

# TM 9-2320-211-10

DEPARTMENT OF THE ARMY TECHNICAL MANUAL

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OPERATOR'S MANUAL

FOR

TRUCK, CHASSIS: 5-TON, 6 x 6, M39, M40, M40C, M61, M63, M63C, M139, M139C, M139D, M139F; TRUCK CARGO; 5-TON, 6 x 6, M41, M54, M54A1, M55; TRUCK, DUMP: 5-TON, 6 x 6, M51; TRUCK TRACTOR, 5-TON, 6 x 6, M52, M52A1; TRUCK TRACTOR, WRECKER, MEDIUM, 5-TON, 6 x 6, M62; TRUCK TRACTOR, WRECKER: M246; TRUCK, WRECKER: MEDIUM 5-TON, 6 x 6, M543



HEADQUARTERS, DEPARTMENT OF THE ARMY  
MARCH 1963



## WARNING

### Carbon Monoxide Gas Can Be Fatal

Carbon monoxide is a colorless, odorless, DEADLY POISONOUS gas which, when breathed, deprives the body of oxygen and causes SUFFOCATION. Exposure to air contaminated with carbon monoxide produces symptoms of headache, dizziness, loss of muscular control, apparent drowsiness, and coma. Permanent BRAIN DAMAGE or DEATH can result from severe exposure.

It occurs in the exhaust fumes of fuel-burning heaters and internal-combustion engines and becomes DANGEROUSLY CONCENTRATED under conditions of INADEQUATE VENTILATION. The following precautions must be observed to ensure the safety of personnel whenever the personnel heater, main, or auxiliary engine of any vehicle is operated for maintenance purposes or tactical use.

- a. DO NOT operate heater or engine of vehicle in an enclosed area unless it is ADEQUATELY VENTILATED.
- b. DO NOT idle engine for long periods without maintaining ADEQUATE VENTILATION in personnel compartments.
- c. DO NOT drive any vehicle with inspection plates, cover plates, engine compartment doors removed unless necessary for maintenance purposes.
- d. BE ALERT at all times during vehicle operation for exhaust odors and exposure symptoms. If either are present, IMMEDIATELY VENTILATE personnel compartments. If symptoms persist, remove affected personnel from vehicle and treat as follows: expose to fresh air; keep warm; DO NOT PERMIT PHYSICAL EXERCISE; if necessary, administer artificial respiration.

THE BEST DEFENSE AGAINST CARBON MONOXIDE POISONING IS ADEQUATE VENTILATION.

## OPERATOR'S PRECAUTIONS

### WARNING

#### Deep Water Fording

Refer to TM 9-238 for general deep-water fording information. Perform the after fording maintenance as soon as tactical situation permits. PAGES 83 & 99.

### WARNING

Drive this vehicle carefully. It has more responsive steering and more available power than other vehicles you are accustomed to driving. Reduce speed on turns. PAGE 26.

### WARNING

Do not attempt to operate the vehicle unless the air pressure system and warning buzzer are functioning properly. PAGES 32 & 35.

### WARNING

Exercise extreme care in opening radiator cap, especially when temperature gage reads above 180°F. PAGE 64.

### WARNING

#### -65°F Power Plant Heater Equipped Vehicle

Do not operate power plant heater when vehicle is in motion. PAGE 100.

### CAUTION

Operators should become completely familiar with Daily Preventive Maintenance Service. PAGES 84-89.

### CAUTION

Observe air filter indicator on diesel-operated vehicles during warm-up period. PAGE 34.

### CAUTION

Attempted operation with only one wheel of a driving axle equipped with a tire chain, may result in serious damage to the tire and/or power train. PAGE 64.

### CAUTION

#### -25°F Personnel Heater Equipped Vehicle

Exercise care in operating defroster control to avoid cracked windshield glass. PAGE 100.

### CAUTION

#### -65°F or -25°F Heater Equipped Vehicle

Do not hold starter detent control out after the starter has engaged. PAGES 100-101.

### CAUTION

When operating this vehicle under any unusual conditions or terrain, follow all practices and precautions listed herein and in FM 31-71 and TM 21-305. PAGES 63, 64, and 65.

### CAUTION

Pull diesel engine fuel shutoff valve control knob out to prevent accidental starting of engine. PAGES 36-37.

### CAUTION

Drain the primary fuel filter (diesel engine) each day. PAGE 32.

### CAUTION

For daytime driving place selector lever of lighting switch to "Stop Lts" position.

### CAUTION

Refer to TM 9-207 for maintenance under extreme cold conditions. PAGE 63.

### CAUTION

Use tow bar, chain, or cable for all towing operations. PAGES 37-38.

### CAUTION

Limit reverse speed to 9 mph.

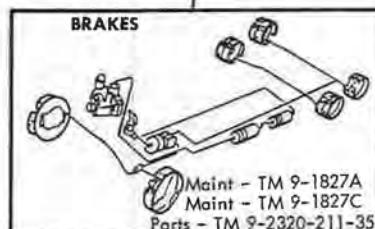
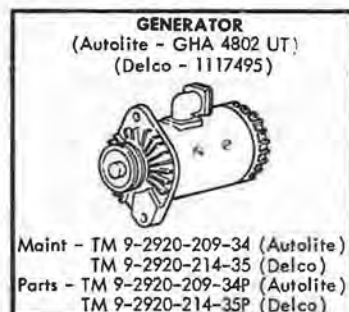
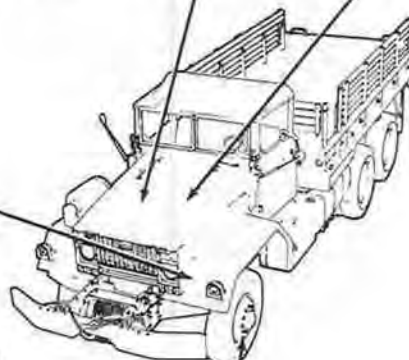
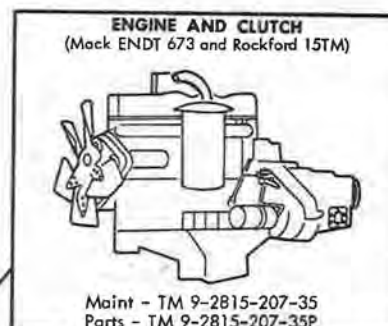
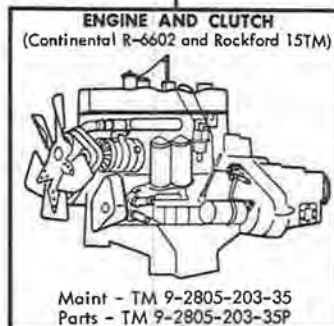
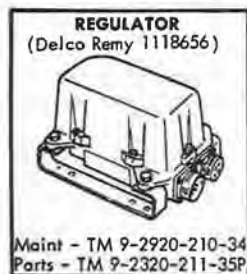
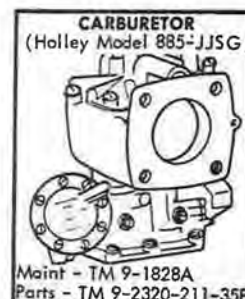
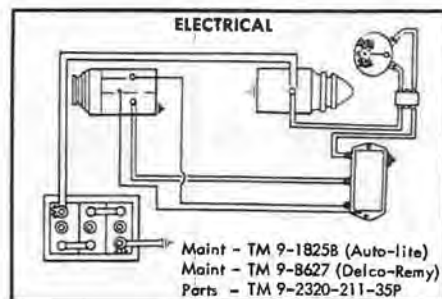
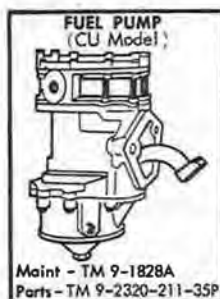
### DO'S

- Operate with correct tire pressures (par. 7e).
- Disengage front wheel drive on hard surfaced roads, except on extremely steep grades.
- Keep vehicle under control at all times.
- Come to a complete stop before shifting into reverse.
- Slow down when approaching curves and corners.
- Avoid getting battery acid on hands or clothing when servicing battery.

### DON'TS

- Do not exceed speeds on instruction plate (fig. 20).
- Do not coast (clutch disengaged) down hills.
- Do not ride clutch.
- Do not race engine, especially when not under load.
- Do not "rev" engine and "slip" clutch to gain torque.
- Do not shift from 1st to reverse gear or vice-versa until engine comes back to idle and vehicle stops moving.
- Do not shift to front wheel drive while one or both rear wheels are spinning.
- Do not operate starter for more than 10 seconds at a time. Wait 15-20 seconds between tries.
- Do not fill radiator when engine is overheated.





**VISUAL PUBLICATIONS REFERENCE**

**TRUCK, CHASSIS:** 5-TON, 6X6, M39, M40, M40C, M61, M63, M63C, M139, M139C, M139D, M139F; **TRUCK; CARGO:** 5-TON, 6X6, M41 M54, M54A1, M55; **TRUCK, DUMP:** 5-TON, 6X6, M51; **TRUCK TRACTOR, 5-TON, 6X6, M52, M52A1; TRUCK TRACTOR, WRECKER, MEDIUM, 5-TON, 6X6, M62; TRUCK TRACTOR, WRECKER: M246; TRUCK, WRECKER: MEDIUM, 5-TON, 6X6, M543**

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*Visual guide to publications.*



TECHNICAL MANUAL

No. 9-2320-211-10

HEADQUARTERS  
DEPARTMENT OF THE ARMY  
WASHINGTON 25, D.C., 11 March 1963

OPERATOR'S MANUAL  
FOR  
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5-TON, 6 X 6, M39, M40, M40C, M61, M63,  
M63C, M139, M139C, M139D, M139F  
TRUCK, CARGO:  
5-TON, 6 X 6, M41, M54, M54A1, M55  
TRUCK, DUMP:  
5-TON, 6 X 6, M51  
TRUCK, TRACTOR:  
5-TON, 6 X 6, M52, M52A1  
TRUCK, TRACTOR WRECKER:  
5-TON, 6 X 6, M246  
TRUCK, WRECKER:  
5-TON, 6 X 6, M62, M543

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\*This manual supersedes so much of TM 9-8028, 13 June 1955, as pertains to Operator's Instructions and TB 9-2320-211-12/1, 10 October 1961.

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# CHAPTER 1

## INTRODUCTION

### Section I. GENERAL

#### 1. Scope

a. This technical manual contains instructions for operation and first-echelon maintenance of the following vehicles: the 5-Ton, 6 x 6 Chassis Truck, Models M39, M40, M40C, M61, M63, M63C, M139, M139C, M139D, and M139F; the 5-Ton, 6 x 6 Cargo Truck Models M41, M54, M54A1, and M55; the 5-Ton, 6 x 6 Dump Truck, Model M51; the 5-Ton, 6 x 6 Tractor Truck, Models M52 and M52A1; the 5-Ton, 6 x 6 Tractor Wrecker Truck, Model 246; and the 5-Ton, 6 x 6 Wrecker Truck, Models M62 and M543.

b. Appendix I contains a list of current references, including supply manuals, technical manuals, forms, and other available publications applicable to the vehicles covered.

c. Appendix II contains a reference to the maintenance allocation chart which is contained in Appendix II of TM 9-2320-211-20.

d. Appendix III contains a list of the basic issue items which are required for stockage by first-echelon maintenance and includes accessories, attachments, component assemblies, and sub-assemblies with quantities thereof, which constitute the major end item of equipment; and the first-echelon maintenance accessories, tools, supplies, and spare assemblies and parts accompanying the equipment, all of which constitute the major end item for issue to users. These are items commonly known as "on-vehicle equipment (OVE)," "running spares," and "on-board spares."

e. This first edition is being published in advance of complete technical review. Any errors or omissions will be forwarded on DA Form 2028 direct to the Commanding Officer, Raritan Arsenal, Metuchen, New Jersey, ATTN: ORDJR-OPRA.

#### 2. Maintenance Allocation

The prescribed maintenance responsibilities as allocated in maintenance allocation charts

are reflected in this technical manual. In all cases where nature of repair, modification, or adjustment is beyond the scope or facilities of operator, crew, or user, the supporting unit should be informed in order that trained personnel with suitable tools and equipment may be provided or other instructions issued.

#### 3. Forms, Records, and Reports

a. General. Responsibility for proper execution of forms, records, and reports rests upon the officers of all units maintaining this equipment. However, the value of accurate records must be fully appreciated by all persons responsible for their compilation, maintenance, and use. Records, reports, and authorized forms are normally utilized to indicate type, quantity, and condition of materiel to be repaired, or to be used in repair. Properly executed forms convey authorization and serve as records for repair or replacement of materiel requiring further repair to ordnance shops. The forms, records, and reports establish work required, progress of work within the shops, and status of the materiel upon completion of its repair.

b. Authorized Forms. The forms generally applicable to units operating this material are listed in Appendix I. For a listing of all forms, refer to DA PAM 310-2.

c. Field Report of Accidents. Injury to personnel or damage to material must be reported to the supporting unit so that reports as required by Army regulations can be prepared.

d. Report of Unsatisfactory Equipment, Materials, or Publications. Any suggestions pertinent to improvement, safety, or unsatisfactory performance of equipment, materials, and publications are to be reported to the supporting unit which will initiate necessary action to report deficiency on DA Form 2407.

## Section II. DESCRIPTION AND DATA

### 4. Description

a. General. This manual covers the 5-ton, 6 x 6 trucks shown in figures 1 through 19, and provides operating instructions on the following models: cargo trucks M41, M54, M54A1 and M55; tractor trucks M52 and M52A1; wrecker trucks M62, M543, and M246; dump truck M51; and chassis trucks M139, M139C, M139D, and M139F. The vehicles are designed for use over all types of roads, highways and cross-country terrain, and in all types of weather. They will ford hard bottom water crossings to a depth of 30 inches. All are equipped with five-speed transmission

with a two-speed transfer case which transmits power to the front and rear axles. Transmission speed ranges are selected manually through a shift lever in the driver's compartment. Control of the transfer case is also accomplished by means of a shift lever in the driver's compartment. Service brakes are of the air-actuated, hydraulic type. The cab is enclosed with removable canvas paulins, and the cargo truck bodies are provided with both removable paulins and end curtains. All vehicles are equipped with a spare wheel and tire, and a pintle hook at the rear permits towing of a trailer.

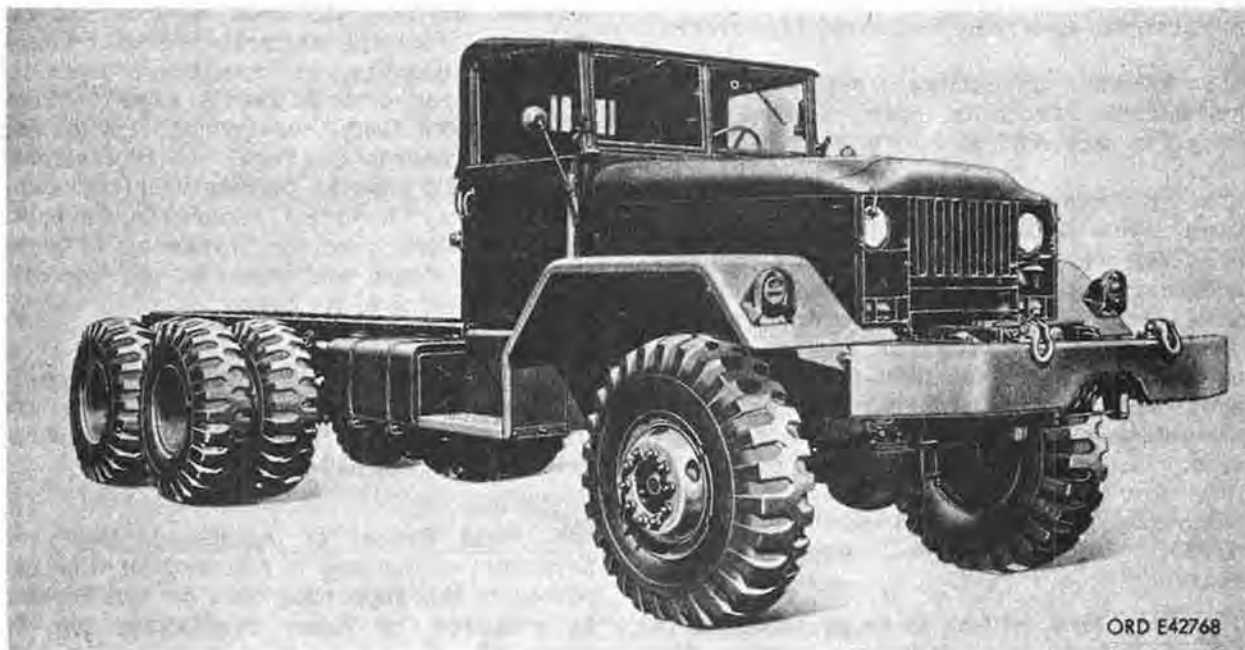
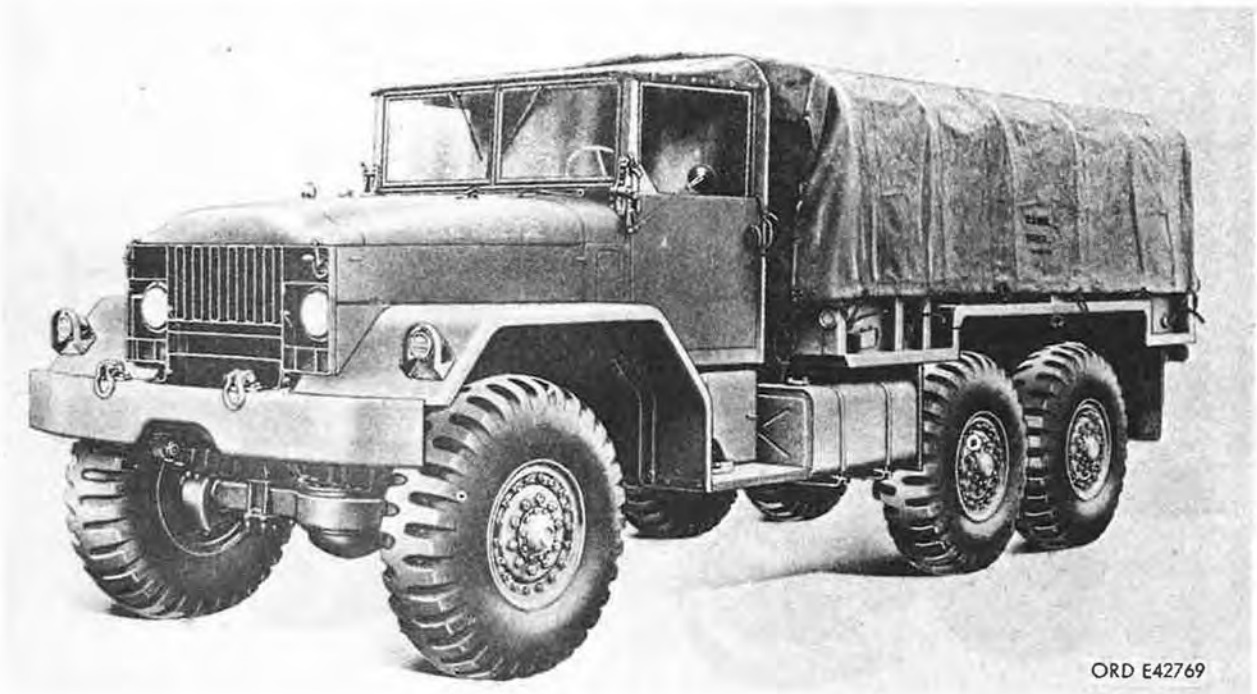


Figure 1. Truck, chassis, M39, M40, M61, M63, M139 - right front view.





*Figure 2. Truck, cargo, M41 - left front view.*



*Figure 3. Truck, cargo, M41 - right rear view.*



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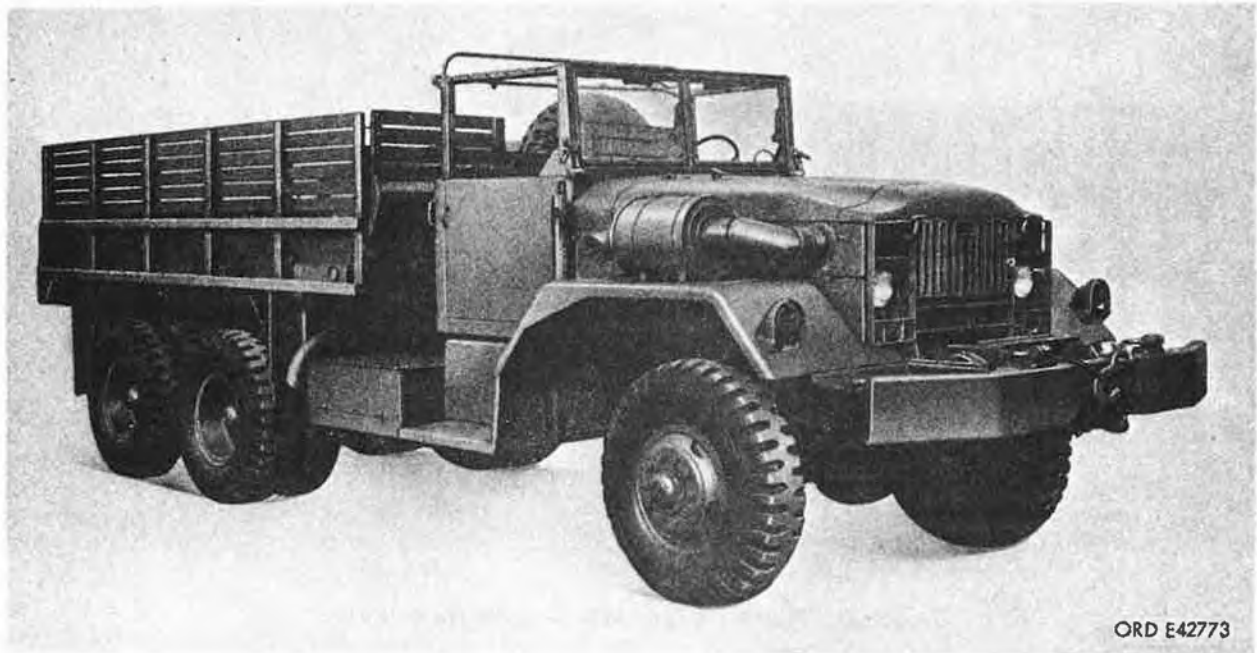
*Figure 4. Truck, cargo, flat bed M54 - left front view.*



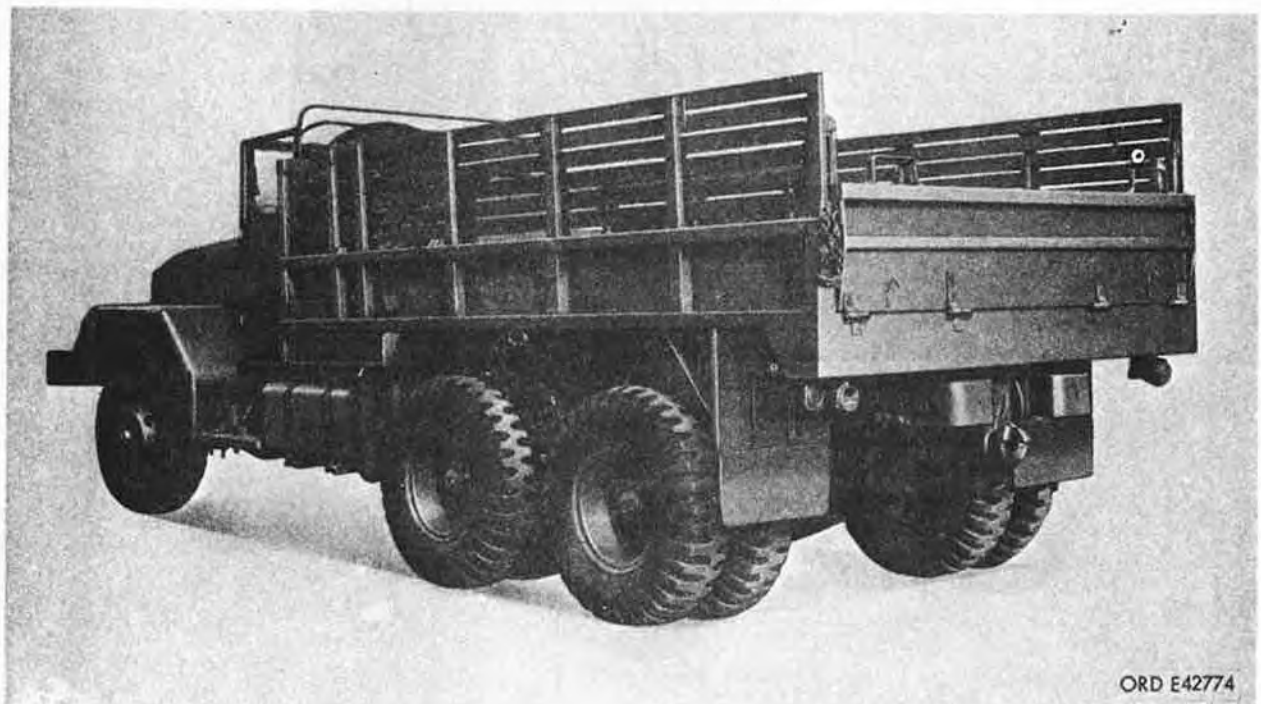
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*Figure 5. Truck, cargo, flat bed, M54 - right rear view.*





