DEPARTMENT OF THE ARMY
TECHNICAL MANUAL

DEPARTMENT OF THE AIR FORCE
TECHNICAL ORDER

TM 5-9051
TO 19-75AC-34

SEMITRAILER

LOW BED
REAR AND SIDE
LOADING, 25-TON

ALL MAKES AND MODELS

DEPARTMENTS OF THE ARMY AND THE AIR FORCE
MARCH 1954

SAFETY PRECAUTIONS

Do not attempt to raise landing gear when semitrailer is not connected to towing vehicle, or when semitrailer front end is not blocked up.

Cutout cocks on the towing vehicle must be closed before disconnecting the air hoses when disconnecting the semitrailer from a towing vehicle. Immediately after connecting semitrailer air hoses, open the cutout cocks on the towing vehicle, and test airbrake operation.

When the loaded semitrailer is to be connected to a prime mover and dolly, couple the drawbar of the dolly to the rear pintle hook of the prime mover before connecting the loaded semitrailer to the dolly. Coupling the dolly to the prime mover when the dolly is already coupled to a loaded semitrailer is dangerous.

Be sure the handbrake is set on the semitrailer before releasing the pressure on the airbrake pressure tank.

Never inflate or deflate a tire on a wheel that is off the semitrailer without placing a safety bar through two holes in the wheel and over the tire.

The semitrailer should always be coupled to a tractor truck or dolly when loading equipment over the rear of the semitrailer.

Always load and unload the semitrailer so that the load on the semitrailer is balanced at all times.

Before towing the semitrailer, and at halt, make sure that its load is balanced, is not topheavy, and is properly secured.

Before disconnecting the semitrailer after towing it, check the brakedrums. If the brakedrums are too hot to touch with the bare hands, chock the wheels fore and aft, open the plug valve on the airbrake pressure tank to bleed the airbrake system of air and allow the brakedrums to cool. The handbrake may then be set.

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* DEPARTMENTS OF THE ARMY AND THE AIR FORCE

WASHINGTON 25, D. C., *18 March 1954*

SEMITRAILER, LOW BED, REAR AND SIDE LOADING, 25 TON, ALL MAKES AND MODELS

TAGO 4644B—Mar. 270485°—54——1

CHAPTER 1

INTRODUCTION

Section I. GENERAL

1. Scope

a. This manual is for the personnel to whom this semitrailer is issued. It contains information on the operation, organizational maintenance, and field and depot maintenance of the semitrailer, as well as a description of the major units and their functions in relation to other components of the materiel. It applies to the semitrailer, low bed, rear and side loading, 25 ton, all makes and models.

b. Supply manuals, technical manuals, and other publications applicable to the equipment covered by this manual are listed in appendix I. Appendix II tabulates the replaceable parts available for the equipment. Appendix III lists the tools and spare parts issued with and carried on or with the equipment.

2. Record and Report Forms

Maintenance record forms listed and briefly described in *a* through *j* below will be used in the maintenance of this equipment.

a. DD Form 110, Vehicle and Equipment Operational Record. This form is used by equipment operators for reporting the accomplishment of daily preventive maintenance services, and for reporting any equipment deficiencies observed during operation.

b. Standard Form 91 Operator's Report of Motor Vehicle Accident. One copy of this form is kept with the equipment at all times. In case of an accident resulting in injury or property damage, Form 91 is filled out immediately (or as promptly thereafter as is practical) by the operator.

c. DA Form 464, Work Sheet for Preventive Maintenance and Technical Inspection of Engineer Equipment. This form is used by personnel of the using organization and higher echelons for reporting the results of preventive maintenance services and technical inspections.

d. DA Form 460, Preventive Maintenance Roster. This form is used for maintaining an operating time record on the item of equipment, and for scheduling lubrication and preventive maintenance services at proper intervals.

e. DA Form 478, MWO and Major Unit Assembly Replacement Record—Organizational Equipment File. Major repairs or re-

building, replacement of major unit assemblies, and accomplishment of equipment modifications are recorded on this form.

f. DA Form 468, Unsatisfactory Equipment Report. This form is used for reporting manufacturing, design, or operational defects in the materiel, with a view to correcting such defects; it is also used for recommending modifications of the materiel. Form 468 is not used for reporting failures, isolated materiel defects, or malfunctions of materiel resulting from fair wear and tear or accidental damage. Form 468 is not used to report issue of parts and equipment, or for reporting replacements or repairs.

g. DD Form 6, Report of Damaged or Improper Shipment. This form is used for reporting damages incurred in shipment.

h. DA Form 9–81, Exchange Part or Unit Identification Tag. This form is used to accomplish the direct exchange of unserviceable for serviceable parts.

i. DA Form 811, Work Request and Job Order. This form is used to request work done by higher echelon organizations.

j. DA Form 867, Status of Modification Work Order. This form is used to maintain records of all modification work performed on equipment.

Section II. DESCRIPTION AND DATA

3. Description

(fig. 4)

The semitrailer, low bed, rear and side loading, 25 ton, is a four-wheel, two-axle vehicle equipped with airbrakes and four dual wheels (fig. 1). The loading ramp assemblies provided with the equipment may be installed at the rear (fig. 2) or on the side (fig. 3) of the vehicle for loading from either of these positions. The semitrailer is pulled either directly by a tractor truck equipped with a suitable fifth wheel, or by a dolly which in turn is pulled by a prime mover. This semitrailer is not well suited to operation in rough terrain, because its wheels are attached without springs to the frame, by a walking beam and trunnion axle arrangement. Landing gear is provided to support the front end of the semitrailer when it is not supported by a dolly or a tractor truck. This landing gear consists of two hand-operated assemblies, one of which is located at either side of the rear of the gooseneck. Each may be lowered or raised independently of the other. A hand-operated parking brake is also provided.

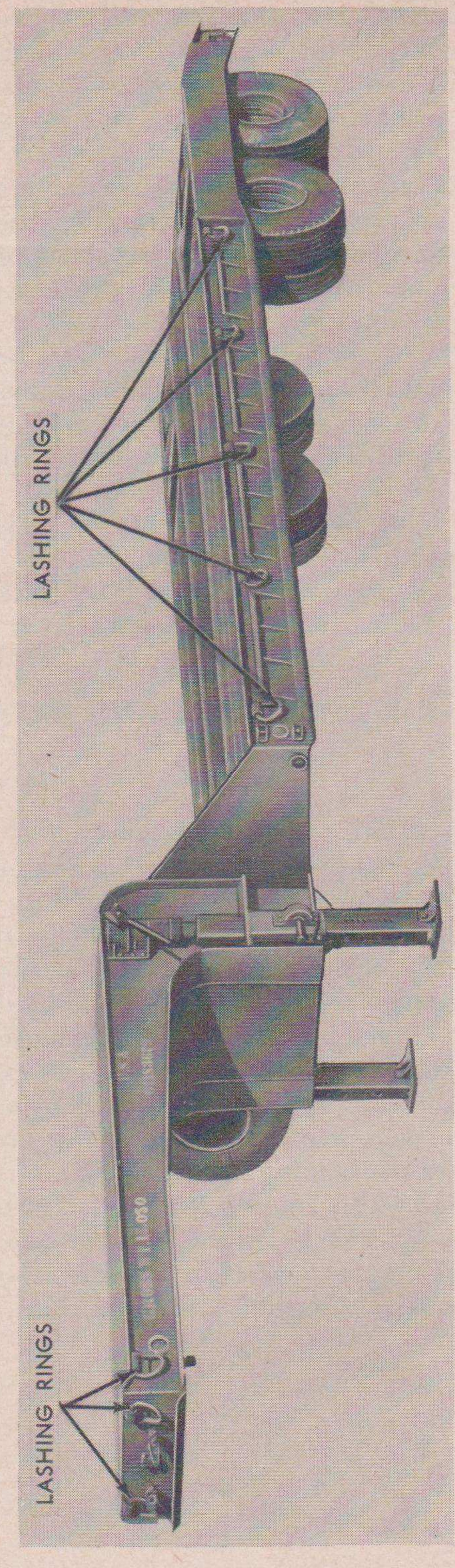


Figure 1. Left front view of semitrailer, landing gear down.

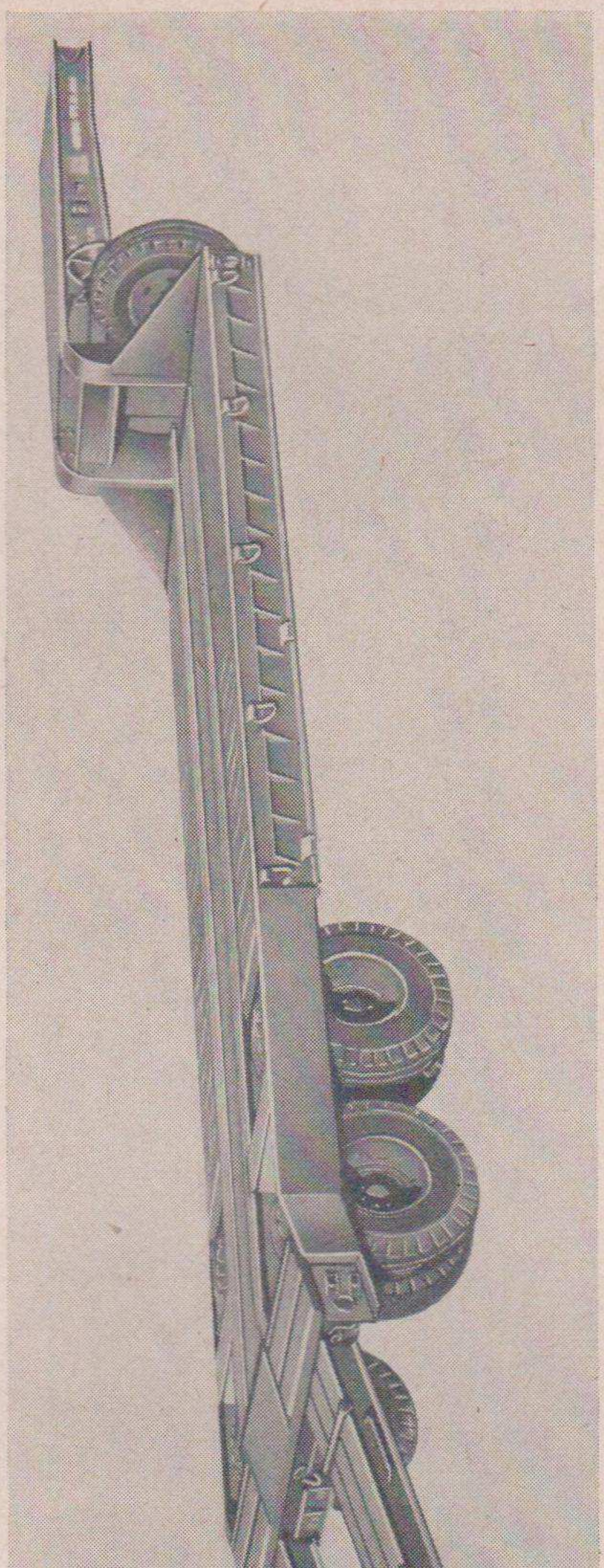


Figure 2. Right rear view of semitrailer, with loading ramp assemblies at rear.

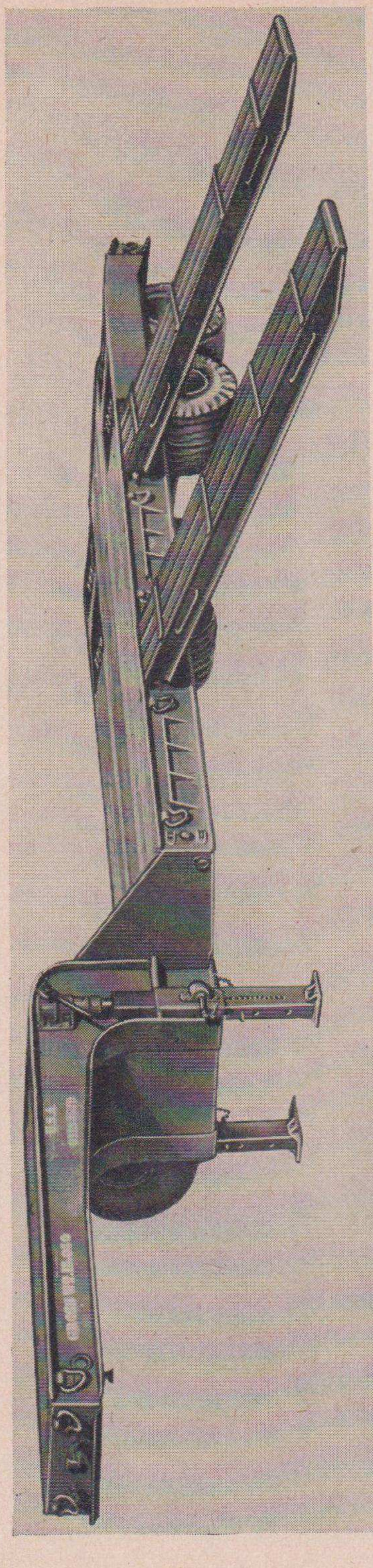


Figure 3. Left side view of semitrailer, with loading ramp assemblies on side.

4. Identification
(fig. 4)

The semitrailer has three identification plates. The Corps of Engineers identification plate (C), manufacturer's nameplate (B), and transportation data plate (A), are riveted to the right side of the semitrailer gooseneck near the front. The Corps of Engineers identification plate specifies the official nomenclature, the model number, and the serial number of the equipment. The manufacturer's nameplate is located at the right of the Corps of Engineers identification plate, and the transportation data plate is at the right of the manufacturer's nameplate. The transportation data plate specifies the overall dimensions of the semitrailer, shipping weight, and other shipping dimensions. When requisitioning spare parts for this equipment, specify the Department of the Army registration and serial numbers, and the model number.

5. Differences in Models

The semitrailer was procured from three different manufacturers. All of the semitrailers are similar in construction and are manufactured to Corps of Engineers drawings. They differ as follows:

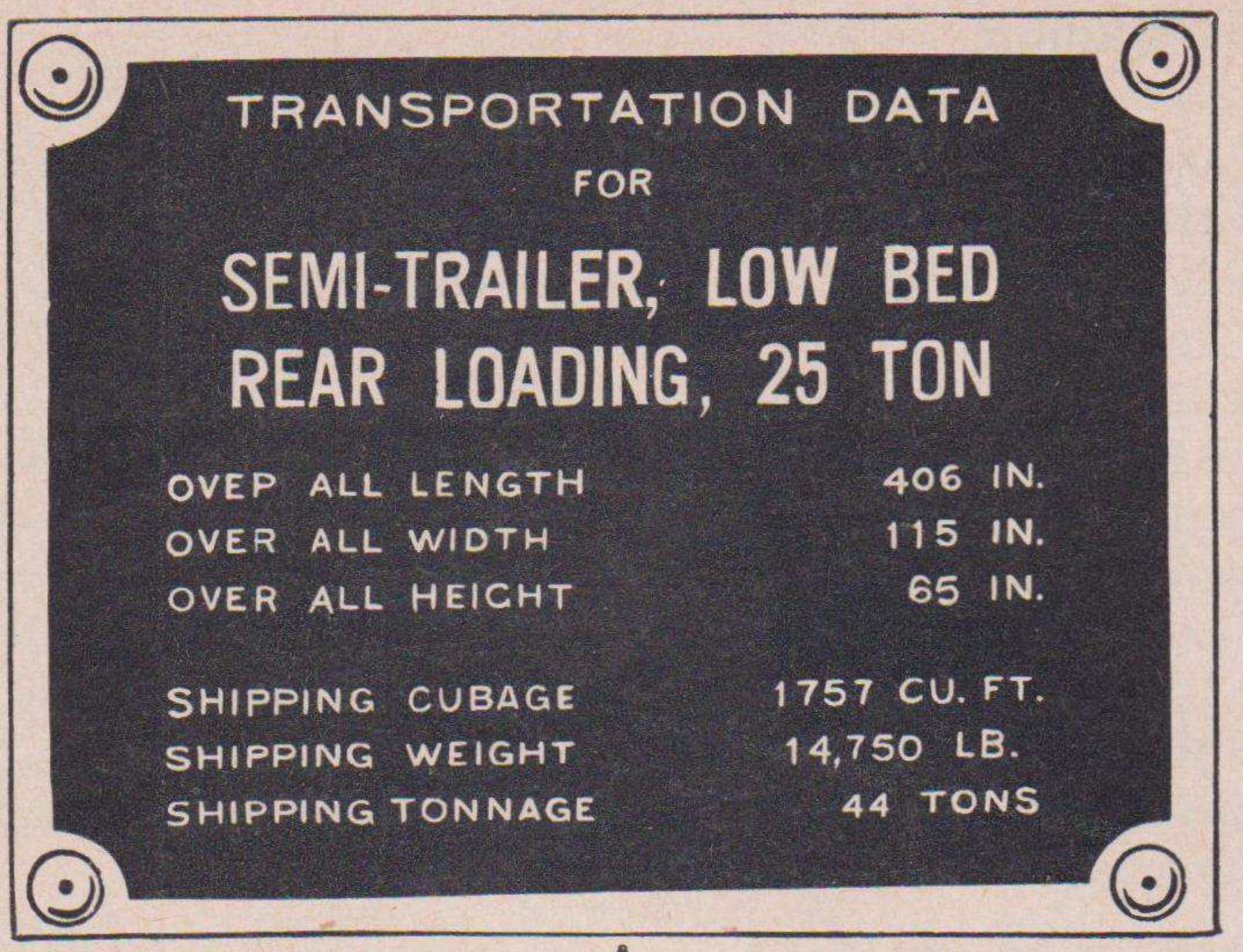
a. Trunnion Axle. The trunnion axle on semitrailers, serial numbers 01183387 to 01183737 inclusive, 01258559 to 01258722 inclusive, 01258738 to 01258837 inclusive, 01269288 to 01269295 inclusive, and 01269419 to 01269435 inclusive is restrained from lateral motion by a cap plate. The trunnion axle used on semitrailers, serial numbers 01269296 to 01269418 inclusive, and 01269436 to 01269788 inclusive, is restrained from lateral motion by a ring clamp.

b. Handwheel Shaft Bearing. The handwheel shaft bearing used on semitrailers, serial numbers 01269288 to 01269788 is welded to a flat plate which is bolted to the frame. That used on all other semitrailers of this type is welded directly to the frame.

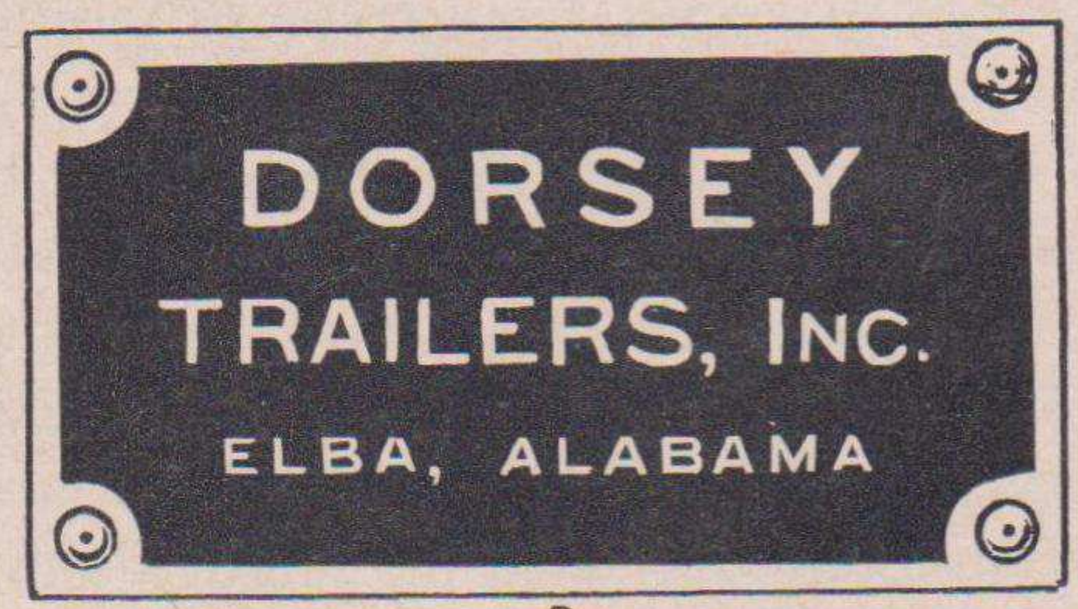
c. Mechanical Brake Controls. The wormshaft of the brake slack adjuster used on semitrailers, serial numbers 01269288 to 01269788, 01270151 to 01270500, and 01276292 to 01276954 is restrained from rotation by a spring-loaded ball. Slack adjuster wormshafts on all other models are restrained from rotation by a spring-loaded collar.

d. Airbrake System. While the airbrake systems on all of these semitrailers are similar, many of their equivalent components differ in part numbers and other minor respects. The principal differences are as follows:

(1) *Air line couplings.* Semitrailers, serial numbers 01269288 to 01269788, 01270151 to 01270500, and 01276292 to 01276954, inclusive, have a second pair of air couplings under the gooseneck. Other models do not have these couplings.



A



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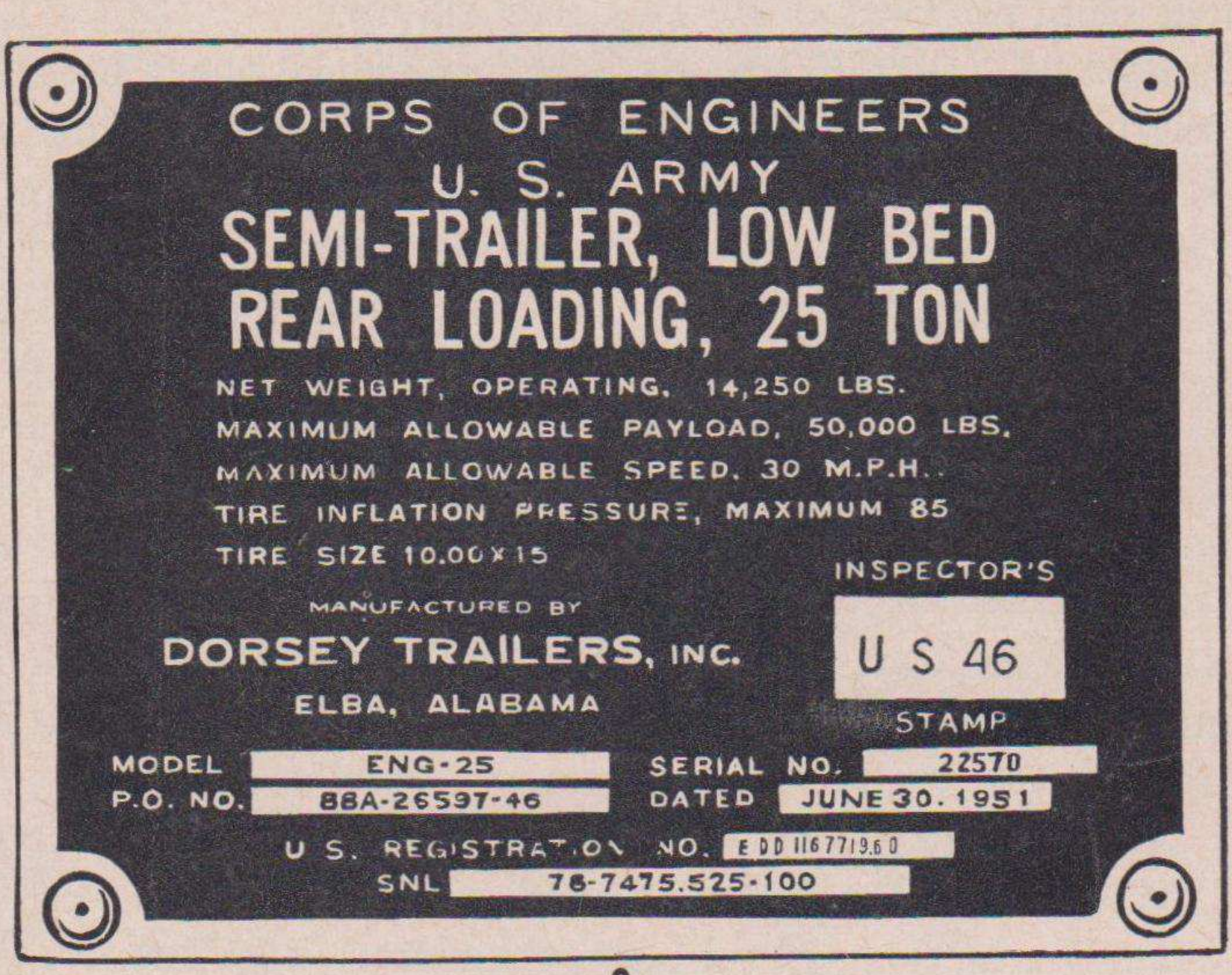


C

Figure 4. Identification plates.

(2) *Relay emergency valve assembly.* The relay emergency valve assembly used on semitrailers, serial numbers 01269288 to 01269788, 01270151 to 01270500, and 01276292 to 01276954, inclusive, is made by a different manufacturer, and, though equivalent, differs completely from that used on other semitrailers.

e. Kingpin. Semitrailers, serial numbers 01269358 to 01269418 inclusive, 01269622 to 01269623 inclusive, and 01269626 to 01269788 inclusive have a double-end kingpin which may be reached through a kingpin access door on top of the gooseneck. This kingpin is clamped in place and may be removed or exchanged end-for-end to fit differing types of fifth wheels. All other models of this trailer have a single-end kingpin which is welded to the frame of the semitrailer.

f. Landing Gear Leveling Jacks. The landing gear leveling jacks used on semitrailers, serial numbers 01183387 to 01183453, inclusive and 01183463 to 01183496 inclusive were made by different manufacturers from those used on other models of this semitrailer. Though both types of landing gear leveling jacks were made to the same Corps of Engineers drawings, several small parts differ.

