TM 5-9034

WAR DEPARTMENT TECHNICAL MANUAL

Maintenance Manual and Parts Catalog

SEMI-TRAILER FLAT BED, 20-TON FRUEHAUF MODEL CPT 20 SPECIAL WITH DC 4 DOLLY

NOTE. This is a reprint of TM 5–9034, Maintenance Manual and Parts Catalog, Semi-Trailer, Flat Bed, 20–Ton, Model CPT 20 Special With Dolly, 2 March 1943. No distribution will be made to personnel possessing the original publication.

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TM 5–9034, Semi-Trailer, Flat Bed, 20-Ton, Fruehauf, Model CPT 20 Special With DC 4 Dolly is published for the information and guidance of all concerned.

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BY ORDER OF THE SECRETARY OF WAR:

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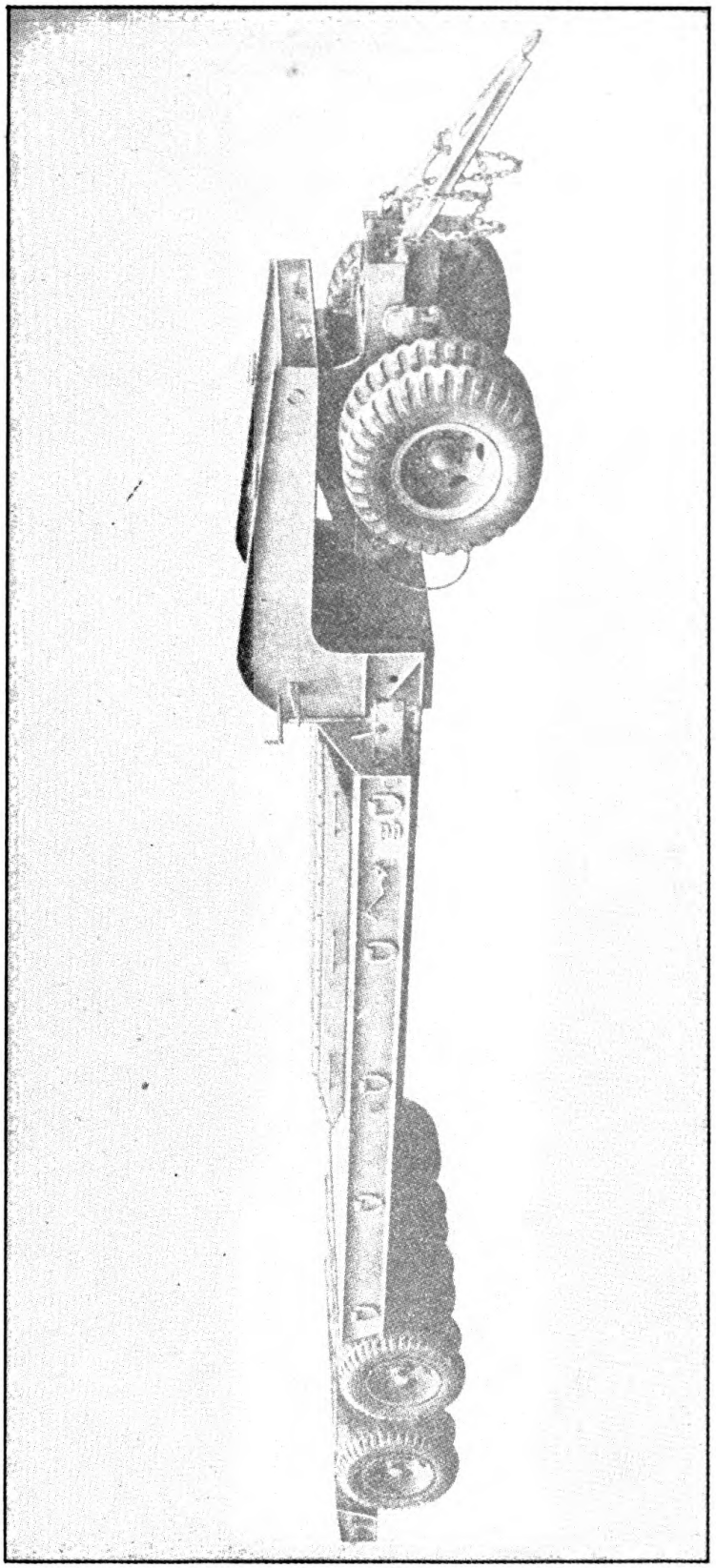

FIGURE 1. MODEL CPT-20 WITH DC-4 CONVERTER GEAR—FULL VIEW.

SECTION I

Introduction

1. PURPOSE AND SCOPE.—These instructions are published for the information and guidance of the using arms charged with the operation, maintenance, and repair of this materiel. They contain descriptions of the major units and their function in relation to the other components of the trailer, as well as instructions for operation, inspection, and maintenance.

SECTION II

Description and Characteristics

1. GENERAL DESCRIPTION.—This 20-ton, low bed, platform trailer is so designed that it may be pulled behind any heavy duty towing vehicle which is provided with a suitable pintle hook. Converter gear can be disconnected from trailer, thus converting trailer into a semi-trailer which can be pulled behind a tractor equipped with a 5th wheel.

a. Identification.—(1) Distinguishing features of this vehicle are its low drop frame, and low bed type platform. Frame is an all-welded unit of pressed, formed hi-tensile, and structural steel. Trailer is mounted on eight dual wheels at rear and two at front.

(2) *Designation.*—Trailer and converter gear serial and name plate are located on the main side rail on right side toward the front.

b. Mobility.—This trailer is designed for highway travel. Its ability to travel cross-country depends on the tractive ability of the towing vehicle. Maximum speed as a semi-trailer is 30 M.P.H.; as a full trailer, 20 M.P.H.

2. *AXLE, FRONT.*—Front axle is of the one-piece I-beam type of cambered, drop forged, heat treated, chrome molybdenum steel. It is made of S. A. E. 4140 steel with a 4″ x 5″ I-beam section. The spindle diameter is 3½″ ground to accurate limits. Axles and wheels are equipped with heavy duty, tapered roller bearings. Simple adjustments of the bearings are made through large castellated nuts and a hardened D-washer.

3. *AXLES, REAR.*—Trunnion type, 2⅞″ diameter spindles, cast molybdenum steel, oscillating on steel shafts and rocker beams clamped to brackets fastened to the frame. Axles have bronze bushings grooved and drilled for lubrication.

4. *BRAKES, FRONT.*—The brakes are of a double anchor, two-shoe, heavy-duty internal expanding type. They have a 16″ diameter and a 6″ width. The brake lining is ¾″ thick with a braking area of 420 square inches. The brake shoes are provided with eccentric adjustment in addition to slack adjuster on the cam shaft. This slack adjuster provides for 360° adjustment on the cam shaft. The cam shaft bearings are of the self-aligning ball bearing type. Actuation of the brakes is by air chambers mounted on the axle. A quick release valve is provided to permit rapid release. Trailer hose connection is provided at the rear with dummy couplings fastened to the converter gear with a chain.

5. *BRAKES, REAR.*—Each axle is equipped with 16″ x 6″ Fruehauf double anchor, heavy duty, mechanical internal expanding-type brakes. These brakes are of the two-shoe type, operating on the cam and lever principle. Total brake lining area is 1680 sq. in. The 360° slack adjusters make it easy to secure a quick and correct minor ad-

justment. Cam shafts are equipped with ball bearings (self-aligning type), plus needle bearings to prevent dragging of brakes. Brakes are actuated by an air cylinder, mounted in inner section of rocker beam, and provided with emergency feature. Filters are provided in the emergency and service air lines. Relay emergency exhaust check valves are provided. Air hose connections and fittings are replaceable with spring protection. Air hose couplings are of the quick detachable type, equipped with dummy couplings. Parking brakes are operated manually by means of a wheel provided at right front side of the trailer.

6. *DRAWBAR.*—The drawbar is constructed of pressed steel; has a drop-forged eye riveted to it. The drawbar is hinged at the front of the gear frame by means of hinge brackets secured with bolts.

7. *ELECTRICAL SYSTEM.*—*a.* The wiring system is the 6-8 volt type. The fuse box is located at the drop in the frame on the left side. Fuses are 1½ amperes capacity. The lighting equipment includes four commercial clearance lights, four clearance blackout lights, one combination blackout stop and tail light at the right hand rear and one combination service stop and tail light and blackout tail light, located at the left hand rear of the trailer. The blackout switch is located on the left side at the drop in the side rail. A jumper cable supplies current to the trailer through a socket which is located in the center of the front crossmember.

b. A socket is installed in the center of rear crossmember to provide a means by which jumper cable can be coupled to any vehicle which may be in tow behind the trailer.

8. *SPRINGS, FRONT.*—(*a*) Main springs are full-shackled type. Both main and auxiliary springs are the semi elliptic type and are made of silico manganese steel. Both springs are attached to axle by means of U-bolts.

b. NOTE: There are no rear springs.

9. *SUPPORTS, FRONT (CONVERTER GEAR).*—Supports are manually operated, single leg adjustable, single wheel, straddle mounted.

10. *SUPPORTS, REAR (TRAILER).*—Trailer is equipped with manually operated supports. Jacks are provided on support legs. These jacks permit lowering or raising the front end of trailer when converter gear is to be coupled or uncoupled. Jacks also facilitate coupling of trailer to a tractor when trailer is to be used as a semi.

11. *WHEELS, FRONT.*—Ventilated disc type, 10-stud, 11¼" bolt circle, made by the Budd Wheel Manufacturing Company.

12. *WHEELS, REAR.*—Ventilated disc type. Six stud, Motor wheel.

13. *TIRES, FRONT.*—12.00/20 to conform to Federal specifications ZZ-T-381. Quantity—4.

14. *TIRES, REAR.*—7.50/20, 8 ply, mud and snow grip tread, heavy duty; to conform to Federal specifications ZZ-T-381. Quantity—16.

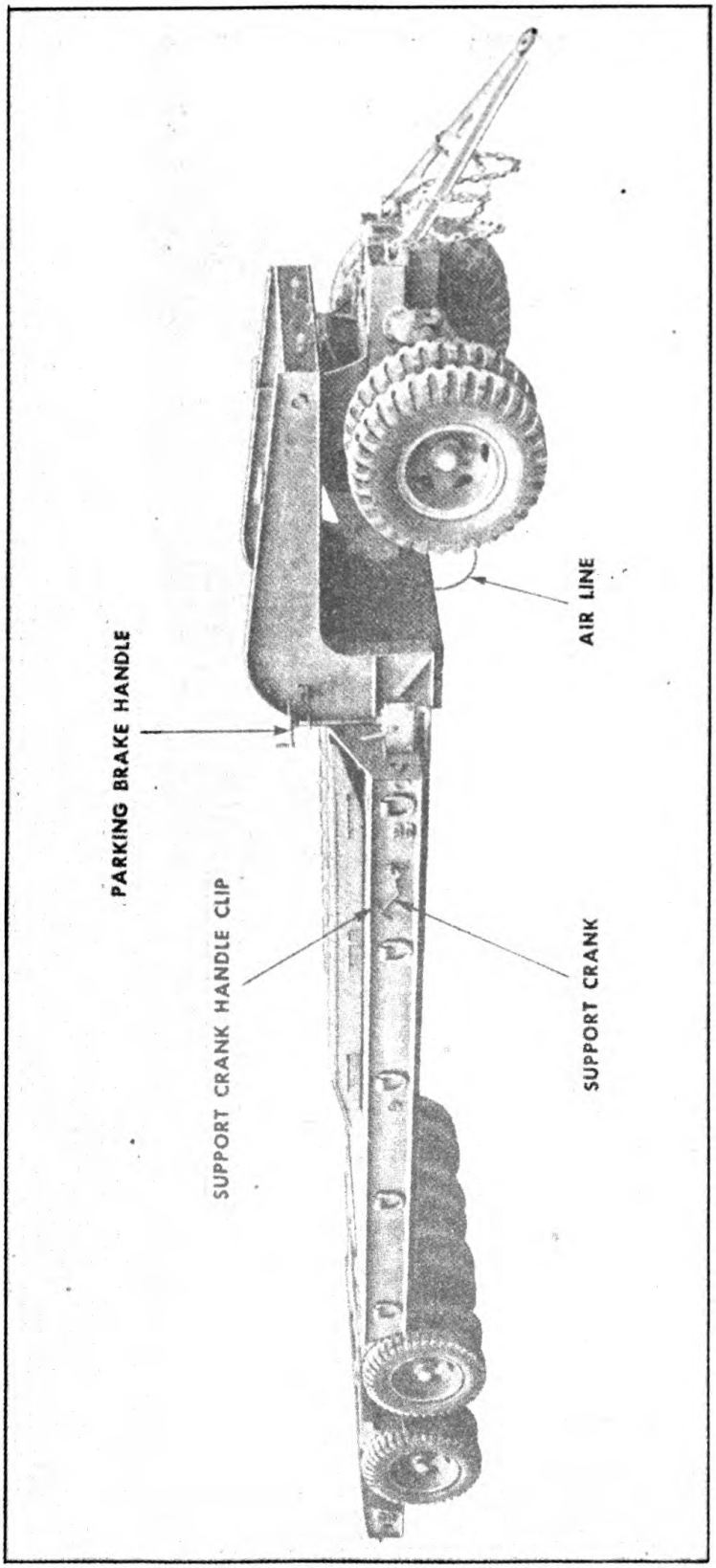

FIGURE 2. CONTROLS—THREE-QUARTER FRONT VIEW.

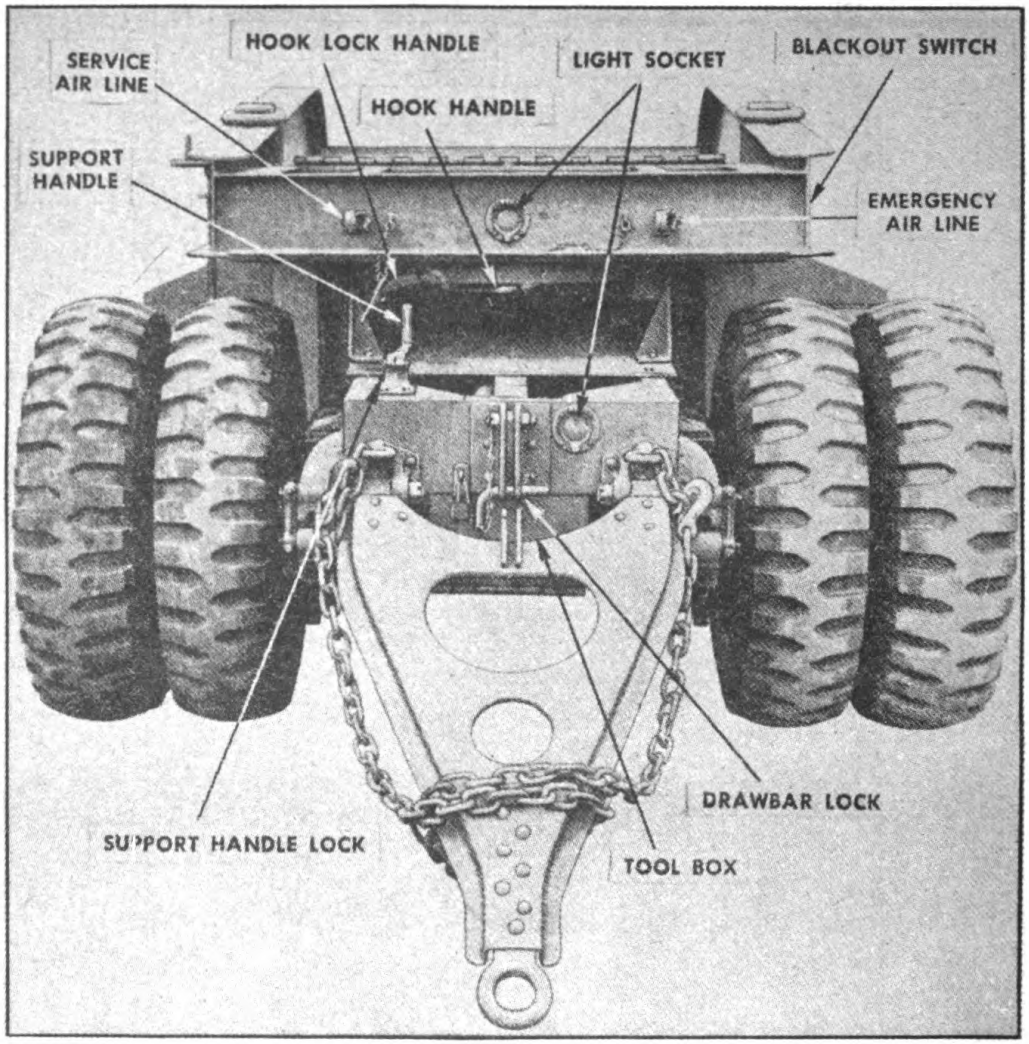

FIGURE 3. CONTROLS—SIDE VIEW.

SECTION III

Operating Instructions and Controls

1. CONTROLS (Figures 2, 3 and 4).—The controls are employed according to the usual trailer-truck combination practice. The driver must become thoroughly familiar with the location and use of all control devices before attempting to operate the vehicles.

***a. Hand brake* (Figure 2).—The hand brake is located on the right side of the trailer at the drop in the frame. Turning the wheel down, in a clockwise direction, applies the brakes. The hand brake can be used as a parking brake or as a supplement to the truck brakes, when descending extremely steep grades with a heavy load.**

***b. Lights* (Figure 3).—This vehicle is equipped with three light**

sockets, one at front and one at rear of main frame, and one in the front frame of converter gear. A jumper cable is also provided. To provide electrical current for the lighting system, plug one end of jumper cable into socket on trailer and the other end into socket on towing vehicle.

c. Blackout switch (Figures 3 and 4).—The blackout switch is located on the left or road side of the main frame and on the rear crossmember of converter gear. There is no "off" position on the switch. It is either at a blackout position or at a standard light position. The switch is operated by means of a coin or screwdriver. The flow of current is controlled at the towing vehicle.

d. Support crank (semi) (Figure 2).—Support crank is located on right side of trailer. When not in use, it is folded to the frame and held in place by a spring clip. When uncoupling trailer from tractor or converter gear, support may be let down by turning support crank in a clockwise direction.

e. Support jacks (Figure 2).—Each support leg is equipped with a hydraulic jack. To operate jacks, close release screw and place jack handle into handle socket. To raise jack pump handle up and down. Jack handle is stored in tool compartment.

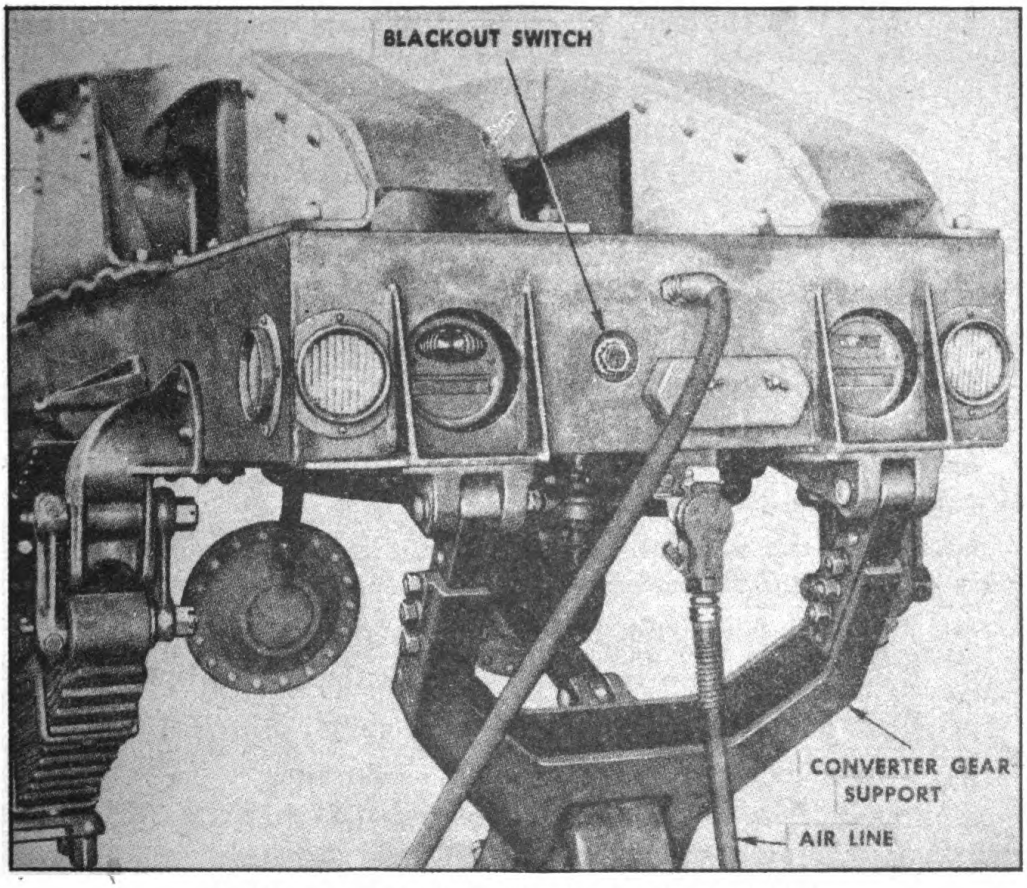

FIGURE 4. CONVERTER GEAR—REAR VIEW.

f. Support crank (converter gear) (Figure 3).—Support crank is located at top of gear frame on the right side. Converter gear supports are used when converter gear is being coupled to trailer or when it is being uncoupled.

g. Drawbar lock (Figure 3).—Drawbar is used to hold drawbar in place when converter gear is being towed alone.

h. Coupler release handle (Figure 3).—By pulling out on coupler release handle, coupler hook becomes unlocked, permitting converter gear to be disconnected from semi-trailer.

2. COUPLING CONVERTER GEAR TO SEMI-TRAILER.—*a.* Be sure drawbar is locked to prevent it from hinging. Couple drawbar to pintle hook at rear of tractor.

b. Couple safety chain at left side of converter gear to right side of tractor. Chain on right side of converter gear should be attached to left side of tractor.

c. CAUTION: When coupling safety chains cross them at top of drawbar rather than underneath. If this is done there will be no possibility of the chains dragging the ground.

d. Wind up supports until stop is reached.

e. Back truck and converter gear up to front of trailer. See that upper king pin, which protrudes below the upper 5th wheel plate on trailer, is centered or nearly so with the jaws of the lower 5th wheel.

f. Back converter gear up until it touches trailer.

g. Set hand parking brake by turning hand wheel in a clockwise direction.

h. Lower support on converter gear, and unlock the drawbar lock.

i. Be sure 5th wheel hook on the converter gear is open. This may be accomplished by pulling out on hook lock handle.

j. Back converter gear under trailer until hook in lower coupler engages king pin on trailer.

k. Try driving tractor ahead; if coupling is complete, movement of trailer will be difficult.

l. Release the hydraulic jacks on trailer supports and wind supports up until stop is reached.

m. Insert support crank handle in spring bracket.

n. Raise supports on converter gear till stop is reached.

o. Place lock ring over support crank handle.

p. Couple air hose between gear and semi-trailer.

q. Couple the two air hoses between tractor and trailer. NOTE: One air line on tractor is tagged "*service*" and the other "*emergency*." Be sure each is coupled to corresponding line on trailer.

r. Couple jumper cable between tractor and trailer.

s. Open air valve between converter gear and trailer and also open the two air valves at rear of tractor.

t. Release hand parking brake to full "*release*" position.

u. Unit is now ready for operation.

v. NOTE: It is good driving practice to test the operation of your trailer brakes before stepping up to full operating speed. Check the air supply on the dash gauge. It should be not less than 60 lb. for proper application.

3. COUPLING TRACTOR TO TRAILER.—*a.* Make sure lower 5th wheel hook on the tractor-truck is open. This is accomplished by pulling out on the hook lock handle.

b. Set the hand parking brake on semi-trailer.

c. Back truck under the semi-trailer so that the upper king pin, which protrudes below the upper 5th wheel plate on the trailer, is centered, or nearly so, on the jaws of the lower 5th wheel. Continue backing until the king pin locks firmly in the lower 5th wheel.

d. Try pulling the trailer ahead. If coupling is complete, movement of the trailer will be extremely difficult.

e. Inspect the trailer connection. If the 5th wheel hook lock handle is in the "in" position and the hook lever is practically at the center-line of the 5th wheel the unit is properly coupled.

f. Connect air hoses to the semi-trailer. Care should be taken to be sure that the "*service*" air hose connection is hooked up with the "*service*" trailer air line and the "*emergency*" air hose with the "*emergency*" trailer air line. Both hoses and trailer connections are tagged.

g. Connect light jumper cord.

h. Release hydraulic support jacks and raise supports by turning the support handle in a clockwise direction until the stop is reached. Replace crank handle in spring bracket.

i. Release parking brake on the semi-trailer.

4. UNCOUPLING CONVERTER GEAR FROM SEMI-TRAILER.

a. Set the hand parking brakes on semi-trailer.

b. Close the two air valves at rear of tractor and disconnect the two air lines.

c. Close air valve at rear of converter gear and disconnect the air line.

d. CAUTION: Trailer and converter gear are equipped with dummy couplers. When not in use all air couplers should be connected with dummy couplers. Dummy couplers prevent foreign matter

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from entering brake system, and prolong the life of the relay emergency valve.

e. NOTE: When disconnecting air hoses, care should be exercised to prevent couplers on air hoses from dragging on the ground. When an air hose is disconnected, hang it up immediately.

f. Disconnect the jumper cable.

g. Lower supports on semi-trailer.

h. Jack hydraulic jacks down until load of trailer at front is carried on the supports.

i. Lower support on converter gear.

j. Unlock coupler on converter gear by pulling out on hook lock handle.

k. Lock drawbar to prevent it from hinging.

l. Pull converter gear out from under semi-trailer.

m. Wind up supports on converter gear until stop is reached.

5. UNCOUPLING TRACTOR FROM SEMI-TRAILER.—*a.* Set the parking brake on the trailer.

b. Lower trailer supports.

c. Jack hydraulic jacks down until load at front end of trailer rests upon the supports.

d. Shut off air valves between tractor and trailer.

e. Disconnect both air hoses.

f. NOTE: Breaking of the emergency air line automatically sets the semi-trailer brakes. Be sure that all dummy hose couplings are installed on the trailer, and that tractor hoses are coupled together. This will eliminate the danger of dirt or foreign matter entering the braking system.

g. Disconnect the light jumper cord.

h. Open the lower 5th wheel hook by pulling out on hook lock handle.

i. NOTE: When pulling out on hook lock handle, the hook lock should automatically move to the unlocked position. If hook handle fails to move, then king pin on semi-trailer is binding against the hook on the coupler. It will then be necessary to pull the hook handle to the unlocked position by hand.

j. Drive tractor from beneath semi-trailer.

6. DRIVING TRUCK AND TRAILER.—*a. General instructions.* —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 gauge. It should not be less than 60 lbs. 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.

7. BRAKING TRUCK AND TRAILER.—*a.—General instructions.* —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.

SECTION IV

Inspection — Lubrication — Adjustment

1. DAILY INSPECTIONS, WHEN IN OPERATION.—*a. Purpose.*

(1) To insure mechanical efficiency, it is necessary that vehicles be systematically inspected at intervals in order that defects may be discovered and corrected before they result in serious damage.

(2) Cracks that develop in castings or other metal parts may often be detected upon the completion of a run, through the medium of dust and oil deposits.

(3) Suggestions toward changes in design prompted by chronic failure or malfunction of a unit or group of units, pertinent changes in inspection or maintenance methods, and changes involving safety, efficiency, economy and comfort should be forwarded through technical channels at the time they develop. Such action is encouraged in order that other organizations may profit thereby.

b. Prestarting inspection.—(1) Check brakes.

(2) Inspect tires for inflation and casing injuries.

(3) Check lights.

(4) Check tools and equipment.

(5) Check to see that draw eye on trailer is properly hooked and locked to pintle on tractor. When towed as a semi-trailer, check the 5th wheel connection.

(6) Check pintle hook on towing vehicle.

(7) Check safety chains.

c. Inspection during operation.—(1) During operation, the driver should be alert to detect unusual sounds, noises or driving characteristics which indicate abnormal functioning of the unit.

(2) Only under exceptional circumstances should a trailer be operated after indications of trouble have been observed. When in doubt, the vehicle should be stopped and assistance obtained. Inspection during operation applies to the entire vehicle and should be emphasized throughout the driving instruction period.

d.—Inspection at the halt.—At each halt the operator should make careful inspection of the vehicle to determine its general mechanical condition. Minor defects detected during the march together with defects discovered at the halt should be corrected during the halt, and proper disposition of the vehicle should be made so that unnecessary delay may be avoided and major failure prevented.

e. Inspection after operation.—At the conclusion of the day's operation an inspection should be made similar to that made at halts, but more thorough and detailed. The inspection should be followed by preventive maintenance. If defects cannot be corrected, they should be

reported promptly to the Chief of section or other designated individual. The following points should be covered:

(1) Check springs and spring hangers.

(2) Check axle and axle U-bolts.

(3) Check wheel studs, tighten loose stud nuts.

(4) Inspect frame for cracked welds.

(5) Check spare wheel and tire; secure replacement if necessary.

(6) Drain moisture from the two reserve air tanks by means of the petcock at the bottom of each tank. (Tanks are located towards the rear of main frame; one on each side.)

2. LUBRICATIONS (Figure 5).—*a. Lubrication.*—See lubrication chart for the type of lubricant, when to lubricate, and method to follow in lubricating assemblies and sub-assemblies.

(1) NOTE: When lubricating support riser screws, remove the two cap screws holding dust shield to the assembly.

(2) "S" cams, anchor pins, and brake shoe rollers are lubricated when wheels are removed to pack inner and outer wheel bearings.

3. MECHANICAL INSPECTION AND ADJUSTMENT.—*a. Drawbar.*—Check for excessive side play. Rebush.

b. Lights.—Check lights and blackout switch for operation. Replace; repair.

c. Underconstruction, front.—(1) Check springs for broken leaves. Replace leaves.

(2) Check spring shackles for looseness. Tighten.

(3) Check spring bushing for excessive wear. Replace bushing and shackle bolts.

(4) Inspect hanger for loose rivets. Re-rivet or bolt.

d. Brakes.—(1) Check linkage and operation. Give brakes minor adjustment.

(2) Check brakes for equalization of application. Give minor adjustment.

(3) Drain moisture from air filter about every 2,000 miles.

(4) Remove strainer from air cleaner body about every 10,000 miles and clean in cleaning fluid.

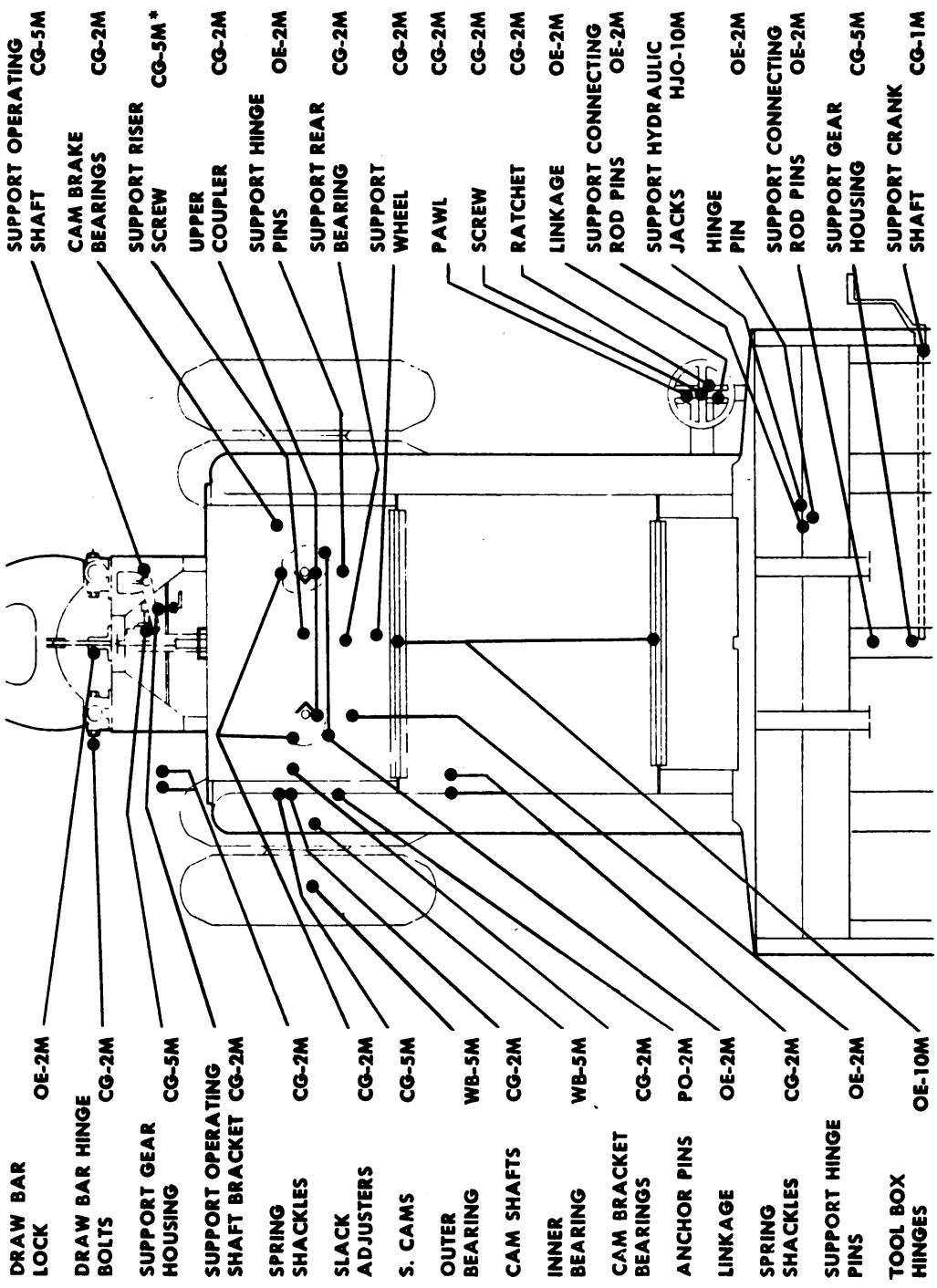
(5) Replace front brake chamber diaphragm once every two years.

(6) Replace diaphragm (2 and 10) of relay emergency valve once a year. (See Brake section.)

(7) Remove strainer (12) of emergency relay valve every six months and clean in cleaning fluid. (See Brake section.)

(8) Remove brake cylinders at rear of unit. Disassemble; clean; replace packing cup (4) if necessary. Lubricate once a year.

e. Underconstruction, rear.—(1) Check all bolts; tighten.



K E Y

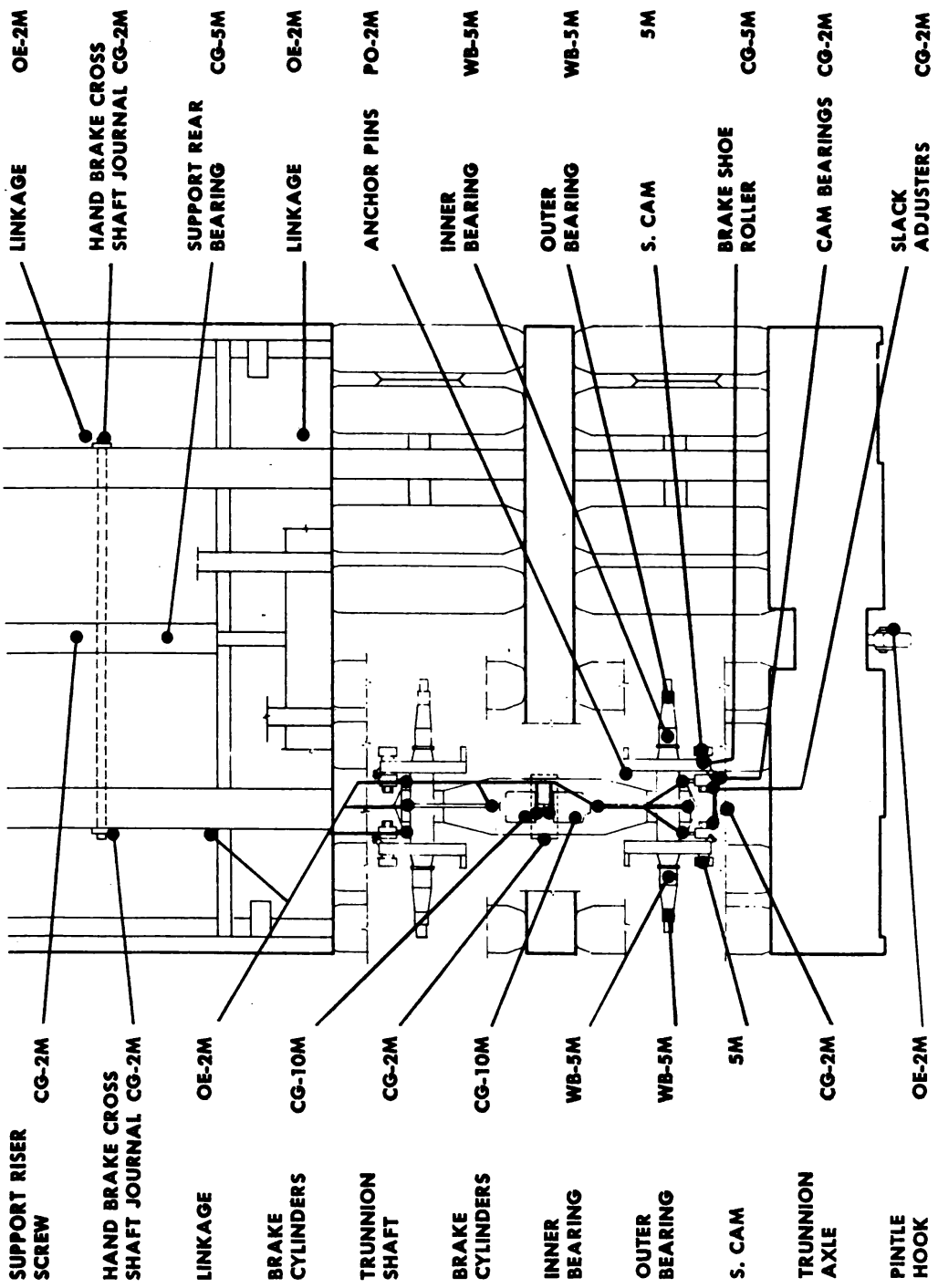
LUBRICANTS

OE—OIL, Engine SAE 30

CG—GREASE, General Purpose
No. 1 (above +32°)
No. 1 or No. 0 (+32° to +10°)
No. 0 (below +10°)

WB —GREASE, General Purpose No. 2
PO —PENETRATING OIL
HJO—HYDRAULIC JACK OIL
*** —SEE NOTES - PARAGRAPH 2, SECTION 4**

FIGURE 5. LUBRICATION CHART.



K E Y

INTERVALS

1M— 1,000 MILES OR EVERY MONTH
2M— 2,000 MILES OR EVERY 2 MONTHS
5M— 5,000 MILES OR EVERY 5 MONTHS
10M—10,000 MILES OR EVERY 10 MONTHS

FIGURE 5. LUBRICATION CHART

SECTION V

Tools and Equipment

1. INTRODUCTION.—Because the trailer has very few wearing parts, the tools have been kept to a minimum. Moreover, the trailer is operated with trucks carrying tools suitable for general care, maintenance and preservation. Accessories should not be used for purposes other than as prescribed and when not in use should be stored in the places or receptacles provided.

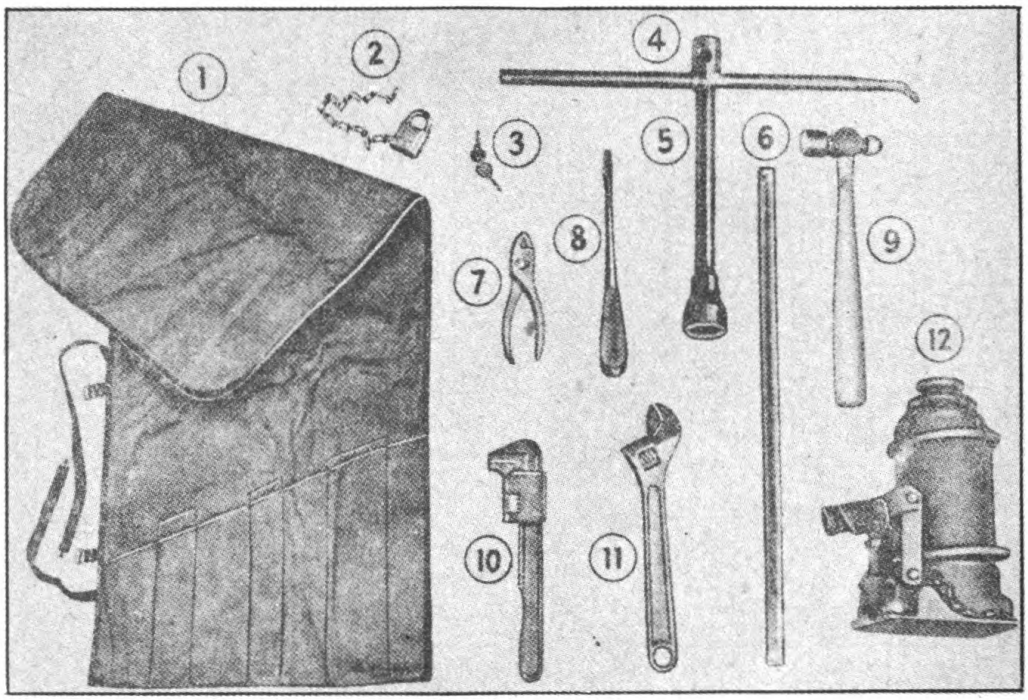


FIGURE 6. TOOLS.

2. TOOLS.—Tools issued with the vehicle are illustrated in (Figure 6).

a. Kit.—Included in the tool kit assembly are the following:

	Item	*Quantity*	*Remarks*
(1)	Kit, olive drab roll	1	
(2)	Lock for tool box	2	
(3)	Keys for lock	4	
(4)	Wrench handle, wheel nut	1	
(5)	Wrench, wheel nut front	1	
(6)	Handle, hydraulic jack, 2 sections	1	
(7)	Pliers, combination	1	6"
(8)	Screwdriver	1	5/16" x 6"
(9)	Hammer, ball peen	1	1 lb.
(10)	Wrench, monkey	1	
(11)	Wrench, adjustable	1	3/4" box end
(12)	Jack, hydraulic	1	

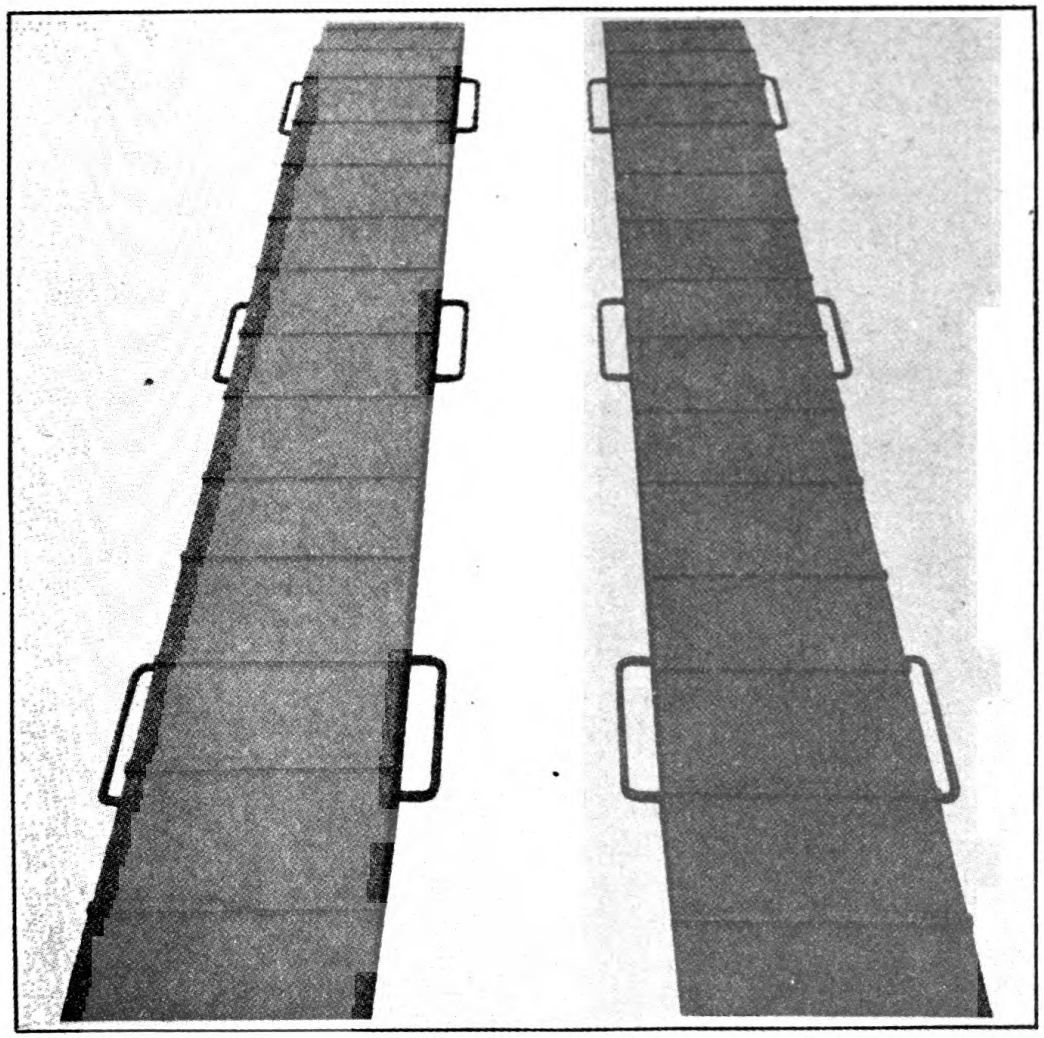


FIGURE 7. EQUIPMENT.

3. EQUIPMENT.—The equipment issued with this vehicle is illustrated in (Figure 7) and contains the items listed below:

Item	*Quantity*	*Remarks*
a. **Loading ramps**	**1 pair**	**10 ton each**
b. **Spare tire—7:50/20**	**1 each**	**(not illus.)**
c. **Spare tube—7:50/20**	**1 each**	**(not illus.)**
d. **Flap for 7:50/20 tire**	**1 each**	**(not illus.)**
e. **Spare wheel**	**1 each**	**(not illus.)**

SECTION I

Safety Instructions

SAFETY INSTRUCTIONS.—*a.* Because the trailer is a relatively unstable unit, greater than ordinary precaution must be followed if accidents are to be avoided. Therefore, before working on the wheel assembly, springs and axles of this unit, it is strongly recommended that the following procedure be followed at all times.

b. In changing the axle on the front gear, put the jacks on solid wood or other material that will make a sound footing. Use four jacks, one on each corner; do not attempt to crawl under the job when jacked up unless blocking is placed under the frame to catch it in case it should drop. Follow the same procedure in changing the rear axle, but it is only necessary to use two jacks.

c. When raising the front end of the unit with a hoist, NEVER connect the chains to the main unit frame. Instead connect them around the frame of the converter gear and lift the two units together. Front end may also be raised by disconnecting the converter gear and fastening hoist to semi-trailer.

(1) When changing front or rear tires, or hub assembly, one jack is sufficient.

d. When jacking the unit always place the jack in a position which will prevent slipping. It is also advisable to use some kind of footing to prevent the jack from sinking into the ground.

SECTION II

Axle — Front

1. AXLE ALIGNMENT.—*a.* Disconnect the drawbar from pintle hook and place a wood horse under drawbar about 24″ from end of eye.

b. Remove both hub assemblies. (See section on Wheels, Hubs and Bearings.)

c. Place a center punch mark in the center of drawbar, 1″ back from the eye.

d. Using a steel tape, measure the distance from center punch mark on drawbar eye to outer end of axle spindle on both sides. The measurement should be identical.

e. If an adjustment is required, use the adjustable radius rod. Loosen the two pinch bolts on the rod and turn the hex adjusting nut to move the spindle on that side forward or backward as required.

f. Once the required adjustment has been secured, tighten down the pinch bolts on the adjustable radius rod to fix the axle in position.

2. DISASSEMBLY TO CHECK AXLE CAMBER OR BENT AXLE.—*a.* Couple hoist to gear frame, raise front of trailer, and remove wheel assemblies. (See section on Wheels, Hubs and Bearings.)

b. Place a wood horse under axle as a safety device. Do not use a jack under axle because it would interfere when checking for camber.

c. NOTE: It is not necessary to remove axle to check for bend or camber.

3. CHECKING FOR BEND (Figure 8).—*a.* Place the axle gauge in position on the front side of the axle.

b. With the single pronged end of the gauge held firmly against the inner bearing surface, adjust the double prongs on the other end of the gauge until they contact the inner and outer bearing surface.

c. Now move the gauge over to the rear side of the axle. If either of the two prongs fails to make contact, a bent spindle is indicated.

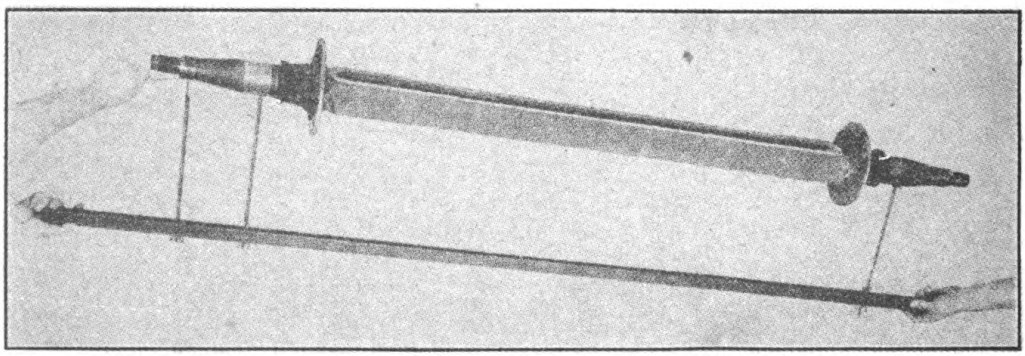


FIGURE 8. CHECKING AXLE FOR BEND.

Use a feeler gauge to determine the amount of the bend. If it is in excess of .002 replace the axle.

d. If checking both sides of one spindle reveals no bend in the axle, turn the gauge end for end and check the other spindle without disturbing the setting of the prongs.

e. If there is clearance at either bearing surface, check with a feeler gauge. If the prongs are in contact at both points, the axle is not bent.

