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TM 5-9004
(REVISED)

WAR DEPARTMENT
MAINTENANCE MANUAL
AND PARTS CATALOG

TRAILER

MODEL No. XBBM 16 TON LOW BED

STEEL PRODUCTS CO., INC.
SAVANNAH, GEORGIA

SEPT. 8, 1942



Combined
OPERATOR'S MANUAL
MAINTENANCE MANUAL

and

SPARE PARTS LIST

for

16-TON, LOW BED, PLATFORM TRAILER

===== MODEL XBBM =====

Manufactured for

CORPS OF ENGINEERS

by

THE STEEL PRODUCTS CO., Inc.

Savannah, Georgia

THIS BOOK COVERS:

U. S. Registration Nos. WO65984 thru WO66313 and
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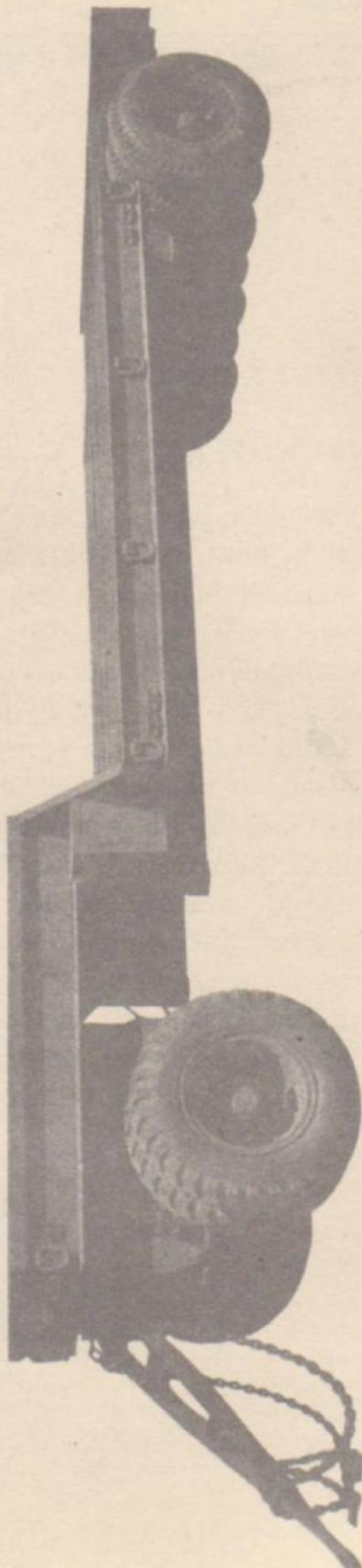
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INTRODUCTION

PURPOSE AND SCOPE—

The data compiled herein describes a Low Bed Machinery Trailer built especially for transporting heavy mobile units of machinery, especially crawler type. It is drawn by a heavy duty prime mover and is equipped with suitable loading ramps to facilitate the loading and unloading of the various machines to be hauled. This trailer differs from many trailers inasmuch as it is a complete unit within itself, consisting of the trailer proper and the Dolly truck upon which the trailer is mounted. This feature classifies it as a full trailer as compared to a semi-trailer which mounts directly upon a truck tractor or prime mover. Its use and operation will, therefore, differ in many respects to the semi-trailer type, and this "Operator's Manual" is prepared to instruct the driver and his helpers in the proper use and operation of the vehicle.



GENERAL INSTRUCTIONS

Two Safety Chains are provided at front of trailer to hold trailer to truck in event pintle hook should fail to hold. Safety Chains are just what the name infers and are not to be used to tow the trailer in lieu of a pintle hook.

Do Not Exceed speed shown on nameplate. Spare tire is carried on a cable type tire carrier beneath the floor of trailer. Use rim wrench to operate tire carrier.

Keep tires inflated to recommended pressures. Tires on rear axles are on demountable rims and all rim lug nuts are righthand thread. Tires on front or Dolly axle are on demountable wheels held in place by a stud-nut which holds the inside wheel and a large nut which screws on the stud-nut to hold the outside wheel. The FRONT wheel stud-nuts and large nuts are RIGHThand thread on the righthand side when facing the front of trailer and LEFThand thread on the opposite side. The lefthand stud-nuts are marked "L" and the righthand are marked "R."

Located on bottom of air brake reserve tank is a drain cock. This is to drain any water or other liquids that may enter brake lines. DRAIN DAILY—THIS IS IMPORTANT!

This machine is a piece of MILITARY EQUIPMENT! Treat it with the same care that you would give your rifle.

OPERATING INSTRUCTIONS AND CONTROLS

1. **CONTROLS**—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*—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. *Light connection*—This vehicle is equipped with a light socket at the front crossmember of the frame.

c. *Blackout switch*—The blackout switch is located on the right or curb side of the main frame. 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 screw driver. The flow of current is controlled at the towing vehicle.

d. *Tire carrier operating nut*—The tire carrier is located on the right side of the trailer. The operating shaft protrudes through the main frame. By removing the stud nuts on the spare tire, and releasing the catch on the ratchet, the tire will fall to the ground. The tire is raised to the carrier by means of cables operated by turning the shaft nut, using the square end of the wheel wrench and handle.

2. **COUPLING TRAILER TO TRUCK**—a. When pulling the trailer behind a truck or another semi-trailer, the draw eye at the end of the drawbar is placed in a pintle hook and locked by means of a pin provided for that purpose.

b. *Safety chains*—Attach the hook end of the trailer safety chains to the two eyes provided on the rear end of the towing vehicle.

c. *Jumper cable*—Connect the jumper cable between the trailer and towing vehicle.

d. *Air hoses*—Connect the air hoses to the 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. Switching of hoses makes impossible the release of brakes, once set.

e. *Open air valves on towing vehicle*—Release the parking brake on the trailer.

3. 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.

4. 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.

5. UNCOUPLING TRAILER FROM TRUCK—*a.* Set the hand or parking brake on trailer.

b. Disconnect safety chains, and place the chains at front of side rail of the main frame of trailer.

c. Disconnect jumper cable.

d. Shut off both air valves on the tractor truck.

e. Uncouple the two air lines at the front of the trailer. Use care not to permit hose coupling to drag in the dirt.

f. Couple the dummy hose couplers to emergency and service lines on trailer. Dummy couplers should be connected at all times when the trailer is not in use to prevent the entrance of foreign matter into the braking system.

g. Disconnect the drawbar eye from the pintle hook on the tractor.

h. Pull the towing vehicle ahead until the two units are separated.

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.

(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 reserve air tank, by means of the pet-cock at the bottom of the tank.

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

- (1) Fifth wheel circle plate.
- (2) Fifth wheel bolster plate.
- (3) Drawbar hinge.
- (4) Underconstruction, includes lubrication of:
 - Spring ends
 - Brake shoe cam
 - Brake anchor pin bushings
 - Cam shaft bracket
 - Slack adjuster
 - Anchor plate bearings.
- (5) Wheel bearings.
- (6) Parking brake, includes lubrication of:
 - Cross shaft journal
 - Parking brake rod clevis pins.

3. MECHANICAL INSPECTION AND ADJUSTMENT—

- a. *Bolster plate*—Examine for cracked welds.
- b. *Drawbar hinge*—Wobbly drawbar—check for excess play. Rebush.
- c. *Lights*—Check all lights and wiring for operation.
- d. *Underconstruction*—(1) Axle: Check alignment.
(2) Springs and shackles: Check for broken spring leaves. Replace springs.

(3) Brakes: Check linkage and operation. Tighten loose hose line connections. Check front end couplings. Adjust brake for equalization at slack adjusters if required. Drain the moisture from the air filter about every 2,000 miles. Remove the filter cartridge every 10,000 miles and wash in gasoline.

(4) Radius rods: Check for worn bushings. Check adjustable radius rods and tighten pinch bolts.

e. *Wheels*—Tighten wheel nuts. Check bearing adjustment by removing hub cap. Adjust if necessary.

4. EVERY FOUR MONTHS—or every 5,000 miles (oftener under hard service condition)

a. *Wheels and Bearings*—Remove, wash and repack and adjust bearings.

b. *Brakes*—Check lining and drums; adjust brakes for equalization. Lubricate brake cams and rollers with lubriplate.

STEERING LOCKS—(see page 10 for instructions)

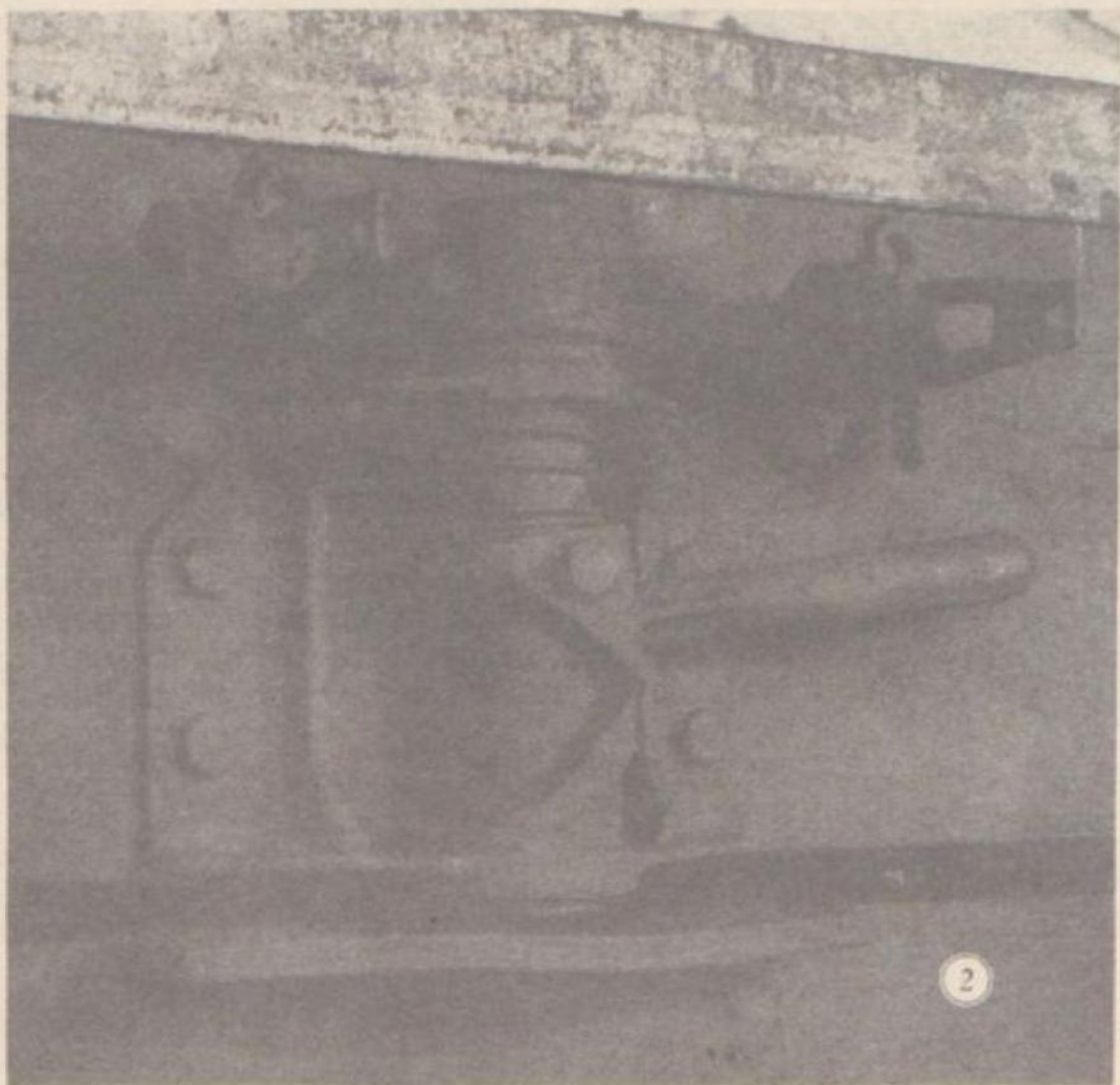
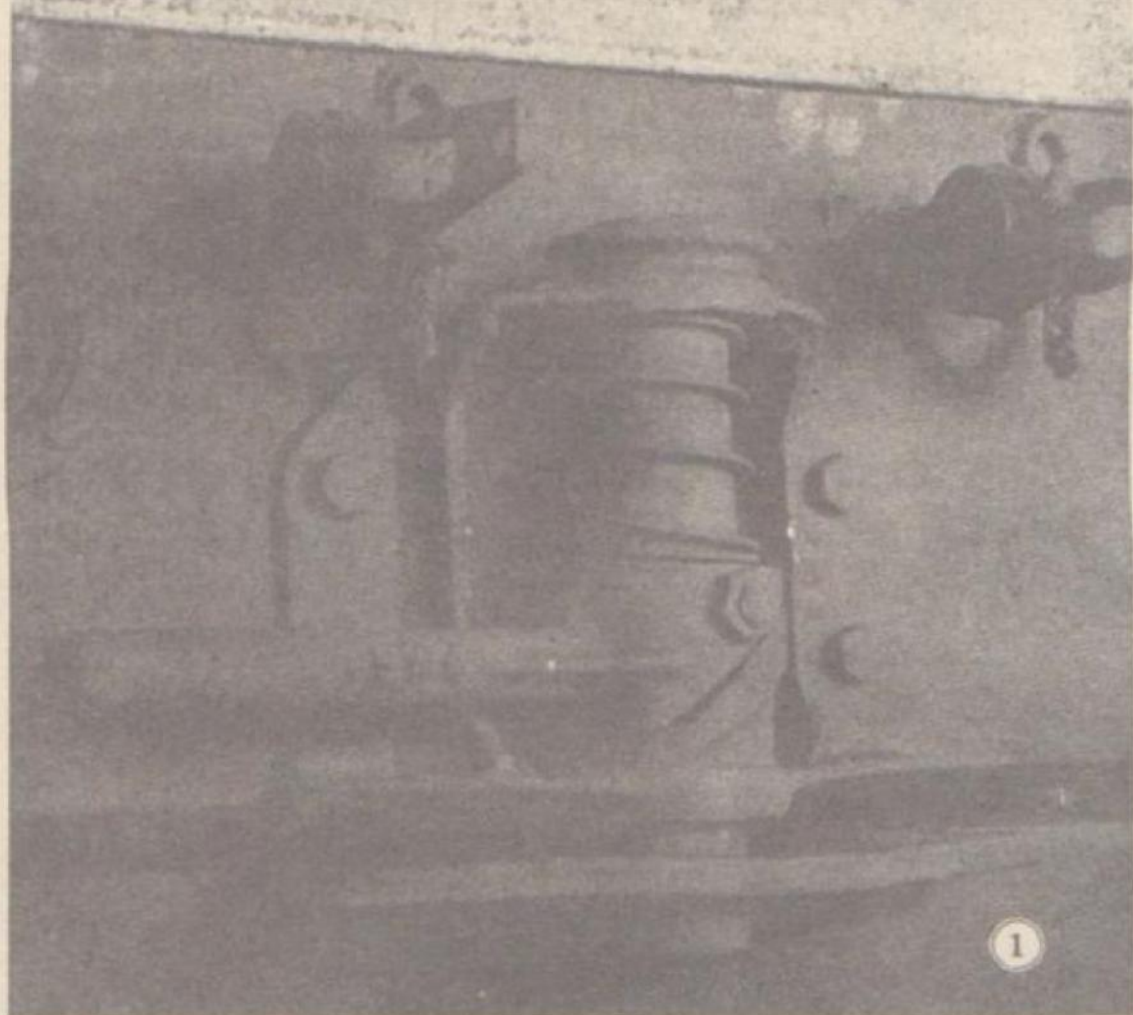
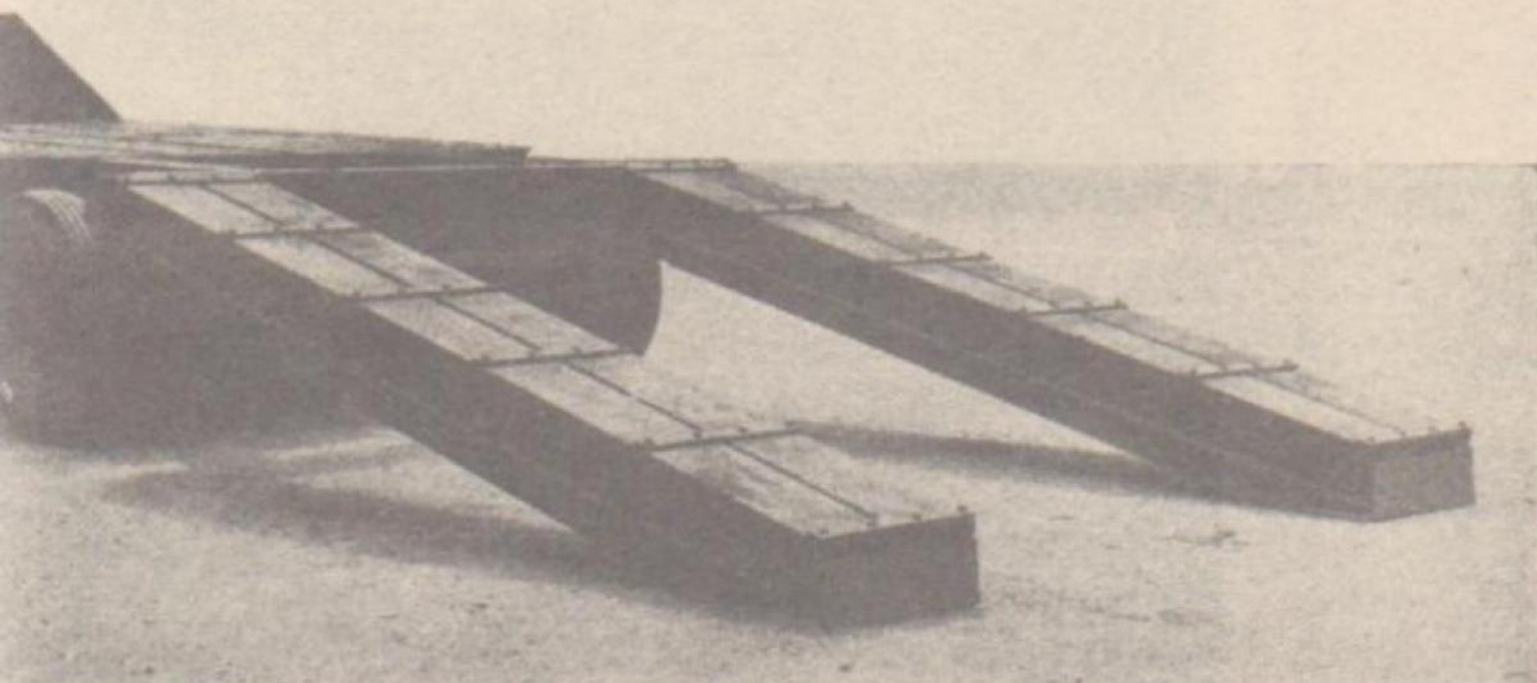
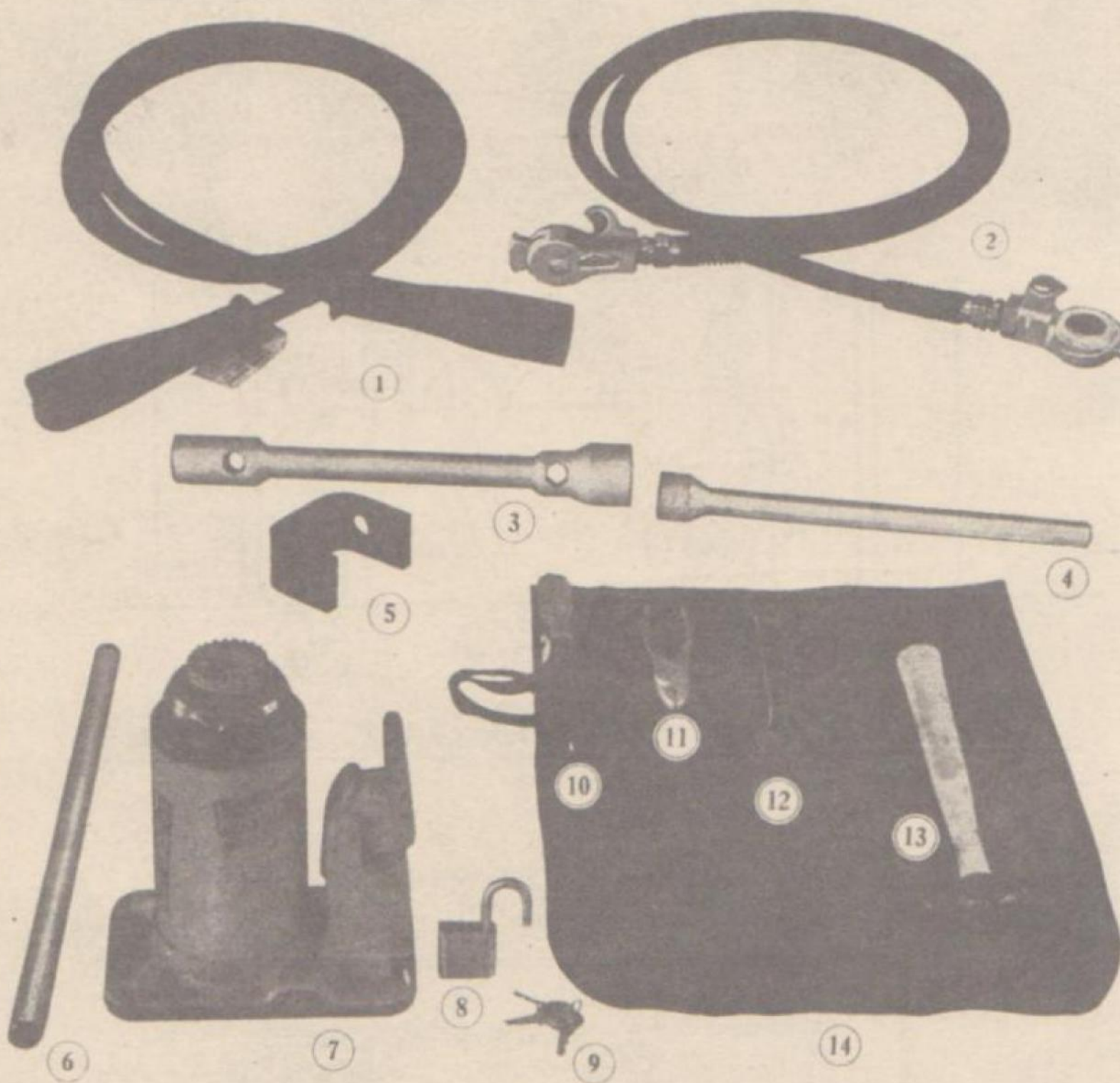


Figure one on page nine shows steering lock in the locked position. The purpose of the steering lock is to make the Dolly track in a straight line with the trailer proper if for any reason this is desired in spotting the trailer when parking. DO NOT drive trailer in transport work with steering lock in locked position, as this will endanger the entire unit.

Figure two shows steering lock in unlocked position.

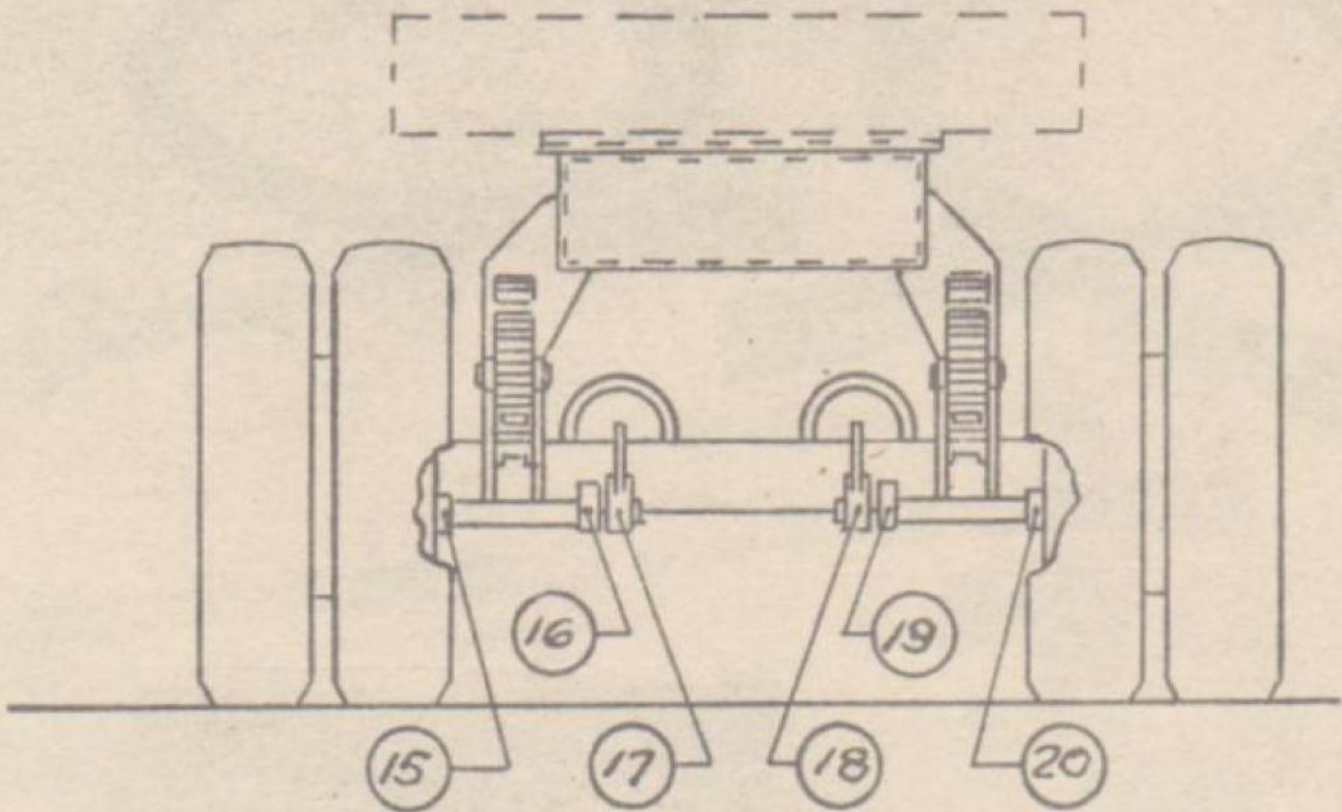


Above is shown the two loading ramps in place. It will be noted that one end of the ramp has a flange to fit into a long flange at rear of trailer to securely hold ramp in position; be sure always that this end is turned to the trailer and that ramp is secure before loading or unloading cargo. Always set parking brake securely before attempting to load or unload. It is also advisable to chock rear wheels of trailer also before loading or unloading.

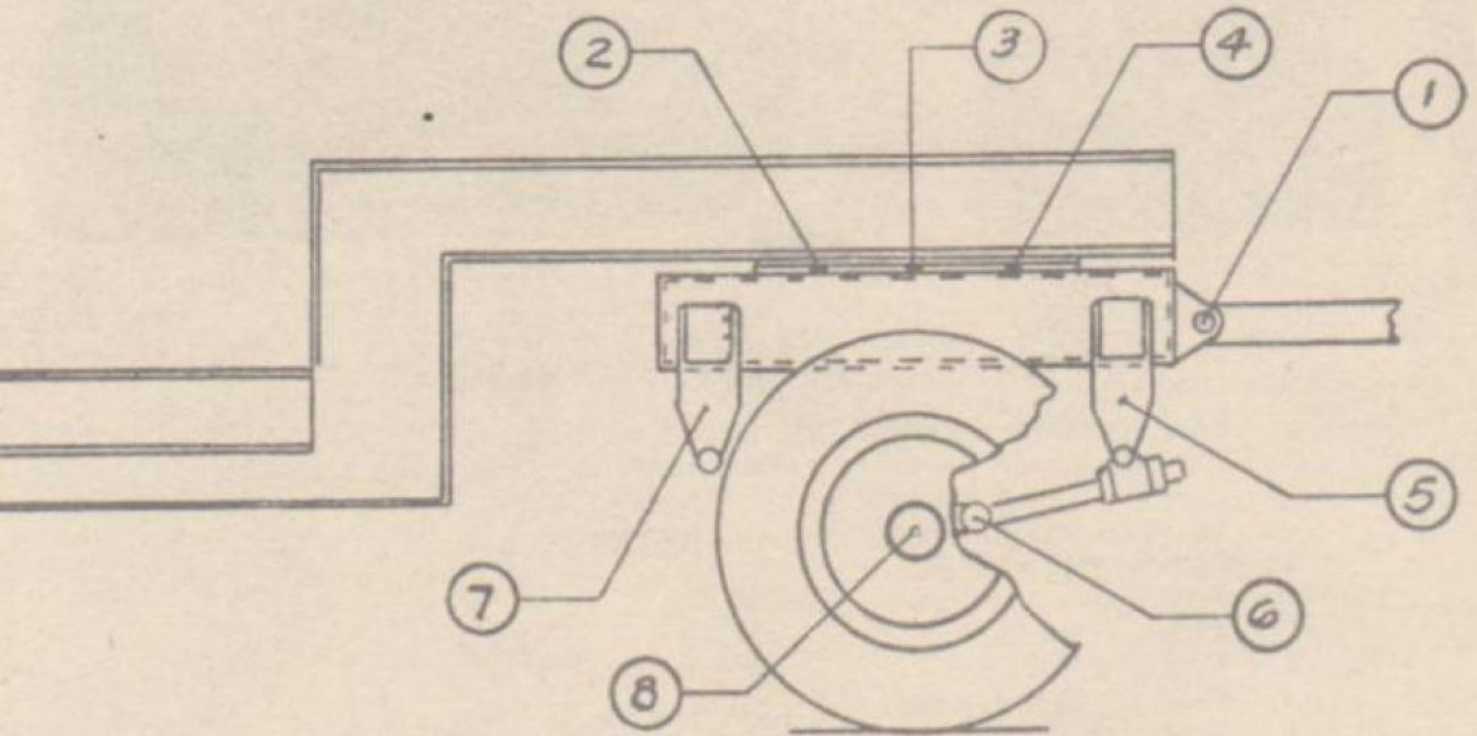


TOOLS AND ACCESSORIES

1. Jumper cable, connects light circuit to truck.
2. Air brake hose, connects trailer brakes to truck. (Quantity—2)
3. Rim and wheel wrench.
4. Leverage bar for rim and wheel wrench.
5. Spindle nut wrench.
6. Jack handle.
7. Jack.
8. Tool box lock.
9. Keys for tool box lock.
10. Screwdriver.
11. Pliers.
12. Crescent type wrench.
13. Ball peen hammer.
14. Tool kit roll.



REAR VIEW OF FRONT DOLLY

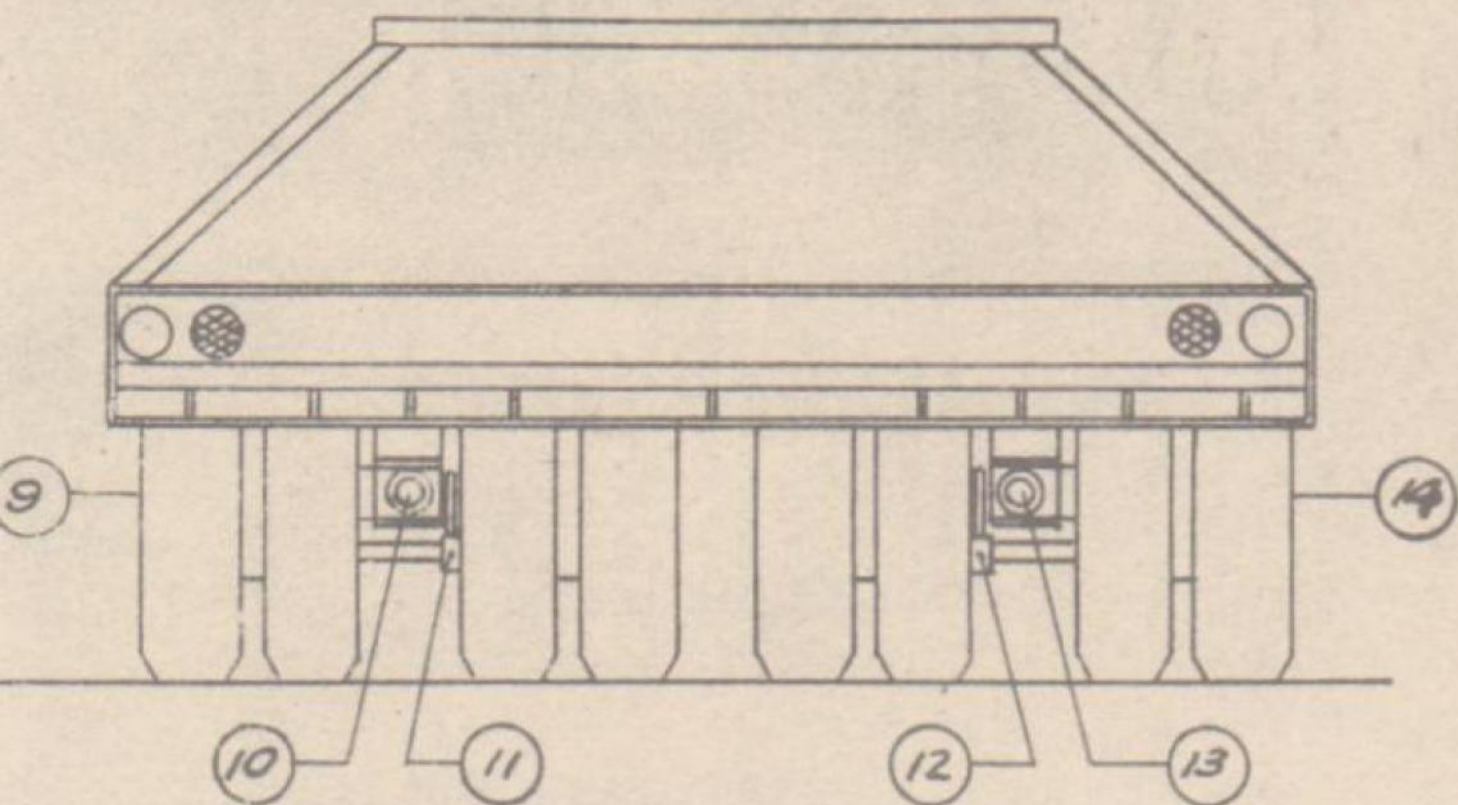


SIDE VIEW OF FRONT DOLLY

All pressure gun fittings should be lubricated each 500 miles of operation or every 30 days. Under unusual dust or sandy conditions or in rainy or muddy weather, pressure gun fittings should be lubricated each 200 miles, and under extreme conditions, each day. Remember always that proper lubrication is the life of a machine and will prolong its use and prevent repairs.

KEY No.	DESCRIPTION	METHOD	MATERIAL
1.	Drawbar Connection	Pressure Gun	Pressure Gun Grease
2.	Fifth Wheel Plate	Pressure Gun	Graphite Grease
3.	Fifth Wheel Plate	Pressure Gun	Graphite Grease
4.	Fifth Wheel Plate	Pressure Gun	Graphite Grease
5.	Spring Slip End	Pressure Gun	Pressure Gun Grease
6.	Torque Rod End	Pressure Gun	Pressure Gun Grease
7.	Spring Slip End	Pressure Gun	Pressure Gun Grease
8.	Wheel Bearings	Hand Application	Fibre Wheel Bearing Grease
15.	Brake Cam Rod Bearing	Pressure Gun	Pressure Gun Grease
16.	Brake Cam Rod Bearing	Pressure Gun	Pressure Gun Grease
17.	Brake Slack Adjuster	Pressure Gun	Pressure Gun Grease
18.	Brake Slack Adjuster	Pressure Gun	Pressure Gun Grease
19.	Brake Cam Rod Bearing	Pressure Gun	Pressure Gun Grease
20.	Brake Cam Rod Bearing	Pressure Gun	Pressure Gun Grease

Instructions on lubrication of wheel bearings are found on a following page of this Manual.

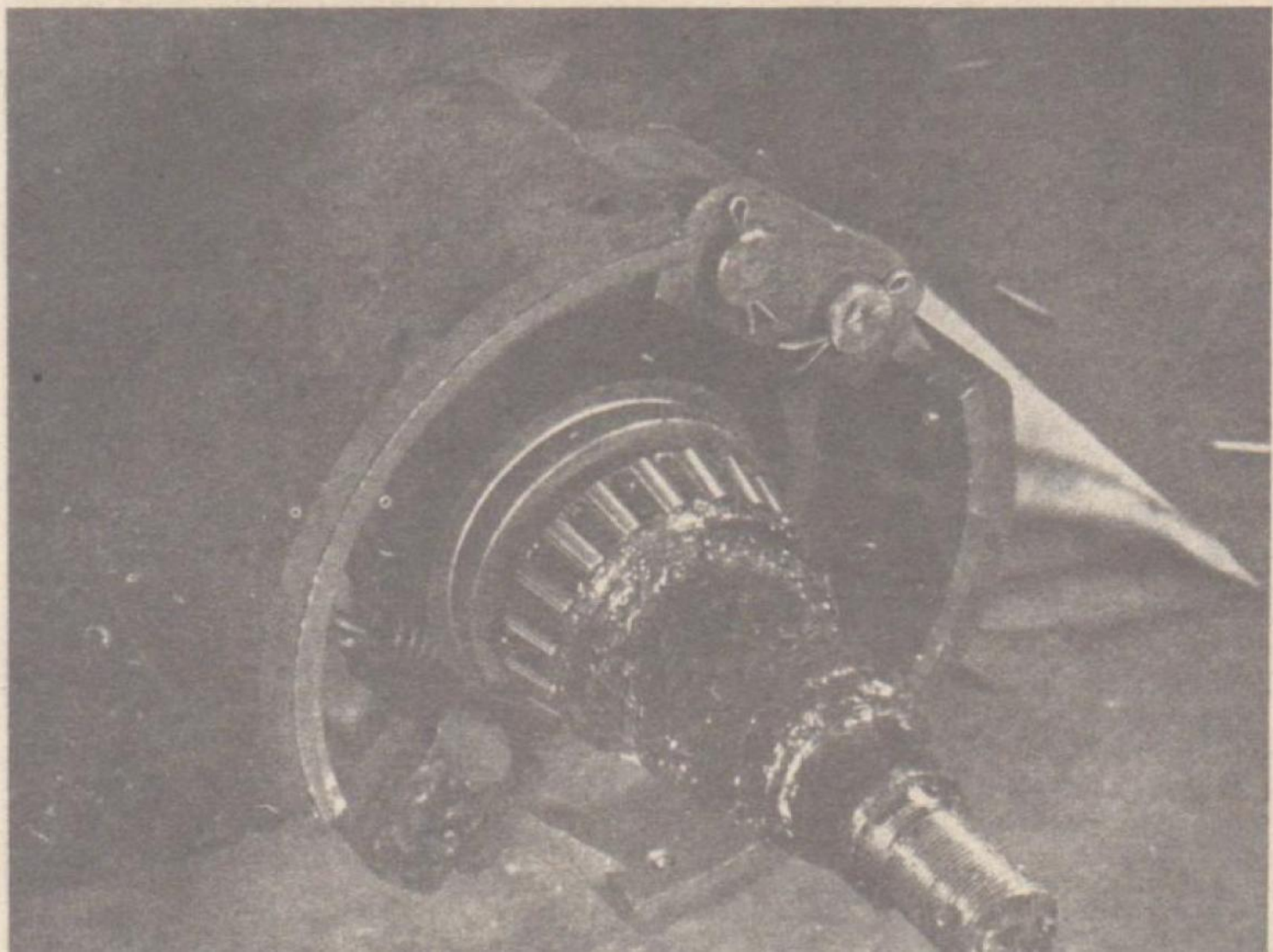
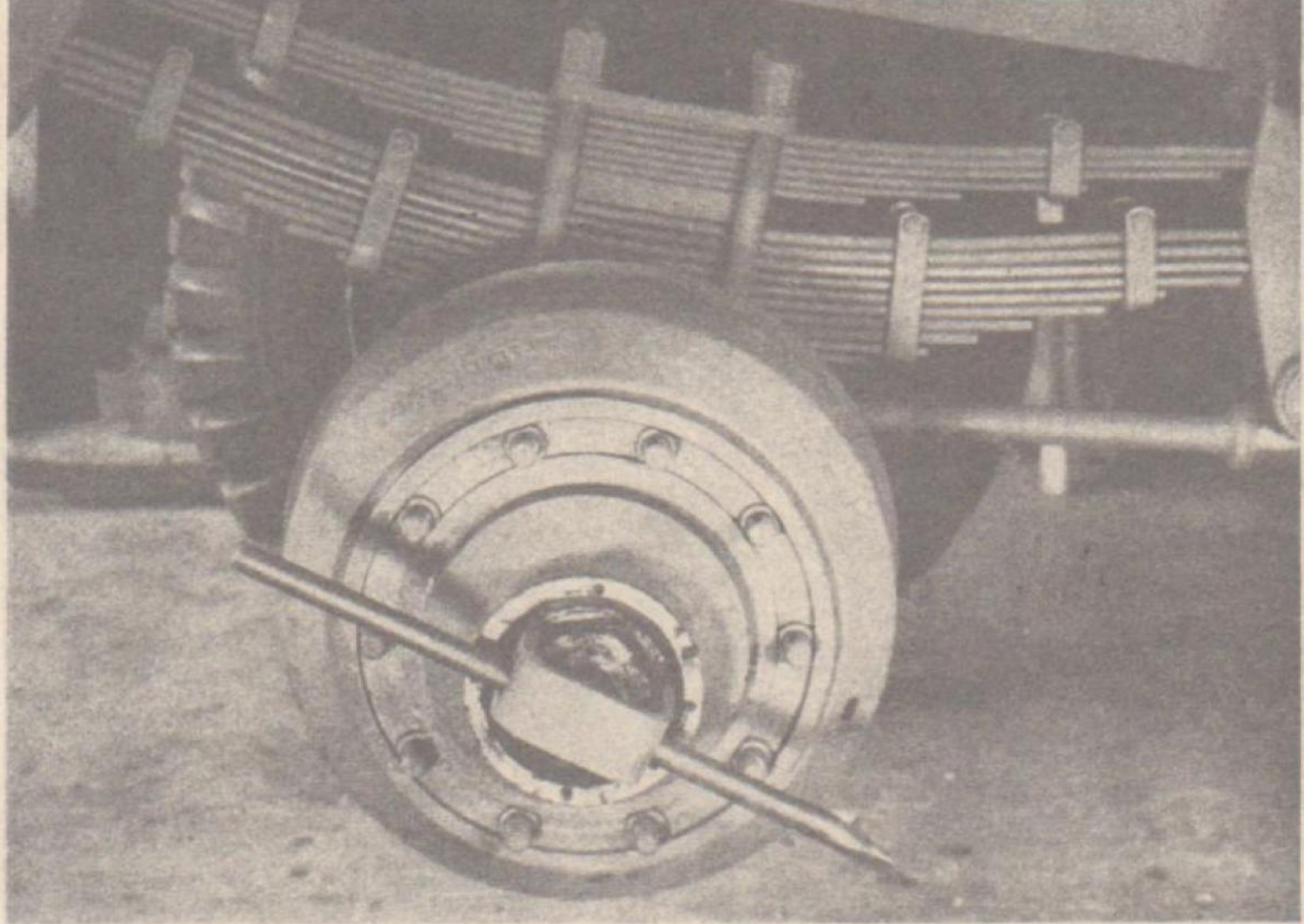


REAR VIEW OF TRAILER

REAR VIEW OF TRAILER

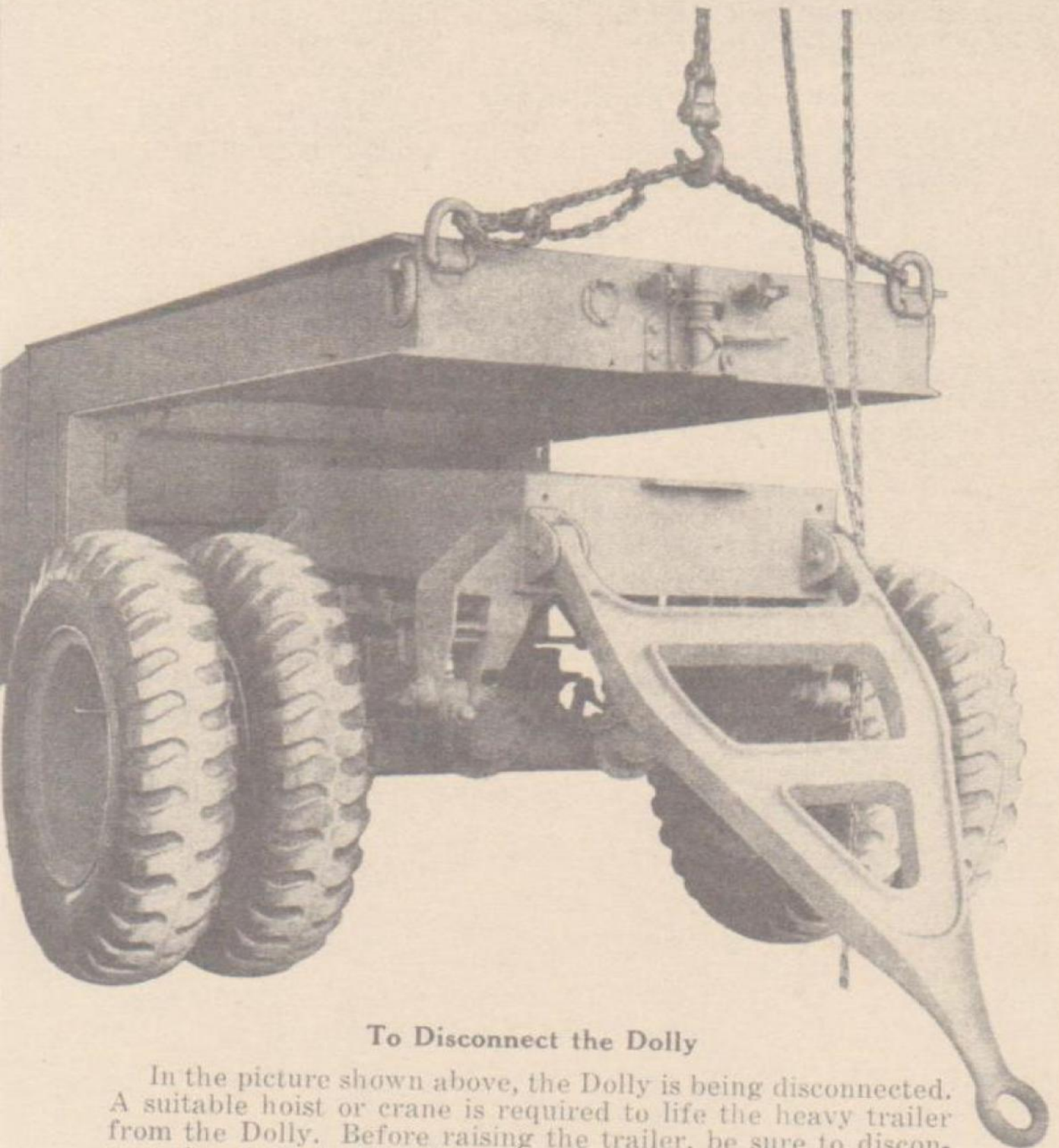
KEY No.	DESCRIPTION	METHOD	MATERIAL
9.	Wheel Bearings	Hand Application	Fibre Wheel Bearing Grease
10.	Oscillating Axle Bearing	Pressure Gun	Pressure Gun Grease
11.	Brake Slack Adjuster	Pressure Gun	Pressure Gun Grease
12.	Brake Slack Adjuster	Pressure Gun	Pressure Gun Grease
13.	Oscillating Axle Bearing	Pressure Gun	Pressure Gun Grease
14.	Wheel Bearings	Hand Application	Fibre Wheel Bearing Grease

To remove wheels for lubrication on the trunion axles on rear of trailer, it is advisable to remove the tires first as this will greatly facilitate the operation by providing much more room to work in the limited space allowed the inside wheels. It is always advisable when wheels are removed to inspect brake drums and linings. If linings are worn to or nearly to rivet heads, linings should be replaced. If drums are badly scored or broken, they should be replaced.



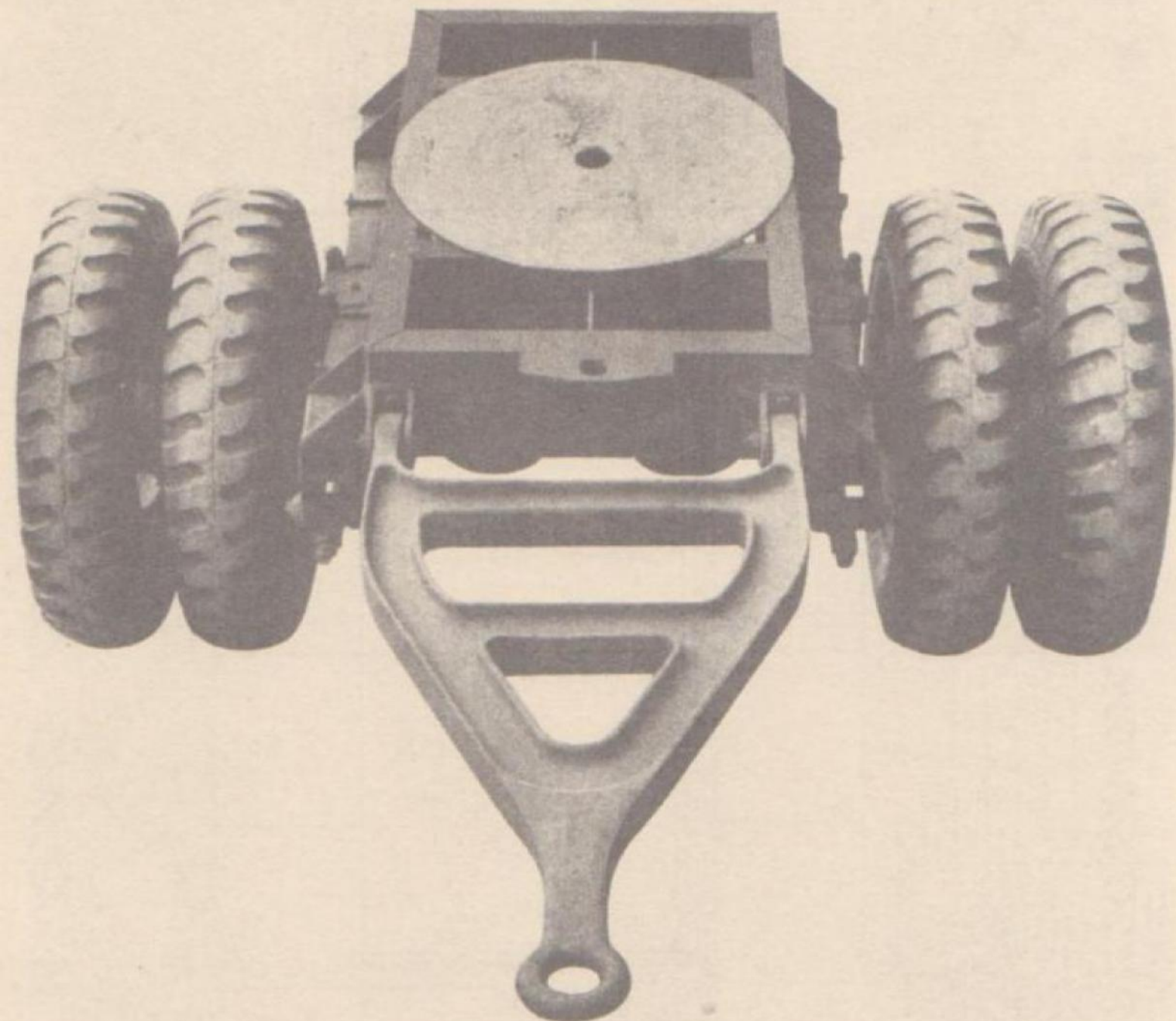
To remove wheels for lubrication, raise the wheel to be removed with jack and after removing hub cap, remove cotter pin and proceed to remove spindle nut with wrench as shown in opposite illustration. **DO NOT REMOVE** spindle nut with hammer and chisel or punch as this will damage nut and in many cases render it unfit for further use. Likewise, do not replace or tighten spindle nut with hammer and chisel or punch.