6. Tabulated Data

Net weight, operating	14,250 lb
Shipping weight	14,750 lb
Allowable pay load, max	50,000 lb
Allowable speed, max	30 mph
Tire pressure, max	85 psi
Tire size	10:00 x 15 in.
Length overall	403 in.
Width overall	115 in.
Spring suspension	None
Height overall	65 in.
Deck length	191½ in.
Deck height	35 in.
Ground clearance under deck	21 in.
Minimum ground clearance at axle	15 in.
Tread	82 in.
Loading ramp assembly length	120 in.
Quantity of loading ramp assemblies	2
Height of gooseneck overall	64 in.
Front overhang, kingpin to front	24 in.
Tire ply	14
Wheel diameter	15 in.
No. wheels	8
No. tires	8
Body type	Low bed
Spare wheels	1
Spare tires	1
Airbrake pressure, min	65 psi
Electrical system voltage	24
Electrical current type	dc

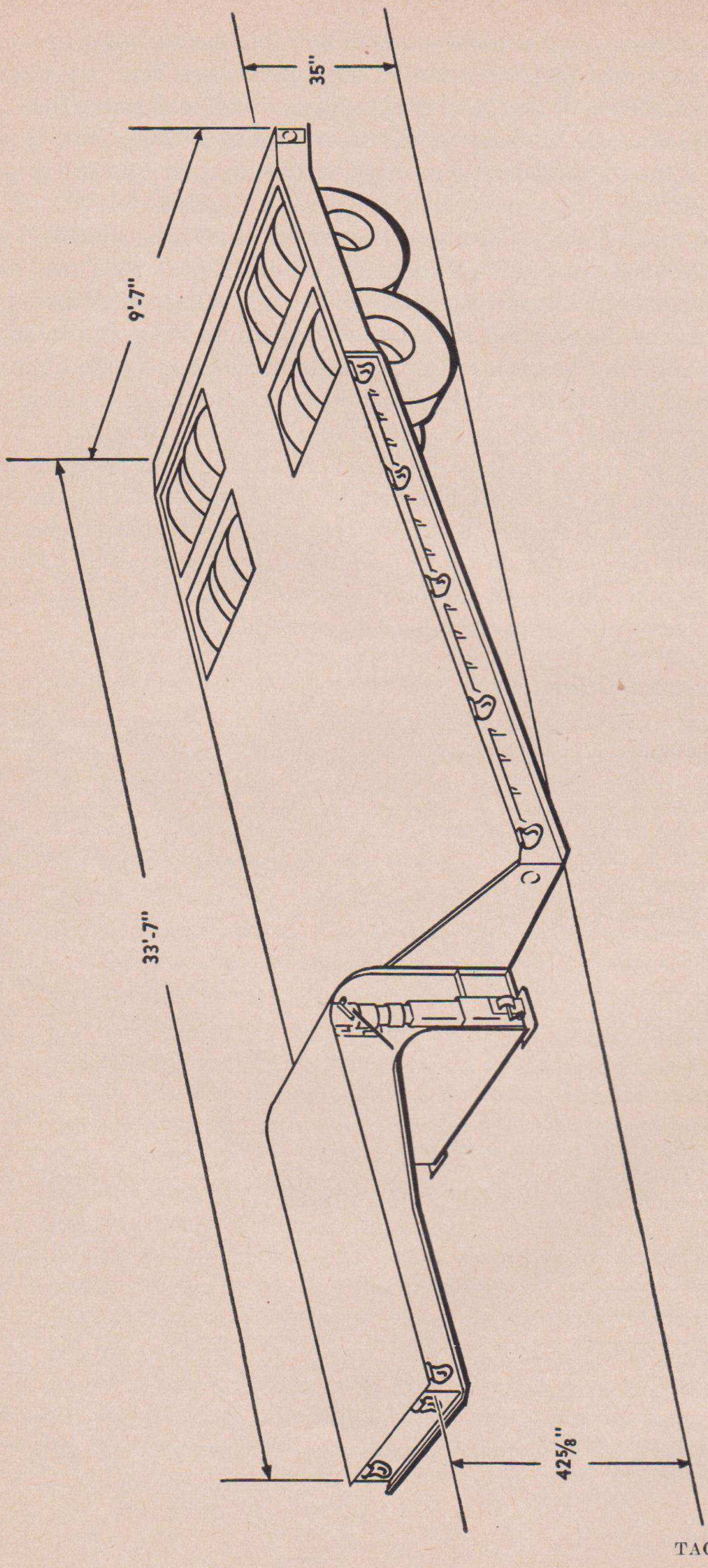


Figure 5. Dimensions of semitrailer disassembled for shipping.

CHAPTER 2

OPERATING INSTRUCTIONS

Section I. SERVICE UPON RECEIPT OF EQUIPMENT

7. New Equipment

a. General. When a new semitrailer is received by the using organization, it must first be unloaded and prepared for use, and the proper personnel must determine whether or not it will operate satisfactorily when placed in service. New equipment may be towed or shipped on flatcars to the using organization. If the vehicle was towed to the using organization most of the operations outlined below should have been performed previously. If the vehicle was shipped loaded on a flatcar, the unloading procedure outlined in *b* below should be followed.

b. Unloading.

(1) Cut, or release, and remove all binding straps (2, fig. 63) or binding cables (4).

(2) Using the handbrake wheel (1, fig. 8), set the handbrake.

(3) If a suitable lifting device, such as a gantry crane or motorized crane, is available, place slings (fig. 62) on the semitrailer, lift it off the flatcar, and ease it down to the ground. Remove the slings.

(4) If no suitable lifting device is available a ramp must be used as follows:

(*a*) If a suitable concrete, steel, or timber ramp with similar overall dimensions to that shown in figure 6 is available, arrange the flatcar and ramp so that the ramp is at the end of the flatcar nearest the front end of the semitrailer.

(*b*) If no suitable ramp is available, a ramp must be constructed. That shown in figure 6 is made of commonly available materials, is easily assembled, and can be readily disassembled and shipped with the semitrailer or stored for future use. Sizes and cut dimensions of all timbers required, fastenings, and the arrangement of the finished ramp are given in figure 6. For standard carpentry procedures required in the assembly of the timbers, see TM 5–226.

(*c*) Raise the front end of the semitrailer on the landing gear assemblies (fig. 11) sufficiently to clear the towing vehicle's fifth wheel.

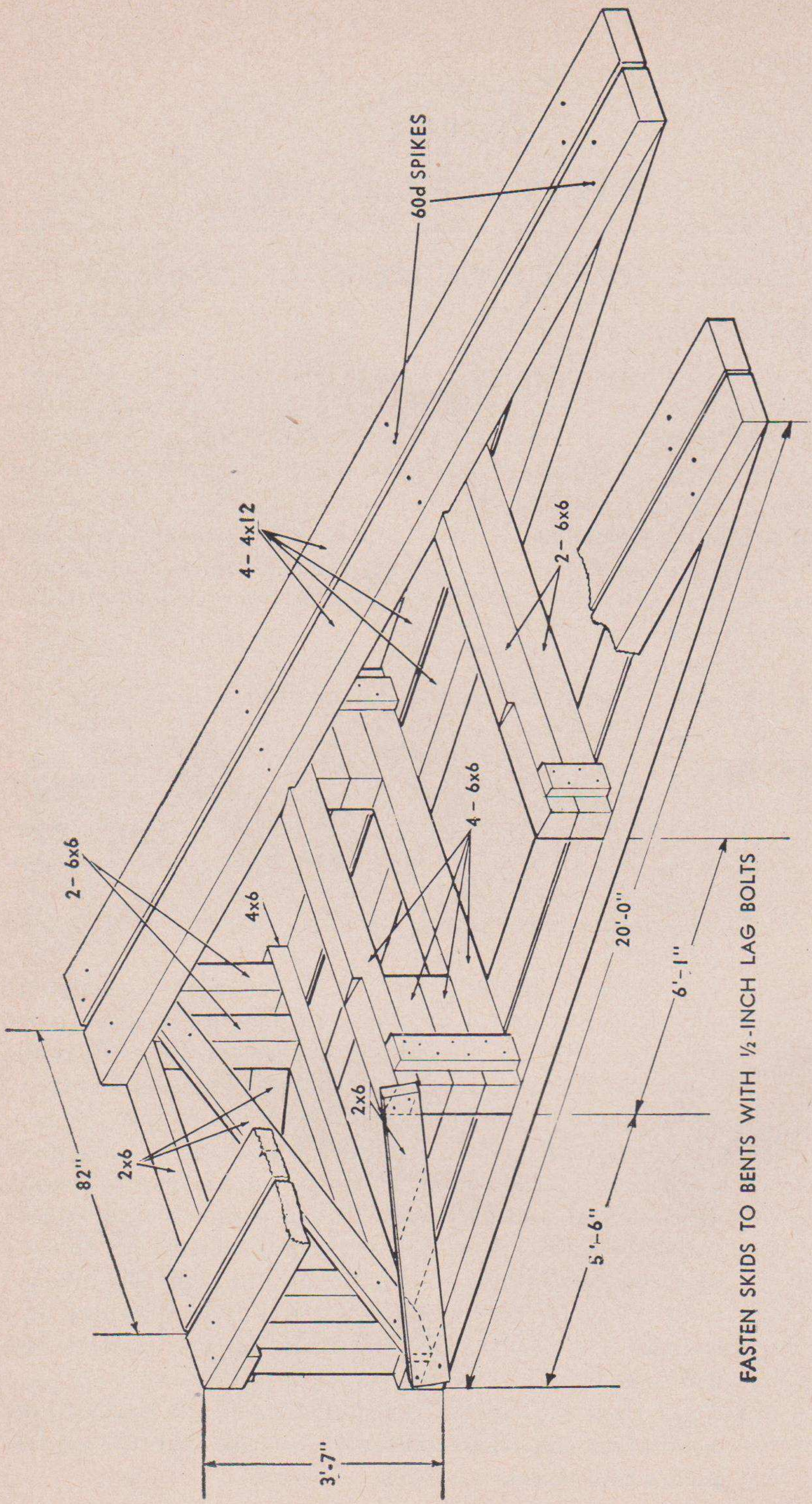


Figure 6. Ramp for unloading the semitrailer from a flatcar.

(*d*) Remove the preservative compound (see *d* below) from the kingpin plate, reference 12, figure 21, and lubricate kingpin plate (par. 32).

(*e*) Back the towing vehicle up the ramp into position at the front end of the semitrailer. Remove all bracing (5, fig. 63) from the gooseneck and the front end of the semitrailer.

(*f*) Back the towing vehicle under the gooseneck of the semitrailer and engage the fifth wheel of the towing vehicle and the kingpin of the semitrailer. Check to make sure that the kingpin is firmly engaged to the fifth wheel.

(*g*) Couple the semitrailer airbrake lines (1 and 3, fig. 12). Connect the electrical cable (2, fig. 12). Open the cutout cocks on the air lines of the towing vehicle.

(*h*) Set all brakes on the towing vehicle. Remove blocking (7, fig. 63) from around the semitrailer wheels and other parts of the semitrailer.

(*i*) Raise the landing gear assemblies (par. 11) on both sides of the semitrailer.

(*j*) Release the semitrailer handbrake (fig. 8) and all brakes on the towing vehicle.

(*k*) Tow the semitrailer from the flatcar down the loading ramp. The loading ramp must be long enough to permit the front end of the bed of the semitrailer to clear the front end of the flatcar as the towing vehicle passes down the ramp.

c. Assembling. Assemble and install any parts or other items which have been removed for shipping. Check tools and accessories. Remove all corrosion and rust preventive compounds coated on the semitrailer by washing it with cleaning solvent. Touch up with paint if necessary.

d. Removal of Preservative Compounds, lubricants, and Devices. Pull the shipping tape off all lights and the electrical connector at the front of the semitrailer. Wash the preservative compound off the areas around the shipping tape with cleaning solvent. Check the airbrake operating parts at the rear of the vehicle and remove any blocks and binding tape which may have been used to prevent motion of these parts in shipping.

e. Inspection. Inspect the semitrailer completely for any visible signs of damage, such as broken or bent parts, and repair or replace as necessary. Record this inspection. Several inspection procedures can be carried out on the semitrailer while it is coupled to a tractor truck or a dolly with towing vehicle, prior to service use.

(1) Connect the semitrailer to a tractor truck or a dolly connected to a towing vehicle.

(2) With power supplied to the light system from the towing vehicle, check the lights.

(3) Move the unit forward slightly and check to be sure that the kingpin has firmly engaged the fifth wheel.
(4) Move the unit forward and check the operation of the air-brakes.
(5) Give the semitrailer a loaded and unloaded road test.
(6) The semitrailer is now ready for loaded operation, but should be carefully observed on its first run.

f. Service. Identify and clean all lubrication fittings. Completely lubricate the semitrailer in accordance with LO 5–9051. Record this service.

8. Used Equipment

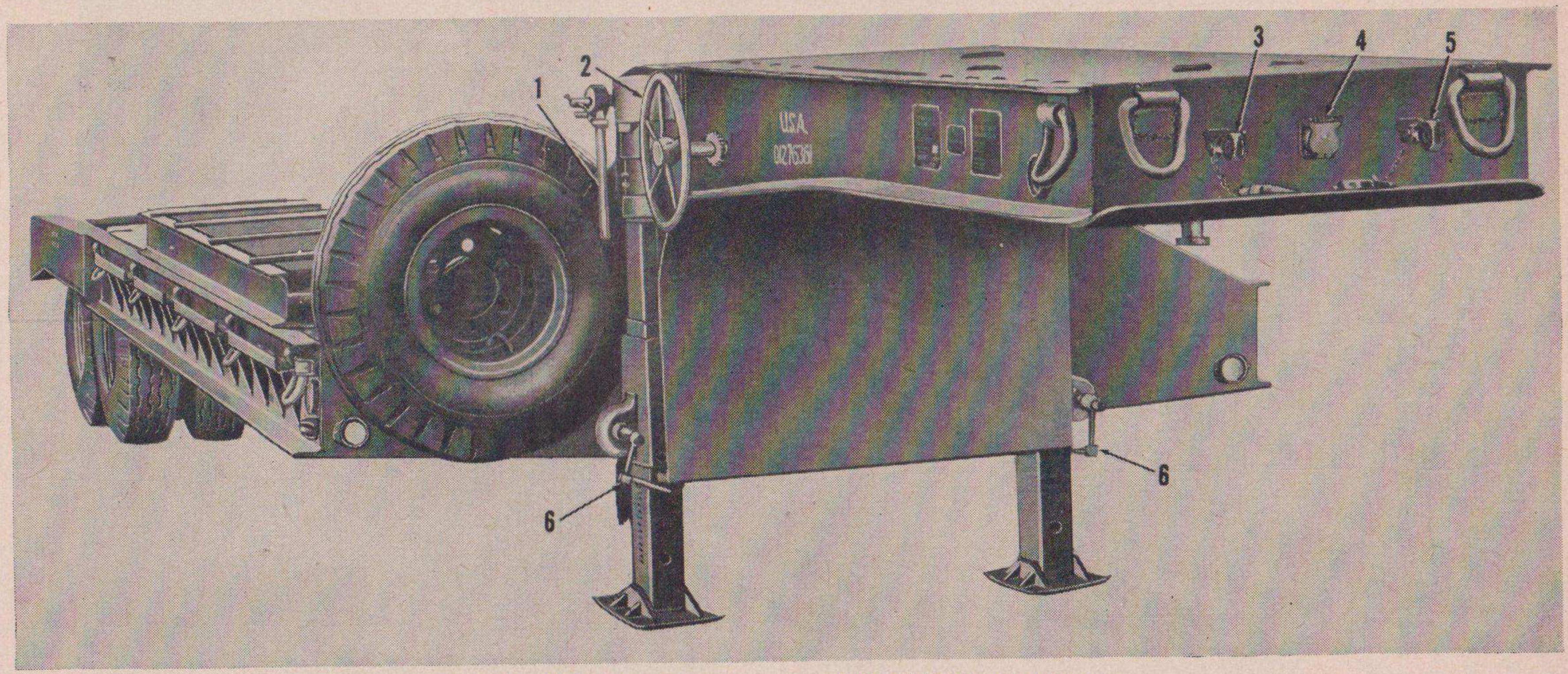
The purpose of inspecting used equipment when delivered to the using organization is the same as that for the inspection stated above for new equipment. Perform all the initial inspections and services outlined for new equipment in paragraph 7. Check all records showing the last servicing and lubrication. If necessary, perform a complete lubrication service. Inspect the vehicle for general tightness of removable components, and wear of parts. Check the records of the semitrailer for any major repairs or modification. Note any deficiency.

Section II. CONTROLS

9. General

(fig. 7)

This section describes, locates, illustrates, and furnishes the operator sufficient information about the controls for the proper operation of the materiel.



1 Jack handle
2 Handbrake wheel
3 Service air hose coupling
4 Electrical connector
5 Emergency air hose coupling
6 Elevating gear cranks

Figure 7. Right front view of semitrailer.

10. Handbrake Wheel

(fig. 8)

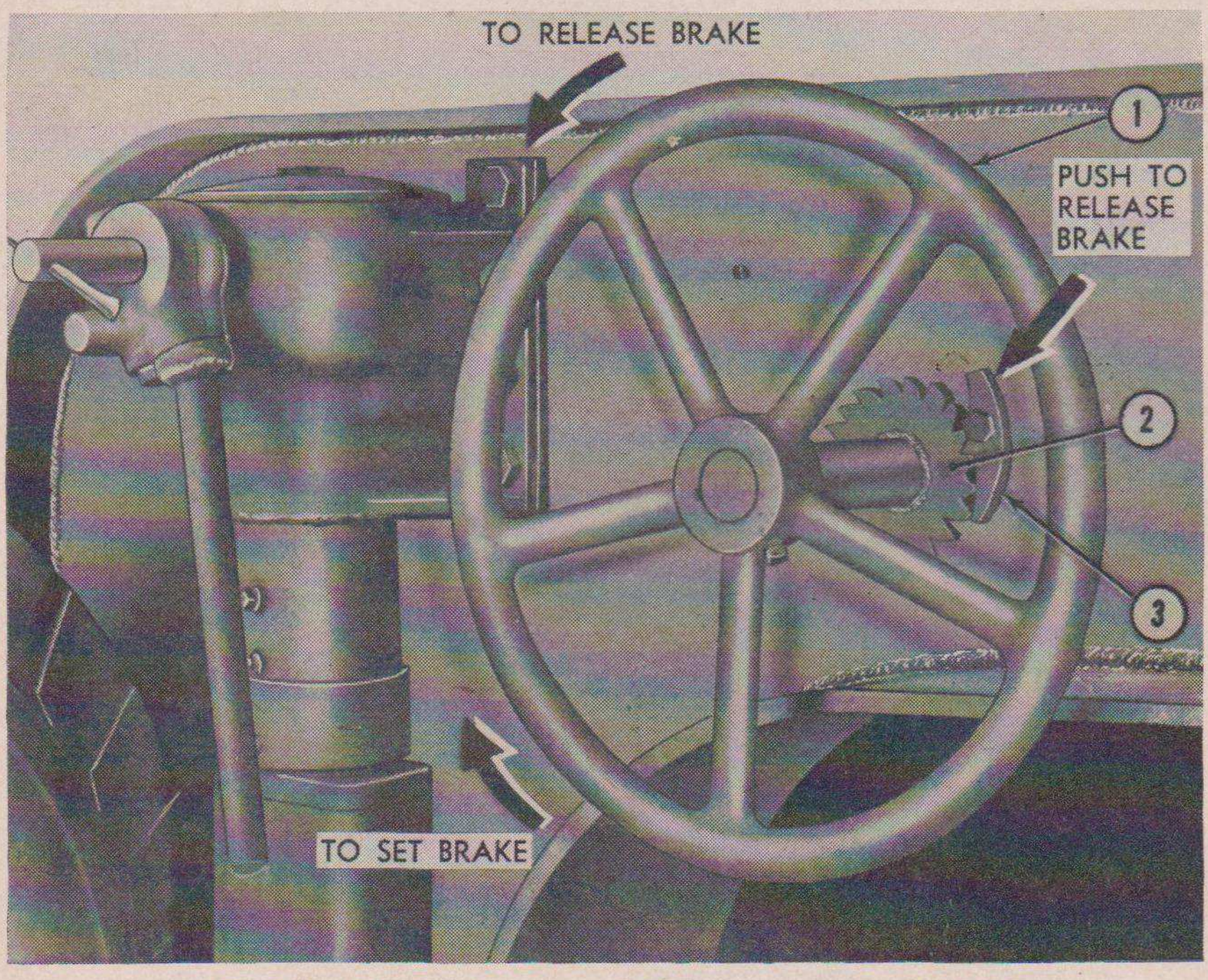
a. Location. The handbrake wheel (1) is located on the right side of the gooseneck when the trailer is viewed from the rear looking toward the towing vehicle. The handbrake wheel is just forward of the spare wheel which is mounted on the right side of the front of the trailer bed.

b. Purpose.

(1) The handbrake wheel (1) is used to set the brakes manually when the vehicle must be parked, since the airbrakes would not be effective in holding the vehicle for any extended time. The handbrake wheel is also used to set the semitrailer brakes when the semitrailer is to be detached from the towing vehicles.

(2) To set the handbrake, the handbrake wheel (1) is rotated in a clockwise direction until it resists further motion, and the pawl (3) is pushed until its lip engages the ratchet (2).

(3) To release the handbrake, move the handbrake wheel (1) clockwise slightly to free the pawl (3), push on the top of the pawl until its lip is clear of the ratchet (2), and spin the handbrake wheel in a counterclockwise direction until it no longer has a tendency to turn in that direction.

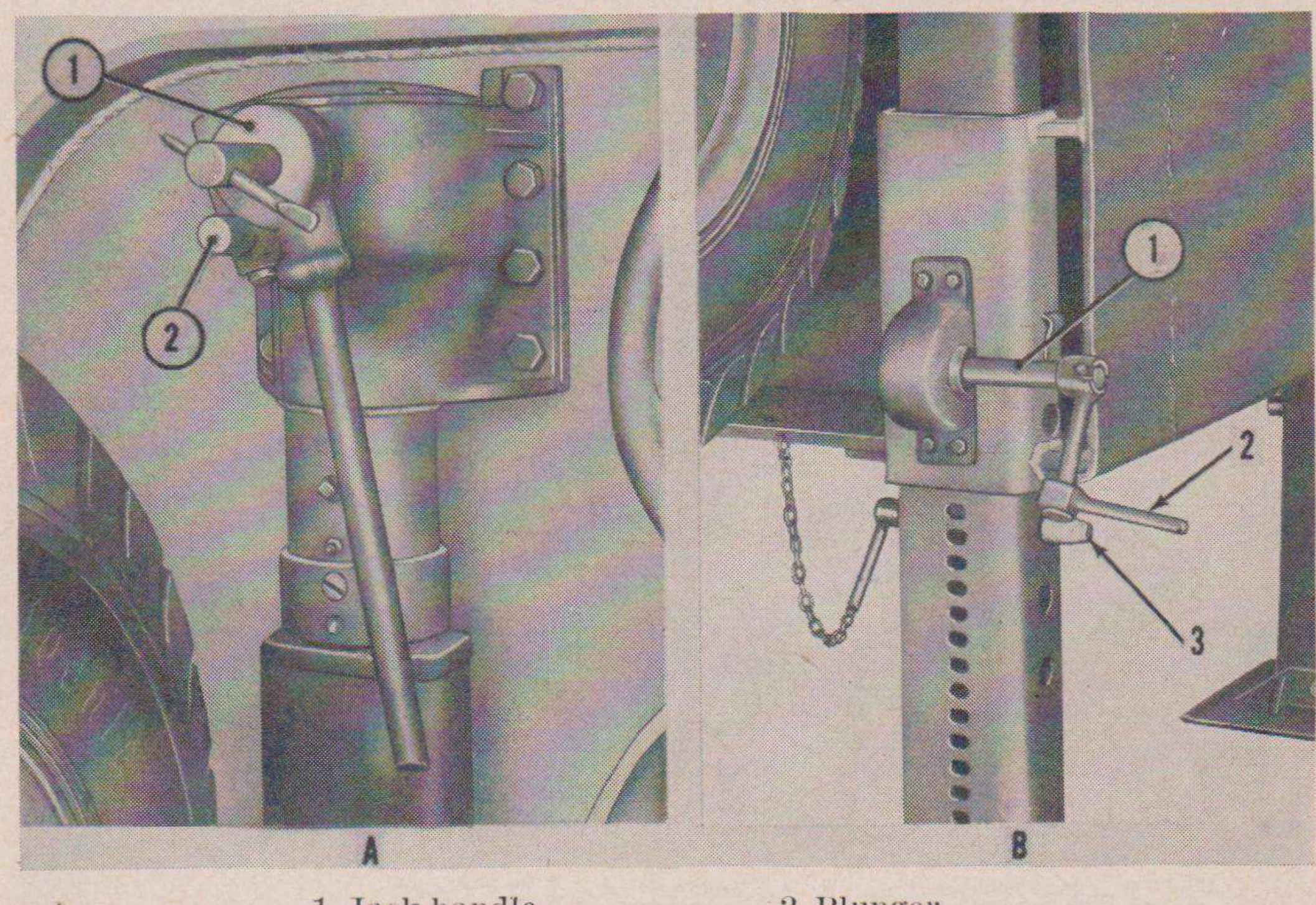


1 Handbrake wheel 2 Ratchet 3 Pawl

Figure 8. Handbrake wheel.

11. Landing Gear Controls

a. Location. The landing gear controls are located on the landing gear. The jack handle (1, fig. 9Ⓐ) is at the top of the landing gear, just below the top of the semitrailer gooseneck. The crank handle (2, fig. 9Ⓑ) of the elevating gear is at the base of the gooseneck on the side of the landing gear, and the retaining pin (3) is fastened to the bottom of the gooseneck with a chain.



A

1 Jack handle
2 Plunger

Ⓐ Landing jack

B

1 Elevating gear crankshaft
2 Crank handle
3 Retaining pin

Ⓑ Elevating gear crank

Figure 9. Landing gear controls.

b. Purpose.

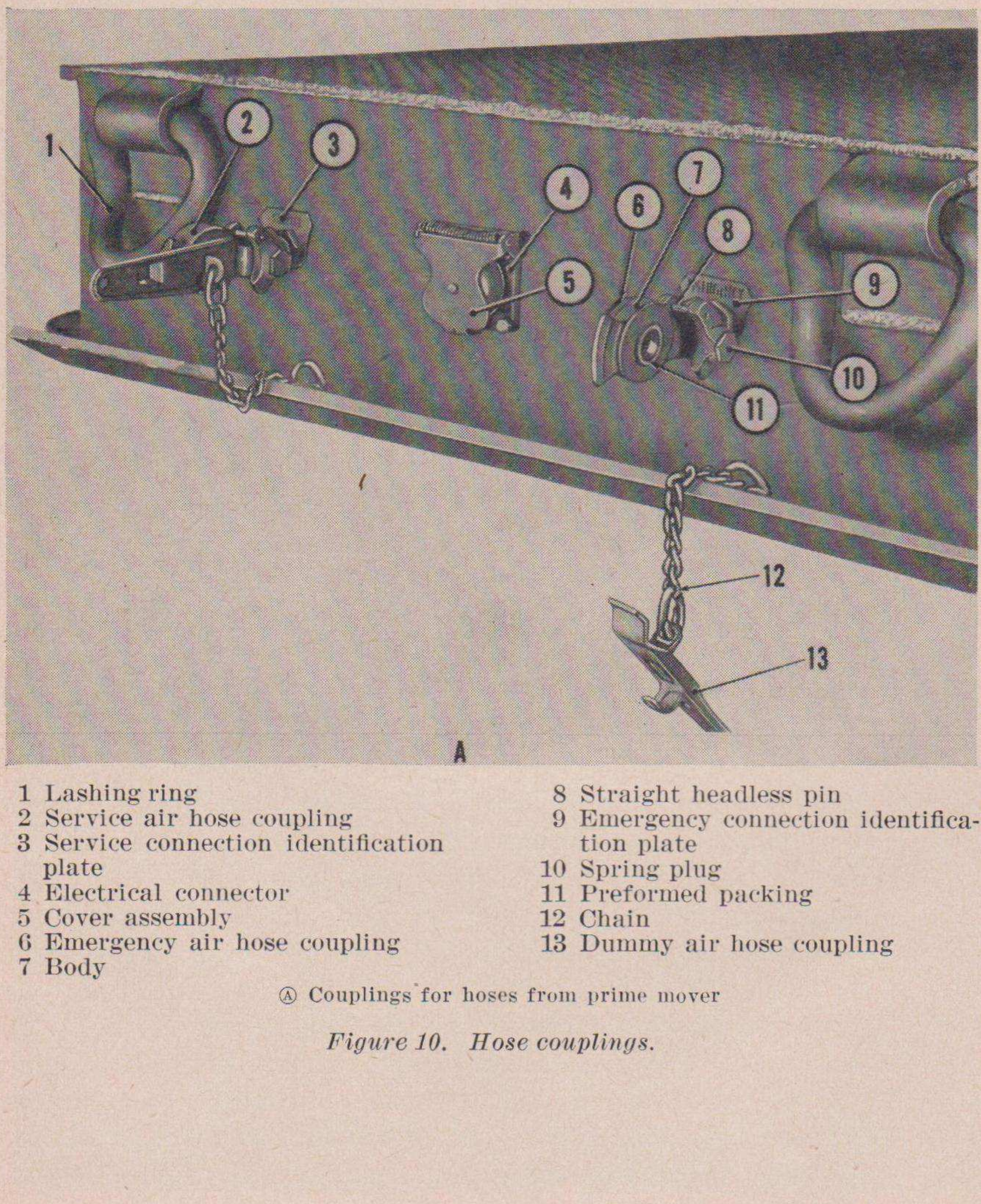
(1) The crank handle (2) on the elevating gear is used to raise and lower the lower tube. The retaining pin (3) is inserted in one of several holes in the lower tube to act as a main position selector.

