

TM 9-891

WAR DEPARTMENT TECHNICAL MANUAL

REGRADED UNCLASSIFIED BY
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SEMITRAILER,
6-TON PAYLOAD,
10-TON GROSS,
2-WHEEL, FUEL TANK,
2000-GALLON

**MICROFIC.
AVAILABL**

RESTRICTED DISSEMINATION OF RESTRICTED MATTER--
The information contained in restricted documents and the essential characteristics of restricted material may be given to any person known to be in the service of the United States and to persons of undoubted loyalty and discretion who are cooperating in Government work, but will not be communicated to the public or to the press except by authorized military public relations agencies. (See also paragraph 23b, AR 380-5, 15 March 1944.)

WAR DEPARTMENT •

OK 3-14
25 AUGUST 1944

WAR DEPARTMENT TECHNICAL MANUAL

TM 9-891

This manual supersedes WDTB 9-891-1, dated 8 February 1944

SEMITRAILER,
6-TON PAYLOAD,
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WAR DEPARTMENT

Washington 25, D. C., 25 August 1944

TM 9-891, Semitrailer, 6-ton Payload, 10-ton Gross, 2-wheel, Fuel Tank, 2,000-gallon, is published for the information and guidance of all concerned.

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O.O.M. 461/Rar. Ars. (26 Aug 44) R]

BY ORDER OF THE SECRETARY OF WAR:

G. C. MARSHALL,
Chief of Staff.

OFFICIAL:

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

DISTRIBUTION: X.

(For explanation of symbol, see FM 21-6.)

CONTENTS

PART ONE—GENERAL

		Paragraphs	Pages
SECTION	I. Introduction	1- 2	1- 3
	II. Description and data	3- 4	4- 7
	III. Tools, parts, and accessories	5- 7	7- 8

PART TWO—OPERATING INSTRUCTIONS

SECTION	IV. Controls and operation	8- 9	9- 20
	V. Operation of auxiliary equipment	10-12	20- 25

PART THREE—ORGANIZATIONAL MAINTENANCE INSTRUCTIONS

SECTION	VI. Lubrication	13-14	26- 32
	VII. First echelon preventive maintenance service	15-19	32- 40
	VIII. Second echelon preventive maintenance	20	41- 52
	IX. Trouble shooting	21-32	52- 59
	X. Wheels, hubs, and bearings.....	33-35	59- 68
	XI. Brake system	36-39	68- 83
	XII. Axle assembly	40-42	81- 85
	XIII. Springs and radius rods	43-44	85- 86
	XIV. Land and tank gear	45-47	86- 87
	XV. Electrical system	48-52	88- 96
	XVI. Piping system	53-57	96-101
	XVII. Hose and fittings	58-60	103-108
	XVIII. Pumping engine	61-72	108-120
	XIX. Pump	73-78	120-126
	XX. Fire extinguishers	79-80	126-127
	XXI. Trailer converter dolly	81-82	127-130

APPENDIX

SECTION	XXII. Shipment and limited storage....	83-85	131-134
	XXIII. References	86-88	135-136
INDEX			137-142

TM 9-891

SEMITRAILER, 6-TON PAYLOAD, 10-TON GROSS,
2-WHEEL, FUEL TANK, 2000-GALLON

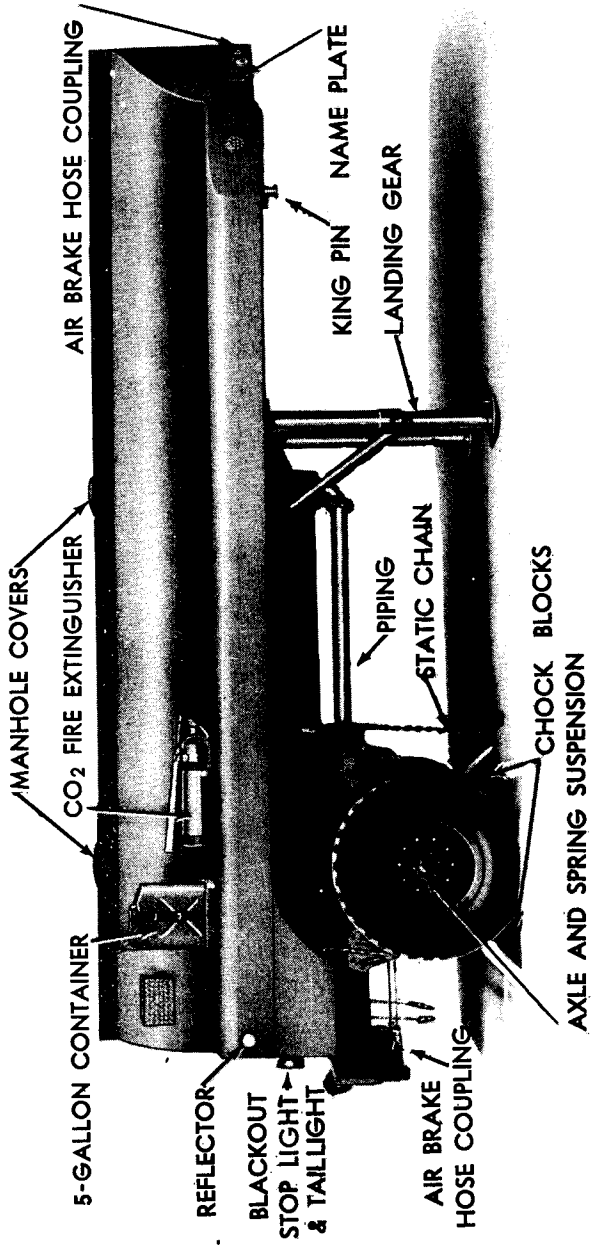


Figure 1—Semitrailer—Right Side View

RA PD 332696

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This manual supersedes WDTB 9-891-1, dated 8 February 1944

PART ONE

GENERAL

Section I

INTRODUCTION

1. SCOPE.*

a. These instructions are published for the information and guidance of the personnel to whom this equipment is assigned. They contain information on the operation and maintenance of the 6-ton payload, 10-ton gross, 2-wheeled, 2,000-gallon, fuel tank, semitrailer, as well as descriptions of the major units and their functions in relation to the other components of this vehicle.

b. This manual has the following arrangement:

(1) Part One, General, contains description and data. It lists the tools, spare parts, and equipment carried on the vehicle. It also lists special tools required for maintenance of the vehicle, and indicates the echelon of maintenance to which each tool is allocated.

(2) Part Two, Operating Instructions, contains instructions for the operation of the vehicle with description and location of the controls and instruments.

(3) Part Three, Organizational Maintenance Instructions, contains information needed for the performance of the scheduled lubrication and preventive maintenance services, and instructions for maintenance operations which are the responsibility of the using organizations (first and second echelons).

2. RECORDS.

a. Forms and records applicable for use in performing prescribed operations are listed below with brief explanations of each.

(1) STANDARD FORM NO. 26, DRIVER'S REPORT—ACCIDENT, MOTOR TRANSPORTATION. One copy of this form will be kept with the vehicle at all times. In case of an accident resulting in injury or property damage, it will be filled out by the driver on the spot, or as promptly as practical thereafter.

*To provide operating instructions with the materiel, this technical manual has been published in advance of complete technical review. Any errors or omissions will be corrected by changes, or, if extensive, by an early revision.

**SEMITRAILER, 6-TON PAYLOAD, 10-TON GROSS,
2-WHEEL, FUEL TANK, 2000-GALLON**

(2) **WAR DEPARTMENT FORM NO. 48, DRIVER'S TRIP TICKET AND PREVENTIVE MAINTENANCE SERVICE RECORD.** This form, properly executed, will be furnished to the driver when his vehicle is dispatched on non-tactical missions. The driver and the official user of the vehicle will complete in detail appropriate parts of this form. These forms need not be issued for vehicles in convoy or on tactical missions. The reverse side of this form contains the driver's daily and weekly preventive maintenance service reminder schedule.

(3) **W.D., A.G.O. FORM NO. 478, MWO AND MAJOR UNIT ASSEMBLY REPLACEMENT RECORD.** This form will be used by all personnel completing a modification or major unit assembly replacement to record clearly the description of work completed, date, vehicle hours, and/or mileage, and MWO number or nomenclature of unit assembly. Personnel performing the operation will initial in the column provided. Minor repairs, parts, and accessory replacements will not be recorded.

(4) **W.D., A.G.O. FORM NO. 6, DUTY ROSTER.** This form, slightly modified, will be used for scheduling and maintaining a record of vehicle maintenance operations. It may be used for lubrication records.

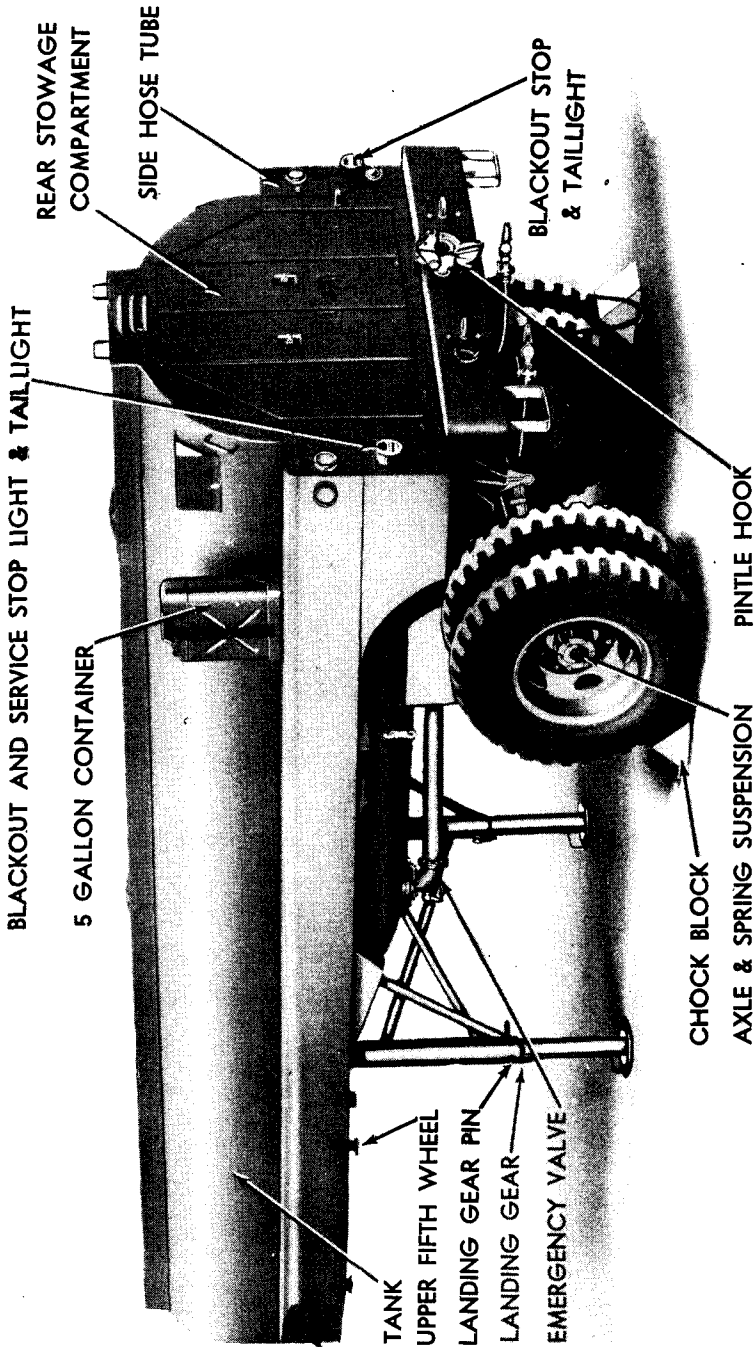
(5) **W.D., A.G.O. FORM NO. 461, PREVENTIVE MAINTENANCE SERVICE AND TECHNICAL INSPECTION WORK SHEET FOR WHEELED AND HALF-TRACK VEHICLES.** This form will be used for all 1,000-mile (monthly) and 6,000-mile (semiannual) maintenance services and all technical inspections performed on wheeled or half-track vehicles.

(6) **W.D., O.O. FORM NO. 7353, SPOT-CHECK INSPECTION REPORT FOR ALL MOTOR VEHICLES.** This form may be used by all commanding officers or their staff representatives in making spot-check inspections on all vehicles.

(7) **W.D., A.G.O. FORM NO. 468, UNSATISFACTORY EQUIPMENT RECORD.** This form will be used for reporting manufacturing, design, or operational defects in material with a view to improving and correcting such defects, and for use in recommending modifications of material. This form will not be used for reporting failures, isolated materiel defects, or malfunctions of materiel resulting from fair wear and tear, or accidental damage, nor for the replacement, repair, or the issue of parts and equipment. It does not replace currently authorized operational or performance records.

(8) **W.D., O.O. FORM NO. 7370, EXCHANGE PART OR UNIT IDENTIFICATION TAG.** This tag, properly executed, may be used when exchanging unserviceable items for like serviceable assemblies, sub-assemblies, parts, vehicles, and tools.

INTRODUCTION



RA PD 332698

Figure 2—Semitrailer—Left Rear View

**SEMITRAILER, 6-TON PAYLOAD, 10-TON GROSS,
2-WHEEL, FUEL TANK, 2000-GALLON**

Section II

DESCRIPTION AND DATA

3. DESCRIPTION (figs. 1, 2, 3, and 4).

a. General. This vehicle is designed to transport fuel, and to pump the load into, or out of the tank, or discharge its load by gravity.

b. Semitrailer. The semitrailer consists of a frameless all-welded steel tank with undercarriage, landing gear and upper fifth wheel directly attached. The tank is divided into two compartments, each fitted with outlet piping and manhole cover. The undercarriage is equipped with Bendix-Westinghouse air brakes. The tubular axle is attached to the tank by slipper end springs and rubber-bushed radius rods to hold the axle in correct alinement.

c. Landing Gear. The landing gear has two telescoping tubular legs which support the semitrailer when it is uncoupled from the tractor truck or converter dolly.

d. Stowage Compartment. A stowage compartment is welded to the rear of the tank. It has the same cross section as the tank and side hose tubes, and is equipped with double opening rear doors. There is a small door at the rear of the hose tubes which are also accessible through the rear stowage compartment.

e. Converter Dolly. The converter dolly, which consists of a frame supported by the same type undercarriage as the semitrailer, carries a lower fifth wheel which engages the kingpin on the semitrailer to convert it into a full trailer. The dolly is equipped with a pintle ring for attaching to a truck or another trailer.

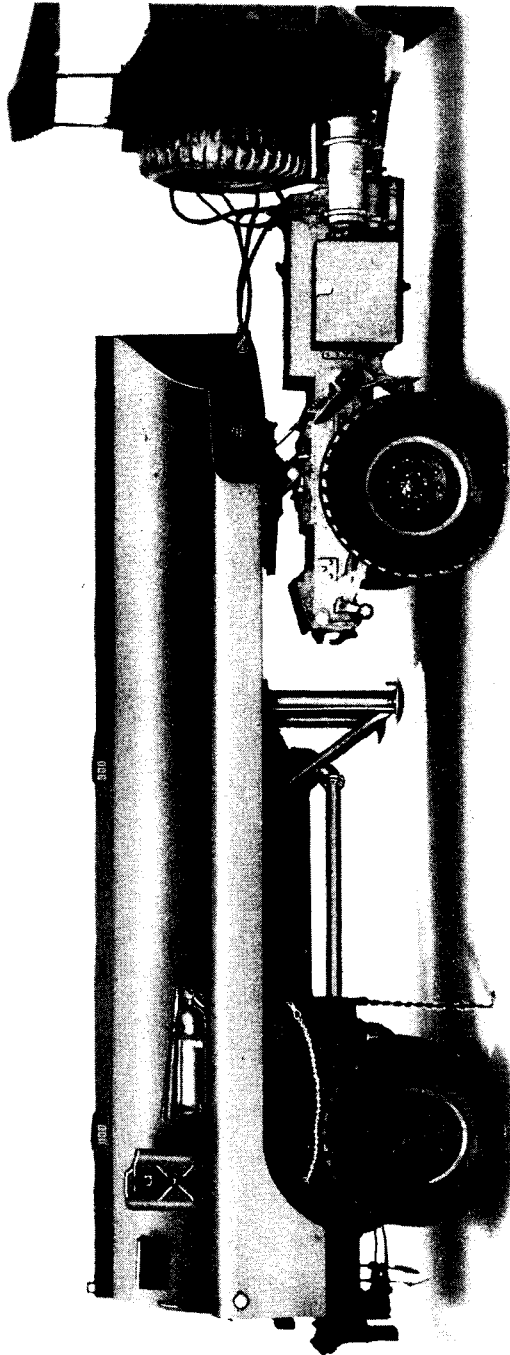
f. Pumping System. An engine driven portable pumping system with attaching hose is carried in the rear compartment for use in pumping fuel into, and out of, the tank.

4. TABULATED DATA.

a. Specifications.

Wheelbase.....	King pin to axle 154½ in.
Length, over-all.....	240 in.
Width, over-all.....	96 in.
Height, over-all.....	93 in.
Wheel size—10 stud 11¼ in.....	20 x 8 in.
Tire size.....	9.00 x 20 in.
Tire type.....	Mud and snow tread

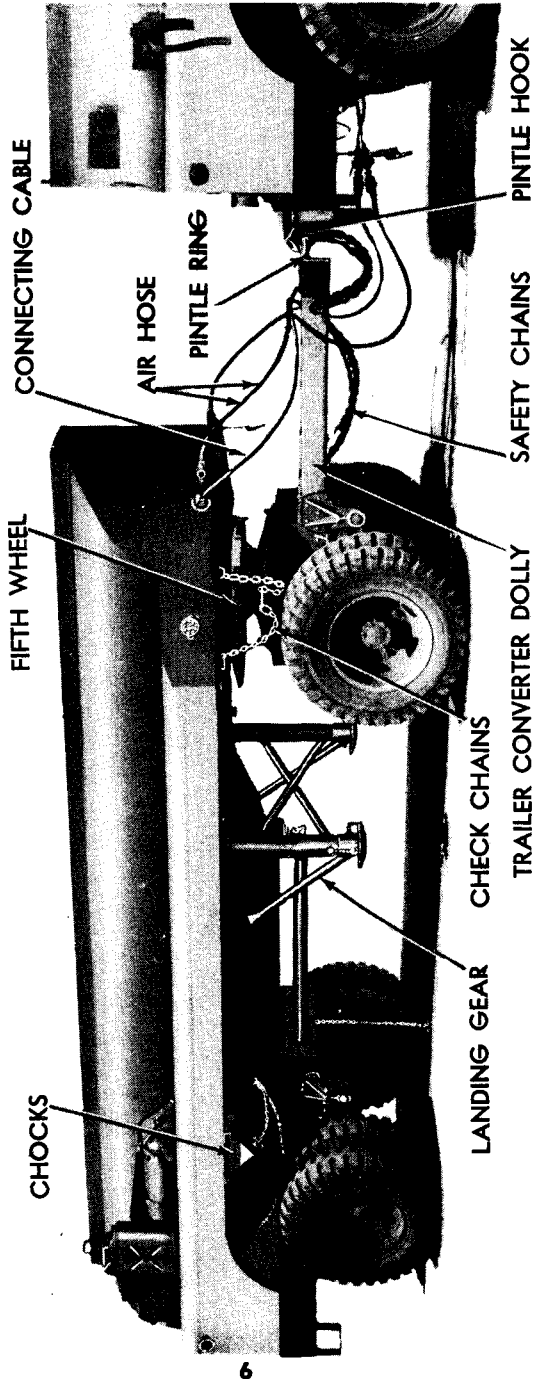
DESCRIPTION AND DATA



RA PD 332699

Figure 3—Semitrailer Coupled to Truck

SEMITRAILER, 6-TON PAYLOAD, 10-TON GROSS,
2-WHEEL, FUEL TANK, 2000-GALLON



RA PD 332700

Figure 4—Semitrailer Coupled to Trailer Converter Dolly

TOOLS, PARTS, AND ACCESSORIES

Tread	
Inside wheels.....	50 1/8 in.
Outside wheels.....	93 7/8 in.
Weight of vehicle—empty.....	6,750 lb
Weight of vehicle—loaded.....	18,950 lb
Axle load	
Dolly axle.....	7,750 lb
Rear axle.....	11,200 lb
Ground clearance (minimum).....	19 1/2 in.
Pintle height.....	36 in.
Tank capacity	
Front compartment.....	900 U.S. gal
Rear compartment.....	1,100 U.S. gal

b. Performance.

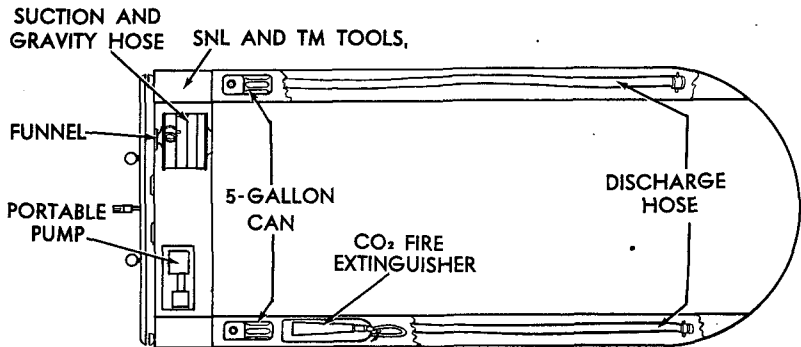
Speed allowable—surfaced road	50 mph
Towing facilities (front).....	Upper fifth wheel
(Dolly—front).....	Pintle ring
(Rear).....	Pintle hook
Pumping capacity.....	20 gpm

Section III

TOOLS, PARTS, AND ACCESSORIES

5. PURPOSE.

a. The lists in this section are for information only. They are not to be used as a basis for requisition.



RA PD 332701

Figure 5—Vehicle Stowage Chart

**SEMITRAILER, 6-TON PAYLOAD, 10-TON GROSS,
2-WHEEL, FUEL TANK, 2000 GALLON**

6. VEHICLE STOWAGE.

a. On-vehicle Tools.

Tool	Number Carried	Where Carried
WRENCH, adjustable, automotive.....	1	Rear compartment
PLIERS, 6 in.....	1	Rear compartment
SCREWDRIVER, 8 in.....	1	Rear compartment
WRENCH, wheel nut.....	1	Rear compartment
WRENCH, spark plug.....	1	Rear compartment
WRENCH, pipe adjusting.....	1	Rear compartment
WRENCH, faucet.....	2	Rear compartment
ROPE, starting.....	1	Rear compartment

b. Equipment.

Extinguisher, fire, CO ₂	1	Right side hose tube
Extinguisher, fire, carbon tetrachloride....	1	Rear compartment
Container, 5 gal.....	2	Side hose tubes, rear
Blocks, chock.....	2	Side hose tubes, rear
Hose, 1-in., discharge.....	8	Side hose tubes and rear compartment
Hose, 1½ in., discharge.....	2	Side hose tubes
Hose, 1½ in., suction.....	1	Rear compartment
Hose, 2 in., suction.....	2	Side hose tubes

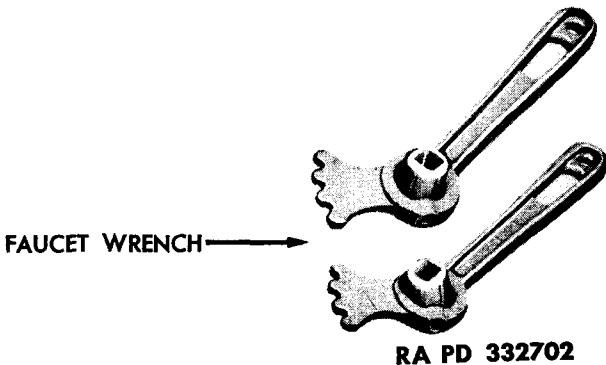


Figure 6—Special Tools

7. SPECIAL TOOLS.

a. No special tools are required for maintenance of this vehicle.

PART TWO

OPERATING INSTRUCTIONS

Section IV

CONTROLS AND OPERATION

8. CONTROLS.

a. **Air Brake Hose Couplings.** Hose couplings are mounted at the service line and emergency line outlets, at the front and rear of the vehicle, to provide a means of attaching hose connections from the towing vehicle or from a second trailer. Dummy couplings are attached by a short chain near each coupling so they may be attached to the hose couplings to prevent the entrance of dirt when the hose couplings are not being used. Each of the air lines is labelled "EMERGENCY" or "SERVICE" by a tag attached directly behind the hose couplings. Cut-out cocks are included in the service, and emergency lines at the rear of the vehicle so these lines may be closed off when not in use.

b. **Semitrailer Electrical Sockets** (fig. 7). A socket with hinged cover is provided at front and rear for attaching electrical cable connecting semitrailer and towing vehicle or another trailer.

c. **Semitrailer Chock Blocks** (fig. 2). Welded steel chock blocks are carried under each hose tube near the rear of the semitrailer. These are held in brackets by safety snaps, and are permanently attached to the vehicle with long chains.

d. **Landing Gear** (fig. 1). A retractable, telescoping landing gear is provided to support the front of the tank when the vehicle is uncoupled from the tractor truck or converter dolly. The landing gear, which is fabricated from steel tube, is held in place either in extended or retracted position by lock pins.

e. **Fifth Wheel** (fig. 8). The fifth wheel consists of a rigid upper fifth wheel plate attached to the semitrailer and a semiautomatic locking lower fifth wheel attached to the converter dolly or tractor truck. The upper fifth wheel has a kingpin, extending down from it, which engages in jaws of the lower fifth wheel, thereby locking the two together in such a manner that the semitrailer is free to swing to right or left.

f. **Safety and Check Chains** (fig. 8). Check chains are provided on the converter dolly to check the turning radius of the dolly. Safety chains from the dolly to the towing vehicle prevent the dolly tongue from dropping to the ground, in the event of a pintle failure, and also support the dolly tongue, when it is uncoupled from the pintle.

**SEMITRAILER, 6-TON PAYLOAD, 10-TON GROSS,
2-WHEEL, FUEL TANK, 2000-GALLON**

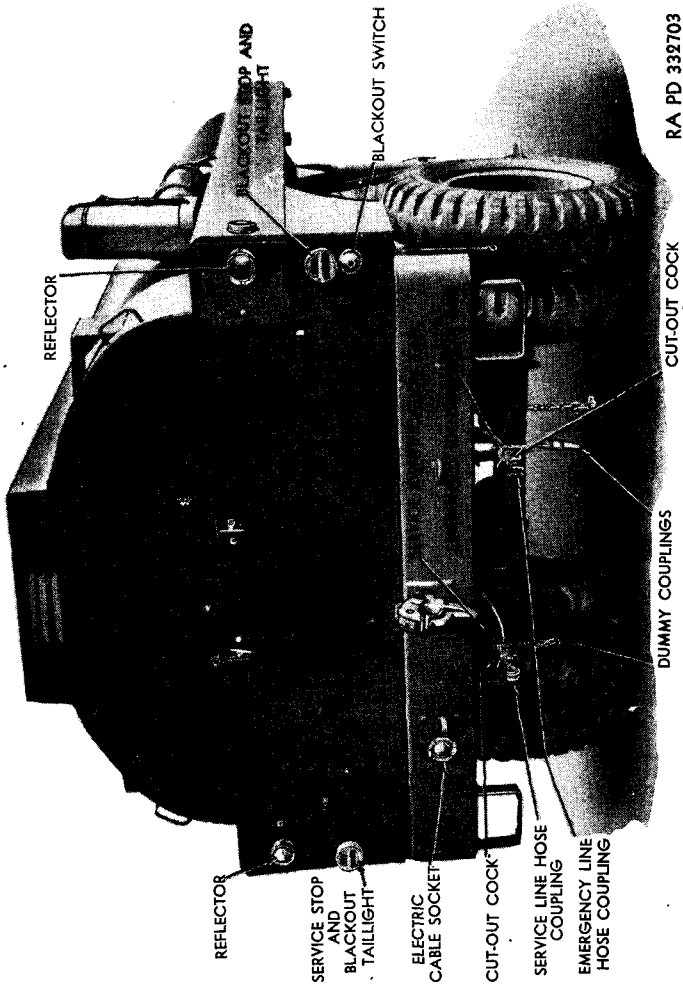
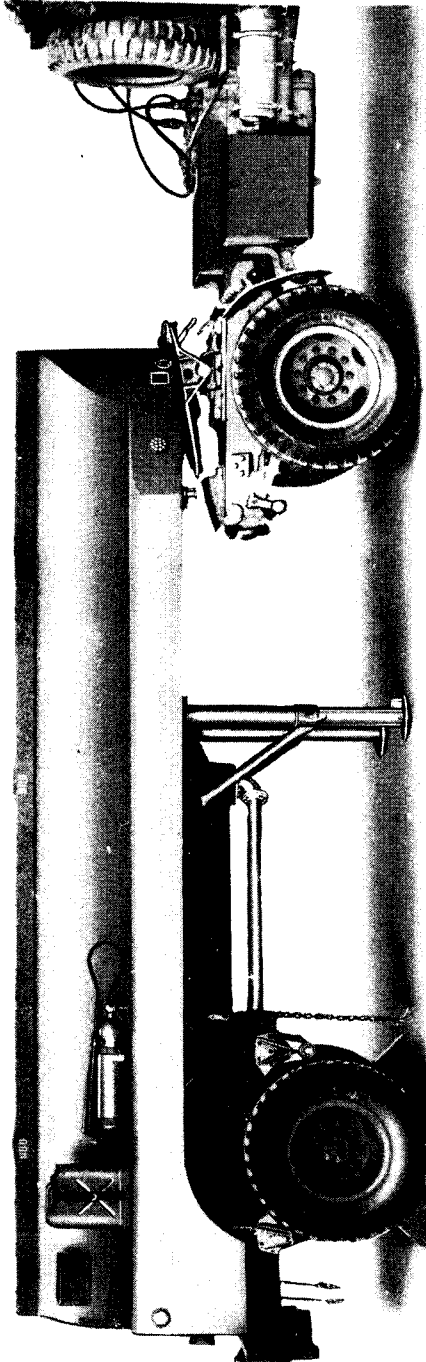


Figure 7—Rear of Semitrailer Showing Air Brake and Electrical Connections

CONTROLS AND OPERATION



RA PD 332704

Figure 8—Coupling Semitrailer to Tractor Truck

**SEMITRAILER, 6-TON PAYLOAD, 10-TON GROSS,
2-WHEEL, FUEL TANK, 2000-GALLON**

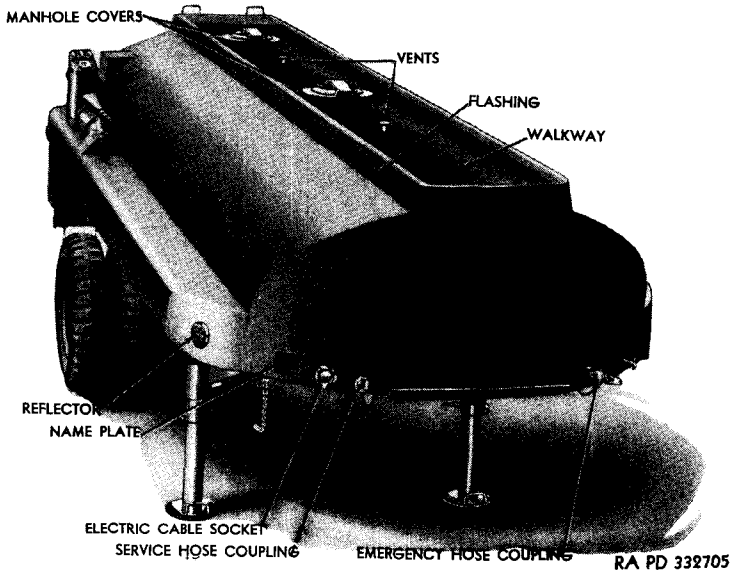


Figure 9—Semitrailer Showing Manhole Covers—Top View

g. Doors and Locks (fig. 2). Access to the rear stowage compartment is through two double opening doors, which are equipped with folding handles and plunger-type locks with keys. The hose tube on each side is equipped with a small hinged door and spring catch to hold it closed.

h. Manhole Covers (fig. 9). A manhole cover for each of the two tank compartments is attached to the top walkway of the tank. These covers are hinged and vented and also equipped with padlocks. Wing-type handles operate the catch which holds the cover closed.

i. Emergency Valve Operator (fig. 10). The emergency valves, which are located at the outlet sump of each compartment, are operated by an operator in the rear stowage compartment, and an emergency release at the front of the tank (fig. 3). The upper (front) lever operates the front tank compartment, and the lower (rear) lever operates the rear compartment. In raised position the valve is open, in lowered position the valve is closed. The front emergency release is for use in closing the valves from the front of the tank in case of fire at the rear. To close the valves, pull out on the lever.

j. Faucets (fig. 1). Two faucets with nozzles underneath the floor are provided in the rear stowage compartment. One of these faucets

CONTROLS AND OPERATION

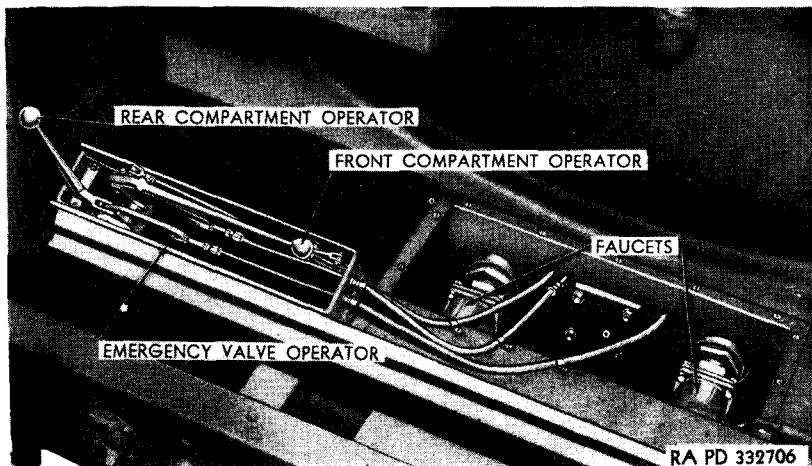


Figure 10—Emergency Valve Operator and Faucets

is attached to each of the compartments through a manifold, so that either compartment may be emptied through either faucet. The faucets are operated by wrench handles which will lock the faucet partially, or fully, open. They are spring operated so that when the handles are removed, the valves are fully closed. The nozzles are fitted with dust caps which are padlocked into place.

k. Blackout Stop Lights and Taillights (fig. 2). The light on the left at the rear is the service stop and blackout taillight, while the one on the right is the blackout stop and taillight. A switch located just above the right-hand light puts either the blackout or service stop light into operation. The lens on each blackout taillight is designed to produce two beams in such a way that when one vehicle is following a vehicle at a specified safe distance, the two beams will merge into a single beam.

l. Gage Stick and Capacity Indicator. A gage stick, carried in the right side of the rear stowage compartment, is marked on one side to show number of gallons in the front compartment, and on the other side to show number of gallons in rear compartment. The purpose of this stick is to measure the amount of fuel in either compartment at any time. It is necessary to have two different scales (one on each side) because the front compartment capacity is 900 gallons and the rear compartment is 1,100 gallons. The capacity indicator in each manhole ring is set at the factor at the correct surface level for specified capacity of each compartment. This should not be changed.

m. Static Chain. The static chain is attached to the tank on the front crossmember of the running gear. This must be in contact with the ground at all times. In case of chain breakage, chock chains may be used until the static chain is replaced.

**SEMITRAILER, 6-TON PAYLOAD, 10-TON GROSS,
2-WHEEL, FUEL TANK, 2000-GALLON**

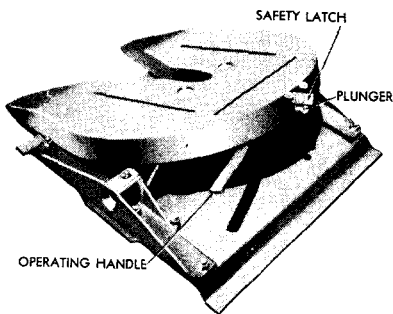
9. OPERATION.

a. **Before-operation Service.** Perform the services in paragraph 16 before using the vehicle.

b. **Coupling Semitrailer to Tractor or Trailer Converter Dolly** (fig. 1).

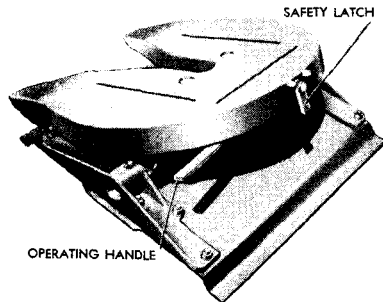
(1) **PRELIMINARY INSTRUCTIONS.** The following instructions apply to coupling the semitrailer to a tractor truck, or trailer converter dolly. Before starting the coupling operation, check the semitrailer for proper position of chock blocks and securely locked landing gear lock pins. Correct position of chocks is one in front, and one in rear, of opposite rear wheels (fig. 2). Check upper fifth wheel kingpin for looseness or damage. If a converter dolly is to be coupled to the semitrailer, attach the dolly pintle ring to the pintle hook of a tractor, and proceed the same as with a tractor only.

(2) **ENGAGE FIFTH WHEEL.** With fifth wheel latch lever in unlatched position (fig. 11), back the lower fifth wheel under the front of the semitrailer, until the upper fifth wheel plate makes contact, and starts lifting the landing gear off the ground. Now, back the fifth wheel under the semitrailer with a quick firm motion. When the kingpin comes in contact with the fifth wheel jaws, the latch lever will automatically jump into the latched position. Move the safety latch on the front of the fifth wheel over the plunger hole to lock the jaws in latched position (fig. 12).



RA PD 332707

Figure 11—Fifth Wheel in Unlatched Position



RA PD 332708

Figure 12—Fifth Wheel in Latched Position

(3) **TEST COUPLING.** To check the fifth wheel for proper latching, try to pull it out from under the trailer before retracting the landing gear, and removing the chocks. If it does not detach itself after a good strong pull, it is then properly latched in place.

CONTROLS AND OPERATION

(4) **CONNECT AIR HOSE TO TRACTOR OR TOWING VEHICLE** (fig. 3). Remove dummy couplings from front hose couplings on semitrailer. Connect emergency line from towing vehicle to emergency line of semitrailer, and connect service line on towing vehicle to service line on the semitrailer. When properly connected the lines are criss-crossed. Tags on the air lines just back of the couplings identify the lines as "SERVICE" or "EMERGENCY." Close cut-out cocks at the rear of the semitrailer, and open those on the towing vehicle; this will charge the semitrailer air system and make the brakes operative. Check operation of the semitrailer brakes by applying the brake lever and checking to see that semitrailer brakes operate properly.

(5) **CONNECT ELECTRICAL CABLE** (fig. 3). Open hinged cover on front cable socket, and insert connecting cable from towing vehicle. The cable plug will go into the socket in only one way. Check operation of the service and blackout stop lights and the blackout tail-lights. The lights are switched from service to blackout by inserting a screwdriver or coin in the slot in the blackout switch and turning it.

(6) **CONNECT CHECK AND SAFETY CHAINS IF CONVERTER DOLLY IS USED** (fig. 8). If the semitrailer has been coupled to a trailer converter dolly, connect the check chains to the two eyes provided on the bottom of the semitrailer next to the upper fifth wheel plate. Attach the pintle ring on the dolly tongue to the pintle hook on the towing vehicle, and attach the safety chains to the two eyes provided at the rear of the towing vehicle.

(7) **RETRACT LANDING GEAR AND PICK-UP CHOCKS**. When all connections have been properly made, remove the landing gear lock pins and telescope the legs to their retracted position, then insert the locking pins to hold them in place. Pick up the wheel chocks and slip them into place, one on each side under the hose tubes in the brackets provided for them. Snap the chain hooks into eyes provided on the tank to hold the chocks in place. When moving semitrailer temporarily, chocks may be hooked to rear door check chains which will hold them off the ground.

c. **Driving Truck and Semitrailer or Full Trailer**. Trailer brakes and lights are operated simultaneously with those of the towing vehicle and are operated by the same controls. If air brakes are locked on a vehicle which has just been hooked up, open the petcock on the bottom of the air reservoir on the semitrailer and bleed the air. Close this and the vehicle is ready for operation. Operation of the tractor and trailer combination is much the same as that of a regular truck except that more allowance must be made on curves, and backing up the unit requires considerable practice in order to do it properly. When driving a train made up of tractor, semitrailer, and full trailer, it is impossible to back this combination up. So make

**SEMITRAILER, 6-TON PAYLOAD, 10-TON GROSS,
2-WHEEL, FUEL TANK, 2000-GALLON**

proper allowance for pulling the unit forward, out of any parking place.

d. Stopping Truck and Semitrailer or Full Trailer. Brake operation of truck with semitrailer or full trailer is the same as for truck alone except that the distance required for stopping is proportionately longer. Depress the brake pedal to stop the vehicles; this operates semitrailer or full trailer brakes as well as tractor brakes.

e. Disconnecting Truck and Semitrailer or Trailer Converter Dolly.