To lubricate wheel bearings, remove wheels and clean hubs, axle spindles and bearings thoroughly with kerosene or other suitable solvent. Pack grease into bearings with the hands, leaving a liberal amount of grease on the spindle between the bearings. **DO NOT FILL HUBS WITH GREASE!** This will cause too much grease to work against the grease retainers, causing grease to enter the brake area, seriously affecting brake action and spoiling the brake linings. In replacing the wheels after repacking, great caution should be exercised not to get adjusting nut too tight—this will cause bearings to heat and burn out. Tighten nut until wheel binds, then reverse the nut until wheel turns freely, ordinarily $\frac{1}{4}$ to $\frac{1}{2}$ turn backwards will be enough. Be sure to lock the wheel nuts securely with cotter pins. Do not re-use old cotter pins unless absolutely necessary. Wheel bearings should be repacked each 10,000 miles under ordinary conditions, and under extreme conditions of mud, sand, or dust, every 5,000 miles. Repack wheel bearings each year regardless of mileage.



To Disconnect the Dolly

In the picture shown above, the Dolly is being disconnected. A suitable hoist or crane is required to life the heavy trailer from the Dolly. Before raising the trailer, be sure to disconnect the air brake line from the lower end of the fifth wheel king pin. Then remove the large nut on the king pin proper. Securely prop the Dolly in position before raising the trailer or it will rotate on its axle and fall, damaging the air brake connection and possibly injuring the person attempting the uncoupling. *After* the brake line is disconnected and the Dolly safely propped, proceed to raise the trailer with crane or hoist as shown.

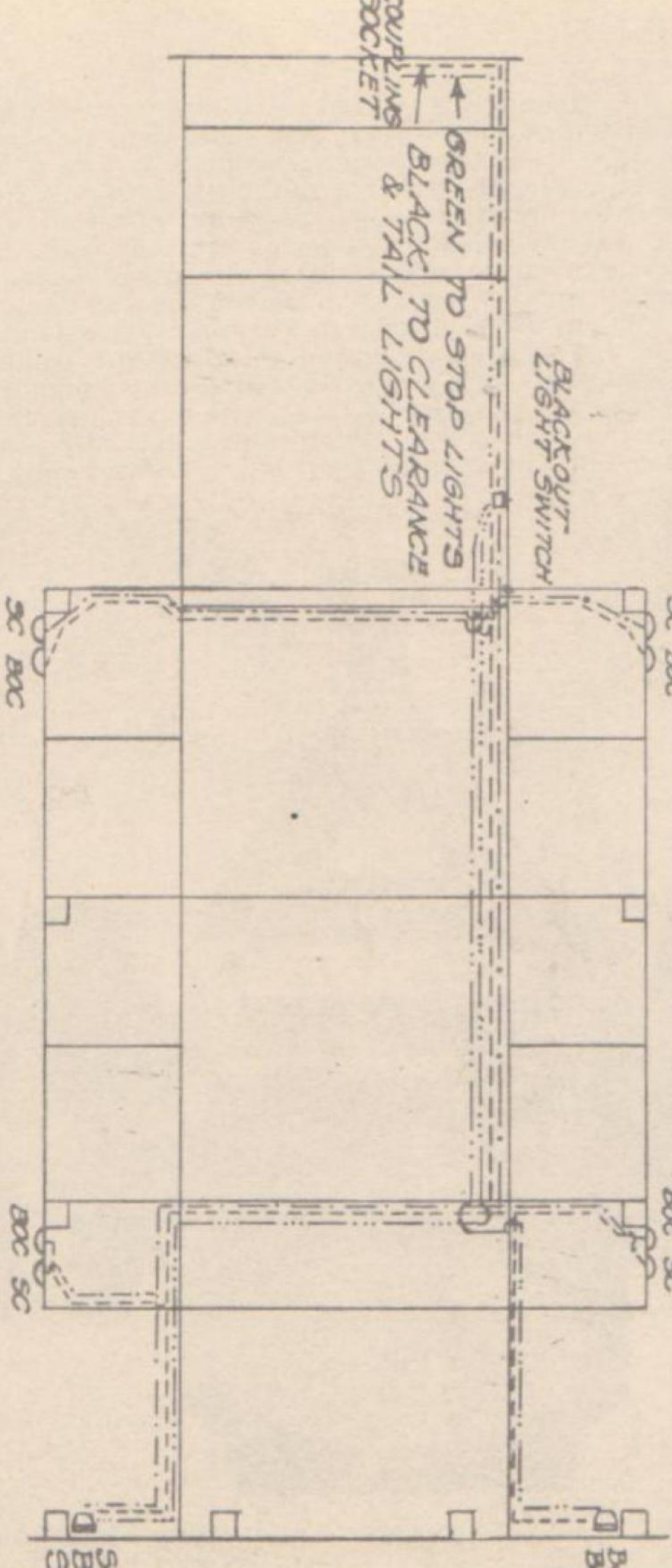


The Dolly Truck

Shown above is the Dolly Truck which has been disconnected from the trailer proper. The disc in the center is the lower half of the fifth wheel which should be kept lubricated with a heavy graphite grease. The fifth wheel should be well supplied with grease to prevent undue wear and to prevent a freezing action from taking place, causing the unit to be unweildly and hard to steer in service. The fifth wheel should be washed clean with kerosene or some other suitable solvent every three months or 5,000 miles, whichever shall occur first. This is a major lubrication operation which requires that the Dolly be disconnected from the trailer proper. The fifth wheel should have a minor lubrication each 30 days or 500 miles, whichever shall occur first. This is done with a pressure gun as is shown on a previous page of this Manual.

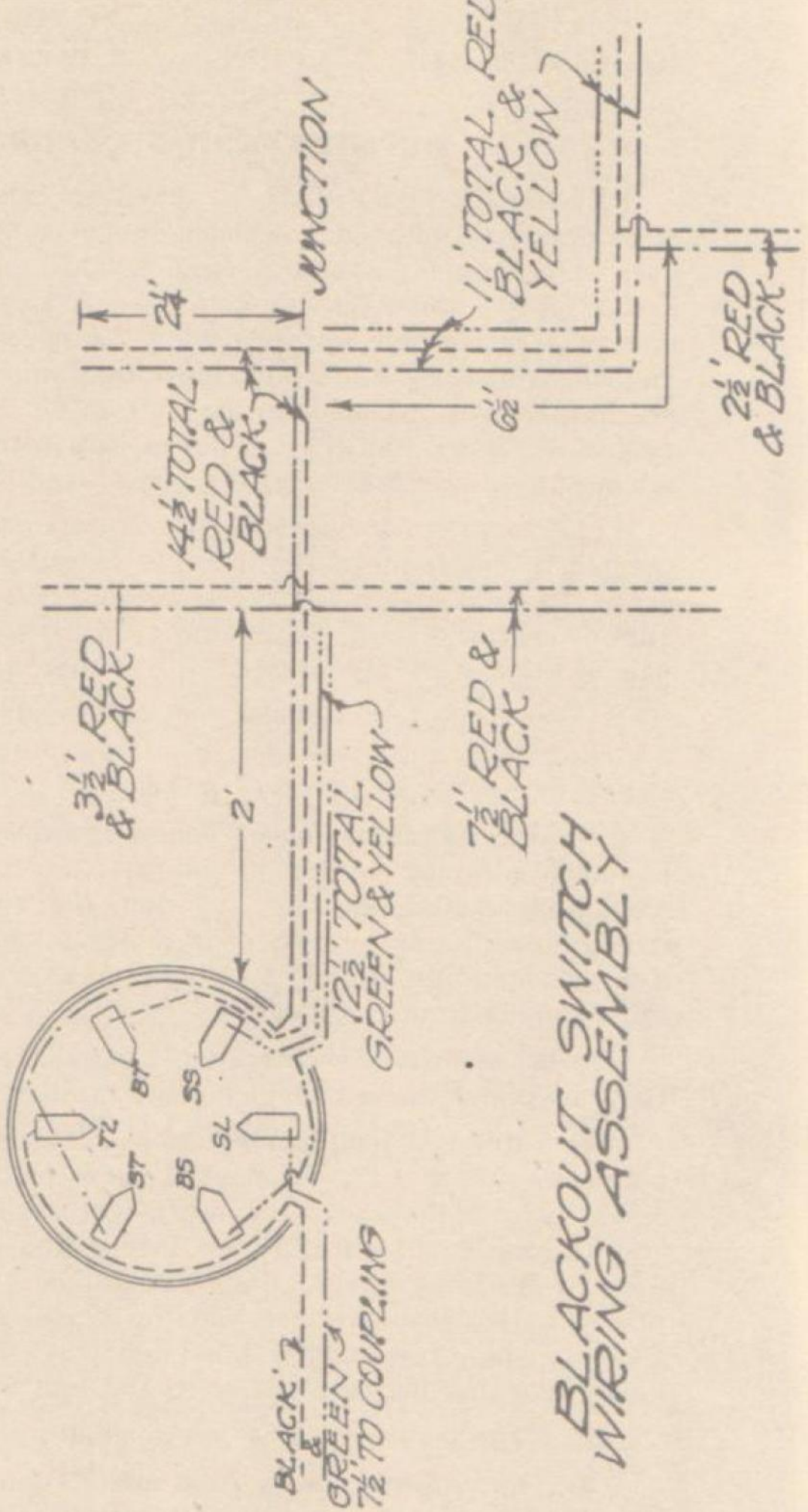
ABB.	LIGHTS
SC	SERVICE CLEARANCE
BOC	BLACKOUT CLEARANCE
BOT	BLACKOUT TAIL
BOS	BLACKOUT STOP
ST	SERVICE TAIL
SS	SERVICE STOP

WIRE COLOR	SYMBOL
RED	---
BLACK	-.-.-
BLACK	---
GREEN	---
RED	---
YELLOW	---



ELECTRIC WIRING DIAGRAM

- TL TAIL LIGHTS & CLEARANCE LIGHTS
- BT BLACKOUT TAIL & BLACKOUT CLEARANCE LIGHTS
- SS SERVICE STOP LIGHT
- SL STOP LIGHTS
- BS BLACKOUT STOP LIGHT
- ST SERVICE TAIL LIGHT & SERVICE CLEARANCE LIGHTS



Blackout light system is operated by Blackout Switch. A coin, screwdriver, knife blade, etc. is used to operate switch.

SHIPMENT AND STORAGE

1. SHIPMENT BY RAIL—*a. General Procedure*—In case of shipment of individual vehicles or where the organization does not accompany its transportation, vehicles are turned over to the Quartermaster for shipment. In such a case the Quartermaster is responsible for furnishing the necessary personnel and material for loading and blocking equipment. Vehicles are usually shipped on flat cars (36' to 60' long), gondolas (36' to 60' long), and these types of cars with wooden floors are most desirable because of the ease of loading and blocking.

b. Preparation of railroad cars—Transportation must be inspected to determine if the cars are in suitable condition to carry the load safely to its destination. Solid floors are required. All loose nails, debris and projections not an integral part of the car and the prescribed blocking must be removed.

c. Preparation of vehicles for loading—If troops are not traveling with their vehicles, all loose property and tools should be packed and secured in boxes.

d. Facilities for loading—Whenever possible, vehicles should be loaded utilizing permanent end ramp and platform. Movement from one flat car to another along the length of the train is made possible by cross-over plate, or a spanning platform after dismounting the car hand brake. An improvised ramp can be made from railroad ties.

e. In securing, or blocking a vehicle, three motions (lengthwise, sidewise and bouncing) must be prevented.

(1) Material for blocking on wood floor cars should be not less than 2" x 4". Blocks cut from material 6" x 6" or 8" x 8" are preferable. Ordinarily straps should be placed over the axle and secured to the floor in lieu of damaging the floor by inserting hooks. Canvas, cloth or burlap should be placed between the rubber and the blocks to reduce wear. Blocking should be snug to eliminate play. In case of metal floors, blocking between the sides and end walk is required.

(2) The trailer parking brake should be set.

(3) Equipment moving from manufacturer to arsenal or proving grounds, or from arsenal or proving grounds to army post, or individual units moving from one army post to another *must* be placarded "DO NOT HUMP."

(4) Further details on loading are to be found in "Special Supplement Containing Rules Governing the Loading Mechanized and Motorized Army Equipment"; also, "Major Calibre Guns for the United States Army and Navy, on Open Top Equipment" published by the Association of American Railroads, Operations and Maintenance Department, April 1, 1941.

2. SHIPMENT BY WATER—Preparation is, with certain modifications, the same as that indicated for rail shipment if the vehicles are accompanying the troops. Special attention must be given to rust prevention, however. All exposed unpainted metal and working parts should be greased.

3. LIMITED STORAGE—Vehicles in this category are those which are ready for immediate service but not used for less than 30 days. The vehicles must be cleaned and lubricated thoroughly before they are placed in storage and the various types of nonmetallic materials must be protected according to existing regulations. Brakes will not be set.

4. INDEFINITE STORAGE—Vehicles in this category are those which will not be required for service for an indefinite period.

a. *Storage conditions*—Vehicles will be stored in closed buildings or covered sheds if available. In lieu thereof, cover by tarpaulin. Storage surface should be solid, free from crushed rock, deep dust and oil surfacing and properly drained. Vehicles should be raised and blocked to keep the tires off the ground. If not completely serviced and maintained, each vehicle is tagged to indicate what repairs are required before it is returned to service.

b. *Parts removal*—Tires are removed and stored as indicated below.

c. *Tires*—Pneumatic tires and tubes should be kept in a cool, dark, dry place. Used casing should be repaired, cleaned and wrapped in burlap, paper, or cloth, and stored vertically side by side. Tubes should be deflated, removed from the casing, cleaned, repaired, folded loosely and stored in pasteboard cartons. Care should be taken that there are no sharp folds and that a small amount of air should be left in the tube to keep creases from forming.

d. *Bodies*—All exposed metal parts of the body and chassis should be slushed thoroughly, except, of course, the wooden floor. Oil drained from a crank case, gear oil thinned with crank case oil, or oil purchased for the purpose may serve as slushing oil.

e. *Equipment*—All tools and accessories will be repainted or regreased if necessary.

f. *Inspection of vehicles in storage*—Inspection of vehicles in storage will be made not less than once each month, under the direct supervision of a commissioned officer, to see that instructions are being complied with.

This "Maintenance Manual" is prepared to instruct repair men in the essentials of disassembly, repair, and reassembly. Sections will come in order and will be listed with the most likely needed repairs first in order.

SAFETY INSTRUCTIONS

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.

In changing the axle on the Dolly, 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 chocking 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.

When raising the front end of the unit, NEVER connect the chains to the main unit frame. Rather connect them around the gear frame and lift the two units together.

However, when attempting to separate the main frame from the Dolly an exception will be made—the chains should then be fastened to the lashing rings on the front of the main frame.

Axle Alignment

Torque rods are adjustable for axle alignment of front or dolly axle. Axle must be at right angle to line of draft. To check alignment, measure from extreme front end of drawbar to a point on axle at inside edge of spring seat, then measure distance to same point on opposite end of axle. When the two measurements are the same, the axle is in line. Adjustment is obtained by removing or inserting shims on torque rod. Except in extreme cases, proper adjustment can be made by adjusting one rod only.

CAUTION—Bushings in drawbar must be tight to obtain proper measurements.

Axle misalignment is indicated by uneven tire wear.

The axles at rear of trailer are fixed and require no adjustment for alignment.

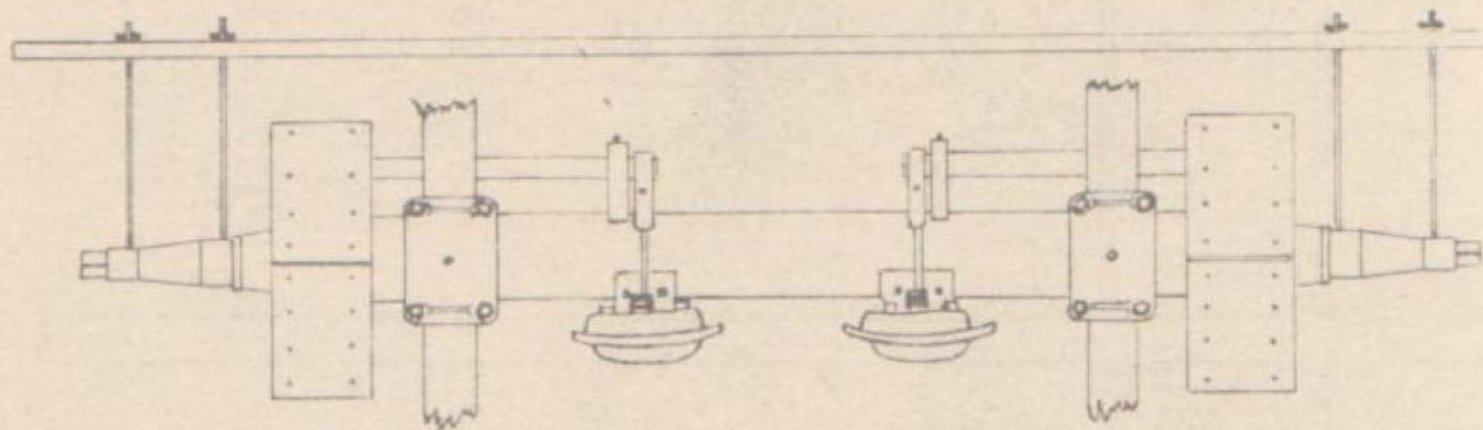
Disassembly to Check Front Axle Camber or Bent Front Axle

Remove wheel assembly.

Place jacks under both sides at the rear of the body rather than under the axle, or hoist from rear crossmember, inasmuch as a jack under the axle will interfere with checking for camber.

Checking for Bend

Place the axle gauge in position on the front side of the axle. (See below.)

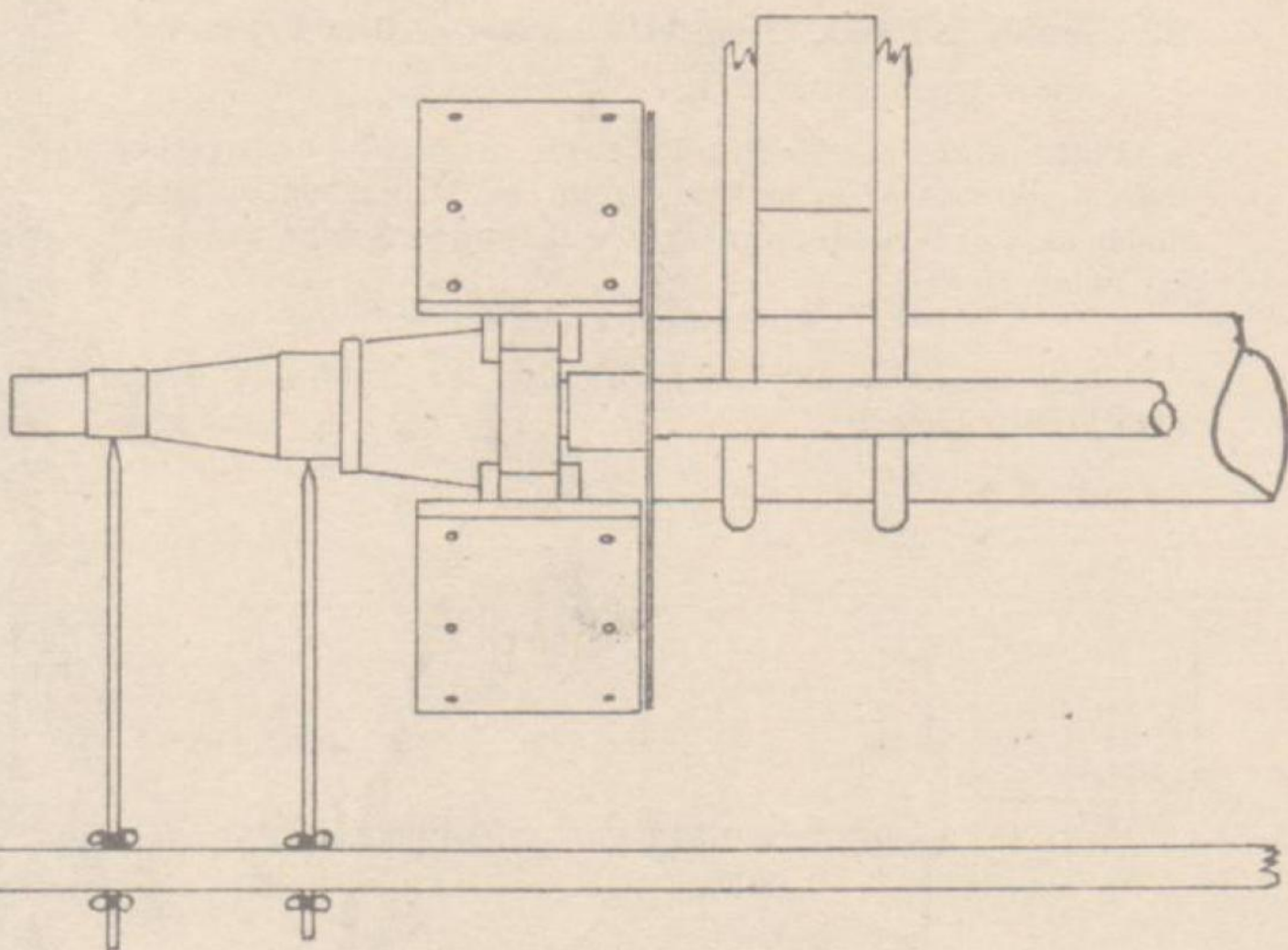


With the single pronged end of the gauge held firmly against the inner bearing surface, adjust the double prongs on the other end of the gauge until they contact the inner and outer bearing surface.

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

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.

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.



Checking for Camber

Set the points of the axle gauge in exactly the same position on the axle and in the same manner as outlined in first two paragraphs of Checking for Bend.

Place the gauge directly under the axle.

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.

Rear or trunion axles do not have any camber, which means that they are perfectly straight. Therefore, it is only necessary to inspect trunion axle for bend only. This is done in exactly the same manner as checking front axle for bend except a shorter axle gauge is used.

BRAKES

Minor Brake Adjustment

Jack up both wheels.

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

Back the adjusting wing wrench off two notches, or enough more so that no drag is felt on the wheel.

Brake Relining

Visual inspection of 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 $\frac{1}{4}$ " cap screws. This exposes the assembly to check for lining thickness, grease on the lining, etc.

It is essential that all four brake blocks be replaced when relining.

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

Remove wheel, hub and drum as an assembly.

To remove brake linings, rivets holding brake linings to shoes must be punched out. A special brake lining machine should be used for this operation. To replace brake linings, linings should be riveted to shoes, using special brake lining machine.

Clean all foreign matter from the shoes and install new brake blocks.

Adjust the brakes in accordance with the major brake adjustment procedure.

Brake Drum Replacement on Front Axle

Brake drums should be replaced when cracked or badly scored. Heat checking, unless severe, does not call for brake drum replacement.

Remove wheel and hub assembly.

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.

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

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

Prick punch each nut at two opposite points to lock in position.

If necessary to replace drums on rear axle, it is necessary to replace the entire wheel, hub and drum assembly, inasmuch as this part is cast integral.

Major Brake Adjustment, Rear Axles Only

The procedure which follows applies only when new linings or drums have been installed.

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

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.

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

Turn the eccentric anchor pin either to right or left as you tighten up on the slack adjuster until the brake shoes are centralized in the drum.

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

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

There is no major brake adjustment to be made on front or Dolly axle, inasmuch as the anchor pins are solid and do not move on eccentrics, the only adjustment being the slack adjuster.

SERVICE CHART

CONDITION	CAUSE	REMEMDY
Slow Pressure Build Up In Reservoirs	Leaking application or brake valve.	Clean valves or replace with reconditioned unit.
	Leaking compressor discharge valve.	Clean valve or replace head with reconditioned unit.
	Leaking lines or connections.	Replace tubing and fittings or tighten fittings.
	No clearance on unloader valves.	Adjust valve to .010" clearance.
	Clogged air cleaner.	Clean.
Quick Loss of Reservoir Pressure When Motor Is Stopped	Worn piston and rings, carbon in discharge line.	Replace with reconditioned unit.
	Worn and leaking compressor discharge valves.	Clean valves or replace head with reconditioned unit.
	Tubing or connections leaking.	Replace tubing or tighten fittings.
	Leaking valves.	Clean or replace unit.
	Leaking governor.	Clean or replace unit.
Compressor Not Unloading	Broken unloader diaphragm.	Install new diaphragm.
	Too much clearance on unloader valves.	Adjust to .010" clearance.
	Restriction in line from governor to unloader.	Replace tubing or clean.
	Governor not operating.	Replace with reconditioned unit.
	Low brake line pressure (Brake valve to chambers).	Adjust pressure through valve.
Slow Brake Application	Brake Chamber push rod travel excessive.	Adjust brakes.
	Restriction in line.	Clean or replace tubing or hose.
	Leaking brake chamber diaphragm.	Replace diaphragm.
	Brake lining or Drum condition.	Replace or recondition.
	Leaking brake valve diaphragm.	Replace diaphragm or complete unit.
Slow Brake Release	Brake valve lever not returning fully to stop.	Adjust operating rod.
	Binding cam or cam shafts.	Lubricate and align properly.
	Brake chamber push rod travel excessive.	Adjust brakes.
	Restriction in tubing or hose	Clean or replace.
	Improper seating of valves.	Clean or replace with a reconditioned unit.
Inefficient Brakes	Low brake line pressure.	Adjust pressure through brake valve.
	Excessive push rod travel on brake chambers.	Adjust brakes.
	Lining and drum condition.	Replace or repair.
	Brake chamber diaphragm leaking.	Replace diaphragm.

When units are to be replaced, use only Bendix-Westinghouse reconditioned units which are available in all key cities of the U. S. A. and Canada, through Bendix-Westinghouse authorized service distributors.

RELAY-EMERGENCY VALVE

The Relay-Emergency Valve serves two purposes: It speeds up brake action on the trailer, and it provides a means of applying the brakes automatically in case of trailer breakaway.

Installation

Correct Relay-Emergency Valve installation should fulfill each of the following requirements:

- (1) The Relay-Emergency Valve should be mounted right side up.
- (2) It should be securely bolted to the frame or a solid frame cross member so that it will be accessible for testing or service and free from vibration.
- (3) Both the Relay-Emergency Valve and the supply reservoir should be mounted as closely as possible to the brake chambers which the Relay-Emergency Valve is to actuate.
- (4) Tubing or hose lines leading to the Relay-Emergency Valve should be as direct as possible.
- (5) When installing the hose or tubing lines leading to the Relay-Emergency Valve, care must be taken to eliminate or minimize the danger of their being broken by spring action or other extraneous causes.
- (6) Lines connecting the brake chamber and Relay-Emergency Valve should be made of flexible hose.
- (7) Air supply lines should be so installed that they permit any condensation collected in them to drain back to the reservoir.

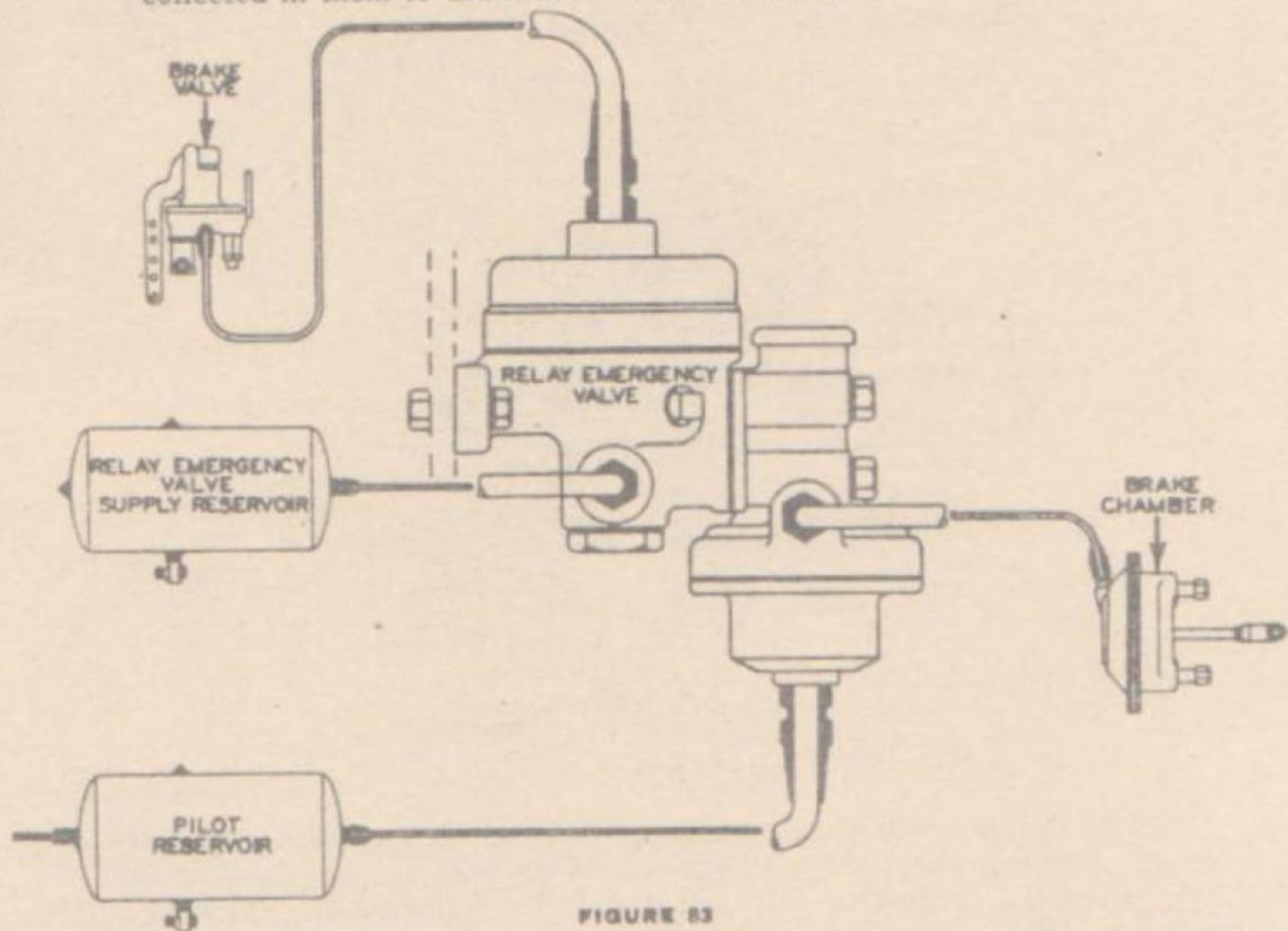


FIGURE 83

The correct method of installing tubing or hose lines to the Relay-Emergency Valve is shown in Figure 83. Two pipe taps, one on either side of the emergency portion, are provided for brake chamber line connection. Either of these ports can be used; however, if only one is used the other should be plugged. Of the four pipe taps in the relay portion of the Relay-Emergency Valve, one of the lower ports is used for connecting the relay-emergency valve supply reservoir and the other three should be closed with pipe plugs. The exhaust port should never be closed. In shipping, the Relay-Emergency Valve has a pipe plug or thread protector in the exhaust port to prevent dirt getting into the valve while in transit. This plug or thread protector must be removed when the valve is placed in service.

Operation

The Relay Emergency Valve operation falls into two classifications: the normal operation and the emergency operation. The normal operation is actuated by the driver and the regular action of the Air Brakes System. The emergency operation is induced by anything (such as trailer breakaway) that would cause a sudden and abnormal drop of air pressure in the pilot reservoir.

The following paragraphs and pictures describe the valve movements necessary to attain each of the various operations illustrated by Figure 84, 85, and 86. Figure 84 shows the valve in full application position. Figure 86 shows the valve in full emergency position. By observing these figures in conjunction with the following descriptions, it is possible to obtain a complete picture of the valve's operation.

Normal Position and Building Up of Air Pressure in Supply Reservoir

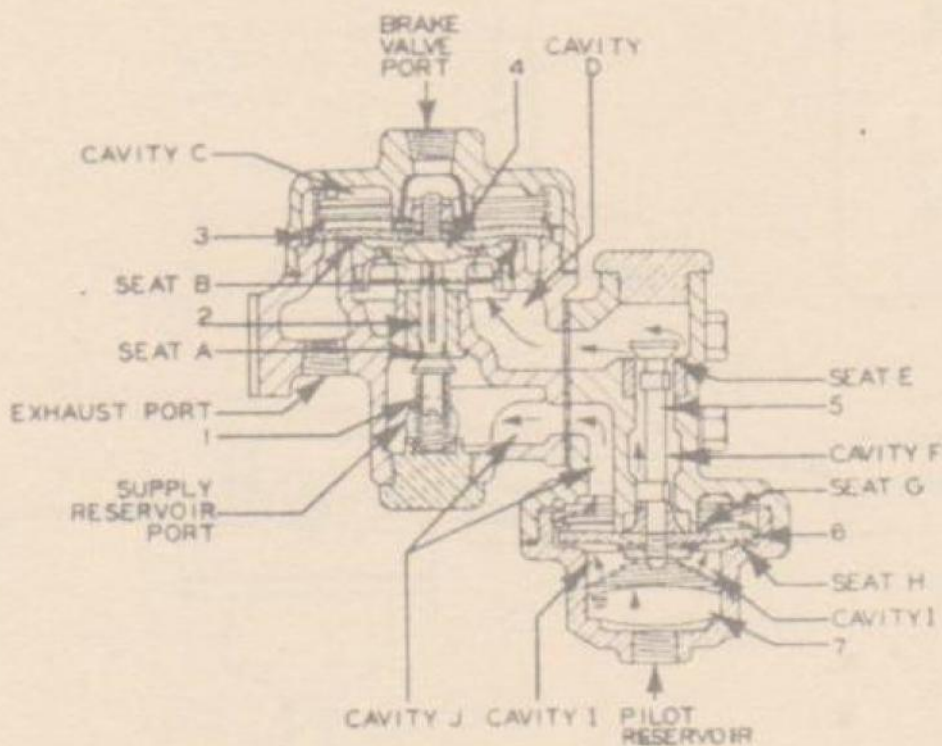


FIGURE 84

The air pressure built up in cavity I by the pilot reservoir holds the edges of diaphragm 6 above seat H, permitting the air pressure from the pilot reservoir and cavity I to pass into cavity J and out through a tubing line to the relay emergency valve supply reservoir. By this method, full pilot reservoir pressure is constantly maintained in the supply reservoir and cavity J. The air pressure in cavity I also forces the center of diaphragm 6 up against seat G, sealing the lower end of cavity F against the pressure held in cavity J. As the diaphragm is held sealed against seat G, emergency valve 5, connected to

the diaphragm, is held up off seat E so that a direct connection is established between cavity D and the brake chambers which are connected into cavity F.

Normal Application

When in regular brake application the driver depresses the brake pedal, the brake valve will deliver air pressure into cavity C, where, due to the Relay Emergency Valve's self-lapping feature, it causes the Relay Emergency Valve to deliver to the brake chamber the same amount of air pressure applied by the brake valve. The air pressure entering cavity C forces diaphragm 3 down against seat B, closing off the exhaust port. The deflection of the diaphragm 3 also causes diaphragm guide 4, connected to the diaphragm, to contact supply valve 2 and move it away from seat A.

As the supply valve is opened, the air pressure which has been restrained in cavity J is permitted to pass up into cavities D and F and out through tubing lines to the brake chambers.

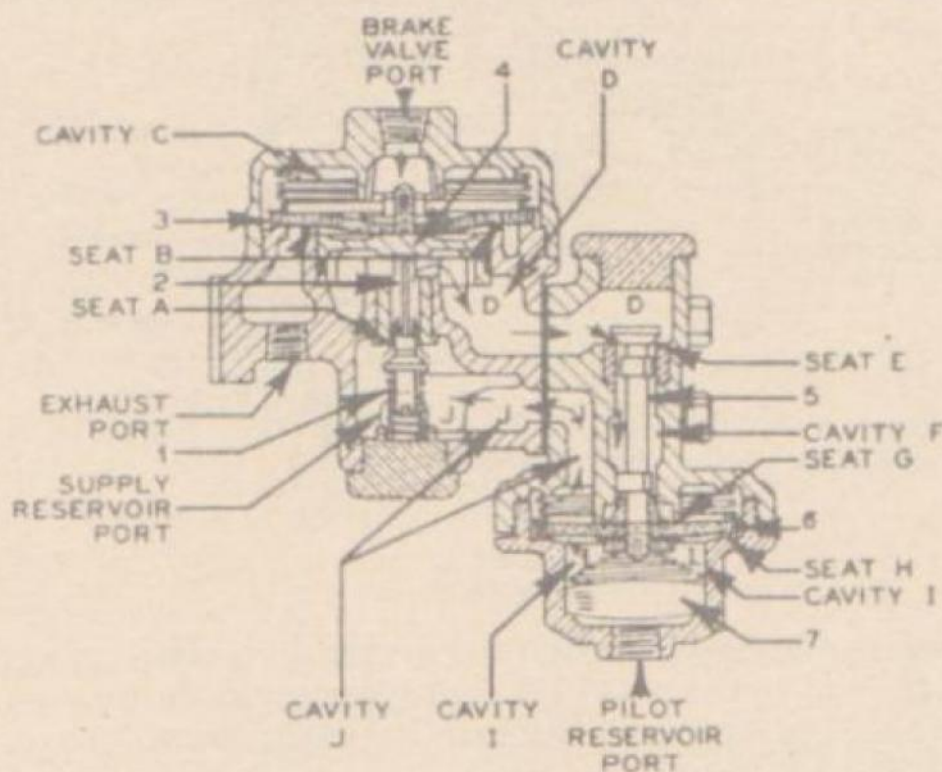


FIGURE 85

Supply valve 2 is held open until the air pressure in the brake chambers and cavity D has been built up to equal pressure applied above the diaphragm by the brake valve, then the valve automatically laps itself. This means that air pressure in cavity D is strong enough to balance the pressure in cavity C and raise diaphragm 3 and diaphragm guide 4 sufficiently to permit spring 1 to close supply valve 2, but not enough to open the exhaust port. This self-lapped position holding the air pressure in cavity D and brake chambers constant, is maintained until brake valve pressure in cavity

C is either increased or decreased. If the brake valve pressure is increased, the performance is repeated until a higher balance pressure is attained. If the brake valve pressure is decreased, pressure in cavity D is strong enough to lift the diaphragm off points B permitting the air pressure to exhaust to atmosphere through the exhaust port until a lower balance pressure is attained. If all the brake valve pressure is released, the exhaust port is held open until all the air pressure is exhausted from the brake chamber and cavity D.

Emergency Application

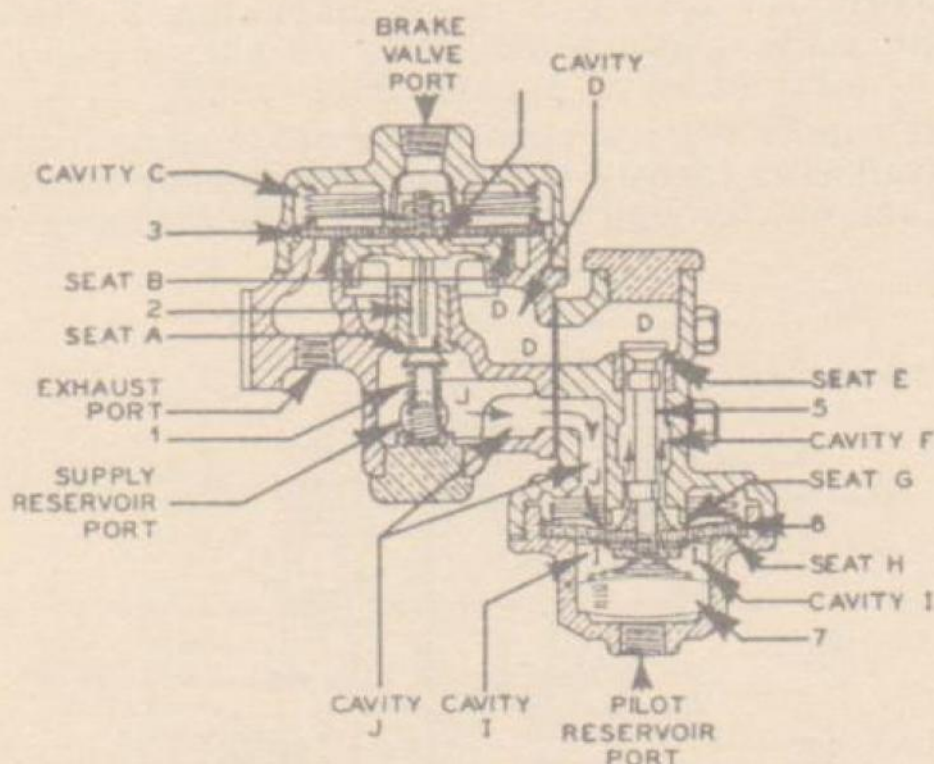


FIGURE 86

The emergency application occurs only in case an accident (such as trailer breakaway) should cause a sudden and abnormal drop of pressure in the line between the pilot reservoir and the Relay-Emergency Valve.

This sudden drop of air pressure in cavity I causes the pressure that has been built up in the supply reservoir and cavity J to force diaphragm 6 down against seat H, so that the air pressure in cavity J cannot escape through cavity I. The downward movement of the diaphragm causes emergency valve 5, connected to diaphragm 6, to move down against seat E, closing the upper end of cavity F so that no pressure can escape through cavity D to the exhaust port. The downward movement also pulls the diaphragm away from points G, opening the lower end of cavity F and permitting air pressure from the supply reservoir and cavity J to pass directly through cavity F to the brake chambers.

Releasing Brakes after Emergency Application

Two methods may be used to release the brakes after an emergency application has occurred. The recommended method is to repair and reconnect the air brakes so that all connection lines and equipment are in their original condition and then to operate the compressor to build up air pressure. As the air pressure in cavity I is built up to equal the pressure in cavities F and J, it presses up diaphragm 6 so that the valve resumes its normal operating position. In this position the diaphragm pressing against points G seals the lower end of cavity F against the air pressure in cavity J likewise, emergency valve 5 is held up off seat E opening the upper end of cavity F into cavity D, so that the air pressure in cavity F and the brake chambers is released through cavity D and the exhaust port to atmosphere. The other method is to drain the air pressure from the relay-emergency valve supply reservoir.

Length of Emergency Application

The length of time that the brakes will maintain an emergency application depends upon the care the equipment has been given. Without proper maintenance, the valve and various connections may be leaking freely and the emergency application time will be comparatively short. However, if the equipment has been carefully maintained, with all connections properly sealed against leakage and the emergency valve leakage held to the minimum, the emergency application will be held for a much longer time.

Inspection

The Relay-Emergency Valve should be inspected at the same periods established for the inspection of the motor vehicle by its manufacturers. The following leakage tests will give an accurate check on the valve's condition. In case leakage in any one of these tests causes a 3-inch soap bubble in 3 seconds, the entire valve should be removed and cleaned or replaced with a reconditioned unit if necessary.

Regular Leakage Tests

- (1) With brakes released, cover exhaust port with soap suds. Leakage is caused by supply valve 2 not seating properly.
- (2) With brakes applied, cover exhaust port with soap suds. Leakage is caused by diaphragm 3 not seating properly.

Emergency Tests

(3) Be sure there is pressure in the trailer reservoir. Disconnect emergency hose between truck and trailer; trailer brakes should apply automatically. This is the safety feature which applies the brakes automatically in case of trailer break-away and should be tested daily to insure proper functioning of the devices in case of an emergency.

(4) Cover emergency hose or connection on trailer with soap suds. Leakage is caused by diaphragm 6 not seating properly.

(5) Cover exhaust port with soap suds. Leakage in excess of that evident in test 1 is caused by valve 5 leaking.

Maintenance Service

Three parts of the Relay-Emergency Valve require periodical maintenance service:

Strainer 7 should be removed about once every six weeks, cleaned thoroughly with gasoline, and replaced.

Diaphragms 3 and 6 should be replaced once each year; more often if operating conditions warrant.

When the Relay-Emergency Valve does not meet the inspection test leakage requirements, it will sometimes be found that the trouble is caused by dirt on the valve or diaphragm seat. This condition can be remedied by removing the leaking valve or diaphragm, cleaning the valve and valve seat with kerosene, and then regrinding the valve.

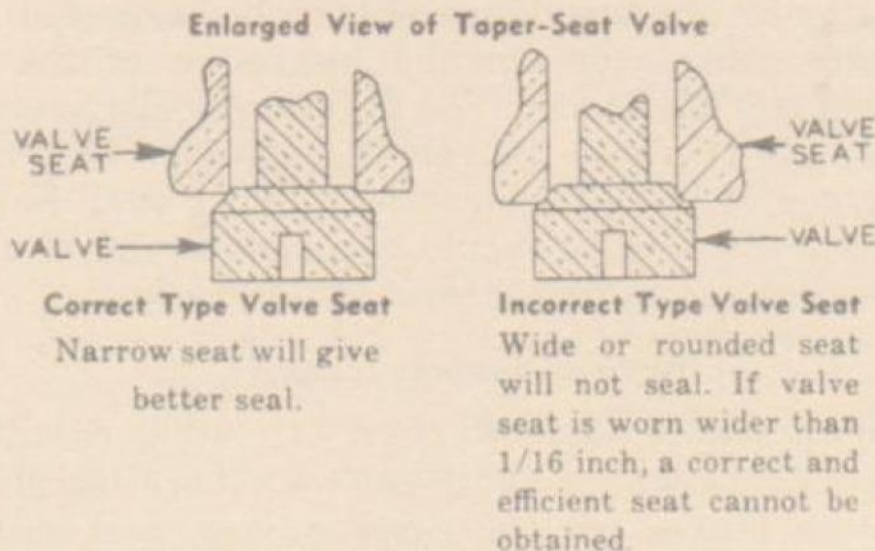


FIGURE 87

All Diaphragms Should Be Replaced Once A Year

TO CLEAN OR REPLACE DIAPHRAGM A. (Refer to Figure C):

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

2. Lift out the diaphragm guide ring (Figure E), 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.

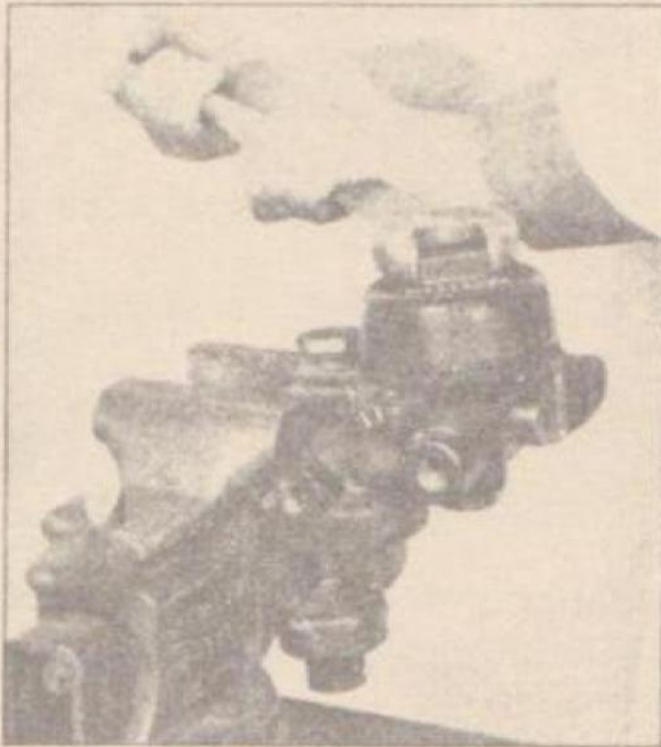


FIGURE D. REMOVING VALVE COVER

FIGURE C. RELAY-EMERGENCY VALVE

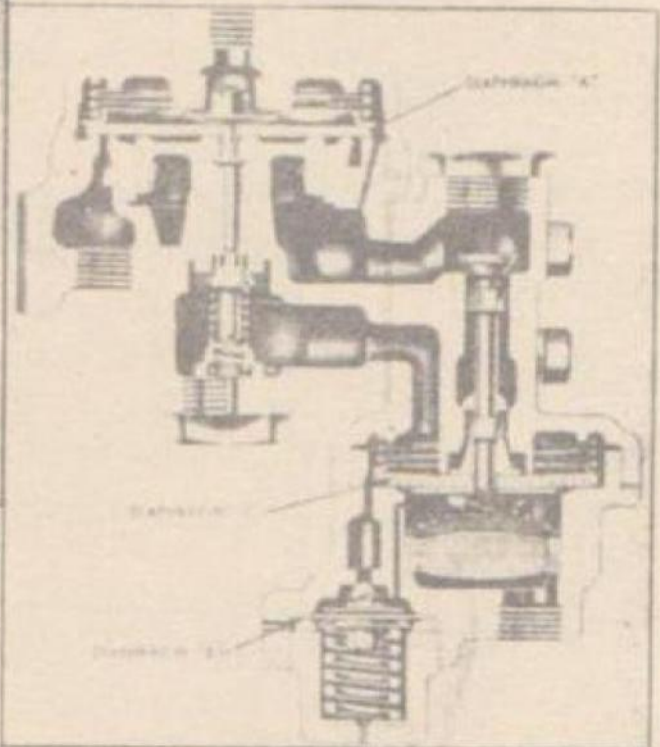


FIGURE E. REMOVING GUIDE RING

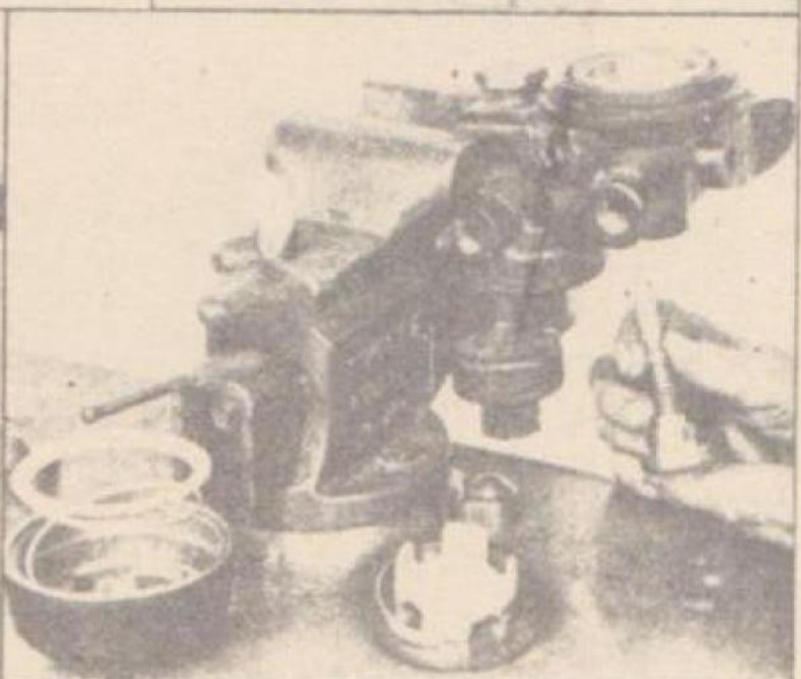


FIGURE F. REMOVING INTAKE VALVE

CLEANING OR REPLACING INTAKE VALVE—(Refer to Figure C):

1. Remove the cap nut.
2. Extract the intake valve with a pair of long nose pliers.
3. Clean. Replace. (Figure F.)

TEST FOR LEAKAGE—RELAY VALVE DIAPHRAGM "A" AND INTAKE VALVE—(Refer to Figure C):

- a. When making leakage tests with soap suds, a 3" bubble in three seconds is permissible.
- b. Release brakes; cover port with soap suds to detect the supply valve leakage.
- c. Apply brakes; cover port with soap suds to detect relay valve diaphragm leakage.
- d. With relay valve in emergency operation, cover this port with soap suds.
- e. Leakage in excess of the first test is caused by the emergency valve not seating properly.

f. Cleaning or Replacing Diaphragm "B"—(Refer to Figure C):

1. Remove cap, spring and diaphragm.
2. Remove stem lock nut. Lift diaphragm and diaphragm follower from stem. Clean or replace.
3. Reassemble by reversing the procedure outlined above.