(2) Small changes in elevation of the front end of the semitrailer within the position selected for the lower tube are accomplished by operation of the jack handle (1, fig. 9Ⓐ) and plunger (2). The plunger is a two-position selector device. With one plunger position, pumping the jack handle up and down raises the semitrailer front end. With the other plunger position, pumping the jack handle up and down lowers the semitrailer front end.

12. Hose Couplings

a. Location. Hose couplings for the semitrailer are provided at the extreme front end of the gooseneck. On some semitrailers (par. 5*d*) additional hose couplings are provided on the front side of the vertical section of the gooseneck near the top.

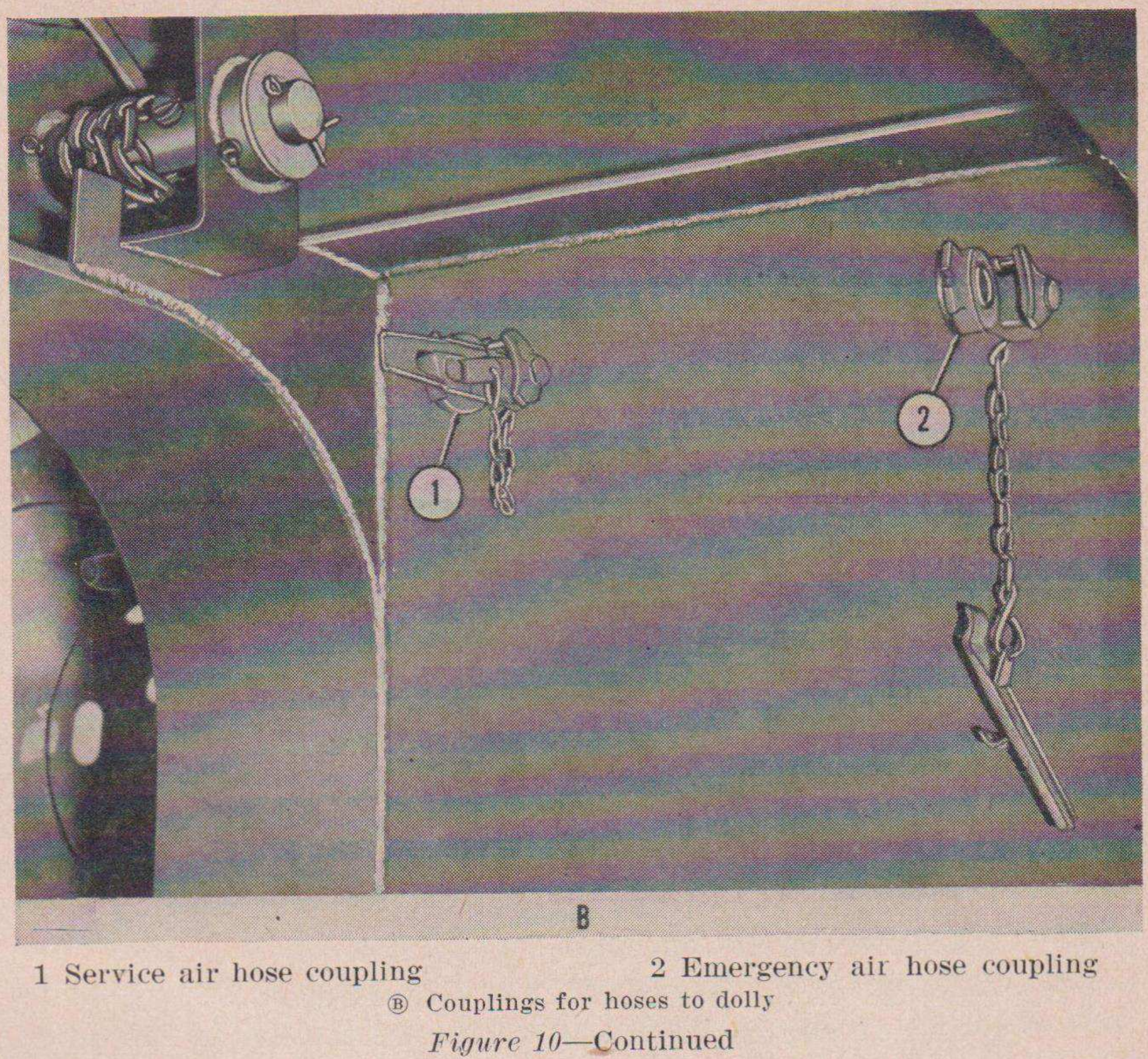
b. Purpose. The hose couplings are provided for quick attachment of the service and emergency airbrake hoses (1) and (3, fig. 12) from the towing vehicle. The front end hose couplings (fig. 10 Ⓐ) are for use with a tractor truck, and the additional hose couplings (fig. 10 Ⓑ) are for attachment of air hoses from a dolly, when one is used.



1 Lashing ring
2 Service air hose coupling
3 Service connection identification plate
4 Electrical connector
5 Cover assembly
6 Emergency air hose coupling
7 Body
8 Straight headless pin
9 Emergency connection identification plate
10 Spring plug
11 Preformed packing
12 Chain
13 Dummy air hose coupling

Ⓐ Couplings for hoses from prime mover

Figure 10. Hose couplings.



1 Service air hose coupling 2 Emergency air hose coupling

Ⓑ Couplings for hoses to dolly

Figure 10—Continued

13. Plug Valve on Airbrake Pressure Tank

a. Location. The airbrake pressure tank plug valve (2, fig. 23) is located at the bottom of the airbrake pressure tank (1), which is fastened to the frame underneath the bed of the semitrailer just forward of the wheels.

b. Purpose. The airbrake pressure tank plug valve is provided to drain condensed moisture from the airbrake pressure tank, or to release the air pressure on the tank.

Section III. OPERATION UNDER USUAL CONDITIONS

14. General

a. The instructions in this section are included for the information and guidance of all personnel responsible for the operation of the semitrailer.

b. It is essential that the operator of the towing vehicle know how to perform every operation of which the semitrailer is capable. This section gives information on connecting and disconnecting the semitrailer from the towing vehicle, instructions on basic motions of the semitrailer, and on how to coordinate the basic motions to perform the specific tasks for which the semitrailer is designed.

15. Operating Details

a. Operating Landing Gear.

(1) *Lowering the landing gear.* The two landing gear assemblies may be lowered one side at a time or both sides simultaneously. Both sides are lowered in a similar manner.

(*a*) Swing the lower tube elevating crank handle out of its crank stowage clip and engage it on the pin on the crank shaft. Holding up the lower tube (7) (fig. 11) with the lower tube elevating crank (5), remove the retaining pin (10) from the hole in the bearing tube (4).

(*b*) Using the lower tube elevating crank (5), crank the lower tube (7), down until the pad assembly (8) is on the ground.

(*c*) Push the retaining pin (10) through the uppermost pin hole in the lower tube (7).

(*d*) Push the jack handle plunger (par. 11) to the extending position and pump the jack handle (2) up and down until the upper tube (3) has been extended far enough to remove most of the load on the fifth wheel. The landing jack (1) has a maximum extension of 6 inches.

(*e*) Repeat (*a*) through (*d*) above for the landing gear assembly on the other side.

(2) *Raising the landing gear.* The landing gear should not be raised unless the front end of the semitrailer is supported either by a fifth wheel on a tractor truck or dolly, an A-frame, or some other suitable support. The landing gear assemblies must be raised one side at a time. Both sides are raised in a similar manner.

(*a*) Push the jack handle plunger (par. 11) under the jack handle (2, fig. 11) to the retracting position and pump the jack handle (2) up and down until the upper tube has been fully retracted.

(*b*) Pull the retaining pin (10) out of the pin holes (6).

(*c*) Raise the lower tube (7) by cranking it up with the lower tube elevating crank (5). Since very little leverage can be obtained with the lower tube elevating crank (5), it may be necessary to start the lower tube in the upward direction by inserting a crowbar or other lever under the foot pad assembly (8) and using this to lift the lower tube (7) slightly.

(*d*) Look through the hole in the bearing tube (4) to be certain that the corresponding hole in the lower tube (7) lines up with this hole. When the holes are lined up, insert the retaining pin (10) through these holes.

(*e*) Slip the crank handle (2, fig. 9Ⓑ) off its pin and stow it in the crank stowage clip provided beside the landing gear in the semitrailer gooseneck.

(*f*) Repeat steps (*a*) through (*e*) above for the landing gear assembly on the other side.

Caution: Do not attempt to raise landing gear when semitrailer is not connected to towing vehicle, or when semitrailer front end is not blocked up.

b. Kingpin and Fifth Wheel.

(1) *Engaging.* Before attempting to engage the kingpin of the semitrailer in the fifth wheel of the towing vehicle, be sure the semitrailer gooseneck is high enough to clear the fifth wheel of the towing vehicle. If it is not, raise it by operating the landing gear (see *a*(1)(*d*) above). Set the parking brake of the semitrailer with the handbrake wheel. Back the towing vehicle or dolly into position in line with the semitrailer and directly ahead of it, facing away from the semitrailer. Turn the plunger safety latch on the fifth wheel of the towing vehicle clear of the plunger. Push the handle on the fifth wheel forward to unlock the fifth wheel jaws. Back the towing vehicle slowly under the gooseneck of the semitrailer so that the jaws of the fifth wheel pass around the sides of the kingpin on the semitrailer. Continue backing the tractor truck or dolly until the kingpin of the semitrailer engages the fifth wheel on the towing vehicle, at which time the fifth wheel jaws should lock into position around the kingpin. Turn the plunger safety latch on the fifth wheel down over the end of the plunger.

(2) *Disengaging.* To disengage the kingpin and fifth wheel, turn the plunger safety latch on the fifth wheel, clear of the plunger, push the handle on the fifth wheel forward, and pull the tractor truck away from the semitrailer. The fifth wheel jaws will open and pass around the kingpin of the semitrailer.

Warning: Handbrake must be set before disconnecting the semitrailer from the towing vehicle.

c. Airbrake Lines.

(1) *Connecting.* The service airbrake line is located on the right-hand side of the semitrailer and the emergency airbrake line is on the left-hand side of the semitrailer. The service airbrake line on the tractor truck or dolly is on the left-hand side and the emergency airbrake line is on the right-hand side. This arrangement is made so that the airbrake lines will be crossed when they are coupled, permitting the semitrailer to turn freely without fouling the airbrake lines.

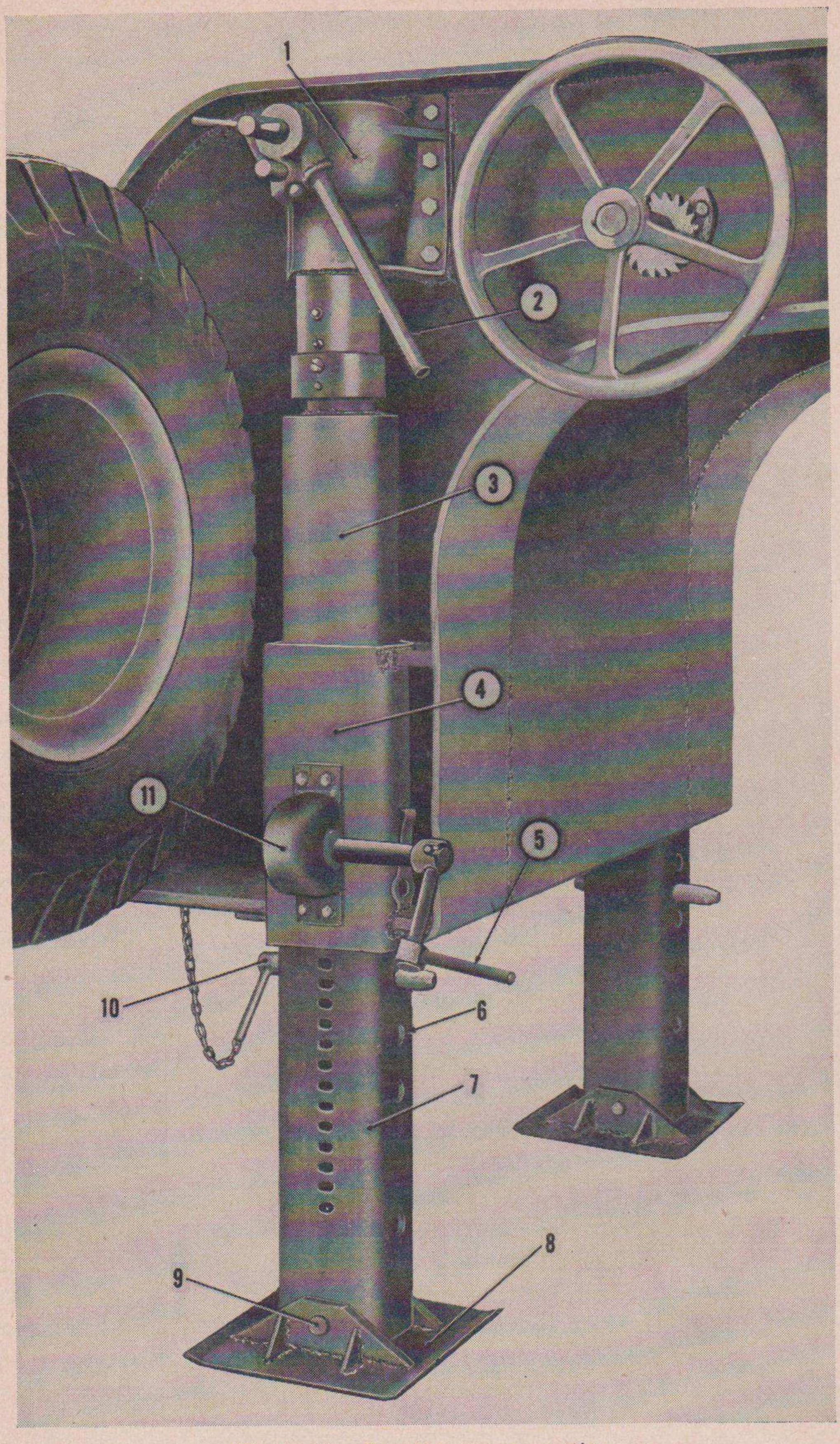
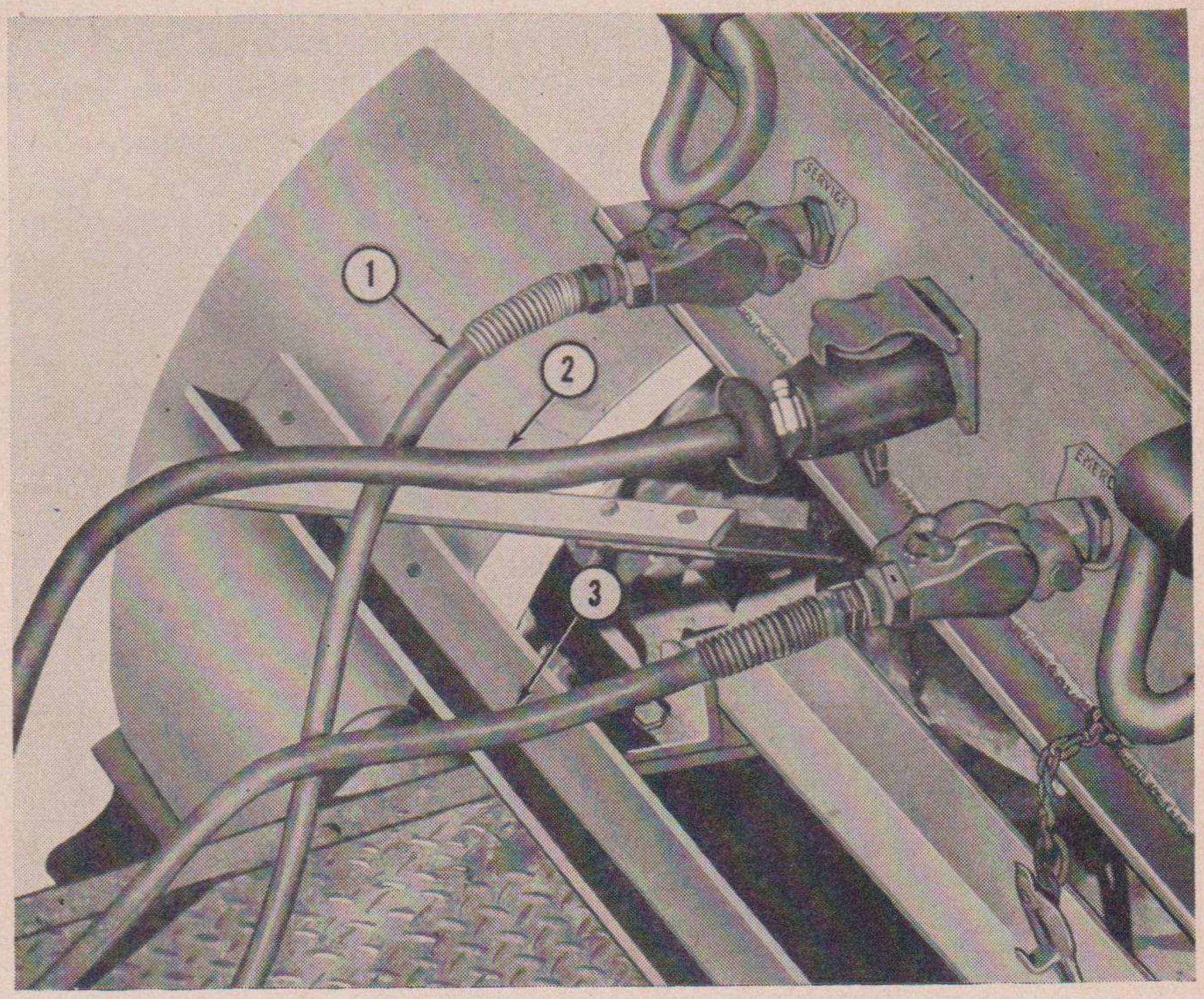


Figure 11. Landing gear operation.

1 Landing jack
2 Jack handle
3 Upper tube
4 Bearing tube
5 Lower tube elevating crank
6 Pin holes
7 Lower tube
8 Foot pad assembly
9 Attaching pin
10 Retaining pin
11 Gear support

Figure 11. Landing gear operation—Continued

Connect the service airbrake line on the semitrailer to the service airbrake line on the tractor truck or dolly, and the emergency airbrake line on the semitrailer to the emergency airbrake line on the tractor truck or dolly. Open the air cutout cocks on the tractor truck or dolly.



1 Service air hose
2 Electrical cable
3 Emergency air hose

Figure 12. Coupled airbrake lines and electrical cable.

Caution: Cutout cocks on the towing vehicle must be closed before disconnecting the air hoses when disconnecting the semitrailer from a towing vehicle. Immediately after connecting the semitrailer air hoses, open the cutout cocks on the towing vehicle and test airbrake operation.

(2) *Disconnecting.* Close the air cutout cocks on the tractor truck. Disconnect the service airbrake line. Disconnect the emergency airbrake line. Fasten the dummy couplings in place on the semitrailer hose couplings to prevent dirt and foreign matter from entering the air lines.

d. Electrical Circuit.

(1) *Connecting.* Remove the electrical cable from the semitrailer tool compartment. Insert one end of the electrical cable (2, fig. 12) into the electrical connector between the two air hose couplings on the front of the semitrailer gooseneck. Insert the other end of the electrical cable into the electrical connector on the rear of the towing vehicle. Test the lights.

Note. Connect electrical cable to towing vehicle immediately after coupling air hoses when connecting semitrailer to a towing vehicle.

(2) *Disconnecting.* Pull the electrical cable ends out of the electrical connectors on the rear of the tractor truck and the front of the semitrailer. Stow the electrical cable in the tool compartment.

e. Operating Handbrake (fig. 8).

(1) *Setting handbrake.* Standing on the right side of the semitrailer facing the trailer at the handbrake wheel, turn the handbrake wheel (1) clockwise to set the brakes. When the handbrake wheel has been turned clockwise until the chain which operates the brakes is wound on the handbrake chain pulley, the handbrake wheel will resist further motion, indicating that the semitrailer brakes are set. At this time, push the bottom end of the pawl (3) in against the ratchet (2) to lock the handbrake wheel in position. Release the handbrake wheel, allowing it to turn back slightly and firmly engage the pawl in the ratchet.

(2) *Releasing handbrake* (fig. 8). Standing on the right side of the semitrailer facing the handbrake wheel, turn the handbrake wheel (1) clockwise about one-sixteenth of a turn to release the pawl from the ratchet. Holding the handbrake wheel in this position, move the pawl (3) clear of the ratchet (2) by pushing the top of the pawl toward the ratchet. When the pawl has been moved clear of the ratchet, turn the

handbrake wheel counterclockwise until the brakes have been released, at which time the handbrake wheel will turn freely in either direction.

Warning: Handbrake must be set before disconnecting the semitrailer from the towing vehicle.

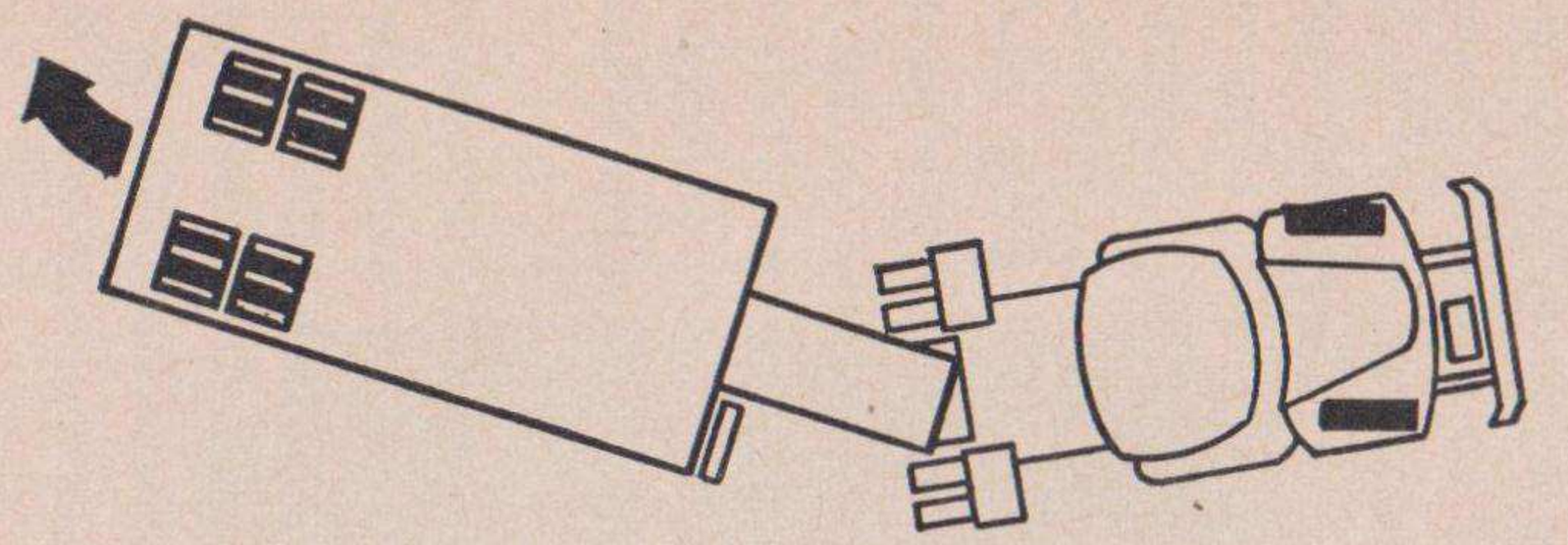
f. Backing the Semitrailer.

(1) *General.* The operator should remember, when backing the semitrailer (fig. 13), that the wheels of the semitrailer will move in a direction opposite to the direction in which the towing vehicle moves. To accomplish a particular motion of the semitrailer, the front wheels of the towing vehicle must be turned one way when the semitrailer is coupled to a tractor truck and the opposite way when the semitrailer is coupled to a tractor truck and dolly because of this reversal of direction.

