the release system reservoir can be independently recharged by any outside compressed air source. The air reservoir fill valve is adjacent to the failsafe release control knob. This knob is automatically reset to the “out” position when the brake air system is pressurized.

2-5. Electrical System

All semitrailer lights and the utility outlet(s) are operated by switches in the cab of the towing vehicle. A standard military, 12-pin, intervehicular electrical receptacle (fig. 2-4) located at the front of the semitrailer provides an electrical power inlet from the towing vehicle. Two circuit breakers (fig. 2-4) are located at the front of the gooseneck; one provides protection for the right-side taillights and clearance lights and the other for the left-side taillights and clearance lights. The semitrailer is equipped with two composite taillights (fig. 2-5) and nine clearance lights (figs. 2-6 and 2-7). Each composite taillight is composed of a taillight, stoplight, turn light and marker light. One utility outlet (fig. 2-5) is provided at the rear of semitrailers No. 201 and on for use with the M746 towing vehicle floodlight or other auxiliary electrical equipment. Semitrailers No. 1 through 200 are equipped with three utility outlets, one on each side by the clearance lights and one at the rear of the vehicle. A threaded cover, secured by a chain, protects the outlet(s) when not in use. The towing vehicle light switch must ‘be set in “SER DRIVE” position to activate the utility outlet(s). Semitrailers No. 1 through 200 have a low pressure warning switch, located on the main beam at the left rear of the semitrailer, it is electrically operated and is activated by a low pressure condition in the semi-trailer air system. The low pressure warning is indicated only in the cab of the M746 towing vehicle when towing semitrailers No. 1 through 200.

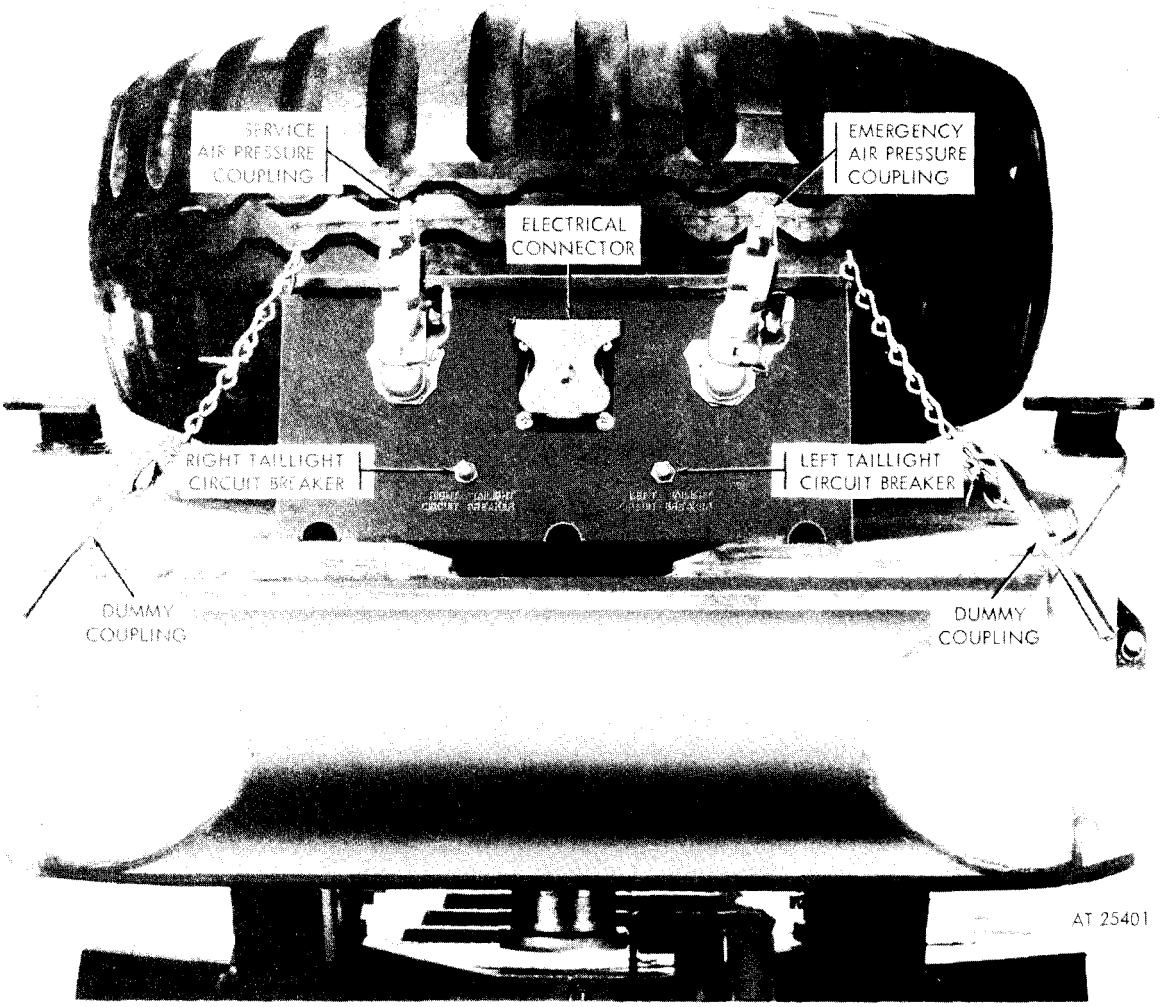


Figure 2-4. Intervehicular connections and circuit breakers.

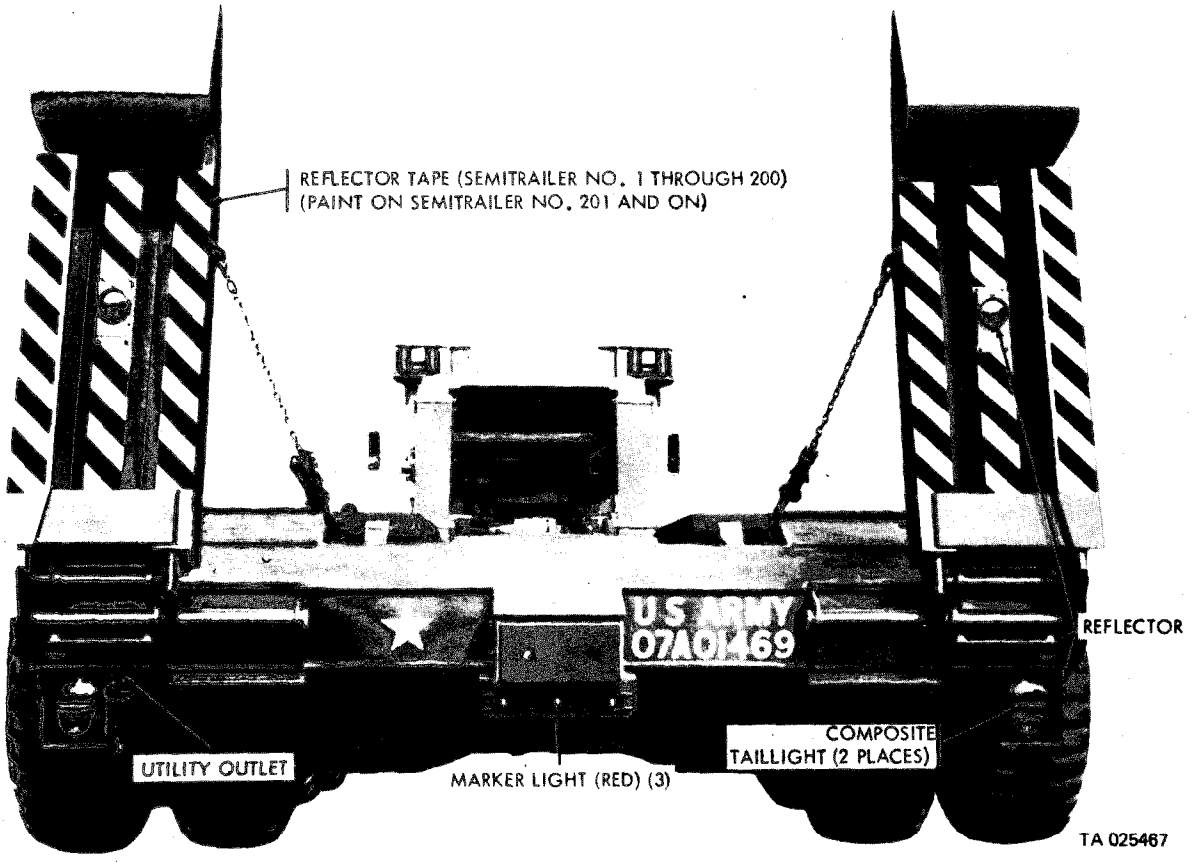


Figure 2-5. Rear electrical components.

2-6. Retractable Clearance Lights
(fig. 2-6 and 2-7)

The semitrailer is equipped with four clearance lights mounted on the front and rear of each side. They are adjustable and should be extended for any payload wider than the bed of the vehicle. To extend clearance light, loosen the clamp lever, pull the clearance light to the desired position, and lock by tightening the clamp lever. The clearance lights should not be in an extended position when the semitrailer is towed empty.

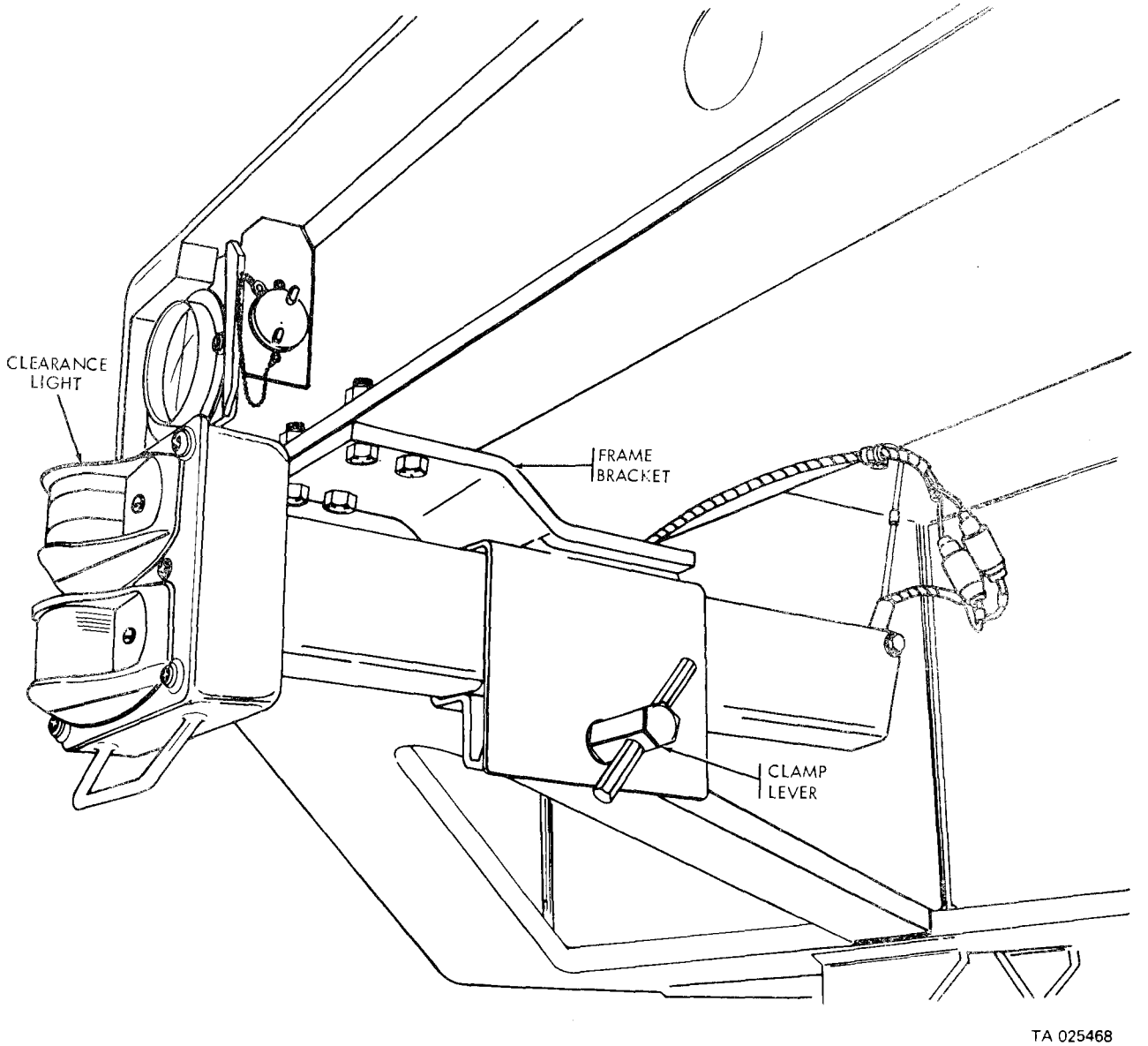


Figure 2-6. Retractable clearance light assembly (semitrailer No. 1 through 200).

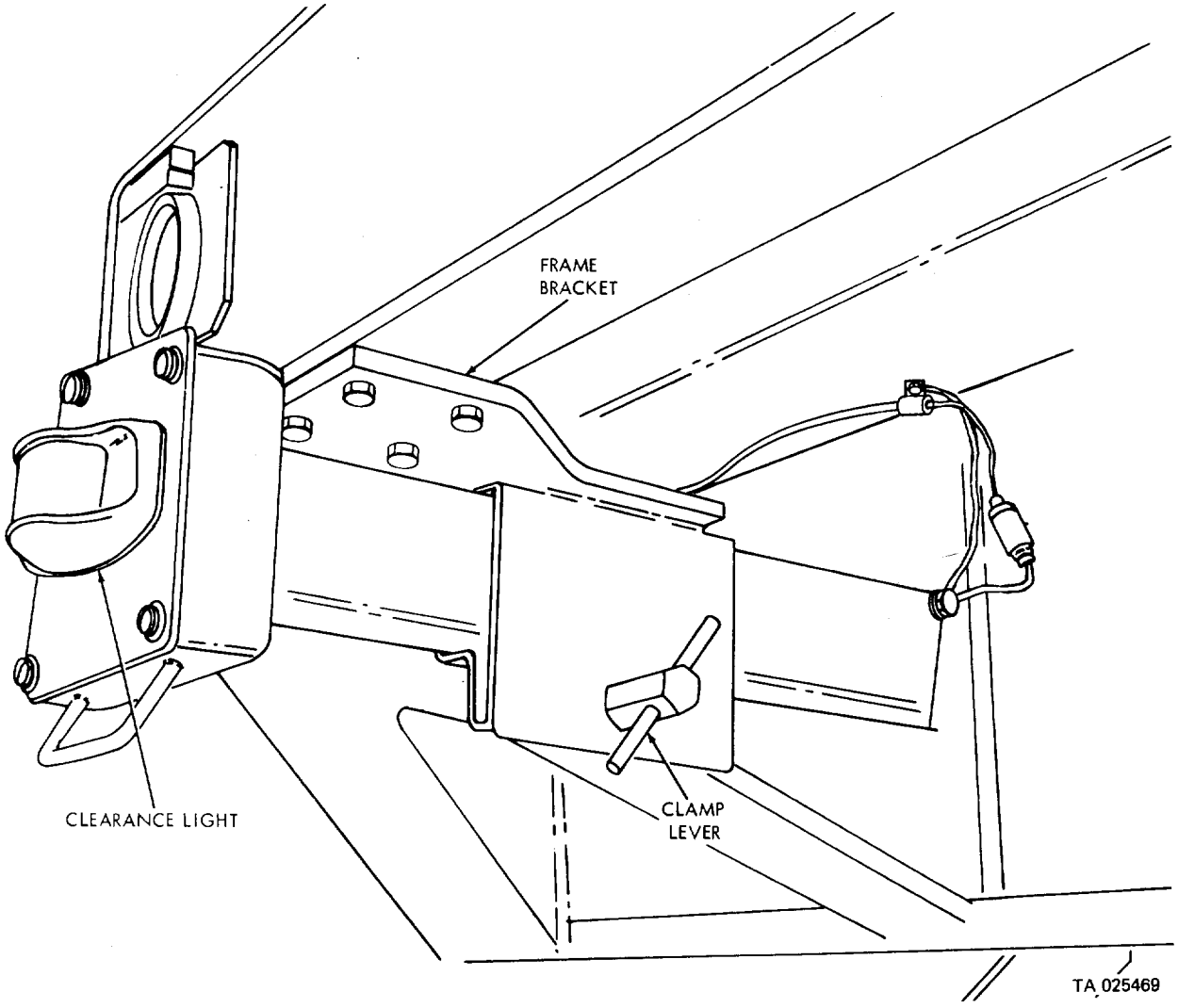


Figure 2-7. Retractable clearance light assembly (semitrailer No. 201 and on).

2-7. Air Suspension Controls
(fig. 2-8)

a. General. The air suspension controls consist of a suspension air control valve and four shutoff valves. The suspension control valve is used to equalize axle loads by providing proper pressure to the air springs for the payload being transported, to raise the two rear axles for better maneuverability or wheel changing, and to raise the two front axles if the semitrailer is without payload to aid wheel changing. The four shutoff valves isolate components of the suspension system and are used to shut off the air supply in the event of air leakage or component damage.

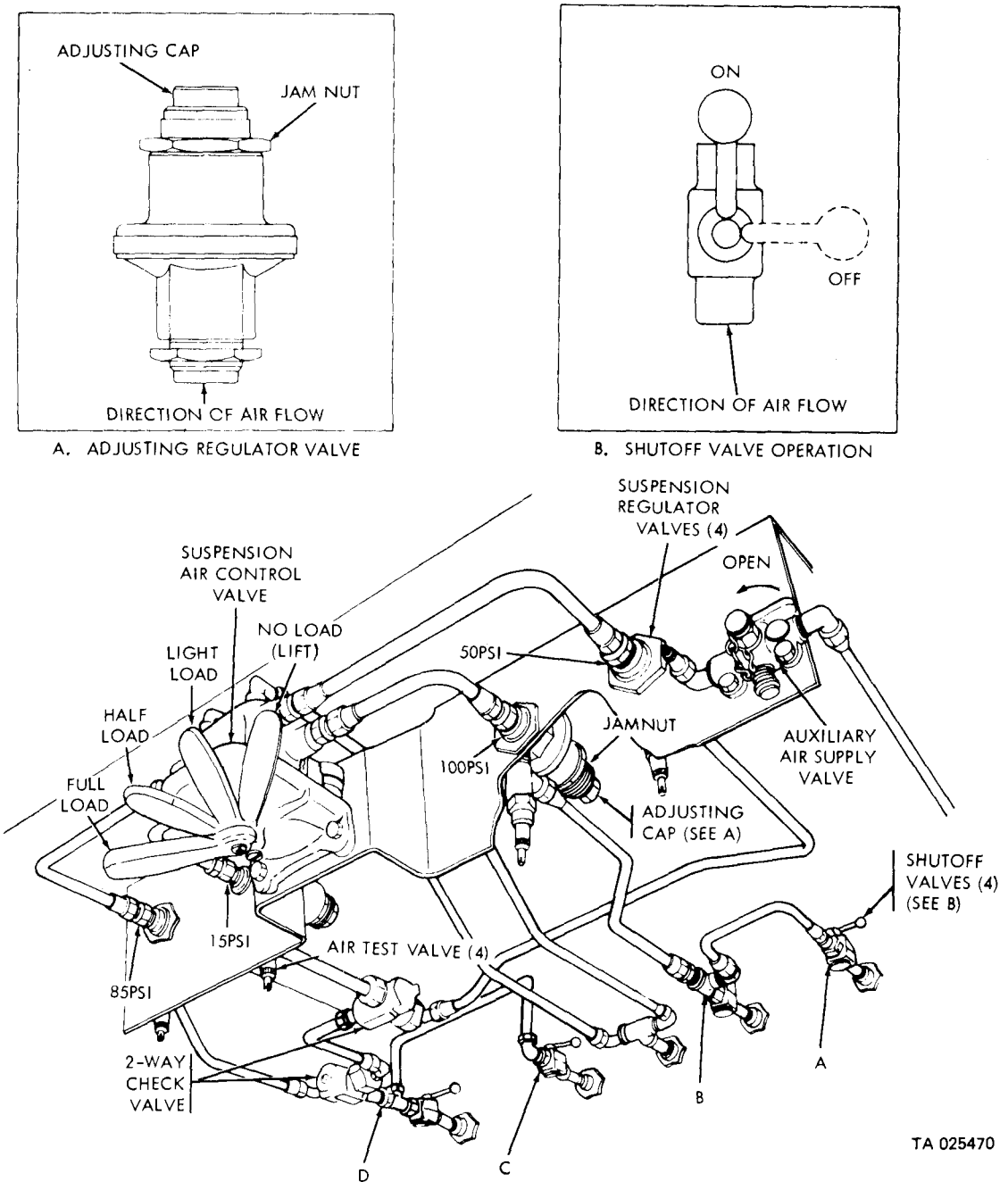


Figure 2-8. Air suspension controls and air supply value.

b. Suspension Air control valve. The air control valve regulates the amount of air pressure in the air springs and activates the air axle lift assembly to raise the two rear axles. Before towing semitrailer, set air control valve handle in proper position for payload being transported. The air control valve handle is located on the left side and has 4 operating positions.

(1) *Full load.* The full load position is used for transporting heavy payloads of 35 to 60 tons and provides 85 psi air pressure in the air springs. This position is also used to lift the two front axles when the semitrailer is empty.

(2) *Half load.* The half load position is used for transporting medium payloads of 15 to 35 tons and provides 50 psi air pressure in the air springs.

(3) *Light load.* The light load position is used

for transporting light payloads up to 15 tons and provides 15 psi air pressure in the air springs.

(4) No *load (lift)*. The no load position is used when it is desired to operate semitrailer with axles 7 and 8 raised and provides 100 psi air pressure in the air axle lift assemblies. The semitrailer may be operated fully loaded with handle in this position only if necessary to negotiate a tight turn at speeds below 5 mph. After completing turn, return handle to correct position for payload.

c. *Air Shutoff Valves.* There are four air control shutoff valves for the air suspension system. These valves enable the operator to cut off the air to a specific air suspension system component in case of damage. The valves control air to the following components: axle 7 air lift (A); axle 8 air lift (B); axle 7 air springs (C); axle 8 air springs (D).

CAUTION

If air suspension supply valve(s) are shut off because of air leak or damage, reduce speed and avoid operating vehicle on terrain that will add excessive strain to the suspension system. Do not exceed 10 mph. Have malfunction remedied by maintenance personnel at the earliest opportunity.

If air leak or damage occurs at any of these components, shut off air supply to affected component by moving pertinent shutoff valve handle clockwise.

2-8. Auxiliary Air Supply Valve

(fig. 2-8)

The auxiliary air supply valve is located on the left side of the semitrailer to the rear of the suspension air control valve. It provides a source of compressed air to inflate tires or for powering auxiliary air equipment. Air system pressure can be checked at the auxiliary air supply valve using the towing vehicle tire air pressure gage. The air system reservoirs can be pressurized through the auxiliary air supply valve.

2-9. Brake Air Line Couplings

(fig. 2-4)

The “SERVICE” and “EMERGENCY” air line couplings are mounted on the top front of the gooseneck. These couplings are used to supply air pressure from the towing vehicle and to control the semitrailer brakes. After the dummy couplings are removed, the intervehicular air hoses from the towing vehicle may be connected to the semitrailer couplings. When semitrailer air line couplings are not in use, the two dummy couplings should be connected to prevent entry of foreign matter into the air system.

2-10. Air Reservoir Drain Cocks

(fig. 2-9)

A drain cock is located on the underside of each air reservoir. The drain cocks are accessible from underneath the semitrailer and should be opened to drain the system of air prior to repairing air system components. Each drain cock should be opened daily before and at the end of semitrailer operation to drain accumulated water from the reservoirs. Be certain each drain cock is securely closed after draining accumulated water. Semitrailers No. 1 through 200 are equipped with four drain cocks and semitrailers No. 201 and on have three,

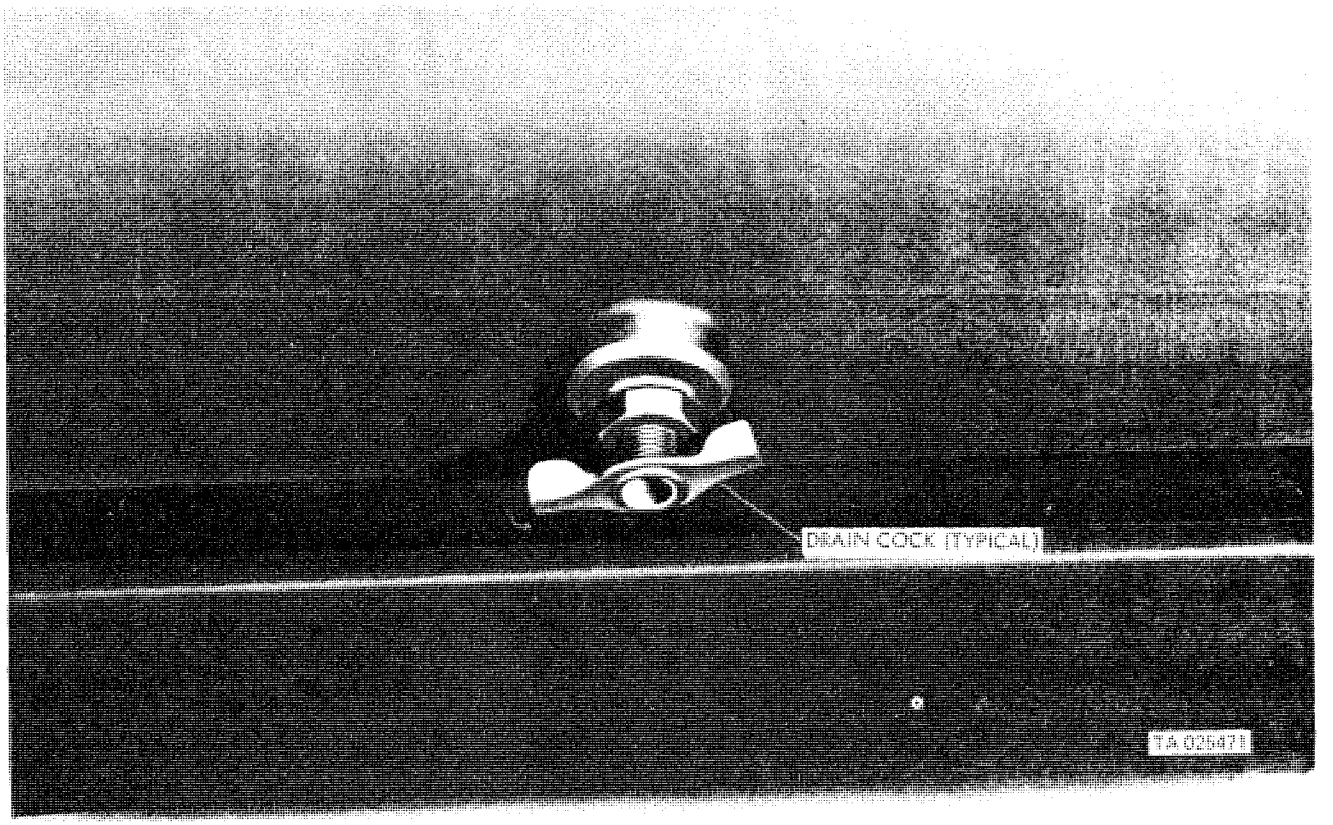


Figure 2-9. Air reservoir drain cock.

2-11. **Landing Gear Assembly** (fig. 2-10)

Two manually operated landing gear assemblies are provided to support the front of the semitrailer (either with or without a payload) when it is parked. Each landing gear can be adjusted in a retracted travel position or in four extended positions to accommodate various terrain. To raise or lower the landing gear assembly, remove lock pin and retaining pin; position the landing gear in the desired position; install retaining pin through bracket and landing gear and secure retaining pin with quick release lock pin.

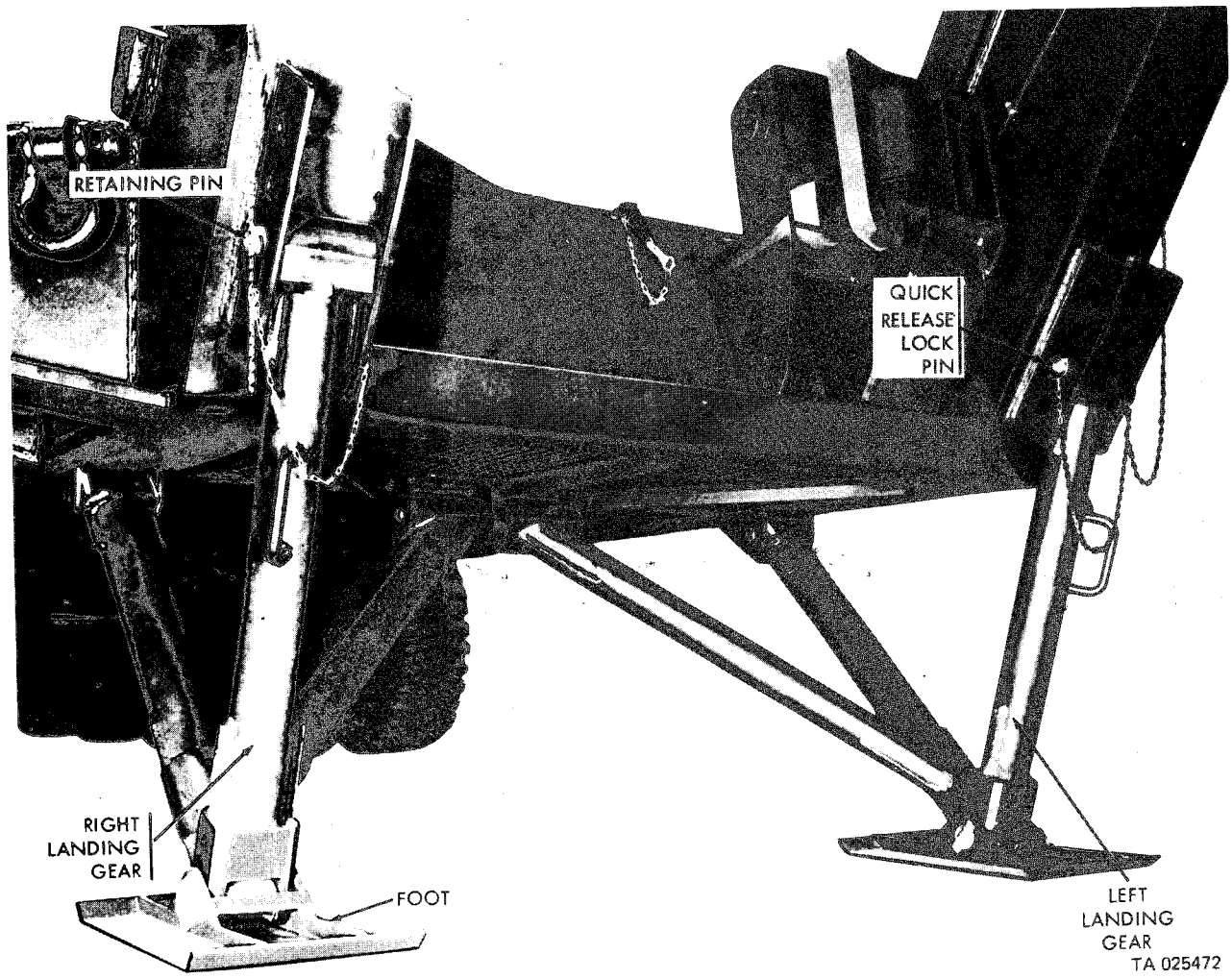


Figure 2-10. Landing gear assembly.

2-12. Loading and Unloading *Ramps*

(fig. 2-11 and 2-12)

a. General. The two adjustable loading and unloading ramps are located at the rear of the semitrailer and can be raised and lowered by two men. When in the travel (raised) position each ramp is secured in position by a tiedown chain assembly. Each ramp is laterally adjustable and can be moved to three positions (two positions on semitrailers No. 1 through 200) to accommodate different width payload vehicles. A hinged flap on each ramp serves as a bridge between the main frame platform and the ramp in the loading position.

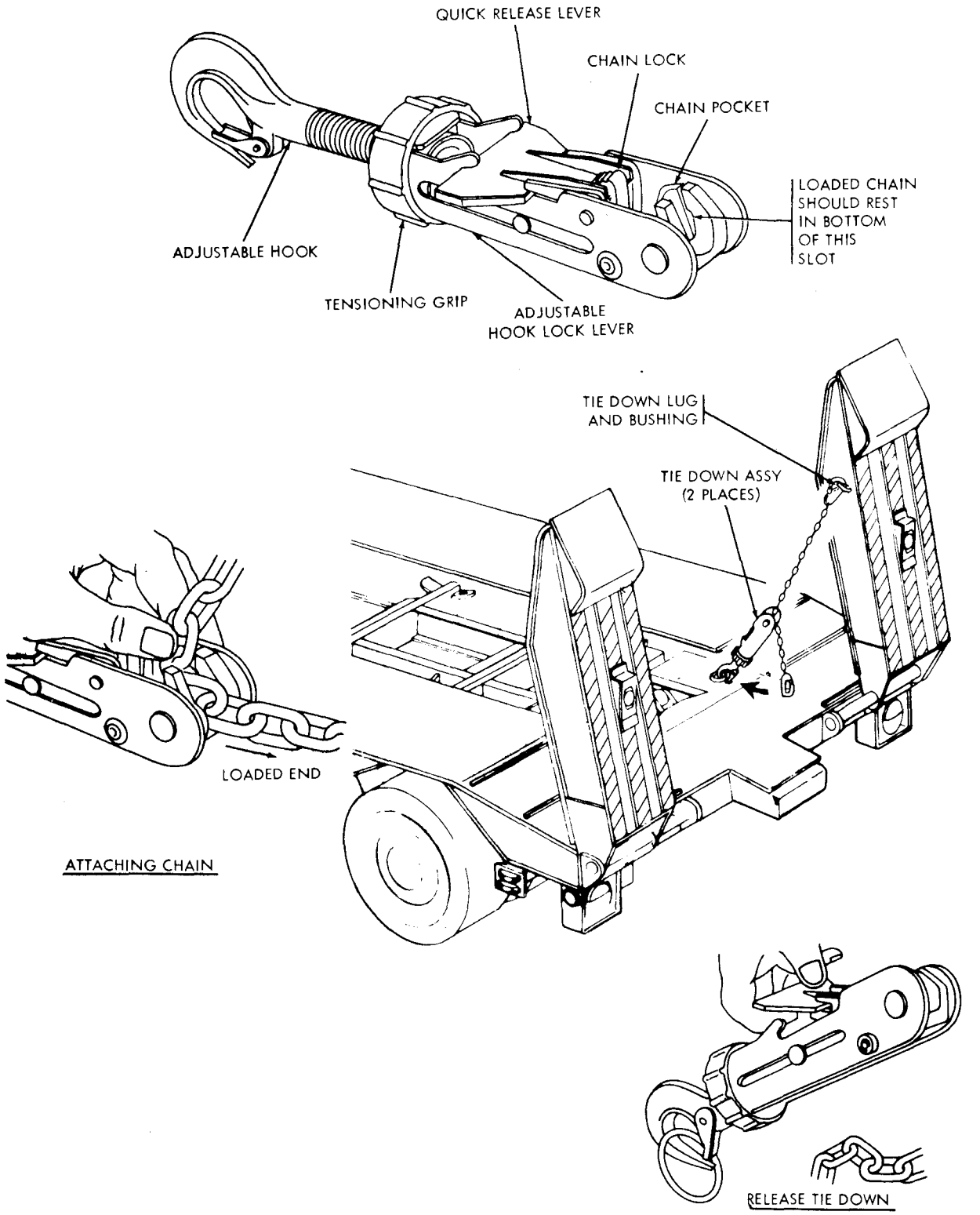


Figure 2-11. Loading ramp and tie-down assembly

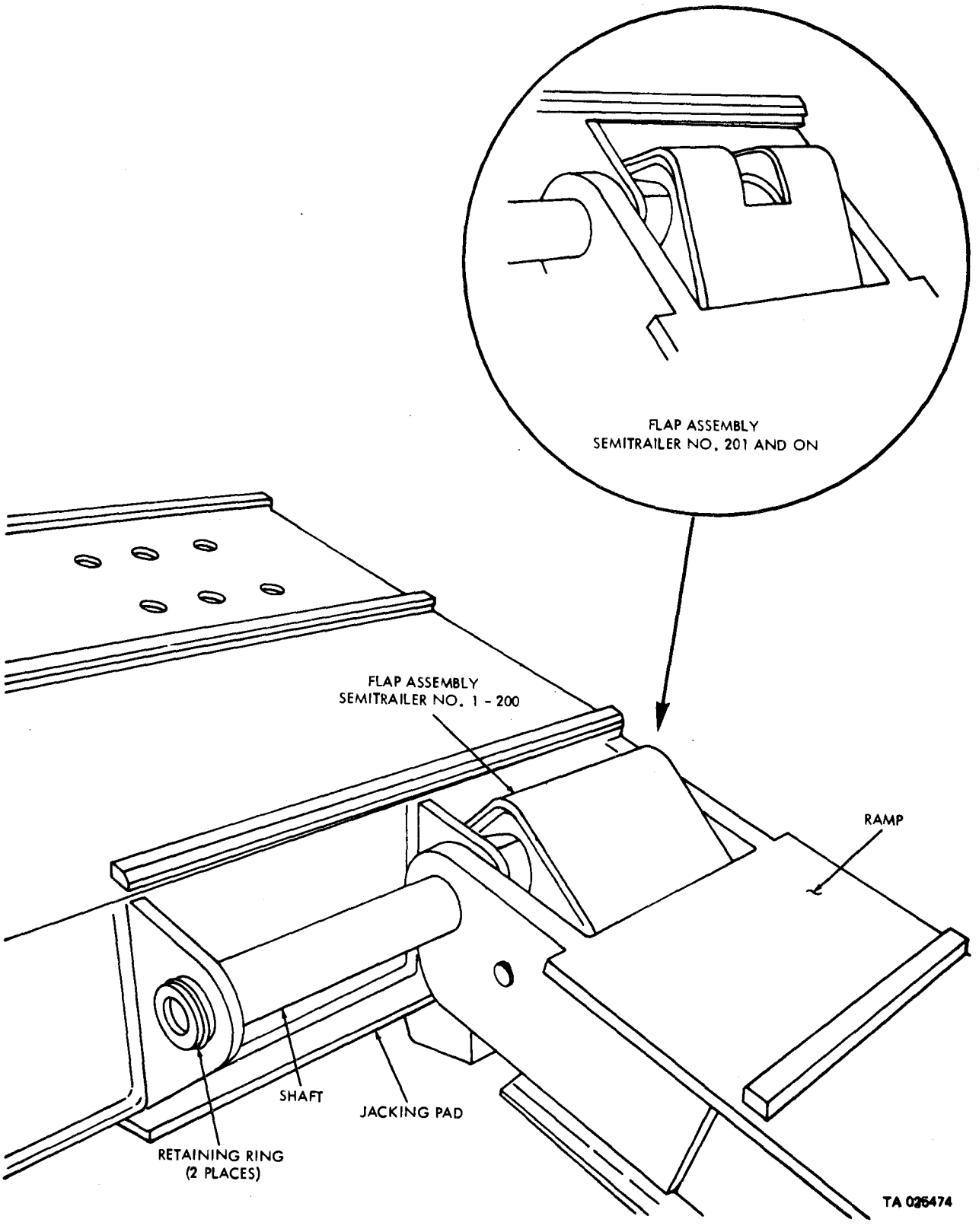


Figure 2-12. Lateral positioning or removal of ramps.

b. Lowering and Raising Ramps. To lower each ramp, pull quick release lever on tie-down assembly (8, fig. B-2) free of notches and lift. This action releases the chain from tie-down assembly. Remove chain from ramp tie down lug Lower ramp to ground. To raise and secure each ramp, lift ramp into travel position. Attach chain to ramp tie down lug. Extend adjustable hooks on tie-down assembly pressing adjustable hook lower lever and turning tensioning grip. Insert chain link into chain pocket of tie-down assembly and push link down until it bottoms in pocket. Attach extended hook of tie-down assembly to semitrailer frame loop and tighten tensioning grip. If chain assembly is loose, release chain and repeat above procedure inserting a link that is further up the chain. Attach chain hook on loose end of chain to frame loop.

c. *Laterally Adjusting Ramps.* The ramps can be set in three positions (two positions on semitrailers No. 1 through 200) for alinement with various payload vehicle track widths. To laterally position ramp, lift flap assembly and slide ramp to desired position. Lower flap assembly.

d. Removing Ramps. (fig. 2-12). The ramps may be removed from the semitrailer when it is to be backed into a dock for loading or unloading cargo. To remove ramps, lower each ramp and lift flap assembly; pry under shaft retaining ring closest to bumper with screwdriver point and rotate screwdriver around shaft until ring is lifted from pin locking groove. Remove retaining ring from shaft. Support, ramp and remove shaft from ramp and frame bracket. Remove ramp. Reverse removal procedure to install ramps.

2-13. Jacking Pads

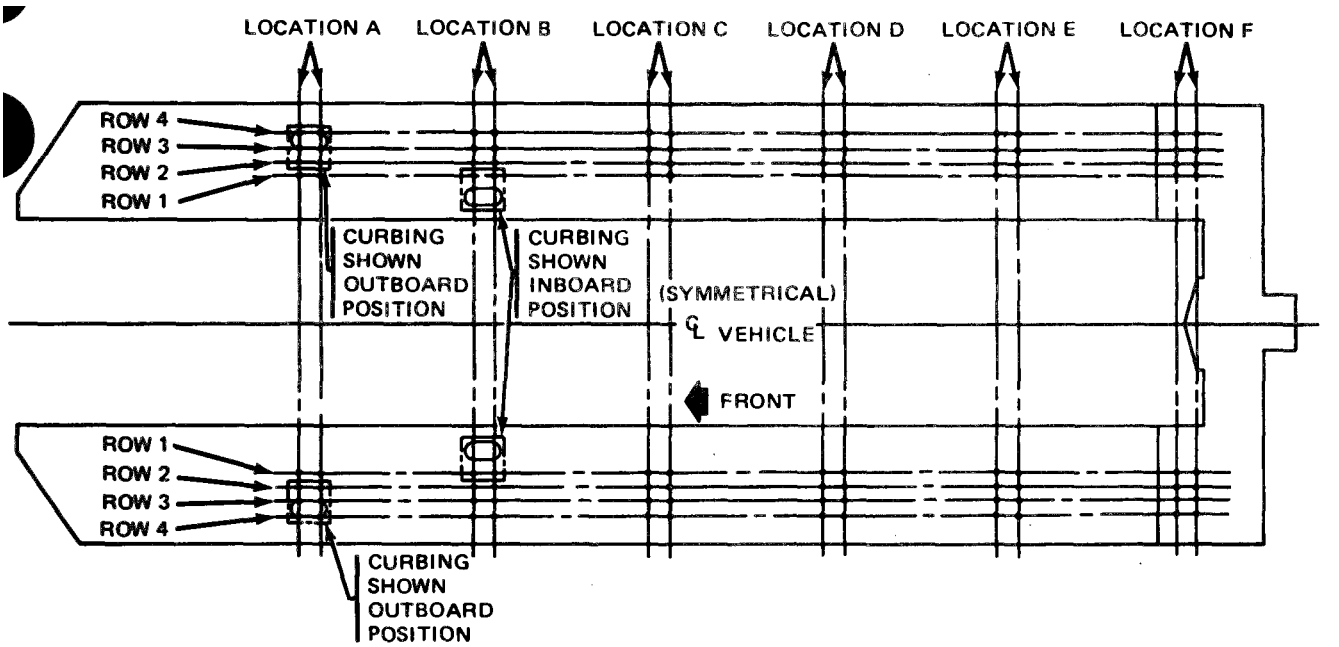
(fig. 2-12)

Two jacking pads are welded underneath the semitrailer frame at the rear corners. The jacking pads are located underneath the stenciled instructions, "BLOCK HERE". Install blocks under the jacking pads when loading a payload exceeding 55 tons.

2-14. Curbing

(fig. 2-13)

When loading or transporting a payload vehicle, eight removable curbs are provided for installation on top of the semitrailer bed, four on each side. Six sets of holes on each side of the semitrailer bed are provided for locating and securing the curbing. Each set of holes provides three lateral positions for adjustment. By selective positioning of the curbs, various payload vehicles can be guided onto the semitrailer and prevented from shifting sideways during loading and transport. The curb portion of the curbing assembly can be positioned either toward the center of the semitrailer bed (inboard) or the outer edge of the bed (outboard). Curbing should always be located in position "F" on each side of the semitrailer when loading or unloading payload vehicles. Position "A" curbing may temporarily be moved to position "F" for loading and unloading operations. Stow position "F" curbs if not used in position "A" before towing semitrailer. Refer to figure 2-13 for curbing location instructions for different payload vehicles.



VEHICLE		LOCATION		ROW	POSITION OF CURBING
VEHICLES UNDER 45,000 lb					
M116, M116A1		A,B	* F	2	Outboard
M114	1st unit	A	F	2	Outboard
	2nd unit	D,E		2	Outboard
M106, M106A1, M113, M113A1, M125A1, M132, M132A1, M548, M548E1, M577, M577A1, M667E1, M688E1, M706E1, M741, M806 M806A1	1st unit	A,B	F	3	Outboard
	2nd unit	D,E		3	Outboard
M551		A,B,C	F	4	Outboard
VEHICLES 45,000 to 60,000 lb					
M108, M110, M578		A,B,C	F	3	Inboard
M109, M109A1		A,B,C	F	4	Inboard
M2, M3(Refer to TM 55-2350-252-14)				1	Inboard
VEHICLES 60,000 lb and UP					
M107		A,B,C	F	3	Inboard
M30, M48A3, M60, M60A1, M60A2 M60A1E1, M60A1E2, M67, M67A1, M67A2		A,B,C,D	F	2	Inboard
M88		A,B,D,E	F	2	Inboard
M1		B,C,D,E	F	2	Inboard

*NOTE. MOVE CURBS FROM POSITION A TO POSITION F WHEN LOADING OR UNLOADING VEHICLE.

TA222159

Figure 2-13. M747 Curbing instrsuctions.

2-15. Snatch Block

(fig. 2-14)

The snatch block is located at the center rear of the semitrailer. It is used in connection with the towing vehicle winch cable during winch operations. Prior to using snatch block, remove tiedown strap. Remov bolt and turn top side plate counterclockwise. Inse cable around sheave, return side plate to closed position and secure plate with bolt.

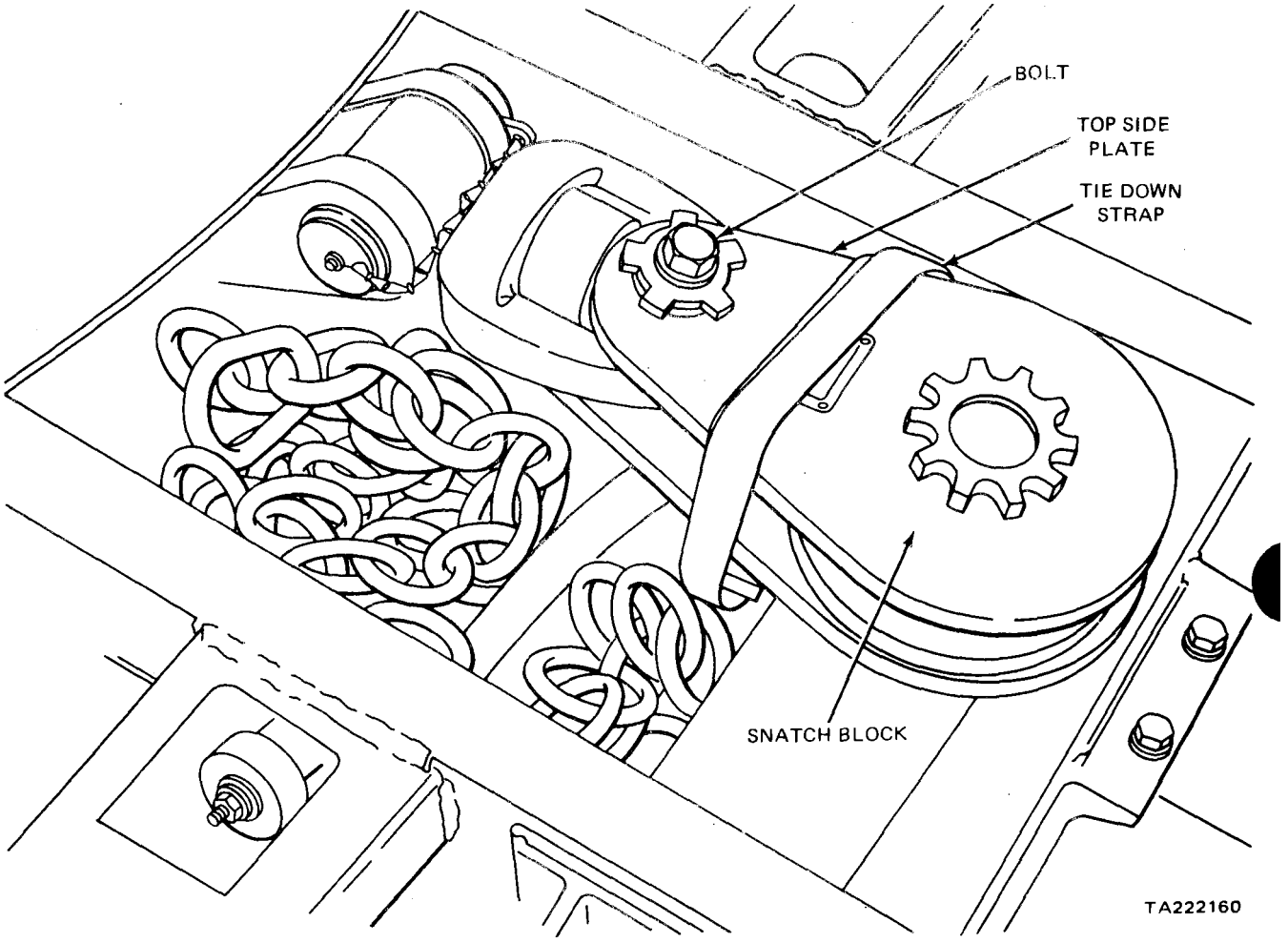


Figure 2-14. Snatch block assembly.

2-16. Roller Assemblies

(fig. 2-15)

Four roller assemblies are mounted at the front of the semitrailer. The winch cables are threaded through the rollers prior to winching operations. One roller assembly, located on the left forward side of the gooseneck, is retractable. This swingaway roller assembly has an operating and a stowed position. To position for operation, remove roller assembly retaining pin securing roller in stowed position, swing roller assembly down, and install pin on opposite side of gooseneck. To install cable for winching-off procedures, remove door retaining pin from door and swing door open. Position cable against roller, close door and install pin.

CAUTION

The gooseneck swingaway roller assembly must be in travel position (secured inside gooseneck) before connecting or disconnecting semitrailer to towing vehicle and during travel operation.

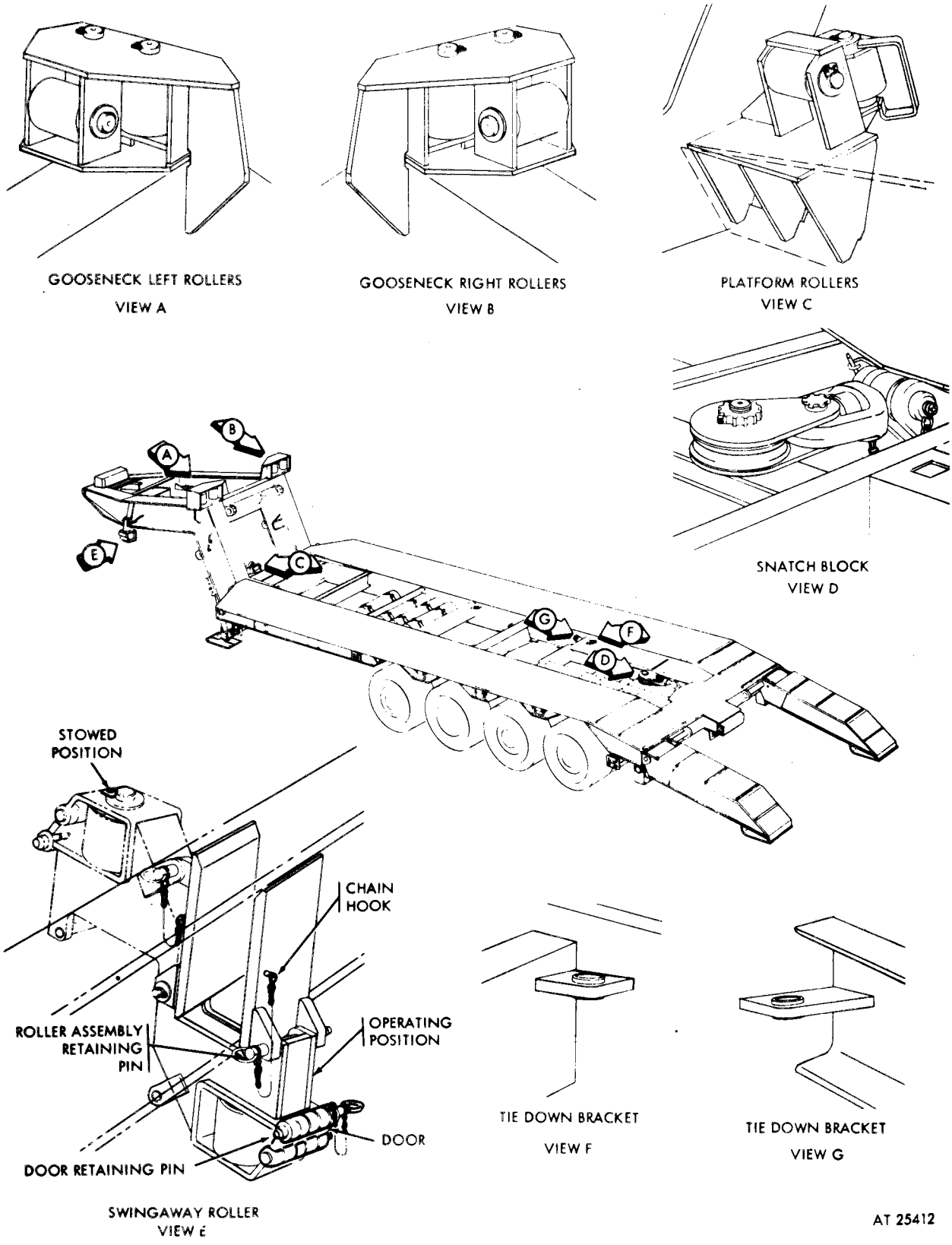


Figure 2-15 Semitrailer winching components and tiedown brackets.

2-17. Wood Blocks

(fig. 2-16)

Wood blocks are provided, as basic issue items, for use in supporting the semi-trailer as shown in figure 2-16. Position A shows the use of blocks, with a hydraulic jack from the tractor, to lift up the side of the semitrailer for changing tires or other work. Position B shows the use of the blocks at the semitrailer rear when loading a vehicle weighing more than 55 tons.

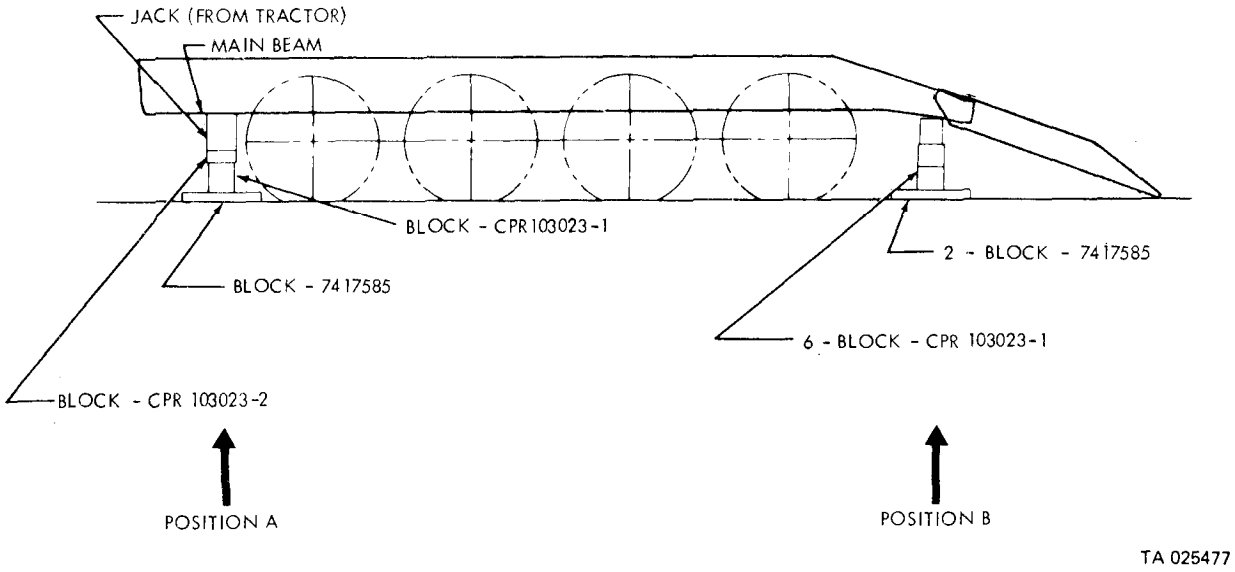


Figure 2-16. Using blocks on semitrailer.

2-18. Before-Operation Service

Services to be performed by the operator or user are designated in paragraphs 3-6 and 3-7. The before-operation services specified in table 3-1 should be performed before using the semitrailer.

2-19. Operating the Semitrailer

a. *Coupling Towing Vehicle to Semitrailer.*

(1) Make sure that ramps are raised and secured with tie-down assemblies (para 2-12), that swingaway roller is secured in travel position (para 2-16), and that retractable clearance lights are secured in retracted position when semi trailer is empty (MPARA 2-6).

(2) Make sure air control handle is in proper position for load on semitrailer (para *2-7b*).

CAUTION

Do not allow kingpin to override fifth wheel.

(3) Couple semitrailer to towing vehicle by backing tractor until semitrailer kingpin is positioned in tractor fifth wheel. Secure kingpin to tractor fifth wheel as directed in towing vehicle operator's manual.

(4) Raise and secure landing gear in travel bracket (para 2-11).

(5) Remove dummy couplings from semitrailer air couplings and connect inter-vehicular emergency air hose to emergency coupling and service air hose to service coupling in semitrailer (para 2-9) and open towing vehicle shutoff cocks.

NOTE

The protection valve on the towing vehicle stops air supply to the semitrailer until a preset minimum tractor air pressure is reached. For the M746 tractor, this pressure is 65 psi. For the M123E2 tractor, this pressure is 25-45 psi.

(6) Connect intervehicular electrical cable to semitrailer (fig. 2-4).

(7) Use towing vehicle controls and check operation of all semitrailer lights and operation of brakes.

b. Preparing Semitrailer for Loading.

WARNING

Load on level ground whenever possible. In adverse conditions, loading can be conducted on side and lateral slopes up to 10 percent and with a towing vehicle- semitrailer offset angle up to 5 degrees. Avoid loading on a severe downgrade to prevent the payload from rolling forward cm the semitrailer.

(1) Aline semitrailer rear end as close as possible (6 feet or less) to disabled vehicle on as level ground as possible.

(2) Set brakes on towing vehicle and semitrailer.

(3) Position air control handle (para *2-7b)* to accommodate pay-load weight as follows:

(a) FULL LOAD position for transporting payloads of 35 to 60 tons (85 psi air pressure in air springs). For payloads over 60 tons (ref. fig. 2-13), the 85 psi regulator valve must be reset to 95 psi (para 2-24).

(b) HALF LOAD position for transporting payloads of 15 to 35 tons (50 psi air pressure in air springs).

(c) LIGHT LOAD position for transporting payloads of up to 15 tons or with no payload (15 psi air pressure in air springs).

(d) NO LOAD position for operating semitrailer with axles 7 and 8 raised (100 psi air pressure in air lifts). This position provides a shorter turning radius and reduces tire wear on the two rear axles when making sharp turns without payload. Used to haul an empty trailer with axles 7 and 8 raised.

(4) Disconnect ramp tie down chains (fig. 2-11) from each ramp and drop ramps to ground. Adjust ramp to width of payload tracks (para 2-12c).

(5) If payload exceeds 55 tons, install support blinks under each rear corner of semitrailer (Position B, fig. 2-16).

(6) Position curbing on deck of semitrailer for vehicle being loaded in accordance with table on figure 2-13. Make sure curbs are at position F during loading. As soon as load is on semitrailer and before moving load forward, move curbs from position F to position A.

c. Preparing Semitrailer for Travel Without Payload.

(1) Couple towing vehicle to semitrailer *(a* above).

(2) Check that all basic issue items are accounted for and are properly stowed.

(3) Check that ramps are raised and secured with tiedown assemblies (para *2-12b),* that landing gear is raised and secured (para 2-11), that swingaway rollers (para 2-16) and retractable clearance lights (para 2-6) are in retracted position.

(4) Position air control handle (para *b* (3) above) at LIGHT LOAD position for short distance travel with all tires on ground. For long distance travel, position air control handle in FULL LOAD position to raise axles 5 and 6, or in NO LOAD position to raise axles 7 and 8.

(5) Use towing vehicle controls and check that semitrailer brakes and all lights are operating.

d. Preparing Semitrailer for Travel With Payload.

(1) Check that all payload securing chains are tight,

(2) Check that air control handle is in proper position for payload (para *b* (3) above).

(3) Check that landing gear is raised and that swingaway rollers are in stowed position.

(4) Check that retractable clearance lights are in retracted position for regular loads or are extended for all loads that are wider than bed of semitrailer.

(5) Check that ramps are raised and secured with tiedown assemblies (para 2- 12b). If two M113 type or M114 vehicles are being transported, secure ramps in raised position with additional chains to payload lifting eyes.

(6) Check that all basic issue items are properly stowed on semitrailer.

(7) Use towing vehicle controls and check that semitrailer brakes and all lights are operating.

e. *Uncoupling and Parking Semitrailer.*

(1) Position semitrailer where required. Select area as level as possible.

(2) Check that swingaway rollers and retractable clearance lights are in stowed position.

(3) Check that all basic issue items are accounted for and are properly stowed.

(4) Disconnect landing gear from travel bracket (para 2-11) and lower landing gear. Secure landing gear to support bracket in lowest position possible. Use 24 x 24 inch board assemblies (5, fig. B-1) under landing gear foot if landing gear is on very soft soil.

(5) Lower axles 5 and 6 or 7 and 8, if in raised position.

(6) Disconnect intervehicular electrical cable from semitrailer.

(7) Close towing vehicle air shutoff cocks, and disconnect intervehicular emergency and service hoses. Install dummy couplings on semitrailer air couplings.

(8) Unlock towing vehicle fifth-wheel lock and drive towing vehicle from semitrailer.

2-20. Precautions

a. General.

(1) All payloads and cargoes should be secured

fully by means of tiedown chains and by expedient use of semitrailer deck curbing.

(2) 'The air spring suspension of the semitrailer should be set to ensure loading on all axles to prevent overloading of any semitrailer axles (para 2-*19b* (3)).

(3) When raising or lowering the landing gear. use hand grip to control gear. The landing ramps should be handled by two men (one man can handle) when raising or lowering the ramps. Exercise caution to avoid injury to personnel.

(4) When installing wheels, proper torquing procedures must be followed (para 2-26), and hand holes in both tandem wheels must be alined with valve stems. When a wheel is installed in the field, the wheel nuts must be tightened as much as possible using tire socket wrench (10, fig. B-2) and wrench handle bar (2, fig. B- 1) and then checked for proper torque at the earliest opportunity at the organizational level. Failure to torque wheel nuts properly will result in fatigue rupture of wheel studs.

b. Highway Driving,

(1) Observe all towing vehicle operation instructions, warnings and cautions.

(2) To prevent shifting of the payload vehicle, curbing should be positioned on semitrailer deck, and the payload should be tied down front and rear. Check and' tighten bindings at every rest and maintenance stop.

(3) Caution must be exercised during highway travel to ensure that all bridges and underpasses may be negotiated. Safety requirements, such as hazard flags, road permits, flashing warning lights, and wide load signs, must be met,.

(4) Operating air pressure to semitrailer brakes must be above 65 psi to prevent application of fail-safe units.

c. Short Trip Off-Road Driving.

(1) Paragraph *b* (1), (2), (3), and (4) above are also pertinent to off-road driving.

(2) Terrain and good judgment should dictate off-road speed. Always travel at a slower speed when in doubt.

d. Turning.

(1) Avoid sharp left or right turns in excess of 10 mph. Such turns may cause payload shifting and overstressing of tiedown hardware with a resulting loss of vehicle control. Turns which may jeopardize payload or vehicle stability should be limited to 10 mph or less. Road conditions and good judgment should dictate turning speed.

(2) When making sharp turns on narrow roads or on city streets, the semitrailer turning radius will be shortened by stopping semitrailer and positioning air control handle (para *2-19b* (3)) in, NO LOAD position to raise axles 7 and. 8. After making turn, reposition air control handle for load being transported.

2-21. Loading and Unloading M747 Semitrailer Using Self-Powered Payload Vehicle

a. Precautions.

(1) Make sure towing vehicle and semitraile parking brakes are applied to assure maxim vehicle stability during drive-on/drive-off operation.

(2) If on a grade, the downhill side of wheels should be blocked.

(3) Blocks should be used under the semitrailer rear frame while loading payloads of 55 tons or greater (B, fig. 2-16).

(4) A guide should stand on top of the semitrailer gooseneck to assure constant visual contact with payload driver.

(5) A ground guide should stand off the rear corner of semitrailer and maintain visual contact with guide on gooseneck.

(6) Prior to loading operations, a system of signals to include "start", "stop, and "slow down" should be worked out between operator of towing vehicle, operator of payload vehicle and all guides (refer to FM 21-305).

(7) Refer to figure 2-13 to determine payload weight and placement of curbing.

b. Drive-On Loading.

WARNING

At no time during loading operations should personnel be on the semitrailer bed.

WARNING

Loading should not be conducted on side and lateral slopes exceeding 10 percent and with a tractor-to-semitrailer offset angle greater then 5 degrees when using winch cables.

(1) Position semitrailer in line with payload on as level ground as possible. Set towing vehicle and semitrailer parking brakes.

(2) Prepare semitrailer for loading (para *2-19b*).

(3) If two vehicles (M113 series and/or M114) are to be loaded, remove and stow two gooseneck bumpers (para 4-65).

(4) When loading any firm-tracked vehicle such as crane or bulldozer, attach towing vehicle winch cables to towing lugs of payload vehicle (B, fig. 2-17) as a safety precaution. Operate towing vehicle winches to keep cable under even tension at all times to prevent payload tipping or rolling backwards an to assist payload during breakover at top of ramp (C, fig. 2- 17). Rig cables for payload weight (fig. 2-20). When loading a crane, turn crane counterbalance to forward end.

(5) Station guide on top of gooseneck to assure constant visual contact with payload driver for guiding, Station second guide off rear corner of

itrailer to maintain visual contact with guide on gooseneck.

(6) Accurately dine vehicle with semitrailer Make sure payload tracks are evenly spaced ramps. Drive payload slowly up ramp. Make sure towing vehicle winch operator keeps winch cables under tension at all times.

(7) After payload is on semitrailer, move curbing from position F to position A on semitrailer (fig. 2-13).

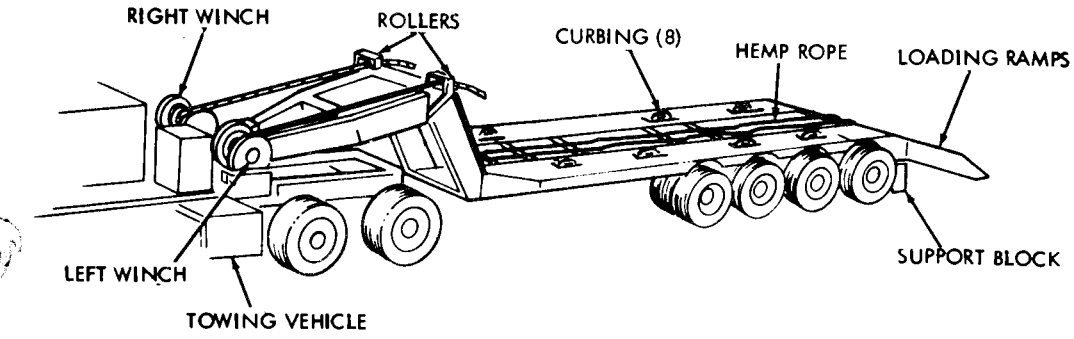
(8) Drive payload vehicle to furthest forward position against wood bumpers on gooseneck (D, fig. 2-17). If loading two vehicles (M113 series and/or Ml 14), second vehicle may be driven onto semitrailer either forward or backwards (fig. 2-21).

(9) Shut payload vehicle down, turn off all switches and close doora and hatches. Make sure all items are secure on payload to prevent falloff during travel.

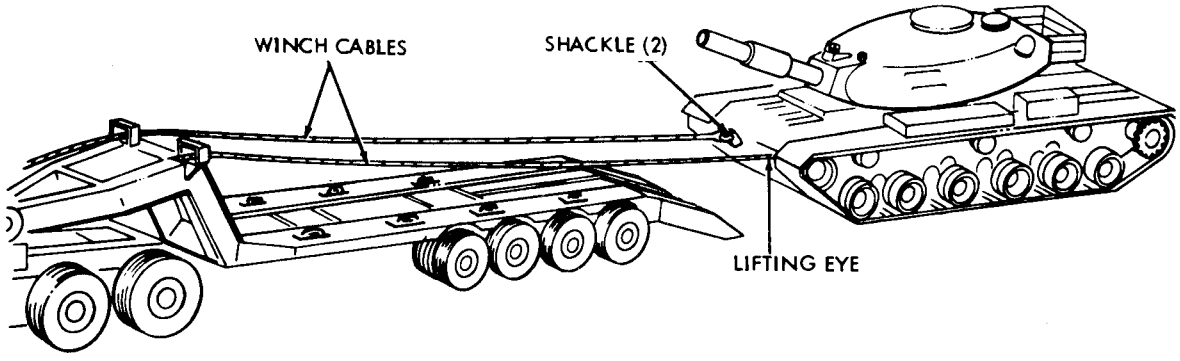
NOTE

Refer to TM 56-2350-255-14 for additional information on loading and unloading the M1.

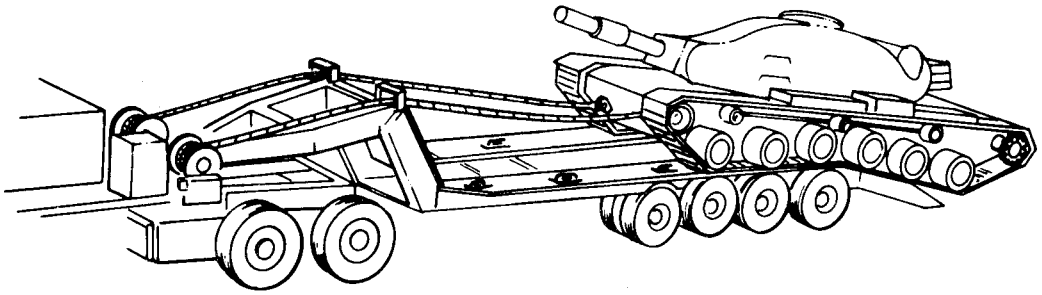
Refer to TM 55-2350-262-14 for additional information on loading and unloading the M2 and M3.



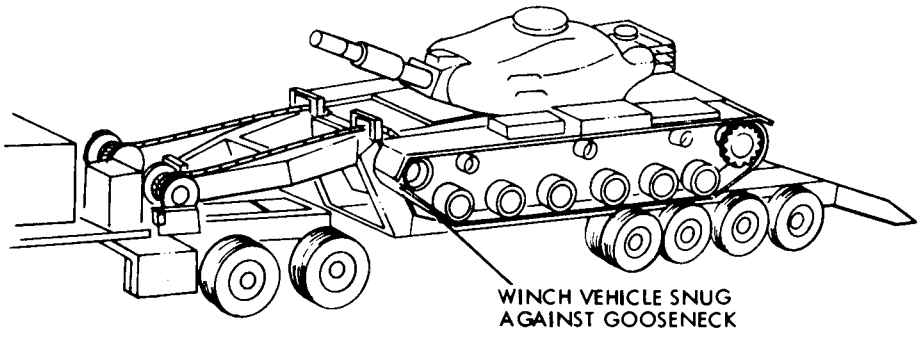
A. REEVING WINCH CABLES ON SEMITRAILER.



B. ATTACHING WINCH CABLES TO PAYLOAD VEHICLES (SEE FIG. 2-20).



C. WINCHING PAYLOAD VEHICLE ON SEMITRAILER.



D. POSITIONING AND SECURING VEHICLE ON SEMITRAILER (SEE FIG. 2-18).

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Figure 2-17. Winching a vehicle on M747 semitrailer.

c. Securing Payload Vehicle. Refer to paragraph 2-22 for payload tiedown procedures.

d. *Preparing for Travel With Payload.* Refer to paragraph *2-19d* and prepare semitrailer for travel.

e. *Drive-Off Unloading.*

(1) Position semitrailer in unloading area and set towing vehicle and semitrailer brakes.

(2) Disconnect and lower each ramp to ground. Adjust ramp to width of payload tracks.

(3) If payload exceeds 55 tons, install support Mocks under each rear comer of semitrailer (position B, fig. 2-16).

(4) Position curbing from position A to position F on deck of semitrailer (fig. 2-13).

(5) For firm-tracked vehicle such as crane or bulldozer, attach towing vehicle winch cables to towing lugs of payload vehicle (B or D, fig. 2-20) as a safety precaution.

(6) Remove tiedown chains and binders from payload.

(7) Station guide on top of gooseneck to assure constant visual contact with payload driver for guiding. Station second guide off rear comer of semitrailer to maintain contact with guide on gooseneck.

(8) Start and warm up payload engine. Drive payload slowly back off semitrailer, observing directions from guide on gooseneck. As payload is driven off semitrailer, the winch cables must be kept taut (TM 9-2320-258-10). The winch operator must be alert to assist firm-tracked vehicles during breakover at the top of ramp and to snub the payload vehicle as it descends ramp should its brakes fail.

(9) Disconnect and stow winch cables and receiving equipment (TM 9-2320-258-10).

(10) Prepare semitrailer for travel without payload (para *2-19c*).

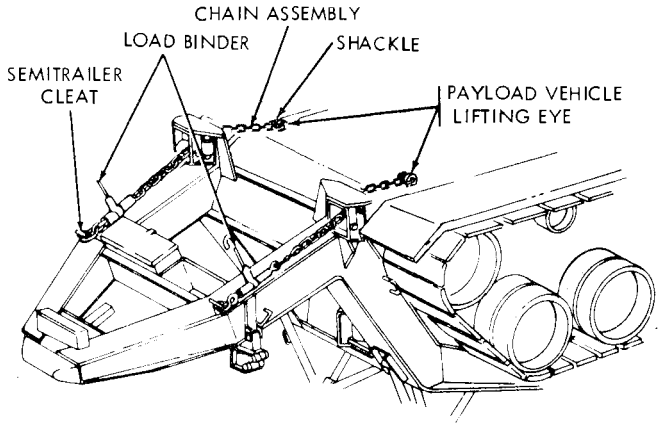
NOTE

Winching operations for drive-off unloading on non-firm-tracked vehicle does not apply.

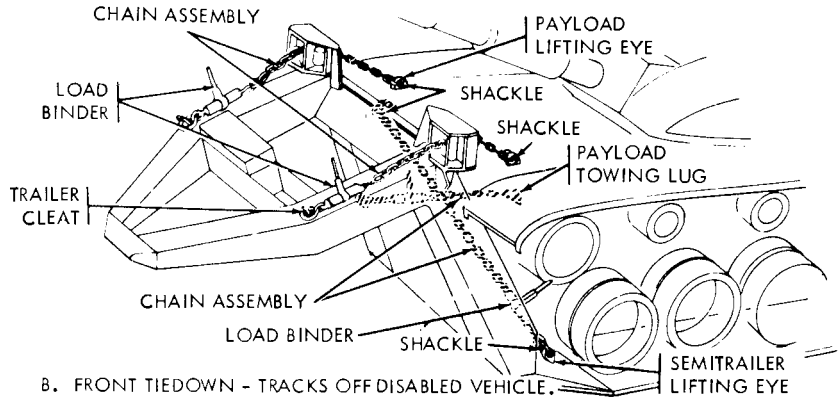
2-22. Securing Payload Vehicle to Semitrailer (fig. 2-18)

a. *Gooseneck Bumpers.* Make sure wood bumpers are secured to gooseneck for all single vehicle loads. Remove and stow wood bumpers if two M 113 series or M114 vehicles are loaded at one time.

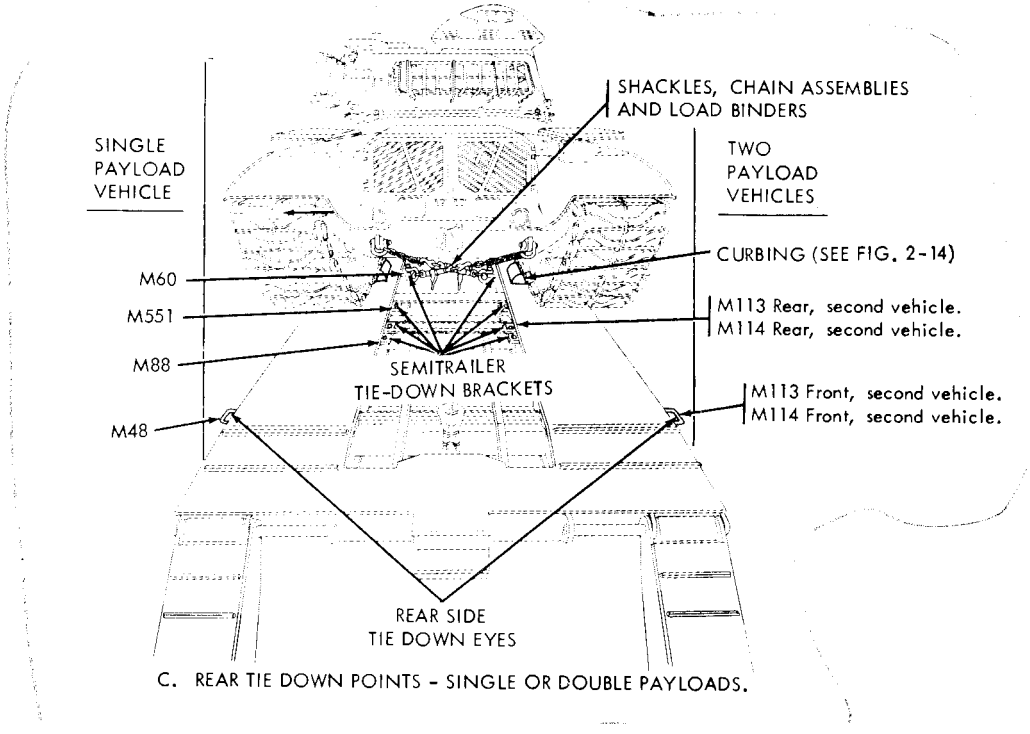
b. Curbing. Make sure curbing is properly located against payload tracks (fig. 2-13).



A. FRONT TIEDOWN - TRACKS ON DISABLED VEHICLE.



B. FRONT TIEDOWN - TRACKS OFF DISABLED VEHICLE.



C. REAR TIE DOWN POINTS - SINGLE OR DOUBLE PAYLOADS.

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Figure 2-18. Payload vehicle secured to semitrailer.

c. Securing Payload With Tracks (A and C, fig. 2-18).

(1) Make sure payload is firmly against goose-neck bumpers.

(2) *Secure chain to* each payload front lifting e with shackles. It may be necessary to remove lights on some vehicles. (M48 and M60) to prevent damage to equipment

(3) Guide each chain through adjacent goose-neck upper rollers, except for M88 vehicle. For M88 payload, cross chains without the use of the rollers.

(4) Install load binder link over cleat at front of gooseneck. Ratchet load binder to full extension and attach binder grab hook to chain.

(5) Tighten chains with load binder.

(6) Attach load binders to semitrailer tiedown brackets with shackles at rear of payload (C, fig. 2-18). Ratchet load bindera to full extension.

(7) Attach chain to each payload rear towing lug with shackles, cross chains and attach to each load binder grab hook.

(8) Tighten chains with load binders.

d. Securing Payload Without Tracks (B, fig. 2-18).

(1) Secure payload to semitrailer (c, above).

(2) Install crossed chains and binders to payload front towing lugs and to semitrailer front lift ing eyes (B, fig. 2-18). If only one track is missing from payload, only one chain and binder may be installed between payload towing lug on tracked side and semitrailer opposite lifting eye.

e. Preparing Semitrailer for Travel. Refer to paragraph *2-19d.*

f. Securing *Payload During Travel.* After initial tiedown of payload vehicle, and after load has been transported some distance, check tiedowns for tension and security. Tighten tiedowns if found to be loose. Repeat this sequence several times on long hauls until payload is definitely secure. Check payload tiedowns at each driver rest stop or maintenance stop.

NOTE

Refer to TM 55-2350-255-14 and this manual for securing the M1.
Refer to TM 55-2350-252-14 and this manual for securing the M2 and M3.

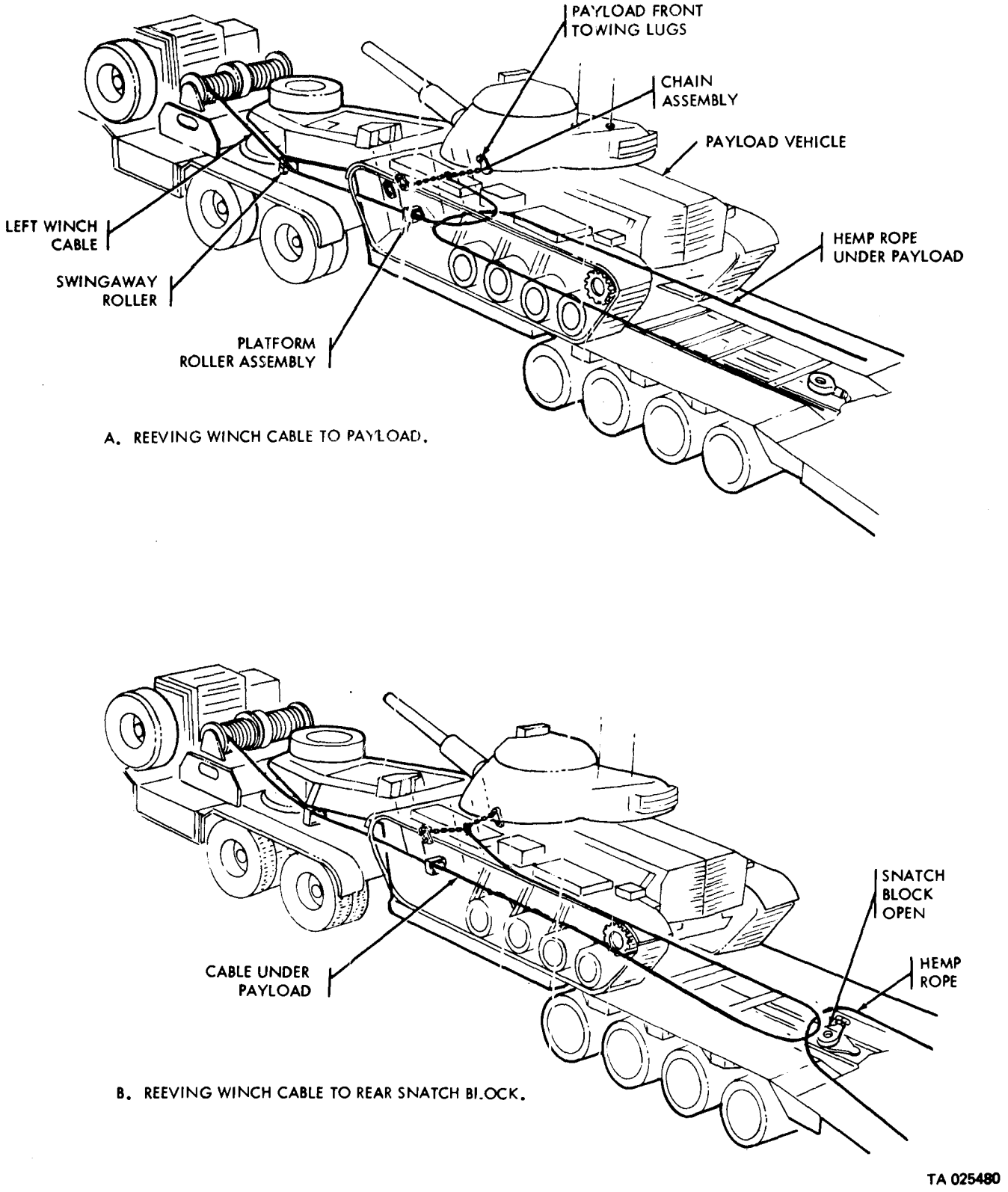
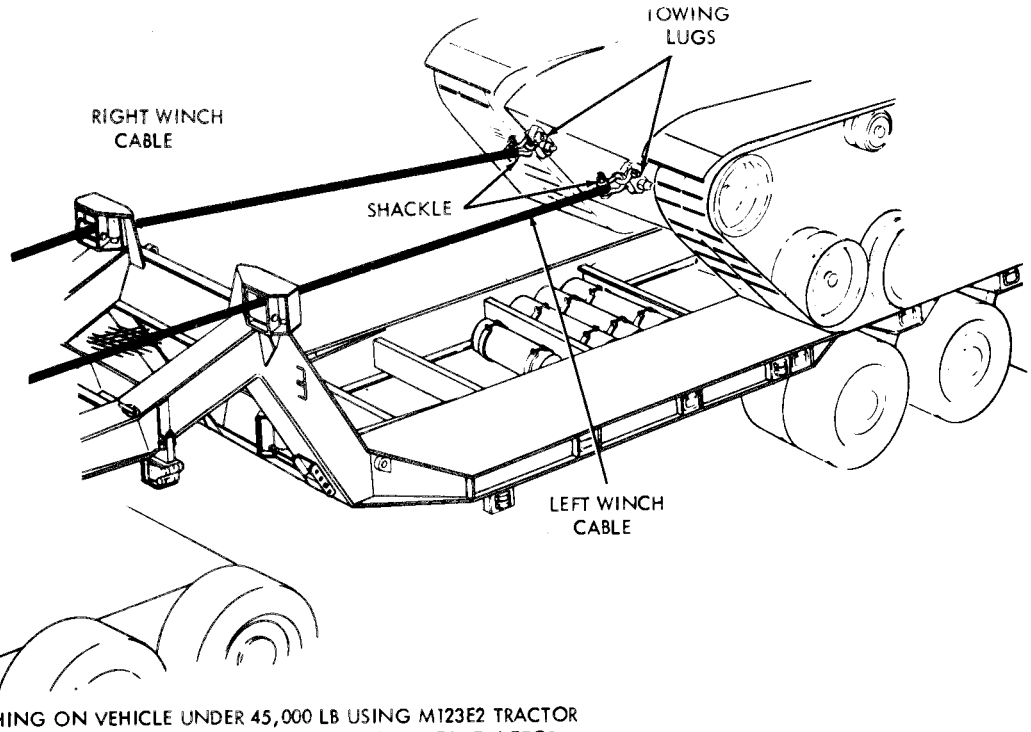
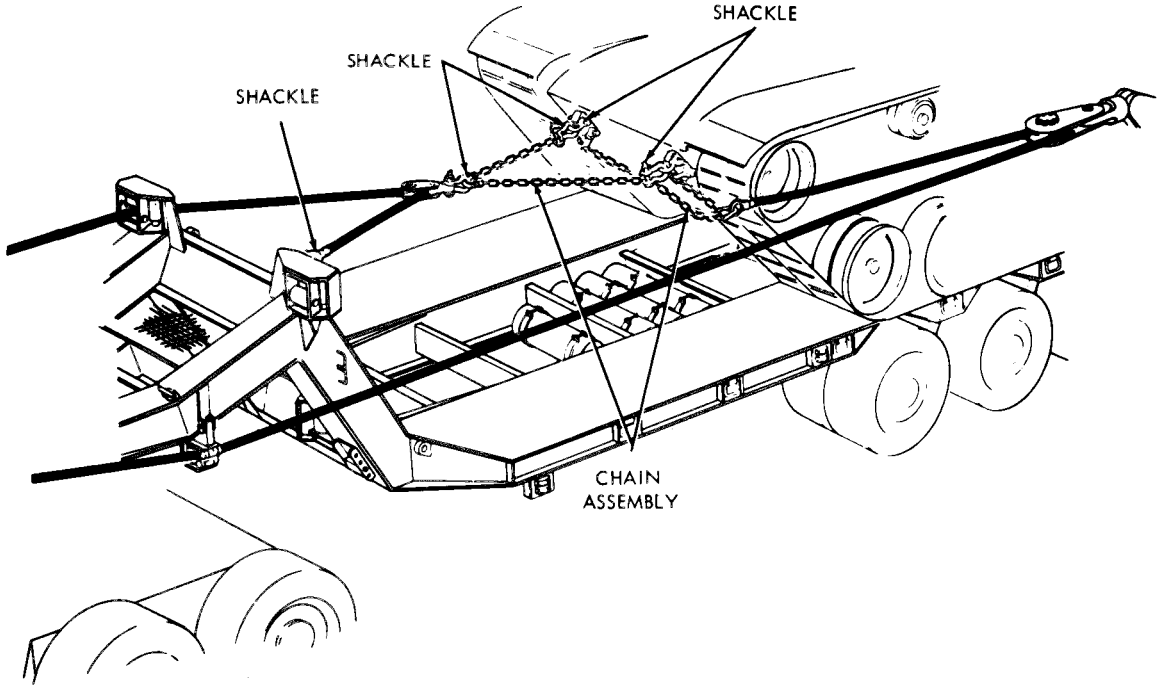


Figure 2-19. Rigging tractor left winch cable for winching payload vehicle off semitrailer.



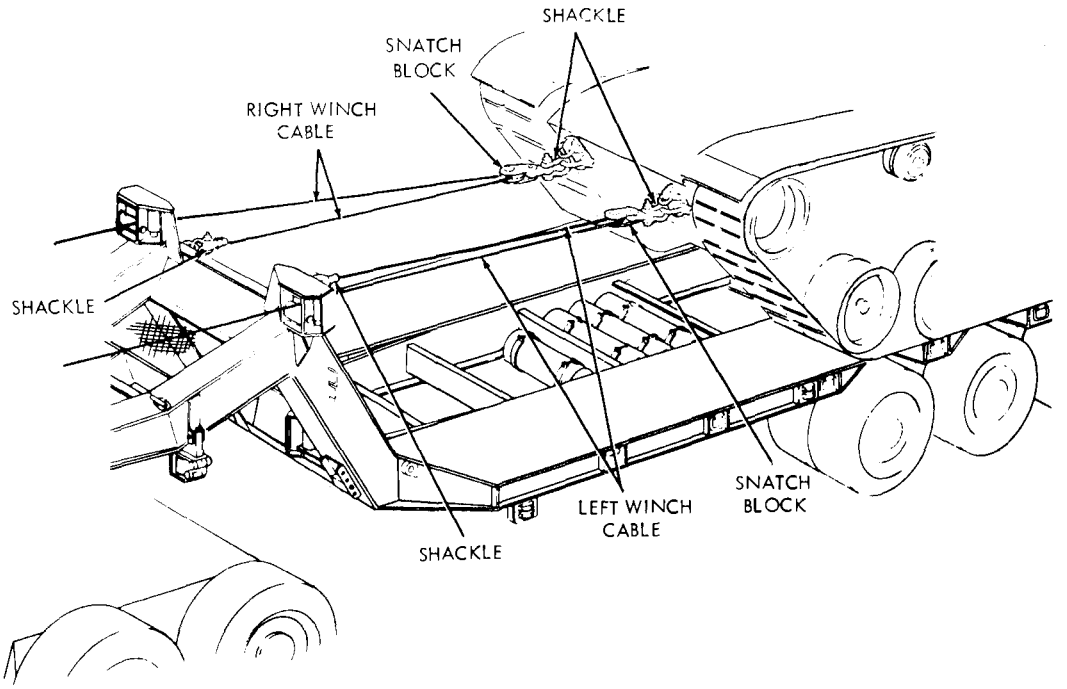
A. WINCHING ON VEHICLE UNDER 45,000 LB USING M123E2 TRACTOR
WINCHING ON VEHICLE UNDER 60,000 LB USING M746 TRACTOR



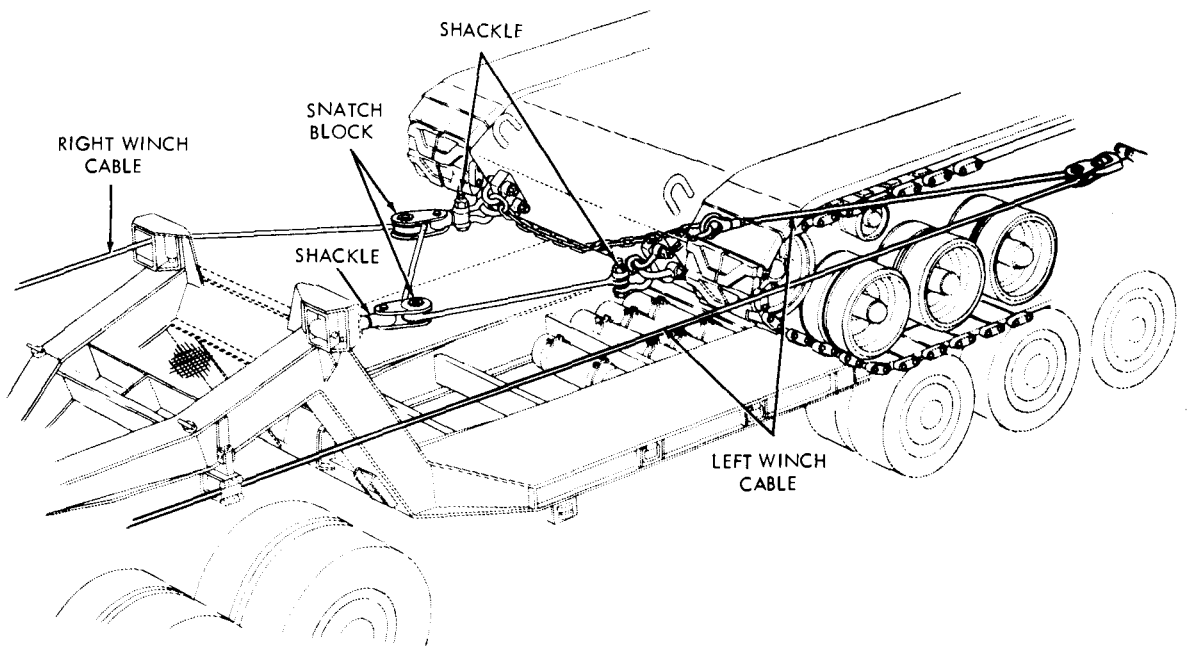
B. WINCHING OFF VEHICLE UNDER 45,000 LB USING M123E2 TRACTOR
WINCHING OFF VEHICLE UNDER 60,000 LB USING M746 TRACTOR

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Figure 2-20. Rigging to winch ON and OFF different payload weights (Sheet 1 of 2).



C. WINCHING ON VEHICLE 45,000 TO 60,000 LB USING M123E2 TRACTOR
WINCHING ON VEHICLE OVER 60,000 LB USING M746 TRACTOR



D. WINCHING OFF VEHICLE 45,000 TO 60,000 LB USING M123E2 TRACTOR
WINCHING OFF VEHICLE OVER 60,000 LB USING M746 TRACTOR

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Figure 2-20. Rigging to winch ON and OFF different payload weights (Sheet 2 of 2).

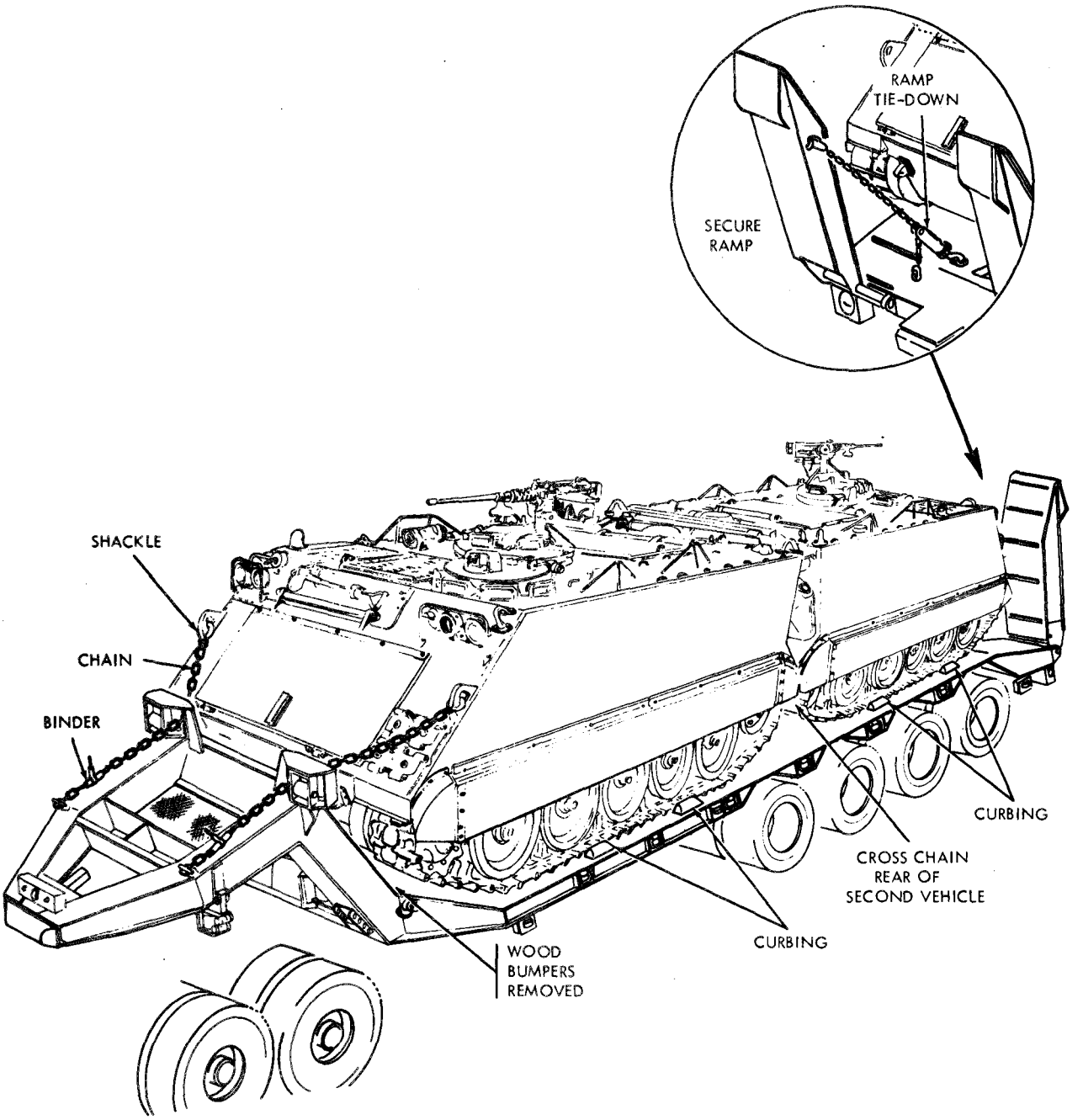


Figure 2-21. Loading two M113 (or M114) *vehicles.*

2-23. Loading and Unloading Non-Operating Payload Vehicle

a. General. Truck tractor M746 is equipped with two 60,000 lb (set to 35,000 lb line pull) winches and the truck tractor M123E2 is equipped with two 95,000 lb line pull winches. The following paragraphs provide precautions and procedures used in loading and unloading a non-operating or disabled vehicle including vehicles with one or both tracks missing. Using a single winch truck tractor to load or unload a completely disabled vehicle, with engine inoperative, without steering or brake controls is not recommended.

NOTE

When additional snatch block is required use snatch block from towing vehicle.

b. Precautions.

(1) Make sure towing vehicle and semitrailer parking brakes are applied to assure maximum vehicle stability during winch-on/winch-off operation.

(2) If on a grade, the downhill side of wheels should be blocked.

(3) Use blocks under rear frame of semitrailer while loading payloads of 55 tons or greater (B, fig. 2-15).

(4) Provide ample clear space behind disabled vehicle during loading to protect personnel and prevent equipment damage should cables break releasing payload when payload is on ramp.

(5) All unnecessary personnel should stand clear of loaded cables.

(6) A ground guide should stand off rear corner of semitrailer and maintain visual contact with winch operator. He should observe cables, snatch blocks, shackles and payload position.

(7) Make sure winch cables are not kinked and that all blocks and shackles are in good condition and properly secured.

(8) Side slope and longitudinal slope loadings should be limited to a maximum slope of 10 percent. Loading on slopes greater than 10 percent may cause loss of control of payload vehicle.

(9) During winch-on operations on longitudinal downgrade, the payload vehicle must be restrained from the rear with some other vehicle to prevent possible loss of control of the payload.

(10) Prior to loading operations, a system of signals to include “start”, “stop”, and “slow down” etc., should be worked out between operator of towing vehicle winch, operator of payload vehicle and all guides (Refer to FM 21-305).

(11) During any operation on a slope, extreme caution should be exercised.

(12) Refer to figure 2-13 to determine payload weight and placement of curbing.

c. Winching-On Non-Operating Vehicle.

WARNING

At no time during loading operation should personnel be on the semitrailer bed.

WARNING

Loading should not be conducted on side and lateral slopes exceeding 10 percent and with tractor- semitrailer offset angle greater than 5 degrees. Avoid loading on a downgrade to prevent payload from rolling forward on semitrailer.

(1) Position semitrailer in line with payload on as level ground as possible. Set towing vehicle and semitrailer parking brakes.

(2) Prepare semitrailer for loading (para 2-19 b).

(3) If two vehicles (M113 series and/or M114) are to be loaded, remove and stow two gooseneck bumpers (para 4-65).

WARNING

Do not overload winches. The M746 tractor winches are set by valves to a maximum of 35,000 lb line pull. The M123E2 tractor winches are protected by shear pins for maximum of 25,000 lb line pull.

WARNING

Always wear leather gloves when handling cables. Never allow cable to run through hands.

(4) Unwind hemp rope and lay rope doubled up along whole length of semitrailer bed (A, fig. 2-17). Position rope over bed crossmembers. The loop in rope should be at front and loose ends at rear of semitrailer bed. This rope will be used to reeve (pull) winch cable to snatch block during unloading.

(5) Operate winches and slowly let out cable. Thread cables through upper gooseneck rollers and attach single line cables to towing lugs of payload vehicle with shackles (A or C, fig. 2-20).

WARNING

During winching operations be sure that all personnel not involved in the operation are clear of the winch cables and payload.

(6) Station guide on each side of payload vehicle to provide directions to winch operator during winching operation.

(7) Using winches pull payload vehicle into alinement with ramps (B, fig. 2-17). Pull payload slowly up ramp, keeping both winch cables under tension at all times (C, fig. 2-17).

(8) After payload is on semitrailer, move curbing from position F to position A on semitrailer (fig. 2-13).

(9) Continue to winch payload vehicle onto semitrailer until it is snug against gooseneck bumpers. Some vehicles may require a change in rigging to allow them to be brought snug against bumpers.

d. *Securing Payload Vehicle. Refer to paragraph* 2-22 *for* payload tiedown procedures.

e. *Preparing for Travel With Payload.* Refer to paragraph *2-19d* and prepare semitrailer for travel.

f. Winching-Off Non-Operating Vehicle.

(1) Position semitrailer in unloading area and set towing vehicle and semitrailer brakes.

(2) Disconnect and lower each ramp to ground. Make sure ramp is adjusted to width of payload tracks.

(3) If payload exceeds 55 tons, install support blocks under each rear comer of semitrailer (Position B, fig. 2-16).

(4) Position curbing from position A to position F on deck of semitrailer (fig. 2-13).

(5) Attach towing vehicle right winch cable to towing lugs of payload vehicle (B or D, fig. 2-20). Reeve left winch cable through swingaway and platform rollers (para 2-16) and attach cable clevis to front of payload vehicle with chain (fig. 2-19). Attach hemp rope to loop of left winch cable and pull cable to rem of semitrailer. Reeve cable through snatch block at rear of semitrailer (para 2-15) and remove hemp rope.

WARNING

During winching operations, be sure that all personnel not involved in the winching operations stand clear of the winch cables and the payload. A snapped cable or shifting payload can be extremely dangerous. If the payload should shift so as to present a hazard, or if any part should fail, stop winching operations immediately and notify organizational maintenance personnel.

(6) Remove tiedown chains, binders, and shackles from payload vehicle.

(7) Station guide on each side of payload vehicle to provide directions to winch operator during winch operation.

(8) Slowly winch disabled vehicle off semitrailer, following all operating precautions outlined in *b* above. While winching off with left winch cable, snub vehicle movement, using right winch in accordance with the following procedures:

CAUTION

Do not permit both winch cables to become taut at the same time. Allow only as much slack in snubber cable (right winch) as necessary: if vehicle is allowed to roll freely and the lines snap taut, they may break.

(a) Place enough slack in snub line on right winch to permit disabled vehicle to be pulled rearward approximately four inches.

(b) Operate only one winch at a time,

(c) Winch disabled vehicle rearward with left winch until snub line starts to become taut.

(d) Repeat procedures *(a*) through *(c*) above until vehicle is unloaded from semitrailer.

(9) When payload vehicle is unloaded, remove cables, chains, snatch blocks and shackles from payload vehicle. Rewind cables onto winches.

g. Preparing Semitrailer for Travel. Refer to paragraph *2-19c.*

2-24. Checking and Adjusting Suspension Air Pressure

CAUTION

The M747 semitrailer should not be operated with a load of 35 tons or greater if the air suspension pressure is less than 75 psi or greater than 95 psi.

a. Checking Air Pressure. Check suspension pressure daily and each time vehicle is loaded. Be sure enough time is allowed for air pressure to build up to normal pressure (90-120 psi). Apply tire air gage to air test valve (fig. 2-8) at bottom of regulator valve in use. Adjust regulator valves if readings exceed following tolerances:

Air control Valve at FULL LOAD position 85±5 psi

Air Control Valve at HALF LOAD position 50±5 psi

Air Control Valve at LIGHT LOAD position 15±5 psi

Air Control Valve at NO LOAD position 100±5 psi

b. Adjusting Regulator Valve. Loosen jam nut (fig. 2-8) which locks valve threaded adjusting cap. Turn adjusting cap to obtain desired pressure: turn clockwise to increase pressure, counterclockwise to reduce pressure. Tigthen jam nut when desired pressure is obtained.

c. *Servicing.* Open drain cocks slightly on air reservoirs daily and allow moisture to drain. Close drain cocks after draining.