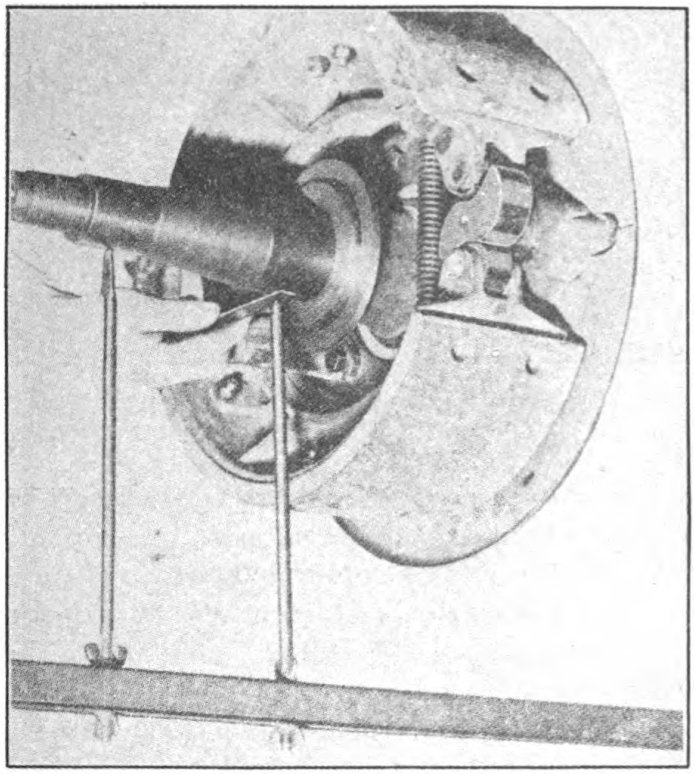


FIGURE 9. CHECKING AXLE FOR CAMBER.

4. CHECKING FOR CAMBER (Figure 9).—*a.* Set the points of the axle gauge in exactly the same position on the axle and in the same manner as outlined in points *a.* and *b.* of Checking for Bend.

b. Place the gauge directly under the axle.

c. Clearance will exist between the inner prong and the bearing surface. Clearance should not exceed .080 or be less than .060. If camber is not within the proper limits, replace the axle.

5. AXLE REPLACEMENT (Figure 10).—*a.* Hoist up the trailer at the front of the gear frame and remove wheel and hub assemblies.

b. Place a mobile jack at center of axle or a wood horse as a safety device and as a means to move axle out.

c. Remove the spring U-bolt nuts. Remove the spring spacer block.

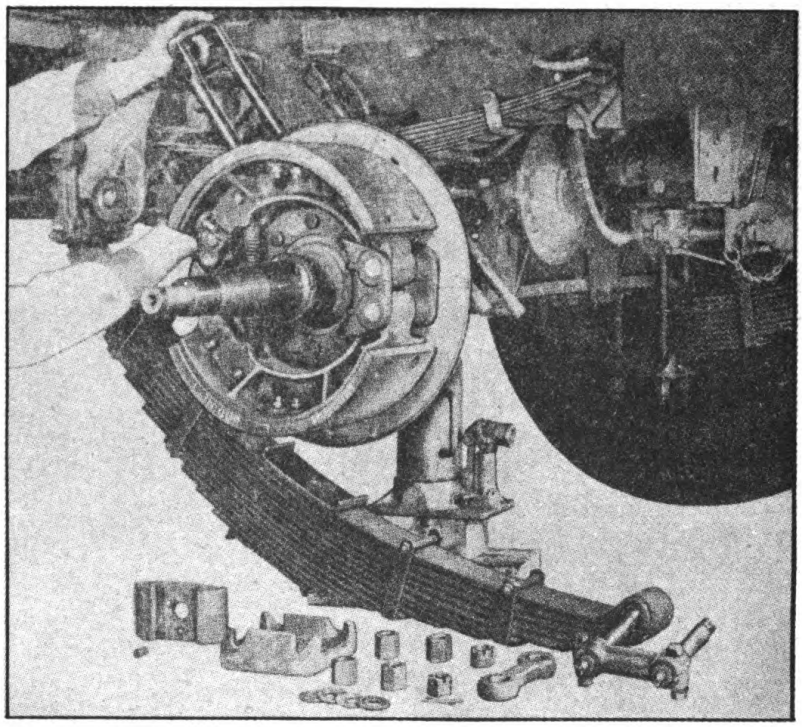


FIGURE 10. AXLE REPLACEMENT.

d. Disconnect the air hoses leading from emergency relay valve to quick release valve which is mounted on axle.

e. Drive U-bolts up, using a copper hammer.

f. Remove the two shackle asemblies at rear of each spring.

g. Hoist gear frame up a few inches. Slide or pull the axle out, using the mobile jack or wood horse.

h. Strip the axle of all brake operating parts by removing the bolts holding the brake chambers and cam brackets to the axle.

i. Remove the bracket holding quick release valve to axle. Remove

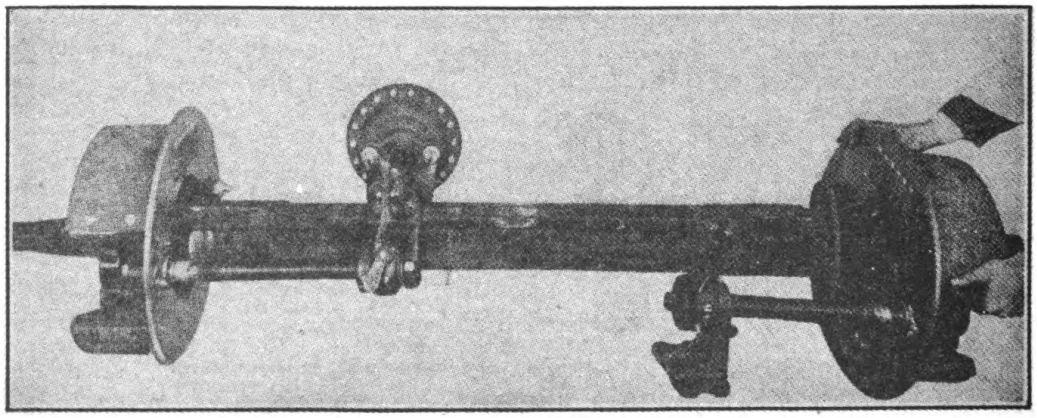


FIGURE 11. REMOVING BRAKE ASSEMBLY IN ONE UNIT

the two copper lines which run between chamber and quick release valve.

j. Mark an "L" on the left-hand brake assembly and an "R" on the right-hand assembly for identification when reassembling. Remove the brake assemblies by taking out the eight bolts holding brake adapter mounting plate to axle flange on both sides (Figure 11). Lift the complete assembly off axle.

k. When installing a new axle make sure the 1/2" dowel pins are in the axle dowel pin holes, and then reverse the above procedure.

l. CAUTION: MATCH THE DOWEL PINS IN BOTH THE RIGHT AND LEFT SIDES OF AXLE.

6. DRILLING DOWEL PIN HOLES IN REPLACEMENT AXLES. —*a.* Place axle on two wood horses and follow layout procedure in (Figure 12).

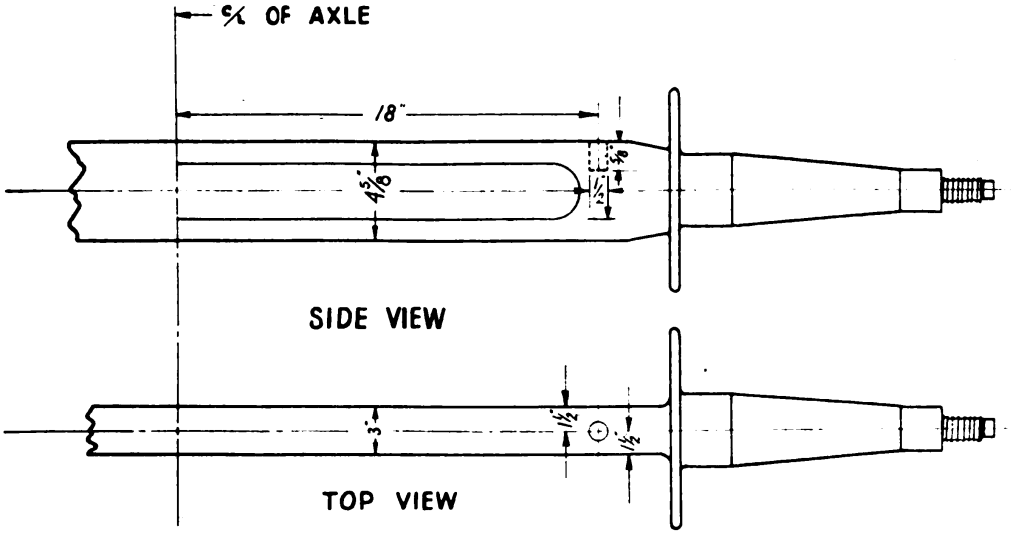


FIGURE 12. AXLE LAYOUT

7. AXLE, FRONT.—Service Diagnosis and Remedy.

SYMPTOM AND PROBABLE CAUSE	PROBABLE REMEDY
a. Hard pulling — Wandering.	
(1) Out of line.	(1) Re-align axle by means of adjustable radius rod.
(2) Bent axle.	(2) Replace.
(3) Out of camber.	(3) Replace.
b. Inside tire wear.	
(1) Out of camber.	(1) Replace.
c. Scuffed tires (both sides).	
(1) Out of line.	(1) Re-align axle.
(2) Bent axle.	(2) Replace.
d. Scuffed tires (one side).	
(1) Bent axle.	(1) Replace.
(2) Loose wheel.	(2) Tighten wheels and adjust bearings.

SECTION III

Axles — Rear

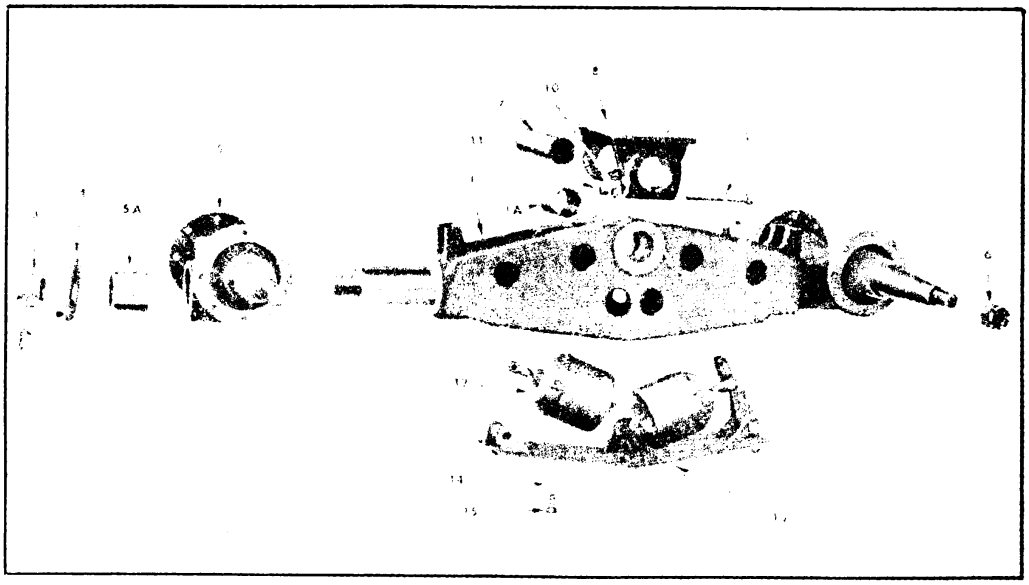


FIGURE 13. UNDERCONSTRUCTION

1. GENERAL (Figure 13).—The major assemblies making up the rear underconstruction of this unit consist of the following: four trunnion axles, two rocker beam trunnion shafts, two rocker beams, and two mounting brackets. Mounting brackets are fastened to main frame. Rocker beams are held to mounting brackets with the trunnion shafts. Trunnion axles are mounted at the front and rear end of rocker beam.

a. Removing trunnion axle (Figure 14).—(1) NOTE: Removal procedure for all four trunnion axles is identical. All four are interchangeable from front to rear, right to left.

(2) If hoisting facilities are not available, then hydraulic jacks must be used. Place jacks under rear crossmember and jack trailer up until wheels clear the ground at either front or rear of rocker beam.

(3) Remove the two inner wheels from the hub assembly (paragraph 2, section XIV).

(4) Remove outer wheel and hub assembly in one unit (paragraph 3, section XIV).

(5) Remove clevis pin from equalizer (Figure 14).

(6) Remove the two cotter pins from equalizer links.

(7) Remove cotter key and nut from rocker beam.

(8) Slide the complete axle assembly off rocker beam (Figure 15).

(9) Remove the eight 1/2″ mounting bolts holding the brake adapter to axle and pull the complete brake assembly off axle (Figure 16).

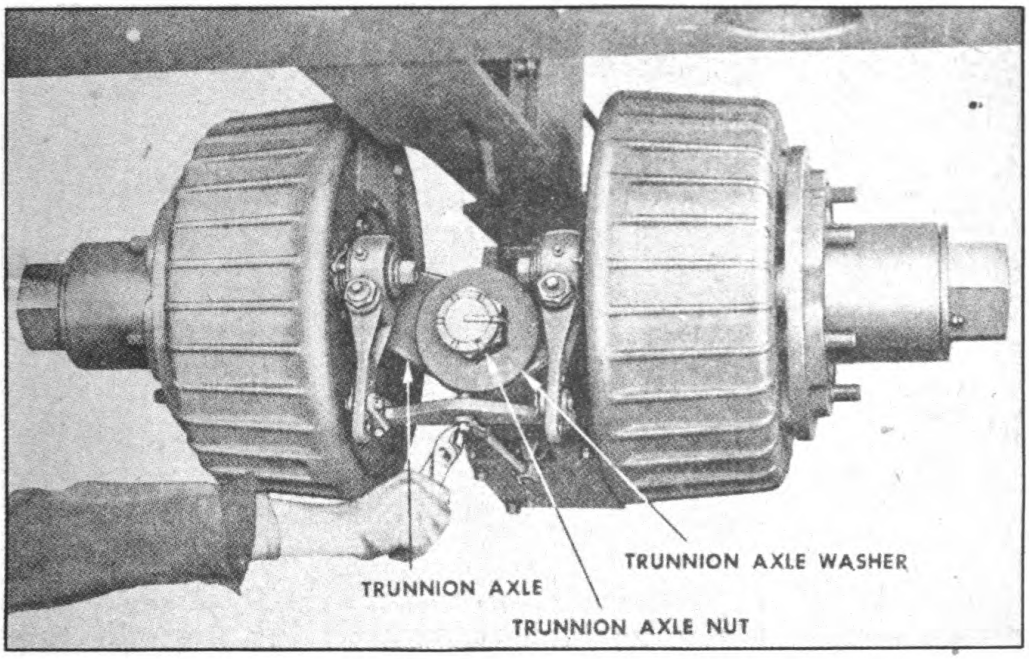


FIGURE 14. TRUNNION AXLE

(10) NOTE: Repate the above operations on opposite side of trunnion axle which you are intending to remove.

b. Replacement of trunnion axle.—(1) Replacement of trunnion axle unit is in reverse of removal instructions previously outlined in this section.

(2) NOTE: When replacing trunnion axle on rocker beam, place a light film of grease over rocker beam spindle and in bushings of trunnion axle.

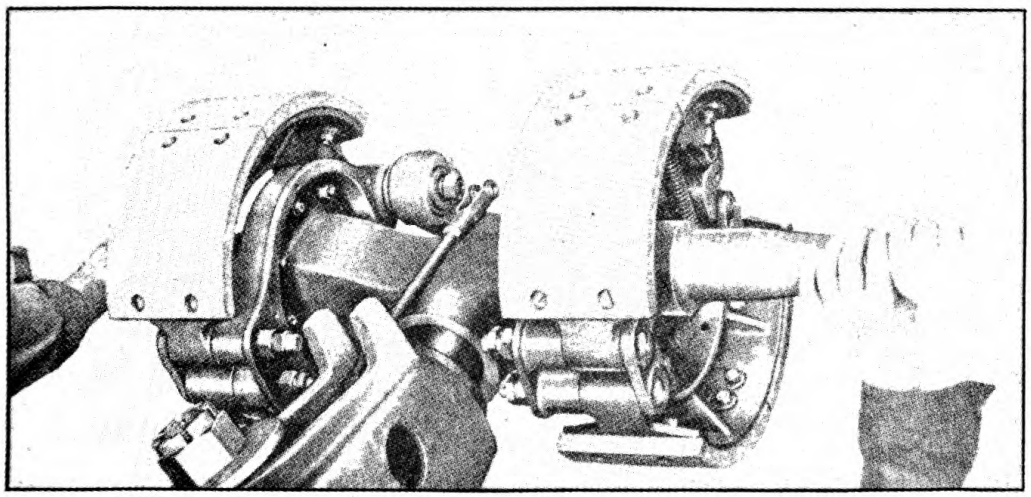


FIGURE 15. TRUNNION AXLE REMOVAL

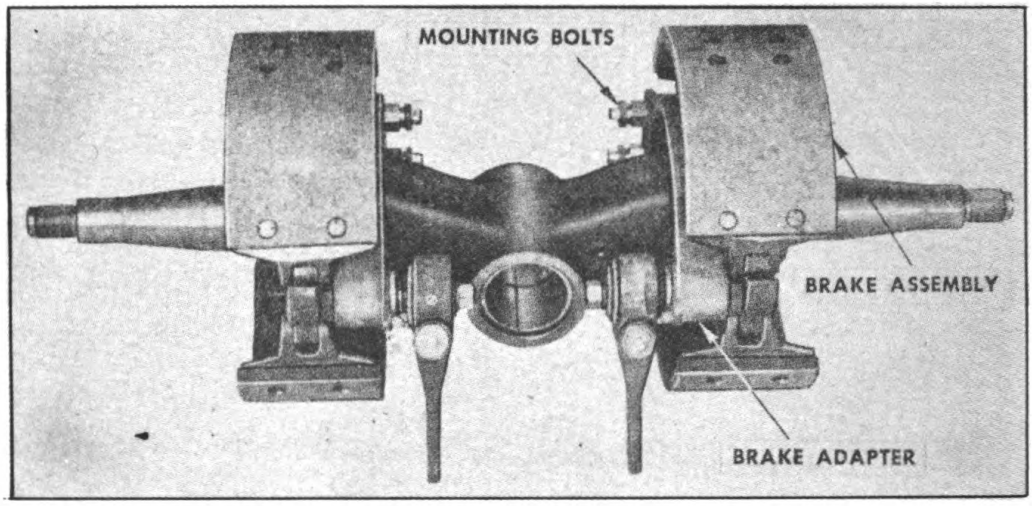


FIGURE 16. REMOVING BRAKE ASSEMBLY

(3) CAUTION: Nut which holds trunnion axle to spindle of rocking beam should not be drawn up too tight. A tight nut will retard the transverse movement of the trunnion axle and cause unnecessary wear. To prevent this, tighten nut until binding begins then back nut off 1/3 turn.

c. *Trunnion shaft removal* (Figure 17).—(1) Place a hydraulic jack under rear crossmember at each corner. Jack trailer up just high enough to relieve the weight of underconstruction against mounting brackets.

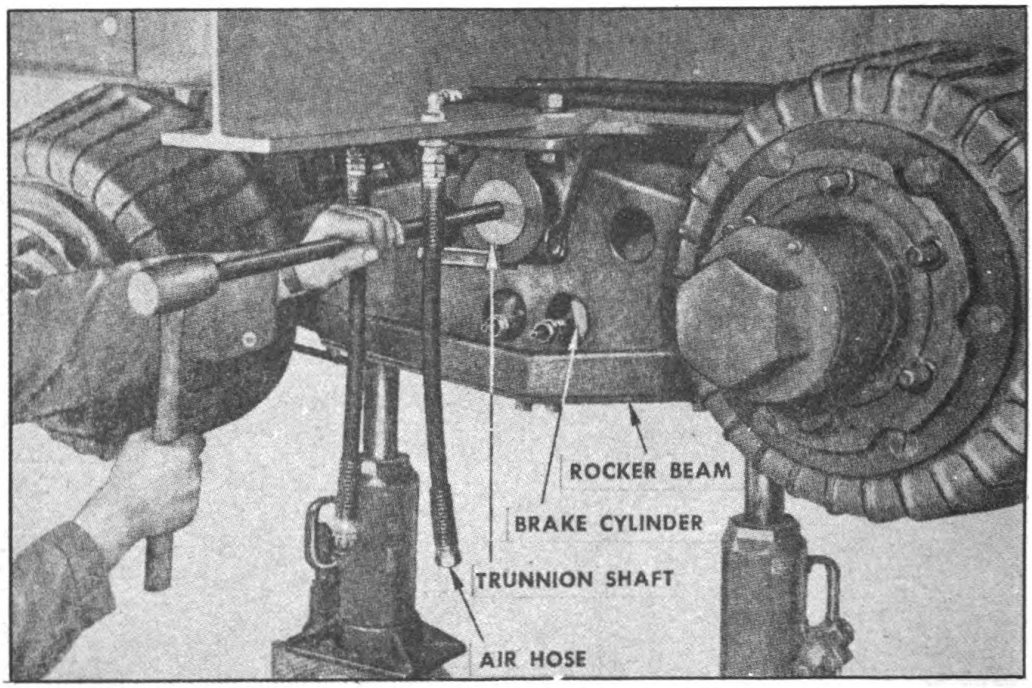


FIGURE 17. TRUNNION SHAFT REMOVAL

(2) Remove the two pinch bolts which run through mounting bracket.

(3) Remove alemite from trunnion shaft.

(4) Disconnect the two air lines at brake cylinders.

(5) With the aid of a heavy bar and sledge hammer drive the trunnion shaft out of mounting brackets and rocker beam.

(6) NOTE: If difficulty is encountered when trying to drive trunnion shaft out of its mountings jacks may not be adjusted properly. Raise or lower jacks until binding of trunnion shaft on mounting brackets ceases.

d. Replacement of trunnion shaft.—(1) Place a light film of grease around shaft and around bushings in rocker beam.

(2) Place shaft through rocker beam and mounting brackets with bolt grooves in shaft down so that grooves will align with bolt holes in mounting bracket.

(3) Install the two pinch bolts and tighten.

(4) Install Alemite fitting and lubricate.

e. Removing rocker beam.—(1) NOTE: This trailer is equipped with two rocker beams; one on the right side and one on the left. Removal procedure for both rocker beams is identical.

(2) Place two jacks under rear crossmember and jack trailer up.

(3) Place a greased plank on steel plate under the outer wheel and hub assembly.

(4) Remove the four inner wheels.

(5) Remove the two inner hub assemblies.

(6) Remove the two outer wheel and hub assemblies in one unit.

(7) Disconnect the front and rear parking brake rods at brake lever.

(8) Remove the two clevis pins from the two equalizers.

(9) Remove front and rear trunnion axle with brake assembly attached.

(10) Disconnect the two air lines which run to brake cylinders mounted on inside of rocker beam.

(11) Place a jack under rocker beam at front and rear.

(12) Remove the pinch bolt from mounting bracket (Figure 17).

(13) Remove alemites from trunnion shaft.

(14) Drive shaft out using a heavy bar and sledge hammer (Figure 17).

(15) Lower the two jacks and lift rocker beam out.

f. Replacing walking beam.—(1) NOTE: Before attempting to install rocker beam test operation of trunnion shaft by shoving it through bushings of rocker beam. Make sure the bushing is not burred as this will prevent trunnion shaft from sliding through.

(2) Place two jacks about 3½ feet apart directly under mounting bracket, lengthwise.

(3) Place rocker beam on the two jacks and jack unit up into position.

(4) Place a film of grease around bushing of rocker beam and over trunnion shaft.

(5) Insert shaft through walking beam with bolt grooves down.

(6) Install the two pinch bolts and tighten.

(7) Remove the two jacks under walking beam and lift brake cylinder mounting plate up to walking beam. Fasten, using the eight cap screws and lockwashers.

(8) Connect the two air lines to the brake cylinders.

(9) Install front and rear trunnion axle and brake assembly on walking beam spindle.

(10) Nut, which holds trunnion axle to walking beam, should not be drawn up too tight. A tight nut will cause unnecessary wear and retard the transverse movement of trunnion axle. To eliminate the possibility of a too tight nut, tighten it up and then back off 1/3 turn.

(11) Connect the parking brake rod and the brake rod at equalizer.

(12) Install the outer hub and wheel assemblies.

(13) Install the two inner hubs.

(14) Mount the four inner tires and wheel assemblies.

(15) Lower the jacks.

SECTION IV

Brakes

1. **MINOR BRAKE ADJUSTMENT.**—*a.* The adjustment of front and rear brakes is identical.

b. Jack up wheels. Turn slack adjuster wing wrench or adjusting nut at each wheel clockwise, until the wheel cannot be turned.

c. Back the adjusting wing wrench off two notches or more so that no drag is felt on the brake drum.

2. **BRAKE RELINING.**—*a.* Visual inspection of all brake shoes and linings can be made without removing wheels from the axle. Simply remove the two dust shields, which are bolted to brake adapter with six 1/4″ cap screws. This exposes the assembly to check for lining thickness and grease on the lining.

b. It is essential that upper and lower brake blocks be replaced when relining.

c. If inspection reveals the necessity for new lining proceed as follows:

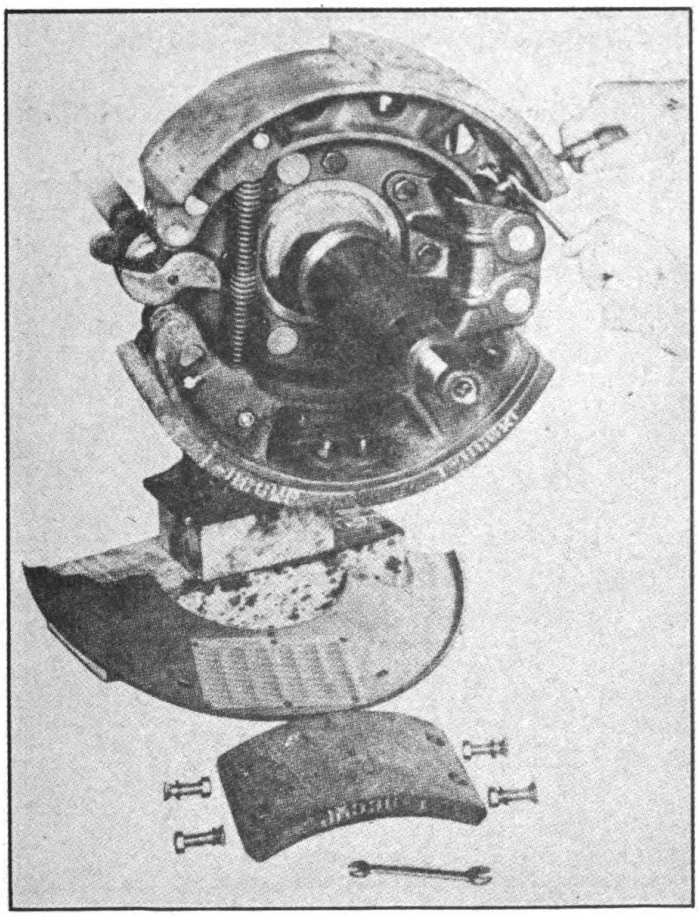


FIGURE 18. RELINING BRAKES

(1) Remove wheel, hub and drum as an assembly when relining the brakes on the outer wheels. (See instructions for removing hub assembly in Wheels, Hubs and Bearings section.)

(2) In order to reline brakes on inner wheels it will be necessary to remove the tires, wheel assembly, and then the hub.

(3) Remove dust shields.

(4) Remove bolts holding brake block to shoes (Figures 18).

(5) Loosen the anchor pin nuts and lock nuts holding anchor pins.

(6) Move anchor pins to check ease of operation.

(7) CAUTION: It is very important that anchor pins move freely. A binding anchor pin will interfere when making major brake adjustment. Major brake adjustment is necessary after brake shoes have been relined.

(8) Remove all rust and dirt from brake shoes, using a putty knife or an old file.

(9) Place brake blocks on shoes and tighten, using bolts and lockwashers.

(10) NOTE: Brake blocks are interchangeable with any brake shoe throughout trailer.

(11) Place a film of grease over S-cam and install wheel and hub assembly.

(12) Give brake a major adjustment. (Paragraph 5, this section.)

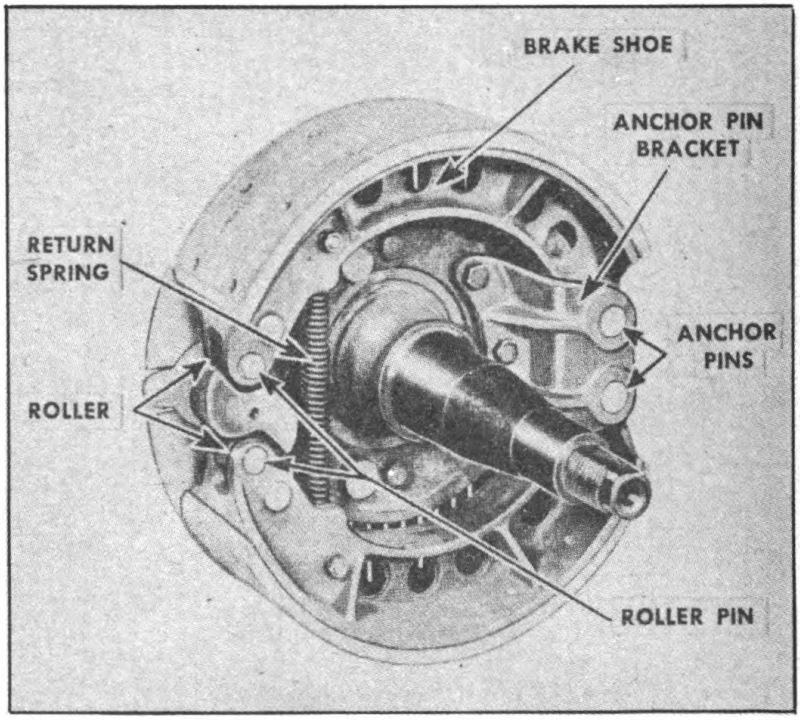


FIGURE 19. BRAKE SHOE REMOVAL

3. BRAKE SHOE.—*a. Removal* (Figure 19). Removal procedure for all brake shoes is the same.

(1) Remove the three bolts holding the anchor pin bracket to the brake mounting plate.

(2) Tap the anchor pin bracket free of the anchor pins and pull both shoes free of the assembly.

(3) Remove the brake shoe return spring by removing the bolt holding it to each shoe.

(4) To install, reverse the procedure outlined above after cleaning the S-cam and anchor pins; spreading a film of grease over both.

***b. Rebushing brake shoes.*—Each shoe has two Oilite bushings at the anchor pin end. To replace worn bushings:**

(1) Drive out the old bushing.

(2) Press or drive in new bushings with care as a mushroomed or burred bushing will retard free movement of brake shoes, both in application and release. These bushings come reamed to proper dimensions.

***c. Replacing brake shoe rollers.*—The brake shoe roller on each shoe is held in place by a shaft fastened by three heavy prick punch marks on each side. Roller shafts may be driven out and rollers replaced without removing the shoes from the assembly.**

4. CAMS, FRONT and REAR.—*a.* NOTE: Replacement procedure of either front or rear cam is the same. EXCEPTION: Rear cams are not held by a cam bracket.

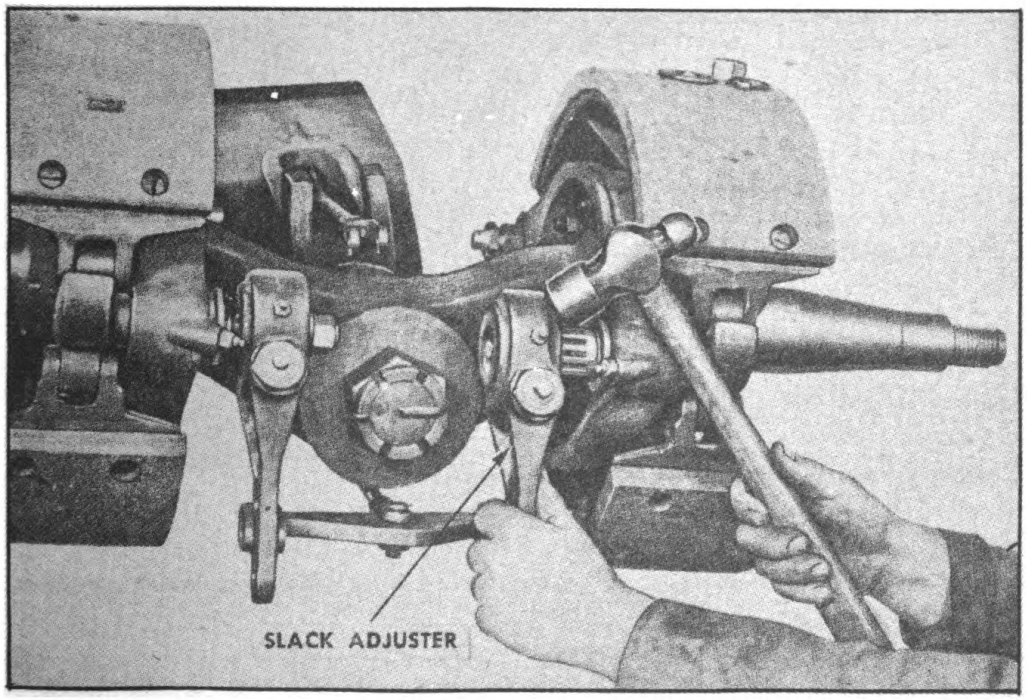


FIGURE 20. REMOVING CAM—STEP ONE

b. Replacing cam.—Cams come in rights and lefts. When replacing them, care should be taken to place the proper cam on the proper side. The inner side of all cams has a number stamped on it; even number—right, odd number—left.

(1) Remove wheel and hub assembly.

(2) Remove nut and lockwasher at the slack adjuster end of the cam.

(3) Remove brake rods from slack adjuster arm and tap slack adjuster off cam spline (Figure 20).

(4) Pry the snap ring free and work it back toward cam end (Figure 21).

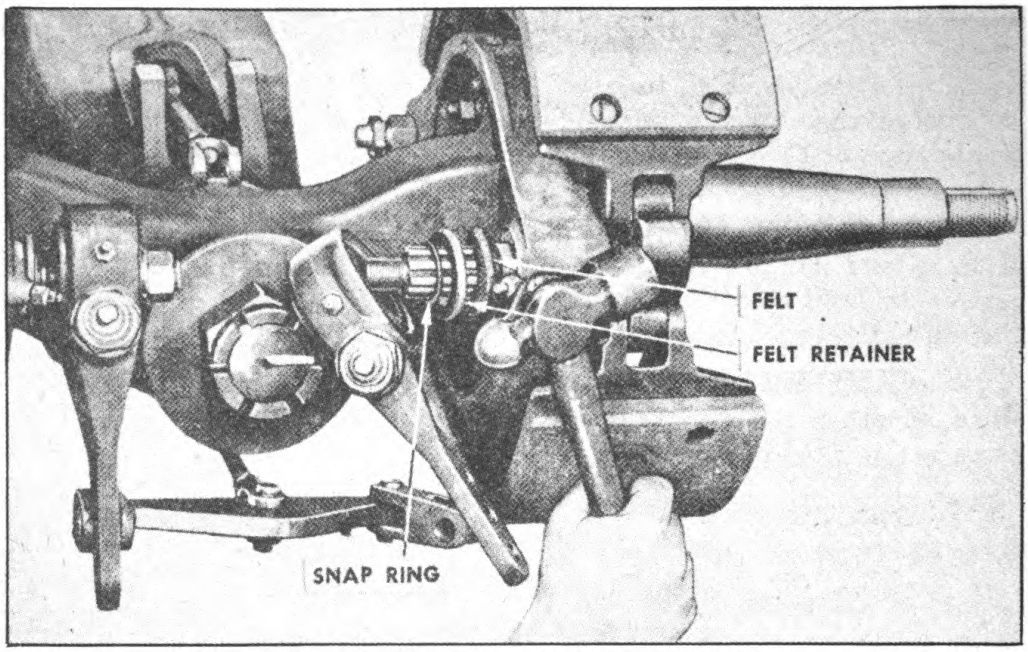


FIGURE 21. REMOVING CAM—STEP TWO

(5) Pull cam out, and remove felt snap ring and felt retainer (Figure 22).

(6) To replace cam, pack needle bearings with a medium light chassis grease, working grease into bearings with finger. Hold the brake shoes apart and insert cam in position. Care should be taken not to harm the needle bearings in the mounting plate brake adapter. Reverse the procedure outlined above.

c. Replacing cam needle bearings.—Cam needle bearings will usually last indefinitely if properly lubricated. However, if they are damaged through accident, or in removing and replacing cam, proceed as follows to replace them:

(1) Remove the two bearings in each mounting plate adapter either individually or both at one time by driving them out with a hammer.

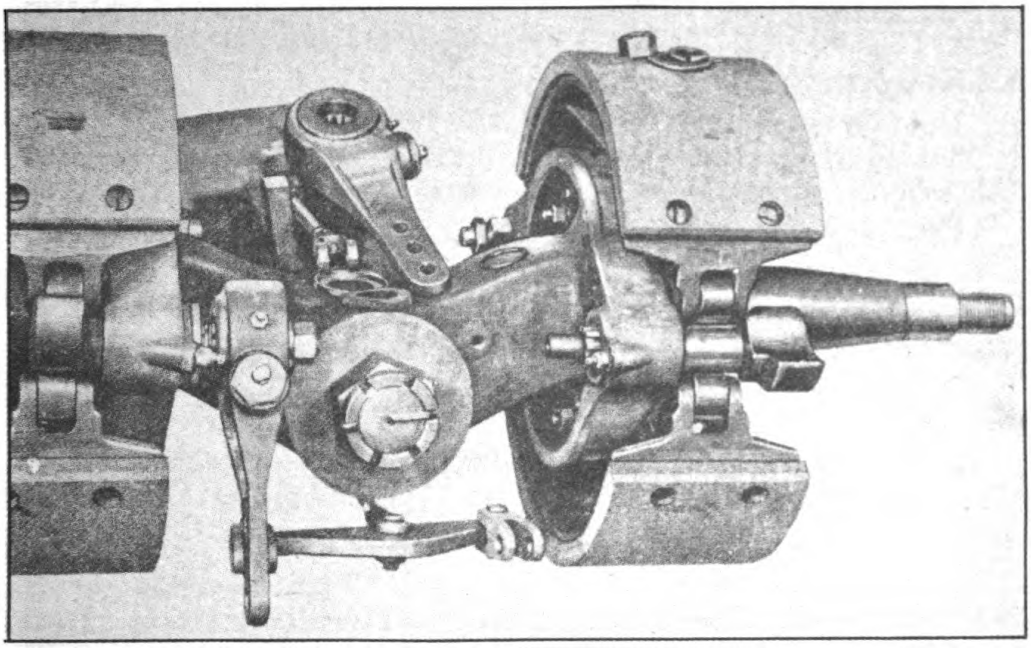


FIGURE 22. REMOVING CAM—STEP THREE

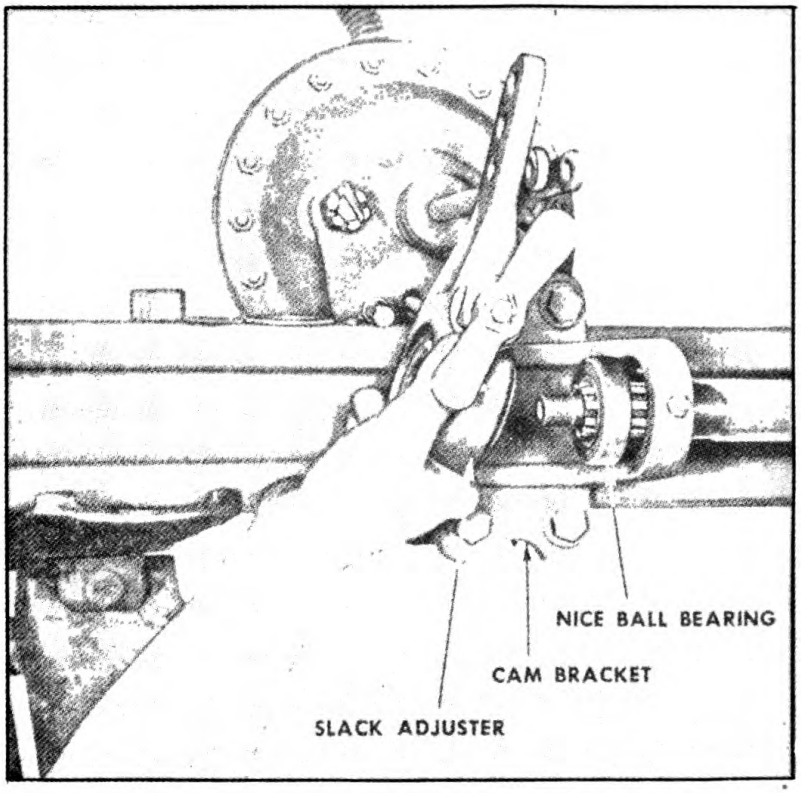


FIGURE 23. REMOVING NICE BALL BEARING

(2) Place the new needle bearings into position and tap gently to start them evenly.

(3) Place pieces of flat wood against both brake adapter and bearing and squeeze the bearing into position with a C-clamp. Bearings should be flush with the outer edges of the adapter.

(4) Inspect to make sure bearings do not cover lubricating hole.

d. Replacing Nice ball bearing in cam bracket, front only.—(1) Remove the slack adjuster. (See Cam Replacement instructions.) (Figure 23).

(2) Tap the outer side of the cam bracket and the ball bearing will usually work out.

(3) If this fails, remove the Alemite fitting, insert a small screwdriver in the Alemite fitting hole and pry outward against the bearing. Continue tapping the cam bracket with a small hammer.

5. SERVICING SLACK ADJUSTER.—*a.* This trailer is equipped with ten slack adjusters; two at the front and eight at the rear. These are identical except that those at the rear are not equipped with wing adjusting wrenches. It is necessary to use an adjustable wrench to adjust the rear slack adjusters.

b. If turning up on the slack adjuster wing wrench fails to bring the brake shoes up against the drum, the worm or worm gear is usually worn or stripped. To replace these parts, proceed as follows:

(1) *Replacing worm and worm gear* (Figure 24).—(a) Remove the worm (1) at the wing wrench adjuster by turning out on the hex nut holding it in position.

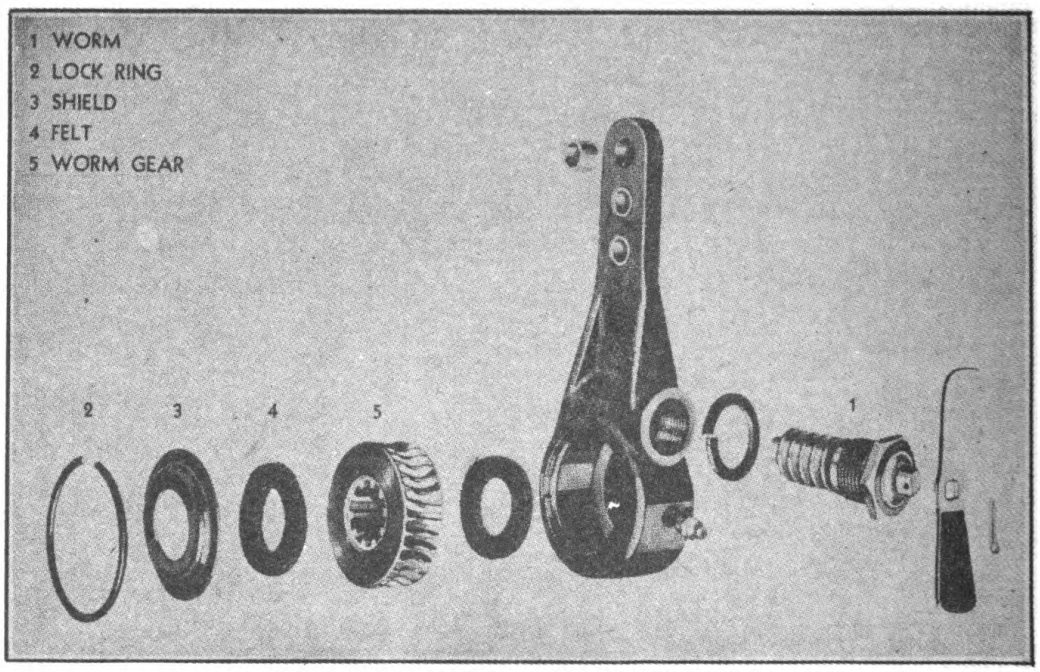


FIGURE 24. SLACK ADJUSTER—EXPLODED

(b) Inspect the worm. If it is stripped, replace it as an assembly.

(c) If the worm is in good condition, pry the lock ring (2) free on the slack adjuster end, remove the shield (3), felt (4) and worm gear (5). If the worm gear is stripped, replace.

(2) *Rebushing slack adjuster.*—(a) Drive out the old bushing. Insert the new bushing.

(b) Ream to 1/2" diameter.

(c) NOTE: All parts of slack adjusters are interchangeable except the housings on the four slack adjusters at rear underconstruction. The housings of these four slack adjusters are ground on one side to accommodate Alemite in brake adapter.

6. BRAKE DRUM REPLACEMENT.—*a.* Brake drums should be replaced when cracked or badly scored. Heat checking, unless severe does not call for brake drum replacement.

(1) Remove wheel and hub in an assembly.

(2) If changing drum on the front wheel, block the wheel at both sides and remove the drum by removing the ten nuts holding it to the hub assembly (Figure 25). When removing rear drums it will be necessary to remove wheel assembly from hub and the hub assembly from axle. Remove the six slot-headed bolts and lift the drum off hub pilot.

(3) Remove any rust or dirt in the drum pilot and install the new drum.

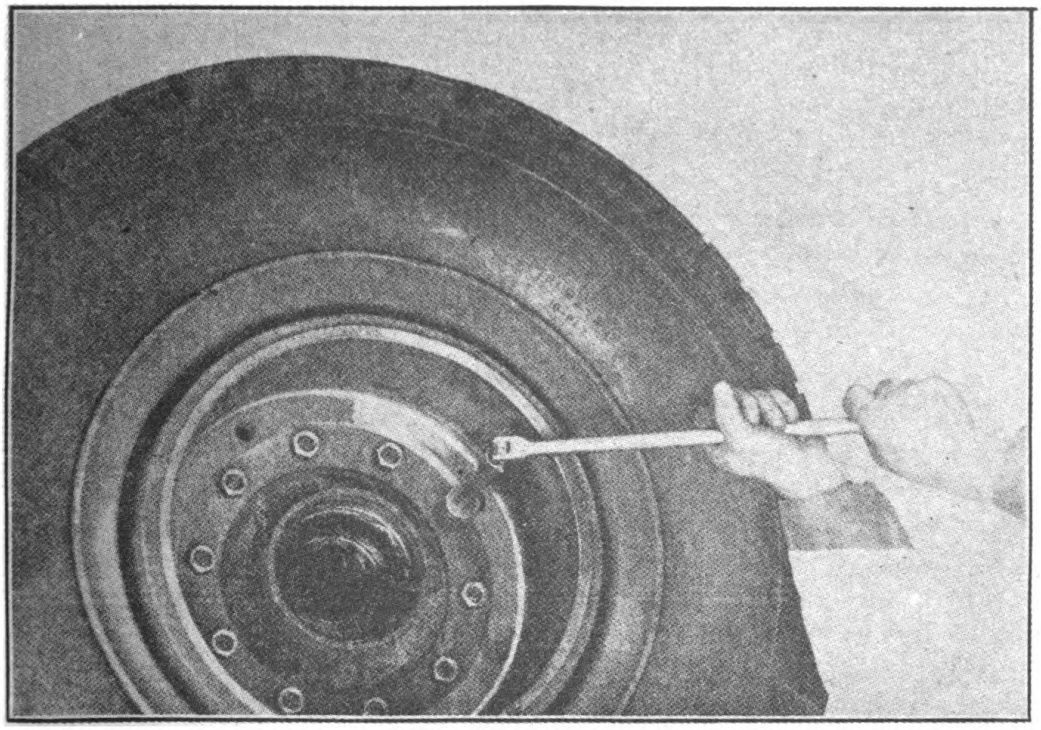


FIGURE 25. DRUM REMOVAL

(4) Successively tighten opposite nuts to bring the drum down evenly to prevent its cocking on the pilot.

7. MAJOR BRAKE ADJUSTMENT.—*a.* The procedure which follows applies to front and rear brakes when new linings or drums have been installed.

(1) Loosen both nuts on both anchor pins so that the anchor pins can be moved freely.

(2) Replace the wheel and drum assembly. If it fails to move on freely, slack off on the slack adjusters through counter-clockwise movement of the slack adjuster wing wrench and centralize anchor pin eccentrics.

(3) With the wheel in place, turn the slack adjuster wing wrench clockwise until the shoes are tight in the drum.

(4) Turn the eccentric anchor pin to right and left as you tighten up on the slack adjuster until the brake shoes are centralized in the drum.

(5) Using a feeler gauge, set the clearance at .010 at the eccentric end and .015 at the cam end of the brake shoes.

(6) Tighten lock nuts on the anchor pins while holding anchor pins firmly in position with a wrench.

8. HAND PARKING BRAKE REPLACEMENT (Figure 26).—*a.* The hand parking brake is located on the right side, at the drop in frame. Turning the wheel in a clockwise direction applies the brakes.

b. Replacing the wheel.—(1) Drive out drive pin and tap wheel handle off screw.

c. Replacing screw.—(1) Loosen set screw in stop collar and turn wheel in a counter-clockwise direction until screw is turned out of bracket.

(2) NOTE: No attempt should be made to straighten bent screws.

d. Replacing ratchet.—(1) Remove the clevis pin from ratchet. Remove cotter key and flat washer from ratchet pin, and drive pin out.

(2) Remove cotter key and flat washer and drive out pawl pin. Reverse this procedure to replace pawl.

9. ADJUSTING HAND PARKING BRAKE.—*a.* Usually the hand parking brake requires little attention, the minor brake adjustment taking care of parking brake adjustments. However, when an adjustment is required, there are two points of adjustment which may be used. Each may be used separately or both at the same time. One adjustment may be made by shortening the brake rod at hand brake ratchet (Figure 26). The other adjustment may be made by shortening the brake rod which is attached to brake cylinder lever.

(1) Shorten brake rod at hand brake ratchet (Figure 26).

b. Place a jack under each trunnion axle and jack until wheels clear ground.