TEST FOR LEAKAGE—EMERGENCY VALVE DIAPHRAGM "C"—(Refer to Figure C):

a. With relay-emergency valve in emergency position, cover port with soap suds to detect emergency diaphragm leakage.

b. Cleaning or Replacing Diaphragm "C"; Washing Strainer—(Refer to Figure C):

1. Remove diaphragm cover body. (Figure G)
2. Lift out spring and strainer. (Figure H)
3. Remove cap nut. (Figure I) Insert screw driver into slotted top of valve and remove diaphragm lock nut. Pull out the valve stem and diaphragm.
4. Clean the strainer and diaphragm in gasoline. Install a new diaphragm if necessary.
5. Reassemble by reversing the procedure outlined above. (Figure J.)



FIGURE H. LIFTING OUT
SPRING AND STRAINER



FIGURE G. REMOVING
DIAPHRAGM COVER BODY

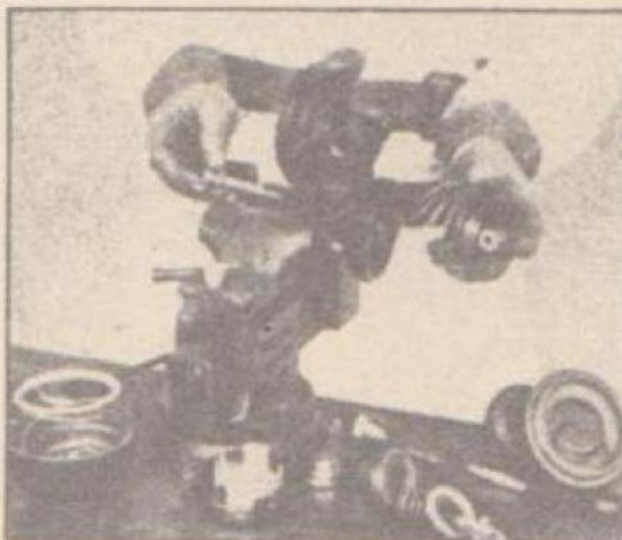


FIGURE J. REASSEMBLING
VALVE



FIGURE I. REMOVING
VALVE

However, if the leakage is caused by a badly worn valve, it will be necessary to replace the worn valve with a new one. In this case, generally it will be found that the valve and both diaphragms are badly worn and the operator will likely find it more economical and satisfactory to replace the entire Relay- Emergency Valve with a genuine factory-reconditioned unit.

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BRAKE DIAPHRAGM

Testing and Correcting Leaks in the Brake Diaphragm

When making leakage test with soap suds, a 3" bubble in 3 seconds is permissible.

1. Apply the brakes.
2. Paint the edge of the diaphragm with soapy water.
3. 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.
4. If the diaphragm is defective, air will escape around the rubber boot on the brake rod when the brakes are applied and the diaphragm must be replaced as follows:

(a) Remove the brake chamber from the trailer by removing the two chamber nuts which hold it to the axle mounting bracket, disconnect the hose assembly and pull the clevis pin at the slack adjuster arm.

(b) Place the chamber in a vise and draw a nail or other sharp object across the chamber edge to mark it for re-assembly.

(c) Remove the bolts, replace the diaphragm and tighten bolts as outlined in step 3. (Refer to Figure A.)

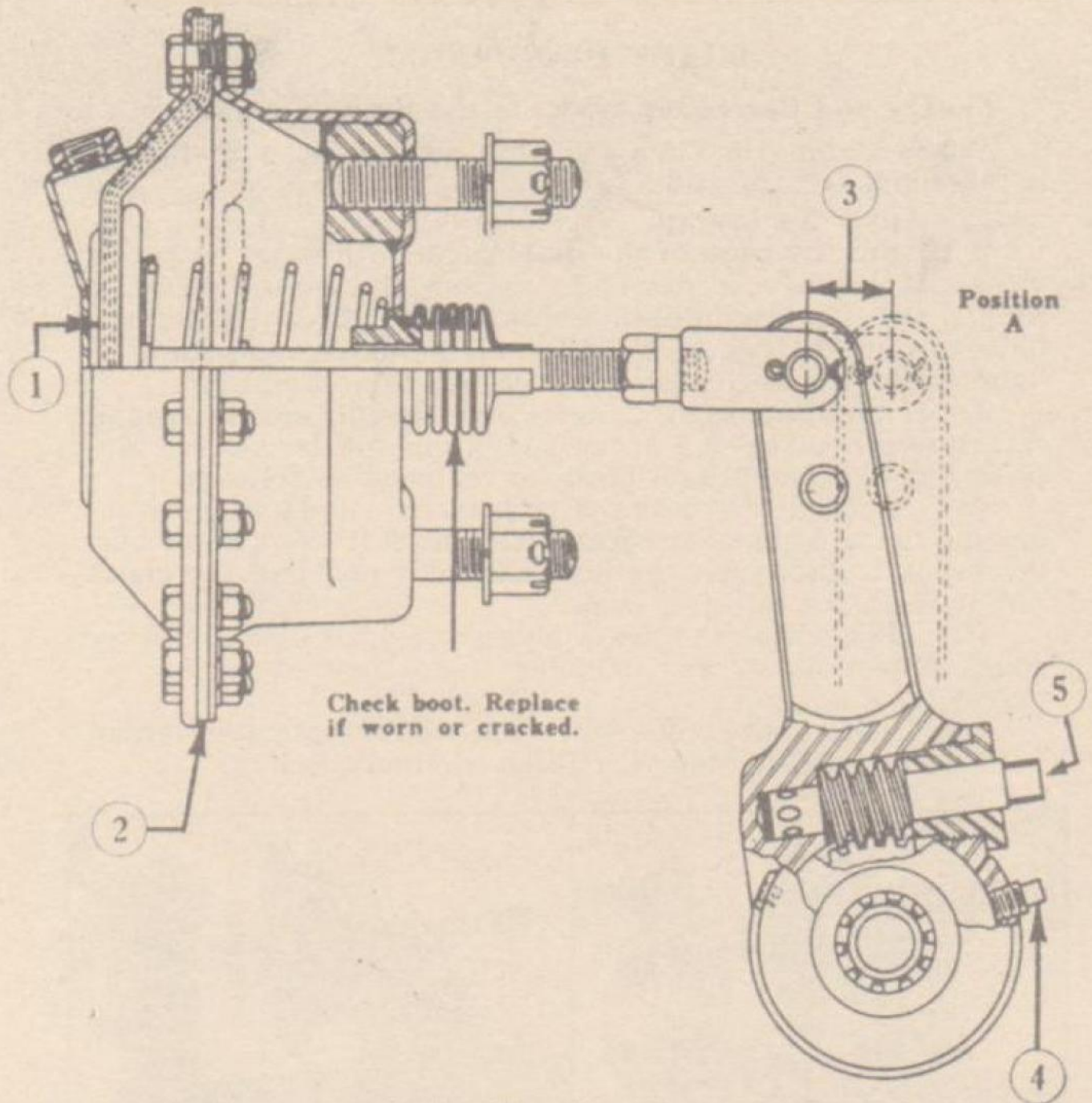


FIGURE B. BRAKE CHAMBER—REPLACING SPRING

FIGURE A. BRAKE CHAMBER—DISASSEMBLY

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 pressure plate. (Figure B.)
3. Bent or worn pressure plates should be replaced.
4. Slightly bent brake push rods may be straightened; if severely bent, should be replaced.
5. Worn boots should be replaced.



Brake Chamber Data
(Dimensions given in inches)

Type	Diameter	Maximum	Proper Maximum stroke when brakes are adjusted	Maximum stroke at which brakes should be adjusted
A, AA*	6-7/8	1-3/4	5/8	1-3/8
B	9-3/16	2-1/4	3/4	1-3/4
C, CC*	8-1/16	2-1/4	3/4	1-3/4
D, DD*	5-1/4	1-5/8	1/2	1-1/4
E, EE*	6	1-3/4	5/8	1-3/8
F	11	3	3/4	2-1/4
G	10	2-1/2	3/4	1-3/4

* The data for the double-acting AA, CC, DD and EE Brake Chambers are for one side only.

Brake Chamber and Block Adjuster**SYMBOL**

1. Replace diaphragm at least once a year.
2. Apply brakes: cover edges of diaphragm and bolt holes to detect leakage. No leakage is permissible. Tighten bolts uniformly until leakage is eliminated. However, bolts should never be tightened so that edges of the diaphragm start to bulge or are distorted.
3. Check push rod travel and adjust brakes so that maximum push rod travel will be in accordance with dimensions shown in chart on opposite page.
4. Pipe plug has been removed and pressure fitting installed, use pressure gun grease.
5. To adjust brakes, turn this nut.

The most efficient brake action will be obtained when the slack adjuster arm travel is held to a minimum so that full length of lever is used. The brake adjustments necessary to maintain proper adjuster arm travel are made by turning the adjusting worm. This rotates the worm gear, cam shaft and cam, expanding the brake shoes so that the slack caused by brake lining wear is taken up and the slack adjuster arm travel is returned to the minimum setting. These brake adjustments usually average less than 5 minutes to a wheel, with Westinghouse slack adjusters.

Air pressure admitted into the Brake Chamber when the brake pedal is depressed moves the diaphragm, push rod and slack adjuster toward position A, applying the brakes. As the brake pedal is released, the air pressure is exhausted from the chamber and the spring returns the diaphragm. Push rod and slack adjuster to their normal positions, releasing the brakes.

In normal braking the entire Slack Adjuster operates as a unit, rotating bodily with the cam shaft as the brakes are applied or released.

Quick-Release Valve

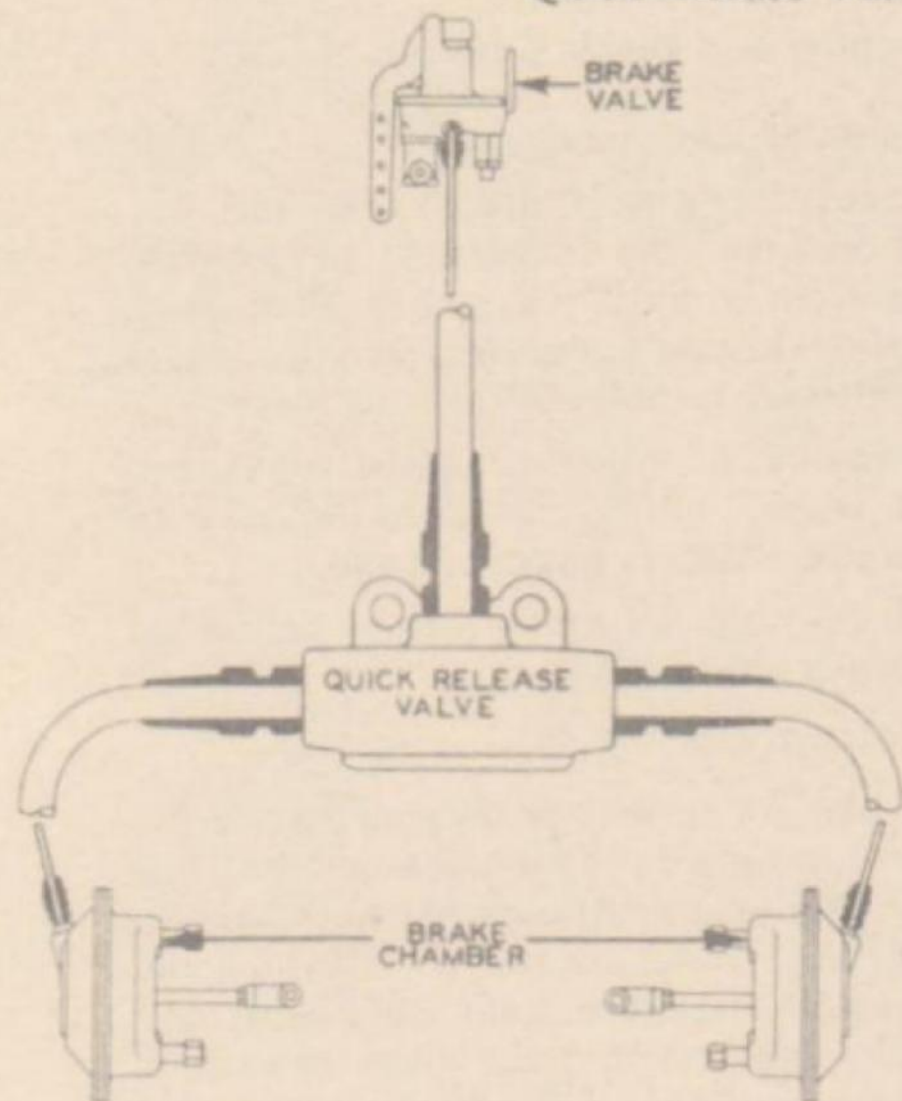


FIGURE 78

Operation

Figure 79 shows the Quick-Release Valve in release position. The brake valve is released, there is no pressure in cavity C, and spring 1 holds the edges of diaphragm 2 against points B and air pressure holds seat E away from points A so that any air pressure in the brake chambers or in cavity D is permitted to exhaust to atmosphere through the exhaust port. As the brake valve is applied, the air pressure passed into cavity C forces seat E to move against points A, sealing the exhaust port, and forcing the edges of diaphragm 2 from point B so that the air pressure is passed into the brake chambers. This position is held until the brake valve is released and pressure is exhausted from cavity C, then the Quick-Release Valve resumes the release position.

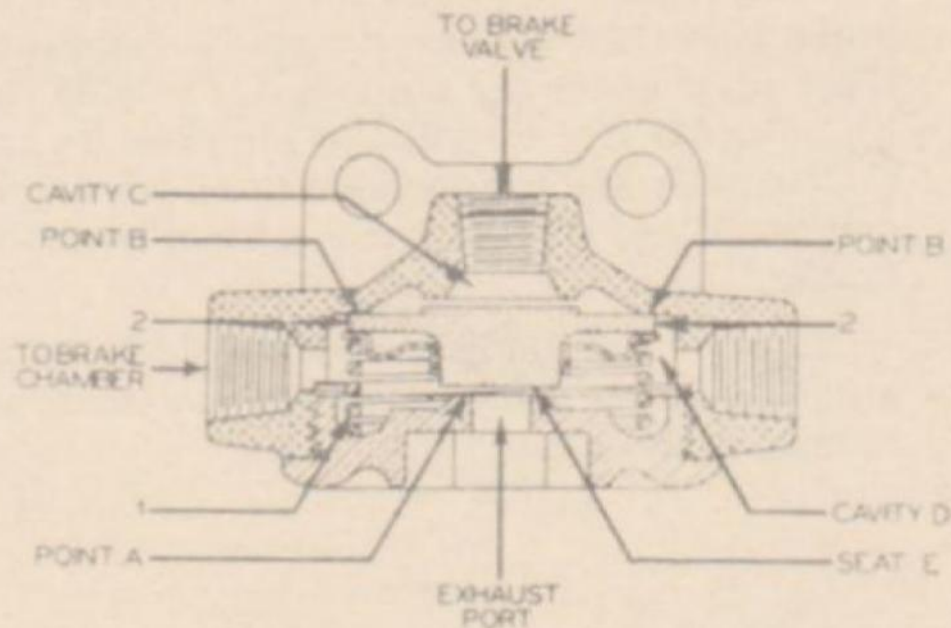


FIGURE 79

The Quick-Release Valve speeds up the release of air pressure from the brake chambers. When the brake valve is moved into release position, the Quick-Release Valve exhaust port is held open so that air pressure accumulated in the brake chambers is exhausted to atmosphere through the Quick-Release Valve. Since the Quick-Release Valve is much closer to the brake chambers than the brake valve, the brake release is naturally more expedient.

Installation

The Quick-Release Valve should be securely bolted to the frame close to the brake chambers it is to release and where it is accessible for testing or servicing. The valve must be mounted with the exhaust port down. When mounted, the port on top of the valve should be connected by a tubing line to the brake chamber port of the brake valve. The two side pipe taps are to be connected by tubing lines to the brake chambers. If only one side port is to be used, the other should be plugged.

Inspection

The Quick-Release Valve should be inspected at the same periods established for the inspection of the vehicle by its manufacturers. The air leakage in the following test should not exceed a 3-inch soap bubble in 3 seconds.

With brakes applied, cover exhaust port with soap suds. Leakage is caused either by dirt on the exhaust seat or by a worn exhaust seat.

Maintenance Service

In case the leakage is caused by dirt on the exhaust seat, the diaphragm should be removed and the seat cleaned. If the seat is worn, the diaphragm should be replaced with a new one. In any event, the diaphragm should be replaced with a new one at least once a year.

Miscellaneous Devices

Reservoir

Figure 94 illustrates one of the air Reservoirs specially constructed to meet the needs of the Westinghouse Automotive Air Brake System. The shell of the Reservoir is made of drawn steel and the one longitudinal seam is electrically welded. The heads are made of pressed steel. The Reservoir is assembled by pressing the heads into the shell, rolling the shell down over the heads and then brazing the shell and heads together.

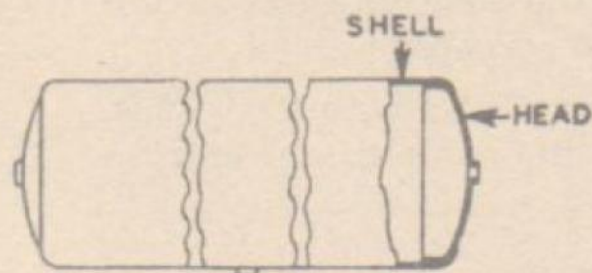


FIGURE 94

After the Reservoir is assembled it is coated inside and out with two coats of baked enamel to prevent rust and corrosion and is then tested with 200 pounds per square inch of hydrostatic pressure. This careful selection of materials and assembling methods makes a rugged Reservoir which is capable of giving trouble-free service throughout the life of the average vehicle.

Installation

Reservoirs are furnished in several sizes to meet the installation and air capacity needs of the various Air Brake Systems. A drain cock should be installed in the bottom port of each Reservoir in the air system. The Reservoir bracket (Figure 95), or the U bolt and filler block (Figure 96) are usually used to install the Reservoirs.

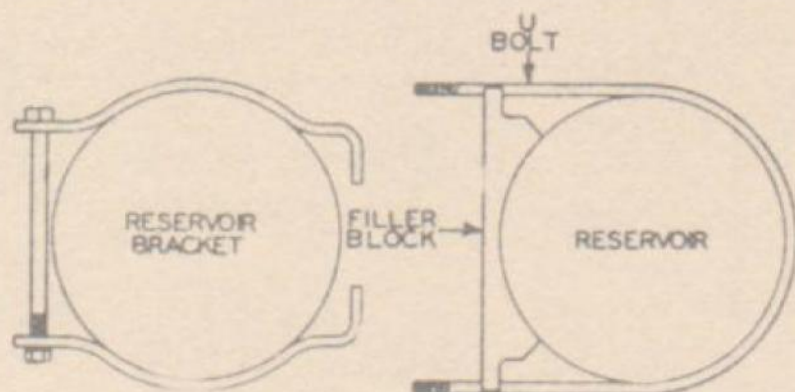


FIGURE 95

FIGURE 96

The Reservoir location will vary in accordance with the vehicle on which it is mounted. However, the following points should always be observed:

- (1) Reservoir should be mounted lower than any other unit of the Air Brake System and all tubing lines should be mounted so that any condensation will be permitted to drain back into the reservoir.
- (2) Tubing lines leading to the Reservoirs should be as direct and as short as possible.

Maintenance Service

It is imperative that each Reservoir be drained daily to eliminate any condensation collected there.

DRAIN COCK, AIR SUPPLY VALVE AND CUT-OUT COCK

DRAIN COCK

CUT-OUT COCK

AIR SUPPLY VALVE

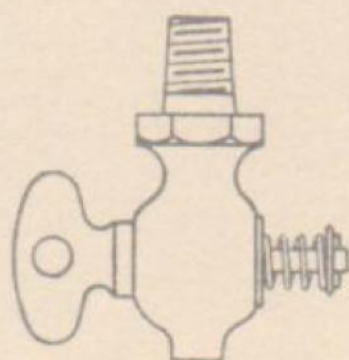


FIGURE 97

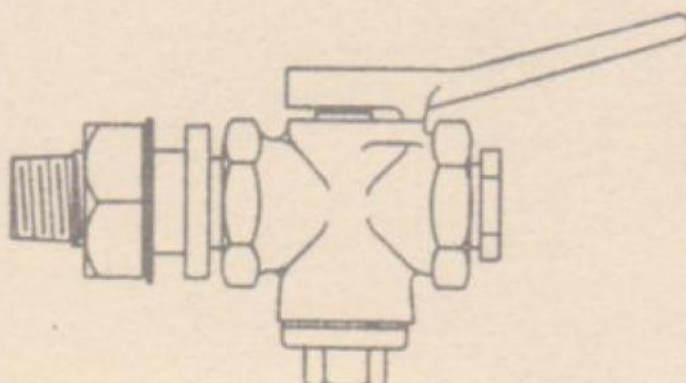


FIGURE 98

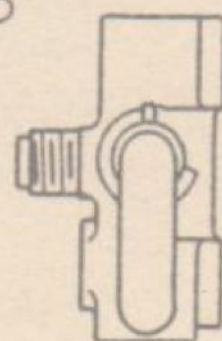


FIGURE 99

Three types of cocks are used in conjunction with the Westinghouse Automotive Air Brake System: The Drain Cock, Cut-Out Cock, and 3-Way Cock or Air Supply Valve. Each of these Cocks is of rugged design and has its key lapped to the seat in order to insure the Cock against leakage.

The Drain Cock (Figure 97) is installed in the bottom port of each reservoir in order to provide a quick means of draining off the condensation which collects in the reservoirs.

The Cut-Out Cock (Figure 98) provides a method of closing off air lines not in use.

The Air Supply Valve (Figure 99) provides a convenient means of using the Air Brake System's pressure for tire inflation or any other purpose where air pressure is needed.

This Air Supply Valve is installed in the line between governor and the reservoir, causing the compressor to operate continuously as long as the 3-way cock is open.

Installation

Care must be taken when installing one of these Cocks not to bend the key or distort the body. When connecting a Cock, the wrench should be on the end of the Cock nearest to the part being installed. If it becomes necessary to bend the operating handle, the entire key should be removed from the body before the bending is done.

IMPORTANT—To operate one of these Cocks, turn the handle with the hand. Never strike the handle with some heavy instrument.

Inspection

These Cocks should be inspected for leakage at the regular inspection periods established for the inspection of the vehicle by its manufacturer. This can be done by closing the Cock, building up 90 pounds air pressure behind it, and covering the opening with soap suds. If the leakage exceeds a 3-inch bubble in 3 seconds, the Cock should be repaired or replaced with a reconditioned one.

Maintenance Service

In some cases when a Cock fails to meet the leakage requirements, it will be found the leakage is caused by dirt on the key. This can be remedied by cleaning the key and seat

with kerosene or gasoline and then lapping the seat with Bendix-Westinghouse Grade 400 Grinding Compound. If the leakage is caused by a worn key or seat, it will likely be more economical and more satisfactory for the operator to replace the Cock with a genuine factory-reconditioned unit.

Trailer Coupling

The trailer connections are made through hose couplings (Figure 100). Figure 101 shows pin 1 upward. These couplings should be installed and connected so that when the coupling is in place it will resemble the set-up in Figure 101. This arrangement minimizes the possibility of accidental unhooking or uncoupling. The rubber seal in these couplings should be replaced at least once every six months; more often under severe service conditions.

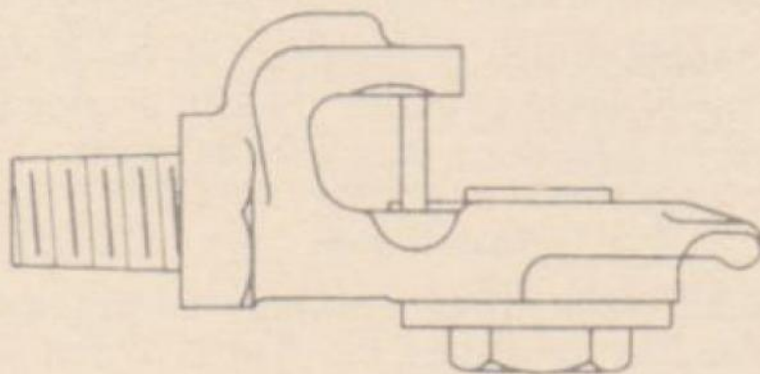


FIGURE 100

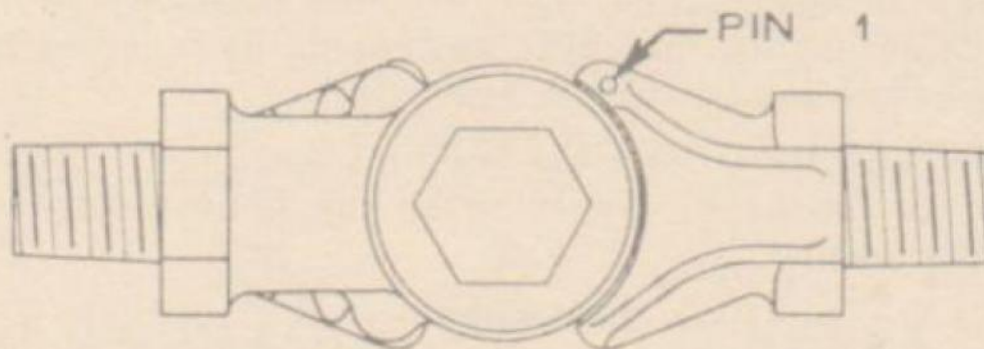


FIGURE 101

Tubing

Both copper and aluminum heavy-duty Tubing are used for connecting the various units in the Westinghouse Automotive Air Brake System. Tubing is of the drawn seamless type and is furnished in the following sizes:

Copper—sizes of 5/16, 3/8, 1/2, 3/4 and 1 inch.

Aluminum—sizes of 3/8 and 1/2 inch.

The materials used in this manufacturing process are carefully selected so that the Tubing will be smooth and free from scale, corrosion, etc. and will be capable of withstanding a

pressure considerably greater than maximum pressure necessary for any operation. Tubing is also specially heat-treated to make it pliable enough for easy installation and flexible enough to insure the maximum service life.

Tubing Fittings

Brass Tubing Fittings used in the Westinghouse Automotive Air Brake System are of the three-piece type shown in Figure 102. These Fittings are specially designed to afford easy installation and to give long trouble-free service. They are furnished in sizes to correspond with the various tubing measurements.

TUBING CONNECTOR

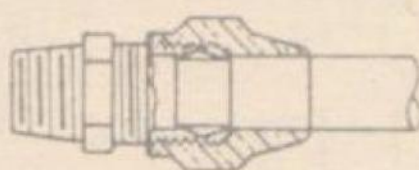


FIGURE 102

Installing Tubing Fittings on Tubing

If reasonable care is exercised in carrying out the following steps, no leakage will occur at the Tubing Fitting when it is installed on tubing line:

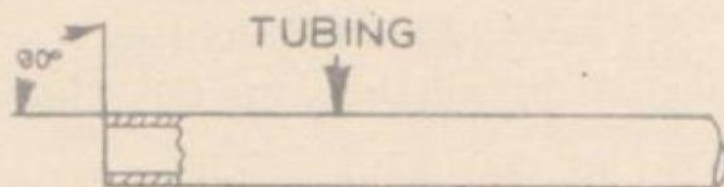


FIGURE 103

(1) Cut tubing. After the cut is made, make sure the end of the tubing is smooth and is cut squarely at right angles to the outside wall. Also, make sure the end of tubing is not crimped or closed.

(2) Blow out tubing with an air line. Remove all burrs, cuttings, or filings.

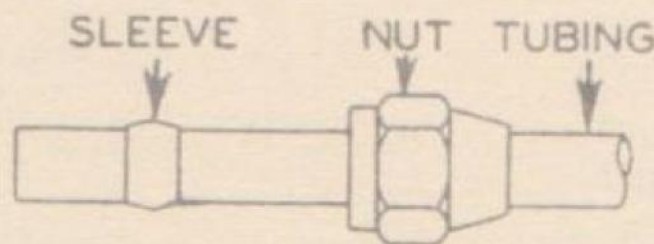


FIGURE 104

(3) Place nut and sleeve on tubing.

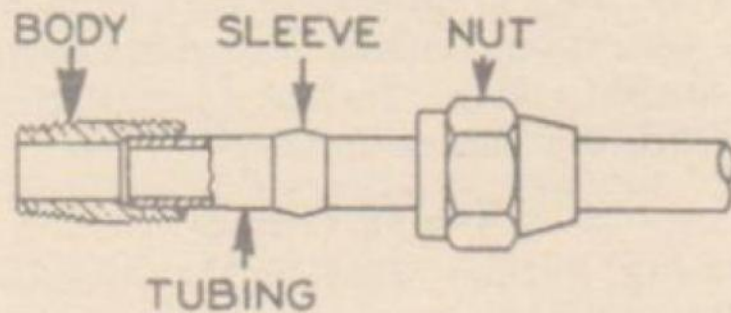


FIGURE 105

(4) Place end of tubing against the bottom of the bore in the tubing fitting body.

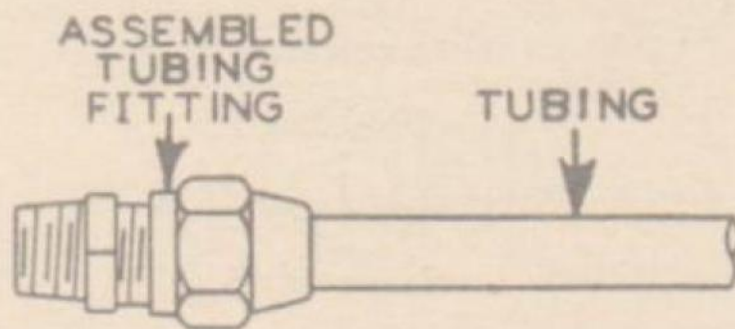


FIGURE 106

(5) Hold tubing at bottom of bore and tighten tubing fitting nut only enough to seal the joint against leakage.

Tubing Line Installations

In all tubing line installations, the following points should be carefully observed:

(1) Use Bendix-Westinghouse tubing in all cases. This tubing is designed specially to withstand the vibration, etc. that comes with automotive uses.

(2) Mount tubing in frame channel so that it will be protected in case of flying stone, driveshaft breakage, etc.

(3) Be sure the tubing line is open and is not crimped or mashed.

(4) Do not make sharp bends in tubing lines. When bending tubing the radius of the bend should be as large as possible. The following minimum bends are recommended:

Tubing Size	Minimum Radius of Bend
3/8 inch.....	3 inches
1/2 inch.....	4 inches
3/4 inch.....	6 inches
1 inch.....	10 inches

Bends in the 3/8-inch and 1/2-inch tubing may be made without filling the tubing with sand. However, it is advisable

to fill the 3/4-inch and 1-inch tubing with sand before making the bends to keep the tubing from wrinkling or crimping.

(5) Clamp tubing to the frame at intervals of 30 to 40 inches.

(6) Keep tubing lines straight and as short as possible.

(7) Install all tubing lines on a slant so that any condensation in the lines will be permitted to drain back to the reservoir.

(8) Wherever the natural action of the vehicle will cause a repeated bending or twisting of the line, flexible hose should be used instead of metal tubing.

Maintenance Service and Inspection

(1) Every 5,000 miles check discharge line to be sure it is free from carbon.

(2) Every 20,000 miles cover all tubing and tubing fittings with soap suds. No leakage is permitted. In case of leakage in the tubing, the leaking piece should be replaced with a new tubing. Leakage at the tubing fitting may be stopped by tightening the fitting.

Rubber Hose

Rubber Hose developed specially for use with the Westinghouse Automotive Air Brake System is constructed of exceptionally tough rubber and fibre. The special construction of this hose makes it extremely pliable and gives it sufficient strength to withstand a pressure considerably greater than maximum pressure necessary for any operation.

Installation

The rubber hose is substituted for metal tubing in places where the normal action of the vehicle would cause a repeated bending or twisting of the tubing. It is used chiefly for lines from the frame to the brake chamber and trailer connection lines.

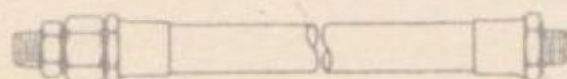


FIGURE 107

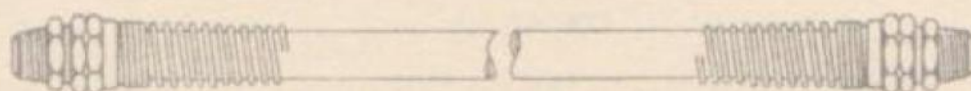


FIGURE 108

Hose assemblies are furnished by the Bendix-Westinghouse Company with either the non-detachable fittings (Figure 107), or the detachable fittings (Figure 108). The latter is furnished in two styles, with a spring guide and without a spring guide. The spring guide prevents the hose from possible chafing against the frame.

Installing Hose Fittings on Hose

The hose with a detachable fitting can be assembled in the field and no leakage will occur at the hose fitting when it is installed on the hose line if reasonable care is exercised in carrying out the following steps:

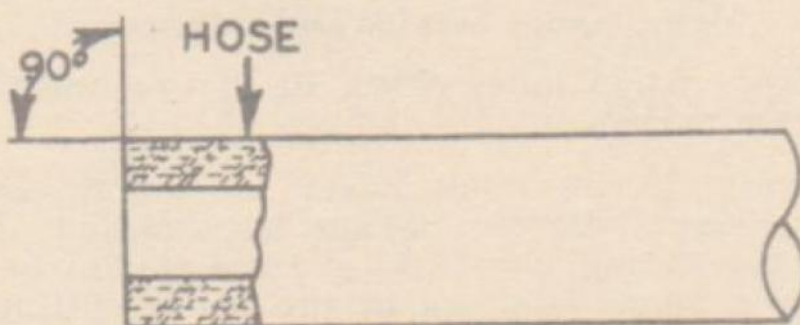


FIGURE 109

(1) Cut hose. After cutting is made, be sure that the end of the hose is smooth and is cut squarely at right angles to the outside wall. Also, be sure that the end of the hose is not crimped or closed.

(2) Blow out hose with a shop air line to remove all cuttings.

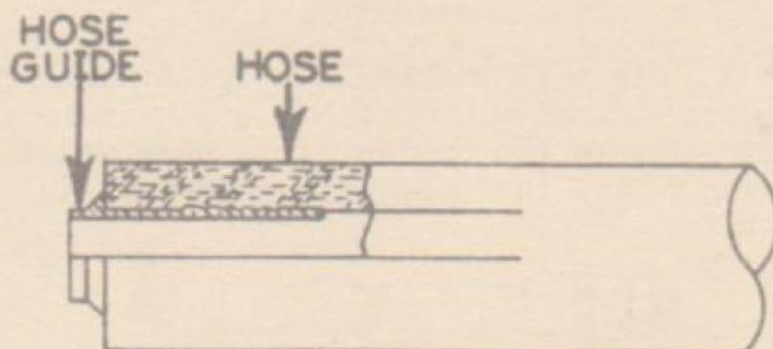


FIGURE 110

(3) Insert hose guide inside the hose until hose is against the shoulder (Figure 110).

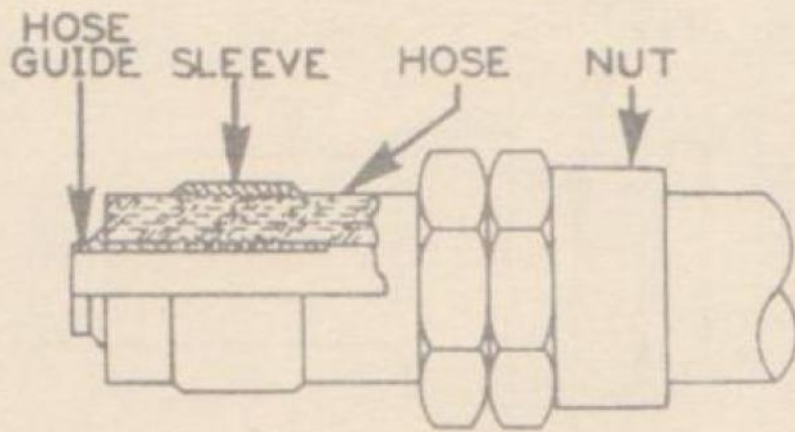


FIGURE 111

(4) Put nut on hose and then screw sleeve on outside of hose until the edge of sleeve abuts against the edge of the body when the shoulder of the hose guide is against the sleeve gasket. The short grooves in the sleeve should be placed on the hose first.

(5) Remove protector cover from sleeve gasket.

(6) Place hose and hose guide on body as indicated in Figure 112.

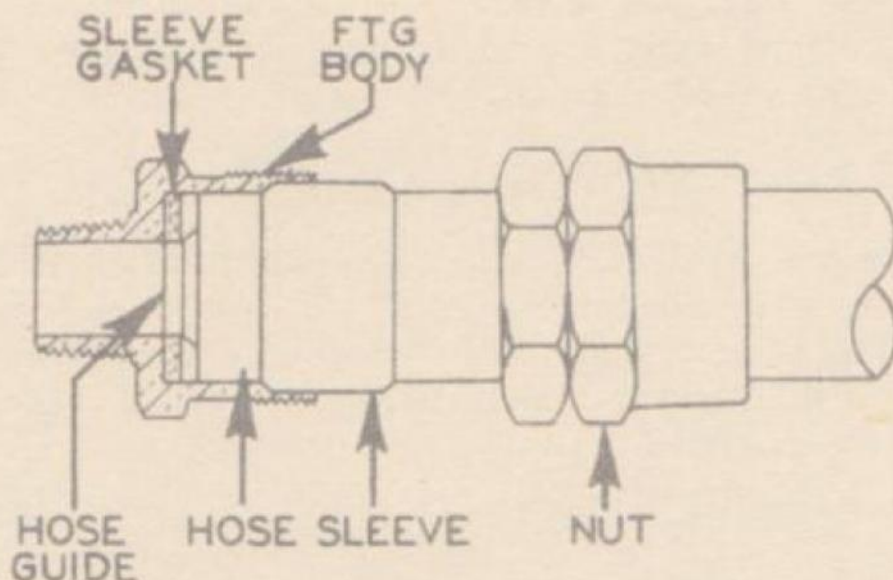


FIGURE 112

(7) Tighten nut enough to seal leakage.

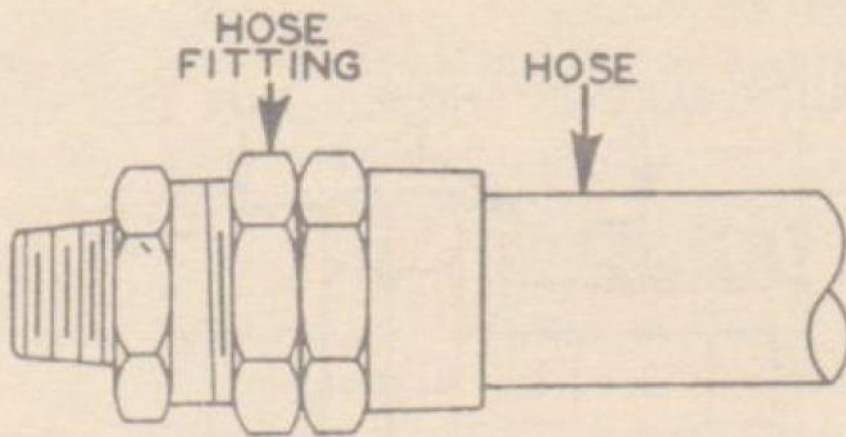


FIGURE 113

General Hose Line Installation

When installing hose line, carefully observe the following:

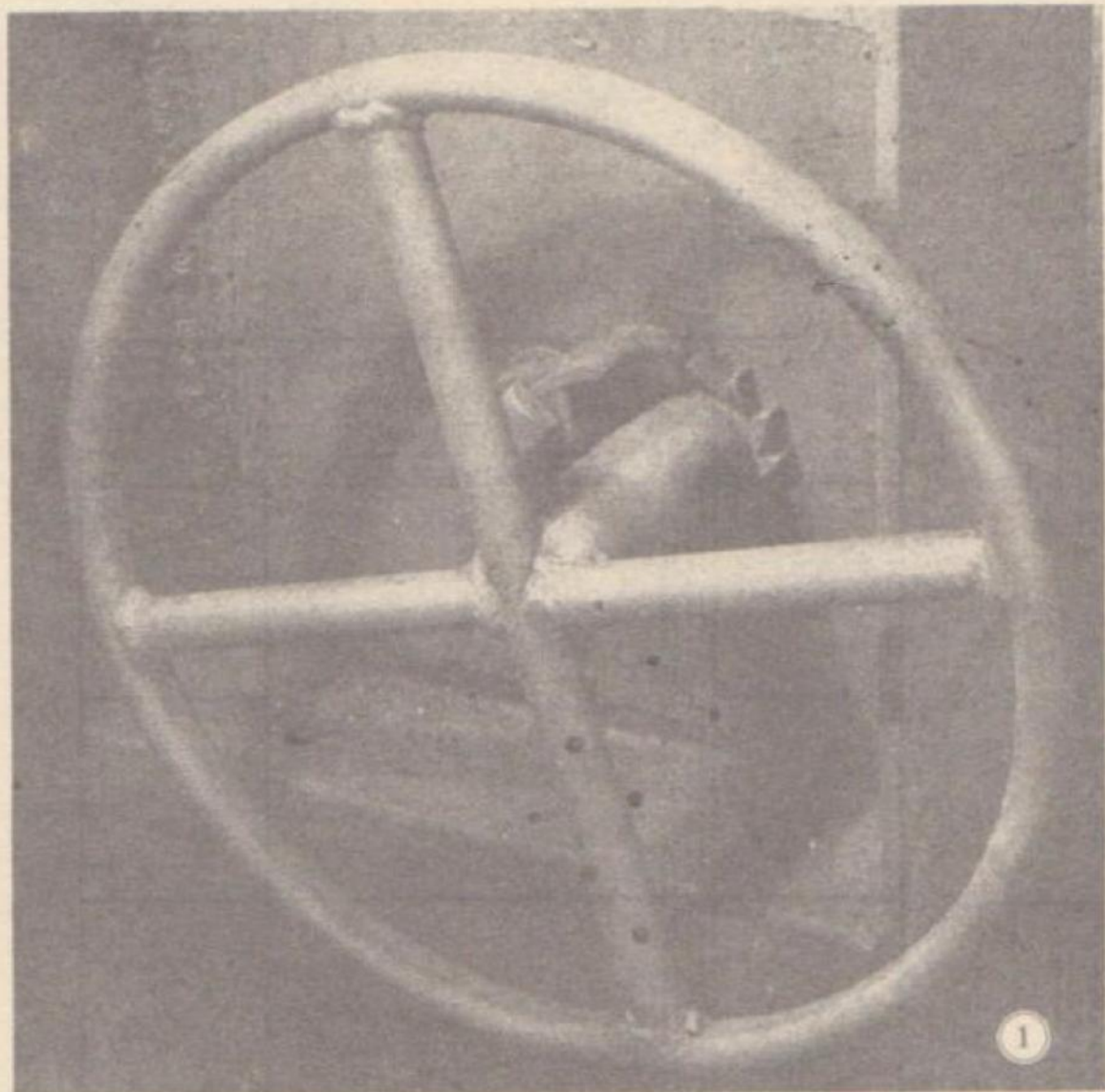
- (1) Allow sufficient hose so that the hose is not strained or stretched by any normal action of the vehicle.
- (2) Install hose so it will not chafe against frame, axle, etc.
- (3) When installing hose connector on trailers, follow the standard practice of installing service line on the left and emergency line on the right when facing connections.

Although the brake cylinders on the rear axles of the trailer are not connected direct to the slack adjusters as on the front or Dolly axle, the adjustment is the same. There being only one adjustment, that of the slack adjuster itself.

The Parking Brake

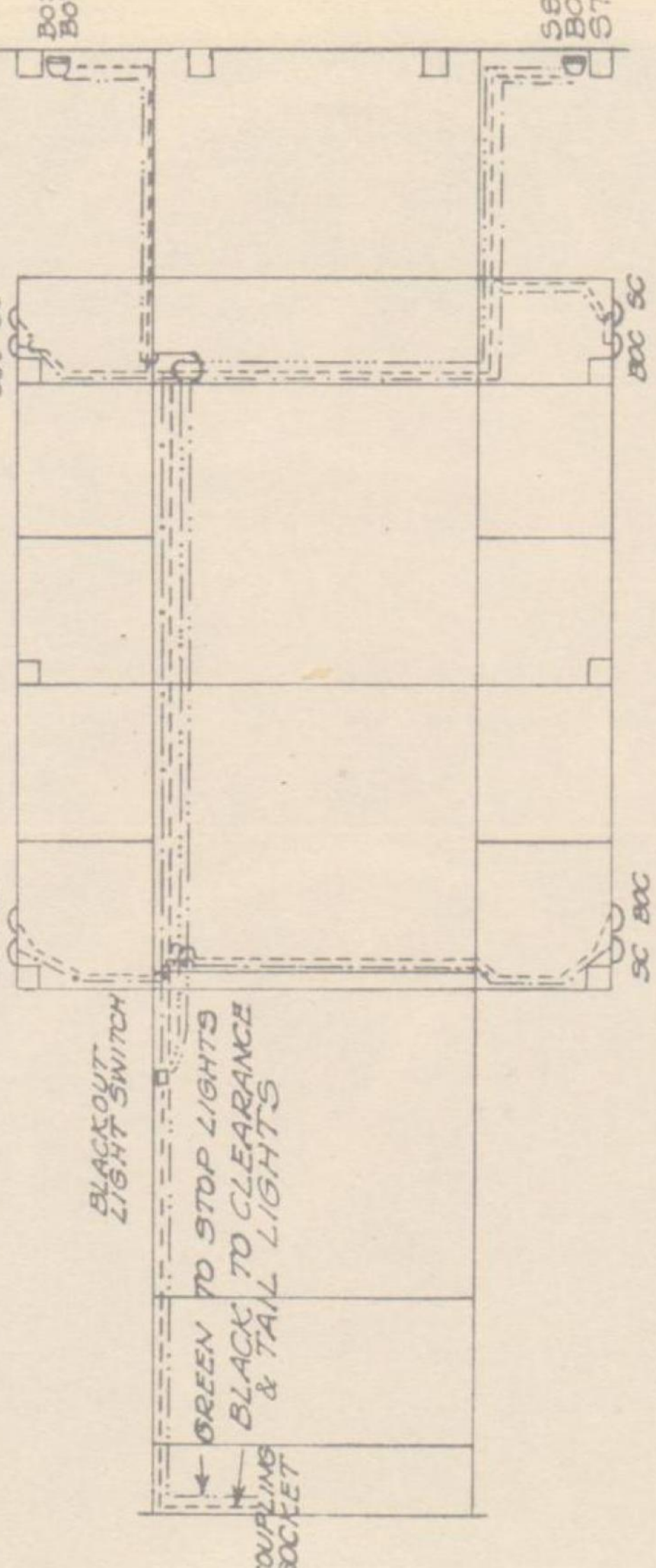
In figure one on the opposite page, the parking brake is set. This is done by turning the wheel clockwise and dropping the latch. To release, turn wheel clockwise enough to free the latch and then trip the latch, letting the wheel turn backwards or anti-clockwise to release the tension.

Figure two shows latch free to allow release of parking brake.



WIRE COLOR	SYMBOL
RED	---
BLACK	---
GREEN	---
RED	---
YELLOW	---

LIGHTS	WIRE COLOR
SERVICE CLEARANCE	RED
BLACKOUT CLEARANCE	BLACK
BLACKOUT TAIL	GREEN
BLACKOUT STOP	RED
SERVICE TAIL	YELLOW
SERVICE STOP	SC BOC



ELECTRIC WIRING DIAGRAM

ELECTRICAL SYSTEM, LIGHTS

Wiring

The general electrical circuit diagram shown on opposite page illustrates all of the electrical circuits used on this vehicle. With this diagram, 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 diagram.

Lights

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

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

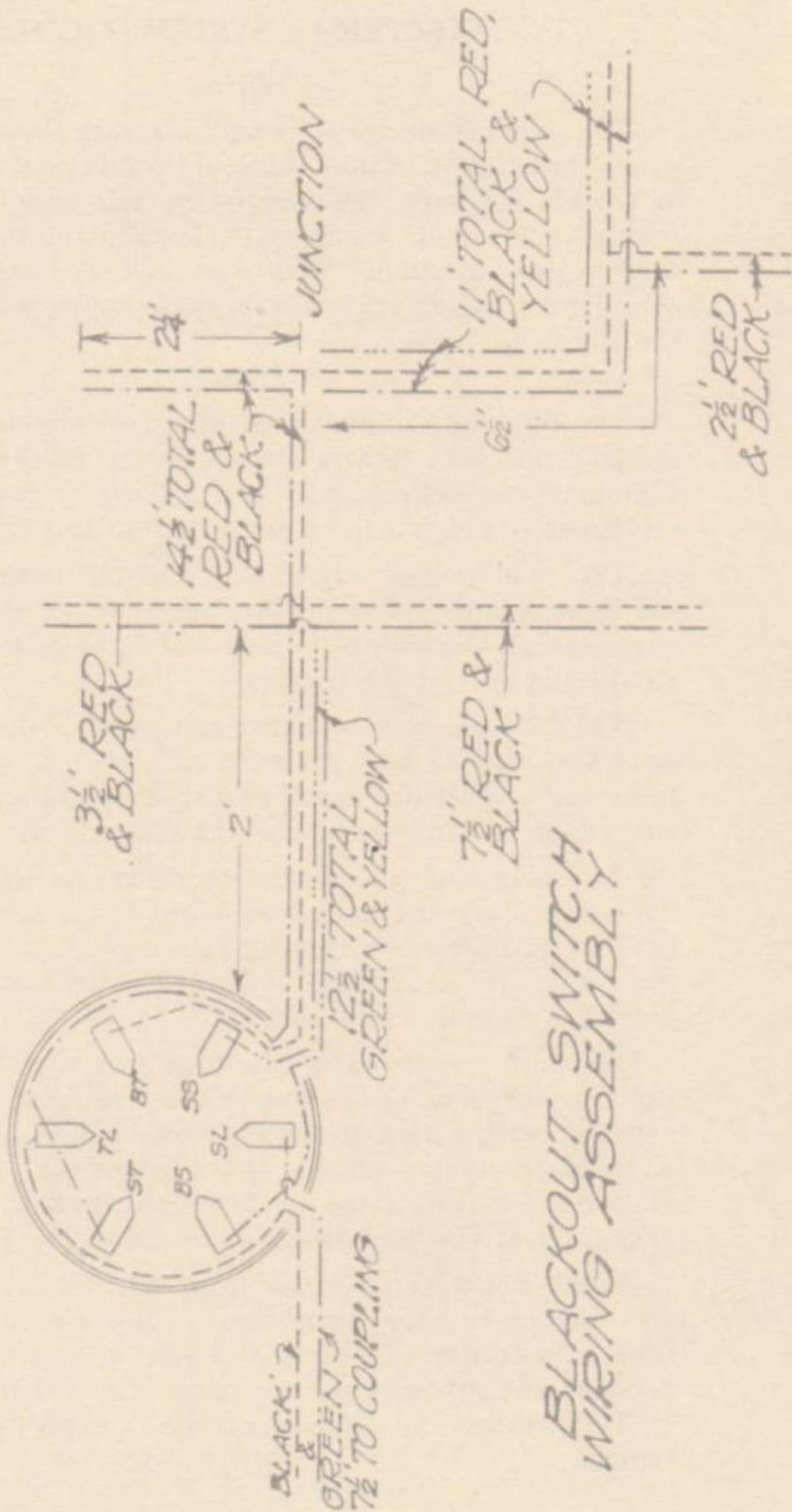
The lens on each blackout tail lamp is designed to produce two beams. This design is such that when one truck is following a preceding truck at a specified safe distance, these two beams will merge into a single highly visible beam.

