

TM 5-9218

WAR DEPARTMENT TECHNICAL MANUAL

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SEMI-TRAILER

LOW BED

20-TON

MODEL 20-T

WITH MODEL 20-TD

DOLLY

MAINTENANCE INSTRUCTIONS

GEREGISTREERD

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WAR DEPARTMENT • SEPTEMBER 1944

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SEMI-TRAILER,
LOW BED,
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MODEL 20-T,
WITH MODEL 20-TD
DOLLY

MAINTENANCE INSTRUCTIONS



WAR DEPARTMENT • 25 SEPTEMBER 1944

WAR DEPARTMENT,
Washington 25, D. C., 25 Sept. 1944

TM 5-9218, Semitrailer, Low Bed, 20-Ton, Model 20T with Model 20TD Dolly, is published for the information and guidance of all concerned.

[A. G. 300.7 (24 Aug. 44).]

By order of the Secretary of War:

G. C. MARSHALL,
Chief of Staff.

OFFICIAL:

J. A. ULIO,
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The Adjutant General.

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PART ONE

INTRODUCTION

SECTION I

GENERAL

1. SCOPE.

These instructions are published for the information and guidance of the personnel to whom this equipment is assigned. They contain information on the operation and maintenance of the equipment as well as descriptions of the major units and their functions in relation to the other components of the equipment. They apply only to the 20-Ton Semitrailer which is equipped with a dolly, and are arranged in five parts: Part One—Introduction; Part Two—Operating Instructions; Part Three—Maintenance Instructions; Part Four—Auxiliary Equipment; and Part Five—Repair Instructions.

2. RECORDS.

a. "Maintenance instruction forms and record forms listed and briefly described in the following subparagraphs will be used in the maintenance of this equipment.

b. WD AGO Form No. 6—Duty Roster. This form slightly modified will be used for recording operation and scheduling lubrication and preventive maintenance services at the proper intervals on individual items of equipment.

c. WD AGO Form No. 48—Driver's Trip Ticket and P. M. Service Record. This form will be used by equipment operators for reporting the accomplishment of daily preventive maintenance services and for reporting any deficiencies observed on the equipment during operation.

d. War Department Lubrication Order. This is a maintenance instruction form and is intended to instruct operators and personnel of the using organization as to the proper lubricants to be used and intervals to follow in lubricating individual items of equipment.

e. War Department Preventive Maintenance Services Engineer Equipment. This is a maintenance instruction form and prescribes daily maintenance services to be performed by the operator as well as the weekly and monthly services to be performed by mechanics of the using organization in providing proper maintenance on individual items of equipment.

f. WD AGO Form No. 464—Preventive Maintenance Services and Technical Inspection Work Sheet for Engineers Equipment. This form is used by personnel of the using organization and higher echelons for reporting the results of preventive maintenance services, command, and technical inspections.

g. WD AGO Form No. 7353—Spot Check Inspection Report for All Motor Vehicles. This form may be used as a check list for items to be inspected during spot check inspections in lieu of WD AGO Form No. 464.

h. WD AGO Form No. 478—MWO AND Major Unit Assembly Replacement Record. Major repairs or rebuilding, the replacement of major unit assemblies and the accomplishment of equipment modifications will be recorded on this form.

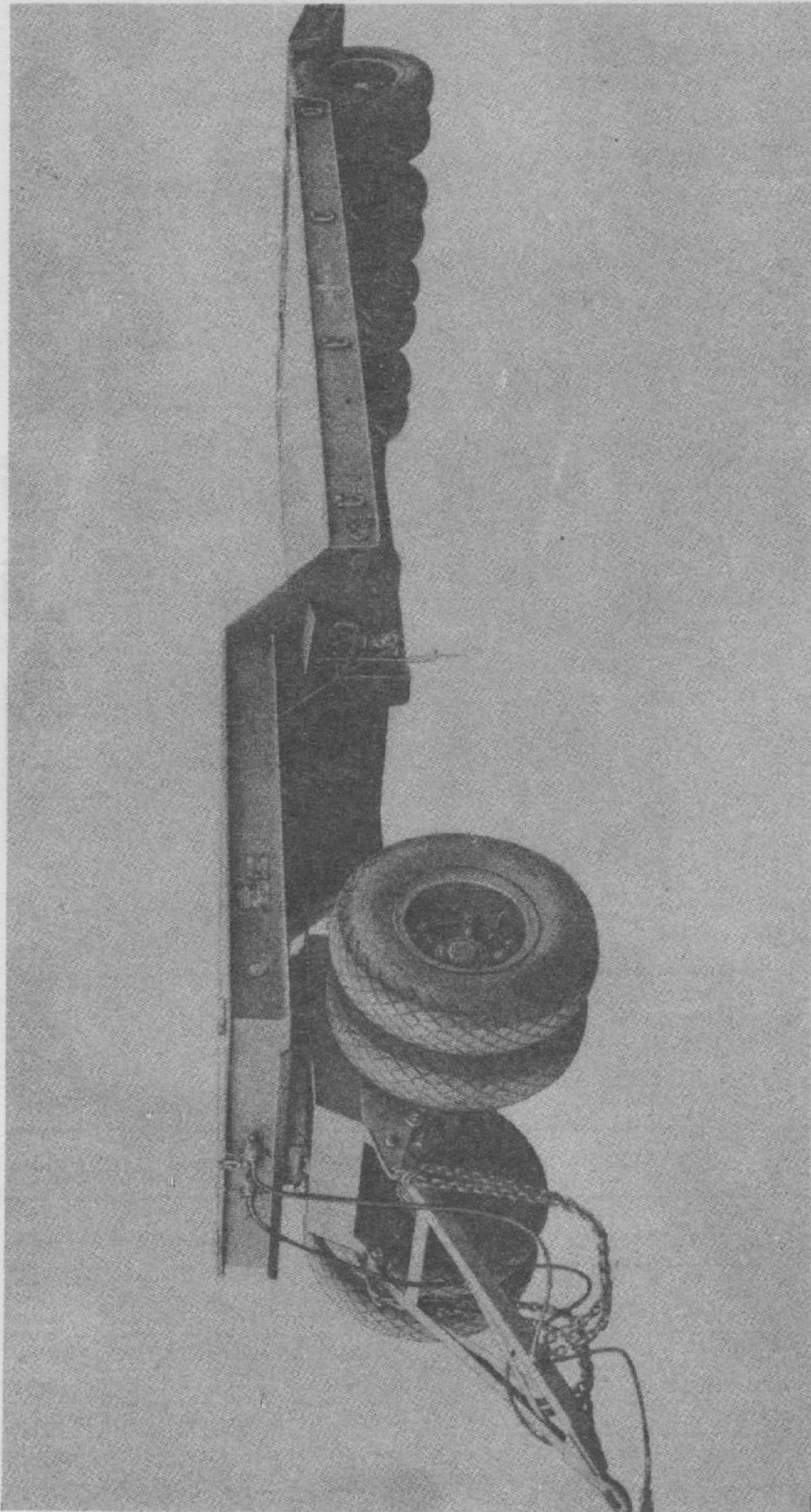
General

FIGURE 1. SEMITRAILER WITH DOLLY— $\frac{3}{4}$ FRONT VIEW

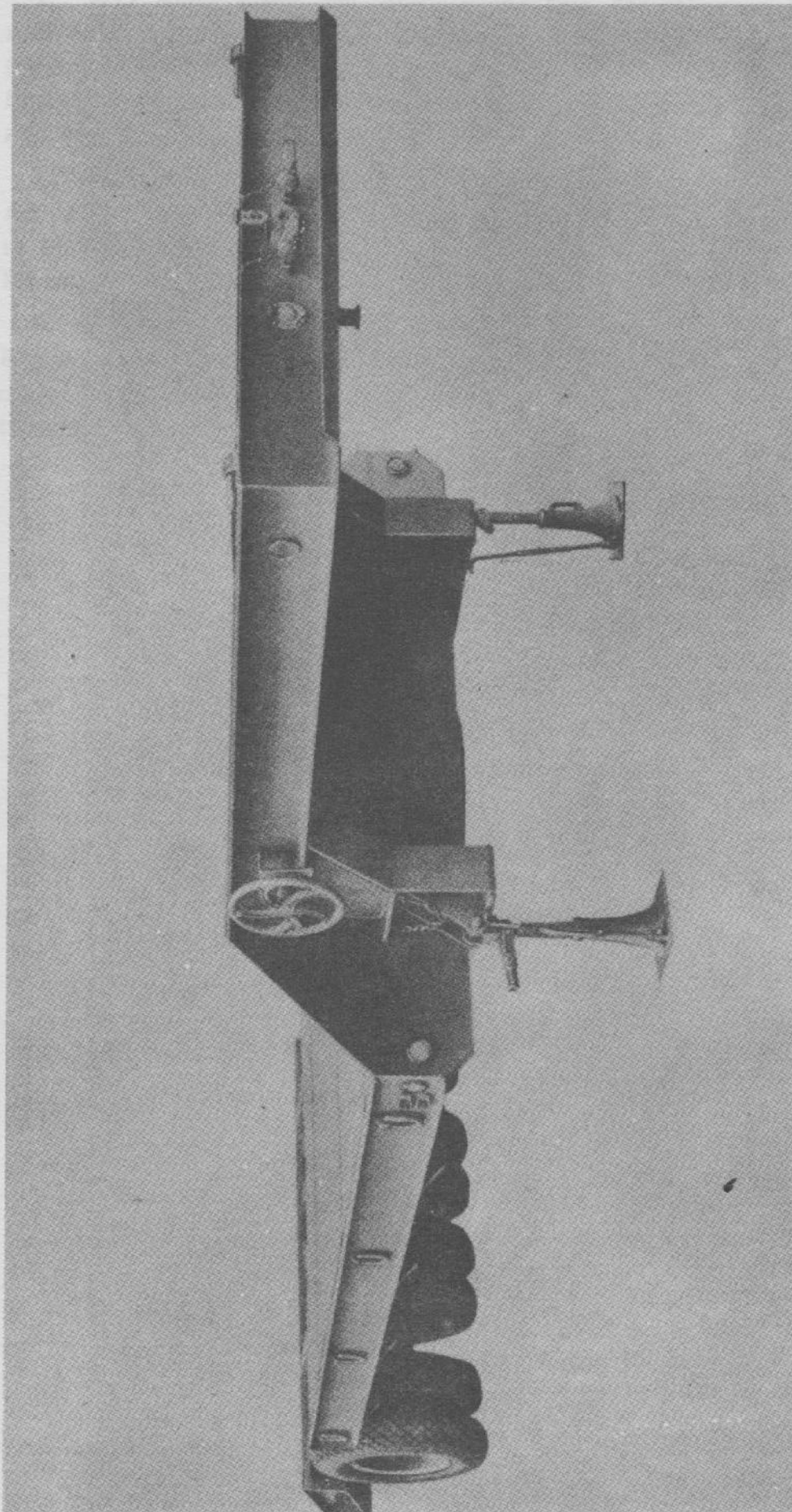


FIGURE 2. SEMITRAILER— $\frac{3}{4}$ FRONT VIEW

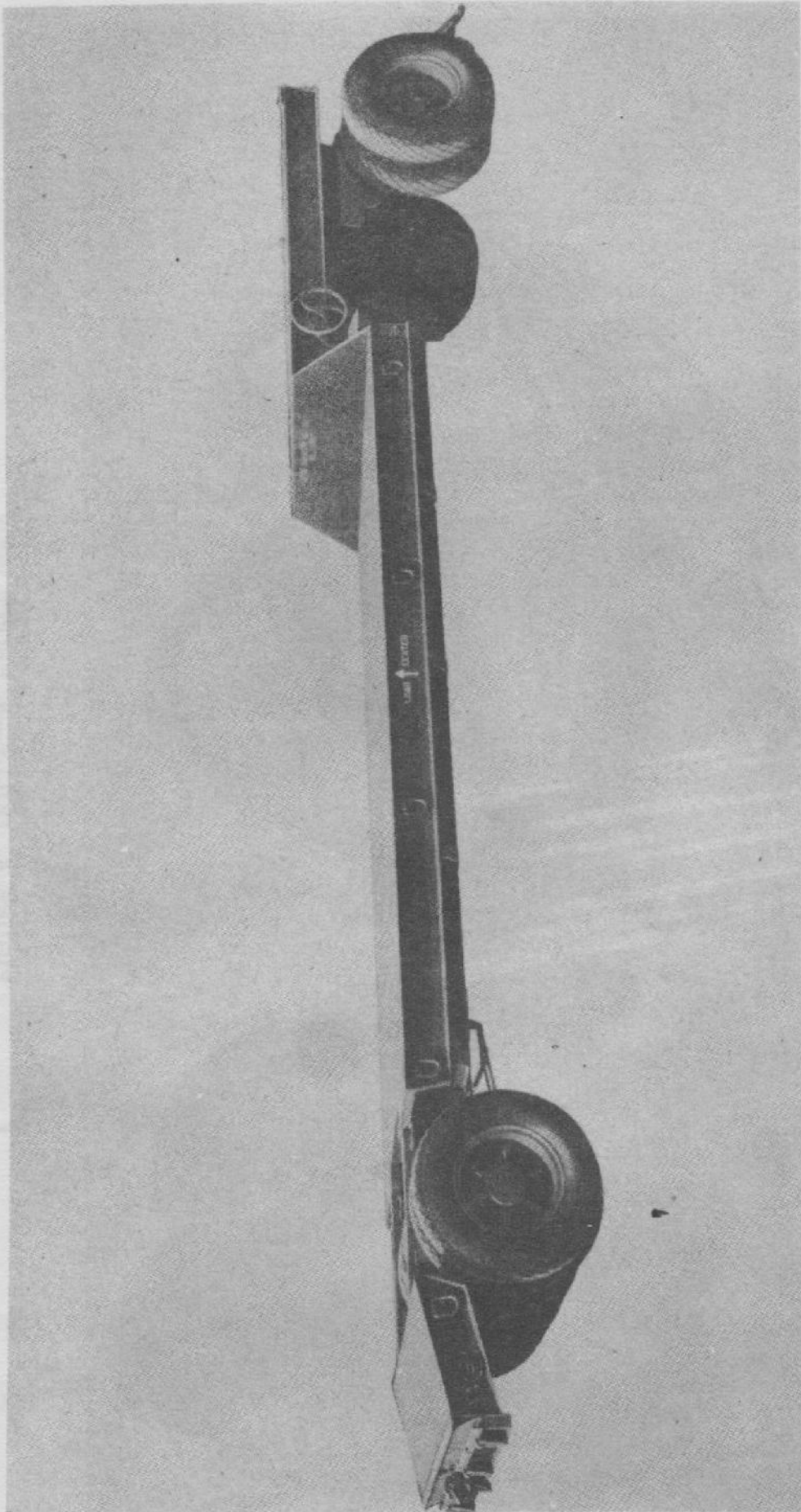


FIGURE 3. SEMITRAILER WITH DOLLY— $\frac{3}{4}$ REAR VIEW

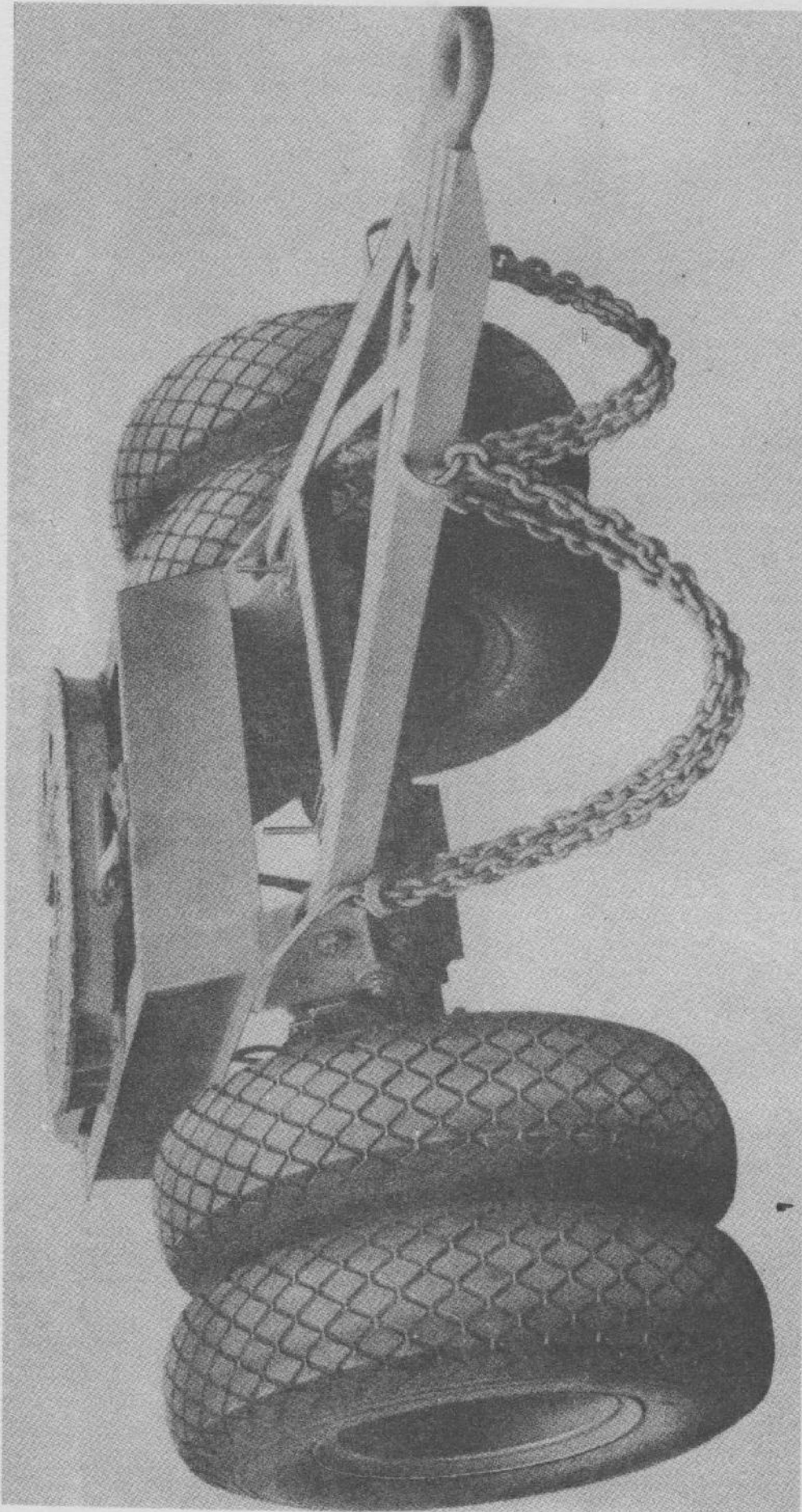


FIGURE 4. DOLLY— $\frac{3}{4}$ FRONT VIEW

General

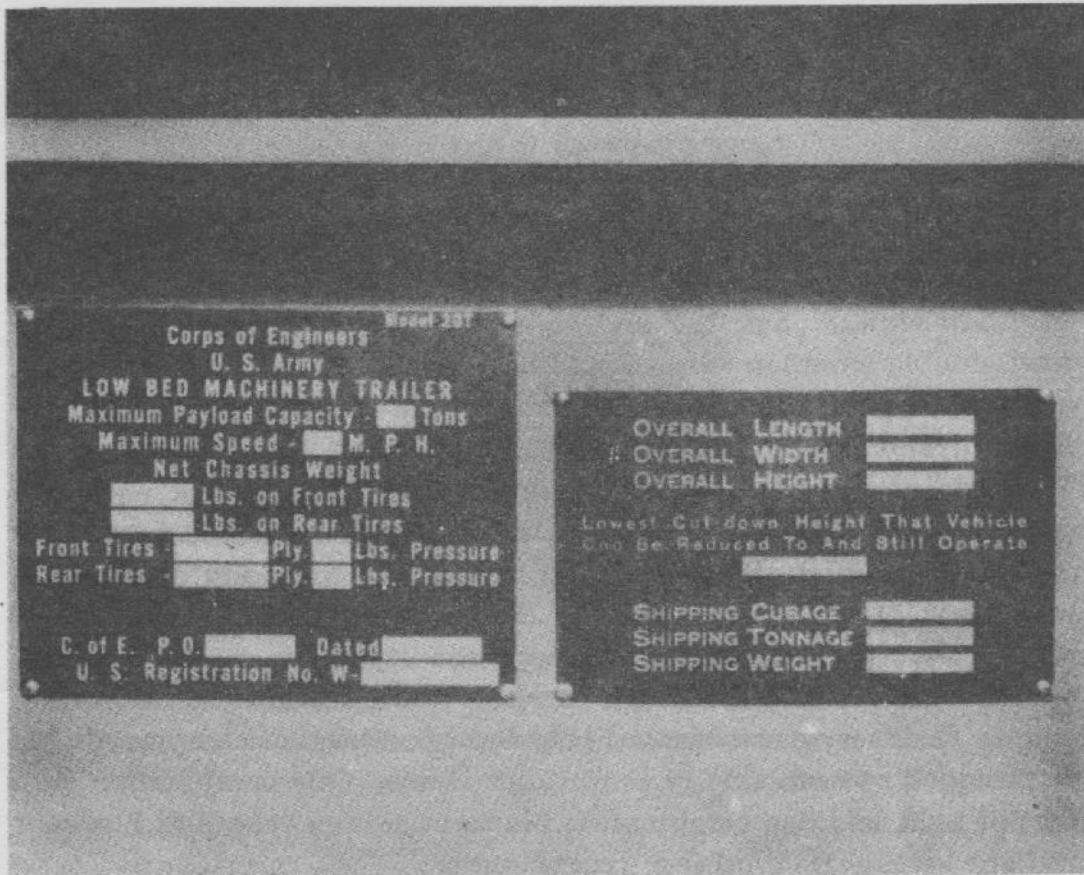


FIGURE 5. SEMITRAILER IDENTIFICATION PLATE

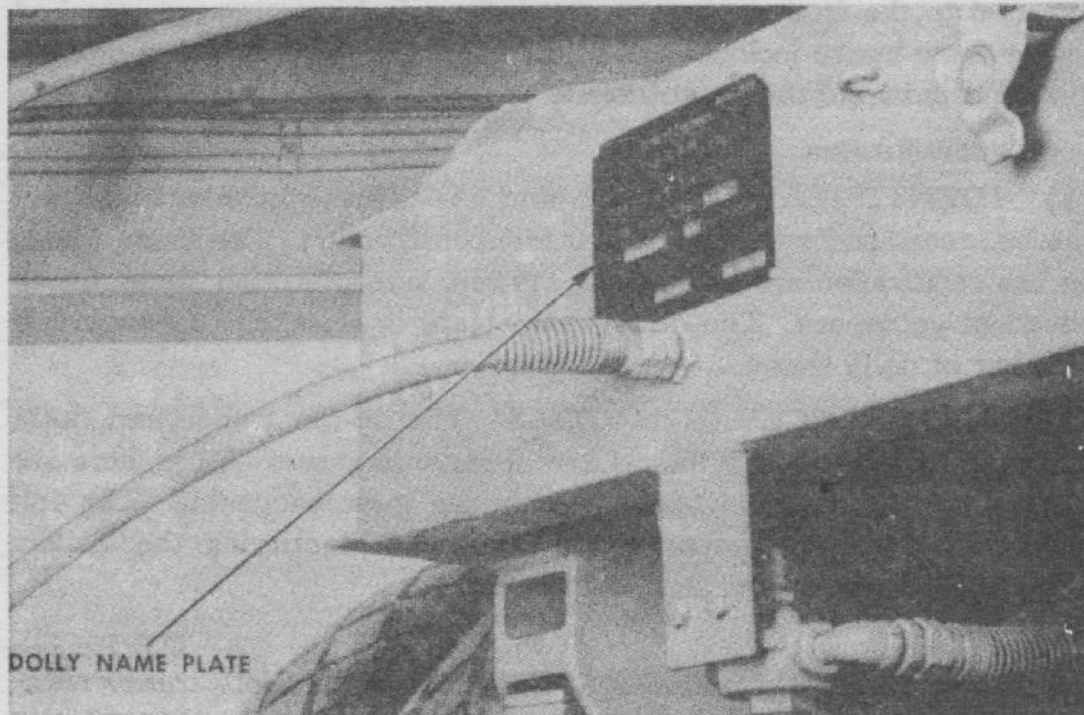


FIGURE 6. DOLLY IDENTIFICATION PLATE

SECTION II

DESCRIPTION AND DATA

3. DESCRIPTION.

a. **Semitrailer** (figs. 1, 2 and 3)—This 20-ton semitrailer is a four wheel, double trunnion axle vehicle having dual tires. Two screw-jack type supports are provided at drop in frame to support the front of the semitrailer when the dolly is disconnected from the semitrailer. The semitrailer is designed to be pulled by a tractor-truck equipped with a suitable fifth wheel, or the semitrailer can be pulled with dolly coupled to the semitrailer and the draw bar of the dolly attached to pintle hook of the towing vehicle. Brakes on the semitrailer wheels are actuated by compressed air supplied from the towing vehicle through a removable hose which connects the semitrailer to the towing vehicle. Four service clearance lights and two blackout clearance lights are provided at each side of semitrailer frame. One combination stop and tail light and one combination blackout service stop and blackout tail light are installed on rear crossmember.

b. **Dolly** (figs. 1, 3 and 4)—The dolly is used to convert the semitrailer into a full trailer. The dolly is equipped with two wheels and dual tires mounted on each wheel. The dolly frame is carried on a single axle, main and auxiliary springs. A hinged type draw bar is fastened to the front spring brackets. Two locking pins are attached to the draw bar to lock the dolly in a level position when the dolly is disconnected from the semitrailer.

c. **Identification.**

(1) **IDENTIFICATION** (figs. 5 and 6)—The semitrailer and dolly can be identified by its low drop-frame construction. The name plates on the semitrailer are located on the left side of trailer main frame ahead of gooseneck. The dolly name plate is attached to rear crossmember of dolly frame.

(2) **DIFFERENCES IN MODELS**—The 20-ton trailer and dolly has been constructed by four different manufacturers. All trailers are identical in construction and all parts are interchangeable. The following list has been prepared as a means of identifying the trailers manufactured by the various companies.

<i>Make</i>	<i>Contract No.</i>	<i>Purchase Order No.</i>	<i>Reqn. No.</i>	<i>U.S. Registration Nos.</i>
Fruehauf Trailer Co.	W-20-064-Eng (MSP)13	11-1060	EP-80863	0810705 thru 0811563

Description and Data

<i>Make</i>	<i>Contract No.</i>	<i>Purchase Order No.</i>	<i>Reqn. No.</i>	<i>U.S. Registration Nos.</i>
La Crosse Trailer & Equipment Co.	W-21-018-Eng (MSP) 12	24-1007	EP-80863	0759392 thru 0759841 0811607 thru 0811628
Rogers Brothers Co.	W-30-023-Eng (MSP) 30	03-1026	EP-80863	0798418 thru 0798867
	W-36-058-Eng (MSP) 147	03-1331	EP-80863	0797668 thru 0798417
Steel Products Co., Inc.	W-819-Eng (MSP) 1701	38-1001	EP-80863	0746547 thru 0747296
	W-819-Eng (MSP) 1702	38-1003	EP-80863	0797169 thru 0797618 and 0804749 thru 0804793

4. DATA.

a. Physical Characteristics.

Weight (total)	16,240 lbs
Net chassis weight on front tires	4,140 lbs
Net chassis weight on rear tires	8,210 lbs
Maximum payload	20 tons
Length (overall)	38 ft 3¼ in.
Length of deck (from drop in frame to center line of rear axle)	18 ft 7 in.
Width	9 ft. 4 in.
Height of draw bar (locked position)	2 ft 11 in.
Height from ground to deck	3 ft 4½ in.
Height from ground to top of gooseneck	5 ft 2 in.
Height of pintle hook	2 ft 10½ in.
Ground clearance (loaded)	13¾ in.
Tires (dolly)	
Quantity	4
Size	12.00/20
Number of plies	12
Air pressure	75 lbs
Tires (semitrailer)	
Quantity	8
Size	9.00/20
Number of plies	10
Air pressure	65 lbs

b. Performance.

Allowable speed	20 mph
Turning radius	31 ft 6 in.

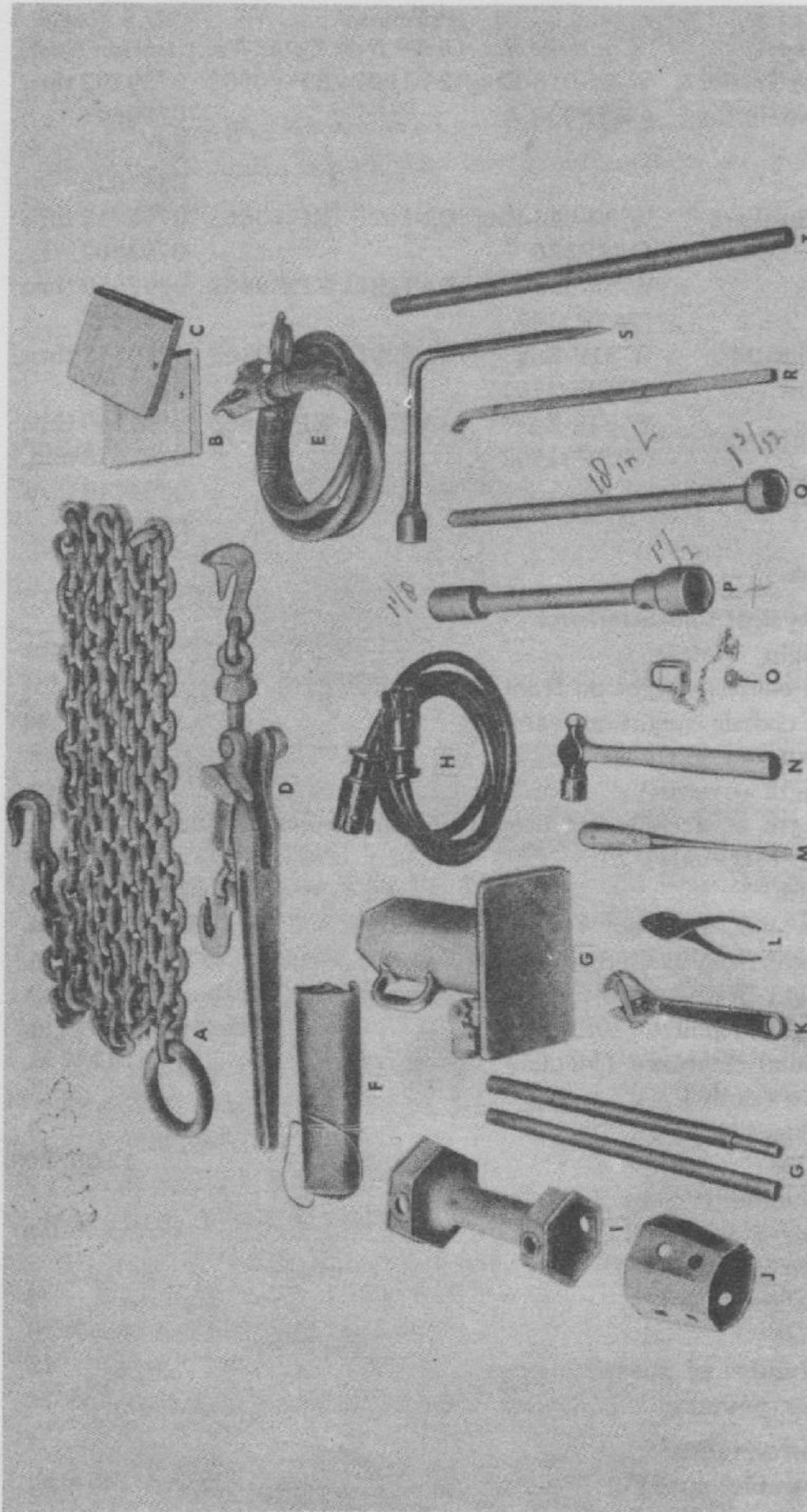


FIGURE 7. TOOLS AND EQUIPMENT

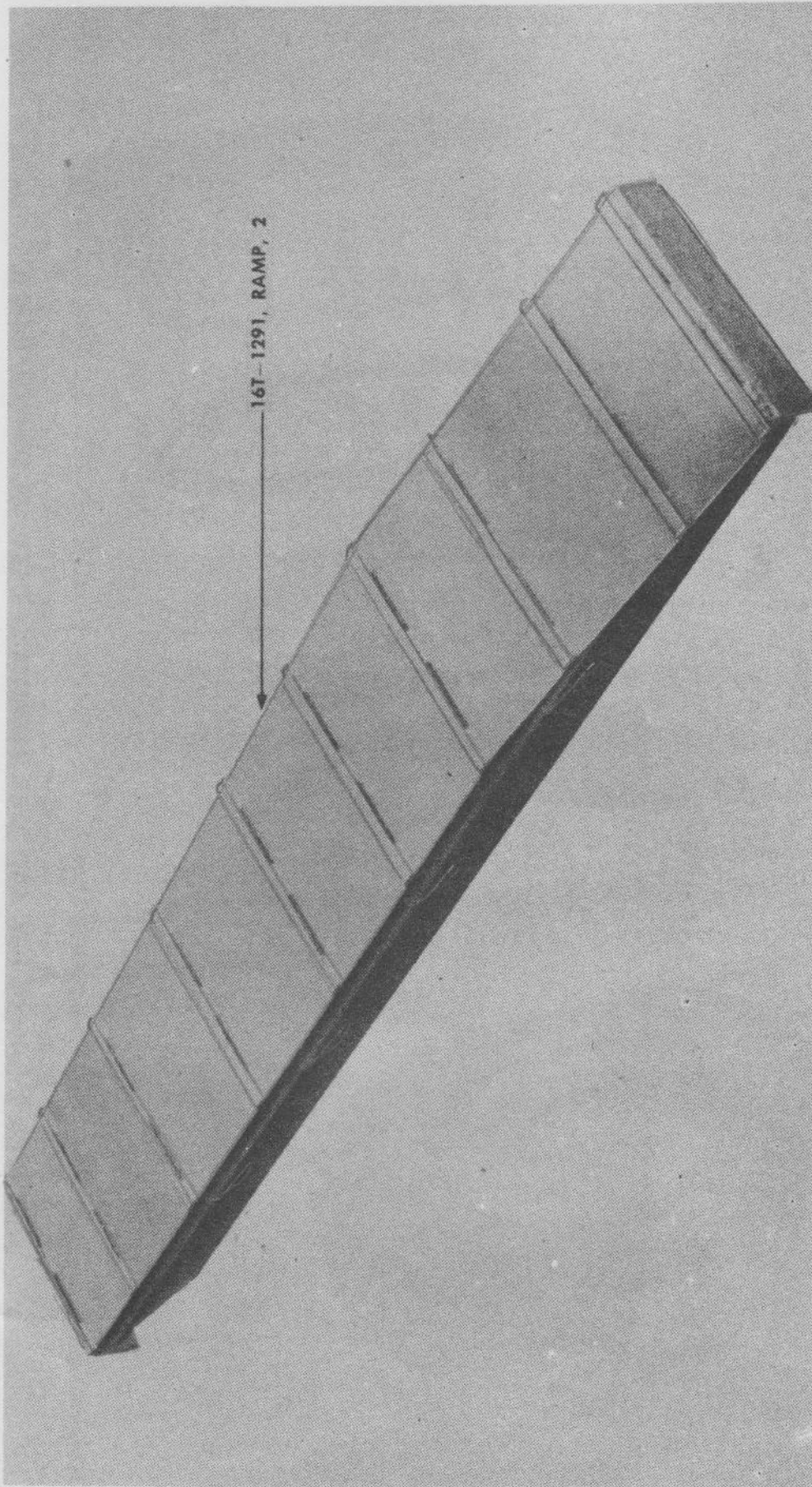


FIGURE 8. RAMPS

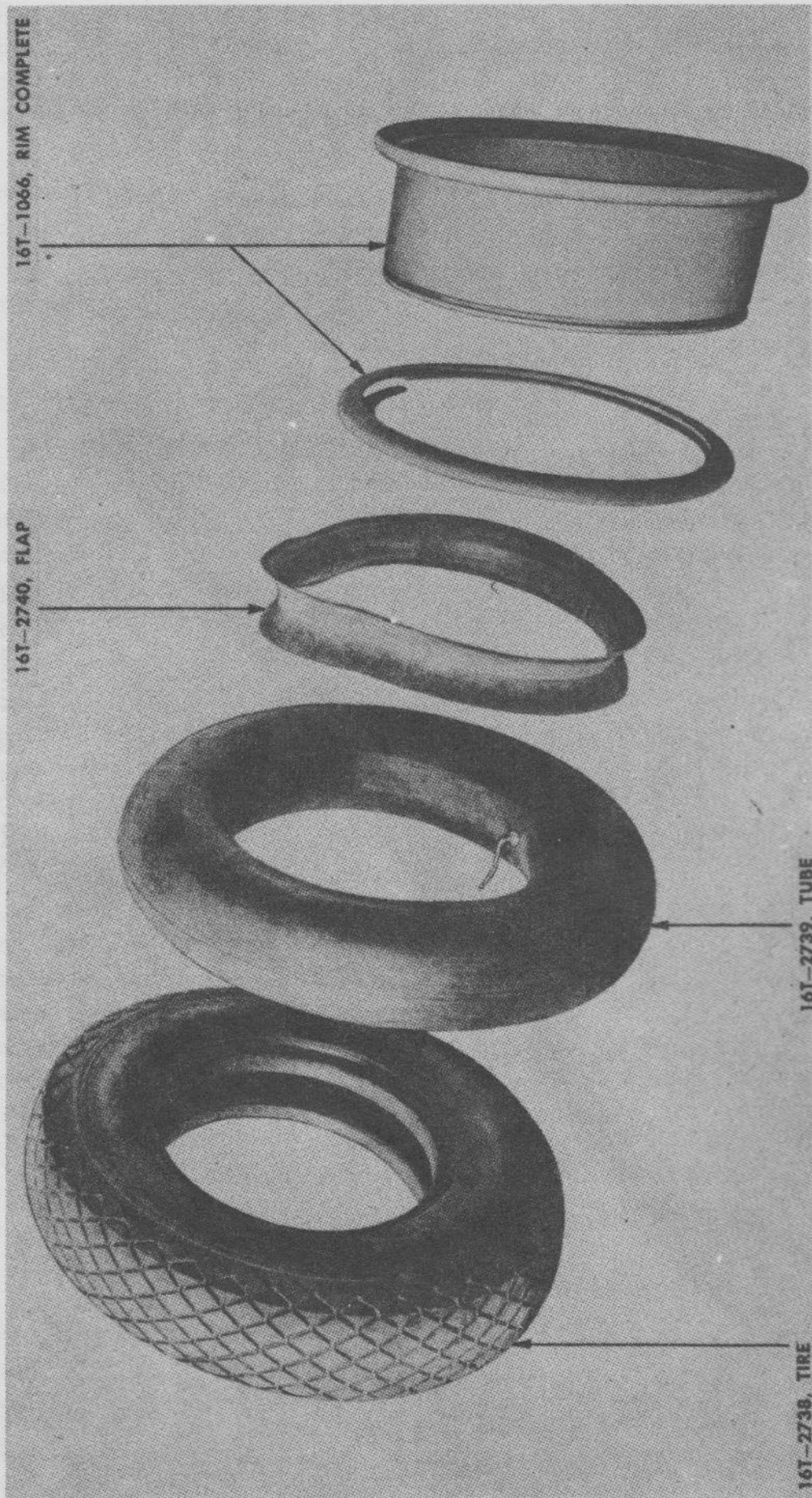


FIGURE 9. SPARE RIM AND TIRE ASSEMBLY—USED ON SEMITRAILER

SECTION III

TOOLS, EQUIPMENT AND FIRST ECHELON SPARE PARTS

5. TOOLS, EQUIPMENT AND FIRST ECHELON SPARE PARTS.

a. **Purpose** (figs. 7, 8, 9, 10 and 11). The following list has been prepared for the purpose of checking all tools, equipment and first echelon spare parts furnished with this vehicle. The list can be used as a basis for requisition.

Key Letter	Part No.	Part Name	Quantity
A	16T-2418	CHAIN—load binder, ½ in. x 18 in.	3
B	TM 5-9218	TECHNICAL MANUAL	2
C	ENG 9-9218	PARTS CATALOG	2
D	16T-2417	LOAD BINDER—complete, w/HOOK	3
E	16T-1549	HOSE—jumper, assembly	2
F	16T-2416	ROLL—tool kit	1
G	16T-2409	JACK—12-ton hydraulic, w/handles....	1
H	20T-4610	CABLE—jumper, complete	1
I	20T-4373	WRENCH—spindle nut, dolly.....	1
J	16T-2419	WRENCH—spindle nut, semitrailer ...	1
K	16T-2415	WRENCH—crescent, 10 in.	1
L	16T-2413	PLIERS—combination, 6 in.	1
M	16T-2412	SCREWDRIVER—10 in.	1
N	16T-2414	HAMMER—ball peen, No. 1.....	1
O	16T-2410	PADLOCK—w/3 keys	1
P	16T-2407	WRENCH—rim	1
Q	16T-2406	BAR—leverage	1
R	20T-5085	TOOL—rim	1
S	16T-3042	RIM—nut wrench	1
T	20T-5030	SCREW—jack handle	4

b. Equipment and Spare Parts—Packed Items (fig. 11).

Carton	Pack- age	Part No.	Item	Quantity
A		20T-4610	CABLE—jumper, complete.....	1
B	1	16T-2416	ROLL—tool kit	1
	2		FUSE—20 amp. ¼ x 1¼ inch....	12
	3	16T-1059	CLAMP—rim	2
		16T-1061	NUT—rim clamp	2
	4	16T-2742	CAP—valve	5
	5	16T-2743	CORE—valve	5

Carton	Pack- age	Part No.	Item	Quantity
	6	TM 5-9218	TECHNICAL MANUAL	2
		ENG 9-9218	PARTS CATALOG	2
	7	16T-2741	EXTENSION—valve	1
	8	16T-2480	PADLOCK—w/3 keys	1
C		16T-1549	HOSE—jumper, assembly	2
D	1	16T-1874	UNIT—blackout, lower	1
	2	16T-1878	UNIT—service, upper	1
	3	16T-1873	UNIT—blackout, upper	1
	4	16T-1867	BULB—6-8 volt	5
E		16T-2412	SCREWDRIVER—10 in.	1
		16T-2413	PLIERS—combination, 6 in.	1
		16T-2414	HAMMER—ball peen, 1 lb.	1
		16T-2415	WRENCH—crescent, 10 in.	1

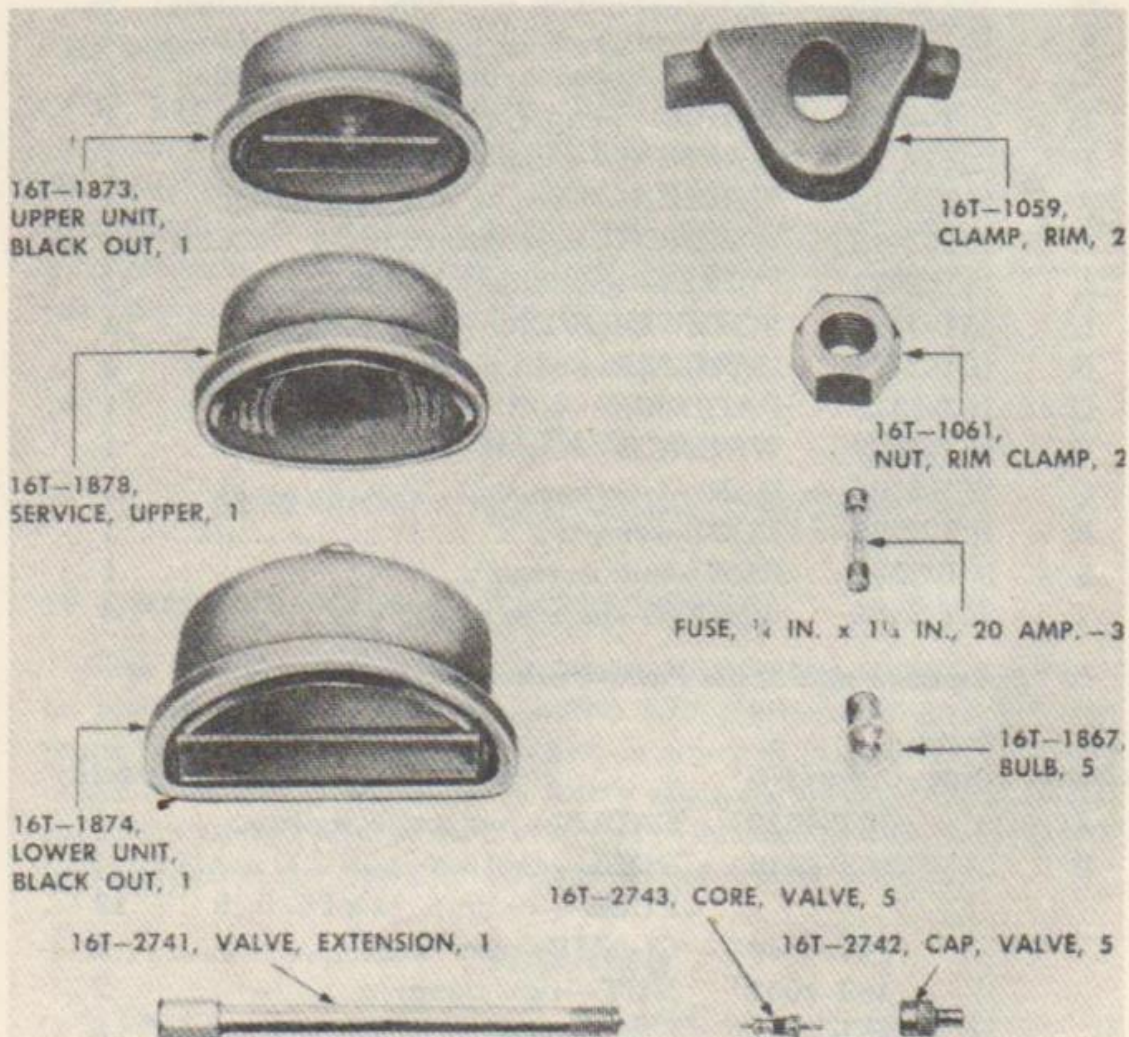


FIGURE 10. SPARE PARTS

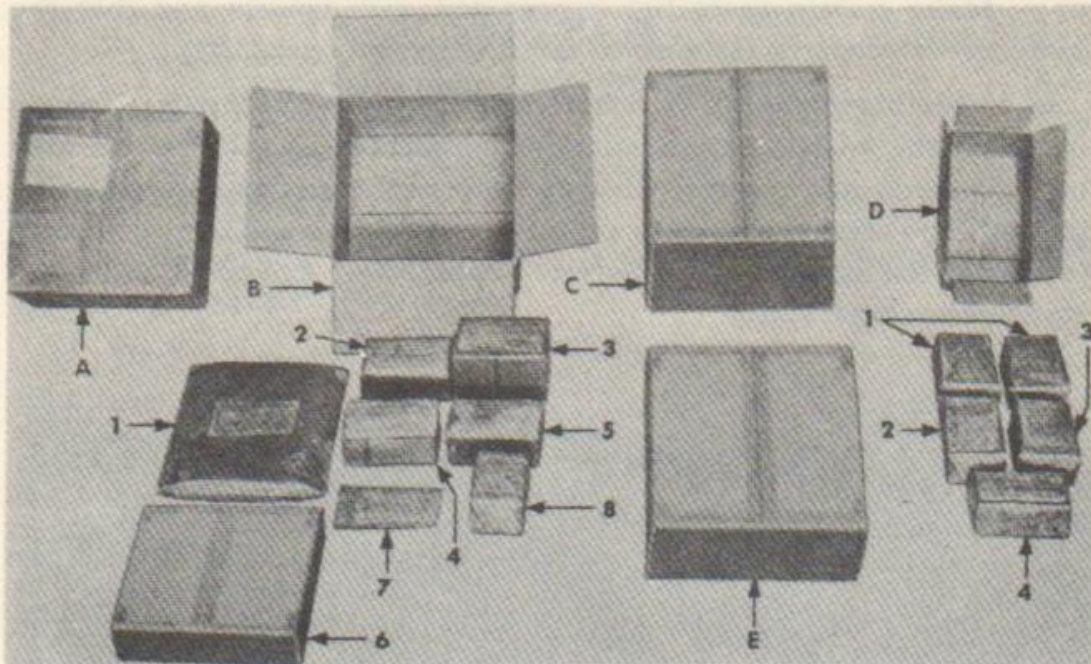


FIGURE 11. EQUIPMENT AND SPARE PARTS—PACKED ITEMS

PART TWO OPERATING INSTRUCTIONS

SECTION IV OPERATING INSTRUCTIONS

6. GENERAL.

Part Two contains information for the guidance of the personnel responsible for the operation of the 20-ton semitrailer with dolly. It contains information on the operation of the equipment together with description and location of all controls.

7. SERVICE UPON RECEIPT OF EQUIPMENT.

a. New Equipment. Check all tools, equipment and first echelon spare parts to make certain the parts are stowed in the tool compartment. Remove lock from package and lock tool compartment. Check ramps, making certain the ramps are placed on the vehicle and properly lashed to trailer using load binders and two load binder chain. (See figures 7, 8, 9, 10 and 11.)

(1) Make certain spare tire is provided with vehicle and that the spare tire is properly fastened to the tire carrier (para. 10).

b. Used Equipment. To insure mechanical efficiency, it is necessary that the vehicle be systematically inspected so that defects may be discovered and corrected before they result in serious damage or failure. The service necessary on receipt of used equipment is similar to that of "Before-Operation Service" (para. 33). Check all tools and equipment (para. 7. a.).

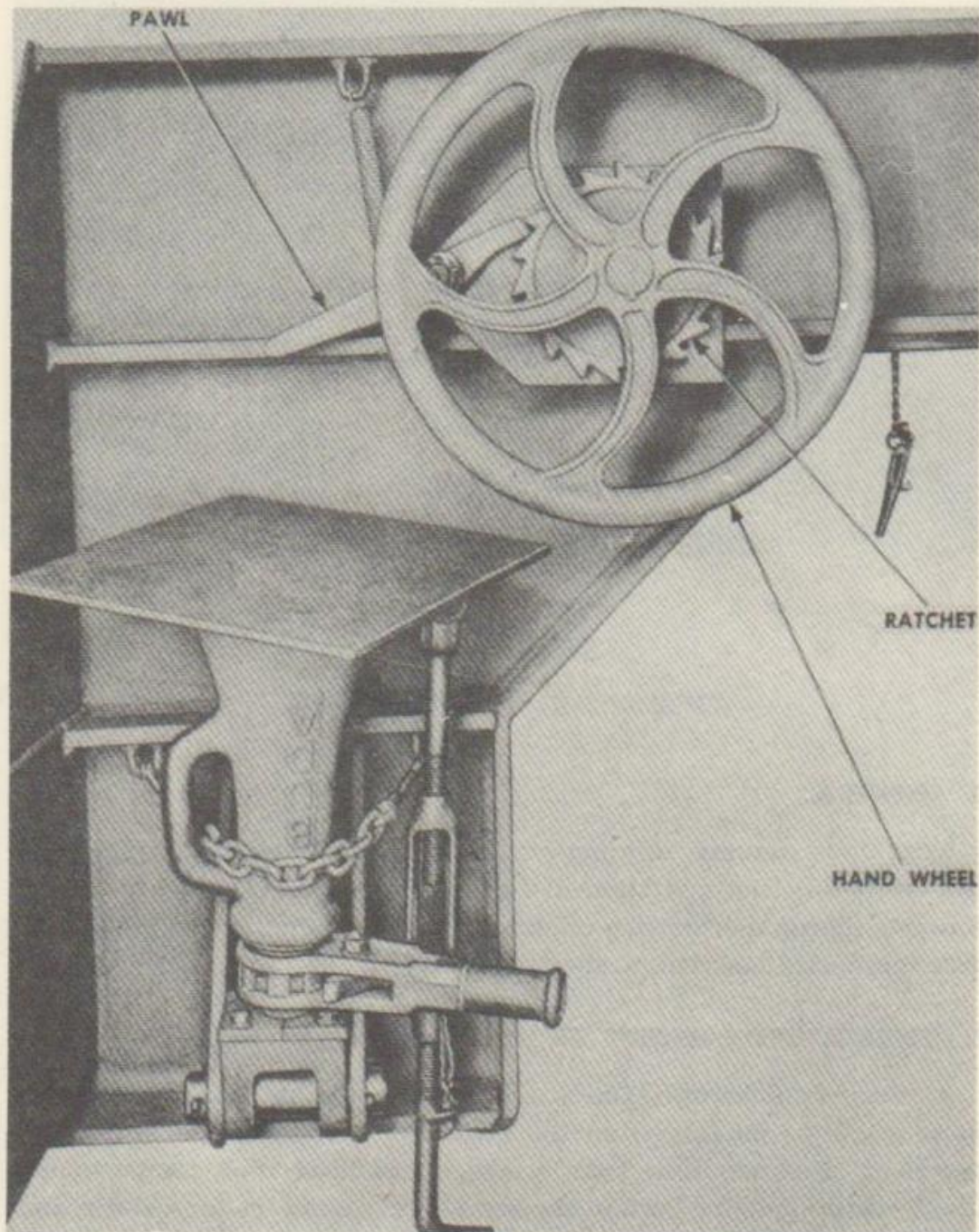


FIGURE 12. HAND BRAKE

SECTION V

CONTROLS AND OPERATION

8. HAND BRAKE.

a. Location (fig. 12). The hand brake is located on the right side of trailer at drop in gooseneck.

b. Description and Purpose. The hand brake can be used as a supplement to the service brake when descending extremely steep grades with a heavy load. When parking trailer for an extended period of time, apply the hand brake. Do not depend on the service brake as a parking brake. Air may leak from the service brake system, causing the brake to release.

c. Operation. Turn hand wheel clockwise to apply the brakes. The pawl will hold the brake in the applied position. To release the hand brake move the hand wheel slightly forward, lift the pawl out of ratchet, and turn the hand wheel counterclockwise until the brakes are fully released.

9. SUPPORTS.

a. Location (fig. 13). The hand brake is located on the right side main frame at drop in gooseneck.

b. Description and Purpose. The supports consist of two screw-jack type assemblies. The purpose of the supports are to support the front of the vehicle when dolly is disconnected from the semi-trailer.

c. Operation. Place jack in the down position by uncoupling snap. Lower jack. Move ratchet pawl so that the pawl will work against the ratchet (fig. 13). Place jack handle into jack and turn the handle counterclockwise until base of jack contacts the ground. Adjust turnbuckle on brace rod to proper length and place end of brace rod into hole at inner side of trailer frame. Place cotter key into brace rod.

10. TIRE CARRIER.

a. Location. The tire carrier is located under the trailer at front side of gooseneck.

b. Operation.

(1) **SPARE TIRE REMOVAL** (fig. 14) — With rim wrench 16T-2407, remove the two lug nuts which hold member to tire carrier.

