TM 9-1795D

WAR DEPARTMENT

TECHNICAL MANUAL

ORDNANCE MAINTENANCE

BODY AND CHASSIS FOR HEAVY WRECKING TRUCK M1

JANUARY 27, 1943

TM 9-1795D

TECHNICAL MANUAL
No. 9-1795D

WAR DEPARTMENT
Washington, January 27, 1943

ORDNANCE MAINTENANCE

BODY AND CHASSIS FOR HEAVY WRECKING TRUCK M1

Prepared under direction of
Chief of Ordnance
(with the cooperation of the Ward La France Truck Corporation)

CONTENTS

ORDNANCE MAINTENANCE
BODY AND CHASSIS FOR HEAVY WRECKING TRUCK M1

CHAPTER 1

INTRODUCTION

1. PURPOSE AND SCOPE.

a. The instructions contained in this manual are for the information and guidance of the personnel charged with the maintenance and repair of the Heavy Wrecker M1, series 2. Information on the detailed construction of the unit, disassembly and assembly procedure, inspection, maintenance and repair is contained in four Technical Manuals—TM 9-1795A, TM 9-1795B, TM 9-1795C and TM 9-1795D—of which this is the fourth—TM 9-1795D. This manual covers a description of and procedure for, the disassembly, inspection, repair and assembly of the brakes, frame, springs, shock absorbers, steering, body and sheet metal. It also contains instructions for packing, shipping and storage, as well as instructions for preparing the vehicle for use in cold climates. Detailed information concerning general decontamination of the unit is contained in TM 9-795. TM 9-1795A covers a description of the Heavy Wrecking Truck M1, series 2; including differences between series 1 and series 2; U.S.A. registration numbers of the vehicle, a description of, and procedure for, the disassembly, inspection, repair and assembly of the front axle, rear axle, universal joints and propeller shafts, transmission, transfer case, wheels and tires. TM 9-1795B covers a description of, and procedure for, the disassembly, inspection, repair and assembly of the engine cooling system, electrical system, engine components, fuel and exhaust system, lubrication and clutch. TM 9-1795C covers a description of, and procedure for, the disassembly, inspection, repair and assembly of the crane, power take-off, drive lines, winches and cables.

2. DESCRIPTION AND NATURE OF MATERIEL.

a. In addition to the description and nature of this materiel as contained in TM 9-1795A, this book contains a detailed description of, and procedure for, the disassembly, inspection, repair and assembly of the brakes, frame, springs, shock absorbers, steering, body and sheet metal. It also contains instructions for packing, shipping and storage.

3. DIFFERENCES AMONG MODELS, SPECIFICATIONS, DATA AND U.S.A. REGISTRATION NUMBERS.

(Contained in TM 9-1795A.)

ORDNANCE MAINTENANCE
BODY AND CHASSIS FOR HEAVY WRECKING TRUCK M1

4. ORGANIZATION MAINTENANCE.

a. Scope. The scope of maintenance and repair by the crew and other units of the using arm is determined by the availability of suitable tools, availability of necessary parts, capabilities of the mechanics, time available and the tactical situation. All of these are variable and no exact system of procedure can be prescribed.

b. Allocation of Maintenance. Indicated below are the maintenance duties for which tools and parts have been provided for the using arm personnel. Other replacements and repairs are the responsibility of ordnance maintenance personnel but may be performed by using arm personnel when circumstances permit, within the discretion of the commander concerned. Echelons and words as used in this list of maintenance allocations are defined as follows:

(1) SECOND ECHELON:	Line organization regiments, battalions, companies, detachments and separate companies (first and second echelons).
(2) THIRD ECHELON:	Ordnance light maintenance companies, ordnance medium maintenance companies, ordnance divisional maintenance battalions and post ordnance shops.
(3) FOURTH ECHELON:	Ordnance heavy maintenance companies and service command shops.
(4) FIFTH ECHELON:	Ordnance base regiments, ordnance bases, arsenals and manufacturers' plants.
(5) SERVICE (including preventive maintenance, par. 23 **a.** (1) and (2), AR 850–15.):	Consists of servicing, cleaning, lubricating, tightening bolts and nuts and making external adjustments of subassemblies or assemblies and controls.
(6) REPLACE (par. 23 **a.** (4), AR 850–15):	Consists of removing the part, subassembly or assembly from the vehicles and replacing it with a new or reconditioned or rebuilt part, subassembly or assembly, whichever the case may be.
(7) REPAIR (par. 23 **a.** (3) and (5) in part, AR 850–15):	Consists of making repairs to, or replacement of, the part, subassembly or assembly that can be accomplished without completely disassembling the subassembly or assemblies, and does not require heavy welding, or riveting, machining, fitting and/or alining or balancing.

INTRODUCTION

(8) REBUILD (par. 23 a. (5) in part and (6) AR 850–15): Consists of completely reconditioning and replacing in serviceable condition any unserviceable part, subassembly or assembly of the vehicle, including welding, riveting, machining, fitting, alining, balancing, assembling and testing.

ABSORBERS, SHOCK AND LINKAGE

	ECHELONS			
	2nd	3rd	4th	5th
Absorber assembly, shock and linkage—replace	X			
Absorber assembly, shock and linkage—repair		X		
Absorber assembly, shock and linkage—rebuild			E	X

AXLE, FRONT

Alinement, wheel, camber and caster			E	X
Alinement, wheel, toe-in—adjust	X			
Arm, steering—replace	X			
*Axle, front assembly—service and replace	*	X		
Axle, front assembly—repair		X		
Axle, front assembly—rebuild			E	X
Bearings, wheel—adjust and replace	X			
Carrier, differential, with cross shaft and pinion cage assembly—replace and repair		X		
Carrier, differential, with cross shaft and pinion cage assembly—rebuild			E	X
Retainers, grease—replace	X			
Rod, tie—replace	X			
Rod, tie—repair		X		
Seals, oil—replace	X			
Shaft, axle—replace	E	X		
Stop, steering knuckle—adjust and replace		X		

AXLE, REAR (TANDEM UNIT)

*Axle assembly, rear or intermediate—replace	*	X		
Axle assembly, rear or intermediate—repair		X		
Axle assembly, rear or intermediate—rebuild			E	X
*Axles, rear assembly (tandem unit)—replace	*	X		
Axles, rear assembly (tandem unit)—repair		X		
Axles, rear assembly (tandem unit)—rebuild			E	X
Bearings, wheel or connecting tube—replace	X			
Carrier, differential with cross shaft assembly (rear or intermediate)—replace and repair		X		
Carrier, differential with cross shaft assembly (rear or intermediate)—rebuild			E	X
Retainers, grease—replace	X			
Rods, torque—replace	X			
Rods, torque—rebuild			X	

See explanatory notes on page 13.

ORDNANCE MAINTENANCE
BODY AND CHASSIS FOR HEAVY WRECKING TRUCK M1

AXLE, REAR (TANDEM UNIT) (Cont'd)

	Echelons			
	2nd	3rd	4th	5th
Seals, oil—replace	X			
Shaft, axle—replace	X			
Shaft, propeller, intermediate with universal joints—replace	X			
Shaft, propeller, intermediate with universal joints—repair		X		
Shaft, propeller, intermediate with universal joints—rebuild			E	X
Tube, connecting, bogie—replace	E	X		

BRAKE GROUP

Adjuster, slack—adjust and replace	X			
Adjuster, slack—repair		X		
Adjuster, slack—rebuild			X	
Brakes—adjust	X			
Chamber, air brake assembly—replace	X			
Chamber, air brake assembly—repair		X		
Chamber, air brake assembly—rebuild			X	
Connections, trailer, front and rear, air brake—replace	X			
Connections, trailer, front and rear, air brake—repair		X		
Diaphragm, air brake chamber—replace	X			
Drum, brake—replace	X			
Governor, air pressure assembly—adjust and replace	X			
Governor, air pressure assembly—repair		X		
Governor, air pressure assembly—rebuild			X	
Lines and connections, air—replace	E	X		
Reservoir, air—service and replace	X			
Reservoir, air—repair		X		
Shoe assemblies, brake—adjust and replace	X			
Shoe assemblies, brake—repair (reline)		X		
Shoe assemblies, brake—rebuild			X	
Valves, air brake assembly—replace	X			
Valves, air brake assembly—repair		X		
Valves, air brake assembly—rebuild			X	

BRAKE GROUP (HAND OR EMERGENCY)

Controls and linkage, hand brake—adjust and replace	X			
Controls and linkage, hand brake—repair		X		
Shoe, hand brake assembly—replace	X			
Shoe, hand brake assembly—repair (reline)		X		

See explanatory notes on page 13.

INTRODUCTION

BODY

	Echelons			
	2nd	3rd	4th	5th
Bumper—replace	X			
Bumper—repair		X		
Cab assembly—replace and repair		E	X	
Cab assembly—rebuild			E	X
Glass, doors—replace		X		
Grill, protective—replace	X			
Grill, protective—repair		X		
Hoods and doors—replace	X			
Seat assembly—replace	X			
Seat assembly—repair		X		
Seat assembly—rebuild			X	
Windshield assembly—replace glass		X		
Windshield assembly—rebuild			X	
Wipers, windshield assembly—replace	X			
Wipers, windshield assembly—rebuild		X		

CASE, POWER TAKE-OFF

Case, power take-off assembly—replace	X			
Case, power take-off assembly—repair		X		
Case, power take-off assembly—rebuild			E	X

CASE, TRANSFER

*Case, transfer assembly—replace	*	X		
Case, transfer assembly—repair		X		
Case, transfer assembly—rebuild			E	X
Controls and linkage—replace	X			
Controls and linkage—repair		X		
Disk, hand brake—replace	X			

CLUTCH

Clutch assembly—replace	E	X		
Clutch assembly—repair		X		
Clutch assembly—rebuild			E	X
Cylinder, air (winch operation)—adjust and replace	X			
Cylinder, air (winch operation)—repair		X		
Cylinder, air (winch operation)—rebuild			X	
Housing, clutch—replace	E	X		
Housing, clutch—rebuild (recondition)			E	X

CRANE AND BOOM ASSEMBLY

Boom and jack leg assembly—replace	X			
Boom and jack leg assembly—repair		X		
Boom and jack leg assembly—rebuild			E	X

See explanatory notes on page 13.

ORDNANCE MAINTENANCE
BODY AND CHASSIS FOR HEAVY WRECKING TRUCK M1

CRANE AND BOOM ASSEMBLY (Cont'd)

	ECHELONS			
	2nd	3rd	4th	5th
*Boom pivot assembly—replace	*	X		
Boom pivot assembly—repair		X		
Boom pivot assembly—rebuild			E	X
Cables—replace	X			
Cables—repair		X		
Chains, drive—service, replace and repair	X			
*Crane and boom assembly—replace	*	X		
Crane and boom assembly—repair		X		
Crane and boom assembly—rebuild			E	X
Jack assembly—replace	X			
Jack assembly—repair		X		
Pulleys and lifting hook—replace	X			
Pulleys and lifting hook—repair		X		
Sprockets, chain drive—replace	X			
Sprockets, chain drive—repair		X		
Topping pivot assembly—replace	X			
Topping pivot assembly—repair		X		
Topping pivot assembly—rebuild			X	
Winches, hand assembly—replace	X			
Winches, hand assembly—repair		X		
Winches, hand assembly—rebuild			E	X

CRANE AND WINCH DRIVE

Bearings and oil seals—replace	X			
Chains, drive—service, replace and repair	X			
Chain tightener assembly—replace and adjust	X			
Chain tightener assembly—repair		X		
Chain tightener assembly—rebuild			X	
Clutch assembly (front winch)—service and replace	X			
Clutch assembly (front winch)—repair		X		
Clutch assembly (front winch)—rebuild			X	
Sprockets, chain drive—replace	X			
Sprockets, chain drive—repair		X		
Transmission, auxiliary (rear and crane winch)—service and replace	X			
Transmission, auxiliary (rear and crane winch)—repair		X		
Transmission, auxiliary (rear and crane winch)—rebuild			E	X

ELECTRICAL SYSTEM

Battery—charge and service	X			
Battery—replace	X			

See explanatory notes on page 13.

INTRODUCTION

ELECTRICAL SYSTEM (Cont'd)

	Echelons			
	2nd	3rd	4th	5th
Battery—repair		X		
Battery—rebuild			E	X
Box, apparatus assembly (generator control)—replace	X			
Box, apparatus assembly (generator control)—repair and adjust		X		
Box, apparatus assembly (generator control)—rebuild			X	
Cables, battery—replace	X			
Horn assembly—service and replace	X			
Horn assembly—repair		X		
Lamps assembly—replace	X			
Lamps assembly—repair		X		
Siren assembly—replace	X			
Siren assembly—repair		X		
Switch assemblies—replace	X			
Switch assemblies—repair		X		
Wiring—replace and repair	X			

ENGINE

Arm, rocker assembly—replace	X			
Arm, rocker assembly—repair		X		
Bearings, connecting rod—replace		E	E	X
Bearings, crankshaft—replace		E	E	X
Belt, fan—adjust and replace	X			
Carburetor assembly—replace	X			
Carburetor assembly—repair		X		
Carburetor assembly—rebuild			X	
Chain case cover assembly—replace	E	X		
Chain timing—replace		E	X	
Compressor, air assembly—replace and service	X			
Compressor, air assembly—repair		X		
Compressor, air assembly—rebuild			E	X
Crankshaft, rebuild (recondition)			E	X
*Engine assembly—replace	*	X		
Engine assembly—repair		X		
Engine assembly—rebuild			E	X
Fan assembly—replace	X			
Fan assembly—repair		X		
Filter, fuel—replace and clean	X			
Filter, oil—service, replace	X			
Filter, oil—repair		X		
Flywheel assembly—replace		E	X	
Flywheel assembly—rebuild (recondition)			E	X

See explanatory notes on page 13.

ORDNANCE MAINTENANCE
BODY AND CHASSIS FOR HEAVY WRECKING TRUCK M1

ENGINE (Cont'd)

	Echelons			
	2nd	3rd	4th	5th
Gaskets, manifold—replace	X			
Generator assembly—replace	X			
Generator assembly—repair		X		
Generator assembly—rebuild			X	
Governor assembly—replace		X		
Governor assembly—rebuild			E	X
Head, cylinder assembly—replace	E	X		
Head, cylinder assembly—repair		X		
Head, cylinder assembly—rebuild (recondition)			E	X
Manifolds—replace	X			
Manifolds—repair		X		
Motor, starting assembly—replace	X			
Motor, starting assembly—repair		X		
Motor, starting assembly—rebuild			X	
Pan, oil—replace, repair		X		
Pan, oil—remove and clean	X			
Piston assembly with pins and rings—replace		E	E	X
Pump, fuel—replace	X			
Pump, fuel—repair		X		
Pump, fuel—rebuild			X	
Pump, oil—replace	E	X		
Pump, oil—repair		X		
Pump, oil—rebuild			X	
Pump, water—replace	X			
Pump, water—repair		X		
Pump, water—rebuild			X	
Rods, connecting—replace		E	E	X
Seat, valve insert—replace			E	X
Seat, valve insert—repair (grind)		E	X	
Shaft, accessory drive—replace	E	X		
Shaft, accessory drive—repair		X		
Sprockets, chain drive—replace		E	X	
Thermostat—replace	X			
Valve tappet guides assembly—replace	E	X		
Valve tappet guides assembly—rebuild			X	
Valves—replace, reface and reseat		E	E	X

ENGINE COOLING SYSTEM

Hose and pipes—replace	X			
Radiator—clean and flush	X			
Radiator assembly—replace	X			
Radiator assembly—repair		X		
Radiator assembly—rebuild			E	X

See explanatory notes on page 13.

INTRODUCTION

EXHAUST SYSTEM

	Echelons			
	2nd	3rd	4th	5th
Mufflers and exhaust pipes—replace	X			

EXTINGUISHERS, FIRE

Extinguishers, fire—replace	X			
Extinguishers, fire—charge or refill—(CARBON TETRACHLORIDE)	X			
Extinguishers, fire (CO_2)—charge or refill		X		
Extinguishers, fire—rebuild			E	X

FRAME

Frame—replace		E	X	
Frame—repair and rebuild			E	X

FUEL SYSTEM

Cleaner, air assembly—service and replace	X			
Cleaner, air assembly—repair		X		
Pipes and connections—replace	X			
Pipes and connections—repair		X		

IGNITION SYSTEM, ELECTRICAL

Coil, ignition—replace	X			
Condenser, ignition—replace	X			
Distributor assembly—replace	X			
Distributor assembly—repair		X		
Distributor assembly—rebuild			X	
Magneto assembly—replace	X			
Magneto assembly—repair		X		
Magneto assembly—rebuild			X	
Plugs, spark—replace	X			
Plugs, spark—(two-piece)—repair		X		
Points, breaker—replace	X			
Switch, dual ignition—replace	X			
Switch, dual ignition—repair		X		
Wiring, ignition—replace and repair	X			

INSTRUMENTS AND GAGES

Instruments and gages—replace	E	X		
Instruments and gages—repair		X		
Instruments and gages—rebuild			E	X

MISCELLANEOUS

Boards, running—replace	X			
Chains, tire—replace and repair	X			
Cleaning	X			

See explanatory notes on page 13.

ORDNANCE MAINTENANCE
BODY AND CHASSIS FOR HEAVY WRECKING TRUCK M1

MISCELLANEOUS (Cont'd)

	Echelons			
	2nd	3rd	4th	5th
Guards, mud—replace	E	X		
Guards, mud—repair		X		
Heater—replace	X			
Heater—repair		X		
Heater—rebuild			X	
Hook, pintle—replace	X			
Hook, pintle—repair		X		
Lubrication	X			
Painting	X			
Pans, splash, and guards—replace	X			
Pans, splash, and guards—repair		X		
Tires and tubes—replace	X			
Tires—repair			E	X
Tubes—repair	E	E	X	
Wheels—replace	X			
Wheels—repair		X		
Wheels—rebuild			E	X

PROPELLER SHAFT ASSEMBLY

Shaft, propeller with universal joints assembly—service and replace	X			
Shaft, propeller with universal joints assembly—repair		X		
Shaft, propeller with universal joints assembly—rebuild			E	X

SPRINGS

Springs and shackles—replace	X			
Springs and shackles—repair		X		
Springs and shackles—rebuild			E	X

STEERING SYSTEM

Arm, pitman—replace	X			
Gear, steering assembly—replace	E	X		
Gear, steering assembly—repair		X		
Gear, steering assembly—rebuild			E	X
Link, drag and component parts—replace	X			
Link, drag and component parts—repair		X		
Link, drag and component parts—rebuild			X	

See explanatory notes on page 13.

INTRODUCTION

TRANSMISSION

	2nd	3rd	4th	5th
Controls and linkage—replace	X			
Controls and linkage—repair		X		
*Transmission assembly—replace	*	X		
Transmission assembly—repair		X		
Transmission assembly—rebuild			E	X

VEHICLE ASSEMBLY

Heavy wrecker assembly—service	X			
Heavy wrecker assembly—rebuild with serviceable unit assemblies			X	E

WINCH, FRONT

Brake, safety—adjust and replace band	X			
Brake, safety—repair (reline)		X		
Brake, winch drum—adjust and replace	X			
Brake, winch drum—repair (reline)		X		
Cable—replace	X			
Cable—repair		X		
Control arm and yoke—adjust and replace	X			
Control arm and yoke—repair		X		
Pin, shear—replace	X			
Winch assembly—replace	E	X		
Winch assembly—repair		X		
Winch assembly—rebuild			E	X

WINCH, REAR AND CRANE

Brake, safety—adjust and replace band	X			
Brake, safety—repair (reline)		X		
Cable—replace	X			
Cable—repair		X		
Lever, transmission control—replace	X			
Lever, transmission control—repair		X		
Pin, shear—replace	X			
Valve, clutch control, two-way—replace	X			
Valve, clutch control, two-way—repair		X		
Valve, clutch control, two-way—rebuild			X	
Winch assembly—replace	E	X		
Winch assembly—repair		X		
Winch assembly—rebuild			E	X

NOTE—Operations allocated will normally be performed in the echelon indicated by "X." Operations allocated to the echelons as indicated by "E" may be accomplished by the respective echelons in emergencies only.

NOTE—*The second echelon is authorized to remove and reinstall engine and transmission assemblies, transfer unit controlled differential assembly and other items marked by asterisk. However, when it is necessary to replace an item marked by an asterisk with a new or rebuilt part, subassembly or unit assembly, the assembly marked by asterisk will not be removed from the vehicle by the second echelon until authorization is received from a higher echelon.

ORDNANCE MAINTENANCE
BODY AND CHASSIS FOR HEAVY WRECKING TRUCK M1

5. PERIODIC MAINTENANCE OPERATIONS.

(In addition to prescribed preventive maintenance inspections.)

Mileage	Operation
2,000 miles	Wash air compressor air strainer (par. 48 **c** (1)).
5,000 miles	Clean carbon from air compressor discharge and unloader valves (par. 48 **c** (2)).
5,000 miles	Clean carbon from air compressor discharge pipe (par. 48 **c** (3)).
5,000 miles	Adjust air compressor unloader valves (par. 48 **c** (4)).
5,000 miles	Tighten air compressor mounting bolts (par. 48 **c** (5)).
5,000 miles	Lubricate air compressor unloader rocker arm shaft (par. 48 **c** (6)).
5,000 miles	Inspect air compressor unloader diaphragms (par. 48 **c** (7)).
5,000 miles	Inspect governor upper valve and lower valve (par. 48 **d** (1)).
5,000 miles	Inspect governor for leaks (par. 48 **d** (2)).
10,000 miles	Inspect safety valve for leaks (par. 48 **e** (1)).
10,000 miles	Adjust safety valve (par. 48 **e** (2)).
5,000 miles	Clean safety valve (par. 48 **e** (3)).
5,000 miles	Inspect air pressure gage (par. 48 **f**).
5,000 miles	Inspect floor foot air valve diaphragms (par. 48 **g** (1)).
2,000 miles	Inspect floor foot air valve for leaks (par. 48 **g** (2)).
2,000 miles	Inspect floor foot air valve exhaust valve (par. 48 **g** (3)).
2,000 miles	Inspect air pressure delivered from floor foot air valve (par. 48 **g** (4)).
5,000 miles	Inspect piston rubber ring in front brake air cylinder and rear brake air diaphragm (par. 48 **h**).
500 miles	Check slack adjusters (par. 109 **b** (6)).
5,000 miles	Lubricate slack adjuster worm gear and worm (par. 48 **i** (1)).
5,000 miles	Inspect slack adjuster arm bushings (par. 48 **i** (2)).
5,000 miles	Inspect slack adjuster quick-release valve and relay valve (par. 48 **j**).

INTRODUCTION

Mileage	Operation
1,000 miles	Adjust slack adjusters (par. 109 **b** (6)).
5,000 miles	Inspect trailer air connections and all air pipes and fittings (par. 48 **k**).
5,000 miles	Replace rubber seals in trailer air connections (par. 133 **b** (2)).
10,000 miles	Replace quick-release valve diaphragm (par. 113 **b** (2)).
5,000 miles	Replace relay valve diaphragm (par. 120 **b** (3)).
5,000 miles	Replace rubber seals in trailer air connections (par. 133 **b** (2)).
100 miles (first)	Tighten four rear spring clamp stud nuts (par. 185 **b** (1)).
1,000 miles	Tighten four rear spring clamp stud nuts (par. 185 **b** (1)).
100 miles (first)	Tighten four rear spring clip nuts (par. 185 **b** (1)).
1,000 miles	Tighten four rear spring clip nuts (par. 185 **b** (1)).
500 miles	Tighten spring leaf clip bolt nuts (par. 185 **b** (2)).
100 miles (first)	Tighten front spring clip nuts (par. 191 **b** (2)).
1,000 miles	Tighten front spring clip nuts (par. 191 **b** (2)).
500 miles	Tighten spring leaf clip bolt nuts (par. 191 **b** (2)).
2,000 miles	Fill steering gear housing with lubricant (par. 207 **b** (3) *(e)*).

ORDNANCE MAINTENANCE
BODY AND CHASSIS FOR HEAVY WRECKING TRUCK M1

CHAPTER 2

SERVICE BRAKES

Section I

GENERAL

6. GENERAL.

a. The service brake mechanism of the two rear axles and front axle is operated by a foot brake air valve connected to the brake pedal. When the brake pedal is depressed, the foot brake air valve delivers air pressure to air brake chambers. These air brake chambers operate the service brake mechanism. Releasing the brake pedal causes the foot brake air valve to exhaust air pressure from the air brake chamber, releasing the service brake mechanism.

b. The service brake mechanism consists of the brake drums, the brake shoes with linings and the mechanical parts which actuate the brake shoes causing them to contact the brake drum, thereby reducing the speed of the wrecker or stopping it completely.

7. SPECIFICATIONS AND DATA.

Service brake make	Timken
Type	Six wheels (four rear, two front)
Drum diameter	16½-in.
Lining thickness	⅜-in.
Width	4-in.
Length	17½-in.

8. REFERENCE TO TM 9-795.

a. Many second echelon operations covered in TM 9-795 are often done by ordnance personnel. Reference should be made to TM 9-795 for lower echelon operations not covered in this manual.

9. ECHELON BREAKDOWN OF MAINTENANCE OPERATIONS.

(Refer to paragraph 4.)

Section II

TROUBLE SHOOTING

10. TROUBLE SHOOTING, INSPECTION AND REMEDIAL MEASURES.

a. The following chart is provided as a guide to common troubles and their causes. It is a recommended procedure for inspection to locate the cause.

Symptom and Probable Cause	Probable Correction
b. Brake Pedal Goes to Floor Board.	
(1) Normal wear of brake lining.	(1) Adjust brakes (pars. 17 and 24).
(2) Low air pressure in air tanks.	(2) Check air system (par. 71).
(3) Air pressure leak.	(3) Check air system (par. 138).
(4) Water trapped in air system.	(4) Drain reservoir (par. 125).
(5) Brake shoes improperly adjusted.	(5) Adjust brakes (pars. 17 and 24).
c. All Brakes Drag.	
(1) Floor foot air valve release rod improperly adjusted.	(1) Adjust floor foot air valve release rod (par. 88).
(2) Weak floor foot air valve release rod spring.	(2) Replace floor foot air valve release rod spring (par. 84).
(3) Water trapped in air system.	(3) Check air system. Drain reservoir (par. 125).
d. One Brake Drags.	
(1) Brake shoe spring weak or broken.	(1) Replace brake shoe spring (par. 12 **b** (1)).
(2) Brake anchor pin tight.	(2) Clean or replace brake anchor pin (par. 12 **b** (2)).
(3) Brake shoes improperly adjusted.	(3) Adjust brakes (pars. 17 and 24).
(4) Wheel bearings improperly adjusted.	(4) Adjust wheel bearings (TM 9-1795A).
(5) Restriction in air tubing or hose.	(5) Clean or replace tubing or hose (pars. 140 and 141).
(6) Grease soaked brake shoe lining.	(6) Replace brake shoe lining (pars. 12 **b** (5), 16 **b** (1)).

ORDNANCE MAINTENANCE
BODY AND CHASSIS FOR HEAVY WRECKING TRUCK M1

Symptom and Probable Cause	Probable Correction
e. Wrecker Pulls to One Side.	
(1) Grease-soaked front brake shoe lining.	(1) Replace brake shoe lining (pars. 12 **b** (5) and 16 **b** (1)).
(2) Front brake shoe improperly adjusted.	(2) Adjust brakes (pars. 17 and 24).
(3) Front spring clips loose.	(3) Tighten front spring clips (par. 191).
(4) Front wheel bearings improperly adjusted.	(4) Adjust wheel bearings (TM 9-1795A).
(5) Front tires not properly inflated.	(5) Inflate tires (TM 9-1795A).
f. Slow Braking Action.	
(1) Restriction in air line.	(1) Clean or replace tubing or hose (pars. 140 and 141).
(2) Brake air cylinder push rod improperly adjusted.	(2) Adjust brakes (pars. 17 and 24).
(3) Floor foot air valve to brake air cylinder, air pressure low.	(3) Adjust air pressure through floor foot air valve (par. 88).
(4) Brake air cylinder diaphragm leaking.	(4) Replace brake air cylinder diaphragm (par. 99).
(5) Brake lining worn.	(5) Adjust brakes (pars. 17 and 24) or replace brake lining (par. 12 **b** (5) and par. 16 **b** (1)).
(6) Floor foot air valve diaphragm leaking.	(6) Replace floor foot air valve diaphragm (par. 85 **b** (2)).
(7) Brake drum worn.	(7) Repair or replace brake drum (par. 14 **b** (2)).
g. Slow Brake Release.	
(1) Floor foot air valve lever not returning to its stop.	(1) Adjust floor foot air valve lever operating rod (par. 88 **b** (3)).
(2) Brake camshaft binding.	(2) Lubricate brake camshaft.
(3) Brake air cylinder push rod travel excessive.	(3) Adjust brake air cylinder push rod (par. 95).
(4) Restriction in air tubing or hose.	(4) Replace or clean air tubing and hose (pars. 140 and 141).
(5) Air valves not seating properly.	(5) Clean or replace air valves (par. 88).

TROUBLE SHOOTING

Symptom and Probable Cause	Probable Correction
h. Brakes not Stopping Wrecker as Soon as They Should.	
(1) Brake air cylinder push rod travel too great.	(1) Adjust cylinder push rod (par. 95).
(2) Brake lining worn.	(2) Adjust brakes (pars. 17 and 24) or replace brake lining (par. 19 **b** (3)).
(3) Brake drum worn.	(3) Repair or replace brake drum (par. 14 **b** (2)).
(4) Brake air cylinder piston ring leaking.	(4) Replace brake air cylinder piston ring (par. 91 **b** (4)).

ORDNANCE MAINTENANCE
BODY AND CHASSIS FOR HEAVY WRECKING TRUCK M1

Section III

FRONT SERVICE BRAKE REMOVAL

11. GENERAL.

a. The front service brakes are operated by compressed air released from air storage reservoirs when the brake pedal is depressed.

b. The air pressure actuates the brake shoe mechanism (fastened to the front axle knuckle flange) causing the brake shoe lining to contact the inner face of the brake drum and slow or stop the wrecker.

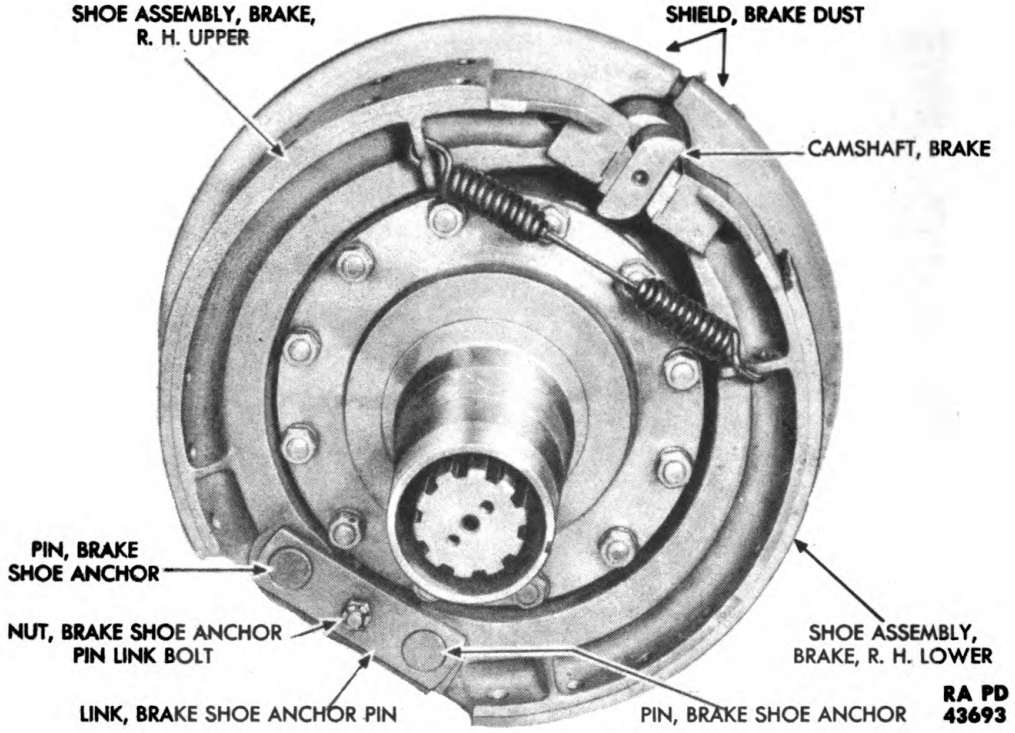


Figure 1—Front Brake Parts

c. The air system is covered in chapter 4.

d. It is necessary to remove the front wheels and tires—TM 9-1795A, chapter 7—wheel hubs and drums—TM 9-1795A, chapter 7, par. 138—brake cylinder (air) and bracket—TM 9-1795A—and slack adjusters—TM 9-1795A—in order to remove the brake shoe assemblies.

e. There are two brake shoes in the right and two in the left front brake mechanism and the procedure of removal is the same. The brake

shoes are anchored at one end by a brake shoe anchor pin and loosely held together at the other end by a brake shoe return spring. A brake shoe anchor pin link connects the two anchor pins of each assembly and is bolted through the knuckle flange assembly. The brake shoe anchor pin is also bolted through the knuckle flange assembly. Lubrication of the brake shoe anchor pin is by means of a lubrication fitting at the inner end.

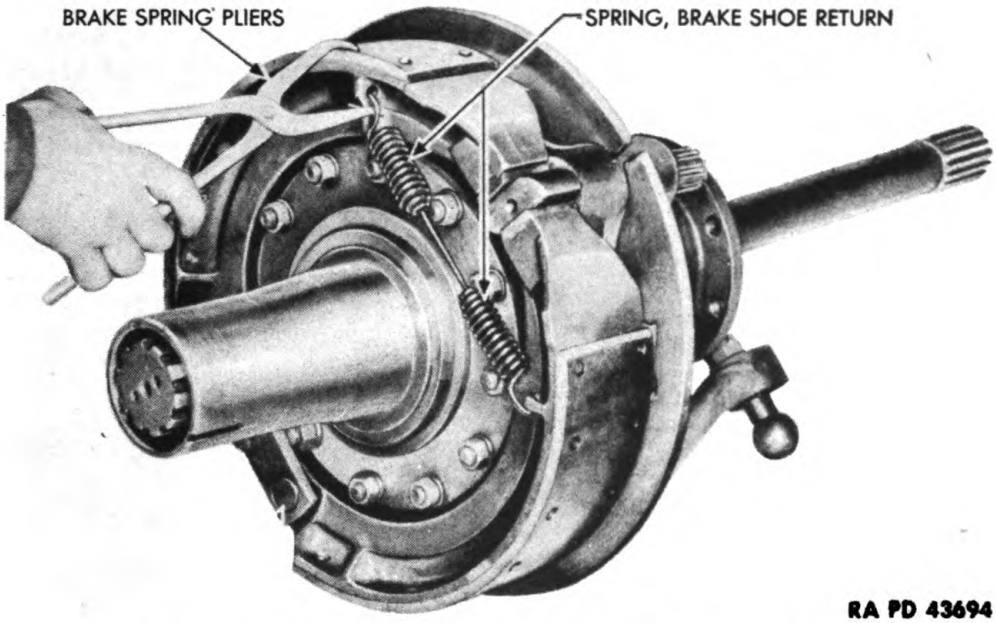


Figure 2—Removing Front Brake Shoe Return Spring

12. FRONT SERVICE BRAKE REMOVAL.

a. Equipment.

CHISEL, cold	VISE, with soft jaws
DRIFT	WRENCH, box, 9/16-in.
DRIFT, brass	WRENCH, box, 7/8-in.
HAMMER	WRENCH, open-end, 7/16-in.
PLIERS	WRENCH, open-end, 5/8-in.
PLIERS, brake spring	WRENCH, open-end, 3/4-in.
PRESS, hydraulic	WRENCH, open-end, 1 1/2-in.
PUNCH, 1/8-in.	WRENCH, socket, 9/16-in.

b. Procedure.

(1) REMOVE BRAKE SHOE RETURN SPRING (fig. 2).

PLIERS, brake spring

(a) Unhook one end of the brake shoe return spring (brake spring pliers) (fig. 2).

(b) Unhook other end of spring with the fingers and remove.

(2) REMOVE BRAKE SHOE ASSEMBLIES.

DRIFT, brass
HAMMER
PLIERS
WRENCH, box, 7/8-in.
WRENCH, open-end, 7/16-in.
WRENCH, open-end, 3/4-in.
WRENCH, open-end, 1 1/2-in.

(a) Remove cotter pin from brake shoe anchor pin link bolt (pliers).

(b) Remove brake shoe anchor pin link bolt and nut (7/8-in. box, and 3/4-in. open-end wrenches) (fig. 1).

(c) Remove two brake shoe anchor pin lubrication fittings (7/16-in. open-end wrench).

(d) Remove two brake shoe anchor pin nuts (5/8-in. open-end, and 1 1/2-in. open-end wrenches).

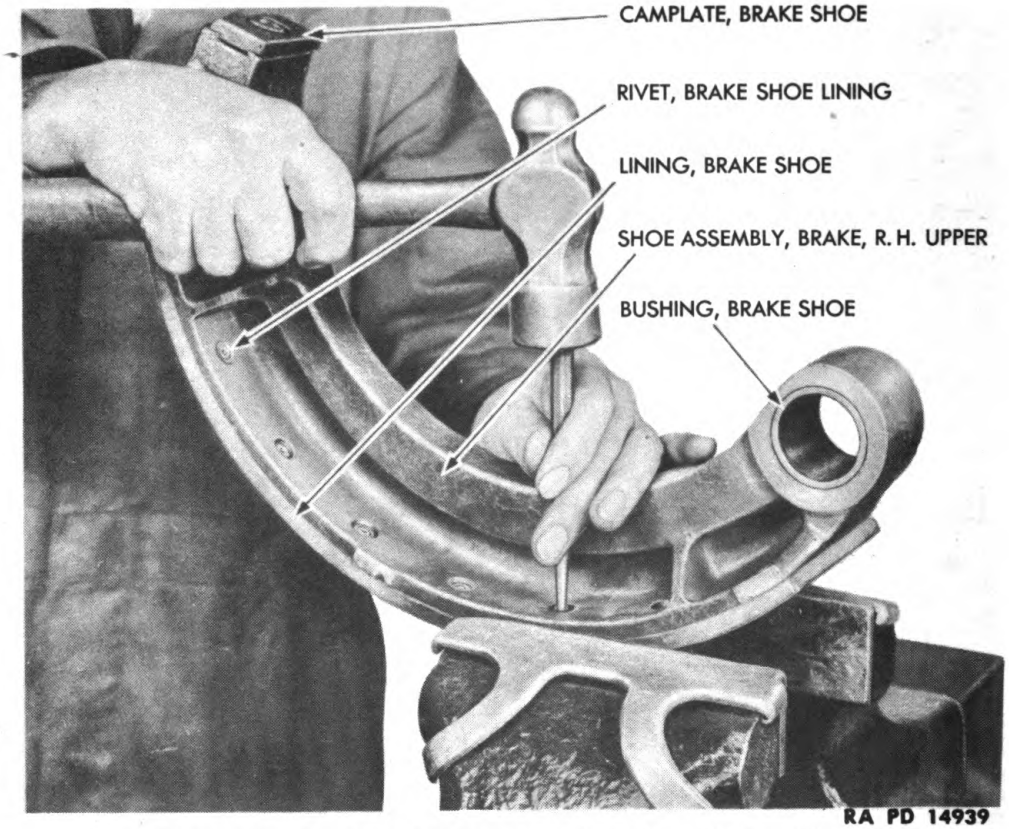


Figure 3—Removing Front Brake Shoe Lining Rivets

(e) Tap out brake camshaft (hammer and brass drift) (fig. 1). Tap out the two brake shoe anchor pins (hammer and brass drift).

(f) Lift off brake shoe anchor pin link and right-hand, upper and lower brake shoe assembly (fig. 1).

(3) REMOVE BRAKE DUST SHIELDS.

WRENCH, box, 9/16-in.

FRONT SERVICE BRAKE REMOVAL

(a) To remove brake dust shields (fig. 1), first remove the knuckle and bushing assembly (TM 9-1795A).

(b) Remove four brake dust shield cap screws and lock washers which hold brake dust shield to knuckle flange (9/16-in. box wrench).

(c) Lift off the two halves of brake dust shield.

(4) REMOVE BRAKE DRUM INSPECTION COVER.

WRENCH, socket, 9/16-in.

(a) Remove brake drum inspection cover cap screw and lock washer (9/16-in. socket wrench).

(b) Lift off brake drum inspection cover.

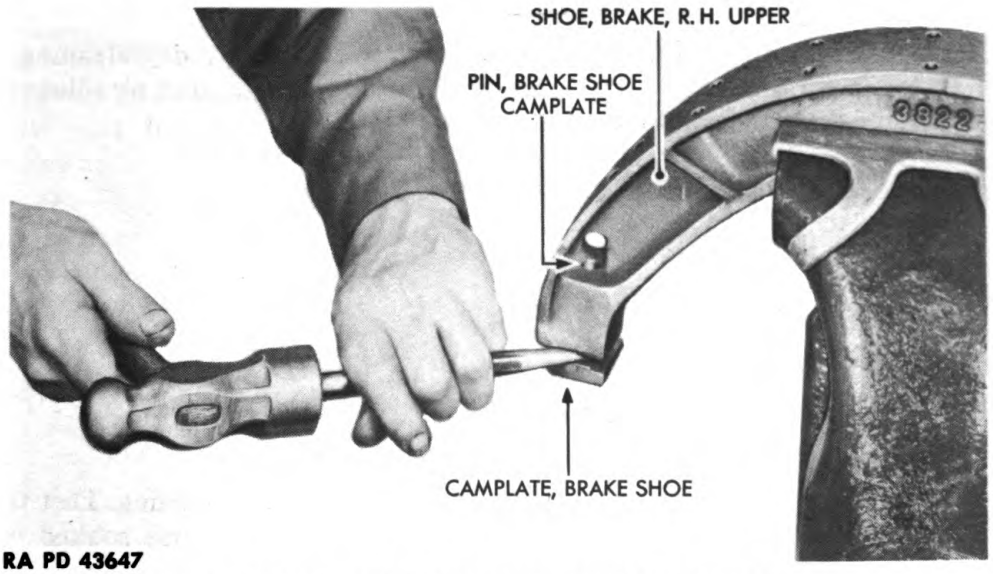


Figure 4—Removing Front Brake Shoe Cam Plate

(5) DISASSEMBLE BRAKE SHOE ASSEMBLIES (figs. 3 and 4).

CHISEL, cold	PRESS, hydraulic
DRIFT	PUNCH, 1/8-in.
HAMMER	VISE, with soft jaws

(a) Place right-hand upper brake shoe assembly in a vise (fig. 3).

(b) Drive out the 14 brake shoe lining rivets from back of brake shoe (hammer and 1/8-in. punch). Lift off brake shoe lining.

(c) Tap brake shoe cam plate pin slightly to loosen it. Then using a hammer and cold chisel, separate brake shoe cam plate pin from brake shoe (fig. 4).

(d) Drive brake shoe cam plate pin out of brake shoe (hammer and drift).

(e) Place brake shoe in a hydraulic press and remove brake shoe bushing (fig. 3).

(f) Repeat operations *(a)*, *(b)*, *(c)*, *(d)* and *(e)* to disassemble right-hand lower brake shoe assembly.

ORDNANCE MAINTENANCE
BODY AND CHASSIS FOR HEAVY WRECKING TRUCK M1

Section IV

FRONT SERVICE BRAKE INSPECTION

13. GENERAL.

a. The inspection of the brake cylinder is covered in paragraph 92, and the slack adjuster in paragraph 106.

b. Clean all brake metal parts with SOLVENT, dry-cleaning, to remove dirt and grease but do not allow any grease, dirt or solvent to get on brake shoe linings.

14. FRONT SERVICE BRAKE INSPECTION.

a. Equipment.

BRUSH, wire
GAGE, feeler
LATHE

b. Procedure.

(1) BRAKE SHOE LININGS.

BRUSH, wire

(a) Examine brake shoe lining for grease or dirt in lining. Dirt that is imbedded must be removed (wire brush). If grease has soaked into lining, replace lining.

(b) If inspection of the brake drum (step (2) below) shows that it requires repair, brake shoe linings must be discarded and new linings used.

(2) BRAKE DRUMS.

LATHE

(a) Examine contacting surface of brake drum for scoring. Slide fingernail across the brake drum face. If there are scores and light scratches present, brake drum face must be turned down on a lathe or refacing machine.

(b) Do not cut more than 0.125 inch of metal off brake drum face. If the scoring requires removal of more than 0.125 inch of metal, replace brake drum.

(c) Brake drum should be balanced in a balancing machine (TM 9-1795A), after being turned down. Hub and drum assembly must then be balanced as an assembly.

(3) BRAKE CAMSHAFT BUSHINGS.

GAGE, feeler

FRONT SERVICE BRAKE INSPECTION

(a) Inspect brake camshaft bushing for wear by placing brake camshaft through bushing.

(b) Try to insert a narrow 0.005-inch feeler gage between brake camshaft and brake camshaft bushing. If feeler blade will pass between bushing and camshaft, bushing must be replaced.

(4) BRAKE SHOE BUSHINGS.

GAGE, feeler

(a) Inspect brake shoe bushing for wear by placing brake anchor pin in bushing.

(b) Try to insert a narrow 0.005-inch feeler gage between brake anchor pin and the brake shoe bushing. If feeler blade will pass between bushing and brake anchor pin, bushing must be replaced.

(5) BRAKE CAMSHAFT.

(a) Examine splines of brake camshaft for burs and cam on opposite end for flat spots. If either condition is found, replace brake camshaft.

(b) Slide the slack adjuster on splines of brake camshaft. If there is lost motion between splines of camshaft and slack adjuster, replace camshaft.

ORDNANCE MAINTENANCE
BODY AND CHASSIS FOR HEAVY WRECKING TRUCK M1

Section V

FRONT SERVICE BRAKE INSTALLATION

15. GENERAL.

a. The four brake shoes used on the front axle are all different, and can be identified by the numbers cast on them. Brake shoes with the number 3822E5 are the upper and lower for the right side, and those with the number 3822F6 are the upper and lower for the left side.

b. The brake shoe anchor pins have an offset on which the brake shoes ride. The brake shoes are adjusted by turning the brake shoe anchor pin so the offset will change the position of the brake shoes.

c. The two brake cylinders on the front axle trunnion socket receive compressed air from the air system and then operate the two slack adjusters.

d. The slack adjuster (located on inner end of brake camshaft), turns the brake camshaft, spreading the brake shoes to apply the brakes (fig. 2).

16. FRONT SERVICE BRAKE INSTALLATION.

a. Equipment.

HAMMER, soft
MACHINE, brake riveting
PLIERS
PLIERS, brake spring
PRESS, hydraulic
WRENCH, box, 9/16-in.
WRENCH, box, 7/8-in.
WRENCH, open-end, 7/16-in.
WRENCH, open-end, 5/8-in.
WRENCH, open-end, 3/4-in.
WRENCH, open-end, 1 1/2-in.
WRENCH, socket, 9/16-in.

b. Procedure.

(1) ASSEMBLE BRAKE SHOES.

HAMMER, soft
MACHINE, brake riveting
PRESS, hydraulic

(a) Place brake shoe in hydraulic press and install brake shoe bushing (fig. 3). Repeat the operation on second brake shoe.

(b) Install brake shoe cam plate on brake shoe and fasten it with brake shoe cam plate pin (soft hammer) (fig. 4). Repeat the operation on second brake shoe.

(c) Install brake shoe lining (fig. 3) and fasten with 14 brake shoe lining rivets. Sink all rivets below brake shoe lining surface (brake riveting machine).

FRONT SERVICE BRAKE INSTALLATION

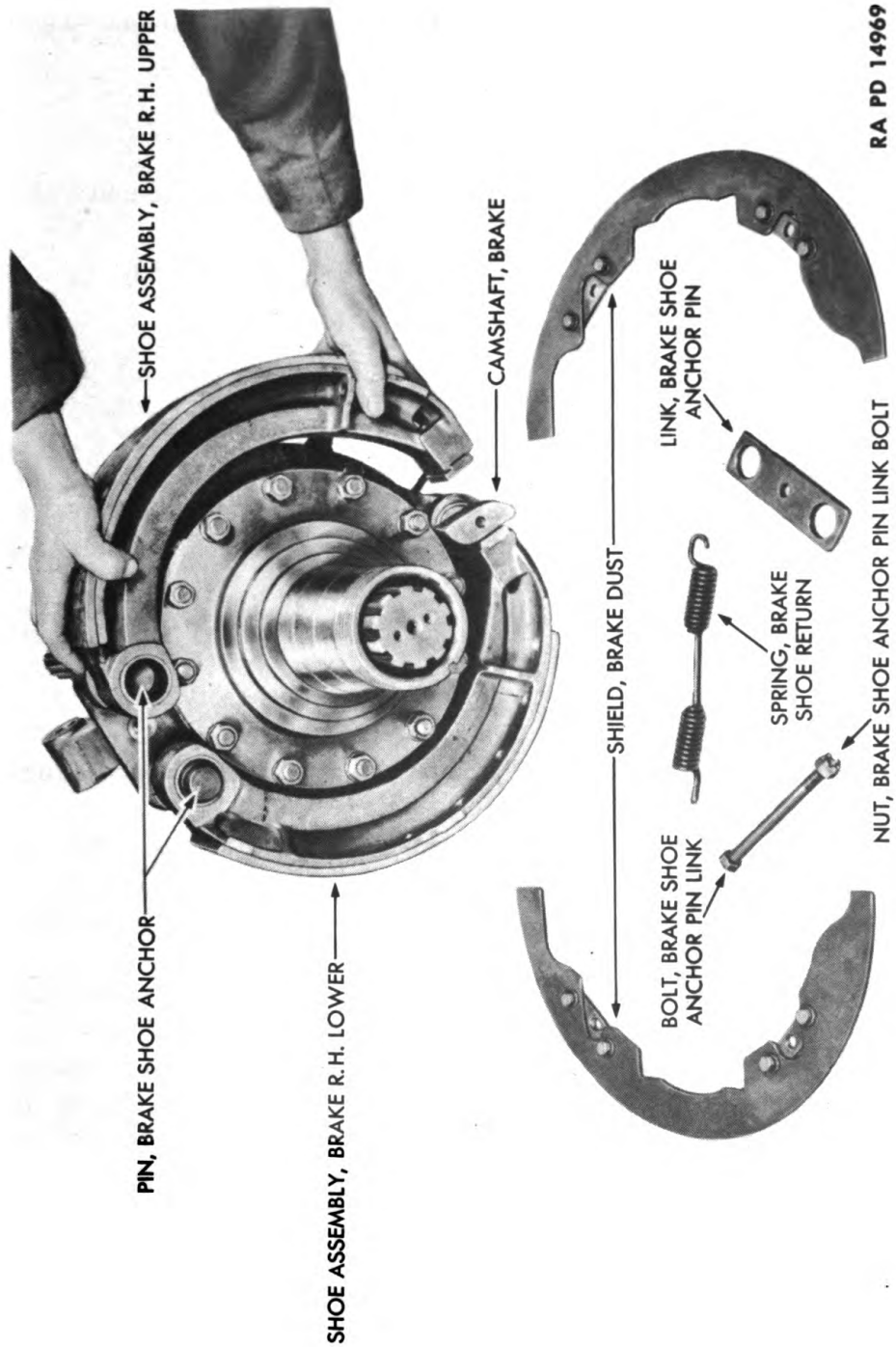


Figure 5—Installing Front Brake Shoe Assembly

(2) INSTALL BRAKE DRUM INSPECTION COVERS.

WRENCH, socket, 9/16-in.

(a) Install brake drum inspection cover and tighten lock washer and cap screw (9/16-in. socket wrench).

(3) INSTALL BRAKE DUST SHIELDS.

WRENCH, box, 9/16-in.

(a) Install brake dust shield (fig. 5) on knuckle flange and tighten lock washers and cap screws (9/16-in. box wrench).

(b) Install knuckle and bushing assembly (TM 9-1795A).

(4) INSTALL BRAKE SHOE ASSEMBLIES (fig. 5).

HAMMER, soft	WRENCH, open-end, 7/16-in.
PLIERS	WRENCH, open-end, 5/8-in.
PLIERS, brake spring	WRENCH, open-end, 3/4-in.
WRENCH, box, 7/8-in.	WRENCH, open-end, 1 1/2-in.

(a) Install brake shoe anchor pin for right-hand, lower brake shoe assembly (fig. 5) tapping it through knuckle flange assembly (soft hammer).

(b) Install right-hand, lower brake shoe assembly on brake shoe anchor pin.

(c) Install brake camshaft in released position (soft hammer) (fig. 5).

(d) Install second brake shoe anchor pin, tapping it through knuckle flange assembly (soft hammer).

(e) Install right-hand, upper brake shoe assembly on brake shoe anchor pin installed in *(d)* above.

(f) Install two brake shoe anchor pin nuts (5/8-in. and 1 1/2-in. open-end wrenches).

(g) Install two brake shoe anchor pin lubrication fittings on anchor pins (7/16-in. open-end wrench).

(h) Install brake shoe anchor pin link (fig. 5). Install brake shoe anchor pin link bolt and nut (3/4-in. open-end wrench, 7/8-in. box wrench). Install brake shoe anchor pin link bolt cotter pin (pliers).

(i) Hook one end of brake shoe return spring (fig. 5) on one brake shoe assembly. Hook other end of spring on second shoe (brake spring pliers).

(5) INSTALL FRONT WHEELS AND TIRES.

(a) Install slack adjusters (TM 9-1795A).

(b) Install brake cylinders and brackets (TM 9-1795A).

(c) Install wheel hubs and drums (TM 9-1795A).

(d) Install front wheels and tires (TM 9-1795A).

FRONT SERVICE BRAKE INSTALLATION

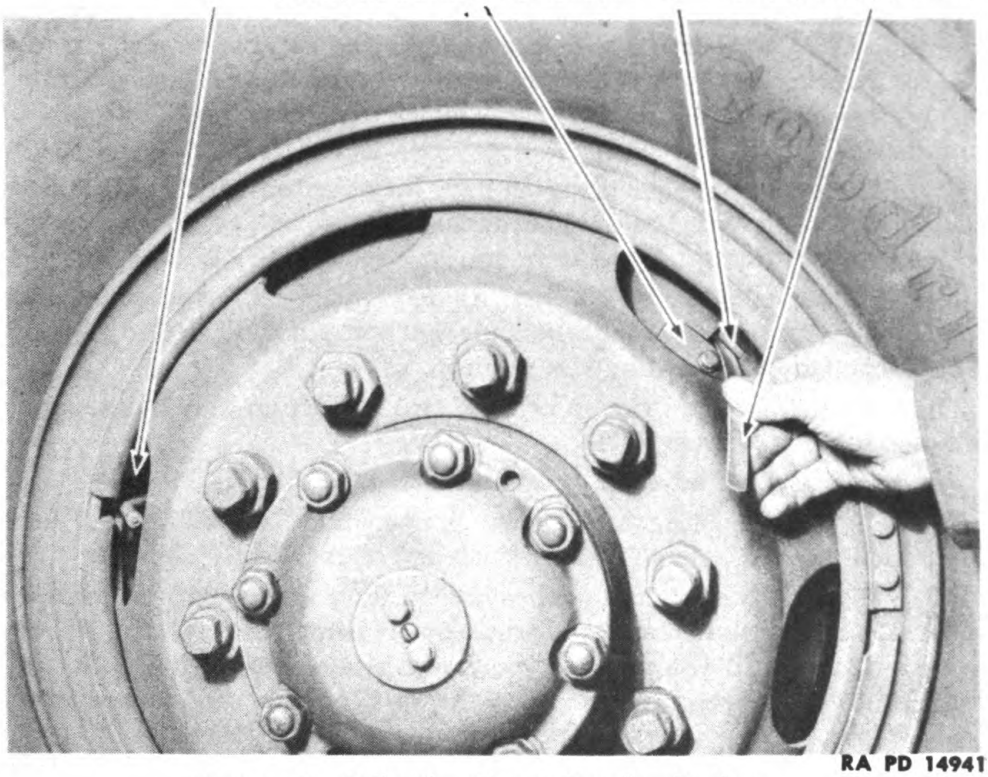


Figure 6—Adjusting Front Service Brakes

17. ADJUSTING FRONT SERVICE BRAKES.

a. Equipment.

GAGE, feeler
JACKS, hydraulic (2)
WRENCH, adjustable
WRENCH, box, 1½-in.
WRENCH, socket, 9/16-in.

b. Procedure.

(1) ADJUST FRONT SERVICE BRAKES (fig. 6).

GAGE, feeler
JACKS, hydraulic (2)
WRENCH, adjustable
WRENCH, box, 1½-in.
WRENCH, socket, 9/16-in.

(a) Using two hydraulic jacks, raise both front wheels and tires clear of ground.

(b) Loosen brake drum inspection cover cap screw (9/16-in. socket wrench), and turn brake drum inspection cover to one side (fig. 6).

(c) Turn wheel and tire so brake drum inspection hole is just above brake shoe anchor pins.

(d) Insert a 0.010-inch feeler gage through brake drum inspection hole and between lining of right-hand upper brake shoe assembly and brake drum (fig. 6).

(e) Loosen upper of two brake shoe anchor pin nuts (1½-in. box wrench). Then turn brake shoe anchor pin (adjustable wrench) clockwise or counterclockwise until right-hand upper brake shoe assembly has been moved, and the 0.010-inch feeler gage is gripped but can be withdrawn.

(f) The brake shoe anchor pins have an offset on which brake shoes ride, and turning the brake shoe anchor pin as in *(e)* above changes brake shoe position.

(g) Repeat steps *(c)*, *(d)* and *(e)* on right-hand, lower brake shoe assembly, adjusting lower brake shoe anchor pin with feeler gage inserted through inspection hole in position "B" (fig. 6).

(h) Turn wheel and tire so brake drum inspection hole is just above brake camshaft "A" (fig. 6).

(i) Adjust slack adjuster (par. 109).

(j) Repeat adjusting and checking operations at each wheel until 0.010-inch clearance is obtained at each end of each brake shoe.

(k) Tighten brake shoe anchor pin nuts carefully so that position of brake anchor pins is not disturbed (1½-in. box wrench). Rotate wheel and tire and listen for a heavy scraping sound. If heard, it indicates that brakes are adjusted too tight, or that there are high spots on brake drum face or brake shoe lining. If a slight loosening of brake adjustment does not eliminate the scraping sound, brake drum will have to be removed and turned true and high spots machined.

(l) Turn brake drum inspection cover into place and tighten cap screw (9/16-in. socket wrench).

(2) ADJUST BRAKE PEDAL LINKAGE. If the action of the front service brakes is not satisfactory, adjust brake pedal linkage (par. 88).

Section VI

REAR SERVICE BRAKE REMOVAL

18. GENERAL.

a. The rear service brakes are operated by compressed air released from air storage reservoirs when brake pedal is depressed.

b. The air pressure actuates the brake shoe mechanism (attached to rear axle housing) and causes brake shoes to expand, forcing the lining against inner face of brake drum.

c. The air system is covered in chapter 4.

d. It is necessary to remove the eight rear dual wheels and tires (TM 9-1795A) and four wheel hubs and drums (TM 9-1795A) in order to remove the brake shoe assemblies.

e. There are four brake shoe assemblies to be removed from the two rear axle assemblies, and each assembly consists of two brake shoes with lining. The brake shoes are anchored at one end by a brake shoe anchor pin and loosely held together at the other end by a brake shoe return spring.

f. The following procedure of removal is for one rear service brake assembly. Repeat procedure to remove the other three rear service brake assemblies.

19. REAR SERVICE BRAKE REMOVAL.

a. Equipment.

DRIFT
HAMMER
PLIERS
PLIERS, brake spring
PRESS, hydraulic
PUNCH, 1/8-in.
SCREWDRIVER
VISE, with soft jaws
WRENCH, box, 5/16-in.
WRENCH, open-end, 7/16-in.
WRENCH, open-end, 5/8-in.
WRENCH, open-end, 3/4-in.
WRENCH, open-end, 7/8-in.
WRENCH, socket, 9/16-in.
WRENCH, socket, 3/4-in.
WRENCH, socket, 7/8-in.
WRENCH, socket head set screw

b. Procedure.

(1) REMOVE BRAKE DUST SHIELDS.

PLIERS
SCREWDRIVER
WRENCH, box, 5/16-in.

(a) Remove six brake dust shield cap screws and lock washers (5/16-in. box wrench).

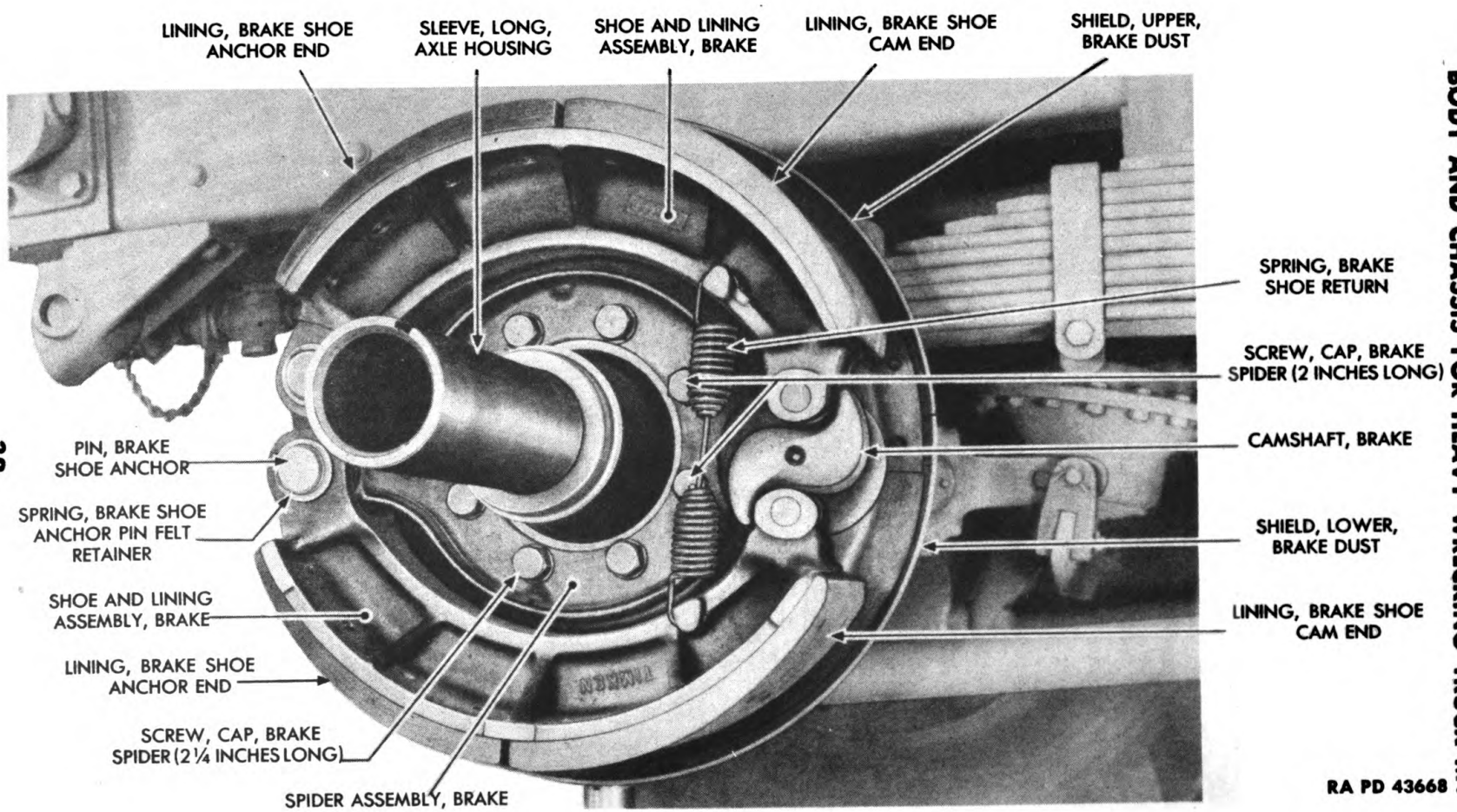


Figure 7—Rear Service Brake Assembly

REAR SERVICE BRAKE REMOVAL

(b) Remove brake dust shield bolt, nut and lock washer (screwdriver and pliers).

(c) Lift off brake dust upper and lower shields (fig. 7).

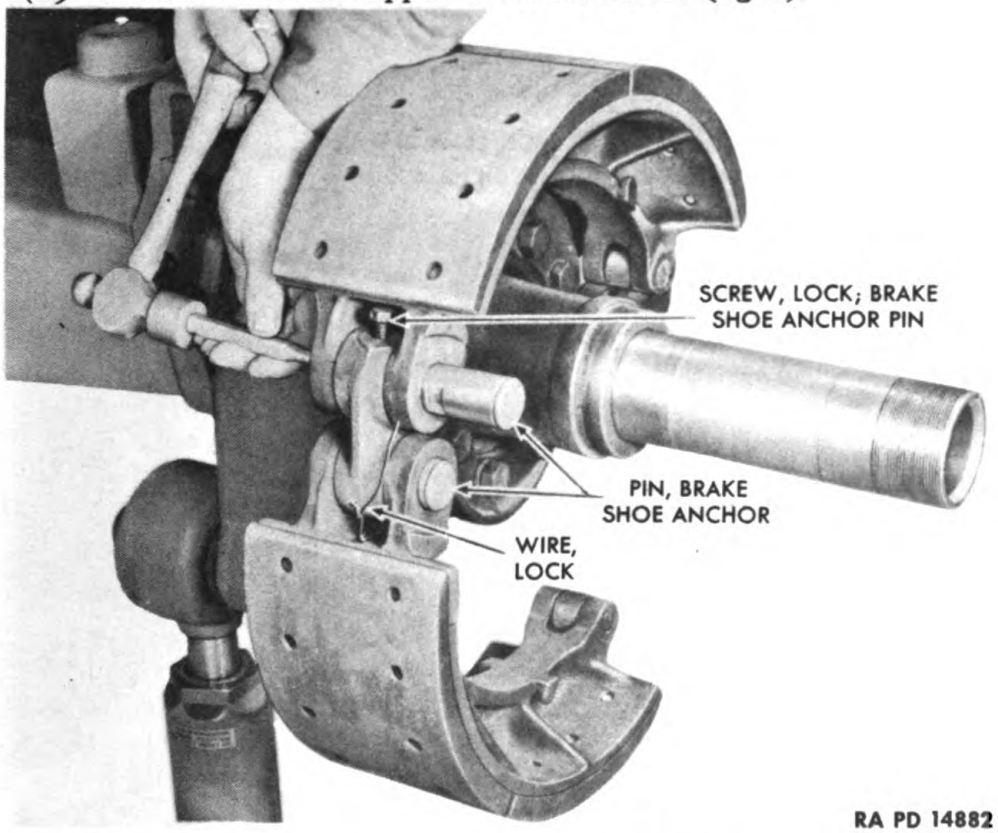


Figure 8—Removing Rear Brake Anchor Pin

(2) REMOVE BRAKE SHOE AND LINING ASSEMBLIES (fig. 8).

DRIFT	PLIERS, brake spring
HAMMER	SCREWDRIVER
PLIERS	WRENCH, open-end, 5/8-in.

(a) Using brake spring pliers, pull up and outward on brake shoe spring (fig. 2). Unhook other end of brake shoe spring. Remove brake shoe spring.

(b) Pry off brake shoe anchor pin felt retainer spring from front end of brake shoe anchor pin (screwdriver) (4, fig. 7). Repeat the operation at rear end of brake shoe anchor pin.

(c) Repeat step *(b)* above on second brake shoe anchor pin.

(d) Lift off brake shoe anchor pin felt retainer and brake shoe anchor pin felt from front end of brake shoe anchor pin. Repeat the operation at rear end of brake shoe anchor pin.

(e) Repeat step *(d)* above on second brake shoe anchor pin.

(f) Cut brake shoe anchor pin lock screw wire (pliers). Remove wire from heads of two brake shoe anchor pin lock screws (fig. 8).

(g) Remove two brake shoe anchor pin lock screws (⅝-in. open-end wrench) (fig. 8).

(h) Drive out two brake shoe anchor pins (hammer and drift) (fig. 8).

(i) Lift off brake shoe and lining assemblies.

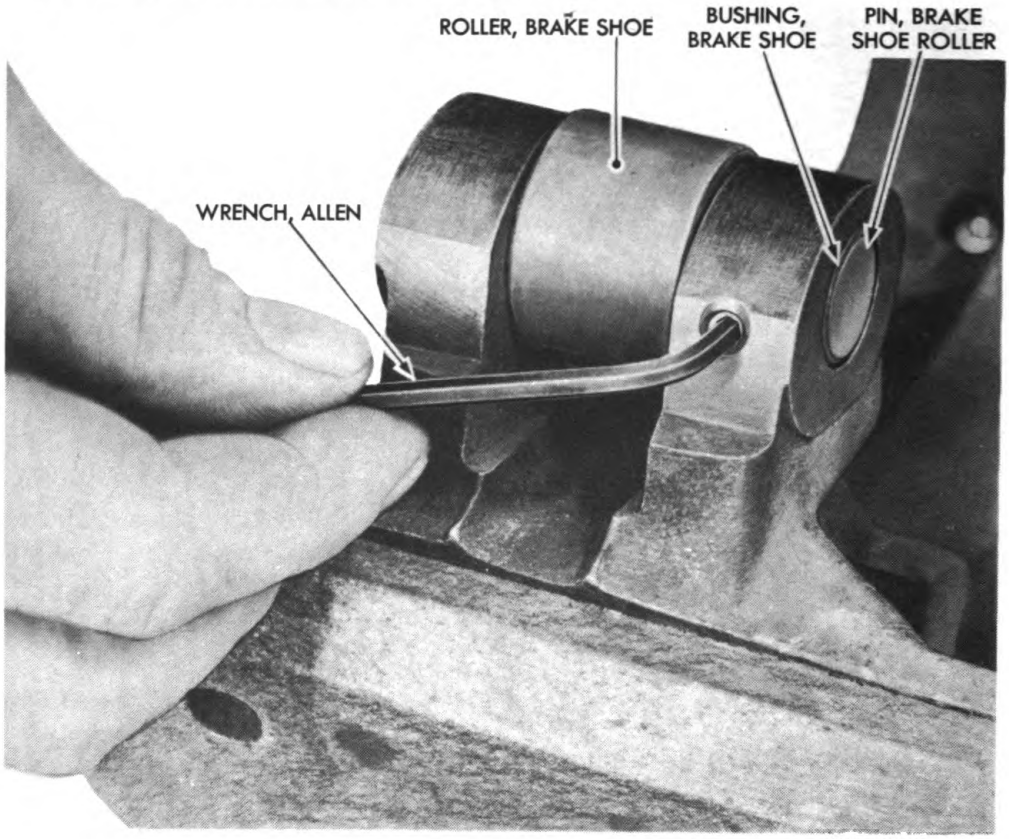


Figure 9—Removing Brake Shoe Roller

(3) DISASSEMBLE BRAKE SHOES AND LININGS (fig. 9).

DRIFT	VISE, with soft jaws
HAMMER	WRENCH, socket head set screw
PRESS, hydraulic	
PUNCH, ⅛-in.	

(a) Place brake shoe and lining assembly in a vise.

(b) Drive out the 16 brake shoe lining rivets from back of shoe (hammer and ⅛-in. punch). Lift off brake shoe lining.

(c) Remove brake shoe roller pin set screw (socket head set screw wrench) (fig. 9).

(d) Tap out brake shoe roller pin and lift out brake shoe roller (hammer and drift).

(e) Press out brake shoe bushings (hydraulic press).

(f) Repeat operations *(a)*, *(b)*, *(c)*, *(d)* and *(e)* to disassemble second brake shoe and lining assembly.

(4) REMOVE SLACK ADJUSTERS.

HAMMER
PLIERS
SCREWDRIVER

(a) Remove cotter pin (pliers) from brake diaphragm equalizer yoke pin (1, fig. 10) and remove yoke pin from brake diaphragm equalizer (11, fig. 10) and from end of slack adjuster arm.

(b) Remove slack adjuster retaining washer screw (8, fig. 12) from inner end of brake camshaft (screwdriver). Lift off slack adjuster retaining washer.

(c) Tap slack adjuster off splines of brake camshaft (hammer).

(d) Repeat operations *(a)*, *(b)* and *(c)* to remove opposite slack adjuster.

(5) REMOVE BRAKE CAMSHAFTS.

PRESS, hydraulic
SCREWDRIVER
WRENCH, open-end, 7/16-in.
WRENCH, socket, 3/4-in.

(a) Slide three brake camshaft spacing washers off splined end of brake camshaft.

(b) Remove two brake camshaft bracket stud nuts and lock washers (3/4-in. socket wrench).

(c) Slide brake camshaft bracket (15, fig. 12) off splined end of brake camshaft.

(d) Press brake camshaft bracket bushing (16, fig. 12) out of brake camshaft bracket (hydraulic press).

(e) Remove brake camshaft bracket grease relief fitting (7/16-in. open-end wrench).

(f) Working at inside of brake spider (21, fig. 12), pry off brake camshaft felt washer lock ring (screwdriver) (17, fig. 12). Pull off brake camshaft felt retainer, brake camshaft felt and another brake camshaft felt retainer from splined end of brake camshaft.

(g) Pull brake camshaft out of brake spider and then slide brake camshaft washer off brake camshaft.

(h) Pull brake camshaft felt retainer and brake camshaft felt out of brake spider.

(6) REMOVE BRAKE SPIDER.

DRIFT
HAMMER
WRENCH, socket, 7/8-in.

(a) Remove six brake spider cap screws (2 1/4 in. long) and two brake spider cap screws (2 in. long) (7/8-in. socket wrench). (The short cap screws are from holes nearest brake camshaft.) Lift off brake spider assembly.

(b) Drive brake spider needle bearings (24, fig. 12) out of brake spider (hammer and drift).

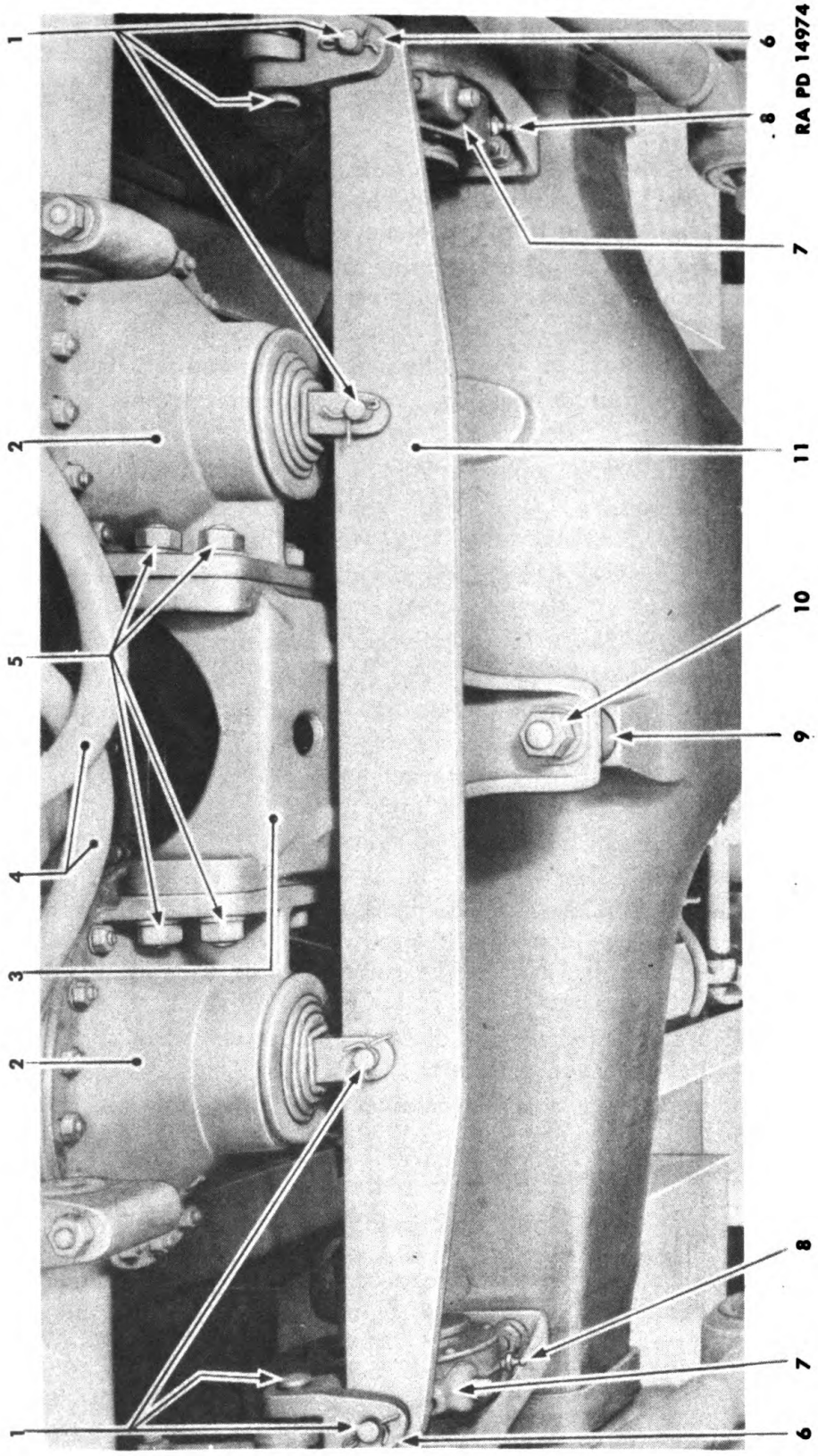


Figure 10—Rear Brake Diaphragm Equalizer Assembly

REAR SERVICE BRAKE REMOVAL

1. PIN, BRAKE DIAPHRAGM EQUALIZER YOKE
2. DIAPHRAGM, BRAKE
3. BRACKET, BRAKE DIAPHRAGM
4. HOSE, AIR
5. NUT, BRAKE DIAPHRAGM STUD
6. YOKE, BRAKE DIAPHRAGM EQUALIZER
7. ADJUSTER, SLACK
8. FITTING, SLACK ADJUSTER LUBRICATION
9. SPACER, BRAKE DIAPHRAGM BRACKET
10. STUD, BRAKE DIAPHRAGM BRACKET
11. EQUALIZER ASSEMBLY, BRAKE DIAPHRAGM

RA PD 14974A

Figure 10A—Legend for Figure 10

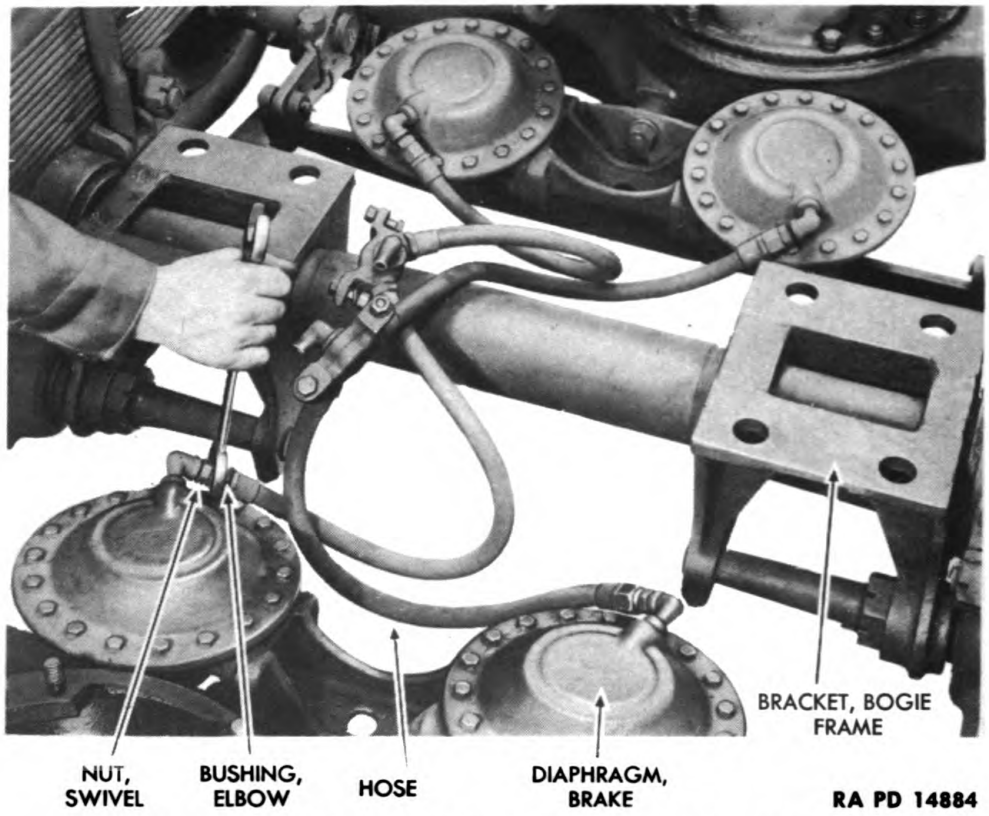


Figure 11—Brake Air Diaphragm Hose Assembly

(7) REMOVE BRAKE DIAPHRAGM ASSEMBLIES (fig. 11).

PLIERS
WRENCH, open-end, 3/4-in.
WRENCH, open-end, 7/8-in.
WRENCH, socket, 3/4-in.

(a) Remove brake diaphragm equalizer yoke pin cotter pin (pliers).

(b) Pull brake diaphragm equalizer yoke pin (1, fig. 10) out of brake diaphragm and brake diaphragm equalizer (pliers).

(c) Disconnect air hose at brake diaphragm assembly (3/4-in. and 7/8-in. open-end wrenches) (fig. 11).

(d) Remove stud nuts and lock washers which hold brake diaphragm (2, fig. 10) to brake diaphragm bracket (3, fig. 10) (3/4-in. socket wrench).

(e) Remove brake diaphragm assembly.

(f) Lift off brake diaphragm equalizer assembly (11, fig. 10).

(g) Repeat operations *(a), (b), (c), (d), (e)* and *(f)* to remove opposite brake diaphragm assembly and two brake diaphragms on the second rear axle.

(8) DISASSEMBLE BRAKE DIAPHRAGM EQUALIZER ASSEMBLIES.

DRIFT
HAMMER
PLIERS

REAR SERVICE BRAKE REMOVAL

(a) Remove cotter pin from brake diaphragm equalizer yoke pin (pliers).

(b) Pull out brake diaphragm equalizer yoke pin which holds brake diaphragm equalizer yoke to brake diaphragm equalizer assembly (fig. 10).

(c) Pull brake diaphragm equalizer yoke off brake diaphragm equalizer.

(d) Drive bushings out of brake diaphragm equalizer yoke (hammer and drift).

(e) Drive bushings out of brake diaphragm equalizer (hammer and drift).

(f) Repeat operations *(a)*, *(b)*, *(c)*, *(d)* and *(e)* to disassemble other diaphragm equalizer assemblies.

(9) REMOVE BRAKE DIAPHRAGM BRACKET.

WRENCH, socket, 3/4-in.

(a) Remove brake diaphragm bracket stud nuts and lock washers (fig. 10) which hold brake diaphragm bracket (3, fig. 10) to rear axle housing (3/4-in. socket wrench). Lift off brake diaphragm bracket.

(b) Lift brake diaphragm bracket spacer (9, fig. 10) from brake diaphragm bracket stud.

(c) Repeat operations *(a)* and *(b)* to remove bracket from second rear axle.

(10) DISASSEMBLE BRAKE DRUM ASSEMBLY.

WRENCH, socket, 9/16-in.

(a) Remove brake drum inspection cover cap screw and lock washer which hold bracket drum inspection cover to brake drum (9/16-in. socket wrench). Lift off brake drum inspection cover.

ORDNANCE MAINTENANCE
BODY AND CHASSIS FOR HEAVY WRECKING TRUCK M1

Section VII

REAR SERVICE BRAKE INSPECTION AND REPAIR

20. GENERAL.

a. The inspection of the brake diaphragm and slack adjuster is covered in paragraphs 99 and 106.

b. Clean all brake metal parts with SOLVENT, dry-cleaning, to remove dirt and grease, but do not allow any grease, dirt or solvent to get on brake shoe linings.

21. REAR SERVICE BRAKE INSPECTION AND REPAIR.

a. Equipment.

GAGE, feeler

b. Procedure.

(1) Inspect brake shoe linings (par. 14 **b** (1)).

(2) Inspect brake drums (par. 14 **b** (2)).

(3) Inspect brake shoe rollers.

GAGE, feeler

(a) Place roller on pin.

(b) Try to insert a narrow 0.005-inch feeler gage between brake shoe roller and pin. If the gage will pass between roller and pin, replace roller pin.

(4) Inspect brake shoe bushings (par. 14 **b** (4)).

(5) Inspect brake spiders.

(a) The brake spiders should be examined for cracks and replaced if cracks are found.

(b) Place brake shoe anchor pins through their holes in brake spider. If pins are loose enough to permit side play, replace pins.

(6) Inspect brake camshaft felts. Examine brake camshaft felts. Replace if oil-soaked.

(7) Inspect brake camshafts (par. 14 **b** (5)).

(8) Inspect brake camshaft washers. Examine brake camshaft washers. Replace if scored or worn unevenly.

Section VIII

REAR SERVICE BRAKE INSTALLATION

22. GENERAL.

a. The eight brake shoe and lining assemblies used on the two rear axles are alike and can be interchanged. There are two brake shoe linings used on each brake shoe and these linings are different. One is used at the cam end of the shoe and the other at the anchor end.

b. The four brake diaphragms receive compressed air from the air reservoirs and act upon the two brake diaphragm equalizer assemblies.

c. The four slack adjusters (located on the inner ends of the four brake camshafts) are operated by the brake diaphragm equalizer assemblies.

23. REAR SERVICE BRAKE INSTALLATION.

a. Equipment.

DRIFT
GAGE, feeler
GREASE, general purpose, seasonal grade
HAMMER
HAMMER, soft
JACKS, hydraulic (2)
MACHINE, brake riveting
PLIERS
PLIERS, brake spring
PRESS, hydraulic
SCREWDRIVER
WRENCH, box, 5/16-in.
WRENCH, open-end, 7/16-in.
WRENCH, open-end, 5/8-in.
WRENCH, open-end, 3/4-in.
WRENCH, open-end, 7/8-in.
WRENCH, socket, 9/16-in.
WRENCH, socket, 3/4-in.
WRENCH, socket, 7/8-in.
WRENCH, socket head set screw

b. Procedure.

(1) INSTALL BRAKE DIAPHRAGM BRACKET.

WRENCH, socket, 3/4-in.

(a) Install brake diaphragm bracket spacer (9, fig. 10) on brake diaphragm bracket stud.

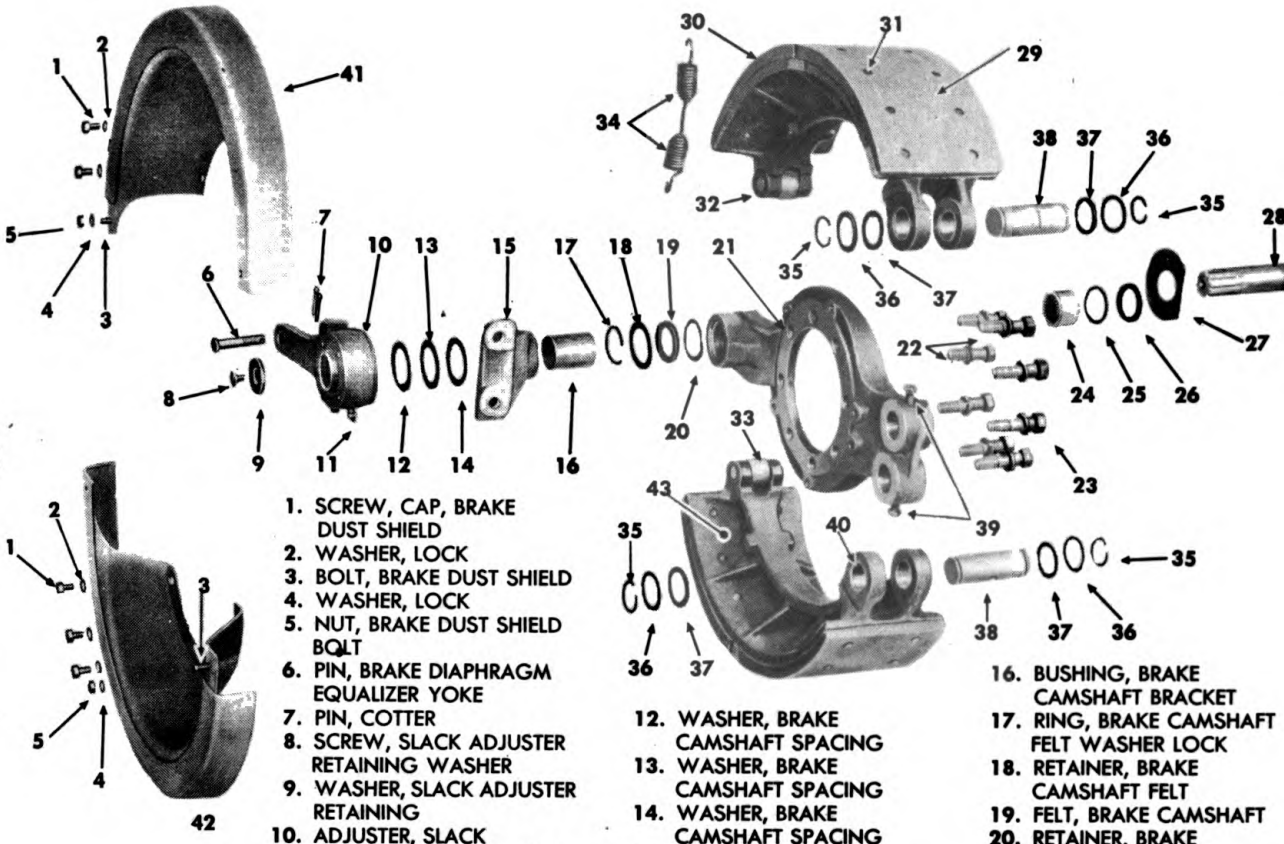
(b) Install brake diaphragm bracket and tighten stud nuts and lock washers (3/4-in. socket wrench).

(c) Repeat operations *(a)* and *(b)* on second rear axle.

(2) ASSEMBLE BRAKE DIAPHRAGM EQUALIZER.

PLIERS
PRESS, hydraulic

(a) Install brake diaphragm equalizer bushings in brake diaphragm equalizer (hydraulic press) (11, fig. 10).



1. SCREW, CAP, BRAKE DUST SHIELD
2. WASHER, LOCK
3. BOLT, BRAKE DUST SHIELD
4. WASHER, LOCK
5. NUT, BRAKE DUST SHIELD BOLT
6. PIN, BRAKE DIAPHRAGM EQUALIZER YOKE
7. PIN, COTTER
8. SCREW, SLACK ADJUSTER RETAINING WASHER
9. WASHER, SLACK ADJUSTER RETAINING
10. ADJUSTER, SLACK
11. FITTING, SLACK ADJUSTER LUBRICATION
12. WASHER, BRAKE CAMSHAFT SPACING
13. WASHER, BRAKE CAMSHAFT SPACING
14. WASHER, BRAKE CAMSHAFT SPACING
15. BRACKET, BRAKE CAMSHAFT
16. BUSHING, BRAKE CAMSHAFT BRACKET
17. RING, BRAKE CAMSHAFT FELT WASHER LOCK
18. RETAINER, BRAKE CAMSHAFT FELT
19. FELT, BRAKE CAMSHAFT
20. RETAINER, BRAKE CAMSHAFT FELT
21. SPIDER, BRAKE
22. SCREW, CAP, BRAKE SPIDER (2 IN. LONG)
23. SCREW, CAP, BRAKE SPIDER (2¼ IN. LONG)
24. BEARING, BRAKE SPIDER NEEDLE
25. RETAINER, BRAKE CAMSHAFT FELT
26. FELT, BRAKE CAMSHAFT
27. WASHER, BRAKE CAMSHAFT
28. CAMSHAFT, BRAKE
29. LINING, BRAKE SHOE—ANCHOR END
30. LINING, BRAKE SHOE—CAM END
31. RIVET, BRAKE SHOE LINING
32. PIN, BRAKE SHOE ROLLER
33. ROLLER, BRAKE SHOE
34. SPRING, BRAKE SHOE
35. SPRING, BRAKE SHOE ANCHOR PIN FELT RETAINER
36. RETAINER, BRAKE SHOE ANCHOR PIN FELT
37. FELT, BRAKE SHOE ANCHOR PIN
38. PIN, BRAKE SHOE ANCHOR
39. SCREW, BRAKE ANCHOR PIN LOCK
40. BUSHING, BRAKE SHOE
41. SHIELD, UPPER, BRAKE DUST
42. SHIELD, LOWER, BRAKE DUST
43. SHOE, BRAKE

RA PD 14897

Figure 12—Rear Service Brakes

(b) Install brake diaphragm equalizer yoke bushings in equalizer yoke (hydraulic press) (6, fig. 10).

(c) Install brake diaphragm equalizer yoke on brake diaphragm equalizer.

(d) Install brake diaphragm equalizer yoke pin (1, fig. 10) through equalizer yoke and through the brake diaphragm equalizer (pliers).

(e) Insert brake diaphragm equalizer yoke pin cotter pin (pliers).

(f) Repeat operations *(b)*, *(c)*, *(d)* and *(e)* to assemble opposite brake diaphragm equalizer yoke. Then repeat operations *(a)*, *(b)*, *(c)*, *(d)* and *(e)* to assemble brake diaphragm equalizer assembly on second rear axle.

(3) INSTALL BRAKE DIAPHRAGM.

PLIERS	WRENCH, open-end, 7/8-in.
WRENCH, open-end, 3/4-in.	WRENCH, socket, 3/4-in.

(a) Install brake diaphragm assembly (2, fig. 10) on brake diaphragm bracket (3, fig. 10), and fasten with four brake diaphragm bracket stud nuts (5, fig. 10) and lock washers (3/4-in. socket wrench).

(b) Connect air hose to brake diaphragm assembly (3/4-in. and 7/8-in. open-end wrenches) (fig. 11).

(c) Repeat operations *(a)* and *(b)* to install opposite brake diaphragm assembly.

(d) Install brake diaphragm equalizer assembly (11, fig. 10) and connect to brake diaphragm assembly with brake diaphragm equalizer yoke pin (1, fig. 10). Repeat the operation to connect opposite brake diaphragm equalizer.

(e) Install equalizer yoke pin cotter pins (pliers).

(f) Repeat operations *(a)*, *(b)*, *(c)*, *(d)* and *(e)* to install brake diaphragms on second rear axle.

(4) INSTALL BRAKE SPIDERS.

DRIFT	HAMMER
GREASE, general purpose, seasonal grade	PRESS, hydraulic
	WRENCH, socket, 7/8-in.

(a) Place brake spider (21, fig. 12) in a hydraulic press and install brake spider needle bearing (24, fig. 12). Coat the bearing with general purpose grease, seasonal grade.

(b) Install brake spider assembly on rear axle housing flange. Install the two brake spider cap screws (2 in. long) (22, fig. 12) in brake spider holes nearest the brake camshaft hole; then install the six brake spider cap screws (2 1/4 in. long) (23, fig. 12). Tighten brake spider cap screws (7/8-in. socket wrench).

(5) INSTALL BRAKE CAMSHAFTS.

PRESS, hydraulic	WRENCH, open-end, 7/16-in.
SCREWDRIVER	WRENCH, socket, 3/4-in.

(a) Install brake camshaft felt (26, fig. 12) and felt retainer (25, fig. 12) into brake spider.

(b) Slide brake camshaft washer (27, fig. 12) on brake camshaft (28, fig. 12) and install brake camshaft in brake spider.

(c) Place brake camshaft felt retainer (20, fig. 12), brake camshaft felt (19, fig. 12) and second brake camshaft felt retainer (18, fig. 12) over splined end of brake camshaft and into brake spider. Install felt washer lock ring (17, fig. 12).

(d) Install brake camshaft bracket grease relief fitting ($\frac{7}{16}$-in. open-end wrench).

(e) Install brake camshaft bracket bushing (16, fig. 12) into bracket (hydraulic press).

(f) Slide brake camshaft bracket on splined end of brake camshaft and on brake camshaft bracket studs.

(g) Install and tighten brake camshaft bracket stud nuts and lock washers ($\frac{3}{4}$-in. socket wrench).

(6) INSTALL SLACK ADJUSTERS.

HAMMER
PLIERS
SCREWDRIVER

(a) Slide the three brake camshaft spacing washers (12, 13 and 14, fig. 12) on splined end of brake camshaft.

(b) Tap slack adjuster (10, fig. 12) on splines of brake camshaft (hammer).

(c) Install slack adjuster retaining washer (9, fig. 12) on end of brake camshaft and fasten with slack adjuster retaining washer screw (screwdriver).

(d) Insert brake diaphragm equalizer yoke pin (6, fig. 12) through brake diaphragm equalizer and end of slack adjuster arm.

(e) Install brake diaphragm equalizer yoke pin cotter pin (pliers).

(f) Repeat operations *(a), (b), (c), (d)* and *(e)* to install opposite slack adjuster.

(7) ASSEMBLE BRAKE SHOES AND LININGS.

HAMMER, soft
MACHINE, brake riveting
PRESS, hydraulic
WRENCH, socket head set screw

(a) Place brake shoe (43, fig. 12) in a hydraulic press and install brake shoe bushings (40, fig. 12).

(b) Install cam end brake shoe lining and anchor end brake shoe lining (brake riveting machine).

(c) Install brake shoe roller (33, fig. 12) in brake shoe and tap brake shoe roller pin through brake shoe roller and into brake shoe (soft hammer).

(d) Install brake shoe roller pin set screw (socket head set screw wrench) (fig. 9).

(e) Repeat operations *(a)*, *(b)*, *(c)* and *(d)* to assemble second brake shoe.

(8) INSTALL BRAKE SHOE AND LINING ASSEMBLIES.

DRIFT
HAMMER
PLIERS, brake spring
WRENCH, open-end, 5/8-in.

(a) Install brake shoe and lining assemblies on brake spider and install brake shoe anchor pins (soft hammer) (38, fig. 12).

(b) Install two brake shoe anchor pin lock screws (5/8-in. open-end wrench) (39, fig. 12).

(c) Install brake shoe anchor pin lock screw wire through heads of brake shoe anchor pin lock screws and twist wire to tighten (pliers).

(d) Slide brake shoe anchor pin felt (37, fig. 12) and brake shoe anchor pin felt retainer (36, fig. 12) on each end of each brake shoe anchor pin.

(e) Install brake shoe anchor pin felt retainer spring (35, fig. 12) on each end of each brake shoe anchor pin, tapping it into place with a hammer and drift.

(f) Hook one end of brake shoe spring (34, fig. 12) on brake shoe and hook the other end onto other brake shoe (brake spring pliers) (fig. 12).

(9) INSTALL BRAKE DUST SHIELDS.

WRENCH, box, 5/16-in.

(a) Install the upper and lower brake dust shields (41 and 42, fig. 12) and tighten retaining bolt nuts (screwdriver and pliers).

(b) Install six brake dust shield cap screws and lock washers (5/16-in. box wrench).

(10) INSTALL BRAKE DRUM INSPECTION COVER.

WRENCH, socket, 9/16-in.

(a) Install brake drum inspection cover (fig. 6) and tighten lock washer and cap screw (9/16-in. socket wrench).

(11) INSTALL REAR DUAL WHEELS AND TIRES.

(a) Install wheel hubs and drums (TM 9-1795A).

(b) Install rear dual wheels and tires (TM 9-1795A).

24. REAR SERVICE BRAKE ADJUSTMENT.

a. Equipment.

GAGE, feeler
JACKS, hydraulic (2)
WRENCH, socket, 9/16-in.

b. Procedure.

(1) ADJUST REAR SERVICE BRAKES.

GAGE, feeler
JACKS, hydraulic (2)
WRENCH, socket, 9/16-in.

ORDNANCE MAINTENANCE
BODY AND CHASSIS FOR HEAVY WRECKING TRUCK M1

(a) Using two hydraulic jacks, raise rear wheels and tires clear of the ground.

(b) Insert a $\frac{9}{16}$-inch socket wrench through a wheel opening and loosen brake drum inspection cover cap screw and turn brake drum inspection cover to one side (fig. 6).

(c) Turn wheel and tire so brake drum inspection hole is just above brake camshaft (A, fig. 6) on first rear wheels and (B, fig. 6) on second rear wheels.

(d) Insert a 0.010-inch feeler gage about nine inches long through brake drum inspection hole and between upper brake shoe lining and brake drum.

(e) Revolve wheel about eight inches forward (first rear wheels) or backward (second rear wheels). Gage must fit with a slight drag as wheel is revolved.

(f) Repeat *(b)*, *(c)* and *(d)* on lower brake shoe.

(g) Adjust slack adjuster (par. 109).

(h) Rotate the wheel and listen for a heavy scraping sound. If heard, it indicates that brakes are adjusted too tightly or that there are high spots on brake drum face or brake shoe lining. If a slight loosening of the brake adjustment does not eliminate the scraping sound, the brake drum will have to be removed and turned true.

(i) Turn brake drum inspection cover into place and tighten cap screw ($\frac{9}{16}$-in. socket wrench).

(2) ADJUST BRAKE PEDAL LINKAGE. If the action of rear service brakes is not satisfactory, adjust brake pedal linkage (par. 88).

CHAPTER 3

PARKING BRAKES

Section I

GENERAL

25. GENERAL.

a. The parking brake assembly should be used to hold the wrecker from moving when the vehicle is not in use.

b. If an emergency arises making it necessary to use the parking brake assembly for stopping, it should be applied gradually because of its twisting action on the propeller shafts and driving mechanism.

c. The parking brake assembly must not be used when the winches are being used for drawing or pulling operations. Use the service brakes for such work.

d. The parking brake assembly is located back of the transfer case and consists of a flat circular parking brake disk fastened between two universal joint flanges. The parking brake lever in the cab is connected to two pairs of parking brake shoes which grip both sides of the parking brake disk, and the braking action is then carried through the propeller shaft to the rear wheels and tires and—if the front axle drive is engaged —to the front wheels also.

26. SPECIFICATIONS AND DATA.

a. Parking Brake.

Make	American Cable
Model	65 D
Type	4-shoe, ventilated disk
Lining dimensions	8- by 3- by ¼-in.
Lining make	American Brake Block
Location	Rear of transfer case, on propeller shaft
Weight	110 lb

ORDNANCE MAINTENANCE
BODY AND CHASSIS FOR HEAVY WRECKING TRUCK M1

27. REFERENCE TO TM 9-795.

a. Many second echelon operations covered in TM 9-795 are often done by ordnance personnel. Reference should be made to TM 9-795 for lower echelon operations not covered in this manual.

28. ECHELON BREAKDOWN OF MAINTENANCE OPERATIONS.

(Refer to par. 4.)

Section II

TROUBLE SHOOTING

29. TROUBLE SHOOTING, INSPECTION AND REMEDIAL MEASURES.

a. The following chart is provided as a guide to common troubles and their causes and is recommended procedure for inspection to locate the cause.

Symptom and Probable Cause	Probable Correction
b. Brake Does Not Hold.	
(1) Normal wear of brake lining.	(1) Adjust brake (par. 44 **b** (1) and (2)).
(2) Brake shoes improperly adjusted.	(2) Adjust brake (par. 44 **b** (3)).
(3) Brake shoe lining burned and glazed.	(3) Replace brake shoe lining (par. 33 **b** (6)).
(4) Brake disk burned and warped.	(4) Replace brake disk (par. 31 **b** (3)).
(5) Brake lever rod improperly adjusted.	(5) Adjust brake lever rod (par. 43 **b** (6)).
(6) Right shoe pull rod and left shoe pull rod improperly adjusted.	(6) Adjust right shoe pull rod and left shoe pull rod (par. 44 **b** (1) and (2)).

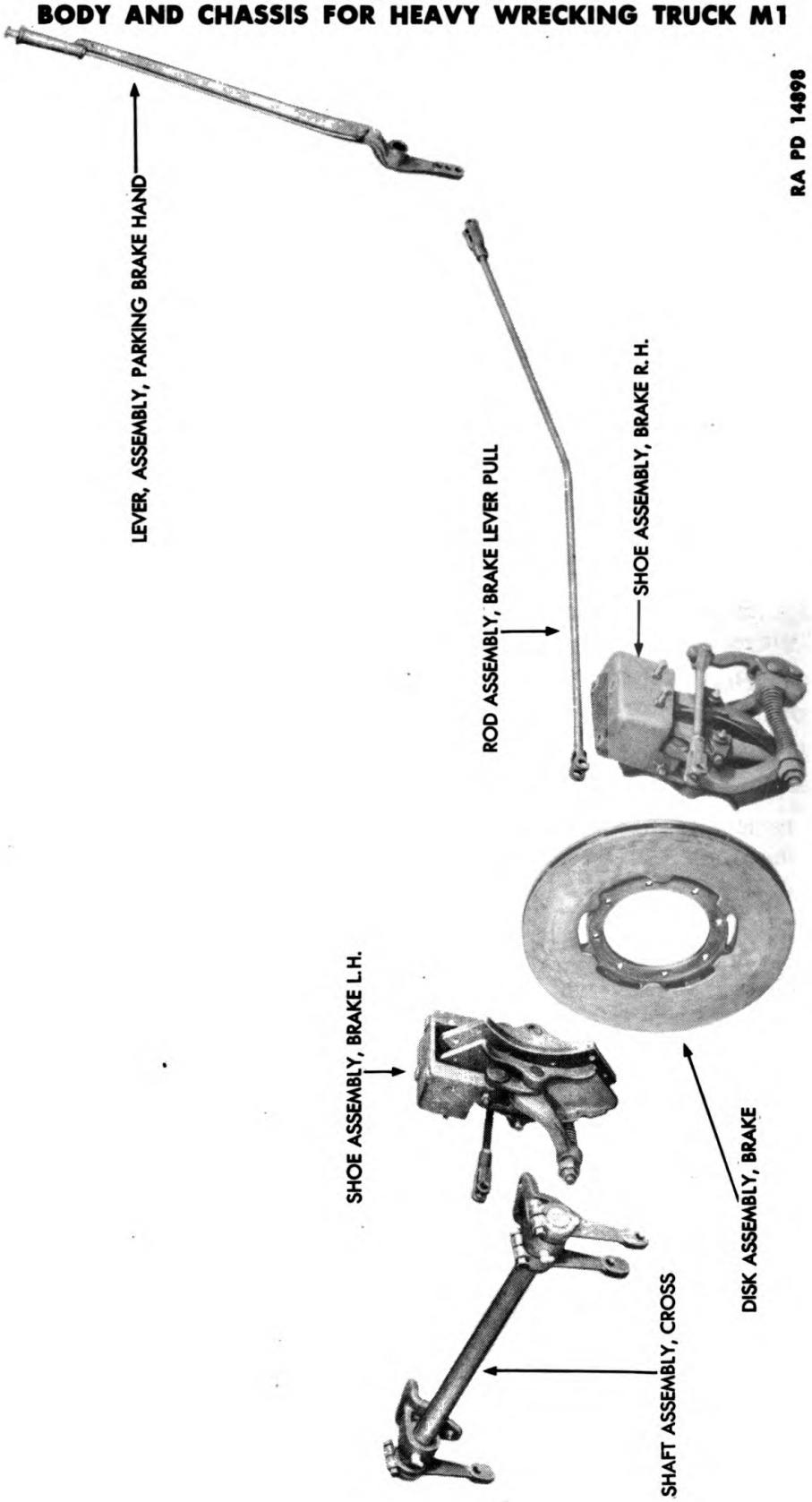


Figure 13—Parking Brake Assembly

Section III

PARKING BRAKE ASSEMBLY REMOVAL

30. GENERAL.

a. The parking brake assembly consists of a brake shoe assembly, right-hand; brake shoe assembly, left-hand; disk assembly; parking brake hand lever assembly and the cross shaft assembly.