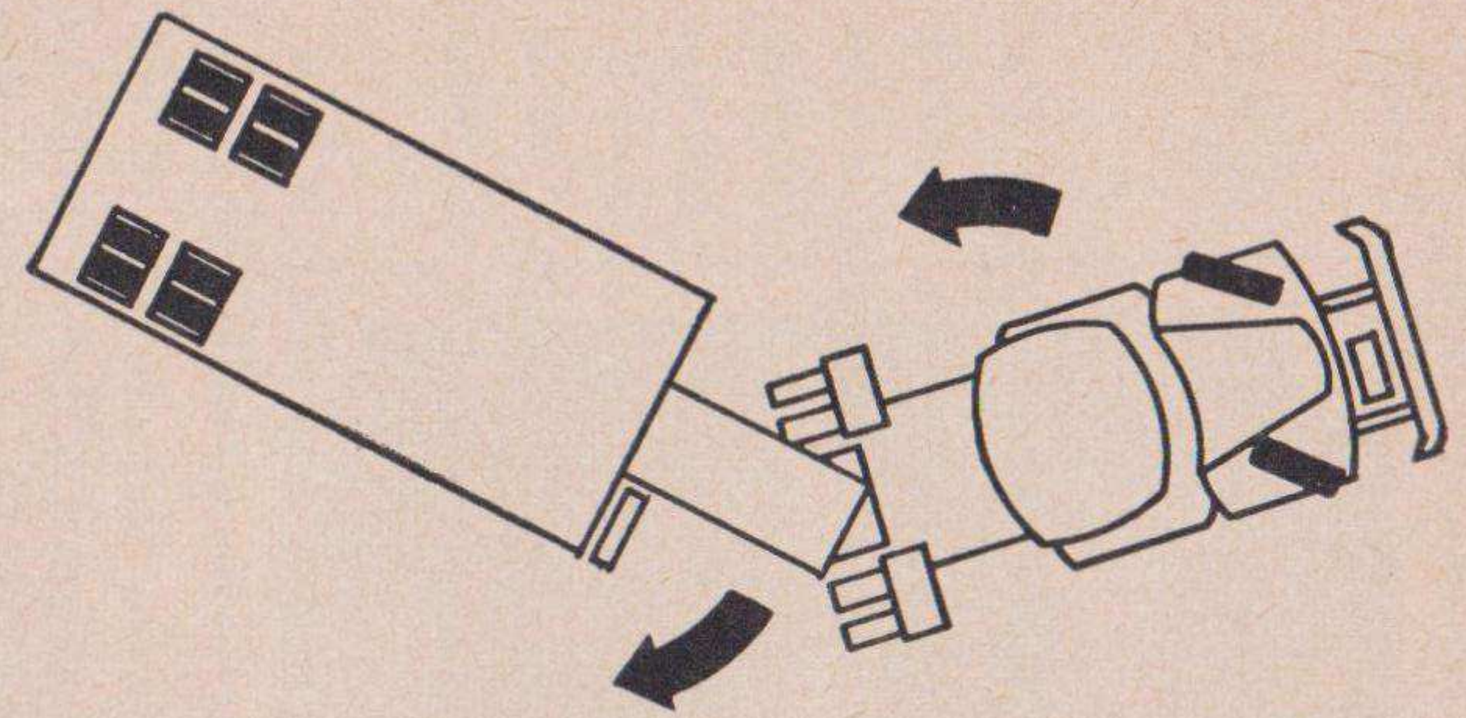
(2) *Coupled to a tractor truck.* When the semitrailer is coupled to a tractor truck, the motion of the semitrailer in backing (fig. 13) will be directly opposite to the motion of the tractor truck. Therefore, to back the semitrailer wheels to the left, the front wheels of the truck should be turned to the right. To back the semitrailer wheels to the right, the front wheels of the truck should be turned to the left.

(3) *Coupled to a dolly.* Backing the semitrailer when it is coupled to a dolly and prime mover is more difficult than when the semitrailer is coupled directly to a tractor truck because of the long coupling and the three separate sections. For this reason, an effort should be made to avoid driving into places that will require backing the semitrailer. If it is necessary to back the coupled dolly and semitrailer over any distance, it is best to disconnect the towing truck, turn it around and engage the dolly drawbar with the front pintle tow hook on the truck. The coupled load can then be pushed back with better control. To back the coupled dolly and semitrailer for short distances, the operator must remember that when the tractor wheels are turned to the right, the dolly wheels will tend to move to the left, forcing the semitrailer wheels to move to the right. However, there is a tendency on the part of the semitrailer and dolly to bind against the truck when backed in this manner.

g. Turning the semitrailer. The semitrailer will readily follow the towing vehicle around a turn. However, the wheels of the semitrailer will tend to follow a shorter arc than those of the towing vehicle because of the length of the semitrailer. The operator must keep this in mind when making a turn. Correct procedure for a turn is to permit the front end of the towing vehicle to pass beyond the point at

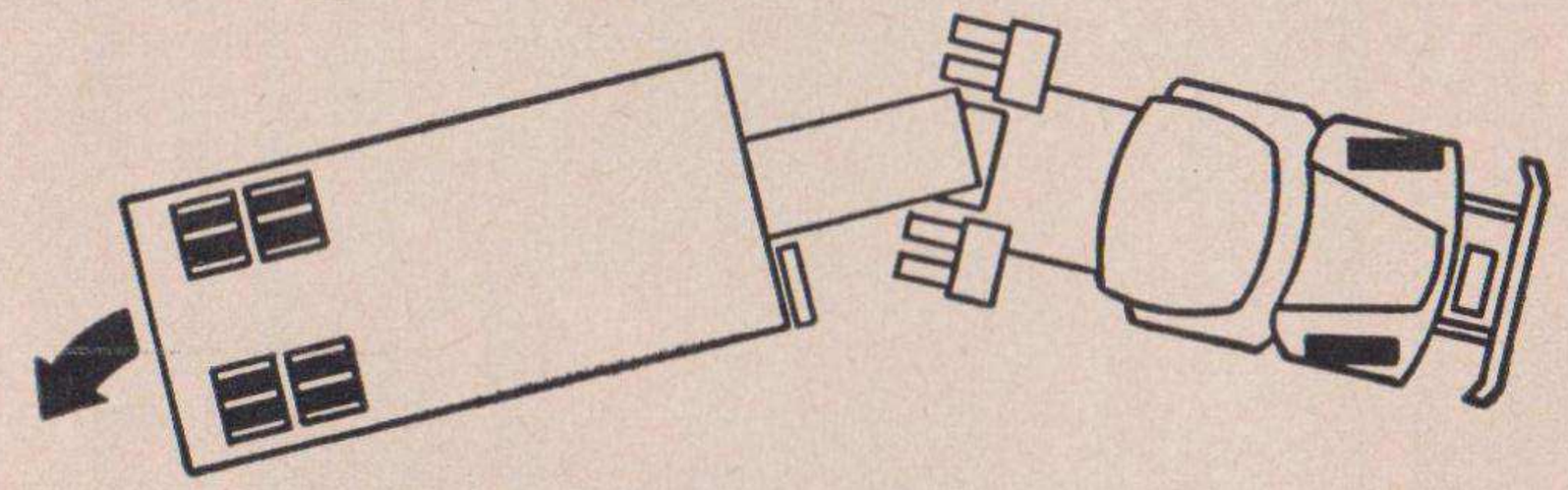


WHEEL TURNED SLIGHTLY

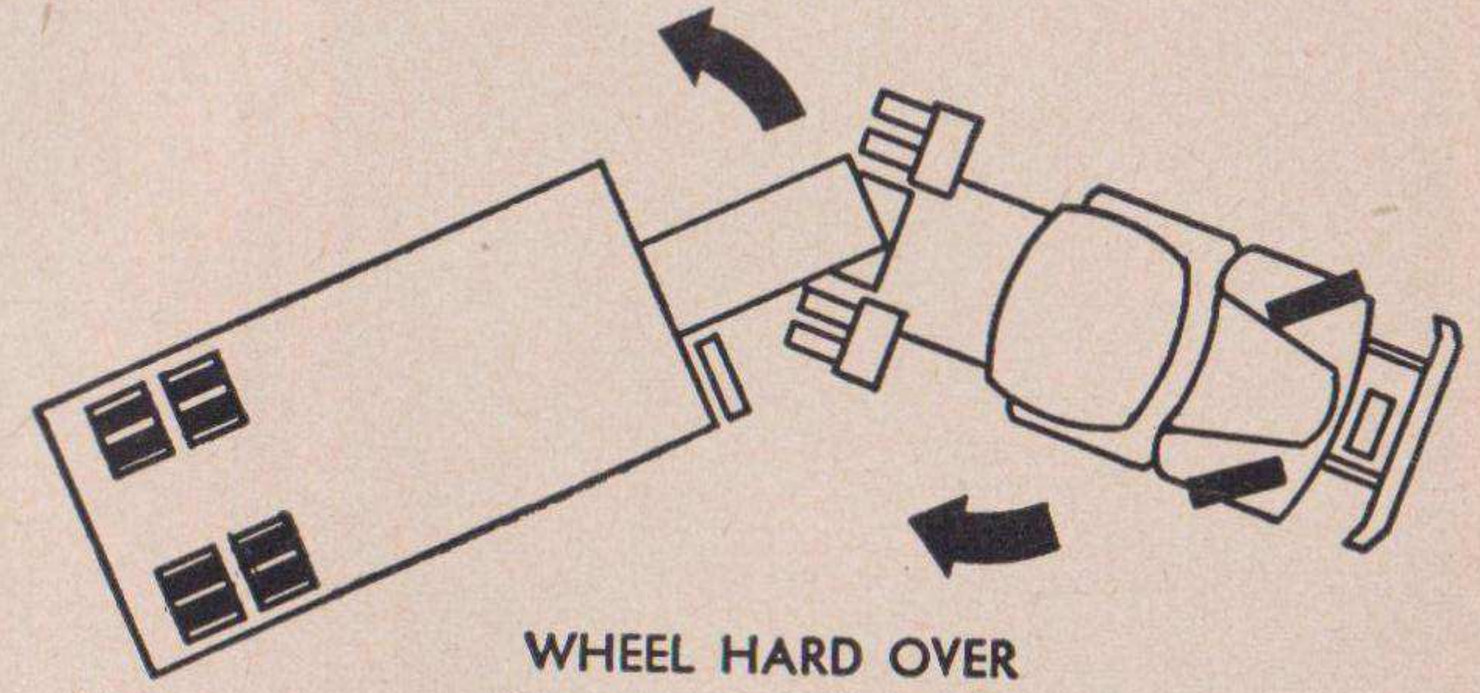


WHEEL HARD OVER

A PRIME MOVER STEERING WHEEL TURNED IN A CLOCKWISE DIRECTION



WHEEL TURNED SLIGHTLY



WHEEL HARD OVER

B PRIME MOVER STEERING WHEEL TURNED IN A COUNTER-CLOCKWISE DIRECTION

Figure 13. The semitrailer motion in backing.

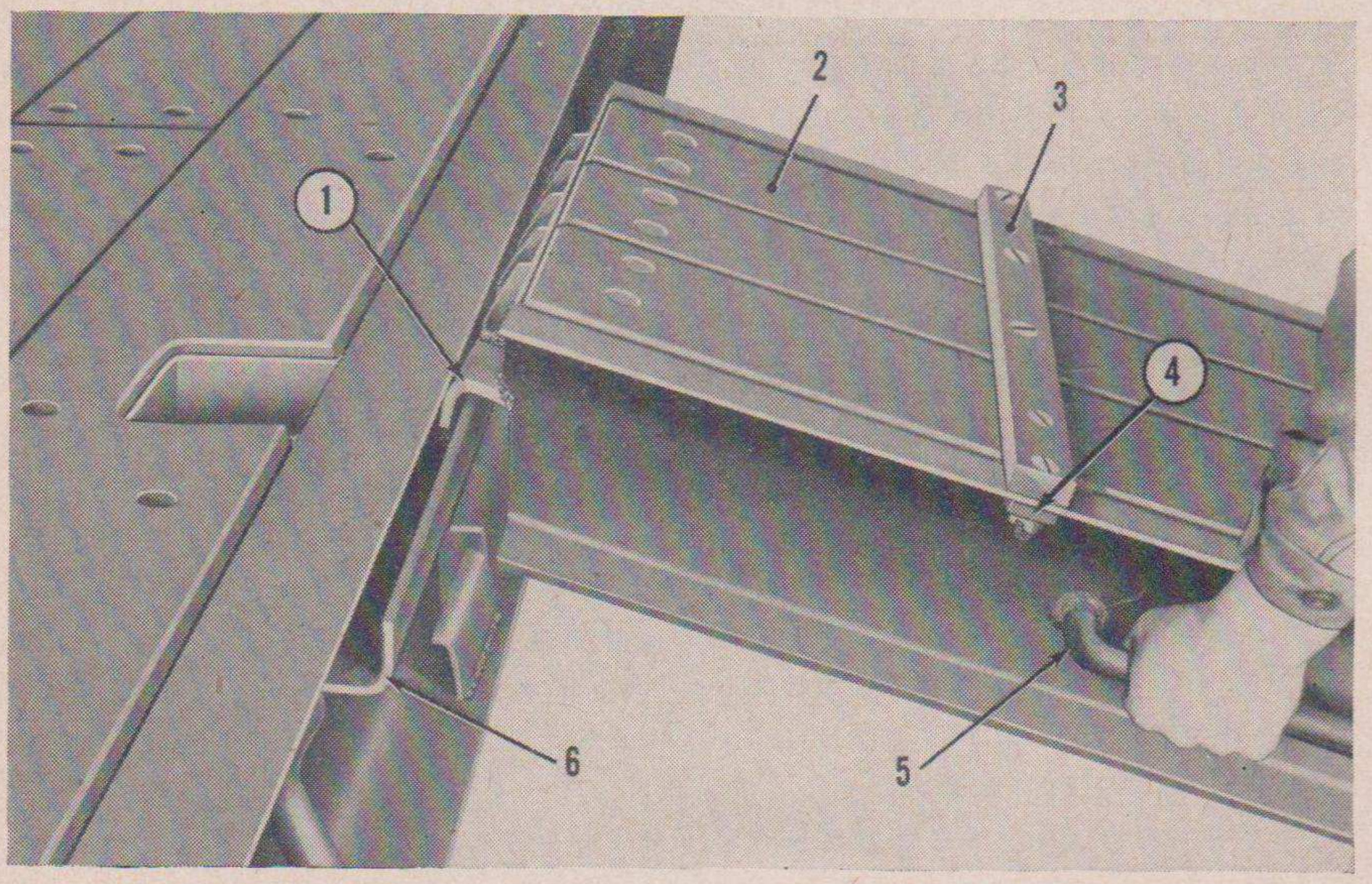
which the operator would ordinarily turn the front wheels, then turn the front wheels of the towing vehicle sharply around the corner, permitting the semitrailer wheels to turn inside the turn made by the tractor truck, so that the semitrailer will clear any obstacle at the corner.

h. Braking. The service brakes on any combination of semitrailer and tractor truck or tractor truck and dolly, are operated simultaneously by the foot brake pedal on the towing vehicle. Some tractors are equipped with a separate brake lever for the semitrailer. For ordinary stops, the service brake pedal is used. Brakes should be applied exactly as they would be if the tractor truck alone were being stopped or slowed, except that an easier application of the brakes should be made. The semitrailer brake lever is used to apply the semitrailer brakes only. Sudden application of the semitrailer brakes, particularly when the semitrailer is heavily loaded, may be dangerous to personnel or equipment. The separate semitrailer brakes should be used only in special cases. In no case should the semitrailer brakes be sharply or suddenly applied. When a heavily loaded semitrailer is being towed at speeds above very slow speeds on steep grades, the operator should never allow the momentum of the semitrailer to push the tractor truck. If the semitrailer does start to push the tractor truck, the operator will find a tendency on the part of the equipment to weave in its forward motion. This weaving is an indication of imminent danger, and the tractor truck should be speeded up to eliminate this condition. If it is necessary in such a case to obtain control of the semitrailer by applying its brakes, they should be applied very gradually. Too sudden an application will cause "jackknifing". The brakes on the semitrailer or semitrailer and dolly should not be used to slow the entire load under ordinary circumstances because of the additional wear created by doing this.

i. Parking the Semitrailer. The semitrailer, when coupled to a tractor truck or tractor truck and dolly, requires a much longer parking space than an ordinary vehicle. Because of this, and the difficulties in backing the semitrailer, care should be taken to select a parking space with easy access. So long as this is kept in mind, the semitrailer can be parked parallel to the curb, parallel to a loading platform, or at a right angle to a loading platform without great difficulty. Immediately after parking the semitrailer, either alone or with a towing unit, the handbrake should be applied on the semitrailer to be certain that no motion of the semitrailer occurs after it is disengaged or while it is parked.

j. Installing loading ramp assemblies (fig. 14). There are four ramp clip angles (6) welded to the frame on each side of the semitrailer and four ramp clip angles welded to the frame across the rear of the semitrailer. These ramp clip angles are intended to engage the

ramp hook (1) on the upper end of each loading ramp assembly (2) when it is in place. To install a loading ramp assembly, lay it beside or at the rear of the semitrailer on the ground, but in the approximate position which it will finally occupy. One man should grasp the ramp lifting handle (5) on one side of the loading ramp assembly, and another man should grasp the ramp lifting handle on the other side, and raise the upper end of the loading ramp assembly until the ramp hook is just above the ramp clip angle. Lower the loading ramp assembly until the ramp hook engages the ramp clip angle. The ramp hook will not properly engage the ramp clip angle unless the loading ramp assembly is at a right angle with the frame of the semitrailer. The two loading ramp assemblies should be spaced so that the wheels of the vehicle to be loaded over the ramp assemblies will pass as nearly as possible up their centers.



1 Ramp hook
2 Loading ramp assembly
3 Ramp cleat
4 Spacer block
5 Ramp lifting handle
6 Ramp clip angle

Figure 14. Connecting ramp hook.

k. Loading Ramp Assembly Stowage. When the semitrailer is to be moved, the loading ramp assemblies (2, fig. 14) should first be disengaged and stowed for transportation. To disengage a loading ramp assembly, one man should grasp each upper ramp lifting handle (5), and raise the end of the loading ramp assembly until the ramp hook (1) is disengaged from the ramp clip angle (6) on the side of the semitrailer. Lift the loading ramp assembly and place it on the bed of the semitrailer. When the semitrailer is to be moved a considerable distance with the loading ramp assemblies on its bed, lash them to the lashing rings (fig. 1) on the side of the semitrailer frame.

16. Coupling

To couple the semitrailer to a dolly or prime mover, perform *a* through *f* below:

a. Set Handbrake (par. 15*e*(1)).

b. Engage Kingpin in Fifth Wheel (par. 15*b*(1)).

c. Connect Airbrake Lines (par. 15*c*(1)).

d. Connect Electrical Circuits (par. 15*d*(1)).

e. Raise Landing Gear (par. 15*a*(2)).

f. Release Handbrake (par. 15*e*(2)).

Caution: Before towing the semitrailer, and at halt, make sure that its load is balanced, is not topheavy, and is properly secured.

g. Test Operation. Pull the towing vehicle several feet ahead and apply the airbrakes to the tractor and semitrailer to test their operation and proper connections. If this test operation is satisfactory, the semitrailer is now ready for towing.

17. Uncoupling

To uncouple the semitrailer from a dolly or prime mover, perform *a* through *e* below:

a. Set Handbrake (par. 15*e*(1)).

Caution: Before disconnecting the semitrailer after towing it, check the brakedrums. If the brakedrums are too hot to touch with the bare hands, chock the wheels fore and aft, bleed the airbrake system of air, and allow the brakedrums to cool. The handbrakes may then be set.

b. Lower Landing Gear (par. 15*a*(1)).

c. Disconnect Electrical Circuits (par. 15*d*(2)).

d. Disconnect Airbrake Lines (par. 15*c*(2)).

e. Disengage Kingpin From Fifth Wheel (par. 15*b*(2)).

After disengaging the kingpin from the fifth wheel, the towing vehicle should be pulled clear of the semitrailer.

18. Loading and Unloading Self-Propelled Equipment

a. General. Each piece of equipment being loaded will have particular requirements that can only be determined in the field. Certain general principles will apply regardless of the equipment being loaded. Self-propelled equipment usually is loaded easily by driving it up the loading ramp assemblies onto the bed of the semitrailer. If the equipment being loaded is shorter than the width of the semitrailer, it should be driven up the loading ramp assemblies from the side of the semitrailer (fig. 15). If the vehicle being loaded is longer than the width of the semitrailer, the loading ramp assemblies should be placed at the rear of the semitrailer and the equipment should be driven up them from the rear of the semitrailer (fig. 16). Prior to loading any equipment from the side, substantial blocks of wood or

metal must be placed under the side frame member near the loading ramp assemblies to prevent the semitrailer from overturning as it is loaded. Two, three, or four blocks should be used, depending on the size of the blocks. The blocks should be spaced along the side so the weight will be equally distributed among them.

Note. The semitrailer should always be coupled to a tractor truck or dolly when loading equipment over the rear of the semitrailer.

After being loaded, the equipment should be secured by lashing it to the lashing rings (fig. 1) on the frame member along the side of the semitrailer (fig. 17). Spring loadbinders furnished as on-equipment tools (app. III) should be used to tighten these lashings. Substantial blocking should be placed under the wheels or tracks of all equipment after it is loaded. This blocking may be nailed to the bed of the semitrailer.

Caution: Always load and unload the semitrailer so that the load on the semitrailer is balanced at all times.

b. Tracked Vehicles. Tracked vehicles should be "walked" up the loading ramp assemblies from the rear of the semitrailer. In the case of bulldozers, the dozer blade should be allowed to rest on the bed of the semitrailer after the vehicle is loaded. When tracked vehicles are being unloaded, they should be driven down the loading ramp assemblies under power, to prevent the tendency of their cleats to slide sideways on the loading ramp assemblies.

c. Shovels and Cranes. Shovels and cranes may be loaded by "walking" them up the loading ramp assemblies, as in the case of other tracked vehicles. It will be easier to drive such vehicles up the loading ramp assemblies with the dipper or boom leading. After loading, the cab may be swung around if it is necessary to clear the tractor truck. To improve clearance on the road it is preferable to have the dipper or boom of the shovel or crane forward over the cab of the towing vehicle. When unloading these pieces of equipment, the dipper or boom should trail the cab of the equipment. It will be found that cranes are much easier to haul if the boom is lowered to a nearly horizontal position after loading the equipment. Great care must be taken in transporting a crane with the boom lying horizontal to prevent the boom from striking objects along the side of the road. In many cases it will be found advantageous to drive the tractor truck and semitrailer slowly and have an additional man walk beside the boom of the crane.

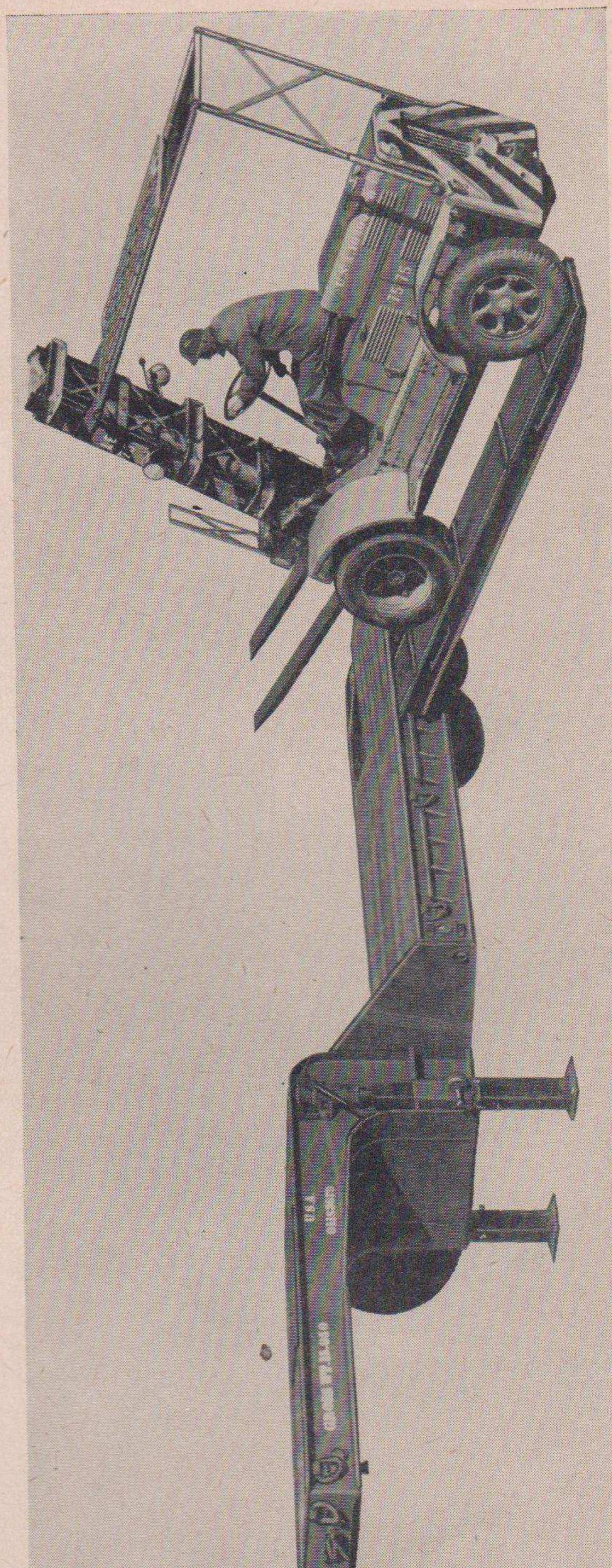


Figure 15. Loading self-propelled equipment from side.

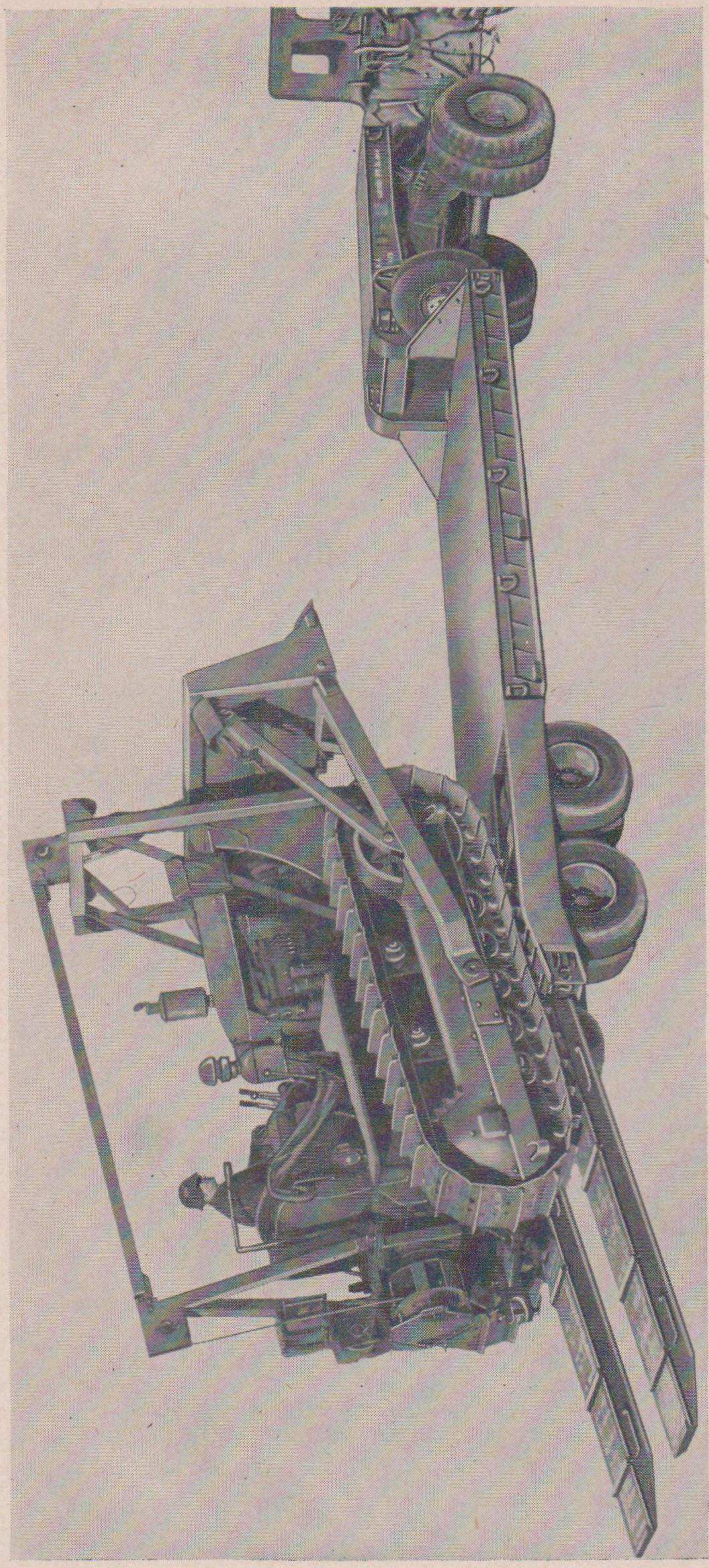


Figure 16. Loading self-propelled equipment from rear.