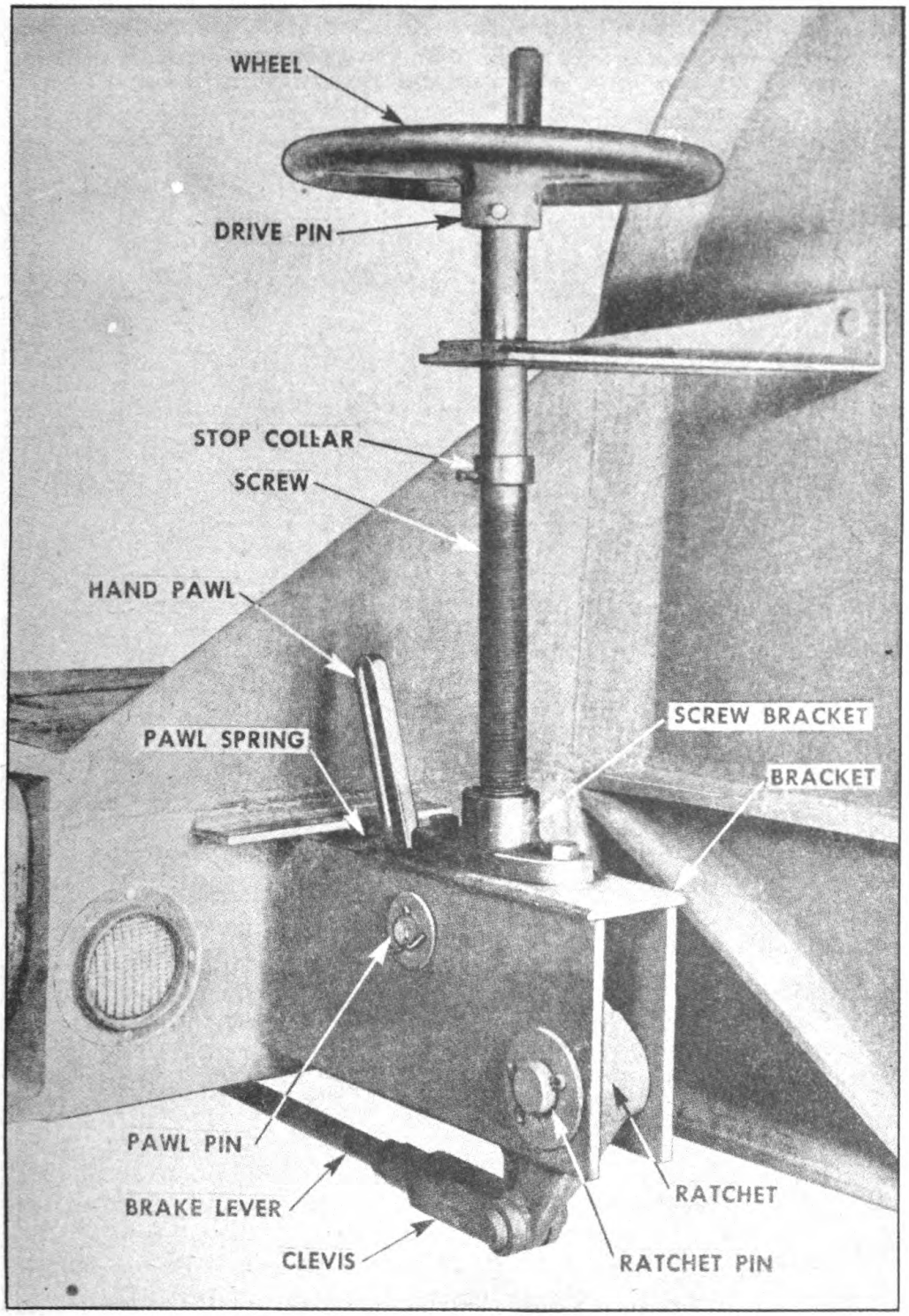


FIGURE 26. HAND PARKING BRAKE

c. Place a block of wood under each outer wheel. This will prevent trunnion axle from oscillating while adjustment is being made. After adjustment has been made, remove the block from under outer wheels and place them under inner wheels and then check adjustment of outer wheels.

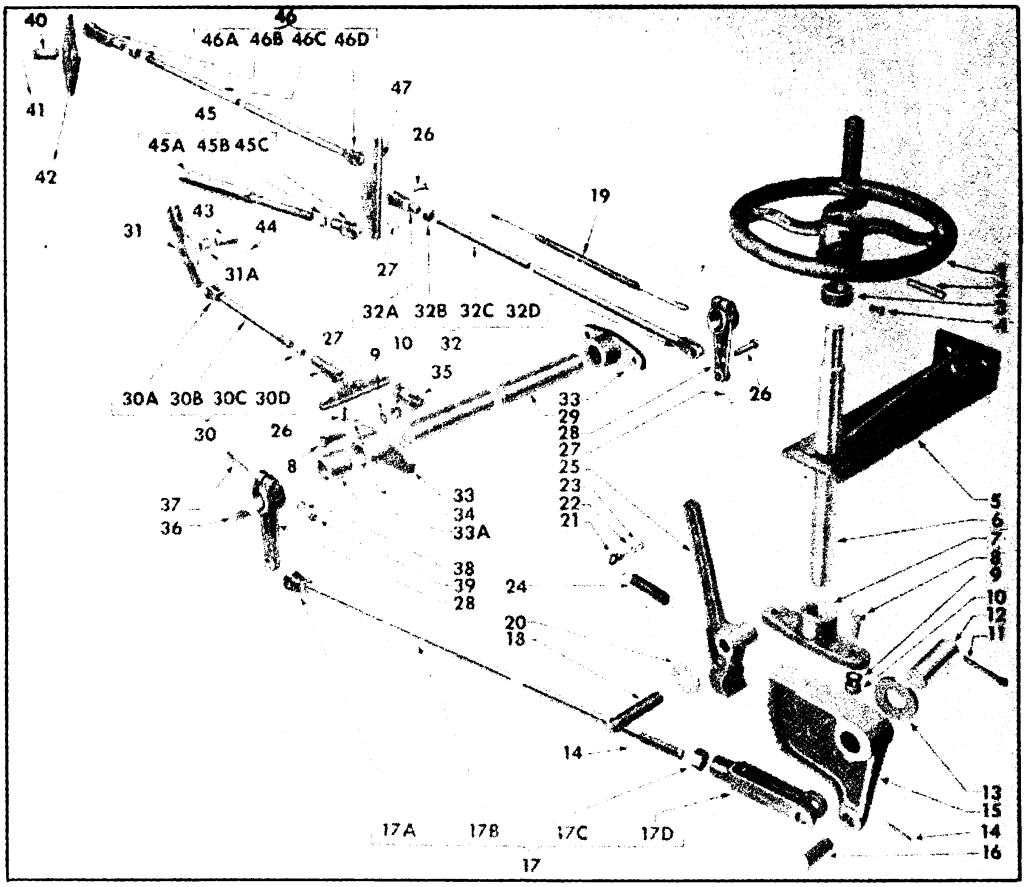


FIGURE 27. HAND BRAKE—EXPLODED

10. CROSS SHAFT (Figure 27).—*a. Removal.*—(1) Disconnect brake rod (32C) which runs between the lever on right-hand side of cross shaft and the ratchet (15).

(2) Disconnect the two brake rods (30B) at cross shaft lever which runs to rear of trailer and rod (32C).

(3) Loosen pinch bolts holding cross shaft levers (28) to cross shaft (29) and drive levers off the shaft.

(4) Remove the two Woodruff keys (36).

(Remove the four bolts (8) from journal (33).

(6) Tap journals off cross shaft and pull the shaft out.

b. Replacement.—(1) Replacement of cross shaft is in reverse of the removal instructions.

(2) NOTE: After cross shaft has been installed and before at-

taching brake rods, check shaft for ease of operation. Cross shaft should work freely, if binding is felt, check levers at end of shaft to make certain they are not binding against journal. If levers are not binding against journal and a bind is still felt drive the journals one way or the other until shaft operates freely. Before installing clevis pins in brake rods, place a light film of grease on them.

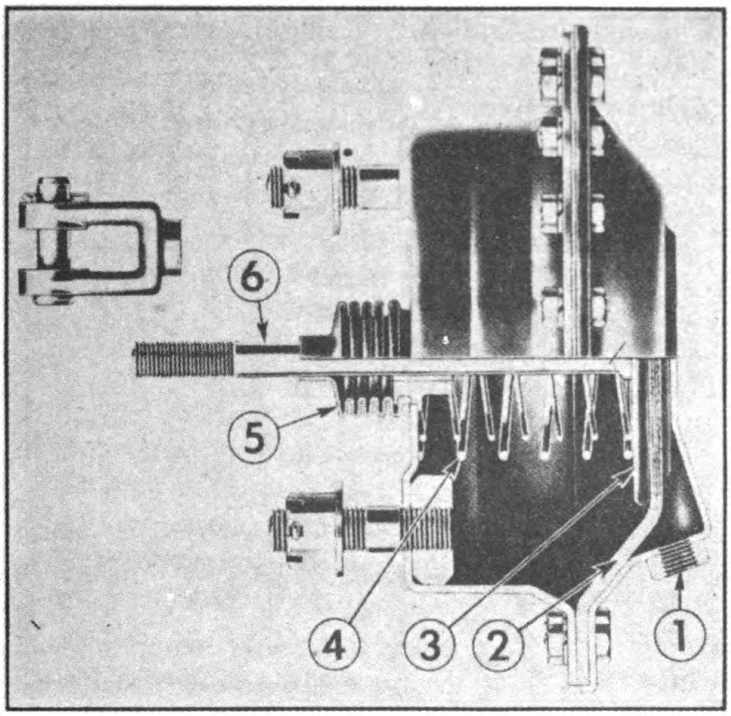


FIGURE 28. BRAKE CHAMBER

11. **BRAKE CHAMBERS** (Figure 28).—*a.* This trailer is equipped with two brake chambers on front axle. They are interchangeable.

b. Function.—The function of the brake chamber is to convert the energy of compressed air into the mechanical force necessary to expand the brake shoes against the brake drum and apply the brakes. Air pressure from relay emergency valve enters port (1) behind the flexible diaphragm (2). The force developed moves the flexible diaphragm, moves the push plate (3) and attached push rod (6), so as to rotate the brake cam and apply the brakes.

c. Adjustment.—(1) The stroke of the brake chamber push rod is limited, therefore, the brake must be adjusted (see Brake Minor Adjustment) to keep the push rod stroke within the correct limits. The stroke should never be permitted to exceed 1¾" and when the brakes are adjusted, the stroke should be as short as possible without the brakes dragging. This minimum stroke is usually about 3/4".

(2) When installing new chamber, slack adjuster should be so adjusted to permit push rod (6) to line up with brake lever. Do not attempt to pull out or push in on rod (6) to align with brake arm—

adjust slack adjuster by turning slack adjuster adjusting nut.

d. Removal.—(1) Uncouple tubing from chamber.

(2) Remove the two cotter keys and nuts from chamber studs.

(3) Remove the cotter key and clevis pin from push rod, and lift chamber out of mounting brackets.

e. Replacement.—Replacement of chamber is in reverse of removal. When replacing, be sure line port in chamber is up, and drain port is down.

12. BRAKE CHAMBER DIAPHRAGM.—*a.* Chamber diaphragm should be replaced once every two years.

b. Test for and correcting leaks in the brake diaphragm.—(1) Apply the brakes.

(2) Paint the edge of the diaphragm with soapy water.

(3) When making test with soapy water, a 3-inch bubble in three seconds is permisible.

(4) If leakage is detected, tighten the bolts uniformly around the diaphragm until it disappears. Never tighten the bolts to the point where the edge of the diaphragm starts to bulge, inasmuch as this greatly weakens the diaphragm.

(5) If the diaphragm is defective, air will escape around the rubber boat on the brake rod when the brakes are applied and the diaphragm must be replaced as follows:

c. Disassembly.—(1) Remove the brake chamber from the trailer by removing the two chamber nuts which hold it to the mounting bracket, disconnect the tubing assembly and pull the clevis pin at the brake lever.

(2) Place the chamber in a vise and draw a nail or other sharp object across the chamber edge to mark it for reassembly.

(3) Remove the bolts, replace the diaphragm and tighten bolts (Figure 29).

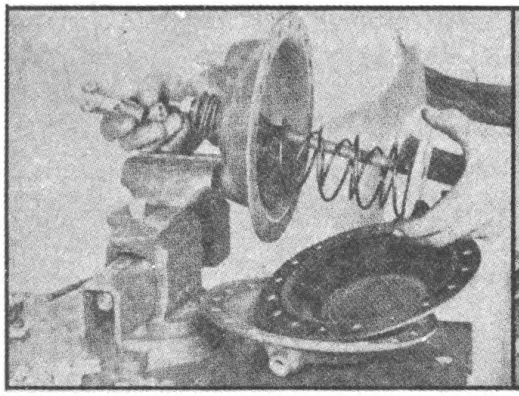


FIGURE 30. BRAKE CHAMBER DISASSEMBLED

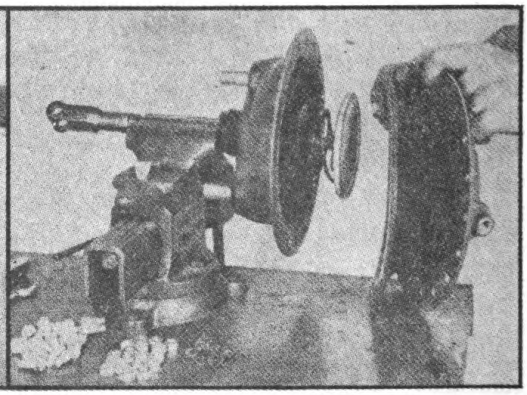


FIGURE 29. REPLACING BRAKE CHAMBER DIAPHRAGM

d. Replacing brake chamber springs, pressure plate, rods, boots.—(1) Follow the procedure outlined above for the disassembly of the brake chamber.

(2) Remove the brake push rod and install the new spring. Make sure the spring is seated properly on push rod plate (Figure 30).

(3) Bent or worn pressure plates should be replaced.

(4) Slightly bent brake push rods may be straightened; if severely bent, they should be replaced.

(5) Worn boots should be replaced.

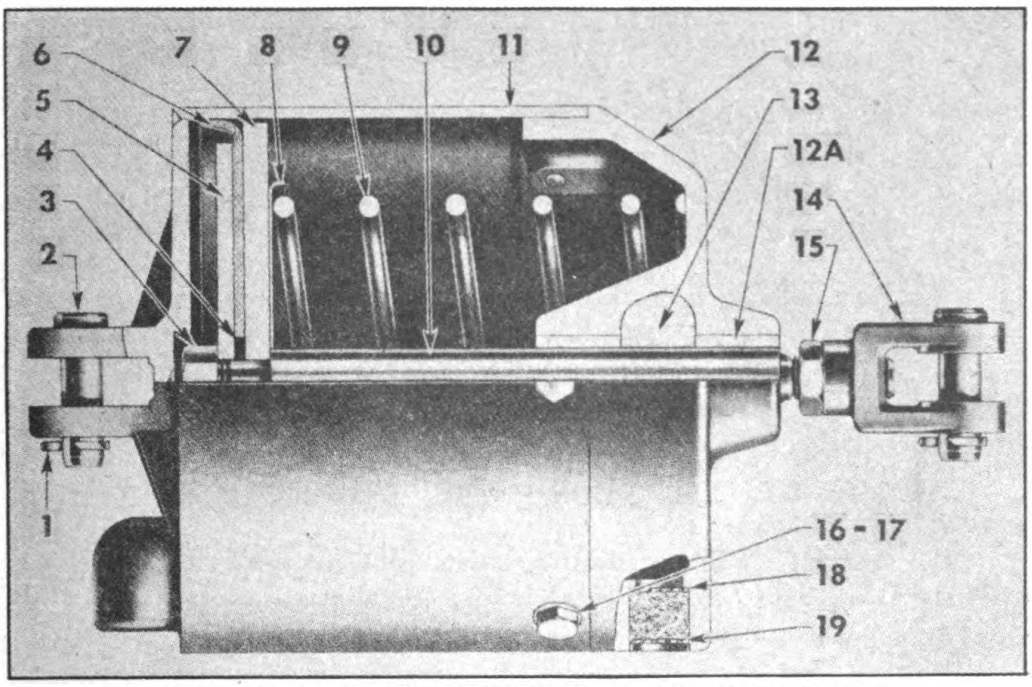


FIGURE 31. BRAKE CYLINDER—SECTIONAL VIEW

13. BRAKE CYLINDERS (Figure 31).—*a. Function.* The function of the brake cylinder is to convert the energy of compressed air into the mechanical force necessary to expand the brake shoes against the brake drum and apply the brakes. Air pressure from the relay-emergency valve enters port behind piston (5), air held in check by packing cup (6) moves the piston-cup assembly, and push rod (10) forward so as to rotate brake lever and apply the brakes.

b. Removal.—(1) Rear brakes are operated by four brake cylinders which are mounted on two plates. The plates are installed in rocker beams.

(2) Disconnect the two air lines which run to cylinders (Figure 32)

(3) Disconnect the brake rods at front and rear end of walking beam.

(4) Disconnect the two parking brake rods.

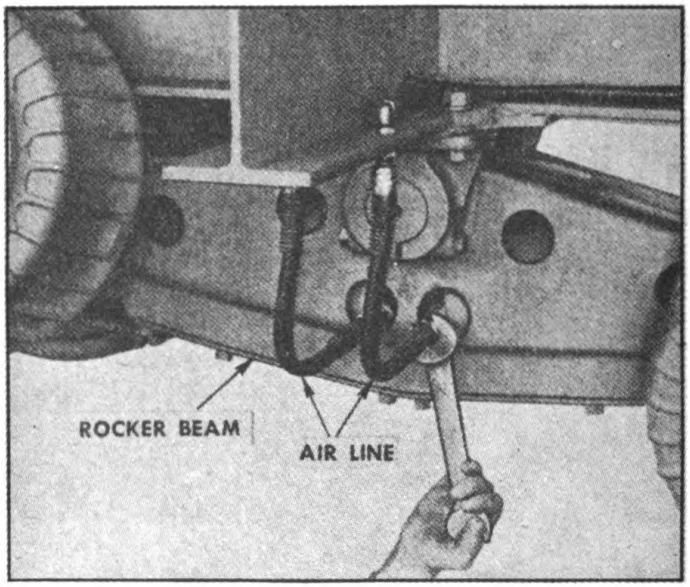


FIGURE 32. REMOVING BRAKE LINES AT WALKING BEAM

(5) Remove the bolts holding mounting plate to walking beam and lower the complete assembly to the ground (Figure 33).

(6) After brake mounting plate has been removed the brake cylinder may very easily be dismounted. Just remove the two clevis pins from brake lever and mounting bracket (Figure 34).

c. Replacement.—(1) Replacement of cylinder is in reverse of removal procedure.

(2) NOTE: When installing clevis pins be sure clevis pins are coated with a light film of grease before installation and see that slide section of parking brake rod is well greased.

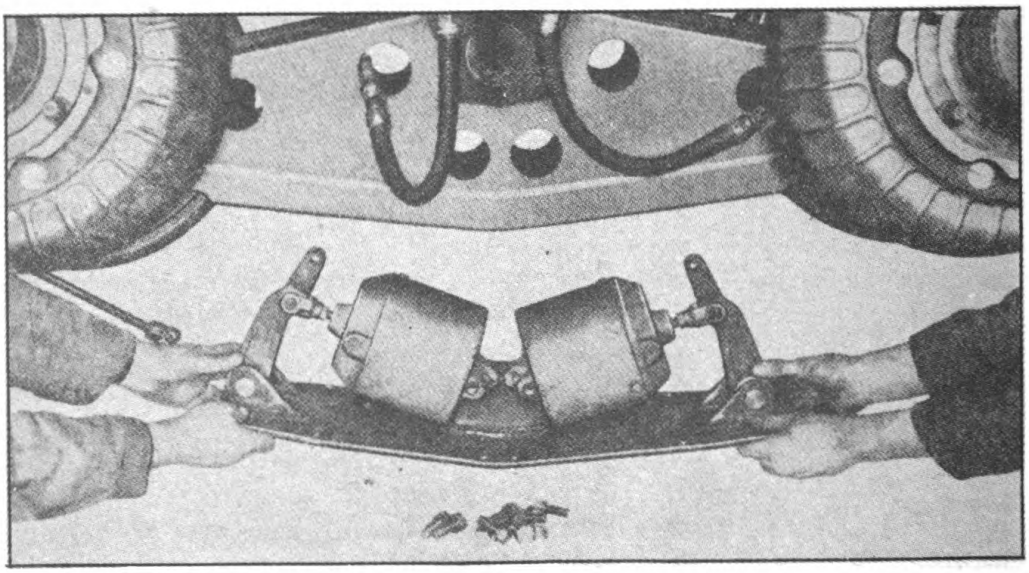


FIGURE 33. LOWERING BRAKE MOUNTING PLATE

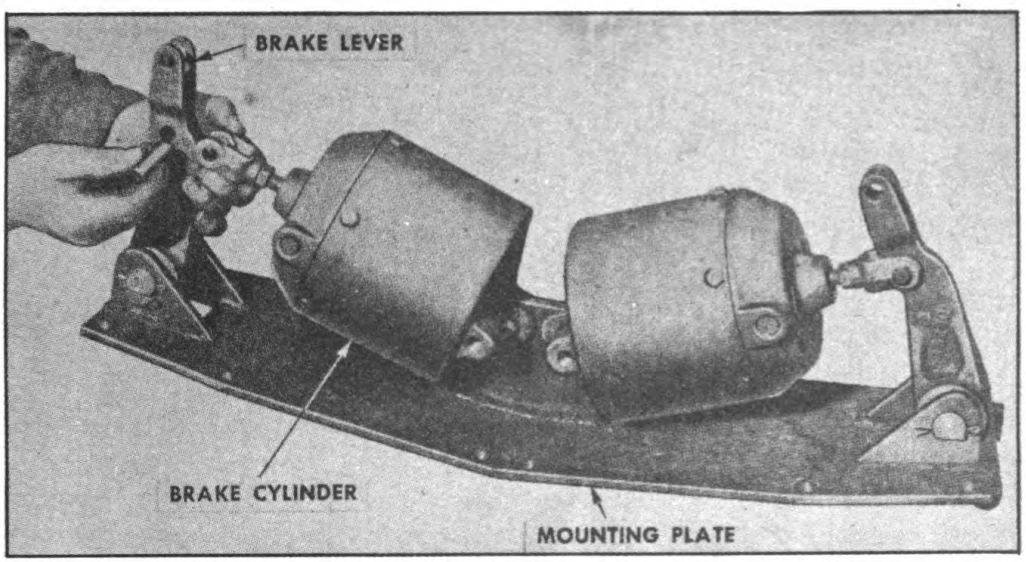


FIGURE 34. REMOVING CYLINDER FROM MOUNTING PLATE

d. Testing for leakage.—(1) It will be necessary to remove brake cylinder from unit to test for leakage.

(2) Apply 60 lbs. of air pressure to cylinders.

(3) With a brush and soap suds paint around bolting flange, at the opening to the air strainer, and around the push rod guide.

(4) Excessive leakage should be corrected by disassembling the cylinder, thoroughly cleaning all parts, and replacing the packing cup.

e. Disassembly (Figure 35).—(1) Remove the six cap screws holding the cylinder head in place and pull push rod and piston assembly out of cylinder body.

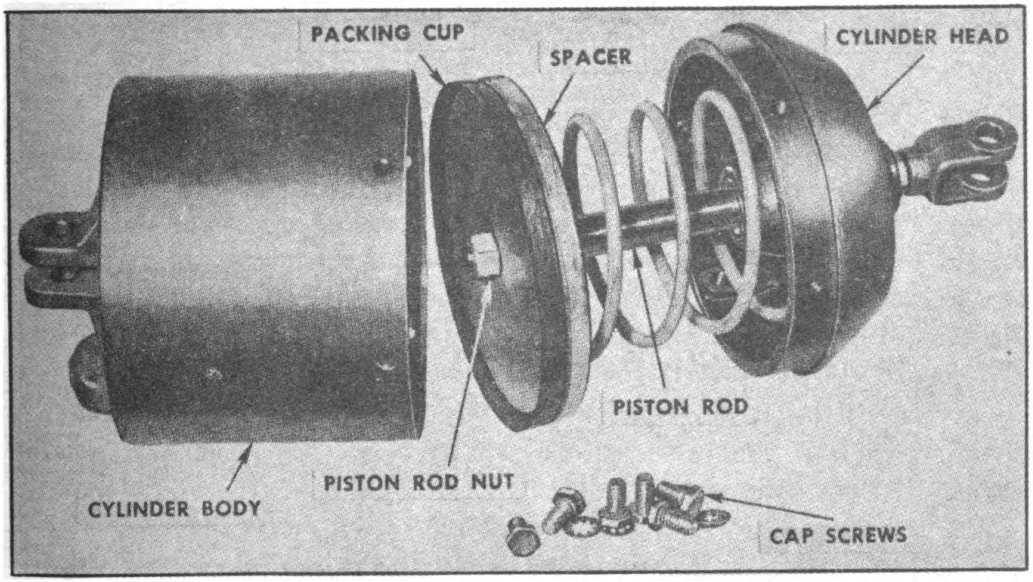


FIGURE 35. CYLINDER—DISASSEMBLED

(2) Remove piston rod nut, piston follower, spacer, packing cap and piston.

(3) Piston rod may then be removed from cylinder head, if necessary.

f. Lubrication (Figure 31).—(1) CAUTION: *(a)* Whenever disassembled, cylinder parts should be thoroughly cleaned and lubricated before reassembly.

(2) Packing cup and cylinder walls should be lubricated with a good grade of light lime base grease.

(3) The felt oiler in the cylinder head (12) should be removed and the cavity around it filled with a good grade of light cup grease.

g. Reassembly.—(1) Reassembly of cylinder is in reverse of disassembly procedure.

(2) CAUTION: When reassembling cylinder extreme care should be exercised to make certain the packing cup is not damaged when placing the piston assembly in the cylinder.

h. Maintenance (Figure 31).—(1) Brake cylinder requires very little attention unless subject to extreme temperatures and difficult operating conditions.

(2) The air strainer (19) should be kept clean by periodically removing the hair and washing in cleaning fluid.

(3) Once each year the cylinder should be removed from trailer and completely disassembled. All parts should be cleaned and a new packing cup installed (6), if necessary. (See paragraph *f.*, Lubrication, this section.)

14. RELAY-EMERGENCY VALVE (Figure 36).—*a. General.*—(1) This trailer is equipped with two relay valves which are located at rear of trailer, ahead of rear underconstruction. They are bolted to longitudinal members.

(2) These relay-emergency valves are identical in construction and are interchangeable.

b. Function (Figure 36).—(1) 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 brakes in case the trailer breaks away from the tractor.

(2) Fundamentally, its function is to operate so as to deliver and maintain the same air pressure in the trailer brake chambers as the brake valve on the tractor delivers to it.

c. Operation (Figure 36).—(1) The operation of the relay-emergency valve is dependent upon the air pressure delivered to it by the brake valve on the tractor.

(2) This brake valve pressure is delivered to the relay-emergency valve through the service line and enters the cavity above the rubber diaphragm through port (1). Because this cavity is small and, there-

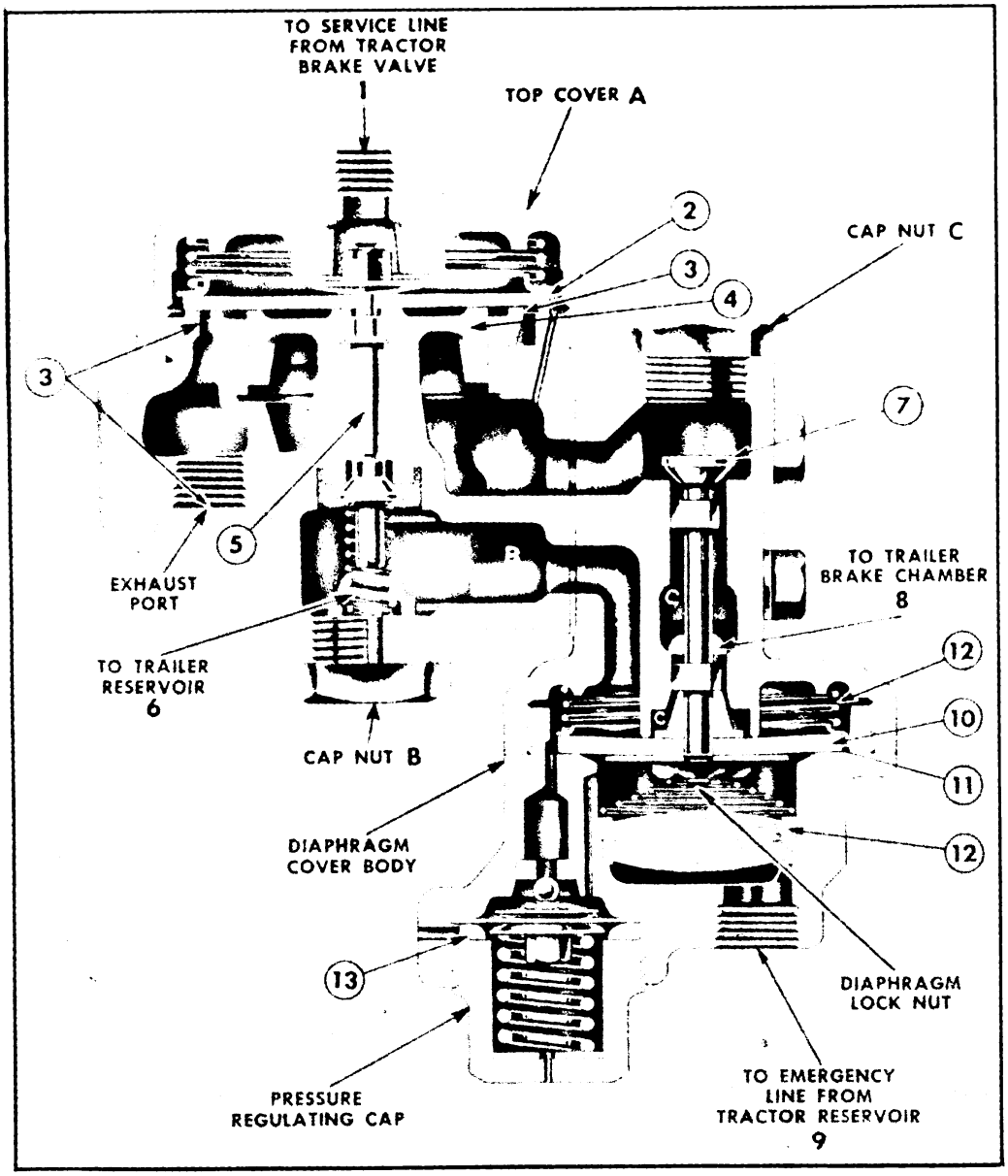


FIGURE 36. RELAY EMERGENCY VALVE.

fore, subject to quick changes in air pressure, the action of the valve in changing its delivered pressure is also very rapid.

(3) The mechanism inside the relay-emergency valve assumes three positions during normal operation. These three positions are the:

(a) Applying Position—When the valve is actually delivering air pressure to the brake chambers.

(b) Holding Position—When the valve is maintaining or holding a constant pressure in the brake chambers.

(c) Releasing Position—When the valve is reducing or releasing air pressure in the trailer brake chambers.

The mechanism inside the valve is so arranged that it can assume another position called the Emergency Position. The mechanism only assumes this position when some abnormal condition, such as a trailer break-away, causes a drop in the air pressure in the trailer emergency line. Under these conditions, the valve permits full trailer reservoir pressure to pass into the trailer brake chambers, applying the trailer brakes; and at the same time, prevents loss of trailer reservoir pressure through the broken trailer emergency line.

(d) Operation of the valve in each of these positions is as follows:

(1) *Applying position.*—As air pressure from the brake valve on the tractor passes through the service line on the trailer and enters port (1) to the cavity above diaphragm (2), the pressure developed depresses the diaphragm. The diaphragm thus seals the exhaust port (3) underneath its outer edge and its center is deflected, forcing the diaphragm guide (4) down against the top of supply valve (5). Continued movement forces this supply valve off its seat and permits air pressure from the trailer reservoir, entering port (6), to flow through cavity A, past emergency valve (7) and out port (81) to the trailer brake chambers.

(2) *Holding position.*—As soon as the air pressure being delivered to the brake chambers equals the pressure being delivered to the relay-emergency valve by the brake valve, the pressure above and below diaphragm (2) is equalized and the center of the diaphragm lifts and resumes its normal position. This permits the supply valve spring to close supply valve (5) limiting the air pressure being delivered to the trailer brake chambers to the same pressure being delivered to the relay-emergency valve by the tractor brake valve. In this position, action of the spring on top of diaphragm (2) makes the outer edge of the diaphragm seal the exhaust port (3). Thus the valve is in its Holding Position maintaining the same air pressure in the trailer brake chambers as the brake valve on the tractor is delivering to it. A rise in brake valve pressure causes the same action until the higher pressure in the trailer brake chambers is similarly established.

(3) *Releasing position.*—If the brake valve pressure above diaphragm (2) is reduced, the trailer brake chamber pressure below the diaphragm overcomes the pressure above the diaphragm and the diaphragm lifts still further. This opens exhaust port (3) permitting the pressure in the trailer brake chambers to exhaust until a lower balanced pressure is reached. If the brake valve pressure on top of the diaphragm is released entirely, the relay-emergency valve also releases all pressure from the trailer brake chambers thus fully releasing the brakes.

(4) *Emergency position.*—The trailer emergency line, connected to port (9) of the relay-emergency valve is directly connected through the trailer emergency line to the tractor reservoir. Any sudden drop in pressure in this trailer emergency line will cause the relay-emergency valve to go to emergency position and apply the trailer brakes. Nor-

mally, the same air pressure is present above and below the emergency diaphragm (10). If a sudden drop in pressure in the trailer emergency line occurs, the pressure trapped above diaphragm (10) forces its outer edge to seal at (11) preventing the further loss of air through port (9) and the trailer emergency line. This pressure also depresses the center of the diaphragm, breaking the seal at (12) and closing the emergency valve (7).

When this occurs, air flows from the trailer reservoir through cavities B and C and out port (8) to the trailer brake chambers, applying the trailer brakes. The trailer brakes are thus applied automatically, due to an abnormal drop in emergency line pressure.

During normal operating conditions, it sometimes happens that the air pressure in the tractor reservoir will fall below the air pressure in the trailer reservoir. If this difference in pressure develops to a sufficient degree, it can be seen how an undesired emergency application might result. In order to guard against this, a pressure regulating cap is included in the assembly. The valve in this cap normally remains open as long as the pressure is above 70 to 80 pounds. This permits pressure above diaphragm (10) to equalize with pressure below the diaphragm as long as the pressure is above 70 to 80 pounds. However, should the pressure drop below this point, the valve in the pressure regulator cap will close, preventing any further equalization of pressure and a continued gradual drop in pressure below diaphragm (11) will also cause an emergency trailer brake application. Thus if leakage develops in the tractor brake system or the trailer emergency line beyond the capacity of the compressor and such leakage causes the air pressure in the tractor brake system to drop below a safe limit, the trailer brakes will be automatically applied to stop both vehicles.

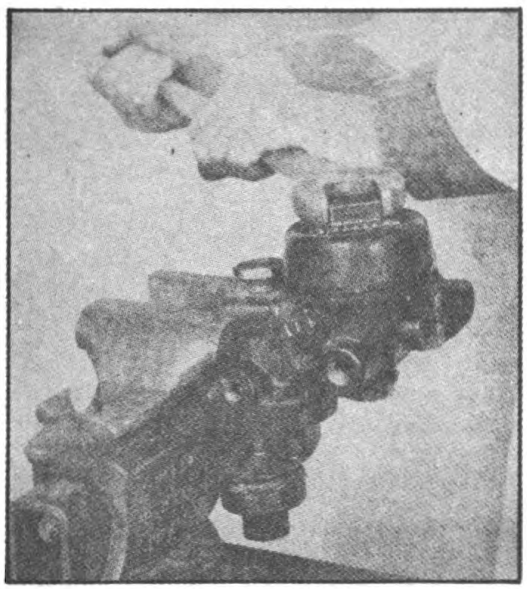


FIGURE 37. REMOVING TOP COVER PLATE

FIGURE 38.
REMOVING GUIDE RING

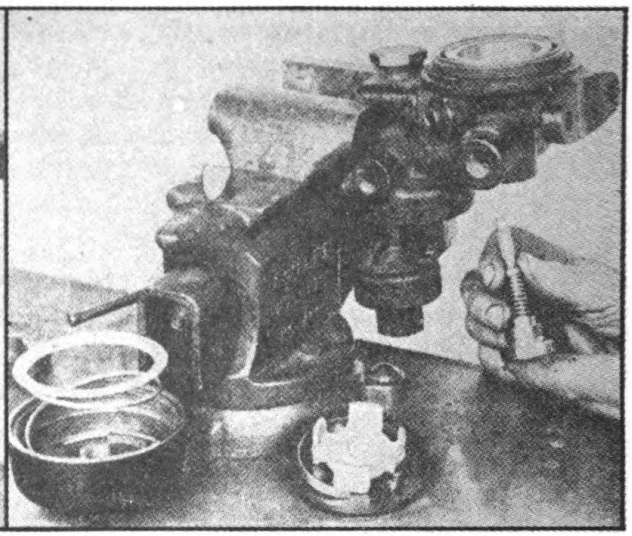


FIGURE 39.
CLEANING INTAKE VALVE

(5) *Disassembly:* Diaphragms (2) and (10) should be replaced once a year.

(a) To clean or replace diaphragm (2) (Figure 36):

1. With the valve held firmly in a vise, remove top cover (A) (Figure 37).

2. Lift out the diaphragm guide ring (Figure 38), remove cotter key, nut and washer holding the diaphragm to the guide. Lift out the diaphragm and replace.

3. Reassemble by reversing the procedure outlined above.

(b) Cleaning or replacing intake valve (5) (Figure 36):

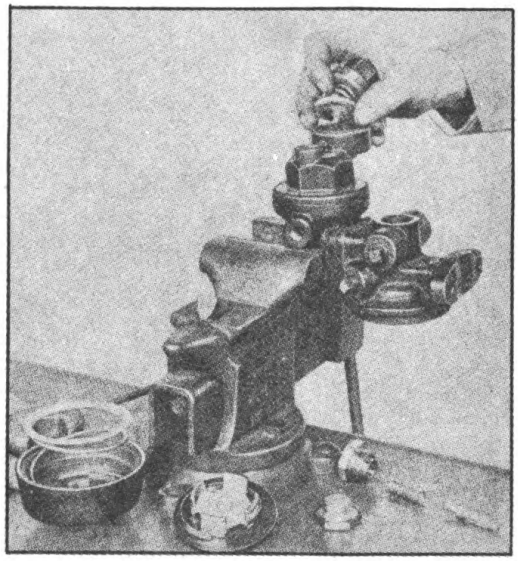


FIGURE 40. REMOVING PRESSURE REGULATING CAP

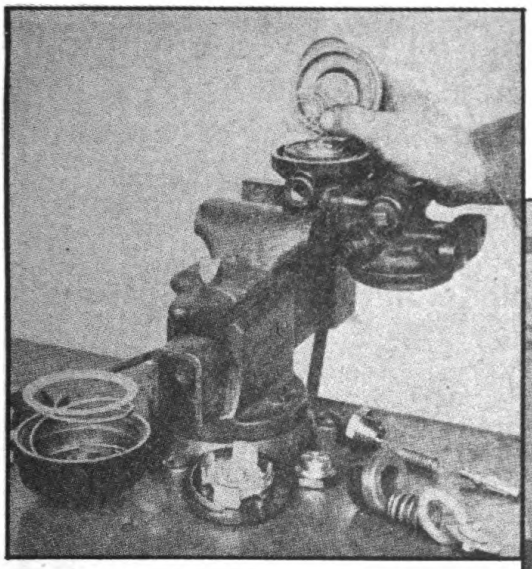


FIGURE 41. REMOVING DIAPHRAGM COVER BODY

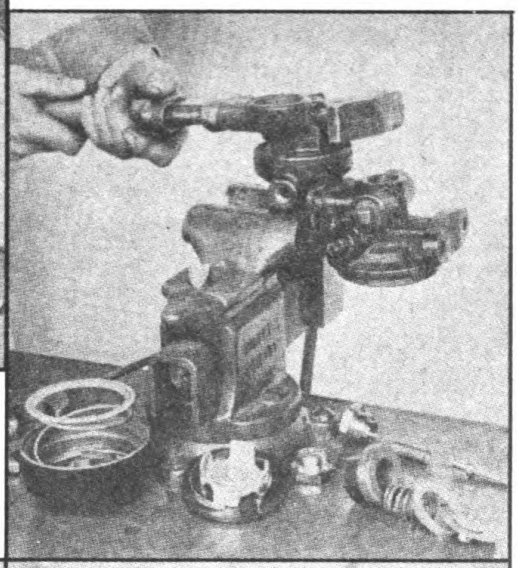


FIGURE 42. LIFTING OUT SPRING AND RETAINER

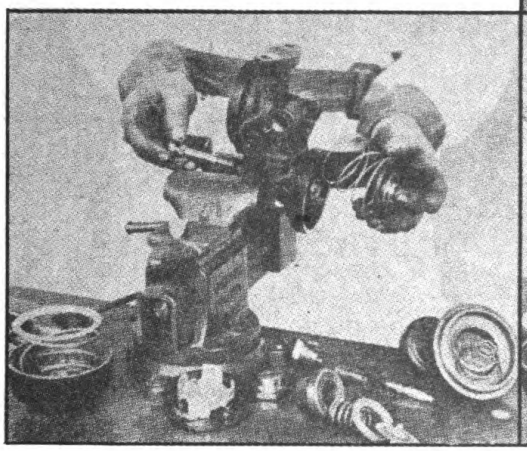


FIGURE 44. PULLING OUT VALVE AND DIAPHRAGM

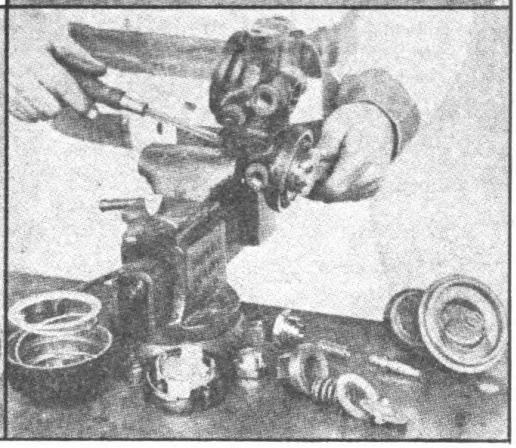


FIGURE 43. REMOVING LOCK NUT FROM VALVE STEM

1. Remove the cap nut (B).

2. Extract the intake valve with a pair of long nose pliers.

3. Clean. Replace (Figure 39).

(c) Cleaning or replacing diaphragm (13) (Figure 36):

1. Remove pressure regulating cap, spring and diaphragm (Figure 40).

2. Remove stem lock nut. Lift diaphragm and diaphragm follower from stem. Clean and replace.

3. Reassemble by reversing the procedure outlined above.

(d) Cleaning or replacing diaphragm (10). Washing strainer (12) (Figure 36).

1. Remove diaphragm cover body (Figure 41).

2. Lift out spring and strainer (Figure 42).

3. Remove cap nut (C) (Figure 36). Insert screwdriver into slotted top of valve and remove diaphragm lock nut (Figure 43). Pull out the valve stem and diaphragm (Figure 44).

4. Clean the strainer and diaphragm in cleaning fluid. Install a new diaphragm if necessary.

5. Reassemble by reversing the procedure outlined above.

(6) *Maintenance* (Figure 36).—(a) The complete valve should be removed from the trailer, dismantled, thoroughly cleaned, and diaphragms (2) and (10) should be replaced at least once a year.

(b) Strainer (12) should be removed and cleaned in cleaning fluid about every six months.

(7) *Leakage tests* (Figure 36): (a) With brakes released, cover exhaust port with soap suds. Leakage is caused by supply valve (5) not seating properly.

(b) With brakes applied, cover exhaust port with soap suds. Leakage is caused by diaphragm (2) not seating properly.

(8) *Emergency feature tests* (Figure 36): (a) With full pressure in the trailer reservoir, disconnect emergency line between tractor and trailer. Trailer brakes should apply automatically. This feature should be checked daily.

(b) Cover emergency line hose coupling at front of trailer with soap suds to check for leakage. Leakage is caused by diaphragm (10) not seating properly at (11).

(c) With valve still in emergency position, cover exhaust port with soap suds. Leakage in excess of that evident in test one is caused by valve (7) not seating properly.

(9) NOTE: When making leakage tests with soap suds, a 3-inch bubble in three seconds is permissible. Leakage may be caused by dirt on the valves, valve seats, diaphragms, or diaphragm seats and may be corrected by cleaning. It may also be caused by worn diaphragms, valves, or seats. Worn diaphragms should be replaced. Worn valves or valve seats may be reclaimed by grinding with Bendix-Westinghouse (Grade 1000) Grinding Compound unless the wear is excessive. If such procedure fails to correct the leakage, the valves and valve seats should be replaced or the complete assembly replaced with a repair exchange unit.

15. TUBING.—*a. Repair.*—When air line tubing becomes kinked or bent, cut out the damaged section and splice in a new one, using standard brass Westinghouse sleeve-type 3/8″ tube union.

16. HOSE COUPLING.—*a. Replacement of packing rings.*—(1) Hose couplings are provided with rubber packing rings which act as gaskets to seal coupled hoses. In time, usually about a year, these become worn or distorted and should be replaced. Simply pry out the old packing rings and push in new ones.

(2) Use of dummy hose couplers prevents the entrance of foreign matter into the braking system. They should be used whenever the hoses are not coupled.

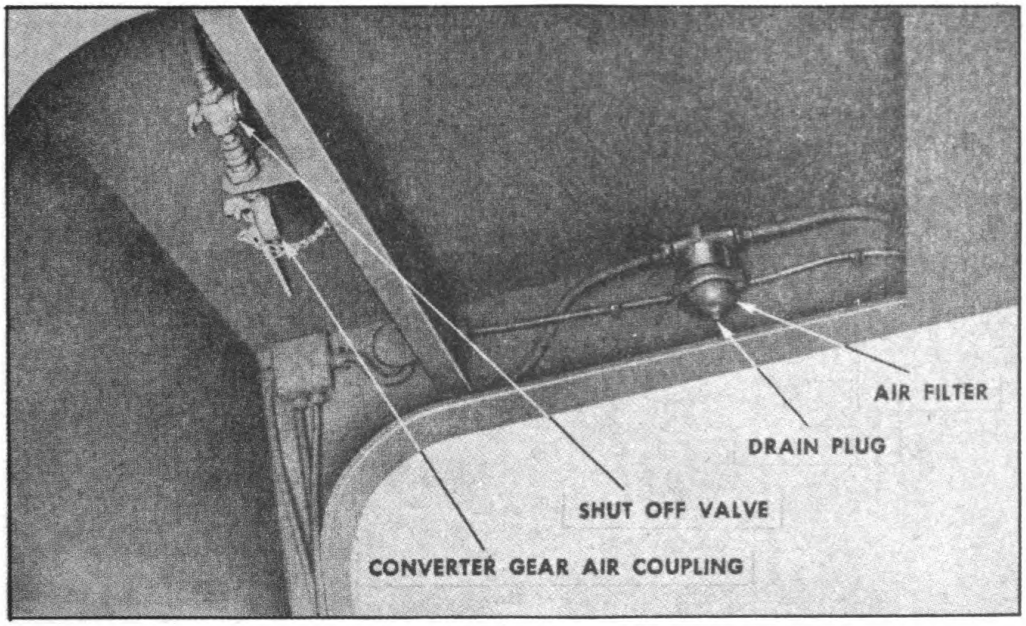


FIGURE 45. AIR FILTER

17. AIR FILTER.—*a. Function* (Figure 45).—Air filters are mounted on inside of main frame side rails, just ahead of drop in frame, one filter in service line and one in emergency line. Filter is designed to remove dirt, water, and oil from air, thereby increasing the life of the functional parts of the emergency relay valve.

b. Maintenance.—No adjustments are necessary. However, filter should be drained every 2,000 miles. Draining of filter is accomplished by simply removing plug in bottom of filter. The filter should be disassembled and air cleaner washed in cleaning fluid every 5,000 miles.

c. Disassembly.—(1) Disconnect the lines leading into the filters. Remove the two bolts holding filter to bracket.

(2) Remove the two cap screws (1) holding cup (2) to upper section of filter. Tap down on cup, separating cup from upper section.

(3) Remove rubber gasket (3); remove cleaner seat (4) and pull out cleaner (5) (Figure 46).

d. Reassembly.—Reassembly is in reverse of disassembly. When replacing rubber gasket be sure to insert it in the groove provided for, in upper section.

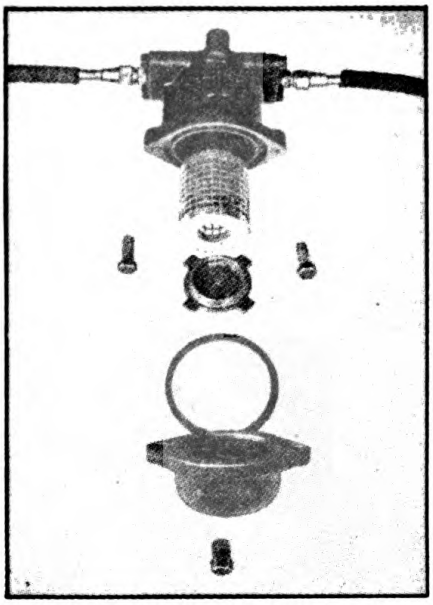


FIGURE 46. AIR FILTER—DISASSEMBLED

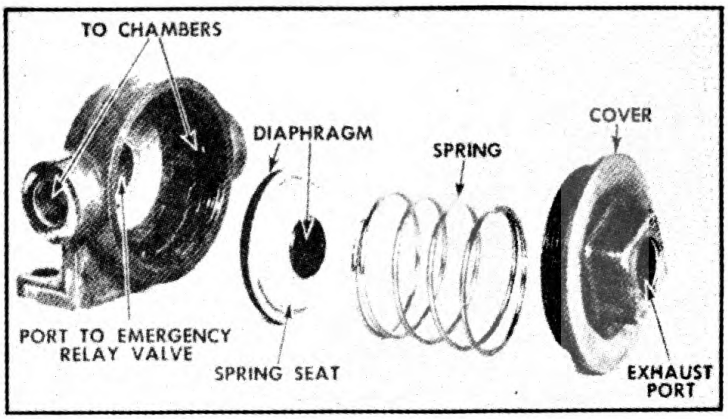


FIGURE 47. QUICK RELEASE VALVE—DISASSEMBLED

18. QUICK RELEASE VALVE.—*a. Operation* (Figure 47).—(1) Quick release valve is mounted on converter gear frame between the two brake chambers.

(2) The quick release valve is operated by air pressure from the brake valve entering into the cavity above the diaphragm. As the air pressure enters this cavity it forces the exhaust seat of the diaphragm against the edges of the exhaust port, sealing the exhaust and permitting the air pressure from the brake valve to pass to the brake chambers. As the brake valve is released the air pressure and the force of the spring lift the diaphragm, removing the exhaust seat from the exhaust port and releasing the air pressure accumulated in the brake chambers to atmosphere.

b. Test for leakage.—Apply brakes, cover exhaust port (open only port on valve) with soap suds to detect leakage. A three-inch bubble

every three seconds is permissible. Leakage is caused either by dirt on the diaphragm exhaust valve seat or by a worn exhaust valve seat. Dirt leakage may be remedied by cleaning the exhaust valve seat. However, if leakage is caused by a worn exhaust valve seat, replace entire valve assembly.

c. Disassembly.—This valve can be disassembled without removing unit from trailer. Screw off cover, remove spring and lift valve assembly out (Figure 47).

19. BRAKES.—Service Diagnosis and Remedy.

SYMPTOM AND PROBABLE CAUSE	PROBABLE REMEDY
a. Slow brake application.	
(1) Low brake line pressure.	(1) Check air pressure at tractor coupling ends. Air supply should not be less than 70 lbs. for proper application. (See tractor manual on maintenance for service procedure.)
(2) Bent rod in chamber or cylinder.	(2) Straighten or replace.
(3) Excessive travel in chamber or cylinder push rod.	(3) Give brakes minor adjustment.
(4) Restriction in line.	(4) Clean or replace tubing or hose.
(5) Leaking diaphragm in brake application chamber, or leaking cylinder.	(5) Tighten chamber bolts or replace diaphragm.
(6) Binding levers and slack adjuster.	(6) Oil—loosen.
(7) Dirt under relay exhaust valve or diaphragm.	(7) Clean relay valve diaphragm.
(8) Dirty air filter.	(8) Clean.
b. Slow brake release.	
(1) Low brake line pressure also results from slow brake application.	(1) See tractor maintenance manual.
(2) Dirty air filter.	(2) Clean.
(3) Brake valve lever on tractor not returning fully to stop.	(3) Adjust operating rod. See tractor maintenance manual.
(4) Binding cam or binding slack adjuster or brake arm.	(4) Lubricate and align properly.
(5) Brake chamber rod travel is excessive.	(5) Give brake adjustment.
(6) Restriction in tubing or hose.	(6) Clean or replace.
(7) Improper seating of valves and relay emergency valve.	(7) Clean or replace valve with reconditioned unit.
c. Emergency brake failing to hold.	
(1) Dirt under emergency valve, diaphragm and emergency valve stem.	(1) Clean or replace emergency valve diaphragm or valve stem.
d. No brakes on one or more wheels.	
(1) Sheared key in brake lever on cross shaft.	(1) Replace.