(1) **PRELIMINARY INSTRUCTIONS.** Park vehicle on as level, and as firm, terrain as possible. The following instructions apply to disconnecting a semitrailer and tractor or a semitrailer and trailer converter dolly. When disconnecting a full trailer and tractor, disconnect hose and cable as instructed in following step (3) below.

(2) **PLACE WHEEL CHOCKS AND LOWER LANDING GEAR.** Remove wheel chocks from brackets underneath hose tubes, one each side. Place one in front of one wheel and one in rear of opposite wheel (fig. 2). Lower landing gear and lock in place with lock pins.

(3) **DISCONNECT HOSE AND CABLES.** Close rear air line cut-out cocks on towing vehicle, then disconnect emergency and service connecting hose lines at front of semitrailer. Attach dummy couplings to the base couplings where connecting hose lines have been removed. Disconnecting the semitrailer should automatically apply brakes on the semitrailer, but no air braked vehicle must be parked where there is danger of its moving, should air pressure leak off and the brakes release. In such cases, wheels must be properly blocked with wheel chocks to prevent semitrailer moving. Remove connecting electrical cable plug from socket at front of semitrailer.

(4) **DISENGAGE FIFTH WHEEL.** Move plunger lock to *unlocked* position and set latch lever in *unlatched* position (fig. 11). If disconnecting semitrailer and converter dolly, unhook dolly check chains from U-bolts underneath tank on the right side (fig. 4). Slowly drive fifth wheel out from under semitrailer, easing the landing gear carefully to ground. **CAUTION:** *Do not withdraw fifth wheel quickly allowing loaded semitrailer to drop on landing gear because damage to the vehicle may result.*

f. Operating Doors and Manhole Covers.

(1) **DOORS.** Insert key in stowage compartment lock and twist until lock springs out about $\frac{1}{4}$ inch. Lift flush-type handle, and twist in either direction, then pull door open. To close the door, twist handle and push door until tightly closed. Push lock plunger in as far as it will go. Check to see that door is properly locked by trying

CONTROLS AND OPERATION

to twist handle. Hose tube doors have spring catch. To open, lift catch and pull open. To close, slam door tightly.

(2) **MANHOLE COVERS** (fig. 9). Unlock padlock locking manhole cover handle down, lift handles and throw over until they are pointing in opposite direction. Lift up fill cover. To close, drop fill cover easily. **CAUTION:** *Do not let fill cover drop hard on manhole as cover may break.* Throw handles over to clamp cover down tightly, and padlock in place.

g. **Safety Precautions in Handling Fuel.** Many casualties and the loss of many thousands of gallons of fuel and lubricants have occurred because proper safety precautions were not taken. For the safety of both men and supplies *the following safety measures must be rigidly enforced at all times and places where gasoline and oil are handled. Under no circumstances build fires or light matches anywhere in the vicinity of gasoline operations.* Smoking must be prohibited at all times. Containers, whether *filled or empty*, must be kept closed at all times. *Never fill a can while it is on a truck.* Place it on the ground so that the static electricity generated by gasoline flowing through the hose will be grounded. Otherwise, the fuel might ignite and explode. Keep flashlights, other than the vaporproof-type, away from cans since the sparks caused by the battery on the contact point for the lamp can easily ignite gasoline vapor. *Leaks must never be neglected;* general inspection for oil and gasoline leaks should be made frequently. All gasoline leakage must be immediately covered by loose earth to retard its evaporation. *Striking the hose nozzle against cans or striking cans together must be avoided* since sparks created in this way can cause an explosion. In unloading tank cars, metal objects must never be brought into forcible contact with any part of the tank car or any equipment near the tank car or gasoline dispenser. Waste and oily rags must not be allowed to collect, for this material can cause spontaneous combustion. When cans are being filled, nozzles should be placed in contact with the edge of the opening. Contact should not be broken until the can is filled and the flow of gasoline has stopped. This procedure prevents the generation of sparks of static electricity; *constant contact will ground static electricity.* All gasoline dispensing equipment and trucks used in the transportation of gasoline *must be equipped with a ground chain*, at least 4 inches of which drags on the ground, to avoid static electricity being generated by the motion of the vehicle. When gasoline must be filtered, use a fine gauze in the filling funnel. Gasoline must not be filtered through a chamois skin unless absolutely necessary, and under no circumstances under pressure. If gasoline must be so filtered, ground the funnel holding the chamois to the container into which the gasoline is being poured, and do not support by wood or other insulating materials.

**SEMITRAILER, 6-TON PAYLOAD, 10-TON GROSS,
2-WHEEL, FUEL TANK, 2000-GALLON**

Containers used for water and gasoline must never be intermixed. Do not use gasoline for cleaning purposes, since there is danger of lead poisoning when it is allowed to come into contact with the skin. All personnel handling gasoline should wear sound shoes and leather gloves, and wherever possible these items of clothing should be treated with dubbin to make them gasoline-proof. Shoes worn by gasoline-handling personnel should be free of metal plates and nails. Personnel handling gasoline should be rotated frequently so that the exposure to gasoline vapors, which are toxic, will be reduced to a minimum. Camouflage, adequate dispersion of gasoline cans, and equipment, and the posting of sentries must receive careful consideration at all times.

h. Gravity Unloading of Tank (fig. 13).

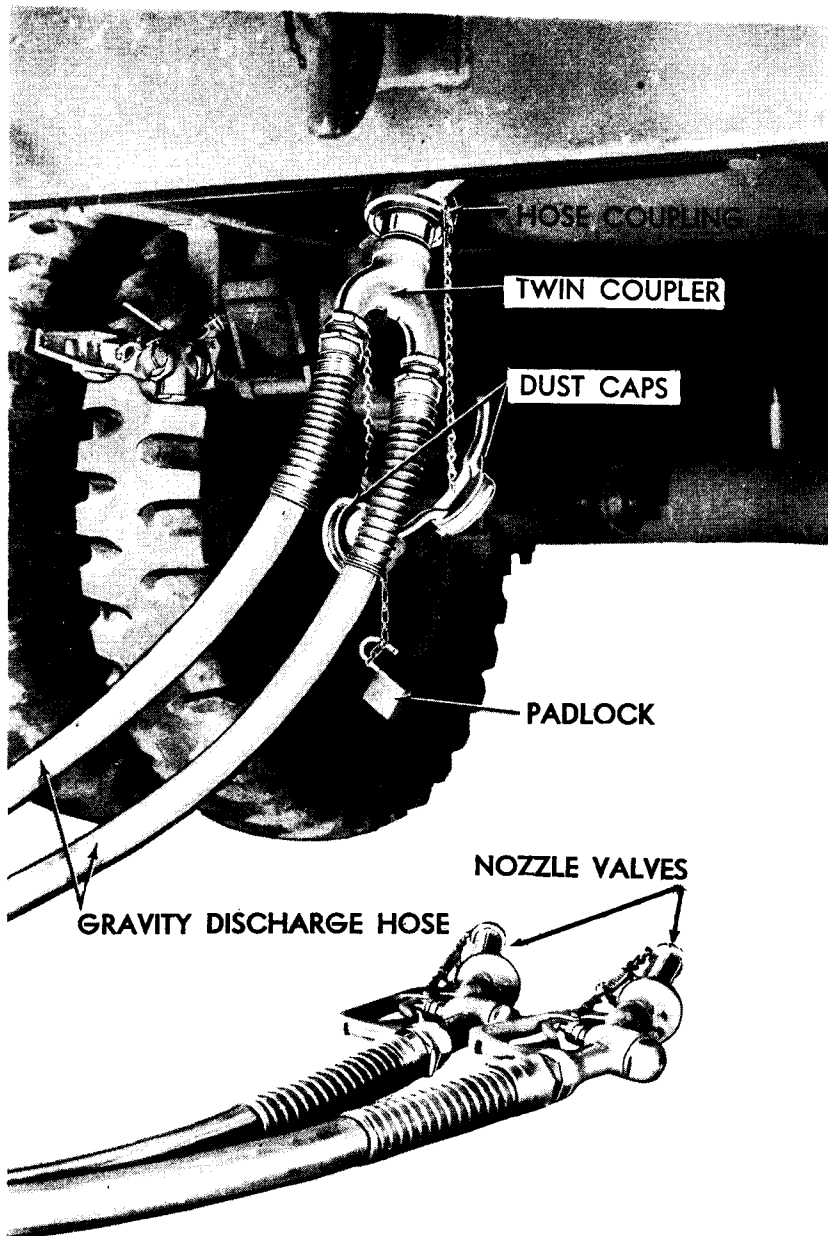
(1) **DESCRIPTION OF GRAVITY HOSE.** A 1½-inch discharge hose 10 feet long and two sections of 1-inch discharge hose connected by a twin coupler are carried in each side compartment. A whistle nozzle is attached to the end of each of the 1-inch discharge hose for filling fuel cans. The 1½-inch discharge hose have a lock ring at one end and a handle type adapter at the other. The 1-inch discharge hose are coupled together by a twin coupler at one end, and have 1-inch whistle nozzles attached to the other. All fittings and nozzles are equipped with dust caps to prevent dirt from entering when the hose are not in use.

(2) **ATTACH GRAVITY HOSE TO FAUCETS.** Remove padlock and dust cap from faucet nozzle underneath stowage compartment. Remove required lengths of gravity discharge hose from stowage compartment, and attach to faucet. Attach faucet wrench to faucet inside rear stowage compartment.

(3) **OPEN EMERGENCY VALVE.** Raise emergency valve operator for compartment from which fuel is to be withdrawn. Front (upper) handle operates front valve, and rear (lower) handle operates rear compartment.

(4) **UNLOAD TANK.** Open faucet to which hose is attached. Remove dust cap from end of nozzle valve tube, and let it hang by its attaching chain. Insert end of nozzle tube into container to be filled and press gasket on tube against the container opening. This tapered gasket will seal the opening. Raise nozzle lever to discharge fuel. During the filling operation a slight hissing sound will be noticed, and when the whistle is loud, the container is full. Release the lever to close the nozzle valve, and remove from the container. Close faucet and emergency valve when filling operations are complete.

CONTROLS AND OPERATION



RA PD 332709

Figure 13—Unloading Tank by Gravity

**SEMITRAILER, 6-TON PAYLOAD, 10-TON GROSS,
2-WHEEL, FUEL TANK. 2000-GALLON**

(5) **DRAIN AND STOW HOSE.** With both emergency valves closed, open faucet, and drain pipes and hose into container. Close faucet, remove handle, and stow in tool box. Remove discharge hose, and stow in stowage compartment. Attach dust cap to faucet nozzle and padlock in place.

Section V

OPERATION OF AUXILIARY EQUIPMENT

10. PUMPING SYSTEM.

a. Before-operation Service. Perform the services in paragraph 16 before using the vehicle. **WARNING.** *Observe safety precautions in paragraph 9 g when operating vehicle.*

b. Description. The portable pumping system used with this vehicle consists of a length of suction and discharge hose equipped with couplers and self-closing whistle nozzles, and a portable gasoline-engine driven pump. This equipment is carried in the rear compartment and side hose tubes.

c. Tabulated Data.

1-inch discharge hose, 20 foot lengths.....	3
1½-inch suction hose, 30 foot length.....	1
Pump capacity.....	20 gpm.

d. Unloading Tank. **CAUTION:** *Pumping operations must be carried out in the open air and away from any open flame, Smoking or open flame must not be permitted in vicinity of fuel pumping operations. (see par. 9 g).*

(1) Remove pump unit from vehicle, and place it on the ground near the rear of the vehicle. Remove the suction hose from stowage compartment. Attach one end to a faucet on the vehicle and the other end to the inlet fitting on the pump. Remove the required discharge hose from the vehicle, and attach to outlet side of pump.

(2) Open the emergency valve of the tank compartment to be emptied (fig. 10). The rear (lower) operator lever operates the rear compartment valve, and the front (upper) lever operates the front compartment valve.

(3) Attach faucet wrench and open faucet (fig. 10).

(4) Start engine and pump (step (11) (c) below).

(5) Remove cap from end of hose nozzle tube. This will be left hanging by the attaching chain. Insert end of nozzle tube into con-

OPERATION OF AUXILIARY EQUIPMENT

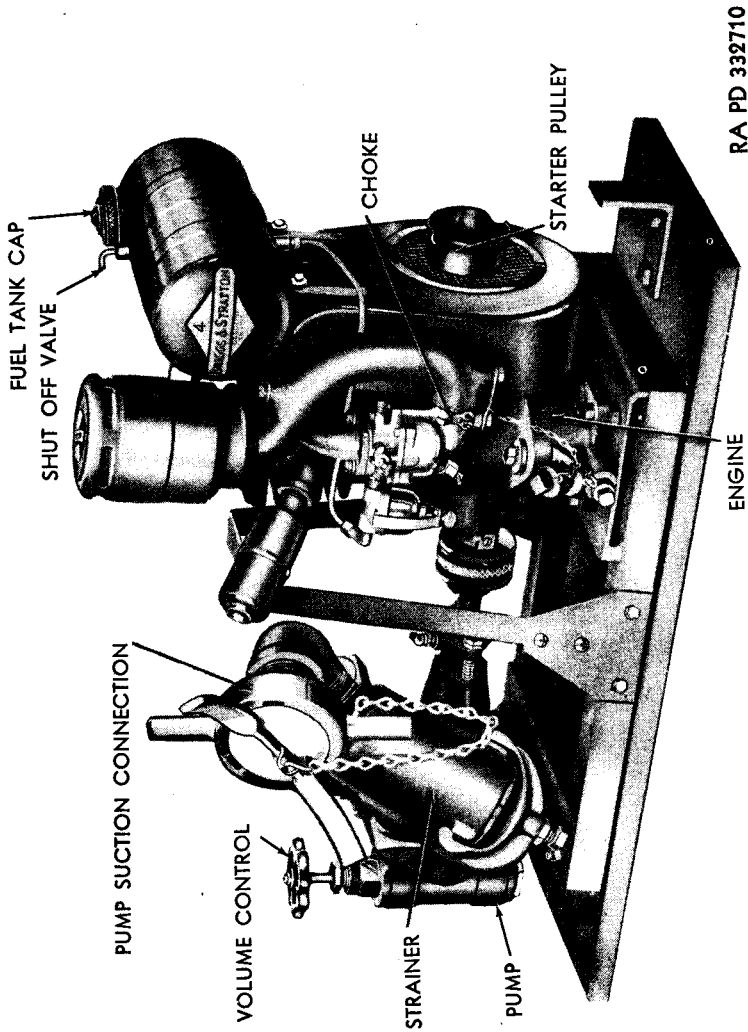


Figure 14—Pumping System

**SEMITRAILER, 6-TON PAYLOAD, 10-TON GROSS,
2-WHEEL, FUEL TANK, 2000-GALLON**

tainer to be filled, and press against container opening. The tapered gasket on the whistle chamber will seal the opening. Raise the nozzle lever to discharge fuel. During the filling operation a slight hissing sound may be noticed. However, when the whistle is loud the container is full. Release the nozzle lever and remove the nozzle from the container.

(6) Close emergency valve and blow lines dry by running engine with nozzle open. Discharge the fuel in the lines during this operation into a container. Close faucet and stop engine.

(7) Uncouple suction and discharge hose, drain thoroughly, and coil evenly in rear stowage compartment of the vehicle. Stow pump unit in rear stowage compartment, and clamp in place.

e. Loading Tank. *CAUTION: Pumping operations must be carried out in the open air and away from all open flame. Smoking, or open flame, must not be permitted in vicinity of fuel pumping operations.*

(1) Remove pump unit from rear stowage compartment of vehicle and place it on the ground near rear of vehicle. Remove the suction hose. Attach one end to side of pump and insert the other in source of supply. Remove a section of discharge hose from the vehicle, and attach to the outlet side of the pump. Open the fill cover of compartment to be filled, and insert hose nozzle with cap removed.

(2) Start engine and pump (subpar. 11 c, below).

(3) Check emergency valves to be sure they are closed. Open nozzle lever to fill tank.

(4) Fill tank compartment to level of capacity indicator.

(5) When tank is full, remove suction hose from supply source, and run engine a short time to blow lines dry. When this is completed close fill cover, lock it and stop engine.

(6) Disconnect hose and drain thoroughly. Coil the hose in rear compartment of the vehicle. Replace pump unit in rear compartment of vehicle and clamp in place.

**11. PORTABLE GASOLINE ENGINE DRIVEN PUMP UNIT
(fig. 14).**

a. Before-operation Service. Perform the services in paragraph 16 before using the vehicle.

b. Description and Tabulated Data.

(1) **DESCRIPTION.** The pump unit consists of a single cylinder, four stroke cycle gasoline engine driving a 20 gallon per minute pump

OPERATION OF AUXILIARY EQUIPMENT

through a flexible coupling. The unit is mounted on a frame equipped with carrying handle (fig. 14).

(2) TABULATED DATA.

Capacity of pump engine fuel tank.....	2 qt
Capacity of pump engine crankcase.....	1 pt

c. Starting Engine and Pump Under Normal Conditions (fig. 14).

(1) When starting a cold engine and pump against a closed nozzle, screw manual flow control on pump all the way down to relieve load on the engine. As soon as the engine is operating normally, adjust control to operating position.

(2) Open shut-off valve on fuel tank by twisting to left, or in a counterclockwise direction, as far as it will go. Open vent in fuel cap.

(3) Completely close carburetor choke by moving choke lever in a clockwise direction.

(4) Wind the starter rope around the starter pulley with the knot in the pulley notch. Pull the rope with a quick steady pull to spin the magneto flywheel with choke fully closed to prime the engine. Then open choke about one-eighth, and repeat operation.

(5) After the engine warms up, gradually open choke valve in a counterclockwise direction until engine runs smoothly with the choke wide open. Operate the choke the same as you would operate the choke of an automobile.

d. Starting Hot Engine.

(1) To start a hot engine, open gasoline shut off valve in fuel tank by turning to the left or in counterclockwise direction. Set choke in center position. Open vent in fuel tank cap.

(2) Wind starter rope around the starter pulley with knot in the pulley notch. Pull the rope with a quick steady pull to spin the flywheel. As engine starts running, open choke in counterclockwise direction until engine runs smoothly with choke wide open.

e. Starting Engine and Pump Under Cold Weather Conditions.

(1) Screw manual flow control on pump all the way down to relieve load on the engine. As soon as the engine is operating normally, adjust control to operating position.

(2) Open gasoline shut-off valve on fuel tank by turning to left, or in a counterclockwise direction. Open vent in fuel tank.

(3) Completely close carburetor choke by moving choke lever in a clockwise direction.

(4) Wind starter rope around the starter pulley with the knot in pulley notch. Pull the rope with a quick steady pull to spin mag-

**SEMITRAILER, 6-TON PAYLOAD, 10-TON GROSS,
2-WHEEL, FUEL TANK, 2000-GALLON**

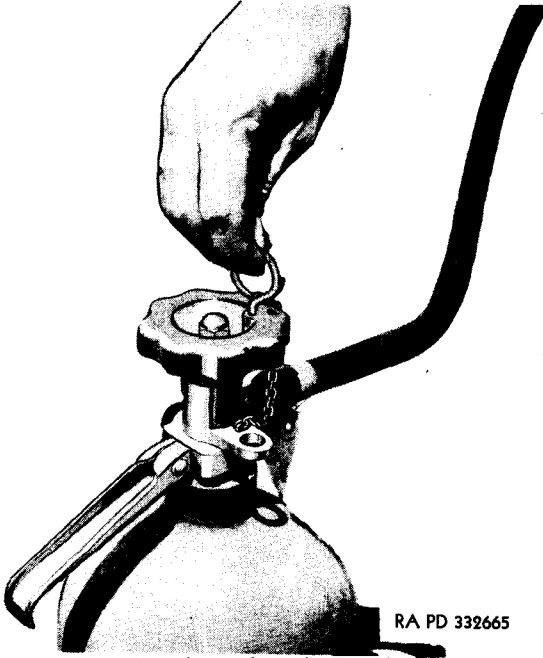


Figure 15—Pulling Fire Extinguisher Lock Pin

neto flywheel with choke fully closed to prime engine. Repeat this operation several times to fully prime engine and circulate stiff oil. Then open choke about one-eighth, and repeat operation.

(5) After the engine warms up, gradually open choke valve in a counterclockwise direction until engine runs smoothly with the choke wide open. Operate this choke the same as you would that of an automobile.

f. Stopping Engine.

(1) To stop the engine, press stop switch mounted on cylinder head against the end of the spark plug until engine stops firing.

(2) Close the fuel shut-off valve so that gasoline will not spill out through carburetor when handling the pump unit.

12. FIRE EXTINGUISHERS.

a. Description. This vehicle carries two fire extinguishers, a portable 15-pound CO₂ extinguisher on the right hose tube at the rear, and a 1-quart carbon tetrachloride hand fire extinguisher inside of the stowage compartment on the right side. Both are held in place by quick opening clamps.

OPERATION OF AUXILIARY EQUIPMENT

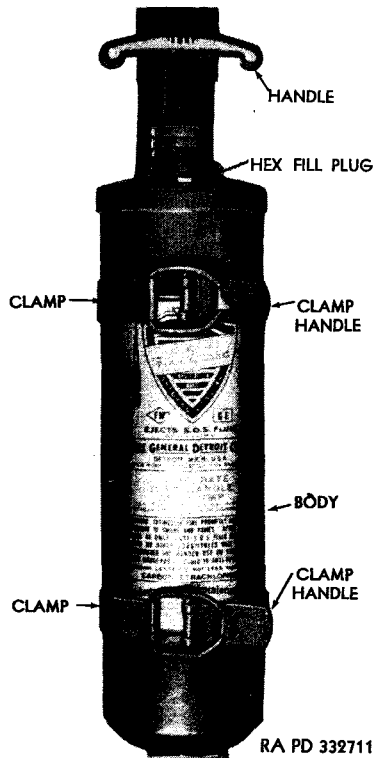


Figure 16—Hand-type Fire Extinguisher

b. Operation of 15-pound CO₂ Extinguisher.

- (1) Remove extinguisher from side of vehicle. To do this open both clamps, and lift out extinguisher.
- (2) Pull lock pin (fig. 15). Keep in vertical position.
- (3) Carry extinguisher to the fire then open valve. Keep extinguisher erect.
- (4) Carry extinguisher with left hand. Hold nozzle at hose end of handle with other hand.
- (5) Direct discharge close to fire.
- (6) Direct discharge first at edge nearest operator, or if on vertical surface, at bottom of fire.

c. Operation of Hand-type Extinguishers. Remove extinguisher from clamp, turn handle, and pump. Direct stream at base of flame. For burning liquids, direct stream against sides of container.

**SEMITRAILER, 6-TON PAYLOAD, 10-TON GROSS,
2-WHEEL, FUEL TANK, 2000-GALLON**

PART THREE

ORGANIZATIONAL MAINTENANCE INSTRUCTIONS

Section VI

LUBRICATION

13. LUBRICATION ORDER.

a. War Department Lubrication Order (figs. 17 and 18) prescribes lubrication maintenance for 6-ton payload, 10-load gross, 2-wheeled, 2,000 gallon, fuel-tank semitrailer.

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

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

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

14. DETAILED LUBRICATION INSTRUCTIONS.

a. **Lubrication Equipment.** Wipe lubricators and surrounding surface clean before applying lubricant. Where relief valves are provided, apply new lubricant until the old lubricant is forced from the vent. Exceptions are specified in notes or on the Lubrication Order. Always wipe metal surfaces, on which a film of lubricant must be maintained, clean by hand, before the film is renewed.

LUBRICATION

b. Points of Application. Lubrication fittings, grease cups oilers, and oil holes are readily identifiable on the vehicle. Wipe clean such lubricators and the surrounding surface before lubricant is applied.

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

d. Lubrication Notes on Individual Units and Parts. The following instructions supplement and repeat for clarity those notes on the Lubrication Order which pertain to lubrication and service of individual units and parts.

(1) **AIR CLEANER.** Daily check pump drive engine air cleaner level and refill to bead level with used crankcase oil or OIL, engine, SAE 30 above $+32^{\circ}\text{F}$, and SAE 10 below $+32^{\circ}\text{F}$.

(2) **CRANKCASE.** Daily drain crankcase while engine is hot. Refill with Oil, engine SAE 30 above $+32^{\circ}\text{F}$, SAE 10 from $+32^{\circ}\text{F}$ to 0°F . After each five hours of operation add oil to bring level to top of filler plug opening.

(3) **WHEEL BEARINGS.** Remove bearing cone assemblies from hub, and wash spindle and inside of hub. Inspect bearing races, and replace if necessary. Wet the spindle, and inside of hub and hub cap with GREASE, general purpose, No. 2, to a maximum thickness of $\frac{1}{16}$ inch only, to retard rust. Wash bearing cones and grease seals. Inspect and replace if necessary. Lubricate bearings with GREASE, general purpose No. 2, with a packer or by hand, kneading lubricant into all spaces in the bearing. Use extreme care to protect bearings from dirt and immediately reassemble and replace wheel. The lubricant in the bearings is sufficient to provide lubrication until the next service period. Do not fill hub or hub cap. Any excess might result in leakage into the brake drum.

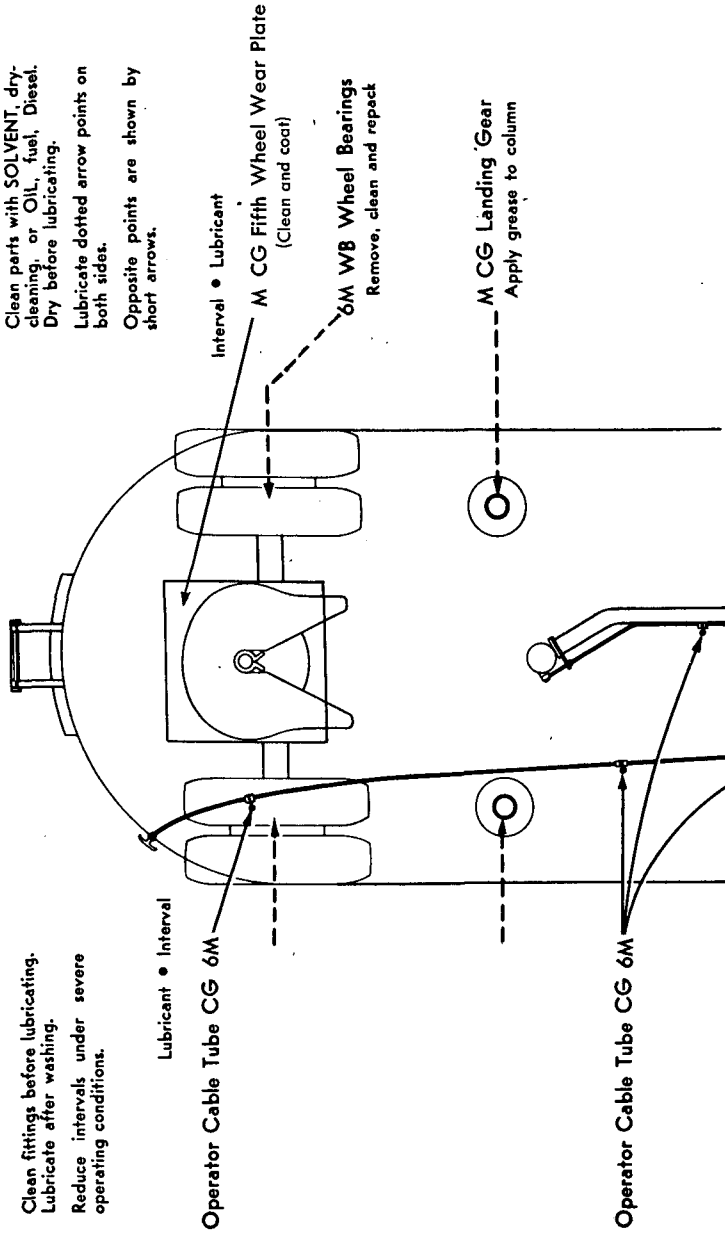
(4) **OIL CAN POINTS.** Every 1,000 miles, lubricate brake linkage clevises and body hinges with OIL, engine, SAE 30 above $+32^{\circ}\text{F}$, SAE 10 from $+32^{\circ}\text{F}$ to 0°F .

(5) **RUBBER BUSHINGS.** Every 1,000 miles, apply FLUID, brake, hydraulic to torque rod bushings. CAUTION: *Do not use oil.*

(6) **LOWER FIFTH WHEEL.** Every 1,000 miles, clean rubbing surface and coat with GREASE, general purpose, No. 1, above $+32^{\circ}\text{F}$, No. 0 below $+32^{\circ}\text{F}$.

(7) **POINTS REQUIRING NO LUBRICATION SERVICE.** Springs, manholes, ladder require no lubrication.

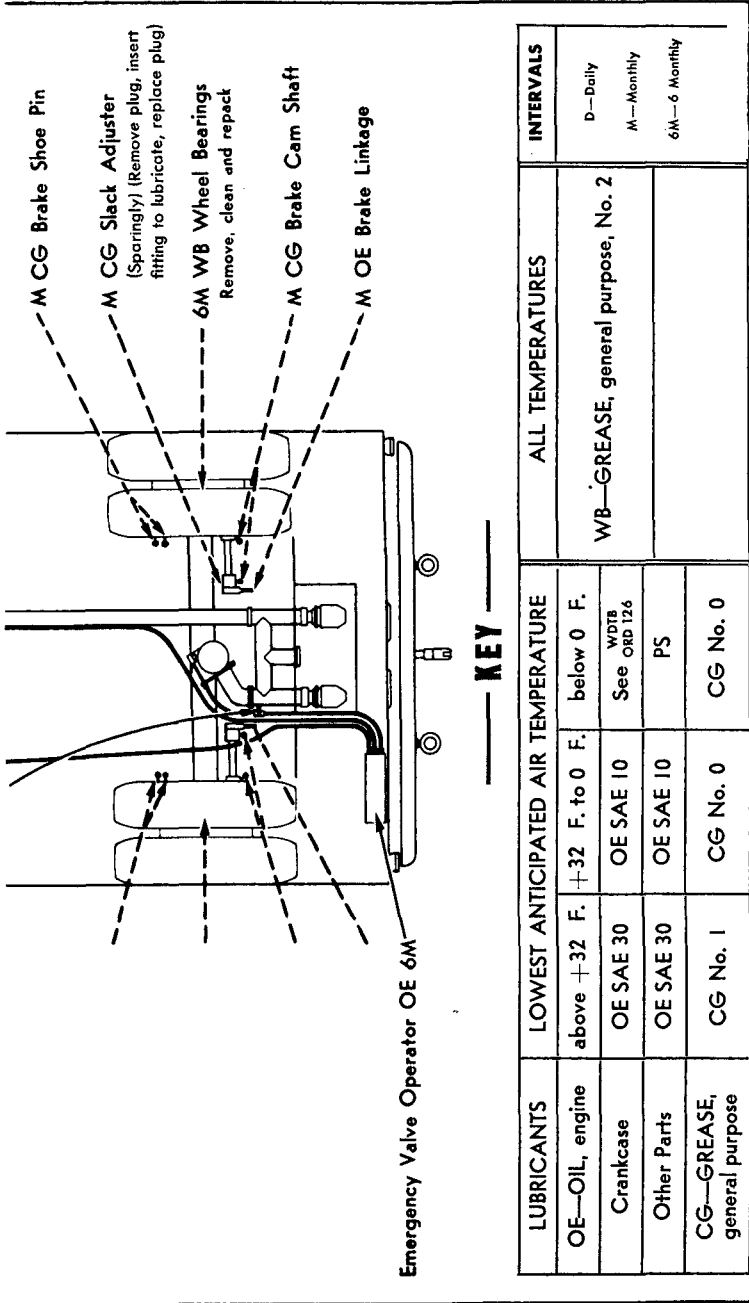
**SEMITRAILER, 6-TON PAYLOAD, 10-TON GROSS,
2-WHEEL, FUEL TANK, 2000-GALLON**



RA PD 341042

Figure 17—

LUBRICATION



KEY

LUBRICANTS	LOWEST ANTICIPATED AIR TEMPERATURE			ALL TEMPERATURES	INTERVALS
	above +32 F.	+32 F. to 0 F.	below 0 F.		
OE—OIL, engine	OE SAE 30	OE SAE 10	below 0 F. WDTB ORD 126	WB—GREASE, general purpose, No. 2	D—Daily M—Monthly 6M—6 Monthly
Crankcase	OE SAE 30	OE SAE 10	PS		
Other Parts	CG No. 1	CG No. 0	CG No. 0		

**SEMITRAILER, 6-TON PAYLOAD, 10-TON GROSS,
2-WHEEL, FUEL TANK, 2000-GALLON**

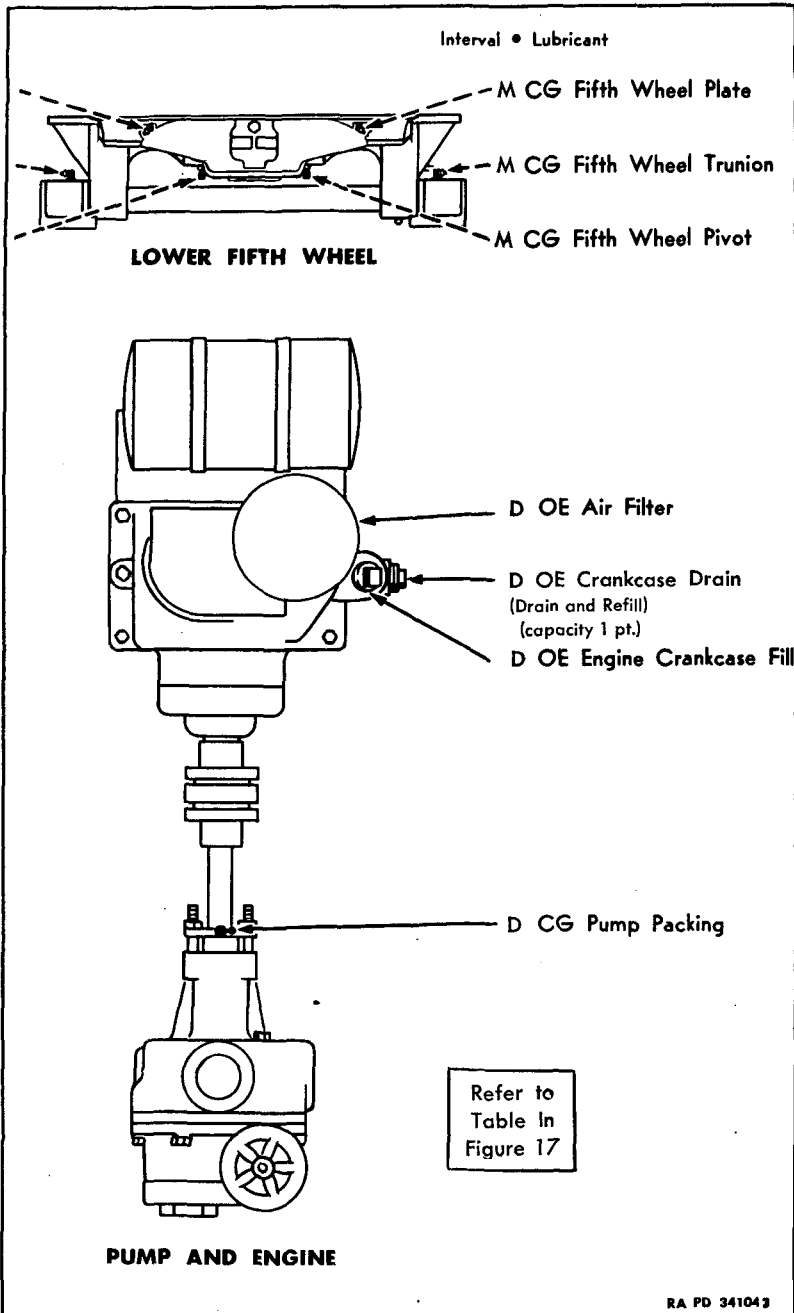


Figure 18—Lubrication Order

LUBRICATION

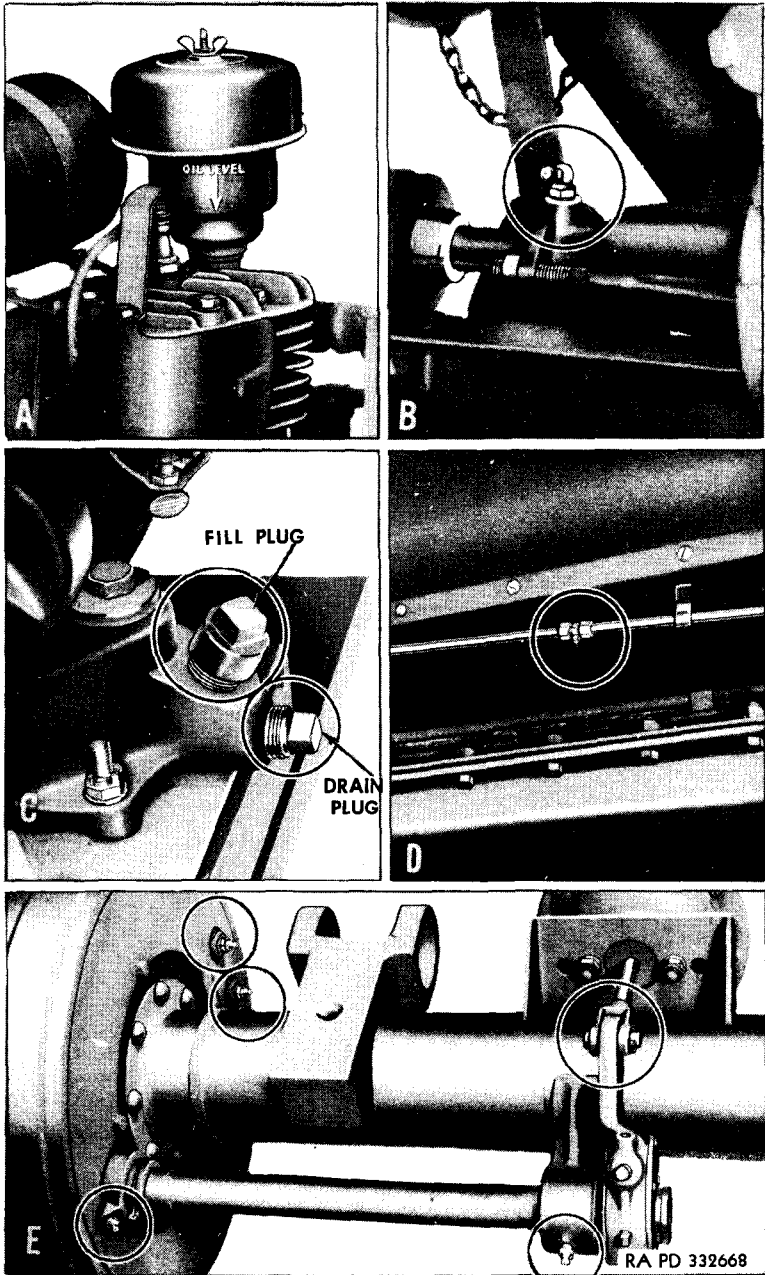
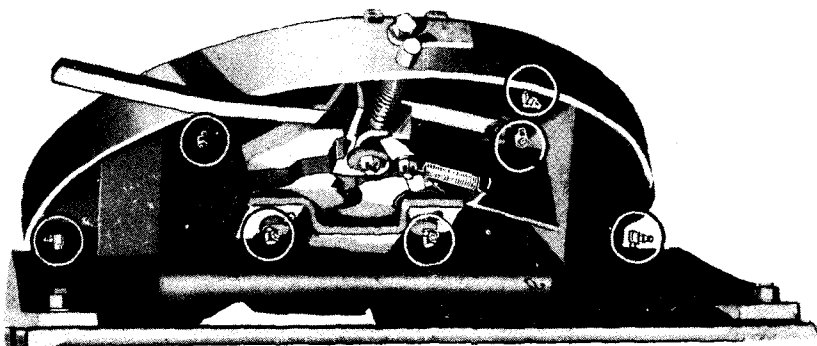


Figure 19.—Localized Lubrication Views

**SEMITRAILER, 6-TON PAYLOAD, 10-TON GROSS,
2-WHEEL, FUEL TANK, 2000-GALLON**



RA PD 332712

Figure 20—Localized Lubrication View—Fifth Wheel

(8) POINTS TO BE SERVICED AND/OR LUBRICATED BY MAINTENANCE PERSONNEL. Pump engine magneto is serviced or lubricated by maintenance personnel.

e. Reports and Records.

(1) REPORTS. Report unsatisfactory performance of materiel to the Ordnance Officer responsible for maintenance in accordance with TM 38-250.

(2) RECORDS. A record of lubrication may be maintained in the Duty Roster (W.D., A.G.O. Form No. 6).