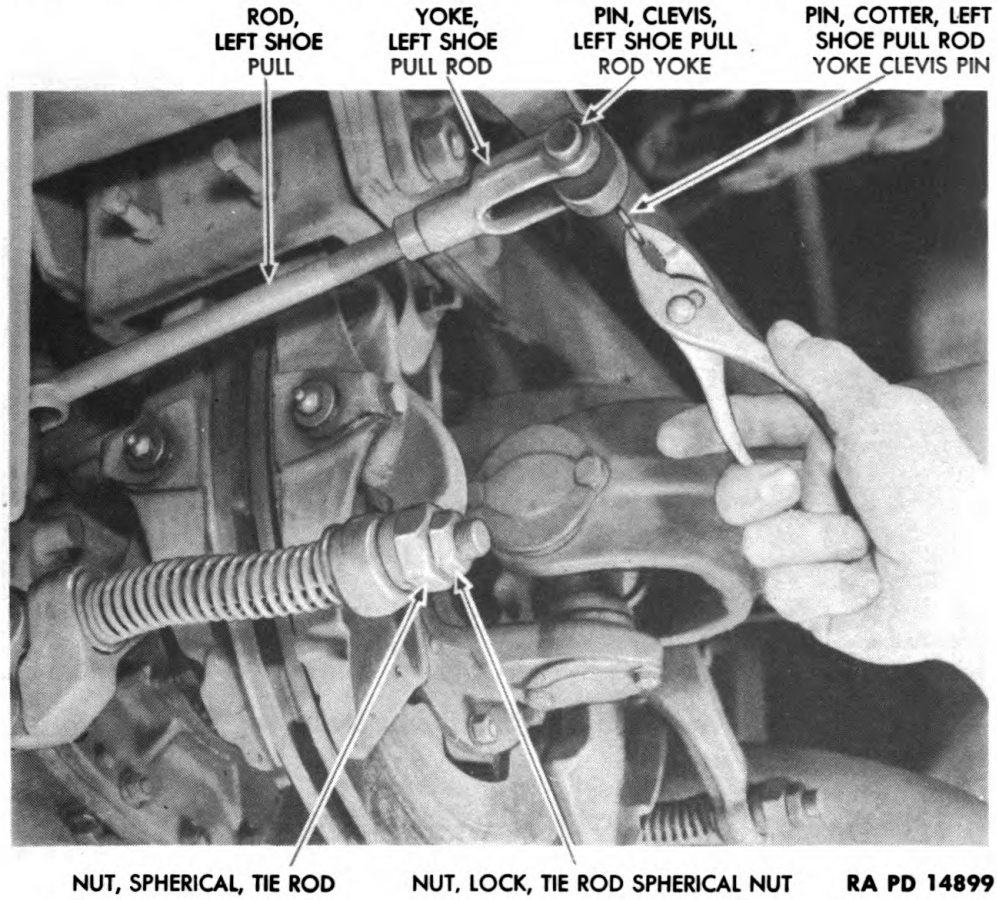


Figure 14—Disconnecting Parking Brake Pull Rod

b. Movement of the parking brake hand lever is transmitted through a brake lever rod to the cross shaft assembly. The ends of the cross shaft are mounted in cross shaft brackets which allow the cross shaft to rotate. Levers clamped on the cross shaft carry the movement to the brake shoe assemblies, clamping them against the disk.

c. Start the engine and observe whether the disk assembly revolves without any wobble or distortion. Then shut off engine.

ORDNANCE MAINTENANCE
BODY AND CHASSIS FOR HEAVY WRECKING TRUCK M1

31. PARKING BRAKE ASSEMBLY REMOVAL.

a. Equipment.

DRIFT	WRENCH, open-end, 9/16-in.
HAMMER	WRENCH, open-end, 3/4-in.
PLIERS	WRENCH, open-end, 7/8-in.
SCREWDRIVER	WRENCH, socket, 9/16-in.
WIRE	WRENCH, socket, 3/4-in.

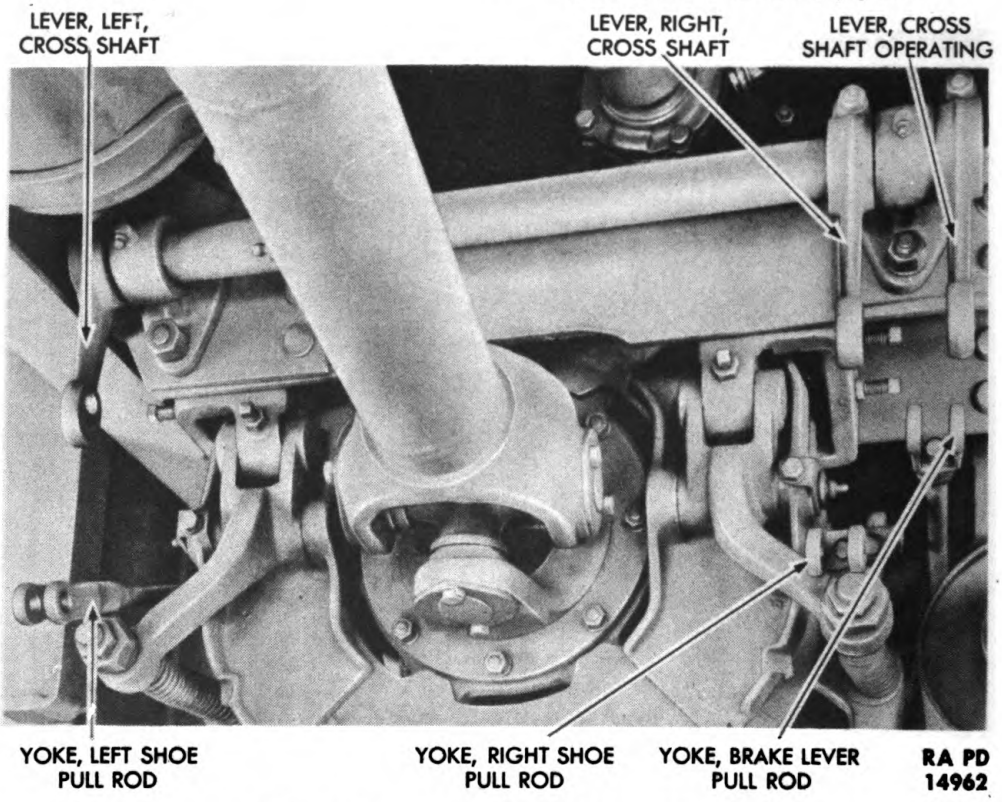


Figure 15—Pull Rods Disconnected

b. Procedure.

(1) DISCONNECT BRAKE SHOE ASSEMBLIES.

PLIERS

(a) Remove brake shoe spring (15, fig. 21) from left-hand brake shoe assembly (pliers). Repeat operation on right-hand brake shoe assembly.

(b) Working at brake cross shaft end of pull rods, remove cotter pin and left shoe pull rod yoke clevis pin (fig. 14). Repeat operation on right shoe pull rod yoke and also on brake lever pull rod yoke (fig. 15).

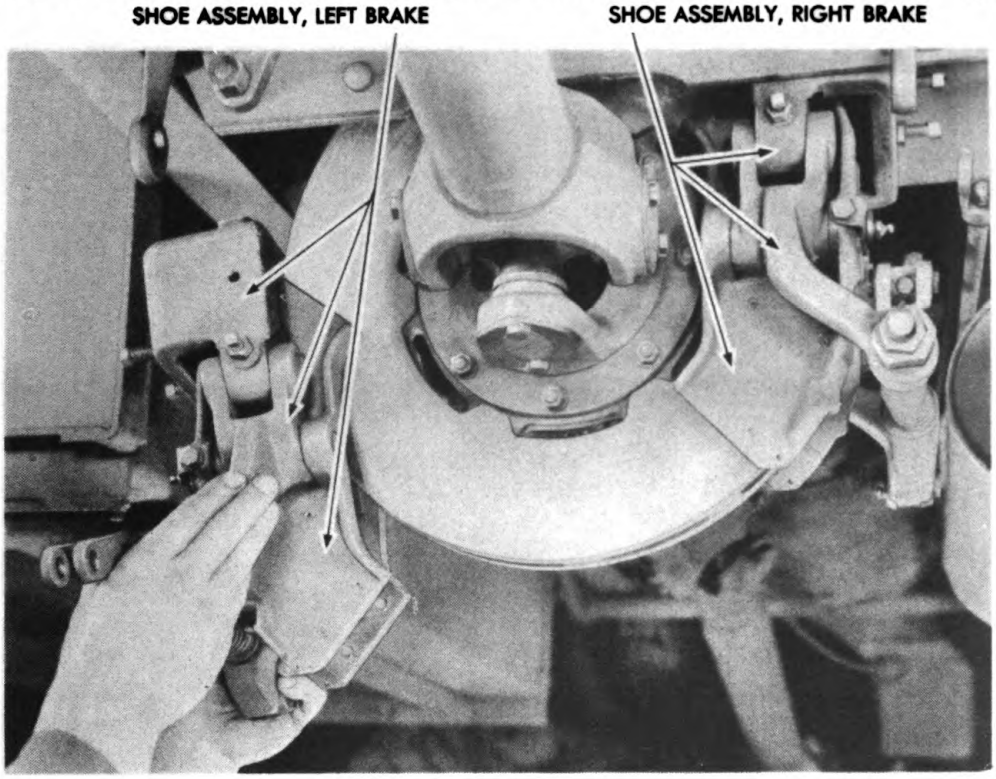
(c) The right shoe pull rod, left shoe pull rod and brake lever pull rod will drop into position shown in figure 15, and they can be left there without being tied up.

PARKING BRAKE ASSEMBLY REMOVAL

(2) REMOVE BRAKE SHOE ASSEMBLIES.

PLIERS
WRENCH, socket, 3/4-in.

(a) The right-hand brake shoe assembly and left-hand brake shoe assembly are fastened to the frame cross member with three cap screws in each brake anchor bracket. Cut and remove brake anchor bracket cap screw lock wire threaded through heads of brake anchor bracket cap screws (pliers). Repeat operation on left-hand brake shoe assembly.



RA PD 14979

Figure 16—Removing Parking Brake Shoe Assemblies

(b) Remove three brake anchor bracket cap screws (3/4-in. socket wrench). Support brake shoe assembly to keep it from falling while cap screws are being removed. Repeat operation on left-hand brake shoe assembly.

(c) Lift off right-hand brake shoe assembly and left-hand brake shoe assembly.

(3) REMOVE DISK ASSEMBLY.

DRIFT
HAMMER
SCREWDRIVER
WIRE
WRENCH, open-end, 9/16-in.
WRENCH, socket, 9/16-in.

(a) Using a 9/16-inch open-end wrench on universal joint flange bolt nut, and a 9/16-inch socket wrench on the bolt, remove two universal joint flange bolt nuts and lock washers at (A) and (B) (fig. 17). Then

use the open-end wrench on universal joint flange bolt and the socket wrench on the nut, and remove remaining six universal joint flange bolt nuts and lock washers.

(b) Remove seven of the universal joint flange bolts (hammer and drift). Leave top universal joint flange bolt in place to hold disk assembly.

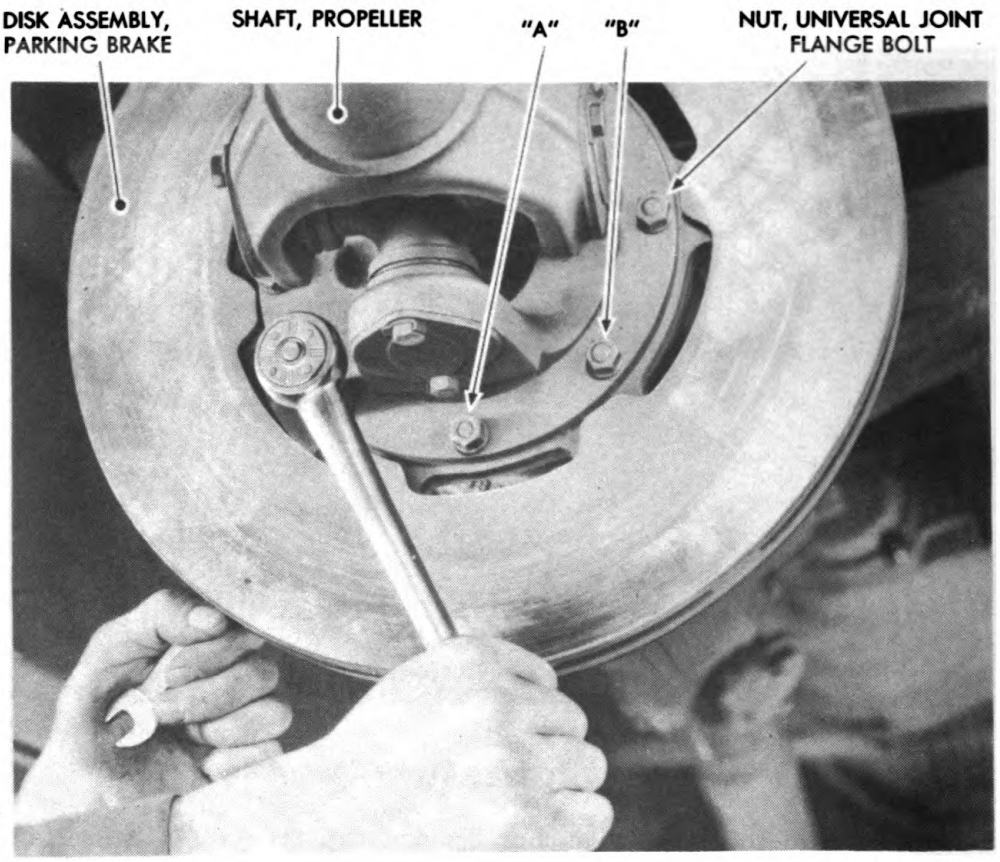


Figure 17—Removing Parking Brake Disk Assembly

(c) Pry universal joint flange toward the rear about ½-inch (screwdriver) (fig. 18).

(d) Push propeller shaft to one side and tie it with wire so that universal joint slip yoke will not slide off the propeller shaft.

(e) Remove top universal joint flange bolt left in place in *(b)* above, and remove disk assembly (hammer and drift).

PARKING BRAKE ASSEMBLY REMOVAL

(4) DISASSEMBLE DISK ASSEMBLY. There are six rivets which hold the disk spider to two disk plates. The disk plates have 12 rivets holding them together. The assembly requires balancing in a special machine and must not be disassembled.

(5) REMOVE CROSS SHAFT ASSEMBLY (fig. 19).

SCREWDRIVER
WRENCH, open-end, 7/8-in.
WRENCHES, open-end, two, 3/4-in.

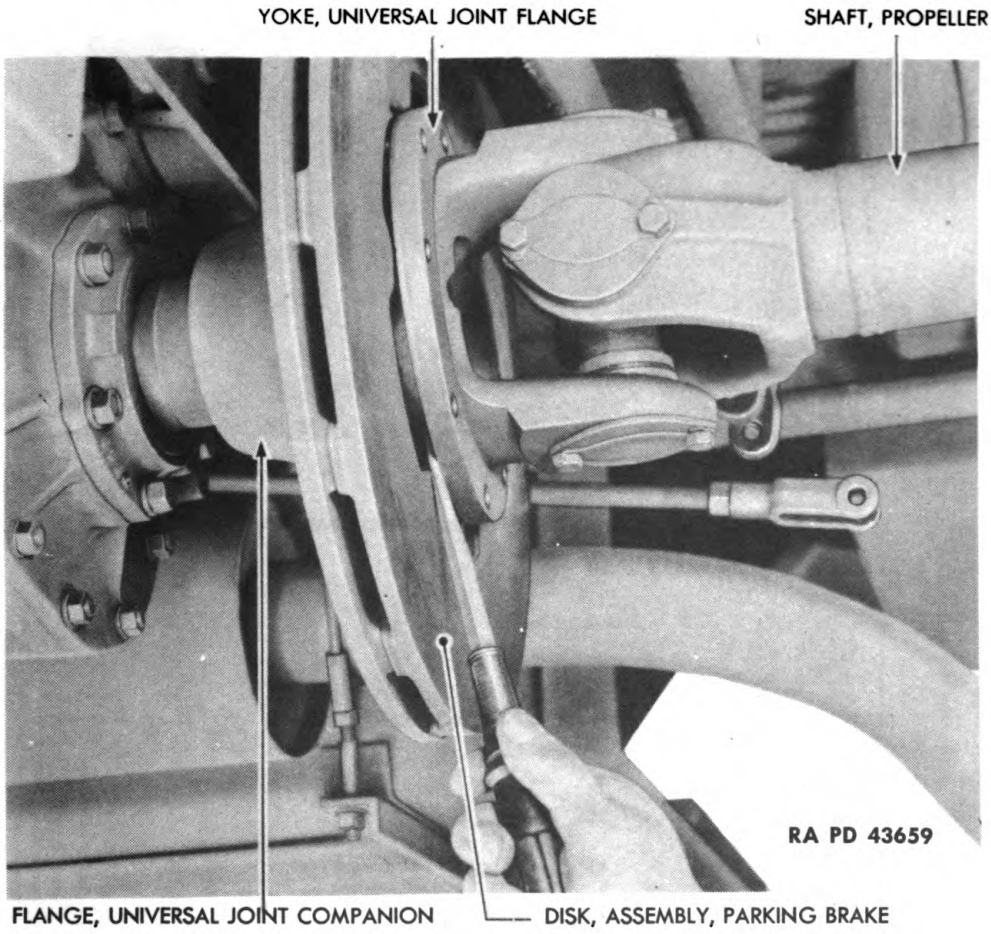


Figure 18—Pry Universal Joint Flange Toward Rear

(a) There are two L-shaped brackets (one at each end of cross shaft) which support the cross shaft. They are bolted to the top and side of frame cross member. Remove cross shaft bracket side bolt, nut and lock washer (two 3/4-in. open-end wrenches) (fig. 19). Repeat operation on opposite cross shaft bracket.

(b) Remove cross shaft bracket top bolt, nut and lock washer (7/8-in. open-end wrench). NOTE: Wedge screwdriver between bolt head and cross member to hold bolt from turning. Repeat operation on opposite cross shaft bracket.

ORDNANCE MAINTENANCE
BODY AND CHASSIS FOR HEAVY WRECKING TRUCK M1

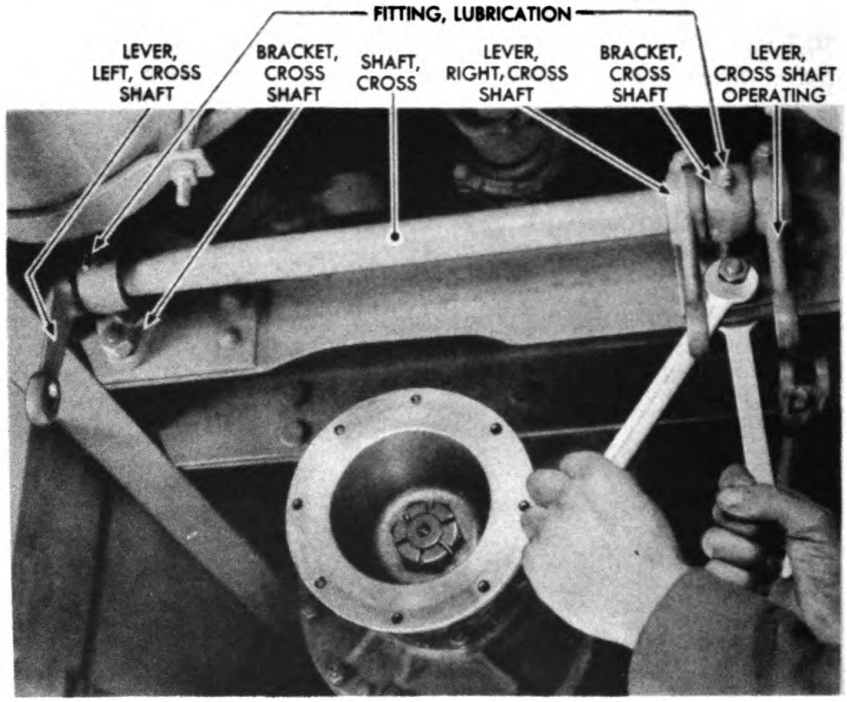


Figure 19—Removing Cross Shaft Assembly

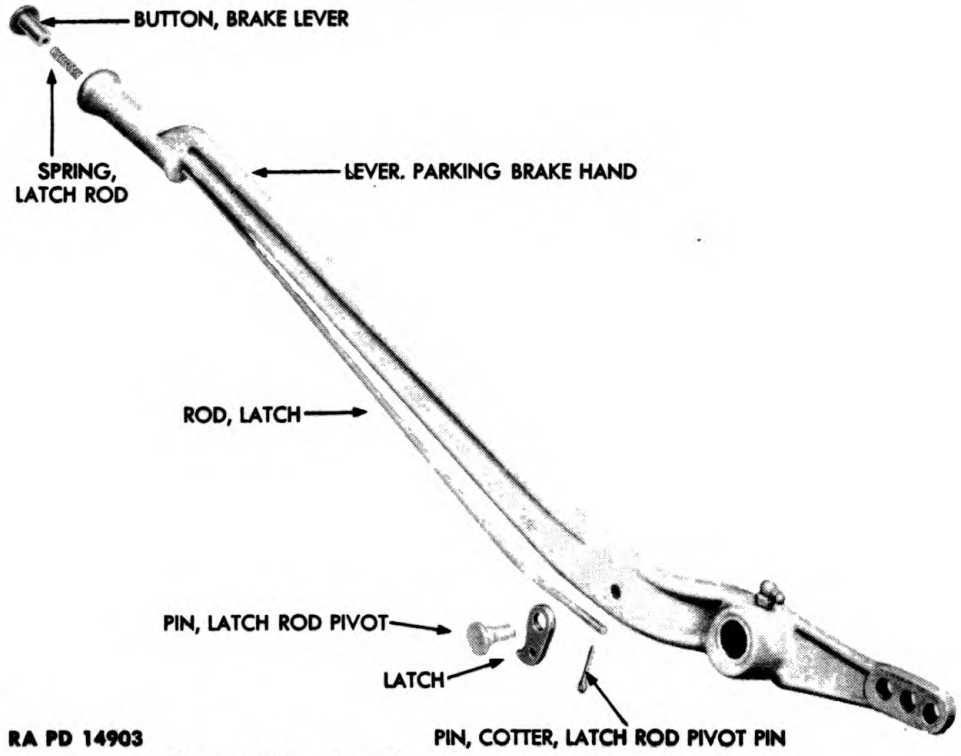


Figure 20—Parking Brake Hand Lever

PARKING BRAKE ASSEMBLY REMOVAL

(c) Lift off cross shaft assembly and cross shaft right bracket shim.

(6) REMOVE EMERGENCY PARKING BRAKE LEVER ASSEMBLY.

(a) Removal of parking brake hand lever assembly requires removal of seat back and cushions (par. 225 b (8)), and floor boards (par. 225 b (9)).

(b) Remove emergency brake lever assembly.

ORDNANCE MAINTENANCE
BODY AND CHASSIS FOR HEAVY WRECKING TRUCK M1

Section IV

PARKING BRAKE DISASSEMBLY

32. GENERAL.

a. There are two brake shoe assemblies to be disassembled, and the procedure in paragraph 33 is for the right-hand brake shoe assembly. Repeat the procedure for the left-hand brake shoe assembly.

33. BRAKE SHOE DISASSEMBLY.

a. Equipment.

DRIFT	WRENCH, open-end, 5/16-in.
HAMMER	WRENCH, open-end, 3/8-in.
HAMMER, soft	WRENCH, open-end, 1/2-in.
PLIERS	WRENCH, open-end, 9/16-in.
PRESS, hydraulic	WRENCH, open-end, 5/8-in.
PUNCH, rivet	WRENCH, open-end, 15/16-in
VISE	WRENCH, open-end, 1 15/16-in.
VISE, with soft jaws	WRENCH, socket, 1 1/4-in.

b. Procedure.

(1) REMOVE RIGHT SHOE PULL ROD ASSEMBLY.

PLIERS

(a) Remove cotter pin from operating lever clevis pin and remove clevis pin (26, fig. 21).

(b) Lift off right shoe pull rod assembly (28, fig. 21).

(2) DISASSEMBLE RIGHT SHOE PULL ROD ASSEMBLY.

WRENCH, open-end, 5/8-in.

(a) Loosen right shoe pull rod yoke lock nut (5/8-in. open-end wrench). Unscrew right shoe pull rod yoke (30, fig. 21).

(b) Remove right shoe pull rod yoke lock nut.

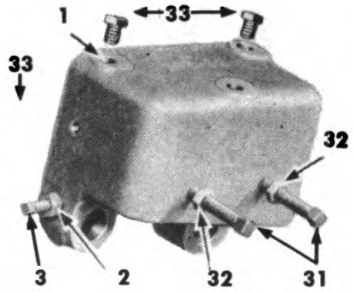
(3) REMOVE LEVER ARM ANCHOR PINS.

DRIFT	WRENCH, open-end, 5/16-in.
HAMMER	WRENCH, open-end, 1/2-in.

(a) Remove anchor pin lock screw nut (2, fig. 21) from anchor pin lock screw (1/2-in. open-end wrench).

(b) Remove anchor pin lock screw from right-hand brake anchor bracket (5/16-in. open-end wrench).

1. BRACKET, BRAKE ANCHOR, R. H.
2. NUT, ANCHOR PIN LOCK SCREW
3. SCREW, ANCHOR PIN LOCK
4. LINING
5. RIVET, LINING
6. SHOE, BRAKE
7. BUSHING, BRAKE SHOE
8. BUSHING, LEVER ARM
9. ARM, LEVER—REAR R. H.
10. NUT, SPHERICAL, TIE ROD
11. NUT, LOCK, TIE ROD SPHERICAL NUT
12. BUSHING, LEVER ARM
13. WASHER, LEVER ARM TIE ROD
14. SCREW, CAP, BRAKE SHOE PIN RETAINER
15. SPRING, BRAKE SHOE
16. PIN, LEVER ARM ANCHOR
17. RETAINER, BRAKE SHOE PIN
18. PIN, BRAKE SHOE
19. SPRING, LEVER ARM RELEASE
20. WASHER, LEVER ARM TIE ROD
21. ARM, LEVER—FRONT R. H.
22. ROD, LEVER ARM TIE
23. PIN, CLEVIS, LEVER ARM
24. PIN, CLEVIS, LEVER ARM TIE ROD
25. LEVER, OPERATING
26. PIN, CLEVIS, OPERATING LEVER
27. BUSHING, LEVER ARM
28. ROD, RIGHT SHOE PULL
29. NUT, LOCK, RIGHT SHOE PULL ROD YOKE
30. YOKE, RIGHT SHOE PULL ROD
31. SCREW, SHOE ADJUSTING SET
32. NUT, LOCK, SHOE ADJUSTING SET SCREW
33. SCREW, CAP, BRAKE ANCHOR BRACKET
34. PIN, CLEVIS PIN COTTER



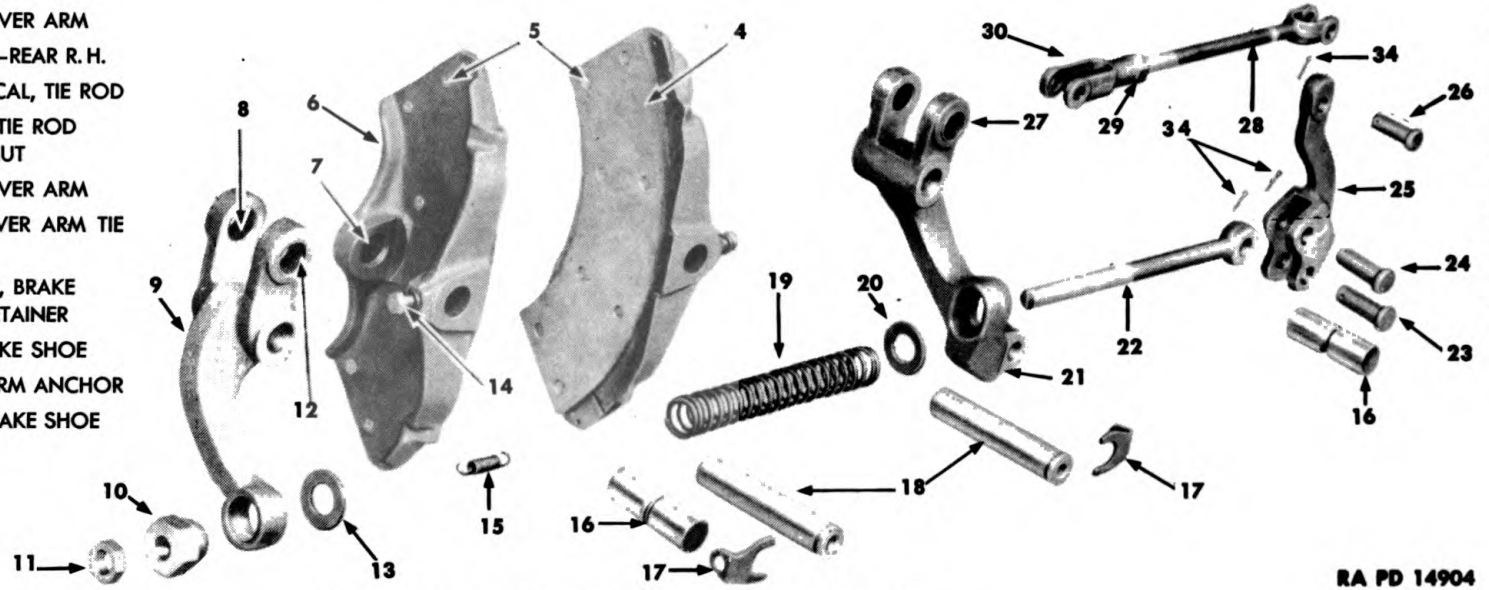


Figure 21—Brake Shoe Parts—Exploded View

(c) Remove lever arm anchor pin (16, fig. 21) from right-hand brake anchor bracket, and right-hand lever arm, rear (hammer and drift).

(d) Repeat operation to remove opposite lever arm anchor pin.

(e) Lift off right-hand brake anchor bracket assembly.

(4) REMOVE BRAKE SHOES.

DRIFT
HAMMER
WRENCH, open-end, ½-in.

(a) Remove brake shoe pin retainer cap screw and lock washer (½-in. open-end wrench), and lift off brake shoe pin retainer (17, fig. 21). Repeat operation to remove opposite brake shoe pin retainer.

(b) Drive out brake shoe pin (18, fig. 21) from brake shoe and rear right-hand lever arm (hammer and drift). Remove brake shoe pin from opposite brake shoe and front, right-hand lever arm.

(c) Lift off the two brake shoe assemblies.

(5) DISASSEMBLE BRAKE ANCHOR BRACKET, RIGHT-HAND.

PRESS, hydraulic
WRENCH, open-end, 3/8-in.
WRENCH, open-end, 9/16-in.

(a) Remove shoe adjusting set screw lock nut from the shoe adjusting set screw (31, fig. 21) (9/16-in. open-end wrench).

(b) Remove shoe adjusting set screw from right-hand brake anchor bracket (3/8-in. open-end wrench).

(c) Place right-hand brake anchor bracket in hydraulic press, and remove lever arm bushings (27, fig. 21).

(6) DISASSEMBLE BRAKE SHOE ASSEMBLIES.

HAMMER
PRESS, hydraulic
PUNCH, rivet
VISE

(a) Place brake shoe assembly in a vise and drive out (from the back of shoe) brake shoe lining rivets (hammer and rivet punch). Lift off brake shoe lining.

(b) Place brake shoe in a hydraulic press and remove brake shoe bushings.

(c) Repeat operation to disassemble remaining brake shoe assembly.

(7) REMOVE LEVER ARM REAR, RIGHT-HAND.

WRENCH, open-end, 15/16-in.
WRENCH, open-end, 1 15/16-in.
WRENCH, socket, 1¼-in.

(a) Place lever arm tie rod in a vise and remove lever arm tie rod spherical nut lock nut (11, fig. 21) (15/16-in. open-end wrench).

(b) Remove lever arm tie rod spherical nut (1 15/16-in. open-end wrench).

(c) Slide lever arm from tie rod, and remove lever arm tie rod washer, release spring and second washer.

(8) REMOVE LEVER ARM BUSHINGS.
PRESS, hydraulic

(a) Place right-hand lever arm, rear, in a hydraulic press and remove bushings (8, fig. 21).

(9) REMOVE LEVER ARM TIE ROD.
PLIERS VISE

(a) Place lever arm tie rod in a vise and remove cotter pin and lever arm clevis pin (23, fig. 21) (pliers).

(b) Slide right-hand lever arm, front, off tie rod.

(c) Remove bushings (27, fig. 21) from right-hand lever arm, front (hydraulic press).

(d) Place lever arm tie rod in a vise and remove cotter pin and clevis pin (24, fig. 21) (pliers).

(e) Lift off operating lever and lever arm tie rod.

34. CROSS SHAFT DISASSEMBLY.

a. Equipment.

DRIFT	VISE, with soft jaws
HAMMER	WRENCH, open-end, 5/16-in.
HAMMER, soft	WRENCH, open-end, 9/16-in.

b. Procedure.

(1) REMOVE CROSS SHAFT LEVERS.

DRIFT	VISE, with soft face jaws
HAMMER	WRENCH, open-end, 9/16-in.
HAMMER, soft	

(a) Place cross shaft in a vise (soft jaws) and remove cross shaft lever clamp bolt, nut and lock washer (9/16-in. open-end wrench) (fig. 24). Repeat operation to remove cross shaft right lever and cross shaft operating lever.

(b) Drive cross shaft left lever off cross shaft (soft hammer). Repeat operation to remove right lever and operating lever.

(c) Remove three cross shaft lever keys from the cross shaft.

(2) REMOVE CROSS SHAFT BRACKETS.
WRENCH, open-end, 5/16-in.

(a) Slide cross shaft brackets from cross shaft.

(b) Remove lubrication fittings from cross shaft bracket (5/16-in. open-end wrench).

35. EMERGENCY (PARKING) BRAKE LEVER DISASSEMBLY.

a. Equipment.

DRIFT	VISE
HAMMER	WRENCH, open-end, 5/8-in.
PLIERS	

b. Procedure.

(1) REMOVE BRAKE LEVER PULL ROD ASSEMBLY.

PLIERS
WRENCH, open-end, 5/8-in.

(a) Loosen brake lever pull rod yoke lock nut (5/8-in. open-end wrench).

(b) Remove cotter pin and clevis pin from parking brake lever (pliers).

(c) Unscrew brake lever pull rod yoke. Remove brake lever pull rod yoke lock nut.

(2) REMOVE EMERGENCY (PARKING) BRAKE LEVER LATCH.

DRIFT
HAMMER
PLIERS
VISE

(a) Place hand brake lever in a vise and drive out the latch pin (hammer and drift) (fig. 20).

(b) Remove latch rod cotter pin (pliers). Unhook latch from latch rod.

(c) Unscrew brake lever button from latch rod and lift latch rod spring out of hand brake lever.

(d) Pull latch rod downward and out of hand brake lever.

Section V

PARKING BRAKE ASSEMBLY INSPECTION AND REPAIR

36. GENERAL.

a. Inspection and repair of the parking brakes require washing of all parts, except the brake shoe lining, in SOLVENT, dry-cleaning.

37. PARKING BRAKE INSPECTION AND REPAIR.

a. Equipment.

INDICATOR, dial PRESS, hydraulic

b. Procedure.

(1) DISK ASSEMBLY.

(a) The disk assembly consists of a spider and two plates riveted together and then balanced in a special machine. Inspect the disk assembly but do not disassemble it.

(b) If it is warped and does not run true, the disk assembly must be discarded and a new one used.

(c) Visually inspect disk assembly for blue spots. If any are found, it is an indication of burning, and disk assembly must be replaced.

(2) BRAKE SHOE LININGS.

(a) There are four brake shoe linings to be inspected. Measure thickness of each brake shoe lining, and if worn to $\frac{1}{8}$ inch or less, discard all four brake shoe linings and use new ones.

(b) If there is a difference of $\frac{1}{32}$ inch or more in the thickness of any of the four brake shoe linings, discard all four and install a new set.

(c) Always use brake shoe linings in sets of four. If one is rejected, discard all four and use four new ones.

(3) BRAKE SHOE BUSHINGS. Place a brake shoe pin in brake shoe bushing. If there is any lost motion between pin and bushing, install new bushing.

(4) LEVER ARM BUSHINGS. Place lever arm anchor pin in lever arm bushing. If there is any lost motion between pin and bushing, install new bushing.

(5) CROSS SHAFT.

INDICATOR, dial PRESS, hydraulic

(a) Place cross shaft in V-blocks and set dial indicator with its plunger resting on cross shaft (fig. 22).

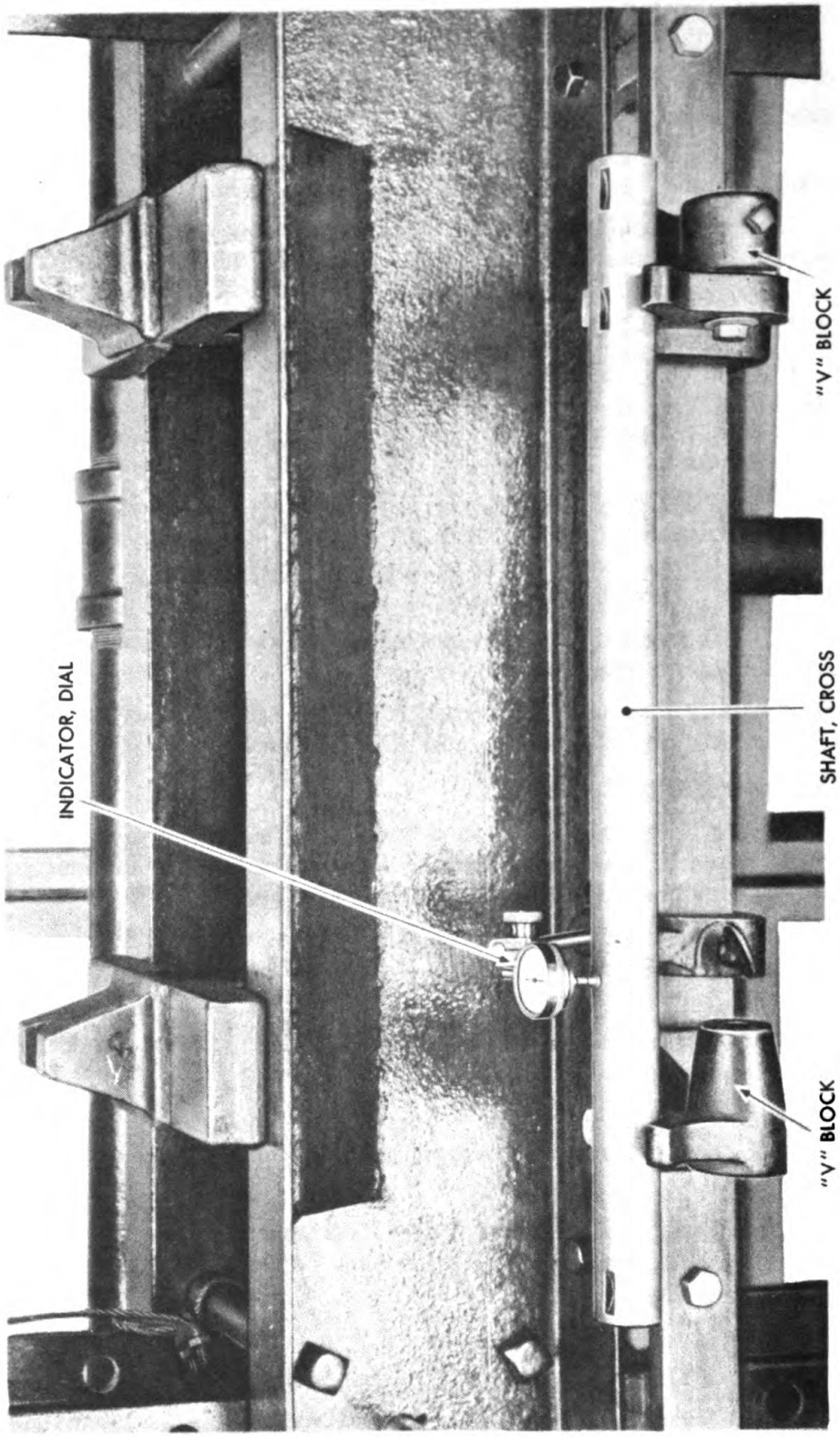


Figure 22—Inspecting Cross Shaft

(b) Revolve cross shaft and observe dial indicator pointer. Then move dial indicator to a different point on cross shaft.

(c) If cross shaft is sprung more than 0.010 inch, it must be straightened.

(d) Cross shaft can be straightened in a hydraulic press by applying pressure at point where dial indicator shows shaft to be sprung (fig. 23).

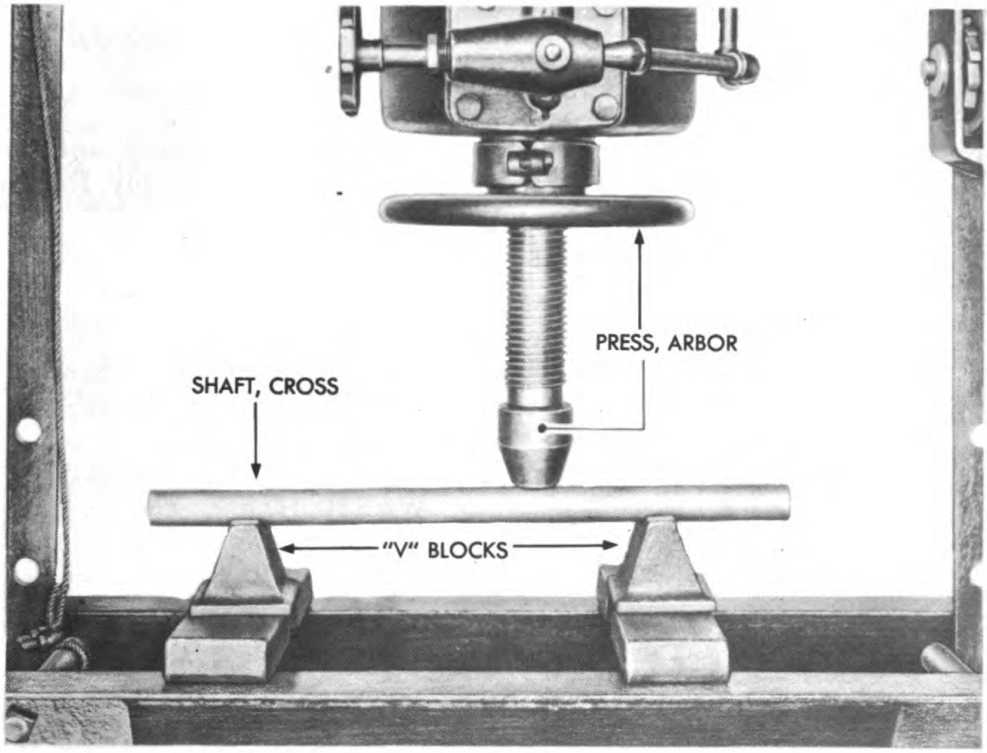


Figure 23—Straightening Sprung Cross Shaft RA PD 14936

ORDNANCE MAINTENANCE
BODY AND CHASSIS FOR HEAVY WRECKING TRUCK M1

Section VI

ASSEMBLY OF PARKING BRAKE

38. GENERAL.

a. There are two brake shoe assemblies to be assembled, and the procedure in paragraph 39 is for right-hand brake shoe assembly. Repeat procedure for left-hand brake shoe assembly.

39. ASSEMBLY OF BRAKE SHOE.

a. Equipment.

DRIFT
HAMMER
MACHINE, brake riveting
PLIERS
PRESS, hydraulic
WRENCH, open-end, 5/16-in.
WRENCH, open-end, 3/8-in.
WRENCH, open-end, 1/2-in.
WRENCH, open-end, 9/16-in.
WRENCH, open-end, 5/8-in.
WRENCH, open-end, 15/16-in.
WRENCH, socket, 15/16-in.

b. Procedure.

(1) INSTALL RIGHT-HAND LEVER ARM FRONT.

PLIERS
PRESS, hydraulic

(a) Place lever arm tie rod (22, fig. 21) in operating lever (25, fig. 21) and install lever arm tie rod clevis pin (24, fig. 21). Install cotter pin (pliers).

(b) Install lever arm bushings (27, fig. 21) in front, right-hand lever arm (hydraulic press).

(c) Slide front, right-hand lever arm (21, fig. 21) on tie rod, and install lever arm clevis pin (23, fig. 21) and cotter pin (pliers).

(2) INSTALL LEVER ARM REAR, RIGHT-HAND.

WRENCH, open-end, 15/16-in.
WRENCH, socket, 15/16-in.

(a) Install lever arm bushings (12 and 8, fig. 21) in rear, right-hand lever arm (hydraulic press).

(b) Slide lever arm tie rod washer (20, fig. 21), lever arm release spring (19, fig. 21), another washer (13, fig. 21) and rear right-hand lever arm (9, fig. 21) on tie rod.

(c) Install lever arm tie rod spherical nut (10, fig. 21) on lever arm tie rod (15/16-in. socket wrench).

(d) Install lever arm tie rod spherical nut lock nut (11, fig. 21) (15/16-in. open-end wrench).

ASSEMBLY OF PARKING BRAKE

(3) ASSEMBLE BRAKE SHOES.

MACHINE, brake riveting
PRESS, hydraulic

(a) Install brake shoe bushings (7, fig. 21) (hydraulic press).

(b) Install brake shoe lining on shoe (brake riveting machine).

(c) Repeat operation to line other brake shoe.

(4) ASSEMBLE RIGHT-HAND BRAKE ANCHOR BRACKET.

WRENCH, open-end, 3/8-in.
WRENCH, open-end, 9/16-in.
WRENCH, open-end, 1/2-in.

(a) Install shoe adjusting set screw in right-hand brake anchor bracket (3/8-in. open-end wrench) (31, fig. 21).

(b) Install shoe adjusting set screw lock nut (32, fig. 21) on shoe adjusting set screw (9/16-in. open-end wrench).

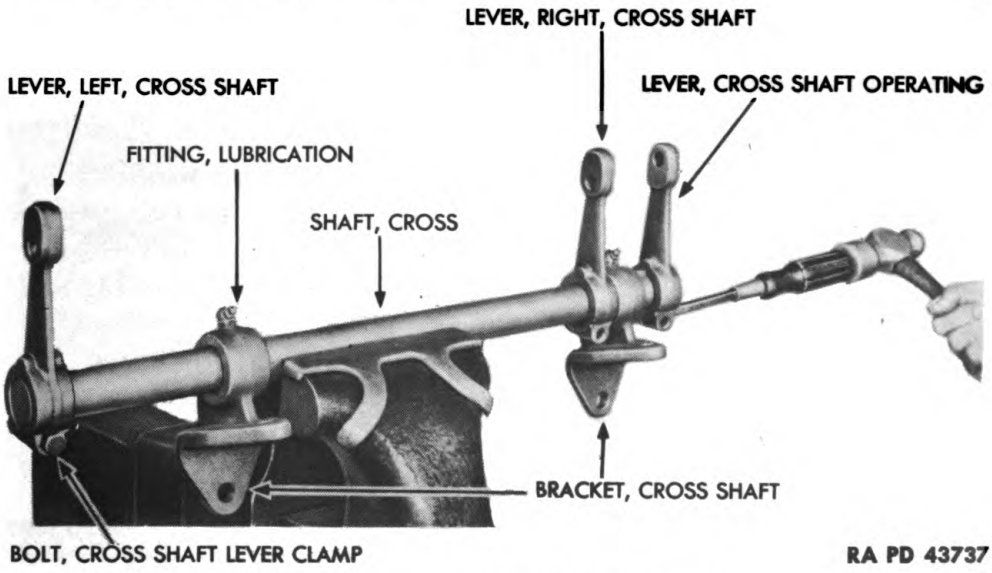


Figure 24—Assembling Cross Shaft

(5) INSTALL BRAKE SHOE ASSEMBLIES.

(a) Place one of the brake shoes in position on rear, right-hand lever arm (9, fig. 21) and install brake shoe pin (18, fig. 21) through brake shoe and right-hand lever arm rear.

(b) Then place other brake shoe in position on front, right-hand lever arm (21, fig. 21) and install other brake shoe pin through brake shoe and front, right-hand lever arm.

(c) Install brake shoe pin retainer (17, fig. 21) on brake shoe, and tighten cap screw (14, fig. 21) (1/2-in. open-end wrench). Repeat operation on opposite brake shoe pin retainer.

(6) INSTALL LEVER ARM ANCHOR PINS.

DRIFT
HAMMER
WRENCH, open-end, 5/16-in.
WRENCH, open-end, 1/2-in.

(a) Install right-hand brake anchor bracket on rear right-hand lever arm and front right-hand lever arm. Install with lever arm anchor pins (16, fig. 21) (hammer and drift).

(b) Install anchor pin lock screws (3, fig. 21) and tighten ($\frac{5}{16}$-in. open-end wrench).

(c) Install anchor pin lock screw nuts (2, fig. 21) ($\frac{1}{2}$-in. open-end wrench).

(7) INSTALL RIGHT SHOE PULL ROD.
WRENCH, open-end, $\frac{5}{8}$-in.

(a) Install right shoe pull rod yoke lock nut (29, fig. 21) on right shoe pull rod (28, fig. 21) ($\frac{5}{8}$-in. open-end wrench). Screw right shoe pull rod yoke (30, fig. 21) on rod. Do not tighten right shoe pull rod yoke lock nut at this time.

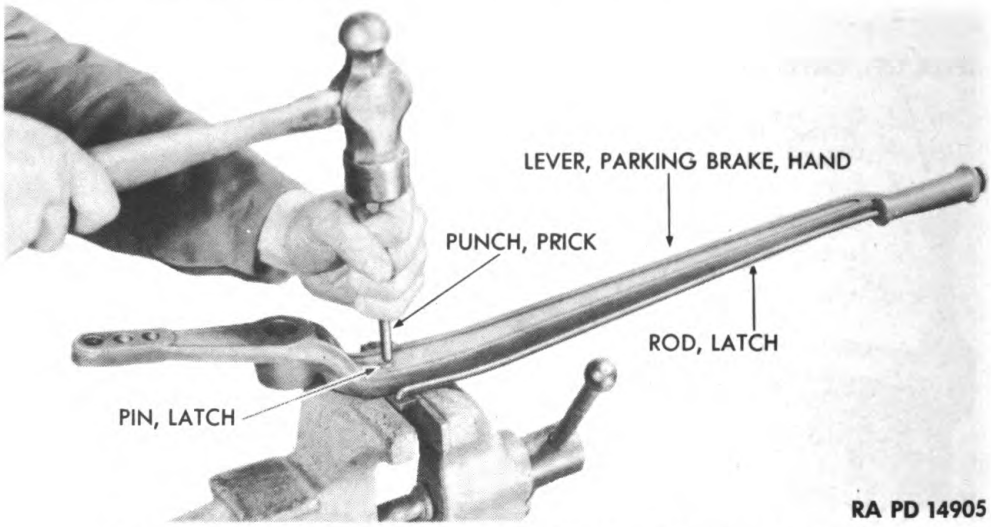


Figure 25—Locking Parking Brake Hand Lever Latch Pin

(b) Install right shoe pull rod (welded yoke end) on operating lever and fasten with operating lever clevis pin (26, fig. 21) and cotter pin (34, fig. 21) (pliers).

40. ASSEMBLY OF CROSS SHAFT.

a. Equipment.

DRIFT	VISE, with soft jaws
HAMMER	WRENCH, open-end, $\frac{5}{16}$-in.
HAMMER, soft	WRENCH, open-end, $\frac{9}{16}$-in.
SCREWDRIVER	WRENCH, open-end, $\frac{5}{8}$-in.

b. Procedure.

(1) INSTALL CROSS SHAFT BRACKETS (fig. 24).
VISE, with soft jaws
WRENCH, open-end, $\frac{5}{16}$-in.

(a) Install lubrication fittings in cross shaft brackets ($\frac{5}{16}$-in. open-end wrench).

(b) Place cross shaft in a vise.

(c) Slide one cross shaft bracket onto cross shaft.

(2) INSTALL CROSS SHAFT LEVERS (fig. 24).

HAMMER, soft
SCREWDRIVER
WRENCH, open-end, 9/16-in.
WRENCH, open-end, 5/8-in.

(a) Install cross shaft left lever key in cross shaft (soft hammer).

(b) Tap screwdriver into clamp slot in cross shaft left lever (fig. 24). Slide cross shaft left lever onto cross shaft so keyway in lever fits over key installed in *(a)* above.

(c) Remove screwdriver, and insert cross shaft lever clamp bolt, lock washer and nut (5/8-in. open-end wrench). Tighten cross shaft lever clamp bolt nut (9/16-in. open-end wrench).

(d) Install cross shaft right lever key in cross shaft and repeat operations *(b)* and *(c)* above on cross shaft right lever.

(e) Slide remaining cross shaft bracket on cross shaft.

(f) Install cross shaft operating lever key in cross shaft (soft hammer) and repeat operations *(b)* and *(c)* above to install cross shaft operating lever.

41. ASSEMBLY OF PARKING BRAKE HAND LEVER.

a. Equipment.

DRIFT
HAMMER
PLIERS
PUNCH, prick
VISE
WRENCH, open-end, 5/8-in.

b. Procedure.

(1) ASSEMBLE PARKING BRAKE HAND LEVER LATCH (fig. 25).

DRIFT
HAMMER
PLIERS
PUNCH, prick
VISE

(a) Place hand brake lever in a vise and push latch rod up and through handle end of lever.

(b) Install latch rod spring (fig. 20) in hand brake lever and over latch rod.

(c) Screw hand brake lever button on latch rod.

(d) Hook latch on latch rod and install latch rod cotter pin (pliers).

(e) Place latch pin through latch and tap it through the hand brake lever (hammer). Use a prick punch and lock latch pin on hand brake lever (fig. 25).

(2) ASSEMBLE BRAKE LEVER PULL ROD.

WRENCH, open-end, 5/8-in.

(a) Install brake lever rod yoke lock nut on brake lever pull rod and screw brake lever rod yoke on rod.

(b) Install brake lever rod yoke clevis pin through brake lever rod yoke and hand brake lever. Install brake lever rod yoke clevis pin cotter pin (pliers).

(c) Do not tighten brake lever rod yoke lock nut at this time.

ORDNANCE MAINTENANCE
BODY AND CHASSIS FOR HEAVY WRECKING TRUCK M1

Section VII

PARKING BRAKE ASSEMBLY INSTALLATION

42. GENERAL.

a. It is necessary to adjust the brake lever pull rod, the right-hand brake shoe assembly and the left-hand brake shoe assembly after the parking brake has been installed.

43. PARKING BRAKE ASSEMBLY INSTALLATION.

a. Equipment.

PLIERS
SCREWDRIVER
WRENCH, open-end, 9/16-in.
WRENCH, open-end, 5/8-in.
WRENCHES, open-end, two, 3/4-in.
WRENCH, open-end, 7/8-in.
WRENCH, socket, 9/16-in.
WRENCH, socket, 3/4-in.

b. Procedure.

(1) INSTALL CROSS SHAFT ASSEMBLY.

SCREWDRIVER
WRENCHES, open-end, two, 3/4-in.
WRENCH, open-end, 7/8-in.
WRENCH, socket, 3/4-in.

(a) There are two L-shaped cross shaft brackets (one at each end of cross shaft) to be bolted to top and side of frame cross member (fig. 19). Aline cross shaft brackets with boltholes in frame cross member.

(b) Install left top cross shaft bracket bolt first, placing bolt through cross shaft bracket and then through frame cross member. Using a 7/8-inch open-end wrench on the cross shaft bracket bolt nut, and a screwdriver (wedged against the bolt head to keep it from turning), install cross shaft bracket bolt lock washer and nut.

(c) Repeat operation *(b)* above on right top cross shaft bracket bolt.

(d) Install cross shaft right bracket shim between bracket and frame cross member.

(e) Install cross shaft bracket side bolt, lock washer and nut (two 3/4-in. open-end wrenches) (fig. 19). Repeat operation on opposite cross shaft bracket.

(2) INSTALL EMERGENCY BRAKE LEVER ASSEMBLY.

(a) Install hand brake lever assembly (TM 9-1795A).

(b) Install floor boards (par. 229 **b** (7)) and seat back and cushions (par. 229 **b** (8)).

PARKING BRAKE ASSEMBLY INSTALLATION

(3) INSTALL DISK ASSEMBLY.

WRENCH, open-end, 9/16-in. WRENCH, socket, 9/16-in.

(a) Place eight universal joint flange bolts through transfer case universal joint flange (fig. 17) and place disk assembly on the bolts. Push universal joint flange bolts through disk assembly until bolt heads are flush with disk face.

(b) Untie propeller shaft and place universal joint flange boltholes in alinement with universal joint flange bolts installed in *(a)* above. Push bolts through universal joint flange.

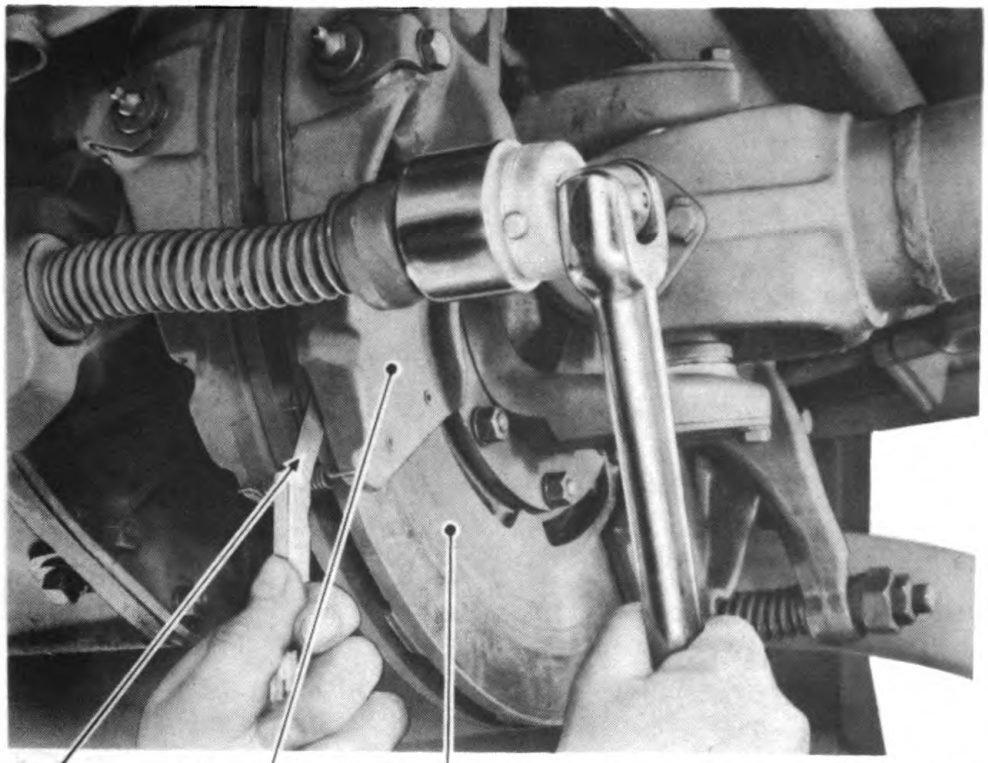


Figure 26—Adjusting Left Shoe Tie Rod

(c) Install universal joint flange bolt lock washers. Using a 9/16-inch socket wrench on the bolt, install two universal joint flange bolt nuts at "A" and "B" (fig. 17) using a 9/16-inch open-end wrench on the nut.

(d) Use a 9/16-inch open-end wrench on universal joint flange bolt and a 9/16-inch socket wrench on nut and install remaining six universal joint flange bolt nuts (fig. 17).

(4) INSTALL BRAKE SHOE ASSEMBLIES.

PLIERS WRENCH, socket, 3/4-in.

(a) The right-hand brake shoe assembly and the left-hand brake shoe assembly are fastened to frame cross member with three cap screws in each brake anchor bracket.

(b) Lift right-hand brake shoe assembly into position (disk assembly between the shoes) (fig. 16) and install and tighten three brake anchor bracket cap screws (¾-in. socket wrench).

(c) Install brake anchor bracket cap screw lock wire through heads of the brake anchor bracket cap screws. Twist wire to lock cap screws in place (pliers).

(d) Repeat operation to install left-hand brake shoe assembly.

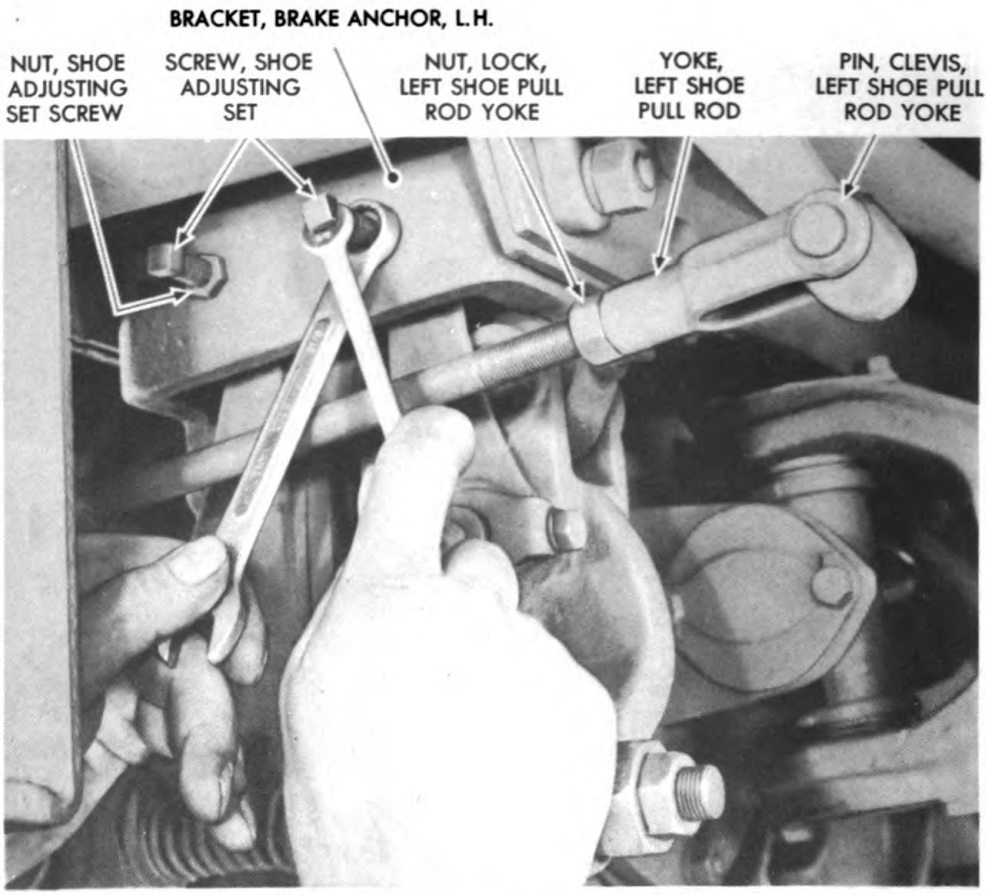


Figure 27—Adjusting Shoe Adjusting Set Screws

(5) INSTALL BRAKE SHOE SPRINGS.

PLIERS

(a) Hook brake shoe spring in front brake shoe and then in rear brake shoe of right-hand brake shoe assembly (pliers).

(b) Install spring in left-hand brake shoe assembly.

(6) CONNECT CROSS SHAFT ASSEMBLY.

PLIERS WRENCH, open-end, ⅝-in.

(a) Set hand brake lever assembly in its full release position.

(b) Remove cotter pin from brake lever pull rod yoke clevis pin and remove clevis pin from emergency brake lever (pliers).

(c) Turn brake lever pull rod yoke (fig. 15) until yoke can be connected to cross shaft operating lever without changing position of hand brake lever.

(d) Connect brake lever pull rod to cross shaft operating lever by installing brake lever pull rod yoke clevis pin and cotter pin (pliers). Turn brake lever pull rod yoke lock nut up against yoke and tighten (5/8-in. open-end wrench).

(e) Connect cross shaft left lever to left shoe pull rod (fig. 14) by turning left shoe pull rod yoke until clevis pin can be inserted. Install clevis pin and cotter pin (pliers).

(f) Repeat procedure *(e)* above to connect cross shaft right lever.

44. PARKING BRAKE ASSEMBLY ADJUSTMENT.

a. Equipment.

PLIERS
SHIM, 1/32-in.
WRENCH, box, 3/8-in.
WRENCH, box, 9/16-in.
WRENCH, box, 15/16-in.
WRENCH, open-end, 15/16-in.
WRENCH, socket, 15/16-in.

b. Procedure.

(1) ADJUST LEFT SHOE PULL ROD.

PLIERS
SHIM, 1/32-in.
WRENCH, box, 15/16-in.
WRENCH, open-end, 15/16-in.
WRENCH, socket, 15/16-in.

(a) Loosen tie rod spherical nut lock nut (15/16-in. open-end wrench) (fig. 14).

(b) Tighten tie rod spherical nut (fig. 14) until operating lever is solidly against front left-hand lever arm (15/16-in. box wrench).

(c) Measure with a piece of shim stock 1/32 inch thick, the clearance between front brake shoe lining and disk assembly. Measure at several places and, if distance is not 1/32-inch, adjust as follows:

1. Make certain that hand brake lever assembly is in fully released position.

2. Remove cotter pin from left shoe pull rod yoke clevis pin (pliers) and remove pin.

3. Turn left shoe pull rod yoke clockwise on rod to decrease clearance between lining and disk and counterclockwise to increase clearance.

4. Install pull rod yoke clevis pin and check clearance. Continue this procedure until proper clearance is obtained. Then install cotter pin (pliers).

5. Leave a piece of shim stock 1/32 inch thick between front brake shoe lining and disk assembly.

6. Repeat procedure on the right shoe pull rod.

(2) ADJUST LEFT SHOE TIE ROD.

SHIM, 1/32-inch
WRENCH, box, 15/16-in.
WRENCH, open-end, 15/16-in.

(a) Tighten tie rod spherical nut until distance between rear brake shoe lining and the disk assembly is 1/32-inch (15/16-in. box wrench). Measure with a piece of shim stock 1/32 inch thick at several places.

(b) Tighten tie rod spherical nut lock nut (15/16-in. open-end wrench).

(c) Repeat operation to adjust right shoe tie rod.

(3) ADJUST SHOE ADJUSTING SET SCREWS (fig. 27).

WRENCH, box, 3/8-in.
WRENCH, box, 9/16-in.

(a) Make certain brake shoe spring is in place.

(b) Examine position of disk assembly between linings of left-hand brake shoe assembly. Brake shoe linings must be parallel with disk assembly and, if they are not, adjust as follows:

1. Loosen shoe adjusting set screw lock nut (9/16-in. box wrench) (fig. 27).

2. Loosen or tighten shoe adjusting set screw until brake shoe lining is parallel with disk assembly (3/8-in. box wrench). Repeat procedure on other shoe adjusting set screw.

3. Repeat procedure *2* to adjust right-hand brake shoe assembly.

4. Remove 1/32-inch shim stock installed in step (1) *(c) 5* this paragraph.

CHAPTER 4

AIR SYSTEM

Section I

GENERAL

45. PRINCIPLE OF THE AIR SYSTEM.

a. General. To better understand the operation of the air system, a knowledge of a few simple compressed air principles is helpful.

b. Compressed Air Pressures. Compressed air can be defined as a large volume of air that has been forced into a small space. Even the air around us is compressed. This compression, or pressure, varies in accordance with the altitude, but 14.7 pounds per square inch is the accepted basis of air calculations. Air pressure varies in direct proportion to the volume of air restricted. For example, an air reservoir with a capacity of six cubic feet ordinarily has an air pressure in the reservoir of 14.7 pounds per square inch, but if the air compressor should force six more cubic feet of air into the reservoir, the pressure becomes 29.4 pounds per square inch. The maximum pressure limit for this air system is 105 pounds per square inch.

c. Action of Compressed Air.

(1) The air pressure distributes itself evenly over the entire area of the two air reservoirs and over all the air pipes that open into the reservoir.

(2) When air pressure is admitted to an airtight chamber behind a movable part, it causes the part to move until a spring pressure resistance is met that is equal to the force of the air pressure. At this point the air pressure in the air chamber is allowed to exhaust and the spring pressure returns the movable part to its original position.

46. AIR BRAKE SYSTEM COMPONENTS.

a. Air Compressor. The air compressor is mounted on the left side of the engine and is driven from the engine accessory drive. Water piped from the water pump keeps the air compressor from overheating.

b. Air Reservoirs. Air is piped from the air compressor to the left air reservoir mounted on the chassis frame and from the left air reservoir to the right air reservoir.

c. Safety Valve.

(1) A safety valve is mounted on the left air reservoir and is connected by a pipe to the air gage on the dash.

(2) The safety valve protects the air system against building up air pressure in excess of 150 pounds per square inch.

d. Governor.

(1) The governor is mounted on the engine side of the dash, and is connected to the air compressor unloading system and the air gage.

(2) The governor stops air compression when the reservoir pressure has been built up to maximum pressure (105 lb per sq in.). The governor starts air compression when the reservoir pressure has dropped to minimum pressure (83 lb per sq in.).

e. Air Pressure Gage.

(1) The air pressure gage is mounted on the left side of the instrument board and indicates the air pressure in the two air reservoirs.

(2) Never put the wrecker in motion until the air pressure reading reaches 70 pounds. If the gage reading drops to less than 50 pounds while the wrecker is in motion, the wrecker should be stopped and a trouble shooting check made (par. 52).

f. Floor Foot Air Valve.

(1) The two front and four rear wheel brakes are applied in the same manner as mechanical brakes are applied. Depressing the brake pedal applies the brakes. Releasing the brake pedal releases the brakes.

(2) The floor foot air valve includes an intake and an exhaust valve which are opened and closed by the action of the brake pedal.

(3) When the brake pedal is in the release position, the intake valve is held closed. This seals the pressure in the air pipe connecting the intake valve to the air reservoir. At the same time, the exhaust valve is held open. All pressure in the front brake cylinders and rear brake diaphragms is then permitted to exhaust through a quick-release valve, until atmospheric pressure is reached.

(4) When the brake pedal is depressed, the exhaust valve is closed and the intake valve is opened. The pressure in the air pipe (connecting the intake valve to the air reservoir) passes into the front brake cylinders and rear brake diaphragms.

g. Front Brake Cylinders and Rear Brake Diaphragms and Slack Adjusters.

(1) The pressure that was released in step **f** (4) above causes the rubber diaphragms and push rods in the front brake cylinders and rear brake diaphragms to move the slack adjusters, thus turning the brake camshafts.

(2) The turning of the brake camshafts forces the brake shoes against the brake drums. The brake drums being fastened to the wheels

are restrained from turning, and the wrecker is slowed down in speed or stopped.

(3) When the brake pedal is released, the condition in step f (3) above continues until all air pressure is exhausted through the quick-release valve. Then the front brake cylinder, the rear brake diaphragm and the brake shoe return springs all exert their pressure and return the rubber diaphragms, with their push rods, slack adjusters and brake camshafts, to their original positions, thereby releasing the brake shoes from the brake drums.

h. Quick-release Valve.

(1) The quick-release valve speeds up the release of air pressure from the two front brake cylinders so the brake release is faster.

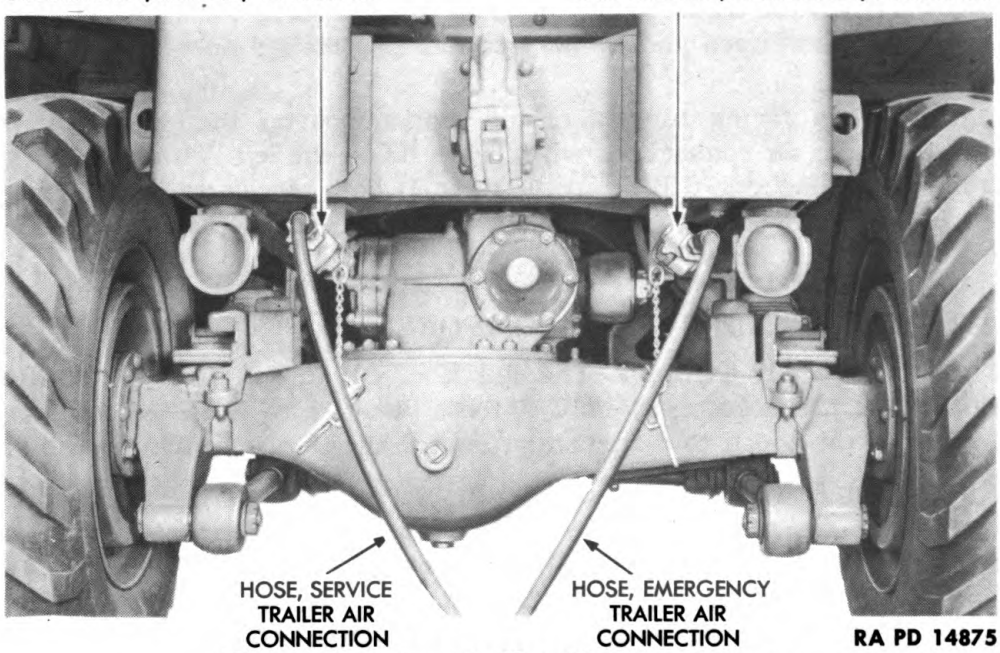


Figure 28—Rear Trailer Air Connections

(2) The exhaust port in the quick-release valve is held open when the brake pedal is in the release position and the quick-release valve (being close to the front brake cylinders and their feed pipes) exhausts the air pressure quickly.

i. Relay Valve.

(1) The relay valve speeds up the application and release of the rear brakes and also speeds up the release of air pressure from the four rear brake diaphragms so that brake release is faster.

(2) The relay valve is designed so that only the small amount of air necessary to actuate the relay valve is supplied by the brake valve. The greater amount of air necessary to actuate the rear brake diaphragms is supplied from the air reservoir to the rear brake diaphragms.

(3) The relay valve exhaust port is never closed. When the brake pedal is in the release position the compressed air in the four rear brake diaphragms is exhausted quickly.

j. Trailer Air Connections.

(1) The trailer air connections at the front or rear of the wrecker can be connected (with flexible hose) to trailer air connections on another unit. The brakes on all units are applied by the operation of the brake pedal.

(2) The emergency trailer air connection at the front of the wrecker has a shut-off cock but the service trailer air connection does not. Both the service and trailer air connections on the rear of the wrecker have shut-off cocks.

(3) When the trailer air connections are not being used, the shut-off cocks must be closed and dummy couplings installed on the trailer air connections.

(4) When facing the trailer air connections on the wrecker, the service trailer air connections will *always* be on the left. The emergency trailer air connection will be on the right. If both service and emergency trailer air connections are used, the flexible hose (connecting the wrecker to the other vehicle or unit) will cross (fig. 28).

47. AIR CLUTCH SYSTEM COMPONENTS.

a. Clutch Air Cylinder. The clutch air cylinder is mounted on the side of the transmission assembly. It can be operated from the crane or from the rear winch to disengage or engage the engine clutch assembly.

b. Clutch Air Cylinder Operation. At the side of the rear winch and the crane, there are hand control levers to accelerate the engine speed and operate the clutch air cylinder. The operator, while at the rear winch or crane, can vary the amount of power (by the throttle control) and apply power (by the clutch cylinder). An assistant in the cab is not needed to operate the accelerator pedal and the clutch pedal.

48. GENERAL MAINTENANCE OF AIR SYSTEM.

a. Air Pressures.

(1) The air pressure gage must show an air pressure of at least 70 pounds before the air system can develop its full effectiveness.

(2) Continually observe the air pressure gage while the wrecker is in operation.

b. Air Reservoirs. Drain each air reservoir daily to remove any water condensation from the air system.

c. Air Compressor.

(1) Wash the air strainer every 2,000 miles, or more often if operating in dusty areas (par. 58).

(2) Clean carbon from discharge and unloader valves every 5,000 miles (par. 55 **b** (3)).

(3) Clean carbon from air compressor discharge pipe every 5,000 miles.

(4) Adjust unloader valves every 5,000 miles (par. 64 **b** (4)).

(5) Tighten air compressor mounting bolts every 5,000 miles (TM 9-1795B).

(6) Lubricate unloader rocker arm shaft every 5,000 miles (par. 56 **b** (4)).

(7) Inspect unloader diaphragms every 5,000 miles (par. 55 **b** (2)).

d. Governor.

(1) Inspect upper valve and lower valve every 5,000 miles (par. 68 **b** (1) and (3)).

(2) Inspect governor for leaks every 5,000 miles (par. 71 **b** (4)).

e. Safety Valve.

(1) Inspect safety valve for leaks every 10,000 miles (par. 78 **b** (1)).

(2) Adjust safety valve every 10,000 miles (par. 78 **b** (2)).

(3) Clean safety valve every 5,000 miles (par. 75).

f. Air Pressure Gage. Inspect air pressure gage every 5,000 miles (par. 81).

g. Floor Foot Air Valve.

(1) Inspect floor foot air valve diaphragms every 5,000 miles (par. 85 **b** (2)).

(2) Inspect floor foot air valve for leaks every 2,000 miles (par. 88 **b** (2)).

(3) Inspect exhaust valve every 2,000 miles (par. 85 **b** (4)).

(4) Inspect air pressure delivered from floor foot air valve every 2,000 miles (par. 88 **b** (1)).

h. Front Brake Air Cylinders and Rear Brake Air Diaphragms. Inspect piston rubber ring in front brake air cylinder and rear brake air diaphragm every 5,000 miles (par. 92 **b** (2) and par. 99).

i. Slack Adjusters.

(1) Lubricate worm gear and worm every 5,000 miles (par. 106).

(2) Inspect slack adjuster arm bushings every 5,000 miles (par. 106).

j. Quick-release Valve and Relay Valve. Inspect quick-release valve (par. 113) and relay valve (par. 120) every 5,000 miles.

k. Trailer Air Connections and Air Pipes and Fittings. Inspect the trailer air connections (par. 133) and all air pipes and fittings (par. 140) every 5,000 miles.

ORDNANCE MAINTENANCE
BODY AND CHASSIS FOR HEAVY WRECKING TRUCK M1

49. SPECIFICATIONS AND DATA—AIR SYSTEM.

a. Air Compressor.

Make	Bendix Westinghouse
Model	216699
Mounted	Left side of engine
Type	Reciprocating, single acting
Capacity	7¼ cubic feet per minute
Weight	54 pounds
Number of cylinders	2
Cooling method	Water
Operating speed	1,250 rpm
Controlled by	Governor
Unloader valve clearance	0.010 to 0.015
Water drain plug	Compressor head
Size of cylinder bore	2.0625
Maximum permissible wear of cylinder bore	0.002
Oversize pistons available in	0.010-0.020-0.030 oversizes
Pistons used	2
Piston rings used	4 per piston
Gap	0.010 to 0.015
Clearance in piston groove	0.0015 to 0.0025
Connecting rods used	2
Clearance (side of connecting rod bearing to cheek on crankshaft)	0.015 maximum
Crankshaft—Bearings	2 ball bearings
Center journal diameter	1.1045
Oil pressure at idling speed	5 pounds
Oil pressure at governed speed of wrecker	15 pounds

b. Governor.

Make	Bendix Westinghouse
Model	0-1
Mounted	Engine side of dash
Type	Valve
Cuts out at air reservoir pressure	105 pounds per square inch
Cuts in at air reservoir pressure of	83 to 85 pounds per square inch

c. Safety Valve.

Make	Bendix Westinghouse
Model	205-105
Mounted	Top of left air reservoir
Opens at	150 pounds pressure per square inch
Closes at	105 pounds pressure per square inch

d. Air Gage.

Make	Stewart-Warner
Mounted	Instrument board
Indicates	Air pressure in pounds per square inch

e. Floor Foot Air Valve.

Make	Bendix Westinghouse
Model	B-4-B
Type	Valve
Mounted	On frame under cab floor

f. Rear Brake Diaphragm.

Make	Bendix Westinghouse
Model	216-830, 216-821
Type	Rubber and fabric diaphragm
Maximum stroke when brakes are adjusted	3/4 inch
Maximum stroke at which brakes should be adjusted	1 3/4 inch

g. Front Brake Cylinder.

Make	Bendix Westinghouse
Model	217-808

h. Slack Adjusters.

Make	Bendix Westinghouse
Model—front	220-574 right; 220-575 left
—rear	217924 right; 217925 left
Type	Diaphragm
Adjustment	Turning the worm

i. Quick-release Valve.

Make	Bendix Westinghouse
Model	205-000
Type	Diaphragm

j. Relay Valve.

Make	Bendix Westinghouse
Model	217-383
Type	Diaphragm

k. Air Reservoirs.

Make	Bendix Westinghouse
Number used	2

l. Air Pipes.

Make	Bendix Westinghouse
Pipes (copper)—1/2 inch O.D.	32 feet
—3/8 inch O.D.	64 feet
Loom—9/16 inch O.D.	24 feet
—7/16 inch O.D.	60 feet

m. Trailer Air Connections.

Make	Bendix Westinghouse

50. REFERENCE TO TM 9-795.

a. Many second echelon operations covered in TM 9-795 are often done by ordnance personnel. Reference should be made to TM 9-795 for lower echelon operations not covered in this manual.

51. ECHELON BREAKDOWN OF MAINTENANCE OPERATIONS.

(Refer to par. 4.)

ORDNANCE MAINTENANCE
BODY AND CHASSIS FOR HEAVY WRECKING TRUCK M1

Section II

TROUBLE SHOOTING

52. TROUBLE SHOOTING, INSPECTION AND REMEDIAL MEASURES.

a. The following chart is provided as a guide to common troubles and their causes and a recommended procedure for inspection to locate the cause:

Symptom and Probable Cause	Probable Correction
b. Slow Build-up of Air Pressure.	
(1) Leaking floor foot air valve.	(1) Clean the floor foot air valve (par. 85).
(2) Leaking air compressor discharge valve.	(2) Clean the air compressor discharge valve (par. 55 **b** (3)).
(3) Leaking air pipes or connections.	(3) Tighten air pipe connections or replace air pipe (pars. 138 and 140).
(4) Air compressor unloader valve not adjusted correctly.	(4) Adjust air compressor unloader valve (par. 64).
(5) Clogged air compressor air strainer.	(5) Clean air compressor air strainer (par. 58).
(6) Worn air compressor pistons and piston rings.	(6) Replace air compressor pistons and piston rings (par. 61 **b** (2)).
(7) Carbon in air compressor discharge pipe.	(7) Clean air compressor discharge pipe (par. 55).
c. Rapid Loss of Air Pressure When Engine Is Stopped.	
(1) Worn or leaking air compressor discharge valves.	(1) Clean air compressor discharge valves (par. 55 **b** (3)).
(2) Leaking air pipes or connections.	(2) Tighten air pipe connections or replace air pipes (pars. 138 and 140).
(3) Leaking floor foot air valve.	(3) Clean floor foot air valve (par. 85).
(4) Leaking quick-release valve.	(4) Clean quick-release valve (par. 113).
(5) Leaking relay valve.	(5) Clean relay valve (par. 120).
(6) Leaking safety valve.	(6) Clean safety valve (par. 75).
(7) Leaking governor.	(7) Clean governor (par. 68).

TROUBLE SHOOTING

Symptom and Probable Cause	Probable Correction
d. Air Pressure too High.	
(1) Broken air compressor unloader diaphragm.	(1) Replace air compressor unloader diaphragm (par. 56 **b** (3)).
(2) Too much clearance on air compressor unloader valves.	(2) Adjust air compressor unloader valves (par. 64 **b** (4)).
(3) Restriction in air pipe from governor to air compressor unloader.	(3) Replace or clean air pipe from governor to air compressor unloader (pars. 138 and 141).
(4) Governor not operating.	(4) Repair governor (par. 68).
(5) Air compressor not unloading.	(5) Replace air compressor unloader valves (par. 56).
e. Braking Action too Slow When Brake Pedal Is Depressed.	
(1) Air pressure between floor foot air valve and front brake air cylinder (or rear brake diaphragms), too low.	(1) Adjust floor foot air valve (par. 88).
(2) Restriction in air pipes or air hose.	(2) Clean air pipes or air hose. Replace air pipes or air hose (pars. 138 and 141).
(3) Leaking front brake air cylinder piston rubber ring.	(3) Replace front brake air cylinder piston rubber ring (par. 93).
(4) Leaking rear brake air diaphragm.	(4) Replace rear brake air diaphragm (par. 98).
(5) Brake shoe lining worn.	(5) Replace brake shoe lining (pars. 12 and 20).
(6) Brake drum scored.	(6) Reface brake drum (par. 14 **b** (2)).
(7) Leaking floor foot air valve diaphragm.	(7) Replace floor foot air valve diaphragm (par. 85).
f. Brakes Slow to Release When Brake Pedal Is Released.	
(1) Floor foot air valve lever does not return fully to its stop.	(1) Adjust floor foot air valve rod (par. 88 **b** (3)).
(2) Binding brake camshaft.	(2) Lubricate brake camshaft at lubrication fitting (par. 23 **b** (5)).
(3) Excessive front brake cylinder push rod travel.	(3) Adjust brakes.
(4) Excessive rear brake diaphragm push rod travel.	(4) Adjust brakes.

Symptom and Probable Cause	Probable Correction
(5) Valve in floor foot air valve not seating.	(5) Clean valve in floor foot air valve (par. 85).
(6) Valve in quick-release valve not seating.	(6) Clean valve in quick-release valve (par. 113).
(7) Valve in relay valve not seating.	(7) Clean valve in relay valve (par. 120).
(8) Valve in safety valve not seating.	(8) Clean valve in safety valve (par. 75).

g. Braking Action not Efficient, Causing Jerky Stopping.

(1) Excessive front brake cylinder push rod travel.	(1) Adjust brakes.
(2) Excessive rear brake diaphragm push rod travel.	(2) Adjust brakes.
(3) Too low air pressure between floor foot air valve and front brake air cylinder (or rear brake diaphragms).	(3) Adjust floor foot air valve (par. 88).
(4) Worn or greasy brake shoe lining.	(4) Replace brake shoe lining (pars. 12 and 20).
(5) Brake drum scored.	(5) Reface brake drum (par. 14 **b** (2)).
(6) Leaking front brake air cylinder (or rear brake) diaphragm.	(6) Replace front brake air cylinder (or rear brake) diaphragm (pars. 91 and 98).

Section III

AIR COMPRESSOR

53. GENERAL.

a. Operation.

(1) The air compressor assembly is mounted on the left side of the engine and it can be removed while the engine is in the chassis (TM 9-1795B). For installing procedure of the air compressor assembly on the engine, see TM 9-1795B.

(2) The air compressor assembly has two cylinders, with two pistons and two connecting rods fastened on a crankshaft driven by the engine accessory drive.

(3) The air compressor rotates continuously while the engine is running. To keep pressure at or below the safe point of 105 pounds per square inch, an unloader system is built into the air compressor head. A governor in the air system is calibrated so that when the air pressure in the air reservoirs reaches 105 pounds, unloader valves in the air compressor head are opened and the air above the piston is by-passed to the atmosphere instead of to the air reservoirs.

b. Compressing the Air.

(1) Air is compressed by the action of the two pistons. When either piston is at the top of its upward stroke, all air has been forced out of the cylinder through the discharge valve. As the piston is pulled downward by the crankshaft, the top of the piston passes below intake ports around and in the cylinder wall. The suction of the piston draws air from the manifold and air strainer, through the intake ports and into the cylinder. As the piston is pushed upward by the crankshaft it closes the intake ports in the cylinder wall and starts compressing the air that was drawn into the cylinder.

(2) As the piston nears the end of its stroke, the air is sufficiently compressed in the cylinder to overcome the resistance of the discharge valve spring and to lift the discharge valve off its seat. The compressed air then passes by the discharge valve into the discharge pipe to the air

reservoirs. After the compressed air has left the cylinder, the discharge valve spring forces the discharge valve back onto its seat.

(3) Procedure (1) and (2) continues until the two pistons have built an air pressure of 105 pounds per square inch in the air reservoirs. Then the governor (par. 65) cuts out the discharge of compressed air to the air reservoir by opening the unloader valves, permitting the compressed air to be exhausted into the atmosphere.

(4) The action of the governor (par. 65) opens the unloader valves by delivering compressed air through the governor unloader pipe to the unloader chamber. This air pressure is admitted to a cavity under the unloader diaphragms, forcing the unloader diaphragms upward, causing the unloader rocker arm to rotate on the unloader rocker arm shaft. As the unloader rocker arm rotates, the two unloader valve adjusting screws are forced down against the two unloader valves. The two unloader valves are moved from their seats and a passage for air is thereby opened from each cylinder to a cavity between the unloader valves.

(5) During the time the air passages in (4) are open, the discharge valves remain closed. The air normally compressed by the piston in its upward movement is permitted to pass, without compression, through the cavity between the unloader valves, into the cylinder in which the piston is moving downward.

(6) The air compressor continues the unloading operation until the air reservoir pressure drops to 83 pounds per square inch when the governor cuts in. As the governor cuts in, the air is exhausted from the governor unloader pipe and air cavity under unloader diaphragm, thus permitting the unloader rocker arm spring to move the unloader rocker arm up and permitting the two unloader valve springs to close the two unloader valves. When the unloader valves are closed, the air compressor resumes the compressing and storing of air under pressure in the air reservoirs.

(7) Lubrication of the air compressor is from the engine. Oil is forced up through oil passages and out over each piston pin bearing, also over each connecting rod lower bearing. As oil is forced out from between the connecting rod and the crankshaft flange, the rotary motion of the crankshaft throws it against the walls of the crankcase and cylinder bores. This action lubricates the cylinder walls and forms an oil mist that lubricates the crankshaft ball bearings. The oil that is splashed against the crankcase wall drips down the side and is drained back into the engine crankcase.

(8) The air compressor is water-cooled by two water pipes connected to the engine water pump. One water pipe is connected to the suction side of the engine water pump and to the air compressor head. The other water pipe is connected to the discharge side of the engine water pump and to the air compressor head.

(9) The air compressor operates at 1,800 revolutions per minute when the maximum governed engine speed is reached.

(10) The air compressor provides 7¼ cubic feet of air per minut

(11) The air compressor crankcase assembly is bolted to the cylind assembly. In this cylinder and crankcase assembly the crankshaft ope ates on two ball bearings. Two connecting rods are bolted at their low ends to the crankshaft and are pinned to pistons at their upper enc Each piston has four piston rings, two above and two below the pist pin. The unloader head assembly is mounted on the cylinder assemb and contains the unloader valves and discharge valves.

54. UNLOADER HEAD DISASSEMBLY.

a. Equipment.

AWL
PLIERS
SCREWDRIVER
WRENCH, open-end, ¼-in.
WRENCH, open-end, 7/16-in.
WRENCH, open-end, ½-in.
WRENCH, open-end, 5/8-in.
WRENCH, open-end, 13/16-in
WRENCH, open-end, 7/8-in.
WRENCH, socket, ½-in.
WRENCH, socket, 15/16-in.

b. Procedure.

(1) SEPARATE UNLOADER HEAD ASSEMBLY FROM CYLIND ASSEMBLY.

WRENCH, open-end, ½-in.
WRENCH, socket, ½-in.

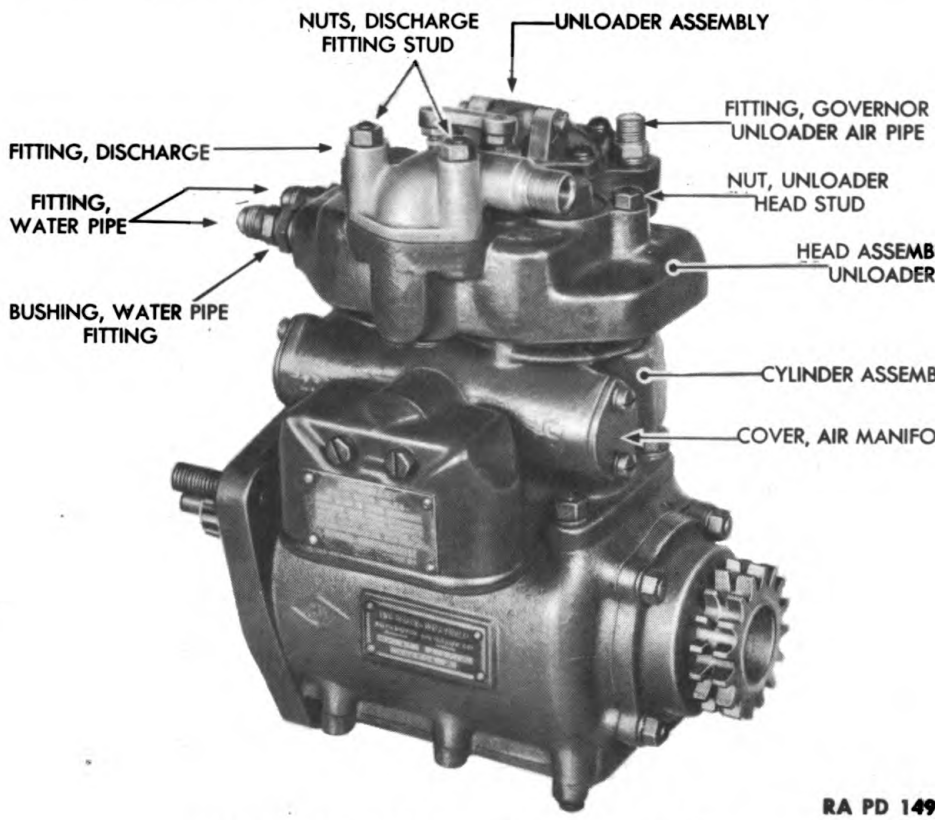


Figure 29—Air Compressor Assembly

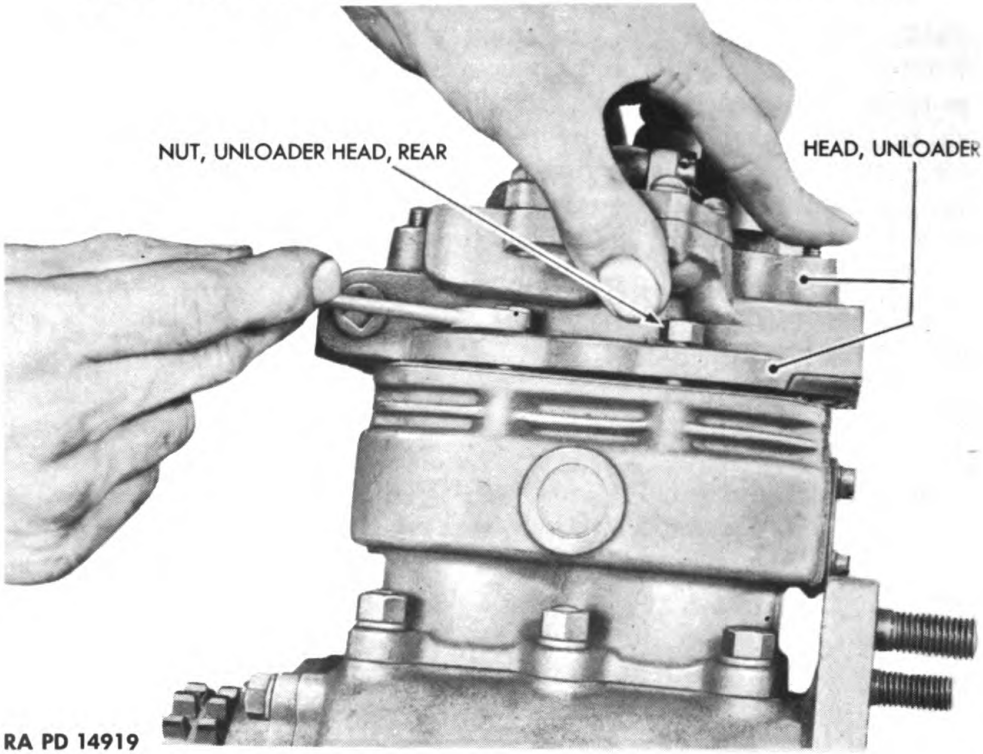


Figure 30—Removing Rear Unloader Head Stud Nuts

(a) Remove two discharge fitting stud nuts and lock washers (½-in. socket wrench). Lift off discharge fitting and discharge fitting gasket (fig. 29).

(b) Remove four front unloader head long stud nuts and lock washers which hold unloader head assembly to cylinder block (½-in. open-end wrench). Remove two rear unloader head short stud nuts and lock washers, raising unloader head off cylinder block as nuts are being removed (½-in. open-end wrench) (fig. 30).

(c) Lift off unloader head assembly.

(2) REMOVE AIR AND WATER PIPE FITTINGS.

WRENCH, open-end, ⅝-in. WRENCH, open-end, ⅞-in.
WRENCH, open-end, 13/16-in.

(a) Place unloader head assembly on a work bench. Remove water pipe fitting (⅝-in. open-end wrench) (fig. 29). Repeat operation to remove opposite water pipe fitting.

(b) Remove water pipe fitting bushing from unloader head (⅞-in. open-end wrench). Repeat operation on opposite water pipe fitting bushing.

(c) Remove governor unloader air pipe fitting from the unloader head assembly (13/16-in. open-end wrench).

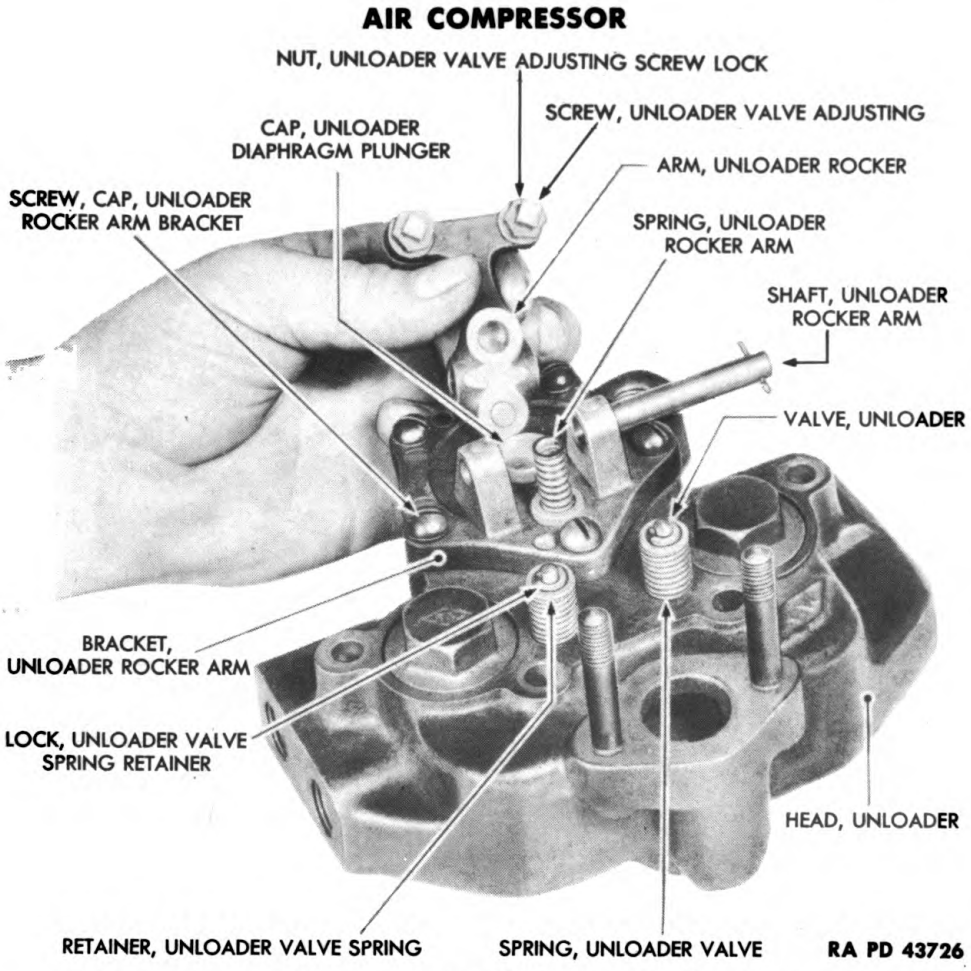


Figure 31—Removing Unloader Rocker Arm

(3) REMOVE UNLOADER ROCKER ARM.

PLIERS
WRENCH, open-end, 7/16-in.
WRENCH, open-end, 1/4-in.

(a) Remove unloader rocker arm shaft cotter pin (pliers) and pull unloader rocker arm shaft out of unloader rocker arm bracket (fig. 31).

(b) Lift unloader rocker arm assembly off unloader rocker arm bracket.

(c) Remove unloader valve adjusting screw and lock nut from unloader rocker arm (1/4-in. and 7/16-in. open-end wrenches). Repeat operation on other unloader valve adjusting screw.

(d) Lift unloader rocker arm spring off unloader rocker arm bracket (fig. 31). Lift unloader diaphragm plunger cap off unloader diaphragm plunger.

(4) REMOVE UNLOADER DIAPHRAGMS (fig. 32).

SCREWDRIVER.

(a) Remove the five unloader rocker arm bracket cap screws and lock washers.

(b) Lift unloader rocker arm bracket off unloader head and remove unloader rocker arm bracket gasket from bracket (fig. 32).

(c) Lift unloader diaphragm plunger and the two unloader diaphragms off unloader head.

(5) REMOVE DISCHARGE VALVES.

WRENCH, socket, $^{15}/_{16}$-in.

(a) Remove discharge valve cap nut from unloader head ($^{15}/_{16}$-in. socket wrench). Lift out discharge valve spring and the discharge valve.

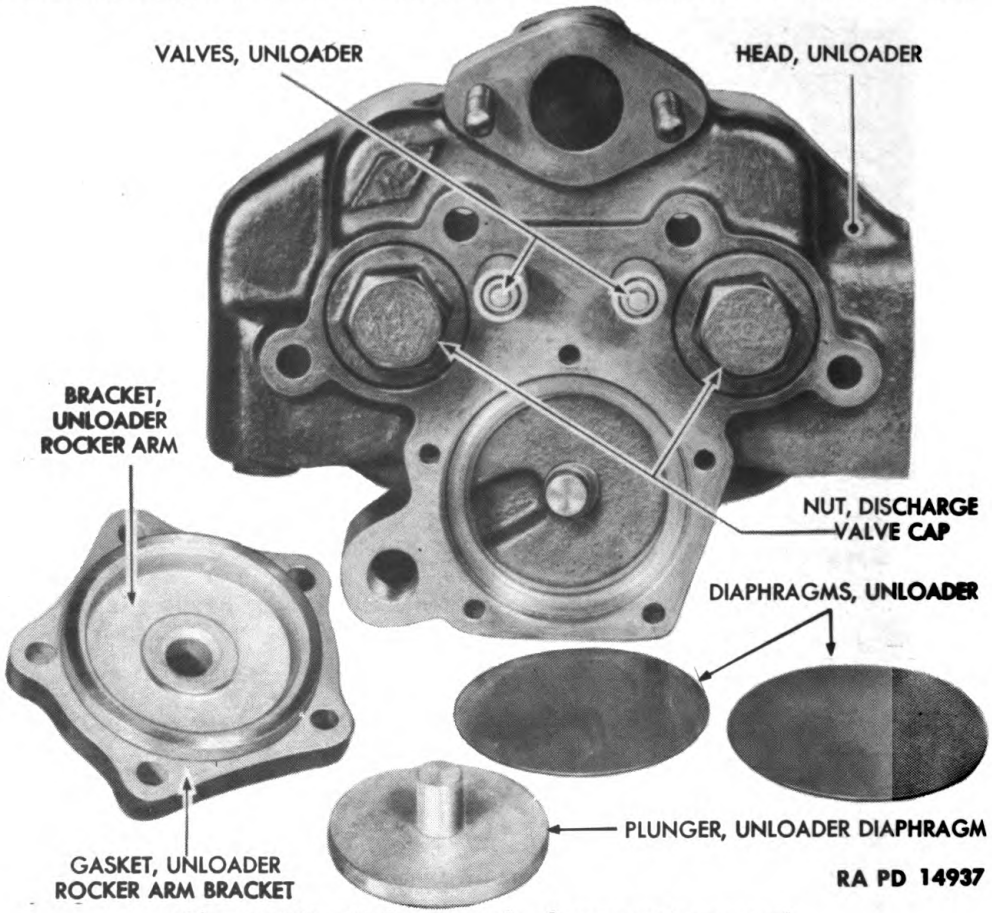


Figure 32—Unloader Diaphragms Removed

(b) Push discharge valve seat from the unloader head with finger.

(c) Repeat operations *(a)* and *(b)* above to remove other discharge valve.

(6) REMOVE UNLOADER VALVES.

AWL

(a) Push down on stem end of unloader valve stem on top of unloader head (fig. 31) and at same time, using an awl, with a twisting motion, remove unloader valve spring retainer lock (fig. 31).