SYMPTOM AND PROBABLE CAUSE	PROBABLE REMEDY
(2) Clevis pin out of levers or rods.	(2) Replace.
(3) Broken cam shaft.	(3) Replace.
(4) Out of adjustment.	(4) Adjust.
(5) Chamber diaphragm leaking.	(5) Replace diaphragm.
(6) Lining worn.	(6) Reline.
e. One or more brakes running hot.	
(1) Return spring broken in hub.	(1) Replace.
(2) Key sheared in brake lever.	(2) Replace.
(3) Return spring missing on levers.	(3) Replace.
(4) Rust on clevis and clevis pins.	(4) Lubricate.
(5) Rusty anchor pin.	(5) Lubricate.
(6) Hand brake not in complete off position.	(6) Release.
(7) Binding brake lever or rods.	(7) Lubricate.
(8) Brake return spring worn.	(8) Replace.
(9) Lever return springs loose, not enough tension.	(9) Replace spring, or lengthen the distance between the two coupling points.

SECTION V

Coupler

1. GENERAL.—The coupler, or fifth wheel, is mounted on the converter gear frame and is used to couple trailer and converter gear together.

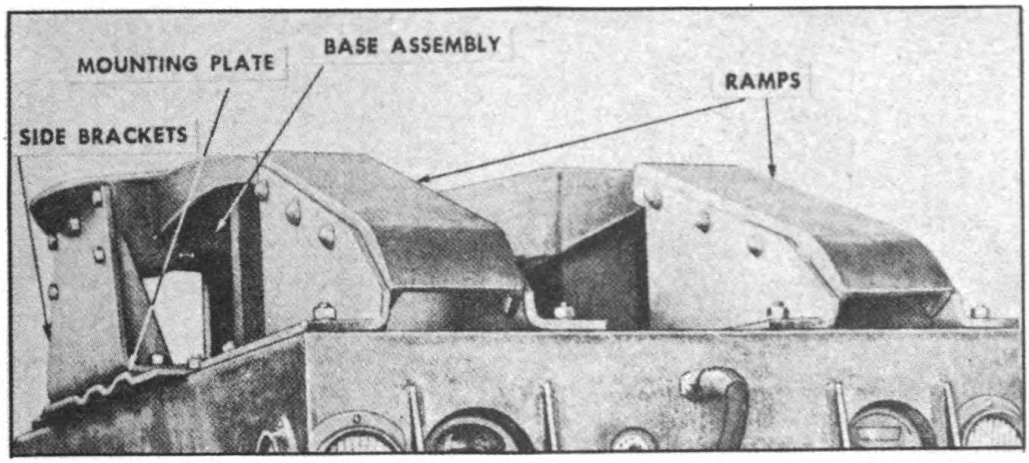


FIGURE 48. COUPLER REMOVAL

2. REMOVAL (Figure 48).—Remove the bolts holding base and side brackets to mounting plate. Lift the coupler assembly off converter gear.

3. REPLACEMENT.—*a.* Replacement of coupler is in reverse of removal procedure.

***b.* NOTE: Before putting replacement coupler in use, spread a heavy film of grease over the embossed portion of coupler and work a little grease around the hook.**

4. TESTING AND CORRECTING PLAY IN HOOK (Figure 49).—

***a.* If the hook pin (17) becomes worn, the coupler will develop an excessive "slap" and lost motion. The following repairs may be made with coupler attached to converter gear.**

(1) NOTE: Because the coupler is easily removed, we recommend that coupler be removed and turned upside down, when performing the above operation.

(2) *Hook* (Figure 49): (a) *Removal:* 1. Remove cotter pins (12 and 18) and nuts (11).

***2.* Pull the hook handle (16) out to the unlocked position.**

***3.* Remove the two cap screws (14) and lift hook handle guide off coupler.**

***4.* Uncouple spring (27) and remove eye bolt (1).**

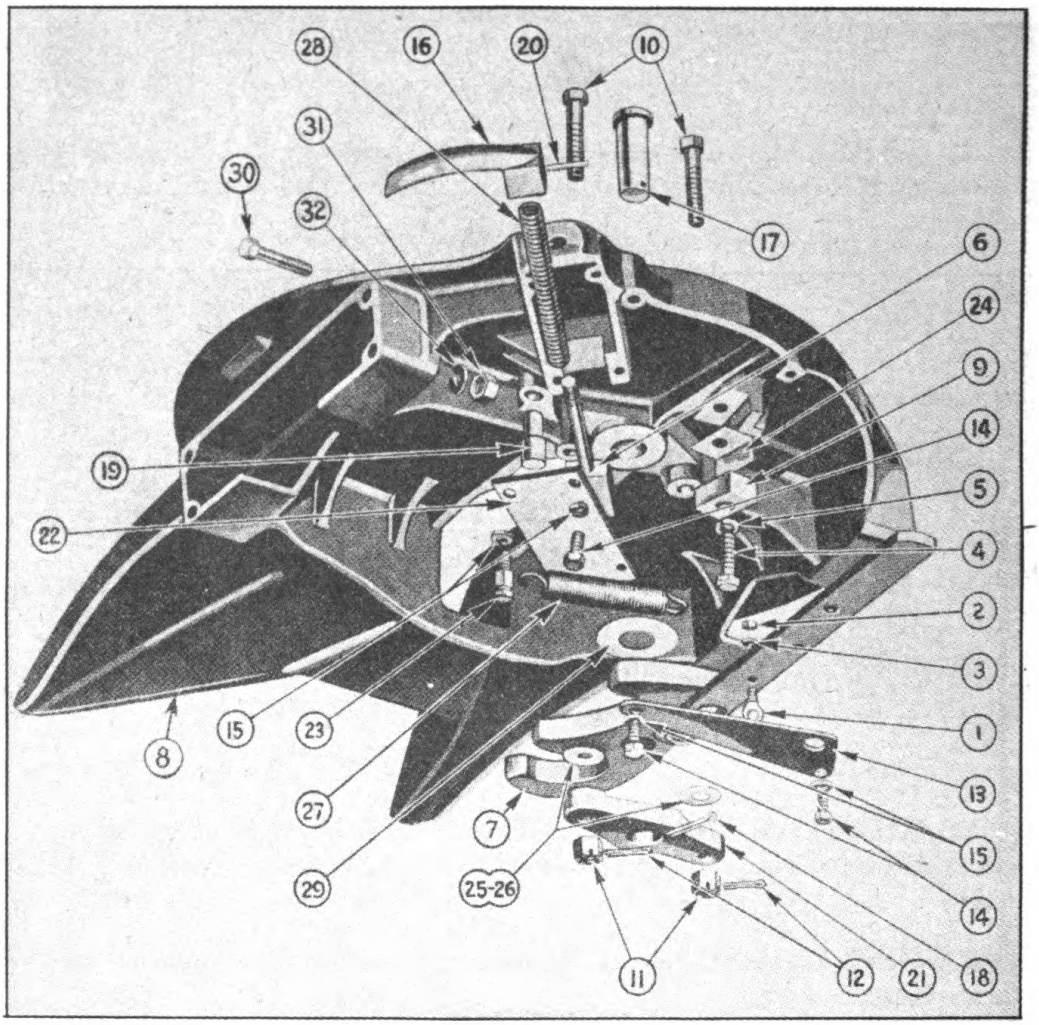


FIGURE 49. COUPLER—EXPLODED

5. Lift the shims (25 and 26) off bolts (10) and lift the hook (7) out.

(b) *Replacement* (Figure 49): *1.* Place a light film of grease around pin (17), over washers (29), and on the surface of hook plate.

2. **Place washers (29) over hook pin (17).**

3. **Place hook (7) over hook pin (17).**

4. **Place shims (25 and 26) over bolts (10).**

5. **Place hook plate (21) over hook pin (17) with the embossed surface down and install the two nuts (11) on the bolts (10).**

6. **Install the eye bolt (1) to hook handle (7).**

7. **Couple the spring (27) between the eye bolt in hook handle and special hook spring cap screw (23).**

8. **CAUTION: Test operation of hook. It should move freely without any up and down play. If the hook moves too freely and there**

is up and down play remove a shim (25 and 26). If hook binds add a shim on each of the bolts (10). After proper adjustment continue the reassembly.

9. Install the cotter key (18) through pin (17).

10. Install the two keys (12), place guide plate (13) in position, and tighten, using the two cap screws (14).

(c) *Installation of hook lock handle* (Figure 49).—*1.* When performing this operation disconnect converter gear from trailer.

2. Remove the hook lock handle (16) by removing the drive pin (20) which holds it to the threaded lock stem (6).

3. Remove hook spring (27).

4. Remove the hook lock cover plate (22).

5. Put the hook (7) in locked position.

6. Pry down on the hook lock (6) and tap the end of the hook lock stem. The hook lock and lock spring (28) will come out.

7. When re-assembling, the slanted or beveled part of the lock must be in toward the hook handle.

5. COUPLER.—Service Diagnosis and Remedy.

SYMPTOM AND PROBABLE CAUSE	PROBABLE REMEDY
a. Excessive lash between coupler and trailer.	
(1) Coupler hook or hook pin worn out.	(1) Replace.
(2) King pin worn.	(2) Replace.
b. Excessive wear on coupler base.	
(1) Coupler base scored and gouged.	(1) Check upper coupler for burrs in metal which may cause gouging. Grind smooth and lubricate.
c. Coupler noisy.	
(1) Loose mounting bolts or nuts.	(1) Check nuts (11 and 31), tighten (Figure 49).
d. Semi-trailer whips.	
(1) Loose coupler.	(1) Tighten mountings.

e. NOTE: At times, difficulty may be encountered when uncoupling. This is no fault of the functional parts of the coupler. The trouble lies in the fact that the trailer king pin is binding on the hook. This is caused by the trailer and tractor being as far apart as possible without actually being uncoupled. All that is necessary to overcome the difficulty is to apply a light pull by hand on the hook handle prior to uncoupling.

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SECTION VI

Drawbar

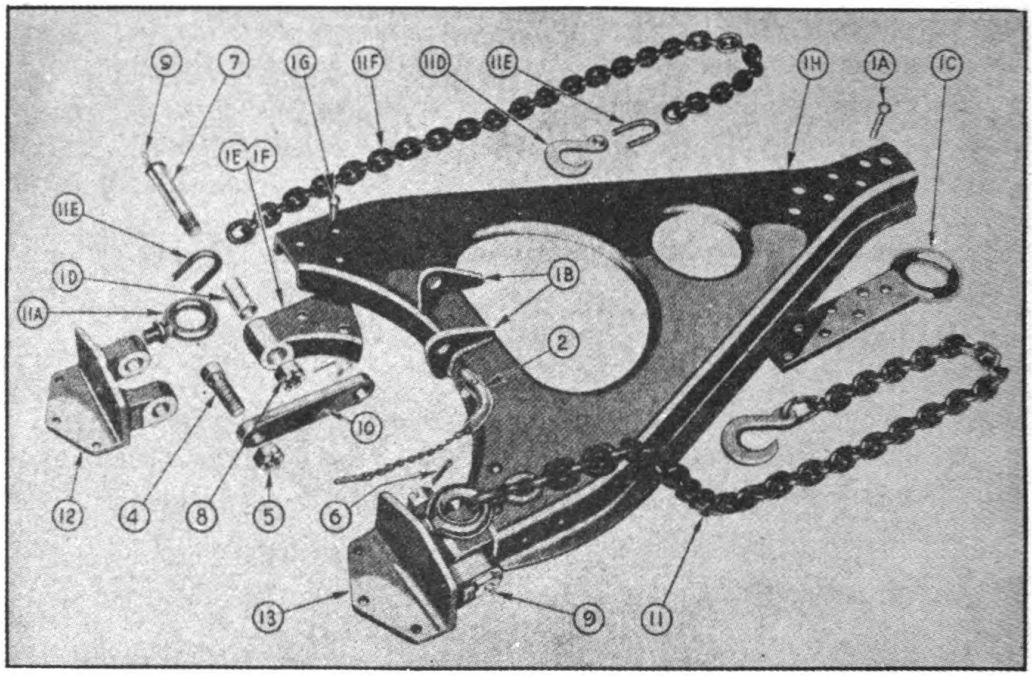

FIGURE 50. DRAWBAR—EXPLODED

1. REBUSHING DRAWBAR (Figure 50).—*a.* New drawbar bushings (1D) come from factory reamed to the proper diameter and care should be used when replacing the new bushing not to burr or mushroom their ends in installation.

(1) Remove the drawbar (1H) from the gear at the frame brackets (13) by removing the cotter pins and castle nuts (8) from the hinge bolts (13) and driving out hinge bolts (7) with a heavy hammer and bar.

(2) Remove the old bushing (1D) by skimming down one side of the steel bushing (3) with an acetylene cutting torch, using care not to cut the casting (1E). Bushing can then be driven out with 1¾″ diameter steel bar, or pressed out on arbor press.

(3) Using an arbor press, put the new bushing into position.

(4) Try bolt (7) in the bushing (1D). If the bolt will not go in, ream to 1½″ diameter.

2. REPLACING EYE (Figure 50).—*a.* This operation can be performed with the drawbar attached to the gear frame.

(1) Cut off the top heads of the seven 5/8″ rivets (1A), using a torch or a cold cut.

(2) Hit the eye (1C) with a sledge hammer to free the eye (1C)

from the drawbar (1H). Do not attempt to drive the old rivets out with a punch.

(3) Bolt the new eye (1C) into position with two bolts.

(4) Drive five rivets, remove the two bolts and drive the remainder. Do all bucking from under side of drawbar.

3. REPLACING AND REPAIRING SAFETY CHAINS (Figure 50).—*a.* Safety chains are held to the front crossmember with eye bolts (11A). By removing weld from inner side of eye bolt with an acetylene cutting torch, a complete safety chain can be replaced.

b. Bent hooks can be heated and bent back to their natural shape. Hooks can be replaced by cutting the link next to the hook and by using a 1/2″ cold shut link. Any part of the chain can be spliced, or links replaced through the use of cold shut links. Whenever cold shut links are used, the open ends should be clamped together and welded.

4. INSTALLING DRAWBAR FRAME BRACKETS (Figure 50).—*a.* Bolt frame brackets (12) to the frame crossmember using three 1/2″ bolts in each bracket.

b. Place the drawbar in place and insert hinge bolts (7), leaving the nuts (8) off.

c. Drive four rivets in each bracket (12). Remove the drawbar and finish driving the rivets. By following these instructions all possible chance of the drawbar (1H) not fitting the brackets (12) is eliminated.

5. RIVETING AND INSTALLING HINGE BRACKETS.—*a.* Cut rivets and welds from hinge brackets (1E-1F).

b. Bolt replacement hinge bracket (1E-1F Right and Left) to drawbar (1H), using three 7/16″ bolts.

c. Install drawbar (1H) to frame brackets (12 and 13).

d. Drive three rivets, remove bolts and finish driving.

e. Remove drawbar from frame brackets (12) and weld. By following the above instructions you eliminate all possible chance of the drawbar (1H) not fitting frame brackets (12 and 13).

6. DRAWBAR.—Service Diagnosis and Remedy.

SYMPTOM AND PROBABLE CAUSE	PROBABLE REMEDY
a. Trailer whips when traveling at maximum speed.	
(1) Drawbar bushing worn.	(1) Rebush.
(2) Loose eye.	(2) Re-rivet.

SECTION VII

Electrical System — Lights

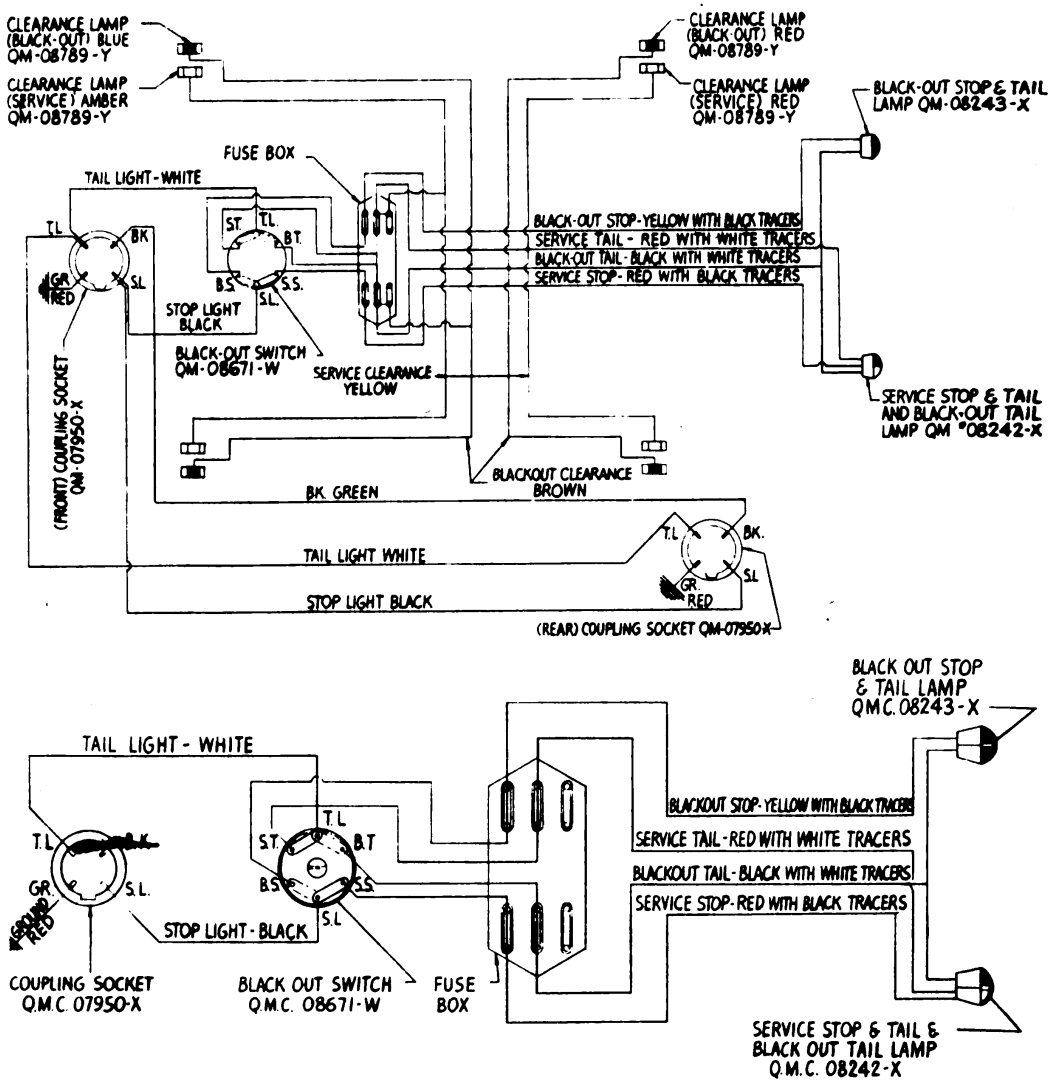

FIGURE 51. WIRING DIAGRAM

1. WIRING.—The general electrical circuit diagrams shown in (Figure 51) illustrate all of the electrical circuits used on this vehicle. With these diagrams, the various circuits can be traced and wiring replacement made. 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 circuit diagrams (Figure 51).

2. LIGHTS.—The lighting equipment on this trailer includes two commercial clearance lights, two clearance blackout lights, two combination blackout stop and blackout tail light, two combination service stop and tail light and blackout tail light.

a. The combination service stop and tail light and blackout tail light is mounted at the left hand rear of the trailer and converter gear. The combination blackout stop and blackout tail light is mounted at the right hand rear of the trailer and converter gear.

b. 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.

c. 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 (Figure 52).

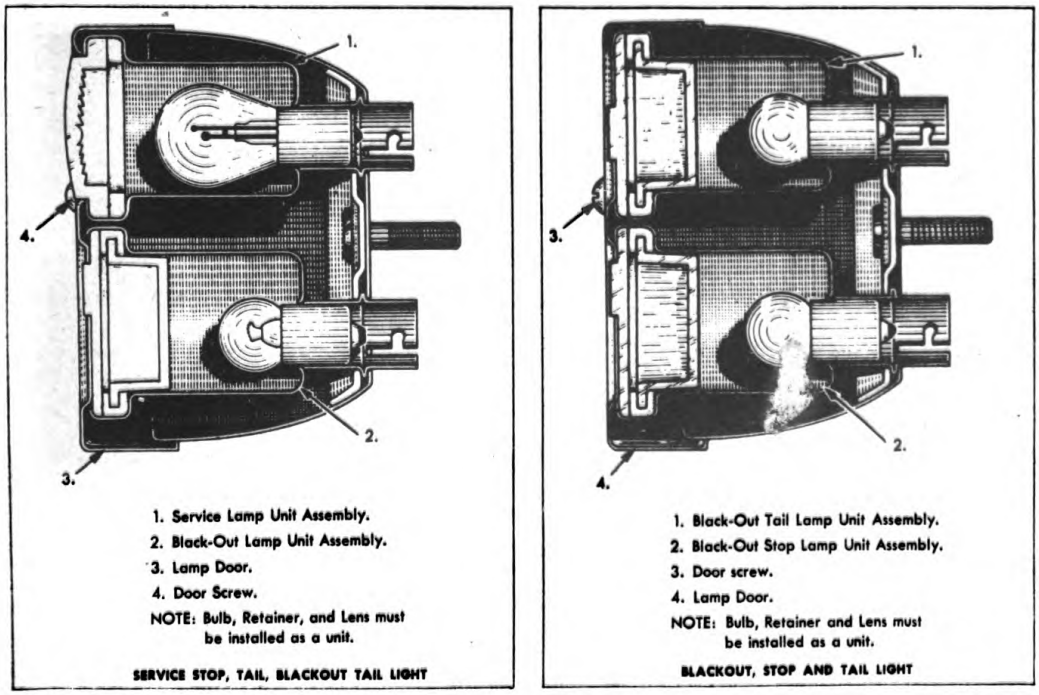

FIGURE 52. SECTIONAL VIEW OF LIGHTS

d. Blackout switch.—The two blackout switches are located on the left or road side at drop in side rail and on rear crossmember of converter gear. The switches are operated with a coin or screwdriver. They are either at a service or blackout light position. There is no "off" position. Flow of current is controlled by the light switch on the truck.

e. The fuse panels are located on the left hand side rail at the drop in the frame and on rear crossmember of converter gear. The panels are protected by a steel box cover, held to the panel by two wing nuts. Fuses are of 1½ amperes capacity.

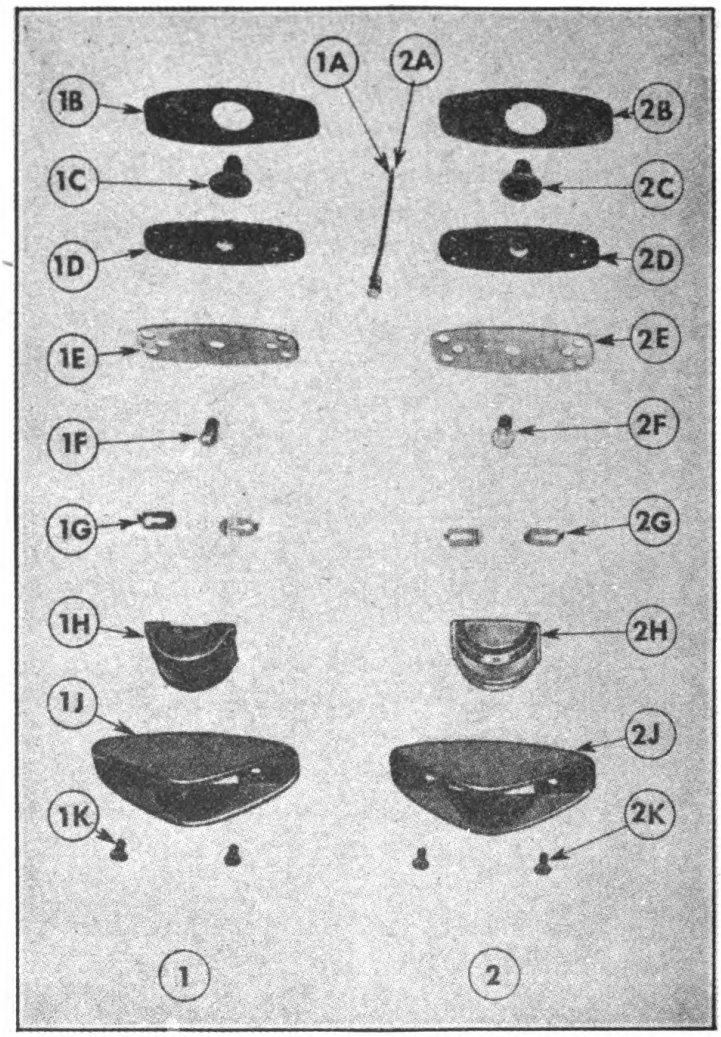

FIGURE 53. CLEARANCE LIGHTS—(1) BLACKOUT—(2) STANDARD

3. CLEARANCE LAMPS.—Servicing procedure on both standard clearance lamps and blackout clearance lamps is identical (Figure 53).

a. Replacing lens.—(1) Turn the two screws holding lens housing to lamp about three-quarters of the way out and lift housing off.

(2) Push either of the two clips from lens and lift lens out of housing.

(3) NOTE: Correct position of blackout lens can be verified by the marking, "bottom," and the arrow pointing down.

b. Replacing bulb.—(1) Turn the two screws holding lens housing to lamp about three-quarters of the way out.

(2) Lift off housing and remove bulb.

(3) When reinstalling housing, be sure felt gasket is put back in position on lamp assembly.

c. Replacing lamp assembly.—(1) Remove lens housing.

(2) Remove felt gasket.

(3) Remove the four bolts holding lamp to frame.

(4) Pull out on lamp,

(5) Remove tape from spliced wire and cut wire leaving it as long as possible.

(6) NOTE: These wires are soldered. If, when replacing lamp, solder is not available, splice the two wires by twisting them together and tape thoroughly.

4. LOCATING TROUBLE.—*a.* Electrical system of towing vehicle will not be discussed in this manual. Source of current will therefore 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.

b. 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 jumper cable, this will indicate jumper cable is in good condition.

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

5. LIGHTS.—Service Diagnosis and Remedy.

SYMPTOM AND PROBABLE CAUSE	PROBABLE REMEDY.
a. Failure to light when other lamps light.	
(1) Burned out bulb.	(1) Replace.
(2) Grounded or broken circuit.	(2) Check connections back to switch.
(3) Stop light switch impaired.	(3) Check and replace if necessary.
(4) Bulb loose or improperly mounted.	(4) Make sure lamp terminals engage socket terminals firmly.
b. Lights dim.	
(1) Bulb loose or incorrectly mounted.	(1) Push bulb fully into socket.
(2) Dirty lens.	(2) Clean.
(3) Poor connection at socket or ground.	(3) Check socket, circuit and insulation; repair or replace.
c. Lights flicker.	
(1) Loose wire connection or intermittent ground.	(1) Check wires and insulation; repair or replace.

SECTION VIII

Frame and Platform

1. GENERAL.—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.

2. 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.

3. REPLACING FRAME MEMBERS.—Severely bent and twisted members should be cut out and replaced.

4. REPAIRING SECTION OF A MEMBER.—*a.* 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. The result is a stronger weld.

b. Back up all spliced joints with a plate or channel reinforcement extending about 6″ on each side of the joint on the inner side of the channel. Put one 1″ diameter hole in every four square inches of space on the splice plate or channel. These holes are to be used for plug welding.

c. Whenever possible, all section splices and reinforcements should be arc welded. This method is recommended for all frame repairs.

d. NOTE: 1″ plug welding hole should be welded solid with bare welding rod. For the remainder of the welding use a coated rod.

5. SPRING HANGERS (Figure 54).—*a.* NOTE: When replacing spring hangers or auxiliary spring brackets disconnect converter gear from semi-trailer.

b. Removal, rear spring hanger.—Removal procedure for rear spring hanger is identical to that of front spring hanger except that there is no radius rod to be removed.

c. Removal, front hanger (Figure 54).—(1) Remove outer and inner wheels on both sides. With wheels removed the hanger is much more easily worked on, especially when rivets are being driven.

(2) Turn gear over and rest it on three horses, two at rear lengthwise and one at front crosswise of frame.

(3) Disconnect radius rod at front end only (Figure 54).

(4) Remove inner shackle and drive upper and lower shackle bolt out as an assembly (Figure 55).

(5) Place a jack between frame and axle to hold weight of the spring off hanger.

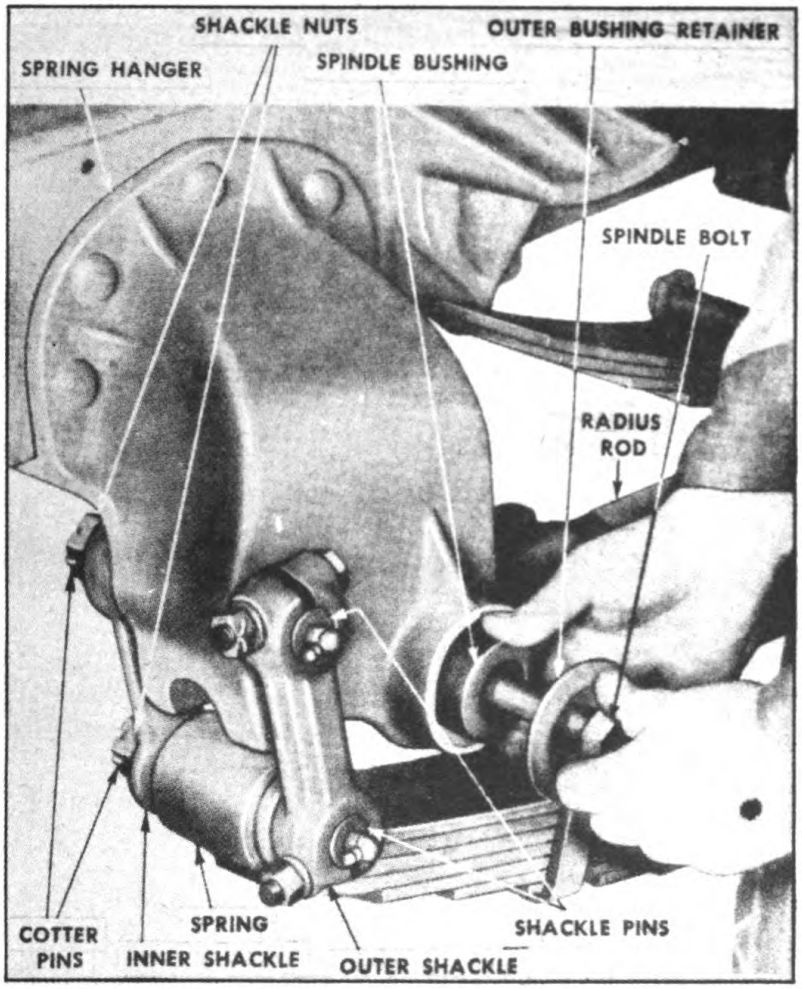

FIGURE 54. REMOVING SPRING HANGER

(6) *Removing rivets:* (a) Using an acetylene torch, with a No. 2 cutting tip, cut inner and outer heads off rivets.

(b) NOTE: Do not attempt to drive rivets out with a punch; but blow through the remaining portion, thus cleaning the hole.

(c) Clean the slag out of the holes using a 3/8″ long tapered punch and a hammer.

(d) Tap spring hanger off frame with a hammer.

(7) NOTE: Rear hangers are interchangeable from right to left. Front hangers come in right and left hand and are not interchangeable. Before installing, check to make certain hanger is mounted properly by checking with (Figure 1).

(8) *Bolting and reaming:* (a) Bolt the replacement hanger into position, using three 1/2″ bolts. Place one bolt in the center of vertical hole and the other two in the second hole from the top at each side of hanger. Draw these bolts up tight, and check to make certain spring hanger is up tight against frame.

(b) Ream the five open holes with a 17/32″ tapered reamer.

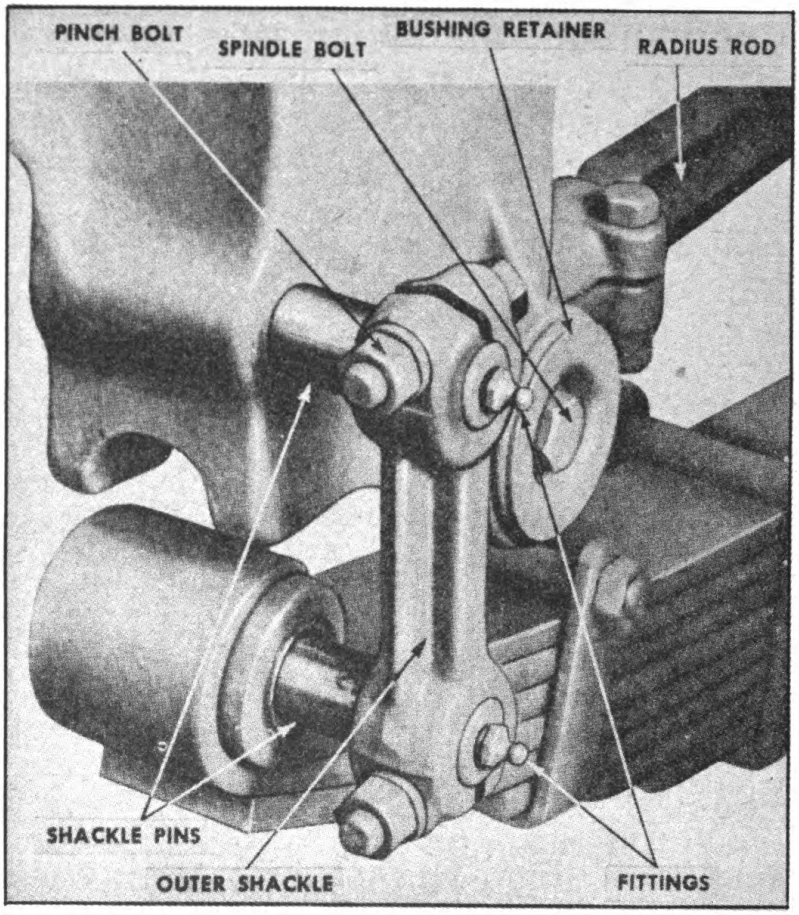

FIGURE 55. REMOVING SHACKLE AND PIN ASSEMBLY

(9) *Riveting:* (a) **CAUTION: When driving rivets drive the vertical ones first.**

(b) NOTE: If riveting hammer is not available ream holes to 9/16″ and use 9/16″ bolts and lockwashers.

(c) When riveting, hot rivets should be used as they can be properly driven with air hammer and bucking bars. Length of rivet to be used depends on condition or oversize of the hole to be used and thickness of pieces to be riveted. Condition of the riveting jack is also a factor. Ordinarily, 1⅛″ stock, projecting past the surface of the part to be riveted is sufficient on all 1/2″ rivets. As stated before, the 1⅛″ stock should be sufficient for a proper head. However, if a collar forms on the first rivet as it is being driven, this indicates that the rivet is too long. The remaining rivets should be shortened by 1/8″ If the rivet has a head that is not full and down, it is too short and 1/8″ should be added to the remainder to be driven.

(d) Before making any changes in length of rivets inspect the inner heads to make sure bucking has been done properly. See that rivet head is snug all around.

(e) Whenever front spring hanger has been replaced check axle alignment. See Section II, paragraph 1.

SECTION IX

Pintle Hook

1. **REMOVAL (Figure 56).—*a.*** The pintle hook is bolted to a mounting plate at rear of trailer. By removing the nut and washer from hook shaft, the hook assembly can be pulled out of sleeves and spring which are held within the box section.

2. **DISASSEMBLY (Figure 57).—*a.*** Place shaft end of hook (1) firmly in vice.

b. Remove cap screw (10) from latch and drive out latch pin (7).

c. Lift out the latch (3).

d. Remove cotter key (15) and nut (12) from the lock bolt (9) and pull bolt out.

3. **REPLACEMENT AND REASSEMBLY OF PINTLE HOOK.—*a.*** Reverse the disassembly procedure.

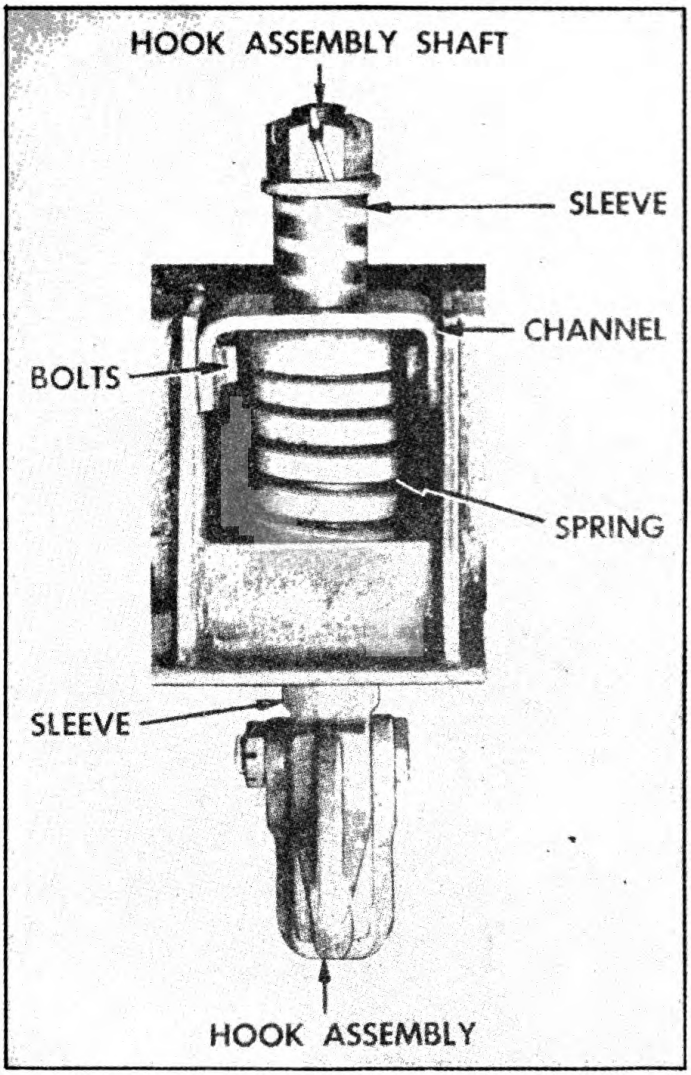

FIGURE 56. PINTLE HOOK

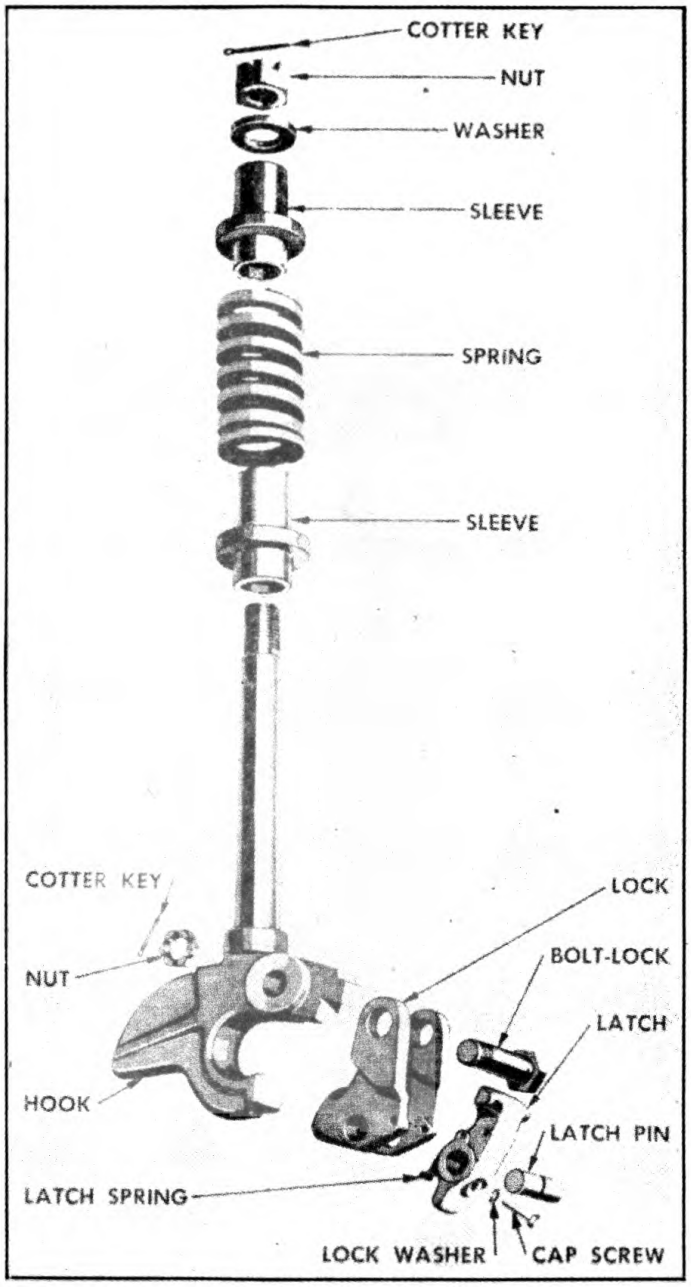

FIGURE 57. PINTLE HOOK—EXPLODED

b. When reassembling, place a light film of grease on latch pin, and between lock and latch. This will prevent rust from forming and insure free operation of latch and lock.

4. PINTLE HOOK SPRING AND SLEEVE, REMOVAL (Figure 56).—*a.* Remove four bolts holding channel to box section.

b. Remove the nut and washer from shaft of hook.

c. Pull hook assembly out of spring and sleeves.

5. PINTLE HOOK SPRING AND SLEEVE, REPLACEMENT.—Reverse the removal procedure.

SECTION X

Radius Rods

1. REMOVAL (Figure 58).—This unit is equipped with two radius rods; one adjustable and the other fixed. Servicing and removal procedure for each is the same.

a. Remove spindle lock screws from each end of radius rod.

b. Remove cotter key, nut, spindle bolt, and the two concave retainer washers.

c. Using a pair of pliers, twist the rubber bushings off the spindle.

d. Drive spindle out of radius rods with a punch and a heavy hammer.

e. CAUTION: When driving spindle out guard against bending or loosening the two flat inner rubber bushing retainers.

2. REPLACEMENT (Figure 58).—*a.* NOTE: One end of radius rod has spindle lock screw hole in the end. The other end has lock screw hole at the bottom. Place radius rod in position with the end hole to front in the spring hanger. The other end, which fits into bracket at axle, should be down. Axle end of radius rod is more difficult to connect, therefore it should be coupled first.

b. Place radius rod in position.

c. Install spindle. (Make sure the two inner flat retainer washers are on spindle between each side of radius rod.)

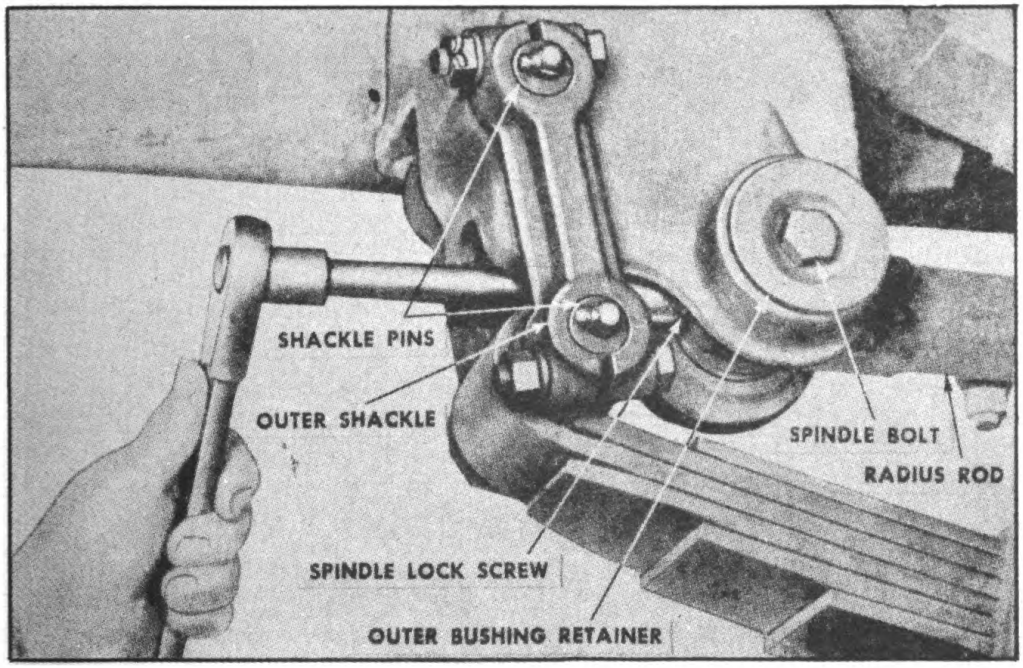

FIGURE 58. REMOVING SPINDLE LOCK SCREW

d. Using a pair of pliers turn spindle until lock screw hole in spindle is in alignment with hole in radius rod.

e. Install lock screw and tighten.

f. Place inner and outer rubber bushings in position.

g. Install the outer concave retainer washers and spindle bolts. (Do not tighten spindle bolt until after both ends of radius rod have been fastened.)

h. NOTE: Rubber bushings are interchangeable as all four are identical.

i. CAUTION: If difficulty is encountered when installing rubber bushings do not use any lubricant to work bushings into position. With the aid of a pry bar squeeze bushings into place.

SECTION XI

Springs

1. REMOVING MAIN SPRING (Figure 59).—*a.* Uncouple converter gear from semi-trailer and place two jacks under axle on the side from which you intend to remove spring.

***b.* Remove the four nuts from U-bolts.**

***c.* Remove upper and lower shackle bolt nuts, and drive upper and lower shackle bolts out in one unit.**

***d.* CAUTION: When driving out shackle bolt assembly keep clear as one end of spring will fall to ground.**

***e.* Remove shackle assembly from opposite end and pull spring out.**

2. INSTALLING MAIN SPRING.—*a.* Replacement of main spring is in reverse of removal.

***b.* NOTE: When replacing spring make certain spring chair is properly placed on spring and that dowel pin is placed in spring chair. When tightening U-bolt nuts use a wrench with at least 3 ft. of leverage.**

3. REMOVING AUXILIARY SPRING.—*a.* Place a jack under frame at front and rear on the side from which you intend to remove auxiliary spring.

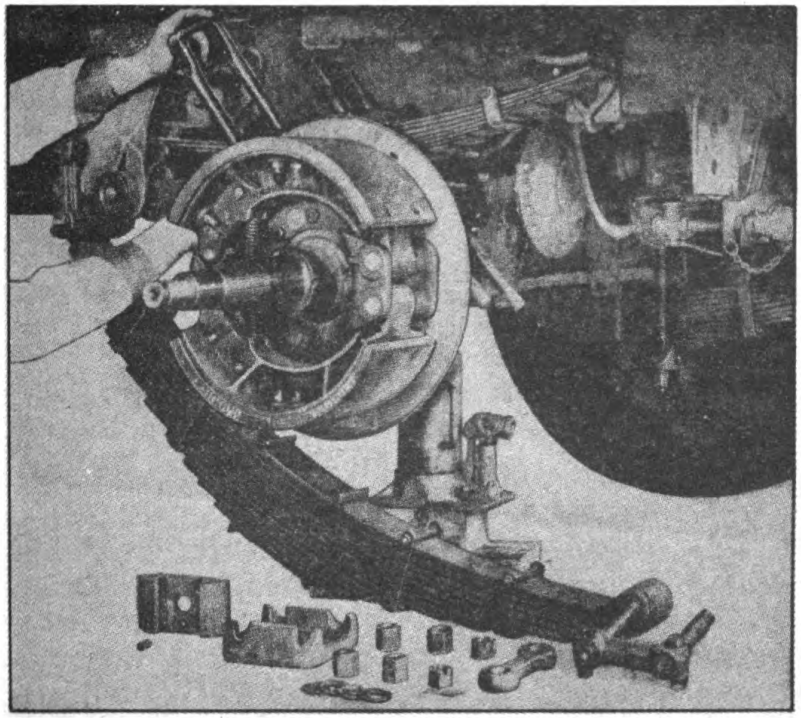

FIGURE 59. SPRING REMOVAL

b. Remove the four U-bolt nuts and pull U-bolts out of the spring assembly.

c. Lift U-bolt seat and auxiliary spring off the axle assembly.

d. Installing auxiliary spring.—Installation of auxiliary spring is in reverse of removal.

4. SPRING REPAIR.—*a.* With the spring on two wood horses place a C-clamp on spring near spring center bolt.

b. Remove nut from spring center bolt and drive out the bolt using a long tapered punch and heavy hammer.

c. Remove the four clip bolts and clip spacers.

d. Remove C-clamp.

e. Inspect all leaves for cracks and breaks. Replace.

f. Check all spring clips; if loose, heat rivets with a heating torch and tighten. Use a ball peen hammer.

5. REPLACING BOTH SPRINGS.—*a.* When replacing both springs, check the arch of the springs prior to installation—it can vary as much as 1/4″—and install the spring with the greatest amount of arch on the curb side. Always keep the spring clip bolts to the inside and nuts to the outside when springs are mounted. This eliminates possible tire damage.

b. Using a piece of straight board as a level, place it across the main leaf from end to end. Measure the distance at the center bolt from board to bottom of spring to determine the arch.

6. REBUSHING SPRINGS AND HANGERS.—*a.* Jack up unit at frame until spring tension is relieved.

b. Remove shackle pin nuts and lift inner shackle off shackle bolts on one end of spring only.

c. Drive upper and lower shackle pins out in one unit using a copper hammer.

d. Inspect the shackles for wear. If worn, reverse them when reassembling. In other words, place the smooth side of each shackle toward the wearing surface. Do not change the position of the shackle from the inner to the outer side of the spring.

e. Outer shackles are easily removed. Remove the two pinch bolts and drive out the shackle pins.

f. Place a 15/16″ x 1-3/16″ bushing driver in bushing hole and drive the old bushing out with a heavy hammer.

g. Place the new bushing over the small end of the bushing driver and drive in. A 1″ washer between the shoulder of the bushing driver and the new bushing will act as a stop when driving, prevent the bushing from going in too far, and prevent the end of the bushing from becoming "mushroomed."

h. After the new bushing has been installed, ream to 1″ diameter.

i. Install shackle bolts and repeat the rebushing operation on the other end of the spring. By removing the shackle bolts from only one end at a time, the spring is held firmly in place while the bushing is being driven out and in and strain is removed from the spring clips.

7. MAINTENANCE.—*a.* Springs should be given frequent visual inspection under hard service. Springs should be checked immediately if trailer does not ride level.

b. Spring shackles should be drawn up tight enough to take up all play caused by wear, but not so tight as to prevent free action of shackles and shackle bolts.

c. U-bolts should be kept tight—checked frequently. Loose U-bolts are a possible source of spring breakage.

d. The spring center bolt should also be kept tight at all times.

e. Spring clips which hold leaves in alignment should be tight, but not so tight as to restrict free movement of leaves. Frequent inspection of clips should be made and they should be tightened up when necessary. Loose clips permit leaves to shift, which may cause shearing of spring center bolt.

f. NOTE: When springs have lost some of their 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 tempering is inadvisable.

