

## CHAPTER 3

### MATERIEL USED IN CONJUNCTION WITH MAJOR ITEM

#### Section I. INTRODUCTION

Note. Information contained within this chapter pertains to both gasoline and multi-fuel model vehicles unless otherwise specified.

#### 370. Scope

This chapter contains instructions for organizational maintenance of the Special Purpose Equipment, (1) the Winterization Kit, (2) Deep-water Fording Kit and (3) the Hot-water Heater Kit (-25°F.) issued for installation on all 2-1/2 ton, 6 x 6, series 44, trucks, both multifuel and gasoline-powered. Also included in this chapter are descriptions of major units of each kit, and their functions in relation to other components of the vehicle. Refer to Operator's Manual, TM 9-2320-209-10 for operation of the Special Purpose Equipment. Operation and maintenance instructions for trucks in extreme cold conditions are contained in TM 9-207.

#### 371. Kit Authorization

a. General. These kits are authorized for issue under criteria defined in SB 9-16 for the winterization kit and SB 9-155 for the deep-water fording kit. Kits must be requisitioned separately from the basic vehicle. Supply lead time must be considered when placing requisitions for kits.

b. Repair Parts and Maintenance Responsibility. Repair parts for support of vehicles equipped with the Special Purpose Equipment (Kits) covered in this chapter are listed in TM 9-2320-209-20P, which is authority for

requisitioning. See Appendix II, Maintenance Allocation Chart, supplement 12, for maintenance responsibilities of organizational maintenance personnel.

#### 372. Service Upon Receipt of Materiel

a. General. When a new or reconditioned vehicle, equipped with a kit, is received, determine if the kit has been properly installed for service, and that all necessary parts are present. Inspect all assemblies, subassemblies, and parts for proper assembly and condition. If any exterior surfaces are coated with rust-preventive compound, remove with dry-cleaning solvent or mineral spirits paint thinner.

b. Systematic Inspection Procedure. In order to follow a system of inspection when a vehicle equipped with a kit is received, perform a preventive-maintenance check (Table 7) on each of the kits.

#### 373. Correction of Deficiencies

a. Ordinary Deficiencies. Ordinary deficiencies disclosed during preliminary inspection and servicing will be corrected by maintenance personnel performing the installation.

b. Serious Deficiencies. Serious deficiencies detected in the equipment which occur under the circumstances indicated in AR 700-38 should be reported immediately in accordance with instructions in these regulations.

#### Section II. WINTERIZATION KIT

#### 374. Description (Gasoline and Multifuel Models)

a. General. The winterization kit consists of a personnel heater kit, an engine heater kit, and a hardtop enclosure kit. The entire package serves to condition the vehicle for operation under rigid subarctic conditions where temperatures frequently drop to -65°F.

- (1) Major components of the personnel heater kit are, a fuel-burning heater, air diverter, flexible ducts, a radiator cover and a thermal barrier cab insulation kit. An alcohol evaporator is included and installed as part of the multifuel truck personnel heater kit.
- (2) Major components of the power plant heater kit are a fuel-burning heater, a

gasoline-fueled, use model 978-M-H. These heaters are designed for use of gasoline fuel only. Multifuel trucks use the Stewart-Warner South Wind Model 8420, which has a number of improved features as well as greater simplicity and compactness. It will operate efficiently on hydrocarbon fuels from gasoline to No. 1 diesel oil (par. 375 b(2)). If a model 8420 heater with its associated controls is installed on gasoline-fueled trucks, the operation and maintenance are the same as for the multifuel application.

- (2) Personnel heaters. Fuel for both types of heaters is drawn from the vehicle fuel supply. These heaters are mounted on the left front fender under the hood. The 978 models employ two blowers, one for combustion air and one for delivery of heated air to the truck cab. One blower on the 8420 models performs both these functions. Both heaters are electrically controlled for starting and running. Some trucks employ a thermostat in the cab to control the degree of heat. Other trucks use a HI-LO switch offering a selection of two heat levels. In both instances further control of cab heat is obtained through the air control knob. The 978 model heaters draw heating air through a flexible hose connected to an air scoop on the outer side of the left hood side panel. Combustion air is picked up from the engine compartment by the combustion air blower. The 8420 model heater picks up its air supply from the engine compartment. Heater exhaust gases are emitted to the atmosphere through flexible tubing routed along the bottom of the left fender apron and down the side of the left fender support on multifuel models and over the tool compartment on gasoline models. The earlier (978-M-R) type gasoline heaters recirculate part of the exhaust gases through the combustion air blower back to the combustion chamber.

c. Power Plant Heater Kit. The power plant heater is a hydrocarbon-fuel-burning unit. The heater is mounted on the side of the vehicle in the battery box compartment. The batteries and battery box are relocated into the crew compartment under the companion seat. The heater heats the coolant in the en-

gine to the operating temperature during standby periods. Exhaust gases from the heater burner pass through tubing to an oil pan shroud and escape between the edges of the shroud and the oil pan, thus heating the crankcase lubricant. The power plant heater is designed for standby heating when the vehicle is at halt.

d. Battery Box Heater. The battery box heater consists of a completely insulated battery box with a heating pad located on the bottom. Hoses are attached to fittings on the heating pad, and to fittings in the engine block and power plant heater. This allows circulation of the heated coolant from the engine to pass through the pad, maintaining the batteries at temperatures required for normal input and output voltages.

e. Electrical Controls. In order to prevent damage to the heat exchanger units of the heaters, a time delay mechanism is built into the on-off switch circuit of both heaters. With this system, the heater blowers continue to operate after the switch has been turned off and fuel has ceased to flow to the burner. A temperature sensitive switch shuts off current to the blower only when the heat exchanger has cooled to the point where warpage of the heat exchanger or other damage cannot occur. Where a warning light is incorporated into a heater control box (TM 9-2320-209-10), when this light is on it indicates that the burner is in operation. The light stays on after the heater is shut off and goes out only when the burner is cool enough to re-ignite safely. A personnel heater emergency switch, independent of the heater control box, is furnished with some heater kits. This switch, when snapped to OFF position, immediately shuts off all electrical power to the personnel heater. The emergency switch is used only in event of atomic or chemical warfare attack to prevent the heater from circulating contaminated air inside the vehicle.

f. Diverter Defroster Assembly. This assembly consists of flexible ducting, which connects the air diverter assembly to existing openings under both windshields. Deflectors are positioned over the openings to ensure even distribution of heated air for defrosting the windshields. Hot air defrosting is controlled by a defroster control handle (located on the instrument panel) which regulates the opening through the air-diverter assembly, allowing maximum defrosting, minimum defrosting or a combination of defrosting and



Table 7. Preventive Maintenance Checks and Services - Continued

Organizational		Semiannual Schedule	
Sequence No.	Item to be inspected	Procedure	Paragraph reference
7	Exhaust tubes	Examine personnel and power plant heater exhaust tubes for breaks, restrictions, leaks, and loose connections. Be sure insulation is secure and not damaged.	Par. 377
8	Engine coolant connections	Check for evidence of coolant leaks and damaged hoses.	Par. 379
9	Personnel heater and defroster controls	Check handles for operation and cables for proper attachment.	Par. 377c
10	Personnel heater control box	Test operation of indicator light.	Par. 377b
11	Personnel heater emergency switch	Make sure switch is in the ON position.	TM 9-2320-209-10
12	Power plant heater control box	Test operation of indicator light.	TM 9-2320-209-10
13	Defroster	Check duct clamps for tightness and ducting for damage.	Par. 377d
14	Battery box heater	Remove batteries and check heating pad for signs of leaks and damage. Check coolant hose connections for tightness and hoses for damage.	Par. 379b
15	Hardtop closure	Check closure for damage and proper attachment, and weather-seals for signs of air leaks.	Par. 230
16	Closure windows	Check operation and clean if necessary.	Par. 230
17	Slave receptacle	Check for dirt in the connectors, and the cap for tightness	Par. 112
18	Hood, side and radiator covers	Check for tears, rips, and other damage. Be sure all straps and fasteners are in place.	Par. 238
19	Alcohol evaporator	Check secureness of mounting. Refill alcohol container if necessary (Alcohol Grade 3).	Par. 374d

Table 8. Troubleshooting - Continued

Malfunction	Probable causes	Corrective action
	<u>PERSONNEL HEATER (-65°F)-</u> <u>Continued</u>	
7. Heater smokes excessively or "bangs" upon starting. - Continued	<u>b.</u> Defective fuel control valve.	<u>b.</u> Notify direct support maintenance unit.
8. Blower runs but heater fails to ignite.	<u>a.</u> No or low fuel pressure. <u>b.</u> Restriction in fuel line. <u>c.</u> Defective electrical wiring. <u>d.</u> Defective preheat resistor. <u>e.</u> Defective ignitor. <u>f.</u> Defective fuel control valve.	<u>a.</u> Check fuel shutoff cock position (TM 9-2320-209-10, and changes thereto). <u>b.</u> Clean fuel filter element. Replace if damaged (par. 378d). <u>c.</u> Notify direct support maintenance unit. <u>d.</u> Notify direct support maintenance unit. <u>e.</u> Notify direct support maintenance unit. <u>f.</u> Notify direct support maintenance unit.
9. Inadequate heat output.	<u>a.</u> Fuel pump filter element restricted. <u>b.</u> Ice crystals in fuel. <u>c.</u> Extreme cold weather. <u>d.</u> Defective component.	<u>a.</u> Clean fuel pump filter element. Replace if damaged (par. 378d). <u>b.</u> Remove ice from fuel system. Replace if damaged. (par. 378d). <u>c.</u> Adjust radiator cover (TM 9-2320-209-10, and changes thereto). <u>d.</u> Notify direct support maintenance unit.
10. Inadequate windshield defrosting.	<u>a.</u> Improperly adjusted heater control cable. <u>b.</u> Improperly adjusted defroster control cable. <u>c.</u> Defroster ducting loose or damaged.	<u>a.</u> Adjust cable (par. 377c). <u>b.</u> Adjust cable (par. 377c). <u>c.</u> Tighten clamps or repair ducting (par. 377c)
11. Heater overheats but continues to run.	<u>a.</u> Defective overheat switch. <u>b.</u> Defective fuel control valve.	<u>a.</u> Notify direct support maintenance unit. <u>b.</u> Notify direct support maintenance unit.
12. Fuel odor.	<u>a.</u> Fuel leak. <u>b.</u> Defective component.	<u>a.</u> Tighten fittings. If odor still exists, refer to direct support maintenance unit. <u>b.</u> Notify direct support maintenance unit.

Table 8. Troubleshooting - Continued

Malfunction	Probable causes	Corrective action
	<u>POWER PLANT HEATER - Continued</u>	
18. Blower will not stop when heater is turned off.	<u>a.</u> Defective flame detector switch. <u>b.</u> Defective wiring.	<u>a.</u> Notify direct support maintenance unit. <u>b.</u> Notify direct support maintenance unit.
19. Heater smokes excessively or "bangs" upon starting.	<u>a.</u> Starting with HI-LO switch in HI position. <u>b.</u> Defective fuel control valve.	<u>a.</u> Refer to operating instructions (TM 9-2320-209-10, and changes thereto). <u>b.</u> Notify direct support maintenance unit.
20. Blower runs but heater fails to ignite.	<u>a.</u> No or low fuel pressure. <u>b.</u> Restriction in fuel line. <u>c.</u> Defective electrical wiring. <u>d.</u> Defective preheat resistor. <u>e.</u> Defective ignitor. <u>f.</u> Defective fuel control valve.	<u>a.</u> Check fuel shutoff cock position (TM 9-2320-209-10, and changes thereto). <u>b.</u> Clean fuel filter element. Replace if damaged (par. 379h). <u>c.</u> Notify direct support maintenance unit. <u>d.</u> Notify direct support maintenance unit. <u>e.</u> Notify direct support maintenance unit. <u>f.</u> Notify direct support maintenance unit.
21. Inadequate heat output.	<u>a.</u> Coolant shutoff cocks partially or fully closed. <u>b.</u> Ice crystals in fuel. <u>c.</u> Extreme cold weather. <u>d.</u> Defective heater component.	<u>a.</u> Open shutoff cocks fully (TM 9-2320-209-10, and changes thereto). <u>b.</u> Remove ice from fuel system. Clean fuel filter element. Replace if damaged (par. 379h). <u>c.</u> Adjust radiator cover (TM 9-2320-209-10, and changes thereto). <u>d.</u> Notify direct support maintenance unit.
22. Heater overheats but continues to run.	<u>a.</u> Defective overheat switch. <u>b.</u> Defective fuel control valve.	<u>a.</u> Notify direct support maintenance unit. <u>b.</u> Notify direct support maintenance unit.
23. Fuel odor.	<u>a.</u> Fuel leak <u>b.</u> Defective component.	<u>a.</u> Tighten fittings. If odor still exists, notify direct support maintenance unit. <u>b.</u> Notify direct support maintenance unit.

Table 8. Troubleshooting - Continued

Malfunction	Probable causes	Corrective action
<u>HOT-WATER HEATER (-25°F)- Continued</u>		
31. Blower motor inoperative.	<u>a.</u> Lead to heater switch disconnected. <u>b.</u> Defective heater electrical circuit. <u>c.</u> Defective blower motor. <u>d.</u> Defective heater switch.	<u>a.</u> Connect lead (fig. 77). <u>b.</u> Check circuit for improper or loose connections (fig. 68). <u>c.</u> Replace blower motor assembly (par. 388). <u>d.</u> Check switch connections. Replace switch if damaged (fig. 386).
32. Blower motor operates on HI only.	<u>a.</u> Loose lead to switch. <u>b.</u> Defective resistor. <u>c.</u> Defective heater switch.	<u>a.</u> Check leads (fig. 68). <u>b.</u> Replace resistor (par. 387). <u>c.</u> Replace heater switch (par. 388).
33. Blower motor operates on LO only.	<u>a.</u> Loose lead to switch. <u>b.</u> Defective heater switch.	<u>a.</u> Check leads (fig. 68). <u>b.</u> Replace heater switch (par. 388).
34. Blower motor will not stop when switch is turned off.	<u>a.</u> Defective heater switch. <u>b.</u> Defective wiring.	<u>a.</u> Replace heater switch (par. 388). <u>b.</u> Check leads and replace if damaged (fig. 68).
35. Inadequate heat output.	<u>a.</u> Shutoff cocks partially or fully closed. <u>b.</u> Extreme cold weather. <u>c.</u> Defective blower motor.	<u>a.</u> Check to see that shutoff cocks are fully open (counterclockwise) (figs. 417 and 418). <u>b.</u> Adjust radiator cover. <u>c.</u> Replace blower motor (par. 388).

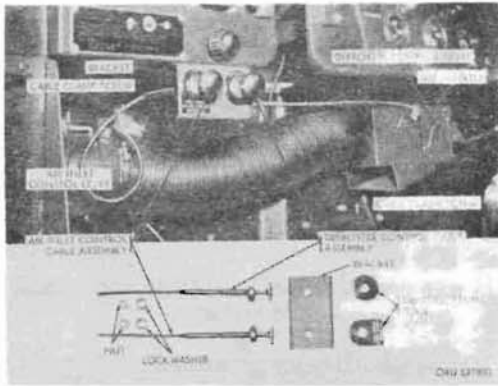


Figure 398. Personnel heater control cables - replacement

**d. Personnel Heater and Defroster Air Ducts and Clamps Replacement (Figs. 399, 400 and 401).**

(1) **Removal.**

(a) **Forward air ducts.** Loosen clamps securing air duct to personnel heater and air inlet adapter or air inlet

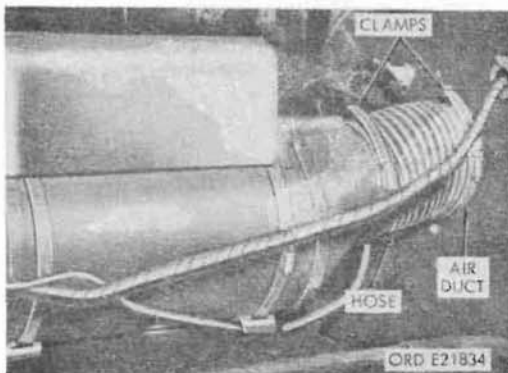


Figure 399. Personnel heater forward air duct replacement - all models

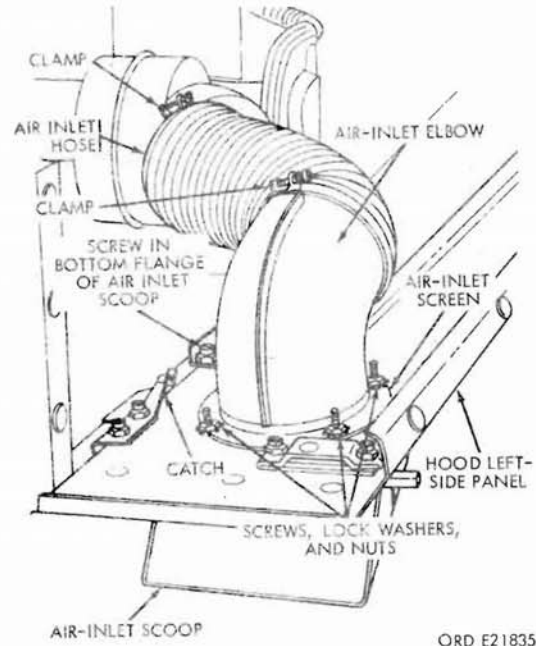


Figure 400. Air inlet elbow and duct replacement - gasoline models

scoop. Slide duct ends off flanges and remove duct.

(b) **Diverter air duct.** Loosen clamps securing air duct to adapter and air diverter. Slide duct ends off flanges and remove duct.

(c) **Defroster ducts (fig. 401).** Loosen clamps securing defroster air ducts to air diverter and windshield de-

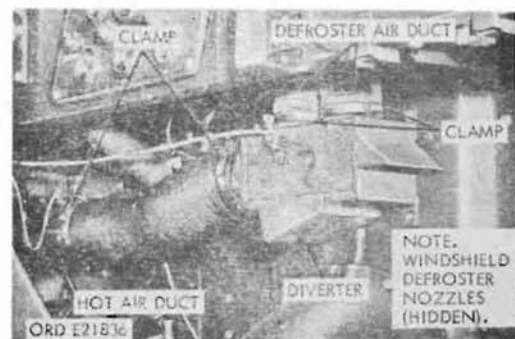


Figure 401. Hot air and defroster duct replacement - all models



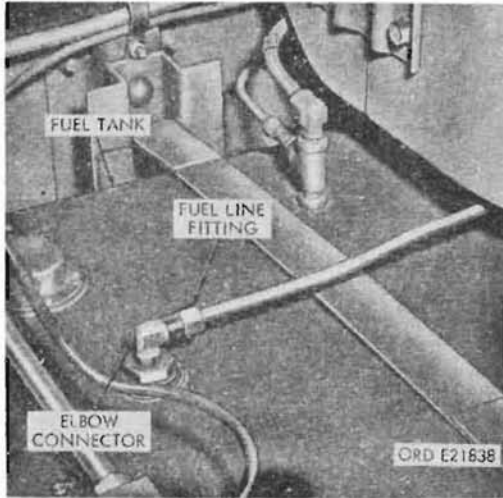


Figure 403. Fuel tank fuel line - multifuel

(1) Removal.

- (a) Disconnect fuel line fitting from fuel tank elbow connector (fig. 403).

**Caution:** Failure to disconnect fuel line fitting at tank connection may result in siphoning of fuel when fitting at fuel pump is disconnected.

- (b) Open compartment door on right running board. Disconnect fuel pump electrical lead at capacitor, feed line at pump, and filter lines at shutoff cock and elbow connector (fig. 404).
  - (c) Remove two nuts and bolts securing fuel pump to mounting bracket and remove pump. If pump is to be replaced, remove shutoff cocks and fittings as an assembly by unscrewing the tee at the pump outlet post.
- (2) Installation. Assemble shutoff cocks and fittings assembly to outlet port of the pump. Locate pump on bracket. Secure with two bolts and nuts, and connect feed line from vehicle fuel tank at lower (intake) port. Connect filter lines to shutoff cocks and elbow. Connect electrical lead to pump capacitor terminal (fig. 404). Turn personnel heater on and check pump operation.

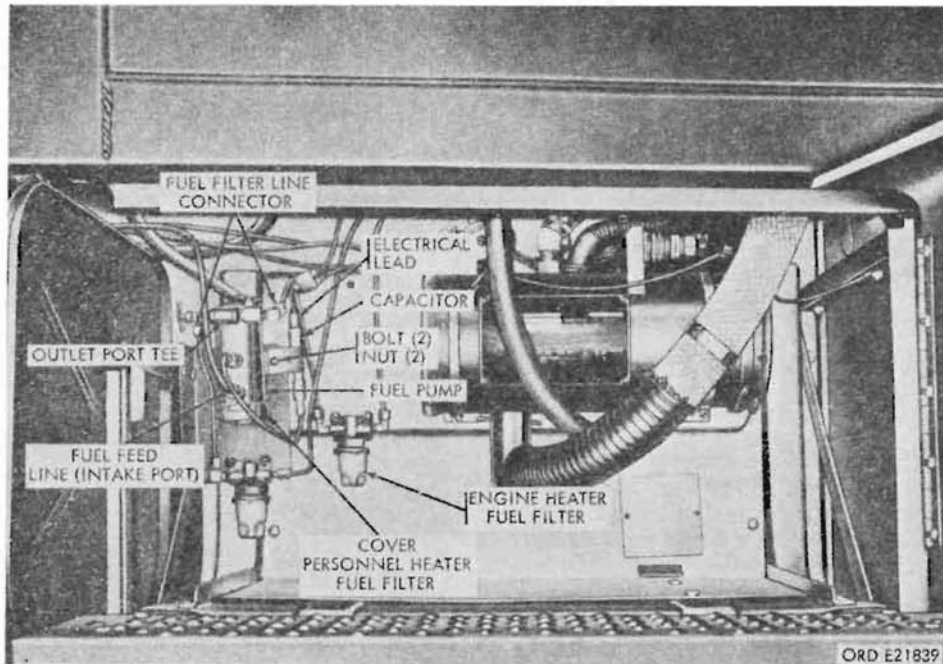


Figure 404. Fuel pump replacement - multifuel

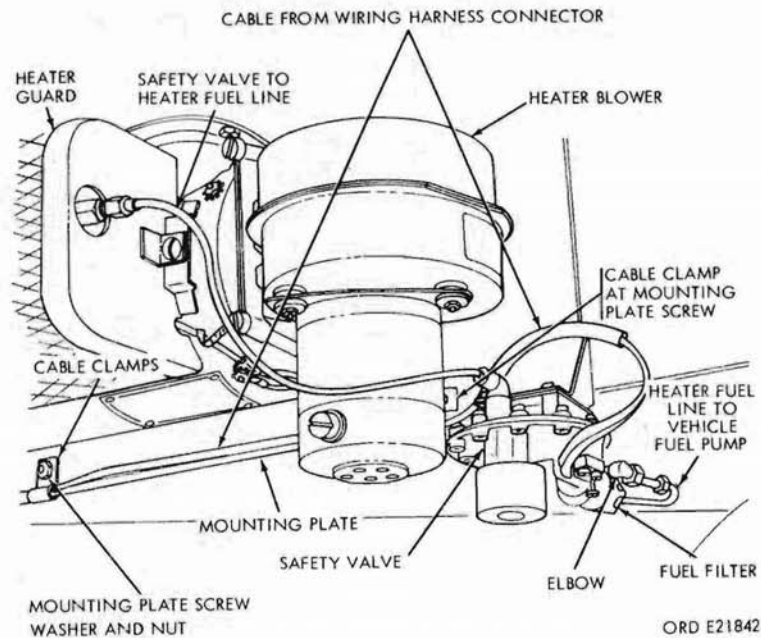


Figure 407. Fuel and electrical connections at fuel filter and safety valve

compartment (fig. 404). On gasoline models it is located at the personnel heater safety valve in the engine compartment (fig. 407). The fuel filter for both multifuel and gasoline model power plant heater is located in the right running board compartment (fig. 404 and 405):

- (2) **Service or replacement.** Remove sediment bowl (fig. 408) by turning it counterclockwise. The gasket may adhere to filter body; discard gasket and remove all particles from bowl and filter body. Inspect filter element and spring for damage. Replace any damaged parts. Wash element and bowl in mineral spirits paint thinner. Dry parts thoroughly, and keep them covered until ready for installation.
- (3) **Installation.** Install new or clean parts in bowl and position new gasket on thread relief flange of bowl. Do not overtighten bowl as gasket may be damaged. Check for leak at gasket at first operation of heaters.

### 379. Power Plant Heater Coolant Hoses, Ducts and Clamps

a. **General.** Engine coolant controlled by thermostat action from power plant heater, is circulated through hoses to heat batteries in cab and control vehicle engine temperature. An exhaust tube vents exhaust combustion gases through an oil pan shroud.

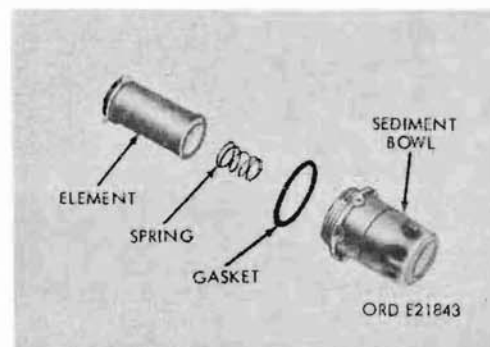


Figure 408. Fuel filter components

Note. When assembling, be sure metal protective shield covering coolant inlet and outlet hoses is positioned properly to prevent hose damage from rubbing.

- (5) For coolant hose replacement sizes, refer to the following data, and cut hoses to required length:

<u>Coolant Hose</u>	<u>Length</u>	<u>I.D.</u>
Inlet shutoff cock to heater top connection	75 in.	5/8 in.
Outlet shutoff cock to battery box heating pad	57 in.	5/8 in.
Heater bottom connection to battery box heating pad	20-1/2 in.	5/8 in.

c. Installation. Install multifuel power plant heater coolant hoses and clamps in reverse order of removal.

d. Removal of Coolant Circulating Hoses - Gasoline Models (Figs. 411, 412, and 413).

- (1) To remove and install the coolant circulating hoses for the gasoline engine model heater, apply the procedures given for the multifuel engine heater. Refer to figures 411, 412, and 413 for hose location.

- (2) For coolant hose replacement sizes, refer to the following data and cut hoses to required length:

<u>Coolant</u>	<u>Length</u>	<u>I.D.</u>
Inlet shutoff cock to heater long nipple	59 in.	5/8 in.
Outlet shutoff cock to battery box heating pad	71 in.	5/8 in.
Heater bottom connection to battery box heating pad	20-1/2 in.	5/8 in.

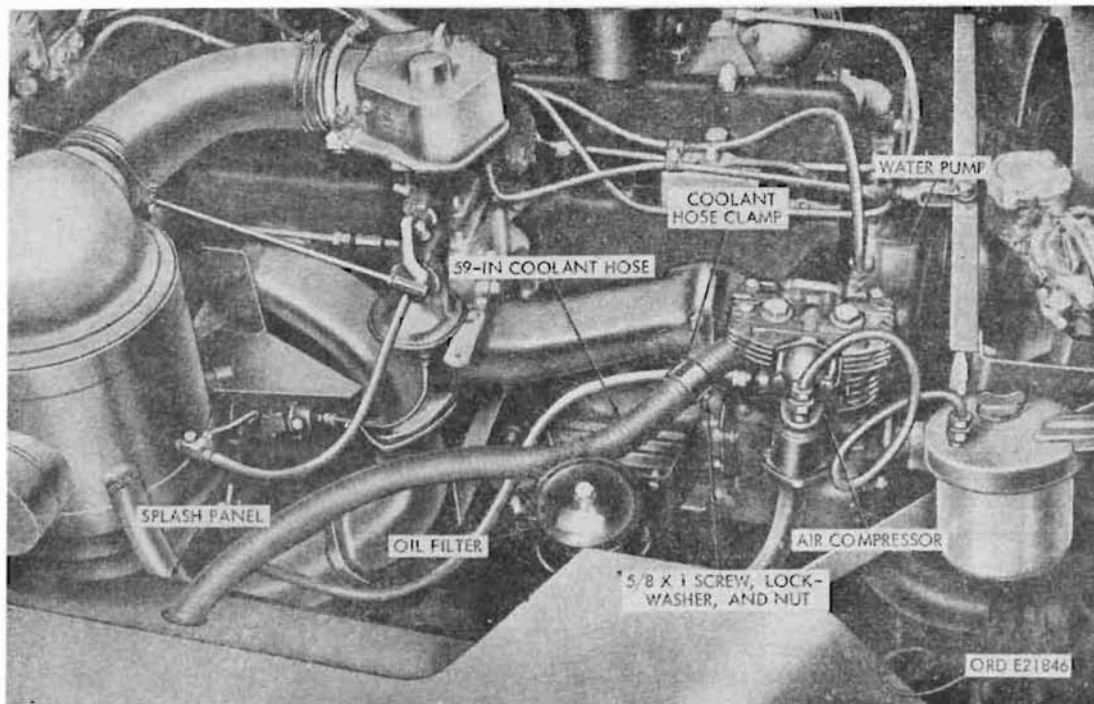


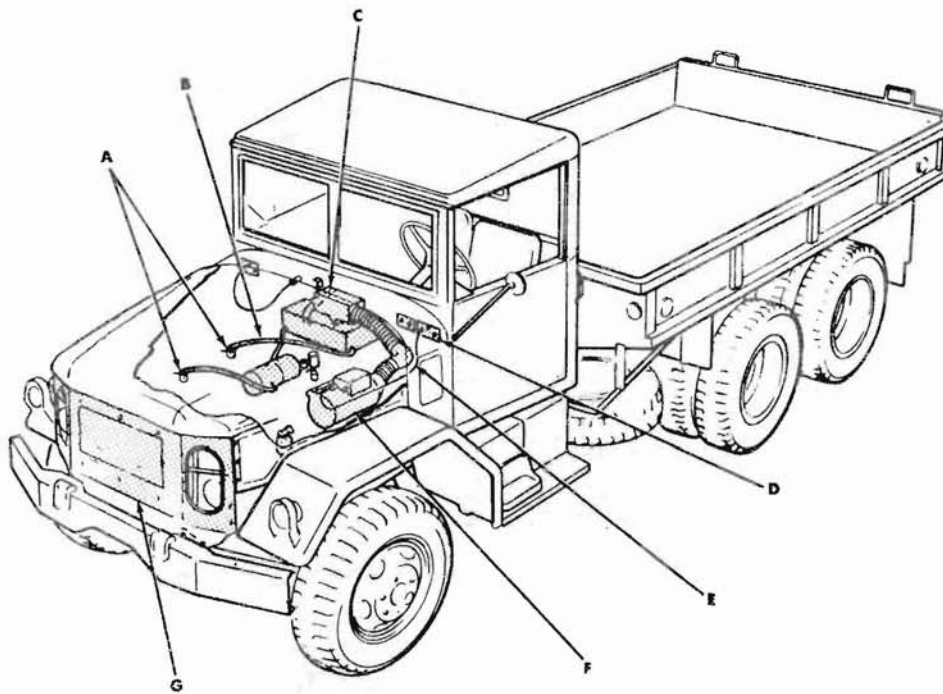
Figure 411. Inlet hose removal - gasoline engine

## Section III. HOT WATER HEATER KIT (-25°F)

## 381. Description (Gasoline and Multifuel Models)

a. General. The hot-water heater kit (fig. 414) consists of a heater assembly; a defroster assembly; a radiator cover assembly; and necessary hoses, ducting, nuts, screws, bolts, and brackets required for installation. The kit is designed for use on vehicles operated in areas where the normal ambient temperature during the coldest part of the year is above -25°F. The heater assembly is mounted in the left front fender under the hood (fig. 415).

b. Heater Operation. The heater assembly is an electrically operated blower-type unit which obtains its heat from engine coolant. The engine thermostat controls the temperature of the coolant, keeping it at engine operating temperature. The heater core receives its supply of coolant from the engine, through coolant hoses attached to the engine block. The heater core is very similar in construction to the vehicle radiator. A heavy duty centrifugal-type blower draws fresh outside air into the heater. The outside air is heated as it is drawn over the heater core and blown into the



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Key	Item
A	Engine coolant connections
B	Heater coolant hoses
C	Defroster assembly
D	Heater and defroster controls
E	Heater electrical wiring
F	Heater assembly
G	Radiator cover assembly

Figure 414. Hot-water heater kit (-25°F) component location

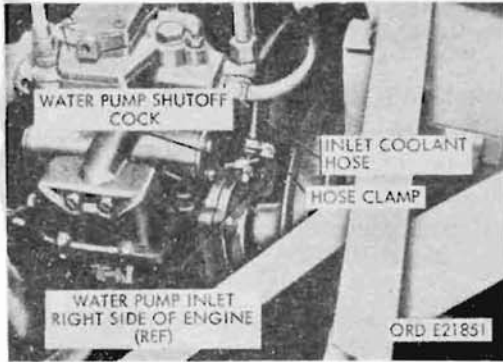


Figure 416. Replacement of inlet coolant hose - gasoline model

- (3) Remove clamp securing inlet hose either to water pump shutoff cock (gasoline model) or intake manifold shutoff cock (multifuel model) (figs. 416 and 418), and remove hoses.

b. Installation.

- (1) Prior to installation, coat interior of hose assemblies with a suitable sealer to prevent coolant leakage.
- (2) Install hot-water heater coolant hoses and clamps in reverse order of removal.
- (3) Open shutoff cocks (figs. 416, 417 and 418).

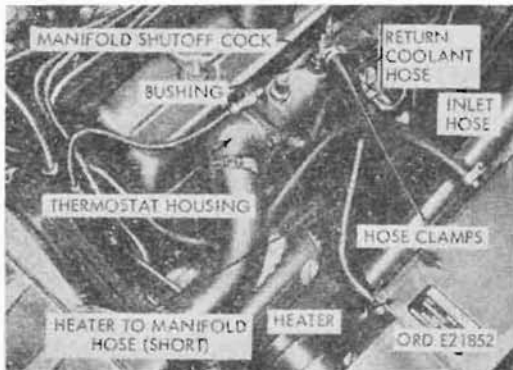


Figure 417. Replacement of return coolant hose - gasoline model

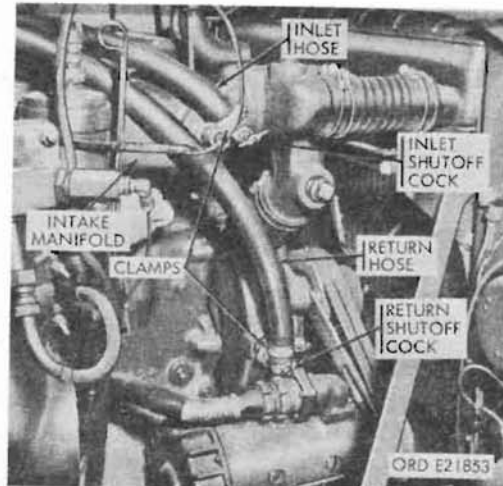


Figure 418. Replacement of inlet and return coolant hoses at engine - multifuel

384. Hot-water Heater (-25°F.) Defroster and Heater Air Ducts

a. Removal.

- (1) Remove two clamps securing ram air inlet duct to heater and to vehicle hood side panel (fig. 415), and remove inlet duct.
- (2) Remove two clamps securing outlet duct to rear of hot-water heater and to fire-wall of vehicle (fig. 415), and remove outlet duct.

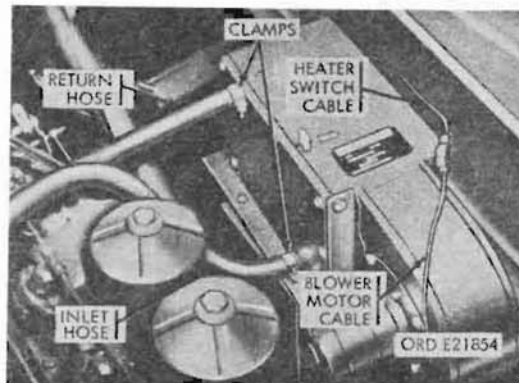


Figure 419. Replacement of inlet and return coolant hoses at heater - multifuel

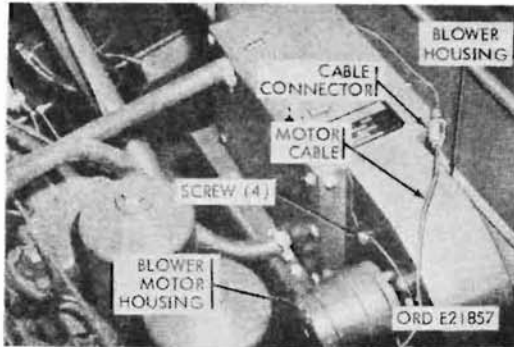


Figure 422. Heater blower motor removal

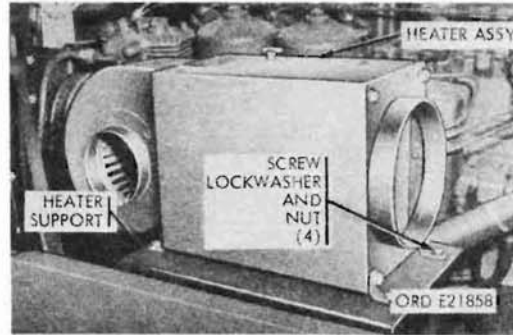


Figure 423. Hot-water heater assembly replacement

**389. Hot-water Heater Assembly**

**a. Removal.**

- (1) Remove hot-water heater coolant hoses from heater assembly (par. 383).
- (2) Remove ram air duct and heater outlet duct (par. 384).

- (3) Disconnect heater blower motor electrical cable (par. 388).

- (4) Remove four screws, lockwashers and nuts securing heater assembly to heater support, and remove heater assembly.

**b. Installation.** Install hot-water heater assembly in reverse order of removal.

**Section IV. DEEP-WATER FORDING KIT**

**390. Description (Gasoline and Multifuel Models)**

The deep-water fording kit (fig. 424) consists of air intake, exhaust, and vent extensions, and a flywheel housing air pressurizing line. The air intake extension is attached to the gun mount on the right side of the cab and furnishes air directly to the air cleaner, and then through a separate hose from the air cleaner to the air compressor intake. The crankcase breather tube is extended to the atmosphere through a hose secured to the air intake extension support. The exhaust system is extended from the tailpipe flange through lower and upper extensions and is mounted on the right side of the cargo body. Beside these three extensions, the kit also provides a flywheel housing air pressurizing system composed of fording control, shutoff valve, regulating valve, transmission breather assembly, and all necessary lines and fittings from the air reservoir to the flywheel housing. It also provides a check valve, line, and fittings for an air reservoir connecting line used as part of the flywheel housing air pressuriz-

ing system. A control handle mounted on the dash panel opens or closes the pressurized air flow into the flywheel housing to prevent water seepage during fording operations. A breather assembly mounted on the transmission housing cover allows excess air pressure to escape. The kit-furnished insulating compound is applied at installation, and additional compound is applied prior to fording, if necessary, to the electrical lead connections on the starter, starter switch, starter solenoid switch, and battery (other than ground). With this kit installed and the flywheel housing drain port closed with the plug from the storage boss, the vehicle can ford hard bottom water crossings up to 72 inches in depth.

**391. Data**

Ordnance part no. . . . .	
Kit, complete . . . . .	10896348
Intake installation kit . . . . .	10896313
Exhaust installation kit . . . . .	8345130
New weight:	
Kit, complete . . . . .	48 lb
Intake installation kit . . . . .	25 lb
Exhaust installation kit . . . . .	23 lb

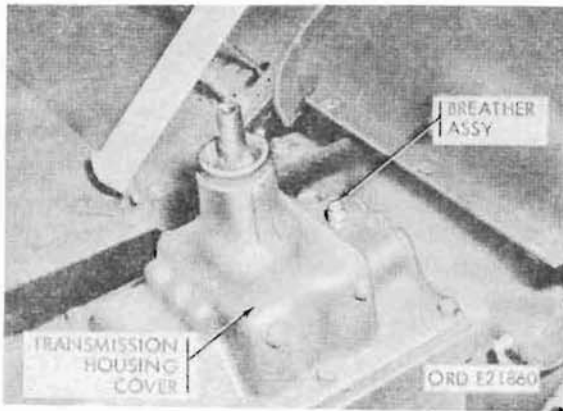


Figure 425. Transmission breather assembly—replacement.

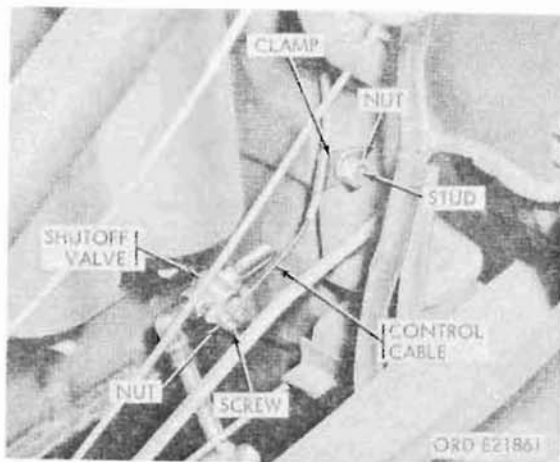


Figure 426. Fording control cable disconnect points—engine compartment end.

- (2) Remove nut and washer securing control cable and clamp to vehicle firewall, and remove clamp from the cable (fig. 422). Release tension on

all other clamps securing control cable to vehicle, to allow control cable to slip through freely.

- (3) The fording control cable handle is located on the center of the dash panel (fig. 423). It is secured to the panel by two mounting nuts, one on the outside of the panel and one on the inside. Remove inside mounting nut and let it slide along cable.
- (4) Using both hands, one outside and one inside of panel, slip cable through firewall and vehicle dash panel.
- (5) Then, using a suitable tool, remove control cable grommet from firewall.

b. *Installation.* Install fording control cable and control cable grommet in reverse order of removal.

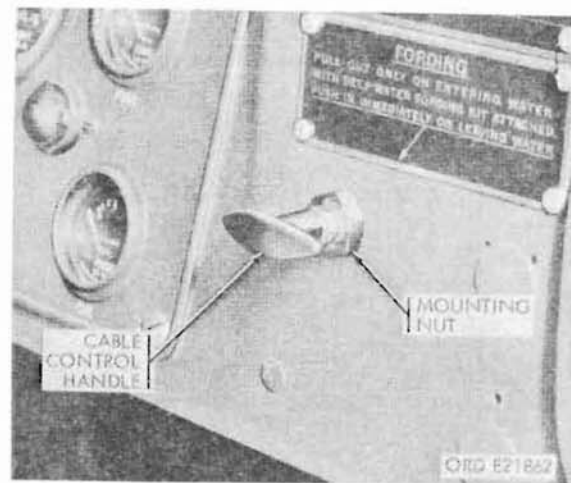


Figure 427. Fording control cable removal—dash panel end.

## CHAPTER 4

### SHIPMENT AND DEMOLITION TO PREVENT ENEMY USE

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#### Section I. SHIPMENT INSTRUCTIONS

##### 394. Shipment

When shipping the 2½ ton, 6 x 6, trucks the officer in charge of preparing shipments will be responsible for the materiel being shipped in a serviceable condition, and properly processed for shipment, including the preparation of Army shipping documents. Coordi-

nate with direct support maintenance unit (para 2) for preparation of materiel for shipment.

##### 395. Loading and Blocking

Organizational maintenance personnel may assist, as required, in loading and blocking the materiel on railroad cars.

#### Section II. DEMOLITION OF MATERIEL TO PREVENT ENEMY USE

Refer to TM 9-2320-209-10 for demolition of materiel to prevent enemy use.



## APPENDIX 1

### REFERENCES

#### 1. Publication Indexes

The following indexes should be consulted frequently for latest changes or revisions and for new publications relating to materiel covered in this technical manual.

Index of Army Motion Pictures, Television Recordings and Film Strips	DA Pam 108-1
Index of Administrative Publications	DA Pam 310-1
Index of Blank Forms	DA Pam 310-2
Index of Training Publications	DA Pam 310-3
Index of Technical Manuals, Technical Regulations, Technical Bulletins, Supply Bulletins, Lubrication Orders, and Modification Work Orders	DA Pam 310-4
Index of Graphic Training Aids and Devices	DA Pam 310-5
Index of Supply Manuals - Ordnance Corps	DA Pam 310-29

#### 2. Forms

Refer to DA Pam 310-2 for a current and complete list of blank forms. TM 38-750, The Army, Equipment Record System and Procedures, contains instructions on the use of maintenance forms pertaining to this material.