*Figure 6. Truck, cargo, flat bed, M54A1 - right front view.*



*Figure 7. Truck, cargo, flat bed, M54A1 - left rear view.*



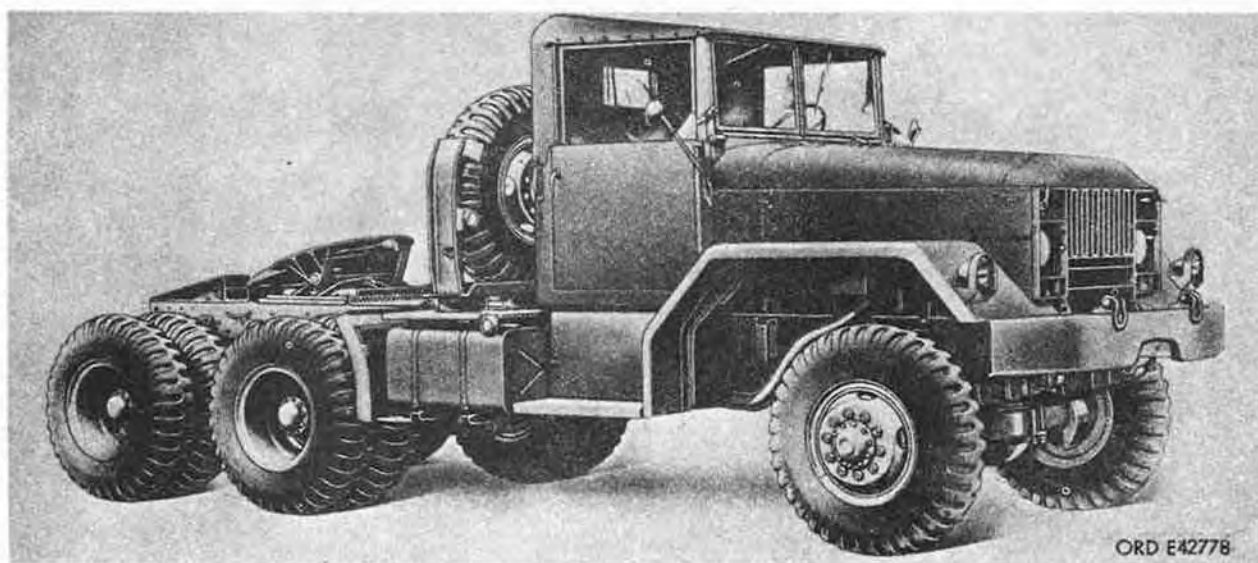
*Figure 8. Truck, cargo, M55 - right front view.*



*Figure 9. Truck, dump, M51 - left front view.*

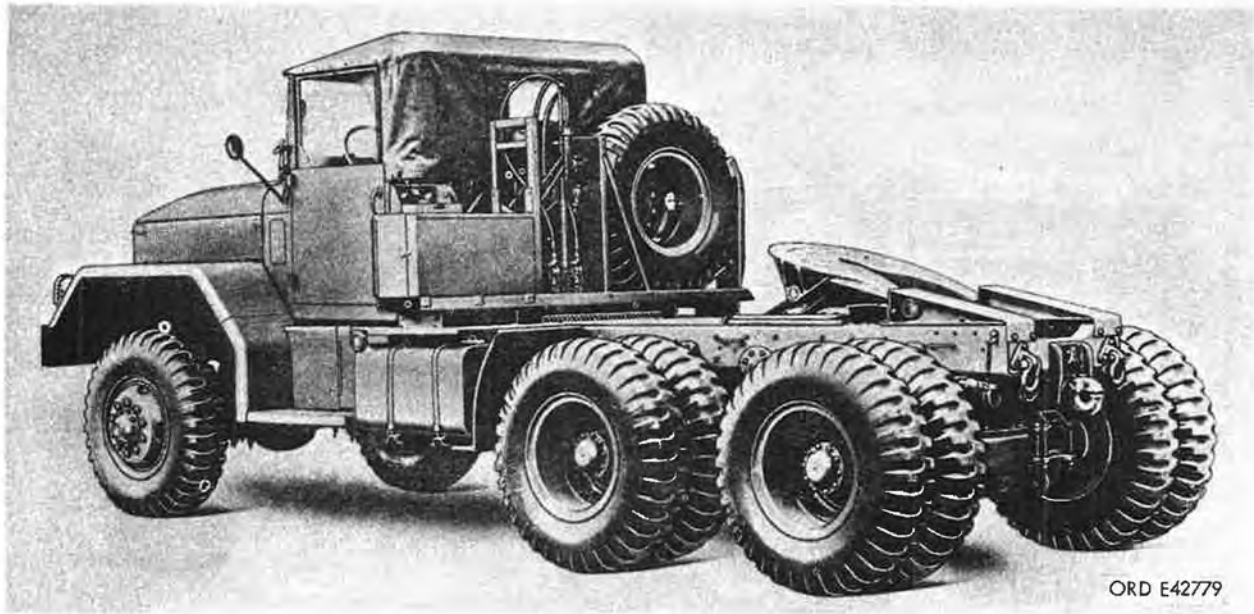


*Figure 10. Truck, dump, M51 - right rear view.*

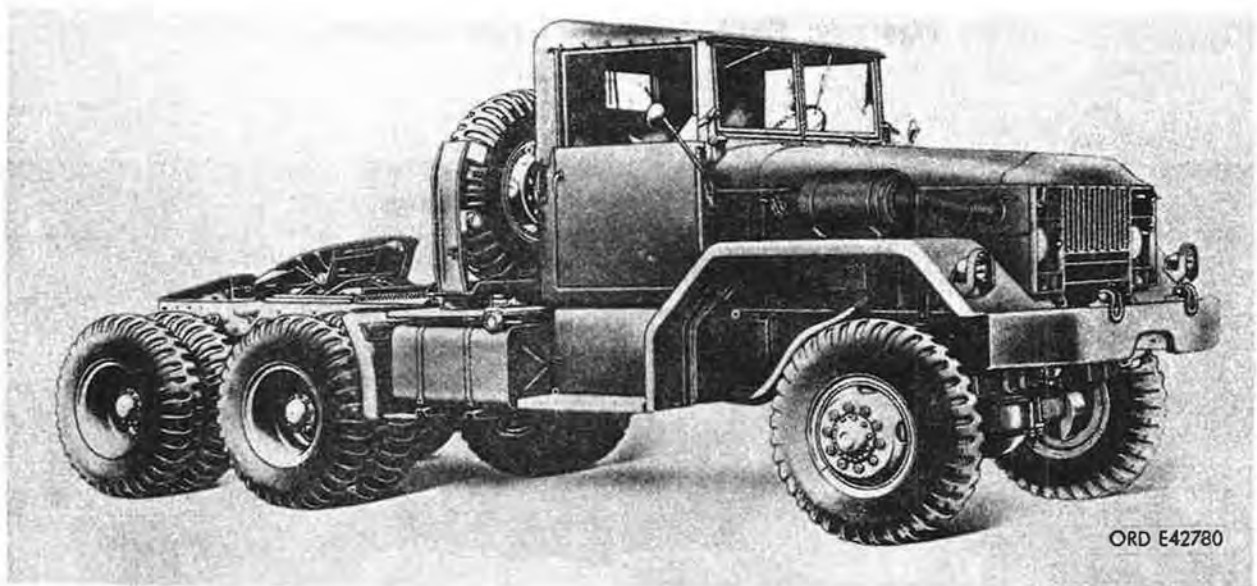


*Figure 11. Truck, tractor, M52 - right front view.*

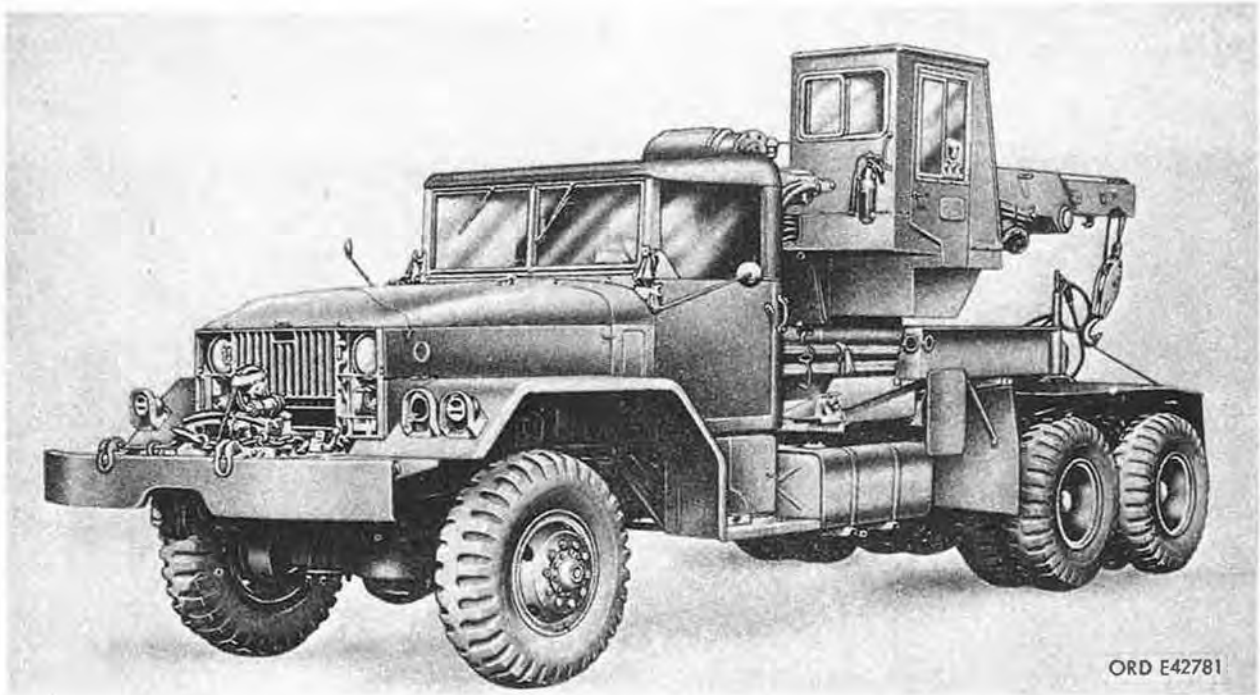




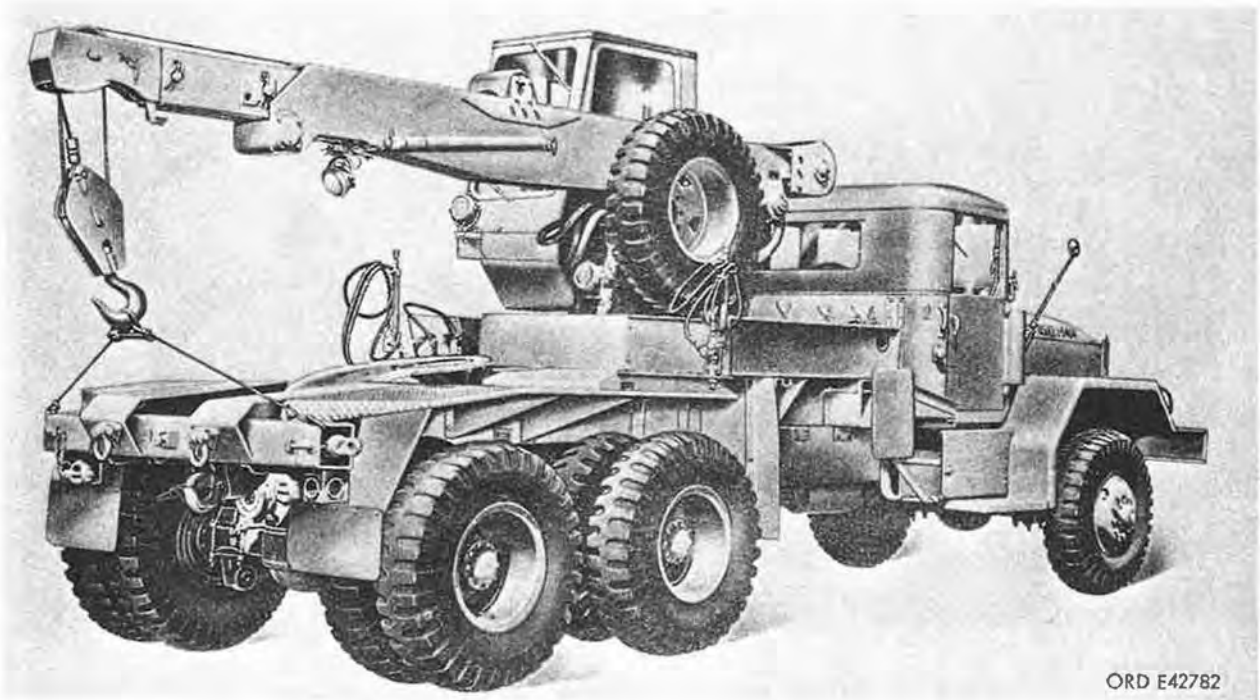
*Figure 12. Truck, tractor, M52 - left rear view.*



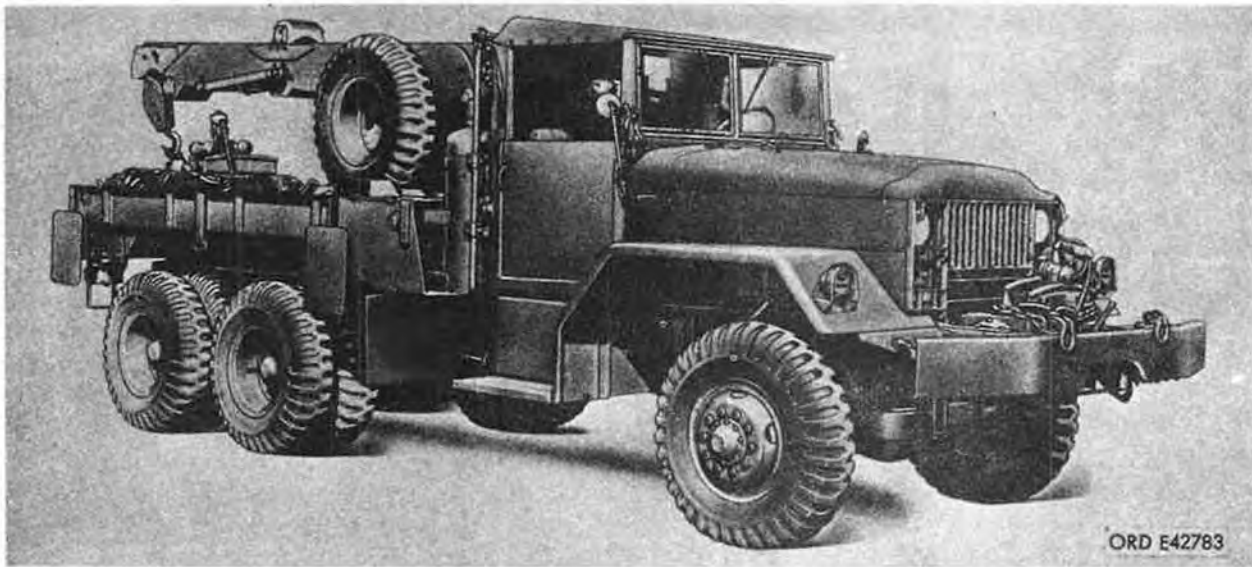
*Figure 13. Truck, tractor, M52A1 - right front view.*



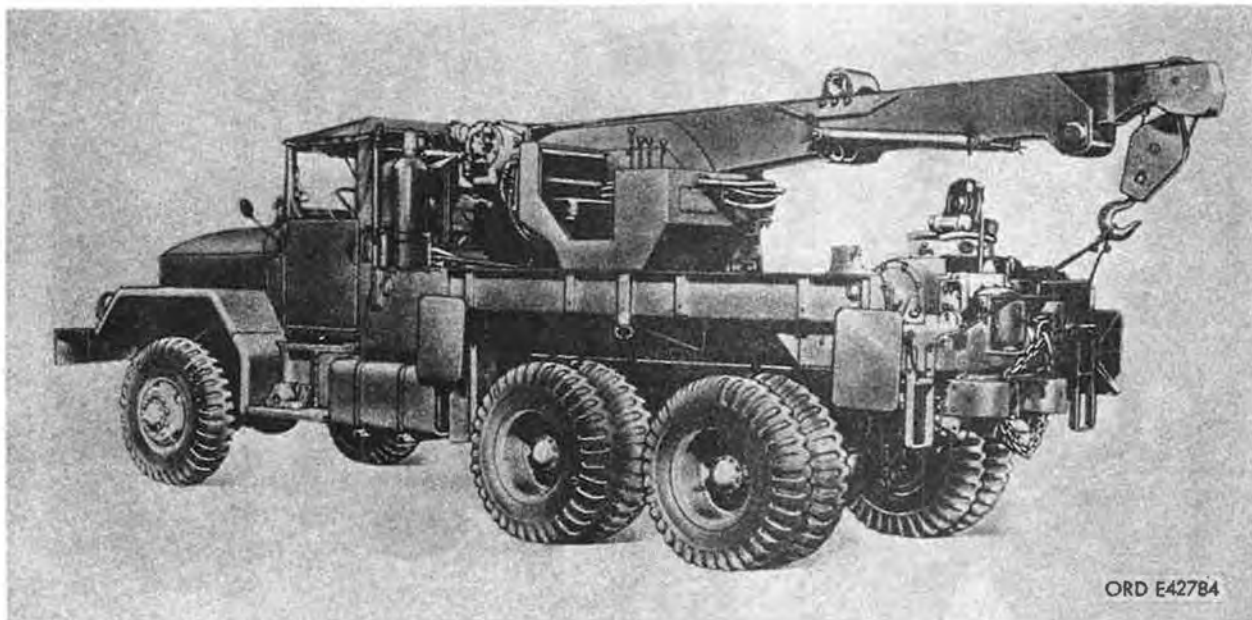
*Figure 14. Truck, tractor, wrecker, M246 - left front view.*



*Figure 15. Truck, tractor, wrecker, M246 - right rear view.*

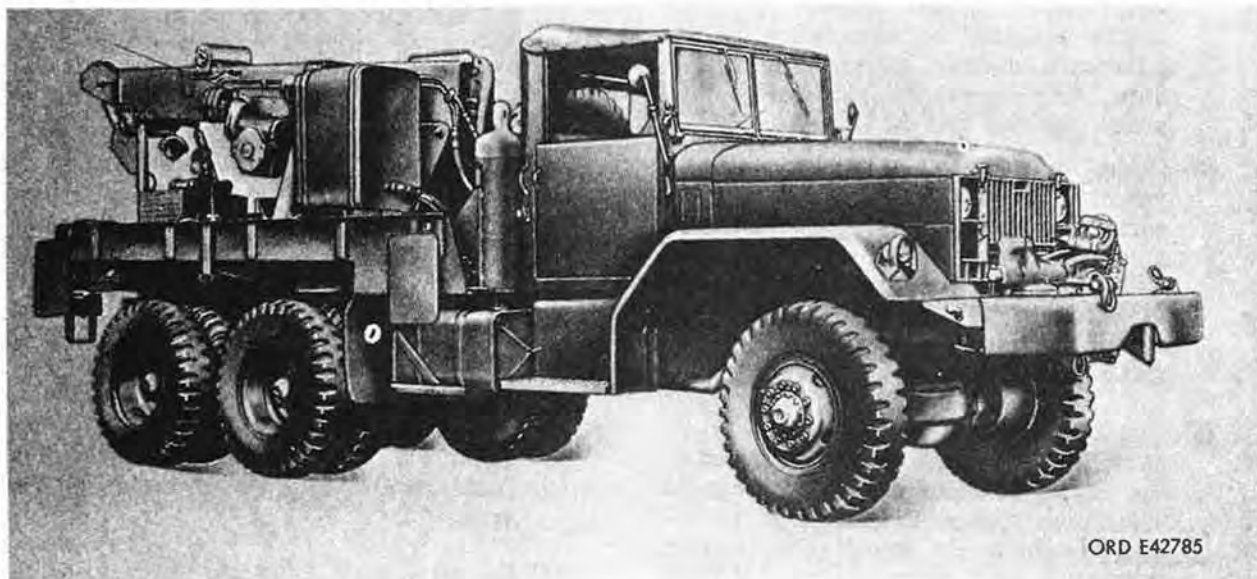


*Figure 16. Truck, tractor, wrecker, M62 - right front view.*

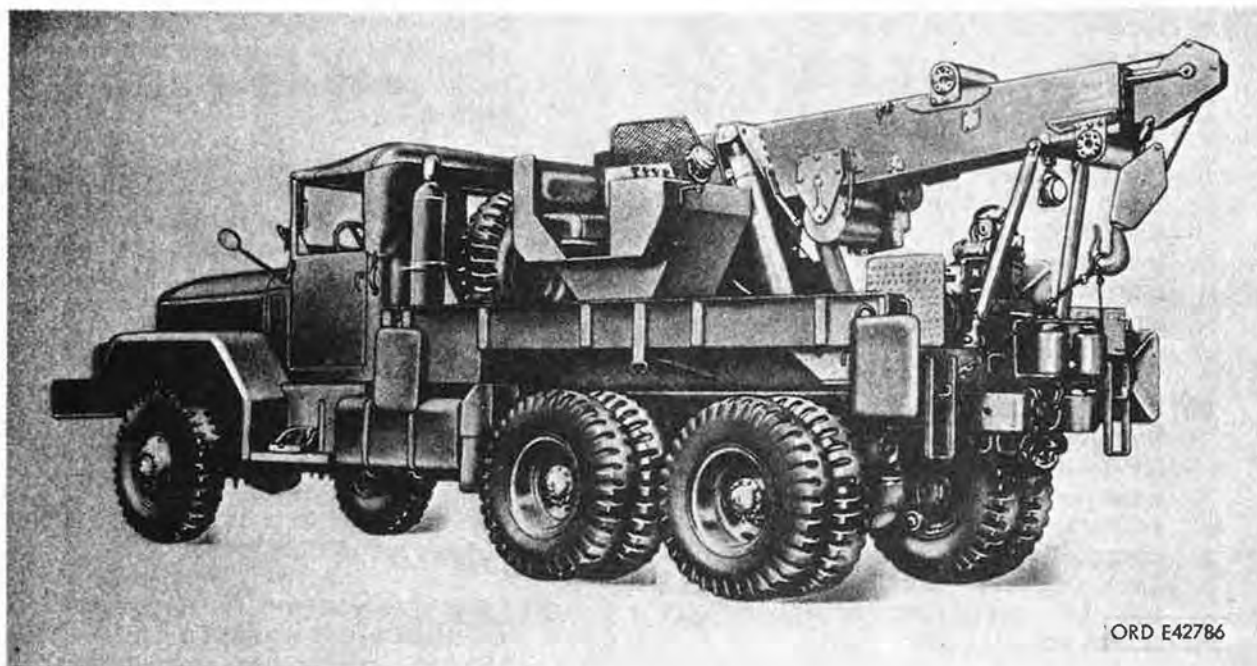


*Figure 17. Truck, tractor, wrecker, M62 - left rear view.*





*Figure 18. Truck, tractor, wrecker, M543 - right front view.*



*Figure 19. Truck, tractor, wrecker, M543 - left rear view.*

## b. Power Train.

- (1) Gasoline engine. The vehicles (except M52A1 and M54A1) are powered by a 224 hp, six-cylinder, liquid-cooled, Continental Model R6602 gasoline engine equipped with the following accessories: starter, generator, distributor, air compressor, carburetor, fuel pump, and fuel and oil filters.
- (2) Diesel engine. The M52A1 and M54A1 vehicles are powered by a 205 hp, six-cylinder, liquid-cooled, turbocharged, compression-ignition Mack Model ENDT 673 diesel engine equipped with the following accessories: starter, generator, air compressor, fuel injector, and oil and fuel filters.
- (3) Transmission. The five-speed, synchromesh transmission is mounted to the flywheel housing of the engine. The transmission is connected to the output of the single, dry-disk type clutch through a main drive shaft and shifted manually by a shift lever in the cab.
- (4) Transfer. The transfer is a two-speed unit driven by the transmission and distributes power to the front and rear axles through propeller shafts. It is located immediately back of the transmission. Control is by means of a shift lever in the vehicle's cab. Transfer gearing permits the front axle to drive at a slightly lower speed than the rear axles. During normal operation in forward or reverse, the front wheels run free. When rear wheels lose traction, the front axle is automatically engaged through the transfer and remains engaged during the loss of rear traction.
- (5) Propeller shafts and universal joints. The transmission-to-transfer, transfer-to-intermediate axle, transfer-to-front axle, and intermediate axle-to-rear-axle propeller shafts are each equipped with two universal joints. Each universal joint has one flanged yoke for connecting to driving and driven components.

**Note.** On those vehicles equipped with a front winch, a propeller shaft similar to the power train propeller shafts is provided for driving the winch.

- (6) Rear axles. Forward-rear and rear-rear axles are tandem-mounted with torque rods on each side interconnecting the axles. Power is transmitted from the transfer by a propeller shaft to the forward-rear axle. A second propeller shaft transmits power from the forward-rear axle to the rear-rear axle.