2-25. Removal of Spare Tire

WARNING

Do not drop or push spare tire from semitrailer to ground.

a. Remove 75 foot rope from front stowage box. Examine rope for frayed or rotted strands. If in doubt as to the ropes condition, do not use. Obtain rope in good condition.

b. Working from either side of the semitrailer gooseneck, double the rope and run the looped end through the tiedown eye below the roller twice.

c. Run looped end of the rope through the gooseneck roller, then down through the nearest opening in the spare tire wheel.

d. Take the looped end from the bottom of the wheel and secure it to the gooseneck tiedown cleat on same side of the semitrailer as the tiedown eye used.

e. Remove two nuts securing spare tire wheel to tire carrier. Two men must lift spare tire wheel clear of the retaining bolts and move wheel to the side of the semitrailer.

f. One man must stand on the ground and holding the ends of the rope, take up the slack. While he holds the rope tightly, the other man eases the wheel off of the gooseneck.

g. Lower wheel to ground and remove the rope.

h. The flat tire wheel can be rolled up either rear ramp and secured to any available tiedown with the rope. After the tire is removed from the rear of the semitrailer for repair, stow the rope in the front stowage box.

i. After repaired spare is secured to tire carrier, torque nuts to 200-250 lb ft.

2-26. Changing Wheel and Tire Assembly

a. General. Semitrailers no. 1 through 200 are equipped with wheels and studs that secure the inner dual wheel with 10 square end nuts and the outer dual wheel is secured with 10 hex nuts threaded into the inner nut. The studs and nuts are left-hand threaded on the left side and right-hand threaded on the right side. Semitrailers no. 201 and on are equipped with wheels and studs that secure both the inner and outer dual wheels at the same time with 10 cap nuts. All studs and nuts on semitrailers no. 201 and on are right-hand threaded.

b. Changing Wheel and Tire on semitrailer No. 1 Through 200.

NOTE

If the semitrailer is unloaded, the entire side of the semitrailer may be jacked up as shown in figure 2-16 position A. otherwise follow the procedures listed below.

(1) Set semitrailer brakes to prevent movement.

(2) Remove spare tire and wheel from gooseneck (para 2-25).

(3) Using wheel nut socket wrench (10, fig. B-2) and wrench handle bar (2. fig. B-1) loosen the 10 large hex cap nuts securing the outer wheel to be removed.

NOTE

Studs on left side of semitrailer are left-hand threaded and studs on right side of semitrailer are right-hand threaded.

NOTE

For removing difficult wheel nuts, use wrench adapter (1, fig. B-1) and crow bar (1, fig. B-2). Do not use for tightening nuts.

NOTE

The air suspension or air lift system may be used to raise axles for changing tires. The two front axles can be raised by turning control valve handle to FULL LOAD position and applying air pressure to the rear suspension if trailer is without a payload. The two rear axles are raised by putting the air control valve handle in NO LOAD (LIFT) position.

(4) Place jack under axle near wheel to be removed and raise axle until tire is off the ground

(5) Remove the 10 hex cap nuts and remove the outer wheel assembly from drum.

NOTE

If inner wheel and tire assembly is not to be removed, proceed to (11) below.

(6) With wheel nut wrench, loosen and remove 10 nuts securing inner wheel. These nuts have a square end and are also threaded to take the outer wheel nuts,

(7) Remove the inner wheel assembly from drum.

(8) Clean all dirt from studs and mating surfaces of hub face and wheel disc.

CAUTION

It is important that these surfaces are clean. A little dirt between the wheel and drum will vibrate out and cause a loose wheel.

(9) Mount serviceable inner wheel on studs. Install 10 inner wheel nuts. Lift and maneuver wheel. using wrench handle under tire, while installing nuts.

CAUTION

The inner wheel nuts cannot be tightened further once the outer wheel nuts 'are attached and securely fastened. Therefore, the inner nuts must be fully tightened before mounting outer wheel and attaching nuts.

(10) Tighten all inner cap nuts slightly to seat ball faces and insure wheel being centered. Use the tightening sequence shown in figure 2-22 and tighten the cap nuts as near as possible to 575-600 pound foot torque.

NOTE

A rule of thumb used to determine torque application without using a torque wrench is as follows: A man's weight times the number of feet of leverage equals the pound foot of torque applied. Apply full weight to wrench handle and bear down hard to obtain proper torque. If possible use a support under the wrench at the handle end during tightening.

CAUTION

In a dual-wheel assembly both tires should be matched in diameter in order to prevent overloading one tire. If the diameter between inner and outer tire differs by more than ½ inch or tread depth by ¼ inch, tires should be changed at completion of the mission to obtain a closer match. Notify organizational maintenance personnel.

(11) Mount serviceable outer wheel and tire assembly on inner wheel nuts, alining rim valve openings to mate. Install the 10 wheel stud nuts. Rounded face of nut must be against wheel.

WARNING

Do not operate trailer with loose or missing wheel nuts.

CAUTION

The cap nuts should be retightened with a torque wrench as soon as the trailer returns to organizational maintenance.

(12) Alternately tighten outer wheel nuts slightly to seat ball faces and to insure wheel being centered. Use tightening sequence shown in figure 2-22 to tighten outer wheel nuts as near as possible to 575-600 pound foot torque.

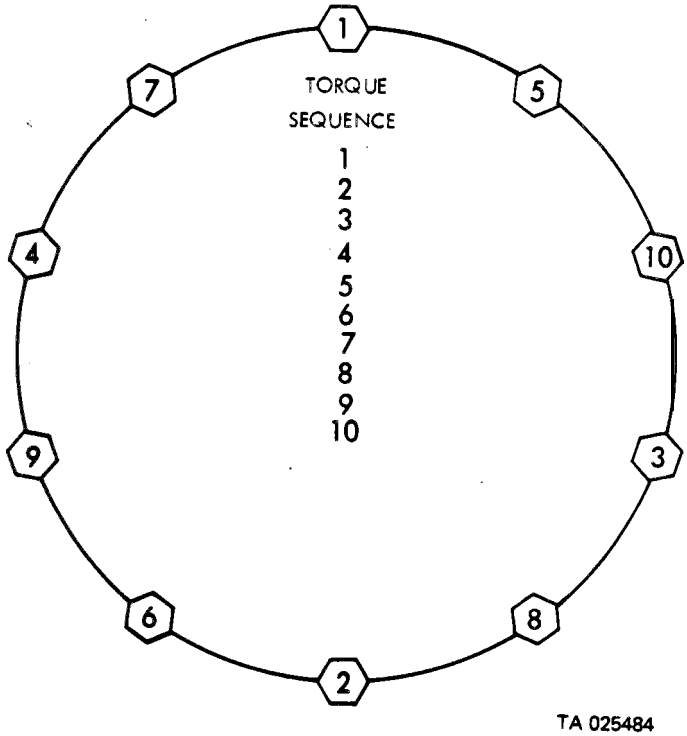


Figure 2-22. Wheel nut tightening sequence.

(13) Lower jack, if used, or lower axles by releasing air pressure from air springs or air lifts.

(14) Install the spare wheel and tire assembly on the spare tire carrier (para 2-25). Stow jack in towing vehicle.

(15) After approxiamately 25 to 50 miles of semitrailer operation with payload, retighten outer cap nuts. If an outer cap nut is loose, loosen it two turns and check tightness of inner cap nut before retightening.

c. Changing Wheel and Tire on Vehicle No. 201 and On.

NOTE

If the semitrailer is unloaded, the entire side of the semitrailer may be jacked up as shown in figure 2-16 position A, otherwise follow the procedures listed below.

(1) Set semitrailer brakes to prevent movement,

(2) Remove spare tire and wheel from gooseneck (para 2-25).

(3) Using wheel nut socket wrench (10, fig. B-2) and wrench handle bar (2, fig. B-1) loosen the 10 cap nuts securing the outer and inner wheel to be removed.

NOTE

All studs and nuts are right-hand threaded.

NOTE

The air suspension or air lift system may be used to raise axles for changing tires. The two front axles can be raised by applying FULL air pressure to the rear suspension if trailer is without a payload. The two rear axles are raised by putting the air control **valve** handle in NO LOAD (LIFT) position.

(4) Place jack under axle near wheel to be removed and raise axle until tire is off the ground.

(5) Remove the 10 cap nuts and remove the outer and inner wheel assemblies from drum.

CAUTION

It is important that these surfaces are clean. A little dirt between the wheels and hub will vibrate out and cause a loose wheel.

(6) Clean all dirt from studs and mating surfaces of drum face and wheel disc.

CAUTION

In a dual-wheel assembly both tires should be matched in diameter in order to prevent overloading one tire. If the diameter between inner and outer tire differs by more than ½ inch or tread depth by ¼ inch, tires should be changed at completion of the mission to obtain a closer match. Notify organizational maintenance personnel.

(7) Mount serviceable inner and outer wheel and tire assembly on drum studs, alining rim valve openings to mate. Install the 10 cap nuts on studs. Flange of nut must be against wheel.

WARNING

Do not operate trailer with loose or missing wheel nuts.

CAUTION

The cap nuts should be retightened with a torque wrench as soon as the trailer returns to organizational maintenance.

(8) Alternately tighten each wheel nut slightly until nut flange is against wheel face. Use tightening sequence shown in figure 2-22 to tighten wheel nuts as near as possible to 575-600 pound foot torque.

NOTE

A rule of thumb used to determine torque application without using a torque wrench is as follows: A man's weight times the number of feet of leverage equals the pound foot torque applied. Apply full weight to wrench handle and bear down hard to obtain proper torque. If possible use a support under the wrench at the handle end during tightening.

(9) Lower jack, if used, or lower axles by releasing air pressure from air springs or air axle lifts.

(10) Install the spare wheel and tire assembly on the spare tire carrier (para 2-25). Stow jack in towing vehicle.

(11) After approximately 25 to 50 miles of semitrailer operation with payload, retighten wheel nuts.

Section II. OPERATION UNDER UNUSUAL CONDITIONS

2-27. General

a. It is imperative that the approved practices and precautions be followed. A detailed study of TM 21-300 and FM 21-305 is essential for use of this materiel under unusual conditions. The M747 semitrailer has mobility to make short trips off-road to reach vehicle collecting points, areas for concealment, and to detour around road obstructions.

b. For description of operations in extreme cold, refer to TM 9-207.

c. Under sandy or dusty conditions, inspect, clean and lubricate parts more frequently than stated on lubrication charts.

d. When chronic failure of equipment results from subjection to extreme conditions, report of the condition should be made, on DA Form 2407, Equipment Improvement Recommendation, and Standard Form 368, Quality Deficiency Report in accordance with TM 38-750.

2-28. Extreme Cold-Weather Operation

a. General.

(1) The driver or operator must always be on the alert for indications of the effect of cold weather on the semitrailer.

(2) The driver must be very cautious when placing the semitrailer in motion after a shutdown. Congealed lubricants may cause failure of parts. Tires frozen to the ground or frozen to the shape of the flat spot while underinflated must be considered. One or more brake shoes may be frozen fast and require preheating to avoid damage. Rocking vehicle back and forth may shear ice if the brake shoes are not badly frozen. Frozen lining can be prevented after hosing vehicle down, operation on wet roads, or after fording operations by lightly "riding" the brakes in travel for about ½ mile; this action will help dry out brakes before parking.

(3) Refer to FM 21-305 for special instructions on driving hazards in snow, ice, and unusual terrain encountered under extreme cold-weather conditions.

b. At-Halt or Parking.

(1) When halted for short shutdown periods, park the semitrailer 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.

(2) Clean all parts of the semitrailer of snow, ice, and mud as soon as possible after operation. Cover and shield the semitrailer but keep the ends of canvas paulins off the ground to prevent them from freezing to the ground.

2-29. Extreme Hot-Weather Operation

a. Do not park the semitrailer in the sun for long periods, as the heat and sunlight will shorten the life of the tires. When practical, park semitrailer under cover for protection from the sun, sand, and dust.

b. Equipment that is inactive for long periods in hot, humid weather is subject to rapid rusting and accumulation of fungus growth. Make frequent inspections and clean and lubricate to prevent excessive deterioration.

c. Clean mildewed canvas straps and pamphlet bag with a dry brush. Remove dirt with water only after mildew has been removed.

2-30. Operation on Unusual Terrain

a. Mud. If one or more wheels become mired, it may be necessary to jack up the mired wheel and insert planking or matting beneath it. If artillery sleds are available install them under the wheels.

b. Sand. Operation under sandy or dusty conditions necessitates frequent inspection, cleaning, and lubrication of working parts.

c. *After-Operation Procedures.* Remove accumulations of ice, snow, and mud from the underside of the semitrailer.

CAUTION

Exercise care when removing such accumulations, in order to prevent damage to air lines, wiring harnesses, and other parts.

2-31. Fording Operations

a. *Before Fording.* Install protective cover on utility outlet. Secure loose items in open stowage compartments so they cannot float away. Remove padlock from bed stowage compartment cover.

b. After Fording.

(1) Reinstall padlock on stowage compartment cover.

(2) Blow out all water from fail-safe units. To blow out, remove plugs (semitrailers No. 1 through 200) or breathers (semitrailers No. 201 and on) from top of fail-safe caps (fig. 2-2). Remove one air test valve (fig. 2-8) from bottom of suspension system regulator valves.

NOTE

Do not remove air test valve from the regulator valve in use. For example, if the suspension air control handle is in "FULL LOAD" position (fig. 2-8) do not remove air test valve from the 85 psi regulator valve. If handle is in "HALF LOAD" position do not remove air valve from 50 psi regulator valve. If handle is in "LIGHT LOAD" position do not remove air valve from 15 psi regulator valve. If handle is in "NO LOAD" position do not remove air valve from 100 psi regulator valve.

Install air test valve in fail-safe plug (breather) hole, Use tire inflator hose and compressed air from towing vehicle and blow water from fail-safe units.

(3) Vehicle should be delivered to organizational maintenance after submersion so wheel bearings and brake plungers can be cleaned and repacked with lubricants, as specified on the lubrication chart.

CHAPTER 3

OPERATOR/ CREW MAINTENANCE INSTRUCTIONS

Section I. LUBRICATION INSTRUCTIONS

3-1. Lubrication Chart

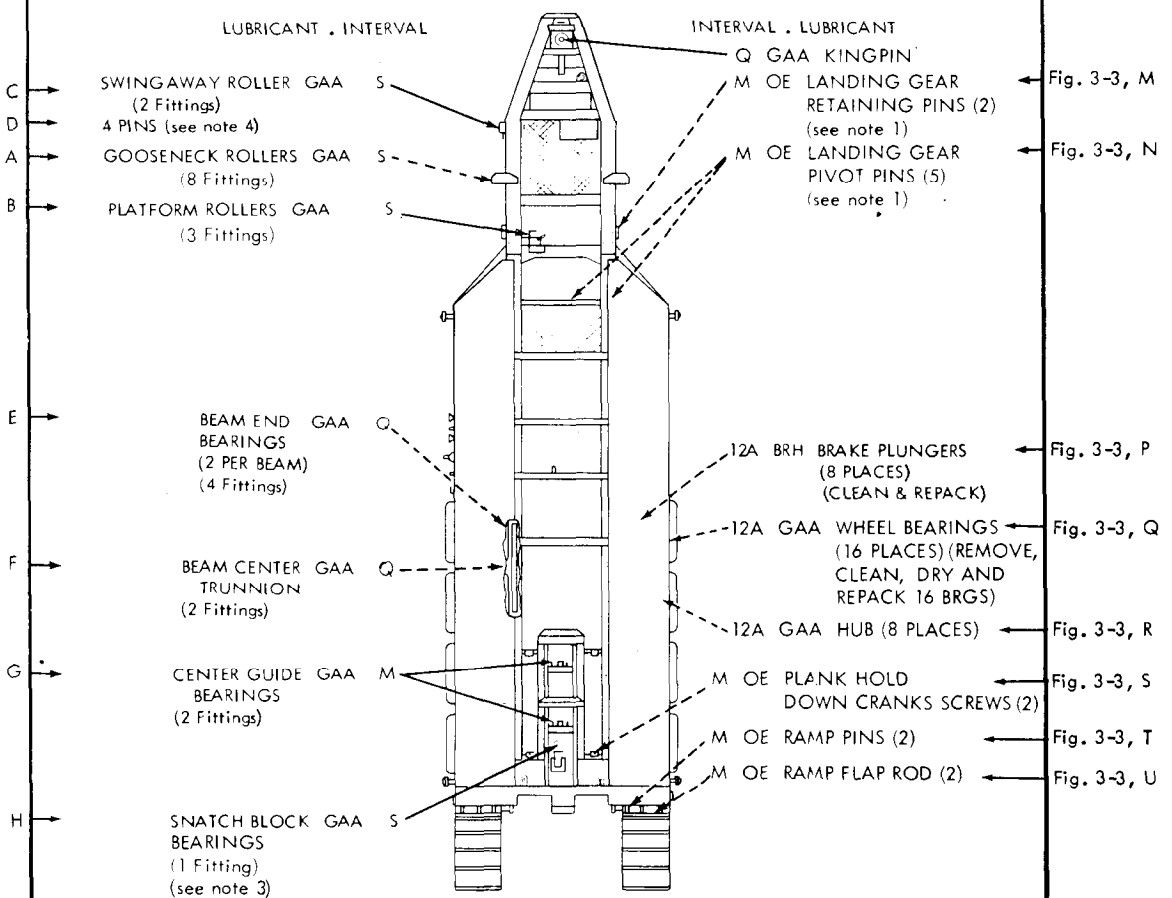
a. The cleaning and lubricating procedures as to location, intervals, and proper materials, are prescribed in the lubrication chart (fig. 3-1 and 3-2). Refer to lubrication chart and figure 3-3 for localized views of lubrication points.

LUBRICATION CHART

SEMITRAILER, LOW BED: HEAVY EQUIPMENT TRANSPORTER, 60 TON, M747

Intervals are based on normal hours of operation. Reduce to compensate for abnormal operations or severe conditions. During inactive periods, sufficient lubrication must be performed for adequate preservation. Clean fittings before lubricating.

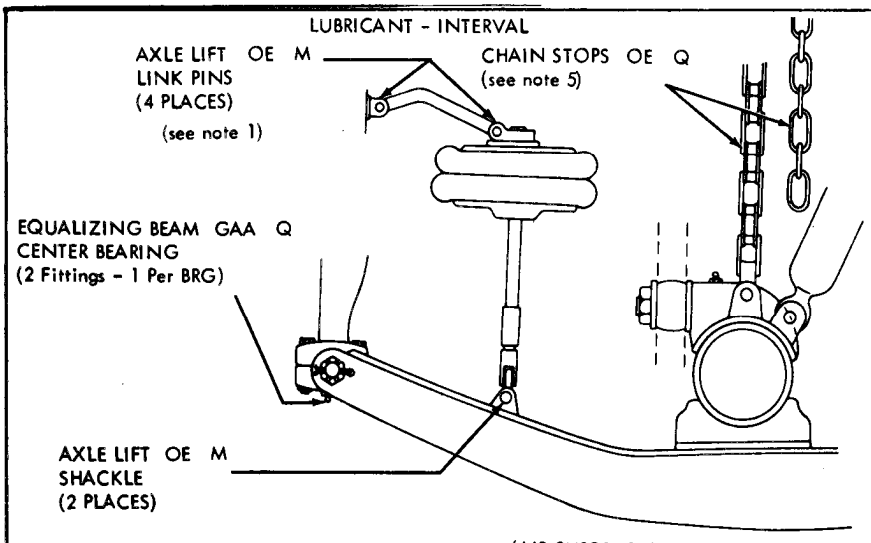
Clean non-rubber parts with SOLVENT, DRY-CLEANING, Type II (SD-2). Dry before lubricating. Lubricate points indicated by dotted arrow shafts on both sides of equipment.



TOTAL MAN-HR		TOTAL MAN-HR	
INTERVAL	MAN-HR	INTERVAL	MAN-HR
M	0.2	S	2.0
Q	0.5	12A	12.0

TA 025485

Figure 3-1. Lubrication chart.



KEY

LUBRICANTS	EXPECTED TEMPERATURES			INTERVALS
	ABOVE +32°F	+40°F TO - 10°F	0°F TO - 65°F	
OE - LUBRICATING OIL, HEAVY DUTY	OE/HDO-30	OE/HDO-10	OEA	M-MONTHLY Q-QUARTERLY S-SEMI-ANNUAL 12A-12,000 MILES OR ANNUALLY WHICHEVER OCCURS FIRST
GAA - GREASE AUTOMOTIVE AND ARTILLERY	GAA	GAA	GAA	
BRH-GREASE, BALL AND ROLLER BEARING BRAKE PLUNGERS	BRH	BRH	BRH	

NOTES

1. OIL CAN POINTS - LUBRICATE TIE DOWN SHACKLES, SNATCH BLOCK BOLTS AND PINS, AXLE STOP CHAINS, HYDRAULIC JACK, AXLE LIFT SHACKLES AND LINK PINS, RAMP PINS, LANDING GEAR HINGE AND RETAINING PINS AND POWER RECEPTACLE COVER HINGE.
2. THE FOLLOWING LIST REFERENCES LUBRICANT SYMBOLS USED WITHIN THIS LUBRICATION CHART AND DESIGNATES THE APPROPIRATE SPECIFICATION NUMBER:

GAA - MIL-G-10924	OEA - MIL-L-46167
OE/HDO-MIL-L-2104	BRH - MIL-G25013D

3. LUBRICATE BOTH SNATCH BLOCKS: REMOVE BOLT (J, FIG. 3-3) AND COAT LIGHTLY. REMOVE PIN (L, FIG. 3-3) RETAINING SNATCH BLOCK TO BRACKET AND COAT LIGHTLY, REMOVE EYE BOLT (K, FIG. 3-3) FROM YOKE AND COAT LIGHTLY.
4. REMOVE, CLEAN AND LIGHTLY COAT WITH GREASE GAA, ALL RETAINING AND HINGE PINS ON SWINGAWAY ROLLER.
5. REMOVE AXLE STOP CHAIN SPRINGS. WORK CHAINS FREE OF BINDING AT JOINTS. WIRE BRUSH THOROUGHLY AND APPLY OIL TO CHAINS AND RETAINING PINS.
6. AS SOON AS POSSIBLE AFTER FORDING OPERATIONS CLEAN AND REPACK WHEEL BEARINGS AND BRAKE PLUNGERS.

TA 025486

Figure 3-2. Lubrication chart.

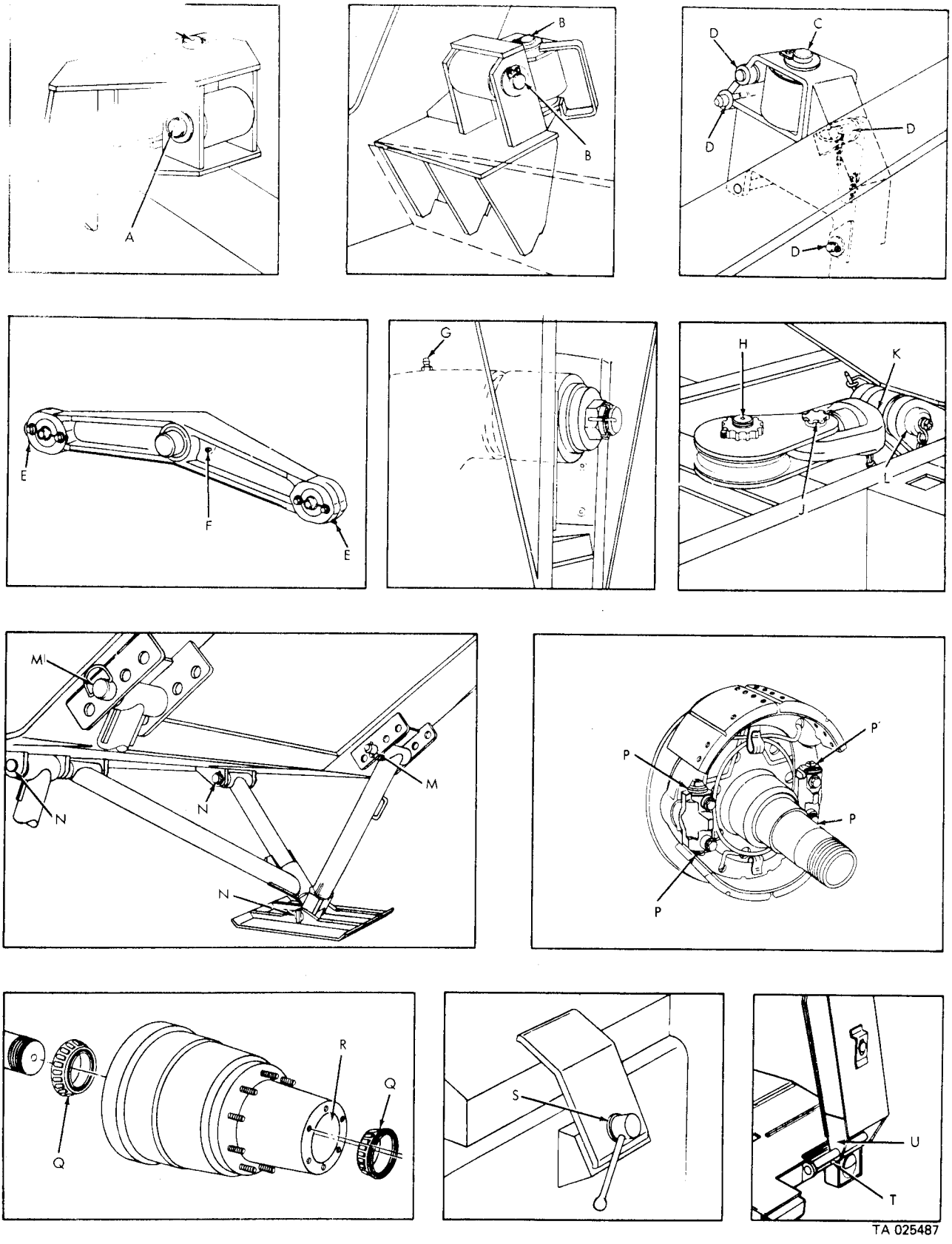


Figure 3-3. Lubrication points—localized views.

b. Any special lubricating instructions required specific mechanisms or parts are contained in the pertinent section.

c. Maintain a record of lubrication of the materiel DA Form 2408-2, Equipment Lubrication ord.

3-2. General Lubrication Instructions **Under Unusual Conditions**

Reduce service intervals specified on the lubrication chart, i.e., lubricate more frequently to compensate for abnormal or extreme conditions, such as high or low temperatures, prolonged periods of high-speed operations, continued operation in sand or dust, immersion in water, or exposure to moisture. Any one of these conditions may cause contamination and quickly destroy protective qualities of lubricants. Intervals may be extended during inactive periods commensurate with adequate preservation.

3-3. Lubrication for Continued Operation Below 0 Degrees F.

Refer to FM 9-207 for instructions on necessary special preliminary lubrication of the semitrailer.

3-4. Lubrication After Fording Operations

After any fording operation, perform annual maintenance service on axles. Clean and repack wheel bearings. Clean brake plungers and lubricate.

3-5. Lubrication After Operations Under Dusty or Sandy Conditions

During continuous operation under dusty or sandy conditions, reduce lubrication interval by 50 percent.

Section II. PREVENTIVE MAINTENANCE CHECKS AND SERVICES

3-6 Purpose

The daily preventive-maintenance service is a systematic inspection of the semitrailer each day it is operated, so that defects may be discovered and rrected before they result in serious damage or lure. This service is performed by the operator and divided into three parts, as indicated in *a* through *c* below. Any defects or unsatisfactory operating characteristics noted during any part of this service, beyond the scope of the operator, will be reported to the organizational maintenance personnel at the earliest opportunity.

a. Before-Operation Service. This is a brief service to ascertain that the semitrailer is ready for operation: it is mainly a check to see if conditions affecting the semitrailer's readiness have changed since the last after-operation service.

b. During-Operation Service. This service consists of detecting unsatisfactory performance. While driving, the driver of the towing vehicle should be alert for any unusual noises, steering irregularities, or any other indications of malfunction of any part of the semitrailer. Every time he applies the brakes or tires the towing vehicle, the driver should instinctively consider it a test and note any unusual or nsatisfactory performance.

c. After-Operation Services. This service consists of having any deficiencies noted during operation and repeating part of the before-operation wire. It is the basic daily service for tactical aterial and consists of correcting, insofar as possible, any operating deficiencies.

3-7. General Procedures

a. The following general procedures apply to preventive maintenance services and to all inspections, and are just as important as the specific procedures.

b. Inspection to see if items are in good condition, correctly assembled or stowed, secure, not excessively worn, not leaking, and adequately lubricated, applies to most items in the preventive maintenance and inspection procedures. Any or all of these checks that are pertinent to any item (including supporting, attaching, or connecting members) will be performed automatically, as general procedures, in addition to any specific procedures given.

(1) Inspection for "good condition" is usually a visual inspection to determine whether the unit is damaged beyond safe or serviceable limits. Good condition means that a component or part is not bent or twisted, not chafed or burred, not broken or cracked, not bare or frayed, not dented or collapsed, not tom or cut, or not deteriomted.

(2) Inspection of any item to see that it is correctly assembled or stowed is usually a visual inspection to see if the item is in its normal position in the vehicle and if all parts are present and in their correct position.

(3) Inspection of an item to determine if it is "secure" is usually a visual examination or a check by hand, wrench, or pry-bar for looseness. Such an inspection must include any brackets, lock washers, lock nuts, locking wires, or cotter pins as well as any connecting tubes, hoses, or wires.

(4) By "excessively worn" is meant worn beyond serviceable limits or to a point likely to result in failure if the item is not replaced before next scheduled inspection. Excessive wear of mating parts or linkage connections is usually evidenced by

too much play (lash or lost motion). It includes illegibility as applied to markings, data, and caution plates.

(5) Where the instruction "tighten" appears in the procedure, it means tighten with a wrench, even if the item appears to be secure.

(6) Such expressions as "adjust if necessary" or "replace if necessary" are not used in the specific procedures. It is understood that whenever inspection reveals the need of adjustment, repairs or replacement, the necessary action will be taken.

c. Clean as follows:

(1) Use dry-cleaning solvent PD-680, (SD II) to clean or wash grease or oil from metal parts. from metal parts.

(2) After the parts are cleaned, rinse and dry them thoroughly. Apply a light grade of oil to all unprotected metal surfaces to prevent rusting.

(3) When authorized to install new parts, remove any preservative materials, such as rust-preventive compound, grease, etc.; prepare parts as required (oil seals, etc.); and for those parts requiring lubrication, apply the lubricant prescribed in Lubrication Chart.

d. General precautions in cleaning are as follows.

(1) Dry-cleaning solvent is flammable and should not be used near an open flame. Fire tinguishers should be provided nearby when t material is used. Use only in well-ventilated places.

(2) This cleaner evaporates quickly and has a drying effect on the skin. If used continuou wihout gloves, cracks in the skin and, in the cas some persons, a mild irritation or inflammation o the skin may result.

(3) Avoid getting petroleum products, such as dry-cleaning solvent, engine fuels, or lubricants, on rubber parts as they will deteriorate rubber which is not resistant to petroleum.

(4) The use of diesel fuel oil, gasoline, or benzene (benzol) for cleaning is prohibited.

e. Nameplates, caution plates and instruction plates may rust very rapidly. When they are found to be rusty, they should be thoroughly cleaned and given a heavy coat of lacquer.

f. Use only tools that are provided and see that they fit properly. Tools that do not fit may slip and cause personal injury and damage to parts.

3-8. Specific Procedures

Table 3-1 gives the specific procedures to be performed on the semitrailer by the operator in the daily service.

Table 3-1. Operator Preventive Maintenance Checks and Services

B — Before Operation
Time required: 2.0

D — During Operation

A — After Operation
Time Required: 0.9

Interval and Sequence No. B	D	A	Item to be inspected Procedure	Work Time M/H)	Equipment is not Ready/Available if:
			CAUTION Place all tags describing conditions of semitrailer in a conspicuous location so that they will not be overlooked.		
1			TIRES Gage tires for correct pressure (65 psi). Remove penetrating objects such as nails or glass. Note any apparent loss of air, unusual wear, or missing valve caps or valve extensions. Check for cuts, gouges or cracks. Check security of spare tire,	0.3	One or more tires missing, flat or unserviceable with no spare available.
2			WHEELS Visually inspect wheel stud nuts to see that they are in place. (Rust streaks coming from stud holes indicates a loose nut). Inner and outer cap nuta used on semitrailer no. 1 through 200 and/or nut assembly used on semitrailer no. 201 and on must be kept tight (para 2-26).	0.3	One or more lug nut (s) missing. One or more studs broken or missing.
3			AIR HOSE COUPLINGS AND ELECTRICAL RECEPTACLES Inspect for cleanliness, security and completeness. Clean as necessary.	0.1	
4			AIR HOSE AND COMPONENTS Look and listen under trailer and inspect hoses and components for apparent air leaks.	0.2	Any cracked, missing or leaking hose.

Table 3-1. Operator Preventive Maintenance Checks and Services — Continued

B — Before Opera Time required: 2.0 | D — During Operation | A — After Operation Time Required: 0.9

Interval and Sequence No. B	D	A	Item to be inspected Procedure	Work Time M/H)	Equipment is not Ready/Available if:
5			AIR SUSPENSION SYSTEM Visually impact all component for damage, especially air springs and air axle lifts. Teat operation of air suspension using control handle (para 2-7). Apply tire air gage to regulator valve in use and check for required air pressure (para 2-24).	0.3	Any damage, will not maintain adequate or safe air pressure.
6			BOGIE ASSEMBLIES Visually impact trunnion shaft, walking beams, and axle mounting brackets for damage or loose nuts. (figs. 5-4, 5-5, and 5-6).	0.1	Damaged or broken walking beams or axle mounting brackets.
7	12	16	BRAKES Note any unusual or unsatisfactory operation when brakes are applied and released. If faulty brakes are suspected, raise axles, apply brakes, end try rotating wheel; try rotating wheel without brakes applied (pare 2-21).	0.1	Brakes do not operate properly.
8			LIGHTS Operate lights (if tactical situation permits) and observe functioning. The towing vehicle air pressure must be above 5 pai to operate stop light switch. Visually impact reflector. See that retractable clearance lights are not unnecessarily in extended position. Check for discolored or broken lens.	0.2	
9			ROLLERS AND SNATCH BLOCK Inspect rollers and snatch block for damage. See that rollers roll free. Check operation of swing-away roller (para 2-16).	0.1	Cable guide roller frozen.
10			FRAME AND COMPONENTS Visually impact frame, landing gear, ramps end ramp tiedown assembly, curbs and decks. Check kingpin for apparent damage. Check frame for cracks at axles 5 and 6 saddle bracket. If cracks appear, notify organizational maintenance personnel.	0.1	Cracks or breaks in and around gooseneck and weldments. Cracks or breaks in frame or crossmembers. Kingpin damaged, cracked, 10088 or chipped.
11			BASIC ISSUE ITEMS Check to see that all basic issue items are on the semitrailer and properly stowed (Appendix B). Inspect reeving ropes for frayed or damaged condition.	0.2	
	13		GENERAL OPERATION Be alert for any unusual noises or improper operation of brakes, tires, air suspension system and winching components. If severe tire thump is noticed at start-up, drive towing vehicle through right end left turns to get flat spots out of phase.	0.1	
	14		OPERATING FAULTS Investigate and correct or report any faults noted during operation.	0.1	
	15		SUSPENSION SYSTEM Inspect suspension system and aaeociated mounting parts to see if they have been damaged.	0.1	

Table 3-1. Operator Preventive Maintenance Checks and Services — Continued

B — Before Operation
Time reauired: 2.0

D — During Operation

A — After Operation
Time Required: 0.9

Interval and Sequence No. B	D	A	Item to be inspected Procedure	Work Time (M/H)	Equipment is not Ready/Available if:
		17	AIR TANKS Drain accumulated water from air tanks by slightly opening tank drain cocks (para 2-10). Tighten drain cocks.	0.2	
		18	ELECTRICAL WIRING Check wiring harnesses to see that they are properly connected and supported and that insulation is not cracked or chafed. Check circuit breaker set (button depressed and locked in depressed position).	0.1	
		19	LUBRICATE Lubricate (within operator capability) those items specified on Lubrication Chart (fig. 3-1 and 3-2) as need arises.	0.5	
		20	CLEAN Wash semitrailer if required.		

Section III. TROUBLESHOOTING

3-9. Scope

a. This section contains troubleshooting information for locating and correcting most of the operating troubles which may develop in the semitrailer. Each malfunction for an individual component, unit, or system is followed by a list of tests or inspections which will help you to determine probable causes and corrective actions to take. You should perform the tests /inspections and corrective actions in the order listed.

b. This manual cannot list all malfunctions that may occur, nor all tests or inspections and corrective actions. If a malfunction is not listed or is not corrected by listed corrective actions, notify your supervisor.

3-10. Troubleshooting Table

The troubleshooting malfunctions, tests and inspections, and corrective actions that can be perfomed by the crew/operator are listed in table 3-2 and 3-3.

NOTE

Before you use these tables, be sure you have performed all applicable operating checks.

Table 3-2. Troubleshooting Semitrailer

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION
ELECTRICAL SYSTEM
1. ALL LAMPS FAIL TO LIGHT
Step 1. Check to see if intervehicular cable is properly plugged into receptacle of towing vehicle. Pull out intervehicular cable and insert it fully into the receptacle (para 2-9).
Step 2. Check current from towing vehicle. Insure that buttons on circuit breakers on semitrailer and towing vehicle are depresse and locked into depressed position.
Step 3. Check for dirty, corroded or loose connections. Clean and tighten connections. Notify organizational maintenance personnel if lights fail to operate.
2. ONE CR MORE LAMPS WILL NOT LIGHT
Step 1. Check for burned-out lamp(s). Replace lamp(s) (para 3-10).
Step 2. Check for dirty or corroded cable contacts in sleeves or lamp sockets. Remove lamps and clean contacts.
Step 3. Check for loose connections or broken cable. Tighten connections. ” Notify organizational maintenance personnel if a wire or cable is broken.
3. DIM OR FLICKERING LIGHTS
Step 1. Check for defective lamp(s). Replace lamp(s) (para 3-10).
Step 2. Check for loose ground connection. Tighten connection.
Step 3. Check for loose, dirty or corroded terminals. Clean and tighten terminals.
Step 4. Check for dirty or corroded lamp sockets, cable connectors, or contacts in wiring harness o inter-vehicular cable plugs. Clean as necessary.
FRAME ASSEMBLY
4. VIBRATION
Step 1. Check tires, wheels and rims for proper-assembly and mounting. Replace badly worn or defective tire (para 2-26). Notify organizational maintenance personnel for defective wheel or rim.

Table 3-2. *Troubleshooting Semitrailer* – Continued

MAI.FUNCTION TEST OR INSPECTION CORRECTIVE ACTION	
Step 2. Brakes not functioning properly. Refer to table 3-3.	

Table 3-3. Troubleshooting Air System

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION	
BRAKE AIR SYSTEM	
1. NO RESPONSE FROM ANY SEMITRAILER BRAKE WHEN BRAKE PEDAL IN TOWING VEHICLE IS DEPRESSED.	
Step 1. Check to see if shutoff valves are closed in towing vehicle service and/or emergency air lines. Open shutoff valve.	
Step 2. Check to see if intervehicular air hoses are properly connected. Close shutoff valve in towing vehicle. Disconnect and reconnect air hose. Open shutoff valve.	
2. ALL SEMITRAILER BRAKES WEAK Check semitrailer pressure at tank valve on auxiliary air supply valve for required 90-120 psi. Replenish air supply (para 2-4)	
3. SLOW BRAKE APPLICATION - ALL SEMITRAILER BRAKES	
Step 1. Check to see if intervehicular service air hose is properly connected. Close shutoff valve on towing vehicle. Disconnect and reconnect air hose. Open shutoff valve.	
Step 2. Check to see if shutoff valve is partially closed on towing vehicle service air line. Open shutoff valve	
4. SLOW BRAKE RELEASE . ALL SEMITRAILER BRAKES Check to see if intervehicular service air hose is properly connected or service air line shutoff valve on towing vehicle is partially closed. Close shutoff valve on towing vehicle. Disconnect and reconnect air hose. Open shutoff valve.	
5. SLOW BRAKE RELEASE ON ONE OR THE OTHER SEMITRAILER TANDEM. Visually inspect emergency relay valve vent and see if it is blocked with mud, ice, or other obstructions. Clean port.	
6. BRAKES OVERHEAT Check semitrailer pressure at auxiliary air supply valve using tire gage, 90-120 psi required. If below 90 psi, replenish air supply (para 2-4).	
7. FAIL-SAFE NOT HOLDING	
Step 1. Manually release power spring. **CAUTION** If springs are already fully released the release bolt may be against its stop so so not use heavy force if the bolt will not turn. Excessive force can strip the release bolt. Turn release bolt counterclockwise until a stop is felt (para 2-3).	
Step 2. Check and see if fail-safe manual release valve handle is pushed in. Pull valve handle out (para 2-4).	

Table 3-3. Troubleshooting Air System–Continued

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION
8. NO BRAKES WILL RELEASE (SEMITRAILER COUPLED TO TOWING VEHICLE)
Step 1. Check semitrailer pressure at auxiliary air supply valve using tire gage, 90-120 psi required. If below 90 psi, replenish air supply (para 2-4).
Step 2. Check to see if intervehicular emergency air hose is improperly connected. Shut off towing vehicle shutoff air cock. Disconnect and reconnect air hose. Open shutoff air cock.
Step 3. Check to see if emergency air hose shutoff valve is closed (M746 only). Open shutoff valve.
Step 4. Check to see if parking brake on towing vehicle is in applied position. Release parking brake.
9. SERVICE BRAKE RELEASE SYSTEM INOPERATIVE
Check air pressure at auxiliary air supply valve using pressure gage. 65 psi pressure required to hold off fail-safe power spring; 45 psi required to automatically release service brakes.
Activate fail-safe brake release system (para 2-3).
10. FAIL-SAFE BRAKE MANUAL RELEASE SYSTEM INOPERATIVE.
Test pressure at air tank fill using tire pressure gage. 65 psi pressure required to hold off fail-safe power spring.
Pressurize fail-safe release tank through fill fitting and manually compress fail-safe units or pressurize entire air system (para 2-4).
SUSPENSION AIR SYSTEM
11. AIR SPRINGS AND AIR AXLE LIFTS FAIL TO INFLATE
Step 1. Check semitrailer pressure at tank valve on auxiliary air supply valve for required 90-120 psi. Wait for brake air system to fully charge.
Step 2. Check to see if all suspension shutoff valves are closed. Open valves (para 2-7).
12. AIR SPRINGS FAIL TO INFLATE WHILE AIR AXLE LIFTS INFLATE PROPERLY.
Check to see if all the suspension shutoff valves to air springs are closed. Open valves (para 2-7).
13. ONE SET OF AIR SPRINGS FAIL TO INFLATE
Check to see if the shutoff valve for malfunctioning air spring is closed. Open valve (para 2-7).
14. BOTH AIR AXLE LIFTS FAIL TO INFLATE
Check to see if the shutoff valve to air springs is closed. Open valve (para 2-7).
15. AIR SPRINGS INFLATE NORMALLY IN ONE POSITION OF AIR CONTROL HANDLE BUT NOT IN OTHER TWO POSITIONS.
Step 1. Check vent ports in air control valve for mud, ice, or other obstructions. Clean ports.
Step 2. Check to see if suspension shutoff valve is closed while air springs are inflated. Open shutoff valve (para 2-7).

Section IV. MAINTENANCE PROCEDURES

3-11. Electrical System

Operator's maintenance of the electrical system consists of replacing defective lamps. Refer to paragraphs 4-19c, *4-21d*, *4-22a*, and *4-27a* for replacement procedures.

NOTE

If lamp replacement does not remedy malfunction, notify organizational maintenance personnel.

CHAPTER 4

ORGANIZATIONAL MAINTENANCE INSTRUCTIONS

Section I. SERVICE UPON RECEIPT OF MATERIEL

4-1. Inspection and Servicing the Equipment

When new, used, or reconditioned materiel is first received by the using organization, it is the responsibility of the officer in charge to determine whether the materiel has been properly prepared for service by the supplying organization and to be sure it is in condition to perform its function. Whenever practicable, the operator, crew, or user will assist organizational maintenance personnel in the performance of their services. Services to be performed are listed below.

a. *General.* If any exterior surfaces are coated with rust-preventive compound, remove with dry-cleaning solvent type II (SD-2). Read "Processing and Reprocessing Record for Storage and Issue of Vehicles and Spare Engines" tag (DD form 1397) and follow all directions carefully.

b. Specific Procedures.

(1) Perform the quarterly preventive maintenance (table 4-2).

(2) Perform all lubrication indicated on the Lubrication Chart (figs. 3-1 and 3-2) regardless of interval.

(3) Schedule second quarterly preventive maintenance service.

(4) Perform a "break in" road test of not less than 25 miles on primary roads at speeds not to exceed 25 mph.

c. Correction of Deficiencies. Deficiencies disclosed during preliminary inspection and ser. vicing or during "break in" period will be corrected by the using organization or supporting maintenance. Deficiencies will be reported in accordance with TM 38-750.

Section II. REPAIR PARTS, SPECIAL TOOLS AND EQUIPMENT

4-2. Tools and Equipment

General mechanic's tool sets and common tool sets required for maintenance on the semitrailer are authorized by the Table of Allowances (TA) and the Table of Organization and Equipment (TOE). Tools and equipment should not be used for purposes other than prescribed and, when not in use, should be properly stowed in the spaces or compartments provided.

4-3. Special Tools and Equipment

Certain tools and equipment specially designed for organizational maintenance and repair of the semitrailer are listed in table 4-1 for information only. This list is not to be used for requisitioning replacements. Special tools for organizational maintenance are listed in TM 9-2330-294-24P, which is the authority for requisitioning replacements.

4-4. Maintenance Repair Parts

Repair parts are supplied to organizational maintenance for the placement of parts that become worn, broken or otherwise unserviceable, provided the replacement of these parts is within the scope of organizational maintenance (see Appendix C). Repair parts for the semitrailer, lowbed, heavy equipment transporter, 60 ton, M747 are listed in TM 9-2330-294-24P, which is the authority for requesting replacements.

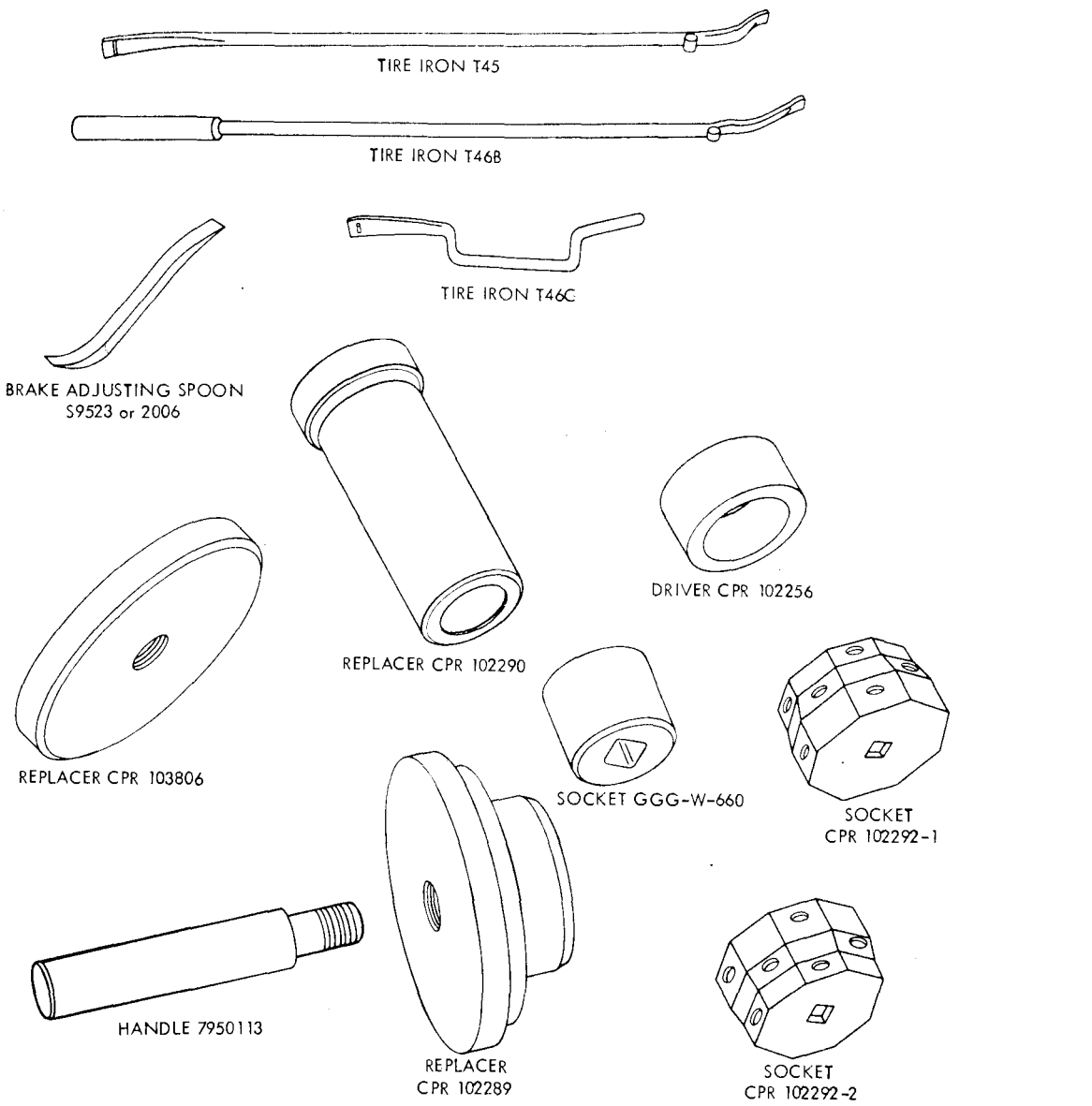


Figure 4-1. Special Tools.

Table 4-1. Special Tools and Equipment

Item	NSN or reference No.	Reference		Use
		Fig. No.	Para NO.	
EAKER, BEAD	4010-01-147-1403 (59'75)		4-59	To remove tire from wheel. Use with Bishman Tire Changer Model 931A.
DRIVER. SEAL	5330-00-498-3893 (CPR 102256)	4-1	*4-35e.*	Seat brake plunger seals.
HANDLE	5120-00-17643879 (7950113)	4-1	*4-60d.*	Used with replacer 5120-00-490-5575.
IRON, TIRE	5120-00-177-6792 (T45)	4-1	*4-59b.*	Tire removal and installation.
IRON, TIRE	5120-00-177-6793 (T46B)	4-1	*4-59b.*	Tire removal and installation.
IRON, TIRE	5120-00-177-6794 (T46C)	4-1	*4-59b.*	Tire *removal* and installation.
REPLACER	5120-00-490-5576 (CPR 102290)	4-1	*4-60d.*	Axle oil seal wiper installation and outer wheel bearing cup installation.
REPLACER	5120-00-490-5575 (CPR 102289)	4-1	*4-60d.*	Inserting oil seal in hub. Used with handle 5120.00.176-8879.
REPLACER	5120-00-493-8820 (CPR 103806)	4-1	*4-60d.*	Inner bearing cup installation.
SOCKET	GGG-W-660	4-1	*4-59f.*	Torque inner wheel nuts (semi. trailer No. 1 through 200).
SPOON, BRAKE AD-JUSTING	512040-962-0118 (S9523)	4-1	*4-30b.*	Adjust brakes.
POON, BRAKE AD-USTING (OPTIONAL)	5120-00-595-8165 (2006)	4-1	*4-306.*	Adjust brakes.
CKET	5120-00-490-5578 (CPR 102292-1)	4-1	*4-60a.* *4-60e.*	Torque wheel bearing jamnut.
SOCKET	5120-00-490-5579 (CPR 102292-2)	4-1	*4-60a.* *4-60e.*	Torque wheel bearing nut.

Section III. LUBRICATION INSTRUCTIONS

4-5. General

This section contains special organizational lubrication instructions not included in the lubrication chart (fig. 3-1 through 3-3) and painting instructions.

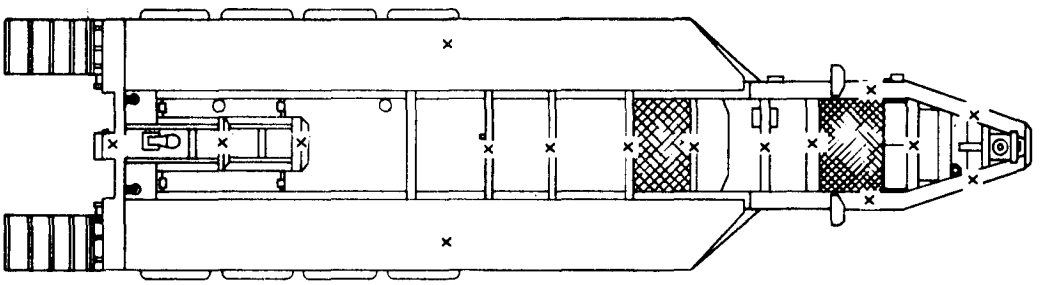
4-6. Special Lubrication Instructions

All special lubricating instructions required for specific mechanisms or parts are contained in the pertinent section.

4-7. Painting

a. General. Instructions for the preparation of the materiel for painting are contained in TM 42-0139. Instructions for camouflage painting are contained in FM5-20. Painting of a complete tactical vehicle can be authorized and performed only by direct support personnel.

b. Walkways. Surfaces marked "X" on figure 4-2 should be coated with walkway compound, non-slip, MIL-W-5044, type II, color OD, Fed Std 696. However, if surfaces become wet from lubricating oils or hydraulic fluids, flight deck compound, non-slip, MIL-D-23003, should be used.



"X" INDICATES AREAS TO BE COATED
WITH WALKWAY COMPOUND

AT 25424

Figure 4-2. Coating of walk way surfaces.

4-8. Vehicle Stenciling
(fig. 4-3)

a. General instructions are contained in TB 43-0209.

b. Stenciling of semitrailers will be performed under the control of organizational maintenance personnel. Drivers or operatore are not authorized to perform this function, except in cases where the operator is also a mechanic or mechanic's helper.

c. Pressure-sensitive adhesive vinyl markers may be located in catalog SC 7660/90-1L and may be used to replace defaced lettering.

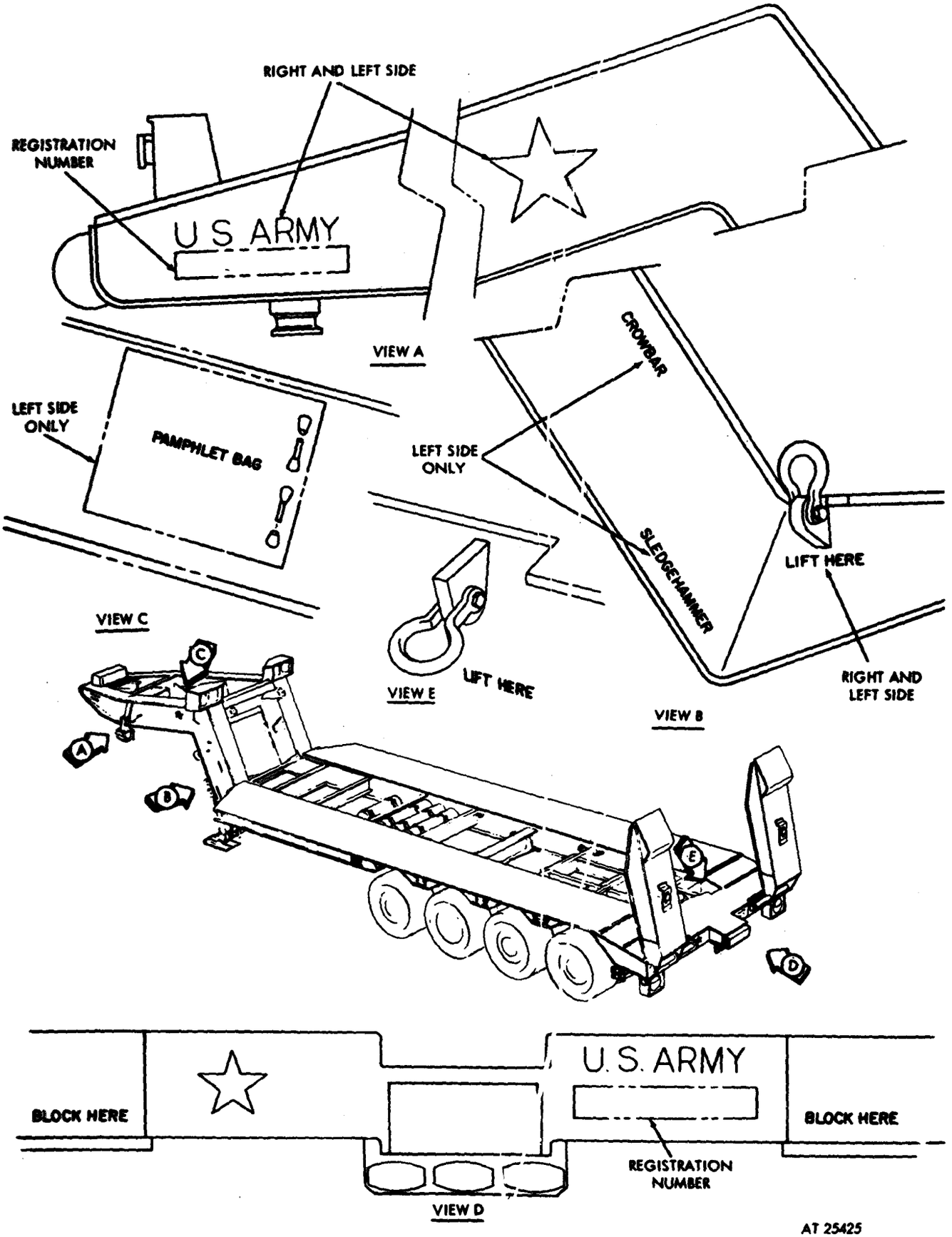


Figure 4-3. Stenciling the M747 semitrailer.

Section IV. PREVENTIVE MAINTENANCE CHECK AND SERVICES (QUARTERLY)

4-9. Recording Repairs

The equipment record system provides for recording repairs required and accomplished on specific items of equipment. This will include, but is not limited to adjusting, cleaning, replacing, and straightening. Deficiencies and shortcomings not corrected by operator, or those discovered during periodic inspections, will be corrected insofar as possible by organizational maintenance personnel. These repairs will be indicated on DA Form 2404 and recorded on the organizational maintenance record of the equipment log.

4-10. General Procedures

a. Operator's Procedures. All of the general procedures given for operator's preventive maintenance, paragraph 3-6, will be followed.

b. Operator Participation. The vehicle operator usually accompanies the vehicle and assists the organizational mechanics in the performance of periodic services.

c. *Unwashed Semitrailer.* The towing vehicle operator should present the semitrailer for a scheduled preventive maintenance service in a reasonably clean condition; that is, it should be dry and not caked with mud to such an extent as to seriously hamper inspection and services, However, washing of the semitrailer should be avoided immediately prior to an inspection, since certain types of defects such as loose parts and oil leaks may not be evident immediately after washing.

d. Plates. Name plates, caution plates, and instruction plates should be thoroughly cleaned and heavily coated with an application of lacquer (refer to TM 43-0139).

e. *Services.* organizational maintenance se are defined by, and restricted to requirements delineated in the Maintenance Allocation Chart, Appendix C.

4-11. Quarterly Preventive Maintenance Services

a. Intervals. The quarterly service is performed by organizational mechanics every 3 months insofar as practicable, in accordance with the procedures outlined in table 4-2.

b. Purpose. The quarterly preventive maintenance service insures the correct adjustment, securing and assembly of all components of the semitrailer. Necessary replacement-s, cleaning, lubrication, and protection of parts and/or assemblies will be accomplished, as required, to give reasonable assurance of trouble-free operation until the next quarterly service is performed.

4-12. Specific Procedures for Organizational Maintenance

Specific procedures for the performance of the quarterly service for the semitrailer is given in table 4-2 for organizational maintenance. The items fall in numerical sequence, and are arranged to provide for ease of maintenance.

Table 4-2. Preventive Maintenance Checks and Services (Quarterly)

Q-Quarterly
Total man-hours required: 5.7

Sequence number	Item to be inspected procedure	Work time (M/H)
	BEFORE ROAD TEST Man-hours required: 2.6	
1	WHEELS AND WHEEL MOUNTING Inspect cap nuts.Look for unusual rust patterns around cap nuts. This usually is an indication of looseness. If rust is present, remove wheel, check for darnaged studs; if serviceable, remount and torque cap nuts to 575-600 pound feet. (para 4-59). Rotate and match tires according to degree of wear. NOTE Semitrailers No. 1 through 200 use inner and outer cap nuts and semitrailers No. 201 and on use outer cap nuts only.	0.2
2	TIRES Gage tires for correct pressure of 65 psi. Replace missing valve caps and valve extenders. Check for matched pair. Check tires for uneven wear. Have axle alinement checked by Organizational Maintenance if tires have unusually rapid wear or high temperatures. Replace tire if objects such as glass or nails penetrate tire or if average tread depth is 3/32 inch or less. No repair is authorized.	0.3

Table 4-2. Preventive Maintenance Checks and Services (Quarterly)—Continued

Quarterly
Total man-hours required: 5.7

Sequence number	Item to be inspected procedure	Work time (M/H)
	CAUTION Retread tires are not authorized for use on the M747 semitrailer.	
3	LIGHTS Operate lights. Replace burned-out lamps. Note condition of reflectors. Check utility electrical outlets for proper operation. Check operation of retractable clearance lights in all positions.	0.2
4	LEAKS Look under semitrailer for an indication of grease. Inspect for air leaks.	0.3
5	AIR SUSPENSION SYSTEM With semitrailer connected to towing vehicles and air pressure applied, check air bags for operation and evidence of leaks. Raise and lower rear axles, noting operation. Check for evidence of damage or wear. Apply air gage to regulator valve air valves and check for correct pressure (para *4-37c).* Adjust regulator valves if required (para 4-37c). Check for wear at lower lift rod connections. Replace missing cotter pins. Check shock absorbers for oil leaks. Replace if leak is found (pare 4-56 and 4-57). Check rubber axle stops for damage or wear and replace if necessary (para 4-58). Check security of air bag protection plates.	0.3
6	BRAKES With semitrailer air lines connected towing vehicle air supply, apply air gage to air valve on auxiliary air supply valve and check system pressure (minimum 65 psi required]. Open, inspect and clean an air chamber. If dirt is present, clean all air chambers (Para 4-33).	0.3
7	TRAILER EQUIPMENT Visually inspect semitrailer towing connections and winching equipment (fig. 2-15). Check tools and BIIL (Appendix B).	0.2
8	LANDING GEAR AND RAMPS Check condition and operation of landing gear and ramps. Inspect for damage, wear or cracks in metal. Replace damaged parts (pare 4-63 and 4-65).	0.4
9	FRAME ASSEMBLY AND GOOSENECK Inspect for damaged or broken parts. Check kingpin for damage or wear. Replace the kingpin if it has uneven wear of 1/16 inch over 1/4 of the circumference of pin, even wear of 1/16 inch over all the circumference of pin, crack of any size on pin welds, or a nick, chip or gouge deeper than 1/8 inch anywhere on the surface of pin. Note condition of paint and legibility of markings and data plates. Inspect for frame cracks where walking beam saddle bracket attaches to main frame. Inspect for frame cracks on main frame where bowtie crossmember joins main frame, near walking beam suspension, (No. 1-200 only).	0.4
	DURING ROAD TEST Man-hours required: 0.4	
10	UNUSUAL NOISE At all times during road test, be alert for unusual or excessive noises that may indicate damage, looseness, defects, or deficient lubrication in semitrailer components and wheels.	0.1
11	BRAKES Make several stops, noting side pull, noise, chatter, or any other unusual condition. Apply semitrailer-brakes alone and observe if they operate effectively. Disconnect hoses from towing vehicle and see if semitrailer brakes apply.	0.3

Table 4-2. *Preventive Maintenance Checks and Services (Quarterly)* –Continued

Q–Quarterly
Total man-hours required: 5.7

Sequence number	Item to be inspected procedure	Work time (M/H)
	AFTER ROAD TEST Man-hours required: 2.7	
12	BRAKE DRUMS AND HUBS Immediately after road test, cautiously feel brake drums and hubs. An overheated brake drum and wheel indicate an improperly adjusted, defective, or dry wheel bearing, or a dragging brake. An abnormally cool condition indicates an inoperative brake.	0.3
13	LEAKS Make general observations under semitrailer for lubricant or air leaks.	0.2
14	SUSPENSION SYSTEM Inspect torque rods, shock absorbers, axle chain stops, mounting brackets, equalizer beams and air suspension components for damage and wear. Check for missing cotter pins and loose nuts. Replace axle stop chains that are badly rusted or frozen at the joints (para 4-56 and 4-57).	0.4
15	FRAME Make general observations of frame, condition and tightness of mounting bolts.	0.3
16	LUBRICATION Lubricate semitrailer in accordance with lubrication chart (fig. 3-1 and 3-2). Coordinate with inspection and disassembly operations to avoid duplication. During wheel bearing lubrication, inspect tires. It is not necessary to remove wheels from hub to perform wheel bearing lubrication.	0.5
17	FINAL ROAD TEST Perform final road test giving special attention to repaired and adjusted items,	0.8
18	WHEELS AND WHEEL MOUNTING Retorque wheel nuts only if wheel has been removed since last torquing by organizational maintenance personnel (para 4-59g).	0.2

Table 4-3. Troubleshooting Semitrailer

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION
ELECTRICAL SYSTEM
1. ALL LAMPS FAIL TO LIGHT
Step 1. Check for defective light switch on towing vehicle. Replace defective switch (TM 9-2320-258-20).
Step 2. Check visually for severed cables in wiring harness. Make open circuit test (para *4-15a*). Repair if accessible (para 4-28). Notify direct support personnel to replace wires buried in body of main harness.
Step 3. Check visually for bare spots in wiring harness. Make short circuit test (para *4-15b*). Repair if accessible (para 4-28). Notify direct support personnel to replace wires buried in body of main harness.
2. ONE OR MORE LAMPS WILL NOT LIGHT
Step 1. Check cable connections at defective lamp. Tighten, repair or replace connectors (para 4-28).
Step 2. Check for damaged composite stoplight-taillight. Replace damaged composite stoplight-taillight (para 4-19).
Step 3. Check for loose or broken ground wire at receptacle. Repair or tighten ground wire. Clean frame surface at the point of ground contact. Clean

Table 4-3. Troubleshooting Semitrailer–Continued

MALFUNCTION TINT OR INSPECTION CORRECTIVE ACTION
2. ONE OR MORE LAMPS WILL NOT LIGHT–Continued
all ground attaching screws and washers to insure metallic continuity between ground wire and frame.
Step 4. Check for damaged retractable clearance light assembly.
Replace damaged retractable clearance light assembly (para 4-20).
3. ALL SERVICE LIGHT (LEFT OR RIGHT SIDE) FAIL TO LIGHT
Step 1. Check for broken cable. Make open circuit test (para 4-15a).
Repair if accessible (para 4-28). Notify direct support personnel to replace wires buried in body of main harness.
Step 2. Check for defective circuit breaker.
Replace circuit breaker (para 4-16).
SUSPENSION SYSTEM
4. SEMITRAILER SAGS TO ONE SIDE
Check for loose bolts on walking beam.
Tighten bolts and nuts.
5. EXCESSIVELY-WORN, SCUFFED OR CUPPED TIRES
NOTE
Mild cupping is normal or non-driving tires. Reverse tires periodically to balance wear,
Step 1. Check for loose wheel bearings.
Adjust wheel bearings (para *4-60e*).
Step 2. Check for deformed rim or wheel.
Replace wheel (para 4-59).
Step 3. Check for out of round brake drum.
Notify direct support maintenance personnel for repair and/or replacement unit.
Step 4. Check air suspension system.
Refer to table 4-4.

Table 4-4. Troubleshooting Air System

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION
BRAKE AIR SYSTEM
1. NO RESPONSE FROM ANY SEMITRAILER BRAKE WHEN BRAKE PEDAL IN TOWING VEHICLE IS DEPRESSED
Step 1. Check for excessive drum to lining clearance on all wheels (para 4-30b).
Adjust brakes (para 4-30b).
Step 2. Check for damaged service air line.
Replace damaged air line (para 4-39).
2. NO BRAKE RESPONSE ON FRONT TANDEM ONLY, OR ON REAR TANDEM ONLY
Step 1. Visually inspect service air line to emergency relay valve on axle tandem without brakes for dents or breaks. Loosen fitting on line at emergency relay valve and depress towing brake pedal. Air will escape when pedal is depressed if line is clear.
Replace damaged or plugged air line (para 4-39).
Step 2. Visually inspect line between semitrailer reservoir and relay valve on affected axle for dents or breaks. Cautiously loosen fitting at relay valve. Air should escape; no air indicates plugged line.
Replace damaged or plugged air line (para 4-39).

Table 4-4. Troubleshooting Air System — Continued

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION
2. NO BRAKE RESPONSE ON FRONT TANDEM ONLY, OR ON REAR TANDEM ONLY-Continued
Step 3. Check for defective emergency relay valve on axle without brakes (para *4-37f).* Replace relay valve (para 4-42).
3. NO BRAKES ON ONE TRAILER AXLE ONLY
Visually inspect air line between emergency relay valve and brake chambers on affected axle for dents or breaks. Cautiously loosen line fitting near one brake chamber while brakes are applied and listen for escaping air; no air indicates plugged line. Replace damaged or plugged air line (para 4-39).
4. NO BRAKE RESPONSE AT ONE WHEEL ONLY
Step 1. Check for excessive drum to lining clearance (pare *4-30b).* Adjust brakes (para *4-30b).* If this fails inspect, repair or replace plunger housing assembly (para 4-35).
Step 2. Visually inspect air line between emergency relay valve and brake chambers for breaks or dents. Cautiously loosen line fitting near one brake chamber while brakes are applied and listen for escaping air; no air indicates plugged line. Replace damaged or plugged air line (para 4-39).
Step 3. Check air chamber for punctured diaphragm (para *4-32a).* Manually compress fail-safe (para *4-30d)* and remove, inspect and clean air chamber and wedge assembly. Pull hub and drum (para 4-60) and visually inspect mechanism. Assure brake shoe return springs are properly engaged. Inspect and service plungers. Clean, repair or replace brake mechanism parts (para 4-30 through 4-35).
5. ALL TRAILER BRAKES WEAK
Step 1. Check for ice or mud in brake mechanism. Pu1l hub(s) and drum(s) (para 4-60) and visually inspect brake parts. Expose brakes to warmth. Clean parts of mud and dry all parts.
Step 2. Pull hub(s) and drum(s) (para 4-60) and visually inspect for worn out brake lining (para 4-31). Replace shoe and lining assembly (para 4-31).
Step 3. Check for excessive lining to drum clearance (para *4-30b).* Adjust brakes (para *4-30b).* If this fails inspect, repair or replace plunger housing assembly (para 4-35).
6. WEAK BRAKES AT ONE OR MORE WHEEL LOCATIONS, BUT NOT ALL
Step 1. Check for ice or mud in brake mechanism. Pull hub(s) and drum(s) (para 4-60) and visually inspect brake parts. Expose brakes to warmth. Clean parts of mud and dry all parts.
Step 2. Pull hub(s) and drum(s) (para 4-60) and visually inspect for worn out brake lining (para 4-31). Replace shoe and lining assembly (para 4-31).
Step 3. Check for excessive lining to drum clearance (para *4-30b).* Adjust brakes (para *4-30b).* If this fails inspect, repair or replace plunger housing assembly (para 4-35).
Step 4. Pull hub(s) and drum(s) (para 4-60) and visually inspect for grease on brake lining. Replace shoe and lining assembly (para 4-31).
Step 5. Pull hub(s) and drum(s) (para 4-60). Activate brakes and observe shoe and plunger movement. One or both wedge assemblies on wheel(s) could be jammed. Depressureize air system. Compress fail-safe(s) manually (para *4-30d). Remove air* chambers (para 4-33) and remove, inspect, clean or replace plunger housing assembly (para 4-35).
Step 6. Check to see if one or both brake air chambers are leaking. Air leak should be audible if very large. Apply and hold brake; leakage in area of brake chambers, other than initial venting of air caused by movement of diaphragm, is not permissible. Replace brake air chamber (para 4-33).

Table 4-4. Troubleshooting Air System – Continued

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

7. SLOW BRAKE APPLICATION - ALL SEMITRAILER BRAKES
   Step 1. Check for damaged service air line.
   Replace damaged air line (para 4-39).
   Step 2. Disconnect service air line (fig. 4-27 or 4-28) at emergency relay valves that serves malfunctioning brakes.
   Depress and release towing vehicle brake pedal. Air should escape with brake application and immediately stop flowing when pedal is released. Any other response indicates plugged line.
   Replace plugged air line (para 4-39).
   Step 3. Visually inspect air line connecting emergency relay valves to reservoir for dents or breaks. Cautiously loosen fitting a few threads at emergency relay valve. Air should escape; no air indicates plugged line.
   Replace damaged or plugged air line (para 4-39).
8. SLOW BRAKE RELEASE - ALL SEMITRAILER BRAKES
   Step 1. See malfunction 7, step 1.
   Replace damage air line (para 4-39).
   Step 2. See malfunction 7, step 2.
   Replace plugged air line (para 4-39).
9. SLOW BRAKE APPLICATION ON ONE OR THE OTHER SEMITRAILER TANDEM
   Step 1. See malfunction 7, step 1.
   Replace damagd air line (para 4-39).
   Step 3. See malfunction 7, step 2.
   Replace plugged air line (para 4-39).
   Step 3. See malfunction 7, step 3.
   Replace damaged or plugged air line (para 4-39).
   step 4. Check for defective emergency relay valve (para *4-37f*).
   Replace relay valve (para 4-42).
10. SLOW BRAKE RELEASE ON ONE OR THE OTHER SEMITRAILER TANDEM
   Step 1. See malfunction 7, step 1.
   Replace damage air line (para 4-39).
   Step 2. See malfunction 7, step 2.
   Replace plugged air line (para 4-39).
   Step 3. See malfunction 9, step 4.
   Replace relay valve (para 4-42).
11. SLOW BRAKE APPLICATION OR RELEASE ON ONE AXLE ONLY
   Step 1. See malfunction 6, step 1.
   Expose brakes to warmth. Clean parts of mud and dry all parts.
   Step 2. See malfunction 4, step 2.
   Replace damaged or plugged air line (para 4-39).
   Step 3. See malfunction 6, step 6.
   Replace brake air chamber (para 4-33).
12. GRABBING BRAKES
   Step 1. Pull hub(s) and drum(s) (para 4-60) and visually inspect for grease on brake linings or damage. Check brake drum for scoring or cracking.
   Replace shoe and lining assembly (para 4-31). Replace grease seals on axle ends if grease is found on linings (para 4-60). Replace drum (para 4-60).
   Step 2. See malfunction 9, step 4.
   Replace relay valve (para 4-42).
   Step 3. Pull hub(s) and drum(s) (para 4-60) and inspect for loose or damaged wheel bearings.
   Adjust or replace wheel bearings (para 4-60).

Table 4-4. Troubleshooting Air System – Continued

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

13. BRAKES OVERHEAT

Step 1. Check for insufficient lining to drum clearance (para *4-30b(3)).*
Adjust brakes (para *4-30b* (3)). If this fails inspect, repair or replace automatic adjuster (para 4-35).

Step 2. Pull hub(s) and drum(s) (para 4-60) and visually inspect brake mechanism. Apply brake and observe shoe movement. Shoes should expand and return smoothly.
Replace broken return spring (para 4-31). If shoe action is still not smooth and free clean brake mechanism parts and reassemble.

14. UNEVEN BRAKES

Step 1. See malfunction 4, step 1.
Adjust brakes (para *4-30b).* If this fails inspect, repair or replace automatic adjuster (para 4-35).

Step 2. See malfunction 4, step 2.
Replace damaged or plugged air line (para 4-39).

Step 3. See malfunction 4, step 3.
Clean, repair or replace brake mechanism parts (para 4-30 through 4.35).

Step 4. See malfunction 9, step 4.
Replace relay valve (para 4-42)

15. HARD PULLING BRAKES

Step 1. See malfunction 4, step 1.
Adjust brakes (para *4-30b).* If this fails inspect, repair or replace automatic adjuster (para 4-35).

Step 2. See malfunction 4, step 2.
Replace damaged or plugged air line (para 4-39).

Step 3. See malfunction 4, step 3.
Clean, repair or replace brake mechanism part (para 4-30 through 4-35).

Step 4. See malfunction 9, step 4.
Replace relay valve (para 4-42).

16. FAIL-SAFE NOT HOLDING

Step 1. Check to see if the power springs are released.

CAUTION

If springs are already fully released, the release bolt may be against its stop so do not use heavy force if the bolt will not turn. Excessive force can strip the release bolt.

Turn release bolt counterclockwise until a stop is felt (para *4-30d).*

Step 2. Check for excessive drum to lining clearance (para *4-30b*).
Adjust brakes (para *4-30b).* If this fails inspect, repair, or replace plunger housing assembly (para 4-35).

Step 3. Check for jammed brake actuators on wheel ends or mud or ice in mechanism.
Expose brakes to warmth. Clean parts of mud and dry all parts.

Step 4. Turn release bolt clockwise. Lack of resistance indicates broken spring or stripped bolt. If bolt turns clockwise after 25 turns are made, bolt threads are stripped.

CAUTION

Do not force bolt. A stop is built into the fail-safe, and the bolt can be stripped if turned past this stop .

Replace fail-safe (para 4-32).

17. NO BRAKES WILL RELEASE (SEMITRAILER COUPLED TO TOWING VEHICLE)
Check for defective emergency relay valve (para *4-37f*),
Replace relay valve (para 4-42).

18. BRAKES WILL NOT RELEASE ON SINGLE WHEEL

Step 1. Visually inspect air line in immediate area of locked wheel for dents or breaks. Manually compress fail-safe; if wheels become free obstruction in air supply is indicated.
Replace damaged or plugged tubing (para 4-39).

Table 4-4. Troubleshooting Air System – Continued

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

18. BRAKES WILL NOT RELEASE ON SINGLE WHEEL – Continued
Step 2. Check to see if the brake lining is frozen to drum.
Expose brakes to warmth.
Step 3. Check lining to drum clearance. If no clearance exists, manually compress fail-safe or adjust brakes (pars *4-30b*) until clearance is obtained, then pull hub and dmm (para 4-60). Visually inspect brake mechanism.
Clean, repair or replace brake mechanism part (pare 4-30 through 4-35).
19. SERVICE BRAKE RELEASE SYSTEM INOPERATIVE
Step 1. Check for ice or mud in brake mechanism. Pull hub(s) and drum(s) (para 4-60) and visually inspect brake mechanism.
Expose brakes to warmth. Clean and dry brake mechanism parts.
Step 2. Visually inspect air line between trailer reservoir and manual release valve for dents or breaks. Cautiously loosen fitting near valve and listen for escaping air. No air escaping indicates plugged line.
Replace damaged or plugged air line (para 4-39).
Step 3. Check for defective manual release valve (para 4-37g).
Replace valve (para 4-45).
Step 4. Pull out manual release valve knob. Loosen fitting on line near emergency relay valve. Push in release valve knob. Air should escape from fitting when manual release valve knob is pushed in. No air indicates plugged line.
Replace plugged line (para 4-39).
Step 5. Check for defective emergency relay valve (para *4-37f*).
Replace valve (para 4-42).
20. FAIL-SAFE BRAKE MANUAL RELEASE SYSTEM INOPERATIVE
Step 1. Visually inspect air line between fail-safe release tank and manual 'release valve for dents or breaks. Try to pressurize release tank thru the fill fitting from an outside air source; if this cannot be done, tubing is plugged.
Replace damaged or plugged tubing (pare 4-39).
Step 2. Check for defective fail-safe broke release valve (para *4-37h*).
Replace valve (pare 4-45).
Step 3. Pull out manual release valve knob. Loosen fitting on air line near fail-safe unit. Push in valve knob. Air should escape from fitting when manual release valve knob is pushed in. No air indicates plugged line.
Replace plugged line (para 4-39).
21. ONE OR MORE (BUT NOT ALL) FAIL-SAFE UNITS WILL NOT RELEASE
Step 1. Check fail-safe unit for air leak. Air wiil continuously leak from vent hole on fail-safe cap if defective.
Replace fail-safe unit (para 4-32).
Step 2. Check for ice and mud in brake mechanism. Pull hub(s) and drum(s) (para 4-69) and visually inspect brake mechanism.
Expose fail-safe to warmth. Clean and dry brake mechanism parts.
22. M746 TRAILER LOW AIR PRESSURE LIGHT COMES ON WHEN BRAKE PEDAL IS DEPRESSED
Step 1. Visually inspect air line between air reservoir and emergency relay valves for dents or breaks,
Replace damaged or plugged line (par 4-39).
Step 2. Check for defective low air pressure warning switch (para *4-37j*).
Replace switch (para 4-29).
23. FAIL-SAFE RELEASE TANK DOES NOT PRESSURIZE - MAIN AIR SYSTEM NORMAL
Check for defective one-way check valve (pare *4-37n*).
Replace valve (para 4-46).

Table 4-4. Troubleshooting Air System – Continued

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

24. FAIL-SAFE RELEASE TANK DOES NOT REMAIN PRESSURIZED WHEN MAIN AIR SYSTEM IS DRAINED

Step 1. Check for leakage in tank fittings or lines leading to fail-safe manual release valve.
Tighten fittings or replace defective components (para 4-39).

Step 2. If no leaks are found in step 1 above, check for defective one-way check valve (para *4-37n).*
Replace valve (para 4-46).

SUSPENSION AIR SYSTEM

25. AIR SPRINGS AND AIR AXLE LIFTS FAIL TO INFLATE

Visually inspect air line between air tank and air control valve for dents or breaks.
Cautiously loosen fitting near air control valve and listen for escaping air. No escaping air indicates plugged line.
Replace damaged or plugged air line (para 4-39).

26. AIR SPRINGS OR AIR AXLE LIFTS FAIL TO INFLATE FULLY

Step 1. Check for defective or misadjusted pressure regulator valves (para *4-37i).*
Adjust valve (para *4-37i*) or replace valve (para 4-49).

Step 2. Check for defective two-way check valve (para *4-37k*).
Replace valve (para 4-51).

27. AIR SPRINGS FAIL TO INFLATE WHILE AIR AXLE LIFTS INFLATE PROPERLY

Step 1. Check for defective two-way check valve (para *4-37k).*
Replace valve (para 4-51).

Step 2. Check for defective air control valve (para *4-37m).*
Replace valve (para 4-48).

Step 3. Visually inspect for torn or damaged air spring.
Replace air springs (para 4-55)

28. ONE SET OF AIR SPRINGS FAIL TO INFLATE

Visually inspect air line going to defective air spring for dents or breaks. Cautiously loosen fitting at air spring with air control valve handle in "LIGHT LOAD" position and listen for air escaping. No escaping air indicates plugged line.
Replace damaged or plugged air line (para 4-39).

29. BOTH AIR AXLE LIFTS FAIL TO INFLATE

Step 1. Check for defective or misadjusted 100 psi regulator valve (para *4-37i).*
Adjust valve (para *4-37i)* or replace valve (para 4-49).

Step 2. Check for broken or loose lift rod.
Tighten or replace lift rod (para 4-54).

Step 3. Check for defective air control valve (para *4-37m).*
Replace valve (para 4-48).

Step 4. Visually inspect for torn or damaged air axle lifts.
Replace air axle lifts (para 4-54).

30. ONE AIR AXLE LIFT FAILS TO INFLATE

Step 1. Visually inspect air line going to defective air axle lift for dents or breaks. Cautiously loosen fitting at air axle lift with air control valve handle in "NO LOAD (LIFT)" position and listen for air escaping. No escaping air indicates plugged line.
Replace damaged or plugged air line (para 4-39).

Step 2. Visually inspect for torn or damaged air axle lift assembly.
Replace air axle lift assembly (para 4-54).

31. AIR WILL NOT VENT WHEN AIR CONTROL VALVE HANDLE IS MOVED FROM HIGH TO LOW PRESSURE POSITION

Check for defective air control valve (para *4-37m).*
Replace valve (para 4-48).

Table 4-4. Troubleshooting Air System – Continued

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION
32. AIR SPRINGS INFLATE NORMALLY IN ONE POSITION OF AIR CONTROL VALVE HANDLE, BUT NOT IN OTHER TWO.
Step 1. Check for defective two-way check valve (para *4-37k*).
Replace valve (para 4-51).
Step 2. Check to see if air control handle is secured to valve.
Replace valve if handle cannot be secured (para 4-48).
Step 3. Check for defective or misadjusted pressure regulator valves (para *4-37i*).
Adjust valve(s) (para *4-37i*) or replace valve(s) (para 4-49).
Step 4. Visually inspect air lines supplying air to regulator valves for dents or breaks. Cautiously loosen fitting on line suspected of being plugged and listen for escaping air while air control valve handle is in appropriate position. No air escaping indicates plugged line.
Replace damaged or plugged air line (para 4-39).

Section V. TROUBLESHOOTING

4-13. Scope

a. This section contains troubleshooting information for locating and correcting most of the operating troubles which may develop in the semitrailer. Each malfunction for an individual component, unit, or system is followed by a list of tests or inspections which will help you to determine probable causes and corrective actions to take. You should perform the tests/inspections and corrective actions in the order listed.

b. This manual cannot list all malfunctions that may occur, nor all tests or inspections and corrective actions. If a malfunction is not listed or is not corrected by listed corrective actions, notify your supervisor.

4-14. Troubleshooting Table

The tests and corrective actions provided in tables 4-3 and 4-4 are" governed by scope scope of the organizational level of maintenance. Table 4-3 includes a list of malfunctions, tests or inspections and corrective actions for the semitrailer electrical system, suspension system and frame assembly. Table 4-4 includes a list of malfunctions, tests or inspections and corrective actions for the brake and suspension air system. Procedures and tests used in conjunction with troubleshooting the air system are included in paragraph 4-37.

NOTE

Before you use these tables, be sure you have performed all applicable operating checks.

Section VI. ELECTRICAL SYSTEM MAINTENANCE

4-15. Tests Used in Conjunction with Troubleshooting

a. *Wiring Harness Open Circuit Test* (fig. 4-4 or 4.5).

(1) If light circuit is inoperative, insure bulbs are good before proceeding with open circuit test. Repair obvious breaks in wiring at harness ends that are accessible (para *4-28c*).

(2) If no break is visible, use volt-ohmmeter and check for open circuit as follows:

(a) Place the range selector on the meter in the Rx100 position.

(b) Perform steps *b* (4) *(b*) through *(d*) of Short Circuit Test below.

(c) Unshort the meter leads and check for continuity between pins D and L on trailer receptacle (J 1, fig. 4-4 or 4-5). Full deflection on the ohmmeter should occur (zero ohms). If full deflection does not occur, check each pin to ground to determine which pin is not grounded properly. Repair faulty circuit.

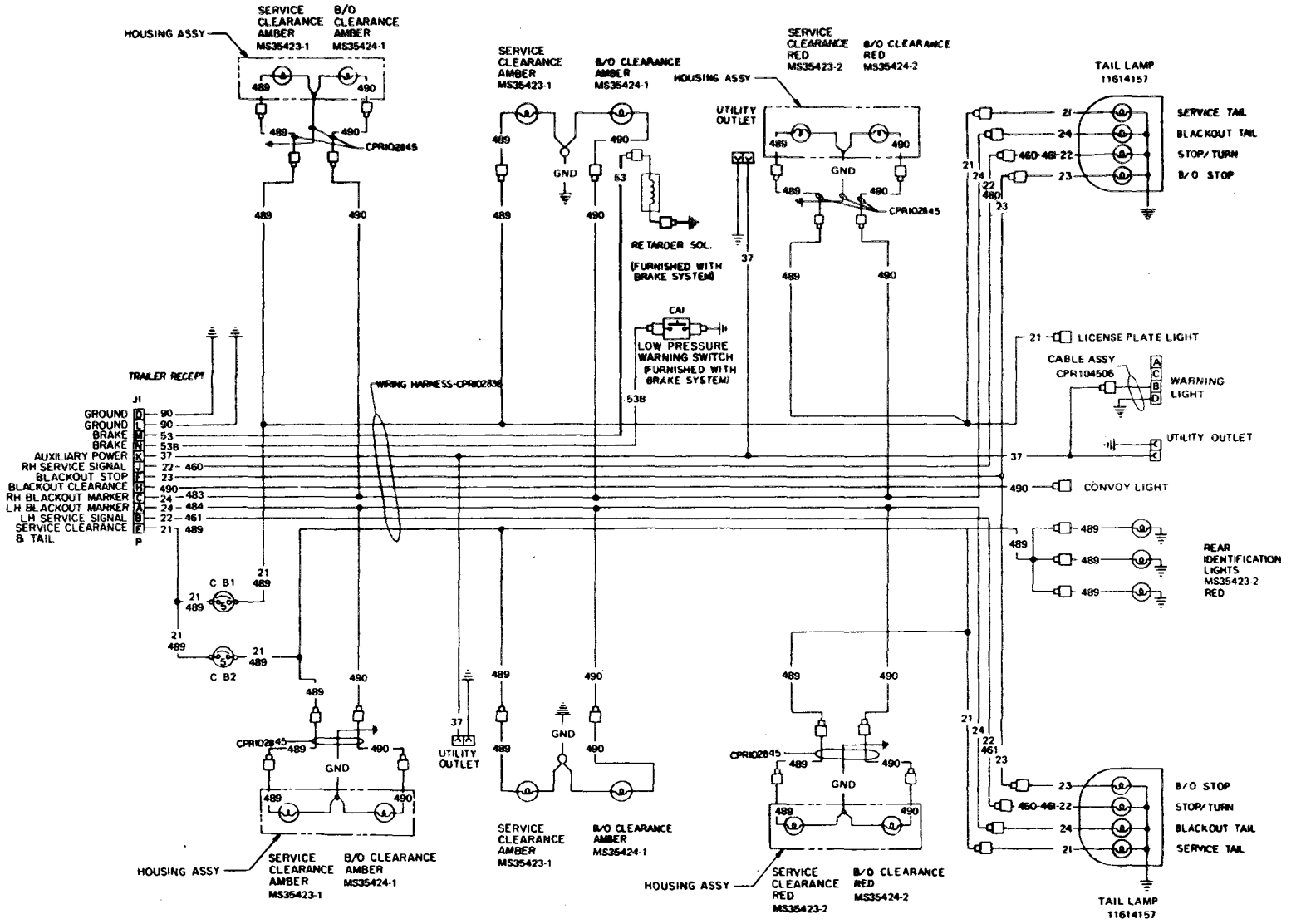
(d) If pins D and L of trailer receptacle J1 are properly grounded, locate the pin on the trailer receptacle for the failed circuit.

(e) On the trailer receptacle, J1, connect a jumper wire from the pin of the failed circuit to pin D or L.

(f) Place the range selector on the volt-ommeter in the Rx100 scale position.

(g) Disconnect connector at inoperative component. Connect one meter lead to connector on main harness (CPR 102836 for semitrailer no. 1 through 200; 11675789 for semitrailer no. 201 and on). Connect the other lead to ground. Full deflection on the ohmmeter should occur (zero ohms). If full deflection occurs, then the component assembly is defective. If full deflection does not occur, and the open circuit is not visible, a new wire is required between the connector on the main harness and the pin on the trailer receptacle J1; notify support personnel.

(h) It should be noted that if the service clearance lamp circuits are being tested and an open circuit condition exists, then an additional open circuit test must also be made on each CPR 102845 harness for semitrailer no. 1 through 200 and 11675775 harness for semitrailer no. 1 through 200 and 11675775 harness for semitrailer no. 201 and on. connected between each clearance lamp assembly and the main harness (CPR 102836 for semitrailer no. 1 through 200; 11675789 for semitrailer no. 201 and on.)



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Figure 4-4. Wiring schematic diagram (semitrailer No. 1 through 200).

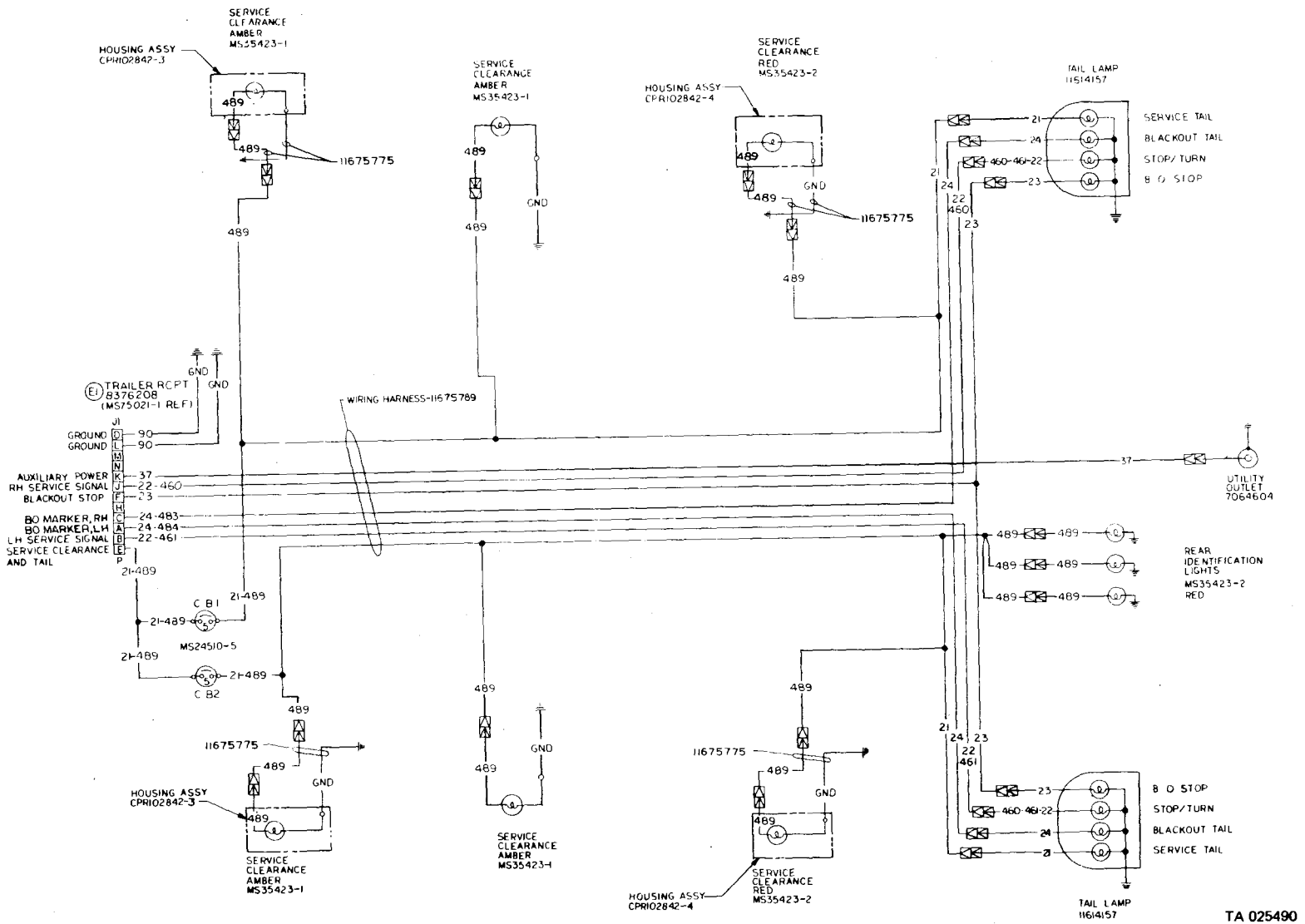


Figure 4-5. Wiring schematic diagram (semitrailer No. 201 and on).

b. Wiring Harness Short Circuit Test.

(1) Inspect harness CPR 102836 and 102845 for semitrailer no. 1 through 200 and harness 11675789 and 11675775 for semitrailer no. 201 and on for chaffing in accordance with paragraph 4-28a.

(2) Remove bulbs from the light assemblies which are not operating.

(3) Using wiring diagram figure 4-4 or 4-5, locate pins of the suspected defective circuit in the trailer receptacle J1 (fig. 4-20 or 4-21).

(4) Use volt-ohmmeter and perform the following short circuit test:

(a) Place the range selector on the meter in the Rx1 position.

(b) Assure meter is set for "DC" operation.

(c) Assure one end of both meter leads are plugged into the proper jacks on the meter.

(d) Short the free ends of the two meter leads together and adjust the meter for zero ohms.

(e) Unshort the meter leads. Connect one lead to ground and the other lead to the trailer receptacle pin of the suspected defective circuit.

(f) In performing step *(e),* no deflection of the meter should occur. However, if pin "N" is being tested, the following reading should be obtained: Pin N to ground– full scale deflection with air pressure below 65 psi.

(g) Any pin being tested which results in a full scale meter deflection (other than pin "N" of *(f*) above) indicates a short to ground. Repair main harness branch end wires as required. Notify direct support personnel for repair of wires buried in main body of harness.

(h) It should be noted that if the service clearance lamp circuits are being tested and a short condition exists, then an additional short circuit test must also be made on each CPR 102845 harness for semitrailer No. 1 through 200 and 11675775 harness for semitrailer No. 201 and on, connected between each clearance lamp assembly and the main harness CPR 102836 for semitrailer No. 1 through 200 and 11675789 for semitrailer No. 201 and on.

(5) If no circuit is found in performing (4) above, remove all bulbs from the trailer lights and any apparatus connected to the utility outlet.

(6) Repeat (4) *(a)* through *(d*) above.

(7) Perform a continuity short circuit test of all pins on the trailer receptacle (J1) in the following manner:

(a) Connect the positive meter lead to pin A. Connect the other meter lead to the other pins of the receptacle (B, C, D . . . N consecutively) one at a time.

(b) Remove the positive meter lead from pin A and connect to pin B. Connect the other meter lead to the other pins of the receptacle (C, D, E . . . N consecutively) one at a time.

(c) Repeat *(b*) above until all remaining pins (C through N) have been connected to the positive meter lead and tested against all the other pins of the connector.

(d) In performing tests *(a)* through *(c)* above, no deflection of the meter should occur except for the following:

(1) Pin A to C and Pin D to L– continuity.

(2) Pin N to D or L–continuity with air pressure below 65 psi.

4-16. Circuit Breaker Replacement

(fig. 4-6)

a. Removal.

(1) Remove boot (jam nut within) and lock washer securing circuit breaker to mounting bracket.

(2) Pull circuit breaker to rear until clear of bracket.

(3) Remove two screws and lock washers securing electrical leads to circuit breaker and remove circuit breaker.

b. Installation. Discard jam nut and keyway washer from new circuit breaker. Install circuit breaker in reverse order of removal *(a* above).

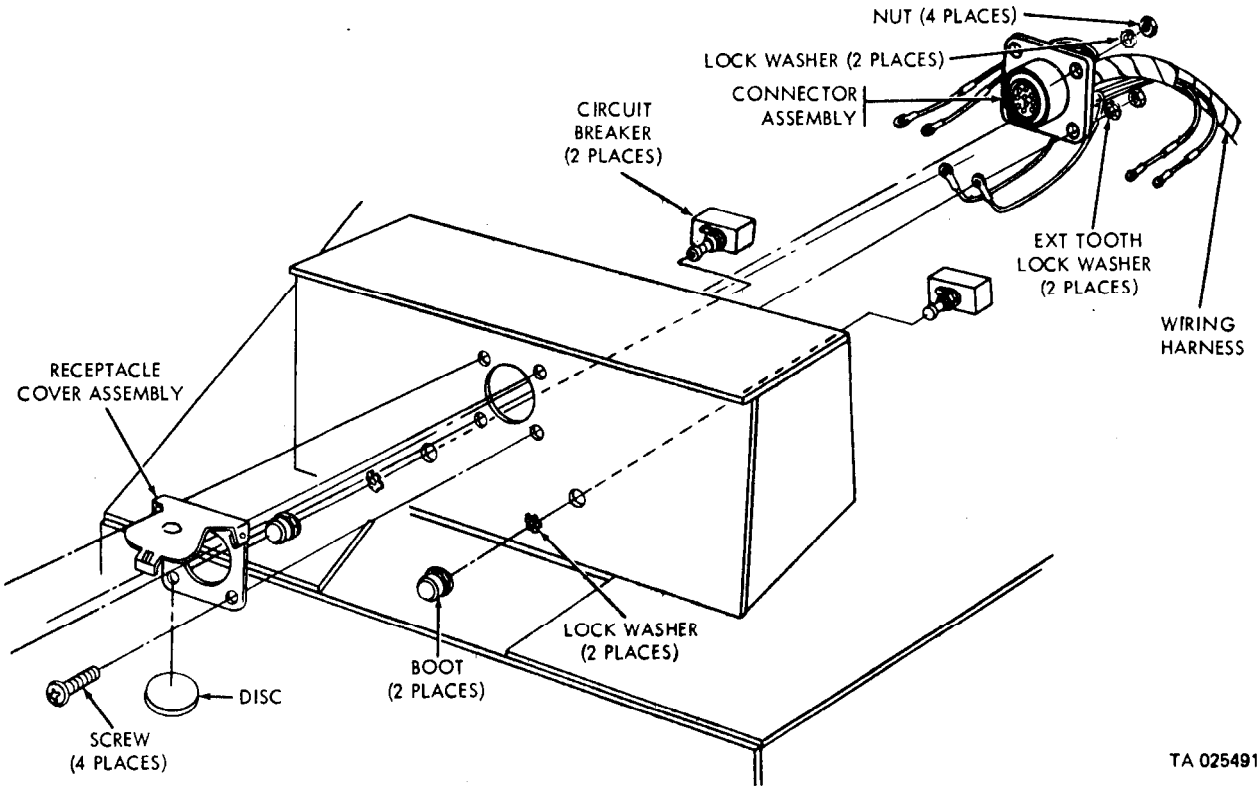


Figure 4-6. Intervehicular receptacle cover and circuit breaker.

4-17. Intervehicular Receptacle *Cover* Replace. ment and Repair

(fig. 4-6)

a. Removal. Remove four nuts, two lock washers (upper), two external tooth lock washers (lower) and four screws securing receptacle cover, connector assembly and wiring harness ground leads to gooseneck bracket. Remove receptacle cover.

b. Repair. Remove cracked or worn rubber disc in cover and replace. Cement new disc in cover with adhesive, rubber, type 11, (MMM-A-1617).

c. Installation. Install receptacle cover in reverse order of removal (a above) being certain to connect wiring harness ground wires to bottom screws.

4-18. Utility Outlet Replacement

(fig. 4.7)

a. Removal.

(1) Disconnect utility outlet electrical connector at main wiring harness .-

(2) Remove cover from outlet.

(3) Remove two screws and lockwashers securing outlet to bracket and remove cover and outlet.

b. Installation. Replace utility outlet and install in reverse order of removal *(a* above).

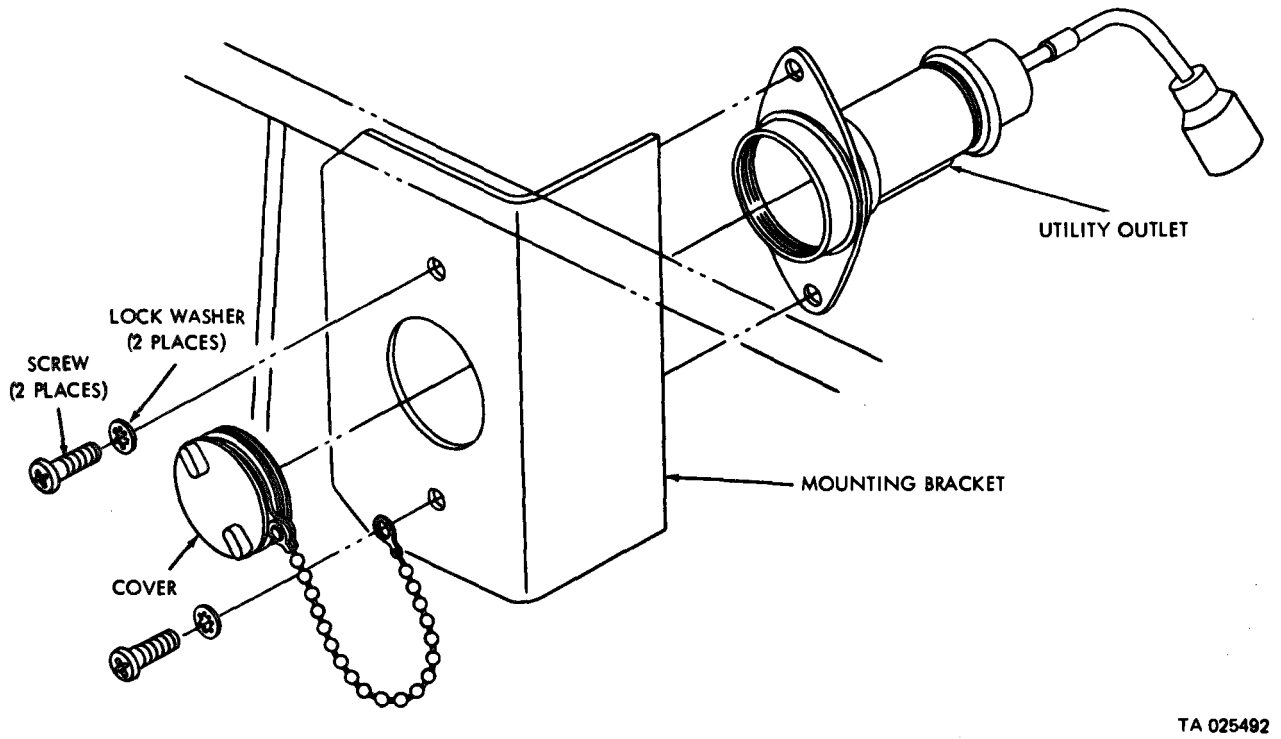


Figure 4-7. Utility outlet.

4-19. Composite Stoplight-Taillight

a. Removal (fig. 4-8).

(1) Remove four cap screws, lockwashers and washers securing light guard to light frame housing and remove guard.