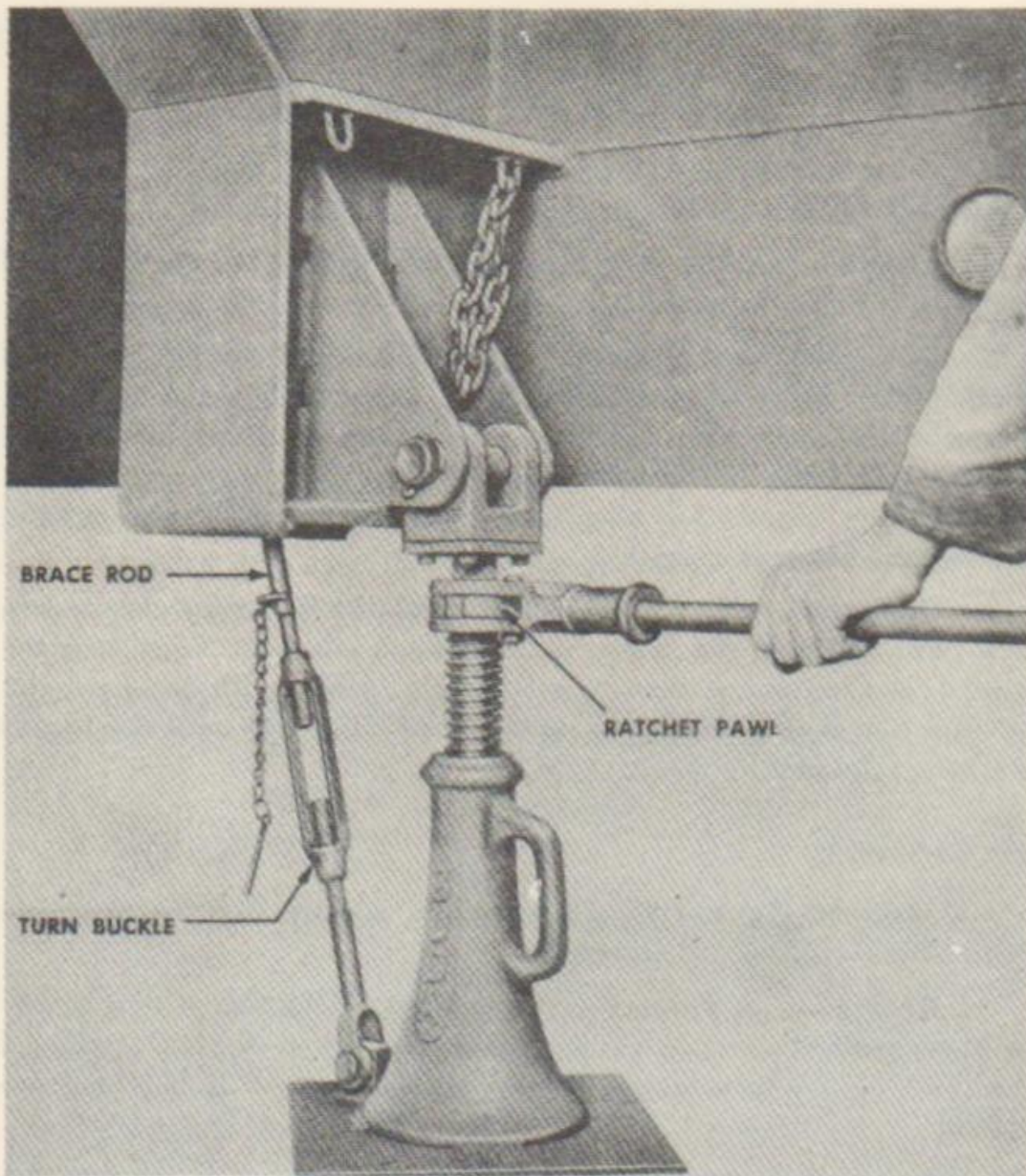


FIGURE 13. SUPPORT—IN DOWN POSITION

Place large end of rim wrench over ratchet nut and turn wrench clockwise to relieve tension from pawl. Lift the pawl out of ratchet and turn the wrench counterclockwise until tire reaches the ground. Place member at a 45 degree angle and lift member out of tire rim. Remove spare tire.

WARNING

Make certain the pawl engages teeth in ratchet. If pawl does not engage ratchet, the tire will fall on the operator after removing the two lug nuts.

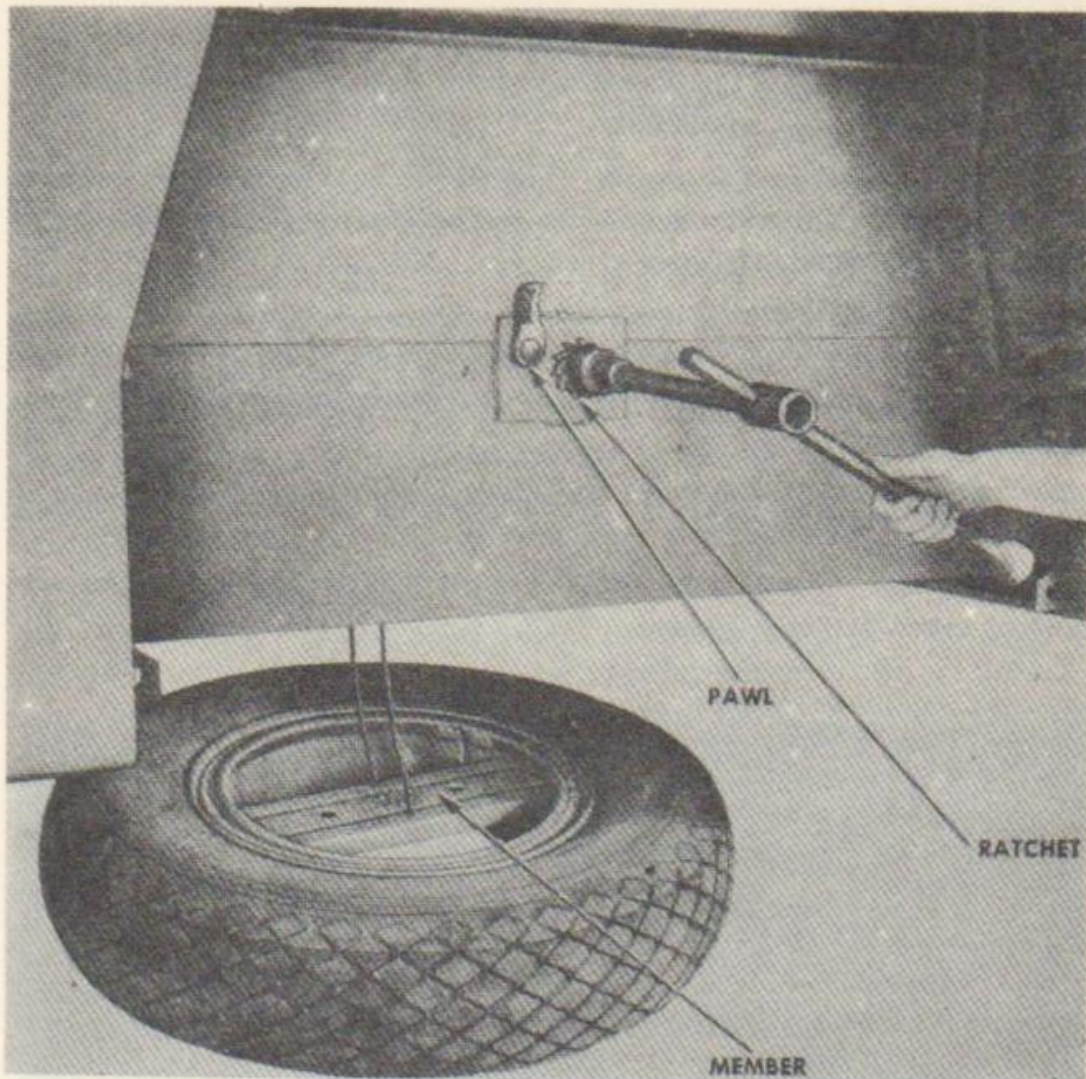


FIGURE 14. REMOVING SPARE TIRE

CAUTION

Do not release pawl and allow tire to fall to ground. It is necessary that a wrench be used at all times to lower the tire. Releasing pawl, and allowing tire to fall to the ground without the aid of a wrench, may cause tire carrier cable to break.

(2) **INSTALLATION**—Place tire under center of trailer near gooseneck, with the lock ring up. Set member into rim (fig. 14). Place pawl in ratchet and turn operating shaft until tire is raised to studs on tire carrier. Guide tire over studs and continue raising the tire, making certain the pawl contacts the ratchet to prevent tire from falling to the ground. Install the two lug nuts.

11. PINTLE HOOK.

a. **Location** (fig. 15). The pintle hook is located in the center of rear crossmember on semitrailer.

b. **Description and Purpose.** The pintle hook is used as a means of attaching another vehicle to be towed behind the trailer. The pintle hook is of the standard Army type.

c. **Operation.** Raise latch out of lock and open the lock. Place lunette of vehicle to be towed into pintle hook. Pull latch and lock down. Install cotter pin into the lock and latch to prevent latch from becoming disengaged.

12. DOLLY JUMPER HOSE.

a. **Location** (fig. 16). The dolly jumper hose is attached to the rear crossmember of dolly frame.

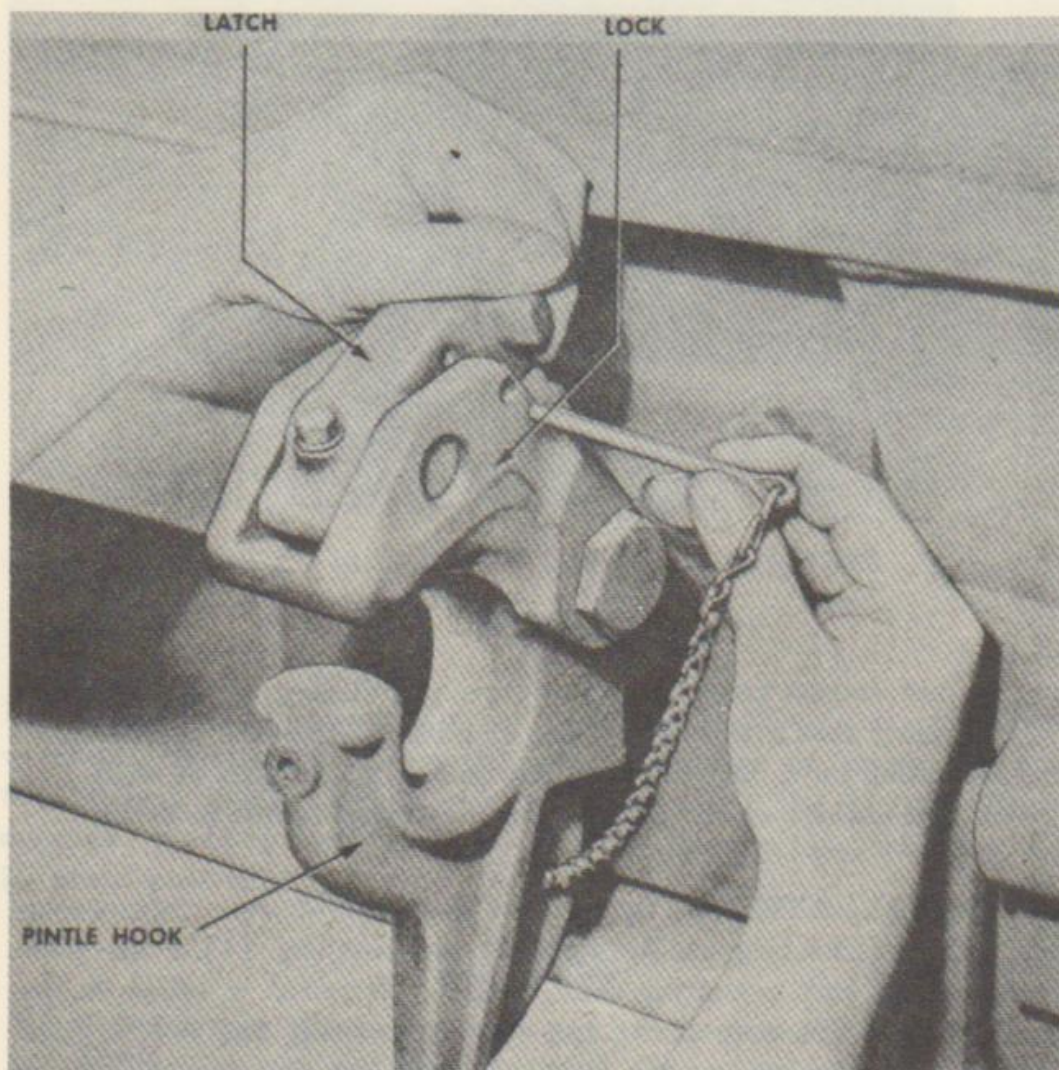


FIGURE 15. PINTLE HOOK

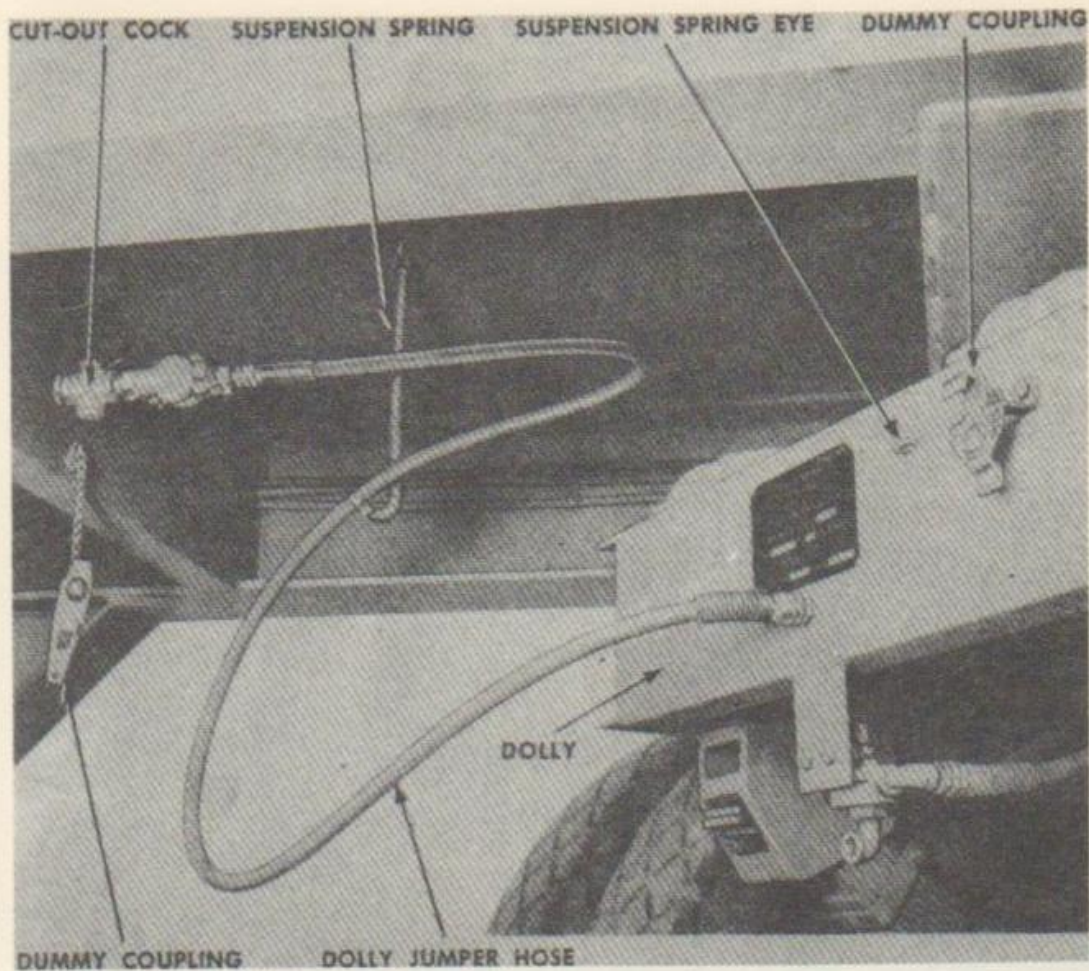


FIGURE 16. DOLLY JUMPER HOSE

b. Description and Purpose. The dolly jumper hose serves as a means of delivering air from semitrailer brake system to the dolly brakes.

(1) A dummy coupling is provided at rear crossmember of dolly. When jumper hose is uncoupled from semitrailer, the hose is attached to the dummy coupler.

(2) The suspension spring is attached to jumper hose to prevent hose from chafing. The suspension spring is detachable to permit spring to be attached to the suspension spring eye when the dolly is uncoupled from the semitrailer.

(3) A cut-out cock is installed in the brake system on semitrailer to enable operator to prevent the air from escaping from the semitrailer brake system when the dolly jumper hose is disconnected.

13. DRAW BAR.

a. Location (fig. 17). The draw bar is attached to dolly gear frame and is located at the front of the vehicle.

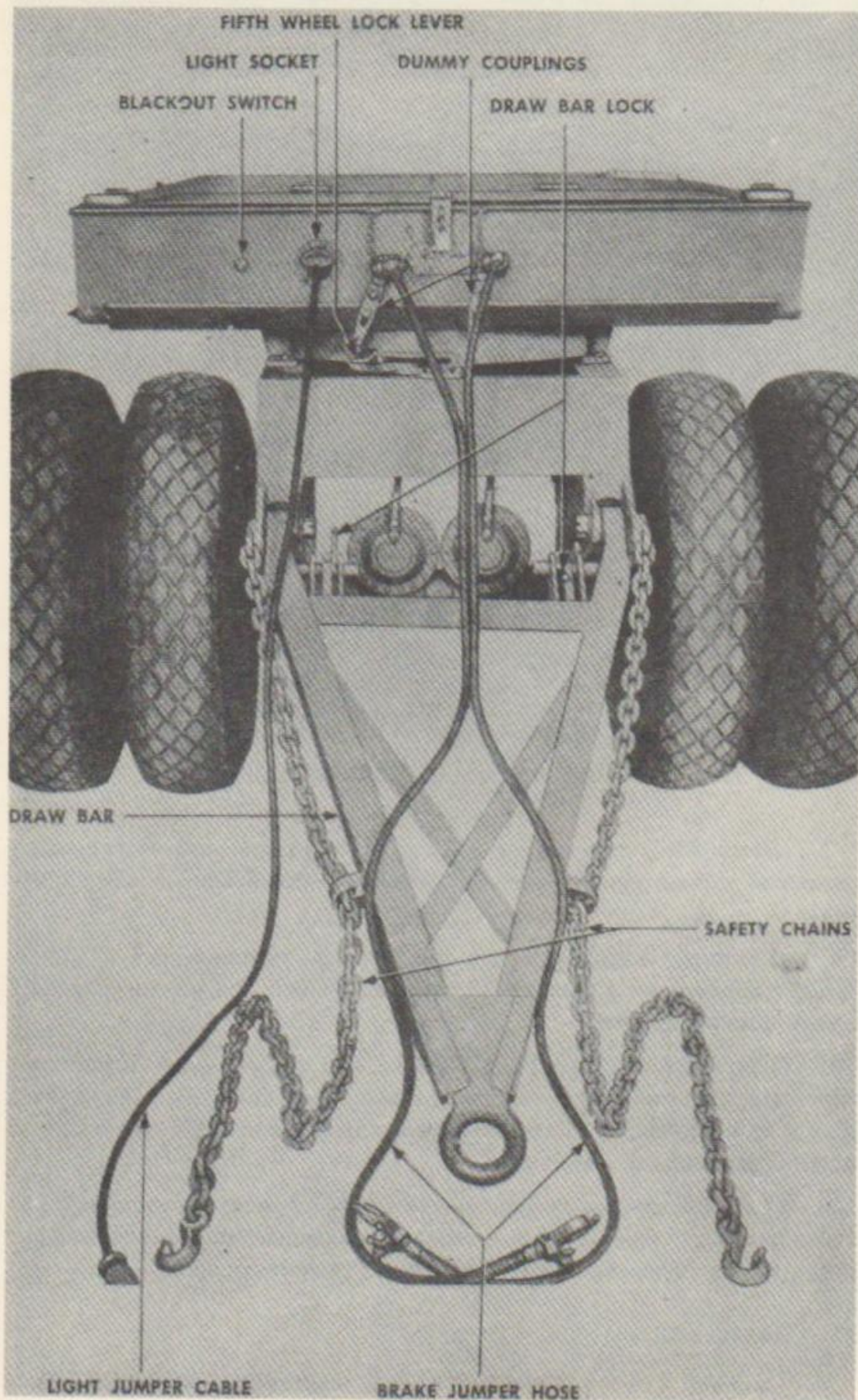


FIGURE 17. FRONT VIEW OF DOLLY AND SEMITRAILER

b. Description and Purpose. The draw bar is of an "A" frame design, all welded construction. A lunette is welded to end of draw bar. Two locking pins are used for locking the draw bar to prevent the dolly from hinging when the dolly is disconnected from semitrailer.

14. SAFETY CHAINS.

a. Location (fig. 17). Two safety chains are attached to dolly front spring bracket.

b. Description and Purpose. The safety chains are welded to dolly front spring bracket. Grab type hooks are fastened to opposite end of safety chains. Two eyes are welded to side of draw bar frame. Safety chains are threaded through the eyes, thus preventing excess chain from dragging. The safety chains are attached to towing vehicle as a safety device should the pintle hook or draw bar fail.

15. BRAKE JUMPER HOSE AND DUMMY COUPLINGS.

a. Location. Two jumper hoses are stowed in the tool compartment.

b. Description and Purpose (fig. 17). The jumper hose allows air to pass from the towing vehicle brake system to trailer brake system. Both jumper hoses are identical in construction and can be used in either the service line or emergency line. The emergency line and service line on both the trailer and towing vehicle are identified by tags which are attached to the couplings. When coupling jumper hose to trailer and towing vehicle, remove dummy couplings from hose couplings on front of trailer. Make certain the hose ends are matched—service to service and emergency to emergency.

CAUTION

When the jumper hoses are disconnected, dummy couplings must be attached to hose couplings to prevent the entrance of dirt, water and other foreign matter from entering the trailer and dolly brake system.

16. BLACKOUT SWITCH.

a. Location. (fig. 17). The blackout switch is located on the front crossmember of semitrailer on the right side.

b. Description and Purpose. When the jumper cable between the towing vehicle and trailer is connected, the operator can turn on either blackout or standard running lights. The face of the blackout switch

is marked with an arrow indicating the position of the blackout light. The switch is operated by a coin, screwdriver or key. The flow of current to the trailer for either of the lights is controlled by the light switch on the towing vehicle.

17. LIGHT JUMPER CABLE AND SOCKET.

a. Location (fig. 17.) The light jumper cable is stowed in the tool compartment. The socket is mounted on front crossmember of semi-trailer.

b. Description and Purpose. The light jumper cable assembly consists of a cable with a plug attached to each end. The jumper cable connects the lighting system on the towing vehicle to trailer lighting system. The jumper cable is plugged into light socket at rear of towing vehicle and to light socket on trailer. Flow of current to the trailer is controlled from light switch on the towing vehicle.

18. FIFTH WHEEL LOCK LEVER.

a. Location (fig. 17). The fifth wheel lock lever is located on the fifth wheel which is mounted on the dolly.

b. Description and Purpose. The fifth wheel lock lever is used for unlocking the fifth wheel from king pin on the semitrailer. When the lever is moved toward the left side and inserted into notch, the fifth wheel jaws become unlocked from the king pin, and the entire mechanism is cocked for recoupling. Movement of the lock lever is the only manual operation required.

SECTION VI

OPERATION UNDER USUAL CONDITIONS

19. COUPLING DOLLY TO TOWING VEHICLE.

Back towing vehicle as near to lunette as possible. Open pintle hook on towing vehicle. Place the lunette into pintle hook and lock the pintle hook. Pass safety chain which is attached to right side of dolly under draw bar, and couple the safety chain to towing vehicle at left side. Pass safety chain which is attached to left side of dolly under draw bar, and fasten the chain to the right side of towing vehicle.

WARNING

Do not couple safety chains too short, for it is necessary to have ample slack in the safety chains to permit turning.

Make certain the two draw bar lock pins are fully engaged and locked. Never attempt to tow dolly with either of the two lock pins unlocked.

20. UNCOUPLING DOLLY FROM TOWING VEHICLE.

Place two chock blocks on downgrade side of wheels to prevent dolly from moving. Check to make certain draw bar is in the locked position. Uncouple the two safety chains. Unlock pintle hook and lower draw bar to ground.

21. COUPLING DOLLY TO SEMITRAILER.

a. Couple dolly to towing vehicle (fig. 17). Inspect dolly fifth wheel to make certain the lock lever is moved toward right side and inserted in notch. Make certain the two draw bar locks are engaged. Adjust support jacks and turnbuckle on brace rod so that the height of semitrailer at the front will be approximately 1½ inches lower than top of fifth wheel (fig. 13). Back dolly under the trailer so that the king pin, which protrudes below the upper fifth wheel plate on the semitrailer, is centered, or nearly so, with the jaws of the fifth wheel.

Note

Do not back dolly completely under the semitrailer. Stop when about one-third of fifth wheel is under the semitrailer.

b. Disengage the two draw bar locks. If difficulty is encountered in releasing draw bar locks, do not drive against lock handle. Instead, use a bar against the pin from the outer side of spring bracket. Check hand brake to make certain the brakes are in the applied position. Continue backing dolly under semitrailer until the fifth wheel locking mechanism engages the king pin. Pull dolly forward. If coupling is complete, movement of the trailer will be difficult.

c. Remove dolly jumper hose (fig. 16) from dummy coupling. Remove suspension spring from eye bolt on dolly, and attach the suspension spring to the eye bolt on semitrailer. Couple the hose to coupling and open cut-out cock.

d. Connect the jumper cable between the trailer and towing vehicle. Place one end in the light socket at the front of trailer main frame and the other in the socket provided at rear of towing vehicle.

e. Remove the dummy couplings from the hose couplings on the trailer, and connect hose lines between the towing vehicle and the trailer. Be careful to see that the service line on the towing vehicle is connected to the service line on the trailer, and that the emergency

line on the towing vehicle is connected to the emergency line on the trailer. Identification tags are mounted on all connections. Open the cut-out cocks on the towing vehicle. Cut-out cocks are open when the handle is at a right angle to the line.

f. Remove cotter pins from screw-jack brace rods and raise the jacks. Fasten the jacks in position at side of main frame using the chains provided for that purpose (fig. 12).

g. Release the hand brake. The dolly and semitrailer combination is now ready for travel. Prior to placing this equipment into operation, see paragraph 33.

22. UNCOUPLING DOLLY FROM SEMITRAILER.

a. Place hand brake in the applied position (fig. 12). Lower the support jacks (figs. 13 and 14). Screw support jacks down until most of the weight is relieved from dolly fifth wheel. Close the cut-out cock at underside of semitrailer and disconnect the hose and suspension spring. Install dummy coupling on coupling. Fasten the hose to dummy coupling and attach the suspension spring to eye bolt provided at rear crossmember of dolly.

b. Shut the two cut-out cocks on towing vehicle, and uncouple the two air hoses from towing vehicle and semitrailer. Couple the two ends together on each hose to prevent dirt from entering the hose. Place the two hoses in the tool compartment. Remove jumper cable and place jumper cable in tool compartment. Install dummy couplings on couplings.

c. Move fifth wheel lock lever toward right side of dolly and insert the handle into notch. Pull towing vehicle forward until the dolly is three-quarters of the way out, or until the dolly is far enough out to permit locking the draw bar. After dolly is partly disconnected from semitrailer, two men can lift up on rear of dolly until holes in spring brackets are in alinement with locking pins. After draw bar is properly locked, continue moving dolly forward.

Note

Do not drive dolly unless draw bar is locked. The dolly frame will hinge and fall toward the rear.

23. COUPLING TRACTOR-TRUCK TO SEMITRAILER.

a. Inspect the fifth wheel to make certain it is in the unlocked position. Apply hand brake on semitrailer.

b. Back tractor-truck under trailer so that the king pin which protrudes below the upper fifth wheel plate on the semitrailer is centered,

Operation Under Usual Conditions

or nearly so, with the jaws of the fifth wheel. Continue backing the tractor-truck until the fifth wheel locking mechanism engages the king pin. Pull tractor-truck forward. If coupling is complete, movement of the trailer will be difficult.

- c. Connect light jumper cable (para. 17. b.).
- d. Raise support jacks (para. 9 c.).
- e. Release hand brake. The semitrailer and tractor-truck combination is now ready for travel. See paragraph 33.

24. UNCOUPLING TRACTOR-TRUCK FROM SEMITRAILER.

Apply hand brake. Uncouple air hose (para. 22. b.). Unlock fifth wheel (para. 22. c.). Lower support jacks (para. 22. a.). Move tractor-truck forward.

25. TRANSPORTING FROM JOB TO JOB.

The fact that the semitrailer and dolly is a mobile unit, the semitrailer and dolly can be transported from job to job by means of any towing vehicle equipped with a pintle hook and air brakes. The dolly can be uncoupled from the semitrailer, and the semitrailer placed on the deck of another dolly and semitrailer combination. The dolly, in turn, can be placed on the semitrailer. Bull rings are provided at the side of semitrailer frame, and load binders and load binder chains are carried in the tool compartment for lashing down the load.

26. BRAKING.

a. Hand Control on Towing Vehicle. The hand control is used for controlling the brakes on a towed vehicle independently of the brakes on the towing vehicle. It is usually mounted on the steering column or on the dash. The driver may set the ratchet type handle in any one of several positions between brakes released, and brakes fully applied position, so the brakes on the towed vehicle are kept applied until the control handle is returned to release position. The distance the brake control handle is moved in a clockwise direction toward applied position determines the severity of the brake application. The driver may, therefore, control the brakes on the towed vehicle as the speed, load and road conditions require. Do not fan the hand control handle, as this gives poor brake performance and wastes brake pressure. Fanning does not increase the brake line pressure, but rather decreases both the reservoir and brake line pressure. The air brake is designed so that when the handle is moved to the limit of its stroke, an emergency ap-

plication results which will stop the vehicle in the shortest possible time. This application should be made in an emergency and not employed in ordinary braking services.

b. Trailer Braking. The trailer brakes should be applied in coordination with the truck brakes. The trailer brakes should not be expected to carry the entire braking load. Such abuse will result in rapid lining wear and greatly reduce the life of the trailer brakes. The following braking procedure is recommended:

- (1) Trailer brakes should be applied easily and released when they grab, as a grabbing brake is not operating with maximum efficiency. For maximum braking efficiency, keep tires just short of the skidding point.
- (2) When parking the trailer for an extended period, set the hand brake.

27. GENERAL OPERATION.

a. Driving Towing Vehicle and Trailer (para. 33). The truck and trailer combination is driven in much the same manner as the straight truck. The following hints, however, should prove helpful:

- (1) It is good driving practice to test the operation of the trailer brakes before stepping up to full operating speed. Check the air supply on the dash gage. It should not be less than 60 pounds for proper application.
- (2) The operation of the lights should also be tested.
- (3) When turning corners, care should be taken to allow for the fact that the trailer rear wheels turn "inside" the turning radius of the truck.
- (4) When backing, the truck should be steered in the opposite direction to which it is desired that the trailer be turned.

SECTION VII

OPERATION UNDER UNUSUAL CONDITIONS

28. CLIMATIC AND ROAD HAZARDS.

a. Extreme Heat and Cold. For proper lubrication under these conditions, refer to lubrication order (fig. 18). Drain water (condensation) from air reservoir before reaching freezing temperature. The air reservoir is located on the right side of trailer on the inner side of main frame ahead of rear wheels. No other special attention is necessary.

b. Sand or Dust. Extremely sandy or dusty operation necessitates

frequent inspection, cleaning and lubrication of the working parts of the trailer.

c. Snow, Ice and Mud. When operating on roads covered with snow, ice or mud, chains can be attached to the trailer wheels. The trailer brakes under these conditions should be applied slightly ahead of the towing vehicle brakes to prevent, if possible, skidding or jack-knifing of the trailer.

SECTION VIII DEMOLITION TO PREVENT ENEMY USE

29. DEMOLITION TO PREVENT ENEMY USE.

a. General. Destruction must be as complete as the available time, equipment and personnel will permit. Destroy the same parts on all identical units of equipment to prevent salvaging from one unit to be used on another. If thorough destruction of parts cannot be completed, the most important features of the equipment should be destroyed, and parts essential to the operation or use of the equipment and which cannot easily be replaced should be demolished.

b. Why? To prevent the enemy from using or salvaging the equipment for their benefit.

c. When? Upon orders from the Commanding Officer.

d. Where? If possible, upon a highway or air field runway to obstruct enemy advance.

e. How and What to Destroy. The method of demolishing must be determined by material and time available.

(1) METHOD NO. 1 — BY EXPLOSIVES.

(a) Place two pounds of TNT between each of the two trunnion axles on semitrailer.

(b) Place two pounds of TNT on the inner side of the dolly tires, both on the right and left sides.

(c) Place two pounds of TNT underneath center of semitrailer body.

(d) Insert TETYRL NONELECTRIC CAPS with at least five feet of safety fuse in each charge placed.

(e) Ignite fuse and take cover.

(f) Elapsed time of two to three minutes if charges are prepared before hand.

(2) METHOD NO. 2 — BY GUN FIRE OR GRENADES.

(a) Fire on the semitrailer and dolly with artillery, tanks, 50 caliber machine guns, rifles, rockets, or grenades. Concentrate the fire upon the hubs, tires, internal brake assembly, brake chambers, and relay valve.

(b) If time permits, douse tires and wood decking with gasoline and ignite.

(3) METHOD NO. 3 — BY SLEDGE HAMMER, AXES, PICK-AXES, CROWBAR, OR ANY HEAVY OBJECT AVAILABLE.

(a) Start at the front of the vehicle, and jerk the light jumper cable out of the coupling socket. Smash the coupling socket, the two ends of jumper cable and the blackout switch.

(b) Destroy the quick release valve at rear of dolly and the brake chambers mounted on dolly axle. Smash all air lines and brake chambers mounted near cross shaft at rear of semitrailer.

(c) Puncture tires. Douse gasoline over tires and wood decking and ignite.

Note

If time will permit and vehicle is coupled to towing vehicle, place the fifth wheel lock lever in the released position and pull dolly out from under the semitrailer, thus permitting semitrailer to fall on its nose.

PART THREE

MAINTENANCE INSTRUCTIONS

SECTION IX

LUBRICATION

30. LUBRICATION ORDER.

a. The Lubrication Order (fig. 18) prescribes lubrication maintenance for the 20-ton semitrailer with dolly.

b. Lubrication instructions on the Order are binding on all echelons of maintenance and there shall be no deviations from these instructions.

c. Service intervals specified on the Order are for normal operating conditions. Reduce these intervals under extreme conditions such as excessively high or low temperatures, prolonged periods of high speed, continued operation in sand or dust, immersion in water, or exposure to moisture, any one of which may quickly destroy the protective qualities of the lubricant and require servicing in order to prevent malfunctioning or damage to the materiel.

d. Lubricants are prescribed in the "Key" in accordance with three temperature ranges; above +32°F, +32°F to 0°F, and below 0°F. Determine the time to change grades of lubricants by maintaining a close check on operation of the vehicle during the approach to change-over periods. Ordinarily, it will be necessary to change grades of lubricants *only when air temperatures are consistently in the next higher or lower range*, unless malfunctioning occurs sooner due to lubricants being too thin or too heavy.

31. DETAILED LUBRICATION INSTRUCTIONS.

a. **Lubrication Equipment.** Operate lubricating guns carefully and in such a manner as to insure a proper distribution of the lubricant. If lubrication fitting valves stick and prevent the entrance of lubricant, remove the fitting and determine cause. Replace broken or damaged lubricators.

b. **Points of Application.**

(1) Lubrication fittings, grease cups, oilers and oil holes are readily identifiable on the vehicle. Wipe clean such lubricators and the surrounding surface before lubricant is applied.

(2) Where relief valves are provided, apply new lubricant until the old lubricant is forced from the vent. Exceptions are specified in notes in subparagraph d. below.

(3) Always wipe clean, metal surfaces on which a film of lubricant must be maintained by manual application, before the film is removed.

c. **Cleaning.** Use SOLVENT, dry-cleaning, or OIL, fuel, Diesel, to clean or wash all parts. Use of gasoline for this purpose is prohibited. After washing, dry all parts thoroughly before applying lubricant. If vehicle is to be washed, lubricate after washing.

d. **Notes on Individual Units and Parts** (figs. 19 and 20). The following instructions pertain to lubrication and service of individual units and parts. Note references in the Order (fig. 18) refer to the step below having the corresponding number.

(1) **WHEEL BEARINGS**—Remove bearing cone assemblies from hub. Wash bearings, cones, spindle, and inside of hub, and dry thor-

No. 1097 WAR DEPARTMENT ○ LUBRICATION ORDER

WAR DEPARTMENT, WASHINGTON 25, D. C., 30 AUG., 1944

SEMI-TRAILER, LOW BED, 20-TON, MODEL 20-T, WITH MODEL 20-TD DOLLY

SEMI-TRAILER SERIAL NO. LOCATED ON LEFT SIDE FRONT
DOLLY SERIAL NO. LOCATED ON REAR CROSS MEMBER

REFERENCE TM5-9218

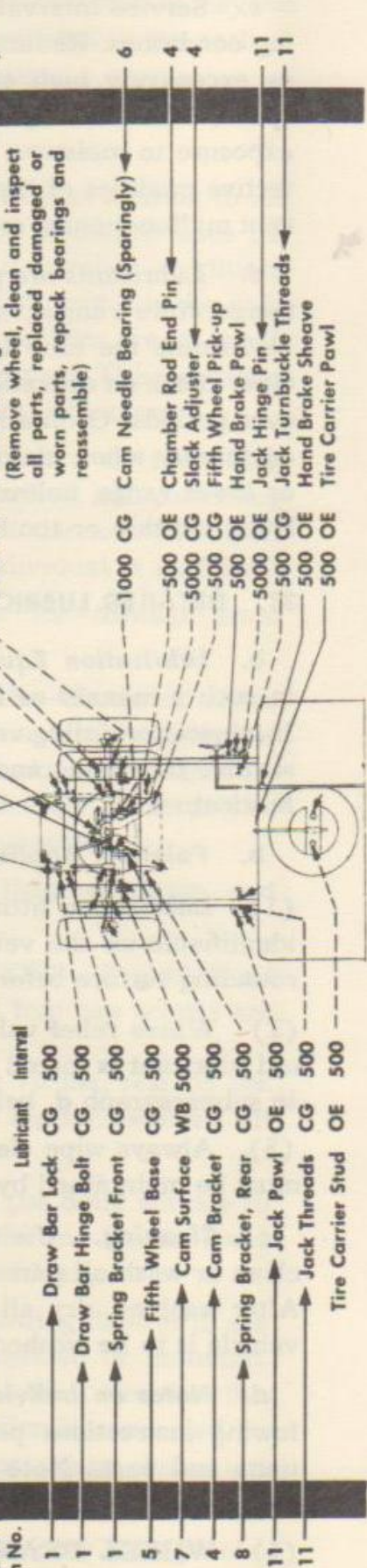
—KEY—

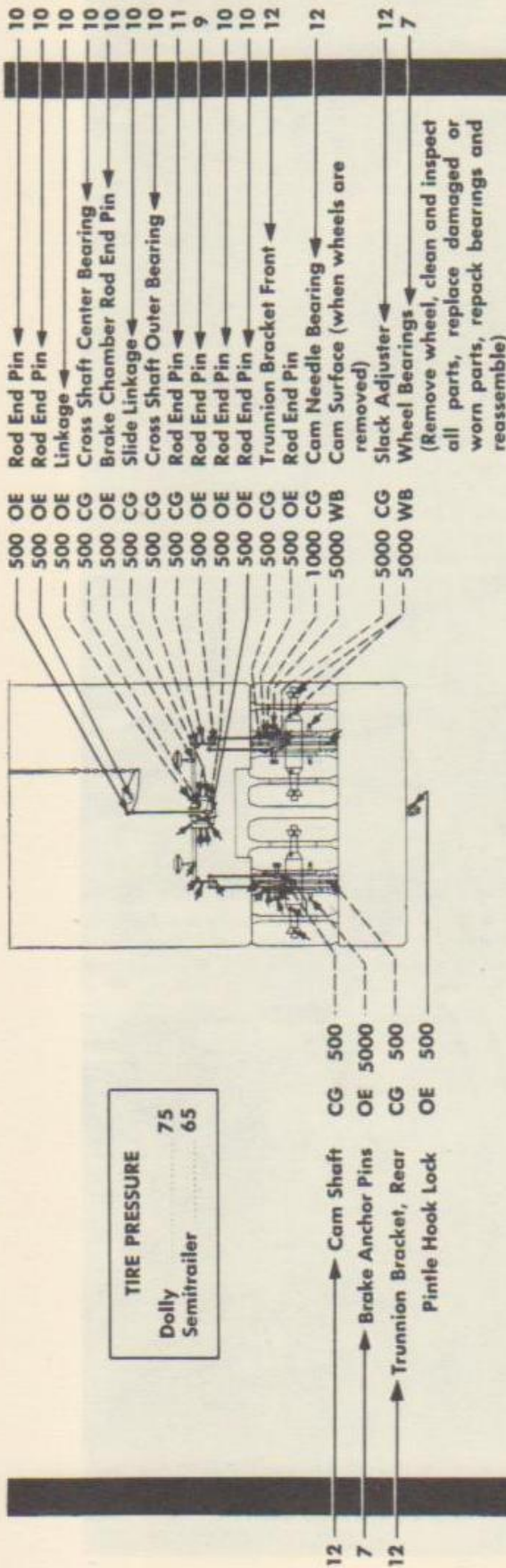
LUBRICANTS	LOWEST EXPECTED AIR TEMPERATURE	
	Above +32°F.	+32°F. to 0°F. Below 0°F.
OE — OIL, engine	OE SAE 30	OE SAE 10
CG — GREASE, general purpose	CG No. 1	CG No. 0
WB — GREASE, general purpose No. 2. All temperatures.	CG No. 0	CG No. 0

CAUTION Lubricate Dotted Arrow Points on both sides. Points on opposite side are indicated by Dotted Short-Shift Arrows.

CAUTION Lubricate Dotted Arrow Points on both sides. Points on opposite side are indicated by dotted Short-Shift Arrows.

Fig. 18 and 19 Item No.





NOTES

- FITTINGS**—Clean before applying the lubricant gun.
- CLEANING**—SOLVENT, dry-cleaning or OIL, fuel, diesel, will be used to clean, or wash all parts. Use of gasoline for this purpose is prohibited. All parts will be thoroughly dry before relubrication.
- MILES**—Lubricate chassis parts every 500 miles or monthly, and wheel bearings every 5000 miles or 5 months, whichever occurs first. The miles indicated are for normal service. For extreme conditions of heat, water, dust, and mud, lubricate more frequently.
- CABLES**—Keep cables well lubricated with OE, except those coming into constant contact with dirt.
- OIL CAN POINTS**—Lubricate all rod end pins, slide brackets, hinge pins, and brake chamber push rods.

No. 1097 } NOT TO BE REPRODUCED in whole or in part without permission of the Office of the Chief of Engineers.

Copy of this Lubrication Order will remain with the equipment at all times; instructions contained therein are mandatory and supersede all conflicting lubrication instructions dated prior to 30 Aug., 1944.

By order of the Secretary of War:

G. C. MARSHALL,
Chief of Staff.

OFFICIAL:

J. A. ULIO,
Major General,
The Adjutant General.

Requisition Replacement Orders from Maintenance Publications Office, War Plans Division, War Planning, OCE, P.O. Box 1679, Columbus, Ohio.

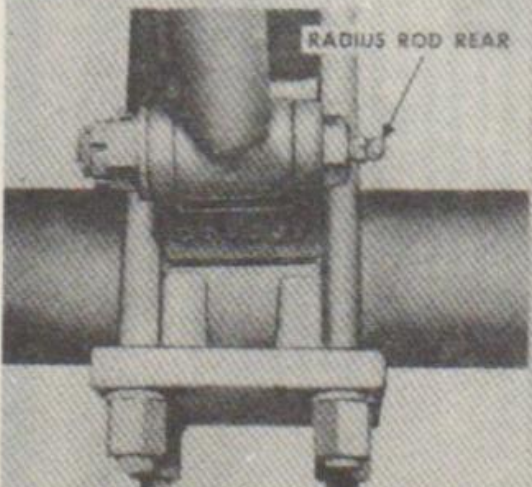
FIGURE 18. LUBRICATION ORDER



ITEM 1—FRONT END OF DOLLY—Place light film of grease over surface of the two draw bar locking pins. Four fittings (two at each side). Apply lubricant through fittings until new grease appears.



ITEM 2—FIFTH WHEEL LOCKING MECHANISM—Oil can. Apply several drops of oil on parts as marked.



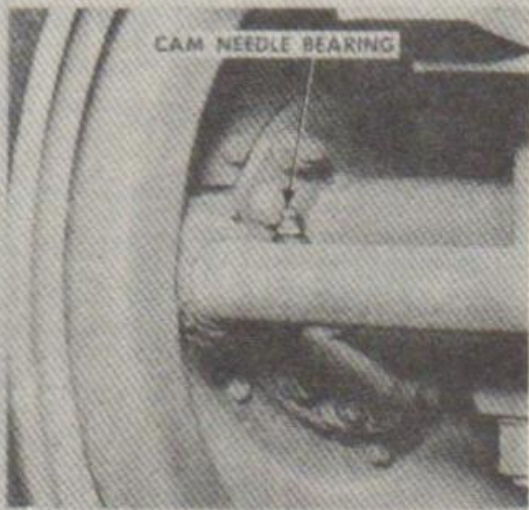
ITEM 3—RADIUS ROD REAR—Two fittings (one on each side). Pressure gun. Apply lubricant through fittings until new grease appears.



ITEM 4—BRAKE OPERATING PARTS—Place several drops of oil on rod end pins (one on each side). Remove pipe plug from slack adjuster. Use pressure gun (one on each side). Apply grease through fittings on cam bracket (one on each side).



ITEM 5—FIFTH WHEEL BASE—Two fittings. Pressure gun. Apply lubricant through fittings until new grease appears, then turn dolly at 45° angle and apply grease.



ITEM 6—CAM NEEDLE BEARING—Two fittings (one on each side). Pressure gun. Use grease sparingly. Over-lubricating will cause grease to flow on brake lining.

FIGURE 19. LOCALIZED LUBRICATION VIEWS

Lubrication

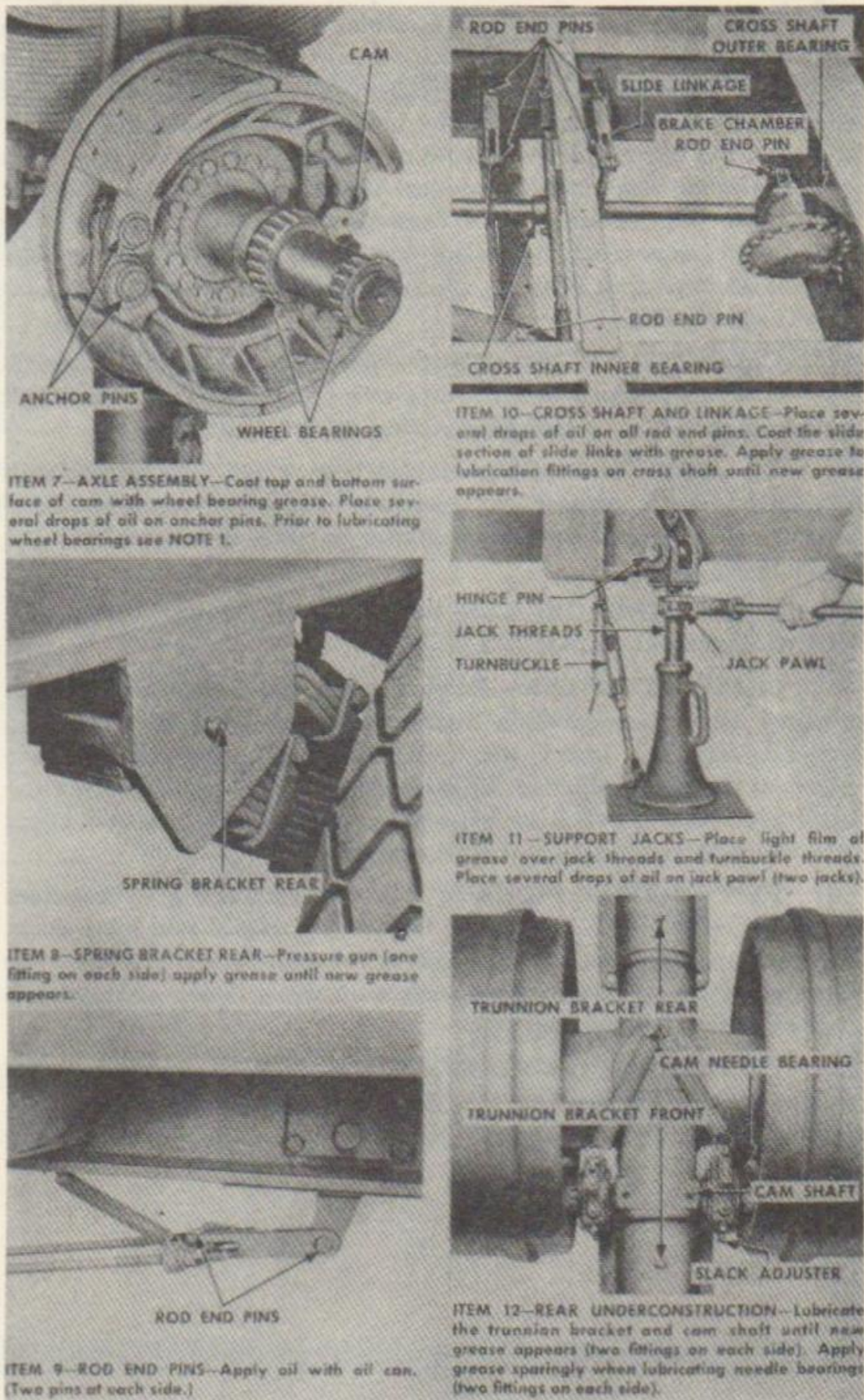


FIGURE 20. LOCALIZED LUBRICATION VIEWS

oroughly. Do not use compressed air. Inspect bearing races and replace if damaged. Wet the spindle and inside of hub and hub cap with GREASE, general purpose, No. 2 to a maximum thickness of 1/16 inch only, to retard rust. Lubricate bearings with GREASE, general purpose, No. 2 with a packer, or by hand, kneading lubricant into all spaces in the bearing. Use extreme care to protect the bearings from dirt, and immediately reassemble and replace wheel. Do not fill hub or hub cap. The lubricant in the bearing is sufficient to provide lubrication until the next service period. Any excess might result in leakage into the drum. Adjust bearings in accordance with instructions in paragraphs 72 and 75.

(2) **CAM NEEDLE BEARINGS**—When lubricating these points care must be exercised in not over-lubricating. Over-lubrication will cause grease to flow on brake shoes, thus causing faulty brakes.

(3) **CAM SURFACE**—Coat top and bottom side of the cam with GREASE, general purpose, No. 2 when wheels are removed for wheel bearing lubrication. Do not allow grease to come in contact with the brake lining.

(4) **SLIDE LINKAGE**—Coat both ends of the slide links with GREASE, general purpose, No. 1.

(5) **SLACK ADJUSTER**—Remove pipe plug from slack adjuster housing. Remove lubrication fitting from cam bracket or trunnion mounting bracket. Install the fitting into slack adjuster and then lubricate the slack adjuster. Remove the lubrication fitting from the slack adjuster and install the pipe plug. Install the lubrication fitting into trunnion mounting bracket or cam bracket.

(6) **FIFTH WHEEL PICK-UP**—Clean all sand and grit off surface of fifth wheel pick-ups, and place a light film of grease over the surface. The pick-ups are to be lubricated prior to backing the dolly under the semitrailer. There is no bearing surface on the pick-ups after dolly is backed under the semitrailer.

(7) **FIFTH WHEEL LOCKING MECHANISM**—The fifth wheel locking mechanism consists of a lock lever, lock and lock plunger. Lubricate the locking mechanism with engine oil to permit easy operation.

SECTION X

FIRST ECHELON PREVENTIVE MAINTENANCE

32. PURPOSE.

a. To insure mechanical efficiency, it is necessary that the vehicle be systematically inspected at intervals each day it is operated, and weekly, so that defects may be discovered and corrected before they result in serious damage or failure. Certain scheduled maintenance services will be performed at these designated intervals. The services set forth in this section are those performed by driver or crew before operation, during operation, at halt, and after operation.

b. Driver preventive maintenance services are listed on the back of Driver's Trip Ticket and Preventive Maintenance Service Record, W.D. Form No. 48. Certain items listed on the form, that do not pertain to the vehicle, are eliminated from the procedures as written into the manual. Every organization must thoroughly school each driver in performing the maintenance procedures set forth in manuals.

c. The items listed on W.D. Form No. 48, that apply to this vehicle, are expanded in this manual to provide specific procedures for accomplishment of the inspections and services. The item numbers are identical with those shown on Form 48.

d. The general inspection of each item applies also to any supporting member or connection, and generally includes a check to see whether or not the item is in good condition, correctly assembled, secure, or excessively worn.

e. The inspection for good condition is usually an external visual inspection to determine whether or not the unit is damaged beyond safe or serviceable limits. The term good condition is explained further by the following: Not bent or twisted, not chafed or burned, not broken or cracked, not bare or frayed, not dented or collapsed, not torn or cut.

f. The inspection of a unit to see that it is correctly assembled is usually an external visual inspection to see whether or not it is in its normal assembled position on the vehicle.

g. The inspection of a unit to determine if it is secure is usually an external visual examination, a hand-feel wrench, or a pry-bar check for looseness. Such an inspection should include any brackets, lock washers, lock nuts, locking wires, or cotter pins used in assembly.

h. Excessively worn will be understood to mean worn close to, or beyond, serviceable limits, and likely to result in a failure if not replaced before the next scheduled inspection.

i. Any defects or unsatisfactory operation characteristics beyond the scope of the first echelon to correct must be reported at the earliest opportunity to the designated individual in authority.

33. BEFORE-OPERATION SERVICES.

a. This inspection schedule is designed primarily as a check to see that the vehicles have not been tampered with, or sabotaged since the After-operation Service was performed. Various combat conditions may have rendered the vehicles unsafe for operation, and it is the duty of the operator to determine whether or not the vehicles are in condition to carry out any mission to which they are assigned. This operation will not be entirely omitted, even in extreme tactical situations.

b. **Procedures.** Before-operation Service consists of inspecting items listed below according to the procedure described, and correcting or reporting any deficiencies. Upon completion of the service, results should be reported promptly to the designated individual in authority.

(1) **TAMPERING AND DAMAGE**—Check for damage from fallen debris, shell fire, sabotage or collision.

(5) **AIR BRAKE TANK AND AIR FILTERS**—Check air brake reservoir tank, air lines, air filters, and connections for looseness or damage. Check for air leaks. Drain water from tanks and close drain cocks. Be sure truck to trailer air couplings are securely connected, or if not in use, that they are closed and properly supported.

(12) **LAMPS AND REFLECTORS**—Check their condition and operation. See that they are securely mounted.

(13) **WHEEL NUTS AND HUB CAP SCREWS**—See that all trailer and dolly wheel mounting studs, nuts, and hub cap screws are present and secure.

(14) **TIRES**—Check for proper inflation—front 70 lbs., rear 65 lbs. Examine for cuts, bruises and embedded foreign matter. Record all bad cuts and bruises on proper form.

(15) **SPRINGS AND SUSPENSIONS**—Check the dolly springs to see whether they have abnormal sag, broken or shifting leaves, loose or missing rebound clips, eyebolts, U-bolts and shackles.

(18) **TOWING CONNECTIONS**—Inspect all towing devices to see that they are in good condition and securely connected or mounted. Check condition of pintle, draw bar and retraction spring. See that the fifth wheel mechanism operates freely, and if trailer is connected to tractor, see that pintle is securely locked, and that safety chains are fastened.

(19) **BODY AND LOAD BINDERS**—Inspect deck for loose planks and damage. Inspect lashing rings and load binders.

34. DURING-OPERATION SERVICES.

a. General. This is an operator's responsibility — to detect deficiencies in operation, unusual sounds or other signs of abnormal operation that would indicate trouble ahead if not corrected promptly. Report deficiencies that develop during operation on Form No. 48.