#### 3. Other Publications

Rigging	TM5-725
Operation and Maintenance of Army Materiel in Extreme Cold Weather, 0° to -65°F., Change 1	TM 9-207
Painting Instructions for Field Use	TM 9-213
Power Brake Systems (Bendix Westinghouse)	TM 9-1827A
Operator and Organizational Maintenance Manual: Truck Mounted Guided Missile Programming Data Computer AN/MJQ-1 (Field Artillery Guided Missile System Redstone)	TM 9-1430-350-12/2
Operator's Manual for 2-1/2 Ton, 6 x 6, M44 Series Trucks	TM 9-2320-209-10
Organizational Maintenance Spare Parts and Special Tools List for 2-1/2 Ton, 6 x 6, M44 Series Trucks	TM 9-2320-209-20P
Lubrication Order for 2-1/2 Ton, 6 x 6, M44 Series Trucks	LO 9-2320-209-12
General Supply: Winterization Kits for Ordnance Tank-Automotive Materiel	SB 9-16
General Supply: Deep-Water Forging Kits for Ordnance Tank-Automotive Materiel	SB 9-155
Processing of Unboxed Self-propelled and Towed Class II Ordnance General Supplies and Related Materiel for Shipment and Storage, Changes I	TB 9-299/1
Combat Vehicles: Inspection, Care, and Preservation during Storage, Changes 2	TB 9-300-1/1
Wheeled Vehicles: Inspection Care, and Preservation during Storage, Changes 2	TB 9-300-2/1
Lubrication of New, Rebuilt, or Inactive Gasoline Reciprocating Engines Before Use	TB ORD-392
Ordnance Tracked and Wheeled Vehicle Hull and Chassis Wiring: Repair of Cracked or Peeled Plastic, Natural Rubber, or Synthetic Rubber-Covered Conduit Cables	TB ORD-650
Ordnance Vehicles: Installation and Use of Overhaul and Overhaul/MWO Instruction Plates	TB ORD-1030
Ordnance Gasoline Engines: Correcting Compression Pressure Readings	TB ORD-1033

Maintenance Allocation Chart

Group No.	Component and related operations	Category						Tools reqd	Remarks
		Organizational			DS	GS	D		
		O/C	CO	BN					
1	2	3	4	5	6	7	8	9	10
	GROUP 01 ENGINE								
0100	Power plant remove and replace			% %	X				
	Engine replace			% %	X				
0101	Cushions, engine mounting. replace			X					
	Head, cylinder replace (gasoline) replace (multifuel)			X		X			
0102	Sleeve, cylinder replace						X		
	Bearing, crankshaft replace						X		
0103	Bearing, pilot (transmission shaft) replace				X				
	Crankshaft replace					X			
0104	Damper, vibration replace						X		
	Pulley, drive replace				X				
0105	Flywheel replace				X				
	Gear, ring, flywheel replace				X				
0104	Housing, flywheel replace				X				
	Bearing, connecting rod (inserts) replace						X		
0105	Rod, connecting replace repair						X		
	Piston replace						X		
0105	Pin, piston replace						X		
	Rings, piston replace						X		
0105	Guide, valve replace						X		
	Seat, valve replace grind						X		
0105	Spring, valve replace gasoline multifuel replace reface					X			
					X				
					X				
					X				

Maintenance Allocation Chart - Continued

Group no.	Component and related operations	Category						Tools reqd	Remarks
		Organizational			DS	GS	D		
		O/C	CO	EN					
1	2	3	4	5	6	7	8	9	10
	<u>GROUP 01 ENGINE - Continued</u>								
0108	Manifold, exhaust replace .....			X					
	Valve, heat control adjust .....			X					
	replace .....				X				
	<u>GROUP 02 CLUTCH</u>								
0200	Housing, clutch replace .....					X			
	Disk, driven, clutch replace .....			CO	X				
	reline .....				X				
	Plate, pressure replace .....			CO	X				
	repair .....						X		
0202	Bearing, release, clutch replace .....			CO	X				
	Controls and linkage, clutch adjust .....		X						
	replace .....		X						
	repair .....		X						
	Fork, clutch, release bearing replace .....					X			
	Shaft, fork, clutch replace .....					X			
	<u>GROUP 03 FUEL SYSTEM</u>								
0301	Carburetor adjust .....		X						
	replace .....		X						
	clean .....				X				
	repair .....				X				
	Injector fuel replace .....				X				
	repair .....						X		
	Nozzle fuel injector replace .....				X				
	repair .....				X				
0302	Pump, fuel replace .....		X						
	repair .....				X				
	Pump, fuel (electrical) (intank) (multifuel only) replace .....		X						
	repair .....				X				

Maintenance Allocation Chart - Continued

Group no.	Component and related operations	Category						Tools reqd	Remarks
		Organizational			DS	GS	D		
		O/C	CO	BN					
1	2	3	4	5	6	7	8	9	10
	<u>GROUP 03 FUEL SYSTEM-Continued</u>								
0311	Pump, primer replace . . . . . repair . . . . .		X	X					
	Lines and fittings, priming replace . . . . .			X					
0312	Controls and linkage, accelerator replace . . . . . repair . . . . .		X	X					
	Controls, choke and throttle replace . . . . . repair . . . . .		X X						
	<u>GROUP 04 EXHAUST SYSTEM</u>								
0401	Muffler replace . . . . .		X						
	Pipe, exhaust and tail replace . . . . .		X						
	<u>GROUP 05 COOLING</u>								
0501	Radiator replace . . . . . repair . . . . .		X		X				
0502	Shroud, radiator fan repair . . . . .				X				
0503	Hose, radiator replace . . . . .		X						
	Lines and fittings, water replace . . . . . repair . . . . .		X X						
	Manifold, water replace . . . . .			X					
	Thermostat replace . . . . .		X						
0504	Pump, water replace . . . . .			X					
0505	Belt, fan adjust. . . . . replace . . . . .		X X						
	Fan replace . . . . .			X					
	<u>GROUP 06 ELECTRICAL SYSTEM</u>								
0601	Generator - alternator replace . . . . .			X					
	Armature replace . . . . . repair . . . . .				X X				

Maintenance Allocation Chart—Continued

Group No.	Component and related operations	Category						Tools reqd	Remarks
		Organizational			DS	GS	D		
		O/C	CO	BN					
1	2	3	4	5	6	7	8	9	10
	GROUP 06 ELECTRICAL SYSTEM— Continued								
0605— Continued	Shaft replace .....				X				
	Coil, ignition replace .....		X						
	Plugs, spark replace .....		X						
	clean .....			X					
	Wiring, ignition replace .....		X						
	repair .....		X						
0607	Breaker, circuit repair .....			X					
	Instruments and gages replace .....			X					
	Lamps replace .....		X						
	Light replace .....			X					
	Switch, ignition replace .....		X						
	Switch, light replace .....		X						
0608	Switch (miscellaneous) replace .....		X						
	Breaker, circuit replace .....			X					
0609	Lamps and lamp units replace .....		X						
	Lights (head and tail) replace .....		X						
	repair .....				X				
0610	Unit, sending replace .....		X						
0611	Horn (air) adjust .....		X						
	replace .....		X						
	repair .....				X				
	Horn (electric) adjust .....		X						
	replace .....		X						
	Switch, horn repair .....		X						
0612	Battery service .....		X						
	recharge .....			X					
	replace .....		X						
	repair .....				X				
	Cables, battery replace .....		X						

Maintenance Allocation Chart - Continued

Group no.	Component and related operations	Category						Tools reqd	Remarks
		Organizational			DS	GS	D		
		O/C	CO	BN					
1	2	3	4	5	6	7	8	9	10
	<u>GROUP 08 TRANSFER - Continued</u>								
0801-	Shaft, clutch, gears, bearings and washers, output front axle replace .....					X			
	Seal, output, rear axle replace .....				X				
	Shaft, w/integral gear, ring and shims, output, rear axle replace .....					X			
	Vent, air, transfer replace .....		X						
0802	Clutch and controls replace .....					X			
0804	Controls and linkage, transfer replace .....		X						
	repair .....			X					
	Fork, shifter shaft replace .....					X			
	Shafts, shifter replace .....					X			
	Seals and packing, shifter shaft replace .....				X				
	<u>GROUP 09 PROPELLER SHAFT</u>								
0900	Shaft, propeller replace .....		X						
	Joint, universal replace .....		X						
	repair .....			X					
	<u>GROUP 10 FRONT AXLE</u>								
1000	Axle replace .....			%%	X				
	Vent, air replace .....		X						
1002	Carrier, differential replace .....				X				
	repair .....					X			
1004	Arms and flanges replace .....				X				
	Bearings and seals replace .....				X				
	Flange, drive, assy replace .....		X						
	Shaft, axle, w/"U" joint replace .....			X		X			
	repair .....						X		
	rebuild .....								
	Kits, repair, flange replace .....		X						

Maintenance Allocation Chart - Continued

Group no.	Component and related operations	Category						Tools reqd	Remarks
		Organizational			DS	GS	D		
		O/C	CO	BN					
1	2	3	4	5	6	7	8	9	10
	<u>GROUP 12 BRAKES - Continued</u>								
1208-Cont.	Valve, safety, air system replace .....		X						
	repair .....				X				
1209	Compressor, air, liquid and air cooled replace .....			X					
	Bearing, ball, crankshaft (liquid cooled) replace .....						X		
	Bearing, connecting rod (liquid cooled) replace .....						X		
	Belt, drive replace .....		X						Special tools required for belt adjustment on multi-fuel engine.
	Crankshaft (liquid cooled) replace .....						X		
	Governor, air adjust .....		X						
	replace .....			X					
	repair .....					X			
	Head, cylinder, compressor (liquid cooled) replace .....				X				
	repair .....					X			
	Piston, air compressor (liquid cooled) replace .....						X		
	Pulley, fittings and gasket (liquid cooled) replace .....				X				
	Ring, set, piston (liquid cooled) replace .....						X		
	Rod, connecting (liquid cooled) replace .....						X		
	repair .....						X		
	Strainer, air compressor service .....		X						
	Valves and fittings, air system replace .....		X						
1211	Connections and fittings, trailer brake replace .....		X						
	Coupling, trailer brake replace .....		X						
	Valve, hand, control replace .....			X					
	repair .....				X				

Maintenance Allocation Chart—Continued

Group No.	Component and related operations	Category						Tools reqd	Remarks
		Organizational			DS	GS	D		
		O/C	CO	BN					
1	2	3	4	5	6	7	8	9	10
	GROUP 15 FRAME AND BRACKETS— Continued								
1503— Continued	Shackle, lifting replace .....		X						
1504	Carrier, spare wheel repair .....			X					
	GROUP 16 SPRINGS AND SHOCK ABSORBERS								
1601	Seat replace .....		X						
	repair .....		X						
	Shackles and bolts replace .....		X						
	Spring, front replace ..		X						
	repair .....			X					
	Spring, rear replace .....		X						
	repair .....			X					
1604	Absorbers, shock replace ..		X						
1605	Rod, torque replace .....		X						
	repair .....				X				
	GROUP 18 BODY, CAB, HOOD, FENDERS, SHIELDS AND RUNNING BOARDS								
1801	Board, running repair .....				X				
	Cab repair .....				X				
	Door repair .....				X				
	Fender repair .....				X				
	Hood repair .....				X				
	Shield, engine repair ..				X				
	Windshield replace .....		X						
	repair .....				X				
1806	Cushion, seat replace .....		X						
	repair .....				X				



Maintenance Allocation Chart - Continued

Group no.	Component and related operations	Category						Tools reqd	Remarks
		Organizational			DS	GS	D		
		O/C	CO	BN					
1	2	3	4	5	6	7	8	9	10
	<u>GROUP 21 BUMPERS AND GUARDS</u>								
2101	Bumper repair .....				X				
	Guard, radiator repair .....				X				
	<u>GROUP 22 MISCELLANEOUS BODY, CAB AND CHASSIS AND ACCESSORIES</u>								
2201	Motor, windshield replace .....		X						
	Arm and blade, windshield wiper replace .....		X						
	Mirror, rear view replace .....		X						
	<u>GROUP 47 GAGES NON - ELECTRICAL</u>								
4701	Speedometer replace .....			X					
	Adapter, speedometer drive replace .....			X					
	Shaft, flexible replace .....		X						
	Core, flexible shaft replace .....		X						
	Tachometer (when equipped) replace .....			X					
	Adapter, tachometer drive replace .....			X					
	Shaft, flexible replace .....		X						
	Core, flexible shaft replace .....		X						
	Joint, angle drive adapter, auxiliary governor replace .....				X				
	repair .....				X				
	<u>SUPPLEMENT NUMBER 1</u>								
	Truck, Dump, 2-1/2 Ton, 6 x 6, M47, M59, M342								
	<u>Note. This supplement pertains to maintenance operations peculiar to the Truck, Dump, M47, M59, M342 and must be used in conjunction with Basic Allocation Chart for Truck, Cargo, 2-1/2 Ton, 6 x 6, M34, M35 and M36, SNL G742.</u>								

Maintenance Allocation Chart - Continued

Group no.	Component and related operations	Category						Tools reqd	Remarks
		Organizational			DS	GS	D		
		O/C	CO	BN					
1	2	3	4	5	6	7	8	9	10
	<u>GROUP 12 BRAKES - Continued</u>								
1211 - Cont.	Valve, hand control replace .....			X					
	repair .....				X				
	<u>GROUP 15 FRAME AND BRACKETS</u>								
1506	Wheel, fifth replace .....			X					
	repair .....				X				
	<u>SUPPLEMENT NUMBER 3</u>								
	Truck, Tank, Gasoline, 2-1/2 Ton, 6 x 6, 1200 Gallons, M49-M49C- M49CA1								
	<u>Note.</u> This supplement pertains to maintenance operations peculiar to the Truck, Tank, Gasoline M49C, M49CA1, M49, and must be used in conjunction with Basic Allocation Chart for Truck, Cargo, 2-1/2 Ton, 6 x 6, M34, M35, M35A1 and M36, SNL G-742.								
	<u>GROUP 03 FUEL SYSTEM</u>								
0308	Adapter, governor valve replace .....					X			
	Core, flexible shaft replace .....		X						
	Shaft, flexible, with core and casing replace .....		X						
	Valve, governor, with shaft adjust & seal .....					X			
	replace .....					X			
	repair .....					X			
	<u>GROUP 18 BODY</u>								
1811	Bearing, center shaft, pump drive replace .....					X			
	Body repair .....					X			
	rebuild .....						X		
	Bolt, connector replace .....		X						
	Cables, operating, emergency valve replace .....		X						

Maintenance Allocation Chart - Continued

Group no.	Component and related operations	Category						Tools reqd	Remarks
		Organizational			DS	GS	D		
		O/C	CO	BN					
1	2	3	4	5	6	7	8	9	10
	<u>GROUP 22 MISCELLANEOUS BODY AND CAB ACCESSORIES-Continued</u>								
2201-Cont.	Hose, gravity dispenser replace .....		X						
	Nozzle, discharge hose, with whistle and dust cap replace .....		X						
	repair .....				X				
	Nozzle, discharge hose replace .....		X						
	repair .....				X				
	Hose, discharge and suction replace .....		X						
	repair .....				X				
	Strainer, suction replace .....		X						
	Doors, equipment compartment repair .....				X				
	Cover, manhole replace .....			X					
	Bearing, center shaft, pump drive replace .....				X				
	Joint, universal replace .....		X						
	Pump, water tank body replace .....			X					
	repair .....					X			
	Shaft, pump drive replace .....		X						
	repair .....				X				
	<u>SUPPLEMENT NUMBER 4</u>								
	Truck, Tank, Water 2-1/2 Ton, 6 x 6, 1000 Gallons, M50, M50A1								
	<u>Note. This supplement pertains to Maintenance Operations peculiar to Truck, Tank, Water, M50, M50A1, and must be used in conjunction with Basic Allocation Chart for Truck, Cargo, 2-1/2 Ton, 6 x 6, M34, M35, and M36, SNL G-742.</u>								
	<u>GROUP 03 FUEL SYSTEM</u>								
0308	Adapter, governor valve replace .....			X					
	Core, flexible shaft replace .....		X						

Maintenance Allocation Chart - Continued

Group no.	Component and related operations	Category						Tools reqd	Remarks
		Organizational			DS	GS	D		
		O/C	CO	BN					
1	2	3	4	5	6	7	8	9	10
	<u>GROUP 06 ELECTRICAL SYSTEM- Continued</u>								
0809- Cont.	Lamp unit replace .....		X						
	Switch, floodlight replace .....		X						
	<u>GROUP 20 POWER TAKEOFF AND HOIST</u>								
2001	Hoist replace .....				X				
	Bearings, pivot post (upper and lower) replace .....					X			
	Cable, hydraulic winch replace .....		X						
	repair .....			X					
	Cam, swing motor replace .....				X				
	Cushion, operators seat replace .....		X						
	repair .....				X				
	Cylinder, boom extension replace .....				X				
	repair .....					X			
	Cylinder, boom lift replace .....				X				
	repair .....				X				
	Levers and linkage control valves repair .....				X				
	Lines, fittings and hose hoist replace .....			X					
	Motor, hydraulic, swing adjust .....				X				
	replace .....				X				
	repair .....					X			
	Motor, hydraulic winch drive replace .....				X				
	repair .....					X			
	Pump, hydraulic replace .....			X					
	repair .....					X			
	Reservoir, hydraulic replace .....			X					
	repair .....				X				
	Valve-Bank, control replace .....				X				
	repair .....					X			

Maintenance Allocation Chart - Continued

Group no.	Component and related operations	Category						Tools reqd	Remarks
		Organizational			DS	GS	D		
		O/C	CO	BN					
1	2	3	4	5	6	7	8	9	10
	<u>GROUP 18 CAB AND BODY-Continued</u>								
1801- Cont.	Seals replace .....			X					
1812	Blower, ventilator replace .....		X						
	repair .....			X					
	<u>GROUP 22 MISCELLANEOUS BODY AND CAB ACCESSORIES</u>								
2202	Reflectors replace .....		X						
2210	Plates, data replace .....		X						
	<u>SUPPLEMENT NUMBER 7</u>								
	Truck, Telephone Construction and Maintenance, 2-1/2 Ton, 6 x 6, V17A/MTQ								
	<u>Note. This supplement pertains to maintenance operations peculiar to the Truck, Telephone Construction and Maintenance V17A/MTQ, (Based on Chassis, Truck, 2-1/2 Ton, 6 x 6, M44) and must be used in conjunction with Basic Allocation Chart for Truck, Cargo, 2-1/2 Ton, 6 x 6, M34, M35 and M36, SNL G-742.</u>								
	<u>GROUP 15 FRAME AND BRACKETS</u>								
1507	Leg, support, truck repair .....					X			
	<u>GROUP 18 BODY</u>								
1808	Pockets and bins repair .....					X			
	Straps, stowage repair .....					X			
1812	Body repair .....					X			
	Clamp, w/chain, derrick pole stowage repair .....					X			
	Linkage and lever, handbrake, revolving platform repair .....					X			

Maintenance Allocation Chart - Continued

Group no.	Component and related operations	Category						Tools reqd	Remarks	
		Organizational			DS	GS	D			
		O/C	CO	BN						
1	2	3	4	5	6	7	8	9	10	
	<u>GROUP 20 WINCH - Continued</u>									
2001 - Cont.	Winch, assy (rear) replace. . . . .			X						
	Worm, drive replace. . . . .				X					
2004	Power takeoff (rear winch) replace. . . . .				X					
	repair . . . . .					X				
	Seals, power takeoff replace. . . . .				X					
	Controls and linkage, power takeoff replace. . . . .		X							
	repair . . . . .			X						
	<u>GROUP 22 MISCELLANEOUS BODY AND CAB ACCESSORIES</u>									
2201	Cover, body repair . . . . .				X					
	<u>SUPPLEMENT NUMBER 8</u>									
	Truck, Earth Boring Machine and Pole Setter, 2-1/2 Ton, 6 x 6, V18A/MTQ									
	<p>Note. This supplement pertains to maintenance operations peculiar to the Truck, Earth Boring Machine and Pole Setter V18A/MTQ (based on Chassis, Truck, 2-1/2 Ton, 6 x 6, M44) and must be used in conjunction with Basic Allocation Chart for Truck, Cargo, 2-1/2 Ton, 6 x 6, M34, M35, and M36, SNL G-742.</p>									
	<u>GROUP 20 WINCH</u>									
2001	Bearing, drum drive shaft replace. . . . .				X					
	Cable, winch (rear) replace. . . . .		X							
	repair . . . . .			X						
	Chain, drive replace. . . . .		X							
	Controls and linkage (rear winch) replace. . . . .		X							
	repair . . . . .			X						

Maintenance Allocation Chart - Continued

Group no.	Component and related operations	Category						Tools reqd	Remarks
		Organizational			DS	GS	D		
		O/C	CO	BN					
1	2	3	4	5	6	7	8	9	10
	<u>GROUP 18 BODY - Continued</u>								
1812 - Cont.	Controls and linkage replace . . . . .			X					
	repair . . . . .			X					
	Earth boring machine replace . . . . .			%%	X				
	Joints, universal (earth boring machine drive shaft) replace . . . . .		X						
	Plate, thrust, auger replace . . . . .		X						
	Plate, thrust, rack replace . . . . .				X				
	Plates, drive, clutch and brake replace . . . . .				X				
	Point, auger replace . . . . .		X						
	Shell, main drive gear and clutch replace . . . . .				X				
	Sprockets, vertical power leveler replace . . . . .				X				
	Worm, horizontal leveling replace . . . . .				X				
	<u>SUPPLEMENT NUMBER 9</u>								
	Truck, Van, Expansibile, 2-1/2 Ton, 6 x 6, M292								
	<u>Note.</u> This supplement pertains to maintenance operations peculiar to Truck, Van, Expansibile, M292 (Based on Chassis, Truck, 2-1/2 Ton, 6 x 6 M46) and must be used in conjunction with Basic Allocation Chart for Truck, Cargo, 2-1/2 Ton, 6 x 6, M34, M35 and M36, SNL G-742.								
	<u>GROUP 18 BODY</u>								
1812	Beam, retractable replace . . . . .					X			
	Cable, counterbalance side panel replace . . . . .		X						
	Clamp, locking, ladder replace . . . . .		X						
	Clamp, toggle, side panel to roof replace . . . . .		X						
	Controls, hand, air conditioner door repair . . . . .			X					

Maintenance Allocation Chart - Continued

Group no.	Component and related operations	Category						Tools reqd	Remarks
		Organizational			DS	GS	D		
		O/C	CO	BN					
1	2	3	4	5	6	7	8	9	10
	<u>GROUP 18 BODY - Continued</u>								
1812- Cont.	Wiring, electrical (24v)								
	replace. ....				X				
	repair. ....			X					
	Box, electrical (120v)								
	replace. ....					X			
	Cable, power (120-208v)								
	replace. ....		X						
	Fixture, fluorescent light								
	replace. ....				X				
	Jack, phone								
	replace. ....				X				
	Lamp (120v)								
	replace. ....		X						
	Lens, dome light								
	replace. ....		X						
	Light, dome (120v)								
	replace. ....				X				
	Light, fluorescent								
	replace. ....		X						
	Receptacle, power cable								
	replace. ....						X		
	Reel, power cable								
	replace. ....					X			
Starter, fluorescent light									
replace. ....		X							
Switch, blackout, door and panel (120v)									
replace. ....				X					
Switch, control panel, electrical box									
replace. ....						X			
Switch, light (120v)									
replace. ....				X					
Wiring, electrical (120-208v)									
replace. ....						X			
repair. ....						X			
	<u>SUPPLEMENT NUMBER 10</u>								
	Truck, Van, Missile Firing Data Computer 2-1/2 Ton, 6 x 6, XM472								
	<u>Note. This supplement pertains to maintenance operations peculiar to the Truck, Van, Missile Firing Data Com- puter XM472, and must be used in con- junction with Basic Allocation Chart for Truck, Cargo 2-1/2 Ton, 6 x 6, M34, M35, and M36, SNL G-742.</u>								



Maintenance Allocation Chart - Continued

Group no.	Component and related operations	Category						Tools reqd	Remarks
		Organizational			DS	GS	D		
		O/C	CO	BN					
1	2	3	4	5	6	7	8	9	10
	<u>GROUP 18 BODY - Continued</u>								
1812-Cont.	Switches (115v) replace. . . . .			X					
	<u>GROUP 22 MISCELLANEOUS BODY AND CAB ACCESSORIES</u>								
2210	Plates, data replace. . . . .		X						
	<u>SUPPLEMENT NUMBER 11</u>								
	Truck, Shop, Van, Electronic 2-1/2 Ton, 6 x 6, XM567								
	<u>Note. This supplement pertains to maintenance operations peculiar to the Truck, Shop, Van, Electronic XM567, and must be used in conjunction with Basic Allocation Chart for Truck, Cargo 2-1/2 Ton, 6 x 6, M34, M35, and M36, SNL G-742.</u>								
	<u>GROUP 18 BODY</u>								
1812	Body repair . . . . .				X				
	Blower, ventilator replace. . . . .			X					
	Breaker, circuit (24v) replace. . . . .		X						
	Breaker, circuit (115v) replace. . . . .			X					
	Doors repair . . . . .					X			
	Harness, wiring, exterior (24v) replace. . . . .			X					
	repair . . . . .			X					
	Harness, wiring, heater power supply replace. . . . .			X					
	repair . . . . .			X					
	Harness, wiring, main body repair . . . . .					X			
	Heater replace. . . . .			X					
	Lamps (24v) replace. . . . .		X						
	Lamps (115v) replace. . . . .		X						

Maintenance Allocation Chart - Continued

Group no.	Component and related operations	Category						Tools reqd	Remarks
		Organizational			DS	GS	D		
		O/C	CO	EN					
1	2	3	4	5	6	7	8	9	10
	<u>SUPPLEMENT NUMBER 12-Continued</u>								
3303-Cont.	Element, fuel filter service. . . . .		X						
	replace. . . . .			X					
	Windshield defroster install . . . . .				X				
	repair . . . . .						X		
3305	Kit: deep - water fording install . . . . .				X				
	Kit: slave receptacle install . . . . .				X				
	Kit: personnel heater (-25°F) install . . . . .				X				
	Cables, capacitors, relays, resistors and switches replace. . . . .				X				
	Control box replace. . . . .				X				
	Fittings, screens and wicks replace. . . . .				X				
	Flame detector switch replace. . . . .				X				
	Fuel control valve replace. . . . .				X				
	Igniter replace . . . . .				X				
	Motor, heater blower replace. . . . .			X					
	Personnel heater (-65°F) replace. . . . .				X				
	repair . . . . .						X		
	Personnel heater: (-25°F) replace. . . . .			X					
	repair . . . . .			X					
	Power plant heater replace. . . . .				X				
	repair . . . . .						X		
	Pump, electrical fuel service. . . . .		X						
	replace. . . . .			X					
	Thermostat and gasket replace. . . . .				X				

Maintenance Allocation Chart-continued

Group No.	Component and related operations	Category						Tools req's	Remarks
		organizational			DS	GS	D		
		O/C	CO	BN					
1	2	3	4	5	6	7	8	9	10
	<u>SUPPLEMENT NUMBER 13</u> <u>Continued</u>								
1812 Cont.	Earth Boring machine								
	remove and install .....				X				
	repair .....					X			
	service .....	X							
	Plate, thrust, rack bar upper and lower								
	inspect .....				X				
	replace .....				X				
	Protector, cab, upper section								
	remove and install .....			X					
	Shaft, propeller (earth boring machine drive)								
	repair .....			X					
	replace .....			X					
	service .....	X							
	Worm, horizontal and vertical leveling								
	adjust .....				X				
	<u>OUTRIGGERS AND HYDRAULIC SYSTEM</u>								
	Cylinder, outrigger legs								
	replace .....				X				
	repair .....					X			
	Hoses and fittings, outrigger hydraulic system								
	replace .....			X					
	Leg assembly, outrigger								
	remove and install .....				X				
	Shaft assembly, hydraulic pump								
	replace .....				X				
	repair .....				X				
	service .....	X							

Maintenance Allocation Chart-continued

Group No.	Component and related operations	Category						Tools req's	Remarks
		organizational			DS	GS	D		
		O/C	CO	BN					
1	2	3	4	5	6	7	8	9	10
2001 Cont.	<u>GROUP 20 REAR WINCH AND AND POWER-DIVIDER</u> <u>Continued</u>								
	<u>REAR WINCH</u>								
	Chains, cable level winder								
	adjust . . . . .			X					
	replace . . . . .			X					
	repair . . . . .			X					
	Winder assembly, cable level, rear winch								
	adjust (carriage) . . . . .			X					
	repair . . . . .					X			
	remove and install . . . . .					X			
	service . . . . .	X							
	Winch assembly, basis (rear)								
	adjust (automatic brake) . . . . .					X			
	repair . . . . .					X			
replace . . . . .					X				
service . . . . .	X								
2004	<u>POWER-DIVIDER</u>								
	Power-divider assembly								
	repair . . . . .						X		
	replace . . . . .					X			
	service . . . . .	X							
	Controls and linkage, power-divider								
	adjust . . . . .			X					
	repair . . . . .			X					
	Shaft, propeller (power-divider drive)								
	repair . . . . .			X					
replace . . . . .			X						

Maintenance Allocation Chart-continued

Group No.	Component and related operations	Category						Tools req's	Remarks
		organizational			DS	GS	D		
		O/C	CO	BN					
1	2	3	4	5	6	7	8	9	10
2001	repair .....			X					
	Chain, drive								
	replace .....			X					
	Pin, shear								
	replace .....	X							
	Sprocket, rear winch								
	replace .....			X					
2004	Sprocket, transfer PTO								
	replace .....			X					

## 2. Deprocessing at Overseas Shipment Destination for Service

a. In order that materiel will not be damaged due to corrosion during initial operation, thoroughly flush all surfaces that have been exposed to salt water with fresh water as soon as practicable. In addition, disassemble, clean, and lubricate essential operating mechanisms, in accordance with pertinent Department of the Army lubrication orders as soon as the tactical or logistical situation permits.

b. Perform any of the deprocessing prescribed in paragraph 1 (a through j) that is applicable to the processed materiel.

## 3. Deprocessing in Storage Prior to Operation

a. General. Perform any of the deprocessing prescribed in a through j (above) that is applicable to the processed materiel.

b. Engines. If the engine is filled with preservative lubricating oil, the preservative oil will be retained until the using service places equipment on scheduled maintenance. Install new elements in the engine oil filters where applicable.

c. Gearcases. Transfer, transmission, differential, and other gearcases will be filled to operating level with prescribed lubricant, or drained and filled with the prescribed seasonal grade lubricant if required.

d. Lubrication. Lubricate materiel in accordance with instructions contained in pertinent Department of the Army lubrication orders.

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## CHAPTER 5 MAINTENANCE PROCEDURES PECULIAR TO M44A2 SERIES TRUCKS

### Section I. INTRODUCTION

#### 396. Scope

This chapter adds data and organizational maintenance instructions for the 2½ ton, 6X6, trucks M35A2, M35A2C, M36A2, M44A2, M45A2, M49A2C, M50A2, M109A3, M185A3, M342A2, M275A2, and M292A2 equipped with the LD 465-1

multifuel engine (fig. 428). This group will be referred to as the M44A2 series trucks in this chapter. General maintenance procedures applicable to the M44 and M44A1 series trucks are also applicable to the M44A2 series.

### Section II. DESCRIPTION AND DATA

#### 397. Description

*a.* The M44A2 series truck chassis and bodies are basically similar to the M44 and M44A1 series.

*b.* The LDS 427-2 multifuel engine in the M44A1 series is replaced by the LD 465-1 multifuel engine (fig. 428) or the LD 465-1C multifuel engine in the M44A2 series truck. The LD 465-1 series engine has a larger displacement, a fuel injector density compensator, a push button solenoid-operated starter, is naturally aspirated, and the turbo-charger has been eliminated. The LD 465-1 engine has a 25 ampere generator; the LD 465-1C engine has a 60 ampere alternator.

*c.* The original M44A2 series truck exhaust system (figs. 429, 430, 431, and 432), was similar to the M44 series truck system. The latest M44A2 series truck, except the M50A2 Water Tanker, is equipped with a stack exhaust system (fig. 427.10). The M49A2C Fuel Tanker and M275A2 Tractor incorporates a spark arrester-type muffler in the stack exhaust system. This muffler is designed to trap engine exhaust sparks inside the muffler. Refer to Section V for converting trucks from horizontal exhaust system to stack exhaust system.

*d.* In the starting system, a push button starter switch (fig. 433) is mounted on the dash panel and a solenoid-operated starter (fig. 434) replaces the

foot pedal and the mechanical linkage-operated starter.

*e.* Turn signals are incorporated into the lighting system (figs. 435, 436, 437 and 438), and operated by a control switch mounted on the steering column. These trucks are also equipped with a re-designed right taillight assembly (fig. 439). The latest M44A2 series trucks are equipped with composite front and rear marker light assemblies (figs. 450 and 451). The rear marker light incorporates a blackout stop lamp section, eliminating the need for the separate blackout stop light assembly (fig. 439). Refer to figures 450 and 451 for lamp arrangement for each light. The new composite light assemblies are not interchangeable with the marker lights shown in figures 155 and 156. Refer to paragraph 116 for replacement of lamp and light assembly.

*f.* On vehicles with a front mounted winch, the drive shaft is replaced by a shaft with split universal joints (fig. 440). This shaft can be removed and replaced by removing the screw, U bolts, and nuts, without removing the winch.

*g.* Engine operation is controlled by the throttle and engine stop linkage assemblies (fig. 441).

*h.* The M49A2C fuel servicing truck is equipped with a 1,200 gallon tank body which is divided into two 600-gallon sections (figs. 442A and B). Operation of fuel delivery system (fig. 443) is basically



the same as for the M49A1C truck. A speed control linkage assembly (fig. 444) controls the speed of the engine, power takeoff, and the delivery pump on both the fuel servicing and water tank trucks. "Go-no-go" fuses will shut off fuel flow when excessive solid contaminants or water enters the system (figs. 445 and 446).

i. The fuel tank and master cylinder vent lines have been combined, with only one line venting into the breather tube. The other vent line opening in the breather tube has been plugged.

j. The Dropside Cargo Truck M35A2C is the same as the M35A1, except that the sides and tailgate are hinged and may be lowered in order to facilitate loading (fig. 453) depicts parts peculiar to the M35A2C "Dropside Cargo Body." Refer to TM 9-2320-209-10 for information regarding usage of the M35A2C.

k. On the latest M44A2 series vehicles having front wheel drive capability, the transfer is a two speed unit with an air activated, positive lock-up mechanism. This system enables the operator to engage the front driving axle at his option. The front wheel drive selector lever is mounted within an indicator plate located just below the instrument cluster. An air control valve connected to the selector lever is located directly behind this panel for controlling the air pressure to the air cylinder mounted on the transfer case. When the selector lever is placed in the IN position, the air cylinder moves with shifting fork inside the transfer case to lock-up two output shaft clutch halves. When this action takes place, the front output shaft of the transfer is driving the front axle at the same rate of speed as the rear axles.

l. The charging system used on the latest M44A2 series vehicles is a 60 ampere, 28 volt negative ground alternator system. This unit keeps the battery fully charged by producing as much as 30 amperes with the engine idling. The alternator is a 28-volt dual rated 60/40 ampere alternator that houses six solid-state silicon rectifiers and a solid-state regulator. The alternator is a fully enclosed

waterproof system with built-in protection against fungus, sand, dust and corrosion. The rotor of the alternator is the counterpart of the generator field coil for producing magnetic lines of force. The rotor of the alternator is electrically excited by means of small brushes, riding on smooth slip rings. The alternator brushes carry only a small current and are subject to less mechanical wear, thereby having longer life than the brushes in a generator. The stator compares to the generator armature. It contains the windings in which the AC voltage is produced. The stator of the alternator is stationary. The windings are connected electrically from the stator directly to the rectifier diodes. The silicon rectifier diodes electrically change the alternating current produced by the alternator to direct current by means of a full wave bridge rectifier circuit. The electronic conversion that takes place in the alternator eliminates the mechanical wear associated with a segmented commutator and heavy load carrying brushes that are prevalent in generators, eliminating the need for continuous maintenance. The built-in solid-state regulator prevents line voltage drop. The alternator is equipped with feed-through capacitors to prevent generation of radio interference, and will not interfere with operation of field communications.

**398. Tabulated Data**

*Transfer with Actuated Positive Lock-Up.*

Ord. No. ....	11609224
Model .....	T-136-36 (FCM 78500)
Type .....	Two-speed synchromesh

*60 Ampere Alternator.*

Ord. No. ....	10929868
Model .....	3002 series
Regulator .....	Built-in (solid-state)
Voltage (adjustable) .....	27-31 volts
Recoverability after load deviation .....	.06 sec
Temperature variables (at rated output) .....	-65° to +250 °F.
Output, minimum (hot) .....	.23 amp at 1000 rpm

Additional and revised tabulated data is contained in TM 9-2320-209-10.

### Section III. REMOVAL AND INSTALLATION

#### 399. Engine

Removal and installation procedures for the LDS 427-2 engine (para 58) are applicable to the LD 465-1 engine, as the two engines are basically similar, except for the exhaust system and other minor parts and relocation of components (fig. 447).

#### NOTE

The latest M44A2 series trucks incorporate the revised engine front mounting (fig. 452). When removing the engine with this type mounting, disconnect engine front and rear mountings as described in paragraph 399.1 below.

#### 399.1 Engine Mounting

##### *a. Removal of Front Mounts.* (fig. 452).

(1) Remove the self-locking nut and plain washer from two mounting bolts, securing engine

and radiator mounting plate and four rubber engine mount to front crossmember. Remove mounting bolts.

(2) Raise front of engine as described in paragraph 47a(5), and remove the two upper mounts from between mounting plate and top of crossmember. Remove the two lower mounts from crossmember channel.

*b. Removal of Rear Mounts.* Refer to paragraph 47 for information pertaining to removal of the rear engine mounts.

*c. Inspection.* Inspect rubber engine mounts for evidence of separation between rubber and metal. If separation is evident, install new cushions in pairs (upper and lower).

*d. Installation of Front and Rear Mounts.* Install front and rear engine mounts in reverse order of removal. Torque tighten all mounting bolts to 30-35 foot-pounds.

## 400. Starter and Switches

(fig. 434).

### a. Removal.

### WARNING

*Disconnect cable at battery.*

- (1) Tag mating leads and posts before disconnecting.
- (2) Disconnect starter-to-battery cable.
- (3) Disconnect solenoid-to-starter switch cables.
- (4) Disconnect ground cable.
- (5) Remove three starter mounting nuts and remove starter. Remove adapter and two gaskets. Discard gaskets.
- (6) Remove four screws and remove switch from starter motor.
- (7) Remove push button switch and solenoid-to-starter leads.

b. *Indexing Procedure* (fig. 448). The same model starter is used on the 2½ and 5 ton trucks and designed for right and left side installation. A replacement starter must be indexed before installation. Remove six internal wrenching bolts. Rotate the drive housing 120° to 135°, and install the bolts.

c. *Installation*. Install in reverse order of removal, using new gaskets.

## 401. Push Button Starter Switch

(fig. 433)

### a. Removal.

- (1) Disconnect wiring plug.
- (2) Remove lock nut securing switch to dash panel.
- (3) Remove switch and lockwasher.

b. *Installation*. Install in reverse order of removal.

**402. Exhaust System** (figs. 429, 430, 431, and 432)*a. Removal.*

- (1) Remove three nuts and screws securing exhaust pipe to exhaust elbow. Remove and discard gasket.
- (2) Remove four nuts, two screws, and elbow at manifold. Remove and discard gasket.
- (3) Remove exhaust pipe, muffler, tailpipe, and extension (para 79 and 80).

*b. Installation.* Install exhaust system in reverse order of removal. Install new gaskets.

**402.1 Vertical Stack Exhaust System (All M44A2 Series Trucks Except M50A2)** (fig. 427.10)*a. Removal.*

- (1) Exhaust elbow (para 402a (1) and (2)).
- (2) Exhaust pipe, muffler, flex-tube, stack pipe extension, and brackets (para 412). Removal procedures are in reverse order of installation.

*b. Installation.* Install stack exhaust system components as described in paragraph 412b (4) through (12).

**NOTE**

Individual items are replaceable, however, clearance of muffler to fender bracket, exhaust pipe to flex tube, and top of stack pipe to support bracket must be checked to insure components of exhaust system are in correct position.

**402.2. Vertical Stack Exhaust System (For Clean Air Configuration Engine)** (Fig. 427.10.1)**NOTE**

The following is applicable to the M44A2 series trucks, with the exception of models M50A2 and M50A3.

*a. General.*

A revision of the vertical stack exhaust system for a clean air configuration engine provides for: a simplified exhaust pipe routing, the elimination of the requirement for a muffler, a protected flex section, an outboard mounted stack exhaust, and exhaust pipes which are aluminized and treated with a heat resistant paint to resist corrosion.

*b. Removal.***NOTE**

All numbers in parenthesis are keyed to numbers on figure 427.10.1.

- (1) Remove screw and nut from coupling (11). Remove coupling. Remove upper exhaust pipe and discard gasket (1). Remove four nuts, four screws, and two brackets from exhaust shield (10). Remove exhaust shield. Loosen—but do not remove—clamp assembly (2).
- (2) Remove two screws, two nuts and four washers from cover plates and remove cover plates (9). Remove air cleaner bonnet and air cleaner element cover and element (3). Remove clamp assembly located below exhaust flex tube by removing screw, nut, and two washers (8). Remove lower coupling from exhaust flex tube by removing screw and nut (6).
- (3) Remove clamp previously loosened (2). Drop lower exhaust pipe and discard gasket (7). Remove screw, nut, and coupling from exhaust flex tube (5). Remove flex tube and discard gasket. Loosen coupling to permit removal of elbow (4). Discard gasket.

*c. Installation.***NOTE**

When installing elbow, rotate elbow and adjust bracket for proper flex tube alignment. Flex tube axial alignment must be within .12 inch.

Install exhaust system in reverse order of removal. Install new gaskets.

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**403. Taillight and B.O. Stop Light Assembly (fig. 439).**

*a. Removal.*

**NOTE**

On right rear side only, the blackout stop light is a separate assembly.

- (1) Disconnect cables.
- (2) Remove two screws, lockwashers, and nuts and remove light assembly and bracket.
- (3) Remove screw and washer, and remove B.O. stop light from bracket.

*b. Disassembly. Refer to paragraph 113.*

*c. Installation.* Install light assembly in reverse order of removal.

**404. Front Winch Drive Shaft (fig. 440).**

*a. Removal.*

- (1) Remove four nuts and screws at power take-off end.
- (2) Remove four nuts and loosen "U" bolts at winch end.
- (3) Pull back on drive shaft and remove.

*b. Installation.* Install shaft in reverse order of removal.

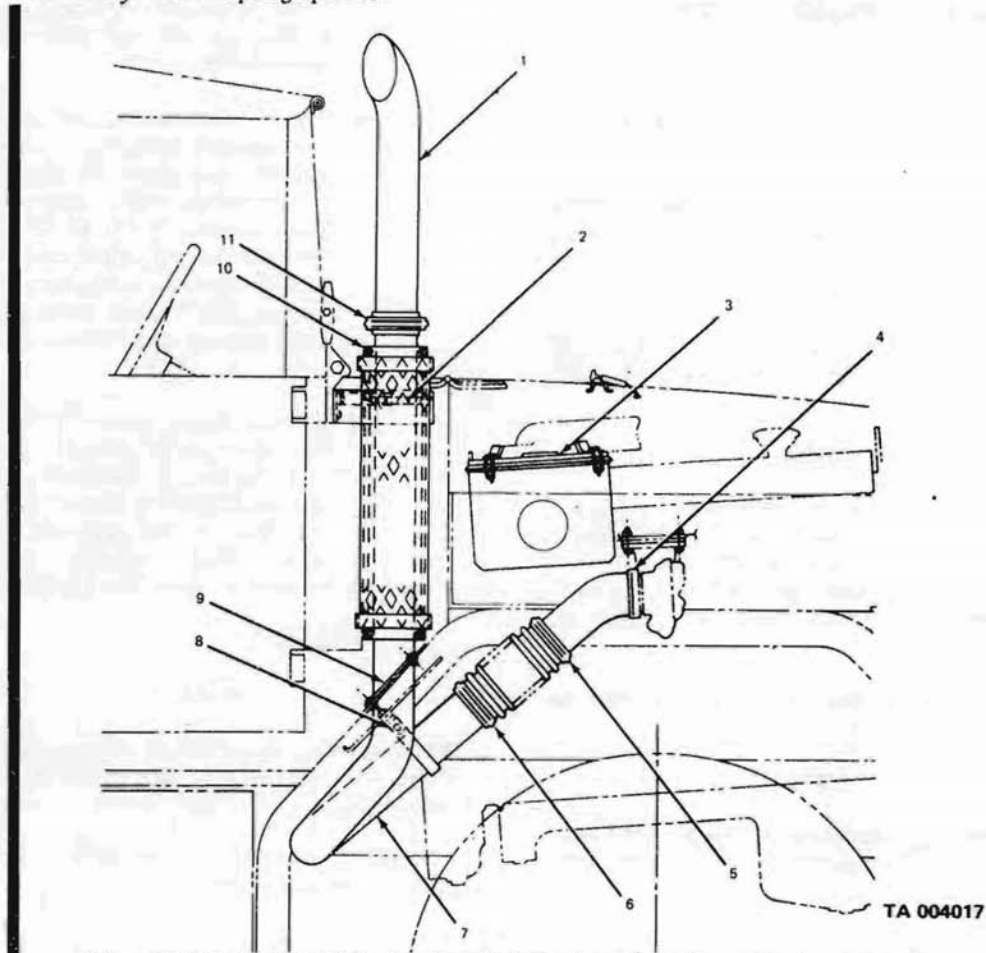


Figure 427.10.1. Vertical stack exhaust (clean air configuration engine) – removal

#### 405. Service and Maintenance of Fuel Delivery System. (Fig. 443)

a. *General.* The primary function of the filter elements and "go-no-go" fuses (Fig. 446) is to collect all contamination and separate the water from the fuel. If solid contaminants or water exceed a safe level, the fuses will shut off all fuel flow. When this occurs, it indicates that the filters and/or water separators are not performing properly. The malfunction should be located and corrected. The "go-no-go" fuses must then be replaced before continuing operation.

b. *Pressure Gage Checking Procedure* (Fig. 449).