## c. Fuel System.

- (1) Gasoline engine. The fuel system for the gasoline-operated vehicles covered by this manual consists of a downdraft carburetor with integral engine speed governor, oil-bath air cleaner, fuel pump, a removable-element fuel filter, and two 55-gallon fuel tanks on the M51 and M52 vehicles. The M41, M54, M55, M62, M139, M246 and M543 vehicles are equipped with one 78-gallon tank.
- (2) Diesel engine. The fuel system consists of two fuel pumps (one electrical and one mechanical), an injection pump with overspeed governor, six injector nozzles, a manually operated primer pump, primary and secondary fuel filters, and a 78-gallon fuel tank. A 3-psi check valve is located in the mechanical fuel pump and supplies fuel to the injector pump in case of vapor lock.

d. Air Induction System. The diesel engine is equipped with an exhaust driven turbocharger mounted on the right side. An intake manifold heater and control box for heating inducted air during cold-weather starting is provided for the engine.

## e. Exhaust System.

- (1) Gasoline. Engine exhaust gases are routed through an exhaust pipe mounted to the exhaust manifold, into a muffler, and out through a tailpipe and elbow at the rear of the stowage box.
- (2) Diesel. Gases from the engine exhaust manifold empty directly into the turbocharger, where they are utilized for driving purposes. The exhaust is then routed through an exhaust pipe and out through a bellows-type elbow at the rear of the stowage box.

f. Cooling System. The cooling system consists of a water pump, a six-blade fan, two thermostats, a tube and fin radiator, and a 7-psi, pressurized-type radiator cap. A pair of matched V-belts drive the pump and fan.

g. Electrical System. The electrical system is a 24-volt dc system; two 12-volt storage batteries are connected in series with the negative terminal grounded. The engine starter and solenoid operate directly from the 24-volt source. An overrun clutch drive on the starter prevents damage to the motor when the engine starts. The system uses a 24-volt generator with an output capacity of 24 amperes. The system provides operating voltages for the vehicle lighting system, instrument panel gages, horn operation, and to a towed trailer through the auxiliary electrical receptacle at the rear of the vehicle.

#### h. Suspension System.

- (1) Front springs and shock absorbers. The front springs are semielliptic and are mounted on spring seats on the axle. The springs are pivoted in spring hangers at the front and shackled to hangers at the rear. Hydraulic shock absorbers are connected to the frame side member and lower "U" bolt bracket on the front axle.
- (2) Rear springs and torque rods. The rear springs are inverted, semielliptic type. Both ends of each spring are free to slide in guide brackets. Driving and braking forces are transmitted to the chassis by six torque rods arranged to maintain a vertical position of the rear axle drives, regardless of uneven road surfaces.

#### i. Brake System.

- (1) Service brake system. The service brake system is of the air-operated, hydraulic type consisting of a master cylinder, air-hydraulic cylinder, individual slave cylinders on each wheel, and the necessary hydraulic lines and linkage to operate the brakeshoes. An air line from the air-hydraulic cylinder leads to the trailer air brake coupling at the right rear of the vehicle.
- (2) Hand brake. The hand brake consists of a brake drum mounted on the trans-

fer rear-output shaft, and inner and outer brakeshoes operated by a single shoe lever. A cable attached to the brakeshoe lever runs through a casing and is connected to the hand brake lever in the vehicle's cab.

j. Steering System. The steering system is comprised of a steering wheel, hydraulically assisted steering gear, hydraulic oil reservoir, hydraulic pump, pitman arm, and steering linkage.

k. Compressed Air System. The compressed air system is composed of a compressor mounted on the lower right side of the engine, and air governor, two air reservoirs, a hand-control valve for controlling the brakes on a towed vehicle, and two air brake hose couplings at the front and the rear of the vehicle.

l. Front Winch. Some vehicles are equipped with a front winch mounted between the radiator and front bumper. Refer to paragraph 19 for detailed description and operation.

m. Rear Winch. The M62 and M543 vehicles are equipped with a rear mounted winch and level winding device. Refer to paragraph 22 for detailed description and operation.

n. Wrecker Crane. The M62, M246, and M543 vehicles are equipped with hydraulically powered cranes mounted on the rear of truck chassis. Refer to paragraphs 23 and 24 for detailed description and operation of the cranes.

o. Fifth Wheel. The M52, M52A1 and M246 vehicles are equipped with a fifth wheel assembly mounted on the rear of the chassis. Refer to paragraph 21 for detailed description and operation.

p. Dump Body and Hoist Assembly. The M51 vehicle is equipped with an all-steel dump body with a tailgate which may be opened at either top or bottom. Refer to paragraph 20 for detailed description and operation of the body and hydraulic hoist assembly.

q. Bodies. For a description of the various types of bodies mounted on the rear of the chassis truck, refer to paragraph 5.



## 5. Difference Between Models

a. General. The 5-ton, 6 x 6 trucks covered in this manual are of various wheelbases and body styles. A brief description of the various chassis and body types is given below.

b. Chassis Truck, M39. The 5-ton, 6 x 6, chassis truck M39 has a 179-inch wheelbase with 14:00 x 20 tires and single rear wheels.

c. Chassis Truck, M40. The 5-ton, 6 x 6, chassis truck M40 has a 179-inch wheelbase with 11:00 x 20 tires and dual rear wheels.

d. Chassis Truck, M40C. The truck is identical with the Model M40 except that it is modified structurally to accommodate wrecker equipment.

e. Chassis Truck, M61. The 5-ton, 6 x 6, chassis truck M61 has a 167-inch wheelbase with 11:00 x 20 tires and dual rear wheels.

f. Chassis Truck, M63. The 5-ton, 6 x 6, chassis truck M63 has a 215-inch wheelbase with 11:00 x 20 tires and dual rear wheels.

g. Chassis Truck, M63C. The 5-ton, 6 x 6, chassis truck M63C has a 215-inch wheelbase with 12:00 x 20 tires and dual rear wheels.

h. Chassis Truck, M139. The 5-ton, 6 x 6, chassis truck M139 has a 215-inch wheelbase with 14:00 x 20 tires and dual rear wheels. This chassis is designed specifically for transporting bridge building equipment.

i. Chassis Truck, M139C and M139D. These two modified versions of the Model M139 are designed specifically for transporting the 7.62-mm rocket launcher and have an axle gear ratio of 10.26: 1.00 for increased tractive effort.

j. Chassis Truck, M139F. This modified version of the Model M139 is designed specifically for transporting the 386-mm rocket launcher and has an axle ratio of 6.443: 1.00.

k. Cargo Truck, M41. The 5-ton, 6 x 6, cargo truck M41 has a 179-inch wheelbase with 14:00 x 20 tires, single rear wheels, and

a 14-foot cargo body mounted on the rear. The cargo body is suitable for transporting troops or cargo.

l. Cargo Truck, M54. The 5-ton, 6 x 6, cargo truck M54 has a 179-inch wheelbase with 11:00 x 20 tires and dual rear wheels. A 14-foot flat bed cargo body is mounted on the rear.

m. Cargo Truck, M54A1. This vehicle is identical to the Model M54 except that it is modified for diesel engine operation.

n. Dump Truck, M51. The 5-ton, 6 x 6, dump truck has a 167-inch wheelbase with 11:00 x 20 tires and dual rear wheels. A 5-cubic yard capacity dump body and twin-cylinder hoist assembly is mounted on the rear of the chassis.

o. Tractor Truck, M52. The 5-ton, 6 x 6, tractor truck M52 has a 167-inch wheelbase with 11:00 x 20 tires and dual rear wheels. A fifth wheel assembly, approach plates, and deck plate, suitable for hauling trailers, are mounted on the rear of the chassis. Tractor-to-trailer brake hoses and connections are mounted behind the cab.

p. Tractor Truck, M52A1. This vehicle is identical to the Model M52 except that it is modified for diesel engine operation.

q. Medium Wrecker Trucks, M62 and M543. The 5-ton, 6 x 6, medium wrecker trucks have a 179-inch wheelbase with 11:00 x 20 tires and dual rear wheels. A hydraulic crane and winch assembly are mounted on the rear of the chassis. The M62 and M543 models differ only with respect to design variations in wrecker crane equipment.

r. Tractor Wrecker Truck, M246. The 5-ton, 6 x 6 tractor wrecker truck M246 has a 215-inch wheelbase with 12:00 x 20 tires and dual rear wheels. A hydraulic crane and fifth wheel assembly are mounted on the rear of the chassis.

## 6. Name, Caution, and Warning Plates

Location and detail views of name, number, data, instruction, caution and warning plates, and decalcomanias are shown in figure 20.

#### A. INSTRUCTION AND CAUTION DATA PLATE - TYPICAL GASOLINE MODELS

B. TRUCK NAMEPLATE

### C. SERVICING AND PUBLICATION DATA PLATE

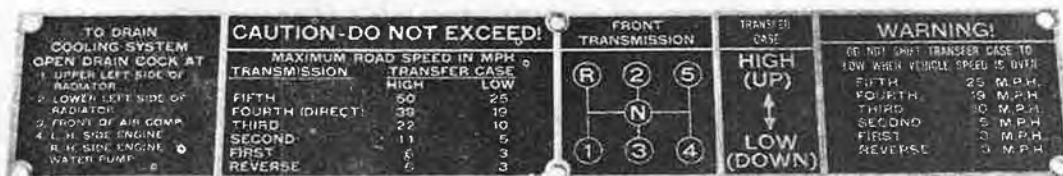
F. LOW AIR PRESSURE WARNING AND WINCH CONTROL DATA PLATE

E. POWER DIVIDER  
CONTROL DATA  
PLATE, M62 OR  
DUMP BODY  
CONTROL DATA  
PLATE, M51

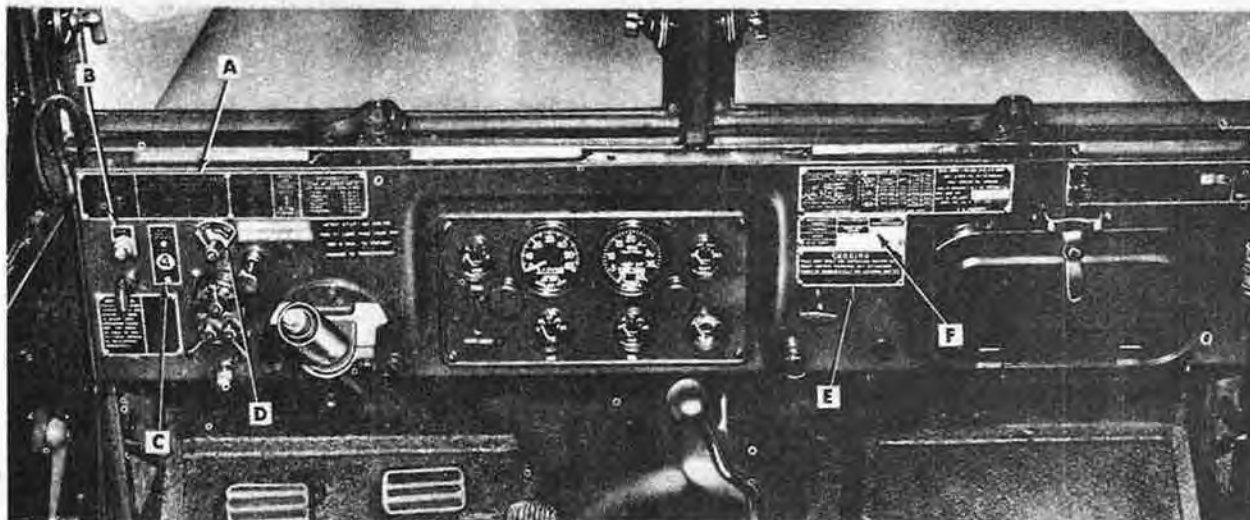
D. BRAKE LOCK DATA  
PLATE (M62, M246,  
M543)

ORD E42787

Figure 20. Name, caution, warning and instruction plates (1 of 10).



A. INSTRUCTION AND CAUTION DATA PLATE - TYPICAL DIESEL MODELS



RESPONSIBLE AGENCY	PROCUREMENT	DEPOT MAINTENANCE
CHASSIS	ARMY ORD CORPS	
BODY		
MTD. EQPT.		

F. RESPONSIBLE AGENCY DATA PLATE



E. CRANKCASE VENTILATING SHUTOFF VALVES DATA PLATE



B. ELECTRIC STARTING BUTTON DATA PLATE (DIESEL)



D. IGNITION SWITCH DATA PLATE (DIESEL)



C. INTAKE MANIFOLD AIR HEATER SWITCH DATA PLATE (DIESEL)

ORD E42788

Figure 20. Name, caution, warning and instruction plates (2 of 10).

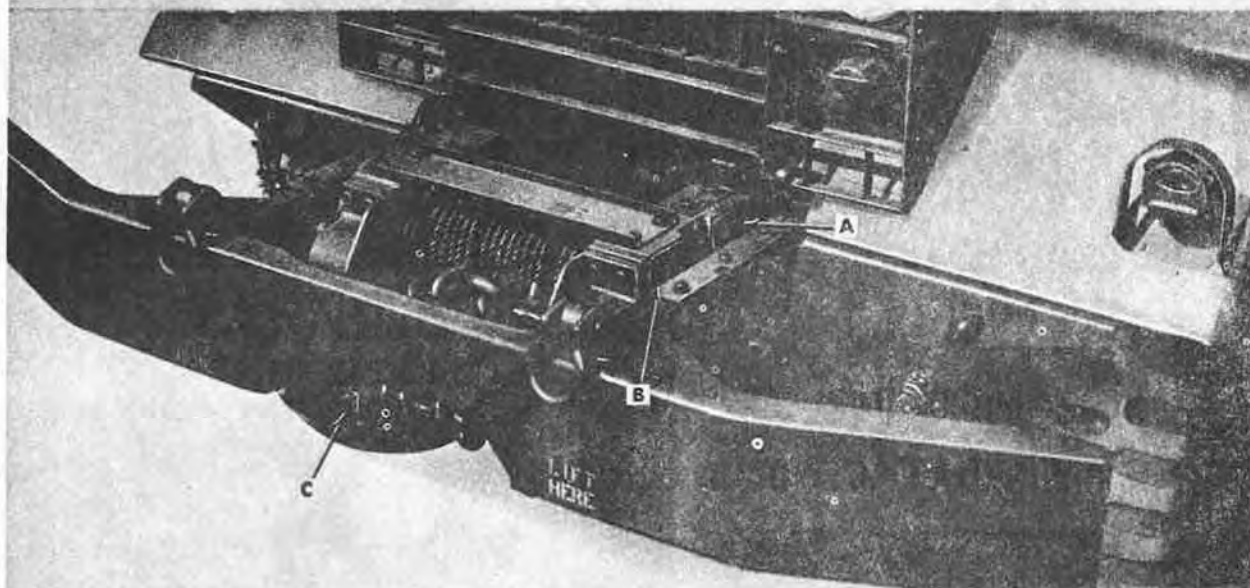




A. FRONT WINCH CLUTCH LEVER  
WARNING PLATE



B. FRONT WINCH DRUM LOCK  
CAUTION PLATE



C. FRONT AND REAR WINCH  
AUTOMATIC BRAKE CAUTION  
PLATE

ORD E42789

Figure 20. Name, caution, warning and instruction plates (3 of 10).

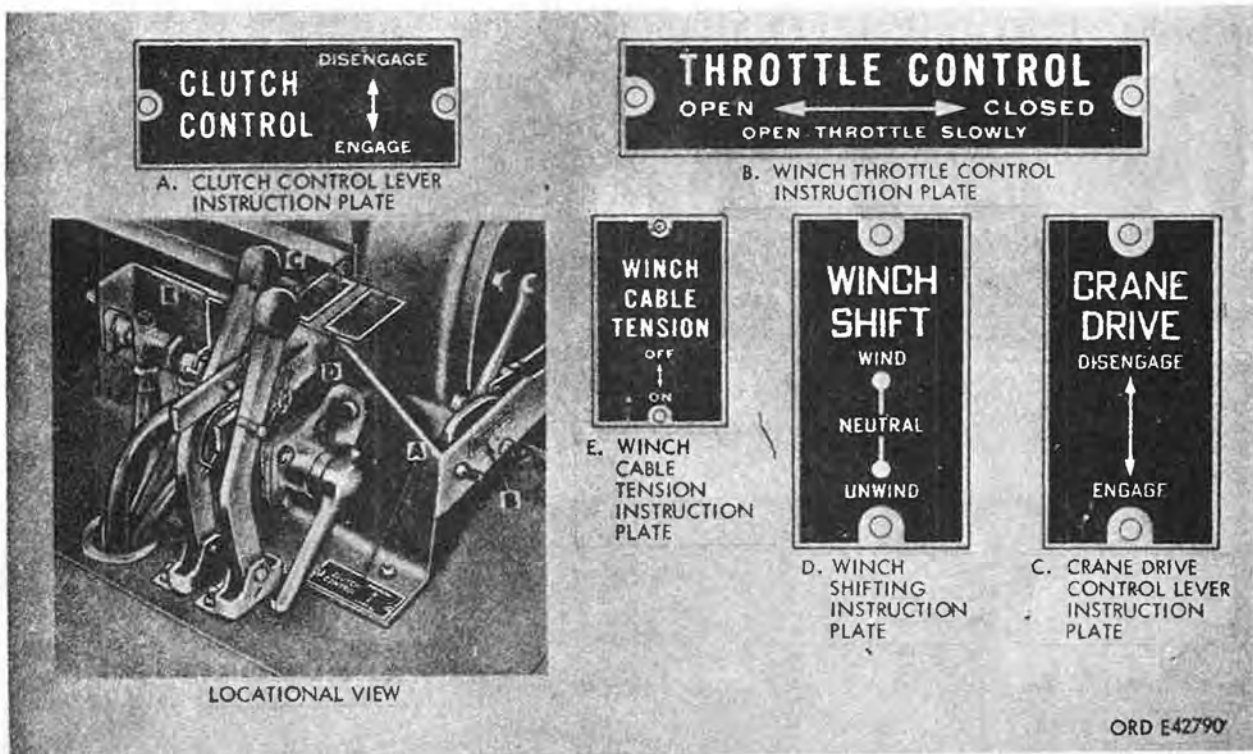


Figure 20. Name, caution, warning and instruction plates (4 of 10).

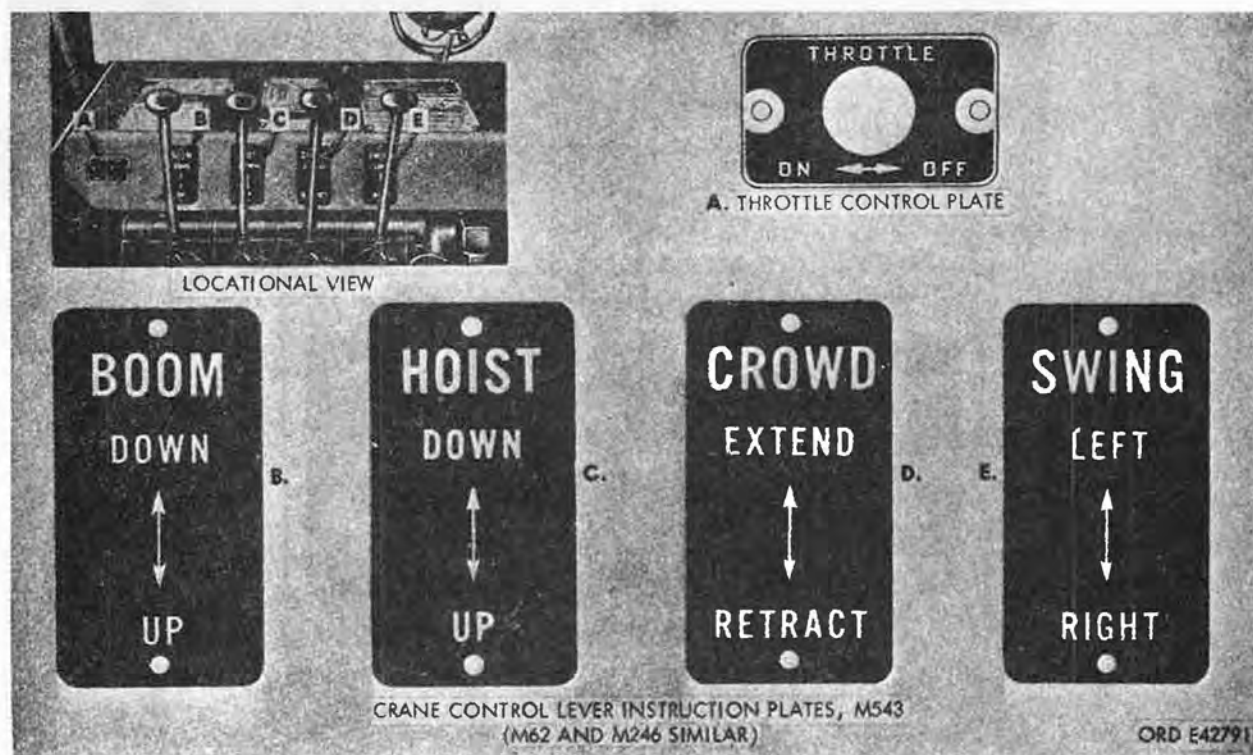
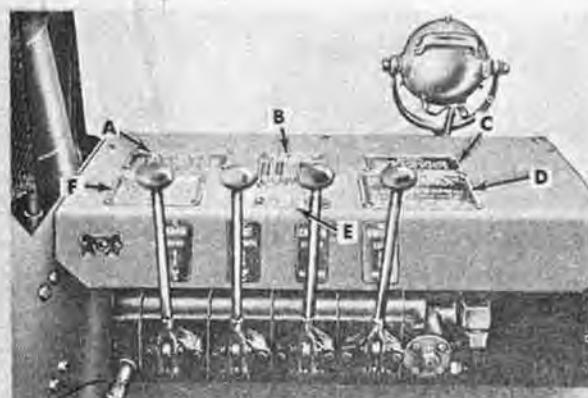


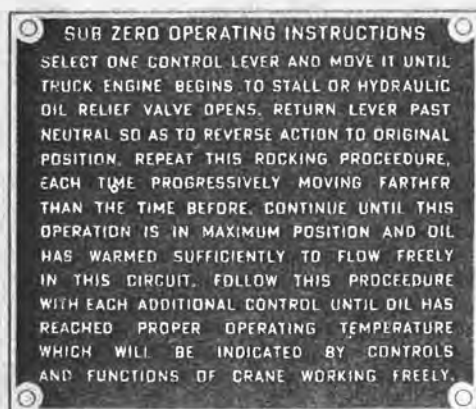
Figure 20. Name, caution, warning and instruction plates (5 of 10).



A. HYDRAULIC OIL INSTRUCTION PLATE



LOCATIONAL VIEW



F. SUB-ZERO OPERATION INSTRUCTION PLATE



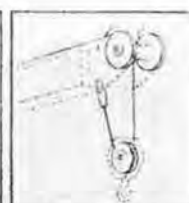
E. HOIST AND CROWD LEVER INSTRUCTION PLATE

CRANE CAPACITY		
2 PART HOIST LINE		
RADIUS	WITH	WITHOUT
	OUTRIGGERS	
18 FT.	4000	3000
17 FT.	4250	3200
16 FT.	4550	3500
15 FT.	5000	3800
14 FT.	5600	4100
13 FT.	6300	4600
12 FT.	7150	5100
11 FT.	8400	5800
10 FT.	10000	6700

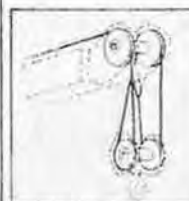
MAXIMUM CAPACITY WITH BOOM RETRACTED & BOOM SUPPORTED TO FRAME - 20,000 # @ 10 FT. RADIUS WITH ALL OUTRIGGERS DOWN - 4-PART LINE.

20,000 # @ 15 FT. RADIUS WITH BOOM JACKS TO GROUND. 4-PART LINE-REAR OUTRIGGERS UP.

B. CRANE CAPACITY CHART



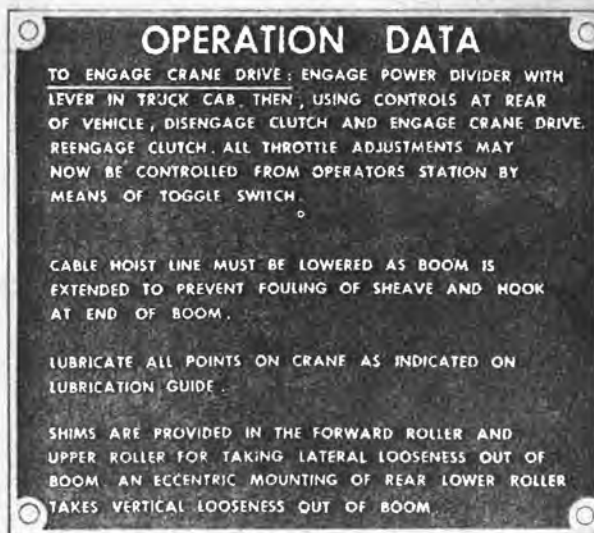
2 PART LINE



4 PART LINE



C. BOOM JACK CAUTION PLATE



D. CRANE OPERATION INSTRUCTION PLATE

ORD E42792

Figure 20. Name, caution, warning and instruction plates (M543 crane controls) (6 of 10).