(27) **BRAKES**—Test trailer brakes independent of tractor brakes. See that they are effective and operate without excessive pull to one side.

(34) **RUNNING GEAR**—Check for any unusual noise or unsatisfactory operating characteristics that would indicate trouble ahead if not corrected immediately.

(35) **TRAILER BODY**—Check for any abnormal sagging or tilting of trailer.

35 AT-HALT SERVICES.

(39) **TEMPERATURES. HUBS, BRAKE DRUMS**—Place hand cautiously on each trailer and dolly wheel drum and wheel hub to see whether it is abnormally hot.

(42) **SPRINGS AND SUSPENSIONS**—Check dolly for broken or shifted spring leaves, damaged or loose clips and U-bolts.

(44) **WHEEL NUTS AND HUB CAP SCREWS**—See that both dolly and trailer wheel rim, mounting and hub cap flange nuts and screws are present and secure.

(45) **TIRES**—Check for cuts, bruises and embedded foreign matter. Record any tire damages on proper form.

(50) **TOWING CONNECTIONS**—Be sure electrical and air brake connections are fastened and that support springs hold the lines so as to prevent chafing. See that the safety chains are securely fastened to trailer and tractor.

(51) **BODY AND LOAD**—Inspect lashing rings and load binders. Be sure trailer and load is not shifting and is safe for travel.

36. AFTER-OPERATION SERVICES.

The following daily After-operation Services are to be performed by the operator (or crew) immediately after the operation period and during continuous operation at 8 hour intervals.

(59) **LAMPS AND REFLECTORS**—See that all units are clean, in good operating condition and securely mounted.

(64) **ELECTRICAL WIRING**—Check all wiring for worn or frayed insulations, broken wires, loose or corroded connections.

(68) **TIRES**—Check for unusual wear, damage and proper inflation. See that caps are on valve stems.

(69) **SPRINGS AND SUSPENSIONS**—Inspect springs for abnormal sag, broken or shifted leaves, and loose or missing rebound clips or U-bolts. Examine trunnion mounting bolts.

(73) **LEAKS, GENERAL**—Look for grease leaks at wheel hub caps and around drums.

(75) **AIR BRAKE TANK AND AIR FILTERS**—Open tank drain cock and drain water. Check tank, air filters and air line connections for looseness and damage. Make sure hose coupling packing ring is not cut, damaged or excessively worn.

(77) **TOWING CONNECTIONS**—Inspect rear pintle hook for looseness, damage and excessive wear. Check fifth wheel on dolly and king pin on trailer for wear or damage, and see that fifth wheel locking mechanism operates properly and locks securely.

(78) **BODY AND LOAD**—Check body carefully for damaged, loose or missing parts. If loaded, make sure it is evenly distributed, secure and safe for travel.

(82) **TIGHTEN**—Tighten all dolly or trailer assembly mounting nuts or screws where inspection has indicated the necessity.

(84) **CLEAN VEHICLE**—Clean dirt, trash and grease from entire trailer.

(85) **TOOLS AND EQUIPMENT**—Check tools and equipment. See that all necessary items are present. See that they are in good condition and properly stowed. See that tool box lids are closed and fastened.

Don'ts.

DON'T operate trailer if safety chains are not fastened.

DON'T overload trailer.

DON'T operate trailer without proper inflation in tires.

DON'T get off or on trailer while trailer is in motion.

DON'T move trailer until maximum air pressure is shown on brake gage.

DON'T fail to drain air filters daily.

SECTION XI

SECOND ECHELON ORGANIZATIONAL MAINTENANCE

37. SECOND ECHELON ORGANIZATIONAL MAINTENANCE SERVICES.

a. Regular scheduled maintenance inspections and services are a preventive maintenance function of the using arm, and are the responsibility of commanders of operating organizations.

(1) **FREQUENCY**—The frequency of the preventive maintenance services outlined herein is considered a minimum requirement for normal operation of vehicles. Under unusual operating conditions such as extreme temperatures, dusty or sandy terrain, it may be necessary to perform certain maintenance services more frequently.

(2) **FIRST ECHELON PARTICIPATION**—The operators should accompany their vehicles and assist the mechanics while periodic second echelon preventive maintenance services are performed. Ordinarily, the driver should present the vehicle for a scheduled preventive maintenance service in a reasonably clean condition; that is, it should be dry and not caked with mud or grease to such an extent that inspection and servicing will be seriously hampered. However, the vehicle should not be washed or wiped thoroughly clean, since certain types of defects, such as cracks, leaks and loose or shifted parts or assemblies are more evident if the surfaces are slightly soiled or dusty.

(3) If instructions other than those which are contained in the general procedures in step (4), or the specific procedures in step (5) which follow, are required for the correct performance of a preventive maintenance service or for correction of a deficiency, other sections of the Vehicle Operator's Manual pertaining to the item involved, or a designated individual in authority should be consulted.

(4) **GENERAL PROCEDURES**—These general procedures are basic instructions which are to be followed when performing the services on the items listed in the specific procedures.

Note

The second echelon personnel must be thoroughly trained in these procedures so that they will apply them automatically.

(a) When new or overhauled subassemblies are installed to correct deficiencies, care should be taken to see that they are clean, correctly installed, properly lubricated and adjusted.

(b) When installing new lubricant retainer seals, a coating of the lubricant should be wiped over the sealing surface of the lip of the seal. When the new seal is a leather seal, it should be soaked in correct lubricant (warm if practicable) for at least 30 minutes. Then, the leather lip should be worked carefully by hand before installing the seal. The lip must not be scratched or marred.

(c) The general inspection of each item applies also to any supporting member or connection, and usually includes a check to see whether the item is in good condition, correctly assembled, secure, or excessively worn. The mechanics must be thoroughly trained in the following explanation of these terms.

1. The inspection for good condition is usually an external visual inspection to determine whether the unit is damaged beyond safe or serviceable limits. The term good condition is explained further by the following: Not bent or twisted, not chafed or burned, not broken or cracked, not bare or frayed, not dented or collapsed, not torn or cut.
2. The inspection of a unit to see that it is correctly assembled is usually an external visual inspection to see whether it is in its normal assembled position in the vehicle.
3. The inspection of a unit to determine if it is secure is usually an external visual examination, a wrench, hand-feel, or a pry-bar check for looseness. Such an inspection should include any brackets, lock washers, lock nuts, locking wires, or cotter pins used in assembly.
4. Excessively worn will be understood to mean—close to or beyond serviceable limits, and likely to result in a failure if not replaced before the next scheduled inspection.

(d) **SPECIAL SERVICES**—These are indicated by repeating the item numbers in the columns which show the interval at which the services are to be performed, and show that the parts or assemblies are to receive certain mandatory services. For example, an item number in one or both columns opposite a *Tighten* procedure, means that the actual tightening of the object must be performed. The special services include:

1. **Adjust**—Make all necessary adjustments in accordance with the pertinent section of the Vehicle Operator's Manual, special bulletins, or other current directives.
2. **Clean**—Clean units of the vehicle with SOLVENT, dry-cleaning, to remove excess lubricant, dirt and other foreign material. After the parts are cleaned, rinse them in

clean solvent and dry thoroughly. Take care to keep the parts clean until reassembled, and be certain to keep solvent away from rubber or other materiel which it will damage. Clean the protective grease coating from new parts since this material is not usually a good lubricant.

3. **Special Lubrication**—This applies either to lubrication operations that do not appear on the vehicle Lubrication Order and to items that do appear on the Order but should be performed in connection with the maintenance operations, if parts have to be disassembled for inspection or service.

4. **Tighten**—All tightening operations should be performed with sufficient wrench torque (force on the wrench handle) to tighten the unit according to good mechanical practice. Do not overtighten, as this may strip threads or cause distortion. Tightening will always be understood to include the correct installation of lock washers, lock nuts, and cotter pins provided to secure the tightening.

(e) When conditions make it difficult to perform the complete organizational maintenance procedures at one time, they can sometimes be handled in sections, planning to complete all operations within the week if possible. All available time at halts and in bivouac areas must be utilized if necessary to assure that maintenance operations are completed. When limited by the tactical situation, items with special services in the columns should be given first consideration.

(f) The numbers of the preventive maintenance procedures that follow are identical with those outlined on W.D. A.G.O. Form No. 464. Certain items on this work sheet that do not apply to this vehicle are not included in the procedures in this manual. Items to be covered on this equipment not listed on Form 464 are given numbers listed on the back of Form 464 that carry no nomenclature.

(5) **SPECIFIC PROCEDURES**—Procedures for performing each item in the 64 hours (weekly) and 256 hours (monthly) maintenance procedures are described in the following chart. Each page of the chart has two columns at its left edge corresponding to the 256 hours and the 64 hour maintenance respectively. Very often it will be found that a particular procedure does not apply to both scheduled maintenances. In order to determine which procedure to follow, look down the column corresponding to the maintenance due, and wherever an item number appears the operation is indicated opposite the number.

MAINTENANCE		
Monthly or 256 hrs.	Weekly or 64 hrs.	
1	1	Before-Operation Services. Check for tampering and damage.
MAIN ASSEMBLY		
76	76	Tires. Check for proper inflation—front 70 lbs., rear 65 lbs. Remove any embedded foreign matter and look for any irregular tread wear. See that valve stems are in proper position and valve caps tight. See that any deficiencies noted are corrected.
77	77	Fifth Wheel, Tow Hitch. Check fifth wheel for loose mounting bolts and nuts. Check friction surfaces, jaw and lock assemblies for excessive wear. Clean base plate thoroughly. Inspect trailer king pin, draw bar and tow hitch connections for wear, loose bolts and nuts. Be sure draw bar support arm and safety chains are secure. See that tow hitch locking jaws operate freely and lever latch, locks securely.
84		Wheels, Dolly and Trailer. Check for proper wheel bearing adjustment. Revolve wheels and listen for evidence of dry or damaged bearings. Inspect around flanges and dust shields for lubricant leaks. If adjustment is necessary, refer to Maintenance Section in Technical Manual. See that wheel mounting and hub flange nuts are tight.
80	80	Frame. Check for cracks or broken welds and alignment.
85	85	Axles, Dolly and Trailer. See that they are not sprung or out of line and that all attachments and mountings are secure. Check trunnion shafts and bushings for wear.
83	83	Springs, Equalizers, Stabilizers. See that spring leaves have not shifted or broken, clips are in place and bolts tight. Check spring shackles and bolts for excessive wear.
99	99	Service Brakes. Check dolly and trailer brake linings through inspection holes in drums to see if they are so worn that rivet heads may contact drums before the next scheduled inspection. If trailer has been operated in deep water, mud or sand remove forward right trailer wheel and drum and examine lining for damage. If this lining must be replaced, remove all trailer and dolly wheels, check their brakes and service as necessary. If none of the above deficiencies are noted, see that brakes hold securely. Adjust if necessary.
001		Emergency or Parking Brake. Check brake to see that

		it holds securely. Adjust if necessary. See that all rods and linkage on brake mechanism are connected, securely mounted and not damaged. See that all keeper pins are in place.
52	52	Lights, Reflectors, Wiring. Test switches and lights — see that they operate properly. See that lamps and reflectors are in good condition and securely mounted. Check all wiring for worn or frayed insulation, broken wires, loose or corroded connections. See that wiring conduit is mounted securely underneath frame.
136	136	Spare Tire Carrier. See that spare tire carrier is in good condition and securely mounted.
137	137	Supports (Screw Jacks). See that they are in good condition, correctly assembled, secure, and adequately lubricated. See whether the screw junctions correctly to raise and lower trailer.
138	138	Floor & Stowage Compartment. See that the decking planks and stowage compartment doors and latches are in good condition.
139	139	Pintle Hook. See that pintle hook is securely mounted, in good condition and that the latch works freely.
AIR BRAKE SYSTEM		
110	110	Leaks, General. Test trailer air brakes for leaks with air pressure at governed maximum. With all brakes applied and engine stopped, there should not be a noticeable drop in pressure within one minute. If any pressure leak occurs during this check, test system for leaks by the soapsuds method.
111	111	Air Brake Reservoirs. Observe whether they are in good condition and secure. Open the drain cocks and drain off water. Close drain cocks.
112	112	Air Filters. Remove drain plugs from bottom of filters and drain dirt, water, oil, and sediment. Replace plugs.
114	114	Brake Cylinders and Chambers. See that they are securely mounted and all connections tight. Check for worn pins and links.
GENERAL		
2	2	Lubrication. Perform all lubrication services as required by the Lubrication Order at the time of inspection. Make certain all fittings are clean and all bearings are taking grease.

3	3	Tools and Equipment. Check and clean all tools. See that they are properly stored.
5	5	Publications. See that Technical Manuals, Lubrication Order, Preventive Maintenance Services, Form 478 and Form 26 are on the machine.
6	6	Appearance. Inspect machine for condition of paint, markings, damage, and general appearance.
7	7	Modification. See that all available modification work orders applying to this machine have been completed and recorded on Form 478.

SECTION XII

TROUBLE SHOOTING

38. GENERAL.

This section contains trouble shooting information and tests which can be made to help determine the causes of some of the troubles that may develop in use under average conditions. Each symptom of trouble given under the individual unit or system is followed by a list of possible causes of the trouble. The tests necessary to determine which one of the possible causes is responsible for the trouble are explained after each possible cause. Paragraphs 42 and 45 apply to the semitrailer only. Paragraphs 40, 41 and 44 apply to the dolly only. Paragraphs 39 and 43 apply to both the semitrailer and the dolly.

39. BRAKING SYSTEM.

a. No Brakes.

- (1) SOURCE OF AIR SUPPLY SHUT OFF AT TOWING VEHICLE—Open cut-out cocks at rear of towing vehicle.
- (2) AIR JUMPER HOSE BETWEEN TRUCK AND TRAILER NOT PROPERLY COUPLED—Make certain air jumper hose tagged "Service" is coupled to connections on semitrailer tagged "Service." Service line is on the right side of semitrailer (para. 15). Make certain hose is connected between dolly and semitrailer and that cut-out cock is open.
- (3) LOW BRAKE LINE PRESSURE—Check air pressure gage on towing vehicle. Pressure must not be below 60 pounds.
- (4) RESERVOIR DRAIN COCK OPEN—Close drain cock on reservoir. Reservoir is located on right side at rear.

b. One or More Brakes Running Hot.

- (1) IMPROPER ADJUSTMENT—Adjust brakes (para. 47).

- (2) **RELEASE SPRING BROKEN IN DRUM**—Replace spring (para. 58).
- (3) **BINDING CAM, ANCHOR PINS OR CHAMBER ROD END PIN**—Lubricate (para. 31).
- (4) **BENT CHAMBER PUSH ROD**—Replace brake chamber (para. 48. *b.*).
- (5) **DRUM OUT OF ROUND**—Replace drum (para. 79).
- (6) **HAND BRAKE NOT IN "OFF" POSITION**—Release the hand brake turning hand wheel counterclockwise.

c. Slow Brake Application or Slow Release.

- (1) **LOW BRAKE LINE PRESSURE**—Check air supply at towing vehicle. Refer to vehicle technical manual.
- (2) **EXCESSIVE TRAVEL IN CYLINDER PUSH ROD**—Adjust brakes (para. 47).
- (3) **DIRTY AIR FILTER**—Clean air filter (para. 50. *d.*).
- (4) **RESTRICTION IN TUBING**—Look for kinked or dented tubing. Replace or repair (para. 51).
- (5) **LACK OF LUBRICATION**—Lubricate anchor pin, cams, slack adjuster, mounting bracket and chamber rod and pins (para. 31). If dolly brakes are slow in releasing, check the quick release valve (para. 52).

d. Drop in Air Pressure.

- (1) **EXCESSIVE LEAKAGE IN RELAY-EMERGENCY VALVE EXHAUST PORT**—Worn check valve body. Replace relay-emergency valve (para. 49); repair relay-emergency valve (para. 92).
- (2) **AIR LEAKAGE AT TUBING CONNECTORS**—Tighten connector bodies and nut until leak disappears.
- (3) **EXCESSIVE LEAKAGE AT SERVICE LINE OR EMERGENCY LINE COUPLINGS**—Damaged packing ring in hose coupling. Replace hose coupling (para. 51. *f.*).
- (4) **EXCESSIVE LEAKAGE AT SERVICE LINE COUPLING WHEN JUMPER HOSE IS DISCONNECTED**—Dirty or worn inlet valve. Replace relay-emergency valves (para. 49); repair (para. 92).
- (5) **EXCESSIVE LEAKAGE AT EMERGENCY LINE COUPLING WHEN JUMPER IS DISCONNECTED**—Defective check valve disk or defective diaphragm. Replace relay-emergency valves (para. 49); repair (para. 92).

e. Intermittent Brakes.

- (1) **GREASE ON LINING**—Caused from over-lubricating of anchor

pins, camshaft or wheel bearing (para. 31. d. (1)). Replace lining (para. 96).

- (2) **BRAKE OUT OF ADJUSTMENT**—Adjust brakes (para. 47).
- (3) **SCORED BRAKE DRUM**—Replace drum (para. 79).
- (4) **IMPROPER LINING**—Use specified lining (para. 96).
- (5) **WHEEL BEARINGS OUT OF ADJUSTMENT**—Adjust wheel bearing (paras. 72 and 75).
- (6) **LINING WORN**—Replace lining before rivets wear drums.

f. Brakes Do Not Release.

- (1) **BRAKE SYSTEM IMPROPERLY CONNECTED**—Connect lines properly (para. 15).
- (2) **BRAKE CONTROL IN THE APPLIED POSITION AT TOWING VEHICLE**—If semitrailer is coupled to towing vehicle, place the control in the released position. If semitrailer is disconnected from towing vehicle open drain cock at reservoir.
- (3) **RELAY-EMERGENCY VALVE IN EMERGENCY POSITION**—Build up pressure in towing vehicle brake system, or open drain cock at reservoir.
- (4) **CUT-OUT COCKS CLOSED ON TOWING VEHICLE**—Open cut-out cocks.
- (5) **RESTRICTION IN TUBING OR HOSE**—Check all tubing and hose.

40. DOLLY SUSPENSION.

a. Shifted Spring Leaves.

- (1) **BROKEN SPRING CENTER BOLTS**—Replace spring center bolt (para. 103. b.).
- (2) **CLIP BOLTS MISSING OR BROKEN**—Replace (para. 67) or repair (para. 103. c.).
- (3) **LOOSE U-BOLTS**—Tighten U-bolts.

b. Uneven Riding.

- (1) **BROKEN SPRING LEAVES**—Replace spring leaves (para. 103).
- (2) **UNEVEN LOAD DISTRIBUTION**—Distribute load evenly.
- (3) **MAIN OR AUXILIARY SPRING HAS LOST ITS ARCH**—Replace main or auxiliary spring (paras. 66 and 67).

c. Over Flexible.

- (1) **BROKEN SPRING LEAVES**—Replace broken leaves (para. 103).
- (2) **OVER-LUBRICATED**—Lubricate at time intervals specified in Lubrication Order (para. 31).
- (3) **SPRING LEAF CLIPS BROKEN**—Place leaves in alinement and install new clips (para. 103).

41. DOLLY AXLE.

a. Semitrailer Wheels Not Tracking With Those of Dolly or Towing Vehicle.

- (1) **AXLE OUT OF ALINEMENT**—Place axle in alinement.

b. Inner Tires Wearing More Rapidly Than Outer Tires.

- (1) **AXLE OUT OF CAMBER**—Check axle camber (para. 102 *b.*). If not correct, replace axle (para. 65 *b.*).
- (2) **BENT AXLE SPINDLE**—Check axle for bend (para. 102 *a.*). Replace axle (para. 65 *b.*).

c. Outer Tires Wearing More Rapidly Than Inner Tires.

- (1) **TOO MUCH CAMBER IN AXLE**—Check camber (para. 102 *b.*). Replace axle (para. 65 *b.*).

d. All Four Tires Wearing Unevenly and Cupping.

- (1) **AXLE OUT OF ALINEMENT**—First check axle for bend (para. 102 *a.*), then place axle in alinement.
- (2) **BENT AXLE**—Check axle for bend (para. 102 *a.*). Replace axle (para. 65 *b.*).

42. REAR TRUNNION AXLE.

a. One Tire Wearing More Rapidly Than the Others.

- (1) **BENT TRUNNION AXLE**—Check trunnion axle for bend (para. 109). Replace axle (para. 69 *b.*).

b. Irregular Tire Wear.

- (1) **LOOSE TRUNNION MOUNTING BOLTS**—Tighten bolts holding trunnion mounting brackets to frame, or replace the bolts.
- (2) **BUSHINGS WORN IN TRUNNION MOUNTING BRACKETS**—Replace trunnion mounting brackets (para. 69 *b.*). Rebrush (para. 110).

43. WHEELS, HUBS AND TIRES.

a. Wobbly Wheel.

- (1) LOOSE WHEEL STUD NUTS—Tighten (para. 78 e.).
- (2) INNER OR OUTER WHEEL BEARINGS BURNED OUT—Replace wheel bearings (paras. 71 and 74).
- (3) BENT AXLE—Check axle for bend (para. 102 a.).

b. Hot Hub.

- (1) LACK OF LUBRICATION—Lubricate (para. 31).
- (2) DAMAGED BEARING OR CUP—Replace bearing (paras. 71 and 74), or bearing cup (para. 80).
- (3) IMPROPER WHEEL BEARING ADJUSTMENT—Adjust wheel bearings (paras. 72 and 75).

c. Undue Tire Wear.

- (1) OVER- OR UNDER-INFLATION—Inflate tire to 65 pound pressure on semitrailer and 70 pound pressure on dolly.
- (2) OVERLOADING OR IMPROPER LOAD DISTRIBUTION—Load to rated capacity, or distribute load evenly.
- (3) TIRE TROUBLE—See axle trouble shooting (paras. 41 & 42).

d. Oil or Grease in Brake Drum or Outside of Wheel.

- (1) DEFECTIVE GREASE RETAINER—Replace retainer (paras. 71 b. and 77).
- (2) CRACKED WHEEL—Replace wheel (paras. 71 and 74).
- (3) IMPROPER OR OVER-LUBRICATION—Relubricate (para. 31).

44. FIFTH WHEEL.

a. Excessive Lash or End Play Between Fifth Wheel and Semitrailer.

- (1) JAWS WORN—Replace the jaws (para. 89).
- (2) KING PIN ON UPPER FIFTH WHEEL PLATE EXCESSIVELY WORN—Check the king pin.
- (3) FIFTH WHEEL LOOSE IN ITS MOUNTINGS—Tighten mounting bolts.

b. Uncoupling Difficulties.

- (1) PLUNGER LOCK BINDING IN JAWS—At times difficulty may be encountered when uncoupling. This is no fault of the functional parts of the fifth wheel. The trouble lies in the fact that the semitrailer king pin is causing the plunger lock to bind. This is caused

Trouble Shooting

by the semitrailer and dolly being as far apart as possible without actually being uncoupled. All that is necessary to overcome the trouble is to apply a light pull on the lock lever and give the towing vehicle a rocking motion by first placing the towing vehicle in reverse and then forward.

- (2) **BENT JAWS**—Replace the jaws (para. 89).
- (3) **BENT OR DAMAGED PLUNGER LOCK**—Replace plunger (para. 89).
- (4) **LACK OF LUBRICATION**—Lubricate jaw pins (para. 31), and place several drops of oil on plunger lock.

45. ELECTRICAL SYSTEM.

a. Lights Will Not Burn.

- (1) **JUMPER CABLE NOT PLUGGED INTO TRAILER FROM TOWING VEHICLE**—Install jumper cable.
- (2) **LIGHT SWITCH AT TOWING VEHICLE IN THE "OFF" POSITION**—Turn switch on.
- (3) **BATTERY AT TOWING VEHICLE NOT SUFFICIENTLY CHARGED**—Check battery on towing vehicle.
- (4) **NO CURRENT FROM TOWING VEHICLE**—Check wiring on towing vehicle.
- (5) **BROKEN OR DAMAGED WIRES**—Check wiring system for broken or damaged wires. Replace or repair.

b. Dim Light.

- (1) **DIRTY OR CORRODED CONTACT BLADES IN COUPLING SOCKET OR JUMPER CABLE**—Clean the blades.
- (2) **DIRTY LENS**—Clean lens.
- (3) **BATTERY AT TOWING VEHICLE NOT SUFFICIENTLY CHARGED**—Check battery.
- (4) **DIRTY OR CORRODED LAMP SOCKETS**—Remove lamp-unit and clean.

c. One or More Lights Will Not Burn.

- (1) **BURNED OUT LAMP-UNIT**—Replace lamp-unit (para. 83).
- (2) **BROKEN WIRE**—Check wires for damage. Replace or repair.
- (3) **DAMAGED LIGHT ASSEMBLY**—Replace light assembly (para. 83).
- (4) **DIRTY OR CORRODED LAMP SOCKET**—Remove lamp-unit and clean.

SECTION XIII

BRAKE SYSTEM

46. GENERAL.

The brakes are of the heavy-duty, mechanical, internal-expanding, two-shoe, anchor pin type, operating on the cam and lever principle. The S-type cams are integral with the camshafts. The cams are carried on bearings. The slack adjusters are of the 360 degree type, and permit rapid and proper adjustment of the brakes. The brakes are actuated by two air chambers mounted on the front side of dolly axle, and two air chambers mounted at rear of trailer on the side rails. Emergency breakaway features are built into the relay-emergency valve which will allow air to pass into the brake chamber, thus holding the trailer brakes for a limited time should the trailer break away from the towing vehicle. The brakes are controlled by a foot or hand control on the towing vehicle.

47. BRAKE ADJUSTMENT.

Jack up wheel assembly until wheels clear ground. When jacking dolly wheel, place jack under U-bolt clip to prevent jack from slipping. When jacking rear underconstruction, jack from rear crossmember at either side. Adjustment of dolly and semitrailer brakes is identical. Turn adjusting screw on slack adjuster clockwise until wheel cannot be turned; then turn adjuster screw counterclockwise about two notches or more until wheel turns freely. Grasp the end of the push rod and slack adjuster and pull the push rod out of brake chamber. The travel of the push rod must not exceed $1\frac{3}{4}$ inches or be less than $\frac{3}{4}$ inch (fig. 21).

48. BRAKE CHAMBER.

a. General. The purpose of the brake chamber is to convert the energy of compressed air into the mechanical force and motion necessary to operate the brakes. As air pressure enters the brake chamber behind the diaphragm, the diaphragm pushes the push rod outward, thus rotating the slack adjuster, brake camshaft and brake cam, applying the brakes. It will be seen that the higher the air pressure admitted to the brake chambers the more severe the application. Two brake chambers are provided on dolly axle and two are installed on the semitrailer main frame. The brake chambers are not interchangeable from dolly to semitrailer.

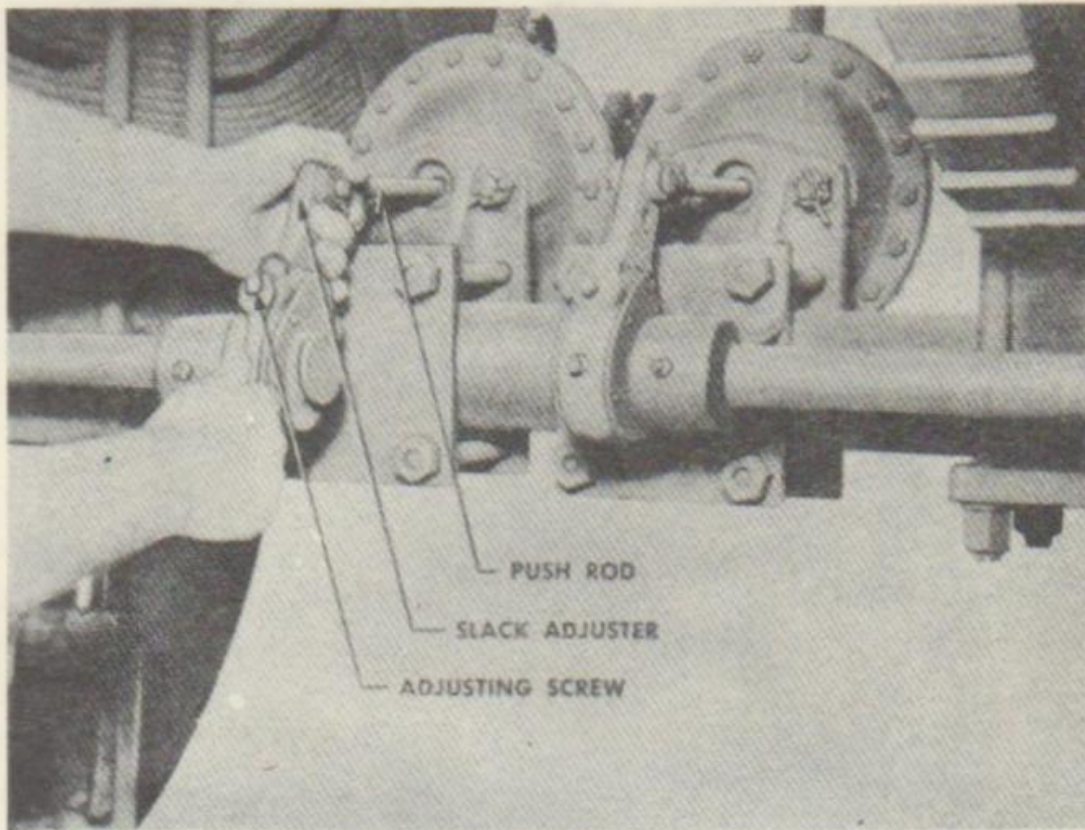


FIGURE 21. BRAKE ADJUSTMENT

b. Removal (figs. 22 and 23). Removal procedure for semitrailer and dolly brake chambers is identical, except that the semitrailer brake chambers are held to their mounting brackets by nuts and lock washers, and the dolly brake chambers are provided with castle nuts.

(1) Disconnect connector nut from connector body, and pull tubing or hose out of chamber. Remove cotter pin from rod end pin and drive out the rod end pin. Remove nuts from studs, and lift chamber off mounting bracket.

c. Disassembly. Before disassembling the brake chamber, be sure to mark the pressure plate and nonpressure plate so that the air inlet opening in the pressure plate will be at the correct angle with the mounting bolt or bracket when the brake chamber is reassembled. Remove all bolts and nuts clamping the outer edges of the diaphragm between the pressure plate and nonpressure plate. Remove pressure plate and diaphragm. Loosen lock nut locking yoke in position on push rod and remove yoke from push rod.

d. Cleaning and Inspection. Clean all metal parts thoroughly using SOLVENT, dry-cleaning, and inspect them for damage. Replace all damaged parts. Inspect rubber diaphragm for signs of checking or wear. Replace if any signs of wear or damage are found.

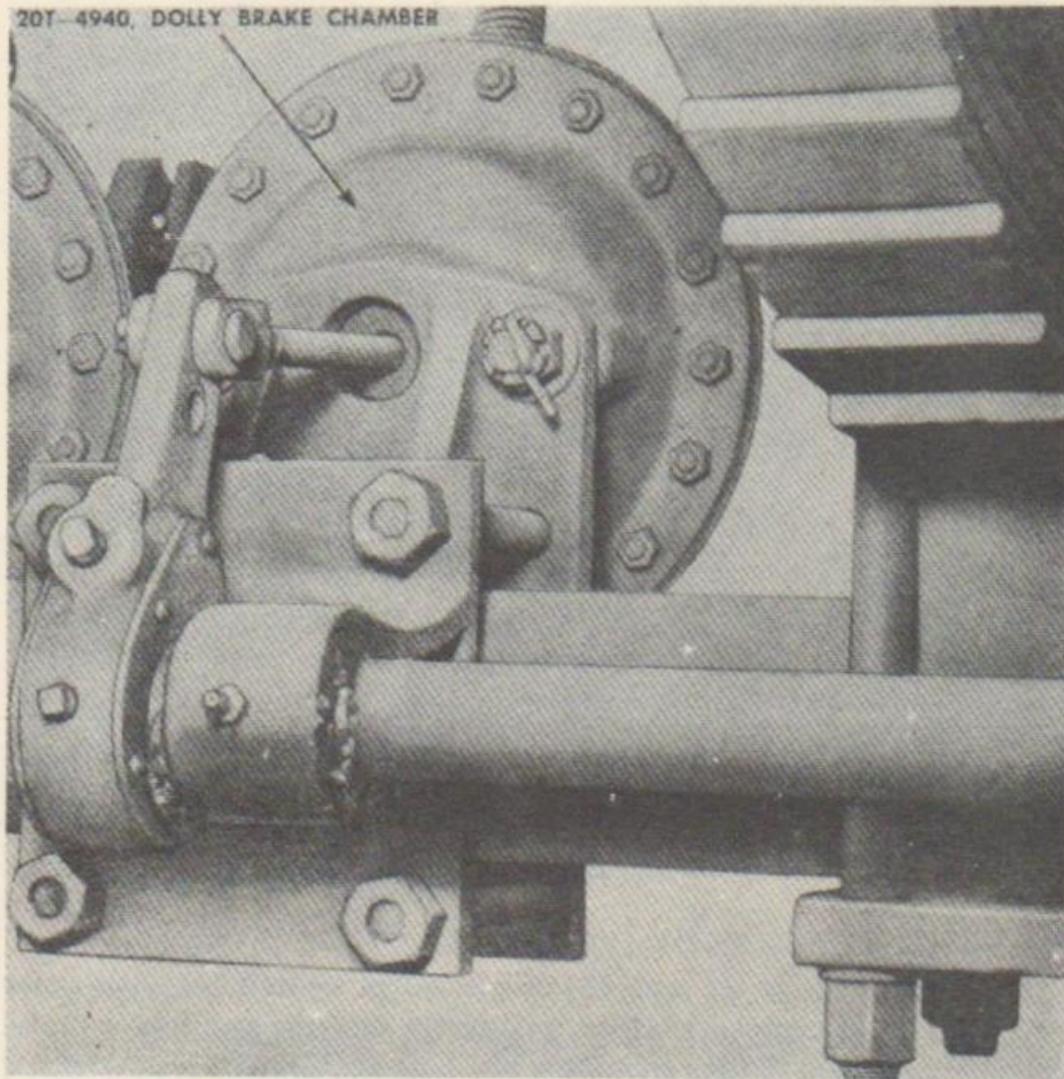


FIGURE 22. DOLLY BRAKE CHAMBER

CAUTION

Do not permit SOLVENT, dry-cleaning, to come in contact with diaphragm.

e. **Reassembly** (figs. 24 and 25). Position push rod, springs and dirt steel washer in place in the nonpressure plate, and install yoke and yoke lock nut. Position diaphragm and pressure plate, being sure the air inlet opening in the pressure plate is in proper relation to the mounting bolt or mounting bracket as marked before disassembly. Install nuts and bolts holding diaphragm between the pressure plate and the nonpressure plate. It is important that all bolts be tightened evenly but not excessively. Tighten the nuts only sufficiently to insure an air tight seal between the pressure plate and the diaphragm and not sufficiently to distort the diaphragm.

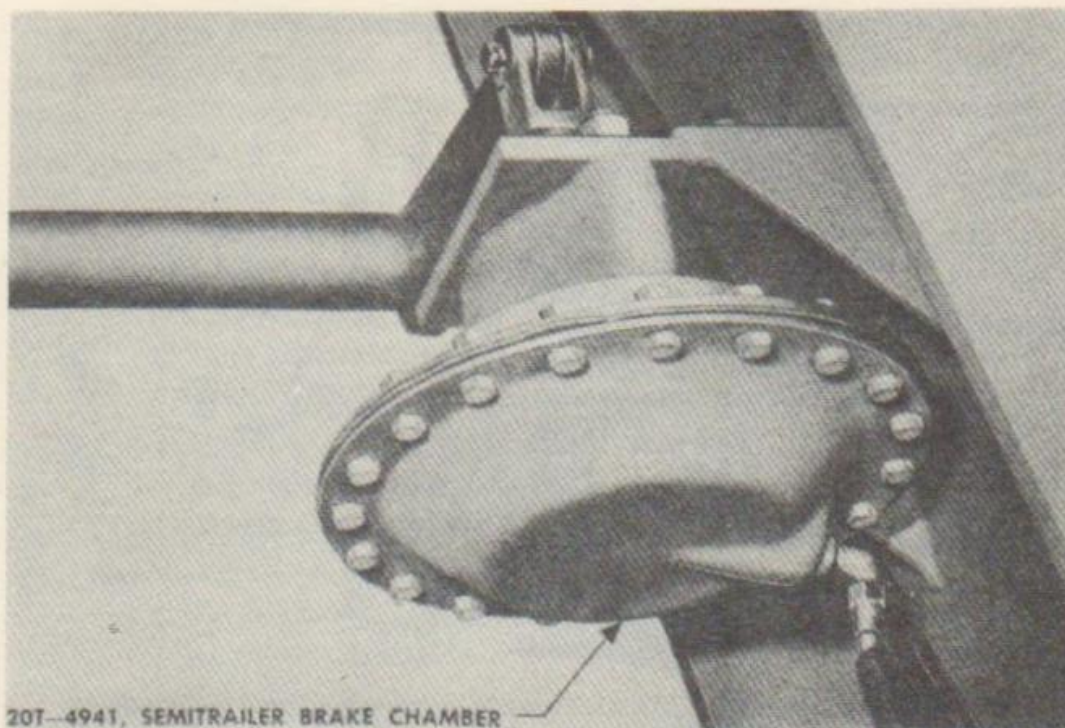


FIGURE 23. SEMITRAILER BRAKE CHAMBER

f. Installation. Position brake chamber in mounting bracket, making certain the port hole in brake chamber is in alinement with the air line. Secure the chamber to mounting bracket using two nuts and two cotter pins on the dolly, or two nuts and two lock washers on the semitrailer. Screw connector body into brake chamber making certain it is tight. Fasten air line to connector body and tighten. Fasten brake push rod to slack adjuster or brake lever using rod end pin and cotter pin.

g. Test for Leaks. Apply the brakes. Cover connector nut with soapy water. If leak is discovered, tighten the connector body and connector nut until leak disappears.

h. Adjustment. Adjust brakes on the wheel or wheels which are controlled by the brake chamber (para. 47).

49. RELAY-EMERGENCY VALVE.

a. General. The relay-emergency valve is located on rear side of channel crossmember near the rear axle. The relay-emergency valve serves as a relay station to speed up the application or release of the trailer brakes and also provides a means of automatically applying the trailer brake in case the trailer should become accidentally disengaged from the towing vehicle. Its function is to operate so as to deliver and maintain the same air pressure in the trailer brake chambers as delivered by the control valve on the towing vehicle.

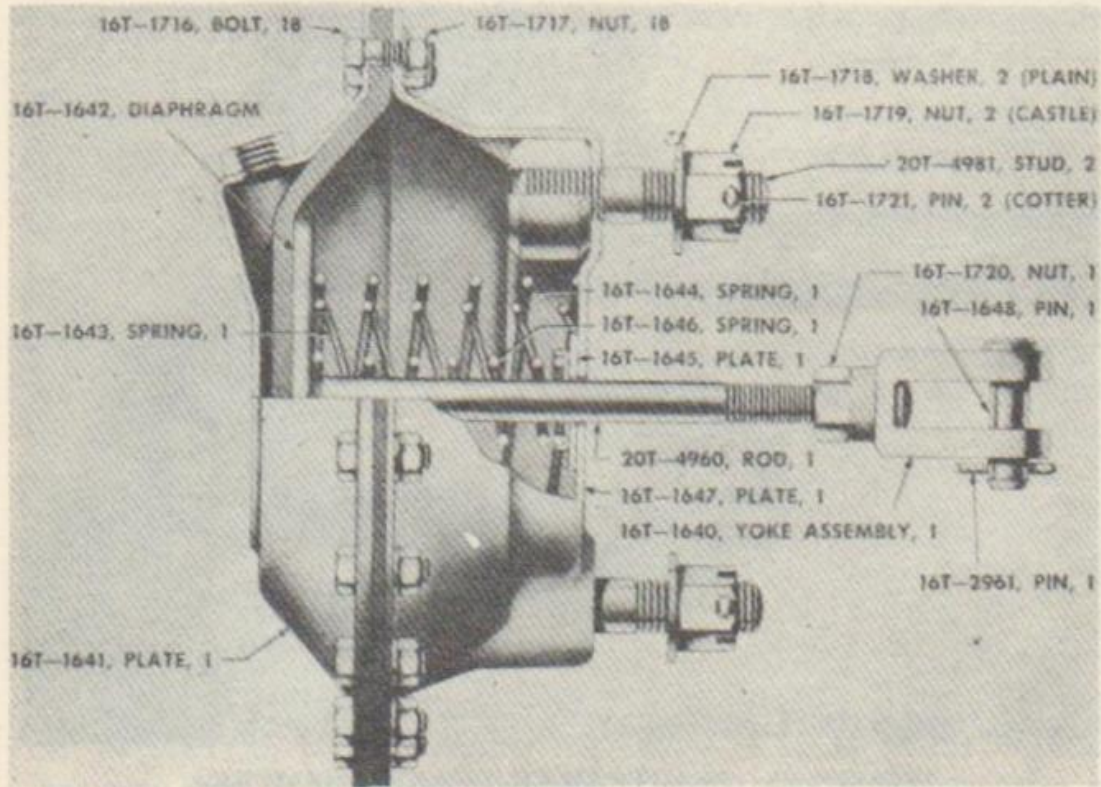


FIGURE 24. DOLLY BRAKE CHAMBER—SECTIONAL VIEW

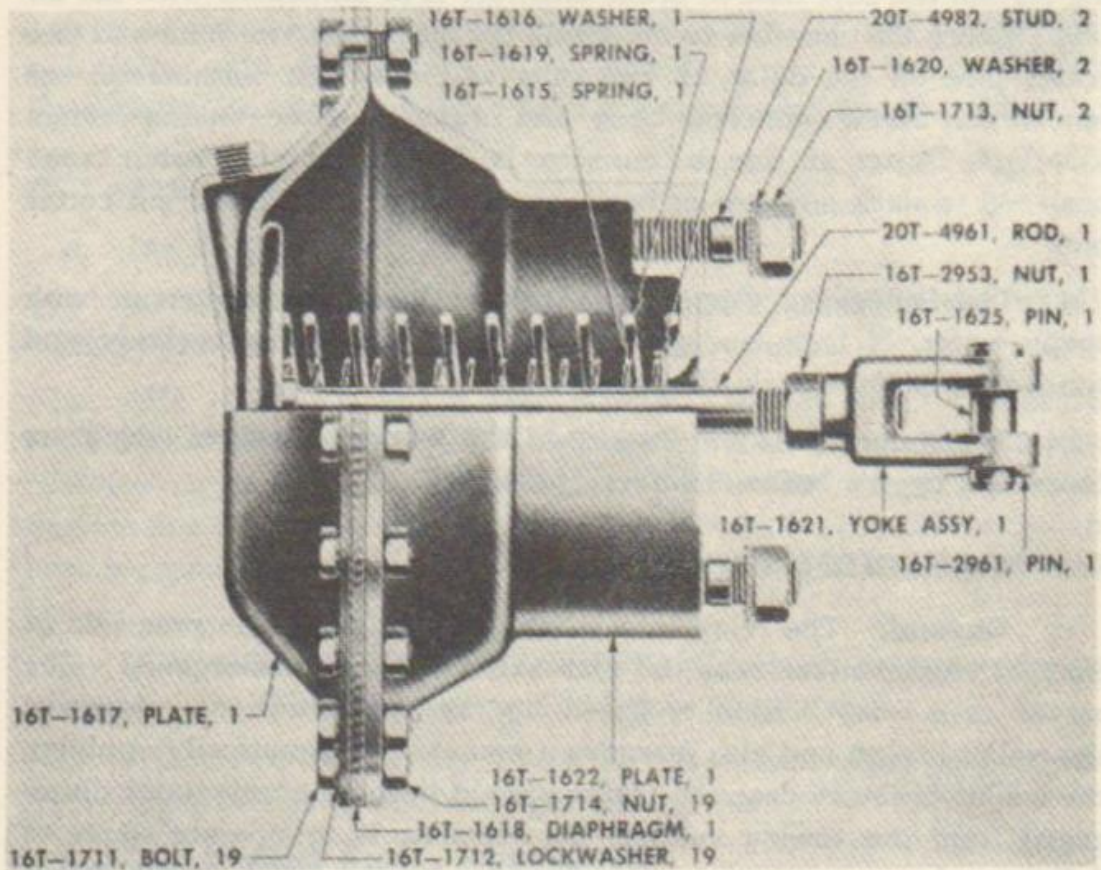


FIGURE 25. SEMITRAILER BRAKE CHAMBER—SECTIONAL VIEW

Brake System

b. **Removal** (figs. 26 and 28). Shut off the air supply to trailer by closing the two cut-out cocks on towing vehicle. Open drain cock at bottom of reservoir tank allowing all air to drain from trailer brake system. Remove tubing nut from tubing elbow at the service line and also at the emergency line. Disconnect the two lines from tubing tee which run to the semitrailer brake chambers. Disconnect line which runs to dolly brakes and reservoir. Remove two nuts, lock washers and cap screws which hold the assembly to frame.

CAUTION

Do not allow dirt or other foreign matter to enter open ports of the assembly.

c. **Installation** (fig. 26). Coat the threaded portion of all valve fittings with shellac. Screw the fittings into their proper ports in relay-emergency valve. Secure the relay-emergency valve to member using two cap screws, two lock washers and two nuts. Couple the two lines to tubing tee. Couple service line to elbow at top and emergency line to elbow at bottom. Couple air line which runs to reservoir and dolly brake chambers. Close drain cock at bottom side of reservoir. Open the two cut-out cocks at towing vehicle. Test all fittings and connectors for leaks (para. 48 g.).

Note

The word "top" is embossed on top of relay-emergency valve. When installing valve make certain the word "top" is up.

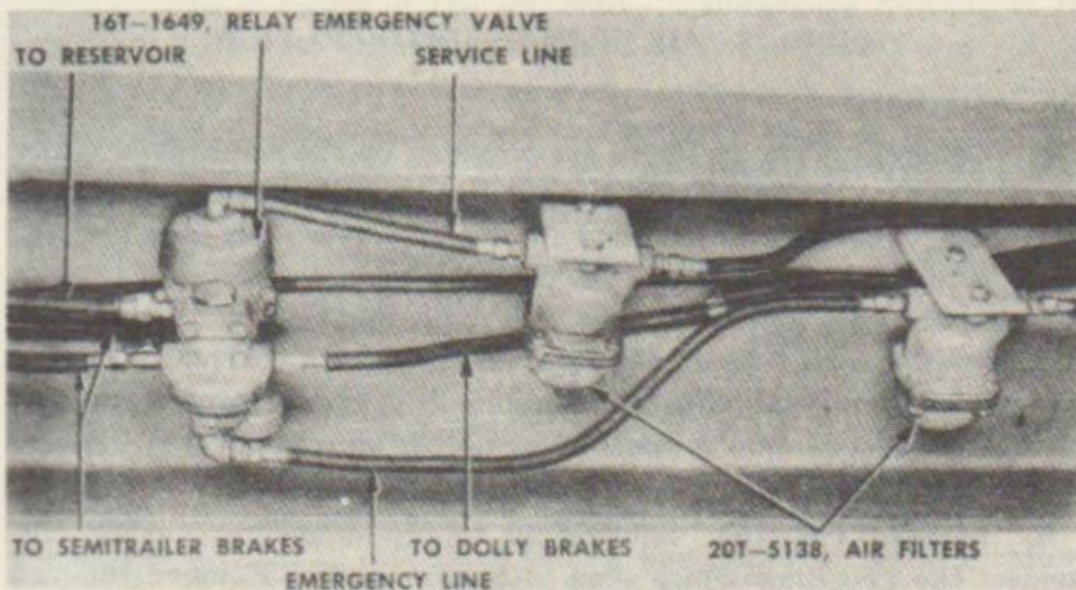


FIGURE 26. RELAY-EMERGENCY VALVE AND AIR FILTERS

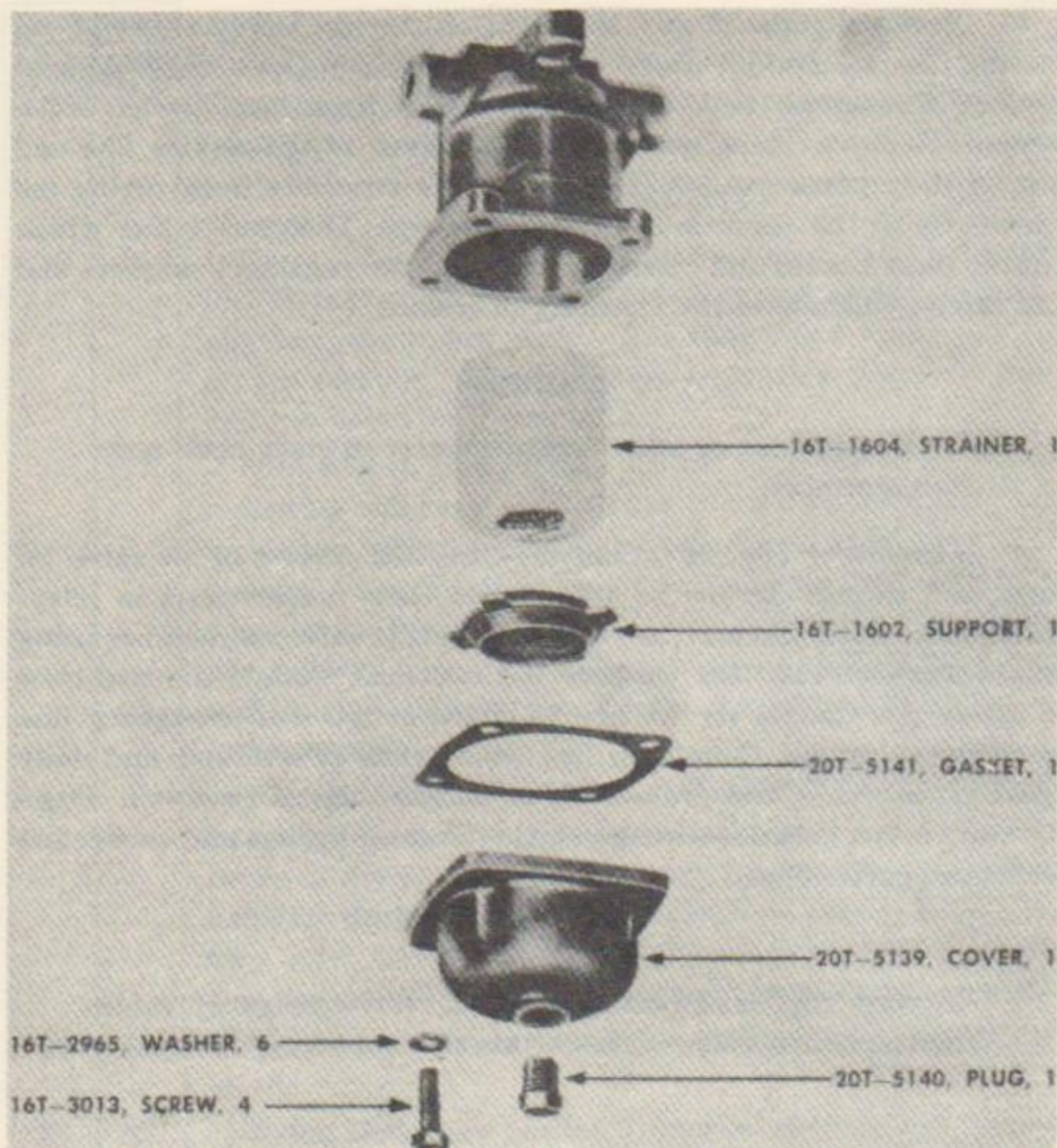


FIGURE 27. AIR FILTER—EXPLODED VIEW

50. AIR FILTER.

a. General. Two air filters are provided on the semitrailer. They are mounted on the inner side of right hand side rail towards the rear of vehicle. One filter is installed in the emergency air line and the other is in the service line. Air filters consist of a metal screen mounted in a housing and are designed to prevent dirt, water and other foreign matter from entering the relay-emergency valve. No adjustment is required to maintain efficient functioning of filter. However, it must be drained every 1,000 miles, disassembled, and thoroughly cleaned every 6,000 miles.

b. Removal (fig. 26). Shut off air supply at towing vehicle. Disconnect the two lines which lead into filter body. Remove the two connector bodies. Remove the two cap screws holding filter to mounting bracket and lift filter out.

c. Disassembly (fig. 27). Remove cap screws and lock washers attaching cover to body. Remove gasket, strainer support and strainer.

d. Cleaning and Inspection. Clean all metal parts using SOLVENT, dry-cleaning. If strainer is merely dirty, clean by brushing. If an oil or gummy deposit is found, the strainer must be replaced.

e. Reassembly (fig. 27). Position strainer in body. Position gasket and strainer support on cover and install cover using four cap screws and four lock washers.

f. Installation. Place cleaner in position on mounting brackets and install two cap screws, but do not tighten. Install the two connector bodies on the air cleaner. Couple the two air lines to the connector bodies and tighten the two cap screws holding cleaner to mounting bracket. Open cut-out valves at rear of towing vehicle and test tubing connectors for leaks using soapy water. Should leaks appear, tighten tube connector bodies and nuts.

Note

When installing air filter it is very important that the arrow embossed on the outer side be pointing toward the air line which runs to the rear of unit.