(b) Lift unloader valve spring retainer and unloader valve spring

off unloader valve. Then pull unloader valve out of opposite (bottom) side of unloader head.

(c) Repeat operations *(a)* and *(b)* above to remove other unloader valve.

55. UNLOADER HEAD ASSEMBLY INSPECTION AND REPAIR.

a. Equipment.

BRUSH, soft
CARBON TETRACHLORIDE
CLOTH, wiping
DIE, thread
PLATE, surface
SOLVENT, dry-cleaning

b. Procedure.

(1) GENERAL.

BRUSH, soft
CARBON TETRACHLORIDE
CLOTH, wiping
SOLVENT, dry-cleaning

(a) All parts should be washed in SOLVENT, dry-cleaning, so that all dirt and oil are removed.

(b) Carbon deposits that may be present on unloader head around valves or valve seats must be soaked in CARBON TETRACHLORIDE and cleaned with a cloth or soft brush. Do not use metal tool to scrape carbon, as part being scraped will be scratched or damaged.

(2) UNLOADER DIAPHRAGMS.

PLATE, surface

(a) Examine unloader diaphragms by placing them on surface plate, making certain they lie flat, with no warpage.

(b) Examine unloader diaphragms for deep scoring or scratches.

(c) If unloader diaphragms are warped or scored, discard them and use new diaphragms. Old diaphragms cannot be repaired.

(3) UNLOADER VALVES AND DISCHARGE VALVES.

(a) Repeat the carbon cleaning procedure in step (1) *(b)*.

(b) Examine valve face and valve seat in head. If valve face and valve seat are pitted, grind valve onto its seat in unloader head, using same procedure as with engine valves (TM 9-1795B).

(c) Repeat procedure *(a)* and *(b)* above to seat remaining unloader valve.

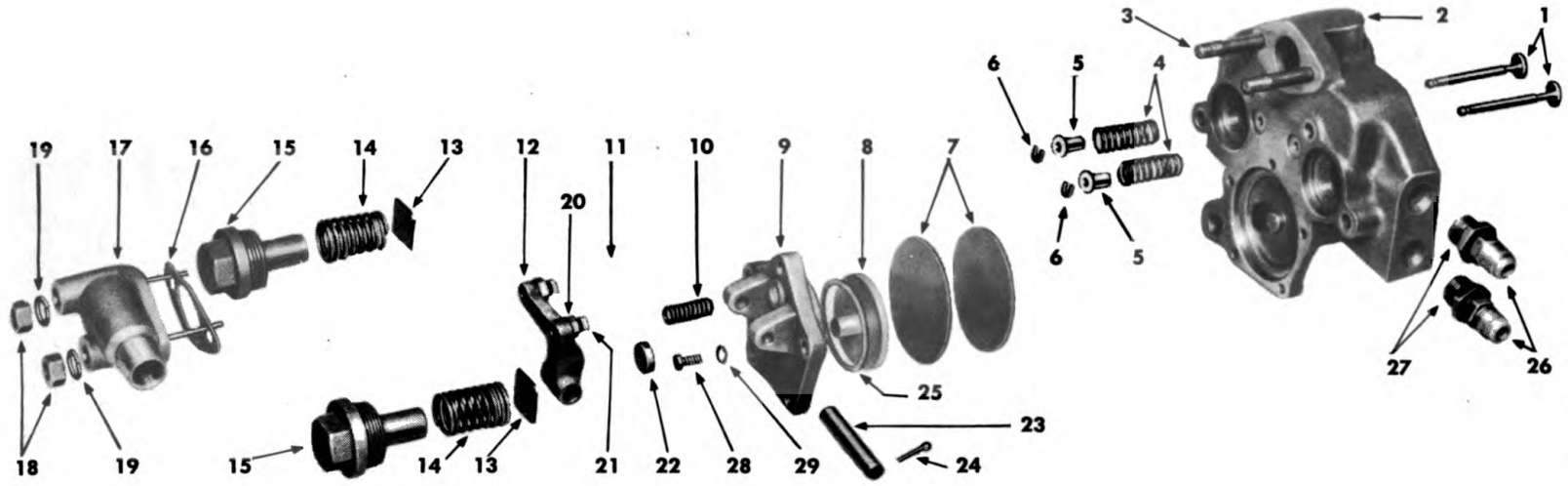
(4) UNLOADER HEAD.

(a) Examine discharge valve seats and unloader valve seats for pits, and, if found, follow procedure in step (3), *(a)* and *(b)*.

(b) Examine unloader head for cracks and, if found, discard unloader head and use a new one.

(5) VALVE SPRINGS.

(a) Lay the two discharge valve springs side by side on a surface plate and measure their height with a scale. The two discharge valve



1. VALVE, UNLOADER
2. HEAD, UNLOADER
3. STUDS, DISCHARGE FITTING
4. SPRING, UNLOADER VALVE
5. RETAINER, UNLOADER VALVE SPRING
6. LOCK, UNLOADER VALVE SPRING RETAINER
7. DIAPHRAGM, UNLOADER
8. PLUNGER, UNLOADER DIAPHRAGM
9. BRACKET, UNLOADER ROCKER ARM
10. SPRING, UNLOADER ROCKER ARM
11. FITTING, GOVERNOR UNLOADER AIR PIPE
12. ARM, UNLOADER ROCKER
13. VALVE, DISCHARGE
14. SPRING, DISCHARGE VALVE
15. NUT, DISCHARGE VALVE CAP
16. GASKET, DISCHARGE FITTING
17. FITTING, DISCHARGE
18. NUT, DISCHARGE FITTING STUD
19. WASHER, LOCK, DISCHARGE FITTING STUD NUT
20. NUT, UNLOADER VALVE ADJUSTING SCREW LOCK
21. SCREW, UNLOADER VALVE ADJUSTING
22. CAP, UNLOADER DIAPHRAGM PLUNGER
23. SHAFT, UNLOADER ROCKER ARM
24. PIN, COTTER, UNLOADER ROCKER ARM SHAFT
25. GASKET, UNLOADER ROCKER ARM BRACKET
26. FITTING, WATER PIPE
27. BUSHING, WATER PIPE FITTING
28. SCREW, CAP, UNLOADER ROCKER ARM BRACKET
29. WASHER, LOCK, UNLOADER ROCKER ARM BRACKET CAP SCREW

RA PD 14932

Figure 33—Unloader Head Assembly

springs must be the same height, and all coils must be open (not tight against one another).

(b) When inspecting the two discharge valve springs, if any doubt arises as to their being in good condition, discard and use new springs.

(c) Repeat procedure *(a)* and *(b)* above to examine unloader valve springs.

(6) UNLOADER ROCKER ARM SPRING. Examine unloader rocker arm spring. All coils must be open (not tight against one another). If coils are not open, discard unloader rocker arm spring and use a new one.

(7) UNLOADER ROCKER ARM SHAFT. Examine unloader rocker arm shaft for ridges or deep scoring at points where unloader rocker arm bracket rests. If unloader rocker arm shaft is ridged or scored, discard it and use a new one.

(8) THREADS.

DIE, thread

(a) Examine threads of studs, screws and fittings for burs or crossed threads. If found, use a thread die to remove burs or straighten crossed threads.

56. ASSEMBLY OF UNLOADER HEAD ASSEMBLY.

a. Equipment.

AWL
COMPOUND, joint and thread
COMPRESSOR, valve spring
OIL, engine
PLIERS
SCREWDRIVER
WRENCH, open-end, 1/4-in.
WRENCH, open-end, 5/8-in.
WRENCH, open-end, 13/16-in.
WRENCH, open-end, 7/8-in.
WRENCH, socket, 15/16-in.

b. Procedure.

(1) INSTALL UNLOADER VALVES.

AWL
COMPRESSOR, valve spring

(a) Insert stem end of unloader valve (1, fig. 33) into its hole in bottom side of unloader head. Push unloader valve into unloader head until unloader valve is seated (fig. 38).

(b) Slide unloader valve spring (4, fig. 33) over stem end of unloader valve. Slide unloader valve spring retainer (5, fig. 33) over stem end of unloader valve and up against unloader valve spring (fig. 33).

(c) Compress unloader valve spring with the fingers or a valve spring compressor and slide unloader valve spring retainer lock (6, fig. 33) over stem end of unloader valve. Using an awl, force unloader valve spring retainer lock into its groove in the stem end of unloader valve.

(d) Repeat procedure *(a)*, *(b)* and *(c)* above to install other unloader valve.

(2) INSTALL DISCHARGE VALVES.

WRENCH, socket, 15/16-in.

(a) Push discharge valve seat into unloader head with a finger.

(b) Install discharge valve (13, fig. 33) and discharge valve spring (14, fig. 33) in unloader head.

(c) Install discharge valve cap nut (15, fig. 33) in unloader head.

(d) Repeat procedure *(a)*, *(b)* and *(c)* above to install other discharge valve.

(3) INSTALL UNLOADER DIAPHRAGMS.

COMPOUND, joint and thread SCREWDRIVER

(a) Install unloader diaphragms (7, fig. 33) in unloader head. Install unloader diaphragm plunger (8, fig. 33) on unloader diaphragms.

(b) Install unloader rocker arm bracket gasket (25, fig. 33) on unloader rocker arm bracket (9, fig. 33), using gasket cement.

(c) Install unloader rocker arm bracket assembled in *(b)* above on unloader head.

(d) Install five unloader rocker arm bracket cap screws and lock washers (screwdriver).

(4) INSTALL UNLOADER ROCKER ARM.

OIL, engine WRENCH, open-end, 1/4-in.
PLIERS

(a) Install unloader diaphragm plunger cap (22, fig. 33) on unloader diaphragm plunger (8, fig. 33). Install unloader rocker arm spring (10, fig. 33) on the unloader rocker arm bracket.

(b) Install unloader valve adjusting screw (21, fig. 33) on unloader rocker arm (1/4-in. open-end wrench). With the fingers, turn unloader valve adjusting screw lock nut on unloader valve adjusting screw, but do not tighten. Repeat operation to install opposite unloader valve adjusting screw.

(c) Install unloader rocker arm assembled in *(b)* above in unloader rocker arm bracket and slide unloader rocker arm shaft (23, fig. 33) through bracket and arm. Install unloader rocker arm shaft cotter pin (pliers).

(d) Lubricate unloader rocker arm shaft with a few drops of engine oil.

(5) INSTALL AIR AND WATER PIPE FITTINGS.

WRENCH, open-end, 5/8-in. WRENCH, open-end, 7/8-in.
WRENCH, open-end, 13/16-in.

(a) Install governor unloader air pipe fitting (11, fig. 33) on unloader head assembly (5/8-in. open-end wrench).

(b) Install water pipe fitting bushing (27, fig. 33) on unloader head (7/8-in. open-end wrench). Repeat operation to install opposite water pipe fitting bushing.

(c) Install water pipe fitting (26, fig. 33) on water pipe fitting bushing ($13/16$-in. open-end wrench). Repeat operation to install opposite water pipe fitting.

57. AIR STRAINER DISASSEMBLY.

a. Equipment.

PLIERS
SCREWDRIVER
WRENCH, socket, $7/16$-in.

b. Procedure.

(1) REMOVE AIR STRAINER ASSEMBLY.

WRENCH, socket, $7/16$-in.

(a) Remove two air strainer assembly cap screws and lock washers which hold air strainer assembly to cylinder assembly ($7/16$-in. open-end wrench) (fig. 34).

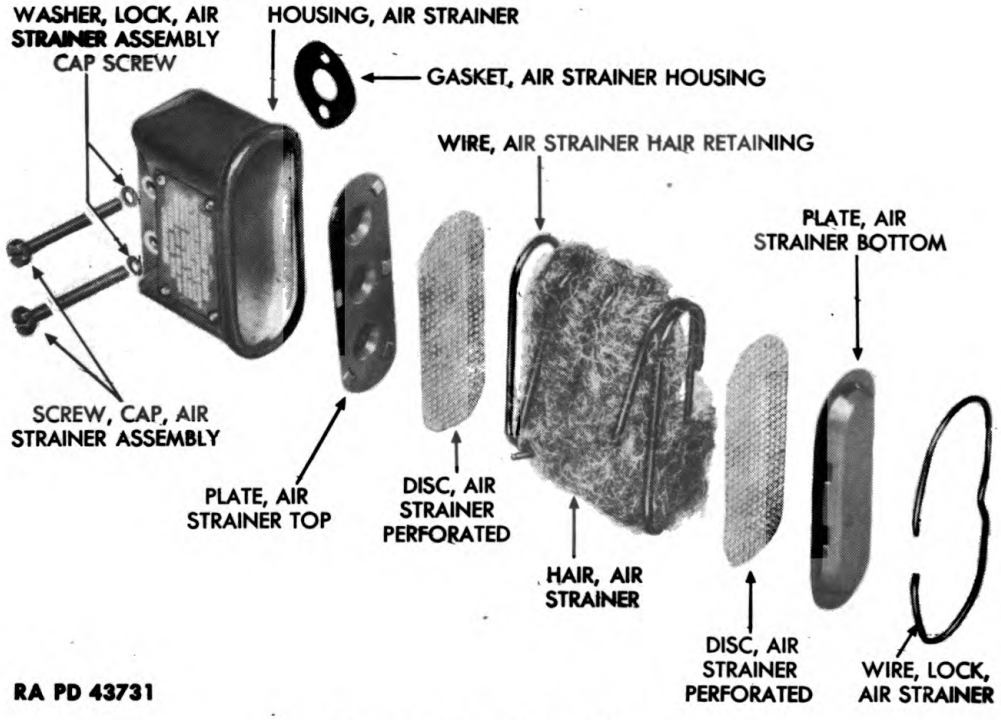


Figure 34—Air Strainer

(b) Lift air strainer assembly and air strainer housing gasket off cylinder assembly.

(2) DISASSEMBLE AIR STRAINER ASSEMBLY.

PLIERS
SCREWDRIVER

(a) Pry out and remove air strainer lock wire from bottom of air strainer housing (screwdriver).

(b) Lift following five parts out of air strainer housing: Air strainer bottom plate; air strainer perforated disk; air strainer hair in the air strainer retaining wire; air strainer perforated disk and air strainer top plate (pliers) (fig. 34).

58. AIR STRAINER ASSEMBLY INSPECTION AND REPAIR.

a. Equipment.

AWL
SOLVENT, dry-cleaning
OIL, engine, SAE 10

b. Procedure. Examine air strainer hair and, if it is matted, separate and fluff the hair in air strainer hair retaining wire (awl). It is not necessary to remove the hair from wire. Wash air strainer hair in SOLVENT, dry-cleaning, and then allow it to dry. Saturate air strainer hair with OIL, engine, SAE 10.

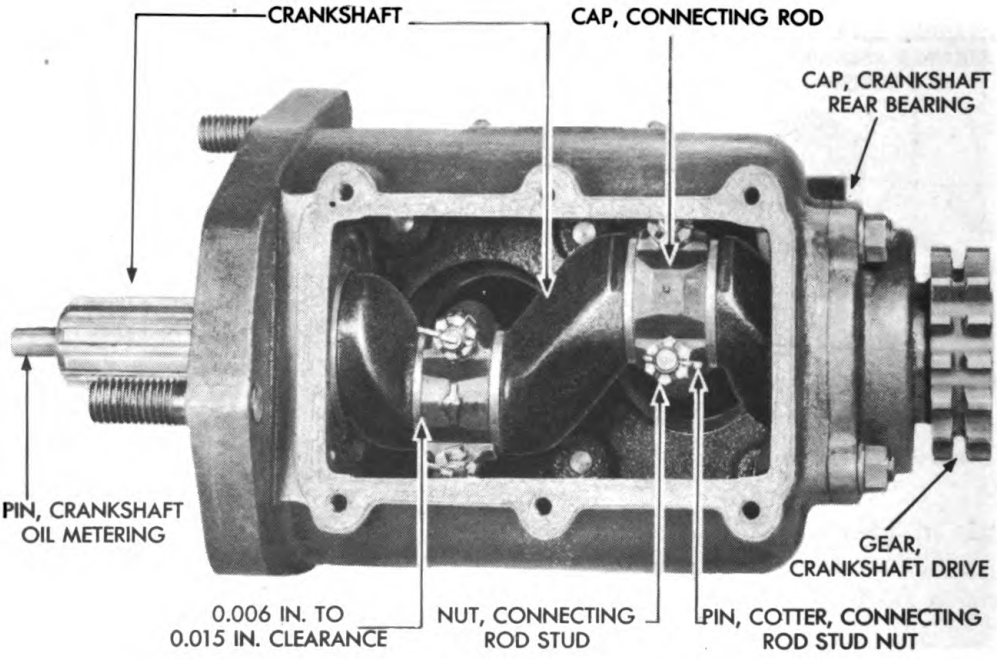


Figure 35—Bottom of Crankcase and Cylinder

RA PD 14920

59. ASSEMBLY OF AIR STRAINER ASSEMBLY.

a. Equipment.

SCREWDRIVER

b. Procedure. Install following five parts in air strainer housing: Air strainer top plate; air strainer perforated disk; air strainer hair in air strainer hair retaining wire; air strainer perforated disk and air strainer bottom plate (fig. 35). Install air strainer lock wire in bottom of air strainer housing, (screwdriver) (fig. 35).

AIR COMPRESSOR

60. CRANKCASE AND CYLINDER DISASSEMBLY.

a. Equipment.

DRIFT, soft
HAMMER
PLIERS
PRESS, hydraulic
PULLER, gear
PUNCH, prick
SCREWDRIVER
TOOL, piston ring remover
WRENCH, box, 9/16-in.
WRENCH, socket, 1/2-in.
WRENCH, socket, 3/4-in.

b. Procedure.

(1) REMOVE OIL PAN.

SCREWDRIVER

(a) Remove remaining four oil pan (slotted head) screws (screwdriver). NOTE: Two oil pan hexagon headed screws were removed when air compressor bracket was removed.

(b) Lift oil pan and oil pan gasket off crankcase.

(2) DISCONNECT CONNECTING RODS.

HAMMER
PLIERS
PUNCH, prick
WRENCH, socket, 1/2-in.

(a) Remove two connecting rod bolt nut cotter pins (pliers) (fig. 35).

(b) Remove two connecting rod bolt nuts which hold connecting rod cap to connecting rod (1/2-in. socket wrench).

(c) Repeat procedure *(a)* and *(b)* above to remove opposite connecting rod bearing cap.

(d) The connecting rod cap for front cylinder has two prick punch marks on it and connecting rod cap for rear cylinder has one prick punch mark. If these punch marks are not visible, use a prick punch and hammer and punch mark the connecting rod caps (fig. 35).

(e) Using prick punch and hammer, mark crankshaft at front cylinder with two punch marks. Mark crankshaft at rear cylinder with one punch mark.

(f) Lift connecting rod caps off connecting rods. Push pistons and connecting rod assemblies out of top of cylinder block. Mark connecting rod with a prick punch and hammer in same way that connecting rod cap was marked (step *(d)* above).

(3) DISASSEMBLE PISTON AND CONNECTING ROD ASSEMBLIES.

DRIFT, soft
HAMMER
PRESS, hydraulic
SCREWDRIVER
TOOL, piston ring remover

(a) Push two connecting rod bolts out of connecting rod. Remove piston pin lock wire from inside piston pin (screwdriver).

(b) Drive out piston pin from piston and connecting rod (hammer and soft drift). Lift off piston assembly and connecting rod assembly.

(c) Remove four piston rings from piston (piston ring remover tool). The top and third piston rings have a straight face and the second and fourth piston rings have a tapered face.

(d) Place connecting rod assembly in a hydraulic press and press piston pin bushing out of connecting rod.

Figure 36—Removing Crankshaft Drive Gear

(e) Repeat procedure *(a)*, *(b)*, *(c)* and *(d)* to disassemble other piston and connecting rod assembly.

(f) Connecting rod end bushing and connecting rod cap bushing are of bearing metal that is cast into connecting rod and connecting rod cap. Connecting rod end bushing and connecting rod cap bushing can be melted out of connecting rod and connecting rod cap (par. 61 **b** (3)).

(4) REMOVE CRANKSHAFT (fig. 36).

DRIFT, soft	SCREWDRIVER
HAMMER	WRENCH, socket, ½-in.
PRESS, hydraulic	WRENCH, socket, ¾-in.
PULLER, gear	

(a) Pull crankshaft oil metering pin out of front end of crankshaft (fig. 35).

(b) Remove four crankshaft rear bearing cap stud nuts and lock washers (½-in. socket wrench) (fig. 35).

(c) At front end of crankshaft, straighten prongs on crankshaft bearing nut lock (hammer).

(d) Drive crankshaft bearing nut off crankshaft (hammer and soft drift). Lift crankshaft bearing nut lock off crankshaft.

(e) Remove crankshaft drive gear nut from the rear end of crankshaft (¾-in. socket wrench).

(f) Remove crankshaft drive gear from crankshaft with a gear puller (fig. 36). Lift crankshaft rear bearing cap and crankshaft rear bearing cap gasket off crankshaft.

(g) Lift crankshaft drive gear nut lock washer and crankshaft drive gear flat washer off crankshaft. Drive crankshaft drive gear key from crankshaft (hammer).

(h) Press rear end of crankshaft out of crankcase with hydraulic press. Crankshaft with crankshaft front ball bearing pressed on it will be removed from crankcase in this operation. Press crankshaft front ball bearing off crankshaft with a hydraulic press.

(i) Place crankcase in hydraulic press and press crankshaft rear ball bearing out of crankcase.

(5) REMOVE CYLINDER ASSEMBLY.

WRENCH, box, 9/16-in.

(a) Lift cylinder head gasket off cylinder.

(b) Remove crankcase and cylinder stud nuts and lock washers which hold cylinder to crankcase (9/16-in. box wrench).

(c) Lift cylinder assembly off crankcase. Lift cylinder to crankcase gasket off crankcase.

(6) DISASSEMBLE CYLINDER ASSEMBLY.

SCREWDRIVER.

(a) Remove air manifold cover cap screws and lock washers (screwdriver). Lift off air manifold cover and gasket.

(b) Repeat procedure to remove opposite air manifold cover.

61. CRANKCASE AND CYLINDER ASSEMBLY INSPECTION AND REPAIR.

a. Equipment.

GAGE, dial cylinder
GAGE, feeler
GAGE, feeler, 0.002-in.
INDICATOR, dial
LATHE
MACHINE, connecting rod babbitting
MACHINE, crankshaft grinding
MICROMETER
PLATE, surface
REAMER, expansion
TOOL, piston ring remover
WRENCH, socket, ½-in.

b. Procedure.

(1) CYLINDERS AND CYLINDER BORES.

GAGE, dial cylinder MICROMETER

(a) Place a dial cylinder gage (or an inside micrometer) in cylinder bore. Check full length of two cylinder bores in several places with dial cylinder gage for a tapered condition. The dial cylinder gage must not show more than 0.002-inch variation. Keep turning dial cylinder gage around in cylinder bores and check full length of cylinder bores for an out-of-round condition. The dial cylinder gage must not show more than 0.002-inch variation.

(b) Measure inside diameter of cylinder bores with inside calipers and a scale, or with an inside micrometer. The bores should measure between 2.0625 and 2.0645 inches. If wear exceeds 0.002-inch, cylinders must be rebored to fit next piston oversize available. Pistons are furnished in 0.010-, 0.020- and 0.030-inch oversize. Amount of reboring depends upon how much of cylinder bore must be removed to make it straight and round.

(c) If cylinders are rebored, new oversize pistons, piston rings and piston pins must be used. Fitting and clearances given in this chapter apply to standard, 0.010-inch oversize, 0.020-inch oversize or 0.030-inch oversize unless otherwise specified.

(d) Inspect cylinder for breaks or cracks and, if found, use a new cylinder. Inspect cylinder bores for scores and, if found, rebore cylinders.

(2) PISTONS, PISTON PINS, PISTON RINGS.

GAGE, feeler MICROMETER
GAGE, feeler, 0.002-in. TOOL, piston ring remover

(a) The pistons must be fitted to front or to rear cylinder bores and then later assembled in bores for which they were fitted. Piston pins must be fitted to pistons and then later assembled in pistons for which they were fitted. Piston rings on each piston must be fitted to cylinder bore and piston and later assembled to pistons for which they were fitted. Keep above parts in separate groups as following inspection is made. Measure diameter of pistons with micrometer. Use micrometer at several points. Pistons must be round. Fit pistons to cylinder bore by placing a 0.002-inch feeler gage, eight inches long, in cylinder bore, then insert piston. Piston should drag as it goes down into cylinder.

(b) Inspect piston pins for scores, ridges or flat spots and, if found, use new piston pins. Install a piston pin in each of the two pistons. Piston pin must be a snug fit, with no side play. A piston pin that can be pushed into piston with palm of the hand is a snug fit.

(c) Insert two piston rings (square face) and two piston rings (tapered face) into cylinder bore, one at a time. Measure distance between ends of each piston ring with a feeler gage. Distance must not be

less than 0.010-inch nor more than 0.015-inch. If distance is greater than this, cylinder must be rebored and oversize pistons and piston rings used.

(d) Place a piston ring (square face) in top piston ring groove of piston, then place a piston ring (tapered face) in next groove, a piston ring (square face) in next groove and a piston ring (tapered face) in bottom groove (piston ring remover tool). Determine distance between edge of piston ring and groove in piston by measuring with a feeler gage. The distance must not be less than 0.0015-inch and not over 0.0025-inch. If distance is more than this, piston grooves and piston rings are worn, and new pistons and piston rings must be used.

(e) Remove piston rings from piston (par. 60 **b** (3) *(c)*).

(3) CONNECTING RODS.

GAGE, feeler
MACHINE, connecting rod babbitting
MICROMETER
PLATE, surface
REAMER, expansion
WRENCH, socket, ½-in.

(a) Place connecting rods on a surface plate. They must be straight, and without any kink or bend.

(b) The two connecting rods and connecting rod caps marked in paragraph 60 **b** (2) *(f)* must be assembled on journal of crankshaft from which they were removed (par, 60 **b** (2) *(e)*). Install connecting rod bolts and nuts, and tighten (½-in. socket wrench). However, it is not necessary to insert connecting rod bolt cotter pin.

(c) The connecting rod must be a snug fit on the crankshaft and turn tightly, but without binding. If connecting rod is loose, it is necessary to remove connecting rod and connecting rod cap (par. 60 **b** (2)). Then follow procedure in (4) *(a)* of this paragraph, and, if necessary, melt bearing metal out of connecting rod and connecting rod cap. Rebush connecting rod and connecting rod cap with bearing metal (connecting rod babbitting machine) and ream to 0.002 inch under crankshaft journal size (step (4) *(a)*) and repeat *(c)* above (expansion reamer).

(d) Measure distance between side of connecting rod bearings and machined part of crankshaft facing side of connecting rod (feeler gage). Distance must be from 0.006- to 0.015-inch; if it is less than 0.006-inch, connecting rod bearing metal must be faced off. If distance is more than 0.015-inch, the connecting rod must be rebushed as in *(c)* above.

(e) Connecting rod cap must not be filed or lapped to obtain proper fit on crankshaft.

(f) Remove connecting rods from crankshaft (½-in. socket wrench).

(4) CRANKSHAFT.

INDICATOR, dial
LATHE
MACHINE, crankshaft grinding
MICROMETER

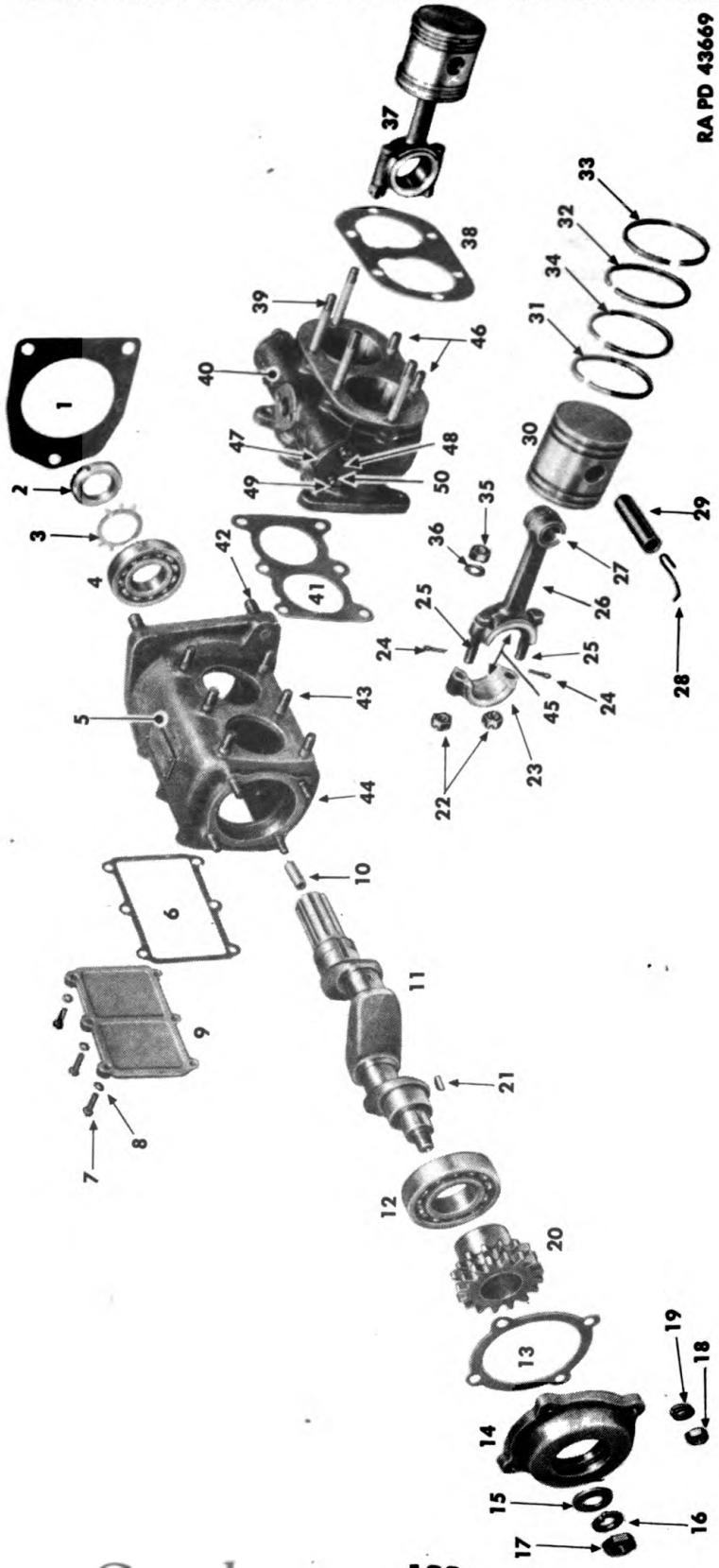


Figure 37—Crankcase and Cylinder—Exploded View

1. GASKET, CRANKCASE
2. NUT, CRANKSHAFT BEARING NUT
3. LOCK, CRANKSHAFT BEARING NUT
4. BEARING, CRANKSHAFT FRONT BALL
5. CRANKCASE
6. GASKET, OIL PAN
7. SCREW, OIL PAN
8. WASHER, LOCK, OIL PAN SCREW
9. PAN, OIL
10. PIN, CRANKSHAFT OIL METERING
11. CRANKSHAFT
12. BEARING, CRANKSHAFT REAR BALL
13. GASKET, CRANKSHAFT REAR BEARING CAP
14. CAP, CRANKSHAFT REAR BEARING
15. WASHER, FLAT, CRANKSHAFT DRIVE GEAR
16. WASHER, LOCK, CRANKSHAFT DRIVE GEAR
17. NUT, CRANKSHAFT DRIVE GEAR
18. NUT, CRANKSHAFT REAR BEARING CAP STUD
19. WASHER, LOCK, CRANKSHAFT REAR BEARING CAP STUD NUT
20. GEAR, CRANKSHAFT DRIVE
21. KEY, CRANKSHAFT DRIVE GEAR
22. NUT, CONNECTING ROD BOLT
23. CAP, CONNECTING ROD
24. PIN, COTTER, CONNECTING ROD BOLT NUT
25. BOLT, CONNECTING ROD
26. ROD, CONNECTING
27. BUSHING, PISTON PIN
28. LOCKWIRE, PISTON PIN
29. PIN, PISTON
30. PISTON
31. RING, PISTON (TAPERED FACE)
32. RING, PISTON (TAPERED FACE)
33. RING, PISTON (STRAIGHT FACE)
34. RING, PISTON (STRAIGHT FACE)
35. NUT, CRANKCASE AND CYLINDER STUD
36. WASHER, LOCK, CRANKCASE AND CYLINDER STUD NUT
37. PISTON AND CONNECTING ROD ASSEMBLY
38. GASKET, CYLINDER HEAD
39. STUD, UNLOADER HEAD LONG
40. CYLINDER
41. GASKET, CYLINDER TO CRANKCASE
42. STUDS, AIR COMPRESSOR MOUNTING
43. STUD, CRANKCASE AND CYLINDER
44. STUD, CRANKSHAFT REAR BEARING CAP
45. BUSHING, CONNECTING ROD END
46. STUDS, UNLOADER HEAD SHORT
47. GASKET, AIR MANIFOLD COVER
48. COVER, AIR MANIFOLD
49. SCREW, AIR MANIFOLD COVER CAP
50. WASHER, COVER CAP SCREW LOCK

RA PD 43669A

Figure 37A—Legend for Figure 37

(a) Measure journal of the crankshaft (where connecting rod fits) at several points. It should measure 1.1045 inch and if it does not, crankshaft should be reground on a grinding machine to 0.010-, 0.020- or 0.030-inch undersize. Then connecting rods and connecting rod caps must be rebushed (step (3) *(c)*) and fitted.

(b) Inspect crankshaft splines for burs or chipping and, if found, use a new crankshaft.

(c) Inspect keyway in crankshaft (for crankshaft drive gear) for burs or chipping and, if found, use a new crankshaft.

(d) Install crankshaft front ball bearing and the crankshaft rear ball bearing (par. 62 **b** (3)) on crankshaft, and if they are not a tight fit, use a new crankshaft and new ball bearings.

(e) Place crankshaft in a lathe. Install a dial indicator so plunger rests on crankshaft front ball bearing journal. Dial indicator should not show the journal to be out-of-round more than 0.002-inch. Repeat operation on crankshaft rear ball bearing journal. If either check shows journal to be over 0.002-inch out-of-round, use a new crankshaft.

(5) CRANKSHAFT DRIVE GEAR. Inspect crankshaft drive gear for rough spots on faces of teeth. Measure width across top of gear teeth. The distance should be $\frac{1}{32}$- or 0.030-inch.

(6) CRANKSHAFT BALL BEARINGS.

(a) Inspect crankshaft front ball bearing and crankshaft rear ball bearing by slowly turning outer race while holding inner race. The ball bearings should turn without a grinding noise or audible clicking noise and, if either noise is heard, use new ball bearings.

(b) Repeat test made in step (4) *(d)*.

(7) PISTON PIN BUSHING.

MICROMETER
REAMER, expansion

(a) Install piston pin in piston pin bushing. Piston pin bushing must be a snug fit with no side play. If there is side play, use a new piston pin bushing and install piston pin in bushing again. If piston pin is too tight in piston pin bushing, measure piston pin diameter with micrometer and ream the bushing 0.002 inch more than piston pin diameter.

62. ASSEMBLY OF CRANKCASE AND CYLINDER ASSEMBLY.

a. Equipment.

DRIFT, soft
HAMMER
HAMMER, soft
INSERTER, piston
OIL, engine
PLIERS
PRESS, hydraulic
SCREWDRIVER
TOOL, piston pin remover
WRENCH, box, $\frac{9}{16}$-in.
WRENCH, socket, $\frac{1}{2}$-in.
WRENCH, socket, $\frac{3}{4}$-in.

AIR COMPRESSOR

b. Procedure.

(1) ASSEMBLE CYLINDER.

SCREWDRIVER

(a) Install air manifold cover gasket (47, fig. 37) and air manifold cover (48, fig. 37). Fasten with two air manifold cover cap screw lock washers and cap screws (screwdriver).

(b) Repeat procedure to install opposite air manifold cover.

(2) INSTALL CYLINDER ASSEMBLY.

WRENCH, box, 9/16-in.

(a) Install new cylinder to crankcase gasket (41, fig. 37) on crankcase and install cylinder on crankcase.

(b) Install crankcase and cylinder stud lock washers and nuts (9/16-in. box wrench).

(3) INSTALL CRANKSHAFT.

DRIFT, soft
HAMMER
HAMMER, soft
OIL, engine
PRESS, hydraulic
WRENCH, socket, 1/2-in.
WRENCH, socket, 3/4-in.

(a) Lubricate crankshaft front and rear ball bearings (4 and 12, fig. 37) with engine oil, and install crankshaft front ball bearing on crankshaft (hydraulic press). Install crankshaft in crankcase and press the crankshaft rear ball bearing in crankcase (hydraulic press).

(b) Tap crankshaft drive gear key (21, fig. 37) in crankshaft (soft hammer).

(c) Slide crankshaft drive gear flat washer (15, fig. 37) and crankshaft drive gear nut lock washer on rear end of crankshaft.

(d) Install new crankshaft rear bearing cap gasket (13, fig. 37), and install crankshaft rear bearing cap on crankshaft rear bearing cap studs.

(e) Install crankshaft drive gear (20, fig. 37) on crankshaft (hydraulic press). Install crankshaft drive gear nut (17, fig. 37) on rear end of crankshaft (3/4-in. socket wrench).

(f) Slide crankshaft bearing nut lock (3, fig. 37) on front end of crankshaft and tap crankshaft bearing nut (2, fig. 37) on crankshaft (hammer and soft drift).

(g) Install crankshaft rear bearing cap stud nut lock washers and nuts (1/2-in. socket wrench).

(h) Test crankshaft for end play and if there is any noticeable end play tighten crankshaft bearing nut installed in *(f)* above. Test crankshaft for free rotation. If crankshaft binds, loosen crankshaft bearing nut installed in *(f)* above.

(i) Bend prongs on crankshaft bearing nut lock down and over crankshaft bearing nut (hammer).

(j) Insert crankshaft oil metering pin (10, fig. 37) in front end of crankshaft. Make sure that end with small hole is outside, and end with large hole is inside, crankshaft.

(4) ASSEMBLE PISTONS AND CONNECTING RODS.

OIL, engine
PRESS, hydraulic
TOOL, piston ring remover

(a) Install piston pin bushing (27, fig. 37) in upper end of connecting rod (hydraulic press). Recheck fit of piston pin in piston pin bushing (par. 61 **b** (7)).

(b) Using a piston ring installer tool, place a piston ring (tapered face, 31, fig. 37) in bottom groove of piston. Place a piston ring (straight face) in third groove of piston. Place a piston ring (tapered face) in

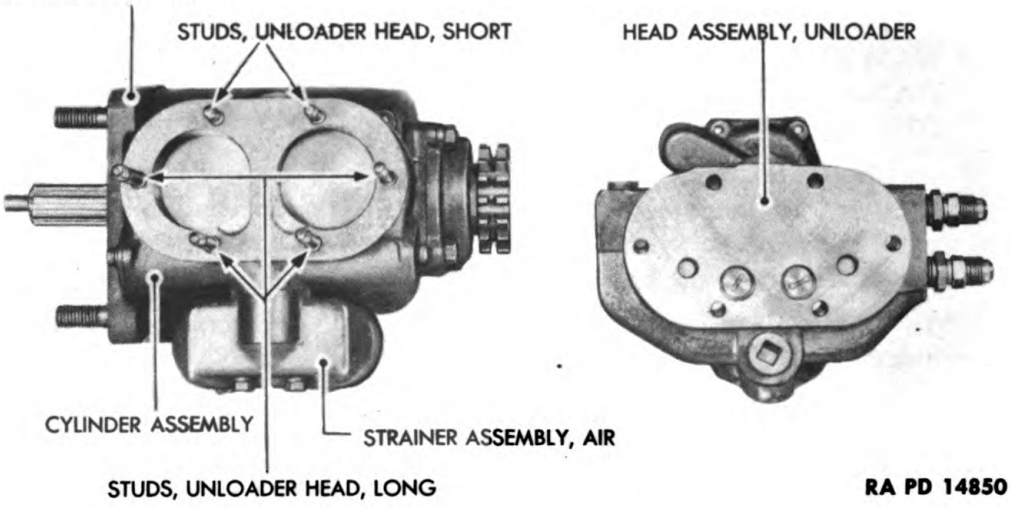


Figure 38—Air Compressor Subassemblies

second groove of piston and a piston ring (straight face) in top groove of piston (piston ring remover tool). These must be the piston rings that were fitted to the piston in paragraph 61 **b** (2) *(a)*. Recheck the fit of piston rings in piston (par. 61 **b** (2) *(a)*).

(c) Coat piston pin with engine oil. Install piston pin through piston and piston pin bushing. Then install piston pin lock wire. If the old connecting rods are being used, make certain that connecting rod removed from front cylinder is assembled to piston fitted to front cylinder.

(d) Insert two connecting rod bolts in connecting rod.

(e) Repeat procedure *(a)*, *(b)*, *(c)* and *(d)* to assemble other piston and connecting rod.

(5) INSTALL CONNECTING ROD AND PISTON ASSEMBLIES.

INSERTER, piston
OIL, engine
PLIERS
SCREWDRIVER
WRENCH, socket, ½-in.

(a) If the two connecting rods being installed are old ones, marked (par. 60 **b** (2) *(d)*), make certain they are installed in cylinders from which they were removed.

(b) Start connecting rod into cylinder from the top and, using a piston inserter (screwdriver), push connecting rod and piston assembly into cylinder. Coat bearing in connecting rod and cap with engine oil and install connecting rod cap.

(c) Install and tighten the two connecting rod bolt nuts (½-in. socket wrench). Install cotter pins (pliers).

(d) Repeat procedure to install other connecting rod and piston assembly.

(e) If connecting rods have new bearing metal, the nuts should be loosened about one half turn. Follow "run-in" procedure (par. 64). Then tighten connecting rod bolt nuts (½-in. socket wrench).

(6) INSTALL OIL PAN.

SCREWDRIVER

(a) Install a new oil pan gasket (6, fig. 37) on crankcase. Install oil pan. Install oil pan (slotted head) screws (screwdriver).

(b) There are two more oil pan screws (hexagon headed) to be installed when air compressor bracket is installed (TM 9-1795B).

63. ASSEMBLY OF AIR COMPRESSOR SUBASSEMBLIES.

a. Equipment.

WRENCH, open-end, ½-in.
WRENCH, socket, 7/16-in.
WRENCH, socket, ½-in.

b. Procedure.

(1) GENERAL. The following procedure covers assembly of unloader head assembly, air strainer assembly and crankcase and cylinder assembly. These subassemblies make up the complete air compressor.

(a) Assemble Unloader Head Assembly.

WRENCH, open-end, ½-in.
WRENCH, socket, ½-in.

1. Start unloader head assembly on unloader head studs and install the two (short) stud lock washers and nuts (fig. 30). Turn nuts on studs as unloader head assembly is being pushed into place (½-in. open-end wrench).

2. Install remaining four unloader head stud lock washers and nuts (½-in. socket wrench).

3. Install a new discharge fitting gasket. Install discharge fitting (½-in. open-end wrench).

4. Install discharge fitting stud lock washers and nuts (½-in. open-end wrench).

(b) Assemble Air Strainer Assembly.

WRENCH, socket, 7/16-in.

1. Install air strainer housing gasket and air strainer assembly on cylinder.

2. Install air strainer assembly lock washers and cap screws (7/16-in. socket wrench).

64. AIR COMPRESSOR ASSEMBLY ADJUSTMENT.

a. Equipment.

GAGE, feeler
GUN, pressure oil
WRENCH, open-end, ¼-in.
WRENCH, open-end, 7/16-in.

b. Procedure.

(1) It is necessary to "run-in" an air compressor that has been disassembled and reconditioned before it is mounted on the wrecker to be used in regular service.

(2) Remove crankshaft oil metering pin. Using a pressure oil gun, generously lubricate interior working parts. Replace crankshaft oil metering pin.

(3) Install air compressor (TM 9-1795B). Make certain that engine has its regular supply of oil, thereby assuring the air compressor of its lubrication. Operate engine at idling speed for about 1½ hour, but do not put wrecker into service during this 1½ hour.

(4) Adjust unloader valves by loosening or tightening unloader valve adjusting screw lock nut, and loosening or tightening unloading valve adjusting screw until there is a clearance of not under 0.010-inch and not over 0.015-inch between adjusting screw and end of valve (¼-in. and 7/16-in. open-end wrenches).

Section IV

GOVERNOR

65. GENERAL.

a. Governor Mounting. The governor is mounted on the engine side of the dash (fig. 40) and is accessible for service operations by lifting the hood.

b. Governor Function. The governor operates between the air reservoirs and the unloader system of the air compressor and prevents the air pressure in the air reservoir from going over 105 pounds per square inch. The governor also prevents air pressure in the air reservoirs from getting below 83 pounds per square inch.

c. Governor Action. When the air pressure in the air reservoirs reaches 105 pounds per square inch, the governor automatically opens the unloader valves. The open unloader valves exhaust the air to the atmosphere. When the air pressure in the air reservoirs has dropped to 83 pounds per square inch, the governor automatically closes the unloader valves, exhausts the air pressure from the unloader system and starts the delivery of air pressure to the air reservoirs.

d. Governor Connections. Two air pipes are used to connect the governor, one leading from the left air reservoir (safety valve "T"-fitting) to the governor lower fitting and the other from the governor upper fitting to the unloader port in the air compressor unloader head (fig. 29).

e. Governor Operation (fig. 39).

(1) The governor (fig. 39) is in the position it takes when the air pressure in the air reservoirs has dropped to 83 pounds per square inch.

(2) The tube (6, fig. 39) is hollow and is connected to the air reservoirs; therefore the air pressure in the tube varies with the air pressure in the air reservoir. The tube is anchored at its lower end only, thus leaving the upper end free to change its tension according to the air pressure within.

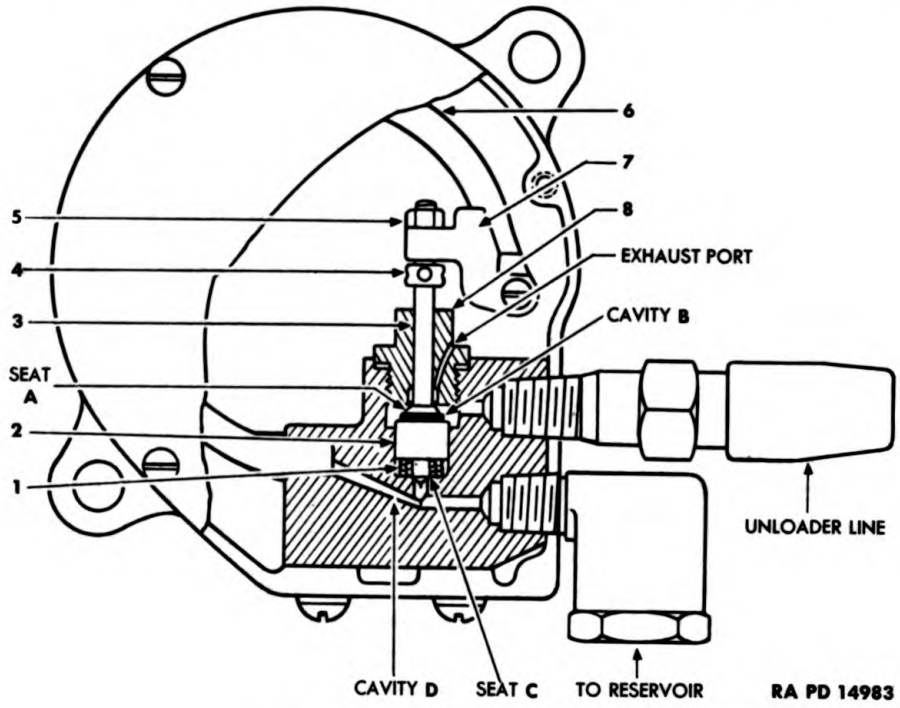


Figure 39—Governor Operation

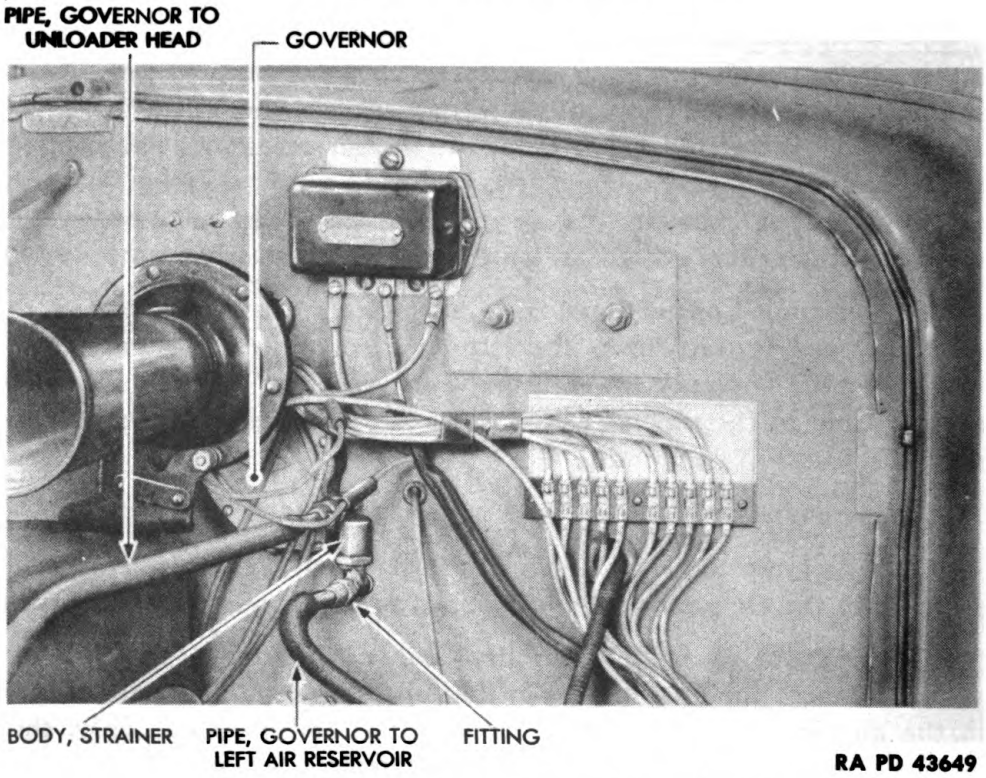


Figure 40—Governor Mounted on Dash

(3) The tension exerted by tube (6, fig. 39) through adjusting screw bracket (7, fig. 39) and upper valve (3, fig. 39) holds lower valve (2, fig. 39) down and against its seat (c, fig. 39). This action seals the air pressure in cavity (d, fig. 39) and also prevents upper valve (3, fig. 39) from getting up on its seat (a, fig. 39). The cavity (b, fig. 39) and the unloading system are opened to the atmosphere through the exhaust port.

(4) As soon as the air pressure has been built up to 105 pounds per square inch, the governor opens the unloader system. The force of the air pressure inside of tube (6, fig. 39) deflects the tube, thus removing the tension that was maintained on the lower valve, through adjusting screw bracket (7, fig. 39) and upper valve (3, fig. 39). When this tension is removed, spring (1, fig. 39) aided by the air pressure that is in cavity (d, fig. 39) pushes the lower valve (2, fig. 39) and upper valve (3, fig. 39) upward so that upper valve (3, fig. 39) is held against its seat (a, fig. 39). This closes the exhaust port. As the lower valve (2, fig. 39) is moved upward, it moves away from seat (c, fig. 39) and the air pressure from cavity (d, fig. 39) is permitted to pass up into cavity (b, fig. 39) and out through the unloader pipe. This position is maintained until the air pressure is down to 83 pounds per square inch.

66. GOVERNOR REMOVAL.

a. Equipment.

WRENCH, open-end, 3/8-in.
WRENCH, open-end, 5/8-in.

b. Procedure.

(1) DISCONNECT AIR PIPES (fig. 40).

WRENCH, open-end, 5/8-in.

(a) Disconnect the governor to left air reservoir pipe at the strainer body (5/8-in. open-end wrench).

(b) Disconnect the governor to unloader head pipe at the governor (5/8-in. open-end wrench) (fig. 40).

(2) REMOVE GOVERNOR.

WRENCH, open-end, 3/8-in.

(a) Remove governor to dash bolts, lock washers and nuts. Lift off governor.

67. GOVERNOR DISASSEMBLY.

a. Equipment.

SCREWDRIVER
WRENCH, box, 7/16-in.
WRENCH, box, 15/16-in.
WRENCH, open-end, 5/16-in.
WRENCH, open-end, 5/8-in.
WRENCH, open-end, 15/16-in.

b. Procedure.

(1) REMOVE STRAINER.

WRENCH, open-end, 5/8-in. WRENCH, open-end, 15/16-in.

(a) Remove strainer nut (15/16-in. open-end wrench). Lift strainer cup and strainer out of strainer body cup.

(b) Remove connector (for governor to unloader header pipe) from governor body (5/8-in. open-end wrench) (fig. 41).

(c) Remove strainer body from governor body and tube assembly.

(2) REMOVE BODY AND TUBE ASSEMBLY.

SCREWDRIVER

(a) Remove cover screws and lock washers holding cover to case (screwdriver). Lift off cover.

(b) Remove screws and lock washers holding body and tube assembly to case (screwdriver). Lift out body and tube assembly.

(3) DISASSEMBLE BODY AND TUBE ASSEMBLY.

SCREWDRIVER
WRENCH, box, 7/16-in.
WRENCH, open-end, 5/16-in.

(a) Remove screw which holds adjusting screw bracket to end of tube (screwdriver). Lift off adjusting screw bracket assembly.

(b) Remove adjusting screw nut from adjusting screw bracket assembly. Remove adjusting screw (5/16-in. open-end wrench).

(c) Remove upper valve body from body and tube assembly (7/16-in. box wrench). Lift shims and upper valve out of body and tube assembly.

(d) Turn body and tube assembly upside down, and the lower valve and spring will drop out of body and tube assembly.

(e) Tube should not be disassembled from body as tube and body are soldered together and must be replaced as a unit.

68. GOVERNOR INSPECTION AND REPAIR.

a. Equipment.

CARBON TETRACHLORIDE
COMPOUND, grinding valve, fine
LINE, compressed air
SOLVENT, dry-cleaning

b. Procedure.

(1) LOWER VALVE.

CARBON TETRACHLORIDE
COMPOUND, grinding valve, fine
SOLVENT, dry-cleaning

GOVERNOR

(a) Inspect the lower valve for carbon or gummed oil and, if found, clean lower valve in a carbon solvent until all carbon and gummed oil are removed.

(b) Using valve grinding compound, regrind lower valve on its seat in body and tube assembly. This is done by placing a small amount of valve grinding compound on face of lower valve. Insert lower valve into body and tube assembly and downward onto its seat. Oscillate lower valve against its seat, using the fingers or a valve grinding tool (a light downward pressure only must be used). Stop grinding as soon as

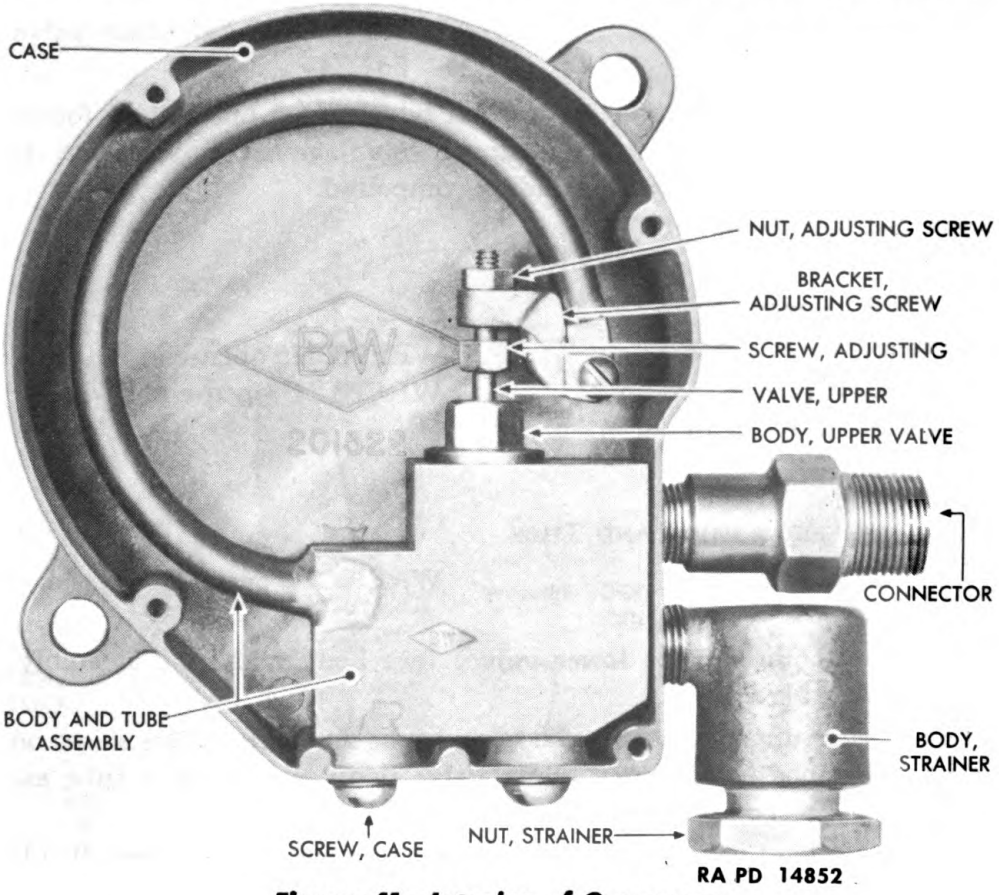


Figure 41—Interior of Governor

the face of lower valve and its seat show a bright, shiny surface. Wash lower valve and its seat in the body and tube assembly in SOLVENT, dry-cleaning, and dry with a shop compressed air hose.

(2) STRAINER AND STRAINER CUP.

CARBON TETRACHLORIDE

LINE, compressed air

(a) Inspect strainer and strainer cup for carbon or gummed oil, and, if found, clean strainer and strainer cup in carbon solvent. If lower

valve had carbon and gummed oil, the strainer and strainer cup will also have the same condition.

(b) It is advisable to replace strainer and strainer cup if carbon and gummed oil are found. However, if new parts are not available they can be cleaned.

(c) The strainer and strainer cup must be thoroughly dried by using a shop compressed air line.

(3) UPPER VALVE.

CARBON TETRACHLORIDE
COMPOUND, grinding valve, fine

(a) Inspect upper valve for carbon or gummed oil, and, if found, clean with carbon solvent. Grind upper valve against its seat with an upward pressure, using valve grinding compound.

69. ASSEMBLY OF GOVERNOR.

a. Equipment.

SCREWDRIVER
WRENCH, box, 7/16-in.
WRENCH, open-end, 5/16-in.
WRENCH, open-end, 5/8-in.
WRENCH, open-end, 15/16-in.

b. Procedure.

(1) ASSEMBLE BODY AND TUBE.

SCREWDRIVER
WRENCH, box, 7/16-in.
WRENCH, open-end, 5/16-in.

(a) Insert spring (for lower valve) into body and tube assembly. Insert lower valve.

(b) Insert upper valve into body and tube assembly. Place shims on upper valve body and screw upper valve body in body and tube assembly (7/16-in. box wrench).

(c) Install adjusting screw in adjusting screw bracket. Install adjusting screw nut (5/16-in. open-end wrench).

(d) Install adjusting screw bracket on end of tube and fasten with the screw (screwdriver) (fig. 41).

(2) INSTALL BODY AND TUBE ASSEMBLY.

SCREWDRIVER

(a) Install body and tube assembly in case and tighten lock washers and screws (screwdriver).

(b) Do not install cover until after governor is installed (par. 70).

(3) INSTALL STRAINER.

WRENCH, open-end, 5/8-in.
WRENCH, open-end, 15/16-in.

GOVERNOR

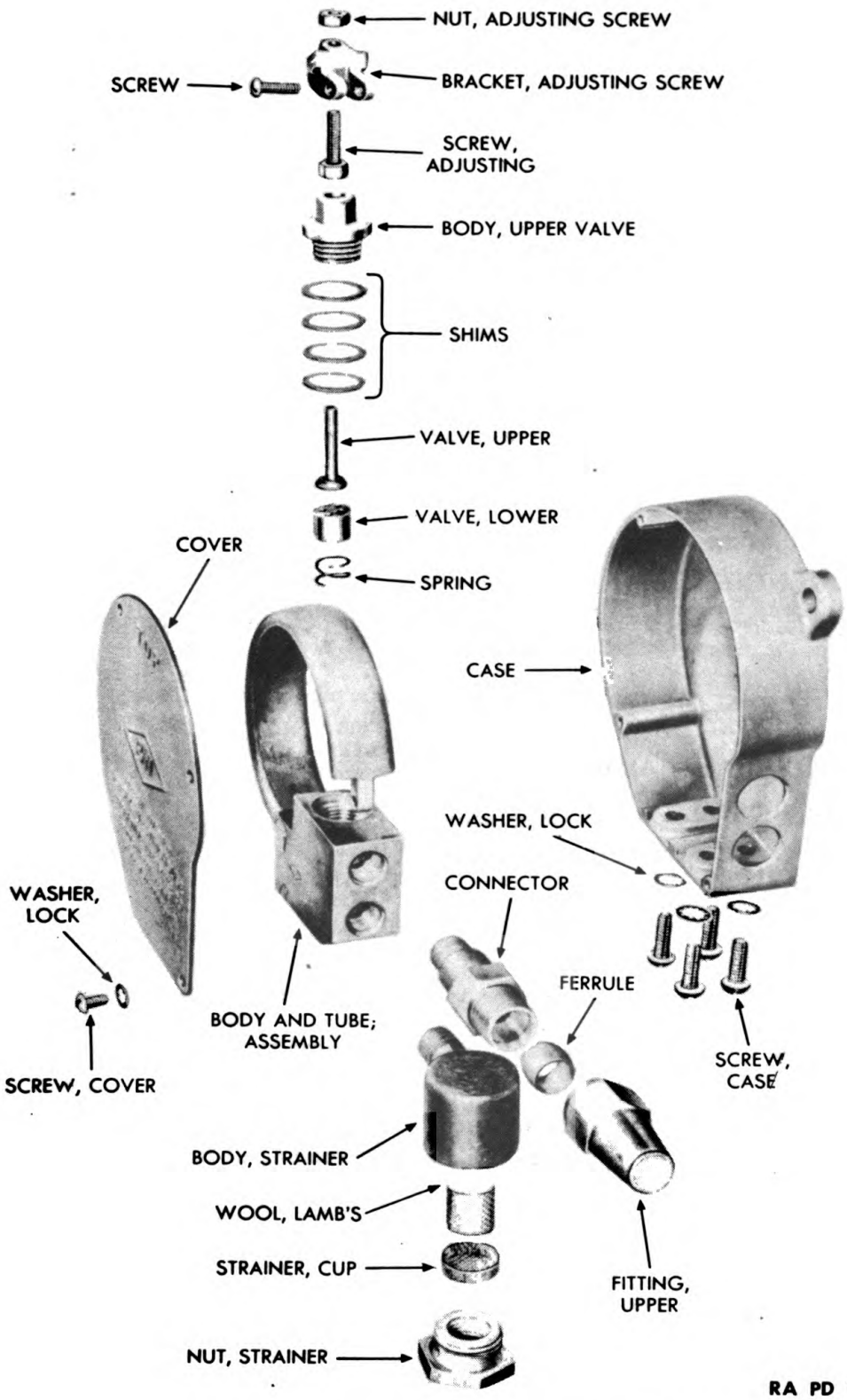


Figure 42—Governor—Exploded View

(a) Insert strainer in strainer body. Insert strainer cup. Install strainer nut ($1\frac{5}{16}$-in. open-end wrench).

(b) Install connector (governor to unloader header pipe) in body ($\frac{5}{8}$-in. open-end wrench).

70. GOVERNOR INSTALLATION.

a. Equipment.

WRENCH, open-end, $\frac{3}{8}$-in.
WRENCH, open-end, $\frac{5}{8}$-in.

b. Procedure.

(1) INSTALL GOVERNOR.

WRENCH, open-end, $\frac{3}{8}$-in.

(a) Install governor on dash and tighten bolts, lock washers and nuts.

(2) CONNECT AIR PIPES.

WRENCH, open-end, $\frac{5}{8}$-in.

(a) Connect governor to unloader head pipe at the governor (fig. 40).

(b) Connect governor to left air reservoir pipe at the strainer body.

71. GOVERNOR ADJUSTMENT.

a. Equipment.

OIL, penetrating
SOAPSUDS
WRENCH box, $\frac{7}{16}$-in.
WRENCHES, open-end, two, $\frac{5}{16}$-in.

b. Procedure.

(1) PRESSURE TEST.

(a) Start the engine and have one man observe the air pressure gage (on dash).

(b) Watch the governor and when the tube is seen to move and the upper valve is seen to move upward, take the reading of the air pressure gage.

(c) Open a shut-off cock (fig. 68) slightly, in order to reduce the air pressure gradually.

(d) Watch the governor and when the tube is seen to move and the upper valve is seen to move downward, take the reading of the air pressure gage.

(e) The reading made in *(b)* above should be 100 to 105. The reading made in *(d)* above should be 83 to 85.

GOVERNOR

(f) If the difference between the two readings *(b)* and *(d)* above was not between 15 and 20, make the pressure range adjustment in step (2) of this paragraph.

(g) If the difference between the two readings *(b)* and *(d)* above was between 15 and 20 but did not read as in *(e)* above, set the pressure (step (3) this par.).

(2) PRESSURE RANGE ADJUSTMENT.

OIL, penetrating WRENCH, box, $\frac{7}{16}$-in.

(a) First try a few drops of penetrating oil around upper valve stem, which may be sticking. Repeat step (1) above. If this does not correct the trouble, adjust the pressure range as follows:

1. To increase pressure range, remove one shim at a time from underneath upper valve body ($\frac{7}{16}$-in. box wrench) (par. 67 **b** (3) *(c)*). Repeat step (1), this paragraph, each time a shim is removed until pressure range is between 12 and 20.

2. To decrease the pressure range, install one shim at a time underneath the upper valve body (par. 69 **b** (1) *(b)*). Repeat step (1), this paragraph, each time a shim is installed until the pressure range is between 15 and 20.

(3) SETTING THE PRESSURE.

WRENCHES, open-end, two, $\frac{5}{16}$-in.

(a) First repeat step (2), this paragraph. If this does not give proper reading (step (1), this par.), set the pressure as follows:

1. Start the engine and, using two $\frac{5}{16}$-inch open-end wrenches, loosen the adjusting screw nut and turn the adjusting screw clockwise or counterclockwise until proper setting is obtained. Turning the adjusting screw clockwise raises the pressure and turning it counterclockwise lowers the pressure.

2. When pressure is correct, hold adjusting screw with one $\frac{5}{16}$-inch open-end wrench, and turn the adjusting screw nut with another $\frac{5}{16}$-inch open-end wrench to lock the adjusting screw in position.

(4) LEAKAGE TESTS.

SOAPSUDS

(a) Start the engine and watch the governor. When the upper valve is seen to move downward, cover the connector (governor to unloader head pipe) with soapsuds. If a soap bubble of three inches or larger is formed, it indicates that the lower valve is not seating or that there is dirt on the lower valve seat and lower valve face. In either case follow procedure in paragraph 68 **b** (1).

(b) Open shut-off cock (fig. 68) slightly, in order to reduce air pressure gradually. Watch governor, and when upper valve is seen to move downward, cover the connector (governor to unloader pipe) with soapsuds. If a soap bubble of three inches or larger is formed, it indicates that the upper valve is not seating or that there is dirt on the upper valve seat and upper valve face. In either case follow procedure in paragraph 68 **b** (1) and (3).

Section V

SAFETY VALVE

72. GENERAL.

a. The safety valve assembly is located on the top of the left air reservoir. It protects the air system against building up air pressure in excess of 150 pounds per square inch.

b. If air pressure in the left air reservoir is built up (by the air compressor) until it exceeds 150 pounds per square inch, the spring forces the ball back on its seat. The air then escapes out of the hole (or exhaust port) into the atmosphere. As soon as the air pressure in the left air reservoir is reduced to 150 pounds per square inch, the spring forces the ball back on its seat.

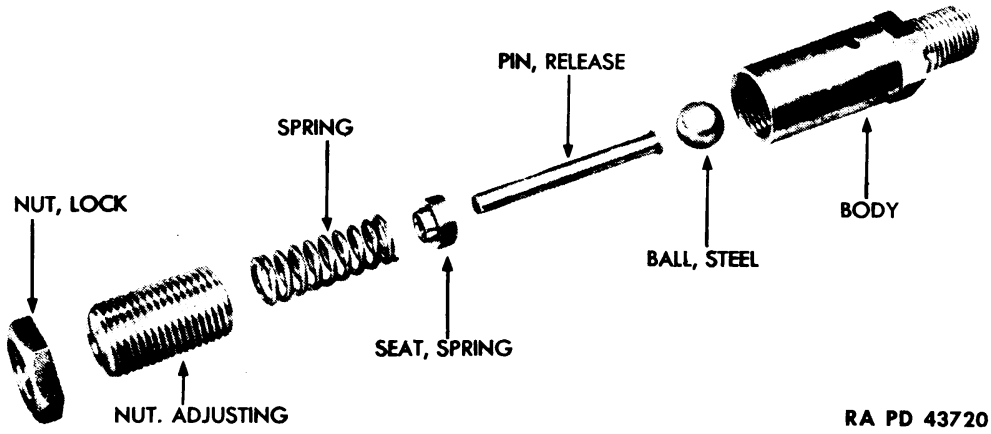


Figure 43—Safety Valve—Exploded View

73. SAFETY VALVE ASSEMBLY REMOVAL.

a. Equipment.

WRENCH, open-end, 3/4-in.

b. Procedure. Open shut-off cock (fig. 68) and wait until all air pressure is exhausted. Remove safety valve assembly from "T"-connection on top of left air reservoir.

ORDNANCE MAINTENANCE
BODY AND CHASSIS FOR HEAVY WRECKING TRUCK M1

74. SAFETY VALVE DISASSEMBLY.

a. Equipment.

SCREWDRIVER
WRENCH, open-end, 3/4-in.

b. Procedure. Remove lock nut (3/4-in. open-end wrench). Remove adjusting nut from body. Lift release pin, spring and spring seat out of body. Slide spring and spring seat off release pin (screwdriver). Turn body upside down and roll steel ball out of body (fig. 43).

75. SAFETY VALVE INSPECTION.

a. Equipment.

SOLVENT, dry-cleaning

b. Procedure. Wash all parts in SOLVENT, dry-cleaning. This must be done every 5,000 miles.

76. ASSEMBLY OF SAFETY VALVE.

a. Equipment.

SCREWDRIVER
WRENCH, open-end, 3/4-in.

b. Procedure. Install steel ball in body. Install release pin in body and slide spring seat and spring on release pin (screwdriver). Install adjusting nut in body. Install lock nut on adjusting nut (3/4-in. open-end wrench). Do not tighten lock nut.

77. SAFETY VALVE ASSEMBLY INSTALLATION.

a. Equipment.

WRENCH, open-end, 3/4-in.

b. Procedure. Install safety valve assembly in the "T"-connection on top of left air reservoir.

78. SAFETY VALVE ASSEMBLY ADJUSTMENT.

a. Equipment.

SCREWDRIVER
WRENCH, open-end, 3/4-in.
SOAPSUDS

b. Procedure

(1) LEAKAGE TEST.

SOAPSUDS

(a) Start engine and wait until air pressure gage registers 150, then shut off engine.

(b) Place soapsuds on safety valve at "T"-connection, and observe if a bubble about three inches in diameter is formed in three seconds. If so, tighten safety valve in "T"-connection and repeat test. Then re-

peat test at opposite end of safety valve assembly, and if a three-inch bubble forms in three seconds, remove safety valve assembly (par. 73) and disassemble (par. 74). Clean parts (par. 75) and reassemble (par. 76). Repeat the test with soapsuds.

(c) Safety valve must be tested for leakage every 10,000 miles.

(2) ADJUST SAFETY VALVE ASSEMBLY.

SCREWDRIVER WRENCH, open-end, 3/4-in.

(a) Set unloader valves of air compressor (fig. 31) so there is no clearance. The unloader system of the air compressor will not work.

(b) Start engine, and when air pressure gage passes the 150 mark, turn off engine and observe safety valve. Air should be heard and felt coming out of hole (discharge port) in body (fig. 43).

(c) If there is no air heard or felt coming out of the safety valve body as described in step *(b)* above, turn off engine and open shut-off cock (fig. 68). Allow shut-off cock to remain open until air pressure gage registers 150. Loosen lock nut on safety valve assembly (3/4-in. open-end wrench). Turn adjusting nut on safety valve assembly clockwise or counterclockwise until safety valve opens at 150 and closes just under 150 (screwdriver). Then tighten lock nut (3/4-in. open-end wrench).

(d) Test safety valve assembly (step *(c)* above) every 10,000 miles.

ORDNANCE MAINTENANCE
BODY AND CHASSIS FOR HEAVY WRECKING TRUCK M1

Section VI

AIR PRESSURE GAGE

79. GENERAL.

a. The air pressure gage is mounted on the instrument board and registers the air reservoir pressure.

b. Never start wrecker in motion until pressure reaches at least 70 pounds.

c. If air pressure gage reads 50 pounds or less while wrecker is in motion, stop wrecker and check air system (par. 52) to determine cause, then make necessary corrections. Air pressure of less than 50 pounds will not satisfactorily operate the wheel brakes. The parking brake cannot be used as a substitute for them.

80. AIR PRESSURE GAGE REMOVAL.

a. Equipment.

SCREWDRIVER
WRENCH, open-end, 5/8-in.

b. Procedure. Disconnect air pipe at rear of air pressure gage (5/8-in. open-end wrench) (5, fig. 112). Remove air pressure gage bolts, nuts and lock washers which hold air pressure gage to instrument board (screwdriver) (5, fig. 112). Lift air pressure gage off back of instrument board.

81. AIR PRESSURE GAGE INSTALLATION AND INSPECTION.

a. Equipment.

GAGE, test
SCREWDRIVER
WRENCH, open-end, 5/8-in.

b. Procedure.

(1) INSTALL TEST GAGE.

(a) Install a test gage in the place of the air pressure gage and repeat the pressure tests given the governor (par. 68), then repeat the test given the safety valve (par. 75).

(b) Install air pressure gage and repeat the same tests (screwdriver, 5/8-in. open-end wrench).

(c) Compare the readings obtained in *(a)* above with results obtained in *(b)* above. If the readings do not agree within four pounds, install a new or a recalibrated air pressure gage.

AIR PRESSURE GAGE

(2) INSTALL AIR PRESSURE GAGE.

SCREWDRIVER WRENCH, open-end, 5/8-in.

(a) Install air pressure gage on instrument board (screwdriver) (5, fig. 112).

(b) Connect air pipe at rear of the air pressure gage (5/8-in. open-end wrench). NOTE: Use a test gage to check air pressure gage. A test gage should be calibrated in steps of one pound and should start with zero and extend to 150 pounds. The test gage should be recalibrated at least every six months.

ORDNANCE MAINTENANCE
BODY AND CHASSIS FOR HEAVY WRECKING TRUCK M1

Section VII

FLOOR FOOT AIR VALVE

82. GENERAL.

a. The floor foot air valve is located on the left side of the wrecker under the floor board and is connected to the brake pedal by an adjustable rod.

b. The floor foot air valve delivers or shuts off air pressure to front and rear wheel brakes. Air pressure is delivered to wheel brakes when the brake pedal is depressed and is shut off when the brake pedal is released. The farther the brake pedal is depressed, the more air pressure is delivered and the more sudden the stop.

c. The floor foot air valve is divided into two sections by a diaphragm. Above the diaphragm is the operating lever and regulating spring. Below the diaphragm is an air cavity, the air pressure outlets and the inlet and exhaust valves.

d. When there is foot pressure on the brake pedal, the lever is rotated on the pin, forcing the regulating spring down onto the diaphragm. The rocker arm is moved down, together with the diaphragm. This depresses the exhaust valve and the intake valve. The exhaust valve is forced against its seat and closed while the intake valve is forced away from its seat and opened. The opening of the intake valve permits air pressure to pass through the air pipes to the wheel brakes and thereby operate them.

e. When there is no foot pressure on the brake pedal, a spring on the brake pedal and a second spring in the head of the lever pull the brake pedal and the lever back into the release position. This removes the pressure on the regulating spring and on the diaphragm. Air pressure under the diaphragm lifts it and the rocker arm. When the rocker arm is lifted, the intake valve is closed by the intake valve spring and the exhaust valve is opened, allowing the air pressure that remains in the floor foot air valve to escape into the atmosphere.

FLOOR FOOT AIR VALVE

83. FLOOR FOOT AIR VALVE REMOVAL.

a. Remove floor foot air valve (TM 9-1795A).

84. FLOOR FOOT AIR VALVE DISASSEMBLY.

a. Equipment.

DRIFT, soft	WRENCH, open-end, 3/8-in.
HAMMER	WRENCH, open-end, 3/4-in.
PLIERS	WRENCH, open-end, 1-in.
PRESS, hydraulic	WRENCH, open-end, 1 5/16-in.

b. Procedure.

(1) REMOVE LEVER.

PLIERS — PRESS, hydraulic

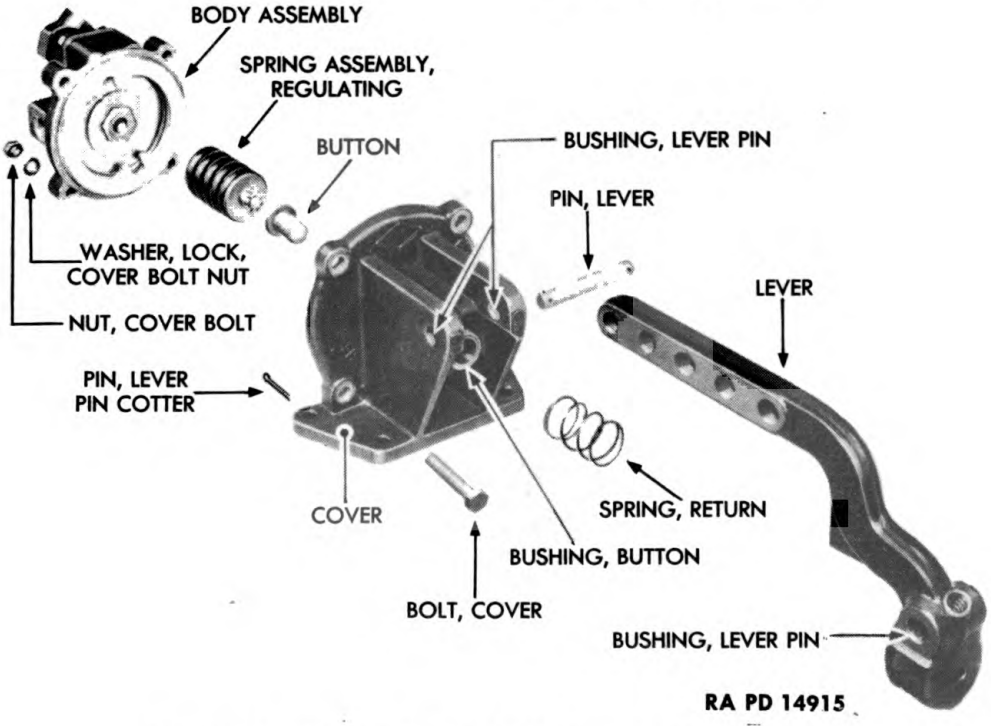


Figure 44—Floor Foot Air Valve—Exploded View

(a) Remove lever pin cotter pin and pull out lever pin (pliers). Lift off lever and return spring.

(b) Press lever pin bushing out of lever (hydraulic press).

(2) REMOVE COVER.

PRESS, hydraulic — WRENCH, open-end, 3/8-in.

(a) Remove bolts, nuts and lock washers which hold cover to body (3/8-in. open-end wrench). Lift off cover.

(b) Lift regulating spring assembly and button out of cover. Do not disassemble regulating spring assembly (par. 85 **b** (5)).

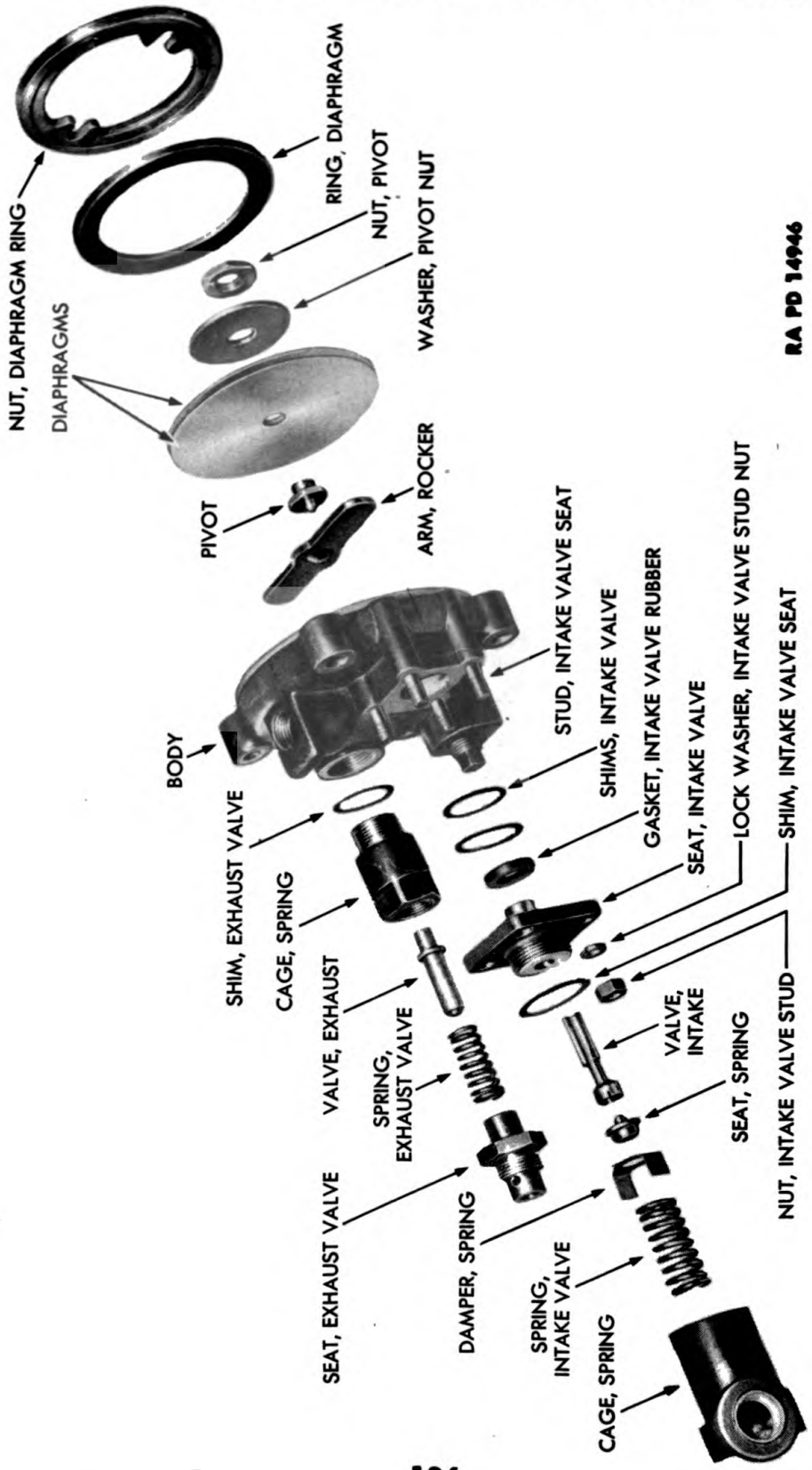


Figure 45—Floor Foot Air Valve Body Assembly—Exploded View

(c) Press the two lever pin busings and the button bushing out of the cover (hydraulic press).

(3) REMOVE DIAPHRAGMS.

DRIFT, soft
HAMMER
WRENCH, open-end, 3/4-in.
WRENCH, open-end, 1-in.

(a) Drive out diaphragm ring nut from body (fig. 45) (hammer and soft drift). Lift diaphragm ring and the diaphragm assembly out of the body.

(b) Remove pivot, pivot nut, pivot nut washer and two diaphragms 3/4-in. and 1-in. open-end wrenches).

(c) Lift rocker arm out of body (fig. 45).

(4) REMOVE EXHAUST VALVE ASSEMBLY.

WRENCH, open-end, 1-in.

(a) Remove exhaust valve spring cage from body (1-in. open-end wrench) (fig. 45).

(b) Lift exhaust valve shim off top of exhaust valve assembly.

(c) Remove exhaust valve seat from spring cage (1-in. open-end wrench). Then lift spring and exhaust valve out of spring cage.

(5) REMOVE INTAKE VALVE ASSEMBLY.

WRENCH, open-end, 3/8-in.
WRENCH, open-end, 15/16-in.

(a) Remove intake valve stud nuts and lock washers (3/8-in. open-end wrench). Lift intake valve assembly off body, and remove intake valve shims off top of intake valve seat.

(b) Unscrew spring cage from intake valve seat (15/16-in. open-end wrench). Lift off intake valve seat shim from top of spring cage.

(c) Pull intake valve out of intake valve seat. Lift intake valve rubber gasket off top of intake valve seat.

(d) Lift spring seat out of spring cage. Pull spring damper out of spring cage. Turn spring cage upside down and remove intake valve spring.

85. FLOOR FOOT AIR VALVE INSPECTION.

a. Equipment.

COMPOUND, grinding valve, fine
LINE, air pressure
SOLVENT, dry-cleaning
PLATE, surface

b. Procedure.

(1) GENERAL.

LINE, air pressure
SOLVENT, dry-cleaning

(a) Wash all parts in SOLVENT, dry-cleaning, and blow them dry with shop air pressure line.

(2) DIAPHRAGMS.

PLATE, surface

(a) Place diaphragms on a surface plate and make certain they are flat and without distortion.

(b) Inspect diaphragms for ridges and scores and, if found, use new diaphragms.

(3) COVER AND BODY. Inspect cover and body for cracks or breaks and, if found, use a new cover.

(4) INTAKE AND EXHAUST VALVES AND VALVE SEATS.

COMPOUND, grinding valve, fine
LINE, air pressure
SOLVENT, dry-cleaning

(a) Inspect intake and exhaust valve seats for scores and pits. Inspect intake and exhaust valves for scores, pits and rounded faces.

(b) If intake and exhaust valves, and intake and exhaust valve seats, are rounded, pitted or scored, place valve grinding compound on valve. Place valve in its seat. Regrind valve and valve seat, using fingers to turn valve. Use only a slight pressure for regrinding. Wash valves and valve seats in SOLVENT, dry-cleaning, and blow them dry with shop air line.

(5) REGULATING SPRING ASSEMBLY. Regulating spring assembly is adjusted and set for preloading floor foot air valve, and special scales are necessary for weighing and preloading. There is no inspection or adjustment that can be made of the regulating spring assembly.

(6) LEVER PIN BUSHING. Insert lever pin in lever bushing. The lever pin must be a snug fit in lever bushing with no side play.

86. ASSEMBLY OF FLOOR FOOT AIR VALVE.

a. Equipment.

DRIFT
HAMMER
PLIERS
PRESS, hydraulic
WRENCH, open-end, 3/8-in.
WRENCH, open-end, 3/4-in.
WRENCH, open-end, 1-in.
WRENCH, open-end, 1 5/16-in.

b. Procedure.

(1) ASSEMBLE INTAKE VALVE.

WRENCH, open-end, 3/8-in.
WRENCH, open-end, 1 5/16-in.

(a) Install intake valve spring in spring cage and place the spring damper on intake valve spring (fig. 45).

(b) Place spring seat on top of spring damper.

(c) Install intake valve rubber gasket on top of intake valve seat. Insert intake valve in intake valve seat.

(d) Install intake valve seat shim on top of spring cage. Screw spring cage on intake valve seat (1 5/16-in. open-end wrench).

(e) Place intake valve shims on top of the intake valve seat. Install intake valve assembly on body. Install four intake valve stud lock washers and nuts (3/8-in. open-end wrench).

(2) ASSEMBLE EXHAUST VALVE.

WRENCH, open-end, 1-in.

(a) Install exhaust valve and install spring in spring cage. Install exhaust valve seat in spring cage (1-in. open-end wrench).

(b) Place exhaust valve shim on top of exhaust valve assembly.

(c) Install exhaust valve assembly on body (1-in. open-end wrench).

(3) INSTALL DIAPHRAGMS.

DRIFT
HAMMER
WRENCH, open-end. 3/4-in.

(a) Install rocker arm in body.

(b) Place one diaphragm on the other so that grain of first diaphragm makes a 90-degree angle to grain of second diaphragm. Then install pivot nut washer, pivot nut and pivot on diaphragms. Attach pivot nut on pivot (3/4-in. open-end wrench).

(c) Install diaphragm assembly in body. Place diaphragm ring in body.

(d) Drive diaphragm ring nut in body (hammer and dritt).

(4) INSTALL COVER.

PRESS, hydraulic
WRENCH, open-end, 3/8-in.

(a) Press two lever pin bushings and button bushing into cover (hydraulic press) (fig. 44).

(b) Install button in cover. Install regulating spring assembly.

(c) Install cover on body. Install four cover bolts, lock washers and nuts which hold cover to body (3/8-in. open-end wrench) (fig. 44).

(5) INSTALL LEVER.

PLIERS
PRESS, hydraulic

(a) Press lever pin bushing in lever (hydraulic press).

(b) Install return spring on cover. Install lever.

(c) Insert lever pin through cover and lever, and insert lever pin cotter pin (pliers).

87. FLOOR FOOT AIR VALVE INSTALLATION.

a. Install floor foot air valve (TM 9-1795A).

88. FLOOR FOOT AIR VALVE ADJUSTMENT.

a. Equipment.

GAGE, test
PLIERS
SOAPSUDS
WIRE
WRENCH, open-end, 5/8-in.

b. Procedure.

(1) ADJUST BRAKE PEDAL.

GAGE, test
PLIERS
WRENCH, open-end, 5/8-in.

(a) Start the engine and when air pressure gage reads 150 pounds, shut off engine.

(b) Install a test gage on air pipe leading to quick release valve (5/8-in. open-end wrench) (fig. 68). Depress brake pedal all the way down. Test gage should read within five pounds of air pressure gage reading.

(c) Repeat procedure in *(b)* above on air pipe leading to the double check valve (fig. 68).

(d) If pressure varies more than five pounds, adjust brake pedal rod (from brake pedal to floor foot air valve). Adjustment is made by removing cotter pin from brake pedal rod clevis pin. Remove clevis pin. Loosen brake pedal rod clevis lock nut. Turn clevis on or off brake pedal rod. Turning clevis on brake pedal rod increases air pressure to quick-release valve or double check valve. Turning clevis off rod, decreases air pressure.

(e) If adjustment procedure in *(d)* above does not give result needed, move brake pedal rod clevis to a different hole in lever.

(2) LEAKAGE TEST.

SOAPSUDS

(a) Make sure that brake pedal is fully released. Cover exhaust opening with soapsuds. A bubble of three inches in diameter should not be formed in a period of three seconds. If bubble exceeds three inches in diameter, regrind intake valve and intake valve seat (par. 85 **b** (4)).

(b) Depress brake pedal completely and cover exhaust opening with soapsuds. If leakage causes bubbles to expand, it indicates that the exhaust valve is not seating. Regrind the exhaust valve and exhaust valve seat (par. 85 **b** (4)).

(3) VALVE TRAVEL TEST.

WIRE

(a) Hold lever in a released position (completely down). Then insert a piece of wire through exhaust opening and on bottom of exhaust valve.

(b) Move lever completely up. Measure distance the wire has to be pushed up before it contacts bottom of exhaust valve again. The measurement should be not less than 3/64-inch and not more than 1 1/16-inch. If measurement is more, install new exhaust valve and exhaust valve seat (par. 86 **b** (2)) or add or remove shims at the top of the exhaust valve assembly (par. 84 **b** (4) *(b)*).

Section VIII

FRONT BRAKE CYLINDERS

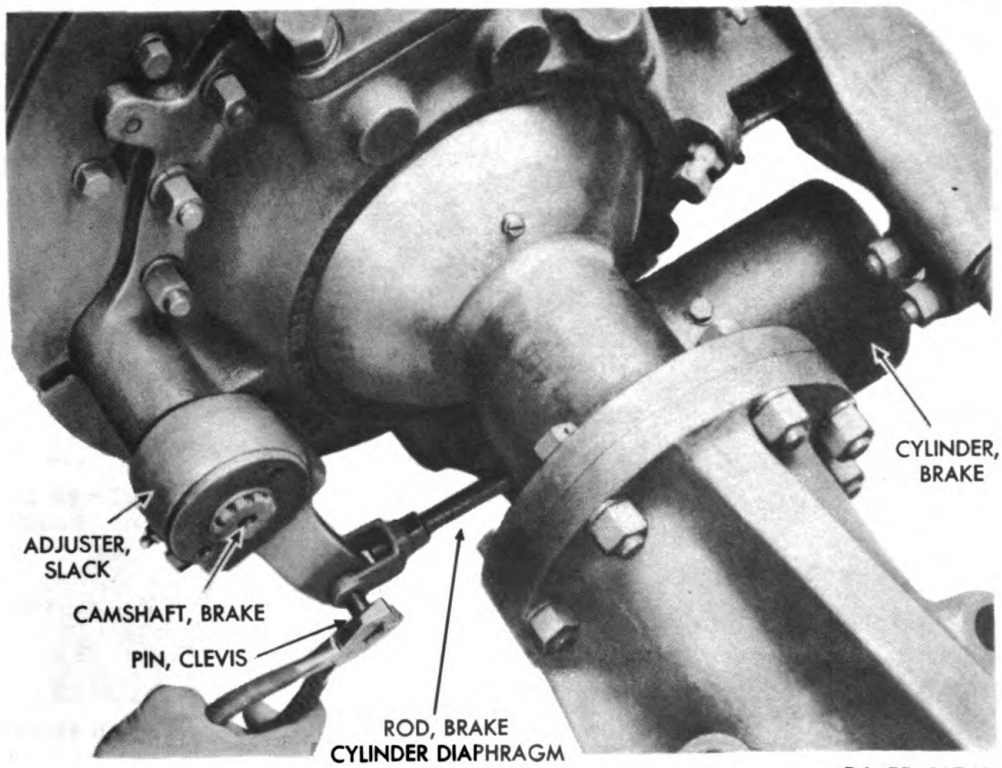


Figure 46—Disconnecting Brake Cylinder from Slack Adjuster

89. GENERAL.

a. The two front brake cylinders convert the energy of compressed air into the mechanical force necessary to expand the two front brake shoes outward and against the two front wheel brake drums.

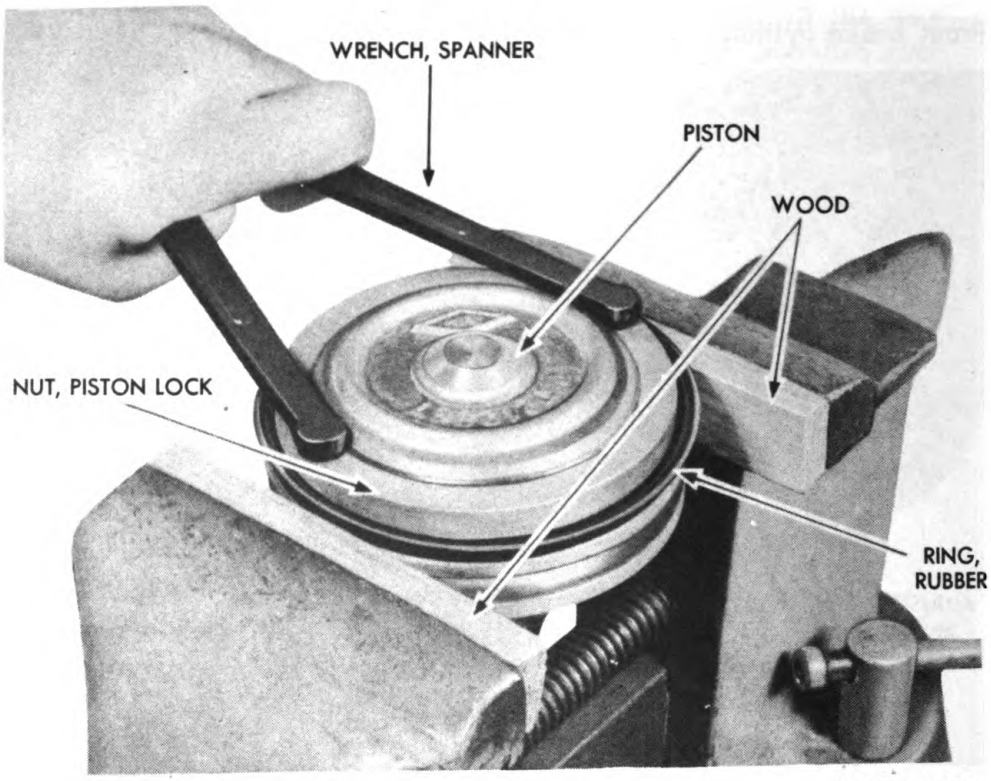
b. The two front brake cylinders are attached to the two slack adjusters by means of the (front brake cylinder) push rod. The slack adjusters are mounted on the brake camshafts. Depressing the brake pedal releases air pressure from the floor foot air valve to the two front brake cylinders and then the (front brake cylinder) push rods move the two slack adjusters. The two slack adjusters (mounted on the two brake camshafts) then move the brake shoe assemblies outward

until they contact the brake drums, thus stopping the rotation of the front wheels.

c. The procedure given is for one front brake cylinder and should be repeated for the opposite front brake cylinder.

90. FRONT BRAKE CYLINDER REMOVAL.

(TM 9-1795A.)



RA PD 14909

Figure 47—Removing Piston Lock Nut

91. FRONT BRAKE CYLINDER DISASSEMBLY.

a. Equipment.

BLOCKS, wooden
PRESS, hydraulic
SCREWDRIVER
VISE
WRENCH, open-end, 5/16-in.
WRENCH, open-end, 3/4-in.
WRENCH, open-end, 1 1/2-in.
WRENCH, pipe
WRENCH, socket, 5/16-in.
WRENCH, spanner

b. Procedure.

(1) REMOVE BRAKE CYLINDER COVERS.

WRENCH, open-end, 3/4-in.
WRENCH, socket, 5/16-in.

FRONT BRAKE CYLINDERS

(a) Loosen rod yoke lock nut (¾-in. open-end wrench) and unscrew rod yoke (fig. 48). Remove rod yoke lock nut.

(b) Remove brake cylinder cover cap screws and lock washers which hold brake cylinder cover to brake cylinder body (5/16-in. socket wrench).

(c) Lift off brake cylinder cover assembly from brake cylinder.

(2) DISASSEMBLE BRAKE CYLINDER COVERS.

PRESS, hydraulic
SCREWDRIVER
WRENCH, open-end, 5/16-in.

(a) Remove lubrication fitting from cover (5/16-in. open-end wrench).

(b) Remove lock ring from cover (screwdriver). Lift out felt retainer and felt from brake cylinder cover.

(c) Press out brake cylinder cover bushing from brake cylinder cover (hydraulic press).

(3) DISASSEMBLE BRAKE CYLINDERS.

WRENCH, pipe

(a) Lift the compression spring out of brake cylinder. Lift out piston assembly.

(b) Remove air pipe elbow from bottom of brake cylinder (pipe wrench). Remove adapter fitting from air pipe elbow.

(4) DISASSEMBLE PISTON ASSEMBLIES (fig. 47 and fig. 48).

BLOCKS, wooden
VISE
WRENCH, open-end, 1½-in.
WRENCH, spanner

(a) Pull rear felt off piston.

(b) Loosen piston rod sleeve lock nut from face of piston (1½-in. open-end wrench). Unscrew piston rod together with piston rod sleeve and piston rod sleeve lock nut. Remove the two piston rod shims from piston.

(c) Slide piston rod sleeve with piston rod sleeve lock nut off piston rod. Unscrew piston rod sleeve lock nut from piston rod sleeve.

(d) Place piston assembly in a vise with two wooden blocks between the piston assembly and the jaws of the vise (fig. 47). Remove piston lock nut (spanner wrench). Lift off piston brass washer and piston rubber ring.

92. FRONT BRAKE CYLINDER INSPECTION.

a. Equipment.

SOLVENT, dry-cleaning

b. Procedure.

(1) GENERAL.

SOLVENT, dry-cleaning

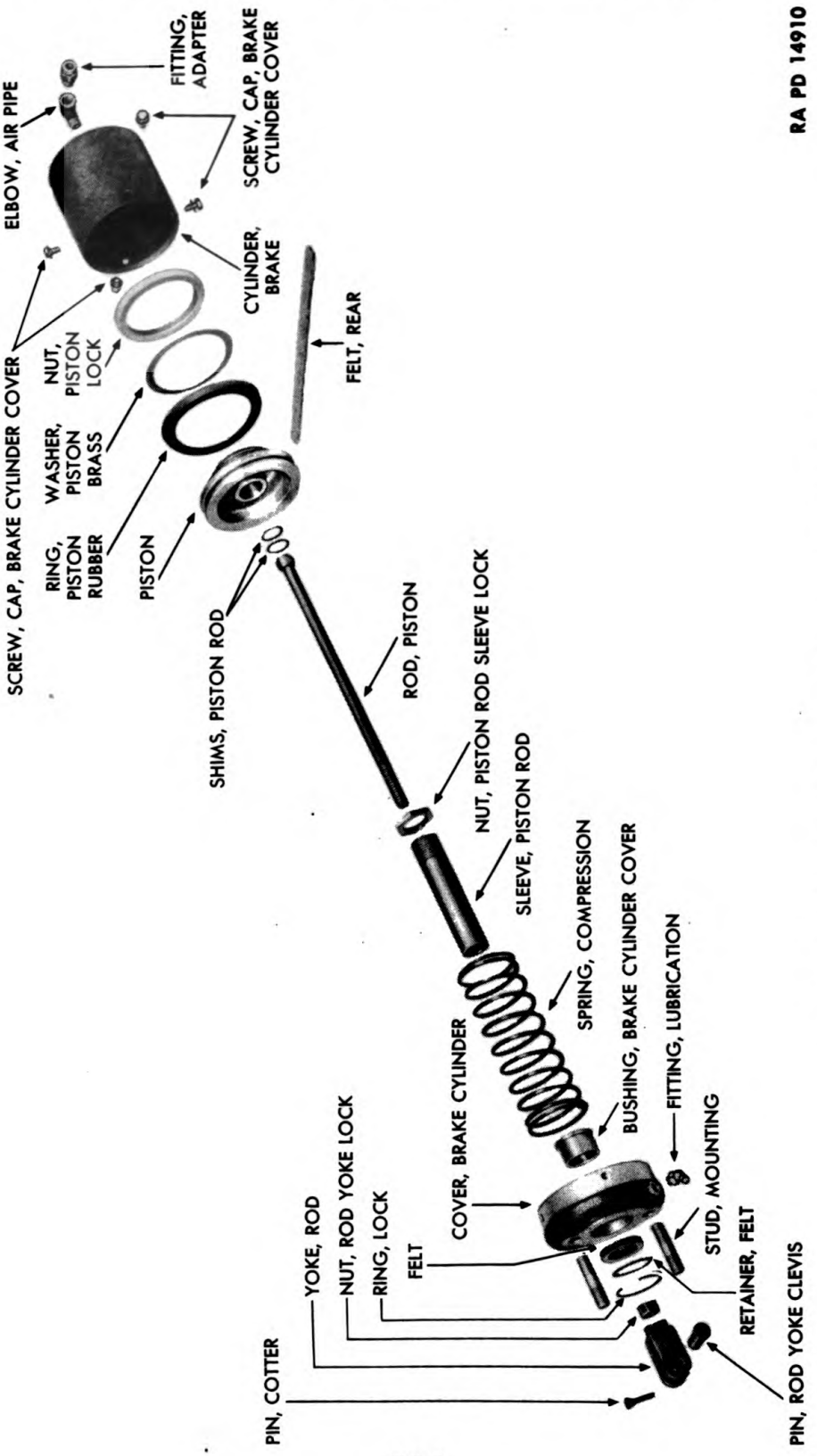


Figure 48—Front Brake Cylinder—Exploded View

FRONT BRAKE CYLINDERS

(a) Wash all metal parts in SOLVENT, dry-cleaning. Do not allow any solvent or oil to get on rubber parts.

(2) PISTON RUBBER RINGS. Inspect piston rubber ring for cracks and, if found, use a new part. If piston rubber ring has been in use for 5,000 miles or more, it is advisable to use a new part.

93. ASSEMBLY OF FRONT BRAKE CYLINDERS.

a. Equipment.

BLOCKS, wooden
PRESS, hydraulic
SCREWDRIVER
VISE
WRENCH, open-end, 5/16-in.
WRENCH, open-end, 3/4-in.
WRENCH, open-end, 1 1/2-in.
WRENCH, pipe
WRENCH, socket, 5/16-in.
WRENCH, spanner

b. Procedure.

(1) ASSEMBLE PISTONS (fig. 48).

BLOCKS, wooden
VISE
WRENCH, open-end, 1 1/2-in.
WRENCH, spanner

(a) Install piston brass washer and piston rubber ring on piston (fig. 48). Place piston assembly in a vise with two wooden blocks between piston assembly and jaws of vise (fig. 47). Install piston lock nut (spanner wrench).

(b) Screw piston rod sleeve lock nut on piston rod sleeve. Slide piston rod sleeve on piston rod.

(c) Install two piston rod shims in top of piston. Install piston rod, as assembled in *(b)* above, on piston by screwing piston rod sleeve into piston. Tighten piston rod sleeve lock nut against face of piston (1 1/2-in. open-end wrench).

(d) Install rear felt on piston.

(2) ASSEMBLE BRAKE CYLINDERS.

WRENCH, pipe

(a) Install adapter fitting on air pipe elbow. Install elbow on bottom of brake cylinder (pipe wrench).

(b) Install piston assembly in brake cylinder. Install compression spring in brake cylinder.

(3) ASSEMBLE BRAKE CYLINDER COVERS.

PRESS, hydraulic
SCREWDRIVER
WRENCH, open-end, 5/16-in.