## WARNING

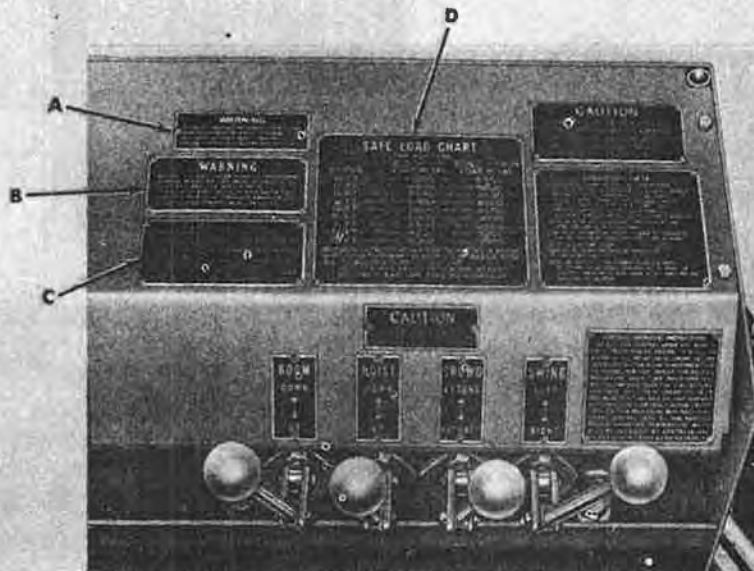
AFTER ALL DEEP WATER FORDING OPERATIONS REMOVE PIPE PLUG FROM BOTTOM OF BASE PLATE. PIVOT POST AND RING GEAR HOUSING SHOULD BE DRAINED THOROUGHLY BEFORE REPLACING PLUG.

A. AFTER DEEPWATER FORDING WARNING PLATE

## WARNING

BEFORE ALL DEEP WATER FORDING OPERATIONS REMOVE BREATHER CAP FROM HYDRAULIC OIL TANK AND REPLACE WITH PIPE PLUG. TIGHTEN PLUG SUFFICIENTLY TO MAKE WATER TIGHT. REMOVE PIPE PLUG AND REPLACE BREATHER CAP AFTER FORDING OPERATION IS COMPLETED.

B. BEFORE DEEPWATER FORDING WARNING PLATE



## SAFE LOAD CHART

2 PART HOIST LINE

RADIUS	WITH OUTRIGGERS LOAD IN LBS.	WITHOUT OUTRIGGERS LOAD IN LBS.
10 FT.	10000	6700
11 FT.	8400	5800
12 FT.	7150	5100
13 FT.	6300	4600
14 FT.	5600	4150
15 FT.	5000	3800
16 FT.	4550	3500
17 FT.	4250	3200
18 FT.	4000	3000

MAXIMUM CAPACITY WITH BOOM RETRACTED & BOOM SUPPORTED TO FRAME - 20,000# @ 10 FT. RADIUS WITH ALL OUTRIGGERS DOWN - 3-PART LINE.  
20,000# @ 15 FT. RADIUS WITH BOOM JACKS TO GROUND, 3-PART LINE - REAR OUTRIGGERS UP.

D. SAFE LOAD DATA PLATE

## OIL HYDRAULIC SYSTEM

USE OE10 MIL-D-2104 -10° TO +90°

USE OE30 MIL-D-2104 ABOVE 90°

USE OES MIL-D-10295 0° TO -65°

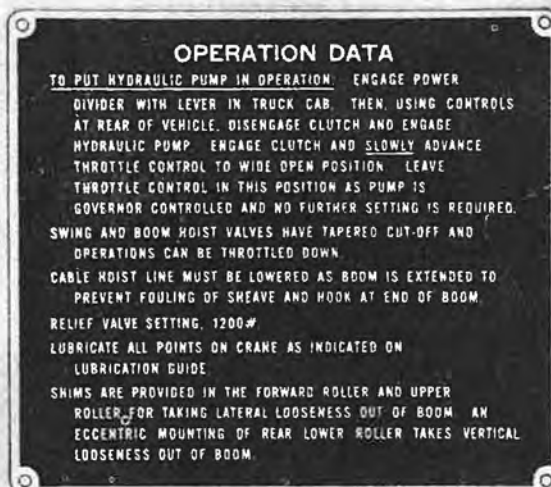
C. HYDRAULIC OIL INSTRUCTION PLATE

ORD E42793

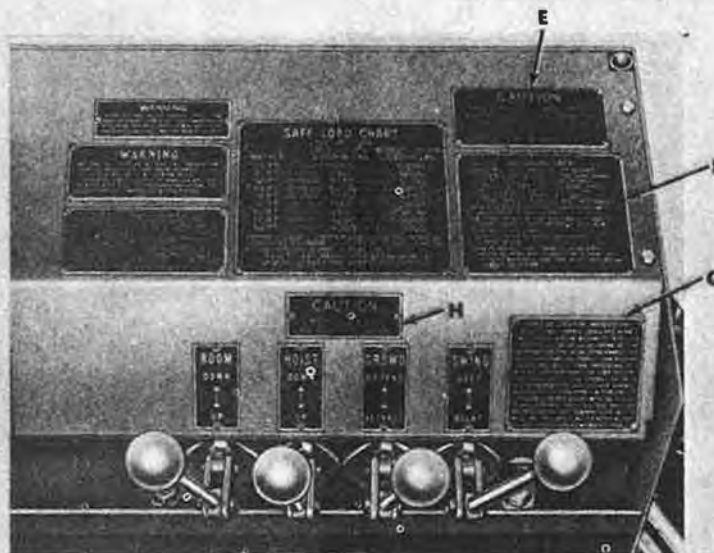
Figure 20. Name, caution, warning and instruction plates (M62 crane controls) (7 of 10).



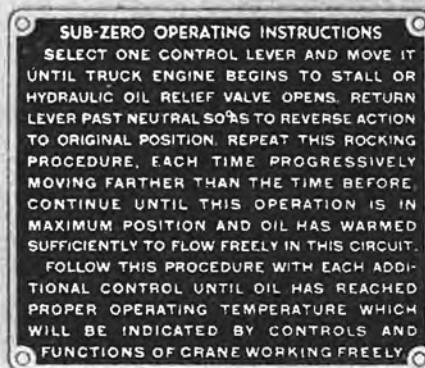
E. BOOM JACK CAUTION PLATE



F. CRANE OPERATION INSTRUCTION PLATE



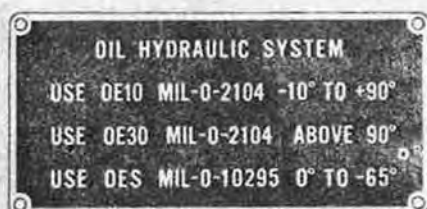
H. CROWD AND HOIST LEVERS INSTRUCTION PLATE



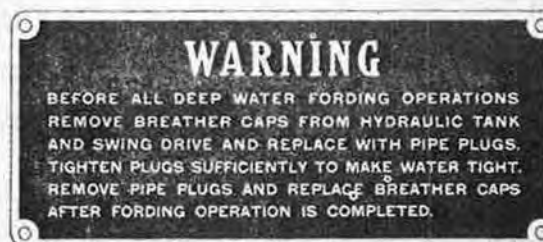
G. CRANE SUB-ZERO OPERATION INSTRUCTION PLATE

ORD E42794

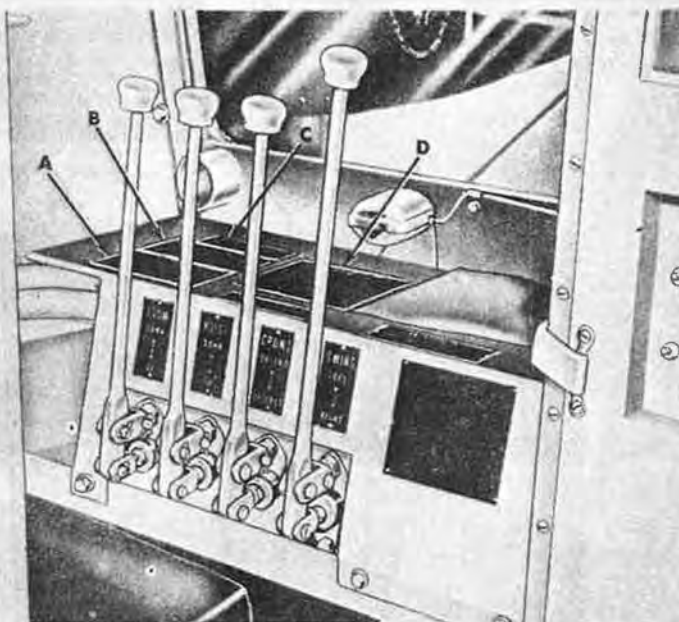
Figure 20. Name, caution, warning and instruction plates (M62 crane controls) (8 of 10).



A. HYDRAULIC OIL INSTRUCTION PLATE



B. HYDRAULIC RESERVOIR AND SWING DRIVE DEEP WATER FORDING WARNING PLATE



D. CRANE OPERATION INSTRUCTION PLATE



C. AFTER DEEPWATER FORDING WARNING PLATE

ORD E42795

Figure 20. Name, caution, warning and instruction plates (M246 crane controls) (9 of 10).



SAFE LOAD CHART		
	WITH OUTRIGGERS	WITHOUT OUTRIGGERS
RADIUS	LOAD IN LBS.	LOAD IN LBS.
11 FT. 6 IN.	10000	5200
12 FT.	9600	4750
13 FT.	8800	4275
14 FT.	8200	3800
15 FT.	7650	3500
16 FT.	7200	3175
17 FT.	6750	2950
18 FT.	6400	2700
19 FT.	6000	2500
20 FT.	5750	2300
21 FT.	5450	2200
22 FT.	5200	2100
23 FT.	5000	2000
24 FT.	4800	1950
25 FT.	4650	1825
26 FT.	4500	1700

MAXIMUM CAPACITY 20,000\*  
AT 15 FT. RADIUS WITH BOOM JACKS TO GROUND REAR OUTRIGGERS UP & 3 PART LINE.

**—WARNING—**  
PIN FOR BOOM JACKS TO BE INSERTED THRU BOOM AND EXTENSION - NOT THRU EXTENSION ONLY.

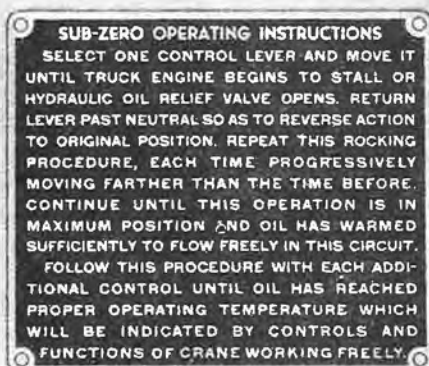
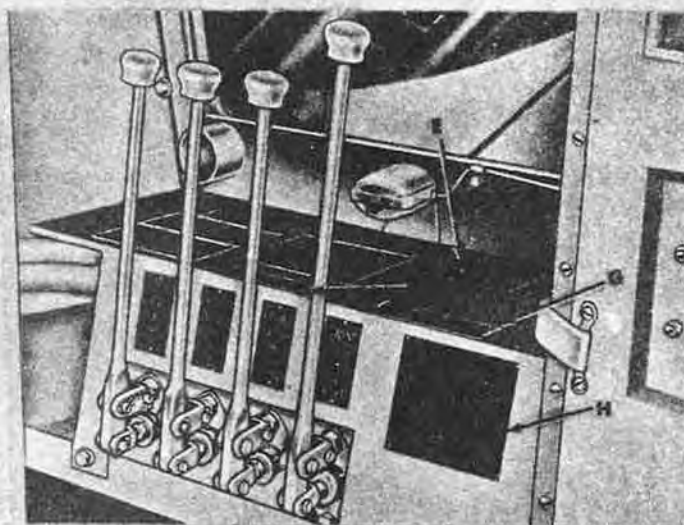
WHEN USING BOOM JACKS, PROVIDE SOLID FOOTING FOR BASES, THEN RELIEVE LOAD OFF BOOM RAM WITH BOOM LEVER.

MAXIMUM CAPACITY WITH BOOM RETRACTED TO 11'-6" RADIUS, WITH 2-PART LINE AND BOOM SUPPORTED TO FRAME-10000\*  
MAXIMUM CAPACITY WITH BOOM RETRACTED TO 11'-6" RADIUS, WITH 2-PART LINE AND ALL OUTRIGGERS DOWN-10000\*.

E. SAFE LOAD DATA PLATE



F. CROWD AND HOIST LEVER INSTRUCTION PLATE



H. CRANE SUB-ZERO OPERATION INSTRUCTION PLATE



G. CRANE PIVOT POST LOCKPIN WARNING PLATE

ORD E42796

Figure 20. Name, caution, warning and instruction plates (M246) (10 of 10).

## 7. Tabulated Data

### a. General.

Crew . . . . . 2  
Vehicle weight (empty) w/o  
front winch:

M41 . . . . .	19,190 lb
M51 . . . . .	21,980 lb
M52 . . . . .	18,813 lb
M52A1 . . . . .	19,063 lb
M54 . . . . .	19,230 lb
M54A1 . . . . .	19,480 lb
M55 . . . . .	20,000 lb
M62 . . . . .	32,981 lb
M139 . . . . .	26,591 lb
M246 . . . . .	31,186 lb
M543 . . . . .	34,440 lb

#### Payload (on highway):

M41 . . . . .	15,000 lb, cargo
M51, M54, M139 . . . . .	20,000 lb, cargo
M52 . . . . .	25,000 lb, weight on 5th wheel
M55 . . . . .	20,000 lb
M62 . . . . .	6,700 lb, carried on crane
M246 . . . . .	16,000 lb, weight on 5th wheel
M543 . . . . .	12,000 lb

#### Payload (off highway):

M41, M51, M54, M139 . . . . .	10,000 lb, cargo
M52 . . . . .	15,000 lb, weight on 5th wheel
M55 . . . . .	10,000 lb
M62 . . . . .	6,300 lb, carried on crane
M246 . . . . .	12,000 lb, weight on 5th wheel
M543 . . . . .	7,000 lb

### b. Dimensions.

#### Height, overall.

M41 . . . . .	111-1/8 in.
M51 . . . . .	110-5/8 in.
M52 . . . . .	103-1/8 in.
M54 . . . . .	116 in.
M55 . . . . .	117-1/2 in.
M62 . . . . .	127-1/8 in.
M139 . . . . .	120-3/4 in.
M246 . . . . .	132 in.
M543 . . . . .	108-5/8 in.

#### Length, overall, w/o front winch:

M41, M62 . . . . .	294-1/4 in.
M51 . . . . .	266-1/8 in.
M52 . . . . .	257-1/2 in.
M54 . . . . .	298-3/4 in.
M55 . . . . .	370-5/16 in.
M139 . . . . .	268 in.

#### Length, overall, w/front winch:

M41 . . . . .	309-3/4 in.
M51 . . . . .	281-5/8 in.
M52 . . . . .	273 in.
M54 . . . . .	314-1/4 in.
M55 . . . . .	385-15/16 in.
M62 . . . . .	348 in.
M139 . . . . .	273-1/16 in.
M246 . . . . .	352 in.
M543 . . . . .	349 in.

#### Width:

M41 . . . . .	96 in.
M51 . . . . .	97-1/4 in.
M52, M54, M62 . . . . .	97 in.
M55 . . . . .	97-1/2 in.
M139 . . . . .	115 in.
M246 . . . . .	97-11/16 in.
M543 . . . . .	96-1/4 in.

#### Ground clearance, minimum:

M41, M139 . . . . .	13 in.
M51, M52, M54, M62 . . . . .	10-1/2 in.
M55 . . . . .	10-1/2 in.
M246 . . . . .	11 in.
M543 . . . . .	11 in.

#### Turning circle (dia), w/o front winch:

M41, M54, M62 . . . . .	41 ft 1 in.
M51, M52 . . . . .	38 ft 9 in.
M55 . . . . .	46 ft
M139 . . . . .	46 ft 6-1/2 in.
M246 . . . . .	46 ft 2 in.
M543 . . . . .	

#### Turning circle (dia), w/front winch:

M41, M54, M62 . . . . .	41 ft 7 in.
M51, M52 . . . . .	39 ft 3 in.
M55 . . . . .	46 ft 6 in.
M139 . . . . .	47 ft 1/2 in.
M246 . . . . .	46 ft 8 in.
M543 . . . . .	46 ft 8 in.

### c. Capacities.

Cooling system . . . . . 44 qt

#### Crankcase:

Gasoline engine (wet refill) . . . . .	18 qt
Diesel engine (wet refill) . . . . .	15 qt
Oil filter (each) . . . . .	2 qt
Differentials, each . . . . .	12 qt
Transmission w/o power take-off . . . . .	9 qt
w/power take-off . . . . .	11 qt

Transfer . . . . . 5-1/4 qt

Winch:

Front . . . . . 2.6 qt

Rear . . . . . 3 qt

Fuel tank:

M51, M52 . . . . . 110 gal

M41, M54, M55, M62, M139,  
M246, M543 . . . . . 78 gal

d. Performance.

Maximum speed:

M41, M139 . . . . . 59 mph

M51, M52, M54, M55 . . . . . 50 mph

M62, M246, M543 . . . . . 52 mph

Fording depth (max) . . . . . 30 in.

Front winch capacity (max) . . . . . 20,000 lb

Recommended towed load (max on highway):

All models except M52  
and M246 . . . . . 30,000 lb (pintle)

M52 . . . . . 55,000 lb (5th wheel)

M246 . . . . . 46,000 lb (5th wheel)

Recommended towed load (max off highway):

All models except M52  
and M246 . . . . . 15,000 lb (pintle)

M246, . . . . . 20,000 lb (5th wheel)

M52 . . . . . 30,000 lb (5th wheel)

e. Tire Pressures.

Highway (psi):

M41, M139 . . . . . 45

M51, M52, M54, M55,  
M62, M543 . . . . . 70

M246 . . . . . 75

Cross-country (psi):

M41, M139 . . . . . 45

All other models . . . . . 35

Mud, sand, and snow (psi):

All models . . . . . 15

f. Power Train.

Engine (gasoline):

Make . . . . . Continental

Model . . . . . R6602

Type . . . . . 6-cylinder

Engine (diesel):

Make . . . . . Mack

Model . . . . . ENDT-673

Type . . . . . 6-cylinder, turbo-  
charged, compression-ignition

Transmission:

Make . . . . . Spicer

Model . . . . . 6352

Speeds forward . . . . . 5

Speeds reverse . . . . . 1

Transfer:

Make . . . . . Timken

Model . . . . . T-138

g. Electrical System.

Batteries (2 in series):

Model . . . . . 6TN23

Voltage (each) . . . . . 12

Ground . . . . . negative

h. Cooling System.

Radiator:

Make (gasoline) . . . . . Modine

Model . . . . . 41197-1A52076

Make (diesel) . . . . . Mack

Model . . . . . 76040-3MFAX559

Radiator filler cap:

Opening pressure . . . . . 7 psi

Thermostat:

Opens at . . . . . 160°F

Fully open . . . . . 185°F

i. Brakes.

Service Brakes:

Type . . . . . air-hydraulic

Brake pedal free travel . . . . . 1/4-1/2 in.

Hand brake:

Location . . . . . transfer rear  
output shaft

j. Front Winch.

Make . . . . . Gar Wood

Model . . . . . GW-DA615

Capacity . . . . . 20,000 lb

Cable Length:

All models except M62,  
M543 and M246 . . . . . 200 ft

M62, M543 and M246 . . . . . 280 ft



## CHAPTER 2

### OPERATING INSTRUCTIONS

#### Section I. SERVICE UPON RECEIPT OF MATERIEL

##### 8. General

a. When a new, used, or reconditioned vehicle is first received by the using organization, it is the responsibility of the officer in charge to determine whether the vehicle has been properly prepared for service by the supplying organization and to be sure it is in condition to perform its respective function.

b. Services to be performed by the operator, crew, or user are designated in paragraph 9. Whenever practicable, the operator, crew, or user will assist organizational maintenance personnel in the performance of these services.

##### 9. Break-In Services

a. Preliminary Services. Prior to initiating the break-in services, the operator or user must become familiar with the vehicle's controls, instruments, and operation by referring to Section II, Controls and Instruments, and to Section III, Operation Under Usual Conditions. When an operator is assigned to a new or reconditioned vehicle, and the break-in period is to be accomplished in normal services, the operator is cautioned against the following:

- (1) Do not exceed 35 mph for the first 100 miles and 40 mph for next 400 miles.
- (2) Lubricate vehicle and change oil at 500 and 1000 miles or at six months whichever occurs first.
- (3) Speeds in excess of those specified on the instruction plate.
- (4) Improper selection of transmission driving range for specified driving conditions (skipping speeds when shifting gears).
- (5) Rapid acceleration and deceleration.
- (6) Sudden stops unless in an emergency.
- (7) Prolonged operation of the vehicle under other than normal weather and terrain conditions.

(8) Sudden or forced engagement of an operating control.

(9) Overheating.

(10) Operation of engine or power train to capacity.

b. Road Test. All vehicles received by the using organization must be road tested to check their operation and determine their condition. For all new or reconditioned vehicles, except those driven 50 miles or more in the course of delivery, the road test will be of a minimum distance of 50 miles. For used vehicles, and vehicles driven 50 miles or more in the course of delivery, the road test will be of sufficient length to allow for the usual observations as to operation and condition. The operator will observe, as frequently as possible, the instrument panel and gages for any indication of unsatisfactory vehicle performance. Periodic stops will be made, at least every 10 miles, to allow the operator to inspect the vehicle for possible coolant, oil, fuel, or exhaust leakage, and any evidence that may indicate that engine, transmission, wheel hubs, brake drums, axle differentials, or transfer assemblies are overheated. The vehicle must be checked thoroughly for any control difficult to operate, and any instrument operating in an erratic manner. Unusual noises and vibrations will be noted. All discrepancies or malfunctions will be reported to organizational maintenance personnel.

**Caution:** During the road test, do not exceed or operate the vehicle continuously at the maximum allowable speeds indicated on the instruction plate.

c. After-road Test. Upon completion of the road test, correct those malfunctions which are within the scope of the operator. All other malfunctions, and the general condition of the vehicle, will be reported to the responsible vehicle commander.

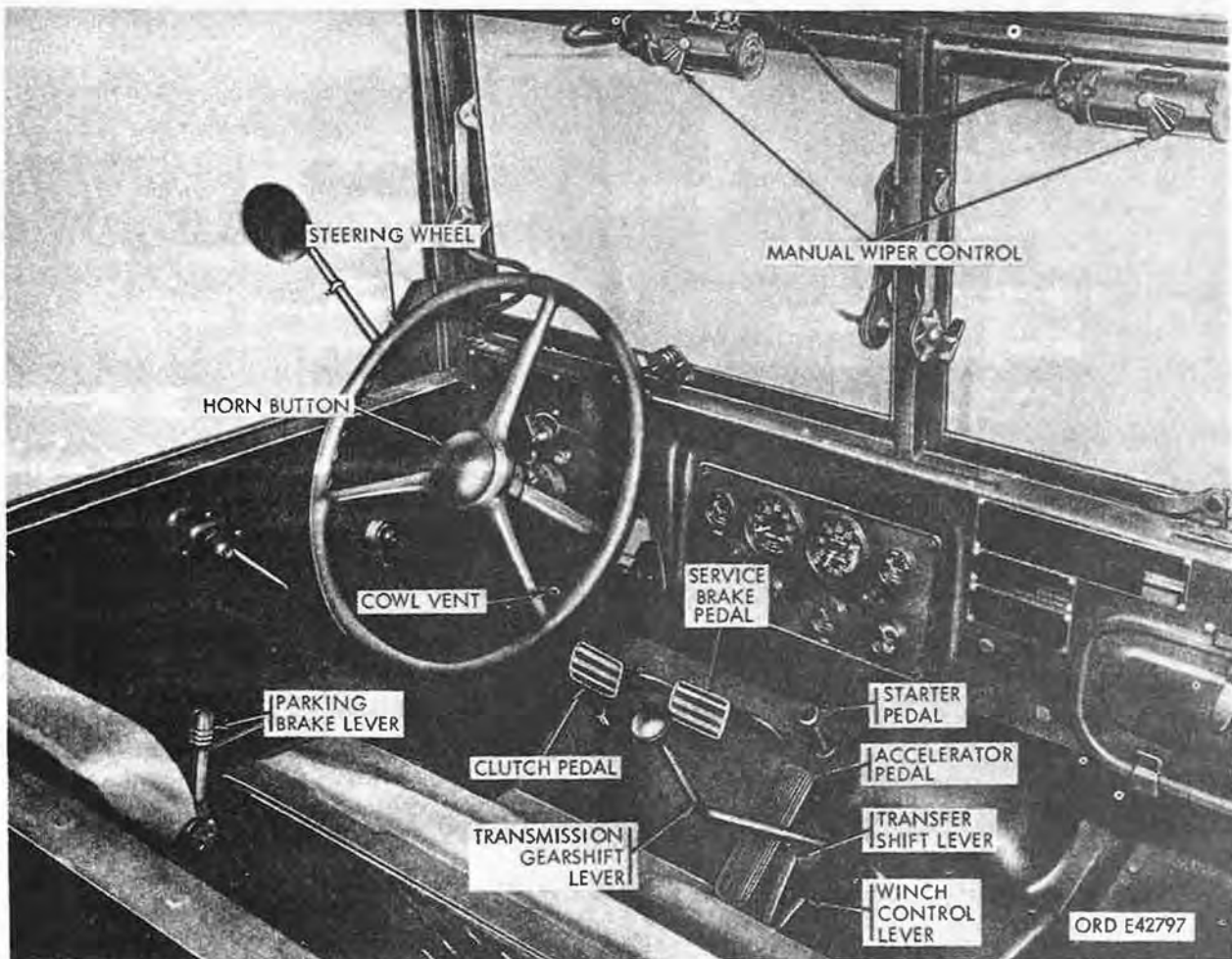
## Section II. CONTROLS AND INSTRUMENTS

### 10. General

This section describes, locates and illustrates the various controls and instruments provided for the proper operation of the vehicles covered by this manual.