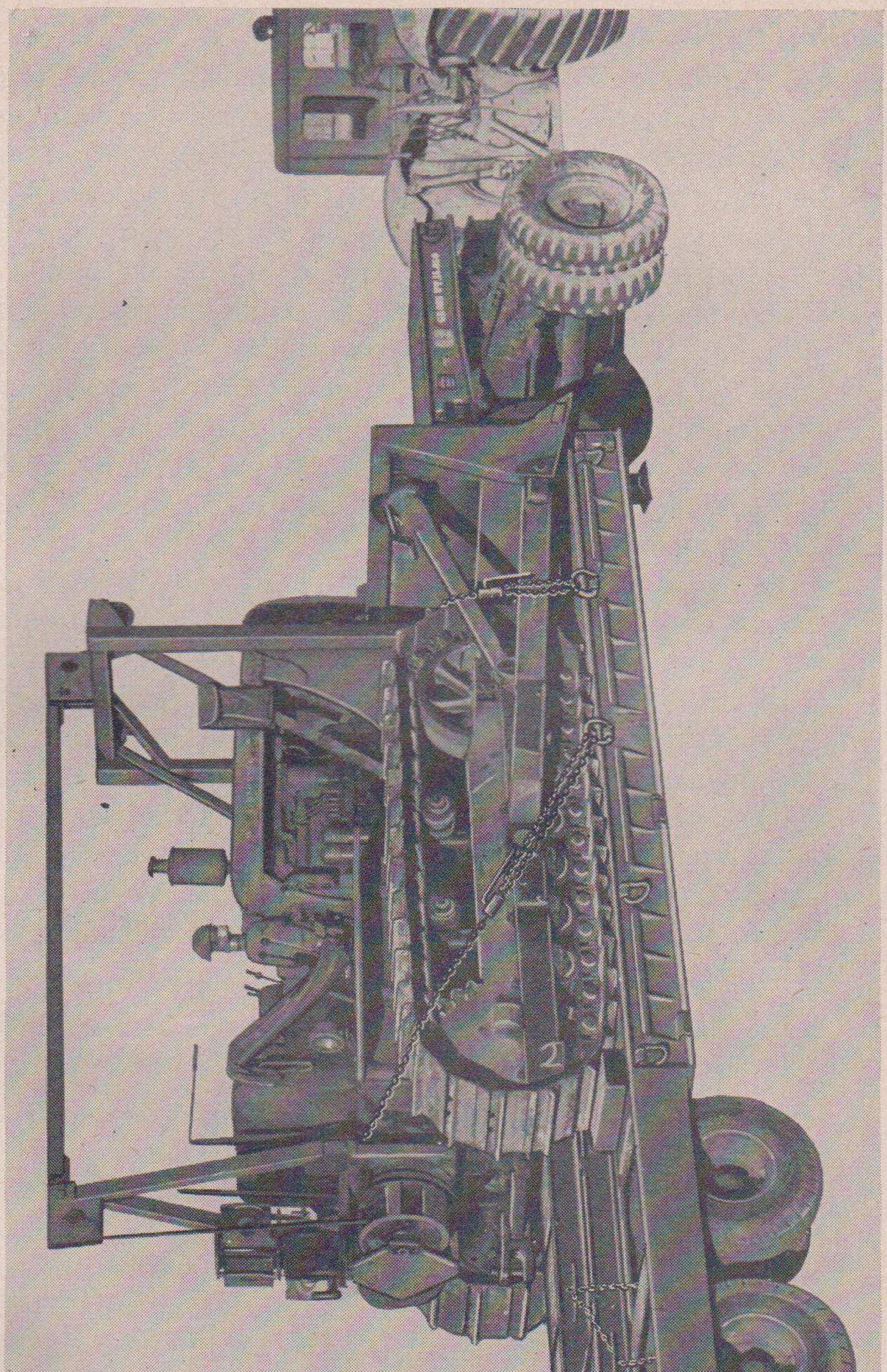


Figure 17. Method of securing load on semitrailer.

19. Loading and Unloading Dead Equipment

a. Loading (fig. 18). Nonself-propelled equipment is most easily loaded by using a crane of suitable size. Using a crane, the equipment is lifted and set into position on the semitrailer or lifted off the semitrailer and set into position on the ground. If no crane is available, dead equipment may be winched into place or pushed into place with a bulldozer. The use of a bulldozer for pushing equipment onto or off the semitrailer is not desirable, however, and should be avoided if it is possible. Winching dead equipment onto or off the semitrailer is not difficult. Since the equipment must slide up the loading ramp assemblies and across the bed of the semitrailer, light planks should be placed as skids prior to moving the equipment. It may be found helpful when loading very heavy equipment to grease these planks before winching the equipment into place.

(1) If the prime mover towing the semitrailer is provided with a rear-mounted winch, winching the equipment into place over the rear of the semitrailer is simple. Back the semitrailer into position with the rear of the semitrailer near the equipment to be loaded and place the loading ramp assemblies at the rear of the semitrailer. Place skid planks up the loading ramp assemblies and across the bed of the semitrailer, and pay out the winch line from the prime mover until the end of the line can be connected to the equipment. Fasten steadying lines to each side of the piece of equipment to keep it from turning while it is being winched into position.

Note: The semitrailer should always be coupled to a tractor truck or dolly when loading equipment over the rear of the semitrailer.

Caution: Always load and unload the semitrailer so that the load on the semitrailer is balanced at all times.

(2) If the prime mover does not have a rear-mounted winch, a front-mounted winch on another piece of equipment can be used to winch the load into position over the rear of the semitrailer through the use of a snatch block. The winch line is led from the truck, which is placed at an angle on the right or left side of the rear of the semitrailer, and passed through a snatch block fastened to the rear of the gooseneck of the semitrailer and back to the equipment to be loaded. After loading the equipment, secure it to the semitrailer before moving the semitrailer. Wire or chain may be attached to the lashing rings on the sides and rear of the semitrailer to hold the load in place. Load binders are provided as part of the on-equipment tools (app. III) for taking the slack out of any chain lashings used. Any movable parts of equipment should be secured in position before moving the semi-

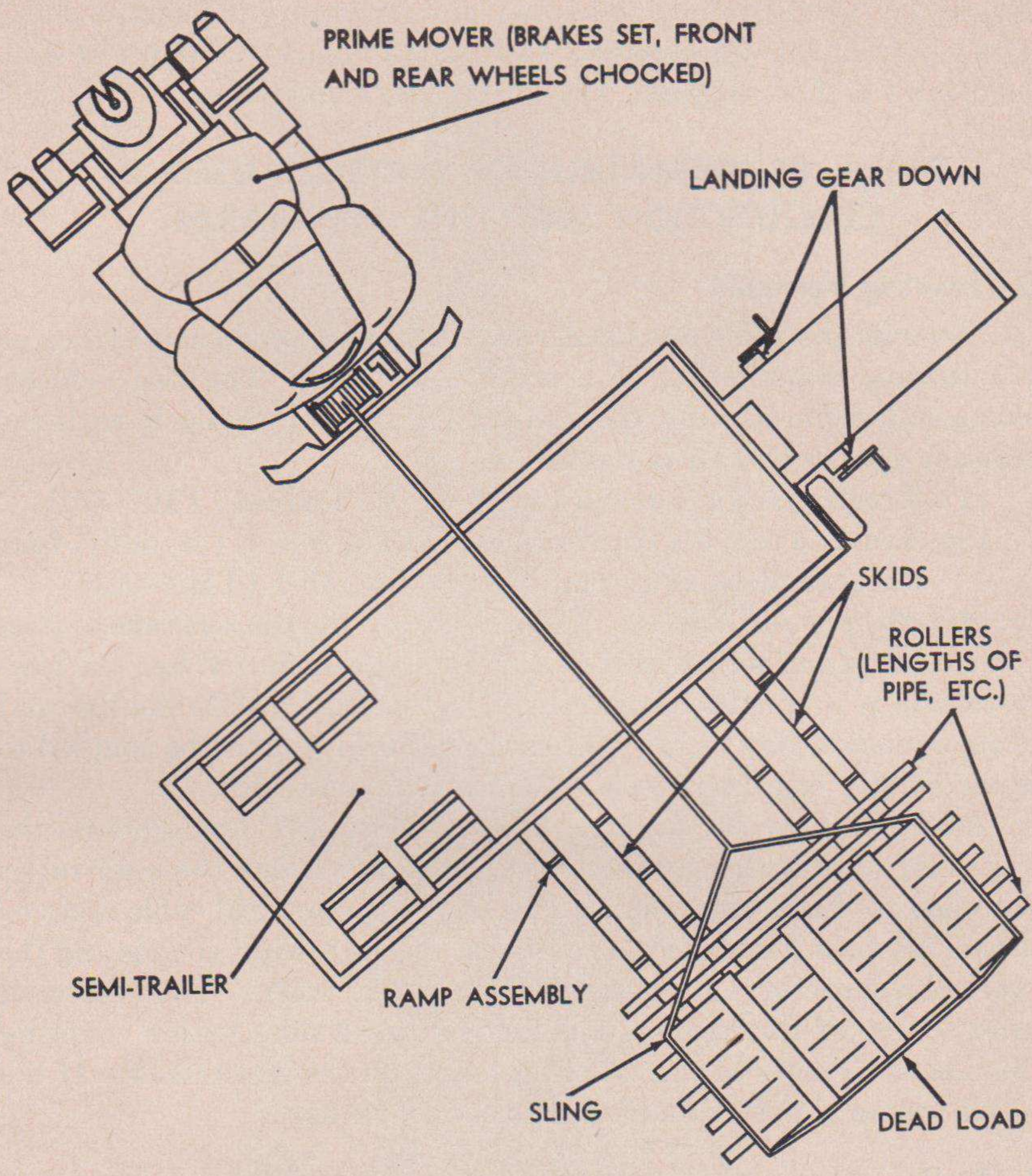


Figure 18. Loading dead equipment.

trailer, particularly in the case of equipment such as shovels and cranes when they are disabled.

b. Unloading. If a crane is not available for unloading dead equipment, the equipment can be unloaded with winch lines. In this case, it is necessary to use two winches and two winch lines, to maintain control of the material being unloaded. One winch line should be fastened to the equipment so that the equipment can be dragged from the semitrailer and down the loading ramp assemblies. Another winch line should be secured to the other side of the piece of equipment. Tension should be kept on this line, to act as a brake while the equipment is being unloaded. If the prime mover towing the semitrailer has a rear-mounted winch, the winch line from the prime mover can be used as a braking line while the equipment is unloaded from the rear of the semitrailer. If the prime mover does not have a rear-mounted winch, two trucks or other equipment having winches can be

used, if the towing vehicle is turned slightly before the equipment is unloaded from the semitrailer. In this case, place one truck at each end of and a short distance away from the semitrailer.

Section IV. OPERATION OF MATERIEL USED IN CONJUNCTION WITH THE SEMITRAILER

20. Towing Vehicles

a. Description. The semitrailer may be towed by a tractor truck or by a towing combination of a truck and dolly. The two vehicles recommended for hauling the semitrailer and supplying it with the necessary electric and air power are—

(1) Truck, tractor, 5 ton, 6 x 6, M–52, W/5 wheel (TM 9–837).

(2) Truck, 6 ton, 6 x 6, prime mover (TM 9–813); w/dolly, four wheel tandem, four dual tires, 20 ton, M–1 (TM 5–9217).

b. Air Supply for Brakes. The air supply for the airbrake system on the semitrailer is provided by the towing vehicle. When the towing vehicle is coupled to the semitrailer, the service airbrake line and the emergency airbrake line on the towing vehicle must be coupled to the air supply couplings on the semitrailer (par. 15*c*).

c. Power Supply for Lights. The power supply for lights on the semitrailer is provided by the towing vehicle. When the semitrailer is coupled to the towing vehicle (fig. 19), the electrical cable must be coupled between the electrical connector on the towing vehicle and the electrical connector on the semitrailer (par. 15*d*). The electrical power source of the towing vehicle must be 24 volts with a coupling cable identical mate to the coupling socket on the semitrailer. If the 24-volt source is not available lights cannot be used.

21. Dolly

a. Description. When the dolly, four wheel, tandem, four dual tires, M–1, is coupled to the semitrailer, it converts the semitrailer to a full trailer. The dolly has a fifth wheel attachment for coupling to the semitrailer and a movable rear axle that may be steered when the dolly is being backed under the gooseneck of the semitrailer. The drawbar at the front of the dolly is coupled to a tractor for towing the dolly and semitrailer.

Caution: When the loaded semitrailer is to be connected to a prime mover and dolly, couple the drawbar of the dolly to the rear pintle hook of the prime mover before connecting the loaded semitrailer to the dolly. Coupling the dolly to the prime mover when the dolly is already coupled to a loaded semitrailer is dangerous.

b. Air Supply for Brakes. When the semitrailer is coupled to a dolly and prime mover, the service airbrake line and emergency airbrake line on the prime mover are connected to the semitrailer. The

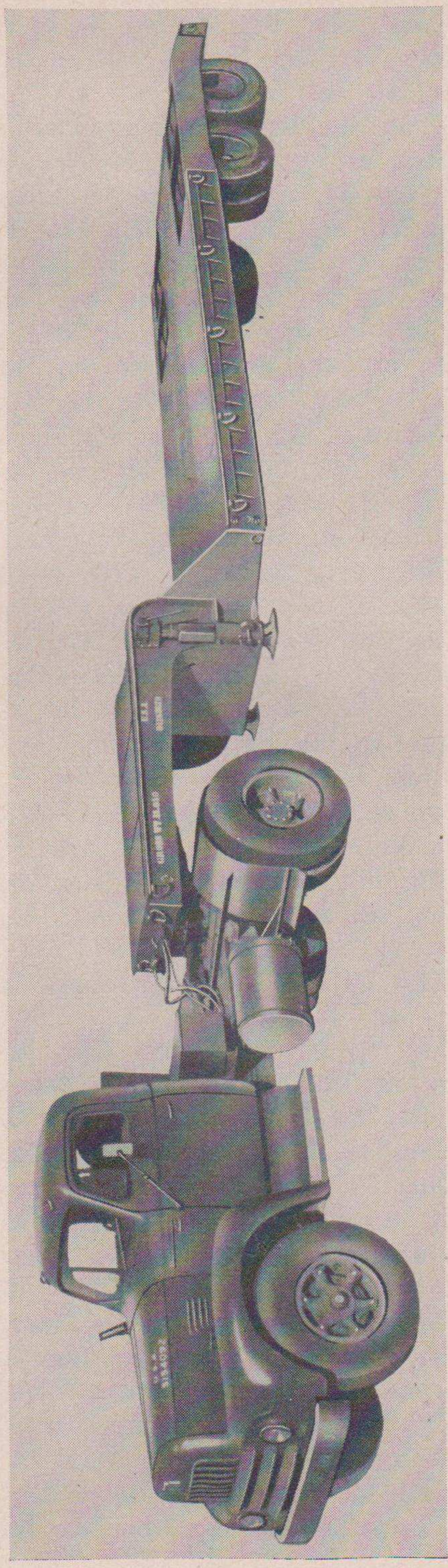


Figure 19. Semitrailer coupled to tractor truck.

rear couplings of the dolly are connected to the couplings under the gooseneck of the semitrailer. The shutoff cocks on the front couplings of the dolly must be closed.

c. Power Supply for Lights. The electrical cable supplied with the semitrailer must be coupled between the electrical connector on the prime mover and the electrical connector on the semitrailer before the semitrailer lights can be used. The power supply for lights on the semitrailer is provided through this cable from the prime mover.

d. Connecting Dolly to Truck. When a prime mover and dolly are used for towing the semitrailer, couple the dolly to the tractor truck prior to coupling the semitrailer to the dolly. Back the tractor truck into position close to the drawbar of the dolly and raise the lunette of the dolly until it will clear the pintle hook of the tractor truck. Back the tractor truck slowly until the lunette of the dolly can be placed on the pintle hook. After connecting the dolly to the tractor truck, connect the service airbrake line and the emergency airbrake line of the truck to the service airbrake coupling and the emergency airbrake coupling on the dolly. Connect the electrical cable from the electrical connector on the truck to the electrical connector on the dolly. Open the air cutout cocks on the prime mover.

e. Connecting Semitrailer to Dolly.

(1) Set handbrake (par. 15*e*(1)).

(2) Unlock the fifth wheel on the dolly.

(3) Back the prime mover to place the dolly under the gooseneck of the semitrailer.

(4) Couple the semitrailer to the dolly (fig. 20), following the procedure outlined in paragraph 16.

Section V. OPERATION UNDER UNUSUAL CONDITIONS

22. Operation in Extreme Cold (Below 0° F.)

The operation of vehicles at extreme low temperatures presents problems that do not exist in temperate climates. Careful servicing by both operational and maintenance personnel is required to offset these special demands. The condensation and freezing of atmospheric moisture may cause trouble in the wiring or airbrake systems. Frequent inspection of the electrical connectors, harnesses, and lights for short circuits is necessary. Moisture and ice should be removed from connectors whenever it is found. Moisture or ice forming on parts of the airbrake system may prevent proper operation of the airbrakes. Such formations should be removed as quickly as possible after they are formed. Vehicle maintenance will be complicated by extreme cold temperatures. It may be necessary in many instances to warm the vehicle before servicing it by placing it in a heated building. Only cold-weather lubricants may be used, and if these

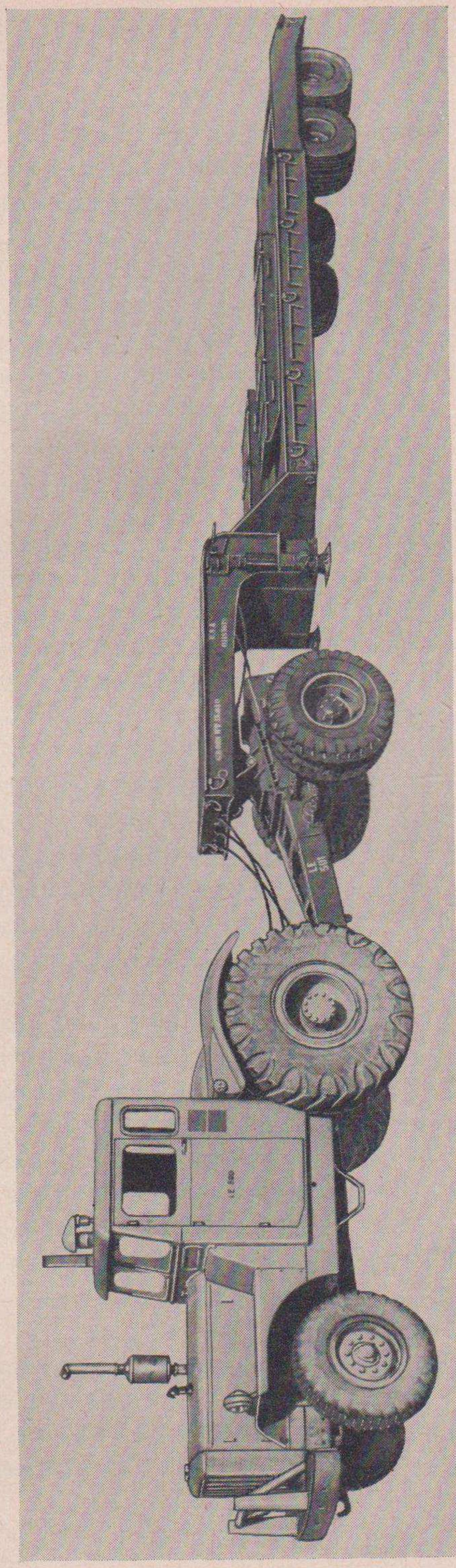


Figure 20. Semitrailer coupled to dolly and prime mover.

lubricants begin to block up, they must be carefully cleaned off all parts with cleaning solvent, and new cold-weather lubricants provided. Improper lubrication will result in little or no service from the vehicle and will seriously shorten the life of the vehicle. Water will condense in the airbrake pressure tank during operation, and therefore the airbrake pressure tank plug valve must be opened to drain the air system when the vehicle is parked. Since this will release the airbrakes, the wheels must be chocked. The handbrakes should not be applied in extreme cold weather because the brake linings may become frozen to the brakedrums. If operating parts of the vehicle become frozen or jammed in cold weather, the parts should be thawed carefully before attempting to force them to operate.

23. Operation on Snow or Ice

Operation of the semitrailer on snow or ice does not present additional hazards, except to increase the likelihood of skidding. Under such circumstances, chains should be installed on the towing vehicle and semitrailer. Avoid speeds requiring severe braking, since "jackknifing" of the towed load, a characteristic danger in trailer operation, can be caused easily when the brakes on the towed load are applied on snow and ice. Accumulations of snow or ice on moving parts of the semitrailer should be removed as soon after operation as possible. Washing with fresh water or steam will usually remove these accumulations. Particular attention must be given to removing the snow and ice accumulations from the kingpin, landing gear, handbrake system, and rear wheels and axles.

24. Operation on Soft Ground

The semitrailer can operate successfully in mud, provided there is sufficient footing to prevent the wheels from sinking in to the axles. However, it is not advisable to tow a heavily-loaded semitrailer through deep mud. Accumulations of mud should be removed from all moving parts of the semitrailer as quickly as possible after operation in mud. Tire pressure should be lowered while operating the semitrailer through muddy ground. Reinflate tires to standard pressure after such use and clean all semitrailer parts with fresh water.

25. Operation on Rough Terrain

It will not damage the semitrailer to operate it on rough terrain. However, it must be remembered that this semitrailer is not equipped with springs of any kind. Accordingly, it must be driven slowly when proceeding over very rough terrain. Tire pressure should be

decreased for rough terrain operation, and rocky or stump-filled ground should be avoided. Reinflate tires to standard pressure after such use.

26. Operation in Salt Water Areas

Metal parts of the semitrailer are subject to deterioration and rapid rusting when operated in salt-water areas. The semitrailer should be cleaned frequently with fresh water and lubricated at more frequent intervals when operated under such conditions. After fording, or if the trailer should be immersed in salt water for any reason, all parts of the trailer, including the airbrakes and the electrical equipment, must be serviced immediately. First flush the exposed parts of the semitrailer with fresh water and then service it. Inspect the semitrailer at frequent intervals for signs of corrosion or rusting of metal parts, and clean off rust or corrosion immediately. After cleaning, wash the exposed area with cleaning solvent and apply a protective coating of paint (par. 33) or rust-preventive compound.

27. Operation in Extreme Heat

a. Hot, Dry Climates. Inspect the semitrailer frequently. More frequent servicing and lubrication will be required, but do not over-lubricate it. Wipe off any excess lubricant, particularly around the wheels. Protect the exterior surfaces of the semitrailer by renewing the paint (par. 33) whenever it shows evidence of deterioration.

b. Hot, Damp Climates. Operation in hot, damp climates causes abnormal deterioration of metal, fabric, and rubber parts. Clean and inspect the semitrailer frequently, but do not over-lubricate it. Protect all exterior surfaces from the atmosphere by renewing the paint (par. 33) on painted surfaces, and keeping a film of light engine oil on unfinished exterior metal surfaces. Remove corrosion whenever it forms, and apply a protective coating of paint, oil, or rust-preventive compound. If the semitrailer has been lubricated with lubricants other than the hot-weather lubricants specified in paragraph 32, clean off all such lubricants and replace them with that of the proper grade. If it is necessary to leave the semitrailer stored for a considerable period in hot, damp climates, it should be examined frequently for evidences of deterioration. Particular attention should be paid to the tires, which will rot rapidly. It is advisable to move the vehicle occassionally to reduce tire rot.

CHAPTER 3

ORGANIZATIONAL MAINTENANCE INSTRUCTIONS

Section I. ORGANZATIONAL TOOLS AND EQUIPMENT

28. General

The tools and equipment listed in this section are those that are required to perform organizational maintenance on the semitrailer, low bed, rear and side loading, 25 ton, all makes and models. Standard mechanic's hand tools and on-equipment tools are not enumerated in this section.

29. On-Equipment Tools

The on-equipment tools normally supplied with this equipment for the use of the operator are listed in appendix III.

30. Special Organizational Maintenance Tools and Equipment

The tools and equipment in table I bearing identification numbers are listed in Department of the Army Supply Manual ENG 3–41. Table I contains only the tools and equipment necessary to perform the operations illustrated or described in this chapter. The table is included for information only and is not to be used for requisitioning tools or equipment.

Table I.—Special Organizational Maintenance Tools and Equipment

Item	Stock No.	References		Use
		Fig.	Par.	
Puller, bearing cup-----	41–6272.150.600-----	51	72	Wheel bearing cups.

Section II. LUBRICATION AND PAINTING

31. General Lubrication Information

a. Lubrication Order 5–9051 prescribes first and second echelon lubrication maintenance for the semitrailer.

b. A lubrication order is published for each item of equipment. The lubrication order shown in figure 21 is a reproduction of an approved lubrication order for this semitrailer. For the current LO 5–9051 refer to SR 310–20–4.

c. Lubrication orders prescribe approved first and second echelon lubrication procedures. The instructions contained therein are mandatory.

32. Detailed Lubrication Information

a. Care of Lubricant. Keep lubricant containers covered when they are not in use. Use care in the handling and storage of all lubricants to be used in lubricating this equipment, and insure that dirt, contaminants, and foreign matter are kept out of them.

b. Points of Application. Follow the detailed lubrication instructions given beneath each of the following lubrication point illustrations indicating procedures to be followed at each point. Apply the lubricant indicated on the lubrication chart.

LUBRICATION ORDER

L05-9051

SEMI-TRAILER, LOW BED, REAR AND SIDE LOADING, 25-TON, ALL MAKES AND MODELS

References: TM 5-9051,

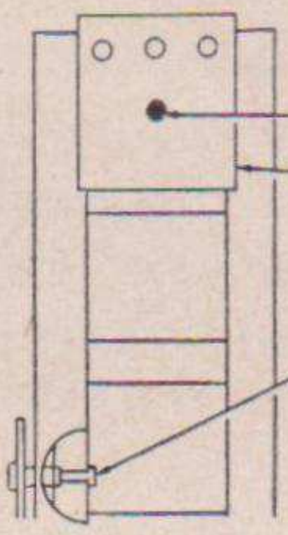
Intervals given are for normal 8-hour day operations. For abnormal conditions or activities, intervals should be shortened to compensate.