(a) Press brake cylinder cover bushing in brake cylinder cover (hydraulic press).

(b) Install felt retainer and felt in brake cylinder cover. Install lock ring (screwdriver).

(c) Install lubrication fitting in brake cylinder cover (5/16-in. open-end wrench).

(4) INSTALL BRAKE CYLINDER COVERS.

WRENCH, open-end, 3/4-in. WRENCH, socket, 5/16-in.

(a) Install brake cylinder cover on brake cylinder and tighten the four brake cylinder cover cap screw lock washers and cap screws (5/16-in. socket wrench).

(b) Install rod yoke lock nut on piston rod (3/4-in. open-end wrench). Screw rod yoke on piston rod. Do not tighten yoke lock nut.

94. FRONT BRAKE CYLINDER INSTALLATION.

a. Install two front brake cylinders (TM 9-1795A).

95. FRONT BRAKE CYLINDER ADJUSTMENT.

a. Equipment.

PLIERS WRENCH, open-end, 3/4-in.
SOAPSUDS

b. Procedure.

(1) PISTON ROD TRAVEL.

PLIERS WRENCH, open-end, 3/4-in.

(a) Depress brake pedal and measure piston rod from brake cylinder on top of rod yoke. Then release brake pedal and take the same measurement. Repeat procedure on opposite front brake cylinder.

(b) The measurement should be between 5/8 inch and 1 3/8 inch. If measurement is 1 3/4 inch, brake must be adjusted immediately (par. 17 b (1) and (2)). If the measurement is about 1 3/8 inch, it is advisable to adjust the brakes. The most desirable measurement is about 5/8 inch, because this keeps the piston travel at a minimum, thereby prolonging the life of the front brake cylinder.

(c) Adjustment of rod yoke is necessary after a brake adjustment. This is done by removing the cotter pin from rod yoke clevis pin, then removing rod yoke clevis pin. Turn rod yoke on or off piston rod until the 5/8-inch measurement in *(b)* above is obtained. Tighten rod yoke lock nut. Install rod yoke clevis pin and cotter pin. Repeat the procedure in *(b)* above.

(2) LEAKAGE TESTS.

SOAPSUDS

FRONT BRAKE CYLINDERS

(a) Cover front brake cylinder cover with soapsuds and observe the place where piston rod passes through the cover, also where the cover is fastened to the brake cylinder. There should be no enlargement of the soap bubbles. If there is, tighten brake cylinder cover cap screws and replace felt and felt retainer. If leakage continues, replace piston rubber ring.

(b) Repeat procedure in *(a)* above at air pipe elbow.

ORDNANCE MAINTENANCE
BODY AND CHASSIS FOR HEAVY WRECKING TRUCK M1

Section IX

REAR BRAKE AIR DIAPHRAGMS

96. GENERAL.

a. The four brake diaphragms for the rear brakes (fig. 11) convert the energy of compressed air into the mechanical force necessary to expand the four rear brake shoes outward and against the four rear wheel brake drums.

b. The four brake diaphragms are connected to the four slack adjusters through brake diaphragm push rods. The slack adjusters are mounted on the brake camshafts. Depressing the brake pedal releases air pressure from the floor foot air valve to an air "Y"-bracket and from this air "Y"-bracket four air hoses carry air pressure to the brake diaphragms. Push rods in the four brake diaphragms move four slack adjusters that are mounted on the four brake camshafts. The four brake camshafts move the brake shoe assemblies outward until they contact the brake drums, thus stopping the rotation of the four rear dual wheels.

c. The procedure given is for one brake diaphragm and should be repeated for the other three brake diaphragms.

97. REAR BRAKE DIAPHRAGM REMOVAL.

a. Equipment.

PLIERS
WRENCH, open-end, 7/8-in.
WRENCH, socket, 3/4-in.

b. Procedure.

(1) DISCONNECT AIR "Y"-BRACKETS. (TM 9-1795A)

(2) DISCONNECT BRAKE DIAPHRAGMS.

PLIERS
WRENCH, open-end, 7/8-in.
WRENCH, socket, 3/4-in.

(a) Disconnect brake diaphragm hoses at four brake diaphragms (7/8-in. open-end wrench) (fig. 11). Lift off hose assembly.

(b) Remove brake equalizer yoke pin cotter pin (pliers). Remove brake equalizer yoke pin.

(c) Remove four brake diaphragm stud nuts and lock washers (¾-in. socket wrench). Lift off brake diaphragm from the rear axle housing.

98. REAR BRAKE DIAPHRAGM DISASSEMBLY.

a. Equipment.

WRENCH, open-end, ½-in.
WRENCH, open-end, ⅞-in.
WRENCH, open-end, 1-in.
WRENCH, pipe

b. Procedure.

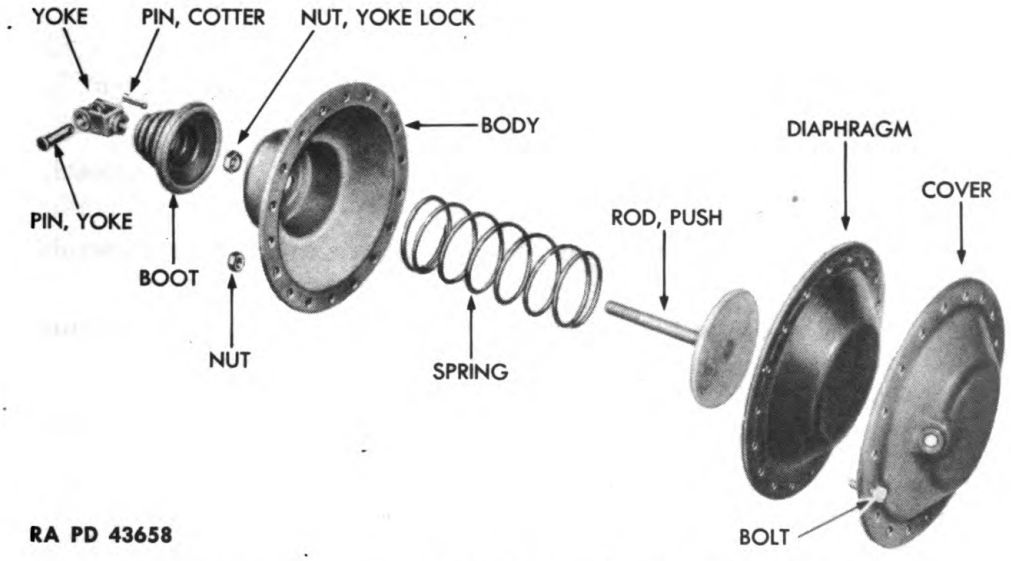


Figure 49—Rear Brake Diaphragm—Exploded View

(1) BRAKE DIAPHRAGM HOSE ASSEMBLY.

WRENCH, open-end, ⅞-in.
WRENCH, pipe

(a) Remove four air hose at "Y"-bracket elbow (⅞-in. open-end wrench).

(b) Disassemble air hose (pars. 139 and 141).

(2) REAR BRAKE DIAPHRAGMS.

WRENCH, open-end, ½-in.
WRENCH, open-end, 1-in.

(a) Remove two cap screws and 16 bolts and nuts that hold body to cover (½-in. open-end wrench). Lift off cover and diaphragm (fig. 49).

(b) Unscrew yoke from push rod and then remove yoke lock nut from push rod (1-in. open-end wrench).

(c) Lift boot off body. Lift push rod and spring out of body.

ORDNANCE MAINTENANCE
BODY AND CHASSIS FOR HEAVY WRECKING TRUCK M1

99. REAR BRAKE DIAPHRAGM INSPECTION.

a. Equipment.

SOLVENT, dry-cleaning

b. Procedure.

(1) GENERAL. Wash all metal parts in SOLVENT, dry-cleaning. Do not allow solvent or oil to get on rubber parts.

(2) DIAPHRAGM. Inspect diaphragm for cracks and, if found, use a new part. If diaphragm has been in use for 5,000 miles or more, use a new part.

100. ASSEMBLY OF REAR BRAKE DIAPHRAGMS.

a. Equipment.

WRENCH, open-end, ½-in. WRENCH, open-end, 1-in.

(1) Install spring on push rod. Install in body (fig. 49).

(2) Install yoke lock nut on push rod (1 in. open-end wrench). Install boot on body.

(3) Install yoke on push rod. Install diaphragm in cover. Assemble cover on body.

(4) Fasten cover to body with two cap screws and 16 bolts and nuts (½-in. open-end wrench).

101. REAR BRAKE DIAPHRAGM INSTALLATION.

a. Equipment.

PLIERS WRENCH, socket, ¾-in.
WRENCH, open-end, ⅞-in.

b. Procedure.

(1) INSTALL REAR BRAKE DIAPHRAGM.

PLIERS WRENCH, socket, ¾-in.
WRENCH, open-end, ⅞-in.

(a) Install rear brake diaphragm on rear axle housing and attach with four brake diaphragm stud nuts and lock washers (¾-in. socket wrench) (fig. 11).

(b) Install brake equalizer yoke pin through brake equalizer and brake diaphragm yoke. Install brake equalizer yoke pin cotter pin (pliers).

(c) Install hose assembly on brake diaphragm (⅞-in. open-end wrench).

(2) CONNECT AIR "Y"-BRACKET (TM 9-1795A).

102. REAR BRAKE DIAPHRAGM ADJUSTMENT.

a. Adjustment of rear brake diaphragms is the same as for front brake cylinders (95 **b** (1)).

Section X

SLACK ADJUSTERS

103. GENERAL.

a. The slack adjuster acts as a brake lever and also provides a quick and easy method of adjusting brakes. The slack adjuster is mounted on the brake camshaft and is attached to the brake equalizer (rear brakes) or to the brake cylinder (front brakes).

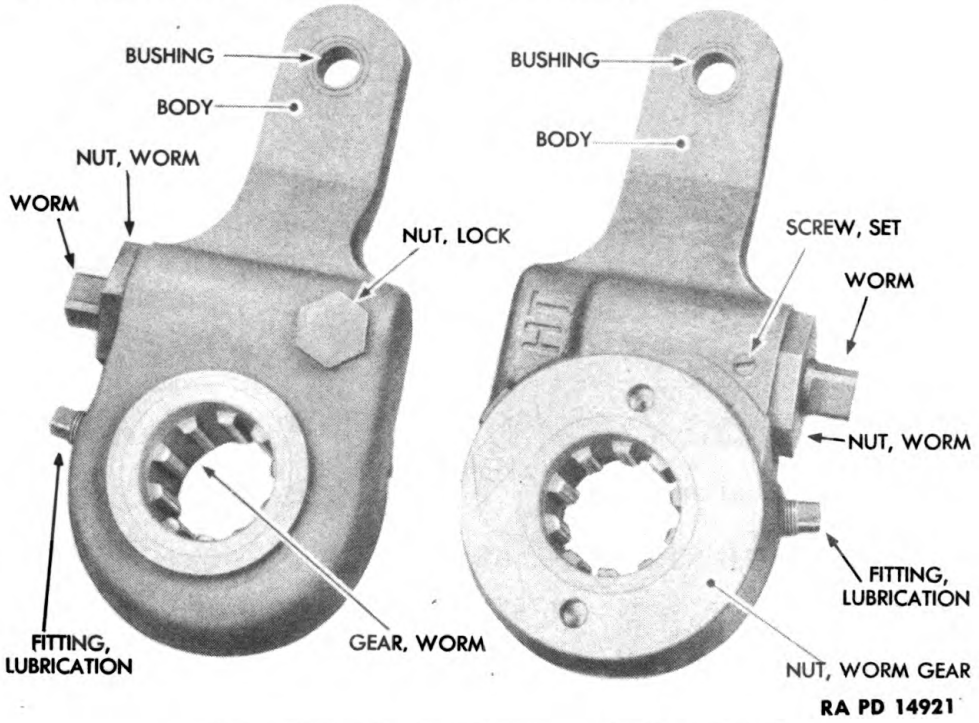


Figure 50—Slack Adjuster—Right and Left

b. Air pressure in brake cylinder or brake diaphragm moves the slack adjuster and brake camshaft, thus expanding the brake shoe assemblies until they contact the brake drums.

c. There are six slack adjusters—one on each of the four rear and the two front brakes. The procedure given is for one slack adjuster and should be repeated for the remaining five slack adjusters.

ORDNANCE MAINTENANCE
BODY AND CHASSIS FOR HEAVY WRECKING TRUCK M1

104. SLACK ADJUSTER REMOVAL.

a. Remove slack adjusters (rear brakes) (par. 19 **b** (4)).

b. Remove slack adjusters (front brakes) (TM 9-1795A).

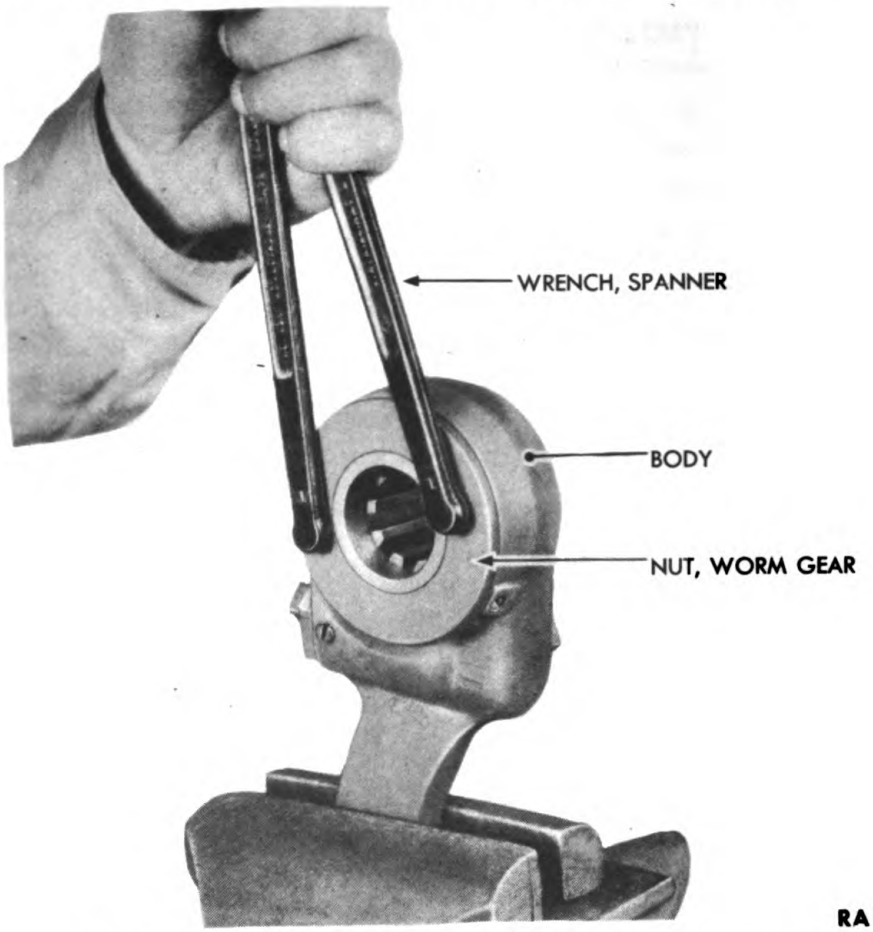


Figure 51—Removing Slack Adjuster Worm Gear Nut

105. SLACK ADJUSTER DISASSEMBLY.

a. Equipment.

PRESS, hydraulic
SCREWDRIVER
VISE
WRENCH, box, 7/16-in.
WRENCH, box, 3/4-in.
WRENCH, socket, 1 1/8-in.
WRENCH, spanner

b. Procedure.

(1) REMOVE WORM GEAR.

SCREWDRIVER
VISE
WRENCH, box, 3/4-in.
WRENCH, spanner

(a) Place slack adjuster in vise. Remove set screw that holds worm nut (fig. 50) and set screw that bolts lock plunger (screwdriver) (fig. 52).

(b) Remove lock nut (¾-in. box wrench) from body and lift out lock spring and plunger.

(c) Remove worm gear nut (spanner wrench) (fig. 51).

(d) Remove worm gear from body.

(2) REMOVE WORM.

PRESS, hydraulic
WRENCH, box, 7/16-in.
WRENCH, socket, 1⅛-in.

(a) Remove worm nut (1⅛-in. socket wrench) and pull out worm.

(b) Remove lubrication fitting (7/16-in. box wrench).

(c) Press bushing out of body (hydraulic press).

106. SLACK ADJUSTER INSPECTION.

a. Equipment.

SOLVENT, dry-cleaning

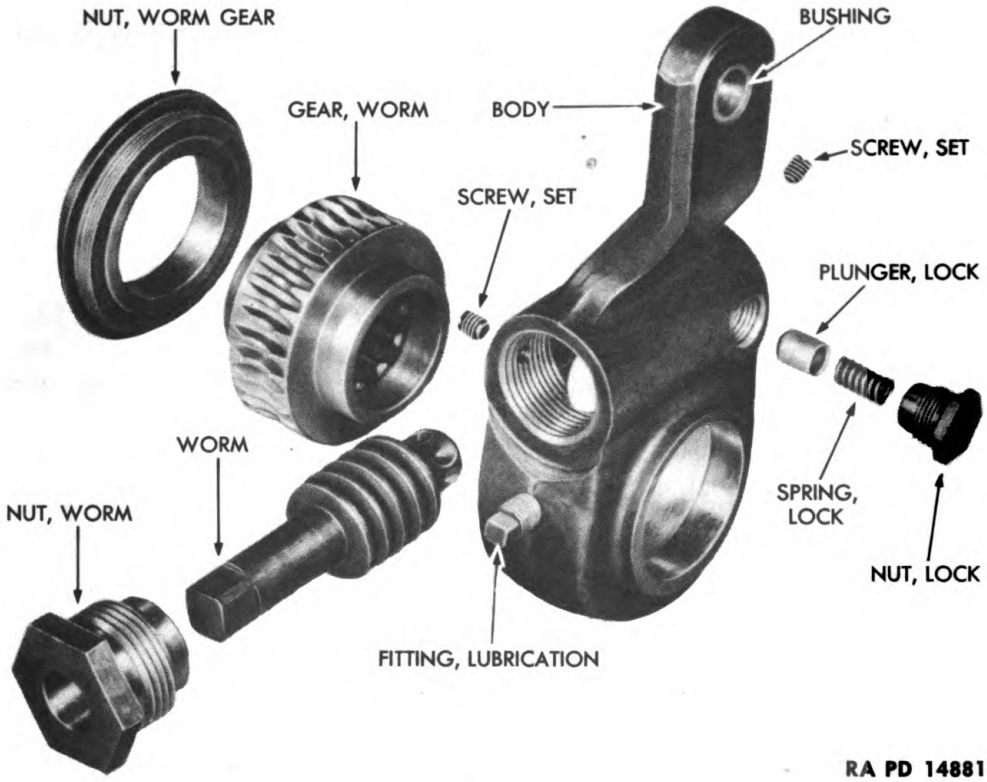


Figure 52—Slack Adjuster—Exploded View

b. Procedure.

(1) GENERAL. Wash all parts in SOLVENT, dry-cleaning.

(2) ARM BUSHINGS. Inspect arm bushings for scores. Insert clevis pin into bushing to check for side play. If pin is loose, install new bushing.

(3) WORM GEAR AND WORM. Inspect worm gear and worm for scoring or ridges and, if found, use new parts.

107. ASSEMBLY OF SLACK ADJUSTERS.

a. Equipment.

PRESS, hydraulic
SCREWDRIVER
VISE
WRENCH, box, 7/16-in.
WRENCH, box, 3/4-in.
WRENCH, socket, 1 1/8-in.
WRENCH, spanner

b. Procedure.

(1) INSTALL WORM.

PRESS, hydraulic
VISE
WRENCH, box, 7/16-in.
WRENCH, socket, 1 1/8-in.

(a) Install lubrication fitting in body (7/16-in. box wrench).

(b) Press bushing into body (hydraulic press) (fig. 52).

(c) Place slack adjuster in vise and install worm in body. Install worm nut (1 1/8-in. socket wrench).

(2) INSTALL WORM GEAR.

SCREWDRIVER
WRENCH, box, 3/4-in.
WRENCH, spanner

(a) Install worm gear in body.

(b) Install gear nut (spanner wrench).

(c) Install lock plunger in body so that slot in lock plunger lines up with hole for set screw. Install lock springs and lock nut (3/4-in. box wrench). Install set screw that holds lock plunger and install set screw that holds worm nut (screwdriver).

108. SLACK ADJUSTER INSTALLATION.

a. Install slack adjusters (rear brakes) (par. 23 **b** (6)).

b. Install slack adjusters (front brakes) (TM 9-1795A).

109. SLACK ADJUSTER ADJUSTMENT.

a. Equipment.

GREASE, general purpose, seasonal grade
JACK
WRENCH, open-end, 3/4-in.

b. Procedure.

(1) Start engine and observe air pressure gage. Stop engine when air pressure gage shows 80. Do not allow this pressure to go below 60 while the following adjustment is being made.

(2) Jack up wheel and tire assembly (jack). Turn worm until brake shoes are tight against brake drum (3/4-in. open-end wrench). Then back off worm until wheel can be turned by hand.

SLACK ADJUSTERS

(3) Check brake shoe clearance (pars. 17 **b** (1) and 24 **b** (1)).

(4) Measure the piston rod travel (par. 95 **b** (1) and par. 101).

NOTE: Adjust worm until travel is 5/8-inch.

(5) Repeat procedure in steps (1), (2), (3) and (4).

(6) The slack adjusters must be adjusted at least every 1,000 miles and checked at least every 500 miles. The piston rod travel should be kept as short as possible.

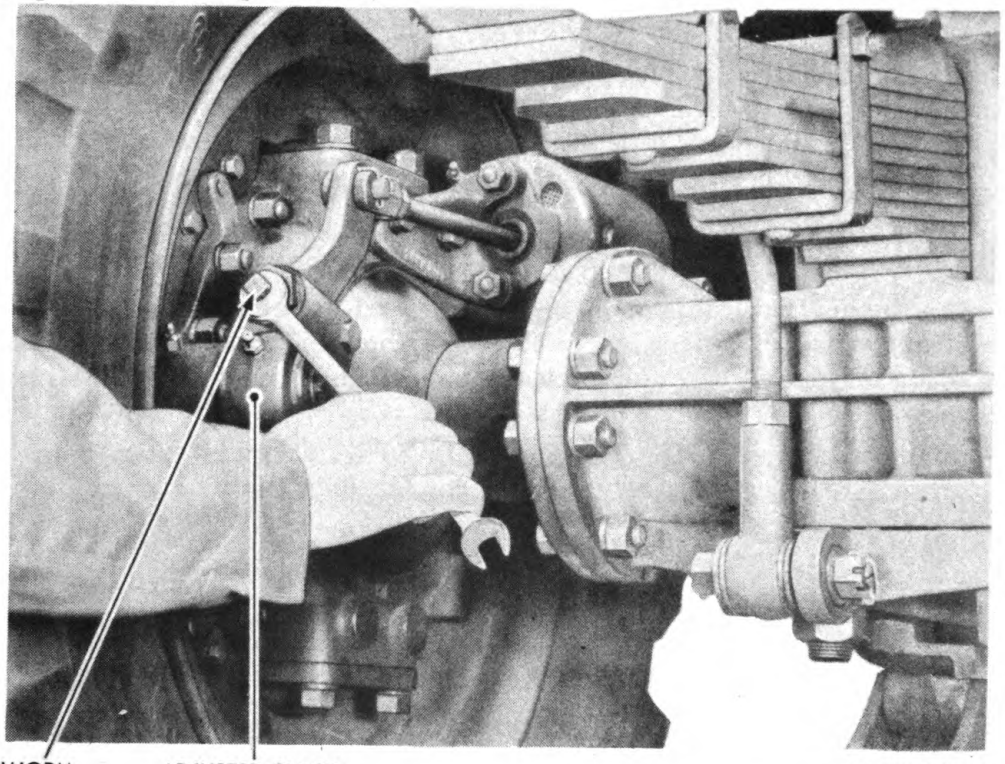


Figure 53—Adjusting Front Slack Adjuster

ORDNANCE MAINTENANCE
BODY AND CHASSIS FOR HEAVY WRECKING TRUCK M1

Section XI

QUICK-RELEASE VALVE

110. GENERAL.

a. The quick-release valve speeds up the release of air pressure from the front brake cylinders. Air pressure in the front brake cylinders is exhausted through the quick-release valve when the brake pedal is released.

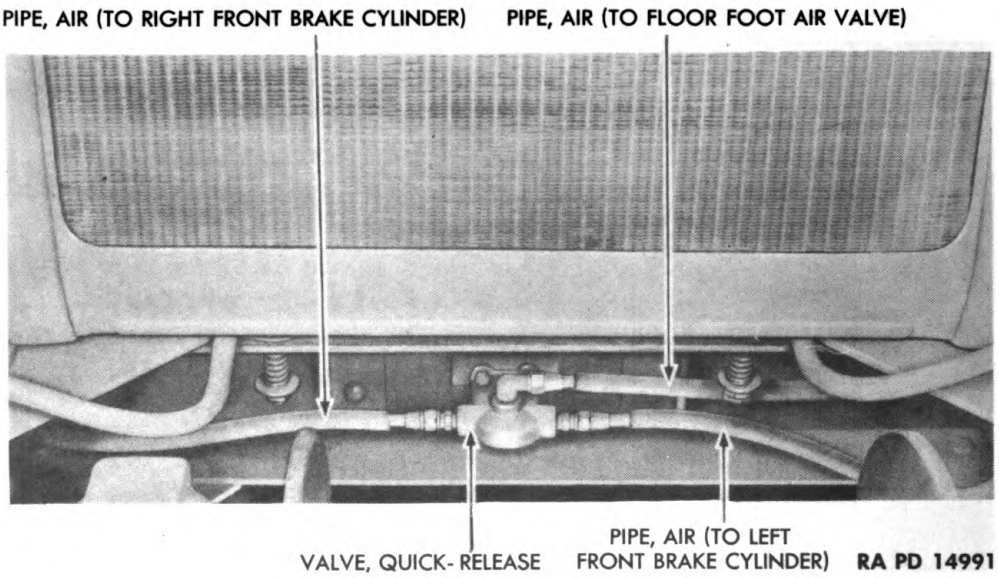


Figure 54—Quick-release Valve

b. The quick-release valve is connected by an air pipe to the floor foot air valve. An air pipe leads from the quick-release valve to the left front brake cylinder and another air pipe leads to the right front brake cylinder.

111. QUICK-RELEASE VALVE REMOVAL.

a. Equipment.

WRENCH, open-end, ½-in. WRENCH, open-end, ⅝-in.

b. Procedure.

(1) DISCONNECT AIR PIPES.

WRENCH, open-end, 5/8-in.

(a) Disconnect air pipe (to floor foot air valve) (fig. 54). Disconnect air pipe (to left front brake cylinder), and air pipe (to right front brake cylinder).

(2) REMOVE QUICK-RELEASE VALVE.

WRENCH, open-end, 1/2-in.

(a) Remove quick-release valve bolts, nuts and lock washers which hold quick-release valve to the quick-release valve frame bracket. Lift off quick-release valve.

(3) QUICK-RELEASE FRAME BRACKET.

(a) The quick-release frame bracket is welded to the chassis frame. Do not attempt to remove unless bracket is broken.

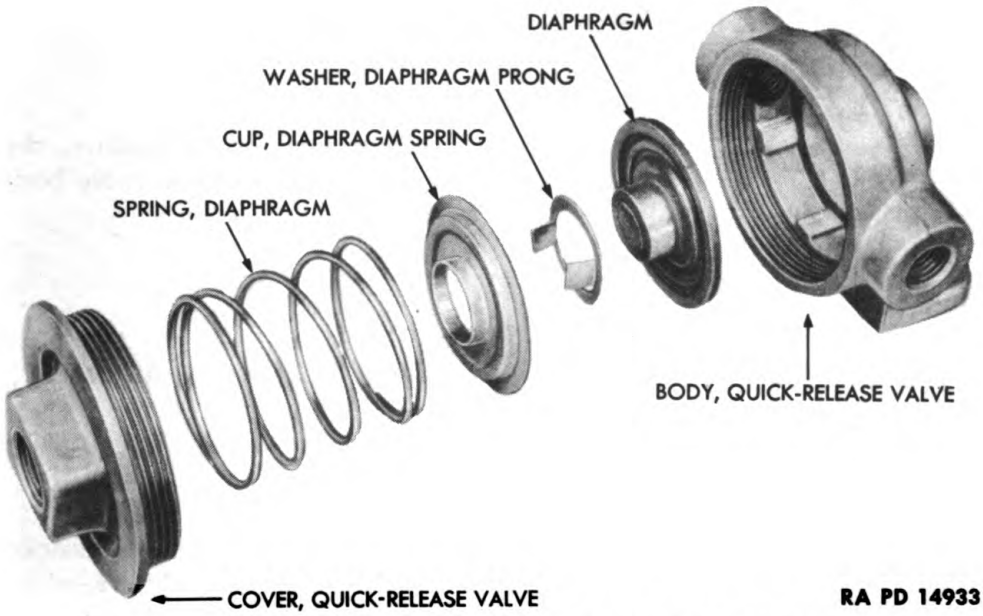


Figure 55—Quick-release Valve—Exploded View

112. QUICK-RELEASE VALVE DISASSEMBLY.

a. Equipment.

WRENCH, adjustable, 1-in.

b. Procedure. Remove quick-release valve cover. Lift diaphragm spring, diaphragm spring cup, diaphragm prong washer and diaphragm out of quick-release valve body.

113. QUICK-RELEASE VALVE INSPECTION.

a. Equipment.

AIR, compressed
SOLVENT, dry-cleaning

b. Procedure.

(1) CLEAN ALL PARTS.

SOLVENT, dry-cleaning

(a) Clean all metal parts in SOLVENT, dry-cleaning. Do not allow solvent or oil to get on any rubber parts.

(2) INSPECT DIAPHRAGM. Inspect diaphragm for cracks and, if found, use a new part. The diaphragm must be replaced after wrecker has been in operation for 10,000 miles.

(3) INSPECT QUICK-RELEASE VALVE BODY AND COVER.

AIR, compressed

(a) Inspect quick-release valve body and cover for particles of dirt around the openings. Using compressed air, blow out the quick-release valve body and cover.

114. ASSEMBLY OF QUICK-RELEASE VALVE.

a. Equipment.

WRENCH, adjustable, 1-in.

b. Procedure. Install diaphragm, diaphragm prong washer, diaphragm spring cup and diaphragm spring in quick-release valve body. Install quick-release valve cover.

115. QUICK-RELEASE VALVE INSTALLATION.

a. Equipment.

WRENCH, open-end, 1/2-in. WRENCH, open-end, 5/8-in.

b. Procedure.

(1) INSTALL QUICK-RELEASE VALVE.

WRENCH, open-end, 1/2-in.

(a) Install quick-release valve on quick-release valve frame bracket. Attach with two quick-release valve bolts, lock washers and nuts.

(2) CONNECT AIR PIPES.

WRENCH, open-end, 5/8-in.

(a) Connect air pipe to right front brake cylinder. Connect the air pipe to left front brake cylinder. Connect the air pipe to floor foot air valve.

116. QUICK-RELEASE VALVE ADJUSTMENT.

a. Equipment.

SOAPSUDS

b. Procedure.

(1) LEAKAGE TEST.

SOAPSUDS

QUICK-RELEASE VALVE

(a) Depress brake pedal.

(b) Cover exhaust hole (at bottom of quick-release valve) with soapsuds. If a soap bubble about three inches in diameter is formed in three seconds it indicates dirt on the exhaust seat, and the quick-release valve will have to be disassembled and cleaned (pars. 112 and 113).

(2) Repeat procedure in (1) above, and if test still shows leakage, use a new diaphragm and diaphragm spring.

(3) Replace diaphragm after every 10,000 miles of wrecker operation.

ORDNANCE MAINTENANCE
BODY AND CHASSIS FOR HEAVY WRECKING TRUCK M1

Section XII

RELAY VALVE

117. GENERAL.

a. The relay valve speeds up the application and release of the rear wheel brakes. The relay valve is connected to the floor air valve by an air pipe and is operated by the floor foot air valve.

b. There are six air pipes leading from the relay valve to operate different units of the wrecker (figs. 56 and 68).

118. RELAY VALVE REMOVAL.

a. Equipment.

WRENCH, open-end, 9/16-in. WRENCH, open-end, 7/8-in.
WRENCH, open-end, 5/8-in.

b. Procedure.

(1) DISCONNECT AIR PIPES (fig. 56).

WRENCH, open-end, 5/8-in. WRENCH, open-end, 7/8-in.

(a) Disconnect two air pipes at the "T" on top of relay valve. Disconnect the two air pipes at left and right side of center of relay valve (7/8-in. open-end wrench) (fig. 56).

(b) Disconnect the three air pipes on the four-way connection (left side of relay valve) (7/8-in. open-end wrench) (fig. 56).

(c) Disconnect air pipe at lower right side of relay valve (7/8-in. open-end wrench) (fig. 56).

(d) Remove air pipe fittings from relay valve (5/8-in. open-end wrench) (par. 141).

(2) REMOVE RELAY VALVE.

WRENCH, open-end, 9/16-in.

(a) Remove the two relay valve cap screws and lock washers that hold relay valve to frame. Lift off relay valve.

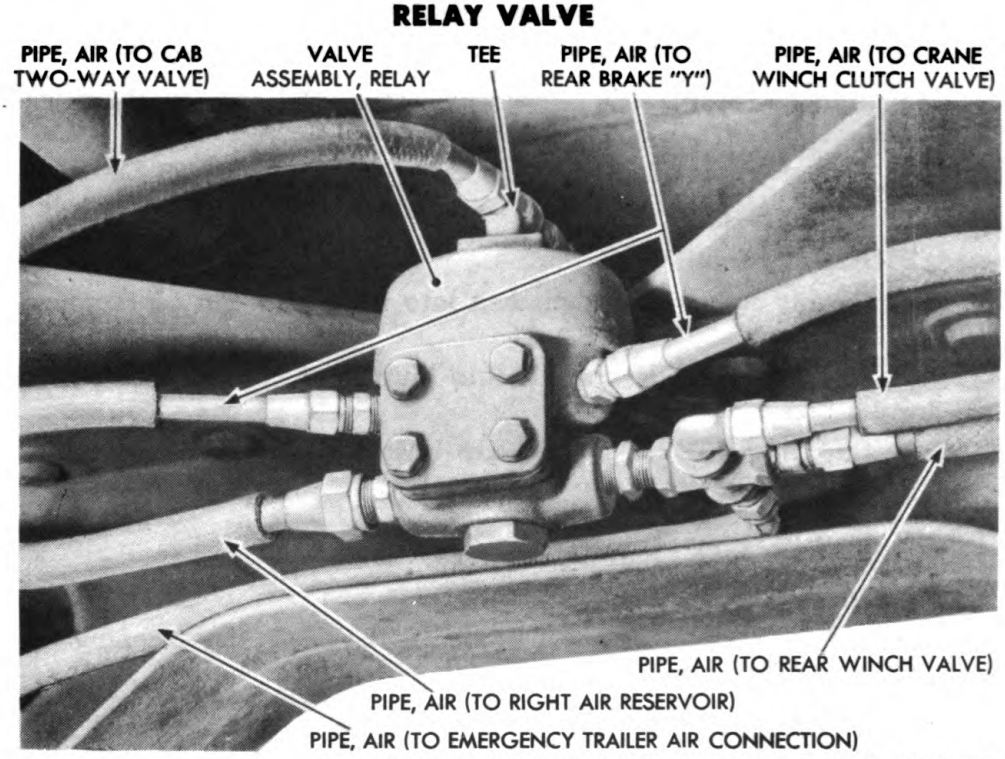


Figure 56—Relay Valve

119. RELAY VALVE DISASSEMBLY.

a. Equipment.

PLIERS
PRESS, hydraulic
WRENCH, box, ½-in.
WRENCH, box, 1¼-in.
WRENCH, open-end, ½-in.

b. Procedure.

(1) REMOVE DIAPHRAGM.

PLIERS
WRENCH, open-end, ½-in.

(a) Unscrew cover from body and remove cover gasket from cover (fig. 57). Lift spring ring and spring off body.

(b) Remove diaphragm stud nut cotter pin (pliers). Remove diaphragm stud nut that holds diaphragm on diaphragm stud (½-in. open-end wrench).

(c) Lift diaphragm washer and diaphragm off diaphragm stud.

(d) Pull diaphragm guide with diaphragm guide spring and diaphragm stud out of body bushing

(2) REMOVE SUPPLY VALVE.

WRENCH, box, 1¼-in.

(a) Remove supply valve plug from body. Pull supply valve spring and supply valve out of body.

(3) REMOVE AIR CAVITY COVER.

WRENCH, box, ½-in.

(a) Remove air cavity cover cap screws and lock washers which hold air cavity cover to body.

(b) Lift air cavity cover and air cavity cover gasket off body.

(4) REMOVE BODY BUSHING AND SUPPLY VALVE SEAT.

PRESS, hydraulic

(a) Supply valve seat is pressed into body and can be removed in a hydraulic press.

(b) Body bushing is pressed into body and can be removed in a hydraulic press.

(c) Supply valve seat and body bushing should not be removed unless it is necessary to reseat supply valve.

120. RELAY VALVE INSPECTION.

a. Equipment.

AIR, compressed
SOLVENT, dry-cleaning
COMPOUND, grinding valve, fine

b. Procedure.

(1) GENERAL.

AIR, compressed
SOLVENT, dry-cleaning

(a) Wash all metal parts in SOLVENT, dry-cleaning. Blow dry with compressed air. Do not allow solvent or oil to get on rubber parts.

(2) SUPPLY VALVE.

COMPOUND, grinding valve, fine
SOLVENT, dry-cleaning

(a) Inspect supply valve and supply valve seat for scores and pits. Inspect face of supply valve where it normally rests on the supply valve seat for scores or pits. If scoring or pitting is found, regrind supply valve on its seat (step *(b)* below).

(b) Place a small amount of valve grinding compound on face of supply valve. Insert supply valve in supply valve seat and oscillate valve against seat with the fingers. Only a slight pressure is needed. After valve has been reground, wash supply valve and supply valve seat in SOLVENT, dry-cleaning, and blow dry with compressed air. Repeat the procedure in *(a)* above and, if inspection shows pits or scores, use a new supply valve and supply valve seat.

(3) DIAPHRAGM.

(a) Inspect diaphragm for cracks and, if found, use a new diaphragm.

(b) Replace diaphragm after 5,000 miles of wrecker operation.

(4) COVER GASKET AND AIR CAVITY COVER GASKET. Inspect cover, gasket and air cavity cover gasket for cracks and, if found, use new gasket.

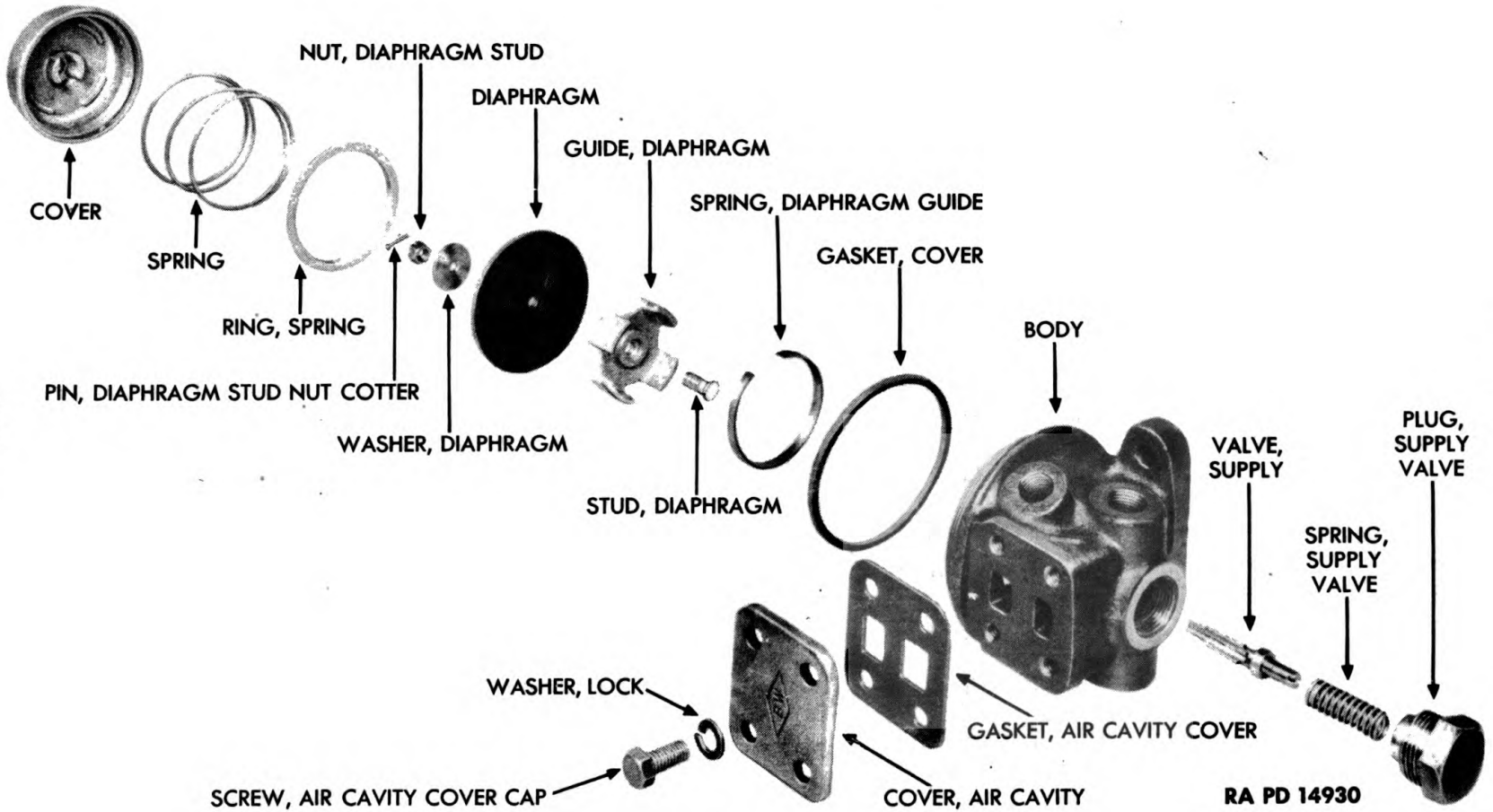


Figure 57—Relay Valve—Exploded View

(5) BODY BUSHING. Inspect body bushing for scores or ridges and, if found, use new body bushing.

121. ASSEMBLY OF RELAY VALVE.

a. Equipment.

PLIERS
PRESS, hydraulic
WRENCH, box, ½-in.
WRENCH, box, 1¼-in.
WRENCH, open-end, ½-in.

b. Procedure.

(1) INSTALL BODY BUSHING AND SUPPLY VALVE SEAT.

PRESS, hydraulic

(a) If new body bushing or supply valve seat is necessary, place body in a hydraulic press and install new body bushing or supply valve seat.

(2) INSTALL AIR CAVITY COVER.

WRENCH, box, ½-in.

(a) Install air cavity cover gasket on body. Install air cavity cover.

(b) Install air cavity cover lock washers and cap screws which hold air cavity cover to body.

(3) INSTALL SUPPLY VALVE.

WRENCH, box, 1¼-in.

(a) Insert supply valve in supply valve seat and insert supply valve spring over supply valve.

(b) Install supply valve plug in body.

(4) INSTALL DIAPHRAGM.

PLIERS
WRENCH, open-end, ½-in.

(a) Insert diaphragm stud in diaphragm guide. Install diaphragm guide spring on diaphragm guide.

(b) Hold diaphragm stud and diaphragm guide spring with the fingers of one hand, while inserting the assembly made in *(a)* above into body bushing with the other hand.

(c) Install diaphragm on diaphragm stud. Install diaphragm washer on diaphragm stud. The cupped side of the diaphragm washer faces up.

(d) Install diaphragm stud nut (½-in. open-end wrench). Install diaphragm stud nut cotter pin (pliers).

(e) Install spring on diaphragm and spring ring on spring.

(f) Install cover gasket in cover and install cover on body.

122. RELAY VALVE INSTALLATION.

a. Equipment.

WRENCH, open-end, 9/16-in.
WRENCH, open-end, 5/8-in.
WRENCH, open-end, 7/8-in.

b. Procedure.

(1) INSTALL RELAY VALVE.

WRENCH, open-end, 9/16-in.

(a) Install relay valve on frame and fasten with the two relay valve cap screw lock washers and cap screws.

(2) CONNECT AIR PIPES.

WRENCH, open-end, 5/8-in. WRENCH, open-end, 7/8-in.

(a) Install air pipe fittings in relay valve (5/8-in. open-end wrench) (par. 141).

(b) Connect air pipe at lower right side of relay valve (7/8-in. open-end wrench) (fig. 56).

(c) Connect the three air pipes on the four-way connection (left side of relay valve) (7/8-in. open-end wrench) (fig. 56).

(d) Connect the two air pipes at the "T" on top of relay valve (7/8-in. open-end wrench). Connect two air pipes at left and right side of center of the relay valve (7/8-in. open-end wrench) (fig. 56).

123. RELAY VALVE ADJUSTMENT.

a. Equipment.

SOAPSUDS

b. Procedure. Make certain brake pedal is fully released and then cover the exhaust opening at bottom of relay valve with soapsuds. If a bubble three inches in diameter is formed in three seconds, the supply valve has dirt under it and must be cleaned (par. 120). Repeat test after cleaning, and if bubble is formed again, regrind supply valve on the supply valve seat (par. 120 **b** (2)). Depress brake pedal, and cover exhaust opening with soapsuds. A bubble about three inches in diameter should not be formed in three seconds. If a bubble three inches in diameter is formed in three seconds, the diaphragm is not seating and diaphragm and diaphragm spring must be replaced (par. 119).

ORDNANCE MAINTENANCE
BODY AND CHASSIS FOR HEAVY WRECKING TRUCK M1

Section XIII

AIR RESERVOIRS

124. GENERAL.

a. There are two air reservoirs connected to each other, one on the right, and the other on the left, side of the wrecker. The left air reservoir is connected directly to the air compressor.

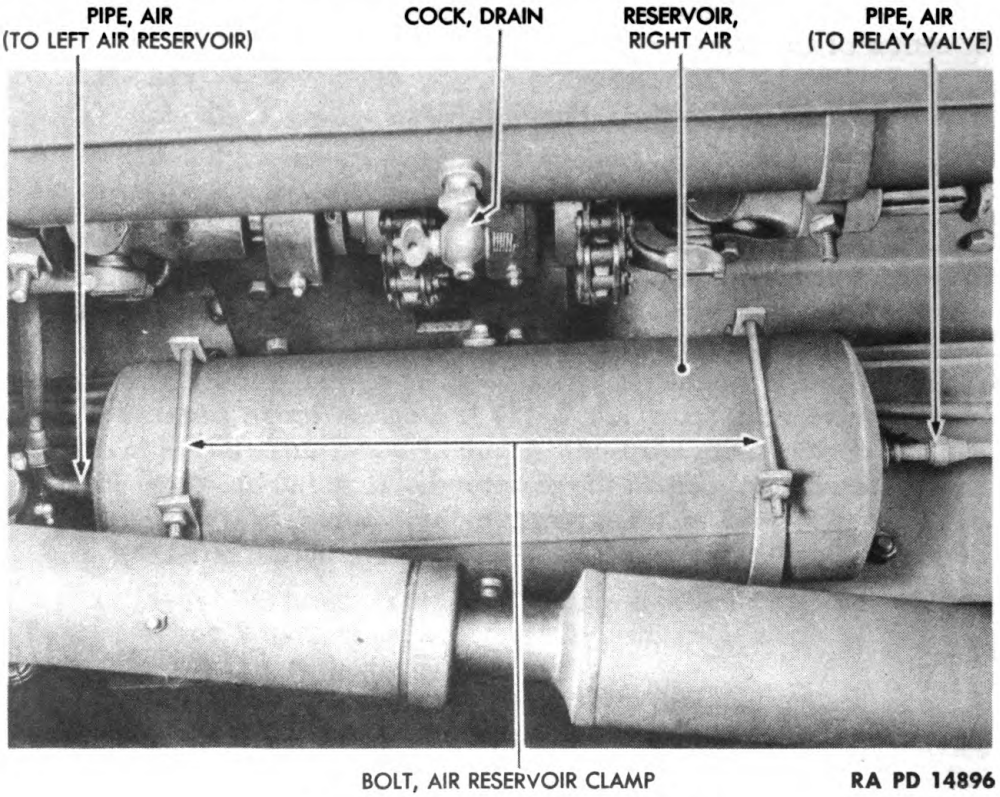


Figure 58—Right Air Reservoir

b. The two air reservoirs are welded and cannot be disassembled.

125. AIR RESERVOIR REMOVAL.

a. Equipment.

WRENCH, open-end, 5/8-in.
WRENCH, open-end, 3/4-in.
WRENCH, open-end, 7/8-in.
WRENCH, pipe

b. Procedure.

(1) DISCONNECTING LEFT AIR RESERVOIR PIPES.

WRENCH, open-end, 5/8-in.
WRENCH, open-end, 3/4-in.
WRENCH, open-end, 7/8-in.
WRENCH, pipe

(a) Disconnect air pipe at rear of air reservoir (7/8-in. open-end wrench). Disconnect top air pipe at safety valve (7/8-in. open-end wrench).

(b) Remove safety valve (3/4-in. open-end wrench). Then remove air reservoir top "T"-connection (pipe wrench).

(c) Disconnect air pipe at elbow at front of the air reservoir (7/8-in. open-end wrench). Remove air reservoir front elbow (7/8-in. open-end wrench). Remove drain cock from bottom of air reservoir (5/8-in. open-end wrench).

(2) DISCONNECTING RIGHT AIR RESERVOIR PIPES.

WRENCH, open-end, 7/8-in.
WRENCH, pipe

(a) Disconnect two air pipes at rear of right air reservoir. Disconnect one air pipe at front of right air reservoir (7/8-in. open-end wrench).

(b) Remove drain cock from bottom of air reservoir (pipe wrench).

(3) REMOVE AIR RESERVOIR.

WRENCH, open-end, 5/8-in.

(a) Remove the two air reservoir clamp bolt nuts and lock washers (5/8-in. open-end wrench) (fig. 58). Slide air reservoir out of clamps.

(b) Repeat operation on opposite air reservoir.

(c) The air reservoir clamps are welded to the frame and the air reservoir clamp bolts are welded to clamps.

126. AIR RESERVOIR INSPECTION.

a. Equipment.

EQUIPMENT, welding

b. Procedure. Inspect air reservoir for cracks at welded joints, and, if found, cracks can be welded.

127. AIR RESERVOIR INSTALLATION.

a. Equipment.

WRENCH, open-end, 5/8-in.
WRENCH, open-end, 3/4-in.
WRENCH, open-end, 7/8-in.
WRENCH, pipe

b. Procedure.

(1) INSTALL AIR RESERVOIR.

WRENCH, open-end, 5/8-in.

(a) Slide air reservoir into clamps. Install clamp bolt lock washers and nuts.

(b) Repeat procedure *(a)* above to install opposite air reservoir.

(2) CONNECT RIGHT AIR RESERVOIR.

WRENCH, open-end, 7/8-in. WRENCH, pipe

(a) Install drain cock in bottom of air reservoir (pipe wrench).

(b) Connect the two air pipes at rear of right air reservoir (7/8-in. open-end wrench). Connect the one air pipe at front of right air reservoir (7/8-in. open-end wrench).

(3) CONNECT LEFT AIR RESERVOIR.

WRENCH, open-end, 5/8-in. WRENCH, open-end, 7/8-in.
WRENCH, open-end, 3/4-in.

(a) Install drain cock on bottom of air reservoir (5/8-in. open-end wrench). Install air reservoir front elbow (3/4-in. open-end wrench).

(b) Install air reservoir top "T"-connection (3/4-in. open-end wrench). Install safety valve in "T" connection (3/4-in. open-end wrench).

(c) Connect top air pipe at safety valve (7/8-in. open-end wrench). Connect air pipe at rear of reservoir (7/8-in. open-end wrench).

Section XIV

TRAILER AIR CONNECTIONS

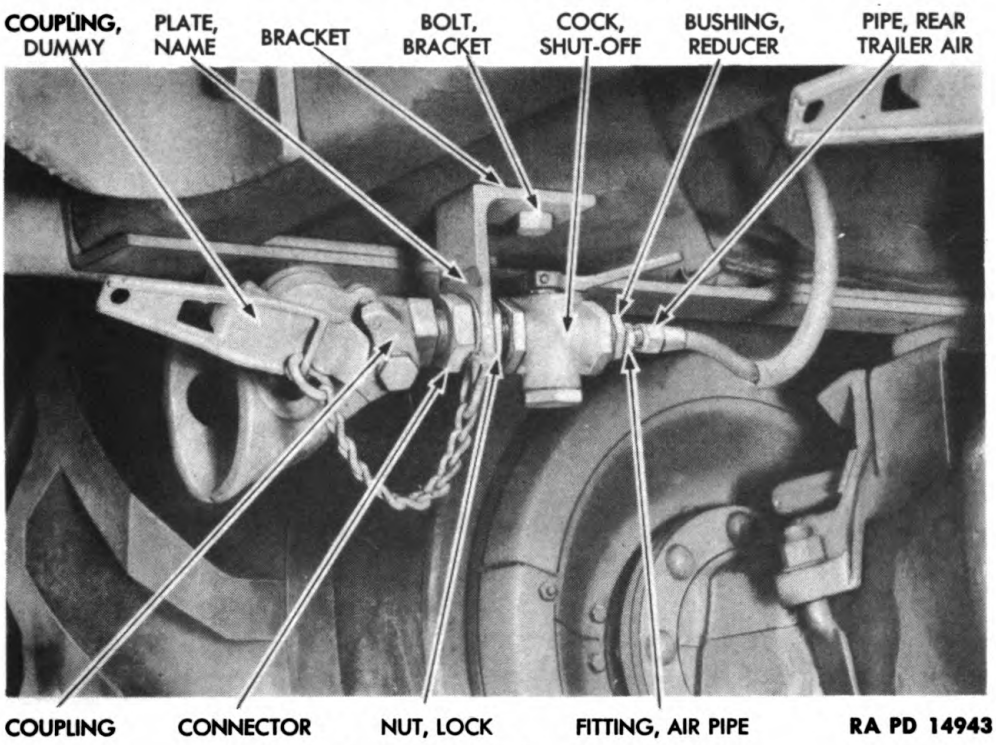


Figure 59—Rear Trailer Air Connection

128. GENERAL.

a. The trailer air connections are at front and rear ends of the wrecker. They connect the brake mechanism of the wrecker to the brake mechanism of a second vehicle in front or behind.

b. The trailer air connections consist of a shut-off cock, a flexible hose assembly with a coupling and a coupling mounted on the second vehicle.

ORDNANCE MAINTENANCE
BODY AND CHASSIS FOR HEAVY WRECKING TRUCK M1

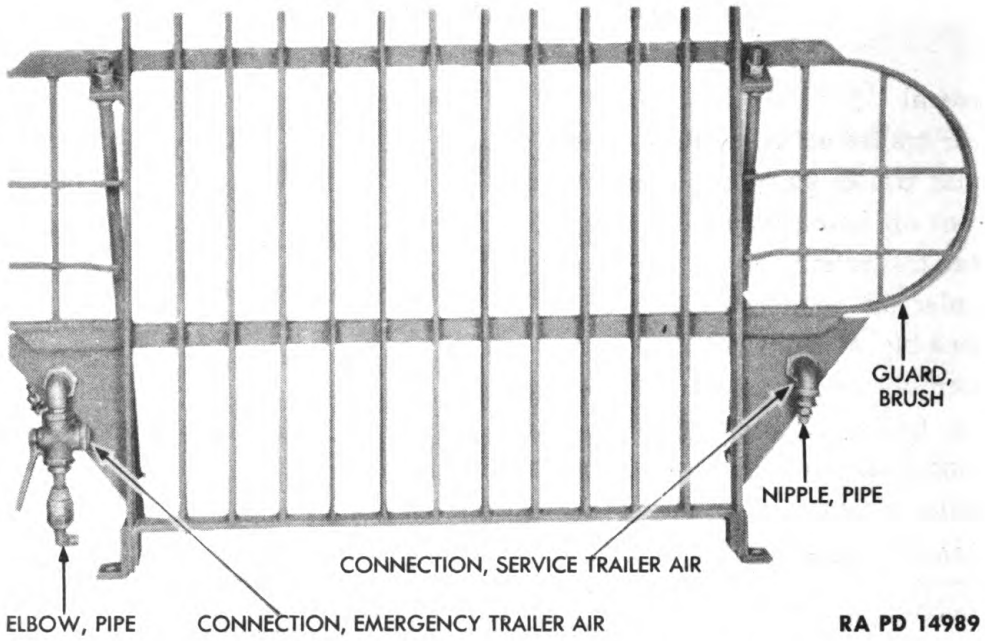


Figure 60—Front Trailer Air Connections

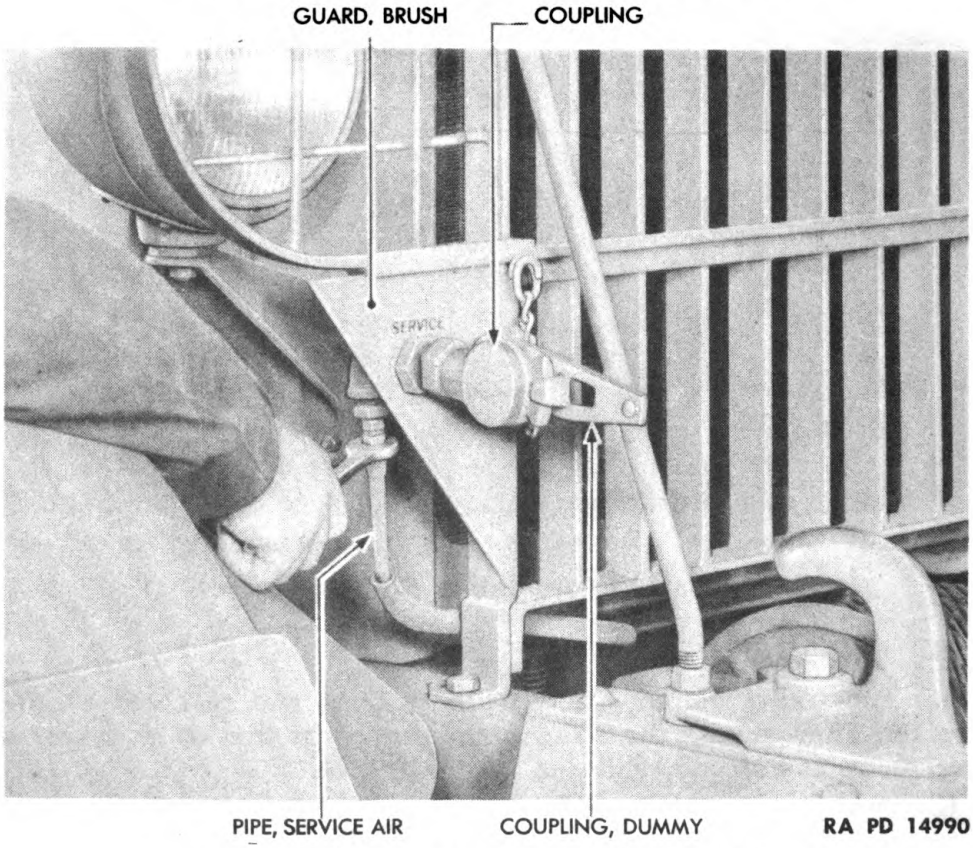


Figure 61—Disconnecting Service Air Pipe

c. When not in use the shut-off cocks are to be left closed.

d. The flexible hose assembly must always be connected (pars. 139 to 141).

e. The procedure given applies to one trailer air connection and should be repeated for the opposite side.

129. REAR TRAILER AIR CONNECTION REMOVAL.

a. Equipment.

WRENCH, open-end, 5/8-in.
WRENCH, open-end, 3/4-in.

b. Procedure.

(1) DISCONNECT AIR PIPES.

WRENCH, open-end, 5/8-in.

(a) Disconnect rear trailer air pipe at shut-off cock (fig. 59).

(2) REMOVE REAR TRAILER AIR CONNECTIONS.

WRENCH, open-end, 3/4-in.

(a) Remove bracket bolt (fig. 59) and lock washer which hold rear trailer air connection to frame. Lift off rear trailer air connection assembly.

130. FRONT TRAILER AIR CONNECTION REMOVAL.

a. Equipment.

SCREWDRIVER
WRENCH, open-end, 5/8-in.
WRENCH, open-end, 15/16-in.
WRENCH, open-end, 1 3/8-in.
WRENCH, open-end, 1 1/2-in.
WRENCH, pipe

b. Procedure.

(1) DISCONNECT AIR PIPES (fig. 61).

WRENCH, open-end, 5/8-in.

(a) Disconnect service air pipe at pipe nipple (fig. 61).

(b) Disconnect emergency air pipe at pipe elbow (fig. 60).

(c) Unhook two dummy couplings from the two couplings (fig. 61).

(2) REMOVE SERVICE TRAILER AIR CONNECTION.

SCREWDRIVER
WRENCH, open-end, 5/8-in.
WRENCH, open-end, 15/16-in.
WRENCH, open-end, 1 3/8-in.
WRENCH, pipe

(a) Remove elbow from nipple (15/16-in. open-end wrench) (fig. 65). Remove reducer bushing from elbow (1 3/8-in. open-end wrench). Remove pipe nipple from reducer bushing (5/8-in. open-end wrench).

(b) Remove connector from coupling (pipe wrench). Remove coupling nut from connector and lift service plate and connector washer off connector (15/16-in. open-end wrench). Pull the connector out of brush guard.

(c) Remove service dummy coupling by inserting a screwdriver in chain loop and prying it open.

(d) Pull rubber seal out of coupling.

(3) REMOVE EMERGENCY TRAILER AIR CONNECTION.

WRENCH, open-end, 1⅜-in. WRENCH, open-end, 1½-in.

(a) Remove coupling from connector (1⅜-in. open-end wrench) (fig. 64). Remove coupling nut from connector (1½-in. open-end wrench). Lift emergency plate and connector washer off connector. Pull connector out of brush guard.

131. FRONT AIR CONNECTION DISASSEMBLY.

a. Equipment.

WRENCH, adjustable
WRENCH, open-end, ¼-in.
WRENCH, open-end, ¾-in.
WRENCH, open-end, 1¼-in.
WRENCH, open-end, 1½-in.
WRENCH, pipe

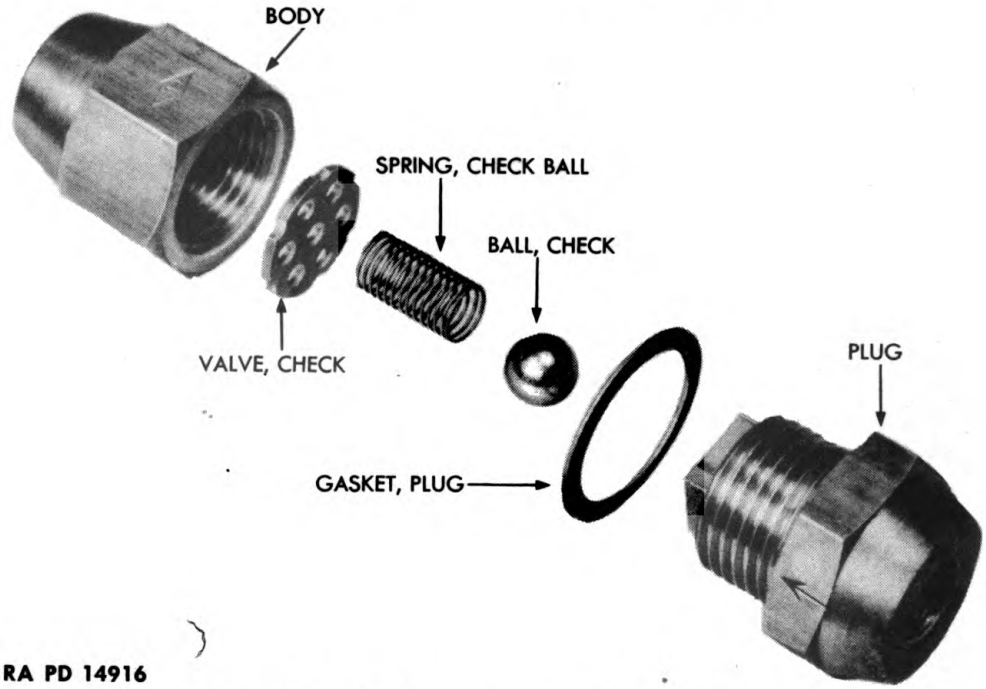


Figure 62—Check Valve—Exploded View

b. Procedure.

(1) DISASSEMBLE EMERGENCY TRAILER AIR CONNECTION.

WRENCH, open-end, ¼-in.
WRENCH, open-end, ¾-in.
WRENCH, open-end, 1¼-in.
WRENCH, open-end, 1½-in.
WRENCH, pipe

(a) Remove reducer elbow from connector (¾-in. open-end wrench). Remove shut-off cock from the reducer elbow (pipe wrench) (fig. 64).

(b) Remove reducer bushing from shut-off cock (1½-in. open-end wrench). Remove pipe nipple from reducer bushing (¼-in. open-end wrench).

(c) Remove check valve from pipe nipple (1½-in. open-end wrench).

(d) Remove pipe elbow from check valve (1¼-in. open-end wrench).

(e) Pull rubber seal out of coupling.

(2) DISASSEMBLE CHECK VALVE.

WRENCH, adjustable

(a) Remove plug from body and lift off plug gasket (fig. 62). Remove check ball, check ball spring and check valve.

132. REAR TRAILER AIR CONNECTION DISASSEMBLY.

a. Equipment.

DRIFT	WRENCH, open-end, 1-in.
HAMMER	WRENCH, open-end, 1⅜-in.
SCREWDRIVER	WRENCH, open-end, 1½-in.
WRENCH, open-end, ⅝-in.	WRENCH, socket. 1¼-in.

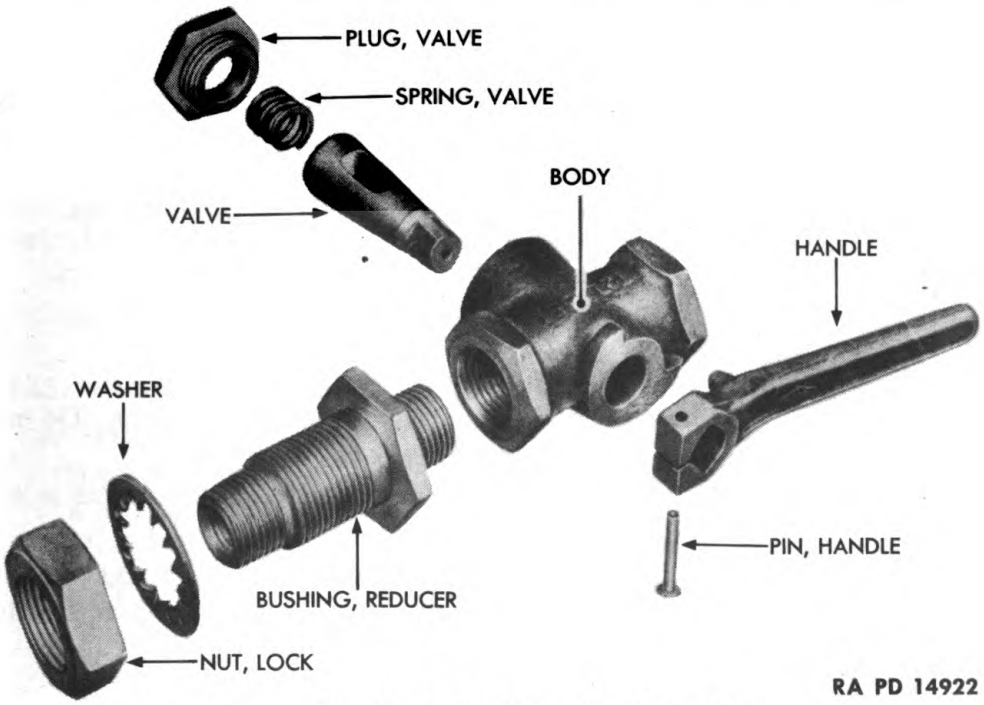


Figure 63—Shut-off Cock—Exploded View

b. Procedure.

(1) DISASSEMBLE REAR TRAILER AIR CONNECTIONS.

SCREWDRIVER	WRENCH, open-end, 1⅜-in.
WRENCH, open-end, ⅝-in.	WRENCH, open-end, 1½-in.
WRENCH, open-end, 1-in.	

(a) Unhook dummy coupling from coupling (fig. 59). The opposite

end of the chain is welded to the bracket. Do not remove dummy coupling from chain.

(b) Remove coupling from the connector. Pull out rubber seal from hole in coupling (1-in. open-end wrench).

(c) Remove shut-off cock from the connector (1½-in. open-end wrench).

(d) Remove lock nut from connector (1½-in. open-end wrench). Lift name plate, bracket and washer off connector.

(e) Remove pipe nipple from reducer bushing (⅝-in. open-end wrench). Remove reducer bushing from the shut-off cock (1⅜-in. open-end wrench).

(2) DISASSEMBLE SHUT-OFF COCK.

DRIFT
HAMMER
WRENCH, socket, 1¼-in.

(a) Drive out handle pin which holds handle to valve (hammer and drift). Lift off handle.

(b) Remove valve plug from body (1¼-in. socket wrench). Lift valve spring and valve out of body.

133. TRAILER AIR CONNECTION INSPECTION.

a. Equipment.

AIR, compressed
COMPOUND, grinding valve, fine
SOLVENT, dry-cleaning

b. Procedure.

(1) GENERAL.

SOLVENT, dry-cleaning

(a) Clean all metal parts with SOLVENT, dry-cleaning. Do not allow SOLVENT, dry-cleaning, or oil to get on rubber parts.

(b) The inspection of front and rear trailer air connections is the same.

(2) RUBBER SEALS. Inspect two rubber seals for cracks and, if found, use new rubber seals. The rubber seals must be replaced after 5,000 miles of wrecker operation.

(3) VALVE (SHUT-OFF COCK).

AIR, compressed
COMPOUND, grinding valve, fine
SOLVENT, dry-cleaning

(a) Inspect valve (shut-off cock) for scoring and pits and. if found. regrind valve in body.

(b) To regrind valve in body, place valve grinding compound on valve. Insert valve in body. Turn valve lightly by hand. Clean valve and body in SOLVENT, dry-cleaning, and blow dry with compressed air.

TRAILER AIR CONNECTIONS

134. ASSEMBLY OF FRONT TRAILER AIR CONNECTIONS.

a. Equipment.

WRENCH, open-end, 1/4-in.
WRENCH, open-end, 3/4-in.
WRENCH, open-end, 1 1/4-in.
WRENCH, open-end, 1 1/2-in.
WRENCH, pipe
WRENCH, socket, 1 1/4-in.

b. Procedure.

(1) ASSEMBLE CHECK VALVE.

WRENCH, socket, 1 1/4-in.

(a) Place check valve in body (fig. 62). Install check ball spring and check ball.

(b) Install plug gasket on plug and screw plug into body (1 1/4-in. socket wrench).

(2) ASSEMBLE SHUT-OFF COCK (par. 135 b (1)).

(3) ASSEMBLE EMERGENCY TRAILER CONNECTIONS.

WRENCH, open-end, 1/4-in.
WRENCH, open-end, 3/4-in.
WRENCH, open-end, 1 1/4-in.
WRENCH, open-end, 1 1/2-in.
WRENCH, pipe

(a) Install pipe elbow on check valve (1 1/4-in. open-end wrench) (fig. 64).

(b) Install check valve on pipe nipple (1 1/2-in. open-end wrench).

(c) Install pipe nipple on reducer bushing (1 1/4-in. open-end wrench). Install reducer bushing in shut-off cock (1 1/2-in. open-end wrench).

(d) Install shut-off cock on reducer elbow (pipe wrench). Install reducer elbow in connector (3/4-in. open-end wrench).

135. ASSEMBLY OF REAR TRAILER AIR CONNECTIONS.

a. Equipment.

HAMMER
WRENCH, open-end, 5/8-in.
WRENCH, open-end, 1-in.
WRENCH, open-end, 1 3/8-in.
WRENCH, open-end, 1 1/2-in.
WRENCH, socket, 1 1/4-in.

b. Procedure.

(1) ASSEMBLE SHUT-OFF COCK.

HAMMER
WRENCH, socket, 1 1/4-in.

(a) Install valve in body. Install valve spring.

(b) Install valve plug in body (1 1/4-in. socket wrench).

(c) Install handle on valve. Insert handle pin through handle (hammer). Peen handle pin with a hammer so that it is tight.

(2) ASSEMBLE REAR TRAILER AIR CONNECTIONS.

WRENCH, open-end, 5/8-in.
WRENCH, open-end, 1-in.
WRENCH, open-end, 1 3/8-in.
WRENCH, open-end, 1 1/2-in.

(a) Install reducer bushing on shut-off cock (1 3/8-in. open-end

wrench). Install pipe nipple in reducer bushing (5/8-in. open-end wrench).

(b) Install name plate, bracket and washer on connector. Install lock nut on connector (1 1/2-in. open-end wrench).

(c) Install connector assembled in *(b)* on the shut-off cock (1 1/2-in. open-end wrench).

(d) Install rubber seal in coupling. Install coupling on connector (1-in. open-end wrench).

(e) Install dummy coupling on coupling.

136. REAR TRAILER AIR CONNECTION INSTALLATION.

a. Equipment.

WRENCH, open-end, 5/8-in.
WRENCH, open-end, 3/4-in.

b. Procedure.

(1) INSTALL REAR TRAILER AIR CONNECTIONS.

WRENCH, open-end, 3/4-in.

(a) Install rear trailer air connection and fasten to frame by installing rear trailer air connection lock washer and bolt.

(2) CONNECT AIR PIPES.

WRENCH, open-end, 5/8-in.

(a) Connect rear trailer air pipe to shut-off cock.

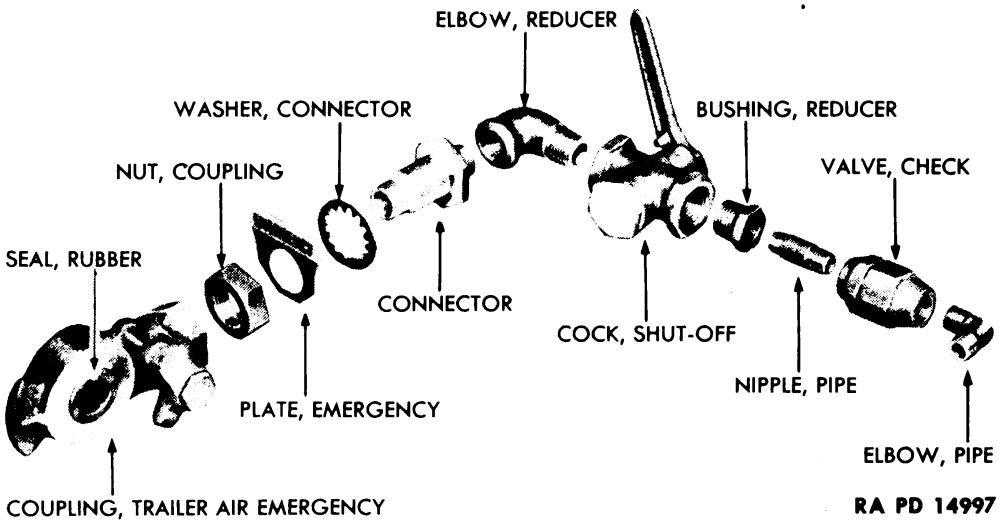


Figure 64—Emergency Trailer Air Connection—Exploded View

137. FRONT TRAILER AIR CONNECTION INSTALLATION.

a. Equipment.

PLIERS
WIRE
WRENCH, open-end, 5/8-in.
WRENCH, open-end, 1 3/8-in.
WRENCH, open-end, 1 1/2-in.

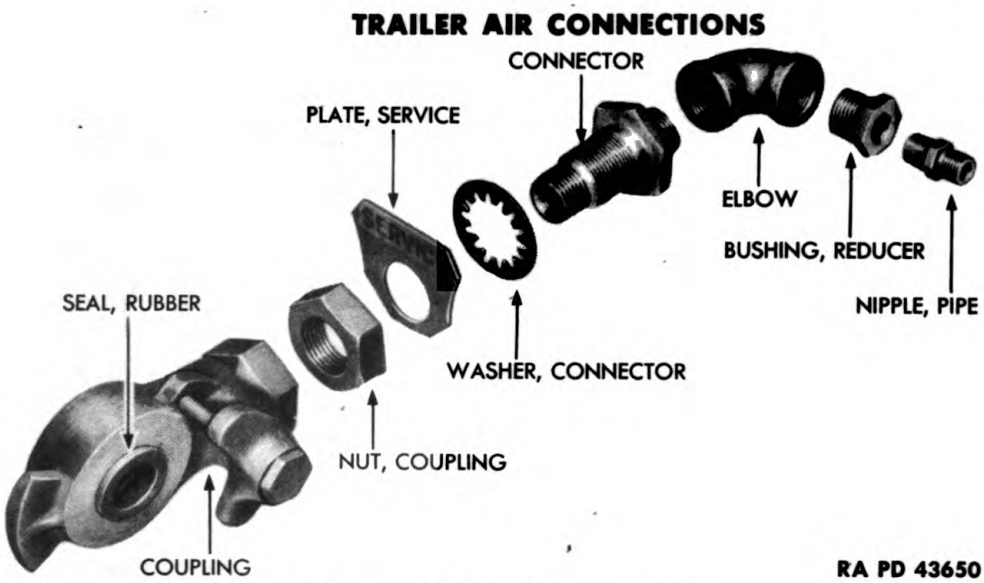


Figure 65—Service Trailer Air Connection—Exploded View

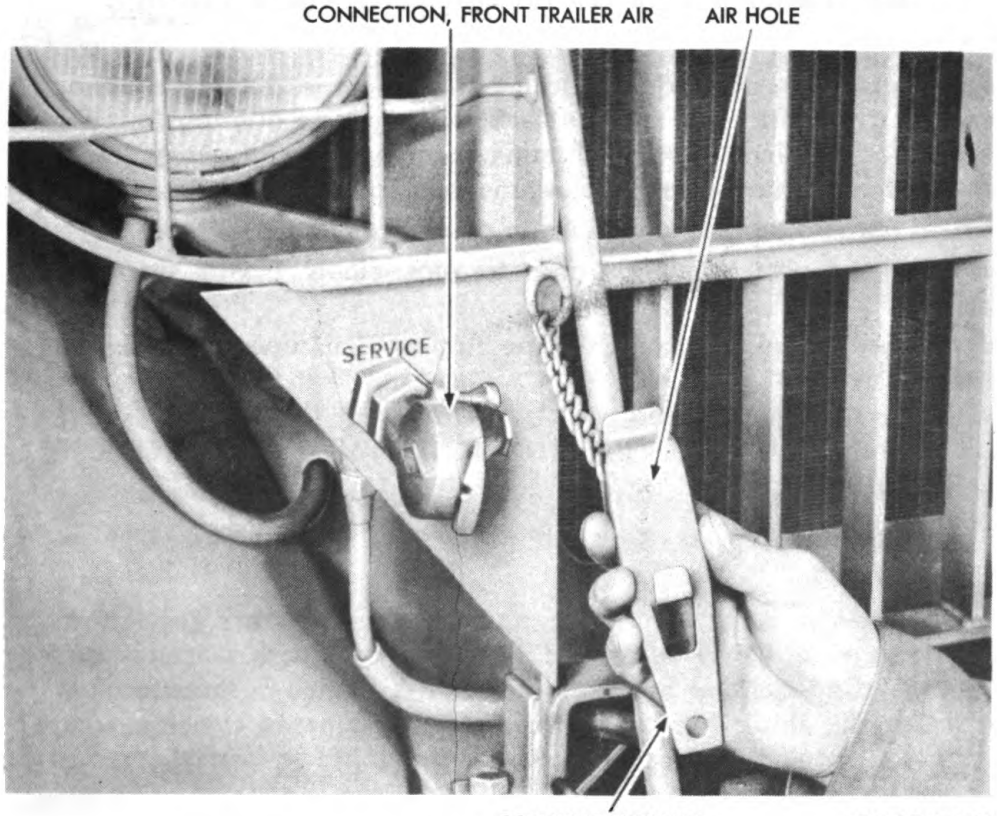


Figure 66—Air Hole in Service Dummy Coupling

b. Procedure.

(1) INSTALL EMERGENCY TRAILER AIR CONNECTION.

WRENCH, open-end, 1⅜-in. WRENCH, open-end, 1½-in.

(a) Insert connector through brush guard (fig. 60) and emergency plate and connector washer on connector (fig. 64). Install coupling nut

on connector and up against brush guard (1⅜-in. open-end wrench). Install coupling on connector (1½-in. open-end wrench). Push rubber seal into coupling (fig. 64).

(2) INSTALL SERVICE TRAILER CONNECTION.

WRENCH, open-end, 1⅜-in.

(a) Install connector (fig. 65) through brush guard (fig. 60). Slide service plate and connector washer on connector.

(b) Install coupling nut on connector and up against brush guard (1⅜-in. open-end wrench). Install coupling on connector.

(c) Insert rubber seal in coupling.

(3) CONNECT AIR PIPES. NOTE: There are two dummy couplings to be connected to chains on brush guard. Dummy coupling for service trailer air connection has an air hole in it (fig. 66) and dummy coupling for emergency trailer air connection does not have air hole.

PLIERS
WIRE
WRENCH, open-end, ⅝-in.

(a) Use a piece of wire and clean out air hole in dummy coupling for service trailer air connection. Attach chain loop to dummy coupling and close loop (pliers). Attach dummy coupling for emergency trailer air connection to chain loop and close the loop (pliers).

(b) Hook two dummy couplings to couplings (fig. 61).

(c) Connect emergency air pipe to pipe elbow (⅝-in. open-end wrench).

(d) Connect service air pipe to pipe nipple (⅝-in. open-end wrench) (fig. 61).

138. TRAILER AIR CONNECTION ADJUSTMENT (FRONT AND REAR).

a. Equipment.

SOAPSUDS

b. Procedure. Start the engine, and when air pressure gage shows 90, turn engine off. Cover outlet end of shut-off cock with soapsuds, and if a bubble of about three inches in diameter is formed in three seconds, it indicates the shut-off cock valve is dirty and needs cleaning (par. 133 **b** (1)). Repeat test procedure and, if bubble is formed, regrind valve and body (par. 133 **b** (3)).

Section XV

AIR PIPES AND FITTINGS

139. GENERAL.

a. The air pipes are copper, 3/8- or 1/2-inch diameter. It is not necessary to fill these sizes of pipes with sand in order to avoid wrinkling or crimping.

b. Pipes that are being replaced should be installed in the same locations as the old pipes. Pipe clamps hold the pipes in position. The clamps are attached to the frame by sheet metal screws or stove bolts.

c. Hose is used in place of copper pipes where the action of the wrecker would cause a repeated bending or twisting of the copper pipes.

140. PIPE FITTINGS.

a. Equipment.

AIR, compressed
FILE
GAGE, air pressure
HACKSAW
PIN, steel
SOAPSUDS
WRENCH, adjustable

b. General. The pipe fittings are made in three pieces for either 1/2- or 3/8-in. pipes. It is not advisable to cut old fittings off pipes and use them on new pipes.

c. Install Pipe Fittings.

AIR, compressed
FILE
GAGE, air pressure
HACKSAW
PIN, steel
SOAPSUDS
WRENCH, adjustable

(1) Saw the pipe to same length as pipe being replaced. The saw cut should be at a right angle to outside wall of pipe (2, fig. 69). Inspect cut end of pipe to be sure that end is not crimped or closed and, if necessary, open the end with a pointed, round steel pin.

(2) Remove all burs from end of pipe with a file. Use compressed air line to blow out all cuttings and filings from tube.

(3) Slide the nut and sleeve on pipe (3, fig. 69). Insert pipe all the way into body (4, fig. 69).

(4) Hold pipe in body and tighten nut until it is snug (adjustable wrench) (5, fig. 69).

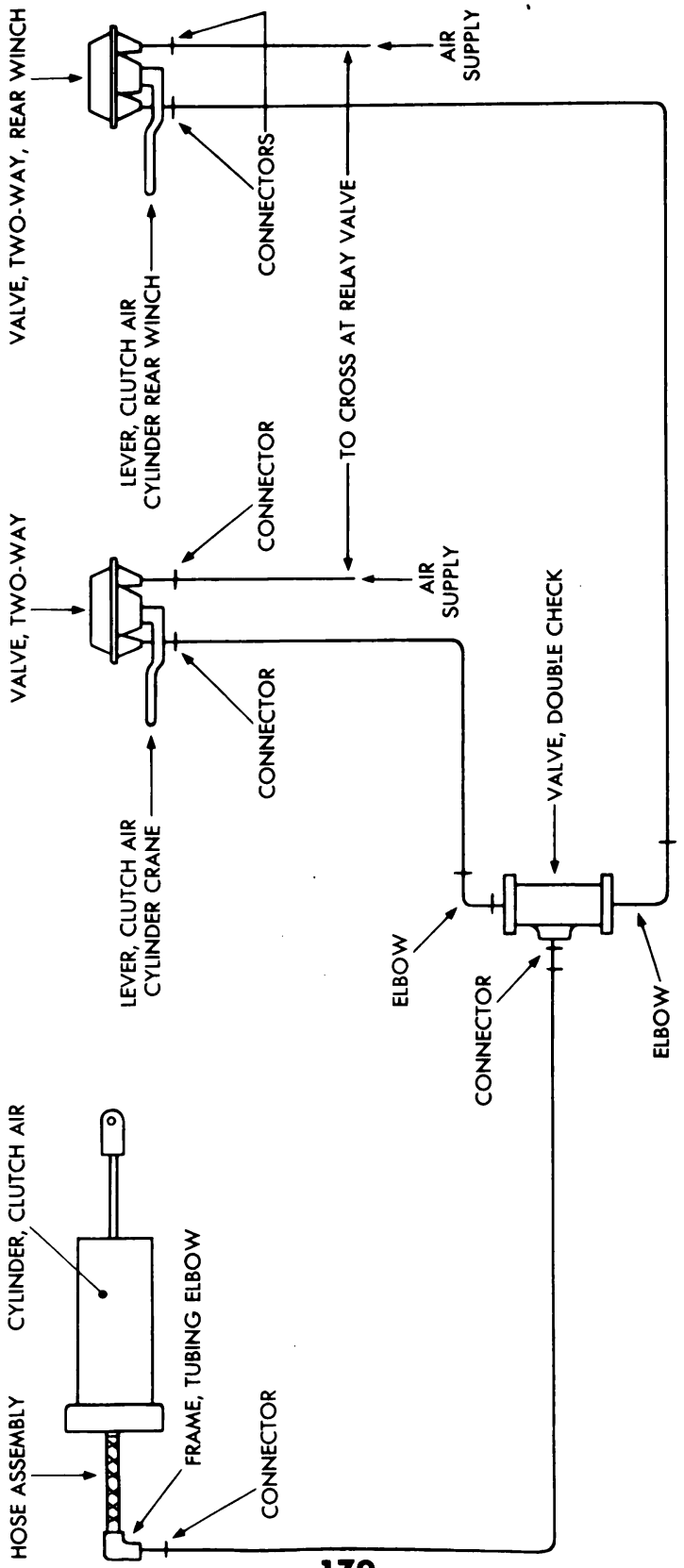


Figure 67—Winch Control Air Pipes

AIR PIPES AND FITTINGS

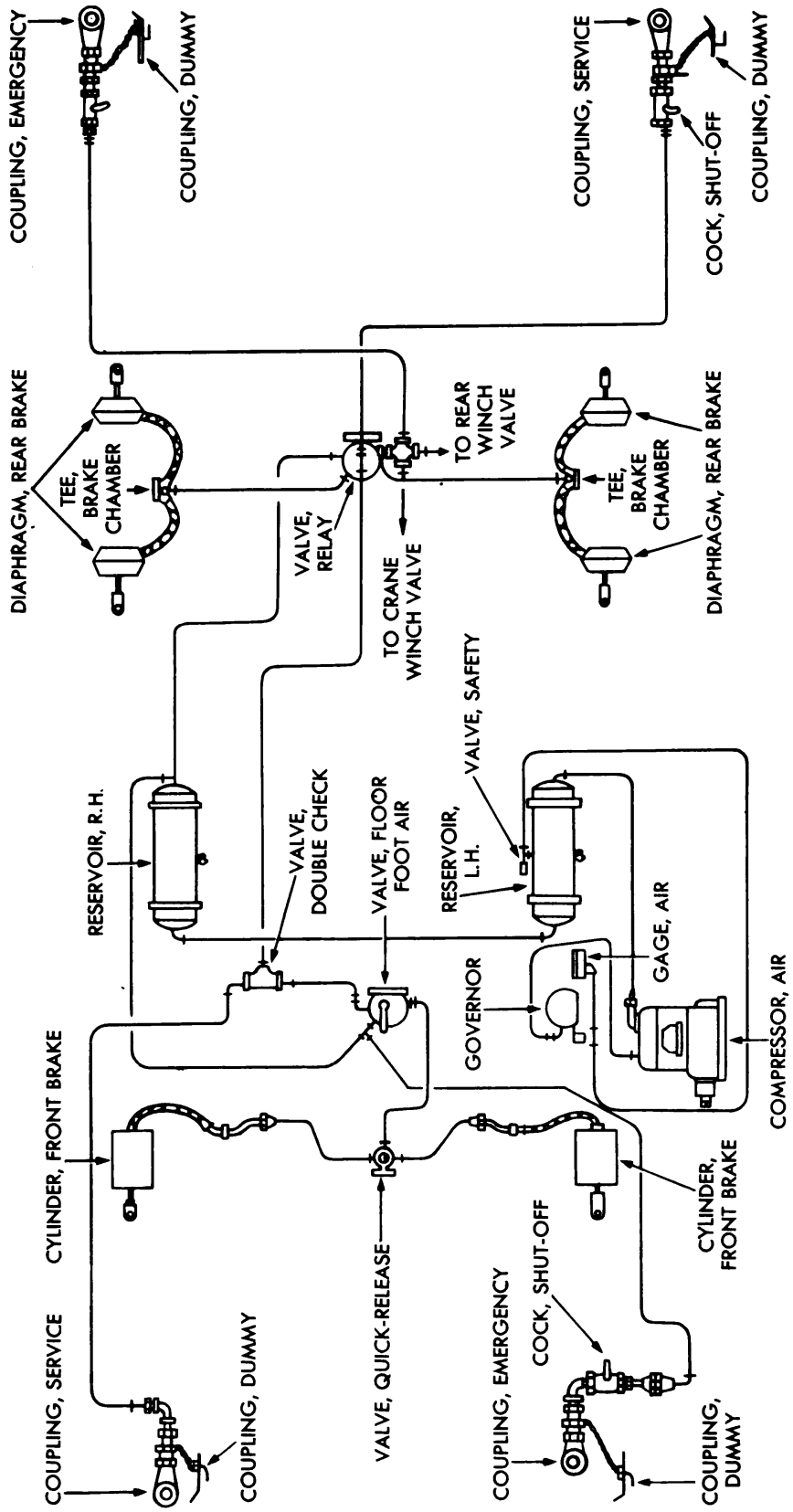


Figure 68—Brake Air Pipes

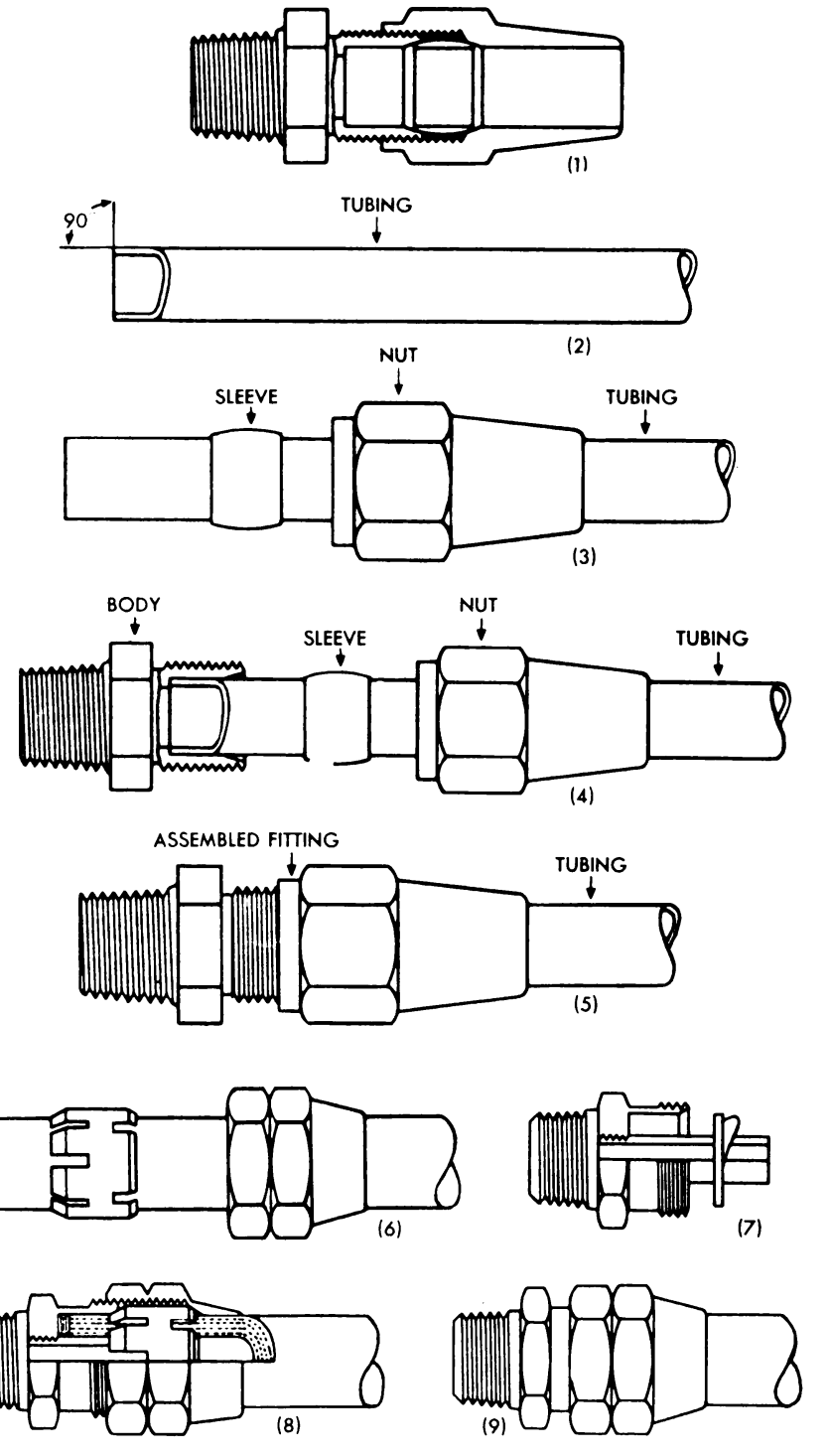


Figure 69—Air Pipe and Air Hose Fittings

(5) Repeat procedure to install fittings on other end of pipe. Test fittings for air leaks after installing. Start the engine. When air pressure gage reads 90 or more, place soapsuds on fitting. No bubbles should be formed, but if there are, tighten nut a full turn at a time until no bubbles are formed.

141. HOSE FITTINGS.

a. Equipment.

AIR, compressed
WRENCH, adjustable

b. Install Hose Fittings.

AIR, compressed
WRENCH, adjustable

(1) Cut hose to same length as hose being replaced. The cut should be a right angle to outside wall of hose. Use compressed air line and blow out any cuttings in the hose.

(2) Slide nut on hose. Install sleeve about one inch from end of hose (6, fig. 69).

(3) Place gasket over end of hose guide in fitting. Remove protector from face of gasket (7, fig. 69).

(4) Install hose in fitting. End of hose and gasket must be against bottom of recess in fitting (8, fig. 69).

(5) Slide sleeve against edge of fitting. Tighten nut until it is snug (adjustable wrench) (9, fig. 69).

(6) Repeat procedure in (1), (2), (3), (4) and (5) to install fitting on other end of hose. Then make test as in paragraph 140 **c** (5).

ORDNANCE MAINTENANCE
BODY AND CHASSIS FOR HEAVY WRECKING TRUCK M1

Section XVI

CAB DOUBLE CHECK VALVE

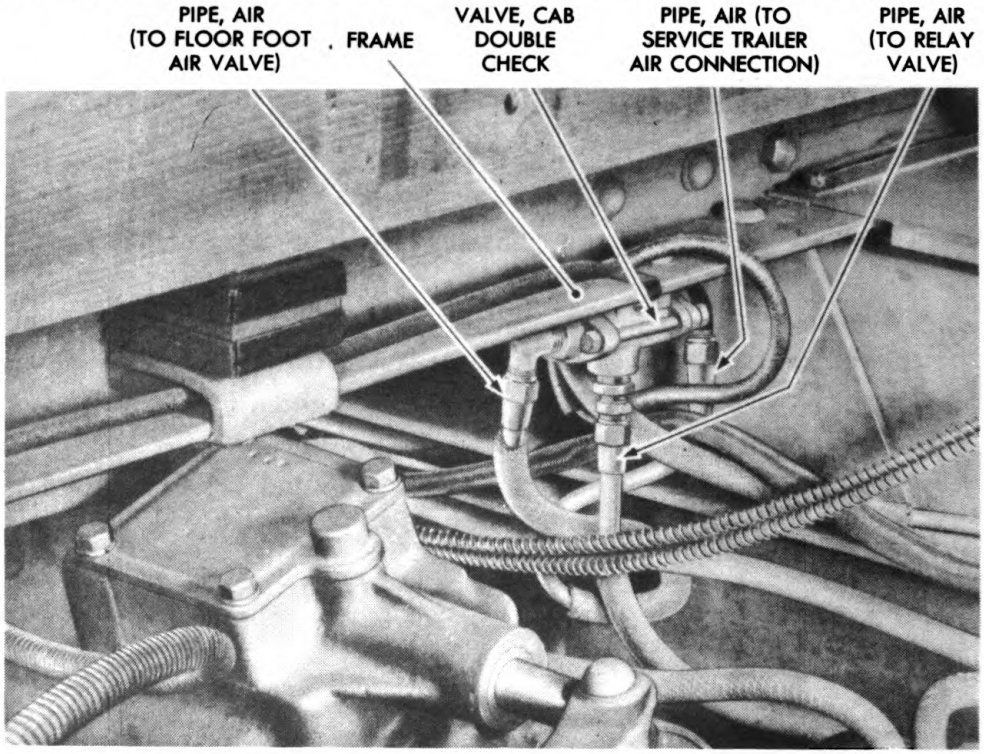


Figure 70—Cab Double Check Valve RA PD 43664

142. GENERAL.

a. The cab double check valve is located on the frame cross member to which the rear of the cab is bolted. The cab double check valve permits the operation of the wrecker brakes from a vehicle ahead of the wrecker. The cab double check valve is connected between the service trailer air connection and the floor foot air valve. The relay valve is also connected to the double check valve.

143. CAB DOUBLE CHECK VALVE REMOVAL.

a. Equipment.

WRENCH, open-end, 5/8-in.

b. Procedure.

(1) PRELIMINARY. Remove seat back and two seat cushions (par. 225 b (8)); floor boards, (par. 225 b (9)); and disconnect and lift out battery (par. 225 (10)) before removing or inspecting cab double check valve.

(2) DISCONNECT AIR PIPES.

WRENCH, open-end, 5/8-in.

(a) Disconnect left air pipe, right air pipe and center air pipe (fig. 70).

(3) REMOVE CAB DOUBLE CHECK VALVE.

WRENCH, open-end, 5/8-in.

(a) Remove cab double check valve bolt, nut and lock washer holding cab double check valve to frame. Lift off cab double check valve.

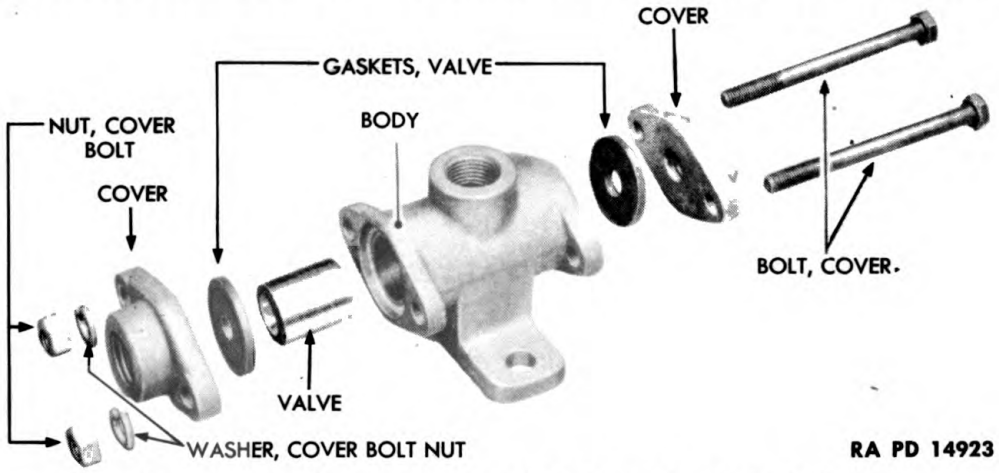


Figure 71—Cab Double Check Valve—Exploded View

144. CAB DOUBLE CHECK VALVE DISASSEMBLY.

a. Equipment.

PRESS, hydraulic

WRENCHES, open-end, two, 7/16-in.

b. Procedure. Remove two bolts, nuts and lock washers which hold the two covers to body (two 7/16-in. open-end wrenches) (fig. 71). Pull bolts out of the two covers and body. Lift two covers off body and remove valve gasket from each end of body. Slide valve out of body. Press valve sleeve from body (hydraulic press).

145. CAB DOUBLE CHECK VALVE INSPECTION.

a. Equipment.

SOLVENT, dry-cleaning

b. Procedure.

(1) GENERAL.

SOLVENT, dry-cleaning

(a) Wash all metal parts in SOLVENT, dry-cleaning. Do not allow solvent or oil to get on rubber parts.

(2) VALVE SLEEVE AND VALVE. Inspect valve sleeve and valve for scores or ridges and, if found, use a new valve and sleeve.

(3) VALVE GASKET. Inspect valve gaskets for cracks and, if found, use new gaskets.

146. ASSEMBLY OF CAB DOUBLE CHECK VALVE.

a. Equipment.

PRESS, hydraulic

WRENCHES, open-end, two, 7/16-in.

b. Procedure. Press valve sleeve in body (hydraulic press). Slide valve into body (fig. 71). Install a valve gasket at each end of body. Install a cover on each end of body. Insert the two bolts through cover and body. Install two lock washers and nuts (two 7/16-in. open-end wrenches).

147. CAB DOUBLE CHECK VALVE INSTALLATION.

a. Equipment.

WRENCH, open-end, 5/8-in.

b. Procedure.

(1) INSTALL CAB DOUBLE CHECK VALVE.

WRENCH, open-end, 5/8-in.

(a) Install cab double check valve. Attach it to frame with cab double check valve bolt, lock washer and nut.

(2) CONNECT AIR PIPES.

WRENCH, open-end, 5/8-in.

(a) Connect left air pipe, right air pipe and center air pipe (fig. 70).

148. CAB DOUBLE CHECK VALVE ADJUSTMENT.

a. Equipment.

GAGE, air pressure
SOAPSUDS

WRENCH, open-end, 5/8-in.

b. Procedure.

(1) LEAKAGE TEST.

GAGE, air pressure
SOAPSUDS

WRENCH, open-end, 5/8-in.

CAB DOUBLE CHECK VALVE

(a) Start engine, and, when air pressure gage shows 90, stop engine and depress brake pedal.

(b) Cover valve covers and air pipe connections with soapsuds. There should be no bubble formed. If there is a bubble at pipe connections, tighten connections. If there is a bubble at valve cover, replace valve cover gasket.

(2) INSTALL BATTERY. Install the battery (par. 229 **b** (5)), floor boards (par. 229 **b** (7)), seat bottom boards (par. 229 **b** (4)), seat back and two seat cushions (par. 229 **b** (8)).

ORDNANCE MAINTENANCE
BODY AND CHASSIS FOR HEAVY WRECKING TRUCK M1

Section XVII

CLUTCH AIR CYLINDER

149. GENERAL.

a. The clutch air cylinder is located on the transmission housing, and it enables the operator of the crane or rear winch to disengage or engage the clutch. NOTE: Removal, installation and adjustment of the clutch air cylinder are covered in TM 9-1795B.

150. CLUTCH AIR CYLINDER DISASSEMBLY.

a. Equipment.

DRIFT, soft
HAMMER
VISE, with soft jaws
WRENCH, adjustable

b. Procedure (fig. 72).

(1) Remove cover (adjustable wrench). Lift piston assembly out of cylinder.

(2) Place piston assembly in vise with soft jaws. Drive piston lock nut from piston rod (hammer and soft drift).

(3) Lift diaphragm off piston rod. Pull piston spring boot out of piston. Lift piston off piston rod. Slide piston spring and piston spring boot off piston rod.

151. CLUTCH AIR CYLINDER INSPECTION.

a. Equipment.

SOLVENT, dry-cleaning

b. Procedure.

(1) GENERAL.

SOLVENT, dry-cleaning

(a) Wash all metal parts in SOLVENT, dry-cleaning. Do not allow solvent to get on diaphragm.

(2) DIAPHRAGM. Inspect diaphragm for cracks and, if found, use new diaphragm.

152. ASSEMBLY OF CLUTCH AIR CYLINDER.

a. Equipment.