8. SPRINGS.—Service Diagnosis and Remedy.

SYMPTOM AND PROBABLE CAUSE	PROBABLE REMEDY
a. Hard riding.	
(1) Insufficient lubrication.	(1) Lubricate spring shackles.
(2) Overloaded.	(2) Load vehicle only to rated capacity.
(3) Uneven load distribution.	(3) Distribute load evenly.
b. Over flexible.	
(1) Over lubricated.	(1) Spring leaves do not require lubrication.
(2) Spring leaf clips broken.	(2) Replace.
(3) Broken spring leaf or leaves.	(3) Replace.
(4) Loose spring shackles.	(4) Tighten.
c. Uneven riding.	
(1) Broken spring leaf or leaves.	(1) Replace.
(2) Uneven load distribution.	(2) Distribute load evenly.

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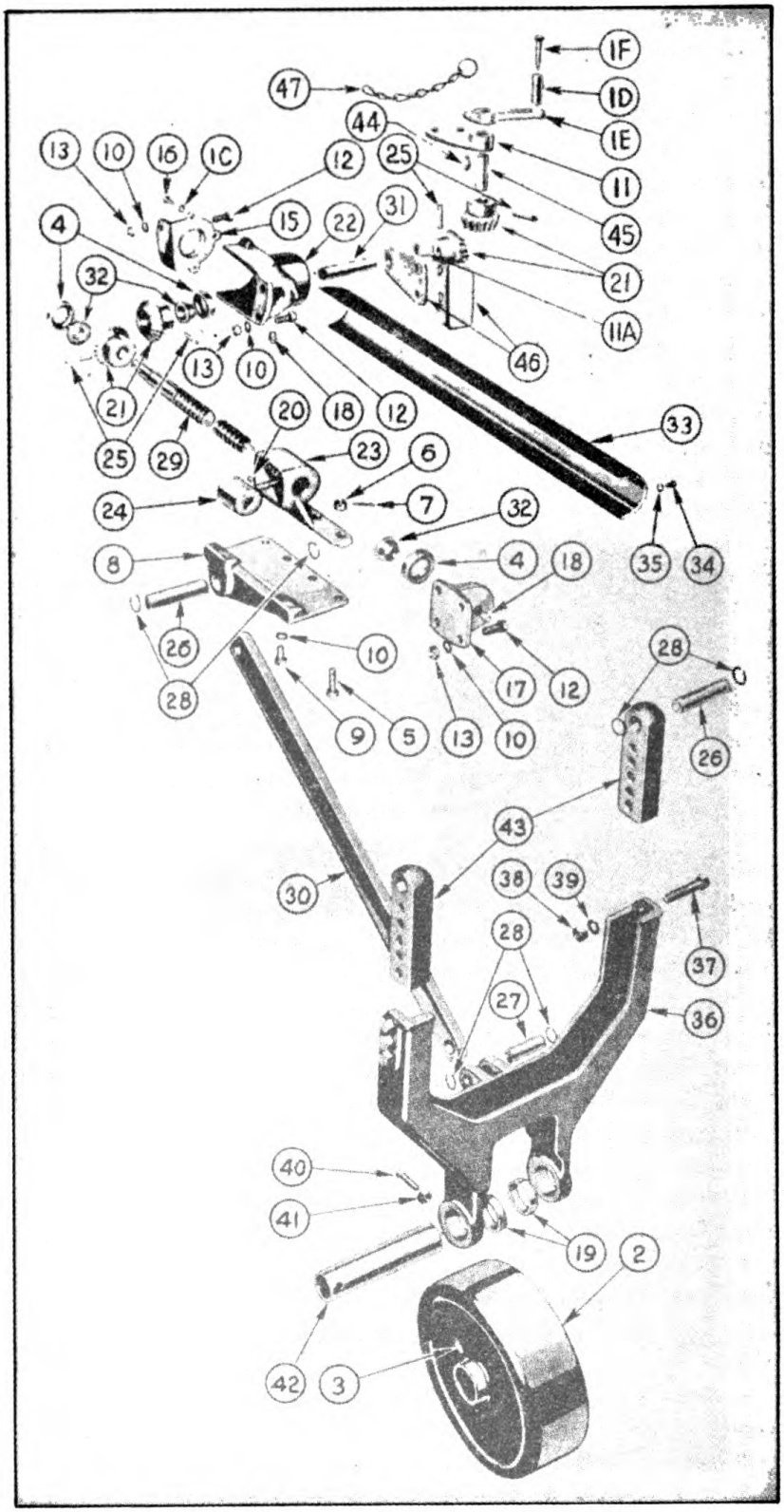

FIGURE 60. CONVERTER GEAR SUPPORT—EXPLODED

SECTION XII

Supports —Converter Gear

1. GENERAL.—*a.* When properly lubricated supports rarely require service. Support wheel should never be used except when parking converter gear or just before converter gear is coupled to the semi-trailer. All service requirements are usually brought about through accident and misuse. An example of this is when the unit is to be moved when coupled under a semi-trailer.

b. Before attempting to work on the supports, place the drawbar in locked position. Place the drawbar eye in the pintle hook on tractor or tie it down securely in such a manner as to offset the natural tendency of the unit to tip backwards when the support no longer holds the rear end of the unit.

2. REMOVING SUPPORT LEGS (Figure 60).—Remove the pin in connecting rod (30) at the support leg (36). Remove pins at the frame support bracket (26). This will permit removal of the support leg. Severely bent support legs should be replaced. When slightly bent, heat and straighten.

3. REMOVING SUPPORT WHEEL AND AXLE.—*a.* The support wheel (2) can be easily removed by removing the two bolts holding the axle (42) to support leg (36). Damaged wheels should be replaced.

b. Remove the axle (42) as you remove the wheel.

4. REPLACING ADJUSTING BAR.—The adjusting bars (43) are held to the leg by three bolts and a 1″ pin (26) in frame support bracket. Remove these and drive the adjusting bar down and out. Replace

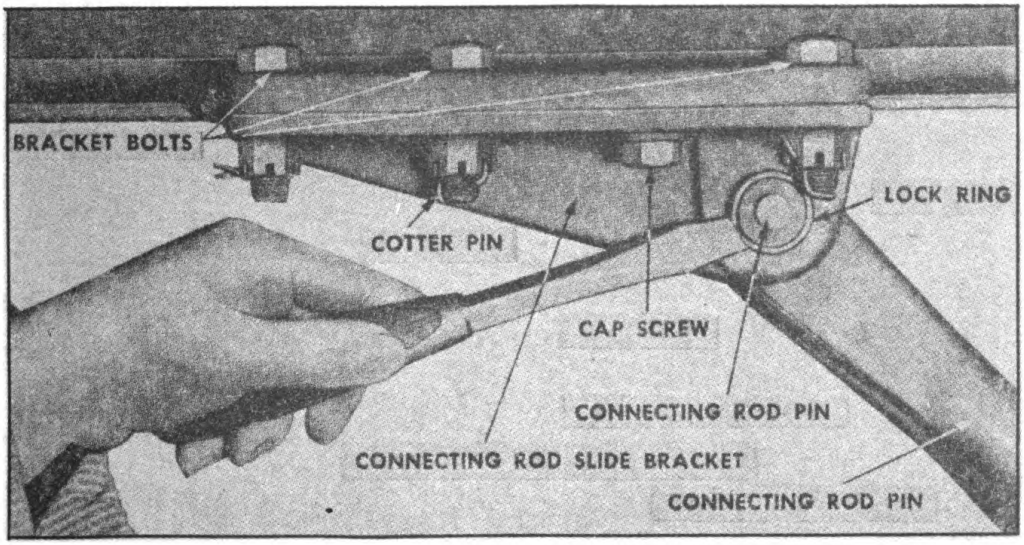

FIGURE 61. REMOVING CONNECTING ROD

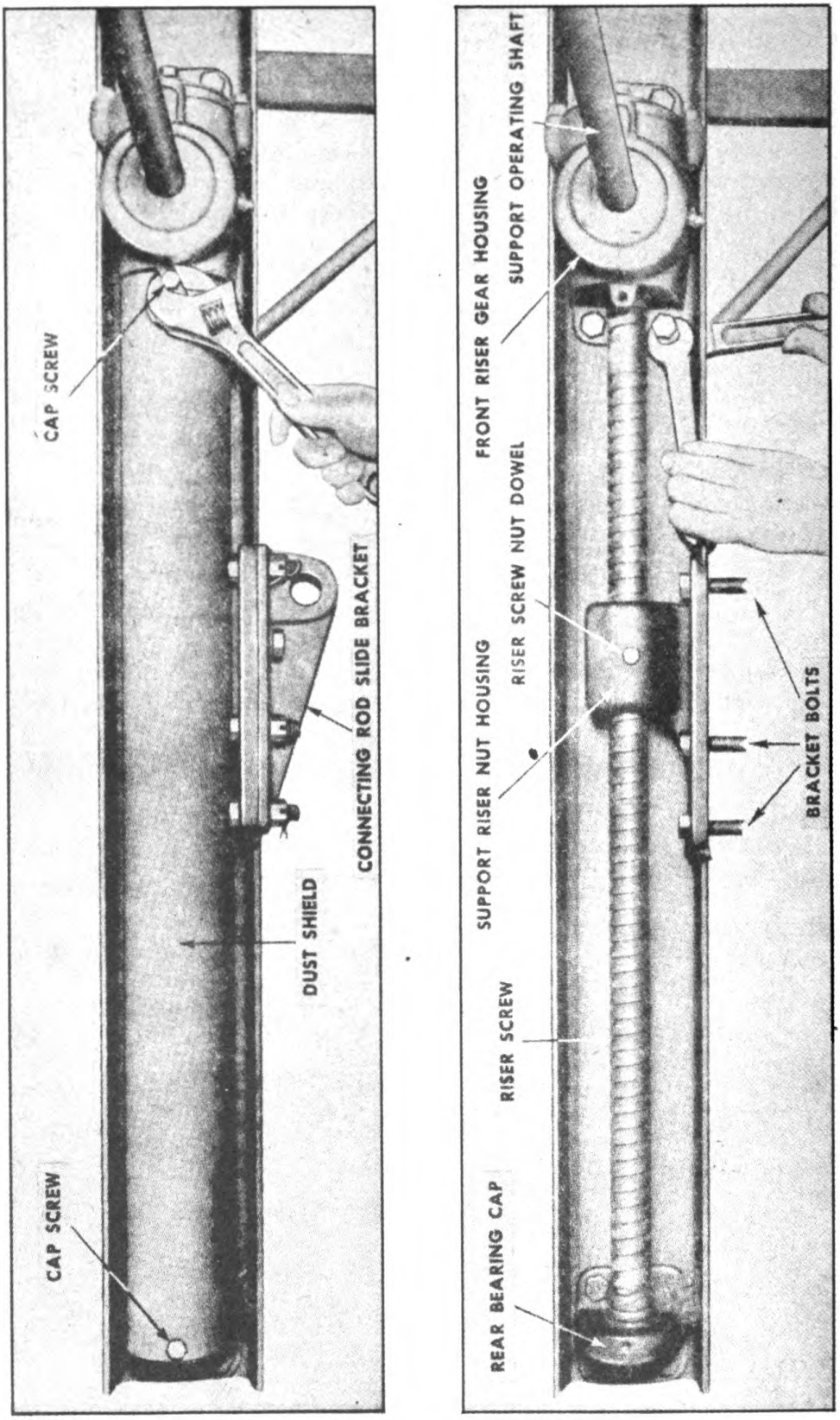

FIGURE 64. REMOVING FRONT RISER GEAR HOUSING

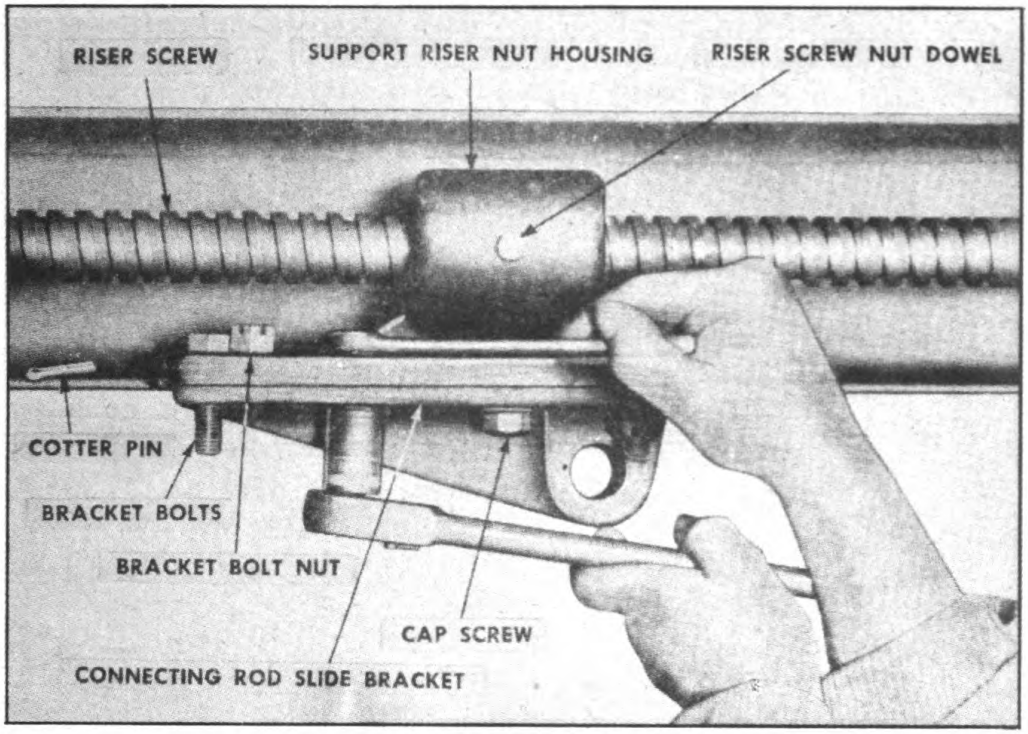

FIGURE 63. REMOVING SUPPORT SLIDE BRACKET

the adjusting bar if severely bent. Heat and straighten if only slightly bent.

5. REMOVING OPERATING PARTS FROM THE I-BEAM (Figure 61).—*a.* Disconnect the connecting rod from connecting rod bracket.

b. Remove the dust shield (Figure 62).

c. Remove the three bolts and one cap screw holding connecting rod bracket and riser nut housing together (Figure 63).

d. Remove the four bolts holding the gear housing to the I-beam (Figure 64).

e. Remove the four bolts holding the rear bearing cap to the I-beam.

f. Remove the two bolts (Figure 60) holding bracket (46) and operating assembly (11 and 45) to frame.

g. Drive out pin (25) from shaft (31).

h. Loosen the two bolts in bracket (46) and pull complete assembly off I-beam.

i. Remove the three cap screws (16) from bearing cap (15) and pull riser screw (29) out of gear housing (22).

6. REASSEMBLY.—*a.* When re-assembling, reverse the above procedure. Be sure that the nut dowel (20) is in the dowel pin hole in the gear housing and the brass riser screw nut (24) is over the dowel pin.

b. Fill gear housing with a light grade of chassis lubricant before bolting assembly to I-beam.

c. Bent operating shafts can be straightened with a sledge hammer. Use heat to straighten severely bent operating shafts.

d. Bent gear housing, connecting rod brackets and bearing caps should be replaced.

e. NOTICE: All operating parts of supports are interchangeable with those on the semi-trailer. EXCEPTION: Operating shaft and crank handle.

SECTION XIII

Supports — Semi-Trailer

1. GENERAL.—*a.* If kept properly lubricated supports will rarely require service. The usual source of damage comes when trailer is uncoupled without letting supports down, and also when the vehicle is moved with the supports in the down position.

b. CAUTION: Do not attempt to work on support unless trailer is coupled to converter gear, tractor, or else properly blocked up at its front end.

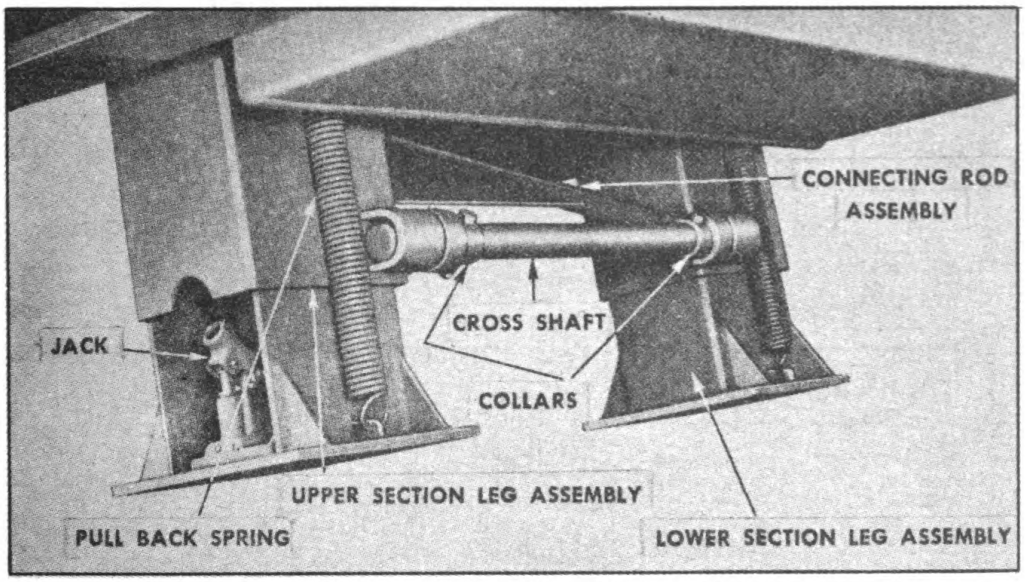

FIGURE 65. SUPPORTS—SEMI-TRAILER

2. REMOVAL OF JACKS.—*a.* Put supports in the "up" position (Figure 65).

b. Uncouple the two pull back springs at lower section of supports, and lower the lower section about 12 inches.

c. Remove the two flat head bolts holding jack to support and lift jack off its mounting.

3. OIL.—*a.* In case of jack failure, first determine whether or not oil level is up to filler screw hole (Figure 66). To do this lower ram and tilt jack.

b. Then remove the filler screw slowly so as to prevent escape of oil if lever is correct.

c. If oil is low add enough to raise the level up to filler hole. It is very important that oil be maintained at the correct level at all times.

d. NOTE: Use only genuine Hein-Werner hydraulic oil or its equivalent.

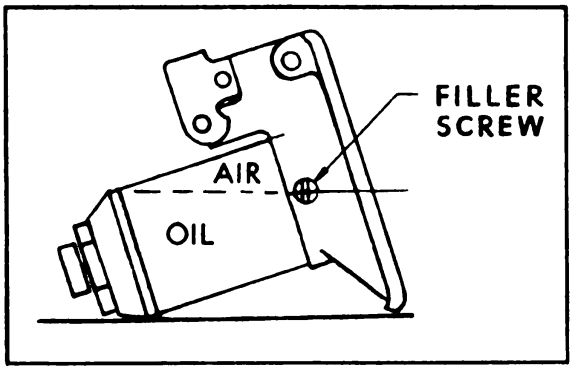

FIGURE 66. JACK-TILTED

e. Piston.—(1) The piston of every jack will need replacing depending upon the amount of work it is put to.

(2) A worn piston can be detected by leakage of oil when lifting a load (Figure 67).

(3) To install a new piston first remove jack filler screw to expel excess air.

(4) Replace filler screw.

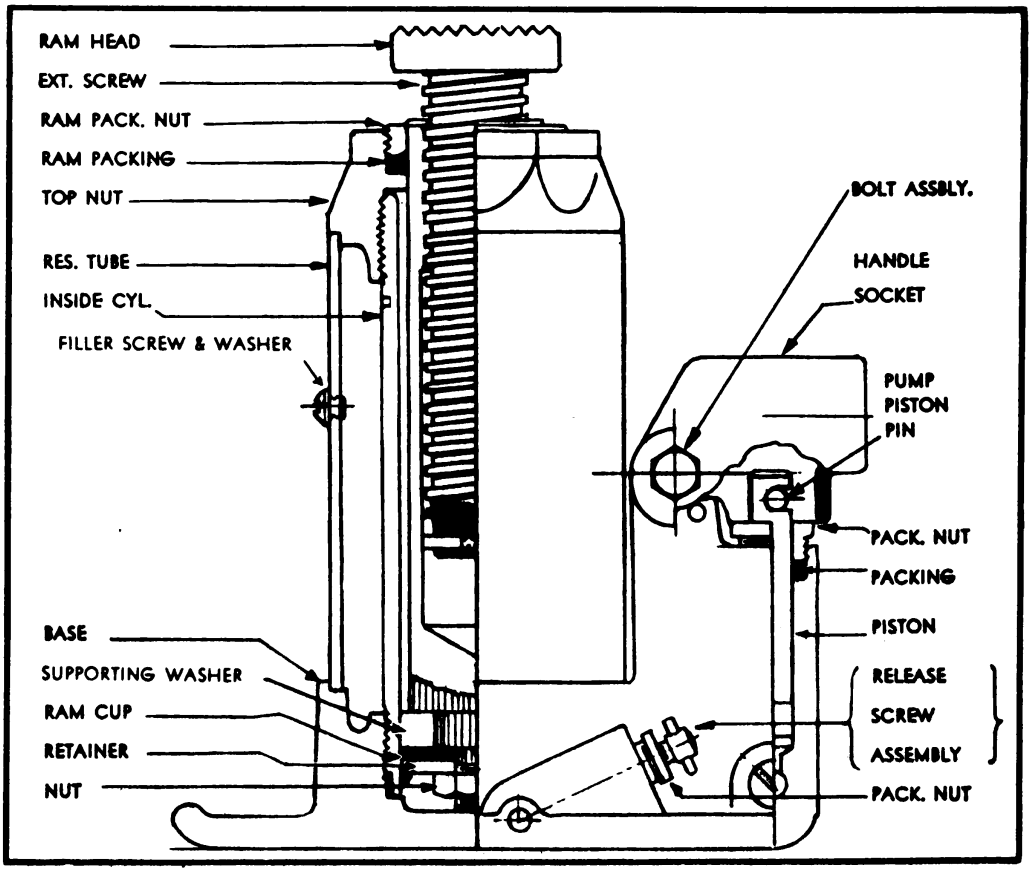

FIGURE 67. SUPPORT JACK

(5) Remove handle socket and piston packing nut.

(6) Pull out old piston and pick out packing.

(7) Clean piston chamber thoroughly.

(8) Dip new piston in oil and insert it with care.

(9) Do not damage piston cup.

f. Pump valves—removal.—(1) NOTE: If your jack fails to lift a load or if it lowers when under a load and the handle slowly raises, the pump valves need cleaning.

(2) To clean pump valves first open release valve to release pressure from jack.

(3) Remove pump valve plug from base of jack and with plug hole down strike base of jack on bench until springs and balls fall out of valve chamber.

(4) Inspect valve chamber for foreign particles.

(5) Clean chamber thoroughly but be careful not to mar or damage hair line valve seats.

(6) Clean balls and springs carefully.

(7) Discard any balls which are rusted or corroded.

(8) *Replacement.*—(a) To re-assemble pump valves first drop small ball in chamber followed by small spring.

(b) Drop in large ball and large spring.

(c) Use a good sealing material on plug and screw it in chamber.

(d) Replace neoprene seal with a new one.

(e) See sketch below for assembly information (Figure 68).

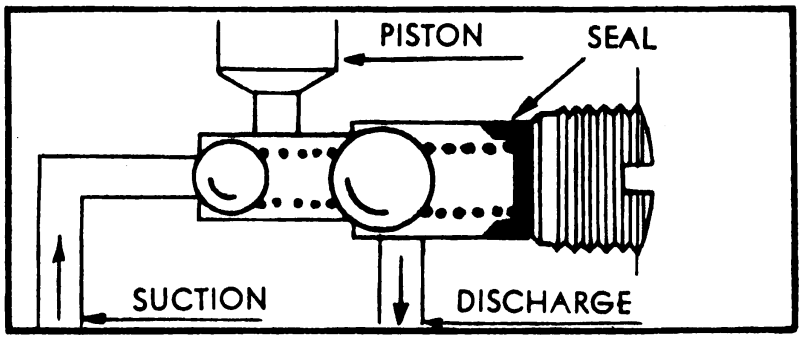

FIGURE 68. SUPPORT JACK PUMP VALVE

g. Release screw.—(1) If release valve is dirty, jack may fail to lift or hold a load.

(2) To clean a release valve, first remove release screw by turning it out by the packing nut.

(3) Pick packing and packing washer from chamber.

(4) Clean and inspect valve seat and point of release screw. (A slight ring on this point is not harmful.)

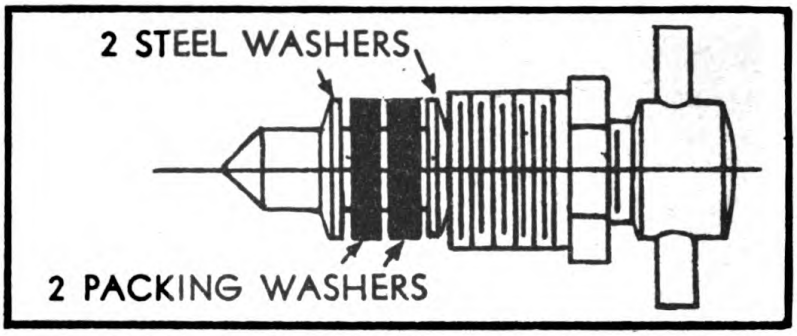

FIGURE 69. SUPPORT JACK RELEASE SCREW

(5) A nicked screw should be replaced.

(6) When reassembling release screw avoid loose threads off packing.

(7) Sketch above (Figure 69) will aid in assembling release screw correctly.

h. Ram cup.—(1) A worn or loose ram cup will cause your jack to lower under load and leak oil around the ram.

(2) *Removals:* (a) Open release valve, then clean outside of jack thoroughly.

(b) Place base securely in a vise, remove ram packing nut and top nut.

(c) Pull ram from inside cylinder and pour all oil from the jack.

(d) Remove old ram cup and install a new one.

(e) Tighten retaining nut securely and center punch.

(3) *Reassembly:* (a) NOTE: Before reassembling jack, inspect inside of cylinder for scoring and replace if scored. Be certain inside cylinder is tight in jack base.

(b) Clean all dry shellac from top nut and cylinder.

(c) Dip new ram cup in oil and insert it in inside cylinder.

(d) Brush a thin coat of shellac on top of reservoir on outside tube and tighten down top nut severely.

(e) Replace ram packing nut and tighten to medium pressure.

(f) Refill jack with oil through filler screw hole to level of hole.

i. Extension screw.—(1) NOTE: A bent or broken extension screw or ram is a sure sign jack has been misused.

(2) *Removal:* (a) Pull up ram.

(b) Place ram in soft vice jaws to avoid marring.

(c) Apply force to extension screw with pipe wrench to force it out of ram.

(d) Upset jack to expel sheared pin.

(e) Screw in new extension screw with its lock pin following thread of ram.

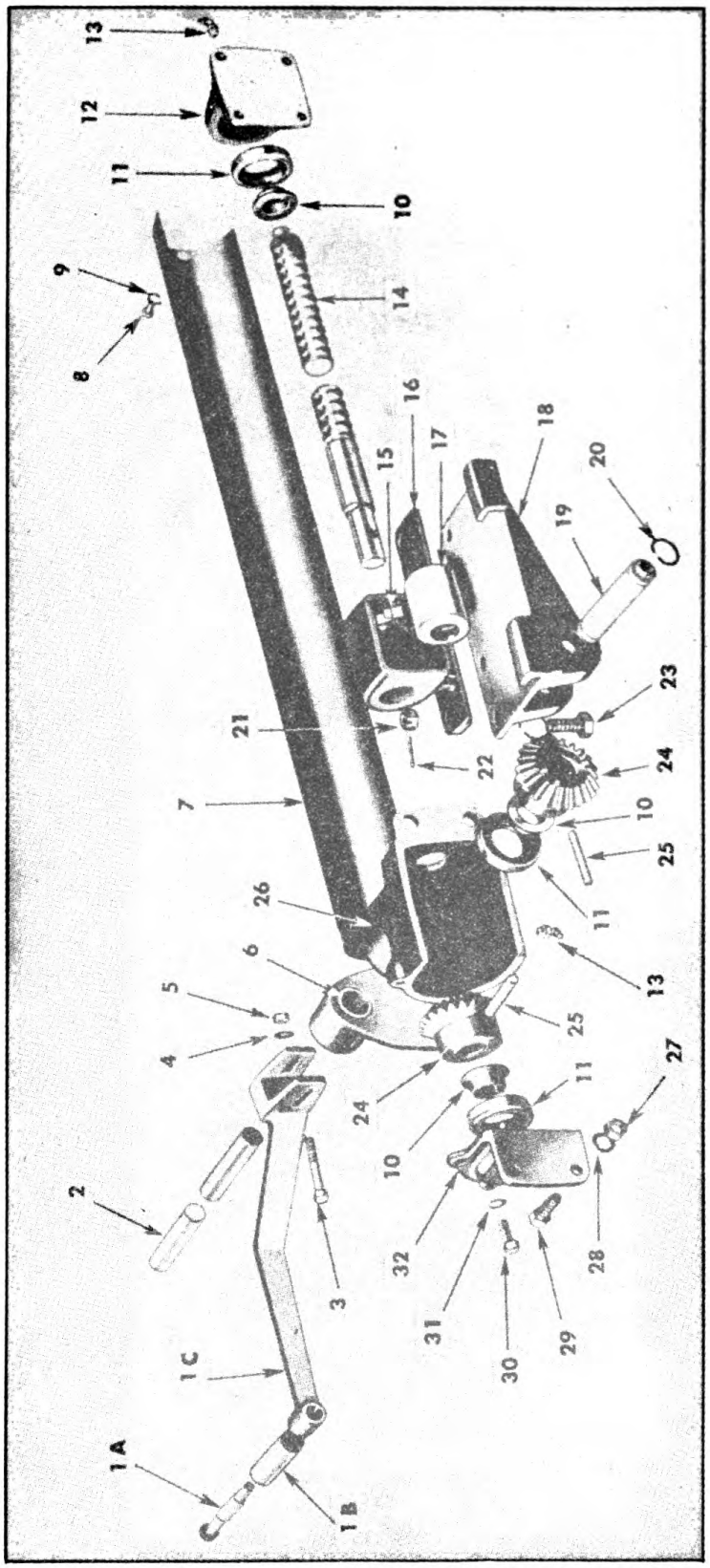

FIGURE 70. SUPPORT OPERATING MECHANISM

j. Air-bound jacks.—If your jack fails to raise, it may be air-bound. To relieve this condition, pull ram up, open release valve and push ram down.

4. SUPPORT LEG ASSEMBLY (Figure 65).—*a. Removal.*—(1) Remove bolts from collar on both sides of cross shaft to remove leg assembly.

(2) Remove cotter key from hinge pin and move the top of the assembly forward and out.

b. Replacement.—(1) Replacement is in reverse of removal procedure.

(2) NOTE: When replacing support leg assembly, place a light film of grease over hinge pin and reverse removal procedure.

5. OPERATING ASSEMBLY.—*a. Removal.*—(1) Place support assembly in the down position.

(2) Remove support crank handle and bracket.

(3) Remove lock ring from right side of hinge pin (Figure 61) and drive pin out.

(4) CAUTION: When driving king pin out, the rear end of connecting rods will fall to the ground. Keep clear to prevent injuries.

(5) Remove the two bolts holding dust shield to operating assembly (Figure 62).

(6) Remove the three bolts and one cap screw from connecting rod bracket (Figure 63).

(7) Remove the four bolts holding gear housing to I-beam (Figure 64).

(8) Lift complete assembly off I-beam.

(9) Remove the four bolts holding rear bearing cap to I-beam (Figure 64).

b. Replacement.—(1) Replacement procedure is in reverse of removal procedure.

(2) NOTE: Before mounting assembly to I-beam fill gear housing with a light grade of chassis lubricant.

c. Disassembly (Figure 70).—(1) Turn riser screw nut housing (16) off riser screw (14).

(2) Remove the three cap screws (30) holding front bearing cap (32) to gear housing (26).

(3) Tap bearing cup off riser screw and pull riser screw out of gear housing.

(4) Pull gear housing off operating shaft (2).

(5) Each gear (24) is held to riser screw (14) and operating shaft (2) by a 3/8″ drive pin (25).

(6) To remove gears simply drive out the drive pins using a long tapered punch and a hammer.

d. Reassembly (Figure 70).—(1) Insert the operating shaft (2) into the small hole in the gear housing (26).

(2) Place bearing (11) over end of operating shaft next to gear housing. (Have concave side of bearing out towards shaft end.)

(3) Place sleeve (10) next to bearing with the larger surface toward shaft end.

(4) Install gear (24) over shaft end, using drive pin (25).

(5) Install gear (24) over end of riser screw (17) using drive pin (25).

(6) Place gear end of riser screw in gear housing.

(7) Place bearing sleeve (10) over end of riser screw with the larger surface next to gear.

(8) Place bearing (11) with the concave surface over bearing sleeve.

(9) Place bearing cap (32) over bearing.

(10) Fasten bearing cap to gear housing (26) using the three 3/8″ cap screws and lockwashers (30) and (31).

(11) Bolt rear bearing cap (12) to I-beam using the four 1/2″ bolts.

(12) Place bearing (11) in rear bearing housing with concave surface to front of unit.

(13) Place bearing sleeve (10) in bearing with large surface to front of unit.

(14) Place riser screw nut dowel (15) in riser screw nut housing (16).

(15) Peen dowel slightly to prevent it from coming out of housing.

(16) Place riser screw nut (17) over dowel and screw the riser screw (14) assembly into the housing (16) and nut (17).

(17) Pack the gear housing with a light grade of chassis grease.

(18) Assembly is now ready to be installed on I-beam in accordance with paragraph on Replacement, this section.

(19) NOTICE: All operating parts on semi-trailer are interchangeable with those on the converter gear. EXCEPTIONS: Operating shaft and crank handle.

SECTION XIV

Wheels, Hubs, Bearings and Tires

1. INTRODUCTION.—There are two types of wheels used on this unit. Front and rear wheels are interchangeable from right to left and vice versa. They are not interchangeable from rear to front or from front to rear.

2. HUB ASSEMBLY, FRONT AXLE.—*a. Removal.*—(1) Hoist the front end by connecting the chain to the front crossmember of the gear frame.

(2) Place a greased steel plate or wood plank under both dual tires to utilize as a skid for the removal of hub and wheel assembly in one unit. The hub assembly with wheel intact is too heavy and cannot easily be removed otherwise.

(3) Take out the four cap screws in hub cap, pull the cotter key from the axle nut and remove the axle nut by turning the nut in a counter-clockwise direction.

(4) Now place a screwdriver under the outer bearing, pry gently and tap D-washer with a hammer. The D-washer and bearing may also be removed as the wheel assembly is pulled off.

(5) Pull the wheel off, using the greased skid plate to facilitate its removal.

b. Installation.—(1) NOTE: Before installing the hub on the axle, all bearings should be washed in cleaning fluid, a stiff brush employed to remove all foreign matter, and bearings thoroughly inspected for pits, chips and signs of wear. All dirt apt to get into hubs should also be removed.

(2) To install the hub, proceed as follows (Figure 71).

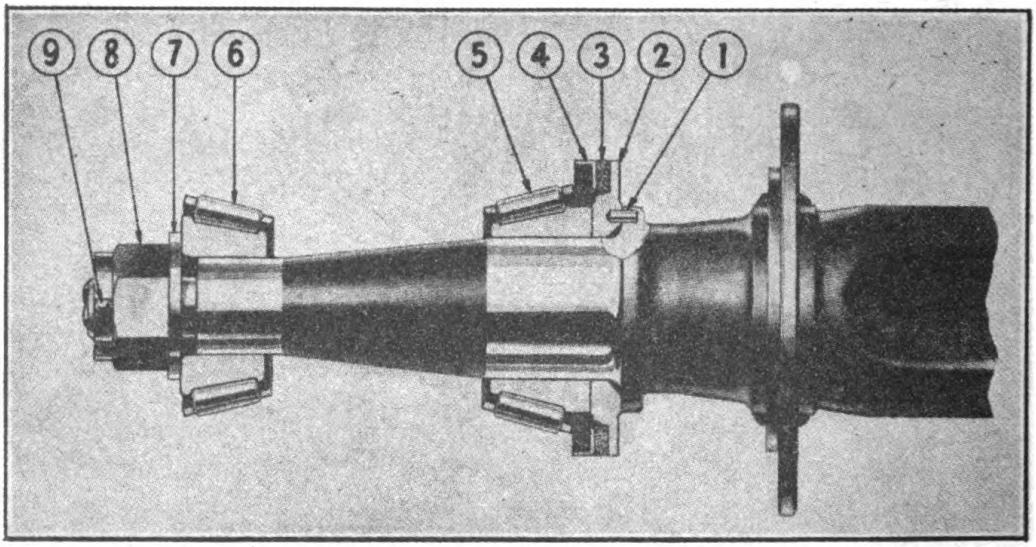

FIGURE 71. AXLE—CUTAWAY VIEW

(a) Repack the space in the hub between the two cups with new grease. Put about 1/8" layer of grease on the inner and outer bearing cups and repack both inner and outer bearings.

(b) CAUTION: Do not place inner bearing, felt, or felt retainer on spindle before installing wheel.

(c) Now place the inner bearing (5) in the hub.

(d) Insert the compression ring (4) with its flanged side toward the inside of the hub. Place the felt grease retainer (3) next to the compression ring.

(e) Place the dust collar (2) on the axle spindle and lock it into place by means of the metal dowel (1) which fits into a slot on the spindle and a hole in the dust collar.

(f) Using a greased skid plate, slide the wheel on the spindle. Place the outer bearing (6) in the hub and install the D-washer (7).

(g) Turn the axle nut (8) up tight, then slack off about 1/3 turn. Test for excessive end play. Use a bar. Rest one end on the floor and lift up on outside tire. By working the bar up and down while holding one finger on the cage of the outer bearing, excessive play is quickly detected.

(h) With the bearings properly adjusted, fit cotter key (9) into axle nut, fill the hub cap 1/3 full of grease and reinstall with cap screws.

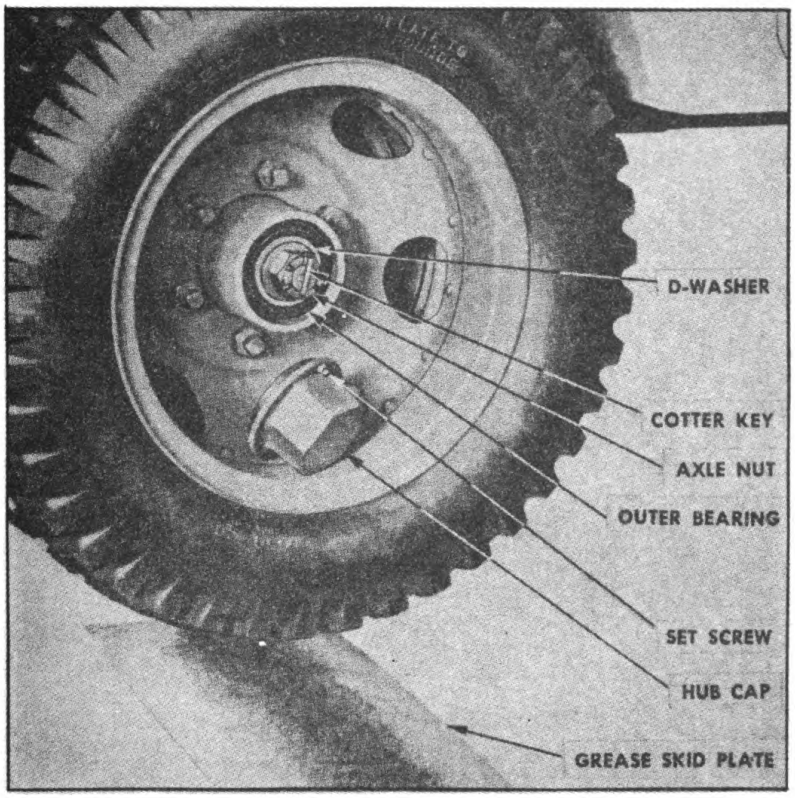

FIGURE 72. REAR OUTER WHEEL ASSEMBLY

Turn the wheel. If the wheel fails to turn freely, check for brake drag by means of the slack adjusters. If this fails to correct the trouble, the felt grease retainer probably slipped out of place during assembly. To correct this difficulty, remove hub assembly and reinstall.

3. OUTER WHEEL ASSEMBLY, REAR AXLE (Figure 72).—*a. Removal.* To remove the axle hub assembly from the axle, proceed as follows:

(1) Place a jack under center of trunnion axle, and jack up until wheel clears ground.

(2) Place a greased steel plate or wood plank under both dual tires to utilize as a skid for the removal of hub and wheel assembly in one unit. The hub assembly with wheel intact is too heavy and cannot easily be removed otherwise.

(3) Take out the 1/4″ set screw in hub cap, tap hub cap in a counter-clockwise direction to loosen, and turn hub cap out of hub by hand.

(4) Pull the cotter key from the axle nut and remove the axle nut by turning the nut in a counter-clockwise direction.

(5) Now place a screwdriver under the outer bearing, pry gently and tap D-washer with a hammer. The D-washer and bearing may also be removed as the wheel assembly is pulled off.

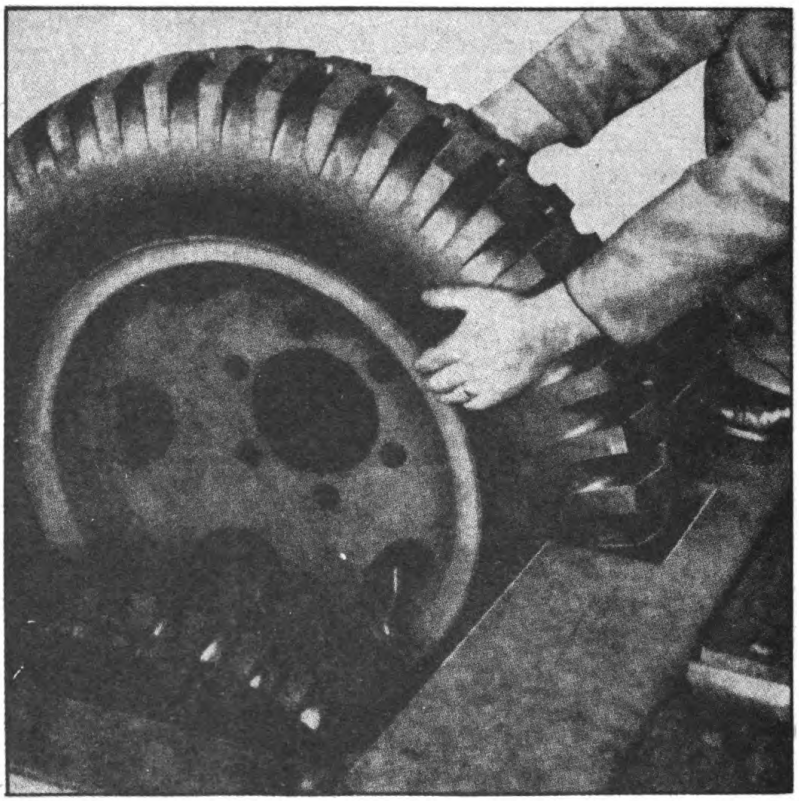

FIGURE 73. REMOVAL REAR INNER TIRE ASSEMBLY

(6) Pull the wheel off, using the greased skid plate to facilitate its removal.

b. Installation.—Follow the same procedure outlined in "Installing Hub Assembly, Front," except hub cap screws into hub and is held in position by a 1/4" set screw.

4. INNER WHEEL ASSEMBLY, REAR AXLE (Figure 73).—*a. Removal.*—(1) When removing inner wheel assembly, it is necessary to remove the two tire assemblies prior to removal of hub assembly.

(2) Remove 1/4" set screw from hub cap, tap hub cap with hammer in a counter-clockwise direction, and turn hub cap out of hub by hand.

(3) Remove cotter key.

(4) Remove axle nut.

(5) Remove D-washer and outer bearing.

(6) Lift hub assembly off axle spindle.

b. Replacement.—(1) NOTE: Before installing the hub on the axle all bearings should be washed in cleaning fluid and scrubbed with a stiff brush. Bearings should be thoroughly inspected for pits, chips, and signs of wear. Inspect inner and outer cups for cracks, chips and excess pitting. All dirt apt to get into hub should be removed.

(2) CAUTION: Always install felt, felt retainer, and bearing in hub assembly instead of on axle spindle.

(3) *Installation of hub* (Figure 71): (a) Repack the space in the hub between the two cups with new grease. Put about a 1/8" layer of grease on the inner and outer bearing cups and repack both inner and outer bearings.

(b) Now place the inner bearing (5) in the hub.

(c) Insert the compression ring (4) with its flanged side toward the *inside* of the hub. Place the felt grease retainer (3) next to the compression ring.

(d) Place the dust collar (2) on the axle spindle and lock it into place by means of the metal dowel (1) which fits into a slot on the spindle and a hole in the dust collar. The wheel is now ready to slip on.

(e) Lift the hub assembly on spindle, using care not to permit felt from coming out of the assembly. Place the outer bearing (6) in the hub and install the D-washer (7).

(f) Turn the axle nut (8) up tight, then slack off about 1/3 turn. Test for excessive end play. Use a bar. Rest one end on the floor and lift up on outside tire. By working the bar up and down while holding one finger on the cage of the outer bearing, excessive play is quickly detected.

(g) With the bearings properly adjusted, fit cotter key (9) into axle nut, fill the hub cap 1/3 full of grease and reinstall hub cap and

set screw. Turn the wheel. If the wheel fails to turn freely, check for brake drag by means of the slack adjusters. If this fails to correct the trouble the felt grease retainer probably slipped out of place during assembly. To correct this difficulty, remove hub assembly and reinstall.

5. BEARING CUPS (Figure 74).—*a. Removal.*—Place a soft steel bar on the inside shoulder or edge of the cup to be removed. Using a heavy hammer, hit first on one side of the cup and then the other. By alternating in this manner, the cup will come out straight with the cup bore. Danger of wedging of the cup in the bore is minimized.

b. Installation.—(1) With the wheel on its side, start the new cup square with the bore so that its smallest inside diameter will be on the inside when it is in place.

(2) 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.

(3) Now place the old cup over the new one in the same manner as in step *a*, and drive the new 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 reassembly of the wheel.

c. Loose cups.—(1) When the bearing cup becomes loose in the hub, replace the hub.

(2) Emergency repair of loose cups can be accomplished by using a heavy center punch to reduce the diameter of the bore. Simply use a heavy center punch and put about 12 punch marks per square inch

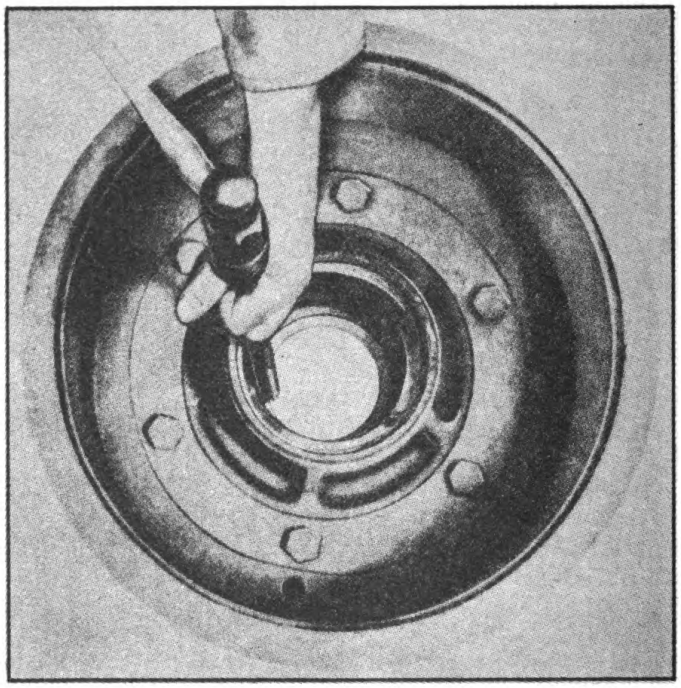

FIGURE 74. CUP REMOVAL

about the diameter of the side wall of the cup bore where the cup normally fits.

d. Bearing and cup inspection.—(1) Bearings and cups should be cleaned and inspected whenever wheels are removed. Pitted or chipped bearings or cups should be replaced.

6. WHEEL STUDS, BROKEN OR WORN.—*a. Removal.*—(1) Remove inner and outer wheels.

(2) Remove hub from the axle and place on the floor with the inside of the drum up.

(3) Remove nut from the stud (or studs) which you wish to replace.

(4) Using a 5/8″ punch, drive out the broken or worn stud.

(5) Turn the hub and drum over and place the new stud in position. Make sure that the shoulder on the stud is placed so that it will fit into the groove in the hub after stud is driven into position.

(6) Drive the stud into position using a copper hammer.

(7) Turn the wheel over with drum up, install lockwasher and nuts on studs, and tighten.

(8) NOTE: Front and rear wheel studs are not interchangeable.

7. TIRE REPAIRS.—*a.* When removing wheels for tire repairs, it will be seen that all studs and nuts are marked with the letters "L" and "R" which indicate left and right. And, while nuts are not interchangeable, the wheels themselves are. They may be used as inner or outer, right or left, but not rear to front.

b. Since the entire load is carried out to the wheels through the studs, care should be taken to draw up wheel nuts tight and with equal pressure at all studs.

c. To insure a tight wheel fit, follow this simple procedure.

(1) Make sure all countersunk holes in wheels are clean, free from dirt or "piled up" paint.

(2) Draw up the sleeve shaped nuts which hold the inner wheel in place. Apply pressure evenly on all nuts by progressively tightening opposite nuts until all are down very tight.

(3) Slide on the outer wheel and draw up the outer stud nuts in the same manner as outlined above.

d. It is good practice when mounting wheels to place the valve stems opposite each other for easy tire inflation.

e. Removing tire from wheel.—(1) Permit the air to escape from the tire by removing the core from the valve stem. Then insert a tire tool in the slot provided for the purpose on the rim and pry down while tapping the opposite side of the rim with a hammer.

(2) When reinstalling the tire, inflate before installing the tire and wheel on hub. Before inflation make sure that the lock rim is properly seated in the groove.

f. Replacing tire on wheel.—(1) Place wheel on floor with valve slot up.

(2) Place tire over wheel with valve stem pointing up.

(3) Place lock ring half way into bead. Drive half of lock ring into position on wheel. Pry the remainder of lock ring over wheel, tapping securely into position.

(4) NOTE: Before inflating tire, check rim to make sure split is properly closed and that lock ring is properly coupled into rim.

(5) CAUTION: AWAYS WRAP TWO SAFETY CHAINS 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.

(6) NOTE: It is good practice when mounting wheels to place the valve stems opposite each other for easy tire inflation.

g. Care and inspection of tires and tubes.—(1) NOTE: All tires on this trailer are built to sustain weight of the loaded trailer. However, unless recommended pressure is maintained, tires will not function as they should and in consequence safe, economical operation of trailer will be affected.