- (1) The elements will gradually become loaded with contamination and the pressure drop through the first stage will increase. The pressure should be checked as follows:

While pump is operating, turn the pressure gage shutoff valve handle clockwise to the three positions and obtain readings. When pressure differential between inlet pressure and outlet pressure (No. 1 and No. 2) exceeds 20 psi, the filters require replacement. When pressure differential between inlet pressure and internal pressure (No. 1 and No. 3) exceeds 15 psi, replace filter elements. When pressure differential between outlet pressure and internal pressure (No. 2 and No. 3) exceeds 15 psi, replace "go-no-go" fuses.

- (2) All elements and fuses must be replaced annually.

c. *Daily Services.*

- (1) Make sure that the tanks are completely filled with fuel and all air is bled from the top of the covers.
- (2) Drain daily, or as often as necessary, the accumulation of water under the watersight glass. If water is not drained, the fuses will absorb it and shut off the flow of fuel.

#### 406. Replacement of Filter Elements. (Fig. 446)

a. *Removal.*

- (1) Open manhole cover and disconnect air vent line.
- (2) Loosen nut and V-band coupling, and remove cover. Discard "O" ring packing.
- (3) Remove three nuts and washers, and remove support plate.
- (4) Lift canister from filter elements.

**Caution:** Canisters are reusable and must be handled carefully to prevent damage to the teflon coating on the screen.

- (5) Pull elements off pedestal and discard.

b. *Installation.*

- (1) Wash canisters and interior of housing with kerosene or turbine fuel. Use care to prevent damage to pedestals.
- (2) Install new elements.
- (3) Position canister carefully over element.

*Note.* Make sure that the plug on top of canister fits securely in the "O" ring seal of the element.

- (4) Install support plate, washers, and nuts in a (3) above. Do not overtighten nuts.
- (5) Install new "O" ring packing, cover, and V-band coupling.
- (6) Connect air line vent and close manhole cover.

*Note.* As soon as possible after the cover is closed, fill the tanks completely with fuel and keep them filled to prevent condensation which reduces operating life of the elements and fuses.

#### 407. Replacement of "Go-No-Go" Fuses. (Fig. 446).

a. *Removal.*

- (1) Remove cover, air vent line, and support plate as in paragraph 406.
- (2) Pull fuses from sockets, and discard.

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*b. Installation.*

- (1) Install new fuses in sockets.

**NOTE**

Since fuses will absorb moisture, do not expose to humid atmosphere longer than necessary after removing from plastic bag. If new fuses must be stored without the bag, immerse fuses in kerosene during storage.

- (2) Install support plate, new "O" ring packing, cover, and air vent line; close manhole cover and fill the tanks (para 406).

#### **408. Removal and Installation of Controls and Linkage for Transfer Transmission with Air Actuated Lock-Up**

- a. Coordination with Direct Support Maintenance Unit.* Refer to paragraph 2 for information

on coordination with a direct support maintenance unit.

*b. Controls and Linkage for Transfer Without Power Take-Off* (fig. 427.2).

(1) *Removal.*

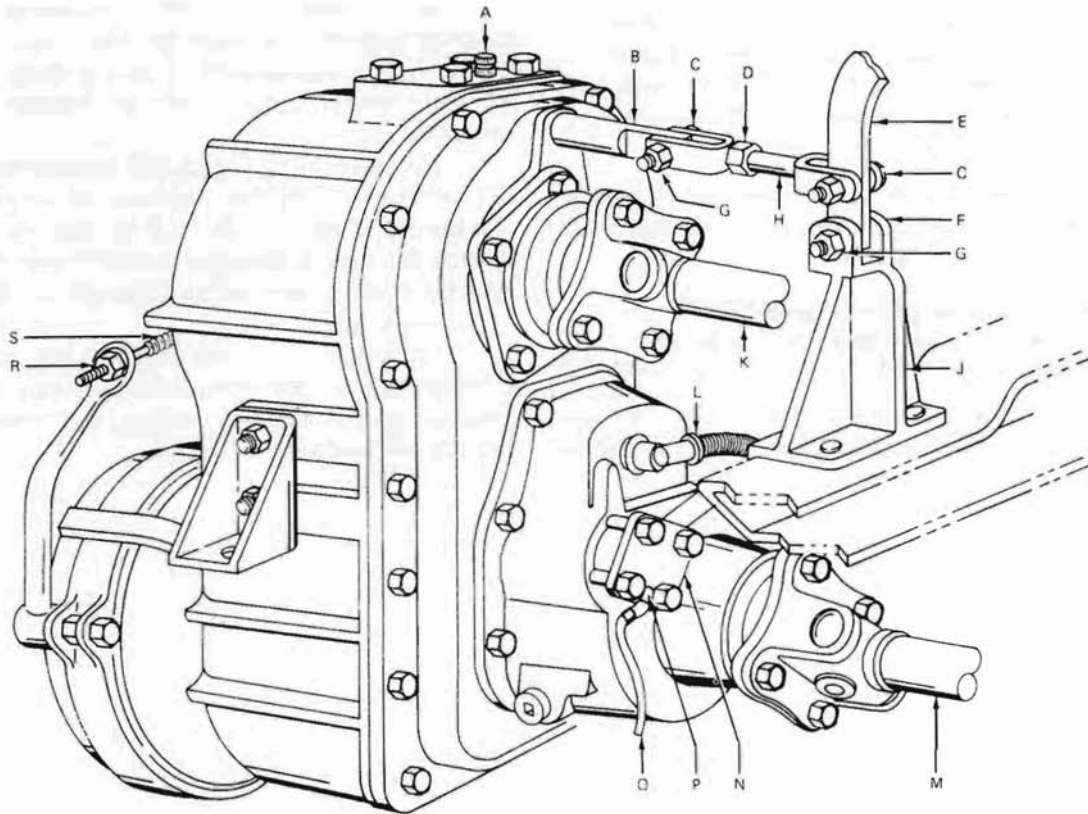
(a) Remove two ½-inch self-locking hex-nuts (G) and two ½ x 2-inch hex-head cap screws (C) connecting link assembly (H) to shifting lever (E) and transfer shifter shaft (B). Remove link assembly (H).

(b) Remove one ½-inch self-locking hex-nut (G) and one ½ x 2¼-inch hex-head cap screw (F) to release shifting lever (E) from the shifting lever bracket (J) that is mounted to the frame cross-member. Remove the transfer shifting lever (E).

(2) *Installation.*

(a) Assemble the shifting lever (E) to the shifting lever bracket (J) mounted on frame cross-member. Secure with one hex-head cap screw (F) and one self-locking hex-nut (G).





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Key Item

- A Transfer vent
- B Transfer shifter shaft
- C ½ x 2 in. lg hex-hd cap screw
- D ½ in. plain hex-nut
- E Transfer shifting lever
- F ½ x 2¼ in. hex-hd cap screw
- G ½ in. self-locking hex-nut
- H Link assembly

Key Item

- K Propeller shaft-transfer to transmission
- L Speedometer flexible shaft
- M Propeller shaft-front axle
- N Air cylinder
- P Elbow
- Q Air supply hose
- R Handbrake adjusting nut
- S Handbrake cable

Figure 127.2. Shift linkage for transfer with positive air lock-up.

(b) Install the link assembly (H) to shifting lever (E) with hex-head cap screw (C) and self-locking hex-nut (G).

(c) Place the shifting lever (E) in LOW range position with lever handle  $\frac{1}{4}$  to  $\frac{1}{2}$ -inch up from cab floor board. Place the transfer shifter shaft (B) outward to engage the low speed gears. The link assembly clevis should match up with the end of the shifter shaft (B) without movement of the transfer shifting lever (E). Install the link assembly clevis assembly to the shifter shaft (B) with hex-head cap screw (C) and self-locking hex-nut (G). If the link assembly clevis cannot be connected to the shifter shaft adjust linkage, see (3) below.

(3) *Adjust linkage.*

(a) Make certain that the transfer shifting lever handle is  $\frac{1}{4}$  to  $\frac{1}{2}$ -inch above the cab floor board (in the LOW range position), and the transfer shifter shaft, held out by detent in transfer, is in the low gear position. Adjust linkage as required until the yoke of the link assembly fits to shifting shaft without the control lever or shaft being moved. Secure with hex-head cap screw and self-locking hex-nut. Move the shifting lever to the NEUTRAL, HIGH, and LOW positions and note, by the lever motion, if transfer shifting is engaged in all positions by the shaft detent within the transfer case. Readjust link assembly, if necessary. Tighten lock nut on link assembly.

(b) Install one end of the link rod assembly (M) on top of the power take-off shifter shaft lever (N) and secure with self-locking hex-nut. If adjustment of the link control lever rod assembly (M) is required to maintain lever (J) in NEUTRAL position, loosen lock nuts on (M), remove nuts from rod ends to power take-off shifter lever (N) and

shifter shaft (J), remove link (M) and turn rod ends to extend or shorten link assembly (M) until proper length is obtained for installation of the link control lever rod assembly. Tighten lock nuts to rod ends.

*c. Controls and Linkage for Transfer Equipped with Power Take-Off (fig. 427.3).*

(1) *Removal of power take-off shift control linkage.* Remove two  $\frac{1}{2}$ -inch self-locking nuts securing power take-off link control lever rod assembly (M) to the power take-off shift control lever (L) and shifter shaft lever (N). Remove control lever rod assembly.

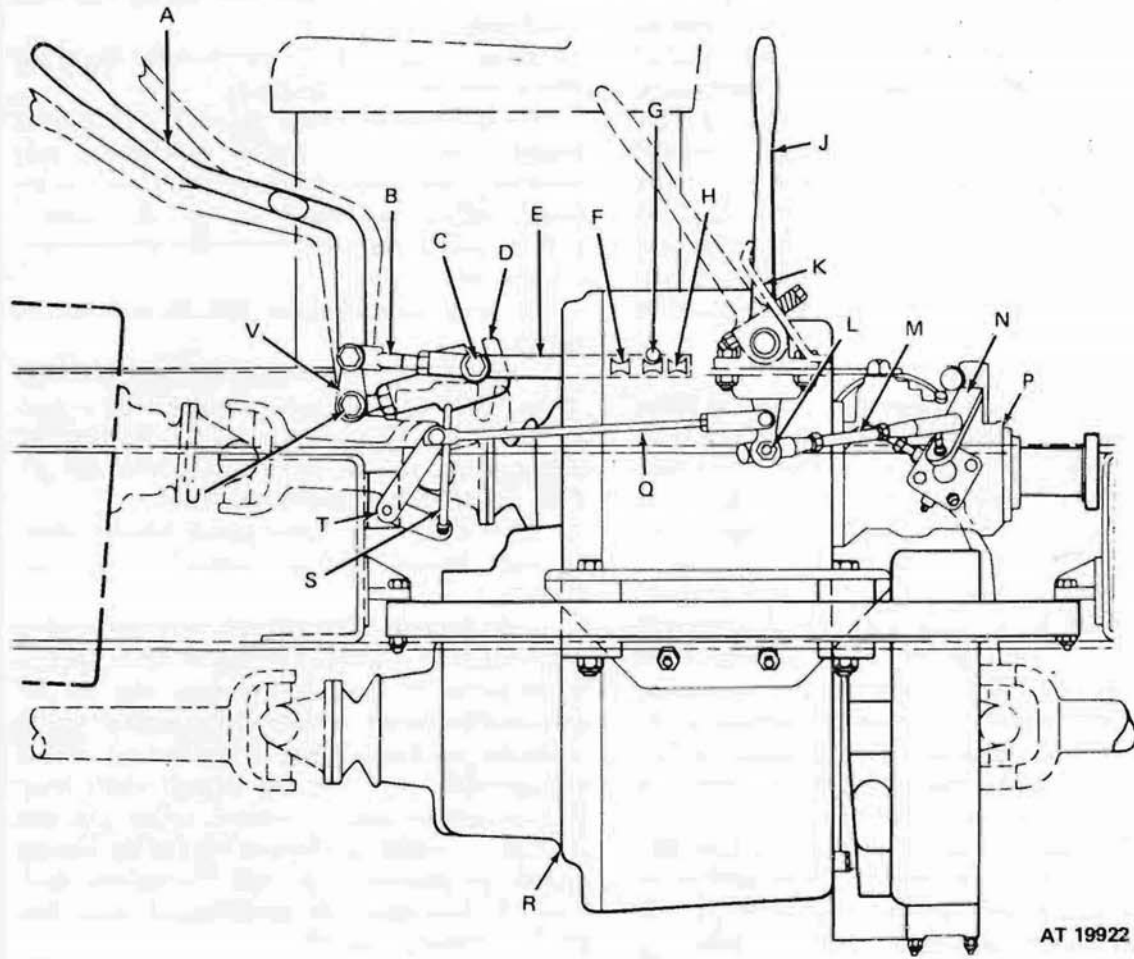
(2) *Installation of power take-off shift control linkage.*

(a) Position the power take-off shift lever (J) in NEUTRAL position with the shift lever locking bar (K) parallel with lever (J). Position the shifter shaft lever (N) on the power take-off unit (P) in the NEUTRAL position by hand.

(3) *Removal of transfer power take-off shifting lever lock-out linkage (models M49A2C and M50A2).*

(a) Remove cotter pin and clevis pin holding lockout control rod assembly (Q) at lower portion of the power take-off shift control lever (L). On later models, remove setscrew from head of swivel to release the forward end of the lockout control rod assembly (Q) from the lockout shaft lever (T). On earlier models remove cotter pin and clevis pin to release the forward end of the lockout control rod assembly (Q) from the lockout shaft lever (T). Disconnect the speed control wire from bracket on power take-off.

(b) Remove two cotter pins and two flat washers holding lockout connector rod (S) to lockout shaft lever assembly (T) and lockout arm (D).



- | Key | Item  | Key | Item   |
|-----|---|-----|--|
| A   | Transfer shift lever                        | L   | Power take-off shift control lever-lower portion |
| B   | Link rod assembly                           | M   | Control lever link assembly                      |
| C   | Bolt  | N   | Lever-power take-off shifter shaft               |
| D   | Lock-out arm                                | P   | Transfer power take-off                          |
| E   | Transfer shifter shaft                      | Q   | Lockout control rod assembly                     |
| F   | Transfer shifter shaft-high gear position   | R   | Transfer transmission                            |
| G   | Transfer shifter shaft-neutral position     | S   | Lockout rod                                      |
| H   | Transfer shifter shaft-low gear             | T   | Lockout shaft assembly                           |
| J   | Power take-off shift lever-engaged position | U   | Shoulder pin                                     |
| K   | Lock-neutral position                       | V   | Transfer shift lever bracket                     |

Figure 427.8. Transfer power take-off linkage assembly.

(c) Remove two ½-inch self-locking hex-nuts securing lock-out arm (D) and transfer shift lever pin (U) to the shift lever bracket (V) mounted on frame crossmember. Remove lockout arm (D) from pin (U) and remove pin from transfer shift lever bracket (V) and transfer shift lever (A).

(d) Remove bolt (C) designed to accommodate the lockout arm (D) attaching link assembly (B) to the shifter shaft (E).

(e) Remove cap screw attaching link assembly (B) to transfer shift lever (A). Remove shift lever (A). Remove shift lever from bracket (V) and link assembly.

(4) *Installation of transfer power take-off shifting lever lock-out linkage (models M49A2C and M50A2).*

(a) Position the transfer shift lever (A) in the saddle portion of the shift lever bracket (V) on the frame crossmember. Install shoulder pin (U) through shift lever bracket and transfer shift lever with shoulder of pin on outside of bracket (V). Install lockout arm (D) on pin shoulder and secure pin with two ½-inch self-locking hex-nuts.

(b) Install and adjust the transfer shift linkage in accordance with paragraph 408b(2)(b), except use bolt (C) (fig. 427.3) to connect link assembly and shifter shaft.

(c) Place the transfer shift lever in NEUTRAL position. Position lockout arm (D) on the transfer shifter shaft link assembly bolt (C). If adjustment of the lockout arm (D) is necessary, loosen lock-nut at rear of lockout arm and adjust arm so that it slides freely on shifter shaft link assembly bolt (C).

(d) Install lockout rod (S) onto the lockout arm (D) and to the inside lever on lockout shaft (T). Secure each end of rod (S) with washer and cotter pin.

(e) Position transfer shift lever (A) in NEUTRAL, engage the power take-off shift lever (J) and make certain that the lockout arm (D) is locked on the shifter shaft link assembly bolt (C). Install the rod end of the lockout control rod (Q) on the outside lever of the lockout shaft (T) and secure with swivel and cotter pin. Adjust length of rod (Q) to fit upper hole of lever (L). Secure the adjustable end of the lockout control

rod (Q) to the lower position on the power take-off shifter shaft control lever (L) with clevis pin and cotter pin. Install speed control wire through swivel and secure with setscrew in end of swivel.

(5) *Transfer power take-off shifter lever lock-out linkage adjustment.* When the power take-off shift lever is in the ENGAGED position, the lockout arm should be locked on the transfer shifter shaft link assembly bolt, locking the transfer shift lever in NEUTRAL position. If locking condition is not obtained, remove lockout rod assembly from the power take-off shifter shaft lever. Loosen nut at rear of adjustable clevis and adjust clevis until the transfer shift lever is locked securely in NEUTRAL position. If rod (Q) does not have enough adjustment, lengthen rod (M) to move lever (J) to a more vertical position. Maintain power take-off in ENGAGED position.

(6) *Transfer shift lever linkage.* Remove in accordance with paragraph 408b(1). Install in accordance with paragraph 408b(2).

#### **409. Removal and Installation of Transfer Transmission with Air Actuated Positive Lock-Up**

a. *Coordination with Direct Support Maintenance Unit.* Refer to paragraph 2 for information on coordination with direct support maintenance unit.

##### *b. Removal*

(1) *Vehicles equipped with transfer mounted power take-off.*

(a) Disconnect transfer power take-off shift control lever linkage and lockout linkage (para 408 c (1) and (3)).

(b) On later models disconnect the speed control wire from swivel at power take-off lockout shaft assembly by loosening setscrew from head of swivel. On earlier models disconnect the speed control wire from bracket on power take-off.

(c) Disconnect delivery pump front drive shaft. Loosen setscrew on safety collar located on the delivery pump front drive shaft, and slide the collar forward as far as possible (model M49A2C only). Remove four locking nuts and screws securing the drive shaft flange to companion flange at rear of power take-off. Remove spline end of drive shaft from yoke assembly.

(2) *A models.*

**NOTE**

The keyletters noted in parentheses below are indicated in figure 427.2, unless otherwise noted.

(a) *Disconnect propeller shafts.* Disconnect frontaxle to transfer (M), transmission-to-transfer (K), and intermediate rear axle propeller shafts from transfer (Para 165).

(b) *Disconnect hand brake cable.* Remove cable nut (R) at brake shoe lever and remove cable (S) from clamp at rear of transfer on power take-off, if so equipped.

(c) *Disconnect transfer linkage.* Remove transfer shifter link assembly and shifting lever handle (Para 408b(1)).

(d) *Disconnect speedometer flexible shaft.* Disconnect speedometer flexible shaft (L) from angle drive adapter on transfer and remove angle drive adapter.

(e) *Disconnect air cylinder supply hose.* Disconnect air cylinder supply hose (Q) at air cylinder (N) in front of transfer. Cap air cylinder elbow (P) holes, and end of hose. If transfer is being replaced, remove elbow (P) from air cylinder (N).

(f) *Draining.* Remove transfer case drain plug and front output shaft cover filler plug, and drain transfer. Replace plugs.

(g) Place a suitable lift under the transfer to support its weight.

**NOTE**

Trucks having insulator mounts locate at center of longitudinal support, refer to paragraph 159b(2)(e) and figure 192, for removal procedure.

(h) *Remove right side mounting plate.* Remove four 1/2-inch self-locking hex-nuts and four 1/2 x 2 3/4-inch hex-head cap screws to release the right side transfer mounting plate from transfer mounting bracket on the frame side rail (fig. 427.4).

(i) *Release left side transfer support.* Remove four 1/2 x 2 3/4 inch-hex-head cap screws to release the left side transfer support bracket from the longitudinal support (fig. 427.5).

(j) *Remove longitudinal support.* Remove one 1/2-inch self-locking hex-nut, washer and insulator from underneath end of longitudinal

support at brackets on frame crossmember. Pull out screw and remove second insulator from under flange of longitudinal support. Repeat procedure to release end of longitudinal support at opposite frame crossmember bracket. Remove longitudinal support (fig. 427.5).

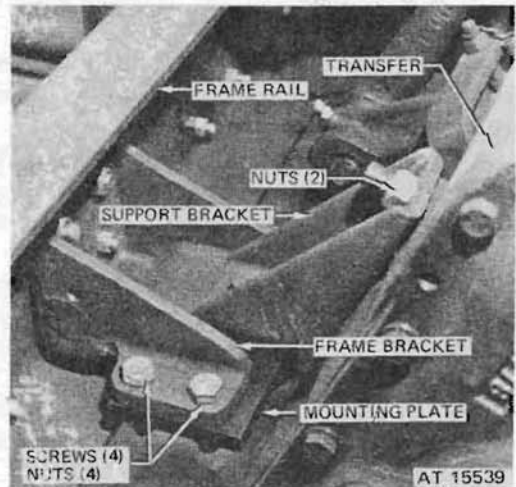


Figure 427.4 Right side transfer mounting.

(k) *Remove transfer.* Lower the transfer and remove from underneath vehicle in the spare tire area.

(l) *Remove right side support bracket.* Remove one 1/2-inch self-locking hex-nut, flat washer and bolt to release the transfer mounting plate and insulator from the transfer right hand support bracket. Remove two 1/2-inch self-locking hex-nuts from studs and remove right hand support bracket from transfer.

(m) *Remove left side support bracket.* Remove four 5/8-inch self-locking hex-nuts from studs and remove the left hand mounting support bracket from the transfer.

*c. Installation.*

(1) *All models.*

**NOTE**

Trucks having insulator mounts located at center of longitudinal support, refer to paragraph 159 c (1) (a) and figure 192, for installation procedure.

(a) *Install right side support bracket.* Position the right hand support bracket on two transfer mounting studs and secure with two 1/2-inch

self-locking nuts. Torque to 125-135 ft. lbs. Assemble bolt, insulator and mounting plate to right hand support bracket. Install washer and one ½-inch self-locking hex-nut (fig. 427.4). Torque to 65-70 ft. lbs.

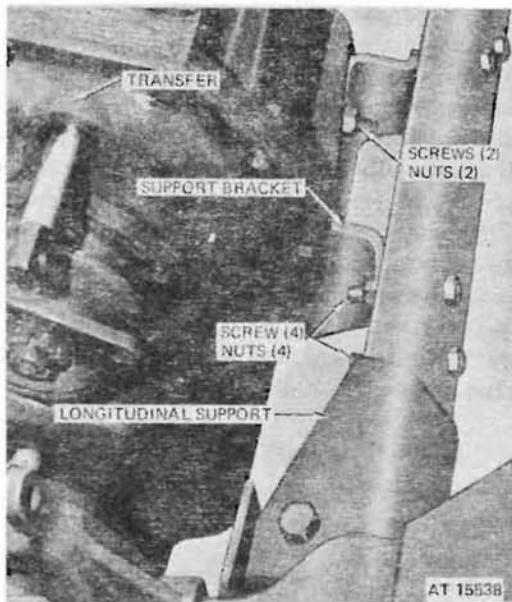


Figure 427.5. Left side transfer mounting.

(b) *Install left side support bracket.* Position the left hand support bracket on 4 transfer mounting studs and secure with four ½-inch self-locking hex-nuts (fig. 427.5). Torque to 125-135 ft. lbs.

(c) *Attach longitudinal support.* Position the longitudinal support on the frame crossmember transfer support brackets. Install one insulator between the underside end flange of the longitudinal support and the top surface of the support bracket on each frame crossmember. Thread screw through flange on longitudinal support, insulator and bracket. From underneath, install second insulator, washer and one ½-inch self-locking nut. Torque to 25-35 ft. lbs. Repeat procedure for opposite end.

(d) *Install transfer.* Place transfer on lift and raise in mounting position so that the right hand mounting plate lines up with the transfer mounting bracket on the frame side rail. Also,

make adjustments so that the holes on the longitudinal support line up with those on the left hand side transfer mounting bracket.

1. Install four ½ x 1¾-inch hex-head cap screws and four ½-inch self-locking hex-nuts to secure the right hand transfer mounting plate to the transfer mounting bracket on frame side rail (fig. 427.4). Torque to 65-70 ft. lbs.

2. Secure the longitudinal support to the left hand transfer support bracket with four ½ x 2¾ inch hex-head cap screws and four ½-inch self-locking hex-nuts (fig. 427.5). Torque to 65-70 ft. lbs.

3. Lower and remove lift from underneath vehicle.

#### NOTE

The key letters noted in parentheses below are indicated in figure 427.2, unless otherwise noted.

(e) *Connect air cylinder supply hose.* Install elbow (P) in air cylinder (N), if previously removed, and connect air cylinder supply hose (Q) to air cylinder elbow.

(f) *Install adapter and speedometer flexible shaft.* Install the speedometer angle drive adapter and connect the speedometer flexible shaft (L).

(g) *Connect transfer linkage.* Install the transfer link assembly and adjust transfer linkage (para 408b(2) and (3)).

(h) *Connect hand brake cable.* Connect the hand brake cable (S) with brakeshoe lever. Install cable nut (R). Install cable to transfer.

(i) *Connect propeller shaft.* Connect front axle, transmission-to-transfer, and intermediate rear axle propeller shafts to transfer with four cap-screws and four self-locking hex-nuts. Tighten nuts to 100-105 ft. lbs.

(2) *Vehicles equipped with transfer mounted power take-off.*

(a) *Connect delivery pump front drive shaft.* Install the splined end of drive shaft in yoke assembly. Install four screws and four self-locking nuts to secure drive shaft flange to the companion flange at rear of power take-off (model M49A2C only). Loosen setscrew in safety collar and slide collar to rear of shaft allowing ¼-inch clearance

between front of safety collar and rear of yoke assembly. Tighten setscrew in collar.

(b) *Connect speed control cable.* On later models connect the speed control wire on swivel at power take-off lockout shaft assembly. Secure by installing setscrew in head of swivel. On earlier models, connect the speed control wire to the bracket on power take-off.

(c) *Connect linkage.* Connect the transfer power take-off lockout linkage and shift control lever linkage (para 408c(2) and (4)).

(3) *Lubricate transfer.* Tighten drain plug to torque of 100-125 ft. lbs.

(4) *Check transfer shift linkage adjustment (para 408b(2)(c) and (3)).* Engage and disengage the transfer shift lever and adjust, if necessary.

(5) *Check power take-off shift control linkage and lockout linkage adjustments (para 408c(2) and (5)).* Place the transfer shift lever in NEUTRAL and engage power take-off shift lever. When the power take-off is engaged, the transfer shift lever should be in the NEUTRAL position. Make adjustments, if necessary.

## 410. Alternator Replacement

a. *Removal (fig. 427.6).*

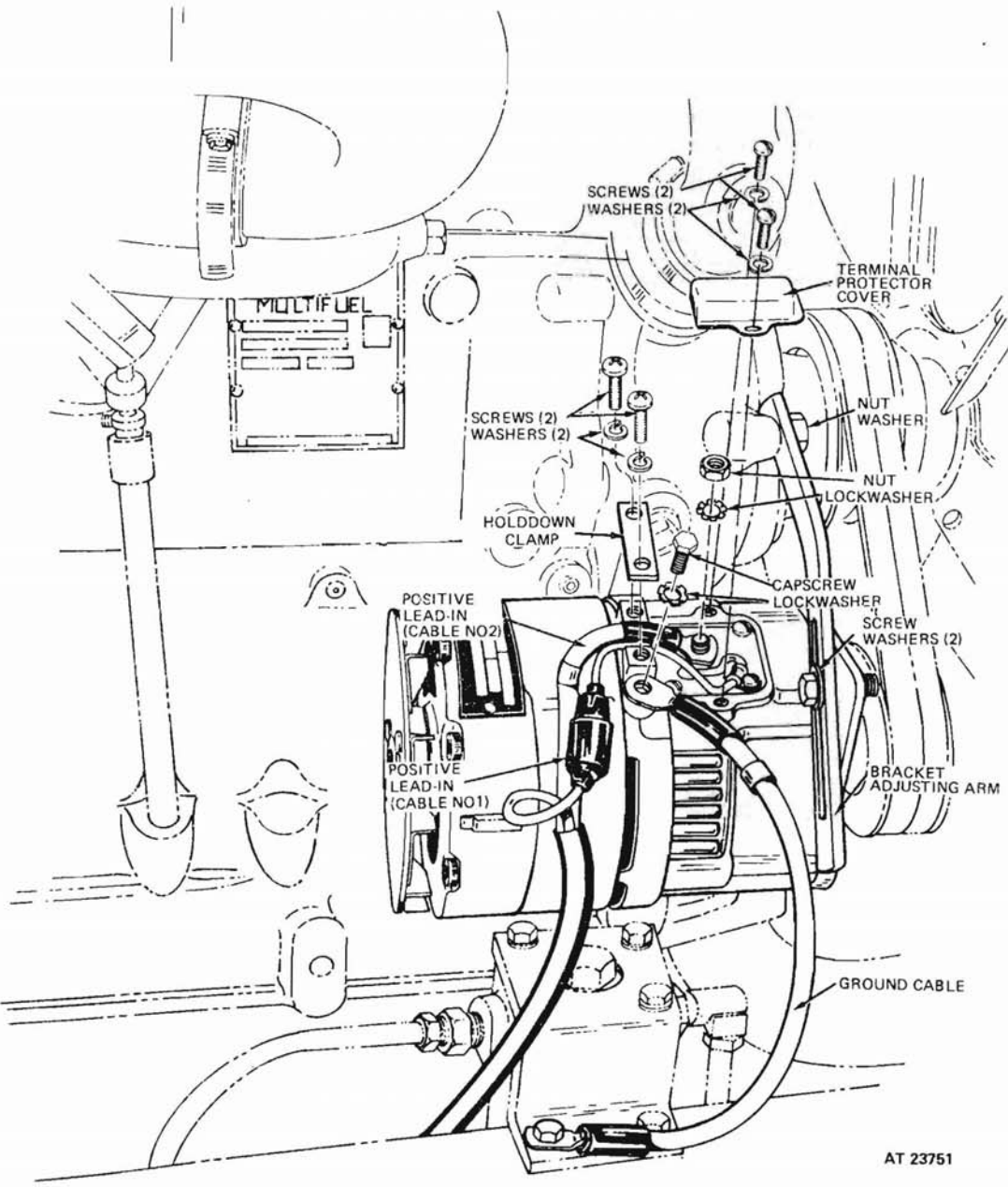
### CAUTION

Disconnect the battery cable connectors from positive and ground posts. Disconnect the ground (negative) cable first.

(1) Remove two screws and two washers from the lead-in cable hold down clamp for accessory switch cable No. 1 and positive cable No. 2. Disconnect cable No. 2. Disconnect cable No. 1 at the terminal assembly connector. Remove two screws and two split lock washers securing the terminal protector cover to the top of the alternator and remove cover. Remove hex-nut and external tooth lockwasher securing the positive lead-in (cable No. 2). Remove cap screw and external tooth lockwasher from the negative terminal on the alternator to release the ground cable.

### NOTE

Retain all fasteners for assembly.



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Figure 427.6. 60 Ampere alternator installation.



(2) Remove screw and lockwasher securing the alternator bracket adjusting arm to the alternator. Push the alternator toward engine enough to allow removal of the two drive belts from alternator pulley. Remove belts.

(3) Remove the cotter pin, locknut, 2 washers and hex-head bolts securing both front and rear alternator mounting legs to the alternator mounting bracket. Lift out alternator (fig. 427.7).

(4) If alternator is being replaced, remove the self-locking nut and flat washer securing the pulley to the alternator shaft. Remove pulley from shaft with a suitable puller. Tape woodruff key to drive shaft.

*b. Installation* (fig. 427.6).

(1) Install alternator pulley onto the alternator drive shaft by inserting, and driving the pulley on to drive shaft over the woodruff key.

**NOTE**

When tightening shaft nut against pulley, the pulley is to be held to prevent shaft rotation. Do not hold fan, as damage to the fan blades can occur.

Torque nut to 40-50 ft. lbs.

(2) Position alternator on mounting bracket and insert bolt through each mounting leg to bracket. Shim as required at rear alternator mounting leg to establish clearance maximum of .005. Position lockwashers, locknuts and cotter pins. Do not tighten nuts. Position matched drive belts onto pulley. Connect the strap adjusting arm to alternator with screw and lockwasher. Do not tighten screw (fig. 427.7).

*c. Belt Adjustment.* Adjust drive belt tension until belt has a measured 1/2-inch deflection at mid-point between the alternator and water pump pulley. Torque tighten the alternator bracket adjusting arm screw to 35-40 ft. lbs. Torque tighten the alternator mounting bracket bolts and nuts to 60-70 ft. lbs.

*d. Alternator wiring installation* (fig. 427.6).

(1) Position negative terminal on alternator, assemble external tooth lockwasher and cap screw. Torque to 82-102 in. lbs.

(2) Position positive lead-in (cable No. 2) to positive terminal and secure with external tooth lockwasher and cap screw. Torque to 45-55 in. lbs.

**CAUTION**

Be careful when installing the positive output (cable No. 2) that goes to the battery. The cable terminal lug is larger and more rounded on one side. This side goes up. Improper installation of this cable could short out the alternator.

(3) Position the terminal protector cover and secure with two flat washers and two screws.

(4) Position hold down clamp over cable No. 1 and cable No. 2 and secure with two washers and two screws. Torque to 11.5 - 13.5 in. lbs.

(5) Connect the accessory switch lead-in (cable No. 1) to the terminal assembly connector.

*e. Alternator adjustment.* Accomplish output regulator voltage adjustment by removing pipe plug at front of alternator and turn adjustment screw with screwdriver. (See electrical troubleshooting table 10, tests 2 and 3).

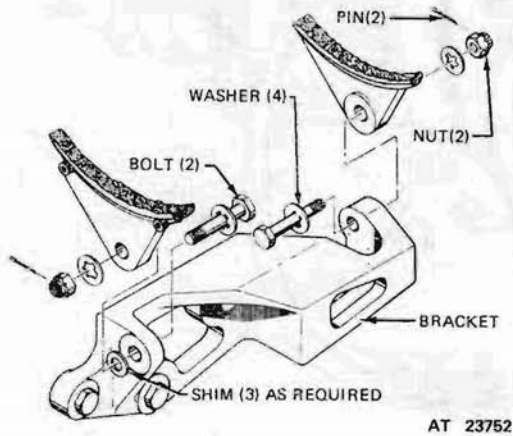


Figure 427.7. 60 Ampere alternator mounting installation.

## Section IV. TROUBLESHOOTING THE M44A2 VEHICLE PECULIAR ITEMS

### 411. Scope

a. Table 9 contains troubleshooting information and tests for locating and correcting some of the troubles which may develop in the M44A2 peculiar items in the vehicle. Each symptom of trouble or malfunction given for an individual unit or system is followed by a list of probable causes of the trouble and corrective actions necessary to remedy the malfunction.

b. Table 10 contains detailed troubleshooting

information for locating and correcting malfunctions in the M44A2 electrical system peculiar items. Each subsystem is treated separately by (1), providing a simplified schematic diagram where required; (2), pointing out the physical locations of the components; (3), pinpointing the disconnect points; and (4), giving in detail a step-by-step procedure to diagnose the trouble using low voltage circuit tester TB-100, figure 35, and adapter set, figure 36.

Table 9. Troubleshooting (M44A2 Series)

<i>Malfunction</i>	<i>Probable cause</i>	<i>Corrective action</i>
	<b>CHARGING SYSTEM 60 AMP ALTERNATOR</b>	
1. Low on no-charge indication on ammeter or battery-generator indicator when batteries have low charge.	Defective alternator.	Test alternator. Refer to Table No. 10, Electrical troubleshooting, figure 427.8 and 427.9.
2. High-charge indication on ammeter or battery-generator indicator when batteries are fully charged.	a. Defective ammeter or battery-generator indicator.  b. Poor electrical connections at alternator. c. Defective alternator.	a. Replace gauge if defective (para 126). Refer to table 5 for electrical troubleshooting procedures. b. Refer to Test no. 1, table 10, electrical troubleshooting. c. Test alternator. Refer to table 10 electrical troubleshooting, figures 427.8 and 427.9.
3. Noisy alternator	a. Loose alternator mountings.  b. Defective alternator.	Inspect alternator mountings, shims and brackets. Tighten as necessary. Refer to paragraph 410.
4. Discharged or low charged batteries.	Defective alternator.	Test alternator. Refer to table 10, electrical troubleshooting. Figures 427.8 and 427.9.

Table 10. Electrical Troubleshooting (M44A2).

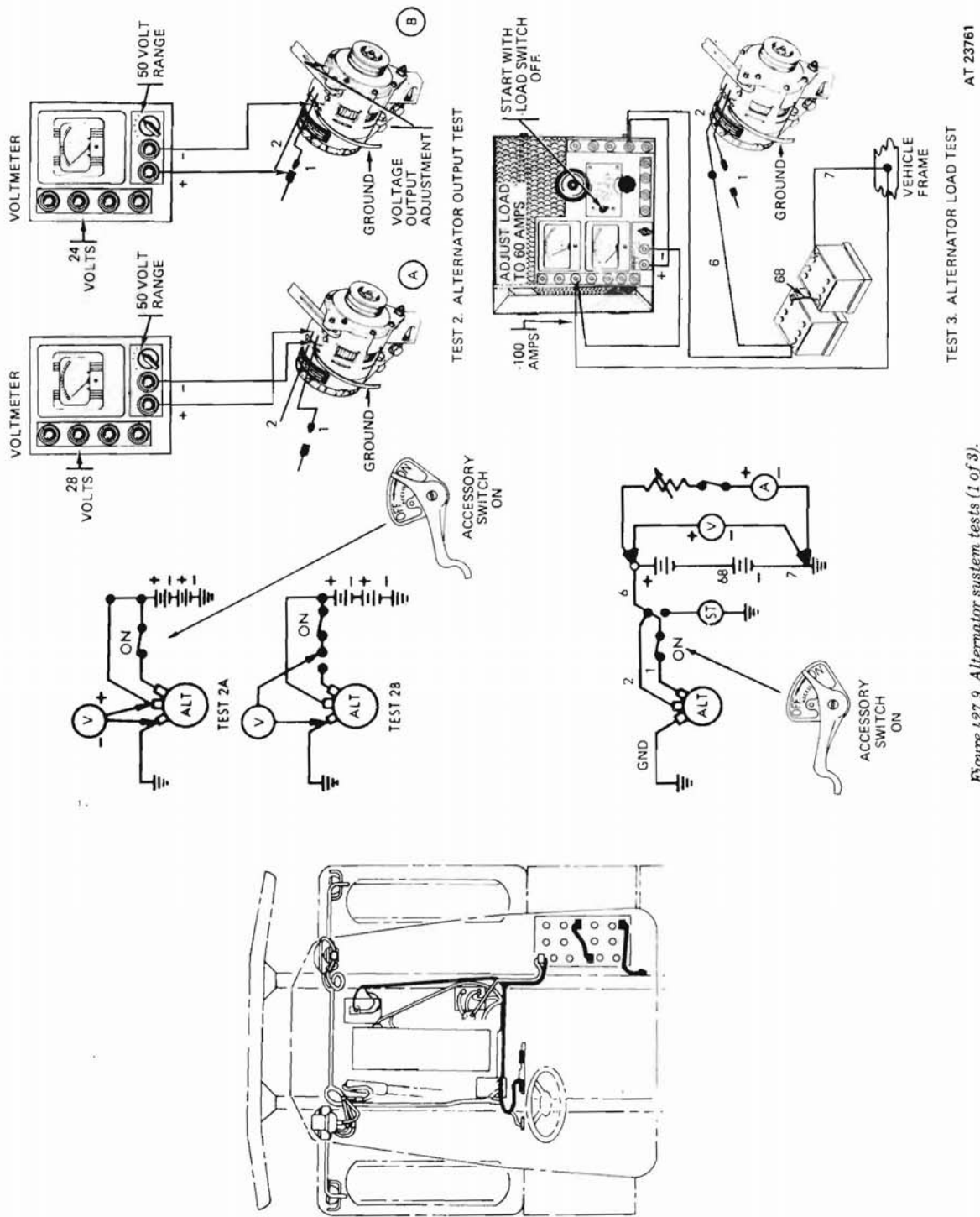
## ALTERNATING SYSTEM

Malfunction	Circuit	Test
Alternator not charging	1, 2, Gnd.	<p><b>Caution:</b> It is very important that the following precautions be observe to prevent damage to the alternator.</p> <ol style="list-style-type: none"> <li>1. NEVER reverse the battery connections. ALWAYS check the battery connecting cables with a voltmeter before any attachments are made to be sure that the negative cable will be connected to the alternator frame and not the positive terminal. Reversal will immediately burn out the alternator rectifiers. Avoid reverse polarity by making sure that battery and alternator hook-ups are positive-to-positive and negative-to-negative.</li> <li>2. Booster batteries for cold weather starting must always be properly connected. Make sure that the negative cable of the booster battery connects to the negative terminal of the vehicle battery, and the positive cable to the positive terminal. If in doubt, use a voltmeter to check. NEVER make a trial connection by "flashing" the cable.</li> <li>3. There is not much chance of getting a battery that has been charged in reverse. It has been known to happen. This condition of reverse polarity could possibly destroy the alternator. Always check a freshly charged battery before putting it in the vehicle with a voltmeter for reverse polarity.</li> <li>4. Always disconnect the battery cables before connecting a fast charger to the battery.</li> <li>5. NEVER ground (short circuit with screwdriver) the alternator output terminal. The internal resistance is very low, and an external short circuit will overload the regulating and generating circuits, resulting in burnout.</li> <li>6. NEVER operate the alternator with the accessory sensing terminal (cable No. 1) energized unless a load is connected to the alternator output.</li> <li>7. NEVER try to polarize an alternator. It is not necessary, and could result in expensive damage.</li> <li>8. NEVER disconnect battery with engine running.</li> <li>9. Be careful when installing the positive output (cable No. 2) that goes to the battery. The cable terminal lug is larger and more rounded on one side. This side goes up. Improper installation of this cable could short-out the alternator.</li> <li>10. NEVER use the alternator for a step or foot rest while working in the engine compartment. Pressure on the terminal protector cover could mesh the cover down on the output terminal and short circuit the alternator.</li> </ol> <p><i>Note.</i> Prior to testing, start and run engine at fast idle until normal temperature is reached.</p> <p><i>Test 1. Make a visual inspection.</i> Check belt tension, loose terminals on alternator, batteries and starter. Also, look for frayed or broken wires, corrosion or any other visible signs of damage deterioration, or maladjustment. Make any required repairs before proceeding with further tests.</p> <p><i>Note.</i> Test the battery for proper charge before testing the alternator.</p> <p><i>Test 2. Perform alternator output tests.</i> Start the engine and operate for 15 minutes at high idle (1000 — 1200 rpm). Connect the voltmeter (circuit tester) from the alternator output terminal (cable no. 2) as shown in figure 427.9, test 2A. The voltmeter should indicate 28 plus or minus 1 volt. If the voltage reading is less than 27 volts, stop the engine and note the voltage indicated. If the voltage reading remains the same as when the engine was running, disconnect the accessory lead (cable no. 1). Connect the test lead from the voltmeter at the alternator ground terminal to the end of lead (cable No. 1) from the accessory switch, as shown in test 2B. Turn on the accessory switch (DO NOT START THE ENGINE). The circuit tester should indicate 24 plus or minus 1 volt. If the voltmeter indicates no voltage or very low voltage, repair or replace cable No. 1, and re-test. If 24 volts is now indicated, reconnect the accessory lead wire (cable No. 1) to the alternator accessory terminal. Repeat the alternator output test above. If the alternator voltage reading is greater than 28.5 volts, or less than 27.5 volts, remove the pipe plug from the</p>



Table 10. Electrical Troubleshooting (M44A2) — Continued  
 ALTERNATING SYSTEM — Continued

Malfunction	Circuit	Test
Alternator not charging	2, 6	<p>front flange of the alternator. Adjust the output control with screwdriver until the voltmeter indicates exactly 28 volts. If the voltage cannot be adjusted to this voltage figure, replace the alternator.</p> <p><i>Test 3. Perform alternator load test.</i> Connect the low voltage circuit tester as shown in figure 427.9, test 3. Be sure the voltmeter is set on the 50 volt range, the ammeter on the 100-ampere range, and the load bank switch turned to the "OFF" position. Set the course load control to "OFF" minimum counterclockwise position. Start the engine. Set the load bank switch to "ON" position and adjust the load control until the ammeter indicates 60 amperes. Note the voltmeter indication at this time. If the voltmeter indicates slightly less than 28 volts, remove the pipe plug at the front of the alternator and adjust the output control with screwdriver to exactly 28 volts, perform the cable tests (test 4, below).</p>



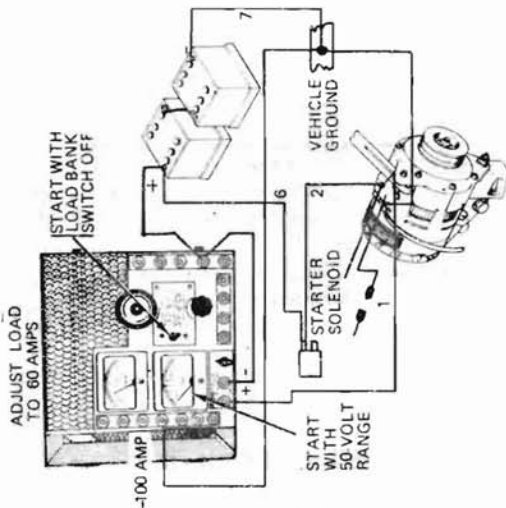
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TEST 3. ALTERNATOR LOAD TEST

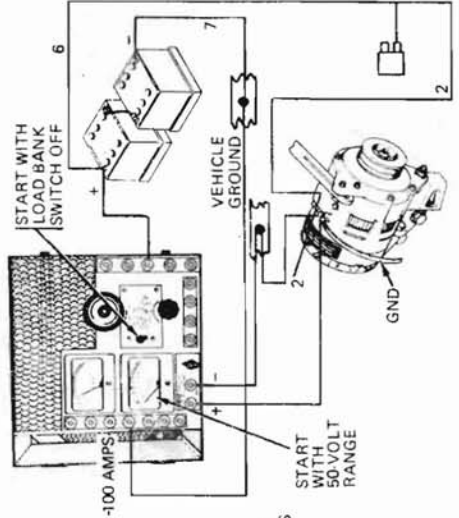
Figure 427.9. Alternator system tests (1 of 3).