51. TUBING, TUBING FITTINGS, AND HOSE COUPLINGS.

a. General. Two sizes of metal tubing are used— $\frac{3}{8}$ inch outside diameter and $\frac{1}{2}$ inch outside diameter. Tubing fittings are used to connect the tubings to various devices of the brake system. Seven hose couplings are used on the semitrailer and one is used on the dolly. All hose couplings are identical. The hose couplings provide an easy and convenient method of connecting and disconnecting air lines between towing vehicle and semitrailer, and between dolly and semitrailer.

b. Tubing Inspection (fig. 28). If evidence is found indicating that brake chambers are not functioning properly, check all tubing lines for dents, kinks or other restrictions. Disconnect tubing lines and blow through the tubing making certain that air passes through the tubing. Replace tubing if necessary.

c. Tubing Removal (fig. 28). Close cut-out cocks at rear of towing vehicle. Open drain cocks at underside of air reservoir and allow all air to drain from trailer brake system. Remove the nuts from each end of damaged tubing. Pry open clips holding tubing to frame and pull tubing and loom out.

d. Tubing Installation. Thread copper tubing through loom and

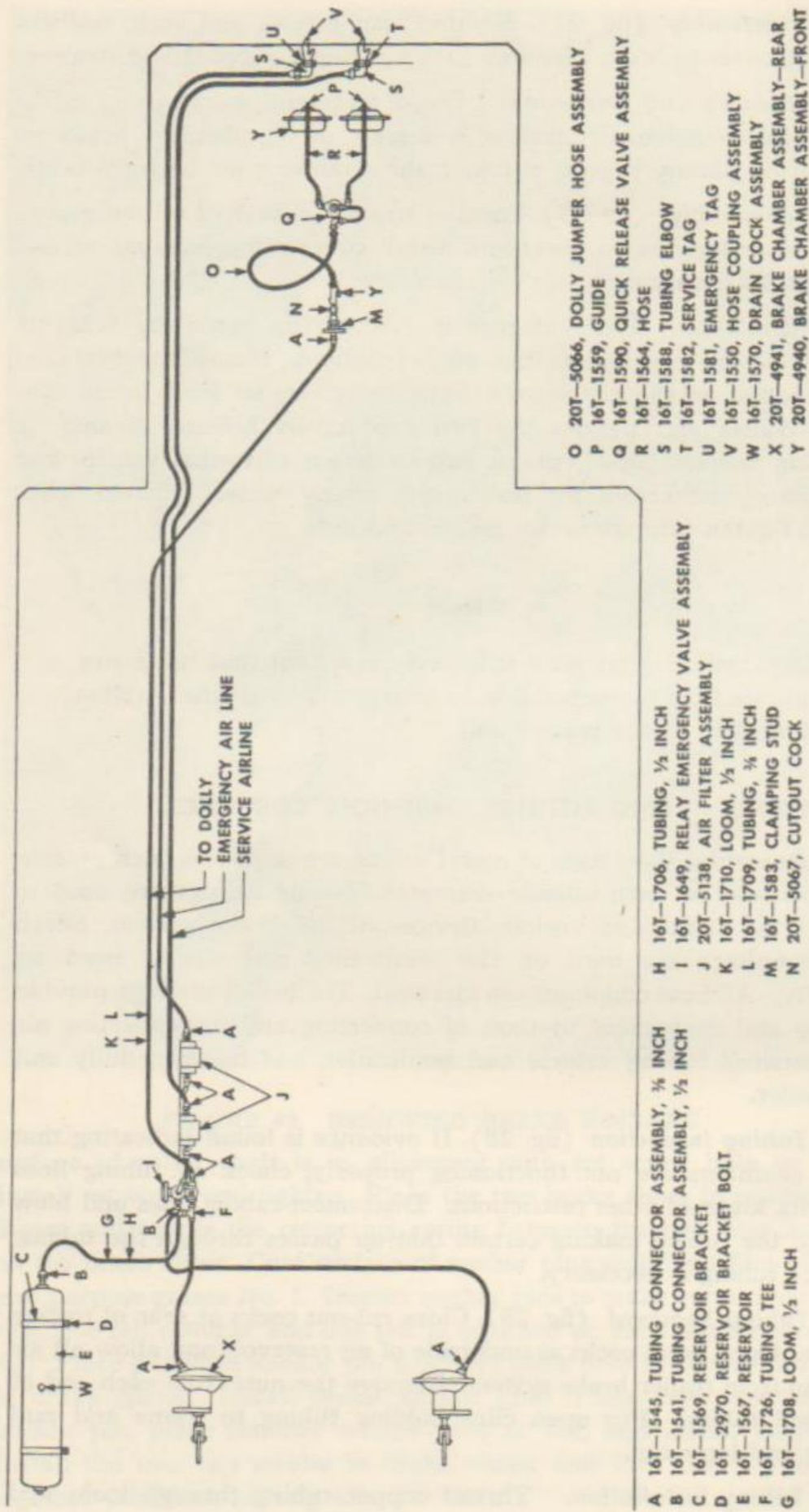


FIGURE 28. BRAKE SYSTEM DIAGRAM

install the loom and tubing, forming it to fit the trailer frame. Install tubing connector nut on tubing and then place sleeve over tubing. Place end of tubing into tubing connector body, hold tubing firmly and straight in recess of connector body, and tighten the connector nut. Keep dirt and other foreign matter out of tubing. When making a cut, use a tubing cutter or a hack saw. If a hack saw is used, blow dust out of tubing as copper dust is detrimental to functional parts of relay-emergency valve. When cutting tubing with a tube cutter, feed cutting wheel into the tubing, a very small amount with each complete rotation until the tube is cut. If the cutter is fed too rapidly, the end of tubing may become beveled inward, reducing the inside diameter of the tube. Make certain all lines are properly anchored to frame members, using tubing clips. When a small portion of tubing becomes damaged, cut off the damaged section and replace using standard $\frac{3}{8}$ inch Westinghouse tubing union at each end of replacement tube. No attempt should be made to repair damaged $\frac{1}{2}$ inch tubing. Remove and replace.

CAUTION

It is very important that care be used when bending and forming tubing to fit frame. A sharp bend will kink tubing and retard brake application and release.

e. Fittings. All tubing fittings used in air brake system are the three piece compression type. Two sizes are used— $\frac{3}{8}$ inch and $\frac{1}{2}$ inch. See (fig. 30) for requisitioning part numbers of fittings.

f. Coupling Removal. With an adjustable wrench turn hose coupling counterclockwise and remove coupling.

g. Coupling Disassembly (fig. 29). Remove gasket by prying it out with a screwdriver. Remove spring plug, lock spring and lock plug.

h. Coupling Inspection. Discard old gasket and clean all other parts in SOLVENT, dry-cleaning. Examine lock spring and lock plug for wear or damage. Replace if necessary. When cleaning the hose coupling body, give particular attention to the groove into which the flange of the hose coupling gasket fits. This groove must be scraped thoroughly clean, otherwise the new gasket will not go into place properly.

i. Coupling Reassembly. To install a new gasket, partially collapse it with the fingers and enter one side of the gasket flange in the groove of the coupling. Then use a blunt nose screwdriver, or some similar instrument, to complete pushing the gasket in place (fig. 30). When properly installed, the exposed face of the gasket will be flat and not twisted or bulged at any point. With a new gasket installed, the assem-

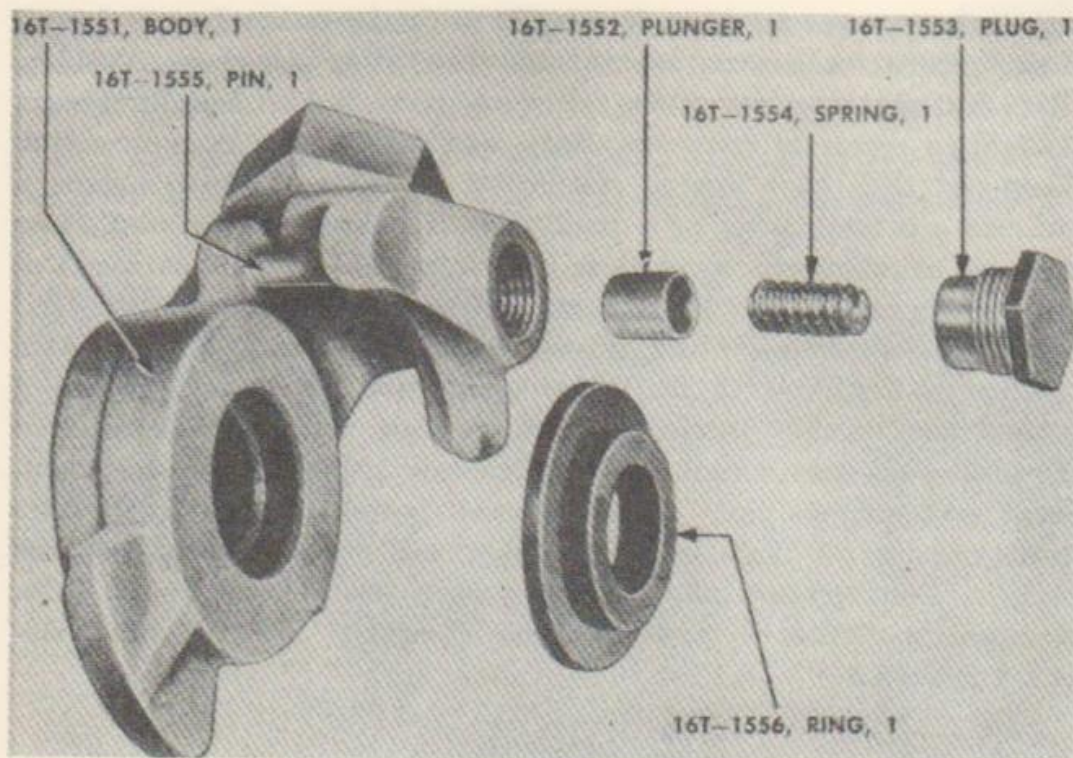


FIGURE 29. COUPLING—EXPLODED VIEW

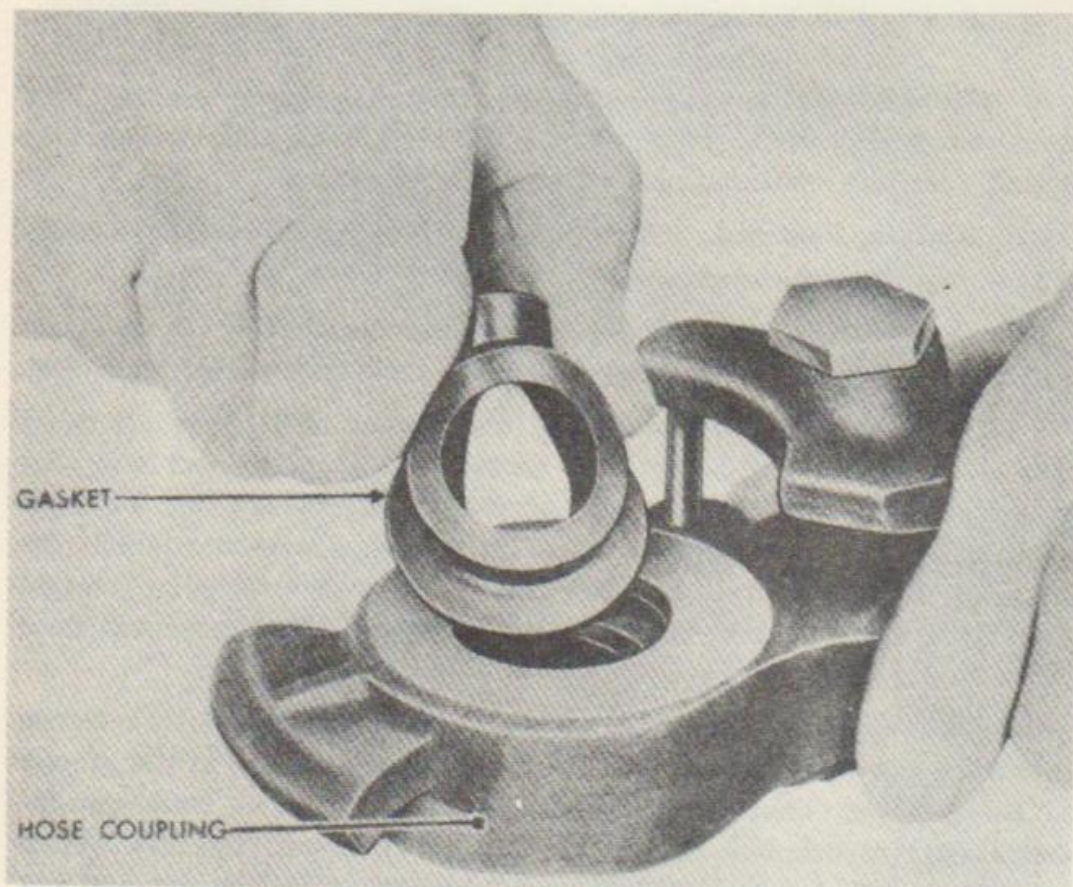


FIGURE 30. INSTALLING GASKET IN COUPLING

bly of the hose coupling is completed by installing the friction lock parts, when these parts are included in the assembly.

j. Coupling Installation. Coat the threaded portion of the pipe or nipple with shellac. Install hose coupling on nipple or pipe and tighten coupling.

Note

After tubing has been replaced, open cut-out cocks at rear of towing vehicle and check for leaks using the soapy water method.

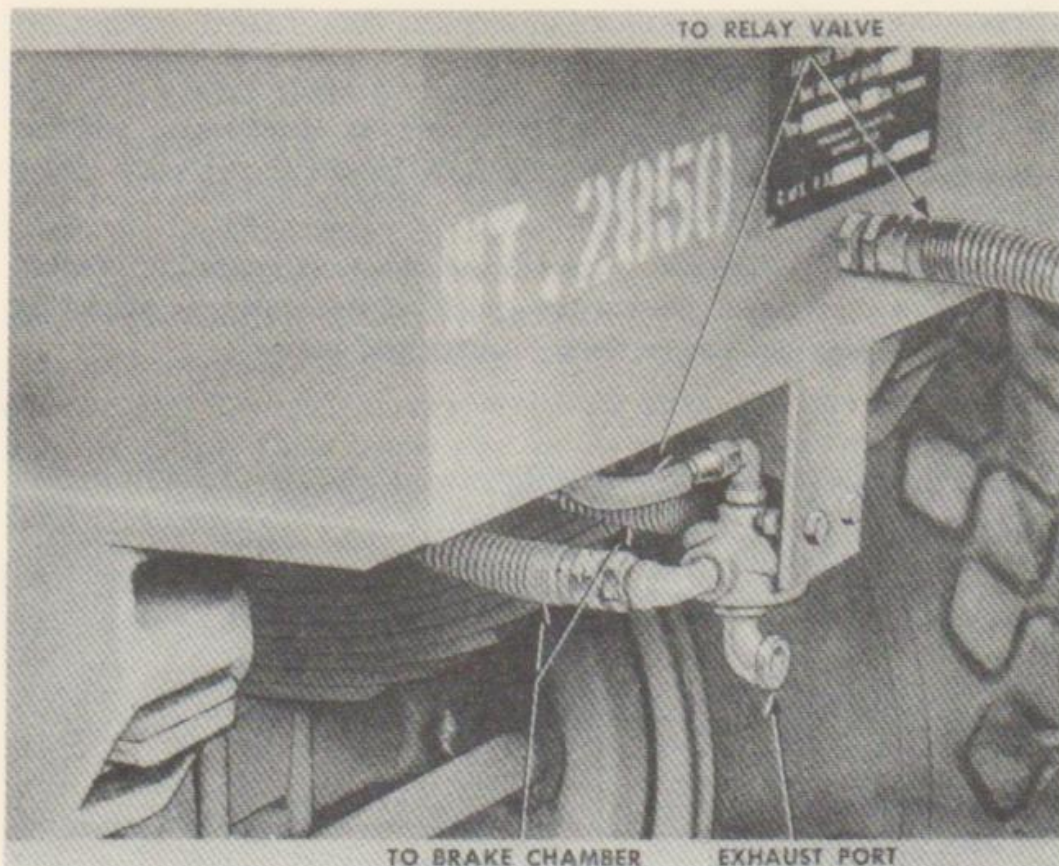


FIGURE 31. QUICK RELEASE VALVE MOUNTED ON DOLLY

52. QUICK RELEASE VALVE.

a. General. The quick release valve is mounted on a bracket which is welded to center of rear crossmember of dolly. The purpose of the quick release valve is to reduce the time required to release the brakes by permitting the exhaust air pressure to escape.

b. Removal (fig. 31). Remove nuts from connector assembly. Remove two nuts, lock washers and cap screws, holding quick release valve to bracket.

c. Disassembly and Inspection (fig. 32).

- (1) Unscrew cover, lift out diaphragm spring, diaphragm spring seat, dampner, and diaphragm. Remove street elbow if necessary.
- (2) Examine diaphragm for signs of cracking, wear or damage. Carefully examine the lower face of the diaphragm which contacts the exhaust port seat in the cover for signs of pitting or grooving. Replace diaphragm if any of these conditions are found.
- (3) Inspect condition of exhaust port seat on cover for signs of pitting. The seat must be smooth and flat. If the exhaust port seat shows scratches or pitting, it can sometimes be repaired by carefully lapping the seat using a piece of fine aluminum abrasive oxide cloth on a flat surface.
- (4) Replace any broken parts.

d. Reassembly. With dampner positioned on diaphragm, position diaphragm and dampner in body (fig. 32). Install spring seat, spring and cover. Tighten cover securely.

e. Installation. Position quick release valve on mounting bracket with exhaust port down. Secure the quick release valve to mounting bracket using two cap screws, lock washers and nuts.

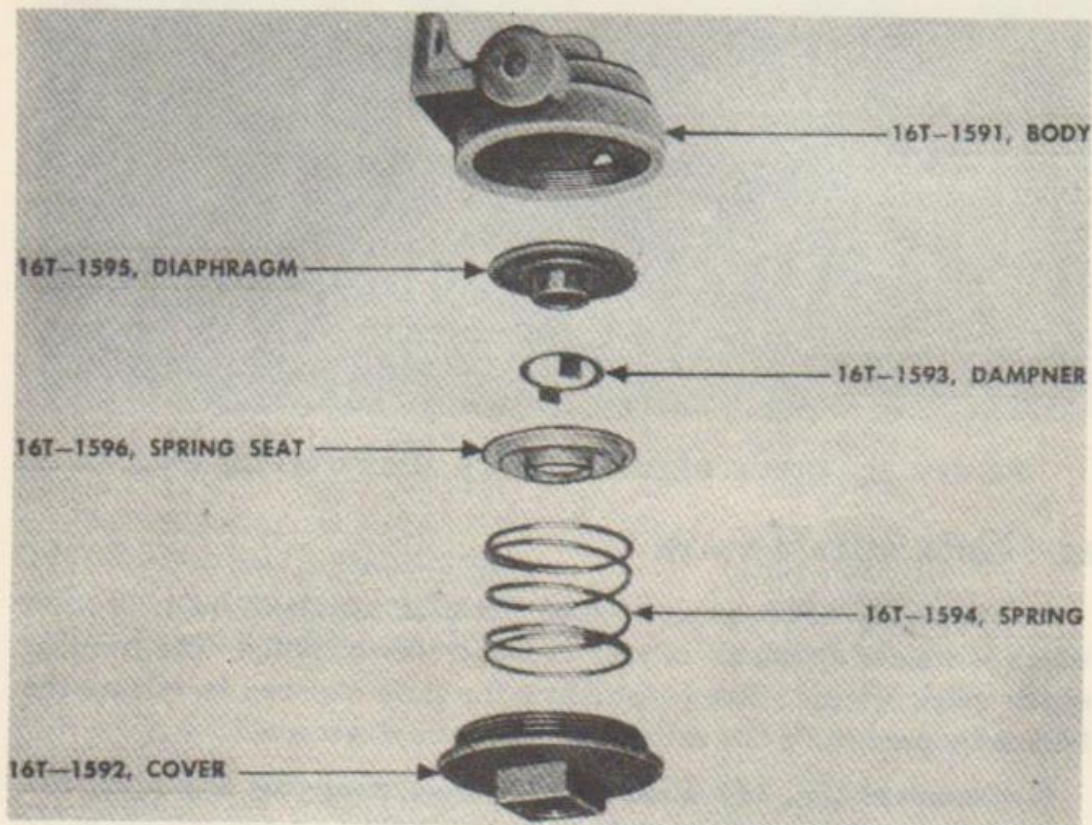


FIGURE 32. QUICK RELEASE VALVE—EXPLODED VIEW



FIGURE 33. DOLLY AND SEMITRAILER AIR HOSE—SECTIONAL VIEW

53. HOSE AND HOSE FITTINGS.

a. General. Two air hose assemblies are provided for the semitrailer and one for the dolly. The two air hose assemblies for the semitrailer are identical. The purpose of the hose is to furnish a connection between the brake system on the towing vehicle and the semitrailer, and between the semitrailer and dolly.

b. Disassembly. Remove nut from body of fitting and pull hose out of body. Do not remove sleeve from hose. If a new piece of hose is to be installed, use a new sleeve. Do not remove hose guide from body.

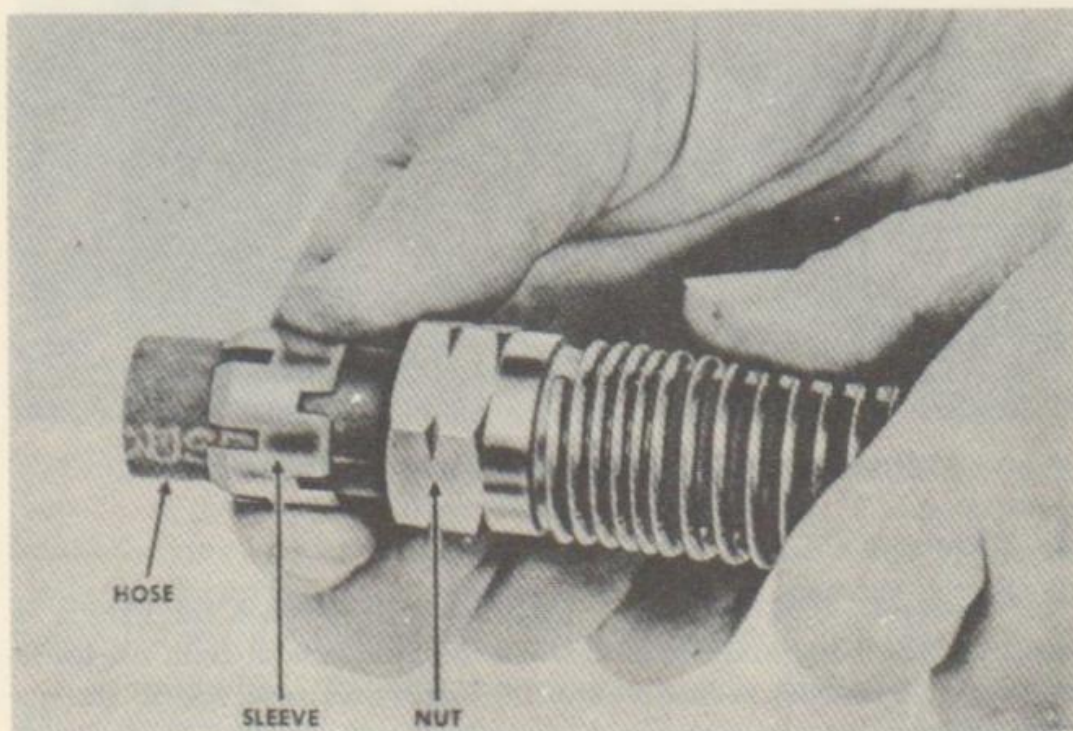


FIGURE 34. CONNECTOR NUT AND SLEEVE POSITIONED ON HOSE

c. Cleaning and Inspection. Clean all metal parts in SOLVENT, dry-cleaning. Inspect hose for abrasions, swelling, or other damage. If hose is damaged, replace with a new piece and discard sleeve and gasket. Springs, nuts and bodies may be used again unless they are damaged.

d. Reassembly.

(1) Cut hose to the desired length, being sure the cut is made at right angle to the outside wall of the hose and that the end of the hose is smooth. Blow out the hose to remove all cuttings. Position nut and sleeve on hose (fig. 34) being sure the barbs on the inside of the sleeve point toward the end of the hose.

(2) Position a new gasket over the end of the guide in the fitting body so the side with the removable protection cover will be next to the hose.

(3) Remove the protection cover from gasket.

(4) Put the end of the hose in the fitting body (fig. 35), making certain the end of the hose and the gasket are against the bottom of the recess in the fitting body.

(5) Move the sleeve, if necessary, until it is against the edge of the fitting body. Then tighten the nut.

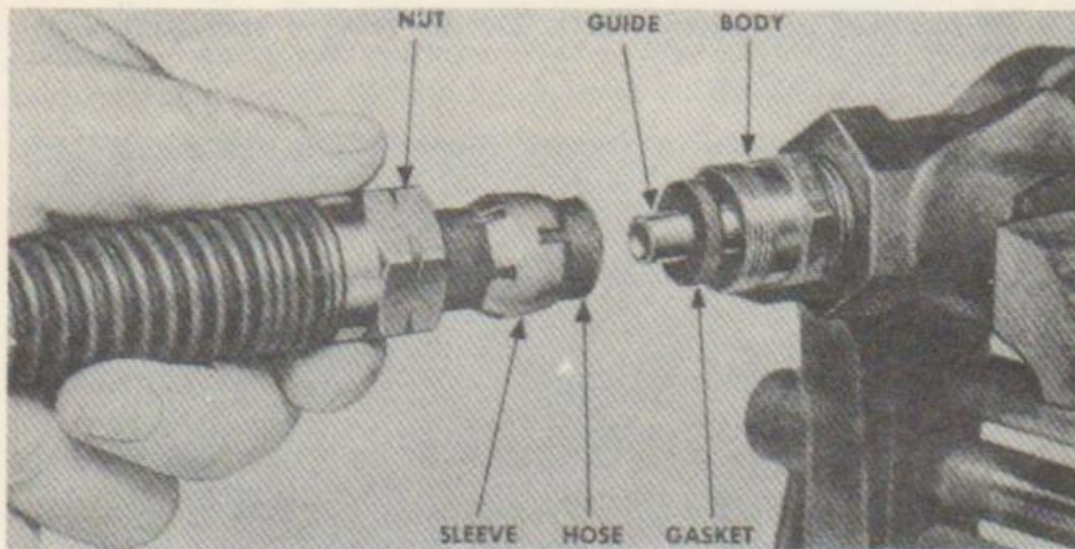


FIGURE 35. PLACING HOSE IN CONNECTOR BODY

54. DRAIN COCK.

a. General. The drain cock (fig. 36) is open when the handle is parallel to the body and is closed when the handle is at right angles to the body. Drain cock is installed in the bottom of reservoir in the air brake system, and its purpose is to provide a convenient means of draining and condensation which normally collects in the reservoirs.

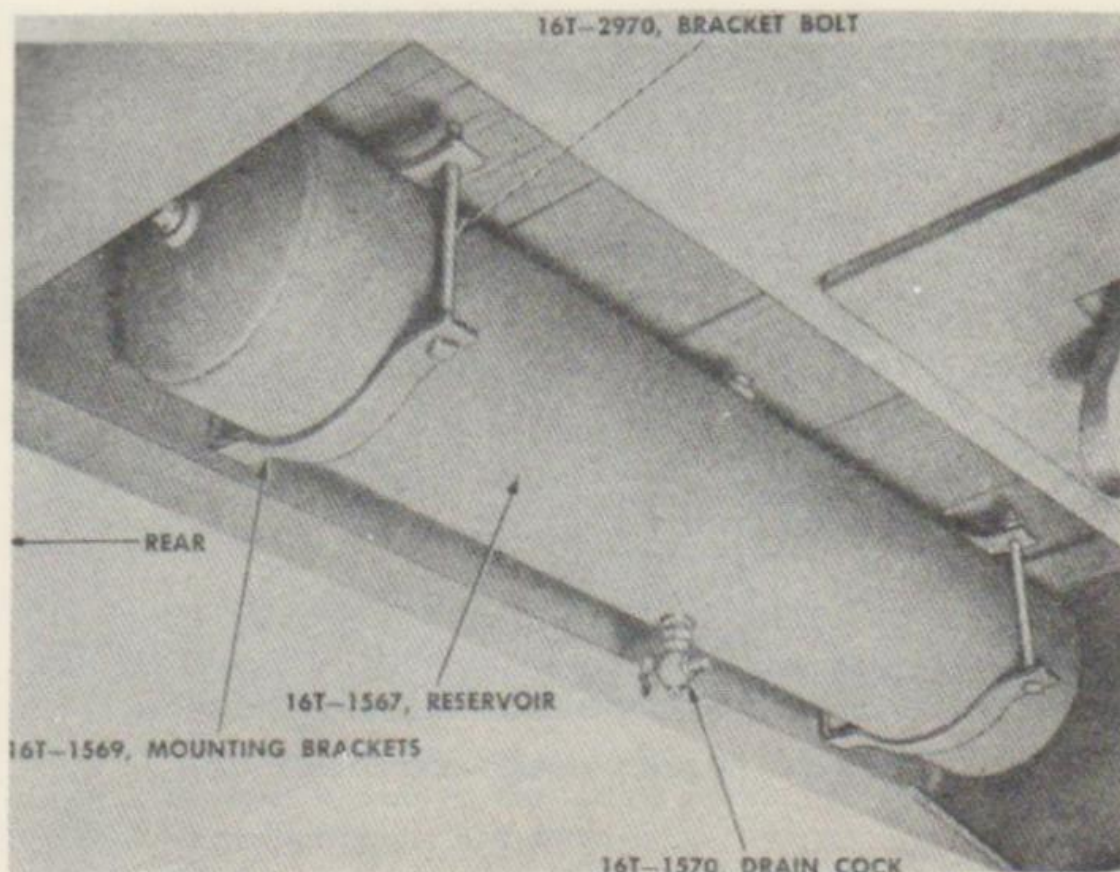


FIGURE 36. DRAIN COCK AND RESERVOIR MOUNTED ON TRAILER

b. Removal. Close cut-out cock at rear of towing vehicle. Check to make certain the hand brake is in the applied position. With open end wrench turn drain cock counterclockwise.

c. Disassembly. Remove the cotter pin from the end of the key, lift off small washer, spring, large washer, and remove key from body.

d. Cleaning and Inspection. Clean all parts with SOLVENT, dry-cleaning. Inspect the key and bore of body for ridges and scoring. Slight leakage due to scoring is corrected by grinding the key to the body using fine grade grinding compound. Leakage due to excessive scoring cannot be corrected and the complete drain cock assembly must be replaced. Do not attempt to fit or grind a new key to an old body or vice versa.

e. Assembly. Put a thin coating of general purpose grease on the outside of the key, and place the key in the body. Place the large washer, spring and small washer in this order over the end of the key and with the spring compressed, put the cotter pin in place through the end of the key. Spread the ends of the cotter pin to lock it in place.

f. Installation. Position drain cock in hole and turn clockwise. Open cut-out cocks at towing vehicle. Check to make certain drain cock is closed.

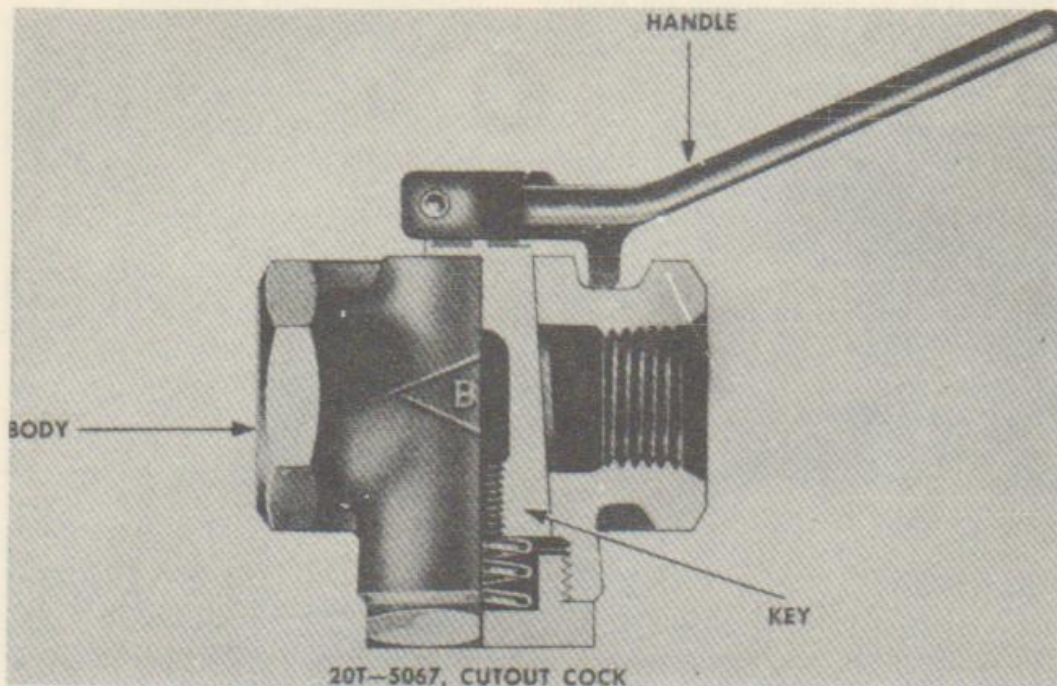


FIGURE 37. CUT-OUT COCK —EXPLODED VIEW

55. CUT-OUT COCK.

a. General. One cut-out cock is used on the semitrailer. It is located under gooseneck at drop in frame. The cut-out cock is used as a means of shutting off the air supply from semitrailer to dolly.

b. Removal. Apply hand brake. Remove coupling from cut-out cock. Turn cut-out cock counterclockwise.

c. Disassembly (fig. 37). Drive out rivet pin attaching the handle to the key and lift off handle. Remove cap nut covering the lower end of the key and lift out spring. Remove key.

d. Cleaning and Inspection. Clean all parts in SOLVENT, dry-cleaning. Inspect the outside of the key and inside bore of the body for ridges and scoring. Leakage due to slight ridges and scoring is corrected by grinding the key to the body using fine grade grinding compound. If leakage has been caused by excessive scoring, replace the complete cut-out cock. Do not attempt to fit or grind a new key to an old body or vice versa.

e. Assembly. Be sure all parts are thoroughly cleaned. Apply a thin coating of general purpose grease with the fingers on the outside of the key and on the inside bore of the body. Place the key in position in the body. Install spring and cap nut putting a thin layer of cup grease under the head of the cap nut where it contacts the body. Tighten cap nut securely. Place handle in position on key being sure

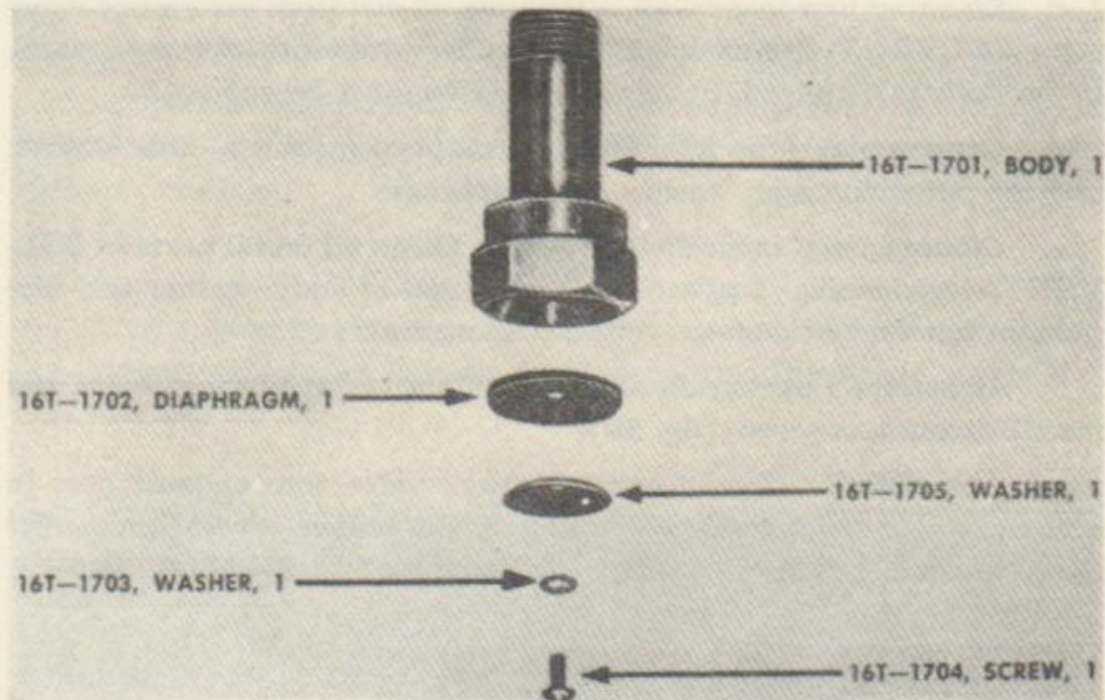


FIGURE 38. EXHAUST CHECK VALVE—EXPLODED VIEW

the key is positioned so that with the handle installed, the projection at the bottom of the handle will properly engage the stops on the top of body in open and closed positions. Tap handle down on key so that rivet hole in key is in line with the rivet hole in the handle. Drive rivet into place and peen the end of it to make it secure.

f. Installation. Place cut-out cock on clamping stud and turn clockwise until cut-out cock is tight on clamping stud and handle is up. Install coupling. Couple the hose between dolly and semitrailer. Apply the brake and check for leaks using the soapy water method. If cut-out cock leaks, tighten until leak disappears.

56. EXHAUST CHECK VALVE.

a. General. The exhaust check valve is a small rubber diaphragm type used in the exhaust port of relay-emergency valves to prevent the entrance of dirt or water through the exhaust port. When air pressure is released through the exhaust port of the relay-emergency valve, it escapes through the exhaust check valve by deflecting the rubber diaphragm. Unless air pressure is passing through the exhaust check valve, sufficient tension is placed on the rubber diaphragm by the diaphragm washer to keep the diaphragm in contact with the body of the exhaust check valve, thus preventing the entrance of dirt or water into the relay-emergency valve.

b. Removal. Turn exhaust check valve counterclockwise and lift out (fig. 26).

c. Cleaning and Inspection. Remove all dirt from exterior of valve using SOLVENT, dry-cleaning. Inspect for broken or damaged parts. If the body is damaged, the complete valve must be replaced.

d. Disassembly (fig. 38). Remove diaphragm screw, lock washer, and lift out diaphragm washer and diaphragm.

e. Cleaning and Inspection of Parts. Clean all metal parts in SOLVENT, dry-cleaning. Inspect diaphragm seat of body, washer and diaphragm for wear or damage. Replace if necessary.

f. Assembly. Position diaphragm and washer in place in body and install diaphragm screw (fig. 38).

g. Installation. Install exhaust check valve into exhaust port in bottom of relay-emergency valve. Apply the brakes several times and check to make certain air exhausts through the exhaust check valve.

SECTION XIV

INTERNAL BRAKES.

57. GENERAL.

a. Description. The internal brake assemblies are bolted to the dolly axle and to the semitrailer trunnion axle. The parts making up the dolly and semitrailer internal brake assemblies are interchangeable, except for the cams and slack adjusters.

b. Two different types of dust shields have been used—the one-piece type and the two-piece type. The following list has been prepared showing the U. S. Registration Numbers and the type dust shields used:

<i>U. S. Registration Numbers</i>	<i>Type of Dust Shield</i>
0810705 thru 0811563	one-piece
0759392 thru 0759841	one-piece
0811607 thru 0811628	one-piece
0798418 thru 0798867	two-piece
0797668 thru 0798417	two-piece
0746547 thru 0747296	one-piece
0797169 thru 0697618	one-piece
0804749 thru 0804793	one-piece

Note

Should a one-piece dust shield become damaged and replacement necessary, discard the one-piece type and replace with the two-piece type.

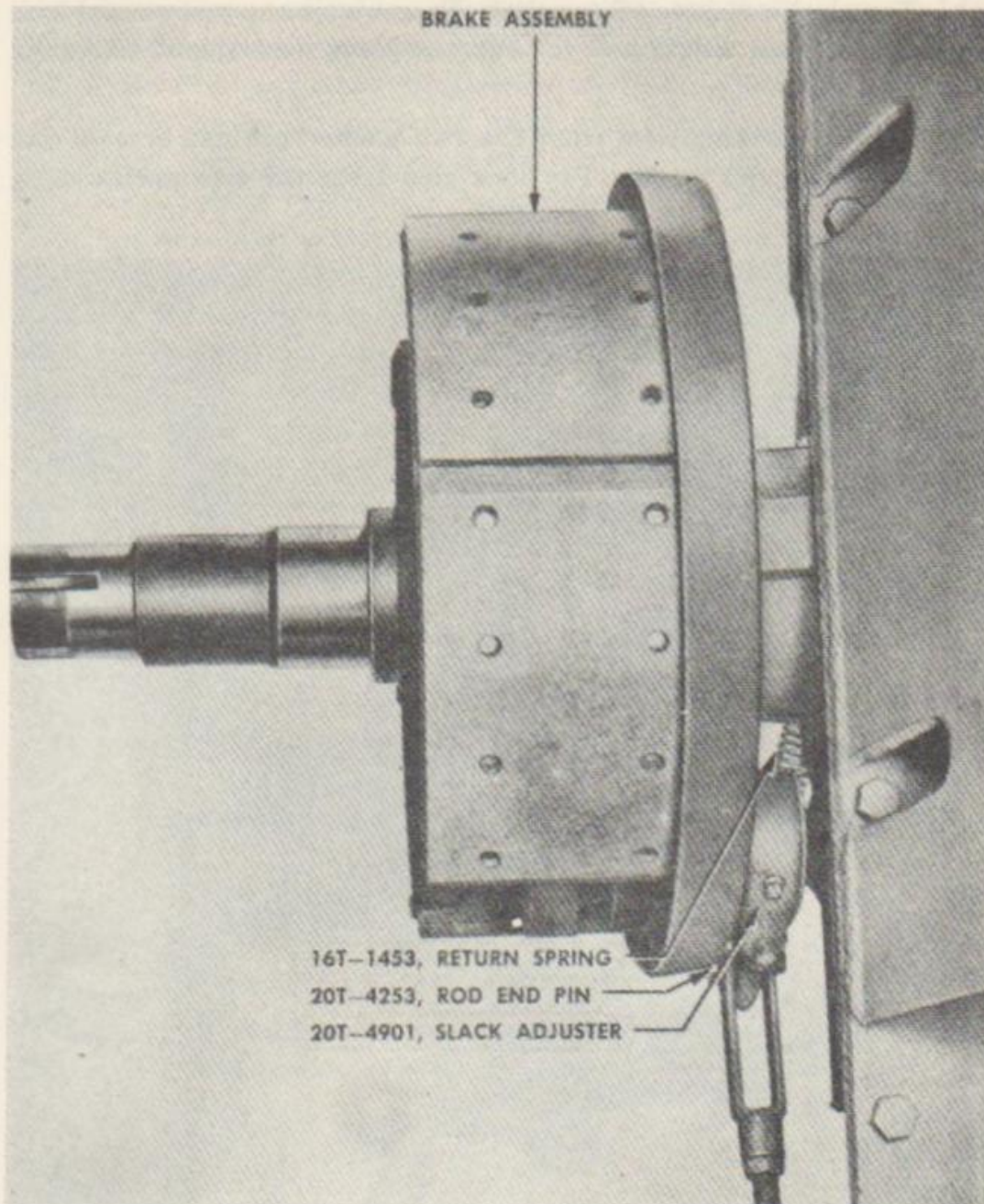


FIGURE 39. BRAKE ASSEMBLY

58. BRAKE SHOES (Semitrailer equipped with one-piece dust shield).

a. Removal.

- (1) Remove wheel and tire assembly as one unit, if outer brake shoes are to be removed (para. 71). If inner brake shoes are to be removed, remove tire and rim assembly (para. 78 a.). Then remove wheel and drum assembly (para. 76).
- (2) Remove cotter pin from rod end pin and drive out pin. Uncouple return spring from slack adjuster (fig. 39).
- (3) Remove cap screws, nuts and lock washers that hold the brake assembly to axle flange, and lift the brake assembly off axle spindle (fig. 40).

(4) Tap slack adjuster off camshaft. Remove six cap screws and lock washers from dust shield and lift the one-piece dust shield off brake spider (fig. 41).

(5) Remove locking wire from the two anchor pin cap screws and remove the two cap screws. Pry lock ring from the two anchor pins

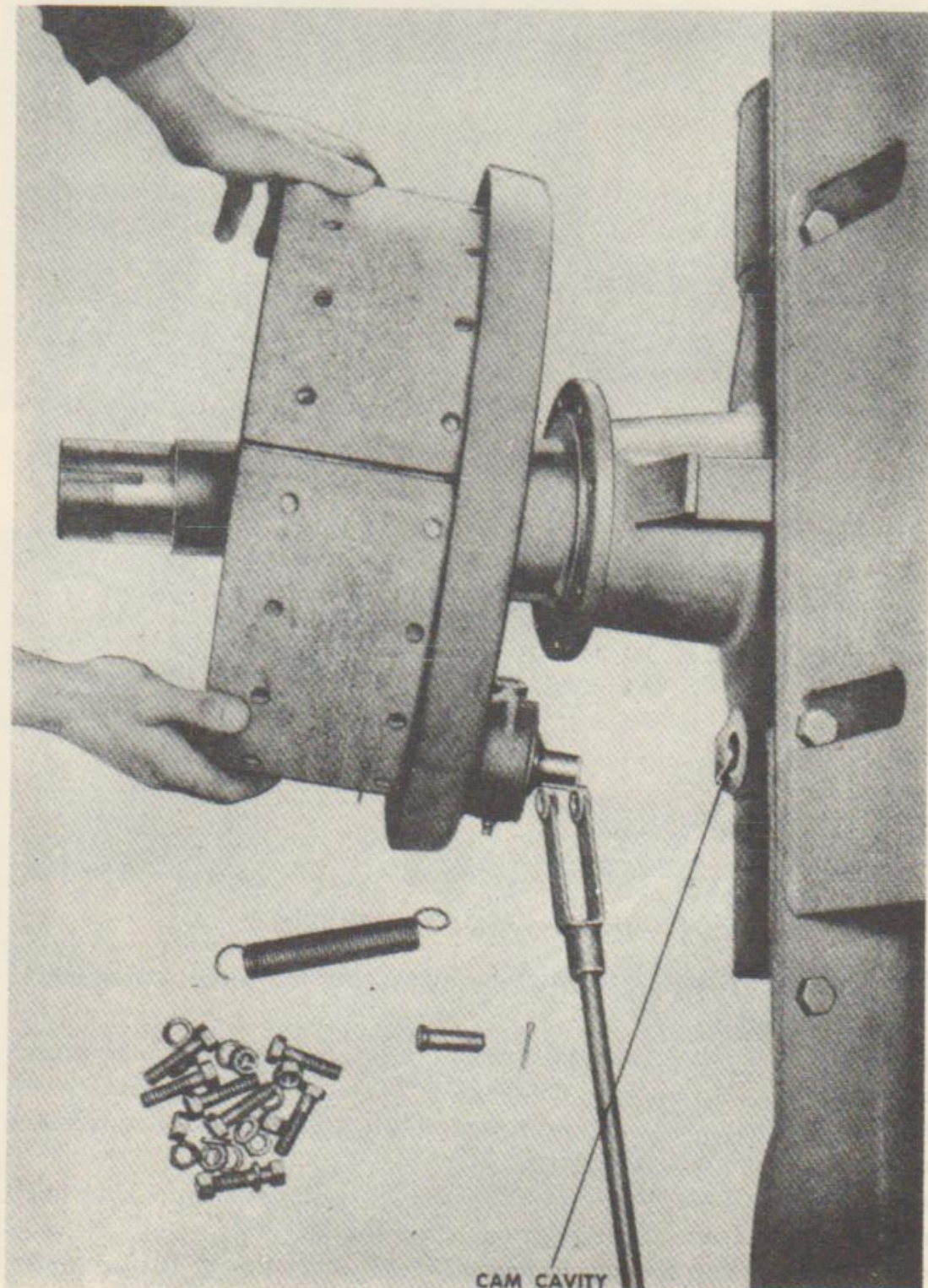


FIGURE 40. REMOVING BRAKE ASSEMBLY

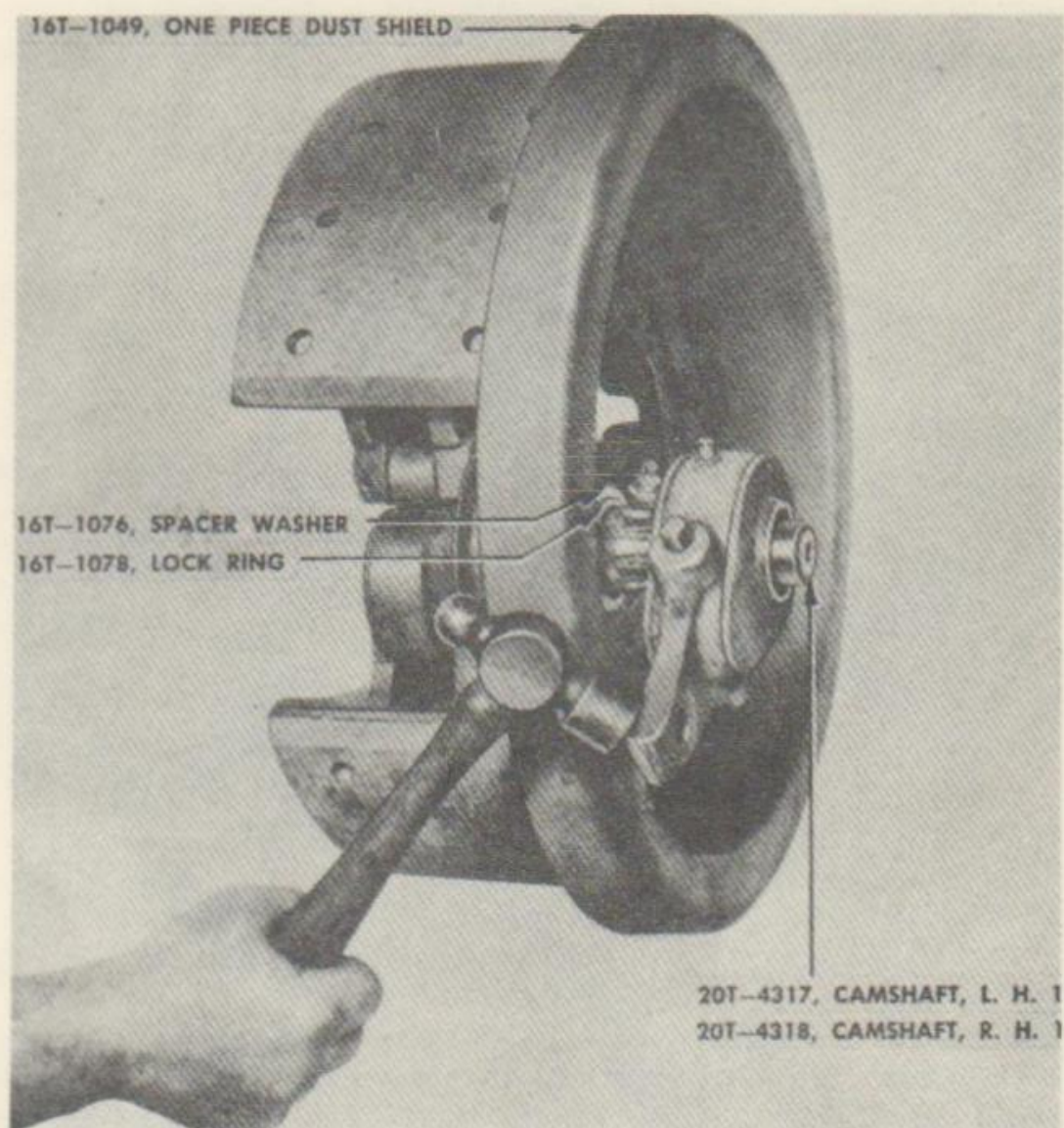


FIGURE 41. REMOVING SLACK ADJUSTER

and remove the two felt retainers and felts. With a long tapered punch tap out the two anchor pins. Remove retracting spring from between the two shoes and lift the shoes out.

(6) Loosen set screw in brake shoe. With a pair of pliers pull out the roller shaft and remove roller (fig. 42).

b. Inspection. Inspect drum for excessive wear, cracks and excessive heat checks. Replace drum if necessary. Heat checking, unless severe, does not call for brake drum replacement.

c. Reassembly.

(1) Clean all dust and other foreign matter from bottom and top surface of S-cam, and coat with a light film of general purpose grease No. 2. Coat surface of roller shaft with general purpose grease No. 1. Place roller in position at end of brake shoe. Aline hole in roller with hole in brake shoe and install roller shaft, making certain the flat

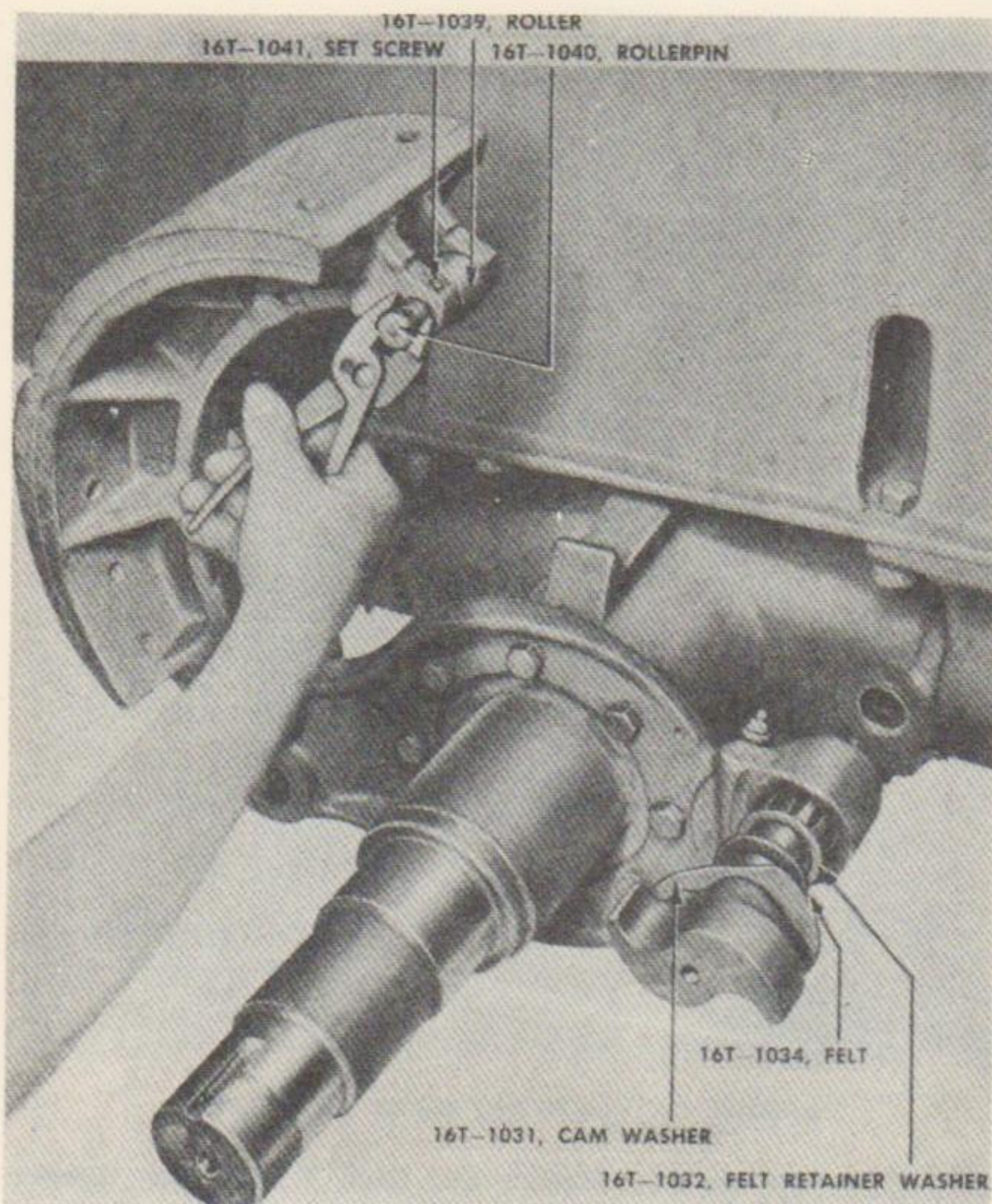


FIGURE 42. REMOVING BRAKE ROLLERS

surface of roller shaft is in alignment with set screw hole in shoe. Install set screw and tighten. Place the two brake shoes in position on S-cam and couple the retracting spring between the two lugs located on the brake shoes. Coat surface of anchor pins with light film of general purpose grease No. 1. Inspect anchor pins to make certain one lock ring, one felt retainer and one felt is installed on each anchor pin (fig. 42). Place punch in anchor pin hole and align hole in shoes with hole in brake spider. Install brake anchor pins. Place felt over end of anchor pin, place retainer washer next to felt, and install lock ring. Install the two cap screws in brake shoes, and lock the two screws together using one locking wire.