(2) Disconnect four electrical leads.

(3) Remove two cap screws and internal-external tooth lockwashers securing composite light to light frame housing and remove composite light.

b. Installation. Install new composite light in reverse order of removal *(a* above).

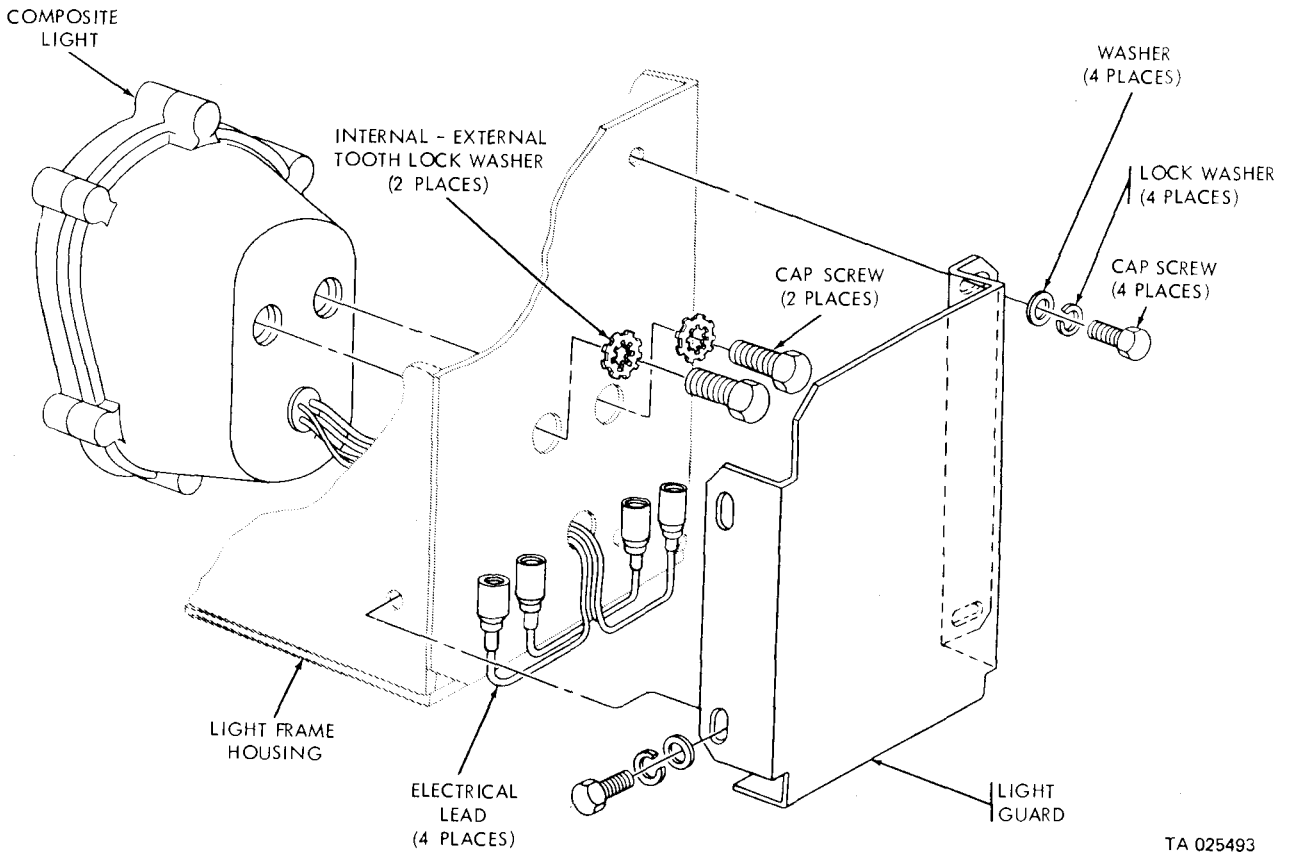


Figure 4-8. Composite stoplight-taillight

c. Door and Lens Assembly and Lamp Replacement (fig. 4-9).

(1) Loosen six captive screws securing door and lens assembly to body assembly.

(2) Remove door and lens assembly and preformed packing.

(3) Replace lamps as required.

(4) Inspect preformed packing and replace if damaged.

(5) Inspect door and lens assembly, replace if damaged, and secure to body assembly with six captive screws.

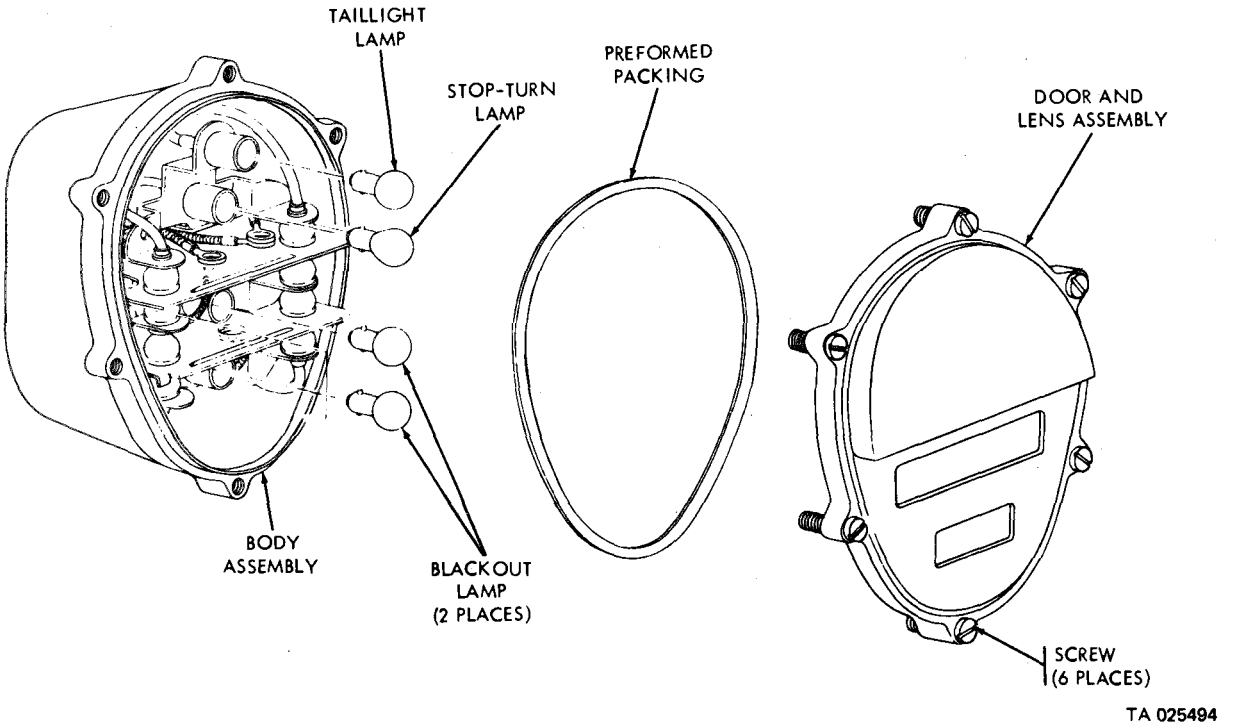


Figure 4-9. Composite stoplight- taillight – exploded view.

4-20. Retractable Clearance Light Housing Assembly Replacement

(fig. 4-10 and 4-11)

a. Removal.

(1) Disconnect clearance light wiring harness electrical connector(s) at main wiring harness connection.

(2) Remove cap screw and lock washer securing wiring harness clamp and disconnect clearance light wiring harness ground lead terminal and harness,

(3) Remove two screws, lock washers and washers from rear of housing assembly.

(4) Loosen clamp lever on frame bracket and pull housing assembly from bracket.

b. Installation. Install new or repaired clearance light housing assembly in reverse order of removal *(a* above).

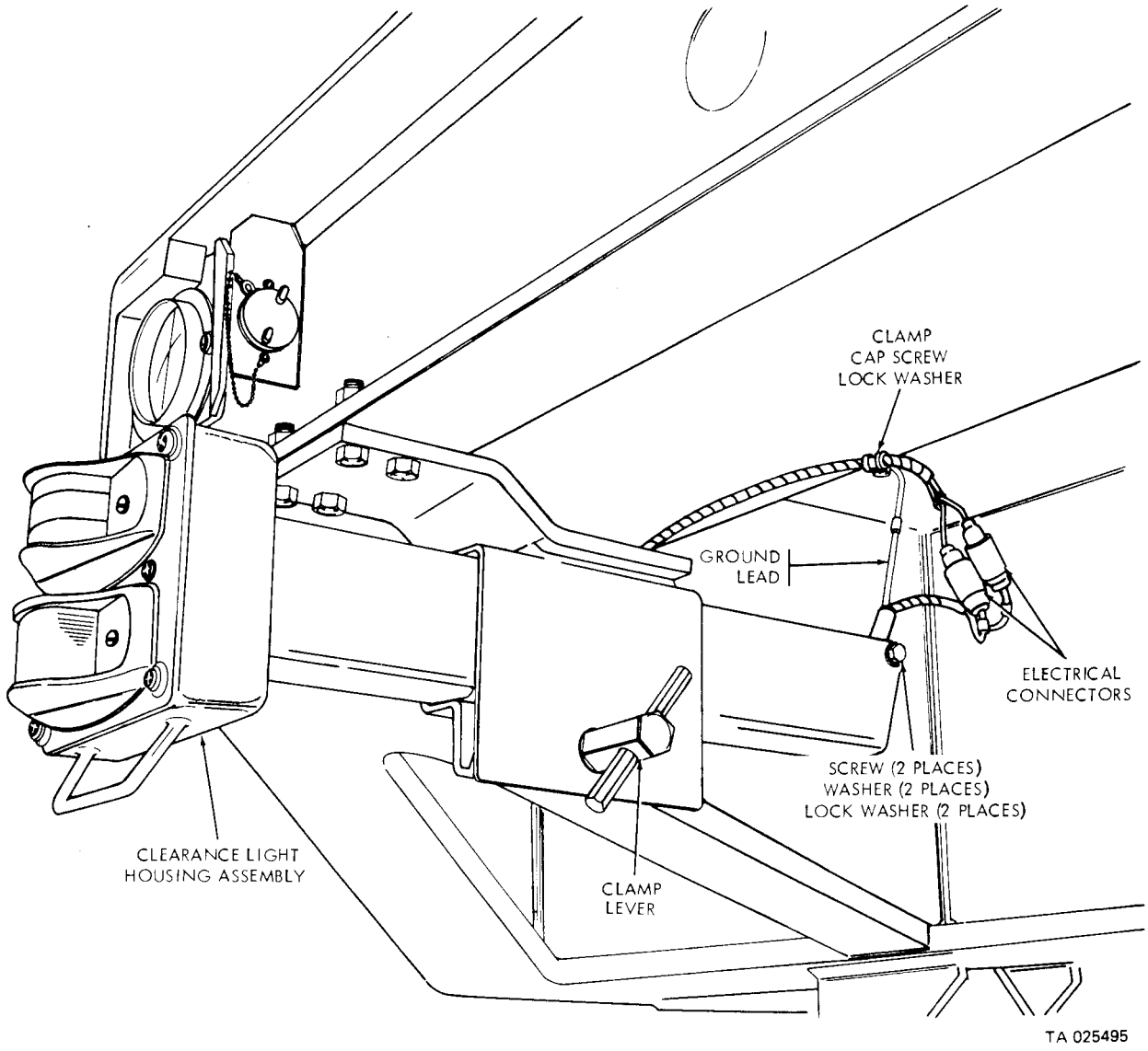


Figure 4-10. Retractable clearance light housing assembly (semitrailer No. 1 through 200).

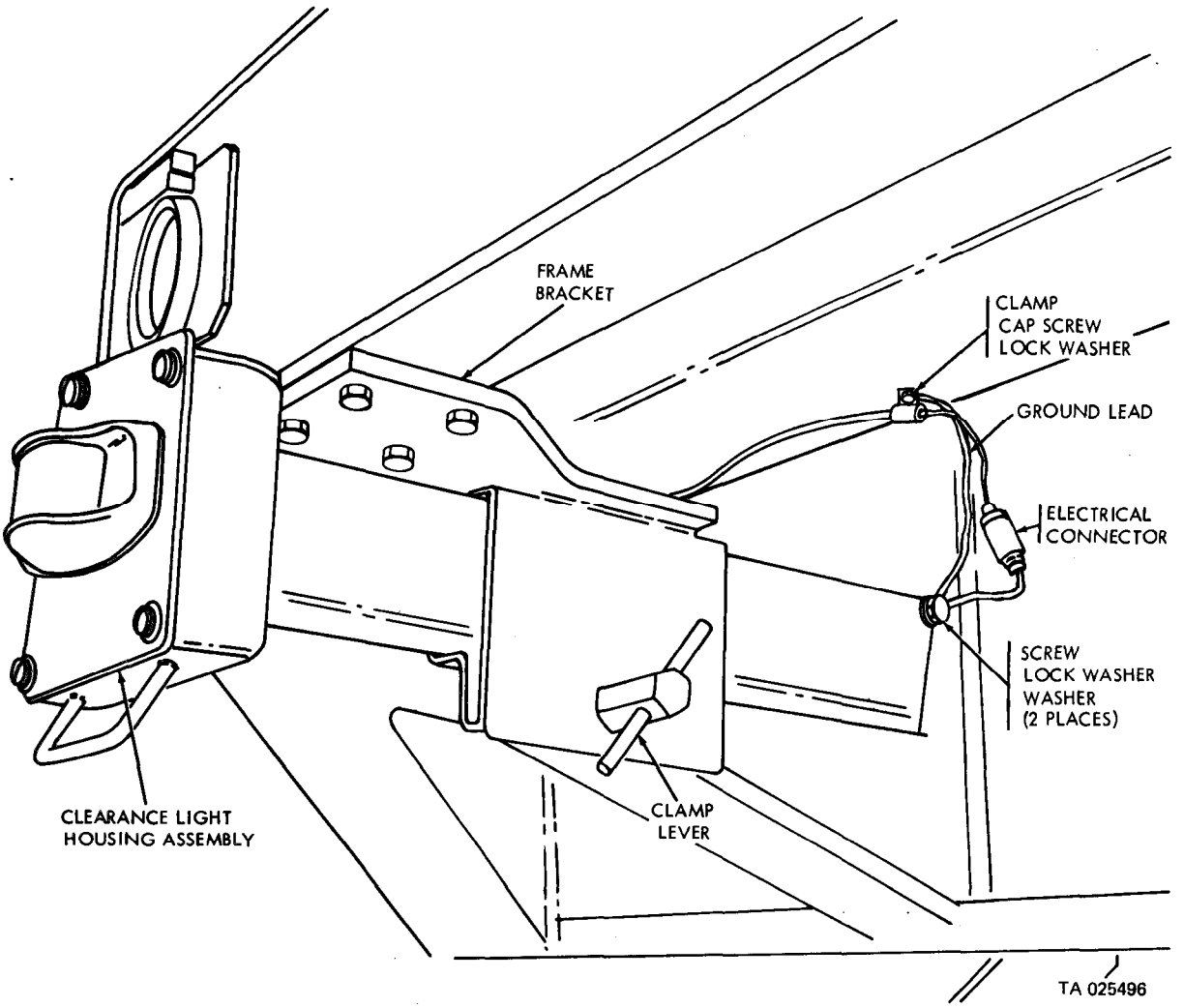


Figure 4-11. Retractable clearance light housing assembly (semitrailer No. 201 and on).

4-21. Retractable Clearance Light Housing Assembly Repair

(fig. 4-12 or 4-13)

a. Disassembly. Remove retractable clearance light housing assembly by following procedure in paragraph *4-20a* above.

(1) Remove four screws, lockwashers and washers securing plate to housing.

(2) Disconnect light assembly wiring harness connector(s).

(3) Remove nut, two lockwashers and screw securing wiring harness clamp and ground wire to plate.

(4) Remove two screws securing clearance light door and remove door and lens.

(5) Remove four screws and lockwashers securing socket and wiring assembly to plate and remove lamp, socket and wiring assembly and gasket. Install door and lens on socket and wiring assembly and secure with two screws removed in (4) above.

(6) For semitrailer No. 1 through 200 repeat (4) and (5) above for blackout light.

(7) If housing or wiring harness is damaged, remove wiring harness by pulling from housing.

b. Repair. Clean plate and housing with dry cleaning solvent type 11 (SD-2). Inspect plate and housing for cracks, bends or other damage and replace if necessary. Repair marker light in accordance with paragraph 4-22. Repair wiring harness per paragraph *4-23b.*

c. Assembly. Assemble in reverse order of disassembly *(a* above). Install retractable clearance light housing assembly by following procedure in paragraph *4-20b.*

d. Clearance Marker Light Assembly Lamp or Lens Replacement.

(1) Remove two screws securing door and remove door, two nuts and lens.

(2) Replace defective lamp or damaged lens.

(3) Install parts removed in (1) above in reverse order.

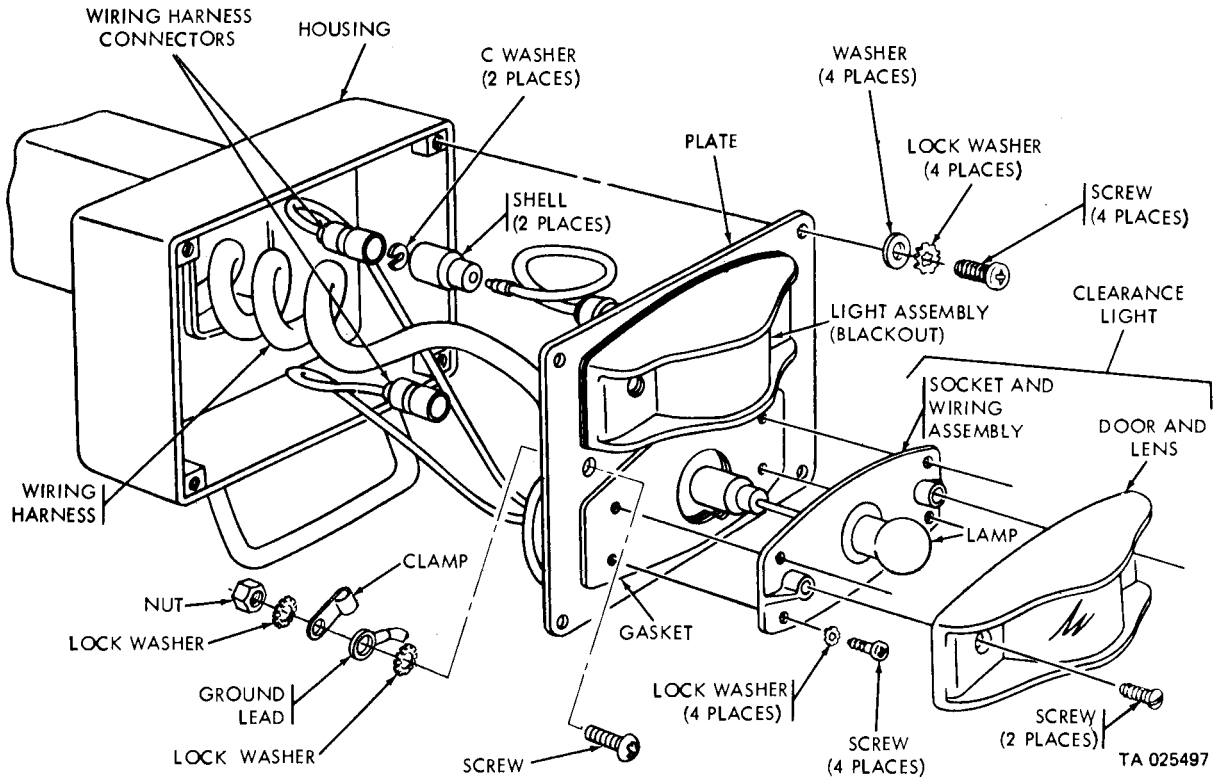


Figure 4-12. Retractable clearance light housing assembly (semitrailer No. 1 through 200).

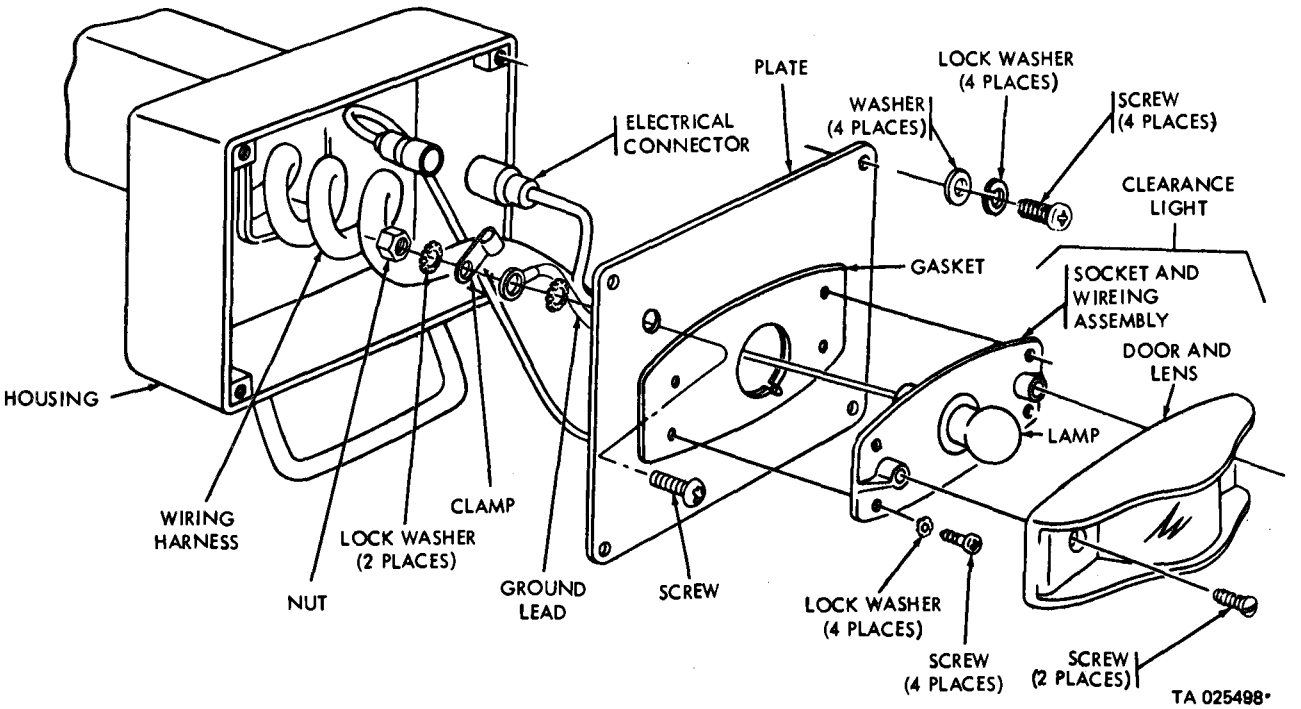


Figure 4-13. Retractable clearance light housing assembly (semitrailer No. 301 and on).

4-22. Clearance Marker Light Repair

(fig. 4-14)

a. *Disassembly.* Remove clearance marker light by following procedure in paragraph *4-21a* or *4-25a.*

(1) Remove gasket from socket and wiring assembly.

(2) Loosen two screws securing door to socket and wiring assembly and remove door, two nuts and lens.

(3) Remove two screws and nuts and remove lens from door.

(4) Remove lamp from socket.

(5) Push shell onto lead, remove C washer, and pull shell from lead.

b. Assembly. Replace damaged or inoperable parts and assemble in reverse order of disassembly (a above). Install clearance marker light in reverse order of removal *(a* above).

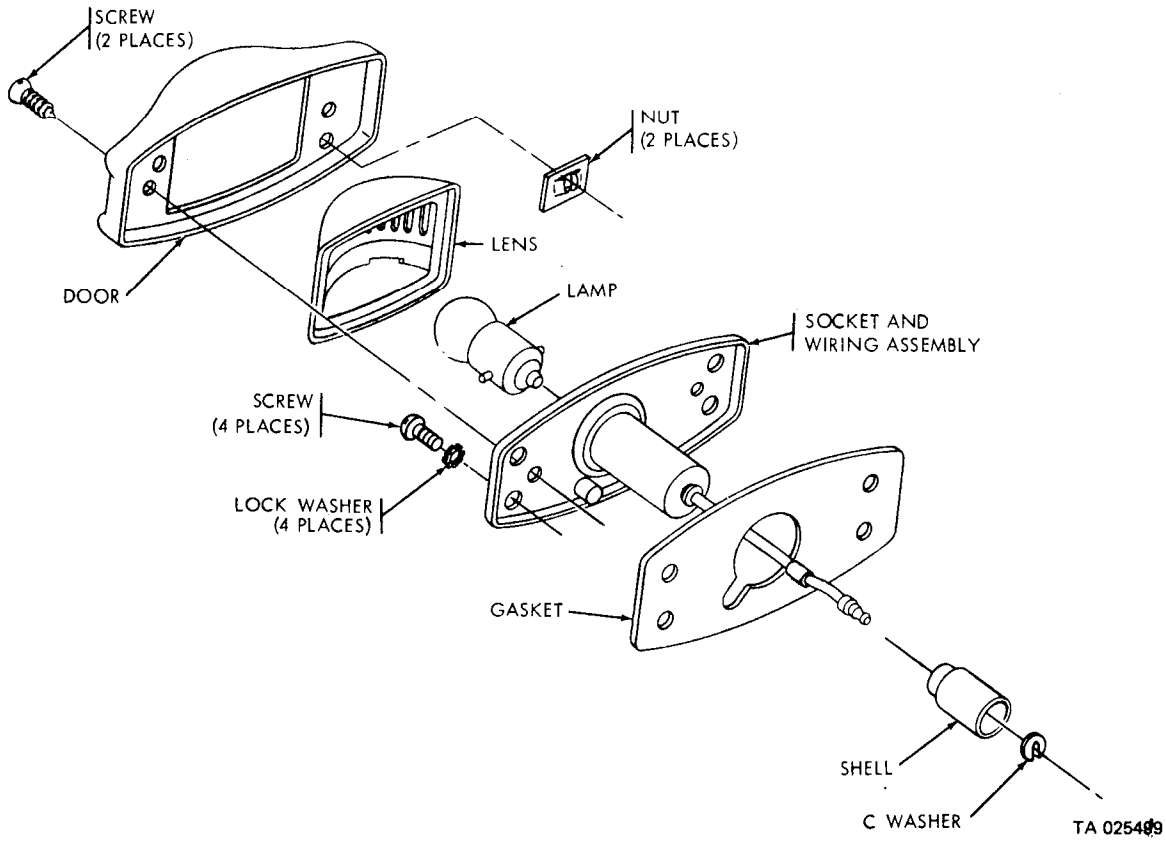


Figure 4-14. Clearance marker light–exploded view.

4-23. Clearance Marker Light Wiring Harness Repair

(fig. 4-15 or 4-16)

a. Removal. Remove clearance marker light wiring harness by following procedure in paragraph 4-21a.

b. Repair. Repair defective clearance light wiring harness by replacing damaged cable, pin contacts, washers, terminal assemblies, sleeves, shells and ground terminals. Maintain part number marker band on wiring harness and circuit number marker bands on each wire.

c. Installation. Install clearance marker light wiring harness by following procedure in paragraph *4-21c.*

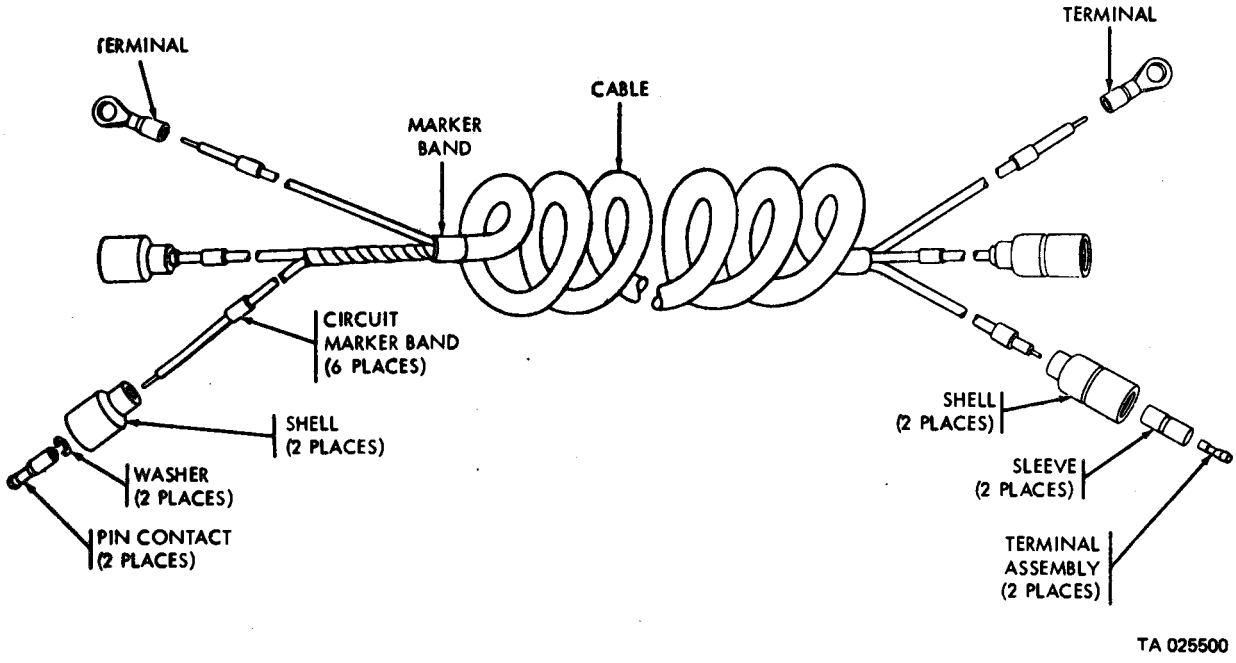


Figure 4-15. Clearance marker light wiring harness (semitrailer No. 1 through 200).

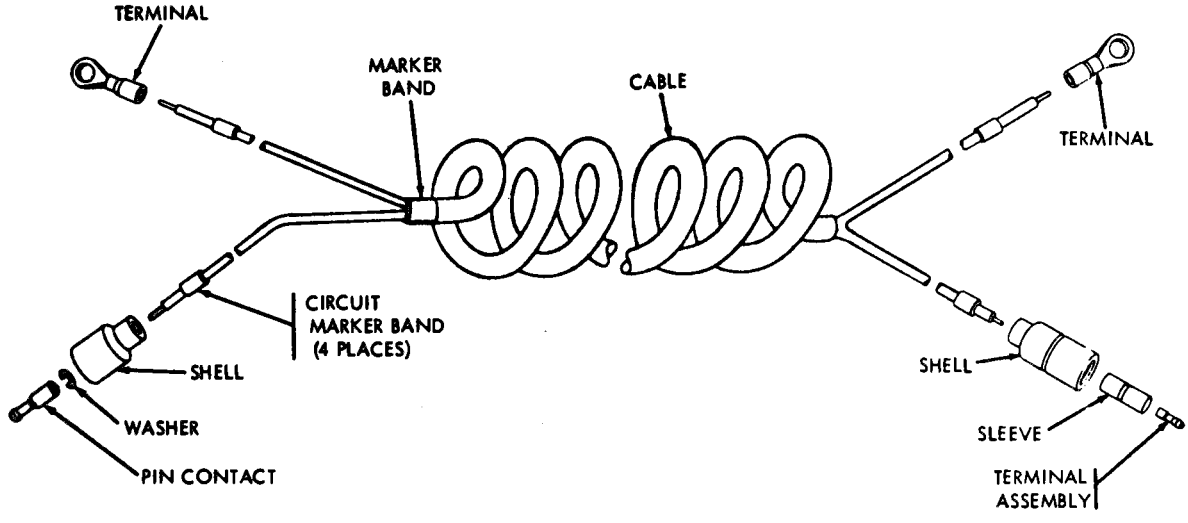


Figure 4-16. Clearance marker light wiring harness (semitrailer 201 and on).

4-24. Frame Bracket Assembly Replacement or Repair

(fig. 4-17)

a. Replace.

(1) Remove retractable clearance light housing assembly by following procedure in paragraph *4-20a.*

(2) For front frame bracket assembly remove four nuts, lockwashers and screws securing bracket to frame. For rear frame bracket assembly remove four cap screws and lock washers securing bracket to frame. Replace frame bracket assembly, and install in reverse order of removal.

b. Repair. Remove cotter pin, self-locking nut, two washers and handle. Replace damaged or missing parts and install in reverse order of removal.

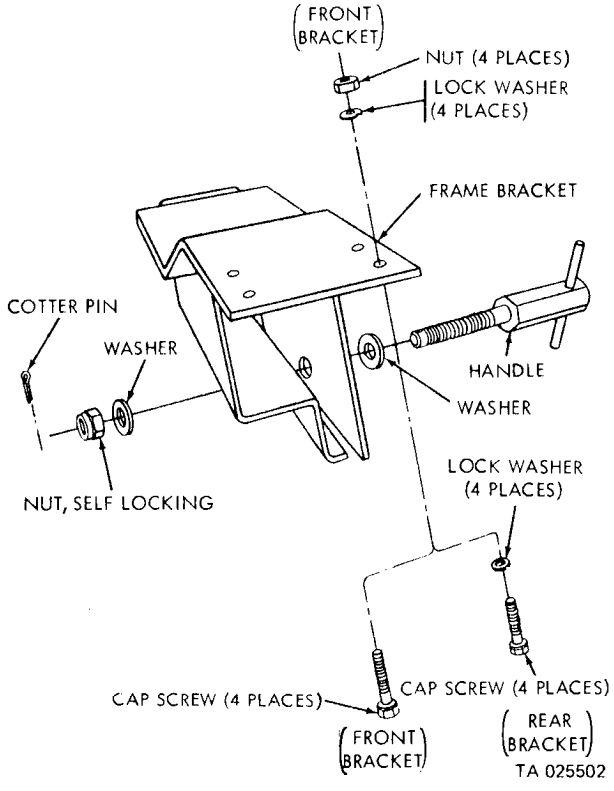


Figure 4-17. *Frame bracket assembly.*

4-25. Stationary Clearance Light Assembly Replacement

(fig. 4-18 or 4-19)

a. Removal.

(1) Remove two nuts, lockwashers, cap screws and washers securing bracket to frame.

(2) Disconnect clearance light electrical connector(s) at main wiring harness connection.

(3) Push shell onto lead, remove C washer, and pull shell from lead(s).

(4) Remove screw and two external tooth lock washers securing wiring harness ground to bracket.

(5) Remove bracket and marker light.

b. Installation. Replace or repair damaged parts and install in reverse order of removal *(a* above).

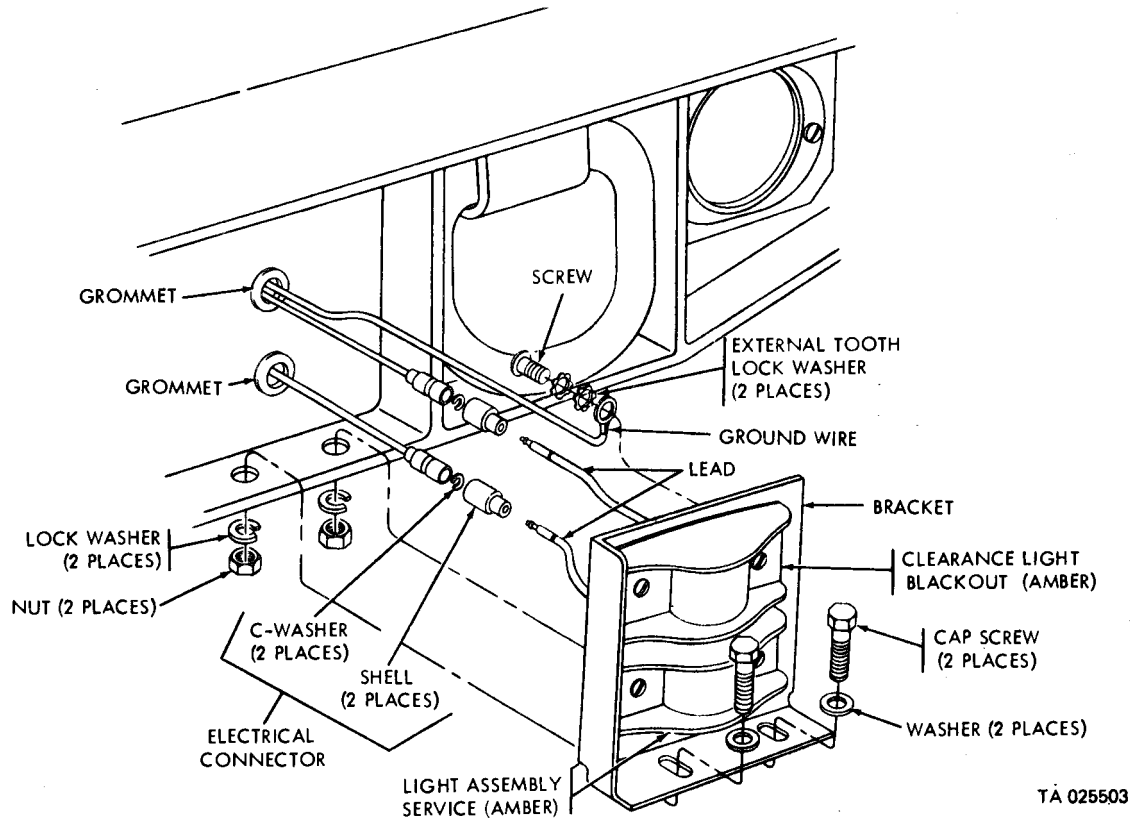


Figure 4-18. Stationary clearance light assembly (semitrailer No. 1 through 200).

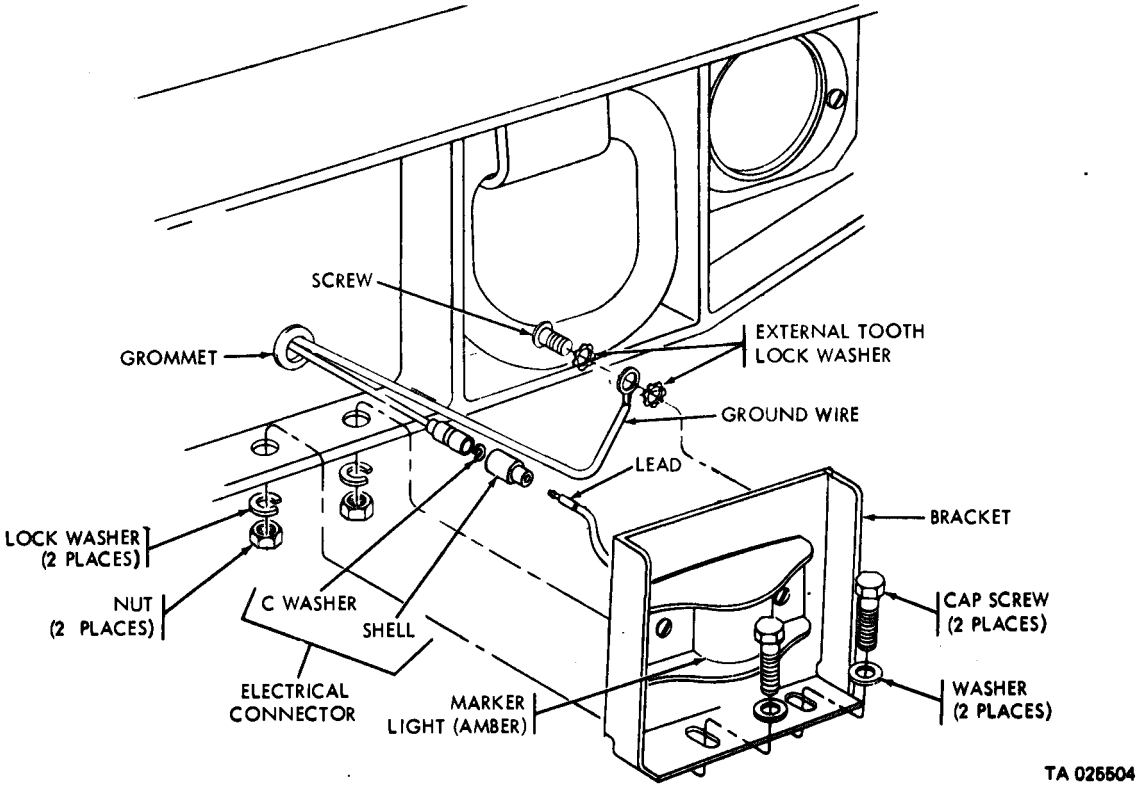


Figure 4-19. Stationary clearance light assembly (semitrailer No. 201 and on).

4-26. Stationary Clearance Light Assembly Repair
(fig. 4-18, 4-19 and 4-14)

a. Disassembly. Remove stationary clearance light assembly by following procedure in paragraph *4-25a.*

(1) Loosen two screws securing door to socket and wiring assembly and remove door, two nuts and lens.

(2) Remove four screws and lock washers securing socket and wiring assembly to bracket and remove socket and wiring assembly and gasket from bracket. Install door and lens on socket and wiring assembly and secure with two screws removed in (1) above.

(3) For semitrailer 1 through 200 repeat steps (1) and (2) above and remove blackout light.

b. Repair. Clean bracket with dry cleaning solvent type II (SD-2). Inspect bracket for cracks, bends or other damage and replace if necessary. Replace defective hardware. Repair marker light in accordance with paragraph 4-22. Repair main wiring harness per paragraph 4-28, if required.

c. Assembly. Assemble in reverse order of disassembly *(a* above). Install stationary clearance light assembly by following procedure in paragraph *4-25b.*

4-27. Rear Marker Light Assembly Replacement and Repair

Replace or repair the rear marker light assembly in the same manner as stationary clearance light (para 4-25 and 4-26).

4-28. Main Wiring Harness
(fig. 4-20 or 4-21)

a. Inspect. Check attaching points for security and condition. Inspect wires for security and for frayed, cracked, or worn insulation. Inspect terminals to determine if they are free of corrosion, dirt, or paint which would interfere with good contact. Clean if corroded or covered with dirt or paint. Refer TB ENG361. Use test equipment to determine of electrical wires are broken or shorted (para 4-15).

b. Cable Connectors Replacement.

(1) *Male cable connector.* Strip cable insulation equal to depth of pin contact shell. Apply insulating compound (MIL-S-8660 or P/N 801362 (19203) to cable end, and slip shell over cable. Insert cable into pin contact shell and crimp. Place "C" washer over cable at crimped junction and slide shell over "C" washer and pin contact.

(2) *Female cable connector.* Strip cable insulation approximately 1/8 inch. Apply compound (MIL-S-8660 or P/N 801362 (19203) to cable end, and slip shell and sleeve over cable. Place cylinder end of terminal on cable and crimp. Slide shell and sleeve over terminal.

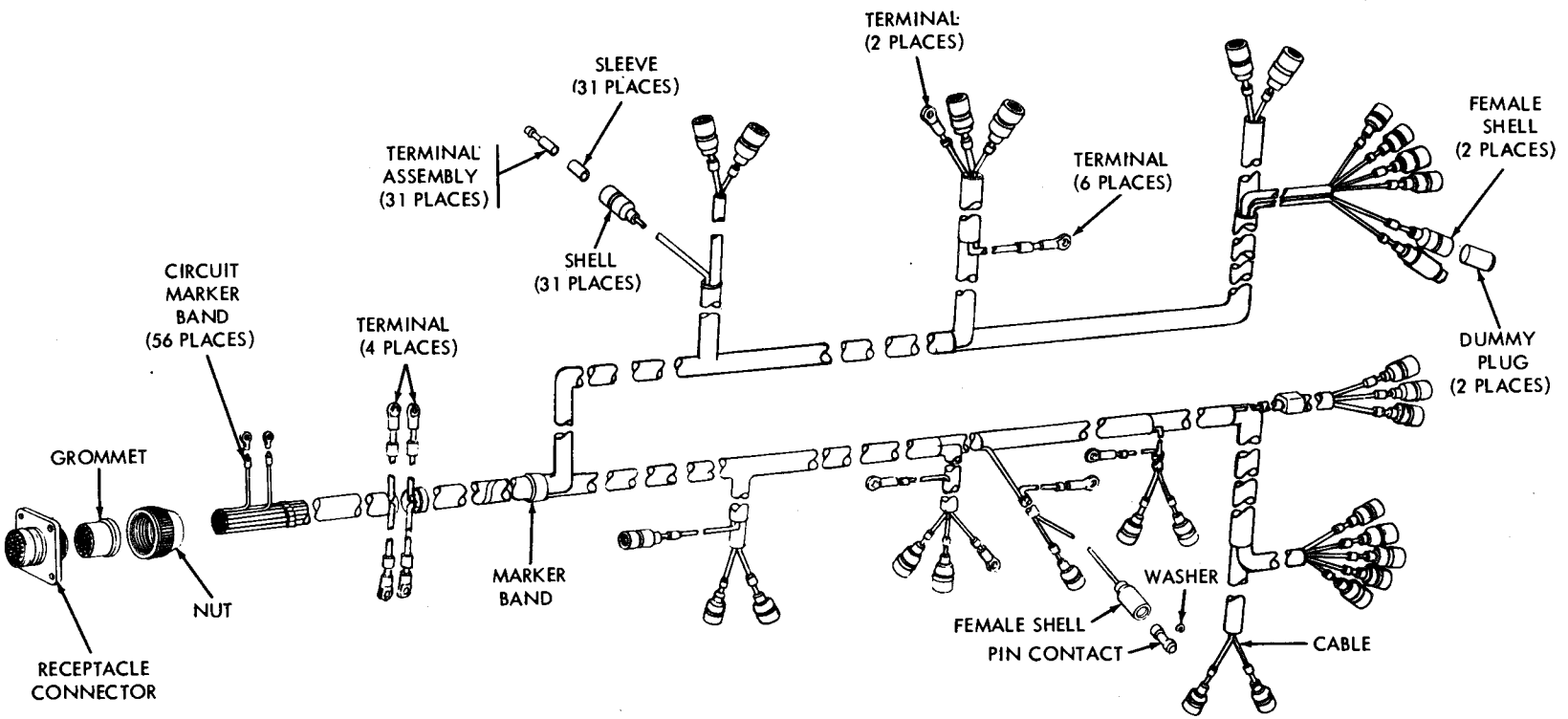


Figure 4-20. Main wiring harness (semitrailer No. 1 through 200).

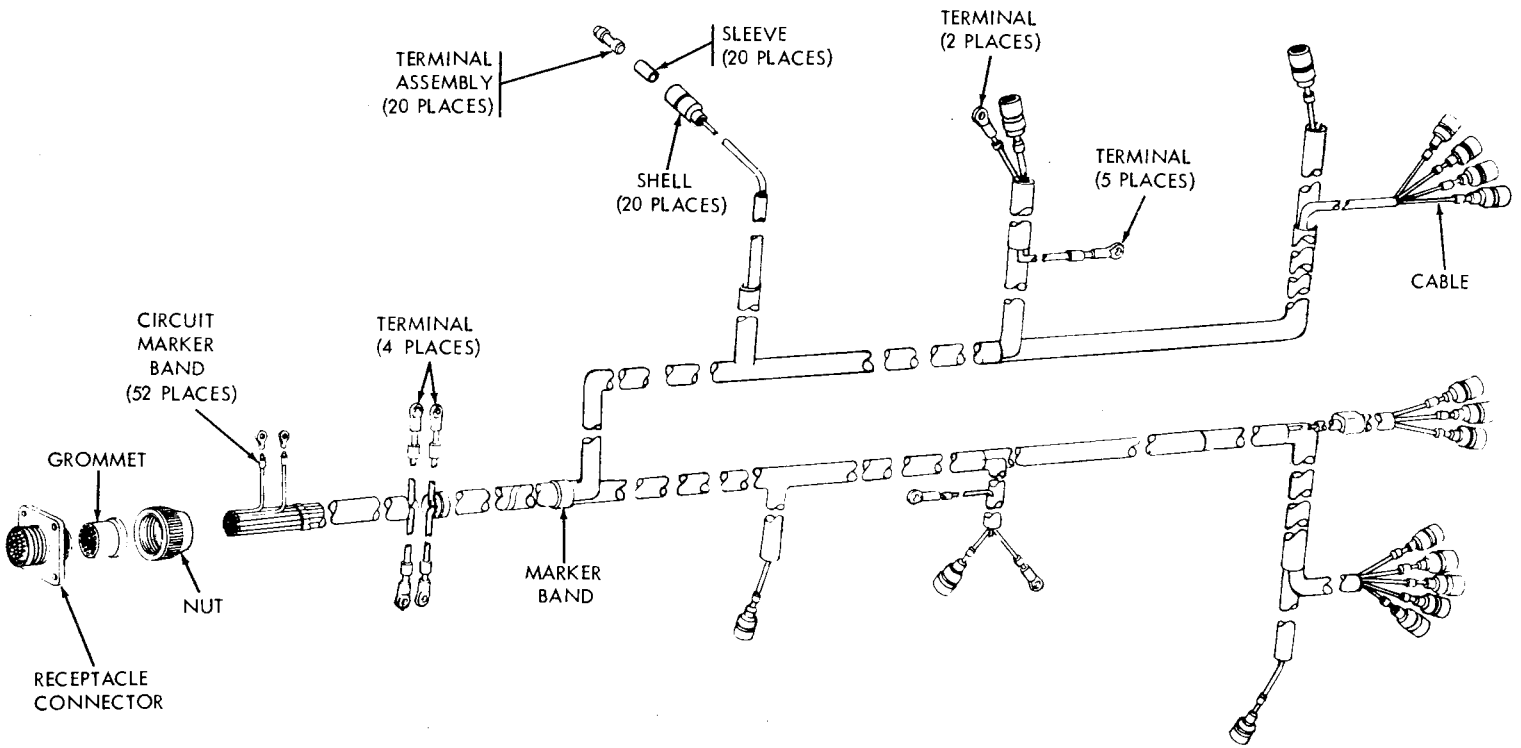


Figure 4-21. Main wiring harness (semitrailer No. 201 and on).

c. Main Harness Repair. All repairs to electrical cables will be made in accordance with TB ORD 650. Repair only the accessible single wires at harness branch ends by splicing. Tape the splices. Notify general support maintenance personnel for repair of wires buried in the harness assembly. Resolder loose wire attaching points in intervehicular connector receptacle assembly. Use only rosin core solder. To replace or repair receptacle assembly, loosen nut. Slide grommet out of connector assembly. Pull grommet from cable inserts and repair cable connections. Assemble in reverse manner. Replace damaged or defective cable connectors on main harness *(b* above). Apply insulating compound (MIL-S-8660 or P/N 801362 (19203) to male shells before mating to female shells. Maintain marker bands close to end of each cable. Replace clamps and grommets as required.

4-29. Low-Air-Pressure Warning Switch Replacement (Semitrailer No. 1 to 200)

(fig. 4-22)

CAUTION

Air pressure must be vented prior to removal of any component of the air system.

a. Removal.

(1) Vent air pressure in accordance with paragraph 4-38.

(2) Disconnect wiring harness and ground lead electrical connectors at switch.

(3) Disconnect air line at switch.

(4) Remove two screws and lockwashers and remove switch.

b. Installation.

NOTE

The air pressure switch is not-repairable and non-procurable. When it no longer functions, discard switch and plug air line.

(1) Remove air pressure switch air line at first tee fitting.

(2) Use 3/8-inch plug and plug tee fitting,

(3) Tape ends of electrical harness connectors,

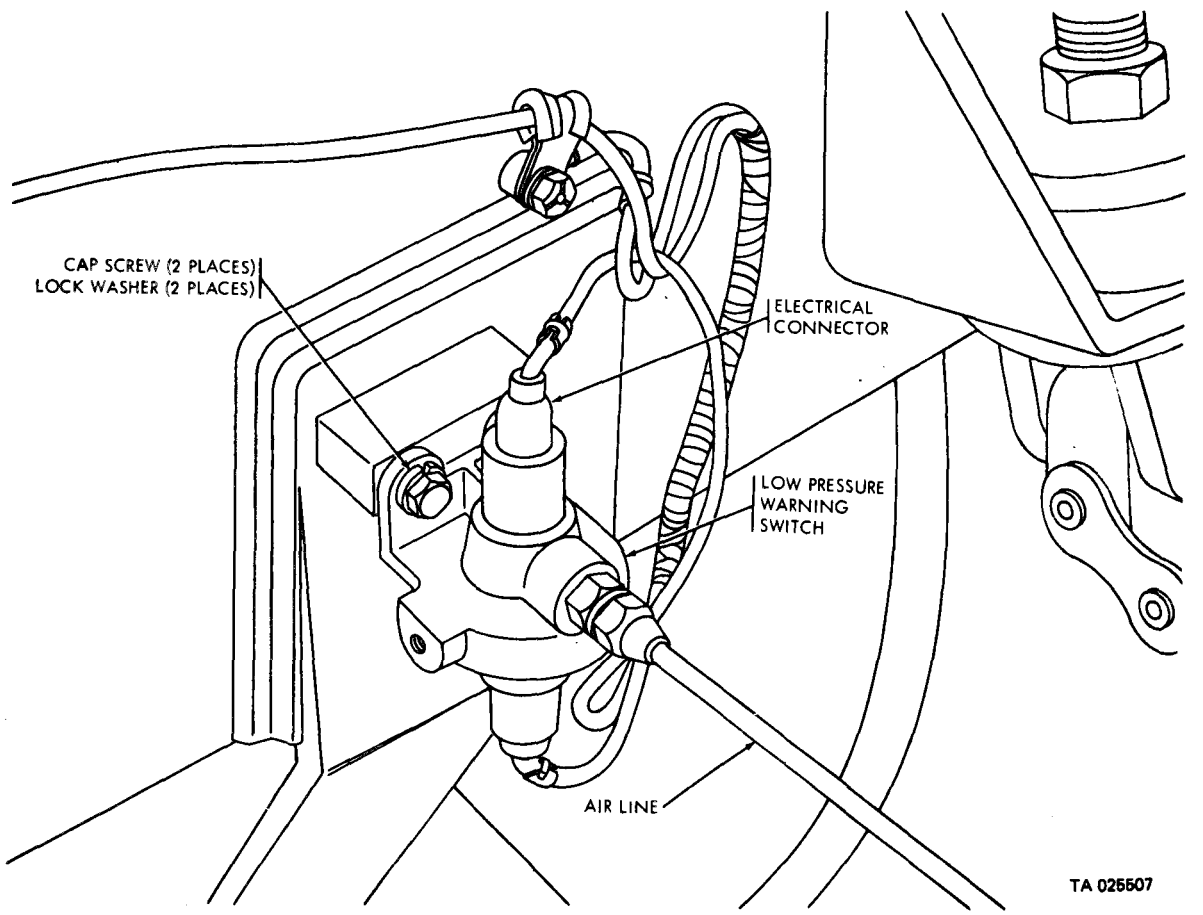


Figure 4-22. Low-air-pressure warning switch.

Section VII. BRAKE MAINTENANCE

4-30. General

a. Service Brakes (fig. 4-23). The air-operated service brakes on the semitrailer are self-adjusting, internal-expanding and of a dual-actuating, wedge-type design. When the semitrailer brake system is connected to the towing vehicle air brake system, the towing vehicle brake system controls the brakes on both vehicles.

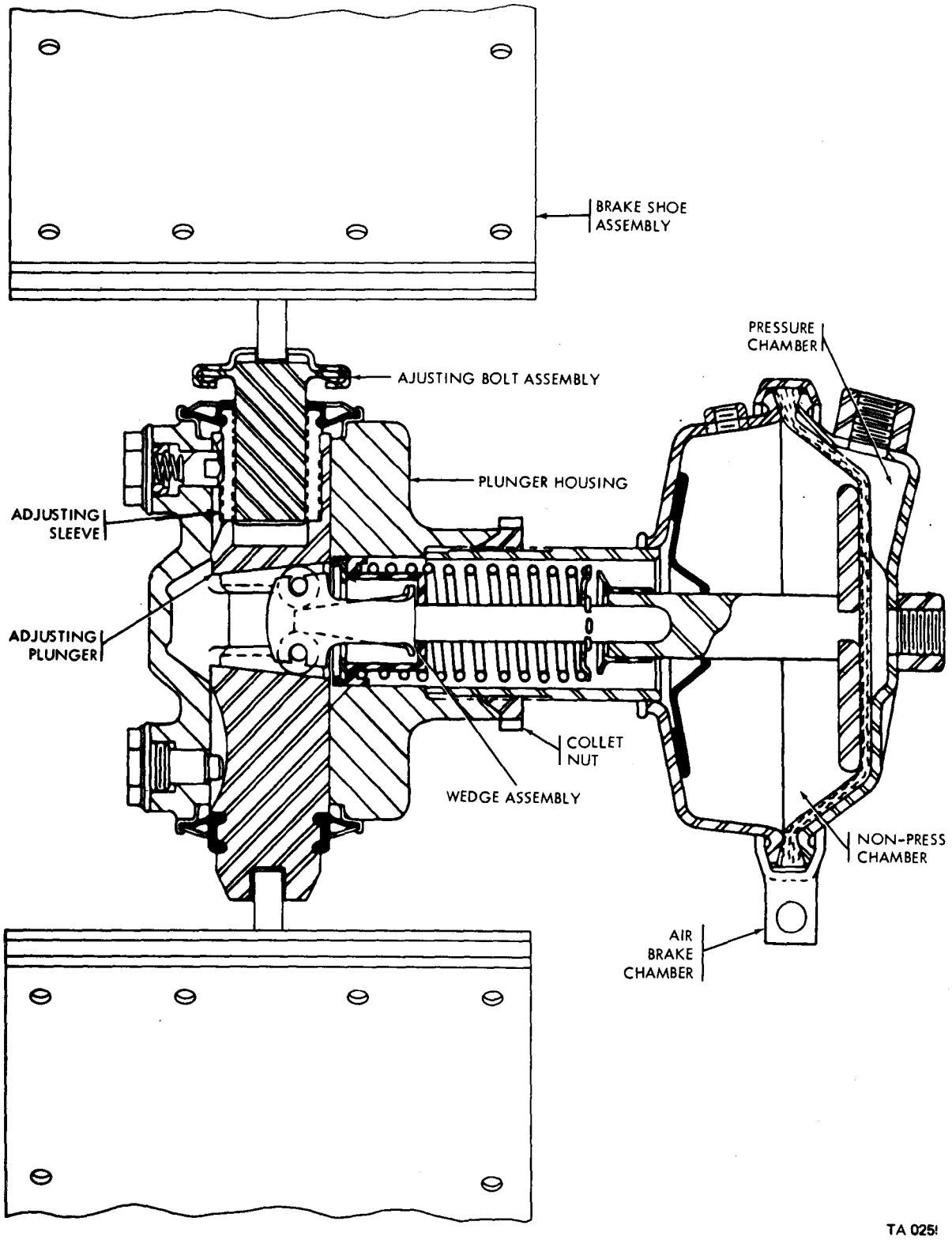


Figure 4-23. Service brake schematic diagram.

b. Service Brake Adjustment (fig. *4-24).* The semitrailer brakes are self-adjusting. The self-adjusting mechanism is activated each time the brakes are applied while semitrailer is moving in a forward direction. After servicing brakes or if wedge assembly or plunger failure causes brakes to lock, adjust brakes manually by following procedure (1) through (7) below.

(1) Jack or lift wheels free of ground with air suspension control.

(2) Compress fail-safe unit per paragraph *d* below.

(3) Remove dust plugs from access slots at top and bottom of dust shield and check brake drum to brake lining clearance using feeler gage. If clearance is .040 to .060 inch, brakes are properly adjusted; insert top and bottom dust plugs, release fail-safe unit and proceed to next brake unit. If clearance is out of .040 to .060 inch limits, proceed to (4) below.

NOTE

Starwheel adjusting bolts should be found below the forward power unit and above the rear power unit, otherwise one or both of the plunger housing assemblies have been assembled on the wrong side of the vehicle.

(4) Remove two dust covers from adjusting slots in the dust shield.

(5) Insert brake adjusting spoon (S9523, optional spoon 2006, fig. 4-1) or long screw-driver into slot to meet adjusting bolt starwheel. Turn right threaded adjusting bolt clockwise until a heavy drum drag develops. If adjusting bolt will not turn using hand pressure, lightly tap tool with hammer.

(6) Back off the adjusting bolt to a very light drag on the drum and check brake lining clearance in accordance with (3) above.

(7) Repeat procedure (4) through (6) above for other shoe on brake.

NOTE

Access to the lower adjusting bolts on semitrailer axle number six is limited by the position of the walking beam.

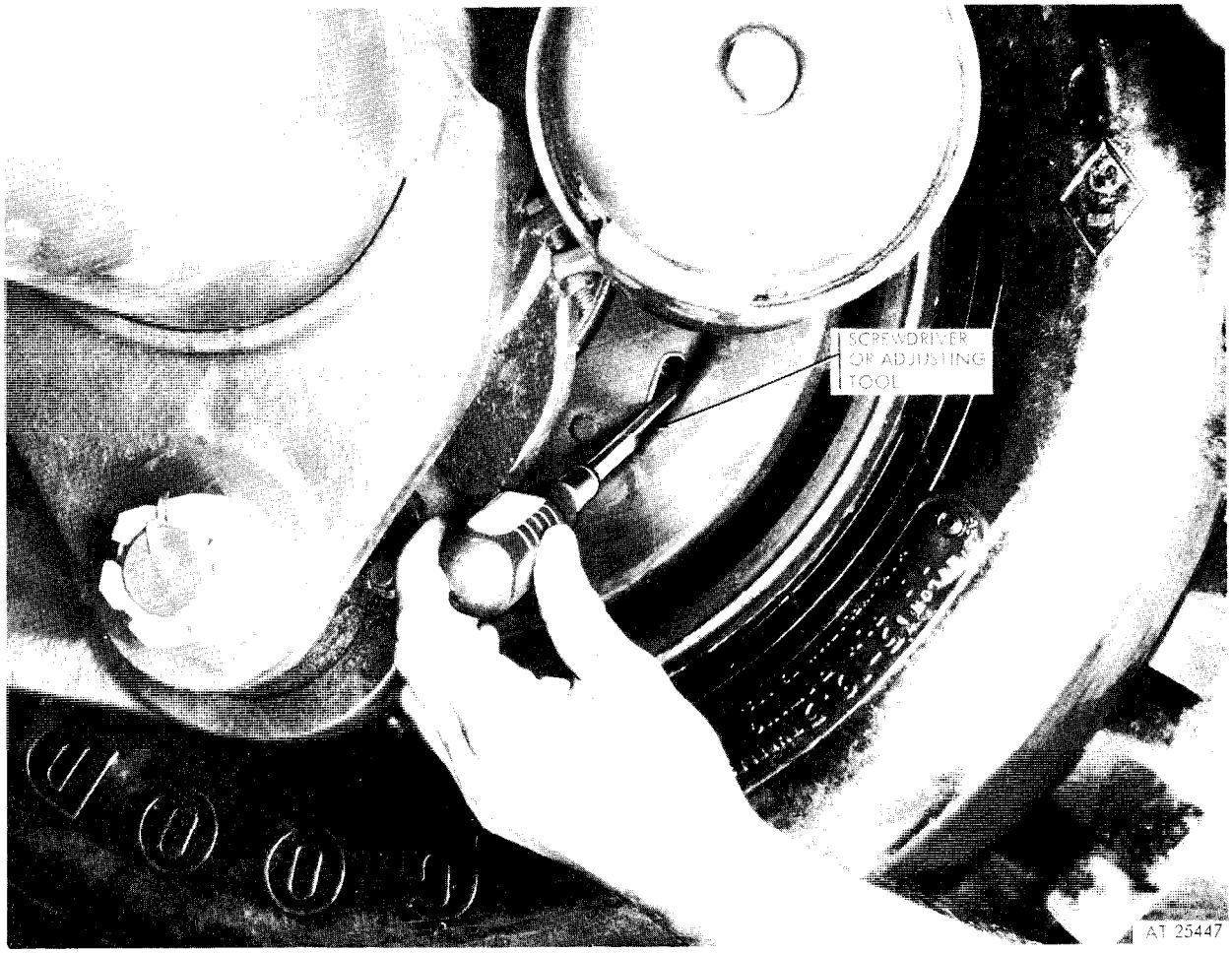


Figure 4-24. Service brake lining adjustment.

c. Fail-Safe Units (fig. 4-25 or 4-26).

(1) The fail-safe units are spring-powered brake. actuators that assemble piggyback on one air chamber of each brake. When 65 psi or more air pressure is applied against the piston in the fail-safe head pressure chamber, the spring will push the piston against the diaphragm plate and apply the brakes. One fail-safe unit is located at each trailer wheel .

(2) A fail-safe release system is provided to allow the vehicle to be moved short distances when its air system is disabled. A control knob, located on the left side of the semitrailer, releases sufficient air from an air tank to release the fail-safe brakes for a short time (para *2-4b).*

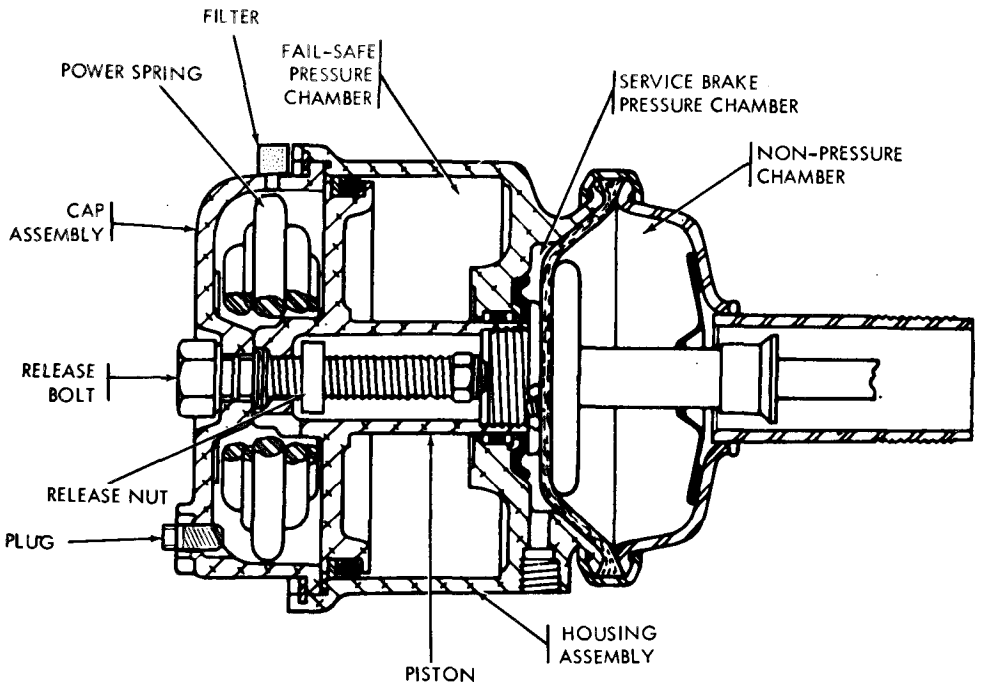


Figure 4-25. Fail-safe chamber assembly schematic diagram (semitrailer No. 1 through 200).

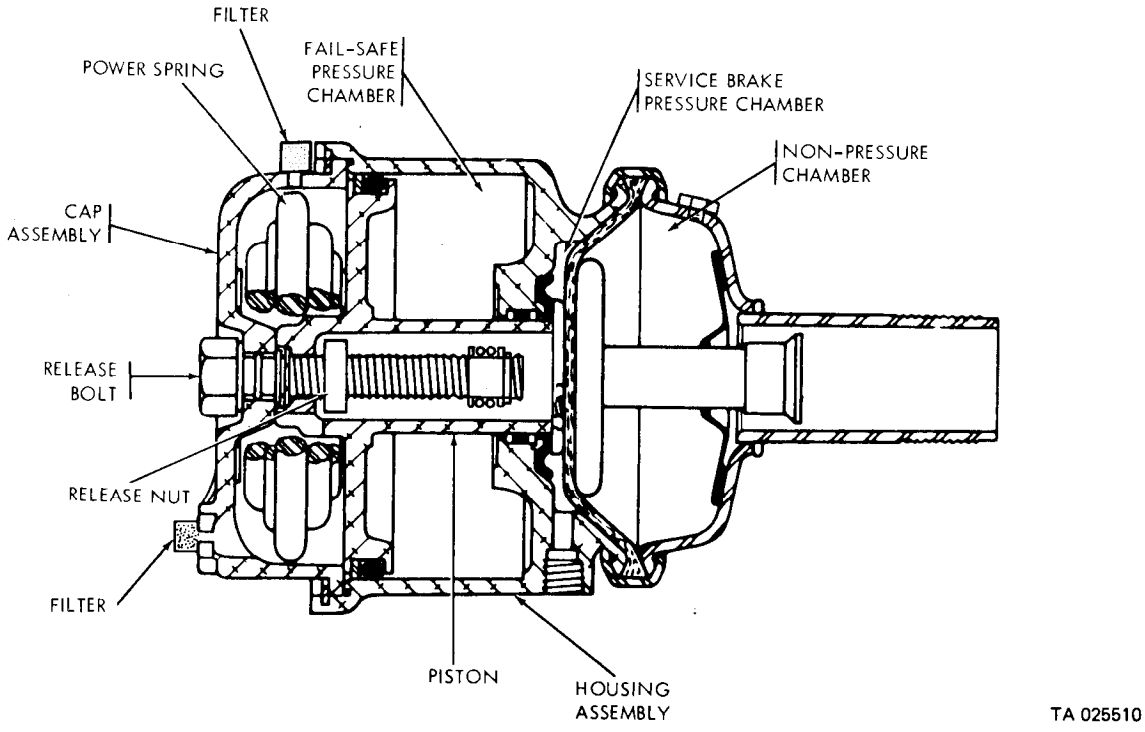


Figure 4-26. Fail-safe chamber assembly schematic diagmm (semitrailer No. 201 and on).

d. Fail-Safe Unit Manual Compression and Release (fig. 4-25 or 4-26).

CAUTION

Do not force release bolt beyond its normal stop when turning in either direction.

NOTE

Compressing and releasing fail-safe unit power spring is made easier if air pressure is used to take the spring load off the release nut. In addition, the normal stops are more perceptible.

To compress fail-safe power spring, turn release bolt clockwise approximately 25 full turns. To release fail-safe power spring, turn release bolt counterclockwise approximately 25 full turns.

e. Brake Compressed Air System (fig. 4-27 or 4-28), Compressed air is transmitted from the towing vehicle through the service and emergency air lines that are coupled to the towing vehicle at the front of the gooseneck. Air pressure in the range of 90 psi to 120 psi is kept in the system through the emergency air line when the towing vechicle engine is running. When the brake pedal in the towing vehicle is applied, air is delivered through the service air line to the emergency relay valves. The emergency relay valves, mounted between the rear and forward axles, speed brake action by releasing air from the main air reservoir to the brake chambers. Air pressure causes the wedge in each brake actuating assembly to move forward and press the brake shoes against the drum. The emergency relay valves route service air to the brakes if the parking brake is applied (M746 tractor) and also automatically apply the brakes if the semitrailer breaks away from the towing vehicle. Three main air tanks and a fail-safe release tank are located between frame cross-members of semitrailer No. 1 through 200. Two main air tanks and a fail. safe release tank are located between frame cross-menbers of semitrailer No. 201 and on. On semitrailers No. 1 through 200 the low-pressure warning switch relays a signal to the towing vehicle cab low-pressure warning light (M 746) when air pressure falls below 65 psi. Refer to paragraphs 1. *6e* and 2-2 through 2-4 for a detailed description of the brake air system. Refer to paragraphs 4-37 and 4-39 for service instructions for air lines, fittings and valves.

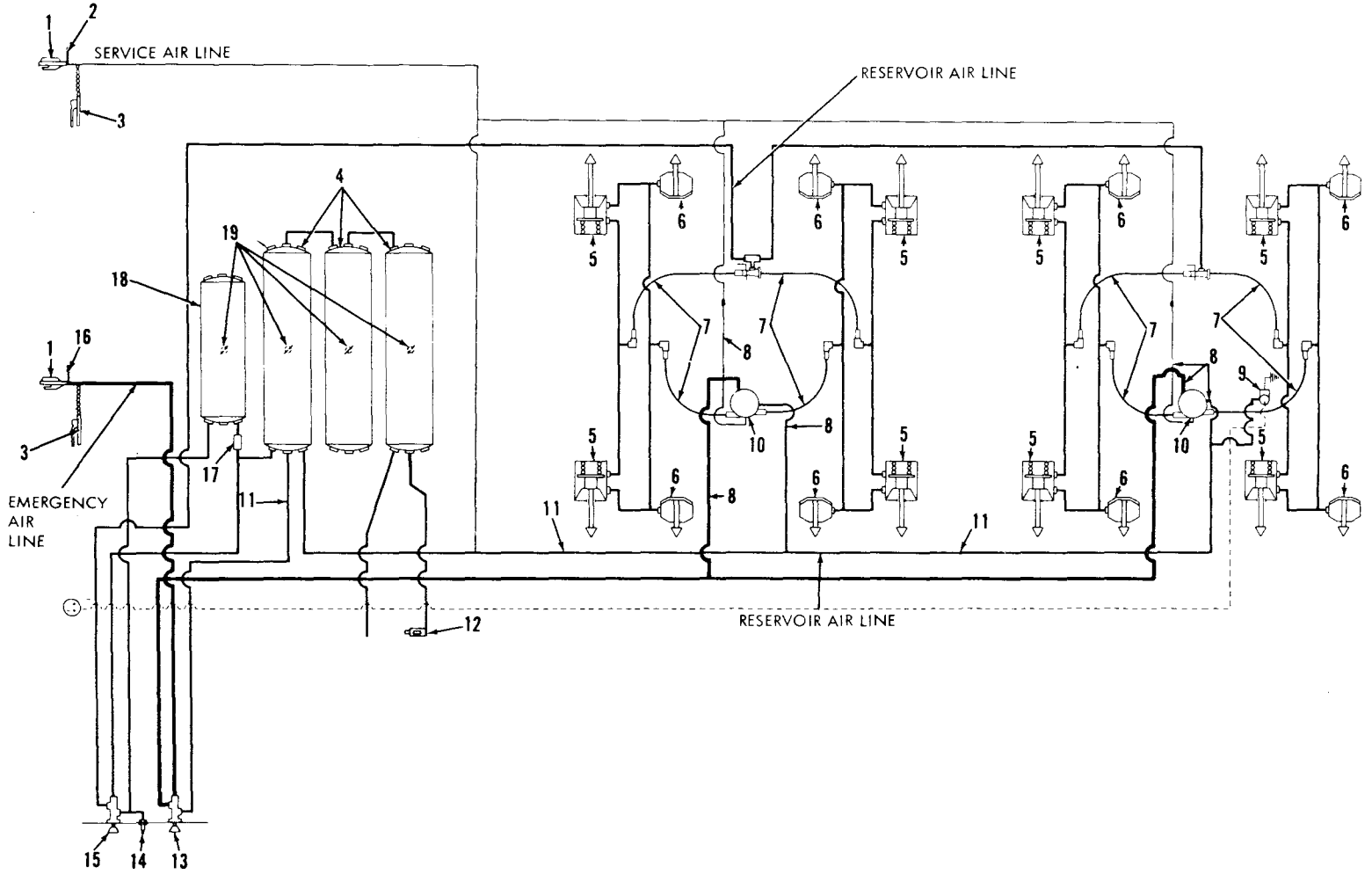


Figure 4-27. Air brake system schematic diagram (semitrailer No. 1 through 200).

Key to figure 4-27:

1 Coupling, hose
2 Tag, service
3 Coupling, dummy
4 Tank assembly, air
5 Chamber assy, brake fail-safe
6 Chamber assy, air brake
7 Hose, 3/8 ID
8 Tubing, Nylon
9 Switch, low pressure
10 Valve, emergency relay
11 Tubing, copper
12 Valve, air supply auxiliary
13 Valve, service brake release
14 Valve, fail-safe air tank fill
15 Valve, fail-safe release
16 Tag, emergency
17 Valve, one-way check
18 Reservoir, fail-safe release
19 Cock, drain

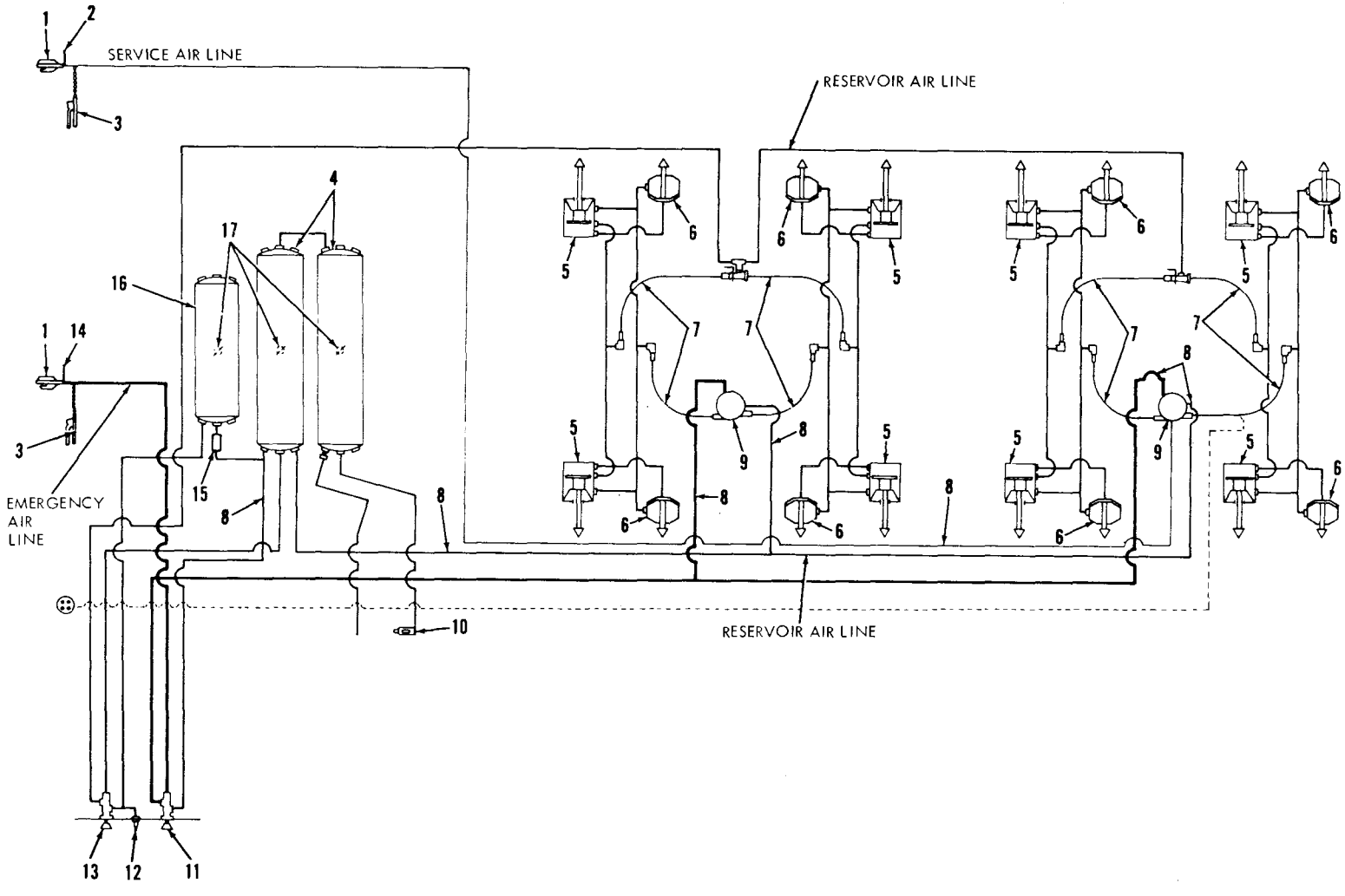


Figure 4-28. Air brake system schematic diagram semitrailer No. 201 and on).

Key to figure 4-28:
1 Coupling hose
2 Tag. service
3 Coupling. dummy
4 Tank assembly. air
5 Chamber assy. brake fail-safe
6 Chamber assy. air brake
7 Hose. 3/8 ID
8 Tubing. nylon
9 Valve. emergency relay
10 Valve. air supply auxiliary
11 Valve. service brake release
12 Valve. fail-safe air tank fill
13 Valve. fail-safe release
14 Tag. emergency
15 Valve. one-way check
16. Reservoir. fail-safe release
17. Cock. drain

4-31. Brake Shoe Assembly Inspection and Replacement

a. Inspection. Remove wheel and hub and drum assembly per paragraph 4-60. Inspect lining for damage and wear. New lining has approximately ½ inch of stock above center rivets and approximately ¼ inch of stock above end rivets. Replace if lining is damaged or worn within .030 inch of rivet heads. By recording lining wear between scheduled annual brake maintenance periods, expected wear can be calculated. Lining that will not last until the next scheduled maintenance interval should be replaced. The lining must be replaced if it haa cracks that are 50% of the way through a new lining. (Cracks 3/8 inch deep in a new lining 3/4 inch thick).

b. Removal. (Fig. 4-29)

(1) Remove wheel end hub and drum assembly per paragraph 4-60.

(2) Lift brake shoe assembly out of plunger slots and hold down clip, and tilt brake shoe to unhook return springs. Remove brake shoe assembly and return springs. Do not remove dust shield or hold down clip, unless in need of service.

(3) Service plunger housing asssmblies by following procedure in paragraph 4-35.

c. Repair. Repair of brake shoe assembly should be accomplished by direct support maintenance **personnel.**

d. Installation.

(1) Apply film of GAA grease to new or relined brake shoe assembly rest pads and the anchor plunger and adjusting bolt slots.

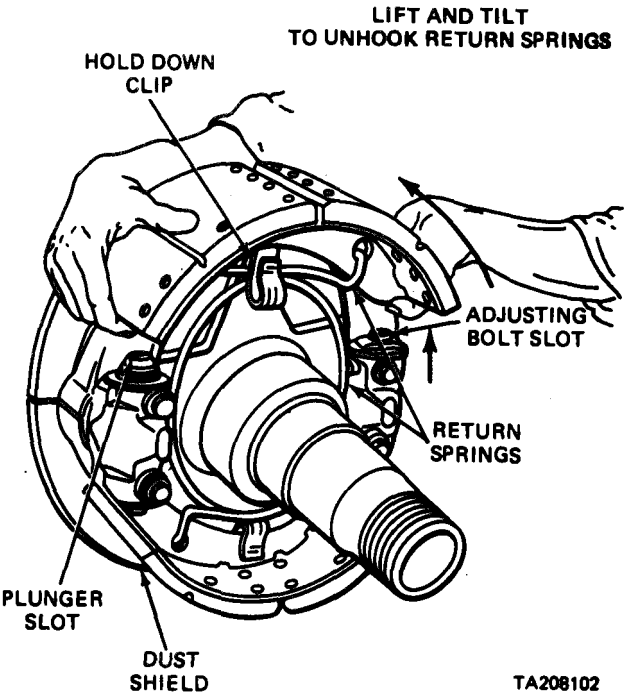


Figure 4-29. Brake shoe removal or installation.

(2) Rotate adjusting bolts to aline slots in bolt retainer with brake shoe webs, being certain that bolts are not bottoming in adjusting plunger (para 4. *35e* (7).

CAUTION

Take care that return springs overlap as shown in figure 4-29.1.

NOTE

Brake shoes should be installed with the direction of rotation arrow, stamped on the brake shoe web, pointing in the direction of wheel rotation for forward movement.

(3) Hook the return springs to the upper brake shoe web.

(4) Place the upper brake shoe web in the hold down clip.

(5) Make sure that the long radius of the brake shoe web is in the adjusting bolt slot and the short radius in the anchor plunger slot. (fig 29.1)

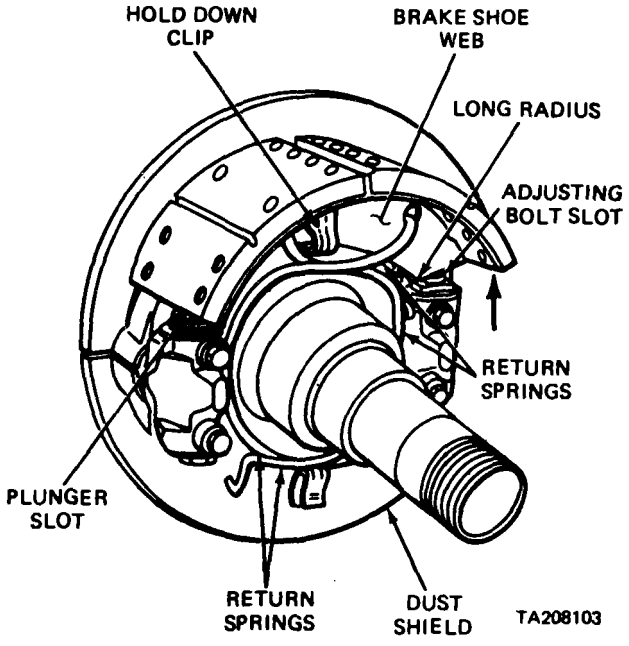


Figure 4-29.1 *Upper brake shoe installation*

(6) Tilt the lower brake shoe away from the dust shield and hook the return spring to the brake shoe web.

(7) Force the lower brake shoe down and toward the dust shield.

(8) Place the lower brake shoe web in the hold down clip (fig 4-30).

(9) Make sure that the long radius of the brake shoe web is in the adjusting bolt slot and the short radius in the anchor plunger slot (fig. 4-30).

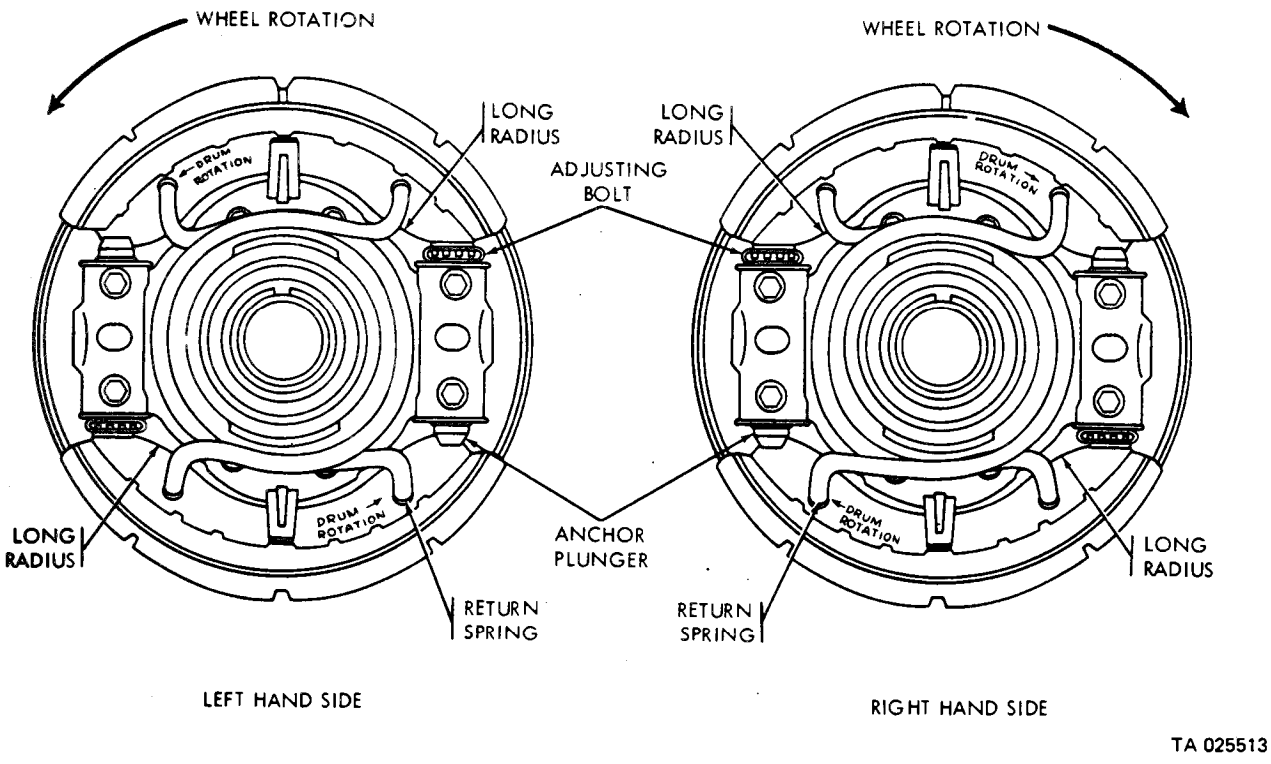


Figure 4-30. Plunger and brake shoe position.

4-32. Fail-Safe Housing Assembly Inspection and Replacement

(fig. 4-25, 4-26, and 4-31)

a *Inspection.* With air hose couplings connected to towing vehicle and brakes applied, coat brake air chamber housing flanges and connections with soapy water. Check for leakage. No leakage is permissible.

CAUTION

Do not overtighten clamp cap screws, as flanges will become distorted and cause additional air leakage.

If leakage is found at flanges, tighten air chamber clamp cap screws evenly. If leakage is found at connections, tighten fittings. With brakes applied, listen at air chamber for venting of air. After initial brake application forces out a small amount of air, no air should be expelled. If air continues to exhaust, remove fail-safe unit in accordance with *b* below and check air chamber housing diaphragm for puncture, cracks or other damage.

b. Removal.

NOTE

This procedure should be used only when it is not necessary to remove the non-pressure housing assembly portion of the fail-safe chamber assembly. Refer to paragraph 4-33 for removal of fail-safe chamber assembly.

(1) Manually compress fail-safe unit power spring by following procedure in paragraph *4-30d.*

(2) Vent air pressure in accordance with paragraph 4-38.

(3) Disconnect air lines and tag for identification at installation.

(4) Remove nut and cap screw securing clamp.

(5) Spread clamp, taking care not to damage it, hold diaphragm on the non-pressure half and remove fail-safe unit.

c. *Repair.* Repair of fail-safe housing assembly should be accomplished by direct support maintenance personnel.

d. Installation. Replace fail-safe unit and install in reverse order of removal *(b* above). Replace diaphragm if rubber at sealing area is damaged or has become set. Be sure to manually release fail-safe unit power spring when installation is completed (para *4-30d*).

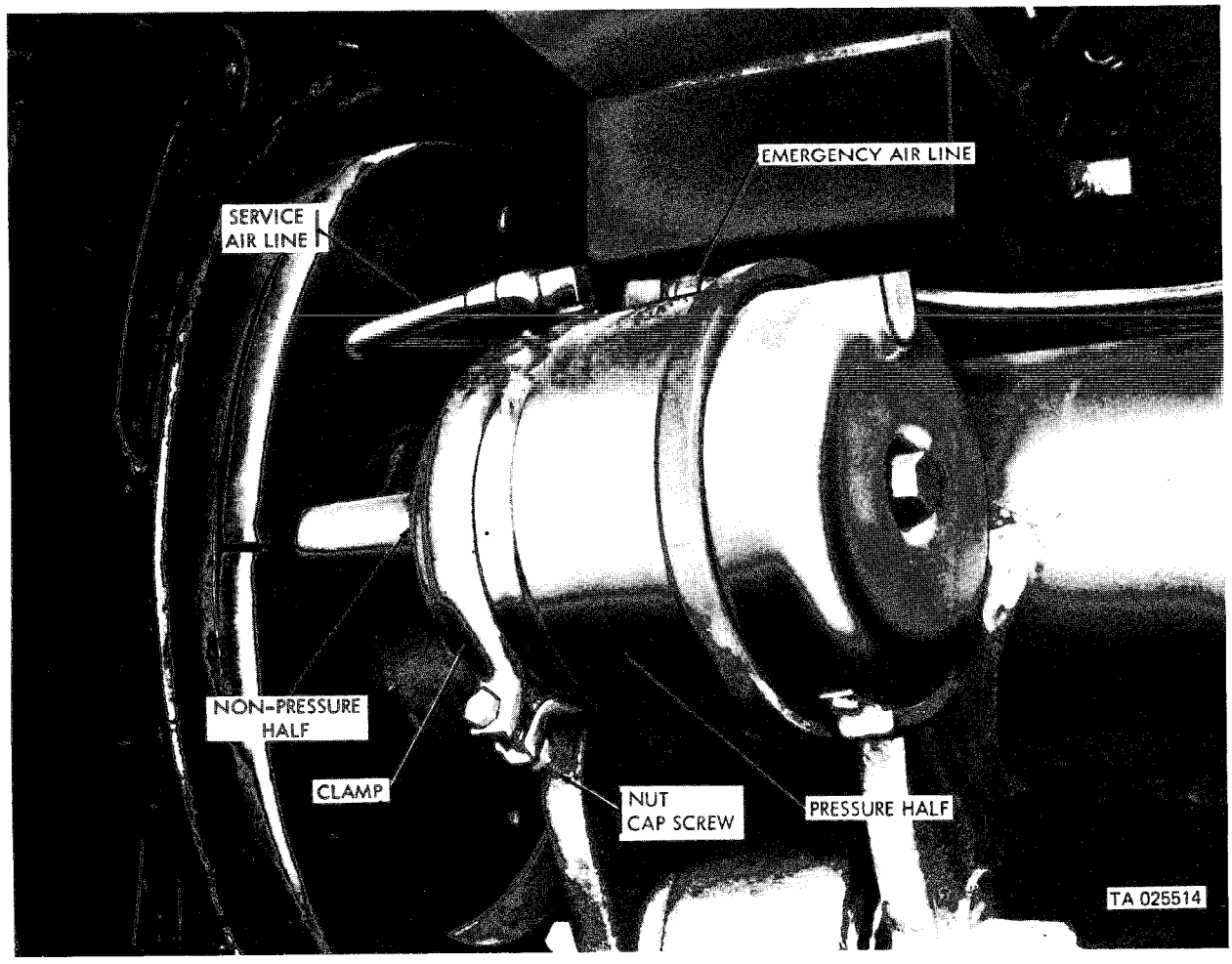


Figure 4-31. Fail-safe housing assembly.

4-33. **Brake Air Chamber Assembly and Fail-Safe Chamber Assembly Replacement**
(fig. 4-32 and 4-33)

a. Removal.

(1) Depressurize air system (para 4-38).

(2) Remove four cap screws and lockwashers securing dust shields to spider. Remove two dust shield halves.

(3) Disconnect airlines from air chamber and fail-safe unit and tag for identification at installation.

(4) Use drift, or other blunt tool, and hammer to loosen collet nut.

(5) Remove brake air chamber assembly or fail-safe chamber assembly by unscrewing from plunger housing. Remove collet nut from chamber assembly.

(6) Remove the inspect wedge assembly by following procedure in paragraph *4-34d*.

6. Repair. Repair of brake air chamber assembly and fail-safe chamber assembly should be accomplished by direct support maintenance personnel.

c. *Installation.*

(1) Insert wedge assembly into plunger housing by following procedure in paragraph 4-34. Make certain wedge assembly is properly seated.

(2) Screw collet nut onto chamber assembly. Screw brake air chamber assembly or fail-safe chamber assembly into plunger housing until it bottoms (collet nut loose).

(3) Aline air inlet ports with brake air lines by unscrewing air chamber assembly. Do not unscrew air chamber assembly more than one full turn.

(4) Hand tighten collet nut: then tighten collet nut with drift and hammer 1½ teeth or 3/16 turn.

(5) Replace two dust shield halves and secure to spider with four cap screws and lockwashers. Torque screws 16-20 lb ft.

(6) Use air source to pressurize air system.

(7) Check for air leakage in accordance with paragraph *4-32a*.

NOTE

Be certain fail-safe power spring has been manually released.

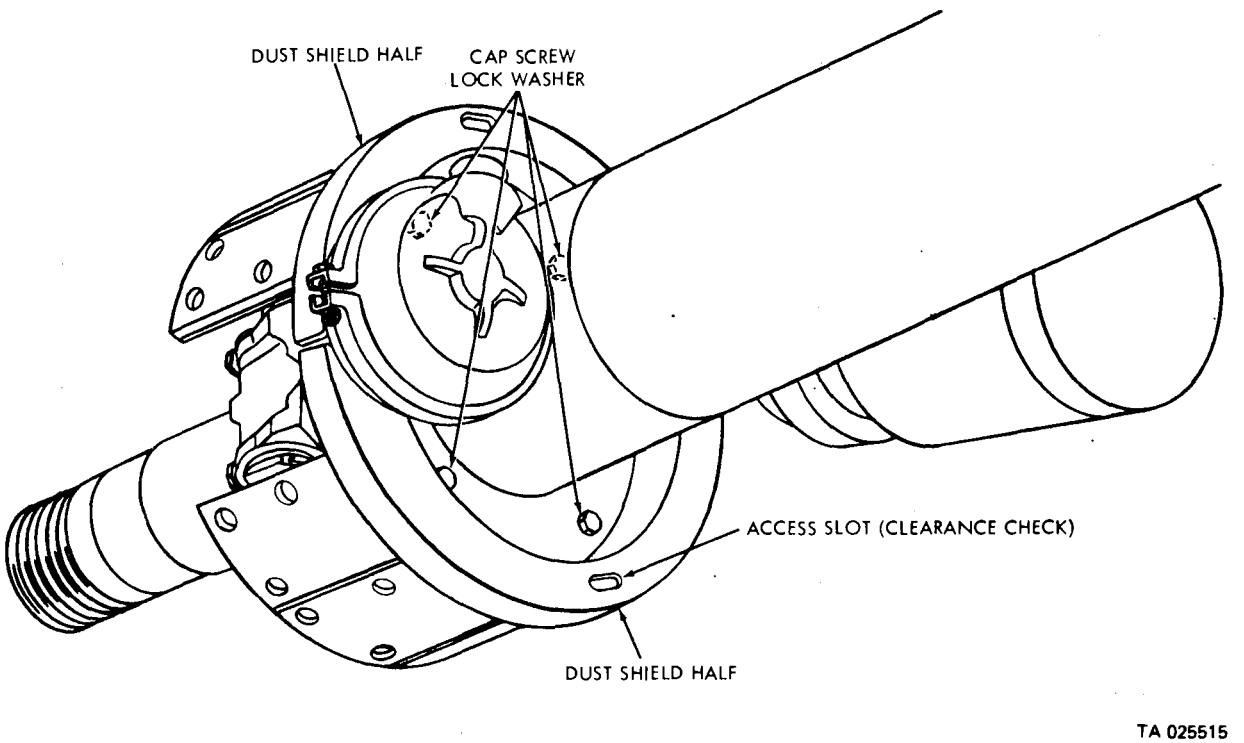


Figure 4-32. Dust shield.

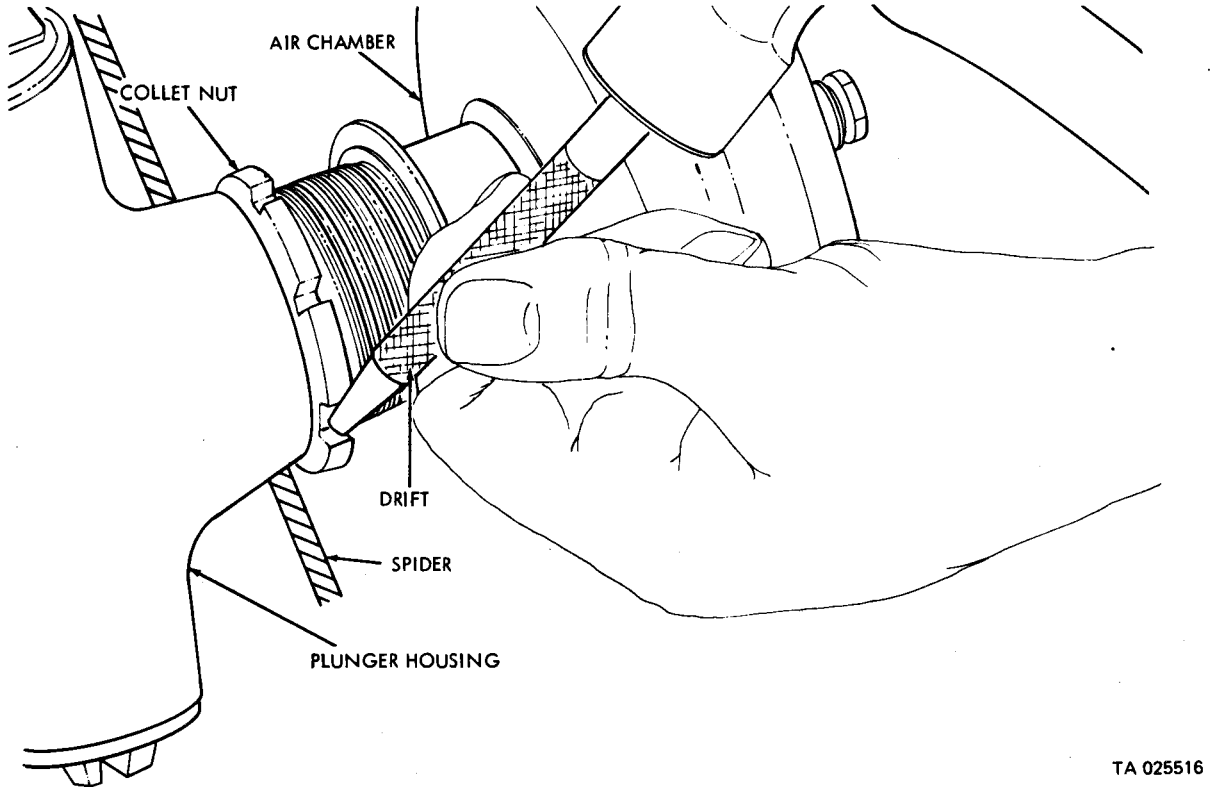


Figure 4-33. Air chamber assembly removal or installation.

4-34. Wedge Assembly Inspection and Replacement

(fig. 4-34).

a. Removal.

(1) Remove brake air chamber assembly or fail-safe chamber assembly by following procedure in paragraph *4-33a.*

(2) Remove wedge assembly by pulling straight out of plunger housing.

b. Inspection. Clean wedge assembly thoroughly with mild soap solution and dry with low pressure compressed air. Inspect for damaged or inoperable parts. Replace wedge assembly, if necessary.

c. Repair. Repair of wedge assembly should be accomplished by direct support maintenance personnel.

d. Installation.

(1) Without disturbing position of plungers, wipe plunger housing wedge assembly chamber with clean rag.

(2) Install wedge assembly into the plunger housing. Check for correct roller-plunger engagement by:

(a) Observing the ears on wedge assembly are in corresponding slots in wedge bore of plungers,

(b) Pushing on wedge rod by hand, while checking for plunger and brake shoe lift, and

(c) Measuring the standout of the wedge rod from the end of the threaded plunger housing bore per inset of figure 4-34. When properly assembled, the wedge rod standout is 2/14 inches.

(3) Install brake air chamber assembly or fail-safe chamber assembly by following procedure in paragraph *4-33c.*

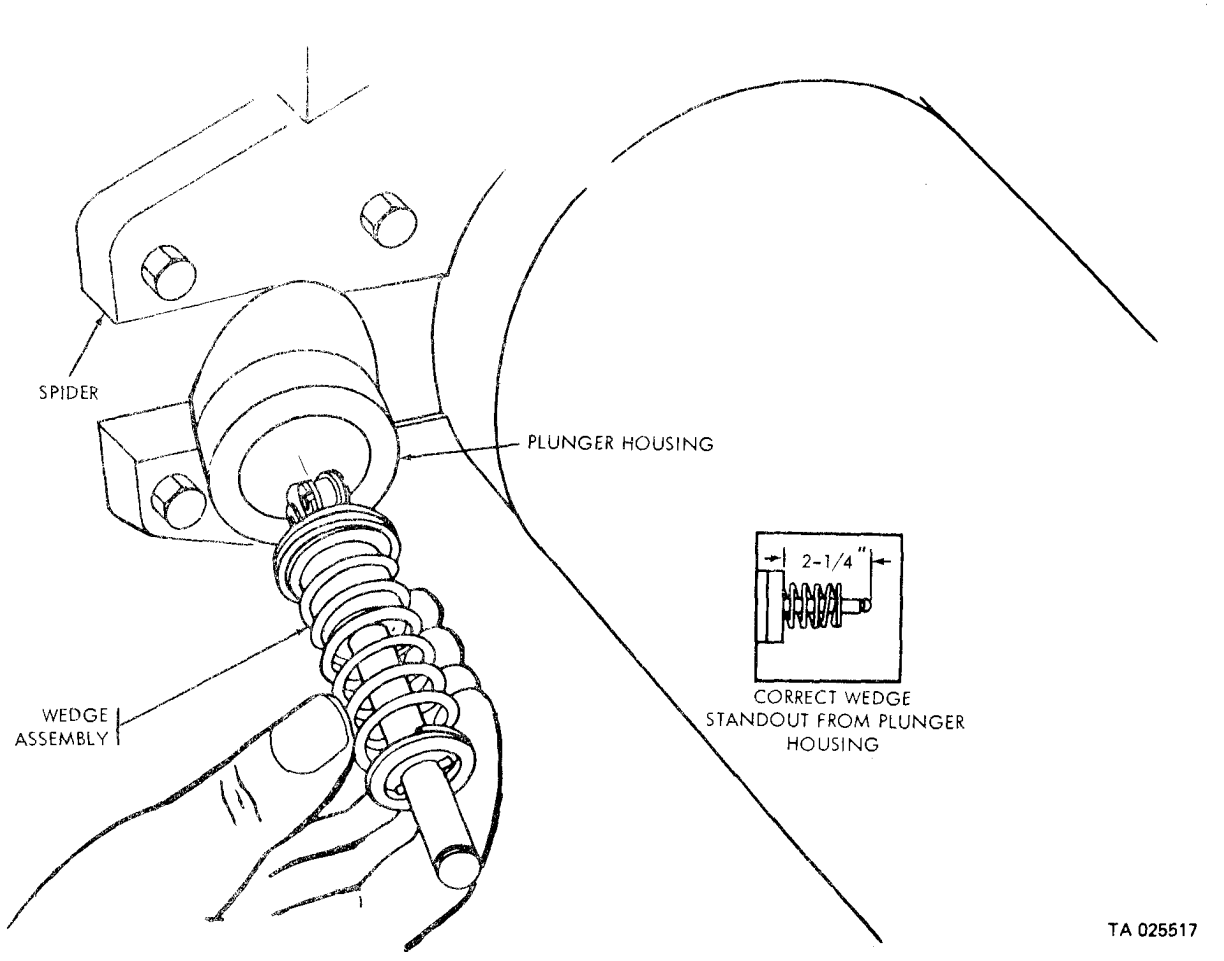


Figure 4-34. Wedge assembly removal or installation.