Table 10. Electrical Troubleshooting (M44A2) — Continued  
 ALTERNATING SYSTEM — Continued

Malfunction	Circuit	Test
Alternator not charging	2, 6	<p><i>Test 4. Perform alternator-to-battery cable test.</i> Connect the low voltage circuit tester as shown in figure 427.9, test 4. Start the engine and run for 15 minutes at high idle (1000-120 rpm). Turn the load bank switch to "ON" and adjust load bank control until 60 amperes is indicated on the ammeter. Connect the voltmeter from the alternator output terminal stud (cable No.2) to the positive battery post. Adjust the voltmeter range switch until a reading is obtained or the 1-volt range is reached. If the meter reading exceeds 1.0 volt, turn off engine and examine all connections between the alternator and battery for loose connections, frayed wires and dirt. Clean and tighten all connections. Repeat the test. If the total voltage drop is still more than 1.0 volt, connect one voltmeter lead directly on the alternator terminal bolt, and successively touch each point (alternator cable, accessory switch cable, and battery cable terminal). As each test point is touched, a small voltage drop of about 0.1 should be seen. If there is a sudden voltage jump at any connection touched, investigate the previous connection or cable. When a 1.0 volt or less drop has been obtained, and the alternator output is still much less than the 27 volts as in test 3, perform the alternator ground cable test (test 5, below).</p>
Alternator not charging	2, 6	<p><i>Test 5. Perform alternator ground cable test.</i> Set up equipment as described in test 4 above. Connect the voltmeter from the negative battery terminal (scraped well) to the ground terminal on the alternator. (Be sure to touch the terminal, not the cable end).</p>



TEST 4. ALTERNATOR-TO-BATTERY CABLE TEST



TEST 5. ALTERNATOR GROUND CABLE TEST

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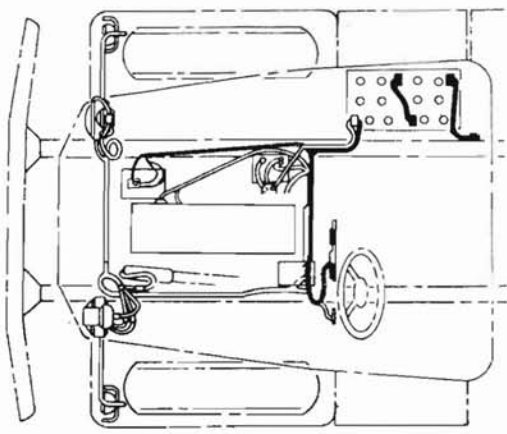
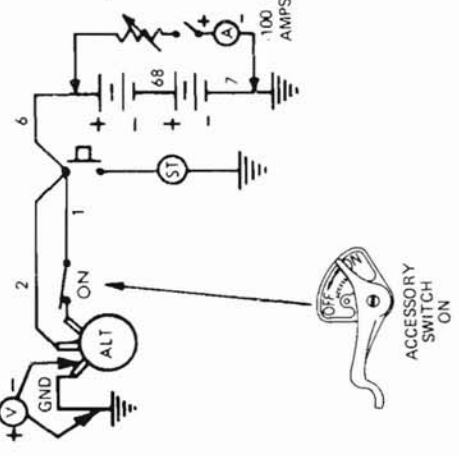
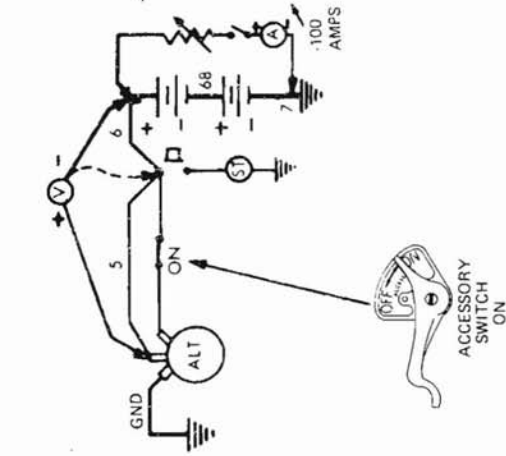
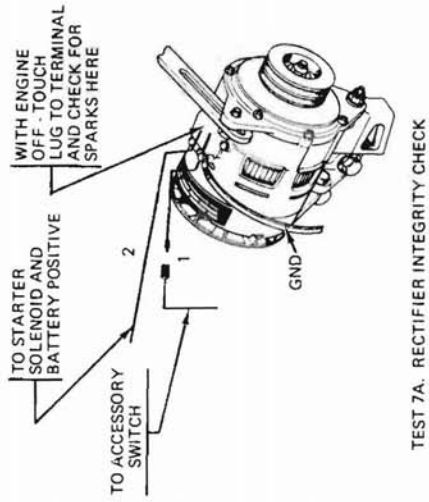


Figure 427.9. Alternator system tests (2 of 3).

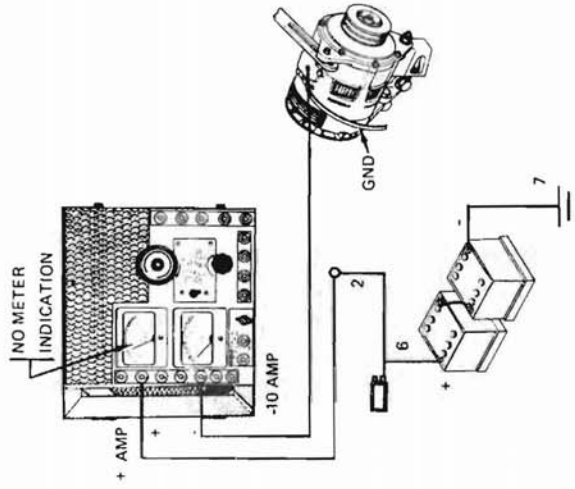


Table 10. Electrical Troubleshooting (M44A2) — Continued  
 ALTERNATING SYSTEM — Continued

Malfunction	Circuit	Test
<p>Alternator not charging</p> <p>Alternator not charging and battery discharges even if vehicle is not in use</p>	<p>1, 2, 6, 7 gnd.</p>	<p>Start the engine and run for 15 minutes. Adjust the load bank (as in Test 4, above) for 60 amperes. The voltmeter should read less than 0.1 volt. If voltage reading is greater than 0.1 volt, investigate and clean the alternator ground cable. If necessary, repeat the alternator load test, (3, above).</p> <p><i>Test 6. Battery cable test.</i> Refer to test numbers, 3, 4, figure 427.9, and test number 6. When all cables have been tested and repaired, repeat the alternator load test (3 above). If the alternator output is still giving erroneous readings, and cannot be adjusted to 28 volts, replace the alternator.</p> <p><i>Test 7. Perform the alternator rectifier integrity (unity) test.</i> Be sure the engine and accessory switch are in the "OFF" position. Remove the cable from the alternator output terminal as shown in figure 427.9, test 7A.</p> <p>A. Touch the cable to the terminal in a darkened area. If there is any indication of sparking, one or more rectifiers or the radio suppression filter is defective. If no sparks appear, connect the ammeter in the line (fig. 427.9, test No. 7A).</p> <p>B. Touch the ammeter test lead to the output terminal of the alternator. (fig. 427.9, test No. 7B). There should be no indication on the meter except a small jump at the moment of connection. If there is any meter indication, the alternator has internal leakage and will discharge the battery in a day or two, depending on the severity of the leakage. If the meter has no indication, reinstall the cable and tighten securely.</p>



TEST 7A. RECTIFIER INTEGRITY CHECK



TEST 7B. RECTIFIER INTEGRITY CHECK (METER TEST)  
AT 23763

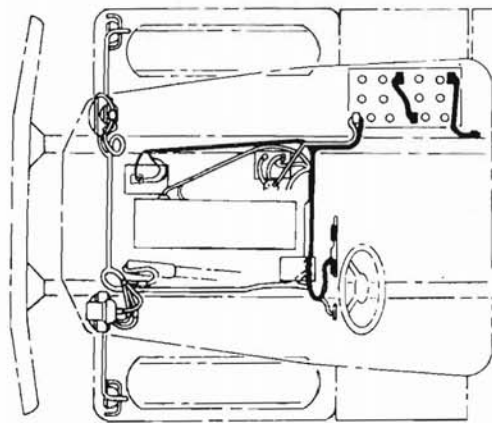
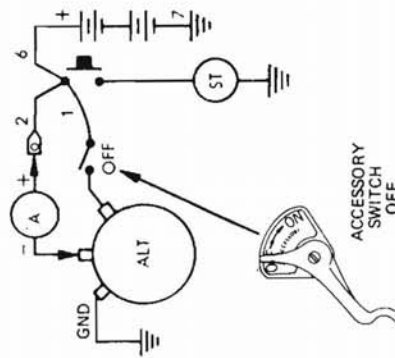
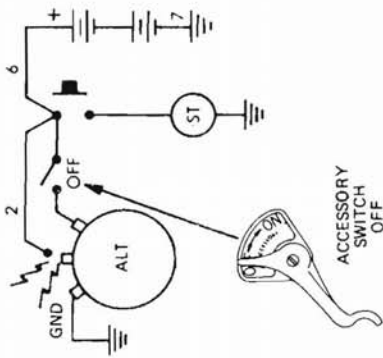


Figure 427.9. Alternator system test (8 of 8).

## Section V. CONVERSION PROCEDURES

### 412. Horizontal to stack exhaust system

(fig. 427.10)

#### NOTE

The exhaust conversion is not applicable to water tanker (M50A2). Refer to paragraph 402 for these trucks.

#### a. Description and General Information.

(1) *Description.* The exhaust system consists of an engine mounted elbow, front exhaust pipe, reverse flow muffler, flexible tube, stack pipe and stack pipe extension. These components are connected by "V" band couplings and gaskets to prevent exhaust leakage and provide ease of maintenance. A shield, mounted to the machinegun mounting bracket and around the stack pipe, protects personnel. The exhaust system is devised to disperse the heavy fumes of burned fuel above and to the side of the roadway.

#### (2) *General information.*

(a) Hardware used in exhaust system which is subject to exhaust heat shall be zinc plated.

(b) Fuel tankers and tractors use a different muffler, clamp and strap than other trucks.

#### b. Conversion Procedure.

(1) Remove horizontal exhaust system in accordance with section III, chapter 5.

(2) Clean and inspect the exposed surfaces of the exhaust manifold elbow for pits and cracks. If replacement is necessary, obtain through regular supply source.

(3) Cut a 4¼-inch hole in the right front fender. Drill 2 holes (11/32 inch) in the front transfer transmission frame crossmember. (For dimensions refer to fig. 427.10.)

#### NOTE

All numbers in parentheses are key numbers referred to in figure 427.10.

(4) Assemble the muffler support bracket (3) and support strap (4) using mounts (2), screws (1) washers (5), and nuts (6). Attach assembly to front side of transfer crossmember, using bolts (7) and nuts (8).

(5) Place muffler support clamp (23) in position on the muffler (24) and install muffler by attaching support strap (4) to support clamp (23)

using screw (22) and nut (25). Do not tighten clamp until all alignments are accomplished.

(6) Place gasket (31) in position on the muffler outlet (24) and secure the flexible outlet tube (26) to muffler using "V" band coupling (33), screw (34), and nut (32).

#### NOTE

Install the muffler with the outer rim ¾-inch back from the rear edge of the front running board and battery box support. The muffler intake (larger opening) should be centered directly below the muffler outlet.

#### CAUTION

Flex tube is not intended to be bent to correct misalignment. Flex tube must be installed in straight line alignment.

(7) Remove the two existing mirror mounting bracket screws and the two existing screws in the forward edge of the gun mount bracket. Place stack exhaust support bracket (10) in position and replace the four screws.

(8) Place exhaust pipe (20) into position between manifold elbow and muffler. Install gasket (17) and attach exhaust pipe to elbow using bolts (18) and nuts (19). Torque nuts to 25-35 foot pounds after alignment is accomplished. Install gasket (30) and "V" band coupling (27) and secure, using screw (28) and nut (29).

#### NOTE

Do not secure shields on fender until installation is complete.

(9) Place top (14) and bottom (15) fender shields in position with the hole in the fender. The top shield (larger diameter screw holes) should be placed with the screw holes below the center line of the ellipse. The bottom shield (smaller diameter holes) should be placed with screw holes above the center line of the ellipse. Attach shields to fender loosely using bolts (13) and nuts (16).

(10) Slide the stack pipe (21) up through the fender shields. Place the clamp assemblies (11) in the top and bottom positions of the heat shield (12). Slide heat shield over stack pipe. Attach heat

shield and stack pipe to stack pipe mounting bracket, but do not tighten clamps. Position stack pipe 1 inch above stack pipe mounting bracket. Tighten lower clamp sufficiently to maintain 1 inch elevation. Install gasket (31) between flex tube (26) and stack pipe (21). Attach stack pipe to flex tube using "V" band coupling (33) screw (34) and nut (32). Position stack pipe and muffler to provide 1 inch clearance between flex tube and exhaust pipe from engine.

(1) Install stack pipe extension (9) so outlet is out and back at a 45 ° angle to the centerline of the truck. Tighten the upper stack pipe heat shield clamp (11). This secures stack pipe extension to stack pipe, and stack pipe and heat shield to stack pipe bracket. Tighten muffler support clamp (23).

(12) Secure fender shields and check installation for clearances referenced, security of mounting, and security of connections. Start engine and check system for operation and exhaust leaks.







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### 412.1. Radiator Stone Shield Kits

a. The radiator stone shield kits described below are installed on all M44A1 and M44A2 series trucks to protect the radiator core from being damaged by stones and other foreign objects. Two kits are available; one for trucks without front winch, and one for trucks with front winch.

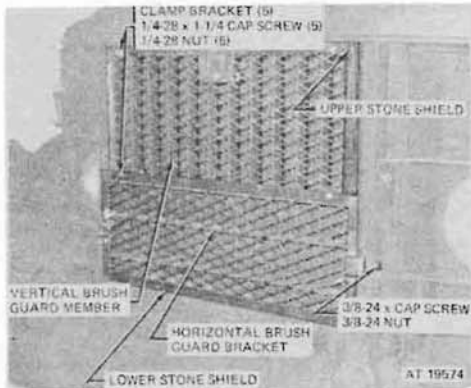


Figure 427.11. Stone shield kit (11609946-1)—installed.

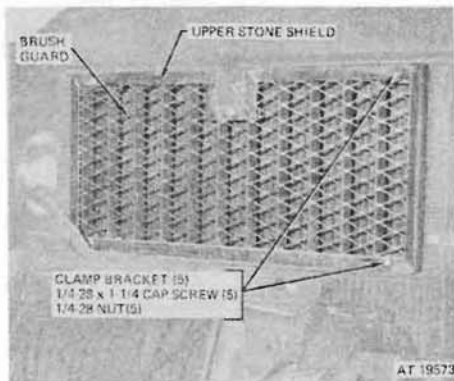


Figure 427.12. Stone shield kit (11609946-2)—installed.

b. Stone shield kit (11609946-1)(fig. 427-11) is installed on trucks without winch. This kit contains upper and lower stone shield assemblies, and necessary mounting hardware. The upper stone shield assembly is clamped to the upper center section of brush guard. The lower stone shield assembly is attached to upper stone shield and side of right and left-hand headlight guards.

c. Stone shield kit (11609946-2)(fig. 427.12) is installed on truck equipped with a front winch. This kit contains only the upper stone shield assembly and necessary mounting hardware. The lower stone shield assembly is not required for this truck application. (Fig. 427.11)

### 412.2. Installation of Stone Shield Kit (11609946-1)

a. Install upper stone shield assembly. Position shield assembly against brush guard. Attach upper portion of shield to vertical brush guard members with three clamp brackets, 1/4-28UNF-2A x 2 cap screws, and 1/4-28UNF-2B self-locking nuts, placing clamp brackets against radiator side of brush guard members.

b. Install lower stone shield assembly. Remove and discard existing cap screw and nut, attaching each end of top horizontal brush guard bracket to brush guard. Position lower stone shield assembly against brush guard. Attach top horizontal brush guard bracket and bracket on each end of stone shield to brush guard with 3/8-24UNF-2A x 1 1/4 cap screws and 3/8-24UNF-2B self-locking nuts provided with kit. Attach top member of lower stone shield to upper stone shield with two clamp brackets, 1/4-28UNF-2A x 2 cap screws, and 1/4-28UNF-2B self-locking nuts as shown in figure 427.11.

## Section VI. ELECTRIC HORN TO AIR HORN

### 412.3 Air Horn

a. All current series military vehicles being manufactured have dual air operated horns. These horns are electrically controlled. The air horns are mounted on the right fender splash apron. Earlier model vehicles were equipped with an electric horn mounted on the right side headlight bracket. Older models still in service that are equipped with the electric horn may be re-equipped with air horns. A listing of components that are to be furnished are described in TM 9-2320-209-20P. Installation can be accomplished by following the

procedure steps indicated below.

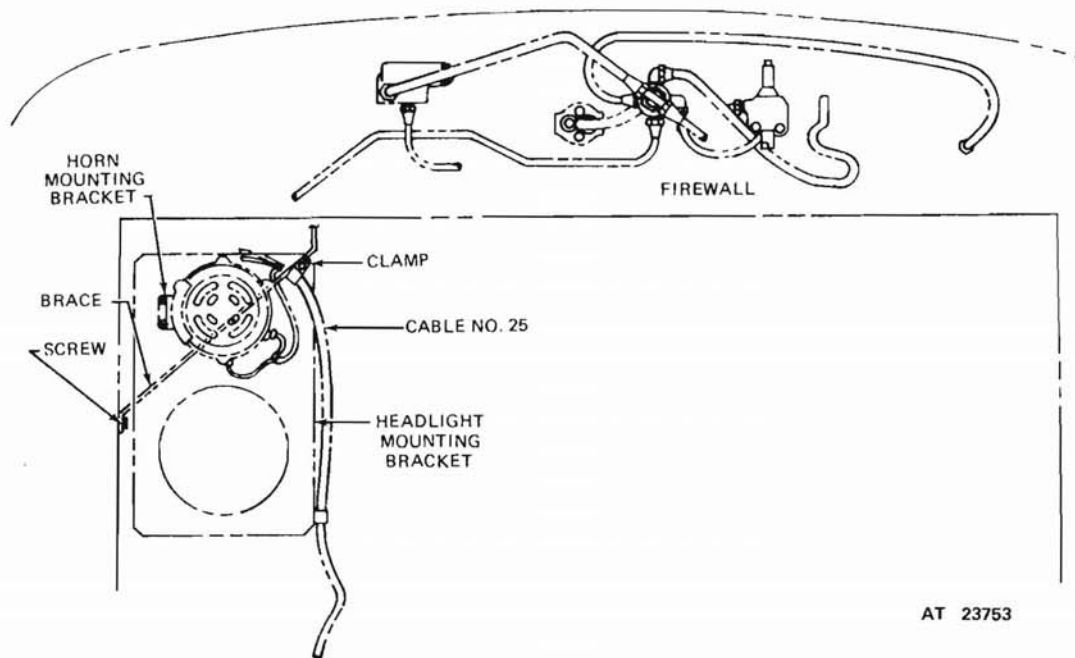
b. Remove electric horn (fig. 427.13).

(1) Refer to paragraph 135b, for removal procedure.

(2) After removing the electric horn and mounting bracket, remove clamp on headlight bracket holding cable No. 25.

(3) Remove screw at fender splash apron holding brace to headlight bracket.

(4) Install grille cover over horn opening on headlight bracket and secure with four- $\frac{1}{2}$  hex-head cap screws and four  $\frac{1}{4}$ -inch self-locking hex-nuts (fig. 427.15).



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Figure 427.13. Electric horn installation.

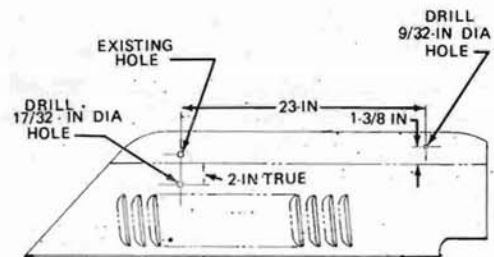
c. Preliminary procedure for air horn installation is as follows:

(1) Locate and drill one 17/32-inch diameter hole below existing brace mounting hole on fender splash apron. Drill one 9/32-inch diameter hole; 23 inches back from the existing upper mounting hole, to accommodate clamp that secures tubing on fender splash apron (fig. 427.14).

(2) Position air horn bracket (Ord. No. 10937872) to front holes on fender splash apron. Secure bottom hole on bracket with one 7/8-inch hex-head cap screw, flatwasher, and 3/8-inch self-locking nut. Position split lockwasher and one 1-inch hex-head cap screw to headlight bracket brace and air horn bracket. Tighten securely to fender splash apron. In case the vehicle is equipped with the 100-ampere alternator kit, install horn mounting bracket (Ord. No. 10937980) that is furnished with the alternator kit (fig. 427.15).

(3) Drain air reservoirs.

(4) Remove the existing tube and connectors between the tee fitting on the air manifold fitting and air governor fitting on engine firewall. Remove connector at bottom of air connector on air governor and install tee. Rotate tee at air manifold fitting on engine firewall to an almost vertical position to accommodate new tubing. Install new tube and connect ends to tee at air manifold firewall fitting and air governor tee (fig. 427.15).



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Figure 427.14. Location of horn mounting holes.

(5) Obtain 64-inch length of tubing and install to the outer end of tee on air governor. Secure tube to engine firewall with clamp, utilizing existing screw on air cleaner bracket. Make minor bends in tubing to accomplish routing of tubing from air governor on engine firewall to air horn. Secure tubing on fender splash apron with clamp, screw, and nut (fig. 427.15).

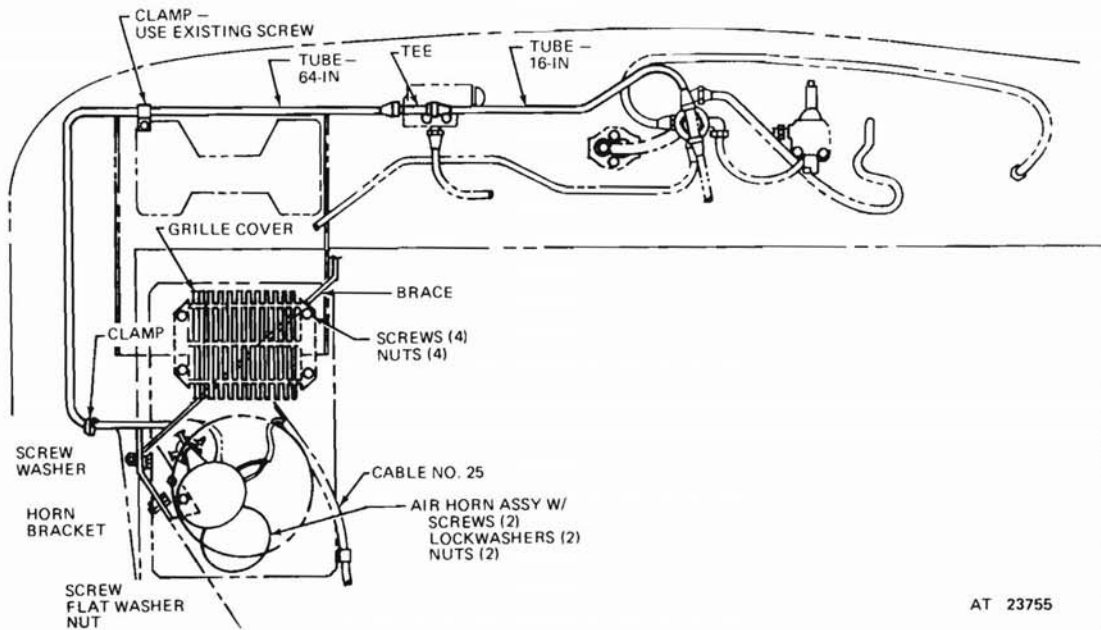
d. Install air horn (fig. 427.15).

(1) Position the dual air horn assembly with solenoid to bracket. Secure with two 1/4-inch hex-

head cap screws, lockwashers, and two 1/4-inch plain hex-nuts.

(2) Place elbow fitting on air horn. Bend and position tubing at elbow fitting on air horns. Secure by tightening connector. Fasten two terminals on cable 25 to connectors on air horn. It may be necessary to splice cable No. 25 in order to reach the new air horn location. Secure cable No. 25 to fender brace with plastic strap.

(3) Operate the vehicle to build up air pressure prior to testing the air horns.




AT 23755

Figure 427.15. Air horn installation.

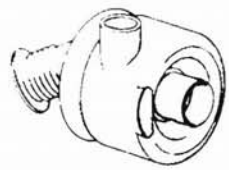
**C 4, TM 9-2320-209-20**

**STARTER**  
(LDS-427-2)  
Autolite MBD-4043UT  
(LD 465-1) Delco Remy 1113904  
(LD 465-1) Leece Neville M0017072 MB



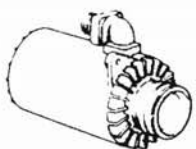
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Autolite — TM 9-2920-236-35  
Delco Remy — TM 9-2920-242-35  
Leece Neville — TM 9-2920-243-35

**TURBOSUPERCHARGER**  
Switzer Model 4-450




Maint. and Parts TM 9-2990-201-45

**GENERATOR**  
Autolite GHA 4802UT  
Delco Remy 1117495



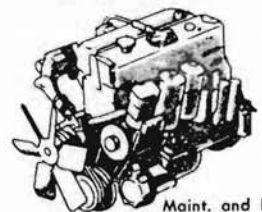
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Delco Remy: TM 9-2920-214-35

**REGULATOR**  
Gov. Standard 8360020  
Delco Remy 1118656




Parts TM 9-2320-209-35P

**ENGINE AND CLUTCH**  
Engine — Military LDS-427-2 & LD465-1  
Clutch — Long 13 CF



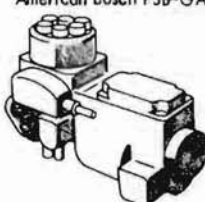
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TM 9-2815-210-35P  
(LDS 427-2) TM 9-2815-204-35  
TM 9-2815-204-35P

**TRANSMISSION,  
TRANSFER AND  
POWER-TAKEOFFS**

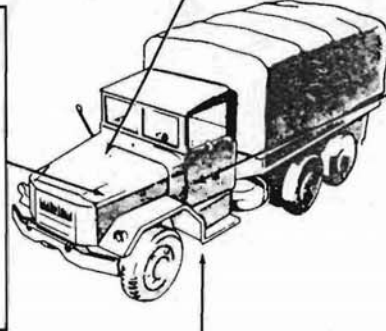


Maint. TM 9-2520-246-35  
Parts TM 9-2520-246-35P

**FUEL INJECTION PUMP**  
American bosch PSB-GA



Maint. and Parts  
(LDS 427-2) TM 9-2910-223-35  
(LD 465-1) TM 9-2910-226-35



LUBRICATION ORDER LO 9-2320-209-12	OPERATOR'S MANUAL TM 9-2320-209-10	ORGANIZATIONAL MAINTENANCE TM 9-2320-209-20	ORGANIZATIONAL PARTS TM 9-2320-209-20P	DIRECT SUPPORT GENERAL SUPPORT AND DEPOT MAINT. TM 9-2320-209-35	DIRECT SUPPORT, GENERAL SUPPORT AND DEPOT PARTS TM 9-2320-209-35P
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**VISUAL PUBLICATIONS REFERENCE**

**MULTIFUEL ENGINE—M44, M44A1 AND M44A2 SERIES, 2 1/2-TON, 6x6 TRUCKS**

ORD E51561

*Visual Guide To Publications—Multifuel Engine Vehicles.*

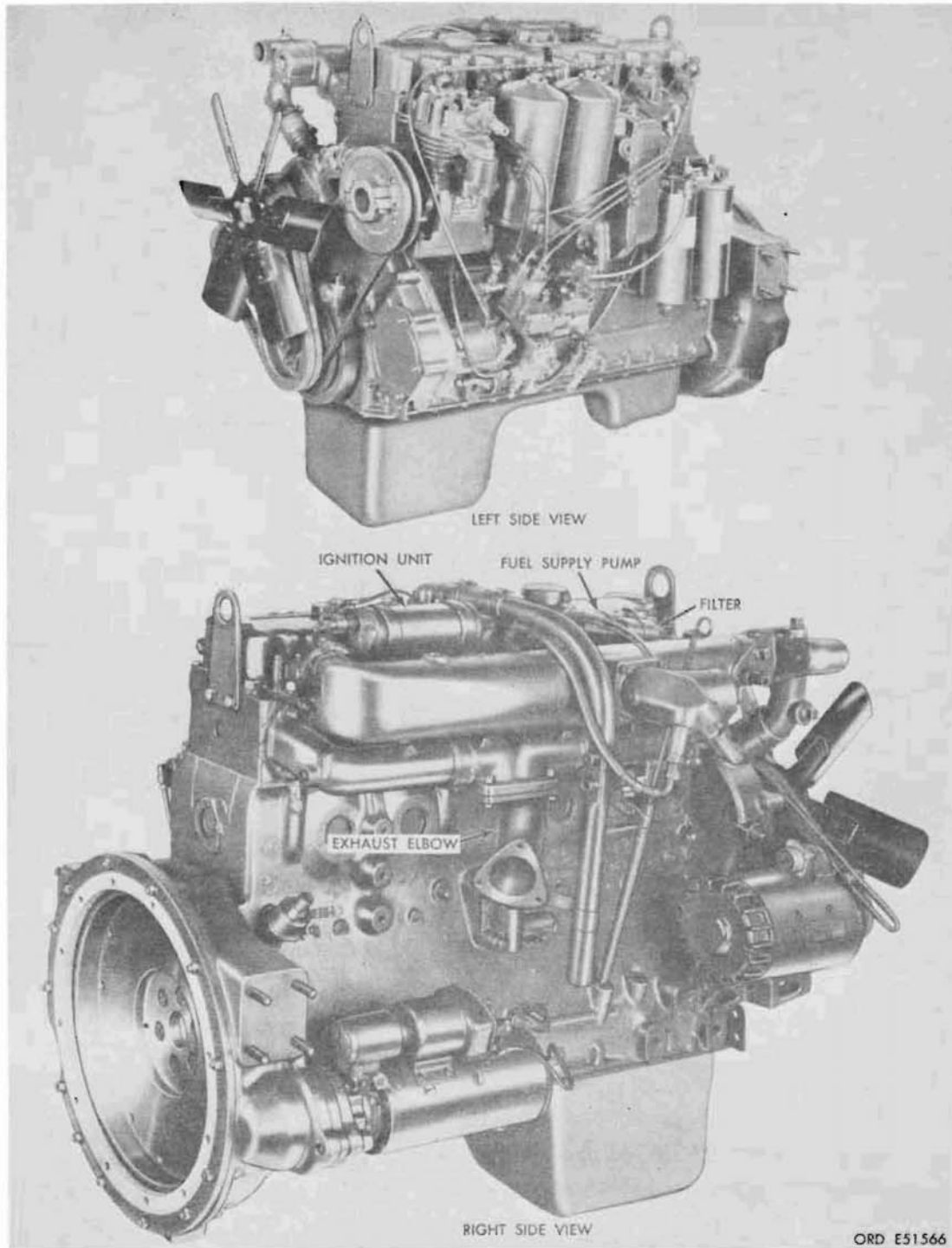


Figure 428. Multifuel Engine LD 465-1.

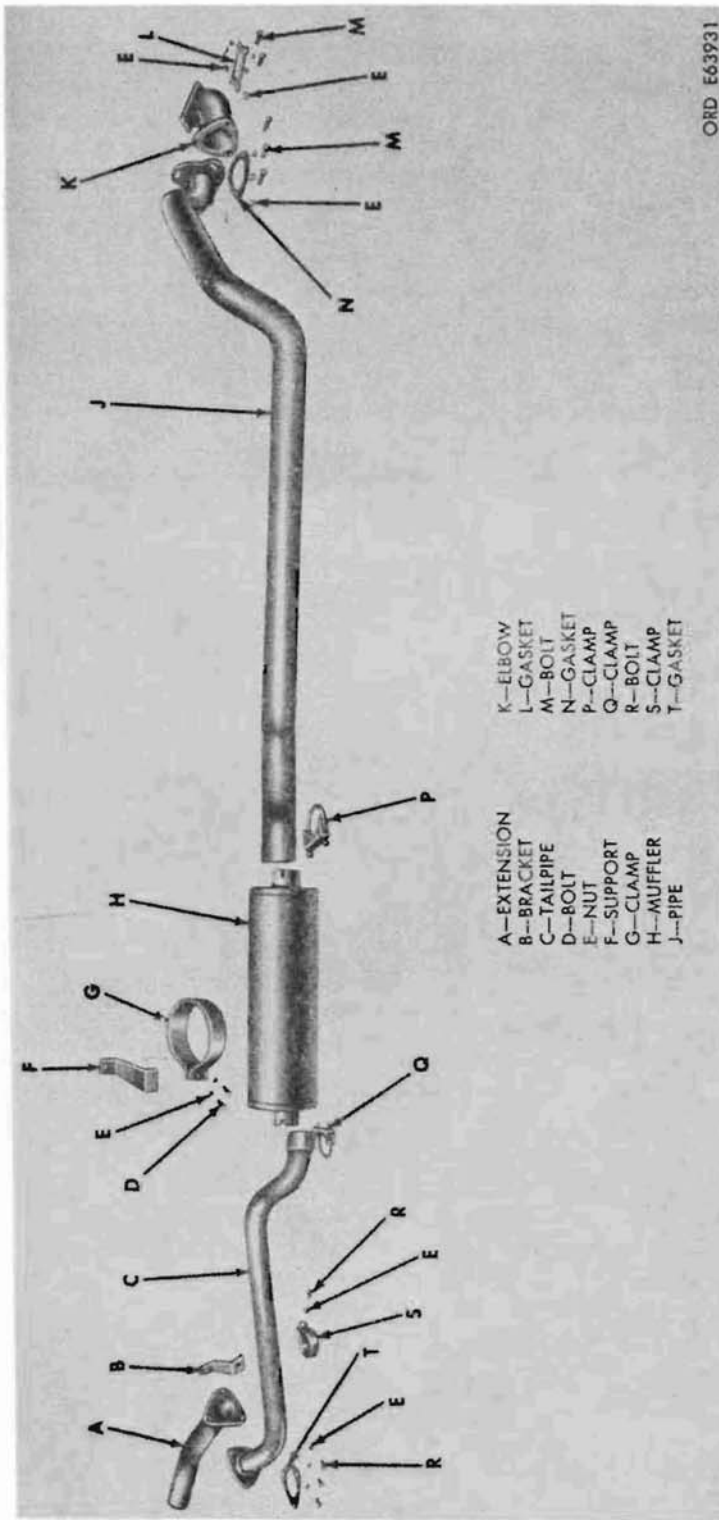


Figure 429. Exhaust System—Exploded View.

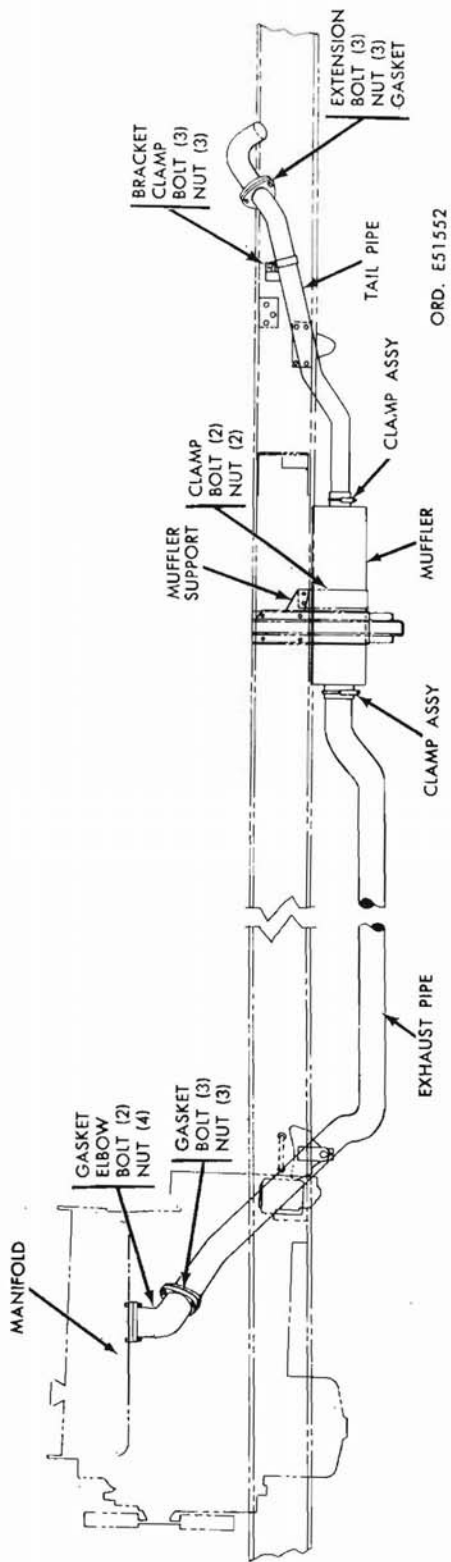
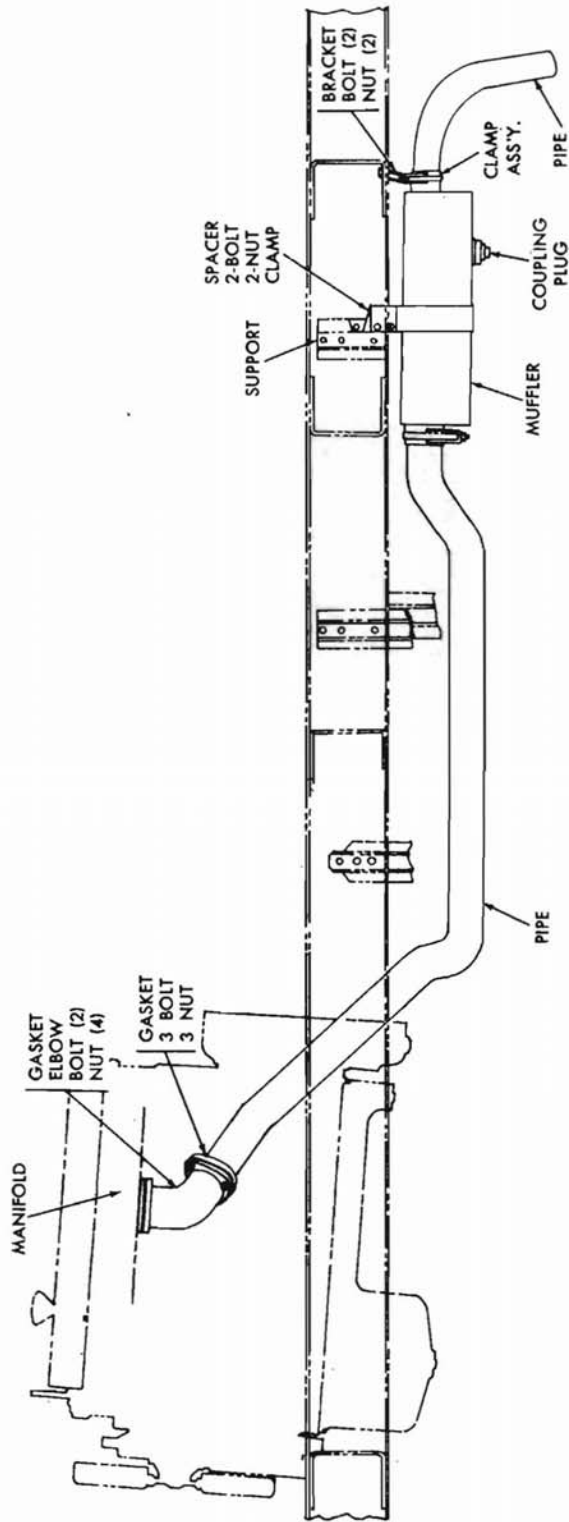


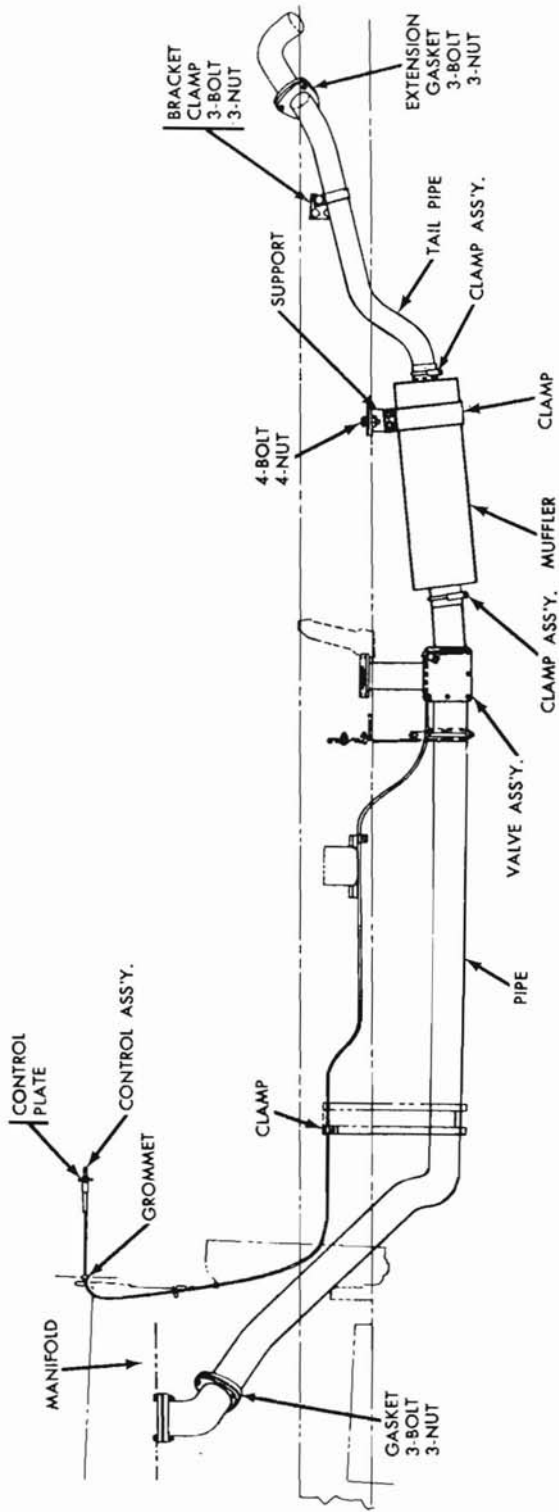
Figure 430. Exhaust System (M95A2).