### 11. Controls and Instruments

Vehicle operator's controls and instruments are illustrated in figures 21 through 24.



*Figure 21. Driver's compartment controls and instruments.*

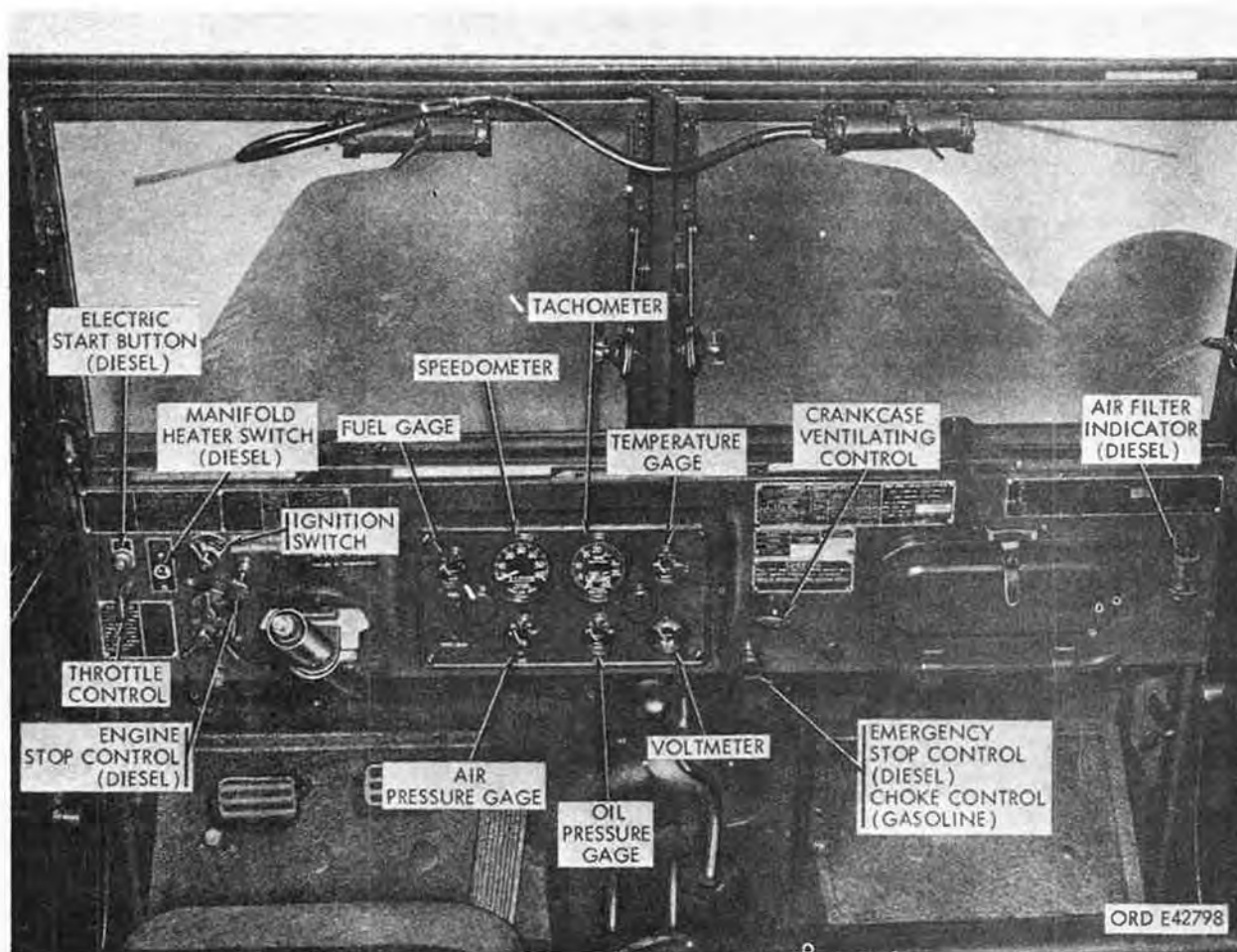
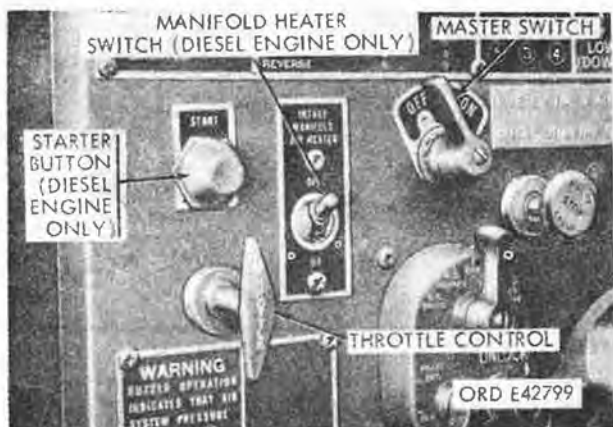
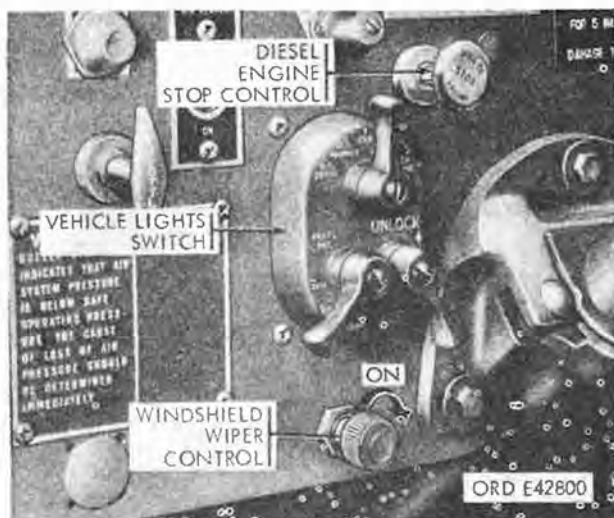


Figure 22. Driver's compartment controls and instruments (steering wheel removed).

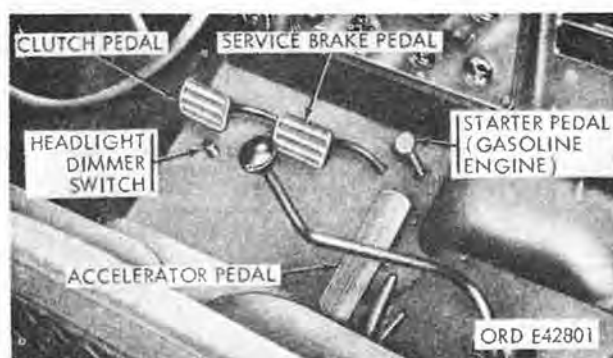




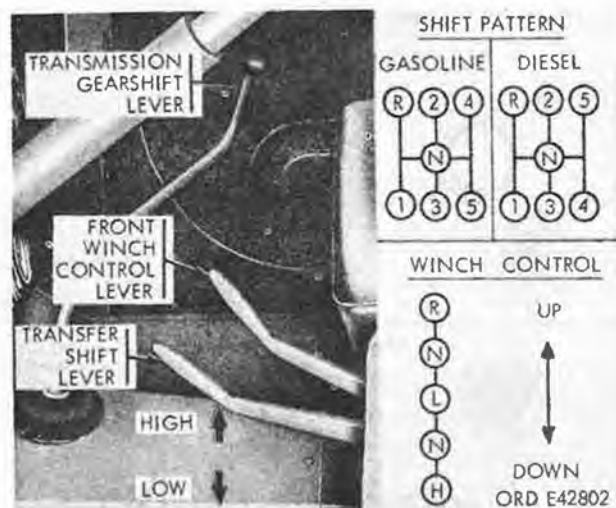
**View A.** Throttle control, starter button, manifold heater switch and master switch.



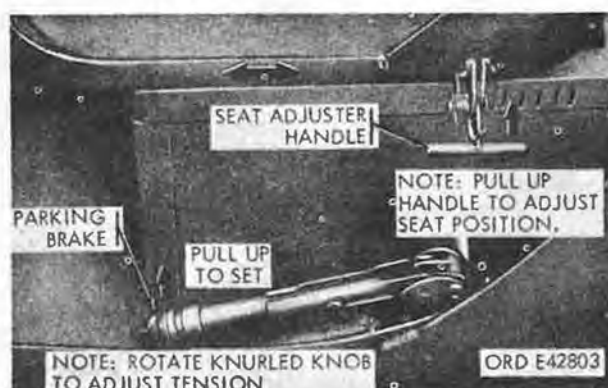
**View B.** Diesel engine stop control, vehicle lights switch and windshield wiper control.



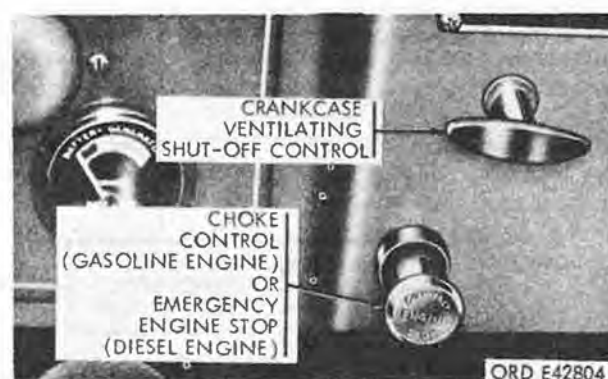
**View C.** Headlight dimmer switch, clutch pedal, accelerator pedal, service brake pedal, and starter pedal.



**View D.** Transmission gearshift lever, front winch control lever and transfer shift lever.



**View E.** Seat adjuster handle and parking brake lever.



**View F.** Crankcase ventilating shutoff control and choke control (or emergency engine stop).

*Figure 23. Driver's compartment controls.*

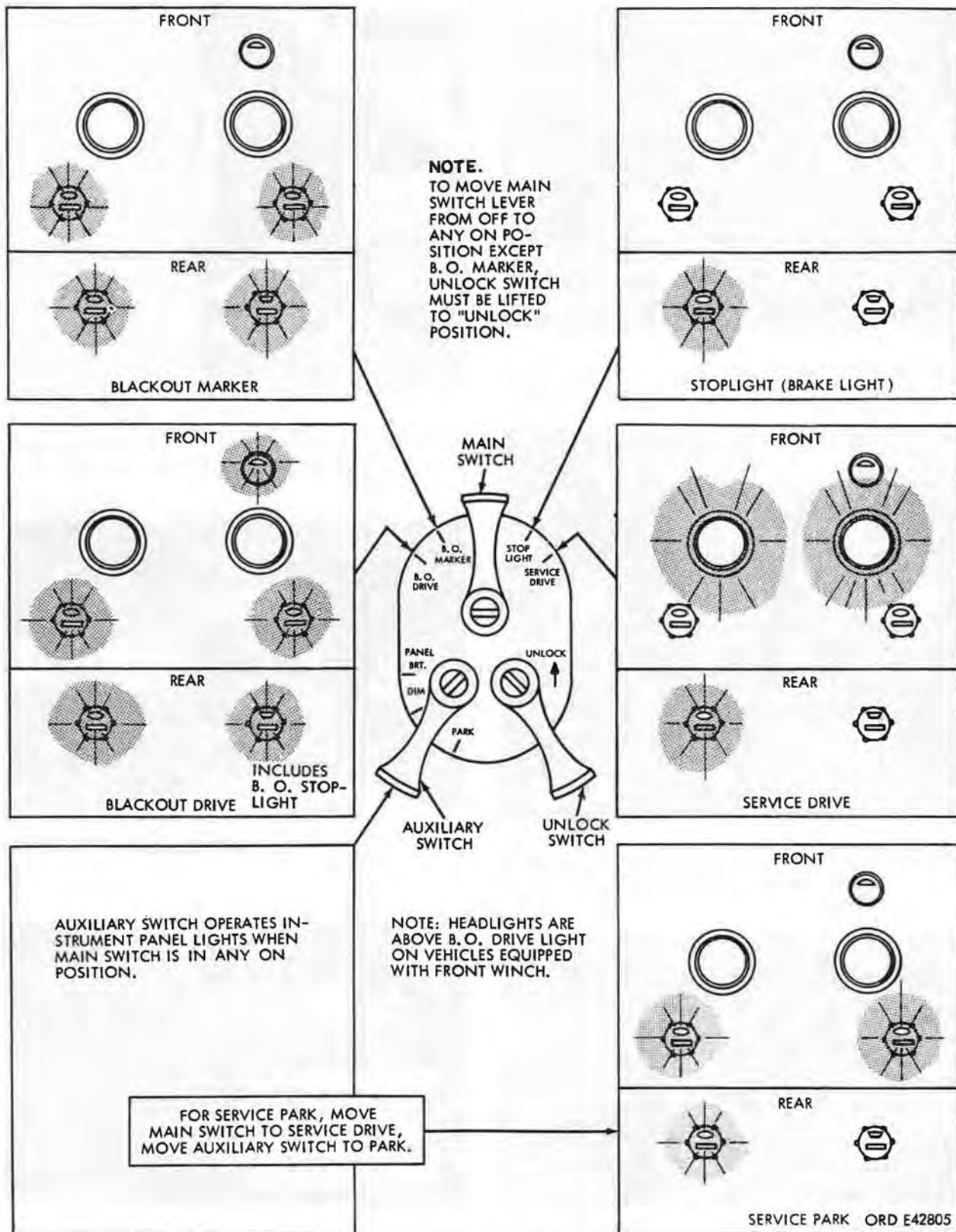


Figure 24. Vehicle lights chart.

### Section III. OPERATION UNDER USUAL CONDITIONS

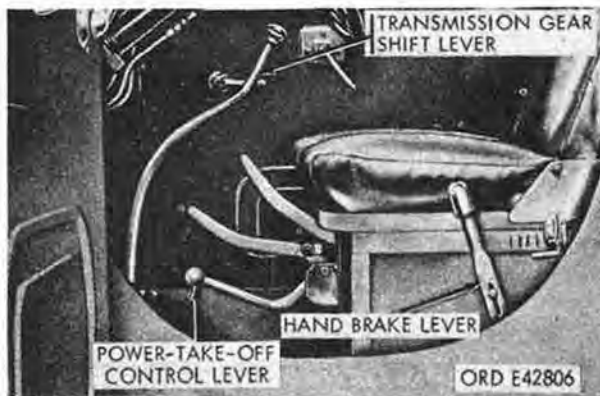
#### 12. General

This section contains instructions for the mechanical steps necessary to operate the 5-ton, 6 x 6 trucks covered in this manual, under conditions of moderate temperatures, humidity, and terrain. For operation under unusual conditions, refer to paragraphs 27 through 32. Vehicle operating steps, procedures, notes and precautions are contained in figures 25 through 31.

#### 13. Starting the Engine

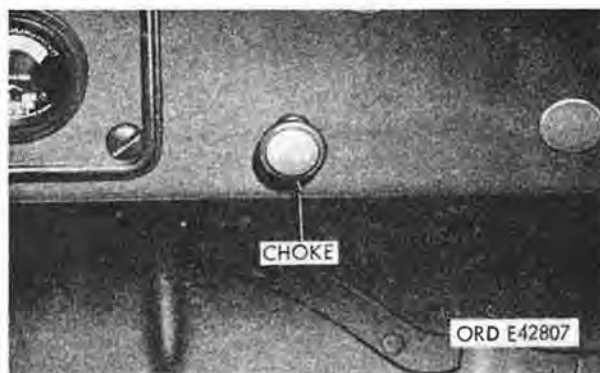
##### a. Starting Gasoline Engine.

FIGURE 25  
STARTING THE ENGINE (GASOLINE)  
Steps 1 through 9



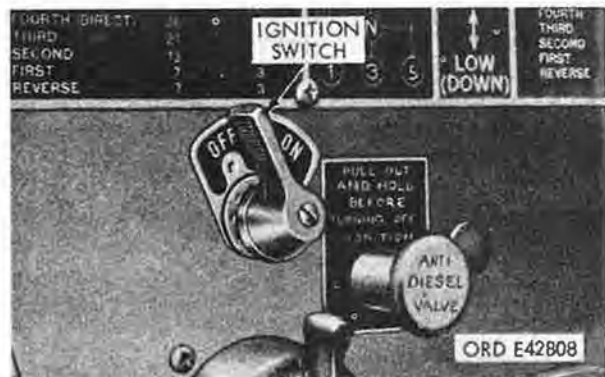
**Step 1.** Apply (pull back) parking brake.

**Step 2.** Place transmission gearshift and power take-off levers in the neutral position.

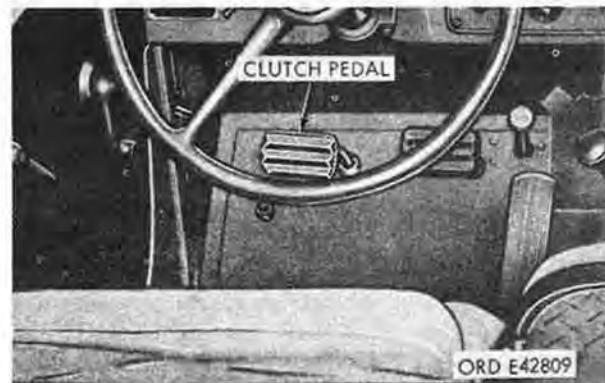


**Step 3.** Pull out choke control knob 1/2 to 3/4 inch.

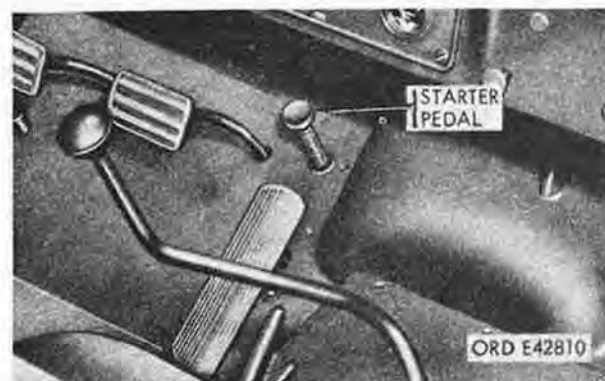
**Note.** Use the choke control sparingly in warm weather, or when engine is warm.



**Step 4.** Place ignition switch lever in "ON" position.



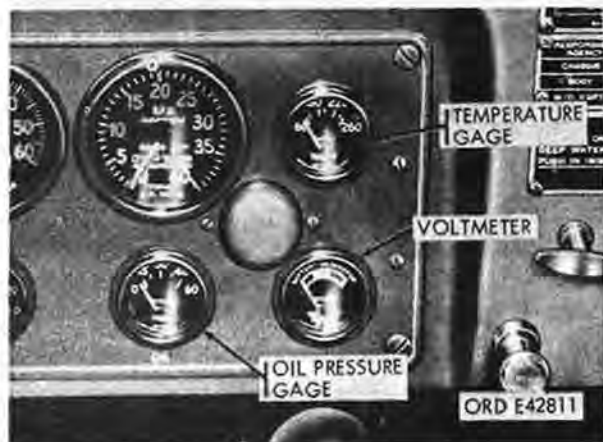
**Step 5.** Depress clutch pedal to disengage clutch. Hold pedal down while engine is being started.



**Step 6.** Depress starter pedal to start engine. Release starter as soon as engine starts.



**Caution:** The starter should not be operated continuously for more than 10 seconds at a time. Operate the starter for 10 seconds, then release the starter for 20 to 30 seconds before trying again. If the engine fails to start after repeated attempts, place the ignition switch lever in the "OFF" position and notify organizational maintenance personnel.



**Step 7.** Check oil pressure. Gage should read above 15 psi. Voltmeter should indicate "charging." Temperature gage should respond normally.

**Caution:** If the oil pressure remains low, or fails to register at all, or if the temperature gage shows an abnormal rise or fails to respond at all, or if the voltmeter does not indicate "charging" with the engine at fast idle with all the accessories turned off, stop the engine immediately and notify organizational maintenance.



**Step 8.** Observe the air pressure gage. The air pressure warning buzzer should

continue to sound until the air pressure is above 110 psi.

**Caution:** If the air pressure does not increase to a normal reading, or if the warning buzzer stops prematurely, stop the engine immediately and notify organizational maintenance personnel.

**Warning:** Do not attempt to operate the vehicle, under any circumstances, unless the air pressure system and warning buzzer are operating properly.

**Step 9.** As the engine warms up, push the choke control knob all the way in. Release the clutch pedal.

**Note.** Allow engine to run for a short warm-up period before operating the vehicle, whenever conditions permit.

*Figure 25. Starting the engine (gasoline).*

\*\*\*

#### b. Starting Diesel Engine.

**FIGURE 26**  
**STARTING THE ENGINE (DIESEL)**  
**Steps 1 through 11**

**Caution:** Drain the primary fuel filter (located on the left side of the engine) once each day before starting the engine. Contamination of fuel will result in a serious condition in the fuel injection system. If large amounts of water and impurities are noticed draining from the primary fuel filter, drain the secondary fuel filter. If water and impurities are found in the secondary fuel filter, the filters should be changed. Extreme care must be taken in changing the secondary fuel filter to prevent dirt particles from entering the fuel-to-injector pump.

Prior to starting, the engine should be cranked for several seconds with the fuel shutoff in the "Stop" position. This will prevent damage to the engine in the event of a hydrostatically locked piston.

**Step 1.** Apply (pull back) parking brake.

**Step 2.** Place transmission gearshift in neutral position.



**Step 3.** Push the engine stop control knob all the way in.



**Step 4.** Check to see that the emergency engine stop control knob is all the way in.



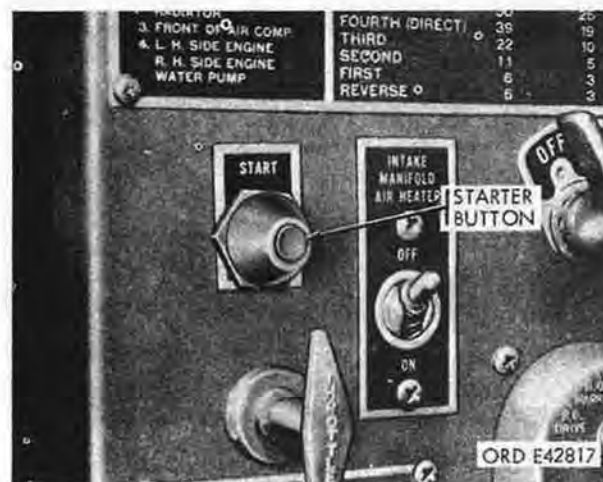
**Step 5.** Move ignition switch lever to "ON" position.



**Step 6.** Pull hand throttle out to 1/2 of its maximum travel.

**Caution:** The hand throttle is to be used for engine starting and warmup only. Do not use the hand throttle in place of the accelerator pedal.

**Step 7.** Depress clutch pedal to disengage clutch. Hold clutch pedal down while engine is being started.



**Step 8.** Push starter button on instrument panel in with a quick forward motion. Release button as soon as engine starts.

**Caution:** The starter should not be operated continuously for more than 10 seconds at a time. Release the starter button after 10 seconds of operation. Wait 10 to 15 seconds between periods of operation. If the engine fails to start after repeated attempts, move ignition switch lever to "OFF" position and notify organizational maintenance personnel.

**Step 9.** Check oil pressure. Gage should read above 15 psi. Voltmeter should indicate "charging." Temperature gage should respond normally.

**Caution:** If the oil pressure remains low, or fails to register at all, or if the temperature gage shows an abnormal rise or fails to respond at all, or if the voltmeter does not indicate "charging" with the engine at fast idle with all the accessories turned off, stop the engine immediately and notify organizational maintenance.

**Step 10.** Observe the air pressure gage. The air pressure warning buzzer should sound until the air pressure is above 110 psi.

**Caution:** If the air pressure does not increase to a normal reading, or if the warning buzzer stops prematurely, stop the engine and notify organizational maintenance personnel.



**Step 11.** Push in the hand throttle until the tachometer indicates 800 rpm. Allow the engine to warm up until the temperature reaches 140°F.

**Caution:** Do not race the engine during the warm-up period. Observe air filter indicator. Red flag should not be visible after engine starts. If red flag remains visible, stop engine and replace air filter element.

*Figure 26. Starting the engine (diesel).*

\*\*\*

### c. Cold-Weather Starting (Diesel).

**Note.** The cold-weather starting procedure for the diesel engine is the same as the normal starting procedure, with the following additional steps:



- (1) As the engine is cranked, activate the cold-weather start kit by holding the intake manifold air heater switch in the "ON" position.
- (2) After the engine starts, release the intake manifold air heater switch to the "OFF" position to deactivate the cold-weather start kit.
- (3) If the engine misfires during idling, reactivate the cold-weather start kit until the engine is running smoothly.