4-35. Plunger Housing Assembly Replacement and Repair

a. Service. The plunger housing assemblies should be serviced by following procedure *c* through e below whenever the brake shoes have been removed. It is not necessary to remove plunger housing from spider to disassemble, inspect and repair or assemble plunger housing assembly components *(c* through *e* below). Remove plunger housing assembly by following procedure in *b* below only if plunger housing is damaged.

CAUTION

The internal components of the plunger housing assemblies used on semitrailer no. 1 through 200 and those used on semitrailer no. 201 and on are not interchangeable. Take extreme care to replace plunger housing assemblies and components of plunger housing assemblies with the correct parts.

b. Removal (fig. 4-35).

(1) Remove brake shoe assemblies by following procedure in paragraph 4-31 *b.*

(2) Remove brake air chamber or fail-safe chamber assembly by following procedure in paragraph *4-33a.*

(3) Remove four cap screws and lock washers securing plunger housing assembly to welded spider and remove plunger housing assembly.

(4) If necessary, remove other plunger housing assembly in same manner.

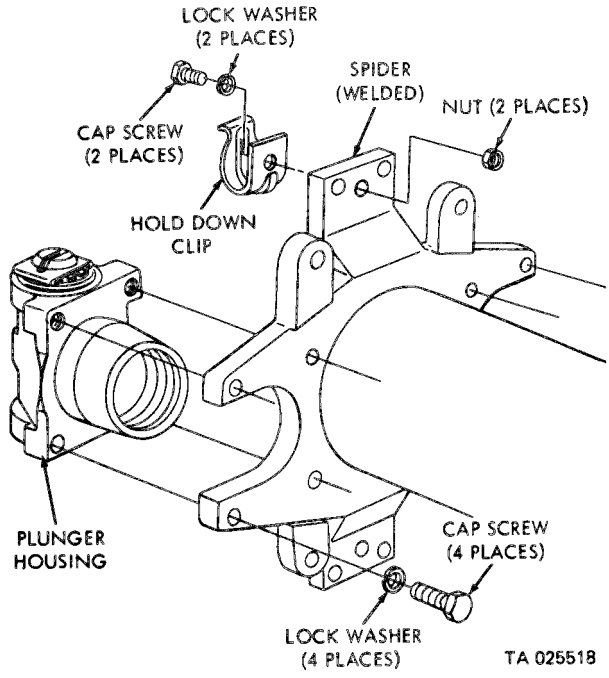


Figure 4-35. Plunger housing assembly.

c. Disassembly (fig. 4-36 or 4-37).

(1) Remove anchor plunger guide and gasket from plunger housing.

(2) Remove guide assembly, gasket and spring from plunger housing. Use a small magnet to remove adjusting pawl.

(3) Pry anchor plunger seal assembly loose from housing and remove seal assembly and plunger. Remove seal assembly from anchor plunger.

(4) Unscrew adjusting bolt from actuator. Pry adjusting bolt seal assembly loose from housing and remove seal assembly and actuator. Remove seal assembly from actuator.

(5) Remove adjusting plunger from housing.

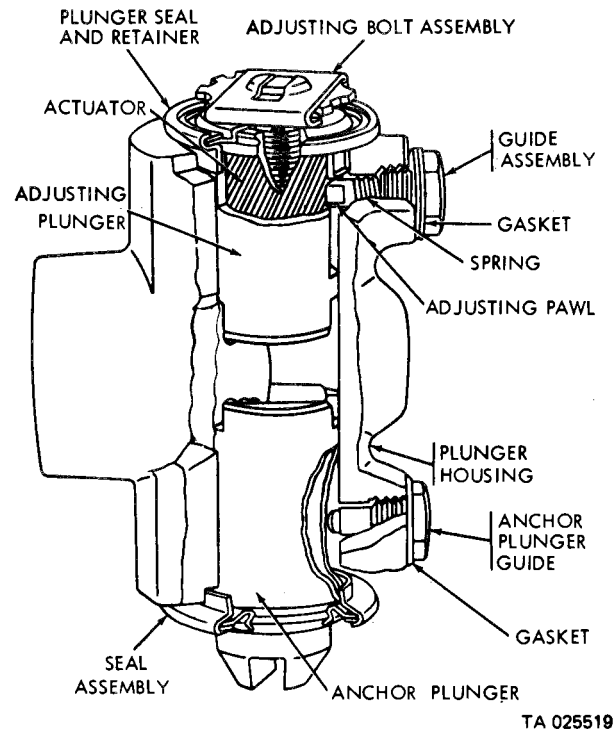


Figure 4-36. Plunger housing assembly (semitrailer No. 1 through 200).

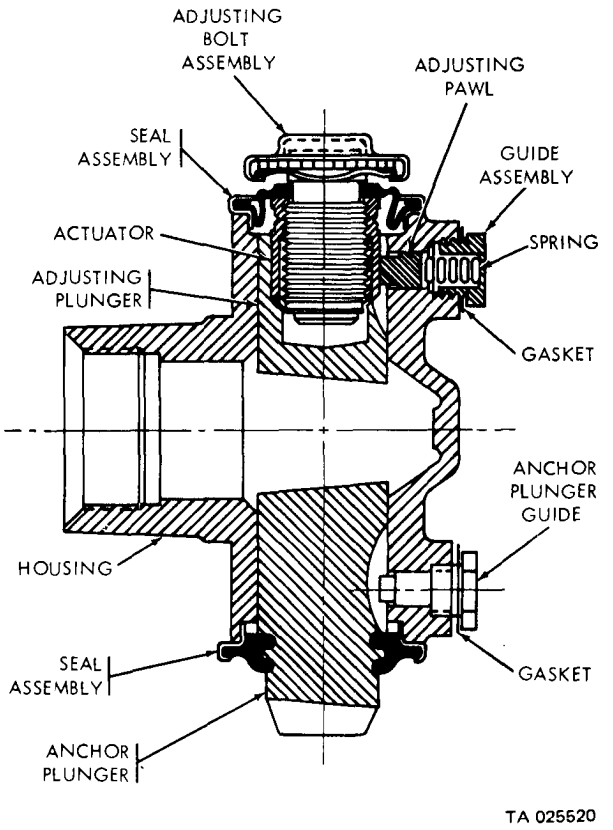


Figure 4-37. Plunger housing assembly (semitrailer No. 201 and on).

d. Inspection and Repair. Thoroughly clean all metal parts with dry cleaning solvent type II (SD-2) and dry with low pressure compressed air.

NOTE

Do not use dry cleaning solvent to clean any rubber parts.

Thoroughly clean seal assemblies and gaskets with mild soap solution and dry with low pressure compressed air. Wire brush plunger parts and adjusting bolt threads, if required, to remove caked-on dirt and corrosion. Inspect seal assemblies and gaskets for tears, cuts and deterioration, and replace if damaged. Check the angled plunger roller faces for pits, nicks or grooves, and replace if necessary. Check anchor plunger nose for burrs, and remove with crocus cloth, if necessary. A bright, shiny surface where wedge assembly roller contacts plunger surface is normal. Check threads of adjusting bolt assembly and replace assembly if damaged.

e. Assembly.

NOTE

Each plunger housing assembly has one adjusting plunger and one anchor plunger. The anchor plunger is marked on the slotted end, "R" for right-band brakes and "L" for left-hand brakes. DO NOT mix at assembly.

(1) Assemble seal assembly onto anchor plunger in the following manner (fig. 4-38):

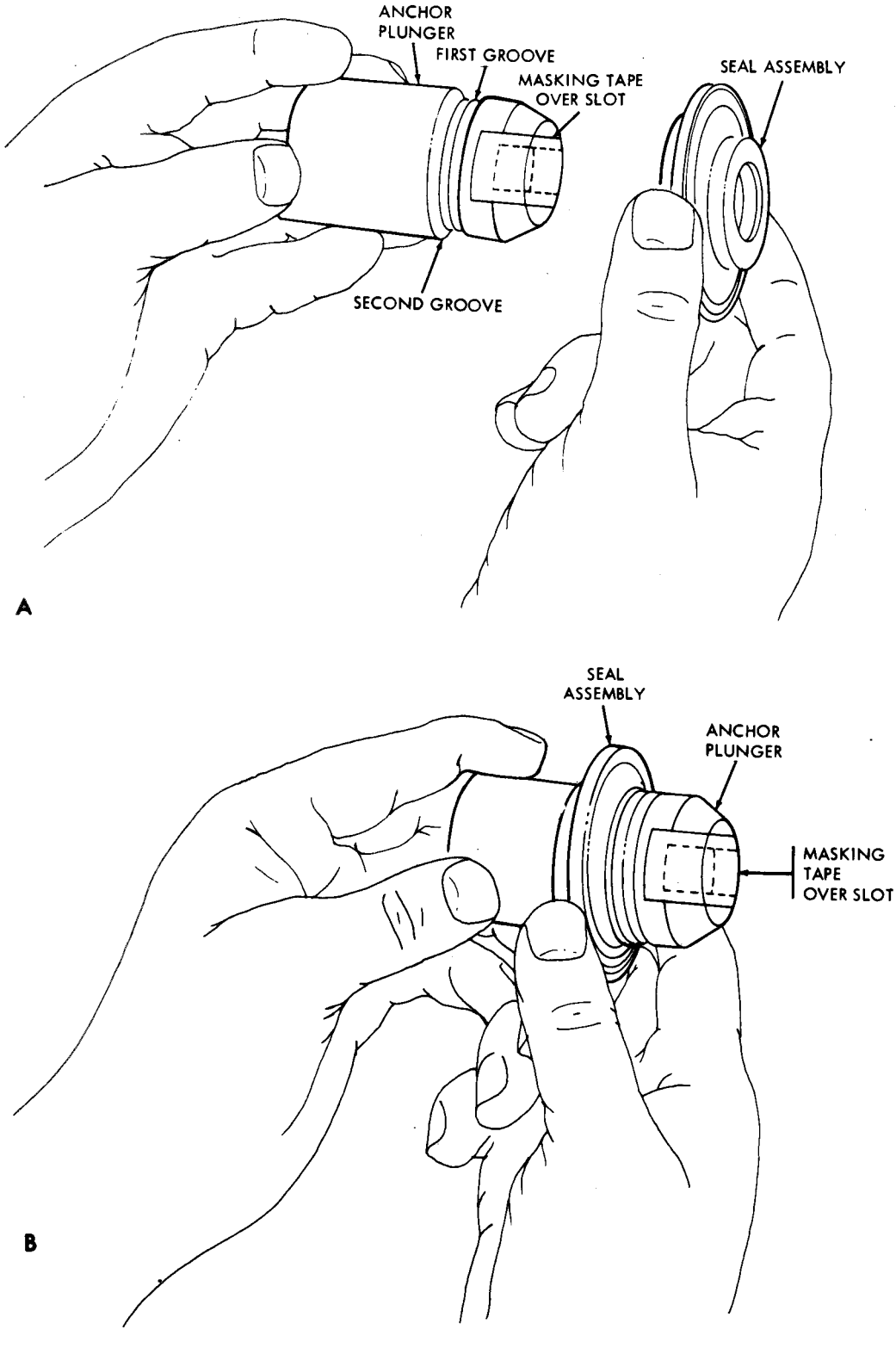


Figure 4-38. Seal assembly installation onto anchor plunger.

(a) Apply film of grease (BRH) to inside surfaces of seal assembly.

(b) Mask brake shoe web slot in plunger nose with masking tape to protect seal. Carefully push the double-lip seal assembly onto the plunger, stretching the outer seal lip over the plunger nose end, until the inner seal is completely in the second plunger groove and the outer seal lip is in the first plunger groove. Remove masking tape from plunger nose.

(2) Install anchor plunger into plunger housing in the following manner:

(a) Coat all plunger bores with grease (BRH).

NOTE

Take care that anchor plungers marked "L" are installed in left-hand brakes and anchor plungers marked " R" are installed in right-hand brakes.

(b) Coat entire anchor plunger with grease (BRH), packing cavity behind seal assembly, and insert plunger and seal assembly into housing with plunger keyway slot alined with anchor plunger guide hole. The plunger must go all the way into the plunger bore and seat on the bosses at bottom.

(c) Seat plunger seal assembly in plunger housing with seal driver tool (CPR 102256) (fig. 4-39). Driver must be centered over seal retainer to prevent damage to seal assembly.

(3) Assemble gasket and anchor plunger guide into plunger housing. Make certain guide end enters the plunger keyway slot, so plunger can slide freely in housing bore. Tighten guide to 15-20 lb ft torque.

(4) Coat the inside and outside surfaces of both the adjusting plunger and the adjusting sleeve with grease (BRH).

NOTE

The adjusting pawl has teeth on one end, flats on the side, and a chamfered edge in the other end. Coat pawl with grease (BRH) and insert it into the guide hole, teeth first, and -IMPORTANT- with chamfer toward the brake shoe. This alines the pawl and actuator teeth and the flats with the keyway slot. Be sure pawl is fully inserted into the plunger housing slot.

Place the adjusting plunger into the plunger housing, alining plunger keyway slot with the guide hole, and assemble adjusting pawl, gasket, spring and guide assembly into the plunger housing. Turn guide assembly in one or two turns.

(5) Assemble the plunger seal onto the adjusting actuator in the same manner described in (1) above, Insert actuator and seal assembly into the adjusting plunger, wiggling it, so the guide pawl and actuator teeth mesh (fig. 4-40). If necessary, back off guide assembly, to enable meshing of pawl and actuator teeth. Push the actuator into the plunger until it bottoms.

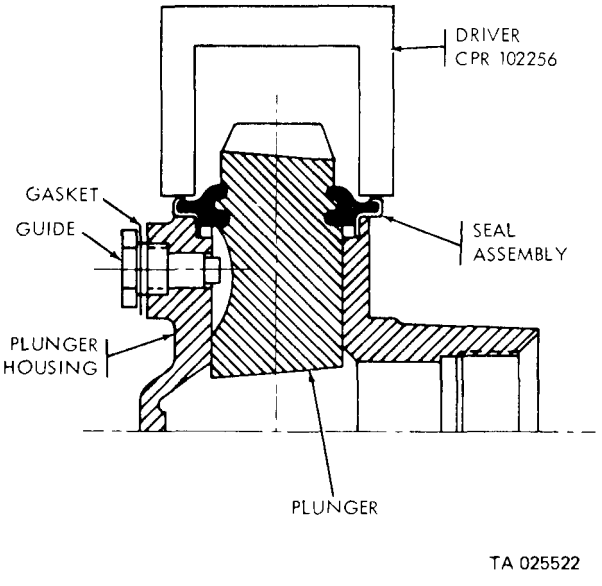


Figure 4-39. Seating plunger seal assembly in plunger housing.

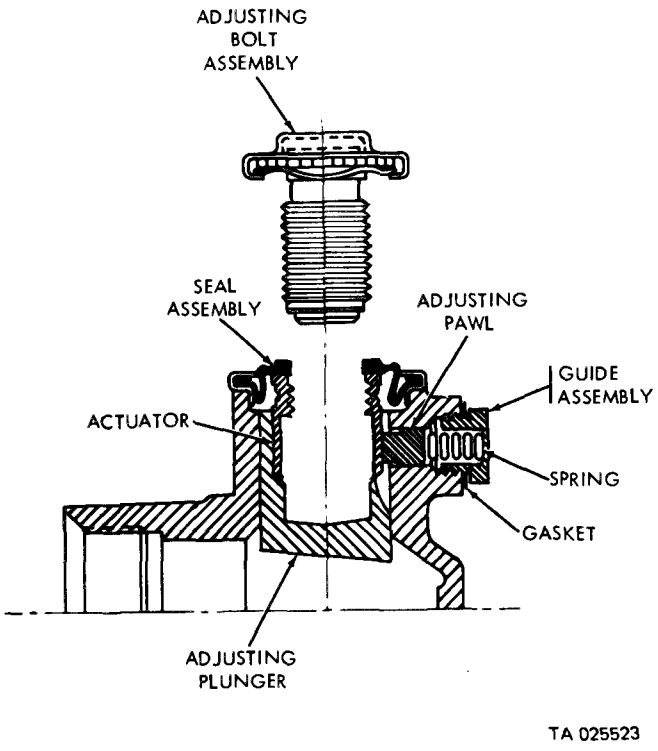


Figure 4-40. Automatic brake adjusting mechanism assembly.

(6) Using driver (CPR 102256) seat seal assembly into the plunger housing same as (2) *(c*) above. Hand tighten guide assembly into the plunger housing.

(7) Proper meshing of the pawl and actuator teeth can be checked at this point. Grease-coat (BRH) adjusting bolt threads and thread adjusting bolt into the adjusting actuator after working it through the seal assembly flap hole, being careful not to pinch the seal in the threads. Thread adjusting bolt into the actuator until it bottoms. A clicking sound and a ratcheting feel will indicate meshing of the teeth. Turn the adjusting bolt out three turns. Proper meshing is indicated if there is no clicking sound or ratcheting feel.

(8) Tighten guide assembly to 15-20 lb ft torque.

(9) Turn adjusting bolt in to just short of the seal assembly. Do not bottom it on the seal. Pull the adjusting bolt and actuator outward slightly against the seal, to insure entry of the seal lip in the actuator groove. Push the bolt and sleeve back into the plunger.

f. Installation. Install new or repaired plunger housing assembly in reverse order of removal *(b* above). Take care to install right-hand and left. hand assemblies on proper side of semitrailer.

Section VIII. AIR SYSTEM MAINTENANCE

4-36 General

The air system includes lines, fittings, valves, controls, and reservoir necessary to operate the air brake and air suspension systems. Refer to paragraph *4-30e* for a description of the brake air system. Refer to paragraph 4-52 for a description of the air suspension air system.

4-37. Tests, Adjustments and Procedures Used in Conjunction with Troubleshooting

a. *General.* The following procedures briefly outline steps necessary to isolate malfunctions. This paragraph also includes individual air system component tests necessary for troubleshooting. All tests for valves are on-vehicle, in-system tests. Valves shold not be removed unless they are to be replaced.

b. Brake Air System Checks.

NOTE

No testa should be made on the semitrailer air system until you make sure that the towing vehicle air system is operating properly.

(1) *Air pressure check.* Prior to making the following checks and tests be sure good connections are made at the air supply couplings from the towing vehicle. Allow approximately 10 minutes for the trailer air system to become fullycharged. Install accurate tire gage (recently calibrated) on tank valve of auxiliary air supply valve (fig. 2-8). Assure that system air pressure is at 90.120 psi. (Same reading should be obtained at tank valve at air tank fill (fig. 2-3)). If air pressure is low, check emergency and reservoir air line tubing for kinks and listen for leakage *(d* below). Refer to figure 4-27 and 4-28 to identify air lines.

(2) *Test while driving.* Tow vehicle short distance while observers are stationed along roadside at sides of trailer, Perform test first with front suspension raised, then with rear suspension raised. If brakes fail (no wheel skid observed), or if brakes pull, grab, are weak, uneven, slow in application, or

become locked in applied position refer to table 4-4.

(3) *Test while parked.* Life front suspension and perform following tests, then, lift rear suspension and repeat tests. Refer to table 4-4, when malfunction is found.

(a) Man in towing vehicle cab applies brakes while two men try to turn raised semitrailer wheel(s). Wheel(s) should not turn.

(b) *While* brakes remain unapplied two men try to turn raised trailer wheel(s). Wheels should turn.

c. *Air Suspension System Tests, Checks and Adjustments.* Refer to figure 4-59 and 4-60 to identify air suspension air lines and components.

NOTE

No test should be made on the air suspension system unless full air pressure (90 - 120 psi) is available in the reservoir air line.

(1) *Operating Check.*

(a) Assure suspension air shutoff valves (fig. 2-8) are open on empty semitrailer. Move suspension air control valve to LIGHT LOAD position. Observe that air springs are inflated. Check 15 psi regulator valve for correct pressure setting (2) below.

(b) Move suspension air control valve handle to HALF LOAD position. Observe that air springs expand. Walk around semitrailer and listen for air leakage. Check 50 psi regulator valve for correct pressure setting (2) below.

(c) Move air control valve handle to FULL LOAD position. Observe that air springs expand and raise forward tandem wheels several inches off ground. Check 85 psi regulator valve for correct preesure setting (2) below.

(d) Move air control valve handle to NO LOAD position. Listen at air control valve for venting of air from the air springs. Observe the front tandem lower and the rear tandem raise approximately three inches off the ground. Test 100 psi regulator valve for correct pressure setting (2) below. Refer to table 4-4 if malfunction is found in any check *(a*) through *(d)* above.

(2) *Regulator Valve Pressure Setting Check.* Apply accurate air gage (recently calibrated) to each suspension regulator valve air test valve (fig. 2-8), and check for the following pressure requirements:

Air Control Valve at LIGHT LOAD Position	1535 psi
Air Control Valve at HALF LOAD Position	50&5 psi
Air Control Valve at HALF LOAD Position	85±5 psi
Air Control Valve at NO LOAD Lift Position	100±5 psi

Adjust valve if required, (3) below. Replace valves that cannot be adjusted to requirements.

NOTE

Incorrect readings may be obtained if system air pressure is below normal. If low pressure is measured at several regulator valves, check for obstruction in air supply line(s) to air control valve.

(3) *Regulator Valve Adjustment.* Adjust each regulator valve by loosening jam nut which locks threaded adjusting cap (fig. 2-8). Turn cap clockwise to increase pressure, counterclockwise to reduce pressure. Tighten jam nut when required pressure is obtained.

d. Air Lines Leakage Test and Inspection. If leaks are suspected, coat air lines, couplings, and connections with soapy water and watch for bubbles. Tighten fittings on lines and hoses that show evidence of leaks. Inspect lines for partial restrictions caused by dents or kinks. Inspect hose assemblies for wear, cuts, or breaks. Replace tubing, hose, or fitting if damaged, or if leak cannot be stopped. Whenever nylon tubing is replaced be sure to add inserts to tube ends, otherwise leakage will occur.

e. *Air Tank Leakage Test.* With air system charged, coat drain cocks and tubing connections with soapy water. No leakage is permissible. Tighten any leaking connections. Inspect tanks for damage or corrosion. Replace tanks that leak, are damaged or are corroded. Open drain cocks slightly on air tanks daily and allow moisture to drain. Close drain cocks after draining.

f. Emergency Relay Valve Operation and Tests.

(1) Purpose (fig. 4-27 and 4-28). The relay valves (2) are connected with the service and emergency air lines, the air reservoirs, and the brake air chambers. The valves function to speed brake operations and to apply brakes if the semitrailer becomes separated from the towing vehicle.

(2) *Operation during pressure build-up.*

(a) Up to 45 psi, system air enters the emergency relay valve through the emergency air line and is distributed to the semitrailer air reservoirs and to the service brakes, keeping them applied.

(b) Above 45 psi, system air enters the relay valve through the emergency air line, but is directed only to the semitrailer reservoirs. Service brakes are released.

(3) *Operation after pressure build-up.*

(a) During brake application, the emergency relay valve receives a pressure signal from the towing vehicle service air line and supplies system air from the semitrailer reservoirs to the semitrailer

brake chambers. Brake air pressure is equal to the signal pressure in the service air line. When the towing vehicle brake pedal is released, brake air chamber air is vented through the relay valve, thus releasing the semitrailer brakes.

(b) If the semitrailer breaks away from the towing vehicle, the pressure loss in the emergency air line is sensed by the relay valve. The relay valve reacts by sending full pressure semitrailer reservoir air to the service brakes to stop the semitrailer. This emergency operation also occurs when the semitrailer is merely uncoupled from the towing vehicle or when the towing vehicle parking brake is applied.

(4) *Operating tests.*

(a) With air hose couplings connected to the towing vehicle, apply brake treadle in towing vehicle, and check to be sure that brakes on all semitrailer wheels engage.

(b) Release brakes, and check to be sure that each brake dieengages promptly. When towing vehicle brake treadle is released, brake chamber air should vent through the exhaust port of the relay valve. If this venting does not occur, the relay valve is defective.

(c) With brake system fully pressurized close shutoff cock in emergency line on towing vehicle, and disconnect air hose coupling tagged EMERGENCY. Check to be sure semitrailer brakes apply automatically.

(d) Connect air hose coupling tagged EMERGENCY, open shutoff cock on towing vehicle, and check to be sure brakes release automatically.

(e) If brakes malfunction, assure that the emergency relay valve is making contact with a pressure signal in the service air line when the brakes are applied. (Disconnect service air line and depress brake pedal to witness the escape of pressured air). Assure that the relay valve is in contact with the air pressure available in the emergency and reservoir air lines. (Check system air pressure with tire air gage and assure that no kinks are present in the air lines.) If required air pressure is applied to relay valve port, but the brakes fail to operate correctly, replace the emergency relay valve (para 4-42).

(5) *Leakage test.*

(a) With air brake system connected to towing vehicle air supply, depress and hold cab brake pedal. Apply soapy water to flanges of relay valve which hold diaphragm, and to service air line couplings. No leakage is permitted. Tighten nuts on flanges, and tighten coupling as required.

(b) Repressurize vehicle emergency air line, and coat exhaust ports of emergency relay valves with soapy water. Leakage must not exceed a 1-inch bubble in 3 seconds. If excess leakage is found, replace emergency relay valve. Refer to paragraph 4-42 for emplacement.

g. Service Brake Manual Release Valve Operation and Test.

(1) *Operation* (fig. 4-27 and 4-28). The valve handle has two positions–in and out. The handle pops out automatically when the semitrailer emergency air line is pressurized, and this is its normal position. In this position the semitrailer emergency air line is connected to the semitrailer emergency relay valves. When this emergency air line is depressurized the emergency relay valves apply the semitrailer service brakes. The service brakes are applied under three circumstances:

(a) The parking brake is applied in the towing vehicle.

(b) The semitrailer is parked and the air lines disconnected from the towing vehicle.

(c) The semitrailer breaks away from its towing vehicle.

(d) The service brake manual release valve is used to release the service brakes once they have been applied by any of the above actions. The release valve handle is pushed IN. This action isolates the trailer emergency air line and uses stored system air to pressurize the emergency air port of the relay valves thus releasing the service brakes.

(2) *Test.*

(a) Pressurize semitrailer air system.

(b) Disconnect intervehicular emergency air line.

(c) Verify valve handle is in the OUT position (brakes applied).

CAUTION

Do not use pliers to loosen fitting. Use only proper wrench. Unscrew fitting only a few threads.

(d) Loosen fitting on air line from manual release valve to emergency relay valves (fig. 4-27 and 4-28). No air should escape from the fitting unless the release valve handle is pushed IN.

(e) Push handle of manual release valve IN. Air should escape forcefully from the loosened fitting.

(f) Replace valve if air escapes when valve handle is OUT or if air does not escape when valve is IN. See paragraph 4-45 for replacement procedure.

h. Fail-Safe Brake Manual Release Valve Operation and Test.

(1) *Operation* (fig. 4-27 and 4-28). This valve is mechanically identical to the service brake manual release valve. When the semitrailer air system is pressurized the control knob handle on this valve pops OUT to its normal position. In this position the fail-safe brake air chambers are pressurized by

system air from the semitrailer air reservoirs. When the air system is depressurized, the fail-safe springs apply the semitrailer brakes. The manual release valve is used to release the fail-safe brakes when the semitrailer air system is depressurized. The valve control handle is pushed IN (and will stay IN as long as the main air system is depressurized). This action connects the fail-safe air chamber to the fail-safe release air tank, thus pressurizing the fail-safes and releasing the semitrailer brakes. (The fail-safe release tank is isolated from the main air system by one-way check valve. This allows the release tank to remain pressurized even though the rest of the air system is not under pressure).

(2) Test.

(a) Pressurize fail-safe brake release tank either by pressurizing semitrailer air system or through the fail-safe brake release tank fill valve (fig. 2-3).

(b) Disconnect intervehicular emergency air line.

(c) Repressurize main air reservoir by opening drain valve in bottom of one tank.

(d) Verify 90 to 120 psi at fail-safe release tank fill valve (fig. 2-3) by checking pressure with a tire air gage.

(e) Position fail-safe manual brake release valve handle to the OUT position.

CAUTION

Do not use pliers to loosen fitting. Use only proper wrench. Unscrew fitting only a few threads,

(f) Loosen an air fitting on air line leading from manual release valve to fail-safe brake chambers (fig. 4-27 and 4-28). No air should escape unless handle is pushed IN.

(g) Push release valve handle IN. Air should escape from the loosened fitting.

(h) Replace valve if air leaks when handle is OUT, or if it does not flow when the handle is IN. See paragraph 4-45 for replacement procedure.

i. Pressure Regulator Values Operation and Test.

(1) *Operation* (fig. *4-27, 4-28, 4-59,* and 4-60). Four pressure regulator valves are used in the semitrailer suspension system. In each case the regulators supply air at a constant pressure to some other component of the semitrailer. Suspension regulators supply air at 15, 50, 85, and 100 psi.

(2) *Test.* The 15 psi brake air system regulator is tested and adjusted in a similar manner to the suspension regulator valves. See *c* (2) above,

j. *Low Pressure Warming Switch Operation and Test.*

(1) *Operation* (fig. *4-27* and 4-28). This switch is part of a circuit that warns the M746 driver when semitrailer air system pressure drops below 65 psi.

(2) Test.

(a) Observe low pressure lamp in towing vehicle as semitrailer air system is pressurized or depressurized. The lamp lights at pressures below 65 psi and goes out at higher pressure.

(b) As an alternative to (a) above connect an ohmmeter across the two terminals of the switch (fig. 4-22) and observe the meter as the air system is pressurized or depressurized. The resistance should be near zero at pressures below 65 psi and very high at pressures above 65 psi.

k. Two-Way Check Value Operation and Test.

(1) *Operation* (fig. 4-59 and 4-60). Two-way check valves are used in the suspension air system to deliver or to shut off air from the various regulator valves. This valve is tee shaped with two inlet ports opposite each other and one outlet port. During operation air is admitted from the inlet port with the highest pressure and directed to the outlet port. The second inlet port is automatically sealed off.

(2) *Test*.

(a) Pressurize air system 90 to 120 psi).

(b) Verify that air at 85 psi, 50 psi and 15 psi is available to the suspension system by checking the tank valves on the suspension pressure regulators using the towing vehicle tire air gage (fig. 4-59 and 4-60).

(c) Verify that the suspension shutoff valves are OPEN (fig. 4-59 and 4-60).

(d) Select FULL LOAD position on suspension air control valve and allow approximately 3 minutes for the system to react.

(e) Replace the two-way check valve in the *85* psi line if the air suspension springs do not inflate or if air vents continuously from the suspension air control valve.

(f) Select HALF LOAD position on suspension air control valve and allow approximately 3 minutes for the system to react.

(g) Replace both two-way check valves if air vents continuously from the air control valve.

(h) If the air bags are not inflated when the air control valve is in the HALF LOAD position *(f*) above either or both two-way check valves may be faulty: continue to (i *)* below.

(i) Select NO LOAD position on suspension air control valve and allow system approximately 3 minutes to react.

(j) Replace both two-way check valves if air leaks continuously from air control valve.

(k) Replace two-way check valve in 50 psi line if air springs are inflated in *(i) or (f)* above.

(l) Replace two-way check valve in 85 psi line if air bags do not inflate in either *(i*) or *(f*) above.

(m) Replace two-way check valve in 50 psi

line if suspension springs inflate in *(f)* but not in *(i)* above.

l. Auxiliary Air Supply Valve Operation and Test.

(1) *Operation.* This valve is a manually controlled air supply valve. It is provided so that auxiliary air-powered equipment may be operated from the semitrailer air system. This includes tire inflation equipment and other air-powered items.

(2) Test.

(a) Pressurized air system. Remove air supply outlet cap (fig. *4-54).*

(b) Place handle of valve in normal operating position (parallel to valve body). No air should escape from the air supply outlet (fig. 4-54), but system air should be available at the air valve-check with the towing vehicle tire air gage.

(c) Turn the valve handle at right angles to the valve body. Air should be available at the air supply outlet. The air valve (tank valve) should be without air.

(d) Place handle in normal operating position and coat entire valve with soapsuds. Leakage at any part of the valve should not exceed 1-inch soap bubble in five seconds.

(e) Replace the valve if excessive leakage occurs in *(d)* above or if air is not supplied at the air supply outlet, when the valve handle is in its proper position (c) above.

m. Air Control Valve Operation and Test.

(1) *Operation* (fig. 4-59 and 4-60). This manually controlled air valve directs air from the semitrailer air system reservoir to one of four pressure regulator valves in the suspension system. The three air lines from the control valve to the regulators that are not in use are vented to the atmosphere through the control valve.

(2) *Test.*

(a) Pressurize semitrailer air system.

CAUTION

Do not use pliers to loosen fittings. Use only proper wrench. Unscrew fitting only several threads.

(b) Loosen a fitting on one air line from the vehicle reservoir to the control valve and verify that air is available to the valve (fig. 4-59 and 4-60).

(c) Select each of the four control valve output positions in turn and check to see if air is being delivered to the proper suspension pressure regulator valve. This can be checked by applying the towing vehicle tire gage to the air test valves on each regulator valve (fig. 2-8).

(d) Replace the valve if it fails to supply air to the regulator valves (pare 4-49) or if it supplies other than the designated regulator pressure.

n. One-Way Check Valve Operation and Test.

(1) Operation (fig. *4-27* and *4-28).* The one-way check valve permits air to fill the fail-safe release air tank at the same pressure that exists in the main reservoir. However, it prevents air from returning to the main reservoir when air pressure is lost in the reservoir air line.

(2) *Test.*

(a) Pressurize trailer air system.

(b) Open drain cock on fail-safe release air tank until a loss of 20-30 psi is registered on an air gage at the air tank fill tank valve.

(c) Close drain cock. Air pressure at the air tank fill should build up to its original pressure.

(d) Close air supply line from towing vehicle and open drain cocks on main reservoir air tanks.

(e) After reservoir air line has drained apply tire air gage to air valve on auxiliary air supply valve. A pressure increase indicates a faulty one-way check valve.

4-38. Repressurizing Air System

WARNING

Depressurize air system prior to removal of any brake or air system component. If loaded, rear of semitrailer will sink as air is purged from air bags.

a. Place air control handle in LIGHT LOAD position to ensure all axles are on ground.

b. Open drain cock on bottom of each air tank assembly and fail-safe release reservoir.

c. After all repairs are completed, close drain cocks on all air tanks and fail-safe reservoir.

4-39. Air System Lines and Fittings

a. General. Repressurize air system (para 4-38) before replacing any air lines. Copper and/or nylon tubing is used in the air system for semitrailer No. 1 through 200 and nylon tubing for semitrailer No. 201 and cm. When replacing copper and/or nylon tubing, use new fittings.

b. Copper Tubing and Fittings. Refer to figure 4-41 through 4-44 for location and replacement of copper tubing and fittings, For preformed replacement copper tubing, notify direct support personnel. Organizational maintenance personnel are only authorized to replace fittings and install tubing. To install copper tubing, assemble nut over tube, open end out, then put sleeve (ferrule) on tube. Lubricate sleeve and threads of fitting and nut with oil (OE /HDO). Insert tube straight and square all the way into male fitting. Run down nut and thread it on, then tighten nut until sleeve just grips tube (moving tube while turning nut until you can no longer turn or move tube). After sleeve grips tube, tighten nut ¼ turn.

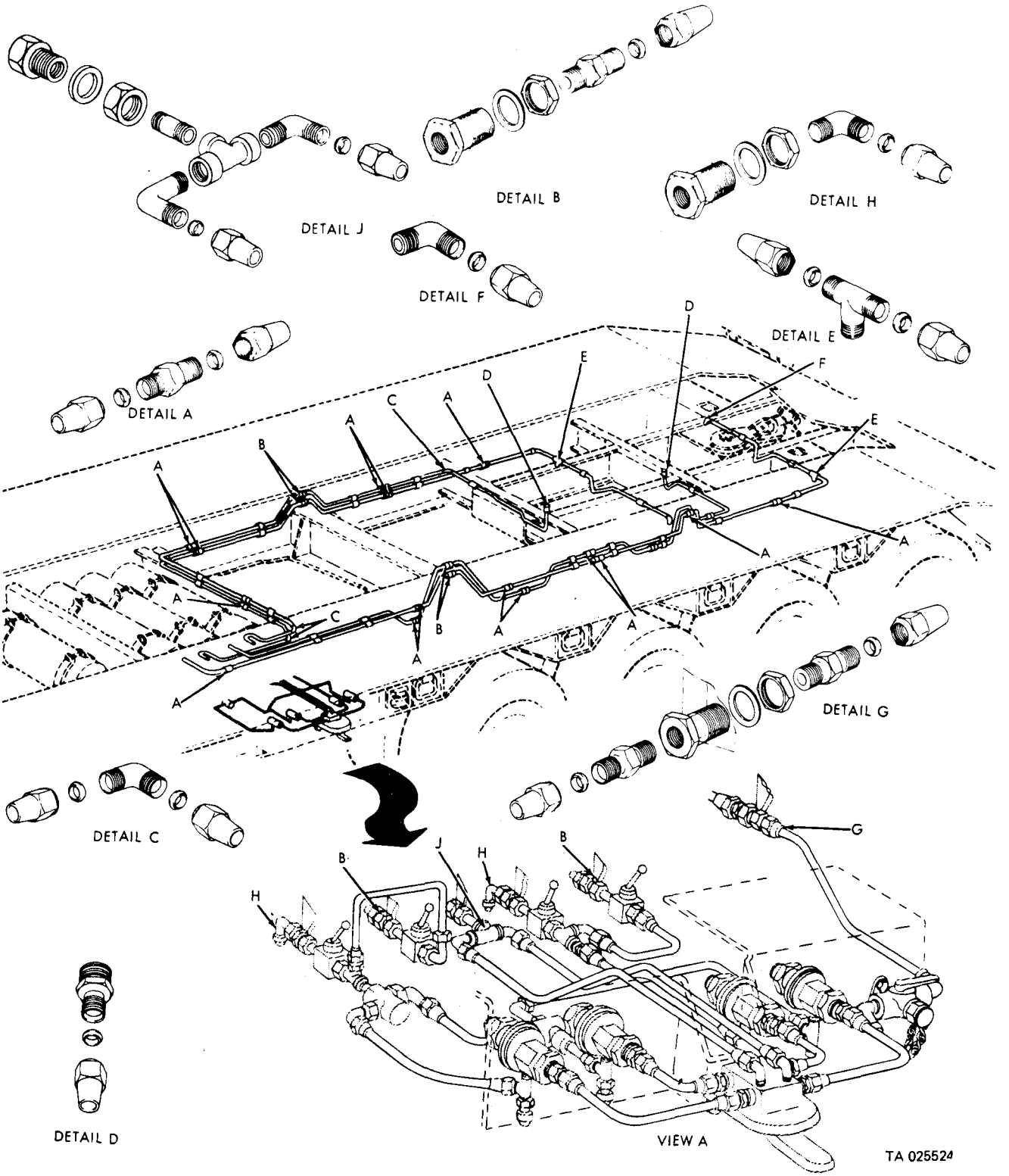


Figure 4-41. Air suspension system lines and fittings (semitrailer No. 1 through 200).

Key to figure 4-41:
A—Nipple (17)
B—Adapter, bulkhead coupling (6)
C—Elbow, 90° (3)
D—Adapter (2)
E—Tee (2)
F—Elbow, 90° (2)
G—Adapter, bulkhead coupling
H—Elbow, 90°, bulkhead coupling (2)
J—Elbow, 90°, bulkhead coupling, pipe nipple, street tee

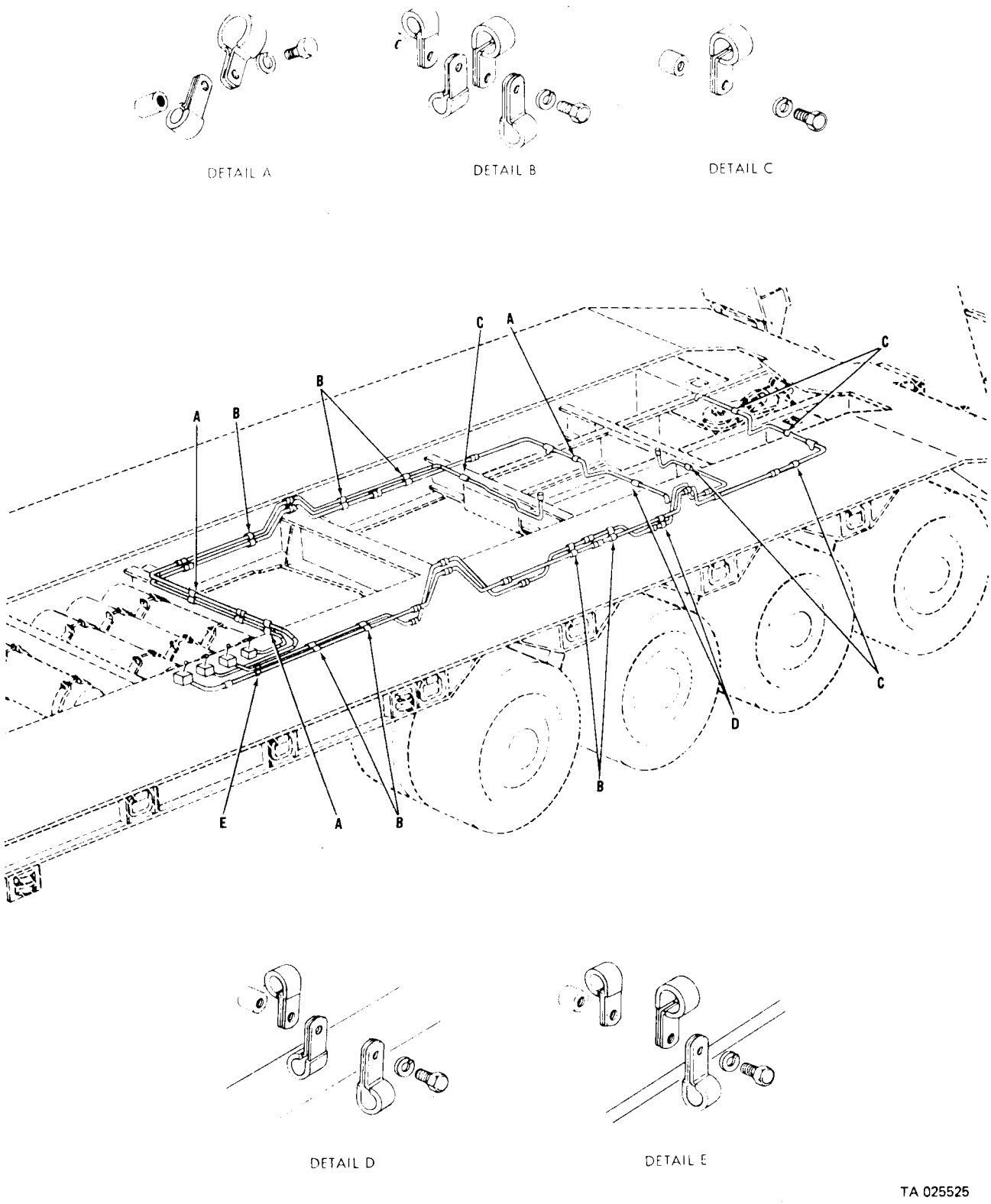


Figure 4-42. Air suspension system tube clamps (semitrailer No. 1 through 200).

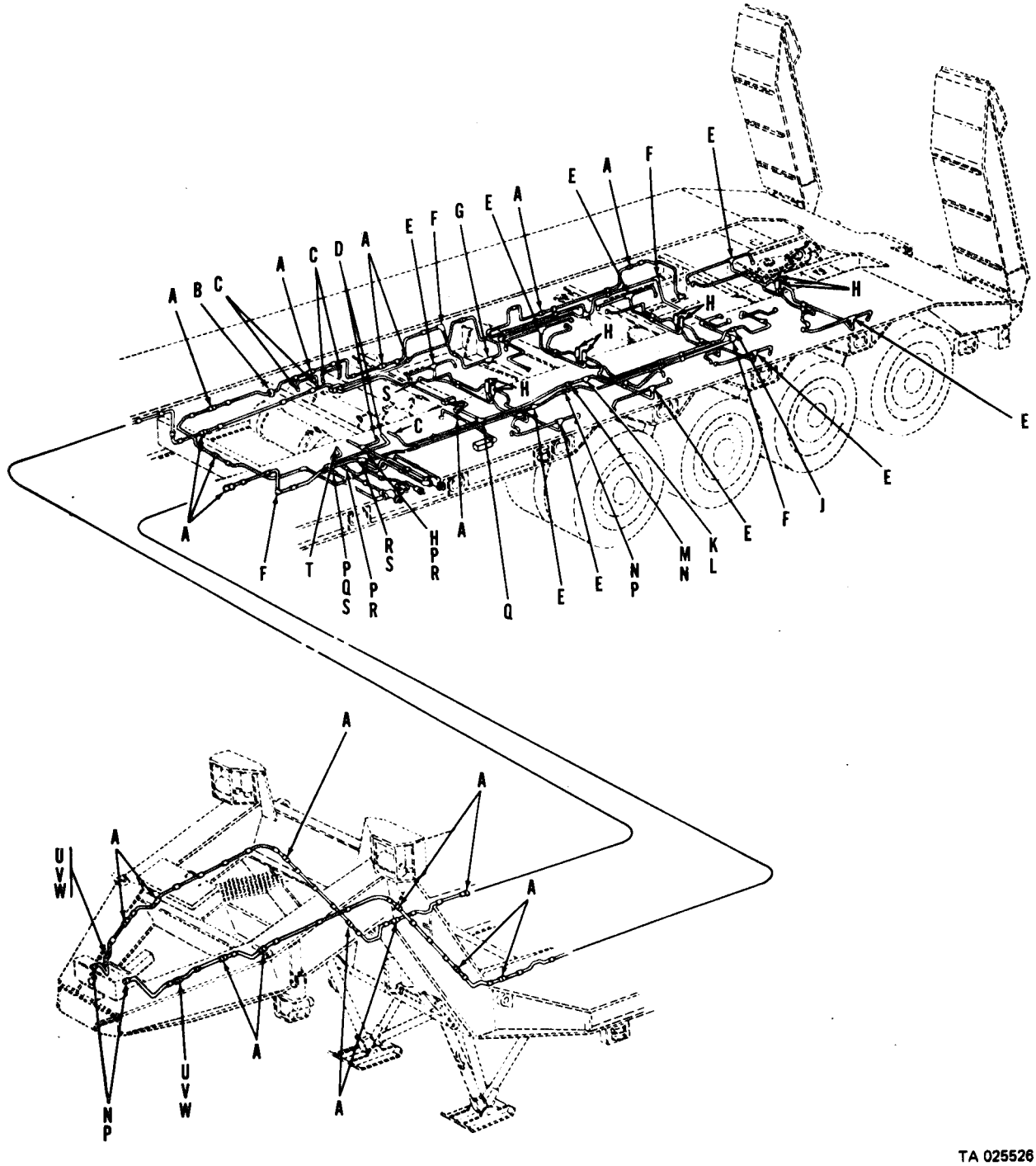


Figure 4-43. Air brake system lines and fittings (Semitrailer No. 1 through 200) (sheet 1 of 2).

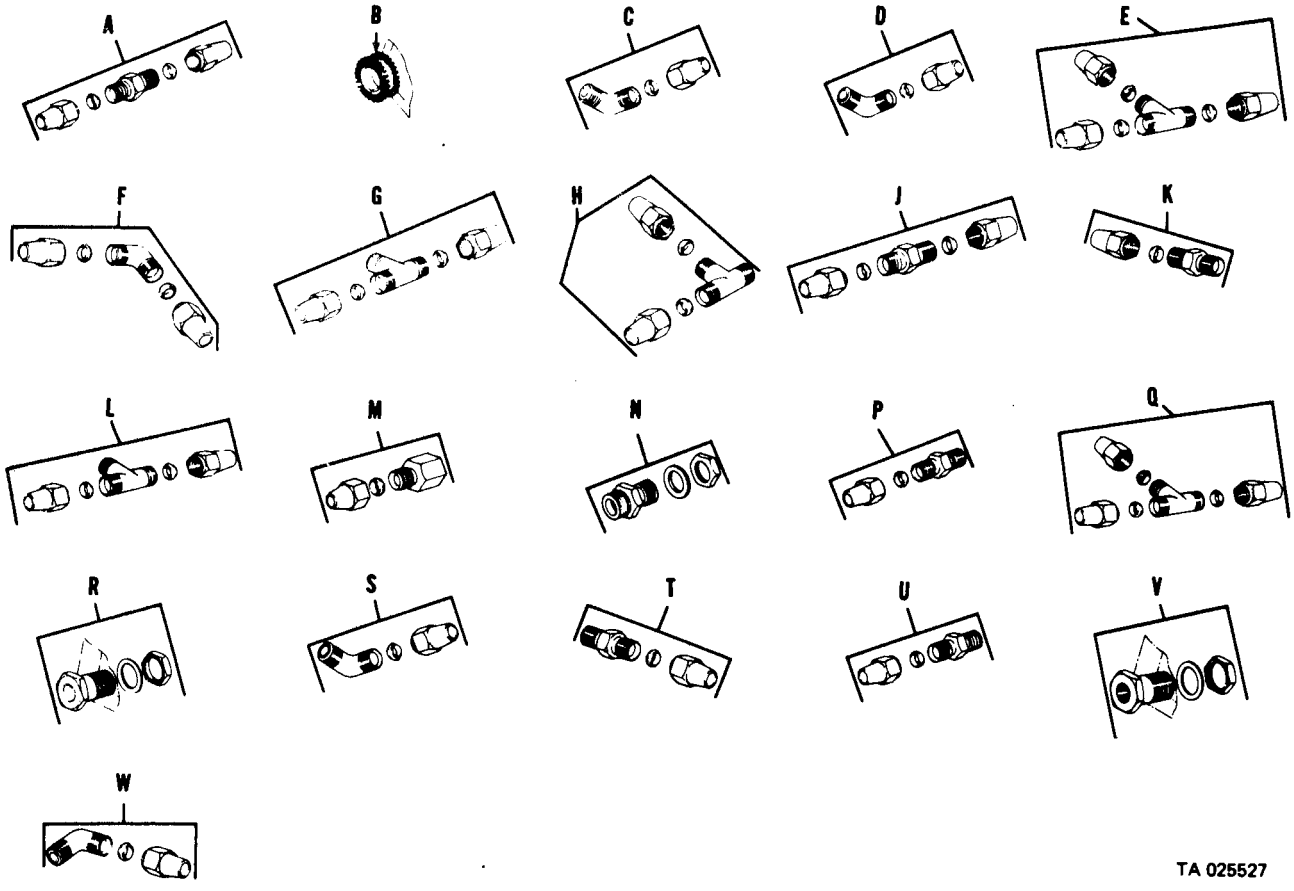


Figure 4-43. Air brake system lines and fittings (semitrailer No. 1 through 200) (sheet 2 of 2).

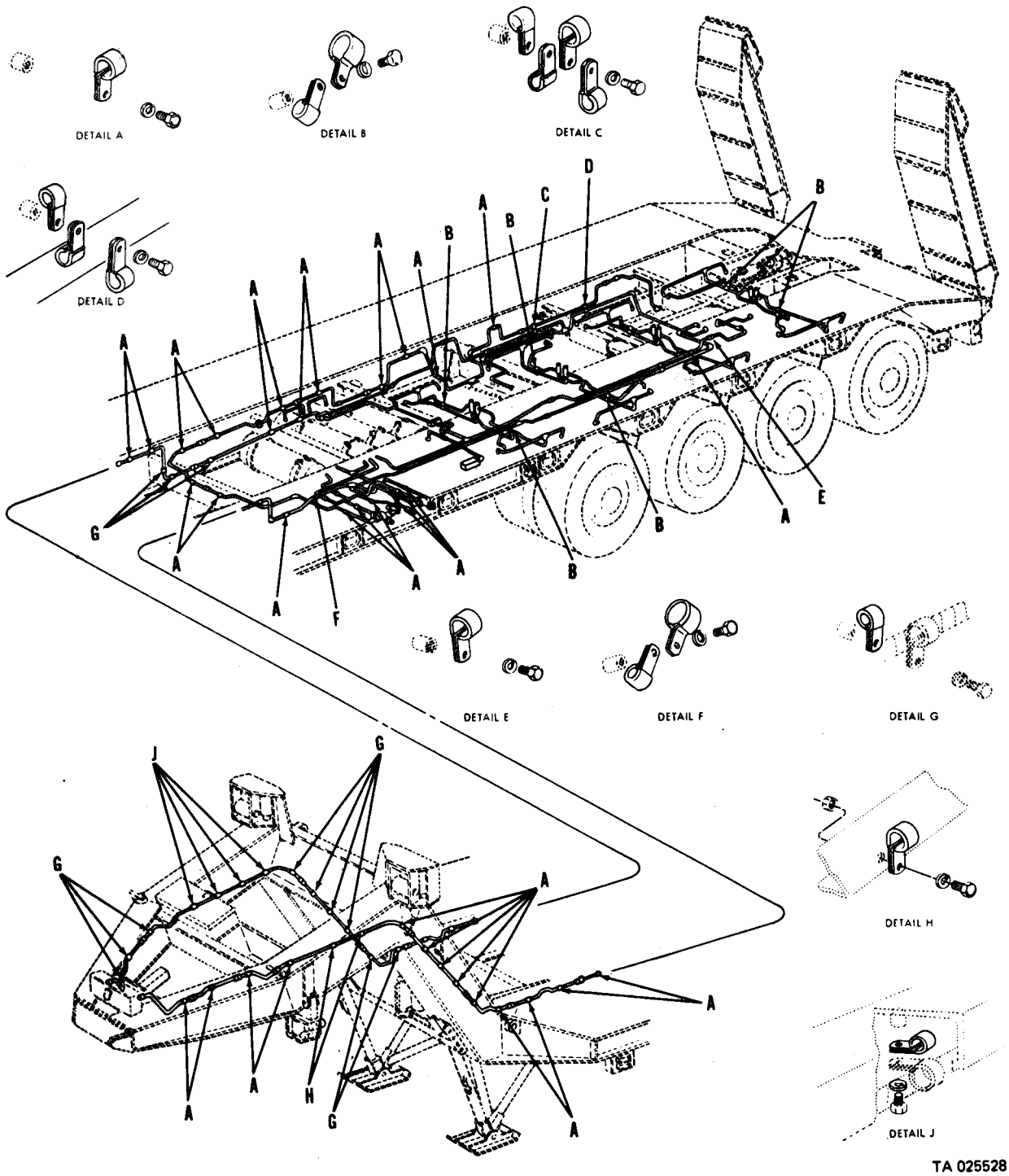


Figure 4-44. Air brake system tube clamps (semitrailer No. 1 through 200).

c. Nylon Tubing and Fittings. Refer to figure 4-45 through 4-48 for location and replacement of nylon tubing and fittings. To install nylon tubing cut ends of nylon tubing square and clean. Assemble nut over tube, open end out, then put sleeve (ferrule) on tube. Add correct size insert to tube end so that tube will not collapse when fitting is tightened. Lubricate sleeve and threads of fitting and nut with oil (OE/HDO). Make sure fittings are positioned to minimize bending of tubing at installation. Insert tube straight and square all the way into male fitting. Run down nut and thread it on, then tighten nut until sleeve grips tube (moving tube while turning nut until you can no longer turn or move tube. After sleeve grips tube, tighten nut ¼ turn.

Key to figure 4-45:

1 Nipple, pipe (2)
2 Elbow assembly, 90° (2)
3 Insert (38)
4 Elbow assembly, 90° (2)
5 Clamp, loop (6)
6 Cap screw (6)
7 Lock washer (6)
8 Tube, nylon,48½ in. long x 3/8 O.D. (2)
9 Tee assembly (2)
10 Tube, nylon, 221 in. long x 3/8 O.D.
11 Tube, nylon, 207 in. long x 3/8 O.D.
12 Tube, nylon, 165 in. long x 3/8 O.D.
13 Tube, nylon, 151 in. long x 3/8 O.D.
14 Tube, nylon, 13½ in. long x 3/8 O.D.
15 Tube, nylon, 20¾ in. long x 3/8 O.D.
16 Tube, nylon, 12 in. long x 3/8 O.D.
17 Tube, nylon, 12¼ in. long x 3/8 O.D.
18 Tube, nylon, 20½ in. long x 3/8 O.D.
19 Tube, nylon, 10½ in. long x 3/8 O.D.
20 Tube, nylon, 6 in. long x 3/8 O.D. (2)
21 Tube, nylon, 22½ in. long x 3/8 O.D. (2)
22 Tube, nylon, 8 in. long x 3/8 O.D.
23 Tube, nylon, 12¾ in. long x 3/8 O.D.
24 Tube, nylon, 7 in. long x 3/8 O.D.

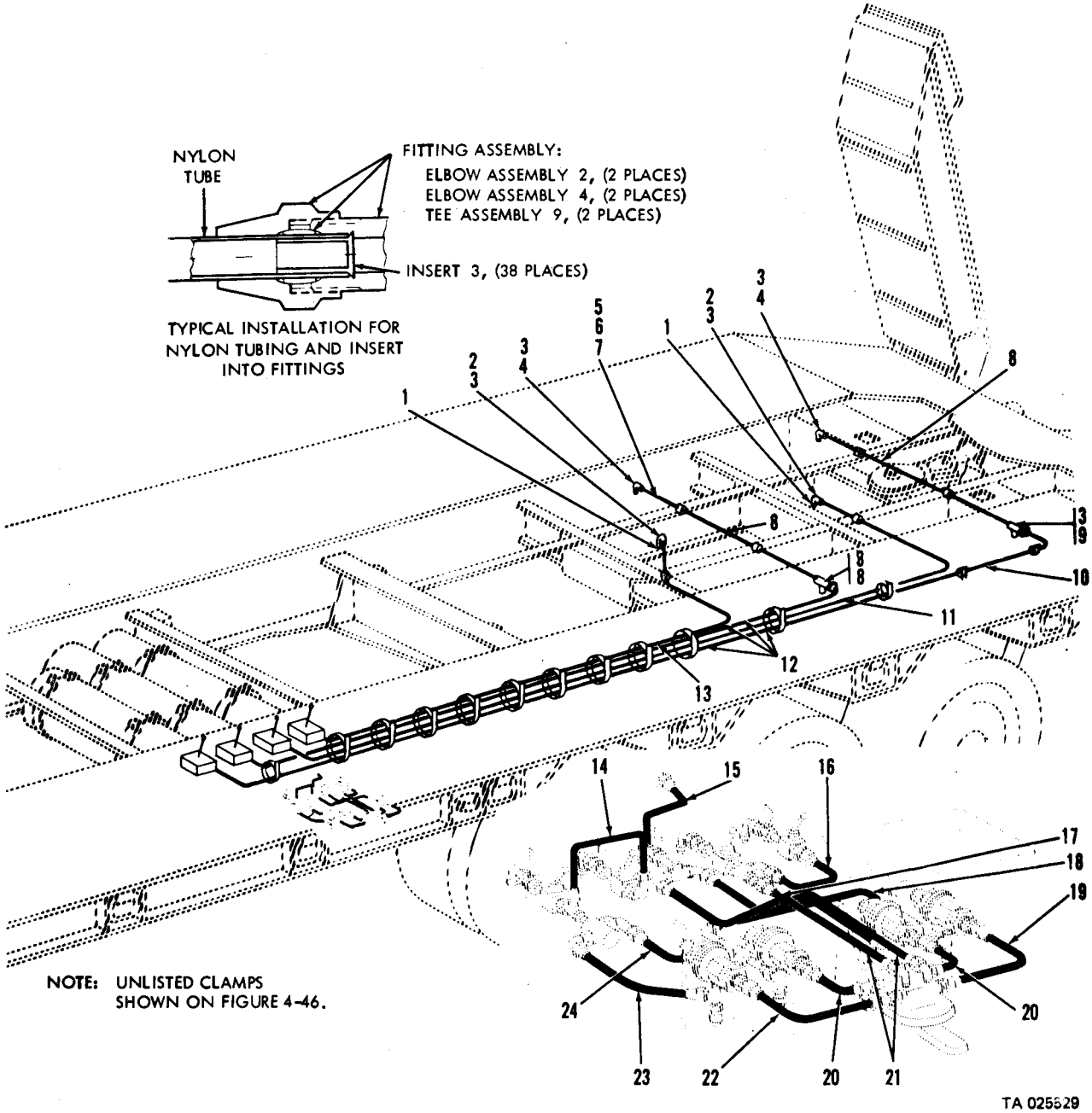


Figure 4-45. Air suspension system lines, clamps and fittings (semitrailer No. 201 and on).

Key to figure 4-46:

1 Cap screw (87)
2 Lock washer (98)
3 Clamp, loop (74)
4 Tube, nylon, 443 in. long x 3/8 O.D.
5 Tube, nylon, 14½ in. long x 5/8 O.D.
6 Elbow assembly, 90° (2)
7 Tube, nylon, 175 in. long x 3/8 O.D.
8 Tee assembly
9 Tube, nylon, 105 in. long x 3/8 O.D.
10 Elbow assembly, 45° (3)
11 Elbow assembly, 90°
12 Tube, nylon, 24½ in. long x 3/8 O.D.
13 Adapter assembly
14 Coupling, pipe
15 Tee assembly
16 Tube, nylon, 15½ in. long x 5/8 O.D.
17 Clamp, loop (3)
18 Tube, nylon, 81 in. long x 5/8 O.D.
19 Tube, nylon, 123 in. long x 3/8 O.D.
20 Clamp, loop (11)
21 Tube, nylon, 92 in. long x 3/8 O.D.
22 Tee assembly
23 Clamp, loop (2)
24 Tube, nylon, 26 in. long x 5/8 O.D.
25 Tee assembly (2)
26 Tube, nylon, 23 in. long x 3/8 O.D.
27 Tube, nylon, 26 in. long x 3/8 O.D.
28 Tube, nylon, 94½ in. long x 3/8 O.D.
29 Tube, nylon, 83 in. long x 5/8 O.D.
30 Insert, 3/8 (47)
31 Insert, 5/8 (10)
32 Cap screw (11)
33 Guard, tube (2)
34 Grommet, Rubber (2)
35 Connector assembly (2)
36 Guard, tube

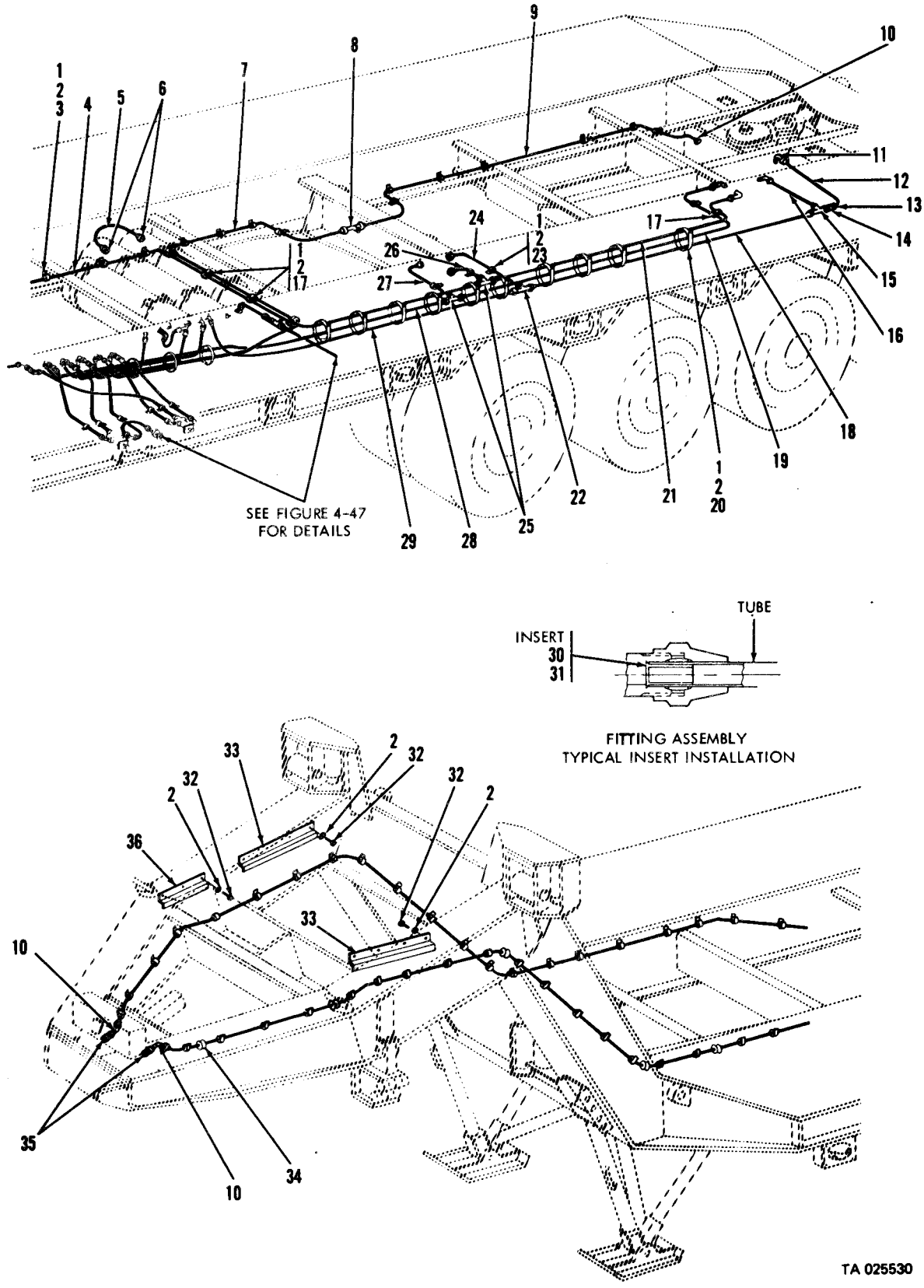
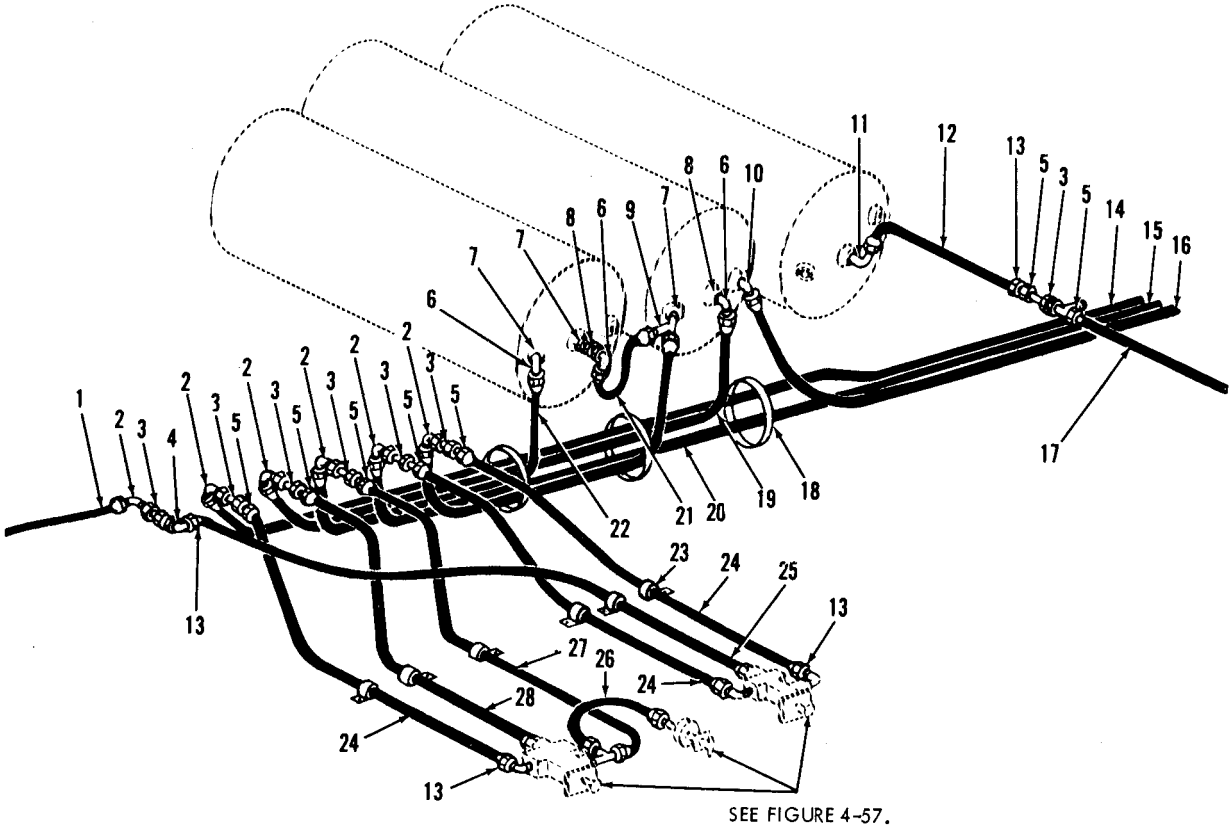


Figure 4-46. Air brake system lines, clamps and fittings (semitrailer No. 201 and on).



1 Tube nylon, 242 in. long x 3/8 O.D.
2 Elbow assembly, 90° (6)
3 Coupling assembly (7)
4 Elbow assembly, 45°
5 Adapter assembly (7)
6 Elbow assembly, 45° (3)
7 Bushing, pipe (4)
8 Valve, check
9 Tee assembly
10 Elbow assembly, 45°
11 Elbow assembly, 90°
12 Tube, nylon, 9 in. long x 3/8 O.D.
13 Insert, 3/8 (30)
14 Tube, nylon, 175 in. long x 3/8 O.D.
15 Tube, nylon, 94½ in. long x 3/8 O.D.
16 Tube, nylon, 83 in. long x 5/8 O.D.
17 Tube, nylon 19¾ in. long x 3/8 O.D.
18 Clamp, loop (3)
19 Tube, nylon, 44 in. long x 3/8 O.D.
20 Tube, nylon, 29 in. long x 3/8 O.D.
21 Tube, nylon, 11½ in. long x 3/8 O.D.
22 Tube, nylon, 32¼ in. long x 3/8 O.D.
23 Clamp, loop (6)
24 Tube, nylon, 26¾ in. long x 3/8 O.D. (3)
25 Tube, nylon, 33½ in. long x 3/8 O.D.
26 Tube, nylon, 11¾ in. long x 3/8 O.D.
27 Tube, nylon, 31½ in. long x 3/8 O.D.
28 Tube, nylon, 24½ in. long x 3/8 O.D.

Figure 4-47. Fail-safe and air reservoir lines, clamps and fittings (semitrailer No. *201 and on).*

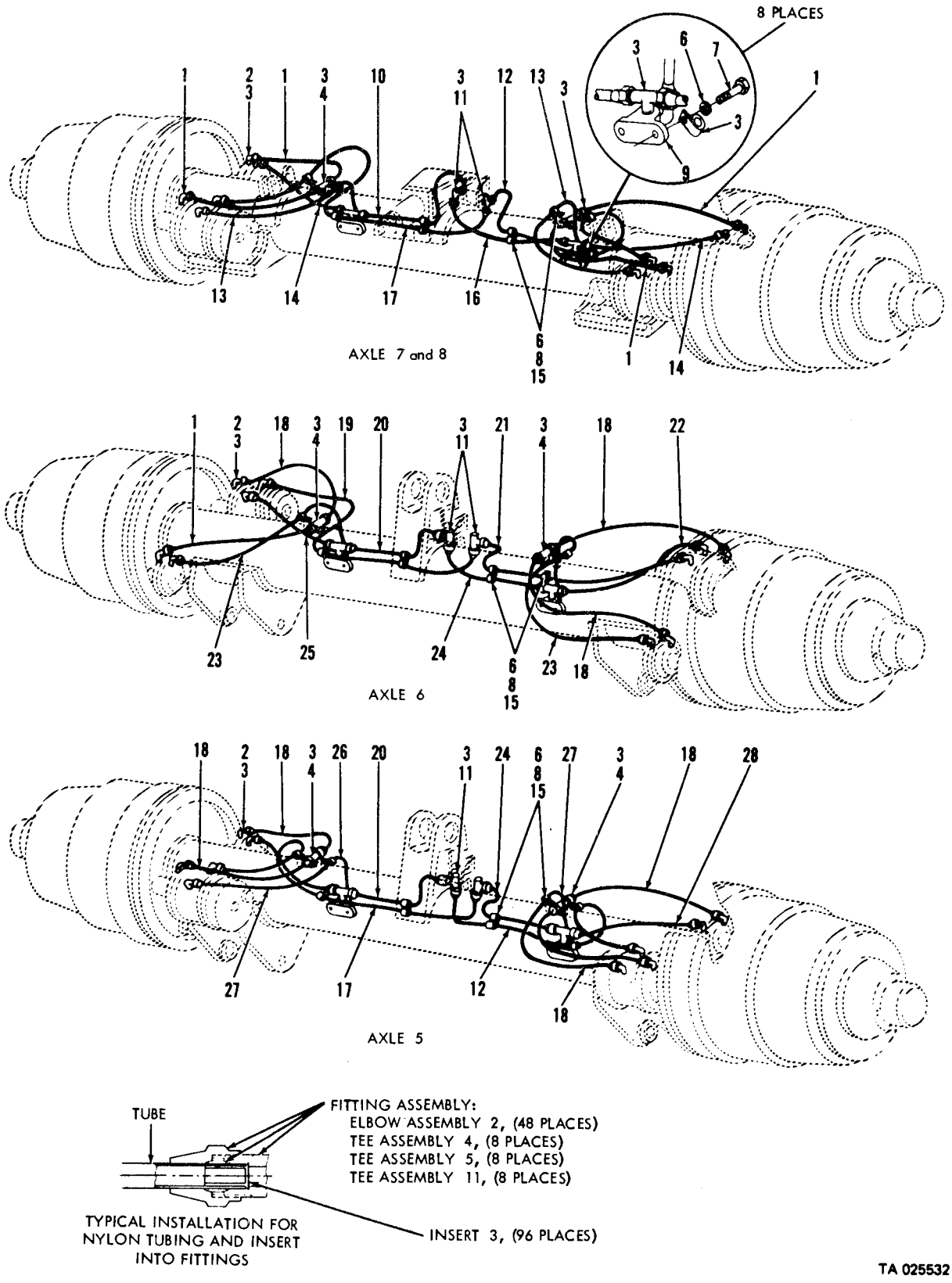


Figure 4-48. Air brake system axle lines, clamps and fittings (semitrailer No. 201 and on).

Key to figure 4-48:

1 Tube, nylon, 20¾ in. long x 3/8 O.D. (8)
2 Elbow assembly, 90° (48)
3 Insert, 3/8 (96)
4 Tee assembly (8)
5 Tee assembly (8)
6 Lock washer (38)
7 Cap screw (16)
8 Clamp, loop (38)
9 Fitting, frame (8)
10 Tube, nylon, 19¾ in. long x 3/8 O.D. (2)
11 Tee assembly (8)
12 Tube, nylon, 44 in. long x 3/8 O.D. (3)
13 Tube, nylon, 30 in. long x 3/8 O.D. (4)
14 Tube, nylon, 17½ in. long x 3/8 O.D. (4)
15 Cap screw (22)
16 Tube, nylon, 15½ in. long x 3/8 O.D. (2)
17 Tube, nylon, 37 in. long x 3/8 O.D. (3)
18 Tube, nylon, 19 in. long x 3/8 O.D. (8)
19 Tube, nylon, 29 in. long x 3/8 O.D.
20 Tube, nylon, 21½ in. long x 3/8 O.D. (2)
21 Tube, nylon, 34 in. long x 3/8 O.D.
22 Tube, nylon, 10½ in. long x 3/8 O D.
23 Tube, nylon, 28½ in. long x 3/8 O.D. (2)
24 Tube, nylon, 18½ in. long x 3/8 O.D. (2)
25 Tube, nylon, 11½ in. long x 3/8 O.D.
26 Tube, nylon, 14½ in. long x 3/8 O.D.
27 Tube, nylon, 26½ in. long x 3/8 O.D.
28 Tube, nylon, 13¼ in. long x 3/8 O.D.

4-40. Quick-Disconnect Coupling Intervehicular Coupling Half

(fig. 4-49)

a. Removal. Dieengage dummy coupling from coupling half. Use wrench to unscrew coupling half from fitting.

b. Disassembly.

(1) Remove preformed packing by prying with blunt-nosed screwdriver.

NOTE

Do not remove identification tags, unless they are illegible and must be replaced. The SERVICE tag must be on the right coupling half (curbside): the EMERGENCY tag on the left side (roadside).

(2) Replace dummy coupling if damaged.

c. Inspect and repair. Inspect and replace preformed packing if there are signs of wear, damage or deterioration, or if more than a year has elapsed since last replacement.

d. Assembly. Assemble in the reverse order of disassembly.

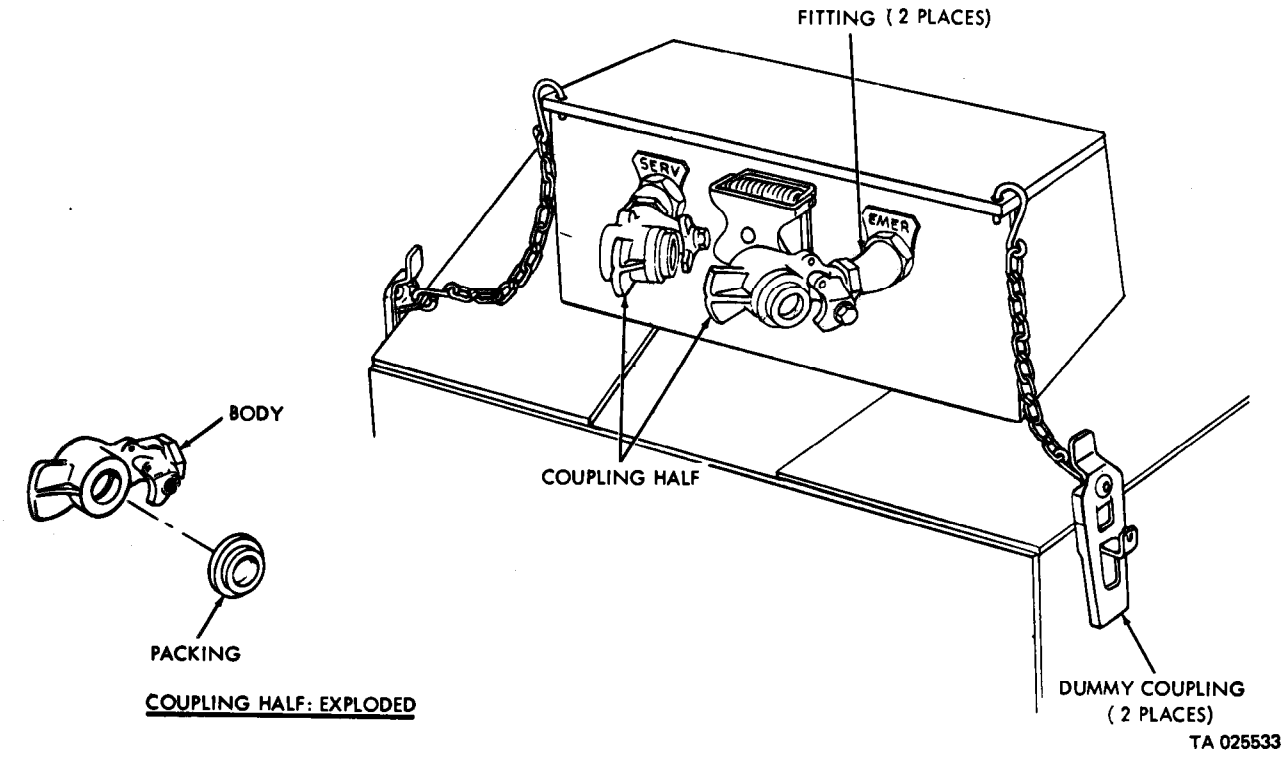


Figure 4-49. Intervehicular coupling half.

e. Installation.

(1) Apply permatex (MIL-S-45180) to threads of fitting mounted in kingpin well.

(2) Screw on coupling half and tighten with wrench.

4-41. Hose Assemblies

(fig. 4-50 or 4-51)

a. General. Hose assemblies are removed only for replacement. Assemblies with broken or cut hose or damaged fittings must be replaced.

b. Replacement. Depressurize air system (para 4-38). Remove hose end from swivel fitting first, then remove other hose end from fixed fitting. Install hose assembly in reverse order of removal.

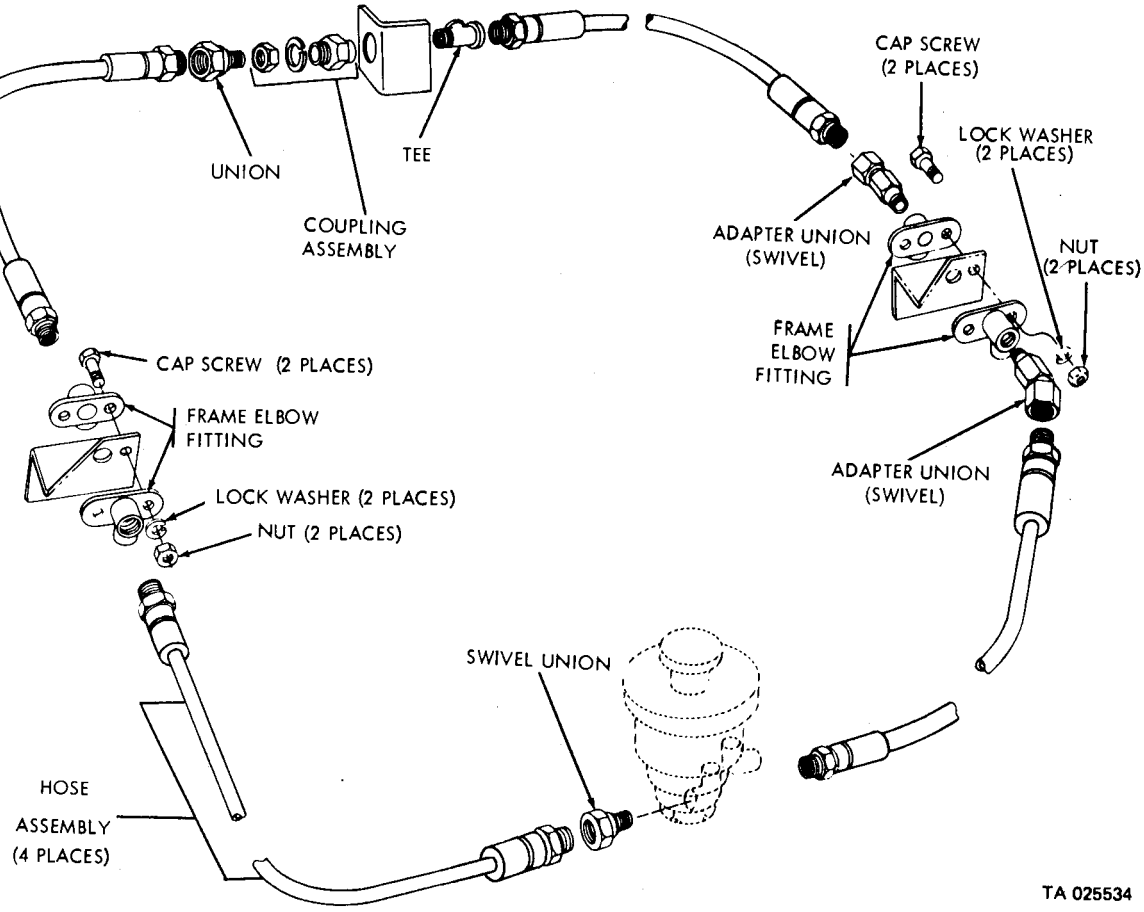


Figure 4-50. Hose assemblies and attaching parts (semitrailer No. 1 through 200).

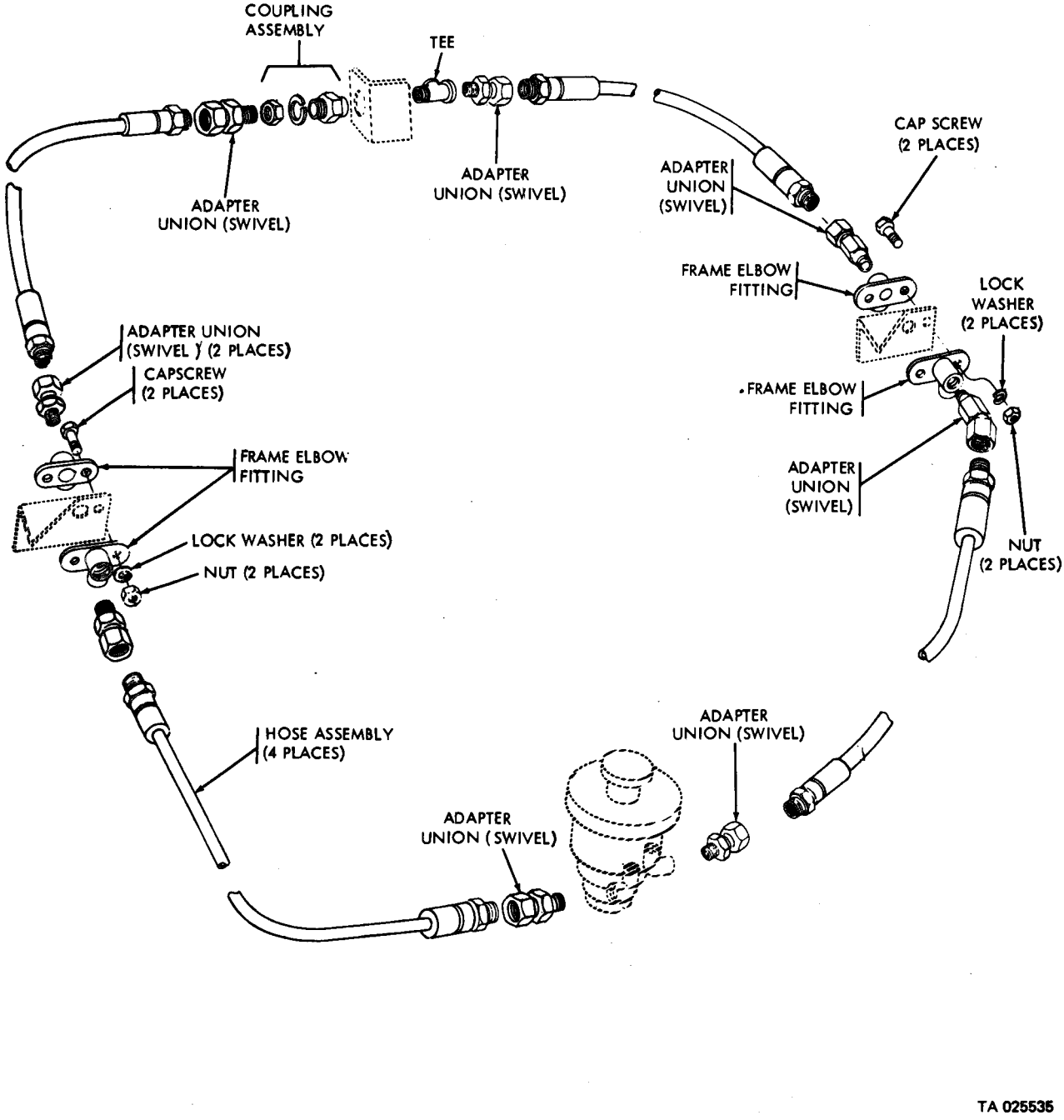


Figure 4-51. Hose assemblies and attaching parts (semitrailer No. 201 and on).

4-42. Emergency Relay Valves

(fig. 4-52 and 4-53)

a. *Removal.*

(1) Repressurize air system (para 4-38).

(2) Disconnect all air lines.

(3) Remove three cap screws and lockwashers securing valve to frame mounting plate.

b. Installation. Reverse procedure to install valves. Nylon tubing is provided so that tubing will bend to fit the different style valves that may be supplied as replacement part. Make sure that inserts are installed in nylon tube ends when connecting tube to fitting so that tube will not be crushed.

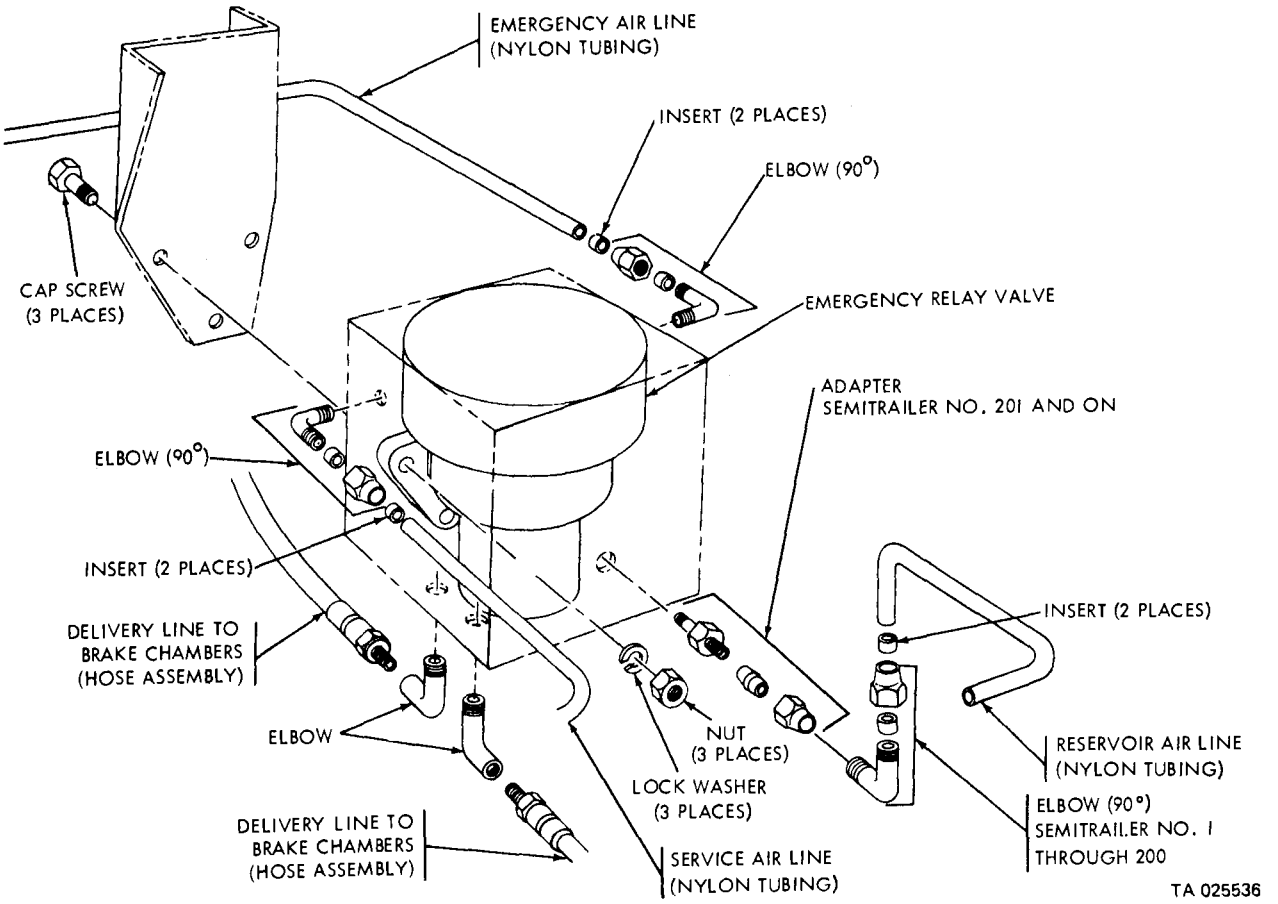


Figure 4-52. Front emergency relay valve.

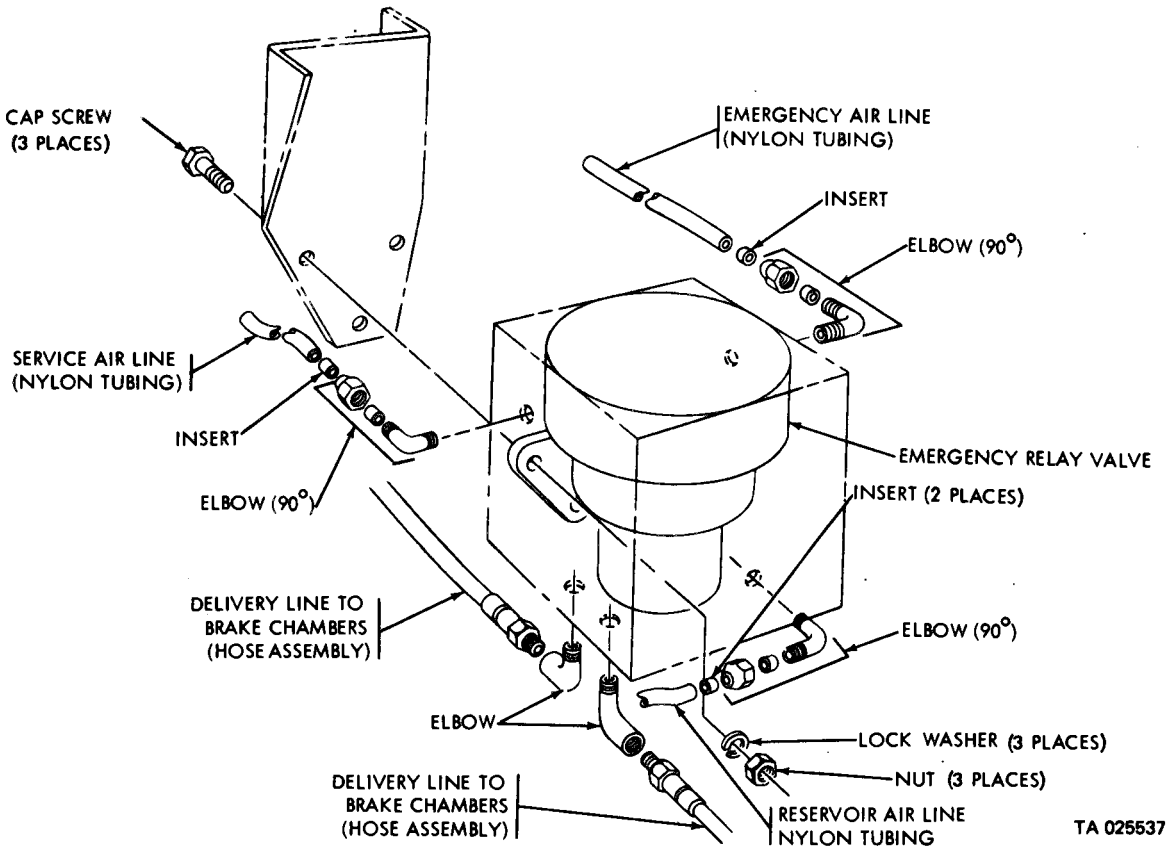


Figure 4-53. Rear emergency relay valve.

4-43. Auxiliary Air Supply Valve

(fig. 4-64)

a. Removal.

(1) Depressurize air system (pare 4-38).

(2) Disconnect tubing from valve.

(3) Remove two cap screws, lockwashers, and nuts and lift out valve.

(4) Remove tank valve from elbow fitting.

(5) Remove two elbow fittinge from valve.

b. Installation.

(1) Install two elbow fittings in valve.

(2) position valve as shown in figure 4.54 and secure cap screws, lockwashers, and nuts.

(3) Connect tubing to valve elbow and install tank valve.

(4) Perform operating test and leakage test (para 4-371).

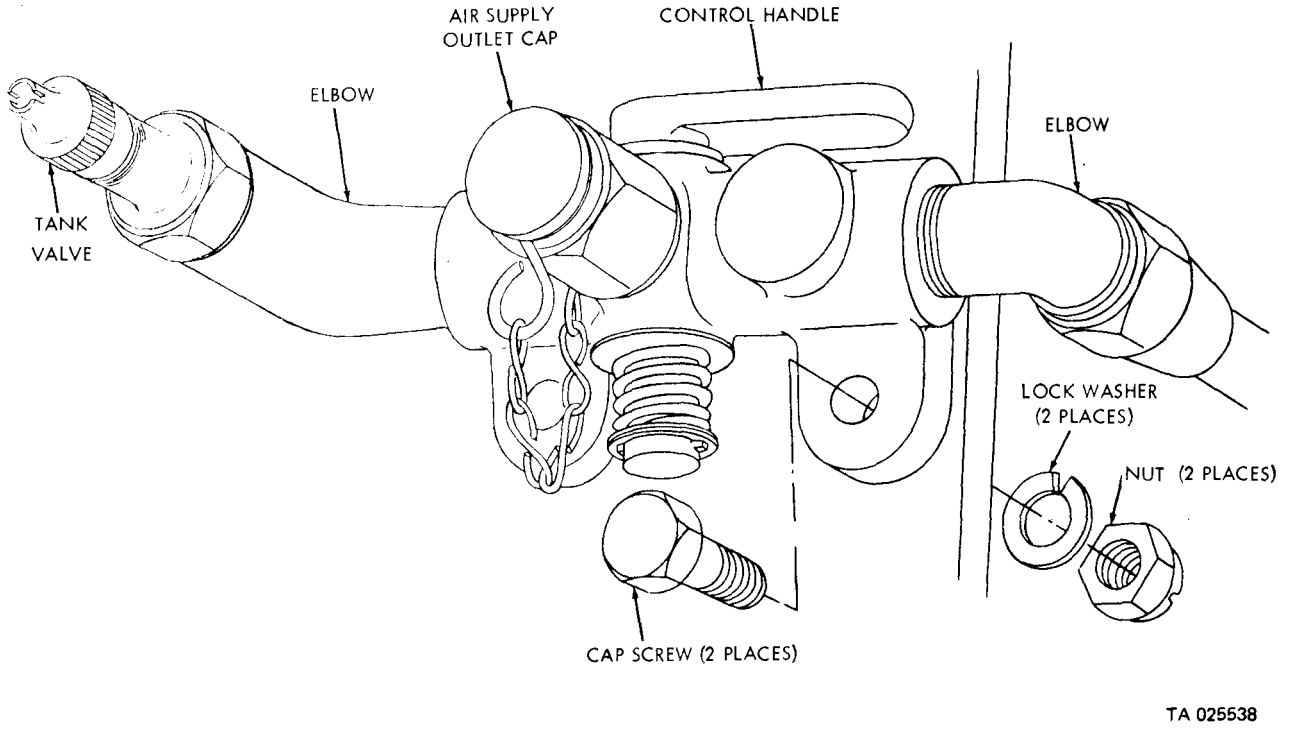


Figure 4-54. Auxiliary air supply valve.

4-44. Air Reservoirs

(fig. 4-55 or 4-56)

a. Removal.

(1) Repressurize air system (para 4-38).

(2) Disconnct air lines.

(3) Remove cap screws, lock washers and nuts compressing reservoir support clamps. Free reservoir from clamps.

(4) If clamps are damaged, remove two cap screws, lockwashers and nuts securing each pair of clamps to frame channel and replace.

b. Installation. Install reservoirs in reverse order of removal.

c. Recharge Fail-safe Release Reservoir. Recharge fail-safe release reservoir, through washers securing valve to frame.

d. Drain. Drain reservoirs of collected moisture by opening drain cocks slightly on bottoms of reservoirs (fig. 2-9).

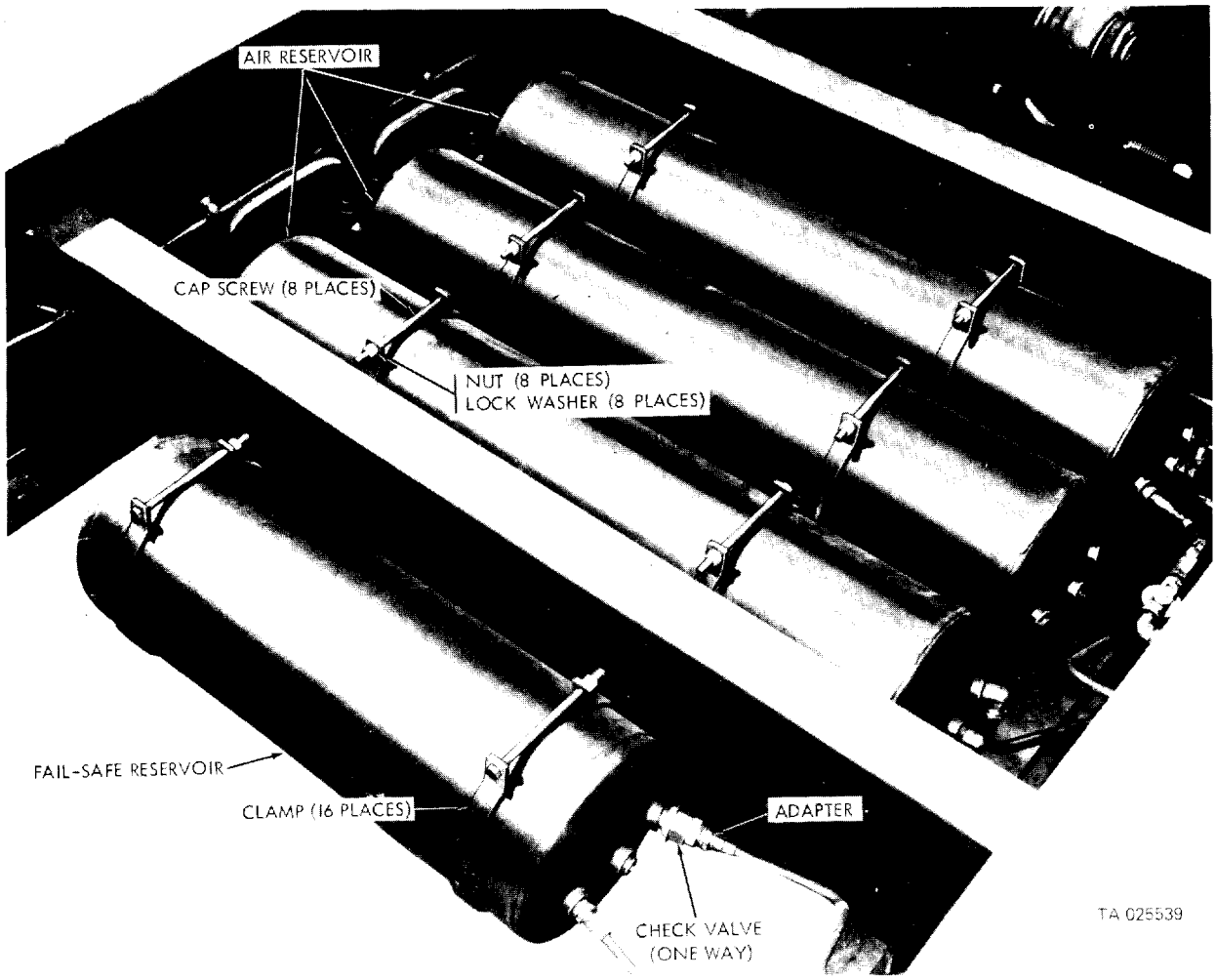


Figure 4-55. Air reservoirs (semitrailer No. 1 through 200).

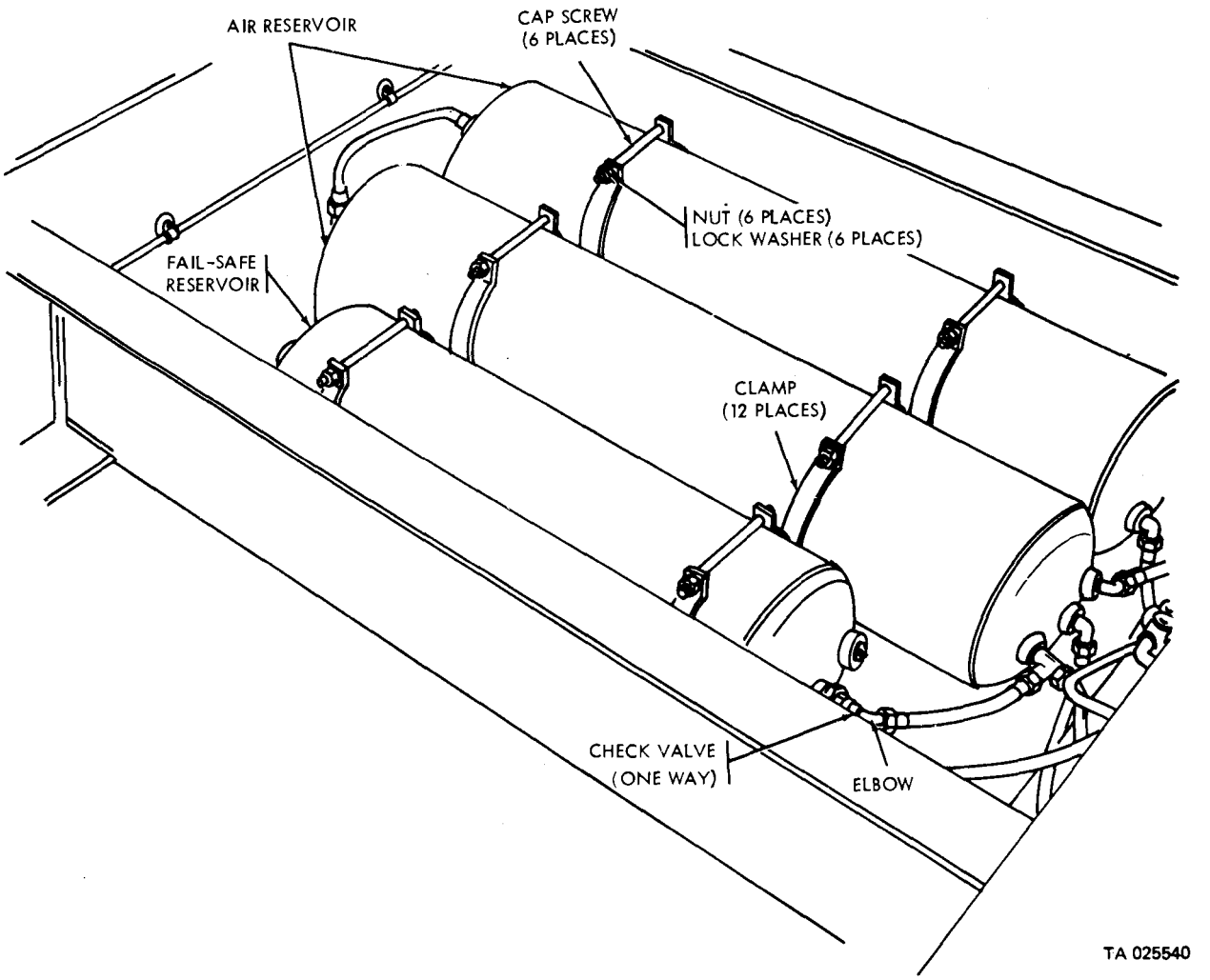


Figure 4-56. Air reservoirs (semitrailer No. 201 and on).