ORD E51559

Figure 431. Exhaust System (M275A2).



ORD E51560

Figure 432. Exhaust System (M50A2).

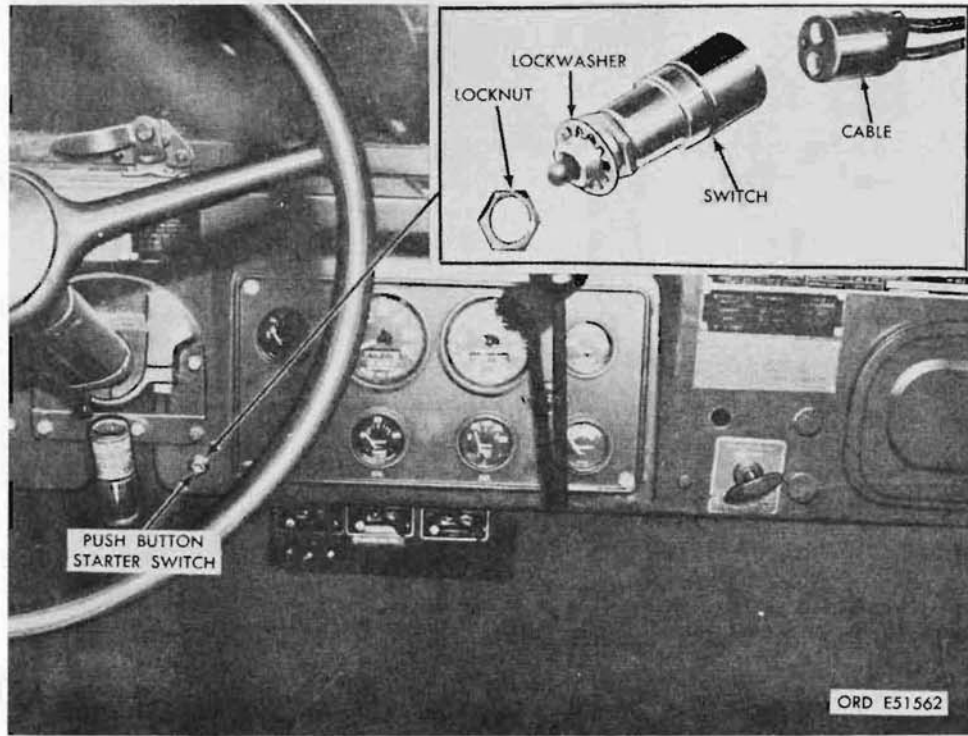


Figure 433. Push-Button Starter Switch.

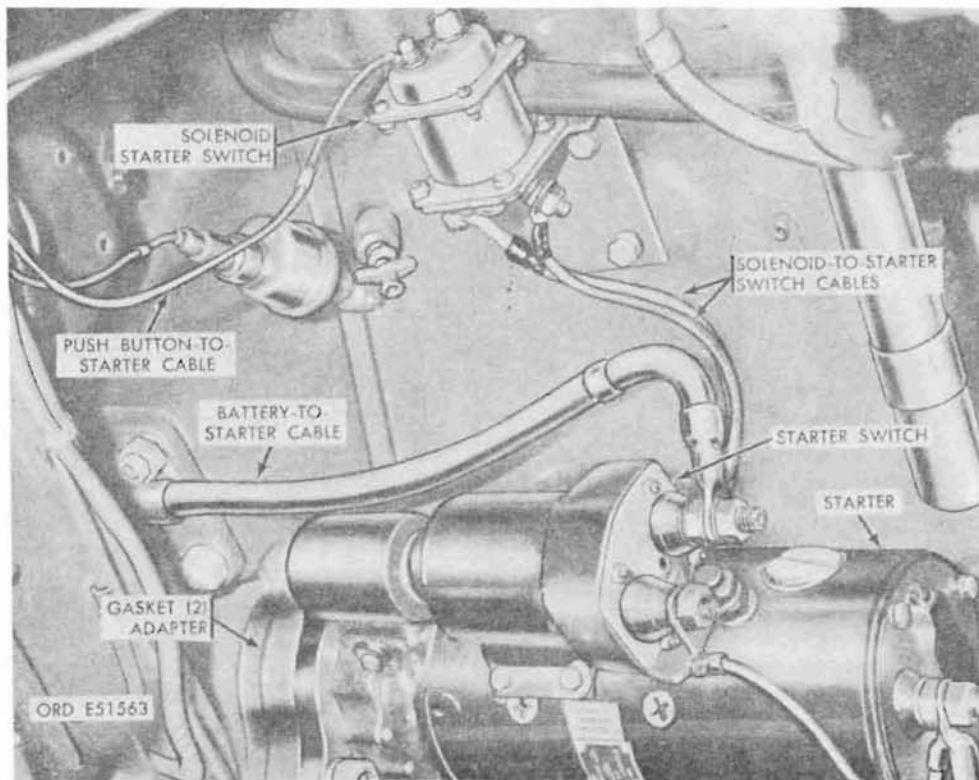


Figure 434. Solenoid-operated Starter (LD 465-1 Engine).

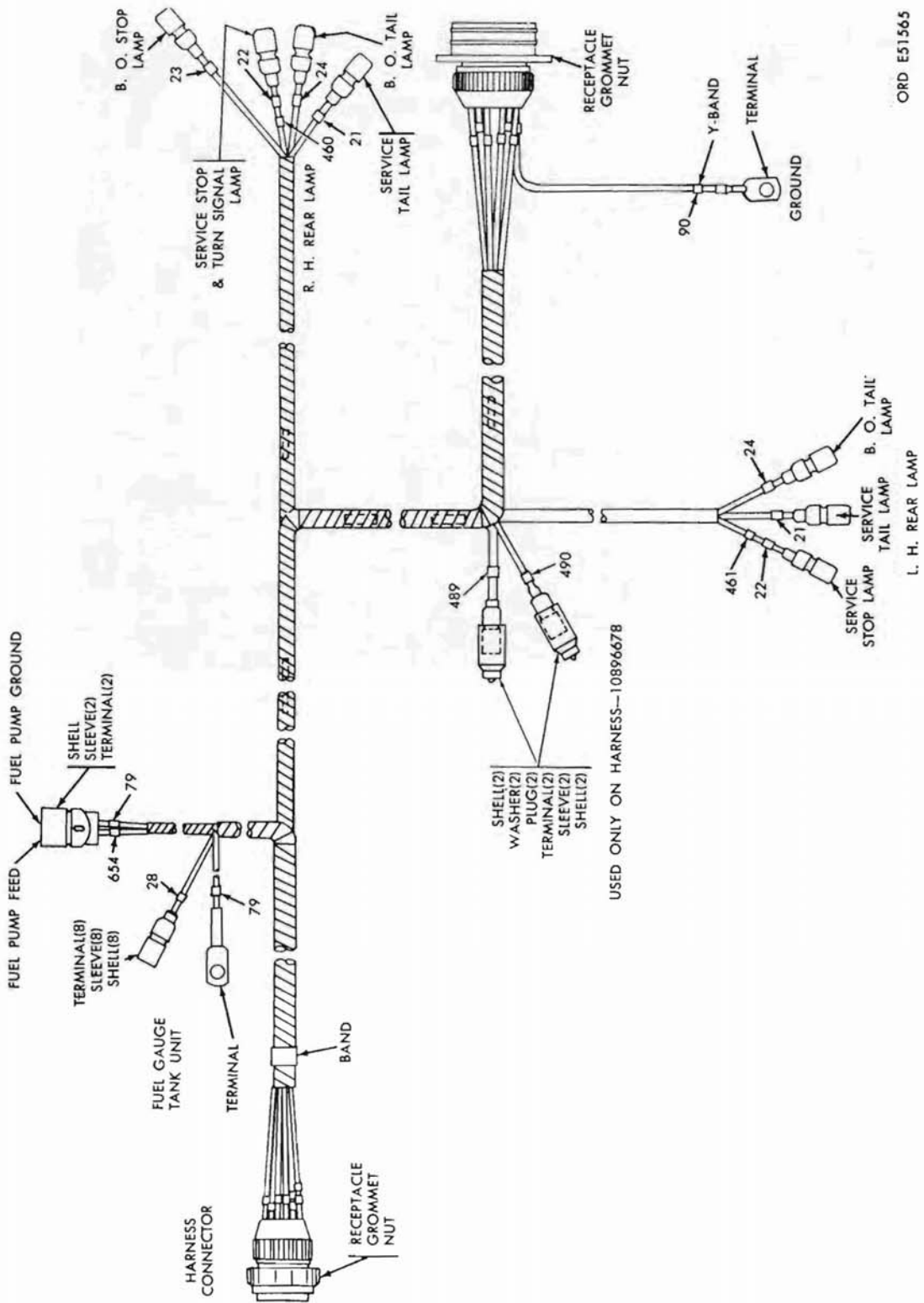


Figure 437. Rear Harness Assembly (M44A2 Series Trucks).

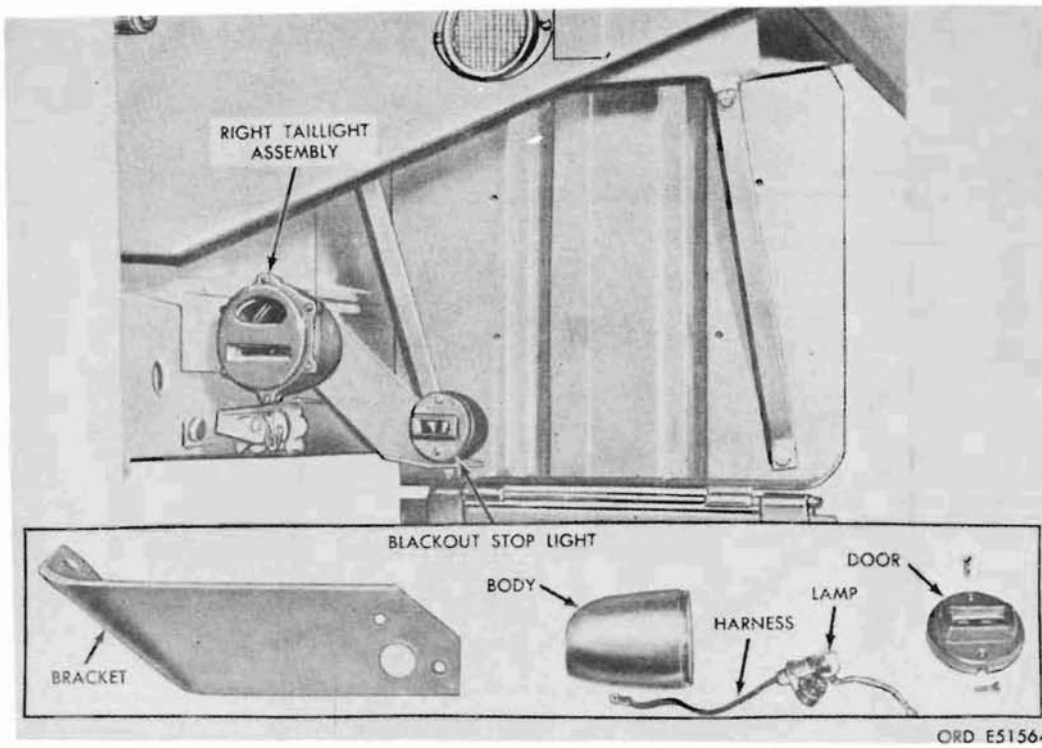


Figure 439. Right Service, Turn, Blackout, Tail, And Stop Lights.

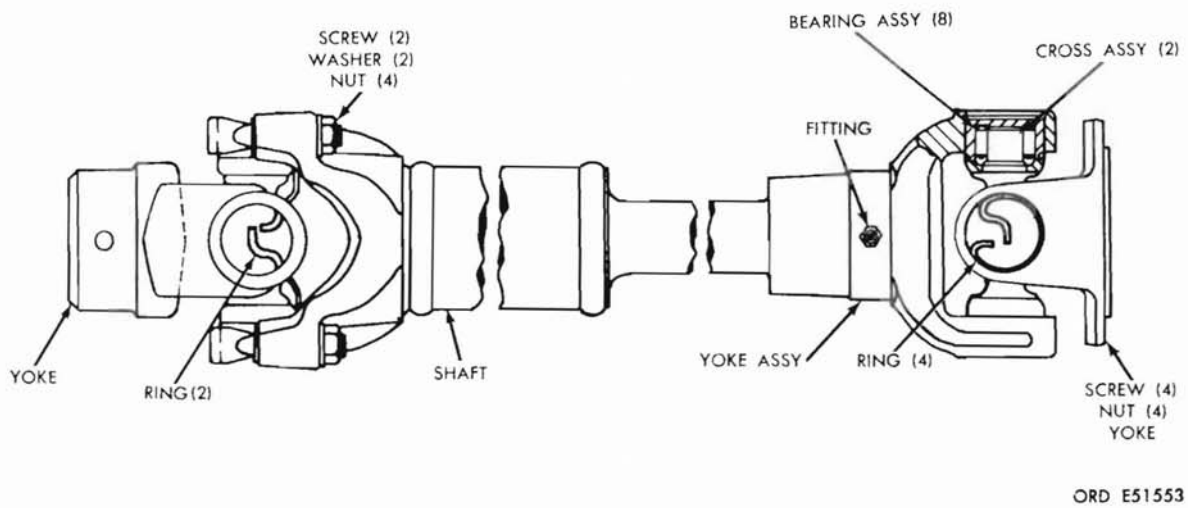
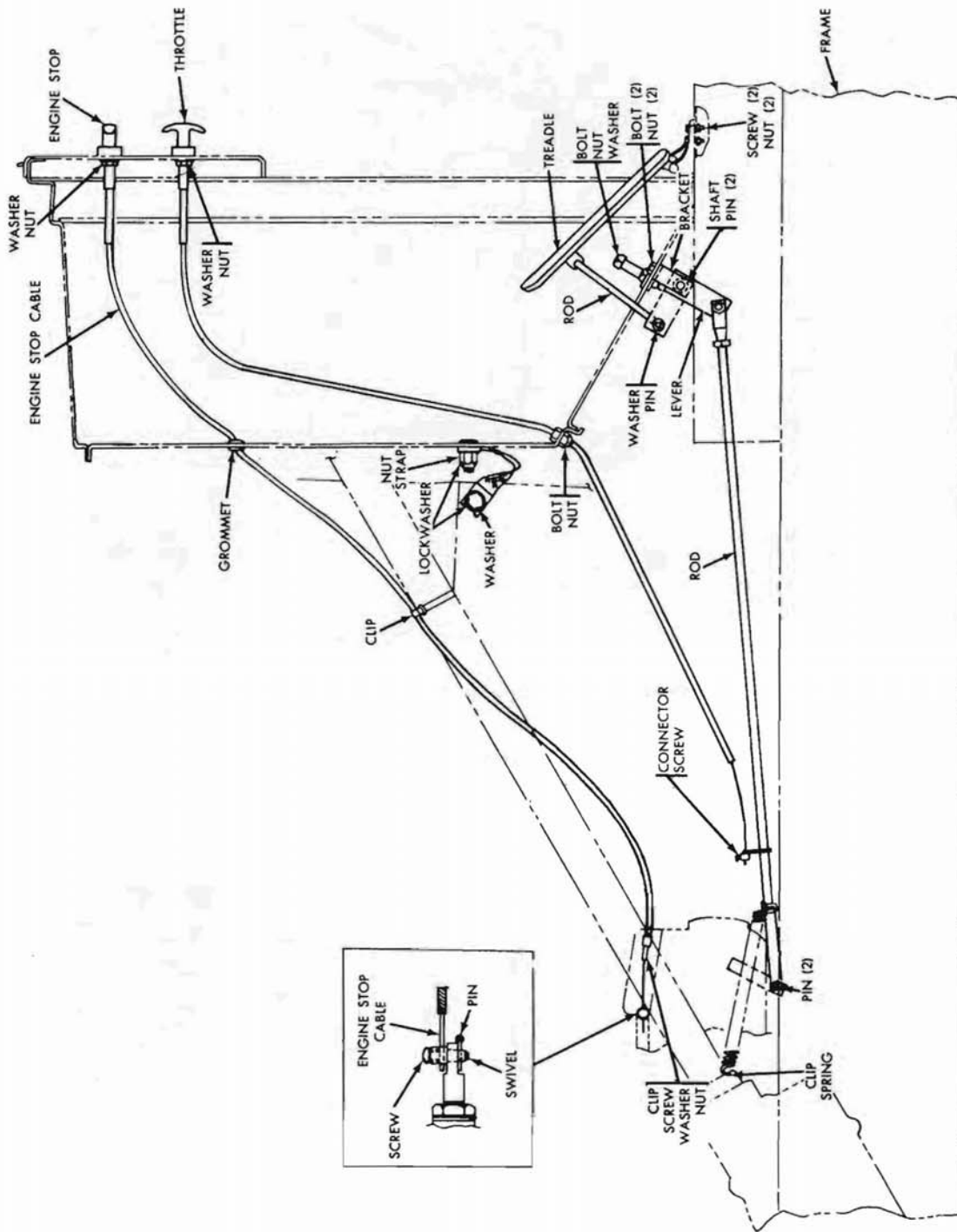
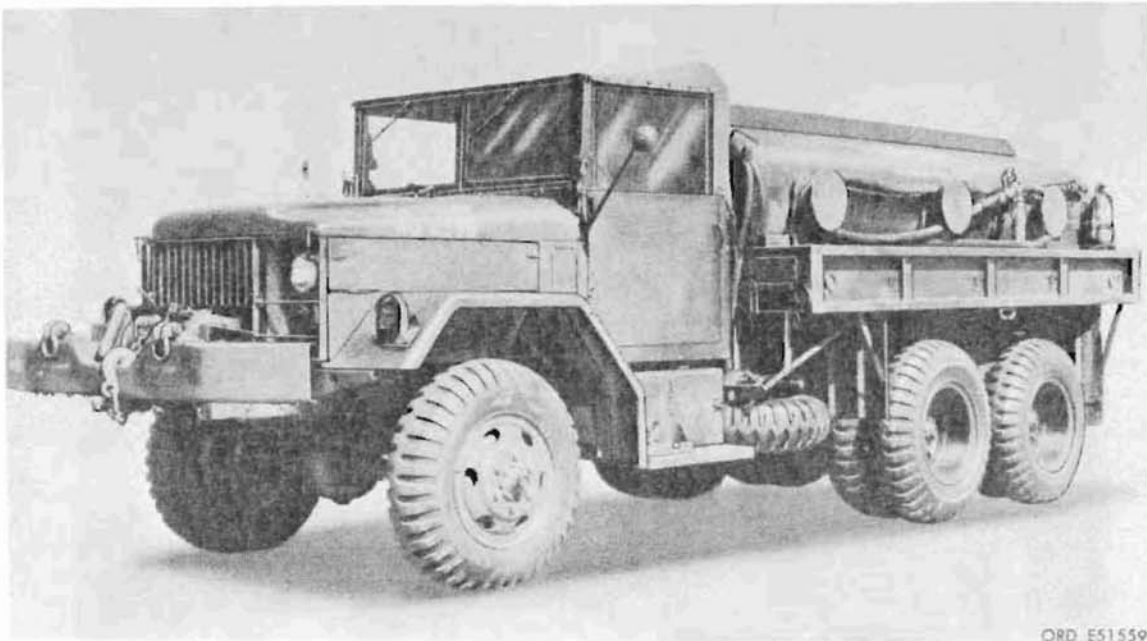


Figure 440. Front Winch Drive Shaft.



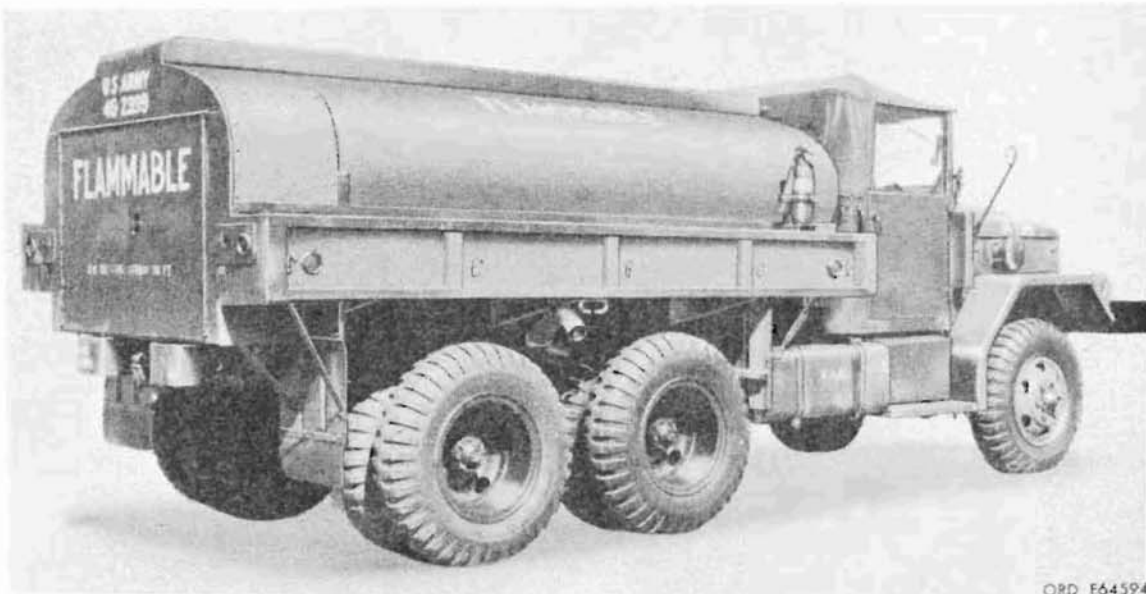
ORD E51567

Figure 441. Throttle And Engine Stop Linkage Assemblies.



ORD E51559

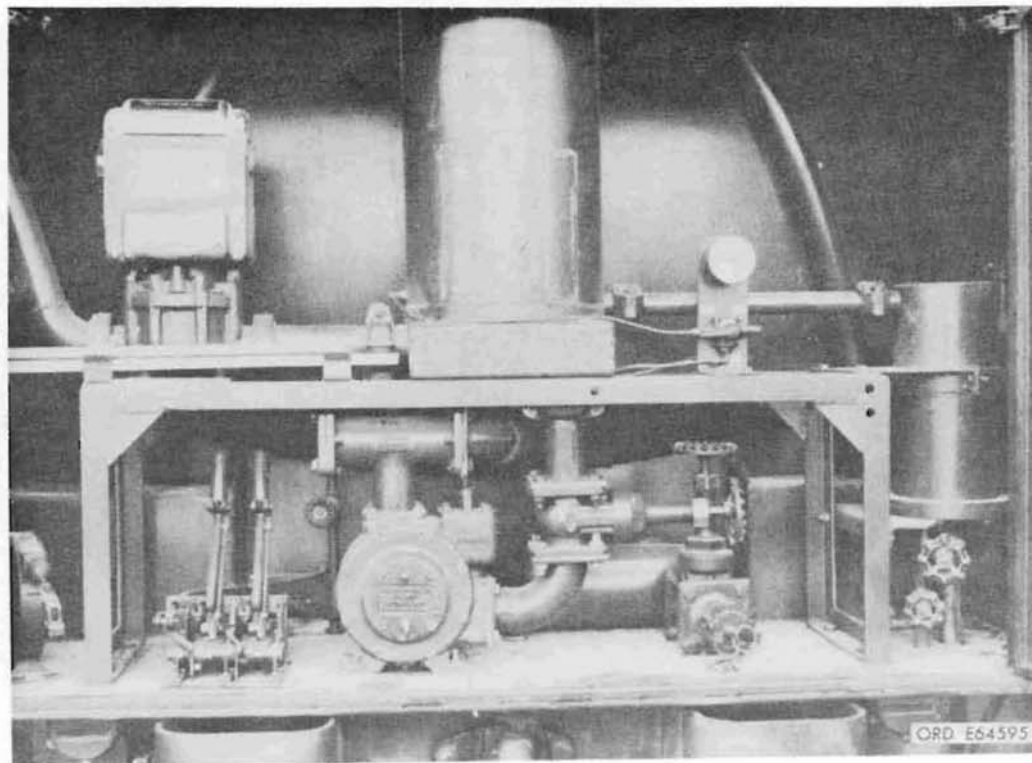
*Figure 442A. Fuel Servicing Tank Truck (M49A2C).*



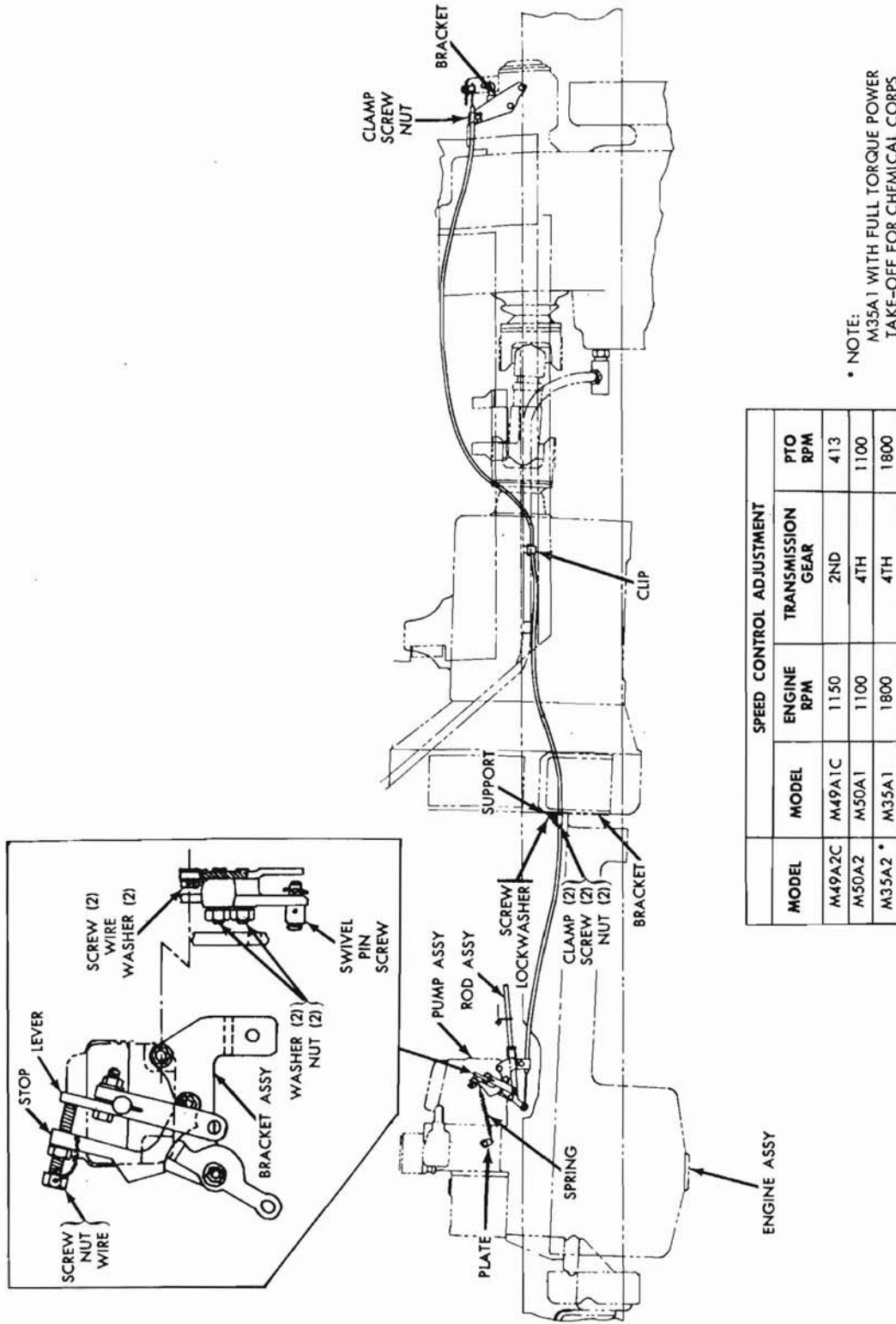
ORD E64594

*Figure 442B. Fuel Servicing Tank Truck (M49A2C).*





*Figure 443. Fuel Delivery Assembly.*



MODEL	SPEED CONTROL ADJUSTMENT			PTO RPM
	MODEL	ENGINE RPM	TRANSMISSION GEAR	
M49A2C	M49A1C	1150	2ND	413
M50A2	M50A1	1100	4TH	1100
M35A2 *	M35A1	1800	4TH	1800

\* NOTE:  
M35A1 WITH FULL TORQUE POWER  
TAKE-OFF FOR CHEMICAL CORPS

ORD E51569

Figure 444. Speed Control Linkage Assembly.

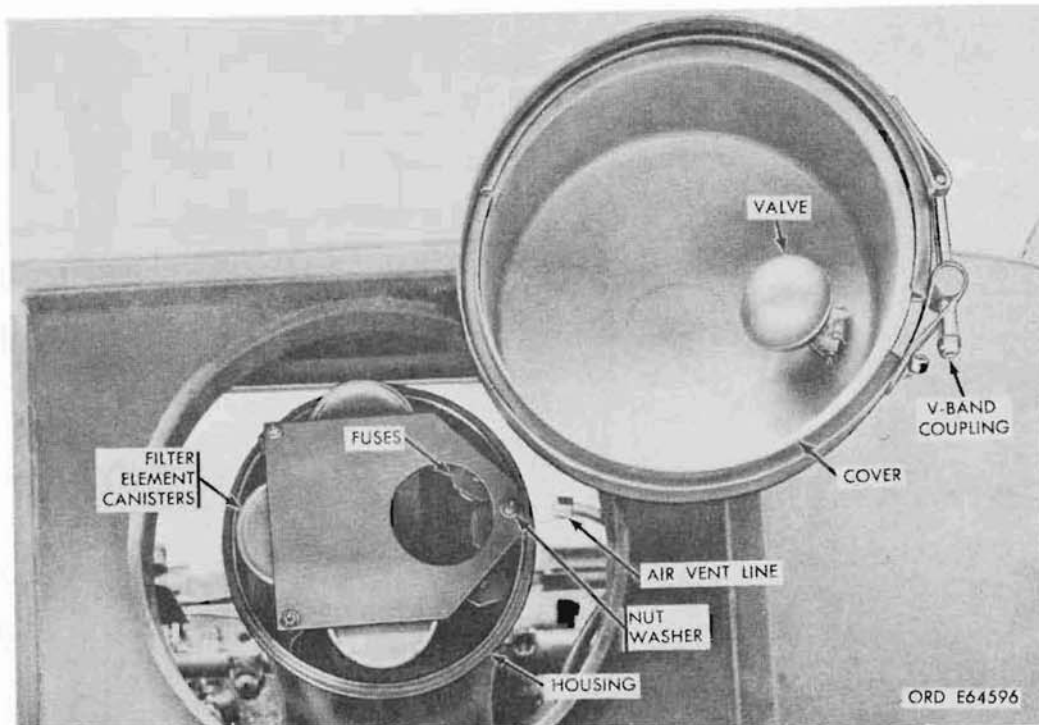


Figure 445. Segregator Assembly—Top View.

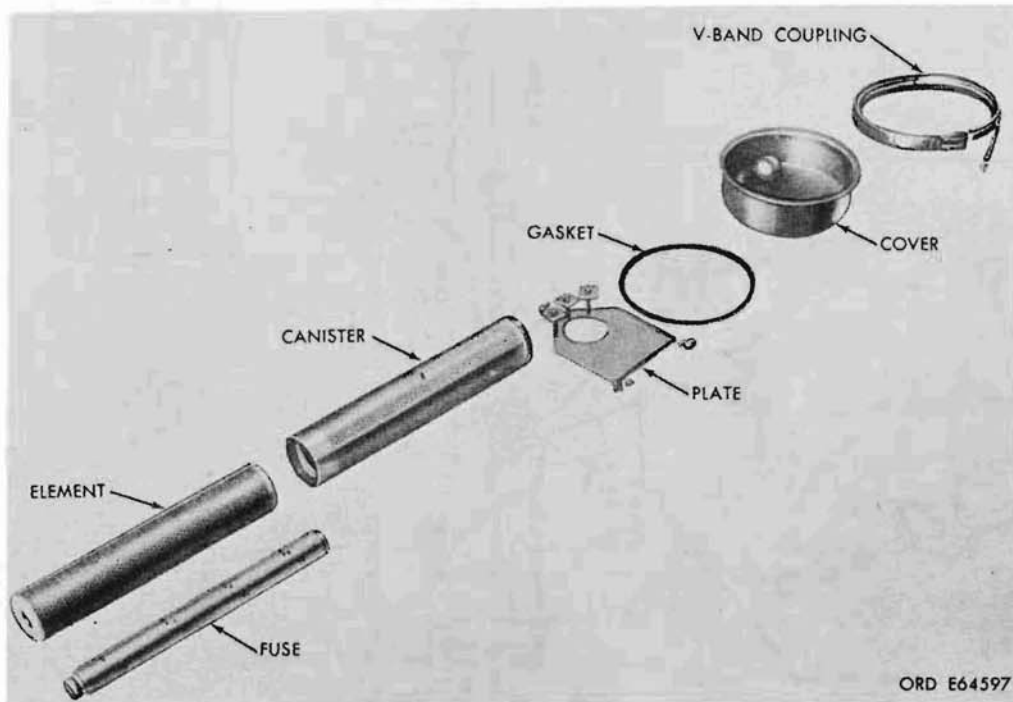


Figure 446. Segregator Filter And Fuse Assembly—Exploded View.

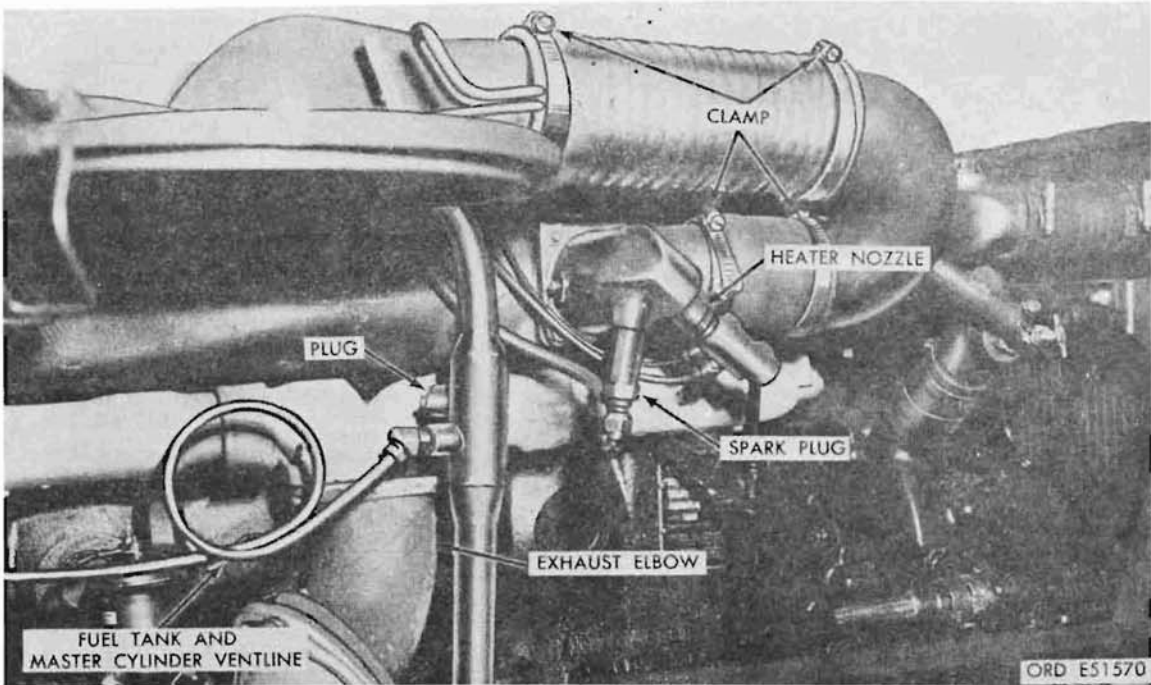


Figure 447. Relocated Vent Lines And Manifold Heater.

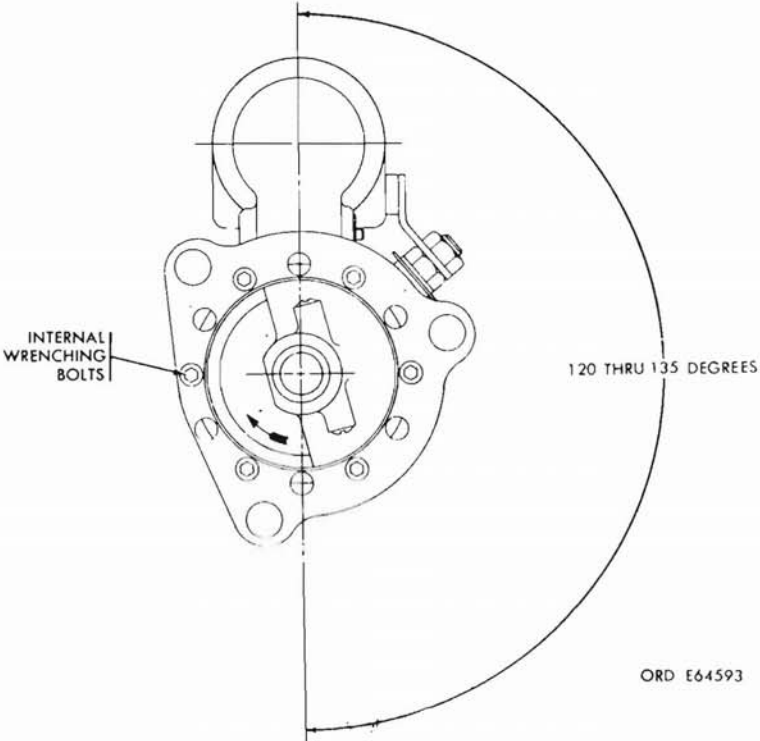


Figure 448. Indexing The Starter.

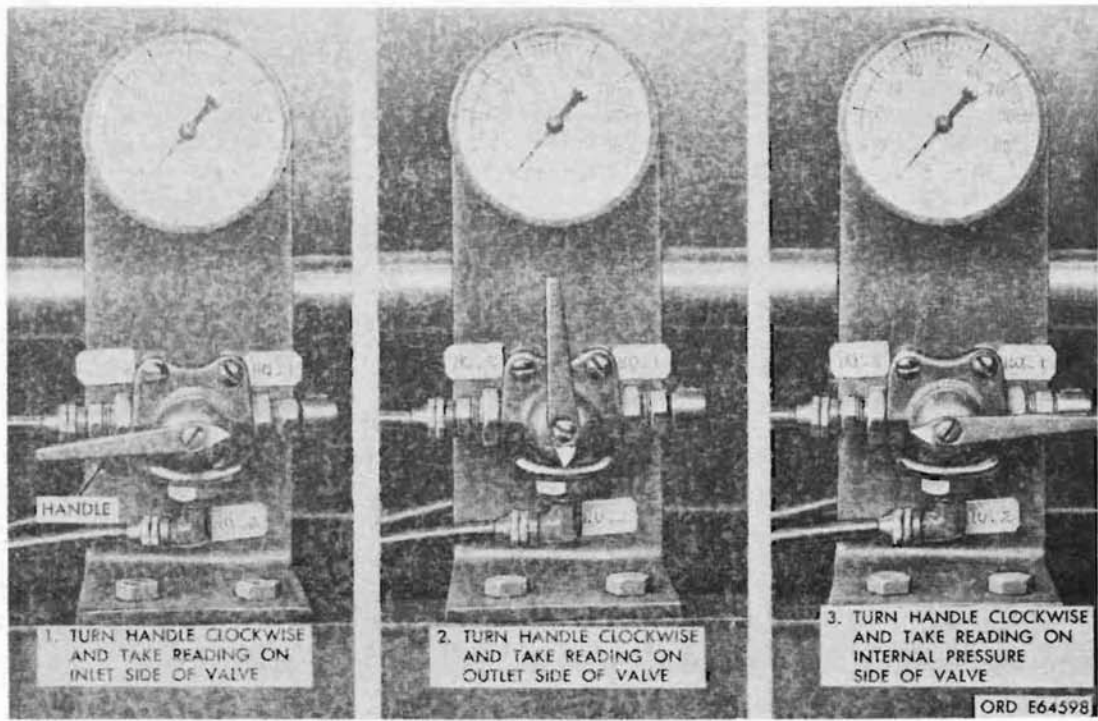


Figure 449. Obtaining Readings From Pressure Gage Shutoff Valve.

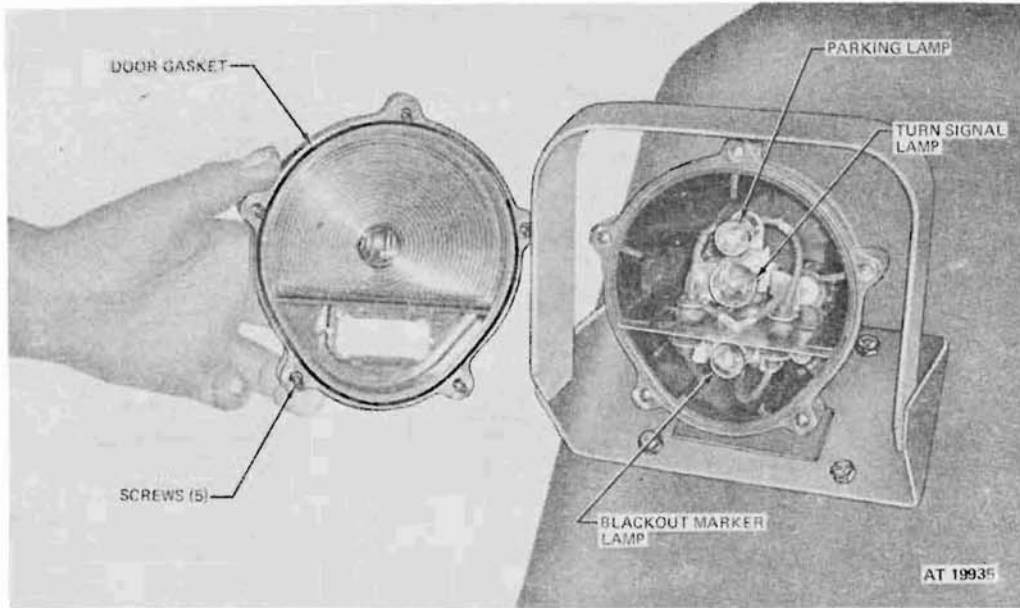


Figure 450. Composite front marker light.