Clean fittings before lubricating.

Relubricate after washing or fording.

Clean parts with SOLVENT, dry cleaning, or with OIL, fuel, Diesel. Dry before lubricating.

Lubricate points indicated by dotted arrow shafts on both sides of the equipment.



	LUBRICANT • INTERVAL
2	Lower and Upper Tubes (Clean and Coat) GAA M
1	Attaching Pin GAA M
2	Landing Jack Lower Bearing GAA M
3	Landing Jack Bracket GAA M
1	Gear Support GAA M
4	
5	Handbrake Shaft Bearings GAA M
6	Push Rod Clevis Pin OE W
7	Slack Adjuster GAA S
8	Brake Spider Bushing (Sparingly) GAA M
9	Cam Surface (Coat Sparingly) GAA S
10	Walking Beam Trunnion Axle Bushing GAA W
7	Slack Adjuster GAA S
9	Cam Surface (Coat Sparingly) GAA S
8	Brake Spider Bushing (Sparingly) GAA M
6	Push Rod Clevis Pin OE W

	INTERVAL • LUBRICANT
11	M GAA Kingpin
12	W GAA Kingpin Plate (Clean and Coat)
13	M GAA Handwheel Shaft Bearings
7	W GAA Brake Camshaft Bracket Bushing
9	S OE Tapered Threaded Pin
14	S WB Tapered Roller Bearing Cone And Rollers (Remove wheels, clean and inspect all parts, replace damaged or worn parts, repack bearings and reassemble).
15	W OE Clevis Pins
	M GAA Shaft Bearing
7	W GAA Brake Camshaft Bracket Bushing
9	S OE Tapered Threaded Pin
14	S WB Tapered Roller Bearing Cone And Rollers (Remove wheels clean and inspect all parts, replace damaged or worn parts, repack bearings and reassemble.)

CONTINUED ON FOLLOWING PAGE

Figure 21. Lubrication order.

CONTINUED FROM
PRECEDING PAGE

—KEY—

LUBRICANT	EXPECTED TEMPERATURE			INTERVALS
	Above +32°F	+32°F to −10°F	Below −10°F	
OE — OIL, Engine, Heavy Duty Other Points	**OE** 30 or 9250	**OE** 10 or 9110	**OE** 10 or 9110	**W** — Weekly **M** — Monthly **S** — Semi-Annually
WB — GREASE, general purpose, No. 2	**WB** 2	**WB** 2	**GAA**	
GAA — GREASE, Automotive and Artillery				

NOTES:

1. OILCAN POINTS — Every week lubricate clevises and pins and handbrake linkage with OE.

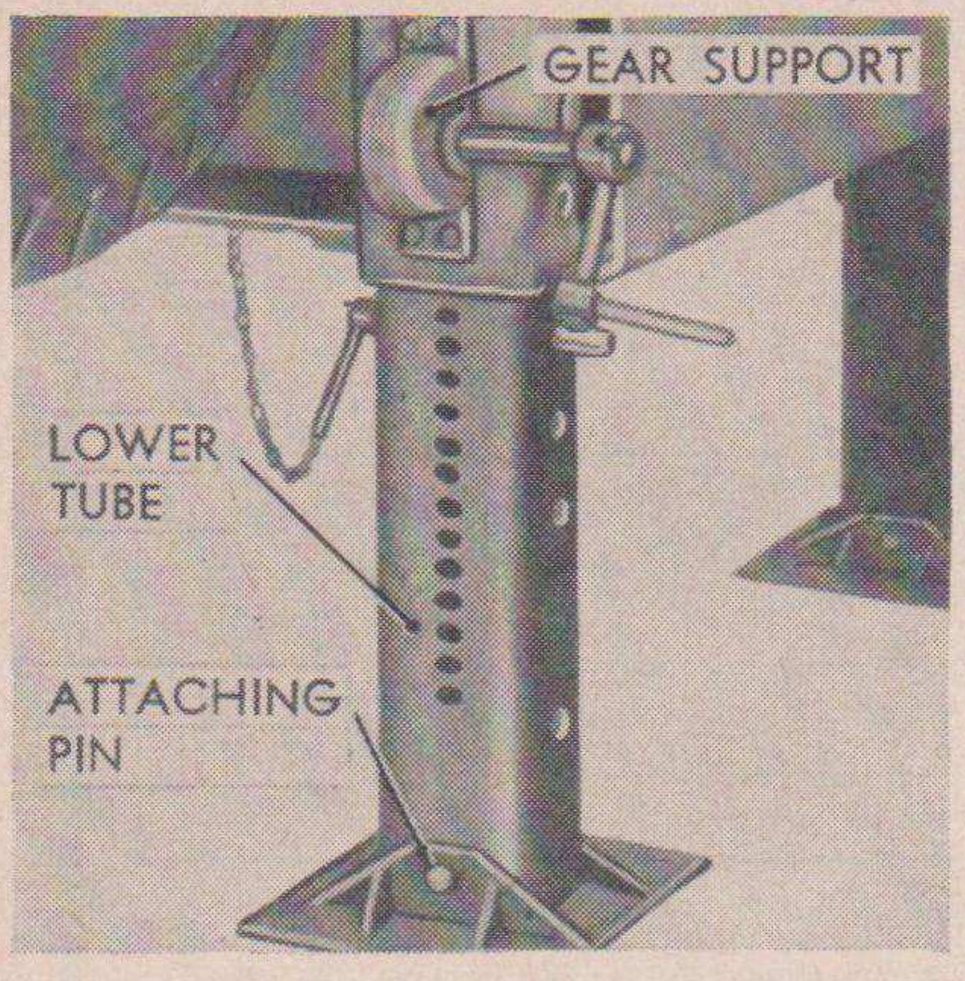
A copy of this Lubrication Order will remain with the equipment at all times: instructions contained herein are mandatory and supersede all conflicting lubrication instructions dated prior to the date of this Lubrication Order.

BY ORDER OF THE SECRETARY OF THE ARMY

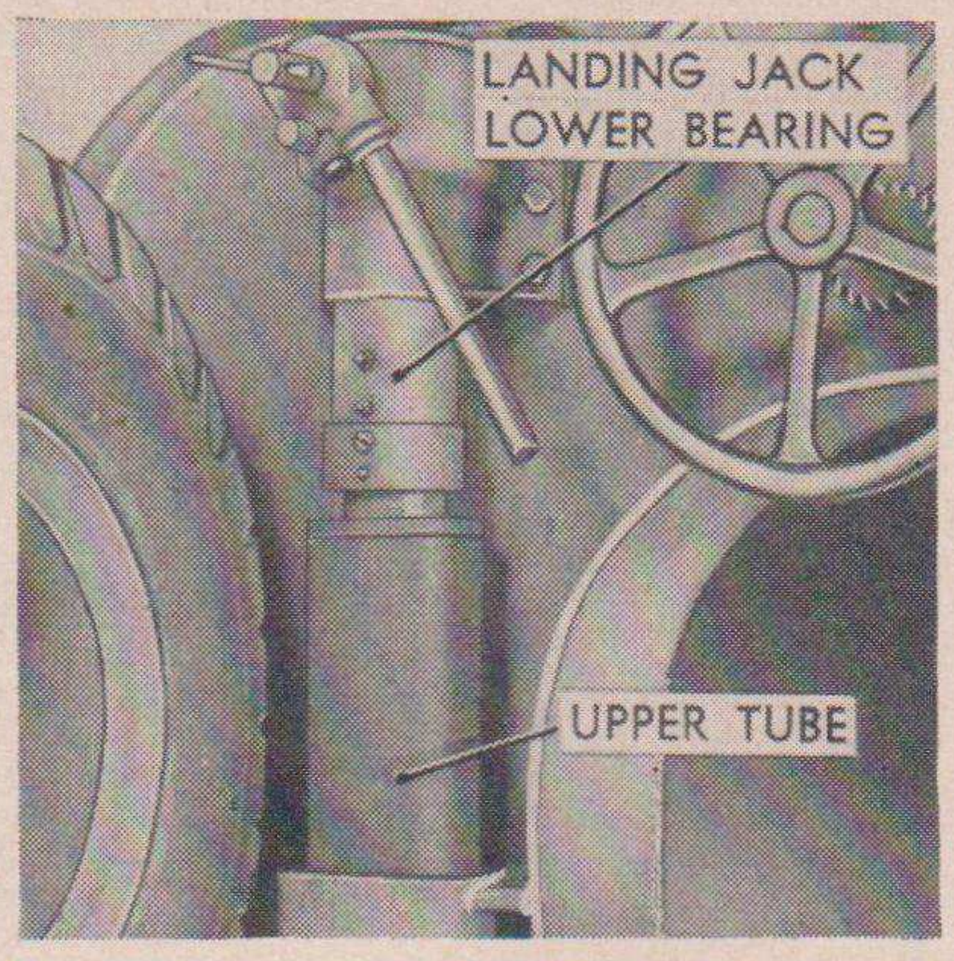
M. B. RIDGWAY
Chief of Staff
United States Army

OFFICIAL
WM. E. BERGIN
Major General, USA
The Adjutant General

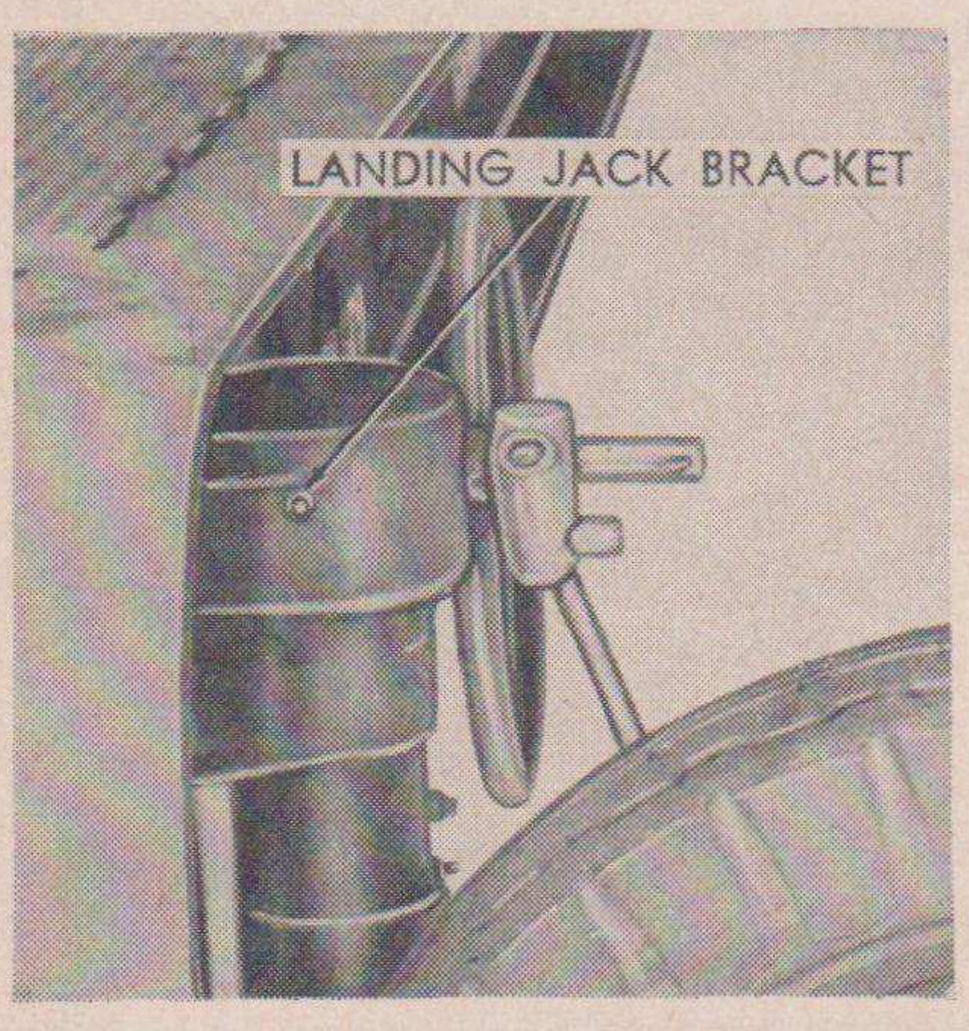
Figure 21—Continued.



Ref. 1. Lubricate attaching pin with GAA, clean lower tube and coat. Lubricate gear support with GAA.

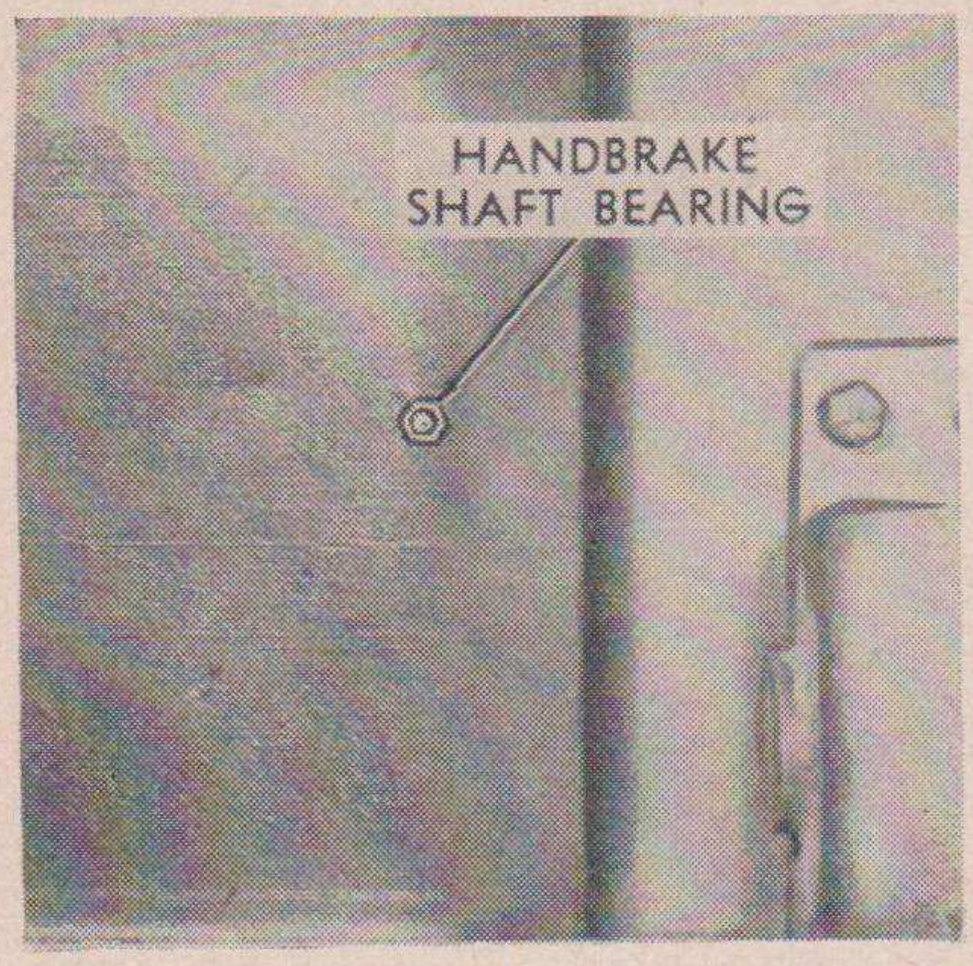


Ref. 2. Clean upper tube and coat. Lubricate bearing with grease gun. Lubricate plunger with oilcan.

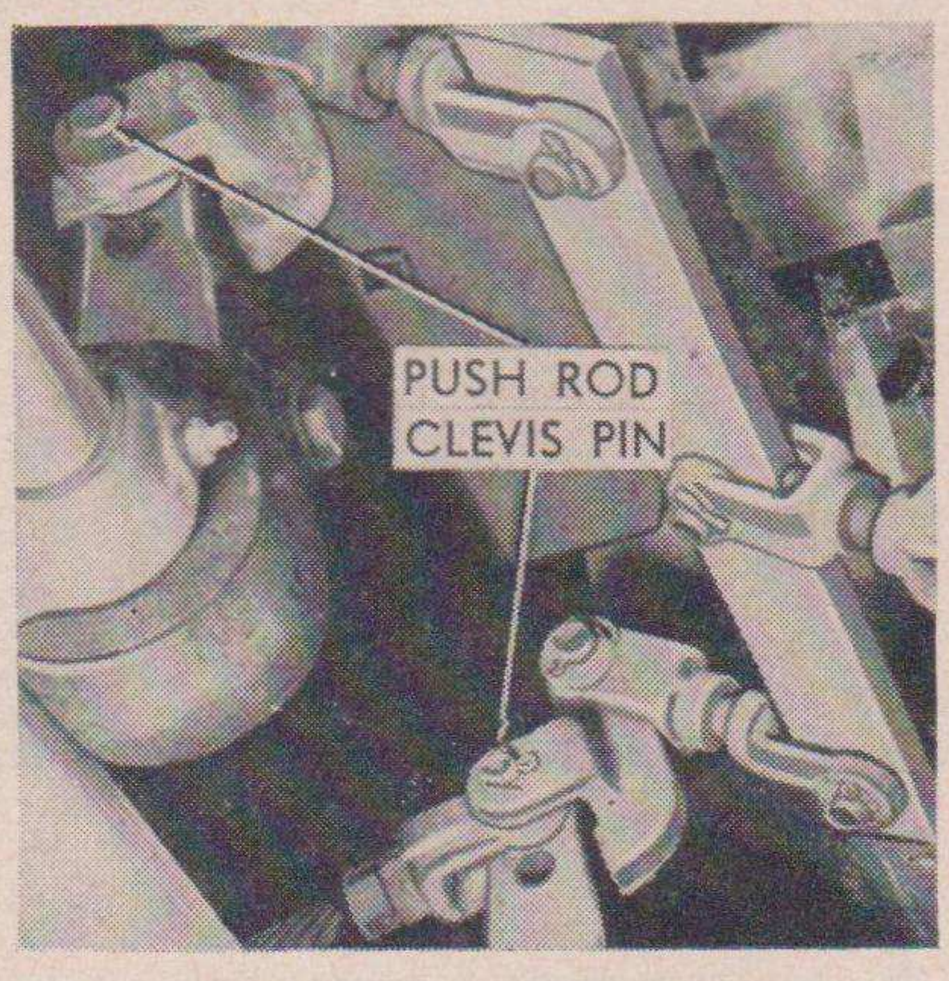


Ref. 3. Lubricate with grease gun.

Ref. 4. Lubricate with grease gun.

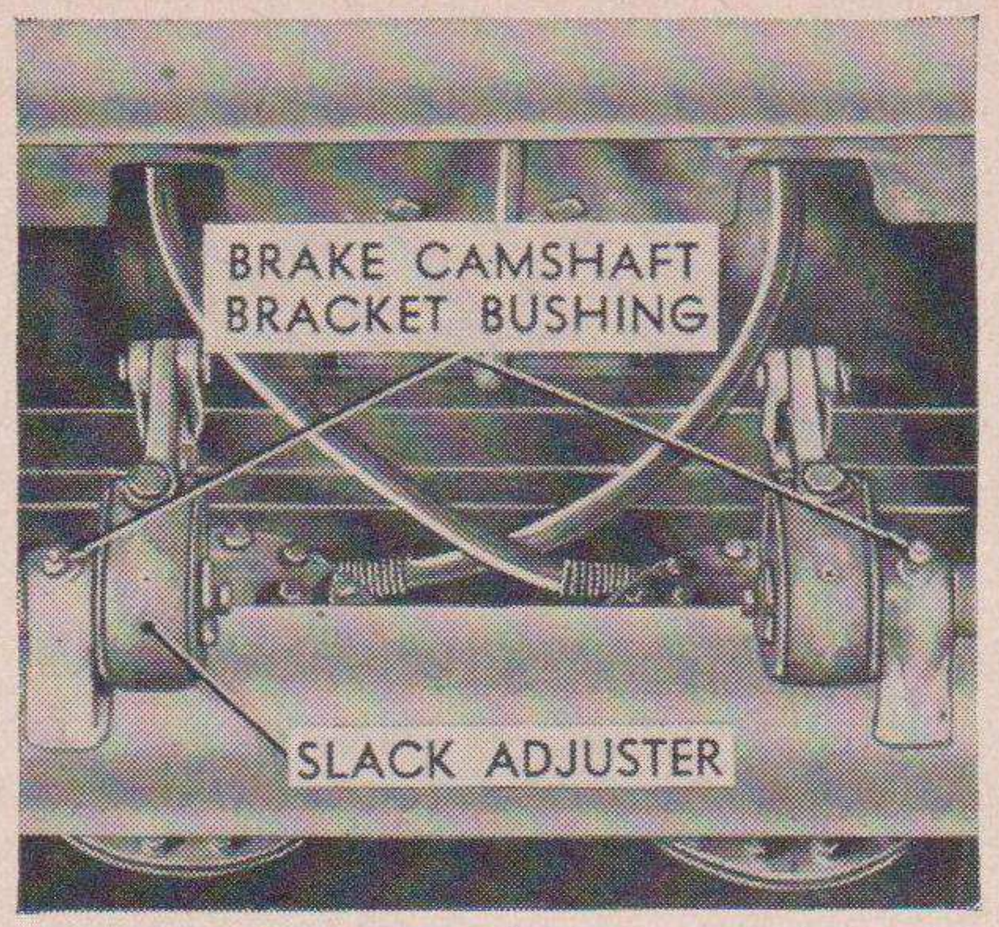


Ref. 5. Lubricate with grease gun.

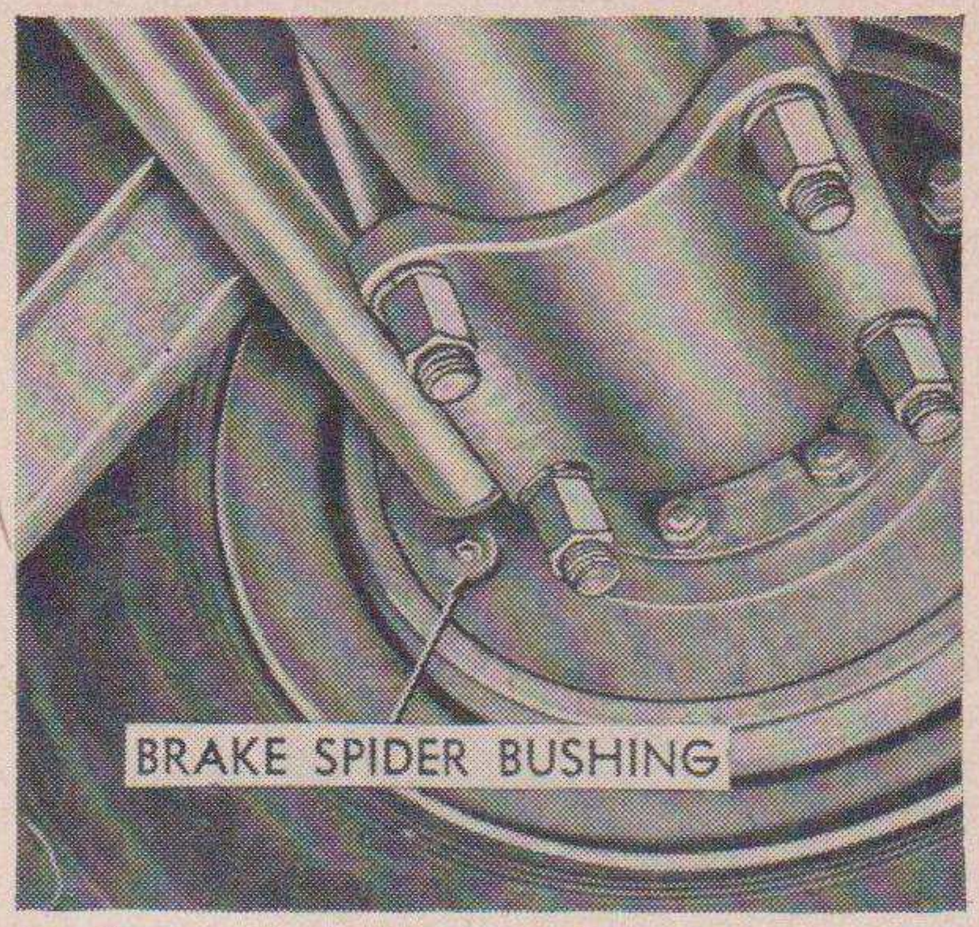


Ref. 6. Lubricate pins with oilcan.

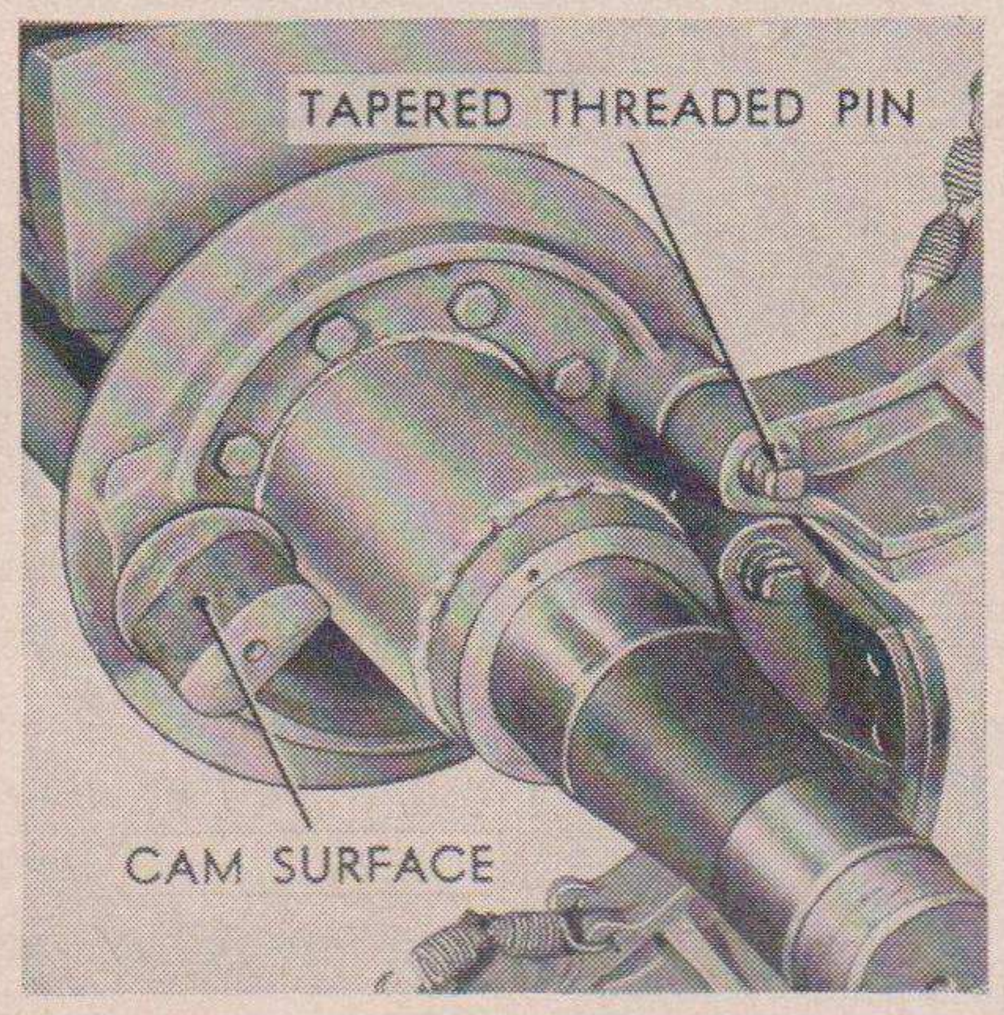
Figure 21—Continued.