4-45, Fail-Safe and Service Brake Release Control Valves

(fig. 4-57)

NOTE

Both control valves are removed and installed in the same manner.

a. *Removal.*

(1) Depressurize air system (para 4-38).

(2) Remove two machine screws and lock washers securing valve to frame.

(3) Unscrew knob and remove retaining plate.

(4) Disconnect air lines and remove valve. Disassemble air line fittings from valve.

b. Installation. Install valves in reverse order of removal.

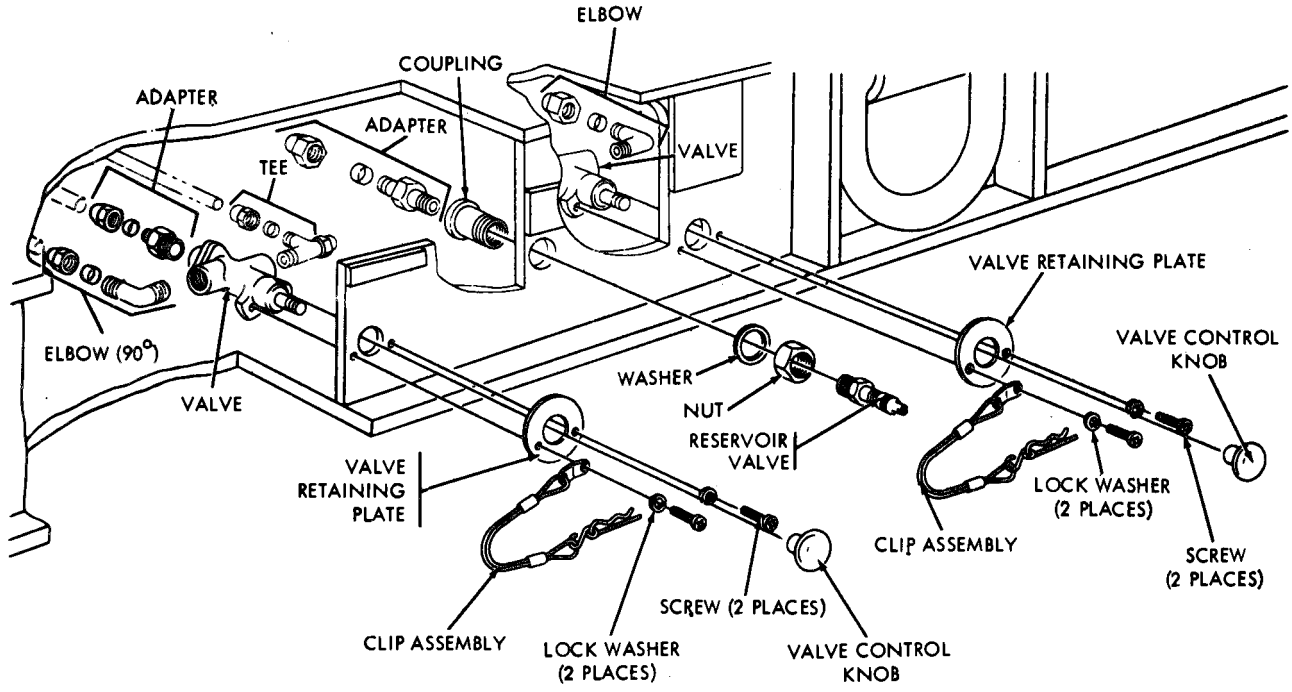


Figure 4-57. Brake release valves and air reservoir fill valve.

4-46. Fail-Safe Air Reservoir Check Valve (One-Way)

(figs. 4-55 and 4-56).

a. *Removal.*

(1) Repressurize air system (para 4-38).

(2) Disconnect air line from check valve.

(3) Unscrew check valve from fail-safe reservoir port. Remove adapter from valve.

b. Installation. Install valve in reverse order of removal.

4-47. Magnet Valve and Regulator Valve (15 psi)

a. The magnet valve and regulator valve are used in conjunction with a retarder switch located in the cab on the M746 pre-production tractors only.

b. Replacement and/or repair of the magnet valve and regulator valve on semitrailer no. 1 through 200 is not necessary.

4-48. Air Suspension Control Valve

(fig. 4-58)

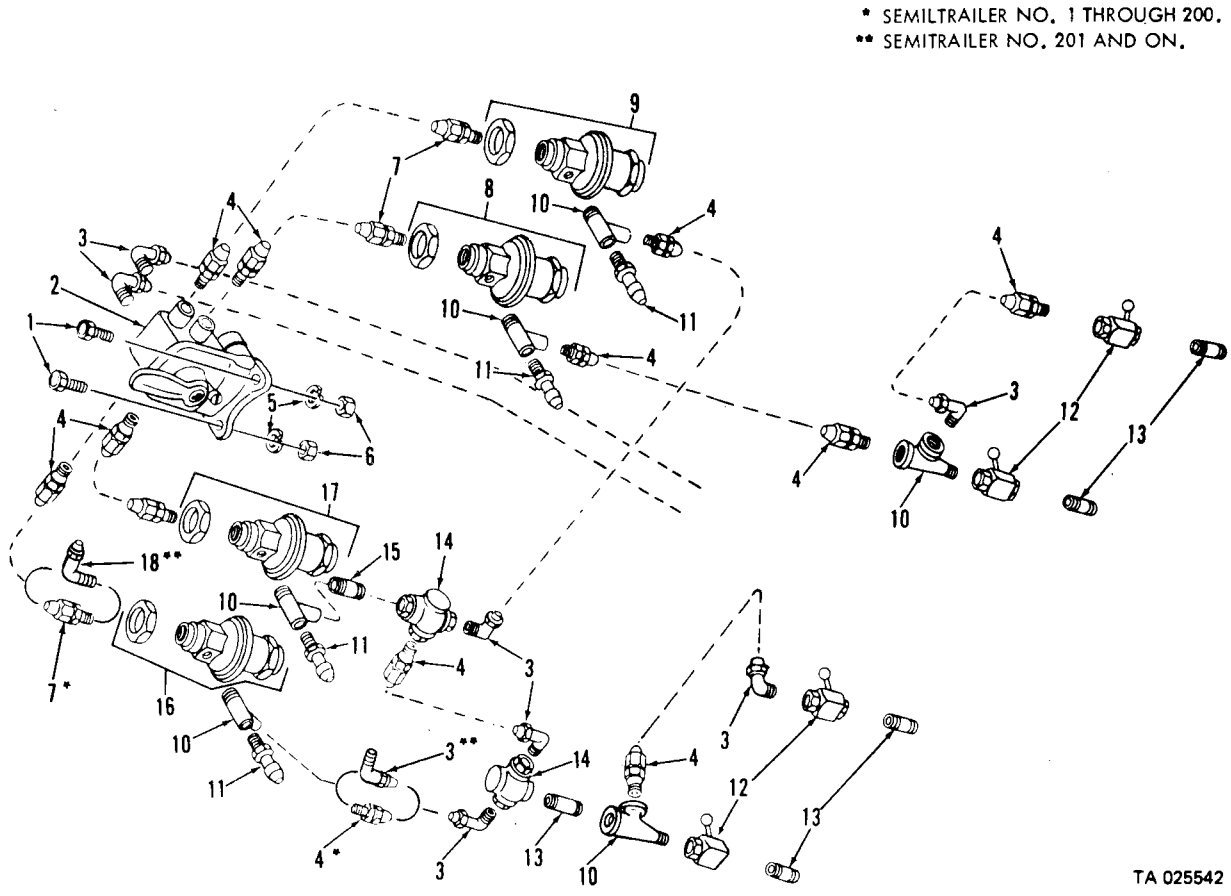
a. *Removal.*

(1) Repressurize air system (para 4-38).

(2) Disconnect six air lines from valve.

(3) Remove two cap screws (1), lock washers (5) and nuts (6) that secure valve (2) to mounting bracket and remove valve. Disassemble fittings from valve,

b. Installation. Install valve in the reverse order of removal.



1 Cap screw (2)
2 Valve, suspension control
3 Elbow (90°) (7)
4 Adapter (11)
5 Lock washer (2)
6 Nut (2)
7 Adapter (4)
8 Valve, pressure regulator 100 psi
9 Valve, pressure regulator 50 psi
10 Tee (6)
11 Valve, tank (4)
12 Valve, shutoff (4)
13 Nipple (5)
14 Valve, two-way check (2)
15 Nipple
16 Valve, pressure regulator, 85 psi
17 Valve, pressure regulator, 15 psi
18 Elbow

Figure 4-58. *Air suspension control, regulator and shutoff valves.*

4-49. Suspension Pressure Regulator Valves
(fig. 4-58)

a. Removal.

(1) Depressurize air system (para 4-38).

(2) Disconnect air lines from valve.

(3) Remove jam nut securing valve (8, 9, 16, or 17) to frame member and remove valve.

(4) Disassemble tube fittings from valve.

b. Installation. Install valves in the reverse order of removal.

4-50. Air Suspension Shutoff Valves
(fig. *4-58)*

a. Removal.

(1) Repressurize air system (para 4-38).

(2) Disconnect air line from valve.

(3) Separate valve (12) from air line fittings and remove valve.

b. Installation. Install valve in the reverse order of removal.

4-51. Air Suspension Check Valves (Two-Way) (fig. 4-58)

a. *Removal.*

(1) Depressurize air system (para 4-38).

(2) Disconnect air lines.

(3) Remove valve (9) from vehicle and remove fittings.

b. Installation. Install valve in reverse order of removal.

Section IX. AIR SUSPENSION SYSTEM MAINTENANCE

***4-52.* General**

While the front two axles utilize an unsprung walking-beam suspension system, the rear two axles use an air suspension trailing-arm arrangement. Two air springa (fig. 4-63) on each rear equalizer beam support the frame on the rear axles. Air pressure in the air springs can be regulated for different payload weights. Either 85 psi, 50 psi or 15 psi air pressure is routed into the air springs by the position of the control valve handle. Air pressure requirements for different payload weights are given on the instruction plate above the control valve (fig. 1-4). When air pressure in the suspension system is adjusted downward, excess air pressure is exhausted at the control valve. An air lift assembly on each rear equalizer beam operates at 100 psi air pressure to raise the rear axles approximately three inches. The lift is also activated through positioning the control valve handle. There is an adjustable regulator valve for each pressure setting on the control valve. Each regulator valve can be tested with a tire air gage for proper operation (para *4-37c*). Four shutoff valves, each with a hand control lever, will isolate that part of the air suspension system that is found to leak (para *2-7c*).

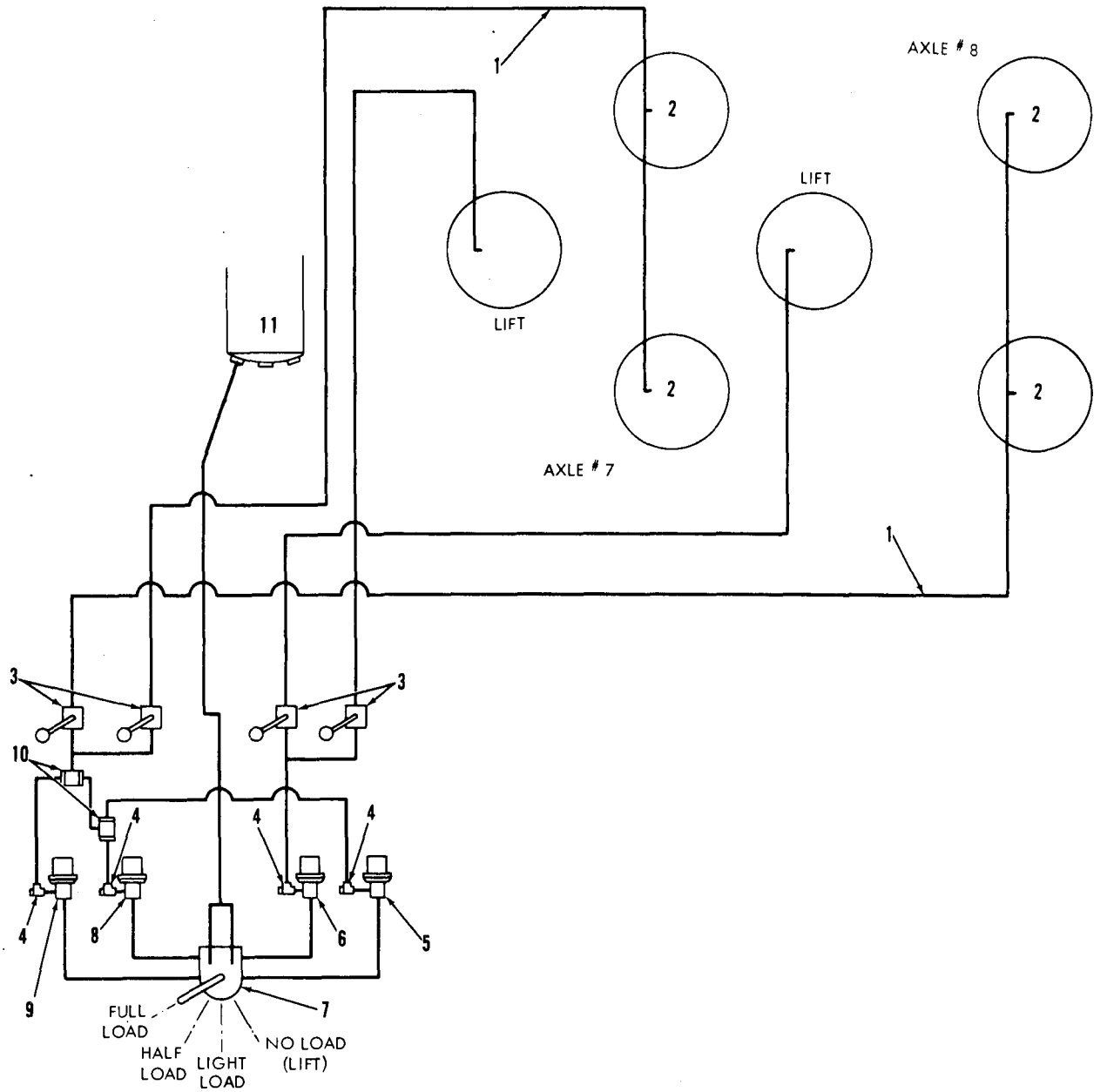


Figure 4-59. Air suspension system schematic diagram(semitrailer No. 1 through 200).

Key to figure 4-59:

1 Tubing, 5/8 copper
2 Air bag, suspension system
3 Valve, shut-off
4 Pressure check point
5 Valve, regulator 50 psi
6 Valve regulator 100 psi
7 Valve, pneumatic hand
8 Valve, regulator 15 psi
9 Valve, regulator 85 psi
10 Valve, two-way check
11 Reservoir assembly

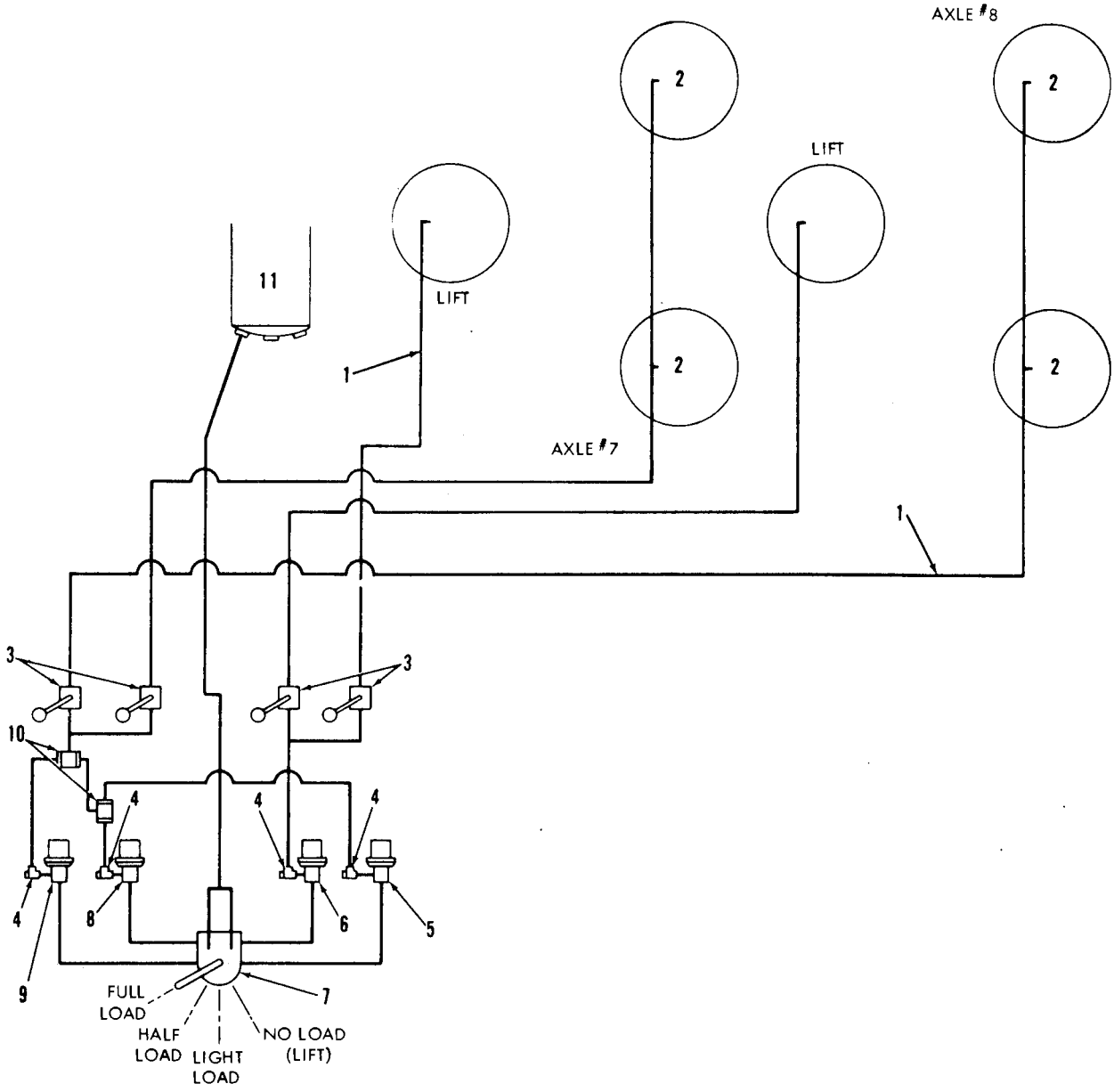


Figure 4-60. Air suspension system schematic diagram (semitrailer No. 201 and on).

Key to figure 4-60:
1 Tubing, 3/8 nylon
2 Air bag, suspension system
3 Valve, shut-off
4 Pressure check point
5 Valve, regulator 50 psi
6 Valve, regulator 100 psi
7 Valve, pneumatic hand
8 Valve, regulator 15 psi
9 Valve, regulator 85 psi
10 Valve, two-way check
11 Reservoir assembly

4-53. Inspection of Suspension System

The suspension system should be checked for damage or worn parts. Inspect axle stop chains, mounting brackets and other components. Inspect axle stop chains, mounting brackets and other components. Inspect lift rod connecting pins for excessive wear. Inspect for missing cotter pins and loose nuts. Inspect shock absorbers for oil leakage. Replace damaged or worn parts. With semitrailer connected to the towing vehicle and air pressure applied. Check air springa for operation.

NOTE

Refer to paragraphs -4-36 through 4-51 for "tests and maintenance instructions on the suspension air system, valves, tubing and fittings.

CAUTION

Prior to performing maintenance on any air system components, system air pressure may have to be released by opening drain cocks on reservoir.

4-54. Air Suspension Axle Lift Assembly

(fig. 4-61 and 4-62)

NOTE

Removal of both axle lift assemblies is identical.

a. Removal.

(1) Cut off air to axle lift assemblies by assuring that air control valve handle is in LIGHT, HALF, or FULL LOAD position.

(2) Remove air line (fig. 4-62) from axle lift assembly.

(3) Remove four cap screws and lock washers (fig. 4-61) that secure bracket to frame above axle lift assembly. Remove bracket.

(4) Remove two cotter pins and two remaining pins (fig. 4-61) that secure link assembly and remove link.

(5) Remove four nuts, lockwashers and flat washers that secure axle lift assembly to frame (fig. 4-62). These nuts are secured to studs that are an integral part of axle lift assembly.

(6) Remove cotter pin and remove retaining pin that secures yoke to shackle (fig. 4-62).

(7) Remove axle lift assembly by raising complete assembly through frame at top of vehicle. To remove rod from axle lift assembly, remove yoke and jam nut, and slide rod through top of axle lift.

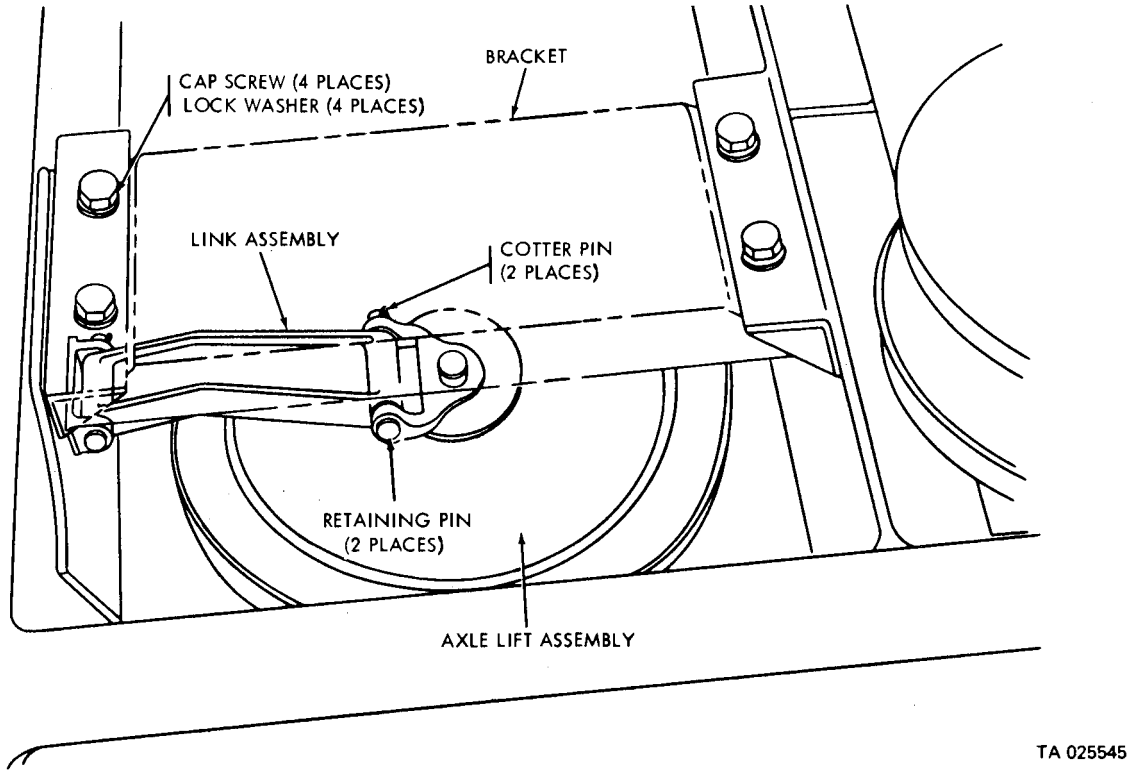


Figure 4-61. Axle lift components above frame.

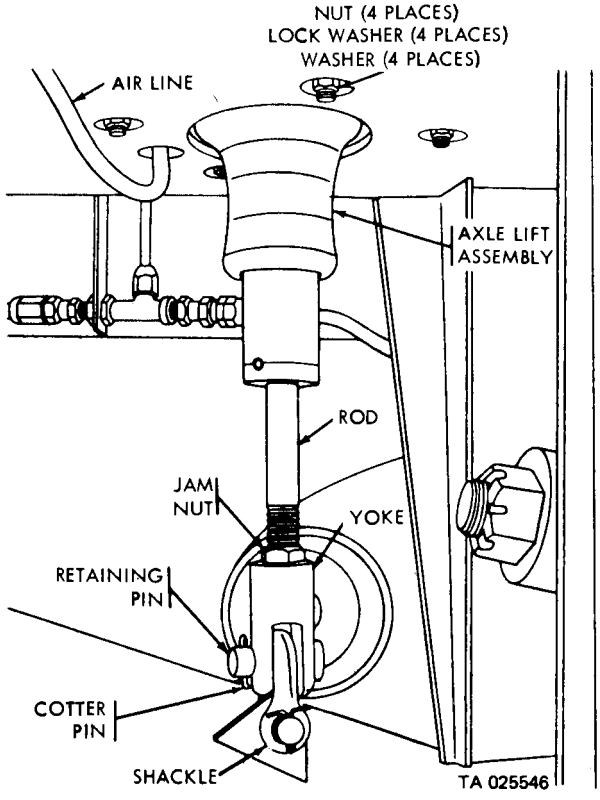


Figure 4-62. Axle lift components below frame.

b. Installation.

(1) Position axle lift assembly in place so that four studs are inserted in holes beneath frame bracket, and check for proper position of air fitting. Secure axle lift assembly with four nuts, lock washers and flat washers (fig. 4-62). Tighten to 55-75 lb ft torque.

(2) Secure yoke to shackle with retaining pin and install cotter pin.

NOTE

To insure proper adjustment of axle lift assembly, inflate air suspension springs to full air pressure prior to securing axle lift rod.

(3) With air suspension spring fully pressurized (air control valve at FULL LOAD position), connect rod to jam nut and yoke (fig. 4-62). Hand tighten by turning rod until free axial play in rod is 0 to 1/16 inch with air suspension spring still inflated, install link assembly, and secure with two retaining pins and cotter pins.

(4) Install bracket and secure with four cap screws and lockwashers (fig. 4-61). Tighten cap screws to 55.75 lb ft torque.

(5) Connect air line to air lift.

c. Test and Adjust. Move air suspension control valve lever to NO LOAD (LIFT) position (para 2-7). With axle lift assemblies inflated, be sure that link

assembly and axle lift assembly do not touch brake at top of axle lift assembly and axle lift assembly do not touch brake at top of axle lift assembly. If either does touch bracket, re-inflate air suspension bag by moving control valve lever to FULL LOAD position and recheck free axial play in rod and readjust if necessary. After axle lift assembly has been adjusted, tighten rod jam nut to 250 to 275 lb ft torque.

4-55. Air Suspension Spring Assembly

a. Test.

(1) Ensure air system is fully pressurized and air shutoff valves are open (para *2-7c).*

(2) Set suspension air control valve to "FULL LOAD" position (para 2-7). Observe that the two front axles are raised until tires are approximately three inches off ground. If axles fail to raise, troubleshoot suspension air system in accordance with table 4-4. If axles raise properly proceed to (3).

(3) Set suspension air control valve to "NO LOAD" position (para 2-7). Observe that the two rear axles are raised until tires are approximately three inches off ground. If either axle fails to raise, troubleshoot suspension air system in accordance with table 4-4.

b. Removal (fig. 4-63).

(1) Depressurize air system (para 4-38).

(2) If axle 8 air springs are to be removed, remove air spring protection plate (para 4-61).

(3) Remove two cap screws and lockwashers securing bottom of air spring to equalizer beam.

(4) Disconnect air line from top of air spring.

(5) Remove two nuts, lockwashers, and washers securing top of air spring to frame.

(6) Remove air spring and plate by compressing air spring and pulling down from frame.

c. Installation (fig. 4-63). Replace air spring and install in reverse order of removal *(b* above). Tighten nuts securing air springs to frame to 55-75 lb ft. Tighten cap screws securing air spring to equalizer beam to 55-75 lb ft. Pressurize air system and test air springs in accordance with *a* above.

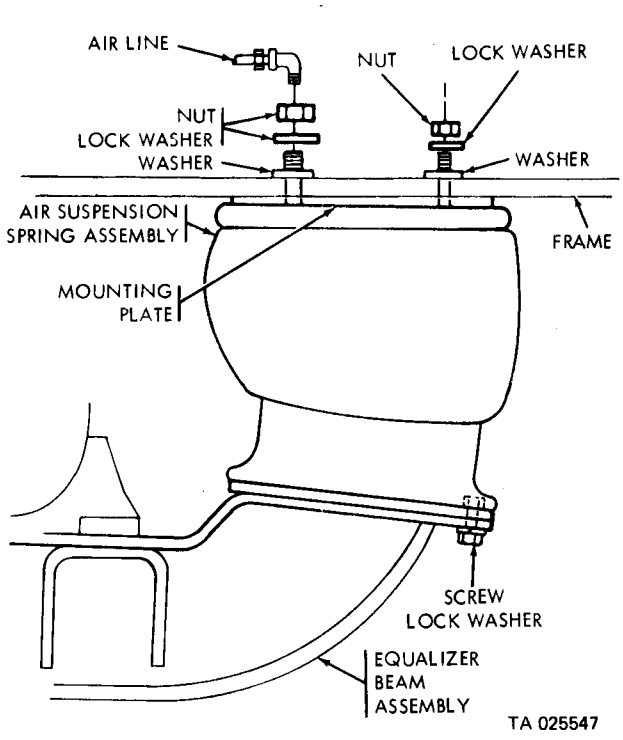


Figure 4-63. Air suspension spring.

4-56. Shock Absorber and Axle Stop Chain (Semitrailer 1 through 200)

(fig. 4-64)

a. Removal.

(1) Detach spring from eye bolt on frame. Remove cap screw, lock washer, nut, spacer and clamp spring to chain.

(2) Remove chain from axle and snubber assembly by removing two cotter pins and retaining pins.

(3) Disassemble chain by removing two cotter pins and link pin retainer securing adapter at each end of chain. Remove adapters.

(4) Remove lock nut and remove snubber and adapter from frame.

(5) Remove lock nut and flat washer from each end of shock absorber. Remove shock absorber.

b. Repair. Replace damaged parts or chain if badly rusted or frozen at the joints.

c. *Installation.*

NOTE

Prior to installation lubricate chain and retaining pins with oil (OE/HDO).

(1) Position shock absorber on axle and frame bracket and secure with self-locking nut and flat washer. Tighten nuts to 65-90 lb ft torque.

(2) Install snubber and adapter to frame using self-locking nut. Tighten nut to 280-360 lb ft torque.

(3) Reassemble adapters to chain ends.

(4) Connect chain to axle and adapter using two retaining pins and cotter pins.

(5) Connect spring to chain using cap screw, lock washer, nut spacer and clamp, Tighten nut securing chain spring to chain to 23 - 30 lb ft torque. Attach spring to eye bolt on frame.

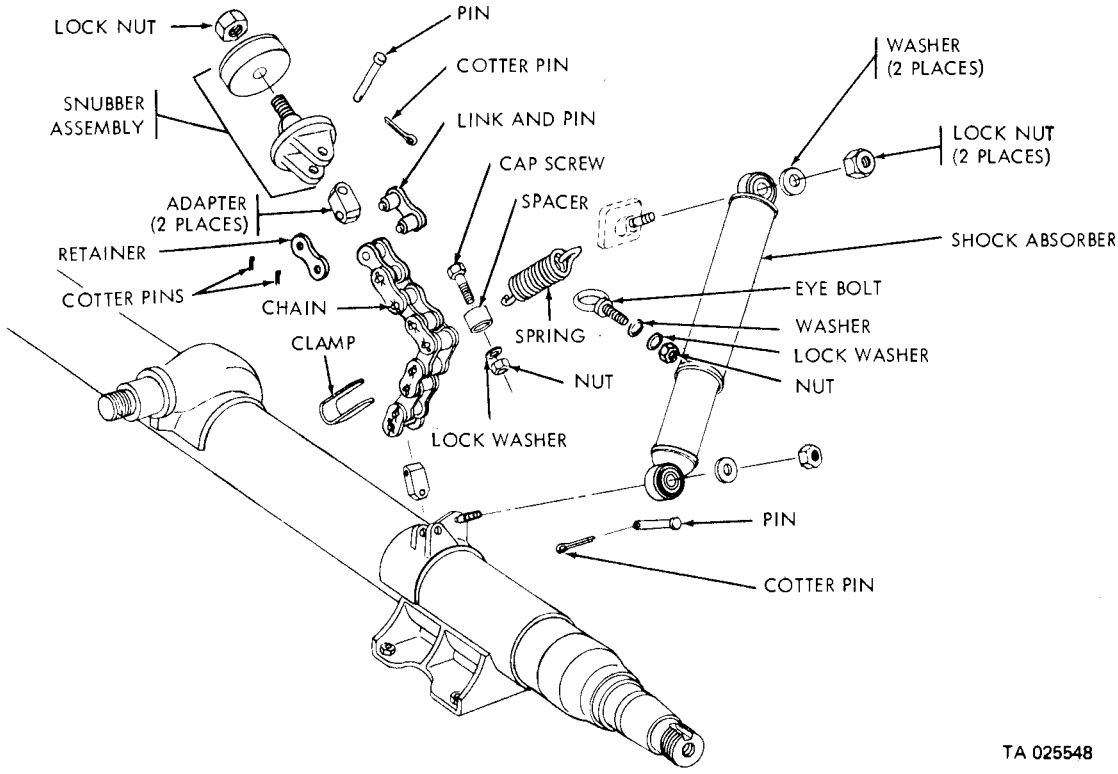


Figure 4-64. Shock absorber and axle stop chain (semitrailer No. 1 through 200).

4-57. Shock Absorber and Axle Stop Chain (Semitrailer no. 201 and on)

(fig. 4-65)

a. *Removal.*

(1) Detach spring from eye bolt on frame and chain. Remove spring.

(2) Remove chain from axle and adapter by removing two cap screws and self-locking nuts.

(3) Remove lock nut and remove snubber and adapter from frame.

(4) Remove lock nut and flat washer from each end of shock absorber. Remove shock absorber.

b. Repair. Replace damaged parts or chain if badly rusted.

c. *Installation.* Install in the reverse order of removal. Tighten lock nut on shock absorber to 65-90 lb ft torque. Tighten lock nut on snubber and adapter to 280 - 360 lb ft torque.

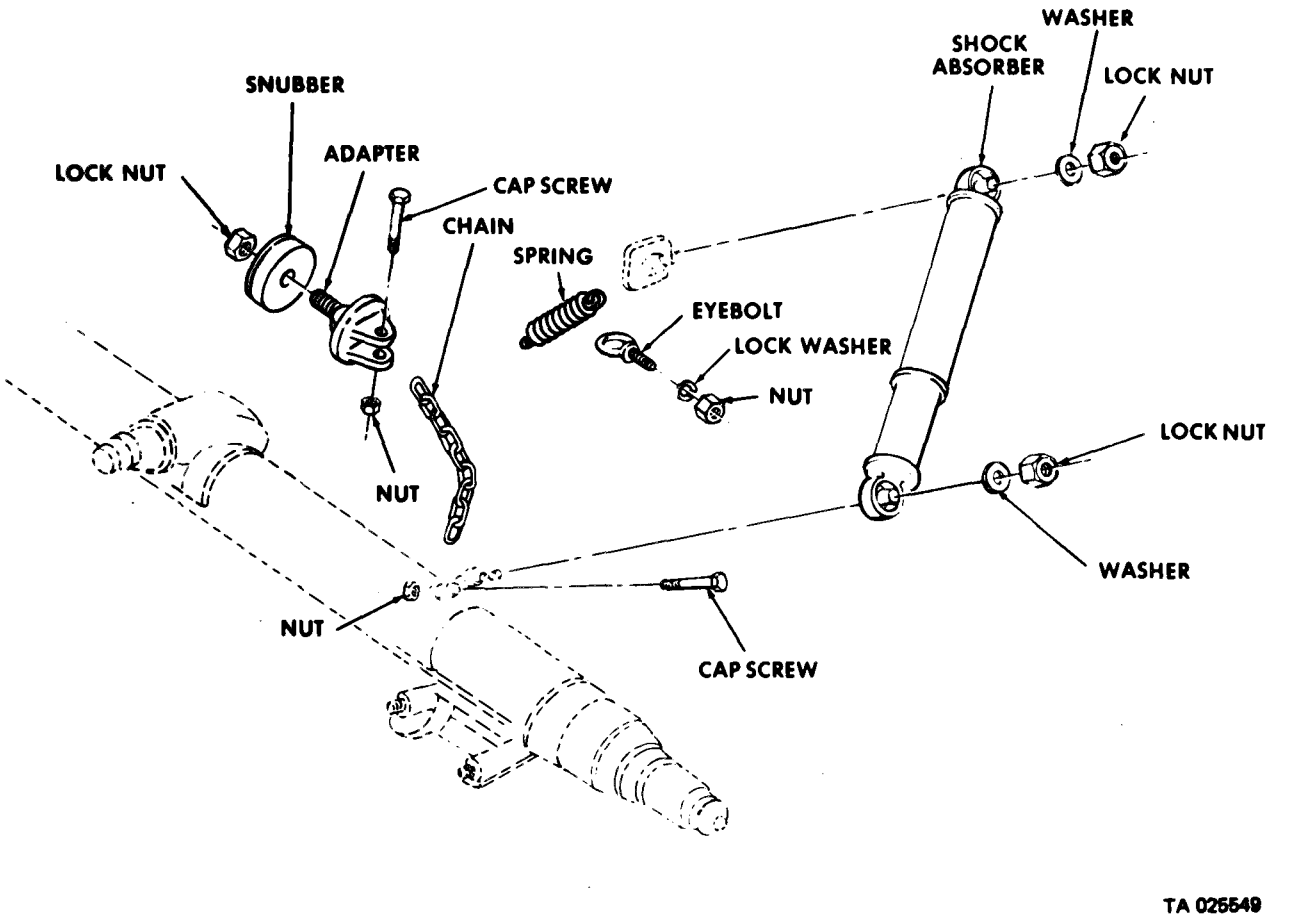


Figure 4-65. Shock absorber and axle stop chain (semitrailer No. 201 and on).

4-58. Upper Axle Stop
(fig. 4-66)

NOTE

Front and rear suspension upper axle stops are removed and installed in the same manner.

a. Removal. Remove wheels adjacent to axle sto being replaced. Remove four lock nuts and fla washers from axle stop studs. Remove axle stop,

b. Installation. Install in the reverse order a removal. Tighten four nuts to 65 - 90 lb ft torque

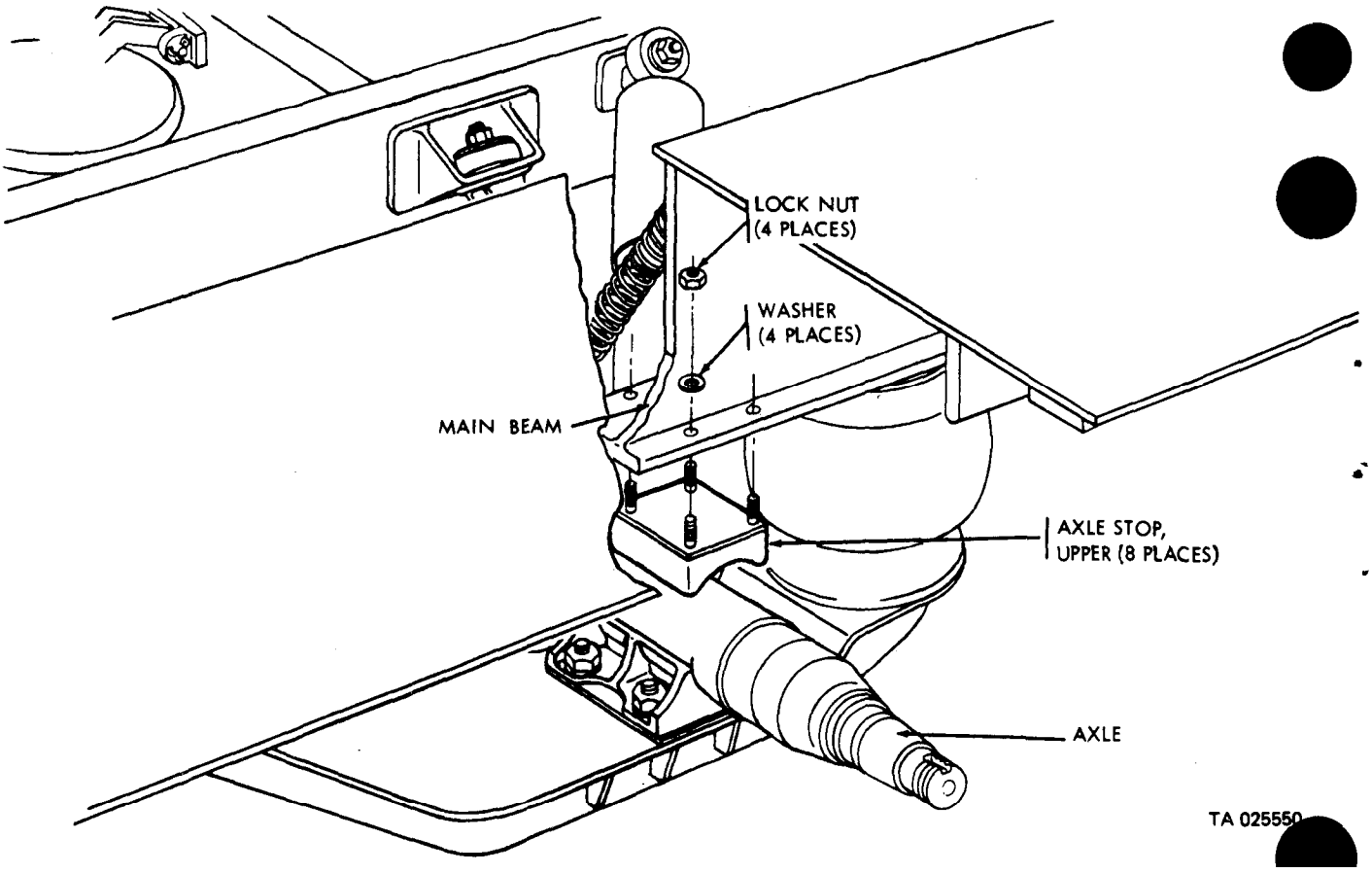


Figure 4-66. *Upper axle stop.*

Section X. WHEELS, TIRES, HUBS AND DRUMS MAINTENANCE

4-59. Wheels and Tires

NOTE

Use the Bishman Tire Changer, Model 931A with the Bead Breaker, P/N 5975 (70932), to remove tire from wheel.

a. Remove Wheel. See paragraph 2-26 for removal **and installation of wheel.**

b. Remove Tire from Wheel **(fig. 4-67 through 4-69). Tire removal and installation on the wheel is a two man operation.**

(1) Deflate tire completely by removing valve core **with core remover.**

(2) Pour rubber soap water around circumference of bead. Use **soap water liberally to thoroughly soak bead and rim. During removal and installation of tire on wheel, continue to apply rubber soap water on tire bead.**

WARNING

Do not, attempt to remove tire until tire has been completely deflated.

(3) Make sure tire is on flat surface with wheel disc **up. With flat end of tire iron (T45) place between tire and rim flange, straighten tire iron to** a vertical **position and hammer downward on the knob of the tire iron until the knob rests against the rim's edge (A, fig. 4-67).** To break first bead loose from rim, apply downward pressure on tire iron (T45) **and insert** metal or wood block (approximately **1½ x** 1½ x 6 inches) between tire and rim to maintain break. Tap tire iron with hammer around cumference of bead until the first bead is completely free from the rim (B, fig. 4-67). Remove wood or metal block.

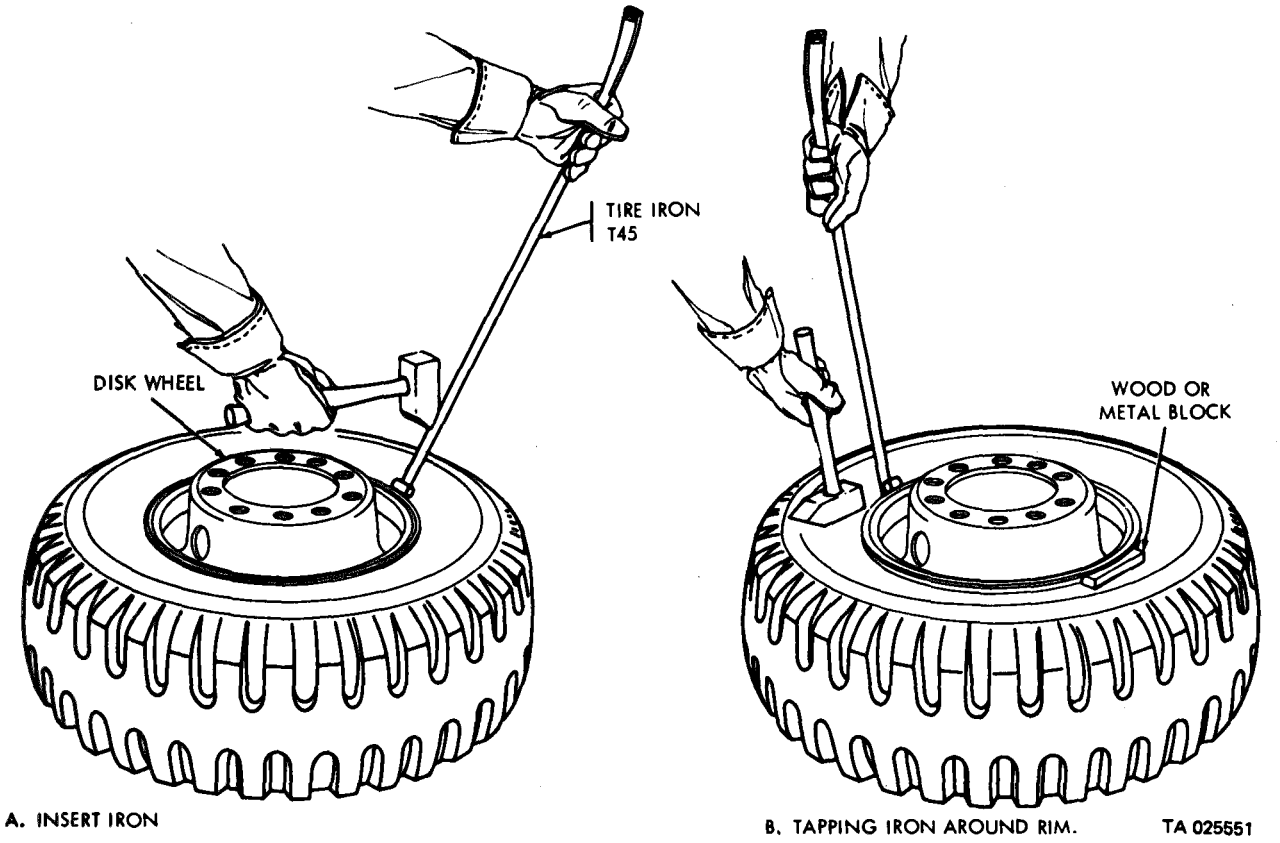


Figure 4-67. Breaking the tire bead.

(4) Turn tire over and repeat (2) and (3) above to free second bead from rim.

NOTE

After tire is completely free from rim, lubricate bead area with rubber soap water solution.

(5) Turn tire over so wheel disc is up. Use tire iron (T46B) to depress tire bead and insert a metal or wood block between wheel flange and tire bead at valve stem to help keep bead separated from flange and to guide tire bead into groove in wheel rim (A, fig. 4-68).

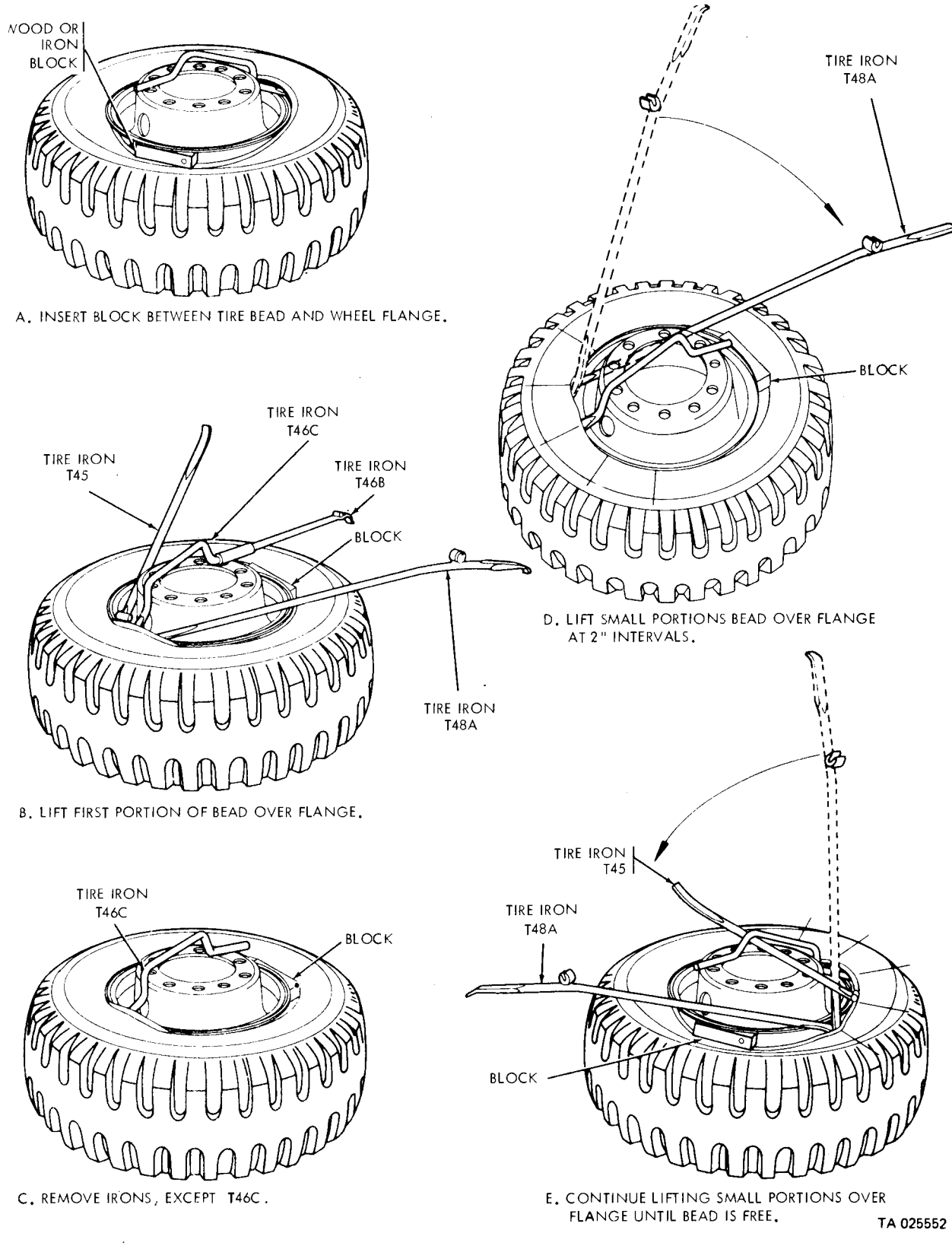


Figure 4-68. Using tire irons to lift first bead over rim.

(6) Insert curved ends of tire iron (T46B and T45) and straight end of tire iron (T48A from common tool set) between bead and flange about four to six inches apart on opposite side of tire from block. Depress tire bead and insert tire iron (T46C) under tire bead until stop is inside bead (B, fig. 4-68). Use the three long tire irons to lift tire bead up over wheel flange and position tire iron (T46C) over wheel disk to hold bead (B, fig. 4-68).

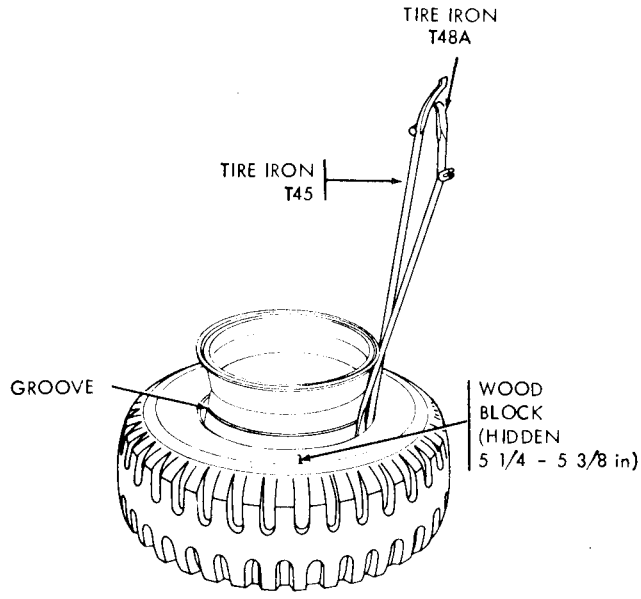
(7) Remove tire irons (T45, T46B and T48A). Tire iron (T46C) will remain in place to hold bead over flange (C, fig. 4-68).

(8) Apply rubber soap water to bead. Insert curved end of the tire iron (T48A) progressively between head and flange, taking small bites each time (D, fig. 4-68) and lift bead over flange. Make sure tire bead at wooden block guides into wheel rim groove. Use tire iron (T45) to hold bead and to assist in inserting tire iron (T48A). Continue operation until first bead is free from wheel flange (E, fig. 4-68). Remove block.

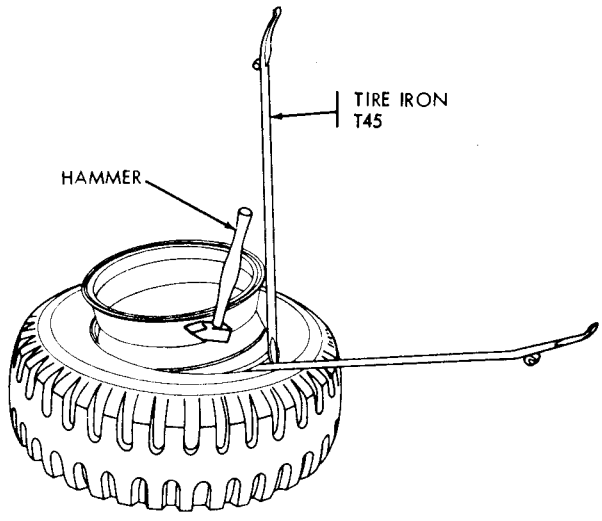
(9) Provide wood block approximately 6 in. x 8 in. that is 5¼ to 5-3/8 in. high. Turn tire over and place wheel disk on block. Tire will rest on floor at height for tire bead to aline with groove in wheel rim.

(10) Thoroughly lubricate tire bead and wheel flange with rubber soap water.

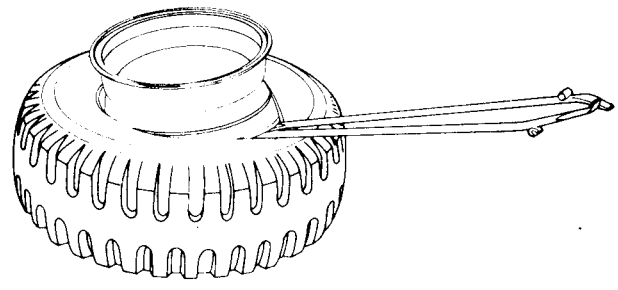
(11) Insert straight ends of tire irons (T48A and T45) under tire bead and over wheel flange (A, fig. 4-69). Apply downward pressure and force portion of bead over flange (B, fig. 4-69). Make sure bead on opposite side of tire goes into groove in wheel rim.



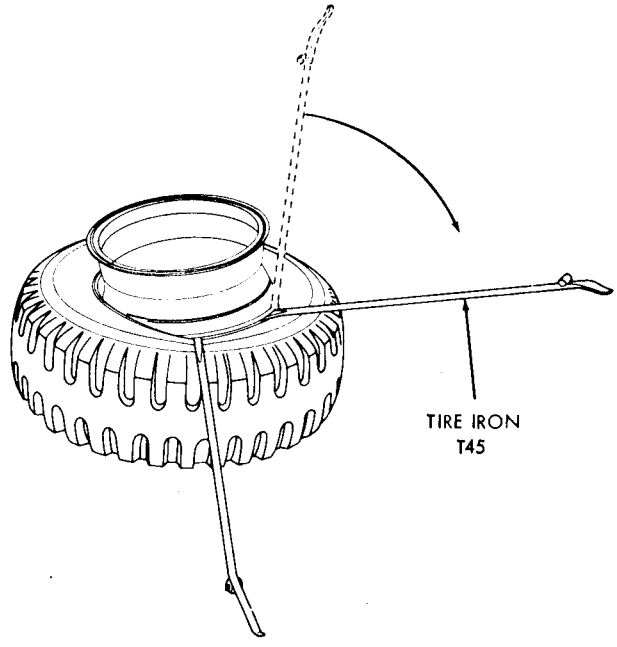
A. INSERT TWO IRONS BETWEEN FLANGE AND TIRE RIM.



C. TAP ONE IRON ALONG FLANGE WITH HAMMER.



B. PUSH BOTH TIRE IRONS DOWN.



D. PUSH IRON DOWN FORCING BEAD OVER FLANGE.

TA 025553

Figure 4-69. Using tire irons and hammer to lift second bead over rim.

(12) Use hammer to move tire irons apart (C, 4-69). Again apply downward pressure and force over flange (D, fig. 4-69). Repeat operation ntil tire is forced from wheel.

(13) Remove nut and washer securing valve in wheel and remove valve stem.

Install Tire on Wheel (fig. 4-70 and 4-71).

WARNING

The steal band used to keep new tire beads expanded during shipment is to be cut and removed before mounting the tire on a wheel. The cutting of such a band on a mounted tire containing even low pressure is very dangerous to personnel.

CAUTION

Retread tires are not authorized for use on the M747 semitrailer.

NOTE

Inspect rim to be sure bead seats and flange are clean and smooth. Remove any nicks or rough spots with file and smooth with crocus cloth. Inspect wheel mounting faces and ball seats for damage before mounting a tire (see *e* below).

(1) Lay wheel down with disc side up. Remove and washer from tire valve. Insert valve, from nside rim, through valve hole and seat valve base against rim. Install washer and nut on stem and tighten nut.

(2) Lubricate tire bead and wheel flange with rubber soap water and position tire over tip of flange. Push a portion of the first tire bead over flange (A, fig. 4-70).

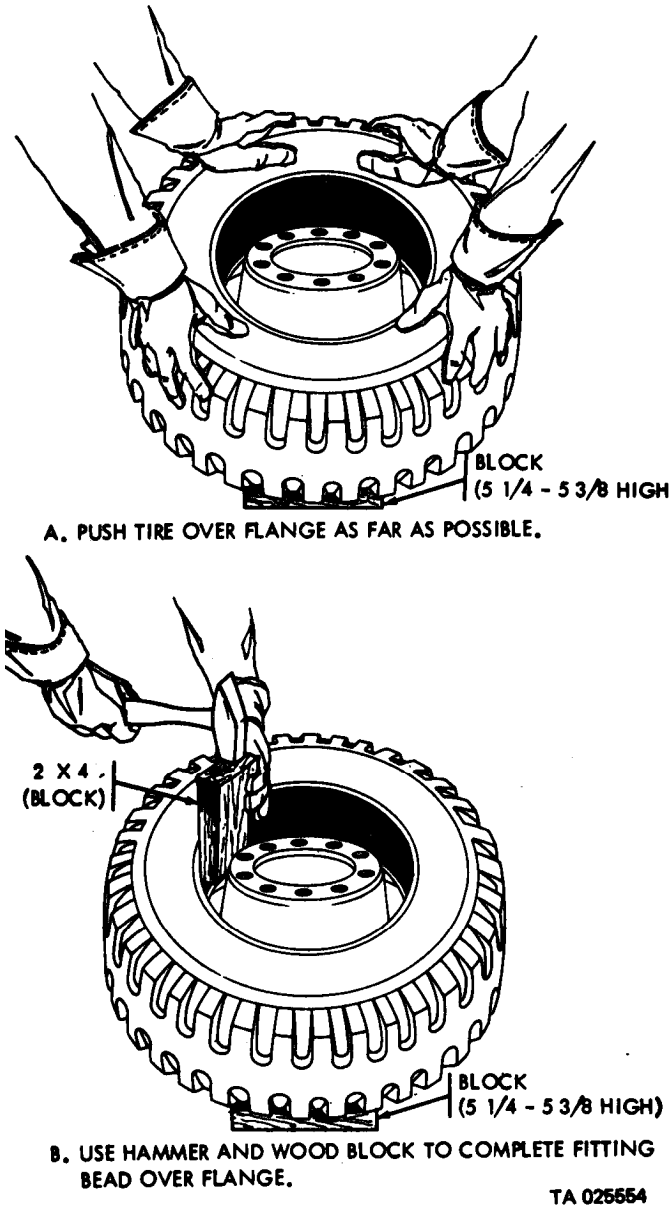


Figure 4-70. Installation of tire on wheel fitting first bead over rim.

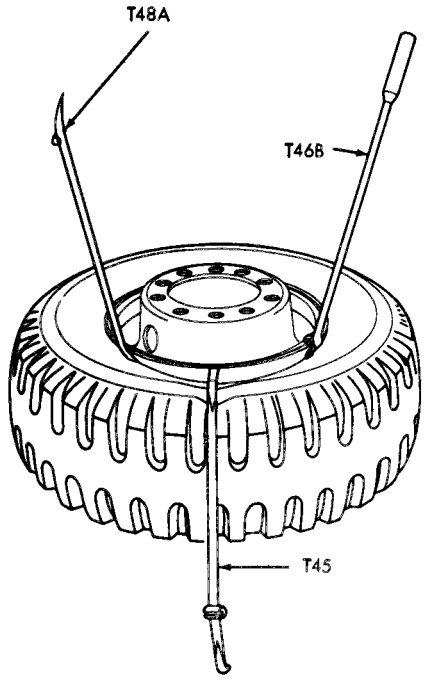
(3) Place wood block approximately 6 in. x 8 in. that is 5 ¼ to 5-3/8 in. high under low side of tire for support and to aline tire bead with groove in wheel rim.

(4) Apply rubber soap water to tire bead and wheel flange. Use a wood 2 x 4 Mock about one foot long and hammer first bead around and under flange (B, fig. 4-70). Make sure that tire bead at starting point goes into groove in wheel rim during this operation.

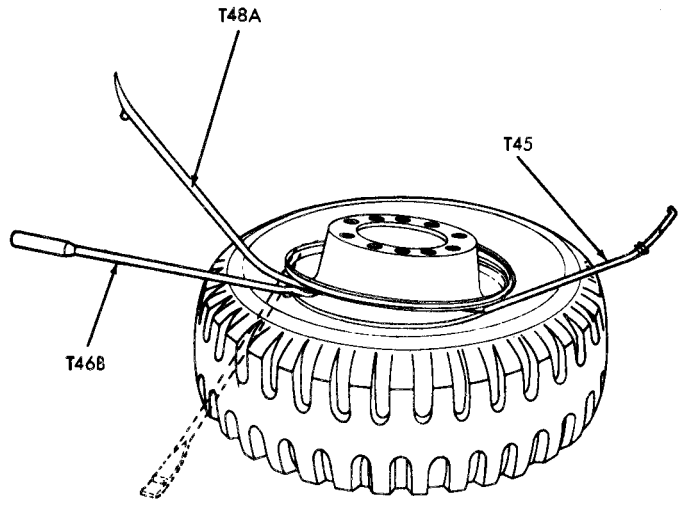
(5) Lubricate second tire bead and wheel flange with rubber soap water.

(6) Insert stop end of tire iron (T46B) and fla end of iron (T48A) between tire bead and wheel flange 10 to 12 inches apart. Insert tire iron (T45) between other tire irons.

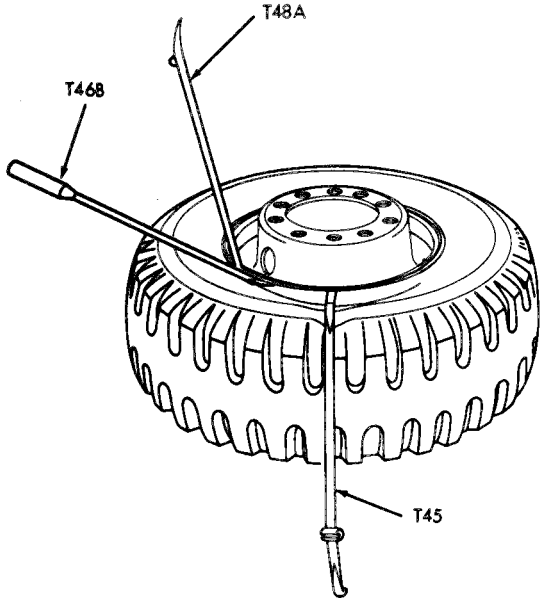
(7) Push down on all three tire irons and for second tire bead over rim flange (A, fig. 4-71).



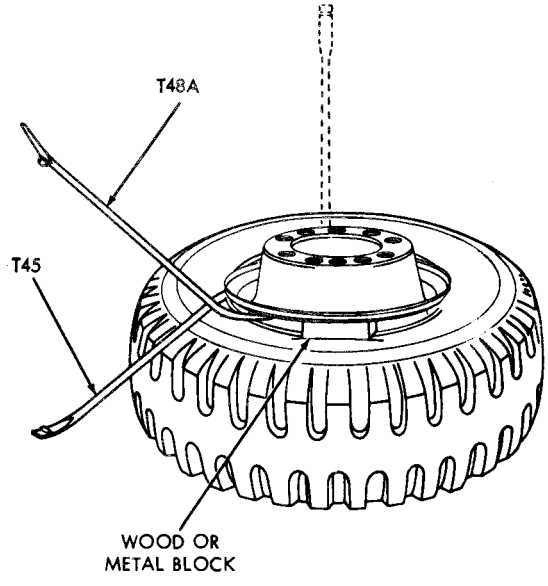
A. PUSH FIRST PORTION OF BEAD BELOW RIM FLANGE.



C. PUSH SECOND SMALL PORTION OF BEAD BELOW RIM FLANGE.



B. REMOVE IRON T46B AND PLACE ADJACENT TO T45 TO HOLD BEAD. REMOVE AND REPOSITION IRON T48A.



D. INSTALL BLOCK AND REMOVE IRON T45. AGAIN REPOSITION IRON T46B AND T48A AND PUSH SMALL PORTION OF BEAD BELOW THE RIM FLANGE.

TA 025585

Figure 4-71. Installation of tire on wheel fitting second bead over rim.

(8) Tire iron (T45) must remain in place to hold second tire bead under flange (B, fig. 4-71). Raise this tire iron slightly to assist placement of other tire irons when they are repositioned.

(9) Alternately remove tire irons (T46B and T48A) and position 2 to 4 inches away and take another bite (C, fig. 4-71). Continue to lubricate bead with rubber soap water.

(10) Continue operation until half way around rim. Tire bead at iron (T45) will be pulled to tire rim. Insert wood or metal block (1½ x 1½ x 6 in.) adjacent to iron (T45) between tire and rim to hold tire bead in position to enter groove in wheel rim (D, fig. 4-71) and remove iron (T45).

(11) Use all three tire irons and continue forcing tire bead over flange until tire bead is completely secured by the flange. Remove irons and block.

d. Inflate Tire. Stand tire upright and hold while applying air. Applying body weight to top of tire will usually seat tire beads and tire will inflate.

CAUTION

Excessive pressure will damage tire internal structure.

If tire beads do not seat during inflation, put a bead expander around outside center of tire to compress tire and force beads to seat. If a bead expander is not available, use load binder and chain. Apply only enough pressure on tire to lightly seal beads against rim. Inflate tire to 65 psi. Check tire beads on both sides and make sure they are completely sealed against rim. Deflate tire and reinflate to remove buildup of stresses in tire. Install cap on valve. If tire is to be mounted as the inside dual, install valve extension on tire valve. Apply rubber soap water around rims and valve and check for leaks.

e. Clean Wheel. Whenever a wheel is removed from its hub, the hub face and mating wheel disc face must be wire brushed to bare metal before the wheel is remounted. I n addition, the wheel studs, cap nuts and wheel ball seats must be clean and undamaged. Any worn cap nuts or damaged studs must be replaced. If mounting face of wheel is not flat or ball seats are damaged wheel *is not* to be put in service. NO OIL OR GREASE IS ALLOWABLE ON CAP NUTS, STUDS OR BALL SEATS OF WHEEL.

f. Torque Tighten Wheel Nuts (fig. 2-22). Semitrailers No. 1 through 200 have inner and outer cap nut sets to secure the dual wheels. Torque nuts in sequence shown on figure 2-22. Use wrench square socket (GGG-W-660) with torque wrench to tighten inner cap nuts to 575 - 600 lb ft. Then tighten outer wheel cap nuts to 575 - 600 lb ft. Semitrailers No. 201 and on have only one set of cap nuts which secures both wheels. Torque cap nuts to 575 - 600 lb ft.

NOTE

Failure to tighten cap nuts to proper torque will result in fatigue rupture of the wheel studs.

Any time a wheel is removed and replaced, and after 25 to 50 miles of operation, wheel cap nuts must be checked and tightened to proper torque using the method just described. If an outer cap nut is below 400 lb ft, retorque each inner and outer cap nut, one at a time, to 575 - 600 lb ft.

NOTE

If wheels are not raised off ground, loosen and retorque only one stud location at a time.

g. Service Wheel Studs.

(1) Before operation and at each stop, inspect for loose nuts, broken or missing studs. Broken studs are a direct result of operating the semitrailer with loose cap nuts or improperly seated wheels.

(2) Studs which have stripped threads, or are bent or cracked must be replaced. Notify Direct Support personnel for replacement of fractured or otherwise damaged studs.

h. Measure Tire for Wear.

(1) Measure tread depth of center groove at three points equally spaced around tire. If the average of these measurements is 3/32 inch or less, replace tire.

(2) Measure tread depth of side grooves at three points equally spaced around tire. If the average of these measurements is 3/32 inch or less, replace-tire.

4-60. Hubs and Drums

a. Removal (fig. 4-72).

CAUTION

The fail-safe chamber power spring must be manually compressed and the air reservoirs must be vented of pressure before removal of hub and drum assembly.

(1) Manually compress fail-safe chamber power spring by following procedure in paragraph *4-30d.*

(2) Vent air system pressure by venting air reservoirs in accordance with paragraph *4-38b.*

(3) Remove wheels in accordance with paragraph 2-26.

(4) Remove six screws and lock washers securing hub cap to hub and remove hub cap and hub cap gasket. Discard gasket.

(5) Remove wheel bearing jam nut using socket (CPR 102292-1, fig. 4-1).

(6) Remove pierced lock washer and remove wheel bearing adjusting nut using socket (CPR 102292-2, fig. 4-1).

(7) Remove outer wheel bearing.

NOTE

Back-off brake shoes (para *4-30b* **),** if required, to ease removal of hub and drum assembly from spindle.

(8) Remove hub and drum assembly from spindle.

(9) Do not remove wiper from spindle unless it is damaged. Remove scored, grooved or otherwise damaged wiper using drift and hammer.

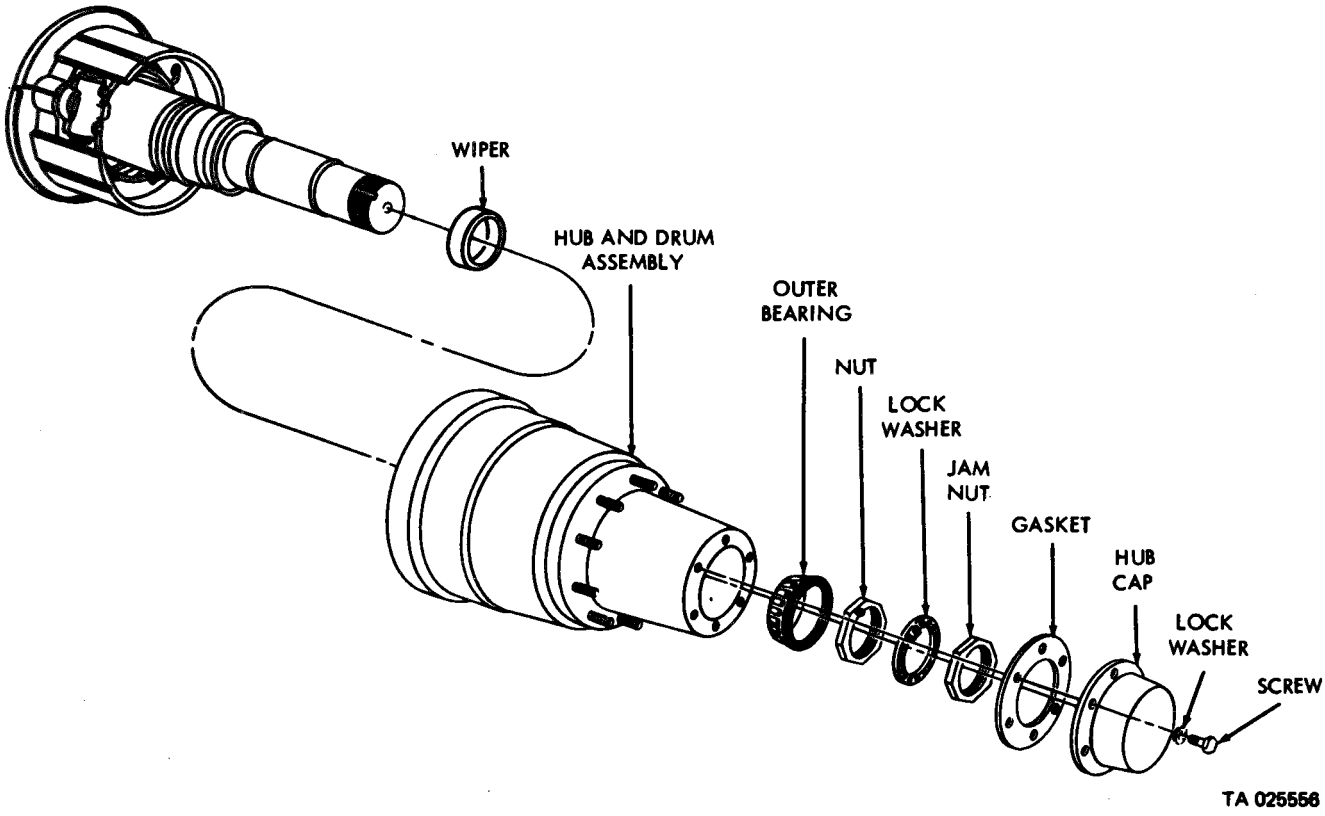


Figure 4-72. Hub and drum assembly.

b. Disassembly (fig. 4-73).

(1) Remove oil seal from hub by applying drift to inner wheel bearing through hub and tapping with hammer on opposite sides until oil seal is free. Discard seal.

(2) Remove inner wheel bearing.

(3) Do not remove bearing cups unless they are damaged. Remove worn or darnaged bearing cups by applying drift through hub to cup inner face and tapping with hammer.

NOTE

Wheel bearing preventive maintenance does not require disassembly of brake drum from hub.

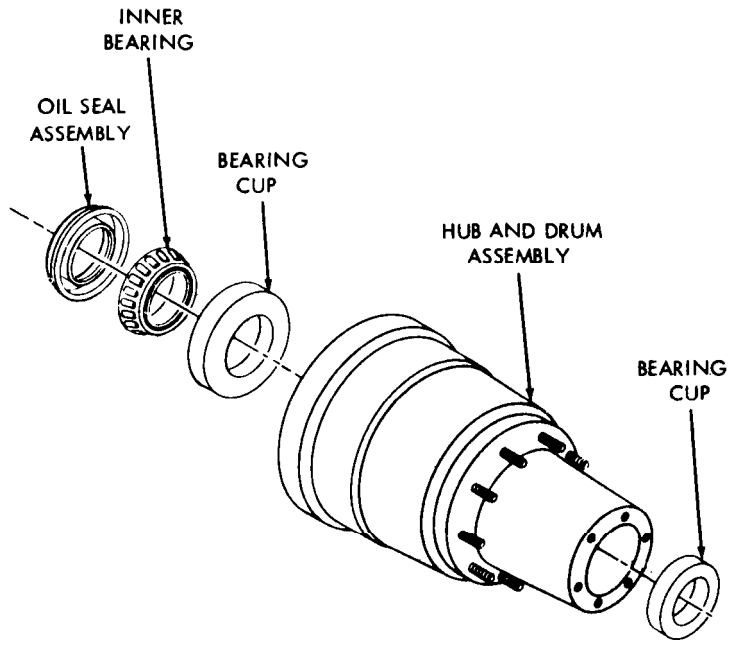


Figure 4-73. Hub and drum assembly disassembly or assembly.

c. Inspection and Service.

CAUTION

Do not clean parts with gasoline, in a hot solution tank or with water and alkaline solutions.

(1) Thoroughly clean all parts with dry cleaning solvent type II (SD-2) and a stiff fiber brush. Ensure parts are completely dry. Use low pressure compressed air to dry parts, if available.

CAUTION

Do not spin bearings with compressed air.

(2) Inspect wheel bearings for cracks or breaks in bearing cage, etching or pitting on roller surfaces and any evidence of wear, and replace if worn or damaged. Refer to TM 9-214 for inspection, care and maintenance of bearings.

(3) Pack bearings from large end of cone with grease (GA A), ensuring all cavities between rollers and cage are filled.

(4) Inspect bearing cups in hub for pits, grooves or flaking and replace if necessary.

(5) Inspect hub cap for damage to flange which would allow water leakage into wheel bearings and replace if damaged.

(6) Replace oil seal and hub cap gasket.

(7) Check threads of studs, screws and nuts for damage. Notify direct support maintenance personnel for replacement of studs.

(8) Inspect brake drum and hub for pitting, scoring or deep cracks. Inspect hub bearing surface for critical damage. If the brake drum and hub unit is darnaged, notify direct support maintenance personnel for repair anti/or a replacement unit.

d. Assembly.

(1) Install inner bearing cup, using replacer (CPR 103806) with handle (7950113) (A, fig. 4-74). Tap replacer so that even pressure is applied to inner bearing cup until it bottoms.

(2) Install outer bearing cup, using replacer (CPR 102290) (B, fig. 4-74). Use wood or brass block on small O. D. end of replacer. Tap wood or brass so that even pressure is applied on cup surface until cup bottoms.

NOTE

Take care not to damage end faces of replacer (CPR 102290) since this tool is also used to replace wiper on spindle.

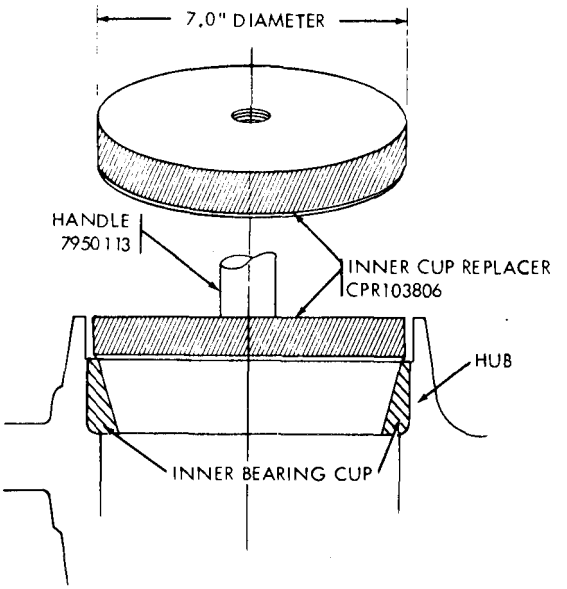
(3) With hub in upright position, install inner wheel bearing (fig. 4-73). Position oil seal on hub and hand-press lightly into hub I.D. (fig. 4-75). Position

replacer (CPR 102289) with handle (7950113) to pilot in bearing 1. D. and tap oil seal until oil seal flanges seats on face of hub inner rim.

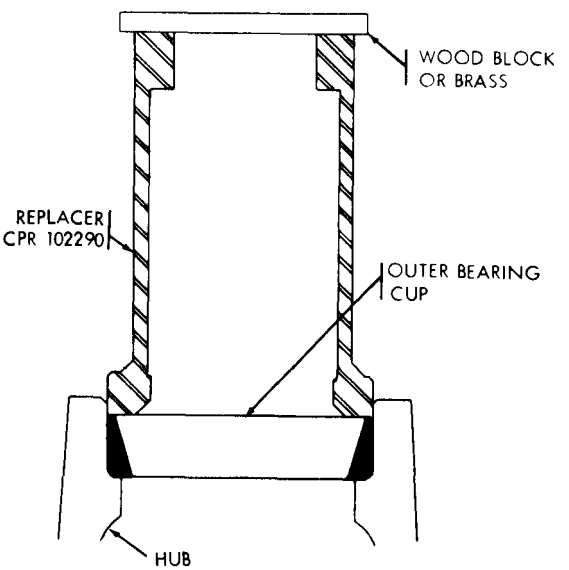
CAUTION

Do not tap on replacer after seal has bottomed.

(4) Ensure the axle spindle is thoroughly clean and apply a thin coat of sealer (MIL-D-45180, type 3) around wiper journal of spindle. Position wiper and replacer (CPR 102290) on spindle, as shown in figure 4-76. Force wiper onto journal by tightening wheel bearing adjusting nut. Wiper must be installed squarely to aline properly with inner wheel bearing.



A. INSTALLING INNER BEARING CUP IN HUB.



B. INSTALLING OUTER BEARING CUP IN HUB.

TA 025558

Figure 4-74. Wheel bearing cup installation.

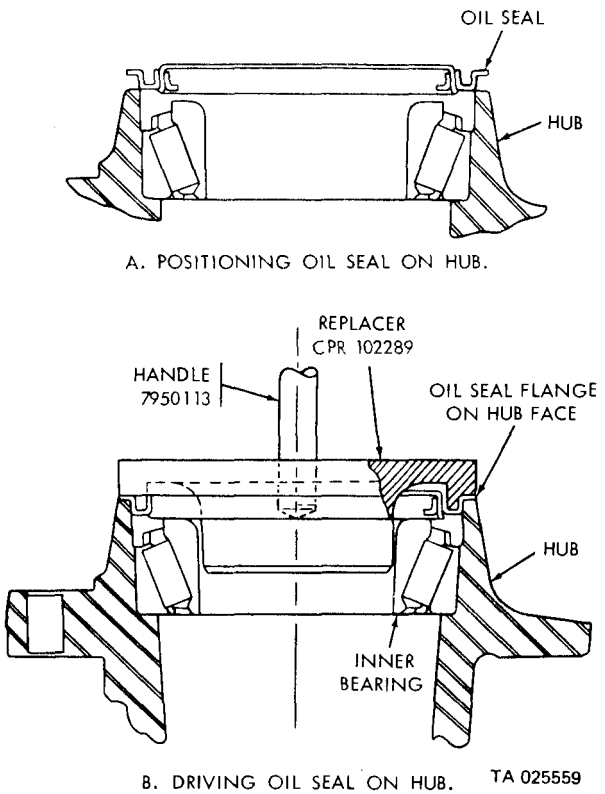


Figure 4-75. Oil seal installation.

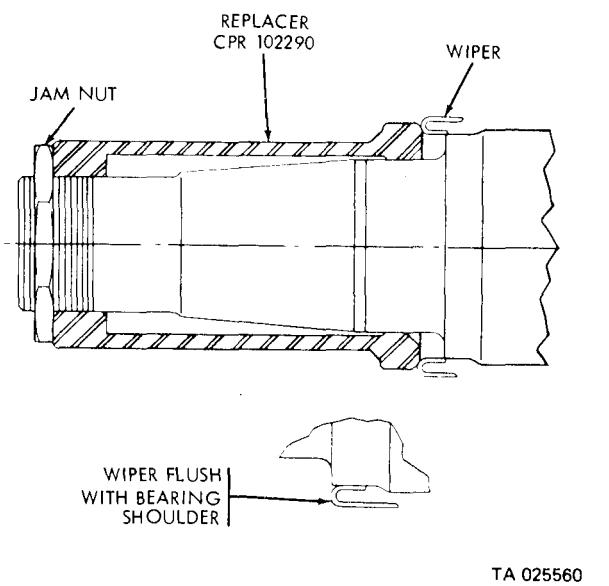


Figure 4-76. Wiper installation.

e. Installation and Adjustment.

(1) Position hub and drum assembly on spindle. If drum binds on brake shoes when partially installed, turn both adjusting bolt starwheels to reduce brake shoe spread.

(2) Refer to figure *4-72.* Install outer bearing by inserting into bearing cup. install wheel bearing adjusting nut against outer bearing using wrench socket (CPR *102292-2).* Provide for sufficient clearance between brake shoe and drum so brake drag will not interfere with bearing adjustment.

(3) Using wrench socket (CPR 102292-2), tighten adjusting nut to 200 lb ft torque while rotating hub and drum assembly in both directions.

(4) Back off adjusting nut approximately ¼ (2 flats) to 1/3 (2-2/3 flats) turn so dowel on nut will aline with lock washer hole when tab on lockwasher is positioned on axle spindle keyway. Assemble wheel bearing lockwasher and jam nut. Using wrench socket (CPR 102292-1), tighten jam nut to 250-300 lb ft torque.

(5) Apply light coat of grease (GAA) to hub cap gasket and position gasket on hub.

(6) Install hub cap and secure with six screws and lockwashers. Tighten screws to 16 - 20 lb- ft torque.

(7) Install wheel in accordance with paragraph 2-26.

(8) Pressurize air system.

(9) Adjust brakes in accordance with paragraph *4-30b.*

(10) Manually release fail-safe chamber power spring by following procedure in paragraph *4-30d.*

Section XI. FRAME AND TOWING ATTACHMENT MAINTENANCE

4-61. Air Suspension Spring Protection Plate

(fig. 4-77)

a. Removal. Remove cotter pin, two washers, and retaining pin. Remove cap screw, lock washer and nut and remove protection plate.

b. Installation. Position plate attaching brackets to mating bracket on frame and install retaining pin, two washers, cotter pin, cap screw, lock washer, and nut. Tighten nut to 23 - 30 lb ft torque.

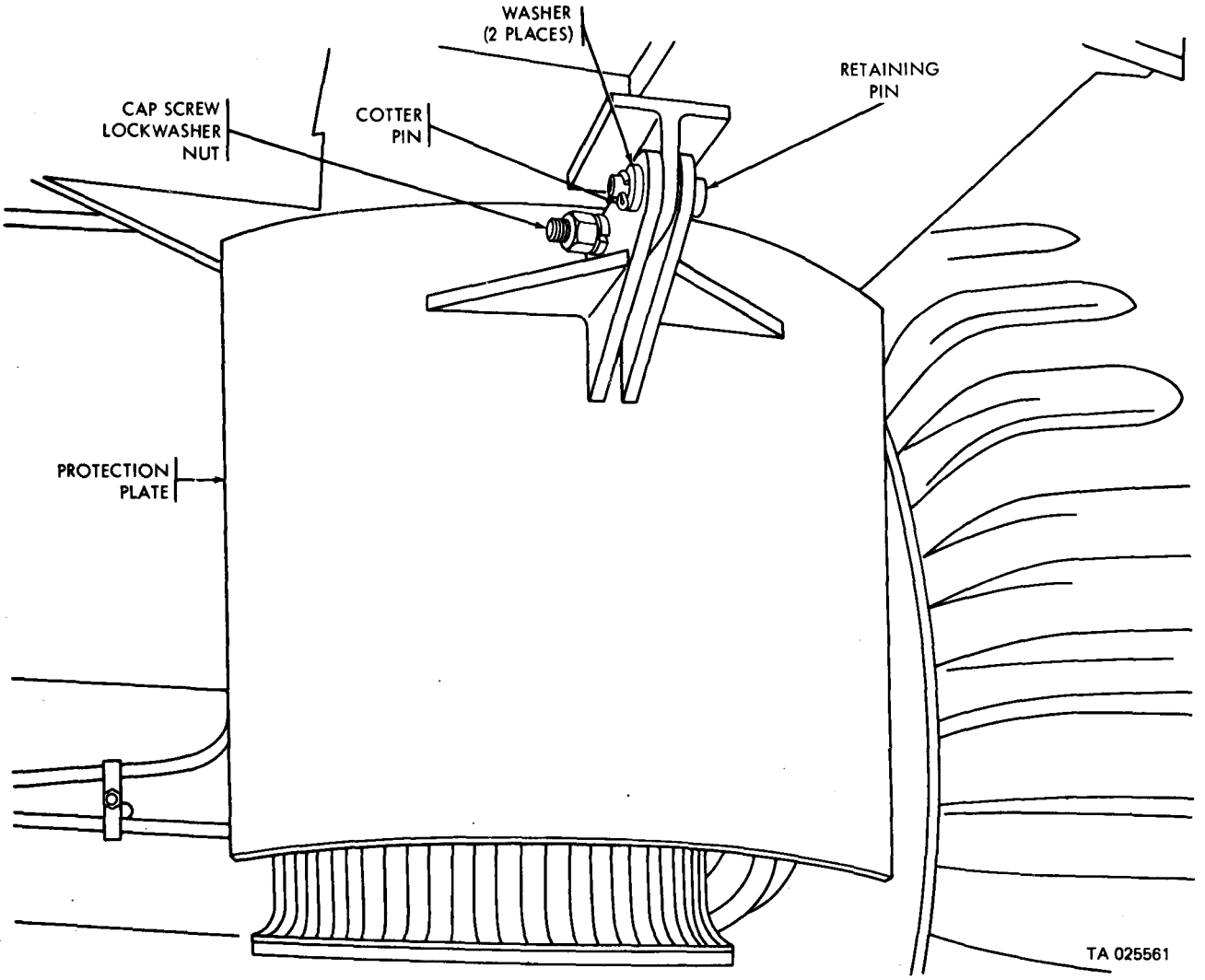


Figure 4-77. Air suspension spring protection plate.

4-62. Axle Lift Bracket

Refer to paragraph 4-54a and e for removal and installation procedures.

4-63. Loading Ramps

(fig. 4-78)

a. Removal.

(1) Remove two retaining rings security flap shaft. Slide shaft out and remove flap assembly.

(2) Remove ramp from trailer by removing two retaining rings and ramp shaft.

(3) Disassemble bushing from tie down lug by removing two retaining rings.

b. Installation. Install loading ramp in the reverse order of removal.

4-64. Spare Wheel Carrier

(fig. 4-79)

The spare wheel carrier consists of a bracket and two bolts, welded in place on the gooseneck, and two nuts. Replace lost or damaged nuts. Nuts should be torque tightened to 200-250 lb ft with spare wheel in position.

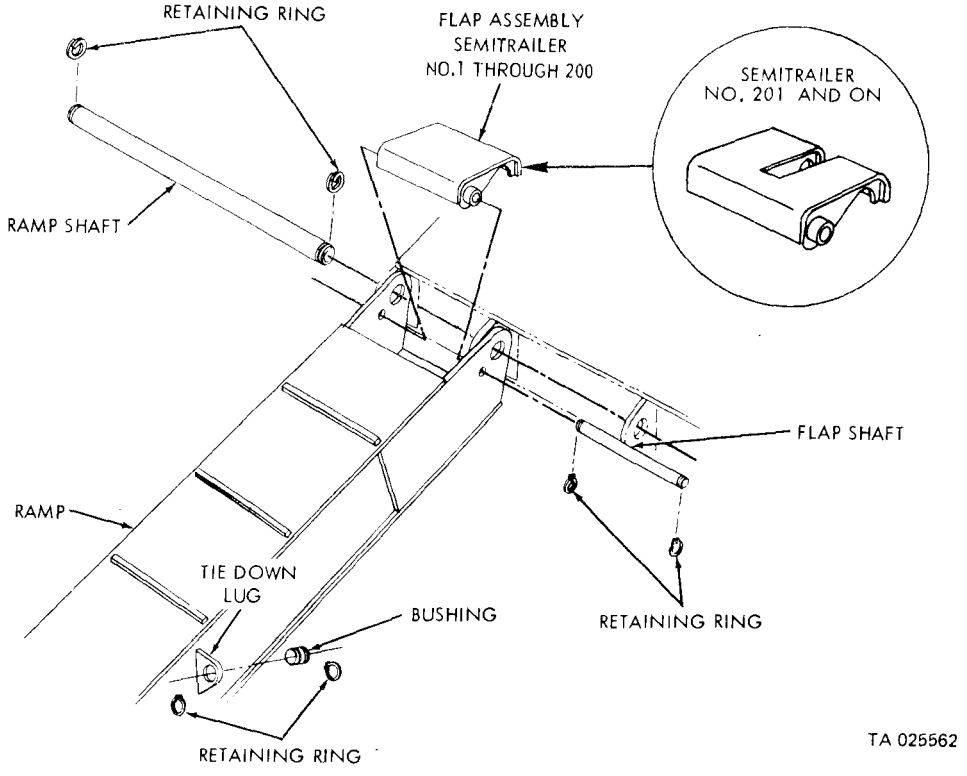


Figure 4-78. Loading ramp.

4-65. Forward Gooseneck Bumper Planks

(fig. 4-79)

a. Removal. Remove bumper planks by removing four cap screws, flat washers, lock washers and two straps securing each plant to gooseneck.

b. Installation. Install bumper planks in the reverse order of removal.

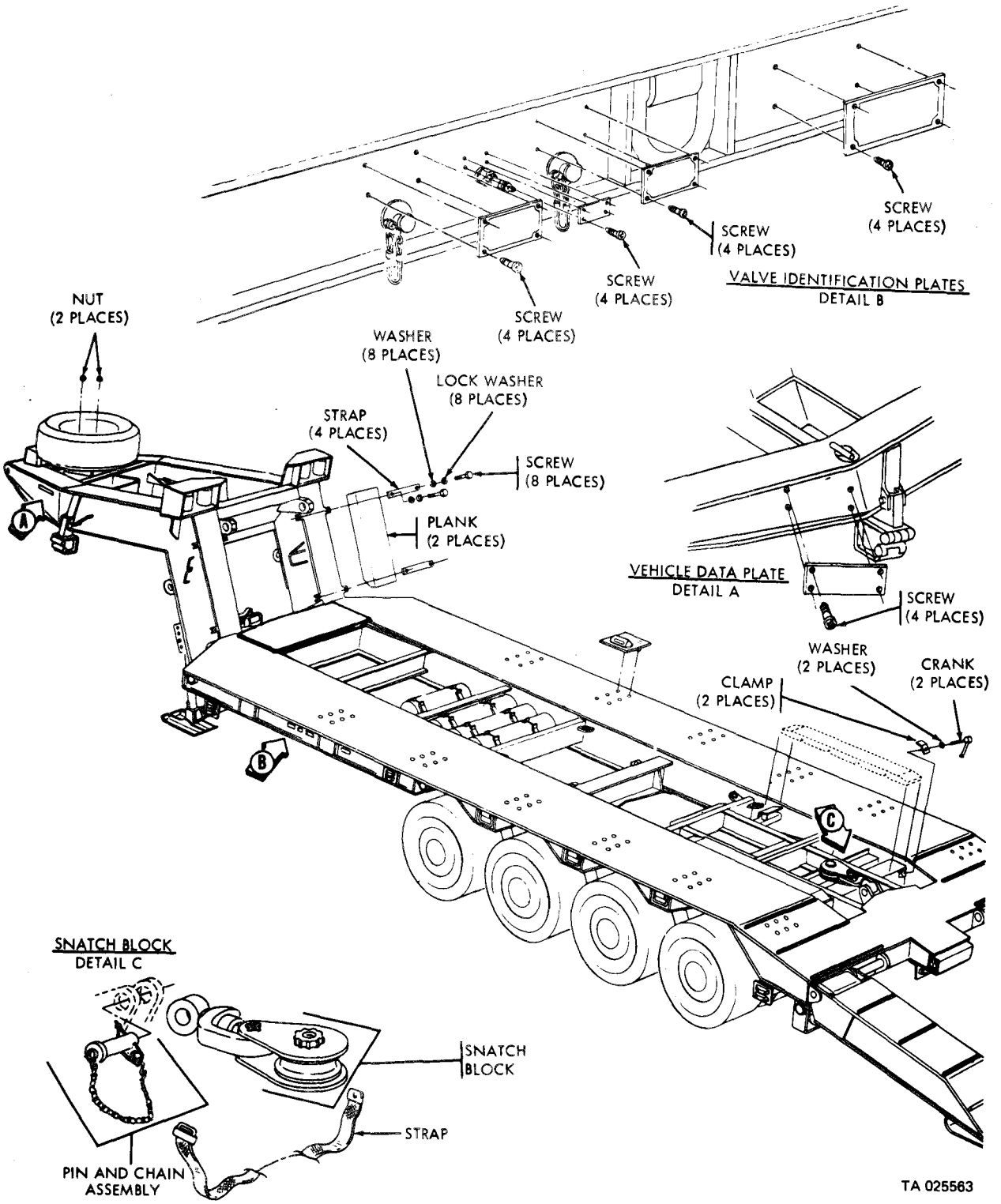


Figure 4-79. Snatch block, planks, spare wheel carrier and data plates.

4-66. Landing Gear

(fig. 4-80)

a. Removal.

(1) Remove quick-release lock pin and remove two retaining pins; one from each landing gear.

(2) Remove two retaining rings and pivot pin from left landing gear.

(3) Remove two retaining rings and pivot pin from right landing gear.

(4) Remove two retaining rings and hinge rod securing each landing gear assembly to center frame bracket.

(5) Carefully remove each landing gear from mounting brackets.

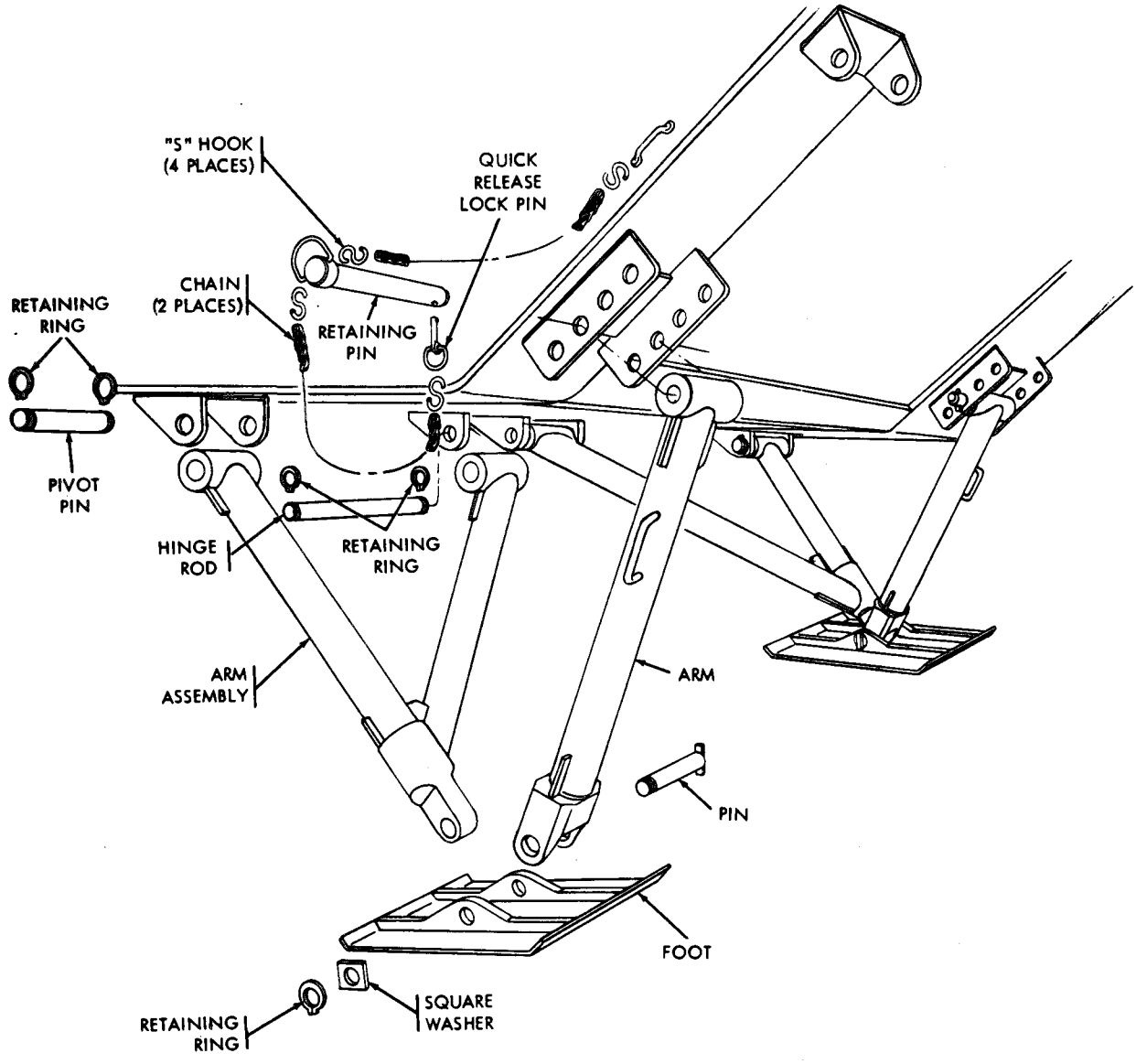


Figure 4-80. Landing gear.

b. Disassembly.

NOTE

Disassembly and assembly on both landing gears are the same.

(1) Remove retaining ring and square washer from pin at foot. Remove pin.

(2) Remove forward arm and rear arm assembly from foot.

c. *Assembly.*

(1) Position forward arm in foot assembly.

(2) Position rear arm assembly in foot assembly and aline arm holes with holes in foot.

(3) Lubricate hinge pin with oil (OE/HDO), and install pin in foot. Install square washer and retaining ring on pin.

d. Installation.

(1) Carefully position right landing gear in frame brackets.

(2) Lubricate pivot Pin with oil (OE/HDO), and install pin and retaining rings in outer arm and frame bracket.

(3) Lubricate center hinge rod with oil (OE/HDO), and install portion of pin in inner rear arm and frame bracket.

(4) Carefully position left landing gear in frame brackets.

(5) Lubricate remaining pivot pin with oil (OE/HDO), and install pin and retaining rings in outer rear arm and frame bracket.

(6) Complete installation of center pivot pin through both landing gear assemblies and install retaining rings.

(7) Coat with oil (OE/HDO), and install two retaining pins to forward arms and frame bracket. Install quick-release lock pins in retaining pins.

Section XII. STOWAGE PROVISIONS, WINCHING COMPONENTS AND ACCESSORY ITEMS MAINTENANCE

4-67. Stowage Provisions Hardware

(fig. *4-81)*

a. Stowage Compartment Hardware. Replace damaged snap hooks, hooks, chains, and hasps. Knock out old hasp rivets with chisel and hammer and replace hasp.

b. Pamphlet Bag Fastener. Replace damaged pamphlet bag fastener.

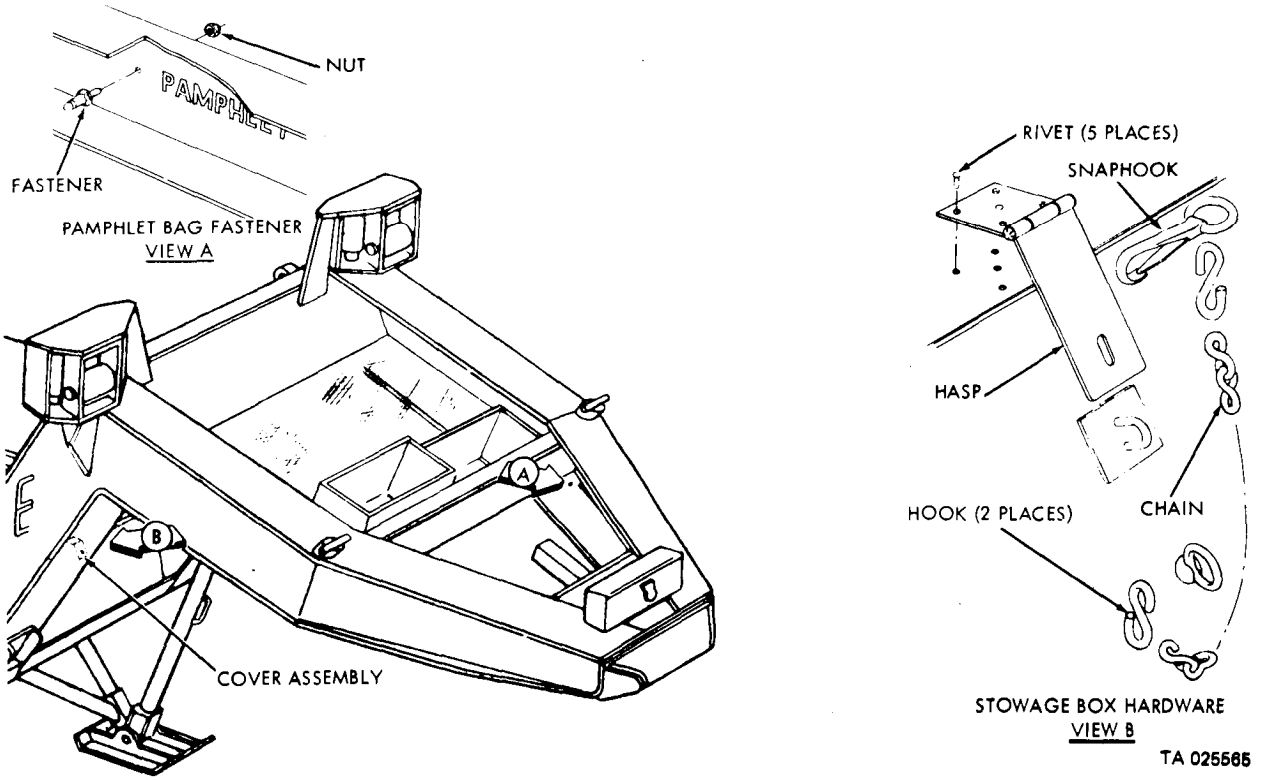


Figure 4-81. Stowage provisions hardware.

4-68. Snatch Block
(fig. 4-79)

a. **Removal.**

(1) Remove holddown strap from snatch block.

(2) Remove safety pin from pin assembly, and remove pin from frame bracket.

(3) Remove snatch block.

b. Installation. Install snatch block in the reverse order of removal.

c. Lubricate. Lubricate sheave bearings through fitting in sheave center pin semi-annually or when required. See figure 3-1.

4-69. **Roller Assemblies**

Organizational maintenance of the roller assemblies is limited to lubrication only. Refer to figure 3-1. Notify direct support personnel if repair or replacement is required.

4-70. Reflectors
(fig. 4-82)

a. *Ramp Reflectors and Brackets.* Remove two machine screws securing reflector to bracket. Remove four machine screws and lockwashers securing bracket to ramp. Replace damaged parts. Coat holes and bracket interface near holes with sealing compound (MIL43- 11031). Install bracket and reflector in reverse order of removal.

b. Rear (Red) Reflectors. Remove two machine screws and lock washers and remove reflector. Install new reflector in reverse order of removal.

c. Side (Amber) Reflectors. Remove two machine screws, lockwashers and nuts and remove reflector. Install new reflector in reverse order of removal.