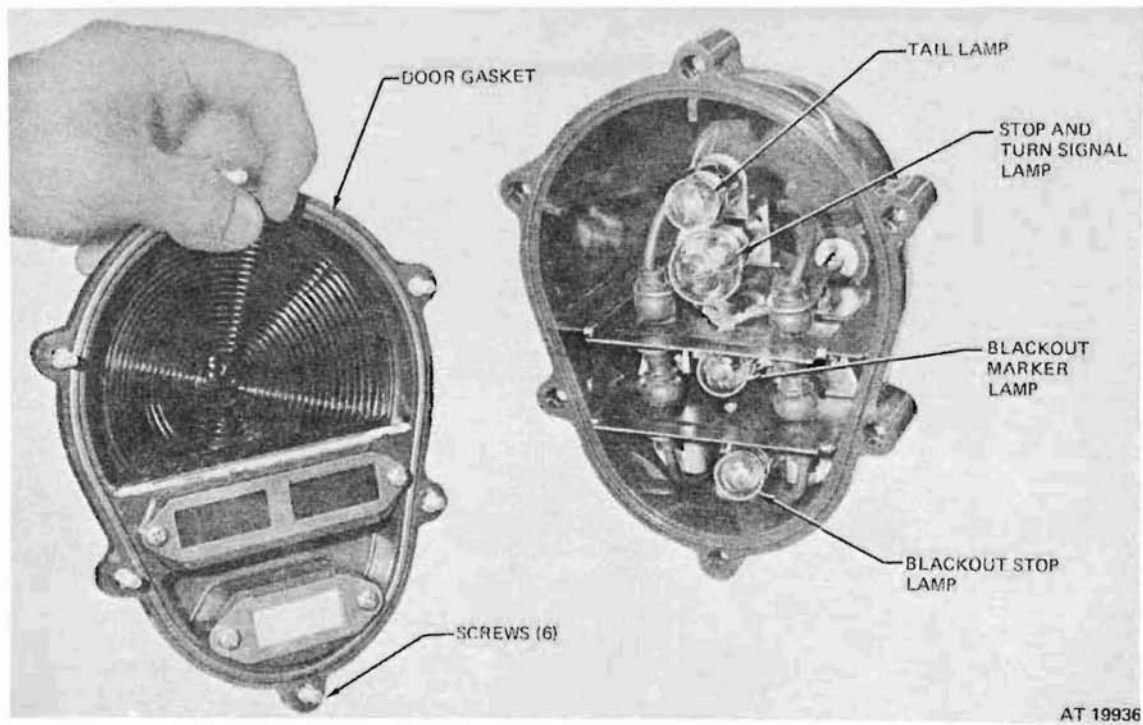
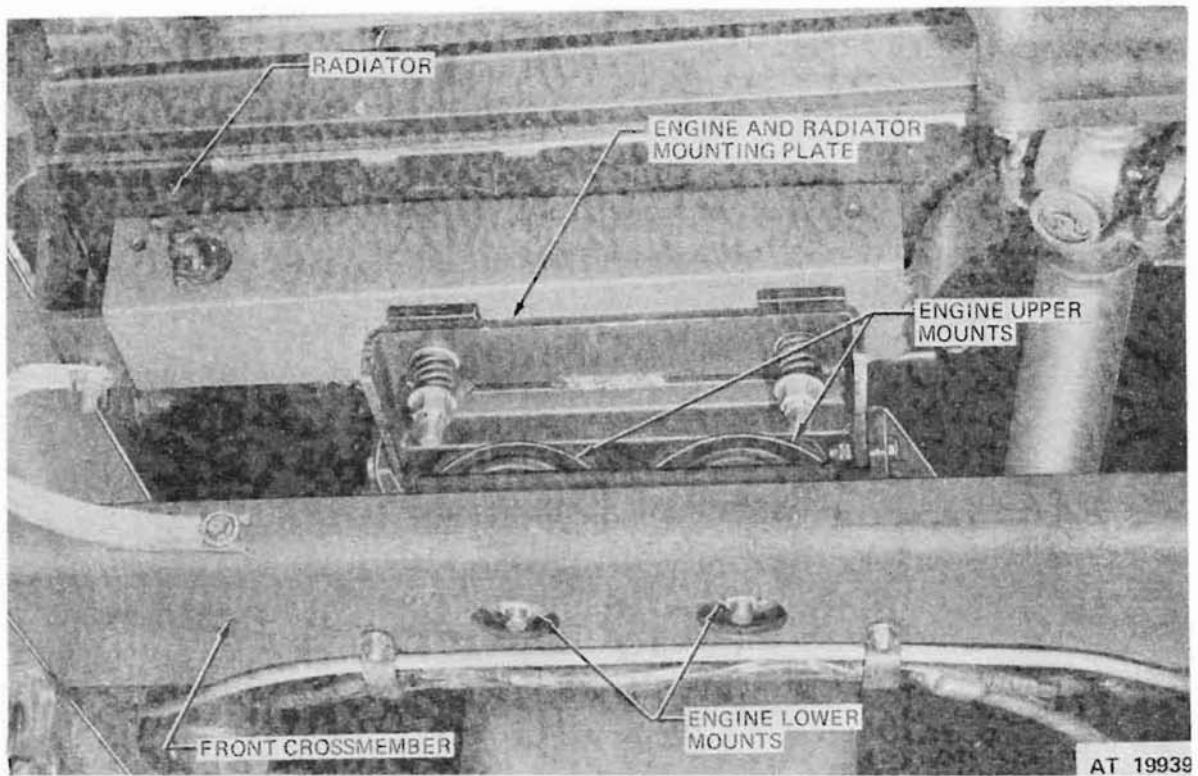
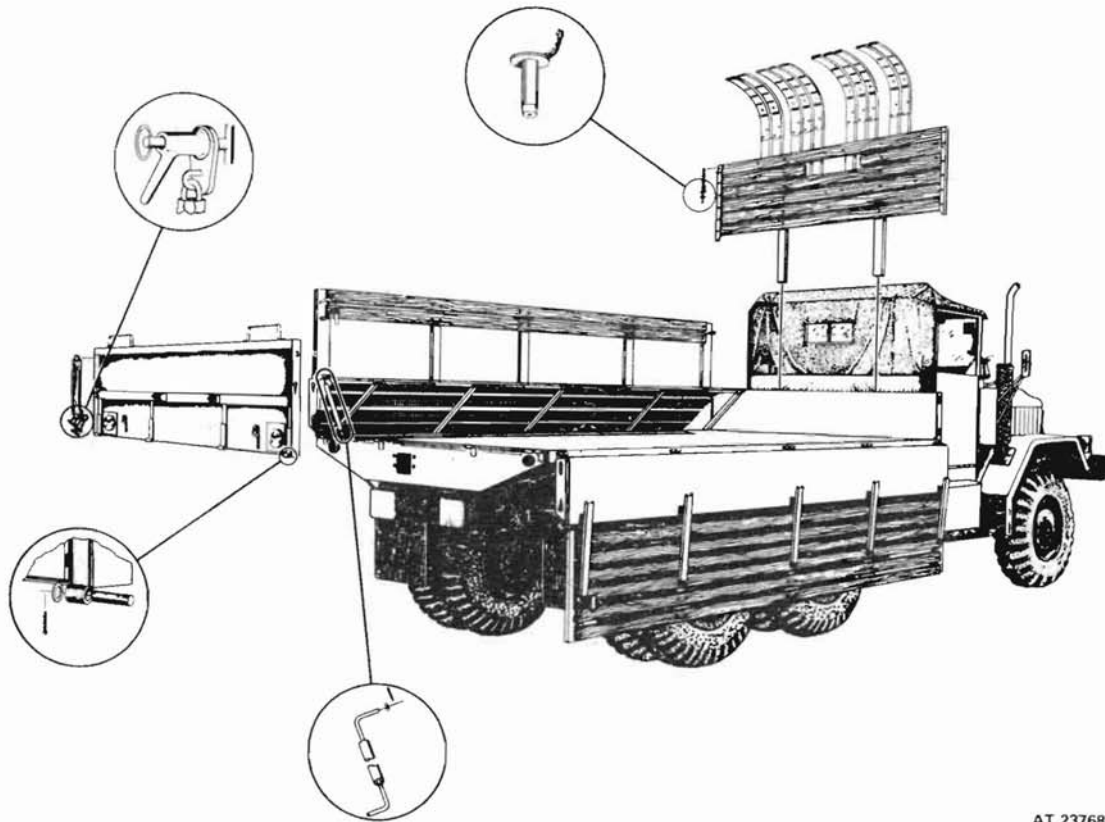


Figure 451. Composite rear marker light.



*Figure 452. Revised engine front mounting.*



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Figure 453. M35A2C "Dropside Cargo Body."



**CHAPTER 6**  
**BODY AND AUXILIARY EQUIPMENT - M764 EARTH**  
**BORING MACHINE AND POLE-SETTER TRUCK**

**Section I. INTRODUCTION**

**413. Scope.**

This chapter contains instructions for organizational maintenance of the body auxiliary equipment peculiar to the multifuel, M764 earth boring machine and pole-setter truck (fig. 454 and

455). Refer to the Operator's manual, (TM 9-2320-209-10) Chapters 1, 6, and 7, for data and description of chassis components and auxiliary equipment pertaining to this truck. Organization Maintenance procedures applicable to the multifuel truck chassis are contained in Chapter 5 of this manual.



*Figure 454. 2-1/2 ton, 6x6, M764 earth boring machine and pole- setter truck - left front view.*

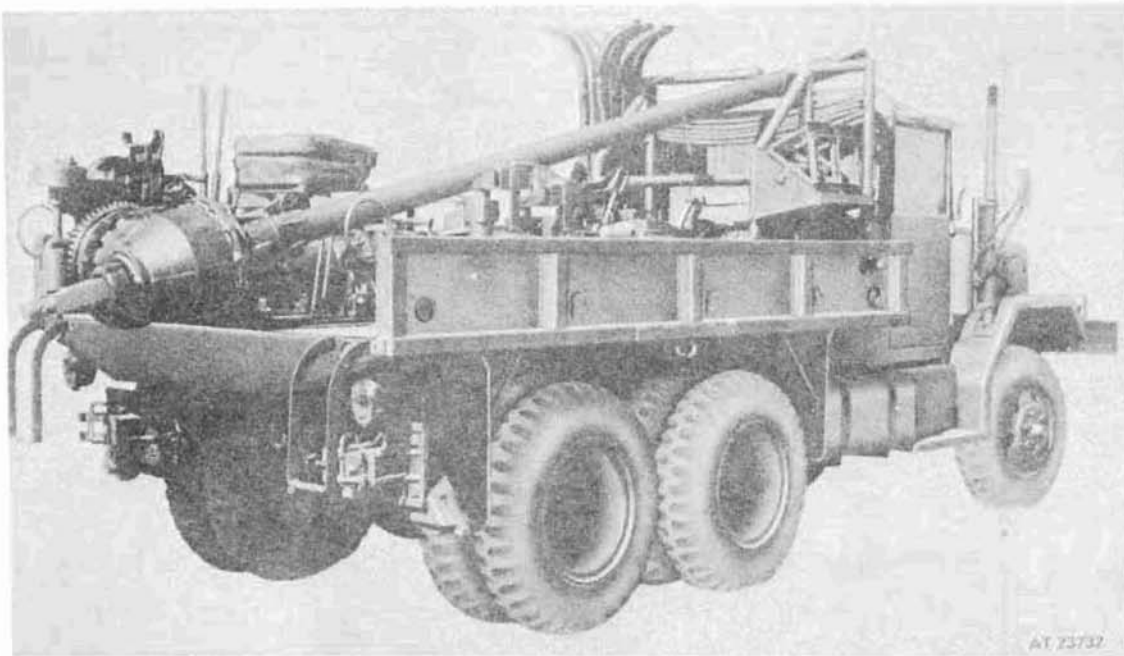


Figure 455. 2-1/2 ton, 6x6, M764 earth boring machine and pole- setter truck - right rear view.

## Section II. PREVENTIVE MAINTENANCE AND TROUBLESHOOTING OF TRUCKS AUXILIARY EQUIPMENT

### 414. Preventive-Maintenance Procedures.

Table 12 contains preventive-maintenance procedures applicable to the auxiliary equipment peculiar to the M764 truck. Preventive- Maintenance procedures, applicable to the trucks chassis, are contained in Table 3 of this manual. Perform all checks and services listed in Table 15 of Operators manual (TM 9-2320-209-10) prior to proceeding with checks and services listed in Table 12.

### 415. Troubleshooting Procedures.

Table 13 contains organization maintenance troubleshooting procedures for locating and correcting troubles which may develop in the rear winch, power-divider, earth boring machine, and outriggers mounted on the M764 truck. Refer to Table 4 of this manual for troubleshooting procedures applicable to chassis related components.

Table 12, Preventive-Maintenance Checks and Service-Continued

Organizational Maintenance		Semiannual Schedule	
Sequence No.	Item to be inspected	Procedure	Paragraph references
1.	Earth boring machine.	<p>a. Every 200 hrs. of boring machine operation, notify direct support maintenance unit for the removal and inspection of upper and lower rack thrust plates.</p> <p>b. Every 200 hrs. of boring machine operation, notify direct support maintenance unit for the adjustment of feed and drive clutch assemblies.</p> <p>c. Semi-annually, notify direct support maintenance unit for checking horizontal and vertical leveling worm adjustments.</p> <p>d. Semi-annually, check tension of horizontal and vertical leveling worm drive chains. Each chain should have 1/8-inch deflection. Adjust if required.</p> <p>e. Check boring case, intermediate case, and main drive idler gear housings for evidence of lubricant leakage. Notify direct support maintenance unit if leakage is observed.</p>	423
2.	Rear Winch	<p>a. Semi-annually, check automatic brake application by lifting and suspending a 1,000 pound load on winch cable. Load should remain suspended without slippage. Notify direct support maintenance unit for adjustment of automatic brake if slippage is observed.</p> <p>b. Semi-annually, check winch drive chain tension. No deflection should be observed in chain. Adjust if required.</p> <p>c. Check tension of all cable level winder drive chains and carriage cross-chain. The first and second reduction drive chains should</p>	416c  418

Table 12. Preventive-Maintenance Checks and Service-Continued

Organizational Maintenance		Semiannual Schedule	
Sequence No.	Item to be inspected	Procedure	Paragraph references
		have approximately 1/2-inch deflection. No deflection should be observed in carriage cross-chain. Adjust chains, if required.	
		d. Unwind entire winch cable (wire rope) from drum. Clean and inspect cable in accordance with procedures contained in TM 5-725. Repair or replace defective cable as required.	417
		e. Check carriage adjustment to ensure that cable is winding evenly onto drum. Adjust carriage if required.	418d
		f. Check worm housing and speed reducer housing for evidence of lubricant leakage. Notify direct support maintenance unit if leakage is observed.	
3.	Rear winch and power-divider control lever linkage.	Operate rear winch and power divider control levers to check engagement and disengagement of each lever. Adjust respective linkage as required.	419, 412
4.	Outriggers and hydraulic system components.	a. Operate outriggers control levers and check operation of each outrigger leg. Each outrigger leg should support the weight of truck without retracting when lever is placed in NEUTRAL position. Notify direct support maintenance unit, if outrigger will not hold.  b. Inspect outrigger pump, control valve, hoses, and fittings for lubricant leakage. Tighten loose connection as required. Notify direct support maintenance unit if lubricant leakage is observed in control valve and pump. Also inspect all hoses for deterioration and damage. Replace defective hoses.	

Table 13, Troubleshooting - Of Auxiliary Equipment  
M764 Truck.

Malfunction	Probable cause	Corrective action
1. Power does not reach winch drive sprocket.	<p style="text-align: center;"><b>REAR WINCH</b></p> <p>a. Defective transfer power take-off.</p> <p>b. Defective power-divider.</p> <p>c. Damaged power-divider drive shaft.</p> <p>d. Broken winch drive chain or chain is loose and does not engage sprocket.</p>	<p>a. If transfer power take-off does not rotate power-divider drive shaft, notify direct support maintenance unit.</p> <p>b. If power-divider does not provide power to winch drive chain, when control lever is placed in REAR WINCH "FWD." or REAR WINCH "REV." positions, troubleshoot power-divider, item 169 through 173 contained in Table 4.</p> <p>c. Inspect power-divider drive shaft for damage, Replace or repair drive shaft (para. 422).</p> <p>d. Replace or adjust winch drive chain (par. 416).</p>
2. Winch drum shaft does not rotate.	<p>a. Defective transfer power take-off or power divider; damaged power-divider drive shaft, or broken winch drive chain.</p> <p>b. Damaged drum shaft drive gear and/or winch drive worm.</p>	<p>a. Refer to 1a through d above.</p> <p>b. Notify direct support maintenance unit.</p>
3. Winch drum does not rotate with drum shaft (drum does not engage).	<p>a. Defective rear winch control lever linkage or linkage out of adjustment.</p>	<p>a. Check action of toothed flange on drum clutch and brake plate to see if flange engages toothed end of winch drum when winch control lever is moved to the ENGAGED position. If plate flange does not engage drum, check action of detent sleeve on hub of clutch and brake plate. Sleeve must move along plate hub a distance of five thirty-seconds of an inch when control lever is moved</p>

Table 13. Troubleshooting - Continued

Malfunction	Probable cause	Corrective action
<p>4. Winch drive clutch does not engage.</p>	<p>b. Worm detent sleeve or components.</p> <p>c. Weak or broken clutch and brake plate spring.</p> <p>a. Rear winch control lever linkage out of adjustment.</p> <p>b. Defective detent sleeve or components.</p>	<p>from NEUTRAL to ENGAGED position. If sleeve does not move correct distance, inspect control lever linkage for bent, worn, or damaged parts. Check linkage adjustment (para. 415) and adjust, if necessary.</p> <p>b. If detent sleeve moves correct distance, and trouble persists, detent sleeve may be in need of rotating. Notify direct support maintenance unit.</p> <p>c. If rotation of detent sleeve does not remedy trouble, clutch and brake plate spring may be weak or broken. If spring is defective, notify direct support maintenance unit.</p> <p>a. Check linkage adjustment (para. 419) and adjust, if necessary.</p> <p>b. Move rear winch control lever from ENGAGED to NEUTRAL position and check movement of detent sleeve on hub of clutch and brake plate. Sleeve must press against flange and force flange out of engagement with winch drum. If sleeve does not bear against plate, detent sleeve may need rotating. Notify direct support maintenance unit.</p> <p>c. If detent sleeve presses against clutch and brake plate, and if plate does not disengage from drum, plate may be damaged. Notify direct support maintenance unit.</p>
<p>5. Winch drum brake does not hold.</p>	<p>a. Rear winch control lever linkage out of adjustment</p> <p>b. Worm drum brake lining.</p>	<p>a. Refer to 4a above.</p> <p>b. Notify direct support maintenance unit.</p>

Table 13. Troubleshooting - Continued

Malfunction	Probable cause	Corrective action
6. Winch drum brake drags during free spooling of winch cable.	Weak or broken clutch and brake plate spring.	Notify direct support maintenance unit.
7. Winch drum slips backward or overruns. (fails to sustain load on winch cable).	a. Worn automatic brake out of adjustment.  b. Worn or damaged worm automatic stop sleeve, worm automatic brake stop nut, stop sleeve pin, brake linings or brake lining plates.	a. Notify direct support maintenance unit.  b. Notify direct support maintenance unit.
8. Worm housing or cable level winder speed reducer leaks lubricant.	a. Loose retainer cap screws in area of leak.	a. Tighten all screws. If leaks continue, notify direct support maintenance unit.
9. Winch cable does not wind evenly onto drum.	Carriage out of adjustment or loose cross-chain.	Adjust level winder carriage and/or tighten cross-chain if required (par. 418d).
10. Cable level winder carriage fails to travel.	a. Broken first and second reduction drive chain is loose and does not engage sprockets.  b. Defective speed reducer assembly.	a. Repair or replace chains. (para. 418d).  b. Notify direct support maintenance unit.
<b><u>POWER DIVIDER</u></b>		
Refer to troubleshooting of V18A/MTQ, Table 4, items 169 through 174. Instead of replacing power-divider, notify direct support maintenance unit.		
<b><u>EARTH BORING MACHINE</u></b>		
11. Both vertical and horizontal power leveling mechanism inoperative.	Damaged clutch in power-leveler, or power-leveler drive pinion.	Notify direct support maintenance unit.
12. One power leveling mechanism inoperative, while the other is operational.	a. Loose or broken drive chains.  b. Worm drive clutch out of adjustment.	a. Adjust, repair, or replace drive chains (para. 423).  b. Notify direct support maintenance unit.
13. Power-leveler shifting handle will not remain engaged.	a. Weak or broken spring in power-leveler shifting handle.	a. Notify direct support maintenance unit.

Table 13, Troubleshooting - Continued

Malfunction	Probable cause	Corrective action
<p>14. Boring machine clutch over-heating.</p> <p>15. Excessive vibration observed in derrick tube during boring operation.</p>	<p>b. Damaged worm drive clutch or clutch out of adjustment.</p> <p>Feed and/or drive clutch plates slipping or excessively worn.</p> <p>a. Too much end play in leveling worm.</p> <p>b. Excessively worn rack bar thrust plates.</p>	<p>b. Notify direct support maintenance unit.</p> <p>Notify direct support maintenance unit.</p> <p>a. Notify direct support maintenance unit.</p> <p>b. Notify direct support maintenance unit.</p>
<p>Refer to troubleshooting of V18A/MTQ earth boring machine, Table 4, items 183 through 186 for additional troubleshooting procedures.</p>		
<p>16. Both outriggers fail to extend or retract.</p>	<p>a. Damaged hydraulic pump drive shaft.</p> <p>b. Defective hydraulic pump.</p>	<p>a. Notify direct support maintenance unit.</p> <p>b. Notify direct support maintenance unit.</p>
<p>17. One outrigger inoperative.</p>	<p>Defective control valve or hydraulic cylinder.</p>	<p>Notify direct support maintenance unit.</p>



## Section III. ORGANIZATION MAINTENANCE PROCEDURES

## 416. Rear Winch Drive Chain (Fig. 456).

## a. Removal.

- (1) Loosen the four idler pulley bracket and shaft assembly mounting screws. Loosen adjusting screw, and remove idler pulley tension from winch drive chain.
- (2) Remove shear pin from winch drive sprocket. Remove snap ring retaining winch drive chain sprocket on sprocket sleeve.
- (3) Remove cotter pin and hex-nut from end of power-divider front output shaft (fig. 462). To remove chain, pull chain sprocket, along with winch drive chain, from power-divider front output shaft, while sliding drive chain sprocket along drive sleeve (fig. 456). Do not remove sprocket from drive sleeve.

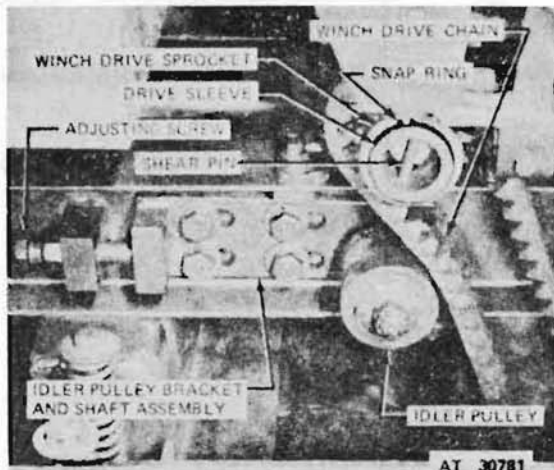


Figure 456. Rear winch drive chain - installed.

b. *Installation.* Install winch drive chain along with chain sprocket, and shear pin in reverse order of removal, after coating shear pin with GAA grease. Lubricate chain and winch drive sprocket in accordance with LO 9-2320-209-12, and adjust chain tension c below.

c. *Winch Drive Chain Adjustment (fig. 456).* Loosen hex-nut on idler pulley adjusting screw, then tighten adjusting screw until there is no deflection in chain. Tighten the four idler pulley bracket and shaft assembly mounting screws, and nut idler pulley adjusting screw.

## 417. Rear Winch Cable.

a. *General.* Whenever inspection reveals wear or damage to the winch cable, the defective portion of cable should be cut-off with wire-rope cutter and a new eye spliced on its end as described in TM 5-725. Before cutting off cable, be certain that 350 feet or more of cable remains on winch drum. Replace the entire cable if less than 350 feet remains on drum after removing the damaged portion of cable.

## b. Removal of Cable.

**Caution:** Use leather gloves when handling the winch cable. Frayed cable can cause painful injury.

Engage winch drum brake, and unwind cable from winch drum. Remove the screw and cable clamp (fig. 459), attaching cable to drum, and remove cable.

## c. Installation of Cable.

- (1) Be certain that the cable level winder carriage has reached the end of its travel toward the end of drum as shown in figure 459, before attaching cable to drum. The extreme end point of carriage travel is when the carriage guide pin in chain guide is on the outside of the cross-chain sprocket, with the pin centrally located—in vertical slot in carriage.

*Note.* During winding of the cable on drum, the cable and carriage horn may have a tendency to become misaligned. If this situation occurs, disconnect second reduction drive chain from level winder (para 418c (1)), then rotate large chain sprocket until alignment is accomplished. Reconnect chain and adjust if necessary after alignment (para 418c (2) and (3)).

- (2) Thread end of new 700 foot cable through the rollers on carriage horn, and attach it to winch drum with cable clamp and 5/8-18 x 1-3/4 cap screw. The end of cable should not extend through the clamp farther than necessary since the protruding end may cause uneven winding of cable. Drive winch in forward direction keeping considerable tension on cable as it is wound onto drum. If necessary, adjust carriage travel (para. 418 d (3)) if cable does wind evenly onto winch drum.

*Note.* Make sure first layer of cable coils are compacted together. If necessary, use a block of wood to hammer or push cable coils together.

- (3) After required amount of cable is wound onto drum, cut off cable and splice eye into end of cable as described in TM 5-725.

#### 418. Cable Level Winder Drive Chains.

*a. Repair of Roller Type Drive Chains.* Remove all damaged connecting links from chain assembly by grinding off the riveted end of connecting link pins. Re-assemble chain with detachable connecting links listed in TM 9-2320-209-20P. The first reduction drive chain, when completely assembled, contains 89 links, and second reduction drive chain contains a total of 77 links. No repair links are available for the carriage cross-chain.

*b. Replacement of First Reduction Drive Chain Assembly.*

- (1) *Removal.*

(a) Remove cap screws and

lockwashers, attaching first reduction drive chain cover (fig. 457) to winch clutch fork shaft bracket and speed reducer bearing retainer. Be certain not to lose the flatwashers (fig. 457) between clutch fork shaft bracket and worm housing; remove chain cover.

(b) Rotate winch drum and locate detachable link, connecting ends of chain together. Remove link, and remove chain from sprockets.

(c) Loosen hex-nut on adjusting screw (fig. 458) in idler sprocket shaft bracket to lower idler sprocket.

(2) *Installation.* Install first reduction drive chain and chain cover in reverse order of removal. Adjust chain tension as described in (3) below.

(3) *Chain adjustment.* The drive chain is adjusted by tightening the adjusting screw (fig. 458) in idler sprocket shaft bracket until there is approximately

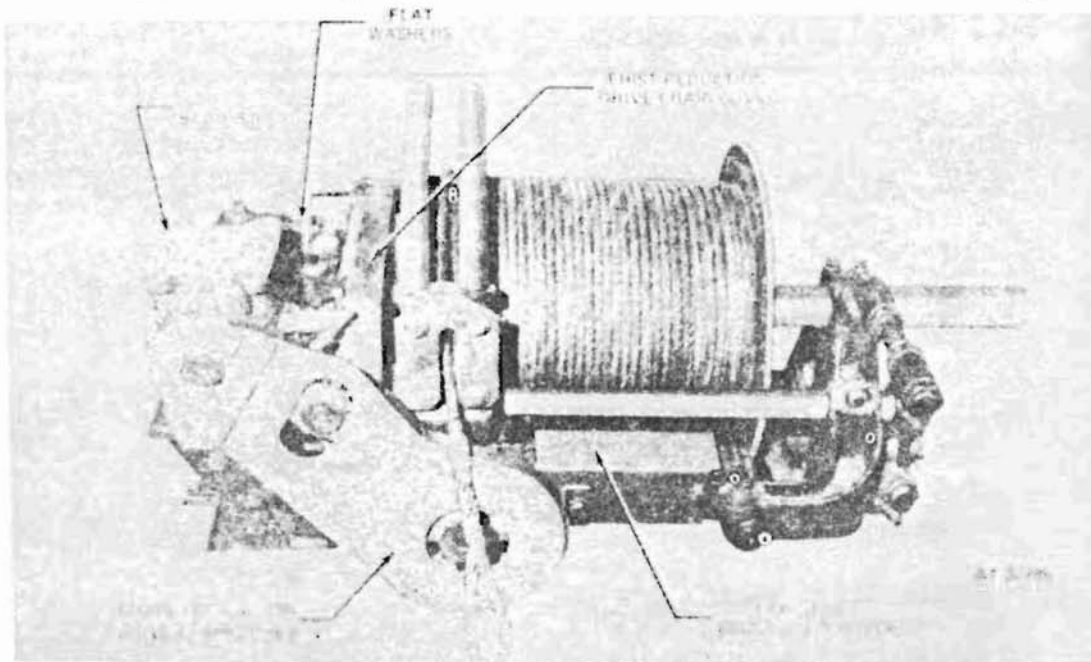


Figure 457. Cable level winder chain covers - rear winch.

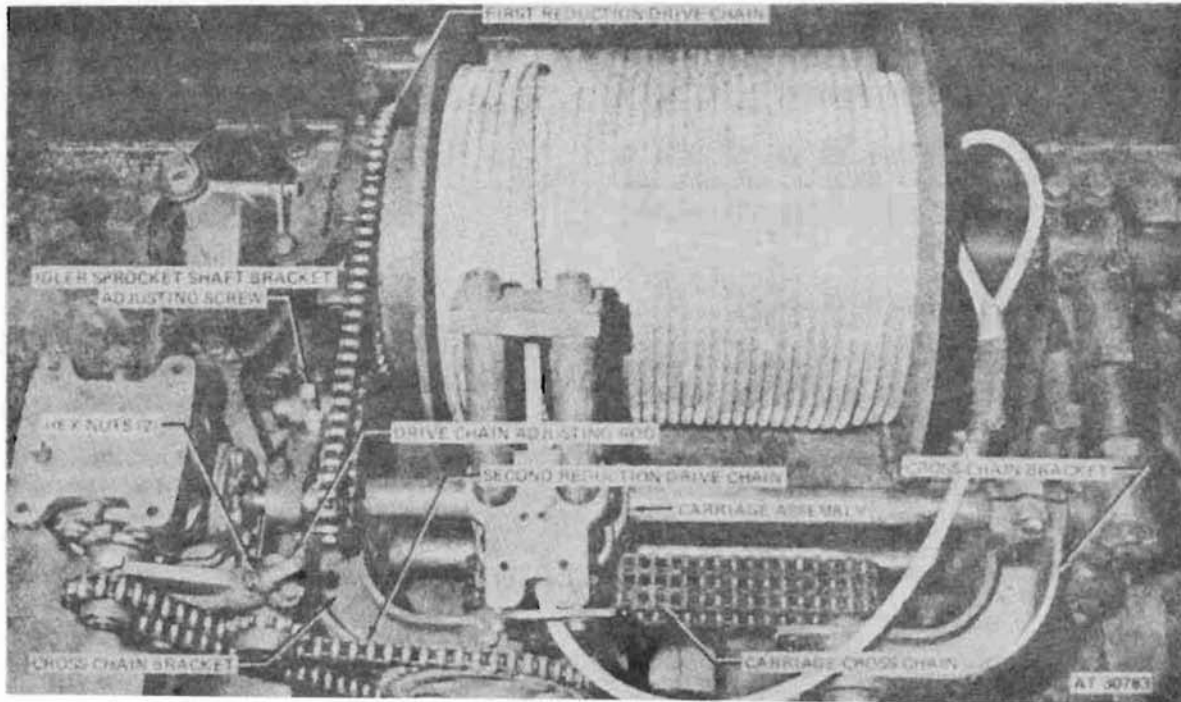


Figure 458. Cable level winder drive chains - rear winch.

1/2-inch deflection in chain. Tighten hex nut on adjusting screw after proper deflection is obtained.

c. *Replacement of Second Reduction Drive Chain.*

(1) *Removal.*

- (a) Remove cap screw and lockwasher, attaching second reduction drive chain cover (fig. 457) to speed reducer. Remove cap screw, lockwasher, and flatwasher attaching cover to crosschain cover; remove chain cover.
- (b) Loosen the two hex nuts on drive chain adjust rod (fig. 458) to remove idler sprocket tension from chain. Locate and remove chain from sprockets.

(2) *Installation.* Install second reduction drive chain and chain cover in reverse order of removal, being certain to place chain against bottom side of idler

sprocket as shown in figure 458. Adjust chain tension as described in (3) below.

- (3) *Chain Adjustment.* The drive chain is adjusted by tightening the lower hex-nut on adjusting rod (fig. 458) until there is approximately 1/2-inch deflection in chain. Tighten other hex nut on adjusting rod after proper deflection is obtained.

d. *Replacement of Carriage Cross-chain.*

(1) *Removal.*

- (a) Remove second reduction drive chain as described in c (1) above. Remove the four cap screws, lockwashers, and flatwashers securing cross-chain cover (fig. 457) to cross-chain brackets; remove cover.

- (b) Rotate large second reduction drive chain sprocket until the cross chain connecting link is accessible.

Loosen two screws clamping each cross-chain bracket to tie rod. Loosen hex nut on each cross-chain bracket adjusting screw threaded in end cross-chain bracket. Loosen both adjusting screws and remove chain tension by tapping both bracket toward each other. Remove the chain connecting link and remove chain assembly from sprockets. Remove two clips and pins connecting chain ends to chain guide.

- (2) **Installation.** Connect end of chain to chain guide with two pins and clips. Position cross-chain on chain triple sprockets, with guide pin inserted between wear plates in carriage. Connect end of chain together with connecting link, then adjust carriage travel and chain tension (3)(b) below. Install cross-chain cover and second reduction drive chain in reverse order of removal after carriage travel adjustment is complete.

- (3) **Carriage travel adjustment (fig 459).**

- (a) Loosen the two cap screws clamping both cross-chain brackets (fig. 458) to carriage tie rods.
- (b) With all slack removed from cross-chain, adjust both cross-chain bracket adjusting screws until an equal spacing is obtained between outside of winch drum flanges and inside of cross-chain brackets. The drum should be rotated one revolution, and the equal spacing checked about four places around each drum flange. This is done so that the adjustment will not be in error due to warpage of drum flanges. After adjustment is complete, tighten the hex nut on each adjusting screw and the two capscrews in each cross-chain bracket. If required, aline carriage horn with cable (para. 417c). Install and adjust second reduction

drive chain c (2) and (3) above. Operate level winder under power and check carriage adjustment.

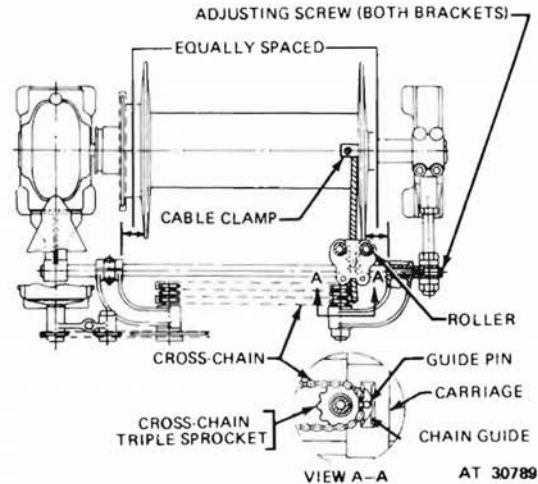


Figure 459. Carriage travel adjustment.

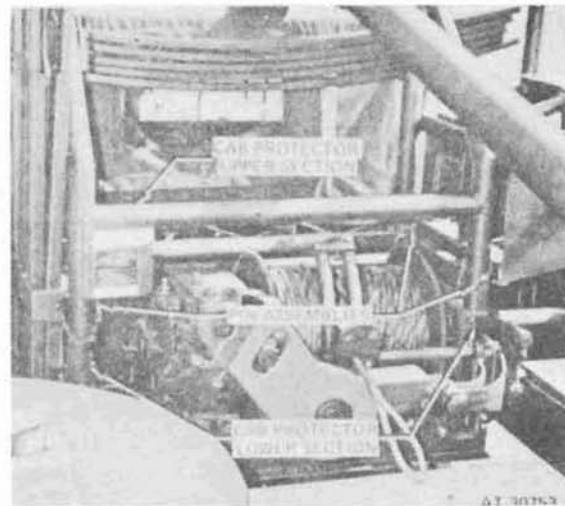


Figure 460. Cab protector disconnect points.

#### 419. Rear Winch Control Lever Linkage Adjustment:

Move rear winch control lever through its operation positions as described in TM 9-2320-209-10 to ensure that linkage engages and disengages the winch clutch and brake. If adjustment is required, lower spare wheel from carrier, and adjust clevis on

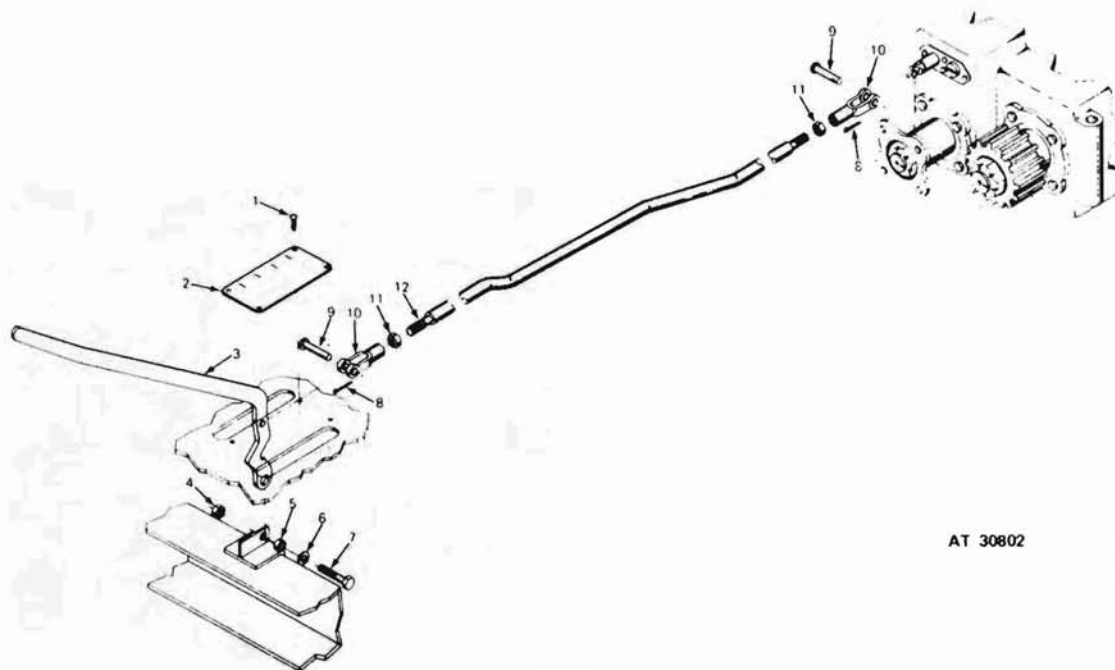
pivot bar end of lever control rod (fig. 347) until proper engagement is obtained. Further adjustments may be obtained in control rod, by adjusting the clevis on control lever end of control rod.

**420. Rear Winch Cab Protector.**

*a. General.* The cab protector is made up of separate upper and lower sections pinned together. The upper section can be easily removed from the lower section to perform field maintenance on winch assembly or to reduce the height of truck for shipping purposes. The derrick support, mounted on the body floor, must be used to support derrick when cab protector is removed.

*b. Removal of Cab Protector Upper Section.*

- (1) Raise the derrick from its support in cab protector. Remove body stave, bows, and wheel chocks from their stowed positions on protector.
- (2) Remove the pin assemblies attaching left and right-hand sides of cab protector upper section to the lower section of cab protector (fig. 460). Attach hoist chain to horizontal tubes of cab protector, and lift protector to remove from sockets in protector lower section.



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**LEGEND**

Key	Item	Key	Item
1	Screw Tapping, thread cutting No. 8-32 x 1/4	7	Screw, Cap, hexagon, 3/8-24UNF-2A x 3/4
2	Plate, instruction	8	Pin, cotter, 3/32 dia x 3/4
3	Lever, control, power-divider	9	Pin, straight, headed
4	Nut, self-locking, 7/16-20UNF	10	Clevis, rod end
5	Spacer, control lever mounting	11	Nut, plain, hexagon, 3/8-24UNF-2B
6	Washer, flat	12	Rod assembly, control

Figure 461. Power-divider control lever linkage.

*Note.* If required, the protector may be removed, using the trucks rear winch in conjunction with the boring machine derrick.

*c. Installation of Cab Protector Upper Section.* Install upper section of cab protector in reverse order of removal, then stow and secure body staves, bows, and wheel chocks in their stowage facilities.

#### 421. Power-Divider Control Lever Linkage Adjustment.

*Note.* The key numbers noted in parentheses are shown in figure 461.

Shift power-divider control lever through all four operating positions to ensure proper engagement of power-divider shifter rod extending from power-divider. While shifting through these positions, check to ensure that the linkage control rod is not contacting the transfer transmission case or flange on rear cab support. If required, remove clevis pin (9) and adjust clevis (10) on each end of linkage control rod (12) until lever engages power-divider in all four positions. Be certain adequate clearance is obtained between transfer case and cab support flange after adjustment is complete. Tighten hex nut (11) against each clevis. Notify direct support maintenance unit if power-divider shifter shaft adjustment is required.

#### 422. Power-Divider Drive Shaft Assembly (Fig. 462).

##### *a. Removal.*

- (1) Remove the four self-locking nuts and lockwashers securing flange yoke to companion flange. Remove the four hex-nuts, lockwashers, and two "U" bolts connecting sleeve yoke journal to end yoke. Collapse drive shaft to remove, being certain not to allow the two journal bearing assemblies to become separated from journal.
- (2) Do not remove companion flange from power-divider input shaft or end yoke for power take-off shaft unless complete assembly is being replaced. If required, remove end yoke by removing cotter pin, slotted hex nut, and flatwashers retaining end yoke on power take-off shaft. Remove yoke from shaft with suitable puller, and tape yoke retaining key to shaft to prevent its loss. To remove companion flange, remove

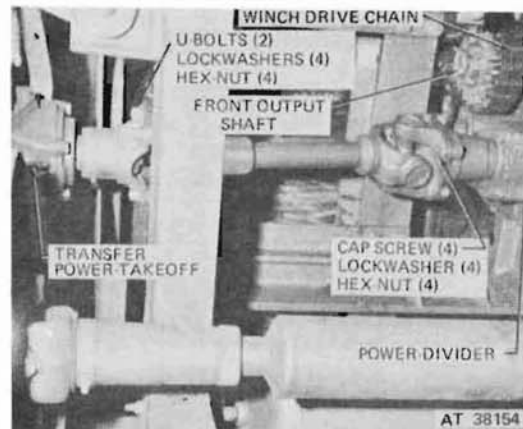


Figure 462. Power-divider propeller shaft - installed.

cotter pin, slotted hex nut, and flatwasher retaining flange on power-divider input shaft.

*b. Installation.* Install drive shaft in reverse order of removal, being certain not to allow the two journal bearing assemblies, at transfer power take-off end of shaft, to become separated from journal. If a new drive shaft assembly is being installed, remove end yoke and companion flange from assembly, and install these parts on transfer power take-off shaft and power-divider input shaft before installing the remaining portion of drive shaft. Tighten "U" bolt nuts to 25-29 foot pounds.

##### *c. Universal Joint Assemblies.*

*Note.* The key numbers noted in parentheses are shown in figure 463.

- (1) *Description.* The power-divider drive shaft assembly is equipped with two snap-ring type universal joint assemblies each composed of a journal (2), four bearing assemblies (3), and four snap-rings (5). The transfer power take-off end of shaft incorporates an end yoke (1) and sleeve yoke (6) which are interconnected by the two journal trunnions. The other two journal trunnions are attached to end yoke (1) by two "U" bolts. The power-divider end of drive shaft assembly incorporates a yoke shaft (7), flange yoke (8), and companion flange (9), with the yoke shaft and flange yoke connected together by the four journal trunnions.

(2) *Replacement of universal joint assemblies.*

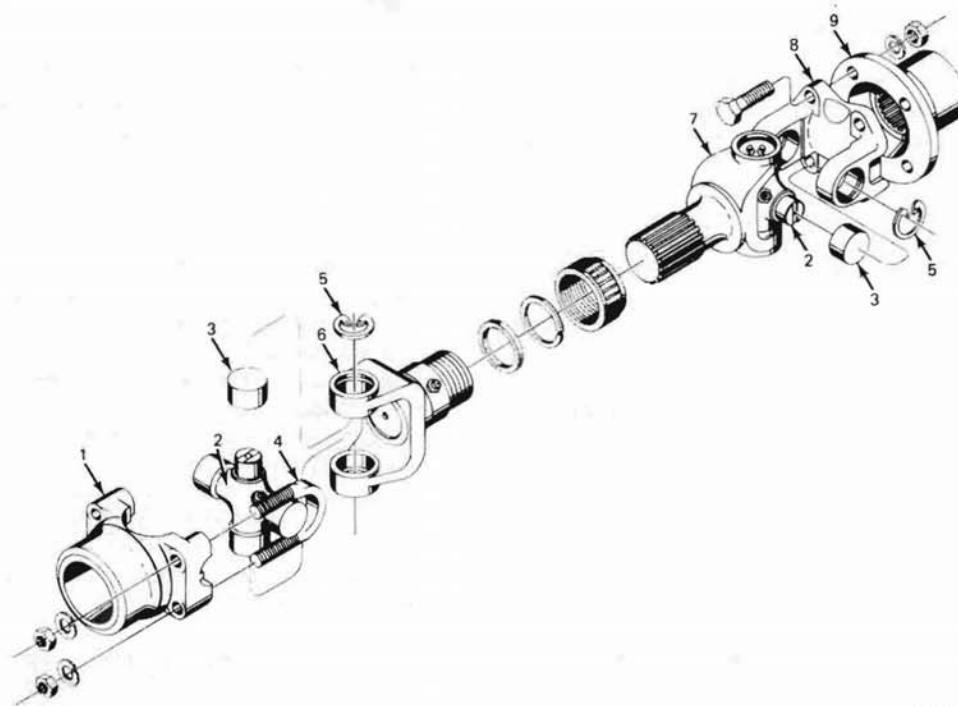
*Note.* The universal joint repair kit provided for this drive shaft assembly contains repair parts for both ends of drive shaft. Discard extra "U" bolts, and "U" bolt hardware that are contained in kit when replacing universal joint assemblies.