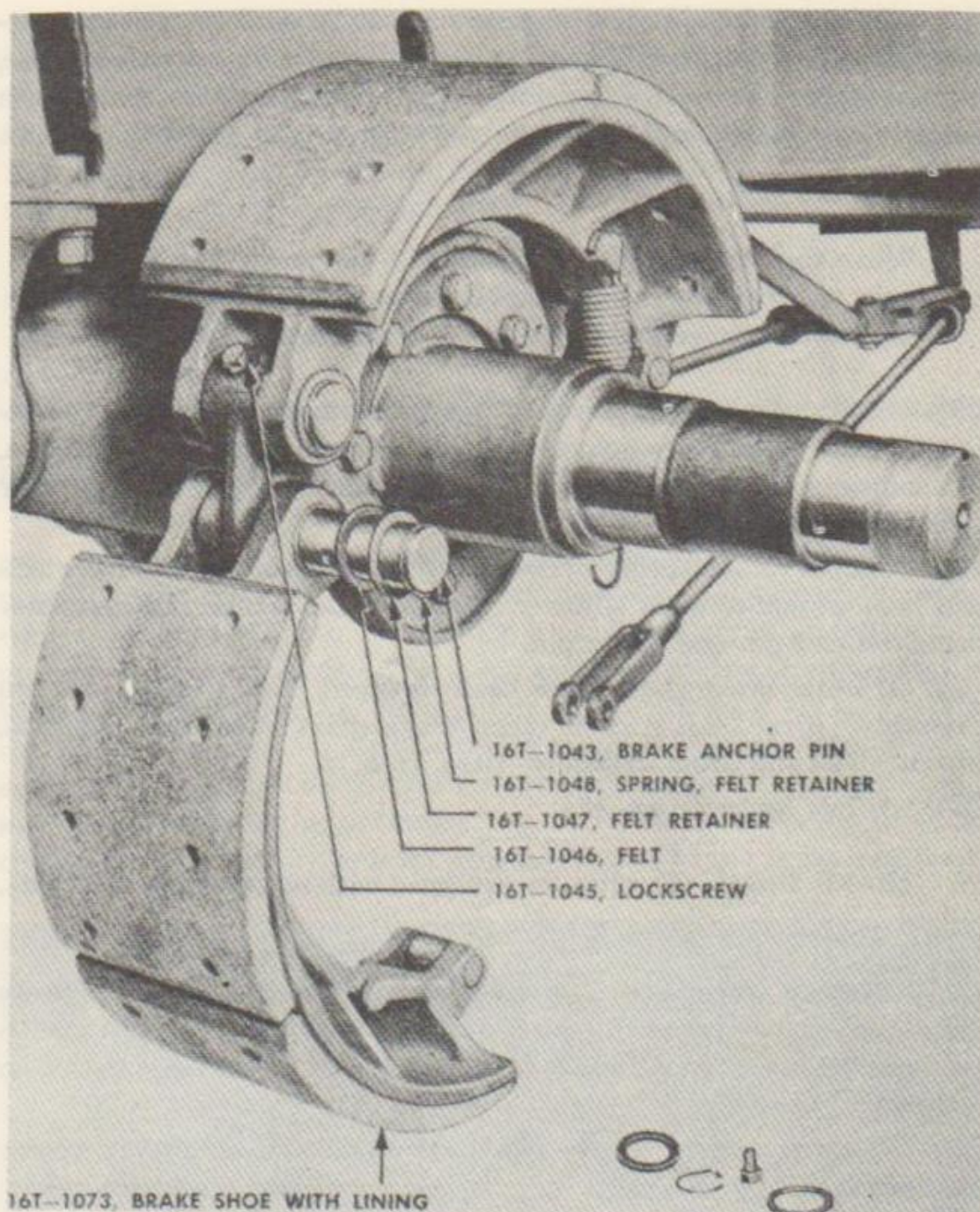


FIGURE 43. BRAKE ANCHOR PINS

Note

The brake anchor pins have a flat surface to accommodate the lock screw making certain the flat surface is in alignment with hole in brake shoe.

- (2) Fasten dust shield to brake spider using six lock washers and six cap screws.
- (3) Place slack adjuster on camshaft, making certain the adjusting screw will be facing towards front of trailer after brake assembly is installed on axle (fig. 41).

(4) Place a small amount of grease in cavity on front side of trunnion axle (fig. 40). Position brake assembly on trunnion axle spindle, and enter the camshaft into cavity. Aline holes in brake spider with holes in axle flange, and install the cap screws, lock washers and nuts.

Note

When tightening the bolts which hold the brake assembly to axle, tighten them evenly to prevent cocking of brake assembly on axle flange and to prevent the cam from binding.

(5) Pull slack adjuster forward by hand to check for free movement. If the brake shoes do not return to the zero point, or off position, this indicates the cam is binding. Tap the cam lightly with a hammer until movement is free.

(6) Couple return spring between lug on rear side of trunnion axle and hook at end of slack adjuster. Couple brake rod to slack adjuster using rod end pin and cotter pin.

(7) If outer brake shoes have been replaced, install wheel and tire assembly (para. 74 *b.*); or if inner brake shoes have been replaced, install wheel and drum assembly (para. 76 *b.*).

(8) Adjust brake (para. 47).

59. BRAKE SHOES (Semitrailer equipped with two-piece dust shield).

a. Removal.

(1) Remove wheel and tire assembly as one unit if outer brake shoes are to be removed (para. 74). If inner brake shoes are to be removed, remove tire and rim assembly and then wheel and drum assembly (para. 76).

(2) Remove six cap screws and lock washers from the two-piece dust shield.

(3) Remove brake shoes (fig. 39) (para. 58 *a.*).

(4) Inspect brake drum (para. 58 *b.*).

b. Reassembly.

(1) Install brake shoes (para. 58 *c.*).

(2) Fasten the dust shield to brake spider using six cap screws and six lock washers.

(3) Install wheel (paras. 74 and 76), and adjust brakes (para. 47).

60. DOLLY BRAKE SHOES.

a. Removal.

(1) Remove wheel and tire assembly as one unit (para. 71).

(2) If dolly is equipped with a one-piece dust shield, remove six cap screws and six lock washers that hold dust shield to brake spider and slide the shield towards dolly main spring. If two-piece dust shield is used, remove the dust shield.

(3) Remove shoes (para. 58 a.).

(4) Inspect drum (para. 58 b.).

b. Reassembly.

(1) Install brake shoes (para. 58 c.).

(2) Fasten dust shield to brake spider using six lock washers and six cap screws.

(3) Install wheel and tire assembly (para. 71 c.) and adjust brakes.

61. SLACK ADJUSTERS.

a. General. Two different styles of slack adjusters are used; however, they are of the same type. The slack adjusters on the dolly are provided with three $\frac{1}{2}$ inch holes, and the slack adjusters on the semi-trailer are provided with one $\frac{5}{8}$ inch hole. Slack adjusters function as adjustable levers and provide a quick and easy means of adjusting the brakes to compensate for brake lining wear. They consist of a worm and gear enclosed in a body which also serves as a lever. During brake application the entire slack adjuster rotates bodily with the brake camshaft. During brake adjustments the worm moves the gear so as to change the position of the lever arm in relation to the brake camshaft.

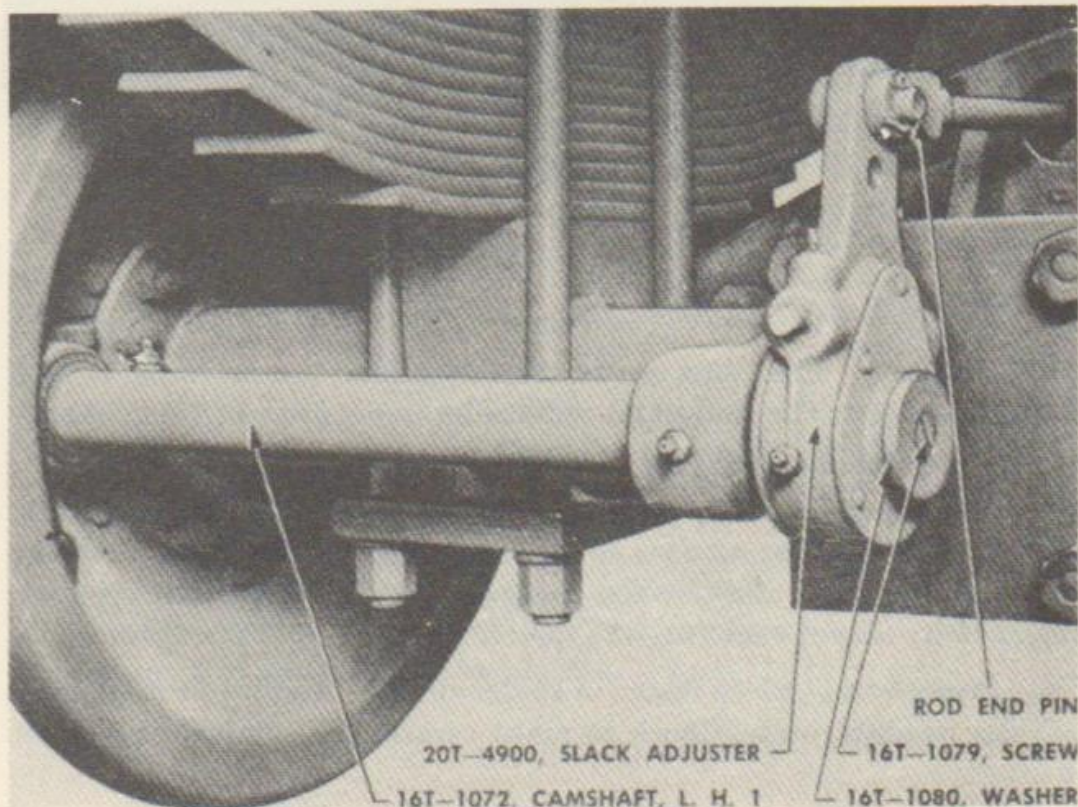


FIGURE 44. DOLLY SLACK ADJUSTER

b. Dolly.

(1) **REMOVAL** (fig. 44)—Remove cotter pin from rod end pin and tap out rod end pin. Remove screw and washer from end of camshaft. Drive slack adjuster off camshaft.

(2) **INSTALLATION**—Inspect cam to make certain washer is installed next to cam bracket bearing. Place a light film of general purpose grease No. 1 over splined surface of camshaft. Install slack adjuster on cam with the small end up and the adjusting screw toward rear of dolly. Install retainer washer securing retainer washer to cam using screw. Turn adjusting screw on slack adjuster until hole in chamber push rod yoke is in alignment with top hole in slack adjuster. Install rod end pin and cotter pin.

Note

Retainer washer is provided with a dowel pin which is an integral part of the retainer washer. Make certain the dowel pin fits into spline on camshaft.

c. Semitrailer.

(1) **REMOVAL**—Remove wheel and tire assembly as one unit if slack adjuster on outer wheels are to be replaced (para. 74). Remove inner wheel and drum assembly if slack adjuster on inner wheels are to be replaced. Remove brake assembly (para. 58 a.) and tap slack adjuster off camshaft (fig. 41).

(2) **INSTALLATION**—Install slack adjuster on camshaft (para. 61 b. (2)). Install brake assembly (para. 58 c.). Install wheel (paras. 74 b. and 76 b.).

62. CAMS.

a. General. The cams are of the S-type and are an integral part of the camshaft. The dolly and semitrailer cams are not interchangeable. The cams are right and left hand.

b. Removal. Remove wheel assembly (para. 76 a.). Remove slack adjuster (para. 61 b. or 61 c.). Uncouple retracting spring between the two brake shoes and turn top towards rear of vehicle. Remove lock ring at inner side of cam (fig. 45). Drive cam out of brake spider.

c. Inspection. Place finger in spider needle bearings to make certain the needles rotate. Check to make certain the lubrication hole is open.

d. Installation. Install cam in brake spider (fig. 45). Install slack

Internal Brakes

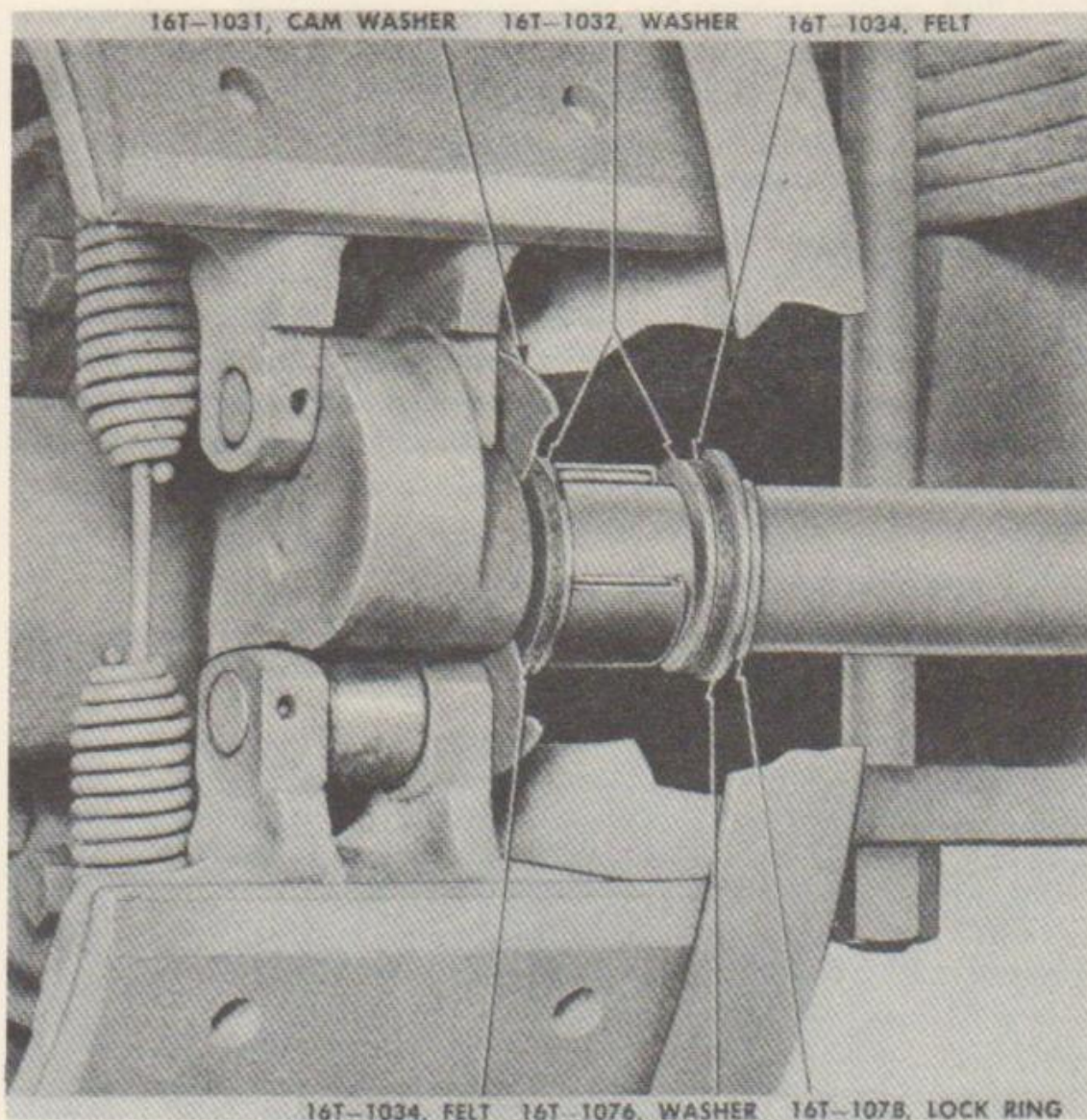


FIGURE 45. SECTIONAL VIEW OF CAM INNER PARTS

adjuster (para. 61 *b.* or 61 *c.*). Install wheel (para. 76 *b.*).

Note

Cams are right and left hand. To determine whether a cam is of the right or left hand design, place cam in position on brake spider, allowing top shoe to rest on cam. Now turn cam in the same direction the slack adjuster would rotate. If roller on brake shoe bucks the high position on end of the S-cam, this indicates the wrong cam is used.

SECTION XV HAND BRAKE

63. HAND BRAKE.

a. **General.** The hand brake consists of an operating wheel which is mounted on the right side of the semitrailer. The operating wheel is keyed to a shaft. A chain and cable assembly is attached to the shaft. The opposite end is fastened to a lever which operates the cross shaft and brake rods. The brake rods are pinned to the slack adjusters which operate the internal brake assemblies.

b. **Hand Wheel and Shaft** (fig. 46).

(1) **REMOVAL**—Remove carriage bolt at inner end of shaft and

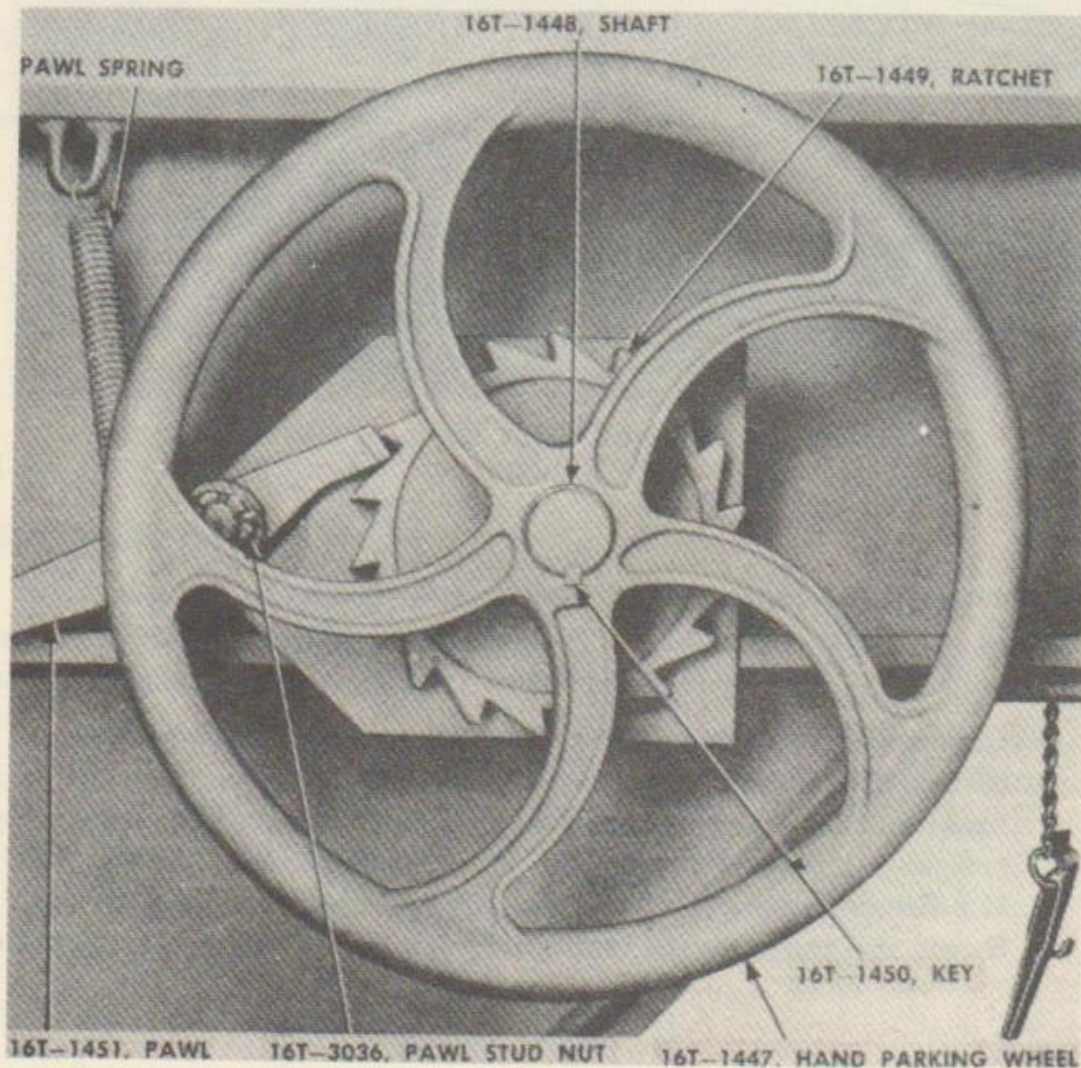


FIGURE 46. HAND WHEEL AND SHAFT

Hand Brake

remove chain. Pull cotter pin from shaft and remove washer. Pull hand wheel and shaft out of frame. Remove set screw out of hand wheel and drive the hand wheel and ratchet off the shaft. Tap key out of keyway.

(2) **INSTALLATION**—Place key in keyway. Install ratchet on shaft with the teeth pointing clockwise (fig. 46). Place hand wheel on shaft with the set screw hole towards the opposite end of shaft. Aline keyway in hand wheel with key in shaft, and drive the hand wheel on the shaft until wheel is flush with the end of shaft. Lift up on the pawl and install the shaft and wheel assembly in hole at gooseneck. Install washer over inner end of shaft and fasten the assembly in position using cotter pin. Fasten end of cable and chain assembly to the shaft using a carriage bolt, lock washer and nut.

c. Cross Shaft and Linkage (figs. 47 and 48).

(1) **REMOVAL**—Removal of cross shafts and linkage consists of removing the rod end pins and bolts which attach the part to the frame or the linkage to the levers.

Note

Prior to removing cross shaft assemblies, mark an "R" on the cross shaft assembly which is mounted on the right side of semitrailer, and an "L" on the left side assembly.

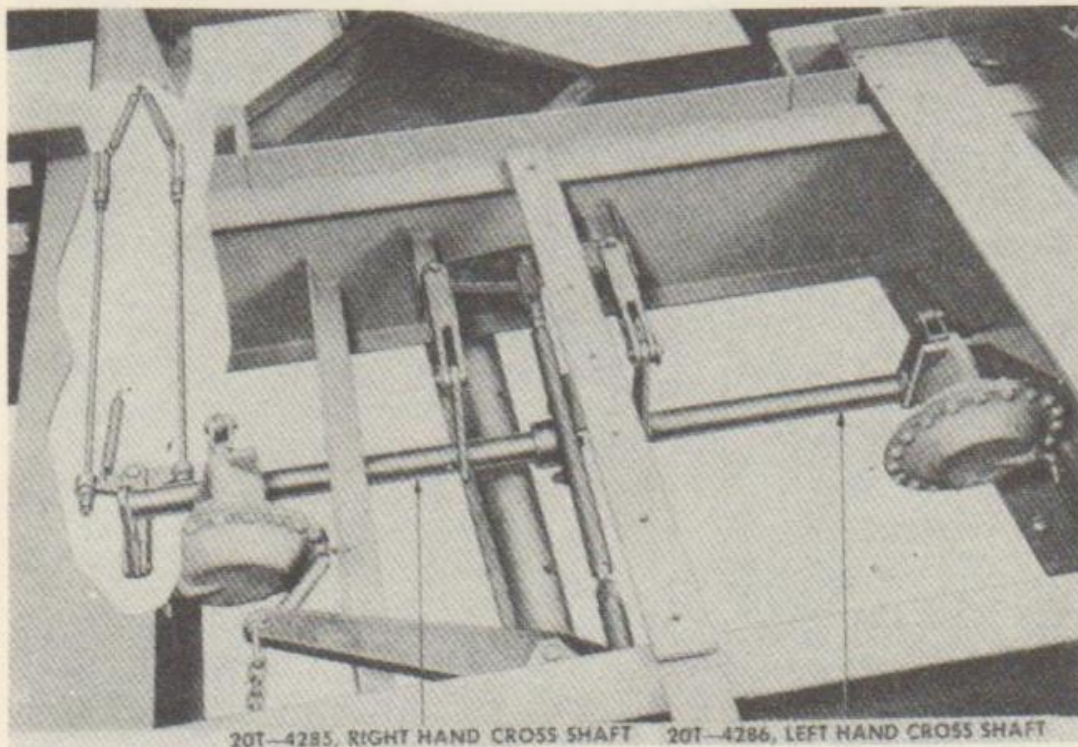


FIGURE 47. HAND BRAKE CROSS SHAFT AND LINKAGE

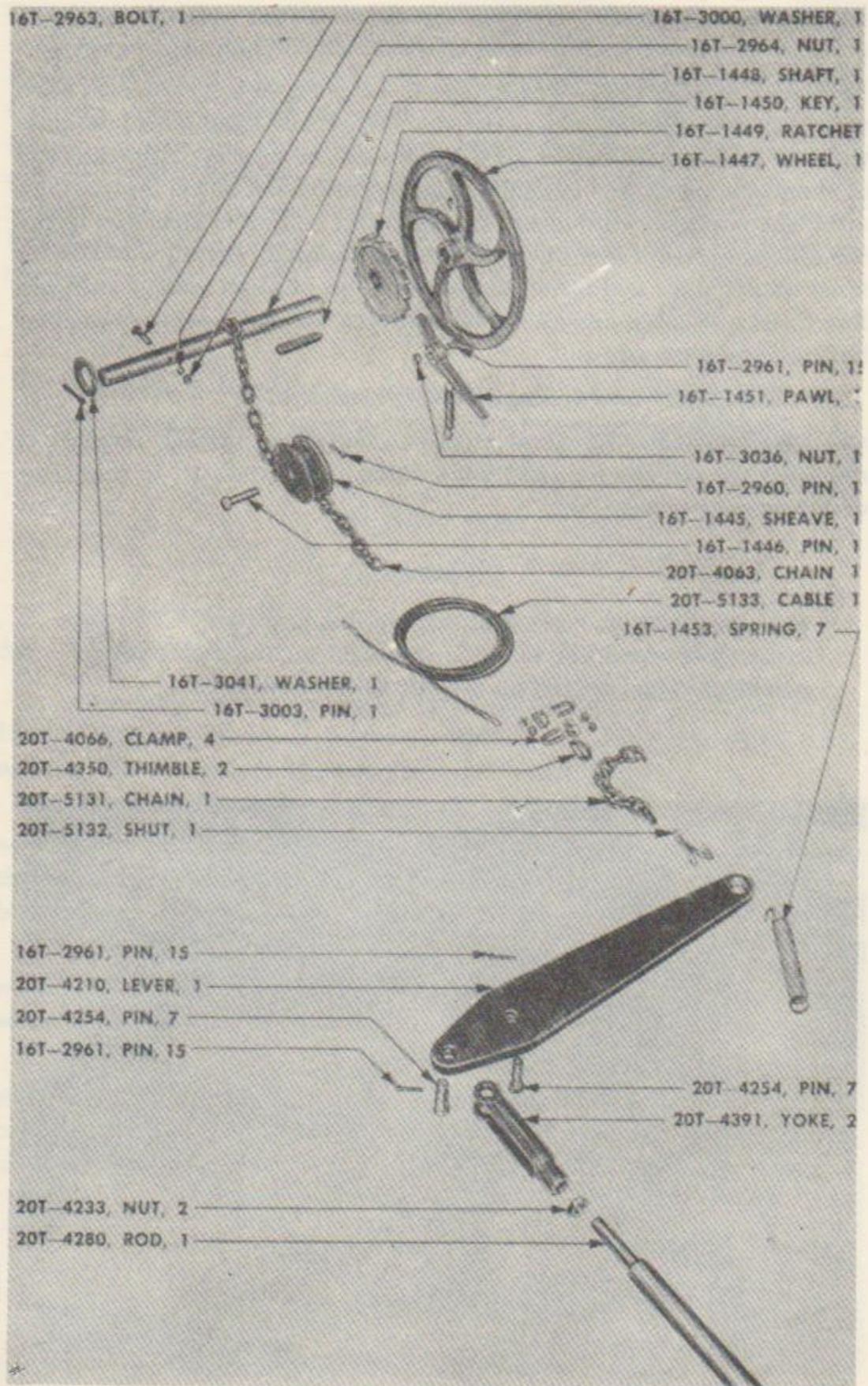


FIGURE 48. HAND BRAKE—EXPLODED VIEW

Hand Brake

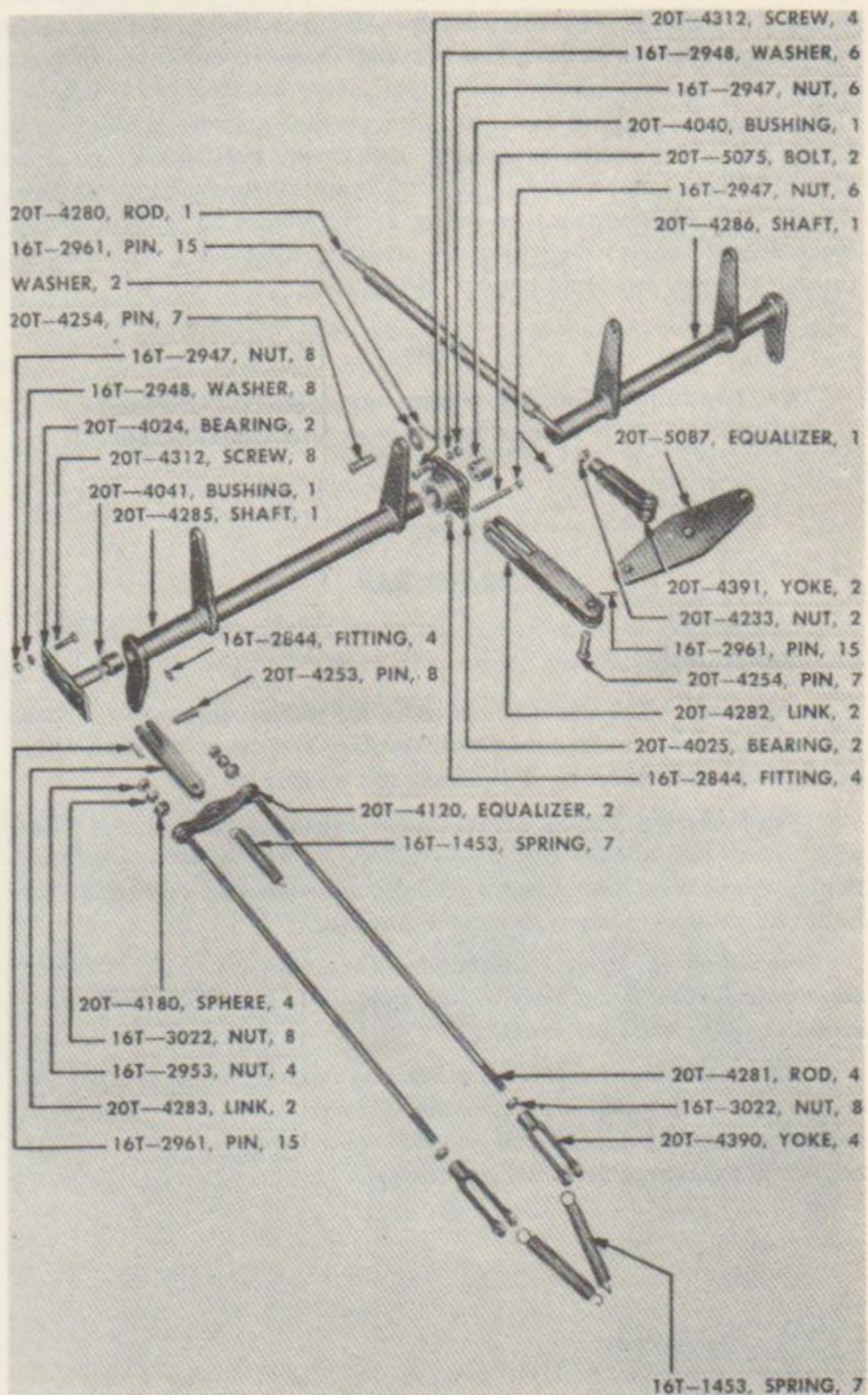


FIGURE 48. HAND BRAKE—EXPLODED VIEW

(2) **INSTALLATION**—Place bearing bracket on end of cross shaft. Position cross shaft on bearing bracket which is attached to outer side rail. Aline holes in bearing bracket with holes in mounting bracket. Fasten the bearing bracket using four bolts, nuts and lock washers. Coat the surface of rod end pins with general purpose grease No. 1. Install rod end pins and cotter pins. Jack trailer until wheels clear the ground. Place hand wheel in the "off" position and try turning the wheels. The wheels must turn freely. If the wheels do not turn freely, lengthen the brake rods which are attached to the slack adjuster by turning the two jam nuts toward end of rod.

Note

The hand brake does not require any adjustment other than adjustment of the internal brakes as outlined in paragraph 47.

SECTION XVI

DRAW BAR

64. DRAW BAR.

a. General. The draw bar is of an all welded construction. Two locking pins are provided to permit locking the draw bar when connecting and disconnecting dolly from the semitrailer.

b. Disassembly. Turn handles out of locking pins using a pipe wrench and pull out the two pins (fig. 83). Remove cotter pins from the two hinge bolts. Remove nuts from hinge bolts and drive the hinge bolts out of hinge brackets. Remove draw bar.

c. Inspection. Inspect lunette for excessive wear. If extremely worn, replace draw bar. Inspect lock pins to make certain they are in sound condition and not bent.

d. Reassembly. Position draw bar on mounting brackets, and install hinge bolts, nuts and cotter pins. Place locking pin into guide brackets with the tapered end toward outer side of trailer. Screw handles into locking pin with pipe wrench.

SECTION XVII

DOLLY UNDERCONSTRUCTION

65. AXLE.

a. General. The dolly underconstruction consists of spring brackets, auxiliary springs, main spring axle, and radius rods. The springs are of the slip-end type. The main spring consists of twelve leaves, one spring center bolt, and two clips. The auxiliary spring consists of three leaves and two clips. The springs are fastened to the axle by U-bolts. Two adjustable radius rods are provided. The function of the radius rods is to position the axle and keep it in proper alinement, and also to transmit the braking effort to the trailer frame.

b. Disassembly (fig. 49). Apply semitrailer hand brake. Place blocking under support jacks on semitrailer frame. Lower support jacks and jack semitrailer until dolly wheels clear the ground. Place hydraulic jack on solid cribbage and jack the dolly frame to prevent dolly from moving. Remove wheel and tire assembly as one unit (para. 71). Place axle nut on axle spindle to prevent threads from becoming damaged. Remove slack adjuster (para. 61 *b.* (1)). Place one jack under center of axle. Remove the sixteen bolts, nuts and lock washers holding internal brake assembly to axle flange and lift the complete assembly off the axle. Remove internal brake assembly from opposite side of axle in the same manner. Remove cotter pins from brake chamber studs, remove stud nuts, and lift the brake chambers out of mounting brackets. Do not remove hose from brake chambers. Disconnect the radius rods at the axle. Remove nuts from U-bolts and tap down on the spring tie clips. Lower jack under center of axle and lift axle out. Remove eight bolts, nuts and lock washers from brake chamber hanger, and remove brake chamber hanger and cam brackets.

c. Inspection. Check axle threads to make certain the axle nut turns freely or with minimum amount of effort. Try the bearings on axle spindle to make certain the bearing will not bind. If burr is found on axle spindle, dress the spindle using fine grade emery cloth.

d. Reassembly.

(1) Place hydraulic jack under center of dolly between the two main springs. Place axle on jack with one man at each axle spindle to steady the axle in the jack.

Note

Make certain the radius rod holes in spring seats are facing the front of dolly.

(2) Jack axle until spring center bolts enter cavity at top of spring seat. Place spring tie clips over U-bolts. Install nuts and lock washers or double nuts. Tap spring leaf in alinement, and tighten U-bolts using a wrench with 36 inch minimum leverage. Fasten radius rods to spring seat using two bolts, nuts and cotter pins. Position internal brake assembly in axle spindle making certain the right hand assembly is placed on the right side. Secure the assembly to axle flange using sixteen bolts, nuts and lock washers.

(3) Place cam bracket over end of camshaft. Install cam spacer washer over end of camshaft, and install slack adjuster. Position brake chamber hanger at front side of axle, aline holes in the brake chamber hanger with those in cam bracket, and bolt the two together. Install cam bracket and chamber hanger on opposite side in the same manner.

(4) Fasten the two brake chambers to chamber hangers using four nuts and four cotter pins. Couple brake chamber push rod to slack adjuster using a 1/2 inch rod end pin and cotter pin.

Note

Grasp the slack adjuster and pull the slack adjuster toward rear of dolly. Check the movement of the cam. The cam must move freely. If cam binds, tap the cam bracket or chamber hanger until bind is eliminated.

(5) Install wheel and drum assembly (para. 73).

66. AUXILIARY SPRINGS.

a. Removal. Remove U-bolts, nuts and lock washers. Tap down on clip and pull U-bolts off main spring. Raise up on auxiliary spring and pull spring out toward the rear of the vehicle.

b. Installation. Place auxiliary spring on spacer block making certain the spring center bolt enters hole in spacer block. Center U-bolt spacer on auxiliary spring. Place U-bolts in position straddling the U-bolt spacer. Place clip at under side of axle on the U-bolts. Install U-bolt nuts and lock washers, and tighten, using a wrench with 36 inch minimum leverage.

67. MAIN SPRING.

a. Removal. Remove nut, lock washer, spacer and bolt from rear hanger. Remove U-bolt nuts and lock washers from side on which

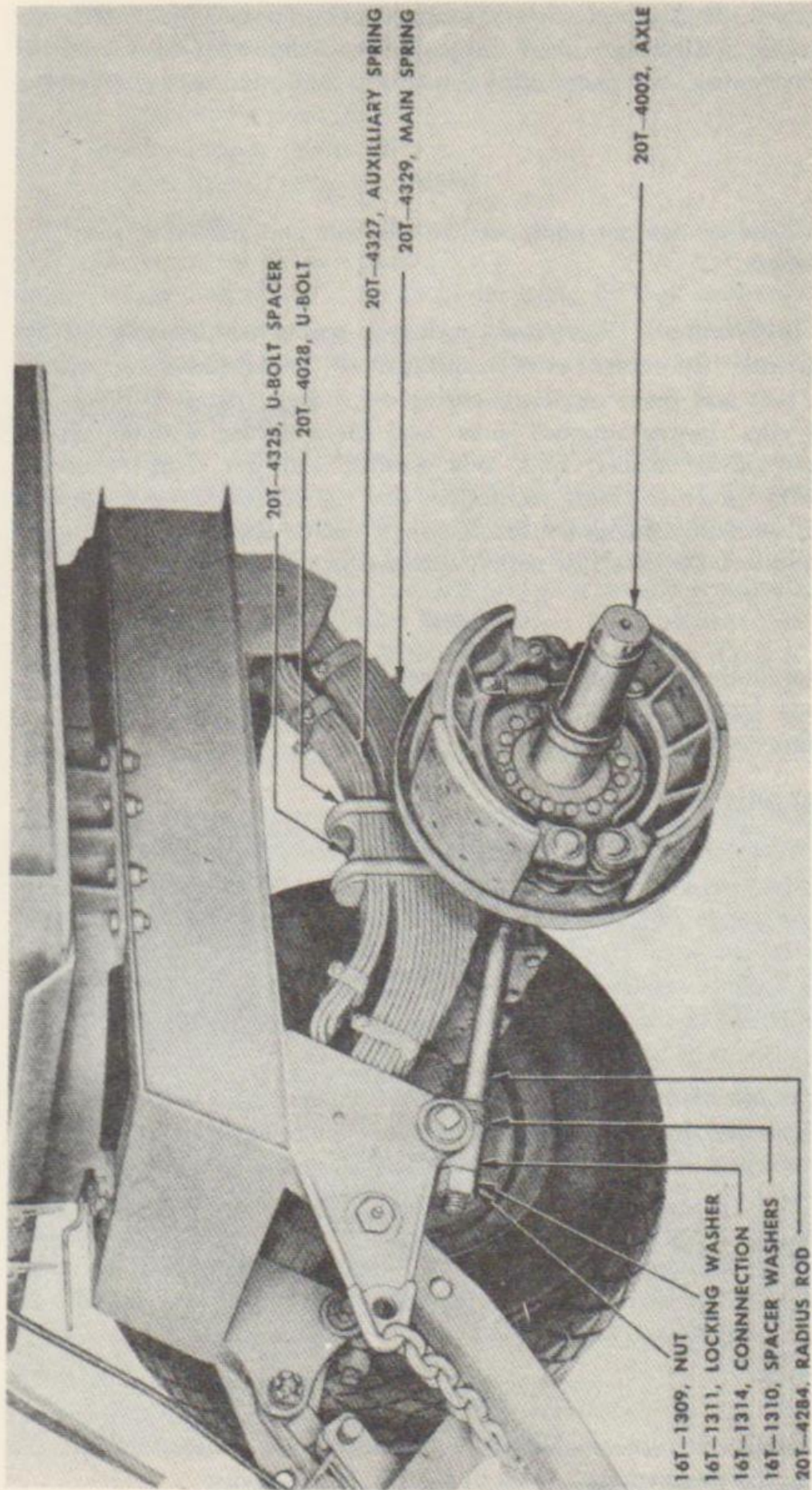


FIGURE 49. DOLLY UNDERCONSTRUCTION

spring is to be replaced. Lower support jacks (para. 9. c.). Jack the semitrailer until weight is off dolly wheels. Remove U-bolts, and lift auxiliary spring and spacer off main spring. Lift main spring off spring seat.

Note

All dollies are not equipped with a bolt and spacer at rear hanger.

b. Installation. Place main spring on spring seat, making certain spring center bolt enters cavity in spring chair. Place spacer over spring center bolt and place auxiliary spring on spacer. Install U-bolts and U-bolt clip. Lower support jacks until main spring contacts spring hangers. Install spacer, bolt, lock washer and nut. Inspect spring leaves for alinement with each other, and tighten U-bolt nuts using a wrench with 36 inch minimum leverage. Place support jacks in the "up" position. Reverse instruction outlined in paragraph 9. c.

Note

For dollies that are not equipped with a bolt through the rear hanger, it will be necessary to install the main spring into cavity of hanger.

68. RADIUS ROD.

a. Removal. Remove inner and outer tire and rim assembly from side of dolly from which radius rod is to be removed (para. 78). Remove cotter pin and nut from radius rod bolt at axle, and drive out the bolt. Pull cotter pin from bolt at front end of radius rod and remove nut and washer. Drive out the bolt. Pull rubber bushing out of spring hanger. Bend locking washer to "open" position, remove nut, and pull radius rod out of connection.

b. Installation. Couple radius rod to spring seat at axle using bolt, nut and cotter pin. Count spacer washers on radius rod at opposite side and place the same amount over end of radius rod. Place connection over end of radius rod. Aline connection with cavity in spring hanger. Place radius rod bolt through the connection and install washer, nut and cotter pin. Install locking washer and nut over end of radius rod. Tighten nut, and bend locking washer over nut. Install tire and rim assemblies (para. 78 e.).

CAUTION

Do not use grease or oil on rubber bushing to assist in entering the connection.

SECTION XVIII

SEMITRAILER UNDERCONSTRUCTION

69. TRUNNION AXLE.

a. General. The semitrailer is equipped with two trunnion axles. Each trunnion axle is mounted in two trunnion brackets. The trunnion mounting brackets permit transverse movement of the underconstruction, allowing one wheel to pass over an obstacle while the remaining wheels remain on the ground. Two internal brake mounting flanges are welded to the trunnion axle. The internal brake assemblies are mounted to each side of the trunnion axle. The outer and inner ends form the spindles on which the wheels are mounted.

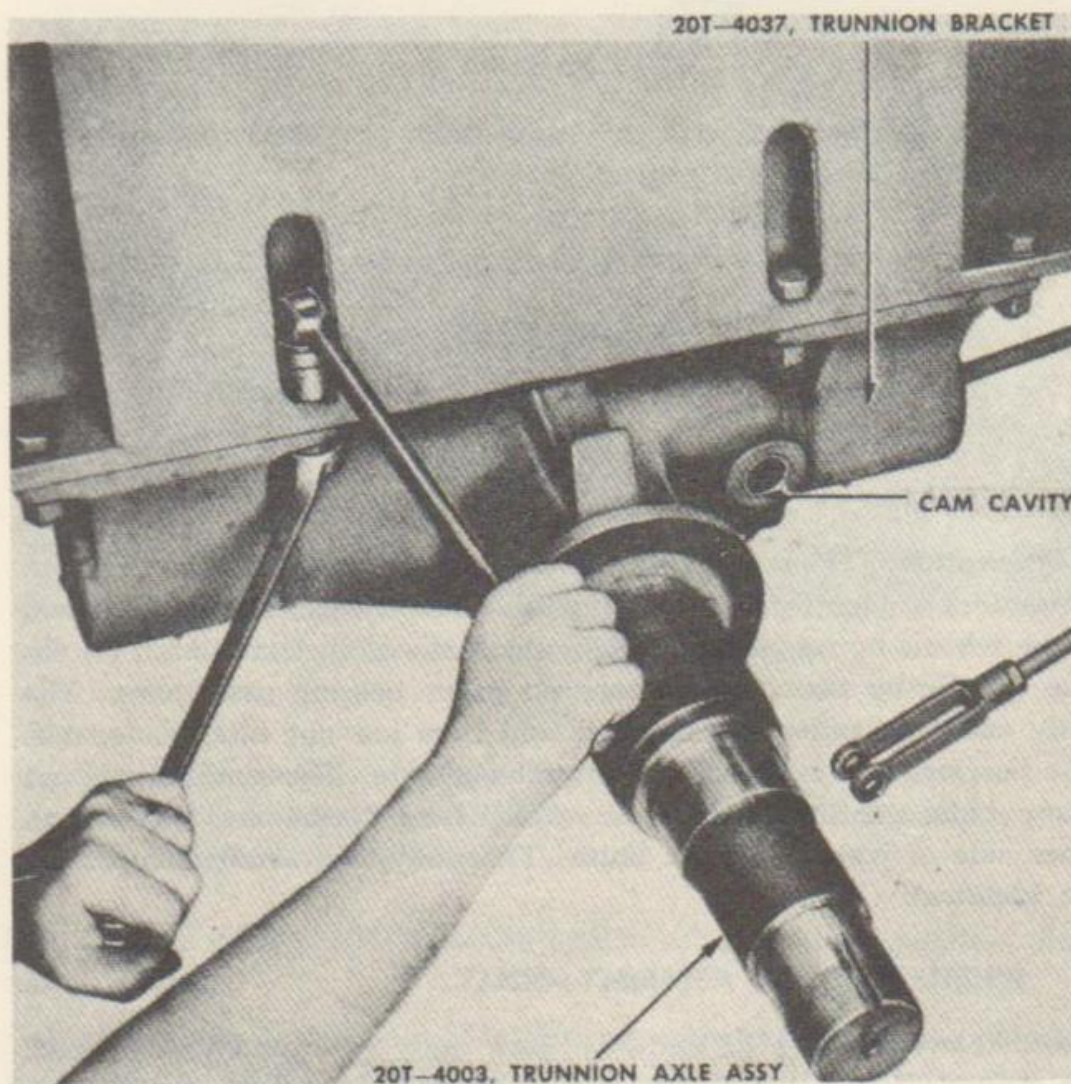


FIGURE 50. REMOVING TRUNNION AXLE

b. Removal. (fig. 50)—Remove outer wheel and tire assembly as one unit (para. 74). Remove inner wheel and drum assembly (para. 76). Remove brake assembly (para. 58 a.). Place axle nut on axle spindle to prevent damaging spindle threads. Place jack under center of trunnion axle. Remove eight bolts, nuts and lock washers from trunnion bracket. With two men steadying the trunnion axle on the jack, lower jack and pull off trunnion brackets. Continue lowering the jack and lift trunnion axle to ground.

c. Installation. Place hydraulic jack under center of main frame between the eight trunnion bracket holes. Place trunnion axle on jack with cam cavity towards the front. Place trunnion brackets over ends of trunnion axle, and jack trunnion axle to the frame. Align holes in trunnion bracket with holes in frame. Install holes in trunnion bracket with holes in frame. Install eight bolts, nuts and lock washers. Some trailers are provided with $\frac{5}{8}$ inch bolts, N.C. threads, with double nuts; and some are provided with $\frac{5}{8}$ inch bolts, N.F. threads, with nuts and lock washer.

Note

Two different types of mounting bolts are used to fasten trunnion bracket to frame.

SECTION XIX

WHEELS, DRUMS, RIMS AND TIRES

70. GENERAL.

Description. The wheels are of the six spoke type. Dual tires are mounted on each wheel. The rim and tire assemblies are fastened to the wheels by six clamps. Each wheel assembly is mounted on the axle spindle by two opposed tapered roller bearing assemblies. The dolly and semitrailer wheels, rims and tires are not interchangeable. The bearings and cups are not interchangeable. The rim clamps and clamp bolts are interchangeable. The brake drums are fastened to inner side of wheel with six bolts. The dolly and semitrailer drums are identical.

71. WHEEL AND TIRE ASSEMBLY—DOLLY.

a. Removal (figs. 51 and 59). Jack dolly axle until wheel clears the ground. Place a greased steel plate or wood plank under dual tires to utilize as a skid. Remove six cap screws and six lock washers

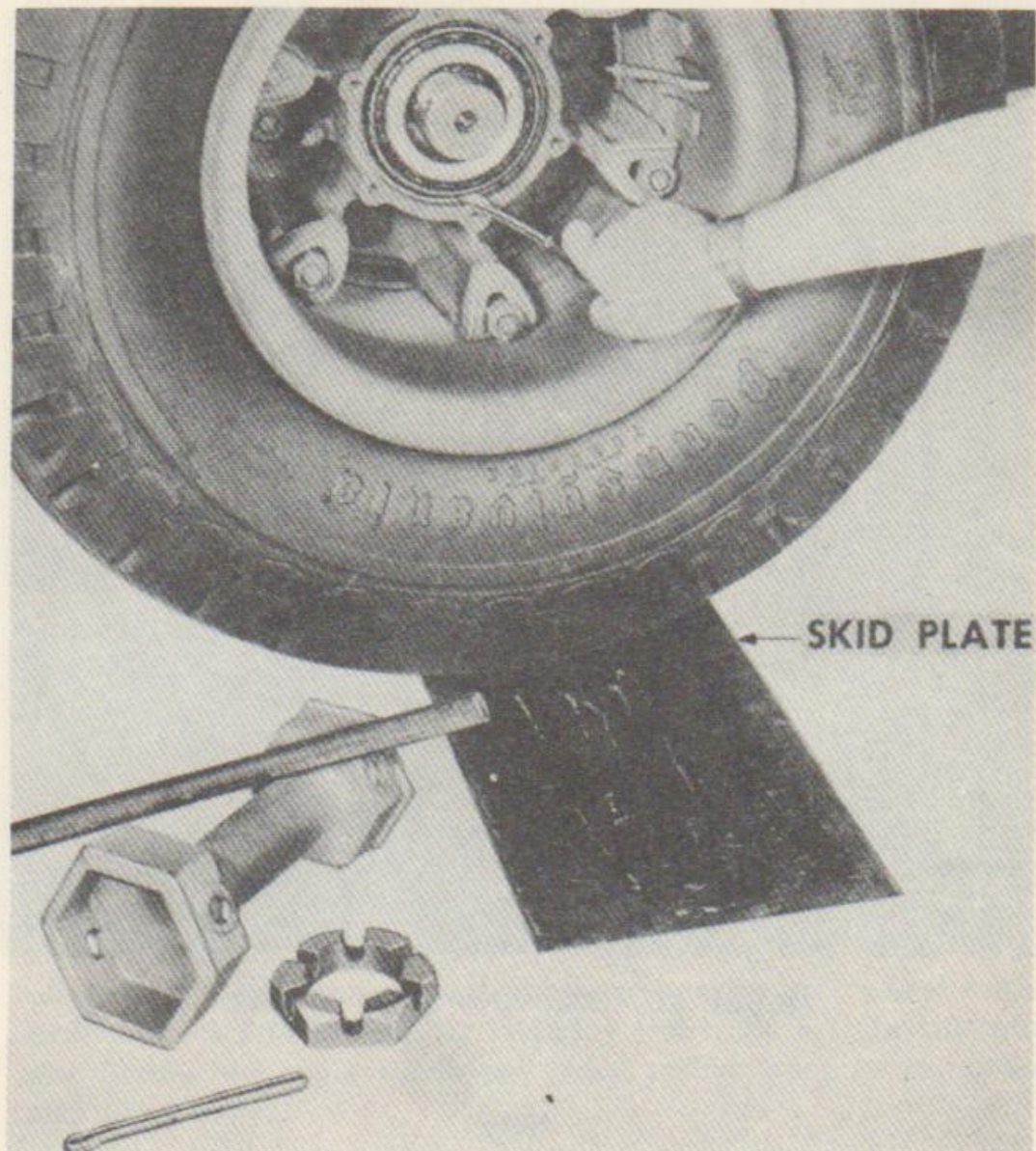


FIGURE 51. REMOVING WHEEL AND TIRE ASSEMBLY

from hub cap, then remove hub cap and gasket. Remove cotter pin from axle nut, turning axle counterclockwise. Place a screwdriver under outer bearing and remove bearing. Pull wheel and tire assembly off axle using greased skid plate to facilitate its removal. If wheel will not slide off freely once outer bearing is removed, it is usually because brake shoes are dragging or groove is worn in drum. This drag can be removed by releasing the brake through a counterclockwise movement of the slack adjuster which is attached to camshaft. Remove the three cap screws and lock washers from dust collar, and pull inner bearing out of wheel (fig. 52).

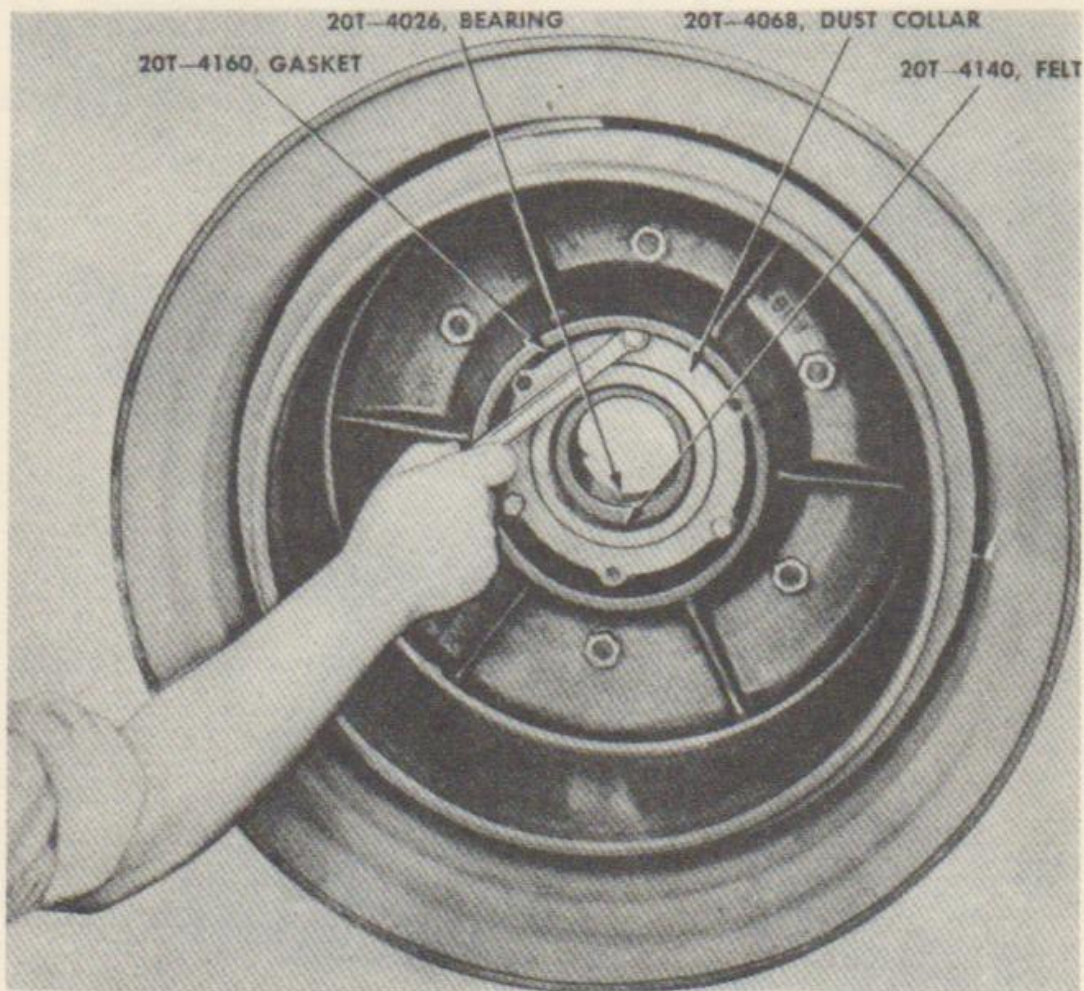


FIGURE 52. REMOVING DUST COLLAR

Note

Wrap bearings in cloth to prevent them from coming in contact with sand and other foreign matter.

b. Inspection. Inspect bearings and bearing cups for chips, pits and excessive wear. Check cups to make certain they are tight in hub bore. Inspect felt grease retainer for excessive wear or over-saturation. Replace felt if necessary. Replace cups (para. 80 c.).

c. Installation. Lubricate wheel bearings (para. 31 d. (1)). Place inner bearing in wheel. Place felt into dust collar. Place gasket in position on inner side of wheel. Install felt and dust collar over gasket using three cap screws and lock washers (figs. 52 and 59). Place greased plank or metal plate under axle spindle. Roll the wheel and tire assembly into greased skid. Aline end of axle spindle with inner bearing by raising or lowering the jack. Slide the assembly on to the spindle using care not to damage the spindle threads. Make

certain the wheel is completely on the spindle. Install outer bearing and axle nut. Adjust wheel bearing (para. 72. *b.*). Install cotter pin in axle nut. Place gasket over hub cap and secure hub cap to wheel using six cap screws and six lock washers. Adjust brake (para. 47) and remove the jack.