Ref. 7. Remove pipe plug, lubricate brake slack adjuster with grease gun, replace pipe plug. Lubricate bushings with grease gun.



Ref. 8. Lubricate with grease gun.



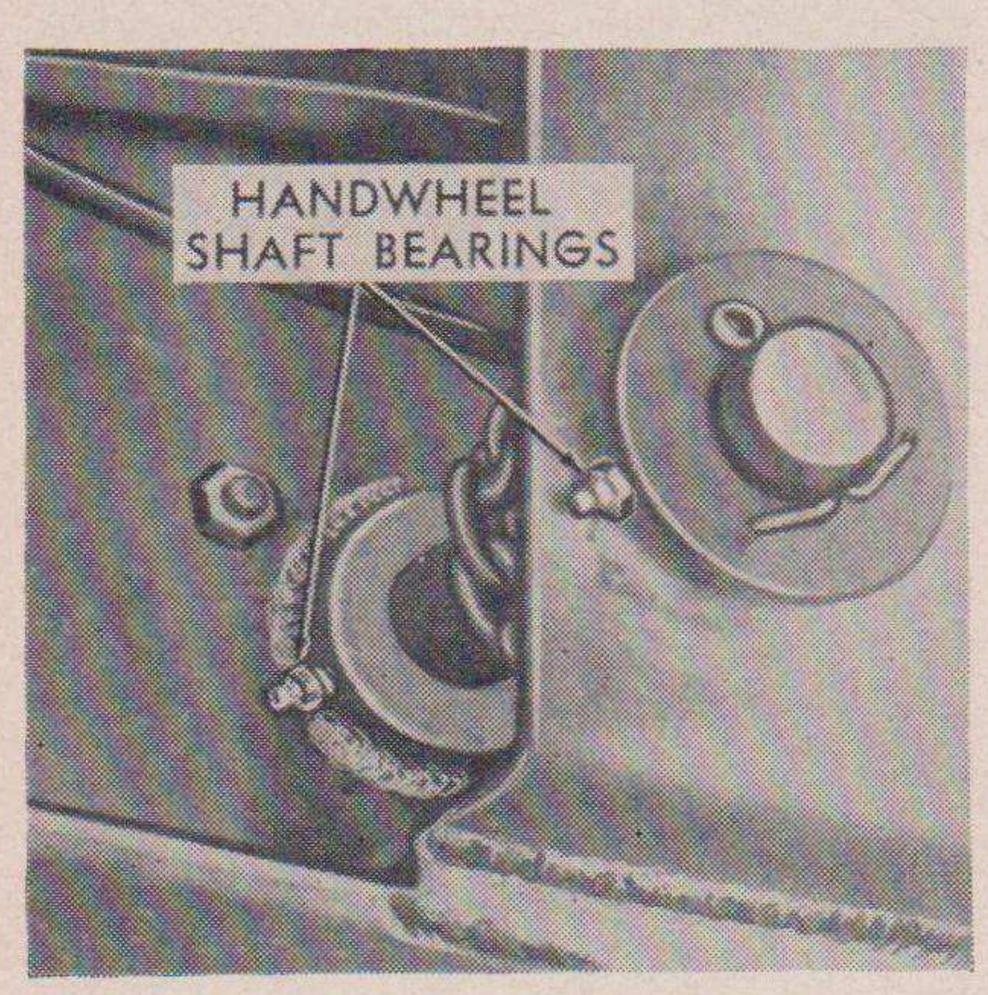
Ref. 9. Coat cam surface sparingly, applying grease with the fingers. Lubricate pins with oil-can.

Ref. 10. Lubricate with grease gun.

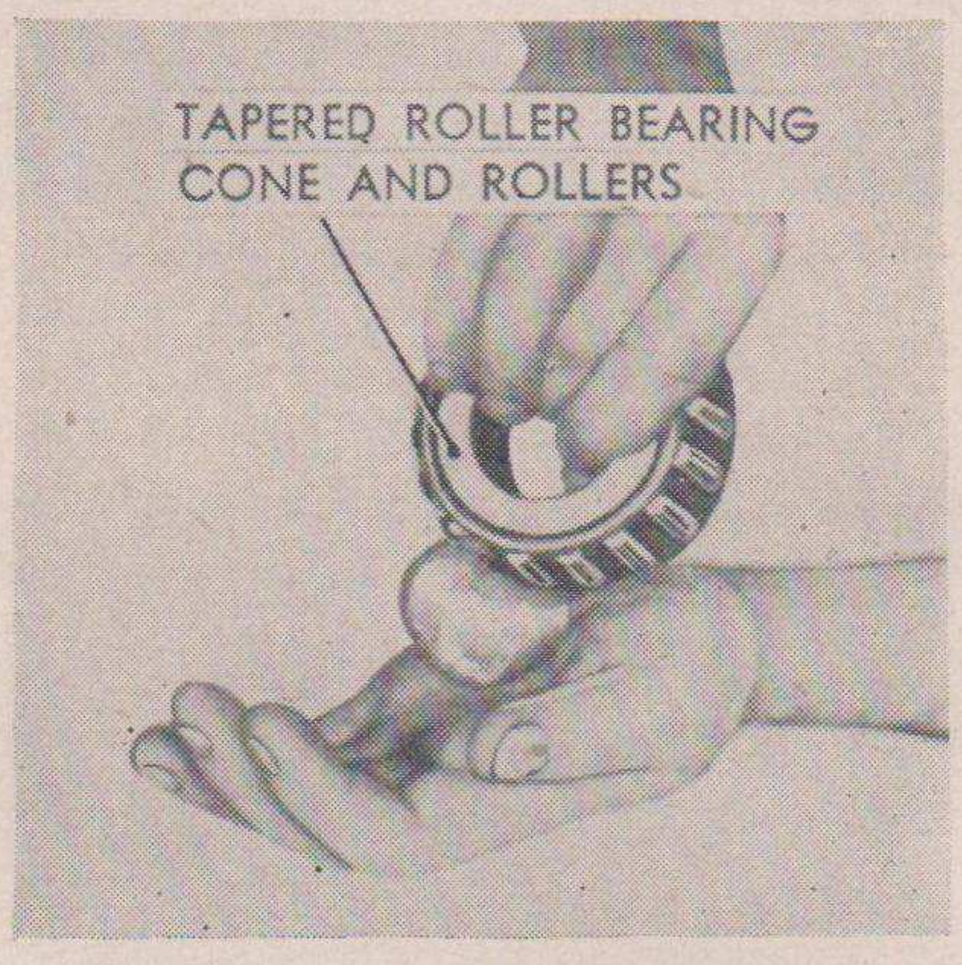
Ref. 11. Grease kingpin assembly with grease gun.

Ref. 12. Clean and coat.

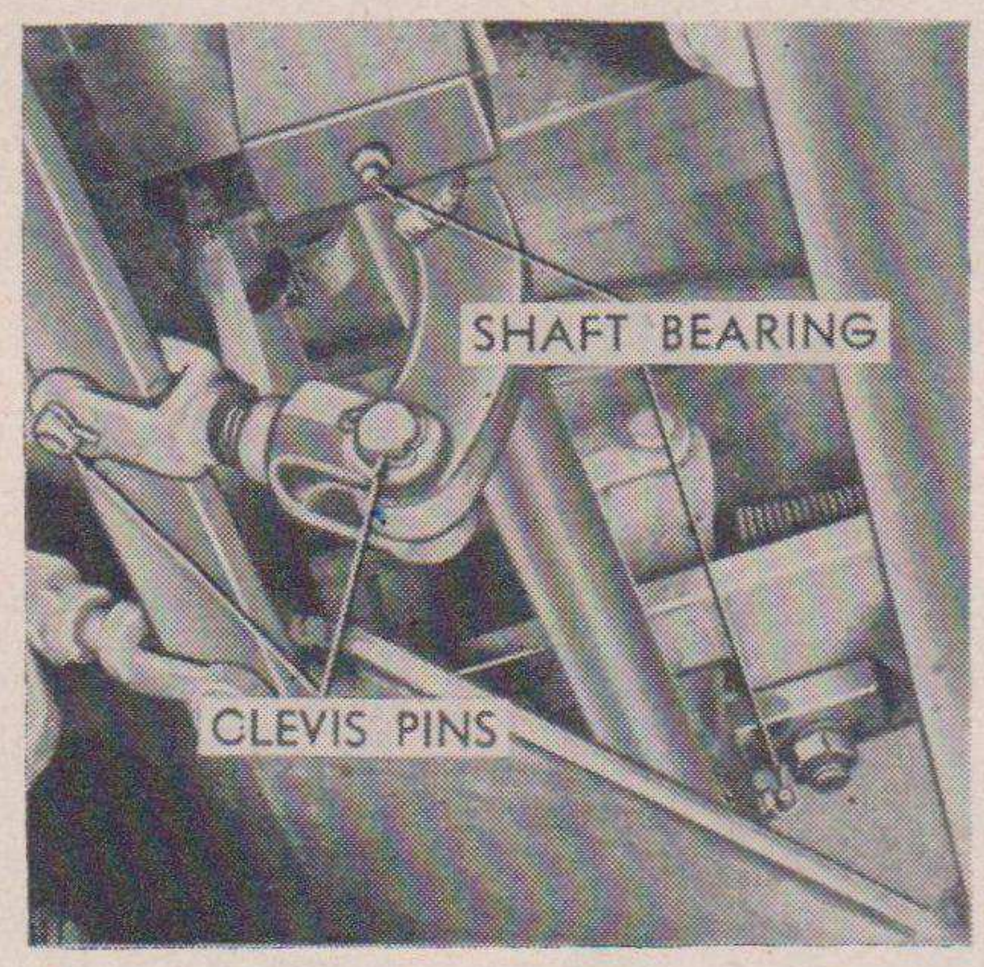
Figure 21—Continued.



Ref. 13. Lubricate with grease gun.



Ref. 14. Remove, clean, dry, repack and replace.



Ref. 15. Lubricate pins with oilcan. Lubricate bearings with grease gun.

Figure 21—Continued.

c. Cleaning. Clean all lubrication points and the area near them with cleaning solvent prior to lubrication.

d. Operation Immediately After Lubrication. Operate each component several times immediately after lubrication if it is possible to do so. If this is not done, the lubricant is not properly distributed over the surfaces it is intended to lubricate, and the component may bind or the lubricant may leak out.

e. Wheel Bearings. Wheel bearings of the semitrailer should be removed, cleaned, repacked, and reinstalled at least semiannually.

(1) Remove wheel bearings (par. 72*a*).

(2) Wash wheel bearings thoroughly in cleaning solvent to remove the old grease and any accumulation of foreign material. Allow wheel bearings to dry before repacking them.

(3) Repack and install wheel bearings (par. 72*d*). Work the grease into the spaces around the rollers carefully to obtain complete lubrication, as shown in reference 14, figure 21.

33. Painting

Condition of the paint on metal parts of the semitrailer should be inspected at regular intervals. Where rust or paint blisters appear, or where moving parts have worn paint down to bare metal, chip off the old paint and rust, or scrape with a wire brush, and touch up the paint. Painting instructions are set out in TM 9–2851. Before applying paint, place masking tape on all items that should not be painted, or that would be damaged by paint, such as identification plates, machined surfaces, wiring and electrical components, lubrication fittings, valve stems and tires, and threads of bolts or take-up adjustments. No special paints or preservatives are required for this material.

Section III. PREVENTIVE MAINTENANCE SERVICES

34. General

The operator of the semitrailer and the organizational maintenance personnel must perform their preventive maintenance services regularly, to make sure the semitrailer operates well and to lessen the chance of mechanical failure.

35. Operator Maintenance

a. Inspections. Inspections must be made before operation, during operation, at halt, and after operation, as described in this section. All inspections of assemblies, subassemblies, or parts must include any supporting members or connections and must determine whether the unit is in good condition, correctly assembled, secure, or worn. Any mechanical condition which may result in further damage to the unit must be corrected before the equipment is operated.

(1) The inspection for "good condition" is usually an external visual inspection to determine whether the unit is damaged beyond safe or serviceable limits, or to determine if it is in such a condition that damage will result from the operation. The term "good condition" is further defined as: not bent or twisted; not chafed or burned; not broken or cracked; not bare or frayed; not dented or collapsed; not torn or cut; adequately lubricated.

(2) Inspection of a unit to see that it is "correctly assembled" is usually an external visual inspection to determine whether it is in its normal assembled position in the equipment.

(3) Check of a unit to determine if it is "secure" is usually an external inspection, a hand-feel, or a prybar or wrench check for looseness in the unit. Such an inspection should include brackets, lockwashers, locknuts, locking wires, or cotter pins used in the assembly.

(4) "Worn" means worn close to or beyond serviceable limits, a condition likely to result in a failure if replacement of the affected parts is not made before the next scheduled inspection.

b. Reporting Deficiencies. The operator will report all deficiencies on DD Form 110.

c. Before-Operation Services. The following services will be performed to determine if the condition of the equipment has changed since it was last operated, and to make sure the equipment is ready for operation. Any deficiencies must be corrected or reported to the proper authority before the unit is put into operation.

(1) *Tampering or damage.* Check for damage caused by improper handling, fallen debris, or sabotage.

(2) *Tires.* Check all tires for proper pressure and inflate as necessary. Check for cuts and tears or foreign material embedded in the tire. Check to see that valve caps are in place.

(3) *Wheels.* Check wheels to determine if all inner and outer wheel nuts are secure.

(4) *Airbrake pressure tank.* Open plug valve to drain moisture. Close plug valve.

(5) *Lights.* Turn all lights on and off to determine if they are in proper condition.

(6) *Hose connections.* Check hose connections to be sure they are tight and not leaking. Apply and release brakes to be sure hoses are properly coupled.

(7) *Visual inspection.* Make a general check of the entire unit for cracked or broken parts, broken wires, missing bolts,

nuts, screws, loose connections, and any damage that may have occurred since equipment was last operated.

(8) *On-equipment tools and spare parts.* Make a visual check to determine that all on-equipment tools and spare parts are on the equipment.

d. During-Operation Services. The operator is responsible for correcting or reporting unusual sounds or odors, deficiencies in performance, or other signs of abnormal operation. He will perform the following specific services.

(1) *Brakes.* Check brake operation frequently to make sure that they do not grab, chatter, or pull to one side. Erratic brake operation on semitrailers is dangerous to personnel and equipment.

(2) *Unusual operation.* Check for unusual operation such as weaving of the semitrailer, failure to trail properly, vibration, overheating or smoking of the brakes, current draw when lights are on, play in kingpin and fifth wheel, or difficulty in towing trailer. Report any irregularity immediately to proper authority.

(3) *Unusual noises.* Check for abnormal noises. If any are noticed, stop operation and report to proper authority.

e. At-Halt Services. During halts, even if only for short periods, the operator should make a general check of the equipment and correct or report any deficiencies noticed, in addition to performing the following specific duties.

(1) *Visual inspection.* Make a general check of the unit for bent, cracked, or broken parts, and for loose or missing bolts and nuts.

(2) *Leaks.* Listen carefully for leaks in the airbrake lines, at the airbrake pressure tank, and at the tires. See that all connections are tight and properly supported.

(3) *Brakes.* Feel the brakedrums to determine if they are overheating. Use care in doing this as brakedrums can reach high temperatures quickly and may harm the hand severely if they are overheated.

(4) *Tires.* Check tires to be sure they are properly inflated. Check for cuts or tears, or foreign material embedded in the tires.

(5) *Check.* Examine the semitrailer to determine the cause of any deficiencies noticed during operation.

(6) *Load security.* Check all lashings, blocking, and general security of equipment loaded on the semitrailer. Inspect loaded equipment for any damage that may have occurred since the last halt.

f. After-Operation Services. To insure that the equipment is ready to operate at any time, the following services must be performed by the operator immediately after any operating period of 8 hours or less. All deficiencies must be corrected or reported to the proper authority.

(1) *Shutdown precautions.* Lower landing jacks on both sides of the semitrailer. Set the hand brake, making sure that the ratchet and pawl are securely engaged. If the tractor truck is being disconnected from the semitrailer, insert dummy couplings in the hose couplings on the semitrailer. Check the wheels to prevent any movement.

(2) *Clean equipment.* Remove by washing in fresh water any accumulations of mud, snow, ice, dust or sand, particularly around the wheels, the brakes and the kingpin.

(3) *Tools and equipment.* See that all tools and equipment assigned to the semitrailer are in serviceable condition, clean, and properly stowed or mounted.

(4) *Lubrication.* Lubricate as required by the current lubrication order.

(5) *Airbrake pressure tank.* Open the plug valve to drain the airbrake pressure tank and leave it open.

(6) *Tires.* Check tires to be sure they are properly inflated. Check for cuts and tears or foreign material embedded in the tires. Check to see that valve caps are in place.

(7) *Visual inspection.* Make a general check of the unit for bent, cracked, or broken parts, and for loose or missing bolts and nuts.

36. Maintenance and Safety Precautions

a. Report or correct any mechanical deficiencies that may result in damage to the unit if operation is continued.

b. Reasonable care must be used in operating the equipment to prevent damage or decreased serviceability.

c. Mud and grit should be removed when it accumulates on the rear axle assemblies and around the brakedrums and airbrake chamber assemblies. Rust accumulations should be removed as quickly after formation as possible.

d. The brake linings must be kept free of grease and oil. If water enters the brake assemblies, the brake linings should be dried out promptly by applying and releasing the brakes several times.

e. Air hose couplings should never be permitted to drag on the ground, and all air lines should be kept free of grit, dust, and foreign objects.

f. The semitrailer should not be left standing with the handbrakes set in extremely cold weather, or when the brakedrums are overheated.

g. The vehicle should not be slowed down for ordinary stops by use of the semitrailer brakes, alone, as this wears the brakes rapidly.

37. Organizational Maintenance

a. Organizational preventive maintenance is performed by organizational maintenance personnel, with the aid of the operator, at weekly and monthly intervals. The weekly interval will be equivalent to 60 hours of use. The monthly interval will be equivalent to 4 weeks, or 240 hours, of use, whichever occurs first.

b. The technical inspection column is provided for the information and guidance of personnel performing technical inspection, and constitutes the minimum inspection requirements for the equipment.

c. The preventive maintenance services to be performed at these regular intervals are listed and described below. The numbers appearing the columns opposite each service refer to a corresponding number appearing on DA Form 464, and indicate that a report of the service should be made at that particular number on DA Form 464. These numbers appear in either second, third, or both columns, as an indication of the interval at which the service is to be performed.

Technical inspection	Service		
	Monthly	Weekly	
1	1	1	Before-operation services. Check and perform services listed in paragraph 35*c*.
2	2	2	*Lubrication.* Inspect entire unit for missing or damaged lurication fittings and for indications of insufficient lubrication.
	2	2	Replace missing or damaged fittings. Lubricate as specified in the current lubrication order.
3	3	3	*Tools and equipment.* Inspect condition of all tools and equipment assigned to the semitrailer.
	3	3	See that all tools and equipment assigned to the semitrailer are clean, serviceable, and properly stowed or mounted.
5	5	5	*Publications.* See that a copy of this technical manual, And LO 5–9051 are on the equipment and in serviceable condition. Standard Form 91, Operator's Report of Motor Vehicle Accident, must be included on all mobile equipment.
6	6	6	*Appearance.* Inspect the general appearance of the unit, paying particular attention to cleanness, legibility of identification markings, and condition of the paint.
	6	6	Correct or report any deficiencies noticed.
7	7	7	*Modifications.* See if all available modification work orders applying to this semitrailer have been completed and recorded on DA Form 478, MWO and Major Unit Assembly Replacement Record—Organizational Equipment File.

Technical inspection	Service		
	Monthly	Weekly	
50	50	50	*Wiring.* See that electrical connector, wiring harness, and male and female connectors are in good condition. See that wiring harness is securely clipped in place against frame and no other components are rubbing against it.
	50	50	See that all deficiencies noticed are corrected or reported to proper authority.
52	52	52	*Lights.* Tighten or replace any loose or missing mounting bolts and screws. Replace defective bulbs and cracked or broken lenses. See that reflectors, mountings, and connections are in good condition and that all lights operate.
	52	52	See that all deficiencies noticed are corrected or reported to the proper authority.
61	61	61	*Valves.* Check air filters and emergency relay valve to see that all connections and mounting bolts are tight. Test connections for leaks by applying soap solution.
	61	61	Tighten loose mounting bolts and leaking connections. See that all deficiences noticed are corrected or reported to proper authority.
62	62	62	*Handbrake linkage.* See that chains, pulley, toggle shaft, bearings, and clevises in hand brake linkage are in good condition, operate freely, and are not worn.
	62	62	See that all deficiencies noticed are corrected or reported to the proper authority.
64	64	64	*Landing jack gear.* See that landing jack gear components are in good condition, are properly lubricated, operate freely, and are not worn.
	64	64	See that all deficiencies noticed are corrected or reported to the proper authority.
76	76	76	*Tires.* See that tires are properly inflated and in good condition, with no cuts, bruises, imbedded foreign matter, or missing valve caps.
	76	76	See that all deficiencies noticed are corrected or reported to the proper authority.
77	77	77	*Couplings.* See that kingpin, coupling hoses, and electrical connector are in good condition, not worn, and operate properly.
	77	77	See that all deficiencies noticed are corrected or reported to the proper authority.
78	78	78	*Rear wheels.* See that all wheels are in good condition and turn freely without binding, that bearings are properly lubricated, and that wheels show no evidences of damage or wear.
	78	78	See that all deficiencies noticed are corrected or reported to the proper authority.

Technical inspection	Service		
	Monthly	Weekly	
80	80	80	*Frame.* Inspect frame and semitrailer bed for dents, twisting, or cracks, and for broken, loose, or rotten deck planks. Tighten any loose screws or nuts. Replace any damaged studs. Straighten bent lashing rings and dented plates.
	80	80	See that all deficiencies noticed are corrected or reported to the proper authority.
82	82	82	*Rear axle assembly.* Inspect trunnion axle for dents, twisting, cracks, or bending. Inspect brake slack adjusters, airbrake chamber assemblies, and brakedrum camshafts for worn components or improper functioning. Check for loose or missing components, missing nuts, and loose connections.
	82	82	Tighten loose connections and loose nuts or mountings. Replace worn components. Make necessary adjustments. See that all deficiencies noticed are corrected or reported to the proper authority.
83	83	83	*Shackle boxes.* Inspect shackle boxes for looseness, loose nuts, and missing components.
	83	83	Tighten loose nuts or mountings. Replace missing or damaged components.
84	84	84	*Walking beams.* Inspect walking beams for dents, twisting, cracks, bends, or failure to turn freely at trunnion axle.
	84	84	Lubricate in accordance with the current LO 5–9051. See that all deficiencies noticed are corrected or reported to the proper authority.
99	99	99	*Service brakes.* Inspect brakes for worn linings, loose connections in airbrake lines, or improper functioning.
	99	99	See that all deficiencies noticed are corrected or reported to the proper authority.
100	100	100	*Handbrake.* Operate handbrakes to determine any improper functioning. Check the linkage for worn or loose components. Check the pawl and ratchet for worn places or failure to engage. Check all bearings for wear.
	100	100	Tighten loose mountings or bolts. Replace worn bearings or other components. See that all deficiencies noticed are corrected or reported to the proper authority.

Section IV. TROUBLESHOOTING

38. Use of Troubleshooting Section

This section provides information useful in diagnosing and correcting unsatisfactory operation or failure of the semitrailer or any of its components. Each trouble symtom stated is followed by a list of probable causes of the trouble. The possible remedy recommended is described opposite the probable cause.

Note. All references in this section to paragraphs 73 through 96 pertain to operations that are the responsibility of the field and depot personnel. Organizational maintenance personnel should not proceed without proper authority.

39. Semitrailer Does Not Track Properly

Probable cause	*Possible remedy*
Loose shackle box.	Inspect shackle boxes and tighten or replace loose components (par 87). See note in paragraph 38.
Bent walking beam.	Replace walking beam (par. 88). See note in paragraph 38.
Bent trunnion axle.	Replace trunnion axle (par. 88). See note in paragraph 38.
Bent trailer frame.	Report to field and depot personnel.

40. Kingpin Will Not Engage Fifth Wheel

Probable cause	*Possible remedy*
Improper elevation of semitrailer gooseneck.	Operate landing gear assemblies to raise or lower front end of semitrailer (par. 15*a*).
Worn kingpin.	Replace kingpin (pars. 95 and 96). See note in paragraph 38.

41. Semitrailer Wheels Fail to Roll Smoothly

Probable cause	*Possible remedy*
Worn bearings.	Replace bearings (par 72).
Bent hub.	Replace wheel hub (par. 72).
Improper lubrication.	Clean and repack wheel bearings (par 32).

42. Handbrake Will Not Operate

Probable cause	*Possible remedy*
Broken component.	Replace broken component (pars. 62 through 65).
Improper lubrication.	Clean and lubricate properly (par. 32).
Pawl frozen against ratchet.	Free-up pawl operation and grease.

43. Landing Gear Will Not Operate

Probable cause	*Possible remedy*
Broken component.	Replace broken component (pars. 83 through 85). See note in paragraph 38.
Loose mountings.	Tighten loose mountings.
Improper lubrication.	Clean and lubricate properly (par. 32).

44. Airbrakes Fail to Operate

Probable cause	*Possible remedy*
Leak in system.	Check system for leaks and replace faulty part.
Clogged air filter.	Clean air filter (par. 50).
Faulty emergency relay valve.	Replace emergency relay valve (par. 52).
Improper adjustment.	Adjust (par. 54).
Faulty brake chamber.	Replace brake chamber (par. 51).
Brakes lock.	Air hoses improperly connected. Disconnect and connect air hoses correctly (par. 15*c*).

45. Lights Do Not Function

Probable cause	*Possible remedy*
Lamp burned out.	Replace lamp (par. 59).
Short circuit in system.	Test circuits (par. 58) and replace faulty wires (pars. 58 and 59).
Loose connections.	Check all connections and tighten.
Tractor truck power failure.	Check tractor truck power supply.