Refer to paragraph 166 *b* for universal joint replacement procedures, except that the two journal bearing assemblies at the end yoke end of shaft are accessible for removal after removing the drive shaft

assembly from truck *a* above. Disregard references to gaskets and gasket retainer mentioned in paragraph 166 *b*. Install the two end yoke journal bearing assemblies, which are held in place by "U" bolts, before installing drive shaft assembly in truck *b* above.

**423. Earth Boring Machine Leveling Worm Drive Chains.**

*a. Repair.* Refer to paragraph 418*a* for procedures for repairing the horizontal and vertical leveling worm drive chains. Each chain is composed of the number of links indicated in figure 465 when



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**Legend**

Key	Item	Key	Item
1	End yoke	6	Sleeve yoke assembly
2	Journal (spider)	7	Yoke shaft
3	Bearing assembly	8	Flange yoke
4	U-Bolt	9	Companion flange
5	Snap ring		

Figure 463. Universal joints assemblies - power-divider drive shaft assembly.

completely assembled. After repairing chain, install and adjust chain tension as described in *b* and *c* below.

*b. Horizontal Leveling Worm Drive Chains.*

(1) *Removal.*

(a) *Remove chain cover (fig. 464).* Remove locking wire, and loosen cone-point setscrew in cover retaining collar (fig. 464); remove collar. Remove cap screw and lockwasher, securing chain cover to power leveler shifting handle bracket. Remove cap screw, lockwasher, flatwasher, and bushing, securing chain cover to end of worm drive pinion shaft. Remove cover.

(b) *Remove chain assembly.* Loosen cap screw and hex nut in chain tightening shaft bracket (fig. 466). Using 1-1/8 open end wrench and adjustable open end wrench turn eccentric holding chain tightening shaft (fig. 466) to loosen tension on first reduction drive and second reduction driven chains (fig. 465). Locate detachable connecting link on chain, and remove link plate from connecting link pins. Remove connecting link from end of chain, and remove chain from sprockets.

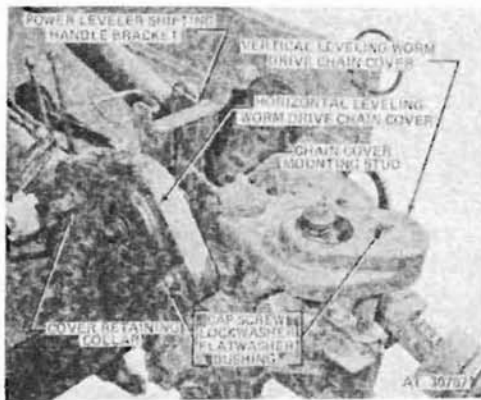


Figure 464. Earth boring machine leveling worm drive chain covers - installed

(2) *Installation.* Install first drive and second reduction drive chains and cover in reverse order of removal. Adjust chain tension (3) below, before installing chain cover.

(3) *Chain adjustment (fig. 466).* Using tools described in (1) *b* above, turn eccentric bushing while holding chain tightening shaft until each chain has approximately 1/2-inch deflection. After adjustment is complete, tighten cap screw and hex nut in chain tightening shaft bracket.

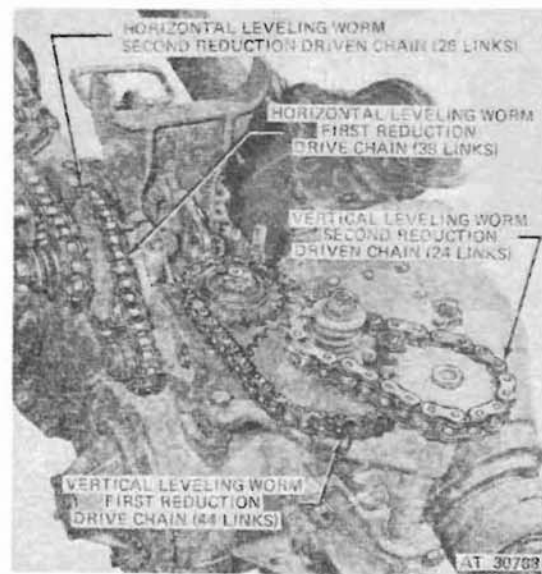


Figure 465. Earth boring machine leveling worm drive chains.

*c. Vertical Leveling Worm Drive Chains.*

(1) *Removal.*

(a) *Remove chain cover (fig. 464).* Remove hex nut and lockwasher from chain cover mounting stud (fig. 464). Remove cap screw, lockwasher, flat washer, and bushing securing cover to end of vertical leveling worm shaft. Remove cover.

(b) *Remove chain assembly.* Remove first reduction drive and second reduction drive chains (fig. 465) as described in *b* (1) (b).



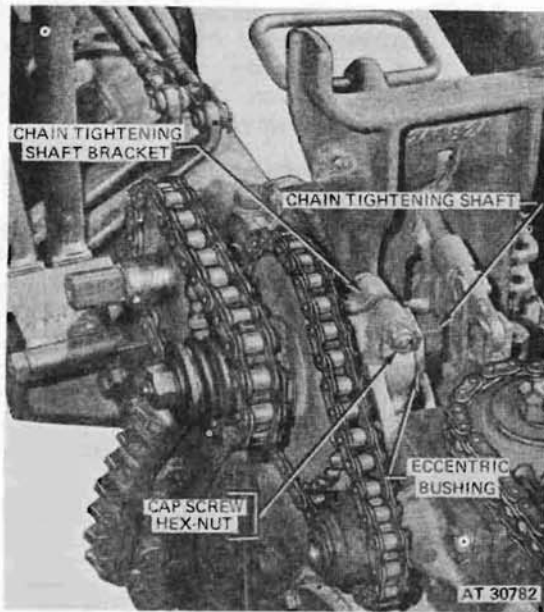


Figure 466. Horizontal leveling chain tightening points.

- (2) *Installation.* Install drive chain and chain cover in reverse order of removal, adjusting tension on both chains as described in *b* (3) above, before installing chain cover.

#### 424. Earth Boring Machine Drive Shaft Assembly.

The M764 earth boring machine drive shaft assembly is made with two snap-ring type universal joint assemblies and one slip joint similar to that shown in figure 349. A flanged yoke is incorporated at each end of drive shaft for connecting to the power-divider output shaft companion flange and companion flange on boring machine main drive pinion shaft. The boring machine drive shaft assembly, front axle propeller shaft assembly, and the rear axle propeller shaft assembly are similar in construction with the difference being in the overall length of assemblies. Refer to paragraph 165*b* for drive shaft assembly replacement procedures. Tighten drive shaft mounting screws to 90-120 foot pounds torque after installation. Repair and replacement procedures for the universal joint assemblies are contained in paragraph 166*b*. Disregard all references pertaining to journal gaskets and gasket retainers, as these parts are an integral parts of the journal bearing assembly.

## CHAPTER 7 BODY AND AUXILIARY EQUIPMENT M756A2 PIPELINE CONSTRUCTION TRUCK

### Section I. INTRODUCTION

#### 425. Scope.

a. This chapter contains instructions for organizational maintenance, troubleshooting, and organizational maintenance procedures for the M756A2 pipeline construction truck body and auxiliary equipment. This body is mounted on a modified M45A2 2-1/2 ton multifuel, 6x6, vehicle chassis (fig. 467 and 468). Organizational maintenance procedures related to the multifuel chassis are contained in the basic portion of this manual.

b. Supplement 14 to Appendix II of the basic manual contains the maintenance allocation chart (MAC) which lists maintenance responsibilities allocated to each level of U.S. Army maintenance for

the M756A2 pipeline construction truck body and auxiliary equipment.

c. TM 9-2320-209-20P contains the repair parts and special tools list for the M756A2 pipeline construction truck body and auxiliary equipment.

#### 426. Description and Data.

Chapters 1 and 8 of the operators manual (TM 9-2320-209-10) provide a complete description and data of the chassis components and auxiliary body equipment of the M756A2 pipeline construction truck.

### Section II. ORGANIZATIONAL MAINTENANCE INSTRUCTIONS

#### 427. General.

This section contains organizational maintenance instructions, preventive maintenance checks and services, and troubleshooting procedures for the M756A2 pipeline construction truck.

#### 428. Repair Parts, Special Tools, and Equipment.

a. *Organizational Maintenance Repair Parts.* Repair parts are supplied to organizational maintenance personnel for replacement of those items most likely to become worn, broken, or otherwise unserviceable, when replacement of these parts is within their scope. Repair parts supplied for the M756A2 truck covered in this portion of the manual are listed in TM 9-2320-209-20P which is the authority for requisitioning replacements.

b. *Special Tools and Equipment.* Standard and commonly used tools and equipment having general application to the M756A2 pipeline construction truck body and auxiliary equipment are authorized for issue by Tables of Allowance and Tables of Organizational

Equipment. Refer to Appendix II, Basic Issue Items List in the operator's manual (TM 9-2320-209-10) for on vehicle equipment. No special tools and equipment are required for organizational maintenance.

#### 429. Lubrication Instructions.

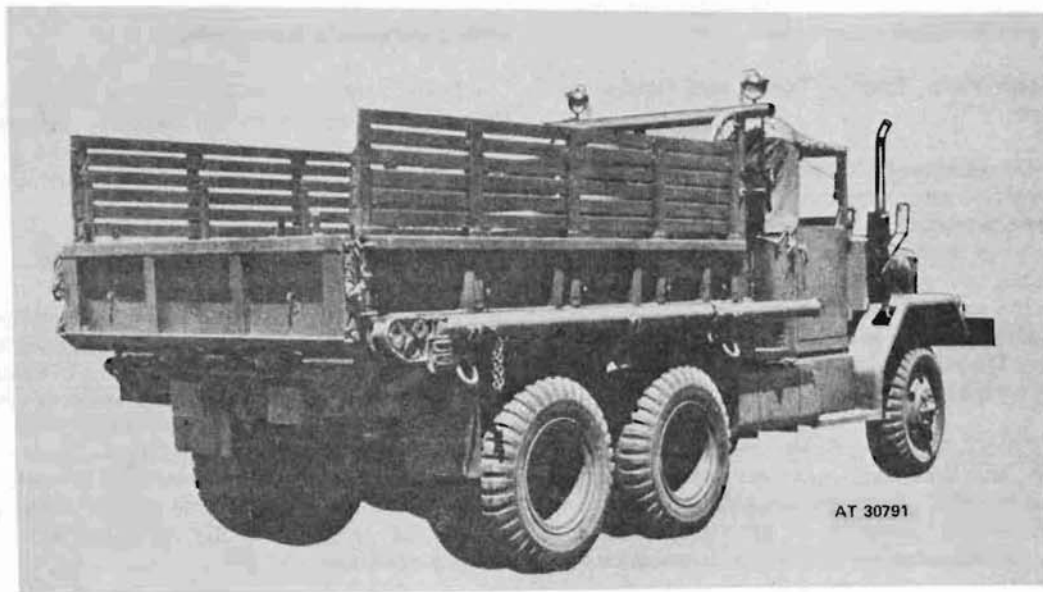
LO 9-2320-209-12 and portions of the Operator's Manual (TM 9-2320-209-10) prescribe lubrication procedures, lubrication points, intervals, and proper material for lubricating the M756A2 truck chassis, body and auxiliary equipment.

#### 430. Preventive Maintenance Procedures.

Table 14 of this manual contains preventive maintenance checks and services for organizational maintenance of the M756A2 pipeline construction truck body and auxiliary equipment. Refer to table 3 of this manual for preventive maintenance checks and services involving the vehicle chassis. Perform all checks and services listed in table 17 of the operator's manual (TM 9-2320-209-10) prior to proceeding with checks and services for the M756A2 body and auxiliary equipment.



*Figure 467. 2-1/2 Ton, 6x6, M756A2 pipeline construction truck - left front view.*



*Figure 468. 2-1/2 Ton, 6x6, M756A2 pipeline construction truck - right rear view*

Table 14. Preventive Maintenance Checks and Service-M756A2 Pipeline Construction Truck

Organizational Maintenance		Semiannual Schedule	
Sequence No.	Item to be inspected	Procedure	Paragraph references
1	Lubrication	<p>Inspect and perform services listed as daily.</p> <p>Inspect the M756A2 body for missing or damaged lubrication fittings, and for indications of insufficient lubrication. Lubricate the pipeline construction vehicle in accordance with lubrication order.</p>	<p>TM 9-2320-209-10</p> <p>TM 9-2320-209-10 and LO 9-2320-209-12</p>
2	Tools and equipment	<p>Inspect the condition of tools and equipment. Inspect the condition of the tool box. Tools and equipment assigned to the pipeline construction body are to be clean, serviceable, and properly stowed or mounted. See that both doors on the tool box close and fasten properly.</p>	<p>Par. 435e (2)</p>
3	Lights, wiring, switch and reflectors	<p>Inspect the exterior flood lights and body reflectors for loose mounting bolts, defective lamps, or broken lenses. Inspect the floodlight wiring harness for frayed, worn, and cracked insulation.</p>	<p>Par. 433e</p>
4	Control levers	<p>Inspect the transfer power take-off shift lever, winch drum clutch lever, and winch drum lock, for improper operation, missing or loose hardware, bends, breaks, and other damage. Tighten or replace loose or missing hardware.</p>	<p>Par. 434</p>
5	Rear winch	<p>Inspect the drum for cracks, bends, broken welds and other damage. If drum is defective, report condition to direct support maintenance. Inspect the winch for loose or missing mounting screws, lubricant leaks, and for broken or missing parts. Tighten or replace loose or missing mounting screws. Report lubrication leaks to direct support maintenance. Fill rear winch worm gear housing and end frame housing to proper level.</p>	<p>Par. 434 and LO 9-2320-209-12</p>
6	Rear winch cable	<p>Inspect the cable for broken wires, kinks, and loose or broken clamps. If defective, replace cable. Tighten or replace loose or broken cable clamps.</p>	<p>Par. 434f</p>

Table 14. Preventive Maintenance Checks and Service-M756A2 Pipeline Construction Truck

Organizational Maintenance		Semiannual Schedule	
Sequence No.	Item to be inspected	Procedure	Paragraph references
7	Sheaves	Replace defective sheaves.	
8	Body	Inspect the body sub-frame for cracks, breaks, broken welds, and improper alignment. Inspect the tailgate, and body panels for breaks, bends and broken welds. Inspect the floorboards and mounting sills for cracks, splits, rotting, and loose or missing mounting hardware. Inspect all brackets for broken welds and loose or missing mounting hardware. Inspect the racks, troop seats, and top assembly for loose or missing hardware. Replace or repair tailgate, and body panels. Replace or repair the mounting sills, floorboards, and floorboard retainers. Repair or replace the racks, troop seats, and top assembly.	Par. 435
9	Winch and cab protector	Inspect the winch and cab protector for loose or missing mounting screws, broken welds, and other damage. Tighten or replace the loose or missing mounting screws on winch and cab protector.	Par. 435f (2)
10	Stiff leg jacks	Inspect the stiff leg jacks for breaks, bends, broken welds, and missing mounting pins. Replace or repair stiff leg jacks.	Par. 435g (2)
11	Tool box	Inspect the tool box for loose or missing mounting hardware, bends, dents, and broken welds. Inspect tool box floor for cracks and rotting. Replace or repair the tool box.	Par. 435e (2)

Table 14. Preventive Maintenance Checks and Service-M756A2 Pipeline Construction Truck

Organizational Maintenance		Semiannual Schedule	
Sequence No.	Item to be inspected	Procedure	Paragraph references
12	Roller and auxiliary bracket assy.	Inspect the roller for freedom of rotation by turning the roller two or three revolutions to check for defective bearings, broken brackets, or brackets out of line, bad welds, or too much end-chuck; must not exceed 1/4" or seals have to make contact with pins. Check for clearance between the roller and auxiliary bracket rollers. Line-to-line contact is acceptable at high point of roller, however, a clearance of 1/8 to 1/4-in. is not considered to be excessive in order to compensate for heavy usage. Replace or repair roller. Adjust auxiliary brackets, if necessary.	Par. 435i (3) (d)
13	A-frame assembly	Inspect the gin poles for bends or broken welds. Inspect sheaves for proper lubrication. Replace or repair defective gin poles, boom chains, and trunnion. Check the A-frame assembly in the rear operating position for distortion. Gin poles should meet without over-lapping.	Par. 435b

**431. Troubleshooting.**

Table 15 contains organizational maintenance troubleshooting procedures for locating and correcting malfunctions which may develop within the M756A2

pipeline construction truck body and auxiliary equipment. Refer to table 4 of this manual for troubleshooting procedures applicable to chassis related components on this truck.

Table 15. Troubleshooting - M756A2 Pipeline Construction Body and Auxiliary Equipment

Malfunction	Probable cause	Corrective action
1. Roller fails to turn and rollers on auxiliary brackets bind.	<p>a. Bearings need lubrication.</p> <p>b. Defective bearings.</p> <p>c. Excessive end-chuck.</p>	<p>a. Clean and repack bearings (par. 435h (3) and LO 9-2320-209-12).</p> <p>b. Replace bearings (Par. 435h(3) (c)).</p> <p>c. If greater than 1/4-in. (1/8-in. at each end of roller), adjust by shimming (par. 435h (5)(b)).</p>

Table 15. Troubleshooting - M756A2 Pipeline Construction Body and Auxiliary Equipment

Malfunction	Probable cause	Corrective action
<p>2. A-frame assembly distorted.</p>	<p>d. No clearance between rollers on auxiliary brackets and roller.</p> <p>Tailboard brackets out-of-line.</p>	<p>d. Check clearance. Line-to-line contact is acceptable at high point of roller. However, a clearance of 1/8 to 1/4-in. is not excessive in order to compensate for heavy usage. Adjust brackets (par. 435i (3)(d)).</p> <p>The tipping of one bracket in either a forward or backward direction can cause distortion of the A-frame. When the gin poles are resting against the tailboard bracket, in the rear operating position, 6-inches is the maximum permissible misalignment for A-frame operation. Notify direct support maintenance unit. If misalignment is beyond acceptable standards.</p>
<p><b>REAR WINCH</b></p>		
<p>3. Rear winch fails to operate.</p>	<p>a. Broken drive chain.</p> <p>b. Defective sprocket on rear winch or power take-off.</p> <p>c. Clutch sticks on drum shaft.</p>	<p>a. Repair or replace rear winch drive chain (par. 434b).</p> <p>b. Replace defective sprocket (par. 434c).</p> <p>c. Notify direct support maintenance unit.</p>
<p>4. Rear winch fails to hold imposed load.</p>	<p>Worn brake lining or defective brake band.</p>	<p>Notify direct support maintenance unit.</p>
<p>5. Rear winch safety brake overheats.</p>	<p>a. Defective lining.</p> <p>b. Defective brake band or drum.</p>	<p>a. Notify direct support maintenance unit.</p> <p>b. Notify direct support maintenance unit.</p>

Table 15. Troubleshooting - M756A2 Pipeline Construction Body and Auxiliary Equipment

Malfunction	Probable cause	Corrective action
6. Rear winch leaks lubricant.	<ul style="list-style-type: none"> <li>a. Defective gaskets or seals.</li> <li>b. End frame or gear case in a cracked or damaged condition.</li> </ul>	<ul style="list-style-type: none"> <li>a. Notify direct support maintenance unit.</li> <li>b. Notify direct support maintenance unit.</li> </ul>
7. Rear winch cable defective.	<ul style="list-style-type: none"> <li>a. Broken or damaged cable.</li> <li>b. Cable does not wind evenly onto drum.</li> </ul>	<ul style="list-style-type: none"> <li>a. Shorten or replace rear winch cable (par. 434f).</li> <li>b. Unwind cable and check for kinks and other damage. Replace if necessary (par. 434f (2)).</li> </ul>
<b>ELECTRICAL SYSTEM</b>		
8. Floodlights fail to operate.	<ul style="list-style-type: none"> <li>a. Lamp burned out.</li> <li>b. Wires disconnected.</li> <li>c. Wiring harness frayed or broken.</li> </ul>	<ul style="list-style-type: none"> <li>a. Replace the lamp (par. 433b).</li> <li>b. Connect wires.</li> <li>c. Repair wiring harness and notify direct support maintenance unit if replacement of wiring harness is necessary.</li> </ul>



**Section III. ORGANIZATIONAL MAINTENANCE PROCEDURES  
FOR THE M756A2 PIPELINE CONSTRUCTION BODY AND AUXILIARY EQUIPMENT**

**432. General.**

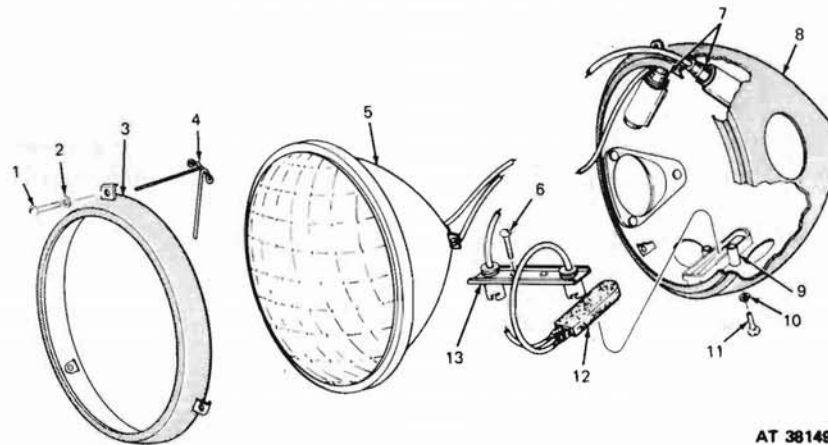
This chapter provides repair instructions for the M756A2 pipeline construction truck body and auxiliary equipment covering all items that are the responsibility of organizational maintenance as allocated by the maintenance allocation chart (MAC). Adjustment, repair, testing, reassembly, and installation procedures are provided.

**433. Electrical System.**

*a. General.* The electrical system for the M756A2 pipeline construction truck body includes two exterior floodlights mounted in swivel type brackets on adjustable supports at each top corner of the winch and cab protector. Individual on and off switches are positioned at the rear of each light housing for controlling the illumination needed for nighttime operation of the rear winch and A-frame assembly.

*b. Floodlight Lamp Bulb Replacement (Fig. 469).*

- (1) Remove three screws and three rings to separate the lamp door from the light housing clips.
- (2) Remove four springs holding lamp inside light housing. Pull lamp out and unplug unit from connector inside the light housing.
- (3) Replace the old lamp with new unit and plug into connector inside light housing.
- (4) Position lamp unit in light housing and assemble springs.
- (5) Attach the lamp door to light housing and secure to clips with three rings and three screws.



AT 38149

Key	Item
1	Screw
2	Ring, screw retaining
3	Door
4	Spring, retaining
5	Lamp
6	Screw, machine
7	Connectors

Key	Item
8	Housing, light
9	Housing, switch
10	Washer
11	Screw, machine
12	Switch assembly
13	Retainer, switch

Figure 469. Floodlight assembly.

c. **Switch Replacement (Fig. 469).** The exterior switch may be replaced by removing the lamp from the housing (see b above) and removing retainer from inside by removing two screws, along with two screws and washers from exterior of light housing. Switch may now be removed.

d. **Floodlight Replacement (Fig. 470).**

- (1) The floodlight assembly may be removed from the swivel bracket assembly by removing two bolts, four spring washers, four flatwashers, two grommets, two spacers, two lockwashers, and two nuts. Reassemble in reverse order of removal.
- (2) The floodlight and swivel bracket may be removed as an assembly by removing two nuts and two fiber washers. Lift floodlight assembly from support.

e. **Cleaning, Inspection and Repair.**

- (1) Clean all parts of the floodlight

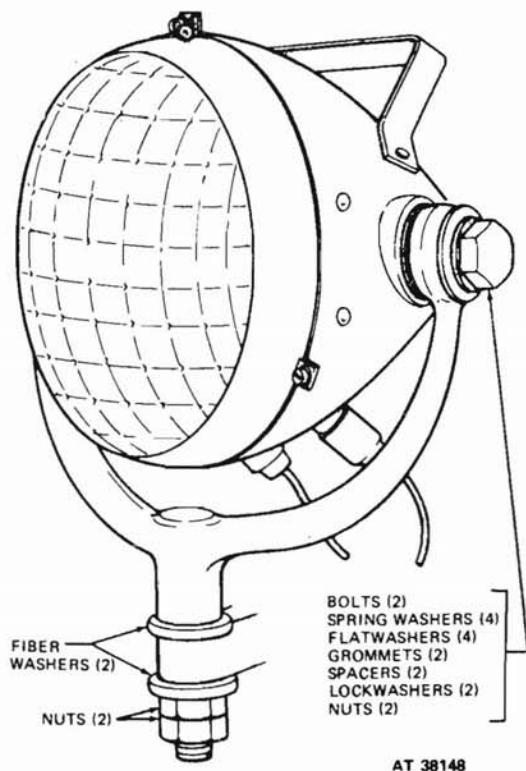


Figure 470. Floodlight and bracket assemblies.

assembly with a cloth dampened in an approved cleaning solvent (non-flammable, and non-toxic).

- (2) Inspect the swivel mounting brackets, light support, bolts, and hardware for cracks, breaks, broken welds, defective hardware, and other damage. Repair or replace all defective parts.
- (3) Inspect the light body for dents, bends, loose or corroded connections, defective wiring, and other damage. Repair or replace defective light body.
- (4) Check switch for proper working condition. If defective, replace in accordance with paragraph 433c.
- (5) Check lamp for loose connections and other damage. If lamp is burned out, replace in accordance with paragraph 433b.
- (6) Inspect the lamp holding spring, door, and hardware for bends, breaks, and other damage. Repair or replace as required.

#### 434. Rear Winch.

a. **General.** For a description of the M756A2 rear winch refer to the operator's manual (TM 9-2320-209-10). This paragraph outlines procedures for maintenance of the drive chain, sprockets, drum clutch, and winch drum lock.

b. **Drive Chain (Fig. 471).**

- (1) **Removal.** Remove the master link from the drive chain. Remove drive chain from the rear winch sprocket and transfer power take-off sprocket.
- (2) **Cleaning, Inspection and Repair.** Clean chain in an approved cleaning solvent (non-flammable, and non-toxic). Inspect the chain for cracked, broken or excessively worn links or pins. If unserviceable, replace the chain.
- (3) **Installation.**
  - (a) Position the drive chain around the winch sprocket and the power

take-off sprocket. Install the master link to secure the drive chain.

*Note.* The winch mounting brackets, which are secured to the vehicle frame, have slotted holes to compensate for winch drive chain adjustment.

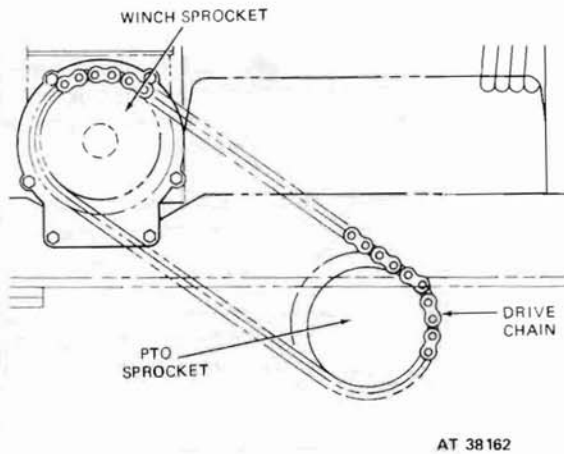


Figure 471. Rear winch drive chain.

- (b) Loosen the nuts. Move the cab guard and winch assembly to the left side of the vehicle to tighten the chain, and to the right to loosen the chain.
- (c) Tighten or loosen the chain until there is a one-half inch deflection in the chain midway between the winch drive sprocket and power take-off sprocket. Tighten nuts.

c. Sprockets.

(1) Winch sprocket and shear pin (fig. 472).

- (a) *Removal.* Remove the drive chain (par. 434b (1)). Remove cotter pin and remove shear pin from the winch sprocket and hub. Remove locking ring from hub. Remove locking ring from sprocket. Rotate hub 90° to line up sprocket and bushing holes. Remove plugs so that pin can easily be removed securing sprocket and hub. Remove sprocket, hub, and bushing from shaft.

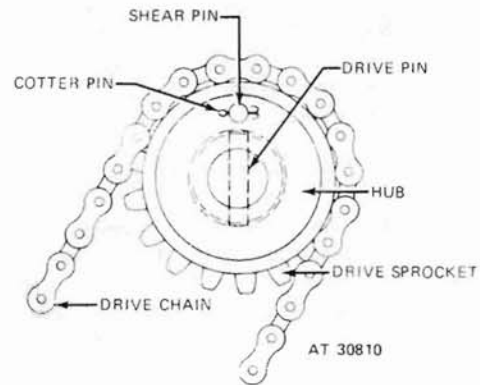


Figure 472. Rear winch sprocket and shear pin.

- (b) *Cleaning, inspection, and repair.* Clean the winch sprocket in an approved cleaning solvent (non-flammable, and non-toxic). Inspect the sprocket for cracks, breaks, chipped or broken teeth, or excessive wear. Replace damaged or worn sprocket.

- (c) *Installation.* Position hub, sprocket and bushing on the worm gear shaft of the rear winch. Rotate hub to line up with sprocket and bushing holes. Insert pin and install plugs at each end. Install locking ring on sprocket and hub. Install shear pin and secure with cotter pin. Install the drive chain (par. 434b (3)).

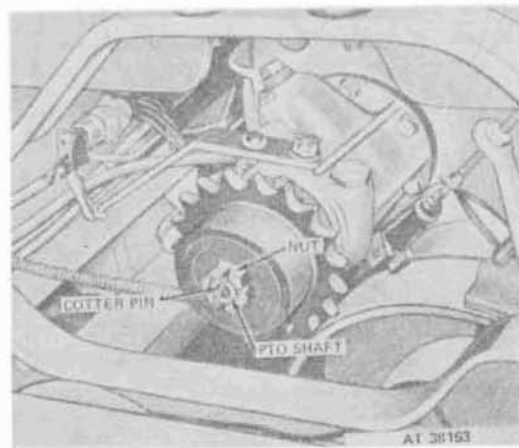
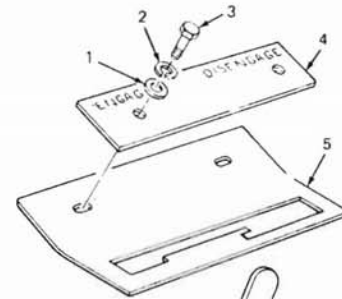


Figure 473. PTO sprocket.

(2) *Power take-off sprocket (fig. 473).*

- (a) *Removal.* Remove the drive chain (par. 434b (1)). Remove the cotter pin and remove the shaft nut. Pull the power take-off sprocket from the power take-off shaft.
- (b) *Cleaning, inspection, and repair.* Refer to paragraph 434c (1) (b) for procedures.
- (c) *Installation.* Install the power take-off sprocket on the transfer power take-off shaft, making certain to align the keyway of the sprocket with the key in the shaft. Install and tighten the shaft nut. Install the cotter pin. Install the drive chain (par. 434b (3)).



d. *Drum Clutch Lever and Guide Plate (Fig. 474 ).*

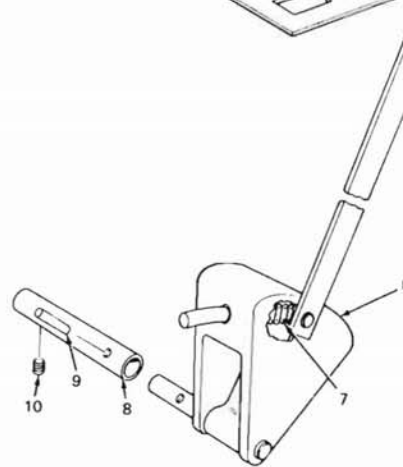
(1) *Removal.*

- (a) Remove two screws, two lockwashers, and two flatwashers, to remove guide plate and data plate from the cab guard.
- (b) Remove the setscrew and pull the clutch lever from the clutch shaft.

*Note.* No additional disassembly is required unless the sleeve or drum clutch lever springs have to be replaced.

- (c) Remove the pin and remove the sleeve from the shaft of the drum clutch lever.

- (2) *Cleaning, inspection, and repair.* Clean the clutch lever and guide plate in an approved cleaning solvent (non-flammable, and non-toxic) and dry thoroughly. Inspect the clutch lever for damaged or worn springs, pins, or shaft. If the lever is badly worn, cracked, or broken, replace it. If the sleeve has been removed and is badly worn or damaged, replace it. Replace all unserviceable hardware.



AT 38166

Key	Item
1	Flatwasher
2	Lockwasher
3	Screw
4	Data plate
5	Plate
6	Spring housing
7	Spring, helical compression
8	Sleeve, adapter
9	Pin
10	Setscrew

Figure 474. Drum clutch lever and guide plate.

(3) *Installation.*

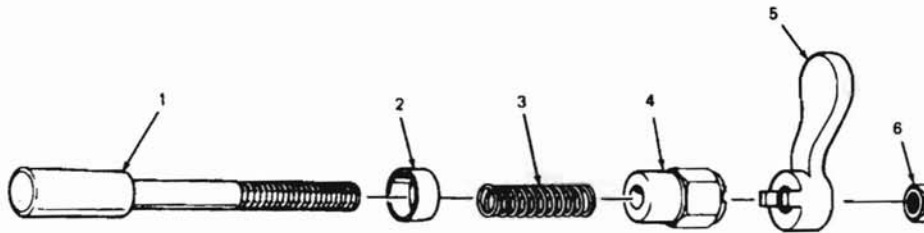
- (a) If the sleeve has to be replaced, position the new sleeve on the shaft of the clutch lever. Line up pin holes, and install the pin.
- (b) Position the clutch lever and adapter sleeve on the clutch shaft, lining up the keyway of the sleeve

on the clutch shaft key, and install set screw.

- (c) Position the guide plate over the clutch lever and install flatwashers, lockwashers, and screws. Tighten securely.

e. Winch Drum Lock (Fig. 475 ).

- (1) *Removal.* Remove the winch drum lock assembly by removing nut, drum lock latch, poppet nut, spring and spacer from the poppet.



AT 30745

Key	Item	Key	Item
1	Poppet	4	Nut
2	Spacer	5	Latch
3	Spring, helical	6	Nut

Figure 475. Winch drum lock assembly.

- (2) *Cleaning, inspection, and repair.* Clean all the parts in the winch drum lock in an approved cleaning solution (non-flammable, and non-toxic) and dry thoroughly. Inspect all parts for wear, especially the poppet and spring. Replace all worn or damaged parts.

(3) *Installation.*

- (a) Position the spacer, spring, poppet nut, and drum lock latch on the poppet. Compress the assembled parts against the spring and install the nut. Tighten nut to secure the assembly on the poppet.
- (b) Insert the winch drum lock into the winch. Install the poppet nut and tighten to the winch to secure the winch drum lock.

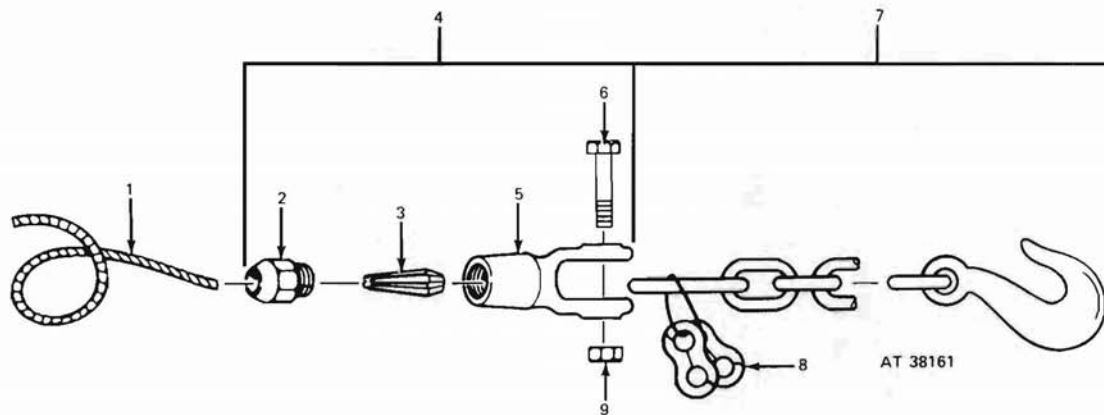
f. Rear Winch Cable (Fig. 476)

(1) *Removal.*

- (a) Freespool the winch cable until all the cable is completely unreeled.

**Warning.** Always use leather gloves when handling wire cable, and do not allow cable to be drawn through your hands rapidly. Broken wires can cause painful injuries.

- (b) Remove the setscrew and pull the end of the cable from the winch drum.
- (c) Remove the sleeve from the clevis and remove the cable.



Key	Item	Key	Item
1	Cable	6	Pin
2	Sleeve	7	Chain assembly
3	Socket	8	Link, repair
4	Clevis assembly	9	Nut
5	Clevis		

Figure 476. Winch cable and chain assembly.

(2) *Cleaning, inspection, and repair.*

- (a) Clean the cable assembly in an approved cleaning solvent (non-flammable, and non-toxic), or clean with steam.
- (b) Inspect the cable for kinks, broken wires, or other damage.
- (c) If the cable has been broken and enough cable remains to obtain a good square cut and still operate the winch properly, weld the wires at the end of the cable to prevent fraying.
- (d) If unserviceable, replace clevis and/or chain, assembly.
- (e) If the cable is badly worn, kinked, or frayed, refer to Chapter 1, Section III of TM 5-725 for instructions.
- (f) Lubricate the cable in accordance with LO 9-2320-209-12.

(3) *Installation.*

- (a) Install the chain assembly on the clevis assembly.

- (b) Insert the end of the cable into the clevis sleeve. Assemble clevis to sleeve and tighten.
- (c) Insert the other end of the cable into the cable recess of the winch drum and install the setscrew to secure the cable to the drum.
- (d) Reel the cable assembly on the winch drum.

*Note.* When drawing in slack cable, a close check must be maintained to avoid the formation of loops which will become kinks. A kinked cable is permanently weakened. Always maintain tension on the cable at the drum to prevent loosening of the coils on the winch drum.

**435. M756A2 Body.**

*a. General.* For a description of the M756A2 body and A-frame assembly, refer to the operator's manual (TM 9-2320-209-10). This paragraph outlines procedures for maintenance of the A-frame assembly, tailboard roller, and other body components.

*b. A-Frame Assembly.* Refer to the operator's manual (TM 9-2320-209-10) for operation of the A-frame.

In case of distortion where the gin poles meet, six inches is the maximum permissible misalignment for effective "A" frame operation.

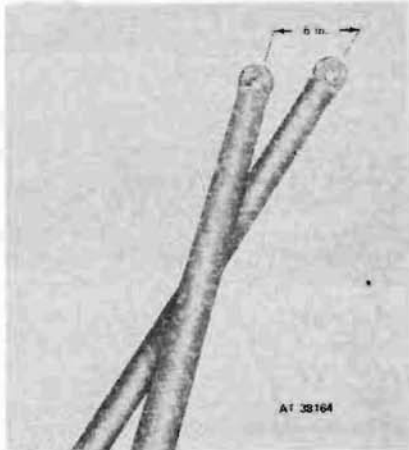


Figure 477. Ginpole distortion.

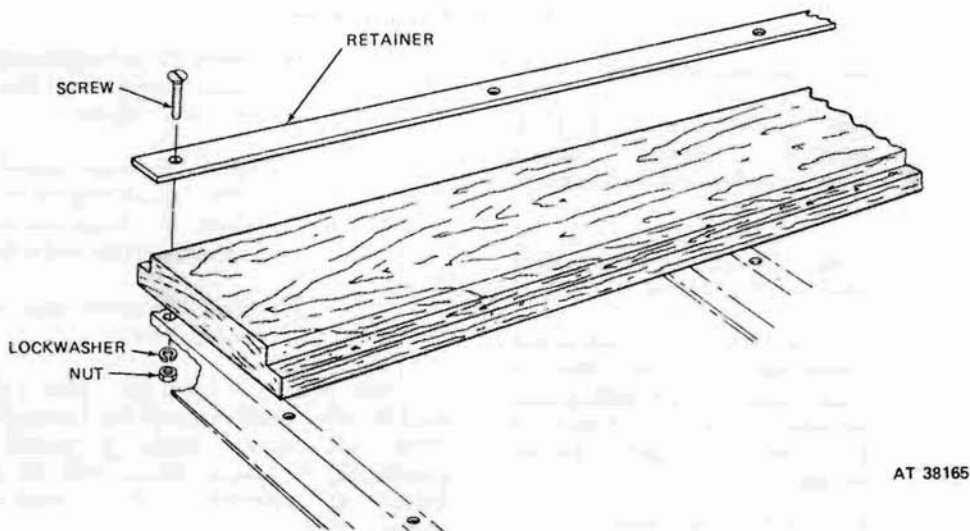


Figure 478. Floorboard assembly.

and other damage. Repair or replace retainers and mounting hardware as necessary.

- (3) *Installation.* Place the floorboards on the frame. Position the retainers on the floorboards, and secure to the frame with the machine screws, lockwashers, and nuts.

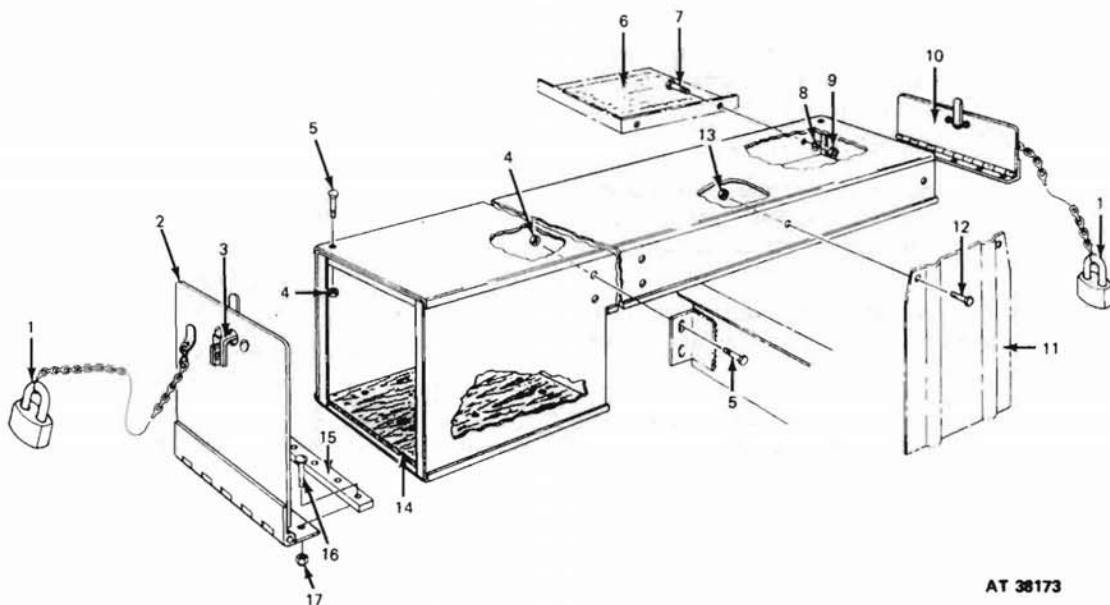
c. *Top Assembly, Racks, and Seats.* Refer to Section XXXIX of this manual for organizational maintenance procedures.

d. *Floorboards (Fig. 478).*

- (1) *Removal.* Remove nuts, lockwashers, machine screws, and floor retainer from floorboards and frame. Remove floorboards from frame, as required.
- (2) *Cleaning, inspection, and repair.* If a steam cleaner is available, steam clean the floorboards, retainers, and mounting hardware. If steam cleaner is not available, use other approved cleaning methods (non-flammable, and non-toxic). Inspect the boards for warpage, breaks, and other damage. Replace defective boards. Inspect the retainers and mounting hardware for cracks, bends, breaks, stripped threads,

e. *Toolbox (Fig. 479).*

- (1) *Removal.*
  - (a) Remove step by removing nuts, lockwashers, and capscrews from the step, cab guard, and toolbox. Remove step.