Note

Dolly inner and outer wheel bearings are identical.

72. WHEEL BEARING ADJUSTMENT—DOLLY.

a. Checking Wheel Bearing Adjustment. Make certain dolly brakes are in the "off" position. Apply hand brake on semitrailer to prevent movement of the dolly. Jack axle until tire clears ground. Test side-wise shake of wheel with hands or with a bar under tire. If bearings are correctly adjusted, shake of wheel will be just perceptible and wheel will turn freely with no drag. If bearing adjustment is too tight, bearings will become over-heated. Too loose adjustment will cause pounding.

b. Adjustment. Jack axle until wheel clears the ground, and rotate wheel to make certain it turns freely. Remove six cap screws and six lock washers from hub cap, and remove hub cap and hub cap gasket. Remove cotter pin from axle nut. With the axle nut wrench turn the axle nut clockwise until wheel binds and at the same time rotate wheel to make certain all surfaces are in contact. Then back adjusting nut off about 1/6 turn, or more, if necessary, making sure wheel rotates freely. Check hub bearing for end play (para. 72. *a.*). Install cotter pin. Secure hub cap and hub cap gasket to hub using six cap screws and lock washers.

73. WHEEL AND DRUM ASSEMBLY—DOLLY.

a. Removal. Remove rim and tire assembly (para. 78 *a.*). Remove outer bearing (para. 71 *a.*). With the aid of another man lift the wheel and drum assembly to ground.

Note

If difficulty is encountered and the wheel and drum will not slide off the axle spindle with a minimum amount of effort, loosen the brakes by adjusting the slack adjuster.

b. Installation. Install inner bearing and dust collar (para. 71. *c.*). Lift wheel and drum assembly on to axle spindle. Install outer bearing and axle nut, and adjust wheel bearings (para. 72. *b.*). Install rim and tire assemblies (para. 78. *e.*).

74. WHEEL AND TIRE ASSEMBLY—SEMITRAILER.

a. Removal.

- (1) Place jack under rear crossmember and jack semitrailer until tires clear the ground.

Note

The two inner wheel and tire assemblies cannot be removed as an assembly.

- (2) Remove six cap screws and lock washers from hub cap. Remove hub cap and hub cap gasket. With axle nut wrench turn jam nut counterclockwise and remove jam nut from axle spindle. With the aid of a screwdriver, pull locking washer off axle spindle and turn adjusting nut counterclockwise. Remove the adjusting nut.

- (3) Pull the wheel and hub assembly off axle spindle. Outer bearing will slide off the spindle with hub. Guard against permitting bearing to fall in the dirt. If wheel and hub assembly does not slide off spindle with a minimum amount of effort, decrease the diameter of brake shoes by turning adjusting screw on slack adjuster clockwise. Pull inner bearing off spindle.

Note

Wrap bearings in a cloth to prevent them from coming in contact with sand and other foreign matter.

b. Installation.

- (1) Inspect bearings and bearing cups for chips, pits and excessive wear. Check cups to make certain they are tight in hub bore. Inspect felt grease retainer for excessive wear or over-saturation. Replace felt if necessary (para. 77.). Lubricate bearings (para. 31 *d.* (1)). Place inner bearing on axle spindle.
- (2) Place greased skid on ground under axle spindle. Roll wheel on to greased skid and adjust jack to aline center of hub with axle spindle. Shove the wheel and tire assembly on the spindle. Install outer bearing and adjusting nut.

CAUTION

Make certain adjusting nut is installed with the dowel toward outer side of hub.

- (3) Adjust bearings (para. 75). Install locking washer and jam nut. Secure hub cap and hub cap gasket to hub using six cap screws and six lock washers. Remove skid plate, jack and blocking.

75. WHEEL BEARING ADJUSTMENT—SEMITRAILER.

Adjustment. Place jack under rear crossmember and raise until wheels clear the ground. Rotate wheel to make certain it turns freely. Remove six cap screws and six lock washers from hub cap, and remove hub cap and hub cap gasket. With axle nut wrench turn jam nut counterclockwise and remove jam nut. Pull locking washer off axle spindle. Tighten adjusting nut using axle nut wrench until wheel binds, and at the same time rotate wheel to make certain all surfaces are in contact. Then back adjusting nut off about 1/6 turn, or more, if necessary, making sure wheel rotates freely. Check hub bearing for end play (para. 72 a.). Install locking washer, making certain hole in locking washer fits into dowel on adjusting nut, install jam nut and tighten. Secure hub cap and hub cap gasket to hub using six cap screws and lock washers.

76. WHEEL AND DRUM ASSEMBLY—SEMITRAILER.

a. Removal (figs. 53 and 60). Remove inner and outer tire and rim assembly (para. 78 a.). Remove the outer bearing assembly (para. 74 a.), and lift the assembly off trunnion axle spindle.

b. Installation. Install inner bearing on trunnion axle spindle (para. 74 b.). Install outer bearing and adjusting nut, and adjust wheel bearings (para. 75). Install tire and rim assembly (para. 78. e.).

77. FELT GREASE RETAINER—SEMITRAILER.

a. Removal (figs. 54 and 60). Remove wheel and tire assembly if felt retainers on outer wheels are to be replaced (para. 74.). If felt retainers on inner wheels are to be replaced, remove wheel and drum assembly (para. 76.). Tap the outer grease retainer, retainer washer, felt and inner retainer off trunnion axle.

b. Installation. Place outer grease retainer on trunnion axle and tap the outer retainer back until stop is reached. Place retainer washer next to outer grease retainer. Place felt and inner grease retainer in position next to the retainer washer. Make certain the parts are placed on the shoulder of axle spindle. See figure 54 for assembly sequence of retainer parts. Install wheel and tire assembly (para. 74. b.) if retainers on outer wheels have been replaced. Install wheel and drum assembly if inner wheel and drum assembly has been removed (para. 76 b.).

78. TIRE AND RIM.

a. Removal. Jack axle until tire clears the ground. Remove six nuts from wheel bolts. Tap the rim clamps lightly with a hammer and

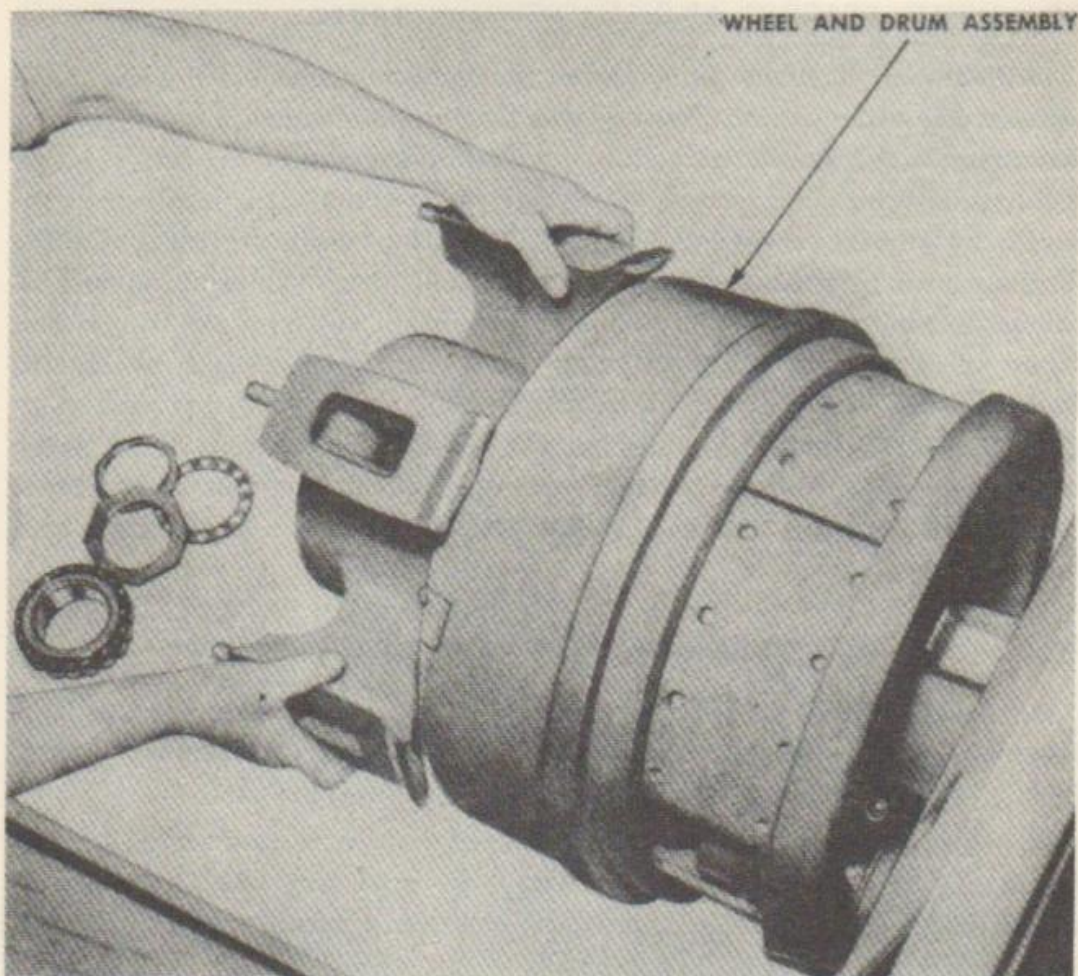


FIGURE 53. REMOVING WHEEL AND DRUM ASSEMBLY—SEMITRAILER

remove the clamps. Pull outer rim and tire assembly off wheel. Tap spacer band off wheel and pull inner tire and rim off the wheel.

Note

Removal procedure for dolly and semitrailer tire and rim assemblies are identical. However, when removing tire and rim assemblies from the semitrailer inner wheels, use special wrench 20T-5085 which is supplied with this vehicle. See item "R", figure 7.

b. Dismounting. Place tire and rim assembly on the floor with valve stem up. Remove valve core to permit all air to escape. Remove valve extension, and insert tire tool in slot on lock ring. While tapping lock ring from opposite side of slot, pry the lock ring out of rim lock and lift the lock ring assembly off the rim. Place tire on edge at a 45 degree slant, and shove the rim out of tire using care not to damage the valve stem. Pull flap and inner tube out of tire.

c. Inspection. Check tubes for punctures, pinches, cuts and cracks. Inspect valve for proper bend and condition of inside and outside threads. Replace any leaking valve cores. Check flaps for folds, tears and cleanliness. Check tire for cuts, bruises, imbedded objects, and other damage. Replace tire if necessary.

d. Mounting. Install valve core in valve stem, and inflate tube to sufficient pressure to remove folds. Place valve cap on tube to prevent threads from becoming damaged. Install tube in tire. Install flap in tire. Place rim on floor with the two lugs which are attached to the rim facing up. Place valve stem into slot on rim and lower tire over rim. Equally space three 2" x 4" x 4" wood blocks under rim. Place lock ring over tire. With a tire tool, force section of lock ring near rivets into rim gutter. Tap the lock ring into position, at the same time prying on ring. Inflate tire with several pounds of air pressure. Tap lock ring to make certain lock ring is properly seated. Inflate dolly tires to 75 pound pressure; inflate semitrailer tires to 65 pound pressure.

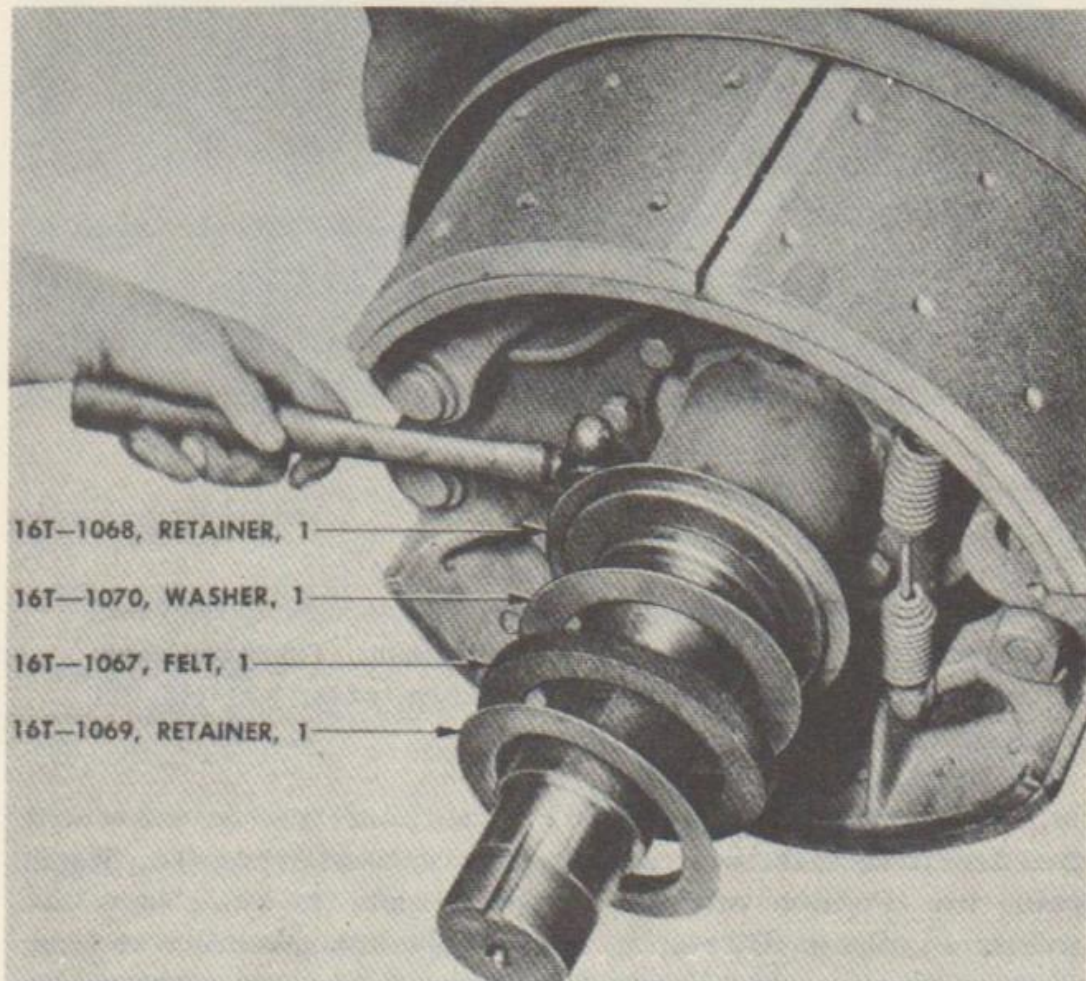


FIGURE 54. REMOVING FELT GREASE RETAINER

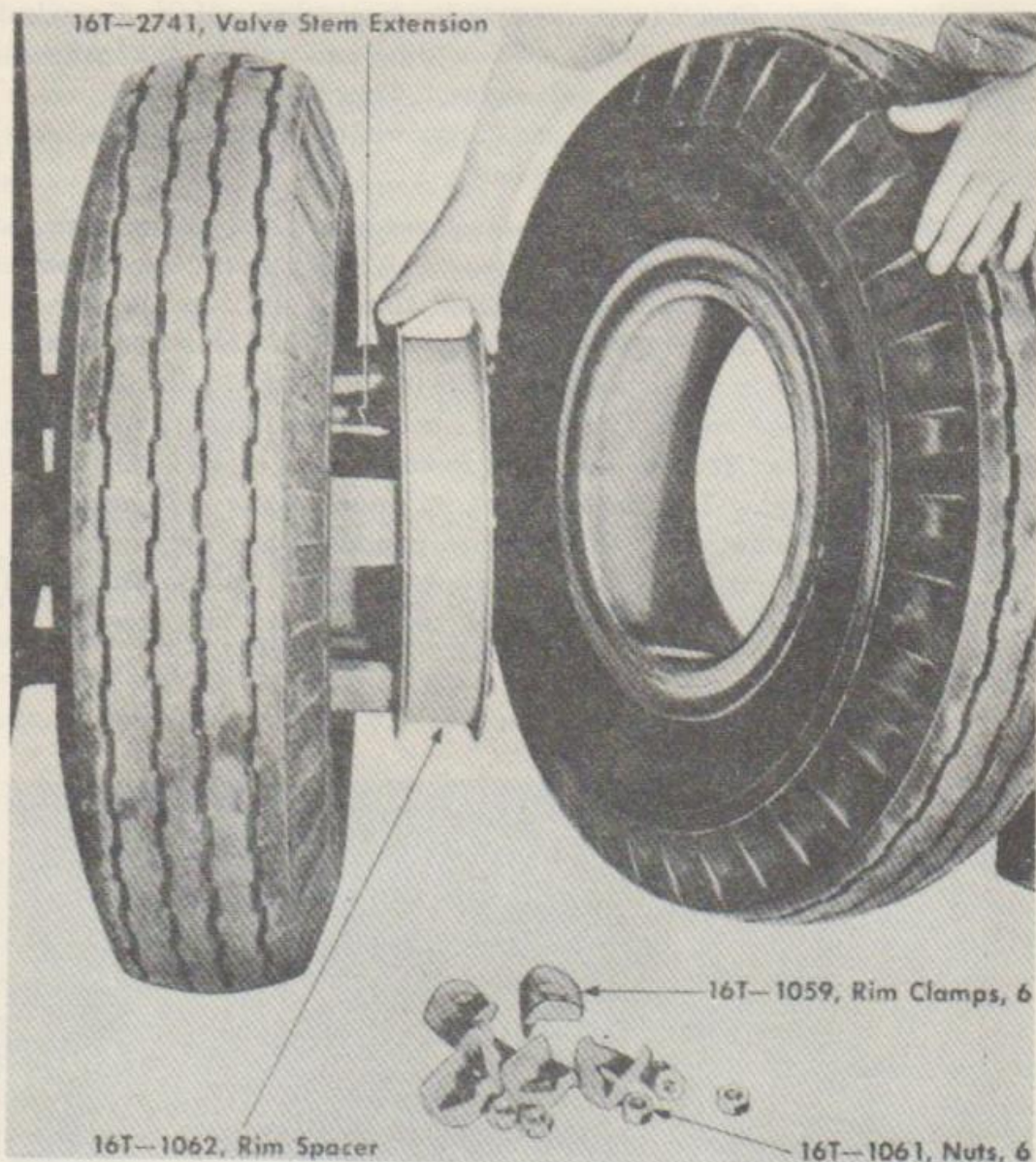


FIGURE 55. INSTALLING TIRES

CAUTION

Wrap two safety chains with grab hooks loosely around two different points of the tire prior to inflation. This safeguards against possible serious injury should the outer lock ring let go during inflation.

e. Installation (figs. 55 and 56). Install inner tire on wheel with valve stem towards the hub cap. Place spacer band in position. Mount outside tire. Position valve stem at next spoke to which inner tire valve stem is placed. By placing valve stem in this manner, both inner and outer valves are more accessible. Place the six clamp lugs on rim nuts. Place the six nuts on the bolts and draw the nuts up, but not

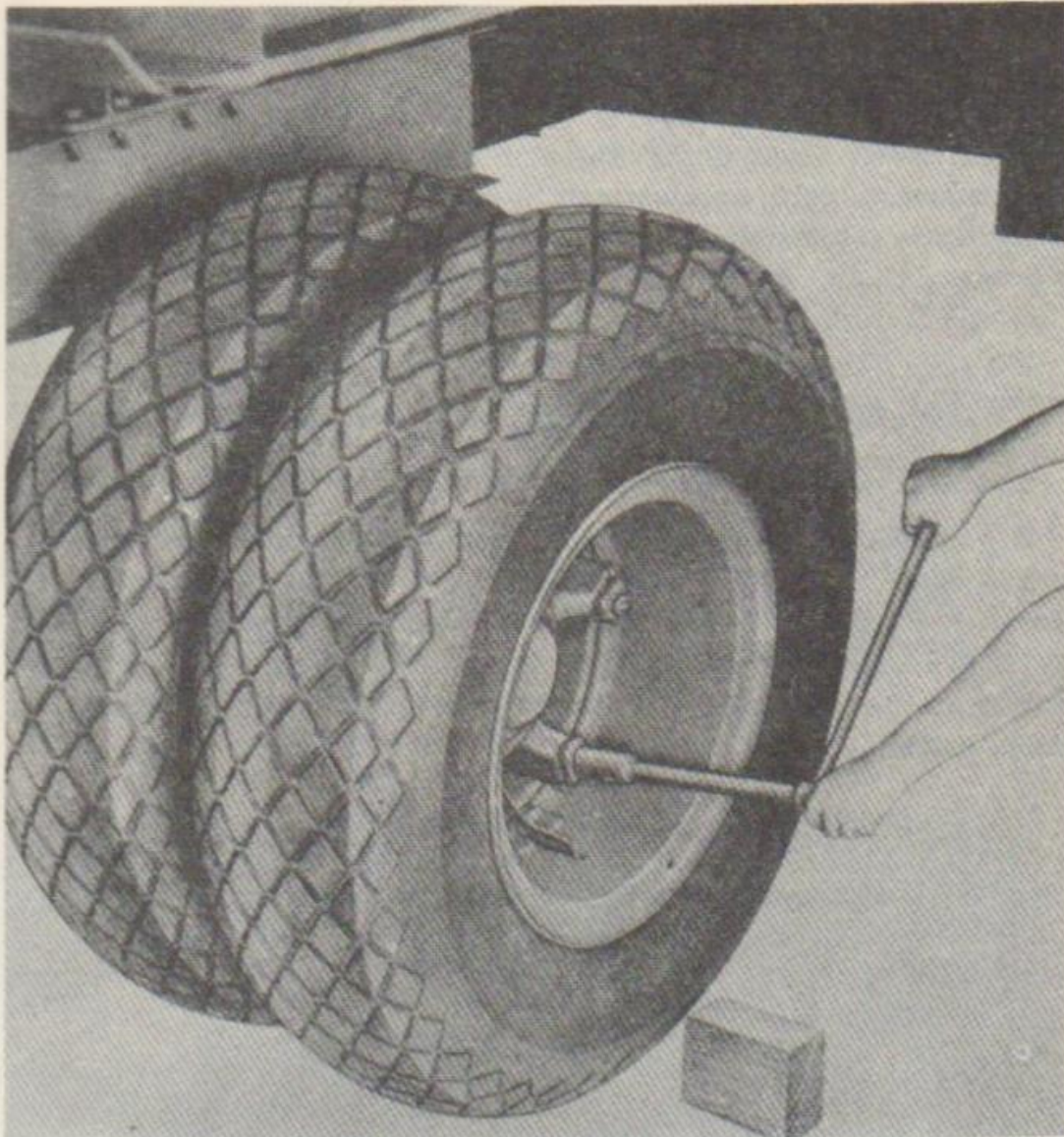


FIGURE 56. CHECKING TIRE FOR WOBBLE

tight. Place a small block of wood on the ground next to the tire and revolve the wheel while watching between wood block and tire (fig. 56). Any wobble in the tire will be readily detected. Draw the nuts up at the lug clamps where the tire has less clearance between wood blocking. Continue this operation until the tire is running true and all lug clamp nuts are tight. One-eighth inch clearance between wood blocking and tire is permissible. Check tire inflation. Pressure should be 65 pounds in semitrailer tires, and 75 pounds in dolly tires.

79. DRUMS.

a. Removal (figs. 57 and 59). Remove tire and rim assembly from wheel (para. 78 *a.*). Remove wheel and drum assembly (para. 73 or 76). With a socket attached to an extension handle, place socket on

the heads of the bolts and remove nuts and lock washers holding drum to wheel. Lift drum off wheel.

b. Inspection and Cleaning. Remove all grease, dust and other foreign matter from drum. Inspect drum for cracks and excessive heat checking. Secure replacement if necessary. Check drums for scoring which was brought about by gravel or other foreign matter entering the drum.

Note

Heat checking, if not excessive, does not necessitate drum replacement.

c. Installation. Make certain all rust and dust is removed from drum pilot on wheel. Place drum over drum pilot. Aline holes in drum with holes in wheel, and install the six bolts, lock washers and nuts. When tightening the bolts, alternate to bring the drum down evenly to prevent cocking of drum on drum pilot. Install wheel and drum assembly (para. 73. b.) or (para. 76. b.).

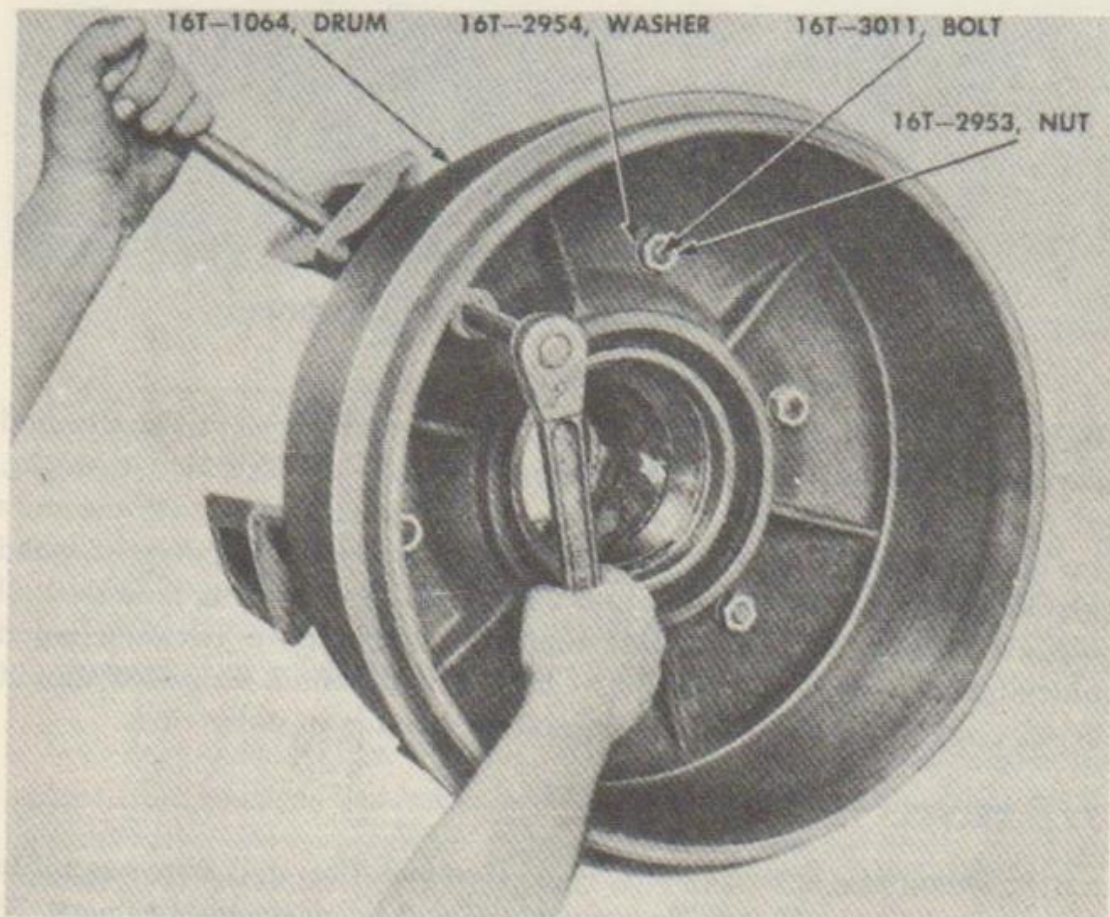


FIGURE 57. REMOVING DRUM

80. CUPS.

a. Removal (fig. 58). Wheel bearing cups must be removed with a cup puller and replaced with a cup driver. However the following instructions are for the first and second echelon maintenance, where cup puller is not available. Remove tire and rim assembly from wheel (para. 78 a.). Remove drum and wheel assembly (para. 73 a. or 76 a.). Place wheel on its side. Place a soft steel bar on inside shoulder of cup. Using a heavy hammer, hit first one side of the cup and then the other. Alternating in this manner makes the cup come out straight with the cup bore, and danger of wedging the cup in the bore is minimized. Turn wheel over and remove opposite cup in the same manner.

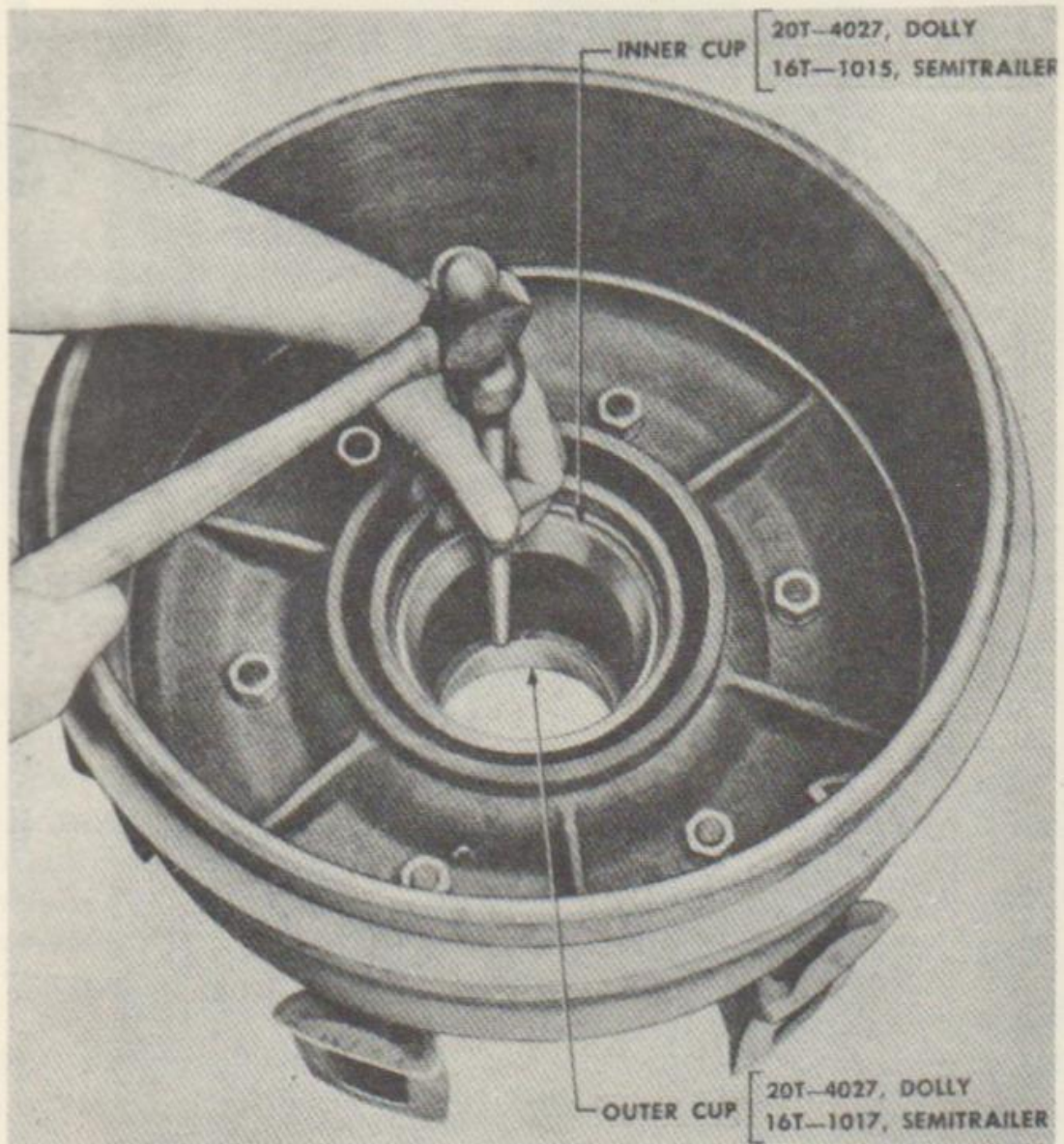


FIGURE 58. REMOVING CUPS

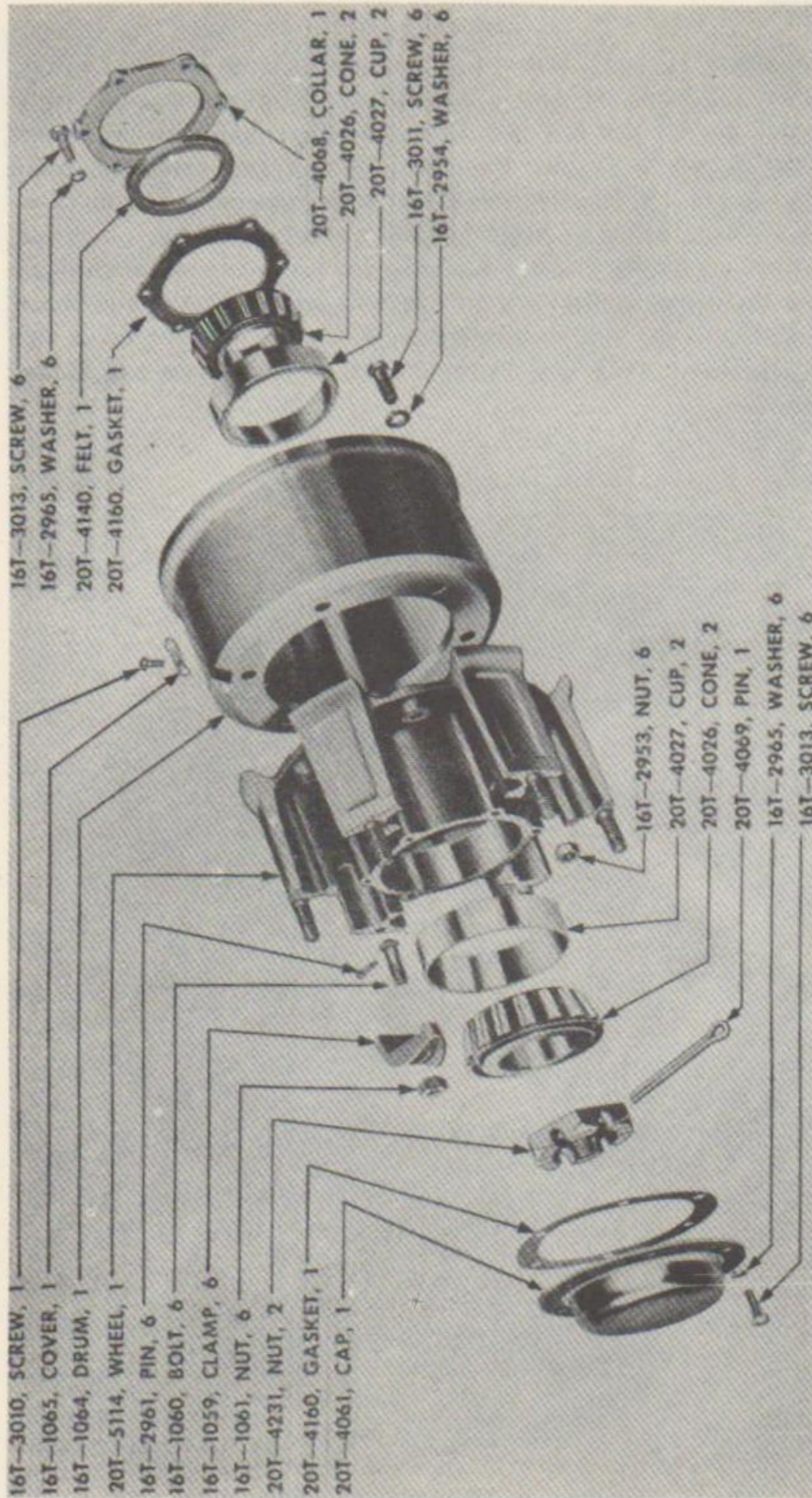


FIGURE 59. DOLLY WHEEL AND DRUM ASSEMBLY—EXPLODED VIEW

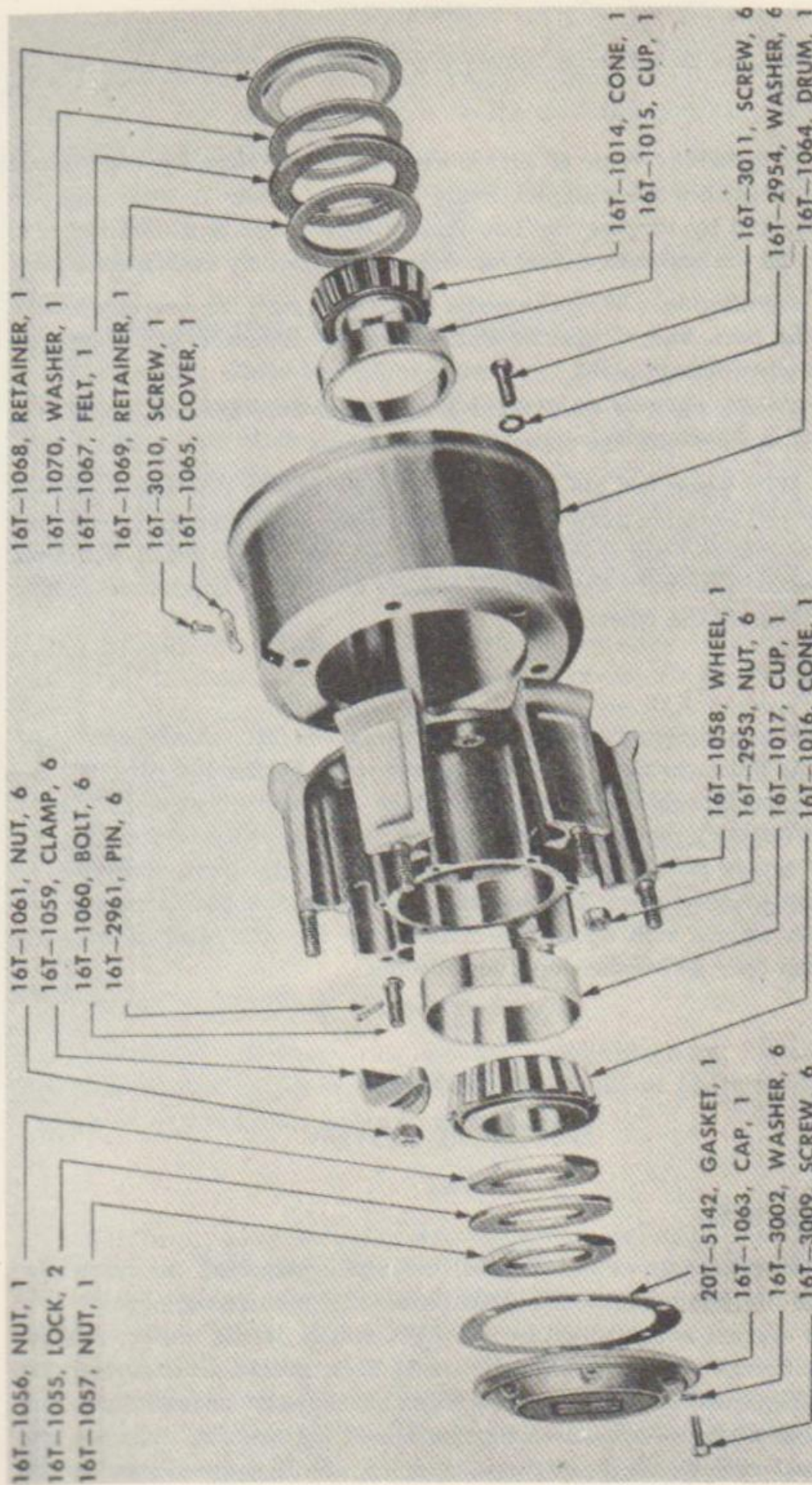


FIGURE 60. SEMITRAILER WHEEL AND DRUM ASSEMBLY—EXPLODED VIEW

Note

Support jack handle makes a good bar for driving out the cup.

b. Inspection. Wipe all grease from surface of cups. Do not remove cups unless they are chipped, badly pitted, or loose. A loose cup can be detected by tapping the cup lightly with a bar and hammer. Do not strike the cup with a steel hammer. Chips may fly and cause injury.

c. Installation. With the wheel on its side, start the new cup square with the bore, and so that its smallest inside diameter will be on the inside when it is in place.

(1) With a piece of hard wood or soft steel over the cup, drive it in until it is flush with the outer edge of the hub.

(2) Now place the old cup over the new one in the same manner and drive the cup in until it is absolutely tight with the cup bore flange. Be sure that the cup is properly seated because if it is not, it will alter the distance between the bearing centers and make impossible proper installation of the wheel.

CAUTION

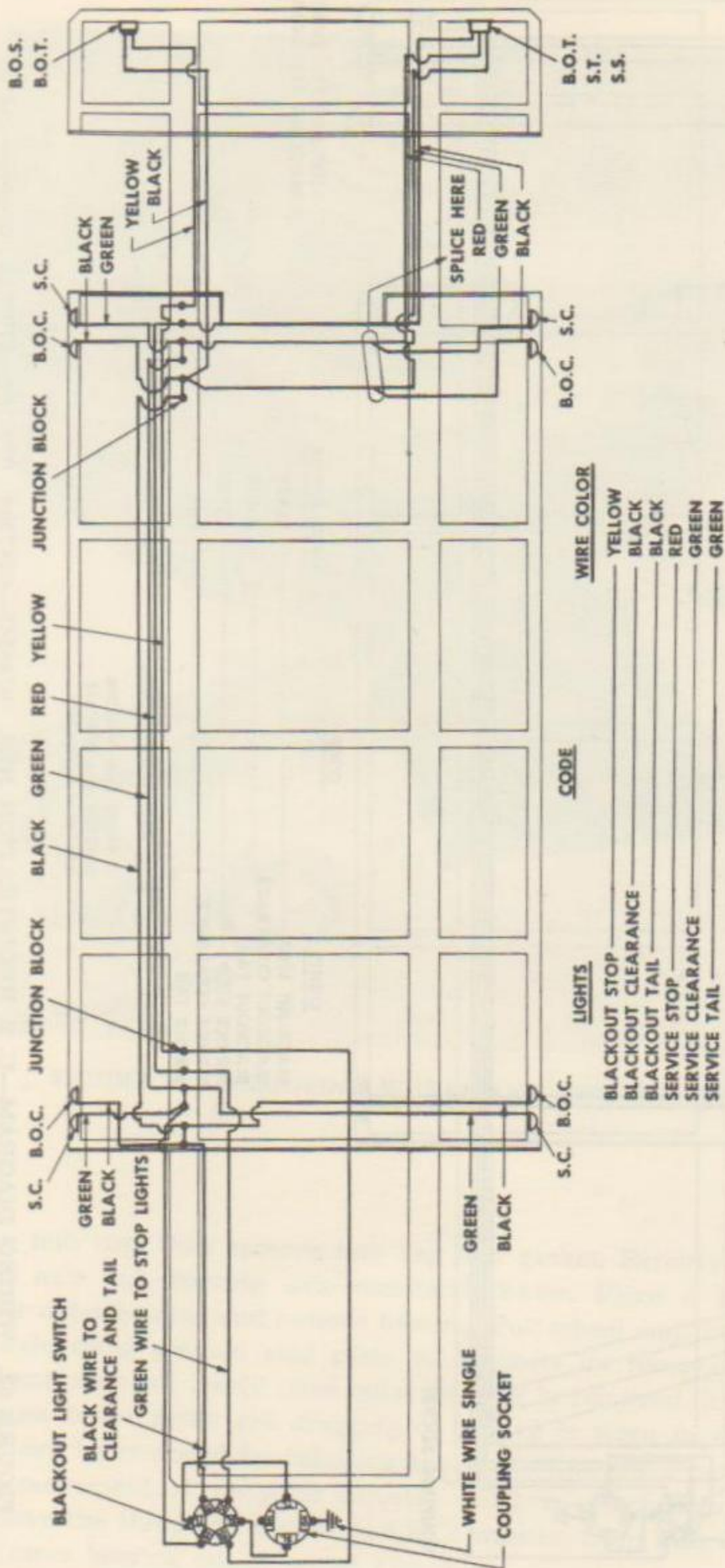
Bearing cups must fit tightly. If cup drives into wheel easily, this indicates the cup bore has been worn by the cup turning in the wheel. The wheel should be replaced. However, an emergency repair of loose cups can be accomplished by using a center punch to reduce the diameter of the bore. Simply use a heavy center punch and put about twelve punch marks per square inch about the diameter of the side wall of the cup bore where the cup normally fits.

SECTION XX ELECTRICAL SYSTEM

81. GENERAL.

a. Description. The electrical current is supplied to the trailer through the jumper cable from the battery on the towing vehicle. The flow of current is controlled by the light switch on the towing vehicle. Four different wiring systems are used. Each wiring diagram has the U. S. Registration numbers for which the diagram is intended. The electrical diagrams shown in figures 61, 62, 63 and 64 illustrate the electrical circuits used on these vehicles. With these diagrams the

Electrical System



CODE	WIRE COLOR
BLACKOUT STOP	YELLOW
BLACKOUT CLEARANCE	BLACK
BLACKOUT TAIL	BLACK
SERVICE STOP	RED
SERVICE CLEARANCE	GREEN
SERVICE TAIL	GREEN

U. S. REGISTRATION NOS.
0797668 thru 0798867

FIGURE 61. WIRING DIAGRAM—U. S. REGISTRATION NOS. 0797668—0798867

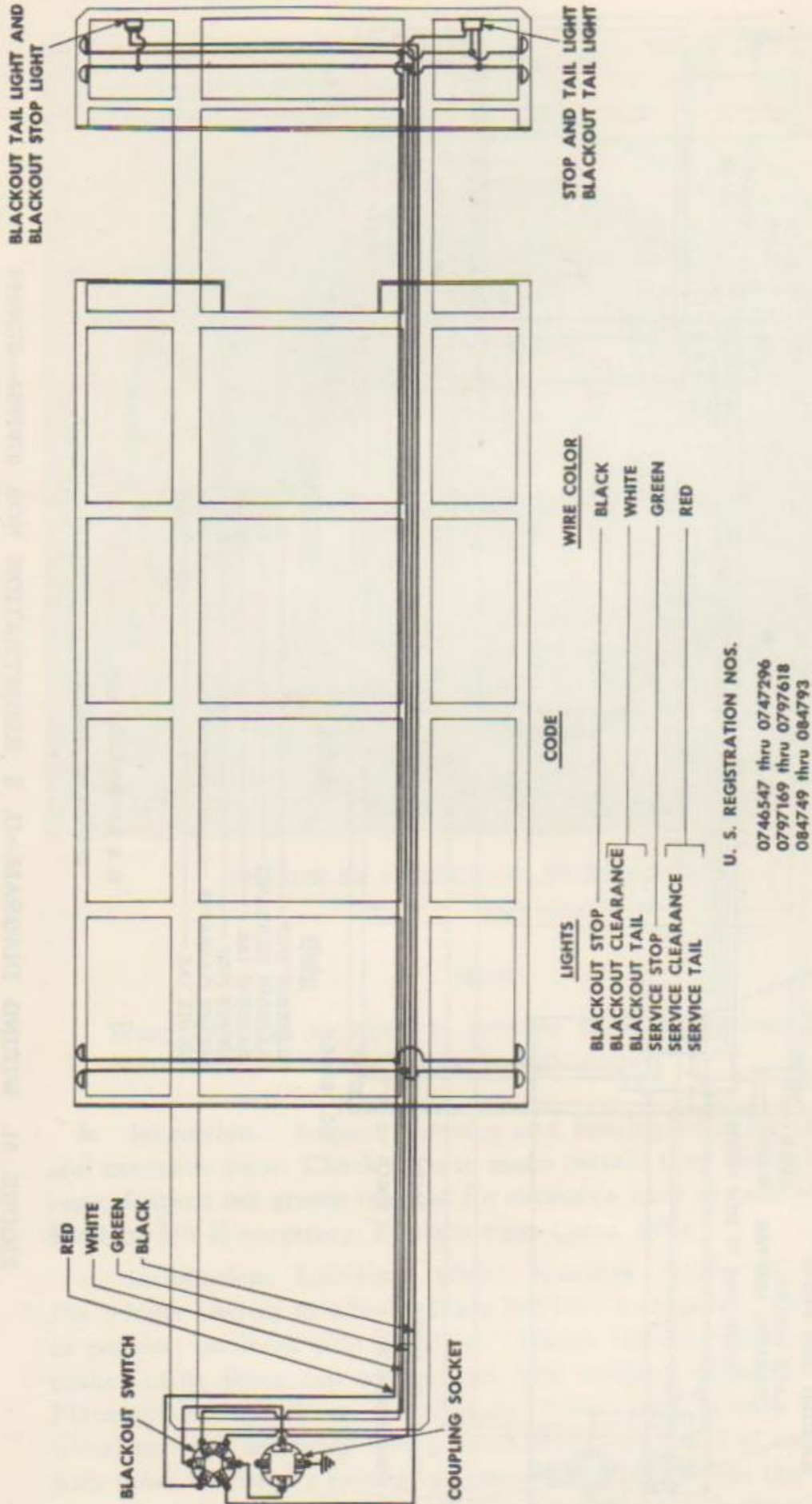
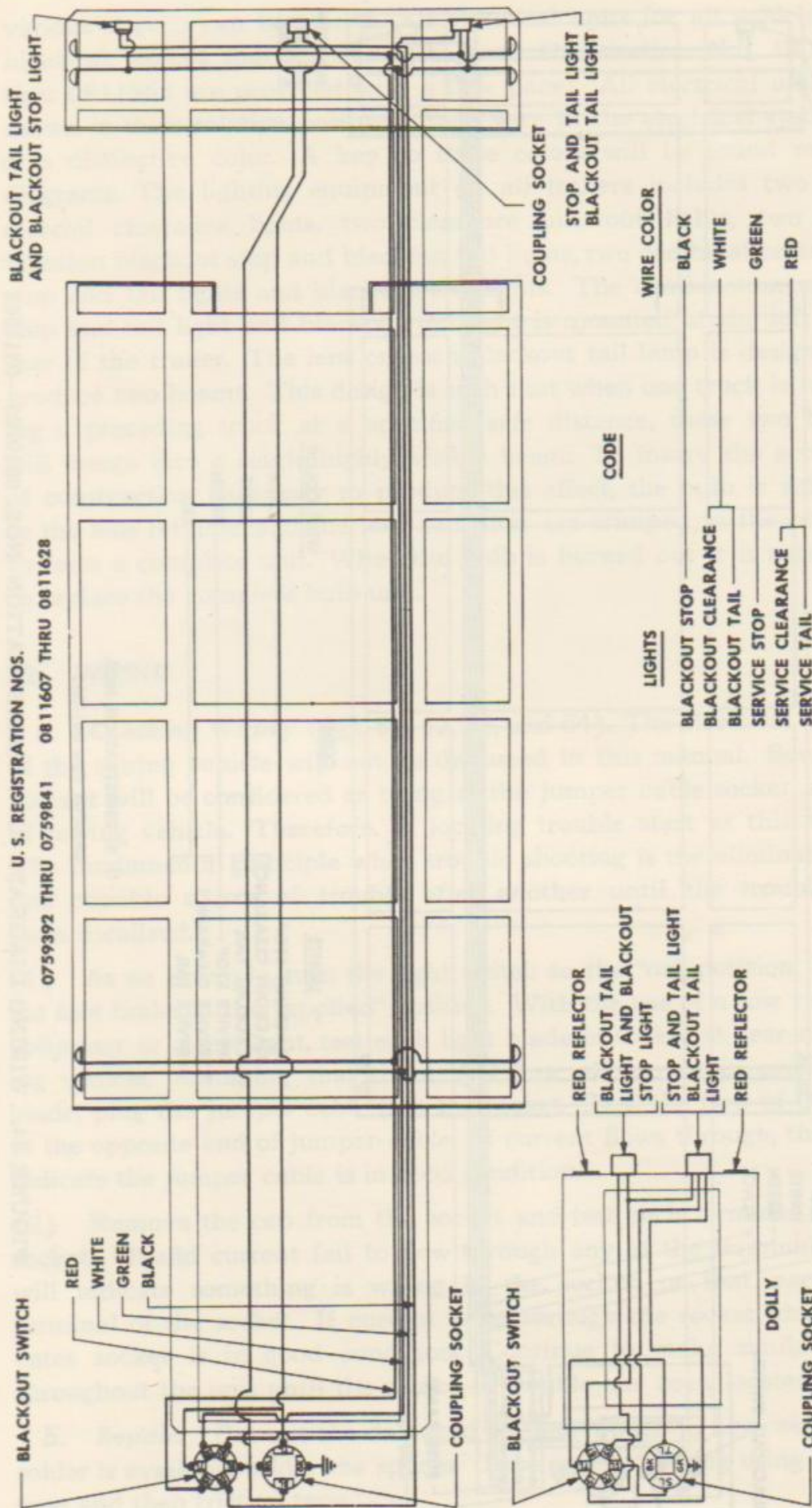


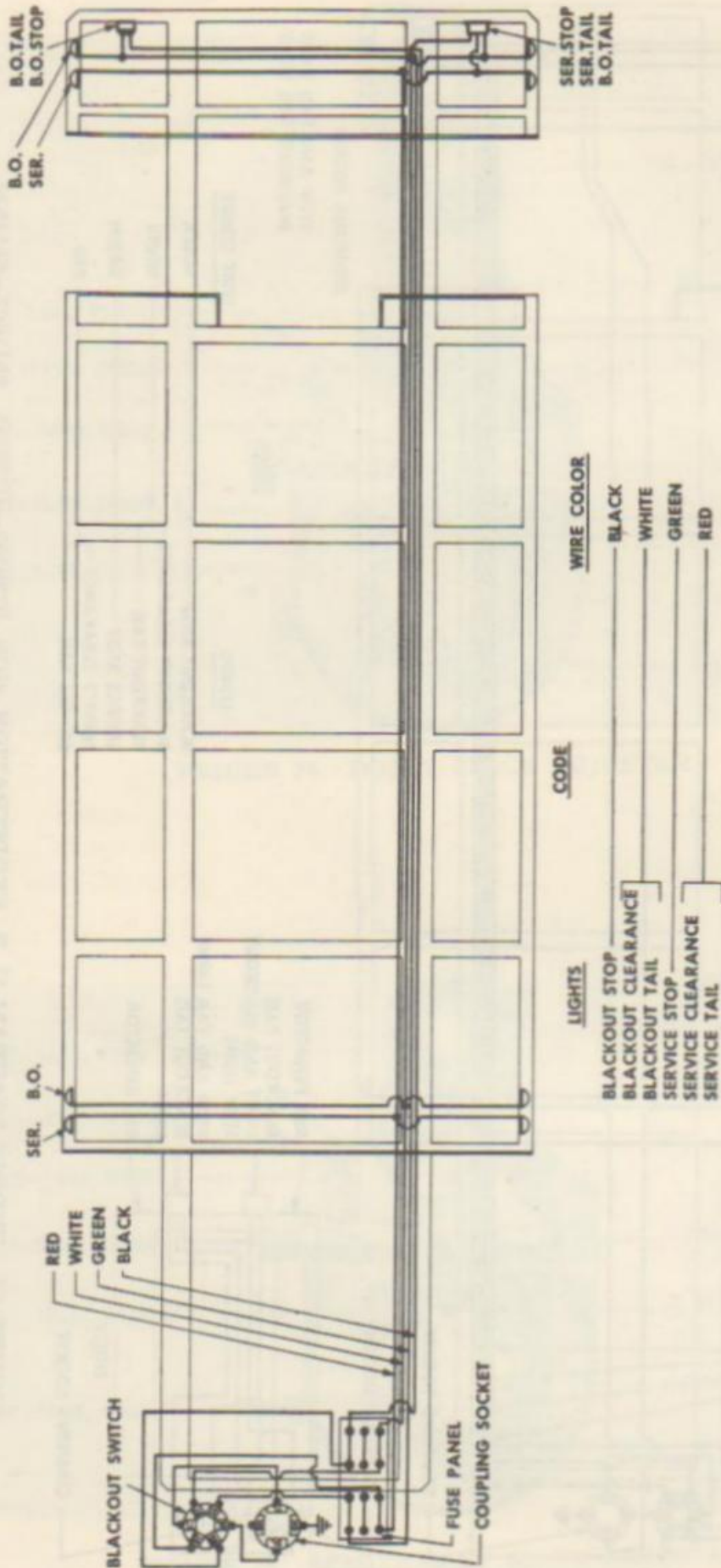
FIGURE 62. WIRING DIAGRAM—U. S. REGISTRATION NOS. 0746547—0747296 0797169—0797618 084749—084793

Electrical System



U. S. REGISTRATION NOS.
0759392 THRU 0759841 0811607 THRU 0811628

FIGURE 63. WIRING DIAGRAM U. S. REGISTRATION NOS. 0759392—0759841 0811607—0811628



U. S. REGISTRATION NOS.
0810705 thru 0811563

FIGURE 64. WIRING DIAGRAM—U. S. REGISTRATION NOS. 0810705—0811563

various circuits can be traced. All electrical units for all vehicles are identical, except that trailers with U. S. Registration Nos. 0810705 thru 0811563 are provided with a fuse panel. All electrical units are shown in their relative position. Each wire in the electrical system is of a distinctive color. A key to these colors will be found on the diagrams. The lighting equipment on all trailers includes two commercial clearance lights, two clearance blackout lights, two combination blackout stop and blackout tail lights, two combination service stop and tail lights and blackout tail lights. The combination service stop and tail light and blackout tail light is mounted at the left hand rear of the trailer. The lens on each blackout tail lamp is designed to produce two beams. This design is such that when one truck is following a preceding truck at a specified safe distance, these two beams will merge into a single highly visible beam. To insure the accuracy of construction necessary to produce this effect, the bulb is soldered to the lens retainer and the lens and filter are crimped to the retainer to form a complete unit. When the bulb is burned out it is necessary to replace the complete bulb unit.