Section VII

FIRST ECHELON PREVENTIVE MAINTENANCE SERVICE

15. PURPOSE.

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

b. Driver preventive maintenance services are listed on the back of "Drivers Trip Ticket and Preventive Maintenance Service Record"

FIRST ECHELON PREVENTIVE MAINTENANCE SERVICE

W. D. Form No. 48, to cover vehicles of all types and models. Items peculiar to specific vehicles, but not listed on W. D. Form No. 48, are covered in manual procedures under the items to which they are related. Certain items listed on the form, that do not pertain to the vehicles involved, are eliminated from the procedure as written into this manual. Every organization must thoroughly school each driver in performing the maintenance procedures set forth in manuals, whether they are listed specifically on W. D. Form No. 48 or not.

c. The items listed on W. D. Form No. 48 that apply to these vehicles are expanded in this manual to provide specific procedures for accomplishment of the inspections and services. These services are arranged to facilitate inspection and conserve the time of the driver and are not necessarily in the same numerical order as shown on W. D. Form No. 48. The item numbers, however, are identical with these shown on that form.

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

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

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

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

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

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

16. BEFORE-OPERATION SERVICE.

a. This inspection schedule is designed primarily as a check to see that the vehicles have not been tampered with, or sabotaged since the After-operation Service was performed. Various combat condi-

**SEMITRAILER, 6-TON PAYLOAD, 10-TON GROSS,
2-WHEEL, FUEL TANK, 2000-GALLON**

tions may have rendered the vehicles unsafe for operation, and it is the duty of the driver to determine whether or not the vehicles are in condition to carry out any mission to which they may be assigned. This operation will not be entirely omitted, even in extreme tactical situations.

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

(1) **ITEM 1, TAMPERING AND DAMAGE.** Examine the exterior of vehicle, attachments and equipment, for injury caused by tampering, sabotage, collision, falling debris, or shell fire since parking.

(2) **ITEM 2, FIRE EXTINGUISHERS.** Inspect all units for loose mountings and damage. See that nozzles are not clogged. If CO₂ extinguisher valve is damaged, or appears to have been opened, report for exchange or refill.

(3) **ITEM 4, ACCESSORIES (PUMP AND ENGINE).** Inspect portable gasoline refueling unit for damage and loose mountings. Be sure fuel and crankcase oil supply is up to proper levels, and examine unit for fuel oil leaks.

(4) **ITEM 5, AIR BRAKE TANKS.** Examine air brake reservoir tank, air lines, and connections, for looseness or damage. Listen for air leaks. Drain water from tanks, and close drain cock. Be sure truck-to-trailer air couplings are securely connected, or if not in use, that they are closed and properly supported.

(5) **ITEM 6, LEAKS, GENERAL.** Look over the tank, in rear storage compartment, and under vehicle for indications of leaks. Trace any leaks found to source and correct or report them.

(6) **ITEM 12, LAMPS (LIGHTS) AND REFLECTORS.** Clean all light lenses and warning reflectors and inspect units for looseness and damage. If trailer is connected, and tactical situation permits, open and close trailer light switches to see if lamps respond properly.

(7) **ITEM 13, WHEEL AND FLANGE NUTS.** See that all trailer and dolly wheel mounting and axle flange nuts are present and secure.

(8) **ITEM 14, TIRES.** Be sure all dolly and trailer tires are properly inflated to 65 pounds (maximum) cool. Remove objects lodged in treads, carcasses, or between duals, and inspect for damage.

(9) **ITEM 15, SPRINGS AND SUSPENSIONS.** Examine trailer, and dolly springs and radius rods, for looseness or damage. Look for excessive spring sag or shifted leaves.

FIRST ECHELON PREVENTIVE MAINTENANCE SERVICE

(10) **ITEM 17, BUMPER.** Examine rear bumper for looseness or damage.

(11) **ITEM 18, TOWING CONNECTIONS.** Inspect all towing devices to see that they are in good condition and securely connected or mounted. Pay particular attention to pintle draw bar and retraction spring. See that fifth wheel mechanism operates properly, and if connected to trailer, that it is securely locked, and that safety and check chains are fastened.

(12) **ITEM 19, BODY (TANK) FRAME AND ATTACHMENTS.** Examine tank body, mounted attachments, frame members, and landing gear for looseness or damage. Be sure manhole covers are in place and securely latched.

(13) **ITEM 20, DECONTAMINATORS.** Make sure decontaminators are fully charged and securely mounted.

(14) **ITEM 21, TOOLS AND EQUIPMENT.** Be sure all items of trailer on-vehicle tools, and standard and special equipment are present, serviceable, and properly stowed or mounted.

17. DURING-OPERATION SERVICE.

a. While the vehicle is in motion, be on the alert for any unusual noise, such as rattles, knocks, squeals or hums that may indicate trouble. Observe if there is any abnormal sag, side sway, or drag that might indicate broken suspensions; disconnected towing or safety devices or dragging brakes.

b. **Procedures.** During-operation Service consists of observing items listed below according to the procedures following each item, and investigating any indications of service trouble. Notice minor deficiencies to be corrected, or reported at earliest opportunity, usually next scheduled halt.

(1) **BRAKES.** Test trailer brakes, independent of truck tractor brakes, to be sure they are effective and operate without excessive pull to one side, chatter, or squealing.

(2) **RUNNING GEAR.** Be on the alert for any unusual noise, or unsatisfactory operating characteristics of trailer or dolly wheels, suspension units, or mountings.

18. AT-HALT SERVICE.

a. At-halt Services may be regarded as minimum maintenance procedures, and should be performed under all tactical conditions, even though more extensive maintenance services must be slighted or omitted altogether.

**SEMITRAILER, 6-TON PAYLOAD, 10-TON GROSS,
2-WHEEL, FUEL TANK, 2000-GALLON**

b. Procedures. At-halt Service consists of investigating any deficiencies noted during operation, inspecting items listed below according to the procedures following the items, and correcting any deficiencies found. Deficiencies not corrected should be reported promptly to the designated individual in authority.

(1) **ITEM 39, TEMPERATURES: HUBS AND BRAKE DRUMS.** Place hand cautiously on each trailer and dolly wheel hub and trailer brake drums to see if they are abnormally hot.

(2) **ITEM 42, SPRINGS AND SUSPENSIONS.** Inspect dolly and trailer springs, radius rods, mountings and connections, for looseness or damage.

(3) **ITEM 44, WHEEL AND FLANGE NUTS.** See that both dolly and trailer wheel rim, mounting and flange nuts are present and secure.

(4) **ITEM 45, TIRES.** Inspect all dolly and trailer tires for under inflation and damage. Remove objects lodged in treads, carcasses, and from between duals.

(5) **ITEM 46, LEAKS, GENERAL.** Look over the tank, under the vehicle, and at portable refueling unit in rear compartment for indications of leaks. Trace any leaks to source and correct or report them.

(6) **ITEM 48, AIR CLEANER.** If operating under extreme conditions of dust or sand, inspect carburetor air cleaner on portable refueling unit to be sure it is in condition to deliver clean air. Service as necessary.

(7) **ITEM 50, TOWING CONNECTIONS.** Inspect all towing and safety connecting devices for looseness or damage. Be sure all locking devices are secure.

(8) **ITEM 51, BODY.** Examine tank and dolly for looseness or damage to mountings or brackets; see that manhole covers, rear doors, and stowage compartment doors are closed and secured.

(9) **ITEM 52, GLASS.** Clean all light and reflector glass, and inspect for looseness or damage.

19. AFTER-OPERATION AND WEEKLY SERVICE.

a. After-operation Service is particularly important because at this time the driver inspects his vehicles to detect any deficiencies that may have developed, and corrects those he is permitted to handle. He should report promptly to the designated individual in authority the results of his inspection. If this schedule is performed thoroughly,

FIRST ECHELON PREVENTIVE MAINTENANCE SERVICE

the vehicles should be ready to roll again on a moment's notice. The Before-operation Service, with a few exceptions is then necessary only to ascertain whether or not the vehicles are in the same condition in which they were left upon completion of the After-operation Service. The After-operation Service should never be entirely omitted even in extreme tactical situations, but may be reduced to the bare fundamental services outlined for the At-halt Service if necessary.

b. **Procedures.** When performing the After-operation Service the driver must remember and consider any irregularities noticed during the day in the Before-operation, During-operation, and At-halt Services. The After-operation Service consists of inspecting and servicing, the following items. Those items of the after-operation that are marked by an asterisk (*) require additional weekly services, the procedures for which are indicated in subparagraph (b) of each applicable item.

(1) **ITEM 59, LAMPS (LIGHTS) AND REFLECTORS.** Clean all units, and inspect them for looseness and damage. Open and close light switches to be sure they operate properly, and see if the lamps respond.

(2) **ITEM 60, FIRE EXTINGUISHERS.** Examine all units for loose mountings, and damage, if extinguishers have been used or valves of CO₂ units have been opened or damaged, report for refill or exchange. Be sure nozzles are not clogged.

(3) **ITEM 61, DECONTAMINATOR.** Inspect for looseness or damage and full charge; if used, report for refill or exchange.

(4) **ITEM 63, ACCESSORIES.**

(a) Inspect portable gasoline refueling unit for damage, loose fuel or electrical connections, clogged cooling fins, and loose mountings. Investigate any unusual noise or unsatisfactory performance noticed during operation.

(b) *Weekly.* Remove carburetor air cleaner. Wash element and oil cup in dry cleaning solvent, fill oil reservoir to correct level with engine oil and reinstall securely. Be sure air horn duct connections and all gaskets are in good condition and tight. Clean fuel filter screen. Start engine and test for satisfactory operation. Observe any excessive noise or exhaust smoke. Be sure starting rope is in good condition.

(5) **ITEM 64, ELECTRICAL WIRING.** Examine all accessible wiring and conduits under vehicle for damage and see that it is properly and securely connected and supported.

**SEMITRAILER, 6-TON PAYLOAD, 10-TON GROSS,
2-WHEEL, FUEL TANK, 2000-GALLON**

(6) ITEM 68, TIRES.

(a) Examine both dolly and trailer tires, including spares, for damage and excessive wear. Remove objects lodged in treads, and carcasses and from between duals. Check for low pressures, proper position of valve stems and presence of valve caps. Inflate to correct pressure, 65 pounds (maximum) cold.

(b) *Weekly.* Replace badly worn or otherwise unserviceable dolly and trailer tires. Serviceable tires which show abnormal wear should be rotated to other wheel positions. Apparent mechanical defects causing such wear should be reported for attention by higher echelon.

(7) ITEM 69, SPRINGS AND SUSPENSIONS. Inspect dolly and trailer springs and radius rods for looseness and damage. Look for excessive spring sag, shifted leaves, missing or damaged rebound clips, or shackles.

(8) ITEM 73, LEAKS, GENERAL. Look tank over thoroughly for any indications of leaks at assembly welds, pipe lines, connections or valves. Also check portable refueling unit for fuel or oil leaks. Trace any leaks found to source, and correct or report them.

(9) ITEM 75, *AIR BRAKE TANK.

(a) Inspect tank on trailer for looseness and damage. See that all connections are tight, and that air lines are properly supported so as not to chafe on other vehicle parts. Drain water from all tanks, and close drain cocks.

(b) *Weekly.* Have assistant operate all brake control valves and listen for air leaks. Tighten tank mountings and all connections where leaks are heard. Clean oil from all trailer air line rubber hose.

(10) ITEM 76, BUMPER AND SPLASH GUARDS. Examine trailer rear bumper and splash guards for looseness and damage.

(11) ITEM 77, *TOWING CONNECTIONS.

(a) Inspect rear pintle and towing shackles for looseness, damage and excessive wear. Examine fifth wheel on dolly and king pin on trailer for wear or damage, and see that latching mechanism operates properly and locks securely.

(b) *Weekly.* Tighten all towing device mounting and assembly nuts securely. Test fifth wheel connecting and locking mechanism for proper operation. Examine pintle hook spring and draw bar for damage.

(12) BODY, FRAME, AND ATTACHMENTS. Examine entire tank for damage or loose parts. See that doors and manhole covers fit and

FIRST ECHELON PREVENTIVE MAINTENANCE SERVICE

operate properly and latch securely. Inspect frame for broken welds, loose nuts or rivets, or damaged rails or crossmembers or brackets. Be sure all landing gear members, and assembly and mounting and lock pins, are present and secure.

(13) ITEM 82, *TIGHTEN.

(a) Tighten any dolly or trailer external assembly or mounting nuts or screws where inspection has indicated the necessity.

(b) *Weekly.* Tighten all dolly and trailer wheel rim, mounting, and axle flange nuts or cap screws, spring U-bolts, shackles and rebound clips, towing connections, or any other mounting or assembly nuts or screws indicated by inspection as necessary, on a weekly, or mileage, basis.

(14) ITEM 83, *LUBRICATE AS NEEDED.

(a) Lubricate dolly and trailer items such as shackles, hinges and latches, control linkage, frictional joints or clevises, and any point where inspection indicates the necessity, according to Lubrication Order instruction (pars. 13 and 14).

(15) ITEM 84, *CLEAN ENGINE AND VEHICLES.

(a) Clean dirt and grease from pump and engine units; remove any foreign matter lodged in cooling fins. Wipe up fuel or oil drippings in stowage compartment, and wipe off all excess dirt or grease from exterior of entire vehicle.

(b) *Weekly.* Wash dolly and trailer when possible. If not possible, wipe off thoroughly. Inspect paint or camouflage pattern for rust or bright spots which might cause reflection. See that all vehicle markings (unless covered for tactical reasons) are legible. **CAUTION:** *When vehicles are driven into water for washing, care must be taken to see that water or dirt does not get into wheel bearings, or brakes, or on electrical units or wiring.*

(16) ITEM 85, *TOOLS AND EQUIPMENT.

(a) Check both dolly and trailer tool and equipment on-vehicle stowage lists, paragraph 6, to be sure all items are present. See that they are in good condition, and properly mounted or stowed.

(b) *Weekly.* Clean all tools and equipment of rust, dirt, or excessive grease. Apply preservatives where necessary and possible. See that tools with cutting edges are sharp and properly protected, and that all items are properly and securely mounted or stowed.

**SEMITRAILER, 6-TON PAYLOAD, 10-TON GROSS,
2-WHEEL, FUEL TANK, 2000-GALLON**



Section VIII

SECOND ECHELON PREVENTIVE MAINTENANCE**20. SECOND ECHELON PREVENTIVE MAINTENANCE SERVICE.**

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

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

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

(3) If instructions other than those contained in the general procedures in paragraph (4) or the specific procedures in paragraph (5) which follow, are required for the correct performance of a preventive maintenance service or for correction of a deficiency, other sections of this manual, or a designated individual in authority, should be consulted.

(4) **GENERAL PROCEDURES.** These general procedures are basic instructions which are to be followed when performing the services on the items listed in the specific procedures. **NOTE:** *The second echelon personnel must be thoroughly trained in these procedures so that they will apply them automatically.*

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

(b) When installing new lubricant retainer seals, a coating of the lubricant should be wiped over the sealing surface of the lip of the seal. When the new seal is a leather seal, it should be soaked in SAE 10 engine oil (warm if practicable) for at least 30 minutes. Then, the leather lip should be worked carefully by hand before installing the seal. The lip must not be scratched or marred.

**SEMITRAILER, 6-TON PAYLOAD, 10-TON GROSS,
2-WHEEL, FUEL TANK, 2000-GALLON**

(c) The general inspection of each item applies to any supporting member or connection, and usually includes a check to see whether or not the item is in good condition, correctly assembled, secure, or excessively worn. The mechanics must be thoroughly trained in the following explanations of these terms.

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

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

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

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

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

1. *Adjust.* Make all necessary adjustments in accordance with the pertinent section of this manual, special bulletins, or other current directives.

2. *Clean.* Clean units of the vehicle with dry-cleaning solvent to remove excess lubricant, dirt, and other foreign material. After the parts are cleaned, rinse them in clean solvent, and dry them thoroughly. Take care to keep the parts clean until reassembled, and be certain to keep dry-cleaning solvent away from rubber or other material which it would damage. Clean the protective grease coating from new parts since this material is not usually a good lubricant.

3. *Special Lubrication.* This applies either to lubrication operations that do not appear on the vehicle chart, and to items that do

SECOND ECHELON PREVENTIVE MAINTENANCE

appear on such charts but should be performed in connection with the maintenance operations, if parts have to be disassembled for inspection or service.

4. *Serve.* This usually consists of performing special operations, such as replenishing battery water, draining and refilling units with oil, and changing the oil filter cartridge.

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

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

(f) The numbers of the preventive maintenance procedure that follow are identical with those outlined on WD AGO Form No. 461, which is the Preventive Maintenance Service Work Sheet for Wheeled and Half Track Vehicles. Certain items on the work sheet that do not apply to this vehicle are not included in the procedure in this manual. In general, this numerical sequence of items on the work sheet is followed in the manual procedures, but in some instances there is a deviation for conservation of the mechanic's time and effort.

(5) **SPECIFIC PROCEDURES.** The procedures for performing each item in the 1,000 miles (monthly) and 6,000 miles (six-month) maintenance procedures, whichever may occur first, are described in the following chart. Each page of the chart has two columns at its left edge corresponding to the 6,000 mile and the 1,000 mile maintenance respectively. Very often it will be found that a particular procedure does not apply to both scheduled maintenance. In order to determine which procedure to follow, look down the column corresponding to the maintenance due, and wherever an item number appears perform the operations indicated opposite the number.

**SEMITRAILER, 6-TON PAYLOAD, 10-TON GROSS,
2-WHEEL, FUEL TANK, 2000-GALLON**

ROAD TEST

NOTE: When the tactical situation does not permit a full road test, perform those items which require little or no movement of the vehicle. When a road test is possible, it should be for preferably four, and not over six, miles.

MAINTENANCE	
6000 Mile	1000 Mile
1	1
5	5
10	10
12	12
13	13
14	14
44	44

Before-operation Inspection. Perform this inspection as outlined in paragraph 16.

Brakes, Service and Emergency (Braking Effect, Side Pull, Noise, Chatter, Air Control). Test trailer brakes separately by use of hand-control or foot treadle, and observe if they are effective. Note any erratic action, side pull, or noise, that might indicate uneven brake shoe pressure, dirty linings, or scored drums. Stop trailer on a reasonable incline, disconnect emergency line, and observe if brakes automatically hold vehicle. Be sure application valve operates properly, and closes fully, when pedal pressure or hand-application lever is in released position.

Unusual Noises (Attachments, Cab, Body, Wheels). Be on the alert during road test for any noise that may indicate loose or damaged attachments mounted on vehicle. Listen particularly for indications of loose wheel mountings. With trailer connected and in motion, have assistant listen for any unusual noise on dolly and trailer from attachments, axles, suspension units, or wheels.

Air-Brake System Leaks. Test trailer air brakes for leaks with air pressure at governed maximum. With all brakes applied and engine stopped, there should not be a noticeable drop in pressure within one minute. If any pressure drop occurs during this check, test for leaks by soapsuds method (par. 39).

Temperature (Brake Drums, Hubs). At completion of run, feel brake drums and hubs of both dolly and trailer for abnormally high temperatures.

Leaks. Inspect the tank carefully for indications of leaks at seams, assembly welds, pipes, valves, and all connections. Correct any leaks found, or report the condition to individual in authority.

Power Pump. Remove portable gasoline refueling unit from stowage compartment. Examine it for good con-

SECOND ECHELON PREVENTIVE MAINTENANCE

MAINTENANCE	
6000 Mile	1000 Mile
44	44
44	
47	47

dition, correct assembly, and secure mounting to base. See that cooling fins are clean, that muffler holes and fly wheel cover screen are not clogged, and that wiring and fuel lines are secure and properly supported. Check for fuel or oil leaks.

CLEAN. Remove and clean spark plug and set point gap to 0.025 inches. Inspect for damaged insulator or burned electrodes. Replace if unserviceable. Remove air cleaner cup and element, wash in dry-cleaning solvent; fill reservoir to proper level and reinstall securely. Clean fuel filter bowl and screen. Start engine and after warm up check for satisfactory operation. Observe any unusual noise or abnormal operating characteristics.

ADJUST. Adjust carburetor and governor, and set magneto timing and point gaps according to instructions (par. 62 and 66).

Tires and Rims (Valve Stems and Caps, Condition, Direction, Matching Spare Carrier). Inspect both truck and trailer tires as follows:

VALVE STEMS AND CAPS. Observe if all valve stems are in good condition and in correct position, and if all valve caps are present and installed securely. Do not tighten with pliers.

CONDITION. Examine all tires for cuts, bruises, breaks and blisters. Remove embedded glass, nails, and stones. Look for irregular tread wear, watching for any sign of flat spots, cupping, feather edges, and one-sided wear. Remove tires worn thin at center of tread (or any other unserviceable tires), and exchange for new or retreaded tires. Any mechanical deficiencies causing such conditions should be determined, and corrected or reported. Wheel positions of tires with irregular wear should be changed to even up wear. Front tires, worn irregularly, should be moved to rear-wheel positions.

DIRECTION. Directional tires and non-directional tires should not be installed on same vehicle. Directional tires on rear wheels should be mounted so that the "V" of chevron will point down when viewed from the front. Directional tires on all front wheels will ordinarily be mounted so that "V" of chevrons will point up when viewed from front of vehicle.

MATCHING. With tires properly inflated, inspect them to see if they are matched according to overall circumstances and type of tread.

**SEMITRAILER, 6-TON PAYLOAD, 10-TON GROSS,
2-WHEEL, FUEL TANK, 2000-GALLON**

MAINTENANCE	
8000 Mile	1000 Mile
47	47
48	

SPARE TIRE CARRIER. See whether or not spare tire carrier is in good condition and secure.

RIMS. All rims and their lock rings or flanges should be in good condition and secure.

TIGHTEN. Tighten all wheel mountings and nuts securely.

SERVE. With dolly and trailer tires properly inflated to 65 pounds (cool), check overall circumference of all tires including spares. Select tires to be mounted on duals or on driving axles, so they will not have difference in overall circumference exceeding the 3/4-inch limits specified in current directives and bulletins. Mount all dual tires with the larger tire outside. The valve stem on inner wheels should point out and the valve stem on outer wheel should point in, and should be opposite each other. **NOTE:** *Spares must be matched and properly mounted for use on one of the road wheels at intervals not exceeding 90 days. A convenient time to do this is during these maintenance services.* **CAUTION:** *After performing the tire-matching service, do not reinstall wheels until wheel-bearing services are completed.*

Rear Brakes (Drums, Supports, Cams and Shafts). Inspect trailer brakes and service as follows: Remove wheels. **NOTE:** *On 6,000-mile maintenance several wheel bearing and brake items, up to 52, are group services and overlap. Perform in best order for economy of time, and orderly assembly.*

DRUMS AND SUPPORTS. Clean dirt and grease from drums and supports, keeping dry-cleaning solvent away from linings. Examine drums and supports to see if they are in good condition, securely mounted, and if drums are excessively worn or scored.

CAMS AND SHAFTS. See if cams and shafts are excessively worn, where they contact; if cam shafts operate freely in collar, and if shafts and collars are worn.

TIGHTEN. Tighten brake support cap screws and hub to drum nuts securely.

SECOND ECHELON PREVENTIVE MAINTENANCE

MAINTENANCE	
8000 Mile	1000 Mile
	49
49	
50	50
52	52

Brake Shoes (Linings, Anchors, Springs). Examine trailer brake linings without removing drums to see if they are so worn rivet heads may contact drums within next 1,000 miles of operation. If vehicle has been operated in deep water, mud, or loose sand, remove forward right trailer wheel and drum and examine linings for damage. If this lining must be replaced, remove all trailer wheels, check brakes and service as necessary, being sure to clean, lubricate, and adjust all removed wheel bearings as described in paragraph 41.

ADJUST. Adjust trailer shoes by minor method if necessary.

With trailer rear wheels removed inspect linings to see if they are in good condition, tightly secured to brake shoes, in good wearing contact with drums, free of dirt or lubricant, and not excessively worn. Also see if shoes are in good condition, properly secured to anchors, guides, and retracting springs, and that springs have sufficient tension to return shoes properly to released position. Thickness of lining at most worn out point should be enough for at least 1,000 miles of service before rivet heads are likely to contact drums.

CLEAN. Clean all dirt and grease from linings with wire brush, cloth, or compressed air.

ADJUST. After subsequent related items to 56 inclusive, are completed, adjust shoes by minor method. Adjust slack adjusters so diaphragm push-rod travel is at minimum, approximately 3/4 inch.

Radius Rods. Inspect all radius rods to see if they are in good condition and securely connected. Test end bushings with pry bar for excessive wear.

Wheels (Bearings, Seals, Flanges, and Nuts). Inspect and service as follows:

WHEELS. Inspect dolly and trailer wheels to see if they are in good condition and secure.

BEARINGS AND SEALS. Check for looseness of wheel bearing adjustment. Revolve wheels and listen for evidence of dry or damaged bearings. Inspect around flanges and brake supports for lubricant leaks.

**SEMITRAILER, 6-TON PAYLOAD, 10-TON GROSS,
2-WHEEL, FUEL TANK, 2000-GALLON**

MAINTENANCE	
6000 Mile	1000 Mile
52	
52	
52	
56	56

FLANGES AND NUTS. Note if the flanges are in good condition, and if nuts are tightened securely.

CLEAN. Disassemble both dolly and trailer wheel bearings and oil seals. Clean thoroughly in dry-cleaning solvent and examine bearing cups and cones to see if they are in good condition; if machined surfaces they contact are in good condition, and if there is any excessive wear.

SPECIAL LUBRICATION. When all of the related items are to the point where wheel bearings are to be re-installed, lubricate bearings according to instructions on Lubrication Order and as follows: Take care to have all parts clean and dry and the hands clean, and use clean lubricant. The inside of the wheel hub, and hub cap or hub flange, and outside of spindle or axle shall be wetted only to a thickness of $\frac{1}{16}$ inch minimum with lubricant to retard rusting. Bearing shall be either machine packed or hand packed by kneading lubricant into all spaces in the bearings. Coat the cups or outer races and the lips of the oil seals with lubricants and install new lubricant retainer seals if necessary.

CAUTION: *Do not pack the large cavity in wheel hubs between wheel bearings with lubricant. To do so is to cause leakage past the seals.*

ADJUST. After lubricating dolly and trailer wheel bearings, reassemble hub-and-drum assemblies into place, and adjust wheel bearings correctly according to paragraph 41.

Springs. (Clips, Leaves, U-Bolts, Hangers, and Shackles). See if all items are in good condition, correctly assembled and secure. Spring clips and bolts should be in place; spring leaves should not be shifted out of their correct position. This may be an indication of a sheared center bolt. Note if deflection of both springs is normal and approximately the same. Test hangers and bolts for excessive wear by means of a pry bar.

TIGHTEN. Tighten all spring U-bolts securely and uniformly.

SECOND ECHELON PREVENTIVE MAINTENANCE

MAINTENANCE		
6000 Mile	1000 Mile	
70	70	Air Brake Reservoirs. See that reservoir on trailer is in good condition and secure. Drain off water and close drain cocks.
76	76	Air Brake (Chambers, Rods, Seals, Slack Adjusters). Examine these items to see if they are in good condition, correctly assembled and secure; that slack adjusters are properly adjusted according to paragraph 37. Examine chambers and air hose and connections for indications of leaks. Tighten all assembly and mounting nuts or screws securely.
80	80	Frame (Side and Crossmembers). Inspect both dolly and trailer frames, brackets, side rails, and crossmembers to see if they are in good condition, secure, and correctly aligned. If the frame appears to be out of line, report condition.
81	81	Wiring, Conduit, and Grommets. Observe these items underneath trailer to see if they are in good condition, properly supported, connected, and secure.
83	83	Brake Lines (Fittings and Hose). Examine all lines and fittings and air brake hose under both dolly and trailer to see if they are in good condition, securely connected and supported so lines or hose will not chafe against other vehicle parts.
83		Remove trailer air brake relay valve, clean thoroughly with brake fluid and reinstall securely.
85	85	Vehicle Lubrication. If due, lubricate all points of dolly and trailer in accordance with instructions in Lubrication Order, paragraph 14, using only clean lubricant, and omitting items that have received special lubrication during this service. Replace missing or damaged grease fittings or plugs. Keep lubricant containers and dispensers covered except when withdrawing lubricant. Open any clogged passages or fittings holes until lubricant is properly delivered. Wipe off excess lubricant that might drip onto brakes, rubber parts, clothes or detract from vehicle's good appearance.
88	88	LOWER VEHICLE TO GROUND Dolly Fifth Wheel. Examine fifth wheel unit on dolly to be sure it is in good condition, and correctly assembled. Tighten all assembly and mounting nuts securely.

**SEMITRAILER, 6-TON PAYLOAD, 10-TON GROSS,
2-WHEEL, FUEL TANK, 2000-GALLON**

MAINTENANCE	
6000 Mile	1000 Mile
88	
88	
89	89
91	91
92	92
100	100

Inspect all accessible friction surfaces, jaw and lock assemblies for good condition and excessive wear. If attached, disconnect trailer, clean base plate thoroughly, inspect for damage and relubricate according to instructions in Lubrication Order, paragraph 14. Inspect trailer king pin connection for good condition and excessive wear. Be sure ground check and safety chains are present and secure. Be sure locking jaws operate freely and lever latch locks securely.

CLEAN. Clean rocker and bed place and king pin latch mechanism thoroughly of all grease and dirt and inspect for damage or excessive wear.

SPECIAL LUBRICATION. Apply a film of grease to fifth wheel top surface latch mechanism and king pin and all fittings, see paragraph 14, Lubrication Order.

Tractor-To-Trailer Brake Hose. Wiring and Connections. Check brake hose and wiring connections to see that they are in good condition and securely fastened to clips, springs and brackets so that they will not chafe or interfere with working parts. Check trailer brake shut-off valve to see that it operates properly.

NOTE: *Always moisten rubber applicators before making connections.*

Lamps (Lights). Operate all trailer switches and note if lamps respond. Include stop and blackout lights. Examine all trailer lights to see if they are in good condition and securely mounted, and if lenses are dirty.

Safety Reflectors. See if they are all present, in good condition, clean, and secure.

Body Tank Trailer. Inspect units such as platforms, stowage compartments, and cat walks, to be sure they are in good condition, correctly assembled and securely mounted. Be sure all manhole covers and compartment doors operate freely and lock securely and that hinges and fasteners are not excessively worn. Examine ladder for looseness or damage; see that it extends and folds properly and that latch holds it securely in folded position. Remove equipment from stowage compartments and clean out thoroughly. Be sure all hose, funnel, and other equipment hangers or locking devices are in good condition and secure. Tighten loose assembly or mounting nuts or screws securely.

SECOND ECHELON PREVENTIVE MAINTENANCE

MAINTENANCE	
8000 Mile	1000 Mile
101	101
124	124
125	125
127	127
127	
131	131
132	132
133	133

Pintle Hook. Examine pintle to see if it is in good condition and securely mounted to frame. Test pintle and latch to see if they operate properly; are adequately lubricated; and if lock pin is present and securely attached by chain. Pay particular attention for broken spring or worn draw bar.

Tow Hitch. Examine dolly towing frame side rails, gussets and pintle ring to be sure they are in good condition and securely assembled.

Air Connections. Inspect trailer air line connections to truck to be sure they are in good condition, not excessively worn, and will couple securely without leaking.

Landing Gear (Front Supports). Examine legs, struts, and all coupling and hinge pins to see if they are in good condition, secure, and not excessively worn. Lubricate all frictional surfaces by oil can or hand greasing.

TIGHTEN. Draw up all assembly and mounting nuts securely.

TOOLS AND EQUIPMENT

Tools (Vehicle and Pioneer). Inspect dolly and trailer standard and special tools, to see if they are all present (see on-vehicle stowage list, paragraph 6) in good condition, clean, and properly stowed or securely mounted. Also examine tools which have cutting edges to see that they are sharp. Any tools mounted on outside of truck or trailer which have bright or polished surfaces, should be painted or otherwise treated to prevent rust, glare, or reflection. Pay particular attention to see that all hose, connections, valves, and operating levers and control linkage for use with refueling unit are in good condition, clean, and securely and properly stowed, or mounted.

Fire Extinguishers. See if they are in good condition, securely mounted, and fully charged. The charge may be determined on gas-type extinguishers by weighing with a scale, and on liquid-type by shaking. Also be sure nozzles are free from corrosion.

Decontaminators. Check to see that decontaminators are in good condition, securely mounted, fully charged and nozzle free and clean. Inspect refill date and tags. Refill required every three months.

**SEMITRAILER, 6-TON PAYLOAD, 10-TON GROSS,
2-WHEEL, FUEL TANK, 2000-GALLON**

MAINTENANCE	
5000 Mile	1000 Mile
135	135
141	141
142	142

Publications. Be sure vehicle manuals, Lubrication Order and Form No. 478 are present and properly stowed.

Modifications (MWO's Completed). Inspect dolly and trailer to be sure any Field Service Modification Work Orders have been completed, and enter any MWO or Major unit assembly replacements made at time of this service on WD, AGO Form No. 478.

Final Road Test. Make a final road test rechecking item 5, 12, 13, and 14. Confine road test to the minimum distance necessary to make proper observations.

NOTE: *Correct or report all deficiencies found during final road test.*

Section IX

TROUBLE SHOOTING

21. GENERAL.

a. This section contains trouble shooting information and tests which can be made to help determine the causes of some of the troubles that may develop in vehicle used under average climatic conditions (above 32°F). Each symptom of trouble given under the individual unit or system is followed by a list of possible causes of the trouble. The tests necessary to determine which one of the possible causes is responsible for the trouble are explained after each possible cause.

22. WHEELS, HUBS, AND BEARINGS.

a. **Uneven Tire Wear.**

- (1) **INCORRECT TIRE INFLATION.** Inflate to 65 pounds pressure (cool).
- (2) **DEFECTIVE BRAKES.** Check brake linings for wear or grease which may cause brakes to grab. Adjust brake (par. 37).
- (3) **LOOSE WHEEL.** Tighten inner and outer wheel cap nuts.
- (4) **LOOSE OR DEFECTIVE WHEEL BEARING.** Check bearing and adjust (par. 35).
- (5) **BENT AXLE.** Replace axle (pars. 41 and 42).

TROUBLE SHOOTING

b. Wheel Wobbles.

- (1) **LOOSE MOUNTING.** Tighten inner and outer wheel cap nuts.
- (2) **LOOSE OR DEFECTIVE BEARING.** Inspect bearing and adjust (par. 35).
- (3) **BENT WHEEL.** Replace wheel (par. 34).

c. Noisy Hub.

- (1) **LOOSE OR DEFECTIVE BEARING.** Inspect bearing and adjust (par. 35).
- (2) **LOOSE BRAKE DRUM.** Tighten drum (par. 38).

d. Hub Runs Hot.

- (1) **TIGHT OR DEFECTIVE BEARING.** Inspect bearing and adjust (par. 35).
- (2) **IMPROPERLY ADJUSTED BRAKE.** Adjust brake (par. 37).

23. BRAKES.

a. **Scope.** The air brake system on the semitrailer is entirely dependent upon the air brake system of the towing vehicle for its air supply and control. Therefore, the air brake system of the towing vehicle must be in good condition; otherwise, it will be impossible to obtain good brake performance on the semitrailer. Before making adjustments on the semitrailer air brake system, check the air brake system on the towing vehicle for proper operation.

b. Insufficient Brakes.

- (1) **INCORRECT BRAKE ADJUSTMENT.** Adjust brakes (par. 37).
- (2) **LOW AIR PRESSURE.** Check system on towing vehicle for low pressure. Check air brake system on towing vehicle and semitrailer for excessive leakage.
- (3) **DEFECTIVE RELAY-EMERGENCY VALVE.** Replace relay-emergency valve (par. 39).

c. Slow Brake Application.

- (1) **INCORRECT BRAKE ADJUSTMENT.** Adjust brakes (par. 37).
- (2) **INADEQUATE LUBRICATION.** Lubricate brakes (par. 14).
- (3) **LOW AIR PRESSURE.** Check system on towing vehicle for low pressure. Check air brake system on towing vehicle and semitrailer for excessive leakage.
- (4) **RESTRICTION IN AIR LINE OR HOSE.** Service or replace defective tubing, connection or hose (par. 39).
- (5) **CLOGGED AIR FILTER.** Clean filters (par. 39).

**SEMITRAILER, 6-TON PAYLOAD, 10-TON GROSS,
2-WHEEL, FUEL TANK, 2000-GALLON**

d. Brakes Do Not Apply.

- (1) **CUT-OUT COCKS IMPROPERLY CLOSED.** Open cut-out cocks on rear of towing vehicle and front of semitrailer.
- (2) **IMPROPER HOSE CONNECTIONS.** Connect hose lines to towing vehicle correctly (par. 9 b (4)).
- (3) **NO AIR PRESSURE.** Charge air brake system.
- (4) **RESTRICTION IN AIR LINE HOSE.** Service or replace defective tubing, connection or hose (par. 39).
- (5) **CLOGGED AIR FILTER.** Clean filters (par. 39).

e. Slow Brake Release.

- (1) **INCORRECT BRAKE ADJUSTMENT.** Adjust brakes (par. 37).
- (2) **INADEQUATE LUBRICATION.** Lubricate brakes (par. 14).
- (3) **DEFECTIVE EXHAUST CHECK VALVE.** Service or replace exhaust check valve (par. 39).
- (4) **RESTRICTION IN AIR LINE OR HOSE.** Service or replace defective tubing, connection or hose (par. 39).
- (5) **CLOGGED AIR FILTER.** Clean filters (par. 39 g).

f. Brakes Do Not Release.

- (1) **IMPROPER HOSE CONNECTIONS TO TOWING VEHICLE.** Connect hose lines correctly (par. 9 b).
- (2) **BRAKE APPLIED ON TOWING VEHICLE.** Release air brake control.
- (3) **BRAKE RIGGING BINDING.** Lubricate or adjust brake rigging.
- (4) **INCORRECT BRAKE ADJUSTMENT.** Adjust brakes (par. 37).
- (5) **EMERGENCY VALVE APPLIED.** Build up pressure in air brake system if connected to towing vehicle. Bleed air brake reservoir thru drain cock, if not connected to towing vehicle.
- (6) **CUT-OUT COCKS IMPROPERLY CLOSED.** Open cut-out cocks on rear of towing vehicle.
- (7) **RESTRICTION IN AIR LINE OR HOSE.** Service or replace defective tubing, connection, or hose (par. 39).

g. Brakes Grab.

- (1) **GREASE ON BRAKE LINING.** Notify higher authority.
- (2) **BRAKE RIGGING BINDING.** Lubricate or adjust brake rigging.
- (3) **DEFECTIVE BRAKE VALVE ON TOWING VEHICLE.** Service or replace.
- (4) **DEFECTIVE RELAY-EMERGENCY VALVE.** Replace relay-emergency valve (par. 39).

TROUBLE SHOOTING

h. Uneven Brakes.

- (1) **INCORRECT BRAKE ADJUSTMENT.** Adjust brakes (par. 37).
- (2) **INADEQUATE LUBRICATION.** Lubricate brakes (par. 14).
- (3) **WORN BRAKE LINING.** Report to higher authority.
- (4) **GREASE ON BRAKE LINING.** Report to higher authority.
- (5) **BRAKE SHOE RELEASE SPRING BROKEN.** Replace shoe release spring (par. 38).
- (6) **BRAKE CHAMBER RELEASE SPRING BROKEN.** Replace brake chamber (par. 39).
- (7) **BRAKE DRUM OUT OF ROUND.** Replace brake drum.
- (8) **LEAKING BRAKE CHAMBER DIAPHRAGM.** Replace brake chamber (par. 39).

i. Excessive Oil and/or Water Present in Air Brake System.

- (1) **RESERVOIR NOT DRAINED DAILY.** Drain reservoir daily through pet-cock in bottom. Clean system if necessary.
- (2) **COMPRESSOR ON TOWING VEHICLE PASSING EXCESSIVE OIL.** Replace compressor.

24. AXLE.

a. Uneven Tire Wear.

- (1) **BENT AXLE.** Replace axle (pars. 41 and 42).
- (2) **LOOSE MOUNTING.** Check U-bolt nuts and tighten (pars. 41 and 42).

b. Tires Scuffed.

- (1) **BENT AXLE.** Replace axle (pars. 41 and 42).
- (2) **LOOSE MOUNTING.** Check U-bolts and tighten (pars. 41 and 42).

25. SPRINGS AND RADIUS RODS.

a. Over Flexible.

- (1) **BROKEN LEAF.** Replace spring (par. 43).

b. Excessive Noise.

- (1) **BROKEN LEAF.** Replace spring (par. 43).
- (2) **BROKEN CENTER BOLT.** Replace spring (par. 43).
- (3) **LOOSE SPRING CLIPS.** Tighten spring clips.

c. Spring Leaf Failures.

- (1) **LOOSE OR MISSING SPRING CLIPS.** Tighten clips, or replace spring assembly (par. 43).
- (2) **REBOUND BOLT MISSING.** Replace rebound bolt (par. 43).

**SEMITRAILER, 6-TON PAYLOAD, 10-TON GROSS,
2-WHEEL, FUEL TANK, 2000-GALLON**

d. Wheels out of Alinement.

- (1) **DEFECTIVE RADIUS ROD BUSHINGS.** Replace radius rod bushings (par. 44).
- (2) **BROKEN RADIUS ROD.** Replace radius rod (par. 44).