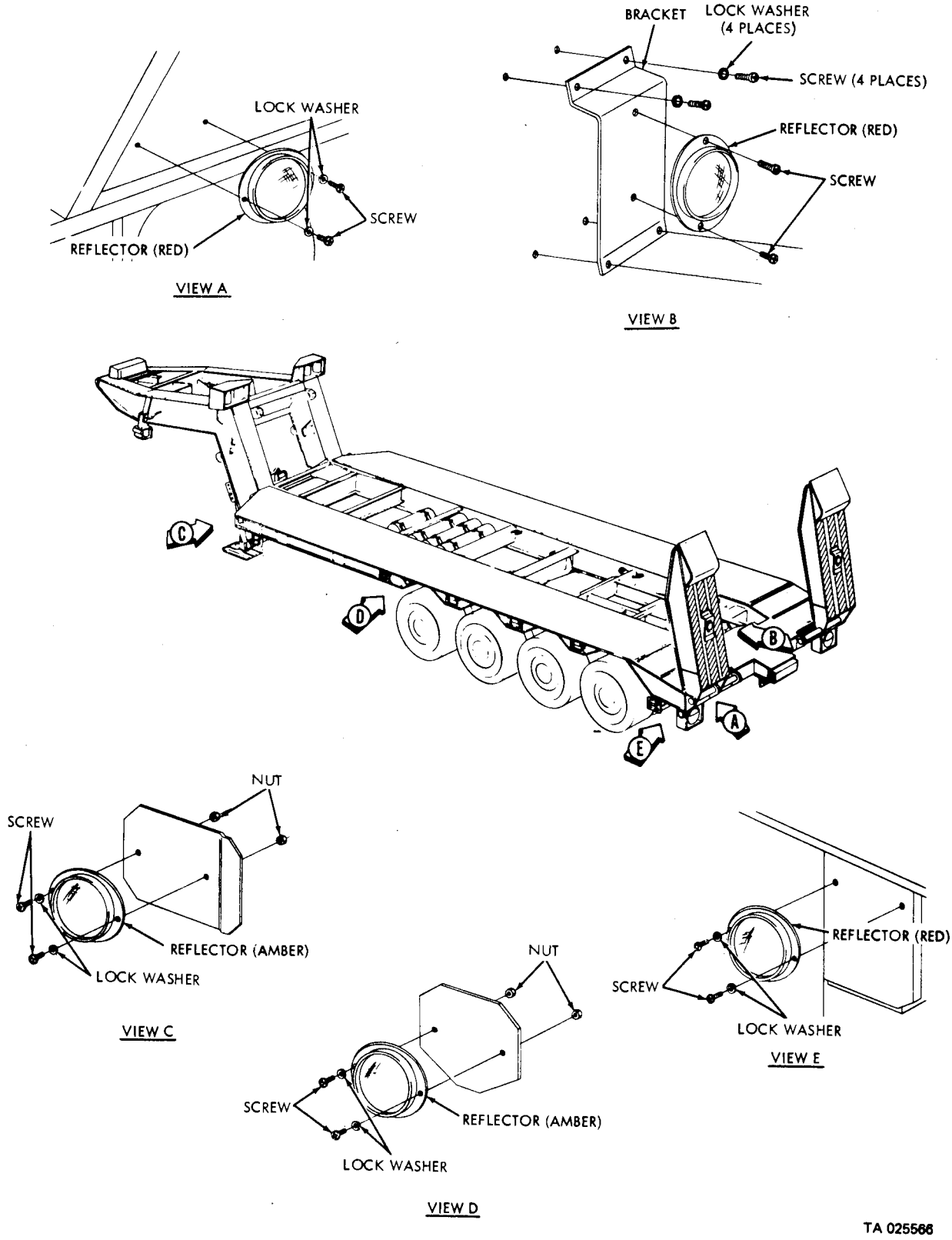


Figure 4-82. Reflectors.

4-71. Data Plates

(fig. 4-79)

aintain data plates in readable condition. Clean plates and remove corrosion with stiff fiber brush. Apply lacquer to preserve plates. Replace unreadable data plates.

Section XIII. DRAIN HOLES INSTALLATION, SNATCH BLOCK BRACKET

4-72. Drain Holes Installation, Snatch Block Bracket.

a. Remove the snatch block hold down strap assembly.

b. Lift the snatch block and rotate it around the hinge pin to the other side to gain access to the cross member for drilling.

c. Make a punch mark at the center of the snatch block holding bracket.

d. Measure 2 3/8 inches from center punch mark along the longitudinal axis toward the front of the trailer and make another punch mark inside the round holding bracket.

e. Drill two 1/2 inch diameter holes at the punch marks.

CHAPTER 5

DIRECT AND GENERAL SUPPORT MAINTENANCE INSTRUCTIONS

Section I. REPAIR PARTS, SPECIAL TOOLS AND EQUIPMENT

5-1. General

Tools, equipment and maintenance parts over and above those available to the using organization are supplied to supporting maintenance units for maintaining, repairing and rebuilding the material.

5-2. Common Tools and Equipment

General mechanic's tool sets and common tool sets required for maintenance of this materiel are authorized for issue by Tables of Allowances (TA) and Tables of Organization and Equipment (TOE).

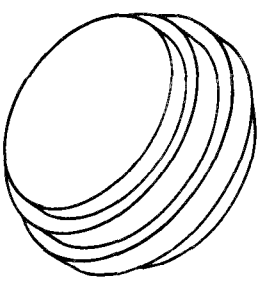
5-3. Special Tools and Equipment

(fig. 5-1)

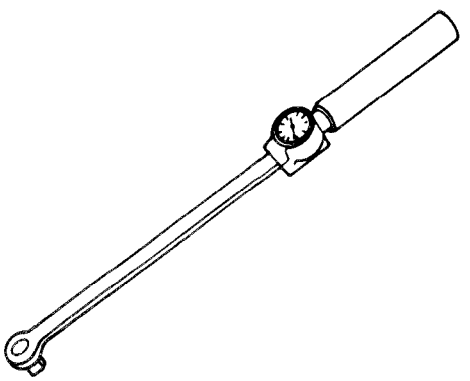
The special tools and equipment listed in table 5-1 are required to perform maintenance operations described in this chapter. The special tools list of TM 9-2330-294-24P is the authority to requisition the tools.

5-4. Maintenance Repair Parts

Repair parts are supplied to support maintenance for the replacement of parts that become worn, broken, or otherwise unserviceable. Repair parts for the semitrailer, low bed, heavy equipment transporter, 60 ton, M747 are listed in TM 9-2330-294-24P, which is the authority for requesting replacements.



REPLACER CPR 102291



WRENCH GGG-W-686

TA 025567

Figure 5-1. Special *tools.*

Table 5-1. Special Tools and Equipment

	NSN or reference No	Reference		Use
		Fig. No.	Para No.	
REPLACER	5120-00-490-5577 (CPR 102291)	5-1	6-7	Replace equalizer beam center bushing (5 and 6 axle assembly)
WRENCH, TORQUE 0.2000 LB-	5120-00-221-7981 (GGG-W-686)	5-1	*5-13f, 5-14f, 5-15b.*	For torquing lower axle stop nuts, beam-to-axle shaft nuts, sleeve assy to spindle nut and axle to equalizer beam cap screws.

Section II. TROUBLESHOOTING

5-5. Scope

a. This section contains troubleshooting information for locating and correcting most of the operating troubles which may develop in the semitrailer. Each malfunction for an individual component, unit, or system is followed by a list of tests or inspections which will help you to determine probable causes and corrective actions to take. You should perform the tests/inspections and corrective actions in the order listed.

b. This manual cannot list all malfunctions that may occur, nor all tests or inspections and corrective actions. If a malfunction is not listed or is not corrected by listed corrective actions, notify your supervisor.

5-6. Troubleshooting Table

Information in table *5-2 is* for use in conjunction with and as a supplement to the troubleshooting information available to organizational maintenance personnel (table 4-3 and 4-4).

Section III. GENERAL MAINTENANCE

5-7. General

a. In disassembly, remove as many major components and subassemblies as required for indicated repair. Subassemblies are further reduced, as required, into individual parts.

b. During assembly, subassemblies should be assembled first, combined into major components and installed to comprise a complete major assembly.

c. Complete disassembly of a component is not always required to make repairs or replacements. Good judgement should be used to keep disassembly operations to a minimum.

Table 5-2. Troubleshooting

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION
ELECTRICAL SYSTEM
1. ONE OR MORE LAMPS FAIL TO LIGHT
Step 1. Make short circuit test (para 4-156).
Repair or replace wiring harness (para 5-11).
Step 2. Make open circuit test (para *4-15a*).
Repair or replace wiring harness (para 5-11).

Table 5-2. Troubleshooting–Continued

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION
BRAKES (Cent)
SLOW BRAKE APPLICATION OR SLOW RELEASE
Check for defective wedge assembly.
Repair wedge assembly (pars 6-30).
4. FAIL-SAFE NOT HOLDING
Check for broken or jammed power spring.
Repair fail-safe (para 6-25).
SUSPENSION SYSTEM
5. SEMITRAILER SAGS TO ONE SIDE
Check for broken or disconnected torque rod axle bracket (fig. 5-5).
Connect torque rod axle bracket (para *5-13f*) or repair weld (para 6-42).
6. EXCESSIVELY WORN, SCUFFED OR CUPPED TIRES
Step 1. Check for damaged suspension components (fig. 5-5 and 5-8).
Replace or repair damaged components (pare 5-13 through 5-16).
Step 2. Check axle alinement.
Aline axle (para 5-9 and 5-14.f.).

d. During disassembly, tag critical parts such as **hims,** bearings, and electrical harnesses and leads, facilitate reassembly. This is especially important **r** electrical equipment of circuit number tags are illegible or missing.

e. Mark mating parts by scribe marks, or with dye, indelible ink, or paint, to be certain of correct positioning at assembly.

CAUTION

Never scribe mark bearing surfaces.

5-8. Specific Procedures

a. Unserviceable and unrepairable assemblies will be broken down into items of issue, and serviceable parts will be returned to stock. Parts or assemblies which cannot be repaired, selective-fitted or reclaimed to the standards contained in this manual will be salvaged and replaced with new parts.

b. When assembling components and assemblies, replace damaged keys with new ones. If screws, washers, or nuts are loose or damaged, they will be replaced.

c. Gaskets, preformed packing, and seals will be **laced.**

d. Springs will be replaced if broken, kinked, cracked or do not conform to specific tensile standards.

e. If a required new part is not available, recon- **tioning** of the old part is necessary. Such parta should be inspected carefully after reconditioning to determine their suitability and probable service lfe. Replacement parts should be requisitioned immediately.

f. Use of Tools

(1) Care must be exercised to use tools that are suitable for the work to be performed, to void damage to tools, damage to the equipment, or injury to personnel.

(2) Special tools and improvised tools are listed and illustrated in table 5-1. These tools should only be used for maintenance operations for which they were designed and personnel should be carefully instructed in their specialized operation.

g. *Ball and Roller Bearings.* Refer to TM 9-214 for cleaning, inspection, and lubrication of bearings, and instructions for evaluation of bearing life.

h. Welding.

(1) For general welding instructions and welding materials refer to TM 9-237. All welds must reflect good workmanship and approved welding procedures. Welds and weldments must be secure, free from cracks, excessive spatter and obvious defects, corrosion, undercutting, overlapping, poor fusion and brittleness.

(2) For specific welding instructions and welding materials refer to paragraph 6-39.

i. Surface Protection.

(1) Clean and repaint all surfaces on which paint has deteriorated or become damaged (TM 43-0139).

(2) Do not paint electrical harnesses or leads.

(3) Paint exterior of walkways with walkway compound, non-slip, MI L-W-5044, type II, color OD, Fed Std 595. All remianing exterior surfaces will be painted olive drab in accordance with TT-E-529 or TT-E-485.

j. Repairing Damaged Threads.

(1) When determined feasible by inspection, damaged thread should be repaired by retapping, by use of a thread die or by use of thread restorer file.

(2) Tapped holes for screw thread inserts that have mutilated threads may be repaired by:

(a) Drilling and tapping holes oversize and installing larger screws.

(b) Filling tapped hole by welding and redrilling and tapping hole to original size.

k. Removing Burrs, Scratches, and Raised Metal.

(1) Use fine mill file, soft stone, or crocus cloth dipped in dry cleaning solvent type II (SD-2) to remove burrs, scratches, or raised metal.

(2) When filing aluminum, clean file often with steel file brush to avoid loading file with aluminum particles which will gouge work surface.

l. Cleaning.

(1) General. Refer to TM 9-247 for cleaning materials to be used.

(2) Cleaning of Material Received from Storage.

(a) Material received by direct and general support maintenance units from storage will be cleaned by the dip-tank, vapor-degreaser, or steam method, whichever is applicable or available. Descriptions of these methods are as follows:

1. Dip tank method. Disassemble as required, place parts in a perforated metal basket, and submerge and agitate in a tank containing dry cleaning solvent type II (SD-2) (use rubber gloves). Repeat, using a second tank with clean solvent. Extent of treatment in each tank will depend on ease with which parts are cleaned.

2. Vapor-degreaser method. Tank containing a heated solution of trichlorethylene or perchlorethylene (type II) are used for decreasing items that are very greasy or oily and are not readily cleaned by dip-tank method. Place parts in a perforated metal basket and submerge just below the vapor in the tank, keeping the basket in this position until all the grease, oil, or dirt melts and runs off the parts. If necessary materiel may be washed with decreasing spray unit.

WARNING

Personnel operating vapor-degreaser are taut ioned not to breathe the vapor fumes.

3. Steam method. Place parts in a perforated metal basket and steam treat until clean. This method is less efficient than the vapor-degreaser method and may require additional cleaning of parts to remove final traces of grease, oil or dirt, particularly from recesses.

(b) If sometime is to elapse before the start of repair or overhaul operations, apply a coat of light grade PE-10 preservative oil to all finished metal surfaces to prevent rusting.

1. Cleaning after repair or overhaul. **Afte** repair or overhaul operations and prior to assembly, remove shop dirt and other foreign matter from all metal surfaces. This is accomplished by the dip-tank and vapor-degreaser methods or by cleaning with cloths soaked in dry cleaning solvent type II (SD-2).

2. Cleaning after shop inspection. After in-process shop inspections, dip parts in a tank containing finger print remover oil (type A), remove parts (with rubber gloves), and dry thoroughly with dry compressed air (provided with moisture filter traps) or by wiping with clean, lint-free cloths. Apply preservatives as soon as possible after cleaning.

m. Lubrication. Refer to paragraph 3-1 and figures 3-1 and 3-2.

5-9. Axle Alinement

(fig. 5-2)

CAUTION

The dimensions included in this paragraph are for reference purposes only and are not to be understood as wear limits.

a. General. Suspension alinement for both front and rear tandems depends on the proper installation and suspension components that are in good condition. Serviceability is the foremost criterion of adequate suspension alinement. Figure 5-2 shows the dimensions pertaining to suspension alinement on the new semitrailer. The procedure for taking these measurements are as follows: With the semitrailer on flat pavement, fix the axles in position so that the same distance (A) exista between the main beam and each axle on either side of the semitrailer. This can be done by shimming below the axle or by wedging blocks of the same size between both ends of each axle and the portion of the main beams above the axle. Once the axles are fixed parallel to, and equal distances from the frame, the measurements shown on figure 5-2 can be taken. Install pipe extensions to each end of first axle. Extensions must be the same length and installed the same measurement on the axle ends. The extensions must be long enough so that measurements E can be taken without interference from the outer tires. Measure the distance between axles from the center of the axle extension ends. Distances (B), on both sides of the semitrailer should be within 3/32 inch of each other. Distance (C), on both sides of the

semitrailer, should be within 1/8 inch of each other. Distances (D) should be within 3/16 inch of each other. Use a plumb bob to mark the centerline of the kingpin and the centers of the first axle ends on the pavement. Measure the distance between the kingpin centerline mark and the two axle end marks. These distances (E) should be within 1 /8 inch of each other.

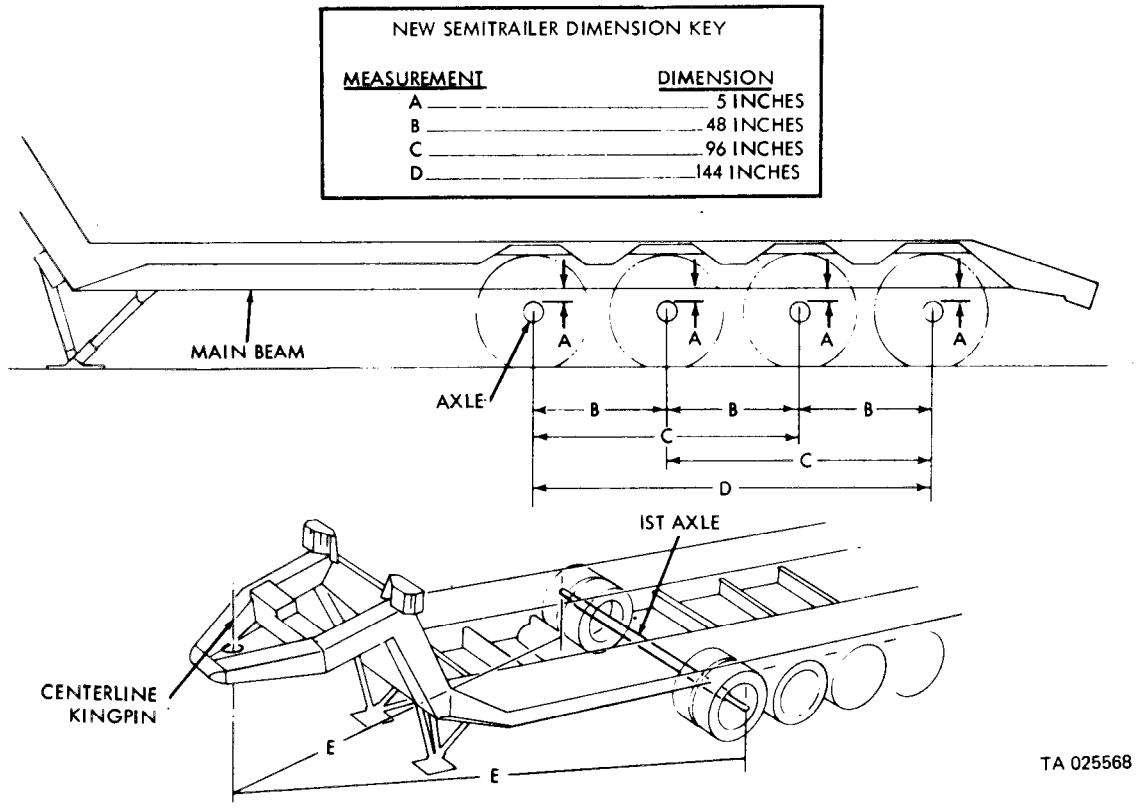


Figure 5-2. New semitrailer suspension alinement.

b. Rear Suspension Alinement Adjustment. If excessive tire wear occurs, when it is apparent that the condition is not caused by tire operation or inadequate maintenance, it may be desirable to break the weld securing the axle adapter pad (fig. 5-8) to the equalizer beam and adjust axle alinement (para 5- *14f*). The cap screw holes in the equalizer beam are oversize for this adjustment. If adjustment is attempted, replace adapter pad and dowel pin. Refer to a above for alinement dimensions. Refer to paragraph 6-39 for welding instructions.

Section VI. REMOVAL AND INSTALLATION OF MAJOR COMPONENTS AND ASSEMBLIES

5-10. General

This section contains information for the guidance of direct support and general support maintenance personnel responsible for removal and installation of major components and assemblies. The instructions provide a systematic procedure for disassembling and assembling the semitrailer in logical order. Before disassembling the semitrailer, remove the spare wheel and all basic issue times (BII). Box and store basic issue items for subsequent installation. For a list of all basic issue items on the semitrailer refer to appendix B.

5-11. Electrical System Components

a. Main Wiring Harness (fig. 4-4 or 4-5).

(1) *Removal.* Disconnect main wiring harness from intervehicular cable receptacle cover and from circuit breakers. Disconnect side utility outlets from

wiring harness on semitrailer No. 1 through 200 only. Disconnect wiring harness from side clearance lights and from clearance light ground connections. Disconnect main wiring harness from magnet valve on semitrailer No. 1 through 200 only. Disconnect wiring harness from low-pressure warning switch. Remove composite light cable guard and disconnect wiring harness from composite light connections and rear utility outlet connection. Disconnect wiring harness from rear marker lights. Remove screws and lockwashers securing wiring harness clamps (fig. 5-3). Remove harness and retain screws, lockwashers and clamps in place by turning screws a few threads into pad holes. Harness is removed from the front of semitrailer. Starting at the rear of semitrailer, pull harness end branches forward through holes in frame members and continue progressively forward to the gooseneck. Pull wiring harness forward through holes in gooseneck frame members and through hold in forward mounting bracket. Remove grommets to facilitate operation.

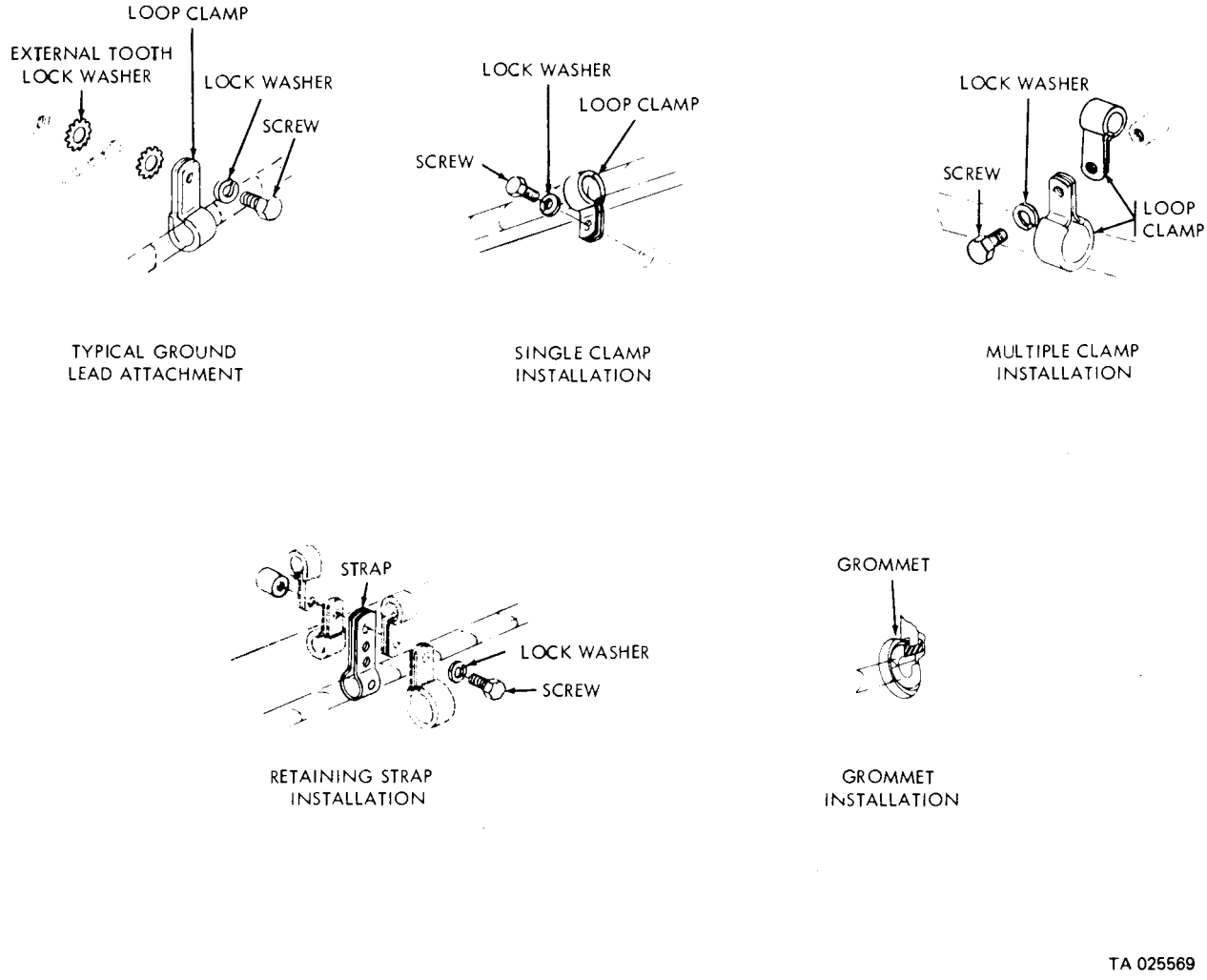


Figure 5-3. Typical main wiring harness clamp installation.

(2) *Repair.* For replacement of shell assemblies, terminals and connectors refer to paragraph 4-28. Refer to paragraph *6-2b* for replacement of defective wiring.

(3) *Installation.* Thread wiring harness, branches first, rearward through hole in gooseneck mounting bracket. Thread branches and main stem of harness through holes in gooseneck frame members and bed frame members. Apply insulating compound (MIL-S-8660 or 801362 (19203) to male shells at all electrical connections before mating with female shells. This compound aids insulation and

makes connecting and disconnecting shells easier. Connect all electrical and ground connections. Turn screws out of pads, install wiring harness into clamps and secure clamps, using screw and lock-washer to each securing point. Install grommet at each harness transit hole.

b. Circuit Breaker. Remove and install circuit breaker in accordance with procedures in paragraph 4-16.

c. Intervehicular Receptacle Cover. Remove and install intervehicular receptacle cover in accordance with procedures in paragraph 4-17.

d. Utility Outlet. Remove and install utility outlet in accordance with procedures in paragraph 4-18.

e. Stationary Clearance Light. Remove and install stationary clearance light in accordance with procedures in paragraph 4-26.

f. Composite Stoplight-Taillight. Remove and install composite stoplight-taillight in accordance with procedures in paragraph 4-19.

g. Retractable Clekarance Light. Remove and install retractable clearance light in accordance with procedures in paragraph 4-21.

h. Low *Air Pressure Warning Switch.* Remove and install low air pressure warning switch in accordance with procedures in paragraph 4-29.

5-12. Air System Components

a. *Air Lines, Fittings, Valves and Air Tanks.*

(1) General. Remove, install, test and adjust air system components in accordance with procedures in paragraphs 4-36 through 4-51.

(2) *Air line nylon tubing.* Nylon tubing is replaced as required (para *4-39d).*

(3) *Air line copper tubing.* Copper tubing is replaced as required (para 4-39b). Direct support personnel will manufacture all specified brake and suspension air system tube assemblies. Appendix D. contains complete illustrated specifications and general fabricating instructions for copper tube assemblies.

(4) *Bench test air valves.* Direct support personnel will perform bench tests of air valves removed from the semitrailer for replacement. Appendix E contains illustrated bench test procedures for all M747 semitrailer air valves. Valves that prove operational will be returned to the supply system.

b. Air Suspension Axle Lift. Remove and install air suspension axle lift in accordance with procedures in paragraph 4-54.

c. Air Suspension Springs. Remove and install air suspension springs in accordance with procedures in paragraph 4-55.

5-13. Front Bogie

a. General. The front bogie on the semitrailer can be removed as a unit for ease of repair, however, individual components may be removed as detailed in Chapter 4.

b. Removal (fig. 5-4 and 5-5).

(1) Depressurize air system (para 4-38) and remove two air hoses from each axle.

NOTE

Figure 5-4 shows the two air hoses to be removed from axle number 2. Axle number 1 has identical air hoses to be removed. It is not necessary to remove any other air lines when removing the front bogie.

(2) Remove nut, two flat washers, bolt and two adapters that secure torque rod to torque rod axle bracket.

(3) Remove nut, two flat washers, bolt and two adapters that secure other end of torque rod to bracket on frame cross-menber. Remove torque rod.

(4) Remove other torque rod in same manner as (2) and (3) above.

(5) Using overhead crane or other suitable lifting device, attach lifting chains to semitrailer (see paragraph 1-7 for semitrailer lift weights), Take up slack in chains but do not lift semitrailer.

(6) Remove four nuts and flat washers that secure right equaliser beam to saddle assembly. Remove left equalizer beam in same manner.

(7) Lift semitrailer until chassis is clear of suspension. Roll suspension forward from under semitrailer.

(8) Position suitable supports under chassis and lower semitrailer onto supports.

(9) Remove air lines and fittings (para 4-39).

(10) SuPport axles and remove wheels and tires (pare 4-59).

(11) Remove hubs and drum (para 4-60).

(12) Remove brake shoes (para 4-31).

(13) Remove plunger housing assembly (para 4-35).

(14) Remove brake air chamber and fail-safe chamber assemblies (para 4-33).

(15) Remove equalizer beam center pin and thrust washers from each equalizer beam (fig. 5-5).

(16) Remove two cotter pins and two nuts that secure each end of equalizer beam to beam hanger bracket on axles (fig. 5-5). Remove two springs, two felt retainers and two felt washers from beam-to-axle shaft. Retain felt washers, springs and felt retainers for inspection.

(17) Support equalizer beam and drive out one beam-to-axle shaft taking care not to damage threads. Lower free end of equalizer beam to rest on gouund and remove other beam-to-axle shaft, Remove equalizer beam from semitrailer.

(18) Remove other equalizer beam in same manner as (16) and (17) above.

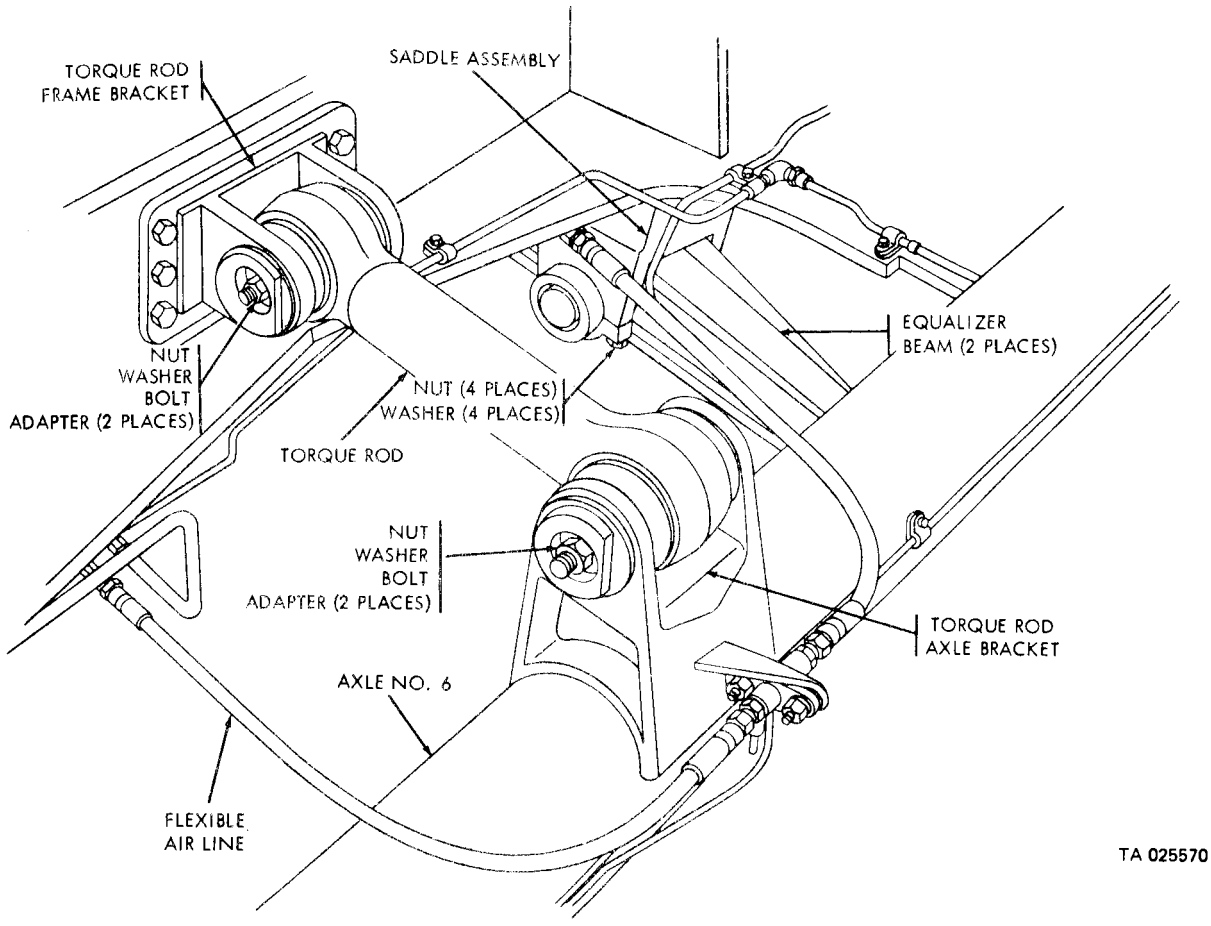
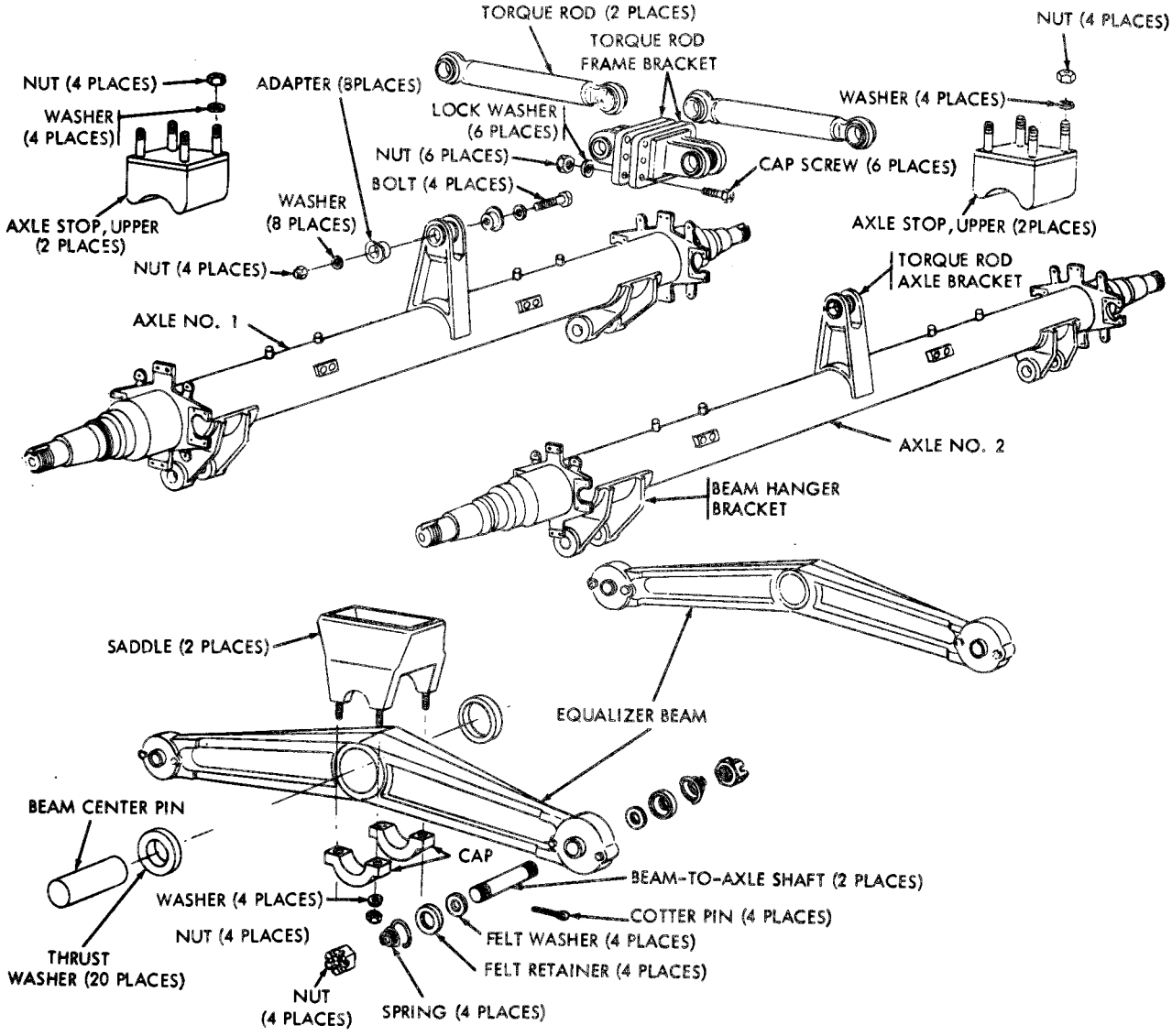


Figure 5-4. Front suspension assembly disconnect points.



TA 025571

Figure 5-5. Front suspension system–exploded view.

c. Cleaning. Clean all dirt and grease from suspension parts using dry-cleaning solvent type II (SD-2) and a stiff fiber brush.

d. Inspection.

(1) Inspect parts for cracks, damage or wear.

(2) Inspect torque rod rubber bushing for damage or deterioration.

(3) Inspect felt washers on beam-to-axle shaft for wear.

(4) Inspect axle shaft for fatique cracks around bearing journals, shoulders and welded hanger brackets or tapping pads.

(5) Inspect journals for extreme wear or scoring. No more than 10 percent of bearing surfaces can be pitted or scored. Markings cannot be over 0.002 inches deep.

(6) See paragraph 6-6 and table 6-1 for repair standards for axle and equalizer beam.

e. Repair.

(1) Replace parts damaged or excessively worn.

(2) Replace axle member of damage is found.

f. Installation.

(1) Reassemble each equalizer beam assembly to axle in reverse order of removal *(b* (16), (17), and (18) above). Using torque Wrench (GGG-W-686) torque beam-to-axle shaft nuts to 1,260-1,680 lb ft.

CAUTION

Take care not to damage or fold over lips of grease seal when inserting equalizer beam center shaft.

(2) Insert equalizer beam center shaft in center housing of each equalizer beam.

(3) Install remaining axle components in reverse order of disassembly *(b* (9) through (14) above.

(4) With chassis raised, position front bogie in place. Refer to figure 5-6 and aline bogie laterally so that 0.44 inch gap exists on the inward side of either beam. Use as many thrust washers as required on the center pin to achieve this dimension. This gap allows lateral travel along the beam center pin during certain suspension stress conditions.

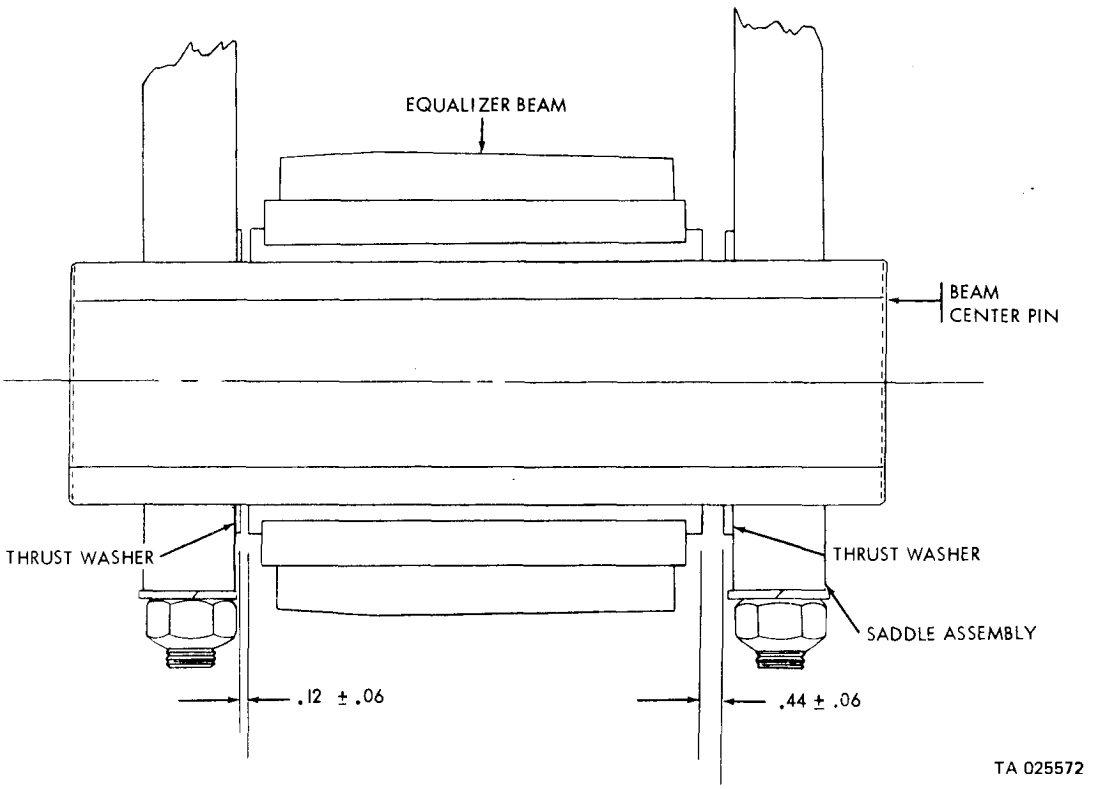


Figure 5-6. *A lining beam center pin in saddle assembly,*

(5) Secure left equalizer beam to saddle assembly with four nuts and flat washers and tighten to 480 - 640 lb ft torque. Secure right equalizer beam by same procedure.

(6) Refer to figure 5-5 and install each torque rod on axle bracket with locking adapters through torque rod bracket leg holes and into torque rod end holes.

NOTE

The flats of the adapter flanges should be vertical when nut and bolt are secured.

(7) Install bolt, with washer under bolt head, through adapters and tighten to 280 - 360 lb ft torque.

(8) Install two air hoses on each axle.

g. Aline. If wheels, hubs and suspension components are properly installed, axle and wheel alinement on the semitrailer is maintained. Misalinement indicates damaged equipment or faulty installation. Check axle alinement (para 5-*9a*).

5-14. Rear Axle Equalizer Beam and Axle

a. General. The rear axle equalizer beam can be removed as a unit, however, individual components may be removed as detailed in chapter 4.

b. Removal.

NOTE

Removal and installation of both rear axle-beam assemblies are similar.

(1) Open drain cocks on air reservoirs and drain.

(2) Disconnect air hoses and lines from air suspension air springs and brakes (para 4-39).

(3) Remove axle chain stop and shock absorber (para 4-56 or 4-57).

(4) Remove axle lift assembly (para 4-54).

(5) Remove air spring protection plate (para 4-61).

(6) Remove air springs (para 4-55).

(7) Support equalizer-beam either with jack or with sling through access in trailer bed (fig. 5-7).

(8) Remove two cotter pins, nuts, fait washers and cap screws retaining bearing cap and two keys (fig. 5-8).

(9) Roll axle-beam assembly rearward until axle guide assembly clears axle guide bracket.

(10) Lower equalizer beam forward end to ground and remove jack (or sling).

(11) Lift semitrailer rear using overhead crane (see paragraph 1-7 for semitrailer lift weights).

(12) Roll axle-beam assembly rearward from under semitrailer.

(13) Lower semitrailer rear onto suitable supports.

(14) With axle-equalizer beam removed from semitrailer, support assembly at three points prior to disassembly of components.

(15) Remove air lines and fittings (para 4-39).

(16) Remove wheels and tires (para 4-59).

(17) Remove hubs and drums (para 4-60).

(18) Remove brake shoes (para 4-31).

(19) Remove plunger housing assembly (para 4-35) .

(20) Remove brake air chamber and fail-safe chamber assemblies (para 4-33).

(21) Remove eight cap screws, square washers and lockwashers that secure axle to equalizer beam (fig. 5-8). Cap screws are torqued to 1,450-1,850 lb ft.

(22) Use suitable sling or fork lift, and lift axle off of two dowel pins iin axle adapter. If axle sticks on dowel pins, lift axle slightly off of supports and tap both ends of equalizer beam with brass hammer.

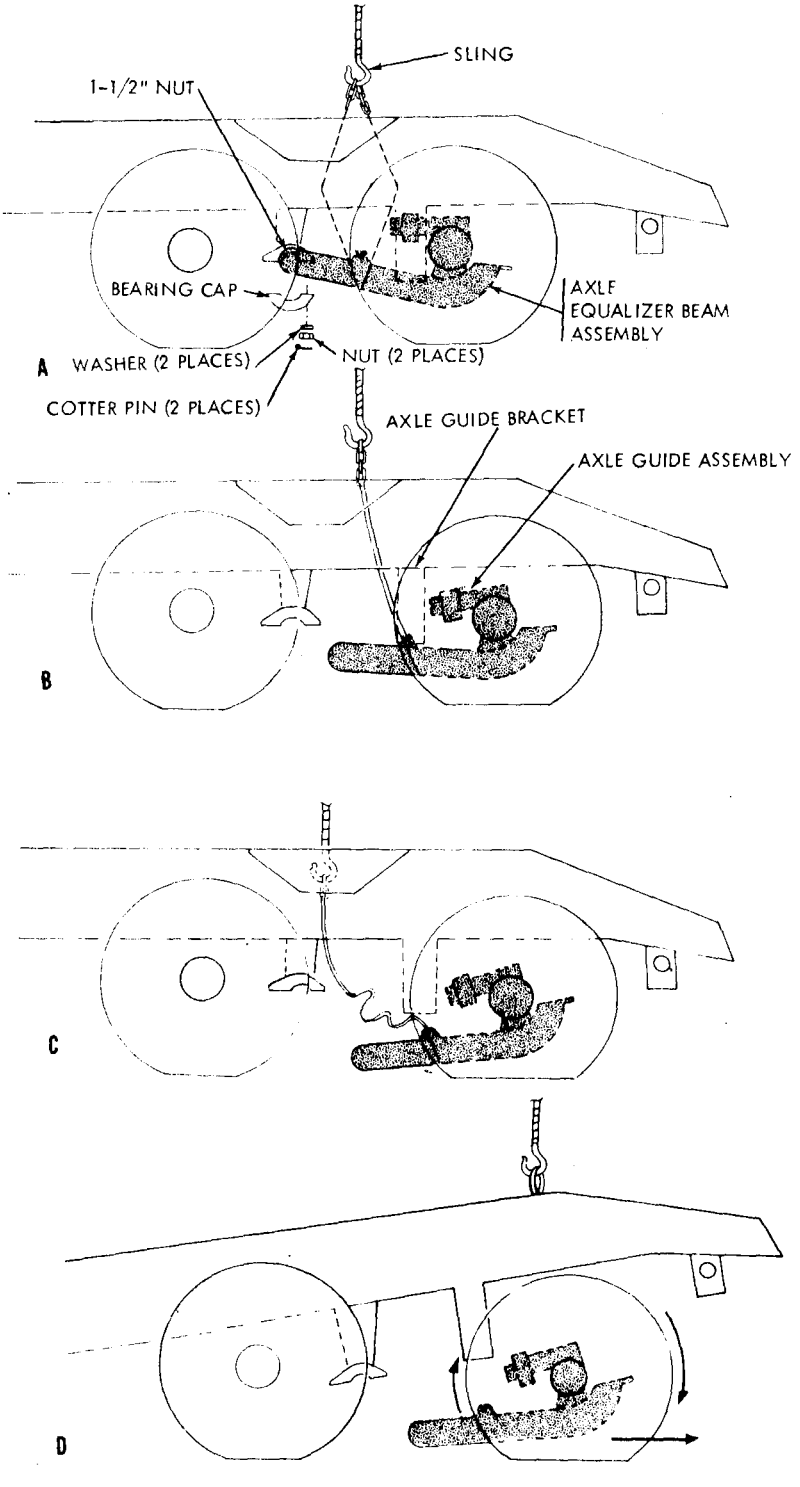


Figure 5-7. Rear axle-equalizer beam assembly removal or installation.

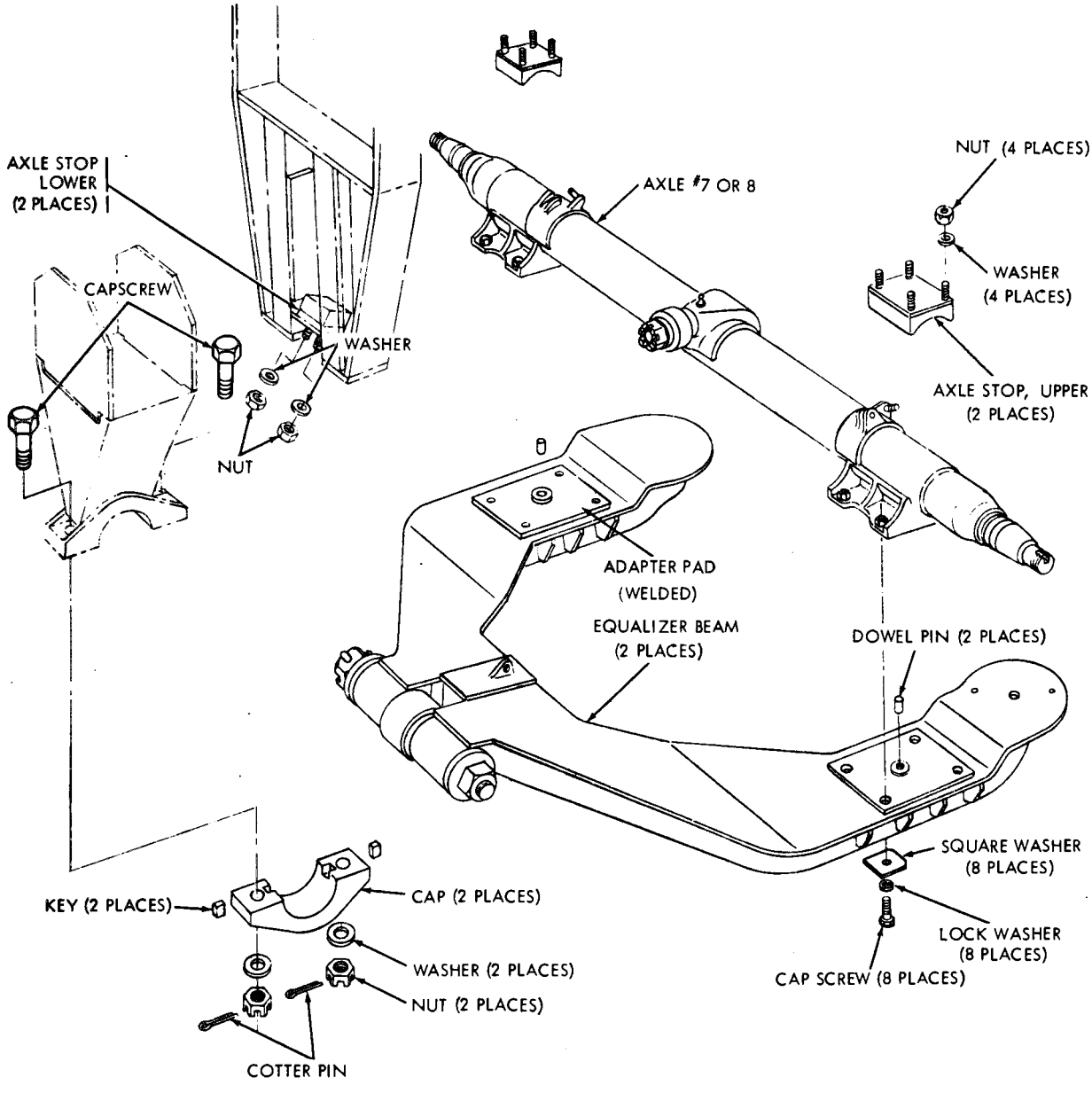


Figure 5-8. Rear axle-equalizer beam assembly-exploded view.

c. Cleaning.

(1) Clean all dirt and grease from suspension parts using dry-cleaning solvent type II (SD-2) and a stiff fiber brush.

(2) Clean rubber air springs and air lift with soap and water.

d. Inspection.

(1) Inspect parts for cracks, damage or wear.

(2) Inspect air springs for leaks.

(3) Inspect axle shaft for fatigue cracks around bearing journals, shoulders and welded brackets or tapping pads.

(4) Inspect journals for extreme wear or scoring. No more than 10 percent of bearing surfaces can be pitted or scored. Markings cannot be over 0.002 inches deep.

(5) See paragraph 6-11 and table 6-2 for repair standards for rear axle equalizer beam components.

e. Repair.

(1) Replace parts damaged or excessively worn.

(2) Replace axle member if damage is found.

f. Installation.

(1) Install axle on equalizer beam in reverse order of removal (b (21) and 22 above).

(2) Install brake components, hubs, drums, wheels, tires, air lines and fittings in reverse order of removal (b (15) through (20) above).

(3) Lift semitrailer rear using overhead lift (see paragraph 1-7 for semitrailer lift weights).

(4) Aline axle-beam with tire wells and axle guide bracket on frame. Roll axle-beam assembly forward under semitrailer, using a plank or metal sheet for forward end of beam to ride on, and position assembly so that end of axle guide spindle is below and just rearward of the axle guide bracket.

(5) Lower semitrailer rear so that axle guide will enter axle guide bracket when assembly is rolled forward.

(6) Roll assembly forward untif axle guide assembly is nested in the axle guide bracket. (Forward end of beam may require support from a dolly-t ype jack, or from a sling through the semitrailer bed, in order to provide clearance for the axle guide).

(7) Lift forward end of equilizer beam with jack or sling and position beam bushing in frame bracket.

(8) Position bearing cap on frame bracket studs with two keys in place. Install cap on frame bracket, using two cap screws, washers and nuts. Using torque wrench (GG-W-686) tighten two nuts to 650-850 lb ft torque. Install cotter pins.

(9) Remove jack or sling support from equalizer beam.

(10) Check axle alinement (para 5-9a). If axle is in alinement, use torque wrench (GGG-W-686) and tighten eight cap screws securing axle to equalizer beam to 1,450- 1,850 lb ft torque. If axle is not in alinement, remove axle and make rear suspension alinement adjustment (para *5-9b)*.

(11) Install axle lift assembly (para 4-54) and air springs (para 4-55).

(12) Install air spring protection plate (para 4-61).

(13) Install axle chain stop and shock absorbers (para 4-56 or 4-57).

(14) Connect air hoses and air lines to air suspension springs and brakes (para 4-39).

(15) Close drain cocks on reservoirs and replenish air supply.

5-15. Lower Axle Stop and Guide Pads (fig. 5-9 or 5-10)

a. Removal.

(1) Remove cotter pin, slotted nut and flat washer from axle guide spindle.

(2) Remove sleeve assembly from spindle on semitrailer No. 1 through 200 and/or sleeve bearing and block on semitrailer 201 and on.

(3) Remove two self-locking nuts and flat washers from axle stop studs. Push axle stop up, so that studs clear holes in guide frame bracket. Remove axle stop.

(4) Remove six cap screws, flat washers and nuts securing each pad to guide bracket on semitrailer No. 1 through 200 and/or six cap screws and flat washers on semitrailer No. 201 and on. Remove pads and spacers.

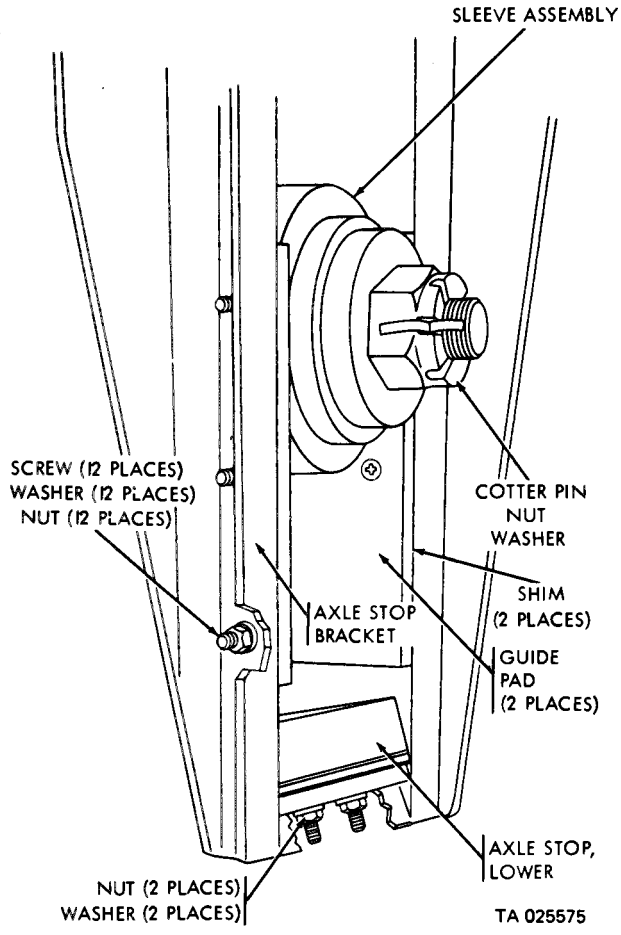


Figure 5-9. Lower axle stop and guide pads (semitrailer No. 1 through 200).

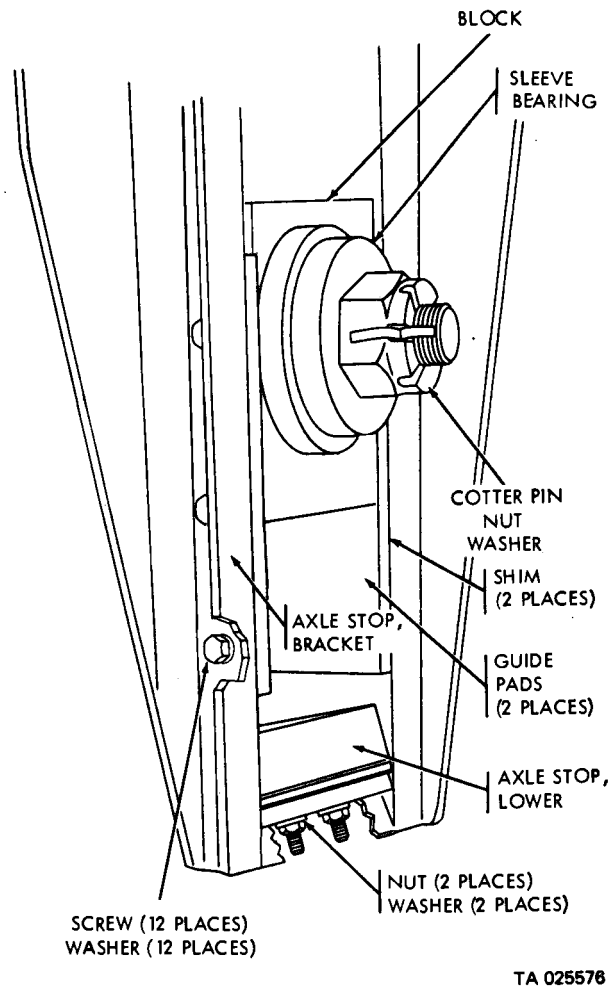


Figure 5-10. Lower axle stop and guide pads (semitrailer No. 201 and on).

CAUTION

The wear pads and shims used in semitrailer No. 1 through 200 and semitrailer No. 201 and on are not interchangeable. Take card to replace damaged shims and pads with correct parts.

b. Installation. Install in the reverse order of removal. Torque nuts securing pads to 75 - 90 lb in. on semitrailer No. 1 through 200 and/or torque cap screws securing pads to 42 - 57 lb ft on semitrailer No. 201 and on. Torque nuts on axle stops studs to 65-90 lb ft. Using Torque wrench (GG - W-686) torque slotted nut securing sleeve assembly on spindle to 850 - 1,050 lb ft on semitrailer No. 1 through 200 and/or torque slotted nut securing bearing and block on spindle to 300-450 lb ft on semitrailer No. 201 and on.

NOTE

Shim as required to maintain 6 1/8 + 1/8 inch clearance between shims on semitrailer no. 1 through 200 and/or shim as required to maintain 5 5/8 + 1/8 inch clearance between shims on semitrailer No. 201 and on.

5-16. Torque Rod

a. *Removal.* Remove torque rod in accordance with procedures in paragraph 5-13b (2) and (3).

b. Inspection and Repair. Inspect torque rod rubber bushing for damage or deterioration. See paragraph 6-13 for repair procedures.

c. *Installation.* Install torque rod in accordance with procedures in paragraph 5-13f (6) and (7).

5-17. Torque Rod Frame Brackets

(fig. 5-4)

a. Removal.

(1) Disconnect torque rods by removing nut, two flat washers, bolt and two adapters that secure torque rods to frame brackets.

(2) Remove six cap screws, lock washers and nuts that secure brackets to frame. Remove brackets.

b. Installation. Install in the reverse order of removal. Torque frame bracket nuts to 130- 170 lb ft. Torque bolts securing torque rod to frame bracket to 280-360 lb ft.

5-18. Loading Ramps

Remove and install loading ramps in accordance with procedures in paragraph 4-63.

5-19. Landing Gear

Remove and install landing gear in accordance with procedures in paragraph 4-66.

5-20. Axle Lift Bracket

Remove and install axle lift bracket in accordance with procedures in paragraph 4-62.

5-21. Stowage Provisions Hardware

Remove and install stowage provisions hardward in accordance with procedures in paragraph 4-67.

5-22. Snatch Block

Remove and install snatch block in accordance with procedures in paragraph 4-63.

5-23. Gooseneck and Platform Roller

(fig. 5-11)

a. Removal.

(1) Remove lock wire, two cap screws and retainer securing roller assembly shaft in mounting bracket.

(2) Remove shaft, roller assembly, two flat washers and two seals.

(3) Remove retaining ring on each end of roller. Remove spacer and two roller bearings from roller.

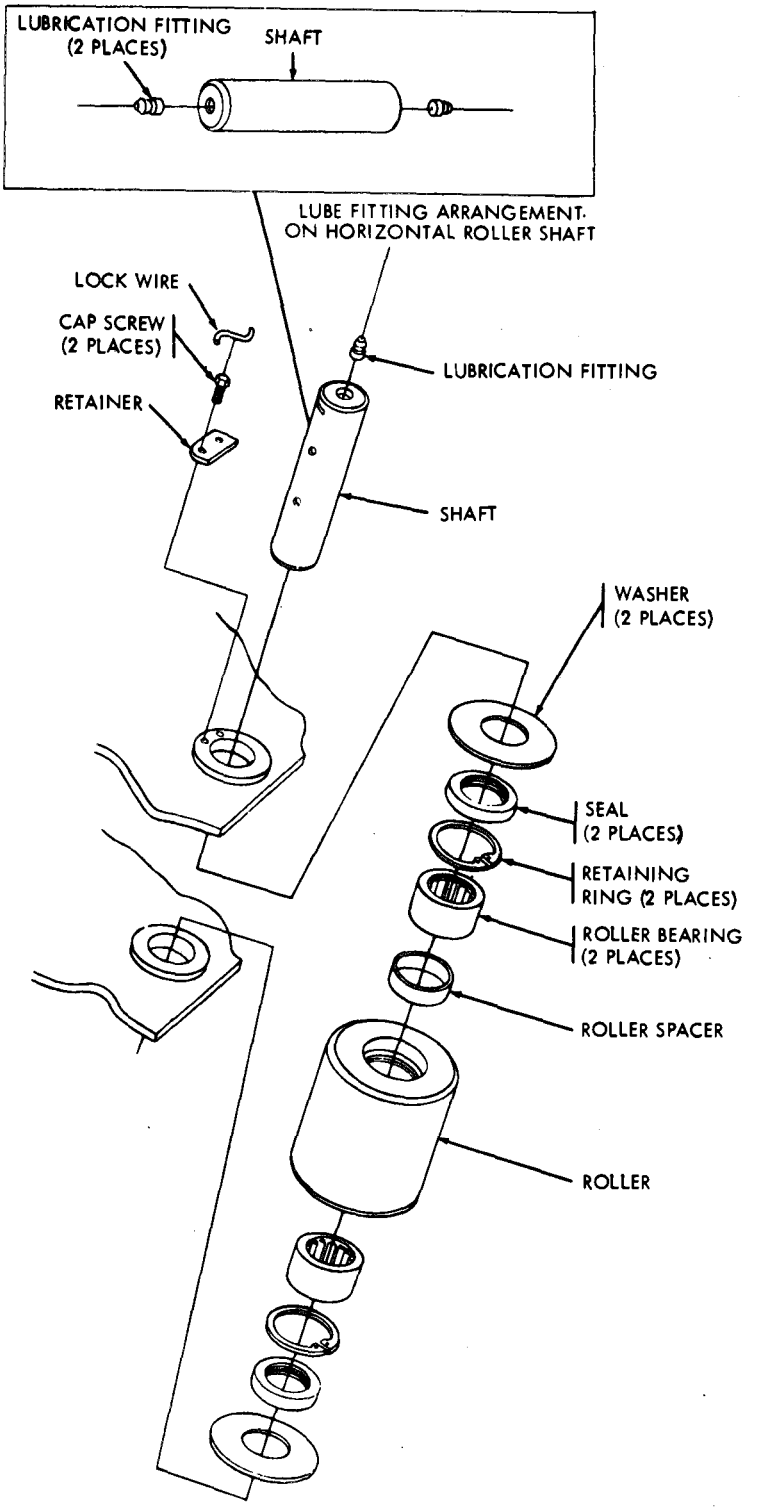


Figure 5-11. Gooseneck and platform rollers.

b. Cleaning. Clean all metal parts using dry-cleaning solvent type II (SD-2).

c. *Inspection.*

(1) Inspect mounting bracket for structural damage or weld cracks or breaks.

(2) Inspect seals for damage ir deterioration.

(3) Inspect shaft and roller bore for pitting or scoring.

(4) Inspect needle rollers in bearings for wear or damage.

d. Repair.

(1) Straighten bent or distorted mounting bracket and weld cracks or breaks.

(2) Replace damaged or defective parts.

e. Installation.

(1) Install spacer and two roller bearings in roller and secure with two retaining rings.

(2) Install one seal in each end of roller.

(3) Position roller assembly and one washer in mounting bracket and insert end of shaft without notch through mounting bracket hole, through washer, and into roller assembly.

(4) Position second washer under roller assembly and push shaft through washer and through opposite bracket hole.

(5) Install retainer in notch in shaft and install two cap screws securing retainer to mounting bracket. Install lock wire to cap screws.

5-24. Swing-away Roller

(fig. 5-12)

a. *Removal.*

(1) Remove quick-release pin securing one end of bracket and roller assembly to trailer.

(2) Remove cotter pin, fiat washer and bracket hinge pin from other end of bracket and roller assembly. Remove bracket and roller assembly.

(3) Remove lockwire, two cap screws and retainer securing roller assembly shaft in mounting bracket.

(4) Remove shaft, roller assembly, two flat washers and two seals.

(5) Remove retaining ring on each end of roller. Remove spacer and two roller bearings from roller.

(6) Remove cotter pin, flat washer and headed retaining pin securing lower cable retaining door to bracket. Remove door by removing quick-release pin from upper part of bracket.

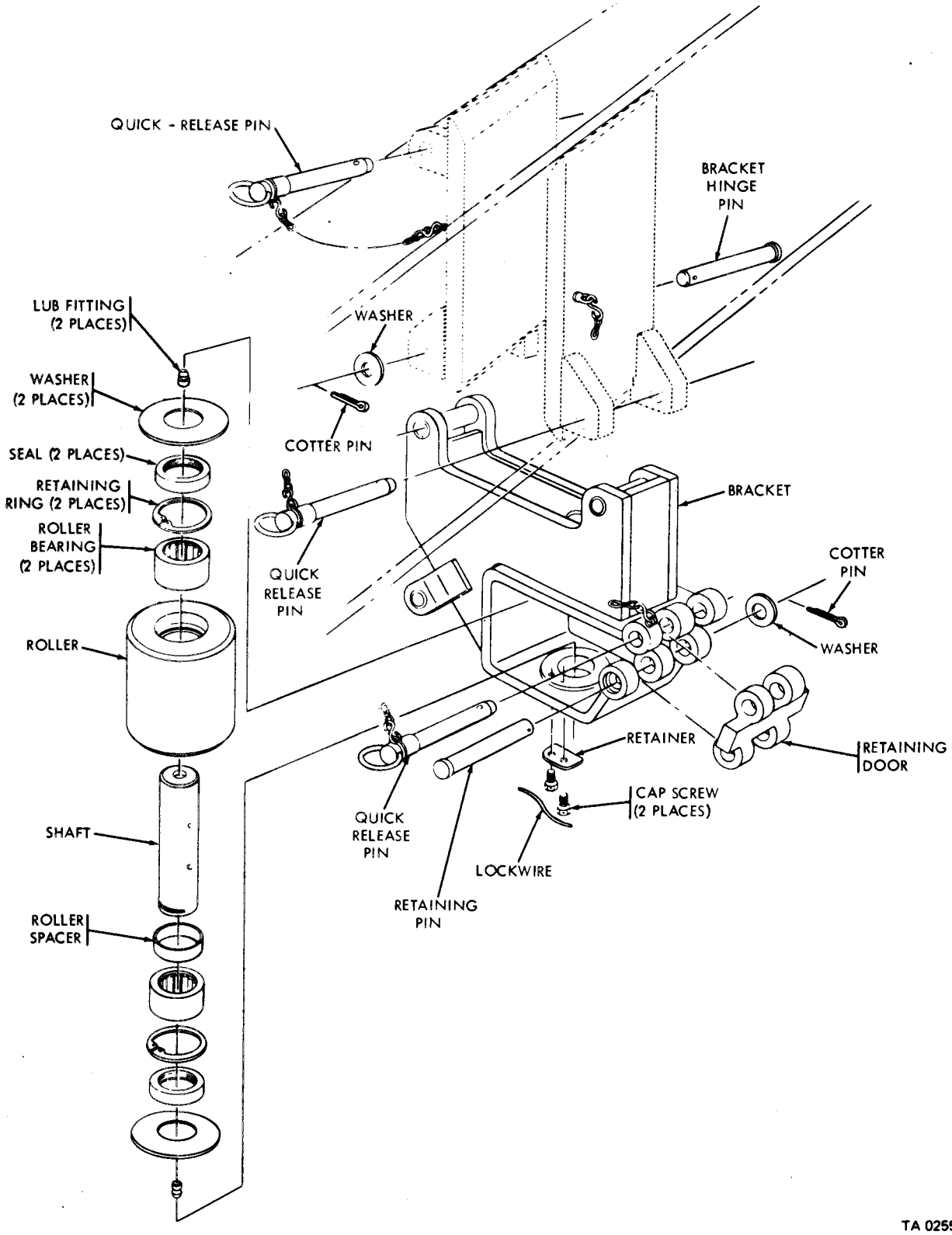


Figure 5-12. Swing-away roller assembly.

b. Cleaning. Clean all metal parts using dry-cleaning solvent type II (SD-2).

c. *Inspection.*

(1) Inspect mounting bracket and door for structural damage or weld cracks or breaks.

(2) Inspect seals for damage or deterioration.

(3) Inspect shaft and roller bore for pitting or scoring.

(4) Inspect needle rollers in bearings for wear or damage.

d. Repair.

(1) Straighten bent or distorted mounting bracket or door and weld cracks or breaks.

(2) Replace damaged or defective parts.

e. *Ins tallat ion.*

(1) Install door on mounting bracket using headed retaining pin, flat washer, cotter pin and quick-release pin,

(2) Reassemble and install roller assembly on bracket following procedures in paragraph 5-23e above.

(3) Position bracket and roller assembly on trailer frame, mating holes of bracket and frame. Insert headed bracket hinge pin through bracket and frame (hole nearest to frame) and install flat washer and cotter pin.

(4) Lift bracket and roller assembly and install quick-release pin through other mating holes.

5-25. Reflectors

Remove and install reflectors in accordance with procedures in paragraph 4-70.

5-26. Data Plates

Remove and install data plates in accordance with procedures in paragraph 4-71.

5-27. Forward Gooseneck Bumper Planks

Remove and install bumper planks in accordance with procedures in paragraph 4-66.

CHAPTER 6

REPAIR INSTRUCTIONS

Section I. GENERAL

6-1. Scope

a. This chapter contains repair instructions for direct and general support maintenance of the semitrailer. It contains procedures for the disassembly, cleaning, inspection, repair, assembly and, when required, test of components which are beyond the scope of tools, equipment or supplies available to the using organization.

b. This chapter does not contain procedures for removal and installation of components and related parts. This information is contained in chapters 4 and 5.

c. Tolerances and wear limits contained in this chapter are the minimum acceptable repair stan. dards and must be adhered to by direct and general support maintenance personnel. Components and/or parts not meeting these standards shall be replaced with new serviceable components or parts.

Section Il. MAIN WIRING HARNESS REPAIR

6-2. Repair

NOTE

All repairs to electrical cables will be made in accordance with TB ENG 361.

a. Shell Assembly, Terminal and Connector Replacement. Refer to paragraph 4-28 and figures 4-21 or 4-22 for procedures to replace shell assemblies, terminals and connectors.

b. Single Wire Replacement.

(1) Remove and discard electrical insulating tape binding defective branch of wiring harness.

(2) Remove and discard electrical insulating tape binding wires of defective branch.

(3) Cut defective wire off at branch leaving sufficient wire for splicing.

(4) Cut new piece of cable to same length as defective wire and splice to harness. Tape splice with insulating tape.

(5) Assemble new terminals, washers, sleeves and connector shells to ends of new wire as required. Install marker band to new cable (See fig. 4-21 or 4-22).

Section III. FRONT EQUALIZER BEAM AND AXLE REPAIR

6-3. General

This section provides information to direct and general support maintenance personnel for the disassembly, cleaning, inspection, repair and assembly of the front equalizer beam and axle. Repair of the equalizer beam consists of replacing the end ball and socket assemblies and center bushing and seals. Repair of the axle is limited to straightening and/or welding hanger brackets welded to the axles.

6-4. Disassembly

(fig. 6-1)

a. Remove two cap screws, four flat washers, and two nuts from each end of equalizer beam. Remove ball and socket assembly from each end.

b. Use screwdriver point and pry out seals from beam center bore.

c, Remove center bushing using 50-ton arbor press.

d. Remove lubrication fittings.

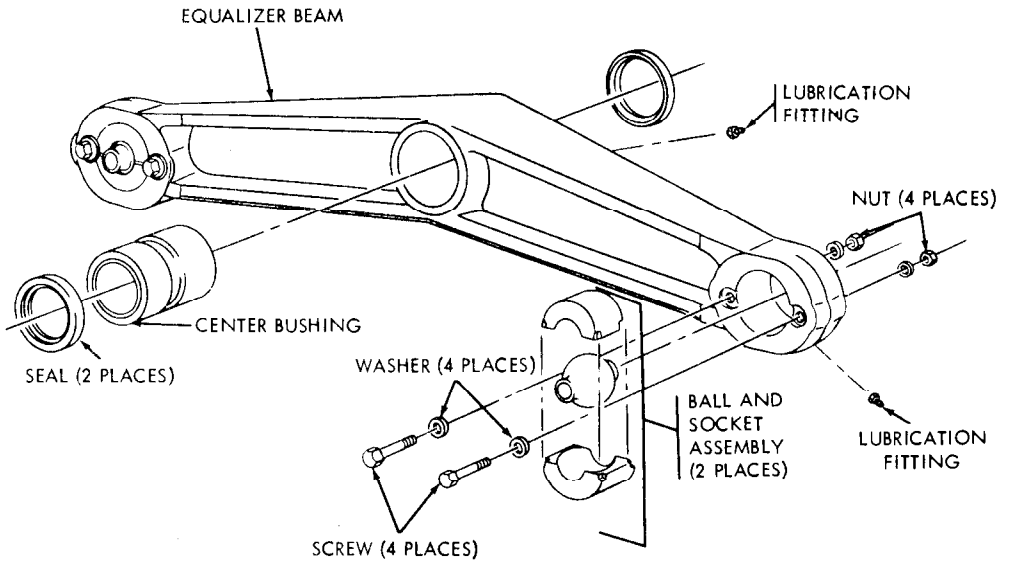


Figure 6-1. Suspension equalizer beam.

6-5. Cleaning, Inspection and Repair

a. Cleaning. Clean all parts using dry-cleaning solvent type II (SD-2).

b. Inspection.

(1) Inspect components for wear and fit in accordance with paragraph 6-6 and table 6-1.

(2) Inspect equalizer beam center bore for scoring.

(3) Inspect axle journals for extreme wear. No more than 10 percent of bearing surfaces can be pitted or scored. Markings cannot be over 0.002 inches deep.

(4) Inspect axle for bent or distorted hanger brackets.

c. Repair.

(1) Replace damaged or defective parts.

(2) Straighten bent or distorted hanger brackets and weld cracks or breaks in brackets on axle.

(3) Replace parts worn beyond limits specified in paragraph 6-6 and in table 6-1.

6-6. Repair Standards

The repair standards (table 6-1) give the minimum, maximum and critical clearance of new or rebuilt parts. They also give wear limits which indicate the point to which a part(s) may be worn before replacement. An asterisk (*) in the wear limits column indicates that the part(s) should be replaced when worn beyond the limits given in the size and fit of new parts column. The leter (L) indicates loose fit.

Table 6-1. Repair Standards for Front Equalizer Beam and Axle

Figure number	Reference letter	Point of measurement	Size and fit of new parts	Wear limits (DS&GS)
6-2	F	Beam center pin o.d.	3.997-3.999	3.994
	G	Beam center bushing id.	4.007.4.009	4.011
	F-G	Fit of pin in center bushing	0.008 L-0.012L	0.017L
	c	Thrust washer flatness	within 0.020	(*)
	E	Beam-to-axle shaft	1.371.1.374	1.370
	D	Beam end bushing id.	1,375-1.377	1 .378
	D-E	Shaft (beam to axle) to beam bushing clearance	0.00 IL. 0.006L	0.008L
	A	Axle spindle outer bearing surface o.d.	3.3748-3.3738	3.3733
	B	Axle spindle inner bearing surface o.d.	4.1248-4.1238	4.1288

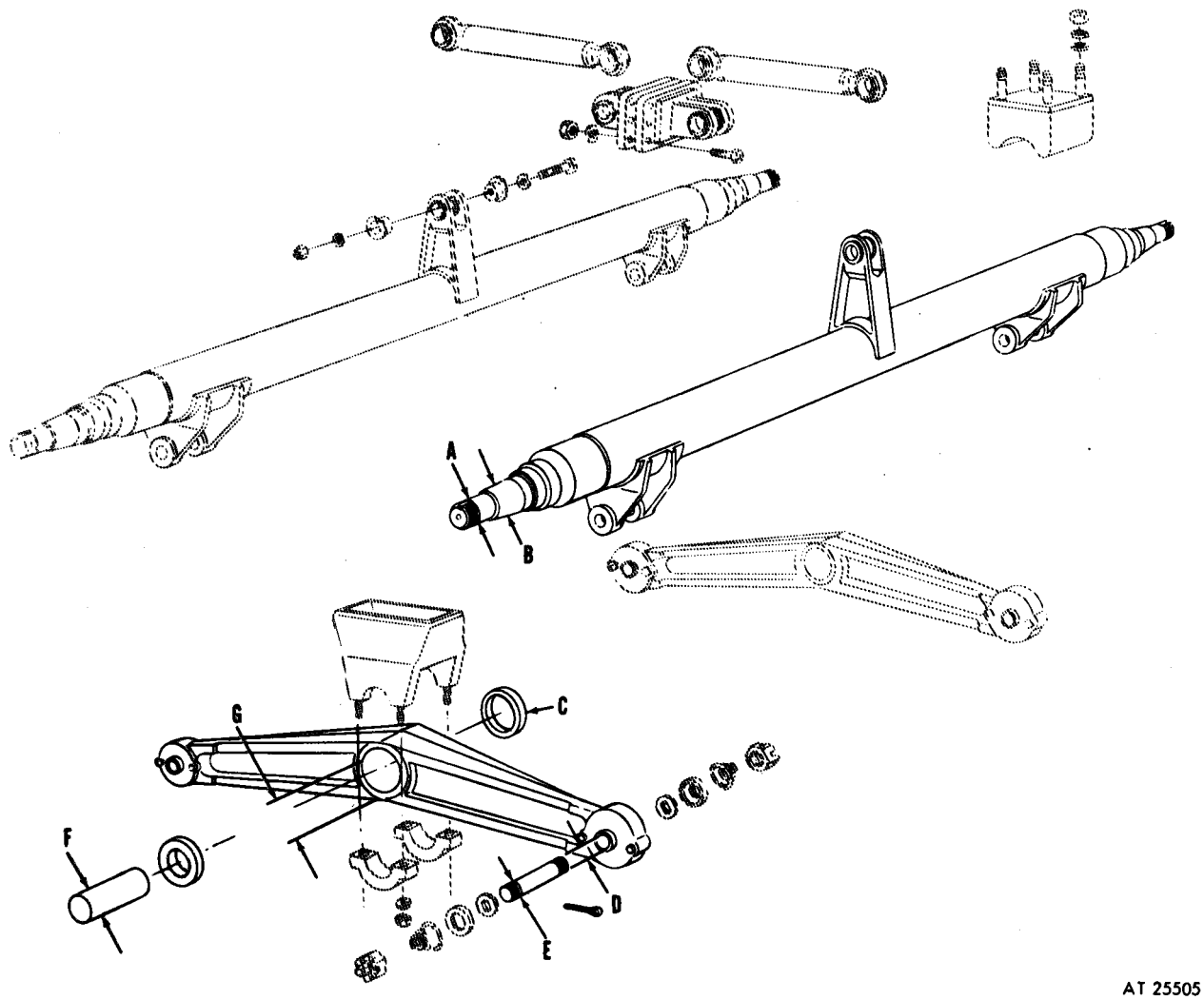


Figure 6-2. Front equalizer beam and axle measurement and inspection points.

6-7. Assembly

a. Install center bushing using 50-ton arbor press and replacer (CRP 102291). Lubricate outer metal of bushing pressing into beam.

NOTE

When pressing center bushing into equalizer beam, the lubrication grooves must lie at groundward side of beam, where they can receive lubricant flow through gravity.

b. Install seals using brass hammer and replacer (CRP 102291). Reverse the position of replacer (fig, 6-3) for driving the seals into the beam. .

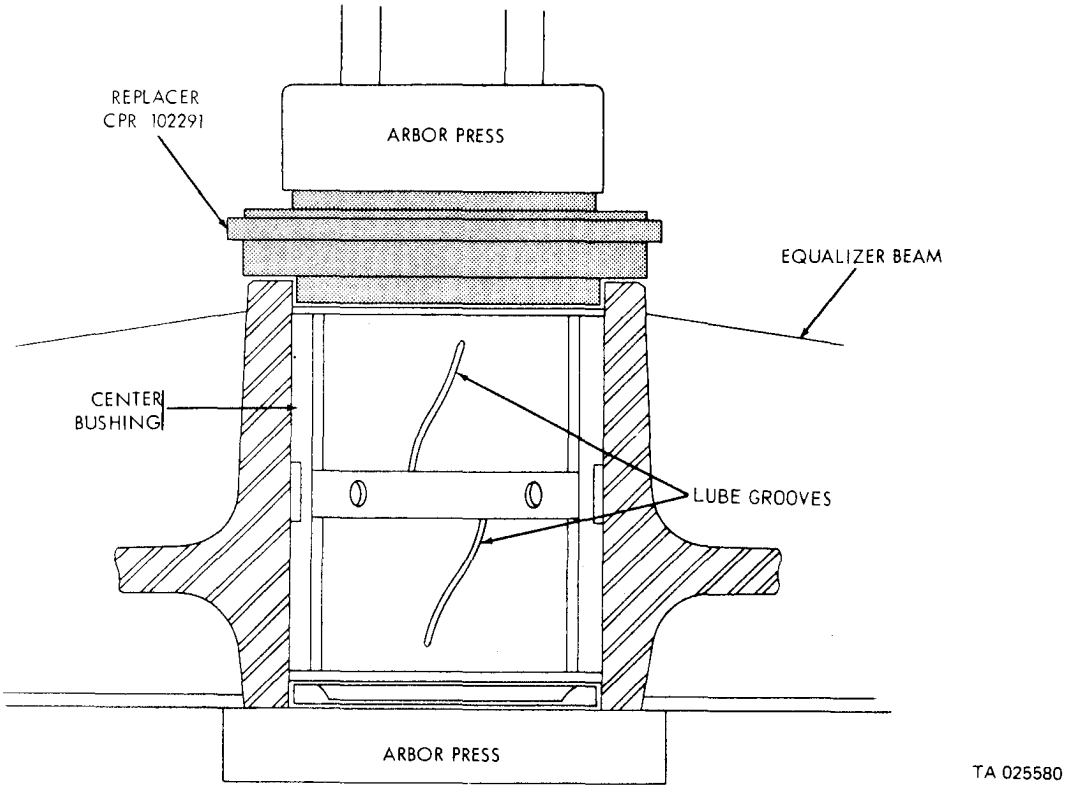
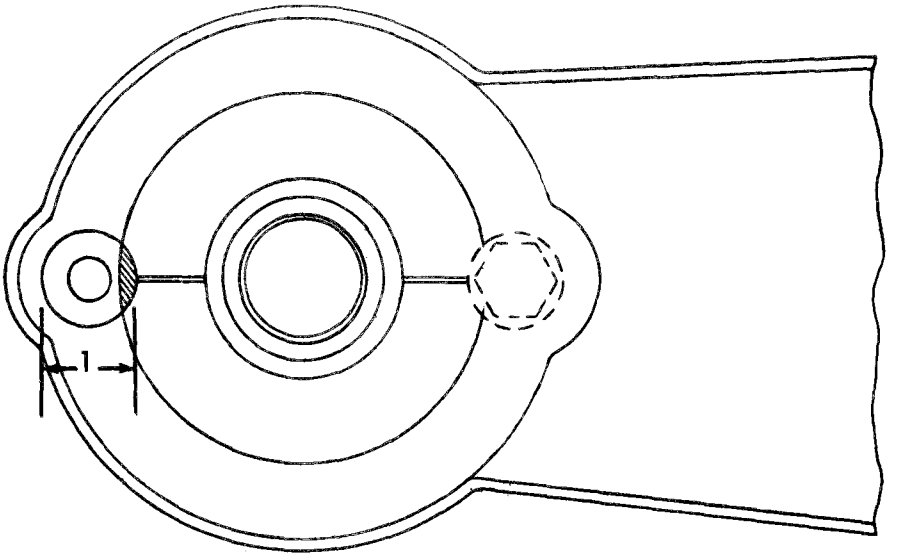
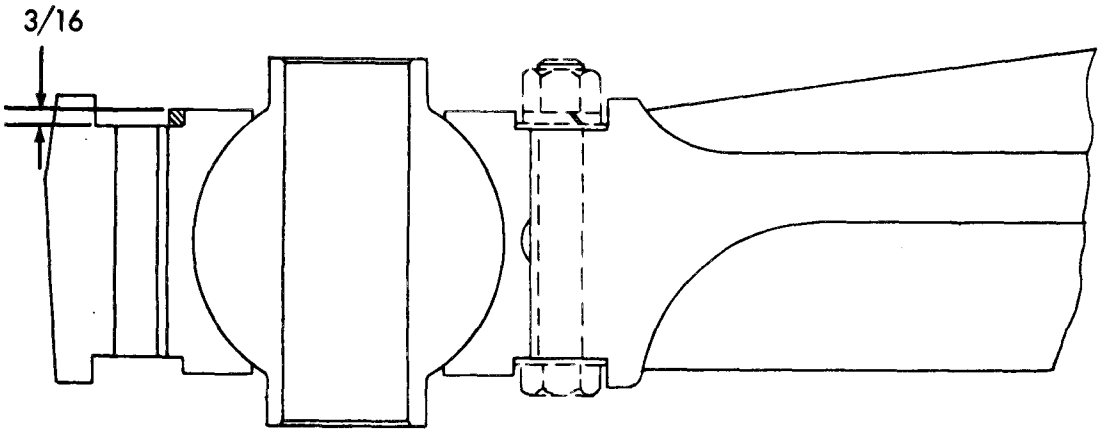


Figure 6-3. Equalizer beam center bushing installation

c. Install ball between socket halves and insert assembly into beam end cavity.

d. After installing new ball and socket assembly into beam end cavity, counter-bore resesses in socket to dimensions indicated in figure 6-4.





NOTE: ALL DIMENSIONS SHOWN ARE IN INCHES

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Figure 6-4. Dimensions for counterboring new ball and socket assembly.

e. Install two cap screws, four flat washers arid two nuts. Tighten nuts to 90 - 120 lb ft torque.

f. When replacing damaged lubrication fittings, hand tighten; then tighten one full turn.

Section IV. REAR EQUALIZER BEAM AND AXLE

6-8. General

This section provides information to direct and general support maintenance personnel for the disassembly, cleaning, inspection, repair and assembly of the rear equalizer beam and axles. Repair of the equalizer beam consists of replacing the snaft assembly, bushing and attaching hardware. Repair of the rear axle consists of replacing the sleeve assembly (semitrailer No. 1 through 200) and/or sleeve and block (semitrailer No. 201 and on) and attaching hardward.

6-9. Disassembly

(fig. 6-5)

CAUTION

The bushing and two spacers in the equalizer beam used on semitrailer No. 1 through 200 and those used on semitrailer No. 201 and on are not interchangeable. Take care to replace damaged components with correct parts.

a. Disassemble equalizer beam by removing cotter pin, slotted nut and flat washer from one end of shaft.

b. Drive shaft from beam bores using hammer and hardwood dowel. Catch bushing and two spacers as shaft is removed.

c. Disassemble axle by removing lubrication fitting, elbow and nipple from center of axle.

d. Remove cotter pin, slotted nut and flat washer from axle guide spindle. Remove sleeve assembly from spindle on semitrailer No. 1 through 200 and or sleeve bearing and block on semitrailer No. 201 and on.

e. Disassemble sleeve assembly on semitrailer No. 1 through 200 only, by removing snap ring securing self-alining bushing in tube (fig. 6-6). Remove bushing.

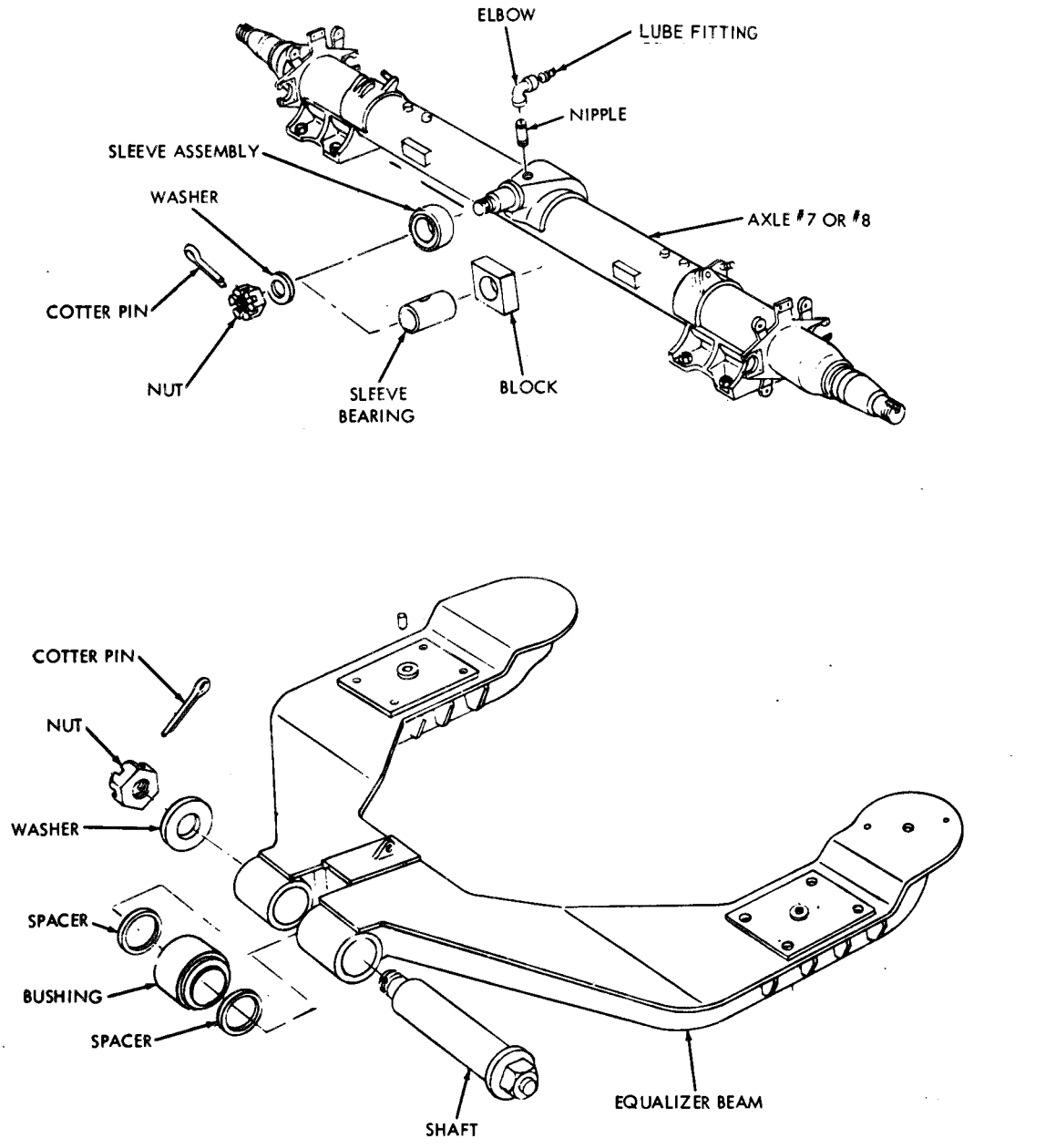


Figure 6-5. Rear equalizer beam and axle.

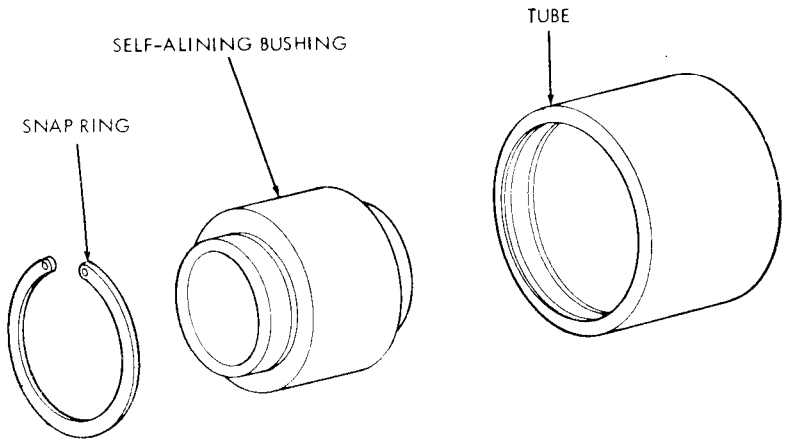


Figure 6-6. Sleeve assembly (semitrailer No. 1 through 200).

6-10. Cleaning, Inspection and Repair

a. Cleaning. Clean all parts using dry cleaning solvent type II (SD-2).

b. Inspection.

(1) Inspect components for wear and fit in accordance with paragraph 6-11 and table 6-2.

(2) Inspect equalizer beam shaft bore for scoring.

(3) Inspect welds on equalizer beam adapter pads.

(4) Inspect shaft, bushing, sleeve bearing, block and self-alining bushing for wear or damage.

(5) Inspect axle journals for extreme wear. No more than 10 perenct of bearing surfaces can be pitted or scored. Markings cannot be over 0.002 inches deep.

(6) Inspect axle for bent or distorted mounting brackets.

c. Repair.

(1) Replace damaged or defective parts.

(2) Straighten bent or distorted mounting brackets and weld cracks or breaks in brackets and adapter pad.

(3) Replace parts worn beyond limits specified in paragraph 6-11 and table 6-2.

6-11. Repair Standards

The repair standards (table 6-2) give the minimum, maximum and critical clearance of new or rebuilt parts. They aslo give wear limits which indicate the point to which a part(s) may be worn before replacement. An asterisk (*) in the wear limits column indicates that the part(s) should be replaced when worn beyond the limits given in size and fit of new parts column. The letter (L) indicates loose fit.

NOTE

Retorquing of fasteners or periodic maintenance will prevent all of the worn conditions outlined in E through D of the table.

Table 6-2. Repair Standards for Rear Equalizer Beam and Axles

Figure number	Reference letter	Point of measurement	Size and fit of new parts	Wear limits (DS & GS)
6-7	A	Axle spindle inner bearing surface o.d.	4.1248-4.1238	4.1233
	B	Axle spindle outer bearing surface o.d.	3.3748-3.3738	3.3733
	C	Shaft, self-alining bushing o.d.	2.995-2.997	2.96
	E	Bushing, self-alining i.d.	2.9994-3.0000	3.02
	D	Equalizer beam shaft bored i.d.	3.000-3.010	3.05
	C-D	Fit of shaft in beam	0.003:-0.015L	0.018L
		Extension Spring; chain .stop	6 inch F. L. inside hooks.	(*)

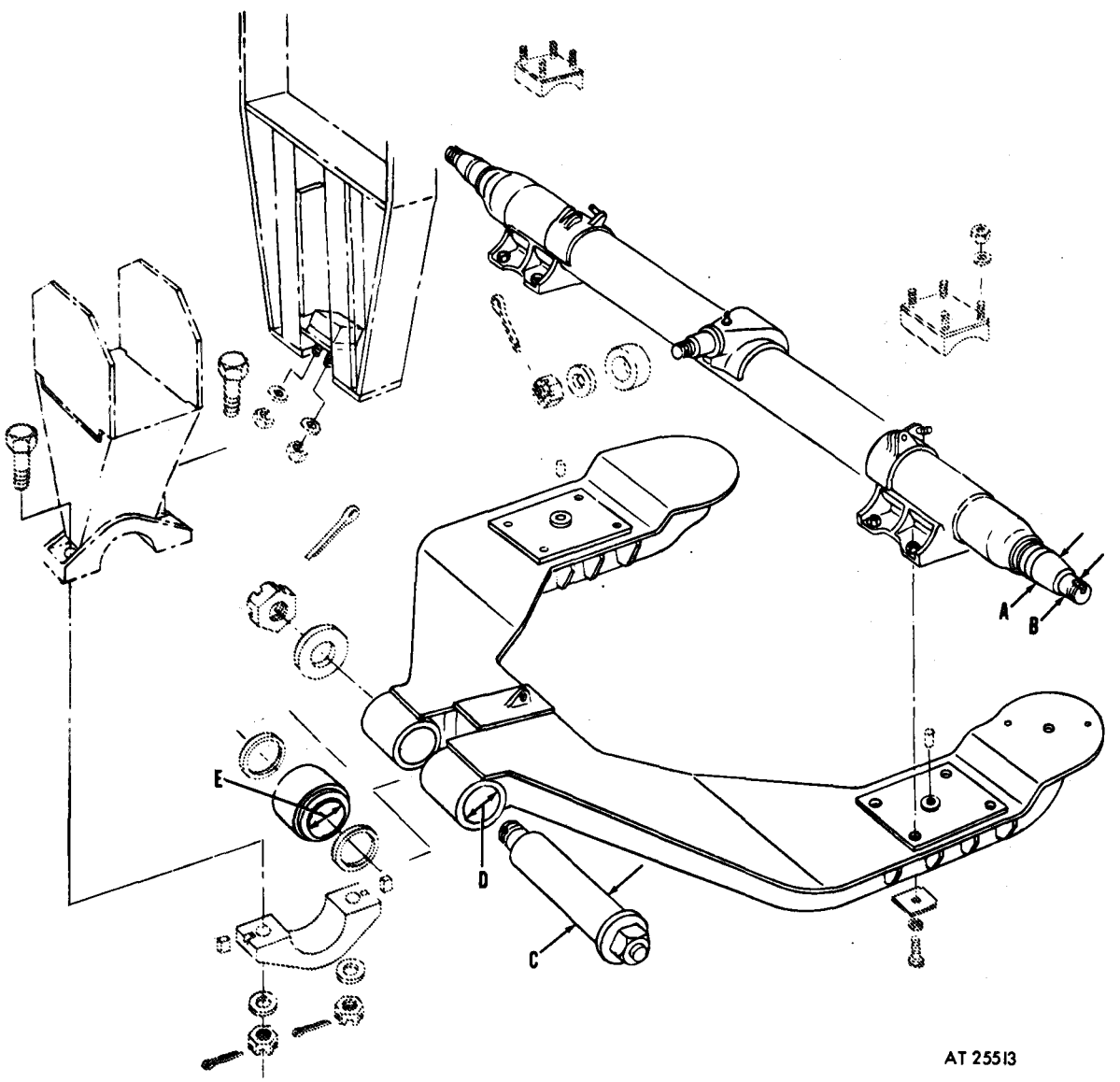


Figure 6-7. Rear equalizer beam and axle measurement and inspection points.

6-12. Assembly

Assemble components to the equalizer beam and axle in the reverse order of disassembly. Using torque wrench (GG-W-686) tighten slotted nut securing shaft and bushing to beam to 850 - 1,050 lb ft torque. Using torque wrench (GGG-W-686) torque slotted nut securing sleeve assembly on axle spindle to 850- 1,050 lb ft on semitrailer No. 1 through 200 and /or torque slotted nut securing sleeve bearing on block on axle spindle to 300-450 lb ft on semitrailer No, 201 and on.

Section V. TORQUE ROD REPAIR

6-13. General

This section provides information to direct and general support maintenance personnel for the disassembly cleaning, inspection, repair and assembly of the torque rods. Repair of the torque rods consists of replacing the rod end bushings.

6-14. Disassembly

(fig. 6-8)

Press rod end bushings out of torque rods using arbor press.

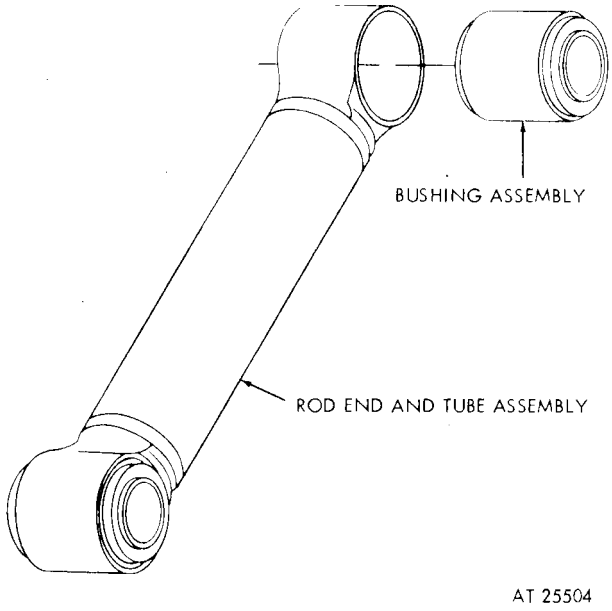


Figure 6-8 Torque rods.

6-15. Cleaning, Inspection and Repair

a. Cleaning. Clean torque rod tube using dry cleaning solvent type II (SD-2).

b. Inspection.

(1) Inspect torque rod rubber bushing for damage or deterioration.

(2) Inspect torque rod tube bores for pitting or scoring.

c. Repair. Replace damaged or defective parts.

6-16. Assembly

Install new bushings in rod ends, using arbor press.

Section VI. BRAKE SHOE REPAIR

6-17. General

This section provides information to direct and general support maintenance personnel for the disassembly, inspection, repair and assembly of the brake shoes. Repair of the brake shoes consists of replacing the brake linings.

6-18. Disassembly

Punch rivets out from back side of shoe using hammer and punch or drift. Remove lining from brake shoes.

6-19. Inspection and Repair

a. Inspection. Inspect shoe and replace if distorted, badly scored, or cracked more than 0.375 inch through new lining. A new lining is 0.750 inch thick.

b. Repair. Replace damaged or defective parts.

6-20. Assembly

NOTE

Do not use combination linings.

a. Make sure lining and shoe contact faces are clean.

b. Clamp lining firmly to shoe. Aline rivet holes in both pieces and locate the "C" clamps as close to rivet holes as possible.

c. Drive riveta squarely into holes with a 7/16-inch flathead drift.

d. Form rivet heads with suitable tubular rivet set, following the sequence ahown in figure 6-9.

e. Check lining installation with a 0.002-inch feeler gage. to assure lining and shoe contact.

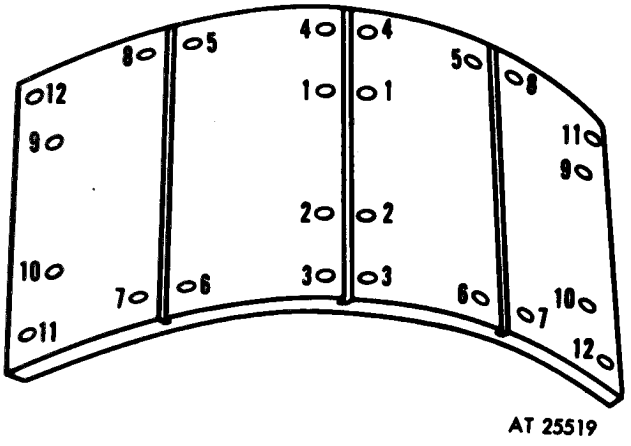


Figure 6-9. Brake lining riveting sequence.

Section VII. BRAKE AIR CHAMBER REPAIR

6-21. General

This section provides information to direct and general support maintenance personnel for the disassembly, cleaning, inspection, repair and assembly of the brake air chambers. Repair of the brake air chambers consists of replacement of worn or damaged parts.

6-22. Disassembly

(fig. 6-10)

CAUTION

All internal components of the brake air chamber assemblies used on semitrailer No. 1 through 200 and those used on semitrailer No. 201 and on are not interchangeable

Take care to replace damaged components with the correct parts.

a. Remove nut and cap screw securing clamp to housing.

b. Spread clamp, taking care not to damage it, and remove clamp.

c. Hold diaphragm to non-pressure housing and remove pressure housing.

d. Carefully remove diaphragm from non-pressure housing.

e. Remove diaphragm plate and wedge guide from non-pressure housing.