(2) Tire air pressure should be checked daily. Correct air pressure is 70 lbs. at rear and 80 lbs. at front.

(3) Check tires daily to make certain each valve stem has a valve cap.

(4) Check tires for imbedded objects, cuts, and signs of uneven wear.

8. WHEELS, HUBS, BEARINGS, TIRES.—Service Diagnosis and Remedy.

SYMPTOM AND PROBABLE CAUSE	PROBABLE REMEDY
a. Wheels pounding.	
(1) Loose wheel bearings.	(1) Adjust.
(2) Tire under-inflated.	(2) Inflate.
b. Uneven tire wear.	
(1) On inside—axle out of camber.	(1) Replace.
(2) On outside—axle bent.	(2) Replace.
c. Tires over-heated.	
(1) Under-inflated.	(1) Inflate to 80 lbs. pressure at front and 70 lbs. pressure at rear.
d. Wheels wobble.	
(1) Loose wheel bearings.	(1) Adjust.
(2) Wheel loose on hub.	(2) Tighten.
(3) Bent axle.	(3) Replace.

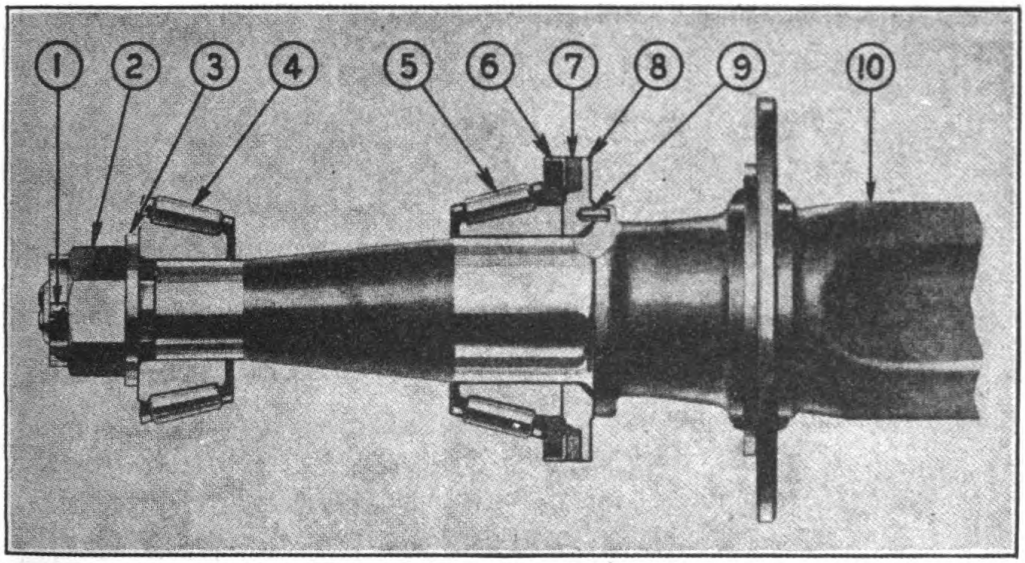

FIGURE 75. CONVERTER GEAR AXLE AND WHEEL PARTS

AXLE AND WHEEL PARTS—CONVERTER GEAR

(FIGURE 75)

Fig. & Ref. No.	*Part No.*	*Name*	*Quantity*
75—1	103425	PIN, cotter, 1/4" x 2-3/4"	2
75—2	530087	NUT, castle, 2"	2
75—3	530086	WASHER, dee	2
75—4	534748	BEARING, outer (TIM-5582)	2
75—5	534749	BEARING, inner (TIM-749)	2
75—6	530368	RING, compression	2
75—7	530370	WASHER, felt	2
75—8	534997	COLLAR, dust	2
75—9	534591	PIN, dowel, dust collar	2
75—10	534502	AXLE, beam, 3" x 4-5/8"—67-5/16" tread	1

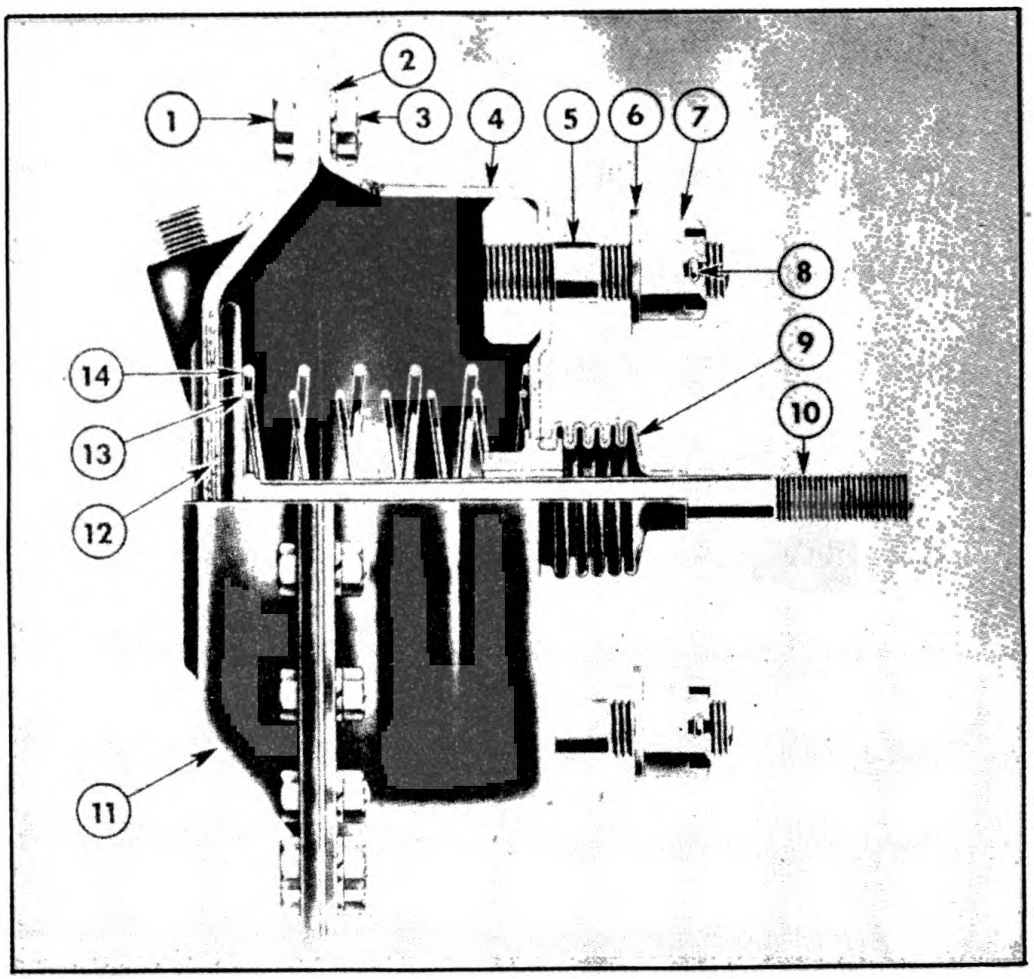

FIGURE 76. BRAKE CHAMBER—CONVERTER GEAR

BRAKE CHAMBER—CONVERTER GEAR

(Figure 76)

Fig. & Ref. No.	*Part No.*	*Name*	*Quantity*
76	WAB-220702	CHAMBER, brake, assembly (535704)	2
76—1	WAB-203151	BOLT, hex-hd.	32
76—2	WAB-201318	WASHER, lock	32
76—3	WAB-203145	NUT, hex.	32
76—4	WAB-220707	PLATE, non-pressure	2
76—5	WAB-202941	STUD	4
76—6	WAB-203173	WASHER, lock	4
76—7	WAB-203172	NUT, hex.	4
76—8	WAB-203156	PIN, cotter	4
76—9	WAB-201687	BOOT	2
76—10	WAB-205129	ROD, push	2
76—11	WAB-202880	PLATE, pressure	2
76—12	WAB-200001	DIAPHRAGM	2
76—13	WAB-212294	SPRING, inner	2
76—14	WAB-212295	SPRING, outer	2

WAB: Bendix-Westinghouse Automotive Air Brake Company, Elyria, Ohio.

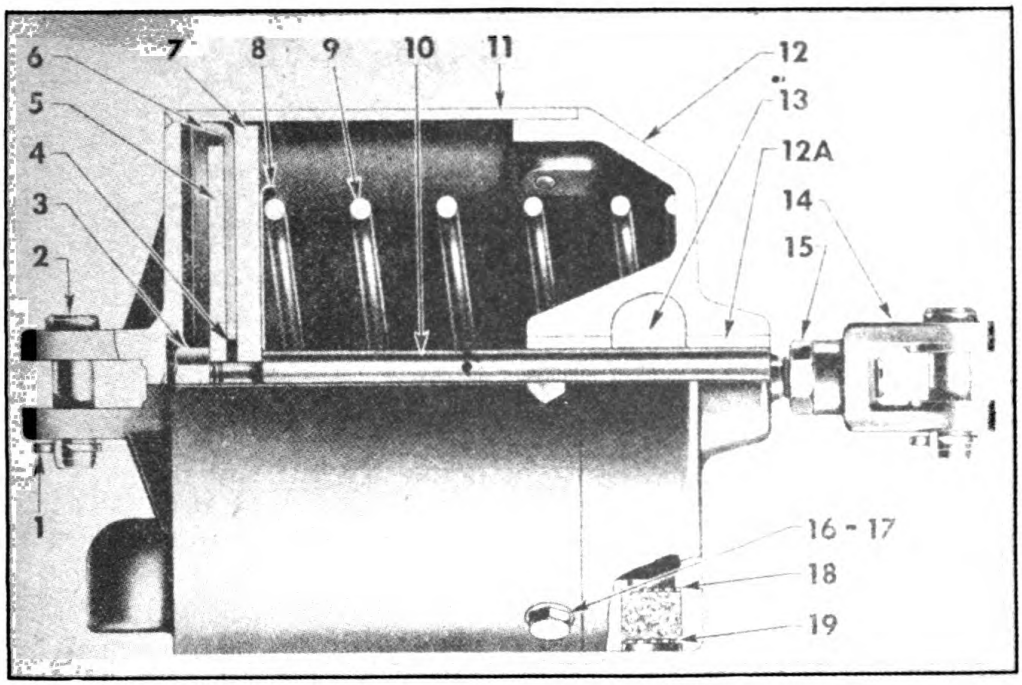

FIGURE 77. BRAKE CYLINDER—TRAILER

BRAKE CYLINDER—TRAILER

(FIGURE 77)

Fig. & Ref. No.	*Part No.*	*Name*	*Quantity*
77	WAB-PC.220929	CYLINDER, brake, assembly (535700)	4
77—1	WAB-203019	PIN, cotter, 1/8" x 1"	4
77—2	WAB-200054	PIN, yoke, 1/2" x 2-1/64"	4
77—3	WAB-203575	NUT, hex., 1/2"—20	4
77—4	WAB-213553	SPACER	4
77—5	WAB-213543	FOLLOWER, piston	4
77—6	WAB-213549	CUP, piston	4
77—7	WAB-213541	PISTON	4
77—8	WAB-213562	SEAT, spring	4
77—9	WAB-214043	SPRING	4
77—10	WAB-214042	ROD, piston	4
77—11	WAB-220930	BODY, cylinder	4
77—12	WAB-220931	HEAD, cylinder, assembly	4
77—12A	WAB-213560	BUSHING	8
77—13	WAB-214044	FELT, oiler	4
77—14	WAB-205622	YOKE, assembly, 1/2"—20	4
77—15	WAB-212309	NUT, hex., cad., thin, 1/2"—20	4
77—16	WAB-212387	BOLT, hex-hd., 5/16"—18 x 3/4"	24
77—17	WAB-201318	WASHER, lock, 5/16"	24
77—18	WAB-204145	PLATE, screen	4
77—19	WAB-212369	COVER, breather	4

WAB: Bendix-Westinghouse Automotive Air Brake Company, Elyria, Ohio.

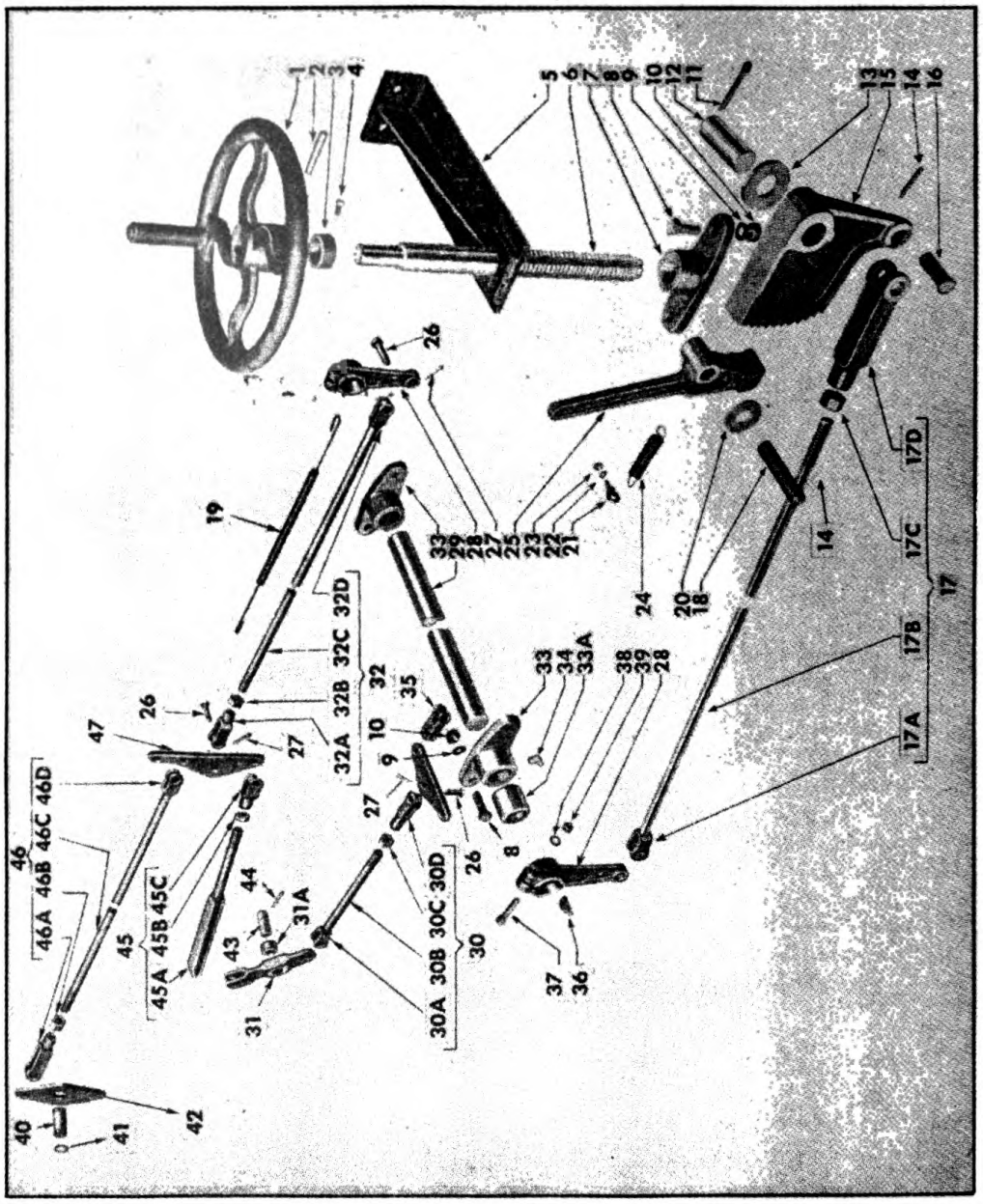

FIGURE 78. HAND PARKING BRAKE

HAND PARKING BRAKE

(FIGURE 78)

Fig. & Ref. No.	*Part No.*	*Name*	*Quantity*
78—1	51485	WHEEL, brake, assembly	1
	630027	HANDLE	1
	630028	PIN	1
	——	WHEEL, brake (not serviced separately)	1
78—2	630298	PIN	1
78—3	533677	COLLAR, cross shaft	1
78—4	102926	SCREW, set, sq-hd., 1/4"—20 x 5/8"	1
78—5	51475	BRACKET, brake operating shaft support, assembly	1
78—6	536427	SHAFT, operating, brake	1
78—7	536232	BRACKET, brake screw	1
78—8	100053	BOLT, hex-hd., 1/2"—20 x 1-3/4"	2
78—9	103323	WASHER, lock, split, 1/2"	2
78—10	103028	NUT, hex., 1/2"—20	2
78—11	103411	PIN, cotter, 3/16" x 2"	2
78—12	536332	PIN, hand brake ratchet	1
78—13	534800	WASHER, plain, 1-1/4"	2
78—14	103397	PIN, cotter, 5/32" x 1-1/4"	2
78—15	536325	RATCHET, hand brake	1
78—16	138145	PIN, clevis, 3/4" x 2-3/64"	2
78—17	51474	ROD, brake, assembly	1
78—17A	144260	CLEVIS, rod end, 3/4"	1
78—17B	536245	ROD, brake, w/144260 CLEVIS attached	1
78—17C	103031	NUT, jam, hex., 3/4"—16	1
78—17D	144247	CLEVIS, adjustable, rod end, 3/4"—16	1
78—18	536331	PIN, pawl	1
78—19	532146	SPRING, return, brake	1
78—20	103346	WASHER, flat, small, 3/4"	2
78—21	532147	EYE, bolt, return spring	3
78—22	103319	WASHER, lock, split, No. 14 or 1/4"	3
78—23	103024	NUT, hex., 1/4"—28	3
78—24	536111	SPRING	1
78—25	536326	PAWL, hand brake ratchet	1
78—26	103498	PIN, clevis, 1/2"	40
78—27	103385	PIN, cotter, 1/8" x 1"	40
78—28	536231	LEVER, brake cross shaft	2
78—29	536230	SHAFT, cross, brake	1
78—30	57006	ROD, brake, assembly	4
78—30A	104039	CLEVIS, adjustable, rod end	4
78—30B	103028	NUT, hex., 1/2"—20	4
78—30C	536328	ROD, brake, w/104044 CLEVIS attached	4
78—30D	104044	CLEVIS, rod end	4
78—31	51476	LEVER, trunnion rocker beam, w/BUSHING, assembly	4
78—31A	534212	BUSHING, lever	4
78—32	57007	ROD, brake, assembly	2
78—32A	104039	CLEVIS, adjustable, rod end, 1/2"	2
78—32B	103028	NUT, hex., 1/2"—20	2
78—32C	536329	ROD, brake, w/104044 CLEVIS attached	2
78—32D	104044	CLEVIS, rod end, 1/2"	2
78—33	51484	JOURNAL, cross shaft, w/BUSHING, assembly	2
78—33A	536262	BUSHING, journal	2
78—34	109461	FITTING, alemite, 1/8"—90°	2
78—35	535730	LINK, equalizing, trunnion rocker beam	8

HAND PARKING BRAKE

(Continued)

(FIGURE 78)

Fig. & Ref. No.	*Part No.*	*Name*	*Quantity*
78—36	117983	KEY, Woodruff, 1/4" x 1-3/8"	2
78—37	100055	BOLT, hex-hd., 1/2"—20 x 2-1/2"	2
78—38	103028	NUT, hex., 1/2"—20	2
78—39	103323	WASHER, lock, reg., 1/2"	2
78—40	630084	PIN, hinge, support	2
78—41	630838	RING, lock	4
78—42	51473	LEVER, brake, rear, w/BUSHING, assembly	2
78—42A	534212	BUSHING, lever (using same as Item 31A)	4
78—43	535729	PIN, trunnion rocker beam lever	4
78—44	103387	PIN, cotter, 1/8" x 1-1/2"	8
78—45	51472	ROD, sliding, brake, assembly	4
78—45A	536307-8	ROD, brake, w/brake rod BAR attached, assembly	4
78—45B	103028	NUT, hex., 1/2"—20	4
78—45C	104039	CLEVIS, adjustable, rod end, 1/2"	4
78—46	57005	ROD, brake, assembly	2
78—46A	104039	CLEVIS, adjustable, rod end	2
78—46B	103028	NUT, hex., 1/2"—20	2
78—46C	536327	ROD, brake, w/104044 CLEVIS attached	2
78—46D	104044	CLEVIS, rod end, 1/2"	2
78—47	51471	LEVER, equalizing, brake, w/PIN, assembly	2

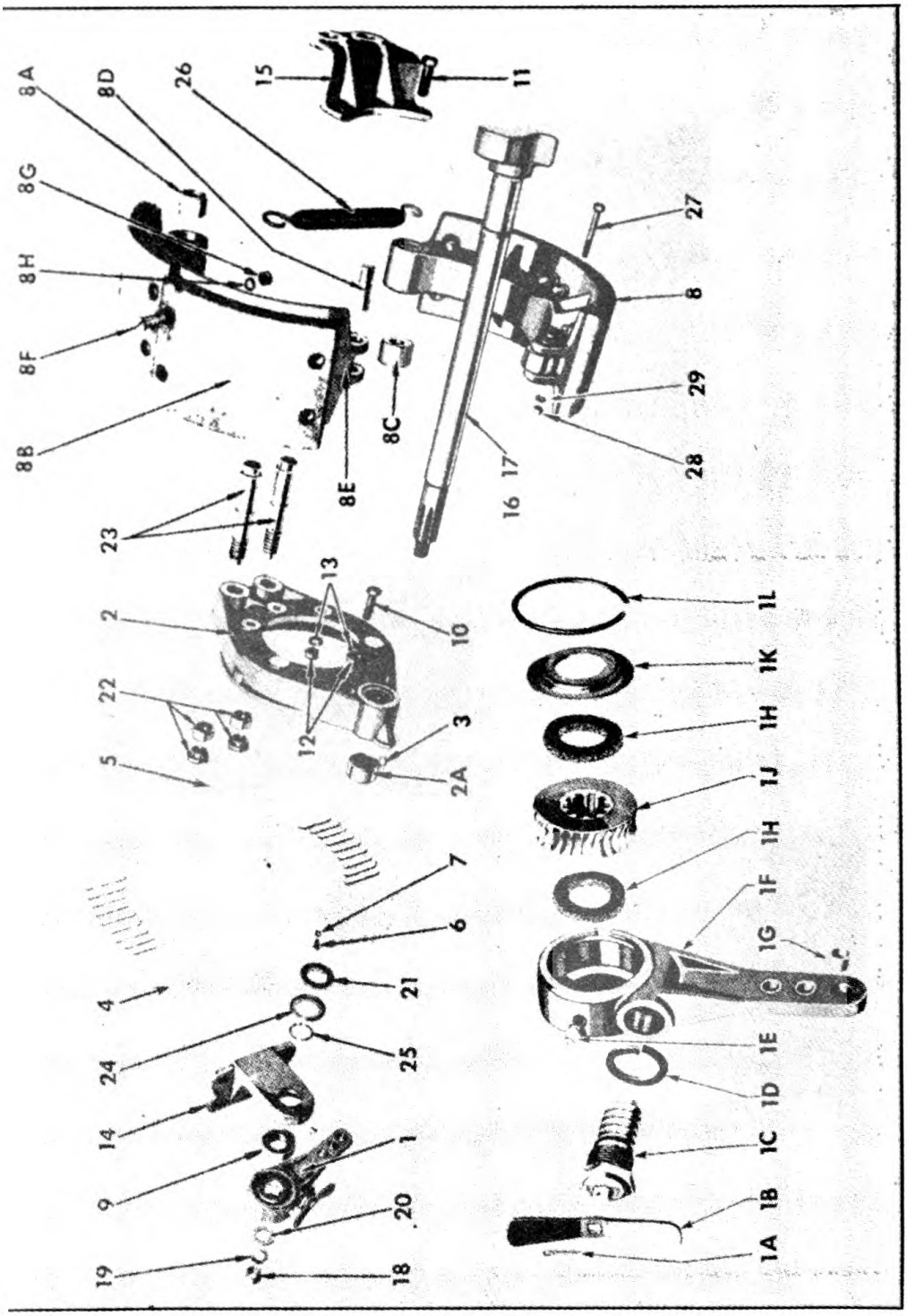

FIGURE 79. INTERNAL BRAKES—CONVERTER GEAR

INTERNAL BRAKES—CONVERTER GEAR

(FIGURE 79)

Fig. & Ref. No.	*Part No.*	*Name*	*Quantity*
79—1	51200	ADJUSTER, slack, assembly	2
79—1A	103385	PIN, cotter, 1/8" x 1"	2
79—1B	535927	LEVER, adjusting	2
79—1C	51240	WORM, assembly	2
79—1D	534014	WASHER, lock, 1-1/8"	2
79—1E	109461	FITTING, alemite, straight, 1/8"	2
79—1F	——	HOUSING, slack adjuster (not serviced separately)	2
79—1G	533066	BUSHING, slack adjuster	6
79—1H	534730	WASHER, slack adjuster felt, large	4
79—1J	534725	GEAR, worm	2
79—1K	534731	RETAINER, felt, slack adjuster, large	2
79—1L	534732	RING-SNAP, felt retainer	2
79—2	51220	ADAPTER, brake, mounting plate (535098)	2
79—2A	535017	BEARING, needle, (BH-2216-X)	4
79—3	536393	FITTING, alemite, straight, 1/8" (Keystone BB Combination)	2
79—4	535772	SHIELD, dust, left	2
79—5	535773	SHIELD, dust, right	2
79—6	106972	BOLT, hex-hd., 1/4"—20 x 1/2"	12
79—7	103319	WASHER, lock, medium, 'A," No. 14 or 1/4"	12
79—8	51262	SHOE, brake, assembly, 16" x 6" (533974)	4
79—8A	532866	BUSHING	8
79—8B	535348	LINING, brake	8
79—8C	533979	ROLLER	4
79—8D	533980	SHAFT, roller	4
79—8E	——	SHOE, brake (not serviced separately)	4
79—8F	114687	SCREW, 3/8"—16 x 1-1/4"	32
79—8G	102635	NUT, 3/8"—16	32
79—8H	103321	WASHER, lock, 3/8"	32
79—9	533368	BEARING, ball (Nice No. 517)	2
79—10	535027	BOLT, 1/2"—20 x 1-1/2"	10
79—11	535028	BOLT, 1/2"—20	6
79—12	103028	NUT, 1/2"—20	16
79—13	103323	WASHER, lock, medium "A," 1/2"	16
79—14	533967	BRACKET, cam	2
79—15	533974	BRACKET, eccentric anchor pin	2
79—16	535101	CAM, medium, left	1
79—17	535102	CAM, medium, right	1
79—18	103031	NUT, 3/4"—16	2
79—19	103326	WASHER, lock type "A," 3/4"	2
79—20	106268	WASHER, plain, 3/4"	2
79—21	534730	FELT	2
79—22	534079	NUT, lock	4
79—23	533975	PIN, eccentric anchor	4
79—24	535018	RETAINER, felt	2
79—25	535019	RING-SNAP	2
79—26	530135	SPRING, brake shoe	2
79—27	100031	BOLT, 3/8"—24 x 2-1/2"	4
79—28	103026	NUT, 3/8"—24	4
79—29	103321	WASHER, lock, 3/8"	4

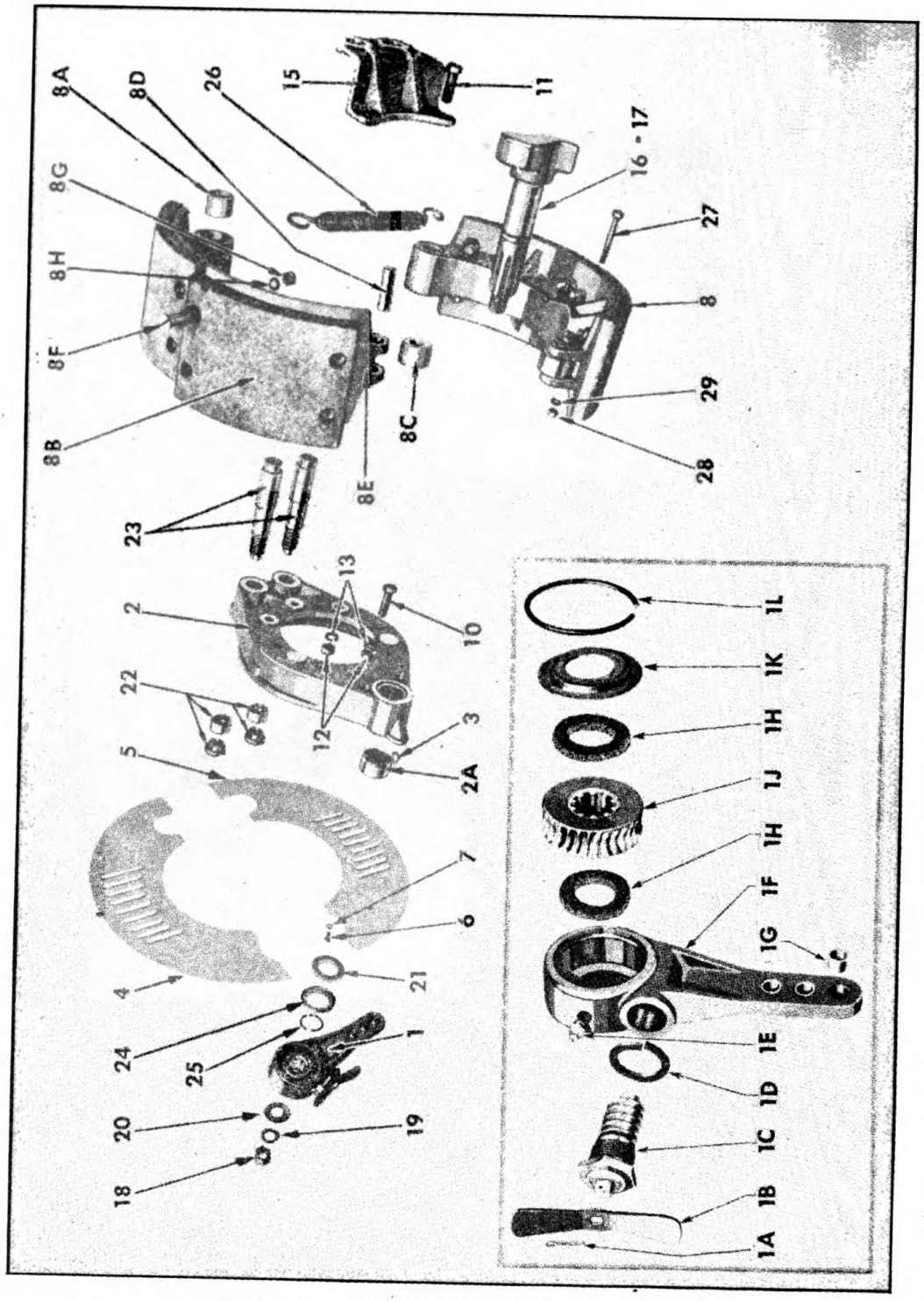

FIGURE 80. INTERNAL BRAKES—TRAILER

INTERNAL BRAKES—TRAILER

(FIGURE 80)

Fig. & Ref. No.	*Part No.*	*Name*	*Quantity*
	{ 51478	ADJUSTER, slack, assembly	4
80—1	}*57064	ADJUSTER, slack, assembly	4
80—1A	103385	PIN, cotter, 1/8" x 1"	8
80—1B	535927	LEVER, adjusting	8
80—1C	51240	WORM, assembly	8
80—1D	534014	WASHER, lock, 1-1/8"	8
80—1E	109461	FITTING, alemite, straight, 1/8"	8
80—1F	——	HOUSING, slack adjuster (not serviced separately)	8
80—1G	533066	BUSHING, slack adjuster	24
80—1H	534730	WASHER, slack adjuster felt, large	16
80—1J	534725	GEAR, worm	8
80—1K	534731	RETAINER, felt, slack adjuster, large	8
80—1L	534732	RING-SNAP, felt retainer	8
80—2	51220	ADAPTER, brake, w/bearing, assembly (535098)	8
80—2A	535017	BEARING, needle, (BH-2216-X)	16
80—3	109461	FITTING, alemite, straight, 1/8"	8
80—4	535772	SHIELD, dust, left	8
80—5	535773	SHIELD, dust, right	8
80—6	106972	BOLT, hex-hd., 1/4"—20 x 1/2"	48
80—7	103319	WASHER, lock, medium "A," No. 14 or 1/4	48
80—8	51262	SHOE, brake, assembly, 16" x 6" (533973)	16
80—8A	532866	BUSHING	32
80—8B	535348	LINING, brake	32
80—8C	533979	ROLLER	16
80—8D	533980	SHAFT, roller	16
80—8E	——	SHOE, brake (not serviced separately)	16
80—8F	114687	SCREW, 3/8"—16 x 1-1/4"	128
80—8G	102635	NUT, 3/8"—16	128
80—8H	103321	WASHER, lock, 3/8"	128
80—10	535027	BOLT, 1/2"—20 x 1-1/2"	40
80—11	535028	BOLT, 1/2"—20	16
80—12	103028	NUT, 1/2"—20	56
80—13	103323	WASHER, lock, medium, "A," 1/2"	56
80—15	533974	BRACKET, eccentric anchor pin	8
80—16	536241	CAM, medium, left	4
80—17	536242	CAM, medium, right	4
80—18	103031	NUT, 3/4"—16	8
80—19	103326	WASHER, lock type "A," 3/4"	8
80—20	106268	WASHER, plain, 3/4"	8
80—21	534730	FELT	8
80—22	534079	NUT, lock (male and female)	16
80—23	533975	PIN, eccentric anchor	16
80—24	535018	RETAINER, felt	8
80—25	535019	RING-SNAP	8
80—26	530135	SPRING, brake shoe	8
80—27	100031	BOLT, 3/8"—24 x 2-1/2"	16
80—28	103026	NUT, 3/8"—24	16
80—29	103321	WASHER, lock, 3/8"	16

***NOTE: Slack adjuster housing is ground off on one side for clearance of alemite fittings.**

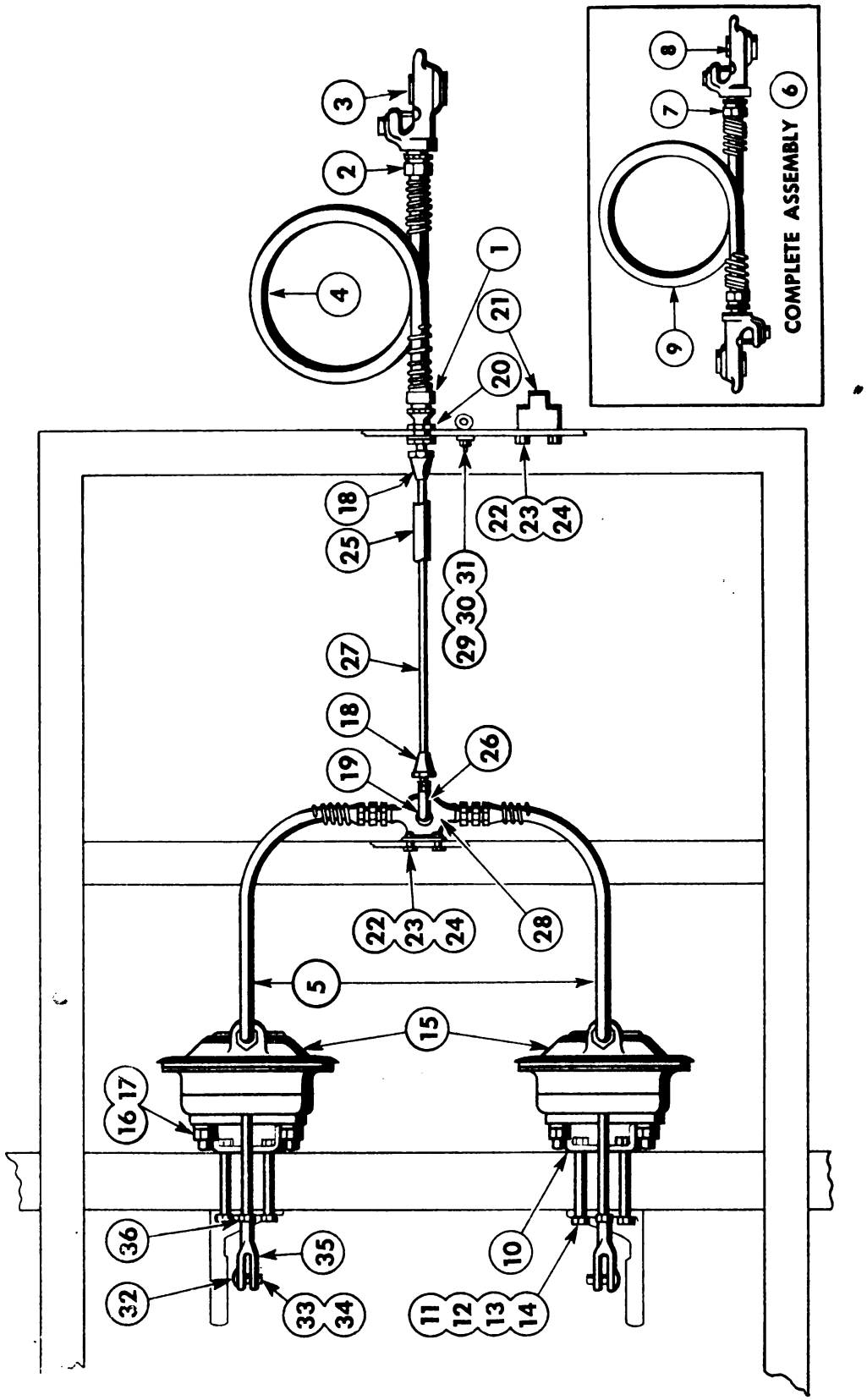

FIGURE 81. OPERATING PARTS FOR BRAKES—CONVERTER GEAR

BRAKE OPERATING PARTS—CONVERTER GEAR

(FIGURE 81)

Fig. & Ref. No.	*Part No.*	*Name*	*Quantity*
81	51490	HOSE, assembly—converter gear to trailer (WAB-215590)	1
81—1	535309	CONNECTION, with WIRE, 1/4"—1/4" thread (WAB-215536)	1
81—2	535308	CONNECTION with WIRE, 1/4"—1/2" thread (WAB-215535)	1
81—3	534533	COUPLING, air hose (WAB-220165)	1
81—4	536281	HOSE	1
81—5	51469	HOSE, flexible, assembly	2
81—6	51493	HOSE, jumper, assembly (WAB-215604)	2
81—7	535308	CONNECTION, with WIRE, 1/4"—1/2" thread	4
81—8	534533	COUPLING, air hose (WAB-220165)	4
81—9	536285	HOSE	2
81—10	532977	BRACKET, mounting, chamber	2
81—11	117051	NUT, hex., 1/2"—20	8
81—12	120911	BOLT, 1/2"—20 x 4-3/4"	8
81—13	103343	WASHER, flat, small, 1/2"	12
81—14	103323	WASHER, lock, medium, 1/2"	8
81—15	535704	CHAMBER, 9", (WAB-220702)—See Figure 76	2
81—16	103028	NUT, hex., 1/2"—20	2
81—17	103343	WASHER, lock, medium, 1/2"	2
81—18	535300	CONNECTOR, 3/8" tubing, 1/4" pipe thread (WAB-205053)	2
81—19	119931	BUSHING, reducing, 3/8" to 1/4"	1
81—20	536214	COUPLING, tubing (WAB-205465)	1
81—21	535705	CAP, dummy, hose	1
81—22	100014	BOLT, hex-hd., 5/16"—24 x 1"	4
81—23	103025	NUT, hex., 5/16"—24	4
81—24	103320	WASHER, lock, plain, 5/16"	4
81—25	*Stk#1043	LOOM, tubing, 7/16" inside diameter	16"
81—26	120063	ELBOW, street, 3/8"—90°—bottom of valve	1
81—27	*Stk#1041	TUBING, copper, 3/8"	16"
81—28	535310	VALVE, quick release (WAB-205000)	1
81—29	532147	EYE, bolt, 1/4"	1
81—30	103024	NUT, hex., 1/4"—28	1
81—31	103319	WASHER, lock, 1/4"	1
81—32	103498	PIN, clevis, 1/2"	2
81—33	103343	WASHER, plain, 1/2"	2
81—34	103385	PIN, cotter, 1/8" x 1"	2
81—35	104039	CLEVIS, adjustable, 1/2"	2
81—36	103028	NUT, 1/2"—20	2

*NOTE: Order by footage.

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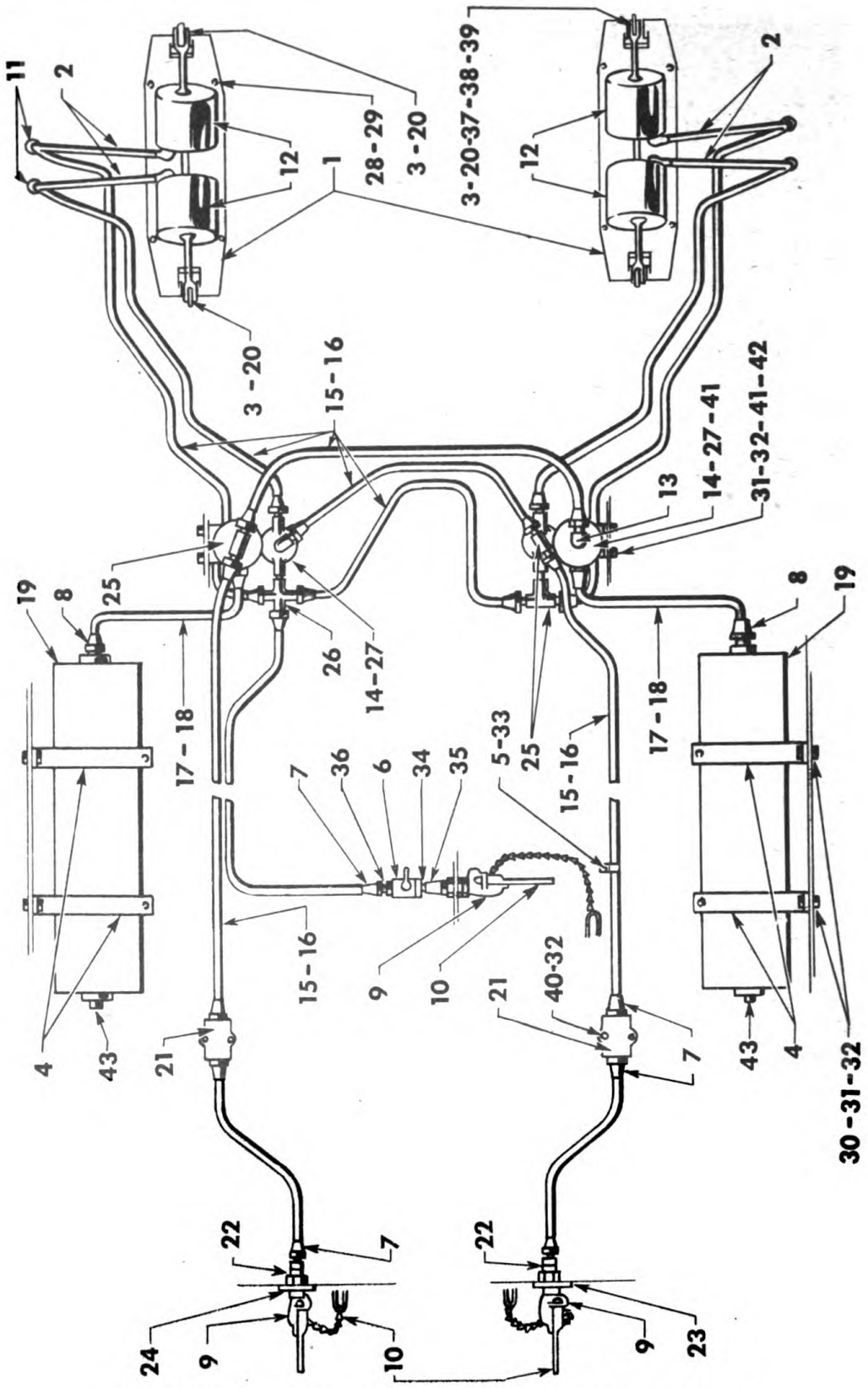

FIGURE 82. OPERATING PARTS FOR BRAKES—TRAILER

BRAKE OPERATING PARTS—TRAILER

(FIGURE 82)

Fig. & Ref. No.	*Part No.*	*Name*	*Quantity*
82—1	51338	CARRIER, brake cylinder, assembly—complete	2
82—2	51480	HOSE, flexible, assembly (WAB-215766)	4
82—3	51476	LEVER, trunnion rocker beam parking brake (536250)	4
	534212	BUSHING, oilite	12
82—4	532827	BRACKET, reservoir	8
82—5	532894	CLIP, tubing	50
82—6	535738	COCK, shut-off (WAB-220745)	1
82—7	535300	CONNECTOR, 3/8" tubing, 1/4" pipe thread (WAB-205053)	13
82—8	535306	CONNECTOR, 1/2" tubing, 3/8" pipe thread (WAB-217525)	4
82—9	534533	COUPLING, air hose (WAB-220165)	3
82—10	535910	COUPLING, dummy (WAB-220636)	3
82—11	536214	COUPLING, tubing (WAB-205465)	4
82—12	535700	CYLINDER, brake (WAB-220929)—See Figure 77	4
82—13	535304	ELBOW, 3/8" tubing, 1/4" pipe thread	2
82—14	536110	FITTING, exhaust—attached to bottom of valve (WAB-221087)	2
82—15	Stk#1043	LOOM, tubing, 7/16" inside diameter	140'
82—16	Stk#1041	TUBING, copper, 3/8"	140'
82—17	Stk#1044	LOOM, tubing, 9/16" inside diameter	2'-3"
82—18	Stk#1042	TUBING, copper, 1/2"	2'-3"
82—19	535736	RESERVOIR, 7" x 36" (WAB-215689)	2
82—20	535729	SHAFT, trunnion rocker beam lever	4
82—21	536108	STRAINER, (WAB-221022)—See Figure 84	2
82—22	536213	STUD, clamping (WAB-205730)	3
82—23	535302	TAG, emergency (WAB-201499)	1
82—24	535301	TAG, service (WAB-201500)	1
82—25	535312	TEE, tubing (WAB-205103)	3
82—26	536251	CROSS, tubing	1
82—27	535303	VALVE, emergency relay (WAB-220353)—See Figure 83	2
82—28	100159	BOLT, hex-hd., 1/2"—13 x 1-1/4"	24
82—29	103323	WASHER, lock, medium, 1/2"	24
82—30	100026	BOLT, hex-hd., 3/8"—24 x 1"	8
82—31	103026	NUT, hex., 3/8"—24	12
82—32	103321	WASHER, lock, medium, 3/8"	16
82—33	144754	SCREW, rnd-hd., self tappg. "A," No. 10 x 1"	50
82—34	144601	NIPPLE, pipe, 3/8" pipe thread	1
82—35	142834	COUPLING, reducing pipe, 1/2" x 3/8"	1
82—36	119931	BUSHING, reducing, 3/8" to 1/4"	1
82—37	103498	PIN, clevis, 1/2"	8
82—38	103385	PIN, cotter, 1/8" x 1"	8
82—39	103387	PIN, cotter, 1/8" x 1-1/2"	8
82—40	100134	BOLT, hex-hd., 3/8"—16 x 1"	4
82—41	119931	BUSHING, reducing, 3/8" to 1/4"	2
82—42	100027	BOLT, hex-hd., 3/8"—24 x 1-1/4"	4
82—43	103867	PLUG, pipe, 3/8"	4
	109461	FITTING, alemite, straight, 1/8"	4
	534434	COCK, drain, 1/4"—bottom of reservoir (WAB-215310)	2

*NOTE: Order by footage.

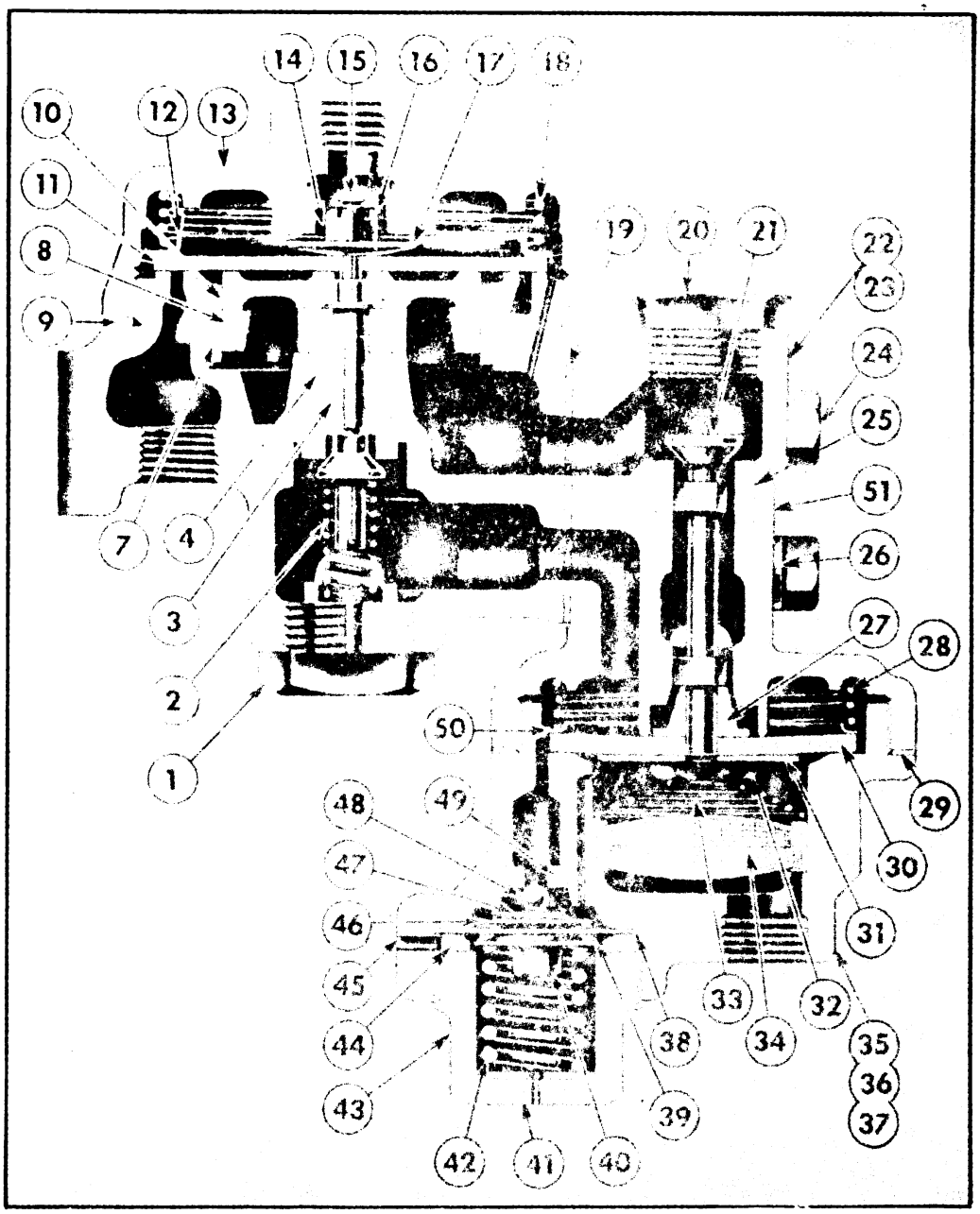

FIGURE 83. RELAY EMERGENCY VALVE

RELAY EMERGENCY VALVE

(FIGURE 83)

Fig. & Ref. No.	*Part No.*	*Name*	*Quantity*
83	WAB-220353	VALVE, emergency, relay, assembly—complete (535303)	2
83—1	WAB-202692	NUT, cap	2
83—2	WAB-202699	SPRING	2
83—3	WAB-202693	VALVE, intake	2
83—4	WAB-202690	SEAT, valve	2

RELAY EMERGENCY VALVE

(Continued)

(FIGURE 83)

Fig. & Ref. No.	*Part No.*	*Name*	*Quantity*
83—5*	WAB-216071	BODY, complete	2
83—6	WAB-204568	BODY	2
83—7	WAB-212135	BUSHING, diaphragm	2
83—8	WAB-202869	RING, diaphragm guide	2
83—9	WAB-211367	GASKET, cover	2
83—10	WAB-204650	GUIDE, diaphragm	2
83—11	WAB-202695	DIAPHRAGM	2
83—12	WAB-202697	SEAT, spring	2
83—13	WAB-202691	COVER	2
83—14	WAB-203016	PIN, cotter	2
83—15	WAB-204651	SCREW, diaphragm	2
83—16	WAB-203227	NUT, diaphragm	2
83—17	WAB-202696	WASHER, diaphragm	2
83—18	WAB-202698	SPRING	2
83—19	WAB-202735	GASKET	2
83—20	WAB-202741	NUT, cap	2
83—21	WAB-203379	STEM, valve	2
83—22†	WAB-215204	EMERGENCY, assembly	2
83—23	WAB-202746	BODY, emergency valve	2
83—24	WAB-203388	BOLT, hex-hd.	2
83—25	WAB-202736	SEAT, valve	2
83—26	WAB-202982	WASHER, lock	2
83—27	WAB-202743	SUPPORT, diaphragm	2
83—28	WAB-202738	SPRING	2
83—29	WAB-202747	GASKET, cover	2
83—30	WAB-202744	DIAPHRAGM	2
83—31	WAB-213387	WASHER	2
83—32	WAB-200029	NUT, lock	2
83—33	WAB-204056	SPRING	2
83—34	WAB-204055	STRAINER	2
83—35‡	WAB-220305	DIAPHRAGM, cover, assembly	2
83—36§	WAB-220304	DIAPHRAGM, cover, complete	2
83—37	WAB-213225	DIAPHRAGM, cover, body	2
83—38	WAB-213227	DIAPHRAGM	2
83—39	WAB-211541	FOLLOWER, lower, diaphragm	2
83—40	WAB-211542	NUT, stem lock	2
83—41	WAB-213229	SHIM	2
83—42	WAB-213228	SPRING	2
83—43	WAB-213230	CAP	2
83—44	WAB-213226	RING	2
83—45	WAB-213224	PIN	2
83—46	WAB-211595	FOLLOWER, upper, diaphragm	2
83—47	WAB-211538	STEM	2
83—48	WAB-211539	BALL	2
83—49	WAB-211537	SEAT, valve	2
83—50	WAB-202737	SEAT, upper spring	2
83—51•	WAB-220829	VALVE, emergency	2

WAB: Westinghouse Automotive Air Brake Company, Elyria, Ohio.