26. LANDING GEAR.

a. Telescoping Leg Inoperative.

- (1) **LEG BENT.** Replace leg (par. 46).
- (2) **LEG RUSTED.** Remove leg and clean off rust and corrosion (par. 46).

b. Does Not Support Tank.

- (1) **LOCK PINS DEFECTIVE.** Replace lock pins.

27. ELECTRICAL SYSTEM.

a. All Lights Will Not Burn.

- (1) **SEMITRAILER LIGHTING SYSTEM DISCONNECTED FROM TOWING VEHICLE.** Plug connecting cable into sockets on semitrailer and towing vehicle.
- (2) **DISCHARGED BATTERY OR DEFECTIVE WIRING ON TOWING VEHICLE.** Check towing vehicle electrical system and perform services required.

b. Individual Lights Inoperative.

- (1) **LAMP BURNED OUT.** Replace lamp.
- (2) **LOOSE CONNECTION AT LIGHT.** Tighten connection.
- (3) **BROKEN WIRING OR DAMAGED CONDUIT TO UNIT.** Replace conduit and wiring.
- (4) **SHORT CIRCUIT OR GROUND (FUSE BLOWS).** Disconnect inoperative unit, and replace fuse. Test, and if fuse remains operative, check the unit for ground or short circuit. Repair if practical or defective unit. If the fuse becomes inoperative, check the tubing and wiring of the inoperative circuit for grounding or short circuiting.

28. PIPING SYSTEM.

a. Leaking.

- (1) **DEFECTIVE GASKET.** Replace gasket (par. 54).
- (2) **OPENED WELD.** Replace piping assembly (par. 54).

b. Emergency Valve Inoperative.

- (1) **BROKEN OPERATOR CABLE.** Replace cable (par. 56).

TROUBLE SHOOTING

(2) **BROKEN VALVE PLUNGER SPRING.** Replace emergency valve (par. 56).

29. HOSE AND FITTINGS.**a. Leaking.**

(1) **DEFECTIVE GASKET AT CONNECTOR.** Replace connector (par. 59).

(2) **DEFECTIVE HOSE.** Replace hose assembly.

b. Connectors Do Not Fit Together.

(1) **BENT OR DAMAGED CONNECTOR.** Replace connector (par. 59).

c. Whistle on Nozzle Inoperative.

(1) **CORK BALL DEFECTIVE.** Replace cork ball (par. 60).

(2) **WHISTLE VALVE CLOGGED.** Clean with dry-cleaning solvent.

d. Nozzle Will Not Shut Off Completely.

(1) **DEFECTIVE VALVE OR SEAT.** Replace nozzle valve.

30. ENGINE.**a. Engine Will Not Start.**

(1) **NO FUEL IN TANK.** Fill tank with correct grade of fuel.

(2) **FUEL FLOW OBSTRUCTED.** Open vent in fuel tank cap. Open fuel tank shut-off valve. If fuel does not flow freely at filter, clean line back to fuel tank and service fuel filter (par. 64).

(3) **IMPROPER CHOKING.** Prime cold motor with choke closed, but do not close choke when starting hot engine.

(4) **FOULED OR CRACKED SPARK PLUG.** Clean and adjust or replace spark plug (par. 67).

(5) **INOPERATIVE IGNITION SYSTEM.** Remove cable from spark plug, hold cable terminal about $\frac{1}{8}$ inch from bare metal of cylinder casing and crank engine. If spark does not jump gap, the ignition is inadequate.

(a) *Loose or Defective Wiring.* Tighten connections, or replace cable if defective (par. 67).

(b) *Breaker Points Defective or Improperly Adjusted.* Replace or adjust breaker points (par. 66).

(c) *Magneto Defective.* Replace magneto (par. 69).

(6) **IMPROPER FUEL MIXTURE.** Adjust carburetor (par. 63).

b. Engine Misfires.

(1) **FOULED OR CRACKED SPARK PLUG.** Clean and adjust, or replace spark plug (par. 67).

TM 9-891

30-32

SEMITRAILER, 6-TON PAYLOAD, 10-TON GROSS, 2-WHEEL, FUEL TANK, 2000-GALLON

(2) **DEFECTIVE WIRING.** Check ignition cable and tighten connections. Replace if insulation is broken (par. 67).

(3) **VALVE WARPED, BROKEN, OR STICKING.** Notify higher authority.

c. Engine Does Not Develop Full Power.

(1) **CARBURETOR CHOKE PARTIALLY CLOSED.** Open carburetor choke by turning counterclockwise.

(2) **IMPROPER FUEL MIXTURE.** Adjust carburetor.

(3) **MUFFLER CLOGGED.** Clean muffler (par. 69).

(4) **COOLING SYSTEM OBSTRUCTED.** Remove blower housing (par. 69). Clean out cylinder fins.

d. Engine Knocks.

(1) **INSUFFICIENT OIL.** Add oil to bring oil level up to proper point (par. 14 d (2)).

(2) **ENGINE OVERHEATED.** Check items in subparagraph c above.

(3) **LOOSE FLYWHEEL.** Tighten flywheel nut (par. 69).

(4) **LOOSE BEARING, WORN OR TIGHT PISTON, CARBON IN CYLINDER.** Notify higher authority.

31. PUMP.

a. Pump Does Not Deliver Required Volume.

(1) **LOW ENGINE SPEED.** This must be 1,900 revolutions per minute to deliver 30 gallons free flow.

(2) **RESTRICTED DISCHARGE.** Clean strainer (par. 78), and check hose for restrictions.

(3) **INCORRECT DISCHARGE PRESSURE ADJUSTMENT.** Wind spring one or two notches (par. 74). If this increases volume, increase the spring tension. Do not wind more than a total of eight notches.

(4) **SUCTION LINE RESTRICTED.** Check for kink in hose or end of hose too close to bottom of container from which fuel is being pumped. Clean strainer (par. 78).

(5) **MANUAL VOLUME CONTROL STICKING.** Clean out manual volume control.

b. Pump Gland Leaks. Adjust or replace pump shaft packing (par. 75).

32. LOWER FIFTH WHEEL.

a. Jaws Will Not Open.

(1) **PLUNGER LOCKED.** Remove lock from plunger hole (par. 9).

WHEELS, HUBS, AND BEARINGS

(2) **PLUNGER RUSTED OR JAMMED.** Clean fifth wheel mechanism with dry-cleaning solvent.

b. **Jaws Do Not Lock Closed.**

(1) **OPERATING LEVER BENT.** Replace fifth wheel (par. 82).

(2) **PLUNGER SPRING BROKEN.** Replace plunger spring.

Section X

WHEELS, HUBS, AND BEARINGS

33. DESCRIPTION AND DATA.

a. **Description.** Budd dual-type wheels with 8-inch flat base rims are mounted on the hubs with 10 studs. The entire wheel and hub assembly rides on two Timken tapered bearings, which are adjustable for wear. Tires are 9.00 x 20 size and have mud and snow, non-directional tread. The trailer converter dolly and semitrailer wheel, hub and tire assemblies are interchangeable as complete assemblies or in any part. Wheel studs and nuts have right-hand threads on right side of vehicle (facing direction of vehicle travel), and left-hand threads on left-hand side (fig. 17). All studs and nuts are plainly marked "R" for right-hand thread and "L" for left-hand thread.

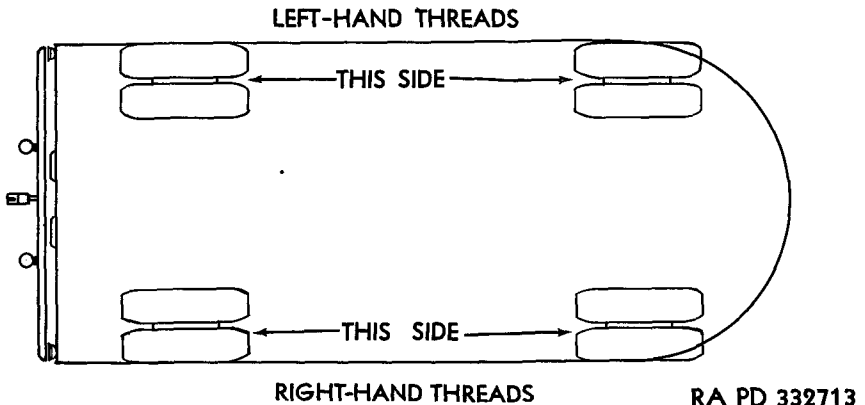


Figure 21—Wheel Stud Thread Chart

**SEMITRAILER, 6-TON PAYLOAD, 10-TON GROSS,
2-WHEEL, FUEL TANK, 2000-GALLON**

b. Tabulated Data.

Wheel size	20 x 8
Rim type (Budd Wheel Co.)	R
Tire size	9:00 x 20
Number of studs	10
Stud circle diameter	11¼ in.
Dual spacing	12 in.
Weight of wheel and lock ring (approx.)	91.3 lb
Wheel bearing cone	Timken
Wheel bearing cup	Timken

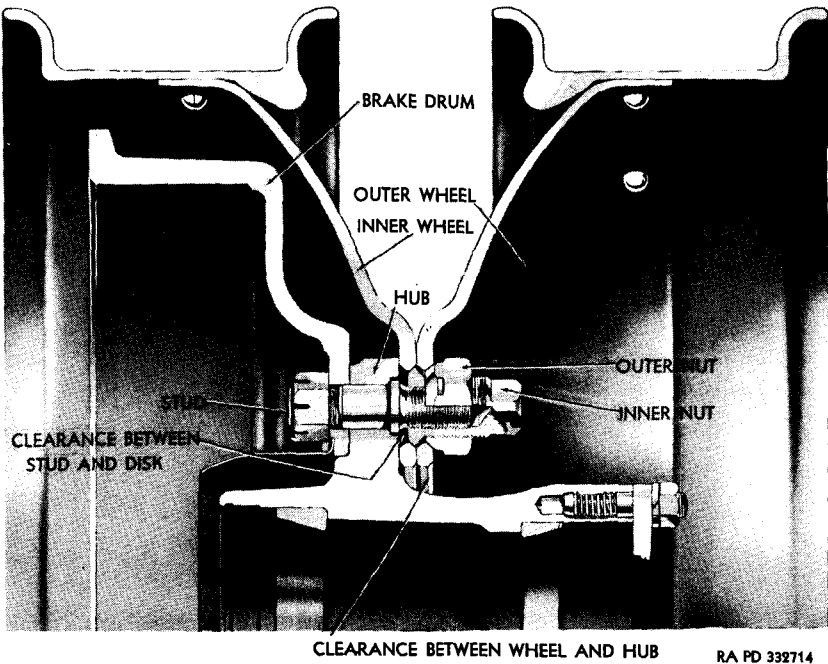


Figure 22—Section Through Dual Wheels and Hub

34. WHEEL AND HUB ASSEMBLY.

a. Wheels (fig. 18).

(1) **REMOVAL.** Jack up axle until tire of wheel to be removed clears the ground. Remove outer wheel cap nuts. Those on right side of vehicle have right-hand thread, and those on left side have left-hand threads. When all nuts have been removed lift off the outer wheel and tire assembly. Remove inner cap nuts and lift off inner wheel and tire.

WHEELS, HUBS, AND BEARINGS

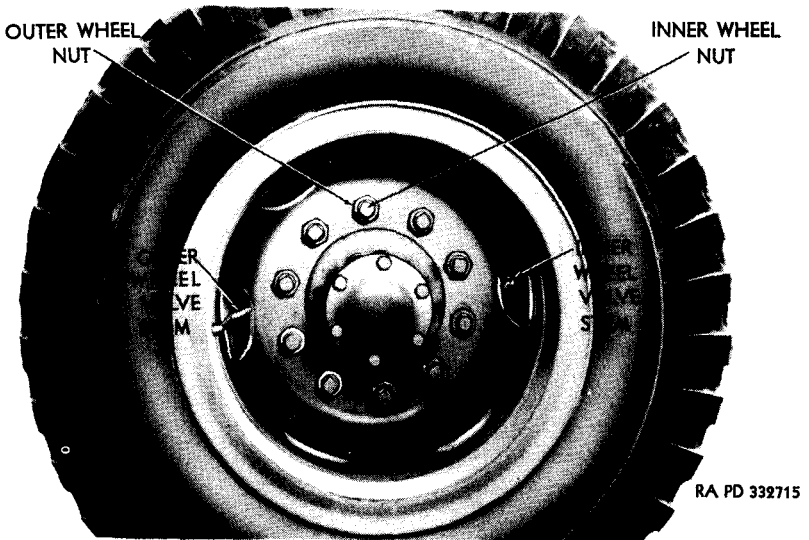
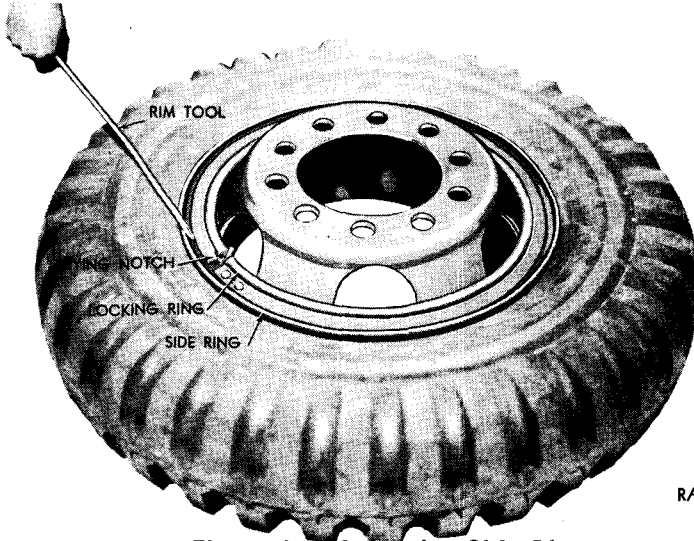


Figure 23—Wheel and Tire

(2) **CLEANING WHEELS.** Wheel must be clean. Inspect wheel before mounting to be sure that countersunk holes, where ball face of cap nut seats, are free from dirt and excess paint; and face of disk and hub flange, where they bear together, must be clean and free from dirt, grease or excess paint. The same applies to both surfaces of dual wheels where the two come together. Presence of foreign matter will prevent proper bearing and create high spots which are likely to cause loose fits, play, and wear. Watch this point particularly in mounting spare wheels which may have picked up road dirt. Clean countersunk holes carefully after a wheel has been painted.

(3) **MOUNTING INNER WHEEL.** With axle jacked up high enough so wheel to be mounted will clear the ground, inspect and clean all wheel studs and hub where wheel surface will bear. This surface and studs must be free from dirt, grease, or excess paint. Check studs for damaged threads which will interfere with installation of cap nuts. Check for loose or broken studs. Set inner wheel with tire installed and fully inflated on the studs, and install sleeve shaped inner cap nuts. When nuts have been turned up snug against wheel, tighten opposite nuts, working around circumference to prevent cocking the wheel and to pull wheel squarely against hub. Use a three foot pipe extension on a standard wheel cap nut wrench to pull nuts up tight. **CAUTION:** *Do not use oil or grease on studs or nuts.*

**SEMITRAILER, 6-TON PAYLOAD, 10-TON GROSS,
2-WHEEL, FUEL TANK, 2000-GALLON**



RA PD 332716

Figure 24—Removing Side Ring

(4) **MOUNTING OUTER WHEEL.** Set outer wheel on studs over inner cap nuts with tire valve stem on opposite side from stem of inner wheel (fig. 19). This simplifies tire inflation when dual wheels are mounted. Install cap nuts, and turn them up snugly against wheel. Tighten opposite nuts, working around circumference, to prevent cocking the wheel and to pull wheel squarely against mating surface of inner wheel. Use a 3-foot pipe extension on a standard wheel cap nut wrench to pull nuts up tightly. **CAUTION: Do not use oil or grease on studs or nuts.**

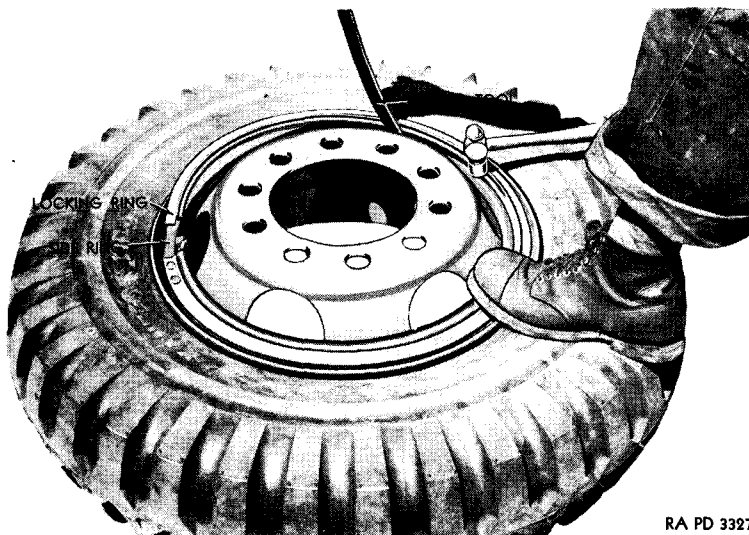
(5) **TIGHTENING CAP NUTS.** To tighten cap nuts when inspection indicates need, back off outer cap nuts, and tighten inner nuts (step (3) above). Tighten outer wheel cap nuts (step (4) above).

b. Tires.

(1) **DESCRIPTION.** Tires are 9:00 x 20, mud and snow tread, non-directional type. The correct pressure is 65 pounds (maximum) cold. Under-inflated tires run sluggishly and wear out quickly from excessive flexing. Over-inflated tires blow out easily, and wear out the center tread.

(2) **GAGING FOR PRESSURE LOSS.** At 500-mile intervals, gage each tire for pressure loss, with an accurate gage, before tires are brought to correct operating pressures to determine the exact pressure load in each tire. **NOTE: If, at any time this check is made,**

WHEELS, HUBS, AND BEARINGS



RA PD 332717

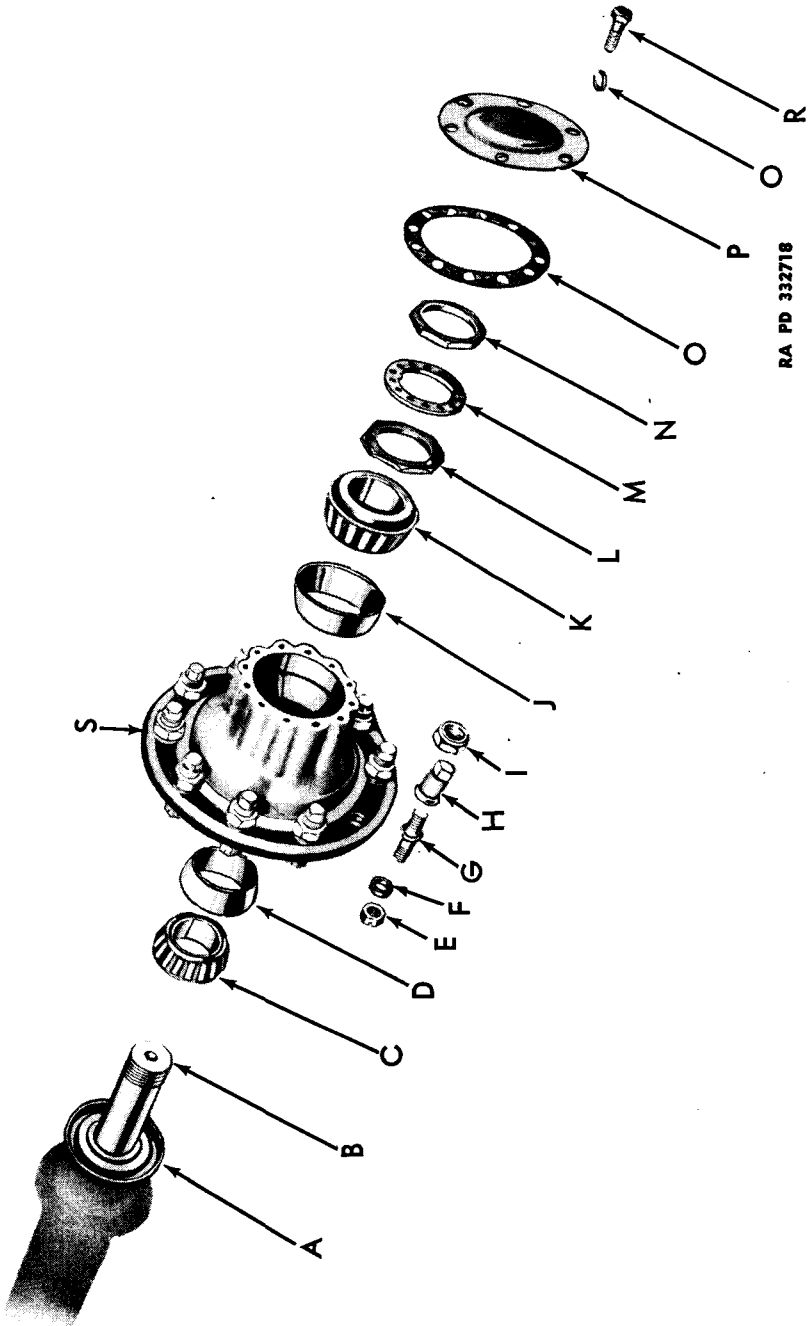
Figure 25—Installing Side Ring

a definite pressure loss above normal is noted in any one of the tires, dismount that tire, and inspect it for cause of excessive loss of air pressure. This method will establish a danger signal on the condition of the tires, and will minimize the road delay. Take the pressure loss check consistently with the same gage so that any element of inaccuracy in the gage will be the same for all tires. Check tires when they are cool, and do not bleed air from hot tire to reduce pressure.

(3) **REMOVAL.** Remove wheel and tire assembly from vehicle (subpar. a, above), and deflate tire completely. Lay wheel on ground with lock ring up, and insert rim tool at prying notch in free end of split locking ring (fig. 20). Pry off locking ring until side ring assembly is free of wheel. Force tire and tube towards outside face of wheel. Use care when removing casing and tube to avoid damage at valve stem of tube.

(4) **INSTALLATION.** Place tube in casing and inflate until tube assumes normal shape within casing. With valve stem in slot provided in wheel, force casing and tube against inner flange of wheel. Inner tire casing bead must seat firmly at all points against inner wheel flange. Place ring assembly over wheel, hooking riveted end of locking ring securely into gutter of rim. Drop ring over gutter into its final location, and hold in place with foot. Work towards free end of locking ring with tool, prying ring into place in gutter of rim. With locking ring seated in gutter of rim, complete application by tapping with soft hammer or tire iron. Check carefully

SEMITRAILER, 6-TON PAYLOAD, 10-TON GROSS,
2-WHEEL, FUEL TANK, 2000-GALLON



RA PD 332718

Figure 26—Hub and Bearings—Disassembled View

WHEELS, HUBS, AND BEARINGS

- | | | | | | |
|---|------------------------|---|-----------------------|---|--------------------|
| A | WHEEL BEARING OIL SEAL | G | STUD | M | BEARING NUT WASHER |
| B | AXLE BEAM | H | INNER STUD NUT | N | OUTER BEARING NUT |
| C | INNER BEARING CONE | I | OUTER STUD NUT | O | HUB CAP GASKET |
| D | INNER BEARING CUP | J | OUTER BEARING CUP | P | HUB CAP |
| E | DRUM STUD NUT | K | OUTER BEARING CONE | Q | HUB CAP WASHER |
| F | DRUM STUD SPACER | L | BEARING ADJUSTING NUT | R | HUB CAP SCREW |

RA PD 332718B

Legend for Figure 26—Hub and Bearings—Disassembled View

**SEMITRAILER, 6-TON PAYLOAD, 10-TON GROSS,
2-WHEEL, FUEL TANK, 2000-GALLON**

to see that locking ring is fully seated in gutter before inflation of tire.

(5) **INFLATION.** Inflate tire just enough to straighten and aline tube in casing. Strike the casing several times around its circumference to promote alinement of ring and casing. Turn over tire and wheel assembly so that locking ring is downward against floor or ground. **CAUTION:** *Placing wheel in this position prevents possible injury in case locking ring was not installed properly and flies off during inflation.* Inflate tire to recommended pressure of 65 pounds and check to make sure casing beads are seating correctly against retaining ring. Install valve cap. Tire valve caps perform another function besides keeping out dirt, dust, moisture, ice, and other foreign matter, and that is to form a positive seal to keep air in the tube. Standard valve caps are designed with an inside sealing washer which definitely seals the air in the tube, when the cap is properly tightened on the valve stem. It is absolutely essential that the positive sealing cap be replaced on the stem after the positive sealing cap is properly tightened on the valve stem. It is absolutely essential that the positive sealing cap be replaced on the stem after gaging and inflating operation. Should any of these valve caps be missing, replace at once. Install wheel and tire assembly on vehicle (subpar. a and b above).

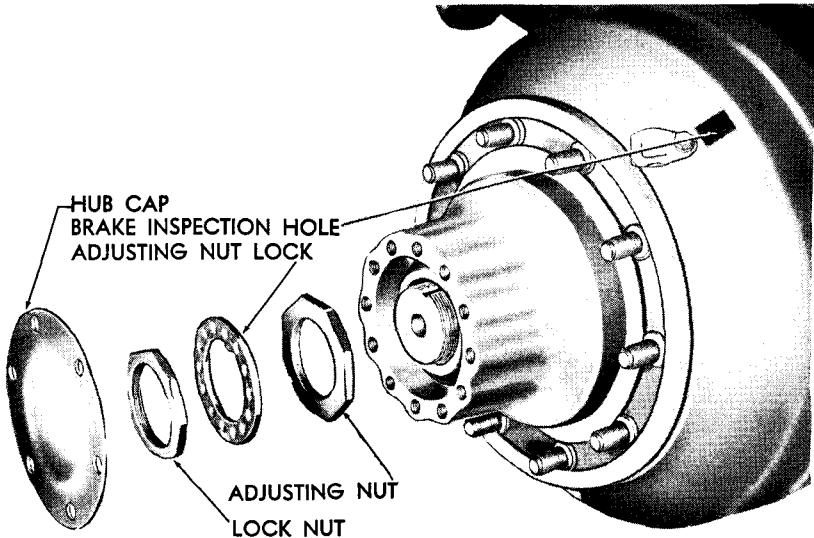
c. Hubs.

(1) **DESCRIPTION.** The hub, which carries dual wheels on 10 studs on one side, and the brake drum on the other, turns on opposed tapered roller bearings. The bearings also serve to hold the hub in place on the axle and in correct alinement. Hub on converter dolly and semitrailer are identical and interchangeable. Dolly hub does not have brake drums attached.

(2) **REMOVAL** (fig. 22). Remove wheels (subpar. a. above). Remove hub caps, bearing adjustment jam nut, lock, and adjusting nut. Pull hub off from axle spindle. **CAUTION:** *Do not allow bearing to drop on floor when removing hub.* Bearing cups are pressed into hubs. Remove with bearing puller. Remove hub-to-drum bolts, and nuts, and press hub from drum.

(3) **INSTALLATION.** Press bearing cups into hub, and install brake drum. Install inner bearing cone on axle, and set hub on axle and cone. Install outer bearing cone. Lubricate and adjust bearing (par. 35). Install dual wheels (subpar. a above).

WHEELS, HUBS, AND BEARINGS



RA PD 332673

Figure 27—Bearing Adjusting Washer and Nuts**35. BEARING ADJUSTMENT** (fig. 23).

a. Removal. Jack up axle until wheel on which bearings are to be adjusted revolves freely. Remove outer wheel and tire. Remove hub cap, bearing adjusting jam nut, lock, and adjusting nut. Pull wheel, hub, and tire assembly off from axle. **CAUTION: Do not allow bearing to drop when wheel is removed.** Remove inner bearing cone.

b. Cleaning and Inspection of Bearings. Clean old grease from bearing cones, axle spindle and bearing cones inside the hub with dry-cleaning solvent. Keep bearings wrapped, when not being handled, to prevent dirt and dust from entering them. **CAUTION: Do not spin bearings while drying with compressed air.** Inspect bearings for pitted cups, chipped roller ends on cones. Both of these conditions are caused by improper lubrication or adjustment and bearings must be replaced immediately. Check oil seal and replace if excessively worn.

c. Lubrication. Refer to paragraph 14.

d. Adjustment. Install inner cone on axle spindle, replace wheel, and holding it firmly in position, slide the outer bearing cone into place on the spindle, pressing it firmly into the hub. Screw on the bearing adjusting nut, turning it up tightly against outer bearing so that wheel binds. At the same time revolve wheel to be sure all

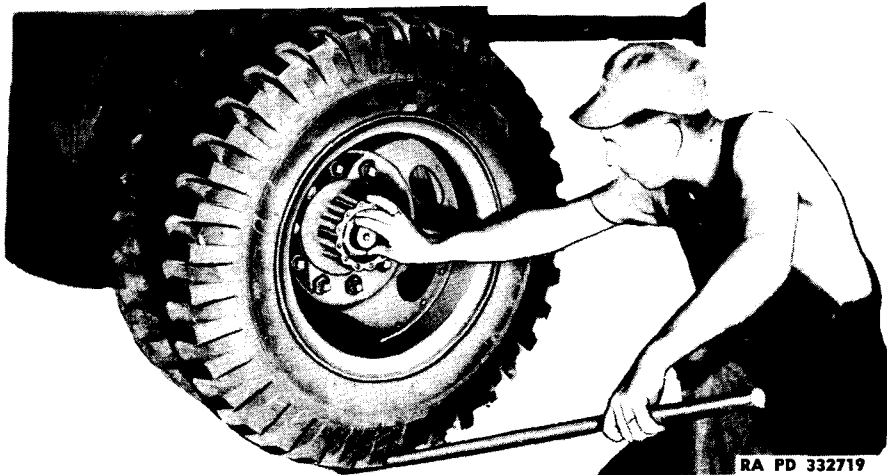
**SEMITRAILER, 6-TON PAYLOAD, 10-TON GROSS,
2-WHEEL, FUEL TANK, 2000-GALLON**

Figure 28—Testing Bearing Adjustment

working surfaces come into contact. Back off the adjusting nut just enough to allow wheel to rotate freely, but without end play. Test adjustment by taking a short bar and placing the end of it between the tire and floor, at the same time holding one finger on the cage of the outer bearing (fig. 28). Work bar up and down to detect any excessive play or looseness. When a barely perceptible shake can be felt and the wheel will rotate when given a slight spin, the adjustment is correct. Install adjusting nut lock and jam nut.

e. **Testing Adjustment.** Test bearing adjustment with short bar (par. d, above). This is necessary to avoid damage to bearings in case installation of lock and jam nut has disturbed original adjustment. Readjust bearings, if wheel does not rotate freely, or if adjustment is too loose. Cover end of axle spindle and lock nuts with grease. Install gasket and hub caps.

Section XI**BRAKE SYSTEM****36: DESCRIPTION AND DATA.**

a. **Description.** The brake system consists of Timken "W" Series, heavy-duty, two-shoe brakes and drums, operated through cam shafts by Bendix-Westinghouse air brake system. Air, con-

BRAKE SYSTEM

trolled by the brake pedal in the towing vehicle, operates brake chambers which are attached to brake cam shafts by adjustable slack adjusters. Brake adjustment is made at slack adjuster.

b. Tabulated Data.

Foundation brake.....	Timken "W" series
Slack adjuster travel	
Minimum	3/4 in.
Maximum	1 1/2 in.
Air brake system.....	Bendix-Westinghouse 219133
Brake size	
Number of shoes per brake.....	2

37. BRAKE ADJUSTMENT.

a. Inspect Linings. Before adjusting brakes, open inspection hole in hub (fig. 27) and inspect linings for grease or excessive wear. If lining is defective or excessively worn, replace both brake shoe and lining assemblies (par. 38).

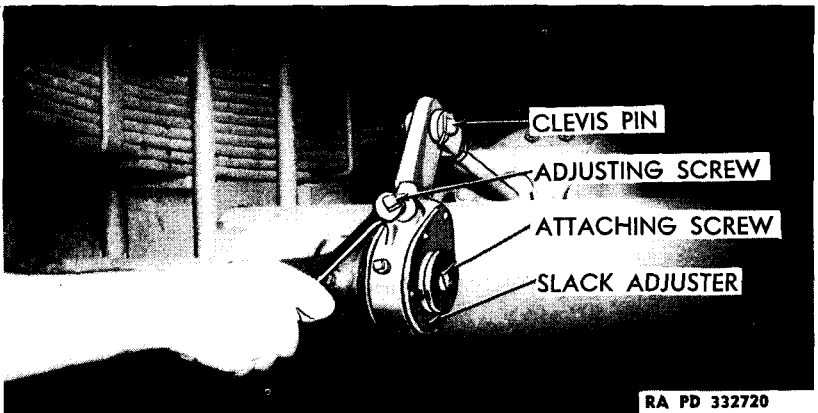


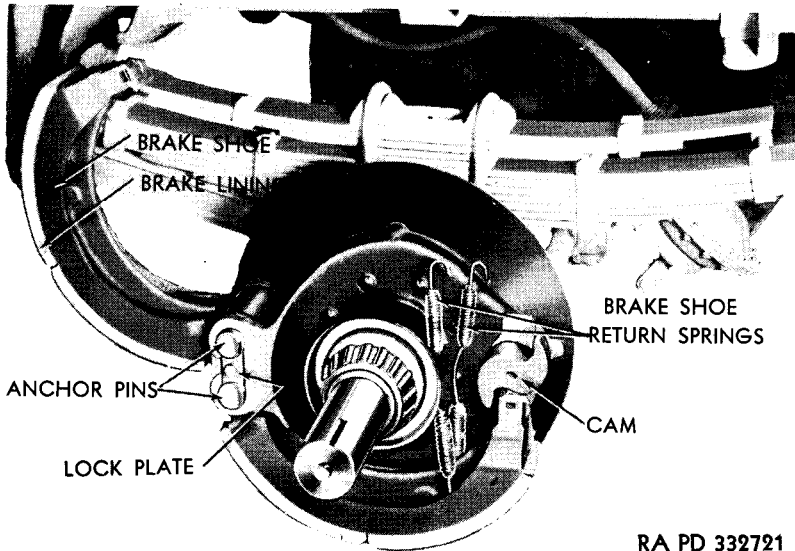
Figure 29—Adjusting Slack Adjuster

b. Adjust Slack Adjusters. Jack wheels up from the ground. Turn adjusting screw clockwise, on end of slack adjuster worm shaft at each wheel (fig. 29), until wheel will not revolve. Back off just enough so wheel turns freely. Both wheels must be adjusted the same, so slack adjuster will travel approximately 3/4 of an inch.

38. FOUNDATION BRAKE ASSEMBLY.

a. Description. The Timken "W" series heavy-duty, two-shoe brake (fig. 30), has thick brake linings bolted to the shoes, and is

**SEMITRAILER, 6-TON PAYLOAD, 10-TON GROSS,
2-WHEEL, FUEL TANK, 2000-GALLON**



RA PD 332721

Figure 30—Brake Assembly With Hub Removed

actuated by air chambers through an S-head cam shaft. Each shoe is anchored to an individual anchor pin (fig. 30) which is locked in place by a lock plate and screw. Double brake shoe return springs retract the shoes when the brakes are released. Brake drum is bolted to the hub with the same studs which hold the wheels.

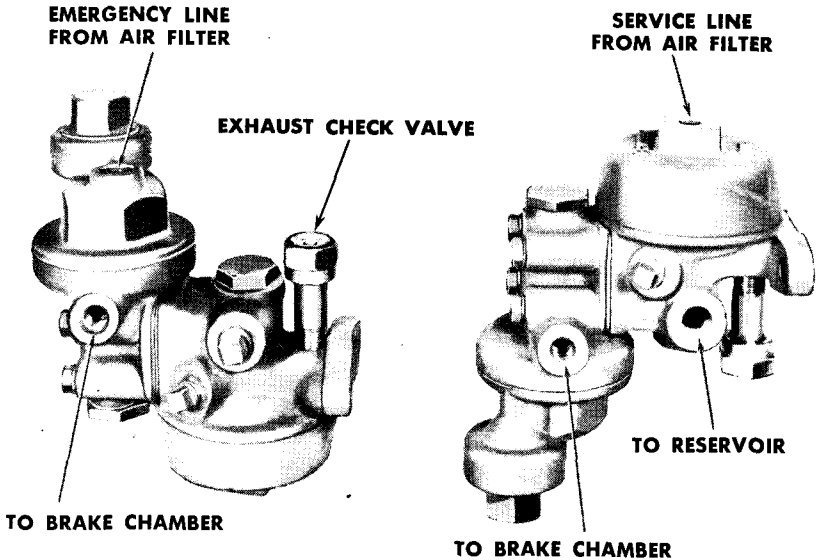
b. Shoes and Linings.

(1) **DESCRIPTION.** The front (primary) brake shoe at each wheel acts primarily in braking forward movement of the vehicle. The rear (secondary) shoe is used mainly for stopping reverse movement of the vehicle. The shoes are anchored at one end and bear against an "S" head on the cam shaft at the other end (fig. 30). As the cam shaft turns, the shoes and linings are forced against the brake drum. Brake shoe return springs hooked across the upper ends of the shoes return them to normal position when brake is released.

(2) **REMOVAL.** Remove wheel, hub, and drum (par. 34). Remove anchor pin lock plate (fig. 30) and drive out anchor pins. Unhook and remove brake shoe return springs. Remove brake shoes.

(3) **INSPECTION.** Examine brake drums carefully for scores, roughness or out-of-round. If drums are badly out-of-round or if they are deeply scored, replace them. However, straight and uniform scores if not too deep will have little detrimental effect on brake efficiency; therefore replacement in such cases is not justified. A satisfactory correction cannot be attained by attempting to clean oil or grease from

BRAKE SYSTEM



RA PD 306064

Figure 31—Relay-emergency Valve

linings. Install new shoe assemblies, and also oil seal responsible, if there is leakage on the lining. Do not use a wire brush on linings. This merely increases the wear-in time required for obtaining the burished lining surface needed for satisfactory braking.

(4) **INSTALLATION.** Set shoes in place on spider and attach brake return springs (fig. 30). Install anchor pins and lock. Back slack adjuster off as far as possible, by turning adjustment counterclockwise as far as it will go. Install hub and drum, and wheel (par. 34). Adjust brakes (par. 37).

c. Slack Adjuster (fig. 29).

(1) **DESCRIPTION.** Slack adjusters consist of a worm and gear enclosed in a body which also serves as an adjustable lever. This provides a quick and easy means of adjusting the brakes, to compensate for brake lining wear. During brake operation the entire slack adjuster rotates bodily with the brake camshaft. During brake adjustments the worm moves the gear so as to change the position of the lever arm in relation to the brake camshaft.

(2) **TESTING FOR SERVICEABILITY.** Adjust brakes (par. 37), and note brake chamber push rod travel when brakes are applied. Make several brake applications and again check push rod travel. Push rod travel must remain the same as it was after adjustment. If the push

**SEMITRAILER, 6-TON PAYLOAD, 10-TON GROSS,
2-WHEEL, FUEL TANK, 2000-GALLON**

rod travel increases, or if difficulty is experienced in keeping the brakes adjusted in service, replace the slack adjuster.

(3) **REMOVAL.** Slack adjusters are a sliding fit on the brake camshafts. Disconnect brake chamber push rod, and remove attaching screw and washer. Pull adjuster off the end of the camshaft.

(4) **INSTALLATION.** Be sure the slack adjuster is of the same size and type as that used on the brakes of the opposite wheel. Slide adjuster over end of camshaft, and attach with screws and washer. Connect push rod slide adjuster after replacing a slack adjuster, adjust brakes (par. 37) and test air brake system for serviceability.

39. AIR SYSTEM.**a. Relay-Emergency Valve (fig. 31).**

(1) **DESCRIPTION.** The function of the relay-emergency valve is to act as a relay station to control the brakes on the trailer and also to automatically apply the brakes on the trailer, in the event the trailer breaks away from the towing vehicle. As well as providing this safety feature, the relay-emergency valve speeds up the operation of the trailer brakes during both application and release.

(2) TESTING FOR SERVICEABILITY.

(a) *Operating Tests.* With the air brake system charged, apply brakes and check to be sure brakes on both wheels of the trailer apply properly. Release brakes, and check to be sure air pressure is exhausted promptly through the exhaust check valve. With the trailer air brake system fully charged, close the cut-out cock in the emergency line on the tractor, and disconnect the emergency line from the trailer. Check to be sure trailer brakes apply automatically. Connect emergency line, open cut-out cock on tractor and check to be sure brakes automatically release.

(b) *Leakage Tests.* With brakes released, coat the exhaust port of the exhaust check valve with soap suds to determine leakage. With brakes fully applied, coat the exhaust port with soap suds to determine leakage. With relay-emergency valve in emergency position (step (c), above) coat the exhaust port with soap suds to determine leakage. Also test for leakage at the emergency-line hose coupling on the trailer. Leakage in any of the above tests must not exceed a 3-inch soap bubble in 3 seconds. If excessive leakage is found, replace the valve.