To insure the accuracy of construction necessary to produce this effect, the bulb is soldered to the lens retainer and the lens and filter are crimped to the retainer to form a complete unit. When the bulb is burned out it is necessary to replace the complete bulb unit.

Blackout switch—The blackout switch is located on the right, or curbside, of the side rail, at the front. The switch is operated with a coin or screw driver. It is 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. (Diagram of blackout switch is on following page.)

Lights not working—Insufficient current to work the lights may be due to poor connections in the socket of the towing vehicle or trailer. To remedy, clean up and tighten all connections and grounds. Check plugs and sockets for corroded or dirty blades. To remedy, scrape or sand blades clean, or replace.

- TZ TAIL LIGHTS & CLEARANCE LIGHTS
- BT BLACKOUT TAIL & BLACKOUT CLEARANCE LIGHTS
- SS SERVICE STOP LIGHT
- SL STOP LIGHTS
- BS BLACKOUT STOP LIGHT
- ST SERVICE TAIL LIGHT & SERVICE CLEARANCE LIGHTS



Drawbar

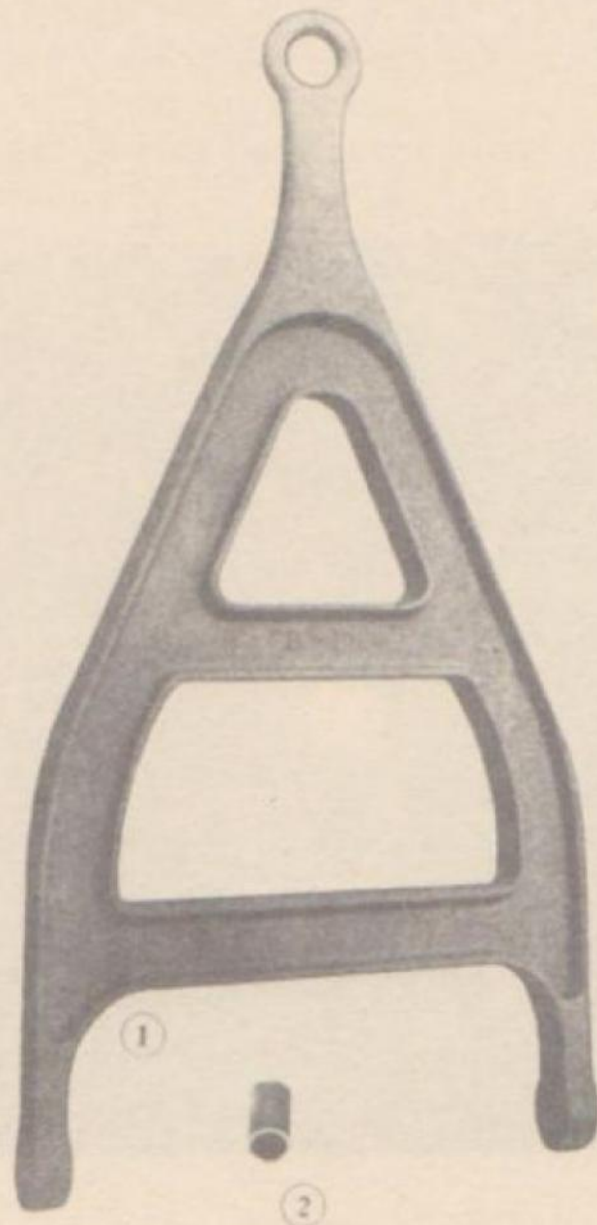
New drawbar bushings come from the factory reamed to the proper diameter, and care should be used when replacing not to burr or damage their ends in installation.

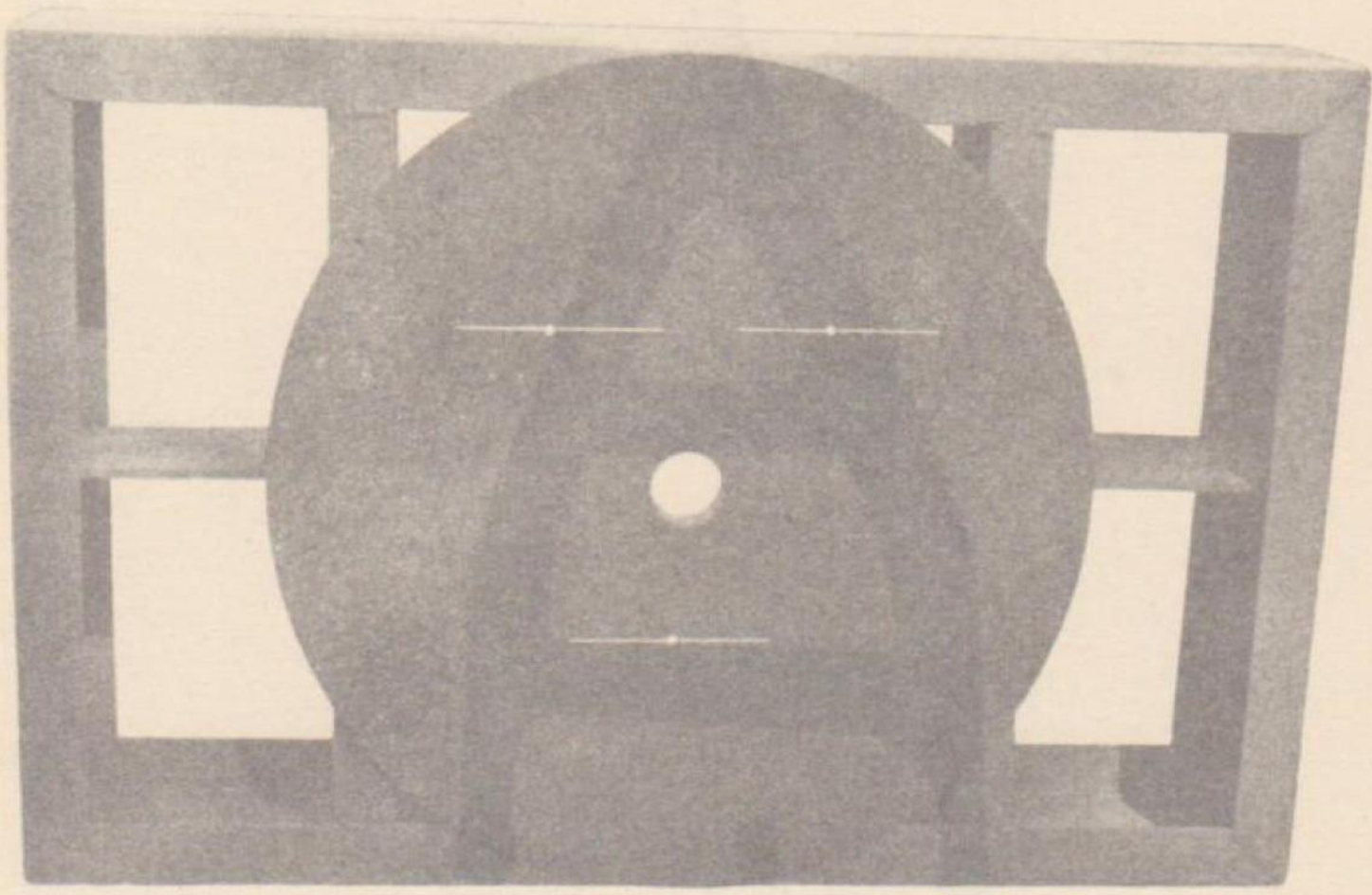
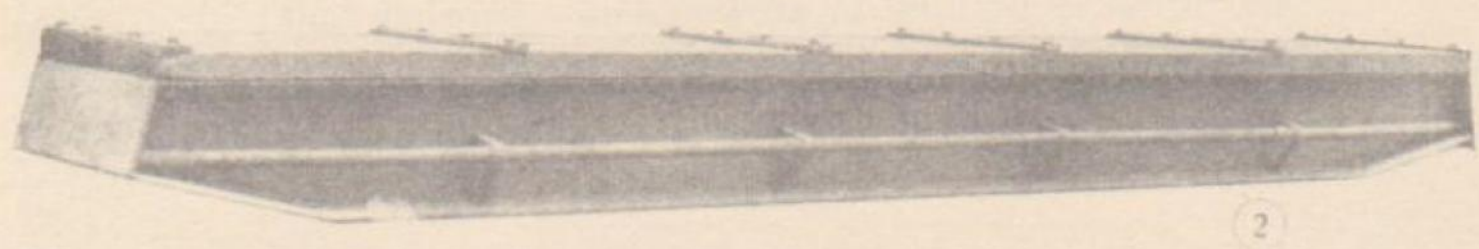
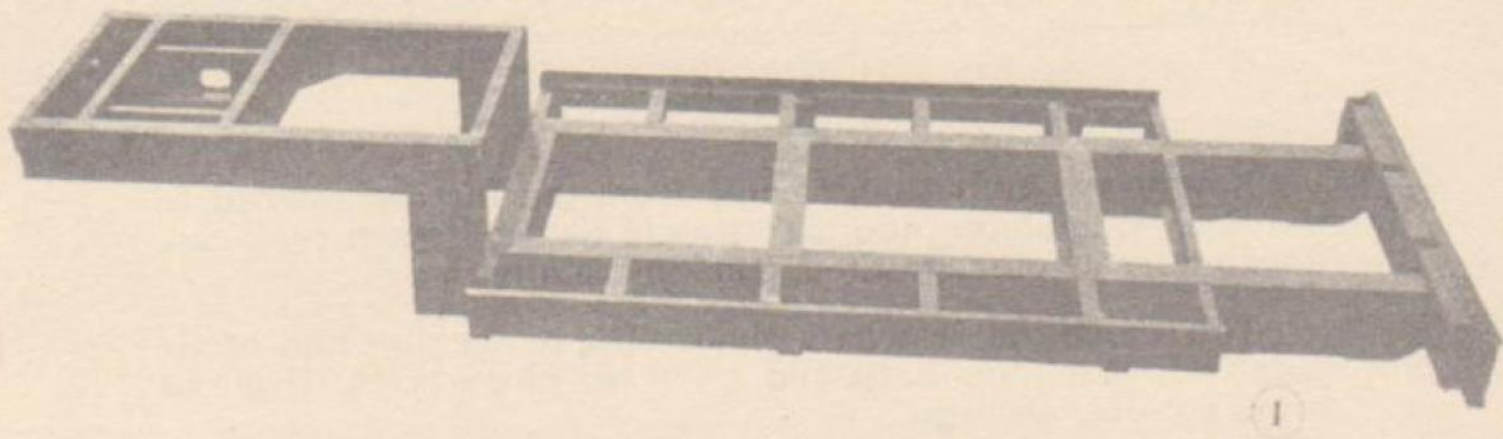
To remove the drawbar, remove the cotter pins and castle nuts from the hinge bolts and drive out hinge bolts. Drive or press out old bushings.

To install new bushings, use a suitable press, if possible.

If bolt will not go into bushing, use a suitable reamer to ream inside of bushing to accommodate drawbar bolt.

CAUTION—Do not over-ream bushings as bolts must be a light driving fit.





FRAME UNITS

1. MAIN TRAILER FRAME.

The main trailer frame will require very little repair unless damaged by accident. However, in the event frame should become cracked or broken, cracks may be welded electrically.

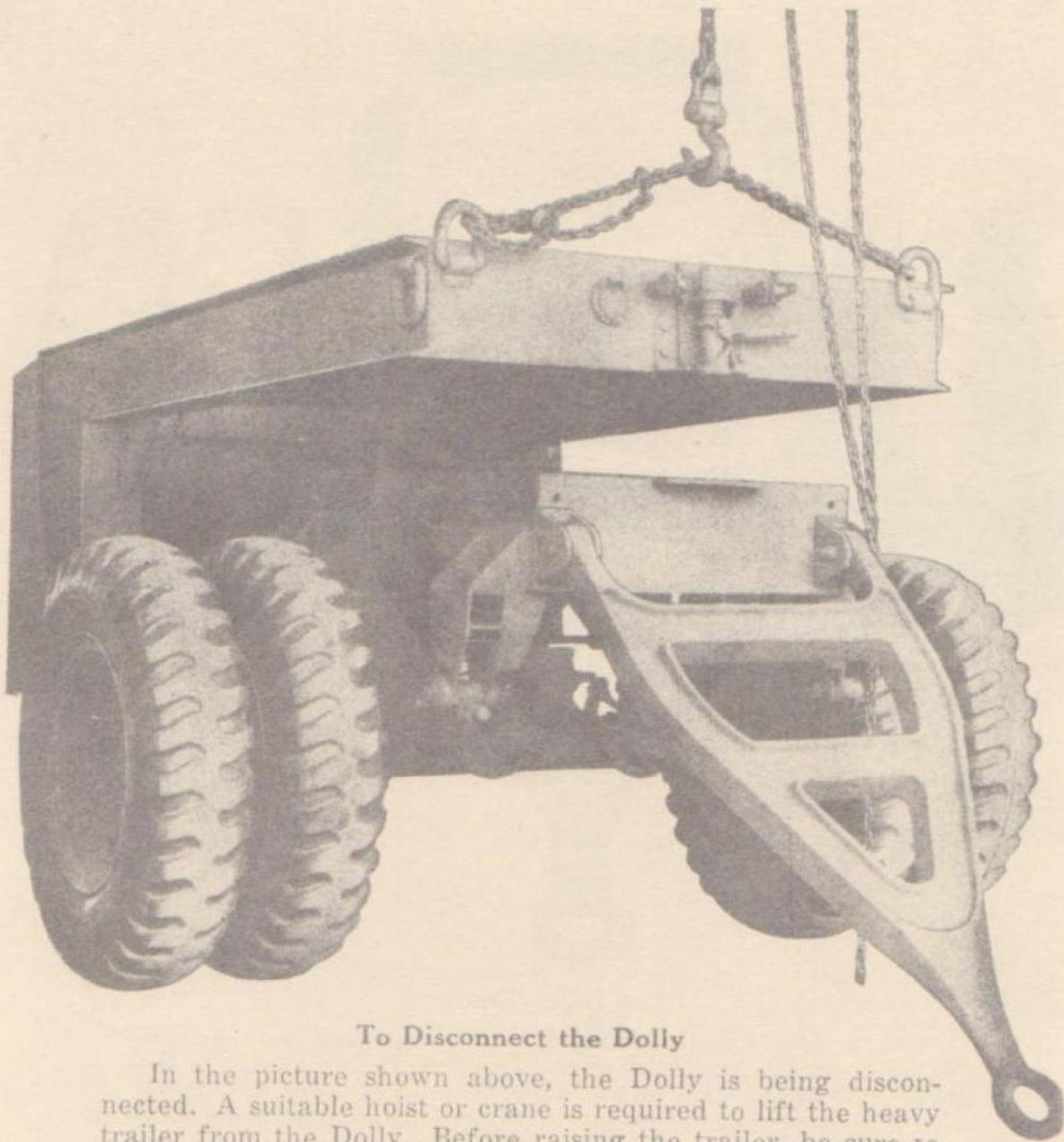
The upper half of the fifth wheel and the fifth wheel king pin are integral parts of the main trailer frame.

2. LOADING RAMPS.

Figure two shows the loading ramp. There are two loading ramps per trailer. Little or no repair shall be required to the loading ramps.

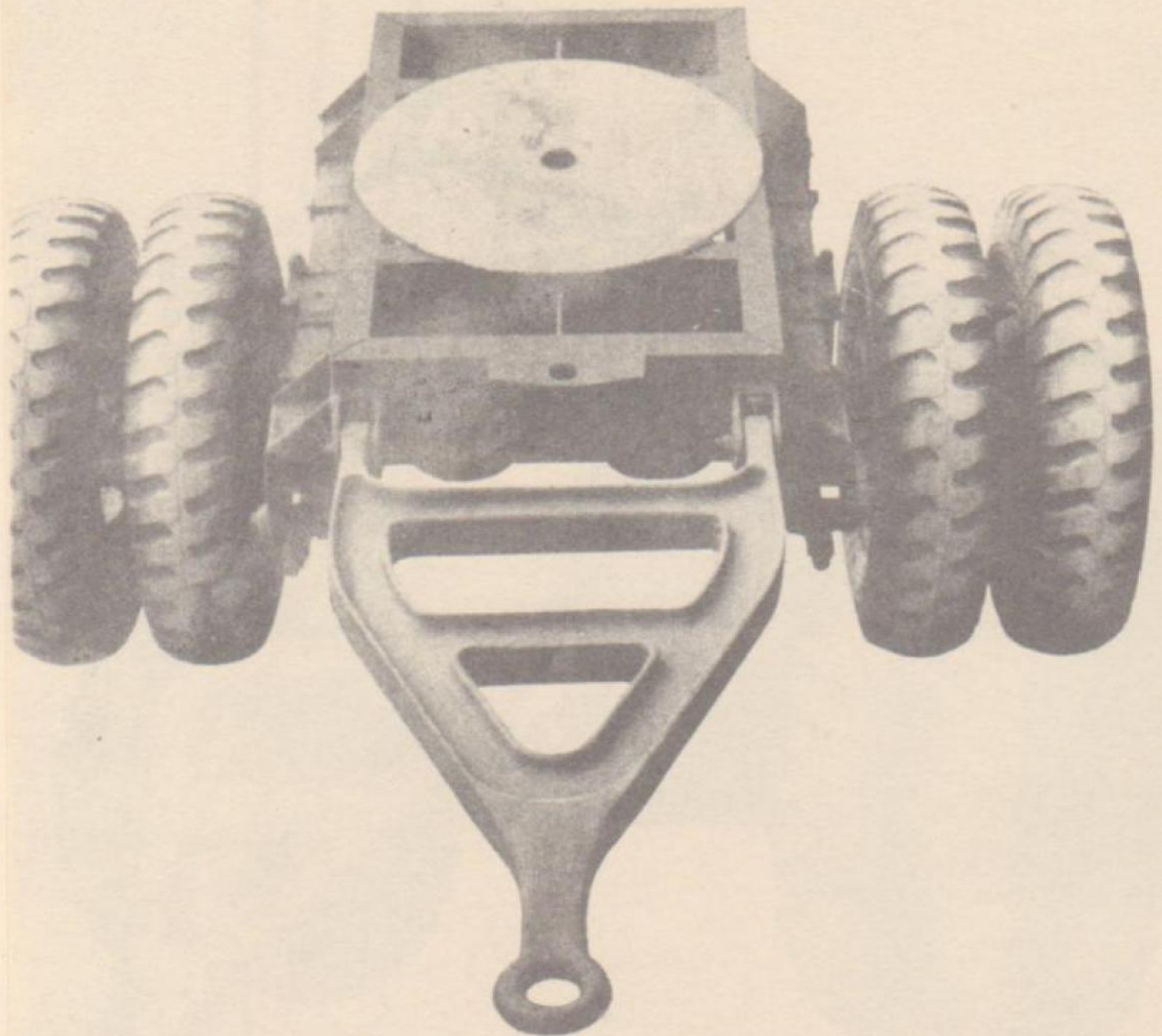
3. DOLLY FRAME.

Figure three shows the dolly frame assembly which includes the lower half of the fifth wheel. The dolly frame will, likewise, require little or no repair, but if it should become broken or cracked, it can be electrically welded to remedy any such break or crack.



To Disconnect the Dolly

In the picture shown above, the Dolly is being disconnected. A suitable hoist or crane is required to lift the heavy trailer from the Dolly. Before raising the trailer, be sure to disconnect the air brake line from the lower end of the fifth wheel king pin. Then remove the large nut on the king pin proper. Securely prop the Dolly in position before raising the trailer or it will rotate on its axle and fall, damaging the air brake connection and possibly injuring the person attempting the uncoupling. After the brake line is disconnected and the Dolly safely propped, proceed to raise the trailer with crane or hoist as shown.

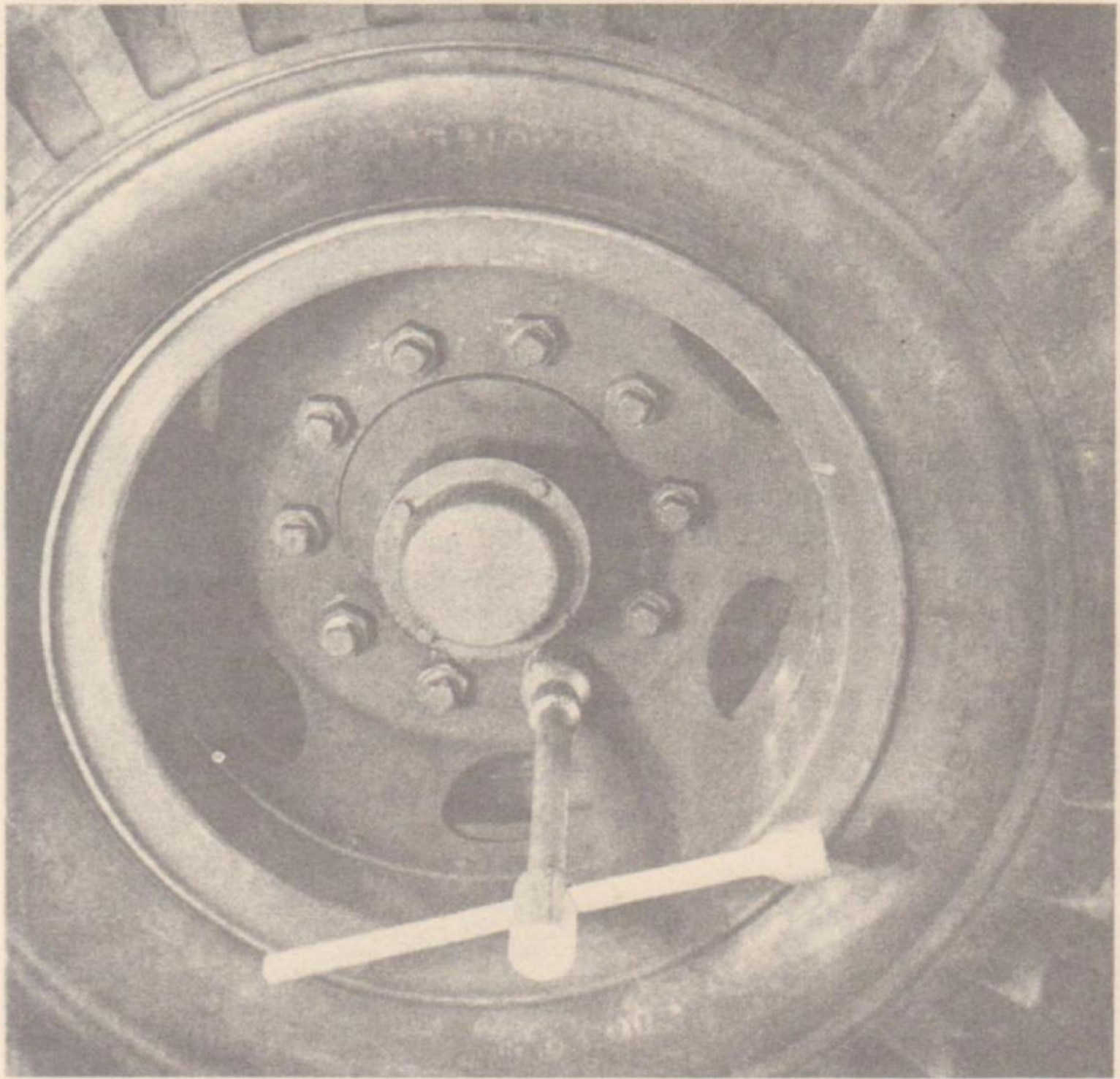


The Dolly Truck

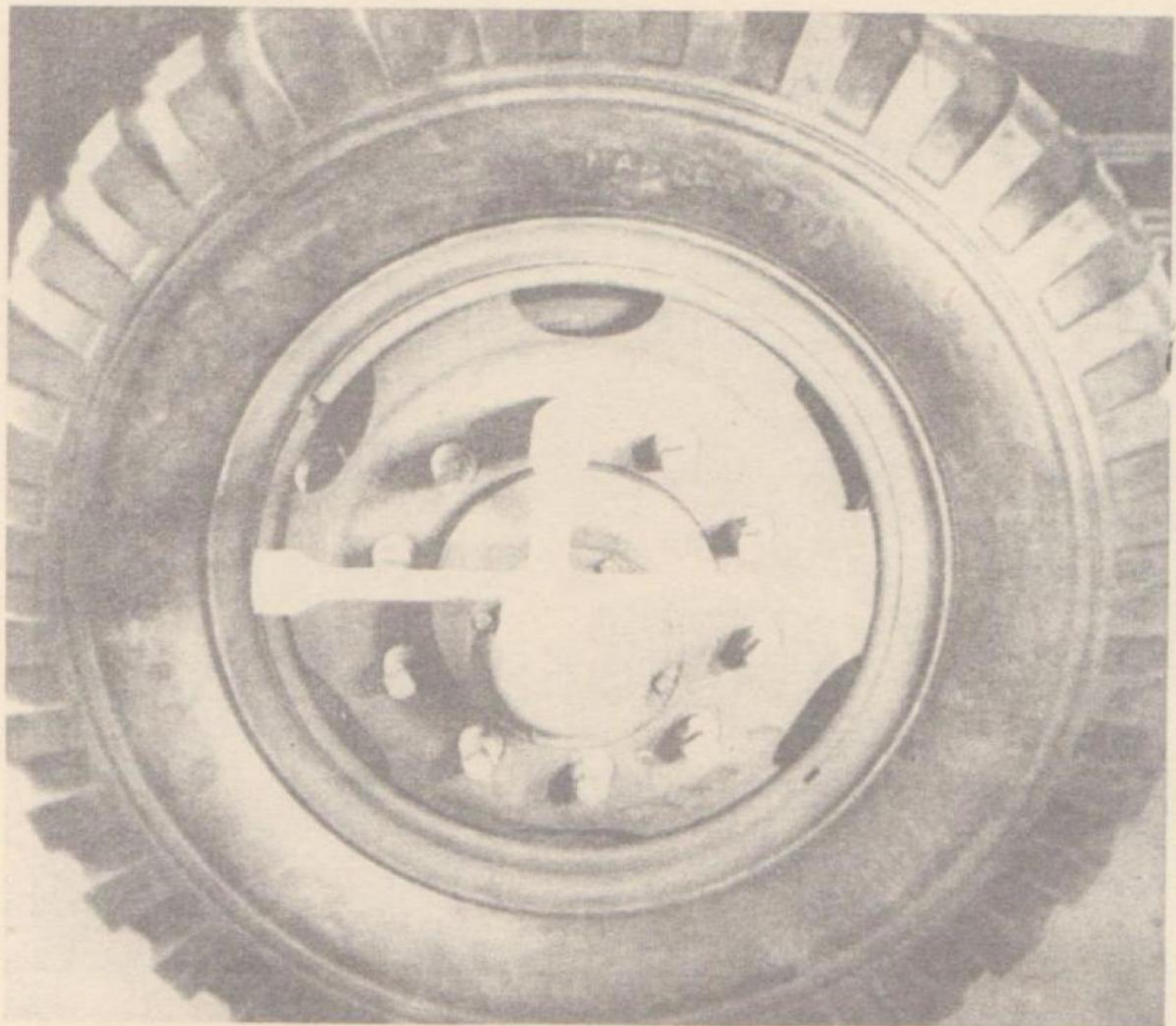
Shown above is the Dolly Truck which has been disconnected from the trailer proper. The disc in the center is the lower half of the fifth wheel which should be kept lubricated with a heavy graphite grease. The fifth wheel should be kept well supplied with grease to prevent undue wear and to prevent a freezing action from taking place causing the unit to be unweildly and hard to steer in service. The fifth wheel should be washed clean with kerosene or some other suitable solvent every three months or 5,000 miles, whichever shall occur first. This is a major lubrication operation which requires that the Dolly be disconnected from the trailer proper. The fifth wheel should have a minor lubrication each 30 days or 500 miles, whichever shall occur first. This is done with a pressure gun as is shown on a previous page of this Manual.

To Disassemble

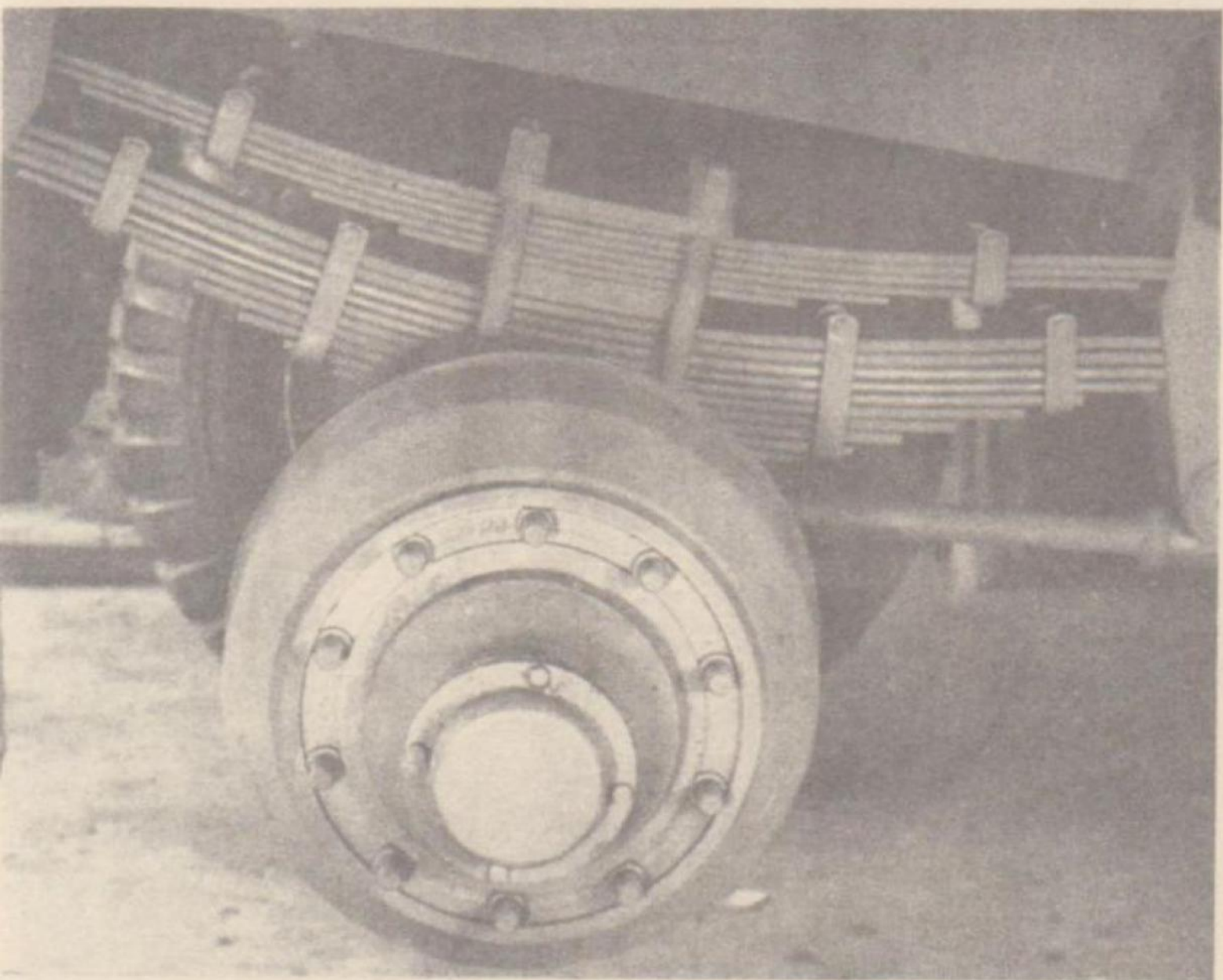
Wheels on front or dolly axle are mounted separately, the inside with a combination bolt nut, and the outside with a nut only. On the right side these bolt nuts and nuts will be found to be marked with the letter "R", which indicates that they are for the righthand side and are righthand thread. The ones on the left are marked with the letter "L" and they are for the left hand side and are lefthand thread.



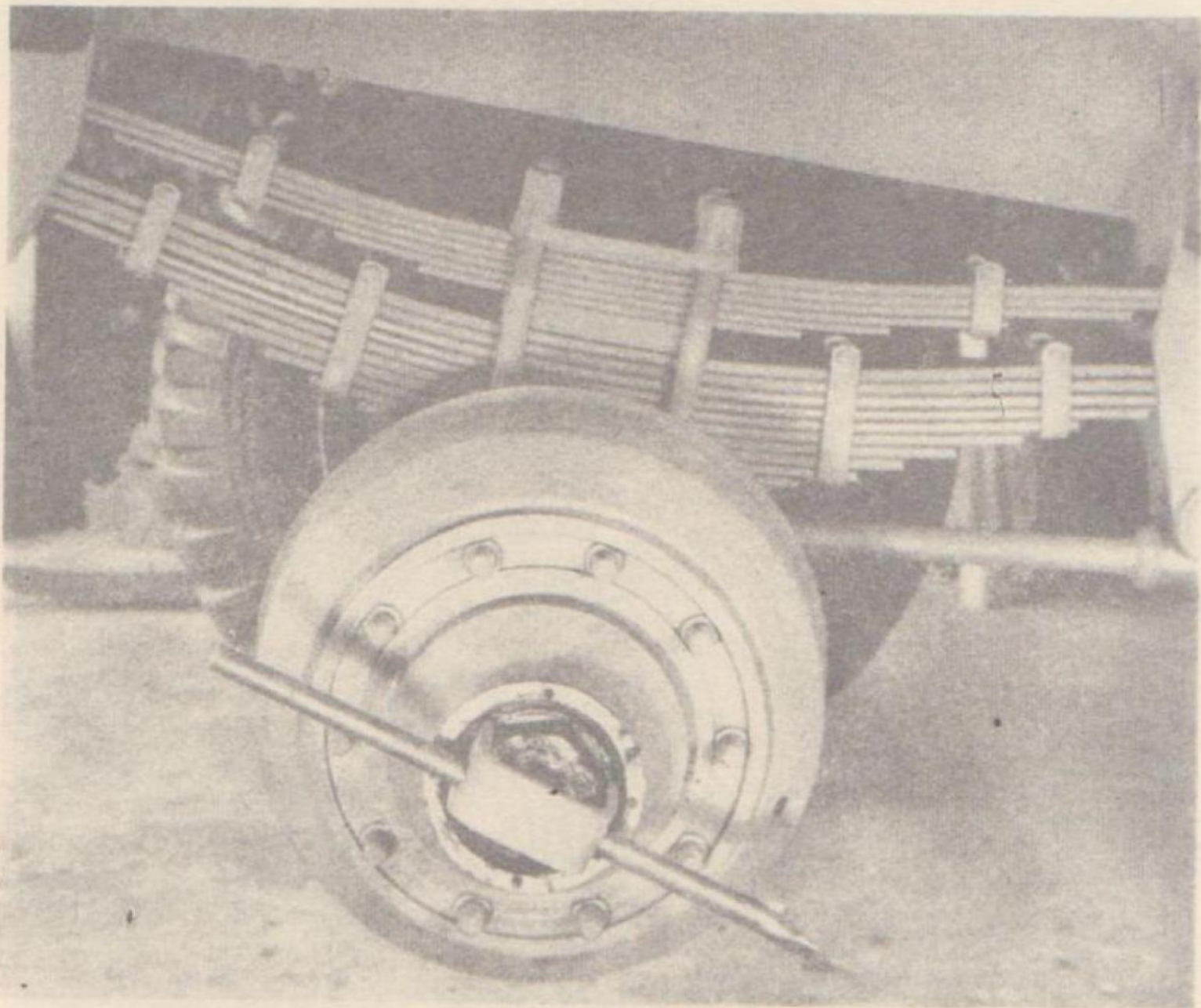
Remove nuts only to remove outside wheel as shown above, using the large or hex end of the wheel wrench. When all nuts are removed, the wheel will slip off.



Here the outside wheel is off and the inside wheel is being removed by removing the combination bolt nut with the small or square end of the wheel wrench. Likewise, when all bolt nuts are removed, the inside wheel will slip off.

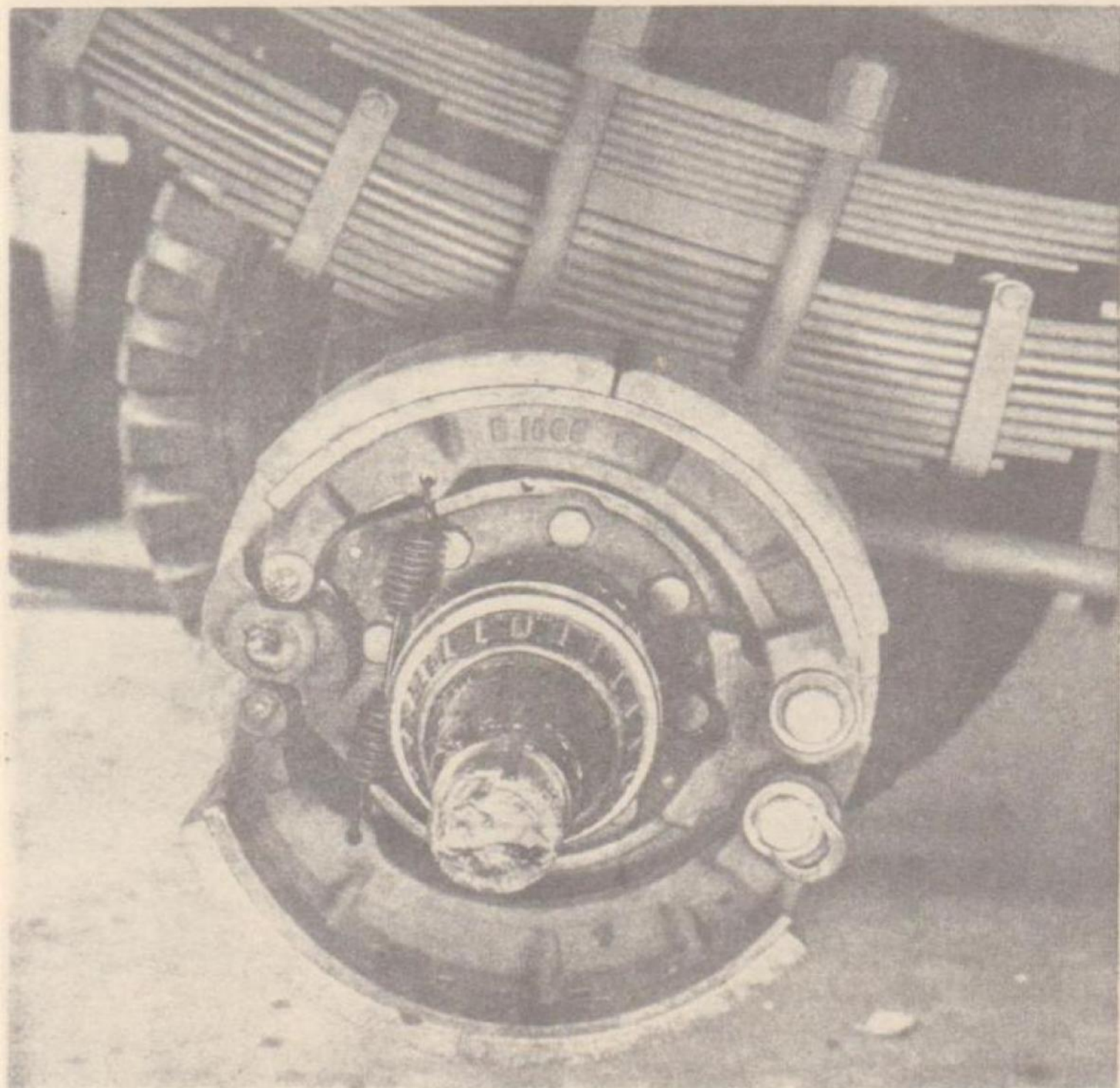


Shown here is the hub with the wheels removed. Now remove the 4 hub cap bolts and the hub cap.

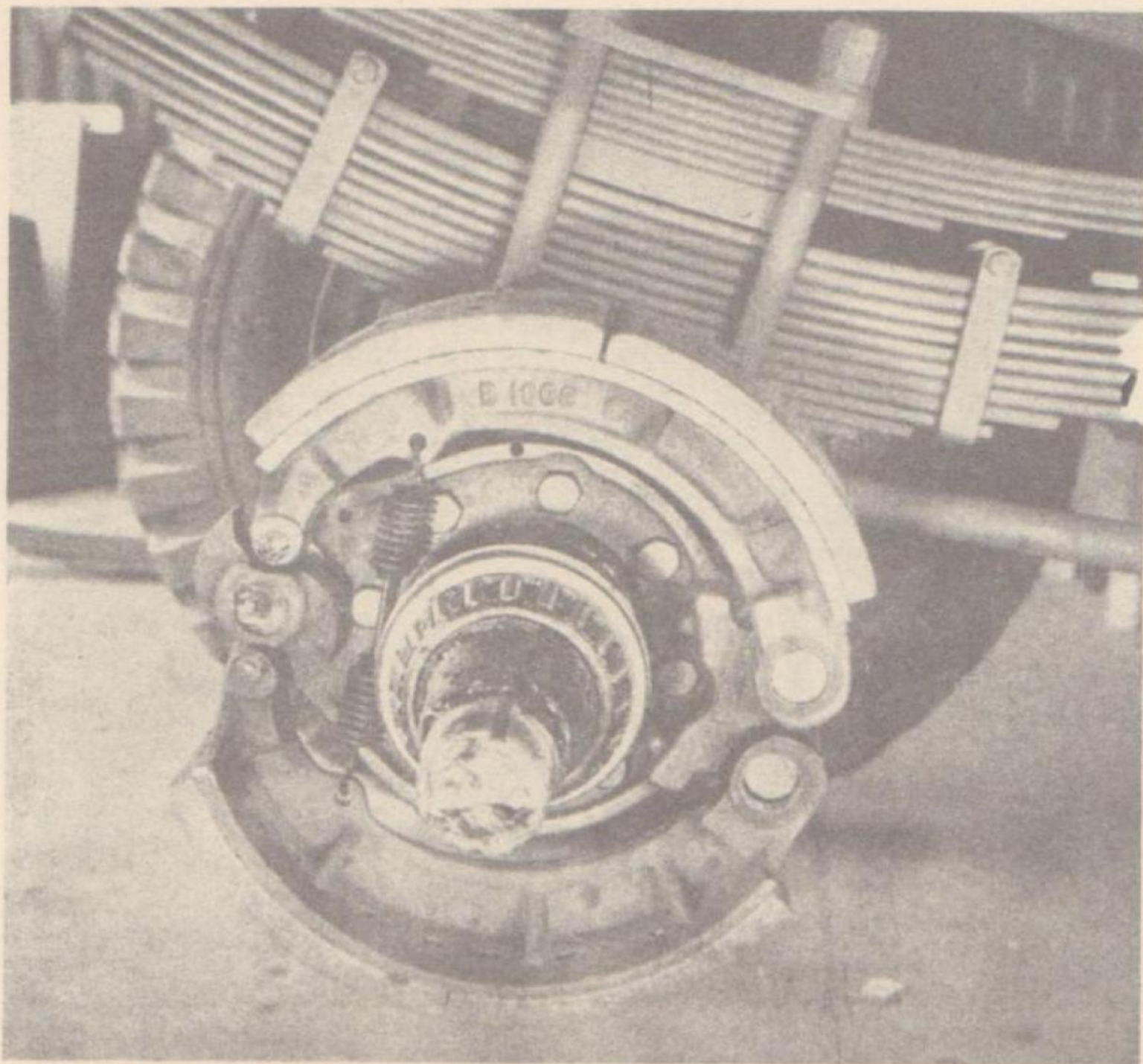


Next remove the cotter pin in the end of the spindle and proceed to remove spindle nut as shown.

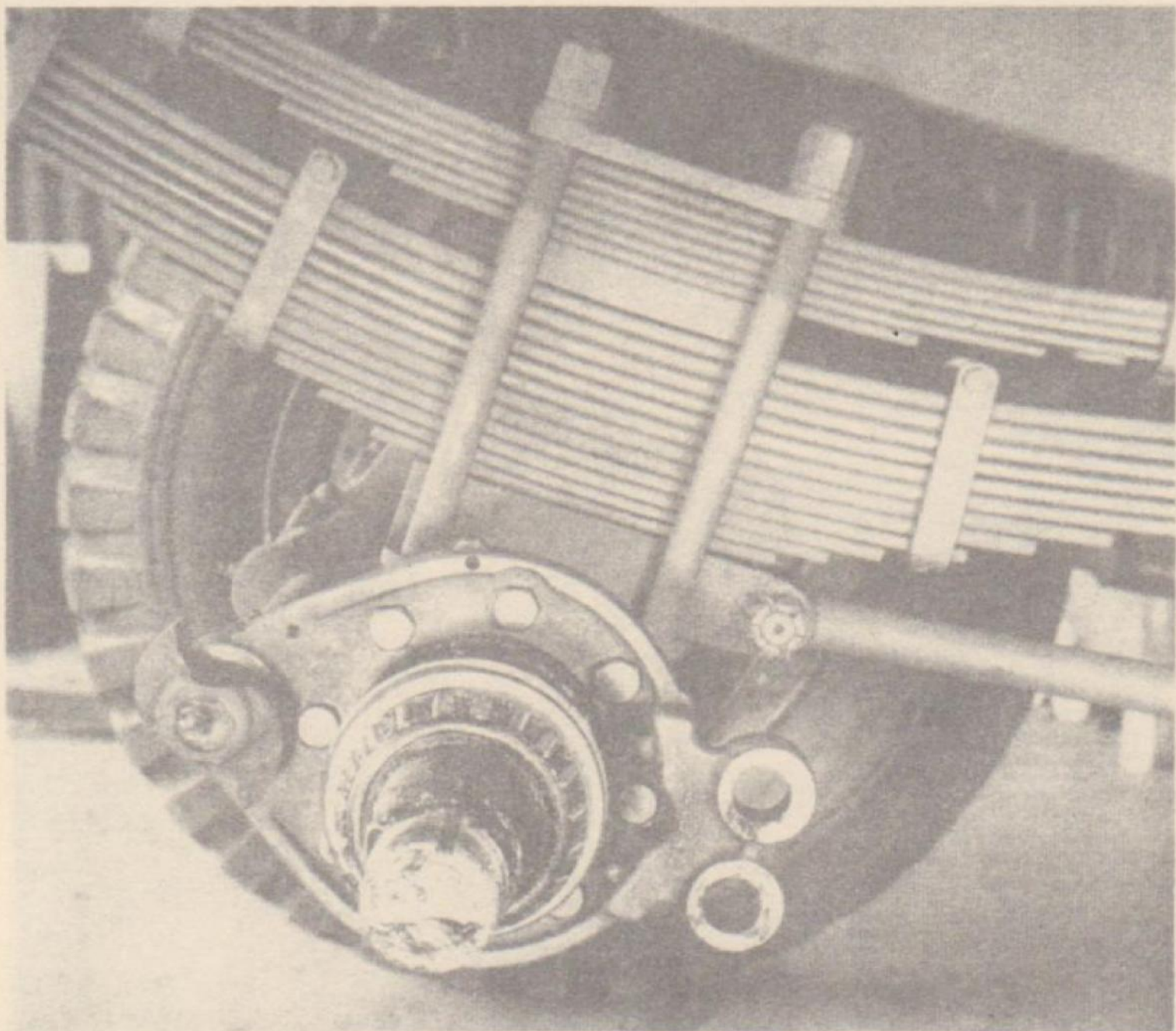
After spindle nut has been removed, hub and drum may be slipped off easily.



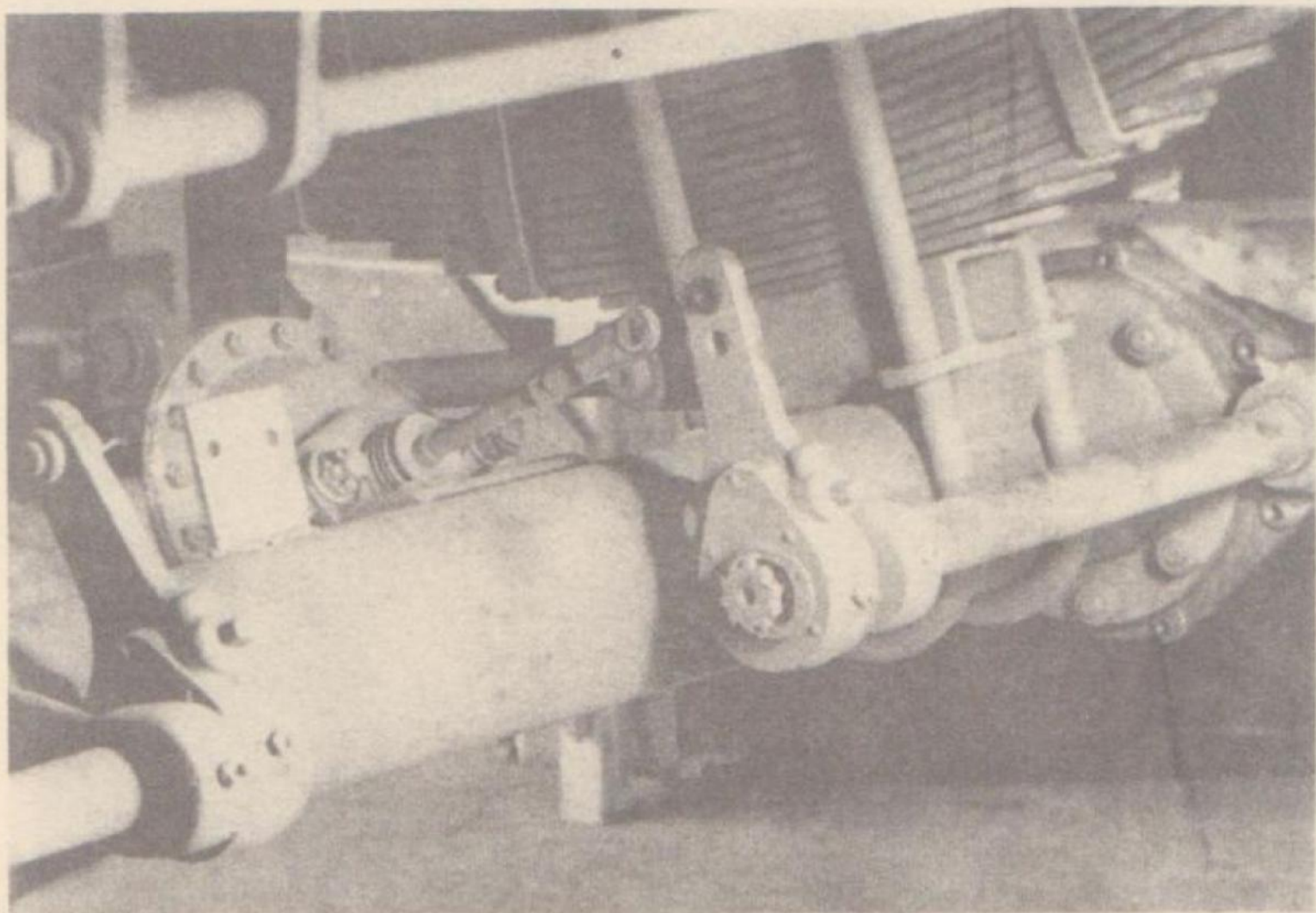
This shows axle with hub removed and U-washer on lower anchor pin partly driven out. Drive out both U-washers.