DRIFT, soft
OIL, engine, SAE 10
HAMMER
VISE, with soft jaws
WRENCH, adjustable

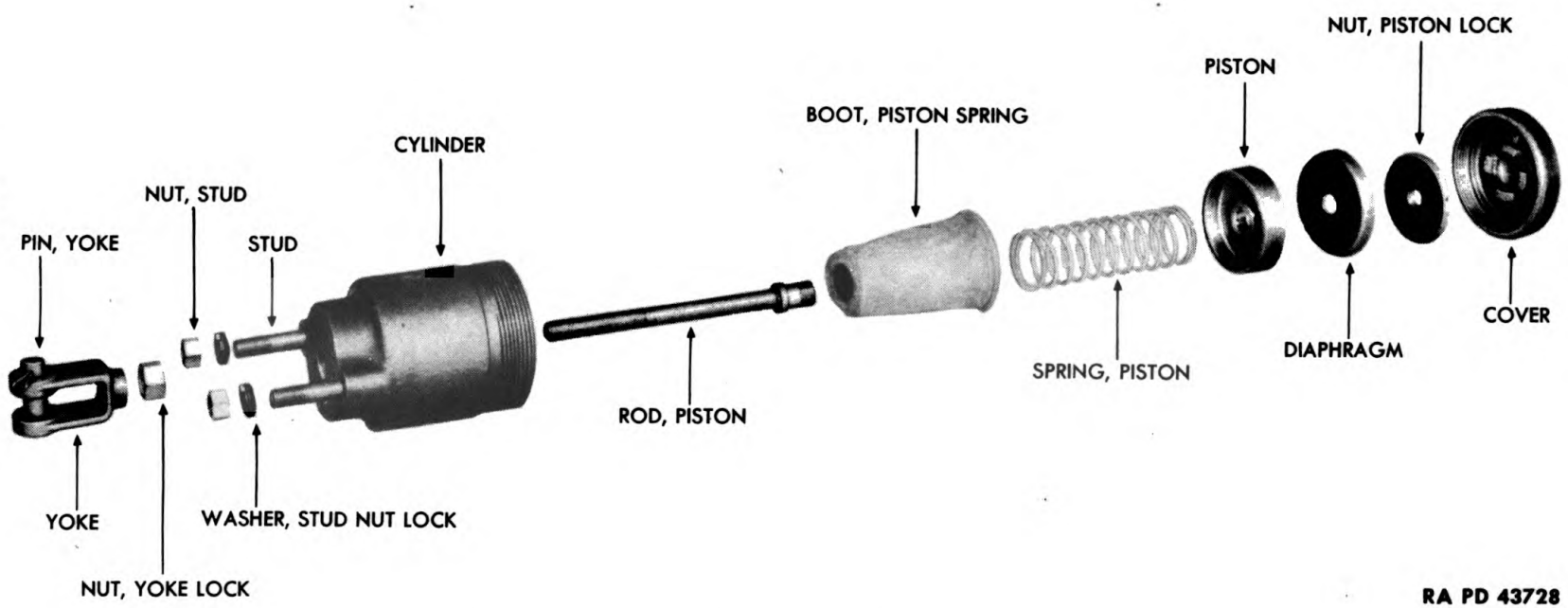


Figure 72—Clutch Air Cylinder—Exploded View

b. Procedure.

(1) Coat inside of cover and cylinder wall with engine oil SAE 10 (fig. 72).

(2) Slide piston spring on piston rod. Slide piston spring boot on piston spring. Slide piston on piston rod. Place diaphragm on piston.

(3) Place piston rod in a vise with soft jaws. Drive on piston lock nut (hammer and soft drift). Install piston assembly in cylinder.

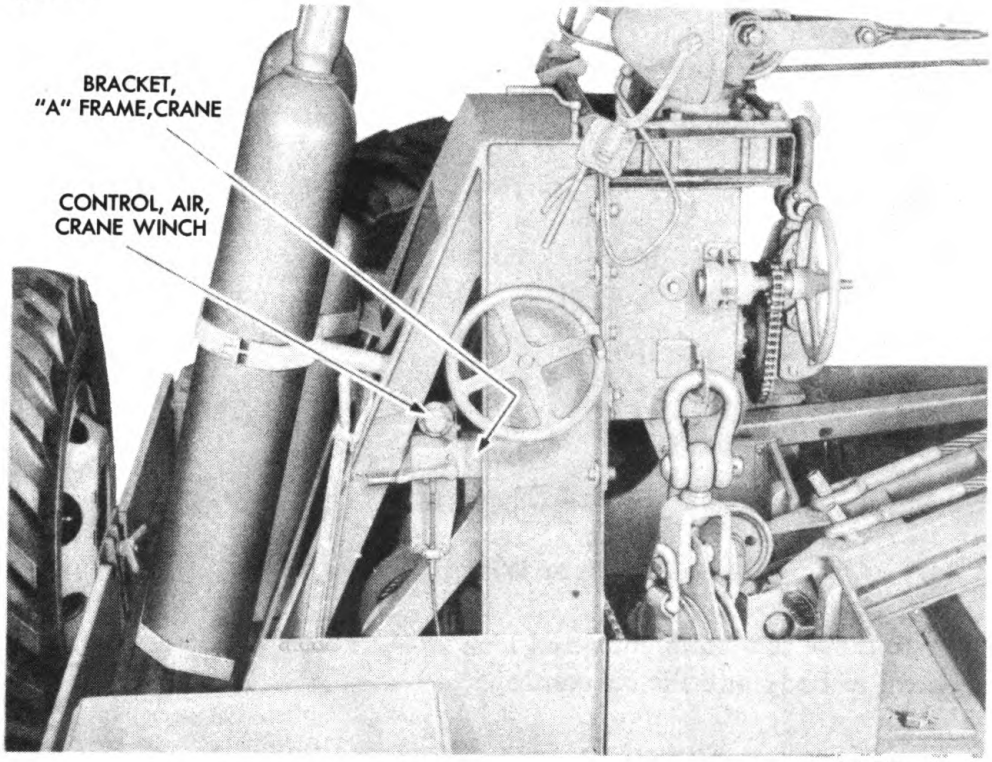
(4) Install cover (adjustable wrench).

Section XVIII

WINCH AIR CONTROLS
(Crane Winch and Rear Winch)

153. GENERAL.

a. The two winch air controls enable the operator stationed at the crane or the rear winch to operate the clutch air cylinder from either place.



RA PD 14945

Figure 73—Crane Winch Air Control

154. WINCH AIR CONTROL REMOVAL.

a. Equipment.

WRENCH, open-end, ¾-in.

b. Procedure.

(1) REMOVE CRANE WINCH AIR CONTROL.

WRENCH, open-end, ¾-in.

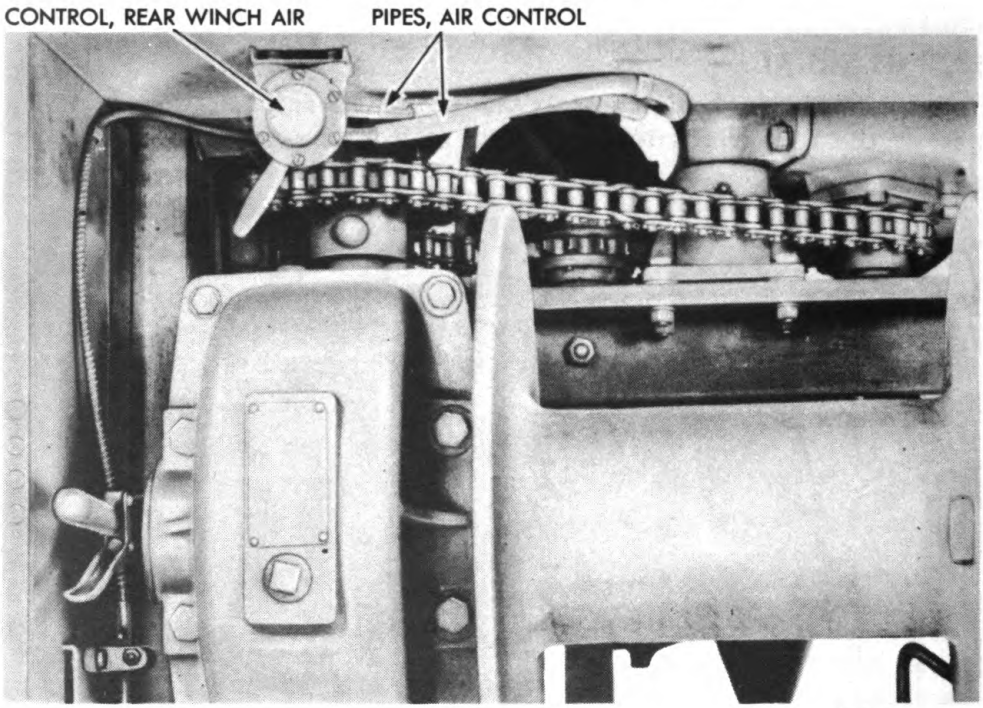
(a) Disconnect two air pipes on crane winch air control (fig. 73). Install plug in air feed line to prevent loss of air pressure.

(b) Remove two bolts, nuts and lock washers which hold crane winch air control to crane "A" frame bracket and lift off control.

(2) REMOVE REAR WINCH AIR CONTROL.

WRENCH, open-end, 3/4-in.

(a) Disconnect two air pipes on rear winch air control (fig. 74). Install plug in air feed line to prevent loss of air pressure.



RA PD 14947

Figure 74—Rear Winch Air Control

(b) Remove two bolts, nuts and lock washers which hold rear winch air control to body and lift off control.

155. WINCH AIR CONTROL DISASSEMBLY.

a. Equipment.

SCREWDRIVER

b. Procedure. Remove handle screw from handle. Lift handle screw nut off handle and remove handle from valve. Push handle lock plate out of handle. Remove six cap screws which hold cover to body. Lift off cover and cover gasket. Lift valve spring off valve. Lift valve off valve rod. Pull valve rod out of body.

WINCH AIR CONTROLS

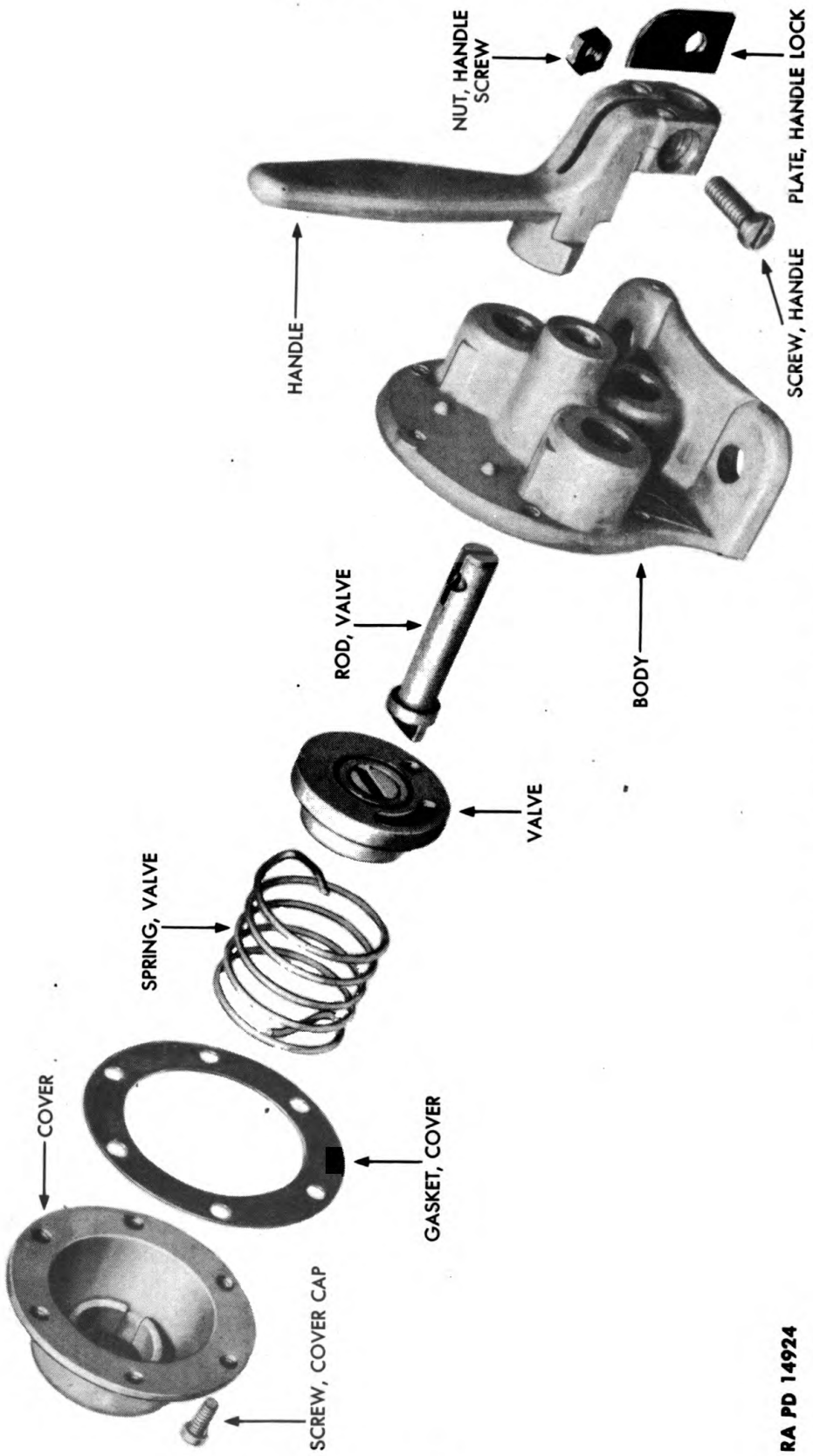


Figure 75—Winch Air Control—Exploded View

ORDNANCE MAINTENANCE
BODY AND CHASSIS FOR HEAVY WRECKING TRUCK M1

156. WINCH AIR CONTROL INSPECTION.

a. Equipment.

AIR, compressed
SOLVENT, dry-cleaning
CARBON TETRACHLORIDE

b. Procedure.

(1) GENERAL.

SOLVENT, dry-cleaning

(a) Wash all parts in SOLVENT, dry-cleaning.

(2) COVER GASKET. Use a new cover gasket.

(3) VALVE.

AIR, compressed
CARBON TETRACHLORIDE

(a) Wash parts in CARBON TETRACHLORIDE.

(b) Blow parts dry with compressed air.

157. ASSEMBLY OF WINCH AIR CONTROLS.

a. Equipment.

COMPOUND, joint and thread
SCREWDRIVER

b. Procedure.

(1) Insert valve rod in body.

(2) Insert handle lock plate in handle. Install handle on valve rod and place valve on valve rod so hole in valve lines up with one of the holes in body (screwdriver).

(3) Cement cover gasket on cover (gasket cement). Install valve spring on valve with lower end of spring in the slot in valve.

(4) Place cover on valve spring with upper end of valve spring in slot in cover.

(5) Tighten screws (screwdriver).

158. WINCH AIR CONTROL INSTALLATION.

a. Equipment.

WRENCH, open-end, 3/4-in.

b. Procedure.

(1) INSTALL CRANE WINCH AIR CONTROL.

WRENCH, open-end, 3/4-in.

(a) Hold crane winch air control on bracket on crane "A" frame (fig. 73). Install two bolts, nuts and lock washers which hold air control to bracket.

(b) Remove pipe plug from end of air feed line. Connect two air pipes to air control.

(2) INSTALL REAR WINCH AIR CONTROL.

WRENCH, open-end, 3/4-in.

WINCH AIR CONTROLS

(a) Place rear winch air control in position on wrecker body and attach two bolts, nuts and lock washers which hold it in place (fig. 74).

(b) Remove air plugs from two air pipes and connect air pipes to air control. Turn cover a quarter turn counterclockwise and install cap screws which hold cover to body. Install handle screw and handle screw nut in handle and tighten handle screw.

159. WINCH AIR CONTROL ADJUSTMENT.

a. Equipment.

SCREWDRIVER
SOAPSUDS
WRENCH, open-end, 5/8-in.

b. Procedure.

(1) Move winch air control handle into open position and observe whether handle automatically returns to off position.

(2) If handle does not return to release position, remove six cap screws from cover (screwdriver). Turn cover a quarter turn counterclockwise and install cap screws.

(3) Start engine and observe air pressure gage. When it shows about 90, turn engine off.

(4) Cover winch air controls and air pipe connections with soapsuds. No bubbles should be formed. If bubbles are formed around cover, install a new cover gasket. If bubbles are formed around air pipe connections, tighten connections (5/8-in. open-end wrench).

ORDNANCE MAINTENANCE
BODY AND CHASSIS FOR HEAVY WRECKING TRUCK M1

CHAPTER 5

FRAME

Section I

GENERAL

160. GENERAL.

a. The frame is the structural center of the wrecker, carrying the load and supporting the body, engine, transmissions, crane, winches and their connecting units. The frame maintains these units in their correct relationship to each other in order that they may operate without stress or strain.

b. Wreckers that have been in a collision, or in an accident that might cause a swayed or sprung frame, must be checked for proper frame alinement (par. 166).

161. SPECIFICATIONS AND DATA.

a. Frame.

Weight without springs	1,895 lb
Serial No. of wrecker located on	Left front corner of frame
Straightening	With frame in vehicle
Brackets	Hot riveted to frame

b. Tow Hooks.

No. used	Two
Location	Front of frame
Model	Union Forging FS-191-192
Weight	8 lb

c. Pintle Hook.

No. used	One
Location	Rear of frame
Model	Timken T-19-C
Weight	50 lb

162. REFERENCE TO TM 9-795.

a. Many second echelon operations covered in TM 9-795 are often done by ordnance personnel. Reference should be made to TM 9-795 for lower echelon operations not covered in this manual.

163. ECHELON BREAKDOWN OF MAINTENANCE OPERATIONS.

(Refer to par. 4.)

Section II

TROUBLE SHOOTING

164. TROUBLE SHOOTING, INSPECTION AND REMEDIAL MEASURES.

a. The following chart is provided as a guide to common troubles and their causes, and it is a recommended procedure for inspection to locate the cause:

Symptom and Probable Cause	Probable Remedy
b. Hard Steering or Wheels do not Track, or They Shimmy or Wander.	
(1) Frame bent.	(1) Straighten frame (par. 166).

ORDNANCE MAINTENANCE
BODY AND CHASSIS FOR HEAVY WRECKING TRUCK M1

Section III

FRAME INSPECTION AND REPAIR

165. GENERAL.

a. A visual inspection will not reveal a bent or sprung frame. Special equipment is necessary to determine whether a frame is sprung and where pressure needs to be applied to force the frame into line.

166. FRAME INSPECTION AND REPAIR.

a. Equipment.

GAGES, centering (3)

MACHINE, wheel alinement and frame straightener

b. Procedure.

(1) INSTALL CENTERING GAGES.

GAGES, centering (3)

(a) Place wrecker on a level floor or on a combination frame straightener and wheel alinement machine.

(b) Install three centering gages on frame of wrecker. Place first centering gage near front end of frame, second centering gage near center of frame and third centering gage near rear end of frame (figs. 76 and 77).

(c) Sight along the three centering gage pins. If centering gage pins are in line, frame is straight, and if they are not in line, frame is bent at point where the centering gage pin is out of line.

(2) STRAIGHTEN FRAME.

MACHINE, wheel alinement and frame straightener

(a) Install wrecker on a combination frame straightener and wheel alinement machine and apply hydraulic pressure to frame side member as shown in figure 78.

(b) Then repeat procedure in step (1) above.

(3) STRAIGHTEN FRAME BRACKETS. Frame brackets that are in the way and prevent frame straightening, should be removed by cutting the rivets. After frame straightening has been completed, brackets should be riveted on, using a pneumatic or electric rivet hammer and hot rivets.

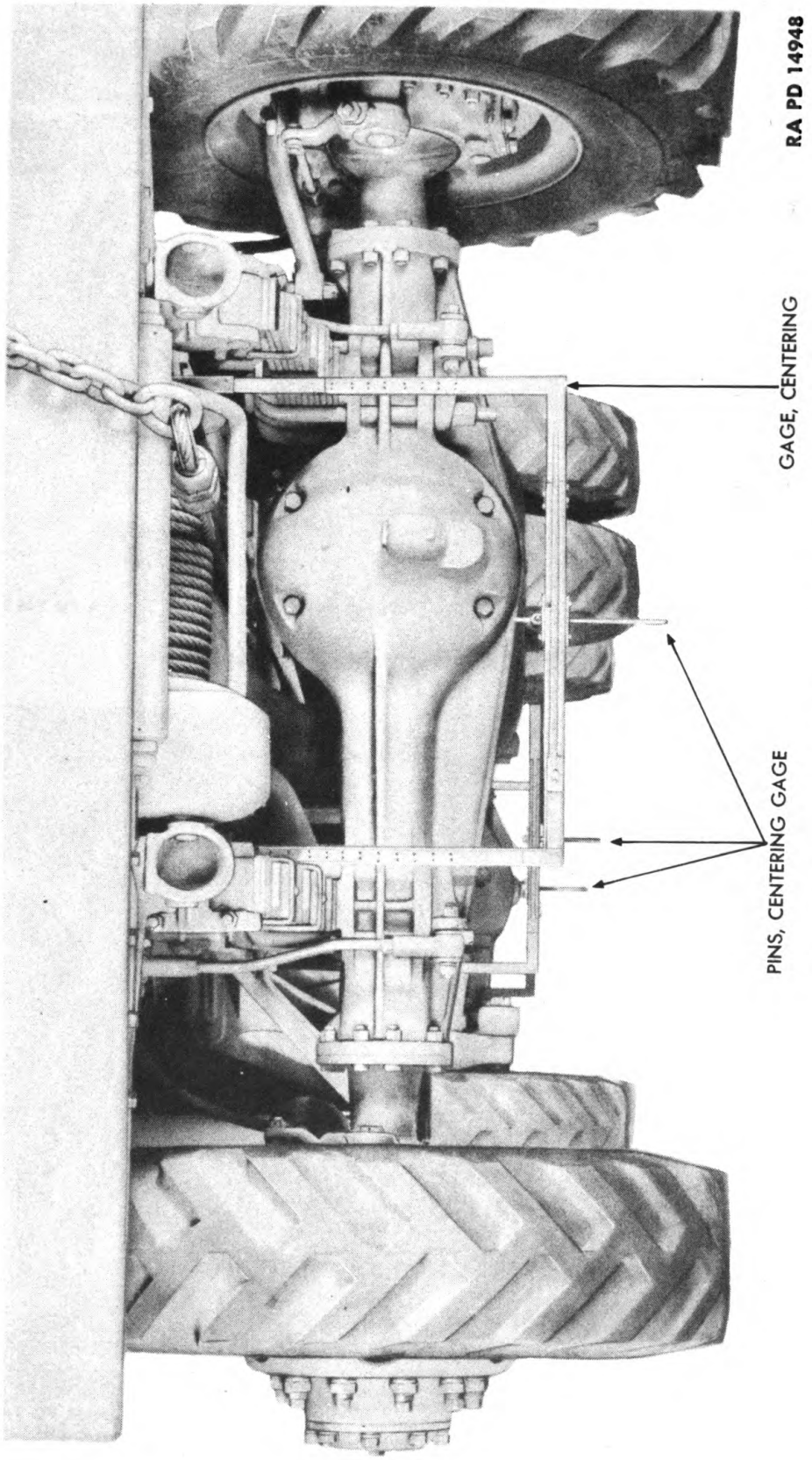


Figure 76—Centering Gage Location

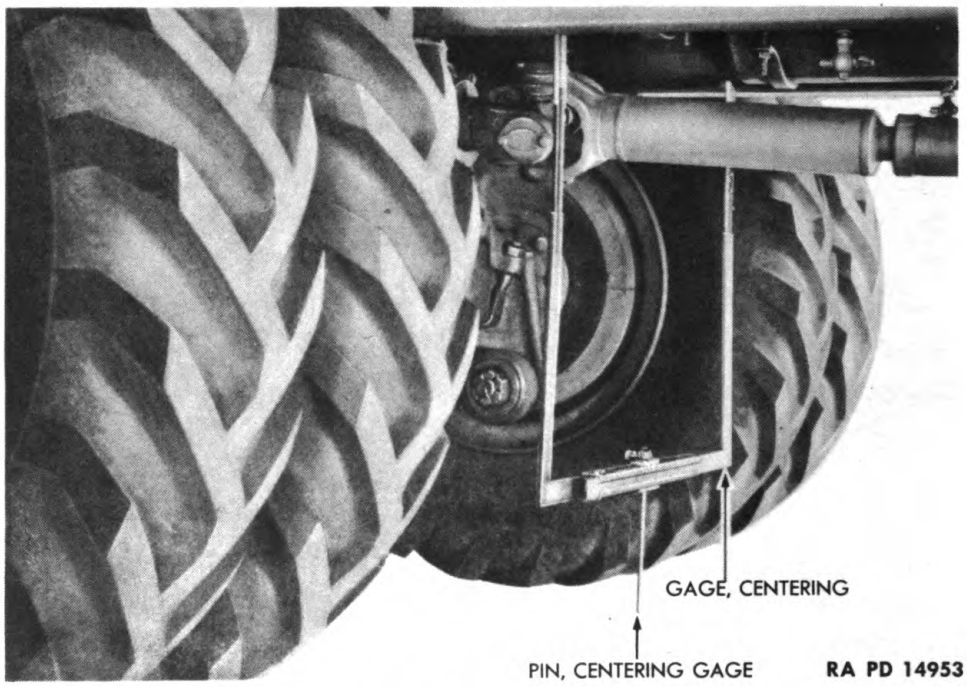


Figure 77—Rear Centering Gage Location

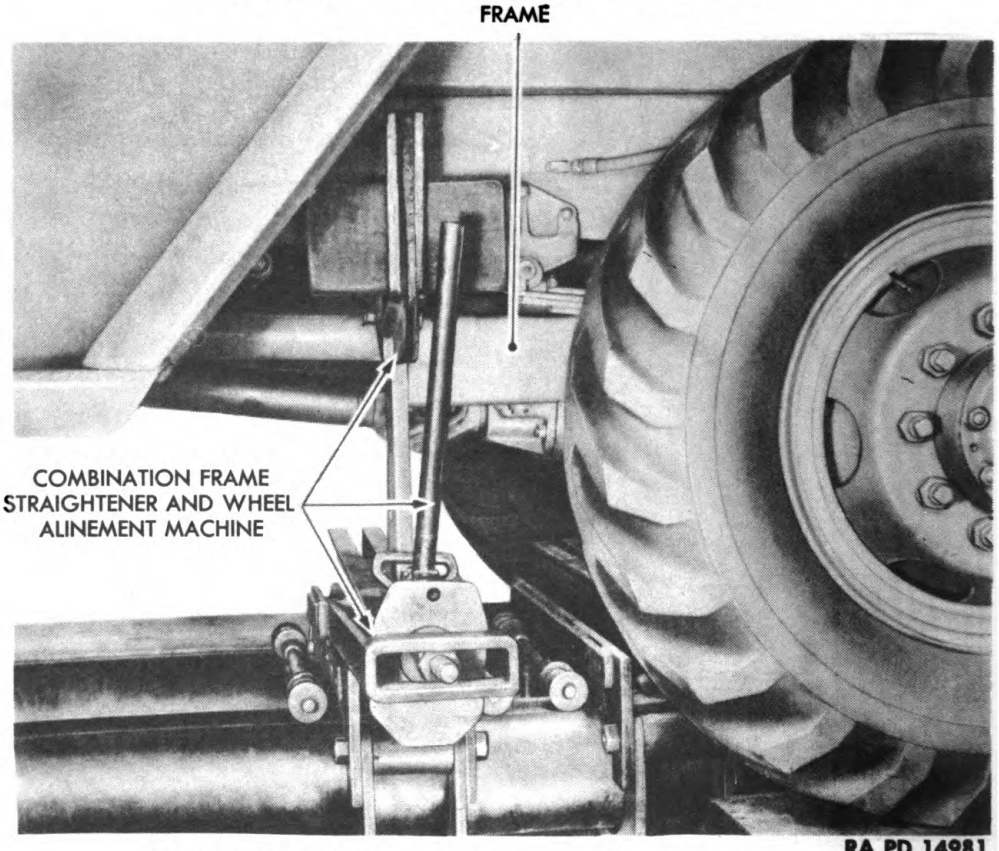
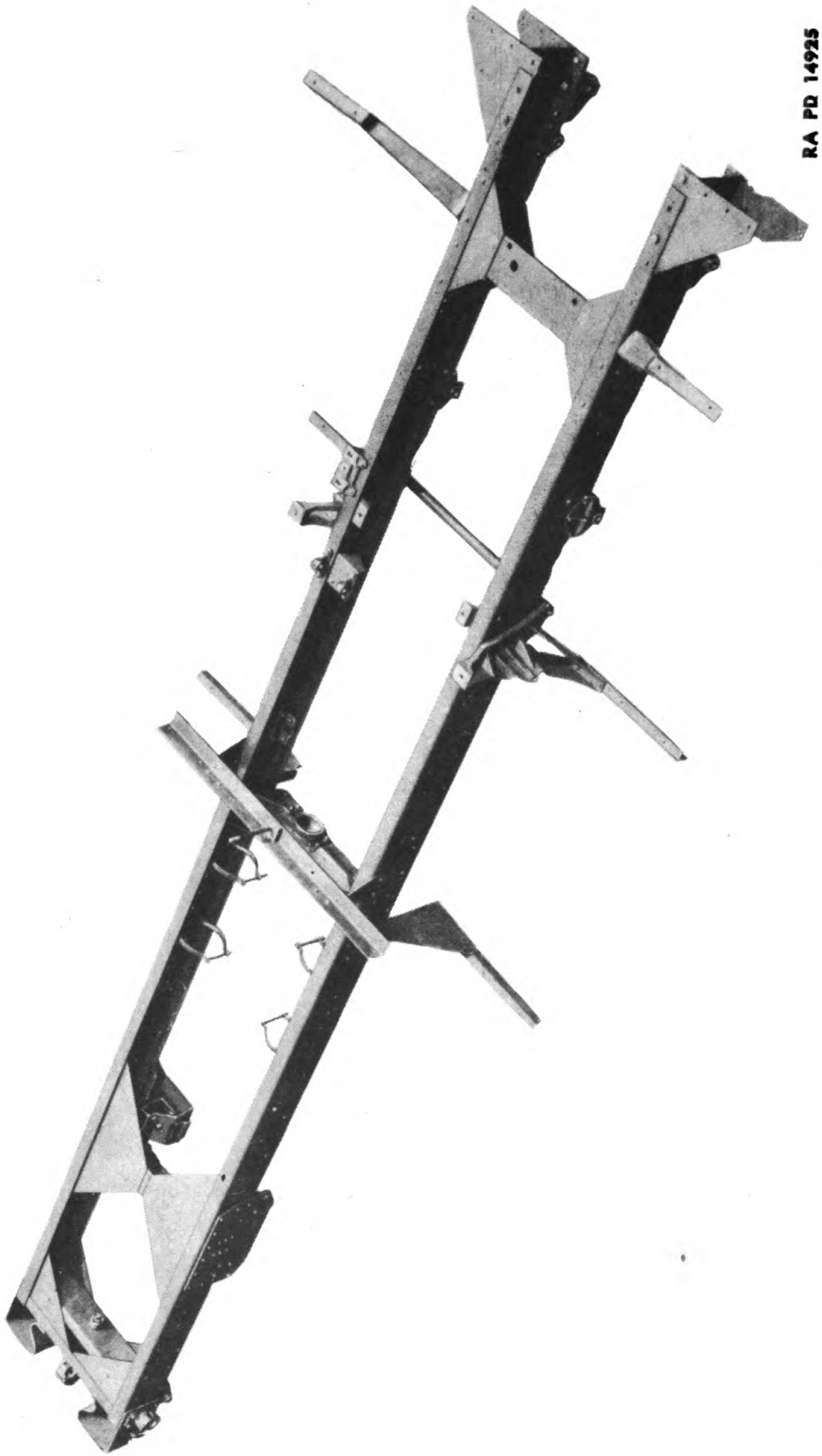


Figure 78—Method of Straightening Sprung Frame



RA PD 14925

Figure 79—Frame, with Brackets

ORDNANCE MAINTENANCE
BODY AND CHASSIS FOR HEAVY WRECKING TRUCK M1

Section IV
PINTLE HOOK

167. GENERAL.

a. The pintle hook is on the rear cross member of the frame, and is used for towing. The pintle hook spring, mounted on the pintle hook stud, cushions the shock on the pintle hook when starts or stops are made.

168. PINTLE HOOK REMOVAL.

a. Equipment.

PLIERS WRENCH, adjustable

b. Procedure.

(1) Remove pintle hook stud nut cotter pin from pintle hook stud (pliers). Remove pintle hook stud nut (adjustable wrench). Pull pintle hook out of frame and lift off pintle hook spring.

169. PINTLE HOOK INSPECTION.

a. Inspect pintle hook for cracks or fractures. Weld, or replace.

b. Pintle Hook Spring. Inspect pintle hook spring for breaks or fractures. Replace if broken.

170. PINTLE HOOK INSTALLATION.

a. Equipment.

PLIERS WRENCH, adjustable

b. Procedure.

(1) Place pintle hook spring back of frame rear cross member (fig. 80)

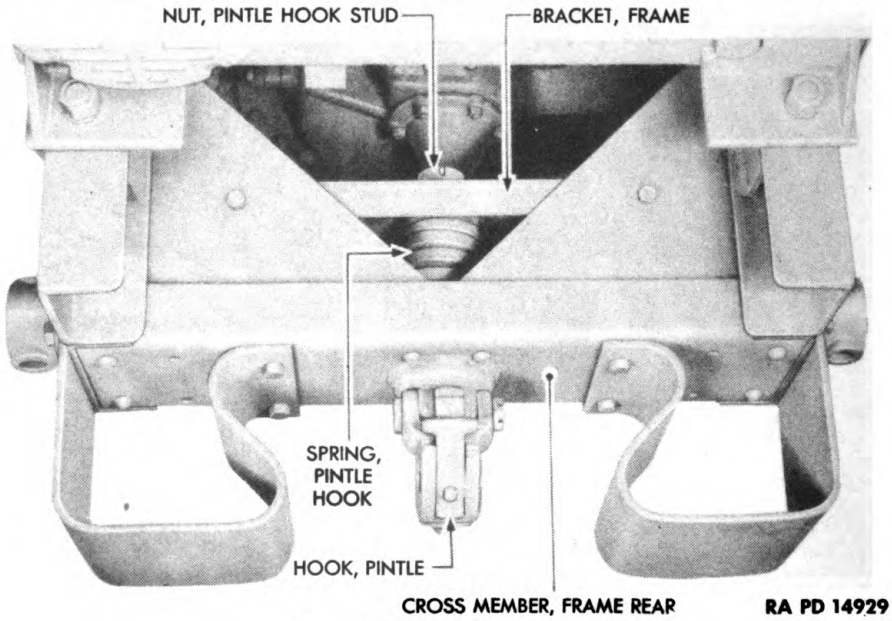


Figure 80—Pintle Hook

Insert pintle hook through frame rear cross member, pintle hook spring and frame bracket. Install pintle hook stud nut (adjustable wrench), and cotter pin (pliers).

Section V

TRANSFER CASE CROSS SHAFT AND LINKAGE (TO FRAME)

171. GENERAL.

a. The transfer case cross shaft is attached to the frame right side bracket by a welded collar and is a slip fit in the frame left side bracket.

b. Remove transfer case cross shaft and linkage (TM 9-1795A). Install (TM 9-1795A).

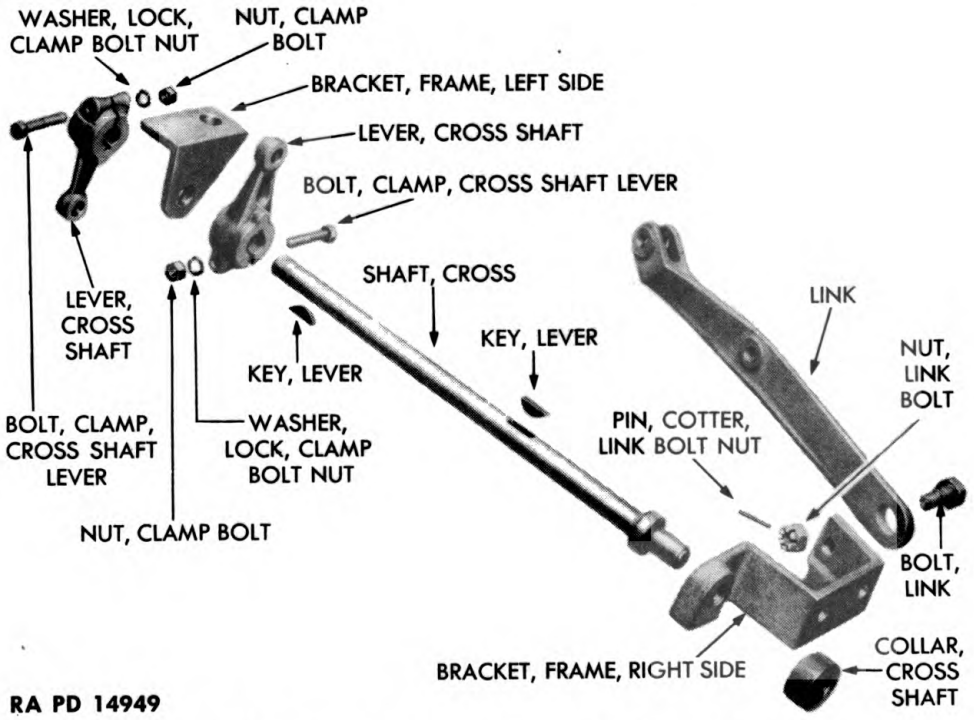


Figure 81—Transfer Case Cross Shaft and Linkage

172. TRANSFER CASE CROSS SHAFT AND LINKAGE DISASSEMBLY.

a. Equipment.

CHISEL, cold
DRIFT
HAMMER
PLIERS
WRENCH, box, 7/8-in.
WRENCH, open-end, 1/2-in.
WRENCH, open-end, 3/4-in.
WRENCH, socket, 9/16-in.

b. Procedure.

(1) REMOVE LINK.

PLIERS
WRENCH, box, 7/8-in.
WRENCH, open-end, 3/4-in.

(a) Remove link bolt nut cotter pin (pliers). Remove link bolt and nut which hold link to frame right side bracket (7/8-in. box wrench and 3/4-in. open-end wrench). Lift link off frame right side bracket.

(2) REMOVE CROSS SHAFT LEVER.

DRIFT	WRENCH, open-end, 1/2-in.
HAMMER	WRENCH, socket, 9/16-in.

(a) Remove cross shaft lever clamp bolt, nut and lock washer (9/16-in. socket wrench and 1/2-in. open-end wrench). Repeat procedure on opposite cross shaft lever.

(b) Drive cross shaft lever off cross shaft (hammer). Remove cross shaft lever key (hammer and drift). Remove left side frame bracket (hammer). Repeat procedure on opposite cross shaft lever.

(3) REMOVE CROSS SHAFT.

CHISEL, cold	HAMMER

(a) Cross shaft collar is welded on cross shaft and will have to be broken loose with a hammer and cold chisel. Lift cross shaft collar off cross shaft. Lift cross shaft out of frame right side bracket.

173. TRANSFER CASE CROSS SHAFT AND LINKAGE INSPECTION.

a. Cross Shaft. Inspect cross shaft for cracks. Inspect keyways in shaft for chipping. If cross shaft is cracked or chipped, replace.

b. Cross Shaft Levers. Inspect cross shaft levers for breaks or fractures and inspect the keyways for chipping. Breaks or fractures in cross shaft levers can be welded, but if the keyways are chipped, new cross shaft levers must be used.

174. ASSEMBLY OF TRANSFER CASE CROSS SHAFT AND LINKAGE.

a. Equipment.

EQUIPMENT, welding	WRENCH, open-end, 1/2-in.
HAMMER	WRENCH, open-end, 3/4-in.
PLIERS	WRENCH, socket, 9/16-in.
WRENCH, box, 7/8-in.	

b. Procedure.

(1) ASSEMBLE CROSS SHAFT.

EQUIPMENT, welding

(a) Install cross shaft in frame right side bracket. Slide cross shaft collar on end of cross shaft. Weld in place.

(2) ASSEMBLE CROSS SHAFT LEVERS.

HAMMER	WRENCH, open-end, 1/2-in.
PLIERS	WRENCH, open-end, 3/4-in.
WRENCH, box, 7/8-in.	WRENCH, socket, 9/16-in.

TRANSFER CASE CROSS SHAFT AND LINKAGE (TO FRAME)

(a) Install cross shaft lever key in cross shaft (hammer). Drive cross shaft lever on cross shaft lever key (hammer). Install frame left side bracket (9/16-in. socket wrench). Repeat procedure on opposite cross shaft lever.

(b) Install cross shaft lever clamp bolt, lock washer and nut (9/16-in. socket wrench and 1/2-in. open-end wrench). Repeat procedure on opposite cross shaft lever.

(c) Install link on frame right side bracket. Install link bolt and nut that hold link to the frame right side bracket (7/8-in. box wrench and 3/4-in. open-end wrench). Install link bolt nut cotter pin (pliers).

CHAPTER 6

SPRINGS AND SHOCK ABSORBERS

Section I

GENERAL

175. GENERAL.

a. Two front springs are anchored to the front axle housing by front spring clips which fit through the front axle housing spring seat. Two brackets riveted on the frame hold the front springs to the frame. The front springs attach directly to the frame rear bracket and, through a shackle, to the frame front bracket. The shackle allows for deflection of the front spring when the wrecker is being driven over bumpy roads.

b. Two rear springs are anchored by rear spring clips to oscillating spring seats on the bogie. The ends of the springs rest on platforms which are a part of the rear axle housing. The ends of the springs are free to move in any direction to eliminate twisting action. It is important that the rear springs be kept tight on their oscillating spring seats, and tightening of rear spring clip nuts every 500 miles is essential. The spring seat is a part of the bogie assembly. The bearings require lubrication and adjustment (TM 9-1795A).

c. The shock absorbers are mounted on the right and left sides of the frame, directly above the front axle. They are connected by a connecting rod to the front axle housing. The shock absorbers aid the front springs in taking shocks when wrecker is operated over bumpy roads.

d. The procedure given applies to one front spring, one rear spring or one shock absorber and should be repeated on the opposite spring or shock absorber.

176. SPECIFICATIONS AND DATA.

a. Springs.

Model	Tuthill
Type—front	Shackled
Type—rear	Radius rod
Location of front	Front axle housing
Location of rear	Bogie assembly
Weight—front	100 lb
Weight—rear	218 lb

b. Shock Absorbers.

Model	Houde, BBH
Type	Hydraulic
Location	Front axle
Weight	14½ lb

177. REFERENCE TO TM 9-795.

a. Many second echelon operations covered in TM 9-795 are often done by ordnance personnel. Reference should be made to TM 9-795 for lower echelon operations not covered in this manual.

178. ECHELON BREAKDOWN OF MAINTENANCE OPERATIONS.

(Refer to par. 4.)

ORDNANCE MAINTENANCE
BODY AND CHASSIS FOR HEAVY WRECKING TRUCK M1

Section II

TROUBLE SHOOTING

179. TROUBLE SHOOTING, INSPECTION AND REMEDIAL MEASURES.

a. The following chart is provided as a guide to common troubles and their causes. It is a recommended procedure for inspection to locate the cause.

Symptom and Probable Cause	Probable Remedy
b. Hard Steering.	
(1) Front spring clips loose.	(1) Tighten front spring clips (par. 191 **b** (2)).
c. Wrecker Bottoms.	
(1) Rear spring broken.	(1) Replace rear spring (par. 180).
(2) Front spring broken.	(2) Replace front spring (par. 186).
(3) Shock absorber weak.	(3) Adjust shock absorber (par. 195).
d. Hard Riding.	
(1) Insufficient lubrication.	(1) Lubricate front spring shackle.
(2) Shackle pins have seized or frozen.	(2) Replace shackle pins (par. 186).
(3) Uneven load distribution.	(3) Distribute load as evenly as possible.
e. Too Flexible Riding.	
(1) Shock absorber not operating.	(1) Replace shock absorber (par. 192).
(2) Spring leaf clips broken.	(2) Replace spring leaf clips (par. 187 **b** (1)).
f. Excessive Noise.	
(1) Shackle pins and front spring end bushings worn.	(1) Replace shackle pins and front spring end bushings (pars. 186 and 187).
(2) Rear spring clips loose.	(2) Tighten rear spring clips (par. 185 **b** (1)).
(3) Rear spring seat bearings loose.	(3) Adjust rear spring seat bearings (TM 9-1795A).

Section III

SPRINGS AND SHOCK ABSORBERS

180. REAR SPRING REMOVAL.

a. Equipment.

BAR, pry
BLOCKS, wooden
JACK, hydraulic
PLIERS
WRENCH, socket, 1⅜-in.
WRENCH, socket, 1⅝-in.

b. Procedure.

(1) LOOSEN SPRING SEAT CLAMP STUD NUTS.

PLIERS
WRENCH, socket, 1⅝-in.

(a) Remove rear spring clamp stud nut cotter pins (pliers). Loosen rear spring seat clamp stud nuts (1⅝-in. socket wrench) (fig. 82).

(2) REMOVE PRESSURE BLOCK.

BAR, pry
WRENCH, socket, 1⅜-in.

(a) Remove rear spring clip nuts and lock washers (1⅜-in. socket wrench). Pry out the two rear spring clips (fig. 82) from spring seat (pry bar). Lift rear spring pressure block off spring.

(3) RAISE BOGIE ASSEMBLY.

BLOCKS, wooden
JACK, hydraulic

(a) Using a hydraulic jack with a wooden block on top of jack, raise bogie assembly (fig. 83).

(4) REMOVE REAR SPRING.

BAR, pry

(a) Pry rear spring straight up about an inch in order to raise spring center bolt out of spring seat ("A," fig. 83).

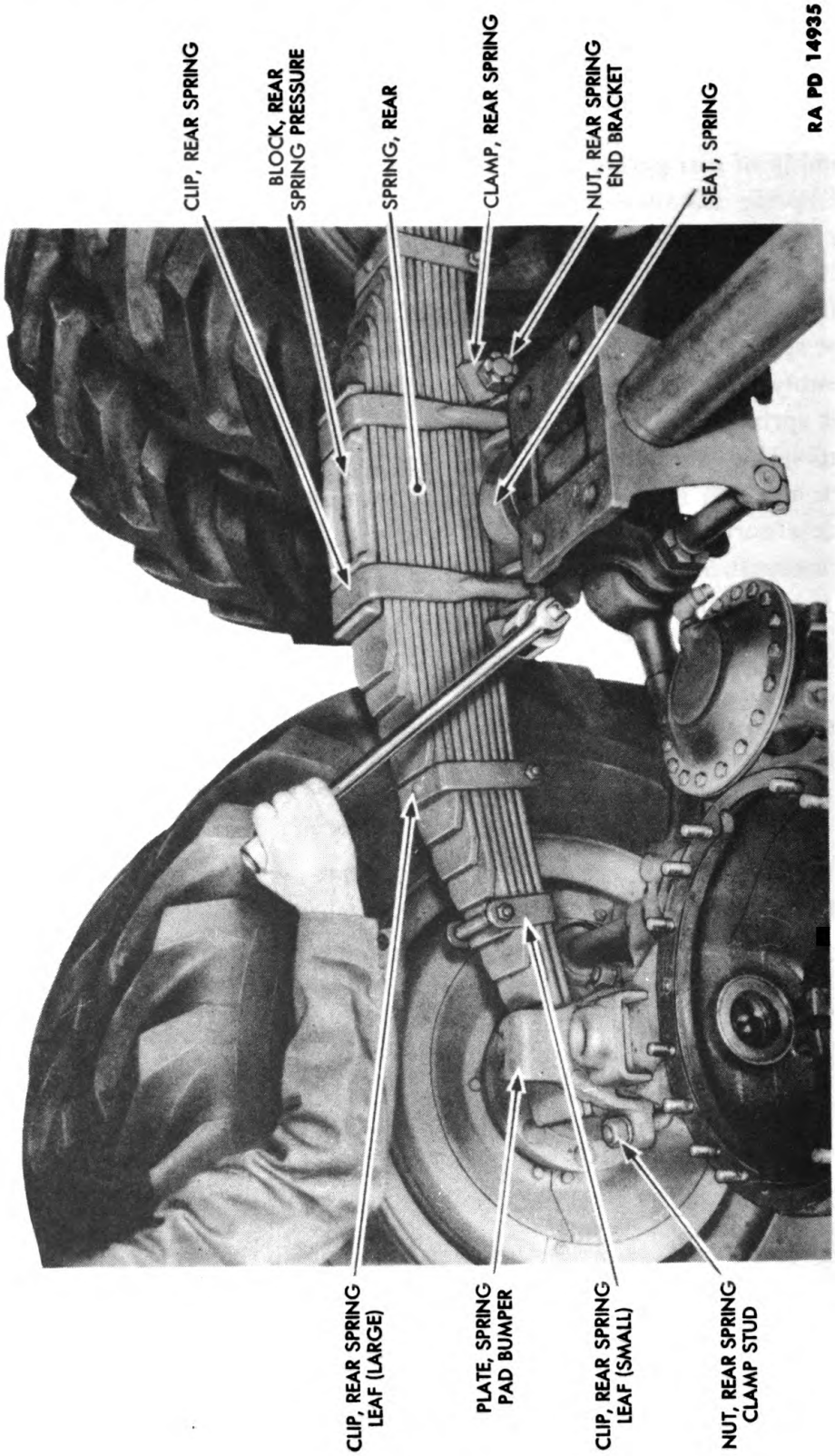


Figure 82—Loosening Rear Spring Seat Clamp Stud Nuts

(b) Force spring forward until end of spring is clear of spring pad bumper plate on axle housing (fig. 83).

(c) Lift rear spring up and back until it clears spring pad bumper plate on opposite axle housing. Remove rear spring.

181. REAR SPRING DISASSEMBLY.

a. Equipment.

CHISEL, cold
DRIFT
HAMMER
WRENCH, box, 9/16-in.
WRENCH, open-end, 1/2-in.

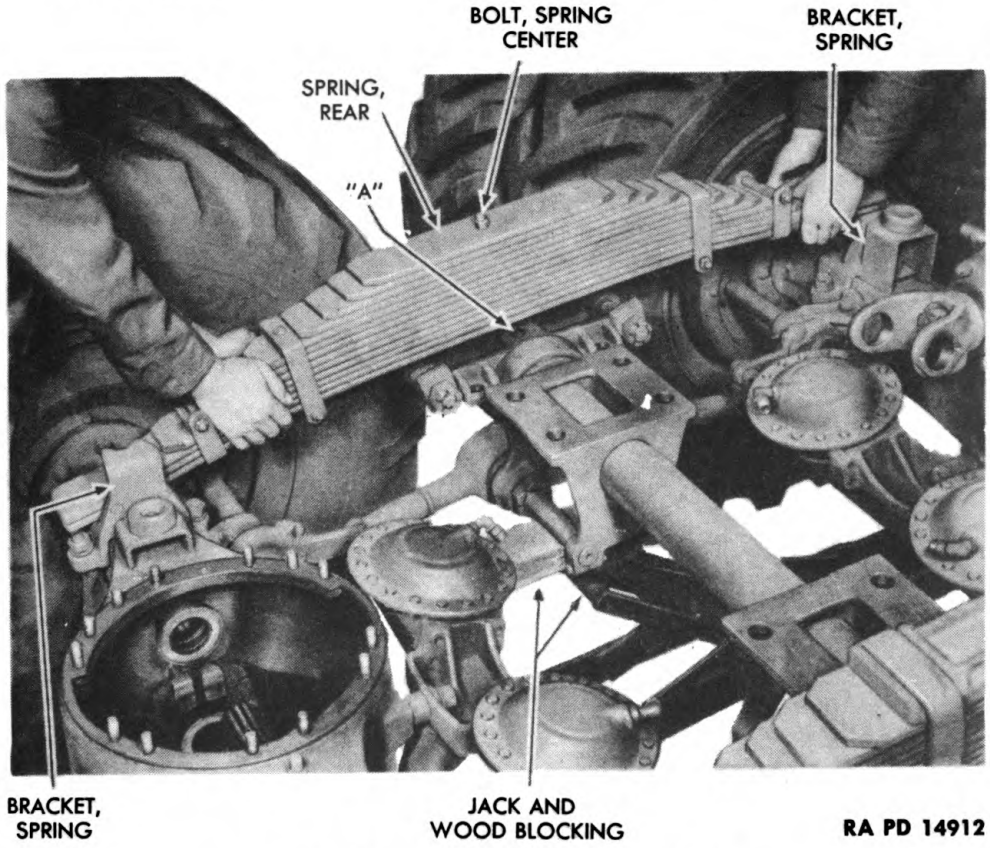


Figure 83—Removing Rear Spring

b. Procedure.

(1) REMOVE FIRST FOUR LEAVES.

DRIFT
HAMMER
WRENCH, box, 9/16-in.

(a) Remove spring center bolt nut (9/16-in. box wrench) and drive spring center bolt (fig. 83) out of spring (hammer and drift). Lift spring center bolt sleeve out of rear spring. Lift off the first four leaves.

(2) REMOVE SPRING LEAF CLIPS.

CHISEL, cold
HAMMER
WRENCH, open-end, ½-in.

(a) Remove spring leaf clip bolt nut (½-in. open-end wrench) (fig. 82). Pull spring leaf clip bolt out of spring leaf clip. Repeat procedure to remove other three spring leaf clips.

(b) Separate rear spring leaves. Cut rivets which hold spring leaf clips to rear spring leaves (hammer and cold chisel).

182. REAR SPRING INSPECTION.

a. Equipment.

SOLVENT, dry-cleaning

b. Procedure.

(1) GENERAL. Wash all parts in SOLVENT, dry-cleaning.

(2) SPRING LEAVES. Inspect all spring leaves for breaks or fractures and, if found, use a new leaf or a new spring assembly.

(3) REAR SPRING CLIPS AND SPRING LEAF CLIPS. Inspect all spring leaf clips and rear spring clips for breaks or fractures and, if found, use new spring leaf clips or rear spring clips.

(4) SPRING CENTER BOLTS. Inspect spring center bolts for fractures or breaks and, if found, use new spring center bolts.

183. ASSEMBLY OF REAR SPRINGS.

a. Equipment.

GREASE, graphite, light
HAMMER
WRENCH, box, 9/16-in.
WRENCH, open-end, ½-in.

b. Procedure.

(1) ASSEMBLE REAR SPRING.

GREASE, graphite, light
HAMMER
WRENCH, box, 9/16-in.
WRENCH, open-end, ½-in.

(a) Coat surface of each leaf with graphite lubricant. Rivet the four spring leaf clips to rear spring leaves (hammer). Assemble rear spring leaves (fig. 83) and rear spring pressure block.

(b) Install spring leaf clip bolt in spring leaf clip. Fasten with spring leaf clip bolt nut (½-in. open-end wrench).

(c) Install spring center bolt sleeve in rear spring. Install spring center bolt in the spring center bolt sleeve. Install spring center bolt nut (9/16-in. box wrench) (fig. 83).

(2) ADJUST SPRING SEAT. Adjust spring seat (TM 9-1795A).

SPRINGS AND SHOCK ABSORBERS

184. REAR SPRING INSTALLATION.

a. Equipment.

BAR, pry
BLOCKS, wooden
JACK, hydraulic
PLIERS
WRENCH, socket, 1⅜-in.
WRENCH, socket, 1⅝-in.

b. Procedure.

(1) INSTALL REAR SPRING.

BAR, pry
BLOCKS, wooden
JACK, hydraulic

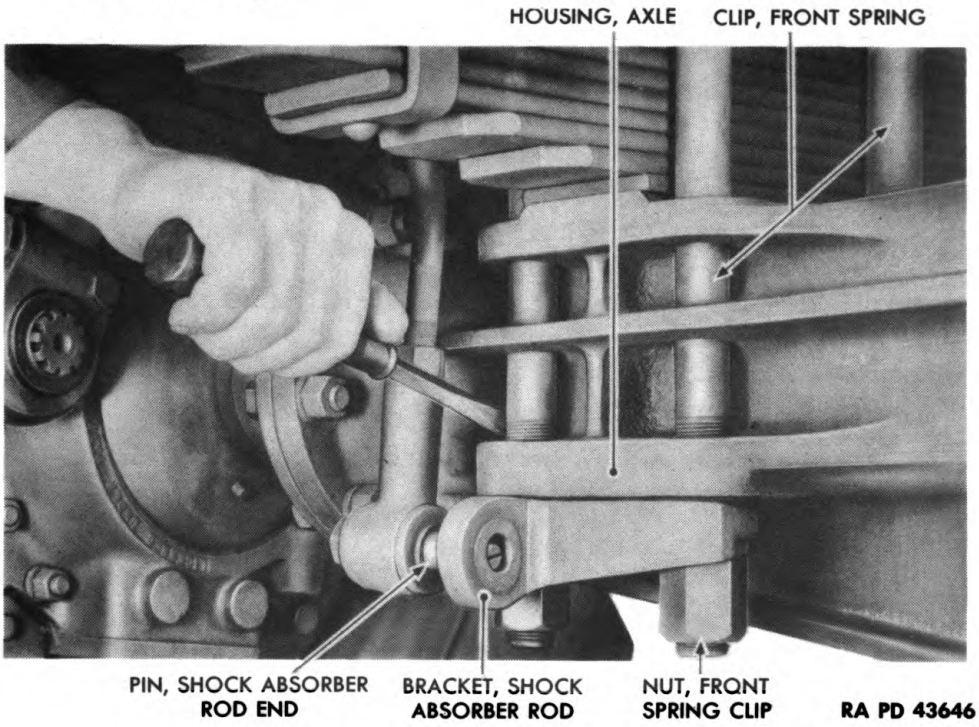


Figure 84—Disconnecting Shock Absorber

(a) Raise bogie with hydraulic jack and wooden blocks.

(b) Install rear spring, forcing two ends of spring under the two spring pad bumper plates on axle housings (fig. 83).

(c) Pry rear spring straight up about one inch and observe whether spring center bolt is in line with its depression ("A," fig. 83) in the spring seat (pry bar). If spring center bolt is not in line with depression in spring seat, force rear spring forward or backward until it is in line.

(d) Remove hydraulic jack and wooden block from under the bogie assembly.

(2) ATTACH REAR SPRING.

PLIERS
WRENCH, socket, 1⅜-in.
WRENCH, socket, 1⅝-in.

(a) Install two rear spring clips (fig. 82) over rear spring pressure block and through spring seat. Install four rear spring clip lock washers and nuts (1⅜-in. socket wrench).

(b) Place two rear spring clamps (fig. 82) against rear spring leaves. Tighten rear spring clamp stud nut (1⅝-in. socket wrench) (fig. 82). Install rear spring clamp stud nut cotter pin (pliers).

185. REAR SPRING ADJUSTMENT.

a. Equipment.

WRENCH, open-end, ½-in.
WRENCH, socket, 1⅜-in.
WRENCH, socket, 1⅝-in.

b. Procedure.

(1) TIGHTEN REAR SPRING CLAMP AND REAR SPRING CLIPS.

WRENCH, socket, 1⅜-in.
WRENCH, socket, 1⅝-in.

(a) Tighten four rear spring clamp stud nuts (fig. 82) after the first 100 miles of wrecker operation, and retighten after every 1,000 miles thereafter (1⅝-in. socket wrench).

(b) Tighten four rear spring clip nuts after first 100 miles of wrecker operation and retighten after every 1,000 miles thereafter (1⅜-in. socket wrench).

(2) TIGHTEN SPRING LEAF CLIPS.

WRENCH, open-end, ½-in.

(a) Tighten spring leaf clip bolt nuts every 500 miles of wrecker operation.

186. FRONT SPRING REMOVAL.

a. Equipment.

BAR, pry
DRIFT
HAMMER
PLIERS
SCREWDRIVER
WRENCH, box, 5/16-in.
WRENCH, box, 1-in.
WRENCH, socket, 1-in.
WRENCH, socket, 1⅜-in.

b. Procedure.

(1) DISCONNECT SHOCK ABSORBER ROD ASSEMBLY (fig. 84).

PLIERS
SCREWDRIVER
WRENCH, socket, 1-in.

(a) Remove cotter pin from shock absorber rod end pin (pliers) (fig. 84). Remove shock absorber rod end pin nut and lock washer

SPRINGS AND SHOCK ABSORBERS

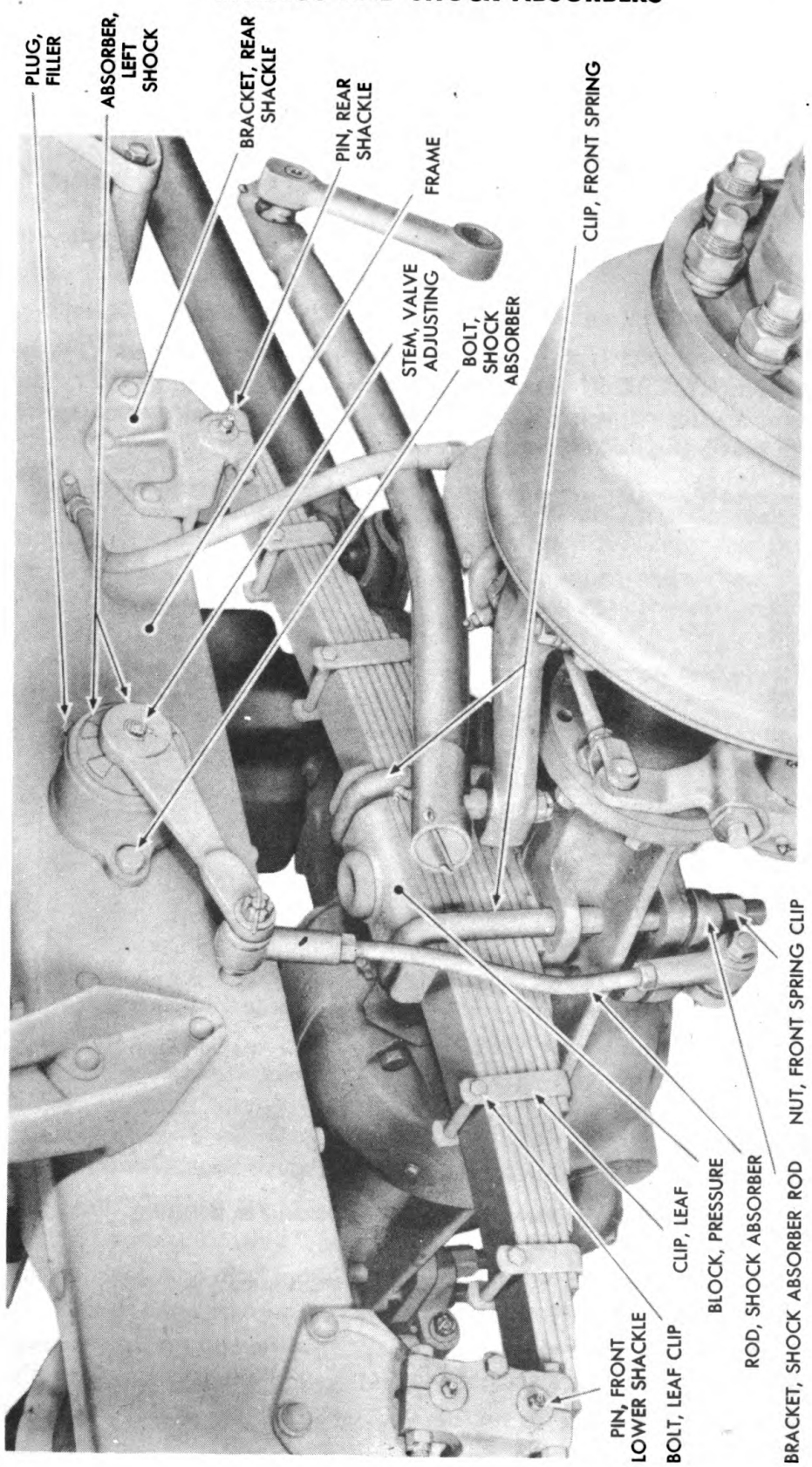


Figure 85—Front Spring

which hold shock absorber to shock absorber rod bracket (1-in. socket wrench) (fig. 84).

(b) Pry shock absorber rod end pin out of shock absorber rod bracket (screwdriver) (fig. 84).

(2) REMOVE FRONT SPRING.

BAR, pry	WRENCH, box, 5/16-in.
DRIFT	WRENCH, box, 1-in.
HAMMER	WRENCH, socket, 1 3/8-in.

(a) Remove four front spring clip nuts and lock washers (1 3/8-in. socket wrench). Lift off shock absorber rod bracket (fig. 84). Pry out two front spring clips from axle housing (pry bar). Lift front spring pressure block (fig. 85) off spring.

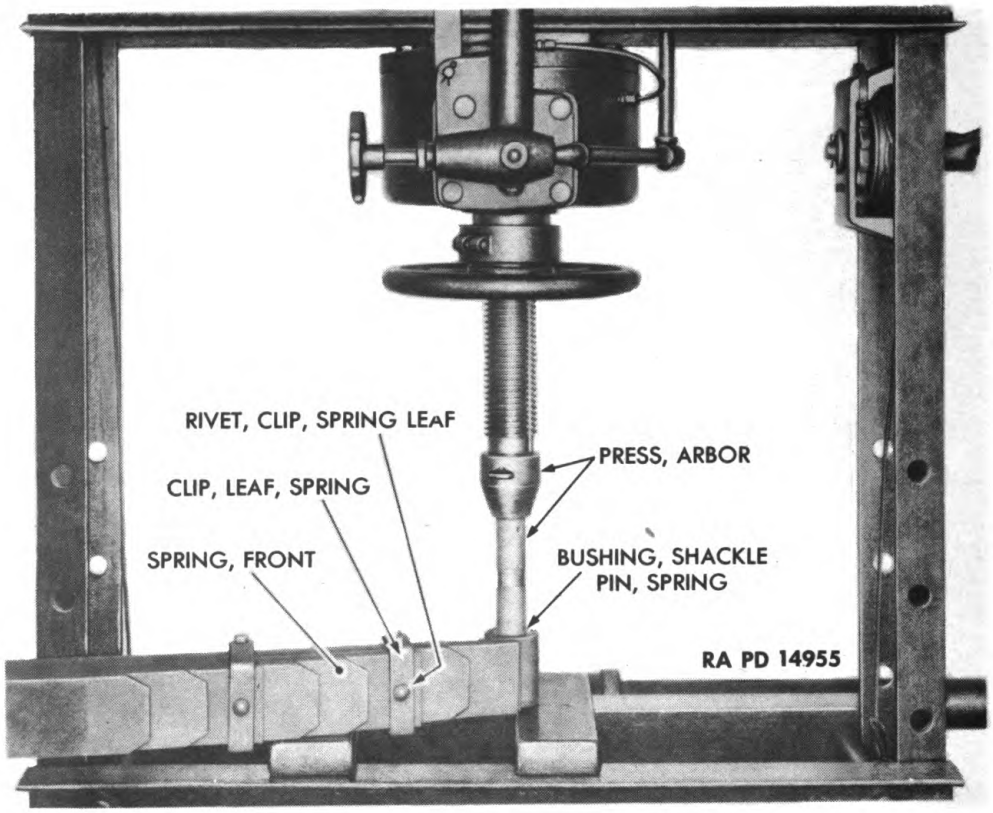


Figure 86—Removing Spring Shackle Pin Bushing

(b) Remove front lower shackle pin clamp bolt and lock washer from shackle (1-in. box wrench).

(c) Drive front lower shackle pin out of shackle and spring (hammer and drift). Remove lubrication fitting (5/16-in. box wrench) (fig. 87).

(d) Repeat procedure to remove rear shackle pin (fig. 85) and lift off front spring.

SPRINGS AND SHOCK ABSORBERS

187. FRONT SPRING DISASSEMBLY.

a. Equipment.

CHISEL, cold	WRENCH, box, 5/16-in.
DRIFT	WRENCH, box, 9/16-in.
HAMMER	WRENCH, open-end, 1/2-in.
PRESS, hydraulic	WRENCH, open-end, 7/8-in.

b. Procedure.

(1) DISASSEMBLE FRONT SPRING.

CHISEL, cold	PRESS, hydraulic
DRIFT	WRENCH, box, 9/16-in.
HAMMER	WRENCH, open-end, 1/2-in.

(a) Remove two spring shackle pin bushings from front spring (hydraulic press) (fig. 86). Repeat procedure to remove opposite spring shackle pin bushing.

(b) Remove spring center bolt nut (9/16-in. box wrench). Drive spring center bolt out of spring (hammer and drift).

(c) Remove spring leaf clip bolt nut (1/2-in. open-end wrench). Pull spring leaf clip bolt out of spring leaf clip (fig. 85). Repeat procedure to remove other three spring leaf clips.

(d) Separate front spring leaves. Cut off four spring leaf clip rivets which hold clips to front spring leaves (hammer and cold chisel).

(2) REMOVE SPRING SHACKLES.

DRIFT	WRENCH, box, 5/16-in.
HAMMER	WRENCH, open-end, 7/8-in.

(a) Remove front upper shackle pin clamp bolt and lock washer out of shackle (7/8-in. open-end wrench) (fig. 87).

(b) Drive front upper shackle pin out of shackle (hammer and drift). Lift shackle off shackle bracket. Remove lubrication fitting (5/16-in. box wrench). NOTE: The front shackle bracket (fig. 87) and rear shackle pin bracket (fig. 85) are riveted to frame.

188. FRONT SPRING INSPECTION.

a. Equipment.

SOLVENT, dry-cleaning

b. Procedure.

(1) GENERAL. Wash all parts in SOLVENT, dry-cleaning.

(2) SPRING LEAVES. Inspect all spring leaves for breaks or fractures and, if found, use a new leaf or a new spring assembly.

(3) SPRING SHACKLE PINS AND BUSHINGS. Inspect spring shackle pins and spring shackle pin bushings for scoring and, if found, use new parts. Slide spring shackle pin in bushing. Pin must be a snug fit with no end play.

(4) SPRING LEAF CLIPS AND FRONT SPRING CLIPS. Inspect spring leaf clips and front spring clips for breaks or fractures and, if found, use new spring leaf clips or front spring clips.

(5) SPRING CENTER BOLTS. Inspect two spring center bolts for fractures and, if found, use new spring center bolt.

189. ASSEMBLY OF FRONT SPRINGS.

a. Equipment.

GREASE, graphite, light
HAMMER
PRESS, hydraulic
WRENCH, box, 9/16-in.
WRENCH, open-end, 1/2-in.

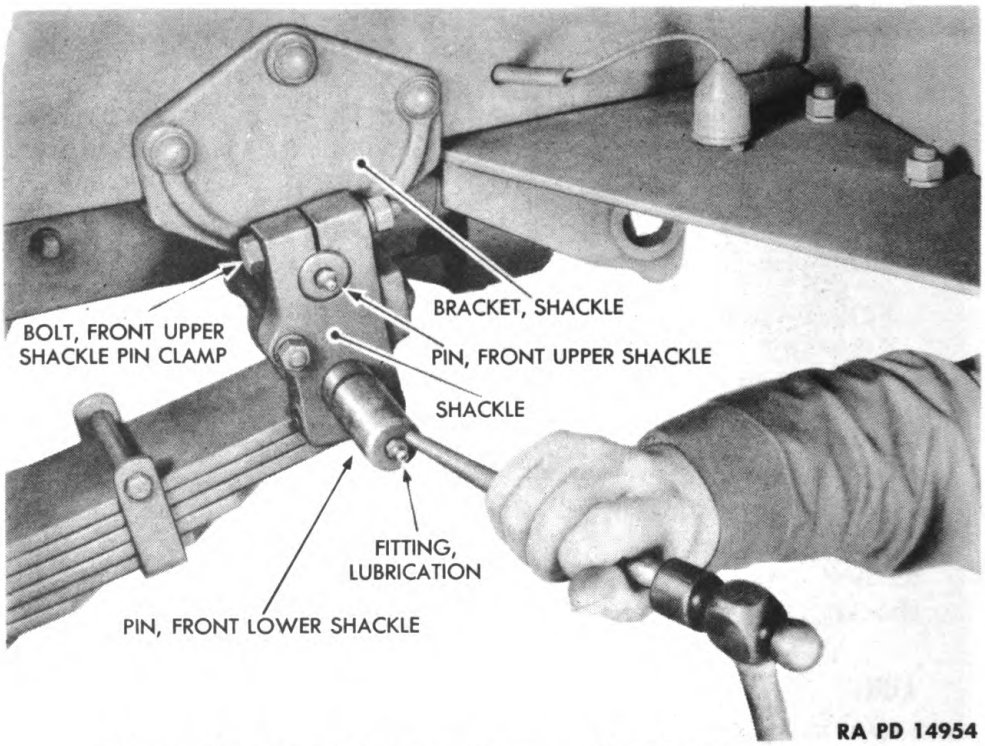


Figure 87—Installing Front Lower Shackle Pin

b. Assemble Front Spring.

(1) Coat surface of each spring leaf with graphite lubricant.

(2) Rivet the four spring leaf clips to spring leaf (hammer) (fig. 85). Assemble spring leaves and install leaf clip bolts and nuts (1/2-in. open-end wrench) (fig. 85). Install spring center bolt and nut (9/16-in. box wrench). Press two spring shackle pin bushings into front spring (hydraulic press) (fig. 86).

SPRINGS AND SHOCK ABSORBERS

190. FRONT SPRING INSTALLATION.

a. Equipment.

DRIFT
HAMMER
PLIERS
WRENCH, box, 5/16-in.
WRENCH, box, 1-in.
WRENCH, open-end, 7/8-in.
WRENCH, socket, 1 3/8-in.

b. Procedure.

(1) INSTALL SPRING SHACKLE.

DRIFT
HAMMER
WRENCH, box, 5/16-in.
WRENCH, open-end, 7/8-in.

(a) Install spring shackle on shackle bracket by driving front upper shackle pin through shackle and bracket (hammer) (fig. 87). Install lubrication fitting (5/16-in. box wrench).

(b) Install front upper shackle pin clamp bolt and lock washer in shackle (7/8-in. open-end wrench).

(2) INSTALL FRONT SPRING (fig. 87).

DRIFT
HAMMER
WRENCH, box, 5/16-in.
WRENCH, box, 1-in.
WRENCH, socket, 1 3/8-in.

(a) Install front spring. Drive front lower shackle pin through shackle and front spring (hammer and drift) (fig. 87). Install lubrication fitting in front lower shackle pin (5/16-in. box wrench).

(b) Install front lower shackle pin clamp bolt and lock washer in shackle (1-in. box wrench).

(c) Repeat procedure *(a)* and *(b)* above to install rear shackle pin.

(d) Install front spring pressure block (fig. 85) on front spring. Install two front spring clips over front spring and on axle housing.

(e) Install shock absorber rod bracket (fig. 85). Install four front spring clip nut lock washers and nuts on front spring clips (1 3/8-in. socket wrench) (fig. 84).

(3) CONNECT SHOCK ABSORBER ROD (fig. 84).

PLIERS
WRENCH, socket, 1-in.

(a) Install shock absorber rod end pin in shock absorber rod bracket (fig. 84). Install shock absorber rod nut on shock absorber rod end pin (1-in. socket wrench). Install shock absorber rod nut cotter pin (pliers).

191. FRONT SPRING ADJUSTMENT.

a. Equipment.

WRENCH, open-end, 1/2-in.
WRENCH, socket, 1 3/8-in.

b. Procedure.

(1) LUBRICATION. Lubricate spring shackle pins.

(2) TIGHTEN SPRING LEAF CLIPS AND FRONT SPRING CLIPS.

WRENCH, open-end, 1/2-in.
WRENCH, socket, 1 3/8-in.

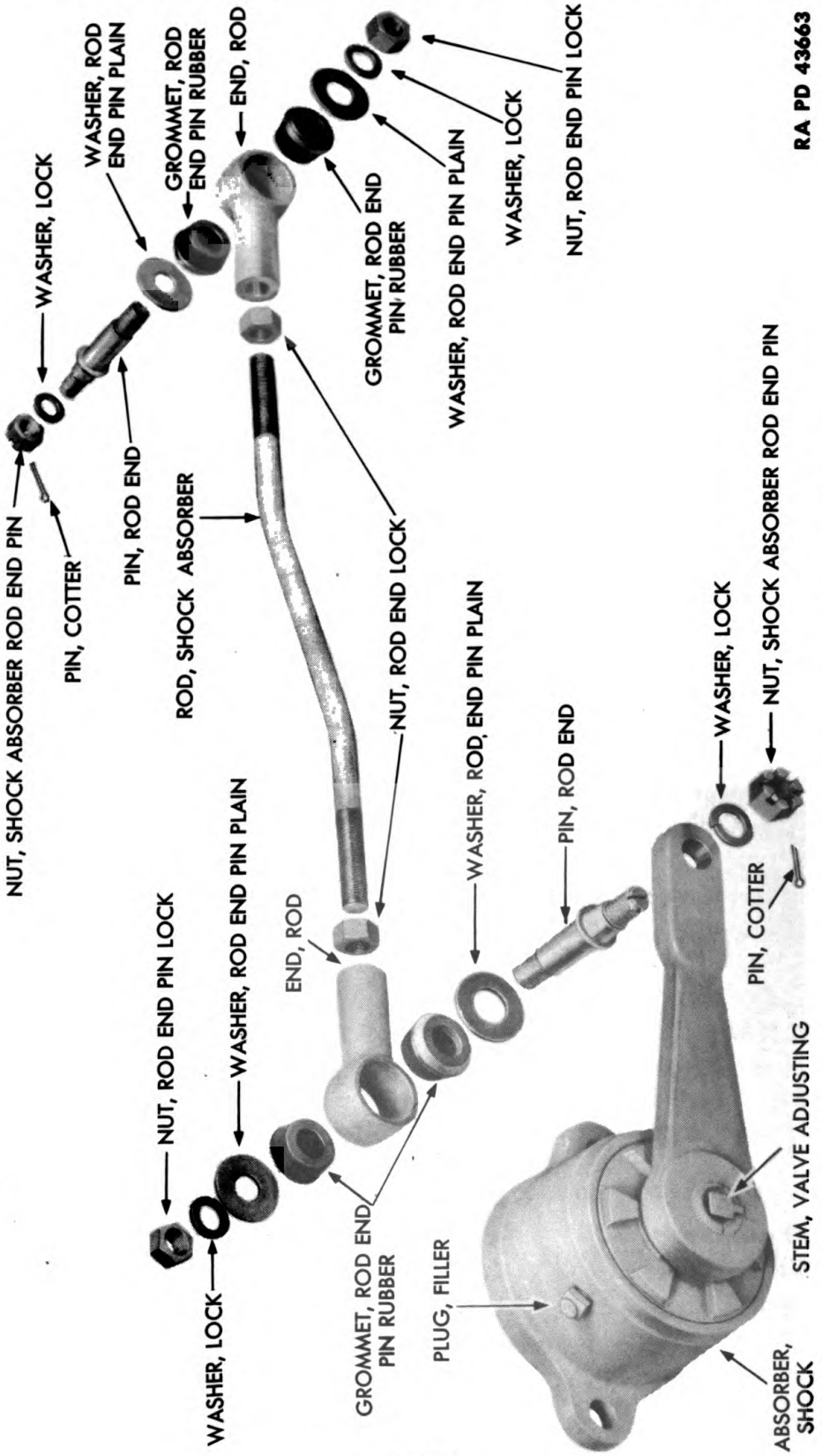


Figure 88—Shock Absorber Rod—Exploded View

(a) Tighten front spring clip nuts (fig. 84) after 100 miles of wrecker operation and retighten after every 1,000 miles thereafter (½-in. open-end wrench).

(b) Tighten spring leaf clip bolt nuts every 500 miles of wrecker operation (1⅜-in. socket wrench).

192. SHOCK ABSORBER REMOVAL AND DISASSEMBLY.

a. Equipment.

DRIFT
HAMMER
PRESS, hydraulic
PULLER
PUNCH
SLEEVE, pipe
SOLVENT, dry-cleaning
VISE
WRENCH, box, 1-in.
WRENCH, open-end, ⅜-in.
WRENCH, open-end, 1-in.

b. Procedure.

(1) REMOVE SHOCK ABSORBER.

WRENCH, open-end, 1-in.

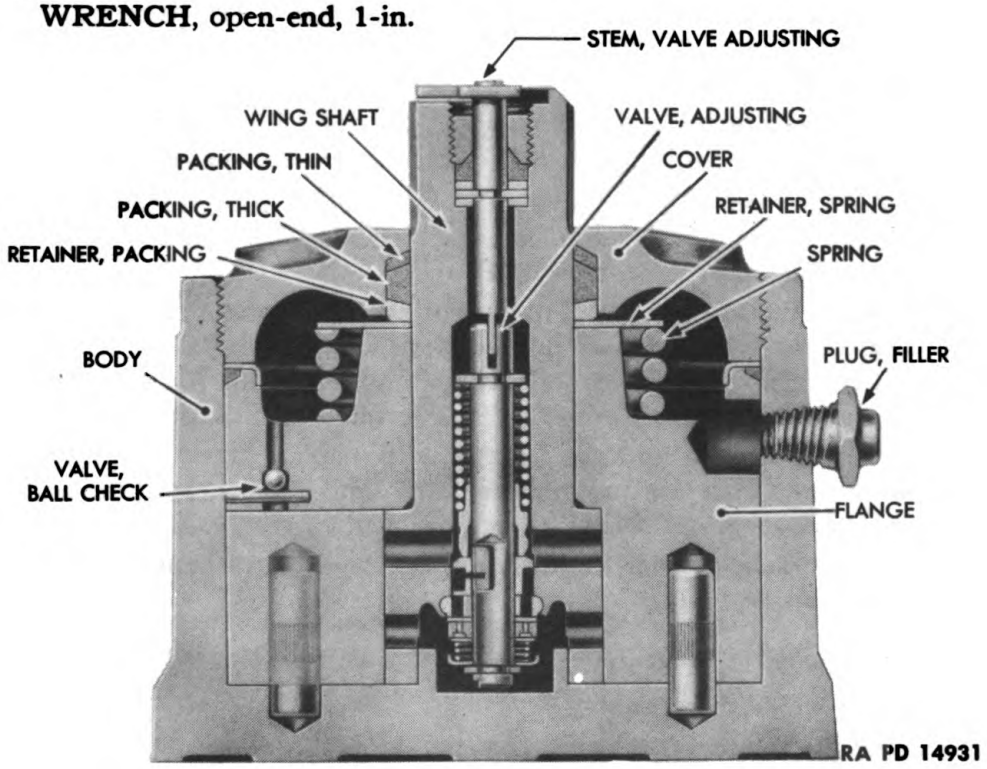


Figure 89—Shock Absorber—Cutaway View

(a) Disconnect lower end of shock absorber rod (par. 186 **b** (1)).

(b) Remove shock absorber bolts (fig. 85), nuts and lock washers which hold shock absorber to frame (1-in. open-end wrench). Lift off shock absorber and shock absorber rod assembly.

(c) Repeat procedure at upper end of shock absorber rod. Lift shock absorber rod assembly off shock absorber.

(2) DISASSEMBLE SHOCK ABSORBER ROD ASSEMBLY (fig. 88).

DRIFT	WRENCH, box, 1-in.
HAMMER	WRENCH, open-end, 1-in.

(a) Remove rod end pin lock nut, lock washer and plain washer (1-in. box wrench).

(b) Drive rod end pin out of rod end (hammer and drift). Slide rod end pin plain washer off rod end pin.

(c) Pull the two rod end pin rubber grommets out of rod end.

(d) Loosen rod end lock nut (1-in. open-end wrench). Unscrew rod end. Remove rod end lock nut from rod.

(e) Repeat procedure *(a)*, *(b)*, *(c)*, and *(d)* at opposite end of shock absorber rod assembly.

(3) DISASSEMBLE SHOCK ABSORBER.

HAMMER	SLEEVE, pipe
PRESS, hydraulic	SOLVENT, dry-cleaning
PULLER	VISE
PUNCH	WRENCH, open-end, 3/8-in.

(a) Remove filler plug (3/8-in. open-end wrench) and drain fluid from shock absorber.

(b) Attach puller to lever with short piece of pipe resting on wing shaft, between wing shaft and puller screw, to avoid damage to adjusting valve. Pull lever from wing shaft.

(c) Clamp body of shock absorber in vise and loosen threaded cover in body, using hammer and punch to unscrew cover. Do not remove cover. Leave last two or three threads engaged with body, otherwise spring pressure will cause cover to fly out when threads are disengaged.

(d) Place unit in hydraulic press, with ram of press resting lightly against cover. Unscrew cover from body and release hydraulic press slowly. Remove shock absorber from hydraulic press.

(e) Turn shock absorber over and tap on edge of bench to remove parts from inside body.

(4) INSPECT DISASSEMBLED SHOCK ABSORBER.

SOLVENT, dry-cleaning

(a) Wash all parts, and inside of body, with SOLVENT, dry-cleaning.

(b) Inspect body for cracks and score marks. Replace, if damaged.

(c) Use new oil seals when assembling.

(5) ASSEMBLE SHOCK ABSORBER.

HAMMER	PUNCH
PRESS, hydraulic	WRENCH, open-end, 3/8-in.

(a) Install wing shaft in body.

(b) Install flange over wing shaft, entering dowel pin in hole. Tap flange in place (hammer).

(c) Install new gasket around outside diameter of flange and hold in place with flanged washer installed with rim downward.

(d) Install spring, spring retainer and oil seal packing over wing shaft.

(e) Place cover on spring retainer and press down to body, using hydraulic press. Engage threads of cover with body and tighten cover (hammer and punch).

(f) Install shock absorber lever to wing shaft, using hydraulic press.

(g) Install heavy shock absorber fluid and install filler plug (3/8-in. open-end wrench).

193. SHOCK ABSORBER INSPECTION.

a. Equipment.

WRENCH, adjustable

b. Procedure.

(1) SHOCK ABSORBER.

WRENCH, adjustable

(a) Inspection of level of shock absorber fluid can be made when shock absorber is on wrecker or after it has been removed. Remove filler plug (wrench, adjustable) (fig. 85). Level of shock absorber fluid must not be lower than 1/2 inch below filler plug opening, and shock absorber fluid can completely fill shock absorber without harm.

(2) ROD END PIN RUBBER GROMMETS. Inspect four rod end pin rubber grommets for cracks and, if found, use new grommets.

194. SHOCK ABSORBER INSTALLATION.

a. Equipment.

HAMMER
WRENCH, box, 1-in.
WRENCH, open-end, 1-in.

b. Procedure.

(1) ASSEMBLE SHOCK ABSORBER ROD.

HAMMER
WRENCH, box, 1-in.

(a) Install rod end lock nut on rod. Screw rod end on rod (fig. 88). Do not tighten rod end lock nut at this time.

(b) Install two rod end pin rubber grommets in rod end.

(c) Slide rod end pin plain washer on rod end. Drive rod end pin in rod end (hammer).

(d) Install rod end pin plain washer, lock washer and lock nut (1-in. box wrench).

(e) Repeat procedure *(a)*, *(b)*, *(c)*, and *(d)* to assemble opposite end of shock absorber rod assembly.

(2) INSTALL SHOCK ABSORBER.

WRENCH, open-end, 1-in.

(a) Install shock absorber on frame and fasten with two shock absorber bolts, lock washers and nuts (1-in. open-end wrench) (fig. 85). NOTE: The shock absorber filler plug must be toward the rear. Do not reverse position of two shock absorbers or they will not work.

(b) Connect lower end of shock absorber rod (par. 190 **b** (2) and (3)). Turn shock absorber rod upper end until over-all measurement of rod is 19 inches. Then tighten the two rod end lock nuts with 1-inch open-end wrench.

(c) Repeat connecting procedure in *(b)* above at upper end of shock absorber rod.

195. SHOCK ABSORBER ADJUSTMENT.

a. Equipment.

WRENCH, adjustable.

b. Adjust Shock Absorber.

(1) Examine level of shock absorber fluid (par. 193 **b** (1)).

(2) Drive wrecker over a bumpy road and observe action of shock absorbers. If the wrecker bottoms, it indicates that the shock absorbers need tightening. If action of front end of wrecker is too stiff, it indicates that shock absorbers need loosening.

(3) Use an adjustable wrench and turn the valve adjusting stem (fig. 89) counterclockwise to decrease stiffness of action and clockwise to increase stiffness of action.

CHAPTER 7
STEERING GEAR AND DRAG LINK

Section I
GENERAL

196. GENERAL.

a. The steering gear assembly is mounted on the left side of the frame. A steering arm at the lower end of the steering tube is connected to one end of the drag link assembly. The opposite end of the drag link assembly is attached to the left steering knuckle of the front axle. The action of turning the steering wheel (at the upper end of the steering tube) rotates the steering tube, turning the steering arm and the front wheels.

b. Adjustment of the steering gear and drag link can be accomplished without removal from the wrecker.

c. Procedure covering the horn button is covered in TM 9-1795B.

197. SPECIFICATIONS AND DATA.

a. Steering Gear Assembly.

Model	Ross T 74
Type	Cam and lever
Gear ratio	Straight ahead driving 23 to 1—Parking 27 to 1

b. Bearings.

Cam	Ball
Stud roller bearing units	Tapered roller
Lever shaft	Bronze
Wheel tube	Ball
Cam thrust bearings	Test 1 to 2 lb pull on rim of steering wheel
Backlash of tapered studs in cam groove	Slight drag over tightest spot
Stud roller bearing units	5 to 11 in. lb torque
Wheel-tube bearing	Spring tension of ball type
Clearance between lever shaft and bushings	0.003- to 0.005-in.

c. Drag Link Assembly.

Model	Superior Universal
Type	Adjustable socket
Weight	15 lb

d. Steering Wheel.

Type	4-spoke, 20-in.

198. REFERENCE TO TM 9-795.

a. Many second echelon operations covered in TM 9-795 are often done by ordnance personnel. Reference should be made to TM 9-795 for lower echelon operations not covered in this manual.

199. ECHELON BREAKDOWN OF MAINTENANCE OPERATIONS.

(Refer to par. 4.)

Section II

TROUBLE SHOOTING

200. TROUBLE SHOOTING, INSPECTION AND REMEDIAL MEASURES.

a. The following chart is provided as a guide to common troubles and their causes, and it is a recommended procedure for inspection to locate the cause.

Symptom and Probable Cause	Probable Remedy
b. Shimmy.	
(1) Wheel and tire out of balance.	(1) Balance wheel and tire (TM 9-1795A).
(2) Drag link loose.	(2) Adjust drag link (par. 214).
(3) Backlash of stud in cam groove.	(3) Adjust backlash (par. 207 **b** (2)).
(4) Worn steering gear parts.	(4) Inspect steering gear parts (par. 204).
c. Wander.	
(1) Drag link loose.	(1) Adjust drag link (par. 214).
(2) Worn steering gear parts.	(2) Inspect steering gear parts (par. 204).
d. Road Shock Felt at Steering Wheel.	
(1) Drag link too tight.	(1) Adjust drag link (par. 214).
(2) Stud in cam groove adjustment, too tight.	(2) Adjust backlash (par. 207 **b** (2)).
e. Hard Steering.	
(1) Lack of lubrication.	(1) Lubricate steering gear (par. 207 **b** (3) *(e)*).
(2) Worn steering gear parts.	(2) Inspect steering gear parts (par. 204).

ORDNANCE MAINTENANCE
BODY AND CHASSIS FOR HEAVY WRECKING TRUCK M1

Section III

STEERING GEAR ASSEMBLY

201. GENERAL.

a. Adjustment or overhaul of steering gear should not be started until a front end alinement check has been completed (TM 9-1795A) and front wheel bearings adjusted (TM 9-1795A). If the wrecker has had an accident which might have sprung the frame, check the frame (pars. 165 and 166).

202. STEERING GEAR ASSEMBLY REMOVAL.

a. Equipment.

HAMMER	PUNCH, prick
HAMMER, soft	WRENCH, open-end, 5/8-in.
PLIERS	WRENCH, socket, 15/16-in.
PULLER, steering wheel	WRENCH, socket, 1 1/2-in.

b. Procedure.

(1) DISCONNECT STEERING ARM.

HAMMER	PUNCH, prick
HAMMER, soft	WRENCH, socket, 1 1/2-in.
PLIERS	

(a) Lift hood and remove steering arm nut cotter pin (pliers). Remove steering arm nut which holds steering arm on lever shaft (1 1/2-in. socket wrench).

(b) Mark location of steering arm on lever shaft (prick punch and hammer). Drive steering arm off lever shaft (soft hammer). The blows of the soft hammer on steering arm must be light to avoid damage to bearings.

(2) DISCONNECT STEERING GEAR (fig. 90).

WRENCH, open-end, 5/8-in.	WRENCH, socket, 15/16-in.

(a) Remove steering gear clamp bolt palnut, clamp bolt nut and clamp bolt (5/8-in. open-end wrench) (fig. 90).

STEERING GEAR ASSEMBLY

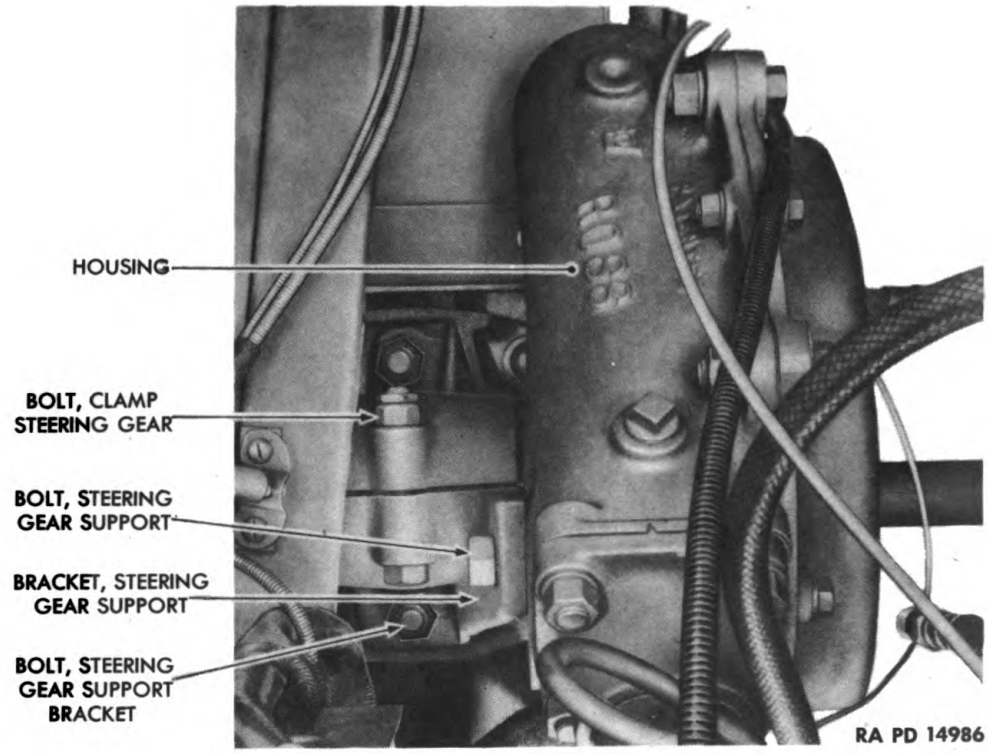


Figure 90—Steering Gear Mounting

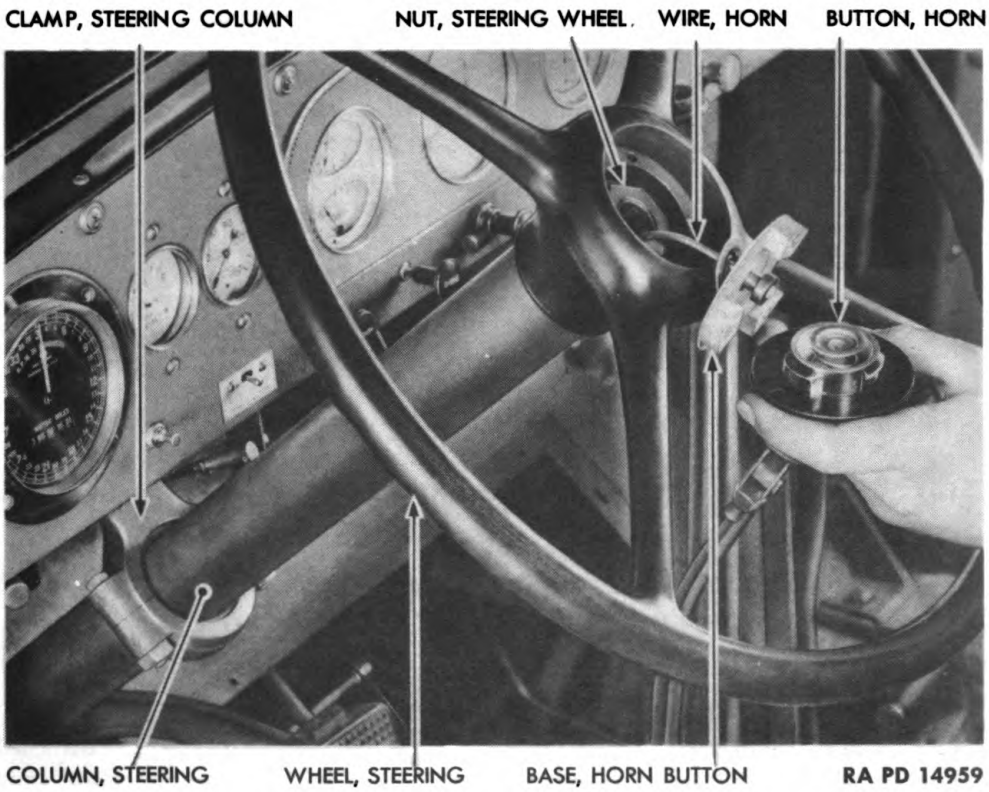


Figure 91—Steering Column Clamp

(b) Remove steering gear support bracket bolt ($1\frac{5}{16}$-in. open-end wrench).

(c) Remove floor board (par. 225 **b** (9)).

(d) From inside cab, remove two steering column clamp nuts and lock washers ($\frac{5}{8}$-in. open-end wrench). Lift steering column clamp (fig. 91) and steering column clamp gasket off steering column.

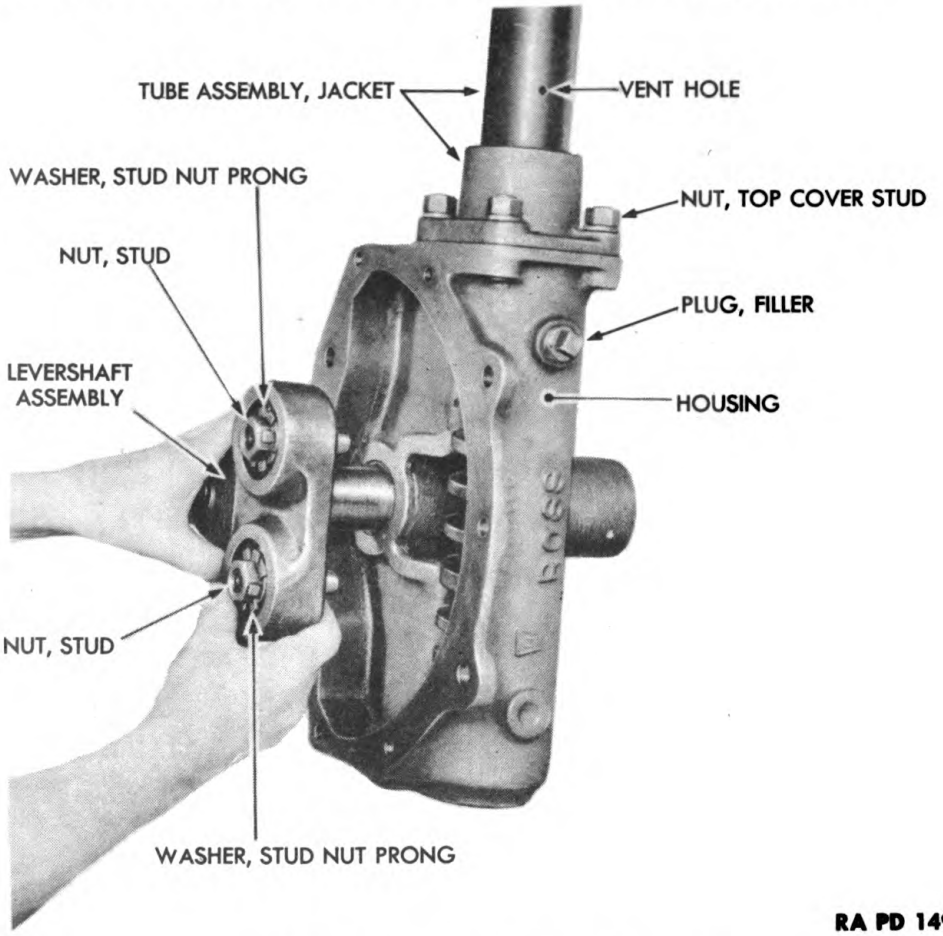


Figure 92—Lever Shaft Assembly

(3) REMOVE STEERING GEAR ASSEMBLY.

PULLER, steering wheel WRENCH, socket, $1\frac{1}{2}$-in.

(a) Remove horn button and horn button base with horn wire. Push horn button down, and turn it one-quarter turn to remove.

(b) Remove steering wheel nut ($1\frac{1}{2}$-in. socket wrench). Remove steering wheel (puller).

(c) Face toward inside of steering gear housing and twist and pull forward on steering gear assembly until it is loose from steering gear bracket (fig. 90). Lift out steering gear assembly.

(4) REMOVE STEERING GEAR BRACKET.

WRENCH, socket, $^{15}/_{16}$-in.

(a) Remove two steering gear support bracket palnuts, nuts and bolts. Lift steering gear support bracket from frame.

203. STEERING GEAR DISASSEMBLY.

a. Equipment.

HAMMER, soft	WRENCH, open-end, $^{5}/_{16}$-in.
PRESS, hydraulic	WRENCH, open-end, $^{9}/_{16}$-in.
SCREWDRIVER	WRENCH, open-end, $^{3}/_{4}$-in.
WRENCH, box, $^{15}/_{16}$-in.	WRENCH, open-end, $1^{1}/_{4}$-in.

b. Procedure.

(1) REMOVE LEVER SHAFT.

SCREWDRIVER	WRENCH, open-end, $^{3}/_{4}$-in.
WRENCH, open-end, $^{5}/_{16}$-in.	WRENCH, open-end, $1^{1}/_{4}$-in.
WRENCH, open-end, $^{9}/_{16}$-in.	

(a) Loosen adjusting screw lock nut ($1^{1}/_{4}$-in. open-end wrench). Turn adjusting screw counterclockwise about three turns (screwdriver) (fig. 95).

(b) Remove four cover bolts, nuts and lock washers ($^{9}/_{16}$-in. open-end wrench). Remove two cover cap screws and lock washers ($^{3}/_{4}$-in. open-end wrench). Remove four cover bolts, nuts and lock washers ($^{5}/_{16}$-in. open-end wrench) (figs. 93 and 93A).

(c) Lift cover and cover gasket off housing. Remove the adjusting screw lock nut, adjusting screw and gasket from cover. Remove filler plug ($^{5}/_{16}$-in. open-end wrench) (figs. 93 and 93A).

(d) Pull lever shaft assembly out of housing.

(2) DISASSEMBLE LEVER SHAFT ASSEMBLY (fig. 92 and fig. 94).

PRESS, hydraulic	WRENCH, box, $^{15}/_{16}$-in.

(a) Bend down prong of stud nut prong washer (fig. 92). Remove stud nut ($^{15}/_{16}$-in. box wrench).

(b) Place lever shaft assembly in hydraulic press with threaded end of stud up. Press stud out of lever shaft (hydraulic press). Catch the 28 bearing rollers as stud is being pressed out of lever shaft. Pull small cup out of lever shaft (fig. 94).

(c) Press large cup out of lever shaft (hydraulic press).

(d) Repeat procedure *(a)*, *(b)* and *(c)* to remove other stud.

(3) REMOVE JACKET TUBE ASSEMBLY.

SCREWDRIVER	WRENCH, open-end, $^{3}/_{4}$-in.

(a) Remove four top cover stud nuts ($^{3}/_{4}$-in. open-end wrench) (12, fig. 93) and lock washers.

(b) Pull wheel tube bearing spring (3, fig. 93) and upper spring seat (4, fig. 93) out of the top of jacket tube. Pry the wheel tube bearing cup (6, fig. 93) out of top of jacket tube.

(c) Pry snap ring (10, fig. 93) off lower spring seat (screwdriver) (5, fig. 93). Pull off retaining ring (9, fig. 93) and felt (8, fig. 93). Lift out lower spring seat and balls (fig. 93) from bearing cup (6, fig. 93).

(d) Pull jacket tube assembly (11, fig. 93) off wheel tube (17, fig. 93). Lift adjusting shims (21, fig. 93) off housing. NOTE: Top cover is welded to jacket tube.

(4) REMOVE CAM AND WHEEL TUBE ASSEMBLY.

SCREWDRIVER

(a) Remove snap ring (14, fig. 93) from upper ball cup (screwdriver) (15, fig. 93) and pull wheel tube (17, fig. 93) out of top of housing. Catch 14 balls as upper ball cup is pulled out of housing. Slide upper ball cup and snap ring off wheel tube.

(b) Remove snap ring (20, fig. 93) and 14 balls from lower ball cup (19, fig. 93) (screwdriver) and pull cam and wheel tube out of housing. Lift lower ball cup and snap ring out of housing. NOTE: Cam cannot be removed from wheel tube.

(5) DISASSEMBLE HOUSING.

HAMMER, soft
PRESS, hydraulic
WRENCH, open-end, $\frac{9}{16}$-in.

(a) Drive lower end cover and oil seal tube (33, fig. 93) out of lower end of housing (soft hammer).

(b) Press lever shaft inner and outer bushing (29, fig. 93) out of housing (hydraulic press). Remove drain plug and filler plug from housing ($\frac{9}{16}$-in. open-end wrench).

204. STEERING GEAR ASSEMBLY INSPECTION.

a. Equipment.

MICROMETER
PRESS, hydraulic
SOLVENT, dry-cleaning

b. Procedure.

(1) GENERAL. Wash all parts in SOLVENT, dry-cleaning.

(2) CAM AND WHEEL TUBE. Inspect threads of cam for chipping or scoring and, if found, use new cam and wheel tube. NOTE: The cam thread is copper-plated for initial service and if some of the copper plate has been worn off no harm will result.

(3) BALL CUPS AND BALLS. Inspect upper ball cup and lower ball cup for chipping, flat spots or scoring. Then inspect 28 balls for flat spots or chipping. Replace all parts that are chipped, scored or have flat spots.

(4) LEVER SHAFT.

(a) Inspect lever shaft at all bearing points for scoring. Inspect splines for twisted condition and wear due to loose steering arm. Inspect lever shaft threads for burs or stripping.

(b) If any of conditions in *(a)* above are found, use new lever shaft.

(5) LEVER SHAFT BUSHINGS.

MICROMETER
PRESS, hydraulic

(a) Inspect lever shaft inner bushing and lever shaft outer bushing for scoring. Install lever shaft in bushings and try for side play.