(3) **REMOVAL.** Drain air brake system. Remove exhaust check valve. Disconnect air lines. Remove mounting bolts and valve.

(4) **INSTALLATION.** Mount valve in position. Install exhaust check valve in exhaust port. Connect air lines. Test valve for serviceability.

BRAKE SYSTEM

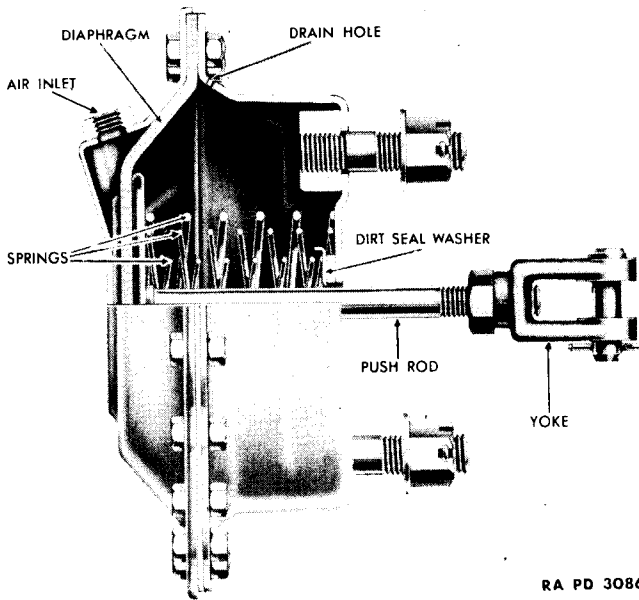


Figure 32—Brake Chamber

b. Brake Chambers (fig. 32).

(1) **DESCRIPTION.** The purpose of a brake chamber is to convert the energy of compressed air into the mechanical force and motion necessary to operate the brakes.

(2) **TESTING FOR SERVICEABILITY.**

(a) **Operating Tests.** Apply brakes, and observe that brake chamber push rods move out promptly without binding. Release brakes and observe that brake chamber push rods return to release position promptly without binding.

(b) **Leakage Tests.** With brakes fully applied, coat the bolting flanges holding the diaphragm in place with soap suds to check for leakage. No leakage is permissible. If leakage is found, tighten flange bolts. All flange bolts must be tightened evenly, and only sufficiently to prevent leakage, otherwise the diaphragm will be distorted and premature failure will result. With brakes fully applied, check for leakage through the diaphragm by coating the clearance hole around the push rod and the drain holes in the non-pressure plate with soap suds. No leakage is permissible. If leakage is found, the diaphragm must be replaced. Excessive push rod travel will cause premature failure of the brake chamber diaphragm. When diaphragms are replaced, brake chamber release springs must also be checked and

**SEMITRAILER, 6-TON PAYLOAD, 10-TON GROSS,
2-WHEEL, FUEL TANK, 2000-GALLON**

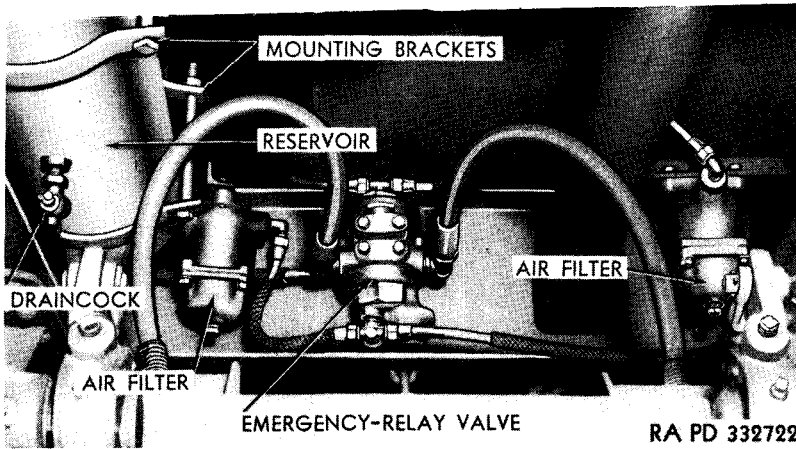


Figure 33—Reservoir and Drain Cock

replaced, if necessary. When replacing brake chamber springs, install the same type of spring as the one removed, otherwise uneven breaking will result.

(3) **REMOVAL.** Disconnect air line. Disconnect push rod yoke. Remove nuts from mounting bolts, and remove chamber.

(4) **INSTALLATION.** Mount brake chamber in position. Connect air line. Connect push rod yoke to slack adjuster. Adjust brakes (par. 37). Apply brakes and be sure push rod is correct length. If necessary, adjust push rod length by screwing yoke on, or off, push rod. Test brake chamber for serviceability.

c. Reservoir (fig. 33).

(1) **DESCRIPTION.** The function of the reservoir is to provide a place to store compressed air so there will be an ample supply available for immediate use in brake operation. It also provides storage for sufficient compressed air to permit several brake applications even after the engine has stopped. Another function of a reservoir is to provide a place where the air may cool, and the oil and water vapors condense.

(2) **TESTING FOR SERVICEABILITY.**

(a) **Leakage Tests.** With brake system charged, coat the outside of the reservoir with soap suds to check for leakage. No leakage is permissible. If any leakage is found, replace the reservoir.

(b) **Inspection.** Inspect inside and outside surfaces for damage or corrosion. A small flashlight is helpful when inspecting the in-

BRAKE SYSTEM

terior. If any damage or corrosion is found that would weaken the reservoir, replace the reservoir.

(3) **REMOVAL.** Drain air brake system, remove air lines and mounting bolts and remove reservoir.

(4) **INSTALLATION.** Position reservoir so that drain cock opening is at the lowest point. Install mounting brackets, connect air lines and test the reservoir for serviceability.

d. Drain Cock (fig. 33).

(1) **DESCRIPTION.** The drain cock is open when the handle is parallel to the body, and is closed when the handle is at right angles to the body. The drain cock is installed in the bottom of the reservoir to provide a convenient means of draining the condensation which normally collects in the reservoir. Always open the drain cock by hand and never strike the handle with a hammer or any other such instrument as the cock will be damaged and leakage will develop.

(2) **TESTING FOR SERVICEABILITY.** With air brake system fully charged, test for leakage past the key using soap suds. Also check for leakage through the body by coating the outside of the drain cock with soap suds. Leakage in excess of a 3-inch soap bubble in 3 seconds is not permissible. Leakage is caused by a dirty or scored key or body. Leakage due to dirt is corrected by cleaning, and applying a thin coating of cup grease on the key before assembly. Leakage due to a scored key or body cannot be repaired, and the drain cock must be replaced.

(3) **REPLACEMENT.** Unscrew drain cock and screw a new cock in place. Test drain cock for serviceability after replacement.

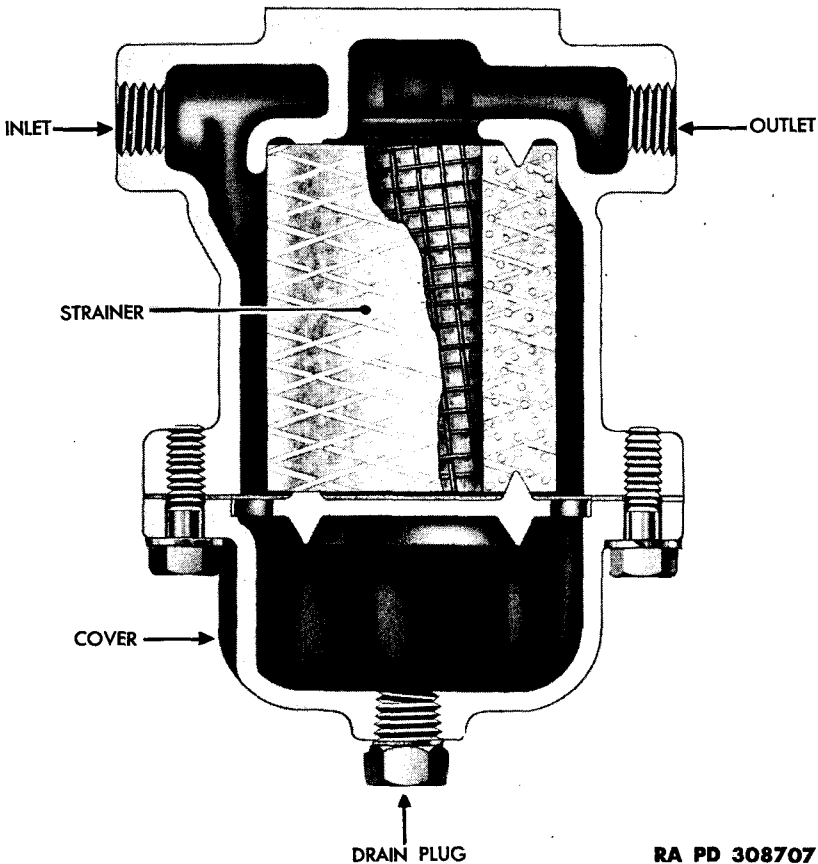
e. Exhaust Check Valve.

(1) **DESCRIPTION.** The exhaust check valve is a small rubber-diaphragm type of check valve used to prevent dirt and water entering the exhaust port of the relay-emergency valve (fig. 31).

(2) **TESTING FOR SERVICEABILITY.** Remove the exhaust check valve and immerse the lower half of the valve containing the diaphragm in water. Check for leakage of water past the diaphragm into the check valve. No leakage is permissible. If leakage is found, remove diaphragm and inspect its condition, also the condition of the diaphragm seat. If leakage is caused by the presence of dirt, cleaning the diaphragm and diaphragm seat should correct the trouble. If the leakage is caused by a defective diaphragm the diaphragm must be replaced. If leakage is caused by a damaged diaphragm seat, the complete exhaust check valve must be replaced.

(3) **REPLACEMENT.** Unscrew valve from exhaust port of relay-emergency valve and screw new valve in place.

SEMITRAILER, 6-TON PAYLOAD, 10-TON GROSS,
2-WHEEL, FUEL TANK, 2000-GALLON



RA PD 308707

Figure 34—Air Filter

f. Cut-Out Cocks (fig. 35).

(1) **DESCRIPTION.** Cut-out cocks have a tapered key ground to the body to prevent leakage. A passage is provided through the key so that when the key is turned to its open position, air is permitted to flow through the cock but when the key is turned to its closed position, or body cannot be repaired and the cut-out cock must be replaced.

(2) **REPLACEMENT.** When installing or removing cut-out cocks, always use the wrench on the end of the cut-out cock being tightened. Any severe strain put on the cut-out cock body due to using the wrench on the wrong end of the body will distort the body and

BRAKE SYSTEM

cause leakage. Test cut-out cock for serviceability after replacement.

g. Air Filters (fig. 34).

(1) **DESCRIPTION.** Air filters are used in the service line and the emergency line on the trailer to trap any dirt or foreign matter which might get into these lines, when the trailer is not connected to a towing vehicle. The filters have removable dirt chambers which are fitted with drain plugs. The correct direction of the air flow through the filter is indicated by an arrow cast on the body. Air flowing from the tractor to the trailer must pass through the filter in the direction indicated by the arrow. Air flowing through the filter readily passes through the strainer but any dirt which might be present in the air stream is stopped by the strainer. Moisture or dirt, which may collect in the filter, is removed by removing the drain plug.

(2) TESTING FOR SERVICEABILITY.

(a) *Operating Tests.* Remove cover and inspect condition of air strainer. Clean strainers by carefully brushing any dust or dirt off the outside. If strainer is covered with an oily or gummy deposit or if it is very dirty, install a new strainer. When assembling the filter, always use a new gasket. The frequency of cleaning the filter or replacing the strainer depends entirely on the operating conditions and the amount of dirt passing into the filter.

(b) *Leakage Tests.* With brakes applied, coat the outside of the filter with soap suds to check for leakage. No leakage is permissible. If any leakage is found through the walls of the filter, replace the filter. If leakage is found past the gasket between the cover and the body of the filter, tighten the cover, or install a new gasket.

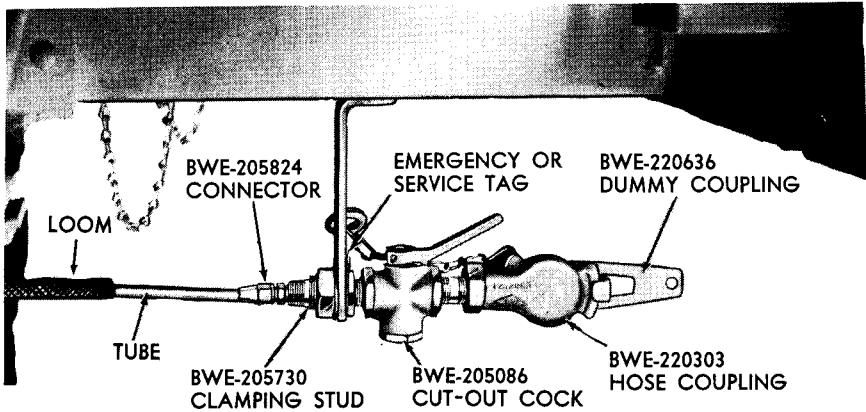
(3) **REMOVAL.** Remove air connections, mounting bolts, and remove filter.

(4) **INSTALLATION.** Position filter so the arrow on the body points towards the air line leading to the relay-emergency valve. Install mounting bolts, and connect air lines. Test filter for serviceability.

h. Hose Couplings and Dummy Couplings (fig. 35).

(1) **DESCRIPTION.** The purpose of using hose couplings is to provide an easy and convenient method of connecting and disconnecting air lines between vehicles. The design of the hose coupling is such that when two of them are coupled together, pressure is put on two rubber gaskets making an air tight seal and at the same time providing a joint which can be easily connected or disconnected by

**SEMITRAILER, 6-TON PAYLOAD, 10-TON GROSS,
2-WHEEL, FUEL TANK, 2000-GALLON**



RA PD 332723

Figure 35—Hose Couplings, Dummy Couplings, and Cut-out Cocks

hand. The hose couplings are fitted with friction locks. Dummy couplings are fitted with a chain to attach them to the trailer, and are used for blanking off the hose couplings rigidly mounted on the trailer when the hose couplings are not being used. This prevents the entrance of dirt or other foreign matter into the air brake lines.

(2) **TESTING FOR SERVICEABILITY.** With the hose couplings connected and brakes applied, coat the hose couplings all over with soap suds to check for leakage. There must be no leakage. Leakage is usually caused by worn, damaged, or improperly installed gaskets. To correct leakage, install a new gasket. Remove old gaskets by prying them out with a screw driver. Before attempting to install a new gasket, be sure the groove in the coupling in which the gasket fits is thoroughly cleaned, otherwise it will be impossible to properly install a new gasket. To install a new gasket, partially collapse it with the fingers and enter one side of the gasket flange in the groove in the coupling. Then use a blunt nosed screwdriver or some similar instrument to push the gasket into place. When properly installed, the exposed face of the gasket will be flat and not twisted or bulged at any point.

i. Tubing and Fittings.

(1) **DESCRIPTION.**

(a) **General.** Tubing and fittings are used to connect the various devices in the air brake system where it is not necessary to use flexible hose.

(b) **Tubing Sizes.** Two sizes of copper tubing are used. The largest size has an outside diameter of 1/2 inch and is used to carry

BRAKE SYSTEM

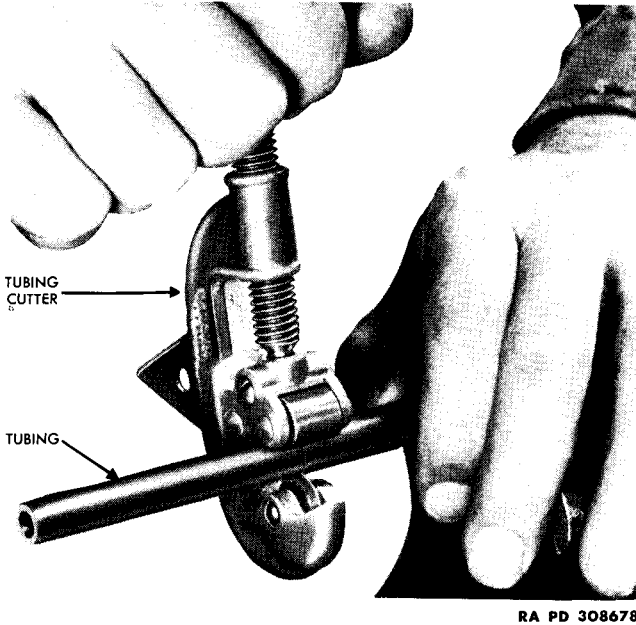


Figure 36—Cutting Tubing to Length With a Tubing Cutter

the air supply to the relay-emergency valve. Other lines have an outside diameter of $\frac{3}{8}$ inch. The inside diameter of these tubing lines is not the same as standard commercial tubing, and it is important that tubing of the correct inside and outside diameter be used, otherwise operation of the air brake equipment will be seriously affected.

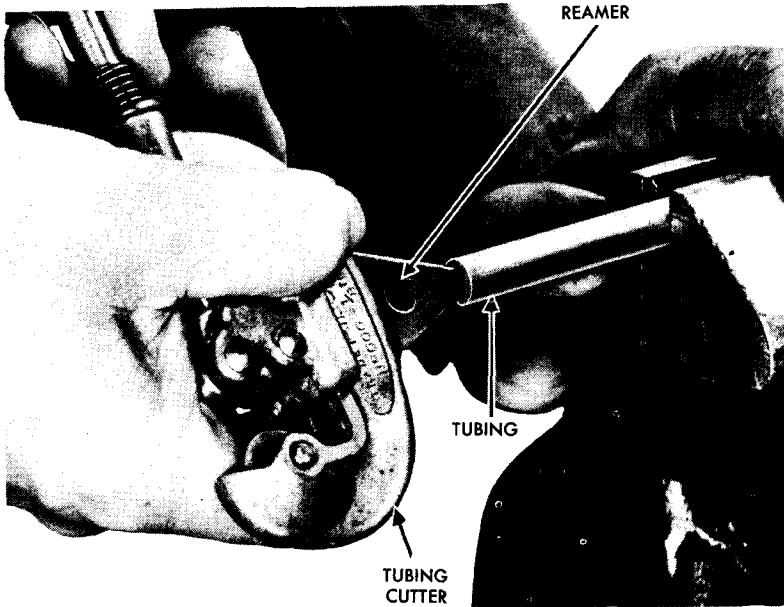
(c) *Fitting Types.* Tubing fittings used in the air brake system are the three-piece compression-type. Flared-type fittings such as those used in gasoline lines must not be used in the air brake system.

(2) TESTING FOR SERVICEABILITY.

(a) *Operating Tests.* If any evidence is found indicating that a tubing line is restricted, remove, and blow air through it in both directions to be sure the passage through the tubing is clear and not obstructed in any way. Inspect tubing for partial restrictions such as may be caused by dents or kinks in the tubing. Tubing having dents or kinks must be replaced.

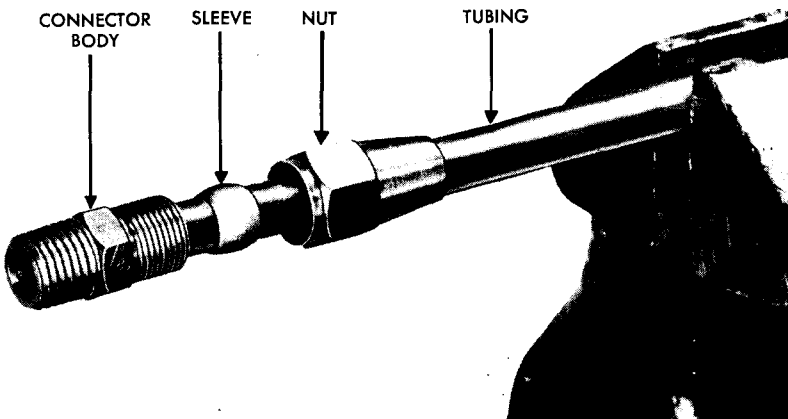
(b) *Leakage Tests.* With the air brake system fully charged and brakes applied, coat all tubing lines and fittings with soap suds to check for leakage. No leakage is permissible. Leakage at a tubing fitting is sometimes corrected by tightening the tubing fitting nut. If this fails to correct the leakage, replace the tubing fitting, the tubing, or both. If any leakage is found in the tubing, install a new piece of tubing.

**SEMITRAILER, 6-TON PAYLOAD, 10-TON GROSS,
2-WHEEL, FUEL TANK, 2000-GALLON**



RA PD 308679

Figure 37—Reaming Tubing After Cutting



RA PD 308677

Figure 38—Tubing and Fitting Ready for Assembly

(3) **REPLACEMENT.** When replacing tubing lines, cut tubing to required length with a hack-saw or tubing cutter (fig. 36). As the cut is made, make sure the end of the tubing is smooth, and that it

AXLE ASSEMBLY

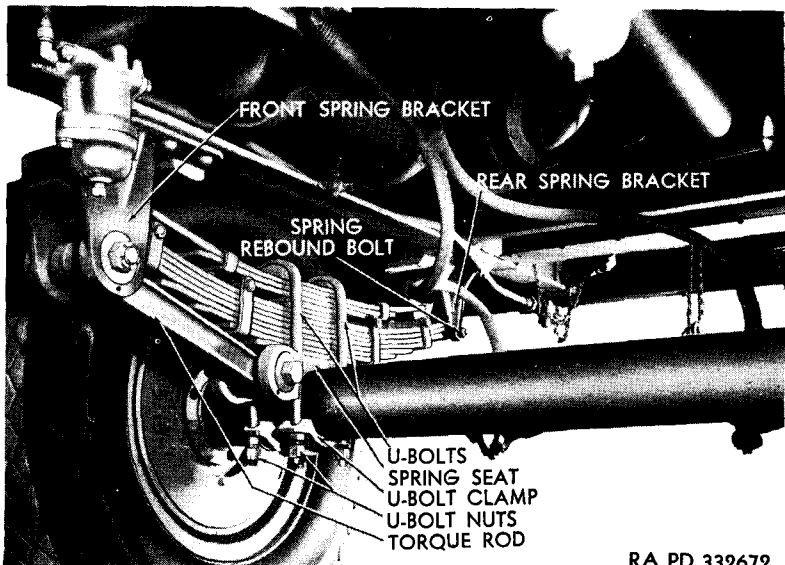
is cut squarely with the outside wall. Make sure the ends of the tubing are not crimped or partially closed. Ream (fig. 37) or file the ends of the tubing if necessary. Blow out tubing with an air line to remove all cuttings and filings. This is very important. Place nut and sleeve on tubing and put the end of the tubing in the recess in the tubing fitting body (fig. 38). Hold tubing at bottom of recess, and tighten nut to seal the joint against leakage. It is only necessary to tighten the nut until sufficient pressure is placed on the sleeve to prevent leakage. Always use a new sleeve when replacing tubing lines. Tubing fitting nuts and bodies may be used again provided they are in serviceable condition.

Section XII

AXLE ASSEMBLY

40. DESCRIPTION AND DATA.

a. **Description.** The semitrailer axle is of the tubular-type with correct camber forged into it at the time of manufacture. The complete assembly includes hubs, drums, brakes, camshafts, slack adjusters, and brake chambers. It is attached to slipper end springs with U-bolts and held in position by non-adjustable, rubber-bushed torque rods.



RA PD 332672

Figure 39—Rear Axle Suspension

SEMITRAILER, 6-TON PAYLOAD, 10-TON GROSS,
2-WHEEL, FUEL TANK, 2000-GALLON

RA PD 332724

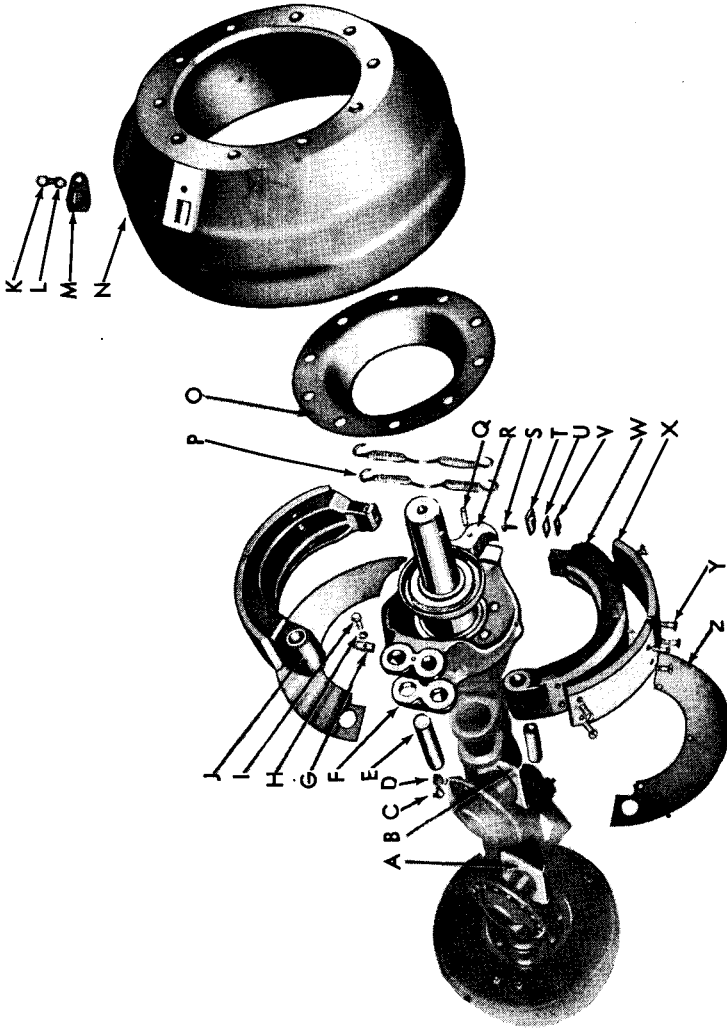


Figure 40—Axle Disassembled

AXLE ASSEMBLY

- A** L.H. BRAKE CAMSHAFT BRACKET **J** BRAKE SHOE ASSY. **R** R.H. CAMSHAFT
- B** R.H. BRAKE CAMSHAFT BRACKET **K** INSPECTION COVER SCREW **S** CAM WEAR SCREW
- C** GREASE FITTING **L** INSPECTION COVER WASHER **T** CAM WEAR PLATE
- D** REDUCING BUSHING **M** INSPECTION COVER **U** CAM WEAR PLATE SHIM (THICK)
- E** BRAKE SHOE ANCHOR PIN **N** BRAKE DRUM **V** CAM WEAR PLATE SHIM (THIN)
- F** BRAKE SPIDER **O** OIL SLINGER **W** BRAKE SHOE
- G** ANCHOR PIN LOCK **P** BRAKE SHOE RETURN SPRING **X** BRAKE LINING
- H** ANCHOR PIN LOCK WASHER **Q** CAMSHAFT BUSHING **Y** BRAKE SHOE ASSY.
- I** ANCHOR PIN LOCK SCREW **R** L.H. CAMSHAFT **Z** DUST SHIELD

Legend for Figure 40—Axle Disassembled

RA PD 332724B

TM 9-891

40-42

SEMITRAILER, 6-TON PAYLOAD, 10-TON GROSS, 2-WHEEL, FUEL TANK, 2000-GALLON

b. Tabulated Data.

Axle model.....	Timken T-2090-W-X-1
Track	72 in.
Hubs	10 stud
Bearings	
Inner and outer cups.....	Timken 5520
Inner and outer cones.....	Timken 5557
Axle diameter.....	5 in.
Over-all of tires.....	96 in.

41. REMOVAL.

a. **Removal of Axle Beam.** Jack semitrailer up until wheels clear the ground, and then jack up frame. Place jack under axle to support it when disconnected. Remove wheels, hubs, and drums (par. 34), disconnect air lines and brake chambers. Remove the cotter pins, castle nuts, and bolts attaching radius rod to the spring seat on axle (fig. 39). Remove U-bolt jam nuts and high nuts, and take off the U-bolt clamps. Lower jack supporting axle and remove axle. Remove brake shoes (par. 38). Remove brake chambers and slack adjusters (par. 38 c.). Brake spiders are riveted to the hub (fig. 40). Cut off rivets, and remove entire brake spider assembly complete with camshaft.

b. **Removal of Axle Assembly.** When removing the entire axle assembly to replace parts of the spring suspension, it is unnecessary to remove wheels, hubs, and drums. Jack up the rear of the semitrailer until the wheels are clear of the ground, and lock the frame in place. Place a hydraulic jack under the rear axle, then disconnect the air hose connection at the brake chamber, remove the cotter pins, castle nuts, and bolts attaching the radius rods to the spring seat, and then take off the nuts and U-bolt clamps attaching axle to spring. Lower the jack and roll the complete axle and wheel assembly out on the wheels.

42. INSTALLATION.

a. **Installing Axle Beam.** Install brake spider and camshaft assembly on the replacement axle beam which is to be installed on vehicle. This spider is riveted in place with eight Timken No. X-1260 rivets (fig. 40). Install brake chambers, camshafts, oil seals and brake shoes (par. 38). Support axle on portable jack, and roll into position under trailer with brake chambers toward the rear. Raise axle until spring seats come in contact with the bottom of springs. Clamp axle to springs with U-bolt clamps and nuts, and attach radius rods (par. 44). Tighten U-bolt high nuts, then install

SPRINGS AND RADIUS RODS

U-bolt jam nuts and pull up tightly against high nuts. Install wheels, hubs, and drums (par. 34).

b. Installing Axle Assembly. Installation of a complete axle assembly is the same as in subparagraph a above.

Section XIII

SPRINGS AND RADIUS RODS

43. SPRINGS.

a. Description. The main spring has eight leaves, the auxiliary spring has three. Both springs slip through spring brackets. U-bolts and spring seats which are welded to the axle attach springs and axle. The axle is held in correct alinement by rubber-bushed radius rods. There are four rebound clips on each main spring and two on each auxiliary spring which are riveted to the shortest sleeve which they surround. The entire spring assembly is held together and in alinement by means of center bolts passing through the center of the leaves.

b. Removal. Jack up frame until all weight is taken off from spring to be removed but spring does not rest on rebound bolts at rear. Take off U-bolt nuts, and remove U-bolts. Remove spring rebound bolt and spacer. Remove spring from the axle towards the rear of the semitrailer.

c. Installation. Working from the rear, set spring on spring seat, which is welded to the axle, with front end inserted in the front bracket and rear end of spring in rear bracket. Install spring rebound spacer bolt and nut. Install U-bolts, U-bolt clamps and nuts (fig. 39). Draw U-bolt high nuts up tightly, then install jam nuts, and pull them up tightly against the high nuts.

44. RADIUS RODS.

a. Description. Non-adjustable-type radius rods hold the axle permanently in correct alinement. These radius rods, which are attached to the front spring bracket and to the spring seat on the axle, are rubber-bushed to absorb road shock.

b. Removal. Jack up semi-trailer frame to take weight off springs. Remove cotter pins and castle bolts from radius rod bolts, then take out retainers, bolts, and bushings (fig. 39). Remove the radius rod.

**SEMITRAILER, 6-TON PAYLOAD, 10-TON GROSS,
2-WHEEL, FUEL TANK, 2000-GALLON**

c. **Installation.** Place front end of radius rod in place and spring bracket. Insert rubber bushings, retainers, and castle nuts. Draw nut up tightly and lock with cotter pin. Install rear end of rod in spring seat on axle in the same way.

Section XIV**LAND AND TANK GEAR****45. TANK AND SKIRTING.**

a. **Description.** This vehicle is designed with running gear, landing gear, and upper fifth wheel attached directly to the tank shell without the use of a trailer frame. The tank is designed to disperse the strains and stresses throughout the entire structure to eliminate possibilities of leaks from opening welds. The tank proper is entirely welded steel with lengthwise wrapper sheets welded to dished heads and baffles. It is divided into two compartments having capacity of 900 gallons in the front compartment, and 1,100 in the rear. The skirting consists of hose tubes on each side and a rear stowage compartment. There is an amber reflector at the front of each hose tube, and two red ones at the rear of each tube, one on the side and one on the rear door.

b. **Replacement.** Side hose tubes and rear stowage compartment doors are the only removable tank or skirting parts. To remove these parts, take out the screws holding them to the tank. To install, set in place, and attach with screws.

46. LANDING GEAR.

a. **Description.** The retractable landing gear consists of upper ends, which are welded to the tank and braced by welded cross tie tubes, and lower ends which retract into the upper ones. The lower ends are held in extended or retracted position by pins with hinged locks to hold them in place.

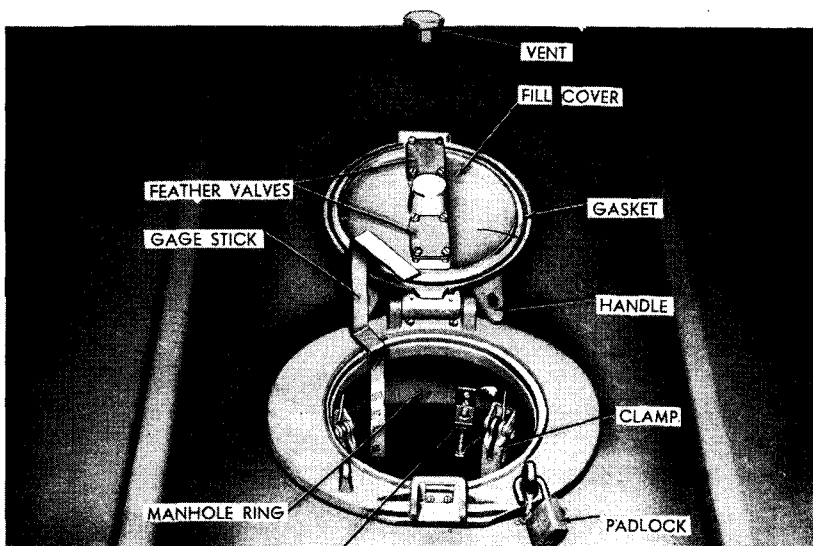
b. **Removal.** Raise front of vehicle until lower end can be removed from upper end. Remove lock pin and withdraw lower end.

c. **Installation.** Raise front of vehicle and insert lower end inside upper end. Lock in place with lock pin and lower vehicle.

47. MANHOLE COVERS (fig. 41).

a. **Description.** Each of the two tank compartments is fitted with a manhole cover, capacity indicator, and fusible vent. The

LAND AND TANK GEAR



**SEMITRAILER, 6-TON PAYLOAD, 10-TON GROSS,
2-WHEEL, FUEL TANK, 2000-GALLON**

Section XV

ELECTRICAL SYSTEM

48. DESCRIPTION AND TABULATED DATA.

a. **Description.** (figs. 43 and 44). This vehicle is wired with a 6-volt, single-contact electrical system having a ground and return. Jumper cable sockets are provided at the front for coupling to electrical system of the towing vehicle and at the rear for coupling to a towed vehicle. On original equipment the various circuits are wired in different colors to facilitate tracing of circuits. The colors and circuits are listed in the tabulated data (subpar. b, below). A combination blackout taillight and service stop light is mounted on the left rear of the semitrailer, and a blackout stop and taillight is provided on the right side. Operation of service light or blackout light is controlled by a switch just underneath the right-hand light. The system is protected by three 20-ampere, 6-volt fuses mounted in the junction box mounted back of the blackout switch, and right-hand taillight inside the stowage compartment.

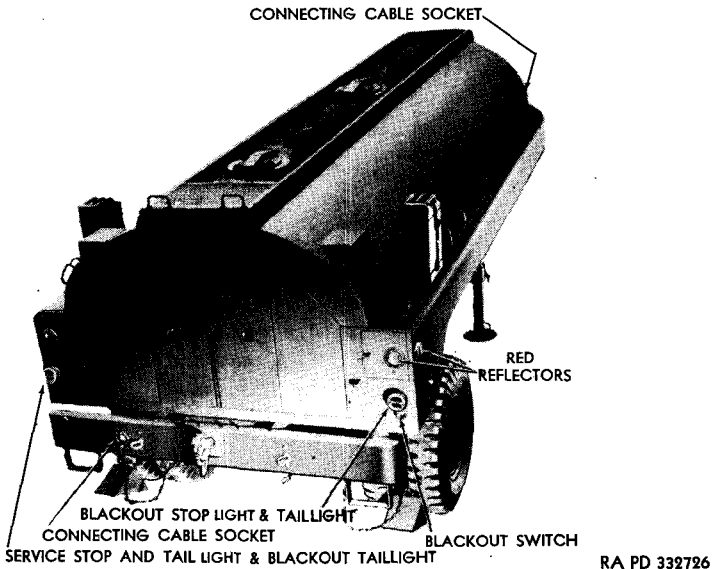
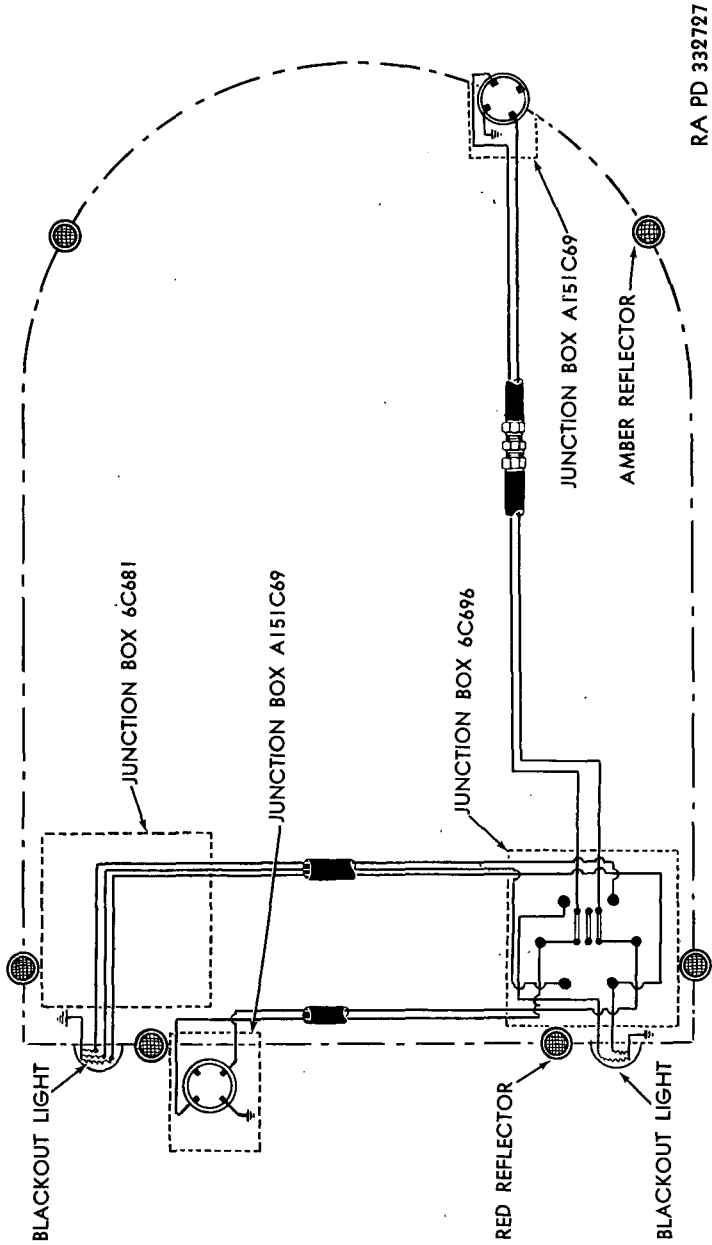


Figure 42—Lights, Reflectors and Sockets

ELECTRICAL SYSTEM



RA PD 332727

Figure 43—Wiring Diagram

SEMITRAILER, 6-TON PAYLOAD, 10-TON GROSS,
2-WHEEL, FUEL TANK, 2000-GALLON

RA PD 332798

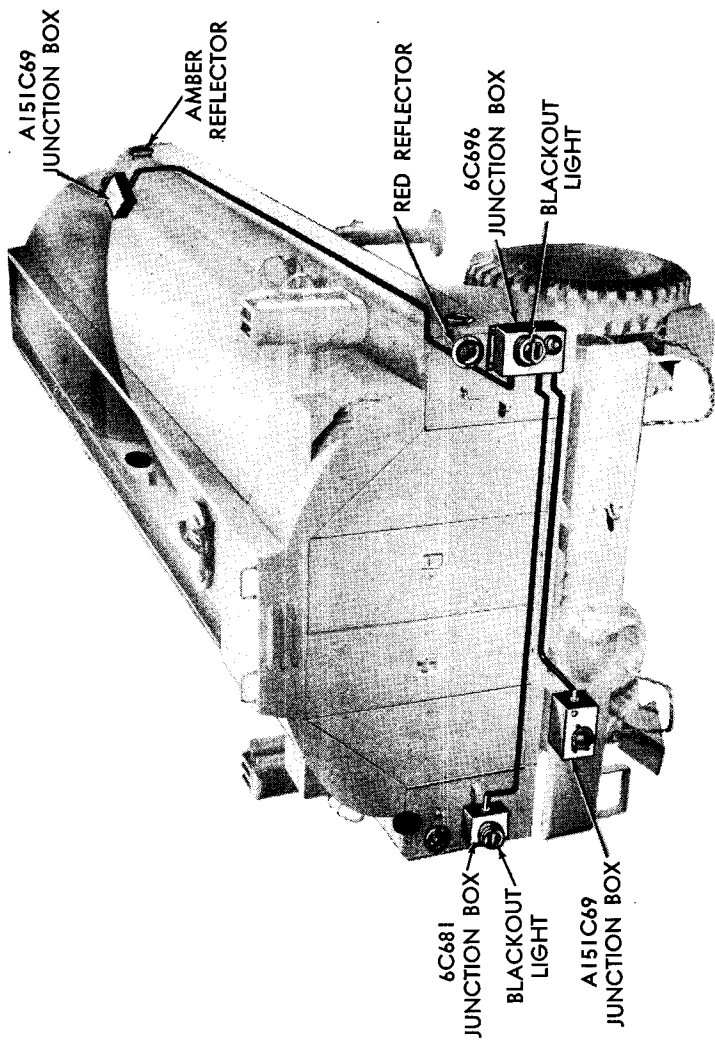
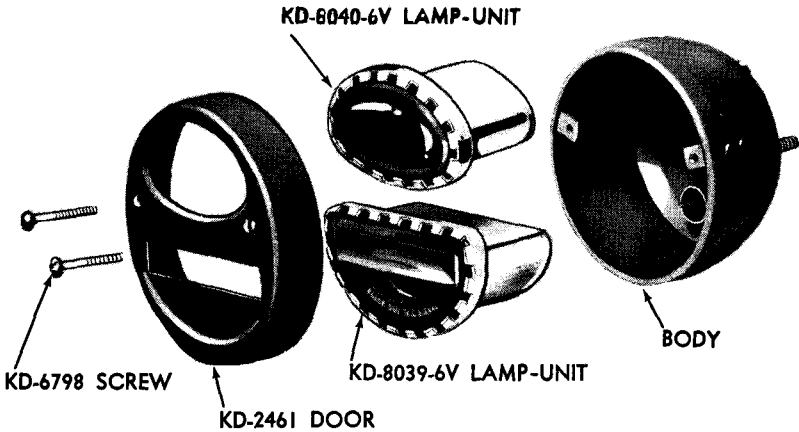


Figure 44—Electrical Equipment

ELECTRICAL SYSTEM



RA PD 332729

Figure 45—Service Stop and Taillight, and Blackout Taillight

b. Tabulated Data.