AT 38173

Key	Item	Key	Item
1	Lock	9	Nut, step to toolbox
2	Door, L.H.	10	Door, R.H.
3	Latch	11	Mudguard, front
4	Nut, body sub-frame mounting (6 locations)	12	Capscrew, mudguard to toolbox
5	Capscrew, body sub-frame mounting (6 locations)	13	Nut, mudguard to toolbox
6	Step	14	Floor, plywood
7	Capscrew, step to toolbox	15	Spacer (1 to each door)
8	Lockwasher, step to toolbox	16	Screw, machine (5 to each door)
		17	Nut (5 to each door)

Figure 479. Toolbox installation.

- (b) Remove front mud guard by removing cap screw that secures the mud guard brace to fuel tank support. Remove nut, lockwashers, cap screw, and brace from front mud guard. Remove nuts, lockwashers, cap screws, and front mud guard from toolbox.
- (c) Remove snaps from latches, turn latches and open doors.
- (d) Remove nuts, lockwashers, and machine bolts from toolbox and frame. Remove toolbox.
- (e) Remove nuts, lockwashers, capscrews, hinges, and doors from toolbox. Remove nuts,

lockwashers, machine screws, and chains and snaps from toolbox doors.

- (f) Remove the plywood floor from toolbox.
- (2) *Cleaning, inspection, and repair.*
  - (a) Clean all parts in an approved cleaning solvent (non-flammable and non-toxic) and dry thoroughly.
  - (b) Inspect the mounting hardware for stripped threads and other damage. Replace defective hardware.
  - (c) Inspect the snap and chain assemblies for cracks, breaks, and other damage. Replace defective



chain and snap assemblies.

- (d) Inspect the doors for warpage, cracks, breaks, and other damage. Repair or replace the door as necessary.
- (e) Inspect the hinges for cracks, breaks, elongated pinholes and other damage. Repair or replace as necessary.

*Note.* If it is necessary to replace the hinge pin, replace door assembly, as the pin is welded to the door.

- (f) Inspect the door latch for breaks, cracks, and other damage. Repair or replace door latch, as necessary.
- (g) Inspect the toolbox for cracks, breaks, and other damage. Repair or replace toolbox as necessary.

(3) *Installation.*

- (a) Install plywood floor in toolbox.
- (b) Position chain and snap assemblies on doors and secure each with machine screws, lockwashers, and nut.
- (c) Place hinges on the doors, position

hinges on the toolbox, and install capscrews, lockwashers, and nuts.

- (d) Position toolbox on body. Install machine screws, lockwashers, and nuts.
- (e) Close doors and secure the latches with snaps.
- (f) Install the front mud guard and step.

f. *Winch and Cab Protector (Fig. 480).*

(1) *Removal.*

- (a) Disconnect the floodlight wiring harness from the chassis wiring harness.
- (b) Remove eight nuts, lockwashers, and capscrews securing the cab protector angle brackets to the front and rear cross angle brackets of the rear winch. Remove eight nuts, lockwashers, and capscrews securing the cab protector to the vehicle frame side rail rear winch support brackets.
- (c) Attach a suitable lifting device to the winch and cab protector and lift cab protector from winch supports and chassis frame.

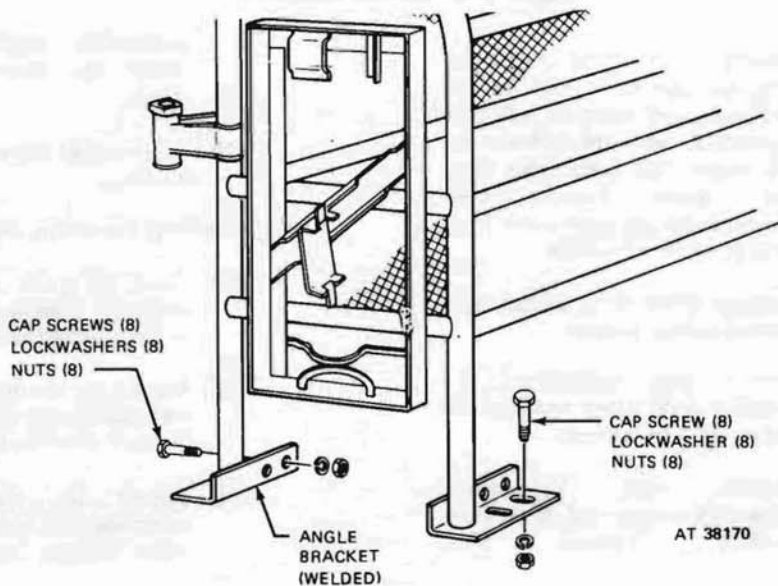


Figure 480. Cab protector installation.

(2) *Cleaning, inspection, and repair.*

- (a) Clean the cab protector with an approved cleaning solvent (non-flammable, and non-toxic).
- (b) Clean the mounting hardware with a wire brush and an approved cleaning solvent (non-flammable, and non-toxic).
- (c) Inspect the cab protector for breaks, bends, broken welds, and other damage. Repair or replace the cab protector, if necessary.
- (d) Inspect the mounting hardware for cracks, breaks, stripped threads, and other damage. Replace defective hardware.

(3) *Installation.*

- (a) Attach a suitable lifting device to the cab protector, and position it on winch supports and brackets.

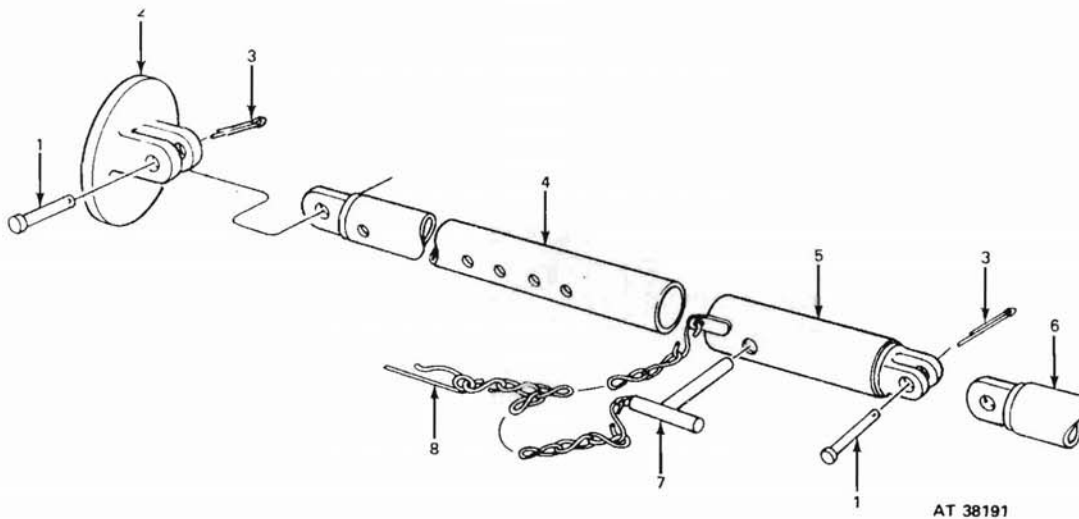
- (b) Install eight capscrews, lockwashers, and nuts to secure the cab protector angle brackets to the front and rear cross angle brackets of the rear winch. Install eight capscrews, lockwashers, and nuts to secure the cab protector to the frame side rail winch support brackets.

- (c) Connect the floodlight wiring harness to chassis wiring harness.

g. *Stiffleg Jacks (Fig. 481).*

(1) *Removal.*

- (a) Place the stiffleg jack assemblies in the operating position.
- (b) Remove safety pin from tee locking assembly.
- (c) Remove tee locking pin from upper leg and lower leg, and pull lower leg from upper leg.



Key	Item
1	Pin
2	Foot
3	Pin, cotter
4	Leg, Lower

Key	Item
5	Leg, upper
6	Link
7	Tee locking assy.
8	Pin, safety

Figure 481. Stiff leg jack assembly.

- (d) Remove the cotter pins from pins.
- (e) Remove pin and upper leg from stiffleg jack link.
- (f) Remove pin and foot from lower leg.

(2) *Cleaning, inspection, and repair.*

- (a) Clean all parts of the stiffleg jack assembly with an approved solvent (non-flammable, and non-toxic).
- (b) Inspect the stiffleg jack assembly for cracks, bends, worn pins, elongated holes, and other damage. Repair or replace the stiffleg jack assemblies, as necessary.

(3) *Installation.*

- (a) Position the foot on lower leg and install pin.
- (b) Place the upper leg on stiffleg jack

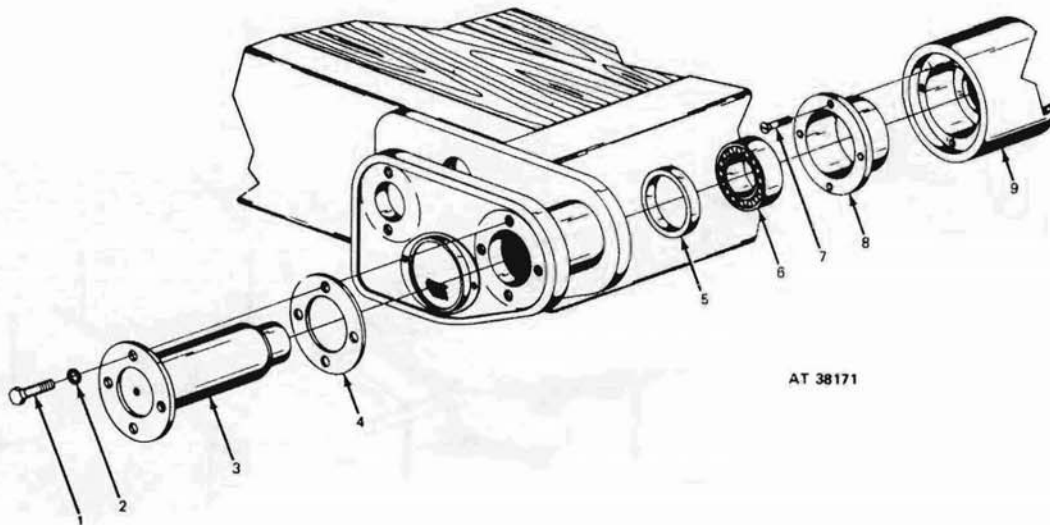
link and install pin. Install cotter pins in pins.

- (c) Insert the lower leg in upper leg and install tee locking pin.
- (d) Install the safety pin in tee locking pin assembly.
- (e) Install the stiffleg jack assemblies in the storage position.

h. *Tailboard Roller (Fig. 482).*

(1) *Removal of roller.*

- (a) Remove machine screws and lockwashers from pin.
- (b) Remove pin and shims from tailboard roller and bracket.
- (c) Remove pin on the opposite side in the same manner.
- (d) Remove tailboard roller from body sub-frame and auxiliary roller support brackets.



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Key	Item
1	Screw
2	Lockwasher
3	Pin
4	Shim
5	Seal

Key	Item
6	Bearing
7	Screw, machine
8	Seat, bearing
9	Roller, tailboard

Figure 482. Tailboard roller assembly.

- (2) *Removal of roller bearings.*
    - (a) Remove machine screw and bearing seat from roller.
    - (b) Remove oil seal and bearing from bearing seat. Discard seal.
    - (c) Remove the opposite bearing seat, oil seal, and bearing in the same manner.
  - (3) *Cleaning, inspection, and repair.*
    - (a) Clean the tailboard roller assembly with an approved cleaning solvent (non-flammable, and non-toxic).
    - (b) Inspect the bearing seats for cracks, breaks, and other damage. Replace defective bearing seats.
    - (c) Inspect the bearings for scoring, galling, and free rotation. Replace defective bearings.
    - (d) Inspect the roller pins and roller for excessive wear, bends, and other damage. Replace defective roller pins and roller.
    - (e) Inspect the mounting hardware for cracks, breaks, stripped threads, and other damage. Replace defective hardware.
  - (4) *Assembly of roller bearings.*
    - (a) Pack the end of the roller cavity and the bearing in accordance with LO 9-2320-209-12.
    - (b) Install the bearing and new oil seal in the bearing seat.
    - (c) Position the bearing seat in roller, and install machine screws.
    - (d) Install the remaining bearing seat, bearing, and new oil seal for the opposite side in the same manner.
  - (5) *Installation.*
    - (a) Position tailboard roller on auxiliary bracket rollers at end of body flatbed.
      - (b) Install shims on pin, and insert pin through bracket and into the bearing.
      - (c) Install lockwashers and machine screws in pin and bracket.
      - (d) Install the opposite pin in the same manner.
      - (e) Check for end-play. Must not exceed 1/4-in, or seals have to be in contact with pins.
- i. Auxiliary Roller Brackets (Fig. 483).*
- (1) *Removal.*
    - (a) Remove the tailboard roller (par. 435h (1)).
    - (b) Remove the nuts, lockwashers, capscrews, and auxiliary brackets from body sub-frame.
    - (c) To disassemble, remove cotter pins, nuts, washers, roller shaft, and rollers, from the auxiliary bracket.
    - (d) Remove lubrication fittings from roller shafts.
  - (2) *Cleaning, inspection, and repair.*
    - (a) Clean all parts of the auxiliary brackets, and support roller with an approved cleaning solvent (non-flammable and non-toxic), and dry thoroughly.
    - (b) Inspect the brackets for cracks, breaks, and other damage. Replace or repair defective brackets as necessary.
    - (c) Inspect the rollers, roller shafts, and other parts for breaks, excessive wear, and other damage. Repair or replace defective rollers, roller shafts, and other parts as necessary.
  - (3) *Installation.*
    - (a) Install lubrication fittings in the roller shafts.

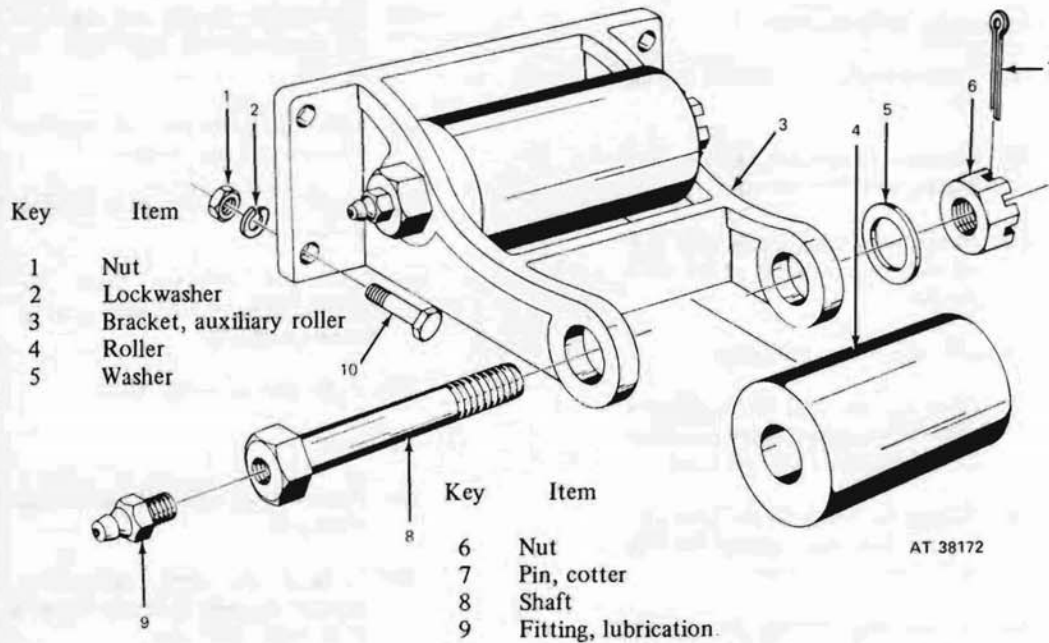
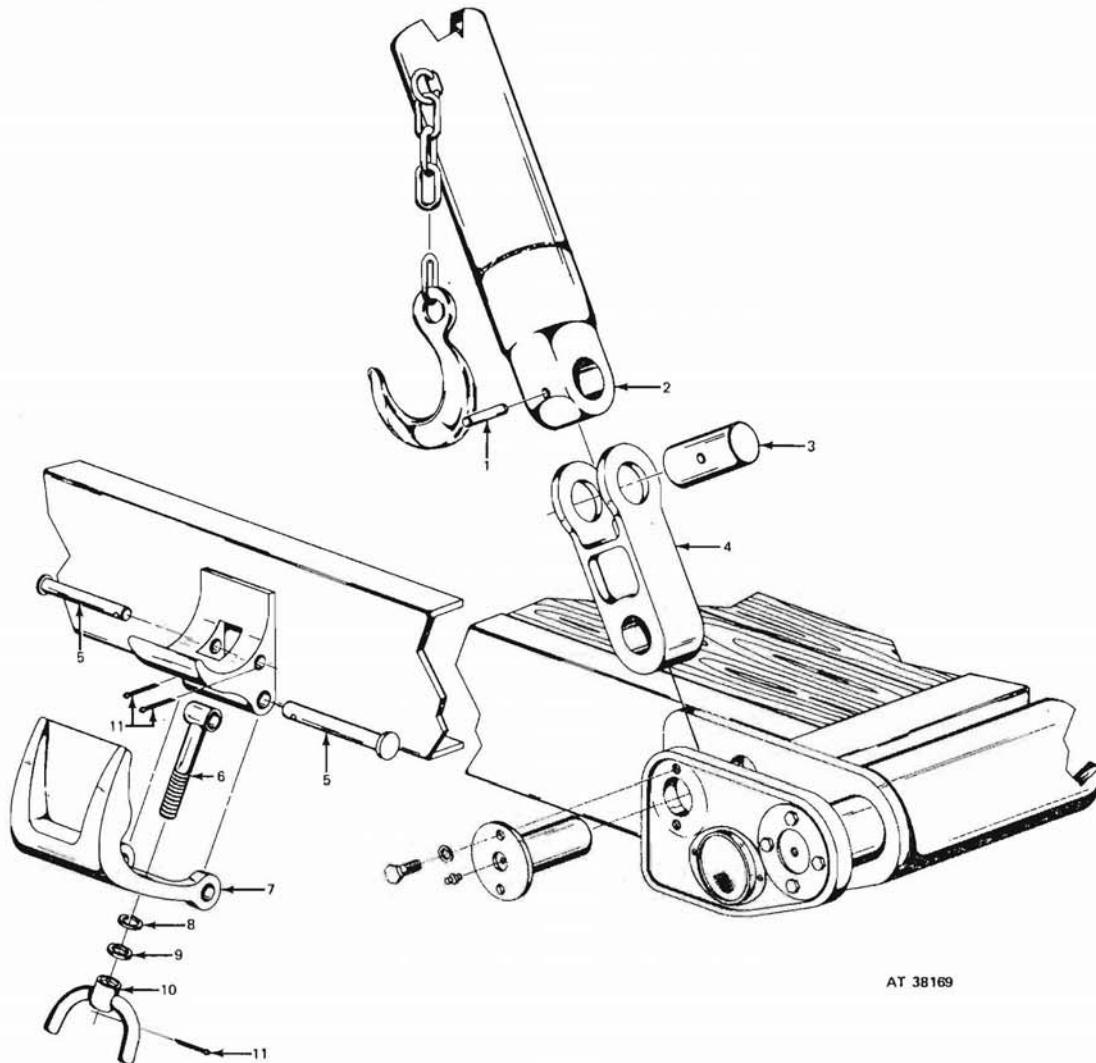


Figure 483. Auxiliary roller bracket assembly.

- (b) Position the rollers in the roller brackets, and insert roller shafts through the brackets and roller.
- (c) Secure roller shafts with nuts and cotter pins.
- (d) Position the roller support bracket on body sub-frame and secure with the capscrews, lockwashers and nuts. When securing the brackets, check for clearance between the rollers of the auxiliary brackets and the tailboard roller. Line-to-line contact is acceptable at high point of roller, however, a clearance of 1/8 to 1/4-inches is not considered as excessive in order to compensate for heavy usage. Adjustment can be accomplished by placing shim stock behind the brackets.
- (e) Install the tailboard roller (par. 435h (5)).
- (f) Lubricate the auxiliary roller brackets (LO 9-2320-209-12).

j. Gin Poles and Clamps.

- (1) Refer to the operator's manual (TM 9-2320-209-10) for instructions in the removal and installation of the gin poles.
- (2) *Disassembly of the gin poles and clamps (fig. 484).*
  - (a) Remove cotter pin, wing nut, lockwasher, and flatwasher from eyebolt.
  - (b) Remove cotter pin, pins and gin pole clamp from bracket.
  - (c) Remove cotter pin, pin and eyebolt from bracket.
  - (d) Drill pin from the link and pin.



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Key	Item
1	Pin
2	Gin pole
3	Pin
4	Link
5	Pin
6	Eye bolt

Key	Item
7	Clamp, gin pole
8	Lockwasher
9	Flatwasher
10	Wing nut
11	Pin, cotter

Figure 484. Gin pole and rest bracket assembly.

- (e) Remove pin from link, and remove link.

(3) *Cleaning, inspection, and repair.*

- (a) Clean all parts of the gin pole clamps and gin pole with an approved cleaning solvent (non-flammable, and non-toxic).
- (b) Inspect all parts of the gin pole clamps for breaks, bends, stripped threads, and other damage. Repair or replace defective gin pole clamps.
- (c) Inspect the gin poles for bends, broken welds, and other damage. Replace defective gin poles.

(4) *Assembly of the gin poles and clamps.*

- (a) Position link and install pin to secure the links together.
- (b) Align the hole in pin and link, and install a new pin.
- (c) Position the eyebolt in the bracket and secure with pin and cotter pin.
- (d) Position clamp on eyebolt and bracket, and install pin and cotter pins.
- (e) Install flatwasher, lockwasher, wing nut, and cotter pin on the eyebolt.

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For explanation of abbreviations used, see AR 320-50.





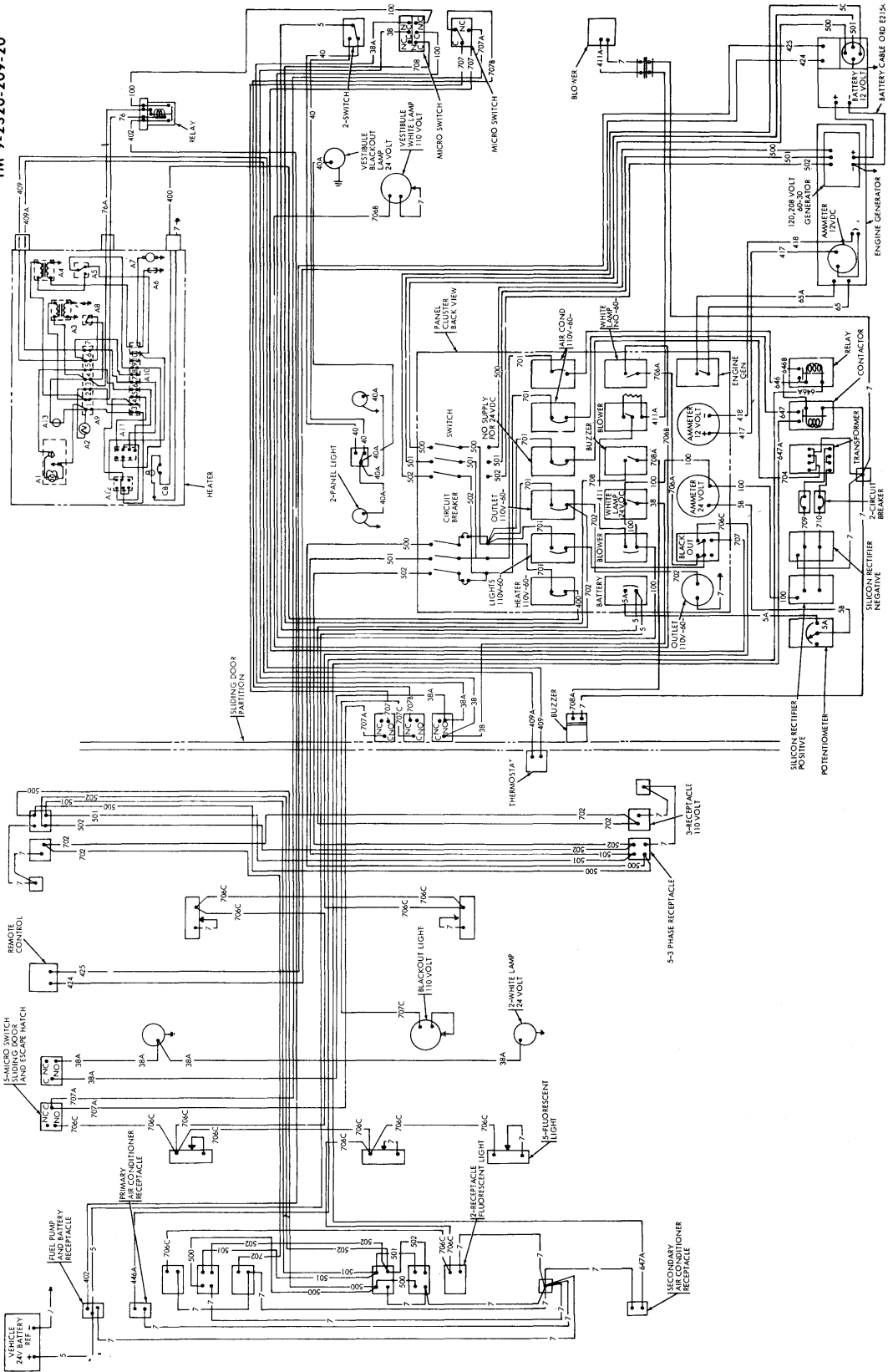
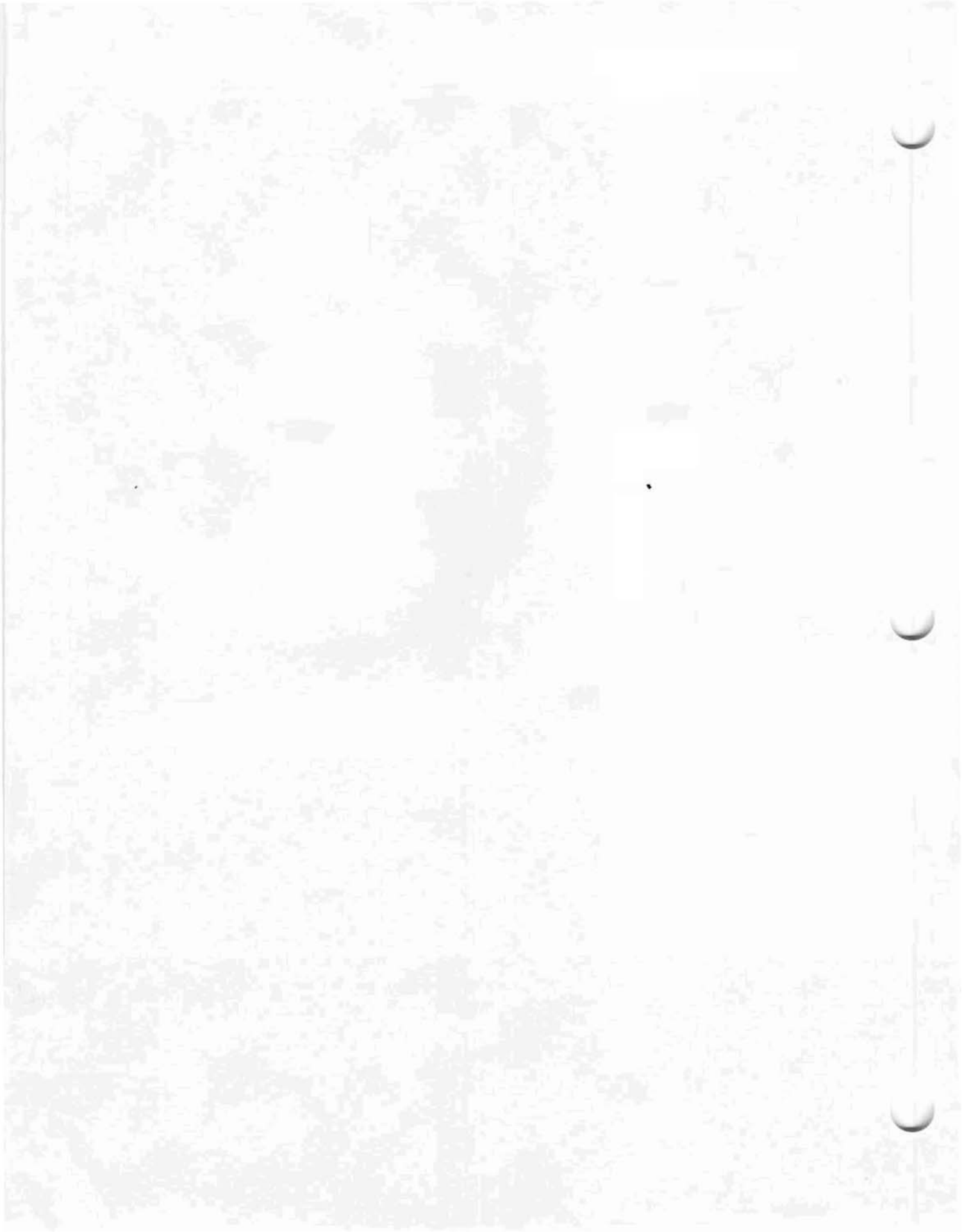
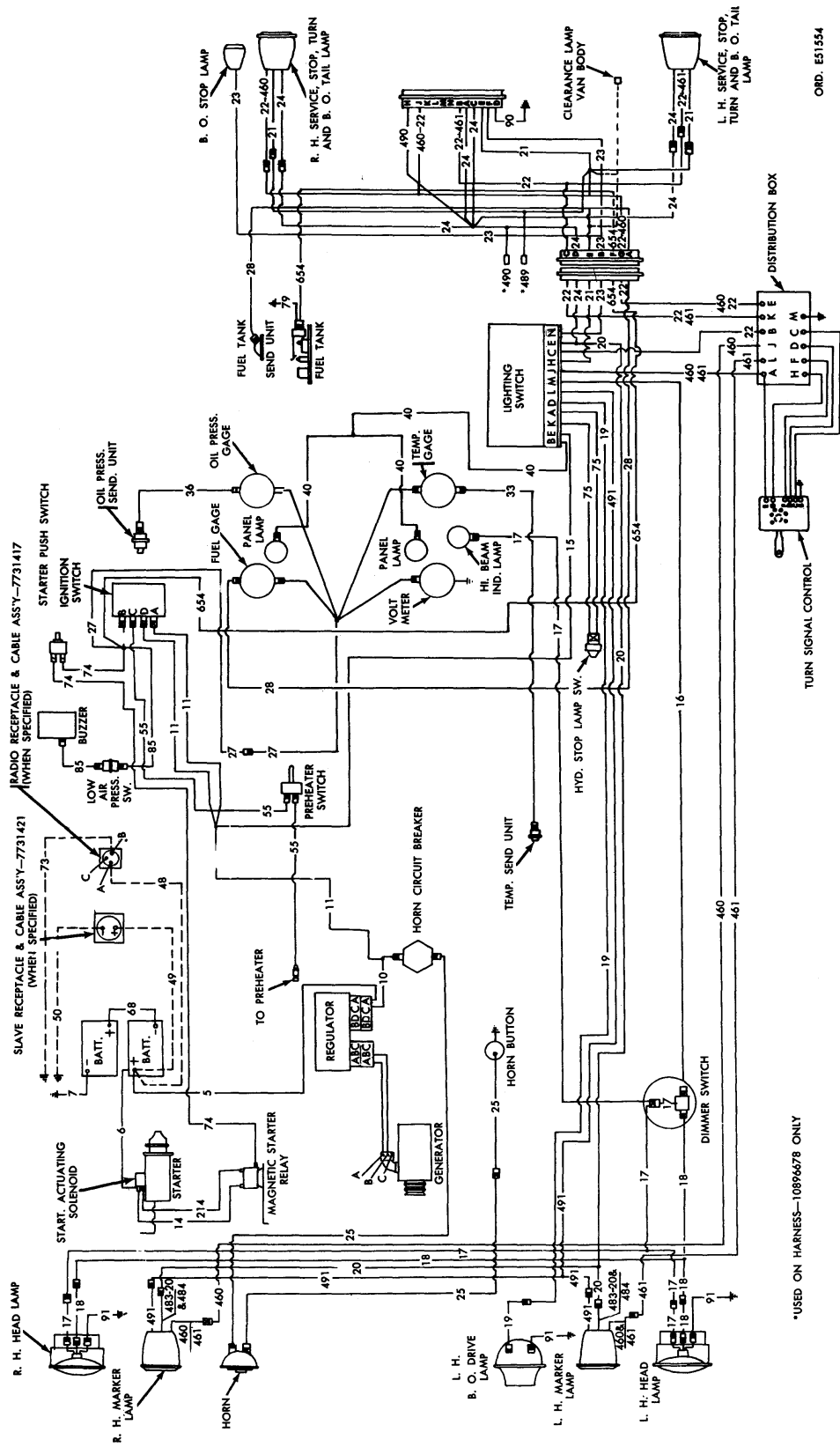


Figure 76. Wiring diagram, XM472 missile firing data computer





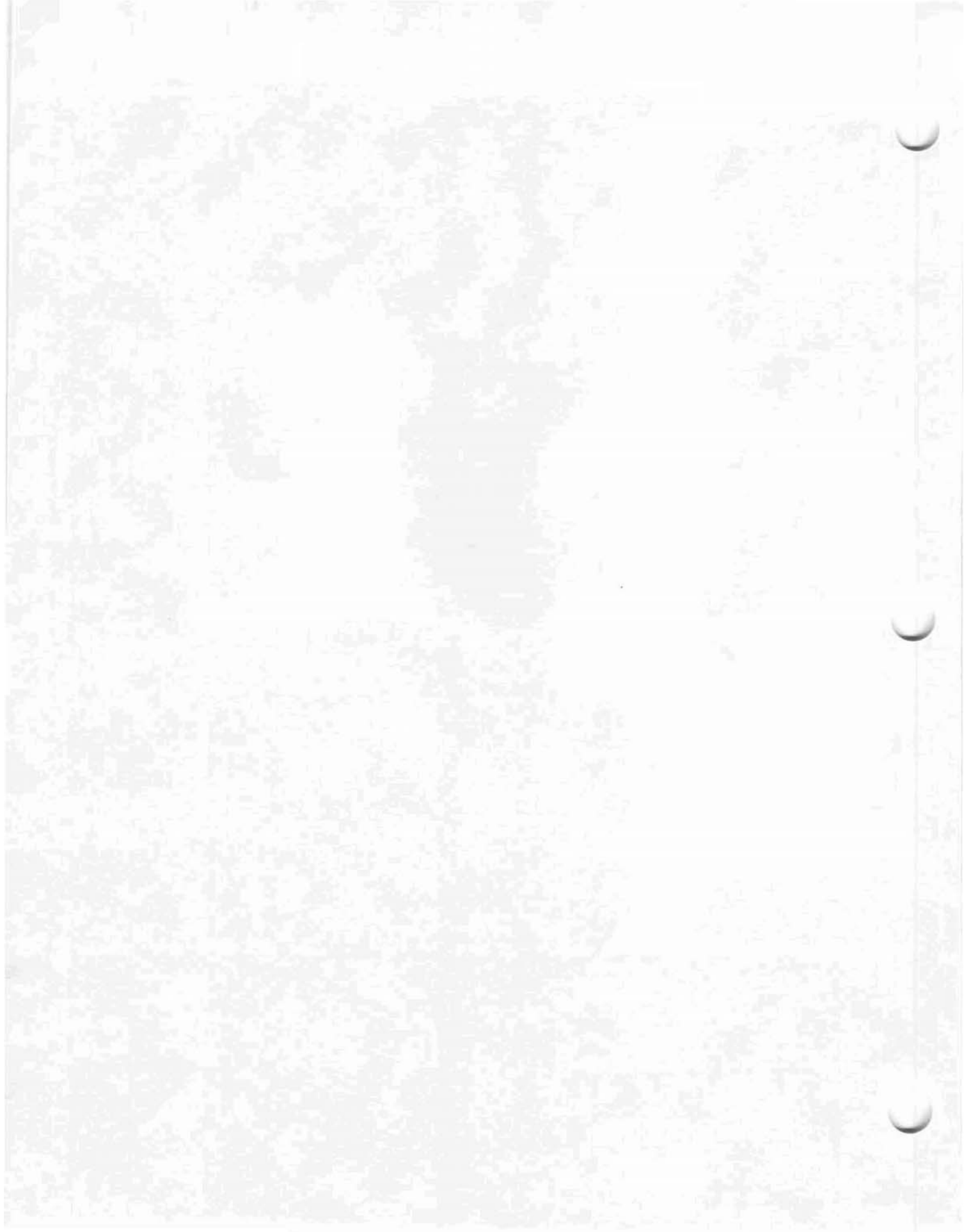


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ORD. E51554

Figure 485. Electrical System Diagram (M65A8).

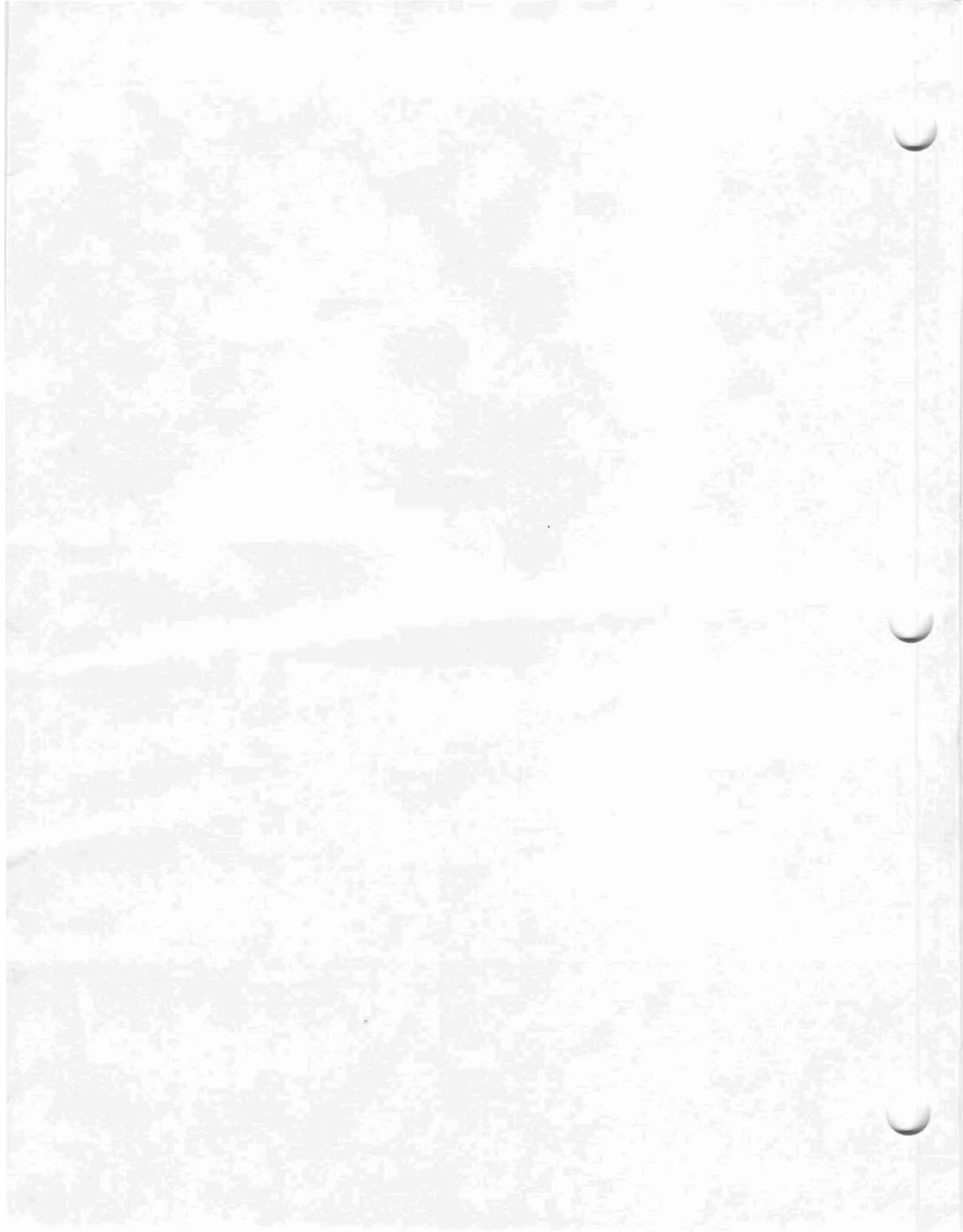


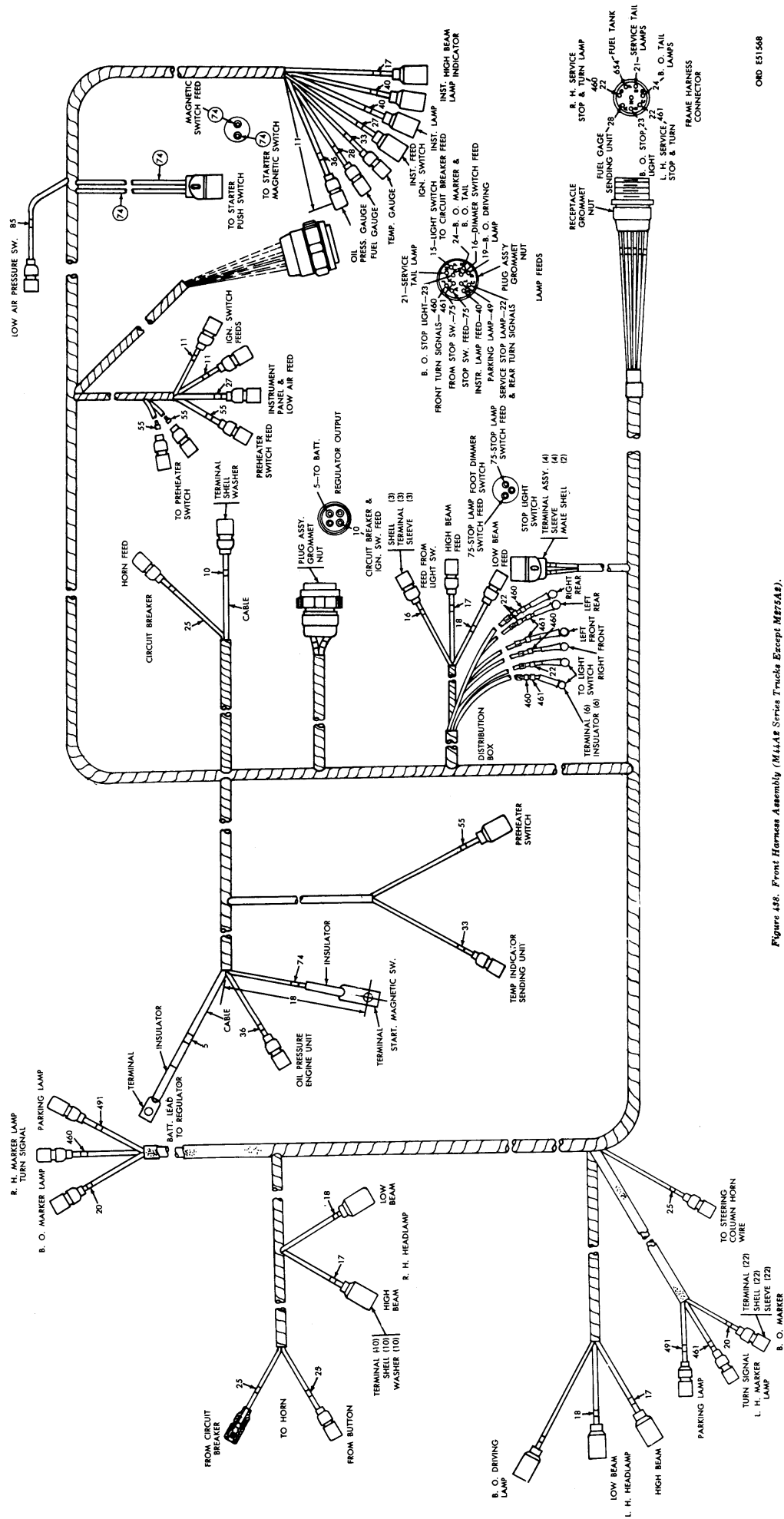












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Figure 438. Front Harness Assembly (M44A8 Series Trucks Except M675A8).