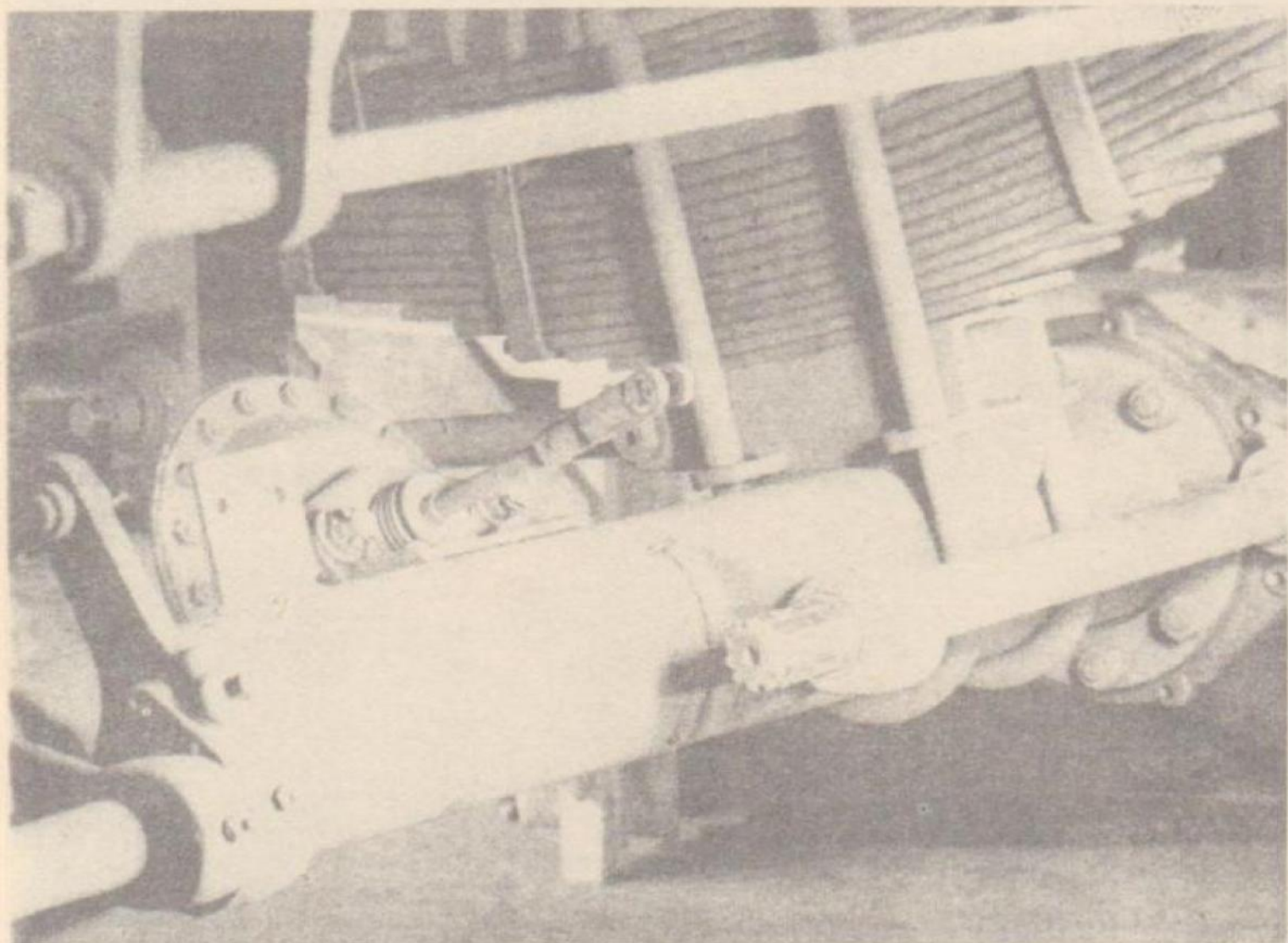
Then drive out anchor pins, using suitable punch and hammer. View preceding shows anchor pins partly driven out.



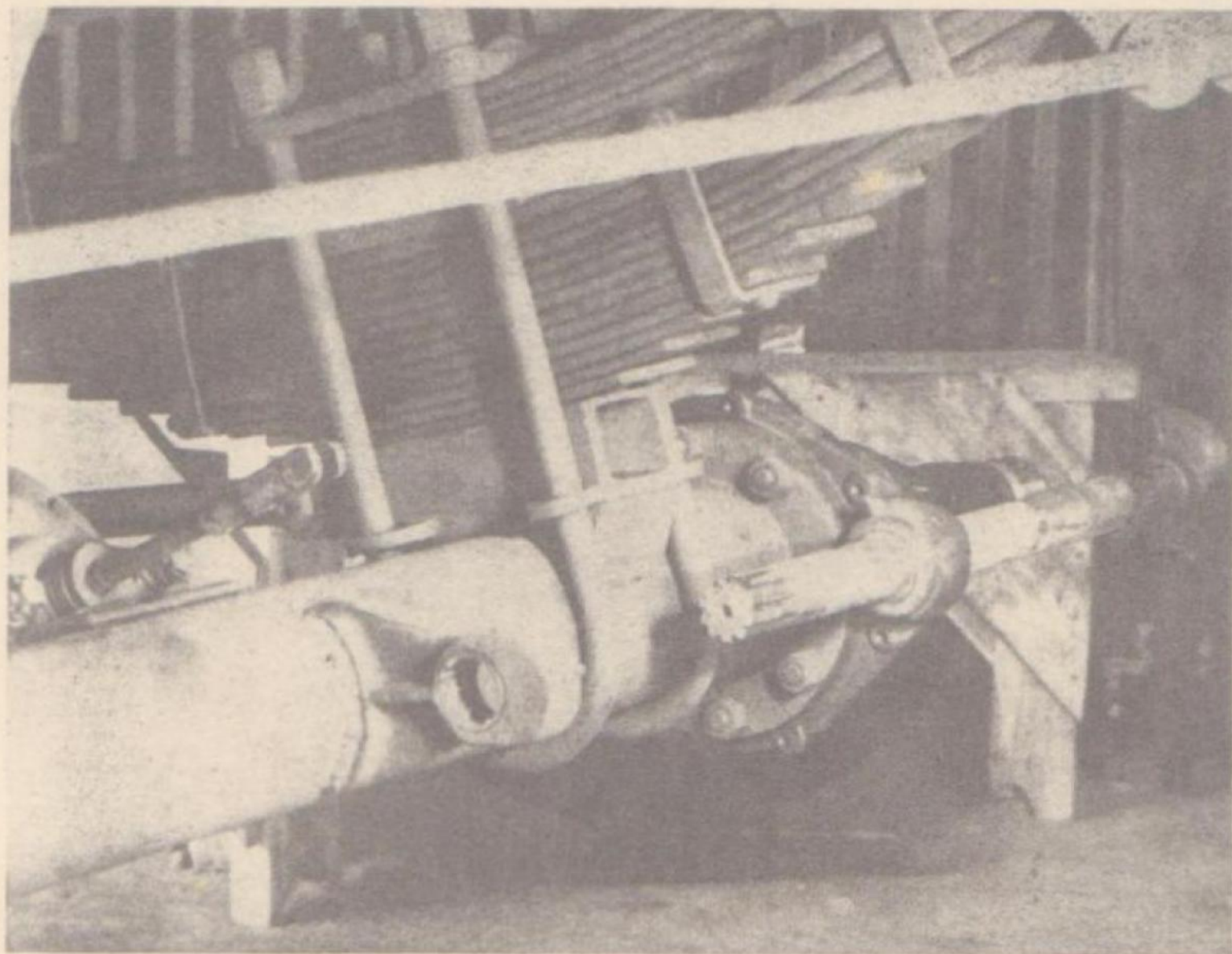
When anchor pins are driven out, brake shoes will be removed by hand and axle will look as shown.



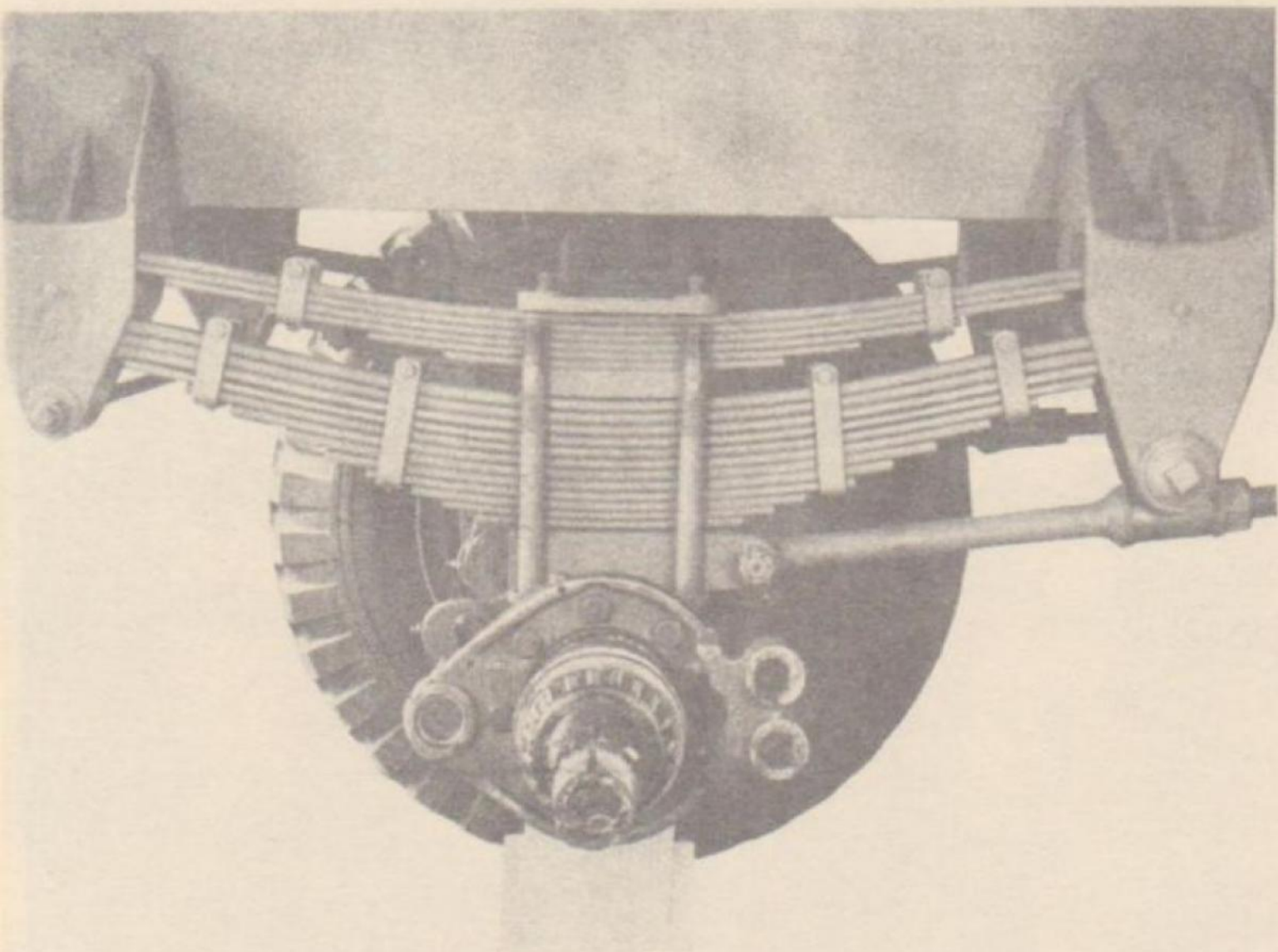
Now, go inside and remove clevis pin and disconnect brake rod from slack adjuster and remove U-washer from end of camshaft as shown. View preceding shows U-washer partly driven out.



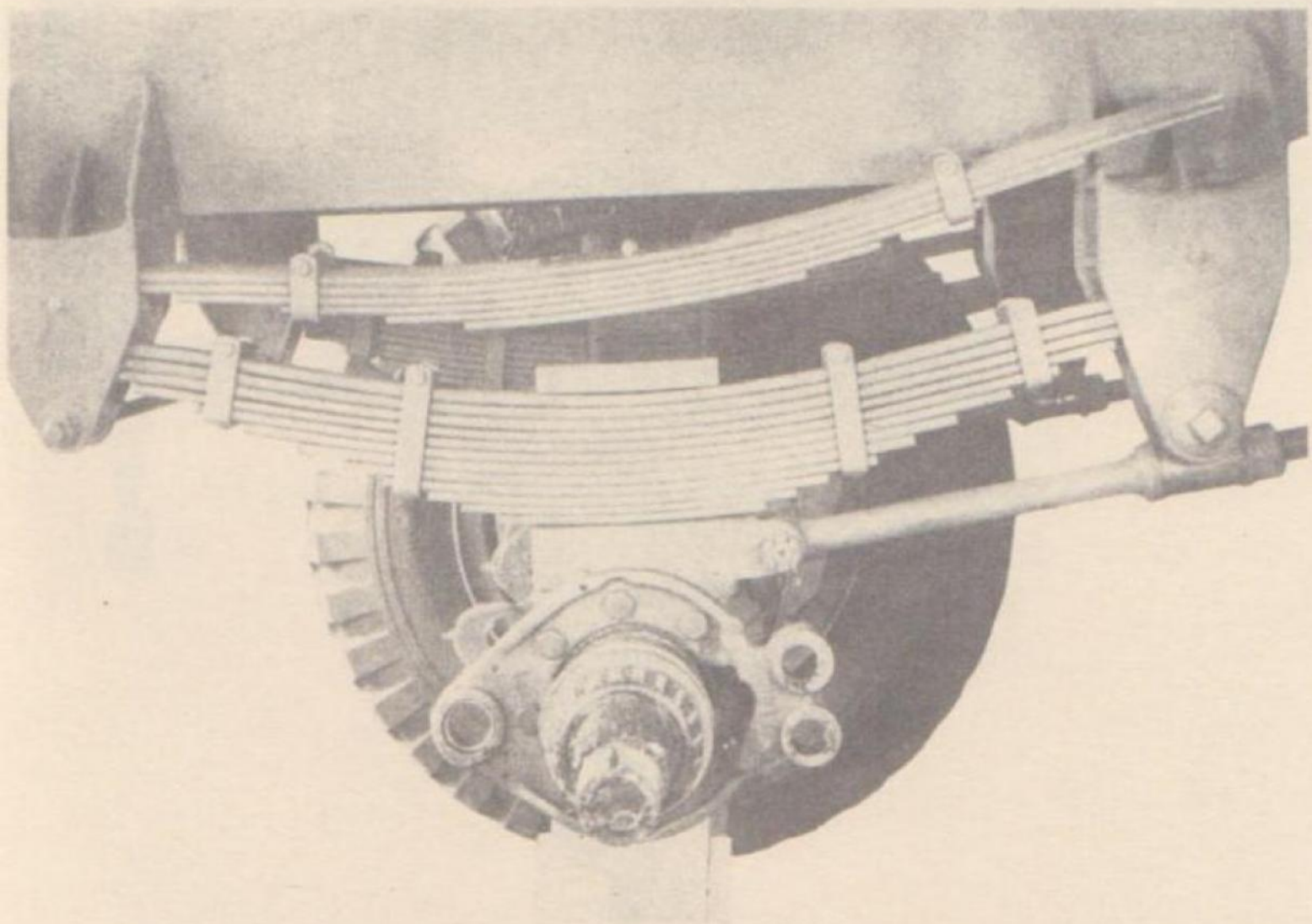
After U-washer is removed, slack adjuster will slip off easily. View shows camshaft with slack adjuster removed.



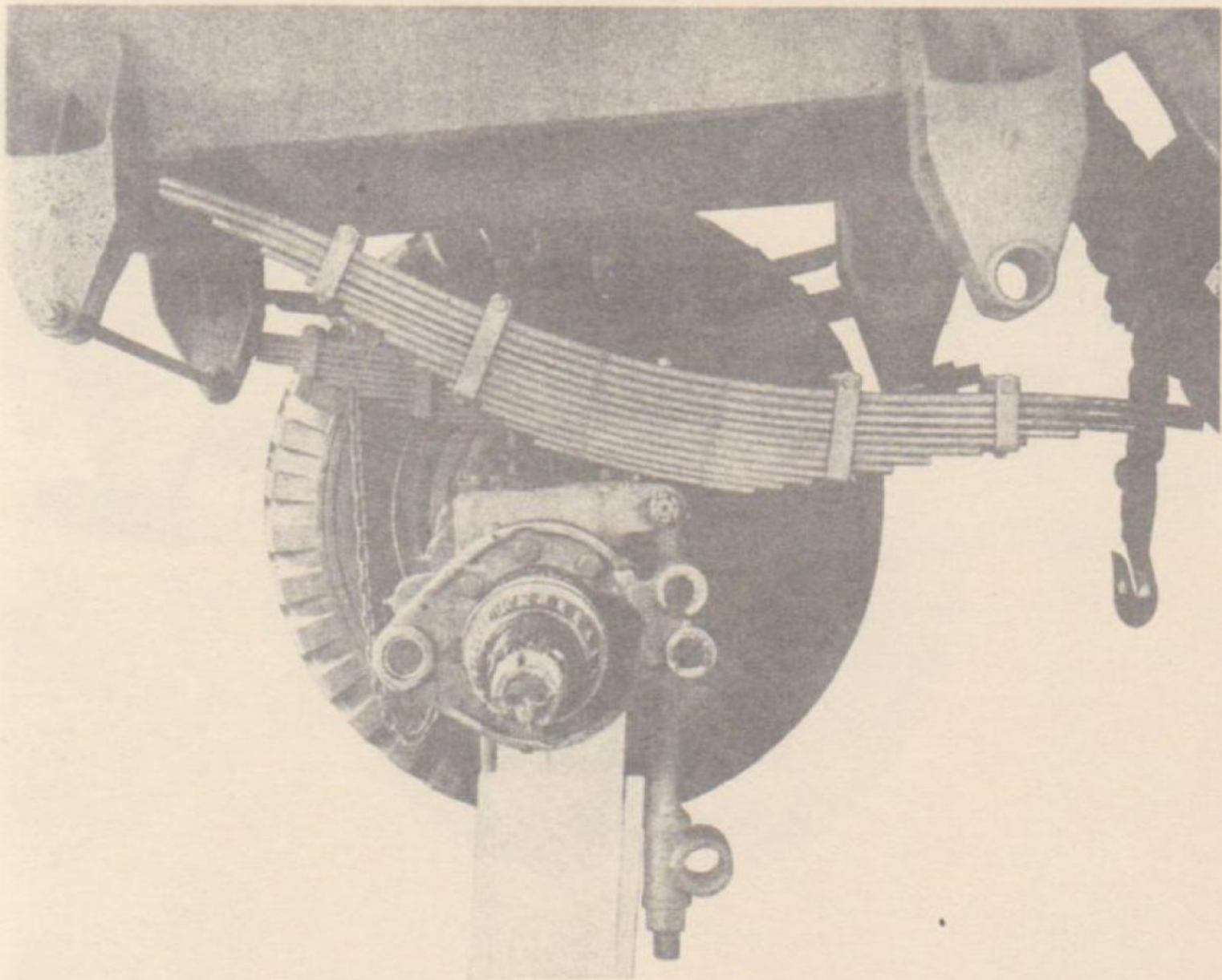
Camshaft can now be driven out as shown.



Returning to the outside, it is readily seen that brake spider may be removed by removing bolts if desired. Also shown are U-bolts from which nuts have been removed. Next, drive U-bolts down and remove them.



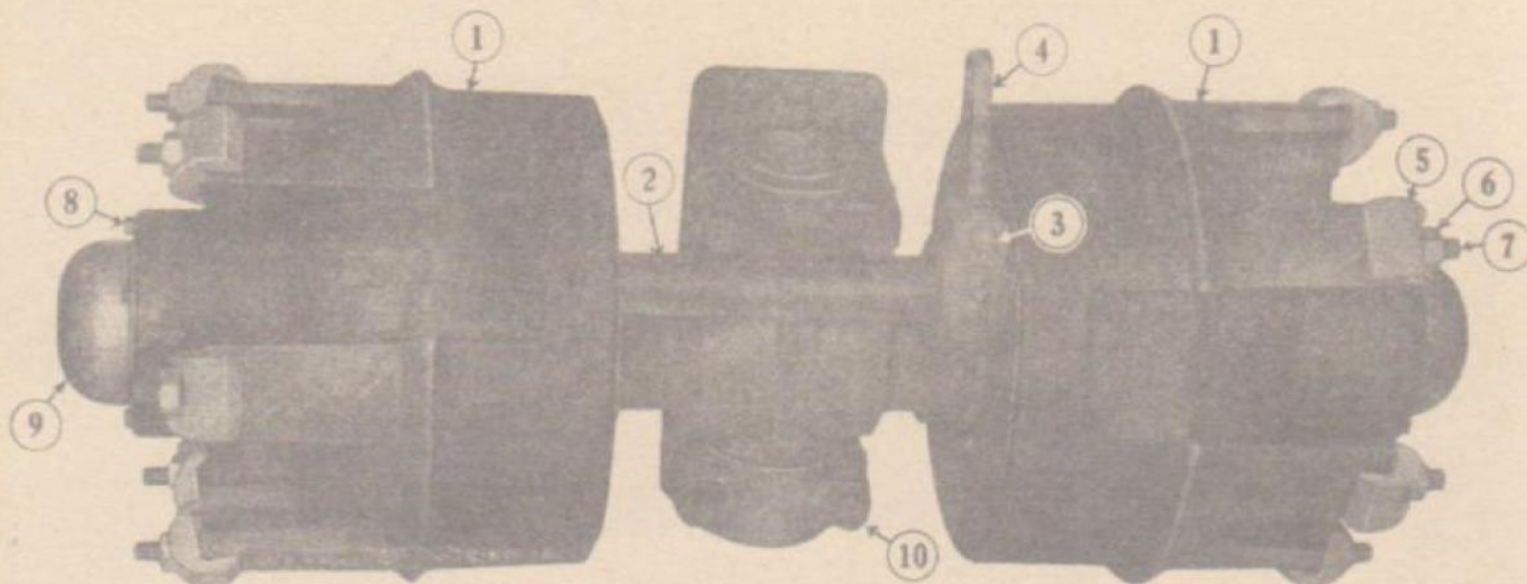
U-bolts having been removed, helper spring will slip out as shown.



To remove main spring, first disconnect front end of torque rod as shown; main spring will then come out. Repeat all the steps preceding on the opposite side of trailer, and front or dolly axle is ready to be dropped down.

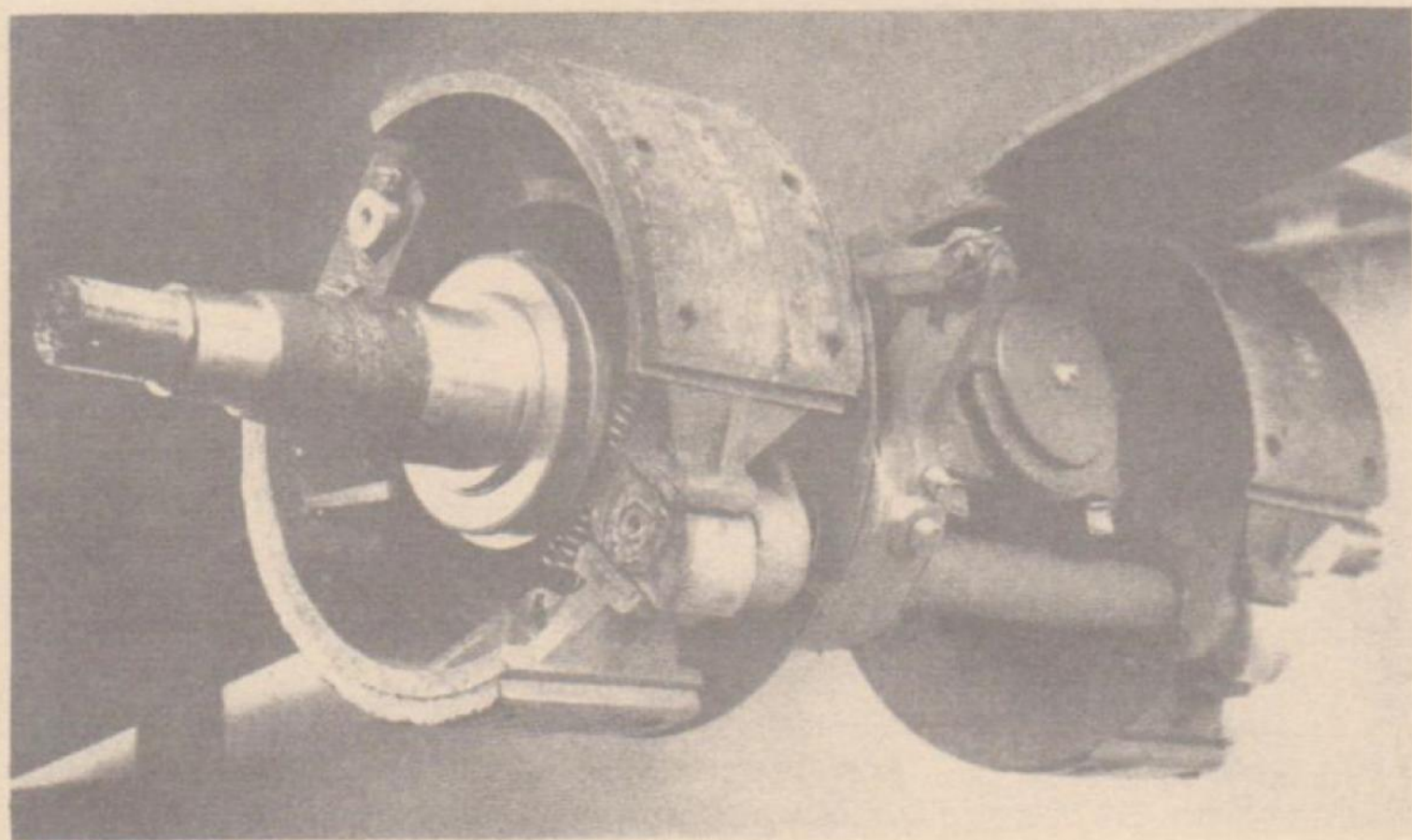
TO RE-ASSEMBLE, REVERSE THE PROCEDURE.

THE REAR OR TRUNION AXLE

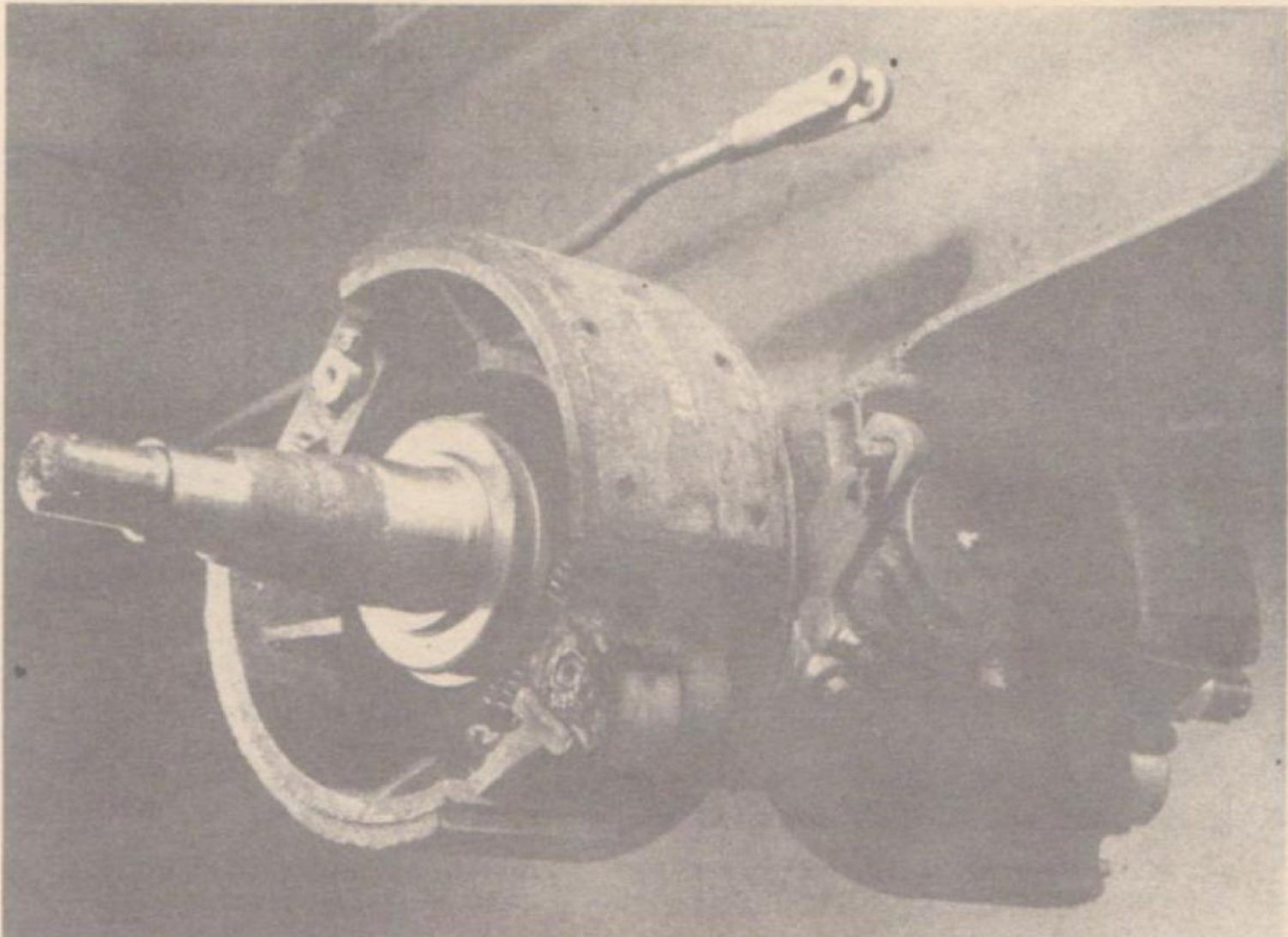


Shown above is the complete trunion axle assembly. No. 1 is the wheel, hub and brake drum which is cast integral. No. 2 is the brake camshaft. No. 3 is the adjust nut on the slack adjuster. No. 4 is the slack adjuster. No. 5 is the rim lug. No. 6 is the lug nut. No. 7 is the wheel stud. No. 8 is the hub cap bolt. No. 9 is the hub cap. No. 10 is the axle to frame bracket bolt.

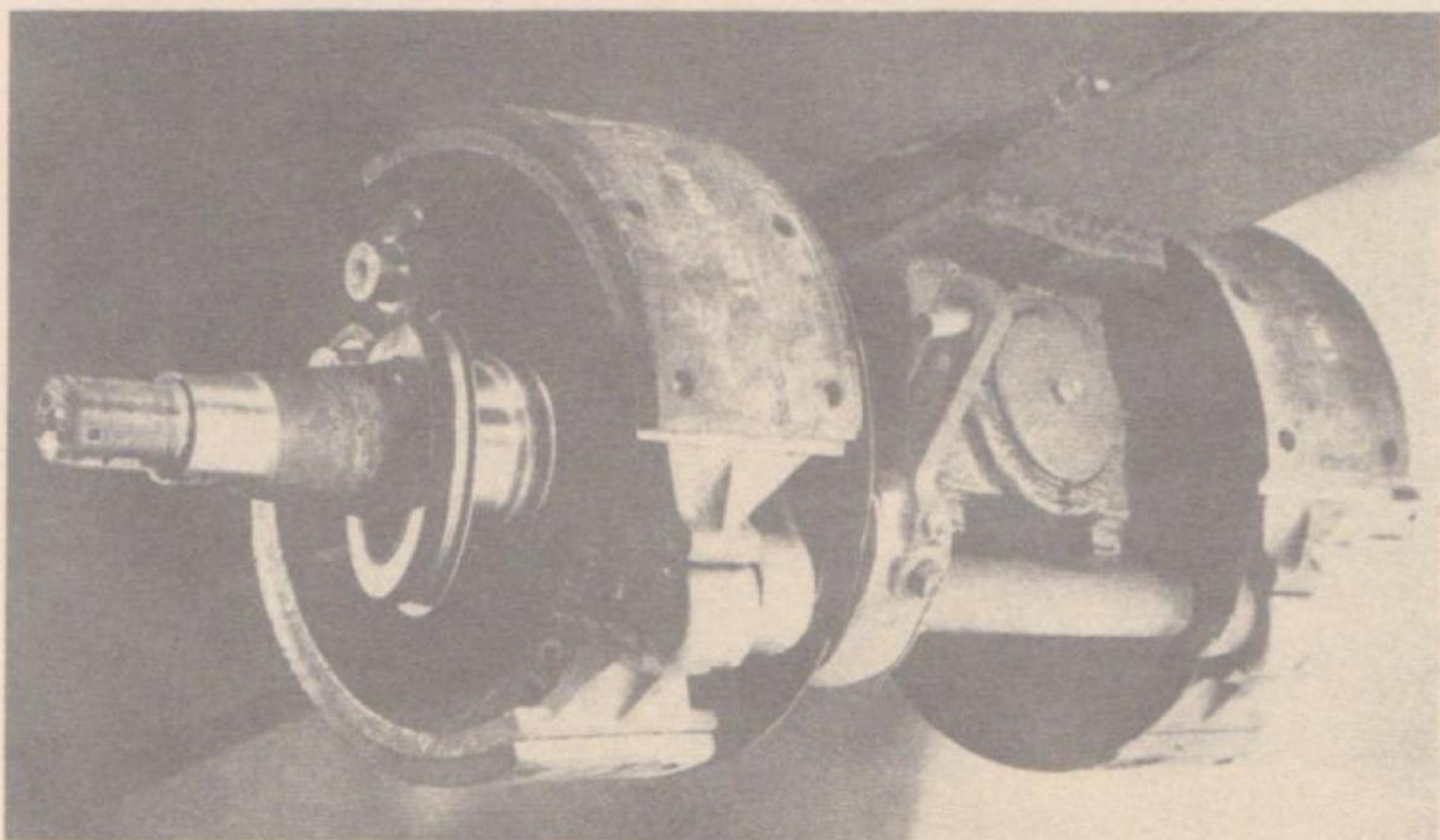
To disassemble—Remove hub cap bolts and hub cap. Remove cotter pin in end of spindle and then remove spindle nut as previously shown on front or dolly axle. Hub can then be pulled off by hand.



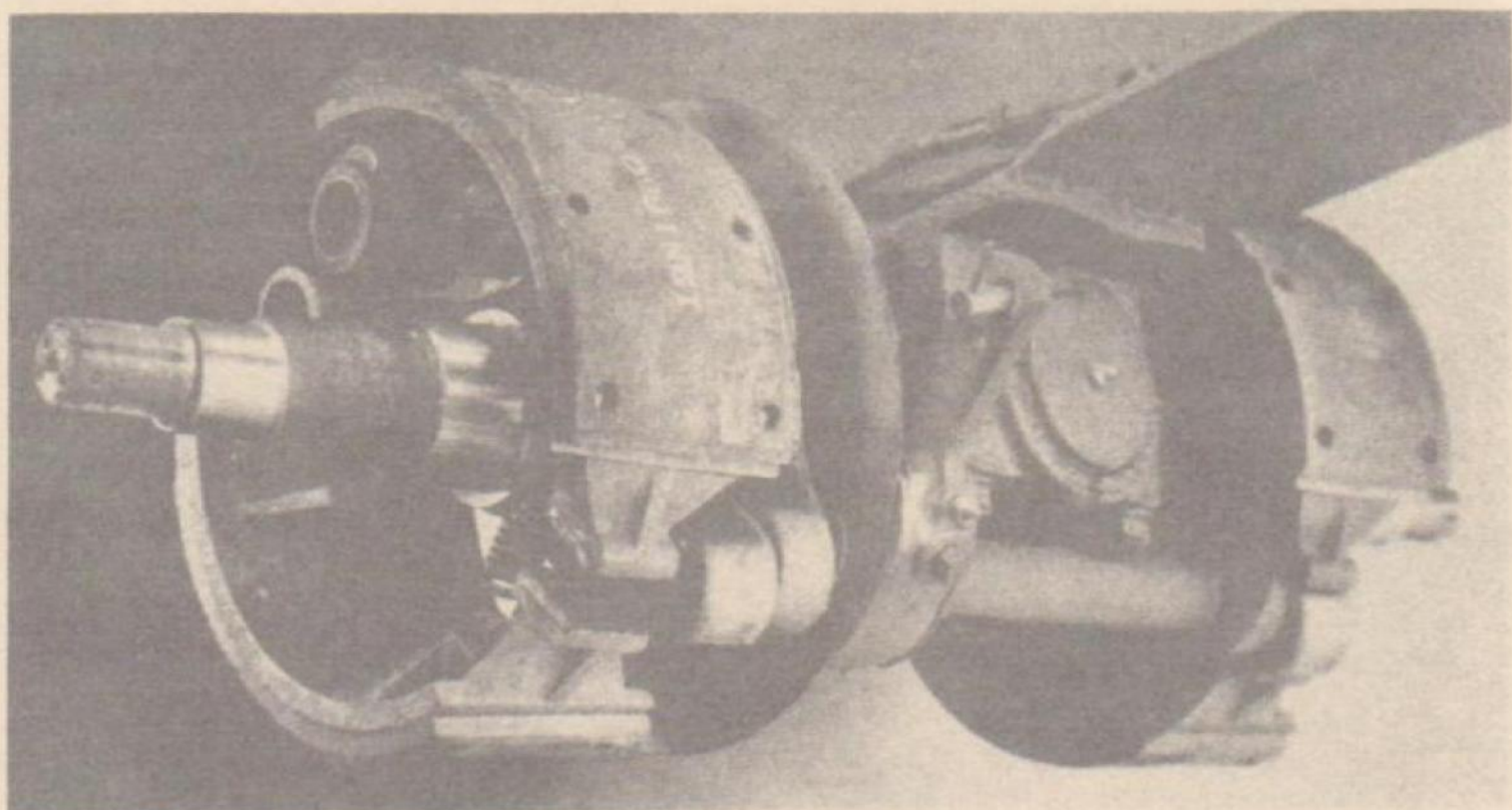
Above is shown trunion with hub removed from inside spindle. When disassembling trunion, *always* work from the *inside out!*



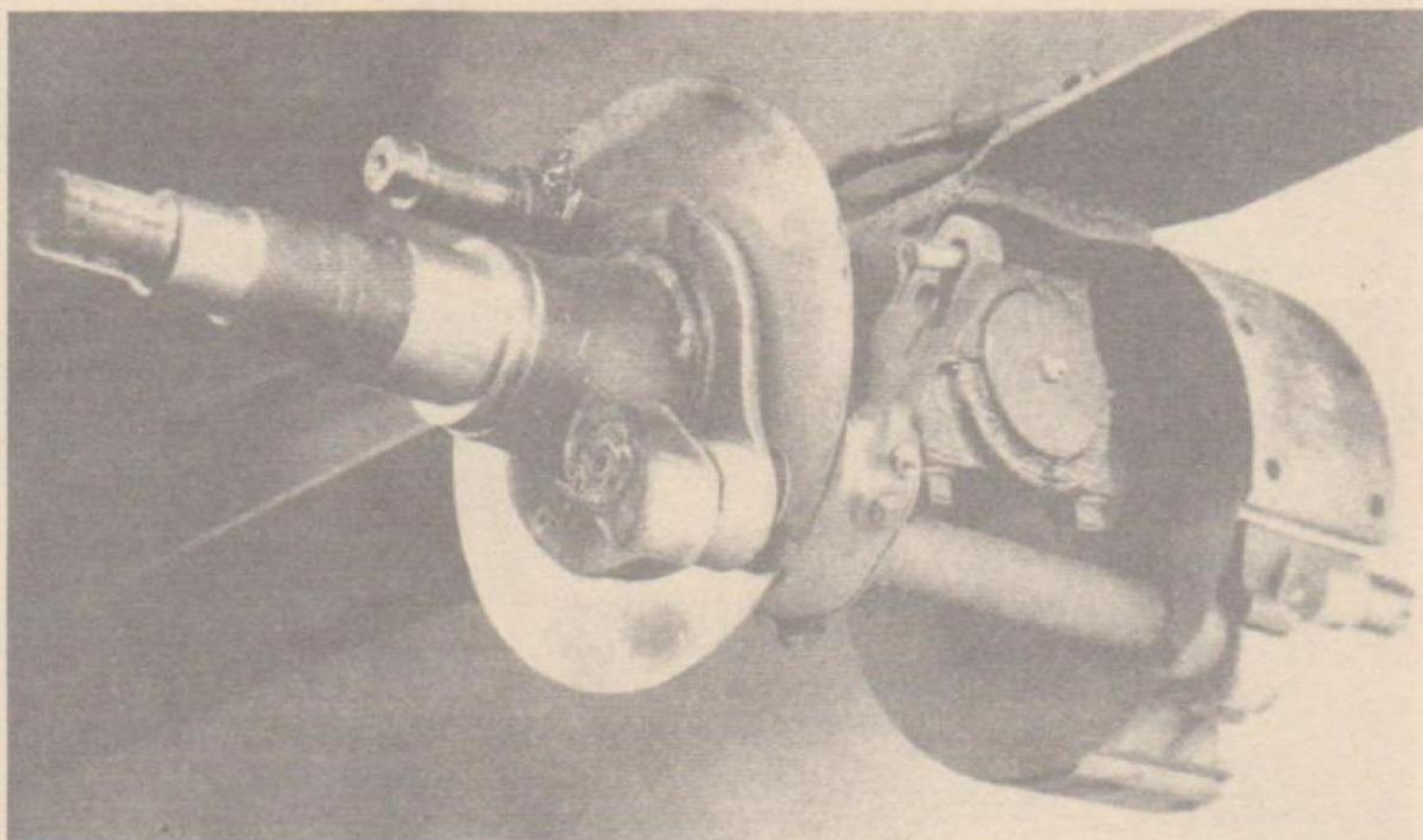
The brake rod is disconnected from the slack adjuster as shown, and cotter pins removed from anchor pins.



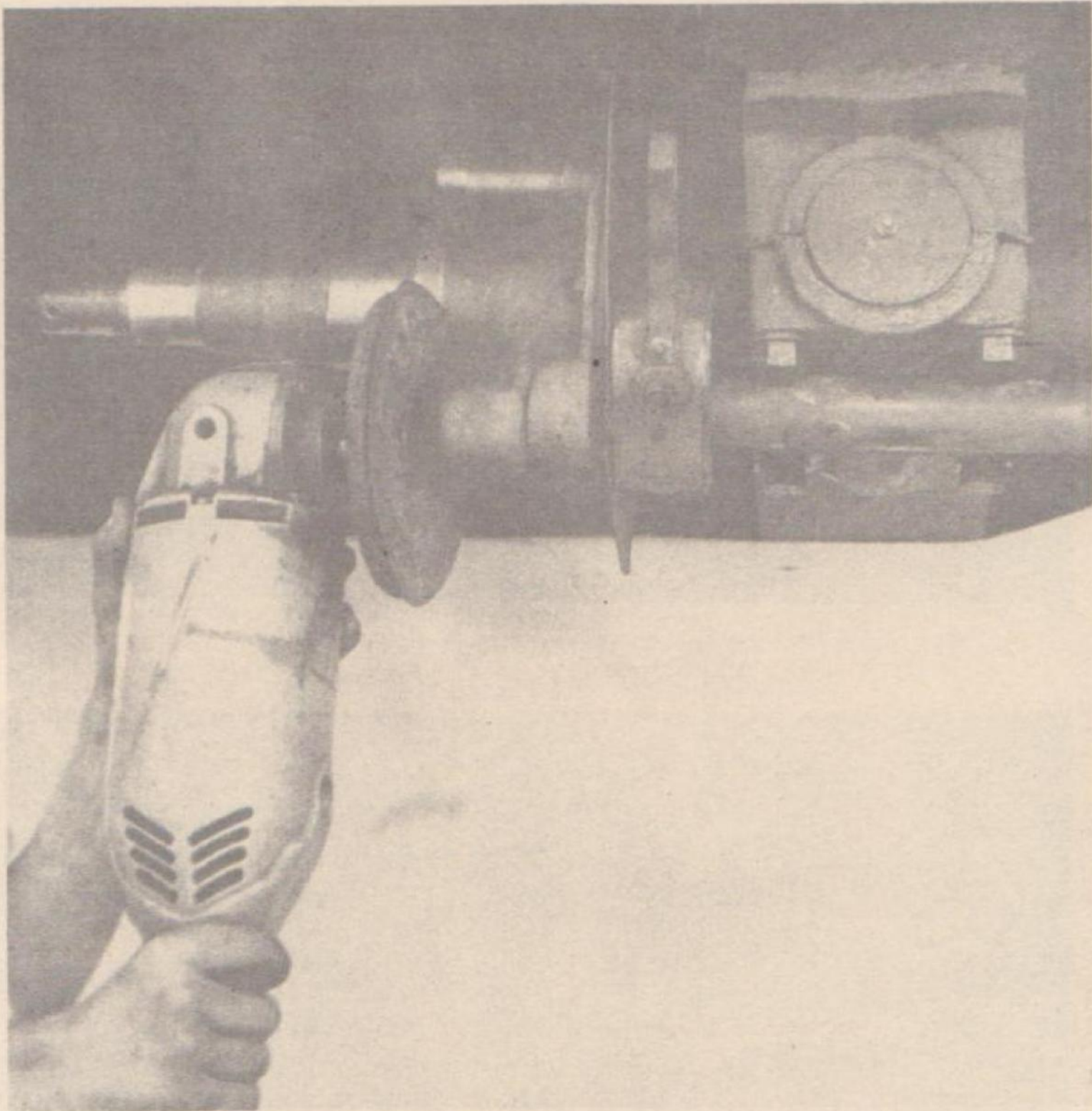
Next remove grease retainer as shown above, and also remove anchor pin bar.



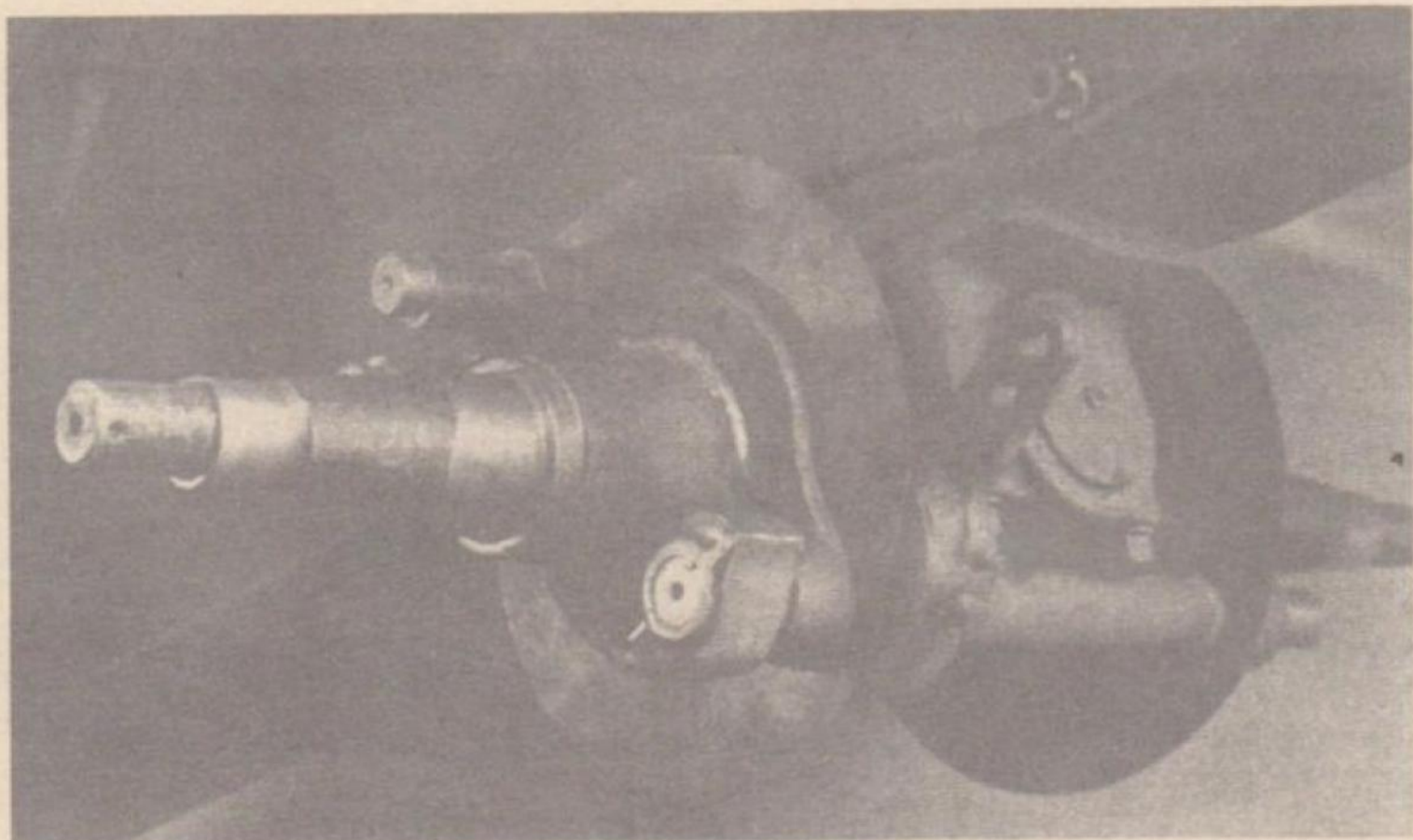
This will allow brake shoes to slip off as shown. Do not remove springs from brake shoes until shoes are removed from anchor pins.



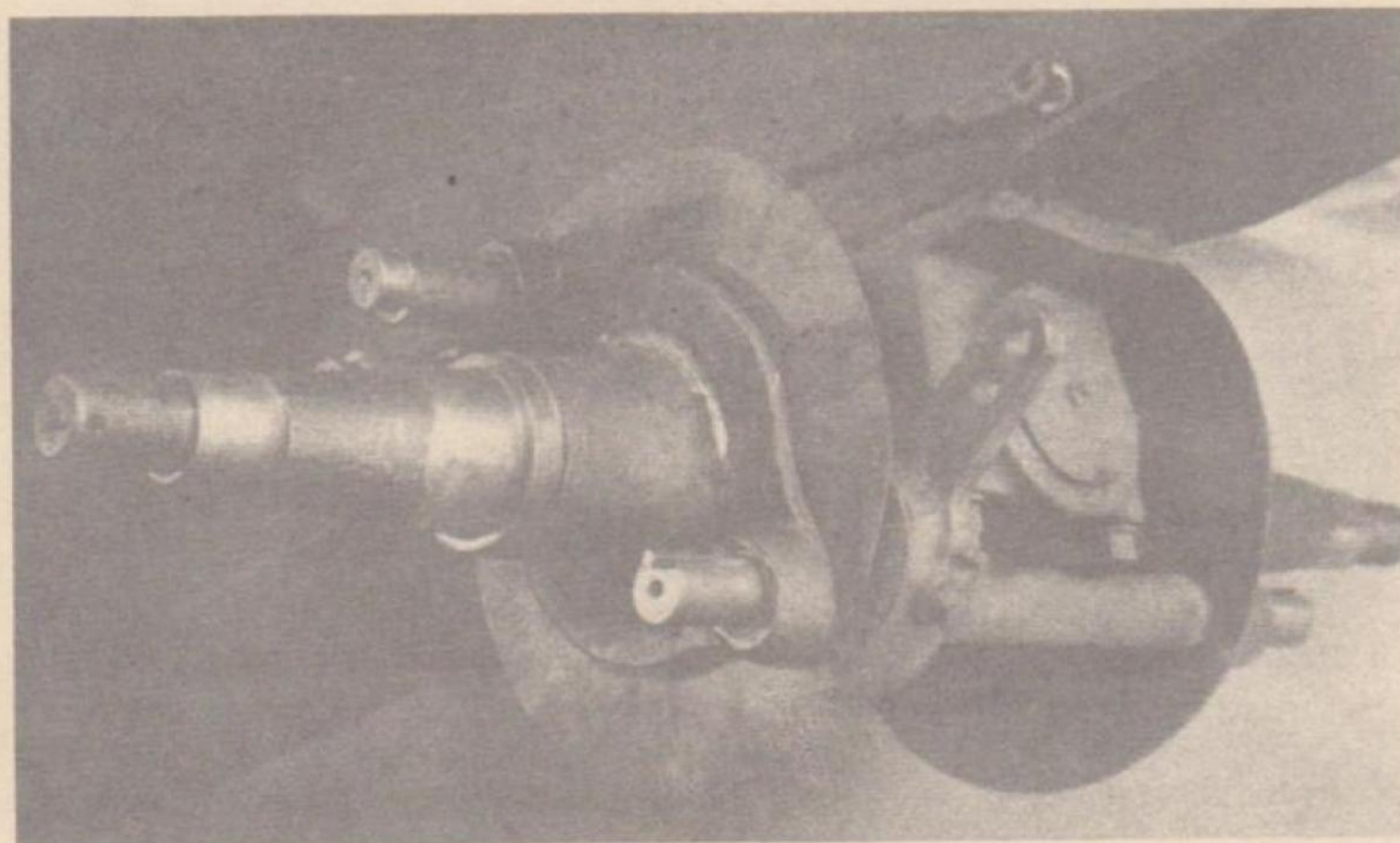
This view shows trunion axle after brake shoes have been removed.