*Figure 27. Cold weather starting procedure (diesel engine).*

\*\*\*

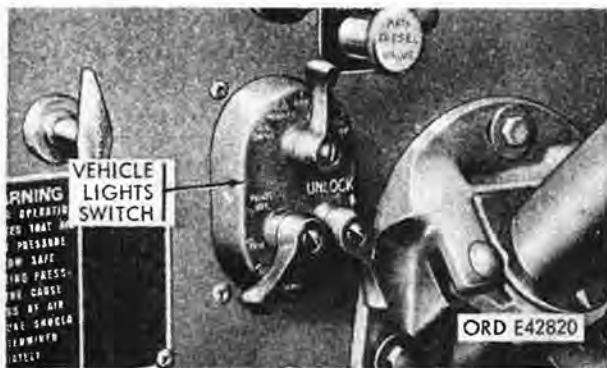
**Caution:** If the engine continues to misfire after reading normal operating temperature, stop the engine immediately and notify organizational maintenance personnel. The cold-weather start kit is not to be used during normal operation of the vehicle.

### 14. Placing the Vehicle in Motion

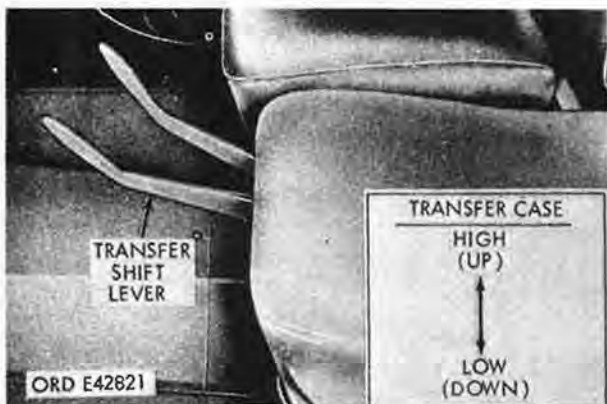
**Warning:** Do not exceed operational limitations shown on transmission and transfer data plates.

**FIGURE 28**  
**PLACING THE VEHICLE IN MOTION**  
Steps 1 through 5





**Step 1.** Set vehicle lights switch for lighting required. Refer to Vehicle Light Chart, figure 24.



**Step 2.** Depress clutch pedal and move transfer shift lever into "HIGH" or "LOW" operating range. Release clutch pedal.

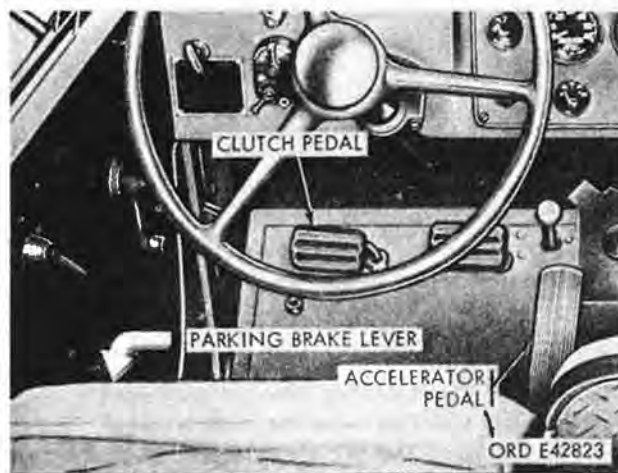
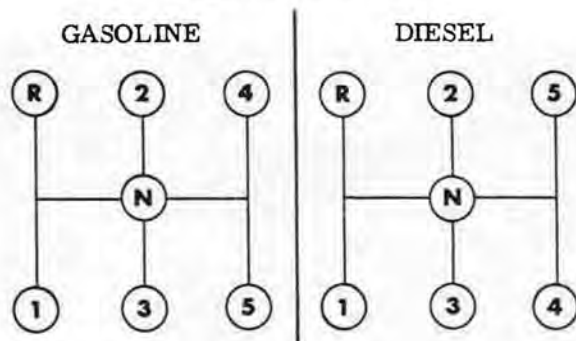
**Note.** Select the proper "HIGH" or "LOW" operating range according to expected terrain and tactical conditions. (See data plate on instrument panel.)



**Step 3.** Depress clutch pedal and place transmission gearshift lever in "1" (first)

position. Do not release the clutch pedal.

### SHIFT PATTERN



**Step 4.** Release parking brake. Slowly release clutch pedal while depressing the accelerator pedal to prevent the engine from stalling.

**Caution:** The clutch must be fully released while the vehicle is moving. Do not "ride" clutch.

**Step 5.** When the vehicle approaches the maximum road speed for "1" (first) gear, depress the clutch pedal and move the transmission gearshift lever to the appropriate successive positions.

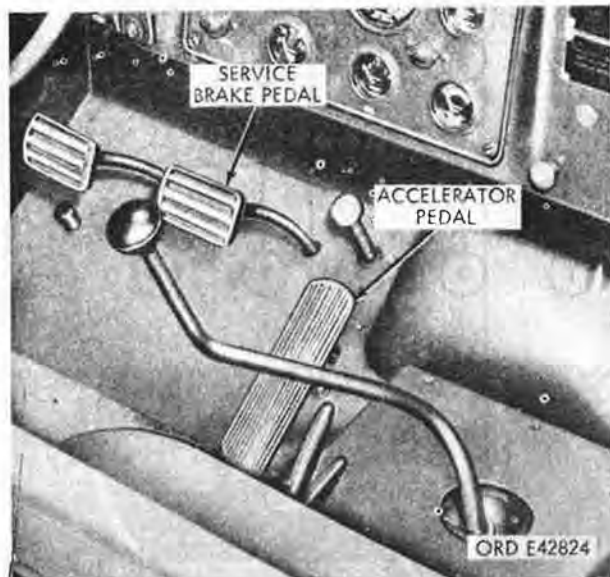
**Caution:** Do not exceed maximum road speeds shown on instruction and caution data plate (figure 20). Bring the vehicle to a complete halt before shifting to reverse gear.

*Figure 28. Placing the vehicle in motion.*

\* \* \*

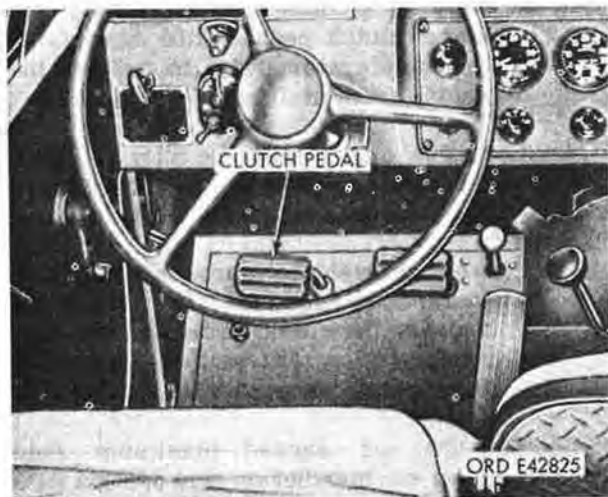
## 15. Stopping the Vehicle and Engine

**FIGURE 29**  
**STOPPING THE VEHICLE AND ENGINE**  
Steps 1 through 5

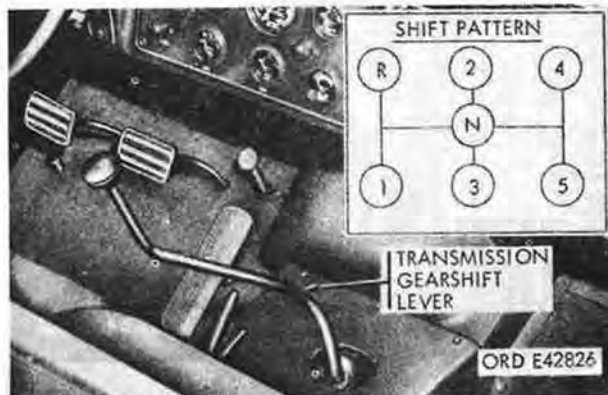


**Step 1.** Release accelerator pedal and depress brake pedal to bring the vehicle to a halt.

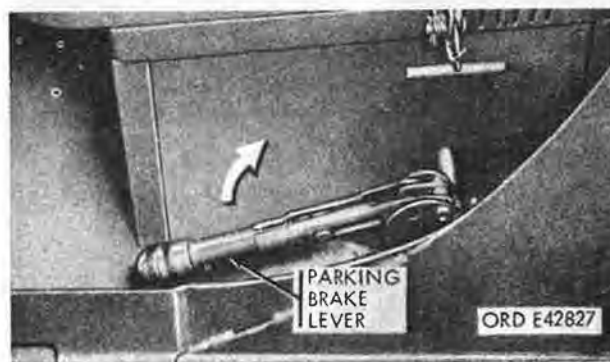
**Note.** Apply smooth, steady pressure to the brake. Do not depress the clutch pedal. With clutch engaged engine can assist in checking vehicle speed.



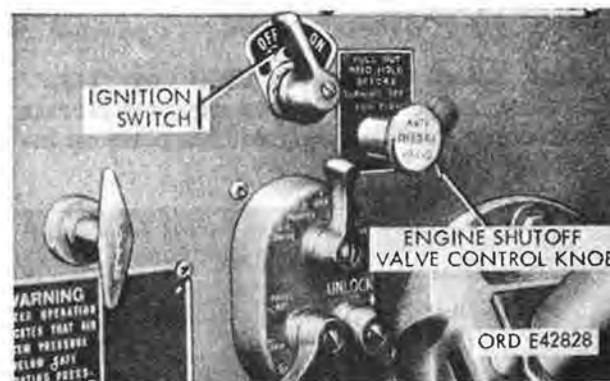
**Step 2.** Depress the clutch pedal when vehicle speed has been reduced so that the engine is near idling speed.



**Step 3.** After the vehicle has come to a complete stop, place the transmission gearshift lever in neutral. Keep the clutch and brake pedals depressed.



**Step 4.** Set the parking brake and release clutch and brake pedals.



**Step 5.** Place all switches in the "OFF" position. Pull the engine shutoff valve control knob out to stop the diesel engine.

**Caution:** The diesel engine shutoff control knob must remain in the "stop" position when the vehicle is not being operated, to prevent

accidental starting of the engine.

**Note.** To shut off the fuel supply on diesel engine in an emergency, pull out the emergency fuel shutoff valve control knob.

*Figure 29. Placing the vehicle in motion.*

\*\*\*

## 16. Operating Precautions

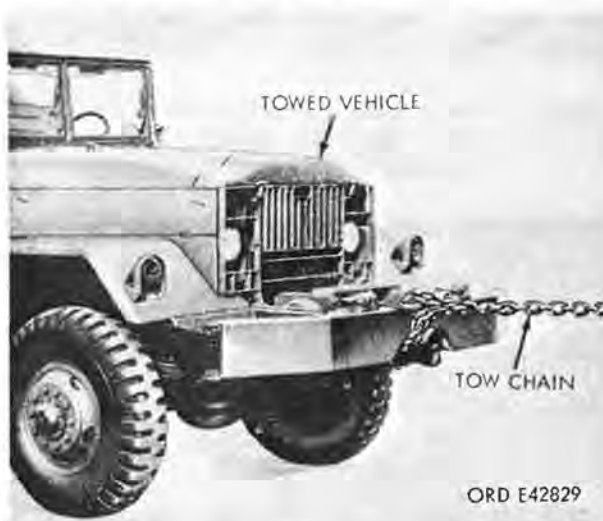
- (1) Do not exceed speeds shown on instruction and caution data plate (fig. 20).
- (2) Do not disengage clutch when descending hills, except when necessary to shift to a lower gear.
- (3) Do not partially engage (ride) clutch.
- (4) Do not race engine when not under load.
- (5) Do not stop engine when overheated. Stop vehicle and carefully loosen radiator cap to release pressure and slowly (1 or 2 quarts at a time) fill radiator until temperature gage indicates normal operating temperature.
- (6) Operate vehicle with recommended tire pressure (refer to paragraph 7e).
- (7) Do not operate starter for more than 10 seconds at a time. Wait at least 30 seconds between attempts to start the engine. If engine fails to start, notify organizational maintenance personnel.
- (8) Bring the vehicle to a complete stop before shifting into reverse gear.
- (9) When vehicle is stuck or under heavy load, do not "rev" up engine and slip clutch.
- (10) When vehicle is stuck, do not rock vehicle by shifting from first to reverse gear while throttle is partly open. Such action will damage transmission gear teeth. Operator must wait for engine to return to idle speed, and for transmission gear sets to stop revolving, before shifting gears to an opposite direction.
- (11) Keep vehicle under control at all times.

## 17. Towing to Start Engine

**FIGURE 30**  
**TOWING TO START THE ENGINE**  
Steps 1 through 8

**Caution:** Diesel engine trucks (Models M52A1 and M54A1) may be towed to start the engine only after approval from the maintenance officer has been obtained.

**Note.** The following instructions pertain to towing of gasoline engine vehicles only.

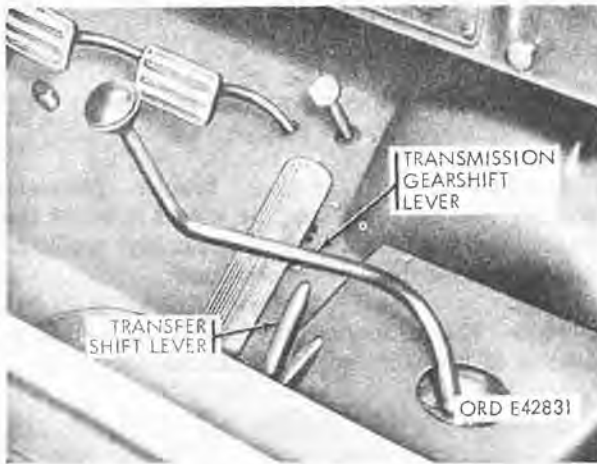


**Step 1.** Attach sufficient length of tow chain or cable from the towing vehicle to the vehicle being towed.

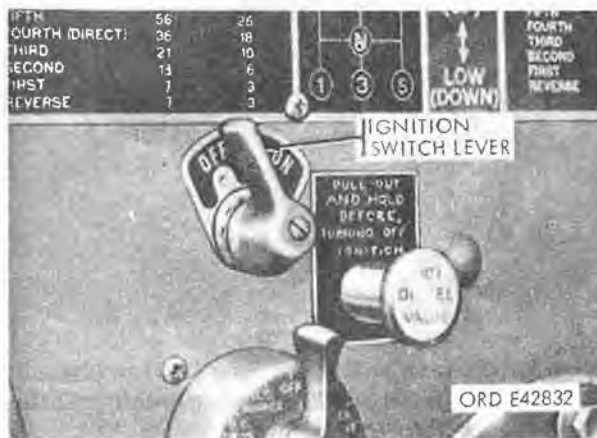


**Step 2.** Pull the towed vehicle throttle out one-half to three-quarters of an inch. If the engine is not warmed up, pull the choke control knob out part way.

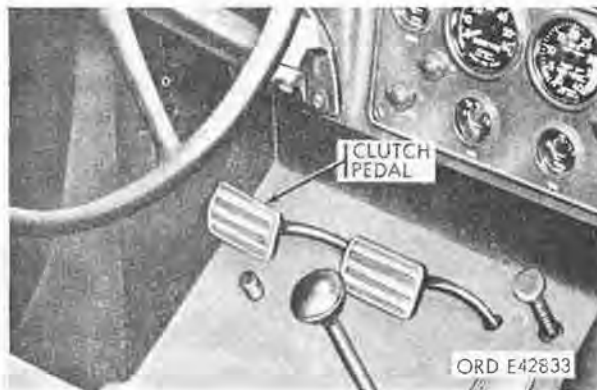




**Step 3.** Place the transmission gearshift lever in "5" position. Place the transfer shift lever in "HIGH."



**Step 4.** Move the ignition switch lever to "ON."



**Step 5.** Depress the clutch pedal and hold the clutch in the disengaged position. Release parking brake and signal the towing vehicle to proceed.

**Step 6.** When the towed vehicle reaches approximately 10 mph, slowly release the clutch pedal to engage the clutch.

**Caution:** If the engine of the towed vehicle does not start within 100 yards after attaining a speed of approximately 10 mph, halt towing operations and notify organizational maintenance personnel.

**Step 7.** Depress the clutch pedal immediately after the engine starts. Move the transmission gearshift lever to neutral and carefully apply the brake pedal. Release the clutch pedal.

**Step 8.** When both vehicles come to a halt, apply the parking brake and allow the engine to warm up. Remove the tow chain or cable.

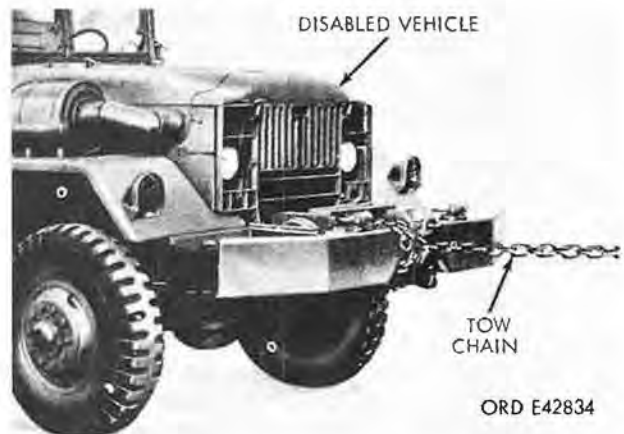
*Figure 30. Towing to start engine.*

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## 18. Towing a Disabled Vehicle

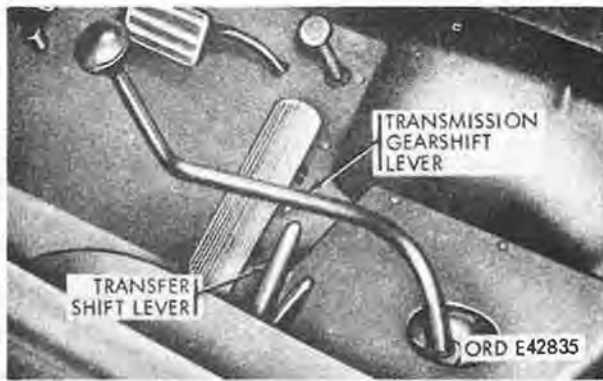
**FIGURE 31**  
**TOWING A DISABLED VEHICLE**  
Steps 1 through 4

**Caution:** Prior to towing a disabled vehicle, determine if any component of the drive train is damaged or inoperative. If towing would cause further damage, notify organizational maintenance personnel.



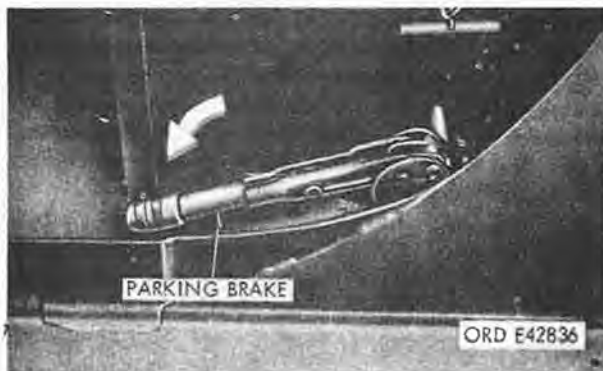
**Step 1.** Connect a towing chain or tow bar to the front of the disabled vehicle.

**Caution:** Never attempt to push a disabled vehicle. Tow vehicle only with tow bar, chain or cable.

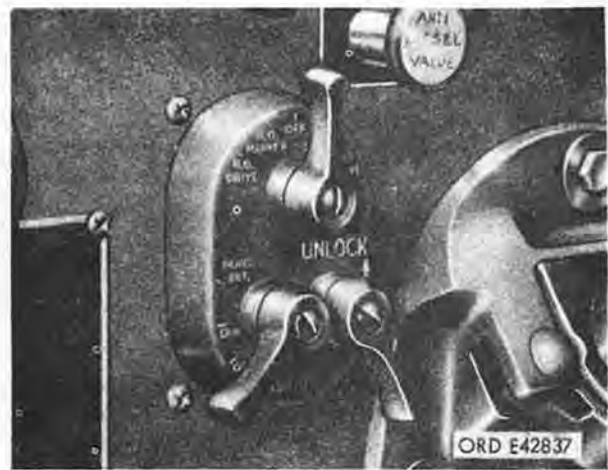


**Step 2.** Place the transmission gearshift and transfer shift levers in their neutral positions.

**Caution:** The transmission gearshift lever must be in the neutral position to avoid damage to the vehicle.



**Step 3.** Release the parking brake in the towed vehicle and signal the towing vehicle to start.



**Step 4.** Set vehicle lights switch for the "STOPLIGHT" position only.

**Note.** The operator of the towed vehicle must be prepared to actuate the vehicle stoplights as those of the towing vehicle become actuated, and to duplicate the hand signals of the driver of the towing vehicle. This is particularly important in populated areas and on heavily traveled roads.

**Caution:** If the vehicle is disabled through failure of the battery or hydraulic brake system, refer towing operations to organizational maintenance personnel.

*Figure 31. Towing a disabled vehicle.*

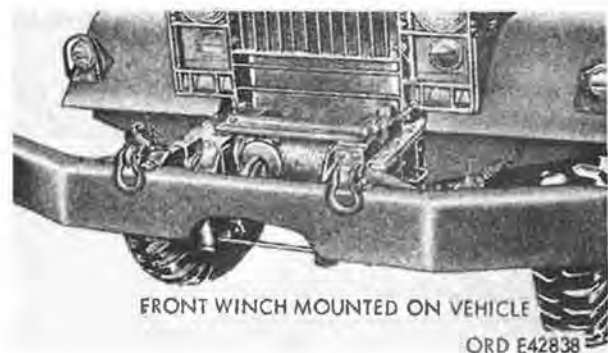
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## Section IV. OPERATION OF MATERIEL USED IN CONJUNCTION WITH MAJOR ITEM

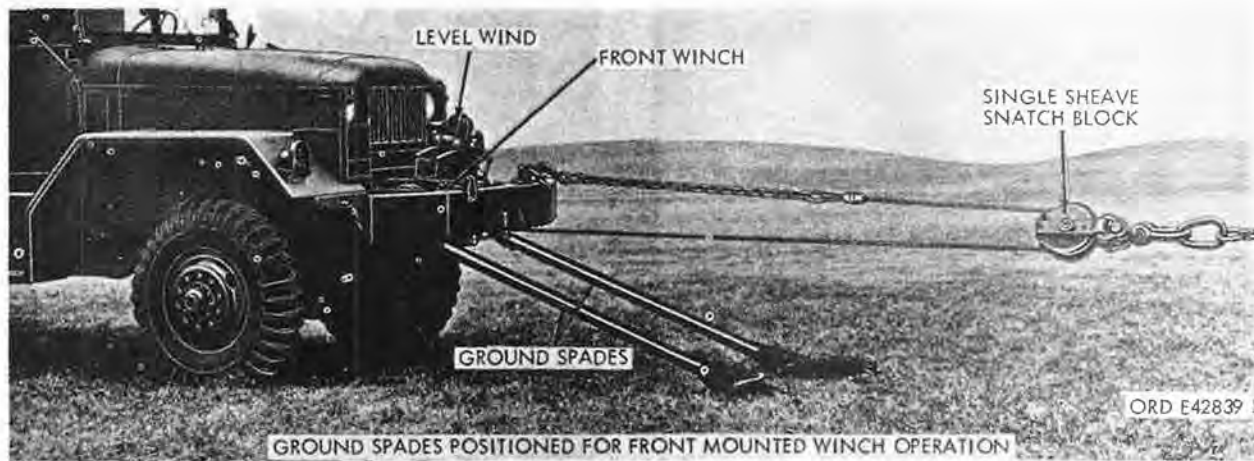
### 19. Operating Front Mounted Winch

**FIGURE 32**  
**FRONT MOUNTED WINCH**  
Views A and B

**a. General.** The worm-gearred, jaw-clutch drum front winch is mounted at the front of the vehicle on support brackets attached to the left and right frame side rail extensions. Power for operation of the front winch is obtained by means of a propeller shaft extending from a power take-off mounted on the right side of the transmission. An internal, automatic safety brake is provided to sustain the winch load when the power take-off is being shifted.



**View A.**



View B.

**Note.** Some vehicles are equipped with a front mounted winch which does not contain the level winding device.

**b. Vehicle Positioning.** Proper alinement of the front winch with the object being recovered is necessary to ensure proper winding of the winch cable. This is particularly important when the winch is not equipped with a level winding device. Position the recovery vehicle and the object being recovered in as direct a line as possible.

**Caution:** It is imperative that the recovery vehicle be firmly anchored in place before starting winch operation. If possible, anchor the rear of the recovery vehicle to a fixed object nearby, by means of anchor cable.

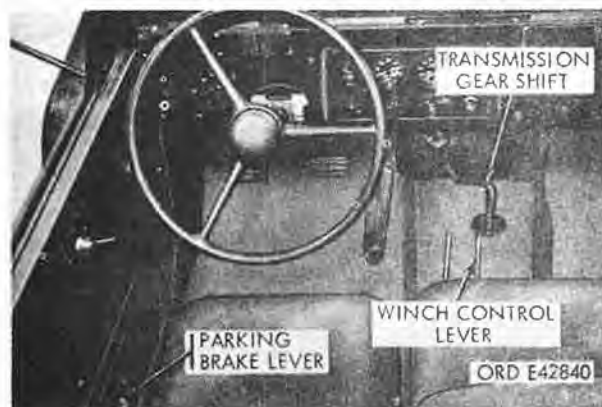
Figure 32. Front mounted winch.