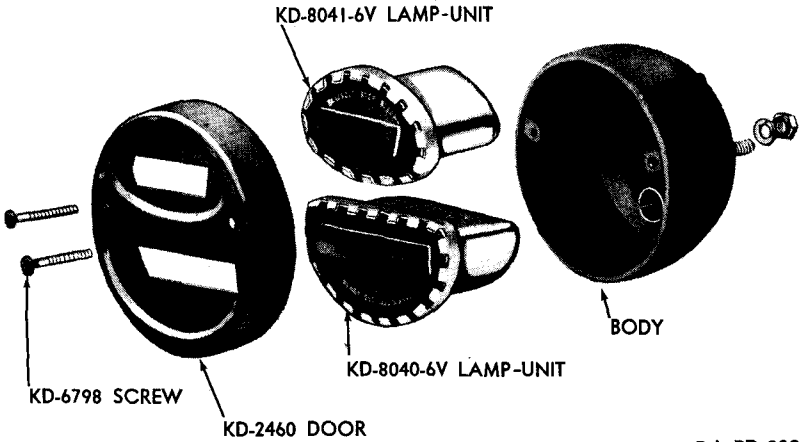
Type of system.....	6-volt, single-contact
Wiring	
Sockets to fuse panel.....	14 gage
Blackout light, right-hand.....	Green
Service light, left-hand.....	White
Fuse panel to lights.....	16 gage
Service taillight, left-hand.....	Black
Service stop light, right-hand.....	Blue
Blackout taillight, left-hand.....	Red
Blackout taillight, right-hand.....	Red
Blackout stop light, right-hand.....	Blue
Tubing.....	$\frac{3}{8}$ -inch O.D. by 0.028-inch wall Bundy weld
Fuses, 3 required.....	20-ampere, 6-volts

49. LIGHTS.

a. Description (figs. 45 and 46). The lens of each blackout taillight is designed to produce two beams. This design is such that when on a truck following a truck, at a specified safe distance, the two beams will merge into a single beam. To produce this effect accurately, the lamp, lens retainer, lens, and filter are manufactured as a single sealed-beam unit.

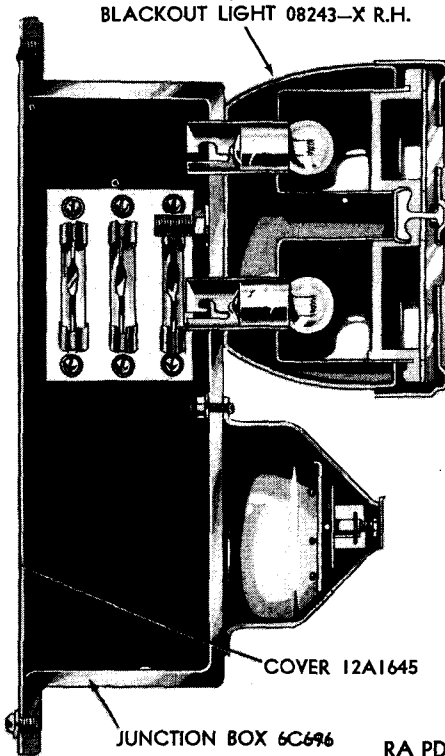
b. Replacing Lamp Unit (figs. 45 and 46). Remove two screws attaching door to body. Pull defective lamp-unit straight out, and insert replacement unit. Be sure to use correct lamp-unit, and that it is all the way in the socket. Test for correct operation before replacing door. Attach door with two screws.

**SEMITRAILER, 6-TON PAYLOAD, 10-TON GROSS,
2-WHEEL, FUEL TANK, 2000-GALLON**



RA PD 332730

Figure 46—Blackout Stop and Taillight



RA PD 332731

Figure 47—Section Through Blackout Stop and Taillight

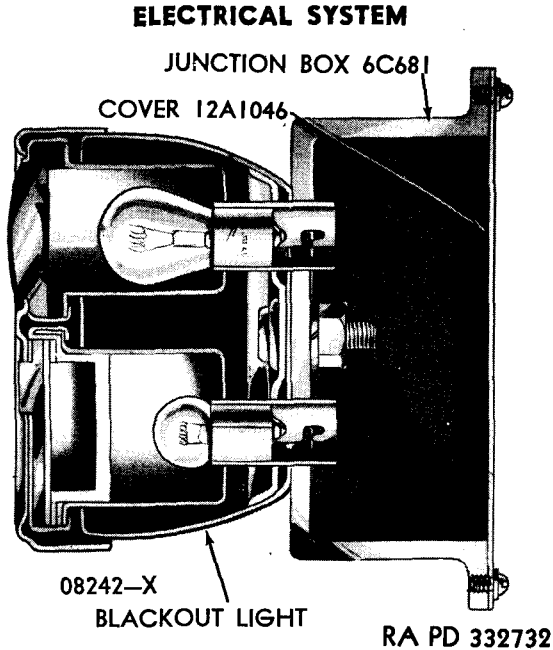


Figure 48—Section Through Service Stop and Taillight and Blackout Stop and Taillight

c. **Removal** (figs. 47 and 48). Remove cover from junction box in back of taillight on the inside rear wall of the stowage compartment. Disconnect wires from light. Push connector in, then turn clockwise, and remove. Remove attaching nuts and light will come free.

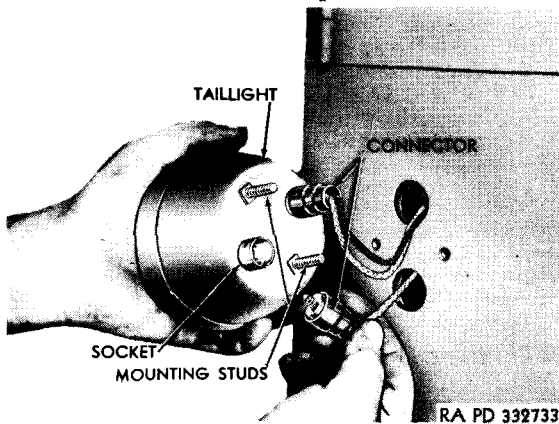


Figure 49—Light Plug Connections

**SEMITRAILER, 6-TON PAYLOAD, 10-TON GROSS,
2-WHEEL, FUEL TANK, 2000-GALLON**

d. **Installation** (figs. 47 and 48). Insert two mounting studs on rear of light through holes in body with wide lens at the bottom (figs. 45 and 46). Attach with 1/4-inch lock washers and 1/4-inch-20 hexagonal nuts. Attach wiring connectors as shown (fig. 49). Solder connection to end of wire. Slide connector over light socket, if it fits only one way, push in, and turn counterclockwise to lock in place. Install junction box cover with gaskets. Test light for proper operation.

50. CONDUITS AND WIRING.

a. **Description.** All wiring is enclosed in 3/8-inch outside diameter, 0.028-inch wall Bundy weld tubing connected to cast iron junction boxes with 3/8-to-1/4-inch connectors. Tubing connecting front socket to junction box containing fuses is provided with a 3/8-inch tubing union at about the center to facilitate repairs. Sta-Kon connectors are installed on the ends of the wires, and are also provided with short insulators.

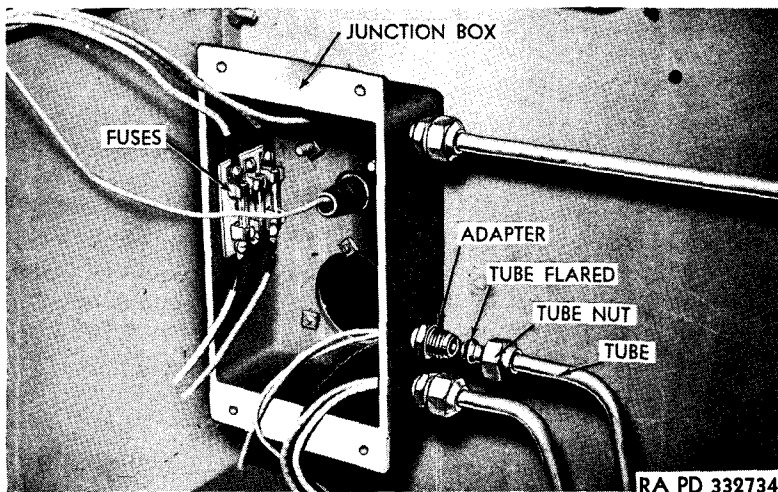


Figure 50—Tubing and Wiring Connections

b. **Removal** (fig. 50). Back off the tubing connector nut and loosen tubing from junction box. Disconnect wire from terminal inside junction box. Loosen opposite ends, then take out the tubing and wire.

ELECTRICAL SYSTEM

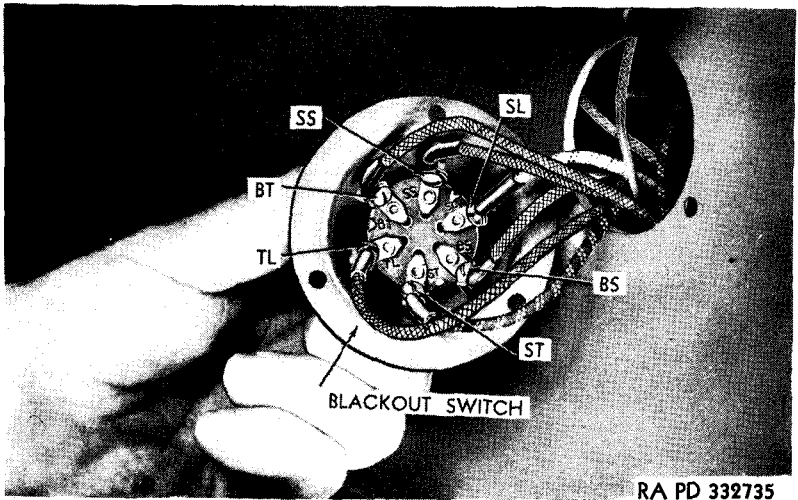


Figure 51—Blackout Switch

c. **Installation** (fig. 50). Cut tubing to proper length with tubing cutter (fig. 36). Insert wires through tubing allowing a few inches to extend out each end. Sta-Kon terminals used on wire ends are as follows:

- TB-B-36.....At cable sockets and lights
- TB-B-71.....Cable socket ground wires
- TB-B-77.....At fuses and switch.

Install tubing connectors on ends of tubing and connect to junction boxes. Attach wire terminals to proper connections (fig. 43).

51. BLACKOUT SWITCH.

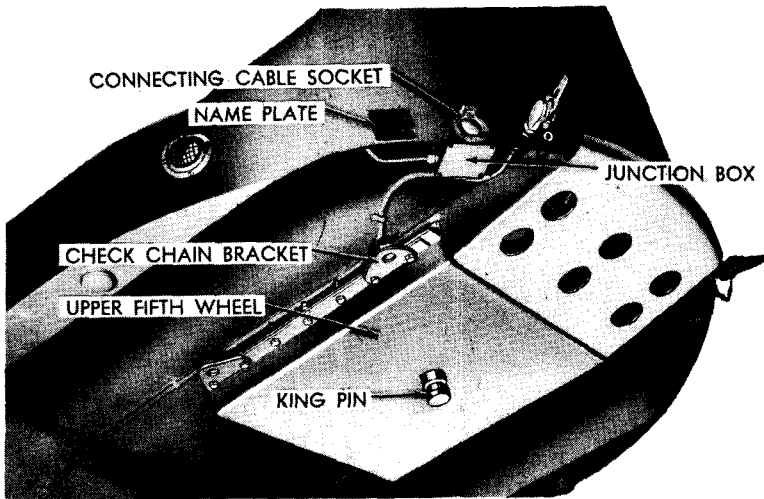
a. **Removal** (fig. 51). Remove attaching screws, and pull switch away from body. Remove attaching nuts holding cable terminals, and remove cables from switch.

b. **Installation** (fig. 51). Connect wire terminals to blackout switch connections with nuts from switch terminals. Terminals must be clean and securely fastened. They are stamped with letters as shown on wiring diagram (fig. 43). Attach switch to body and junction box (fig. 47).

52. JUMPER CABLE SOCKETS.

a. **Description**. Sockets provided at the front of the vehicle for jumper cables are built with terminal studs on the rear, for wiring connections, and hinged cover on the front. The socket is attached to vehicle with four hexagonal head cap screws.

**SEMITRAILER, 6-TON PAYLOAD, 10-TON GROSS,
2-WHEEL, FUEL TANK, 2000-GALLON**



RA PD 332736

Figure 52—Cable Socket and Junction Box

b. Removal (fig. 52). Remove junction box cover and disconnect cables and ground wires from socket terminal studs. Remove socket attaching cap screws and withdraw socket.

c. Installation (fig. 52). Insert socket in opening in vehicle body and fasten with $\frac{1}{4}$ -inch—28 cap screws, 1 inch or $\frac{3}{4}$ inch long, and nuts. Connect wire terminals inside junction box (fig. 43). Install junction box cover and gasket.

Section XVI

PIPING SYSTEM

53. DESCRIPTION AND TABULATED DATA.

a. Description (fig. 53). A 3-inch emergency valve is bolted to the tank outlet flange of each tank compartment to control flow from the tank compartment. From these emergency valves, welded steel pipe assemblies lead to a manifold at the rear. The pipe assemblies are flanged and bolted to valve and manifold with gaskets, to seal the joints. Two 2-inch faucets are attached to the outlet manifold. The emergency valves are controlled by an operator at the left of the rear stowage compartment. A front safety release and fusible link are also provided to close the valve in case of fire in the stowage compartment. Valves are connected to the operator by cables enclosed in bundy weld tubing fitted with lubrication fittings.

PIPING SYSTEM

RA PD 332737

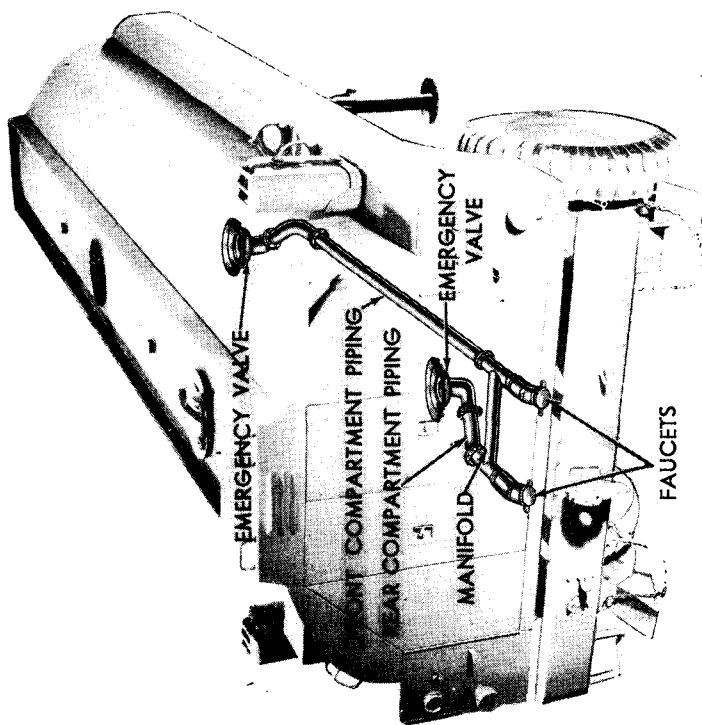


Figure 53—Piping Diagram

**SEMITRAILER, 6-TON PAYLOAD, 10-TON GROSS,
2-WHEEL, FUEL TANK, 2000-GALLON**

b. Tabulated Data.

Emergency valves.....	3-in. angle-type
Emergency valve screen.....	40-mesh
Piping.....	3¼-in. O.D. tube
Faucets.....	2-in. male straight pipe thread
Gaskets	
Emergency valve to tank.....	HLC-22B898
Emergency valve to piping.....	HLC-22B567
Piping to manifold.....	HLC-22A272
Manifold blind cover.....	HLC-22B243

54. PIPING ASSEMBLIES AND GASKETS.

a. Replacing Gaskets. Remove piping assembly or emergency valve to which gasket to be replaced is attached (subpar. **b** below or par. 56). Clean off mating flanges of all old gasket pieces, grease, dirt or paint. Set new gasket (par. 53) in place, no gasket cement is required, and bolt assembly back in place (subpar. **c** below or par. 56), with hexagonal head bolts, nuts, and lock washers. Draw nuts up as tightly as possible.

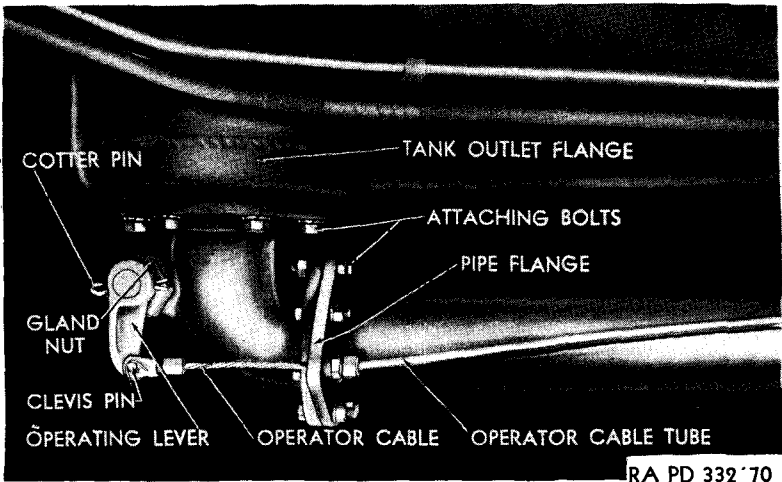


Figure 54—Front Compartment Piping

b. Removing Piping Assemblies (figs. 54 and 55). Procedure for removal of front and rear compartment piping is the same. Unscrew jam nut on operator cable at emergency valve, and remove cable from cable connector. Remove tube nut and tubing from

PIPING SYSTEM

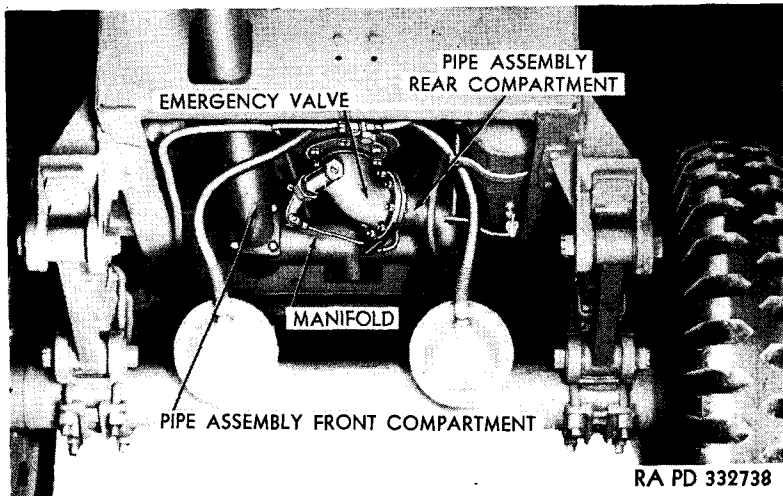


Figure 55—Rear Compartment Piping

piping flange and pull control cable through flange. Remove bolts, nuts, and lock washers attaching flange at both ends of piping assembly, and remove assembly. To remove manifold, take off faucets (par. 57) and disconnect from piping assemblies.

c. **Installing Piping Assemblies** (figs. 54 and 55). Procedure for installing front and rear compartment piping assemblies is the same. Install tubing connector in piping flange. Using new gaskets (par. 53) set piping in place and bolt flanges with hexagonal-head bolts, nuts, and lock washers. Draw nuts up as tightly as possible. Thread operator cable through flange, then attach tubing to connector with tubing nut. Remove clevis from emergency valve, and install on end of cable with cable connector assembly (fig. 56). Attach clevis to emergency valve, and adjust tension at operator if necessary (par. 56). To install manifold, connect it up to piping assemblies first, then install faucets (par. 57).

55. EMERGENCY VALVES (figs. 54 and 55).

a. **Description.** The emergency valve consists of a cast elbow-shaped body containing a spring loaded disk valve. The valve is operated through a shaft and lever which are connected to the operator in the rear storage compartment by cable. The valve inlet is surrounded by a 100 mesh screen to strain out sediment or other foreign material.

b. **Gland Packing.** If the packing gland on the emergency valve shaft develops a leak, tighten the gland nut just enough to stop the

**SEMITRAILER, 6-TON PAYLOAD, 10-TON GROSS,
2-WHEEL, FUEL TANK, 2000-GALLON**

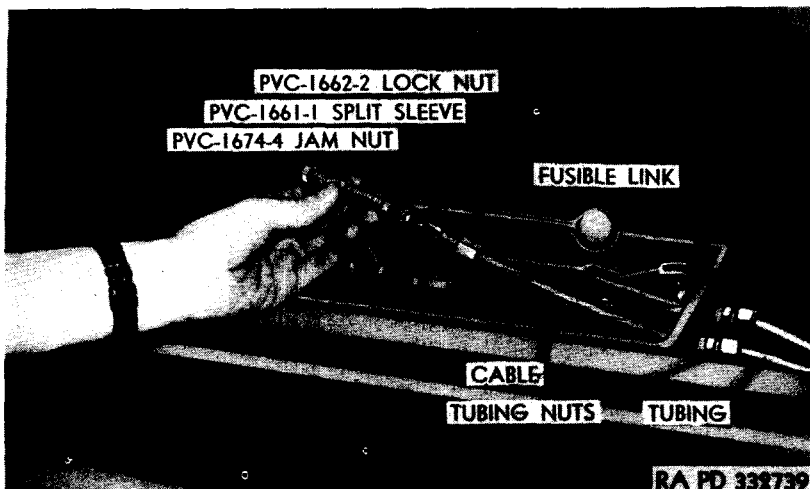


Figure 56—Cable Connector Assembly

leak, no more. If it still leaks after the gland nut has been turned in as far as it will go, replace the packing. Remove cotter pin from emergency-valve operating lever, and remove the lever. Unscrew the gland nut and remove packing. Install a new packing set, and replace gland nut and lever.

c. **Removal.** Drain compartment from which valve is to be removed. **CAUTION:** *Keep all open flame away from area where work is being done. Remove clevis pin and disconnect operator cable. Remove bolts attaching valve to tank and to piping, then remove valve.*

d. **Installation.** Bolt valve, to tank outlet flange, and then to piping flange, using new gaskets in both places. Attach cable clevis to valve operating lever. Adjust cable (par. 56).

56. EMERGENCY-VALVE OPERATOR (fig. 57).

a. **Description.** The emergency-valve operator consists of two handles hinged in a frame and connected to the emergency valves through cables enclosed in tubing. These levers are also connected by cable to a handle on the front of the tank which, if pulled, will close either valve, or both valves, should they be open. A fusible link in the front control cable will close the valves automatically, if a fire occurs in the rear of the tank.

PIPING SYSTEM

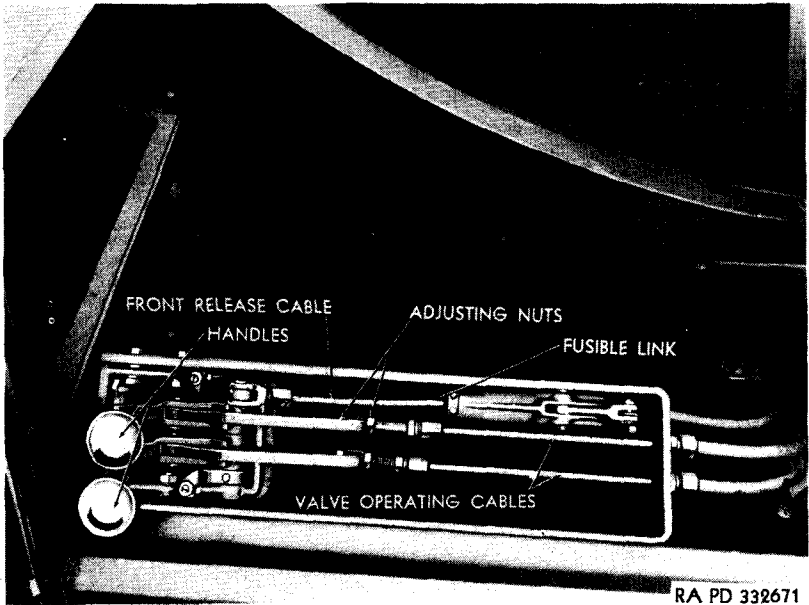


Figure 57—Emergency Valve Operator

b. Adjustments. Set adjusting nuts so that the levers will just slide over dead center and remain open when pulled all the way back. There must be no tension on the cable when valve is released or valve will not seat correctly, and fuel will leak out of tank into pipe lines.

c. Removal. Loosen jam nuts on cable connectors and unfasten cables. Turn tubing nuts off to loosen tubing from operator. Remove attaching screws, and lift out operator.

d. Installation. Install operator in position with screws, nuts, and lock washers. Insert cable ends through frame and attach cable connector assemblies (fig. 56) to adjusting studs. Attach tubing to operator frame with tubing connectors. Insert studs through operator handles, and adjust cable tension (subpar. b above).

57. FAUCETS (fig. 58).

a. Description. Two-inch faucets are attached to the piping manifold, to control flow from piping system to pumping system or for gravity discharge. Faucets have male, straight pipe thread fitting for installation on manifold by half coupling and 3- by 2-inch reducing bushing. Faucets are operated by detachable wrench handles. The faucet valve is spring load so that it is tightly closed

**SEMITRAILER, 6-TON PAYLOAD, 10-TON GROSS,
2-WHEEL, FUEL TANK, 2000-GALLON**

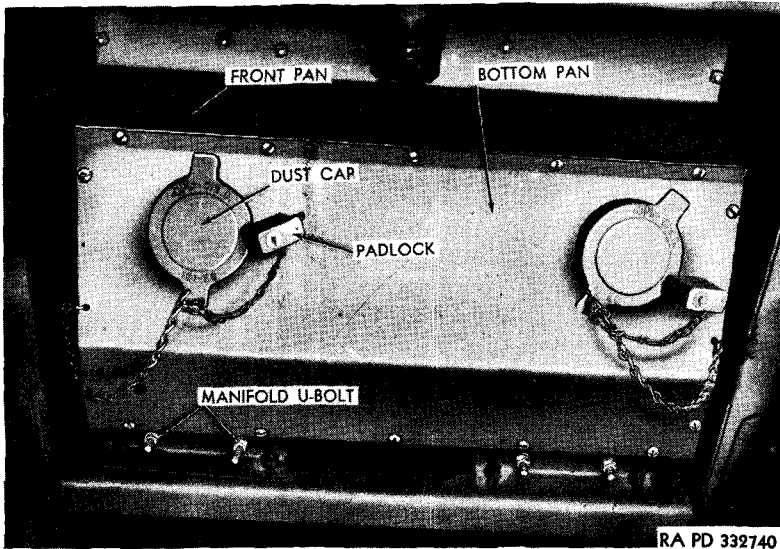


Figure 58—Faucets

when wrench is removed. Notches are provided to lock wrench handle in full or partially open positions.

b. Gland Packing. When a leak develops, remove the gland nut lock screw, and turn packing nut up just enough to stop the leak, no more. When nut has been pulled up as far as it will go without stopping leak, replace the packing. Remove gland nut and dig out old packing. Insert new packing, install packing gland nut and lock screw.

c. Adapter Gasket. The faucets are fitted with quick hose adapters (ON-132BG) and gaskets (ON-H4277-M). When leaks develop at the faucets, unscrew adapter and replace gasket.

d. Removal. Disassemble faucet by removing flange bolts and take off upper half of faucet. Unscrew pipe coupling attaching adapter to manifold, and remove adapter.

e. Installation. Disassemble faucet at flange, and install adapter in pipe coupling on manifold. Use red lead on all threads. Attach faucet to adapter with gasket, bolts, nuts, and lock washers.

Section XVII

HOSE AND FITTINGS

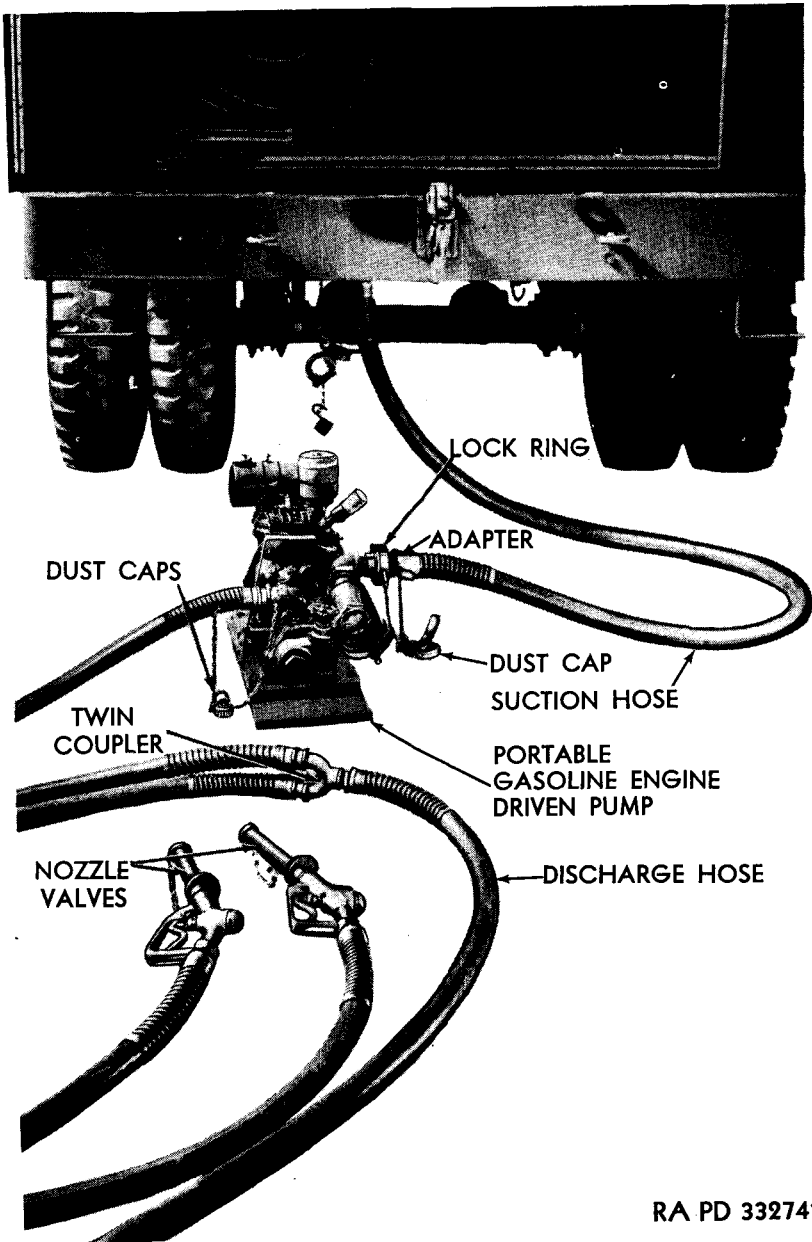
58. DESCRIPTION.

a. **Description.** Several different sizes and lengths of hose with couplers and fittings are carried in stowage compartments for the pump and gravity systems. All fittings and nozzles are brass. The 1-inch discharge hose are connected with Y-connection at one end, and have nozzles installed on the other end. Nozzles are the whistle-type to indicate when container being loaded is full. All fittings are of the quick coupling-type. Dust caps are provided for all hose ends to prevent entrance of dust and dirt.

b. **Tabulated Data.**

No. and Name	No. Req.	Where Used	Type of Connection
71-G, 1 in. x 1 in. —Hose Nipple	1	Pump assembly	1 in. std. pipe thread, male x 1 in. 11½ thd. male hose.
128-R—Lock ring (drill for chain)	1	Pump assembly	No threads, fits over lugs on 132-B, 132-BG, or 132-BH.
131-EG—Dust cap	2	Faucets	No threads, fits over lugs on 132-B, 132-BG, or 132-BH.
132-B, 2 in.— Adapter	1	2 in. Suction hose	2 in. std. pipe tap.
132-BC, 1½ in.— Cap	4	2 in. Gravity lines	No threads, lugs fit—128-R.
132-BG, 2 in.— Adapter	2	Faucets	2 in. 11½ thd. female hose with washer.
132-BH, Adapter (handle type)	2	2 in. Gravity lines	1½ in. std. pipe tap.
132-T, 1½ in. Tail	4	2 in. Gravity lines	1½ in. std. pipe thread, male.
132-T, 2 in. Tail	1	2 in. Suction hose	2 in. std. pipe thread, male.
451, 1 in. x 1 in. x 1 in. Twin coup- ler	1	Pump line	1 in. std. pipe tap, x 1 in. 11½ thd., male hose.

SEMITRAILER, 6-TON PAYLOAD, 10-TON GROSS,
2-WHEEL, FUEL TANK, 2000-GALLON

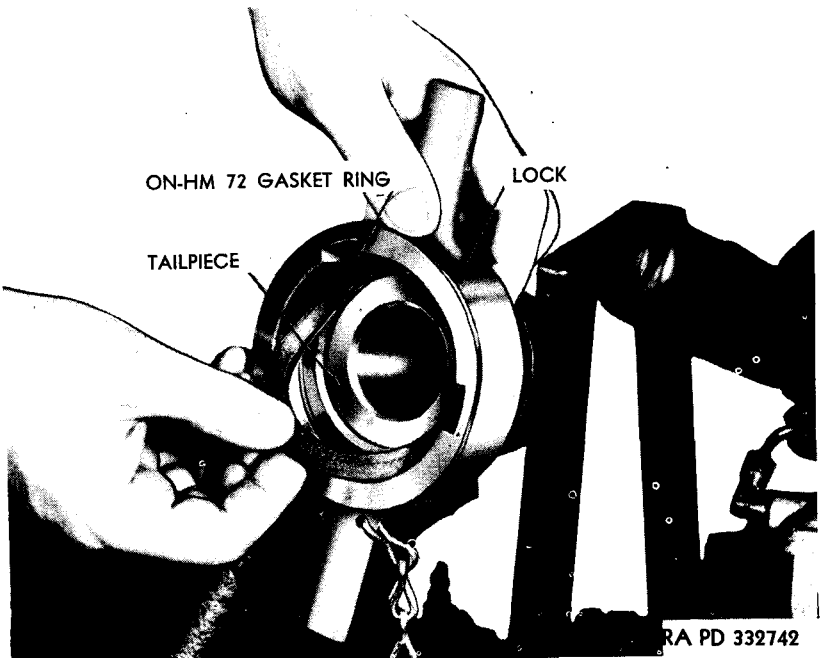


RA PD 332741

Figure 59—Typical Hose and Fittings

HOSE AND FITTINGS

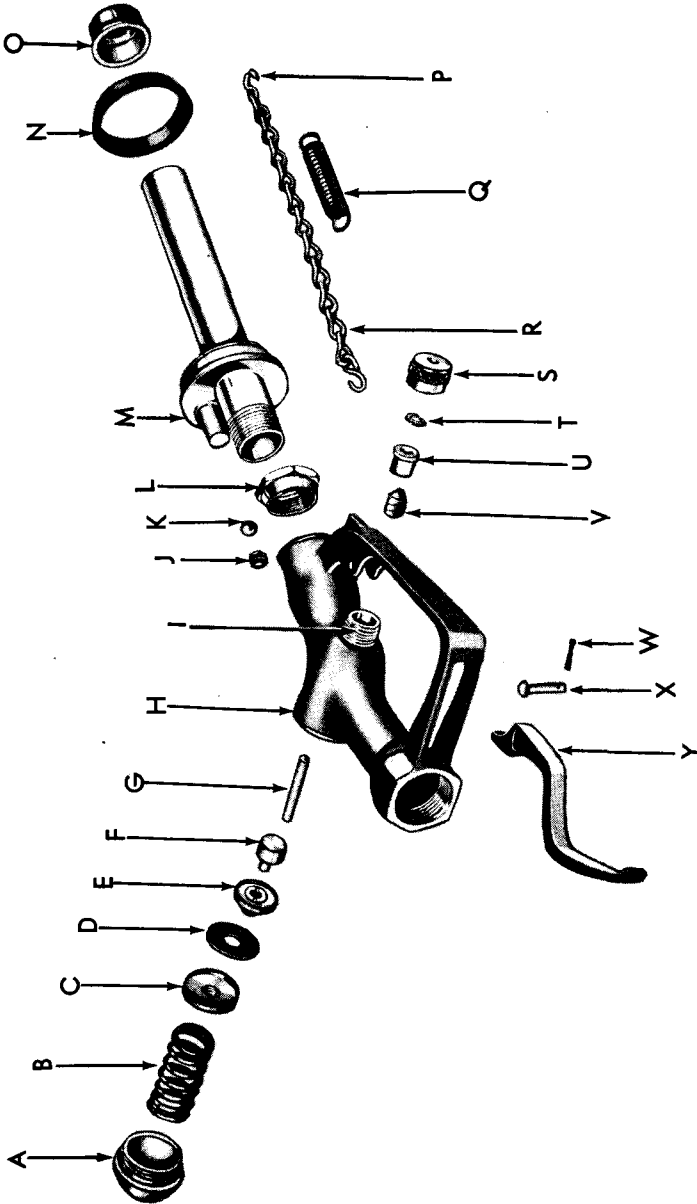
No. and Name	No. Req.	Where Used	Type of Connection
451, 1½ in. x 1 in. x 1 in.—Twin coupler	2	2 in. Gravity lines	1½ in. std. pipe tap, x 1 in. 11½ thd., male hose.
531-F, 1 in. Dust cap—female	1	Pump assembly	1 in. 11½ thd., female hose.
531-F, 2 in. Dust cap—female	1	2 in. Suction hose	2 in. 11½ thd., female hose.
531-M, 1 in. Dust cap (plug)	1	Pump—line	1 in. 11½ thd., male hose.
531-M, 2 in. Dust cap (plug)	1	2 in. Suction hose	2 in. 11½ thd., male hose.
711-WC, 1 in. Brass hose nozzle valve	4	2 in. Gravity lines	1 in. std. pipe tap.