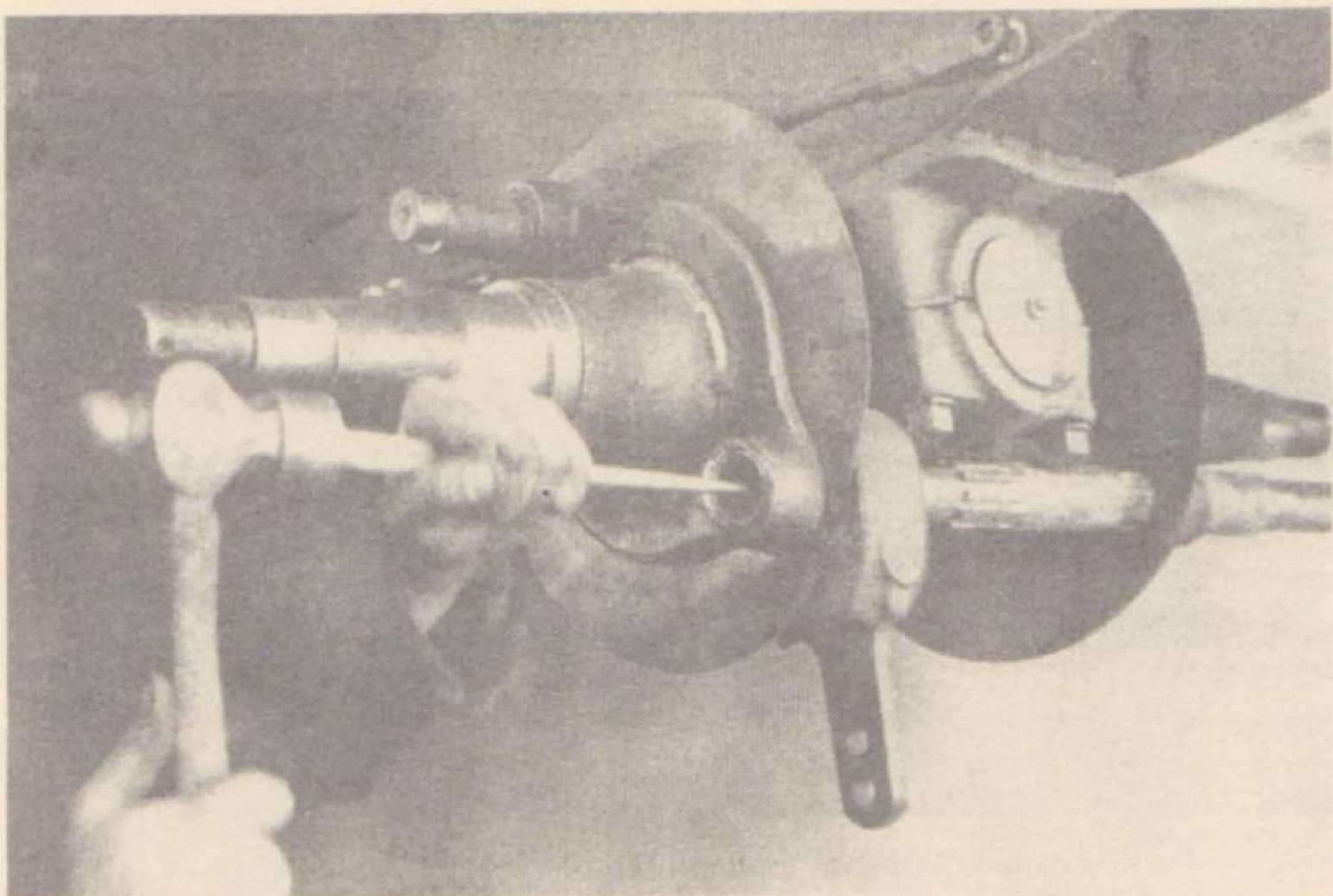
Next, the weld that holds cam on *inside* end of camshaft is ground off with a portable grinder.



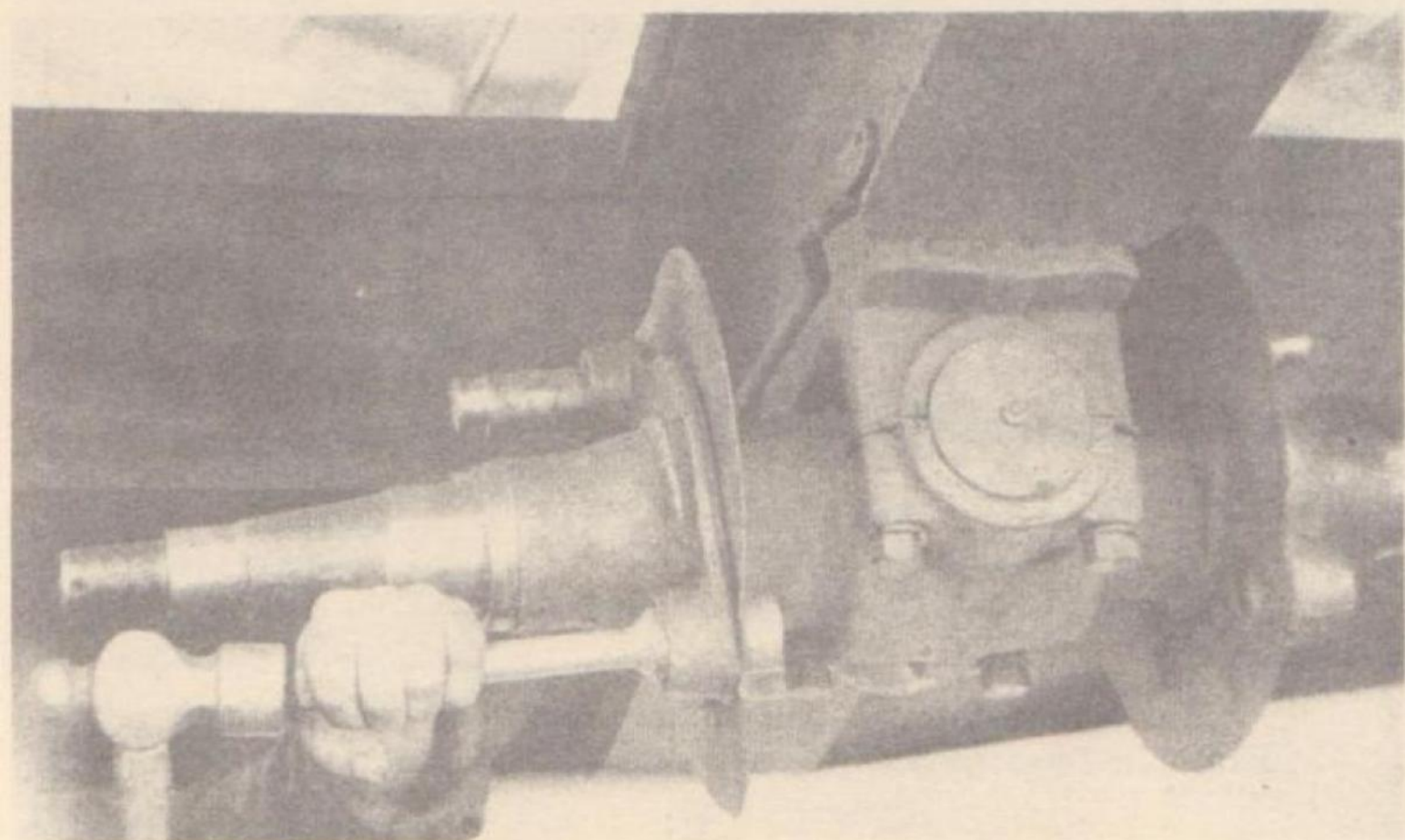
Now we see the cam with the weld ground off and cam partly driven off. Drive cam all the way off.

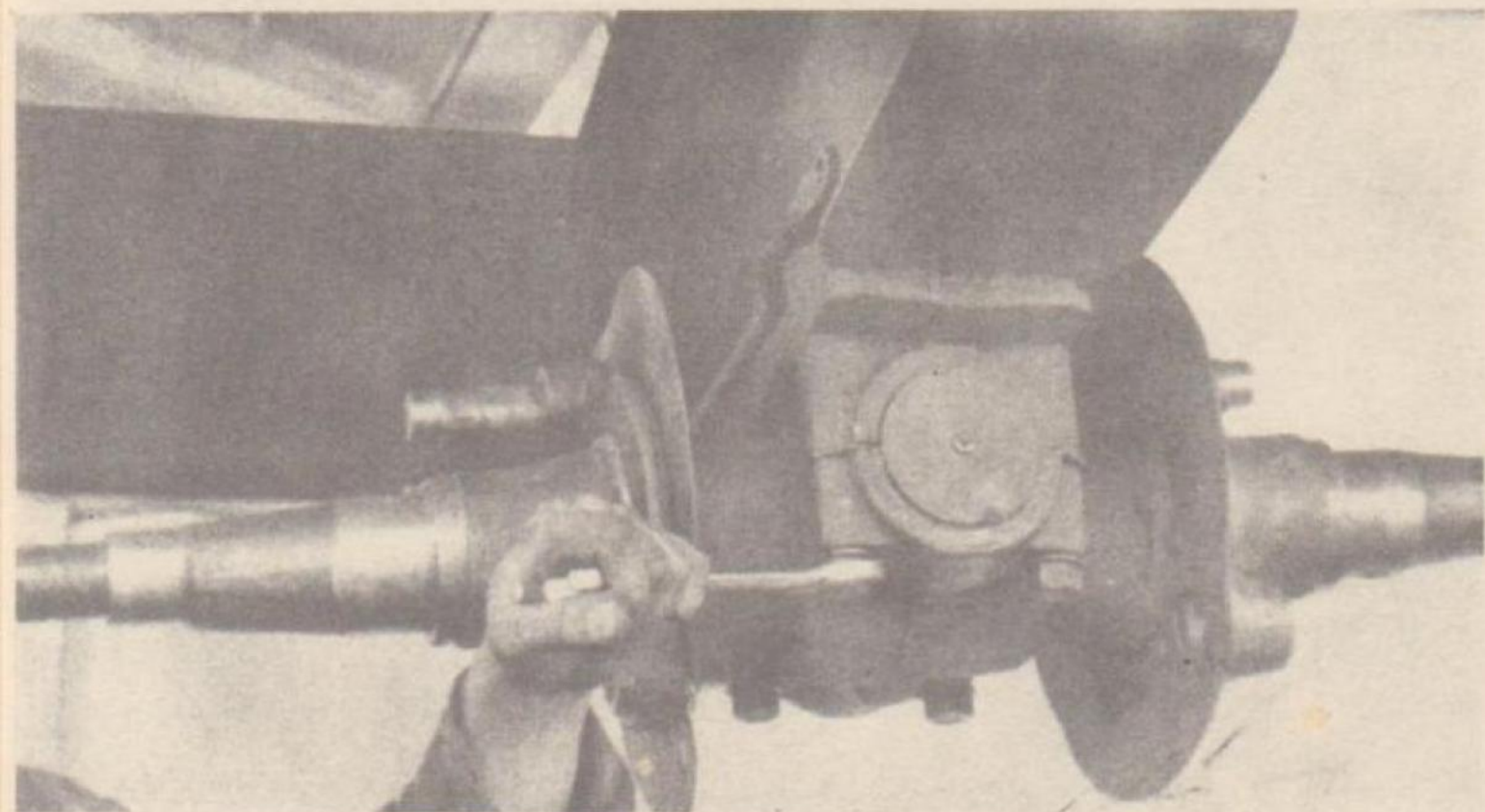


This shows camshaft with cam off of shaft with the key still in the shaft. Drive out key.

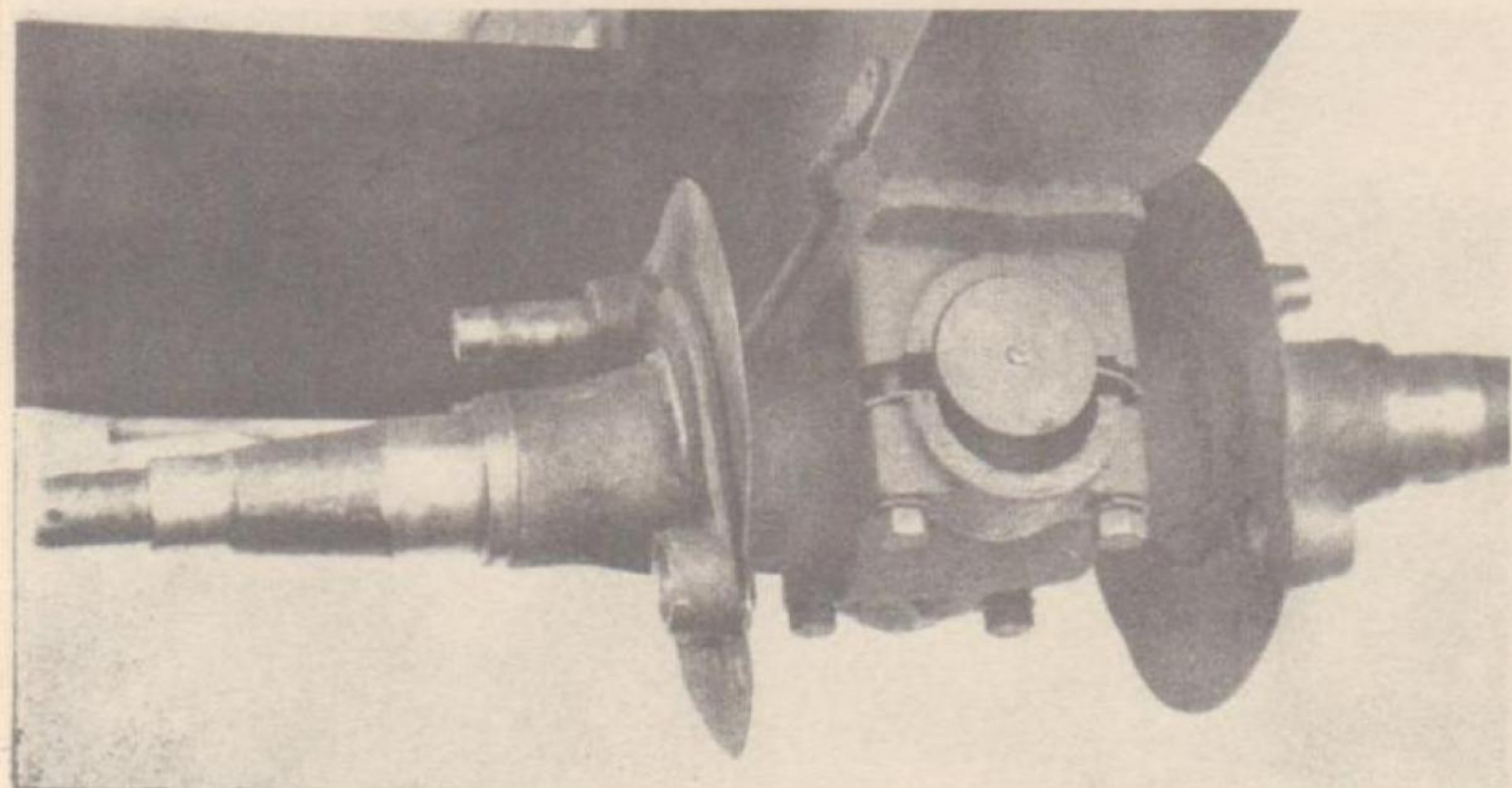


After key is removed, drive out camshaft as shown. The bushing in the outside brake spider will come out as camshaft is driven out, and slack adjuster will drop off.

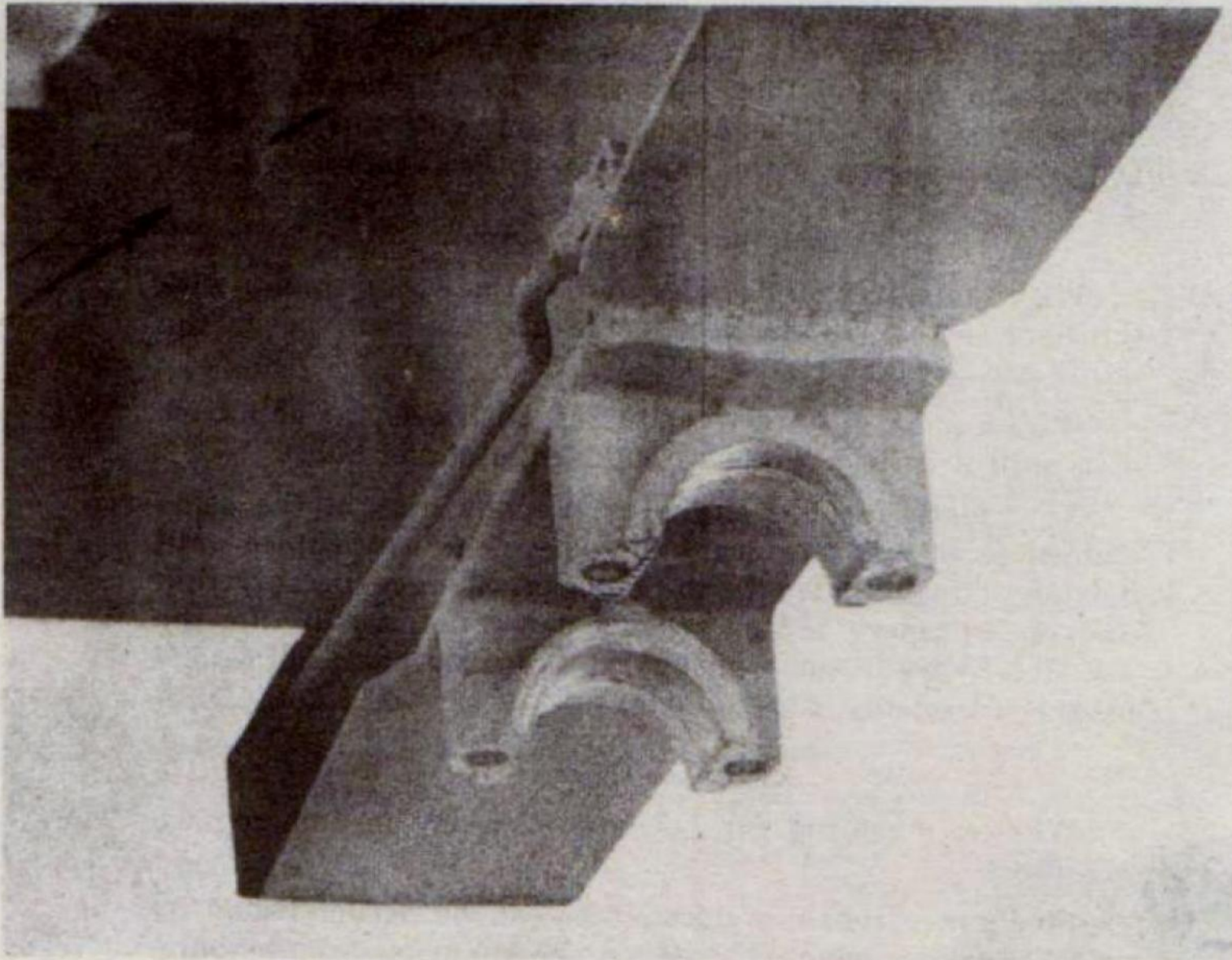




The caps holding trunion axle in place are now ready to be removed by removing cap bolts as shown.



This shows the cap bolts partly removed. Remove both cap bolts from each cap.



Caps having been removed, trunion axle has now dropped down and saddle is shown with axle gone.



To re-assemble, reverse the process, being sure to tack weld the brake cam to the camshaft with gas or electric welding torch.

CAUTION—In re-assembly, do not tighten spindle nuts too tight as this will cause bearings to bind and run hot, which will result in bearing failure. Tighten spindle nut until wheel binds and then back nut off until wheel turns free. One third to one half turn will generally be sufficient. Be sure to place cotter pins in spindle after spindle nut is at desired place. Do not re-use old cotter pins unless absolutely necessary.

Removing Bearing Cups

Place a soft steel bar on the inside shoulder or edge of the cup to be removed. Using a heavy hammer, hit first 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.

Installing Bearing Cups

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.

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.

Now place the old cup over the new one in the same manner as in first paragraph 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.

Loose Cups

When the bearing cup becomes loose in the hub, replace the hub.

Emergency repair of loose cups can be accomplished by using a center punch to reduce the diameter of the bore. Simply use a heavy center punch and put about 12 punch marks per square inch about the diameter of the side wall of the cup bore where the cup normally fits.

Bearing and Cup Inspection

Bearings and cups should be cleaned and inspected whenever wheels are removed. Pitted or chipped bearings or cups should be replaced.

ABOVE INSTRUCTIONS APPLY TO BOTH FRONT AND REAR AXLES.

THE STEEL PRODUCTS CO., INC.

SAVANNAH, GEORGIA

SERVICE BULLETIN NO. 1

The purpose of this Service Bulletin is to correct an unsatisfactory condition existing on the rear or trunnion axles on Model No. SBBM 16 Ton Low Bed Trailers, U. S. Registration Numbers WO65984 thru WO66313, manufactured for U. S. Army Corps of Engineers by The Steel Products Co., Inc., Savannah, Georgia, on C of E Purchase Order No. 55579.

It will be noted by examining Illustration No. 1 that too much space is present between the hub and the grease retainer. To correct this condition, proceed as follows:

1. Raise rear of trailer sufficiently to allow clearance to remove rear tires. An overhead hoist or jacks may be used for this operation. Place blocks securely under trailer to remove any danger of trailer falling if jacks or overhead hoist should fail.

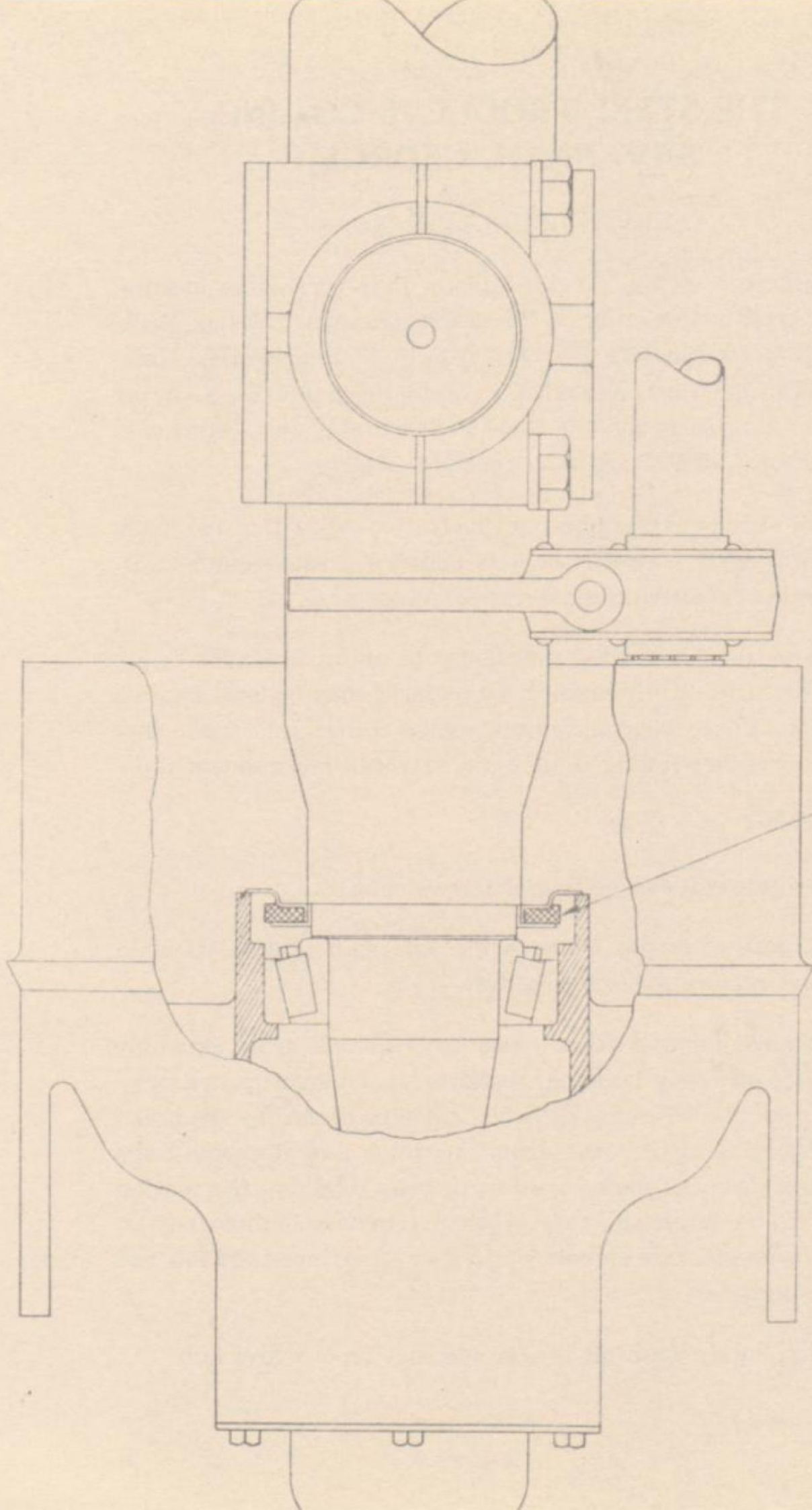
2. Remove rear tires.

3. Remove hub cap bolts and remove hub cap.

4. Remove cotterpin which holds axle spindle nut locked in place and remove axle spindle nut.

5. Remove hub and drum assembly. Hub and drum assembly should slip off easily by hand. However, if hub and drum assembly does not slip off easily by hand, it will be caused by the brake shoes dragging against the drum, in which case disconnect the brake rod from the slack adjuster, thereby releasing the tension on the brake shoes. Be careful when removing hub to not let axle spindle nut, axle spindle washer, or wheel bearings fall and become dirty.

6. Thoroughly wash all grease and dirt from wheel hub.



ARROW INDICATES TOO MUCH SPACE BETWEEN THE HUB AND THE GREASE RETAINER

ILLUSTRATION No. 1

7. Now refer to Illustration No. 2, which shows Key No. 1, which is the ring to be inserted in the INSIDE of the hub bore to correct the difficulty. In the same illustration, Key No. 2 shows the ring directly above the point of installation and also indicates that one edge of the ring is chamfered to facilitate starting the ring into the hub bore. BE SURE WHEN INSTALLING THIS RING THAT THE CHAMFERED EDGE GOES AGAINST THE HUB AS THIS WILL GREATLY FACILITATE THE ENTRY OF THE RING INTO THE HUB.

8. The ring is now placed in position to be driven into the hub. BE SURE THAT THE RING STARTS IN STRAIGHT. Place a mild steel bar against the ring and drive the ring into the hub, constantly changing the position of the bar and constantly changing the point at which the hammer strikes, to insure that the ring will go in straight without excessive binding. Rings will be found to be a hard driving fit. Continue to drive with hammer until ring is completely in hub.

9. Thoroughly clean all grease and dirt from axle spindle and grease retainer with kerosene or some other suitable solvent.

10. Make sure that all grease and dirt has been removed from hub, bearings, etc.

11. Repack spindle and bearings with new grease, using the type lubricant specified for wheel bearings. This repacking operation should be done either with the hands or suitable paddle, making sure that wheel bearings are thoroughly packed with grease. Put a liberal amount of grease on the spindle in the space between the two wheel bearings. CAUTION—DO NOT FILL HUBS WITH GREASE.

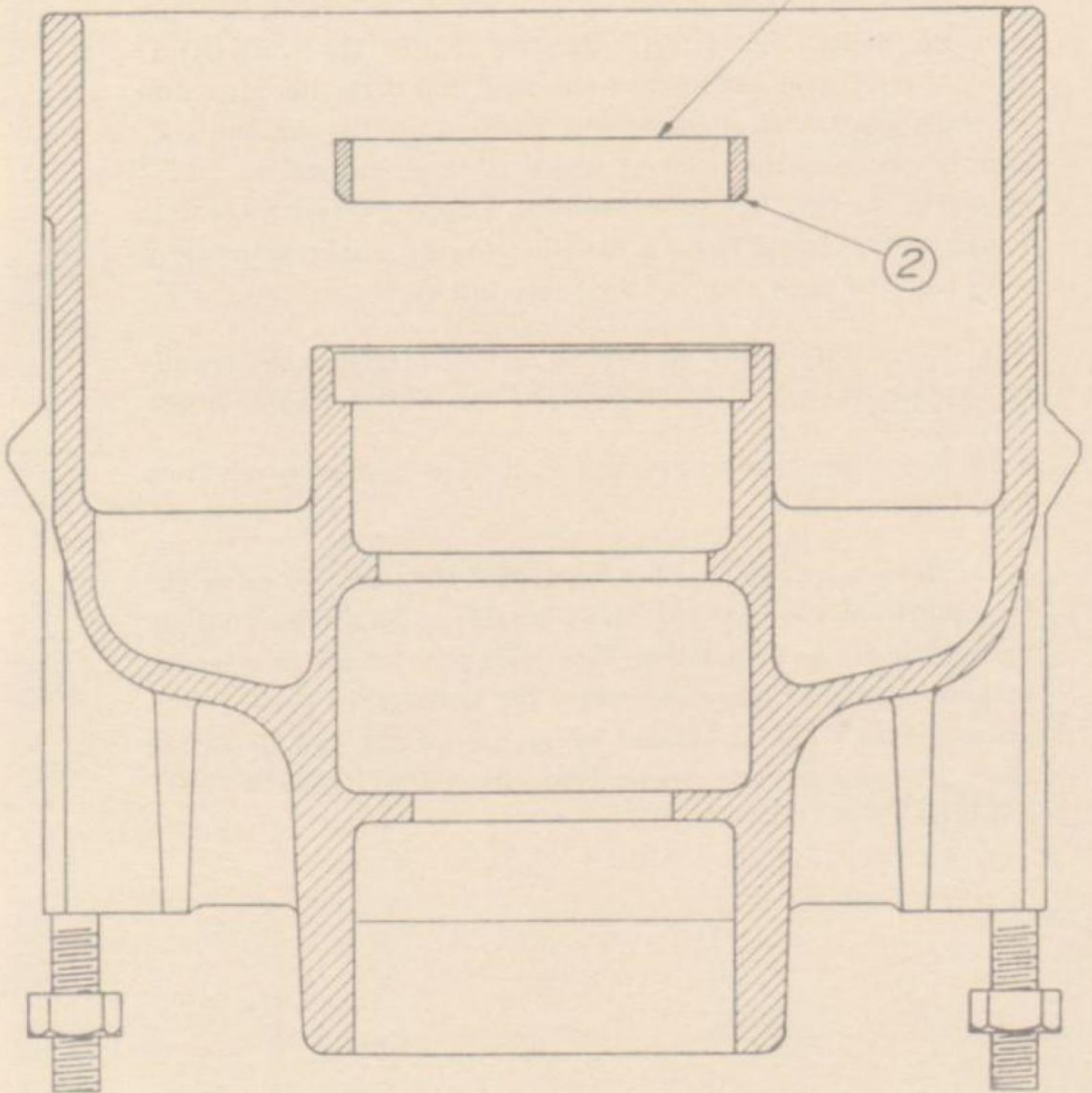
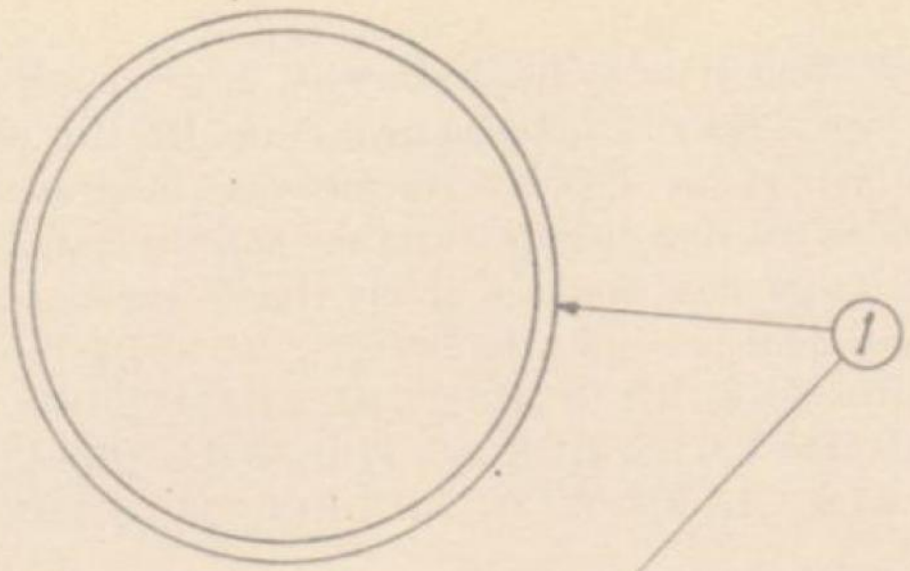


ILLUSTRATION No. 2

12. Replace hub on axle spindle, being cautious to see that hub goes completely on the spindle. Replace outside wheel bearing.

13. Place axle spindle washer on axle spindle and install axle spindle nut. Tighten axle spindle nut until wheels bind. Loosen axle spindle nut until wheel turns freely, then thoroughly check and rotate wheel to see if wheel is completely in place and seated on the bearings.

14. Tighten axle spindle nut once more until wheel binds and then back nut off enough to allow wheel to turn freely. 1/4 to 1/2 turn backwards will usually be sufficient. Install new cotterpin to lock axle spindle nut in position. Do not use old cotterpin unless absolutely necessary.

15. Replace hub cap and hub cap bolts.

16. Replace tires. After tires are replaced, extreme caution should be exercised to see that tires are squarely on the wheel. Otherwise, they will wobble when the wheel is rotating in service. To overcome this condition, rotate wheels by hand while they are jacked up and check to see if tires run in a true line. If they do not, the tires can be straightened by loosening the lug nuts, which are pushing tires on the wheels too far, and tightening the nuts on the opposite spoke of the wheel. Continue to rotate the wheels and changing the tension of the nuts until tires rotate without any wobbling movement.

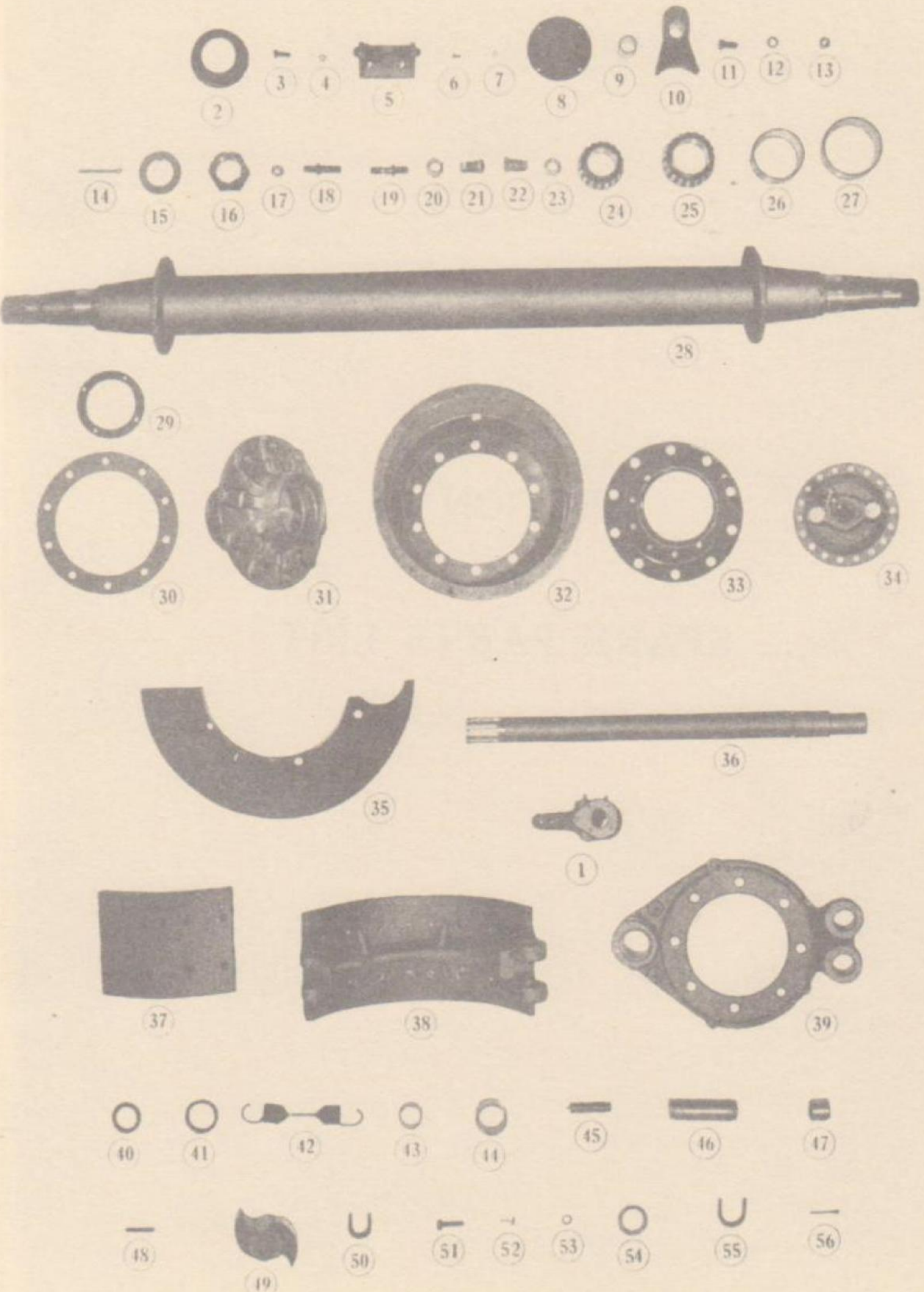
17. Remove blocks under trailer and lower trailer completely, and it is again ready for service.

SPECIAL INSTRUCTIONS

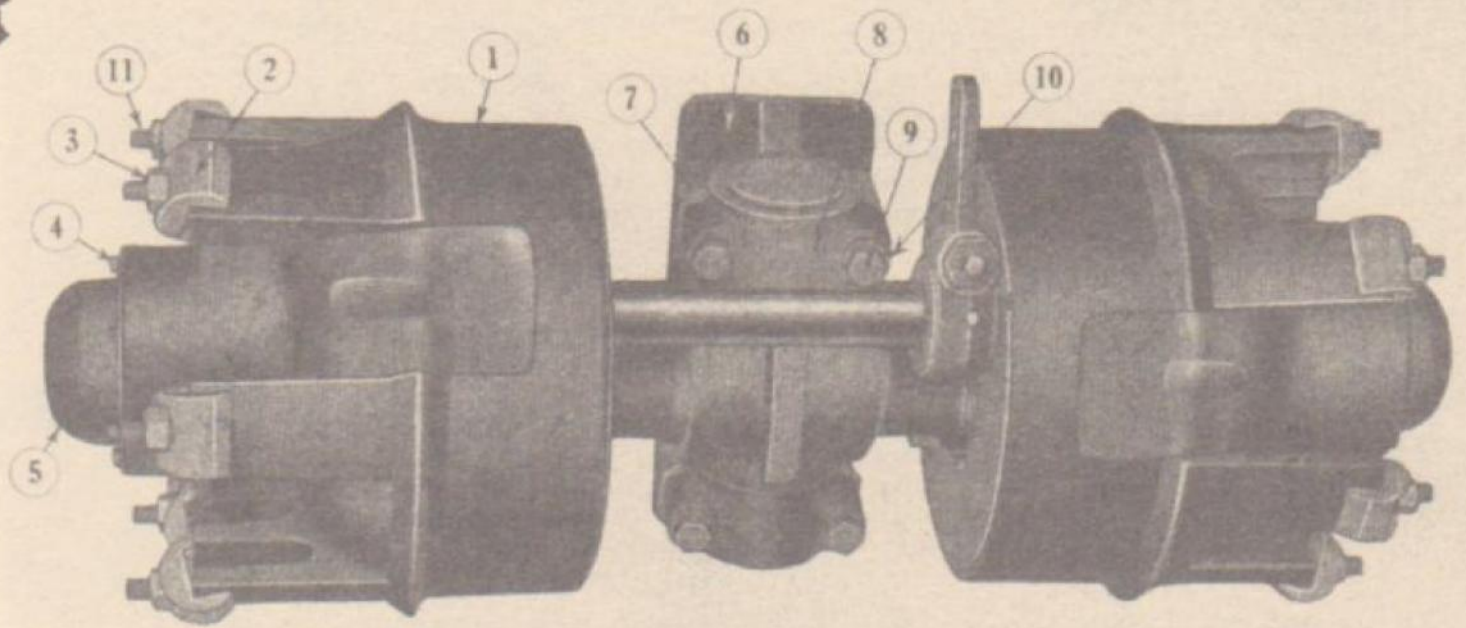
It will be noted that there are two rear or trunnion axles on each trailer. Each rear or trunnion axle has two wheels, one inside and one outside. Therefore, there are four hubs on each trailer in which one ring must be installed in each hub. Therefore, the operation described in this Service Bulletin consists of four complete operations per trailer.

SECTION III

SPARE PARTS LIST



Key Number	Part Number	Description	Quantity
1	217904	SLACK ADJUSTER (See Page 119)	2
2	F-918	COLLAR, Dust with Felt	2
3	X-9302	BOLT, Air Chamber	4
4	X-4-206	LOCKWASHER, Air Chamber	4
5	B-652	BRACKET, Air Chamber	2
6	X-9-151	BOLT, Hub Cap	8
7	X-4-203	LOCKWASHER, Hub Cap Bolt	8
8	W-243-1	CAP, Hub	2
9	CS-1-9c	BUSHING, Camshaft Support	2
10	B-1039-6	SUPPORT, Camshaft	2
11	B-283	BOLT, Brake	16
12	X-4-208	LOCKWASHER, Brake Bolt	16
13	X-1-207	NUT, Brake Bolt	16
14	X-8-361	PIN, Cotter, Axle Center Spindle Nut	2
15	F-733-1	WASHER, Axle Center Spindle	2
16	F-732-1	NUT, Axle Center Spindle	2
17	X-1-209	NUT, Wheel Hub Stud	20
18	13989	STUD, Wheel Hub, L.H.	10
19	13988	STUD, Wheel Hub, R.H.	10
20	10705	NUT, Cap, Outer, L.H.	10
21	10709	NUT, Cap, Inner, L.H.	10
22	10708	NUT, Cap, Inner, R.H.	10
23	10704	NUT, Cap, Outer, R.H.	10
24	560—Timken	CONE, Wheel Bearing, Outer	2
25	580—Timken	CONE, Wheel Bearing, Inner	2
26	553-x—Timken	CUP, Wheel Bearing, Outer	2
27	572—Timken	CUP, Wheel Bearing, Inner	2
28	R-509-71	AXLE CENTER	1
29	W-244	GASKET, Hub Cap	2
30	B-1021	GASKET, Oil Drain	2
31	W-292-2	HUB, Wheel	2
32	B-1164-1	DRUM, Brake	2
33	B-620	OIL DRAIN	2
34	216565	AIR CHAMBER, R.H. (See Page 109)	1
	216564	AIR CHAMBER, L.H. (See Page 109)	1
35	B-1063-1	SHIELD, Dust (Assembly)	2
36	B-1120-3	SHAFT, Cam	2
37	B-1062-5	LINING, Brake Shoe	8
38	B-1066-1	SHOE, Brake, L.H.	2
	B-1066-2	SHOE, Brake, R.H.	2
39	B-1045-3	SPIDER, Brake, L.H.	1
	B-1045-4	SPIDER, Brake, R.H.	1
40	X-6-560	FELT, Brake Spider Bearing	4
41	X-6-558	FELT, Brake Shoe Anchor Pin	8
42	B-981	SPRING, Brake Shoe Release	2
43	B-615-4	BUSHING, Brake Shoe, Anchor Pin	8
44	B-1055	BEARING, Brake Spider	2
45	B-1052	SHAFT, Brake Shoe Roller	4
46	B-1048	PIN, Anchor, Brake Shoe	4
47	B-1053	ROLLER, Brake Shoe	4
48	B-622-1	KEY, Camshaft	2
49	B-1044-1	CAM	2
50	B-1054	U-WASHER, Brake Shoe Anchor Pin	8
51	DB-8-X	BOLT, Dust Shield	12
52	X-13-216	RIVET, Brake Shoe	64
53	DB-9-X	LOCKWASHER, Dust Shield Bolt	12
54	B-1056	WASHER, Brake Spider Bearing	4
55	B-1054	U-WASHER, Cam Shaft	2
56	X-8-205	KEY, Cotter, Brake Shoe Roller Shaft	4



<i>Key Number</i>	<i>Part Number</i>	<i>Description</i>	<i>Quantity</i>
1	R-6836—A212	Trunnion Axle Assembly WHEEL, with drum integral	2 4
2	5414	CLAMP, Rim	24
3	5149	NUT, Rim Clamp	24
4	HC-3N	BOLT, Hub Cap, $\frac{1}{8}$ " x $\frac{1}{2}$ " USS	24
5	HC-2	CAP, Hub	4
6	(R-653-1	BRACKET, see Trunnion Axle Parts)	
7	(R-525	SHIM, see Trunnion Axle Parts)	
8		(CAP, comes with Bracket)	
9	R-526	(BOLT, see Trunnion Axle Parts)	
10	X-4-210	(LOCKWASHER, see Trunnion Axle Parts)	



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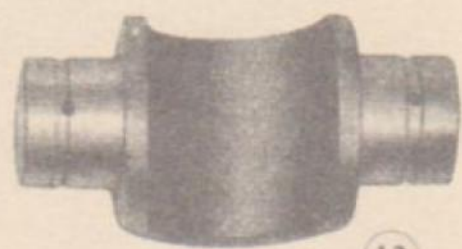
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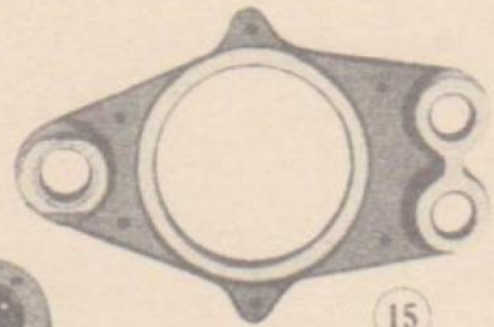
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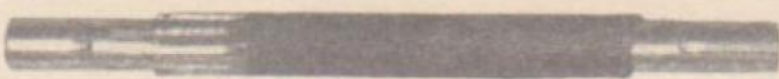
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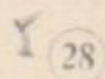
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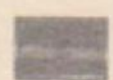
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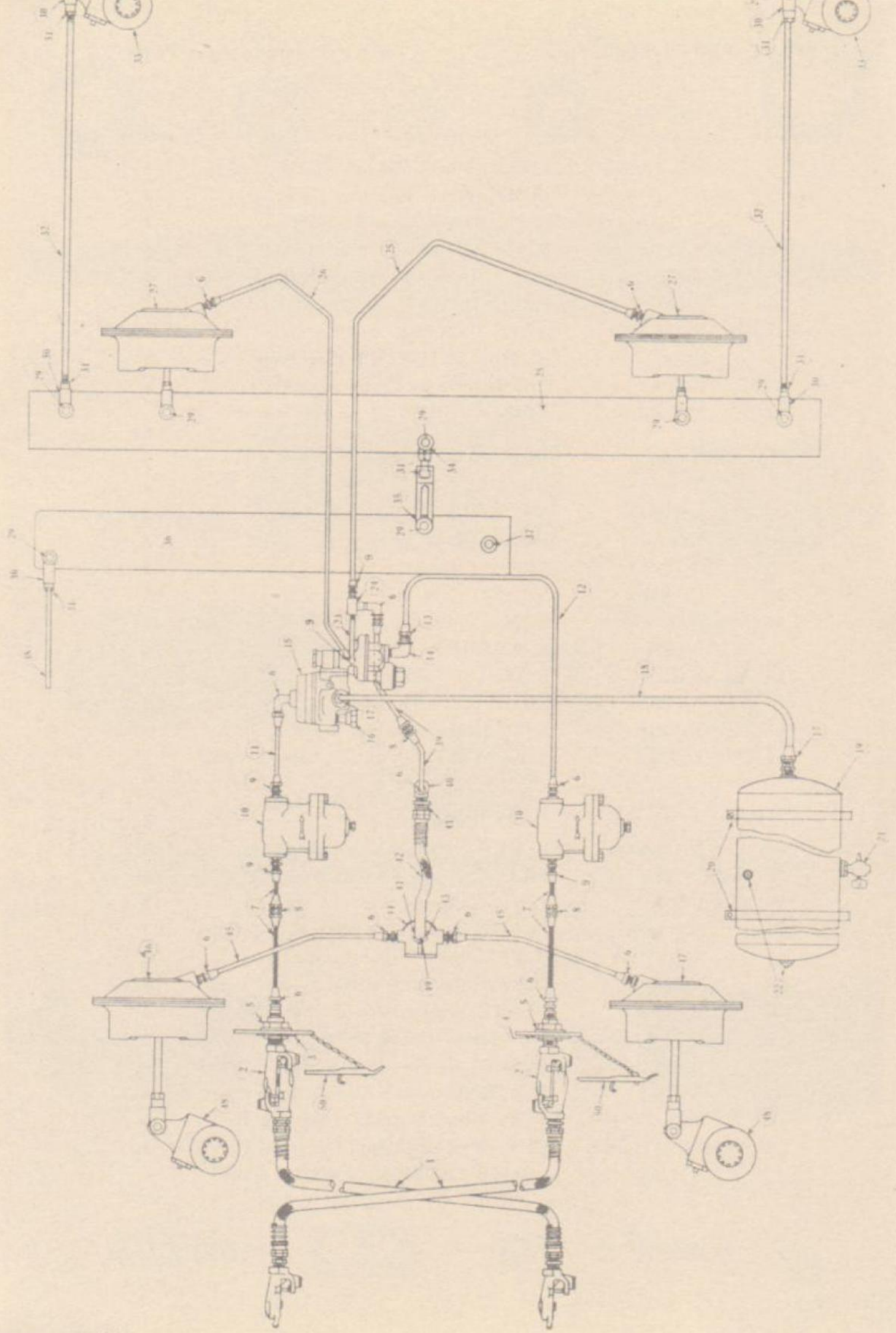