(b) If inspection shows scoring or side play, use new lever shaft bushings.

(c) If new lever shaft bushings are necessary, lever shaft must be measured with micrometers, and lever shaft bushings line-reamed to 0.0005 inch over the size of lever shaft.

(6) LOWER END COVER AND OIL SEAL TUBE.

(a) Inspect lower end cover and oil seal tube for distortion. Install lower end cover and oil seal tube in housing. Lower end cover must be a tight fit and oil seal tube must be straight.

(b) If inspection shows oil seal tube to be bent or lower end cover to be loose in housing, replace tube.

(7) WHEEL TUBE BEARING. Inspect wheel tube bearing for scoring and, if found, use new bearing.

205. ASSEMBLY OF STEERING GEAR ASSEMBLY.

a. Equipment.

GREASE, general purpose, seasonal grade
HAMMER
HAMMER, soft
PRESS, hydraulic
SCREWDRIVER
WRENCH, box, $^{15}/_{16}$-in.
WRENCH, open-end, $^{5}/_{16}$-in.
WRENCHES, open-end, two, $^{9}/_{16}$-in.
WRENCHES, open-end, two, $^{3}/_{4}$-in.
WRENCH, open-end, $1^{1}/_{4}$-in.

b. Procedure.

(1) ASSEMBLE HOUSING.

PRESS, hydraulic
WRENCH, open-end, $^{9}/_{16}$-in.

(a) Install drain plug (34, fig. 93) and filler plug (23, fig. 93) in housing ($^{9}/_{16}$-in. open-end wrench).

(b) Press lever shaft inner bushing (29, fig. 93) and outer bushing in housing (hydraulic press). NOTE: If new lever shaft bushings are being used, see paragraph 204 **b** (5) *(c)*.

(2) INSTALL CAM AND WHEEL TUBE.

GREASE, general purpose, seasonal grade
HAMMER, soft

ORDNANCE MAINTENANCE
BODY AND CHASSIS FOR HEAVY WRECKING TRUCK M1

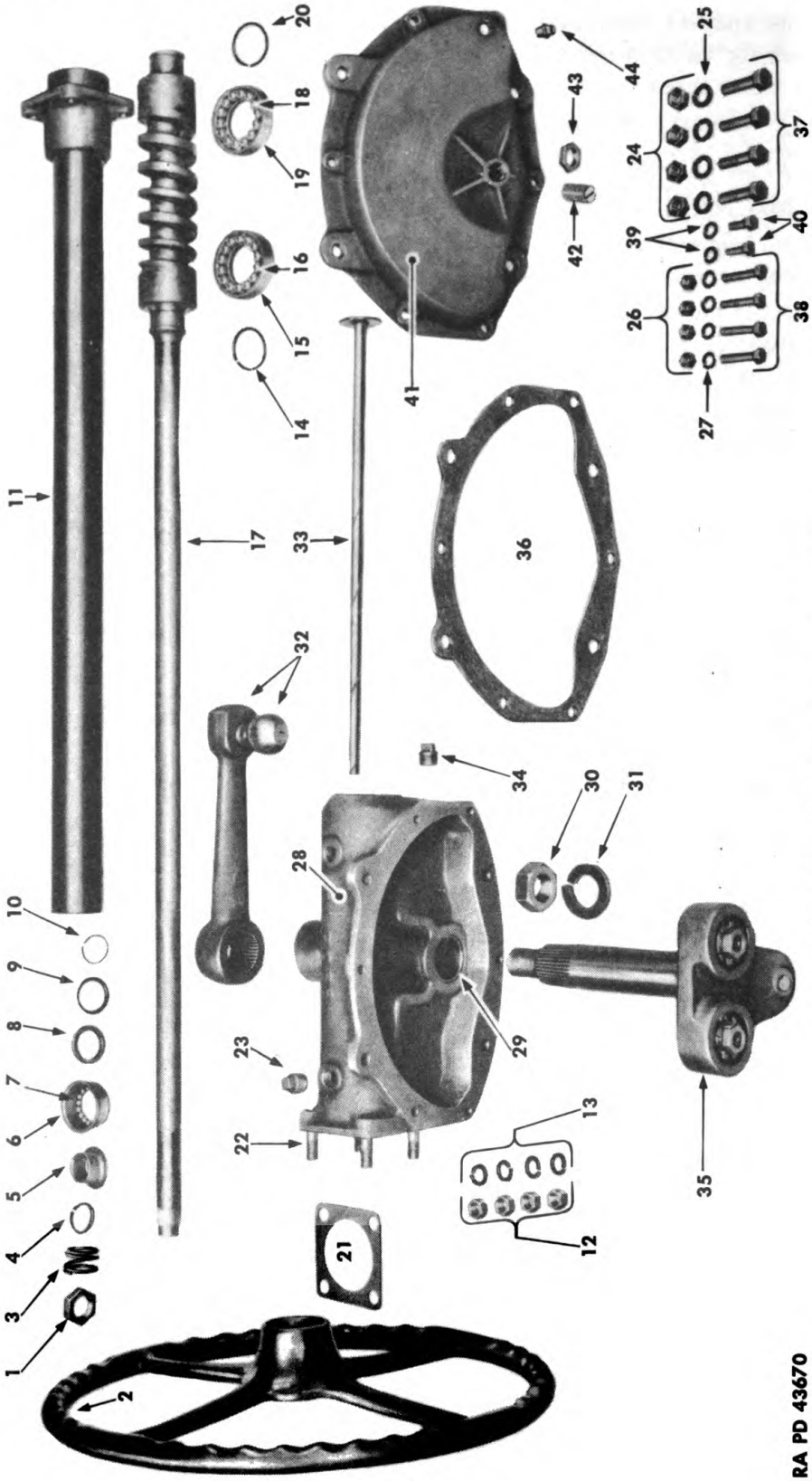
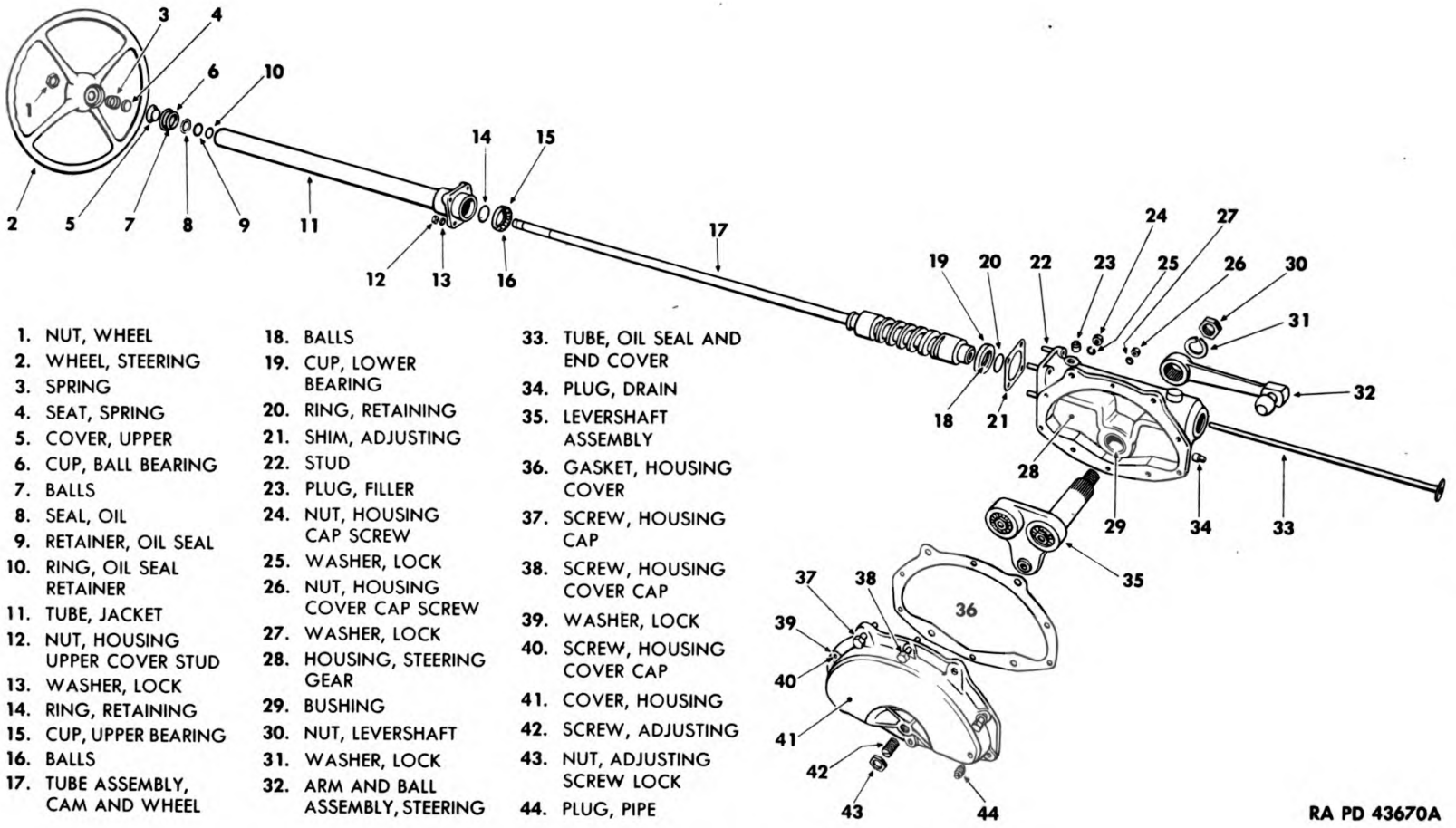


Figure 93—Steering Gear Assembly



1. NUT, WHEEL
2. WHEEL, STEERING
3. SPRING
4. SEAT, SPRING
5. COVER, UPPER
6. CUP, BALL BEARING
7. BALLS
8. SEAL, OIL
9. RETAINER, OIL SEAL
10. RING, OIL SEAL RETAINER
11. TUBE, JACKET
12. NUT, HOUSING UPPER COVER STUD
13. WASHER, LOCK
14. RING, RETAINING
15. CUP, UPPER BEARING
16. BALLS
17. TUBE ASSEMBLY, CAM AND WHEEL
18. BALLS
19. CUP, LOWER BEARING
20. RING, RETAINING
21. SHIM, ADJUSTING
22. STUD
23. PLUG, FILLER
24. NUT, HOUSING CAP SCREW
25. WASHER, LOCK
26. NUT, HOUSING COVER CAP SCREW
27. WASHER, LOCK
28. HOUSING, STEERING GEAR
29. BUSHING
30. NUT, LEVERSHAFT
31. WASHER, LOCK
32. ARM AND BALL ASSEMBLY, STEERING
33. TUBE, OIL SEAL AND END COVER
34. PLUG, DRAIN
35. LEVERSHAFT ASSEMBLY
36. GASKET, HOUSING COVER
37. SCREW, HOUSING CAP
38. SCREW, HOUSING COVER CAP
39. WASHER, LOCK
40. SCREW, HOUSING COVER CAP
41. COVER, HOUSING
42. SCREW, ADJUSTING
43. NUT, ADJUSTING SCREW LOCK
44. PLUG, PIPE

Figure 93A—Steering Gear Assembly

ORDNANCE MAINTENANCE
BODY AND CHASSIS FOR HEAVY WRECKING TRUCK M1

(a) Start cam and wheel tube (17, fig. 93) into housing. Pack lower ball cup (19, fig. 93) with lubricant and install 14 balls (18, fig. 93) in lower ball cup.

(b) Install lower ball cup on lower end of wheel tube. Install snap ring (20, fig. 93).

(c) Pack upper ball cup (15, fig. 93) with lubricant and slide it on wheel tube. Install 14 balls in upper ball cup. Tap cup into housing (soft hammer). Install snap ring (14, fig. 93).

(d) Install lower end cover and oil seal tube (33, fig. 93) in lower end of housing.

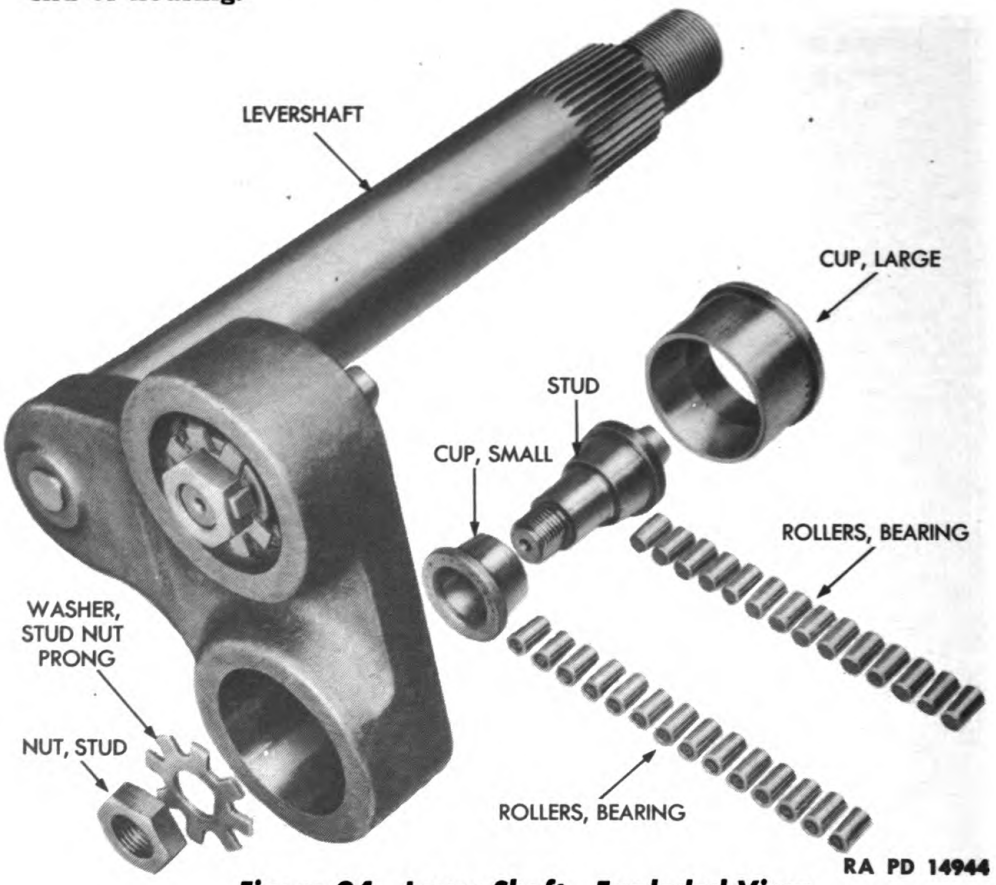


Figure 94—Lever Shaft—Exploded View

(3) INSTALL JACKET TUBE ASSEMBLY.

GREASE, general purpose, seasonal grade
WRENCH, open-end, 3/4-in.

(a) Pack bearing cup (6, fig. 93) with lubricant. Place balls (7, fig. 93) in bearing cup.

(b) Install lower spring seat (5, fig. 93) in bearing cup. Install felt (8, fig. 93) and retaining washer (9, fig. 93) on lower spring seat. Install snap ring (10, fig. 93) on lower spring seat.

(c) Press wheel tube bearing into top of jacket tube. The flange must be against the tube end uniformly.

(d) Install the adjusting shims (21, fig. 93) on housing. Slide jacket tube assembly on wheel tube.

(e) Aline adjusting shims with top cover and install four top cover stud nuts and lock washers (3/4-in. open-end wrench).

(4) ASSEMBLE LEVER SHAFT (fig. 94).

GREASE, general purpose, seasonal grade
HAMMER
PRESS, hydraulic
SCREWDRIVER
WRENCH, box, 15/16-in.

(a) Install large bearing cup in lever shaft. Pack bearing cup with lubricant (fig. 94).

(b) Install 14 bearing rollers in each side of bearing cup (fig. 94) and press stud in place (hydraulic press).

(c) Install stud nut (15/16-in. box wrench) and prong washer. There should be a heavy drag on the bearings when the stud is being turned. NOTE: It should require a torque of 5 to 11 inch-pounds to revolve the stud.

(d) Bend one prong of washer against stud nut (screwdriver and hammer).

(5) INSTALL LEVER SHAFT.

WRENCH, open-end, 5/16-in.
WRENCHES, open-end, two, 9/16-in.
WRENCHES, open-end, two, 3/4-in.
WRENCH, open-end, 1 1/4-in.

(a) Install lever shaft assembly in housing. Install cover gasket and cover on housing (fig. 92).

(b) Install filler plug (44, fig. 93) in the cover (5/16-in. open-end wrench) (fig. 92).

(c) Using two 9/16-inch open-end wrenches, install the four cover bolts, lock washers and nuts. Using one 9/16-inch open-end wrench, install the two cover cap screws. Then using two 3/4-inch open-end wrenches, install the four cover bolts, lock washers and nuts (fig. 93).

(d) Install adjusting screw and adjusting screw nut (1 1/4-in. open-end wrench and screwdriver) (fig. 95).

206. STEERING GEAR ASSEMBLY INSTALLATION.

a. Equipment.

WRENCH, open-end, 5/8-in.
WRENCH, socket, 15/16-in.
WRENCH, socket, 1 1/2-in.

b. Procedure.

(1) INSTALL STEERING GEAR BRACKET.

WRENCH, socket, 15/16-in.

(a) Install the steering gear bracket on frame (fig. 90). Install steering gear support bracket bolts, nuts and palnuts.

(2) INSTALL STEERING GEAR ASSEMBLY.

WRENCH, socket, 1½-in.

(a) Face toward inside of steering gear housing and install steering gear in steering gear bracket by twisting and pushing it into place.

(b) Install wheel tube bearing spring (3, fig. 93) on spring seat (flange of spring seat must be against spring). Install spring seat in jacket tube (spring upward).

(c) Install steering wheel on wheel tube. Install steering wheel nut (1½-in. socket wrench) (1, fig. 93).

(d) Install horn button base with wire, and install horn button (fig. 91).

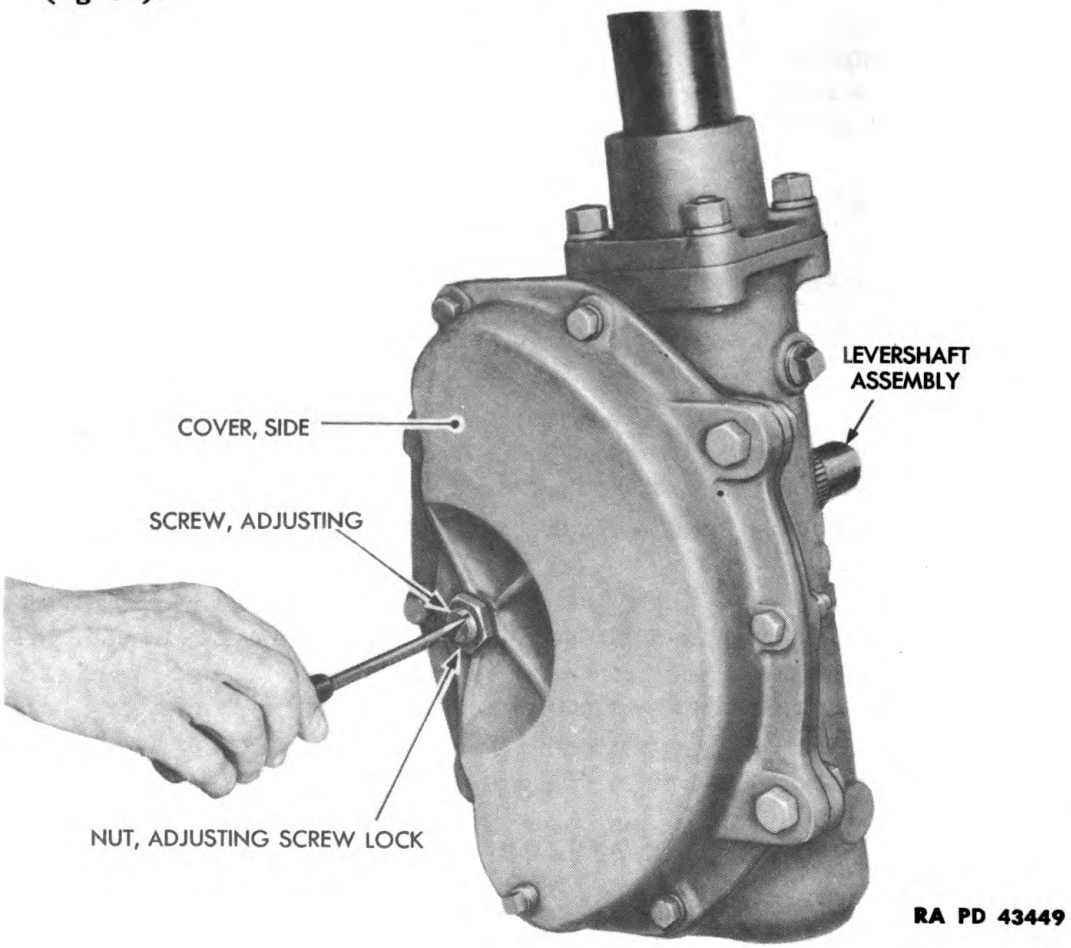


Figure 95—Adjusting Steering Gear

(3) CONNECT STEERING GEAR.

WRENCH, open-end, ⅝-in. WRENCH, socket, 15/16-in.

(a) Install steering gear clamp bolt, nut and palnut (⅝-in. open-end wrench) (fig. 90). Install steering gear support bolt (15/16-in. open-end wrench) (fig. 90).

(b) Install steering column clamp gasket and steering column clamp (fig. 91). Install the two steering column clamp nut lock washers and nuts. Do not tighten until after adjustments have been made. NOTE: Do not connect steering arm or install floor board until after adjustments have been made.

207. STEERING GEAR ASSEMBLY ADJUSTMENT.

a. Equipment.

LUBRICANT, gear
PLIERS
SCREWDRIVER
WRENCH, open-end, 5/8-in.
WRENCH, open-end, 3/4-in.
WRENCH, open-end, 1 1/4-in.
WRENCH, socket, 1 1/2-in.

b. Procedure.

(1) BEARINGS.

SCREWDRIVER
WRENCH, open-end, 3/4-in.
WRENCH, open-end, 1 1/4-in.

NOTE: The upper ball bearing and the lower ball bearing at each end of cam are adjustable by means of the shims 0.003 and 0.007 inch thick, between housing and top cover plate. Make this adjustment before making the backlash adjustment (step (2) below).

(a) Turn steering wheel with thumb and forefinger lightly gripping steering wheel rim. The steering wheel should turn freely but have a barely perceptible drag. Adjust by loosening adjusting screw lock nut (1 1/4-in. open-end wrench) (fig. 95), and turn the adjusting screw counterclockwise about three turns (screwdriver).

(b) Remove four top cover stud nuts and lock washers (3/4-in. open-end wrench) (fig. 92). Raise top cover enough to remove a 0.003-inch adjusting shim. Install top cover and repeat test procedure *(a)* above. Continue this procedure until the test in *(a)* is satisfactory.

(2) BACKLASH.

SCREWDRIVER

(a) Turn steering wheel from one extreme position to the other. A slight drag should be felt when passing through the mid-position, because the cam is ground slightly higher in the mid-position to provide close adjustments where the straight-ahead driving action takes place.

(b) Turn adjusting screw clockwise until steering wheel has a drag at the mid-position while turning steering wheel from one extreme to the other. Pay no attention to backlash at extreme positions of steering wheel. Adjust for a drag at the mid-position.

(3) CONNECT STEERING ARM.

LUBRICANT, gear	WRENCH, open-end, 5/8-in.
PLIERS	WRENCH, socket, 1 1/2-in.

(a) Install steering arm on lever shaft with prick punch marks lined up (par. 202 **b** (1) *(b)*).

(b) Install steering arm nut on lever shaft (1 1/2-in. socket wrench). Install steering arm nut cotter pin (pliers).

(c) Install floor board (par. 229 **b** (7)).

(d) Tighten steering column clamp nuts.

(e) Fill steering gear housing with lubricant through pipe plug at top of housing (fig. 92) until lubricant begins to run out of vent-hole in jacket tube. Add lubricant after every 2,000 miles of wrecker operation. Install filler plug (5/8-in. open-end wrench).

(4) INSPECT COLUMN ALINEMENT. Inspect column alinement after drag link has been adjusted (par. 214).

Section IV

DRAG LINK ASSEMBLY

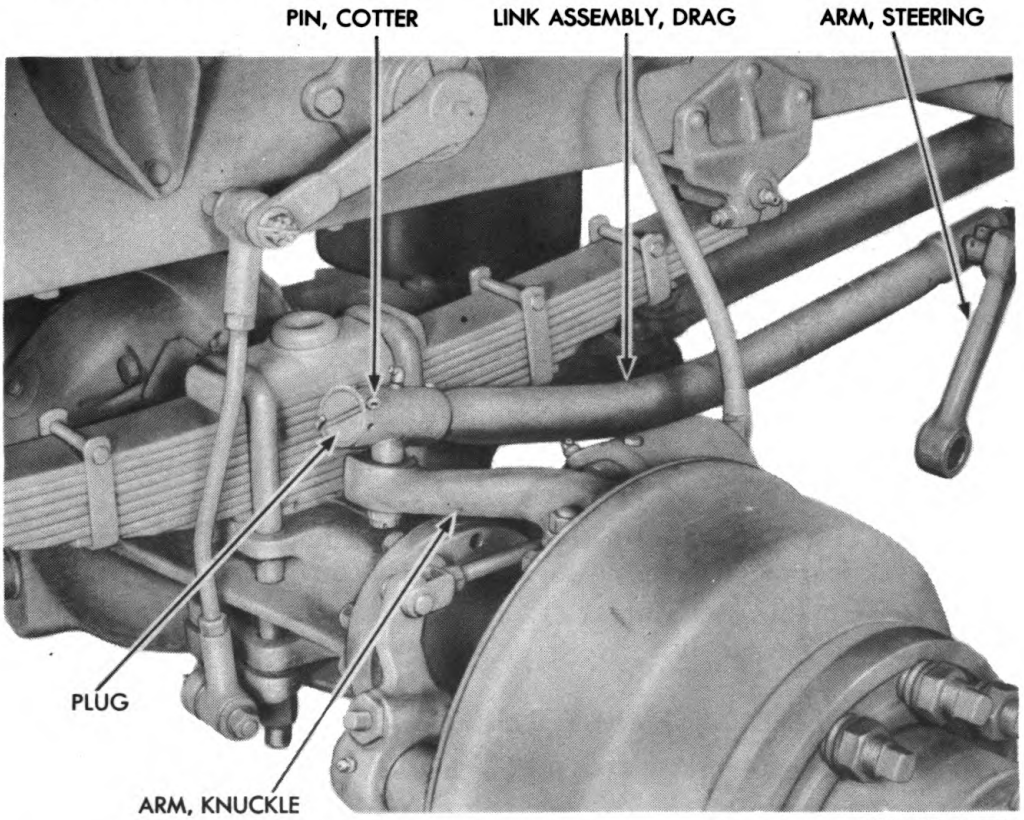


Figure 96—Drag Link Assembly

208. GENERAL.

a. Adjustment or overhaul of the drag link assembly should not be started until the checks have been made for the steering gear assembly (par. 207).

b. The drag link assembly connects the steering gear assembly to the front axle left steering knuckle.

209. DRAG LINK ASSEMBLY REMOVAL.

a. Equipment.

PLIERS SCREWDRIVER

b. Procedure.

(1) REMOVE DRAG LINK ASSEMBLY. Mark position of steering arm on the lever shaft (par. 202). Disconnect steering arm from lever shaft (par. 202 **b** (1)).

(2) Remove cotter pin at (front axle left knuckle arm) end of drag link assembly (pliers) (fig. 96). Loosen plug in end of drag link tube (screwdriver). Remove drag link assembly from left knuckle arm.

210. DRAG LINK DISASSEMBLY.

a. Equipment.

PLIERS
SCREWDRIVER
WRENCH, open-end, 5/16-in.

b. Procedure.

(1) REMOVE STEERING ARM.

PLIERS
SCREWDRIVER

(a) Remove cotter pin at steering arm end of drag link assembly (pliers). Remove plug (screwdriver). Lift steering arm out of tube.

(2) DISASSEMBLE TUBE (fig. 97).

SCREWDRIVER
WRENCH, open-end, 5/16-in.

(a) Lift two bearings out of tube. Remove bearing adjuster pin from tube (screwdriver).

(b) Lift large adjuster, small adjuster, spring and seat out of tube. Remove lubrication fitting (5/16-in. open-end wrench).

(c) Repeat the procedure *(a)* and *(b)* to disassemble opposite end of drag link assembly.

211. DRAG LINK ASSEMBLY INSPECTION.

a. Equipment.

CLOTH, abrasive, aluminum-oxide
SOLVENT, dry-cleaning

b. Procedure.

(1) GENERAL.

CLOTH, abrasive, aluminum-oxide
SOLVENT, dry-cleaning

(a) Clean all parts in SOLVENT, dry-cleaning, and remove rust with fine CLOTH, abrasive, aluminum-oxide.

(2) BEARINGS.

CLOTH, abrasive, aluminum-oxide

DRAG LINK ASSEMBLY

(a) Inspect bearings for scoring and, if found, either remove scores with CLOTH, abrasive, aluminum-oxide, or replace bearings.

(3) TUBE. Inspect tube for fractures or kinks and, if found, use new tube.

212. ASSEMBLY OF DRAG LINK ASSEMBLY.

a. Equipment.

PLIERS SCREWDRIVER

b. Procedure.

(1) Install seat (fig. 97) in tube.

(2) Install bearing adjusting pin in tube (screwdriver). Install spring in small adjuster.

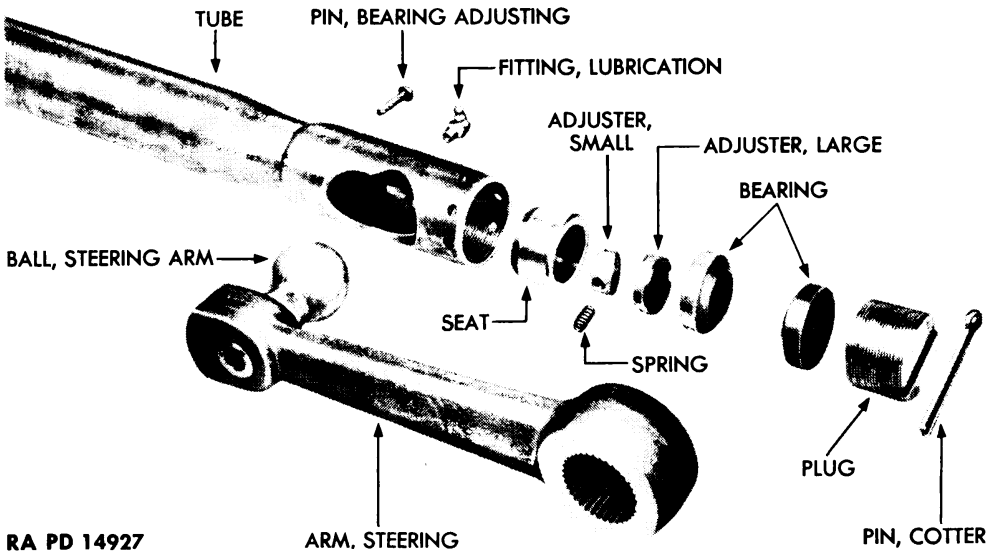


Figure 97—Drag Link—Exploded View

(3) Install small adjuster, bevel side out, in tube. Install large adjuster, bevel side in, on small adjuster so that the beveled faces fit together.

(4) Install one bearing, steering arm ball and another bearing.

(5) Install plug (screwdriver) and cotter pin (pliers).

(6) Repeat procedure on the opposite end of drag link, but do not install bearings or plug.

213. DRAG LINK ASSEMBLY INSTALLATION.

a. Equipment.

SCREWDRIVER

b. Procedure. Install one bearing in drag link (fig. 97). Install drag link assembly on left knuckle arm (fig. 96). Then install second bearing and plug (screwdriver). Install steering arm on lever shaft (par. 207 **b** (3)).

214. DRAG LINK ASSEMBLY ADJUSTMENT.

a. Drag Link Adjustment. NOTE: Steering wheel should be in mid-position when front wheels are straight ahead. Check to see if this condition is true, and, if it is not, proceed as follows:

(1) Disconnect drag link assembly from the steering arm (par. 209 **b** (1)).

(2) Turn steering wheel as far as possible to right and then to left. Count number of turns made by steering wheel. Turn steering wheel to the right one-half of the count made. The steering wheel is now in mid-position.

(3) Turn front wheel to a straight-ahead position. Lift drag link assembly up as though it were to be connected. If steering arm ball does not line up with hole in drag link assembly, remove steering arm from lever shaft (par. 202 **b** (1)) and move it one or more splines on lever shaft. NOTE: Moving steering arm one spline on lever shaft will shift position of steering arm ball 10 degrees.

(4) Install drag link assembly (par. 212) on steering arm.

b. Column Alinement.

(1) Loosen the two steering column clamp nuts (par. 202 **b** (2) *(a)*). Observe whether jacket tube moves to a different position. If it does it has been out of line, and the two steering column clamp nuts must be tightened with jacket tube in the new position.

NOTE: If the jacket tube has been permanently bent because of misalinement, it may be necessary to replace jacket tube. To determine whether replacement of the jacket tube is necessary, first make the trouble shooting checks given in paragraph 200.

CHAPTER 8

BODY AND SHEET METAL

Section I

GENERAL

215. GENERAL.

a. This chapter deals with the body which rests on the rear platform of the wrecker, the cab assembly, the instruments on the cab instrument board, the bumper, brush guard, fenders and sheet metal parts.

216. SPECIFICATIONS AND DATA.

a. Body weight with tool boxes ..... 1,850 lb

b. Front Bumper.

Height from ground to center line ..... 35 in.
Weight ..... 104½ lb

c. Rear Bumperettes.

Quantity 2
Height from ground to center line ..... 40 in.
Weight ..... 53½ lb

d. Tow Hooks.

Model ..... Union Forging FS191-FS192
Weight ..... 8 lb

e. Cab.

Model ..... Brockway B21
Windshield ..... Du Plate
Windshield weight ..... 40 lb
Windshield wiper ..... Trico
Windshield wiper model 204-142
Windshield wiper weight ..... 1 lb

f. Instruments.

Oil pressure gage ..... Stewart Warner
Graduations 0-40-80
Weight ..... ¼ lb

ORDNANCE MAINTENANCE
BODY AND CHASSIS FOR HEAVY WRECKING TRUCK M1

Oil quantity gage	Stewart Warner
Type	12V Electric
Operating unit model	103-998
Dash unit model	106-711
Fuel quantity gage	Stewart Warner
Type	6V Electric
Tank unit model	439-002
Dash unit model	933-13
Water temperature gage	Stewart Warner
Type	Fluid-Thermo
Graduations	100-180-212
Model	93-319
Speedometer	Stewart Warner
Type	Magnetic
Graduations	0 to 70 mph in 5 mph graduations
Model	S-585-Z
Cable model	95-000
Cable weight	5½ lb
Tachometer	Jones
Weight	7 lb
Ammeter	Stewart Warner
Type	Magnetic
Graduations	45-0-45
Model	949-19
Weight	¼ lb
Rear view mirror	Yankee
Type	Non-glare
Location	Outside on cab corner post
Model	52-38
Weight	⅕ lb
Hot water heater	E. A.
Weight	10½ lb
Reflexes	Monroe Acme
Colors used	4 red, 2 amber
Diameter	4 in.
Model	840
Fire extinguisher	M. L. Snyder
Model	Stemple pistol grip
Type	Tetrachloride
Location	In cab and on crane
Capacity	1 qt
Type	43
Weight	7 lb

GENERAL

217. REFERENCE TO TM 9-795.

a. Many second echelon operations covered in TM 9-795 are often done by ordnance personnel. Reference should be made to TM 9-795 for lower echelon operations not covered in this manual.

218. ECHELON BREAKDOWN OF MAINTENANCE OPERATIONS.

(Refer to par. 4.)

ORDNANCE MAINTENANCE
BODY AND CHASSIS FOR HEAVY WRECKING TRUCK M1

Section II

TROUBLE SHOOTING

219. TROUBLE SHOOTING, INSPECTION AND REMEDIAL MEASURES.

a. The following chart is provided as a guide to common troubles and their causes, and is a recommended procedure for inspection to locate the cause.

Symptom and Probable Cause	Probable Remedy
b. Overheating of Engine.	
(1) Lack of water because water temperature gage not registering.	(1) Fill cooling system (TM 9-1795B). Replace temperature gage (par. 226 **b** (27)).
c. Engine Stops.	
(1) Fuel quantity gage broken or shows no fuel.	(1) Switch to opposite fuel tank or fill fuel tanks. Replace fuel gage (par. 226 **b** (29)).
d. Windshield Wiper Not Operating.	
(1) Leaking.	(1) Test for leaks (par. 235 **b**).
(2) Broken valve parts.	(2) Replace valve parts (par. 237).
(3) Paddle worn.	(3) Replace paddle (par. 237).
(4) Kinked hose or tubing.	(4) General inspection (par. 238).
(5) Shaft broken.	(5) Replace shaft (par. 237).
(6) Dirty.	(6) Clean wiper motor (par. 237). Inspect hose and tubing (par. 235 **b**).
e. Tachometer.	
(1) Tachometer head pointer fluctuates and jumps.	(1) Examine flexible shaft for kinks or binding and straighten or replace flexible shaft (par. 245). Examine right angle units for binding. Lubricate right angle units (par. 246). Replace right angle units (par. 244). Replace tachometer head (par. 226 **b** (21)).

Section III

BODY ASSEMBLY

220. GENERAL.

a. The body assembly is on the rear platform of the wrecker and carries the tool boxes, body flare boards, welding bottles and spare wheels and tires.

b. It is necessary to remove the body assembly in order to remove the crane assembly.

221. BODY ASSEMBLY REMOVAL.

a. Equipment.

BARS, pry (2)
CHAIN, loose
CRANE
PLIERS
WRENCHES, open-end, two, 9/16-in.
WRENCHES, open-end, two, 5/8-in.
WRENCHES, open-end, two, 3/4-in.
WRENCH, open-end, 7/8-in.
WRENCH, open-end, 15/16-in.

b. Procedure.

(1) GENERAL.

(a) Lift all loose equipment off body and crane "A" frame (fig. 98).

(b) Remove the two searchlights (TM 9-1795B).

(c) Remove crane cable and boom. Disconnect winch control air pipes (par. 154). Disconnect winch remote throttle control and remove spare wheels and tires (TM 9-1795A).

(2) REMOVE WELDING BOTTLES.

PLIERS
WRENCH, open-end, 5/8-in.

(a) Unscrew welding bottle clamp wing nut at left side of welding bottles (pliers); swing welding bottle clamp open. Lift out three welding bottles (fig. 98).

(b) Remove welding bottle clamp hinge bolt and nut (5/8-in. open-end wrench). Lift off welding bottle clamp.

(3) REMOVE FLARE BOARDS.

NOTE: There are five flare boards—one at rear right side, two at rear end of body and two on left side of body. Lift five flare boards out of the stake pockets on body (figs. 98 and 99).

ORDNANCE MAINTENANCE
BODY AND CHASSIS FOR HEAVY WRECKING TRUCK M1

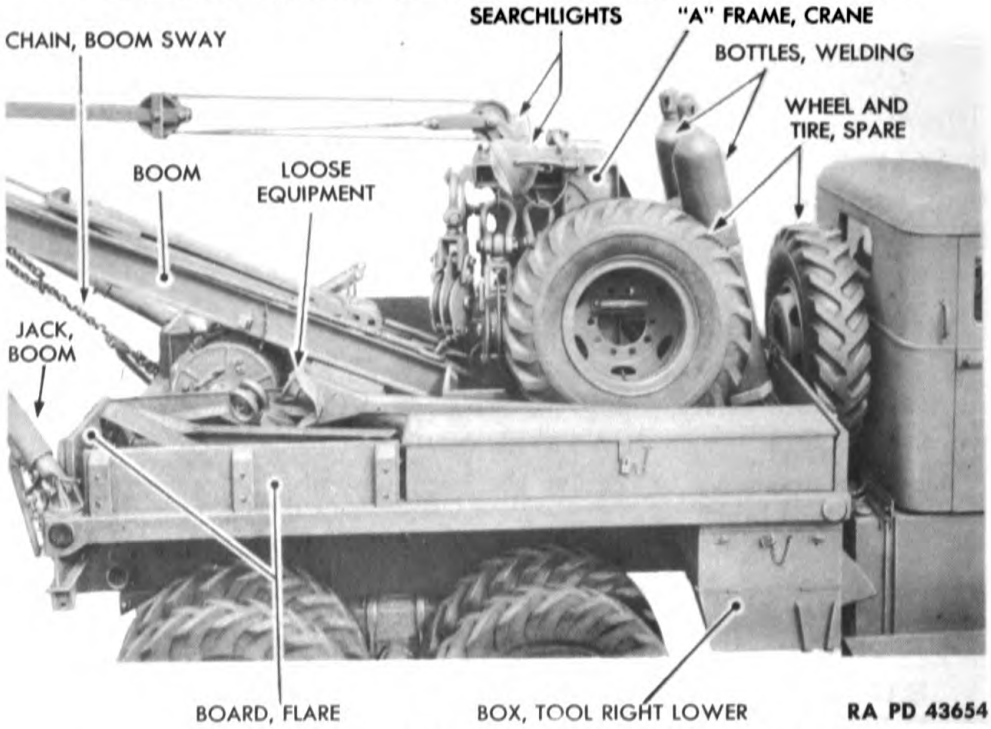


Figure 98—Body and Wrecker Equipment

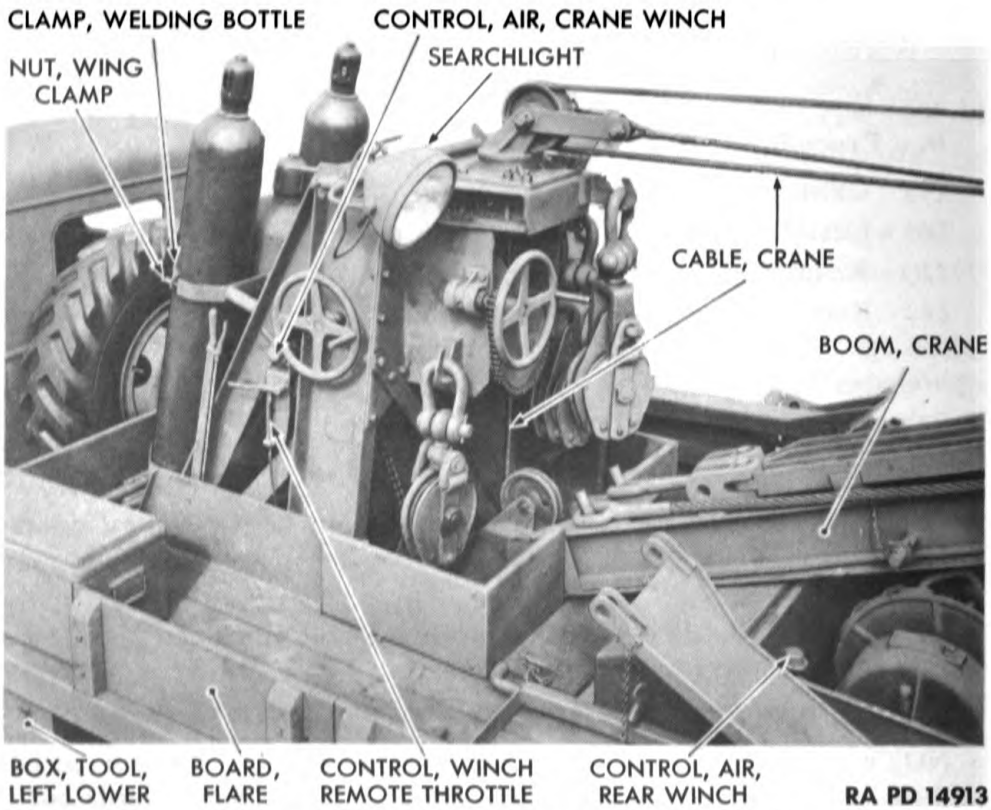


Figure 99—Body and Wrecker Equipment

(4) REMOVE TOOL BOXES.

WRENCHES, open-end, two, 9/16-in.

WRENCHES, open-end, two, 5/8-in.

(a) Remove eight right lower tool box bolts, nuts and lock washers, and two right lower tool box bolts, nuts and lock washers. Lift off right lower tool box (5/8-in. and 9/16-in. open-end wrenches) (fig. 98).

(b) Remove nine left lower tool box bolts, nuts and lock washers. Lift off left lower tool box (5/8-in. and 9/16-in. open-end wrenches) (fig. 99).

(5) REMOVE TAIL LAMPS.

WRENCH, open-end, 5/8-in.

(a) Pull wiring connector out of tail lamp (fig. 100). Remove two nuts and lock washers that hold tail lamp to tail lamp bracket (5/8-in.

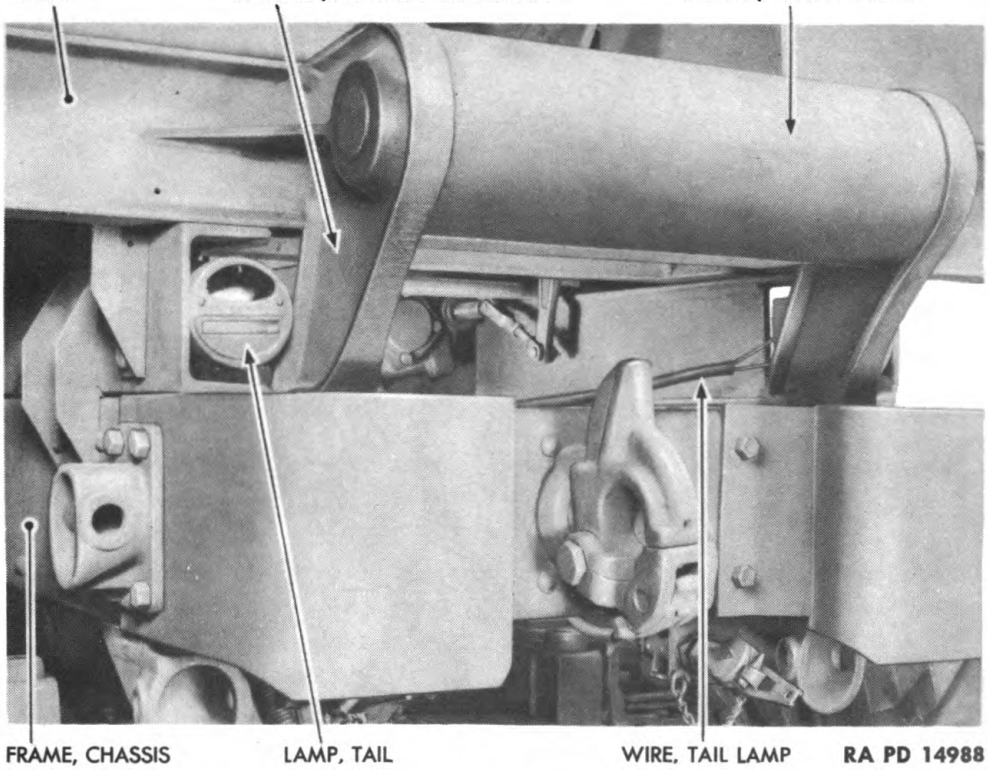


Figure 100—Rear Winch Roller Bracket

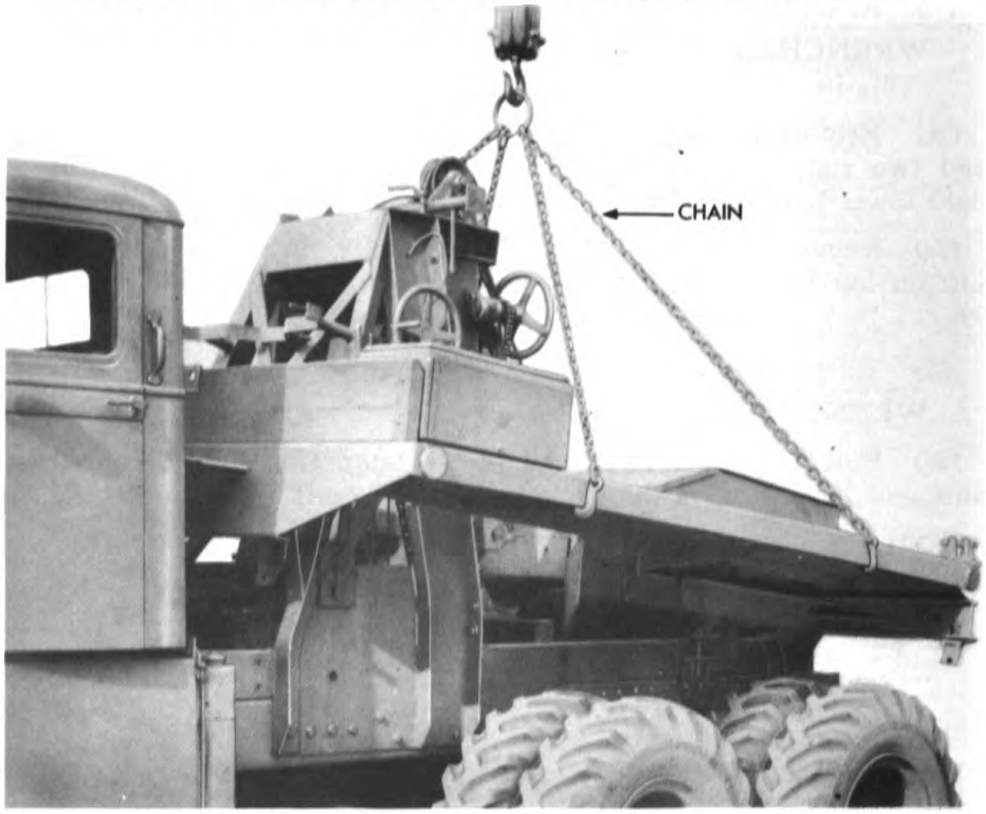
open-end wrench) (fig. 103). Remove tail lamp. Repeat procedure to remove opposite tail lamp.

(6) DISCONNECT BODY.

WRENCH, open-end, 7/8-in.

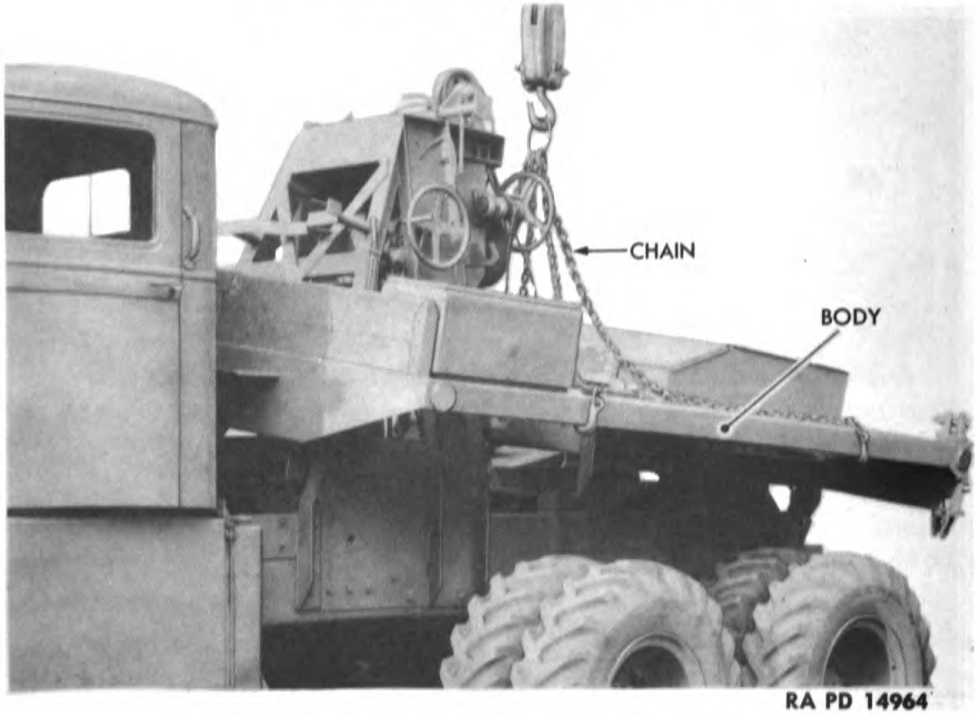
WRENCH, open-end, 15/16-in.

(a) Remove ten body frame bolts, nuts and lock washers (five on each side).



RA PD 43651

Figure 101—Raising Front End of Body



RA PD 14964

Figure 102—Body Raising Chain Adjustment

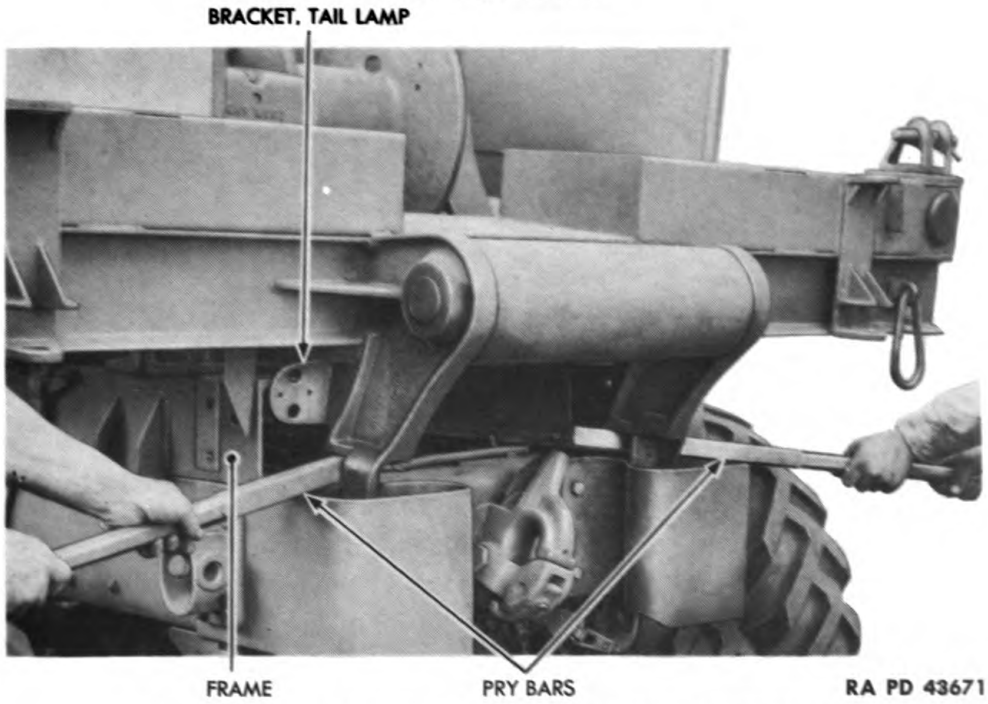


Figure 103—Prying Rear End of Body Backward

(7) DISCONNECT REAR WINCH ROLLER BRACKET.

WRENCHES, open-end, two,
¾-in.

(a) Remove four rear winch roller bracket bolts, nuts and lock washers which hold rear winch roller bracket to frame. (The rear winch roller bracket is welded to the body.)

(8) REMOVE BODY.

BARS, pry (2) CRANE
CHAIN, loose

(a) Raise front end of body. NOTE: Crane capacity must be sufficient to handle the 1,850-pound body. Raise and twist front end of body until body is clear of rear winch chain and sprocket. NOTE: Front end of body will be about 14½ inches up from frame (fig. 101). Stop raising body and adjust lifting chains so that right side will be raised (fig. 102).

(b) Pry rear end of body backward about four inches so that tail lamp brackets clear frame (two pry bars) (fig. 103).

(c) Raise body slowly. Have a man ride body as it is being raised, to work body clear of any brackets that may interfere with removal. Lift body clear of wrecker.

222. BODY ASSEMBLY INSPECTION.

a. Equipment.

SOLVENT, dry-cleaning

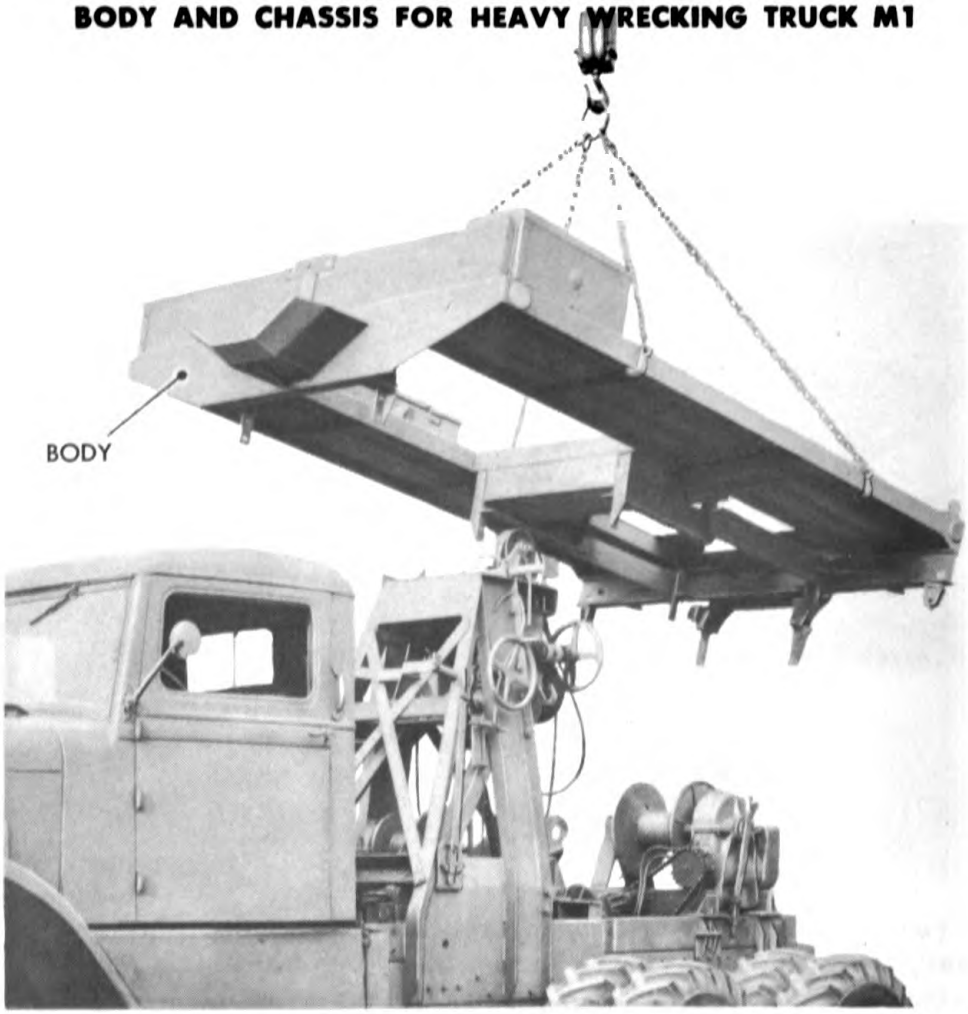


Figure 104—Raising Body Clear of Wrecker RA PD 43645

b. Procedure.

(1) Clean body with SOLVENT, dry-cleaning.

(2) Inspect for cracks or breaks, and, if found, repair by welding or reinforcing and bolting.

(3) Remove all tools from tool boxes on body and clean with SOLVENT, dry-cleaning. Install them in tool box from which they were removed.

(4) Repaint body (chap. 12).

223. BODY ASSEMBLY INSTALLATION.

a. Equipment.

BARS, pry (2)
CHAIN, loose
CRANE
PLIERS
WRENCHES, open-end, two, 9/16-in.
WRENCHES, open-end, two, 5/8-in.
WRENCHES, open-end, two, 3/4-in.
WRENCH, open-end, 7/8-in.
WRENCH, open-end, 15/16-in.

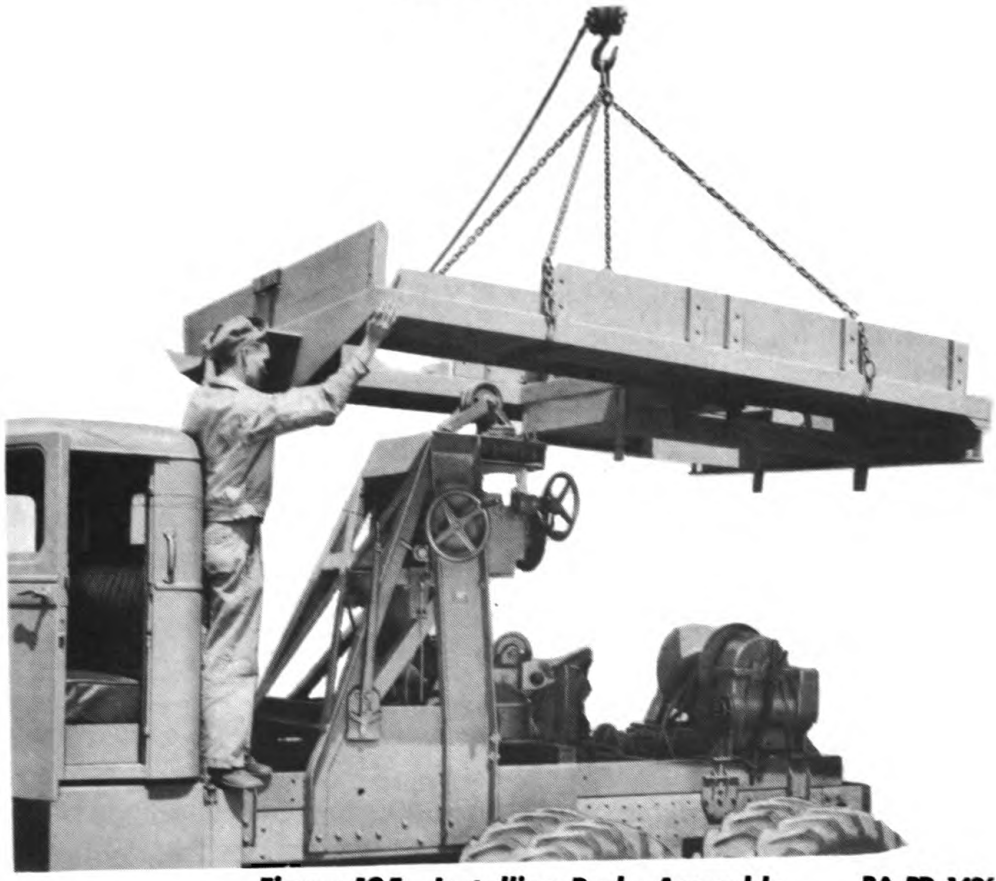


Figure 105—Installing Body Assembly RA PD 14968

b. Procedure.

(1) INSTALL FLARE BOARDS. Install flare boards in their stake pockets on body.

NOTE: There are five flare boards—one at rear right side, two at rear end of body and two on left side of body (figs. 98 and 99).

(2) INSTALL BODY.

BARS, pry (2) CRANE
CHAIN, loose

(a) Lower body slowly on wrecker and have a man ride body, as it is being lowered, to work body over any brackets that may interfere with its installation.

(b) Pry rear end of body backward so that tail lamp brackets clear chassis frame (two pry bars) (fig. 103).

(c) Stop lowering body and adjust chains so that right side of body will be raised (fig. 102).

(d) Lower and twist front end of body until body passes over rear winch chain and sprocket (front end of body will be about 14½ inches up from frame) (fig. 101). Lower body on wrecker.

(3) CONNECT REAR WINCH ROLLER BRACKET.

WRENCHES, open-end, two, ¾-in.

(a) Install rear winch roller bracket bolts, nuts and lock washers which hold rear winch roller bracket to frame (fig. 100).

(4) CONNECT BODY.

WRENCH, open-end, ⅞-in. WRENCH, open-end, 15/16-in.

(a) Install ten body frame bolts, nuts and lock washers (five on each side).

(5) CONNECT TAIL LAMPS.

WRENCH, open-end, ⅝-in.

(a) Install and connect tail lamp and install two nuts and lock washers that hold tail lamp to tail lamp bracket (fig. 103).

(b) Repeat procedure to install opposite tail lamp.

(6) INSTALL TOOL BOXES.

WRENCHES, open-end, two, 9/16-in. WRENCHES, open-end, two, ⅝-in.

(a) Install left lower tool box and tighten nine left lower tool box bolts, nuts and lock washers (fig. 99).

(b) Install right lower tool box (fig. 98). Tighten bolts, nuts and lock washers.

(7) INSTALL WELDING BOTTLES.

PLIERS WRENCH, open-end, ⅝-in.

(a) Install welding bottle clamp hinge bolts and nuts (⅝-in. open-end wrench).

(b) Install three welding bottles and swing welding bottle clamp over them. Install and tighten welding bottle clamp wing nut (pliers) (fig. 99).

(8) GENERAL.

(a) Install spare wheel and tires. Connect winch control air pipes (par. 158). Install crane boom and crane cables.

(b) Install searchlights (TM 9-1795B). Install on body and crane "A" frame (figs. 98 and 99) all loose equipment which was moved (par. 221 b (1) *(a)*).

Section IV

CAB ASSEMBLY

224. GENERAL.

a. The cab assembly is bolted to the frame and is cushioned from road shocks by coil springs on the front corner mounting bolts and by rubber pads at the rear mounting bolt.

b. The cab has two doors, a windshield and instruments which are attached to an instrument board. The cab assembly is constructed of sheet steel, formed around hardwood braces. Sheet steel that has been damaged should be bumped out or welded.

225. CAB ASSEMBLY REMOVAL.

a. Equipment.

CHAIN, loose
HOIST, chain
PLIERS
SCREWDRIVER
SCREWDRIVER, Phillips
STICK, hardwood, 3-in. by 3-in. by 7-ft.
WRENCH, box, $\frac{1}{2}$-in.
WRENCH, box, $1\frac{1}{16}$-in.
WRENCH, open-end, $\frac{5}{8}$-in.
WRENCHES, open-end, two, $\frac{3}{4}$-in.
WRENCH, open-end, $\frac{7}{8}$-in.
WRENCH, open-end, $\frac{15}{16}$-in.
WRENCH, socket, $\frac{7}{16}$-in.
WRENCH, socket, $\frac{3}{4}$-in.

b. Procedure.

(1) DISCONNECT CABLES, WIRES AND PIPES ON ENGINE SIDE OF DASH.

PLIERS

(a) Disconnect tachometer shaft (22, fig. 106), spark control wire (17, fig. 106), choke wire (8, fig. 106), hand throttle wire (5, fig. 106), starter cable (1, fig. 106), oil pressure gage pipe (7, fig. 106), ignition switch to coil wire (14, fig. 106), ignition switch to magneto wire (15, fig. 106), horn wire, water heat indicator tube (6, fig. 106) windshield wiper hose (4, fig. 106), heater hose (2, fig. 106).

ORDNANCE MAINTENANCE
BODY AND CHASSIS FOR HEAVY WRECKING TRUCK M1

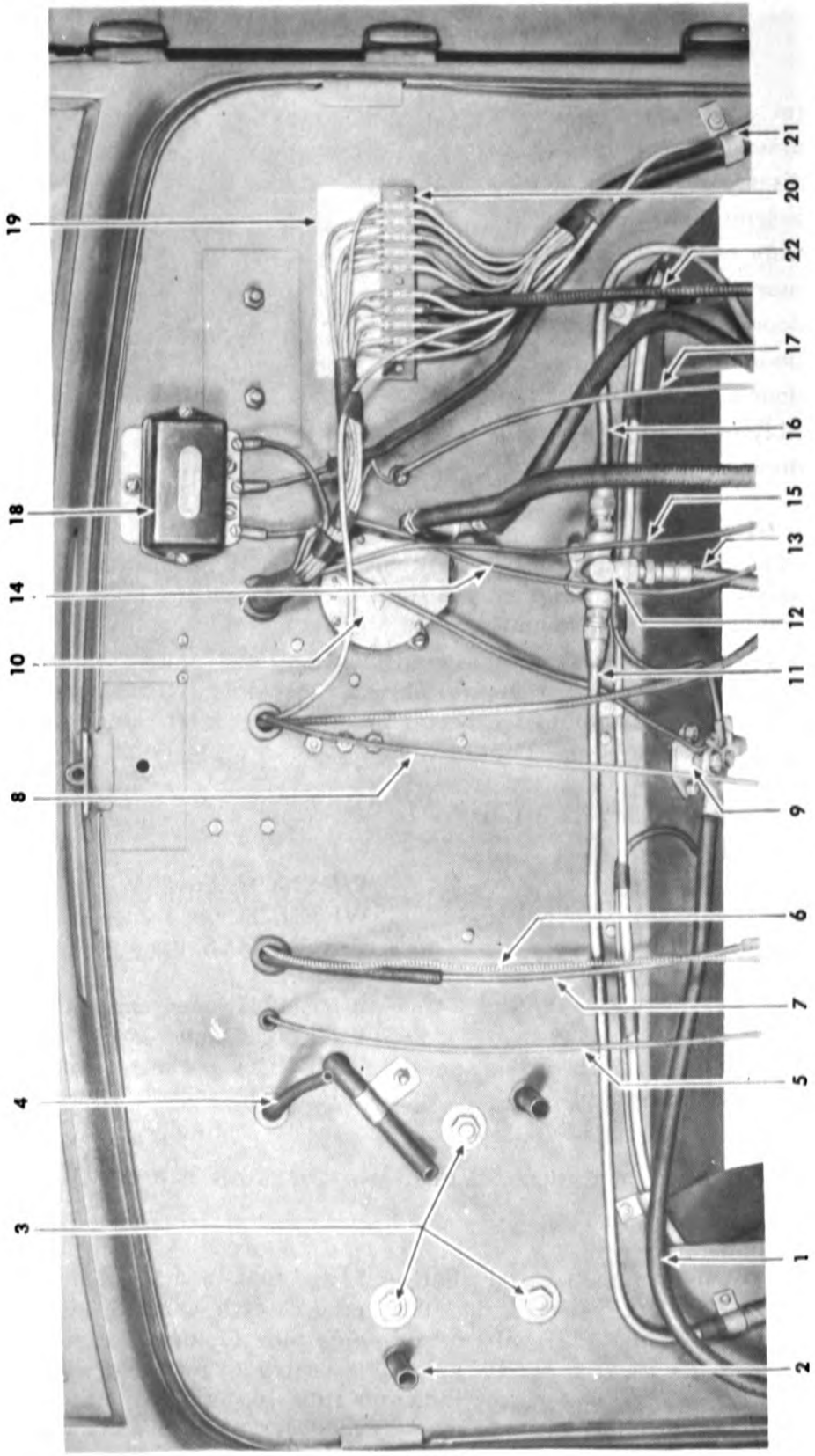


Figure 106—Engine Side of Dash (Engine Removed)

CAB ASSEMBLY

1. CABLE, STARTER SWITCH TO STARTER
2. CONNECTIONS, HOT WATER HEATER
3. BOLTS, HEATER MOUNTING
4. HOSE, WINDSHIELD WIPER
5. WIRE, HAND THROTTLE CONTROL
6. TUBE, WATER HEAT INDICATOR
7. TUBE, OIL PRESSURE GAGE
8. WIRE, CARBURETOR CHOKE
9. SWITCH, STARTER
10. GOVERNOR
11. PIPE, GASOLINE, CHANGE-OVER SWITCH TO RIGHT TANK
12. SWITCH, GASOLINE CHANGE-OVER, RIGHT AND LEFT TANK
13. HOSE, GASOLINE, FUEL PUMP TO CHANGE-OVER SWITCH
14. WIRE, IGNITION SWITCH TO COIL
15. WIRE, IGNITION SWITCH TO MAGNETO
16. PIPE, GASOLINE, CHANGE-OVER SWITCH TO LEFT TANK
17. CABLE, DISTRIBUTOR SPARK RETARDING
18. REGULATOR, VOLTAGE
19. PLATE, JUNCTION BLOCK WIRING
20. BLOCK, JUNCTION
21. CLIP, WIRE HARNESS
22. CABLE, TACHOMETER

RA PD 14998A

Figure 106A—Legend for Figure 106

(b) Remove hood assembly (par. 261) and radiator tie rod (par. 261).

(c) Disconnect and remove battery (TM 9-1795B).

(d) Unhook clutch pedal return spring (pliers) (fig. 107).

(2) DISCONNECT DASH JUNCTION BLOCK WIRES. Pull ten lower dash junction block wires out of their connections (20, fig. 106).

(3) DISCONNECT VOLTAGE REGULATOR WIRES.

SCREWDRIVER

(a) Remove three wires from voltage regulator (18, fig. 106) (engine side of dash).

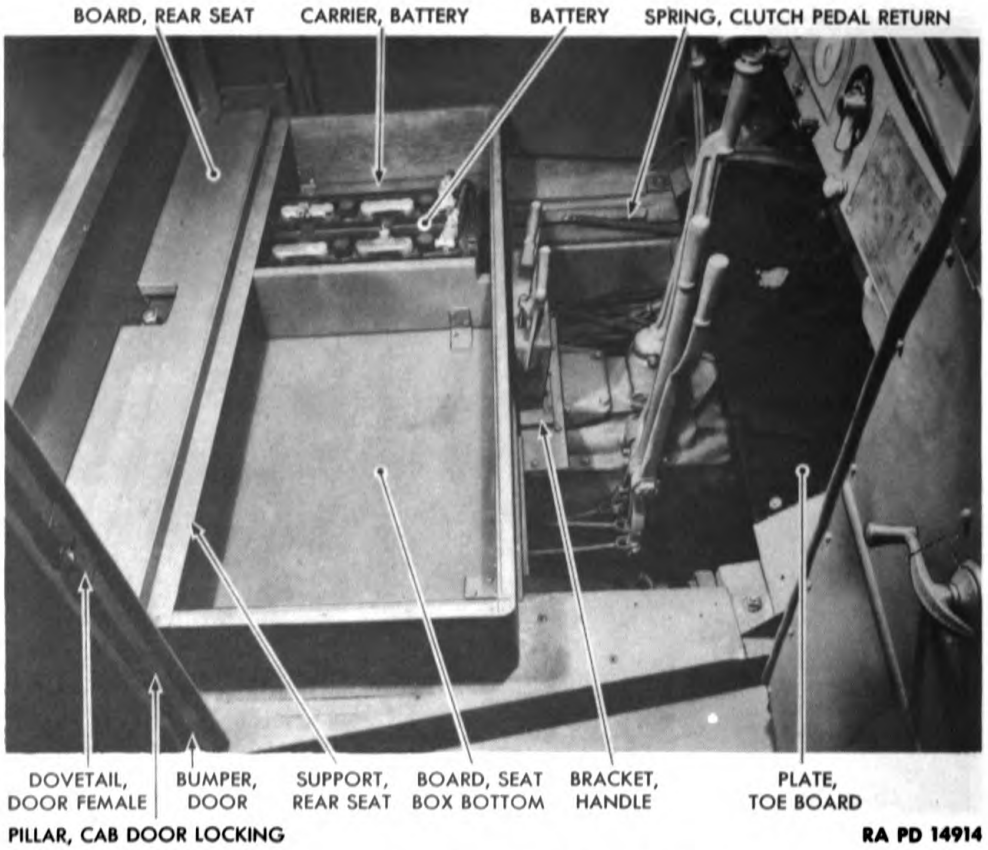


Figure 107—Seat and Floor Boards

(4) DISCONNECT RIGHT AND LEFT GASOLINE TANK PIPES.

WRENCHES, open-end, two, ¾-in.

(a) Disconnect right and left gasoline tank pipes (11, 16, fig. 106). Disconnect gasoline two-way valve flexible hose (13, fig. 106) at fuel pump.

(5) DISCONNECT GOVERNOR.

WRENCH, open-end, ⅝-in.

(a) Disconnect two air pipes at governor (10, fig. 106).

CAB ASSEMBLY

(6) DISCONNECT WIRE HARNESS.

SCREWDRIVER WRENCH, box, ½-in.

(a) Loosen wire harness clip bolt and nut and slip wire harness out from underneath wire harness clip (21, fig. 106).

(7) DISCONNECT STEERING GEAR ASSEMBLY. Disconnect steering gear assembly at frame and instrument board (par. 202 b (2)). Remove horn button and horn button wire and remove steering wheel (par. 202 b (3)).

(8) REMOVE SEAT CUSHIONS AND SEAT BACK.

SCREWDRIVER

(a) Lift out two seat cushions. Remove four seat back screws from two seat back brackets and lift out seat back. Remove equipment under seat cushions.

(9) REMOVE FLOOR BOARDS.

SCREWDRIVER

(a) Lift floor mat off floor, toeboards, foot switches, control levers and pedals.

(b) Remove four floor board screws. Lift back of floor board up and pull it out from under toeboard plate (fig. 107). Remove floor board.

(10) REMOVE BATTERY CARRIER.

SCREWDRIVER, Phillips WRENCH, socket, ¾-in.

(a) Remove four rear seat board screws. Lift off rear seat board (fig. 107). Remove three rear seat support screws (screwdriver, Phillips). Lift off rear seat support (fig. 107).

(b) Remove the four battery carrier nuts and lock washers (¾-in socket wrench). Lift off battery carrier (fig. 107).

(11) REMOVE TOEBOARD PLATE.

PLIERS SCREWDRIVER, Phillips
SCREWDRIVER WRENCH, socket, $\frac{7}{16}$-in.

(a) Remove eight seat box bottom board screws (screwdriver).

(b) Loosen four handle bracket nuts and tip handle bracket forward.

(c) Lift off seat box bottom board (fig. 107).

(d) Remove accelerator pedal bolt, nut and lock washer that hold accelerator pedal to accelerator pedal bracket. Lift accelerator pedal off accelerator rod and remove accelerator pedal ($\frac{7}{16}$-in. socket wrench). Remove accelerator rod cotter pin at accelerator rod cross shaft and pull out accelerator rod (pliers.)

(e) Remove nine toeboard plate bolts, nuts and lock washers and lift out toeboard plate (screwdriver, Phillips). Remove two accelerator pedal bracket bolts, nuts and lock washers. Remove accelerator pedal bracket from toeboard plate.

ORDNANCE MAINTENANCE
BODY AND CHASSIS FOR HEAVY WRECKING TRUCK M1

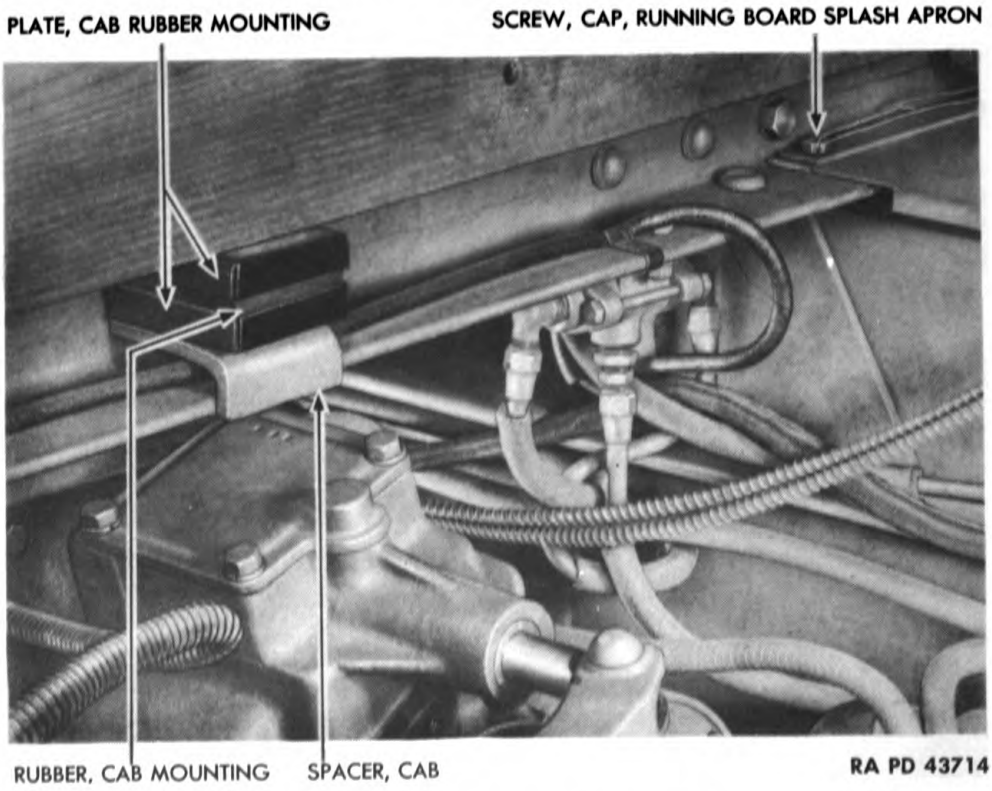


Figure 108—Cab Rear Mounting

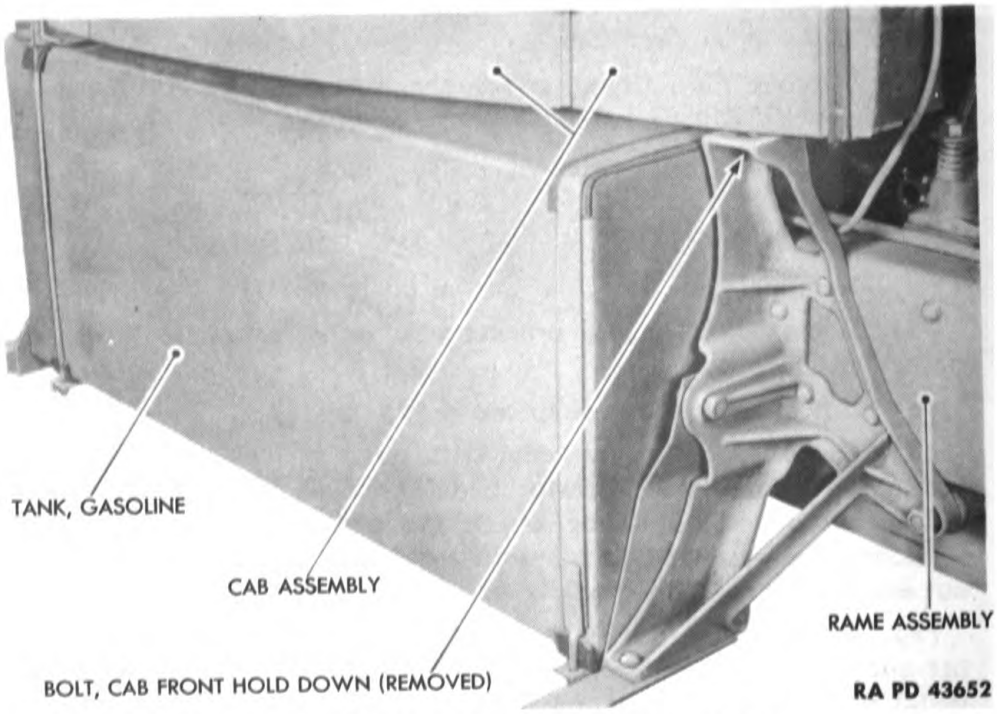


Figure 109—Cab Front Hold-down Bolts

CAB ASSEMBLY

(12) REMOVE CAB REAR-HOLD-DOWN BOLT NUT (fig. 108).

WRENCH, box, $1\frac{1}{16}$-in.

(a) Remove cab rear hold-down nut. Lift cab rear hold-down bolt, lock washer and plain washer off cab rear hold-down bolt (fig. 109).

(13) REMOVE CAB FRONT HOLD-DOWN BOLTS.

WRENCH, open-end, $\frac{7}{8}$-in. WRENCH, open-end, $\frac{15}{16}$-in.

(a) Remove two cab front hold-down bolt nuts, one at right and one at left side of cab. Remove hold-down bolt spring from right cab front hold-down bolt.

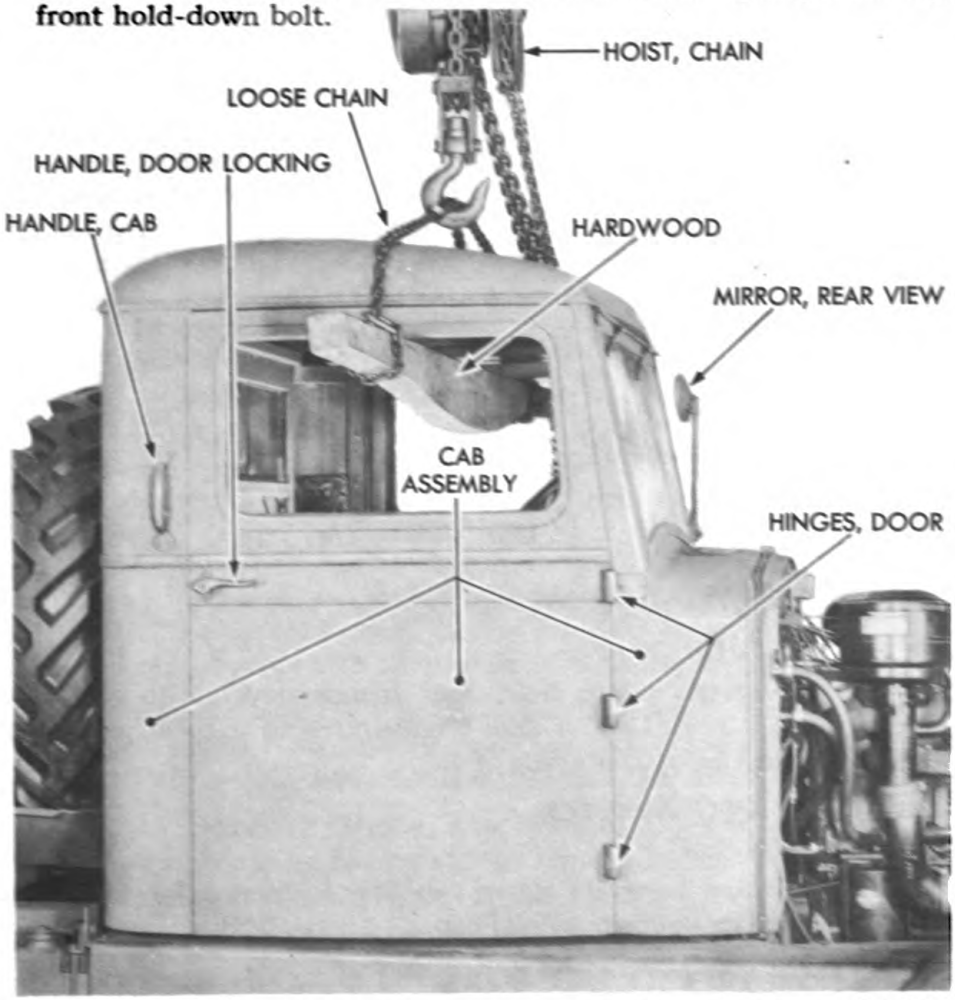


Figure 110—Removing Cab Assembly RA PD 14975

(14) REMOVE CAB ASSEMBLY.

CHAIN, loose
HOIST, chain
STICK, hardwood, 3-in. by 3-in. by 7-ft.

(a) It is necessary to have at least 14 feet between floor and end of chain hoist lifting hook. The chain hoist must be rigged for a straight pull. Place a hardwood stick through door windows and attach about 15 feet of loose chain to each end of hardwood stick (fig. 110).

(b) Attach chain hoist to loose chain. Remove cab, tipping steering gear assembly to clear cab as cab is being raised.

(c) Lift cab rubber mounting plate, cab rubber mounting, second cab rubber mounting plate and cab spacer off cab rear hold-down bolt (fig. 108). Cab rear hold-down bolt is welded to frame cross member.

226. CAB DISASSEMBLY.

a. Equipment.

CHISEL
DRIFT
HAMMER
PLIERS
SCREWDRIVER
SCREWDRIVER, Phillips
SOLVENT, dry-cleaning
WRENCH, box, 1/2-in.
WRENCH, open-end, 11/32-in.
WRENCH, open-end, 3/8-in.
WRENCHES, open-end, two, 7/16-in.
WRENCH, open-end, 1/2-in.
WRENCH, open-end, 9/16-in.
WRENCH, open-end, 5/8-in.
WRENCH, open-end, 3/4-in.
WRENCH, open-end, 1-in.
WRENCH, socket, 1/2-in.
WRENCH, socket, 5/8-in.
WRENCH, socket, 3/4-in.

b. Procedure.

(1) REMOVE DOOR LOCK STRIKERS.

SCREWDRIVER, Phillips

(a) Remove screws which hold door lock striker to cab door locking pillar (fig. 107). Lift off door lock striker and repeat procedure on opposite side of cab.

(2) REMOVE DOOR FEMALE DOVETAILS.

SCREWDRIVER, Phillips

(a) Remove screws which hold door female dovetail to cab door locking pillar (fig. 109). Lift off door female dovetail. Repeat procedure to remove dovetail on opposite side of cab.

(3) REMOVE DOOR BUMPERS.

SCREWDRIVER

(a) Pry two door bumpers out of cab door locking pillar (fig. 107). Repeat procedure on opposite side of cab.

(4) REMOVE CAB HANDLES.

SCREWDRIVER
WRENCH, open-end, 1/2-in.

(a) Remove bolts, nuts and lock washers which hold cab handle to cab (fig. 110). Lift off cab handle and repeat procedure to remove other door handle.

(5) REMOVE CAB HALF OF DOOR HINGES.

DRIFT
HAMMER
SCREWDRIVER, Phillips

(a) Remove cab doors by driving out door hinge pins (hammer and drift)

(b) Remove 12 door hinge screws which hold cab half of door hinges (fig. 110) to cab hinge pillar. Lift off cab half of door hinges and repeat procedure to remove hinges on opposite side of cab.

(6) REMOVE WINDSHIELD.

SCREWDRIVER, Phillips

(a) Remove 14 windshield top frame screws. Unscrew two windshield adjusting wing nuts and lift off the two adjusting wing nut washers.

(b) Pull wiper motor hose off right and left wiper motors.

(c) Lift windshield assembly off cab.

(7) REMOVE WINDSHIELD ADJUSTING ARMS.

SCREWDRIVER

(a) Unscrew right and left wing nuts off two windshield adjusting arm brackets.

(b) Remove two windshield adjusting arm screws and lift off two windshield adjusting arms.

(8) REMOVE WINDSHIELD ADJUSTING ARM BRACKETS.

SCREWDRIVER, Phillips

(a) Remove screws which hold windshield adjusting arm bracket to windshield. Lift off windshield adjusting arm bracket. Repeat procedure on opposite side of cab.

(9) REMOVE WINDSHIELD ADJUSTING ARM CAB BRACKETS.

SCREWDRIVER

(a) Remove two windshield adjusting arm cab bracket screws that hold the bracket to cab. Lift off windshield adjusting arm cab bracket and repeat procedure on opposite side of cab.

(10) REMOVE WIPER BLADES. Lift lower end of two windshield wiper blades upward and away from windshield glass. Continue lifting until wiper blades slide off windshield wiper arms.

(11) REMOVE WIPER ARM SPRING COVERS. Push up on the two wiper arm spring covers and at same time pull top of covers off wiper arms and remove wiper arm spring covers.

(12) REMOVE WIPER ARMS. Slide upper end of two wiper arms out of wiper motor shaft and remove wiper arms.

(13) REMOVE WINDSHIELD GLASS.

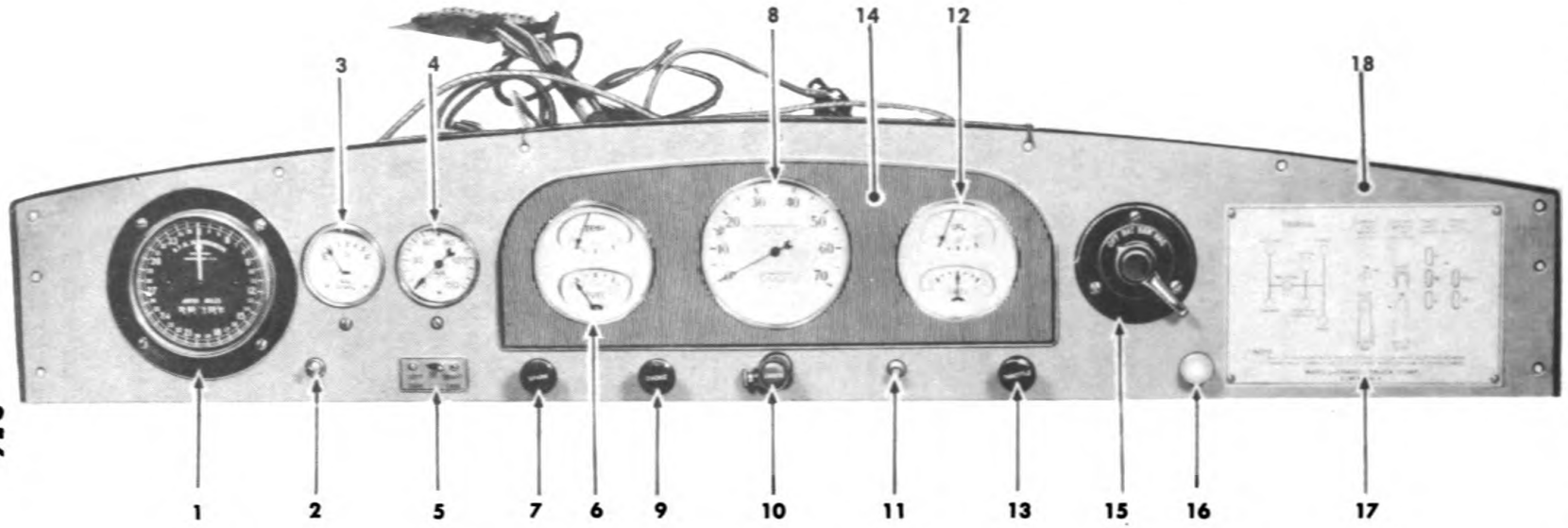
CHISEL
HAMMER
SCREWDRIVER, Phillips
SOLVENT, dry-cleaning

(a) Remove two wiper motors from windshield (par. 236).

(b) Remove two windshield right and left upper corner screws.

(c) Chisel windshield frame top bar (with glass seal) off windshield glass.

(d) Soak edges of windshield glass with SOLVENT, dry-cleaning, until glass can be lifted out of windshield frame.

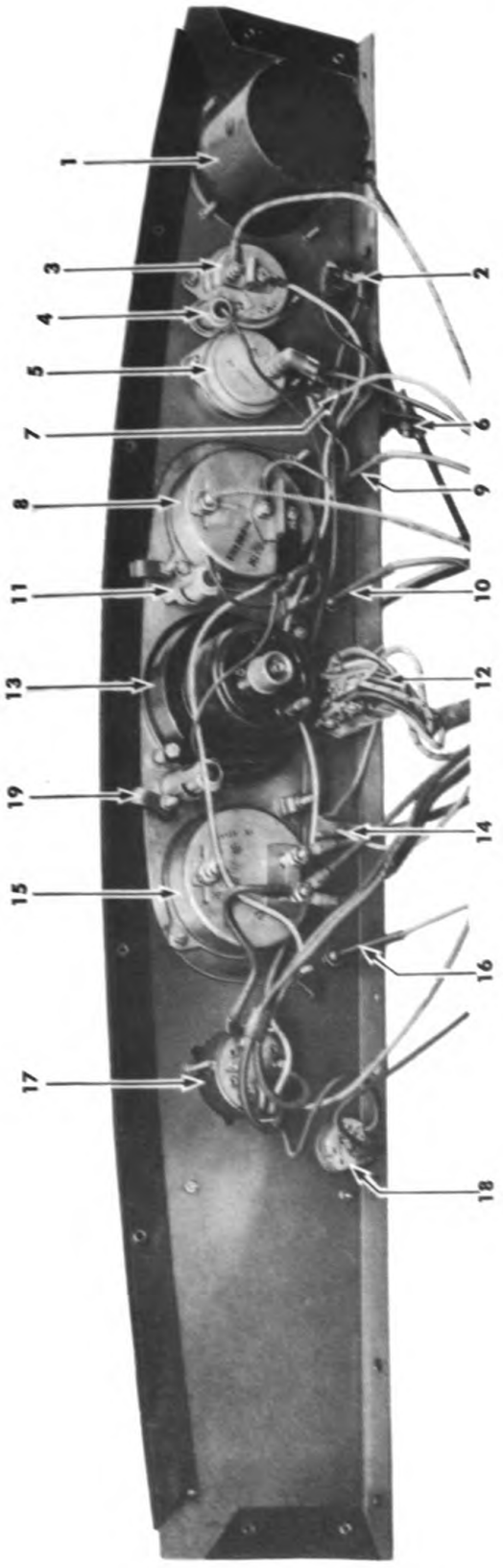


1. HEAD, TACHOMETER
2. SWITCH, AUXILIARY STOP LIGHT
3. GAGE, OIL LEVEL
4. GAGE, AIR PRESSURE
5. SWITCH, GASOLINE RIGHT AND LEFT TANK
6. GAGES, WATER TEMPERATURE AND FUEL LEVEL
7. KNOB, SPARK CONTROL WIRE
8. HEAD, SPEEDOMETER
9. KNOB, CHOKE CONTROL WIRE
10. KNOB, LIGHT SWITCH
11. SWITCH, SIREN LIGHT
12. GAGE, OIL PRESSURE AND AMMETER
13. KNOB, HAND THROTTLE CONTROL
14. PANEL, INSTRUMENT
15. SWITCH, IGNITION
16. KNOB, HEATER SWITCH
17. PLATE, SHIFTING INSTRUCTION
18. BOARD, INSTRUMENT

RA PD 14984

Figure 111—Instrument Board Assembly—Front View

CAB ASSEMBLY



1. HEAD, TACHOMETER
2. SWITCH, AUXILIARY STOP LIGHT
3. GAGE, OIL LEVEL
4. LIGHT, DASH
5. GAGE, AIR PRESSURE
6. ROD, AIR BRAKE HOLD-DOWN
7. SWITCH, GASOLINE RIGHT AND LEFT TANK
8. GAGE, WATER TEMPERATURE
9. WIRE, SPARK CONTROL
10. WIRE, CHOKE
11. LIGHT, DASH
12. SWITCH, LIGHT
13. SPEEDOMETER
14. SWITCH, SIREN LIGHT
15. AMMETER AND GAGE, OIL PRESSURE
16. THROTTLE, HAND
17. SWITCH, IGNITION
18. SWITCH, HEATER
19. CLIP, INSTRUMENT PANEL

Figure 112—Instrument Board Assembly—Rear View

ORDNANCE MAINTENANCE
BODY AND CHASSIS FOR HEAVY WRECKING TRUCK M1

(14) REMOVE RIGHT WIPER MOTOR HOSE. Pull right wiper motor hose out of windshield header board, cab roof board and off "T" above left wiper motor. (The other end was attached to right wiper motor.)

(15) REMOVE LEFT WIPER MOTOR HOSE. Pull left wiper motor hose through windshield header board and off "T" above left wiper motor. (The other end of the hose was attached to left wiper motor.)

(16) REMOVE VACUUM HOSE AND "T." Pull vacuum hose off "T" (above left wiper motor) and remove "T." Pull other end of rubber hose off wiper copper pipe. Remove vacuum hose by pulling it through windshield header board.

(17) REMOVE WIPER COPPER PIPE.

PLIERS

(a) Remove nails that hold wiper copper pipe to groove in cab left front pillar (pliers). Straighten upper end of wiper copper pipe so it can be pulled downward and clear the end of instrument panel.

(b) Pull right end of wiper rubber hose (under instrument panel) off end of wiper copper pipe and pull wiper copper pipe down and remove.

(18) REMOVE WIPER RUBBER HOSE. Left end of wiper rubber hose, disconnected in step (15), is threaded among the wires under instrument board to the right side of dash where it is pushed through a rubber grommet (4, fig. 106). Pull wiper rubber hose out of dash and off instrument board wires.

(19) DISCONNECT INSTRUMENT BOARD ASSEMBLY.

SCREWDRIVER, Phillips
WRENCH, open-end, $^{9}/_{16}$-in.
WRENCHES, open-end, two, $^{7}/_{16}$-in.

(a) Remove 11 instrument board screws (fig. 111) that hold instrument board to cab (screwdriver, Phillips). Remove two instrument board end bolts, nuts and lock washers from each end of instrument board (two $^{7}/_{16}$-in. open-end wrenches).

(b) Remove two instrument panel bolts, nuts and lock washers that hold instrument panel to steering gear bracket ($^{9}/_{16}$-in. open-end wrench).

(20) TILT INSTRUMENT BOARD ASSEMBLY (fig. 112).

WRENCH, open-end, $^{9}/_{16}$-in.
WRENCH, open-end, 1-in.
WRENCH, open-end, $^{5}/_{8}$-in.

(a) Instrument board assembly can be tilted forward for inspection and repair. Disconnect air pressure gage pipe (5, fig. 112) leading to governor ($^{5}/_{8}$-in. open-end wrench).

(b) Disconnect oil pressure gage pipe (15, fig. 112) leading to engine ($^{9}/_{16}$-in. open-end wrench).

(c) Disconnect tachometer cable (1, fig. 112) at tachometer adapter (1-in. open-end wrench).

(d) Disconnect speedometer cable (13, fig. 112) at speedometer head (1-in. open-end wrench).

(21) REMOVE TACHOMETER HEAD ASSEMBLY (fig. 112).

PLIERS
SCREWDRIVER
WRENCH, open-end, $^3/_8$-in.
WRENCH, open-end, 1-in.

(a) Remove tachometer adapter from tachometer head (1-in. open-end wrench) (1, fig. 112).

(b) Remove tachometer buzzer wire nut from side of tachometer head and lay tachometer buzzer wire aside (pliers).

(c) Remove four tachometer head bolts, nuts and lock washers that hold tachometer head to instrument board (screwdriver) (1, fig. 112).

(d) Lift tachometer head off the front of instrument board.

(22) REMOVE AUXILIARY STOP LIGHT SWITCH (fig. 112).

PLIERS
SCREWDRIVER

(a) Remove nut which holds auxiliary stop light switch to instrument board (screwdriver and pliers) (2, fig. 112).

(b) Remove two switch wire screws from rear of auxiliary stop light switch and lay switch wires aside (pliers).

(c) Lift auxiliary stop light switch off back of instrument board.

(23) REMOVE OIL LEVEL GAGE.

PLIERS
SCREWDRIVER
WRENCH, open-end, $^3/_8$-in.

(a) Pull dash light wire and connection out of oil level gage light holder (4, fig. 112) and remove dash light bulb.

(b) Remove oil level gage to ignition switch wire nut and lay oil level gage to ignition switch wire aside (pliers) (3, fig. 112).

(c) Remove bolts, nuts and lock washers which hold oil level gage to instrument board ($^3/_8$-in. open-end wrench) (3, fig. 112).

(d) Lift oil level gage off back of instrument board.

(24) REMOVE AIR PRESSURE GAGE (figs. 111, 112).

PLIERS
SCREWDRIVER

(a) Remove bolts, nuts and lock washers which hold the air pressure gage (4, fig. 111) to the instrument board. Lift the air pressure gage off back of instrument board.

(25) REMOVE AIR BRAKE HOLD-DOWN ROD.

PLIERS
SCREWDRIVER
WRENCH, socket, $^1/_2$-in.

(a) Remove bolt, nut and lock washer which hold air brake hold-down bracket to instrument board and then lift off bracket, rod and spring ($^1/_2$-in. socket wrench) (6, fig. 112).

(b) Remove rod ball socket nut (pliers). Pull rod out of air brake hold-down rod bracket.

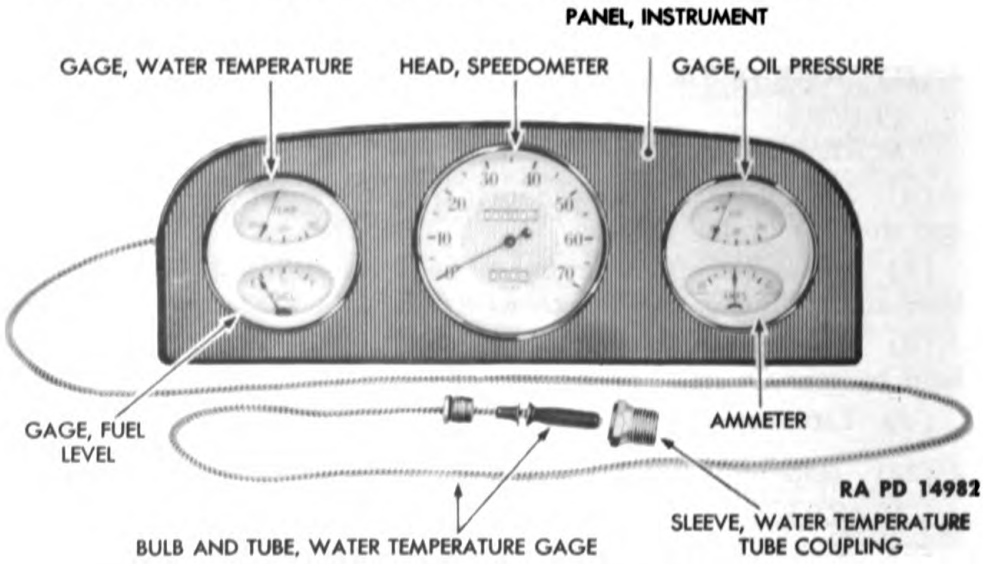


Figure 113—Instrument Panel Assembly—Front

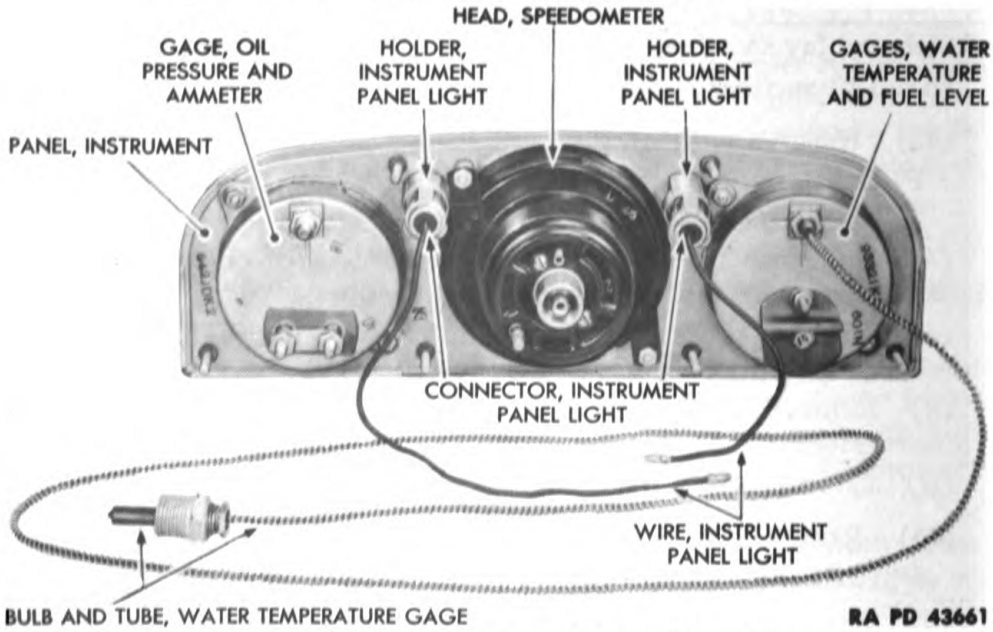


Figure 114—Instrument Panel Assembly—Rear

(c) Remove upper end of spring from dash and slip spring off rod (screwdriver).