82. WIRING.

a. Checking Wiring (figs. 61, 62, 63, and 64). The electrical system of the towing vehicle will not be discussed in this manual. Source of current will be considered as being at the jumper cable socket at rear of towing vehicle. Therefore, in locating trouble start at this socket. The fundamental principle when trouble shooting is the elimination of one possible source of trouble after another until the trouble has been localized.

(1) As an example, turn the light switch to the "on" position. Place the foot brake in the "applied" position. With the use of a low reading voltmeter or a test light, test each light blade in socket at rear of towing vehicle. Assuming that there is a flow of current in each light blade, plug the jumper cable into the socket. Test the flow of current at the opposite end of jumper cable. If current flows through, this will indicate the jumper cable is in good condition.

(2) Remove the cap from the socket and test each terminal on the socket. Should current fail to flow through any of the terminals, this will indicate something is wrong in the socket, or that particular terminal of the socket. If current flows through the socket, that indicates socket is in good condition. Continue to make similar tests throughout the unit until the source of trouble has been located.

b. Repair. Cut out the damaged section. Splice in new wiring. If solder is available solder the splices. Tape exposed wiring using rubber tape and then friction tape.

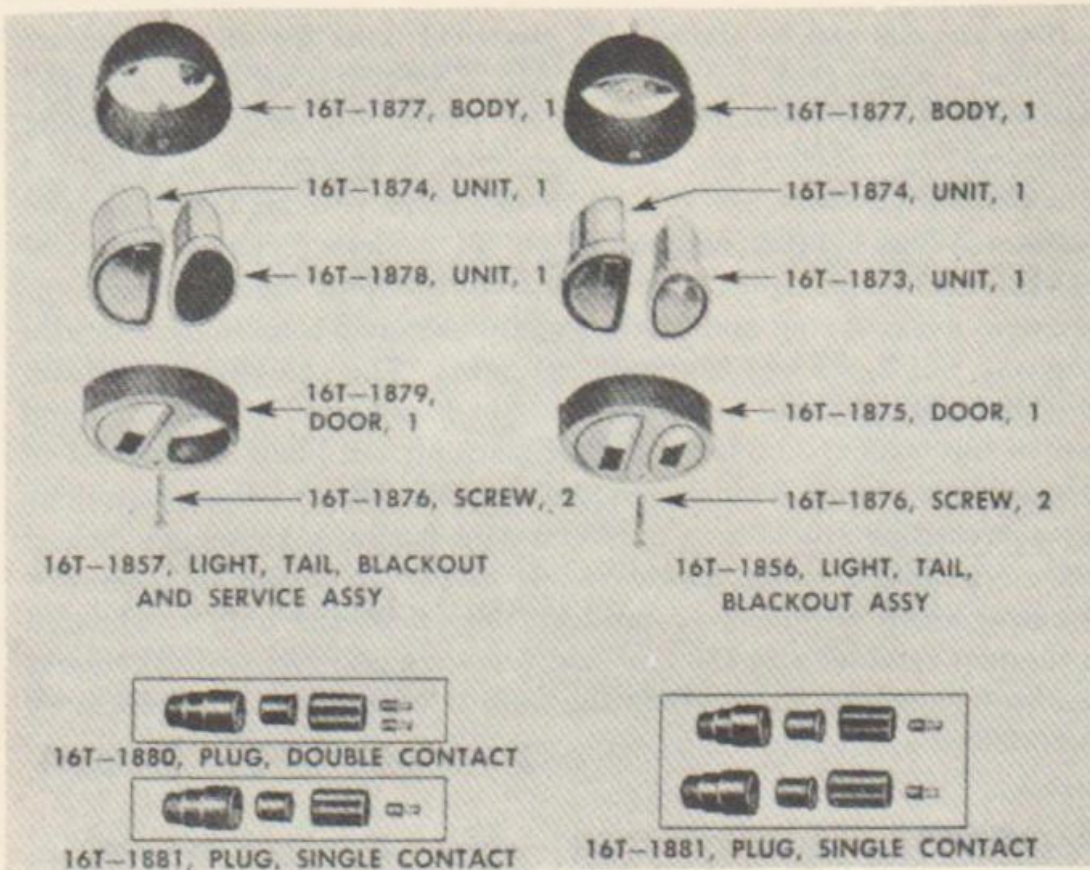


FIGURE 65. TAIL LIGHT—EXPLODED VIEW

83. TAIL LIGHT.

a. **Removal** (fig. 65). Pull out cable and remove two nuts and lock washers from studs which hold tail light to mounting bracket.

b. **Remove Sealed Lamp Unit.** With a screwdriver remove two screws from tail light cover and remove cover. Slide sealed lamp unit from light body.

c. **Install Sealed Lamp Unit.** Insert new unit into light body, replace cover, and secure with screws.

d. **Install Tail Light.** Position tail light on bracket and secure with stud nuts and lock washers. Couple wire to light.

84. CLEARANCE LIGHTS.

a. **Removal** (fig. 66). Removal procedure for standard and blackout clearance lights is identical. Turn the two screws holding the lens housing to the light assembly in a counterclockwise direction until the housing is free on the assembly. Pull the clip which holds the lens to the housing toward the outer edge of the housing and lift the lens out. Remove the lamp and lift the gasket off the plate. Remove the four screws from the plate and pull the assembly out of the frame. Disconnect the short wire from the main line, and separate the pad from the plate.

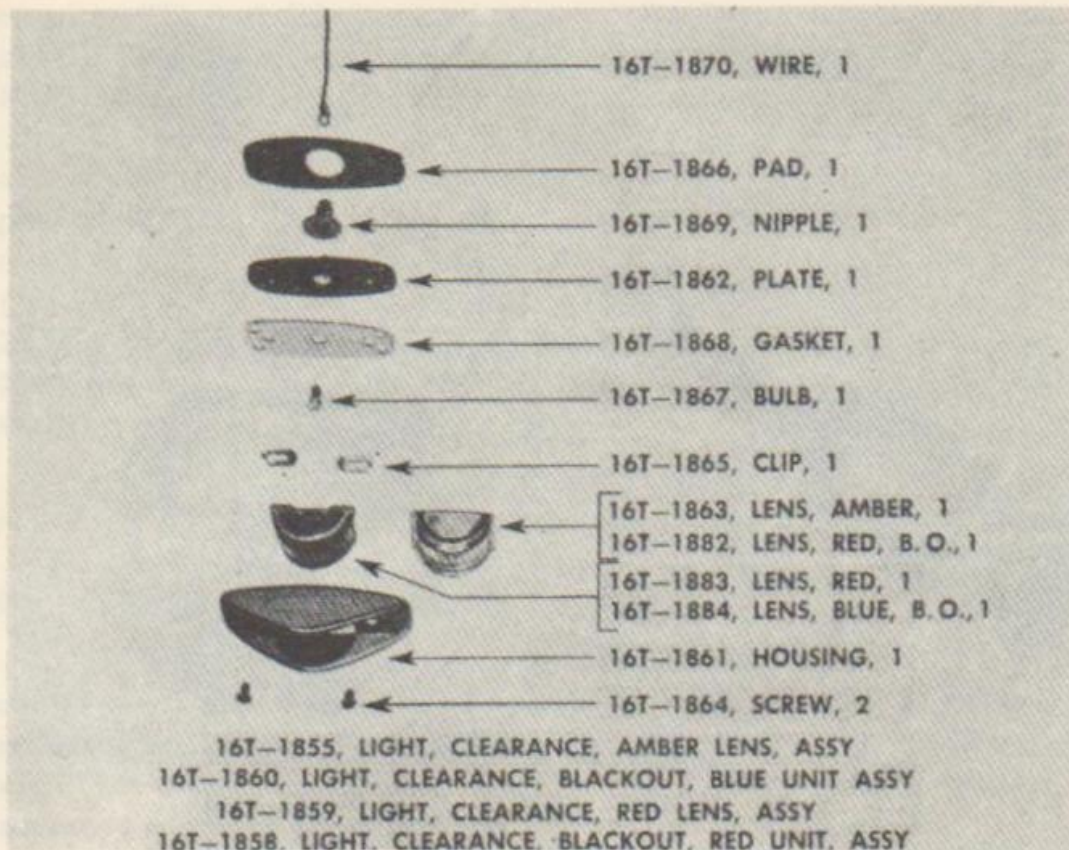


FIGURE 66. CLEARANCE LIGHT—EXPLODED VIEW

b. Reassembly. The procedure for reassembly of the clearance light is the reverse of the removal procedure. When replacing the lens in the blackout light, be sure the arrow on the lens is pointing down, and that the word "bottom" is at the bottom of the light.

85. JUMPER CABLE.

a. Removal. Pull jumper cable out of coupling socket at rear of towing vehicle. Pull opposite end out of coupling socket at front of semitrailer.

b. Disassembly (fig. 67). Remove two bolts (J) from plug handle, and pull the handle from the plug (A). Remove nuts which hold the terminals to the plug. Unsolder wires (G) from the four terminals. Pull the insulating sleeves and insulation washer off the wires.

c. Inspection and Cleaning. Inspect all terminals for sound condition. Clean all corrosion off terminals.

d. Assembly (fig. 67). Remove outer cover of cable (I) 1½ inches back from end exposing individual rubber covered wires (G). Remove insulation from wires (G) 3/16 inch back from end. Slide cable (I) through plug handle (K). Assemble cable clamp (H) as close to the end of cable as possible. Slip all wires (G) through insulating washer (F). Slide insulating sleeves (E) on wires (G). Solder terminals (C)

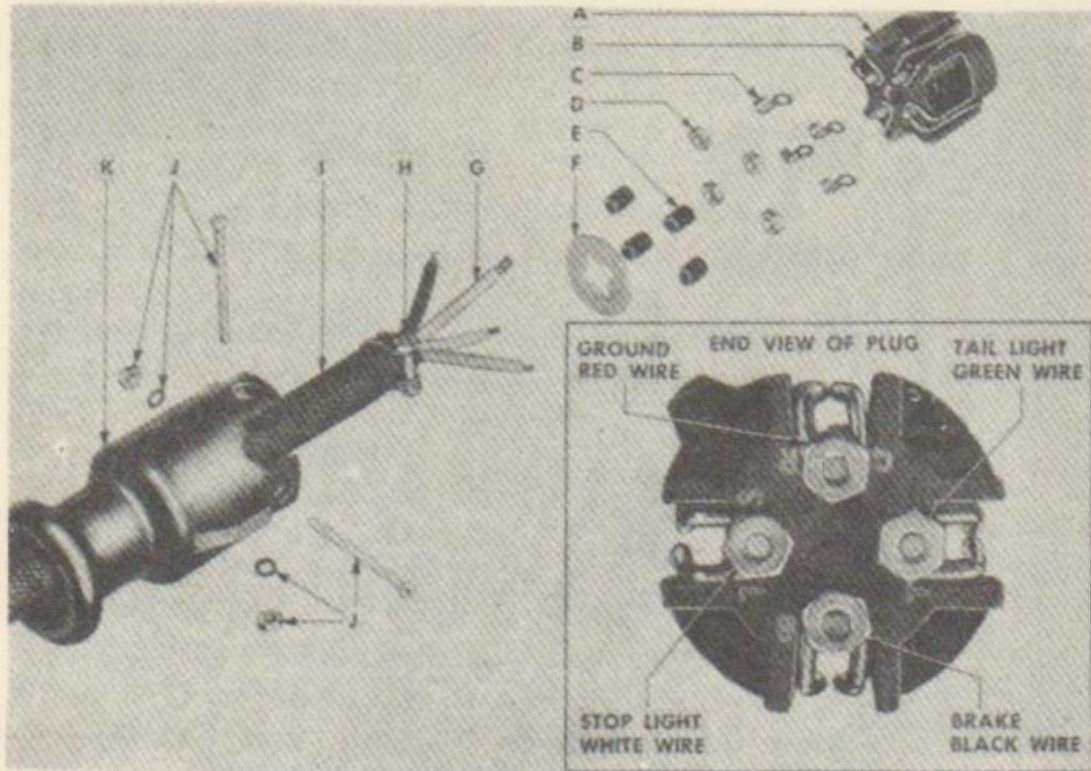


FIGURE 67. JUMPER CABLE—EXPLODED VIEW

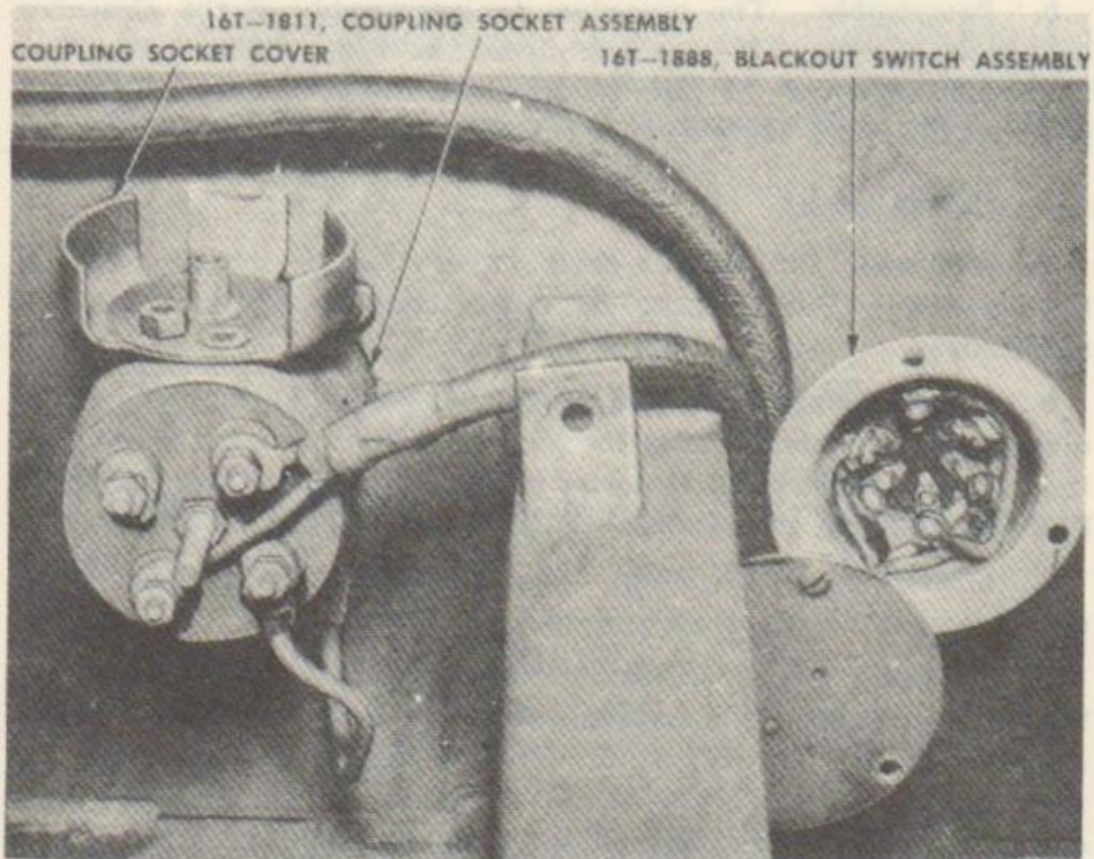


FIGURE 68. COUPLING SOCKET AND BLACKOUT SWITCH

on wires (G), and slide insulating sleeves (E) down over soldered ends of terminals (C). Place terminals (C) on bolts (B) in plug end (A). Refer to figure 67 for wire color code and markings on plug end (A). Tighten nuts (D) down on terminals (C). Bend terminals (C) up at a 90 degree angle after tightening nuts (D). If this is not done, plug handle (K) will not slide down over wires. Slide plug handle (K) down to plug end (A). Turn plug handle (K) so bolt in cable clamp (H) will not rest on top of either of the two lugs inside of plug handle. Be sure the key on plug handle matches with key on plug end. Assemble bolts (J) through plug handle (K) and plug end (A) to hold them together.

e. Installation. Open cover at coupling socket and install the jumper cable.

86. COUPLING SOCKET.

a. Removal (fig. 68). Open tool compartment. Remove the two stove bolts holding guard to members. Remove the guard. Remove nut and lock washer from stud, and remove the cover. Disconnect each wire from terminals. Remove the four bolts holding coupling socket to trailer crossmember and remove the coupling socket.

b. Disassembly (fig. 69). Remove nuts, washers and lock washers from terminal bolts. Lift off the fiber insulator and pull out the insert, bolts and blades.

c. Inspection. Inspect all threads for damage. Check blades for corrosion. Clean or replace if necessary.

d. Reassembly. Position blades in insert. Install insert into case. Place insulator over the bolts and fasten the bolts to the case using washer and nuts, following the sequence illustrated in figure 69.

e. Installation. Place coupling socket assembly through hole in front crossmember with the guide down. Place cover in position at the two top holes. Fasten cover and coupling socket assembly to the crossmember using four bolts, lock washers and nuts. Couple the wire to the terminals in accordance with wiring diagrams (figs. 61, 62, 63 or 64). Place coupling socket cover over coupling socket and fasten using lock washer and nut. Install the guard using two stove bolts.

87. BLACKOUT SWITCH.

a. Removal. Open tool compartment. Remove two stove bolts holding guard to members. Remove the guard. Remove nut and lock washer from blackout switch end which extends through trailer crossmember. Pull out the blackout switch. Remove three bolts from cover and remove screws and lock washers from terminal.

b. Installation (fig. 68). Place ends of wires through hole in side of switch. Fasten the wires to the terminal. See wiring diagrams, figures 61, 62, 63, or 64. Secure cover to switch using three bolts. Place the switch through the hole in crossmember and install lock washer and nut. Check lighting operations, then install guard over the switch.

Note

Each terminal is marked. Make certain color of wire matches terminal.

88. FUSE PANEL.

a. Removal (fig. 70). Fuse panel is located on front crossmember on trailer with U. S. Registration Nos. 0810705 thru 0811563. Remove cotter pins from studs. Remove two wing nuts and lift cover off the panel. Pull fuse out of retainer clips. Remove terminal screw and lift off the wires. Remove nut and lock washer from the two studs, and remove panel and fiber gasket.

b. Installation. Position fiber gasket and panel on trailer front crossmember. Aline holes and insert the two studs with the cotter pin to the outer side. Secure the two studs using lock washers and nuts. Place the wire through the hole in center of panel and attach the wires

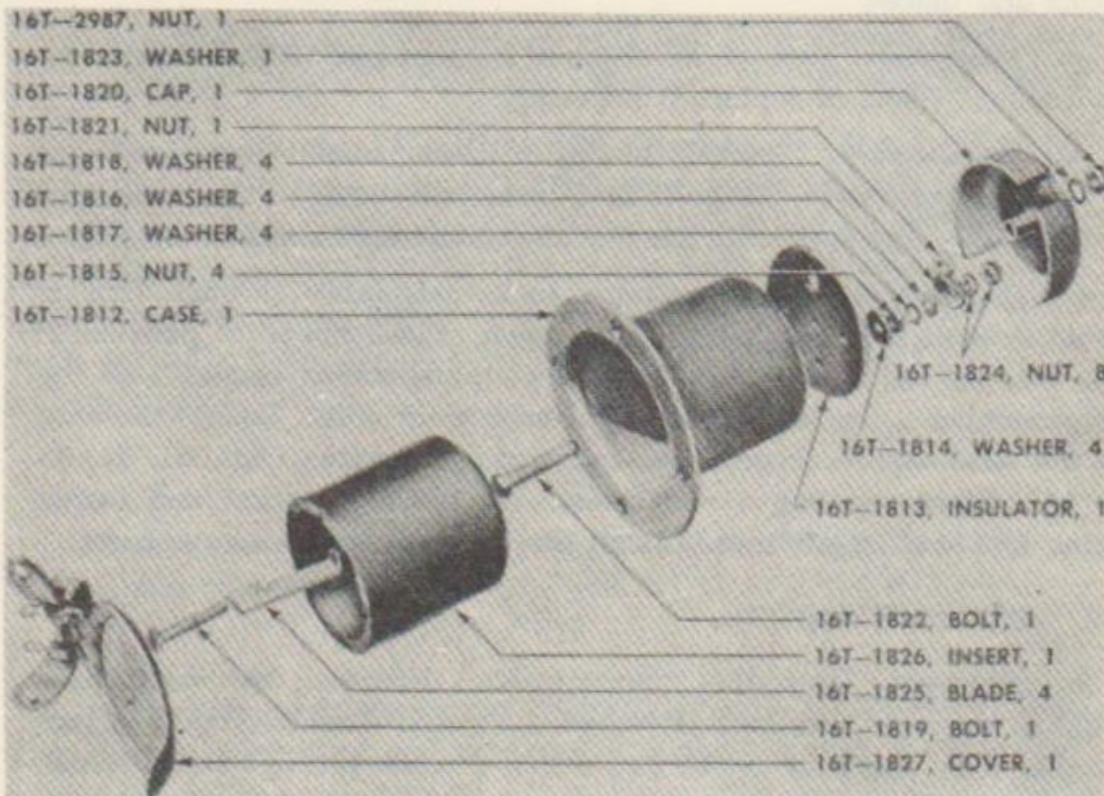


FIGURE 69. COUPLING SOCKET—EXPLODED VIEW

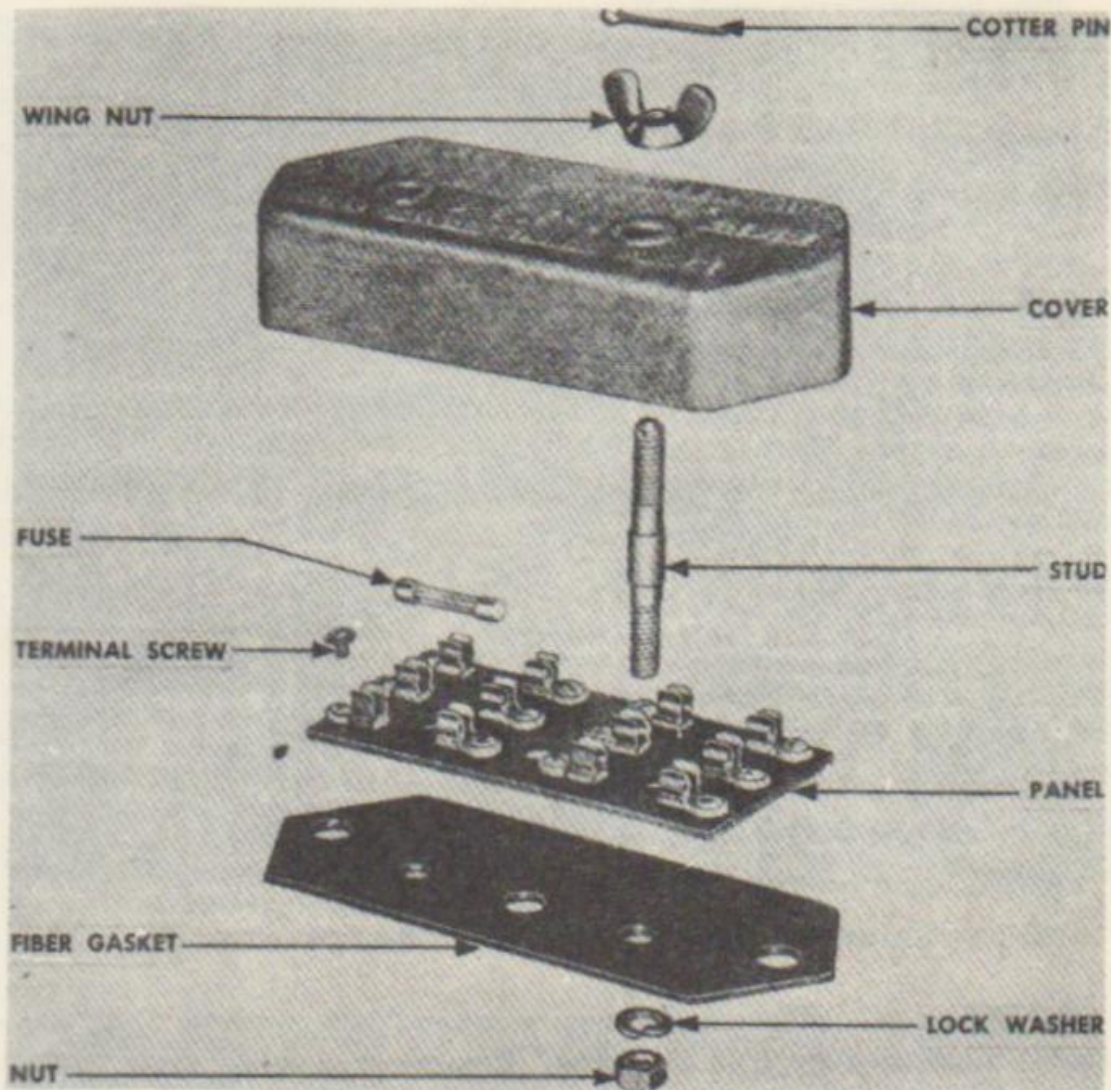


FIGURE 70. FUSE PANEL—EXPLODED VIEW

to the terminals. See figure 64 for proper wire installation. Install the fuse. Place cover over studs and install wing nuts and cotter keys. Fuses used are $\frac{1}{4}$ in. x $1\frac{1}{4}$ in. 20 amp. capacity.

SECTION XXI FIFTH WHEEL

89. FIFTH WHEEL.

a. Description. The fifth wheel is a semi-automatic, single jaw type. The jaw embraces the entire surface of the king pin when the dolly is coupled to the semitrailer. When the operating lever is engaged, a latch drops behind the lug on the plunger. This holds the plunger in the unlatched position until the dolly is withdrawn. During this operation the entire mechanism is cocked for recoupling.

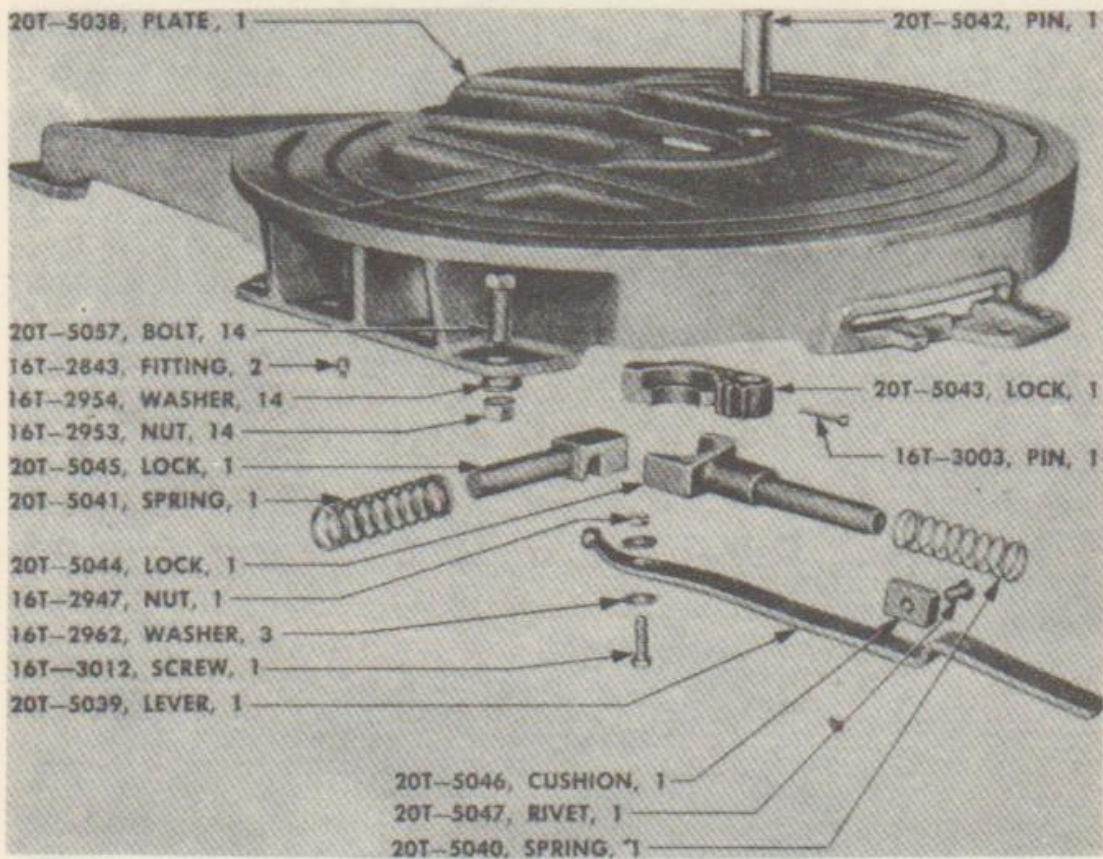


FIGURE 71. FIFTH WHEEL—EXPLODED VIEW

b. Removal. Remove fourteen nuts and lock washers from cap screws holding plate to dolly frame. Remove fifth wheel from dolly.

c. Disassembly (fig. 71). Place fifth wheel on blocks for extraction of hinge pin. Pull cotter pin 16T-3003 from hinge pin 20T-5042 and use drift to remove hinge pin. Push lever 20T-5039 to center of plate and remove hinged lock 20T-5043. Keep lever in retracted position while removing sliding lock 20T-5044 and spring 20T-5040. Remove block carefully from lock plunger and remove plunger lock 20T-5044 and spring 20T-5041.

CAUTION

Place block against lock plunger so that plunger is flush against channel side. Remove cap screw, two washers and nut from lever and remove lever.

d. Inspection and Lubrication. Check all parts for excessive wear. Test springs for tension and breakage. Inspect plate for cracks. Place a light film of general purpose grease No. 1 over jaws on the hinged lock, plunger lock and sliding lock. Grease the pin for hinged lock and all lock shafts.

e. **Reassembly.** Place lock plunger spring 20T-5041 over shaft of lock plunger 20T-5045 and set in position. Remove block carefully from channel and push lever toward center of plate. Place spring 20T-5040 on sliding lock shaft and install sliding lock. Place hinged lock 20T-5043 in position and install hinged lock pin 20T-5042, securing the same with cotter pin.

CAUTION

Put block against lock plunger between channel so that plunger is in a secure position. Place lever 20T-5039 in position with lever ball in socket of lock plunger. Install cap screw and washer over lever with the washer and nut beneath lever.

f. **Installation.** Place fifth wheel on dolly and align bolt holes in plate with holes in dolly frame with drift. Install all bolts, washers and nuts.

SECTION XXII

PINTLE HOOK

90. PINTLE HOOK.

a. **Description.** A pintle hook is provided in the center of the rear crossmember. This hook is used to attach the draw bar of another vehicle for towing purposes. The pintle hook consists of a hook and lock that secures the draw bar eye bolt of the towed vehicle. A heavy spring is attached to the pintle hook for absorbing excessive shocks.

b. **Removal.** Remove cotter pin and castle nut from pintle hook shaft. Pull out assembly, leaving sleeves and spring in position. With a leverage bar, force spring and sleeves from position.

c. **Disassembly** (fig. 72). Place shaft end of pintle hook firmly in vise. Remove cap screw and lock washer from latch and drive out latch pin. Lift out latch pin. Remove cotter pin and nut from lock bolt and pull bolt out. Turn screw holding lock pin chain and remove same.

d. **Inspection and Lubrication.** Check lock bolt and latch pin for excessive wear. Inspect hook, latch and lock for breaks. Place a light film of general purpose grease No. 1 on latch pin and between lock and latch to insure free operation of lock and latch.

e. **Reassembly.** Install lock pin chain to pintle hook. Assemble lock and pintle hook in position and secure with nut, bolt and cotter

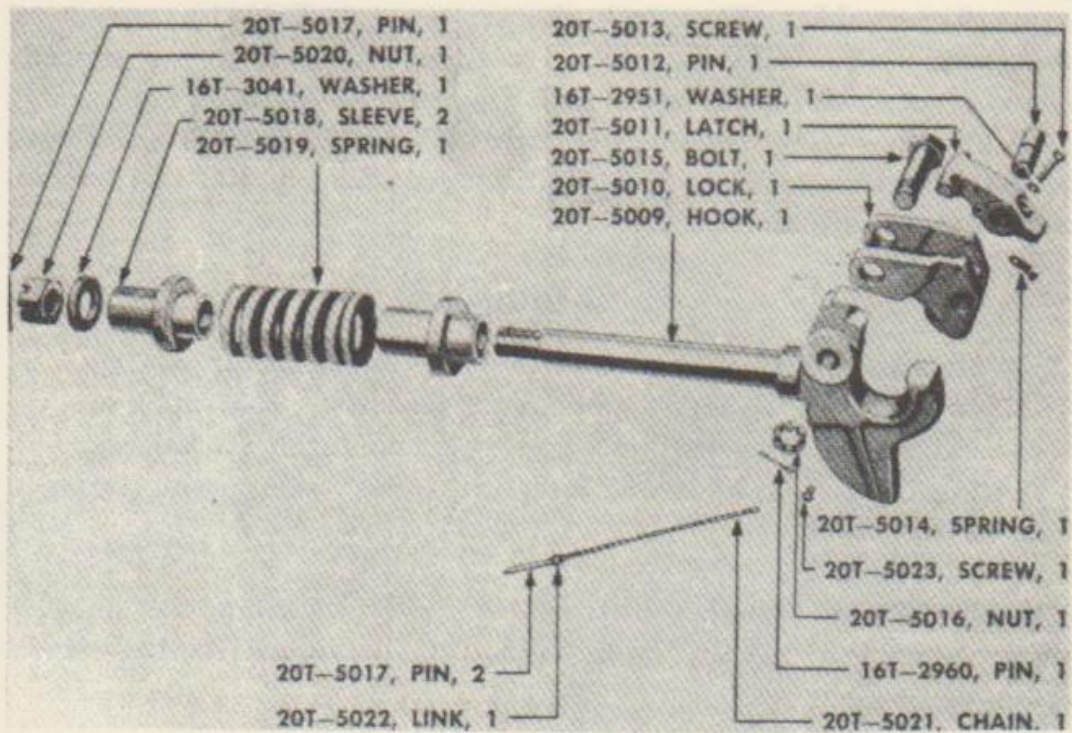


FIGURE 72. PINTLE HOOK—EXPLODED VIEW

pin. Aline latch yoke in position and drive latch pin in place. Install latch pin locking screw and lock washer.

f. Installation. Place sleeve in opposite ends of spring and install assembly in position between rear crossmember center. Aline spring and sleeves and put pintle hook shaft in opening. Place castle nut on shaft, tighten nut and secure with cotter pin.

PART FOUR AUXILIARY EQUIPMENT

No auxiliary equipment is used on either the semitrailer or dolly.

PART FIVE REPAIR INSTRUCTIONS

SECTION XXIII GENERAL

91. SCOPE.

a. These instructions are published for the information and guidance of the maintenance personnel responsible for the third and higher echelons of maintenance of the 20-ton semitrailer with dolly, which is beyond the scope of the tools, equipment and supplies normally available to using organizations.

b. This part of the manual contains a description of and procedure for disassembly, inspection, repair and assembly of all the assemblies which are beyond the scope of the second echelon. A table of fits and tolerances follows each disassembly procedure.

SECTION XXIV BRAKE SYSTEM

92. RELAY-EMERGENCY VALVE.

a. **General.** The War Department has published a technical manual referred to as TM 9-1827A. This manual covers all assemblies, sub-assemblies and component parts of the brake system. The description, disassembly, inspection, repair and assembly of the relay-emergency valve and slack adjuster will be found in TM 9-1827A. The manual will be referred to as follows:

b. **TM 9-1827A**

War Department Technical Manual
21 December 1943
Ordnance Maintenance Power Brake Systems
Section III
Pages 113 thru 126
Paragraphs 60 thru 65

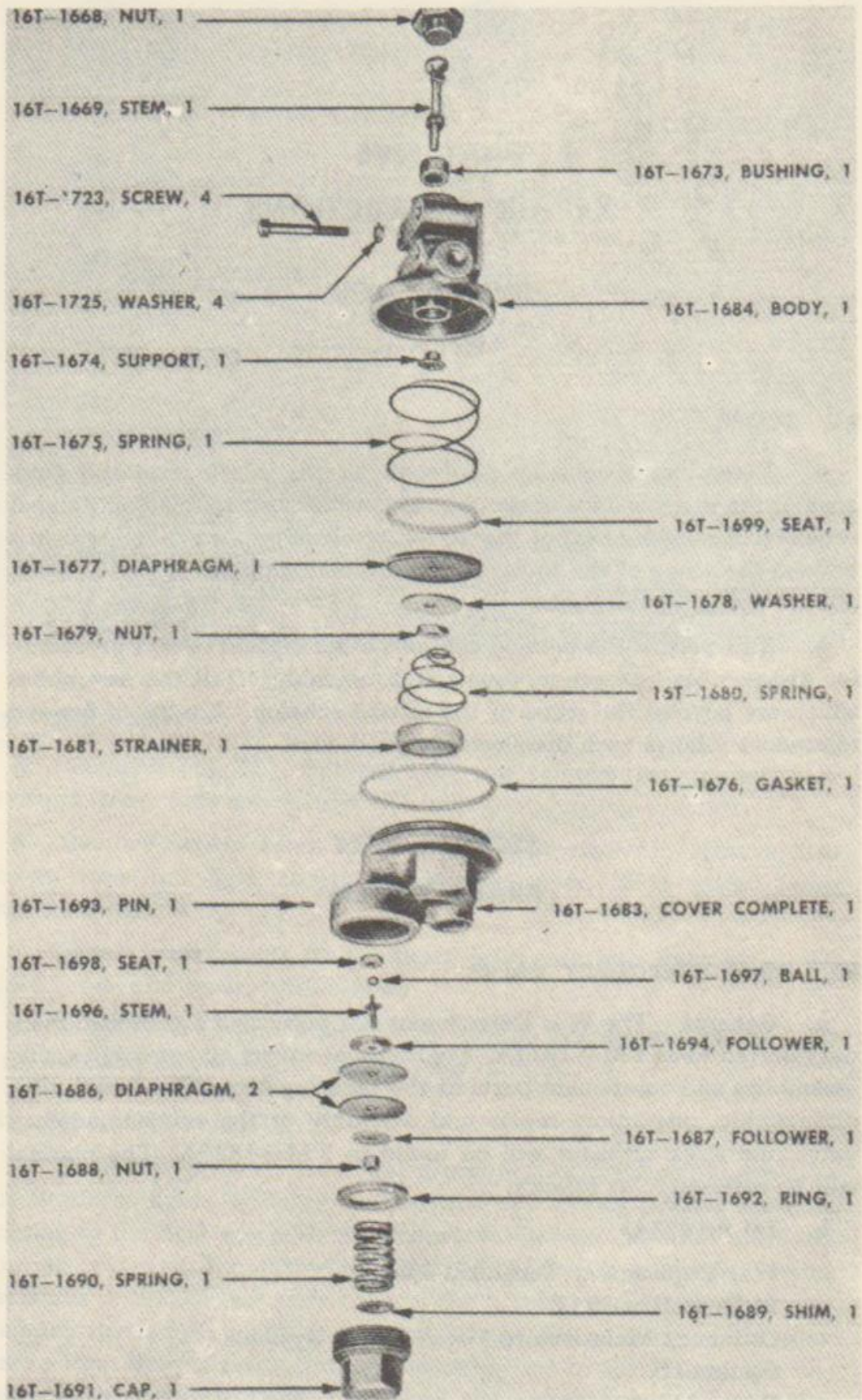


FIGURE 73. RELAY-EMERGENCY VALVE—EXPLODED VIEW

Brake System

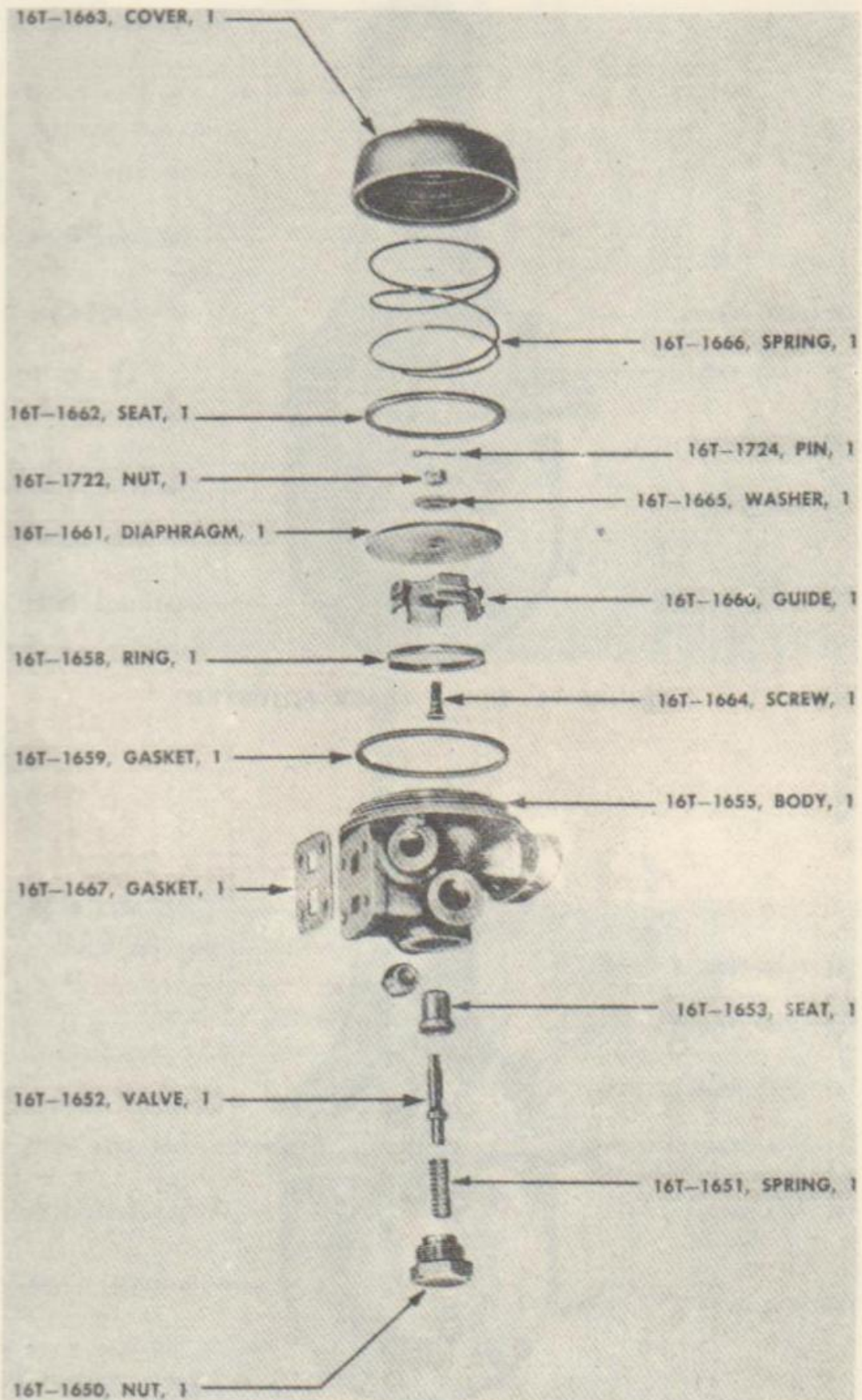


FIGURE 73. RELAY-EMERGENCY VALVE—EXPLODED VIEW

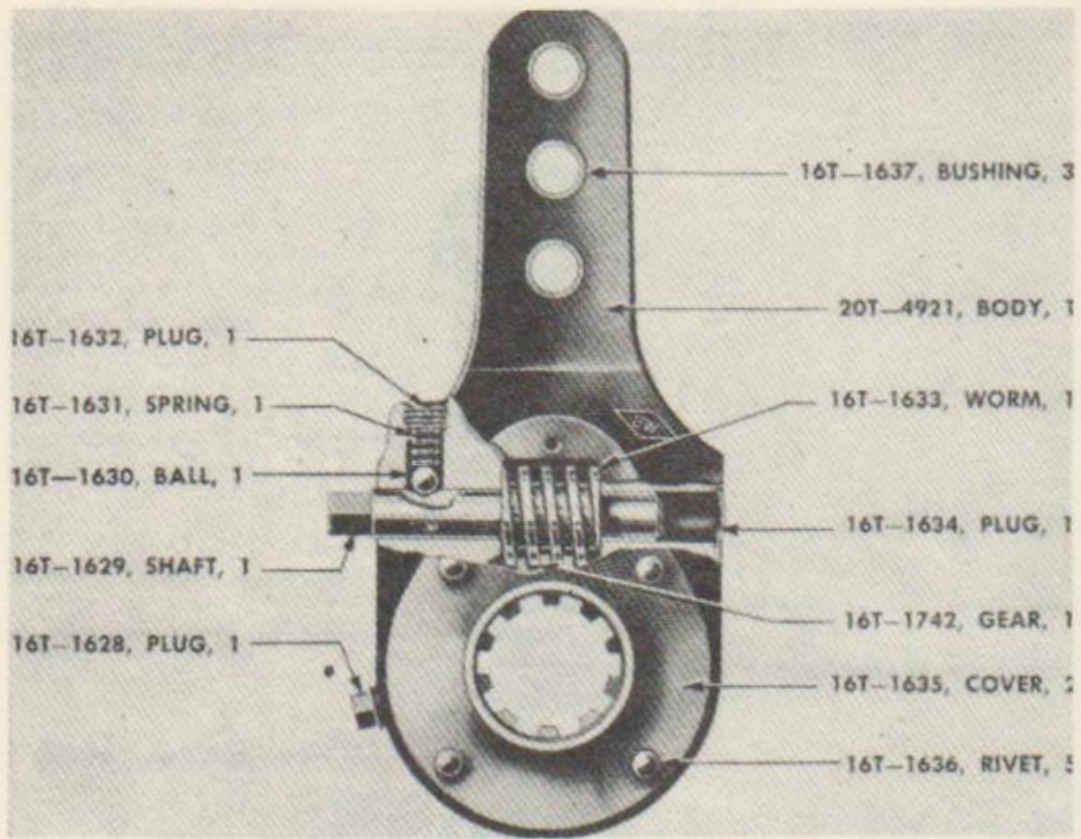


FIGURE 74. DOLLY SLACK ADJUSTER

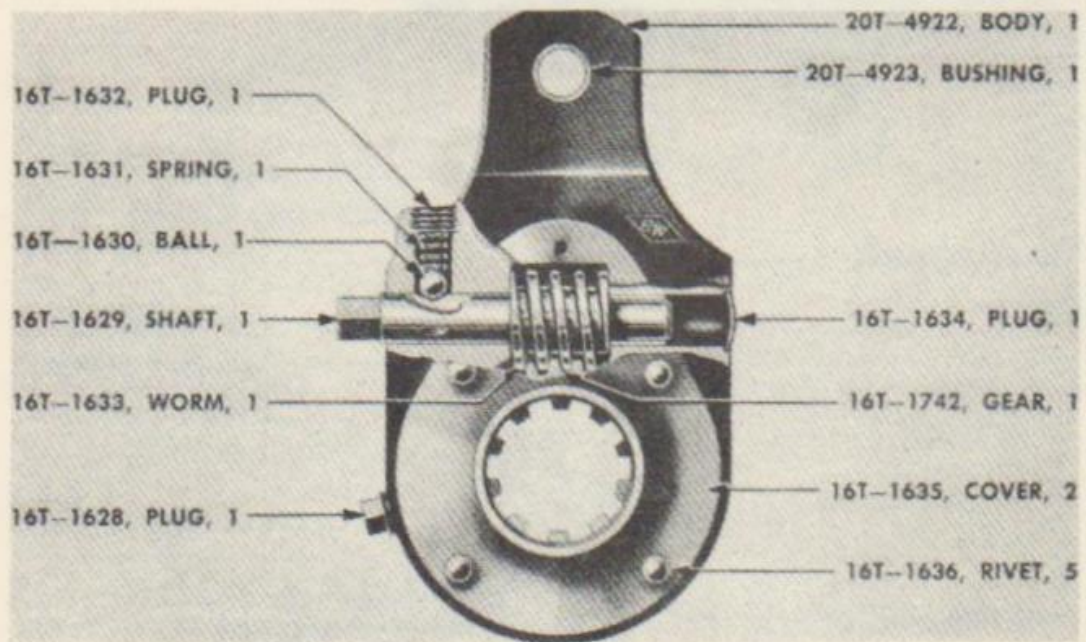


FIGURE 75. SEMITRAILER SLACK ADJUSTER

93. SLACK ADJUSTER.

- a. **General** (para. 92 a.).
- b. **TM 9-1827A**

War Department Technical Manual
21 December 1943
Ordnance Maintenance Power Brake Systems
Section I
Pages 136 thru 140
Paragraphs 76 thru 80

Note

Service procedure for dolly and semitrailer slack adjusters is identical. All parts are interchangeable except for the body and body bushings. (Figs. 74 and 75).

SECTION XXV INTERNAL BRAKE ASSEMBLY

94. INTERNAL BRAKE ASSEMBLY.

Description. The brakes are of the internal expanding, double-anchor, two shoe type. The shoes are expanded by movement of an "S" cam. The brake shoes are mounted to the brake spider by two anchor pins. The camshaft is provided with a 360-degree slack adjuster which permits rapid and accurate brake adjustment. The camshaft is carried on bushing plug needle bearings to prevent drag. The dolly brakes are actuated by two brake chambers mounted on the axle. The semitrailer brakes are actuated by two brake chambers mounted on the trailer main frame. All component parts of the dolly and semitrailer internal brake assemblies are interchangeable except for the cams.

95. DISASSEMBLY OF INTERNAL BRAKE INTO SUB-ASSEMBLIES.

Remove Brake Shoes (figs. 76 and 77). Remove brake assembly and its component parts (paras. 58-59). The internal brake assembly consists of two sub-assemblies, the brakes and spider.

96. BRAKE SHOES.

- a. **Cleaning.** Steam-clean all parts, including lining.