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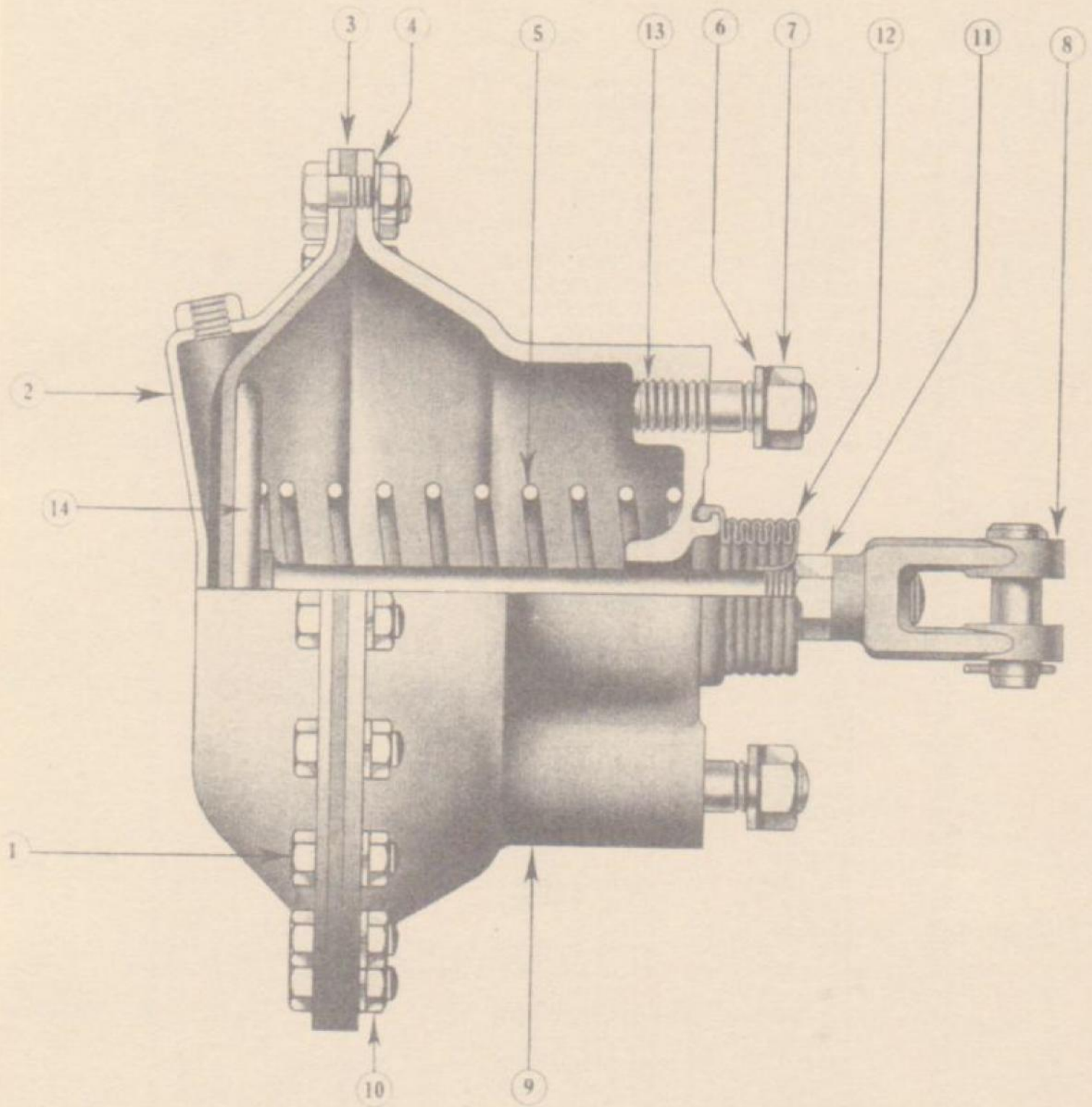
<i>Key Number</i>	<i>Part Number</i>	<i>Description</i>	<i>Quantity</i>
1	567—Timken	CONE, Wheel Bearing, Inner	4
2	528—Timken	CONE, Wheel Bearing, Outer	4
3	X-1-115	NUT, Axle Center Spindle	4
4	F-219-4	WASHER, Axle Center Spindle	4
5	X-8-383	PIN, Cotter, Axle Center Spindle Nut	4
6	F-802-1	COLLAR, Dust	4
7	R-474-5	AXLE CENTER	2
8	217722	SLACK ADJUSTER (See Page 117)	2
9	R-525	SHIM, Axle to Frame Bracket	8
10	X-4-210	LOCKWASHER, Axle to Frame Bracket	8
11	R-526	BOLT, Axle to Frame Bracket	8
12	R-653-1	BRACKET, Axle to Frame	2
13	R-652-1	TRUNNION, Axle	2
14	B-862-1	SHOE, Brake	8
15	B-1179-1	SPIDER, Brake	4
16	B-1174-1	SHAFT, Cam	2
17	B-863A-1	CAM	4
18	B-1054	U-WASHER, Cam Shaft	4
19	B-622-1	KEY, Cam Shaft	4
20	B-1180	SHIELD, Brake Dust	8
21	X-1-210	NUT, Brake Shoe Anchor Pin	8
22	X-4-211	LOCKWASHER, Brake Shoe Anchor Pin	8
23	X-8-281	PIN, Cotter, Brake Shoe Anchor Pin Plate	8
24	X-15-302	SCREW, Brake Shoe Wear Plate	8
25	B-778	PLATE, Brake Shoe Wear	8
26	B-867	LINING, Brake Shoe	8
27	X-9-168	SCREW, Brake Dust Shield	24
28	X-13-115	RIVET, Brake Shoe Lining	80
29	B-624-1	PIN, Brake Shoe Anchor	8
30	B-875	PLATE, Brake Shoe Anchor Pin	4
31	B-1165	BUSHING, Brake Spider	4
32	B-866	SPRING, Brake Shoe Release	4
33	B-614-2	BUSHING, Brake Shoe Anchor Pin	8
	563—Timken	CUP, Wheel Bearing, Inner, in Hub	4
	522—Timken	CUP, Wheel Bearing, Outer, in Hub	4
	X-4-202	LOCKWASHER, Brake Dust Shield Screw	24



Key Number	Part Number	Description	Quantity
1	215604	HOSE, Assembly	2
2	220165	COUPLING	2
3	201500	TAG, Service	1
4	201499	TAG, Emergency	1
5	205730	STUD, Clamping	2
6	205102	ELBOW	12
7	†16T1707	TUBING, $\frac{3}{8}$ " Copper 20'	2
8	205134	UNION	3
9	205053	CONNECTOR	5
10	221022	STRAINER, Air (See Page 115)	2
11	†16T1707	TUBING, $\frac{3}{8}$ " Copper 5 $\frac{1}{2}$ "	1
12	†16T1707	TUBING, $\frac{3}{8}$ " Copper 10 $\frac{1}{2}$ "	1
13	205824	CONNECTOR	1
14	214253	ELBOW, Street $\frac{3}{8}$ "	1
15	220353	VALVE, Relay Emergency (See Page 111)	1
16	221087	VALVE, Exhaust Check	1
17	217525	CONNECTOR	2
18	†16T1709	TUBING, $\frac{1}{2}$ " Copper 4'	1
19	215689	RESERVOIR	1
20	205267	BRACKET	2
21	215310	COCK, Drain	1
22	203098	PLUG	2
23	†16T1437	NIPPLE, $\frac{1}{4}$ " close	1
24	†16T1438	TEE, $\frac{1}{4}$ "	1
25	†16T1707	TUBING, $\frac{3}{8}$ " Copper 13"	1
26	†16T1707	TUBING, $\frac{3}{8}$ " Copper 14 $\frac{1}{2}$ "	1
27	220898	CHAMBER, Brake, Type F	2
28	*SB-1	BAR, Equalizer	1
29	*75-S-6	PIN, $\frac{1}{2}$ "	7
30	*60-S-6	CLEVIS	5
31	203575	NUT, $\frac{1}{2}$ " SAE	6
32	*SBR-1	ROD, Service Brake	2
33	217722	ADJUSTER, Slack	2
34	60-S-88	YOKE, End	1
35	BK-10183	YOKE, Slide	1
36	*PB-5	BAR, Fulcrum	1
37	75-S-16	PIN, $\frac{1}{2}$ "	1
38	*M-2	ROD, Parking Brake	1
39	†16T1707	TUBING, $\frac{3}{8}$ " Copper 19 $\frac{1}{2}$ "	1
40	*KP-1	PIN, King	1
41	215536	CONNECTOR, Hose	2
42	BW-101M	HOSE, 2'	1
43	203497	BUSHING, $\frac{3}{8}$ " x $\frac{1}{4}$ " Reducing	1
44	205000	VALVE, Quick Release (See Page 113)	1
45	†16T1707	TUBING, $\frac{3}{8}$ " Copper 11 $\frac{1}{2}$ "	2
46	216565	CHAMBER, Type B	1
47	216564	CHAMBER, Type B	1
48	217904	ADJUSTER, Slack	2
49	†16T1439	ELBOW, Street, $\frac{3}{8}$ "	1
50	220636	COUPLING, Dummy	2

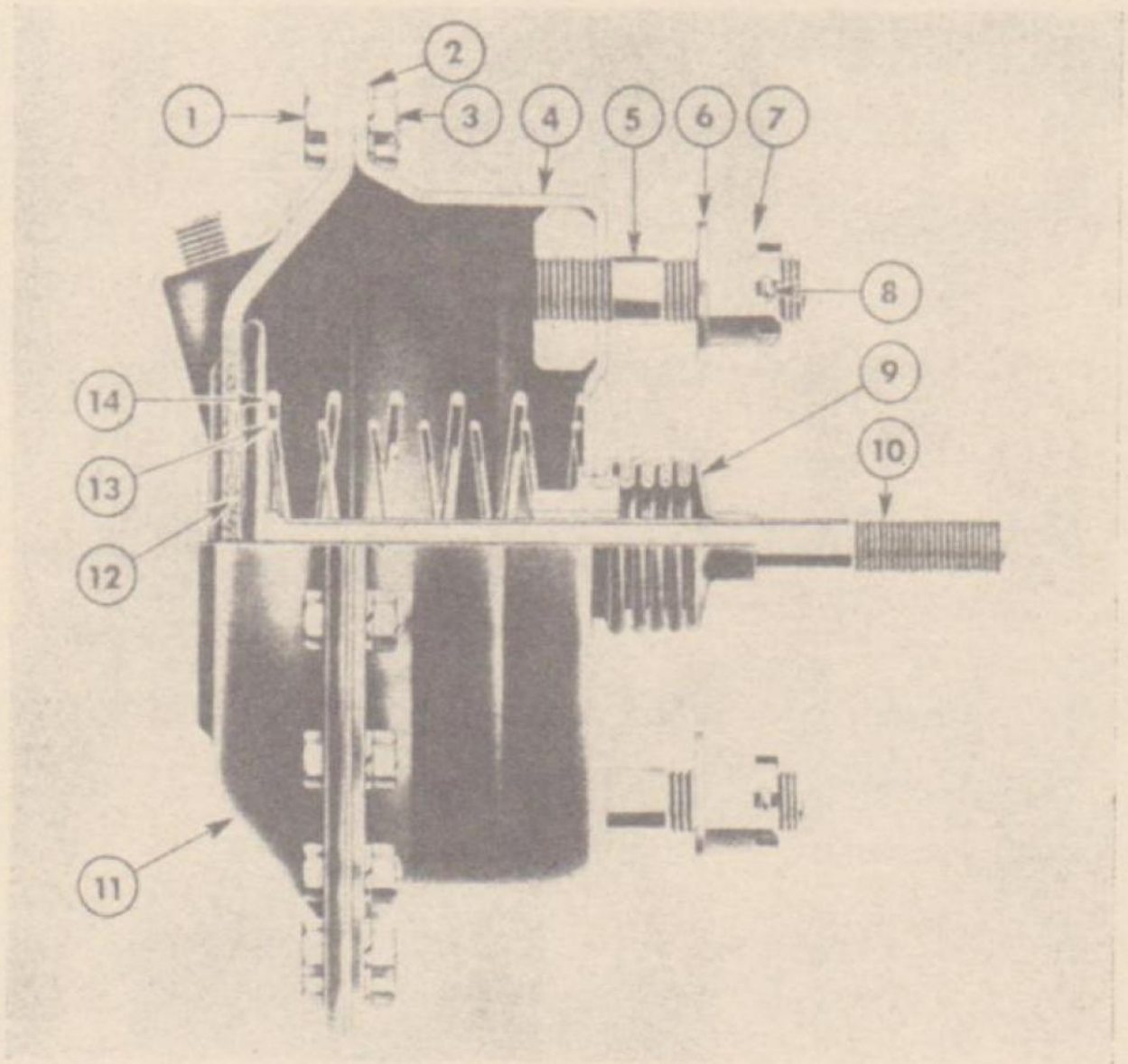
*Steel Products Brake Linkage Parts.

†Order tubing in stock lengths—not in cut lengths.



TYPE F BRAKE CHAMBER

<i>Key Number</i>	<i>Part Number</i>	<i>Description</i>	<i>Quantity</i>
		BENDIX-WESTINGHOUSE TYPE "F" BRAKE CHAMBER	
1	211370	BOLT, $\frac{3}{8}$ " x 1" SAE	38
2	211853	PLATE, pressure	2
3	200630	DIAPHRAGM	2
4	201504	LOCKWASHER, $\frac{3}{8}$ "	38
5	213088	SPRING	2
6	201777	LOCKWASHER, $\frac{5}{8}$ "	4
7	203007	NUT, Hex, $\frac{3}{8}$ " SAE	4
8	216797	YOKE	2
9	213081	PLATE, Non-pressure	2
10	203569	NUT, Hex, $\frac{3}{8}$ " SAE	38
11	204781	NUT, $\frac{5}{8}$ " SAE	2
12	210795	BOOT	2
13	211103	STUD	4
14	220894	ROD, Push	2

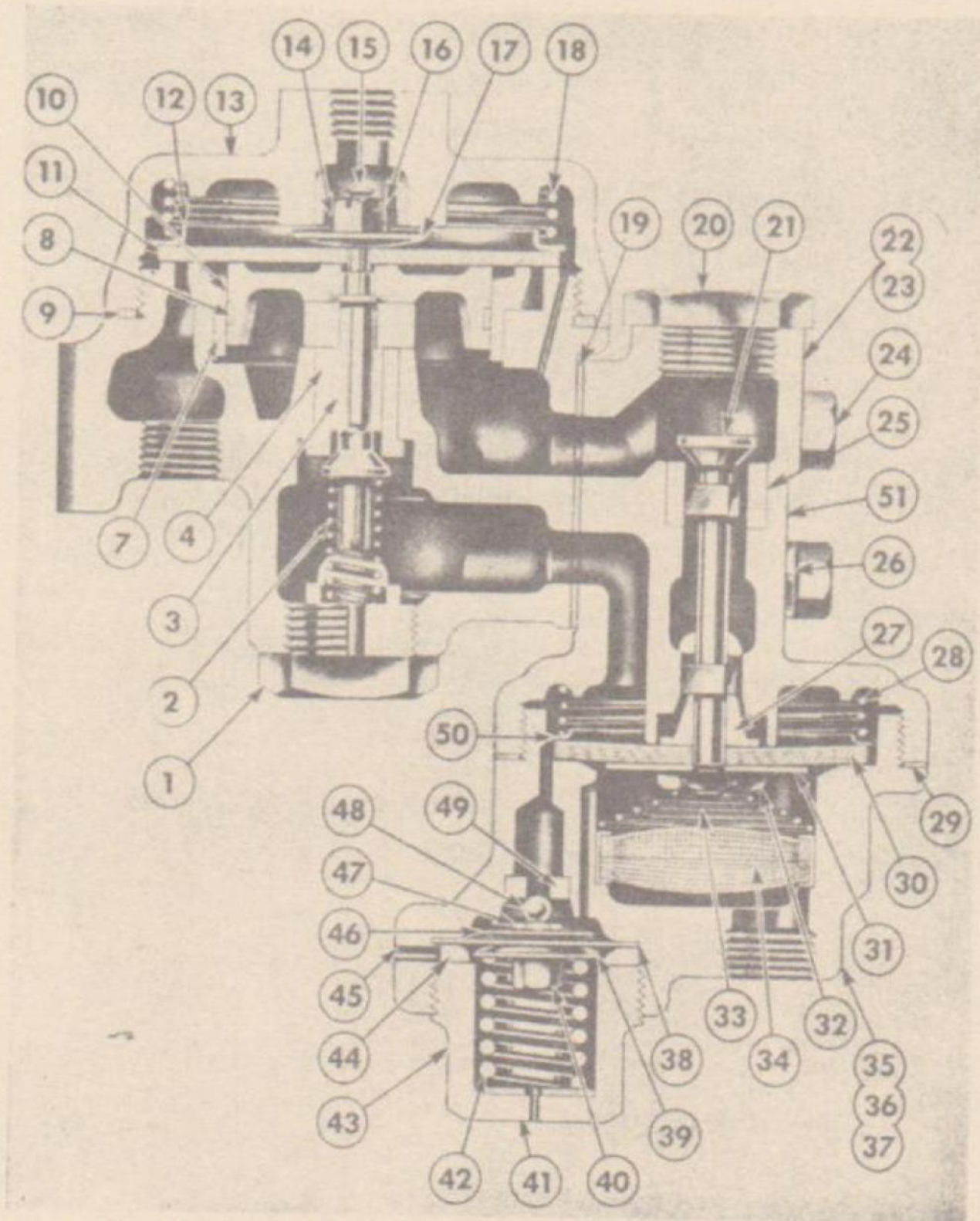


TYPE B BRAKE CHAMBER

SPARE PARTS LIST

Bendix-Westinghouse
Brake Operating Parts

<i>Key Number</i>	<i>Part Number</i>	<i>Description</i>	<i>Quantity</i>
1	203151	BOLT, Hex Head	36
2	201318	LOCKWASHER	36
3	203145	NUT, Hex	36
4	217269	PLATE, Non-pressure	2
5	202941	STUD	4
6	203173	LOCKWASHER	4
7	203172	NUT, Hex	4
8	203156	COTTER PIN	4
9	*201687	BOOT	2
10	216566	ROD, Push	2
11	202880	PLATE, Pressure	2
12	200001	DIAPHRAGM	2
13	212294	SPRING, Inner	2
14	212295	SPRING, Outer	2



EMERGENCY RELAY VALVE

SPARE PARTS LIST

Bendix-Westinghouse
Brake Operating Parts

<i>Key Number</i>	<i>Part Number</i>	<i>Description</i>	<i>Quantity</i>
		BENDIX-WESTINGHOUSE RELAY EMERGENCY VALVE	
1	202692	NUT, Cap	1
2	202699	SPRING	1
3	202693	VALVE, Intake	1
4	202690	SEAT, Valve	1
5	216071	BODY, Complete	1
6	204568	BODY	1
7	212135	BUSHING, Diaphragm Guide	1
8	202869	RING, Diaphragm Guide	1
9	211367	GASKET, Cover	1
10	204650	GUIDE, Diaphragm	1
11	202695	DIAPHRAGM	1
12	202697	SEAT, Spring	1
13	202691	COVER	1
14	203016	PIN, Cotter	1
15	204651	SCREW, Diaphragm	1
16	203227	NUT, Diaphragm	1
17	202696	WASHER, Diaphragm	1
18	202698	SPRING	1
19	202735	GASKET	1
20	202741	NUT, Cap	1
21	203379	STEM, Valve	1
22	215204	EMERGENCY, Assembly	1
23	202746	BODY, Emergency Valve	1
24	203388	BOLT, Hex Head	1
25	202736	SEAT, Valve	1
26	202982	WASHER, Lock	1
27	202743	SUPPORT, Diaphragm	1
28	202738	SPRING	1
29	202747	GASKET, Cover	1
30	202744	DIAPHRAGM	1
31	213387	WASHER	1
32	200029	NUT, Lock	1
33	204056	SPRING	1
34	204055	STRAINER	1
35	220305	DIAPHRAGM, Cover Assembly	1
36	220304	DIAPHRAGM, Cover Complete	1
37	213225	DIAPHRAGM, Cover Body	1
38	213227	DIAPHRAGM	1
39	211541	FOLLOWER, Lower Diaphragm	1
40	211542	NUT, Stem Lock	1
41	213229	SHIM	1
42	213228	SPRING	1
43	213230	CAP	1
44	213226	RING	1
45	213224	PIN	1
46	211595	FOLLOWER, Upper Diaphragm	1
47	211538	STEM	1
48	211539	BALL	1
49	211537	SEAT, Valve	1
50	202737	SEAT, Upper Spring	1
51	220829	VALVE, Emergency	1

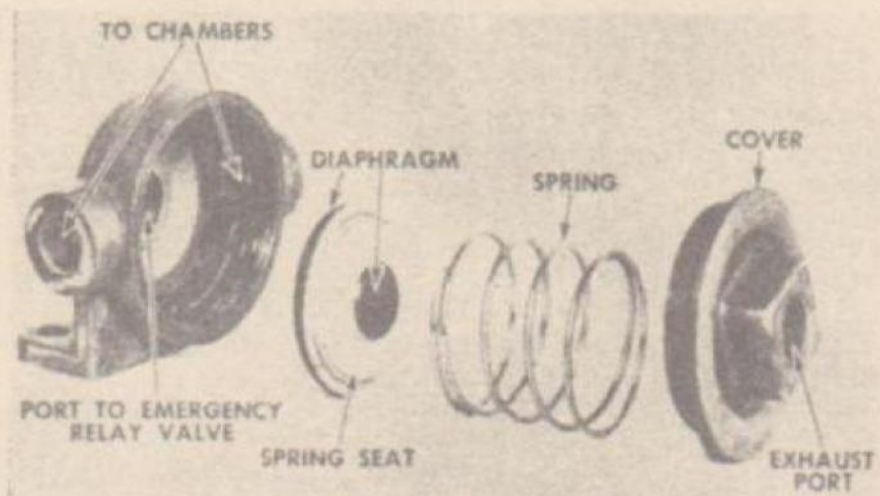
No. 5 includes No. 4, 6 and 7

No. 22 includes No. 23 and 25

No. 35 includes No. 36 to 49, incl.

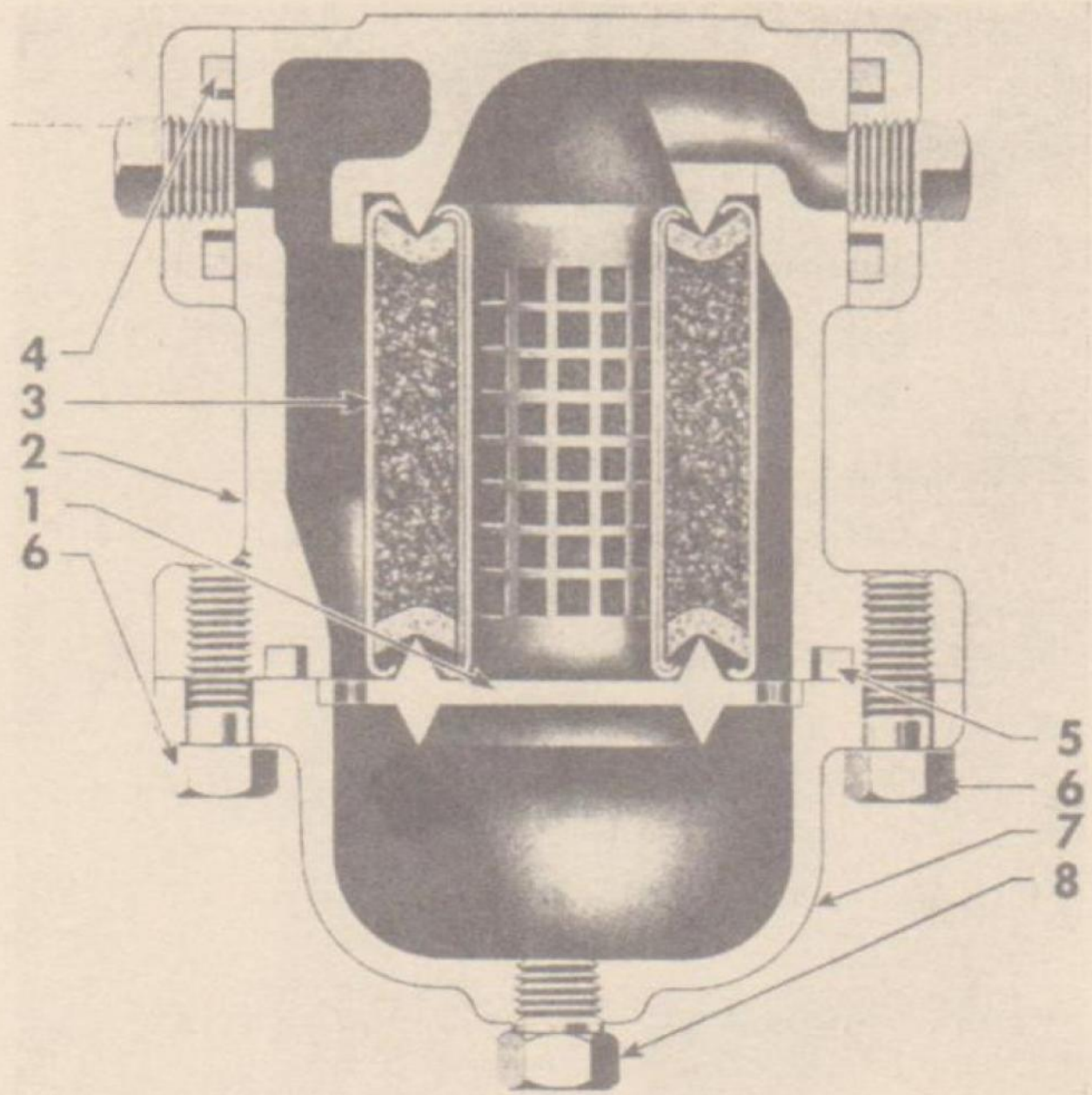
No. 36 includes No. 37, 45 and 49

No. 51 includes No. 20 to 50, incl.



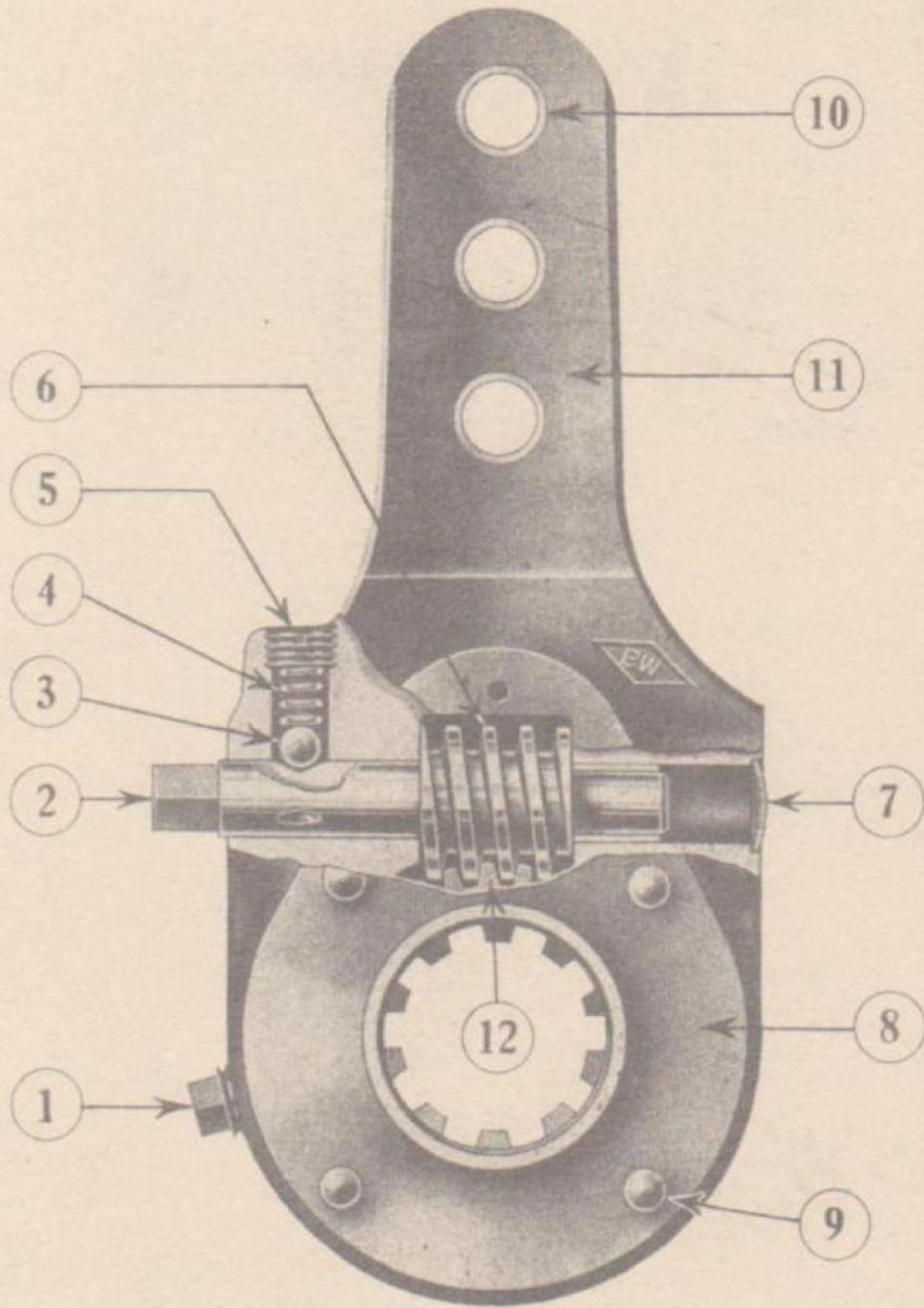
QUICK RELEASE VALVE

<i>Part Number</i>	<i>Description</i>	<i>Quantity</i>
	BENDIX-WESTINGHOUSE QUICK RELEASE VALVE	
205000	VALVE, Quick Release	1
204847	BODY	1
211379	DIAPHRAGM	1
202587	SEAT, Spring	1
202588	SPRING	1
211028	COVER	1
203328	DAMPNER	1



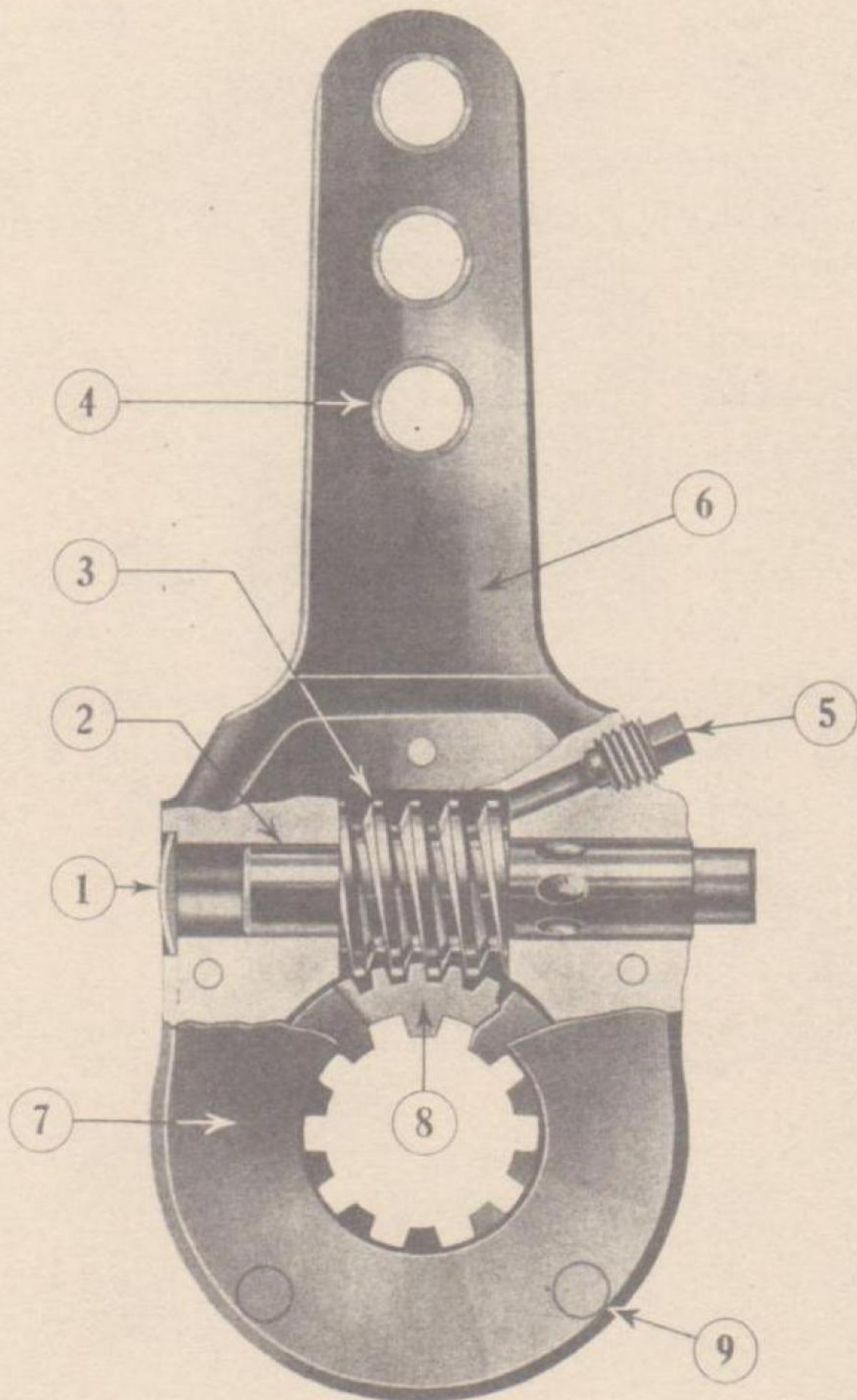
AIR STRAINER

<i>Key Number</i>	<i>Part Number</i>	<i>Description</i>	<i>Quantity</i>
		BENDIX-WESTINGHOUSE AIR STRAINER	
1	214171	SUPPORT, Strainer	2
2	214169	BODY	2
3	221053	STRAINER	2
4	214174	GASKET, Flange	4
5	214173	GASKET, Body	2
6	210897	BOLT, Hex-Hd.	4
7	214172	CHAMBER, Dirt	2
8	213530	PLUG, Pipe	2



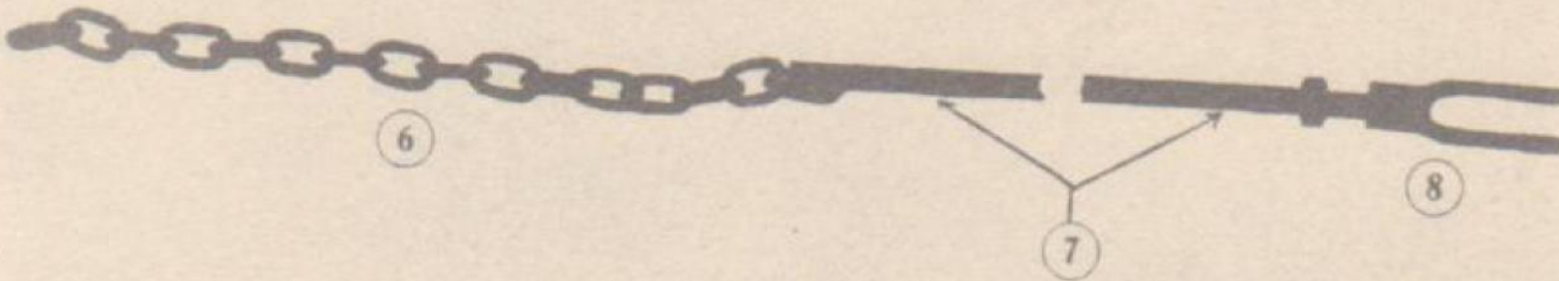
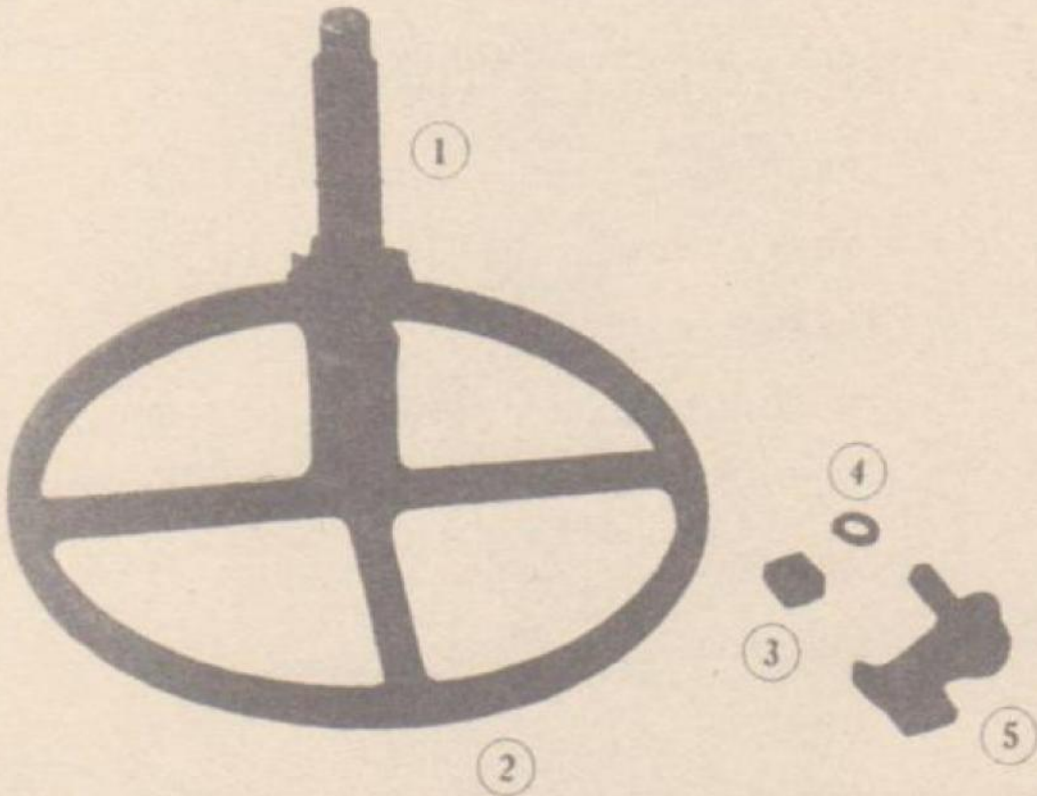
SLACK ADJUSTER TYPE K

<i>Key Number</i>	<i>Part Number</i>	<i>Description</i>	<i>Quantity</i>
		BENDIX-WESTINGHOUSE SLACK ADJUSTER TYPE "K"	
1	203680	PLUG, Pipe, $\frac{1}{8}$ "	2
2	212630	SHAFT, Worm	2
3	201327	BALL, Lock	2
4	212633	SPRING	2
5	201326	PLUG, Screw	2
6	212628	WORM	2
7	212357	PLUG, Welsh	2
8	212631	COVER	4
9	212632	RIVET	10
10	201225	BUSHING	6
11	212708	BODY	2
12	212699	GEAR, WORM	2

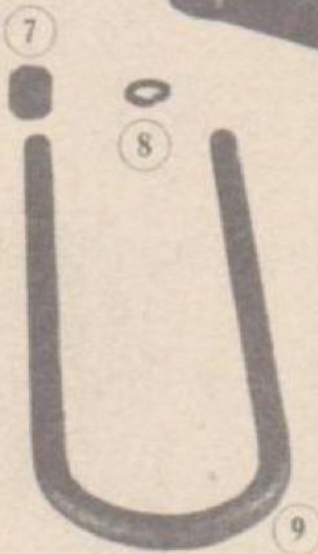
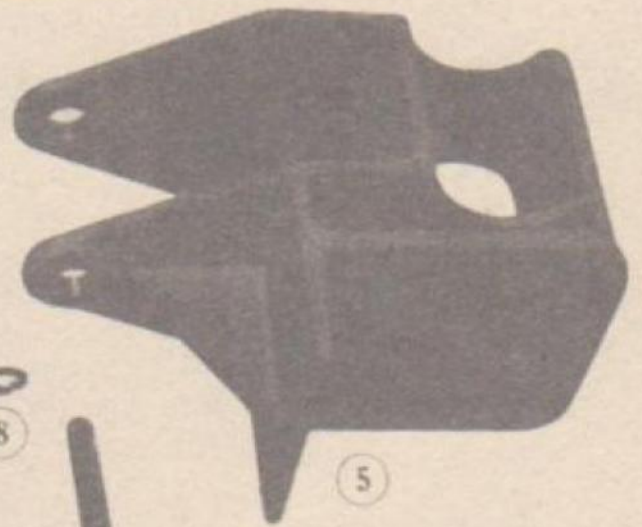
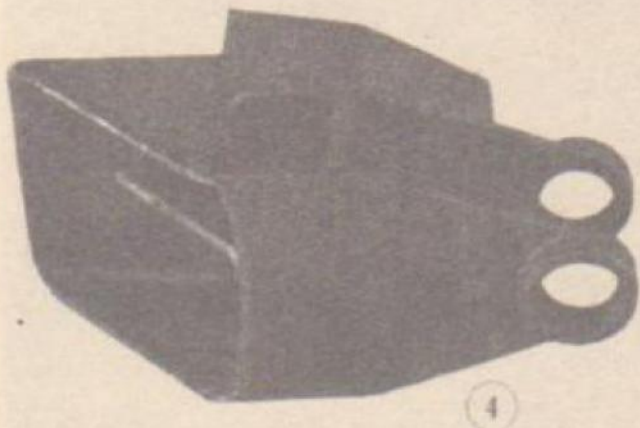
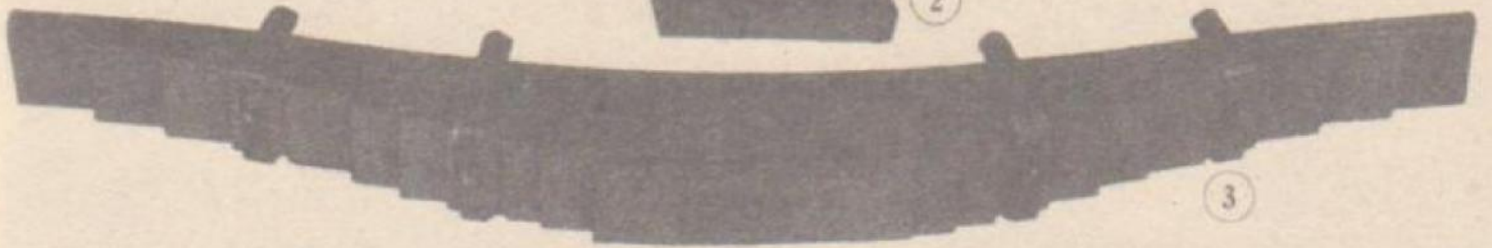
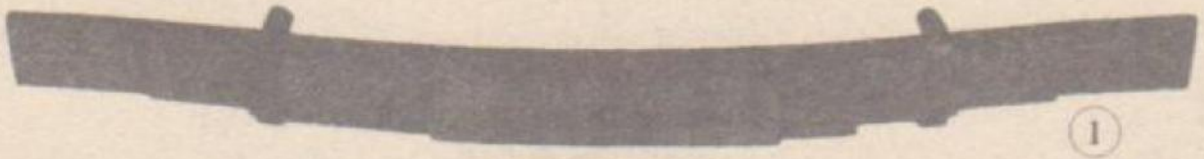


SLACK ADJUSTER TYPE RB

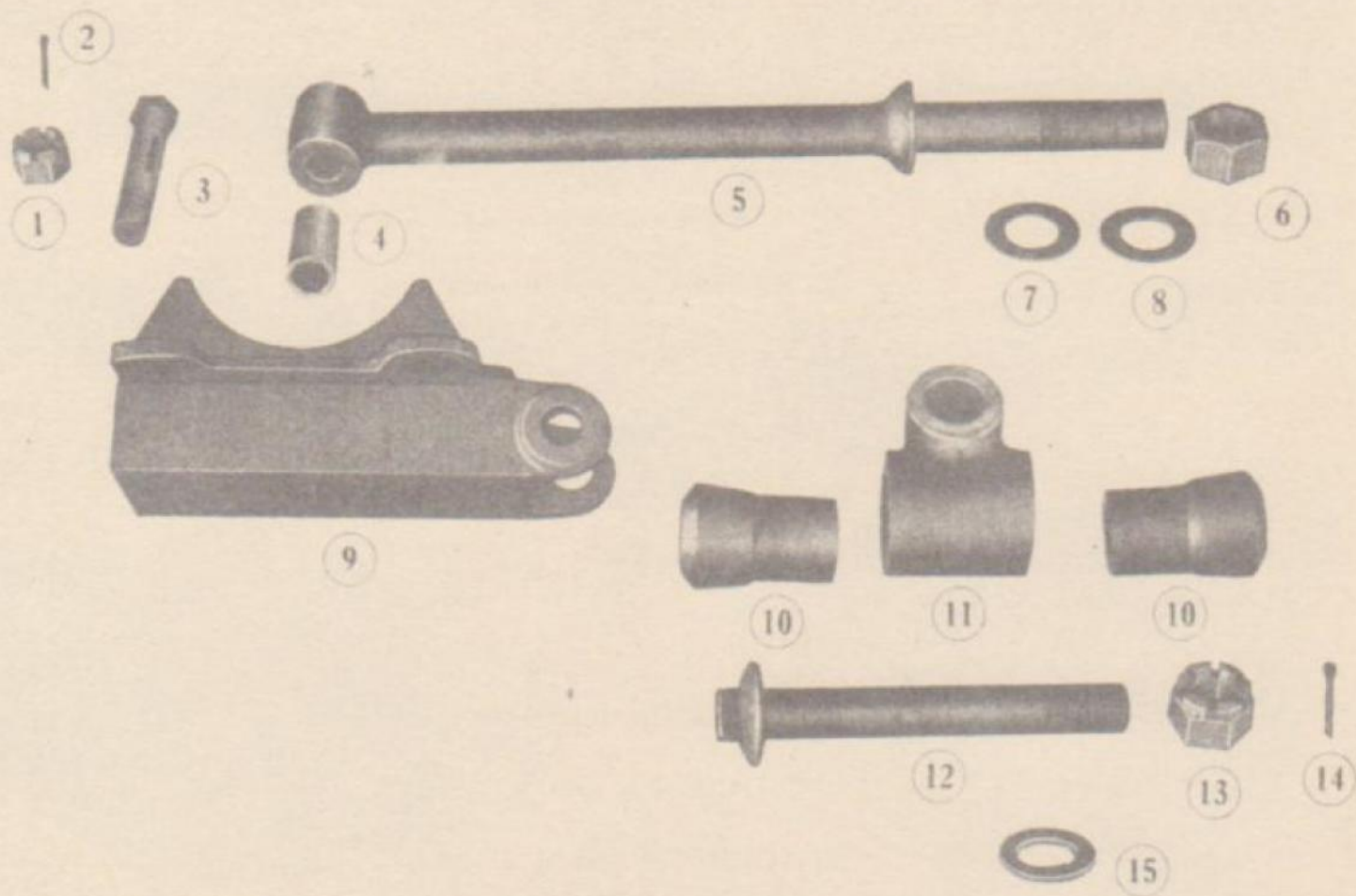
<i>Key Number</i>	<i>Part Number</i>	<i>Description</i>	<i>Quantity</i>
		BENDIX-WESTINGHOUSE SLACK ADJUSTER TYPE "RB"	
1	214050	PLUG, Welsh	2
2	214038	SHAFT, Worm	2
3	214037	WORM	2
4	211537	BUSHING	6
5	203680	PLUG, Pipe $\frac{1}{8}$ "	2
6	214071	BODY	2
7	214040	COVER	2
8	214036	GEAR, Worm	2
9	214041	RIVET	12
	212109	SPRING, Plunger	2
	212108	PLUNGER	2






<i>Key Number</i>	<i>Part Number</i>	<i>Description</i>	<i>Quantity</i>
1	PB-D	DRUM, Parking Brake	1
2	PB-1X	Parking Brake Wheel, Ratchet, and Shaft Assembly	1
3	PB-10	NUT, Pawl Bolt, $\frac{5}{8}$ " Std.	1
4	PB-10LW	LOCKWASHER, Pawl Bolt, $\frac{5}{8}$ "	1
5	PB-2	Parking Brake Pawl, Bolt and Washer Assembly, $\frac{5}{8}$ " x $2\frac{1}{2}$ "	1
6	PB-4X	CHAIN, Parking Brake	1
7	M-2	ROD, Parking Brake	1
8	PB-7	CLEVIS, Parking Brake	1

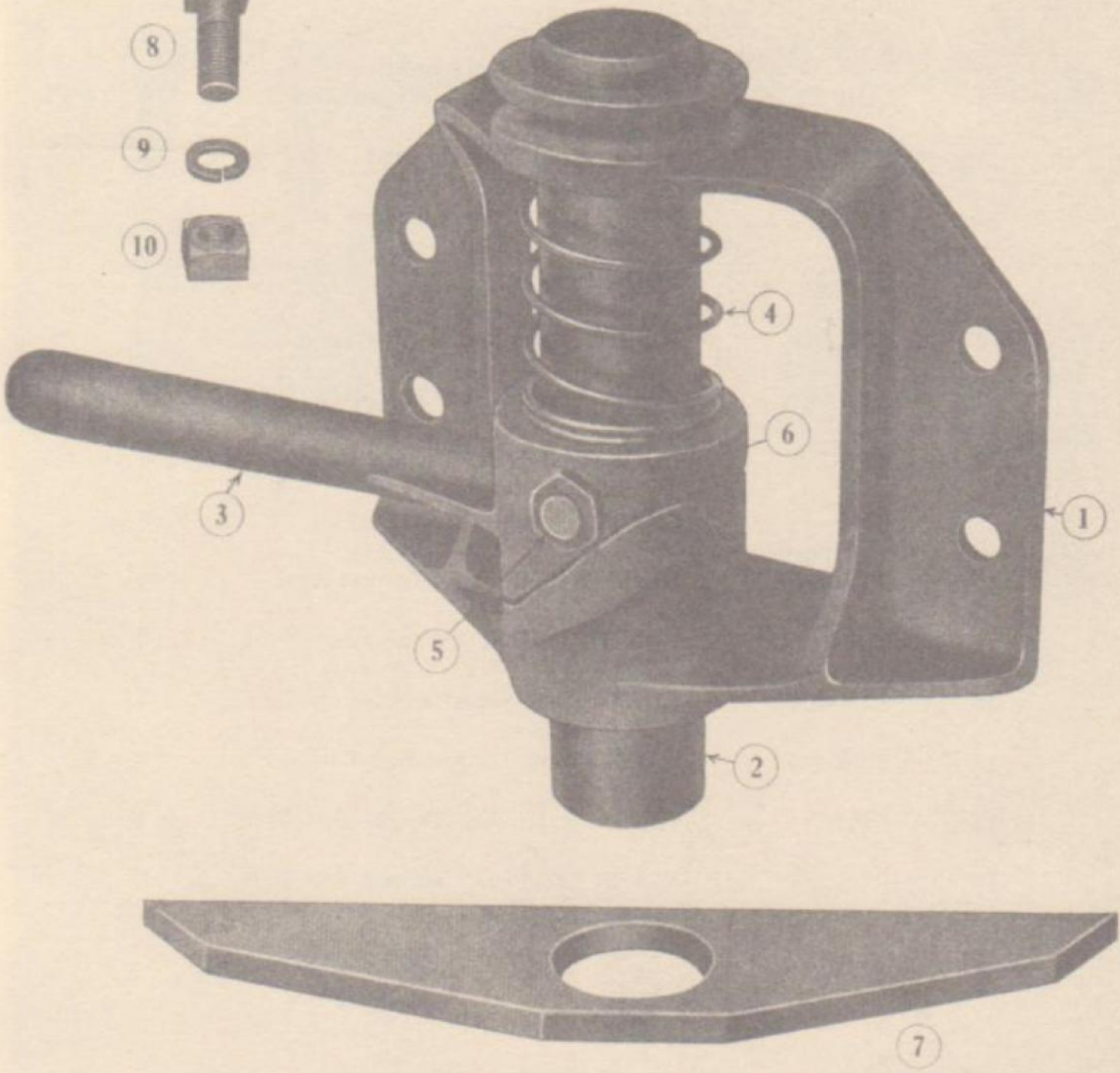


<i>Key Number</i>	<i>Part Number</i>	<i>Description</i>	<i>Quantity</i>
1	13131	SPRING, Helper	2
2	S-SP-1	SPACER, Spring	2
3	14341	SPRING, Main	2
4	H-4R	HANGER, Spring (Front)	2
5	H-9	HANGER, Spring (Rear)	2
6	P-5	PLATE, U-Bolt	2
7	SU-2	NUT, U-Bolt $\frac{7}{8}$ " SAE Hex high	8
8	SU-3	LOCKWASHER, U-Bolt $\frac{7}{8}$ "	8
9	SU-1S	U-BOLT	4
10	HTR-1	ROD, Rear Spring Hanger Tie	1
11	TRW-1	WASHER, Tie Rod $\frac{3}{4}$ "	2
12	TRS-1	SPACER, Tie Rod $\frac{3}{4}$ " Pipe	2
13	HTR-2	NUT, Tie Rod $\frac{3}{4}$ " SAE	2
14	TRL-1	LOCKWASHER, Tie Rod $\frac{3}{4}$ "	2