RA PD 332742

Figure 60—Connector

SEMITRAILER, 6-TON PAYLOAD, 10-TON GROSS,
2-WHEEL, FUEL TANK, 2000-GALLON



RA PD 332743

Figure 61—Nozzle Valve—Disassembled View

HOSE AND FITTINGS

A VALVE SPRING CAP	I STUFFING BOX	R DUST CAP CHAIN
B VALVE SPRING	J NOZZLE TUBE QUILL PLUG	S PACKING NUT
C VALVE DISK SKIRT	K CORK BALL	T STUFFING BOX LOCK WASHER
D VALVE DISK	L TUBE NUT	U PACKING GLAND
E VALVE DISK HOLDER	M NOZZLE TUBE ASSY.	V GLAND PACKING
F PLUNGER	N NOZZLE TUBE GASKET	W LEVER COTTER PIN
G STEM	O DUST CAP	Y NOZZLE LEVER
H WHISTLE NOZZLE BODY	P CHAIN LINK	X LEVER FULCRUM PIN
	Q DUST CAP SPRING	

RA PD 332743B

Legend for Figure 61—Nozzle Valve—Disassembled View

**SEMITRAILER, 6-TON PAYLOAD, 10-TON GROSS,
2-WHEEL, FUEL TANK, 2000-GALLON****59. CONNECTOR (fig. 60).**

a. **Description.** Quick couplings are provided on base ends to provide a means for quickly rigging up hose lines for operation. The connector consists of adapter, washer, and locking ring.

b. **Replacing Gaskets.** Pull gasket out of lock ring, and insert a new one.

c. **Replacing Connector.** Connector adapter is screwed into hose or pipe end. Unscrew it and screw in replacement part. Put red lead on threads before installing.

60. NOZZLE VALVE (fig. 61).

a. **Description.** Nozzle valves are of the self-closing type, and are fitted with a whistle device to warn when receptacle being loaded is full. The valve stem is fitted with a packing gland, and nozzle tube has a tapered neoprene gasket to seal receptacle opening.

b. **Replacing Whistle Ball.** When valve no longer whistles, whistle ball probably is defective and requires replacement. Remove plug and ball. Insert new cork ball, and screw plug in tightly.

c. **Replacing Gasket.** Pry old gasket loose and slide off, over the tube. Work new gasket over gasket seat on tube with thick edge towards top.

d. **Gland Packing.** If leak develops at valve stem, turn gland nut down far enough to stop leak, no farther. If leak persists after nut has been turned down as far as possible, replace the packing. Remove gland nut, lock washer gland and dig out all the old packing. Examine stem for defects that might cause leakage. Insert new packing, gland, lock washer, and gland nut.

e. **Replacing Valve Disk.** When the nozzle valve leaks, it is necessary to replace the valve disk (ON-HM662). To do this, unscrew the spring cap, remove spring and disk holder assembly. Unscrew skirt from holder and remove disk. Install new disk, assembly disk holder, disk, and skirt. Place the assembly in nozzle body, and replace spring and spring cap.

Section XVIII**PUMPING ENGINE****61. DESCRIPTION AND TABULATED DATA.**

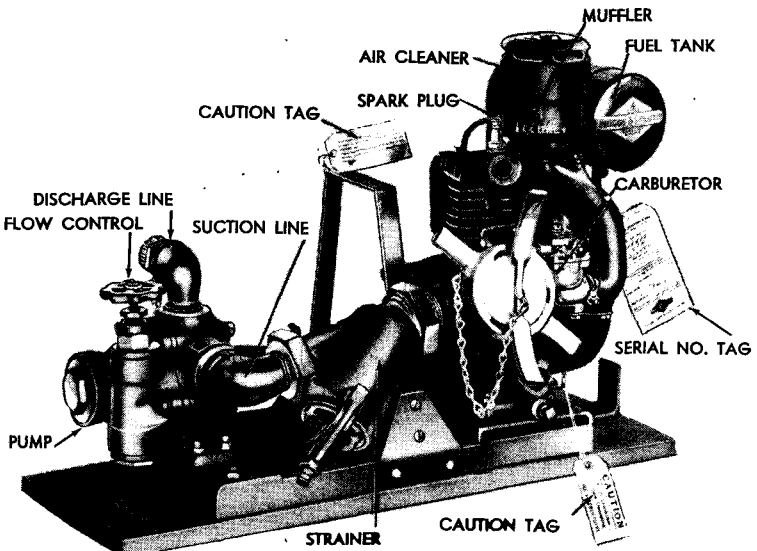
a. **Description.** This engine is a single-cylinder, L-head, air-cooled type, equipped with flywheel, magneto ignition, and adjustable float feed, gravity-type carburetor. An oil-bath air cleaner is

PUMPING ENGINE

installed on the carburetor. Speed is automatically maintained under varying loads by an air vane governor. Lubrication is supplied by an oil pump which is built into the base of the engine.

b. Tabulated Data.

Model	Briggs & Stratton NPR
Bore	2 in.
Stroke	2 in.
Piston displacement	6.28 cu in.
Brake horsepower (2,600 to 3,600 rpm)	1½ bhp
Idling speed	1,600 rpm
Spark plug	14 mm
Spark plug gap	0.025 in.
Magneto contact point gap	0.020 in.
Valve clearances	
Intake (cold)	0.008 in.
Exhaust (cold)	0.015 in.
Valve arrangement	L-head



RA PD 332744

Figure 62—Portable Pump and Engine—Front View

**SEMITRAILER, 6-TON PAYLOAD, 10-TON GROSS,
2-WHEEL, FUEL TANK, 2000-GALLON**

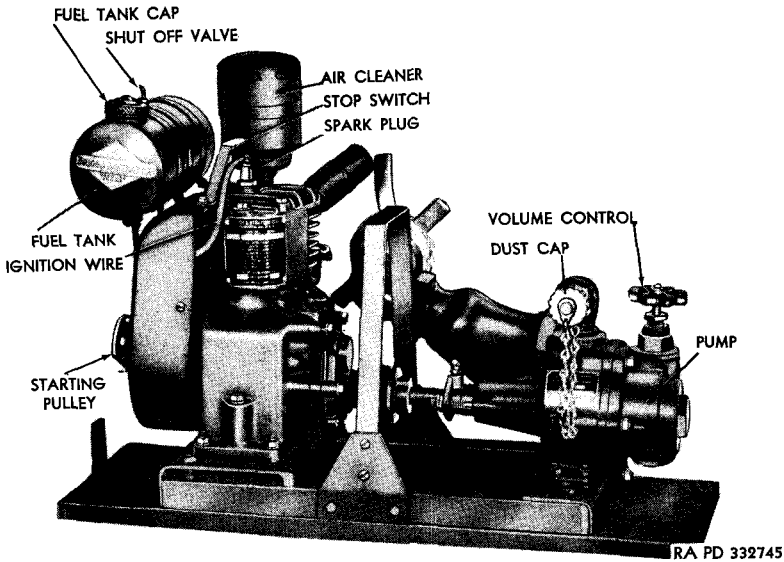


Figure 63—Portable Pump and Engine—Rear View

62. ENGINE TUNE-UP.

a. **Purpose.** Engine tune-up consists of a simple step-by-step procedure of minor tests and adjustments which may be followed to restore engine to best performance possible without the aid of major repairs.

b. Procedure.

(1) **SERVICE SPARK PLUG.** Remove and clean spark plug. Inspect insulator for cracks or breaks, and electrode for excessive burning. Replace unserviceable plug with new one. Adjust electrodes to 0.025 inch by bending grounded electrode. Install new gasket and do not overtighten plug. If new plug is required, use BR-29693 (CP-J8) or equivalent.

(2) **SERVICE MAGNETO CONTACT POINTS.** Remove blower housing, flywheel, dust cover. Clean, inspect, and adjust contact points. Clean flywheel and blower housing (par. 70). Reinstall dust cover, flywheel, and blower housing (par. 70).

(3) **CRANKCASE OIL.** Remove drain plug, located at end of engine base, and drain oil. Do not flush out with kerosene. Replace drain plug, refill with recommended oil (par. 19), and replace filler plug.

PUMPING ENGINE

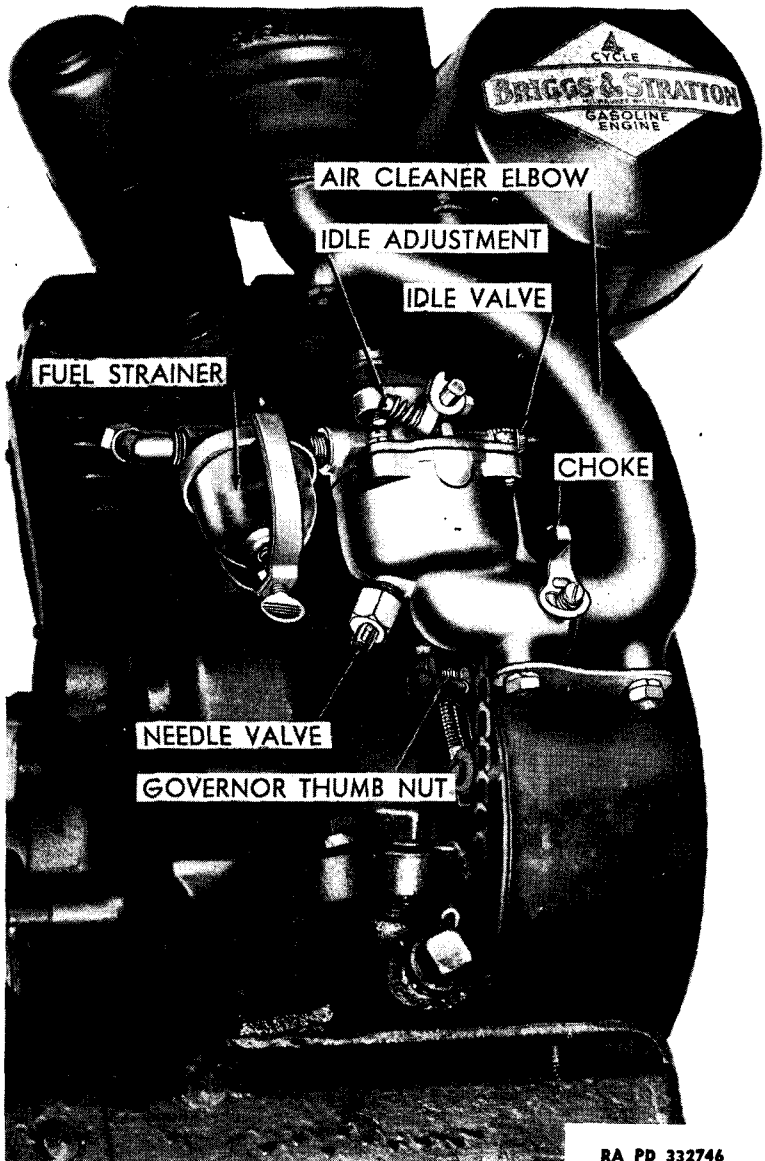


Figure 64—View of Carburetor and Governor on Engine

**SEMITRAILER, 6-TON PAYLOAD, 10-TON GROSS,
2-WHEEL, FUEL TANK, 2000-GALLON**

(4) **CLEAN FUEL TANK AND LINE.** Remove, clean, inspect, and reinstall fuel tank cap and vent. Remove fuel line at filter, flush out tank and line, reinstall fuel line (par. 65).

(5) **CLEAN FUEL FILTER.** Remove fuel filter bowl, gasket and screen. Clean, inspect and reinstall filter parts (par. 64).

(6) **SERVICE AIR CLEANER.** Remove air cleaner, wash out, re-install, and fill with oil to correct level (par. 63).

(7) **ADJUST CARBURETOR.** Adjust carburetor idling speed and idling mixture (par. 62).

(8) **GOVERNOR.** Correct engine speed at take-off shaft is 1,900 revolutions per minute. To increase engine speed turn speed adjusting thumb nut down. To decrease speed, turn thumb nut up.

(9) **READJUST CARBURETOR.** Repeat step (7) above if necessary.

63. CARBURETOR AND GOVERNOR.

a. **Description.** The carburetor on this engine is the float-feed gravity-type. The throttle is automatically controlled by an adjustable vane type governor which is operated by the air current blown by the flywheel fins. The carburetor has an adjust needle valve to adjust the fuel mixture. A choke lever for use in starting a cold engine is installed in the air inlet.

b. Carburetor and Governor Adjustment on Engine (fig. 64).

(1) Turn needle valve to right (clockwise) as far as possible. Do not use force or screw up too tightly as this may damage needle valve. Open needle valve from 1 to 1¼ turns to the left (counterclockwise).

(2) Start engine, and when it has warmed up, adjust needle to the point at which engine operates best with full load.

(3) Holding throttle lever adjustment screw tightly against stop to keep engine at idling speed, turn idle adjusting screw right, or left, to point where engine idles most smoothly. The proper setting is from ½ to ¾ open. Do not force idle adjusting screw against seat.

(4) Turn throttle adjusting screw to the right (clockwise) to increase idling speed. **NOTE:** *Correct idling speed is approximately 1,600 revolutions per minute.*

c. **Removal.** Close shut-off valve on fuel tank. Remove air cleaner elbow attaching screws, and take off elbow and cleaner. Disconnect fuel line at fuel filter. Remove carburetor attaching screws, and disconnect throttle link and spring at carburetor. Remove car-

PUMPING ENGINE

buretor and fuel filter. Unscrew fuel filter and nipple from carburetor inlet. Remove carburetor.

d. Installation. Screw nipple and fuel filter into inlet side of carburetor. Holding carburetor in approximate mounting position attach governor spring in inner hole of carburetor throttle lever. Attach governor throttle line in outer hole of throttle lever. Install carburetor with two attaching screws, lock washers and a new carburetor gasket (BR-68987). Attach fuel line to fuel filter inlet, and open shut-off valve on fuel tank. Install air cleaner and elbow.

64. AIR CLEANER.

a. Description. The engine is equipped with an oil-bath air cleaner to protect the engine from dirt and grit. The cleaner consists of a cover, filter element, and bowl, all of which are attached to the elbow by a threaded rod and wing nut.

b. Service. Remove cover and filter, and pour out oil. Wash filter element bowl, and cover with dry-cleaning solvent, and dry thoroughly. Install screen in cover. Check gasket, and defects that might cause leakage, and replace if necessary. There is one gasket between air cleaner and elbow, and one gasket between air cleaner housing and cup.

c. Removal. Unscrew wing nut, and slide entire cleaner assembly over rod.

d. Installation. Install bowl over end of air cleaner elbow, and fill to oil level mark with oil of same viscosity used in crankcase. Install filter element, and cover, and tighten assembly to elbow with wing nut.

65. FUEL FILTER.

a. Description. The fuel filter is installed in the fuel line, just ahead of the carburetor, to remove sediment from the fuel. It consists of a glass bowl, gasket, and screen, secured to a cover by means of a clamp and thumb screw at the base of bowl. The inlet and outlet ports are on opposite sides of the cover.

b. Clean Filter Bowl. Close shut-off valve in fuel tank. Loosen thumb screw below filter bowl. Remove and clean filter bowl, gasket and screen. Dissolve gummy, varnish-like substance, if present in the bowl, with dry-cleaning solvent or carburetor cleaning compound. Install bowl (subpar. d, below). Install screen (BR-62876) in cover. Check gasket (BR-68477) for defects that may cause leakage, and replace if necessary.

SEMITRAILER, 6-TON PAYLOAD, 10-TON GROSS,
2-WHEEL, FUEL TANK, 2000-GALLON

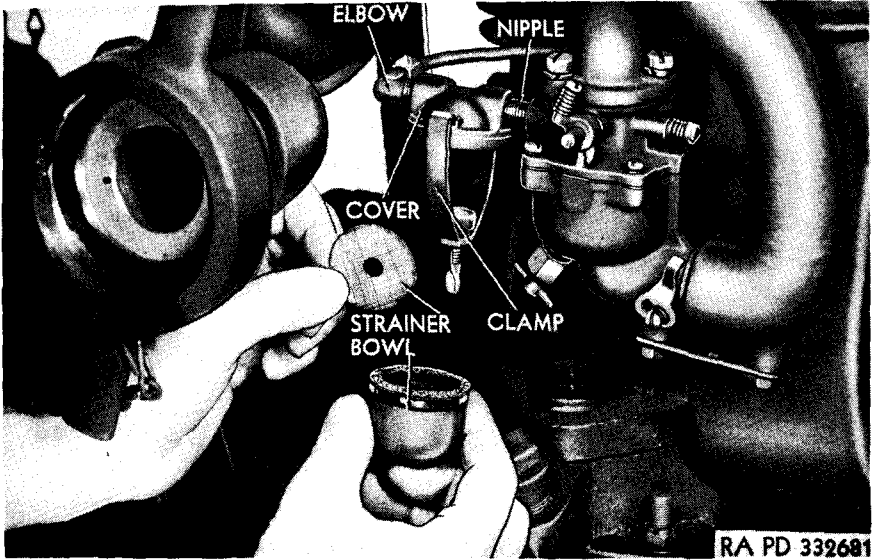


Figure 65—Servicing Fuel Filter

c. **Remove Filter.** Close shut-off valve in fuel tank. Loosen thumb screw, and remove clamp and bowl from cover. Disconnect fuel line at strainer. Unscrew cover from nipple carburetor. Remove fuel line elbow from cover.

d. **Install Filter.** Close shut-off valve in fuel tank. Screw fuel line elbow into end of cap marked "IN." Screw cap into nipple carburetor with side marked "OUT" towards carburetor. Turn into position so bowl will be on the bottom. Reassemble clamp and bowl. Connect fuel line. Open shut-off valve in fuel tank.

66. FUEL TANK AND LINES.

a. **Description.** The fuel tank, which is attached to the cylinder and blower housing, is connected to the carburetor by a single copper tube connected by tube nuts at each end. The fuel tank cap has a vent which allows air to enter the tank as fuel leaves it. The gas tank cap is also equipped with a cork gasket to seal it shut, and a safety chain which attaches it to tank when cap is removed. The shut-off valve stem extends through the top of the tank. Turn to the left (counterclockwise) to open and the opposite to close.

b. **Service.** Remove fuel tank cap, open vent and blow through vent hole to clean it out. Remove fuel line (subpar. c, below) and blow through it to clean it out.

PUMPING ENGINE

c. **Remove Fuel Line.** Close shut-off valve in fuel tank. Disconnect tube nuts at tank, and elbow at fuel filter.

d. **Remove Fuel Tank.** Close shut-off valve in fuel tank and disconnect fuel line. Remove screws attaching tank clamps to brackets, and remove tank.

e. **Install Fuel Tank.** Set fuel tank on tank brackets, and attach clamps with screws, nuts, and lock washers. Connect fuel line, and open tank shut-off valve.

f. **Install Fuel Line.** Cut tubing to proper length to reach from fuel tank to elbow in fuel filter. Tubing ends must be perfectly flush and the tubing perfectly round. Install a tube nut on each end of the tubing, and connect to fuel tank and fuel filter elbow.

67. SPARK PLUG AND WIRE.

a. **Spark Plug.** Clean and reset points to 0.025 inches. When replacing use Champion No. J 8 (14MM) or its equivalent.

b. **Removal.** Remove ignition wire from spark plug.

c. **Ignition Wire.** Insulation must not be broken, or soaked with oil or water, or grounded, where it touches the engine as this will interfere with good ignition. Check remove blower housing (fig. 63). Replace wire, if insulation is defective in any way.

68. INTAKE AND EXHAUST SYSTEMS.

a. **Description.** Two valves are employed in the intake and exhaust system. They are operated by a gear driven camshaft, and are adjustable only by grinding the ends of the valve stems.

b. **Checking Clearances.** Check valve clearances with feeler gage. Intake valve should be 0.008 inches, and exhaust valve 0.015 inches. Should these clearances become so great the engine runs unevenly or loses power, refer to higher authority repair.

c. **Valve Timing.** The timing of the valves is taken care of by the meshing of the cam gear with the gear on the crankshaft. These gears are properly meshed when the mark on the cam gear is in line with the mark on the crankshaft collar.

69. MAGNETO (fig. 66).

a. **Description.** The spark is produced by a high tension magneto composed of armature, condenser, contact points, and rotating magnets cast in the flywheel. The magneto is assembled on a plate which is attached to the engine in back of the flywheel.

**SEMITRAILER, 6-TON PAYLOAD, 10-TON GROSS,
2-WHEEL, FUEL TANK, 2000-GALLON**

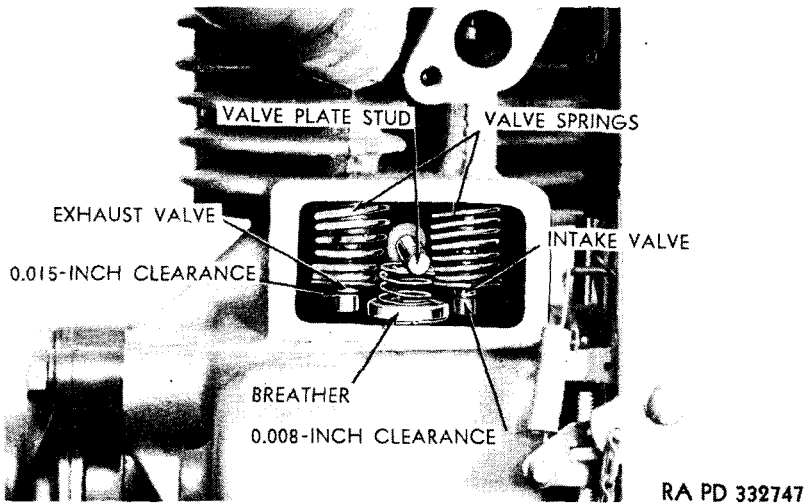


Figure 66—Valve Cover Plate Removed

b. Adjustment. Remove blower housing, flywheel, and magneto dust cover (par. 70). Clean points with a contact point dresser. Check for proper opening and good contact when closed, by turning crankshaft by hand. Set crankshaft with plunger on high point of crankshaft. Loosen adjusting lock screws, and move contact point bracket to obtain a gap between contact points of 0.020 inches, then tighten lock screw. If either contact point is pitted or burned, replace with breaker point repair kit (BR-290307) and adjust as above. Install dust cover, flywheel, and blower (par. 68).

c. Condenser Replacement (fig. 67). Remove blower housing, flywheel, and magneto dust cover (par. 70). Disconnect condenser wire, and remove condenser repair kit (BR-290392). Install magneto dust cover, flywheel, and blower housing (par. 70).

d. Removal. Remove blower housing, flywheel, and magneto dust cover (par. 70). Remove fuel tank (par. 66), remove complete carburetor, air cleaner and fuel strainer assembly by taking out the two screws attaching carburetor to manifold. Remove screws attaching fuel tank brackets to cylinder head. Remove magneto plate mounting screws, and take off magneto assembly.

PUMPING ENGINE

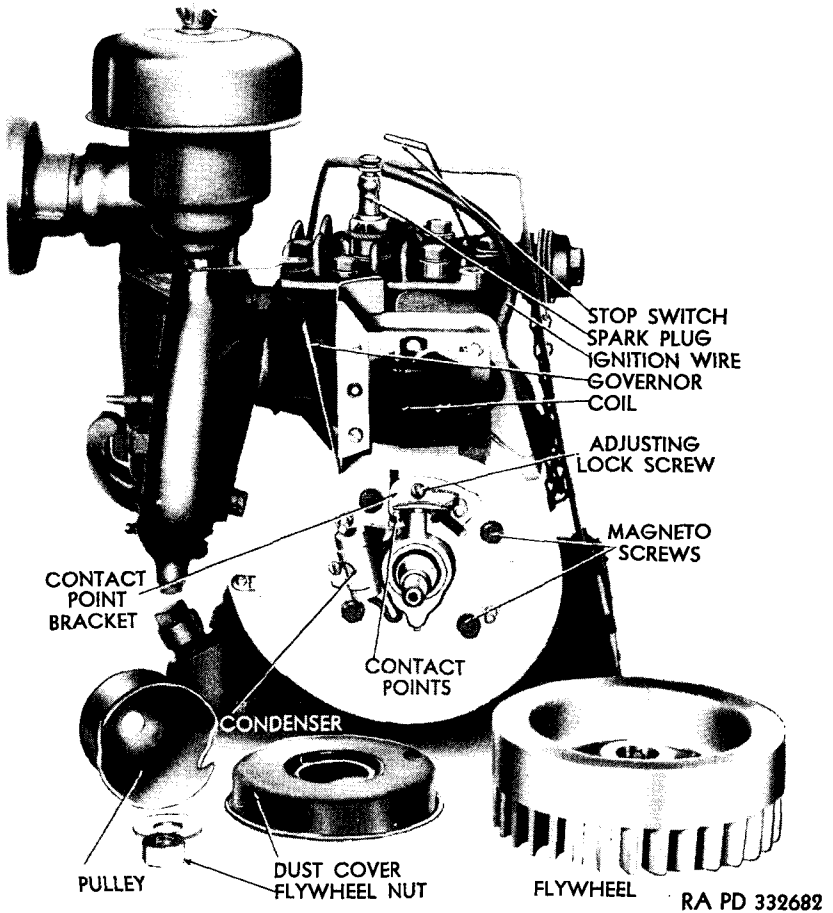


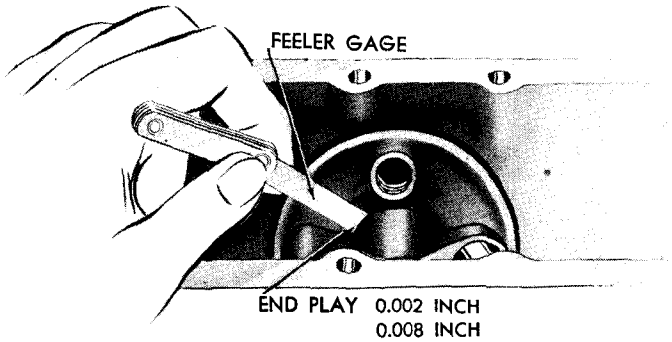
Figure 67—Magneto With Dust Cover Removed

e. **Installation.** Use proper thickness gasket to give end play of 0.002 to 0.008 inches between magneto bearing and crankshaft thrust faces. Use one of the following new gaskets for proper end play (fig. 68):

BR-6759	0.005 in.
BR-67607.....	0.009 in.
BR-67307.....	0.015 in.

Install gasket and magneto assembly with magneto plate mounting screws and lock washers. Install dust cover, flywheel, and blower (par. 68).

**SEMITRAILER, 6-TON PAYLOAD, 10-TON GROSS,
2-WHEEL, FUEL TANK, 2000-GALLON**



RA PD 332748

Figure 68—Correct Crankshaft End Play

70. FLYWHEEL (fig. 67).

a. Description. The flywheel serves as magneto magnet, flywheel, and blower fan for cooling engine. Air is forced by the blower housing around the fins on the cylinder head for proper cooling. Do not operate engine with blower housing removed.

b. Removal. Disconnect fuel line, and move clear of housing. Move housing attaching screws and take off housing. Place block under fins to prevent flywheel turning and loosen flywheel nut by turning clockwise with 10-inch, or longer wrench. Tap wrench with hammer to loosen nut. Place wood block against end of crankshaft and strike with hammer to loosen flywheel, while prying from behind.

c. Installation. Locate flywheel on crankshaft with key, and install spring washer with hollow or concave side next to flywheel. Place block under flywheel, and draw flywheel nut up very tightly by turning counterclockwise with 10-inch, or longer, wrench. Tap wrench with hammer to tighten. Set blower housing in place, and install attaching screws and lock washers. Connect fuel line.

71. CYLINDER.

a. Description. The cylinder head is held in place with six cap screws. It is finned for cooling, and has the spark plug installed in it.

b. Removal. Remove spark plug and cylinder head attaching bolts (fig. 69).

c. Installation. Use a new gasket. If new gasket is not available, clean the old one, and coat both sides with grease, do not use

PUMPING ENGINE

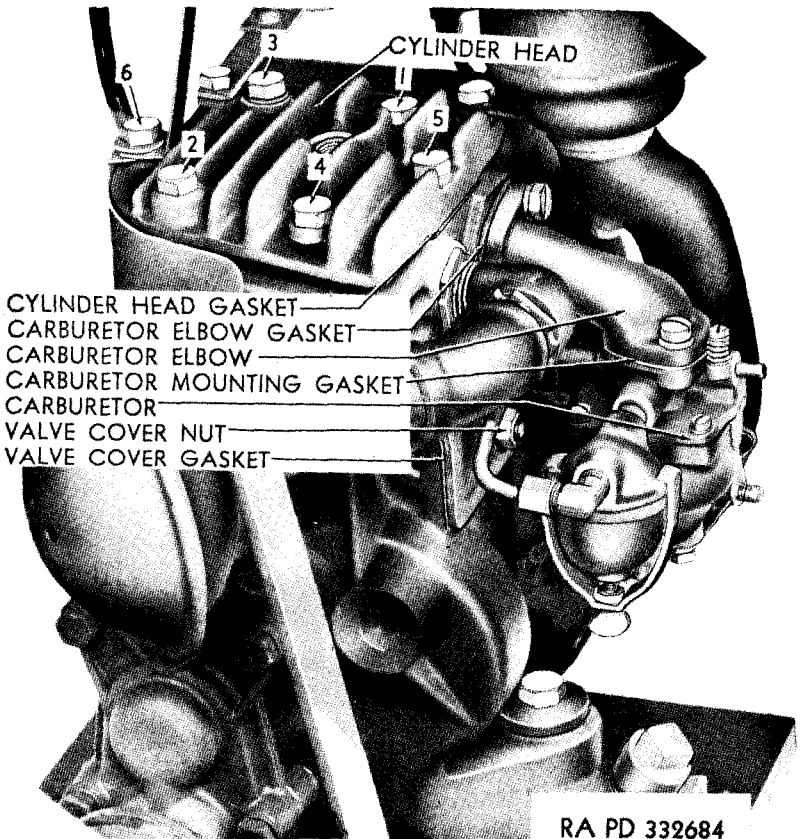


Figure 69—Cylinder Head

shellac. Set cylinder head and gasket in place on cylinder, and install cap screws. With engine cold, tighten cap screws a little at a time, taking them in sequence of numbers shown in figure 69. Replace spark plug with a small amount of graphite on the threads.

72. REMOVAL, INSTALLATION AND ALINEMENT (fig. 63).

a. **Removal.** Remove attaching nuts, and drop bolts down through mounting bracket. Back engine away from coupling, and lift off from mounting bracket. Loosen set screw on coupling, and remove from engine shaft.

b. **Installation.** Install engine half coupling on engine shaft with feather key and set screw. Tighten on shaft with end flush with face of coupling. Set engine in place, engaging pump and engine

**SEMITRAILER, 6-TON PAYLOAD, 10-TON GROSS,
2-WHEEL, FUEL TANK, 2000-GALLON**

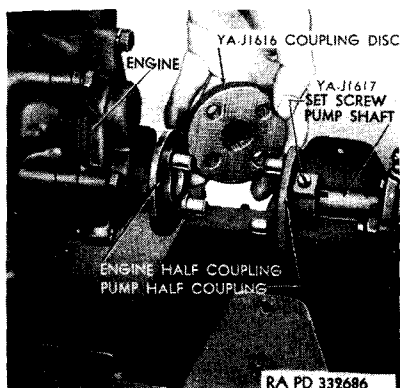


Figure 70—Coupling Disk

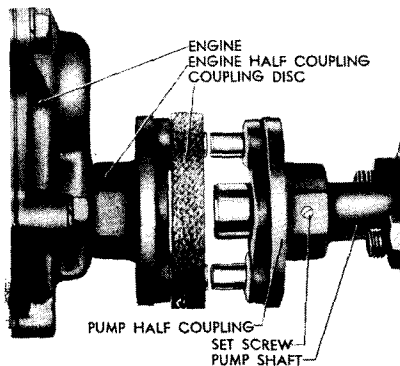


Figure 71—Alining Pump and Engine

coupling halves in the coupling disk (fig. 70). Install attaching bolts from below, lock washers, and nuts. Before tightening nuts, aline pump and engine (subpar. c below).

c. **Aline Couplings** (figs. 70 and 71). To operate freely, the shafts of the gasoline engine and pump must be in line. Loosen set screw and slide pump coupling back on pump shaft. Rotate shaft until pins line up (fig. 71).

d. **Shim Motor or Pump**. Loosen pump or engine attaching nuts, and shim up pump or engine until the pins are perfectly alined in both the horizontal and vertical planes, and tighten attaching nuts. Turn pump coupling until pins line up with proper holes in coupling disk and slide out on pump shaft until it properly engages coupling. Be sure key is in place, and tighten down set screw.

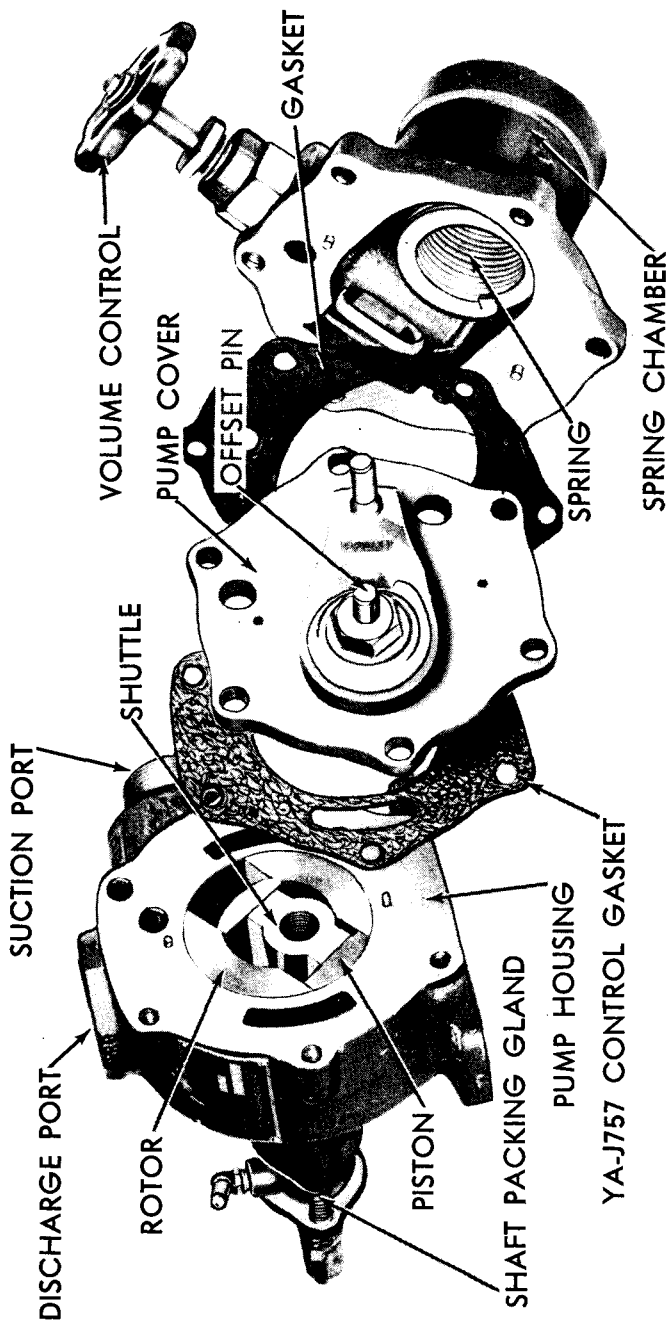
Section XIX

PUMP

73. DESCRIPTION.

a. The pump used in the portable engine driven pump unit is a Yale and Towne model 20 DV having a capacity of 20 gallons per minute. A manual volume control is provided for easy starting of the engine. Pump is driven by the engine through a flexible coupling attaching pump and engine shafts. Except for shaft gland grease fitting the pump is self lubricating.

PUMP



RA PD 332749

Figure 72—Pump Disassembled To Show Major Parts

**SEMITRAILER, 6-TON PAYLOAD, 10-TON GROSS,
2-WHEEL, FUEL TANK, 2000-GALLON**

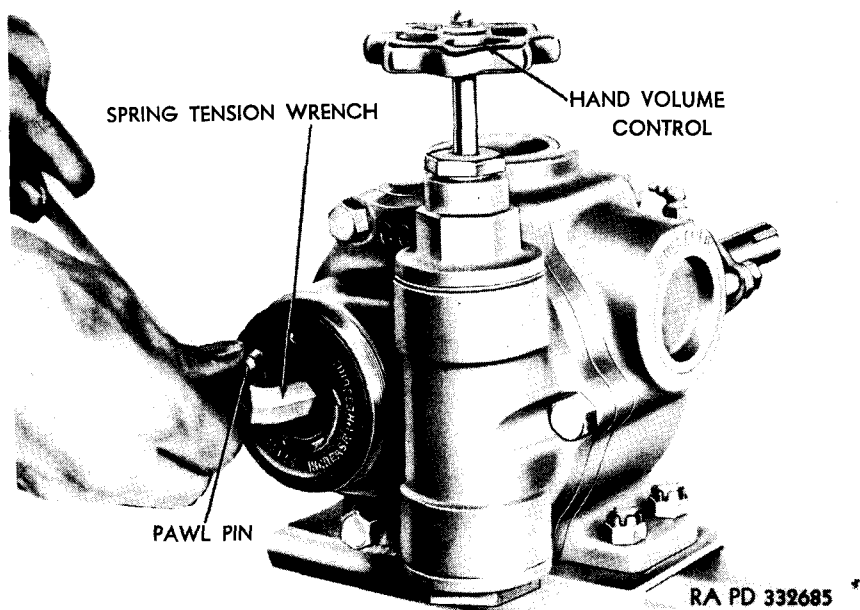


Figure 73—Adjusting Discharge Pressure of Pump

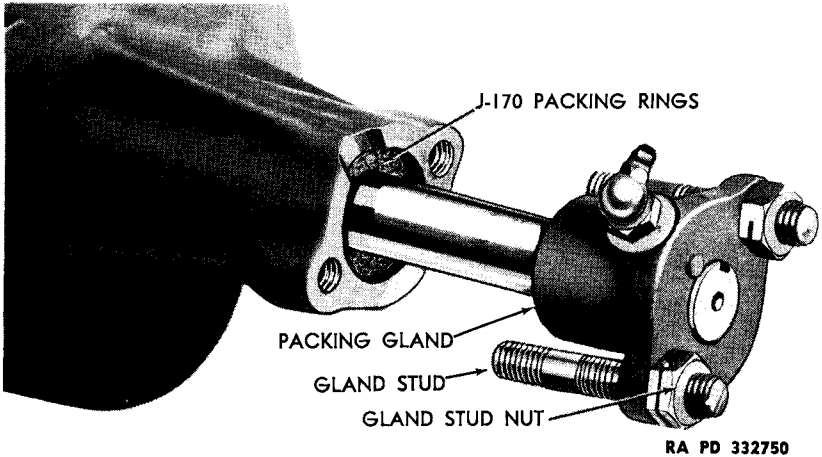
74. DISCHARGE PRESSURE ADJUSTMENT.

a. Remove spring chamber cap. Insert spring adjusting wrench in end of top spring plate (fig. 73). Turn the wrench to the left, until spring tension is felt, and the control mechanism comes up against the stop. Turn the wrench until eight holes in spring plate have passed hole in head casting, and insert the pawl pin to lock spring in position. This tension should give an approximate idling pressure of 25 pounds. Screw spring chamber cap on tightly before operating the pump.

75. PACKING GLANDS.

a. **Pump Shaft Gland** (fig. 74). The 20 DV tri-rotor pump is equipped with a bearing bronze packing gland which, due to its extended support on the shaft, eliminates the necessity of an outboard bearing. It is packed with a special gasoline and fuel oil resisting packing (YA-J170). To adjust, tighten nuts evenly and just enough to prevent leakage, no more. A grease fitting is provided to lubricate this gland. If gland heats up when pump is first put into service, grease frequently until gland runs cool. If gland has been tightened

PUMP

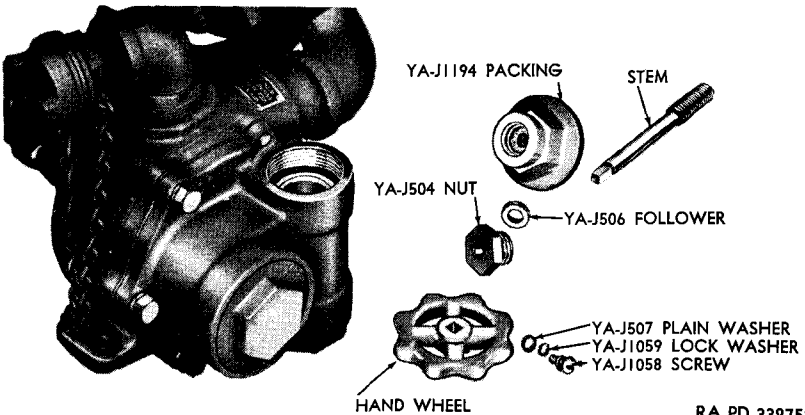


RA PD 332750

Figure 74—Pump Shaft Packing Gland

as far as it will go and leak persists, remove gland, and install new packing set.

b. Volume Control Packing (fig. 75). If volume control packing leaks, adjust by turning gland nut just far enough to stop the leak, no more. If leak persists after nut has been tightened as far as possible, remove hand wheel, gland nut, follower, and replace packing. Install follower, gland nut, and hand wheel.