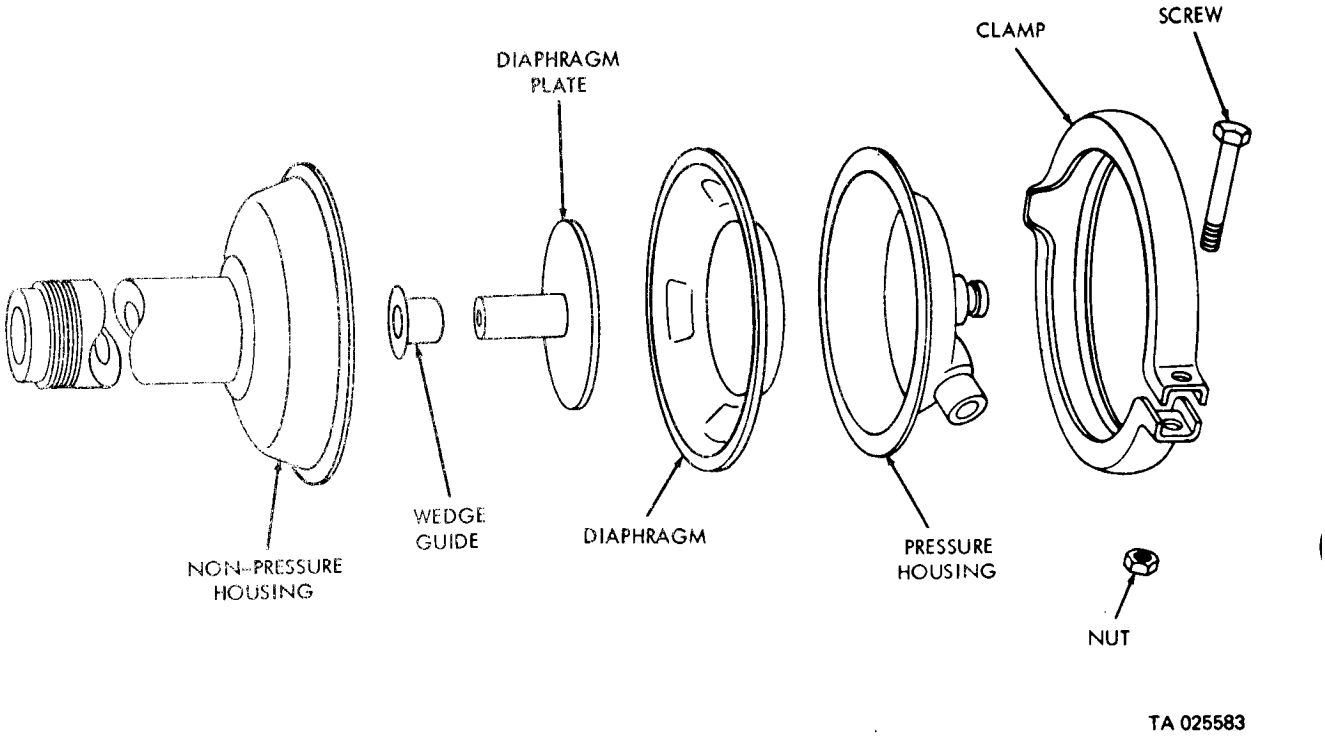


Figure 6-10. Brake air chamber assembly.

6-23. Cleaning, Inspection and Repair

a. Cleaning.

(1) Clean all metal parts using dry cleaning solvent type II (SD-2).

(2) Clean diaphragm with mild soap solution.

b. Inspection.

(1) Inspect wedge guide and non-pressure housing tube for wear, pits or grooves.

(2) Inspect and replace diaphragm if tom, cracked or if rubber at sealing edge has become set or distorted.

c. Repair. Repair damaged or defective parts.

6-24. Assembly

Assemble brake air chamber components in reverse order of disassembly.

Section VIII. FAIL-SAFE UNIT REPAIR

6-25. General

This section provides information to direct and general support maintenance personnel for the disassembly, cleaning, inspection, repair and assembly of the fail-safe units. Repair of the fail-safe units consists of replacement of worn or damaged parts. If repair to the fail-safe head consists of replacement of housing assembly components only, do not disassemble cap assembly.

6-26. Disassembly

(fig. 6-11)

CAUTION

All internal components of the fail-safe units

used on semitrailer no. 1 through 200 and those used on semitrailer no. 201 and cm are not interchangeable. Take care to replace damaged components with correct parts.

a. Disassemble brake air chamber (para 6-22).

b. Release foot set screw, unscrew foot from piston, and remove set screw, foot and preformed packing. Discard packing.

c. Remove cap assembly snap ring and separate cap assembly from housing. Do not disassemble cap assembly; refer to paragraph 6-29 below for service instructions.

d. Remove rubber washer from housing. Discard washer.

e. Remove preformed packing and two back-up rings from inside housing. Discard packing and back-up rings.

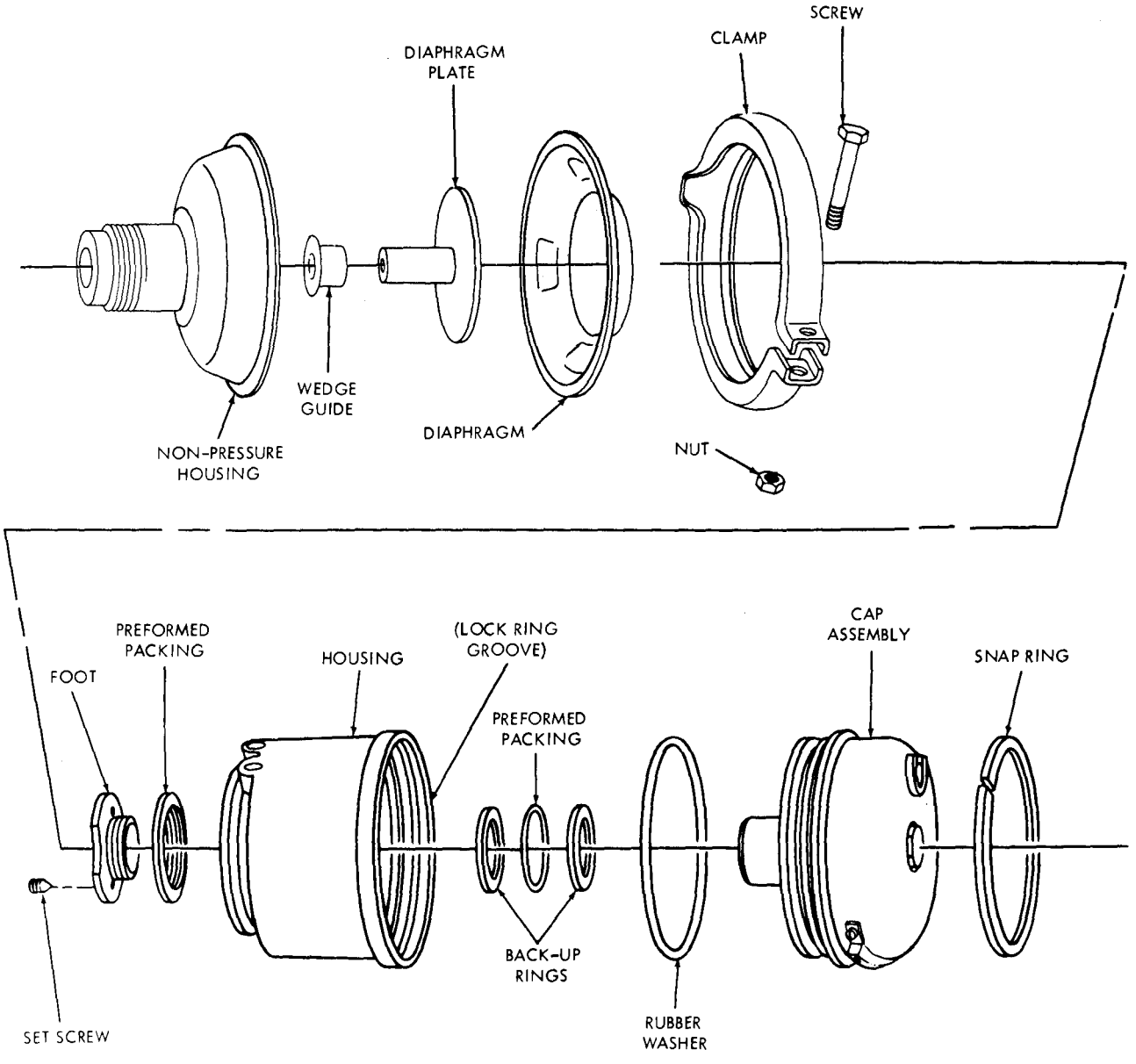


Figure 6-11. Fail-safe chamber assembly.

6-27. Cleaning, Inspection and Repair

a. *Cleaning.*

(1) Clean all metal parts using dry cleaning solvent type II (SD-2).

(2) Clean diaphragm with mild soap solution.

b. Inspection.

(1) Inspect wedge guide, housing, and non. pressure housing tube for wear, pits or grooves.

(2) Inspect and replace diaphragm if tom, cracked or if rubber at sealing edge has become set or distorted.

c. Repair.

(1) Replace all preformed packings, back-up rings and the rubber washer.

(2) Replace damaged or defective parts.

6-28. Assembly

Assemble fail-safe unit in the reverse order of disassembly.

6-29. Cap assembly

(fig. 6-12 and 6-13)

a. Disassembly.

CAUTION

The compression spring must be held in compressed position for disassembly. Exercise extreme care to ensure cap assembly is secure, and will remain so, in arbor press during disassembly.

(1) Secure cap assembly in arbor press so compression spring is maintained in the compressed position, and assess to release bolt is provided.

(2) Remove snap ring and hex nut from release bolt on semitrailer no. 1 through 200 and/or retaining ring, two washers and spring from release bolt on semitrailer no. 201 and on.

(3) Remove release bolt nut by turning release bolt counterclockwise until nut falls free.

(4) Release pressure of arbor press until spring tension is unloaded. Release piston, spring and cap from arbor press. Remove spring and two washers.

(5) Remove back-up ring and preformed packing from piston. Discard ring and packing.

(6) Remove snap ring and inner washer from release bolt inside cap on semi-trailer No. 1 through 200 and/or retaining ring, washer, and spring washer from release bolt inside cap on semitrailer No. 201 and on.

(7) Pull release bolt from cap. Remove O ring and outer washer from bolt on semitrailer No, 1 through 200 and /or remove two preformed packings and washer from bolt on semitrailer No. 201 and on. Discard O ring and packings.

(8) For cap assemblies used on semitrailer No. 1 through 200, remove plug from cap, then remove two screws and lockwashers securing breather cap. Remove breather cap and filter. For cap assemblies used on semitrailer No. 201 and on remove four screws securing filter retainers. Remove filter retainers and filters. Discard filters.

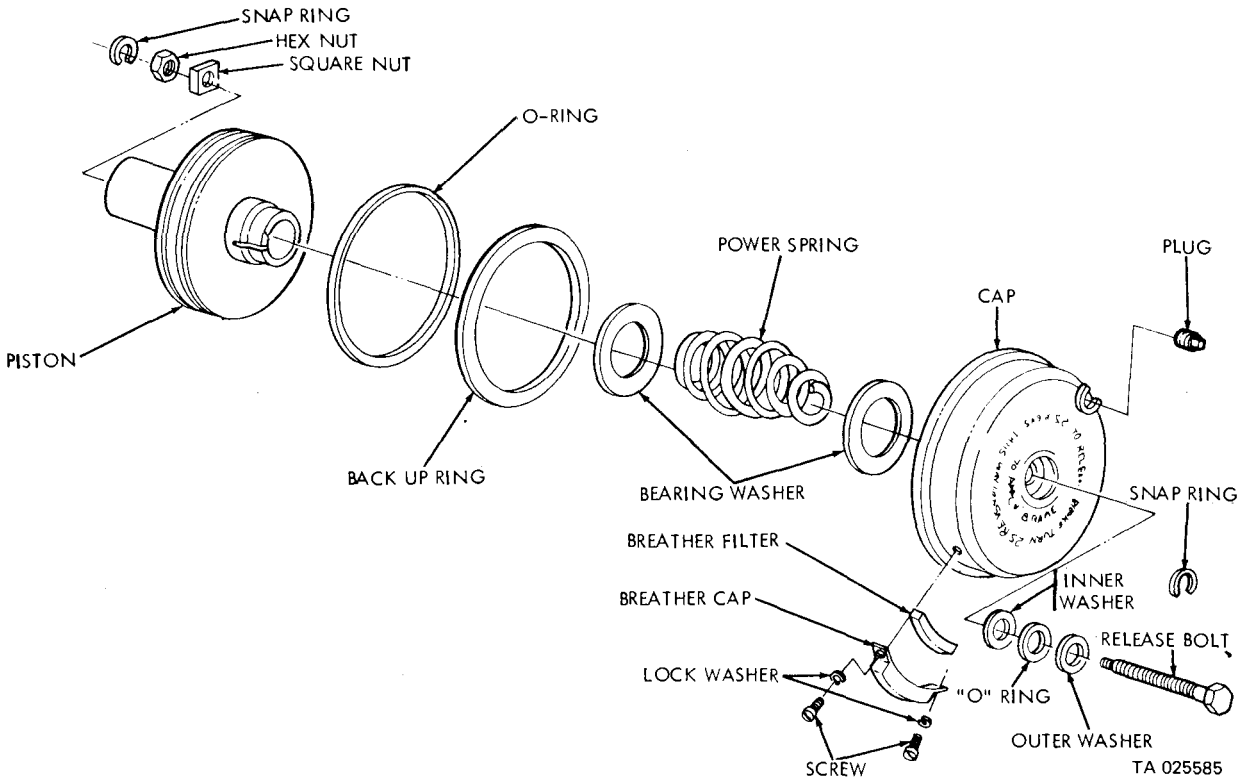


Figure 6-12. Fail-safe chamber cap assembly (semitrailer No. 1 throu 200)

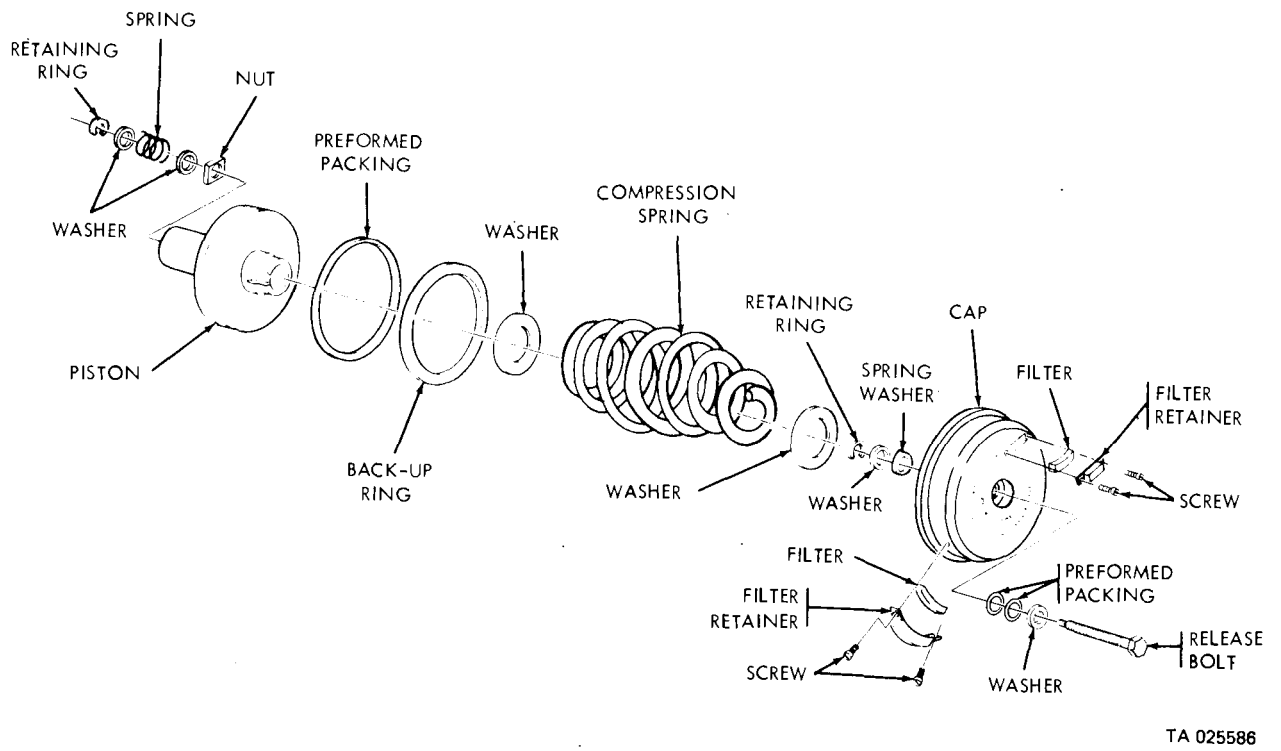


Figure 6-13. Fail-safe chamber cap assembly (semitrailer No. 201 and on).

b. Cleaning. Clean all metal parts with dry cleaning solvent type II (SD-2).

c. *Inspection.*

(19 Inspect piston for wear, pits or grooves.

(2) Inspect cap for nicks, scratches or cracks.

(3) Inspect power spring for breaks or cracks.

(4) Inspect threads of bolt.

d. Repair.

(1) Replace all preformed packings and filters.

(2) Replace damaged or defective parts.

e. Assembly.

CAUTION

The compression spring must be held in compressed position for assembly. Exercise extreme care to ensure cap assembly is secure, and will remain so, in arbor press during assembly.

(1) Grease bolt, piston and inside of cap, except in area of filters, with lubricant (MIL-C-25013). Pack spring and spring washers with grease (BRH).

(2) Assemble cap assembly in reverse order of disassembly *(a* above).

Section IX. WEDGE ASSEMBLY REPAIR

6-30. General

This section provides information to direct and general support maintenance personnel for the disassembly, cleaning, inspection, repair and assembly of the wedge assembly. Repair of the wedge assembly consists of replacement of worn or damaged parts.

6-31. Disassembly

(fig. 6-14)

a. Compress spring by hand and remove cotter pin from wedge.

b. Remove washer, wedge spring, boot and spring retaining washer from wedge. Discard boot.

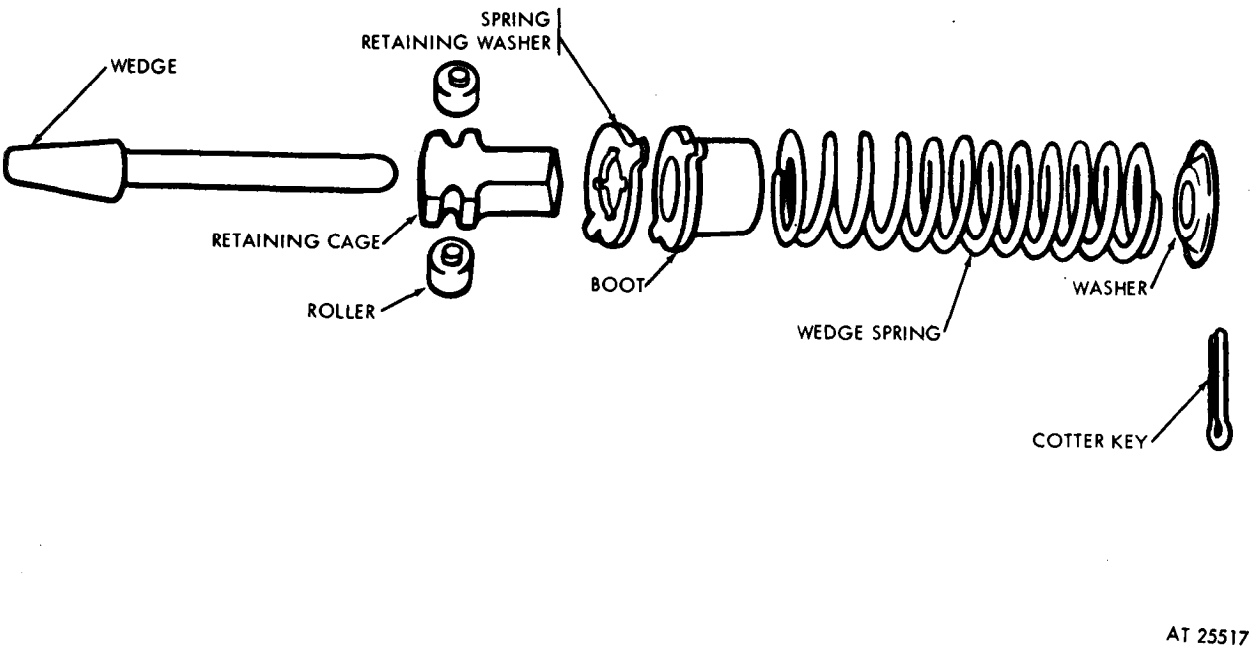


Figure 6-14. Wedge assembly.

c. Insert a thin-bladed screwdriver between one flat of the wedge head and roller retainer cage (fig. 6-15). Spread the cage open just far enough to remove the rollers.

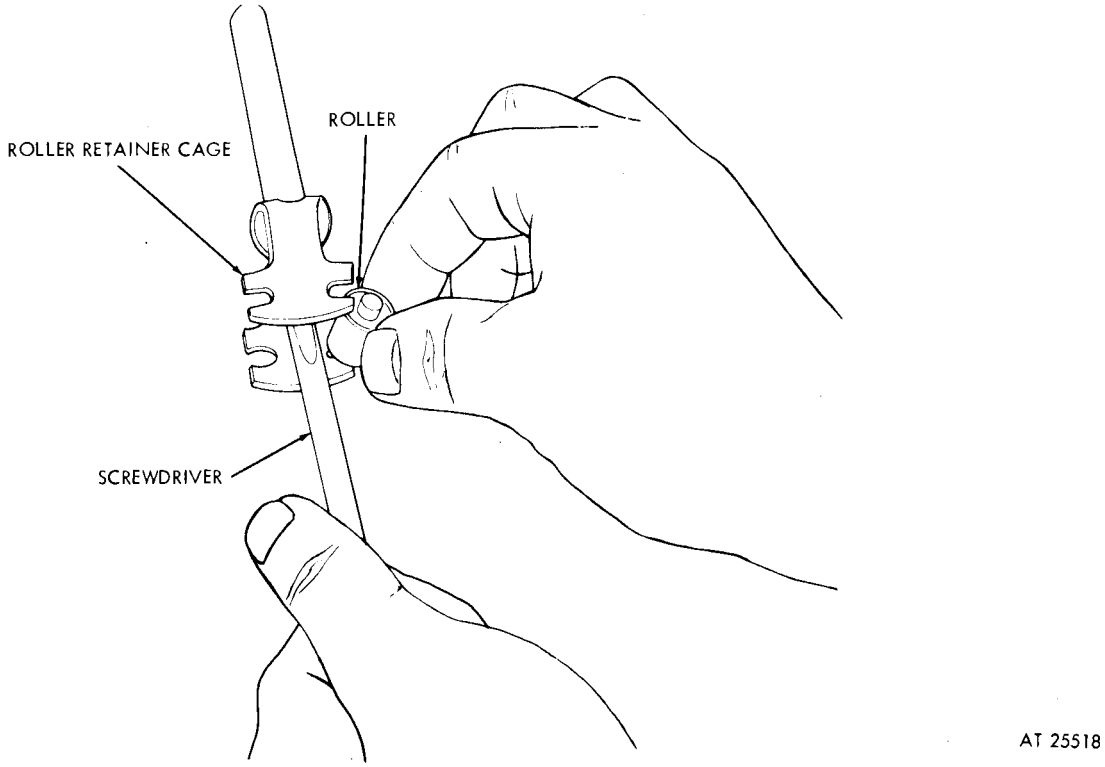


Figure 6-15. Wedge assembly roller removal or installation.

CAUTION

Do not attempt to drive the wedge through the rollers and cage or force the rollers through the slightly closed slots of the cage. This will damage the cage.

6-32. Cleaning, Inspection and Repair

a. Cleaning. Clean all metal parts using dry cleaning solvent type II (SD-2).

b. Inspection.

(1) Inspect angled faces of wedge for nicks, pits or grooves.

(2) Inspect spring for cracks.

(3) Inspect roller cage to ensure proper holding of rollers.

c. Repair. Replace damaged or defective parts. Replace boot.

6-33. Assembly

a. Insert wedge shaft into roller retainer cage so angled faces of the wedge head are exposed.

b. Insert screwdriver (fig. 6-15) between flat of wedge head and roller retainer cage. Spread cage open just enough to insert roller journal hub into cage slot. Tip roller into cage and position other journal hub into slot of retainer cage. Install other roller in same manner and remove screwdriver. Do not force rollers through end of the cage slots.

c. Install spring retaining washer over wedge shaft and position centrally over cage and roller assembly. Install rubber boot.

d. Install wedge spring over wedge shaft. Add spring washer and compress spring by hand far enough to expose cotter pin hole. Insert cotter pin,

Section X. HUB AND DRUM REPAIR

6-34. General

This section provides information to direct and general support maintenance personnel for the disassembly, cleaning, inspection, repair and assembly of the hub and drum. Repair of the hub and drum consists of replacing damaged studs and minor refacing of the drum. This section also covers wear limit standards for wheel bearings.

6-35. Disassembly

(fig. 6-16)

a. Position hub and drum on hub end. Use suitable marker and number each wheel stud head and adjust area of drum or hub so that studs can be reinstalled in the same holes. Mark relative position of drum to hub.

b. Separte hub from drum by pressing ten studs out with arbor press.

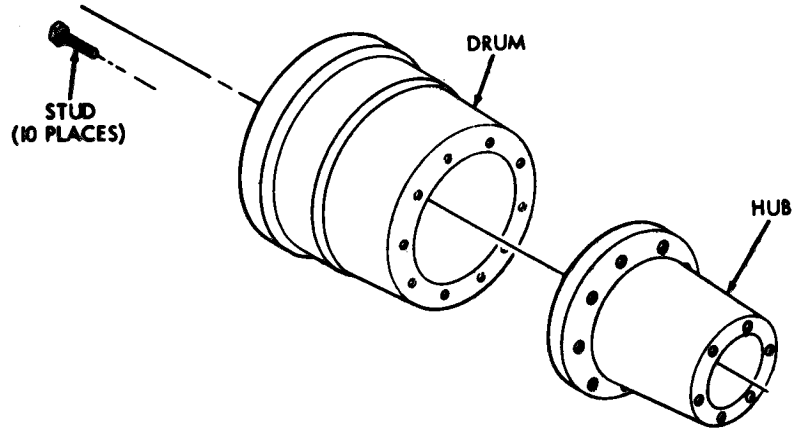


Figure 6-16. Hub and drum.

6-36. Cleaning, Inspection and Repair

a. Cleaning. Clean hub and drum using dry cleaning solvent type II (SD-2).

b. Inspection.

(1) Inspect inside of drum for pitting or scoring.

(2) Inspect hub bearing surfaces for critical damage

(3) Inspect hub and bearings for conformity to repair standards (table 6-3).

(4) Inspect wheel studs for damage.

(5) Inspect drum for out-of-round condition.

(6) Inspect inside of drum for deep cracks. This condition is tolerable only to ±0.020 inch.

c. Repair.

(1) Drums that are scored, pitted or have deep cracks on the inner surface can be machined in 10 inch increments. However, the refacing he minor, since oversize brake linings are not available. The inside diameter of a new drum is 15 inches, and should not be machined to a size greater than 15.090 inches.

(2) Replace parts worn beyond limits specified m paragraph 6-37 and table 6-3.

(3) When a damaged or broken wheel stud is replaced, the stud on each side of it should be replaced. This is necessary because the studs near the damaged or broken stud halve been carrying a heavier than normal load and may be weakened.

6-37. Repair standards

The repair standards (table 6-3) give the minimum, maximum and critical clearance of new or rebuilt parts. They also give wear limits which indicate the point to which a part(s) may be worn before replacement. An asterisk (*)in the wear limits column indicates that the part(s) should be replaced when worn beyond the limits given in the sise and fit of new parts column. The letter (L) indicates loose fit. The letter (T) indicates tight fit.

Table 6-3. Repair Standards for Wheel Hubs and Bearings

Figure number	Reference letter	Point of measurement	Size and fit of new parts	Wear limits (DS & GS)
6-17	C	Bearing, inner wheel, cup o.d.	7.125-7.126	(*)
	D	Bearing, inner wheel, cone i.d.	4.1250-4.1260	(*)
	B	Bearing, outer wheel, cup o.d.	5.596-5.597	(*)
	A	Bearing, outer wheel, cone i.d.	3.3750-3.3760	(*)
	F	Hub, inner wheel, bearing i.d.	7.122-7.124	7.1245
	G	Hub, outer wheel, bearing i.d.	5.593-5.595	5.5955
	C-F	Inner wheel bearing cup o.d., to hub bearing i.d. clearance	0.001T-0.004T	0.0005T
	B-G	Quter wheel bearing cup o.d. to hub bearing i.d. clearance	0.001T-0.04T	0.0005T
	E	Inner wheel bearing i.d. to axle spindle bearing surface clearnce	0.0002L-0.0022L	0.0027L
	H	Outer wheel bearing i.d. to axle spindle bearing surface clearance	0.0002L-0.0022L	0.0027L

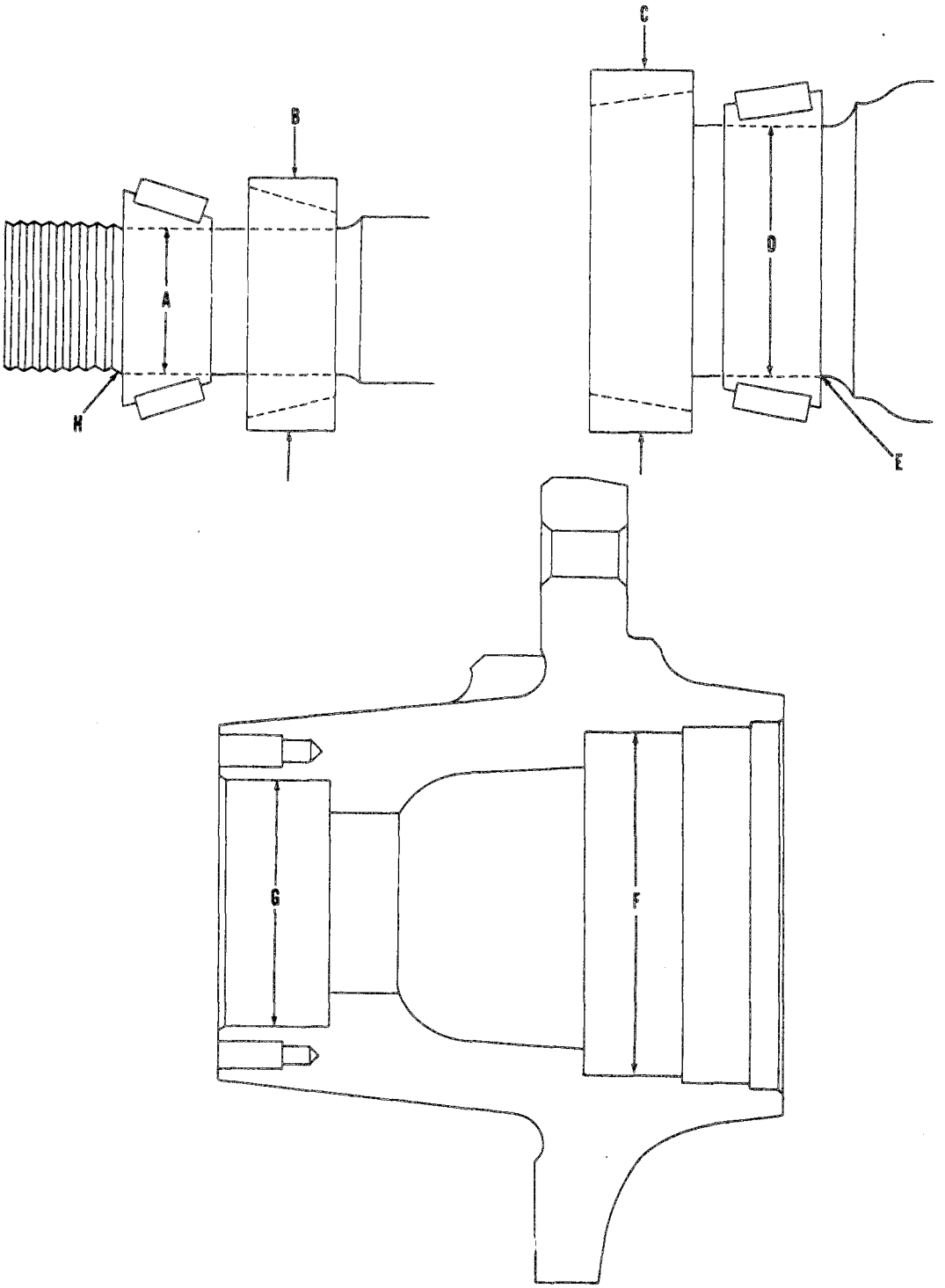


Figure 6-17. Wheel hub and bearings measurement and inspection points

6-38. Assembly

a. Position drum on hub and aline markings made during disassembly (a above).

NOTE

If a new drum and/or hub is assembled this alinement is not necessary.

b. Aline holes in drum and hub and fit studs perpendicular (on centers of hub holes. Using arbor press, install studs.

NOTE

Make sure that the heads of studs are firmly in contact with drum after they have been pressed in place. If a piece of paper can slip under the stud head, the stud is not properly seated and must be pressed further. No clearance is tolerable between stud head, drum face and hub face.

Section XI. WELD REPAIRS

6-39 General

The M747 semitrailer is fabricated from high-strength. steel and aluminum alloys. These materials, although not new in the present state of the art of high-strength metals, require qualified and experienced welders and procedures to prevent degradation of material properties and to minimize distortion which result from poor welding practices. Requirements for weld repair of the different grades of steel and aluminum used in the semitrailer are generally adequately covered in TM 9-237. However, the 50,00() psi yield strength steels, referred to as HSLA (High-Strength, Low-Alloy), are not referenced in TM 9-237. These steels are readily weldabie. For best results, it is recommended that this grade of steel be welded with low-hydrogen electrodes. No preheat is recommended for 50,000 psi yield strength steels.

NOTE

Weld repairs or replacement shall be performed in accordance with TM 9-237, and as specified herein. Paragraph 6-45 contains important supplementary repair information.

6-40. Frame Structure

The frame structure is fabricated from 50,000 psi and 100,000 psi yield strength steels as indicated in figure 6-18. The class of welding electrodes to be used for weld repair of these steels are listed in table 6-4.

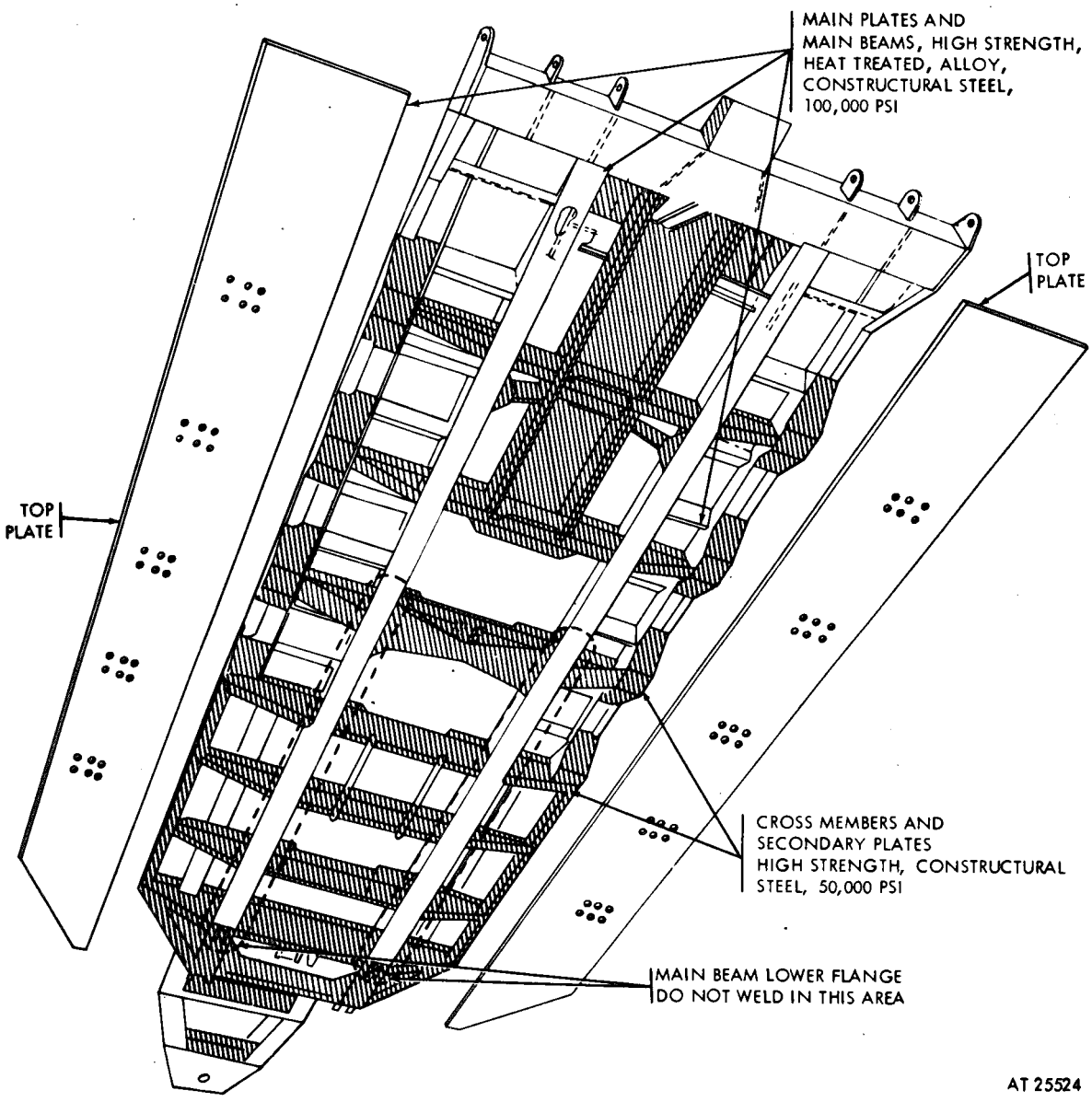


Figure 6-18. Frame assembly steel grades.

Table 6-4. Electrode Requirements for Frame Welding

Class of Metal	Type of Repair	
	Base Metal	Weld Repair*
(PSI x 10^3)		
50 (Low Alloy)	7018 9018	7018
100 (High Strength Alloy Tempered Structural Steel)	11018	9018

*For addition of brackets or fillet weld repairs.

Filler rods and wires are also available for the metal-arc inert gas (MIG) and tungsten electrode inert gas (TIG) welding processes. The filler metal shall be of equivalent strength, as indicated in above table.

CAUTION

No weld repairs shall be made in the tension flange of the main beam, forward of axle support plates, as indication in figure 6-18.

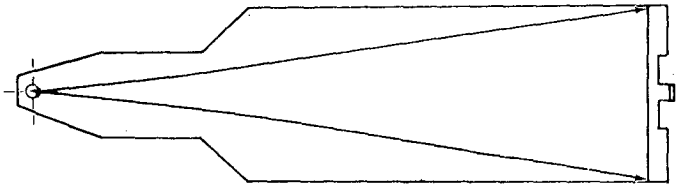
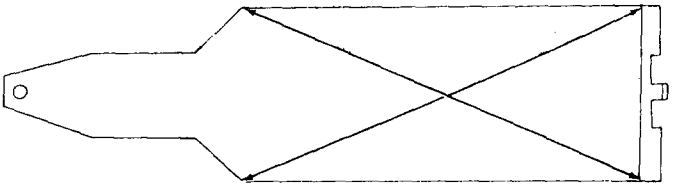
6-41. Frame Alinement

CAUTION

The dimensions included in this paragraph are for reference purposes only and are not to be understood as wear limits.

The conformity of the semitrailer frame to original production dimensions depends greatly on the amount of abuse, in terms of excessive strains and stress the semitrailer receives, and on the amount and quality of repair welding done to the major components of the frame. Frame alinement will be considered adequate, as long as the semitrailer remains serviceable both as a towed vehicle and as a transporter. The dimensions most pertinent to frame alinement, used in the production of new semitrailers are shown in figure 6-19.

FRAME ALINEMENT

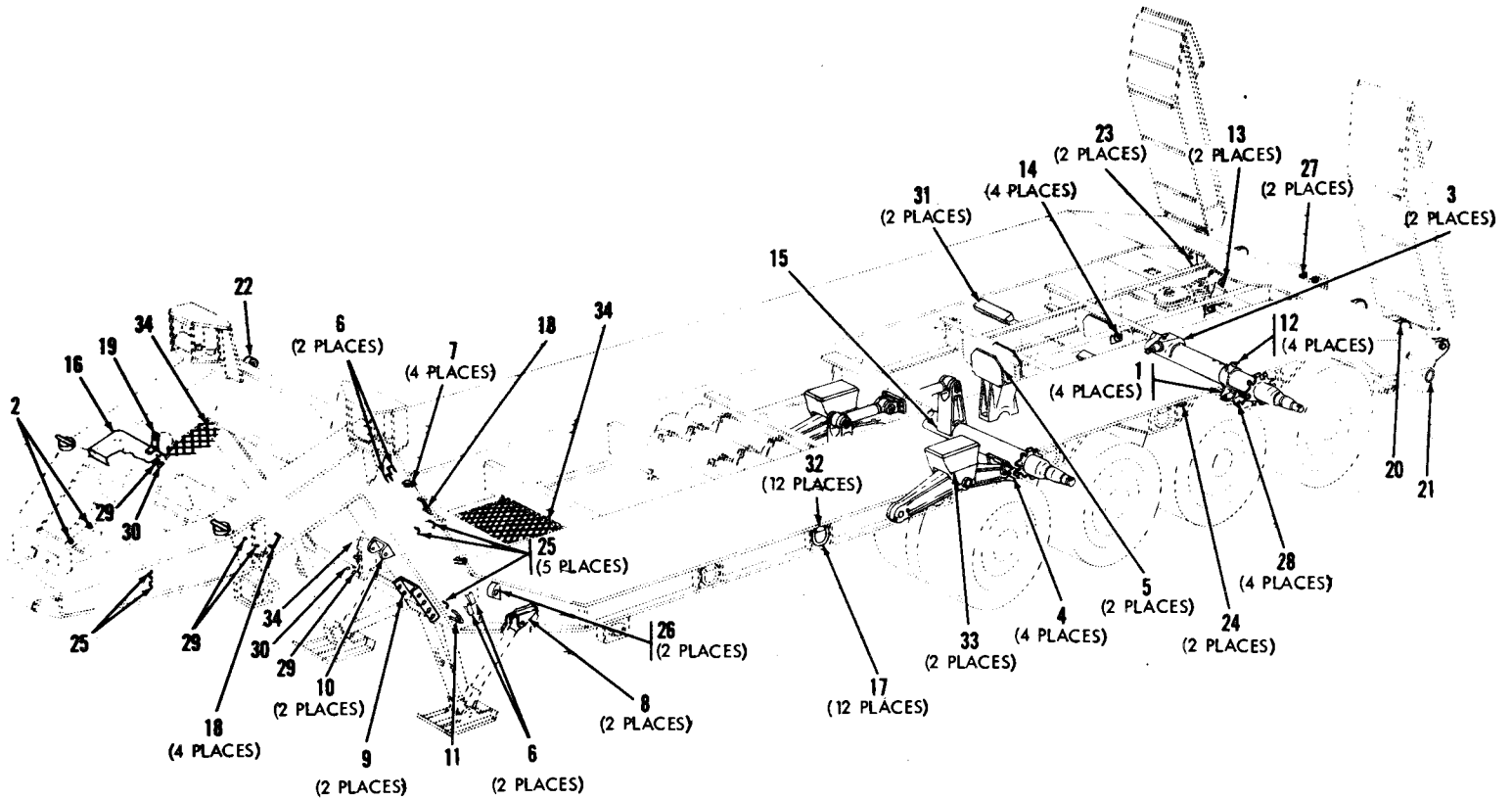
Description	Illustration	Dimensions
Centerline of king pin to outer rear corners of deck top plate (points on a horizontal plane)		453.43 inches
Bed diagonals: deck top plate form and outer corner to opposite rear outer corner.		319.40 inches

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Figure 6-19. Frame dimensions.

6-42. Miscellaneous Welded Parts on Semitrailer

Brackets, eyes, pads, etc., shall be repaired or replaced in accordance with TM 9-237 procedures. The components most likely to require repairs in service are listed in table 6-5. Refer to figure 6-20 for location of these parts.



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Figure 6-20. Semitrailer welded parts.

Table 6-5. Filler Metal Requirements for M747 Welded Repair Parts

Figure 6-2o Item	Component	Part Number	Material Class (PSI X 10^3)	Weld Filler*	Remarks
1	Adapter; axle 7 and 8	CPR 102240	Chromium Alloy Steel	7081	Base Metal 11018
2	Bolt; spare wheel carrier	CPR 100367-2** CPR 104508***	Low Carbon Steel	7018	
3	Bracket; axle guide spindle support	CPR 102239	Chromium Alloy Cast Steel	7081	Base Metal 11018
4	Bracket; beam hanger (front tandem)	CPR 102750	Cast Steel	7018	Medium Carbon
5	Bracket; beam hanger (rear tandem)	CPR102337	Chromium Alloy Cast Steel	7018	Base Medal 11018
6	Bracket; crow bar stowage	CPR 100800 CPR 100801	Low Carbon Steel	7018	
7	Bracket; gooseneck bumper mounting	CPR 102865	Low Carbon Steel	7018	
8	Bracket; landing gear, hinge	CPR 101121	High Strength Alloy Tempered Structural Steel	9018	Base Metal 11018
9	Bracket; landing gear, support	CPR 101134	High Strength Alloy Tempered Structural Steel	9018	Base Metal 11018
10	Bracket; landing gear travel	CPR 101133	Low Carbon Steel	7018	
11	Bracket; sledge hammer stowage	CPR 100799	Low Carbon Steel	7018	
12	Bracket; shock and chain	CPR 100439-1 CPR 100439-2	Chromium Alloy Steel	7018	
13	Bracket; snatch block	CPR 100973	High Strength Alloy Tempered Structural Steel	9018	Base Metal 11018
14	Bracket; shock absorber, frame	CPR 102329	Chromium Alloy Cast Steel	7018	Base Metal 11018
15	Bracket; torque rod, axle	CPR102747	Cast Steel	7018	Medium Carbon
16	Cover; warning light stowage box	CPR 102982**	Low Carbon Steel	7018	
17	Eye; tiedown	CPR 100364	Alloy Steel	7018	
18	Handhold	CPR 102834	Low Carbon Steel	7018	
19	Hasp; warning light stowage box cover	MS 27965-18**	Low Carbon Steel	7018	
20	Hinge plate; ramp	CPR 100954 CPR 100957 CPR 100958	High Strength Alloy Tempered Structural Steel	9018	Base Metal 11018
21	Housing; composite taillight, frame	CPR 102666 CPR 102667	Low Carbon Steel	7018	
22	Lifting eye	CPR 100424-1 CPR 100424-2	Low Carbon Steel	7018	
23	Lifting eye	CPR 100988	Low Carbon Steel	7018	
24	Loop; check block retained to frame	CPR 101527**	Low Carbon Steel	7018	
25	Loop; various strap	MS 51939-1	Low Carbon Steel	7018	
26	Lug; tiedown	CPR 101229	Low Carbon Steel	7018	
27	Nut; bumper plate	MS 51967-20**	Medium Carbon Steel	7018	
28	Pad; axle adapter	CPR 102345	Low Carbon Steel	7018	
29	Pad eye; chain retaining	MS 51930-1	Low Carbon Steel	7018	
30	Pad eye; chain retaining	MS 51030-3	Low Carbon Steel	7018	
31	Retainer; plank	CPR 101157-1** CPR 101157-2**	Low Carbon Steel	7018	
32	Retainer; tiedown eye	CPR 100351	Low Carbon Steel	7018	Equivalent Medium Carbon
33	Saddle	CPR 102740-1	Alloy Steel	9018	Base Metal 11019
34	Tray; stowage expanded metal	CPR 102856 CPR 102861 CPR 102862	Low Carbon Steel	7018	Expanded Metal

* Approved equivalent metal-arc inert-gas shielded welding filler metal may be used (XX15 or XX16 Low-Hydrogen Class Electrodes Optional)

**Semitrailer No 1 through 200

***Semitrailer No 201 and on

6-43. Suspension Components

Weld repair of suspension components are covered in TM 9-237; high strength, alloy, tempered steels and alloy steels shall be repaired, using 11018 electrode. Weld repairs to the walking beam require grinding of the weld deposit to be flush with the flange. Tension surface fillet welds shall blend with the joining surfaces.

6-44. Landing Gear and Ramp

The aluminum used in the M747 landing gar and ramp is 6061 temper T6. TM 9-237 procedures shall be used to perform repair on the structure, using 5356 electrode or wire. Repairs made to defective welds require that cracks be removed prior to making weld repair, Weld repairs shall be made using only qualified welders employing techniques that will minimize loss of strength in the metal adjacent to the weld.

6-45. Supplementary Repair Information

a. Determine extent of defect in each component prior to making repair. If possible, remove defective component from vehicle or add supports to area to be welded to minimize distortion and to facilitate welding in the flat postiion.

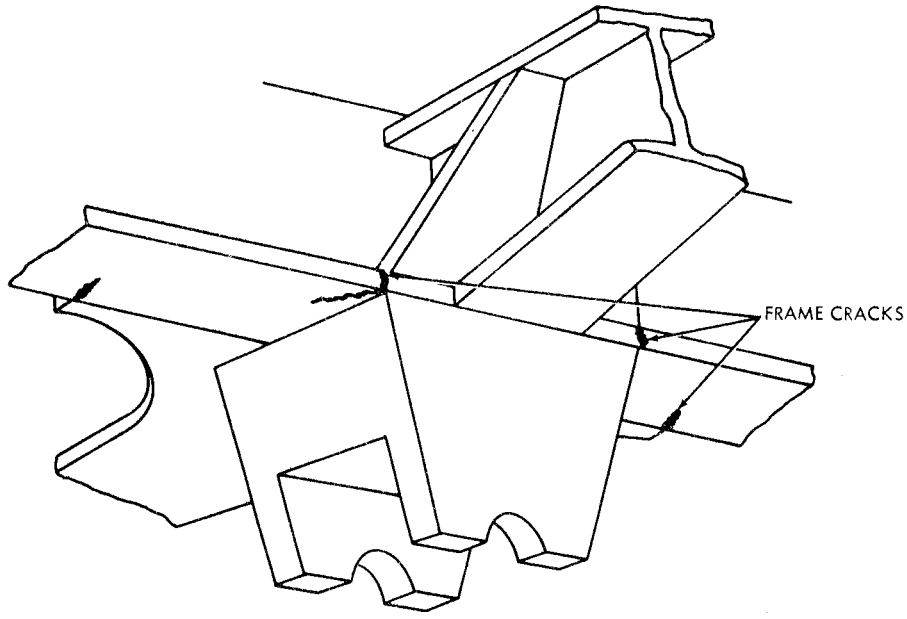
b. Drill holes through member at ends of crack prior to making weld repair.

c. Avoid straightening of high strength, alloy, tempered steels using temperatures over 1000° F. It is necessary that high-strength steels be heated to a uniform temperature when attempting to straighten.

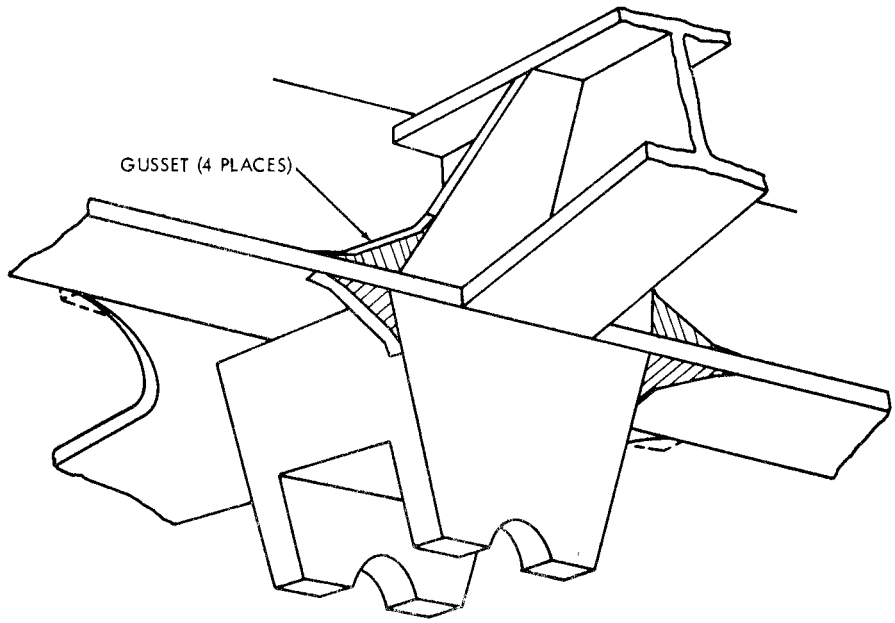
d. Inspect all weld repairs using magnetic particle inspection method (steel only) or dye-penetrant method (steel and aluminum).

e. Generally, these requirements would be applicable to minor repairs or damage to the structure as the result of an accident. In the event that repeated repairs are necessary in a particular location, field modifications may be necessary. These deficiencies should be reported through the proper channels for appropriate action.

f. Cracks may occur in the frame at the walking beam saddle brakcet (A, fig. 6-21) in semitrailer No. 1 through 200. If cracks develop in these areas, reinforce frame with gussets (B, fig. 6-21). Fabricate gussets from tempered 1/2 inch steel (C, fig. 6-21).



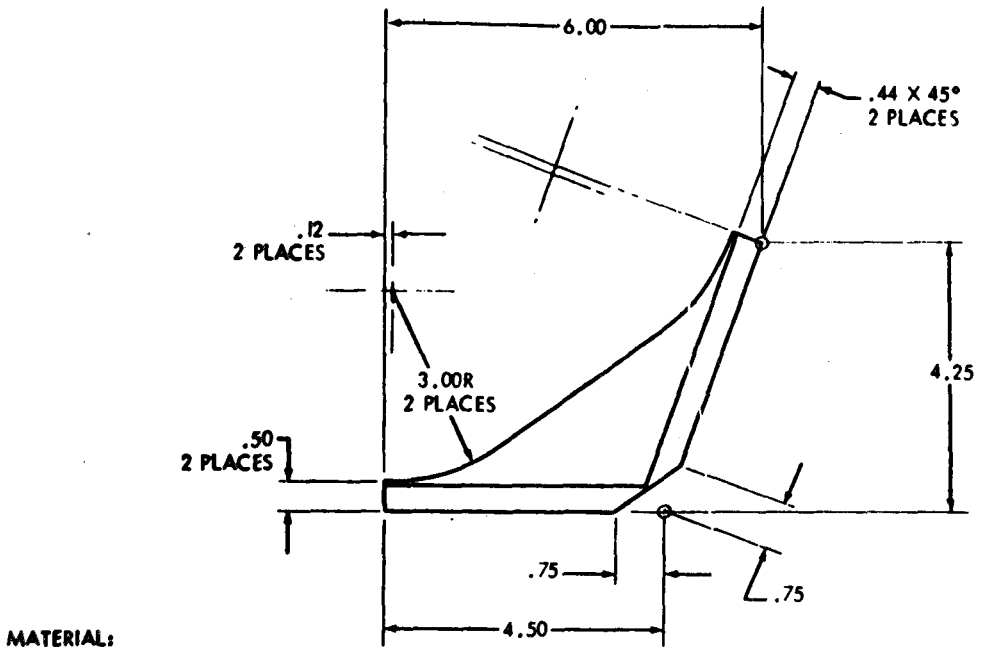
A. TRAILER FRAME CRACKS AT WALKING-BEAM SADDLE BRACKET.



B. TRAILER FRAME REINFORCEMENT.

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Figure 6-21. Semitrailer frame *and saddle bracket gusset reinforcement repair (semitrailer No. 1 through 200) (sheet 1 of 2).*



C. GUSSET

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Figure 6-21. Semitrailer frame and saddle bracket gusset reinforcement repair (semitrailer No. 1 through 200) (sheet 2 of 2).

Section XII. MINOR ALTERATIONS

6-46. Drainhole Installation, Frame Crossmember, (fig. 6-22)

a. Mark a 2 inch diameter semi-circular hole at the centerline of the vehicle on the crossmember to be cut.

CAUTION

Use great care to insure that other structural members are not burned or cut.

b. Use a torch and cut out the marked 2 inch diameter semicircular hole as close to the bottom of the crossmember as possible.

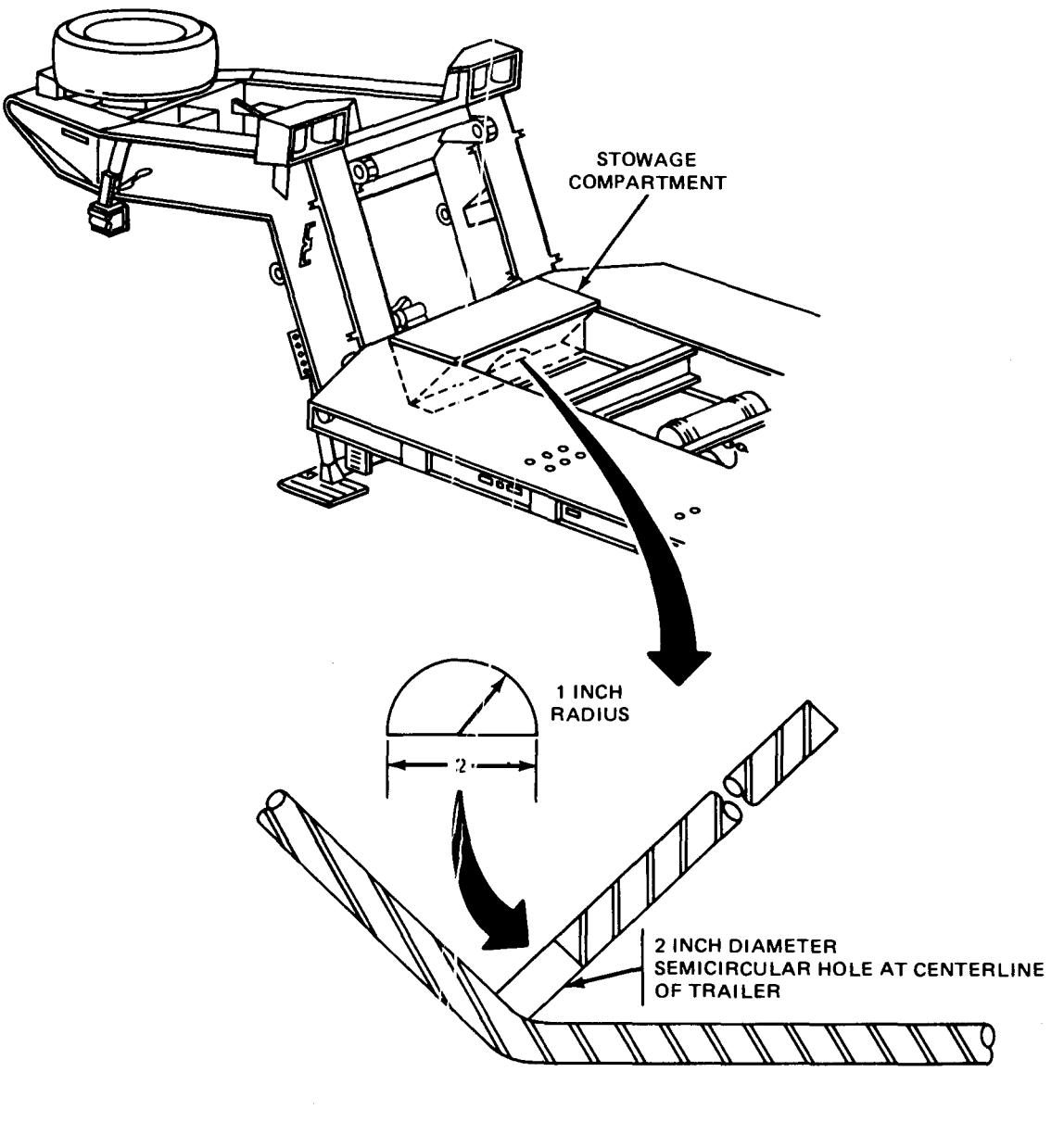


Figure 6-22. Drainhole installation, frame crossmember (Semitrailer 1 through 200).

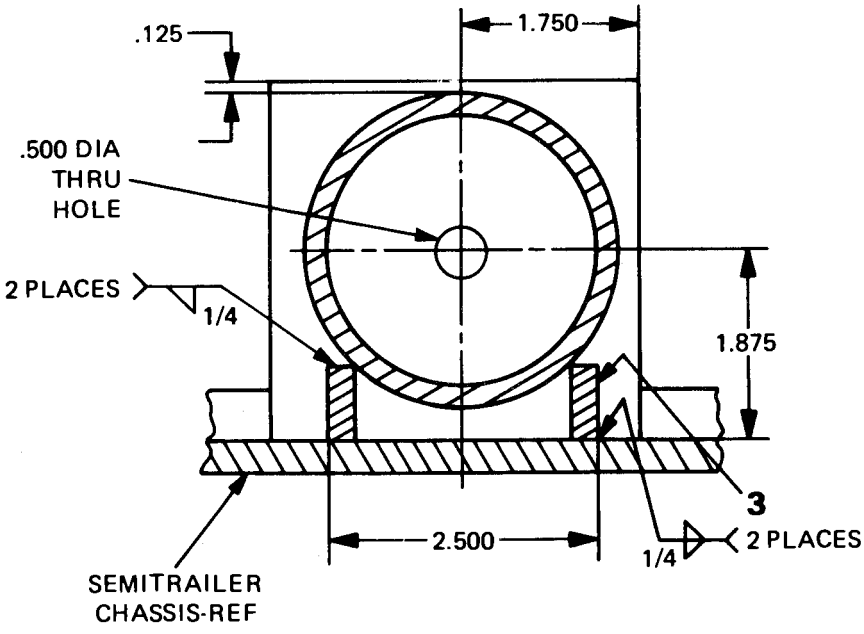
6-47. Davit Adapter for Spare Tire Block and Tackle

Semitrailers beginning with serial numbers 201 and up do not have the adapter installed to accommodate a davit block and tackle to lift the spare tire and wheel. An adapter can be fabricated and installed on the semitrailer by referring to the contents of Figures 6-23 and 6-24.

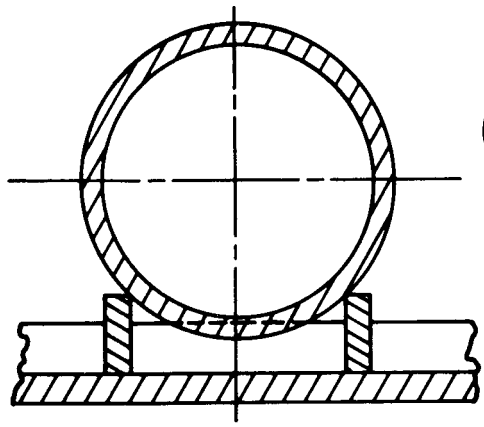
6-48. Items Required to Use Davit Adapter

The following item are necessary to use with the adapter in order to lift and lower the spare tire and wheel safely.

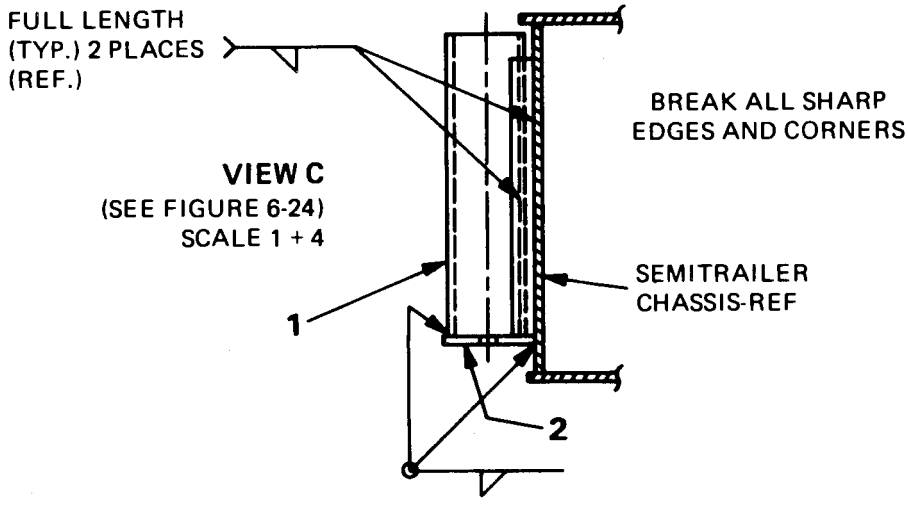
Nomenclature	Part Number	FSCM	National Stock Number
Block and Tackle, Manila Rope, Safety Type	8331191	19207	3940-00-077-1983
Chain Assembly	8331194	21450	4010-00-273-2980
Davit Assembly	8760259	19207	2590-01-112-2152



SECTION B-B
SCALE-FULL
(SEE FIGURE 6-24)



SECTION A-A
SCALE-FULL
(SEE FIGURE 6-24)



POS	QTY	DESCRIPTION
1	1	TUBE, CPR103088-1*
2	1	PLATE, STEEL, 3.5 x 3.5 x .250 THICK
3	2	BRACE, STEEL, .750 x .250 x 11.0 LONG
		MATERIAL FOR BRACE AND PLATE, CARBON STEEL 1010-1020

*1. MAY BE OBTAINED FROM SUPPLY AS PART NUMBER CPR103088, NSN 2590-00-490-5500.

2. A PIPE CAN ALSO BE USED THAT CONFORMS TO THE FOLLOWING:

12 INCHES LONG 3.0 x .05 INCHES OD x .250 THICK WALL TUBING, CARBON STEEL, 1010-1020 SEAMLESS, CONDITION CD, SPECIFICATION QQ-T-830.

Figure 6-23. Fabrication of adapter (Semitrailer No. 201 and on).

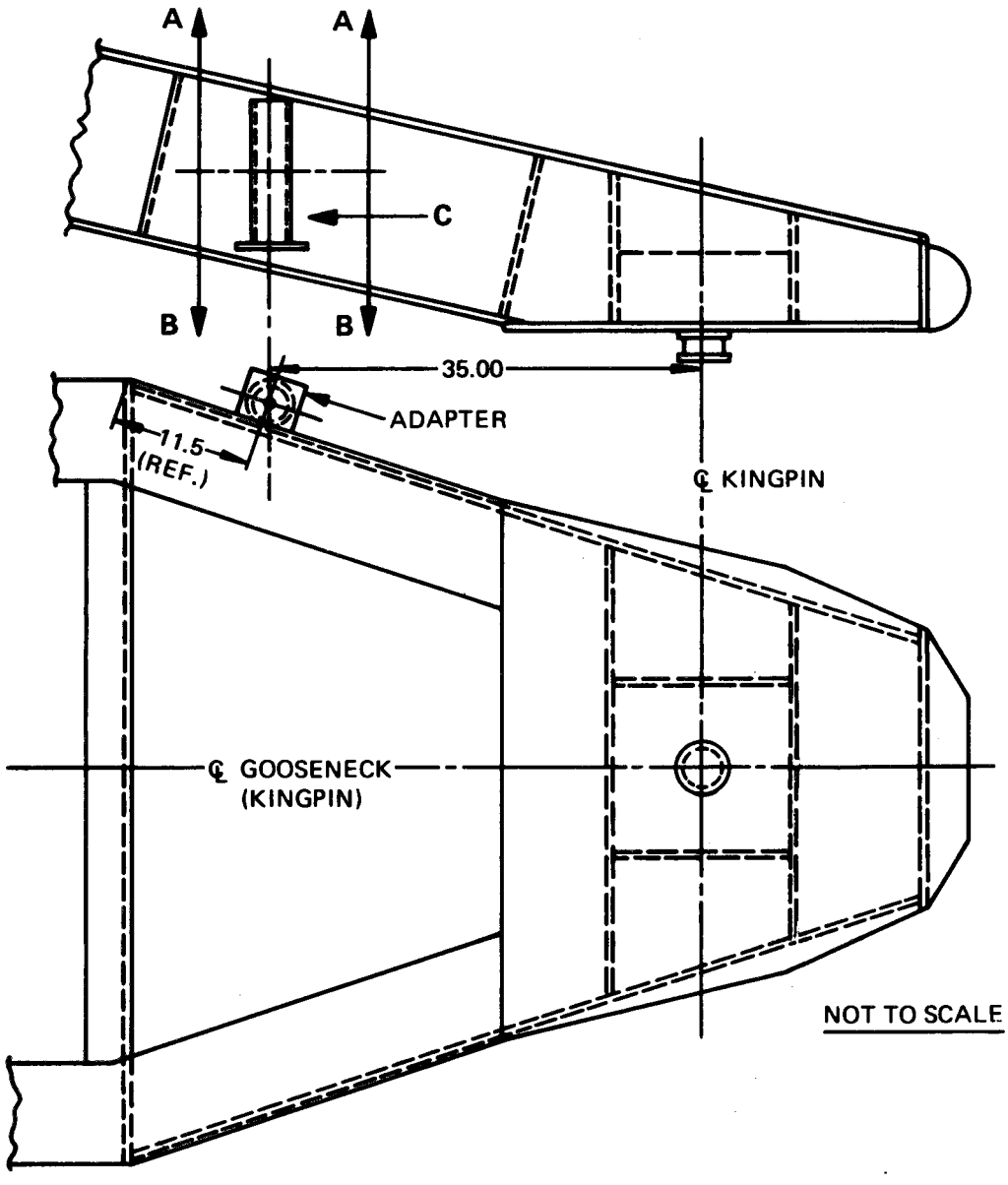


Figure 6-24. Location of adapter (Semitrailer No. 201 and on).

APPENDIX A

REFERENCES

A-1. publication Indexes

The following indexes should be consulted frequently for latest changes or revisions and for new publications relating to equipment covered in this technical manual.

DA Pam 310-1	Consolidated Index of Army Publications and Blank Forms
DA Pam 108-1	Index of Army Motion Pictures and Related Audio-Visual Aida

A-2. Forms

Refer to TM 38-750, The Army Maintenance Management System (TAMMS), for instructions on the use of maintenance forms pertaining to this equipment.

A-3. Publications

a. *Destruction to Prevent Enemy Use.*

FM 5-25	Explosives and Demolitions
TM 750-244-6	Procedures and Destruction of Tank-Automotive Equipment to Prevent Enemy Use

b. Maintenance.

FM 31-70	Basic Cold-Weather Manual
FM 5-20	Camouflage
TM 9-214	Inspection, Care, and Maintenance of Antifriction Bearinga
9-237	Operator's Manual Welding Theory and Application
TM 43-0139	Painting Instructions for Field Use
TM 9-2330-294-24P	Organizational, Direct Support and General Support Maintenance Repair Parts and Special Tools List for Semitrailer, Lowbed, Heavy Equipment Transporter, 60 Ton, M747
TB 43-0209	Color, Marking and Camouflage Painting of Military Vehicles
MIL-V-62038	Shipment and Limited Storage
TM 9-2610-200-20	Organizational Care, Maintenance and Repair of Pneumatic Tirea and Inner Tubea
TM 9-2610-201-14	Standards and Criteria for Technical Inspection and Classification of Tirea (FSC 2610)

c. Operating Vehicle.

FM 31-71	Northern Operations
AR 600-55	Motor Vehicle Driver Selection, Testing and Licensing
FM 21-305	Manual for the Wheeled Vehicle Driver
FM 9-207	Operation and Maintenance of Ordnance Materiel in Extreme Cold Weather –0° to –65° F
TM 9-2320-258-10	Operator's Manual for Truck-Tractor, 22 1/2 Ton, 8X8, M746
TM 9-2320-206-10	Operator's Manual for Truck-Tractor, 10-Ton, 6x6, M123 Series and Truck, Cargo; 10-Ton, 6x6, M125 (2320-219-7340)
9-2320-270-10	Operator's Manual for Trucks, Tractor, Commercial, Heavy Equipment Transporter (C-HET) 85,000 GVWR, 8x6, M911

d. Transportability.

TM 55-2325-255-14	Transportability Guidance Tank, Combat, Full-Tracked, 105-MM Gun, M1 (General ABRAMS)
55-2350-252-14	Transportability Guidance for Infantry Fighting Vehicle, M2 and Cavalry Fighting Vehicle, M3

APPENDIX B

BASIC ISSUE ITEMS LIST AND ITEMS TROOP INSTALLED OR AUTHORIZED LIST

Section I. INTRODUCTION

B-1. Scope

This appendix lists basic issue items and items troop installed or authorized required for operation of the

B-2. General

This Basic Issue Items and Items Troop Installed or Authorized List is divided into the following sec. tions:

a. Section Il. Basic Issue Items List. A list, in alphabetical sequence, of items which are furnished with and which must be turned in with the end item.

b. Section III. Items Troop Installed or Authorized List A list, in alphabetical sequence, of items which, at the discretion of the unit commander, may accompany the end item, but should not be turned in with the end item.

B-3. Explanation of Columns

The following provides an explanation of columns found in the tabular listings:

a. Illustration. This column is divided as follows:

(1) *Figure number.* Indicates the figure number of the-tin in which the item is shown.

(2) item *number. The* number used to identify each item called out in the illustration.

b. National Stock Number. Indicates the National stock number assigned to the item and will be used for requisitioning purposes.

c. Description. Indicates the Federal item name and, if required, a minimum description to identify the item. The last line for each item in the BIIL and ITIAL indicates the part number with the FSCM in parentheses. The Federal Supply Code for Manufacturer (FSCM) is a 5-digit numeric code listed in SB 708-42 which is used to identify the manufacturer, distributor, or Government agency, etc.

d. Unit of Measure (U/M). Indicates the standard of the basic quantity of the listed item as used in performing the actual maintenance function. This measure is expressed by a two-character alphabetical abbreviation (e.g., ea, in, pr, etc.). When the unit of measure differs from the unit of issue, the lowest unit of issue that will satisfy the required units of measure will be requisitioned.

e. Quantity Furnished with Equipment. (Basic Issue Items only). Indicates the quantity of the basic issue item furnished with the equipment.

f. Quantity Authorized. (Items Troop Installed or Authorized only). Indicates the quanity of the item authorized to be used with the equipment.

B-4. Special Information

The following publications pertain to the M747 semitrailer and its components:

TM 9-2330-294-24P, Semitrailer, Low Bed, Heavy Equipment Transporter, 80 Ton, M747

B-5. Abbreviations

dia . . . .diameter
hex . . . . . hexagon
in . . . . inch
sq . . . . square

Section Il. BASIC ISSUE ITEMS LIST

(1) Illustration (a) Fig No.	(1) Illustration (b) Item No.	(2) National stock number	(3) Description Part Number & FSCM — Usable On Code	(4) Qty furn with equip
B-1	1	5120-01-059-0092	ADAPTER, SOCKET WRENCH: 13/16 sq-tang, 1½ hex-tang, 2 in. dia., 4 inches long (in stowage compartment w/cover on front deck) CPR 103856 (19207)	1
B-1	2	5120-00-243-2419	BAR, HANDLE: ¾ in. dia., 30 inches long (in stowage compartment w/cover on front deck) 6196147 (19207)	1

(1) Illustration (a) Fig No.	(1) Illustration (b) Item No	(2) National stock number	(3) Description Part Number & FSCM — Usable On Code	(4) Qty furn equip
B-1	3	3990-00-401-1503	BINDER, LOAD: Ratchet-type with 1 grab-hook and 1 pear-shaped link, 12-ton capacity (in stowage compartment w/cover on front deck) CPR 102265 (19207)	6
B-1	4	5510-00-491-0306	BLOCK, WOOD: 7 x 8 x 9 (in open stowage compartment on front deck) CPR 103023-1 (19207)	6
B-1	4	5510-00-491-0307	BLOC K, WOOD: 4 x 8 x 9 (inopen stowage compartment on front deck) CPR 103023-2 (19207)	1
B-1	5	2510-00-741-7585	BOA RD, W OOD: 24 x 24 x 2-5/8 (in open stowage compartment on front deck) 7417585 (19207)	2
B-1	6	2540-00-436-4586	CHAIN, LIFTING: 7/8 in. dia. chain link, 57-5/8 inches reach (in open stowage compartment below rigging block on rear deck) CPR 100423 (19207)	2
B-1	7	4010-00-449-6573	CHAIN, UTILITY: ¾ in. dia. chain link, 12 ft. long (4 in open stowage compartment atop gooseneck) 8744250 (19207)	6
B-2	1	5120-00-224-1390	CROWBAR: 1¼ in. wide, 6 ft long (on left hand side of gooseneck, outboard) 11677049-1 (19207)	2
B-2	2	2540-00-490-0769	CURB ING, TRACK GUIDE: (in open stowage compartment on front deck) CPR 101269 (19207)	8
B-2	3	5120-00-900-6097	HAMMER, BLACKSMITHS, DOUBLE FACE: 10-pound, 30 to 33 in. long handle (on left hand side of gooseneck, outboard) 11677050-2 (19207)	1
B-2	4	5340-00-682-1508	PADLOCK: with 2 keys, w/clevis and chain (on stowage compartment w/cover on front deck) MS35647-3 (96906)	1
B-2	5	4020-00-477-3734	ROPE, MANILA: 1/1-inch dia., 75 ft. long, w/whipped ends (in stowage compartment w/cover on front deck) CPR 102915 (19207)	1
B-2	6	4030-00-389-0312	SHACKLE, ANCHOR, SCREW PIN TYPE: 1¼ in. dia. pin (in stowage compartment w/cover on front deck) 8387707-2 (19207)	14
B-2	6	4030-00-389-0313	SHAC KLE, ANCHOR, SCREW PIN TYPE: 2¼ in. dia. pin (in stowage compartment w/cover on front deck) 8387707-3 (19207)	2
B-2	6	4030-00-133-6518	SHACKLE, ANCHOR, BOLT TYPE: 2¼ in. dia. bolt (optional) (in stowage compartment w/cover on front deck) 10944788-11 (19207)	2
B-2	7	3940-00-181-2776	SNAT CH BLOCK, RIGGING, WIRE ROPE: 1-in. dia. rope, 60-ton (in stowage compartment w/cover on front deck) CPR 100165 (19207)	1
B-2	8	4010-00-133-6736	TIE-DOWN ASSEMBLY, CARGO: 9/32 in. dia. chain, 43 in. long (in place, between ramp and trailer securing ramp in travel position) CPR 101228 (19207)	2
B-2	9	4910-00-262-0392	TRESTLE, ADJUSTABLE: 15 in. closed, 25 in. extended, 5-ton capacity (in open stowage compartment on front deck) MIL-T-14521 (81349)	1
B-2	10	5120-00-795-0664	WRE NCH, SOCKET: 13/16 in. sq opening, 1 ½ hex opening, 22 in. to 24 in. long (in stowage compartment w/cover on front deck) MIL-W-43105 (81349)	1

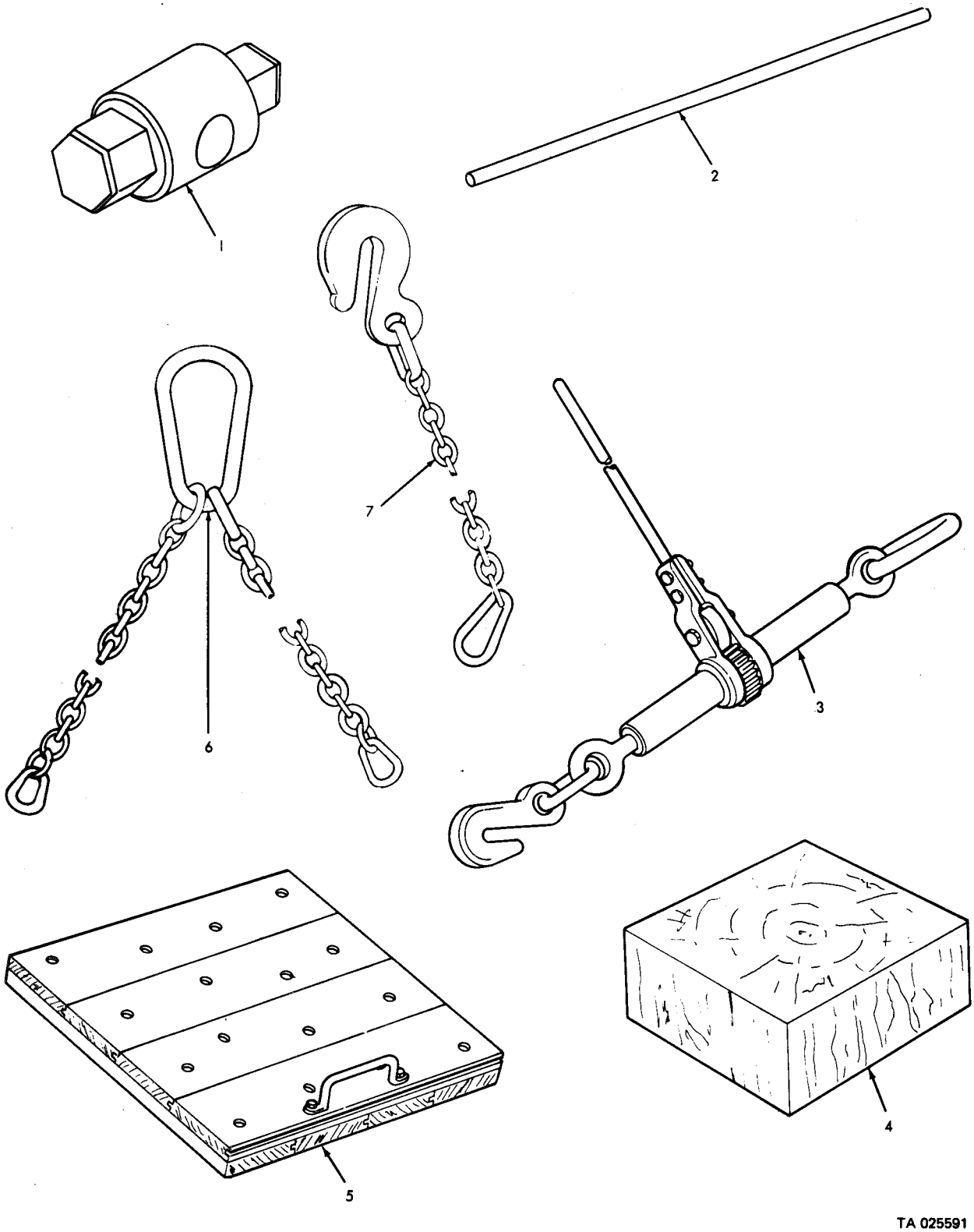


Figure B-1. Basic issue items.

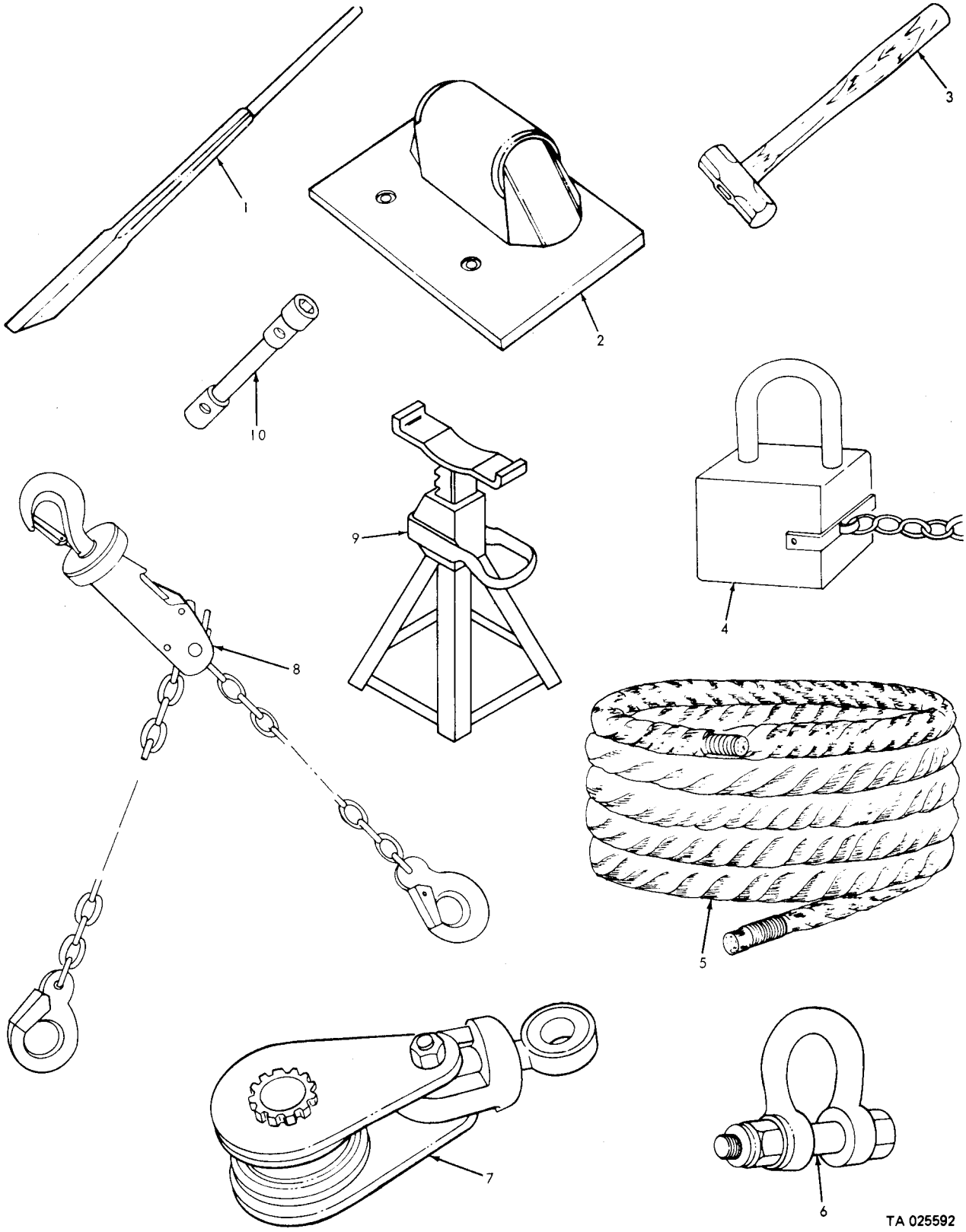


Figure B-2. Basic *issue items.*

Section III. ITEMS TROOP INSTALLED OR AUTHORIZED LIST

(1) National stock number	(2) Description Part Number & FSCM / Usable On Code	(3) U/M	(4) Qty auth
2540-00-670-2459	BAG, PAMPHLET, CLOTH: 3 x 9¼ x 11¼ (on gooseneck frame - inboard left hand side) 7961712 (19207) 11676920 (OPTIONAL) (19207)	EA	1
5340-00-753-3740	STRAP, COTTON DUCK: 1 in. wide, 8 in. long, w/buckle (to secure sledge hammer on left hand side of gooseneck, outboard) 8690460 (19207)	EA	1
2540-00-586-7579	STRAP, COTTON DUCK: 1 in. wide, 16 in. long, w/buckle (to secure crowbar on left hand side of gooseneck, outboard) 8690464 (19207)	EA	1

APPENDIX C

MAINTENANCE ALLOCATION CHART

Section I. INTRODUCTION

C-1. General

The purpsoe of the maintenance allocation chart (MAC) is to allocate specific maintenance operations to the proper maintenance level and category. Allocation of maintenance operations is made on the basis of time, tools, and skills normally available to the various maintenance categories in a combat situation and influenced by maintenance policy and sound maintenance practices, as outlined in AR 750-1.

This appendix is divided into three sections as follows:

Section I. Introduction

Section II. Maintenance Allocation Chart (MAC)

Section III. Tool and Test Equipment Requirements

C-2. Maintenance Functions

The maintenance allocation chart designates overall responsibility for the maintenance function on an end item or assembly. Repair and/or rebuild of major assemblies is designated by authority of the Army Commander representative, except for the specific subfunctions listed in the maintenance allocation chart. Deviations from maintenance operations allocated in the maintenance allocation chart are authorized only upon approval of the Army Commander representative. The maintenance functions and definitions to be performed at the designated levels are listed below.

a. Adjust. Maintain within prescribed limits by bringing into proper or exact position, or by setting the operating characteristics to the specified parameters.

b. Aline. To adjust specified variable elements of an item to bring about optimum or desired performance.

c. Calibrate. To determine and cause corrections to be made or to be adjusted on instruments or test measuring and diagnostic equipment. Consists of comparisons of two instmments, one of which is a cirtified standard of known accuracy, to detect and adjust any discrepancy in the accuracy of the instrument being compared.

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

e. Install. The act of emplacing, seating, or fixing into position an item, part, module (component or assembly) in a manner to allow the proper functioning of the equipment/system.

f. Overhaul. That, maintenance effort (service/action) necessary to restore an item to a completely serviceable/operational condition as prescribed by maintenance standards (e.g. DMWR) in pertinent technical publications. Overhaul is normally the highest degree of maintenance performed by the Army. Overhaul does not normally return an item to like-new condition.

g. Rebuild. Consists of those services/actions necessary for the restoration of unserviceable equipment to a like-new condition in accordance with original manufacturing standards. Rebuild is the highest degree of materiel maintenance applied to Army equipment. The rebuild operation includes the act of returning to zero those age measurements (hours, miles, etc.) considered in classifying Army equipment/components.

h. Repair. The application of maintenance services (inspect, test, service, adjust, aline, calibrate, replace) or other maintenance actions (welding, grinding, riveting, straightening, facing, remachining or resurfacing) to restore serviceability to an item by correcting specific damage, fault, malfunction or failure in a part, subassembly, module (component or assembly), end item or system.

i. Replace. The act of substituting a serviceable like-type part, subassembly, module (component or assembly) in a manner to allow the proper functioning of an equipment/system.

j. Service. Operations required periodically to keep an item in proper operating condition, ie; to clean, preserve, drain, paint, or to replenish fuel/lubricants/hydraulic fluids or compressed air supplies.

k. Test. To verify serviceability and to detect incipient failure by measuring the mechanical or electrical characteristics of an item and comparing those characteristics with prescribed standards.

l. Symbols. The uppercase letter placed in the

appropriate column indicates the lowest level at which that particular maintenance function is to be performed.

C-3. Explanation of Format

The maintenance allocation chart is divided into five columns.

a. Column 1, Group Number. Column 1 lists group numbers, the purpose of which is to match components, assemblies, subassemblies and modules with the next higher assembly.

b. Column 2, Component/Assembly. Column 2 lists the next higher assembly group and the item names of components, assemblies, subassemblies and modules within the group for which maintenance is authorized.

c. *Column 3, Maintenance Function.* Column 3 lists the applicable maintennace functions defined in C-2 above. Each maintenance function required for an item shall be specified by the symbol among those listed in *d* below which indicates the level responsible for the required maintenance. Under this symbol there shall be listed an appropriate work measurement time value determined as indicated in *d* below.

d. Column 4, Maintenance Category. Column 4 specifies, by the listing of a "work time"' figure in the appropriate subcolumn(s), the lowest level of maintenance authorized to perform the function listed in Column 3. This figure represents the active time required to perform that maintenance function at the indicated category of maintenance. The number of man-hours specified by the "work time" figure represents the average time required to restore an item to a serviceable condition under typical field operating conditions. This time includes preparation time, troubleshooting time, and quality assurance /quality control time in addition to the time required to perform the specific tasks identified for the maintenance functions authorized in the maintenance allocation chart. The subcolumns are:

C – Operator/Crew
O–Organizational
F– Direct Support
H – General Support
D – Depot

e. Column 5, Tools and Equipment. Column 5 specifies by code, those common tool sets (not individual tools) and special tools, test, and support equipment required to perform the designated function.

Section II. MAINTENANCE ALLOCATION CHART

(1) Group number	(2) Component / assembly	(3) Maintenance function	(4) Maintenance category* C	O	F	H	D	(5) Tools and equipment
06	ELECTRICAL SYSTEM							
0608	Circuit Breakers	Inspect		0.1				
		Replace		0.5				
	Utility Outlets	Inspect		0.1				
		Replace		0.3				
0609	Light Assemblies	Inspect		0.2				
		Replace		1.2				
		Repair		0.5				
	Lamps	Inspect	0.1					
		Replace	0.2					
0613	Wiring Harness, Main	Inspect		1.5				
		Test		0.3				
		Replace			0.8			
		Repair			2.0			
	Cover, Intervehicular Receptacle	Inspect		0.1				
		Replace		0.2				
		Repair		0.2				
11	REAR AXLE							
1100	Axle Assemblies	Inspect		0.2				
		Replace			9.0			
		Repair				5.0		
	Front Bogie	Inspect		0.2				
		Replace			8.0			
		Repair				4.0		
	Axle Beam Assemblies, Rear	Inspect		0.2				
		Adjust			0.5			

Section II. MAINTENANCE ALLOCATION CHART

(1) Group number	(2) Component assembly	(3) Maintenance function	(4) Maintenance category* C	O	F	H	D	(5) Tools and equipment
11	REAR AXLE—Continued							
1100	Axle Beam Assemblies, Rear—Continued							
		Replace			4.			
		Repair				2.(		
	Equalizer Beam Assembly	Inspect		0.2				
		Service		0.4				
		Replace			8.			
		Repair				4.(		1
	Torque Rod	Inspect		0.1				
		Replace			0.			
		Repair		1.0				
	Saddle Assembly	Inspect		0.2				
		Repair			1.			
12	BRAKES							
1202	Shoe Assembly	Inspect		0.1				
		Replace		8.0				
		Repair			1.			,8
1208	Actuator Assembly	Inspect		0.1				
		Service		0.2				
		Replace		1.0				
		Repair		0.5				5
	Fail Safe Units	Inspect		0.1				
		Replace		2.0				
		Repair			6.			
	Lines, Fittings, Air	Inspect		0.2				
		Replace		0.4				
		Repair			0.			
	Valves, Air	Inspect		0.1				
		Test			0.			
		Service		0.5				
		Replace		1.0				
	Brake Chamber	Replace		2.0				
		Repair			1.			
	Wedge Assembly	Inspect		0.2				
		Replace		4.0				
		Repair			1.			
13	WHEELS AND SUSPENSION							
1301	Air Lines	Inspect		0.1				
		Test		0.1				
		Replace		0.2				
		Repair			0.			
	Valves (except regulators)	Inspect		0.1				
		Test			0.			
		Replace		0.2				
	Pressure Regulator Valves	Inspect		0.1				
		Test			0.			
		Adjust	0.:					
		Replace		0.2				
	Air Springs	Inspect		0.1				
		Test		0.2				
		Replace		1.5				
1311	Bearing, Wheel	Inspect		0.1				12,13
		Service		0.3				
		Adjust		0.1				
		Replace		0.5				5
	Drum, Brake	Inspect		0.1				
		Replace		1.0				
		Repair			1.			
	Hub	Inspect		0.1				
		Service		0.2				

Section II. MAINTENANCE ALLOCATION CHART

(1) Group number	(2) Component / assembly	(3) Maintenance function	(4) Maintenance category* C	O	F	H	D	(5) Tools and equipment
13	WHEELS AND SUSPENSION — Continued							
1311	Bearing Wheel — Continued							
		Replace		1.0				
		Repair			1.0			
	Seal, Oil	Inspect		0.1				
		Replace		0.5				2.3.4
	Wheel	Inspect		0.5				
		Replace		0.3				6
	Valve Cores and Extensions	Inspect	0.1					
		Replace		0.3				
1313	Tire	Inspect	0.1					
		Replace		0.1				9,10,11
		Repair		0.6				
15	FRAME, TOWING ATTACHMENTS							
1501	Brackets	Inspect		0.1				
		Replace			0.3			
	Frame	Inspect		0.3				
		Repair				8.0		
	Ramps	Inspect		0.1				
		Replace		0.2				
		Repair			2.0			
	Chains, Ramp	Inspect		0.1				
		Replace		0.2				
	Planks, Bumpers	Inspect		0.1				
		Replace		0.3				
1504	Nuts, Spare Wheel Carrier	Inspect		0.1				
		Replace		0.2				
1507	Landing Gear	Inspect		0.1				
		Replace		0.5				
		Repair			2.0			
16	SPRINGS, SHOCK ABSORBERS							
1604	Axle Stop, Lower	Inspect		0.1				
		Replace			0.3			14
	Axle Stop, Upper	Inspect		0.1				
		Replace		0.3				
	Chain Stop	Inspect		0.1				
		Replace		0.2				
	Shock Absorber	Inspect		0.1				
		Replace		0.2				
18	TRAILER BODY							
1808	Stowage Facilities	Inspect		0.1				
		Service		0.3				
		Replace		0.5				
		Repair			0.5			
20	WINCHING COMPONENTS							
2001	Snatch Block	Inspect		0.1				
		Replace		0.5				
	Rollers	Inspect		0.1				
		Service		0.2				
		Replace			0.3			
		Repair			2.0			
22	ACCESSORY ITEMS							
2202	Reflectors	Inspect		0.1				
		Replace		0.2				
2210	Data Plates	Inspect		0.1				
		Replace		0.2				
26	SPECIAL TOOLS							

Section III. TOOL AND TEST EQUIPMENT REQUIREMENTS

Tool or test equipment reference code	Maintenance category	Nomenclature	National NATO stock number	Tool number
1	H	Replacer (For Replacing Bronze Center Bushing, Axles 5 and 6)	5120-00-490-5577	CPR102291
2	O	Handle, Universal Driver (For Inserting Oil Seal in Hub, Axles 5, 6, 7 and 8, Used W/Replacer CPR102289)	5120-00-176-8879	7950113
3	O	Replacer (For Inserting Oil Seal in Hub, Axles 5, 6, 7 and 8, Used W/Handle 7950113)	5120-00-490-5575	CPR102289
	O	Replacer (For Pressing Oil Seal Wiper Onto Axles 5, 6, 7 and 8)	5120-00-490-5576	CPR102290
5	O	Replacer (For Pressing Bearing Cup No. 772 Into Inner Hub or Axles 5, 6, 7 and 8)	5120-00-493-8820	CPR103806
6	O	Socket (13/16 Inch Square, ¾ Inch Female Square Drive, For Torquing Wheel Studs)		GGG-W-660
7	O	Tool (Brake Adjusting)	5120-00-962-0118	S9523
8	O	Tool (Brake Adjusting, Optional)	5120-00-595-8165	2006
9	O	Tire Iron	5120-00-177-6792	T45
10	O	Tire Iron	5120-00-177-6793	T46B
11	O	Tire Iron	5120-00-177-6794	T46C
12	O	Socket (4 3/8 Inch Octagon, 3/4 Inch. Female Square Drive) (For Torquing Wheel Bearing Nuts)	5120-00-490-5578	CPR102292-1
13	O	Socket (4 7/8 Inch Octagon, 3/4 Inch. Female Square Drive) (For Torquing Wheel Bearing Nuts)	5120-00-490-5579	CPR102292-2
14	F	Wrench, Torque 2000 Ft/Lb	5120-00-221-7981	GGG-W-686
15	O	Driver, Seal (For Seating Brake Plunger Seals)	5330-00-498-3893	CPR102256

APPENDIX D

ILLUSTRATED FIELD MANUFACTURE ITEMS LIST

D-1 Introduction

This appendix includes complete specifications for field manufacture of all copper tube assemblies, listed in TM 9-2330-294-24P, Organizational, Direct Support and General Support Maintenance Repair Parts and Special Tool List, that have an MFO-source code.

The combined part number index and bill of materials list includes all items in part number sequence, with cross-references to figures in which items appear, and includes the National Stock Numbers of tubing material necessary for manufacture of items listed.

D-2. General Fabrication Instructions

a. All dimensions specified in figures D-1 through D-20.aving second-place decimals, will be held to tolerances of +0.06 inch.

b. Each tube assembly will be identified by a marker band indicating the tube assembly part number.

c. Marker band, MS 39020-2, is used with 0.375 - inch tube stock.

d. Marker band, MS 39020-3, is used with 0.625 - inch tube stock.