*Includes Items No. 4, 6 and 7. Item No. 7 cannot be replaced in the field.

†Includes Items No. 23 and 25.

‡Includes Items No. 36 to 49, inclusive.

§Includes Items No. 37, 45 and 49.

•Includes Items No. 20 to 50, inclusive.

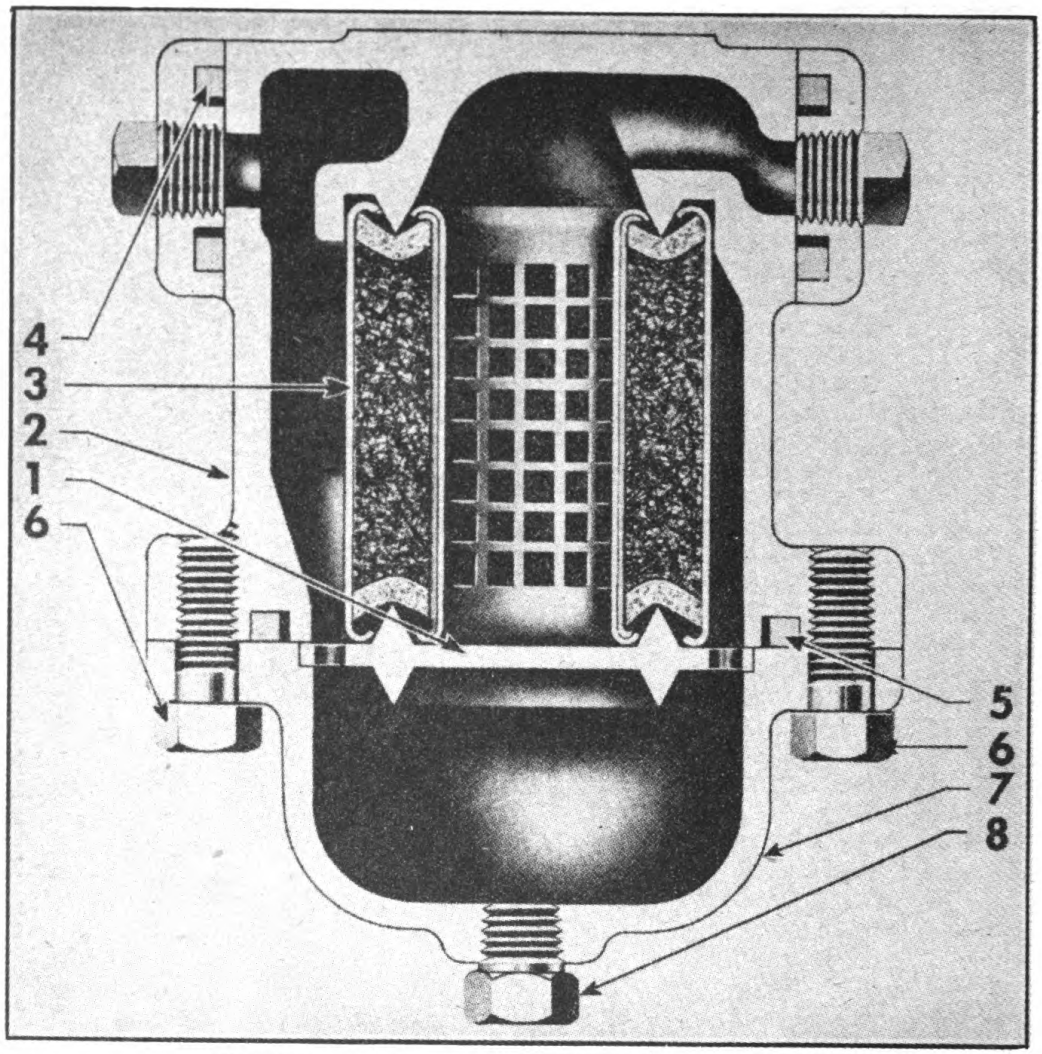

FIGURE 84. STRAINER FOR BRAKE LINES

STRAINER

(FIGURE 84)

Fig. & Ref. No.	*Part No.*	*Name*	*Quantity*
84	WAB-221022	STRAINER, assembly—complete (536108)	2
84—1	WAB-214171	SUPPORT, strainer	2
84—2	WAB-214169	BODY	2
84—3	WAB-221053	STRAINER	2
84—4	WAB-214174	GASKET, flange	4
84—5	WAB-214173	GASKET, body	2
84—6	WAB-210897	BOLT, hex-hd.	4
84—7	WAB-214172	CHAMBER, dirt	2
84—8	WAB-213530	PLUG, pipe	2

WAB: Westinghouse Automotive Air Brake Company, Elyria, Ohio.

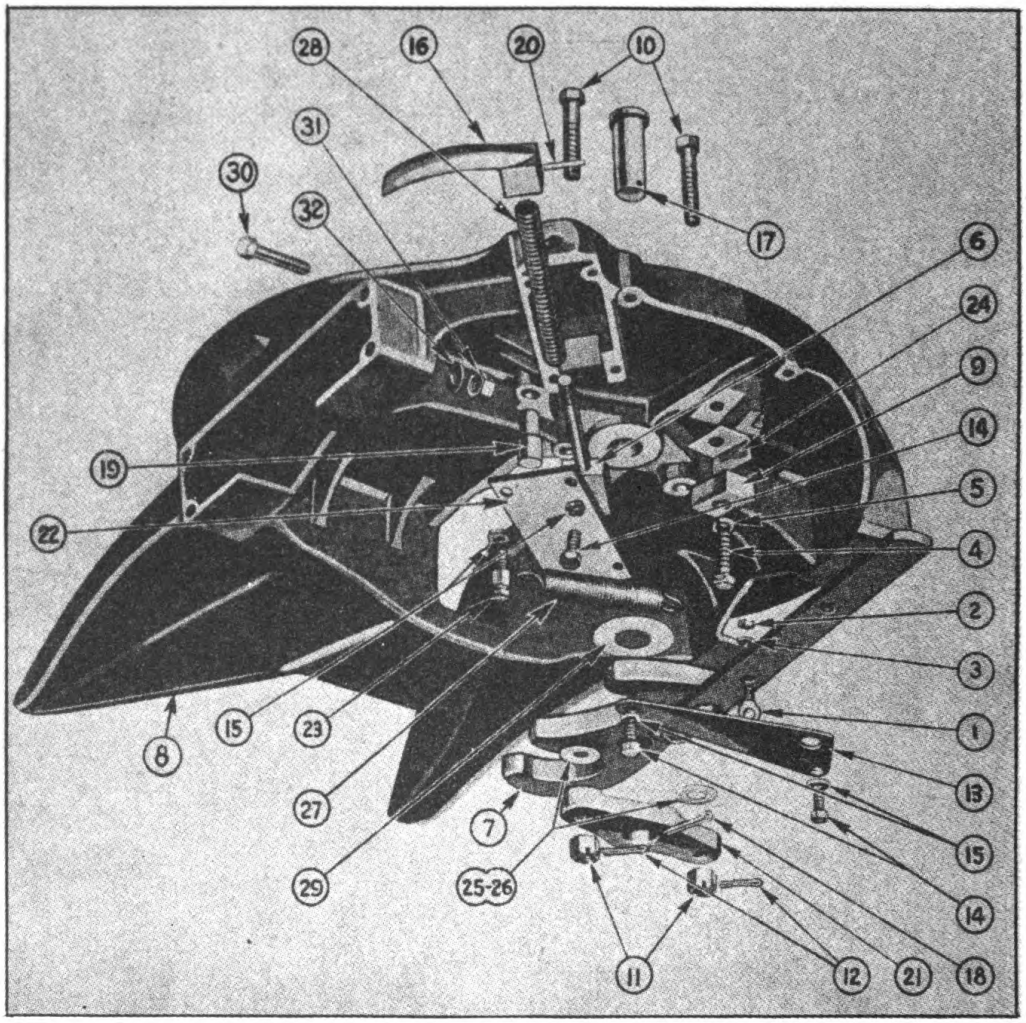

FIGURE 85. COUPLER OR FIFTH WHEEL

LOWER COUPLER (Fifth Wheel)—CONVERTER GEAR

(FIGURE 85)

Fig. & Ref. No.	*Part No.*	*Name*	*Quantity*
85—1	532147	EYE, bolt, 1/4"	1
85—2	103024	NUT, hex., 1/4"—28	1
85—3	103319	WASHER, lock, medium "A," 1/4"	1
85—4	100162	BOLT, hex., 1/2"—13 x 2"	1
85—5	103323	WASHER, lock type, medium "A," 1/2"	1
85—6	50668	BLOCK with STEM, lock, assembly	1
85—7	50667	HOOK with HANDLE, assembly	1
85—8	650561	BASE, 28" lower coupler	1
85—9	650566	BLOCK, wear, coupler hook stop	1
85—10	650058	BOLT, coupler hook plate	2
85—11	119256	NUT, slotted hex., 5/8"—18	2
85—12	103388	PIN, cotter, 1/8" x 1-3/4"	2
85—13	650282	GUIDE, coupler hook handle	1
85—14	106329	BOLT, hex-hd., 3/8"—16 x 5/8"	5
85—15	103321	WASHER, lock, medium "A," 3/8"	5
85—16	500400	HANDLE, coupler hook lock	1
85—17	650014	PIN, coupler hook	1
85—18	103411	PIN, cotter, 3/16" x 2"	1
85—19	650584	PIN, coupler hook stop	1
85—20	650162	PIN, coupler hook lock handle	1
85—21	650155	PLATE, coupler hook	1
85—22	650116	PLATE, coupler lock cover guide	1
85—23	650115	SCREW, coupler hook spring	1
85—24	650592	SHIM, coupler hook stop wear block	as req'd
85—25	650070	SPACER, coupler hook plate	as req'd
85—26	650070-A	SPACER, coupler hook plate	as req'd
85—27	650114	SPRING, coupler hook	1
85—28	650118	SPRING, coupler lock	1
85—29	650009	WASHER, coupler hook spacer	1
85—30	100059	BOLT, hex-hd., 1/2"—20 x 4-1/2"	8
85—31	103028	NUT, hex., 1/2"—20	8
85—32	103323	WASHER, lock, medium, 1/2"	8
	100083	BOLT, hex-hd., 5/8"—18 x 4-1/2"	2
	103030	NUT, hex., 5/8"	2
	103325	WASHER, lock, medium, 5/8"	2

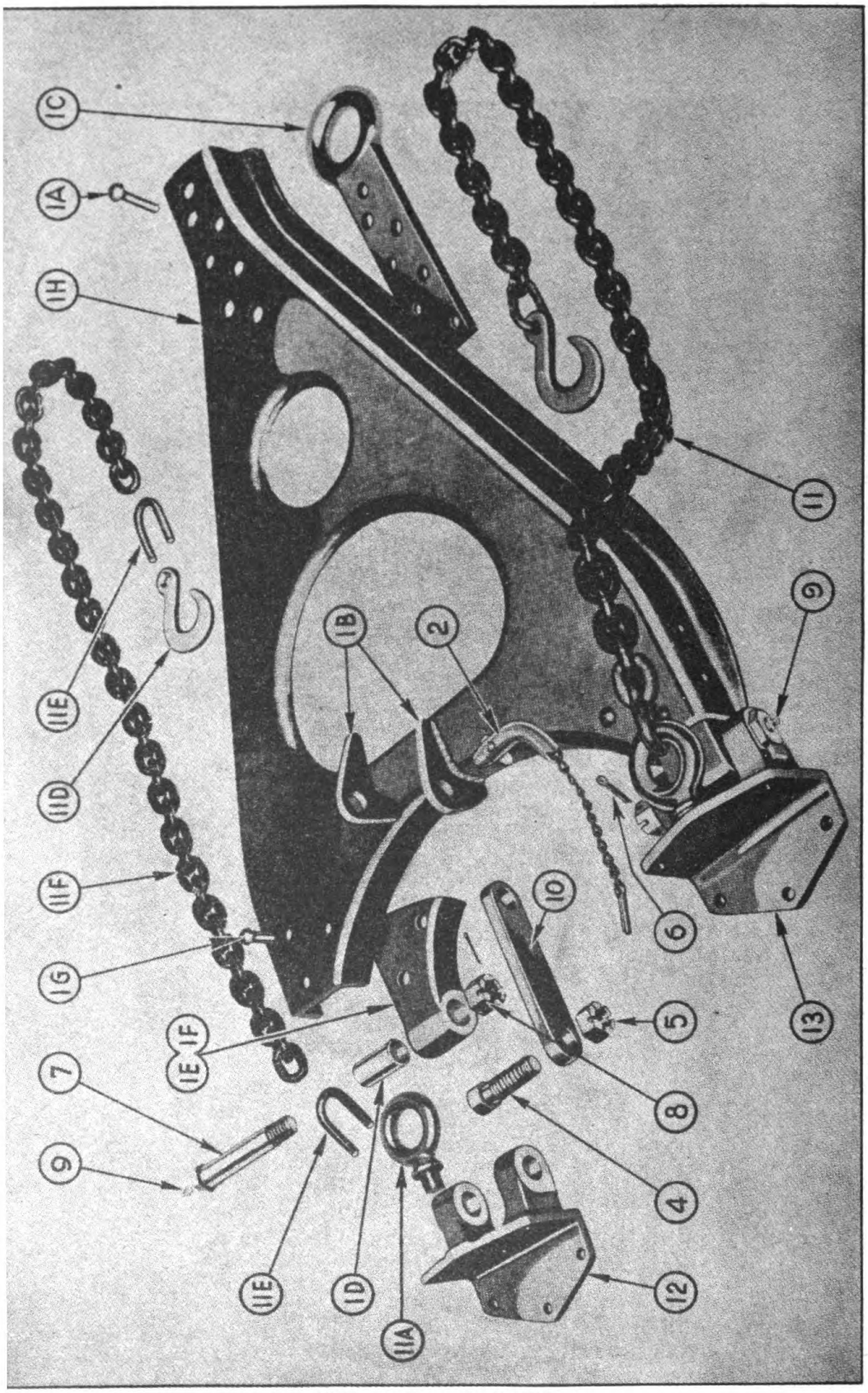

FIGURE 86. DRAWBAR

DRAWBAR

(FIGURE 86)

Fig. & Ref. No.	*Part No.*	*Name*	*Quantity*
86	52112	DRAWBAR, assembly	1
86—1A	138070	RIVET, rnd-hd., 5/8" x 3¼"	7
86—1B	600039	BRACKET, drawbar support	2
86—1C	601071	EYE, drawbar	1
86	52097	DRAWBAR, assembly, 4'-0" (Midland No. E-5798)	1
86—1D	595255	BUSHING, drawbar	2
86—1E	600001	BRACKET, drawbar hinge, left (with bushing)	1
86—1F	600002	BRACKET, drawbar hinge, right (with bushing)	1
86—1G	110438	RIVET, rnd-hd., 7/16" x 1⅝"	10
86—1H	599996	PLATE, drawbar	1
86—2	54961	PIN, lock, drawbar, assembly	1
86—4	599591	BOLT, special	1
86—5	109893	NUT, slotted hex., 1"—8	1
86—6	103388	PIN, cotter, 1/8" x 1¾"	2
86—7	560503	BOLT, spring shackle	2
86—8	119260	NUT, slotted hex., thick, 1⅛"—12	2
86—9	109461	FITTING, alemite, straight, 1/8"	2
86—10	599956	ARM, support, drawbar	1
86—11	52110	CHAIN, safety, assembly	2
86—11A	600874	EYE, bolt, safety chain	2
86—11D	675503	HOOK, 1/2" chain	2
86—11E	599809	LINK, chain, 9"	4
86—11F	600730	CHAIN, safety, 8' 6"	2
86—12	55071	BRACKET, drawbar frame, left, assembly (599529)	1
86—13	55072	BRACKET, drawbar frame, right, assembly (599529)	1

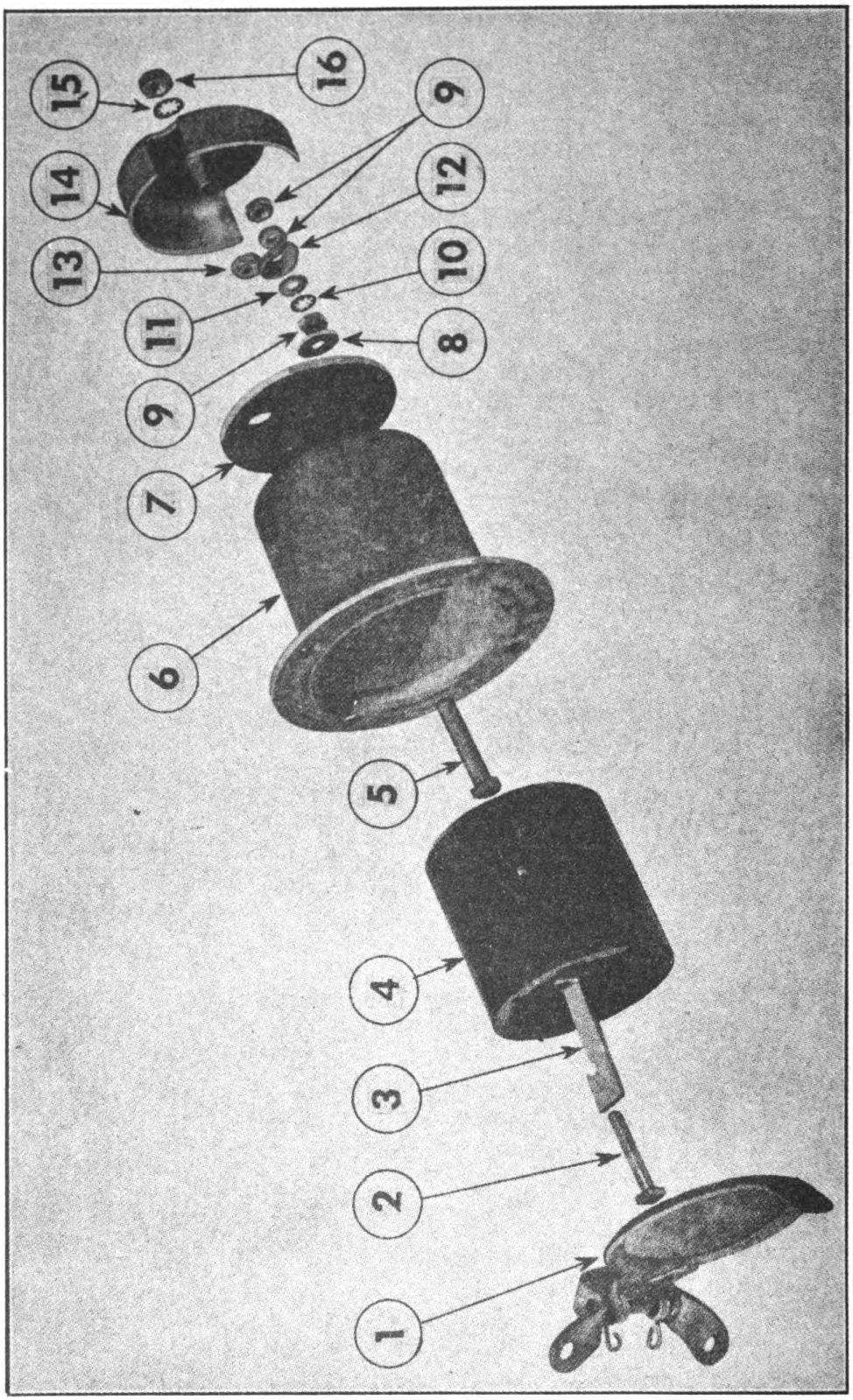

FIGURE 87. COUPLING SOCKET

COUPLING SOCKET AND COVER

(FIGURE 87)

Fig. & Ref. No.	*Part No.*	*Name*	*Quantity*
87	51310	SOCKET, coupling and COVER, assembly—complete (WEB-3529 & WEB-11935)	3
87—1	WEB-11935-B	COVER, coupling socket, assembly	3
87—2	WEB-110243	BOLT, terminal, sq-hd., No. 10, 1-1/4" SAE	12
87—3	WEB-110247	BLADE, contact, safety switch	12
87—4	WEB-3528	INSERT, coupling socket (bakelite)	3
87—5	WEB-110589	BOLT, sq-hd., cadmium, 1/4" x 1-5/16" SAE	3
87—6	WEB-20102	CASE, coupling socket	3
87—7	WEB-110417	INSULATOR, coupling socket case, back	3
87—8	WEB-110346	WASHER, plain, cadmium, 7/32"	12
87—9	WEB-110477-A	NUT, hex., cadmium, No. 10 SAE	36
87—10	WEB-110334	WASHER, lock, internal teeth, 3/16"	12
87—11	WEB-110110	WASHER, plain, brass, 7/32"	12
87—12	WEB-110242	WASHER, terminal cup	12
87—13	WEB-110638	NUT, jam, hex-hd., 1/4" SAE	3
87—14	WEB-110634	CAP, coupling socket, assembly	3
87—15	WEB-110335	WASHER, lock, internal teeth, 1/4"	4
87—16	WEB-110006	NUT, hex., cadmium, 1/4" SAE	3

WEB: Warner Electric Brake Mfg. Co., Beloit, Wisconsin.

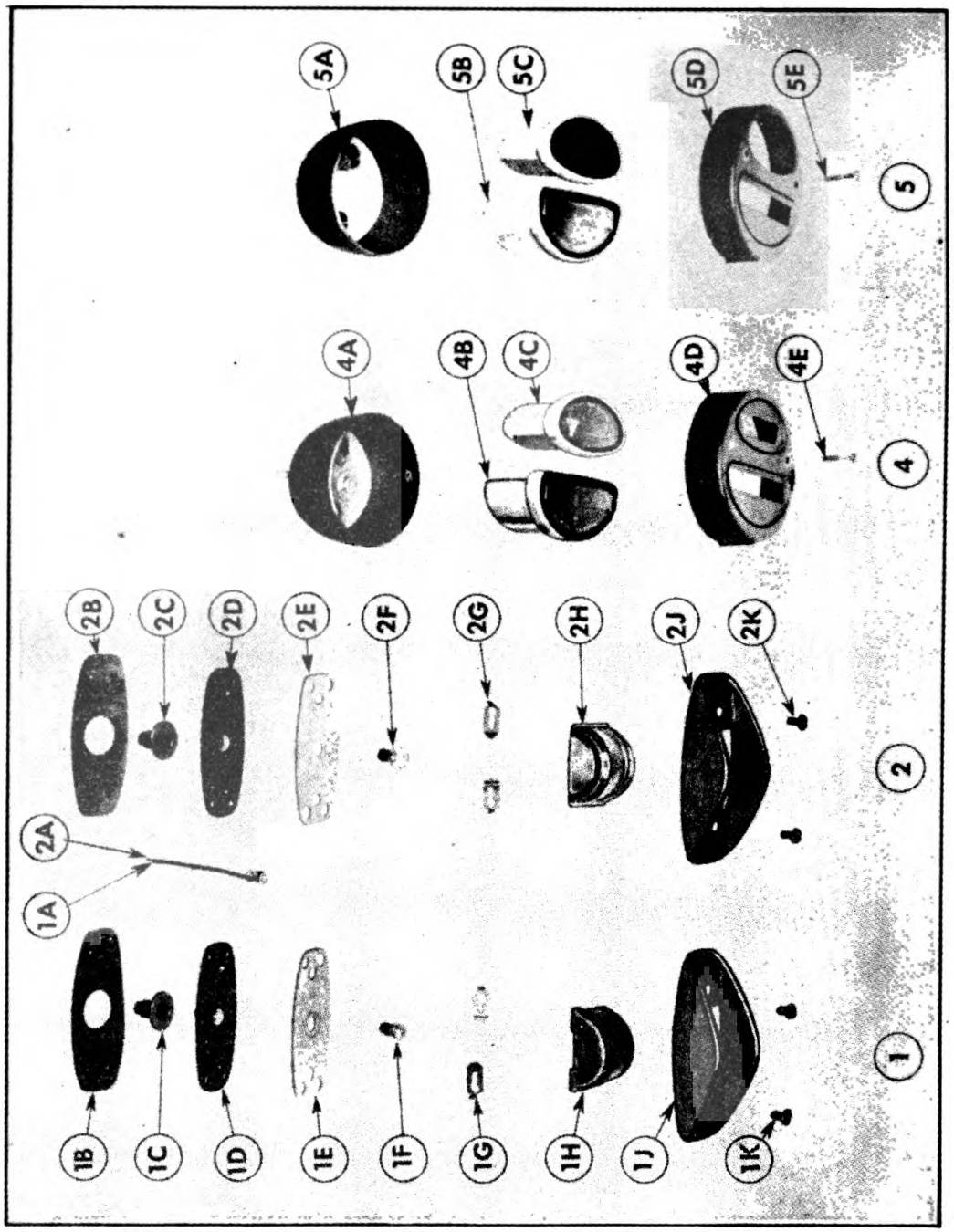

FIGURE 88. LIGHTS

LIGHTS—TRAILER AND CONVERTER GEAR

(FIGURE 88))

Fig. & Ref. No.	*Part No.*	*Name*	*Quantity*
88—1	320488	LIGHT, clearance, blackout, blue lens, assembly—complete (KD-541)	2
88—1A	KD-7136	WIRE, pig-tail	2

LIGHTS—TRAILER AND CONVERTER GEAR

(Continued)

(FIGURE 88))

Fig. & Ref. No.	*Part No.*	*Name*	*Quantity*
88—1B	KD-5140	GASKET, rubber—only	2
88—1C	KD-4684	NIPPLE, rubber	2
88—1D	KD-9526	PLATE, backing	2
88—1E	KD-2878	GASKET, lexide	2
88—1F	No. 55	BULB, 2 C. P., 6-8 Volt	2
88—1G	KD-1996	CLIP, retaining, lens	4
88—1H	KD-8014	UNIT, blackout, blue lens	2
88—1J	KD-1135	HOUSING, clearance light	2
88—1K	KD-6777	SCREW, brass, 1/4" SAE	4
88—1	320625	LIGHT, clearance, blackout, red lens, assembly—complete (KD-541)	2
		NOTE: Same components as 320488 with the exception of Ref. No. 1H. (Omit KD-8014 blue filter and use KD-8013 red filter.)	
88—2	320487	LIGHT, clearance, amber lens, assembly—complete (KD-541)	2
88—2A	KD-7136	WIRE, pig-tail	2
88—2B	KD-5140	GASKET, rubber—only	2
88—2C	KD-4684	NIPPLE, rubber	2
88—2D	KD-9526	PLATE, backing	2
88—2E	KD-2878	GASKET, lexide	2
88—2F	No. 55	BULB, 1-1/2 C. P., 6-8 Volt	2
88—2G	KD-1996	CLIP, retaining, lens	4
88—2H	KD-4393	LENS, amber, clearance light	2
88—2J	KD-1135	HOUSING, clearance light	2
88—2K	KD-6777	SCREW, brass, 1/4" SAE	4
88—2	320624	LIGHT, clearance, red lens, assembly—complete (KD-541)	2
		NOTE: Same components as 320487 with the exception of Ref. No. 2H. (Omit KD-4393 amber lens and use KD-4392 red lens.)	
88—4	320593	LIGHT, blackout tail and blackout stop, assembly—complete, 6 Volt (CB-9210)	2
88—4A	CB-9212	HOUSING, blackout tail and blackout stop light	2
88—4B	CB-9225	UNIT, blackout tail light, assembly, lower, 6 Volt (320678)	2
88—4C	CB-9234	UNIT, blackout stop light, assembly, upper, 6 Volt (320677)	2
88—4D	CB-9232	DOOR, blackout tail and blackout stop light	2
88—4E	CB-9233	SCREW, machine, rd-hd., No. 8 x 1-1/4" SAE	4
88—5	320592	LIGHT, blackout tail and service stop, assembly, 6 Volt (CB-9207)	2
88—5A	CB-9212	HOUSING, blackout tail and service stop light	2
88—5B	CB-9225	UNIT, blackout tail light, assembly, lower, 6 Volt (320678)	2
88—5C	CB-9218	UNIT, service stop light, upper, 6 Volt (320676)	2
88—5D	CB-9231	DOOR, blackout tail and service stop light	2
88—5E	CB-9233	SCREW, machine, rd-hd., No. 8 x 1-1/4" SAE	4

KD: KD Lamp Co., Tulsa, Oklahoma.
CB: Corcoran-Brown Lamp Division, Cincinnati, Ohio.

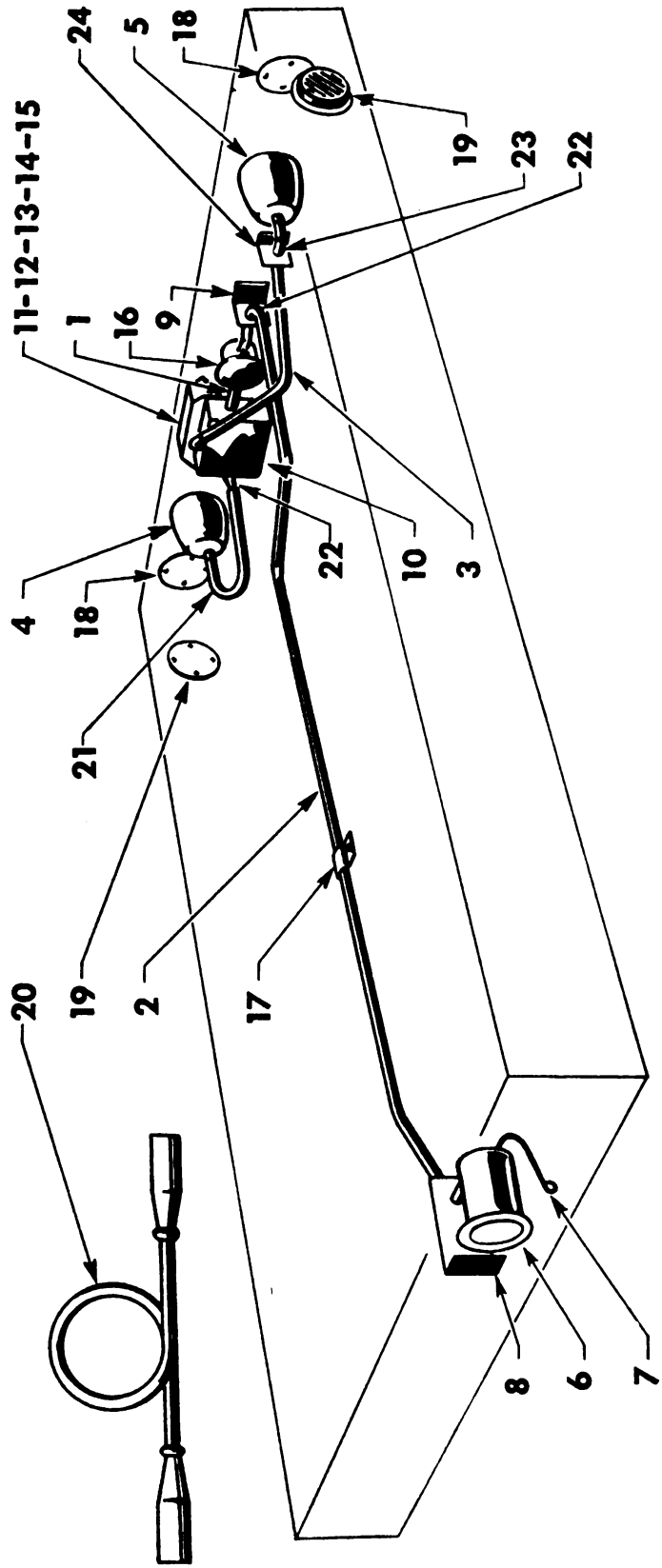

FIGURE 89. WIRING AND LIGHTS—CONVERTER GEAR

WIRING AND LIGHTS—CONVERTER GEAR

(FIGURE 89)

Fig. & Ref. No.	*Part No.*	*Name*	*Quantity*
89—1	54977	CONDUIT with WIRE, assembly—complete—blackout switch to junction box	1
89—2	56040	CONDUIT with WIRE, assembly—complete—socket to blackout switch	1
89—3	54964	CONDUIT with WIRE, assembly—complete—junction box to service tail light	1
89—4	320593	LIGHT, blackout stop and tail, assembly (QMC Drawing #08243-X)—See Figure 88	1
89—5	320592	LIGHT, service stop and tail and blackout tail, assembly—See Figure 88	1
89—6	51310	SOCKET, coupling, assembly	1
89—7	54517	WIRE, ground, assembly	1
89—8	600766	ANCHOR, conduit	1
89—9	675063	BRACKET, conduit	1
89—10	675101	BOX, junction	1
89—11	690085	COVER, fuse panel	1
89—12	106653	FUSE, 20 amperes, 1-1/4"	4
89—13	690007	GASKET, fuse panel	1
89—14	690006	PANEL, fuse	1
89—15	690008	STUD, fuse panel	2
89—16	320518	SWITCH, blackout (Gov't Spec. #08671-W)	1
89—17	320493	STRAP, pipe, fit .632 conduit (T&B #65)	4
89—18	320704	REFLECTOR, red	2
89—19	320658	REFLECTOR, red	2
89—20	54887	CORD, jumper, assembly, 9' (WEB-3737)	1
89—21	54963	CONDUIT with WIRE, assembly—complete—junction box to blackout stop and tail light	1
89—22	675060	CONNECTOR, 90° angle	2
89—23	675059	CONNECTOR, straight	1
89—24	675724	ANCHOR, conduit	1
	320588	BUSHING, anti-short—used on end of conduit	4
	320559	BUSHING, anti-short—used on end of conduit	4
	674732	GROMMET, 5/8" thick, 17/32" diameter hole	1
	Used for attaching Ref. Nos. 4 and 5.		
	120375	NUT, hex., 1/4"—20	4
	120380	WASHER, lock, medium, 1/4"	4
	Used for attaching Ref. No. 6.		
	106275	BOLT, hex-hd., 1/4"—28 x 7/8"	4
	103024	NUT, hex., 1/4"—28	4
	103319	WASHER, lock, medium, No. 14 or 1/4"	4
	Used for attaching Ref. No. 15.		
	102634	NUT, hex., 5/8"—18	2
	103320	WASHER, lock, plain, 5/16"	2
	103128	NUT, wing, 5/16"—18	2
	103362	PIN, cotter, 1/16" x 3/4"	2
	Used for attaching Ref. No. 17.		
	133043	SCREW, rnd-hd., 1/4"—20 x 3/4"	4
	134551	NUT, common hex., 1/4"—20	4
	120380	WASHER, lock, medium, 1/4"	4
	Used for attaching Ref. Nos. 18 and 19.		
	132915	SCREW, rnd-hd., No. 10-32 x 3/4"	16
	120614	NUT, common hex., No. 10	16
	120217	WASHER, lock, medium, No. 10	16

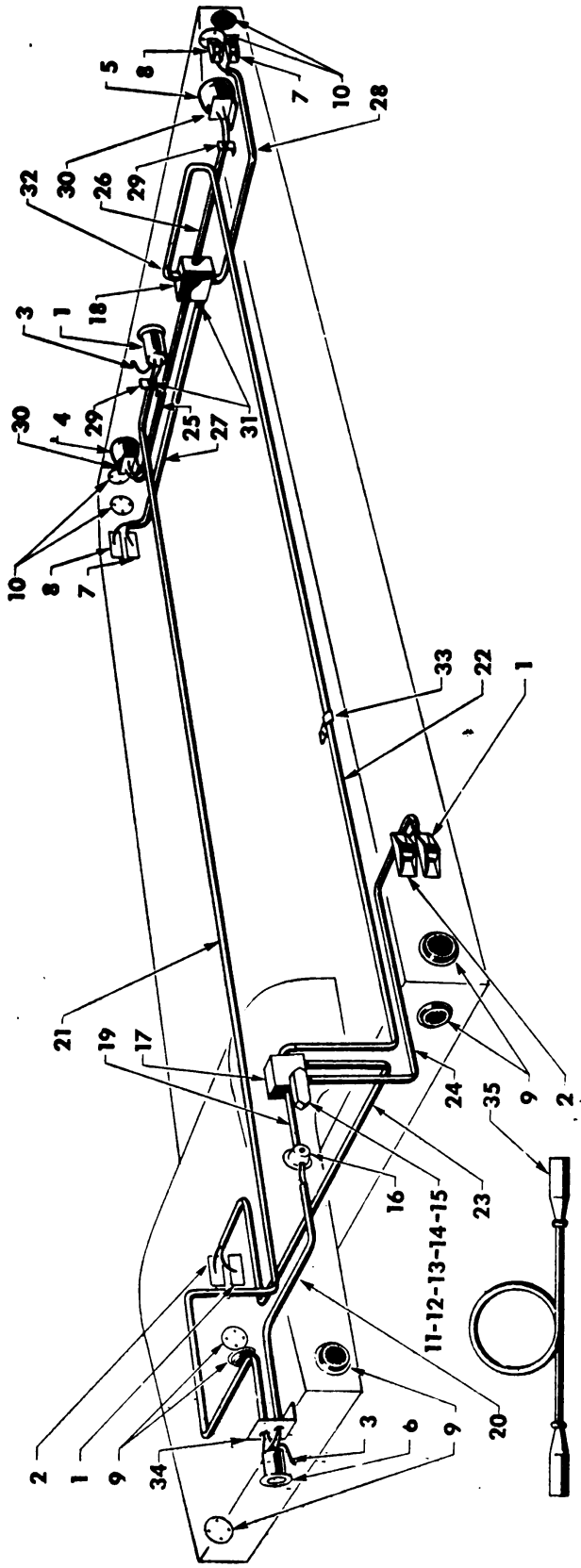

FIGURE 90. WIRING AND LIGHTS—TRAILER

WIRING AND LIGHTS—TRAILER

(FIGURE 90)

Fig. & Ref. No.	*Part No.*	*Name*	*Quantity*
90—1	320488	LIGHT, clearance, blackout, blue lens, assembly—See Figure 88	2
90—2	320487	LIGHT, clearance, amber lens, assembly—See Figure 88	2
90—3	54517	WIRE, ground, assembly	2
90—4	320593	LIGHT, blackout stop and tail, assembly (QMC Drawing #08243-X)—See Figure 88	1
90—5	320593	LIGHT, service stop and blackout tail, assembly	1
90—6	51310	SOCKET, coupling assembly	2
90—7	320625	LIGHT, clearance, blackout, red lens, assembly (KD-541) (QMC Drawing #08789-X)—See Figure 88	2
90—8	320624	LIGHT, clearance, red lens, assembly (KD-541) (QMC Drawing #08789-Y)—See Figure 88	2
90—9	320657	REFLECTOR, amber (Eng. Drawing A-2042-1B) (KD-333)	8
90—10	320658	REFLECTOR, red (Eng. Drawing A-2042-1B) (KD-333)	4
90—11	690085	COVER, fuse panel	1
90—12	690007	GASKET, fuse panel	2
90—13	106653	FUSE, 20 amperes, 1-1/4"	6
90—14	690006	PANEL, fuse	1
90—15	690008	STUD, fuse panel	2
90—16	320518	SWITCH, blackout	1
90—17	675727	BOX, front junction (T&B #188)	1
90—18	675209	BOX, junction (T&B #188)	1
90—19	54977	CONDUIT with WIRE, assembly—complete—blackout switch to junction box	1
90—20	54978	CONDUIT with WIRE, assembly—complete—coupling socket to blackout switch	1
90—21	54979	CONDUIT with WIRE, assembly—complete—front coupling socket to rear coupling socket	1
90—22	54976	CONDUIT with WIRE, assembly—complete—front junction box to rear junction box	1
90—23	54975	CONDUIT with WIRE, assembly—complete—front junction to clearance lights, right	1
90—24	54972	CONDUIT with WIRE, assembly—complete—front junction to clearance lights, left	1
90—25	54981	CONDUIT with WIRE, assembly—complete—junction box to blackout stop and blackout tail light	1
90—26	54980	CONDUIT with WIRE, assembly—complete—rear junction box to service stop and blackout tail light	1
90—27	54973	CONDUIT with WIRE, assembly—complete— rear junction box to clearance lights, right	1
90—28	54974	CONDUIT with WIRE, assembly—complete—rear junction box to clearance lights, left	1
90—29	675063	BRACKET, conduit	7
90—30	675022	BRACKET, light	2
90—31	675059	CONNECTOR, straight	12
90—32	675060	CONNECTOR, 90° angle	2
90—33	320493	STRAP, pipe, to fit .632 conduit	75
90—34	600356	ANCHOR, conduit	1

WIRING AND LIGHTS—TRAILER

(Continued)

(FIGURE 90)

Fig. & Ref. No.	*Part No.*	*Name*	*Quantity*
90—35	54887	CORD, jumper, assembly, 9'	1
	320588	BUSHING, anti-short—used on end of conduit	10
	320559	BUSHING, anti-short—used on end of conduit	4
		Used for attaching Ref. Nos. 1, 2, 7 and 8.	
	132768	SCREW, rnd-hd., No. 8-32 x 3/4"	32
	120622	NUT, common hex., No. 8-32	32
	121841	WASHER, lock, medium, No. 8	32
		Used for attaching Ref. Nos. 4 and 5.	
	120375	NUT, hex., 1/4"—20	4
	120380	WASHER, lock, medium, 1/4"	4
		Used for attaching Ref. No. 6.	
	106275	BOLT, hex-hd., plain, 1/4"—28 x 7/8"	8
	103024	NUT, hex., 1/4"—28	8
	103319	WASHER, lock, medium, No. 14 or 1/4"	8
		Used for attaching Ref. Nos. 9 and 10 .	
	132915	SCREW, rnd-hd., No. 10-32 x 3/4"	48
	120614	NUT, common hex., No. 10	48
	120217	WASHER, lock, medium, No. 10	48
		Used for attaching Ref. No. 15.	
	102634	NUT, hex., 5/16"—18	2
	103320	WASHER, lock, plain, 5/16"	4
	103128	NUT, wing, type "A," 5/16"—18	2
	103362	PIN, cotter, 1/16" x 3/4"	2
		Used for attaching Ref. No. 18.	
	133046	SCREW, rnd-hd., slotted, 1/4"—20 x 7/8"	2
	134551	NUT, common hex., 1/4"—20	75
	120380	WASHER, lock, medium, 1/4"	2
		Used for attaching Ref. No. 33.	
	133043	SCREW, rnd-hd., 1/4"—20 x 3/4"	75
	134551	NUT, common hex., 1/4—20	75
	120380	WASHER, lock, medium, 1/4"	75

FRAME—CONVERTER GEAR AND TRAILER

Fig. & Ref. No.	*Part No.*	*Name*	*Quantity*
	55084	FRAME, converter gear, assembly—complete (includes all items welded or riveted to frame)	1
	55074	MOUNTING, coupler, assembly—complete (mounting on which coupler is mounted to converter gear frame)	1
		Attaching parts (not included)	
	103028	NUT, hex., 1/2″—20	8
	103323	WASHER, lock, reg., 1/2″	8
	100052	BOLT, hex-hd., 1/2″—20 x 1-1/2″	8
	55073	SKID, pick-up, coupler, assembly	2
		Attaching parts (not included)	
	100053	BOLT, hex-hd., 1/2″—20 x 1-3/4″	8
	103323	WASHER, lock, reg., 1/2″	8
	103028	NUT, hex., 1/2″—20	8
	55053	FRAME, trailer, assembly—complete (includes all items welded or riveted to frame)	1
	590284	RING, bull	17
	600259	BRACKET, mounting, bull ring (for side rings)	14
	600459	ANGLE, mounting, bull ring (for front rings)	3
	651305	PIN, king (coupler hook-up to trailer)	1
		Attaching parts (not included)	
	104131	RIVET, rnd-hd., 1/2″ x 1-1/2″	6
	600990	STAPLE (rear of trailer)	2

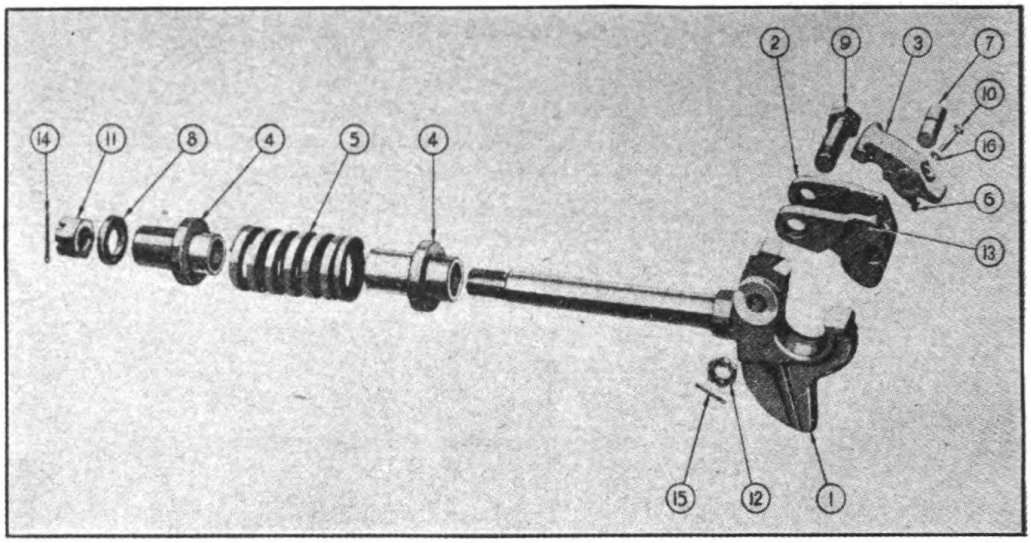

FIGURE 91. HOOK CONNECTION

PINTLE HOOK CONNECTION—TRAILER

(FIGURE 91)

Fig. & Ref. No.	*Part No.*	*Name*	*Quantity*
91	52872	HOOK, pintle, assembly (To conform to Q. M. #C-57093-X) (Austin Trailer Equipment Co., Muskegon, Mich., #T-110)	1
		(Composed of:	
91—1	ATE-101-2	HOOK, pintle	1
91—2	ATE-102-2	LOCK, pintle hook	1
91—3	ATE-103-3	LATCH, pintle hook	1
91—4	ATE-104	SLEEVE, pintle hook	2
91—5	ATE-105	SPRING	1
91—6	ATE-106	SPRING, latch	1
91—7	ATE-107	PIN, latch	1
91—8	ATE-108	WASHER	1
91—9	ATE-109	BOLT	1
91—10	100015	SCREW, cap, 5/16"—24 x 1-1/4"	1
91—11	ATE-59	NUT, slotted hex., 1-1/2"—6	1
91—12	145019	NUT, slotted hex., 1/2" thick, 1"—14	1
91—13	103426	PIN, cotter, 1/4" x 3"	1
91—14	103415	PIN, cotter, 3/16" x 3"	1
91—15	103389	PIN, cotter, 1/8" x 2"	1
91—16	103320	WASHER, lock, 5/16"	1

ATE: Austin Trailer Equipment Company, Muskegon, Michigan.