(26) REMOVE RIGHT AND LEFT GASOLINE TANK SWITCH (fig. 106).

PLIERS SCREWDRIVER

(a) Remove three screws holding three wires on right and left gasoline tank switch (screwdriver). Lay the three wires aside (7, fig. 112).

(b) Remove two switch bolts, nuts and lock washers that hold switch to instrument board (pliers and screwdriver) (5, fig. 111).

(c) Lift right and left gasoline tank switch off back of instrument board and switch plate off front of instrument board.

(27) DISCONNECT SPEEDOMETER AND WATER TEMPERATURE GAGE.

PLIERS WRENCH, open-end, $^{7}_{16}$-in.

(a) The instrument panel assembly contains water temperature gage, fuel level gage, speedometer, oil pressure gage and ammeter. Loosen six instrument panel clip bolt nuts ($^{7}_{16}$-in. open-end wrench). Turn six instrument panel clips a quarter turn (19, fig. 112).

(b) Disconnect speedometer cable at speedometer head (pliers) (13, fig. 112). Remove water temperature bulb at right side of engine (TM 9-1795B).

(28) DISCONNECT AMMETER.

WRENCH, open-end, $^{1}_{2}$-in.

(a) Remove one ammeter terminal nut and lock washer, and lay aside the ammeter to ignition switch wire, ammeter to cut-out wire and ammeter to coil wire (all three wires are on one terminal). Tag wires for identification. Remove other ammeter terminal nut and lay aside ammeter to generator wire (15, fig. 112).

(29) DISCONNECT FUEL LEVEL GAGE.

WRENCH, open-end, $^{3}_{8}$-in.

(a) Remove fuel level gage terminal nut and lay aside wire leading to right and left gasoline tank switch. Lift instrument panel off instrument board (fig. 114).

(30) DISASSEMBLE INSTRUMENT PANEL

WRENCH, open-end, $^{11}_{32}$-in. WRENCH, open-end, $^{3}_{8}$-in.

(a) Pull two instrument panel light connectors out of two instrument panel light holders (fig. 114). Remove bulbs from instrument panel light connectors. This will leave two instrument panel light wires, tension springs, washers and connectors.

(b) Remove nuts which hold oil pressure gage and ammeter unit to instrument panel ($^{11}_{32}$-in. open-end wrench). Lift off oil pressure gage and ammeter unit.

(c) Remove nuts which hold water temperature gage and fuel level gage unit to instrument panel ($^{11}_{32}$-in. open-end wrench).

(d) Remove two nuts which hold speedometer head to instrument panel and lift off speedometer head ($^{3}_{8}$-in. open-end wrench) (fig. 114). Then lift four speedometer head spacers off instrument panel studs.

(31) REMOVE SHIFTING INSTRUCTION PLATE.

SCREWDRIVER

(a) Remove screws which hold shifting instruction plate to instrument board. Lift off shifting instruction plate (17, fig. 111).

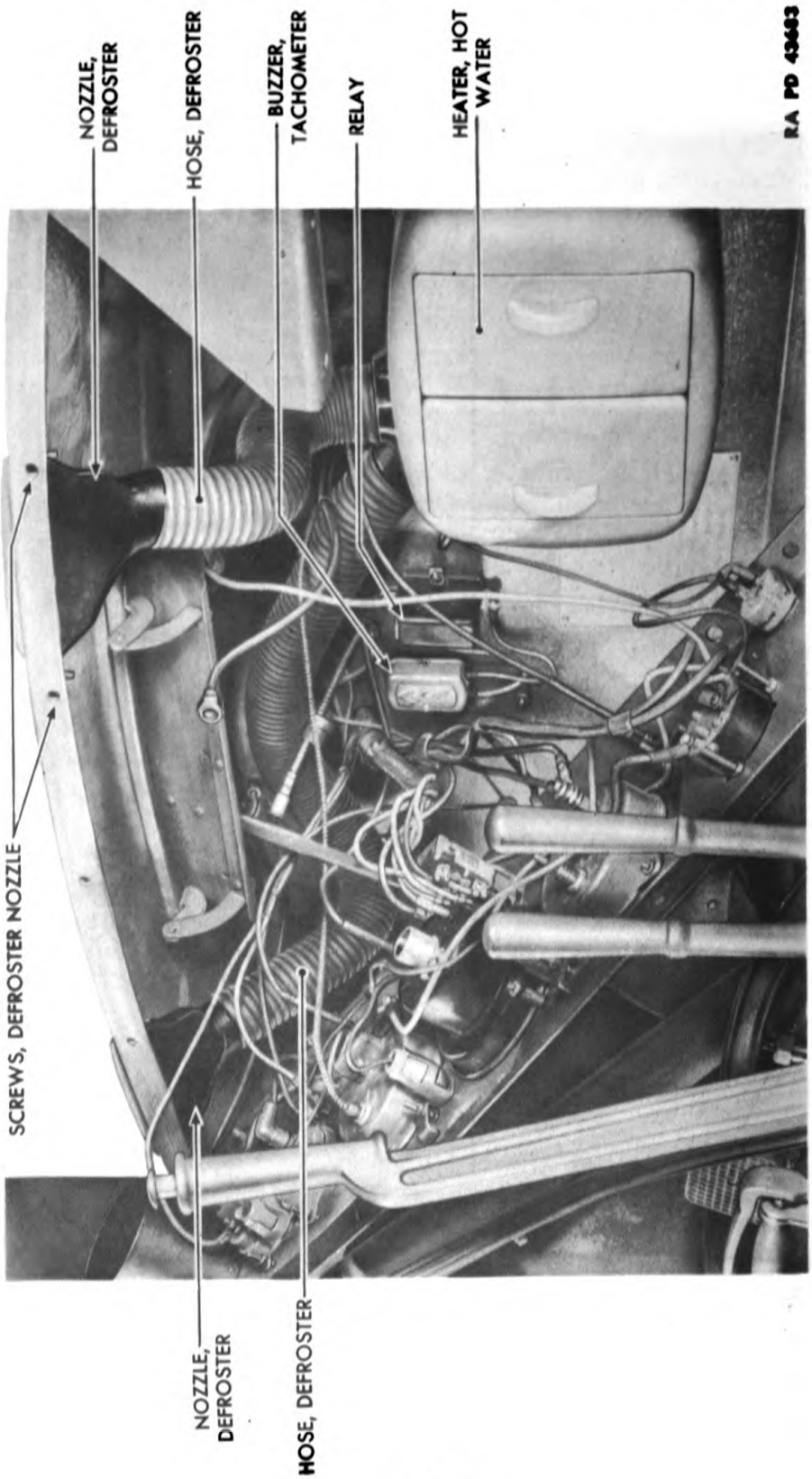


Figure 115—Dash—Cab Side

CAB ASSEMBLY

(32) REMOVE THROTTLE, SPARK AND CHOKE KNOBS.

PLIERS WRENCH, open-end, $^{9}_{16}$-in.

(a) Disconnect spark control wire at distributor (TM 9-1795B). Disconnect throttle control wire at carburetor (TM 9-1795B). Disconnect choke wire at carburetor (TM 9-1795B).

(b) Remove three knob nuts that hold spark control knob (9, fig. 112), throttle control knob (16, fig. 112) and choke knob (10, fig. 112) to instrument panel ($^{9}_{16}$-in. open-end wrench and pliers).

(c) Pull spark control knob and wire off front of instrument board. Repeat procedure on throttle control knob and wire and choke knob and wire (fig. 111).

(33) REMOVE SIREN LIGHT SWITCH.

PLIERS SCREWDRIVER

(a) Remove two switch terminal screws from back of siren light switch (14, fig. 112) and lay aside siren light switch to siren light wire and siren light switch to light switch wire (pliers and screwdriver).

(b) Remove siren light switch nut from front of switch (pliers) (11, fig. 111).

(c) Pull siren light switch off back of instrument board.

(34) REMOVE HOT WATER HEATER SWITCH.

PLIERS SCREWDRIVER

(a) Remove screws which hold hot water heater switch to heater wire and heater switch to ignition switch wire (screwdriver) (8, fig. 112).

(b) Remove heater switch nut from front of heater switch (pliers) (16, fig. 111).

(c) Pull hot water heater switch off back of instrument board.

(35) REMOVE HEATER SWITCH BULB. Pull heater switch control knob outward and off hot water heater switch. Turn heater switch bulb a quarter turn and remove bulb.

(36) REMOVE HOT WATER HEATER (fig. 115).

SCREWDRIVER WRENCH, socket, $^{3}_{4}$-in.

(a) Remove three hot water heater stud nuts and plain washers from engine side of dash ($^{3}_{4}$-in. socket wrench) (3, fig. 106).

(b) Remove wire screw that holds hot water heater switch to heater wire, and lift off wire (screwdriver).

(c) Pull defroster hose off hot water heater and lift heater off dash (fig. 115).

(37) REMOVE DEFROSTER NOZZLES AND HOSE.

PLIERS SCREWDRIVER

(a) Remove bolts, nuts and lock washers which hold defroster nozzles to cowl (screwdriver and pliers) (fig. 115).

(b) Pull hose from two defroster nozzles, and remove. Lift two defroster nozzles off cowl.

(38) REMOVE TACHOMETER BUZZER.

PLIERS SCREWDRIVER

(a) Remove buzzer cover nut from tachometer buzzer (pliers) (fig. 115). Remove screws which hold relay to tachometer buzzer wire, and tachometer buzzer to ground wire (screwdriver). Place wires aside.

(b) Remove screw which holds tachometer buzzer to cab side of dash (screwdriver). Then remove tachometer buzzer.

(39) REMOVE RELAY.

SCREWDRIVER WRENCH, box, ½-in.

(a) Remove screws which hold relay to switch wire, relay to tachometer wire, relay to buzzer ground wire and relay to buzzer wire. Place wires aside (screwdriver) (fig. 115).

(b) Remove four relay bolts, nuts and lock washers which hold relay to cab side of dash (½-in. box wrench). Lift off relay.

(40) REMOVE SIREN LIGHT FLASHER UNIT.

PLIERS SCREWDRIVER

(a) Remove screws which hold flasher to siren light switch wire and flasher to siren light wire (screwdriver).

(b) Remove two siren light flasher unit bolts, nuts and lock washers which hold flasher unit to cab side of dash (pliers). Lift off siren light flasher unit.

(41) REMOVE GASOLINE TANK CHANGE-OVER SWITCH.

SCREWDRIVER WRENCH, socket, ⅝-in.
WRENCH, open-end, 9/16-in.

(a) Remove handle screw (screwdriver). Lift off handle.

(b) Remove bolts, nuts and lock washers which hold switch handle plate to cab side of dash (⅝-in. socket wrench).

(c) Disconnect three fuel pipes from gasoline tank change-over switch (change-over switch to right gasoline tank) (change-over switch to left gasoline tank) (change-over switch to fuel pump) (9/16-in. open-end wrench).

(d) Lift switch handle plate off cab side of dash, and gasoline tank change-over switch from engine side of dash.

(42) REMOVE CIRCUIT BREAKER (fig. 115).

PLIERS SCREWDRIVER

(a) Remove bolt, nut and lock washer which hold circuit breaker to cab side of dash (pliers).

(b) Remove two wire screws holding two circuit breaker wires to circuit breaker (screwdriver).

(c) Lift circuit breaker off cab side of dash.

(43) REMOVE VOLTAGE REGULATOR (fig 109).

SCREWDRIVER WRENCH, box, ½-in.

CAB ASSEMBLY

(a) Remove bolts, nuts and lock washers which hold voltage regulator to engine side of dash (½-in. box wrench) (18, fig. 106).

(b) Remove three wire screws holding three voltage regulator wires to voltage regulator (screwdriver).

(c) Lift voltage regulator off engine side of dash.

(44) REMOVE GOVERNOR (AIR).

PLIERS
SCREWDRIVER
WRENCH, open-end, ⅝-in.

(a) Remove bolts, nuts and lock washers which hold governor to engine side of dash (screwdriver and pliers) (10, fig. 106).

(b) Disconnect the three air pipes from governor (⅝-in. open-end wrench).

(c) Lift governor off engine side of dash.

(45) REMOVE HEAD LAMP DIMMER SWITCH.

PLIERS
SCREWDRIVER

(a) Remove bolts, nuts and lock washers which hold head lamp dimmer switch to toeboard (pliers).

(b) Remove screws which hold three head lamp dimmer switch wires to switch (screwdriver).

(c) Lift off head lamp dimmer switch from underneath toeboard.

(46) REMOVE RIGHT AND LEFT SIREN SWITCHES.

PLIERS
SCREWDRIVER
WRENCH, open-end, $^{9}/_{16}$-in.

(a) Remove bolts, nuts and lock washers which hold right siren switch to toeboard ($^{9}/_{16}$-in. open-end wrench).

(b) Remove nuts and lock washers which hold two siren switch wires (screwdriver and pliers). Remove wires and lay aside.

(c) Pull off siren switches from underneath toeboard.

(47) REMOVE LIGHT SWITCH.

SCREWDRIVER
WRENCH, open-end, ¾-in.

(a) Loosen light switch knob set screw and pull light switch knob off light switch (screwdriver).

(b) Loosen blackout safety switch nut (¾-in. open-end wrench). Press in on blackout safety switch release button and switch off instrument board.

(c) Remove screws from back of light switch and lay wires aside (screwdriver).

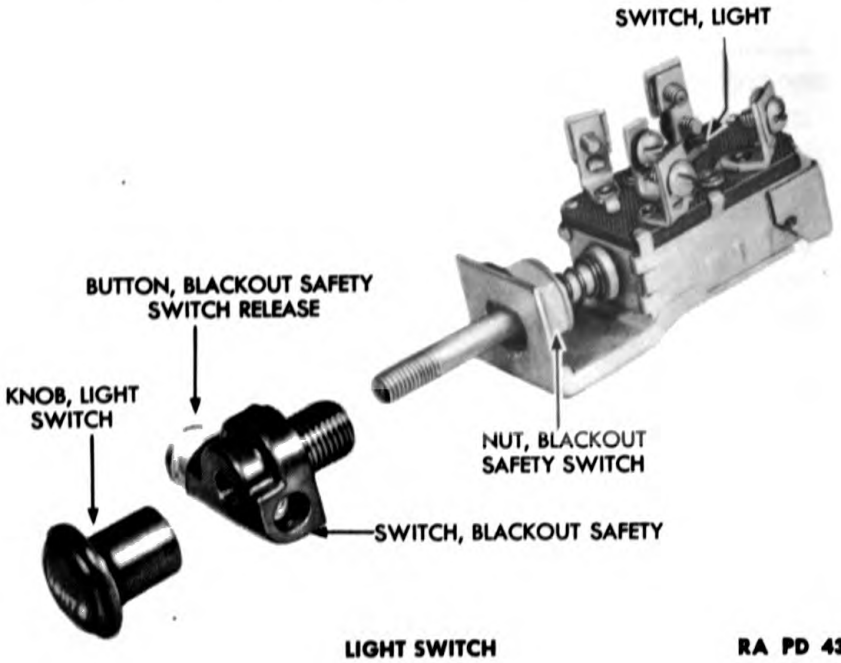
(d) Pull light switch out of and off the back of instrument board.

(48) REMOVE IGNITION SWITCH.

PLIERS
SCREWDRIVER

(a) Remove bolts, nuts and lock washers which hold ignition switch to instrument board (pliers) (15, fig. 111).

ORDNANCE MAINTENANCE
BODY AND CHASSIS FOR HEAVY WRECKING TRUCK M1



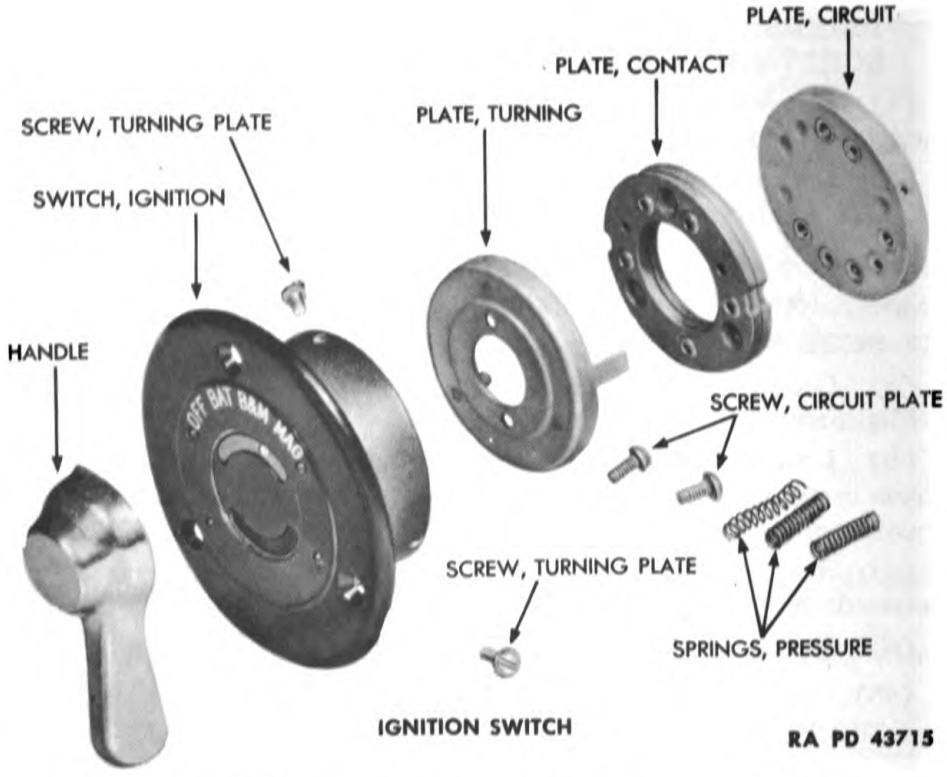


Figure 116—Light and Ignition Switches—Exploded Views

(b) Remove screws from back of ignition switch and lay aside the four ignition switch wires (screwdriver).

(c) Lift ignition switch from front of instrument board.

(49) DISASSEMBLE IGNITION SWITCH (fig. 116).

SCREWDRIVER

(a) Remove screws which hold circuit plate to ignition switch (screwdriver). Lift off circuit plate.

(b) Lift contact plate and three pressure springs out of ignition switch.

(c) Remove two turning plate screws and lift handle off face of ignition switch (screwdriver). Lift turning plate out of back of ignition switch.

(50) REMOVE JUNCTION BLOCK.

PLIERS SCREWDRIVER

(a) Pull all wires off clips on junction block (engine side of dash) (20, fig. 106).

(b) Remove bolts, nuts and lock washers which hold junction block and wiring instruction plate to dash (screwdriver and pliers).

(c) Lift off junction block and wiring instruction plate from engine side of dash.

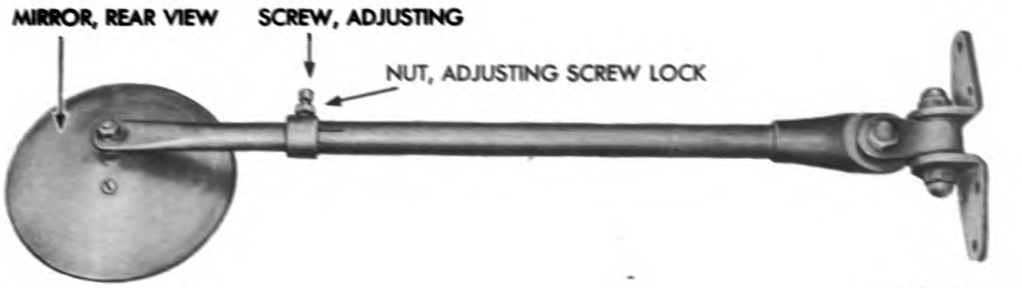


Figure 117—Rear View Mirror Assembly

(51) REMOVE REAR VIEW MIRROR ASSEMBLY (fig. 117).

SCREWDRIVER

(a) Remove screws which hold rear view mirror assembly to cab left pillar (fig. 110). Lift off rear view mirror assembly (fig. 117).

(52) REMOVE OILCAN HOLDER.

SCREWDRIVER

(a) Lift oilcan out of oilcan holder (engine side of dash). Remove two oilcan holder screws from engine side of dash. Lift off oilcan holder.

(53) REMOVE REAR GLASS (fig. 118).

SCREWDRIVER, Phillips

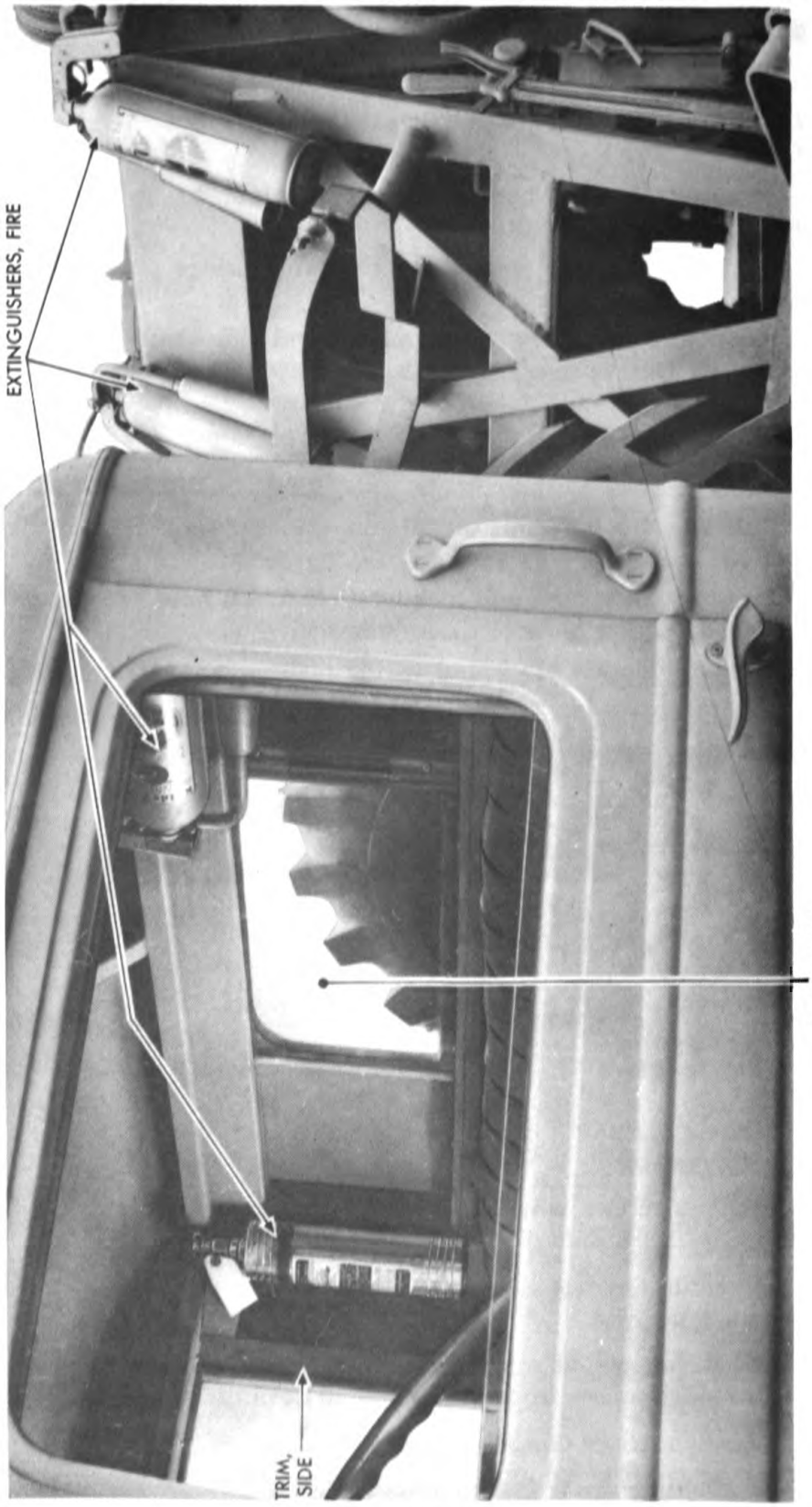


Figure 118—Cab Assembly—Interior

CAB ASSEMBLY

(a) Remove six screws which hold rear glass run wood strip to cab. NOTE: Rear glass run wood strip is fastened to seat back and it is not necessary to remove rear glass run wood strip in order to remove rear glass (Phillips screwdriver).

(b) Pull lower edge of rear glass downward. Remove rear glass with glass pull handle. The rear glass pull handle is cemented to rear glass.

(54) REMOVE REAR GLASS RUN CHANNELS. NOTE: Glass run channels (at top and bottom of rear glass opening in cab) are cemented in place. Pull rear glass run channels out of rear glass opening of cab.

(55) REMOVE REAR GLASS STOP.

SCREWDRIVER, Phillips

(a) Remove three screws which hold rear glass stop to cab. Lift off rear glass stop. Pull rear glass rubber channel off cab.

(56) REMOVE REAR GLASS FELT BRACKET.

SCREWDRIVER, Phillips

(a) Remove three screws which hold rear glass felt bracket to cab. Lift rear glass felt and felt bracket. Pull felt out of felt bracket.

(57) REMOVE FIRE EXTINGUISHERS.

SCREWDRIVER

(a) Pull two fire extinguisher bracket clamps up, back and forward. Pull two fire extinguishers out of two fire extinguisher brackets (fig. 118).

(b) Remove screws which hold the two fire extinguisher brackets to cab, and lift off two fire extinguisher brackets (screwdriver).

(58) REMOVE SIDE TRIM (fig. 119).

SCREWDRIVER SCREWDRIVER, Phillips

(a) Remove two screws which hold side trim to cab door pillar (Phillips screwdriver). Then remove upholstery tacks which hold back and bottom edges of side trim to cab (screwdriver).

(59) REMOVE DOOR WINDCORD.

SCREWDRIVER, Phillips

(a) Remove screws which hold door windcord steel plate to cab. (The door windcord steel plate is the full length of rear side of door opening.)

(b) Lift off door windcord steel plate and pull door windcord off cab.

227. CAB ASSEMBLY INSPECTION.

a. Wiring and Wiring Connections. Inspect all wiring and wiring connections (TM 9-1795B).

b. Gages. Inspect all gages on instrument board and instrument panel for broken glass. Clean and tape all connections.

c. Sheet Steel and Wood.

(1) Inspect all sheet steel for fractures or breaks and weld where necessary. If necessary, use a sheet steel reinforcement under fracture or break.

(2) Inspect all wood parts for decay or fractures and, if found, use a new wood part. Splicing of wood parts is not advisable.

d. Trim. Inspect all cab interior trim, including the two seat cushions and seat back. Damaged trim should be sewn or replaced.

228. ASSEMBLY OF CAB ASSEMBLY.

a. Equipment.

HAMMER
OIL, engine, SAE 10
PLIERS
SCREWDRIVER
SCREWDRIVER, Phillips
VARNISH, shellac
WRENCH, adjustable
WRENCH, box, 1/2-in.
WRENCH, open-end, 11/32-in.
WRENCH, open-end, 3/8-in.
WRENCH, open-end, 7/16-in.
WRENCH, open-end, 1/2-in.
WRENCH, open-end, 9/16-in.
WRENCH, open-end, 5/8-in.
WRENCH, open-end, 3/4-in.
WRENCH, open-end, 1-in.
WRENCH, socket, 1/2-in.
WRENCH, socket, 5/8-in.
WRENCH, socket, 3/4-in.

b. Procedure.

(1) INSTALL DOOR WINDCORD.

SCREWDRIVER, Phillips

(a) Install door windcord along full length of rear side of door opening. Then install door windcord steel plate and fasten with screws.

(2) INSTALL SIDE TRIM.

HAMMER
SCREWDRIVER, Phillips

(a) Install side trim on cab door pillar. Fasten with upholstering tacks at back and bottom edges of side trim (hammer). Install two screws which hold side trim to cab door pillar (Phillips screwdriver) (fig. 119).

(3) INSTALL FIRE EXTINGUISHERS.

SCREWDRIVER

(a) Install fire extinguisher brackets in cab and fasten with 12 screws (screwdriver) (fig. 118).

(b) Install the two fire extinguishers in two fire extinguisher brackets and clamp in place with two fire extinguisher bracket clamps.

(4) INSTALL REAR GLASS FELT BRACKET.

SCREWDRIVER, Phillips

(a) Install rear glass felt in rear glass felt bracket. Install bracket in cab. Fasten rear glass felt bracket with three screws (fig. 118).

(5) INSTALL REAR GLASS STOP.

SCREWDRIVER, Phillips

(a) Install rear glass rubber channel in cab. Install rear glass top (Phillips screwdriver).

(6) INSTALL REAR GLASS RUN CHANNELS.

VARNISH, shellac

(a) Cement rear glass run channels at top and bottom of rear glass opening in cab.

(7) INSTALL REAR GLASS PULL HANDLE. Cement rear glass pull handle to rear glass.

(8) INSTALL REAR GLASS.

SCREWDRIVER, Phillips

(a) Install rear glass upward and then back. Install rear glass wood strip and fasten with six screws.

(9) INSTALL OILCAN HOLDER.

SCREWDRIVER

(a) Install oilcan holder on engine side of dash and fasten with two screws. Install oilcan in holder.

(10) INSTALL REAR VIEW MIRROR ASSEMBLY.

SCREWDRIVER WRENCH, adjustable

(a) Install rear view mirror assembly and fasten with six screws (screwdriver).

(b) Loosen adjusting screw lock nut and adjusting screw and adjust rear view mirror. Tighten adjusting screw and lock nut (adjustable wrench) (fig. 117).

(11) INSTALL JUNCTION BLOCK.

PLIERS SCREWDRIVER

(a) Install wiring instruction plate (19, fig. 106), junction block (20, fig. 106) and fasten bolts, nuts and lock washers (pliers).

(b) Install wires in junction block clips according to wiring instruction plate (screwdriver).

(12) ASSEMBLE IGNITION SWITCH.

SCREWDRIVER

(a) Install turning plate in ignition switch (fig. 116). Install the handle. Fasten turning plate with screws.

(b) Install contact plate and three pressure springs in ignition switch.

(c) Install circuit plate and fasten with screws to ignition switch.

(13) INSTALL IGNITION SWITCH.

PLIERS SCREWDRIVER

(a) Install ignition switch from front of instrument board (15, fig. 111) and fasten bolts, nuts and lock washers (pliers).

(b) Install four ignition switch wires (screwdriver).

(14) INSTALL LIGHT SWITCH.

SCREWDRIVER
WRENCH, open-end, 3/4-in.

(a) Install light switch (12, fig. 112) from back of instrument board (3/4-in. open-end wrench) and install wires (screwdriver).

(b) Press in on the blackout safety switch release button (fig. 116) and push blackout safety switch on front end of light switch. Release blackout safety switch release button and tighten blackout safety switch nut (3/4-in. open-end wrench).

(c) Install light switch knob and tighten set screw (screwdriver).

(15) INSTALL RIGHT AND LEFT SIREN SWITCHES.

PLIERS
SCREWDRIVER
WRENCH, open-end, 9/16-in.

(a) Install right siren switch from underneath toeboard and fasten with four right siren switch bolts, nuts and lock washers (9/16-in. open-end wrench).

(b) Install two siren switch wires (screwdriver and pliers).

(16) INSTALL HEAD LAMP DIMMER SWITCH.

PLIERS
SCREWDRIVER

(a) Install head lamp dimmer switch from underneath toeboard and fasten with two bolts, nuts and lock washers (pliers).

(b) Install three head lamp dimmer switch wires (screwdriver).

(17) INSTALL GOVERNOR (AIR).

PLIERS
SCREWDRIVER
WRENCH, open-end, 5/8-in.

(a) Install governor (10, fig. 106) on engine side of dash (screwdriver and pliers).

(b) Install three air pipes (5/8-in. open-end wrench).

(18) INSTALL VOLTAGE REGULATOR.

PLIERS
SCREWDRIVER
WRENCH, box, 1/2-in.

(a) Install voltage regulator (18, fig. 106) on engine side of dash and fasten with three bolts, nuts and lock washers (1/2-in. box wrench).

(b) Install three voltage regulator wires and fasten with three screws (screwdriver and pliers).

(19) INSTALL CIRCUIT BREAKER.

PLIERS
SCREWDRIVER

(a) Install circuit breaker from cab side of dash (pliers).

(b) Install two circuit breaker wires (screwdriver).

(20) INSTALL GASOLINE TANK CHANGE-OVER SWITCH (fig. 106).

SCREWDRIVER
WRENCH, socket, 5/8-in.
WRENCH, open-end, 9/16-in.

CAB ASSEMBLY

(a) Install gasoline tank change-over switch (13, fig. 106) from engine side of the dash and switch handle plate from cab side of dash.

(b) Fasten switch handle plate with bolts, nuts and lock washers ($^5/_8$-in. socket wrench). Install handle and handle screw (screwdriver).

(c) Connect three fuel pipes—change-over switch to right gasoline tank, change-over switch to left gasoline tank and change-over switch to fuel pump ($^9/_{16}$-in. open-end wrench).

(21) INSTALL SIREN LIGHT FLASHER UNIT.

PLIERS SCREWDRIVER

(a) Install siren light flasher unit on cab side of dash and fasten with two bolts, nuts and lock washers (pliers).

(b) Install two siren light flasher unit wires (screwdriver).

(22) INSTALL RELAY.

SCREWDRIVER WRENCH, box, $^1/_2$-in.

(a) Install relay on cab side of dash and fasten with four bolts, nuts and lock washers ($^1/_2$-in. box wrench) (fig. 115).

(b) Install the three relay wires (screwdriver).

(23) INSTALL TACHOMETER BUZZER.

PLIERS SCREWDRIVER

(a) Install tachometer buzzer (fig. 115) on cab side of dash and fasten with screw (screwdriver).

(b) Install the two tachometer buzzer wires and fasten with screws (screwdriver).

(c) Install the buzzer cover and fasten with buzzer cover nut (pliers).

(24) INSTALL DEFROSTER NOZZLES AND HOSES.

PLIERS SCREWDRIVER

(a) Install two defroster nozzles (fig. 115) on cowl and fasten each one with two bolts, nuts and lock washers (pliers).

(b) Install the two defroster hoses on defroster nozzles (screwdriver).

(25) REMOVE HOT WATER HEATER.

SCREWDRIVER WRENCH, socket, $^3/_4$-in.

(a) Install hot water heater (fig. 115) on cab side of dash and fasten with three nuts and lock washers from engine side of dash ($^3/_4$-in. socket wrench).

(b) Install defroster hose on hot water heater. Install hot water heater switch to heater wire (screwdriver).

(26) INSTALL HOT WATER HEATER SWITCH.

PLIERS SCREWDRIVER

(a) Install hot water heater switch (18, fig. 112) from back of instrument board and fasten with nut on front of heater switch (pliers).

(b) Install hot water heater switch wires (screwdriver).

(27) INSTALL SIREN LIGHT SWITCH.

PLIERS SCREWDRIVER

(a) Install siren light switch (14, fig. 112) from back of instrument board and fasten nut on front of siren light switch (pliers).

(b) Install two siren light switch wires (screwdriver).

(28) INSTALL THROTTLE, SPARK AND CHOKE KNOBS.

PLIERS WRENCH, open-end, 9/16-in.

(a) Install spark control knob and wire (7, fig. 111) from front of instrument board. Install knob nut (9/16-in. open-end wrench).

(b) Install throttle control knob (13, fig. 111) and choke knob (9, fig. 111) (9/16-in. open-end wrench).

(c) Connect spark control wire at distributor (TM 9-1795B). Connect throttle control wire at carburetor (TM 9-1795B) and connect choke wire at carburetor (TM 9-1795B).

(29) ASSEMBLE INSTRUMENT PANEL.

WRENCH, open-end, 11/32-in. WRENCH, open-end, 3/8-in.

(a) Install the four speedometer head spacers on instrument panel studs. Install speedometer head, fastening with two nuts (3/8-in. open-end wrench) (fig. 114).

(b) Install water temperature gage and fuel level gage unit and fasten with two nuts (11/32-in. open-end wrench) (fig. 114).

(c) Repeat procedure to install oil pressure gage and ammeter unit.

(d) Slide connectors, tension springs and washers on two instrument panel light wires. Then install bulbs in connectors and install connectors in instrument panel light holders (fig. 114).

(30) CONNECT FUEL LEVEL GAGE.

WRENCH, open-end, 3/8-in.

(a) Install instrument panel assembly on instrument board and install wire on fuel level gage terminal.

(31) CONNECT AMMETER.

WRENCH, open-end, 1/2-in.

(a) Connect ammeter wires.

(32) CONNECT SPEEDOMETER AND WATER TEMPERATURE GAGE.

WRENCH, open-end, 7/16-in.

(a) Install water temperature gage bulb (fig. 114) on right side of engine (TM 9-1795B).

(b) Connect speedometer cable to speedometer head (13, fig. 112).

(c) Turn six instrument panel clips a quarter turn and tighten the instrument panel clip bolt nuts (7/16-in. open-end wrench) (19, fig. 112).

(33) INSTALL SHIFTING INSTRUCTION PLATE.

SCREWDRIVER

CAB ASSEMBLY

(a) Install shifting instruction plate (17, fig. 111) on instrument board.

(34) INSTALL RIGHT AND LEFT GASOLINE TANK SWITCH.

PLIERS
SCREWDRIVER

(a) Install right and left gasoline tank switch (7, fig. 112) from back of instrument board and install switch plate (5, fig. 111) from front of instrument board (pliers).

(b) Install switch wires (screwdriver).

(35) INSTALL AIR BRAKE HOLD-DOWN ROD.

PLIERS
SCREWDRIVER
WRENCH, socket, $^{1}_{2}$-in.

(a) Install upper end of spring on dash and slip air brake hold-down rod on spring (6, fig. 112).

(b) Install air brake hold-down rod bracket on instrument board and fasten with bolt, nut and lock washer (pliers and screwdriver).

(c) Install air brake hold-down rod in air brake hold-down bracket. Fasten with rod ball socket nut ($^{1}_{2}$-in. socket wrench).

(36) INSTALL AIR PRESSURE GAGE.

PLIERS
SCREWDRIVER

(a) Install air pressure gage (5, fig. 112) from back of instrument board and fasten with two air pressure gage bolts, nuts and lock washers.

(37) INSTALL OIL LEVEL GAGE.

PLIERS
WRENCH, open-end, $^{3}_{8}$-in.

(a) Install oil level gage (3, fig. 112) from back of instrument board and fasten with two bolts, nuts and lock washers ($^{3}_{8}$-in. open-end wrench).

(b) Install oil level gage wire (pliers).

(c) Install bulb in dash socket light wire. Install oil level gage light wire and socket in holder.

(38) INSTALL AUXILIARY STOP LIGHT SWITCH.

PLIERS
SCREWDRIVER

(a) Install auxiliary stop light switch (2, fig. 112) from back of instrument board (pliers).

(b) Install the two wires (screwdriver).

(39) INSTALL TACHOMETER HEAD ASSEMBLY.

PLIERS

(a) Install tachometer head assembly (1, fig. 112) from front of instrument board.

(b) Install wire.

(c) Install tachometer adapter on tachometer head.

ORDNANCE MAINTENANCE
BODY AND CHASSIS FOR HEAVY WRECKING TRUCK M1

(40) CONNECT AIR PRESSURE OIL PRESSURE GAGES, TACHOMETER AND SPEEDOMETER.

WRENCH, open-end, 9/16-in. WRENCH, open-end, 1-in.
WRENCH, open-end, 5/8-in.

(a) Connect speedometer cable to speedometer head (5/8-in. open-end wrench) (13, fig. 112). Connect tachometer flexible shaft to tachometer adapter (9/16-in. open-end wrench) (1, fig. 112). Connect oil pressure gage pipe leading to engine (1-in. open-end wrench). Connect air pressure gage pipe leading to governor (1-in. open-end wrench).

(41) CONNECT INSTRUMENT BOARD ASSEMBLY.

SCREWDRIVER, Phillips WRENCH, open-end, 9/16-in.
WRENCH, open-end, 7/16-in.

(a) Push instrument board assembly into position and install 11 instrument board screws (18, fig. 111) which hold instrument board to cab (Phillips screwdriver).

(b) Install two instrument board end bolts, nuts and lock washers at each end of instrument board (7/16-in. open-end wrench).

(c) Install two instrument panel bolts, nuts and lock washers which hold instrument panel to steering gear bracket (9/16-in. open-end wrench).

(42) INSTALL WIPER RUBBER HOSE. Install wiper rubber hose (4, fig. 106) through rubber grommet in right side of dash and over wiring under cowl to right left of dash.

(43) INSTALL WIPER COPPER PIPE.

HAMMER

(a) Install wiper copper pipe in groove in cab left front pillar and nail in place (hammer). Connect wiper rubber hose (step (42)) to wiper copper pipe.

(b) Bend upper end of wiper copper pipe so that pipe is lined up with left wiper motor.

(44) INSTALL VACUUM HOSE AND "T." Install vacuum hose by pushing it through windshield header board. Install "T" in one end and attach other end to wiper copper pipe.

(45) INSTALL LEFT WIPER MOTOR HOSE. Install left wiper motor hose through windshield header board on "T" and other end will be attached to left wiper motor.

(46) INSTALL RIGHT WIPER MOTOR HOSE. Install right wiper motor hose through windshield header board and through cab roof board. Attach one end to "T" (above the left wiper motor). NOTE: The other end will be attached to the right wiper motor.

(47) INSTALL WINDSHIELD GLASS.

OIL, engine, SAE 10 SCREWDRIVER, Phillips
PAPER, flint, class B

CAB ASSEMBLY

(a) Make sure there is no rust in windshield frame where glass is to be inserted and, if so, use PAPER, flint, class B, to remove. Use everseal glass channel filler, $\frac{1}{16}$-inch thickness. Cut filler about two inches longer than distance around windshield frame and windshield frame top bar. Pinch ends of everseal glass filler together and insert filler onto edges of windshield glass.

(b) Coat inside of windshield frame and windshield frame top bar with OIL, engine, SAE 10, and push windshield glass with everseal glass channel filler into windshield frame and windshield frame top bar. Trim off ends of everseal glass channel filler. NOTE: It requires 24 hours for engine oil to make everseal glass channel filler swell and thereby prevent water leaks around windshield glass.

(c) Install two windshield right and two left upper corner screws (Phillips screwdriver).

(48) INSTALL WIPER MOTORS.

(a) Install two wiper motors on windshield (par. 240).

(b) Install two wiper arms on two wiper motor shafts.

(c) Install two wiper arm spring covers on wiper arms.

(d) Install two wiper blades on wiper arms.

(49) INSTALL WINDSHIELD ADJUSTING ARM BRACKETS.

SCREWDRIVER, Phillips

(a) Install windshield adjusting arm brackets on windshield and fasten with two screws on each bracket.

(50) INSTALL WINDSHIELD ADJUSTING ARMS.

SCREWDRIVER, Phillips

(a) Install adjusting arms on windshield and fasten with two windshield adjusting arm screws (Phillips screwdriver). Install right and left wing nuts on adjusting arm brackets.

(51) INSTALL WINDSHIELD.

SCREWDRIVER, Phillips

(a) Install windshield and fasten with 14 windshield top frame screws. Install two adjusting wing nut washers and windshield adjusting wing nuts.

(b) Install wiper motor hose on two wiper motors.

(52) INSTALL CAB HALF OF DOOR HINGES.

SCREWDRIVER, Phillips

(a) Install cab half of door hinges on hinge pillars.

(b) Install cab doors (par. 234).

(53) INSTALL CAB HANDLES.

SCREWDRIVER WRENCH, open-end, $\frac{1}{2}$-in.

(a) Install two cab handles (fig. 110). Fasten with eight cab handle bolts, nuts and lock washers to both sides of cab.

(54) INSTALL DOOR BUMPERS.

SCREWDRIVER

(a) Push four door bumpers into two cab door locking pillars.

(55) INSTALL DOOR FEMALE DOVETAILS.

SCREWDRIVER, Phillips

(a) Install door female dovetails (fig. 107). Fasten eight screws to two cab door locking pillars.

(56) INSTALL DOOR LOCK STRIKERS.

SCREWDRIVER, Phillips

(a) Install two door lock strikers (fig. 107) on two door locking pillars and fasten with four door lock striker screws.

229. CAB ASSEMBLY INSTALLATION.

a. Equipment.

CHAIN, loose
HOIST, chain
PLIERS
SCREWDRIVER
SCREWDRIVER, Phillips
STICK, hardwood, 3-in. x 3-in. x 7-ft
WRENCH, box, 1/2-in.
WRENCH, box, 1 1/16-in.
WRENCH, open-end, 5/8-in.
WRENCH, open-end, 3/4-in.
WRENCH, open-end, 7/8-in.
WRENCH, open-end, 15/16-in.
WRENCH, socket, 7/16-in.
WRENCH, socket, 3/4-in.

b. Procedure.

(1) INSTALL CAB ASSEMBLY.

CHAIN, loose
HOIST, chain
STICK, hardwood, 3-in. x 3-in. x 7-ft

(a) Have at least 14 feet between floor and end of chain hoist lifting hook. The chain hoist must be rigged for a straight pull. Install cab spacer on cab rear hold-down bolt (fig. 108). Install cab rubber mounting plate, cab rubber mounting and second cab rubber mounting plate.

(b) Place a hardwood stick through door windows and attach about 15 feet of loose chain to hardwood stick at ends (fig. 110).

(c) Attach chain hoist to loose chain and install cab.

(2) INSTALL CAB FRONT HOLD-DOWN BOLTS.

WRENCH, open-end, 7/8-in.
WRENCH, open-end, 15/16-in.

(a) Push left front hold-down bolt (fig. 109) up and through splash apron and through rubber washer.

(b) Place spring on right front hold-down bolt and push bolt up and through the splash apron and rubber washer. Install and tighten nut (7/8-in. and 15/16-in. open-end wrenches).

(3) INSTALL CAB REAR HOLD-DOWN BOLT NUT.

WRENCH, box, 1 1/16-in.

CAB ASSEMBLY

(a) Install cab rear hold-down bolt plain washer and lock washer on cab rear hold-down bolt. Install cab rear hold-down bolt nut.

(4) INSTALL TOEBOARD PLATE.

PLIERS
SCREWDRIVER
SCREWDRIVER, Phillips
WRENCH, socket, $\frac{7}{16}$-in.

(a) Install accelerator pedal bracket on toeboard plate and fasten with two bolts, nuts and lock washers ($\frac{7}{16}$-in. socket wrench). Install toeboard plate on cab and fasten with nine bolts, nuts and lock washers (Phillips screwdriver).

(b) Install accelerator rod on accelerator rod cross shaft and fasten with cotter pin (pliers). Install accelerator pedal on end of the accelerator rod and fasten pedal to accelerator pedal bracket with bolt, nut and lock washer ($\frac{7}{16}$-in. socket wrench).

(c) Install seat box bottom board (fig. 107). Tip handle bracket back into seat box bottom board and tighten four handle bracket nuts ($\frac{7}{16}$-in. socket wrench).

(d) Install eight seat box bottom board screws (screwdriver).

(5) INSTALL BATTERY CARRIER (fig. 107).

WRENCH, socket, $\frac{3}{4}$-in.

(a) Install battery carrier and fasten with four nuts and lock washers (fig. 107).

(6) INSTALL SEAT BOARDS (fig. 107).

SCREWDRIVER, Phillips

(a) Install rear seat support and fasten with three screws. Install rear seat board and fasten with four screws.

(7) INSTALL FLOOR BOARD AND FLOOR MAT.

SCREWDRIVER

(a) Install the floor board under the toeboard plate and push floor board in place. Install four floor board screws. Install the floor mat over the foot switches, control levers and pedals.

(8) INSTALL SEAT CUSHIONS AND SEAT BACK.

SCREWDRIVER

(a) Install equipment under seat cushions. Install seat back and fasten to seat back brackets with four screws. Install the two seat cushions.

(9) CONNECT STEERING GEAR. Connect steering gear assembly at frame and instrument board (par. 206). Install the horn button and horn button wire (par. 206) and install the steering wheel (par. 206).

(10) CONNECT WIRE HARNESS.

SCREWDRIVER
WRENCH, box, $\frac{1}{2}$-in.

(a) Slip the wire harness under the wire harness clip (21, fig. 106). Tighten wire harness clip bolt and nut.

(11) CONNECT GOVERNOR.

WRENCH, open-end, 5/8-in.

(a) Connect the two air pipes at the governor (fig. 68).

(12) CONNECT GASOLINE TWO-WAY VALVE.

WRENCH, open-end, 3/4-in.

(a) Connect left and right gasoline two-way valve pipes. Then connect the gasoline two-way valve flexible hose (13, fig. 106) at fuel pump.

(13) CONNECT VOLTAGE REGULATOR.

SCREWDRIVER

(a) Connect the three wires to the voltage regulator (fig. 106).

(14) CONNECT DASH JUNCTION BLOCK WIRES.

SCREWDRIVER

(a) Connect the 10 lower dash junction block wires (20, fig. 106) as instructed in wiring instruction plate under junction block.

(15) CONNECT CABLES, WIRES AND PIPES ON ENGINE SIDE OF DASH.

(a) Connect tachometer shaft (22, fig. 106), spark control wire (17, fig. 106), choke wire (8, fig. 106), hand throttle wire (5, fig. 106), starter cable (1, fig. 106), oil pressure gage pipe (7, fig. 106), ignition switch to coil wire (14, fig. 106), ignition switch to magneto wire (15, fig. 106), horn wire, water indicator tube (6, fig. 106), windshield wiper hose (4, fig. 106) and heater hose (2, fig. 106).

(b) Install hood assembly and radiator tie rod (par. 265).

(c) Install and connect battery (TM 9-1795B).

(d) Hook clutch pedal return spring to the cab sill (fig. 107).

230. CAB DOOR ASSEMBLY REMOVAL.

a. Equipment.

DRIFT
HAMMER
SCREWDRIVER, Phillips

b. Procedure.

(1) GENERAL.

(a) The procedure given in this paragraph covers removal of a right door assembly. The same procedure applies to removal of left door assembly.

(2) LOOSEN DOOR CHECK STRAP.

SCREWDRIVER, Phillips

(a) Remove two screws which hold door check strap clamp to cab. Lift off the door check strap clamp.

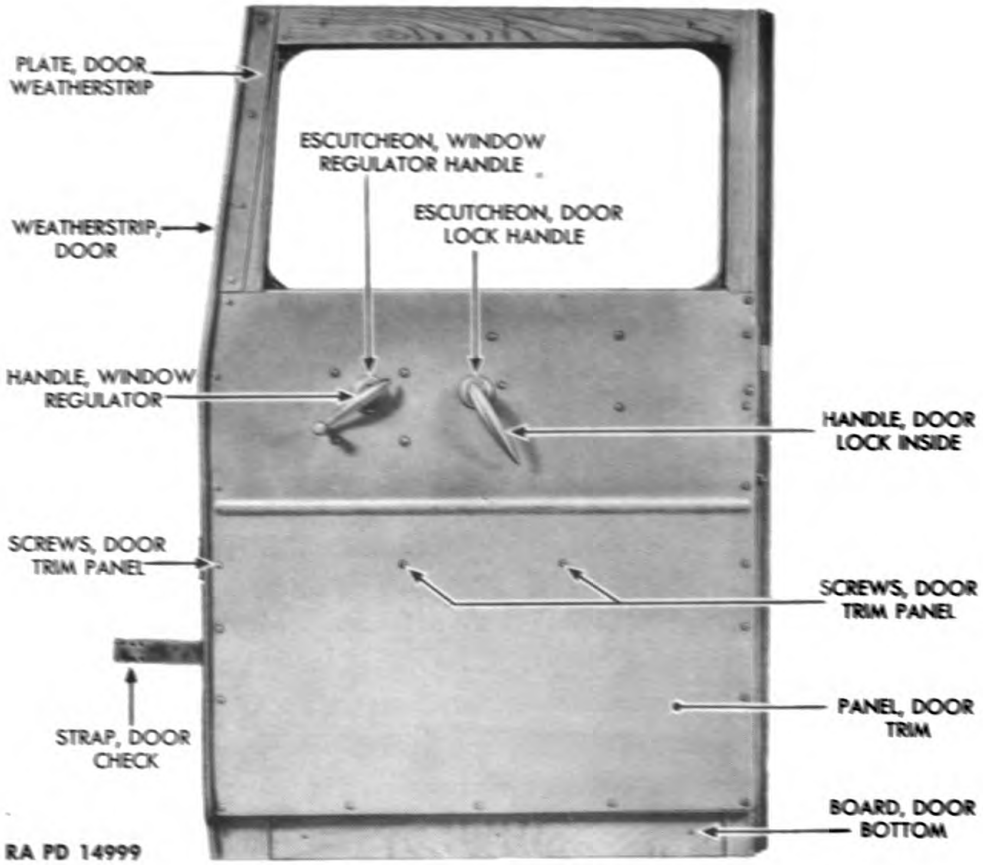


Figure 119—Cab Door Assembly

(3) REMOVE CAB DOOR ASSEMBLY.

DRIFT HAMMER

(a) Drive out three door hinge pins and lift off door assembly.

231. CAB DOOR DISASSEMBLY.

a. Equipment.

AWL
SCREWDRIVER
SCREWDRIVER, Phillips
SOLVENT, dry-cleaning
WRENCH, open-end, 1/2-in.

b. Procedure.

(1) REMOVE DOOR LOCK AND REGULATOR HANDLES.

AWL

(a) Press down on door lock handle escutcheon (fig. 119) and push out pin which holds door lock handle to door lock shaft.

(b) Lift door lock handle and door lock handle escutcheon off door lock shaft.

(c) Repeat procedure to remove window regulator handle.

(2) REMOVE DOOR OUTSIDE HANDLE.

SCREWDRIVER, Phillips

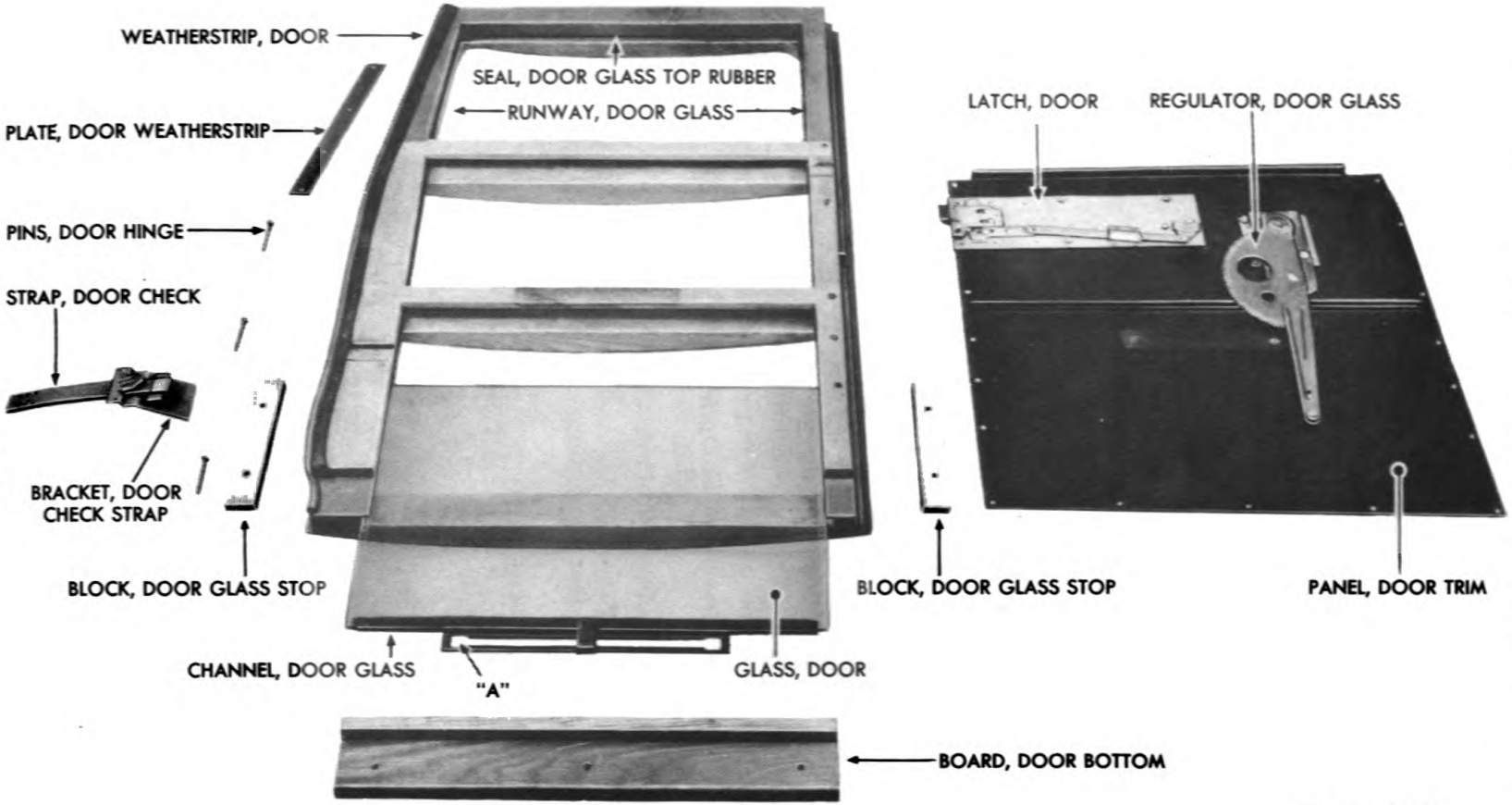


Figure 120—Cab Door—Exploded View

(a) Remove two screws which hold door outside handle to door. Pull door outside handle off door.

(3) REMOVE DOOR TRIM PANEL.

SCREWDRIVER, Phillips

(a) Remove screws around outer edge of door trim panel. Do not remove eight slotted head screws (fig. 119).

(b) Remove the two door trim panel screws in center of door trim panel (fig. 119).

(4) REMOVE DOOR BOTTOM BOARD.

SCREWDRIVER, Phillips

(a) Remove three screws which hold door bottom board to inside of door (fig. 120). Lift off door bottom board.

(5) REMOVE DOOR CHECK STRAP.

SCREWDRIVER, Phillips

(a) Lift up bottom of door trim panel and remove two door check strap bracket screws. Lift off door check strap bracket and door check strap.

(6) REMOVE DOOR GLASS SIDE STOP BLOCKS.

SCREWDRIVER, Phillips

(a) Lift up bottom of door trim panel and remove door glass side stop block screws from front and rear edges of door.

(b) Lift off two door glass side stop blocks (fig. 120).

(7) REMOVE DOOR GLASS.

SOLVENT, dry-cleaning

(a) Lift up bottom of door trim panel and move door window regulator arm over to end of door glass channel (A, fig. 120) and then lift arm out of channel.

(b) Pull door glass and door glass channel downward and out from underneath door trim panel.

(c) Soften door glass seal in channel by soaking with SOLVENT, dry-cleaning. Pull door glass out of door glass channel.

(8) REMOVE DOOR TRIM PANEL ASSEMBLY. Lift door trim panel assembly upward and toward top of door about 12 inches. Remove door trim panel assembly from door.

(9) REMOVE DOOR LATCH.

SCREWDRIVER WRENCH, open-end, $\frac{1}{2}$-in.

(a) Remove four bolts, nuts and lock washers which hold door latch to door trim panel. Remove door latch.

(10) REMOVE DOOR GLASS REGULATOR.

SCREWDRIVER WRENCH, open-end, $\frac{1}{2}$-in.

(a) Remove four bolts, nuts and lock washers which hold door glass regulator to regulator bracket. NOTE: It is necessary to install door

glass regulator handle on door glass regulator and revolve the regulator so that all bolts can be reached through hole in regulator arm (fig. 120).

(b) Remove four bolts, nuts and lock washers which hold regulator bracket and remove bracket from door trim panel.

(11) REMOVE DOOR WEATHER STRIPS.

SCREWDRIVER SCREWDRIVER, Phillips

(a) Remove screws which hold door weather strip plate to door frame and lift off plate. Remove tacks that hold weather strip to door frame (screwdriver) and lift off weather strip.

(12) REMOVE DOOR GLASS RUNWAYS AND TOP SEALS. Pull door glass top seal out of door. Pull door glass front runway and door glass rear runway out of door.

(13) REMOVE DOOR DOVETAILS AND DOOR HINGES.

SCREWDRIVER, Phillips

(a) Remove screws which hold door dovetail to door. Lift off door dovetail.

(b) Remove screws which hold door half of hinge to door and lift off door hinges.

232. CAB DOOR ASSEMBLY INSPECTION.

a. Wood. Inspect all wood parts for decay or breaks and replace or repair any wood parts showing breaks or decay.

b. Sheet Steel. Weld or reinforce and weld any sheet steel parts that are cracked or broken.

233. ASSEMBLY OF CAB DOOR ASSEMBLY.

a. Equipment.

AWL
HAMMER
SCREWDRIVER, Phillips
VARNISH, shellac
WRENCH, open-end, ½-in.

b. Procedure.

(1) INSTALL DOOR DOVETAILS AND DOOR HINGES.

SCREWDRIVER, Phillips

(a) Install door half of hinges on door.

(b) Install door dovetail on door.

(2) INSTALL DOOR GLASS RUNWAYS AND TOP SEALS.

VARNISH, shellac

(a) Cement door glass top seal, door glass front runway and door glass rear runway, to the door.

(3) INSTALL DOOR WEATHER STRIP.

HAMMER SCREWDRIVER, Phillips

(a) Place door weather strip on doorframe and tack to doorframe (hammer). Install door weather strip plate and fasten with screws to doorframe (Phillips screwdriver).

(4) INSTALL DOOR WINDOW REGULATOR.

SCREWDRIVER WRENCH, open-end, $\frac{1}{2}$-in.

(a) Install regulator bracket on door trim panel. Fasten with four bolts, nuts and lock washers ($\frac{1}{2}$-in. open-end wrench and screwdriver).

(b) Install door glass regulator handle on door glass regulator. Install regulator on regulator bracket. Turn door glass regulator handle so that all four bolts, nuts and lock washers can be installed through hole in regulator arm.

(5) INSTALL DOOR TRIM PANEL ASSEMBLY. Slide door trim panel assembly downward about 12 inches and toward bottom of door.

(6) INSTALL DOOR GLASS.

(a) Install door glass in channel in same manner as windshield glass was installed (par. 228 **b** (4)).

(b) Slide door glass and channel under bottom of door trim panel. Move door window regulator arm over and insert it in end of door glass channel (A, fig. 120).

(7) INSTALL DOOR GLASS SIDE STOP BLOCKS.

SCREWDRIVER, Phillips

(a) Install two door glass side stop blocks on front and rear edges of door and fasten with screws.

(8) INSTALL DOOR CHECK STRAP.

SCREWDRIVER, Phillips

(a) Install door check strap in door check strap bracket and fasten bracket to door with two screws.

(9) INSTALL DOOR BOTTOM BOARD.

SCREWDRIVER, Phillips

(a) Install door bottom board on door and fasten with three screws.

(10) INSTALL DOOR TRIM PANEL SCREWS.

SCREWDRIVER, Phillips

(a) Install two door trim panel screws in center of door trim panel (fig. 119). Install screws around outer edge of door trim panel.

(11) INSTALL DOOR HANDLES.

AWL SCREWDRIVER, Phillips

(a) Install door outside handle on door and fasten with two screws.

(b) Install door lock handle escutcheon and door lock handle on the door lock shaft and press down on escutcheon while inserting the pin through door latch handle and door latch shaft.

(c) Repeat procedure to install window regulator handle.

ORDNANCE MAINTENANCE
BODY AND CHASSIS FOR HEAVY WRECKING TRUCK M1

234. CAB DOOR ASSEMBLY INSTALLATION.

a. Equipment.

HAMMER SCREWDRIVER, Phillips

b. Procedure.

(1) INSTALL CAB DOOR ASSEMBLY.

HAMMER

(a) Install cab door assembly and drive door hinge pins through hinges.

(2) INSTALL CHECK STRAP.

SCREWDRIVER, Phillips

(a) Install door check strap clamp. Attach to cab with two screws. NOTE: The distance the door opens can be regulated by installing the door check strap clamp in a different place on door check strap.

Section V

WINDSHIELD WIPER MOTOR

235. GENERAL.

a. There are two windshield wiper motors located on the right and left sides of the windshield. These windshield wiper motors are operated

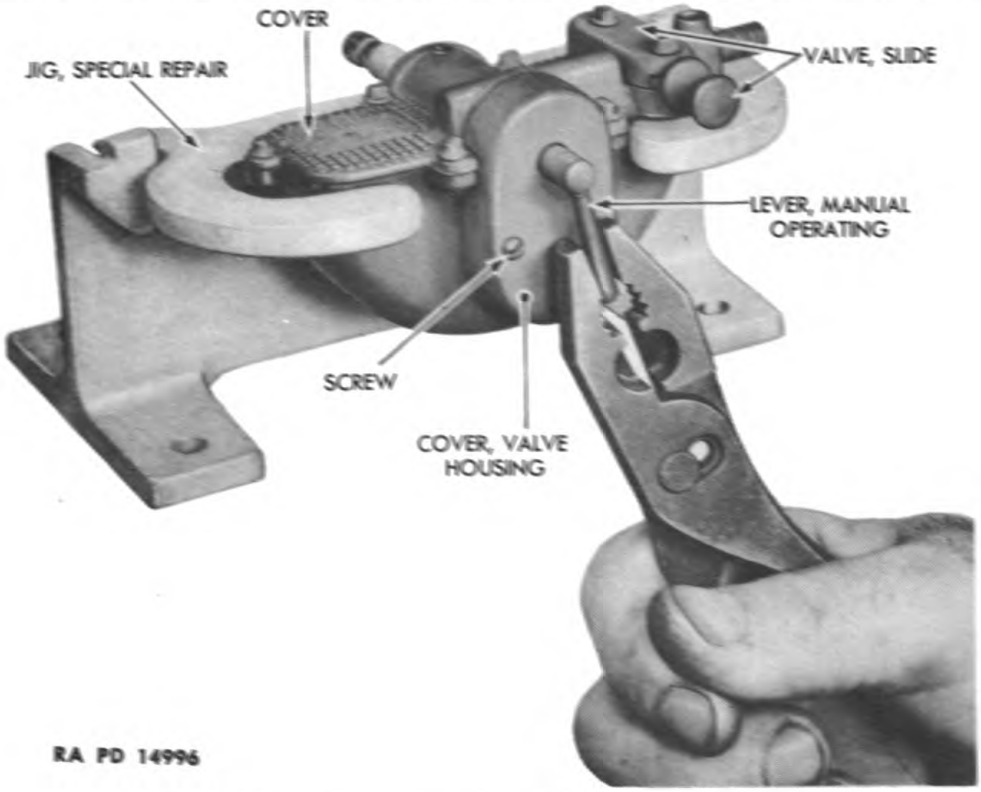


Figure 121—Removing Manual Operating Handle

by the vacuum created by the engine piston action. The procedure given in this chapter applies to one of the windshield wiper motors and should be repeated for the opposite motor.

b. Make a preliminary check by starting the engine and turning the wiper motor on. Hold wiper motor shaft against the pull of the paddle. Repeat procedure with wiper blade in opposite direction. Listen for

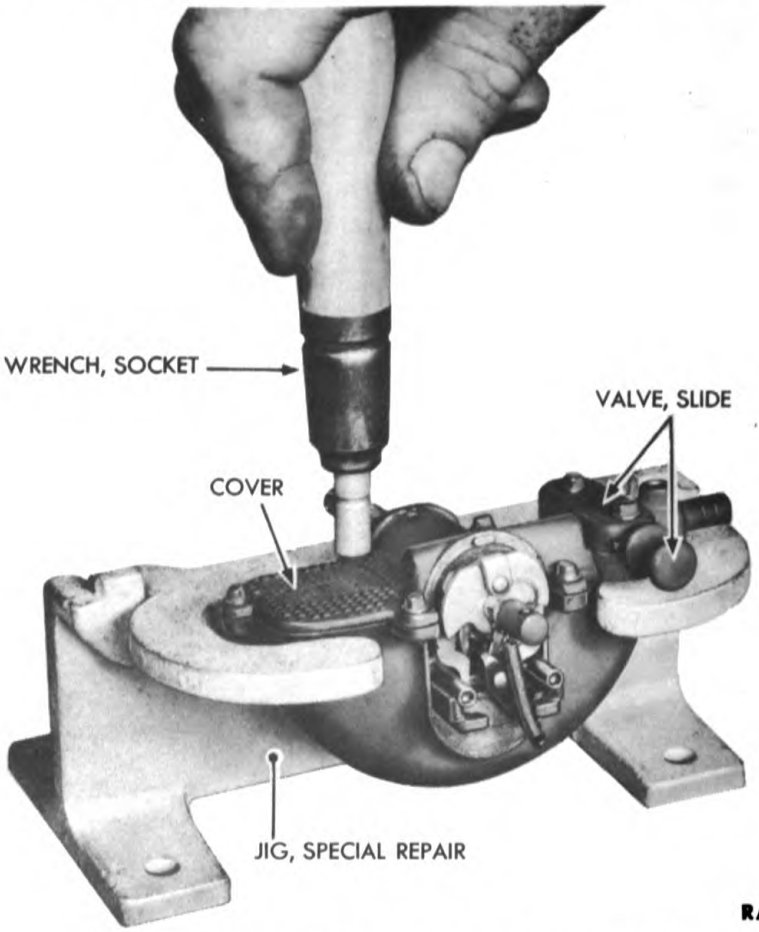


Figure 122—Removing Cover Assembly

escaping air which indicates a leak. Gradually move the paddle through its stroke forward and back. If the leak continues on the forward and the back stroke, it indicates leakage in the valve or in the paddle.

236. WINDSHIELD WIPER MOTOR REMOVAL.

a. Equipment.

WRENCH, open-end, ½-in.

b. Remove Wiper Motor.

(1) Remove wiper blade (par. 226 **b** (10)), wiper arm cover (par. 226 **b** (11)) and wiper arm (par. 226 **b** (12)). Make a preliminary check (par. 235 **b**).

(2) Remove wiper motor shaft nut, metal washer and soft washer from outer end of wiper motor shaft (½-in. open-end wrench).

(3) Pull wiper hose off wiper motor (from inside the cab). Then pull wiper motor off windshield.

WINDSHIELD WIPER MOTOR

237. WINDSHIELD WIPER MOTOR DISASSEMBLY.

a. Equipment.

HAMMER	PUNCH, special
HOOK, special wire	SCREWDRIVER
JIG, special repair	WRENCH, special socket,
JIG, special rivet	2933-J
PLIERS	

b. Procedure.

(1) REMOVE VALVE HOUSING COVER.

JIG, special repair	SCREWDRIVER
PLIERS	WRENCH, special socket

(a) Place wiper motor in special repair jig and remove manual operating lever with a twisting and pulling action (pliers) (fig. 121).

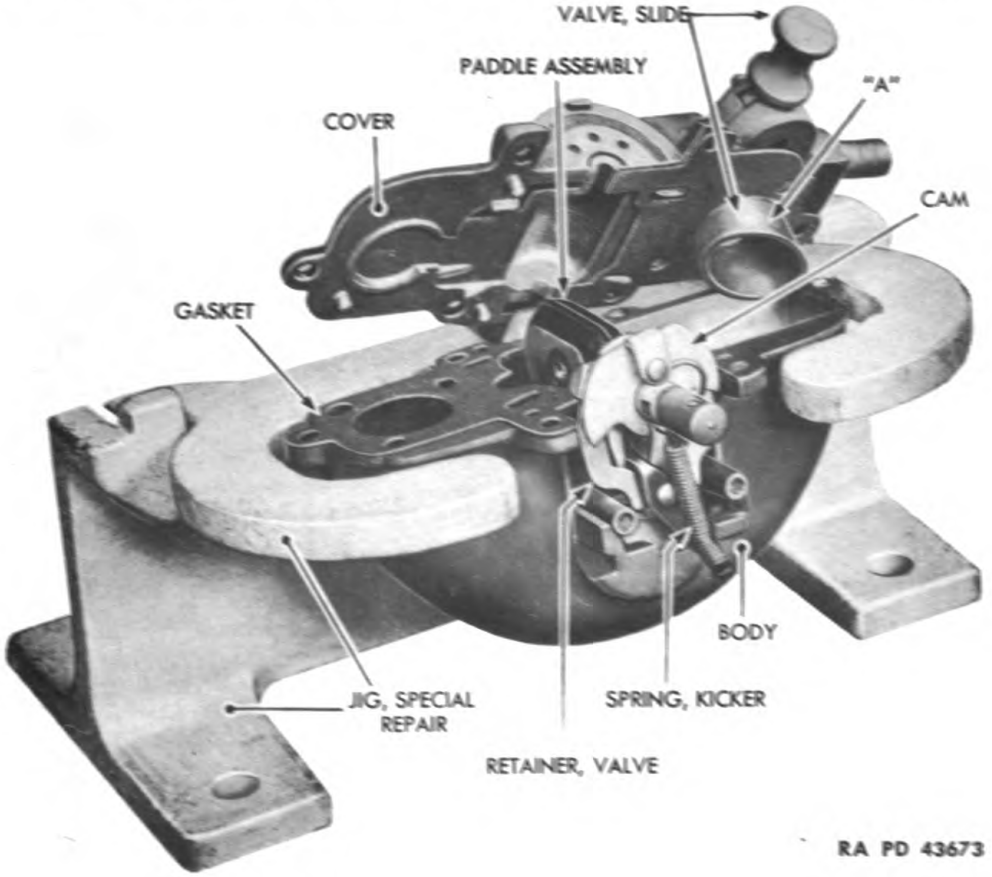


Figure 123—Wiper Motor with Cover Lifted

(b) Remove the two screws (slotted head) which hold valve housing cover to body and remove valve housing cover (screwdriver) (fig. 121).

(2) REMOVE COVER. NOTE: The slide valve (fig. 126) is a part of the cover and must not be removed. Remove six cover screws and lift off cover and two cover gaskets (special socket wrench) (fig. 122).

(3) REMOVE VALVE PARTS.

HOOK, special wire

(a) Unhook and remove kicker spring (special wire hook); remove kicker; push cam with cam spring up and off shaft; pull valve spring off shaft; pull valve retainer off shaft and pull valve off shaft. Lift body out of special repair jig (fig. 123).

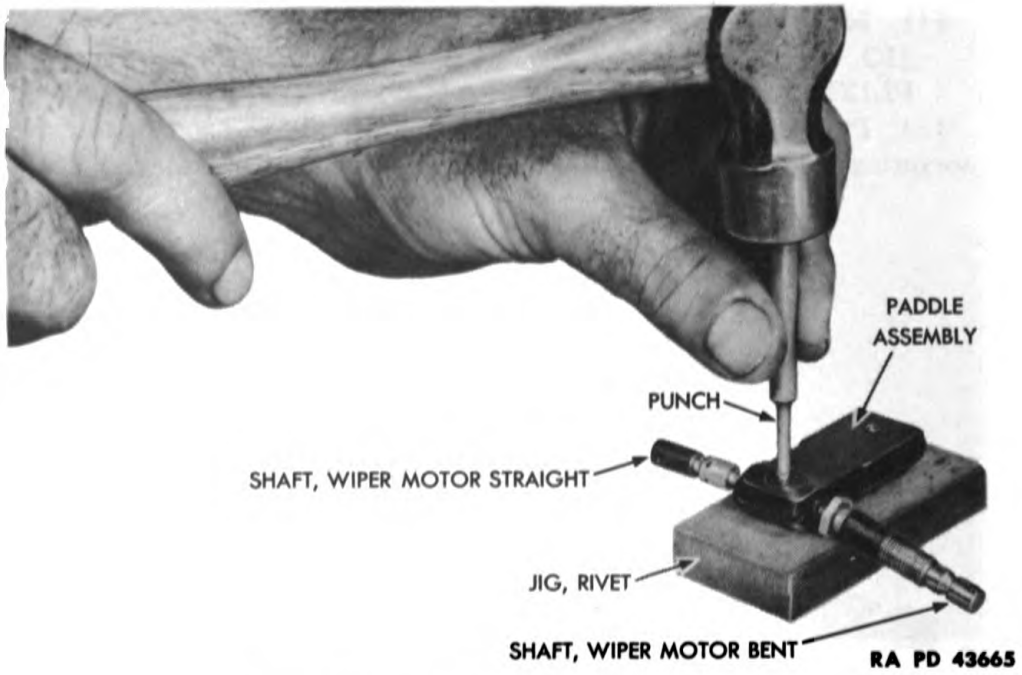


Figure 124—Removing Paddle Rivet

(4) DISASSEMBLE PADDLE ASSEMBLY.

HAMMER
JIG, special rivet
PUNCH, special

(a) Place paddle assembly in special rivet jig and, using special punch and hammer, remove rivet which holds wiper motor shaft to paddle.

(b) Remove wiper motor bent shaft and wiper motor straight shaft from paddle and lift paddle off special jig (fig. 124). NOTE: This step is not necessary if the inspection (par. 238) shows paddle to be in satisfactory condition, or if wiper motor shaft is in satisfactory condition.

238. WINDSHIELD WIPER MOTOR INSPECTION AND REPAIR.

a. Equipment.

AIR, compressed
GAGE, special "Go, No-go"
KIT, special repair
SOLVENT, dry-cleaning

b. Procedure.

(1) GENERAL.

AIR, compressed SOLVENT, dry-cleaning

(a) Clean all metal parts (SOLVENT, dry-cleaning) and dry with compressed air.

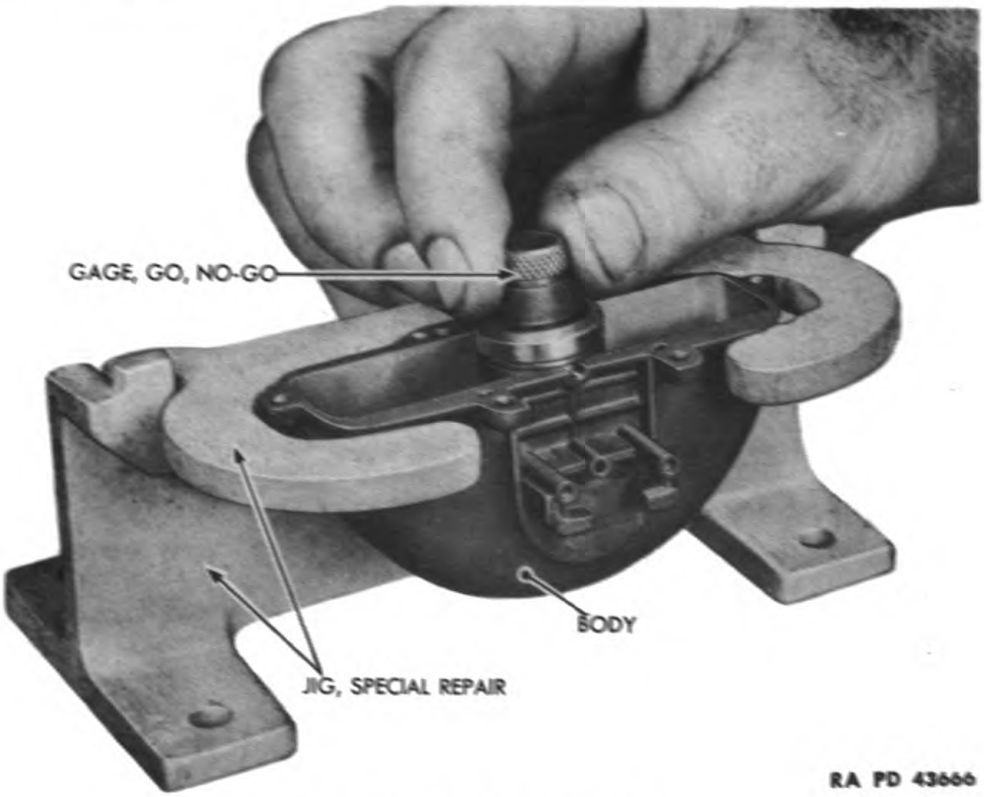


Figure 125—Checking Body

(2) BODY.

GAGE, special "Go, No-go"

NOTE: The special "Go, No-go" gage has three different diameters. The lower diameter indicates a body that is too narrow, the center diameter indicates a body that is correct and the top diameter indicates a body that is too wide.

(a) Insert the special "Go, No-go" gage in body and slide it full length of body.

(b) If body is too narrow, use end of a hammer handle and slightly widen the body. If the body is too wide, place body in a vise and squeeze it slightly. Repeat testing (step *(a)* above) until body is correct width.

(3) VALVE COVER ASSEMBLY.

KIT, special repair

(a) Place a drop of the special oil from repair kit on the sliding valve.

ORDNANCE MAINTENANCE
BODY AND CHASSIS FOR HEAVY WRECKING TRUCK M1

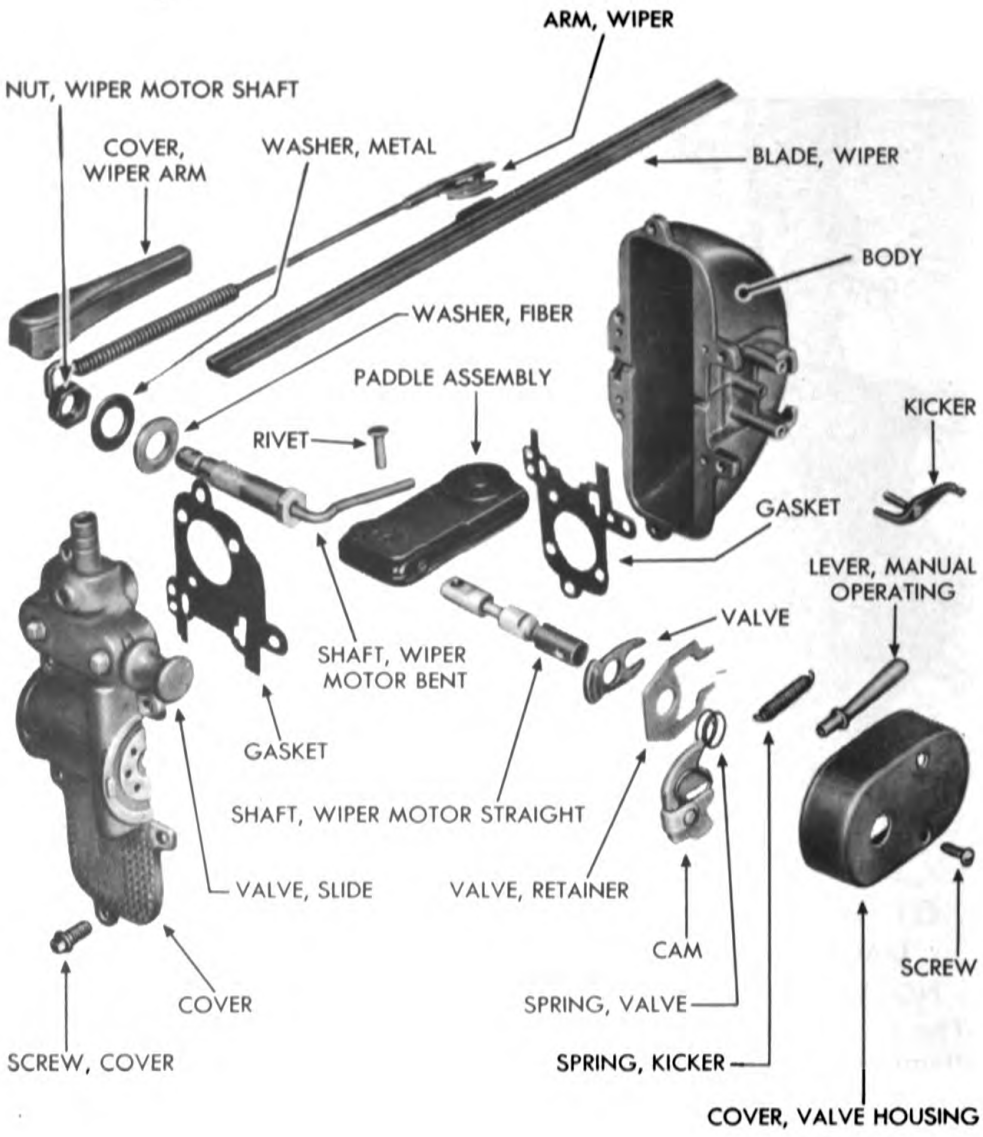


Figure 126—Wiper Motor—Exploded View

WINDSHIELD WIPER MOTOR

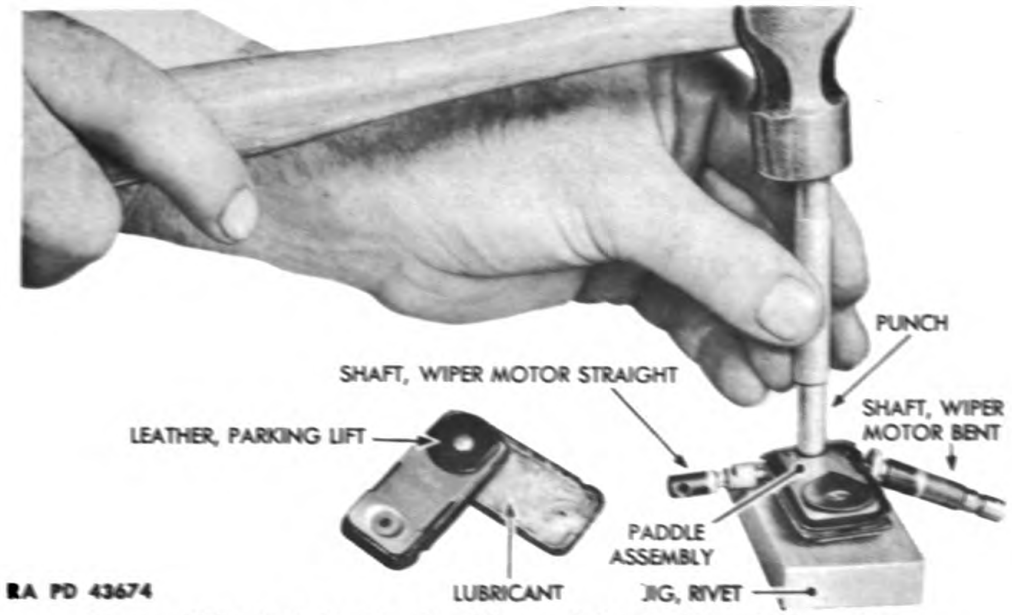


Figure 127—Lubricating Paddle and Assembling Wiper Motor Shafts in Paddle

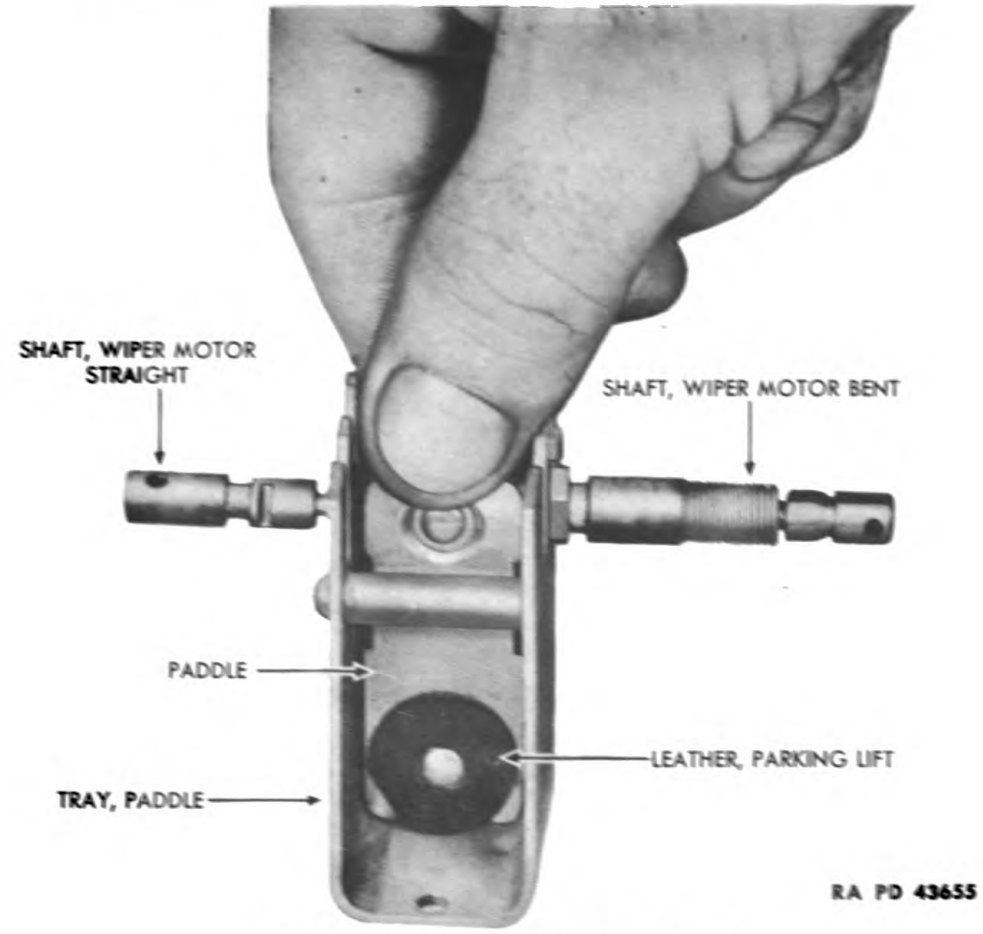


Figure 128—Forming the Paddle

(4) VALVE PARTS. Inspect kicker, kicker spring, valve retainer, valve, valve spring and cam for breakage or fractures and use new parts if necessary.

(5) PADDLE. If preliminary check (par. 235 b) indicates a leak, and none of the valve parts are broken, discard the old paddle.

239. ASSEMBLY OF WINDSHIELD WIPER MOTOR.

a. Equipment.

HAMMER
HOOK, special wire
JIG, special
KIT, special repair
PUNCH, special
RIVET, new
SCREWDRIVER
TRAY, special
WRENCH, special socket

b. Procedure.

(1) ASSEMBLE PADDLE.

HAMMER
JIG, special
KIT, special repair
PUNCH, special
RIVET, new

(a) Open paddle and pack inside with lubricant from the kit (fig. 127).

(b) Try the paddle on the cover and make sure that parking lift leather (fig. 127) will fit on inside of sliding valve "A" (fig. 123).

(c) Install paddle on special rivet jig and install wiper motor straight shaft in paddle (fig. 127).

(d) Install a new rivet from the kit through the paddle and wiper motor straight shaft and rivet the paddle and shaft together (fig. 127). Use special punch and a hammer but do not strike the rivet too hard or paddle may be buckled.

(e) Insert wiper motor bent shaft in paddle (fig. 127).

(f) Form the sides and bottom edges of paddle toward the center of the paddle by running the round part of the shank of a screwdriver up and down the edges.

(g) Repeat procedure in *(b)* above.

(2) FORM THE PADDLE ASSEMBLY.

TRAY, special

(a) Insert paddle assembly in special tray and push paddle all the way down into paddle tray. Allow it to remain in tray for about three minutes (fig. 128). Then remove paddle assembly.

(3) INSTALL THE PADDLE ASSEMBLY.

KIT, special repair
SCREWDRIVER

(a) Spread a light coat of lubricant (special repair kit) on inside walls of body and install body in special repair jig.

(b) Insert paddle assembly straight down into body. Be careful not to cut or chip the paddle during the insertion.

(c) Using flat end of a screwdriver, form the paddle around wiper motor shafts by pressing downward on edge of paddle. Do not damage paddle.

(4) FIT PADDLE ASSEMBLY. Install cover assembly on body and hold cover assembly down evenly while turning the wiper motor shaft in short strokes (this will form top edges of paddle).

(5) INSPECT PADDLE ASSEMBLY.

(a) Lift cover assembly off body and examine paddle and body for chips. If found, it indicates that paddle has not been properly formed in special tray (step (3) above) or that cover was not held evenly (step (4) above).

(b) A new paddle should be used if condition in *(a)* above is found.

(6) INSTALL COVER ASSEMBLY.

WRENCH, special socket

(a) Install two new cover gaskets. Install the six cover screws at center of wiper motor on each side of shaft.

(7) INSTALL VALVE PARTS.

HOOK, special wire

(a) Install kicker in body and place valve on shaft so that prongs of valve are over kicker. Install valve retainer with prong side down. Install valve spring on shaft. Push cam with cam spring downward and into slots in shaft with spring side up. Hook kicker spring onto cam spring and kicker (special wire hook).

240. WINDSHIELD WIPER MOTOR INSTALLATION.

a. Equipment.

WRENCH, open-end, ½-in.

b. Procedure. Install wiper motor on windshield. Install wiper motor shaft, metal washer, soft washer and wiper motor shaft nut. Install wiper motor hose on wiper motor. Install wiper arm cover, wiper arm and wiper blade.

241. WINDSHIELD WIPER MOTOR ADJUSTMENT.

a. Repeat preliminary checking (par. 235 **b**) and, if action is not satisfactory, check wiper motor hose and pipe to engine for dirt in hose and pipe, kinks in hose or pipe and inspect hose and pipe for leakage

ORDNANCE MAINTENANCE
BODY AND CHASSIS FOR HEAVY WRECKING TRUCK M1

Section VI

TACHOMETER

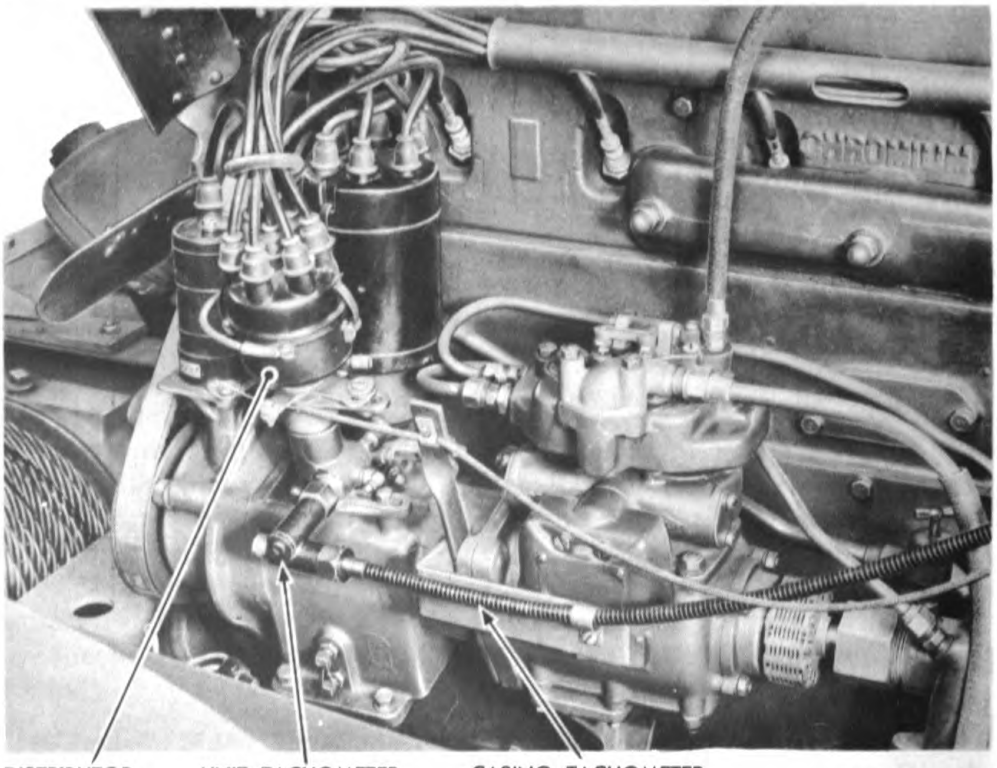


Figure 129—Tachometer Installed on Engine

242. GENERAL.

a. The tachometer assembly consists of the tachometer head mounted on the instrument board, tachometer shaft, and right angle drive units at tachometer head and engine.

b. The tachometer head indicates the revolutions per minute of the engine and shows the operator how much power and torque can be used for any wrecker operation. The maximum torque of the engine is 364 foot pounds and is obtained at 1,200 revolutions per minute. The maximum horse power is 138 and is obtained at 2,400 revolutions per minute.

TACHOMETER

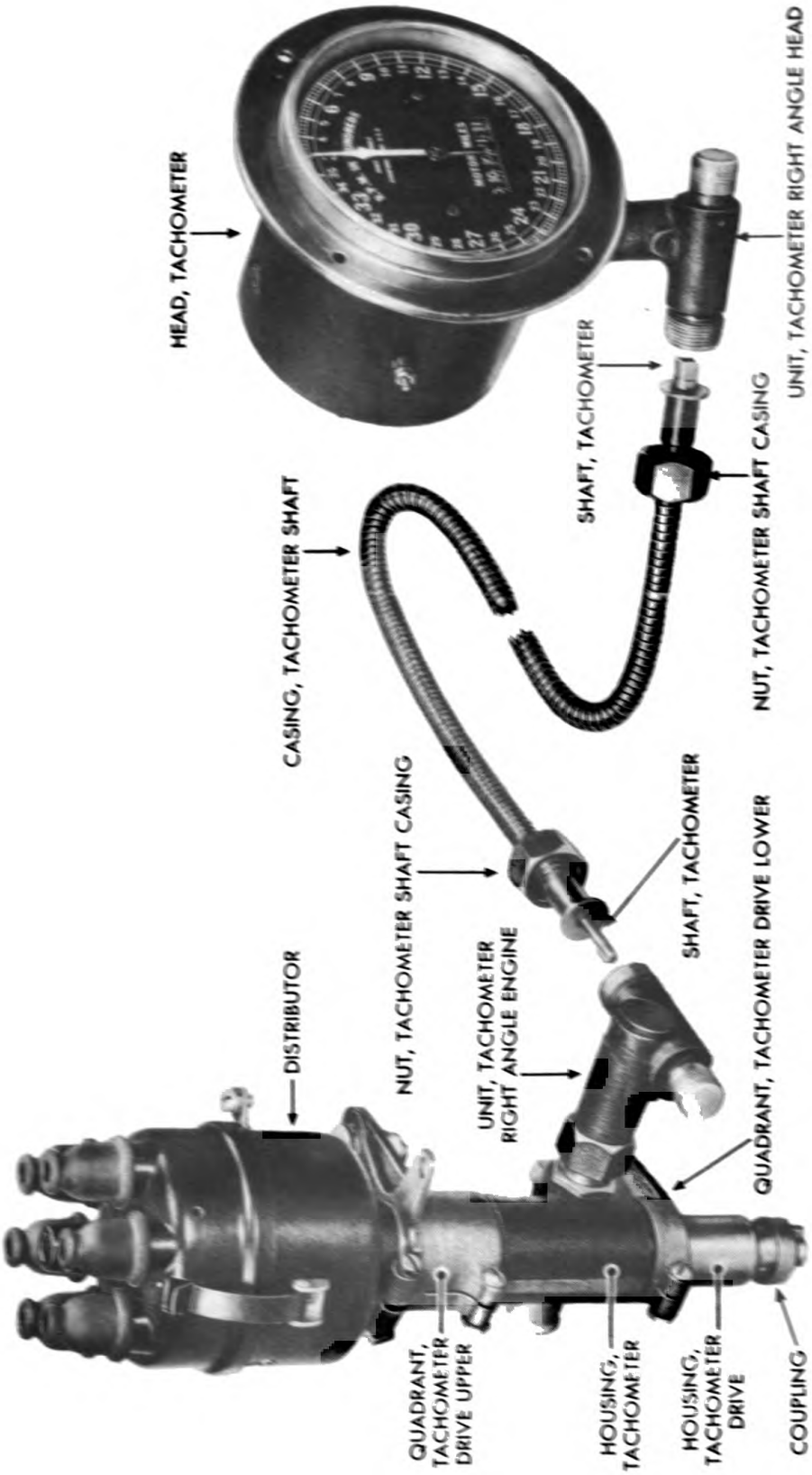


Figure 130—Tachometer Drive Layout

ORDNANCE MAINTENANCE
BODY AND CHASSIS FOR HEAVY WRECKING TRUCK M1

243. TACHOMETER ASSEMBLY REMOVAL.

a. Equipment.

WRENCH, open-end, 7/16-in.

b. Procedure. Disconnect tachometer shaft casing nut at the engine (TM 9-1795B) and at tachometer head (par. 226 b (21)). Pull tachometer shaft out of tachometer shaft casing. Remove distributor assembly (TM 9-1795B). Remove the bolt nut (9, fig. 131) that holds tachometer drive upper quadrant to distributor quadrant and lift off two washers. Unscrew bolt sleeve (6, fig. 131) off bolt (1, fig. 131) and lift bolt, plain washer, spring washer and plain washer off distributor quadrant. Pull distributor assembly with distributor quadrant off the tachometer drive housing.

244. TACHOMETER DRIVE DISASSEMBLY.

a. Equipment.

DRIFT
HAMMER
PLIERS
SCREWDRIVER
WRENCH, open-end, 3/8-in.
WRENCH, open-end, 7/16-in.
WRENCH, open-end, 1/2-in.
WRENCH, open-end, 7/8-in.
WRENCH, open-end, 1-in.
WRENCH, socket head set screw

b. Procedure.

(1) REMOVE TACHOMETER LUBRICATION FITTING.

WRENCH, open-end, 7/16-in. WRENCH, open-end, 1/2-in.

(a) Remove lubrication fitting (12, fig. 131) from tachometer drive housing.

(2) REMOVE TACHOMETER RIGHT ANGLE ENGINE UNIT.

WRENCH, open-end, 7/8-in. WRENCH, open-end, 1-in.

(a) Remove tachometer right angle engine unit while holding tachometer drive sleeve (14, fig. 131) from turning.

(3) REMOVE TACHOMETER DRIVE GEAR.

WRENCH, open-end, 7/8-in.

(a) Remove tachometer drive sleeve from tachometer drive housing. Pull drive pinion (13, fig. 131) out of tachometer drive housing. Remove grease cup cap from tachometer drive grease cup (31, fig. 131). Remove the tachometer drive grease fitting (32, fig. 131) from tachometer drive housing.

(4) REMOVE TACHOMETER DRIVE QUADRANTS.

SCREWDRIVER WRENCH, open-end, 3/8-in.

(a) Remove lower quadrant by removing clamp screw nut (28, fig. 131) and clamp screw. Then repeat procedure on upper quadrant.

(b) Slide the five lower quadrant washers off tachometer drive housing.

(5) REMOVE DRIVEN GEAR.

DRIFT HAMMER

(a) Drive the drive coupling pin (27, fig. 131) out of drive coupling (26, fig. 131) and driven gear shaft (hammer and drift). Slide drive coupling off driven gear shaft and lift off driven gear shaft washer.

(b) Pull driven gear out of tachometer drive housing.

(6) REMOVE TACHOMETER HEAD.

WRENCH, open-end, 7/8-in. WRENCH, open-end, 1-in.

(a) Remove tachometer head from the instrument board (par. 226 b (21)) and remove tachometer right angle head unit.

(7) DISASSEMBLE TACHOMETER RIGHT ANGLE ENGINE UNIT.

PLIERS WRENCH, socket head set
SCREWDRIVER screw

(a) Unscrew grease cup (pliers) (21, fig. 131) and then remove the shaft drive pinion sleeve set screw (socket head set screw wrench) (24, fig. 131). Pull shaft drive pinion sleeve (22, fig. 131) out of right angle housing (16, fig. 131).

(b) Pull shaft drive pinion (23, fig. 131) out of right angle housing. Remove driven pinion cap set screw (18, fig. 131) and pull off driven pinion cap (20, fig. 131). Pull out driven pinion (19, fig. 131).

(c) Remove driven pinion bushing set screw slotted head (screwdriver) (17, fig. 131) and press out driven pinion bushing (15, fig. 131) from right angle housing.

(d) Repeat procedure to disassemble tachometer right angle head unit.

245. TACHOMETER ASSEMBLY INSPECTION.

a. Equipment.

CLOTH, wiping SOLVENT, dry-cleaning
GREASE, general purpose, seasonal grade

b. Procedure.

(1) GENERAL.

GREASE, general purpose, seasonal grade SOLVENT, dry-cleaning

(a) Wash all parts, except tachometer head, in SOLVENT, dry-cleaning, and wipe with a cloth.

(2) TACHOMETER SHAFT. Inspect tachometer shaft for bends or kinks and, if found, use a new shaft. Apply a light film of grease to the tachometer shaft.