46. Semitrailer Will Not Turn at Fifth Wheel

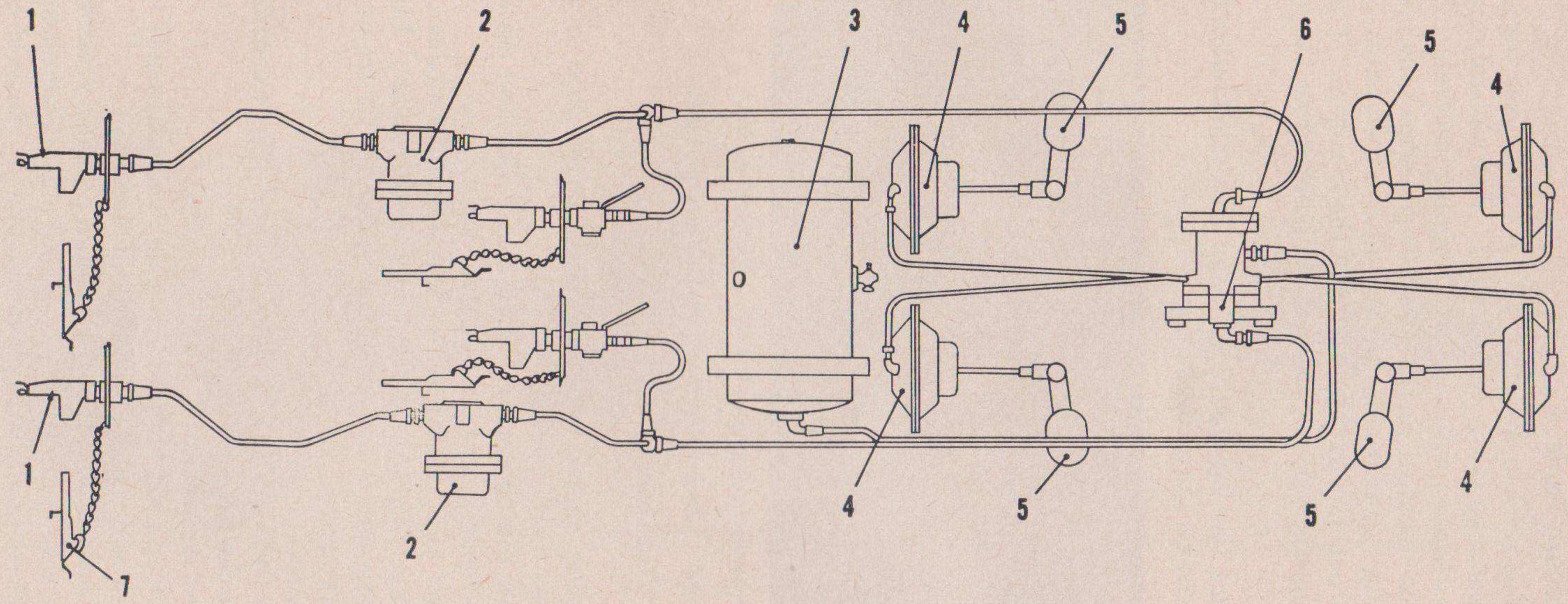
Probable cause	*Possible remedy*
Broken kingpin.	Replace kingpin (pars. 95 and 96). see note in paragraph 38.
Frozen fifth wheel on tractor truck.	Check tractor truck fifth wheel and repair.
Bent gooseneck.	Notify field and depot maintenance personnel.

Section V. AIRBRAKE SYSTEM

47. Description

(fig. 22)

Both hose couplings at the front of the semitrailer are connected by airbrake lines to the emergency relay valve at the rear wheels. When the semitrailer is coupled to a tractor truck, the air under pressure in the airbrake pressure tank on the tractor truck flows through the emergency air line to the emergency relay valve (6). There is no pressure on the service air line until the brakes are applied on the tractor truck, at which time the pressure in the service air line is proportional to the amount by which the brake pedal is depressed. The emergency relay valve performs four functions: first, air in the emergency air line is directed into the airbrake pressure tank; secondly, when air pressure is applied through the service air line, the emergency relay valve feeds air at that same pressure from the airbrake pressure tank on the semitrailer to the airbrake chamber assemblies; thirdly, if pressure in the emergency air line drops, the emergency relay valve automatically feeds full pressure from the airbrake pressure tank to the airbrake chamber assemblies; and finally, if there is full pressure on the emergency air line and the brake pedal is released, there is no pressure on the service air line and the emergency relay valve exhausts the air from the airbrake chamber assemblies. When air pressure is applied to the airbrake chamber assemblies (4), a diaphragm in each airbrake chamber assembly is forced out of place, pushing a rod connected to the brake slack adjuster (5). This causes the brake slack adjuster to rotate a brakedrum camshaft which has a cam on the end at the brake. Rotation of this cam forces the brakeshoes against the brakedrum. An air filter (2) is included in the service air line and emergency air line on the semitrailer to collect foreign material in the air and prevent fouling of the air lines. A plug valve is provided on the airbrake pressure tank (3) to drain condensation.



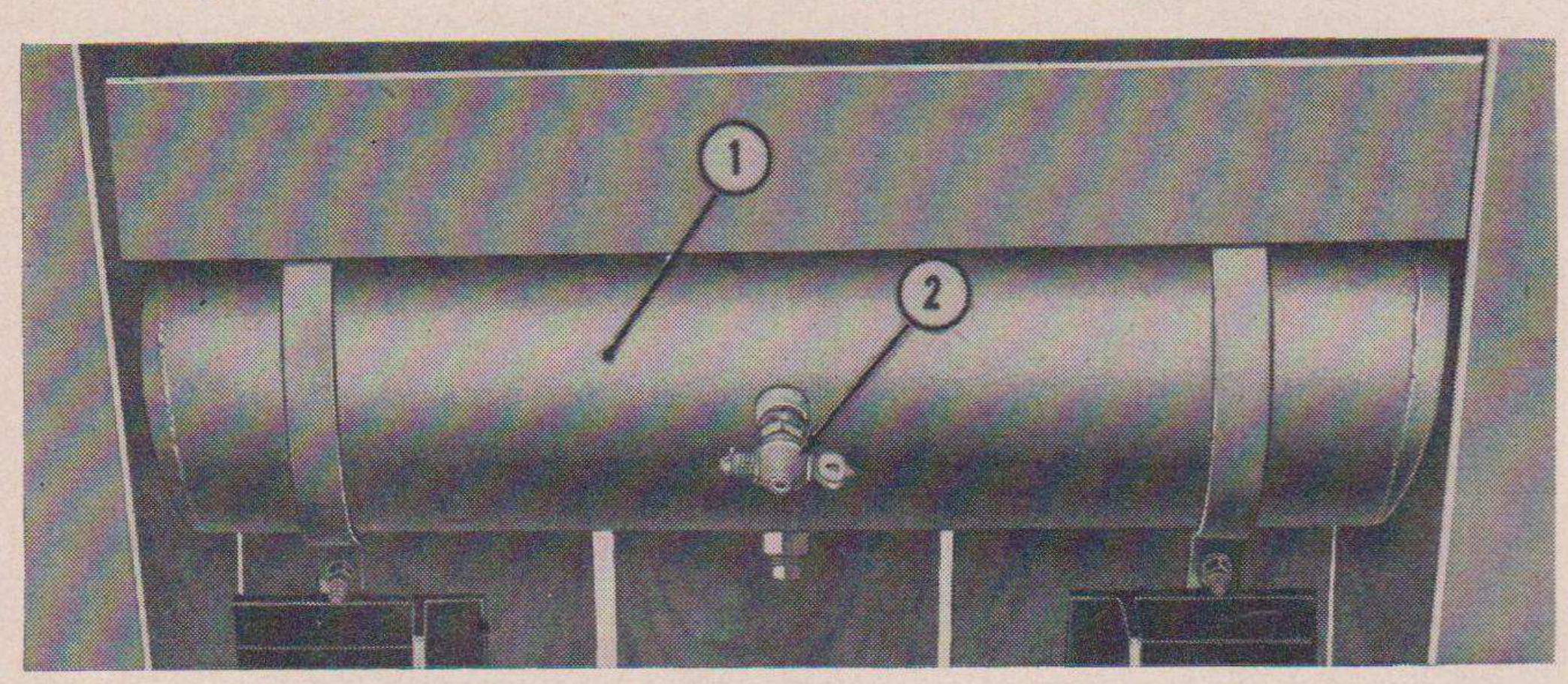
1 Hose coupling
2 Air filter
3 Airbrake pressure tank
4 Airbrake chamber assembly
5 Brake slack adjuster
6 Emergency relay valve
7 Dummy air hose coupling

Figure 22. Schematic diagram of airbrake system.

48. Airbrake Pressure Tank

a. Draining Condensation. Moisture in the compressed air of the airbrake system condenses as the system cools. This moisture must be drained from the airbrake pressure tank at regular intervals. A plug valve (2, fig. 23) is installed in the airbrake pressure tank (1) for draining this moisture or releasing the pressure on the system. Turn the plug valve (2) one-quarter turn to drain the moisture. Turn the plug valve back one-quarter turn before applying air to the system again.

Caution: Be sure the handbrake is set on the semitrailer before releasing the pressure on the airbrake pressure tank.



1 Airbrake pressure tank 2 Plug valve

Figure 23. Plug valve on airbrake pressure tank.

b. Removal and Disassembly.

(1) *Removal.*

(*a*) Turn plug valve (9, fig. 24) one-quarter turn to release pressure on air system.

(*b*) Unscrew tubing connector nut on air line and disconnect air line from pipe-to-tube adapter body (10).

(*c*) Unscrew and remove four nuts and lockwashers from mounting bolts (4) on front of frame member. Lift airbrake pressure tank and components clear of frame member and remove.

(2) *Disassembly.*

(*a*) Loosen two nuts (2) on bolts (1) and slip two straps (3) off airbrake pressure tank (6).

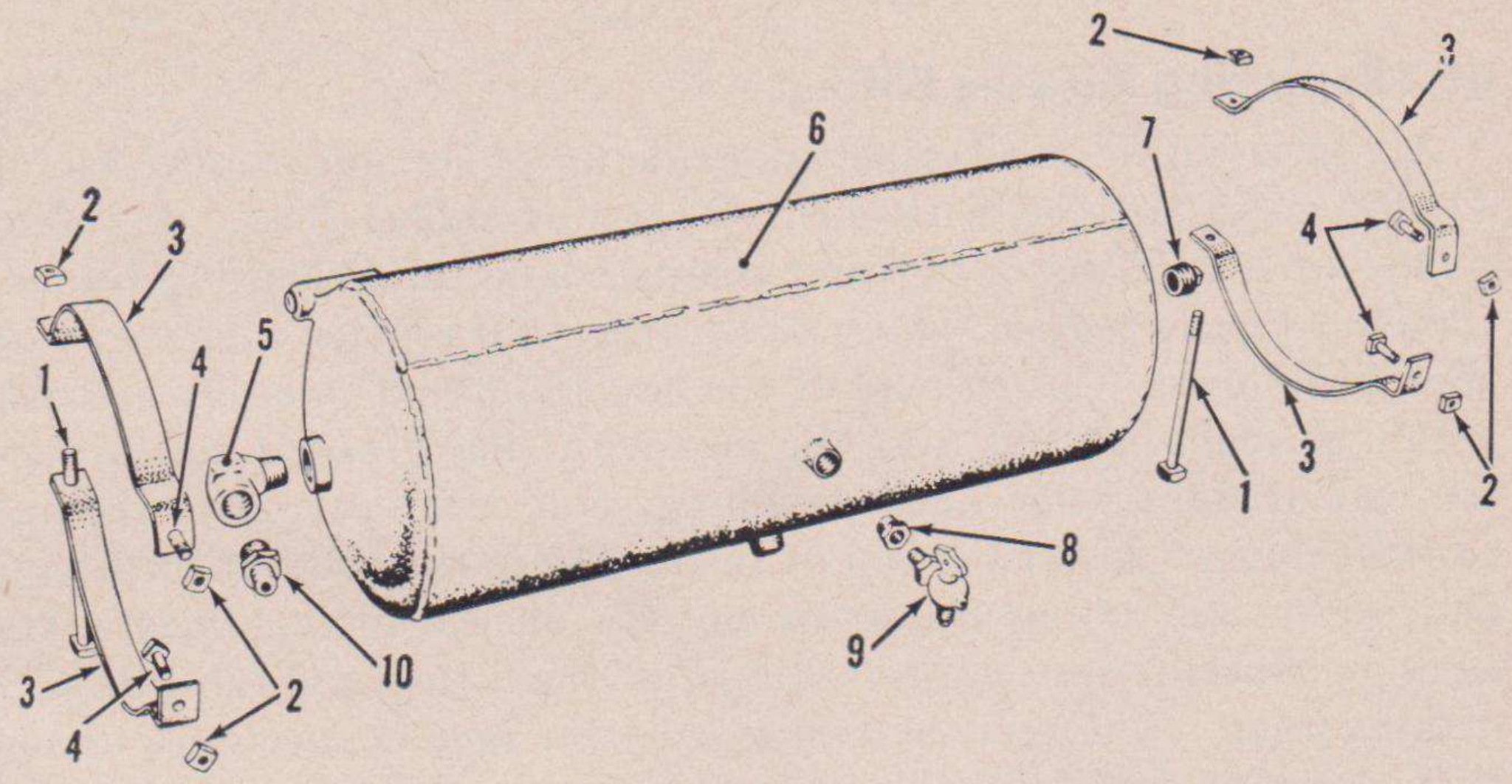
(*b*) Unscrew and remove plug (7).

(*c*) Unscrew and remove plug valve (9) and adapter (8).

(*d*) Unscrew and remove pipe-to-tank elbow (5).

c. Cleaning and Inspection. Clean interior of airbrake pressure tank with steam. Use a wire brush to clean rust and mud accumulations off exterior. Wash all components in cleaning solvent. Inspect compo-

nents for broken or worn threads. Inspect airbrake pressure tank for leaks. Apply rust-preventive compound or renew paint as necessary.



1 Bolt
2 Nut
3 Strap
4 Mounting bolt
5 Elbow, pipe-to-tank
6 Airbrake pressure tank
7 Plug
8 Adapter, ½''-to-¼''
9 Plug valve
10 Straight pipe-to-tube adapter body

Figure 24. Airbrake pressure tank exploded.

d. Reassembly and Installation.

(1) *Reassembly.*

(*a*) Screw pipe-to-tank elbow (5, fig. 24) into airbrake pressure tank (6).

(*b*) Screw plug valve (9) in adapter (8) and screw adapter into airbrake pressure tank (6).

(*c*) Screw plug (7) in end of airbrake presure tank (6).

(*d*) Slip two straps (3) on airbrake pressure tank (6) and tighten nuts (2) on bolts (1).

(2) *Installation.*

(*a*) Slide assembled airbrake pressure tank into position against the rear of the frame member. Insert four mounting bolts (4, fig. 24) through straps (3) and frame member.

(*b*) Install four lockwashers and nuts on mounting bolts (4) on front of frame member. Tighten nuts securely.

(*c*) Install pipe-to-tube adapter body (10) on pipe-to-tank elbow (5), install air line on pipe-to-tube adapter body, and tighten tubing connector nut.

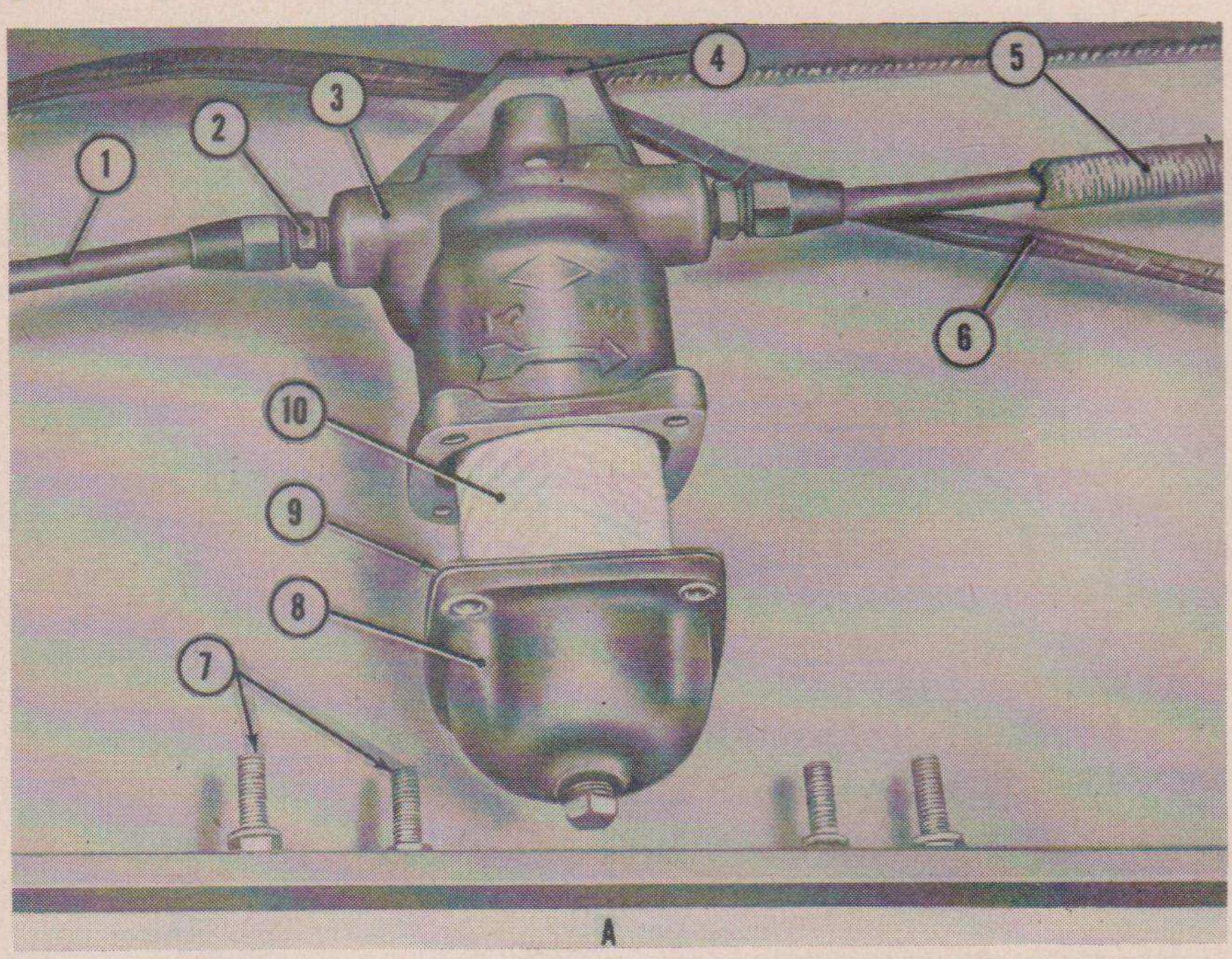
(*d*) Turn plug valve (9) to close off airbrake system.

e. Testing. Couple both air lines from the semitrailer to a tractor truck. Open the cutout cocks on the tractor truck and run the engine until the air pressure gage on the tractor truck shows a normal pressure reading. Shut off the engine. There should be no ap-

preciable drop in pressure reading on the air pressure gage of the tractor truck in ten minutes. A drop in pressure reading indicates a leak.

49. Replacing Air Line Fittings

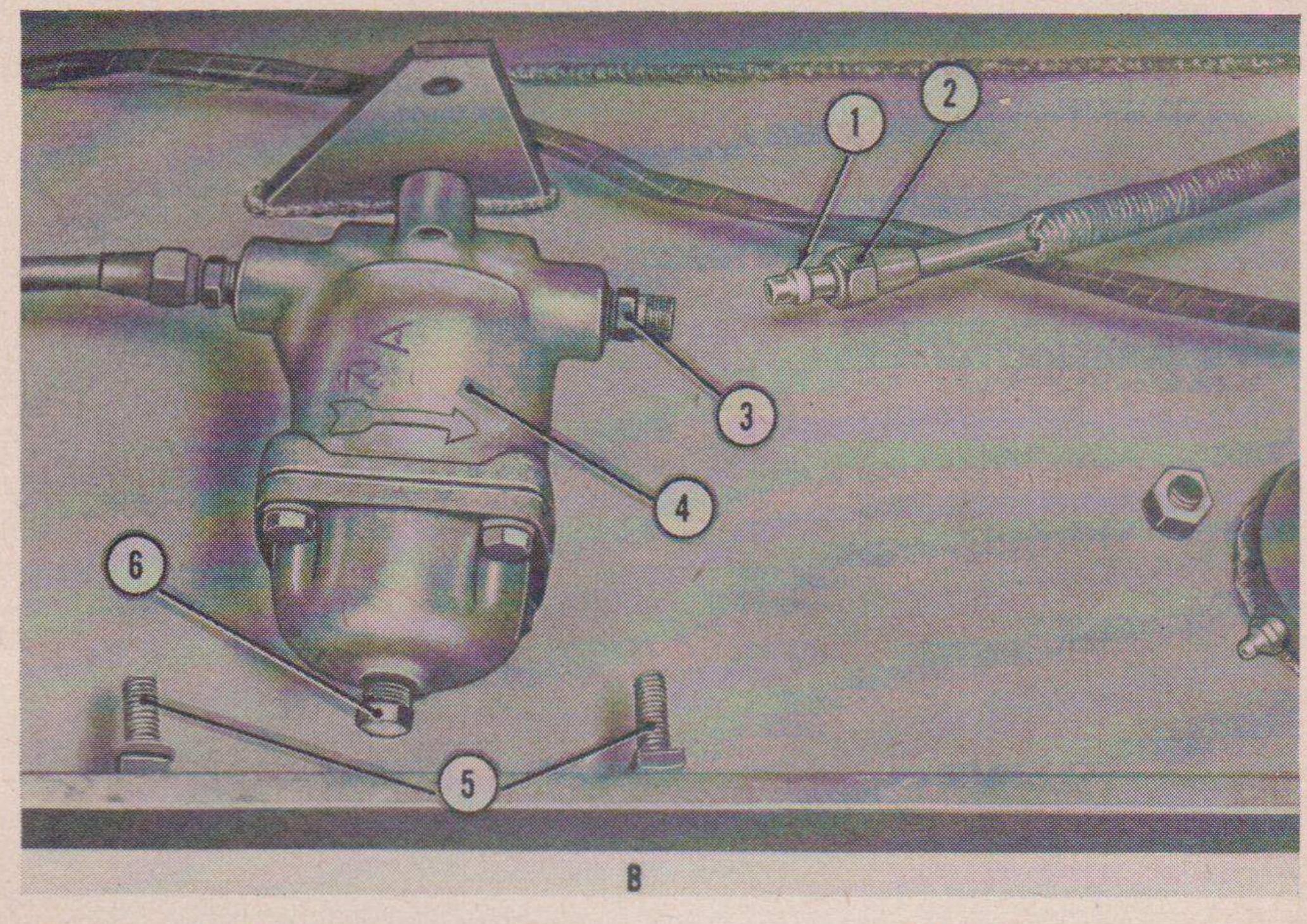
Air lines on the semitrailer are made up of straight copper tubing (1, fig. 25Ⓐ) covered with loom (5), or of rubber hose. A tubing connector nut (2, fig. 25Ⓑ) and tubing connector sleeve (1) connect the ends of the copper tubing to fittings. To replace a fitting, proceed as follows. Cut the end of the new tubing off squarely and slip a tubing connector nut over the end with the threaded end toward the end of the tubing. Slip a tubing connector sleeve over the end of the tubing. Insert the end of the tubing in the body of the fitting and screw the tubing connector nut up on the fitting body. The tubing connector sleeve is forced against the fitting and tube, making a tight joint. The same system is used for hose connections, except that a spring guard is slipped over the end of the hose before the nut and sleeve are slipped on. After the nut is tightened, the spring guard is pushed over the end of the nut.



1 Tubing
2 Straight tube connector
3 Body
4 Mounting bracket
5 Loom
6 Flexible conduit
7 Bottom cover bolt
8 Bottom cover
9 Gasket
10 Strainer

Ⓐ Air filter with bottom cover removed

Figure 25. Air filter removal and disassembly points.



1 Tubing connector sleeve
2 Tubing connector nut
3 Tubing connector body
4 Air filter
5 Mounting bolt
6 Pipe plug

Ⓑ Air filter removed

Figure 25—Continued.

50. Air Filter

a. Removal.

(1) Turn plug valve (9, fig. 24) on airbrake pressure tank one-quarter turn to release pressure on air system.

(2) Unscrew two tubing connector nuts (2, fig. 25Ⓑ) and disconnect copper tubing on each side of air filter (4).

(3) Unscrew and remove two mounting bolts (5, fig. 25Ⓑ) and lockwashers from mounting bracket (4, fig. 25Ⓐ), holding air filter (4, fig. 25Ⓑ). Remove air filter.

b. Disassembly (fig. 25Ⓐ).

(1) Unscrew and remove four bottom cover bolts (7) and lockwashers. Remove bottom cover (8). Remove and discard gasket (9).

(2) Remove strainer (10).

(3) Unscrew and remove two straight tube connectors (2), one on each side of body (3).

c. Reassembly (fig. 25Ⓐ).

(1) Wash and clean all parts thoroughly before reassembling.

(2) Screw two straight tube connectors (2) into body (3), one on each side.

(3) Slide strainer (10) into body (3).

(4) Using a new gasket (9), place bottom cover bolts (7) through lockwashers and bottom cover (8) into body (3) and screw them in tightly.

d. Installation.

(1) Hold body (3, fig. 25Ⓐ) of air filter against mounting bracket (4) and insert two mounting bolts (5, fig. 25Ⓑ) through lockwashers and mounting bracket into body of air filter. Tighten mounting bolts.

(2) Insert end of tubing (1, fig. 25Ⓐ) on each side of body (3) of air filter in straight tube connectors (2). Tighten tubing connector nuts (2, fig. 25Ⓑ), on straight tube connectors.

(3) Turn plug valve (9, fig. 24) on airbrake pressure tank one-quarter turn to close it before applying air pressure to the system.

51. Airbrake Chamber Assembly

a. Removal.

(1) Turn plug valve (9, fig. 24) on airbrake pressure tank one-quarter turn to release pressure on air system.

(2) Unscrew nut on flexible hose from connector (9, fig. 26) and disconnect flexible hose.

(3) Remove cotter pin (1) and push rod clevis pin (3) from brake slack adjuster (5, fig. 22) and push rod clevis body (2, fig. 26).

(4) Unscrew push rod clevis body (2) and remove.

(5) Unscrew and remove two nuts (4) and lockwashers (5) from studs (7).

(6) Slide airbrake chamber assembly (8) out of brake chamber mounting bracket (6).

b. Disassembly.

(1) Unscrew jam nut (14, fig. 27) and remove it from end of push rod (6).

(2) Unscrew and remove 18 nuts (12) and 18 lockwashers (11) from bolts (1).

(3) Disengage and lift apart airbrake chamber components.

(4) Unscrew elbow (4) from pressure plate (2) and unscrew connector (3) from elbow (4).

c. Cleaning. Clean mud and rust off all exposed metal parts with a wire brush. Wash all components in cleaning solvent. Blow out elbow (4, fig. 27) and connector (3) with air to remove foreign material.

d. Reassembly.

(1) Screw elbow (4, fig. 27) in pressure plate (2). Screw connector (3) in elbow (4).

(2) Place diaphragm (5) on pressure plate (2), and push rod (6) on diaphragm (5).