Internal Brake Assembly

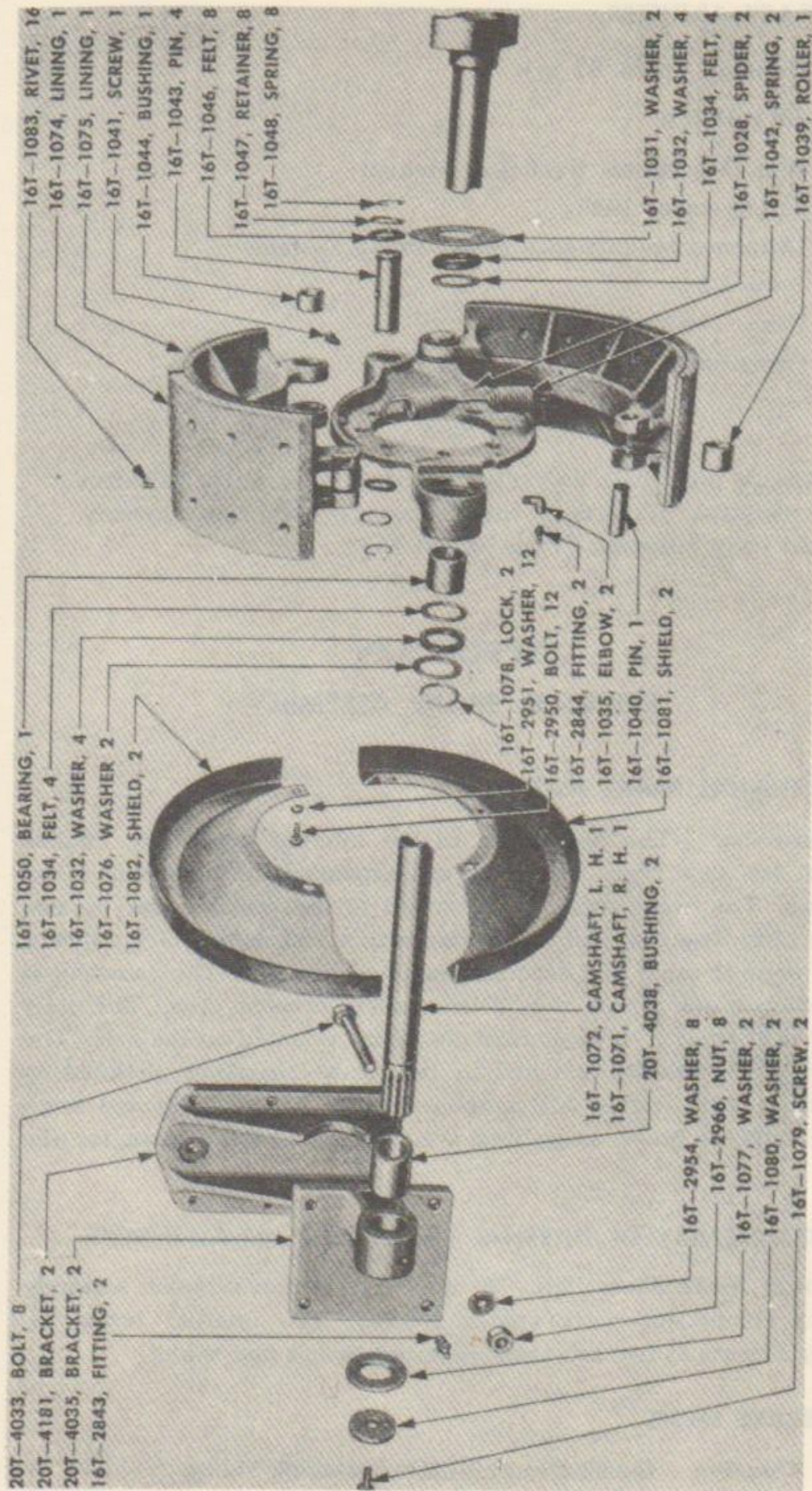


FIGURE 76. DOLLY INTERNAL BRAKE ASSEMBLY—EXPLODED VIEW

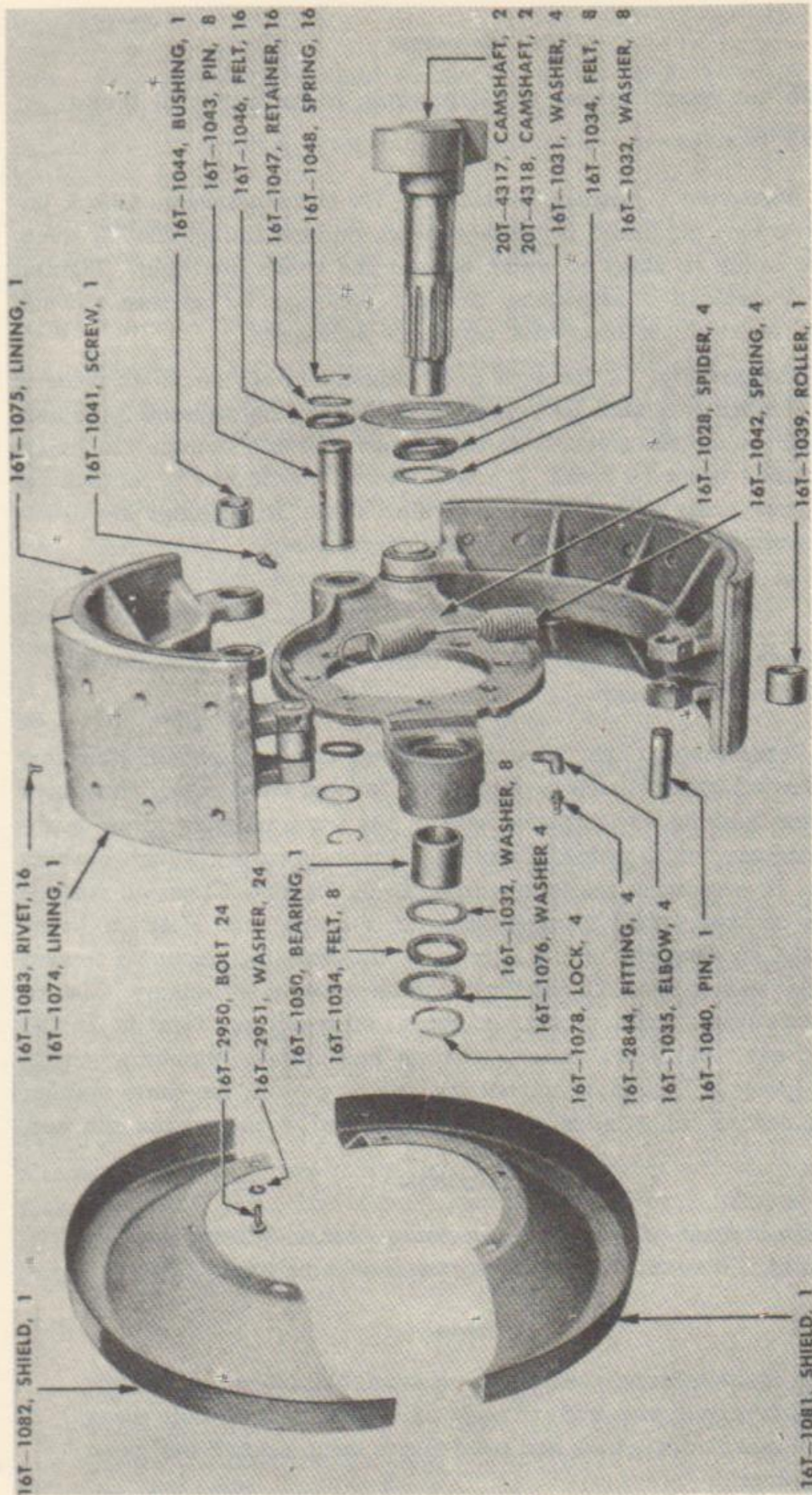


FIGURE 77. SEMITRAILER INTERNAL BRAKE ASSEMBLY—EXPLODED VIEW

CAUTION

Do not permit grease or oil to come in contact with brake lining.

b. Inspection. Inspect brake lining for excessive wear. Check lining for grease. If lining is grease-soaked, replace lining. Check rivets holding lining to shoes to make certain the rivets are tight. Tighten rivets or replace if necessary. Inspect bushings for excessive wear. Inspect brake shoes for cracks; replace if necessary.

c. Disassembly. If lining is to be reinstalled on the shoes, prior to removal mark each shoe for reassembly. With a long tapered 3/16 inch punch, drive out the rivets from the peened side and remove the lining. Try turning roller by hand. If roller fails to rotate freely, remove set screw from brake shoe and tap out roller shaft. If bushings are excessively worn or out of round, press out the bushings.

Note

Brake shoe bushings are the Oilite type and replacement is rarely necessary.

d. Reassembly (figs. 76 and 77). Press one bushing into bushing bore, leaving end of bushing flush with face of shoe. Turn shoe over and press bushing into opposite side in the same manner. Shoe bushings come reamed to proper diameter. Try anchor pin through bushing for size. If reaming is necessary, ream to 1.252 inch. Clean all rust off surface of brake shoe using a rasp or a coarse file. Position lining 16T-1074 on cam end of the shoe with the smallest thickness toward the roller end of shoe. Clamp lining to shoe using a C-clamp. Clamps will assure lining fitting contour of shoes and result in a tight fit. Install three rivets 16T-1083, remove clamps and install remaining rivets. Install lining 16T-1075 on anchor pin end of shoe in the same manner making certain the smallest thickness is placed at the anchor pin end.

CAUTION

Do not attempt to replace one lining block. When replacing lining it is necessary that four new blocks be used.

Note

If a brake relining machine is not available, place a 7/16 inch bolt firmly in vise with threads up. Place rivet in hole using bolt as a bucking tool, and peen rivets using a small ball peen hammer.

97. SPIDER.

a. Disassembly. Needle bearings are a pressed fit. Prior to disassembly, place finger on needle bearings and try to rotate rollers. If rollers do not revolve, press out needle bearing assemblies. Remove lubrication fitting.

b. Cleaning. Clean all parts using SOLVENT, dry-cleaning. Polish the eccentric surface of anchor pins using 5/0-180 abrasive cloth. Inspect inner surface of needle bearing hole for burrs and scraped metal surface. Remove burrs with a round file.

c. Repair. Check spider for sheared dust shield cap screws. If a broken screw is found, remove broken portion. Check diameter of needle bearing hole (para. 99). Check threads in lubrication hole and clean worn thread by retapping. Check diameter of anchor pin holes, making certain they are not out-of-round (para. 99).

d. Assembly. Press needle bearing 16T-1050 into spider. Press needle bearing into bore of spider until bearing is centered into the machined surface. Coat needle with general purpose grease No. 1. Install lubricating fitting.

98. ASSEMBLY OF SUB-ASSEMBLIES (figs. 76 and 77).

a. Place a light film of grease on cam surface. Place washer 16T-1031, felt 16T-1043, and retainer 16T-1032 over the cam and place the cam through spider 16T-1028. Place retainer 16T-1032 over end of cam, and install felt 16T-1034 next to the retainer. Place washer next to felt and lock the cam to the spider using lock ring 16T-1078. Coat surface of anchor pin 16T-1043 with a light film of general purpose grease No. 1. Position the two brake shoe assemblies on brake spider, and couple the retracting spring 16T-1042 between the two shoes. Aline hole in spider with brake shoe and install the two anchor pins. Aline anchor pins with hole in spider, install the set screws 16T-1041, and lock the two screws using wire. Place felt 16T-1046 over inner and outer ends of the anchor pins, place felt retainers 16T-1047 next to the felt, and lock the retainers to anchor pins using lock rings 16T-1048. Fasten dust shields 16T-1082 and 16T-1081 to the brake spider. Install brake assembly on axle and install the slack adjuster (para. 61).

Note

Should it become necessary to replace the dust shields on the brake assemblies that are equipped with the one-piece type, replace the dust shields using the two-piece type, 16T-1082 and 16T-1081 (figs. 76-77).

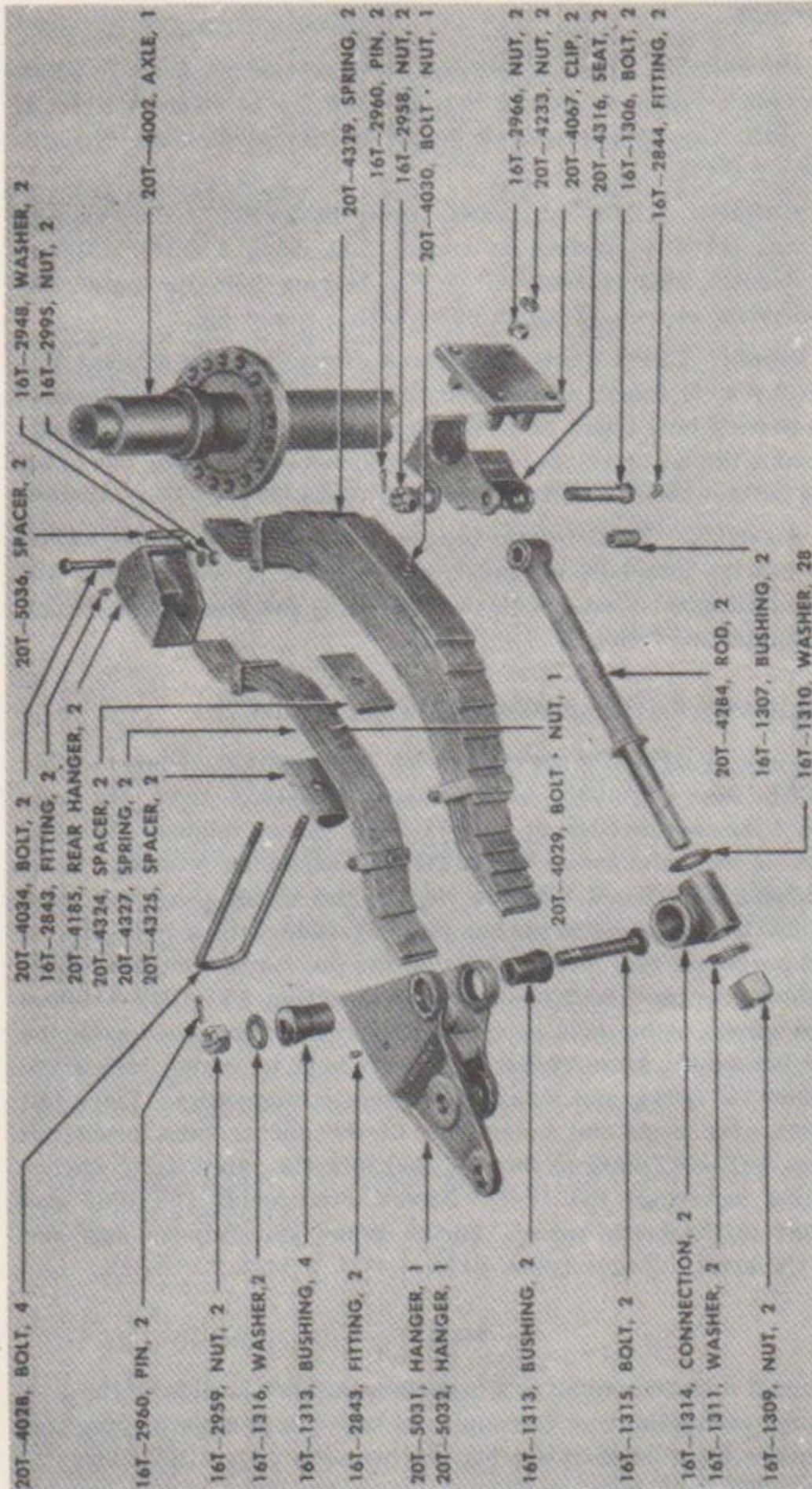


FIGURE 78. DOLLY UNDERCONSTRUCTION—EXPLODED VIEW

99. FITS AND TOLERANCES.

<i>a. Description.</i>	Maxi- mum (in.)	Mini- mum (in.)	Part No.	Replace Beyond (in.)
Brake shoe bushing (ream diameter	1.252	1.250	16T-1044	1.3125
Anchor pin (diameter)....	1.250	1.245	16T-1043	1.1875
Roller shaft (diameter)....	.749	.748	16T-1040	.7334
Brake cam bracket bushing (ream dia.).....		1.500	20T-4038	1.6875
Brake shoe roller (outside diameter)	1.252		16T-1039	When out of round or ex- cessively worn
Lining rivet—7/16 in. flat head, 3/16 in. diameter, length size 5/8 in.....			16T-1083	

**SECTION XXVI
DOLLY UNDERCONSTRUCTION**

100. DOLLY UNDERCONSTRUCTION.

Description. The dolly underconstruction consists of two main springs, two auxiliary springs and axle. A radius rod is attached to the front side of axle and dolly frame. The purpose of the radius rods is to keep the axle in proper alinement. Lengthening and shortening of the radius rods is accomplished by removing or adding spacer washer between the shoulder on radius rod and the universal connection. The axle member is held to the spring assembly by four U-bolts. A collar is shrunk to each side of the axle and then welded. The internal brake assemblies are bolted to this collar (fig. 78).

101. DISASSEMBLY OF DOLLY UNDERCONSTRUCTION INTO SUB-ASSEMBLIES.

Remove Axle (para. 65. b.). Remove auxiliary and main springs (paras. 66 and 67). Remove radius rod (para. 68).

102. AXLE.

a. Checking Axle for Bend (fig. 79). Checking axle for bend can

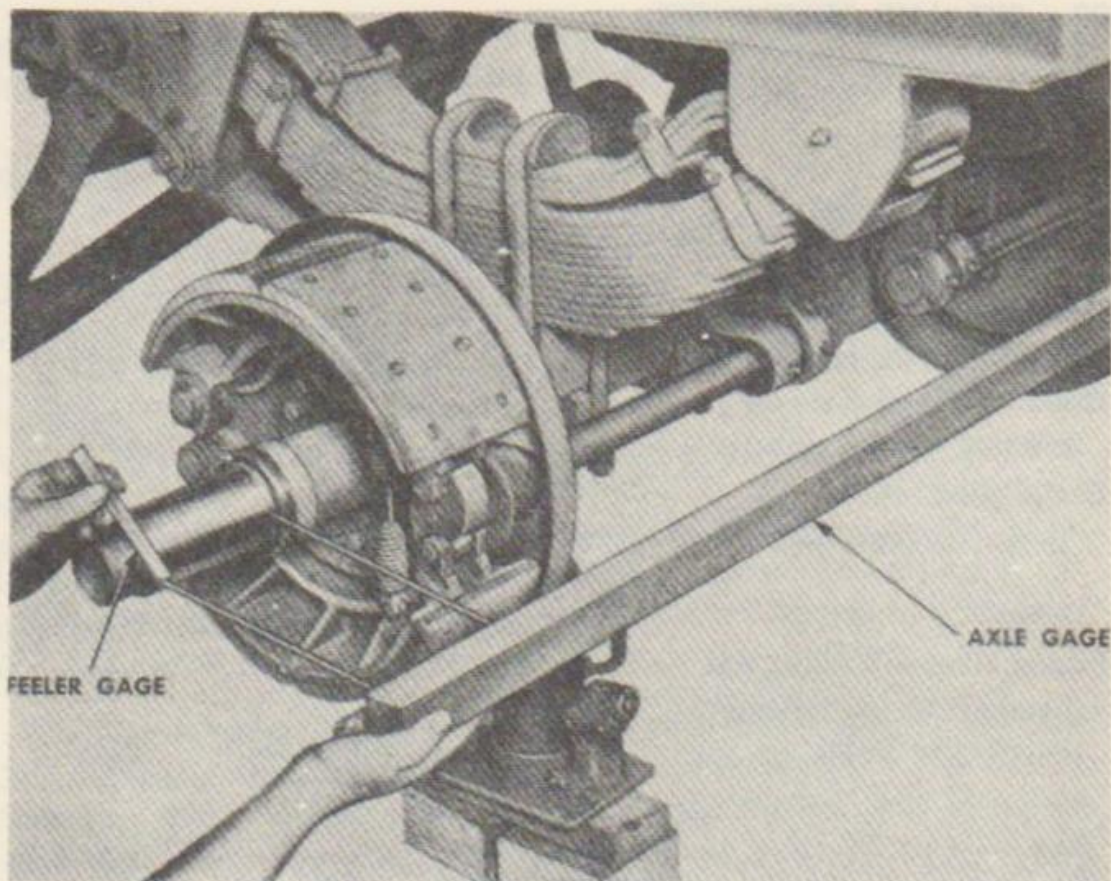


FIGURE 79. CHECKING AXLE FOR BEND

be accomplished with the axle installed or removed from the dolly.

(1) Place axle gage in position on front side of axle with the single pronged end of the gage held firmly against the inner bearing surface. Adjust the double prongs on the opposite end of the gage until they contact the inner and outer bearing surface. Move the gage over to the rear side of the axle. If either of the two prongs fail to make contact, a bent axle is indicated. Use a feeler gage to determine the amount of bend. If it is in excess of 0.020 inch, replace axle.

(2) If when checking both sides of one spindle it reveals no bend, turn the gage end for end and check the other spindle without disturbing the setting of the prongs. If there is clearance at either bearing surface, check with a feeler gage. If the prongs are in contact at both points, the axle is not bent.

b. Checking Axle Camber (fig. 80). Axle can be checked for camber installed or removed from the vehicle. When checking axle for camber, check for bend first and do not disturb the setting of the prongs. Prong settings established on a straight axle are a necessary factor in checking for camber. Place gage directly under axle. There must be clearance between inner prong and inner bearing

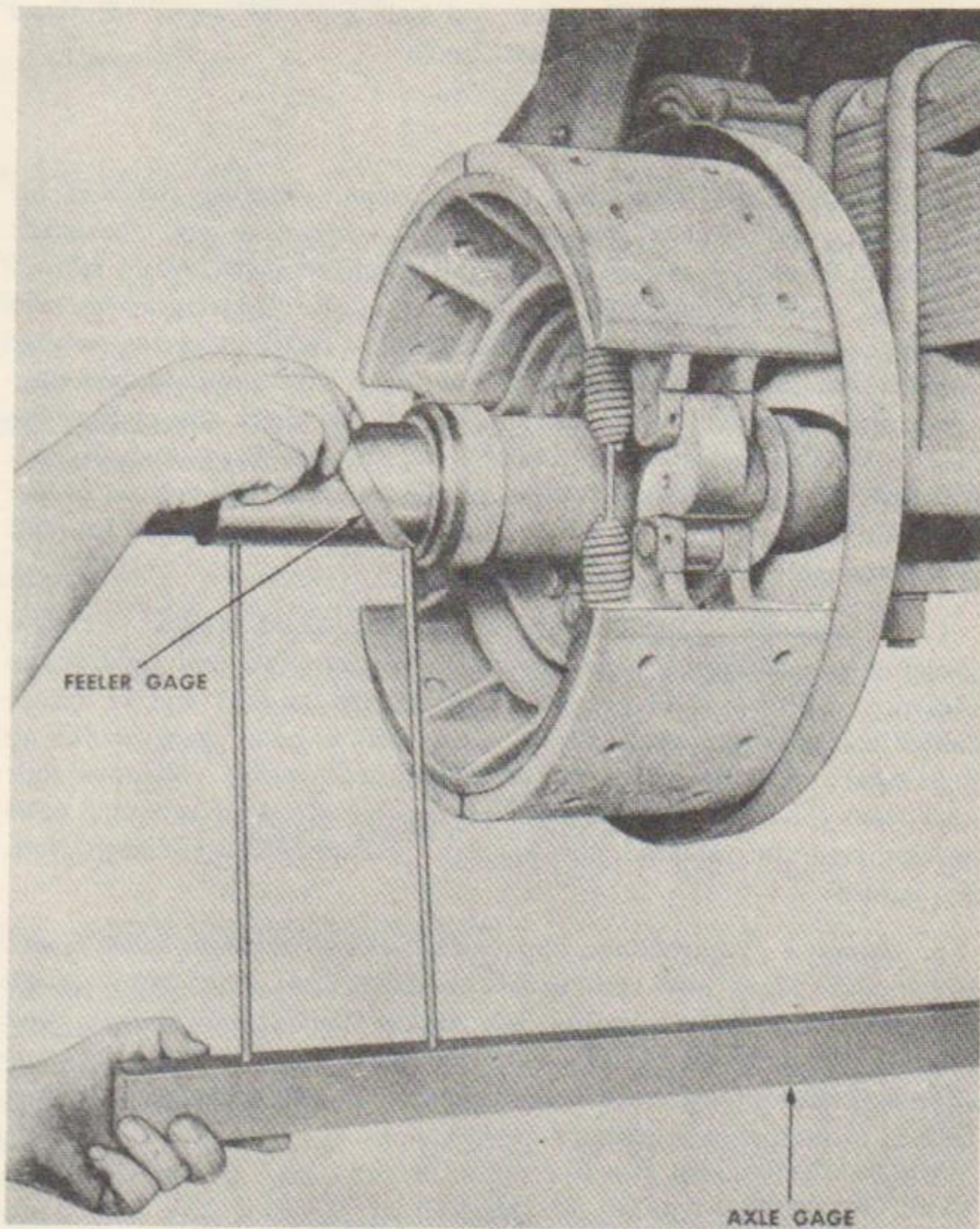


FIGURE 80. CHECKING AXLE CAMBER

surface. Using a feeler gage, check the clearance. Clearance must not be in excess of 0.1250 inch, nor less than 0.0600 inch. If clearance is not within these limits, replace axle. If axle camber is correct on one spindle, reverse gage and check the opposite spindle.

c. Inspection. Inspect axle threads by turning axle nut on axle spindle. The nut must turn with minimum amount of effort. If axle nut does not turn freely, clean up threads using a thread restorer or a three-cornered file. Check welds around collar for cracks. Reweld all cracks. Inspect spring seats for cracks, cracked welds and excessive

wear. Check diameter of radius rod bolt hole for wear. If worn beyond 0.9707, replace spring seat.

103. MAIN SPRING.

a. Cleaning and Inspection. Steam clean. Inspect top leaf for excessive wear. Check rebound clips for breakage and looseness. Check all leaves for cracks. Replace all damaged parts. When springs have lost some of their arch, resilience or elastic properties it is best to replace them with new ones. Any attempt at restoring spring camber or arch by heating, bending, and tampering is inadvisable, unless they are in the hands of a competent blacksmith. To check the arch of the main spring, place a straight board on top leaf from end to end. Measure the distance from bottom of the board to the bottom of the last leaf. The arch must be within $\frac{5}{8}$ inch of the original arch. Re-arch or replace main spring if necessary.

b. Disassembly. Place spring across two wood horses. Place a C-clamp about three inches from spring center bolt and tighten the C-clamp. With a hand grinder, grind off the peened end of spring center bolt and remove nut from spring center bolt. With a $\frac{3}{8}$ x 10 inch steel rod, drive spring center bolt out of spring. Remove four nuts from the four rebound clips. Drive out the four rebound bolts and remove the rebound clip spacers. Remove the C-clamp from the spring.

c. Repair. Tap rebound clips with hammer to detect loose rivets. If rivets are loose, heat the head of the rivet with an acetylene torch and drive rivet from opposite side with a ball peen hammer until rivets are tight. Replace broken rebound clips by riveting new clips in position. With a wire brush remove all rust scale from top and bottom surface of each spring leaf.

Note

Two different size rebound clips are used when installing new clips. Make certain the proper clip is used on the proper spring leaf (fig. 78).

d. Assembly. Place main leaf across two wood horses with the arch up. Continue building up the spring starting with the longest leaf and ending with the shortest leaf. Make certain each spring center bolt hole is in alignment with each other. Shove a $\frac{7}{16}$ inch rod down through the spring center bolt holes to make certain the holes are in alignment and that shifting of the leaves will not take place when C-clamp is installed. Install C-clamp and tighten, com-

pressing the leaves. Remove the 7/16 inch rod from spring center bolt hole and install spring center bolt with the head down toward bottom of spring. Install nut on spring center bolt and tighten. Peen the end of the bolt to prevent nut from becoming loose. Place clip spacer between each of the rebound clips. Secure spacer to clips using bolt and nut. Place two punch marks at end of bolts to prevent nut from coming loose.

104. AUXILIARY SPRING.

a. *Cleaning and Inspection.* Steam clean auxiliary spring. Inspect for broken leaves. Inspect rebound clips for breakage and loose rivets. Replace or repair.

b. *Disassembly.* Place a C-clamp about two inches from spring center bolt and tighten the C-clamp. With a hand grinder, grind off the peened end of the spring center bolt and remove the nut. Drive out the spring center bolt. Remove two nuts from the two rebound clips. Drive out the two bolts and remove the clip spacers. Remove the C-clamp.

c. *Repair.* Tap rebound clips with hammer to detect loose rivets. If rivets are loose, heat the head of the rivet with an acetylene torch and drive rivet from opposite side with a ball peen hammer until rivets are tight. Replace broken rebound clips if necessary.

d. *Assembly.* Place the longest leaf, or top leaf, across two wood horses with the arch up. Place the two remaining leaves over the top leaf. Aline spring center bolt holes and compress the leaves together using a C-clamp. Install spring center bolt and tighten. Peen end of spring center bolt to prevent nut from becoming loose. Install the two clip bolts and clip spacers, and remove the C-clamp.

105. RADIUS ROD.

a. *Cleaning and Inspection.* Steam clean. Inspect bushing for excessive wear. If worn beyond .9687 replace bushing. Inspect threads for sound condition. Check for bend and cracks. Inspect the rubber bushing for excessive wear. Replace if necessary.

b. *Disassembly.* Place radius rod 20T-4284 in arbor press and press out the bushing.

c. *Assembly.* Press bushing 16T-1307 into radius rod 20T-4284, and ream to .8753.

using a $\frac{1}{8}$ inch pipe tap if necessary. Check the four $\frac{5}{8}$ inch holes in mounting bracket 20T-4037 for over size. If the holes are extremely over size, replace the mounting bracket. Check diameter of axle spindle bearing surface for excessive wear (para. 111). Check the mounting end of trunnion axle for excessive and uneven wear (para. 111). Replace if necessary. Place trunnion bracket assembly 20T-4037 over mounting end of trunnion axle and move the bracket with a rocking motion. If movement is excessive, rebush the mounting bracket.

(1) CHECKING TRUNNION AXLE SPINDLE FOR BEND (fig. 82). Place axle gage in position on front side of trunnion axle with the single-pronged end of gage held firmly against the inner bearing surface. Adjust the double prongs on the opposite end of the gage

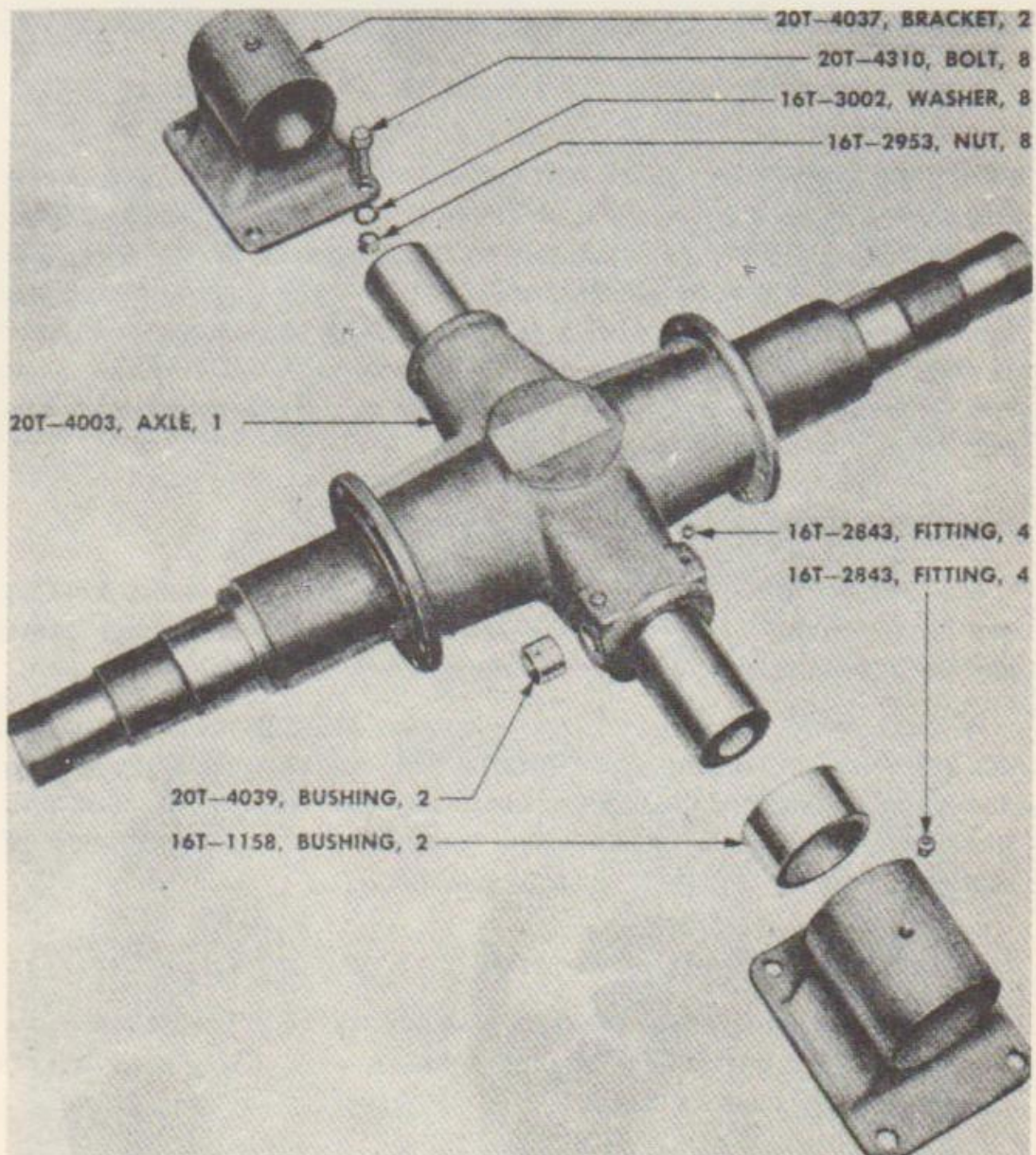


FIGURE 81. TRUNNION AXLE—EXPLODED VIEW

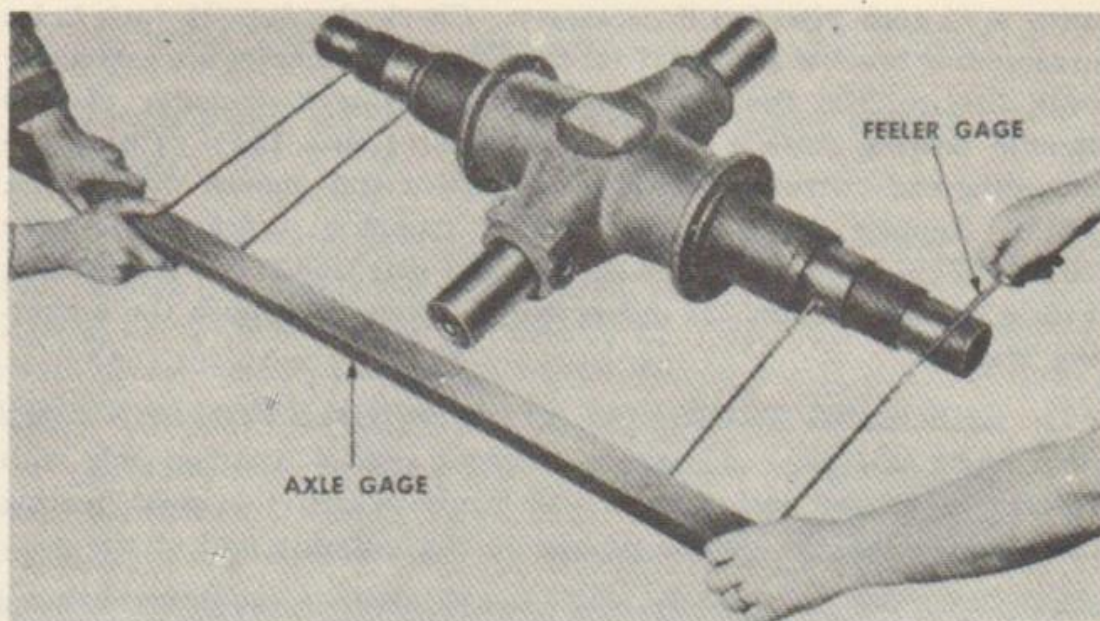


FIGURE 82. CHECKING TRUNNION AXLE FOR BEND

until they contact the inner and outer bearing surface. Now move the gage over to the rear side of the axle, and then to the top side. If either of the double prongs fail to make contact at the rear side or the top side, a bent axle is indicated. Use a feeler gage to determine the amount of bend. If bend is in excess of 0.010 inch, replace axle. If checking three sides of one spindle reveals no bend, turn the gage end for end and check the opposite spindle in the same manner without disturbing the setting of the prongs.

110. TRUNNION AXLE MOUNTING BRACKETS.

a. Disassembly. With a cold chisel, cut the four welds holding cap to mounting bracket. Place mounting bracket on arbor press and press out the two bushings. Remove lubrication fitting.

b. Assembly (fig. 81). Place mounting bracket on arbor press and press in one bushing 16T 1158, leaving end of bushing flush with end of mounting bracket. Turn mounting bracket end for end, and install second bushing in the same manner. Place cap over end of mounting bracket and tack weld in position.

Note

Bushings come reamed to proper diameter. Try the mounting bracket over end of trunnion axle for size. If reaming is necessary, ream to 3.003.

c. Installation. Install trunnion axle (para. 69. c.).

111. FITS AND TOLERANCES.

a. Description.

	Maxi- mum (in.)	Mini- mum (in.)	Part No.	Replace Beyond (in.)
Outer bearing surface.....	2.6243	2.6240	20T-4003	
Inner bearing surface.....	2.7503	2.750	20T-4003	
Cam bushing, I. D.	1.1253	1.1250	20T-4039	1.1875
Mounting bracket bushing I. D.	3.0156	3.0000	16T-1158	When ex- tremely worn

SECTION XXVIII

DRAW BAR, FRAME, TIRE CARRIER AND SUPPORT JACKS

112. DRAW BAR.

a. Description. The draw bar is an all welded unit. It is fastened to the front crossmember of the dolly by two hinge brackets. A lock is provided at each side of the draw bar. The lock keeps the draw bar from hinging when the dolly is disconnected from the semitrailer.

b. Inspection and Repair (fig. 83).

- (1) Inspect lunette eye 16T-1325 for excessive wear. If badly worn, remove with an acetylene cutting torch and reweld new lunette eye in position.
- (2) Check lock pin 20T-5063 for ease of operation. Check handle 20T-5064 for bend and breakage. If the handle is broken, remove the broken portion by drilling a 1/4 inch diameter hole into center of the broken handle 1/2 inch in depth. Back out the handle using a back-out tool.
- (3) Inspect all welds for cracks; reweld if necessary. Check bushings 20T-5065 for excessive wear. If worn beyond 1.3125, remove bushing. Install new bushing and ream to 1.2500.
- (4) Check draw bar for bend. Straighten by using hydraulic jack, chains and I-beam.

Note

Avoid heating.

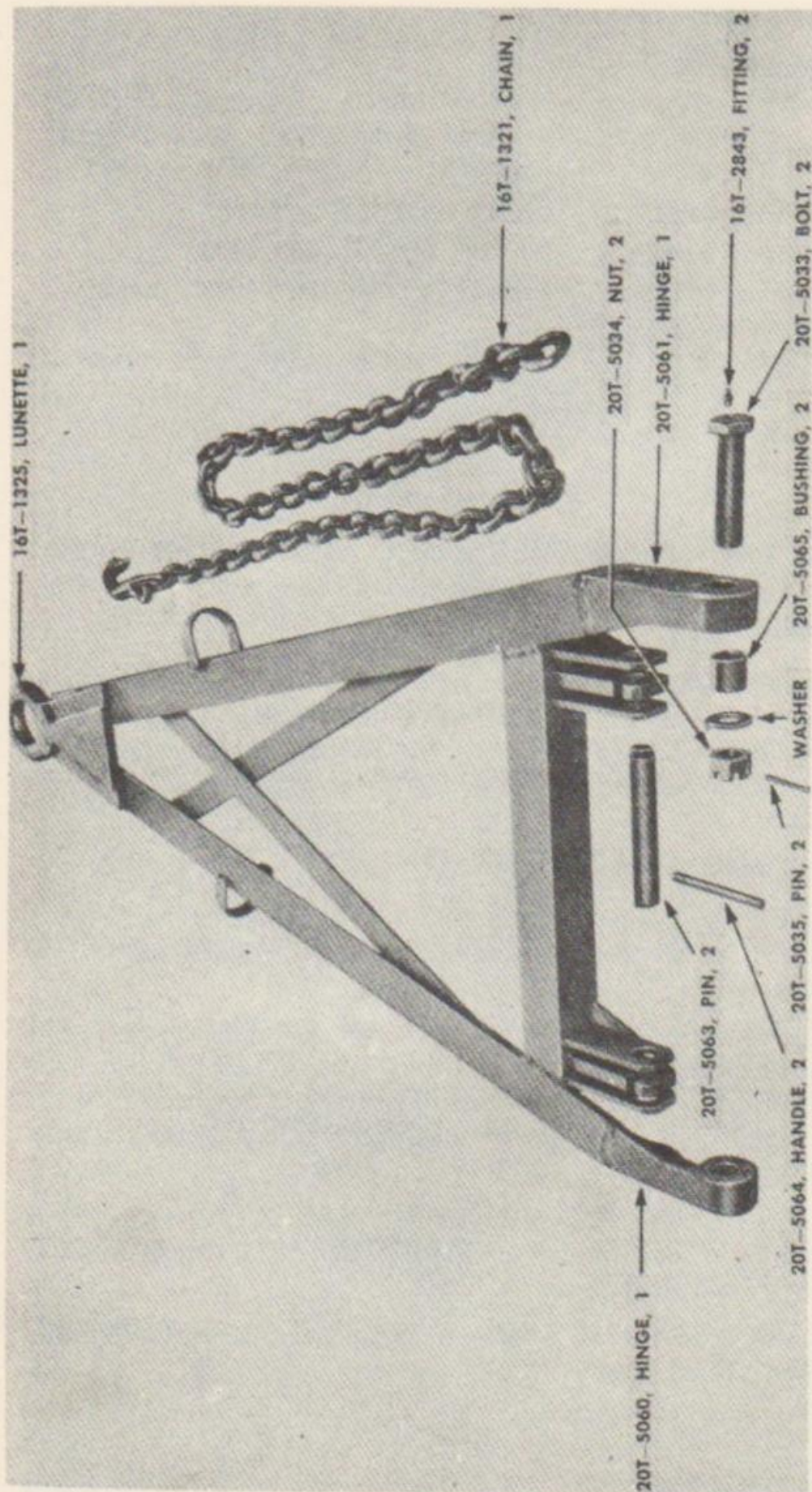


FIGURE 83. DRAW BAR—EXPLODED VIEW

113. FRAME.

a. Description. Due to the exceptionally rugged design of the frame used in this trailer, very little attention is required to maintain its dependability. However, trailers which have been in a collision, upset or accident of a major nature may have bent or twisted cross-members which will require attention.

b. Straightening Bent Frame Members. Frame members may be straightened through the use of a heavy I-beam, jacks, and chains. The use of heat is recommended provided the metal is not heated to an extreme. Heat only to a dull red. Extreme heat weakens the structural characteristics of the frame members.

c. Replacing Frame Members. Severely bent and twisted members should be cut out and replaced.

d. Repairing Section of a Member. Cut across the outside of the damaged section at a 30 degree angle, insert the splice section, and arc weld. By cutting at a 30 degree angle, the cut and weld are distributed over a greater area and result in a stronger weld. Back up all spliced joints with a plate or channel reinforcement extending about 6 inches on each side of the joint on the inner side of the channel. Put one 1 inch diameter hole in every four square inches of space on the splice plate or channel. These holes are to be used for plug welding. Whenever possible, all section splices and reinforcements should be arc welded. This method is recommended for all frame repairs. A 1 inch plug welding hole should be welded solid with bare welding rod. For the remainder of the welding use a coated rod.

114. TIRE CARRIER.

a. Description. The tire carrier is the wind-up type. It is mounted in the center of the semitrailer at rear of the drop. The tire carrier operating shaft has a cable attached, and by turning the operating shaft with a wrench, the tire is lifted to the main member and fastened in the up position with two nuts.

b. Disassembly (fig. 84). Remove spare tire (para. 10). Remove two nuts from U-bolt 16T-2634 and pull lifting member 20T-5127 off the cable. Pull the cable out of the operating shaft 20T-5122. Remove cotter pin 20T-5128 from end of shaft and pull the shaft out. Drive out pin 20T-5129 and tap ratchet 20T-5123 off the shaft.

c. Assembly. Place ratchet 20T-5123 over end of shaft. Aline hole in ratchet with hole in shaft, and install pin 20T-5129. Install the ratchet and shaft assembly through hole in pawl plate 20T-5126.

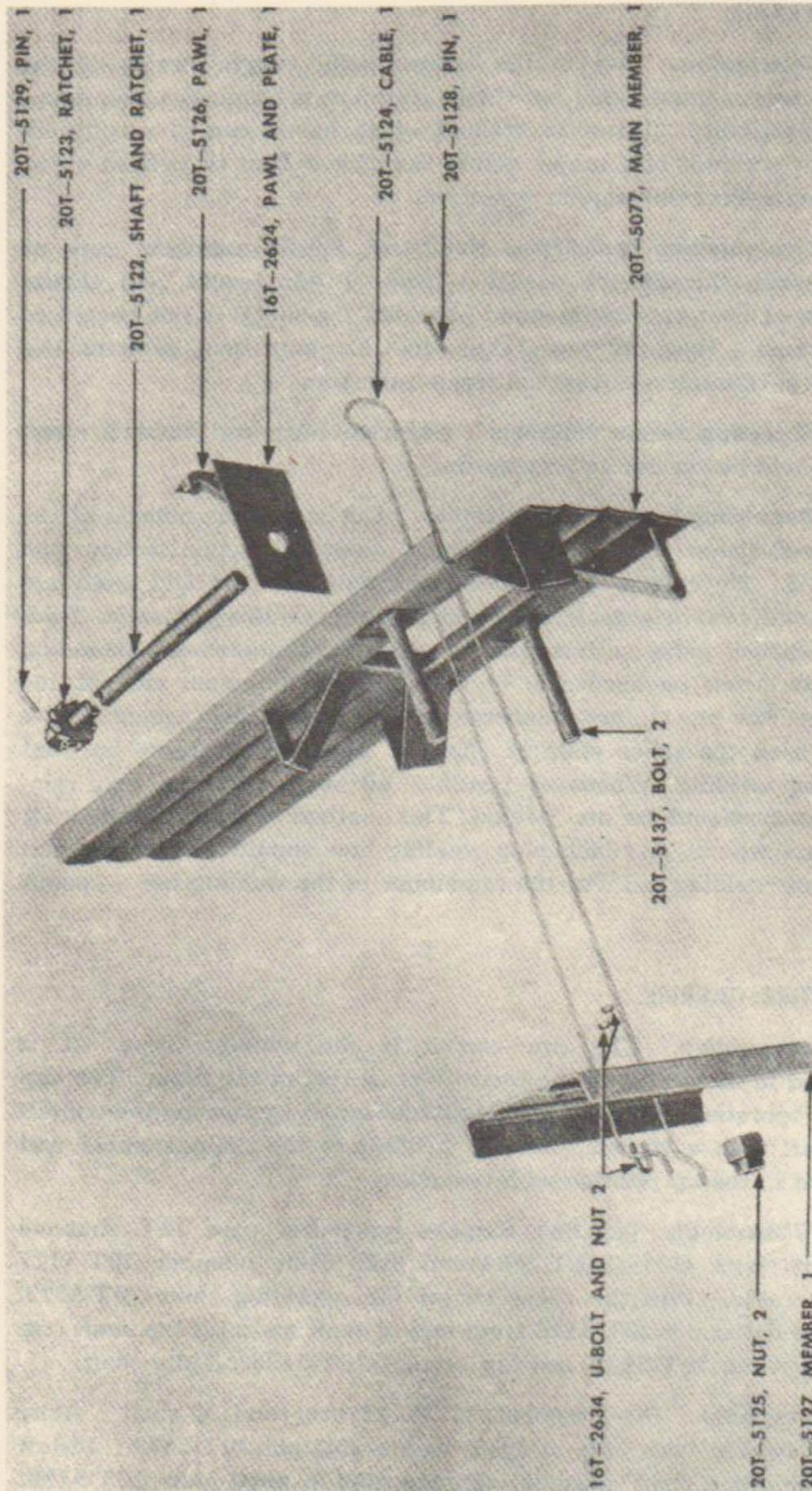


FIGURE 84. TIRE CARRIER—EXPLODED VIEW

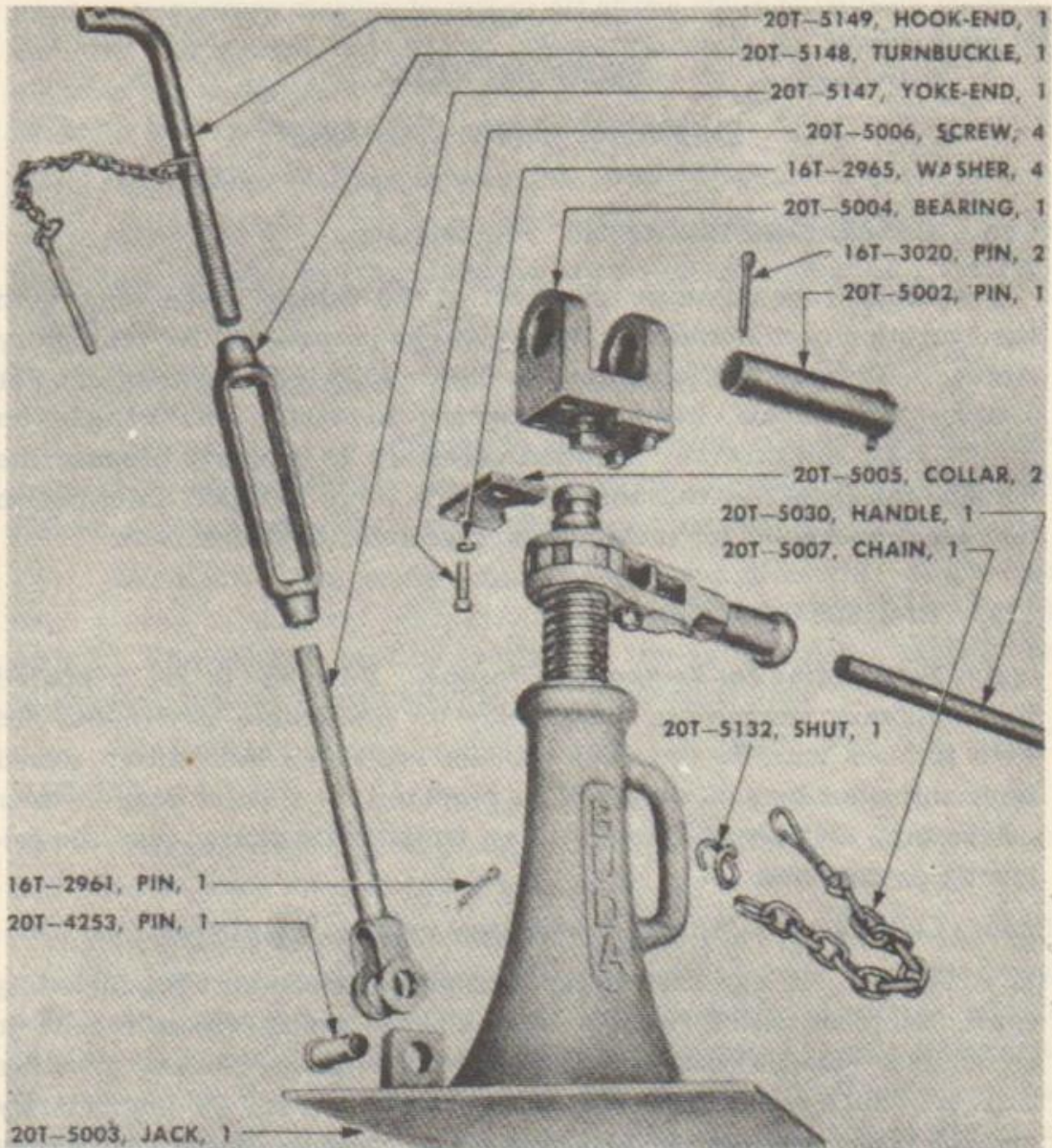
Draw Bar, Frame, Tire Carrier and Support Jacks

Fasten ratchet to main member using cotter pin 20T-5128. Thread cable through the two holes in shaft making both ends the same length. Thread the two ends through member 20T-5127 and install U-bolt, making certain both ends of the cable are fastened under the U-bolt.

115. SUPPORT JACKS.

a. Description. Two support jacks are mounted at drop in frame. The purpose of the support jacks is to hold the semitrailer in a level position when dolly is disconnected. A ratchet type screw is provided. An adjustable brace is installed on the jack base to prevent jack from hinging when the jack is in the down position.

b. Disassembly (fig. 85). Remove cotter pin 16T-3020 from



*Wordt helemaal gemodificeerd.
Zie Stafbode GN/101 en 1202. Niet meer aan te kopen.*

FIGURE 85. SUPPORT JACK—EXPLODED VIEW

hinge pin 20T-5002. Drive the hinge pin out of bearing bracket 20T-5004. Remove four cap screws and lock washers from the two collars 20T-5005, and lift the bearing bracket off the screw. Remove cotter pin from end of brace and remove rod end pin.

c. Assembly. Place bearing bracket on top of screw. Install the two collars 20T-5005 and fasten the collars to bearing bracket using four cap screws and four lock washers. Position jack assembly in mounting brackets at side of semitrailer frame. Aline holes in bearing bracket with holes in mounting bracket, and install hinge pin 20T-5002. Secure the hinge pin using cotter pin 16T-3020.

APPENDIX

SECTION XXIX

SHIPMENT AND STORAGE

116. GENERAL INSTRUCTIONS.

Preparation for domestic shipment of the vehicle is the same with the exception of minor added precautions as preparation for temporary storage. Preparation for shipment by rail includes instructions for loading the vehicle, blocking necessary to secure the vehicle on freight cars, and other information necessary to properly prepare the vehicle for domestic rail shipment. For more detailed information and for preparation for indefinite storage refer to AR 850-18.

117. LIMITED STORAGE.

a. Preparation for Temporary Storage. Vehicles to be prepared for temporary storage are those ready for immediate service but not used for less than 30 days. If vehicles are to be indefinitely stored after shipment by rail, they will be prepared for such storage at their destination. If the vehicles are to be temporarily stored, take the following precautions.

- (1) **LUBRICATION.** Lubricate the vehicle completely (par. 30).
- (2) **TIRES.** Clean, inspect, and properly inflate all tires including spares. Replace with serviceable tires all tires which require repairs or retreading. Do not store tired vehicles on floors, cinders, or other surfaces which are soaked with oil or grease. Wash off immediately any oil, grease, gasoline or kerosene which comes in contact with tires under any circumstances.

Appendix

(3) **ROAD TEST.** The preparation for limited storage will include a road test after the lubrication service to check on the general condition of the vehicle. Correct any defects noted in the vehicle operation before the vehicle is stored, or attach a tag in a conspicuous place, stating the repairs needed or describing the condition present. A written report of these items will then be made to the officer in charge.

(4) **EXTERIOR OF VEHICLE.** Remove rust appearing on any part of the vehicle exterior with flint paper. Repaint painted surfaces whenever necessary to protect wood or metal. Coat exposed polished metal surfaces susceptible to rust, such as winch cables and chains, with medium grade preservative lubricating oil. Close the tailgate. Leave rubber floor mats, when provided, in an unrolled position on the floor, not rolled or curled up.

(5) **INSPECTION.** Make a systematic inspection just before shipment or temporary storage to insure all above steps have been covered and that the vehicle is ready for operation on call. Make a list of all missing or damaged items and attach it in a conspicuous place. Refer to Before-Operation Service (par. 33).

(6) **BRAKES.** Release brakes and chock wheels.

b. Inspection in Limited Storage. Vehicles in limited storage will be inspected weekly for tire failures, evidence of vandalism, tampering, etc.

118. SHIPMENT-LOADING AND BLOCKING FOR RAIL.

a. Preparation. In addition to the preparation described in paragraph 117, when vehicles are prepared for domestic shipment, the following preparation and precautions must be taken.

(1) **BRAKES.** The brakes must be released after the vehicle has been placed in position with a brake wheel clearance of at least 6 inches. The vehicles will be located on the car in such a manner as to prevent the car from carrying an unbalanced load.

(2) All cars containing vehicles must be placarded "DO NOT HUMP."

(3) Vehicles may be shipped on flat cars, end door box cars, or drop end gondola cars, whichever type car is the most convenient.

b. Facilities for Loading. Whenever possible, load and unload vehicles from open cars, using permanent end ramps and spanning platforms. Movement from one flat car to another along the length of the train is made possible by cross-over plates or spanning platforms. If no permanent end ramp is available, an improvised ramp can be made from railroad ties. Vehicles may be loaded in gondola cars without drop ends by using a crane.

c. Securing Vehicles. In securing or blocking a vehicle, three motions, lengthwise, sidewise, and bouncing, must be prevented.

(1) Make twelve blocks using 8 in. x 10 in. wood. Cut the ends of the blocks at a 45 degree angle. Locate four blocks, one to the front of each dolly wheel, and position four blocks at the front of the rear semitrailer wheels and four at the rear. Nail the heel of each block to the car floor with six 40-penny nails. Toe-nail the position of each block under the tire to the car floor with four 40-penny nails. Make four cleats 6 in. x 6 in. x 18 in. Position one cleat next to the outer side of each front and rear wheel. Place burlap between the cleats and the tires, and nail the cleats to the car floor using six 40-penny nails in each cleat, thus preventing side motion. Pass four strands (two wrappings) of No. 8 gage, black annealed wire through bull ring at each corner on each side and one through bull ring at center of trailer body. Fasten the wires to the car stake pocket and tighten the wire. Wire ramps.

Note

All wheel blocking must be located against the outside wheel of the dual.

d. Shipping Data.

Weight	16,240 lbs.
Length.....	38 ft. 3 in.
Width.....	9 ft. 4 in.

119. DEAD STORAGE.

"Dead Storage" reference will be made to TM 5-9715 (Under Trailers), Preparation of Corps of Engineer Equipment for Storage, issued by Maintenance Division, Military Supply, Office, Chief of Engineers, P. O. Box 1679, Columbus, Ohio.

120. EXPORT SHIPMENT.

"Export Shipment" reference will be made to TM 5-9711, Instructions for Preparation of Corps of Engineer Equipment for Export, issued by Maintenance Division, Military Supply, Office, Chief of Engineers, P. O. Box 1679, Columbus, Ohio.

121. PUBLICATION REFERENCE.

For a list of all parts pertaining to this vehicle, reference will be made to ENG 9-9218.