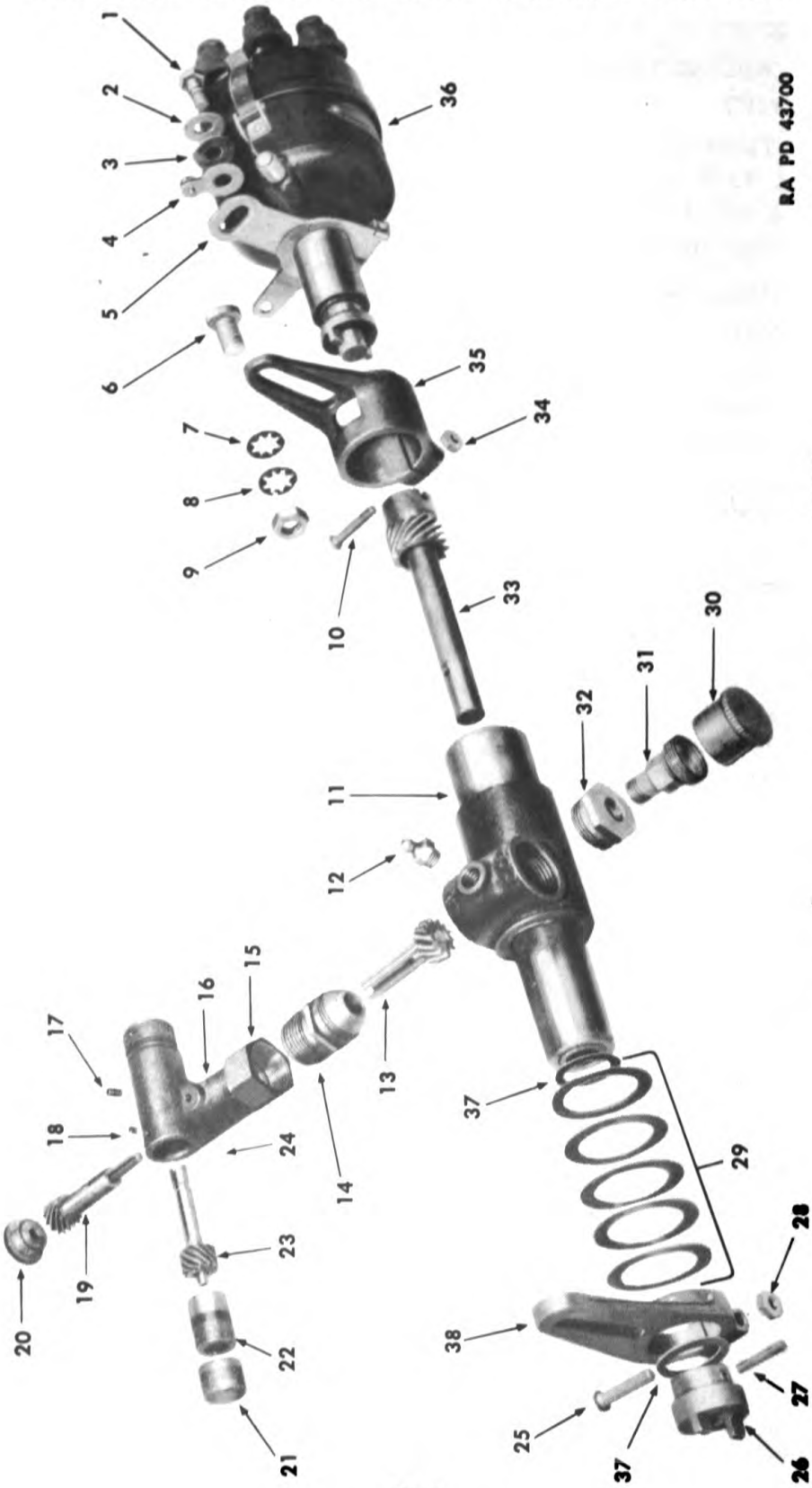


Figure 131—Tachometer Drive—Exploded View

TACHOMETER

RA PD 43700A

1. BOLT
2. WASHER, PLAIN
3. WASHER, SPRING
4. WASHER, PLAIN
5. QUADRANT, DISTRIBUTOR
6. SLEEVE, BOLT
7. WASHER, NUT
8. WASHER, NUT
9. NUT, BOLT
10. SCREW, CLAMP
11. HOUSING, TACHOMETER DRIVE
12. FITTING, LUBRICATION
13. PINION, DRIVE
14. SLEEVE, TACHOMETER DRIVE
15. BUSHING, DRIVEN PINION
16. HOUSING, RIGHT ANGLE
17. SCREW, DRIVEN PINION BUSHING
18. SCREW, DRIVEN PINION CAP SET
19. PINION, DRIVEN
20. CAP, DRIVEN PINION
21. CUP, CONTACT
22. SLEEVE, SHAFT DRIVE PINION
23. PINION, SHAFT DRIVE
24. SCREW, SHAFT DRIVE PINION SLEEVE SET
25. SCREW, CLAMP
26. COUPLING, DRIVE
27. PIN, DRIVE COUPLING
28. NUT, CLAMP SCREW
29. WASHER, LOWER QUADRANT
30. CAP, CONTACT CUP
31. CUP, TACHOMETER DRIVE CONTACT
32. FITTING, TACHOMETER DRIVE CONTACT
33. GEAR, DRIVEN
34. NUT, CLAMP SCREW
35. QUADRANT, TACHOMETER DRIVE UPPER
36. DISTRIBUTOR ASSEMBLY
37. WASHER, DRIVEN GEAR SHAFT
38. QUADRANT, TACHOMETER DRIVE LOWER

Figure 131A—Legend for Figure 131

(3) TACHOMETER GEARS. Inspect tachometer drive gear and driven gears for chipping of teeth and, if found, use new gears.

246. ASSEMBLY OF TACHOMETER ASSEMBLY.

a. Equipment.

GREASE, general purpose, seasonal grade
HAMMER
PLIERS
SCREWDRIVER
WRENCH, open-end, 3/8-in.
WRENCH, open-end, 7/16-in.
WRENCH, open-end, 1/2-in.
WRENCH, open-end, 7/8-in.
WRENCH, open-end, 1-in.
WRENCH, socket head set screw

b. Procedure.

(1) ASSEMBLE TACHOMETER HEAD.

WRENCH, open-end, 7/8-in.
WRENCH, open-end, 1-in.

(a) Install tachometer right angle head unit (fig. 130) on tachometer head (1-in. open-end wrench).

(b) Install the tachometer head on instrument board (par. 228 **b** (39)), (7/8-in. open-end wrench).

(2) INSTALL DRIVEN GEAR.

HAMMER

(a) Install driven gear (33, fig. 131) in the tachometer drive housing and slide driven gear shaft washer on driven gear shaft.

(b) Slide drive coupling on driven gear shaft and drive the drive coupling pin through drive coupling and driven gear shaft (hammer).

(3) INSTALL TACHOMETER DRIVE QUADRANTS.

SCREWDRIVER
WRENCH, open-end, 3/8-in.

(a) Slide five lower quadrant washers (29, fig. 131) on tachometer drive housing.

(b) Install lower quadrant (38, fig. 131) and fasten with clamp screw and clamp screw nut (screwdriver, 3/8-in. open-end wrench). Repeat the procedure to install upper quadrant.

(4) INSTALL TACHOMETER DRIVE GEAR.

GREASE, general purpose, seasonal grade
WRENCH, open-end, 7/8-in.

(a) Install tachometer drive grease fitting (32, fig. 131) on tachometer drive housing. Install the tachometer drive grease cup. Fill grease cap with lubricant and install grease cap on grease cup.

(b) Install drive pinion (13, fig. 131) in tachometer drive housing and then install the tachometer drive sleeve (14, fig. 131) in tachometer drive housing.

(5) ASSEMBLE TACHOMETER RIGHT ANGLE ENGINE UNIT.

GREASE, general purpose, seasonal grade
PLIERS
SCREWDRIVER
WRENCH, socket head set screw

(a) Press driven pinion bushing (15, fig. 131) into right angle housing and install driven pinion bushing set screw slotted head (screwdriver) (17, fig. 131).

(b) Install driven pinion (19, fig. 131) in right angle housing. Install driven pinion cap and fasten with the driven pinion cap set screw (socket head set screw wrench) (18, fig. 131).

(c) Install the shaft drive pinion (23, fig. 131) in right angle housing.

(d) Install shaft drive pinion sleeve (22, fig. 131) in right angle housing. Install shaft drive pinion sleeve set screw (socket head set screw wrench) (24, fig. 131). Fill grease cup (21, fig. 131) with lubricant and install grease cup (pliers).

(6) INSTALL TACHOMETER RIGHT ANGLE ENGINE UNIT.

WRENCH, open-end, $\frac{7}{8}$-in.
WRENCH, open-end, 1-in.

(a) Install tachometer drive sleeve and hold it while installing tachometer right angle engine unit.

(7) INSTALL TACHOMETER LUBRICATION FITTING.

GREASE, general purpose, seasonal grade
WRENCH, open-end, $\frac{7}{16}$-in.
WRENCH, open-end, $\frac{1}{2}$-in.

(a) Fill grease cup with lubricant and install grease cup on the tachometer right angle engine unit. Install lubrication fitting (12, fig. 131) on tachometer drive housing.

247. TACHOMETER ASSEMBLY INSTALLATION.

a. Equipment.

WRENCH, open-end, $\frac{7}{16}$-in.

b. Procedure.

(1) INSTALL TACHOMETER ASSEMBLY.

WRENCH, open-end, $\frac{7}{16}$-in.

(a) Install distributor assembly with distributor quadrant (5, fig. 131) in tachometer drive housing.

(b) Install plain washer, spring washer and plain washer on bolt (1, fig. 131). Install bolt through distributor quadrant and screw the bolt into the bolt sleeve (6, fig. 131).

(c) Install the two nut washers and bolt nut ($\frac{7}{16}$-in. open-end wrench).

(d) Install distributor assembly (TM 9-1795B).

(e) Install tachometer shaft in tachometer shaft casing and attach tachometer shaft assembly at the engine (TM 9-1795B) and at the tachometer head (par. 228 b (40)).

(2) ENGINE TUNE-UP. Follow procedure on engine tune-up (TM 9-1795B).

ORDNANCE MAINTENANCE
BODY AND CHASSIS FOR HEAVY WRECKING TRUCK M1

Section VII

SHEET METAL

248. FRONT BUMPER AND REAR BUMPERETTE REMOVAL.

a. Equipment.

SCREWDRIVER
WRENCH, box, $^{15}/_{16}$-in.
WRENCH, open-end, $^{3}/_{4}$-in.
WRENCH, open-end, $^{7}/_{8}$-in.
WRENCH, open-end, $^{15}/_{16}$-in.
WRENCH, socket, $^{3}/_{4}$-in.
WRENCH, socket, 1-in.

b. Procedure.

(1) REMOVE FRONT BUMPER BOLTS (fig. 132).

WRENCH, open-end, ¾-in. WRENCH, socket, ¾-in.

(a) Remove 14 front bumper bolts, nuts and lock washers that hold front bumper to frame. NOTE: There are three front bumper bolts on top edge of front bumper on right side and three on the opposite side. There are four front bumper bolts on bottom edge on the right side and four on opposite side.

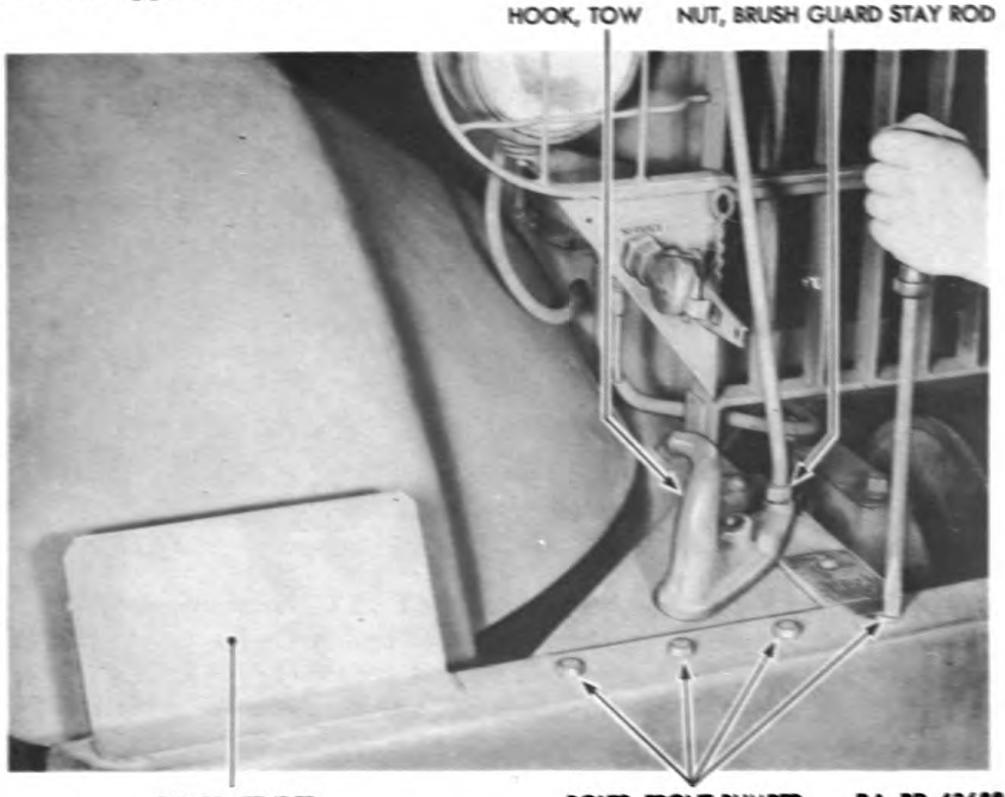


Figure 132—Removing Front Bumper

(2) LOOSEN TOW HOOKS (fig. 132).

WRENCH, open-end, $^{15}/_{16}$-in. WRENCH, socket, 1-in.

(a) Unhook front winch chain hook from tow hook and place it out of the way.

(b) Loosen brush guard rod nut ($^{15}/_{16}$-in. open-end wrench) (fig. 132).

(c) Remove tow hook bolt nut and lock washer from tow hook and swing tow hook to one side (1-in. socket wrench) (fig. 132). Repeat procedure on opposite tow hook. NOTE: There is a front bumper bolt underneath each of the tow hooks.

(3) REMOVE FRONT BUMPER BOLTS.

SCREWDRIVER WRENCH, open-end, $^{7}/_{8}$-in.

(a) Remove front bumper bolt under tow hook and repeat procedure on opposite side.

(4) REMOVE FRONT BUMPER. Lift front bumper forward about four inches. Lift front bumper off frame. NOTE: The two front fender guards are welded to the bumper.

(5) REMOVE REAR BUMPERETTES.

WRENCH, box, $^{15}/_{16}$-in.

(a) Remove bolts, nuts and lock washers that hold rear bumperettes to frame (fig. 133).

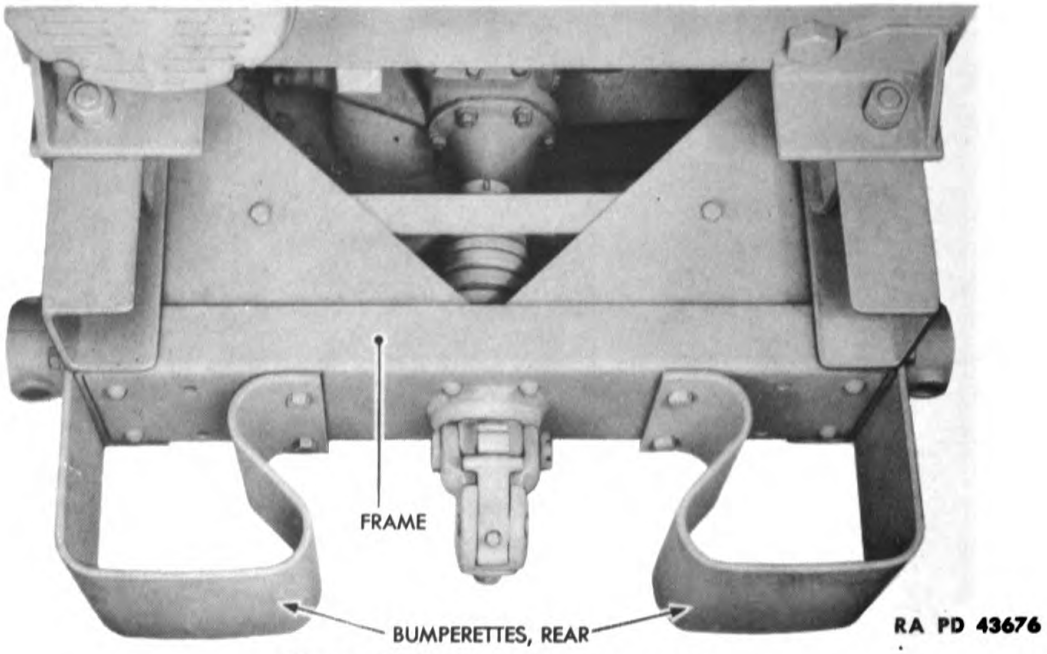


Figure 133—Rear Bumperettes

249. FRONT BUMPER AND REAR BUMPERETTE INSPECTION.

a. Equipment.

EQUIPMENT, welding

b. Procedure. Inspect front bumper for cracks or breaks and weld any cracks or breaks found. A break in front bumper can be reinforced with a piece of steel welded behind the break.

250. FRONT BUMPER AND REAR BUMPERETTE INSTALLATION.

a. Equipment.

SCREWDRIVER
WRENCH, box, $^{15}/_{16}$-in.
WRENCH, open-end, $^{3}/_{4}$-in.
WRENCH, open-end, $^{7}/_{8}$-in.
WRENCH, open-end, $^{15}/_{16}$-in.
WRENCH, socket, $^{3}/_{4}$-in.
WRENCH, socket, 1-in.

b. Procedure.

(1) INSTALL FRONT BUMPER.

SCREWDRIVER — WRENCH, open-end, $^{7}_{8}$-in.

(a) Install front bumper on frame. Fasten with two front bumper bolts, nuts and lock washers that are under the tow hooks.

(2) TIGHTEN TOW HOOKS.

WRENCH, open-end, $^{15}_{16}$-in. — WRENCH, socket, 1-in.

(a) Turn two tow hooks into position and install the two tow hook bolts, nuts and lock washers.

(b) Hook front winch chain hook on tow hook.

(3) INSTALL FRONT BUMPER BOLTS.

WRENCH, open-end, $^{3}_{4}$-in. — WRENCH, socket, $^{3}_{4}$-in.

(a) Install 14 front bumper bolts, nuts and lock washers that hold bumper to frame (fig. 132).

(4) INSTALL REAR BUMPERETTES.

WRENCH, box, $^{15}_{16}$-in.

(a) Install rear bumperettes and fasten to the frame with bolts, nuts and lock washers (fig. 133).

251. FENDER AND RUNNING BOARD REMOVAL.

a. Equipment.

PLIERS — WRENCH, open-end, $^{9}_{16}$-in.
WRENCH, open-end, $^{1}_{2}$-in. — WRENCH, socket, $^{9}_{16}$-in.

b. Procedure. NOTE: The fenders, running boards, hood sills and splash aprons are all bolted together and the procedure covers the right side. It should be repeated for the left side with the exception noted. (The siren is mounted on the left fender.) It is advisable to remove the parts as an assembly in order to work on any one of the parts.

(1) REMOVE FENDER AND RUNNING BOARD ASSEMBLY.

WRENCH, open-end, $^{9}_{16}$-in.

(a) Remove hood assembly (par. 261). Remove two hood sill bolts, nuts and lock washers that hold hood sill to frame ($^{9}_{16}$-in. open-end wrench) (fig. 134).

(b) Pull head lamp wires out of their connectors and then pull wires out of hood sill. Remove rubber grommet from hood sill.

(c) Remove siren assembly and siren brush guard from left fender (par. 259).

(2) REMOVE FENDER BOLTS.

WRENCH, socket, $^{9}_{16}$-in.

(a) Remove two fender bracket bolts, nuts and lock washers that hold fender to fender bracket.

(3) REMOVE SPLASH APRON CAP SCREWS.

PLIERS — WRENCH, open-end, $^{1}_{2}$-in.

ORDNANCE MAINTENANCE
BODY AND CHASSIS FOR HEAVY WRECKING TRUCK M1

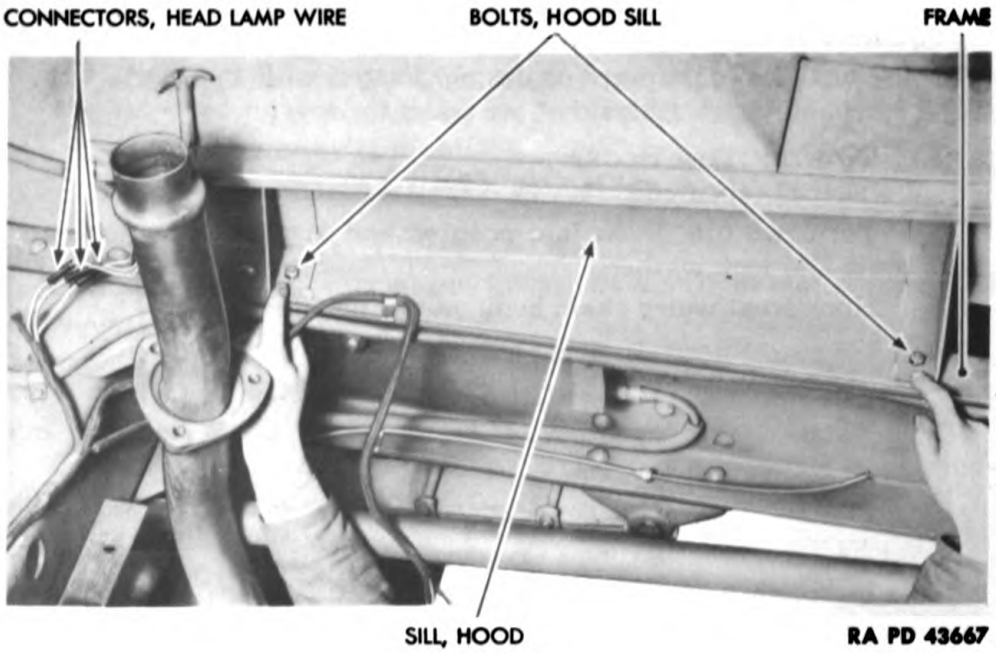


Figure 134—Hood Sill Bolts

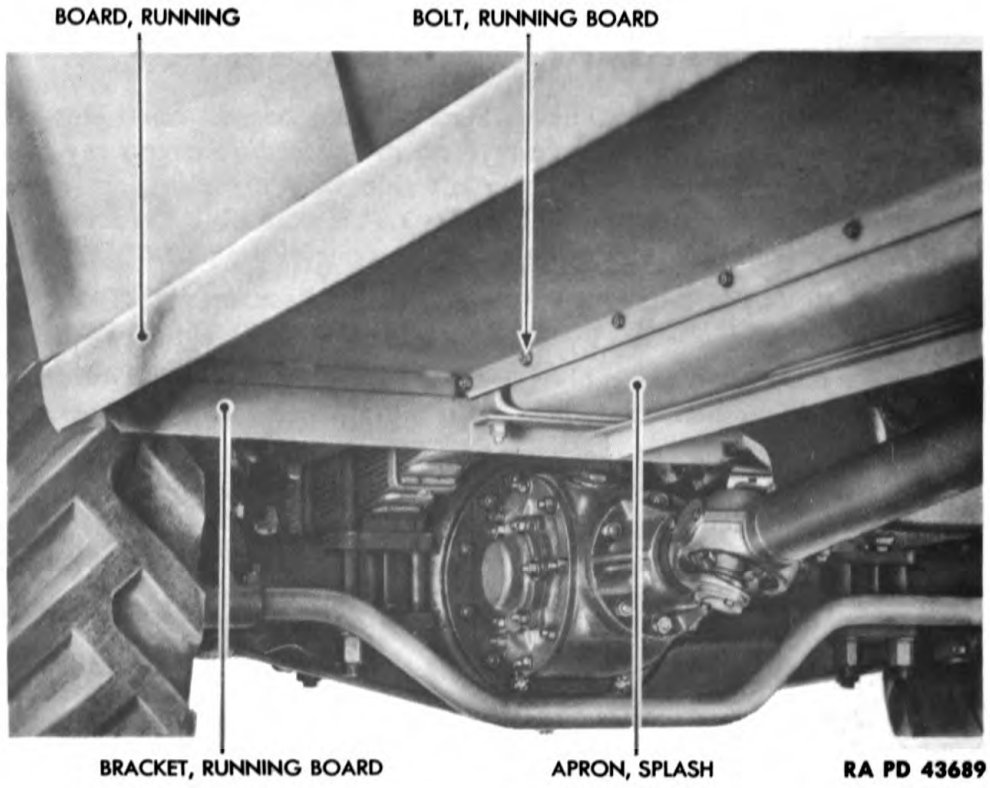


Figure 135—Running Board and Splash Apron

(a) Remove seat cushions, seat back (par. 225 **b** (8)) and seat boards (par. 225 **b** (10) *(a)*).

(b) Remove cab front hold-down bolts (par. 225 **b** (13)).

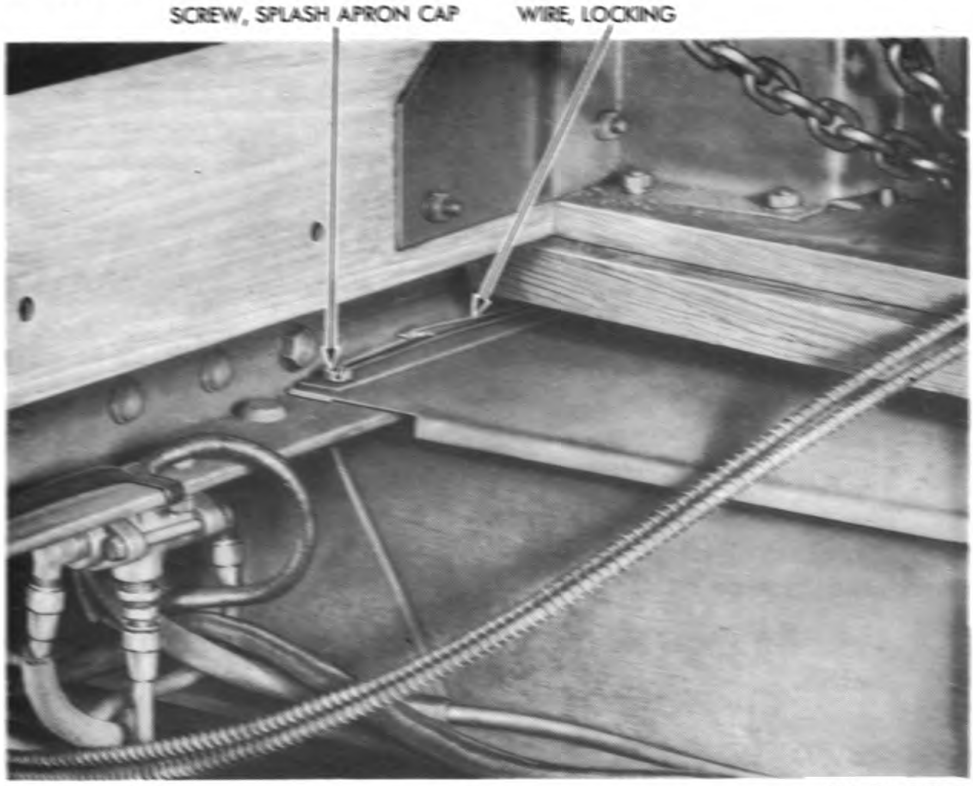
(c) Cut locking wire on heads of two splash apron cap screws (pliers) (fig. 136). Remove two splash apron cap screws ($1\frac{1}{2}$-in. open-end wrench).

(4) REMOVE RUNNING BOARD BOLTS.

WRENCH, socket, $\frac{9}{16}$-in.

(a) Remove four bolts, nuts and lock washers that hold each end of running board to two running board brackets ($\frac{9}{16}$-in. socket wrench).

(b) Lift off running board, splash apron, hood sill and fender assembly (fig. 137).



RA PD 43725

Figure 136—Splash Apron Cap Screws

252. FENDER AND RUNNING BOARD DISASSEMBLY.

a. Equipment.

SCREWDRIVER
WRENCH, box, $1\frac{1}{2}$-in.
WRENCH, open-end, $1\frac{1}{2}$-in.
WRENCH, socket, $\frac{9}{16}$-in.

b. Procedure.

(1) REMOVE HOOD SILLS.

SCREWDRIVER
WRENCH, open-end, $1\frac{1}{2}$-in.

(a) Remove seven bolts, nuts and lock washers that hold hood sill to fender and lift off the hood sill (fig. 137).

(2) REMOVE FENDERS.

SCREWDRIVER
WRENCH, box, ½-in.
WRENCH, socket, 9/16-in.

(a) Remove bolts, nuts and lock washers that hold fender to running board (½-in. box wrench).

(b) Remove bolts, nuts and lock washers that hold fender to splash apron (screwdriver, ½-in. box wrench).

(c) Remove bolts, nuts and lock washers that hold fender to hood sill (½-in. box wrench).

(d) Remove bolts, nuts and lock washers that hold splash apron to fender (9/16-in. socket wrench).

(e) Lift off fender and splash apron and running board.

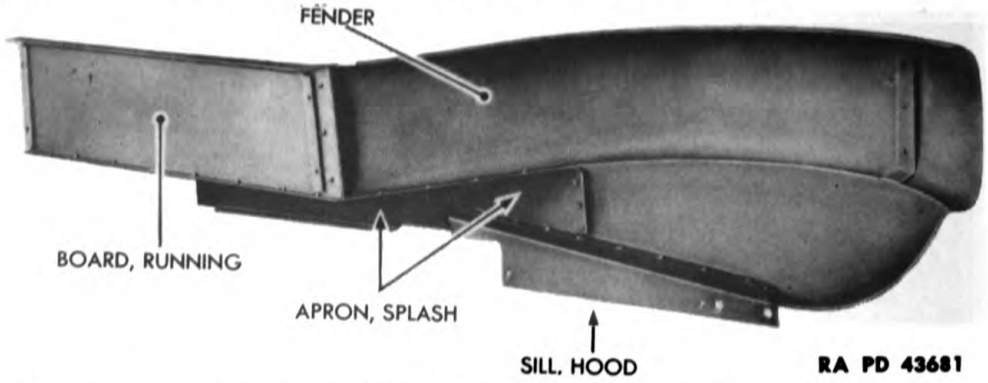


Figure 137—Fender, Hood Sill, Splash Apron and Running Board

253. FENDER AND RUNNING BOARD INSPECTION.

a. The fenders, running boards, hood sills and splash aprons are made of pressed sheet steel and can be welded, torch soldered, metal finished and then painted.

254. ASSEMBLY OF FENDERS AND RUNNING BOARD ASSEMBLIES.

a. Equipment.

SCREWDRIVER
WRENCH, box, ½-in.
WRENCH, open-end, ½-in.
WRENCH, socket, 9/16-in.

b. Procedure.

(1) ASSEMBLE FENDERS AND RUNNING BOARDS.

SCREWDRIVER
WRENCH, box, ½-in.
WRENCH, open-end, ½-in.
WRENCH, socket, 9/16-in.

(a) Install bolts, nuts and lock washers that hold splash apron to fender (9/16-in. socket wrench) (fig. 137).

(b) Install bolts, nuts and lock washers that hold fender to hood sill (½-in. box wrench).

(c) Install bolts, nuts and lock washers that hold fender to splash apron (screwdriver, ½-in. box wrench).

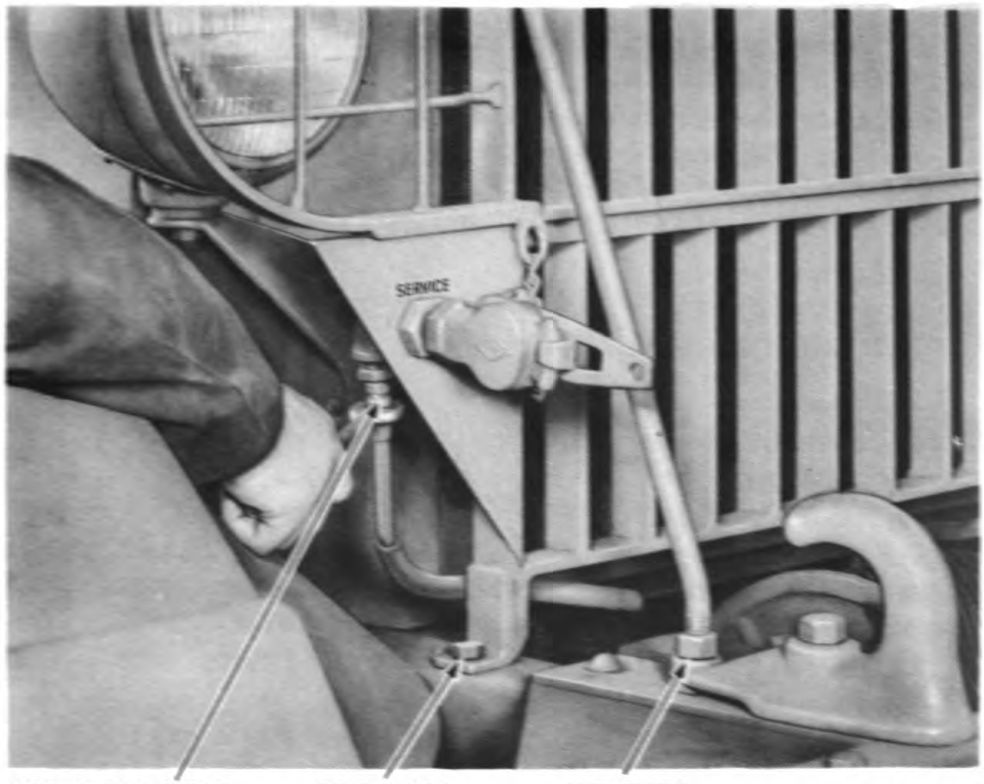


Figure 138—Removing Brush Guard Assembly

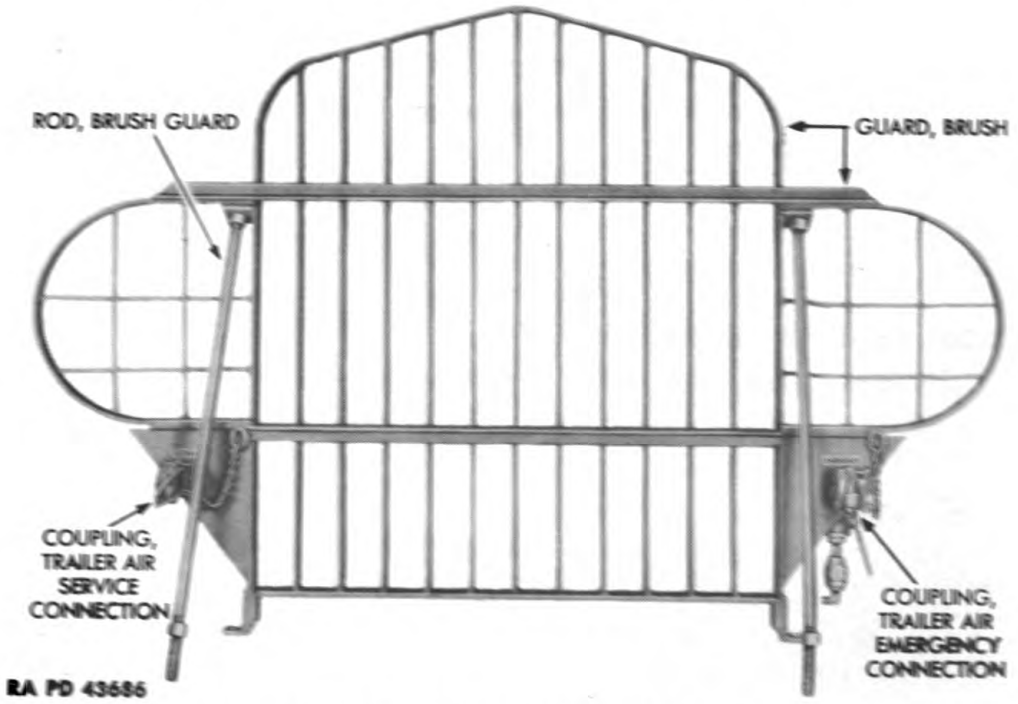


Figure 139—Brush Guard Assembly—Front

(d) Install bolts, nuts and lock washers that hold fender to running board (½-in. box wrench).

(e) Install bolts, nuts and lock washers that hold hood sill to fender (½-in. open-end wrench, screwdriver).

255. FENDER AND RUNNING BOARD INSTALLATION.

a. Equipment.

SCREWDRIVER
WRENCH, open-end, ½-in.
WRENCH, socket, 9/16-in.

b. Procedure.

(1) INSTALL FENDER AND RUNNING BOARD ASSEMBLY.

SCREWDRIVER
WRENCH, open-end, ½-in.
WRENCH, socket, 9/16-in.

(a) Install fender and running board assembly. Install the four bolts, nuts and lock washers that hold each end of running board to the two running board brackets (9/16-in. socket wrench).

(b) Install two splash apron cap screws and fasten with lock wire (½-in. open-end wrench) (fig. 136).

(c) Install cab front hold-down bolts (par. 229 **b** (2)).

(d) Install seat boards (par. 229 **b** (6)), seat back and seat cushions (par. 229 **b** (8)).

(e) Install two bolts, nuts and lock washers that hold fender to the fender bracket (9/16-in. socket wrench).

(f) Install two bolts, nuts and lock washers that hold the hood sill to frame (screwdriver, ½-in. open-end wrench) (fig. 134).

(2) INSTALL SIREN. Install siren assembly and siren brush guard on left fender (par. 260).

(3) CONNECT HEAD LAMP WIRES. Install rubber grommet in hood sill. Push the head lamp wires through rubber grommet. Connect head lamp wires in their connectors.

256. BRUSH GUARD REMOVAL.

a. Equipment.

WRENCHES, open-end, two, ¾-in.
WRENCH, open-end, 15/16-in.

b. Procedure.

(1) Loosen brush guard lock nuts. Remove two nuts that hold rod to frame (15/16-in. open-end wrench) (fig. 138).

(2) Remove two bolts, nuts and lock washers that hold brush guard to frame (two ¾-in. open-end wrenches) (fig. 138). Disconnect trailer air connections (par. 130 **b** (2)). Lift off brush guard assembly. Remove brush guard rod from brush guard.

SHEET METAL

257. BRUSH GUARD INSPECTION.

a. Inspect the brush guard for fractures or breaks and, if found, weld the fracture or break.

258. BRUSH GUARD INSTALLATION.

a. Equipment.

WRENCHES, open-end, two, $\frac{3}{4}$-in.
WRENCH, open-end, $\frac{15}{16}$-in.

b. Procedure.

(1) Install brush guard rod on brush guard. Install brush guard assembly and connect trailer air connections (par. 137).

(2) Install two bolts, nuts and lock washers that hold brush guard to the frame (two $\frac{3}{4}$-in. open-end wrenches).

(3) Install two nuts that hold brush guard rod to frame ($\frac{15}{16}$-in. open-end wrench). Tighten brush guard rod lock nuts ($\frac{15}{16}$-in. open-end wrench).

259. SIREN ASSEMBLY REMOVAL.

a. Equipment.

SCREWDRIVER
WRENCH, box, $\frac{7}{16}$-in.
WRENCHES, open-end, two, $\frac{1}{2}$-in.

b. Procedure.

(1) REMOVE SIREN BRUSH GUARD.

WRENCHES, open-end, two, $\frac{1}{2}$-in.

(a) Remove five bolts, nuts and lock washers that hold siren brush guard to left front fender. Lift off siren brush guard (fig. 140).

(2) REMOVE SIREN ASSEMBLY.

SCREWDRIVER
WRENCH, box, $\frac{7}{16}$-in.
WRENCH, open-end, $\frac{1}{2}$-in.

(a) Remove three bolts, nuts and lock washers holding siren assembly to left front fender ($\frac{1}{2}$-in. open-end wrench).

(b) Remove siren wire screws that hold siren wires to siren. Lift off siren assembly (screwdriver).

(c) Remove siren cable bolts, nuts and lock washers that hold the siren cable to fender. Remove siren cable from fender. NOTE: The top of the siren cable is held by a clip that is attached to the fender by the inner of the three bolts removed in *(a)* above ($\frac{7}{16}$-in. box wrench).

NOTE: Disassembly and inspection of siren assembly are covered in TM 9-1795B.

ORDNANCE MAINTENANCE
BODY AND CHASSIS FOR HEAVY WRECKING TRUCK M1

260. SIREN ASSEMBLY INSTALLATION.

a. Equipment.

SCREWDRIVER
WRENCH, box, 7/16-in.
WRENCHES, open-end, two, 1/2-in.

b. Procedure.

(1) INSTALL SIREN ASSEMBLY.

SCREWDRIVER
WRENCH, box, 7/16-in.
WRENCH, open-end, 1/2-in.

(a) Install siren cable on left front fender. Install siren cable bolts, nuts and lock washers that hold siren cable to fender (7/16-in. box wrench).

(b) Install siren wires on siren and fasten with siren wire screws (screwdriver).

(c) Place clip at top of siren cable. Install siren assembly with three bolts, nuts and lock washers (1/2-in. open-end wrench).

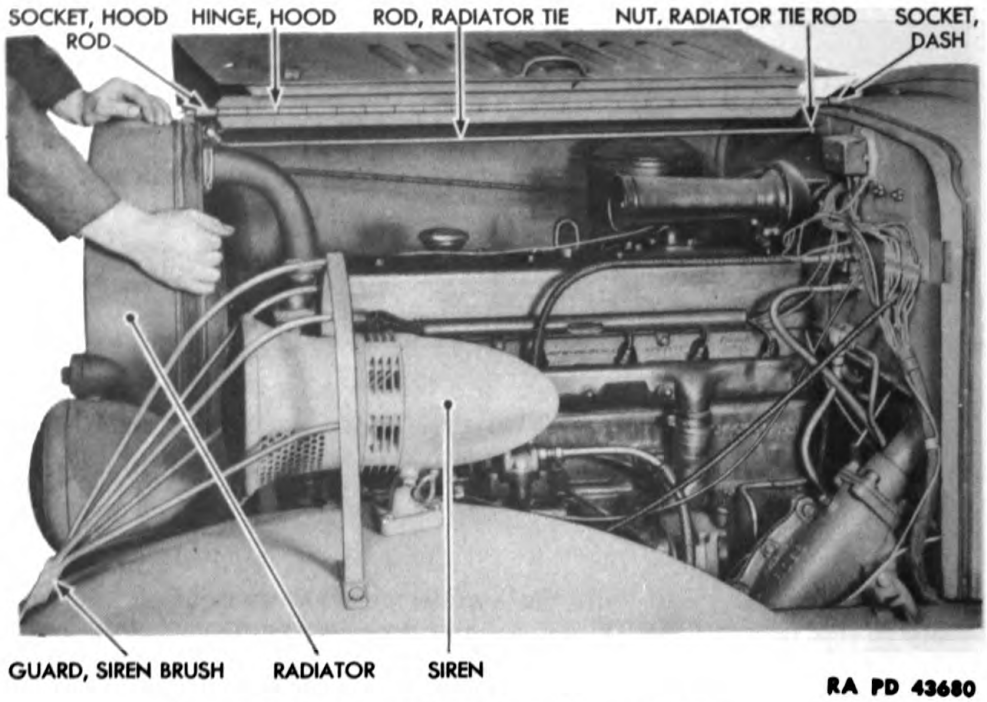


Figure 140—Removing Hood Assembly

(2) INSTALL SIREN BRUSH GUARD.

WRENCHES, open-end, two, 1/2-in.

(a) Install the siren brush guard on the left front fender. Attach the five bolts, nuts and lock washers that hold the siren brush guard on the fender.

SHEET METAL

261. HOOD ASSEMBLY REMOVAL.

a. Equipment.

WRENCH, open-end, $^{9}/_{16}$-in.

b. Procedure. Remove radiator tie rod nut inside the cab on dash. Loosen tie rod nut under hood at dash (fig. 140). Pull radiator forward to remove hood center hinge rod from radiator socket. Slide hood assembly forward and out of dash socket and lift off hood assembly.

262. HOOD DISASSEMBLY.

a. Equipment.

DRIFT HAMMER

b. Procedure.

(1) Drive out hood center hinge rod and two hood side hinge rods (hammer and drift).

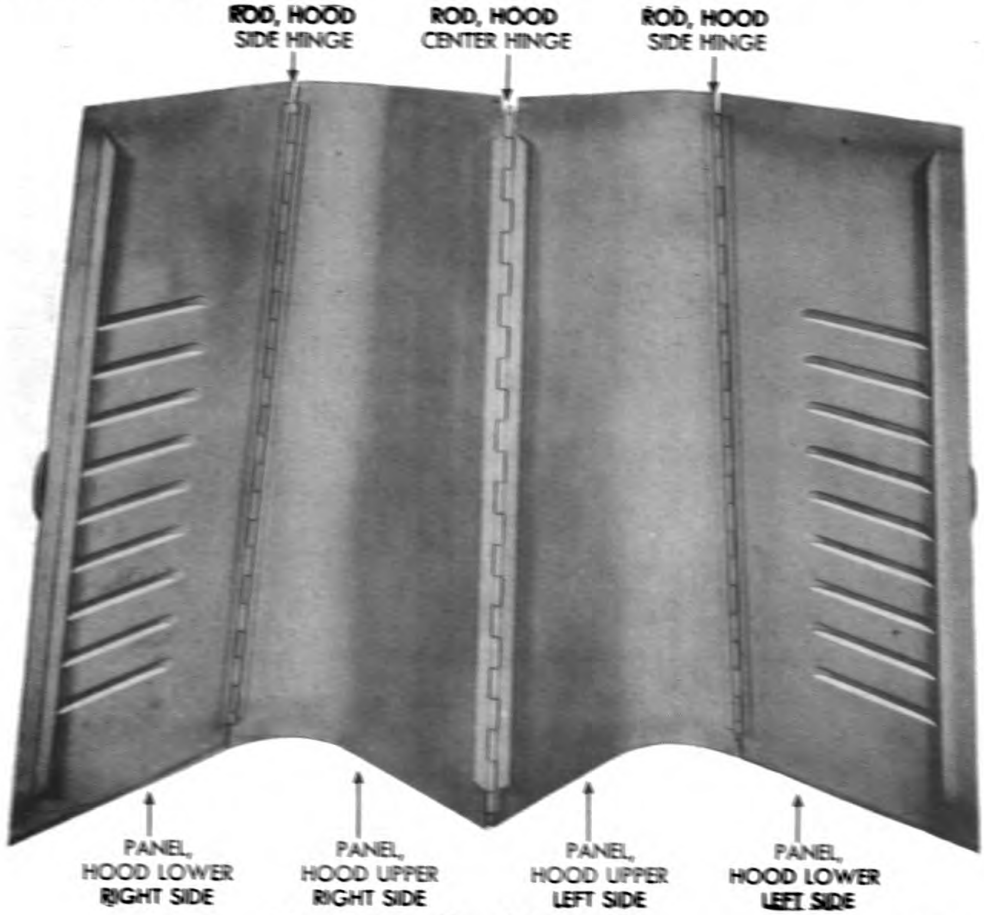


Figure 141—Hood Assembly RA PD 43677

(2) Lift off hood upper left side panel, hood lower left side panel, hood upper right side panel and hood lower right side panel. NOTE: The four hood latches are riveted to hood and the two hood handles are spot-welded to hood.

ORDNANCE MAINTENANCE
BODY AND CHASSIS FOR HEAVY WRECKING TRUCK M1

263. HOOD ASSEMBLY INSPECTION.

a. Equipment.

SOLVENT, dry-cleaning

b. Procedure. Clean hood panels in SOLVENT, dry-cleaning. Inspect for fractures or breaks and, if found, weld. Metal-finish and paint.

264. ASSEMBLY OF HOOD ASSEMBLY.

a. Equipment.

OIL, engine

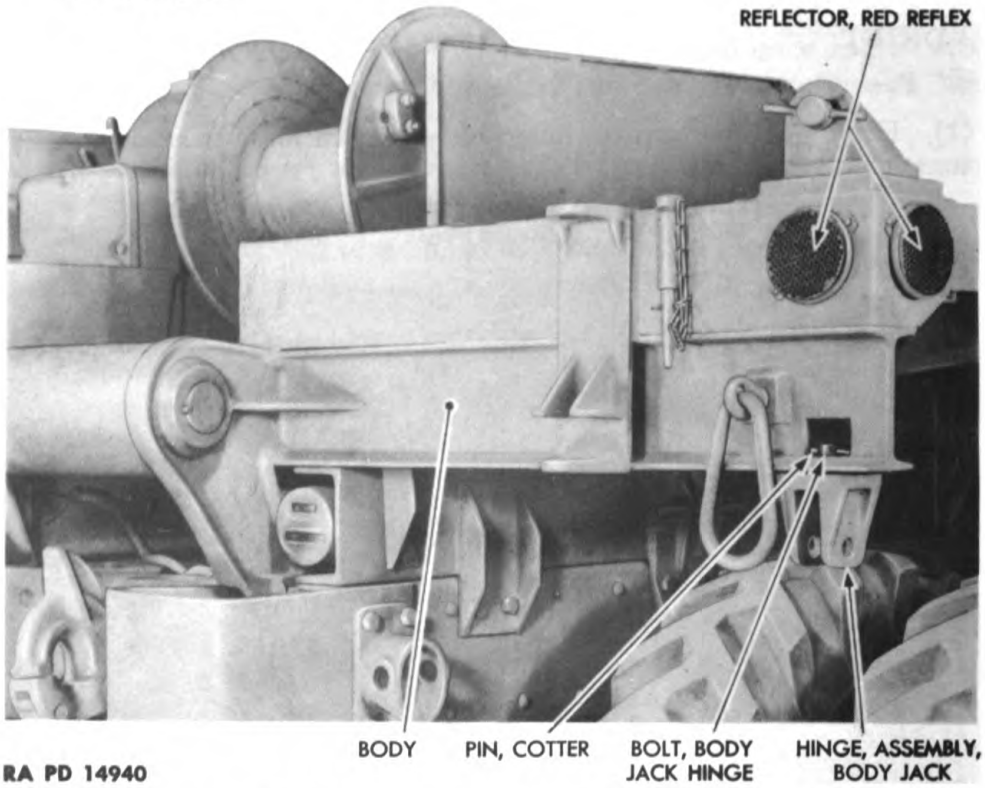


Figure 142—Wrecker Frame and Body—Rear View

b. Procedure. Lubricate hood center hinge rod and two hood side hinge rods with engine oil, and install in hood upper left side panel, in hood lower left side panel, in hood upper right side panel and in hood lower right side panel.

265. HOOD ASSEMBLY INSTALLATION.

a. Equipment.

WRENCH, open-end, $^{9}/_{16}$-in.

b. Procedure. Install hood assembly so hood center hinge rod is in radiator socket and dash socket (fig. 140). Install radiator tie rod nut inside of cab on the dash ($^{9}/_{16}$-in. open-end wrench). Tighten until hood fits at dash and at radiator. Tighten radiator tie rod nut under hood at dash ($^{9}/_{16}$-in. open-end wrench).

SHEET METAL

266. BODY JACK HINGE ASSEMBLY REMOVAL.

a. Equipment.

PLIERS SCREWDRIVER

b. Procedure. Remove cotter pin that holds body jack hinge bolt to body (pliers). Wedge a screwdriver between body jack hinge and head of body jack hinge bolt and turn the body jack hinge off the bolt (pliers). Remove body jack hinge bolt from body.

267. BODY JACK HINGE ASSEMBLY INSPECTION.

a. Equipment.

SOLVENT, dry-cleaning

b. Procedure. Clean body jack hinge and body jack hinge bolt in SOLVENT, dry-cleaning. Inspect hinge for cracks or breaks and weld any cracks or breaks found.

268. BODY JACK HINGE INSTALLATION.

a. Equipment.

PLIERS SCREWDRIVER

b. Procedure. Install body jack hinge on body. Install body jack hinge bolt through hinge and body. Fasten bolt with cotter pin (pliers). Wedge a screwdriver between the body jack hinge and head of body jack hinge bolt and turn the hinge on the bolt (pliers).

269. SIDE TOOL BOX LATCH REMOVAL.

a. Equipment.

SCREWDRIVER WRENCH, open-end, $\frac{5}{8}$-in.

b. Procedure. Remove padlock and open cover of side tool box on side of wrecker body. Bend down lugs which hold side tool box latch nut to cover (screwdriver). Remove side tool box latch nut ($\frac{5}{8}$-in. open-end wrench) and pull side tool box latch off cover. Repeat procedure to remove opposite side tool box.

270. SIDE TOOL BOX LATCH INSPECTION.

a. Equipment.

SOLVENT, dry-cleaning

b. Procedure. Clean side tool box latch with SOLVENT, dry-cleaning, and inspect for breaks or cracks. Weld any breaks or cracks found, and then paint side tool box latch.

271. SIDE TOOL BOX LATCH INSTALLATION.

a. Equipment.

SCREWDRIVER WRENCH, open-end, $\frac{5}{8}$-in.

b. Procedure. Install side tool box latch on side tool box cover. Fasten with tool box latch nut ($\frac{5}{8}$-in. open-end wrench). Bend down

lugs that hold side tool box latch nut to cover (screwdriver). Close side tool box cover and install padlock. Repeat procedure to install opposite side tool box.

272. TOOL BOX COVER REMOVAL.

a. Equipment.

DRIFT HAMMER

b. Procedure. Remove padlock and open tool box cover. Drive the hinge pin that holds the box half of the hinge to the cover half of hinge and lift off cover. Repeat procedure to remove all tool box covers.

273. TOOL BOX COVER INSPECTION.

a. Equipment.

PAPER, flint SOLVENT, dry-cleaning

b. Procedure. Clean all parts with SOLVENT, dry-cleaning, and remove any rust with flint paper. Inspect for cracks or breaks and repair by welding or patching, then paint.

274. TOOL BOX COVER INSTALLATION.

a. Equipment.

DRIFT HAMMER

b. Procedure. Install tool box cover on tool box and drive hinge pin through the box half and cover half of the hinge. Close tool box cover and install padlock. Repeat procedure to install all other tool box covers.

275. TOOL BOX PADLOCK AND CHAIN REMOVAL.

a. Equipment.

FILE PLIERS

b. Procedure. Unlock padlock and remove it from tool box cover. File rivet which holds chain clip to padlock. Remove chain from padlock. Twist open loop at opposite end of chain (pliers) and remove chain from body. The five padlocks are all keyed alike. The same key will open any padlock.

276. TOOL BOX PADLOCK AND CHAIN INSPECTION.

a. Equipment.

GRAPHITE, amorphous SOLVENT, dry-cleaning

b. Procedure. Clean all parts with SOLVENT, dry-cleaning, and inspect padlocks for free action by inserting key in padlock and trying the action of padlock. If padlock sticks, insert GRAPHITE, amorphous, through the keyhole. Oil will thicken and cause stiff action and must not be used.

SHEET METAL

277. TOOL BOX PADLOCK AND CHAIN INSTALLATION.

a. Equipment.

HAMMERS (2) PLIERS

b. Procedure. Install loop of chain on body and twist the loop until it is closed (pliers). Install clip at opposite end of chain on padlock and rivet it in place (two hammers).

278. REFLEX REFLECTOR REMOVAL.

a. Equipment.

SCREWDRIVER

b. Procedure.

(1) GENERAL. There are two amber reflex reflectors on both sides of the front end of body, and four red reflex reflectors on the rear and rear sides of body. All are removed in the same manner.

(2) REMOVE REFLEX REFLECTOR.

SCREWDRIVER

(a) Remove two screws that hold reflex reflector to body and lift off reflex reflector.

279. REFLEX REFLECTOR INSPECTION.

a. Equipment.

SOLVENT, dry-cleaning

b. Procedure. Clean all parts with SOLVENT, dry-cleaning, and inspect for breaks. Replace broken reflex reflectors.

280. REFLEX REFLECTOR INSTALLATION.

a. Equipment.

SCREWDRIVER

b. Procedure. The two amber reflex reflectors are on right and left sides of front end of the body. The four red reflex reflectors are on right and left sides of rear end of body and on the right and left ends of body (fig. 314). Install reflex reflectors and fasten to the body with screws.

CHAPTER 9

CLEARANCES AND TOLERANCES

281. GENERAL.

a. To assure correct inspection and assembly of the various units covered in TM 9-1795A, the clearances and tolerances listed in the following paragraph must be observed.

282. CLEARANCES AND TOLERANCES.

a. Crane.

(1) BOOM WINCH.

Worm, end play	0.005- to 0.030-in.

(2) CRANE WINCH.

Worm, end play	0.005- to 0.030-in.

(3) TRANSMISSION.

Gear backlash, not more than	0.125-in.

b. Rear Winch.

(1) REAR WINCH WORM

Worm, end play	0.005- to 0.030-in.

(2) TRANSMISSION.

Gear backlash, not more than	0.125-in.

c. Front Winch.

Worm, end play	0.005- to 0.030-in.

d. Service Brakes.

(1) BRAKE DRUMS.

Refacing cut limit	0.125-in.

(2) BRAKE CAMSHAFT.

Bushing clearance, not over	0.005-in.

(3) BRAKE SHOE.

Brake shoe lining to disk, clearance	0.010-in.

(4) REAR BRAKE SHOE ROLLER PIN.

Roller to roller pin, clearance, not over	0.005-in.

CLEARANCES AND TOLERANCES

e. Parking Brakes.

(1) CROSS SHAFT.

Spring limit	0.010-in.

(2) BRAKE SHOE.

Brake shoe lining to disk, clearance	0.0625-in.

f. Air System.

(1) AIR COMPRESSOR.

Unloader valve, clearance	0.010- to 0.015-in.
Cylinder bore, size	2.0625-in.
Cylinder bore, worn limits	0.002-in.
Pistons, oversize available	0.010- 0.020- and 0.030-in.
Piston ring gap	0.010- to 0.015-in.
Piston groove, clearance	0.0015- to 0.0025-in.
Connecting rod, clearance side of connecting rod bearing to check on crankshaft, maximum	0.015-in.
Crankshaft center journal, diameter	1.1045-in.
Crankshaft front ball bearing journal out-of-round limits	0.002-in.
Crankshaft drive gear width of teeth across top	0.030-in.
Piston pin bushing, clearance on piston pin	0.002-in.

g. Steering Gear.

(1) LEVER SHAFT.

Bushings, clearance over lever shaft	0.005-in.

ORDNANCE MAINTENANCE
BODY AND CHASSIS FOR HEAVY WRECKING TRUCK M1

CHAPTER 10

PREPARATION FOR USE IN COLD CLIMATE

283. GENERAL.

a. Operation and maintenance of automotive vehicles at low temperatures involve factors not found at normal operating temperatures and operators must devote more time to protective maintenance. Failure to provide extra service will result in actual damage, unnecessary and unwarranted expense and failure to start.

b. For detailed instructions on preparation for use in cold climates, see OFSB 6-11.

CHAPTER 11

PAINTING

284. GENERAL.

a. Ordnance materiel is painted before issue to the using arms, and one maintenance coat per year will ordinarily be ample for protection. With but few exceptions this materiel will be painted with ENAMEL, synthetic, olive-drab, lusterless. The enamel may be applied over old coats of long oil enamel and oil paint previously issued by the Ordnance Department if the old coat is in satisfactory condition for repainting.

b. Paints and enamels are usually issued ready for use and are applied by brush or spray. They may be brushed on satisfactorily when used unthinned in the original package consistency or when thinned no more than five percent by volume with thinner. The enamel will spray satisfactorily when thinned with 15 percent by volume of thinner. (Linseed oil must not be used as a thinner, since it will impart a luster not desired in this enamel.) If sprayed, it dries hard enough for repainting within one-half hour and dries hard in 16 hours.

c. In no case should an oil or kerosene mixture be used to impart a polished surface.

285. PREPARING FOR PAINTING.

a. If the base coat on the materiel is in poor condition, it is more desirable to strip the old paint from the surface than to use sanding and touch-up methods. After stripping, it will then be necessary to apply a primer coat.

b. PRIMER, ground, synthetic, should be used on wood as a base coat for synthetic enamel. It may be applied either by brushing or spraying. It will brush satisfactorily as received or after the addition of not more than five percent by volume of thinner. It will be dry to touch in 30 minutes and hard in five to seven hours. For spraying, it may be thinned with not more than 15 percent by volume of thinner. Lacquers must not be applied to the primer within less than 48 hours.

c. PRIMER, synthetic, rust inhibiting, for bare metal, should be used on metal as a base coat. Its use is similar to that outlined in paragraph **b**, above.

d. The success of a job of painting depends partly on the selection of a suitable paint, but also largely upon the care used in preparing the surface prior to painting. All parts to be painted should be free from rust, dirt, grease, kerosene, oil and alkali, and must be dry.

ORDNANCE MAINTENANCE
BODY AND CHASSIS FOR HEAVY WRECKING TRUCK M1

286. PAINTING METAL SURFACES.

a. If metal parts are in need of cleaning they should be washed in a liquid solution consisting of one-half pound of soda ash in eight quarts of warm water, or an equivalent solution and then rinsed in clear water and wiped thoroughly dry. Wood parts in need of cleaning should be treated in the same manner, but the alkaline solution must not be left on for more than a few minutes and the surfaces should be wiped dry as soon as they are washed clean. When the vehicle is in fair condition and marred only in spots, the bad places should be touched with ENAMEL, synthetic, olive-drab, lusterless, and permitted to dry. The whole surface will then be sandpapered with PAPER, flint, No. 1, and a finish coat of ENAMEL, synthetic, olive-drab, lusterless, applied and allowed to dry thoroughly before the materiel is used. If the equipment is in bad condition, all parts should be thoroughly sanded with PAPER, flint, No. 2, or equivalent, given a coat of PRIMER, ground, synthetic, and permitted to dry for at least 16 hours. They will then be sandpapered with PAPER, flint, No. 00, wiped free from dust and dirt, and a final coat of ENAMEL, synthetic, olive-drab, lusterless, applied and allowed to dry thoroughly before the materiel is used.

287. PAINT AS A CAMOUFLAGE.

a. Camouflage is now a major consideration in painting ordnance vehicles, with rust prevention secondary. The camouflage plan at present employed utilizes three factors: color, gloss and stenciling.

b. Color. Vehicles are painted with ENAMEL, synthetic, olive-drab, lusterless, which was chosen to blend in reasonably well with the average landscape.

c. Gloss. The new lusterless enamel makes a vehicle difficult to see from the air or from relatively great distances over land. A vehicle painted with ordinary glossy paint can be detected more easily and at greater distances.

d. Stenciling. A blue-drab stencil enamel is used which does not photograph well. The numbers are illegible to the eye at distances exceeding 75 feet.

e. Preserving Camouflage.

(1) Continued friction or rubbing must be avoided, as it will smooth the surface and produce a gloss. The vehicle should not be washed more than once a week. Care should be taken to see that the washing is done entirely with a sponge or a soft rag. High-pressure water and fender brushes must be used to clean chassis and suspension. The surface should never be rubbed or wiped, except while wet, or a gloss will develop.

(2) It is not desirable that vehicles, painted with lusterless enamel, be kept as clean as vehicles were kept when a glossy paint was used. A small amount of dust increases the camouflage value. Grease spots

should be removed with SOLVENT, dry-cleaning. Any portion of the spot which cannot be so removed should be allowed to remain.

(3) Continued friction of wax-treated tarpaulins on the sides of a vehicle will also produce a gloss which should be removed with SOLVENT, dry-cleaning.

(4) Tests indicate that repainting with olive-drab paint will be necessary once yearly, and with blue-drab paint twice yearly.

288. REMOVING PAINT.

a. After repeated paintings, the paint may become so thick as to crack and scale off in places, presenting an unsightly appearance. If such is the case, remove the old paint by use of REMOVER, paint and varnish. It is important that every trace of paint remover be completely rinsed off and that the equipment be perfectly dry before repainting is attempted. Crevices or cracks in wood should be filled with putty and the wood sandpapered before refinishing. The surfaces thus prepared should be painted according to directions in paragraph 286.

289. PAINTING LUBRICATING DEVICES.

a. Oil cups, grease fittings, oilholes and similar lubricating devices, as well as a circle about $\frac{3}{4}$ inch in diameter at each point of lubrication, will be painted with red, water-resisting enamel in order that they may be readily located. Do not paint openings in fittings through which lubricant passes.

CHAPTER 12

SHIPPING AND STORAGE

Section I

DOMESTIC SHIPMENT

290. GENERAL.

a. The Heavy Wrecking Truck M1 will be shipped uncrated for both overseas and domestic shipments. In most cases when shipment is domestic, the heavy wrecking truck will be shipped completely assembled without removing the fuel or water. (Water should be drained only when freezing weather is anticipated.) Domestic shipment will generally be made on flat freight cars with blocking as shown in figure 144 and described in paragraph 292.

291. PREPARATION.

a. The following steps shall be taken in the preparation of the heavy wrecking truck for domestic shipment:

(1) Disconnect the battery cables.

(2) Inflate tires to about 10 pounds per square inch above normal.

(3) Apply COMPOUND, rust-preventive, lead base, Specification AXS-673, to all exterior unpainted surfaces by spraying or brushing.

(4) Drain water from the radiator if freezing weather is anticipated. If water is drained from the radiator, attach to the steering wheel a conspicuous tag indicating that the water has been drained from the radiator. (NOTE: It is not necessary to remove fuel from the fuel tanks for shipment by rail.)

292. METHODS OF SECURING HEAVY WRECKING TRUCKS ON FREIGHT CARS.

a. General. There are two approved methods of blocking the heavy wrecking truck on a freight car as described below. All blocking will be located against the outside wheel of the dual. These requirements are the minimum requirements and any additional blocking deemed necessary or desirable may be added.

b. Loading.

(1) BRAKE WHEEL CLEARANCE. Each freight car must be loaded

DOMESTIC SHIPMENT

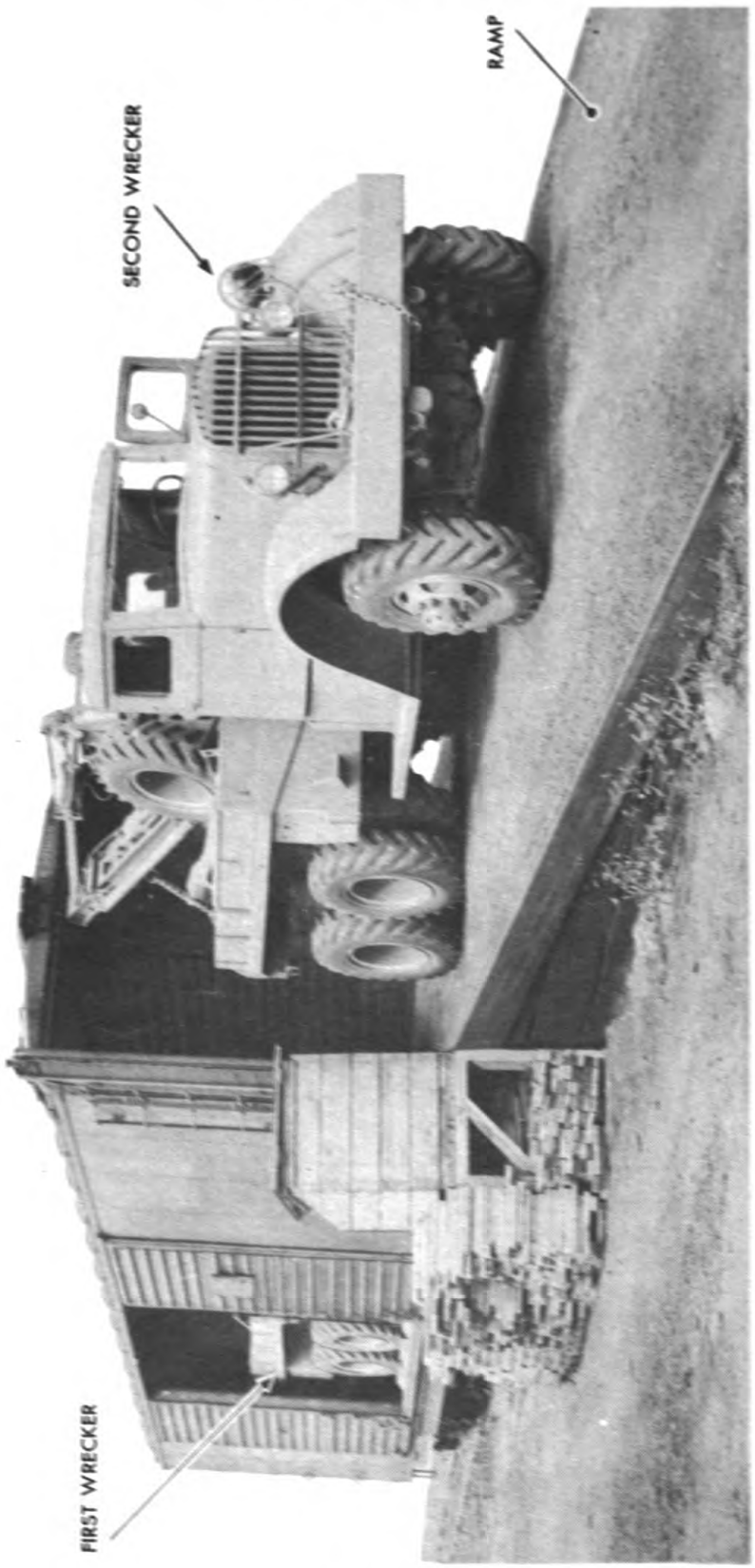


Figure 143—Loading Two Trucks in an End-door Box Car

ORDNANCE MAINTENANCE
BODY AND CHASSIS FOR HEAVY WRECKING TRUCK M1

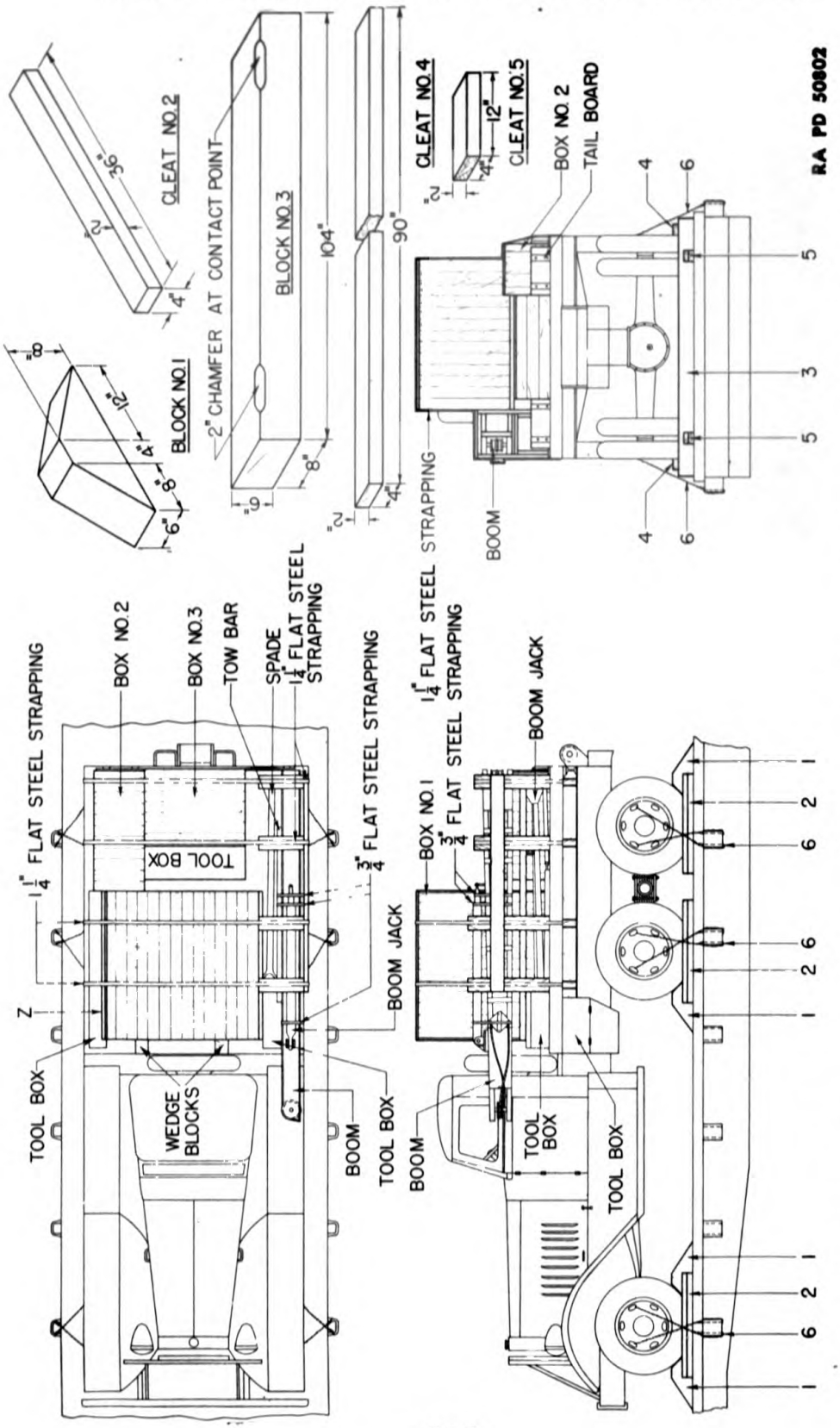


Figure 144—General Views of Heavy Wrecking Truck (Including Blocking Requirements for Rail Shipment)

with the resulting brake wheel clearance of at least six inches in front, on top and at each side of the brake wheel.

(2) DISTRIBUTION OF LOAD. The load must be so distributed that there is, as near as possible, equal weight bearing on each truck of the railroad car.

(3) PLACARDING. Each railroad car must be placarded "DO NOT HUMP."

(4) BRAKES. After loading and bracing the trucks, the brakes should be set.

(5) TYPES OF CAR. Flat cars, box cars (fig. 143) or gondola cars may be used. However, the flat car is preferable because of ease of loading and blocking.

c. Method 1 (fig. 144).

(1) BLOCKS 1. Eight blocks 1 should be located to the front and to the rear of each front wheel and to the front of each forward rear wheel and to the back of each rearward rear wheel as shown in figure 144. The heel of the block should be nailed to the car floor with five 40-penny nails and that portion of the block under the wheel will be toenailed to the car floor with two 40-penny nails.

(2) CLEATS 2. Two cleats 2 should be located against the outside face of each wheel. The lower cleats should be nailed to the car floor with three 40-penny nails and the top cleats to the cleat below with three 40-penny nails.

(3) STRAPPING 6. Four strands, two wrappings of No. 8 gage, black annealed wire, indicated as 6 (fig. 144), should be passed through the holes in the wheels and passed through the stake pockets. The wire should then be tightened enough to remove slack. The holes in the wheels through which the wire passes should be equal distance from the floor. When a box car is used this strapping should be attached to the floor by wrapping the wire around a block and nailing the block to the floor. When flat steel strapping 1½ inches wide is used it should be passed over the axles and attached to the floor by means of anchor plates.

d. Method 2 (fig. 144).

(1) BLOCKS 3. Two blocks 3 should be placed—one to the front and one to the rear of the front wheels (fig. 144). Two blocks 3 should be placed—one to the front of the forward rear wheel and one in back of the rearward rear wheel. These blocks should be at least 8 inches wider than the over-all width of the vehicle at the car floor.

(2) CLEATS 5. Sixteen cleats 5 should be located—two against blocks 3 to the front and two blocks to the rear of each blocked wheel as shown in figure 144. These cleats should be nailed to the car floor with three 40-penny nails.

(3) CLEATS 4. Two cleats 4 should be located against the outside of the rear wheels on the top of blocks 3. These cleats should be nailed to blocks 3 at each end of the cleat with three 40-penny nails.

(4) CLEATS 2. Two cleats 2 should be located against the outside face of each front wheel on top of blocks 3. These cleats should be nailed to blocks 3 with three 40-penny nails at each end.

(5) STRAPPING. Strapping for Method 2 should be identical to the strapping for Method 1.

Section II

OVERSEAS SHIPMENT

293. PREPARATION.

a. The following steps shall be taken in the preparation of the heavy wrecking truck for overseas shipment:

(1) Drain the water from the radiator.

(2) Drain all fuel from the fuel tank.

(3) Disconnect the battery cables and remove all acid from the battery in order to ship the battery dry.

(4) Fill the crankcase with SAE 20 oil and inject a small amount of SAE 50 oil in the upper part of each cylinder.

(5) Apply COMPOUND, rust-preventive, lead base, Specification AXS-673, to all exterior unpainted surfaces by spraying or brushing.

(6) Attach to the steering wheel a conspicuous tag indicating that the water, fuel and battery liquid have been removed.

(7) For overseas shipment only, prepare the truck as described in paragraph 294.

294. METHOD OF SHIPPING HEAVY WRECKING TRUCK M1 OVERSEAS.

a. General. The heavy wrecking truck is packed for overseas shipment by removing and crating the boom to the left-hand side of the truck and by constructing three boxes which are used as follows (figs. 144 to 148):

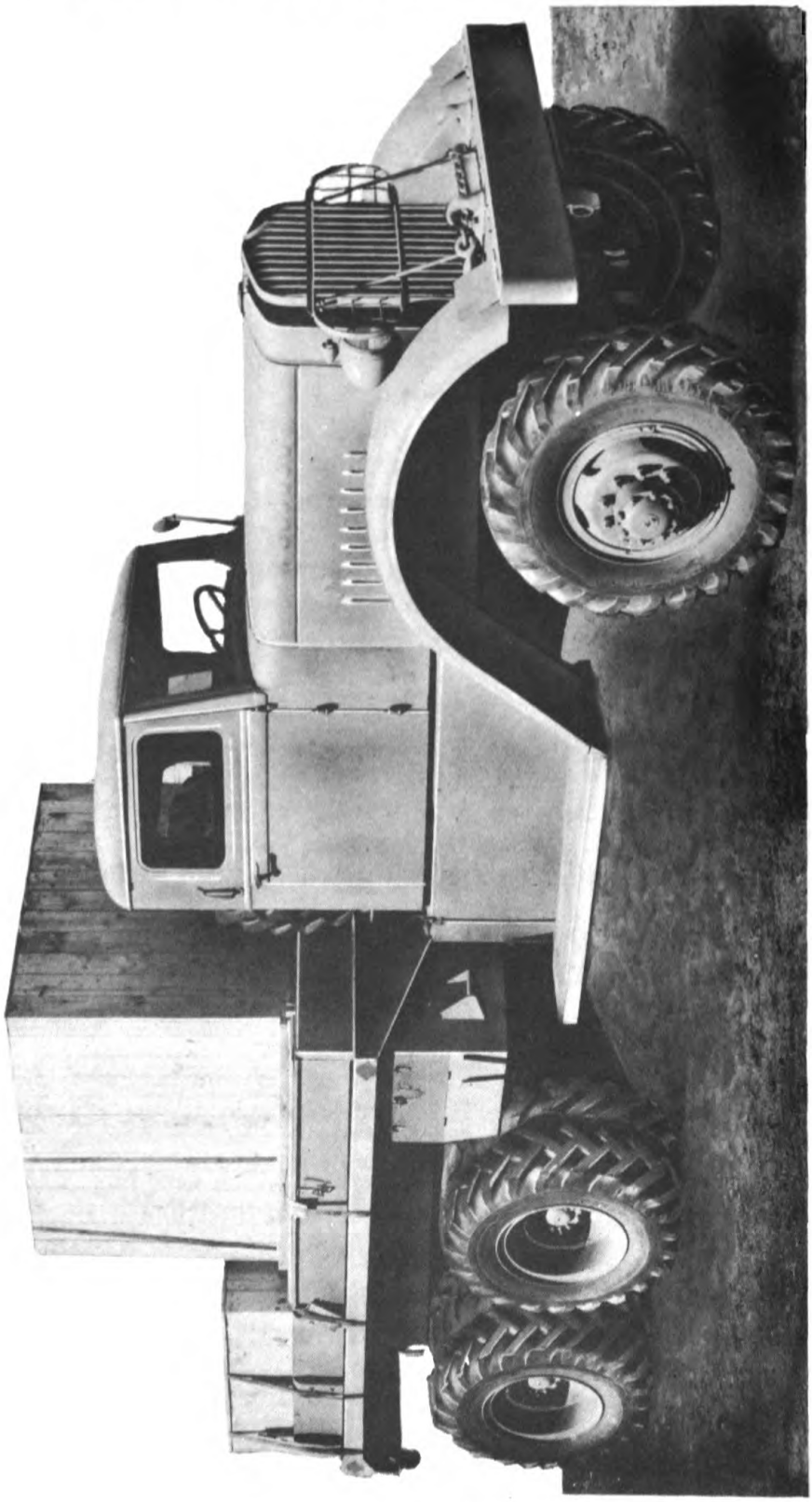
(1) Box No. 1. Box No. 1 covers the crane gear box, spare tires, welding and cutting outfit and miscellaneous equipment. This box, which has no bottom, slips over the fixed parts which it contains (fig. 144).

(2) Box No. 2. Box No. 2 is used for packing snatch blocks, sheaths and miscellaneous equipment. This box is located to the rear of the truck on the right side (fig. 144).

(3) Box No. 3. Box No. 3 covers the rear winch gear box. This box is located over the parts it contains to the rear of the truck.

b. Construction of Boxes.

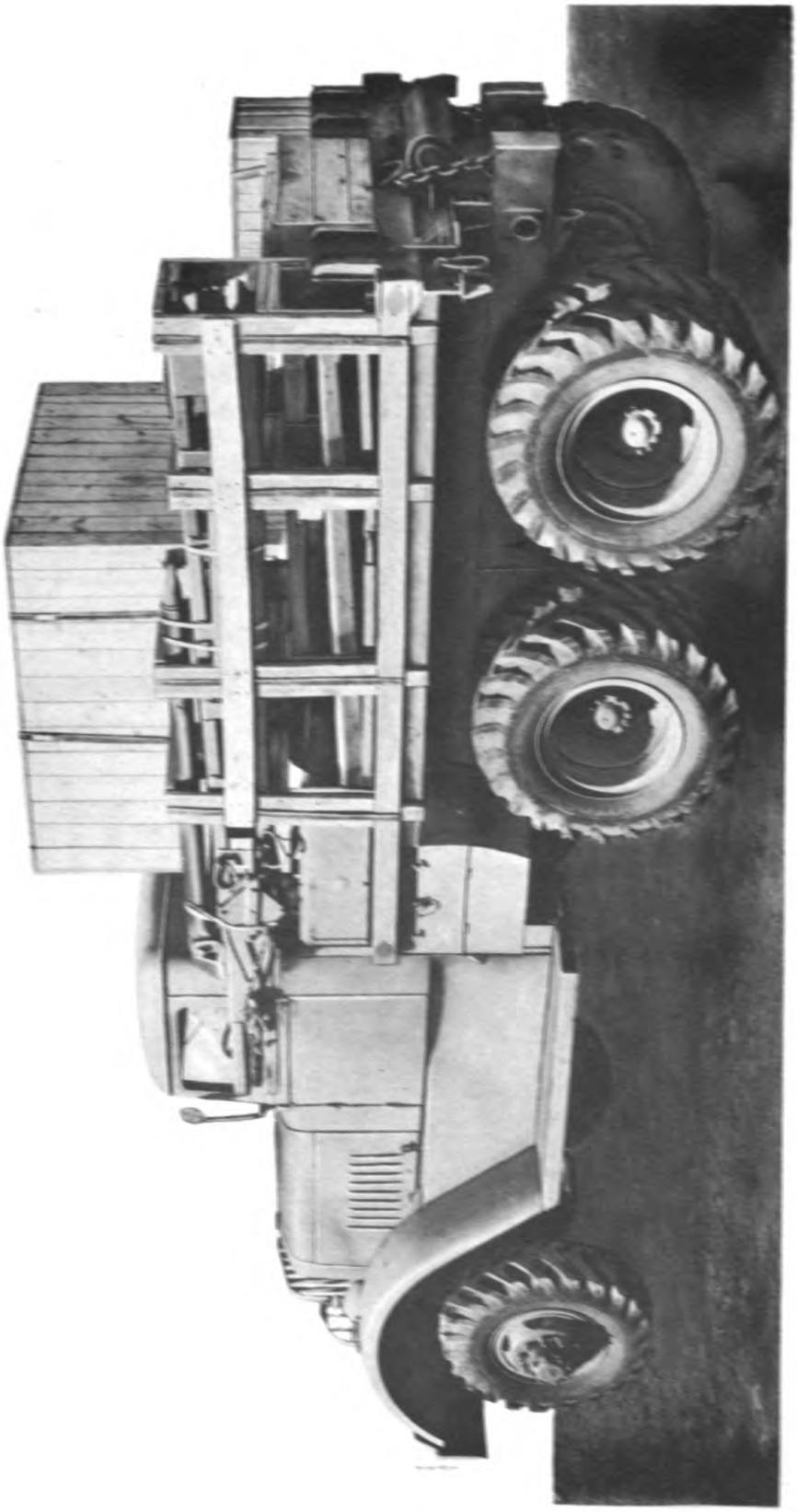
(1) Box No. 1. Box No. 1 will be constructed as shown in figure 148. This box shall be lined with waterproof paper, uncreped, of water resistance, strength and other properties equal to type C waterproof paper as listed in Section XXII, IOSSC—*(a)*, Introduction to Ordnance Storage and Shipment Chart, section *(a)* "Instructions and Specifications for Packaging Ordnance General Supplies." The following is the bill of material for Box No. 1:



RA PD 52520

Figure 145—Method of Preparing Heavy Wrecking Truck M1 for Overseas Shipment—Right Side View

OVERSEAS SHIPMENT



RA PD 52521

Figure 146—Method for Preparing Heavy Wrecking Truck M1 for Overseas Shipment—Left Side View

ORDNANCE MAINTENANCE
BODY AND CHASSIS FOR HEAVY WRECKING TRUCK M1

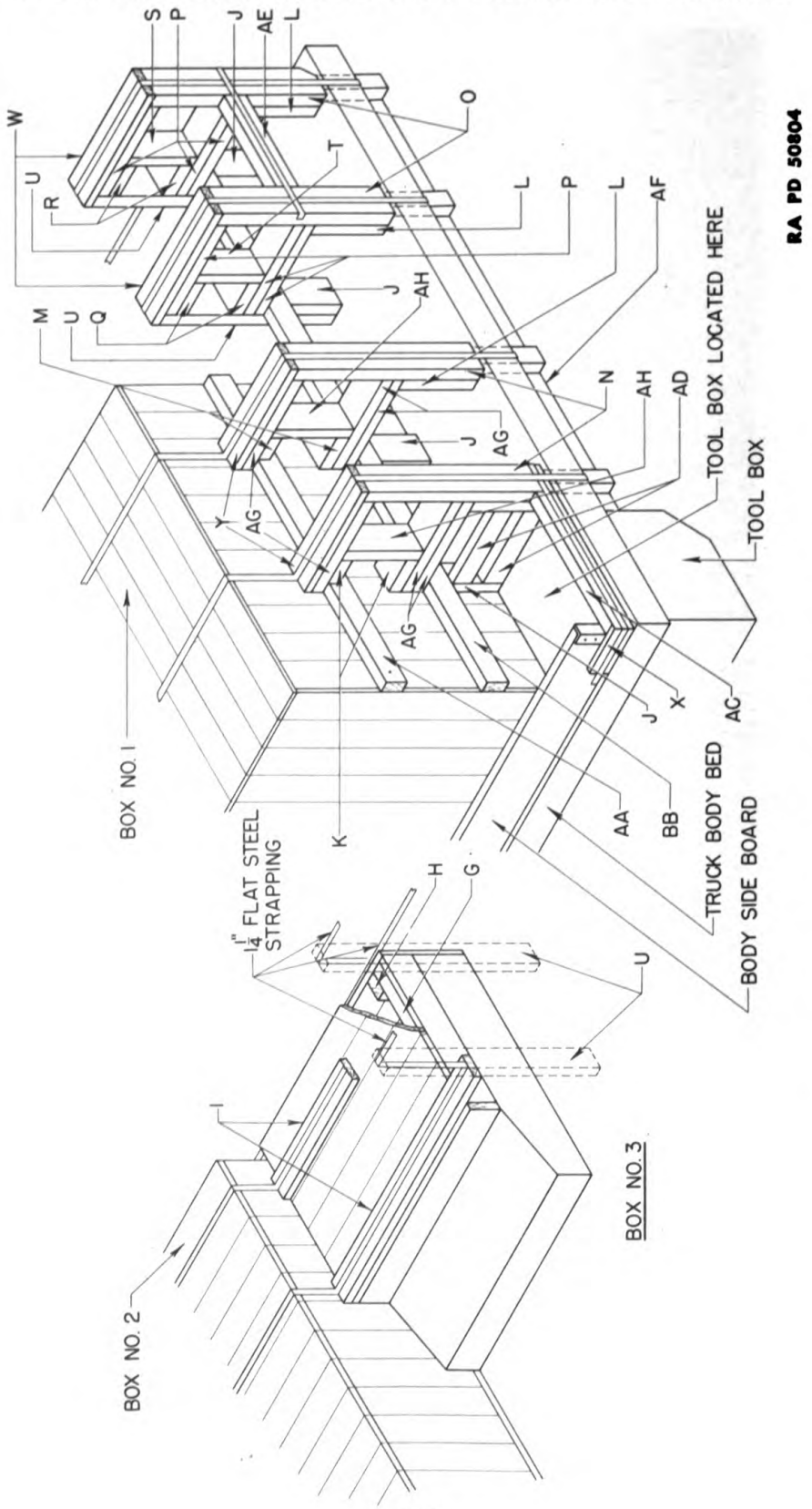


Figure 147—Details of Box No. 3 and Boom Blocking

OVERSEAS SHIPMENT

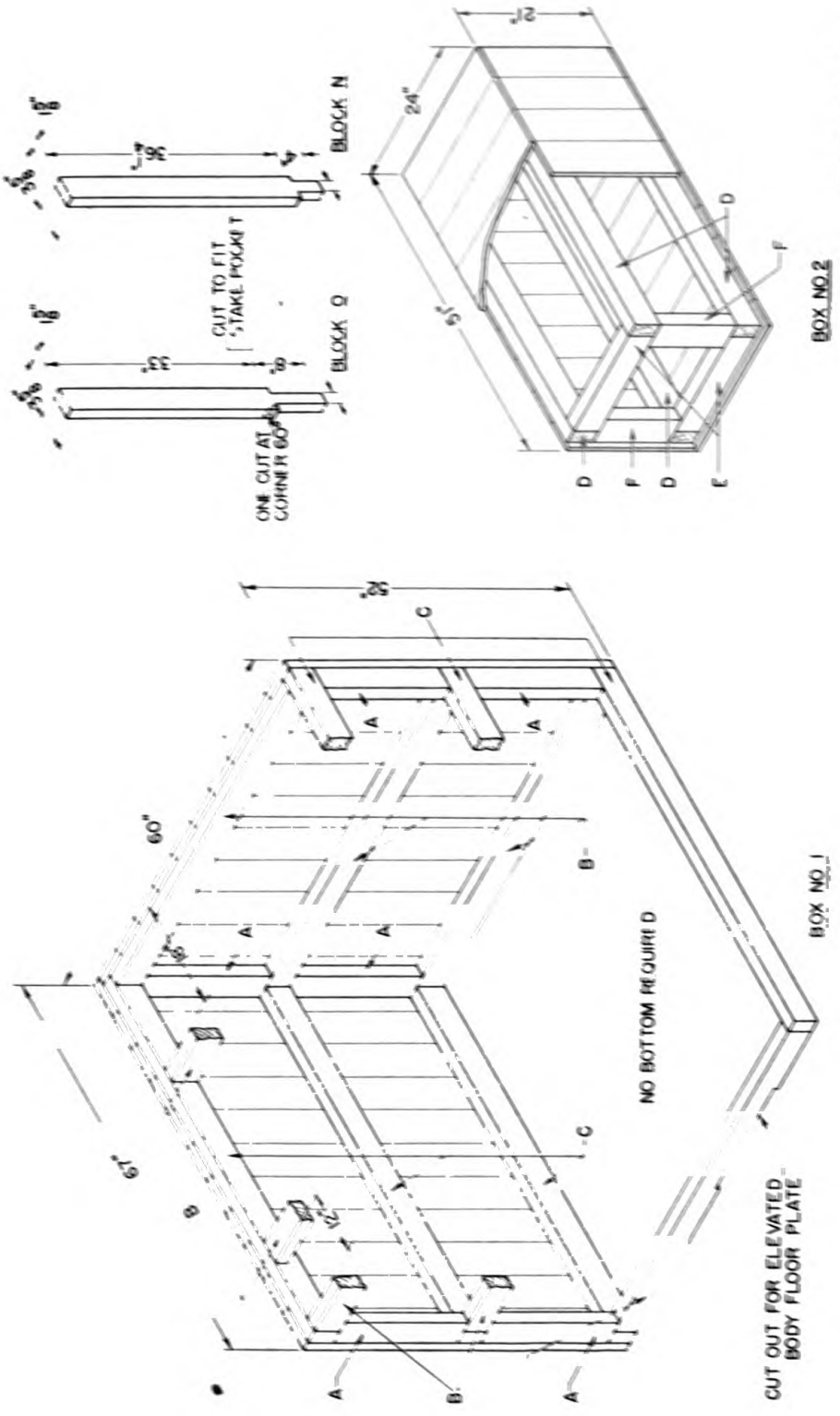


Figure 148—Details of Boxes Nos. 1 and 2

ORDNANCE MAINTENANCE
BODY AND CHASSIS FOR HEAVY WRECKING TRUCK M1

Indicating Letter	Quantity Required	PART	Actual Size of Finished Piece		
			Thickness (Inch)	Width (Inch)	Length (Inch)
A	8	Frame member	1 5/8	3 5/8	20 9/16
B	8	Frame member	1 5/8	3 5/8	56
C	6	Frame member	1 5/8	3 5/8	66 1/4
—	1	Sheathing	3/4[1]	254[2]	52
—	1	Sheathing	3/4[1]	61[2]	67 3/4

(2) Box No. 2. Box No. 2 will be constructed as shown in figure 148. This box shall be lined with waterproof paper, uncreped, of water resistance, strength and other properties equal to type C waterproof paper as listed in section XXII, IOSSC-*(a)*, Introduction to Ordnance Storage and Shipment Chart, section *(a)* "Instructions and Specifications for Packaging Ordnance General Supplies." The following is the bill of material for Box No. 2:

Indicating Letter	Quantity Required	PART	Actual Size of Finished Piece		
			Thickness (Inch)	Width (Inch)	Length (Inch)
D	4	Frame member	1 5/8	3 5/8	49 1/2
E	4	Frame member	1 5/8	3 5/8	19 1/4
F	4	Frame member	1 5/8	3 5/8	12 1/4
—	1	Sheathing	3/4[1]	125[2]	24
—	1	Sheathing	3/4[1]	102[2]	19 1/2

(3) Box No. 3. Box No. 3 will be constructed as shown in figure 147. This box shall be lined with waterproof paper, uncreped, of water resistance, strength and other properties equal to type C waterproof paper as listed in section XXII, IOSSC-*(a)*, Introduction to Ordnance Storage and Shipment Chart, section *(a)*, "Instructions and Specifications for Packaging Ordnance General Supplies." The following is the bill of material for Box No. 3:

Indicating Letter	Quantity Required	PART	Actual Size of Finished Piece		
			Thickness (Inch)	Width (Inch)	Length (Inch)
G	2	Frame member	1 5/8	3 5/8	32
H	2	Frame member	1 5/8	3 5/8	15 3/4
I	2	Brace	1 5/8	3 5/8	48
		Sheathing	3/4[1]	54[2]	42

[1]Nominal one-inch lumber.
[2]May be constructed of six-, eight-, or ten-inch lumber.

OVERSEAS SHIPMENT

(4) The following is the bill of material for bracing and blocking the boom (fig. 147):

Indicating Letter	Quantity Required	PART	Actual Size of Finished Piece		
			Thickness (Inch)	Width (Inch)	Length (Inch)
J	4	Block	$1\frac{5}{8}$	$5\frac{5}{8}$	$10\frac{1}{2}$
K	2	Block	$1\frac{5}{8}$	$5\frac{5}{8}$	$6\frac{3}{4}$
L	4	Block	$1\frac{5}{8}$	$5\frac{5}{8}$	14
M	2	Block	$1\frac{5}{8}$	$3\frac{5}{8}$	$4\frac{5}{8}$
N	2	Block (fig. 148)	$1\frac{5}{8}$	$3\frac{5}{8}$	$44\frac{1}{4}$
O	2	Block (fig. 148)	$1\frac{5}{8}$	$3\frac{5}{8}$	41^{3}
P	4	Block	$1\frac{5}{8}$	$5\frac{5}{8}$	$19\frac{3}{4}$
Q	2	Block	$1\frac{5}{8}$	$5\frac{5}{8}$	6
R	2	Block	$1\frac{5}{8}$	$5\frac{5}{8}$	$8\frac{3}{4}$
S	1	Block	$1\frac{5}{8}$	$5\frac{5}{8}$	$13\frac{3}{8}$
T	1	Block	$1\frac{5}{8}$	$5\frac{5}{8}$	12
U	2	Block	$1\frac{5}{8}$	$5\frac{5}{8}$	33
V	2	Block	$\frac{3}{4}$[1]	$5\frac{5}{8}$	$21\frac{1}{2}$
W	2	Block	$\frac{3}{4}$[1]	$5\frac{5}{8}$	23
X	1	Block	$\frac{3}{4}$[1]	$3\frac{5}{8}$	10
Y	2	Braces[4]	$1\frac{5}{8}$	$3\frac{5}{8}$	24
AA	1	Cleat	$1\frac{5}{8}$	$3\frac{5}{8}$	66
AB	1	Cleat	$1\frac{5}{8}$	$3\frac{5}{8}$	116
AC	1	Block	$1\frac{5}{8}$	$3\frac{5}{8}$	$29\frac{1}{4}$
AD	2	Block	$1\frac{5}{8}$	$3\frac{5}{8}$	$16\frac{5}{8}$
AE	1	Block	$1\frac{5}{8}$	$3\frac{5}{8}$	$20\frac{1}{8}$
AF	1	Block	$1\frac{5}{8}$	$3\frac{5}{8}$	90
AG	6	Block	$1\frac{5}{8}$	$5\frac{5}{8}$	20
AH	2	Block	$1\frac{5}{8}$	$5\frac{5}{8}$	$15\frac{1}{4}$
Z	1	Block	$1\frac{5}{8}$	$3\frac{5}{8}$	66
		$1\frac{1}{4}$-inch flat steel strapping			
		$\frac{3}{4}$-inch flat steel strapping			

c. Packing Procedure. The following steps should be followed in packing the Heavy Wrecking Truck M1 for export:

(1) Remove the boom as follows:

(a) Release the cable for the boom winch and locate it to the top side of the boom.

(b) Unwind the cable from the boom swing worm gear and remove the eight bolts and nuts at the base of the pulley on the top of the winch structure.

(c) Rewind the cable around the pulley and the cylinder which was removed from the winch structure in *(b)*. Place this assembly in Box No. 2.

[1]Nominal one-inch lumber.
[3]Cut one at corner, 60 degrees.
[4]Braces used to hold down boom. These are nailed against blocks O and V.

(d) Remove one shaft pin from the base of the boom and remove the boom. The boom will be located in its proper place after (2) and (3) below.

(2) Box No. 1. Locate Box No. 1 (figs. 144, 145, 146, and 148) as follows:

(a) Box No. 1 covers the boom winch structure, gas and air cylinders, spotlights and siren packed in boxes or cartons. (NOTE: The two spotlights and the siren are removed and may be packed in a cardboard carton 16-in. x 10-in. x 12-in.)

(b) Remove the wing nut from the spare wheel allowing enough clearance for the bottom rail of Box No. 1 (fig. 148).

(c) Place the air and gas cylinders on top of the chassis frame at the base of the boom winch.

(d) Lower Box No. 1 into position and replace the wing nut from the spare wheel.

(e) Force the box over the stop on the spotlight shaft to prevent the box from moving.

(3) Box No. 3. Locate Box No. 3 (figs. 144, 146, and 147) over the rear winch gear box as shown in figure 147.

(4) Box No. 2 (figs. 144, 145, 146, and 148).

(a) Box No. 2 contains the following items:

1. Pulley and cylinder assembly.

2. Two sets of ground anchors with fourteen anchor staples.

3. Two single snatch blocks.

4. Two double snatch blocks.

5. One rear snatch block support.

6. Two bracing jacks.

7. Two boom sway chains.

8. Two swivel connections from rear of deck used for boom jacks.

(b) Apply to the contents of Box No. 2, listed above, COMPOUND, rust-preventive, lead base, Specification AXS-673.

(c) Locate Box No. 2 as shown in figure 144.

(5) BRACING BOOM ON TRUCK DECK (figs. 144, 145, 146, and 147).

(a) Release the boom jack from the right side of the boom to enable the boom to be placed firmly on the bracing.

(b) Remove side stake boards on the left side of the truck.

(c) Construct the strapping as shown in figure 147 and locate the boom in position, bracing it to Box No. 1.

OVERSEAS SHIPMENT

(6) STRAPPING.

(a) Strap Box No. 1 by passing two bands of $1\frac{1}{4}$-inch flat steel strapping over Box No. 1 and the boom bracing, fastening the straps to the chassis frame of the truck (figs. 145, 146, and 147).

(b) Strap Boxes No. 2 and No. 3 with two bands of $1\frac{1}{4}$-inch flat steel strapping by passing the straps over Boxes No. 2 and No. 3 and over the boom bracing and fastening the straps to the chassis frame of the truck (figs. 144, 145, 146, and 147).

(c) Bind together, boom, cables and tow bars with $\frac{3}{4}$-inch flat steel strapping.

(d) Pass one band of $1\frac{1}{4}$-inch flat steel strapping around the back of Boxes No. 2 and No. 3, fastening it to the boom bracing and Box No. 2.

ORDNANCE MAINTENANCE
BODY AND CHASSIS FOR HEAVY WRECKING TRUCK M1

Section III

STORAGE

295. PREPARATION.

a. When the Heavy Wrecking Truck M1 is prepared for storage, the precautions listed in paragraph 293 will be followed, except that the boom will not be disconnected and the components will not be boxed.

296. PROCEDURE DURING STORAGE.

a. Inspections. Periodic inspections will be made to determine the effectiveness of the rust preventives. (If any part of the truck shows signs of corrosion, it is necessary that the entire truck be rust-proofed again.)

b. Other Regulations. All other regulations as set forth in AR 850-18, "Storage of Motor Vehicles" should be followed.

CHAPTER 13
SPECIAL TOOLS

297. GENERAL.

a. All tools required to do any special job on the units covered in this manual are described in the following paragraph. Machines, such as a lathe or a press, are not listed here since they are of a special nature and require the judgment of the inspector in charge, as to whether their use is necessary or advisable. The wrecker is equipped with six tool boxes which contain standard tools and equipment. A list of the contents of each tool box is given in TM 9-1795.

298. SPECIAL TOOLS.

a. Gages, Centering. Three centering gages are needed to inspect the alinement of the frame (fig. 116).

b. Gage, "Go," "No-go." Special gage is needed to inspect windshield wiper motor (fig. 125).

c. Hook, Wire. Special wire hook is needed to hook the windshield wiper motor spring into the cam spring and kicker (fig. 146).

d. Jig, Repair. Special jig is required to hold the windshield wiper motor for disassembly and assembly (figs. 121 and 146).

e. Jig, Rivet. Special jig is needed to remove and install rivet that holds windshield wiper motor shaft to paddle (fig. 127).

f. Punch. Special punch is required to remove the rivet from the windshield wiper motor paddle (fig. 124).

g. Punch, Special. Special punch is required to install the rivet in the windshield wiper motor paddle (fig. 127).

h. Machine, Frame Straightener and Wheel Alinement. A special hydraulically operated machine is needed for straightening a bent frame and putting wheels in alinement (fig. 118).

i. Tray, Special. Special tray is needed to form the windshield wiper motor paddle (fig. 128).

j. Wrench, Socket. Special socket wrench is required for disassembly and assembly of windshield wiper motor cover (fig. 122).

CHAPTER 14

REFERENCES

299. STANDARD NOMENCLATURE LISTS.

a. Truck, wrecking, heavy, M1 (Ward La France) ..... SNL G-116

b. Cleaning, preserving, and lubricating materials ..... SNL K-1

Current Standard Nomenclature Lists are as tabulated here. An up-to-date list of SNL's is maintained as the Ordnance Publications for Supply Index ..... OPSI

300. EXPLANATORY PUBLICATIONS.

a. Wrecking Truck Materiel.

Heavy wrecking truck M1—(Ward La France) ..... TM 9-795
Ordnance Maintenance—Power train for heavy wrecker M1, Series 2 ..... TM 9-1795A
Ordnance Maintenance—Engine for heavy wrecking truck M1 ..... TM 9-1795B
Ordnance Maintenance—Crane and winches for heavy wrecking truck M1 ..... TM 9-1795C

b. Lubrication.

Cleaning, preserving and lubricating materials ..... TM 9-850
Automotive lubrication ..... TM 10-540

c. Inspection and Maintenance.

Fire prevention, safety precautions, accidents ..... TM 10-360
Echelon system of maintenance ..... TM 10-525
Motor transport inspections ..... TM 10-545
Maintenance and care of pneumatic tires ..... TM 31-200
Maintenance and repair ..... TM 10-520
Sheet metal work, body, fender, and radiator repairs ..... TM 10-450

d. Storage and Shipment.

Storage of motor vehicle equipment ..... AR 850-18
Loading of mechanized and motorized army equipment on open top railroad equipment ..... OSSC-G

REFERENCES

e. Automotive Materiel.

The internal combustion engine	TM 10-570
Automotive electricity	TM 10-580
Automotive brakes	TM 10-565
Fuels and carburetion	TM 10-550
The motor vehicle	TM 10-510
Cold weather operation of automotive equipment	OFSB 6-G-3

f. Miscellaneous.

List of publications for training	FM 21-6
Hand, measuring, and power tools	TM 10-590
Motor transport	FM 25-10
Military motor vehicles	AR 850-15
Military motor transportation	TM 10-505
Automotive power transmission units	TM 10-585
Electrical fundamentals	TM 1-455

301. TRAINING FILMS AND FILM STRIPS.

a. Lubrication.

Lubrication	FS 10-39
The story of automotive lubrication	TF 25-76

b. Inspection and Maintenance.

The motor vehicle driver, loading, trouble shooting, reports and vehicle abuse	TF 11-559
Third echelon of maintenance	FS 10-55
Fourth echelon of maintenance	FS 10-56

c. Automotive Materiel.

Automotive brakes	FS 10-36
Automotive power transmission units	FS 10-34
Automotive electricity	FS 10-33
The storage battery	FS 10-61

ORDNANCE MAINTENANCE—BODY AND CHASSIS FOR HEAVY WRECKING TRUCK M1

INDEX

INDEX

ORDNANCE MAINTENANCE—BODY AND CHASSIS FOR HEAVY WRECKING TRUCK M1

INDEX

ORDNANCE MAINTENANCE—BODY AND CHASSIS FOR HEAVY WRECKING TRUCK M1

INDEX

ORDNANCE MAINTENANCE—BODY AND CHASSIS FOR HEAVY WRECKING TRUCK M1

INDEX

ORDNANCE MAINTENANCE—BODY AND CHASSIS FOR HEAVY WRECKING TRUCK M1

[A.G. 062.11 (12-19-42)
O.O. 461/32630 O.O. (1-27-43)]

By order of the Secretary of War:

G. C. MARSHALL,
Chief of Staff.

Official:

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

Distribution: R 9(2); IBn 9(1); IC 9(4)

(For explanation of symbols, see FM 21-6)