\* \* \*

**Note.** Wrecker Models M62 and M543 are provided with ground spades which attach to the frame to help secure the vehicle. In addition, a single sheave snatch block can be used to pull a particularly heavy load.

**c. Unwinding Winch Cable.**

**FIGURE 33**  
**UNWINDING WINCH CABLE**  
**Steps 1 through 5**

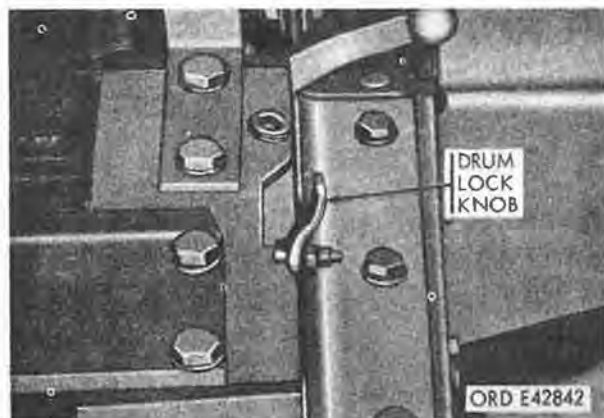


**Step 1.** Apply the parking brake. Move the transmission gear shift lever and winch control lever into their neutral positions.



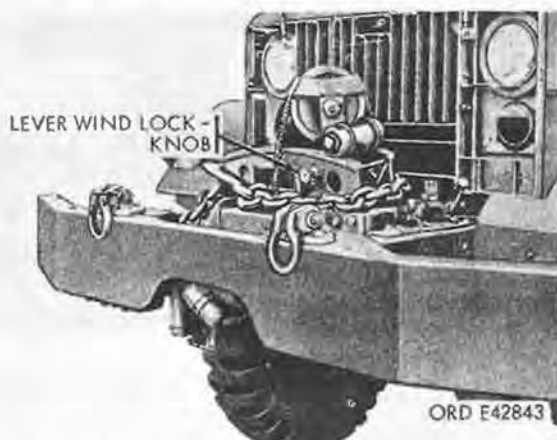
**Step 2.** Facing the front of the vehicle, move the drum clutch lever as far as it will go toward the winch drum. This will disengage the drum jaw clutch.





**Step 3.** Pull the drum lock knob all the way out, rotate it 90°, then release it. The knob should remain in place, unlocking the drum.

**Note.** To lock the drum, rotate the lock knob 90° to its original position so that the lock plunger is aligned with one of the holes in the drum flange. Release the knob so that the projections on the inner side of the knob fit into the slots on the nut which secures the lock assembly to the winch end frame.



**Step 4.** If the winch has a level wind, pull the level wind lock knob out, rotate it 90°, then release it. The knob should remain in place, unlocking the level wind.

**Note.** To lock the level wind, rotate the lock knob 90° to its original position so that the lock plunger is aligned with the hole in the level wind frame. Release the knob so that the projections on the inner side of the knob fit into slots on the nut which secures the lock assembly to the level wind frame.

**Step 5.** Pull end of cable until the required length is unreeled. A drag brake on

the drum flange prevents the drum from unwinding too rapidly. Do not kink cable.

**Caution:** Always wear leather gloves when handling winch cable. Never allow cable to run through hands. Broken wires can cause painful injuries. Do not operate winch with less than four turns of cable on the drum.

**Note.** Winch power increases proportionally with the amount of cable reeled off the drum.

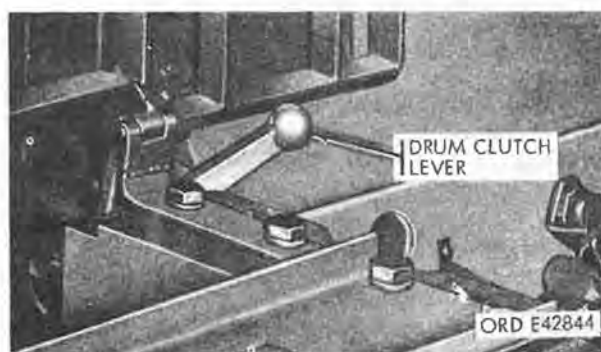
*Figure 33. Unwinding winch cable.*

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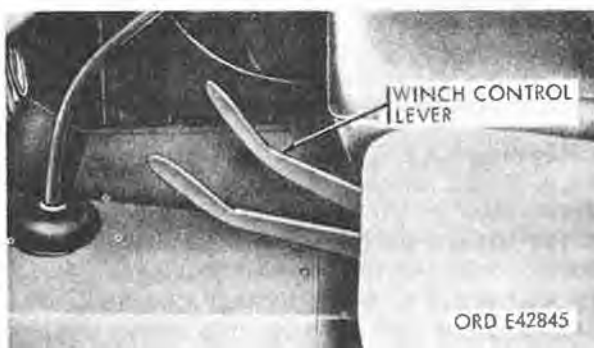
#### d. Lifting or Pulling a Load.

**FIGURE 34**  
**LIFTING OR PULLING A LOAD**  
Steps 1 through 4

**Step 1.** Securely attach the end of the winch cable to the object being recovered.

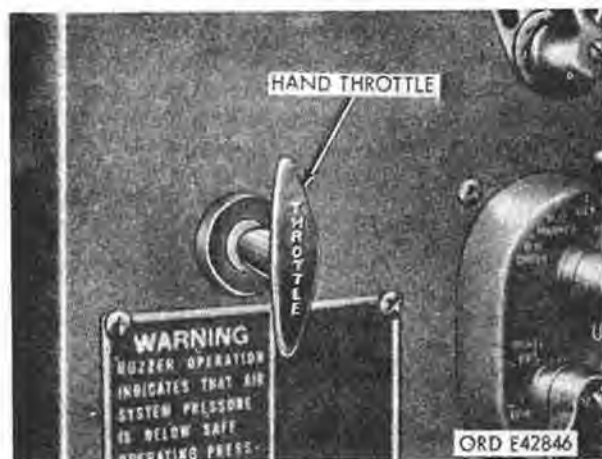


**Step 2.** Facing the front of the vehicle, pull the drum clutch lever completely away from winch drum. This will engage the drum clutch.



**Step 3.** Start the engine and move the winch control lever to "L" for heavy load; to "H" for a light load. If in doubt use "L."

**Note.** Be sure that the transmission gearshift lever is in the neutral position.



**Step 4.** As the winch begins to pull or lift the load with the engine idling, pull out the hand throttle until the desired winch operating speed is attained.

**Note.** The notched rod of the hand throttle will allow it to be placed in the "locked out" position at any point. Carefully select a moderate operating speed with the throttle lever in the vertical position. The throttle lever will hold in place.

**Caution:** Always use the hand throttle in the "locked out" position when operating the winch to maintain a smooth, steady speed. Operating the engine at an excessive or erratic speed can cause overloading of the winch, which may result in damage or failure of parts.

#### e. Stopping Winch

To stop the winch, place the winch control lever in the "N" (Neutral) position.

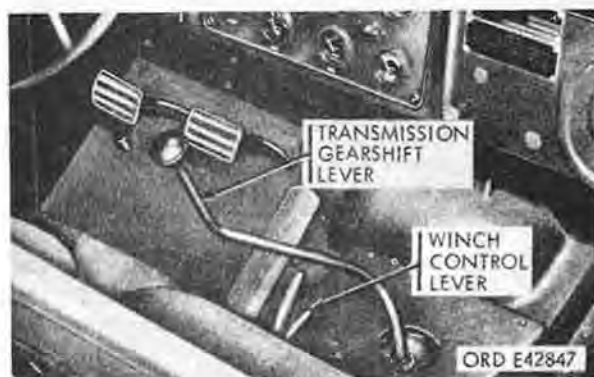
**Warning:** During winch operation, or when stopping the winch, direct all personnel to stand clear of the winch cable and load, or object being recovered. A snapped cable or shifting load can be extremely dangerous. If the load shifts so as to present a hazard, or if failure of any part occurs, stop winch operation immediately and notify organizational maintenance personnel.

*Figure 34. Lifting or pulling a load.*

\*\*\*

#### f. Lowering Load or Unwinding Slack Cable.

**FIGURE 35**  
**LOWERING LOAD OR UNWINDING**  
**SLACK CABLE**  
**Steps 1 and 2**



**Step 1.** Place the winch control lever in the "R" (reverse) position. Be sure that the transmission gearshift lever is in neutral.



**Step 2.** As the winch begins to operate, adjust the hand throttle as necessary. Allow the winch to operate smoothly, and at a moderate speed.

*Figure 35. Lowering load or unwinding slack cable.*

\*\*\*

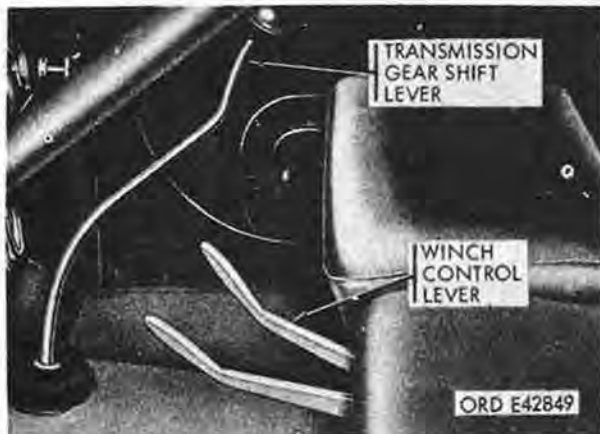
**Caution:** Do not operate the winch with less than four turns of cable on the drum. The cable clamp screw alone will not hold against a load.

**Note.** When unwinding cable under power without a load, it is necessary to maintain manual tension on the cable to keep the coils tight on the drum, and to prevent crossing coils due to loosening of the cable.

g. Winding Winch Cable on Drum.

**FIGURE 36**  
**WINDING WINCH CABLE ON DRUM**  
Steps 1 and 2

- Step 1.** Place a load on the end of the cable. If no load is available, attach the cable to a tree or any other stationary object on ground level with the vehicle.



- Step 2.** Move the winch control lever to the "L" (Low) position. Set the transmission gearshift lever in neutral. The winch will pull the vehicle forward, winding the cable on the drum. Light pressure on the brake pedal will ensure a tight and neat wind.

**Note.** Be sure that the first layer of coils is wound evenly and that each successive layer starts back across the drum properly. If necessary, the coils can be hammered or pushed in place with a block of wood to ensure a closely wrapped cable.

**Caution:** Always wear gloves when handling cable. Do not allow cable to run through hands. Broken wires can cause painful injuries.

*Figure 36. Winding winch cable on drum.*

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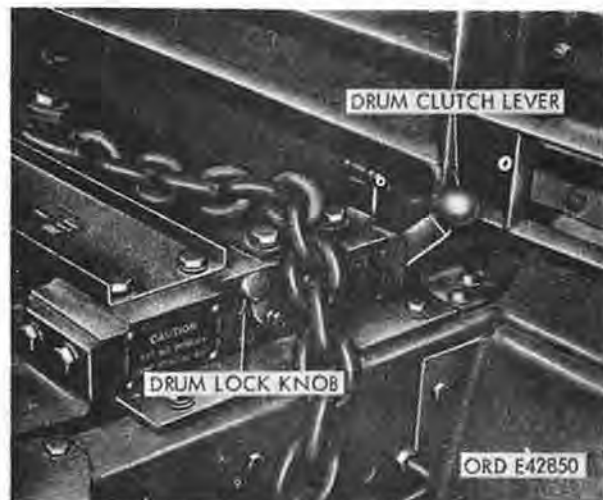
h. Locking Winch for Travel.

- (1) If the winch is equipped with a level winding device, pull the cable chain up through the space between the bumper and the winch. Wind the chain around the back of the level winding frame, and then across the front, so that the hook can be attached to the

left side (facing the front of vehicle) of the level winding frame.

If the winch does not have a level winding device, position the cable chain above the winch and then under the bumper so that the hook can be attached to the left (facing the vehicle) lifting shackle. Turn the winch drum until the cable is taut.

- (2) Move the winch control lever to the "N" (neutral) position.
- (3) Facing the front of the vehicle, disengage the drum jaw clutch by moving the drum clutch lever as far as it will go toward the winch.
- (4) Lock the drum in place with the drum lock knob. If necessary, rotate the drum by hand to allow the drum lock plunger to engage the nearest hole on the drum flange.
- (5) If the winch is equipped with a level winding device, lock the level wind lock knob. If necessary, move the level wind by hand to allow the lock plunger to engage the hole in the frame.



*Figure 37. Locking winch for travel.*

**20. Operating Dump Truck Model M51**

a. General. The dump body, mounted on the rear of the dump truck M51, is of all-

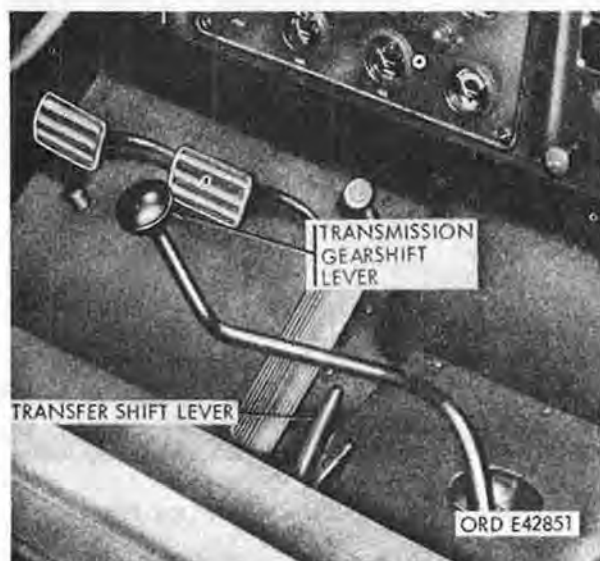


steel welded construction with a universal-type tailgate which may be opened at either the top or the bottom. This construction permits operation of the vehicle as either a regular, rocker-type, or spreader-type dump truck. The dump body which has a capacity of five cubic yards, is hinged to the rear of the sub-frame, which is mounted directly on the truck chassis. The hoist assembly is used to raise and lower the dump body and is comprised of two hydraulic cylinders, a hydraulic pump, a hydraulic oil reservoir, and connecting high pressure-type hoses. The hydraulic pump is driven by a propeller shaft connected to a power take-off which is mounted on the lower right of the transmission. Operation of the hoist assembly is controlled by the dump body control lever which is located in the cab, to the left of the driver's seat. Shifting instructions for this lever are shown on the dump body control data plate mounted on the instrument panel.

#### b. Operation as a Regular Dump.

**FIGURE 38**  
**OPERATION AS A REGULAR DUMP**  
Steps 1 through 8

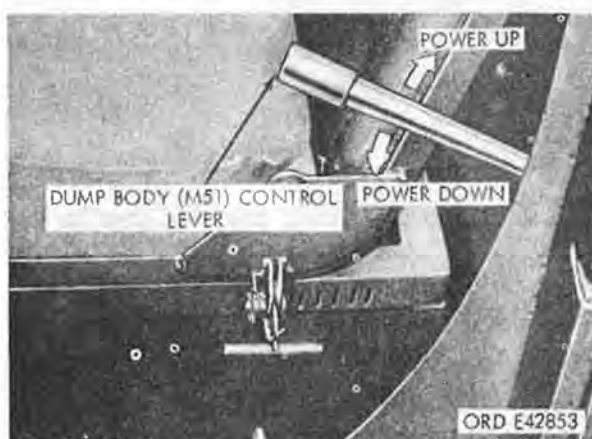
- Step 1.** Position the vehicle for dumping. Apply the parking brake.



- Step 2.** Place the transmission gearshift lever and transfer lever in the neutral position.



- Step 3.** Pull the tailgate-control-rod hand lever forward and down as far as it will go to unlock the tailgate.



- Step 4.** Depress the clutch pedal. Release the lock on the dump body control lever and move the lever to the POWER-UP position.

**Caution:** The vehicle must be at a complete halt, and the clutch must be disengaged in order to shift the dump body control lever out of the NEUTRAL position to engage the power take-off and hoist pump. However, once these units have been engaged, the dump body control lever may be moved through its entire operating range, for whichever body function is desired, until the lever is again placed in the NEUTRAL position.

- Step 5.** With the engine running at idling speed, release the clutch pedal to engage the clutch. The dump body will begin to rise.

**Note.** The dump body will stop automatically when it reaches its limit of travel.

**Step 6.** To lower the dump body, move the dump body control lever to the **POWER-DOWN** position.

**Step 7.** When the dump body is completely lowered, move the dump body control lever to the **NEUTRAL** position and lock it.

**Caution:** It is extremely important that the dump body control lever remain in the locked position when the hoist is not being operated.

**Step 8.** Push the tailgate-control-rod hand lever up and back as far as it will go to lock the tailgate in the closed position.

*Figure 38. Operation as a regular dump.*

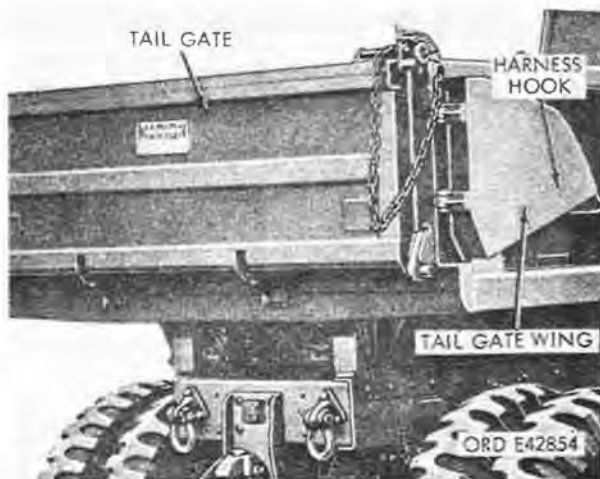
\* \* \*

c. Operation as a Rocker-Type Dump.

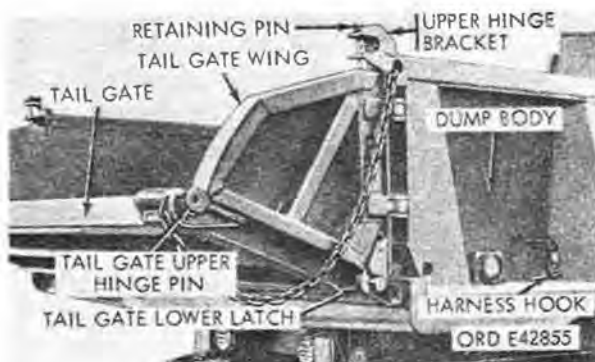
**FIGURE 39**  
**OPERATION AS A ROCKER-TYPE DUMP**  
Steps 1 through 6

**Step 1.** Position the vehicle for dumping. Apply the parking brake.

**Step 2.** Place the transmission gearshift lever and transfer lever in the neutral position.



**Step 3.** Unfasten the harness hooks which secure the tailgate wings to the sides of the dump body. Swing the tailgate wings to the rear.



**Step 4.** Remove retaining pins securing the tailgate upper hinge pins to the upper hinge brackets. Lower the tailgate so that hinge pins engage the grooves in the tailgate wings. Replace retaining pins in the upper hinge brackets.

**Step 5.** For dumping operations, perform steps 3 through 7 of paragraph 20b.

**Step 6.** Remove retaining pins from the upper hinge brackets. Close the tailgate and replace retaining pins. Swing the tailgate wings forward against the dump body. Secure tailgate wings with the harness hooks.

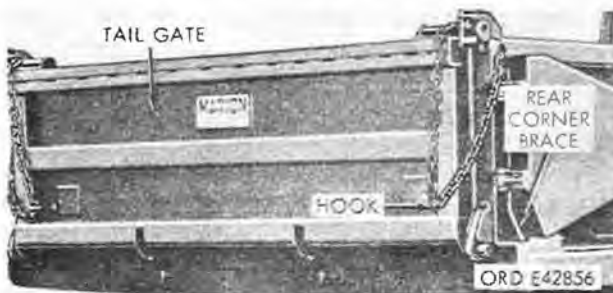
*Figure 39. Operation as a rocker type dump.*

\* \* \*

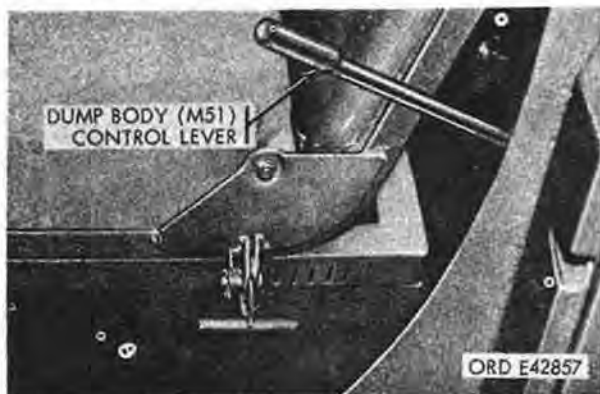
d. Operation as a Spreader-Type Dump.

**FIGURE 40**  
**OPERATION AS A SPREADER-TYPE DUMP**  
Steps 1 through 12

**Step 1.** Place the transmission gearshift and transfer levers in neutral. Apply the parking brake if not on level ground.



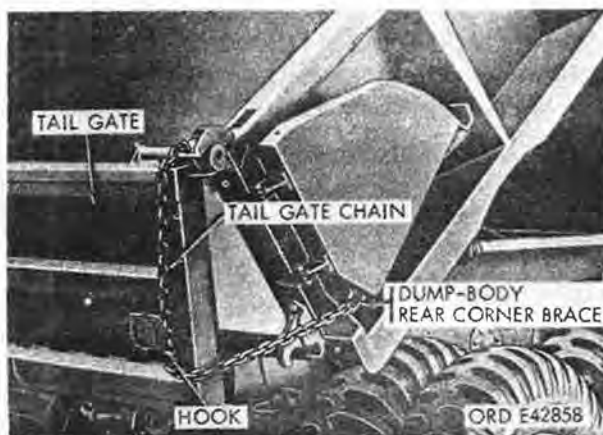
**Step 2.** Thread the tailgate chains around the hook at each lower corner and through the hole at the lower end of each brace. Adjust the chain length to limit the tailgate opening as required.



**Step 3.** Depress the clutch pedal. Release the lock on the dump body control lever and move the lever to POWER-UP.

**Caution:** The vehicle must be at a complete halt, and the clutch must be disengaged in order to shift the dump body control lever out of the NEUTRAL position to engage the power take-off and hoist pump. However, once these units have been engaged, the dump body control lever may be moved through its entire operating range, for whichever body function may be desired, until the lever is again placed in the NEUTRAL position.

**Step 4.** With the engine running at idling speed, release the clutch pedal. The dump body will begin to rise.



**Step 5.** When the dump body has raised two or three feet, move the dump body control lever to HOLD.

**Note.** The dump body may be raised higher, if necessary. The height required for best spreading results will depend on the weight and substance of the material being spread and on the tailgate opening.

**Step 6.** Pull the tailgate-control-rod hand lever forward and completely down. The material should just start to spill out of the tailgate.

**Step 7.** Disengage the engine clutch. Place the transmission gearshift lever in "1" and the transfer shift lever in the "L" position.

**Step 8.** Increase the engine speed slightly. Slowly release the clutch to set the vehicle in motion.



**Step 9.** Raise the dump body at intervals, moving the dump body control lever to POWER-UP and then back to HOLD. Keep the spreading material flowing.

**Step 10.** After unloading, move the dump body control lever to the POWER-DOWN and bring the vehicle to a halt.

**Step 11.** Move the dump body control lever to NEUTRAL and lock it in place.

**Caution:** Never leave the hoist assembly engaged while the vehicle is being driven to and from a job location.

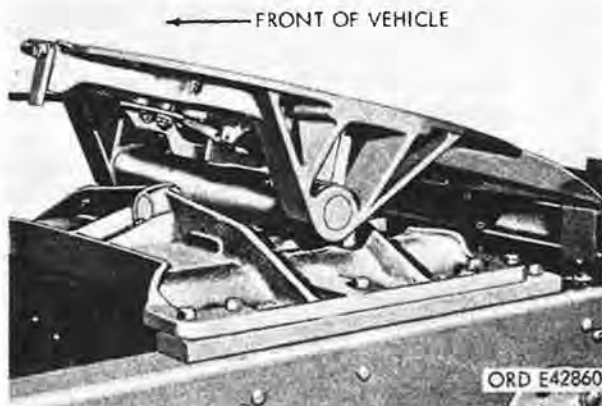
**Step 12.** Push the tailgate-control-rod hand lever up and completely back to lock the tailgate in the closed position. Secure tailgate chains.