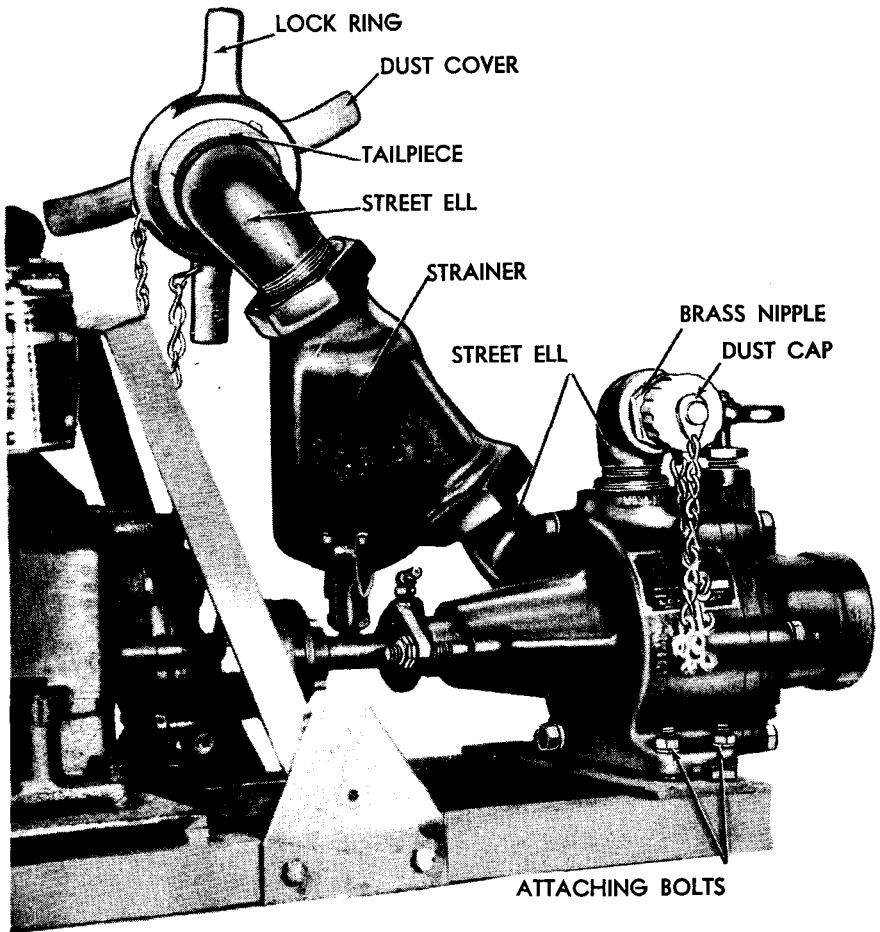
RA PD 332751

Figure 75—Volume Control Packing Gland

76. REPLACEMENT OF GASKETS.

a. The control head gaskets (YA-5757) and end cap gasket (YA-5764) are replaced by disassembling pump into the three major assemblies as shown in figure 72. To do this, remove the spring cap,

**SEMITRAILER, 6-TON PAYLOAD, 10-TON GROSS,
2-WHEEL, FUEL TANK, 2000-GALLON**



RA PD 332752

Figure 76—Pump Suction Line, and Lock Ring

which unscrews, and release spring tension by inserting spring tension wrench (fig. 73), and exerting sufficient pressure in counter-clockwise direction, and removing pawl pin. Remove bolts attaching control head, and disassemble pump. **CAUTION: Do not drop out or disassemble rotor parts.** Install new gaskets and bolt pump together. Adjust spring tension (par. 74).

77. REMOVAL AND INSTALLATION (fig. 76).

a. **Removal.** Remove pump suction line, strainer (par. 78), and discharge line elbow, and reducer. Remove attaching nuts and

PUMP

drop bolts through mounting bracket. Slide pump back to disengage coupling, and remove from base. Loosen coupling set screw, and slide off pump half coupling and feather key.

b. Installation. Install pump half coupling on pump shaft with key but do not tighten set screw. Set pump in place on base, and attach with bolts, nuts, and lock washers. Aline pump and engine (par. 72). Install reducer and street elbow in pump discharge port. Install 1-inch adapter and dust cap in street ell. Install pump suction line and strainer.

78. SUCTION LINE AND STRAINER.

a. Suction Line (fig. 76). The pump suction line consists of a quick coupler lock ring, line strainer, street elbows, and reducing bushings.

(1) **LOCK RING GASKET.** The lock ring clamps the quick coupler nut against a gasket (ON-HM 72). To replace, pull the gasket out by the fingers (fig. 76), and insert a new one.

(2) **REMOVAL.** Twist line into position so that strainer may be unscrewed from street elbow, which is attached to pump by a nipple. Remove strainer clamp and cover, then remove strainer body from elbow. Remove street ell and nipple at pump.

(3) **INSTALLATION.** Use antisieze compound on all threaded joints. Install close nipple in suction port of pump, and install street elbow on nipple. Turn ell into position (fig. 76), and install strainer with reducing bushing. Install street ell, and quick coupling on strainer, and twist into correct position (fig. 63).

b. Strainer (fig. 77).

(1) **SERVICING.** Loosen strainer cover clamp lock nut and screw. Remove clamp and cover. Withdraw strainer screen from body, and wash out with dry-cleaning solvent. Flush out strainer body, and the cover also. Insert screen in body. Install cover and clamp.

(2) **REPLACING CAP GASKET** (fig. 77). The strainer cap is fitted with a cork gasket (ON-HM 440). Should a leak develop at the cap, replace this gasket. Loosen nut, remove clamp and cap. Pry out old gasket, and install new gasket. Install cap, clamp, and tighten in place with nut.

(3) **REMOVAL.** Remove quick coupling and street ell on inlet side of strainer. Twist line into position (fig. 76) and remove strainer clamp and cover. Remove strainer from ell attached to pump.

**SEMITRAILER, 6-TON PAYLOAD, 10-TON GROSS,
2-WHEEL, FUEL TANK, 2000-GALLON**

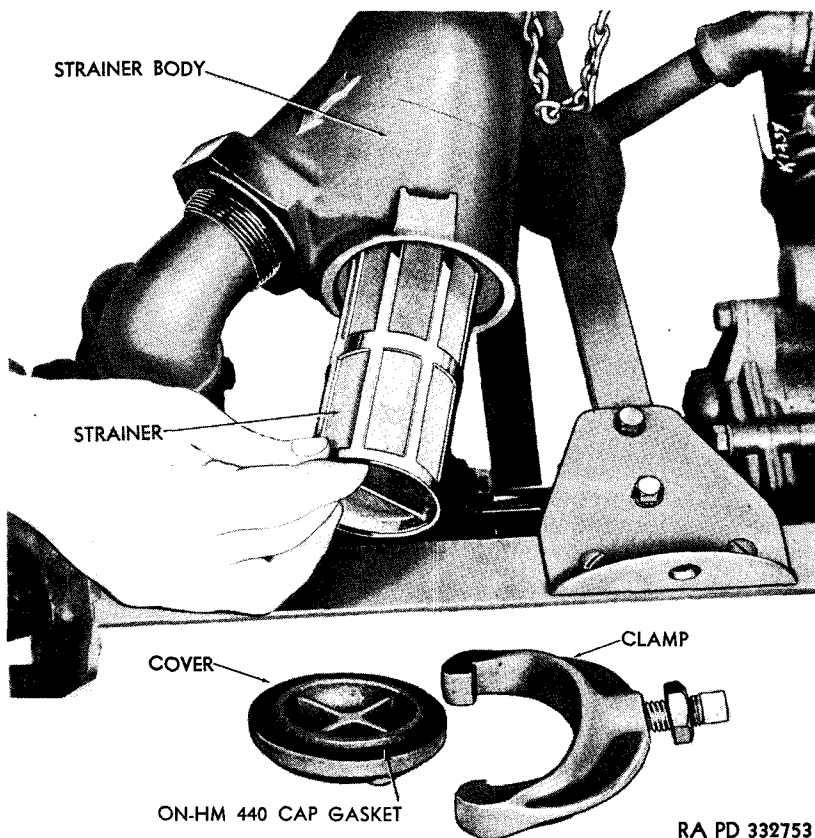


Figure 77—Strainer

(4) **INSTALLATION.** Use red lead on all threaded joints. Remove cover and clamp from strainer. Install strainer on ell attached to pump and attach cover with clamp. Arrow cast in body, must point towards pump. Install street ell and quick coupling with dust cover on inlet side of strainer. Twist suction line into correct position (fig. 63).

**Section XX
FIRE EXTINGUISHERS**

79. CARBON DIOXIDE TYPE EXTINGUISHER (fig. 1).

a. **Description.** A single CO₂ fire extinguisher (58-E-201-20) is carried in clamps at the rear on the right side hose tube. This type extinguisher uses carbon dioxide as the extinguishing agent. Carbon dioxide is normally colorless except that, when discharging, it re-

TRAILER CONVERTER DOLLY

sembles a cloud of steam. When inhaled, it produces a tingle in the nostrils, the same as experienced when drinking soda water. It is a non-conductor of electricity, is non-injurious to all substances, and although heavier than air, it may be easily diffused, and removed by ventilation.

b. **Service.** Weigh each fire extinguisher every 6 months. The total weight with hose and horn should be 50¼ pounds. If the total weight falls below 49¼ pounds, have it recharged immediately. A record card is attached to the extinguisher. Keep an accurate record of weights, and recharges on this card. When assembling hose on the extinguisher outlet, never twist the hose beyond the fitting attached to the hose. Screw hose on finger-tight only, then use small wrench on hexagon fitting, seating the fitting lightly against the face of the extinguisher valve.

c. **Removal and Installation.** Pull clamps open and lift from hose tube. Replace with front of extinguisher towards front of vehicle and with horn clamp on top. Pull clamp tightly around the extinguisher.

80. CARBON-TETRACHLORIDE TYPE EXTINGUISHER (fig. 16).

a. **Description.** The hand-type extinguisher (58-E-202) which is carried in clamps in the rear stowage compartment uses carbon tetrachloride as its extinguishing agent. It is operated by pumping the handle in and out. The extinguishing liquid is a non-conductor of electricity and is antifreeze.

b. **Service.** Refill used extinguisher at once with carbon tetrachloride. Remove fill plug and, with pump handle in locked position, pour in liquid until case is full. **CAUTION:** *Use carbon tetrachloride filler only. Water or other substitutes will damage extinguisher and render use on electrical fires dangerous.*

c. **Removal and Installation.** Open rear stowage compartment to gain access to extinguisher. Pull clamp handles forward to unlock clamp, grasp body of extinguisher, and pull from clamp. Install extinguisher, lock handle, and push extinguisher into clamp (fig. 16). Lock clamps.

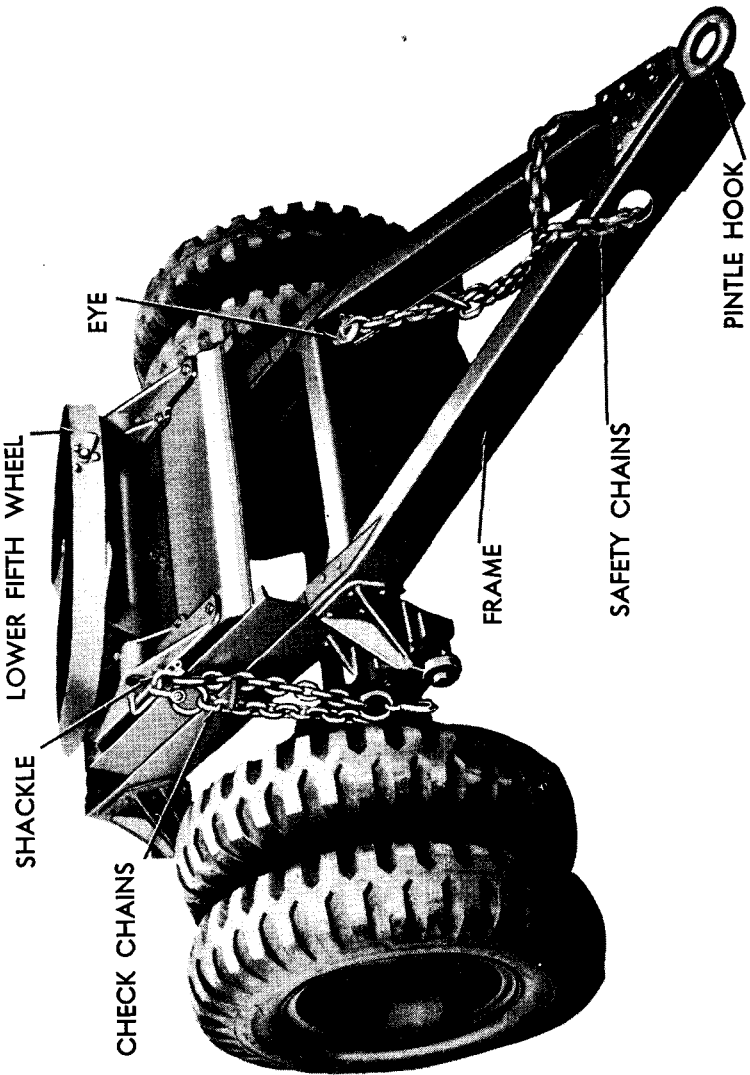
Section XXI

TRAILER CONVERTER DOLLY

81. TRAILER CONVERTER DOLLY (fig. 78).

a. **Description.** The trailer converter dolly consists of a frame mounted on springs, and a single axle equipped with 9.00-20 non-directional mud-and-snow tread tires. A semiautomatic lower fifth wheel is bolted to the top of the frame. The dolly is equipped with check chains and safety chains.

SEMITRAILER, 6-TON PAYLOAD, 10-TON GROSS,
2-WHEEL, FUEL TANK, 2000-GALLON



RA PD 340303

Figure 78—Semitrailer Converter Dolly

TRAILER CONVERTER DOLLY

b. Interchangeability With Semitrailer. All of the following parts are interchangeable on semitrailer and converter dolly: tires, wheels, hubs, bearings, seals, springs, brackets, radius rods, radius rod bushings, and U-bolts. The converter dolly axle is the same type as the one used in the semitrailer, except without brake chambers and brakes. In an emergency, either axle could be substituted for the other.

c. Wheels and Hubs. The semitrailer and converter dolly wheels and hubs are the same. See paragraph 34 for instructions. The dolly axle does not have brake drums installed on the hubs as the semitrailer axle has.

d. Axle.

(1) **DESCRIPTION.** This is the same axle used on semitrailer except it does not have brakes. It consists of a tubular steel axle beam with camber permanently fixed by a bend in the beam. Spring seats are welded to the axle.

(2) **REMOVAL.** If axle beam is to be replaced, remove wheels and tires before removing axle (par. 34). If axle is to be removed for any other reason, it is not necessary to remove wheels and tires, inasmuch as the axle can then be rolled out on the wheels. Jack up dolly frame until wheels clear the ground. Remove wheels if necessary. If wheels are removed, place portable jack under axle to support it, and jack up until tension is removed from springs. Loosen U-bolt nuts, and remove U-bolts. Remove radius rod nut, bolt, retainers, and bushings from spring seat (fig. 79). Roll axle out from under frame. Strip axle beam of usable parts, if it is damaged.

(3) **INSTALLATION.** Place axle on portable jack with spring seats up and radius rod connection towards the front. Move axle in place below frame, and lower frame until springs rest on spring brackets. Attach U-bolt clamps below axle, and install U-bolt nuts and high nuts. Attach radius rod with bushings, retainers, bolts, and nuts. Coat bushings with shock absorber fluid before installing lower jack supporting axle, and remove jacks supporting dolly frame.

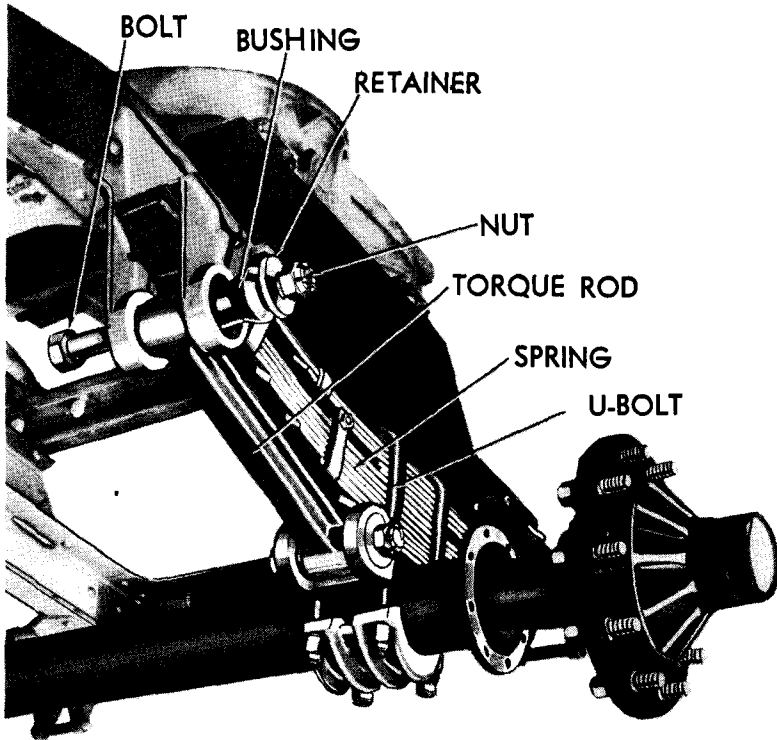
e. Springs and Radius Rods. Springs and radius rods are the same on dolly and semitrailer. See paragraphs 43 and 44 for instructions.

f. Chains. Check chains and safety chains are attached to the dolly frame by shackles with bolts, nuts, and lock washers. To remove a chain, remove the nut and bolt on the shackle, then remove chain.

82. LOWER FIFTH WHEEL.

a. Description. A semiautomatic lower fifth wheel is bolted to the dolly frame. It is pivoted to rock forward and backward only, not sideways.

**SEMITRAILER, 6-TON PAYLOAD, 10-TON GROSS,
2-WHEEL, FUEL TANK, 2000-GALLON**



RA PD 332674

Figure 79—Spring Suspension

b. Removal of Fifth Wheel. To remove the lower fifth wheel, remove nuts from bolts attaching fifth wheel brackets to plate on top of frame. Hook a hoist on the fifth wheel, and lift off from the frame.

c. Installation of Fifth Wheel. Set fifth wheel in position on top of frame, with V-opening towards rear of frame. Bolt fifth wheel brackets to the plate.

d. Lubrication and Testing. Smear a thin coating of grease on top of the fifth wheel plate and lubricate all fittings. Check operation of fifth wheel by coupling dolly to semitrailer. Check to see that jaws snap closed on contact with semitrailer kingpin, and that lock will secure it in closed position. Check lever to see that it will properly unlatch the jaws for uncoupling from semitrailer.

APPENDIX

Section XXII

SHIPMENT AND LIMITED STORAGE

83. GENERAL INSTRUCTIONS.

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

84. PREPARATION FOR LIMITED STORAGE.

a. Vehicles to be prepared for limited storage are those ready for immediate service but not used for less than 30 days. If vehicles are to be indefinitely stored after shipment by rail, they will be prepared for such storage at their destination.

b. If the vehicles are to be placed in limited storage, take the following precautions:

- (1) **LUBRICATION.** Lubricate the vehicle completely (par. 14).
- (2) **TIRES.** Clean, inspect, and properly inflate all tires including spares. Replace with serviceable tires, all tires requiring repairing or retreading. Do not store vehicle on floors, cinders, or other surfaces which are soaked with oil or grease. Wash off immediately any oil, grease, gasoline, or kerosene which comes in contact with tires under any circumstances.
- (3) **ROAD TEST.** The preparation for limited storage will include a road test after the lubrication service to check on the general condition of the vehicle. Correct any defects noted in the vehicle operation before the vehicle is stored, or attach a tag in a conspicuous place, stating the repairs needed or describing the condition present. A written report of these items will then be made to the officer in charge.
- (4) **FUEL IN TANKS.** It is not necessary to remove the fuel from the tanks for shipment within the United States, nor to label the tanks under Interstate Commerce Commission Regulations. Leave fuel in tanks except when storing in locations where fire ordinances or other local regulations require removal of all gasoline before storage.
- (5) **EXTERIOR OF VEHICLE.** Remove rust appearing on any part of the vehicle exterior with flint paper. Repaint surfaces whenever necessary to protect wood or metal. Coat exposed polished metal surfaces susceptible to rust, such as chains, with medium grade preservative lubricating oil. Close the rear doors.

**SEMITRAILER, 6-TON PAYLOAD, 10-TON GROSS,
2-WHEEL, FUEL TANK, 2000-GALLON**

(6) **INSPECTION.** Make a systematic inspection just before shipment or limited storage to insure all above steps have been covered and that the vehicle is ready for operation on call. Make a list of all missing or damaged items and attach it in a conspicuous place. Refer to Before-operation Service (par. 16).

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

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

85. LOADING AND BLOCKING FOR RAIL SHIPMENT.

a. **Preparation.** In addition to the preparation described in paragraph 84 when ordnance vehicles are prepared for domestic shipment, the following preparation and precautions must be taken:

(1) **EXTERIOR.** Cover the body of the trailer with the canvas cover supplied as an accessory or available for use during rail shipment.

(2) **RAILROAD BRAKE WHEEL CLEARANCE.** Place the vehicle in position with a railroad brake wheel clearance of at least 6 inches. The vehicles will be located on the car in such a manner as to prevent the car from carrying an unbalanced load.

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

(4) Ordnance vehicles may be shipped on flat cars, end door box cars, side door cars, or drop end gondola cars, whichever type is the most convenient.

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

c. **Securing Vehicles.** In securing or blocking a vehicle, three motions, lengthwise, sidewise, and bouncing, must be prevented. Two methods for blocking vehicle on freight cars (fig. 80) are given below. **NOTE:** *All wheel blocking must be located against the outside wheel of the dual.*

(1) **FIRST METHOD.**

(a) **Front of Vehicle.** Position supporting frame beneath the connection plates so that crossbeam is at right angles to the trailer

SHIPMENT AND LIMITED STORAGE

frame. Nail one cleat (2- x 4- x 8-in.) to the top of the crossbeam against the outside of the frame on each side, using four 40-penny nails for each cleat (fig. 80). Toe-nail the three supports (fig. 80) to the car floor using 40-penny nails. Toe-nail braces (fig. 80) and nail all cleats to the car floor with 40-penny nails.

(b) *Rear of Vehicle.* Place four blocks (C, fig. 80), one to the front and one to the rear of each wheel. Nail the heel of the block to the car floor with five 40-penny nails, and nail the portion of the block under the tire to the car floor with two 40-penny nails. Place two cleats (D, fig. 80) to the outside of each wheel (four cleats (D) required). Nail the lower cleat to the car floor with three 40-penny nails, and nail the top cleat to the cleat below with three 40-penny nails.

(c) *Strapping Vehicle* (fig. 80). Secure vehicle in front (H) and at the side (J) by strapping, consisting of four strands, two wrappings, of No. 8 gage, black annealed wire, passed around the connection plate roller and secured at the stake pockets of the railroad car. Secure vehicle at wheels (L) by passing wire through opposite openings in the wheels, and attaching at the closest stake pocket of the car.

(2) **SECOND METHOD.**

(a) *Front of Vehicle.* The front of the vehicle is blocked the same as in first method (step (1) (a) above).

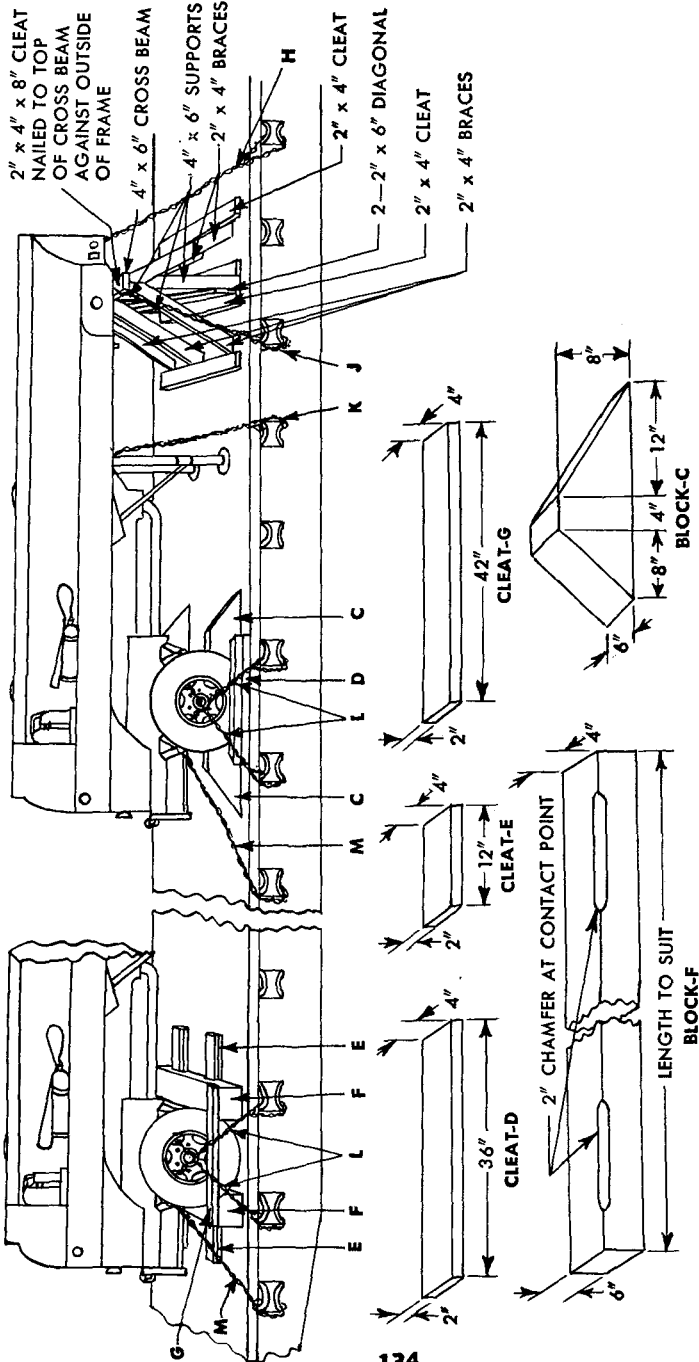
(b) *Rear of Vehicle* (fig. 80). Place one block (F) to the front, and one to the rear of the wheels. Blocks (F) must be at least 8 inches longer than the over-all width of the vehicle at the car floor. Place cleats (G) against the outside face of the wheels on top of blocks (F). Nail cleats (G) to blocks (F) with 40-penny nails, using two nails at each end of cleat (G). Place cleats (E) against blocks (F), two to the front and two to the rear of each outside wheel. Nail each lower cleat to the car floor with three 40-penny nails, then nail each top cleat to the cleat below with three 40-penny nails.

(c) *Strapping Vehicle.* Strapping is applied in the second method as in step (1) (c) above.

d. Shipping Data.

Length of vehicle (over-all).....	20 ft
Width of vehicle (over-all).....	8 ft
Height of vehicle (over-all).....	7 ft 9 in.
Shipping weight per vehicle.....	6,750 lb
Volume occupied per vehicle (approximate).....	1,240 cu ft
Area of car floor occupied per vehicle (approximate).....	160 sq ft
Bearing pressure (lb per sq ft of area occupied per vehicle) (approximate).....	42

SEMITRAILER, 6-TON PAYLOAD, 10-TON GROSS,
2-WHEEL, FUEL TANK, 2000-GALLON



RA PD 341041

Figure 80—Blocking Requirements for Rail Shipment

Section XXIII
REFERENCES

86. PUBLICATIONS INDEXES.

The following publications indexes should be consulted frequently for latest changes to or revisions of the publications given in this section and for new publications relating to materiel covered in this manual:

- a. Introduction to Ordnance Catalog (explaining SNL system) ASF Cat.
ORD 1 IOC
- b. Ordnance Publications for Supply Index (index to SNL's) ASF Cat.
ORD 2 OPSI
- c. Index to Ordnance Publications (listing FM's, TM's, TC's, and TB's of interest to Ordnance personnel, FSMWO's, OPSR, BSD, S of SR's, OSSC's and OFSB's and including alphabetical listing of Ordnance major items with publications pertaining thereto) OFSB 1-1
- d. List of Publications for Training (listing MR's, MTP's, FM's, TM's, TR's, TB's, SB's, MWO's, WDLO's, and FT's) FM 21-6
- e. List of Training Films, Film Strips and Film Bulletins (listing TF's, FS's, and FB's by serial number and subject) FM 21-7
- f. Military Training Aids (listing graphic training aids, models, devices, and displays) FM 21-8

87. STANDARD NOMENCLATURE LISTS.

- Cleaning, preserving and lubrication materials, recoil fluids, special oils, and miscellaneous related items SNL K-1
- Semitrailer, 6-ton, payload, 10-ton gross, 2-wheel fuel tank, 2,000-gallon SNL G-678
- Soldering, brazing and welding materials, gases and related items SNL K-2
- Tool sets (common), specialists and organizational SNL G-27
Section 2
- Tool sets—for Ordnance service command, automotive shops SNL N-30
- Tools, maintenance, for repair of automotive vehicles SNL G-27
Section 1

**SEMITRAILER, 6-TON PAYLOAD, 10-TON GROSS,
2-WHEEL, FUEL TANK, 2000-GALLON**

88. EXPLANATORY PUBLICATIONS.

a. Fundamental Principles.

Automotive electricity	TM 10-580
Basic maintenance manual	TM 38-250
Chassis, body, and trailer units	TM 10-560
Driver selection and training	TM 21-300
Driver's manual	TM 10-460
Electrical fundamentals	TM 1-455
Military motor vehicles	AR 850-15
Motor vehicle inspections and preventive maintenance service	TM 9-2810
Precautions in handling gasoline	AR 850-20
Standard military motor vehicles	TM 9-2800

b. Maintenance and Repair.

Cleaning, preserving, lubricating, and welding materials and similar items issued by the Ordnance department	TM 9-850
Maintenance and care of pneumatic tires and rubber treads	TM 31-200
Ordnance maintenance: Power brake systems (Bendix-Westinghouse)	TM 9-1827A

c. Protection of Materiel.

Camouflage	FM 5-20
Chemical decontamination, materials and equipment	TM 3-220
Decontamination of armored force vehicles....	FM 17-59
Defense against chemical attack	FM 21-40
Explosives and demolitions	FM 5-25

d. Storage and Shipment.

Ordnance storage and shipment chart, group G —major items	OSSC-G
Registration of motor vehicles	AR 850-10
Rules governing the loading of mechanized and motorized army equipment, also major caliber guns, for the United States Army and Navy, on open top equipment, pub- lished by Operations and Maintenance De- partment of Association of American Rail- roads.	
Storage of motor vehicle equipment	AR 850-18

**SEMITRAILER, 6-TON PAYLOAD, 10-TON GROSS,
2-WHEEL, FUEL TANK, 2000-GALLON**

C—(contd.)		Page	E		Page
Chocks			Echelons		
description	9		first	32	
pick up	15		second	41	
Cleaning			Electrical system		
all parts	27, 42		after-operation and weekly serv-		
engine	39		ice (wiring)	37	
road test	45		connecting cables	15	
wheels	61		data	91	
Condenser, replacement	116		description		
Conduits			conduits and wiring	94	
description and removal	94		sockets	9	
installation	95		system	88	
Connector, description and replace-			installation		
ment	108		conduits and wiring	95	
Controls, operation	9		lights	94	
Converter dolly (See Trailer con-			removal		
verter dolly)			conduits and wiring	94	
Couplings			lights	93	
alinement	120		trouble shooting	56	
description, hose and dummy	77		Emergency valve		
semitrailer to tractor or trailer			adjustment of valve operation	101	
converter dolly	14		description		
testing for serviceability	78		operator	100	
Crankcase, lubrication	27		valve	99	
Cut-out cocks, description and			installation and removal		
replacement	76		operator	101	
Cylinder, description, removal, and			valve	100	
installation	118		operation		
			operator	12	
			valve	18	
			Engine		
			cleaning	39	
			pump (starting)	23	
			trouble shooting	57	
			tune-up	110	
			Equipment		
			after-operation and weekly serv-		
			ice	39	
			before-operation service	35	
			(See also Auxiliary equipment		
			and under Lubrication)		
			Exchange Part or Unit Identifica-		
			tion Tag, W.D., O.O. Form		
			No. 7370	2	
			Exhaust check valve	75	

D

Decontaminators		
after-operation service	37	
before-operation service	35	
Doors, operation	12, 16	
Drain cock, description, testing,		
and replacement	75	
Driver's Trip Ticket W.D., Form		
No. 48	2	
Drums, brake, road test	46	
During-operation service	35	
Duty Roster, W.D., A.G.O. Form		
No. 6	2	

INDEX

F	Page	G	Page
Faucets		Gaskets	
adapter gasket	102	cap and lock ring	125
description	101	replacement (pump)	123
operation	12	Gland packing	
removal and installation	102	leaks	99
Fifth wheel		replacement	102
description	129	Glass, at-halt service	36
disengaging	16	Governor (engine)	
engage and test coupling	14	adjustment	45
installation, removal, lubrication, and testing	130	engine speed adjustment	112
operation	9	Gravity hose	
road test	49	description and use in unload- ing tank	18
special lubrication	50	draining and stowing	20
trouble shooting	58		
Final road test	52	H	
Fire extinguishers		Hose and fittings	
after-operation service	37	description and data	103
before-operation service	34	trouble shooting	57
carbon dioxide type		Hubs	
description	126	data	59
removal and installation	127	description	59, 66
carbon-tetrachloride type	127	installation	66
operation	25	removal	
road test	51	hub	66
Flywheel	118	wheel and hub assembly	60
Foundation brake assembly (<i>See</i> <i>under Brake system</i>)		temperatures	36
Frame, road test	49	trouble shooting	52
Fuel, safety precautions in han- dling	17	I	
Fuel filter		Ignition wire, care in handling, removal, and replacement	115
cleaning	112	Intake systems, description, check- ing clearances, and valve timing	115
description	113		
installation and removal	114	Jumper cable sockets	
Fuel line		description	95
cleaning	112	removal and installation	96
description and servicing	114	L	
removal and installation	115	Lamps (lights)	
Fuel tank		after-operation service	37
cleaning	112	road test	50
removal and installation	115		
shipment and storage	131		

**SEMITRAILER, 6-TON PAYLOAD, 10-TON GROSS,
2-WHEEL, FUEL TANK, 2000-GALLON**

L—(contd.)		Page	N	Page
Landing gear			Nozzle valve	108
description	4, 86		Nuts (wheel and flange), at-halt	
operation	9		service	36
removal and installation	86			
retracting	15		O	
road test	51		Oilcan points	27
trouble shooting	56			
Leaks			P	
at-halt service	36		Packing glands	
road test	44		pump shaft	122
Lights			volume control packing	123
description and replacing lamp			Participation, first echelon in second echelon maintenance services	41
unit	91		Pintle hook, road test	51
installation	94		Piping assemblies	
removal	93		installation	99
(See also under Electrical System and Lamps)			removal	98
Loading for rail shipment	132		Piping system	
Lock ring gasket, replacement	125		data	98
Locks, operation	12		description	96
Lower fifth wheel (See Fifth wheel)			trouble shooting	56
Lubrication			Portable gasoline engine driven pump unit	22
after-operation service	39		Power pump, road test	44
by maintenance personnel	32		Publications, road test	52
equipment	26		Pump	
points of application and notes	27		adjustment of discharge pressure	122
special	42		description	
Lubrication order	26		pump	120
			shaft gland	122
M			installation	125
Magneto			removal	124
adjustment	116		starting	23
description	115		trouble shooting	58
installation	117		Pumping engine	
removal	116		data	109
Maintenance			description	
first echelon	32		cylinder	118
general discussion	42		engine	108
second echelon	44		removal and installation	
Manhole covers			cylinder	118
description	86		engine	119
operation	12, 17			
removal and installation	87			
Modifications (MWO's completed)	52			

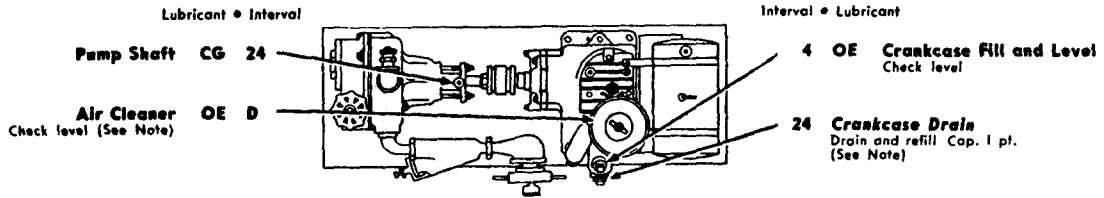
19 FEBRUARY 1945

SEMITRAILER, 6 TON PAYLOAD, 10 TON GROSS, 2-WHEEL, FUEL TANK, 2,000 GAL.

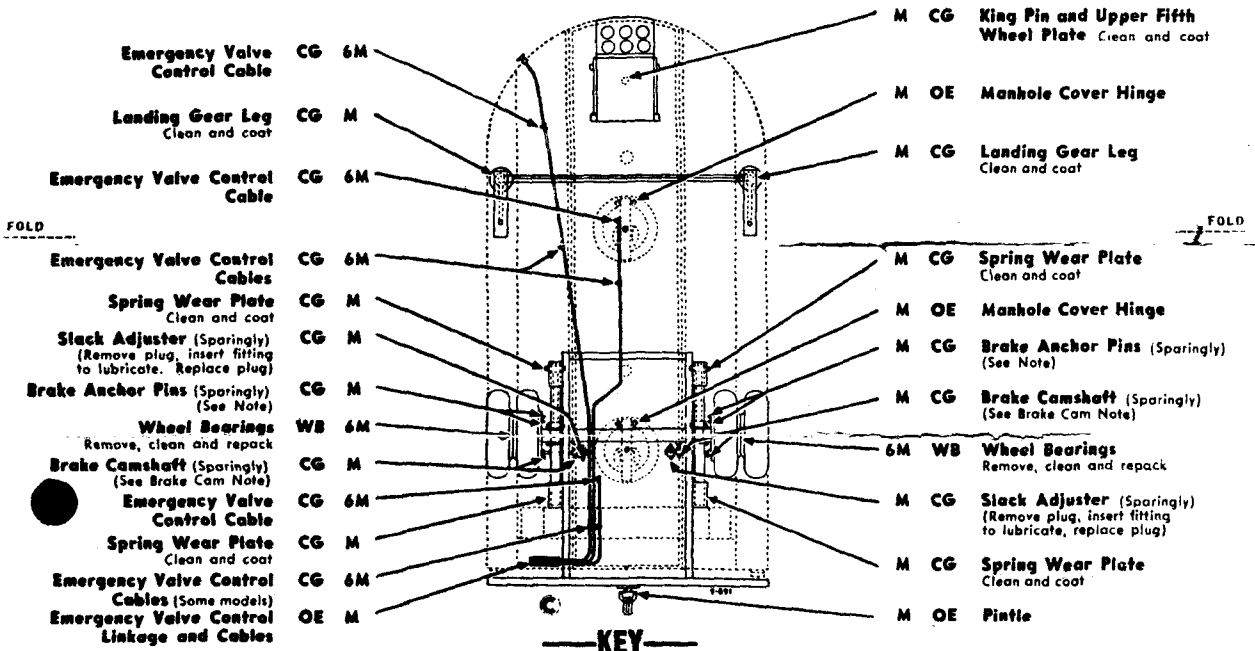
References: ORD 7 SNL G-478, TM 9-891.

Check fittings before lubricating. Lubricate after work is done.
Clean parts with SOLVENT, dry cleaning or OIL, fuel, Diesel. Dry before lubricating.

Service intervals are based on actual operation under normal conditions. Reduce under extreme conditions. Extend when not in use.



PUMP AND ENGINE



LUBRICANTS	LOWEST ANTICIPATED AIR TEMPERATURE			LUBRICANTS	INTERVALS
	above +32°F.	+32°F. to 0°F.	below 0°F.		
OE—OIL, engine	SAE 30	SAE 10	SAE 10	WB—GREASE, general purpose, No. 2	D—Daily M—Monthly 6M—6 months 4—4 hours 24—24 hours
Crankcase	SAE 30	SAE 10	PS		
Other points	SAE 30	SAE 10	PS		
CG—GREASE, general purpose	No. 1	No. 0	No. 0	PS—OIL, lubricating, preservative, special	

NOTES

AIR CLEANER—Fill to bead level with used crankcase oil or OE. Below 0°F. use OE (SAE 10). Every 24 hours of operation, disassemble, clean all parts, reassemble and refill.

BRAKE CAM AND ANCHOR PINS—When wheel bearings are removed, clean brake cams and coat lightly with WB. Clean and lubricate brake anchor pins with 1 or 2 drops of OE.

CRANKCASE—Drain only when engine is hot. Below 0°F., drain when engine will not be operated for 4 hours or more. Locate tag to indicate crankcase is empty.

OIL CAN POINTS—Monthly, lubricate Manhole Cover Lock Arms, Brake Clevises and Compartment Latches and Hinges with OE.

DO NOT LUBRICATE—Springs, Radius Rod Bushings.

Copy of this Lubrication Order will remain with the equipment at all times; instructions contained therein are mandatory and supersede all conflicting lubrication instructions dated prior to 19 February 1945.

[A.G. 300.8 (19 February 1945)]

BY ORDER OF THE SECRETARY OF WAR:

OFFICIAL:

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

G. C. MARSHALL,
Chief of Staff.