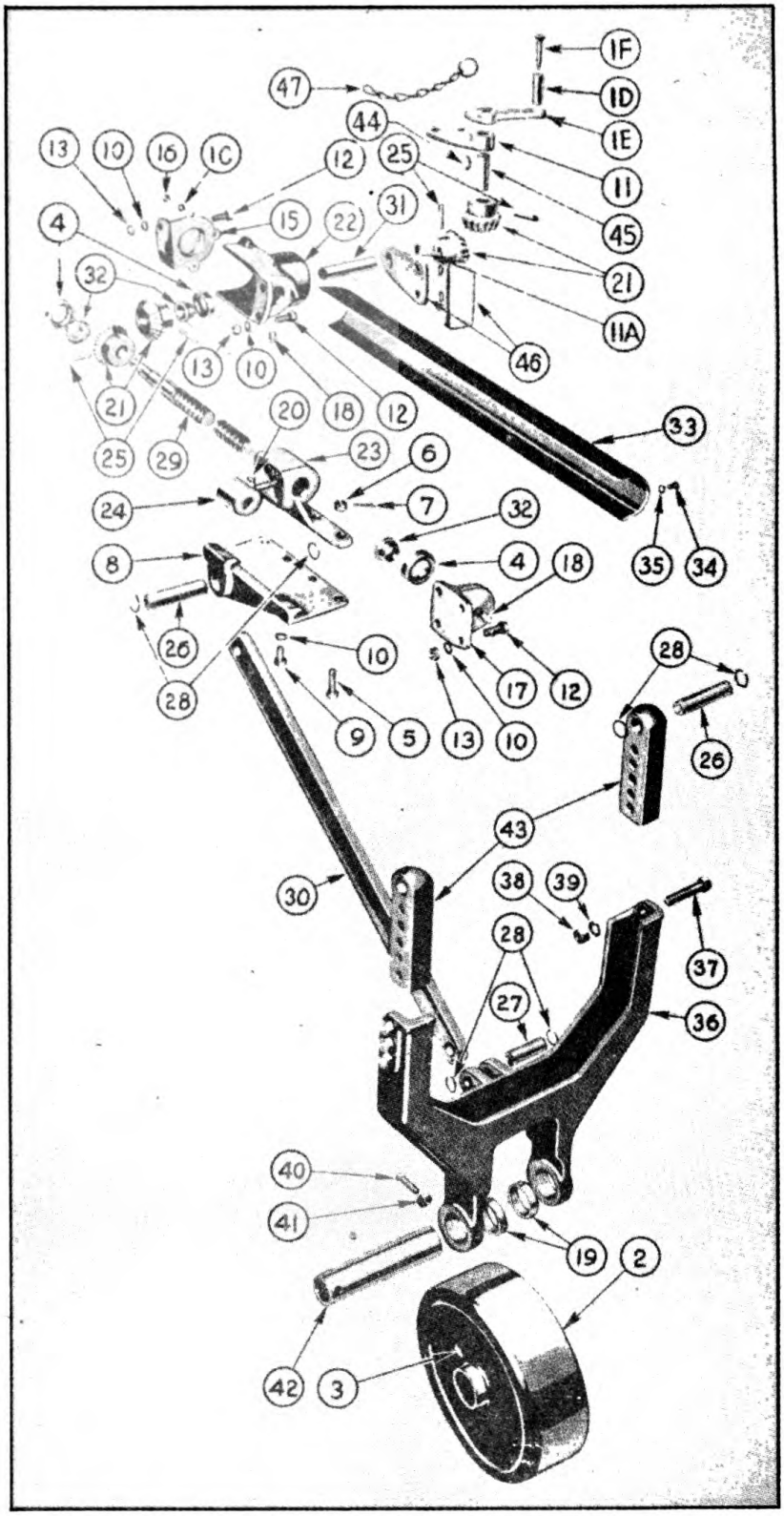

FIGURE 92. CONVERTER GEAR SUPPORT

SUPPORTS—CONVERTER GEAR

(FIGURE 92)

Fig. & Ref. No.	*Part No.*	*Name*	*Quantity*
92—1	53779	CRANK, support, assembly	1
92—1A	100030	BOLT, hex., long, 3/8"—24 x 2"	1
92—1B	103026	NUT, hex., 3/8"—24	1
92—1C	103321	WASHER, lock, medium "A," 3/8"	1
92—1D	630027	HANDLE, support crank	1
92—1E	631933	LEVER, crank support (serviceable complete only under Part No. 53779)	1
92—1F	631869	PIN, support crank handle	1
92—2	630986	WHEEL, support	1
92—3	111595	FITTING, alemite, straight, 1/4"—28	1
92—4	532633	BEARING	3
92—5	630663	BOLT, drill/for pin, 1/2—20 x 1-3/4	3
92—6	119254	NUT, hex., slotted, thick, 1/2"—20	3
92—7	103385	PIN, cotter, 1/8" x 1"	3
92—8	630569	BRACKET, connecting rod	1
92—9	100158	BOLT, hex-hd., 1/2"—13 x 1" USS	1
92—10	103323	WASHER, lock, medium "A," 1/2"	11
92—11	50174	BRACKET, operating shaft, assembly (630418)	1
92—11A	563784	BUSHING, support, operating shaft bracket	1
92—12	100051	BOLT, hex-hd., 1/2"—20 x 1¼"	10
92—13	103028	NUT, hex., thick, 1/2"—20	10
92—15	630575	CAP, bearing	1
92—16	100134	BOLT, hex., 3/8"—16 x 1"	3
92—17	630576	CAP, bearing, rear	1
92—18	109461	FITTING, alemite, straight, 1/8"	2
92—19	631667	COLLAR, axle support	2
92—20	630589	PIN, dowel, riser screw nut	1
92—21	630070	GEAR, support, plain	4
92—22	630570	HOUSING, riser gear	1
92—23	630568	HOUSING, support riser nut	1
92—24	630574	NUT, riser screw	1
92—25	630298	PIN, mitre gear, grooved	4
92—26	630020	PIN, support hinge	3
92—27	630457	PIN, support hinge	1
92—28	630838	RING, lock	8
92—29	630583	SCREW, riser	1
92—30	631938	ROD, connecting	1
92—31	631937	SHAFT, support operating	1
92—32	630573	SLEEVE, support bearing	3
92—33	630580	SHIELD, support, dust	1
92—34	106973	BOLT, hex-hd., 5/16"—18 x 1/2"	2
92—35	103320	WASHER, plain lock, 5/16"	2

SUPPORTS—CONVERTER GEAR

(Continued)

(FIGURE 92)

Fig. & Ref. No.	*Part No.*	*Name*	*Quantity*
92—36	631940	LEG, support	1
92—37	100080	BOLT, hex-hd., 5/8"—18 x 3"	6
92—38	103030	NUT, hex., 5/8" SAE	6
92—39	103325	WASHER, lock, medium "A," 5/8"	6
92—40	110094	SCREW, sq-hd., set, rnd-point, 1/2"—13 x 1½"	1
92—41	102637	NUT, hex., thick, 1/2"—13	1
92—42	630621	AXLE, support, wheel	1
92—43	631939	BAR, support, adjusting	2
92—44	113782	KEY, Woodruff, No. 15	1
92—45	631174	SHAFT, hand crank	1
92—46	53782	BRACKET, support operating shaft, assembly (50174 and 631944)	1
	631944	BRACKET, operating shaft angle	1
92—47	56436	CHAIN, support handle, assembly	1
	532147	BOLT, eye, 1/4—28	1
	103024	NUT, hex., 1/4"—28	1
	103319	WASHER, lock, No. 14, 1/4"	1

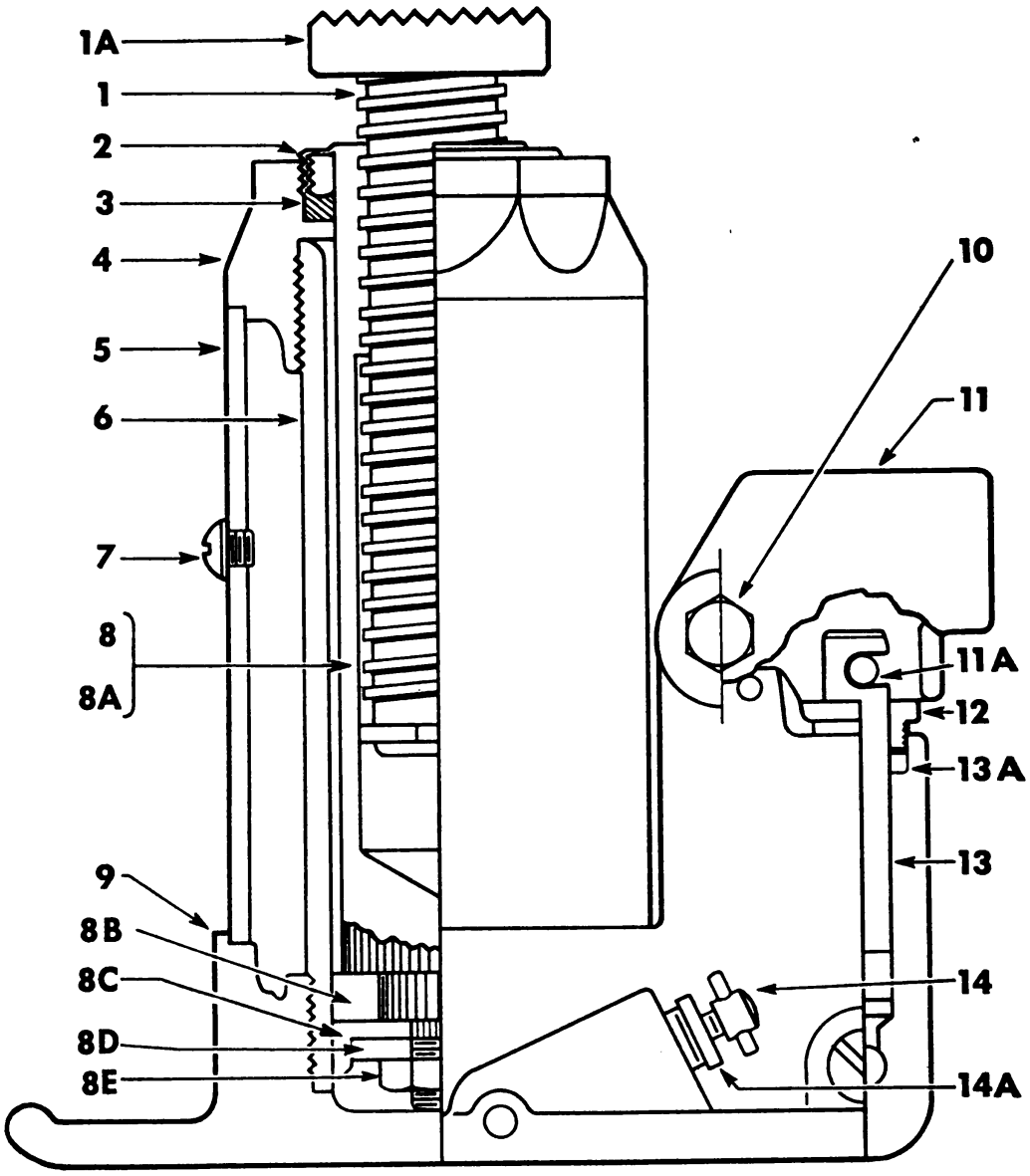

FIGURE 93. JACK FOR TRAILER SUPPORT

HYDRAULIC JACK—(Model 12-11A)

(FIGURE 93)

Fig. & Ref. No.	*Part No.*	*Name*	*Quantity*
93	HW-12.11A	JACK, Hein-Werner, assembly—complete (53799) Composed of:	2
93—1	HW-12-14	SCREW, extension, w/RAM HEAD, assembly	2
93—1A	HW-12-20	RAM HEAD	2
93—2	HW-12-8	NUT, ram packing	2
93—3	HW-12-7	PACKING, ram (felt)	2
93—4	HW-12-11	NUT, top	2
93—5	HW-12.11-2	TUBE, reservoir	2
93—6	HW-12.11-3	CYLINDER, inside	2
93—7	HW-12-23A	SCREW, oil filler, and WASHER	2
93—8	HW-12.11-4A	RAM, assembly	2
93—8A	HW-12.11-4	RAM (only)	2
93—8B	HW-12-6	WASHER, supporting ram cup	2
93—8C	HW-12-5	CUP, leather	2
93—8D	HW-12-9	WASHER, retaining, ram cup	2
93—8E	HW-12-10	NUT, retaining, ram cup	1
93—9	HW-12-1	BASE, jack	2
93—10	HW-12-33	BOLT, handle socket, w/NUT and WASHER	2
93—11	HW-12-12	SOCKET, handle, assembly	2
93—11A	HW-12-18	PIN, pump piston	2
93—12	HW-12-17	NUT, packing, pump piston	2
93—13	HW-12-15D	PISTON, pump, assembly	2
93—13A	HW-12-16	PACKING, pump piston	2
93—14	HW-12-13B	SCREW, release, w/NUT, packing, assembly	2
93—14A	HW-12-22	NUT, packing	2
	HW-12-21	HANDLE, jack #12 (2 sections) (631962)	2

HW: Hein-Werner Motor Parts Corporation, Waukesha, Wisconsin.

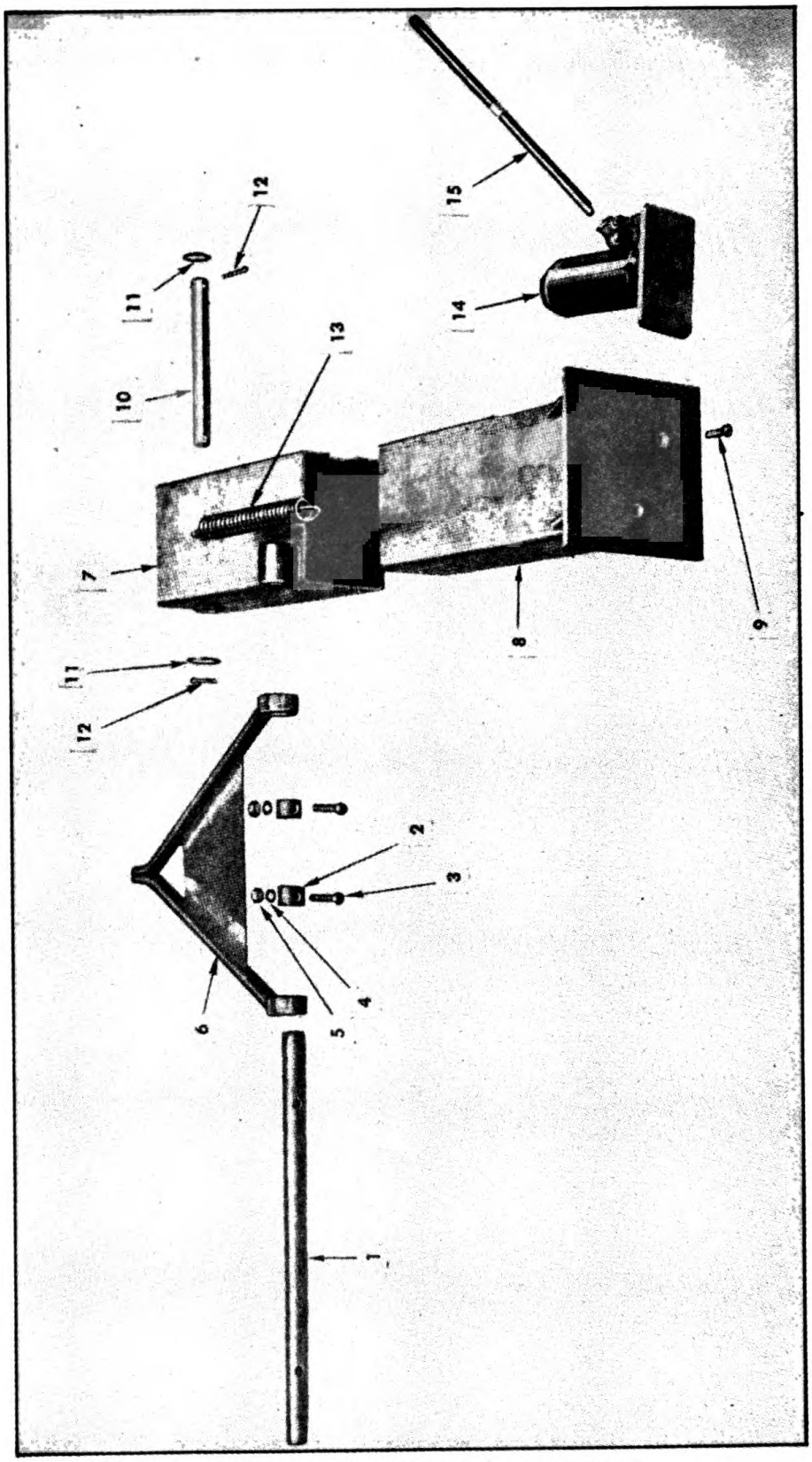

FIGURE 94. TRAILER SUPPORT LEG

SUPPORT LEGS—TRAILER

(FIGURE 94)

Fig. & Ref. No.	*Part No.*	*Name*	*Quantity*
94—1	631984	AXLE, support	1
94—2	631987	COLLAR, support axle	2
93—3	100080	BOLT, hex-hd., 5/8"—18 x 3"	2
94—4	103325	WASHER, lock, reg., 5/8"	2
94—5	103030	NUT, hex., 5/8"—18	2
94—6	53794	ROD, connecting, assembly	1
	631978	GUSSET, connecting rod	1
	631979	ROD, connecting	2
94—7	53797	LEG, upper, assembly, left side	1
	53798	LEG, upper, assembly, right side	1
94—8	53796	LEG, lower, assembly	2
94—9	115259	BOLT, flat-hd., 1/2"—20 x 1¾"	4
	103028	NUT, hex., 1/2"—20	4
	103323	WASHER, lock, reg., 1/2"	4
94—10	631985	SHAFT, support hinge, 1½" Dia., 14⅛" lg.	1
94—11	103422	PIN, cotter, 1/4" x 2"	4
94—12	240918	WASHER, plain, 1½"	4
94—13	631980	SPRING, lift	4
94—14	631961	JACK, hydraulic (only) (Hein-Werner 12.11A) See Figure 93	2
94—15	631962	HANDLE, jack—consisting of 2 sections, (Hein-Werner No. 2 for 12.11A)	2

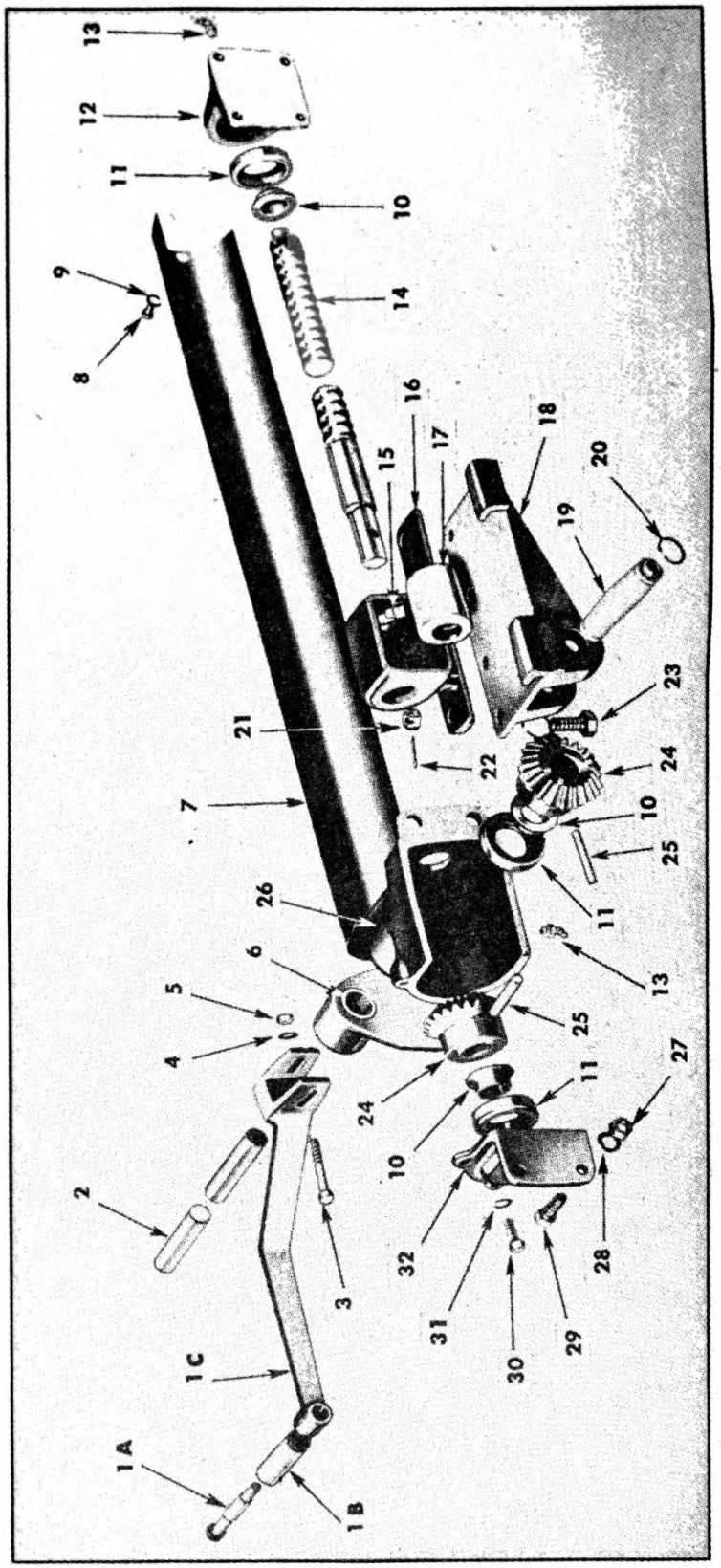

FIGURE 95. TRAILER SUPPORT OPERATING MECHANISM

SUPPORT OPERATING MECHANISM—TRAILER

(FIGURE 95)

Fig. & Ref. No.	*Part No.*	*Name*	*Quantity*
95—1	50121	CRANK, support, assembly	1
95—1A	630028	PIN, crank handle	1
95—1B	630027	HANDLE, crank	1
95—1C	630092	CRANK, support (not serviced separately)	1
95—2	631986	SHAFT, trailer support crank	1
95—3	100031	BOLT, hex-hd., s-fin., 3/8—24NF-2 x 2½	1
95—4	103341	WASHER, plain, S., S. A. E., std., 3/8	2
95—5	103026	NUT, reg., hex., s-fin., S., 3/8—24NF-2	1
95—6	50174	BRACKET, trailer support crank shaft, w/BUSHING, assembly	1
95—7	630579	SHIELD, dust, trailer support	1
95—8	106973	SCREW, cap, hex-hd., S., 5/16—18NF-2 x 3/8	2
95—9	103320	WASHER, lock, reg., S., 5/16	2
95—10	630573	SLEEVE, trailer support bearing	3
95—11	532633	BEARING, roller, trailer support (NC517)	3
95—12	630576	CAP, trailer support bearing, rear	1
95—13	109462	FITTING, lubrication, push type, elbow, 1/8, 90°	2
95—14	630572	SCREW, riser, trailer support	1
95—15	630589	PIN, dowel, trailer support riser nut	1
95—16	630568	HOUSING, trailer support riser nut	1
95—17	630574	NUT, riser, trailer support screw	1
95—18	630569	BRACKET, slide, trailer support connecting rod	1
95—19	630020	PIN, hinge, trailer support connecting rod	1
95—20	630838	RING, lock, trailer support hinge pin	2
95—21	119254	NUT, slotted, heavy, S., 1/2—20NF-2	3
95—22	103385	PIN, cotter, split, S., 1/8 x 1	3
95—23	630663	BOLT, hex-hd., s-fin., drilled, 1/2—20NF-2 x 1¾	3
95—24	630070	GEAR, trailer support	2
95—25	630298	PIN, grooved, trailer support gear	2
95—26	630570	HOUSING, trailer support riser gear	1
95—27	103028	NUT, reg., hex., s-fin., S., 1/2—20NF-2	10
95—28	103323	WASHER, lock, reg., S., 1/2	11
95—29	100051	BOLT, hex-hd., s-fin., 1/2—NF-2 x 1¼	10
95—30	100134	SCREW, cap, hex-hd., S., 3/8—16NC-2 x 1	3
95—31	103321	WASHER, lock, reg., S., 3/8	3
95—32	630575	CAP, trailer support bearing, front	1

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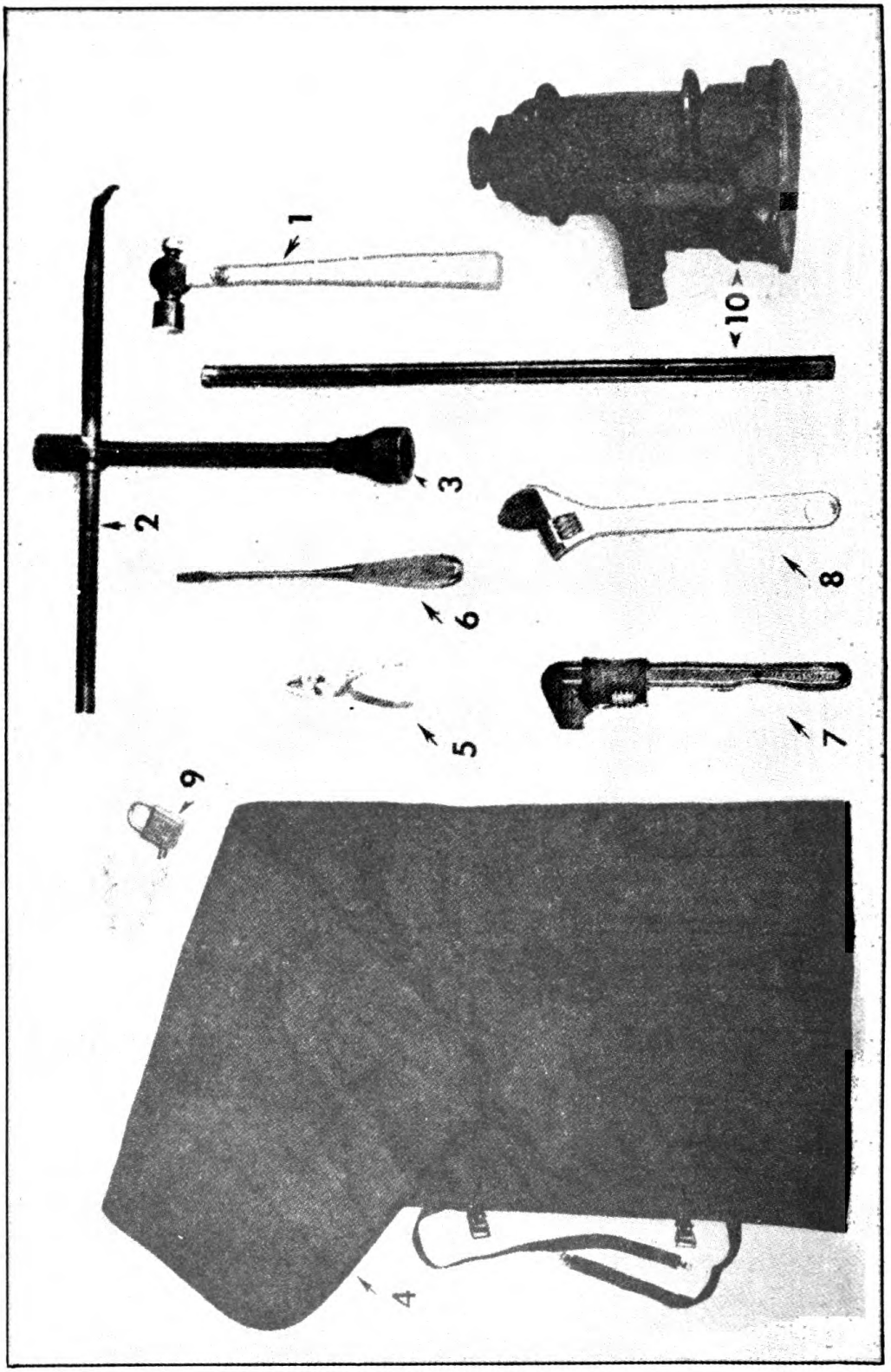

FIGURE 96. TOOL KIT AND ACCESSORIES

TOLL KIT AND ACCESSORIES

(FIGURE 96)

Fig. & Ref. No.	*Part No.*	*Name*	*Quantity*
96	56151	TOOL KIT, complete, assembly	1
		Composed of:	
96—1	676277	HAMMER, round pattern B/P—1½ lb.	1
96—2	675165	HANDLE, wheel wrench (Budd #17899)	1
96—3	675164	WRENCH, wheel (Budd #18806)	1
96—4	676321	ROLL, tool kit	1
96—5	676276	PLIERS, 6" combination	1
96—6	676278	SCREWDRIVER, perfect handle, 5/16" x 6"	1
96—7	676275	WRENCH, 11", auto	1
96—8	676279	WRENCH, diamond adjustable calk	1
96—9	675128	LOCK, pad, w/KEY (per Fed. Spec. FF-P-101-A, Type 1A)	2
96—10	56161	JACK, 12-ton, assembly	1
		Composed of:	
	631962	HANDLE, jack, consisting of 2 sections (Hein-Werner #12 for #12.11A)	1
	675932	*JACK, hydraulic (Hein-Werner) #12.11A)	1

*NOTE: Same as jack shown on Figure 93 and 94, less holes drilled in base.

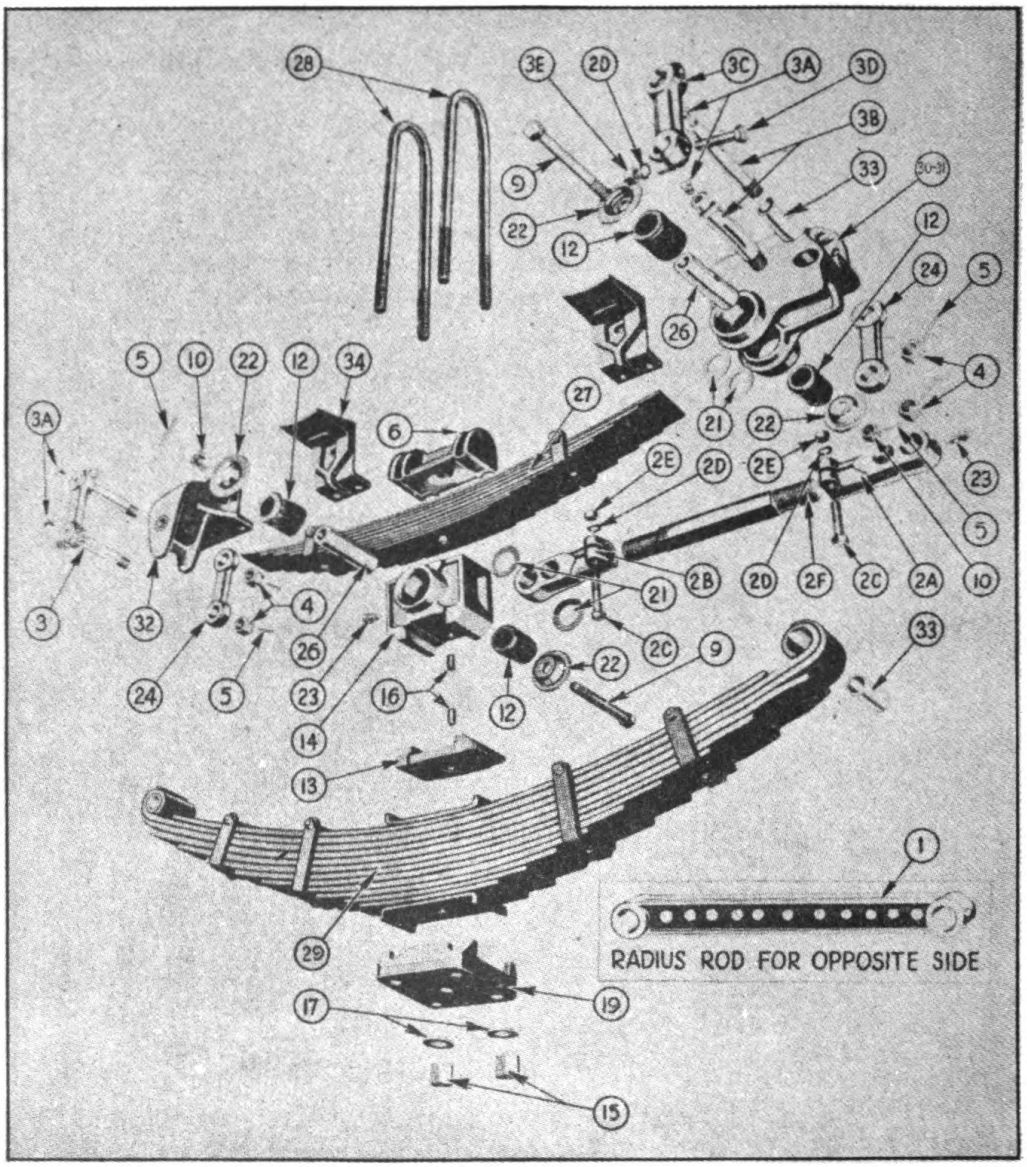

FIGURE 97. CONVERTER GEAR UNDERCONSTRUCTION

UNDERCONSTRUCTION—CONVERTER GEAR

(FIGURE 97)

Fig. & Ref. No.	*Part No.*	*Name*	*Quantity*
97—1	53149	ROD, radius, assembly	1
	53157	ROD, radius, adjustable, assembly	1
97—2A	564622	END, adjustable, radius rod, right thread	1
97—2B	564621	END, adjustable, radius rod, left thread	1
97—2C	181436	BOLT, hex-hd., 1/2"—20 x 2¼"	2
97—2D	103323	WASHER, lock, medium "A," 1/2"	2
97—2E	240826	NUT, steel, 1/2"	2
97—2F	564625	SPACER, radius rod, adjustable	1
97—3	53060	SHACKLE, spring, outer, assembly	4
97—3A	109462	FITTING, alemite, 1/8"—90° angle	8
97—3B	563961	BOLT, spring shackle	8
97—3C	563912	SHACKLE, spring, outer	4
97—3D	181440	BOLT, hex-hd., 1/2"—20 x 2½"	8
97—3E	103028	NUT, hex., thick, 1/2"—20	8
97—2D	103323	WASHER, lock, medium "A," 1/2"	8
97—4	119258	NUT, slotted hex., 7/8" SAE	8
97—5	103387	PIN, cotter, 1/8" x 1½"	12
97—6	560103	SEAT, U-bolt	2
97—9	563825	SPINDLE, radius rod bolt	4
97—10	119256	NUT, slotted hex., 5/8"—18	4
97—12	563400	BUSHING, rubber, radius rod spindle	8
97—13	563865	CHAIR, spring, 5/8" rise	2
97—14	564518	CHAIR, auxiliary spring	2
97—15	560245	NUT, U-bolt, 1"	8
97—16	560836	PIN, dowel, 1/2" x 1"	4
97—17	103348	WASHER, flat, small, 1"	8
97—19	563965	PLATE, U-bolt, 3½" spring	2
97—21	564270	RETAINER, rubber bushing, inner	8
97—22	563823	RETAINER, rubber bushing, outer	8
97—23	563497	SCREW, spindle lock	4
97—24	560402-A	SHACKLE, spring, inner	4
97—26	563824	SPINDLE, radius rod	4
97—27	563839	SPRING, auxiliary	2
97—28	565159	U-BOLT, 1" x 3½" x 22"	4
97—29	564220	SPRING, main	2
97—30	53033	HANGER, spring, left front, assembly (597105)	1
97—31	53034	HANGER, spring, right front, assembly (597106)	1
97—32	53035	HANGER, spring, rear, assembly (597108)	2
97—33	560750	BUSHING	4
97—34	563814	BRACKET, auxiliary spring	4
	104133	RIVET, rnd-hd., 1/2" x 1¾"	12
	105514	RIVET, rnd-hd., 1/2" x 2¼"	28

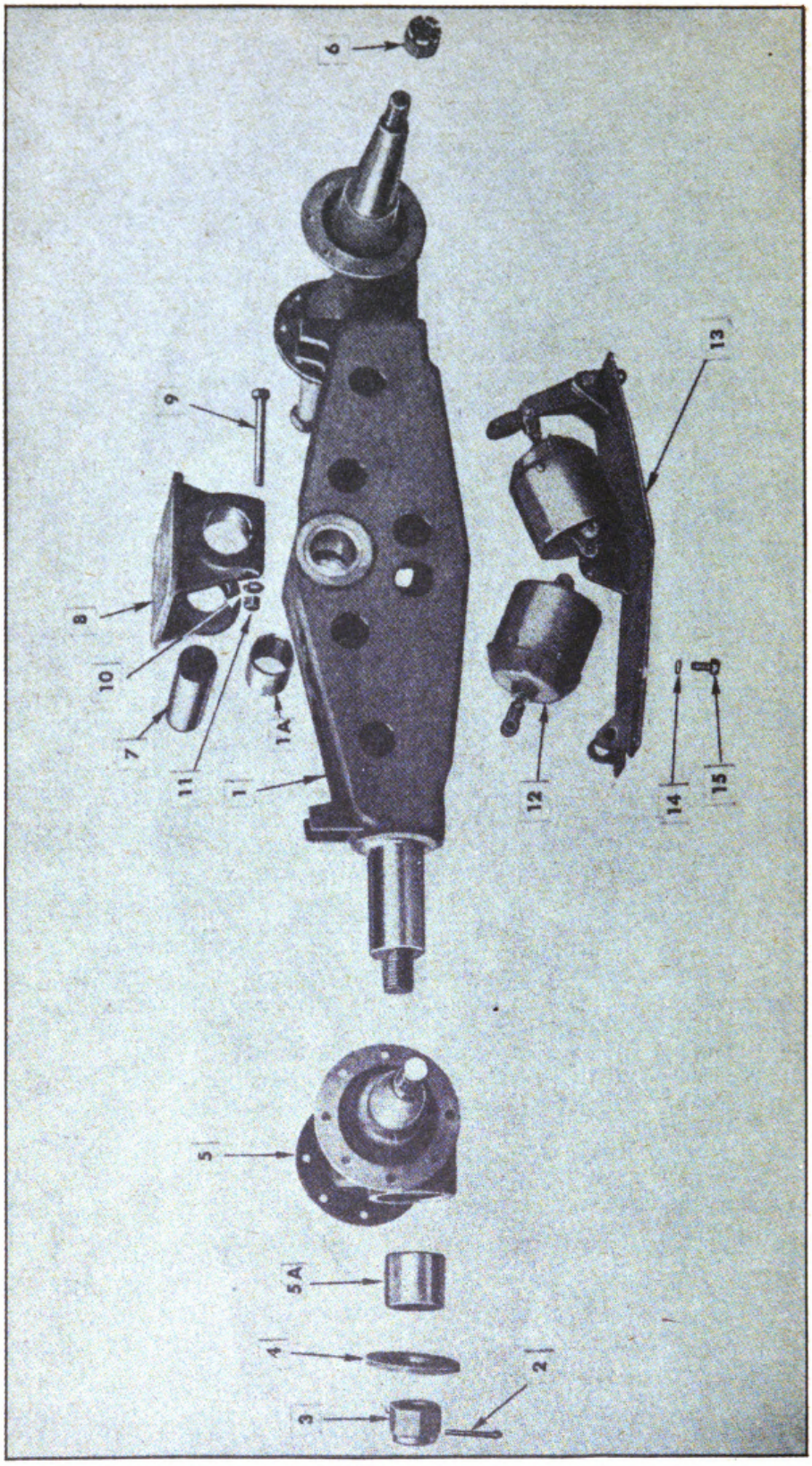

FIGURE 98. TRAILER UNDERCONSTRUCTION

UNDERCONSTRUCTION—TRAILER

(FIGURE 98)

Fig. & Ref. No.	*Part No.*	*Name*	*Quantity*
98—1	53310	BEAM, trunnion rocker, w-BUSHING, assembly	2
98—1A	564633	BUSHING, trunnion beam	4
98—2	147637	PIN, cotter, 1/4" x 3¼"	4
98—3	530087	NUT, hex., castle, 2" SAE	4
98—4	564996	WASHER, thrust, trunnion axle	4
98—5	53318	AXLE, trunnion, w/BUSHING, assembly	4
98—5A	564636	BUSHING, trunnion axle	8
98—6	530088	NUT, hex., castle, 1½" SAE	8
98—7	563474	SHAFT, trunnion	2
98—8	563903	*BRACKET, trunnion shaft	2
98—9	119167	BOLT, hex-hd., 5/8—18 x 5½"	2
98—10	103325	WASHER, lock, reg., 5/8"	2
98—11	103030	NUT, hex., 5/8"—18	2
98—12	535700	CYLINDER, brake, assembly (See Figure 77)	4
98—13	51338	CARRIER, brake cylinder, w/welded parts attached, assembly	2
98—14	103323	WASHER, lock, reg., 1/2"	24
98—15	100159	BOLT, hex-hd., 1/2"—13 x 1¼"	24
		*attaching trunnion shaft brackets to frame	
	100091	BOLT, hex-hd., 3/4"—16 x 2½"	16
	103031	NUT, hex., 3/4"—16	16
	103332	WASHER, lock, reg., 3/4"	16

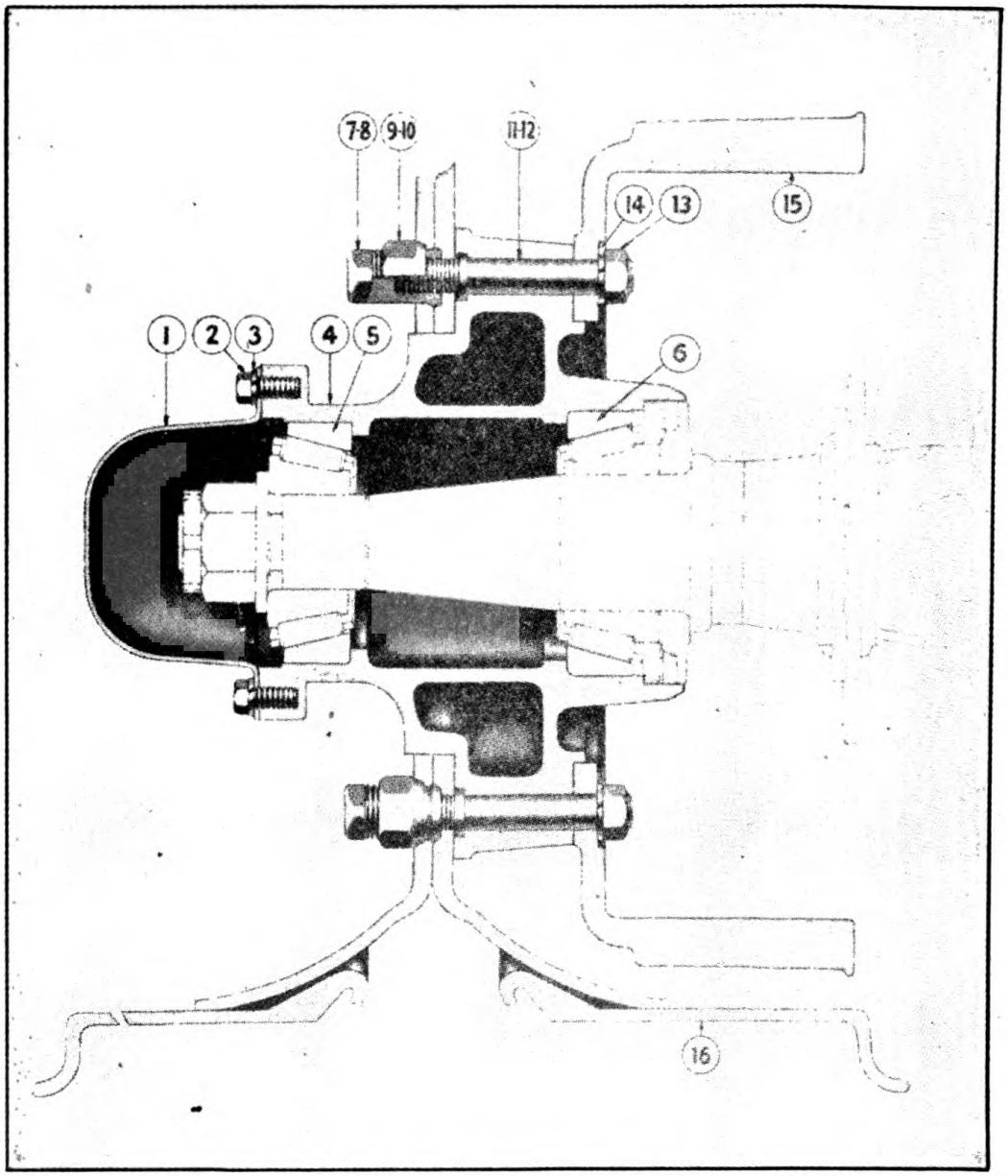

FIGURE 99. CONVERTER GEAR WHEELS, HUBS and DRUMS

WHEELS, HUBS AND DRUMS—CONVERTER GEAR

(FIGURE 99)

Fig. & Ref. No.	*Part No.*	*Name*	*Quantity*
99—1	530057	CAP, hub	2
99—2	100145	BOLT, hex-hd., 7/16"—14 x 3/4"	8
99—3	103322	WASHER, lock, medium, 7/16"	8
99—4	532588	HUB, wheel	2
99—5	534757	CUP, bearing, outer (5521)	2
99—6	534759	CUP, bearing, inner (5720)	2
99—7	536078	NUT, double cap, inner, left (BW-43809)	10
99—8	536079	NUT, double cap, inner, right (BW-43808)	10
99—9	536080	NUT, double cap, outer, left (BW-43812)	10
99—10	536081	NUT, double cap, outer, right (BW-43811)	10
99—11	536076	STUD, Budd, left (BW-6857)	10
99—12	536077	STUD, Budd, right (BW-6856)	10
99—13	103031	NUT, hex., 3/4"—16	20
99—14	103326	WASHER, lock, medium, 3/4"	20
99—15	535831	DRUM, brake, 16" x 6"	2
99—16	536075	WHEEL, Budd (BW-45530)	4
	675458	TIRE (12.00 x 20) 10 ply (Conform with Federal Specification ZZ-T-381)	4
	675459	TUBE (for 12.00 x 20 tires) mud and snow grip tread (Conform with Federal Specification ZZ-T-721) (TR-78E-12)	4
	675460	FLAP (for 12.00 x 20 tires)	4
	675980	EXTENSION, tire tube valve (SV-6284)	2

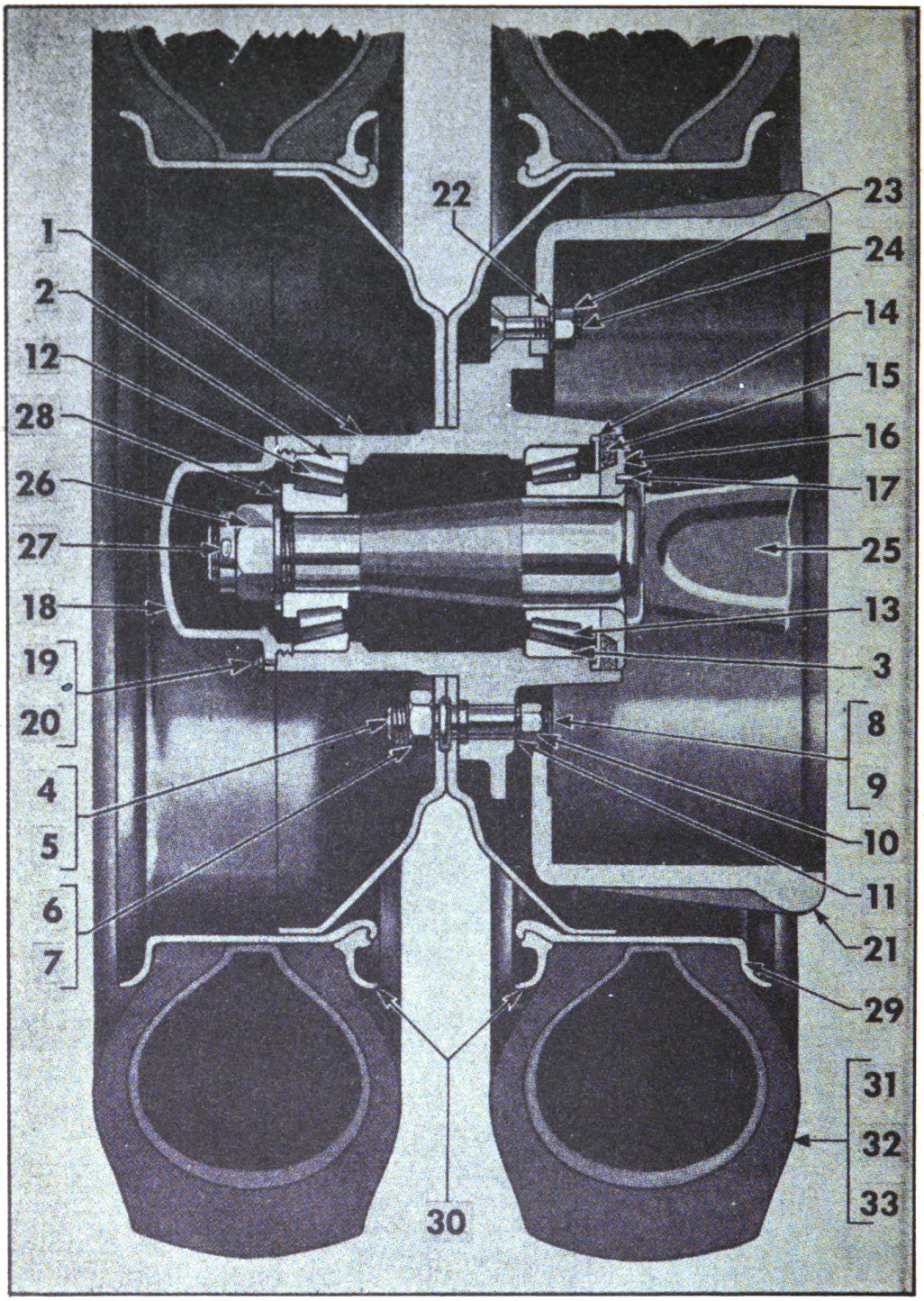

FIGURE 100. TRAILER WHEELS, HUBS AND DRUMS

WHEELS, HUBS AND DRUMS—TRAILER

(FIGURE 100)

Fig. & Ref. No.	*Part No.*	*Name*	*Quantity*
100—1	532999	HUB, wheel	8
100—2	534757	CUP, bearing, outer (TIM-5521)	8
100—3	534758	CUP, bearing, inner (TIM-5720)	8
100—4	536078	NUT, double, wheel, left, inner (BW-43809)	24
100—5	536079	NUT, double, wheel, right, inner (BW-43808)	24
100—6	536080	NUT, double, wheel, left, outer (BW-43812)	24
100—7	536081	NUT, double, wheel, right, outer (BW-43811)	24
100—8	536290	STUD, left (BW-13989E)	24
100—9	536291	STUD, right (BW-13988E)	24
100—10	103031	NUT, jam, hex., 3/4"—16	48
100—11	103326	WASHER, lock, medium, 1/4"	48
100—12	534746	BEARING, outer (TIM-5565)	8
100—13	534747	BEARING, inner (TIM-5752)	8
100—14	530368	RING, compression	8
100—15	530370	WASHER, felt, axle	8
100—16	534996	COLLAR, dust, axle	8
100—17	534591	PIN, dowel	8
100—18	532920	CAP, hub	8
100—19	102926	SCREW, set, sq-hd., cone point	8
100—20	109084	NUT, jam, hex., 1/4"—20	8
100—21	535832	DRUM, brake, 16" x 6"	8
100—22	103331	WASHER, lock, heavy, 5/8"	48
100—23	103030	NUT, hex., 5/8"—18	48
100—24	535381	SCREW, machine, flat-hd., 5/8"—18 x 2¼"	48
100—25	53318	AXLE, trunnion, assembly (565161) (See Figure 98)	4
100—26	530088	NUT, axle, slotted, 1½"	8
100—27	103425	PIN, cotter, 1/4" x 2¾"	8
100—28	530085	WASHER, dee	8
100—29	536452	WHEEL, (MW-82161)	16
100—30		RING, locking, wheel side—included with wheel	16
100—31	675056	TIRE, 7.50 x 20—8 ply, heavy duty, mud and snow grip tread, truck-bus balloon type (Fed. Spec. ZZ-T-381)	16
100—32	675057	TUBE, 7.50 x 20, heavy duty (Fed. Spec. ZZ-T-721) (TR-177E-12)	16
100—33	675853	FLAP, for 7.50 x 20 tire	16

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ATE —Austin Trailer Equipment Company, Muskegon, Michigan.

CB —Corcoran-Brown Lamp Company, Cincinnati, Ohio.

HW —Hein-Werner Motor Parts Corporation, Waukesha, Wisconsin.

KD —K-D Lamp Company, Cincinnati, Ohio.

WAB—Bendix-Westinghouse Automotive Air Brake Company, Elyria, Ohio.

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WAB—Bendix-Westinghouse Automotive Air Brake Company, Elyria, Ohio.
WEB —Warner Electric Brake Mfg. Company, Beloit, Wisconsin.

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