Table D-1. Combined Part Number Index and Bill *of Materials List for* Copper Tube *Assemblies*

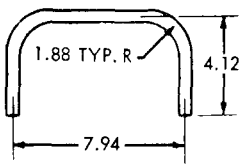
Part number	Fabricate from NSN	Stock dimensions (inches)	Figure number
CPR102920	4710-00-277-5530	0.625 x 0.035 x 15.00	D-1
CPR102921	4710-00-203-3172	0.375 x 0.032 x 22.25	D-1
CPR102922	4710-00-203-3172	0.375 x 0.032 x 25.50	D-1
CPR102923	4710-00-277-5530	0.625 x 0.035 x 37.00	D-1
CPR102924	4710-00-203-3172	0.375 x 0.032 x 33.25	D-1
CPR102925	4710-00-203-3172	0.375 x 0.032 x 16.81	D-1
CPR102927	4710-00-203-3172	0.375 x 0.032 x 31.88	D-2
CPR102928	4710-00-203-3172	0.375 x 0.032 x 9.62	D-2
CPR102929	4710-00-203-3172	0.375 x 0.032 x 13.69	D-2
CPR102930	4710-00-277-5530	0.625 x 0.035 x 34.12	D-2
CPR102931	4710-00-203-3172	0.375 x 0.032 x 28.75	D-2
CPR102932	4710-00-203-3172	0.375 x 0.032 x 49.50	D-2
CPR102933	4710-00-203-3172	9.375 x 0.032 x 18.50	D-3
CPR102934	4710-00-203-3172	0.375 x 0.032 x 26.88	D-3
CPR102935	4710-00-203-3172	0.375 x 0.032 x 16.50	D-3
CPR102936	4710-00-203-3172	0.375 x 0.032 x 43.00	D-3
CPR102937	4710-00-203-3172	0.375 x 0.032 x 37.88	D-3
CPR102938	4710-00-203-3172	0.375 x 0.032 x 40.25	D-3
CPR102939	4710-00-203-3172	0.375 x 0.032 x 28.75	D-4
CPR102940	4710-00-203-3172	0.375 x 0.032 x 21.50	D-4
CPR102941	4710-00-203-3172	0.375 x 0.032 x 9.00	D-4
CPR102942	4710-00-203-3172	0.375 x 0.032 x 20.75	D-4
CPR102943	4710-00-203-3172	0.375 x 0.032 x 29.38	D-4
CPR102945	4710-00-203-3172	0.375 x 0.032 x 40.25	D-4
CPR102946	4710-00-203-3172	0.375 x 0.032 x 39.50	D-5
CPR102976	4710-00-203-3172	0.375 x 0.032 x 24.00	D-5
CPR102978	4710-00-203-3172	0.375 x 0.032 x 6.00	D-5
CPR102979	4710-00-203-3172	0.375 x 0.032 x 12.00	D-5
CPR102980	4710-00-203-3172	0.375 x 0.032 x 49.06	D-5
CPR102983	4710-00-203-3172	0.375 x 0.032 x 13.38	D-6
CPR102984	4710-00-203-3172	0.375 x 0.032 x 7.00	D-6
CPR102985	4710-00-203-3172	0.375 x 0.032 x 11.50	D-6
CPR102986	4710-00-203-3172	0.375 x 0.032 x 18.50	D-6
CPR102987	4710-00-203-3172	0.375 x 0.032 x 24.47	D-6
CPR102999	4710-00-203-3172	0.375 x 0.032 x 8.62	D-7
CPR103000	4710-00-203-3172	0.375 x 0.032 x 20.88	D-7
CPR103001	4710-00-203-3172	0.375 x 0.032 x 10.38	D-7

Table D-1. Combined Part Number Index and Bill of Materials List for Copper Tube Assemblies – Continued

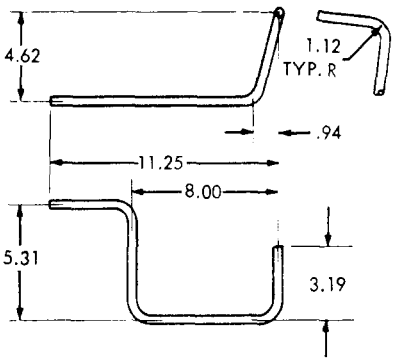
Part number	Fabricate from NSN	Stock dimensions (inches)	Figure number
CPR103002	4710-00-203-3172	0.375 x 0.032 x 13.38	D-7
CPR103005	4710-00-203-3172	0.375 x 0.032 x 20.05	D-7
CPR103006	4710-00-203-3172	0.375 x 0.032 x 11.50	D-7
CPR103007	4710-00-203-3172	0.375 x 0.032 x 7.72	D-8
CPR103014	4710-00-203-3172	0.375 x 0.032 x 16.12	D-8
CPR103015	4710-00-203-3172	0.375 x 0.032 x 23.25	D-8
CPR103016	4710-00-203-3172	0.375 x 0.032 x 46.44	D-8
CPR103017	4710-00-277-5530	0.625 x 0.035 x 44.88	D-8
CPR103018	4710-00-203-3172	0.375 x 0.032 x 21.56	D-8
CPR103029	4710-00-203-3172	0.375 x 0.032 x 10.00	D-9
CPR103030	4710-00-203-3172	0.375 x 0.032 x 19.00	D-9
CPR103032	4710-00-277-5530	0.625 x 0.035 x 32.50	D-9
CPR103040	4710-00-203-3172	0.375 x 0.032 x 31.72	D-9
CPR103058	4710-00-203-3172	0.375 x 0.032 x 32.68	D-9
CPR103061	4710-00-203-3172	0.375 x 0.032 x 35.62	D-9
CPR103062	4710-00-203-3172	0.375 x 0.032 x 29.62	D-10
CPR103072	4710-00-203-3172	0.375 x 0.032 x 29.12	D-10
CPR103074	4710-00-203-3172	0.375 x 0.032 x 36.50	D-10
CPR103075	4710-00-203-3172	0.375 x 0.032 x 38.00	D-10
CPR103076	4710-00-203-3172	0.375 x 0.032 x 28.31	D-10
CPR103080	4710-00-203-3172	0.375 x 0.032 x 9.00	D-11
CPR103081	4710-00-203-3172	0.375 x 0.032 x 36.12	D-11
CPR103082	4710-00-203-3172	0.375 x 0.032 x 26.75	D-11
CPR103083	4710-00-203-3172	0.375 x 0.032 x 40.00	D-11
CPR103084	4710-00-203-3172	0.375 x 0.032 x 17.00	D-11
CPR103085	4710-00-203-3172	0.375 x 0.032 x 28.00	D-11
CPR103089	4710-00-203-3172	0.375 x 0.032 x 20.50	D-12
CPR103090	4710-00-203-3172	0.375 x 0.032 x 34.00	D-12
CPR103093	4710-00-203-3172	0.375 x 0.032 x 31.50	D-12
CPR103094	4710-00-203-3172	0.375 x 0.032 x 7.25	D-12
CPR103095	4710-00-203-3172	0.375 x 0.032 x 29.75	D-12
CPR103098	4710-00-203-3172	0.375 x 0.032 x 35.94	D-12
CPR103123	4710-00-203-3172	0.375 x 0.032 x 39.50	D-13
CPR103129	4710-00-203-3172	0.375 x 0.032 x 30.75	D-13
CPR103130	4710-00-203-3172	0.375 x 0.032 x 42.00	D-13
CPR103131	4710-00-203-3172	0.375 x 0.032 x 31.50	D-13
CPR103136	4710-00-203-3172	0.375 x 0.032 x 37.50	D-14
CPR103139	4710-00-203-3172	0.375 x 0.032 x 35.75	D-14
CPR103140	4710-00-203-3172	0.375 x 0.032 x 24.50	D-14
CPR103141	4710-00-203-3172	0.375 x 0.032 x 15.94	D-14
CPR103142	4710-00-203-3172	0.375 x 0.032 x 39.81	D-14
CPR103149	4710-00-203-3172	0.375 x 0.032 x 33.00	D-15
CPR103150	4710-00-203-3172	0.375 x 0.032 x 23.00	D-15
CPR103151	4710-00-203-3172	0.375 x 0.032 x 22.12	D-16
CPR103152	4710-00-203-3172	0.375 x 0.032 x 45.50	D-15
CPR103153	4710-00-203-3172	0.375 x 0.032 x 43.50	D-15
CPR103154	4710-00-203-3172	0.375 x 0.032 x 48.75	D-16
CPR103155	4710-00-203-3172	0.375 x 0.032 x 32.00	D-16
CPR103166	4710-00-203-3172	0.375 x 0.032 x 45.00	D-16
CPR103171	4710-00-203-3172	0.375 x 0.032 x 15.50	D-17
CPR103172	4710-00-203-3172	0.375 x 0.032 x 36.50	D-17
CPR103173	4710-00-203-3172	0.375 x 0.032 x 24.00	D-17
CPR103186	4710-00-203-3172	0.375 x 0.032 x 24.00	D-17
CPR103198-1	4710-00-203-3172	0.375 x 0.032 x 32.00	D-17
CPR103198-3	4710-00-203-3172	0.375 x 0.032 x 54.12	D-17
CPR103198-7	4710-00-203-3172	0.375 x 0.032 x 36.38	D-17
CPR103198-9	4710-00-203-3172	0.375 x 0.032 x 33.00	D-17
CPR103198-11	4710-00-203-3172	0.375 x 0.032 x 35.00	D-17
CPR103198-13	4710-00-203-3172	0.375 x 0.032 x 26.50	D-17
CPR103198-15	4710-00-203-3172	0.375 x 0.032 x 49.50	D-17
CPR103198-23	4710-00-203-3172	0.375 x 0.032 x 42.00	D-17
CPR103198-25	4710-00-203-3172	0.375 x 0.032 x 17.00	D-17
CPR103207	4710-00-203-3172	0.375 x 0.032 x 24.25	D-17

Table D-1. Combined Part Number Index and Bill of Materials List for Copper Tube Assemblies– Continued

Part number	Fabricate from NSN	Stock dimensions (inches)	Figure number
CPR103208	4710-00-203-3172	0.375 x 0.032 x 16.50	D-18
CPR103217	4710-00-203 3172	0.375 x 0.032 x 17.75	D-18
CPR103219	4710-00-203-3172	0.375 x 0.032 x 42.75	D-18
CPR103220	4710-00-203 3172	0.375 x 0.032 x 34.75	D-18
CPR103222	4710-00-203-3172	0.375 x 0.032 x 63.50	D-18
CPR103223	4710-00-277-5530	0.625 x 0.035 x 8.44	D-19
CPR103229	4710-00-203-3172	0.375 x 0.032 x 63.88	D-19
CPR103230	4710-00-203-3172	0.375 x 0.032 x 24.12	D-19
CPR103231	4710-00-203-3172	0.375 x 0.032 x 34.25	D-19
CPR103232	4710-00-203-3172	0.375 x 0.032 x 34.25	D-19
CPR103233	4710-00-203-3172	0.375 x 0.032 x 17.75	D-19
CPR103234	4710-00-203-3172	0.375 x 0.032 x 47.25	D-20
CPR103265	4710-00-203-3172	0.375 x 0.032 x 16.50	D-20
CPR103267	4710-00-203-3172	0.375 x 0.032 x 24.25	D-20
CPR103708	4710-00-203-3172	0.375 x 0.032 x 23.12	D-20
CPR103712	4710-00-277-5530	0.625 x 0.035 x 25.38	D-20

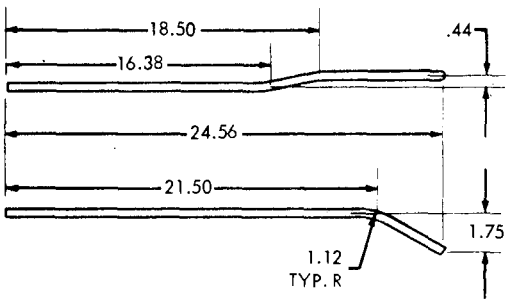


CPR102920

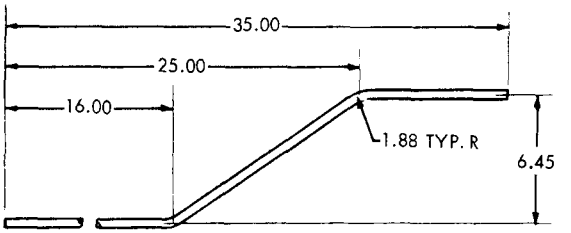


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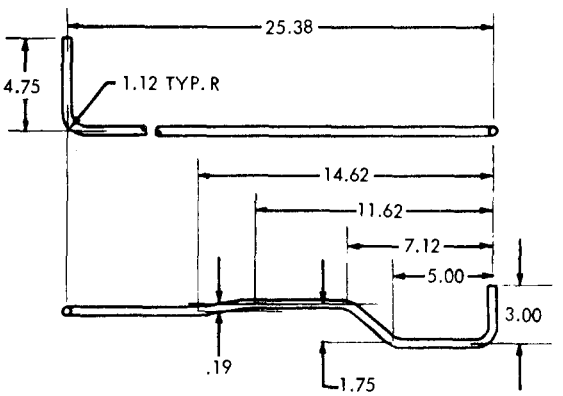
NOTE: ALL DIMENSIONS SHOWN ARE IN INCHES



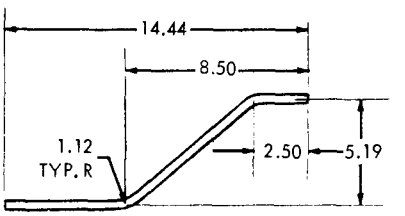
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CPR102923



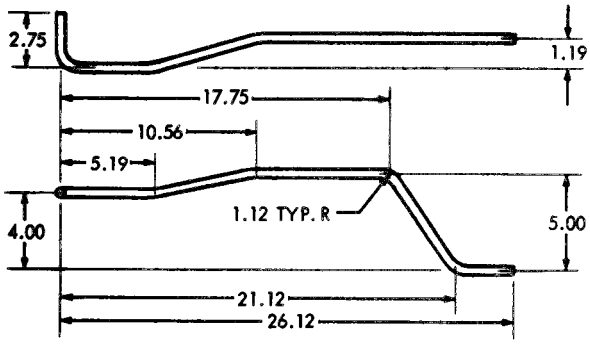
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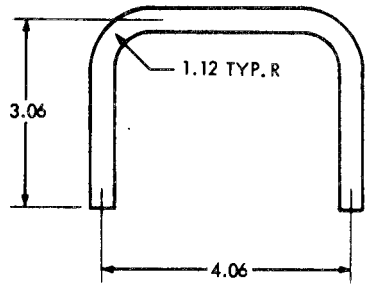
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AT 25531

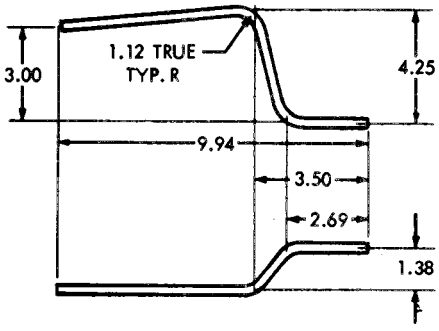
Figure D-1. Tube assembly fabrication details.



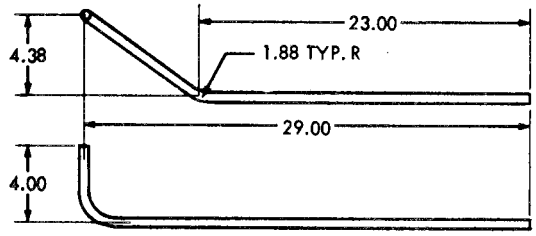
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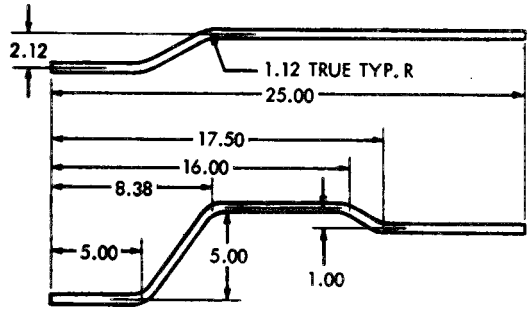
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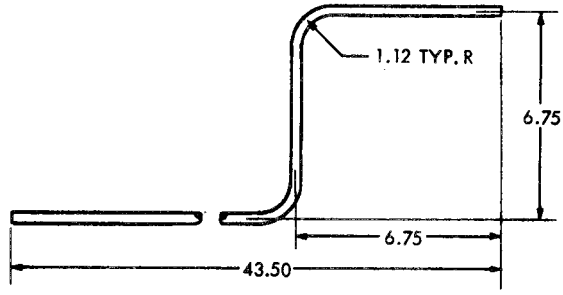
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CPR102930



CPR102931

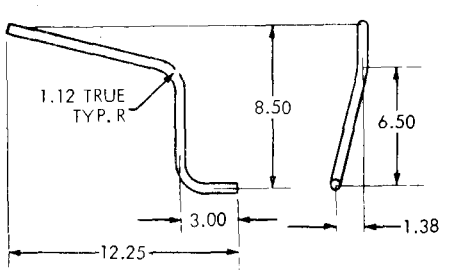


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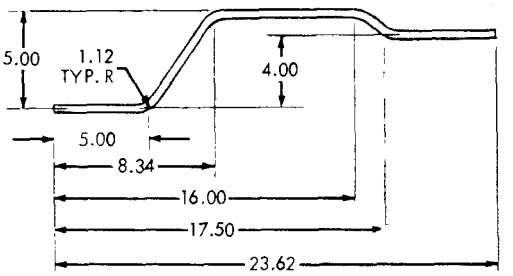
NOTE: ALL DIMENSIONS SHOWN ARE IN INCHES

AT 25532

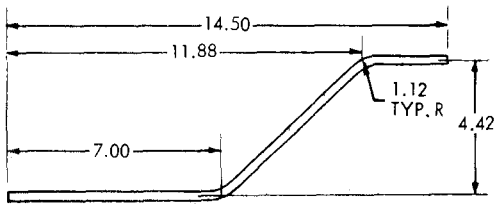
Figure D-2. Tube assembly fabrication details.



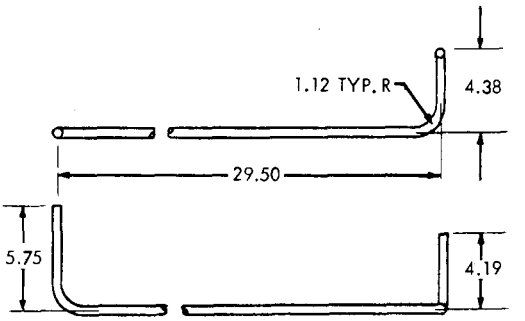
CPR102933



CPR102934

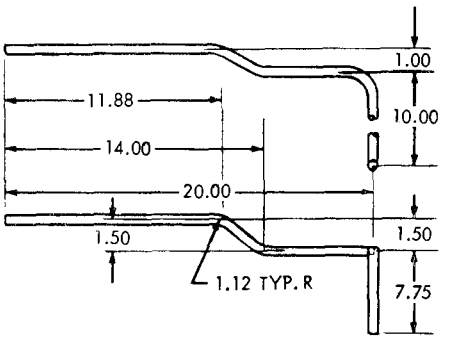


CPR102935

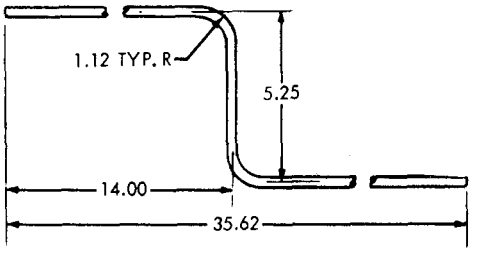


CPR102936

NOTE: ALL DIMENSIONS SHOWN ARE IN INCHES

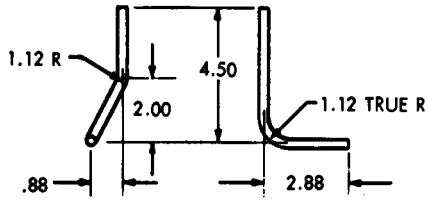


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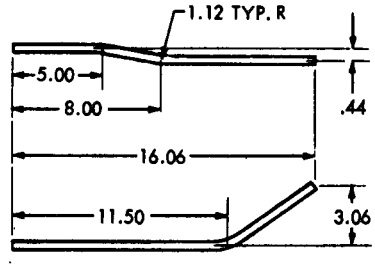


CPR102938 AT 25533

Figure D-3. Tube assembly fabrication details.

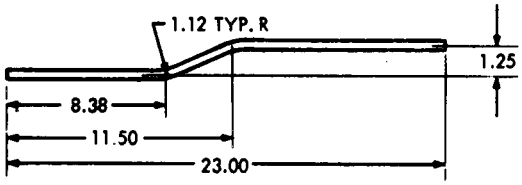


CPR103007

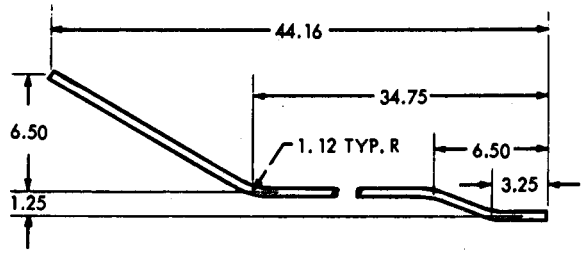


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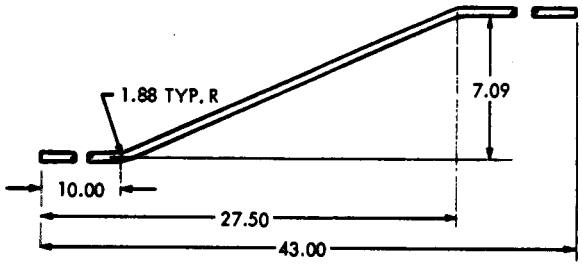
NOTE: ALL DIMENSIONS SHOWN ARE IN INCHES



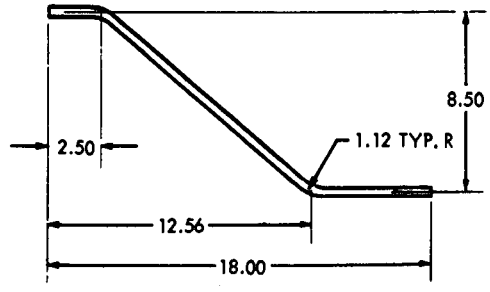
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CPR103016



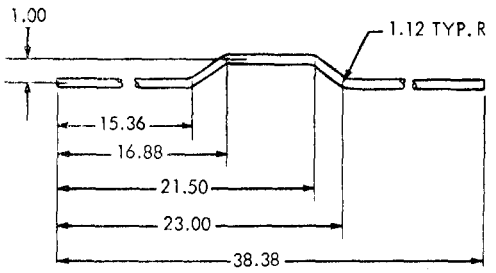
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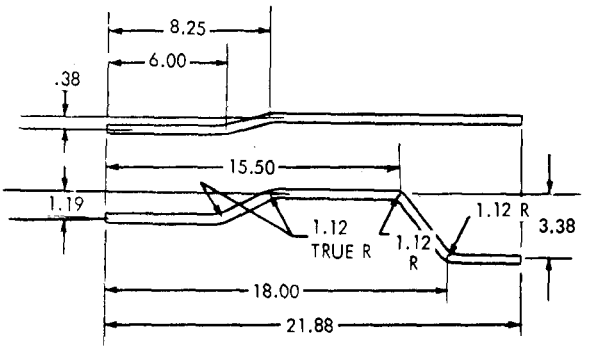
CPR103018

AT 25538

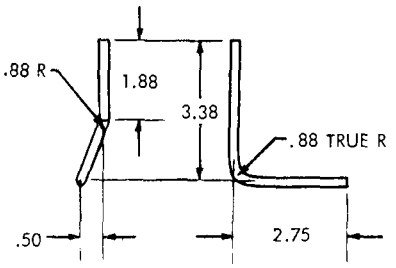
Figure D-4. Tube assembly fabrication details.



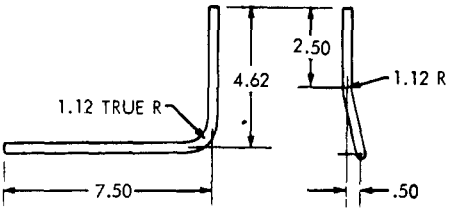
CPR102946



CPR 102976

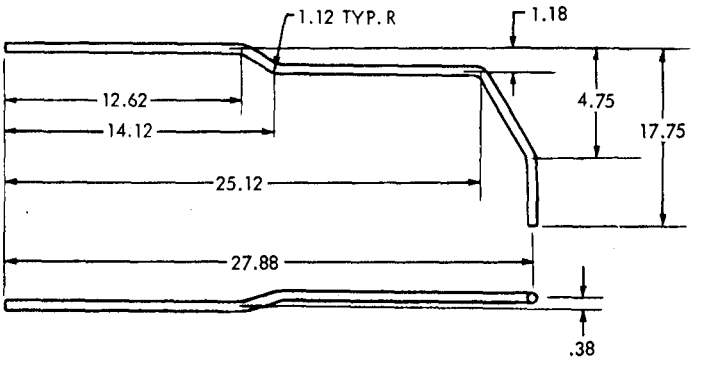


CPR 102978



CPR102979

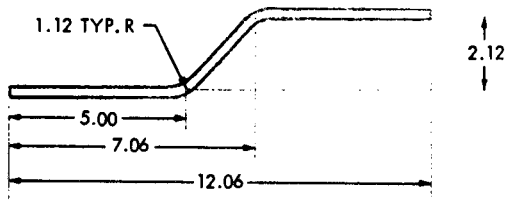
NOTE: ALL DIMENSIONS SHOWN ARE IN INCHES



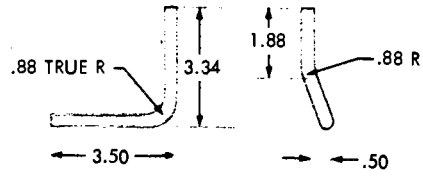
CPR102980

AT 25535

Figure D-5. Tube assembly fabrication details.

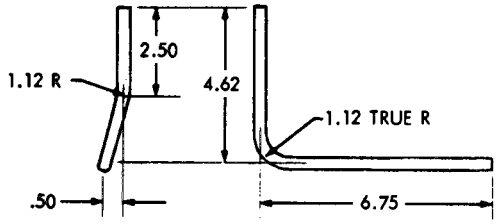


CPR102983

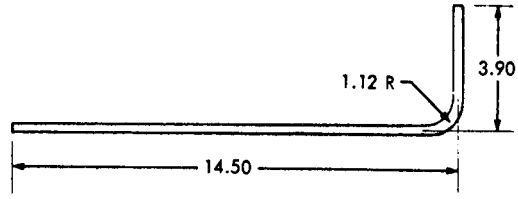


CPR102984

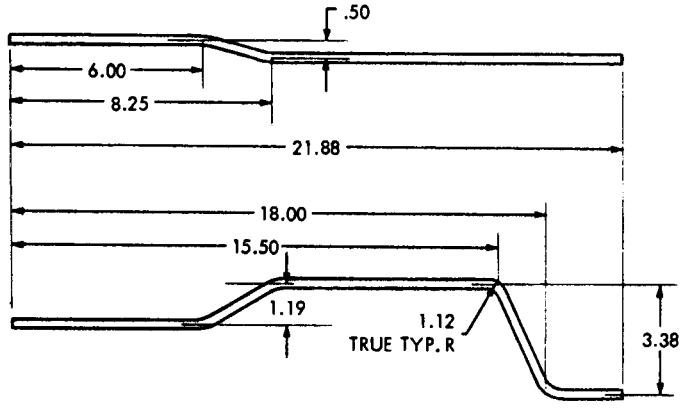
NOTE: ALL DIMENSIONS SHOWN ARE IN INCHES



CPR102985



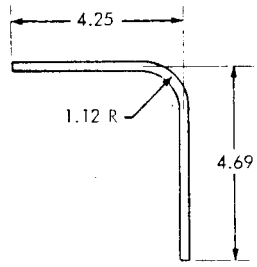
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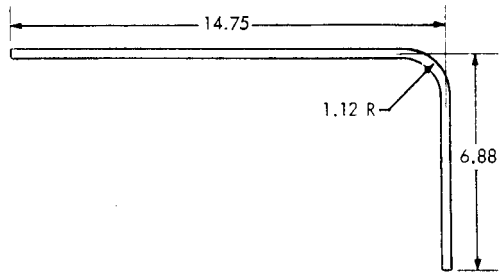
CPR102987

AT 25536

Figure D-6. Tube assembly fabrication details.

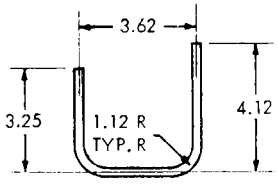


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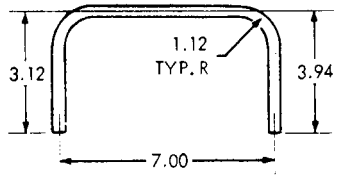


CPR103000

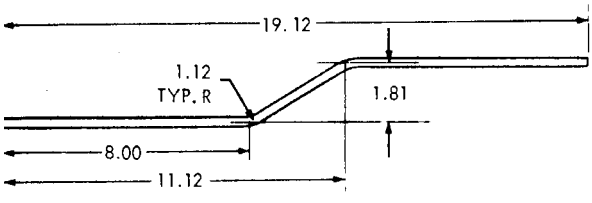
NOTE: ALL DIMENSIONS SHOWN ARE IN INCHES



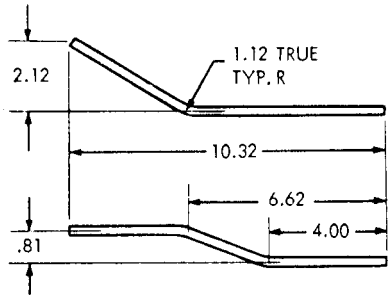
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CPR103002

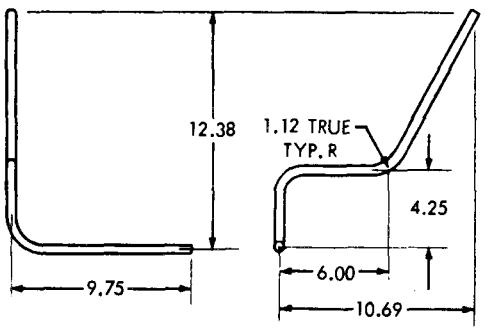


CPR103005

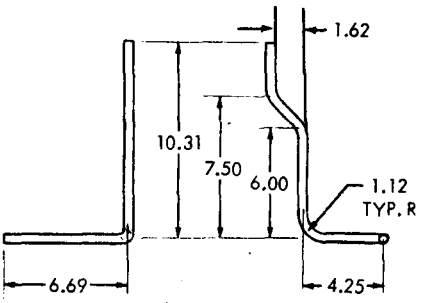


CPR103006 AT 25537

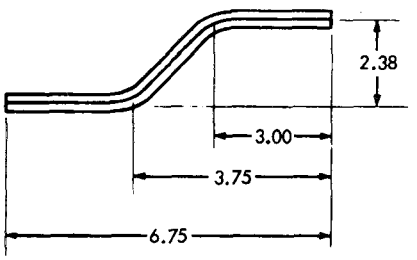
Figure D-7. Tube assembly fabrication details.



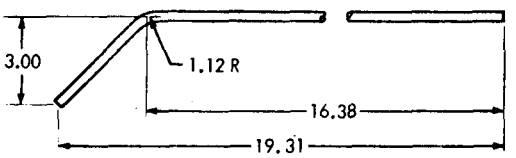
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CPR102940

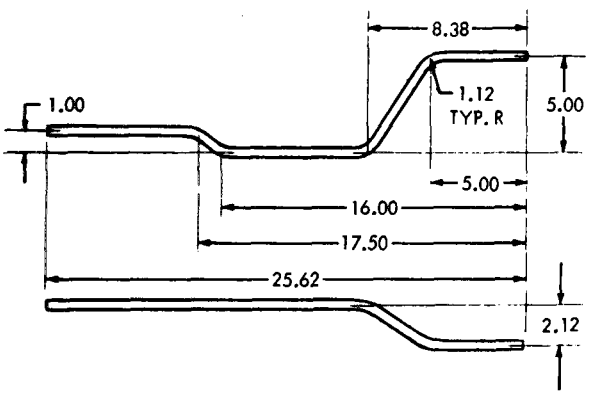


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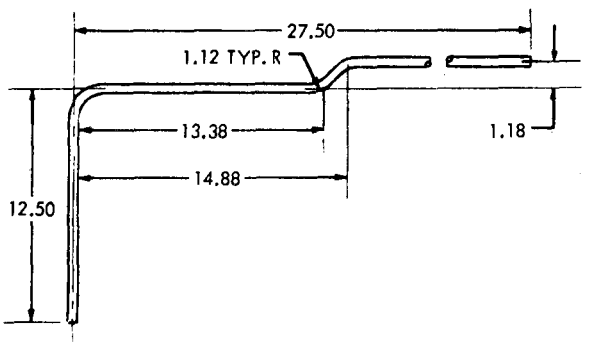


CPR102942

NOTE: ALL DIMENSIONS SHOWN ARE IN INCHES



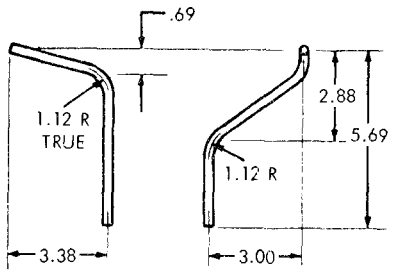
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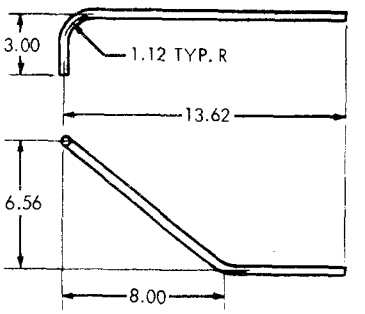
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AT 25534

Figure D-8. Tube assembly fabrication details.

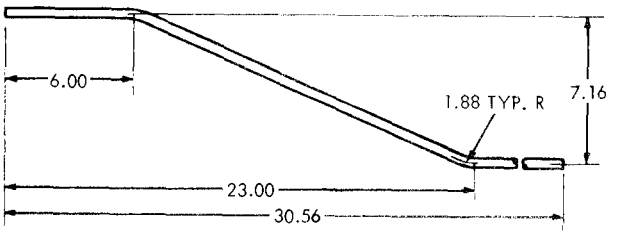


CPR103029

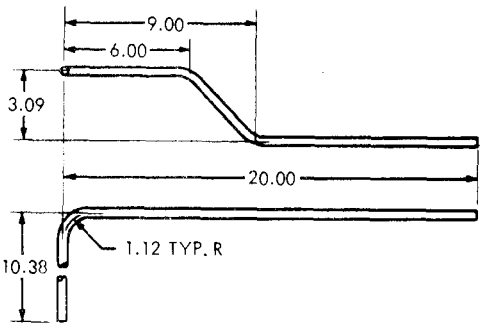


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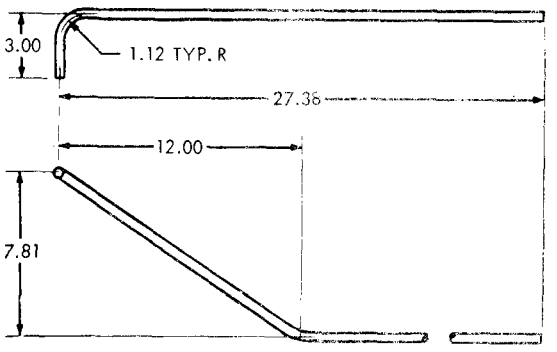
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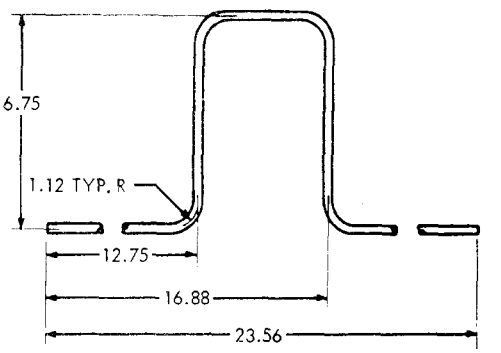
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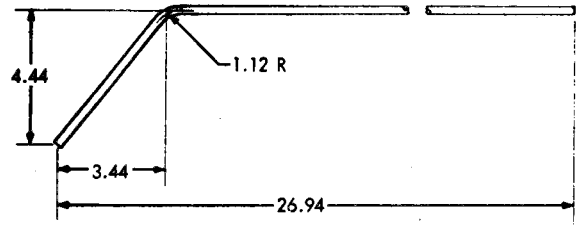
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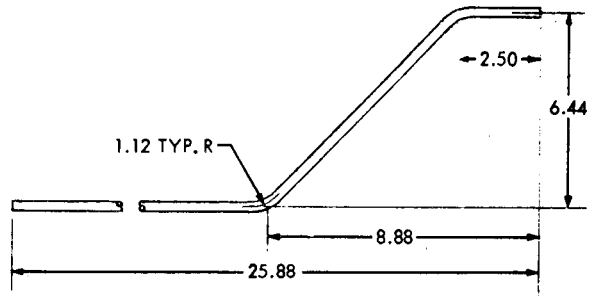
CPR103061

AT 25539

Figure D-9. Tube assembly fabrication details.

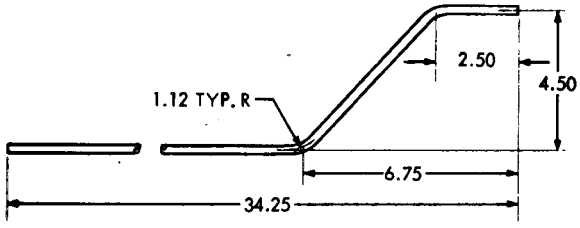


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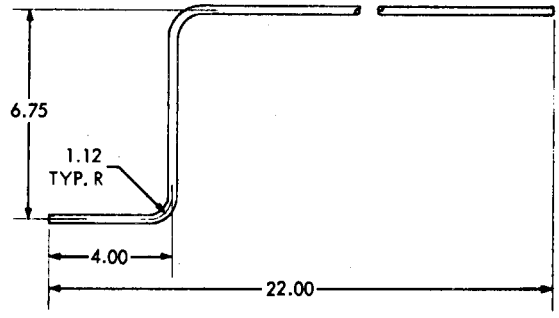


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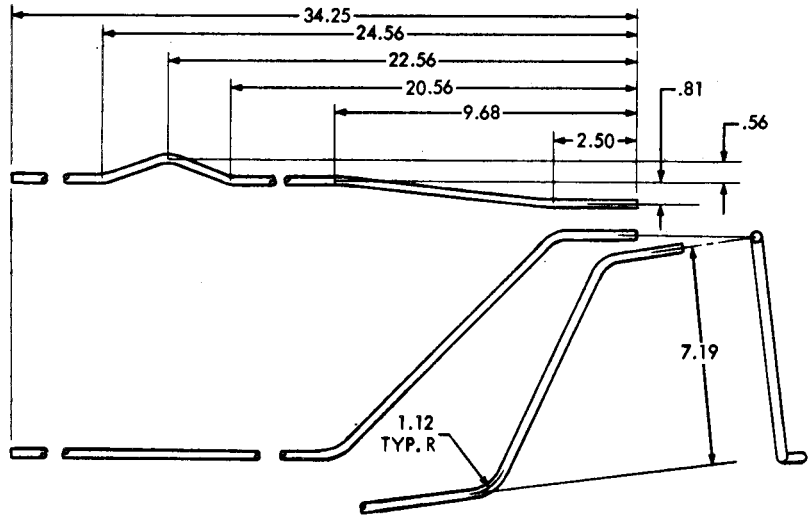
NOTE: ALL DIMENSIONS SHOWN ARE IN INCHES



CPR103074



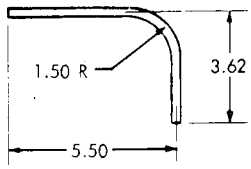
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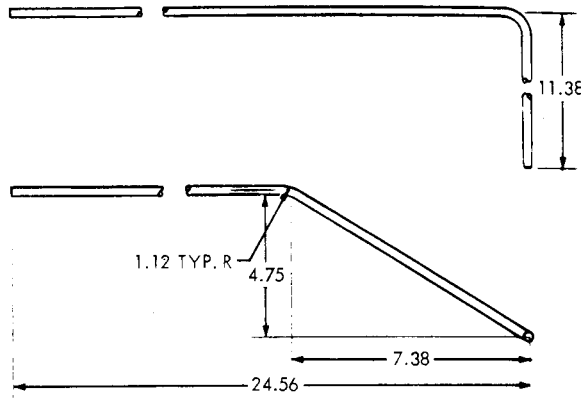
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AT 25540

Figure D-10. Tube assembly fabrication details.

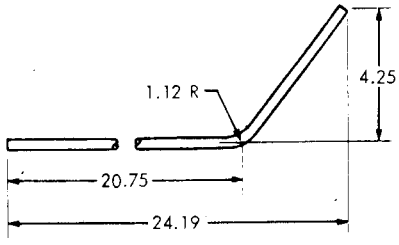


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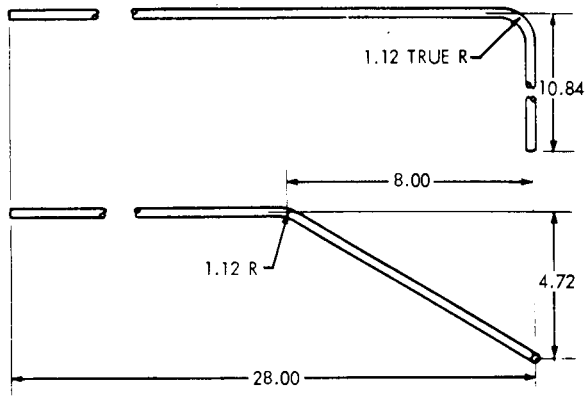


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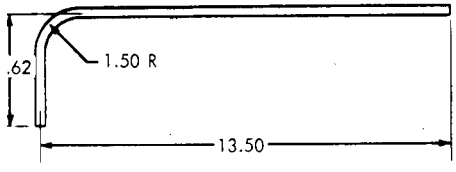
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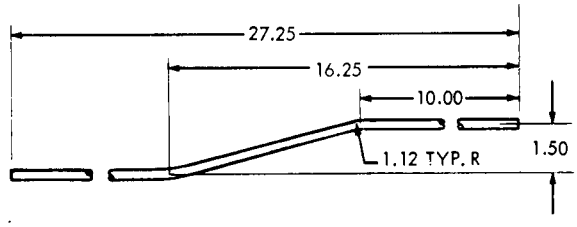
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CPR103083

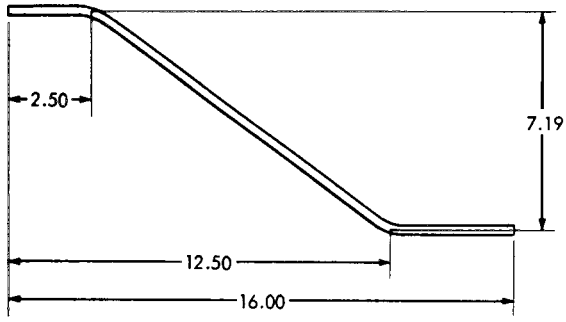


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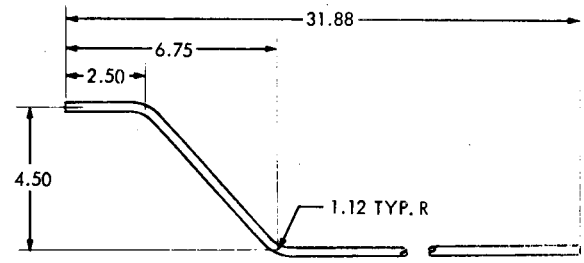


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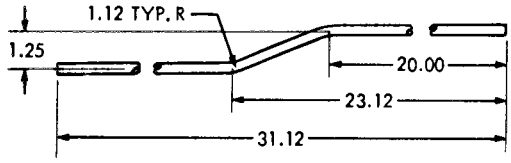
Figure D-11. Tube assembly fabrication details.



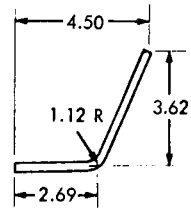
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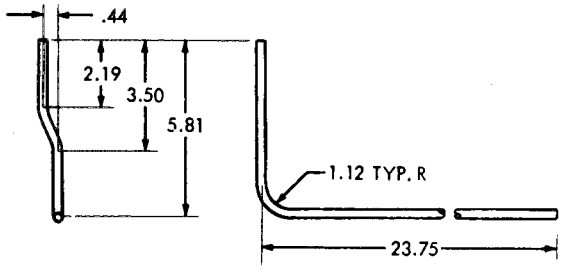


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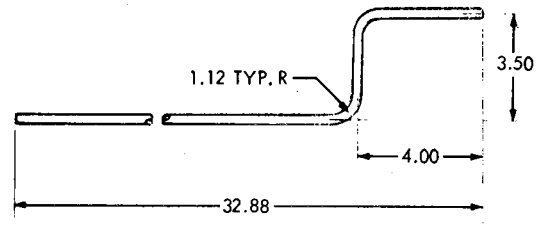


CPR103094

NOTE: ALL DIMENSIONS SHOWN ARE IN INCHES



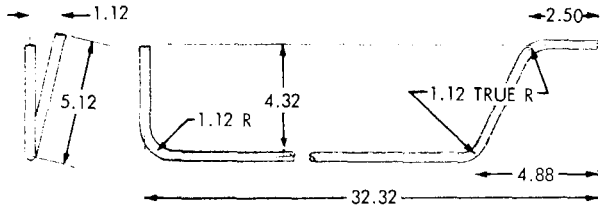
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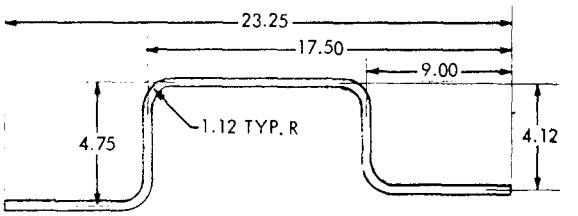
CPR103098

AT 25542

Figure D-12. Tube assembly fabrication details.

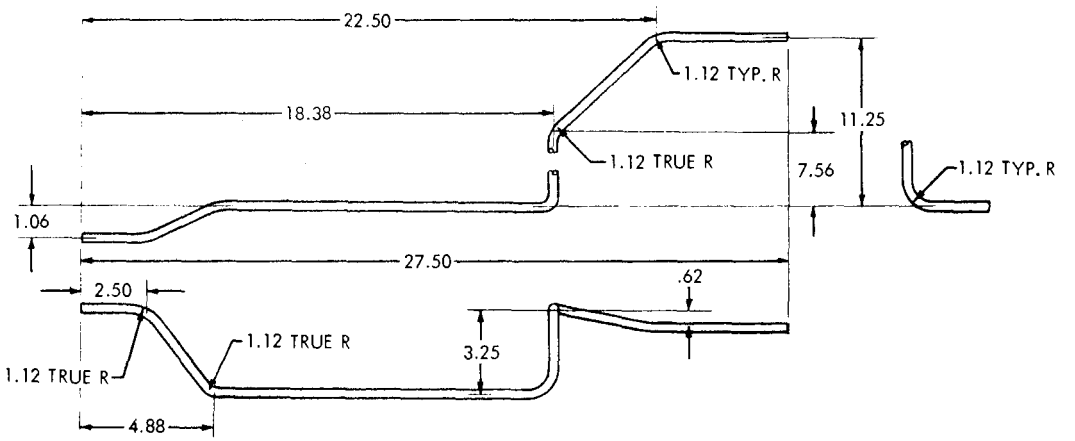


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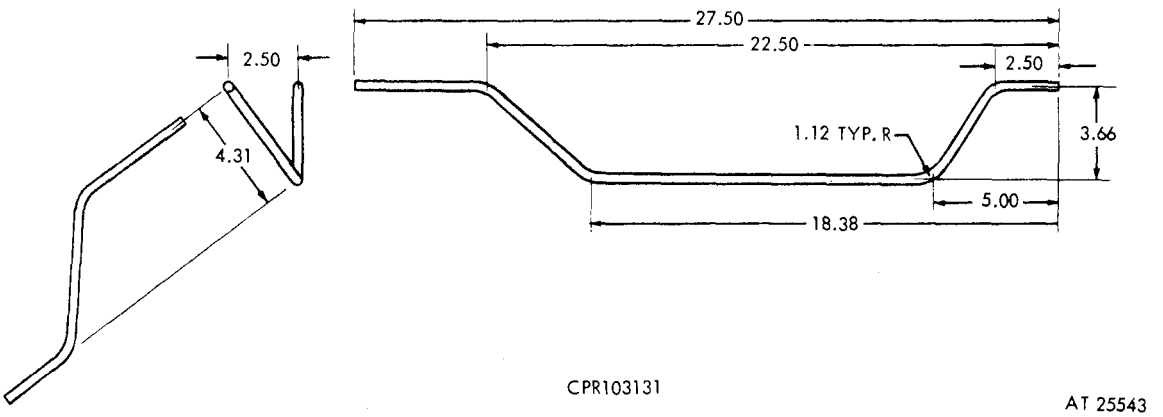


CPR103129

NOTE: ALL DIMENSIONS SHOWN ARE IN INCHES



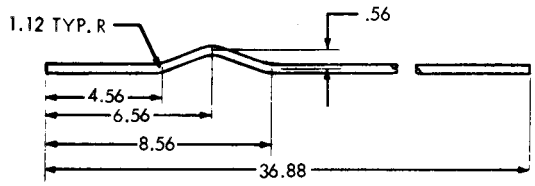
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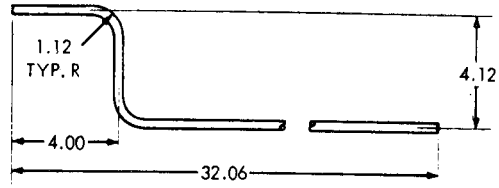
CPR103131

AT 25543

Figure D-13. Tube assembly fabrication details.

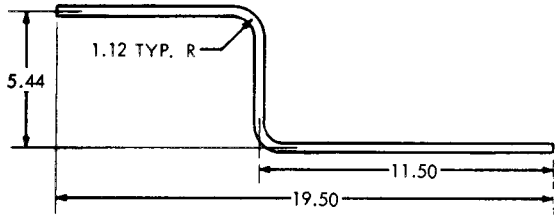


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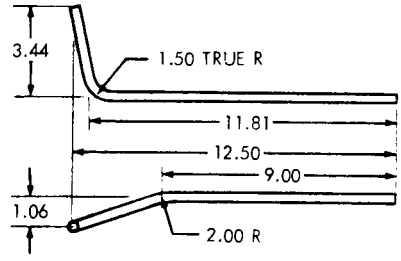


CPR103139

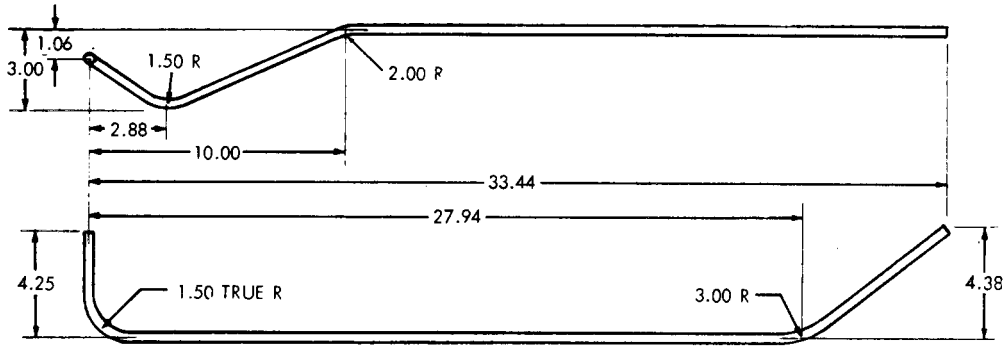
NOTE: ALL DIMENSIONS SHOWN ARE IN INCHES



CPR103140



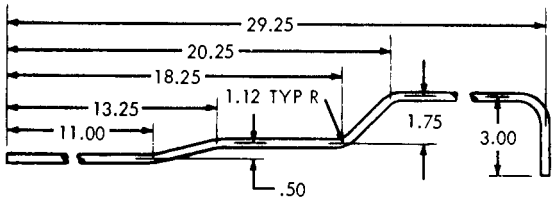
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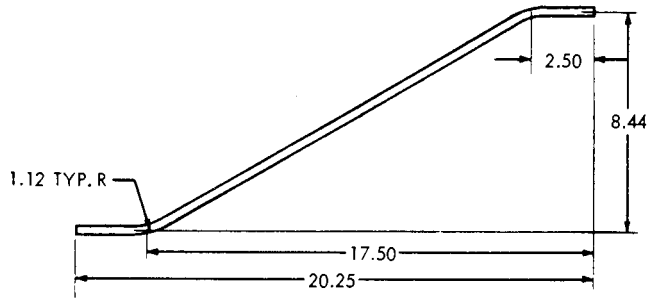
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AT 25544

Figure D-14. Tube assembly fabrication details.

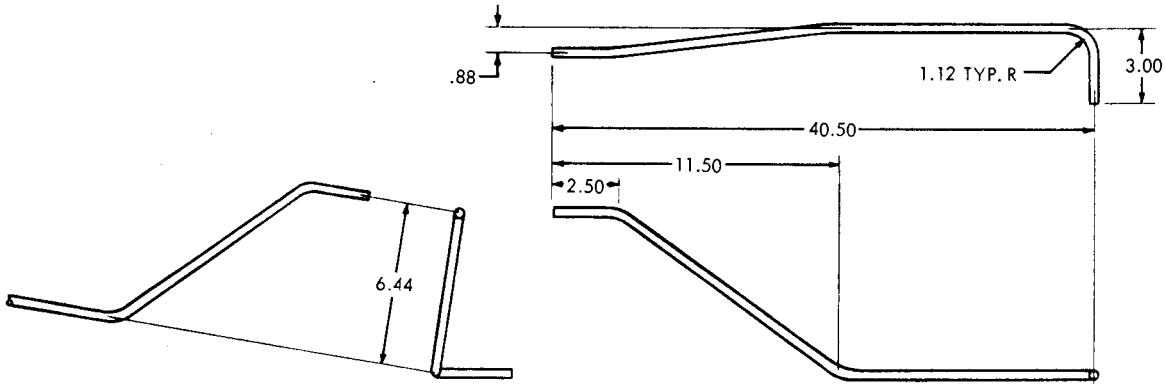


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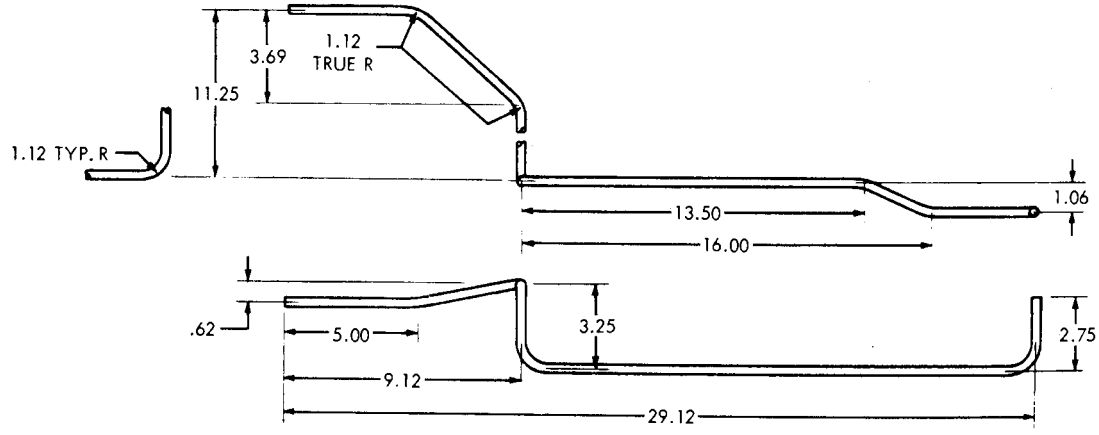


CPR103150

NOTE: ALL DIMENSIONS SHOWN ARE IN INCHES



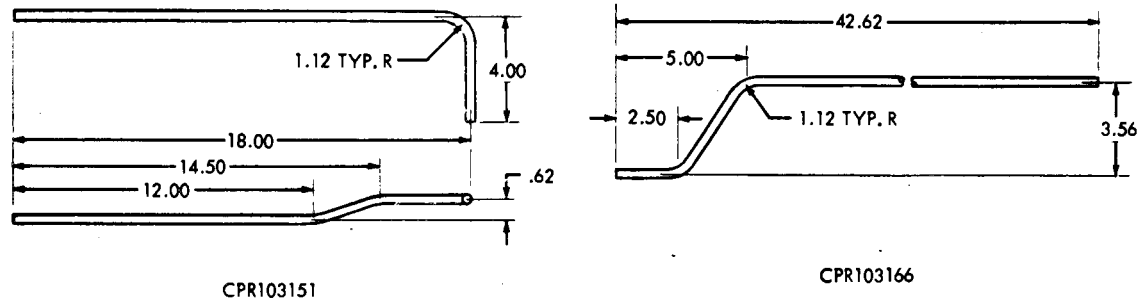
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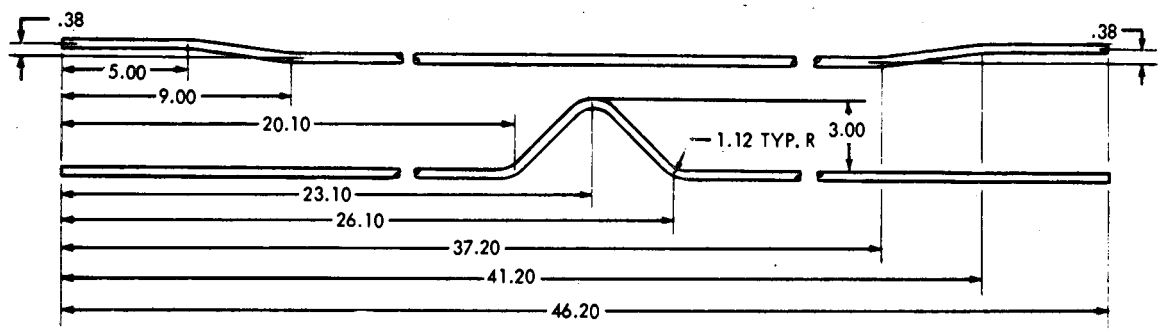
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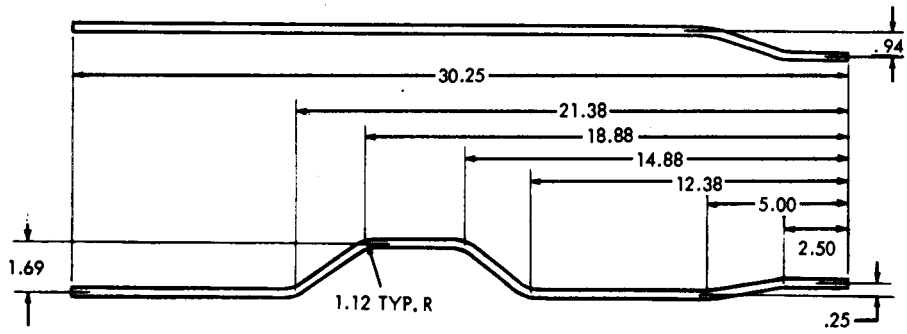
AT 25545

Figure D-15. Tube assembly fabrication details.



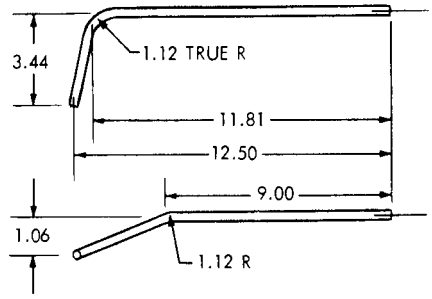
NOTE: ALL DIMENSIONS SHOWN ARE IN INCHES



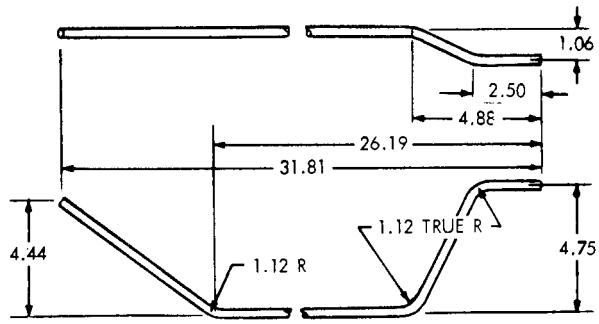


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Figure D-16. Tube assembly fabrication details

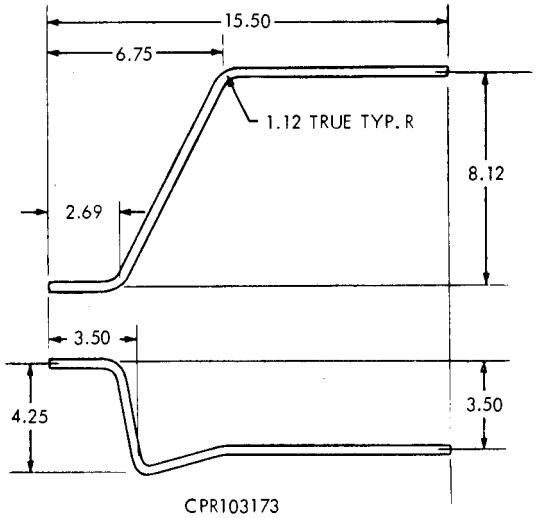


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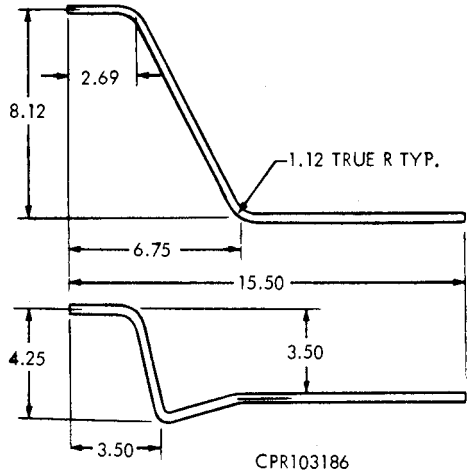


CPR103172

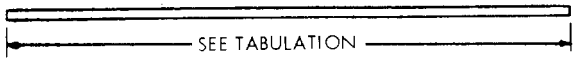
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CPR103173

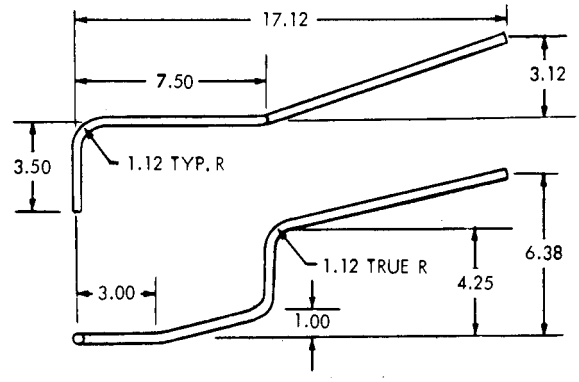


CPR103186



CPR*103198-1, 3, 7, 9, 11, 12, 13, 15, 23, 25

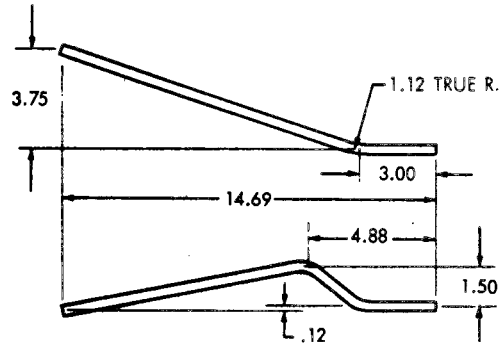
PART NO.	TUBE	± .06
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CPR103198-3	CPR103198-4	54.12
CPR103198-7	CPR103198-8	36.38
CPR103198-9	CPR103198-10	33.00
CPR103198-11	CPR103198-12	35.00
CPR103198-13	CPR103198-14	26.50
CPR103198-15	CPR103198-16	49.50
CPR103198-23	CPR103198-24	42.00
CPR103198-25	CPR103198-26	17.00



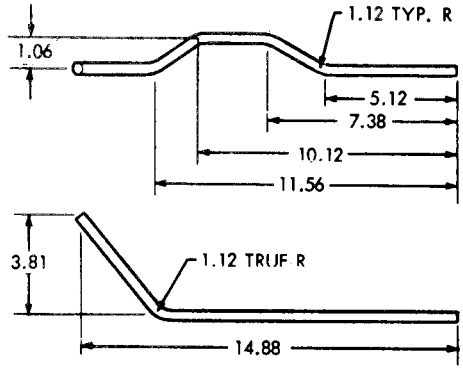
CPR103207

AT 25547

Figure D-17. Tube assembly fabrication details.

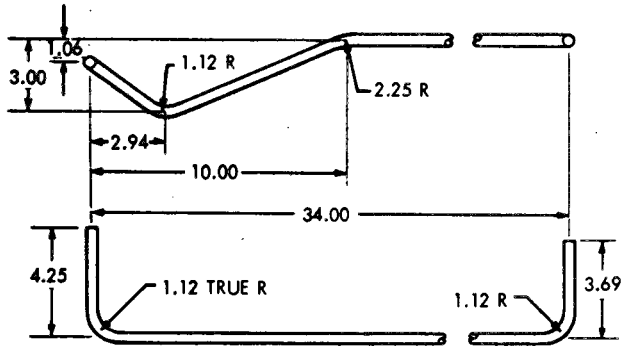


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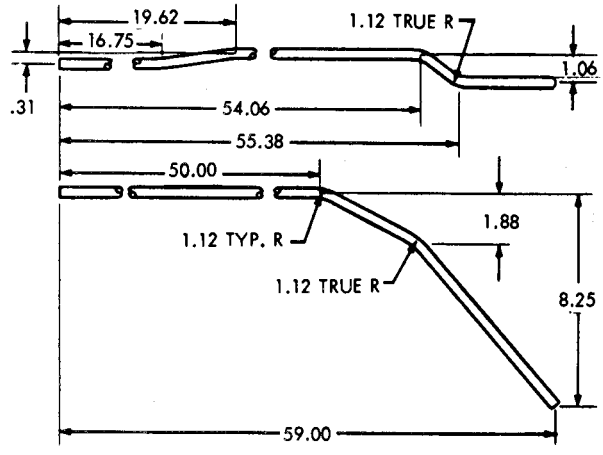


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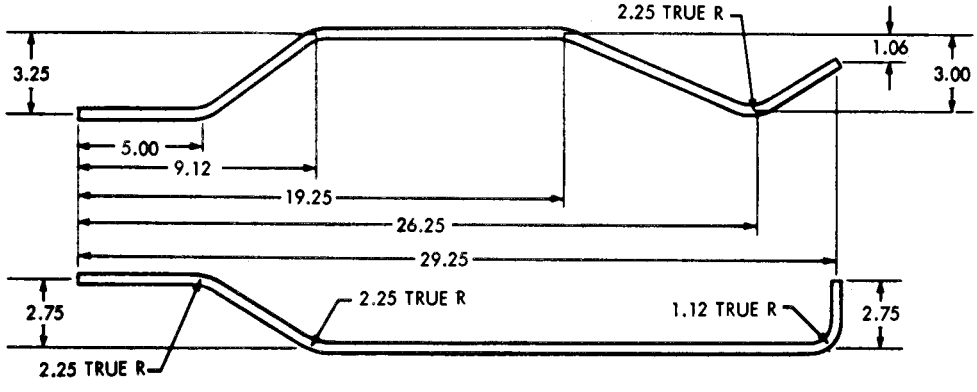
NOTE: ALL DIMENSIONS SHOWN ARE IN INCHES



CPR103219



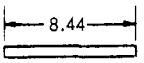
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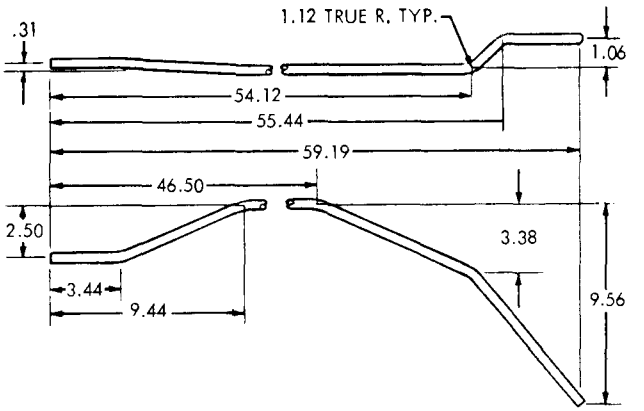
CPR103220

AT 25548

Figure D-18. Tube assembly fabrication details.

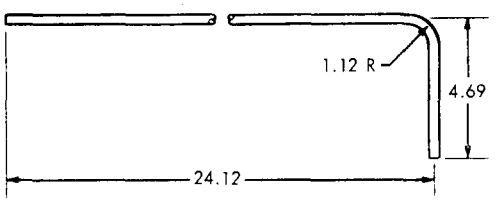


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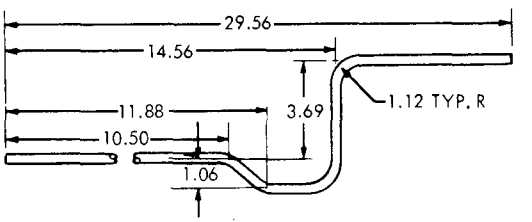


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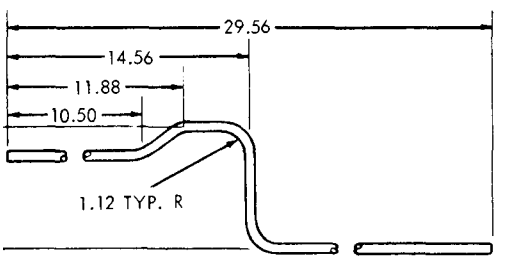
NOTE: ALL DIMENSIONS SHOWN ARE IN INCHES



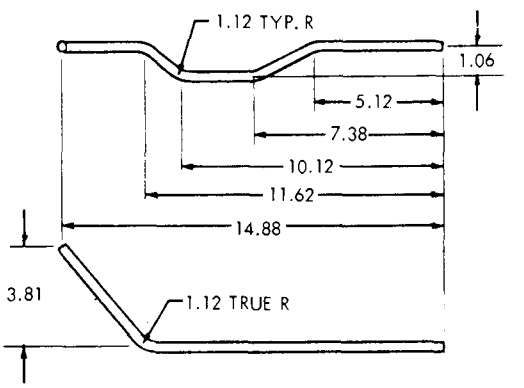
CPR103230



CPR103231



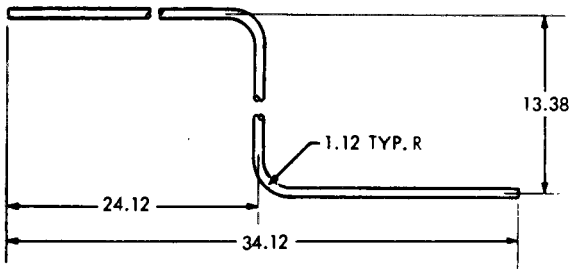
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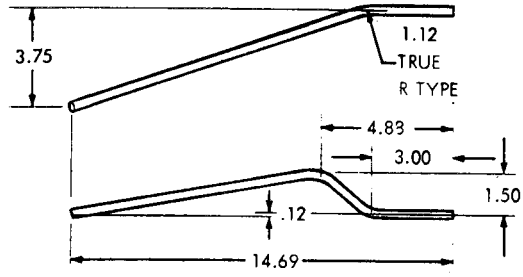
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AT 25549

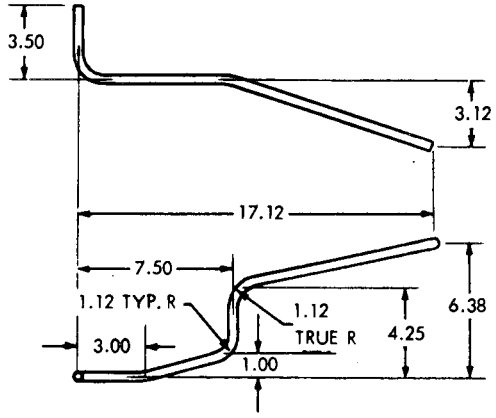
Figure D-19. Tube assembly fabrication details.



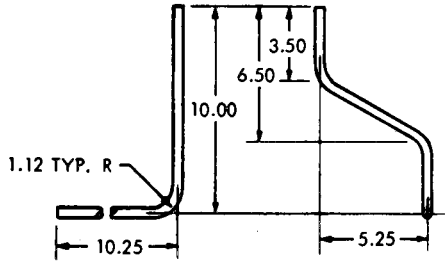
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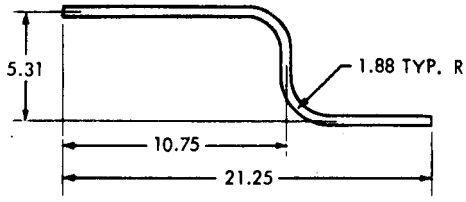
CPR103265



CPR103267



CPR103708



CPR103712

NOTE: ALL DIMENSIONS SHOWN ARE IN INCHES

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Figure D-20 Tube assembly fabrication details

APPENDIX E

BENCH TEST PROCEDURES FOR AIR SYSTEM AIR VALVES

E-1. General

Bench Tests of air system air valves that have been removed from the M747 semitrailer for disposal are to be performed by direct support personnel. It is expected that a percentage of these valves will prove serviceable and will be returned to the supply system. In addition to the operating and leakage tests, valve port openings and threads should be inspected for damage.

E-2. Bench Tests

a. *Emergency Relay Valve (MS53004-1)* (Fig. E-1)

(1) Using suitable air lines and fittings, connect the relay emergency valve assembly to a testing device as shown in figure E-1.

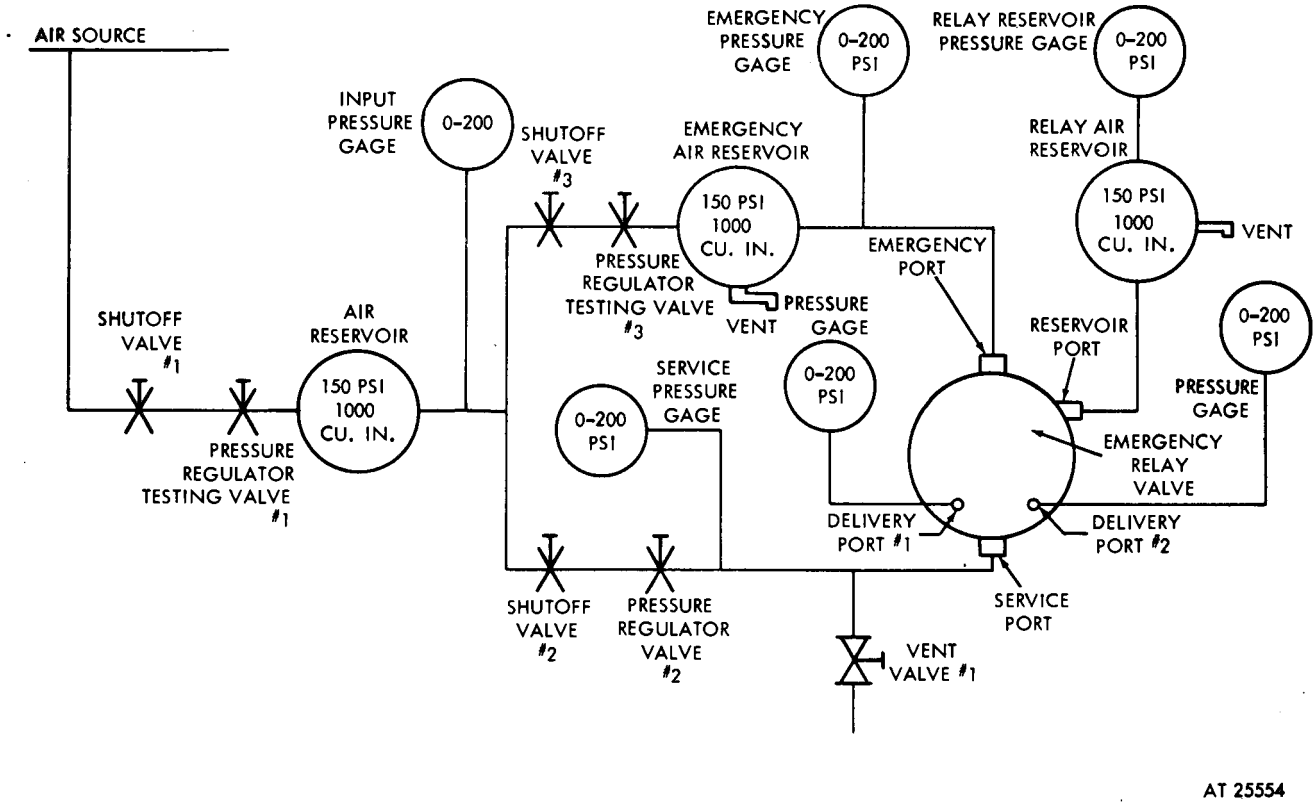


Figure E-1. Bench testing the emergency relay valve.

(2) Plug the two (2) delivery ports not being used.

(3) Adjust pressure regulator valve #1 for input pressure of 125 psi.

(4) Open shutoff valve #3 (shutoff valve #2 closed) and adjust pressure regulator valve #3 for an emergency pressure of 45 psi. Pressure at reservoir port and delivery ports shall be equal to emergency pressure.

(5) Adjust pressure regulator valve #3 for an emergency pressure of 70 psi. Delivery port pressure at both delivery ports shall be 0 psi.

(6) Adjust pressure regulator valve #3 for an emergency pressure of 100 psi. Pressure at reservoir port shall be equal to emergency port pressure.

(7) Close vent valve #1. Open shutoff valve #2 and adjust pressure regulator #2 for service pressure of 50±5 psi. Air pressure at service line shall be greater than delivery port pressure. Pressure dif-

ferential between service port and any delivery port shall not be more than 5 psi.

(8) Reduce service port pressure to 0 psi. Pressure at delivery ports shall be 0 psi.

(9) Close shutoff valve #3 and vent emergency port air reservoir. Pressure at delivery ports shall be equal to reservoir port pressure.

(10) Close emergency air reservoir vent valve. Open shutoff valve #3. Adjust pressure regulator valve #3 until relay reservoir pressure gage reads 100 psi.

(11) Using a suitable solution, test for air leakage at exhaust port. Air leakage shall not exceed l-inch diameter bubble in 5 seconds.

(12) Close vent valve #1 and open shutoff valve #2.

(13) Adjust pressure regulator valve #2 until delivery port pressure reads 60 psi.

(14) Using a suitable solution, test for air leakage at exhaust port. Air leakage shall not exceed a 1-in diameter bubble in 5 seconds.

(15) Reduce service port pressure to 0 psi. Adjust pressure regulator valve #3 for an emergency pressure of 45 psi.

(16) Using a suitable solution, test for air leakage at exhaust port. Air leakage shall not exceed a 1-inch diameter bubble in 5 seconds.

(17) Close shutoff valve #1. Vent emergency and relay air reservoirs.

(18) Open vent valve #1.

(19) Remove emergency relay valve from testing device,

b. Air Suspension Air Control Valve (CPR 102322) (fig. E-2).

(1) Using suitable lines and fittings, connect the air control valve to a testing device as shown in figure E-2, so that handle is up.

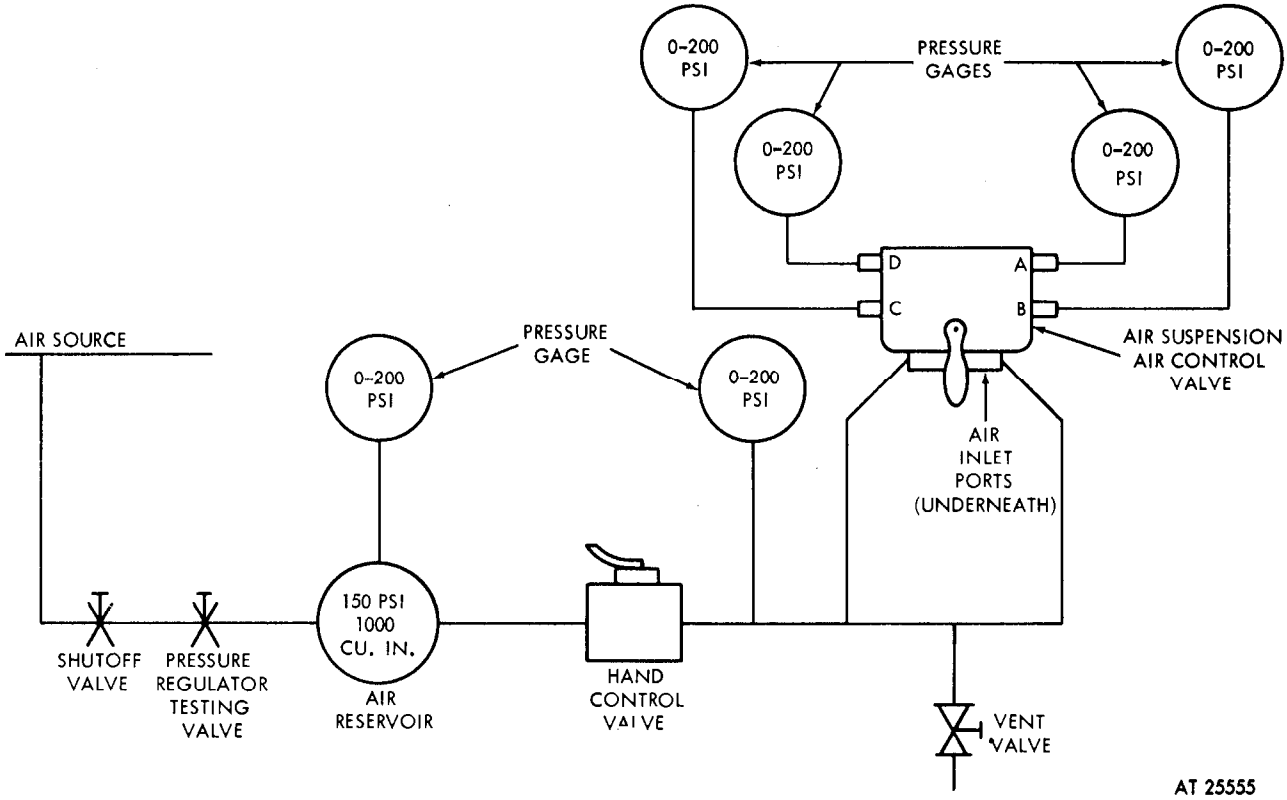


Figure E-2. Bench testing the air suspension air control valve.

(2) Close vent valve, Open hand control valve.

(3) Adjust pressure regulator valve for inlet pressure of 90 psi,

NOTE

Stand clear of hand valve exhaust ports for remainder of test.

(4) Place air control valve handle in position No. 1 (extreme right), Pressure at outlet port "B" shall equal the inlet port pressure, Pressure at outlet ports "A", "C" and "D" shall equal 0 psi.

(5) Using a suitable solution, check for air leakage at exhaust ports, Air leakage shall not exceed a 10-inch diameter bubble in 3 seconds,

(6) Using a suitable solution, check for air

leakage at casting surfaces, gaskets and assembly screws. No leakage is permissible.

(7) Place air control valve handle in position No. 2 (second from extreme right). Pressure at outlet port ''C'' shall equal the inlet port pressure. Pressure at outlet port "A", "B" and "D" shall equal 0 psi.

(8) Place air control valve handle in position No. 3 (in line with valve body). Pressure at outlet port "A" shall equal the inlet port pressure. Pressure at outlet ports "B", "C" and "D" shall equal 0 psi.

(9) Place air control valve handle in position No. 4 (extreme left). Pressure at outlet port "D" shall equal the inlet port pressure. Pressure at outlet Ports''A", "B" and "C" shall equal 0 psi.

(10) Repeat (7).

(11) Open vent valve and adjust pressure regulator valve (inlet pressure) for 0 psi. Remove air control valve from testing device.

c. *Air Suspenison* 15 *psi Regulator Valve (CPR 102285-1)(fig.* E-3).

(1) Using suitable air lines and fittings, connect the air suspension 15 psi regulator valve assembly to a testing device as shown in figure E-3.

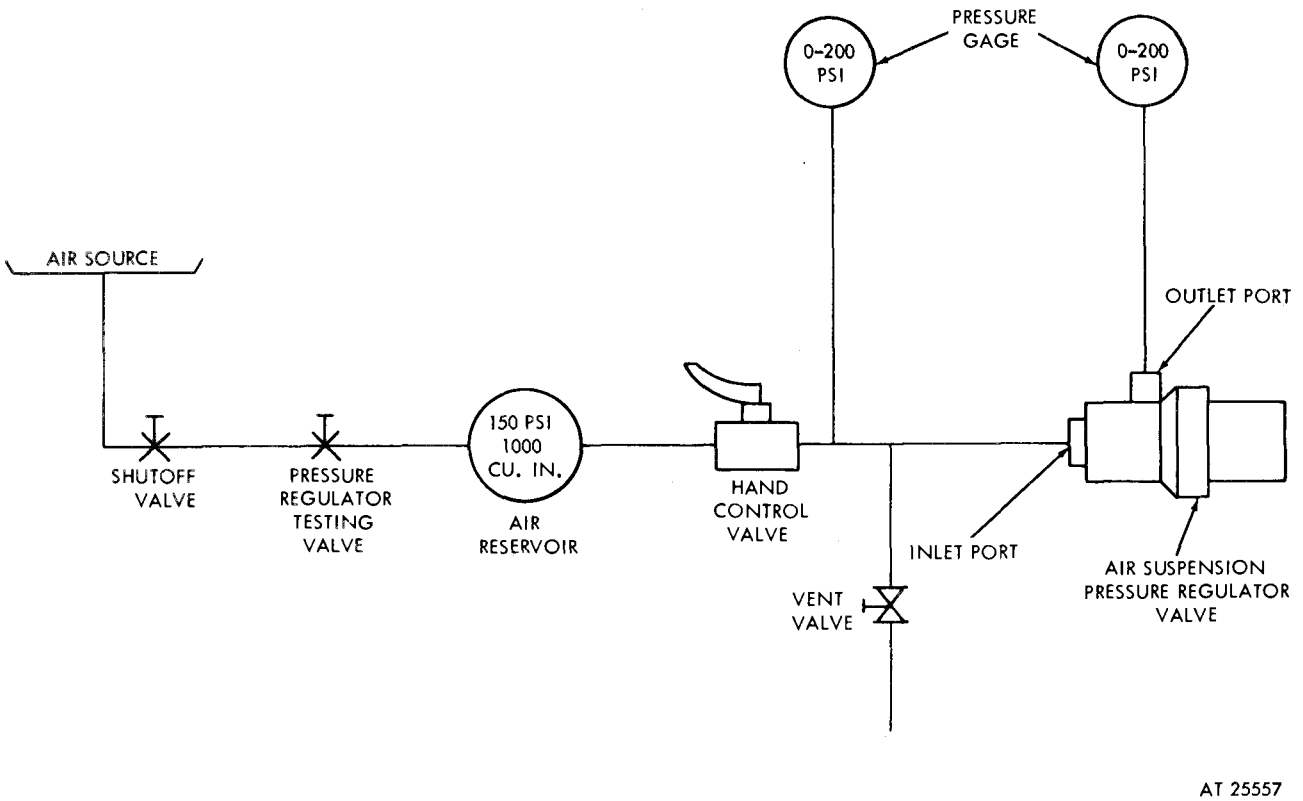


Figure E-3. Bench testing the air suspension pressure regulator valves,

(2) Close vent valve.

(3) Open hand control valve and adjust pressure regulator testing valve for an inlet pressure of 125 psi.

(4) Adjust air suspenison 15 psi regulator valve for an outlet port pressure of 15 psi.

(5) Reduce inlet pressure to 0 psi, then reapply 125 psi to inlet port. Pressure at outlet port shall be 15±5 psi.

(6) Using suitable solution, check air suspension 15 psi regulating valve for air leakage. Air leakage at exhaust port shall not exceed a 1-inch diameter bubble in 6 seconds.

(7) Reduce inlet pressure to 0 psi and remove air suspension 15 psi regulator valve from testing device.

d. Air Suspension 50 psi Regulator Valve (CPR 102285-2) (fig. E-3).

(1) Using suitable air lines and fittings, connect the air suspension 50 psi regulator valve to a testing device as shown in figure E-3.

(2) Close vent valve.

(3) Open hand control valve and adjust pressure regulator testing valve for an inlet pressure of 125 psi.

(4) Adjust air suspension 50 psi regulator valve for an outlet port pressure of 50 psi.

(5) Reduce inlet pressure to 0 psi, then reapply

125 psi to inlet port. Pressure at outlet port shall be 50±5 psi.

(6) Using suitable solution, check air suspension 50 psi regulating valve for air leakage. Air leakage at exhaust port shall not exceed a 1 -inch diameter bubble in 6 seconds.

(7) Reduce inlet pressure to 0 psi and remove air suspension 50 psi regualtor valve from testing device.

e. *Air Suspension 85 psi Regulator Valve (CPR 102285-3) (fig.* E-3).

(1) Using suitable air lines and fittings, connect the air suspension *85* psi regulator valve to a testing device as shown in figure E-3.

(2) Close vent valve.

(3) Open hand control valve and adjust pressure regulator testing valve for an inlet pressure of *125* psi.

(4) Adjust air suspension 85 psi regulator valve for an outlet port pressure of 85 psi.

(5) Reduce inlet pressure to 0 psi, then apply 125 psi to inlet port. Pressure at outlet port shall be 85±5 psi.

(6) Using suitable solution, check air suspension 85 psi regulating valve for air leakage. Air leakage at exhaust port shall not exceed a 1-inch diameter bubble in 6 seconds.

(7) Reduce inlet pressure to 0 psi and remove air suspension 85 psi regulator valve from testing device.

f. Air Suspension 100 psi Regulator Valve (CPR 102285-4) (fig. E-3).

(1) Using suitable air lines and fittings, connect the air suspension 100 psi regualtor valve to a testing device as shown in figure E-3.

(2) Close vent valve.

(3) Open hand control valve and adjust pressure regulator testing valve for an inlet pressure of 125 psi.

(4) Adjust air suspension 100 psi regulator valve for an outlet port pressure of 100 psi.

(5) Reduce inlet pressure to 0 psi, then reapply 125 psi to inlet port. Pressure at outlet port shall be 100±5 psi.

(6) Using suitable solution, check air suspension 100 psi regulating valve for air leakage. Air leakage at exhaust port shall not exceed a 1-inch diameter bubble in 6 seconds.

(7) Reduce inlet pressure to 0 psi and remove air suspension 100 psi regulator valve from testing device.

g. *Auxiliary Air Supply Valve (MS500046-1)* (fig. E-4),

(1) Using suitable air lines and fittings, connect the auxiliary air supply valve to a testing device as shown in figure E-4.

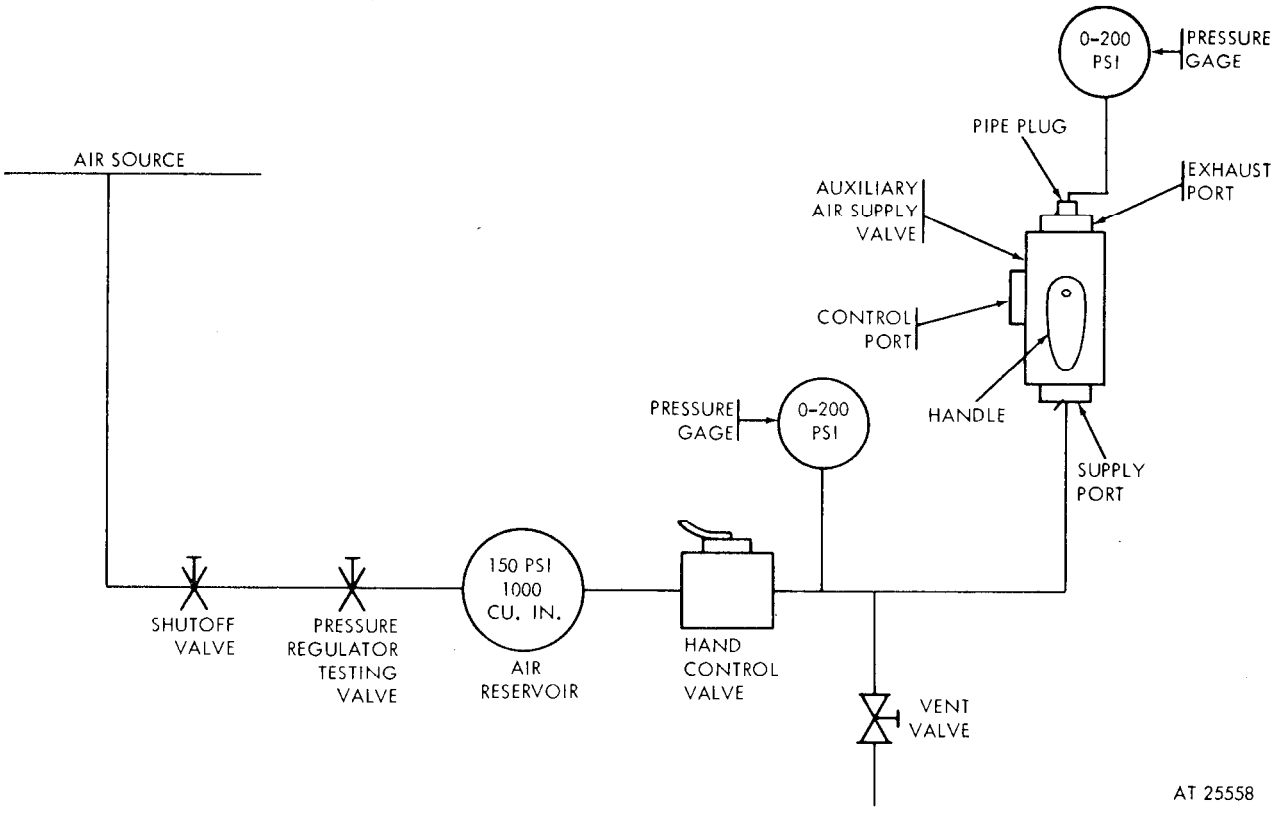


Figure E-4. Bench testing the auxiliary air supply valve.

(2) Close vent valve. Install pipe plug in exhaust port of auxiliary air supply valve.

(39 Turn auxiliary air supply valve handle to "off" position (parallel to .valve body). Open hand control valve and adjust pressure regulator testing valve until supply pressure gage reads 100 psi.

(4) Using suitable solutions, check for air leakage at exhaust port. Air leakage shall not exceed a 1-inch diameter bubble in 3 seconds.

(5) Using a suitable solution, check for air leakage at handle stem. No leakage permissible.

(6) Turn auxiliary air supply valve handle to "on" position (right angles to valve body). Pressure at control port shall equal supply pressure. Using a suitable solution check for air leakage at the exhaust port. No leakage is permissible. Again check for leakage at valve handle stem; leakage should not exceed 1-inch diameter bubble in 3 seconds.

(7) Turn auxiliary air supply valve to "off" position. Pressure at control port shall read 0 psi.

(8) Repeat (4) above.

(9) Close hand control valve. Open vent valve and reduce supply pressure to 0 psi. Remove auxiliary air supply valve from testing device.

h. Low-pressure Warning Switch (MS27152-1) (fig. E-5).

(1) Using suitable air lines, fitting and electrical wiring, connect the low-pressure warning switch to a testing device as shown in figure E-5.

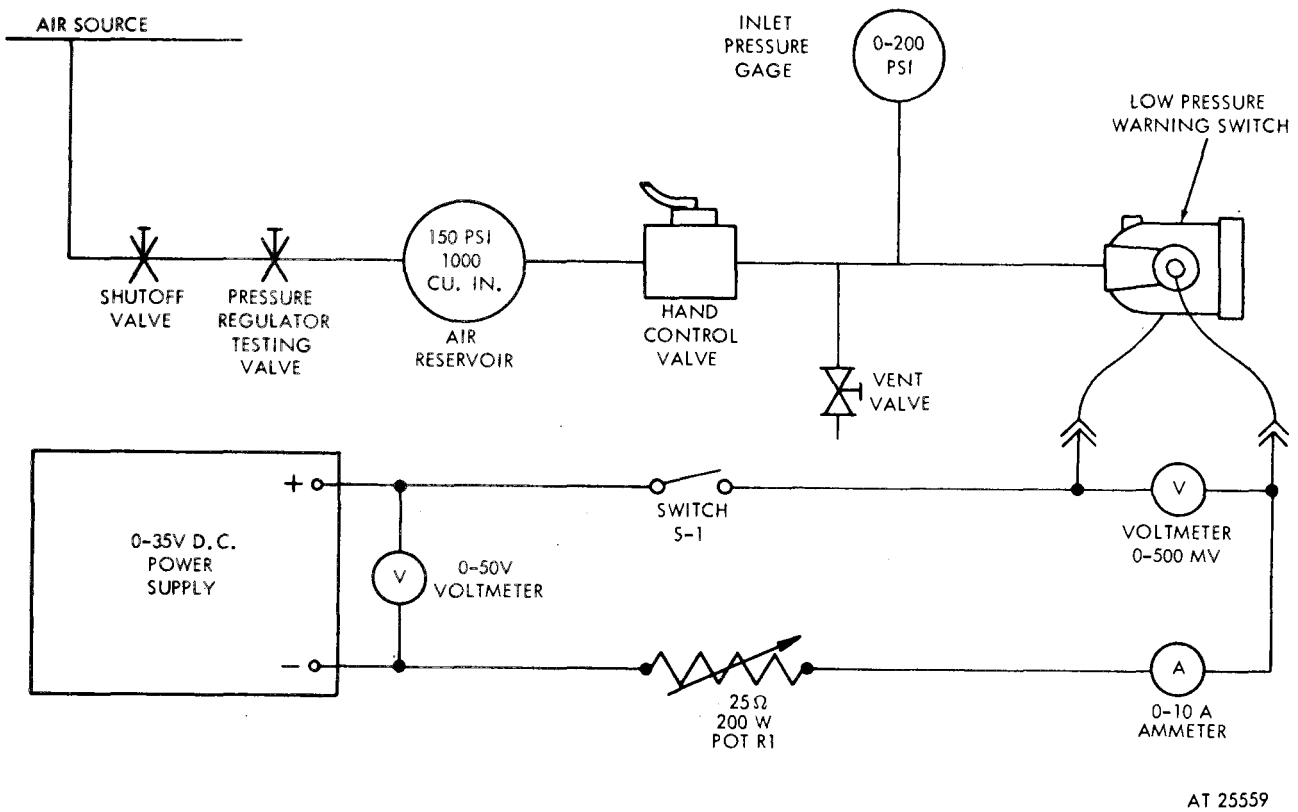


Figure E-5. Bench testing *the low-pressure warning swltch.*

(2) Close vent valve.

(3) Adjust pot R1 for maximum resistance.

(4) Close switch S-1 and adjust power supply for 24 vdc.

(5) Adjust pot R1 until ammeter reads 5 amperes. Voltmeter No. *2* shall not exceed a reading greater than 150 millivolts.

(6) Adjust pot R1 until ammeter reads I ampere.

(7) Open hand valve and adjust pressure regulaor valve for an inlet pressure of 75 psi. Ammeter reading drops to 0 ampere.

(8) Slowly decrease inlet pressure until ammeter reads 1 ampere. Pressure at inlet port shall equal 60±6 psi at the point where the ammeter jumps from 0- to 1-ampere reading.

(9) Open switch S-1 and reduce inlet pressure to 0 psi. Remove low-pressure warning switch from testing device.

i. Manual Shutoff Valve (CPR 102258) (fig. E-6).

(1) Using suitable air lines and fittings, connect the manual shutoff valve assembly to a testing device as shown in figure E-6. Do not connect outlet pressure gage.

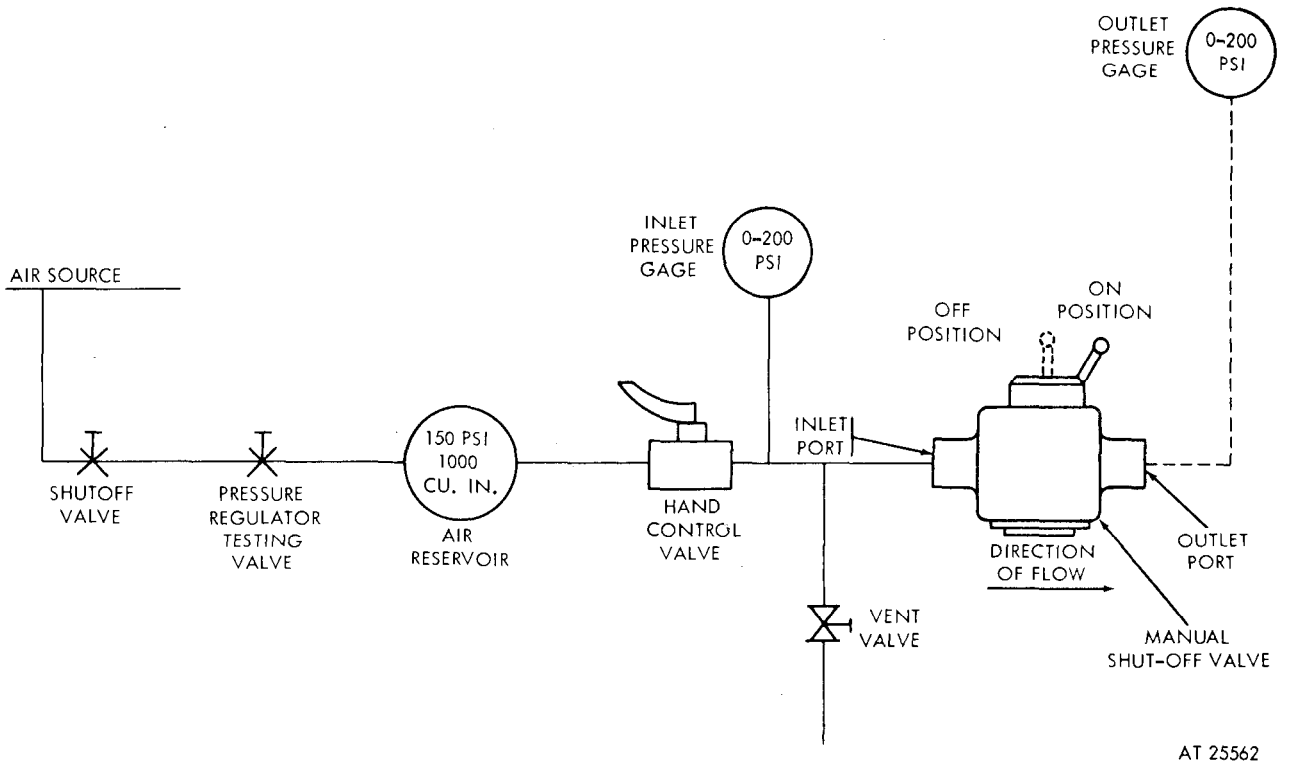


Figure E-6. Bench testing the manual shutoff valve.

(2) Close vent valve.

(3) Place manual shutoff valve handle in "off" position (right angle to valve body).

(4) Open hand control valve and adjust testing regulator for an inlet pressure of 125 psi.

(5) Using a suitable solution, check for air leakage at outlet port. Air leakage shall not exceed a 1-inch diameter bubble in 6 seconds.

(6) Close hand valve and vent inlet pressure. Connect a 0- to 200-psi pressure gage to the outlet port.

(7) Place manual shutoff valve handle in the "ON" position (parallel to valve body).

(8) Close vent valve.

(9) Open the hand control valve and adjust regulator for an inlet" pressure of 125 psi. Outlet pressure shall equal the inlet pressure.

(10) Open vent valve and adjust pressure regulator valve for an inlet pressure of 0 psi. Remove manual shutoff valve from testing device.

j. Two-Way Check Value (CPR 100241) (fig. E-7).

(1) Using suitable air lines and fittings, connect the two-way check valve to a testing device as shown in figure E-7.

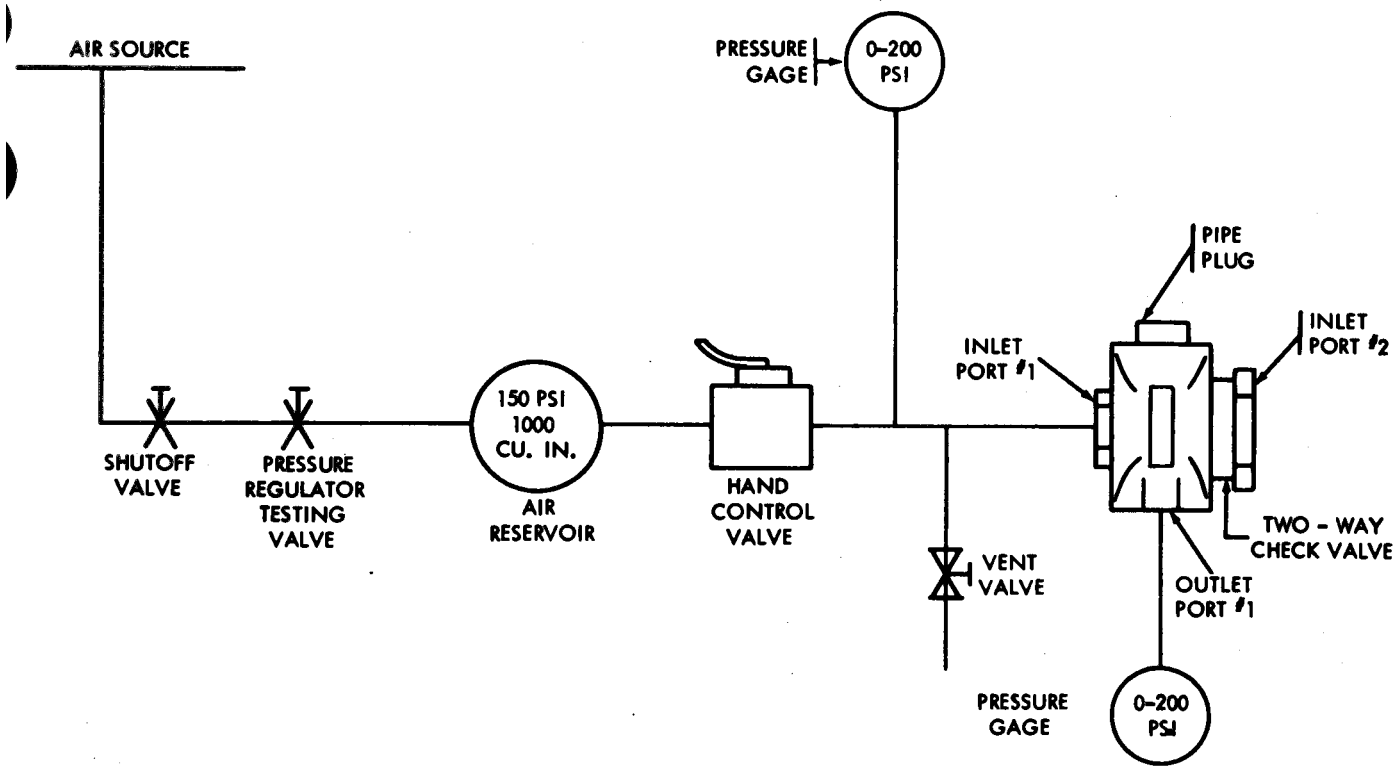


Figure E-7. Bench testing *the one-way* check value.

(2) Close vent valve.

(3) Plug outlet port No. 2 of the two-way check valve.

(4) Open hand control valve.

(5) Adjust pressure regulator testing valve for an inlet pressure of 100 psi. Outlet port No. 1 pressure gage shall be equal to the inlet pressure.

(6) Using a suitable solution, check for air leakage at inlet port No. 2. Air leakage shall not exceed a inch diameter bubble in 3 seconds.

(7) Open vent valve and adjust pressure testing regulator for an inlet pressure of **0** psi. Remove connection from inlet port No. 1 and connect to inlet port No. 2. Close vent valve and repeat steps 3 and 4. (Check air leakage at inlet prot No. 1 instead of inlet port No. 2).

(8) Open vent valve and adjust pressure regulator for an inlet pressure of **0** psi.

(9) Remove plug from outlet port No. 2.

(10) Remove pressure gage from outlet port No. 1 and connect to outlet port No. 2.

(11) Plug outlet port No. 1.

(12) Close vent valve.

(13) Adjust pressure regulator valve for an inlet pressure of 100 psi. Outlet port No. 2 pressure gage shall be equal to the inlet pressure.

(14) Open vent valve and adjust pressure regulator valve for an inlet pressure of **0** psi. Remove two-way check valve from testing device.

(15) Remove plug from outlet port No. 1.

k. One-Way Check Valve (01922157) (fig. E-8).

(1) Using suitable air lines and fittings, connect the one-way check valve outlet port to point “A” as shown in figure E-8.

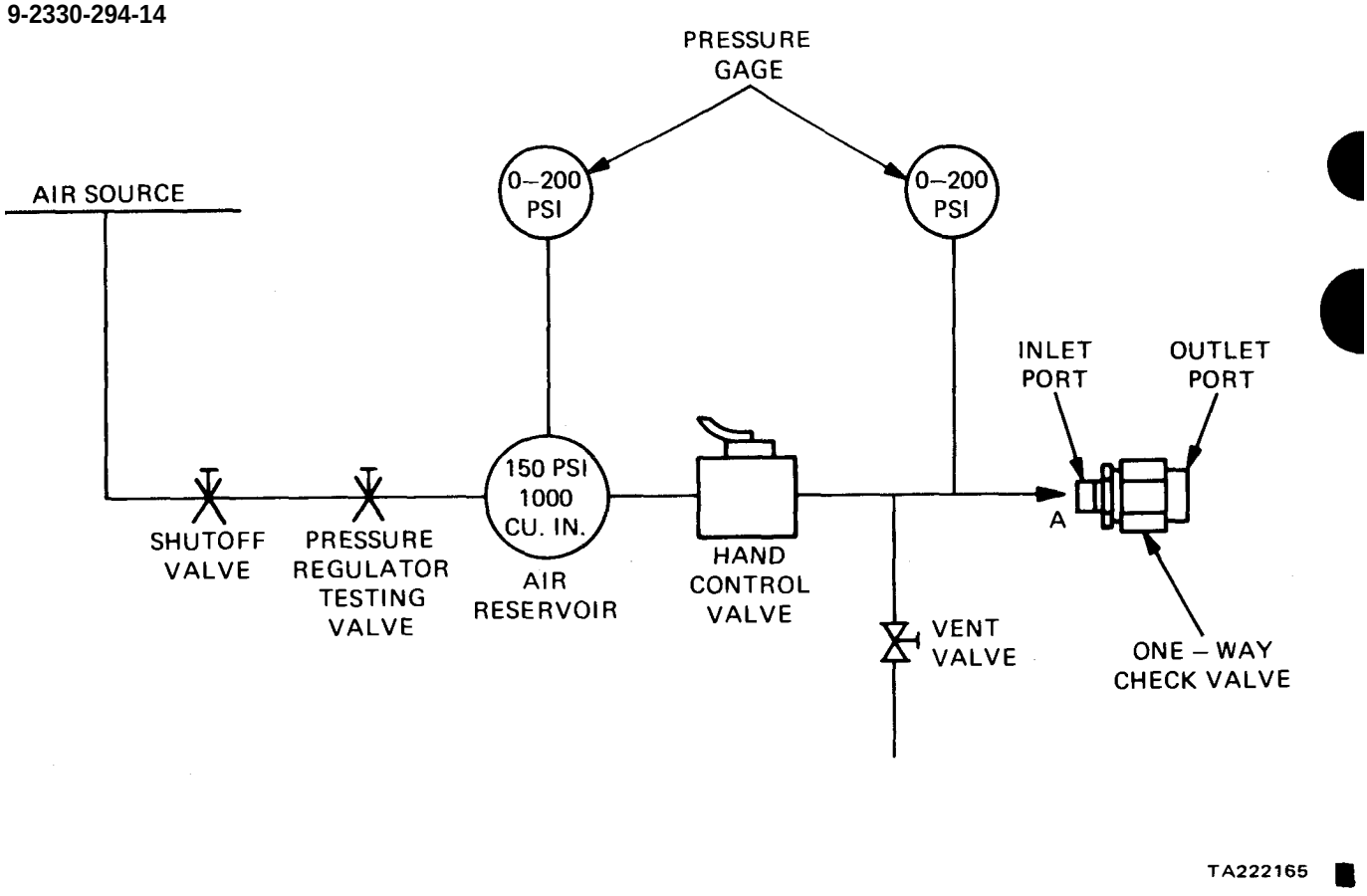


Figure E-8. Bench testing the one-way check valve.

(2) Close vent, valve.

(3) Open hand control valve.

(4) Adjust pressure regulator valve until pressure gage reads 100 psi.

(5) Using suitable solution, check for air leakage at inlet port of one-way check valve. Air leakage shall not exceed a l-inch diameter bubble in 6 seconds.

(6) Close shutoff valve and vent pressure to 0 psi.

(7) Adjust regulator for 0 psi output.

(8) Close vent valve.

(9) Connect point “A” (fig. E-11) to inlet port of one-way check valve.

(10) Open shutoff valve.

(11) With outlet port open, slowly adjust pressure regulator valve and assure air passes through valve. Upon verifying that air passes through valve, adjust pressure regualtor valve for 0 psi.

(12) Plug the outlet port and apply 120 psi to inlet port. Check for leakage at gasket surface. No leakage is permissible.

(13) Close shutoff valve and vent pressure down to 0 psi. Remove one-way check valve from testing device.

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