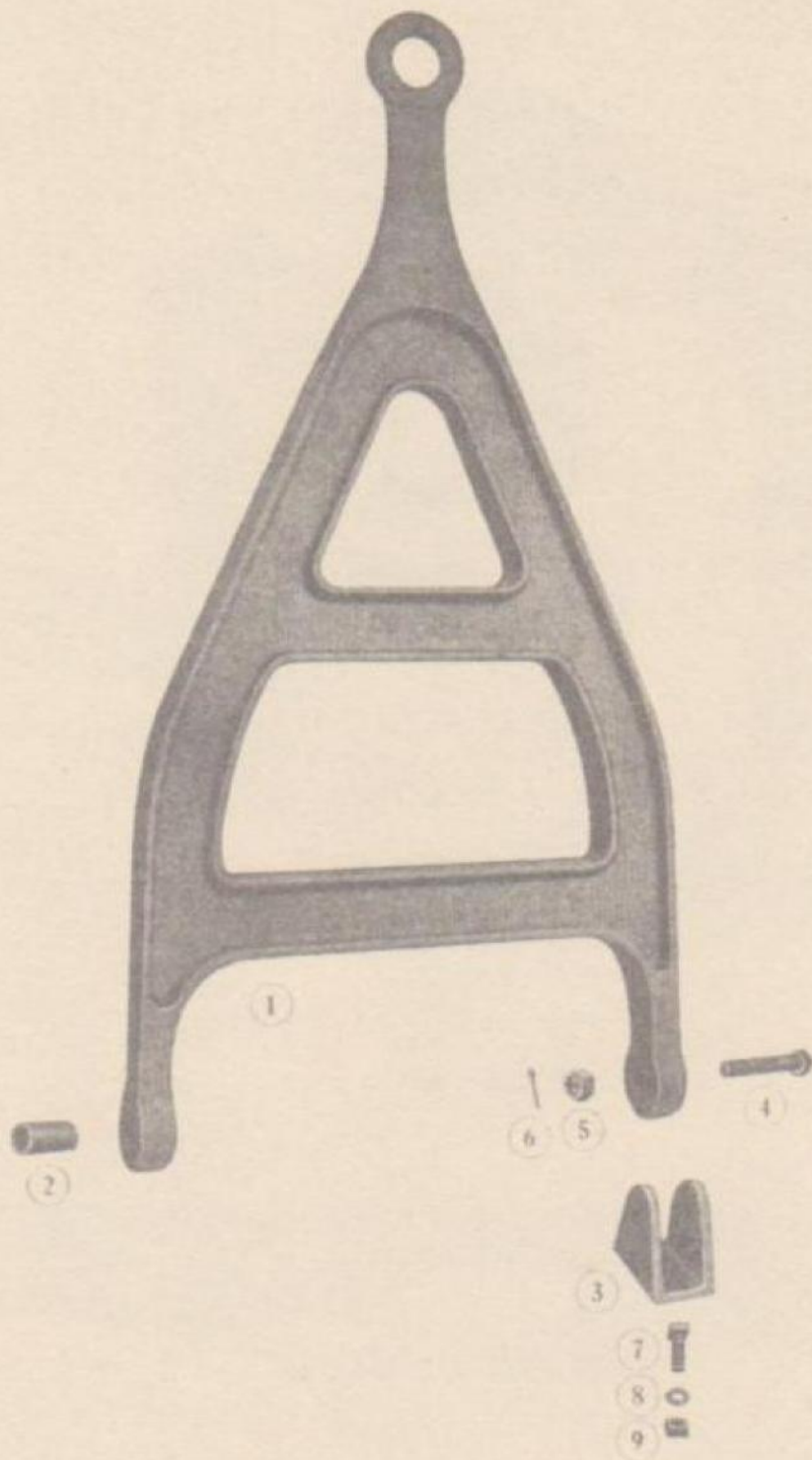


<i>Key Number</i>	<i>Part Number</i>	<i>Description</i>	<i>Quantity</i>
1	ST-7	NUT, Rear Torque Rod Bolt.....	2
2	CP-1	PIN, Cotter, Front Torque Rod Bolt.....	2
3	ST-6	BOLT, Rear Torque Rod.....	2
4	EF-350	BUSHING, Bronze, Torque Rod.....	2
5	STA-3	ROD, Torque.....	2
6	STA-3-1	NUT, Torque Rod Adjusting.....	2
7	STA-3-3	SHIM, Torque Rod Adjusting.....	14
8	STA-3-2	LOCKWASHER, Torque Rod.....	2
9	SF-5	SEAT, Spring.....	2
10	STA-3-5A	BUSHING, Rubber, Torque Rod.....	4
11	T-5	CONNECTION, Torque Rod Front.....	2
12	STA-3-4	BOLT, Torque Rod Front.....	2
13	STA-3-5	NUT, Front Torque Rod Bolt.....	2
14	CP-2	PIN, Cotter, Rear Torque Rod Bolt.....	2
15	STA-3-6	WASHER, Front Torque Rod Bolt.....	2

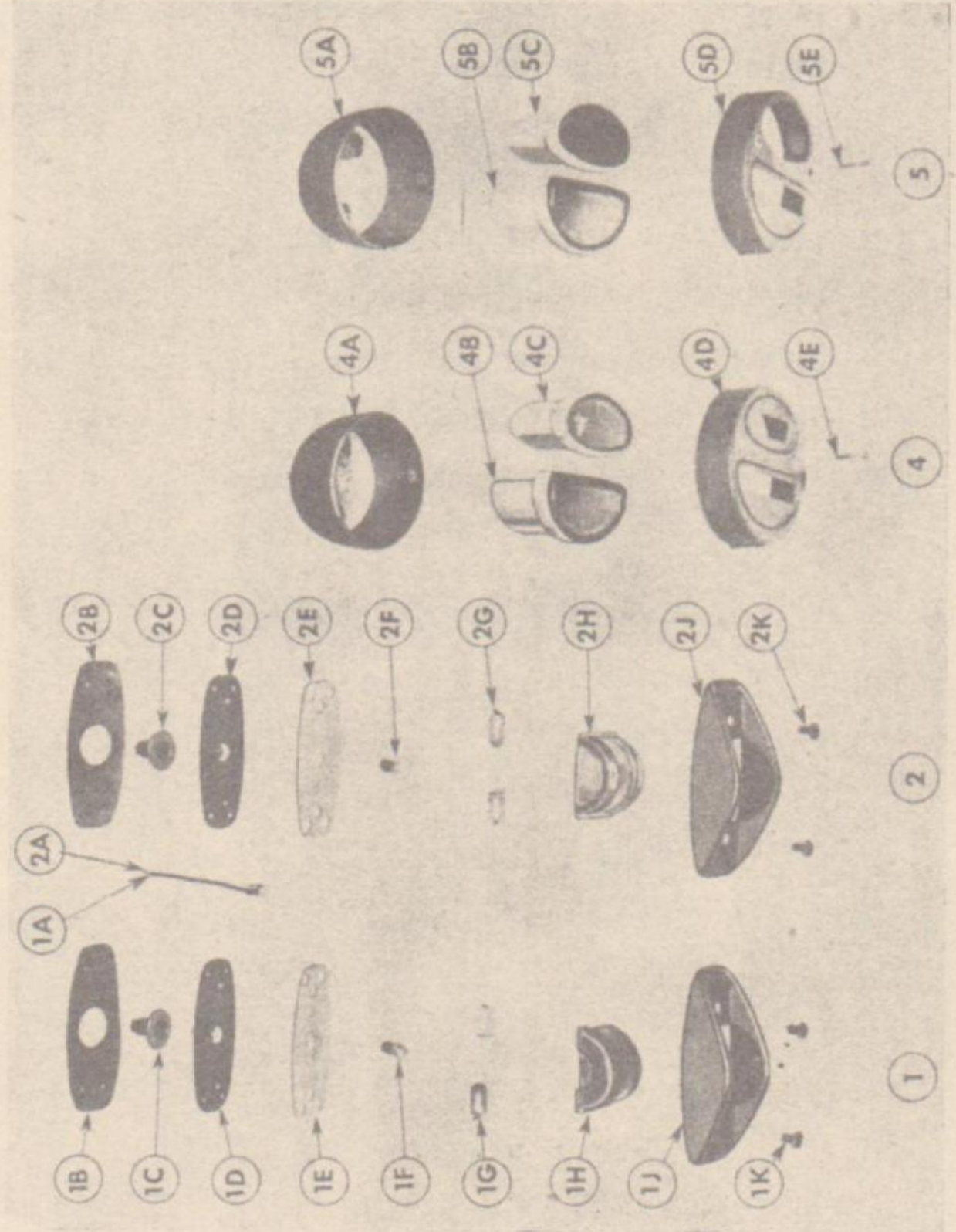
- 8 
- 9 
- 10 



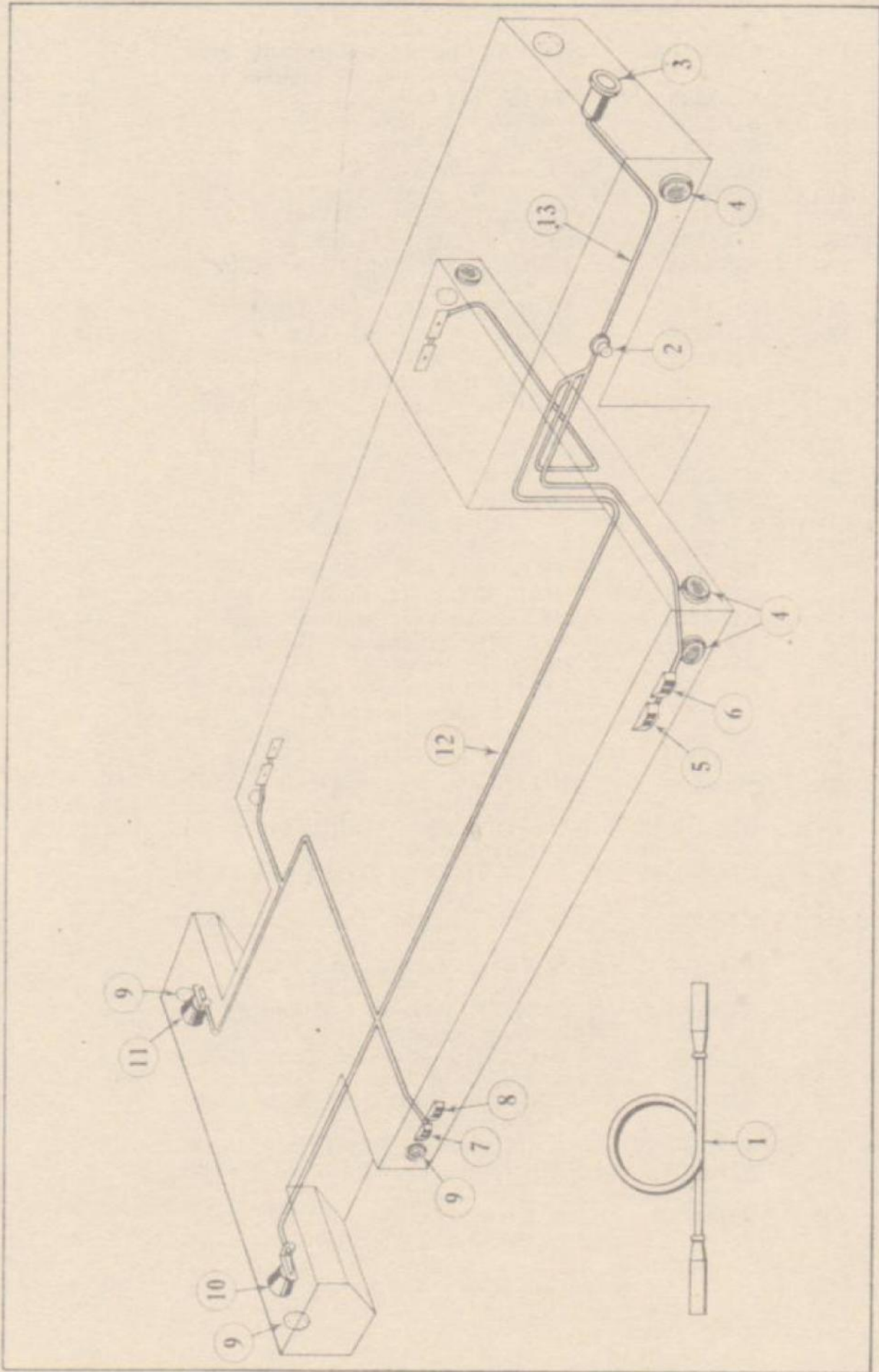
<i>Key Number</i>	<i>Part Number</i>	<i>Description</i>	<i>Quantity</i>
	FW2A	ASSEMBLY, Fifth Wheel Lock	1
1	F1011A	BODY	1
2	F1009	PIN	1
3	F1010	HANDLE	1
4	F1013	SPRING	1
5	16T2994	BOLT, Pin $\frac{1}{2}$ " x $3\frac{1}{4}$ " USS	1
6	16T2995	NUT, Pin Bolt $\frac{1}{2}$ " USS	1
7	P-28	PLATE, Lower	1
8	16T2996	BOLT, $\frac{1}{2}$ " x 1" USS	4
9	16T2948	LOCKWASHER, $\frac{1}{2}$ "	4
10	16T2995	NUT, $\frac{1}{2}$ " USS	4



<i>Key Number</i>	<i>Part Number</i>	<i>Description</i>	<i>Quantity</i>
1	DB101	DRAWBAR	1
2	DB-1B	BUSHING, Drawbar	2
3	DB-1F	FLANGE, Drawbar mounting	2
4	ST-6	BOLT, Drawbar Hinge	2
5	ST-7	NUT, Drawbar Hinge Bolt	2
6	CP-2	COTTER PIN, $\frac{1}{8}$ " x $1\frac{1}{2}$ "	2
7	16T3007	BOLT, $\frac{3}{4}$ " x 2" USS	4
8	16T2957	LOCKWASHER, $\frac{3}{4}$ "	4
9	16T3008	NUT, $\frac{3}{4}$ " USS	4

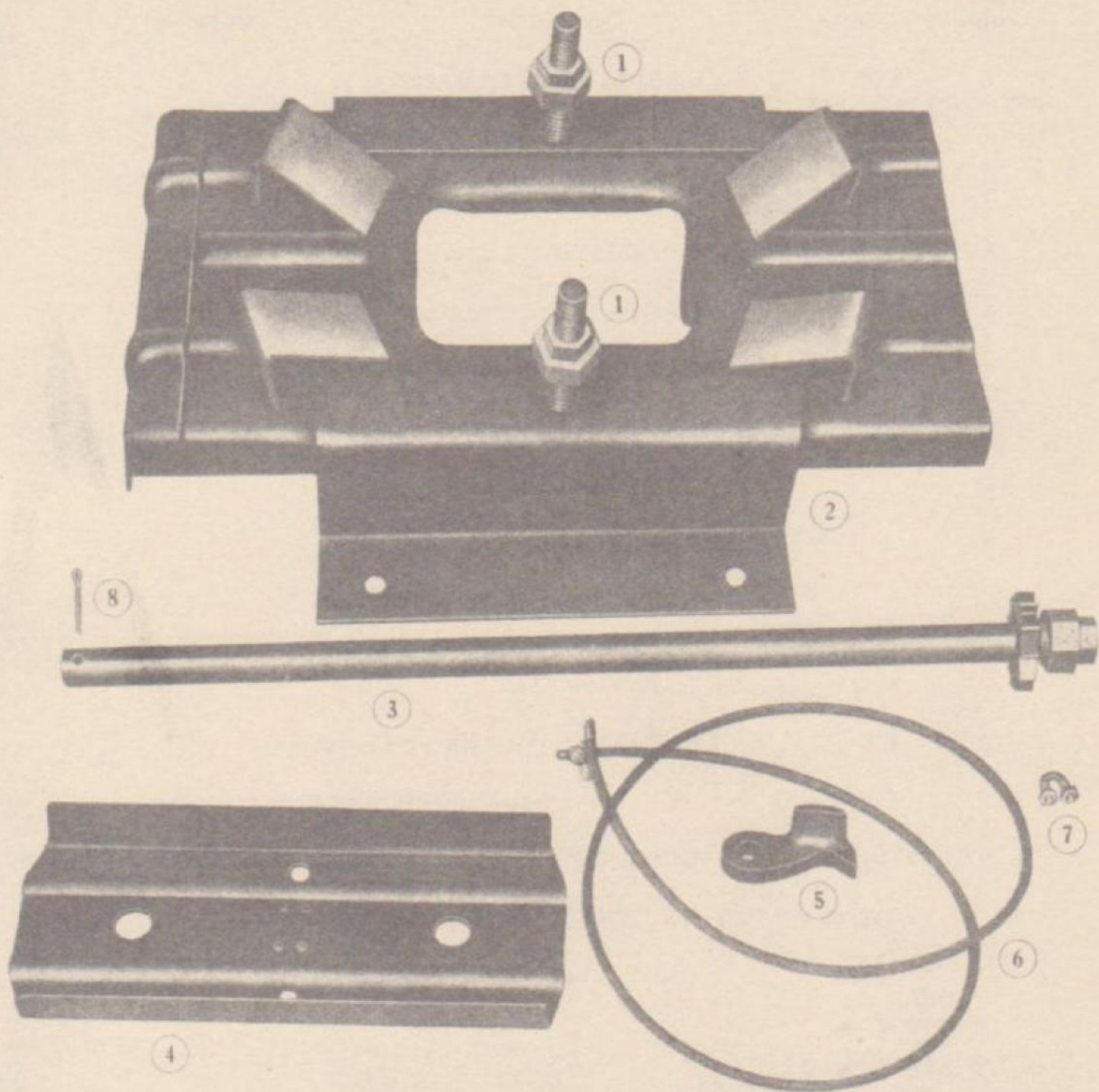


<i>Key Number</i>	<i>Part Number</i>	<i>Description</i>	<i>Quantity</i>
1	KD541-B06	LIGHT, Clearance, Blackout, Blue Lens, Assembly Complete	2
1A	KD-7136	WIRE, Pig-tail	2
1B	KD-9526	GASKET, Rubber—only	2
1C	KD-4684	NIPPLE, Rubber	2
1D	KD-9526	PLATE, Backing	2
1E	KD-2878	GASKET, Lexide	2
1F	No. 55	BULB, 1½ C.P., 6-8 Volt	2
1G	KD-1996	CLIP, Retaining, Lens	4
1H	KD-4446	LENS, and KD-8014 blue Filter with Casing, assembly	2
1J	KD-1135	HOUSING, Clearance Light	2
1K	KD-6777	SCREW, Brass, ¼" SAE	4
1	KD541-B-6	LIGHT, Clearance, Blackout Red Lens, Assembly complete	2
2	KD541-OD6	LIGHT, Clearance, Amber, Assembly—complete	2
2A	KD-7136	WIRE, Pig-tail	2
2B	KD-9526	GASKET, Rubber—only	2
2C	KD-4684	NIPPLE, Rubber	2
2D	KD-9526	PLATE, Backing	2
2E	KD-2878	GASKET, Lexide	2
2F	No. 55	BULB, 1½ C.P., 6-8 Volt	2
2G	KD-1996	CLIP, Retaining, Lens	4
2H	KD-4393	LENS, Amber, Clearance Light	2
2J	KD-1135	HOUSING, Clearance Light	2
2K	KD-6777	SCREW, Brass, ¼" SAE	4
2	KD541-OD6	LIGHT, Clearance, Red Lens, Assembly—complete	2
4	KD951-K-6	LIGHT, Blackout Tail and Blackout Stop, assembly comp.	2
4A	KD-8045	HOUSING, Blackout Tail and Blackout Stop Light	2
4B	KD8040-6V	UNIT, Blackout Tail Light, assembly, lower	2
4C	KD8041-6V	UNIT, Blackout Stop Light, assembly, upper	2
4D	KD2460	DOOR, Blackout Tail and Blackout Stop Light	2
4E	KD 6798	SCREW, Machine, Rd.-hd. No. 8 x 1¼" SAE	4
5	KD950-I-6	LIGHT, Blackout Tail and Service Stop, assembly	1
5A	KD8045	HOUSING, Blackout Tail and Service, Stop Light	1
5B	KD8040-6V	UNIT, Blackout Tail Light, assembly, lower	1
5C	KD8039-6V	UNIT, Service Stop Light, upper	1
5D	KD2461	DOOR, Blackout Tail and Service Stop Light	1
5E	KD6798	SCREW, Machine, Rd.-hd., No. 8 x 1¼" SAE	2

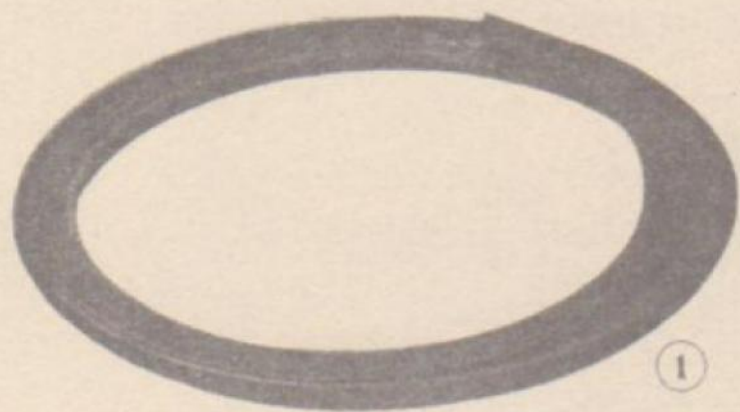


<i>Key Number</i>	<i>Part Number</i>	<i>Description</i>	<i>Quantity</i>
1	3398	CABLE, Jumper (Warner)	1
2	2480	SWITCH, Blackout (Cole Hersee)	1
3	3529	SOCKET, Assembly (Warner)	1
4		*REFLECTOR, Amber	
5		*LAMP, Amber Clearance	
6		*LAMP, Blue Blackout	
7		*LAMP, Red Clearance	
8		*LAMP, Red Blackout	
9		*REFLECTOR, Red	
10		*LAMP, Blackout Stop and Tail	
11		*LAMP, Service Stop and Tail and Blackout Tail	
12	LW-2L	SET, Light Wire Harness, long	1
13	LW-1S	SET, Light Wire Harness, short	1
	G-1204	GROMMET	14
	G-1142	GROMMET	1
	10824	CLIP, Wire	23

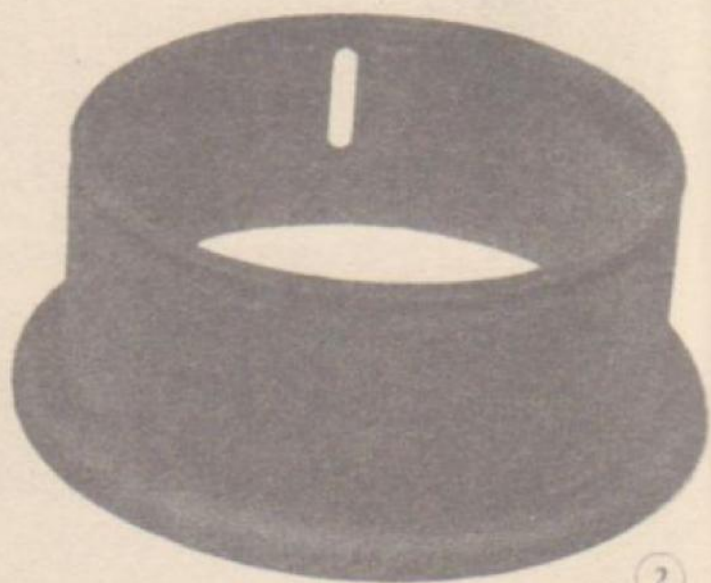
*See Page 131



<i>Key Number</i>	<i>Part Number</i>	<i>Description</i>	<i>Quantity</i>
	FRA-T12-15SP	TIRE CARRIER ASSEMBLY.....	1
1	TC-11	NUT, Tire Carrier.....	2
2	TC-1FR	FRAME, Tire Carrier.....	1
3	TC-2	SHAFT, Cross, Tire Carrier.....	1
4	TC-3	CLAMP, Tire Carrier.....	1
5	TC-4	PAWL.....	1
6	TC-5	CABLE.....	1
7	TC-6	U-CLAMP AND NUT.....	2
8	16T2982	COTTER PIN $\frac{1}{8}$ " x $1\frac{1}{2}$ ".....	1



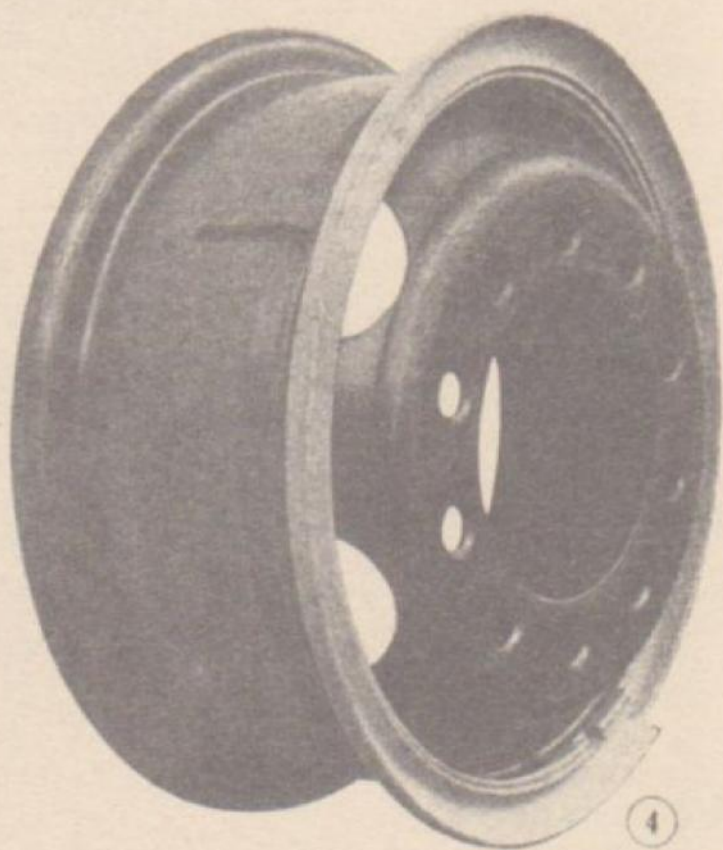
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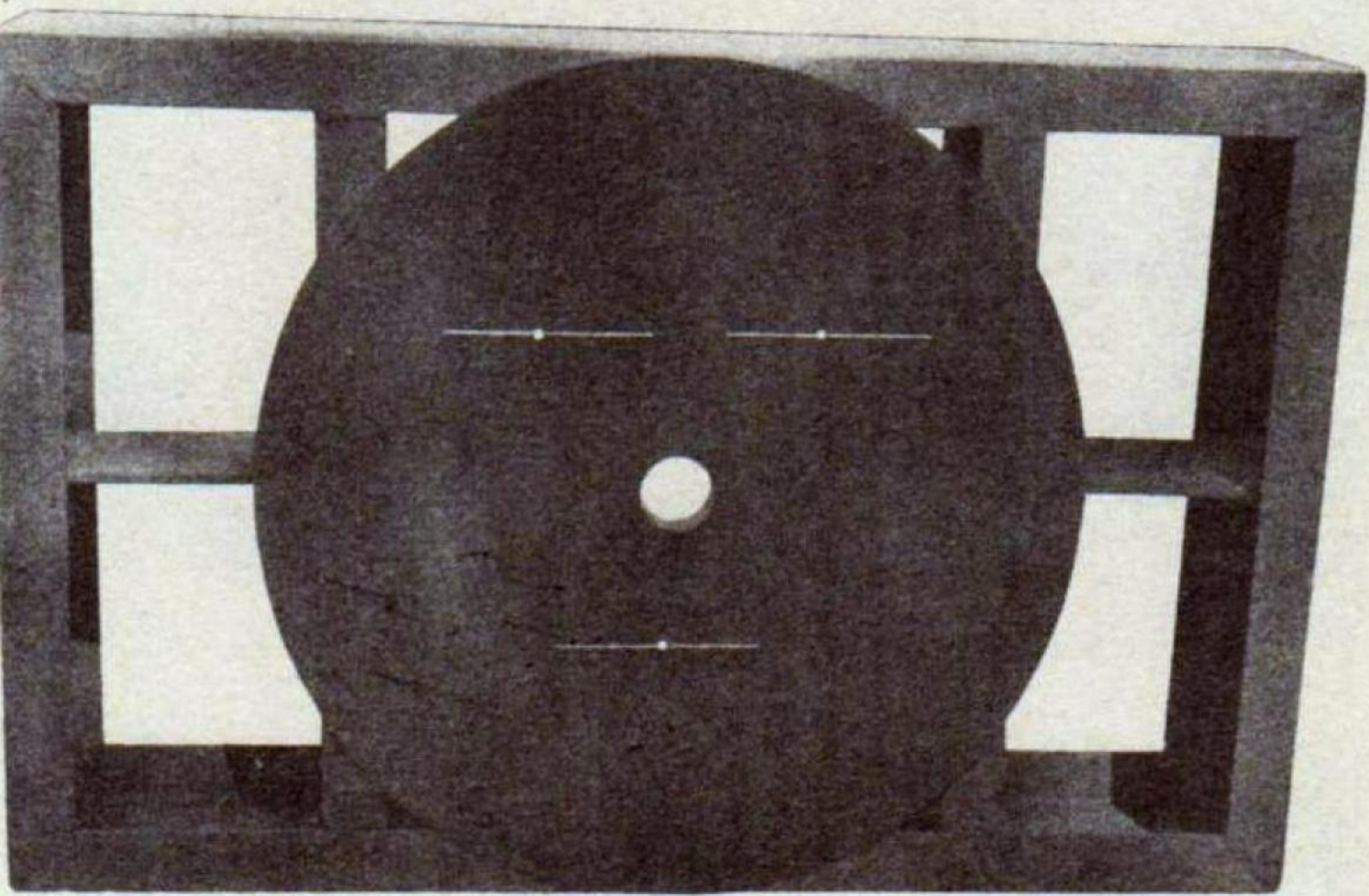
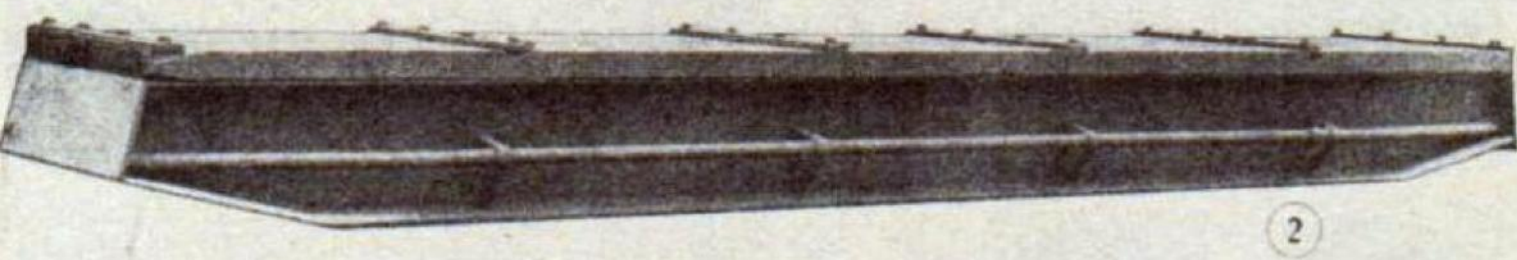
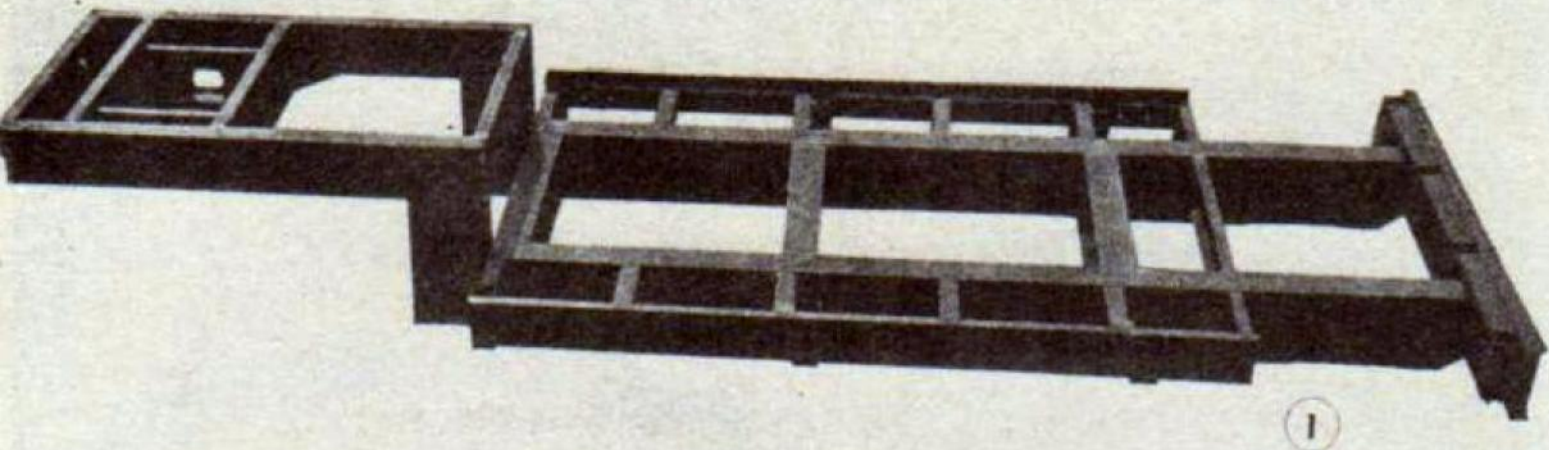


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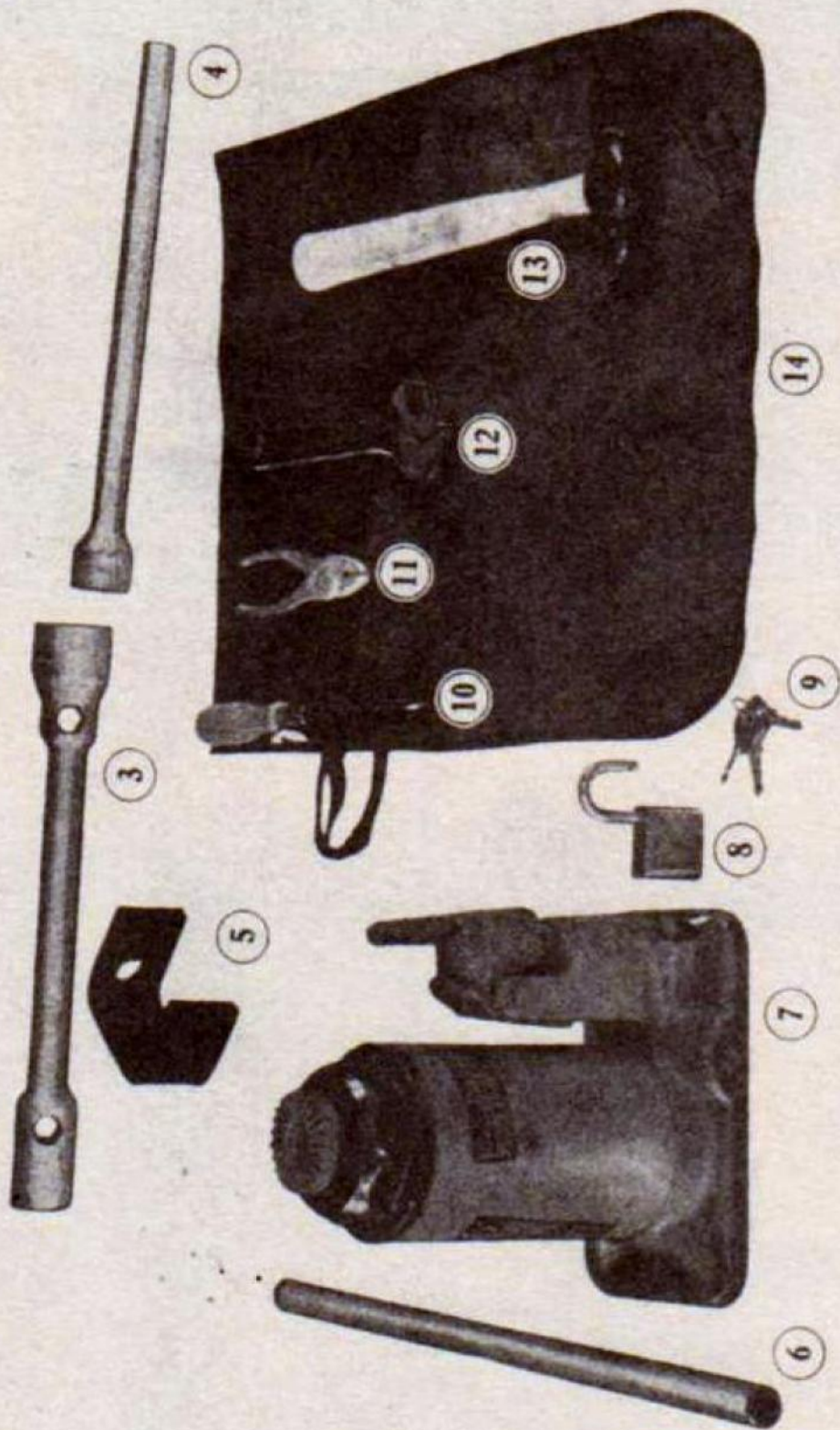


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<i>Key Number</i>	<i>Part Number</i>	<i>Description</i>	<i>Quantity</i>
1	SR96R	RING, Split, 15 x 7 Rim	9
2	96R-1X	RIM, Demountable, with Ring 15 x 7	9
3	SB-78F34	SPACER, Rim (15 x 3 $\frac{3}{8}$ ")	4
4	44470-D1	WHEEL, Demountable, 20 x 8	4
	(BUDD)		



<i>Key Number</i>	<i>Part Number</i>	<i>Description</i>	<i>Quantity</i>
1	AF-101	FRAME, Main Trailer	1
2	LR-2	RAMP, Loading	2
3	DF-102	FRAME, Dolly Truck	1



SPARE PARTS LIST**Tools**

<i>Key Number</i>	<i>Part Number</i>	<i>Description</i>	<i>Quantity</i>
3	1150-A	UNIVERSAL Rim Wrench (Herbrand)	1
4	1150-C	LEVERAGE BAR (Herbrand)	1
5	SW-5F	SPINDLE NUT WRENCH	1
6 & 7	12-H-J	SIMPLEX HYDRAULIC JACK and Handle—12 ton	1
8 & 9	773	YALE LOCK with keys	1
10	TK-5	10" SCREW DRIVER	1
11	TK-4	Pair 6" Combination Pliers	1
12	TK-2	Crescent Type Wrench 10"	1
13	TK-3	1 lb. Ball Pein Hammer	1
14	TKB-2	Tool Kit Bag	1

<i>Part Number</i>	<i>Description</i>	<i>Quantity</i>
	TIRE, Pneumatic, 8:25 x 15	9
	TUBE, inner, 8:25 x 15, Stem No. TR-179	5
	TUBE, inner, 8:25 x 15, Stem No. TR-177E12	4
	TIRE, Pneumatic, 9:00 x 20	4
	TUBE, inner, 9:00 x 20, Stem No. TR-175E12	4
	FLAP, 20" Rim	4
M-24	NAME PLATE	1
16T2842	SCREW, Drive, No. 6 x $\frac{5}{8}$ " U Brass Plated	8
1610	FITTING, Zerk $\frac{1}{8}$ "	27
1612	FITTING, 67 $\frac{1}{2}$ °	4
TB-100	BOX, Tool	1

<i>Part No.</i>	<i>Description</i>	<i>Quantity</i>
16T2954	LOCKWASHER, $\frac{5}{8}$ "	16
16T2955	CUT WASHER, $\frac{5}{8}$ "	5
16T2956	NUT, $\frac{3}{4}$ " SAE	2
16T2957	LOCKWASHER, $\frac{3}{4}$ "	22
16T2958	NUT, $\frac{7}{8}$ " SAE Castle	4
16T2960	PIN, Cotter, $\frac{1}{8}$ " x 1"	18
16T2962	WASHER, $\frac{1}{2}$ " Plain	1
16T2963	BOLT, Parking Brake Drum, $\frac{3}{8}$ " x $2\frac{1}{4}$ " Carriage	1
16T2964	NUT, $\frac{3}{8}$ " USS	9
16T2965	LOCKWASHER, $\frac{3}{8}$ "	15
16T2966	NUT, $\frac{3}{8}$ " USS	6
16T2967	BOLT, $\frac{3}{8}$ " x $\frac{3}{4}$ " Rd. Head Stove USS	57
16T2968	NUT, $\frac{3}{8}$ " USS	57
16T2970	BOLT, Sq. Head, $\frac{3}{8}$ " x 6" USS	2
16T2972	BOLT, $\frac{3}{8}$ " x 1" USS	4
16T2973	NUT, Hex 1"-14 Spec. SAE Thin	2
16T2974	BOLT, $\frac{3}{16}$ " x $\frac{3}{4}$ " SAE	2
16T2975	NUT, $\frac{3}{16}$ " SAE	2
16T2985	NUT, $\frac{1}{4}$ " SAE	5
16T2988	CAPSCREW, Hex Head, $\frac{1}{4}$ " x 1" SAE	2
16T2989	CAPSCREW, Hex Head, $\frac{1}{4}$ " x $\frac{3}{4}$ " SAE	2
16T2990	LOCKWASHER, $\frac{1}{4}$ " SAE	4
16T2991	BOLT, Rd. Hd. Stove, $\frac{1}{4}$ " x $\frac{3}{4}$ " USS	32
16T2992	NUT, $\frac{1}{4}$ " USS	36
16T2993	LOCKWASHER, $\frac{1}{4}$ "	36
16T2994	BOLT, $\frac{1}{2}$ " x $3\frac{1}{4}$ " USS	1
16T2995	NUT, $\frac{1}{2}$ " USS	1
16T2996	BOLT, $\frac{1}{2}$ " x 1" SAE	4
16T2999	BOLT, $\frac{3}{8}$ " x 2" USS	1
16T3000	WASHER, Flat, $\frac{3}{8}$ "	4
16T3001	BOLT, $\frac{1}{16}$ " x $\frac{3}{4}$ " Hex USS	12
16T3002	LOCKWASHER, $\frac{1}{16}$ "	12
16T3003	COTTER PIN, $\frac{1}{4}$ " x $2\frac{1}{2}$ "	4
16T3004	BOLT, Hex, $\frac{1}{2}$ " x $3\frac{1}{2}$ " SAE	48

NUMERICAL PARTS LIST

<i>Part No.</i>	<i>Page No.</i>	<i>Price</i>	<i>Part No.</i>	<i>Page No.</i>	<i>Price</i>
AF-101	139	\$595.00	F-733-1	99	\$.65
B-283	99	.10	F-802-1	103	1.50
B-614-2	103	.38	F-918	99	1.60
B-615-4	99	.18	F-1009	127	2.55
B-620	99	2.10	F-1010	127	6.08
B-622-1	99 & 103	.25	F-1011A	127	9.70
B-624-1	103	1.80	F-1013	127	.45
B-652	99	2.60	FRA-T-12-15SP	135	16.00
B-778	103	.38	FW-2A	127	12.00
B-862-1	103	7.00	G-1142	133	.04
B-863A-1	103	4.10	G-1204	133	.04
B-866	103	.40	H-4R	123	10.22
B-867	103	3.40	H-9	123	7.82
B-875	103	1.50	HC-2	101	1.25
B-981	99	.60	HC-3N	101	.04
B-1021	99	.14	HTR-1	123	1.00
B-1039-6	99	2.70	HTR-2	123	.08
B-1044-1	99	7.30	KP-1	105	6.50
B-1045-3	99	10.60	KD-541-B-6	131	3.00
B-1045-4	99	10.60	KD-541-BO-6	131	3.00
B-1048	99	.60	KD-541-OD-6	131	3.00
B-1052	99	.25	KD-950-1-6	131	5.10
B-1053	99	1.00	KD-951-K-6	131	5.10
B-1054	99 & 103	.12	KD-1135	131	.50
B-1055	99	1.28	KD-1996	131	.06
B-1056	99	.20	KD-2460	131	.25
B-1062-5	99	6.00	KD-2461	131	.25
B-1063-1	99	4.50	KD-2878	131	.06
B-1066-2	99	9.30	KD-4393	131	.30
B-1120-3	99	5.80	KD-4446	131	.80
B-1164-1	99	28.40	KD-4684	131	.12
B-1165	103	.66	KD-6777	131	.06
B-1174-1	103	5.25	KD-6798	131	.03
B-1179-1	103	8.10	KD-7136	131	.12
B-1180	103	.80	KD-8039-6V	131	1.00
BK-10183	105	.60	KD-8040-6V	131	1.00
BW-101-M	105	.38	KD-8041-6V	131	1.00
CP-1	125	.02	KD-8045	131	.50
CP-2	125 & 129	.02	KD-9526	131	.25
CS-1-9	99	.70	LR-2	139	68.00
DB-1B	129	.58	LW-2L	133	4.90
DB-1F	129	3.10	LW-1S	133	.60
DB-2F	129	.12	M-2	105 & 121	1.30
DB-8-X	99	.08	M-24	142	1.00
DB-9-X	99	.02	M-29	142	.02
DB-101	129	60.10	P-5	123	2.34
DF-102	139	81.00	P-28	127	.50
EF-350	125	.62	PB-1X	121	5.00
F-219-4	103	.50	PB-2	121	.60
F-732-1	99	1.40	PB-4X	121	1.30

NUMERICAL PARTS LIST—Continued

<i>Part No.</i>	<i>Page No.</i>	<i>Price</i>	<i>Part No.</i>	<i>Page No.</i>	<i>Price</i>
PB-5	105	\$ 1.60	W-244	99	\$.08
PB-7	121	.35	W-292-2	99	29.80
PB-10	121	.02	X-1-115	103	.75
PB-10LW	121	.03	X-1-207	99	.06
PB-D	121	.30	X-1-209	99	.10
R-474-5	103	66.00	X-1-210	103	.12
R-509-71	99	93.00	X-4-202	103	.04
R-525	101 & 103	.55	X-4-203	99	.04
R-526	101 & 103	.20	X-4-206	99	.04
R-652-1	103	57.50	X-4-208	99	.04
R-653-1	101 & 103	37.80	X-4-210	101	.04
R-6836-A-212	101	45.02	X-4-211	103	.08
SB-1	105	2.50	X-6-558	99	.05
SB-78F34	137	3.50	X-6-560	99	.08
SBR-1	105	.60	X-8-205	99	.02
SF-5	125	4.25	X-8-281	103	.02
SR-96R	137	3.00	X-8-361	99	.04
S-SP-1	123	.48	X-8-383	103	.04
ST-6	125 & 129	1.22	X-9-151	99	.04
ST-7	125 & 129	.12	X-9-168	103	.04
STA-3	125	6.00	X-13-115	103	.04
STA-3-1	125	.20	X-13-216	99	.04
STA-3-2	125	.14	X-15-302	103	.10
STA-3-3	125	.04	X-9302	99	.40
STA-3-4	125	.80	211595	111	.50
STA-3-5	125	.12	211853	107	6.83
STA-3-5A	125	.30	212108	119	.06
STA-3-6	125	.06	212109	119	.05
SU-1S	123	1.60	212135	111	1.08
SU-2	123	.14	212294	109	.50
SU-3	123	.02	212295	109	.62
SW-5F	141	.65	212357	117	.015
T-5	125	3.50	212628	117	.19
TC-2	135	2.22	212630	117	.40
TC-3	135	2.40	212631	117	.32
TC-4	135	.60	212632	117	.015
TC-5	135	2.20	212633	117.	.06
TC-6	135	.20	212699	117	
TC-1FR	135	10.90	212708	117	9.75
TC-11	135	.40	213081	107	7.00
TB-100	142	10.30	213088	107	.25
TKB-2	141	1.72	213224	111	.04
TRL-1	123	.02	213225	111	2.62
TRW-1	123	.02	213226	111	.19
TRS-1	123	.10	213227	111	.20
TK-2	141	1.52	213228	111	.19
TK-3	141	.68	213229	111	.06
TK-4	141	.44	213230	111	.50
TK-5	141	.38	213387	111	.14
W-243-1	99	1.25	213530	115	.20

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214036	119		16T1439	105	\$.15
214037	119	\$.19	16T1707	105	4.50
214038	119	.40	16T1709	105	1.50
214040	119	.40	16T2948	127	.05
214041	119	.015	16T2954	143	.03
214050	119	.015	16T2955	143	.02
214071	119	9.75	16T2956	143	.08
214169	115	11.85	16T2957	129 & 143	.03
214171	115	1.80	16T2958	143	.12
214172	115	4.32	16T2960	143	.02
214173	115	.34	16T2962	143	.02
214174	115	.42	16T2963	143	.04
214253	105	.78	16T2964	143	.03
215204	111	9.45	16T2965	143	.02
215310	105	1.05	16T2966	143	.06
215536	105	1.00	16T2967	143	.02
215604	105	12.20	16T2968	143	.02
215689	105	13.35	16T2970	143	.08
216071	111	15.80	16T2972	143	.06
216564	99 & 105	26.65	16T2973	143	.18
216565	99 & 105	26.65	16T2974	143	.03
216566	109	3.04	16T2975	143	.02
216797	107	1.62	16T2982	135 & 143	.02
217269	109	10.00	16T2985	143	.02
217525	105	.40	16T2988	143	.05
217722	103 & 105	19.45	16T2989	143	.03
217904	99 & 105	12.00	16T2990	143	.04
220165	105	3.76	16T2991	143	.05
220304	111	3.06	16T2992	143	.02
220305	111	6.25	16T2993	143	.05
220353	105	50.20	16T2994	127 & 143	.02
220636	105	.85	16T2995	127 & 143	.03
220829	111	20.46	16T2996	127 & 143	.07
220894	107	4.26	16T2999	143	.08
220898	105	37.20	16T3000	143	.12
221022	105	20.35	16T3001	143	.05
221053	115	3.00	16T3002	143	.02
221087	105	2.70	16T3003	143	.03
16T1437	105	.06	16T3004	143	.07
16T1438	105	.16	16T3008	129	.08