*Figure 40. Operation as a spreader type dump.*

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**21. Operation of Tractor Truck Fifth Wheel—Models M52 and M52A1, and Tractor Wrecker Truck Fifth Wheel, Model M246**

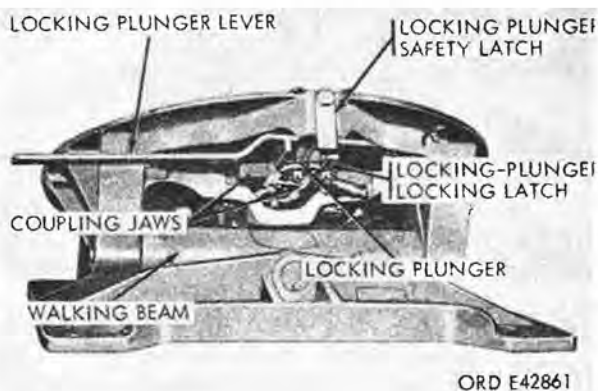


*Figure 41. Fifth wheel assembly - M52, M52A1 and M246 vehicles.*

**a. General.** The fifth wheel, or semitrailer coupler, is mounted on the rear of tractor trucks M52 and M52A1, and on the crane body over the tandem rear axles on tractor wrecker truck M246. The base of the fifth wheel pivots on a walking beam which in turn pivots on the sub-base. This construction permits movement of the fifth wheel in all planes.

**b. Coupling.**

**FIGURE 42  
COUPLING FIFTH WHEEL  
Steps 1 and 2**



**Step 1.** Swing the locking plunger safety latch aside. Move the locking plunger lever

toward the front of the vehicle until the locking plunger locking latch drops into position and the lever locks. The coupling jaws are now set for coupling.

**Step 2.** Back the vehicle under the trailer so the trailer kingpin slides into the V-shaped opening at the rear of the fifth wheel. Continue until movement of the trailer kingpin releases the locking plunger locking latch and secures coupling.

*Figure 42. Coupling fifth wheel.*

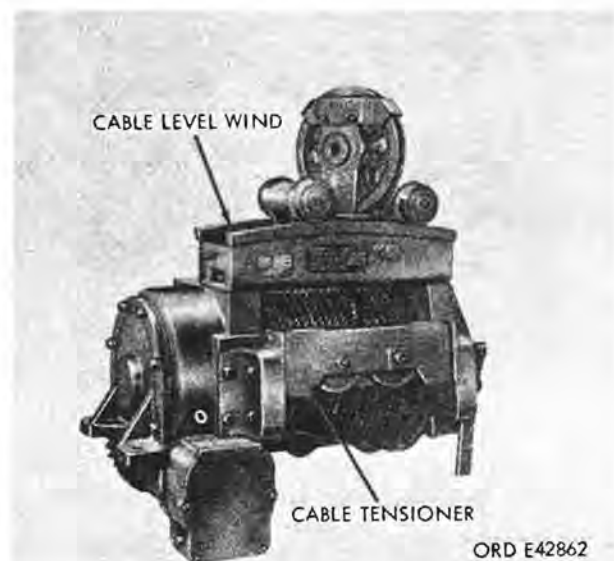
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**Note.** Refer to the appropriate trailer technical manual for correct preparation of vehicle for coupling and uncoupling operations.

**c. Uncoupling.**

- (1) Swing the locking plunger safety latch aside and push the locking plunger lever toward the front of the vehicle.
- (2) Drive the vehicle forward from under the front of the trailer.

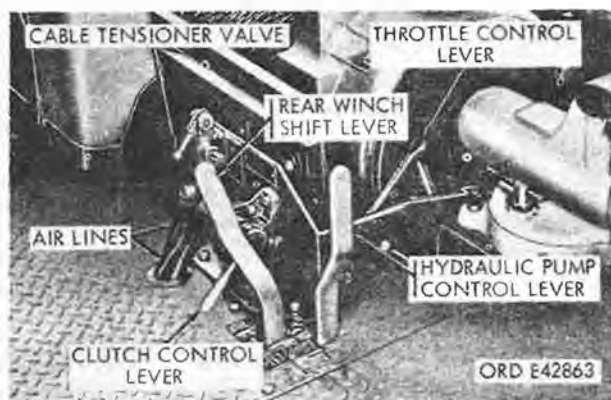
**22. Operation of Rear Winch—Wrecker Truck Models M62 and M543**



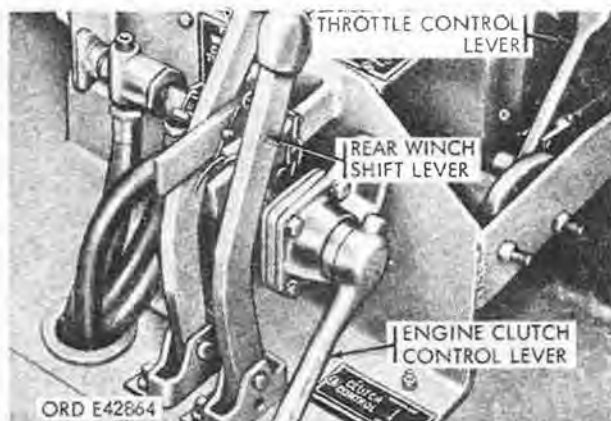
*Figure 43. Rear winch assembly.*

a. General. The rear winch is a worm-gear, horizontal-drum winch mounted on the rear of Wrecker Trucks M62 and M543. Power for operation of the winch is obtained from two propeller shafts extending from the power divider to a drive sprocket connected to the winch drive shaft sprocket by a roller chain. An automatic safety brake is provided to sustain the winch load when the winch shift lever is used for shifting the power divider. The winch is equipped with a level wind and pneumatically controlled cable tensioner.

FIGURE 44  
REAR WINCH CONTROLS—  
M62 AND M543  
Views A and B



View A.



View B.

Figure 44. Rear winch controls - M62 and M543.

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b. Rear Winch Controls. Controls for operating the winch are the power divider control lever located in the cab, engine clutch

control valve, rear winch shift lever, cable tensioner control valve, and the throttle control lever, which are located at the rear of the vehicle.

#### c. Rear Winch Operation.

- (1) Vehicle positioning. The most effective positioning of the vehicle is when the load is directly behind the winch. However, guide rollers permit pulling a load at any angle up to 90°, right or left, and at any angle up to 60° above or below the horizontal centerline of the winch.

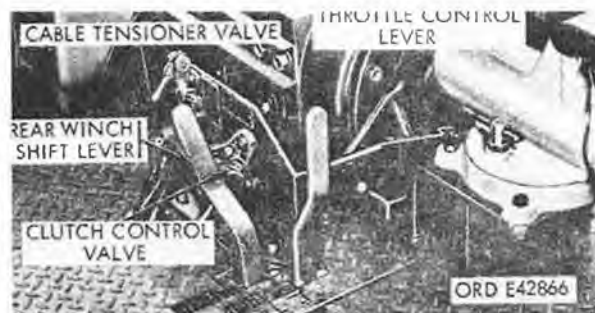
**Note.** The maximum rated pull of 45,000 lbs. is available only when sufficient cable is off the drum to completely expose the first layer.

- (2) Unwinding winch cable.

FIGURE 45  
UNWINDING WINCH CABLE  
Steps 1 and 2



- Step 1.** Apply parking brake and start engine. Engage power divider and set throttle lever to give about 1,000 rpm no-load engine speed.



- Step 2.** Shift clutch control valve lever to DISENGAGE, move winch shift lever to UNWIND and move cable tension valve lever to OFF position. Return clutch control valve lever to ENGAGE and unwind the required amount of cable.

**Note.** Return clutch control valve lever to **DISENGAGE** and place winch shift lever in **NEUTRAL** after the required amount of cable is unwound. Maintain tension on cable while drum is turning to prevent snarled cable on drum.

Figure 45. Unwinding winch cable.

\* \* \*

(3) Pulling load.

- (a) Attach cable to load and move the cable tension valve lever to **ON**. Move winch shift lever to **WIND** and move clutch control valve lever to **ENGAGE**. Remove all slack from cable before winching.

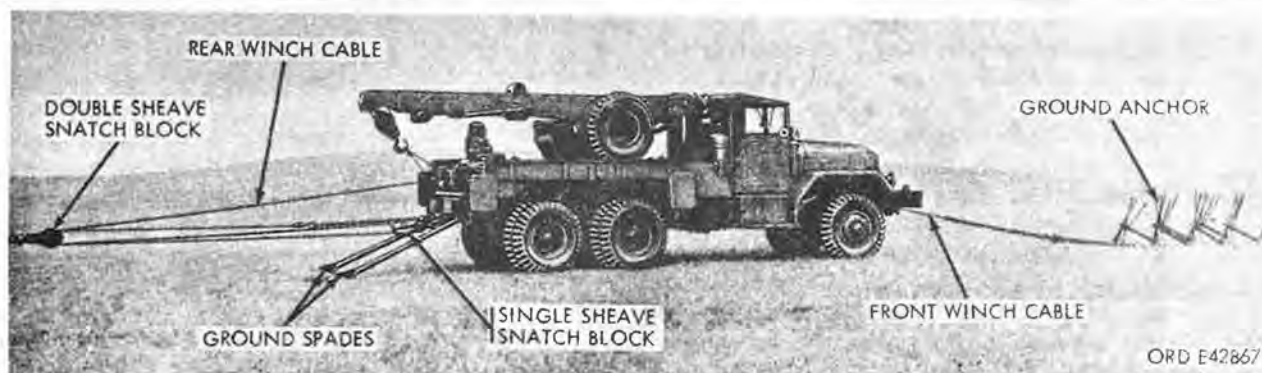


Figure 46. Ground spades and ground anchors positioned for heavy rear winch operation.

- (b) After all cable slack is removed, shift the clutch control valve lever to **ENGAGE**, move cable tension control valve lever to **OFF** and move winch shift lever to **WIND**.

**Note.** Be sure incoming cable is winding tightly and evenly on drum. Hammer or push coils in place with block of wood, if necessary.

- (c) To stop the winch, move the clutch control valve lever to **DISENGAGE**, move the winch shift lever to **NEUTRAL**.
- (4) Pulling heavy load. When pulling an especially heavy load, stabilize the vehicle by attaching ground spades to the frame. Anchor the front winch cable to a tree or utility pole, or use ground anchors to form a suitable anchorage. Single and double sheave snatch blocks are provided and should

be rigged according to load requirements.

**Warning:** Always wear leather gloves when handling winch cable. Never allow cable to run through hands. During winch operation, or when stopping winch, direct all personnel to stand clear of winch and load. A snapped cable or shifting load can be extremely dangerous.

## 23. Operation of Wrecker Crane—Wrecker Truck Models M62 and M543

- a. General. A hydraulically operated, engine-powered crane is mounted on the vehicle chassis and has an extendable boom of from 10 to 18 feet. The crane is capable of 360°

rotation and approximately 45° elevation. Maximum lifting loads are shown on the safe load data plate located at the crane operator's station.

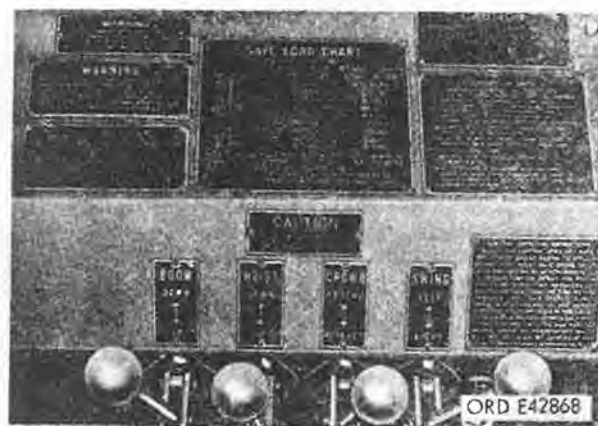


Figure 47. Crane control valve bank assembly - M62.



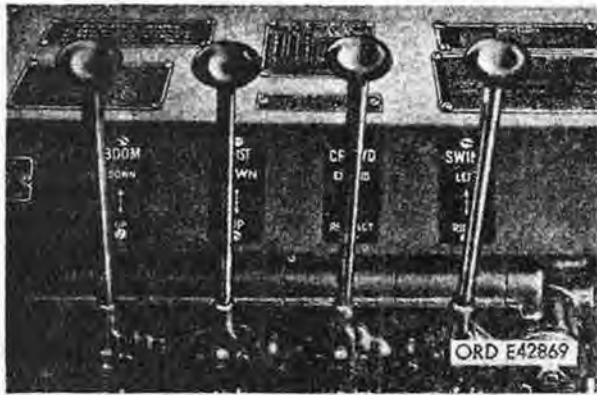
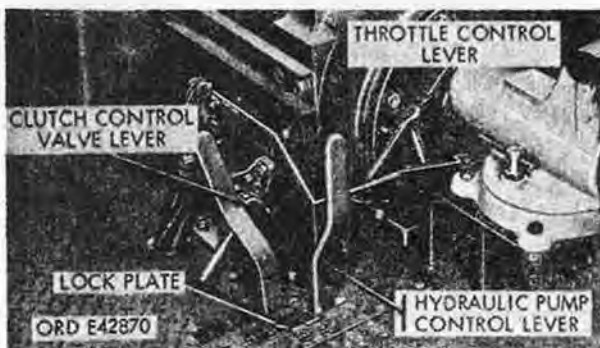


Figure 48. Crane control valve bank assembly - M543.

**b. Wrecker Crane Controls.**

- (1) Operation of the crane is controlled by a control valve bank assembly located in the operator's cab. The control valve bank is comprised of four hydraulic, two-way valves bolted together to form a single unit. Each valve controls one of the four functions of the crane such as lifting or lowering the boom, winding or unwinding the hoist drum, extending or retracting the boom, and swinging the boom left or right. Any two operations can be performed simultaneously. Each control valve lever is spring-loaded and will return to its neutral position when released by the operator.

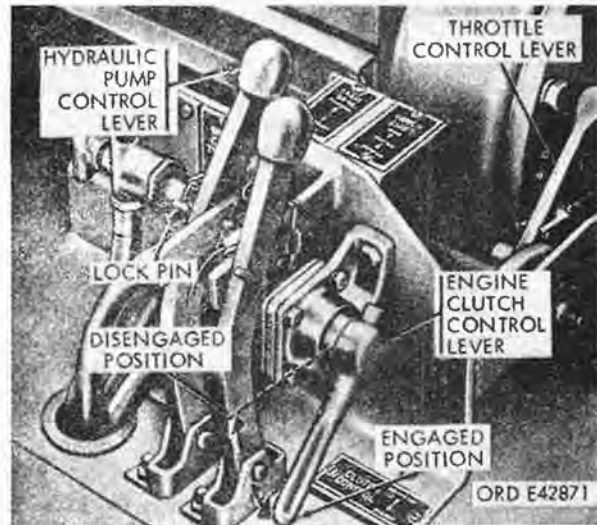
FIGURE 49  
CRANE REAR CONTROLS  
Views A and B



View A

- (2) M62 crane rear controls are comprised of engine clutch control lever, throttle control lever, and hydraulic

pump control lever. Hydraulic pump lever has a hinged lockplate which must be raised to operate lever.



View B

- (3) M543 crane rear controls are located in front of the winch left side. They are comprised of engine clutch control lever, throttle control lever, and a hydraulic pump control lever. Hydraulic lever has a lockpin which must be removed to operate lever.

Figure 49. Crane rear controls - M62

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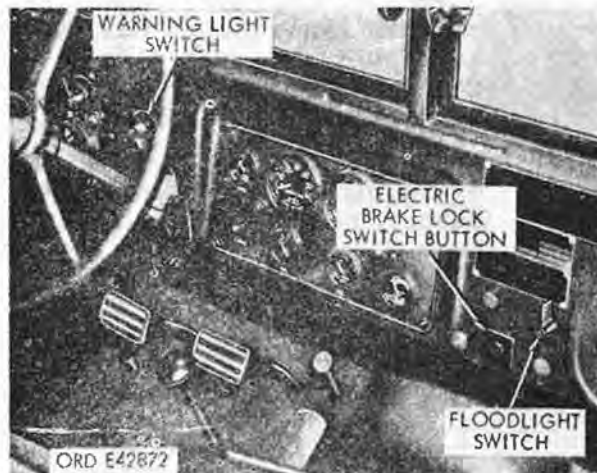


Figure 50. Crane rear controls - M543.

- (4) In addition to the controls in the crane operator's cab, an electric brakelock switch button, a floodlight master con-

trol switch, a warning light switch, and power divider lever are located in the vehicle cab.

### c. Operation of Crane

**Note.** The crane load capacity is inversely proportional to the length of the boom. Therefore the vehicle should be positioned for a direct rear lift, whenever possible, with the least amount of boom extension (fig. 51).

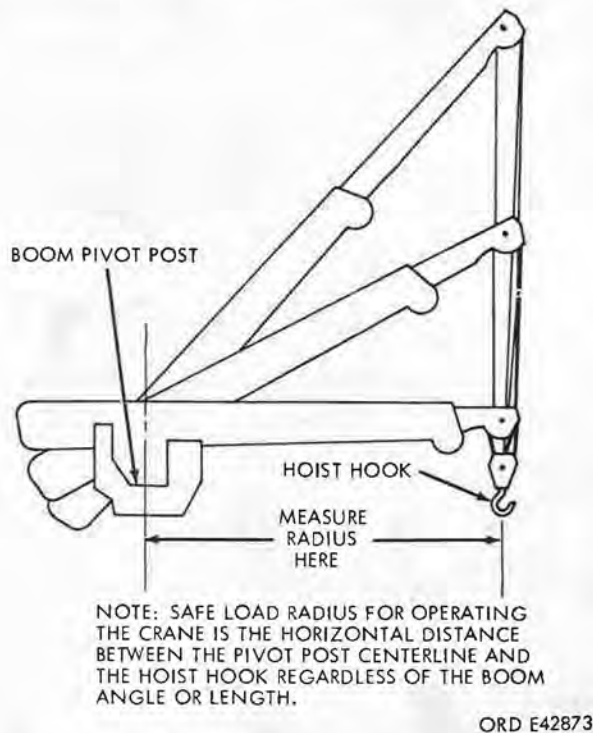
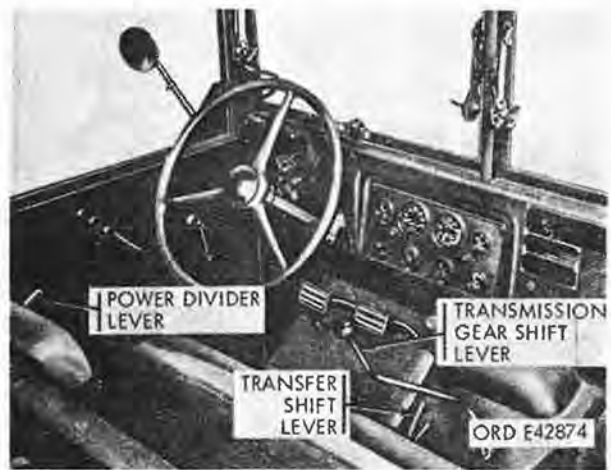


Figure 51. Boom safe load radius, M62, M543, and M246.

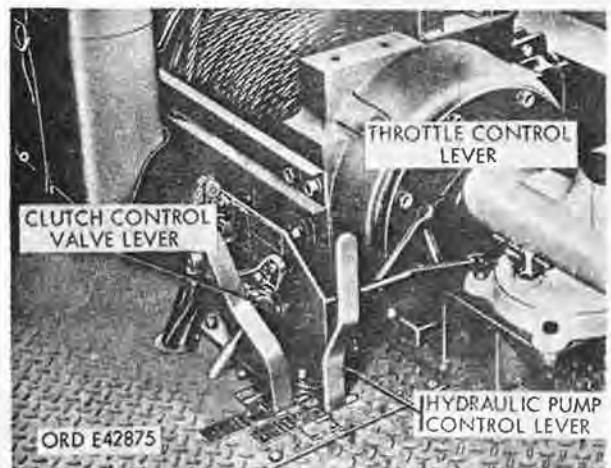
### FIGURE 52 OPERATION OF THE CRANE— M62 AND M543 Steps 1 through 5

**Step 1.** Apply (pull back) parking brake.

**Note.** On M62 wrecker, depress brake pedal then press electric brake lock. To release, depress brake pedal.



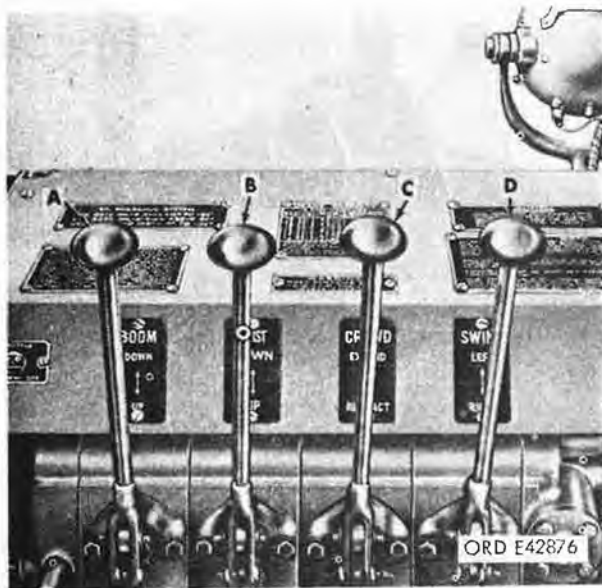
**Step 2.** Start engine, disengage engine clutch, move the transmission gear shift lever to "5" and place the transfer shift lever into NEUTRAL. Move the power divider control lever to ENGAGE. Engage the engine clutch.



**Step 3.** Disengage (pull up) the engine clutch with the engine clutch lever at the rear of the vehicle. Move hydraulic pump control lever to ENGAGE. Engage engine clutch.

**Step 4.** Pull throttle control lever to OPEN.

**Caution:** Do not attempt to operate crane at low engine idle speed because the hydraulic pump will provide insufficient operating pressure at low pump shaft speeds.



**Step 5.** Push the hoist control lever (B) forward to unwind cable and lower the crane hook. Secure hook to load and operate the boom (A), hoist, (B) crowd (C), and swing control (D) levers as required to move the load to the desired position.

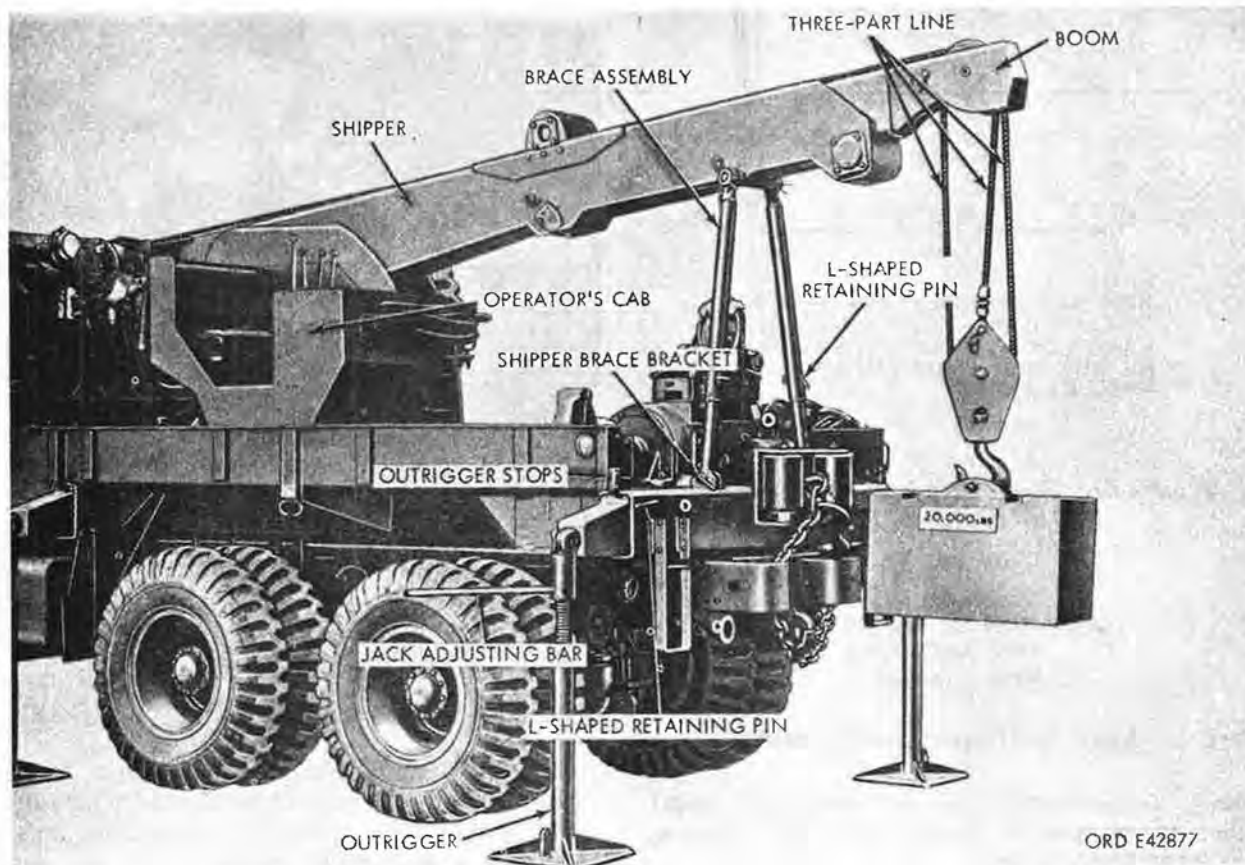
**Caution:** Do not pay out cable after the hook has reached the load or ground. Continued rotation of the drum will loosen cable in the drum groove.

*Figure 52. Operation of the crane - M62 and M643.*

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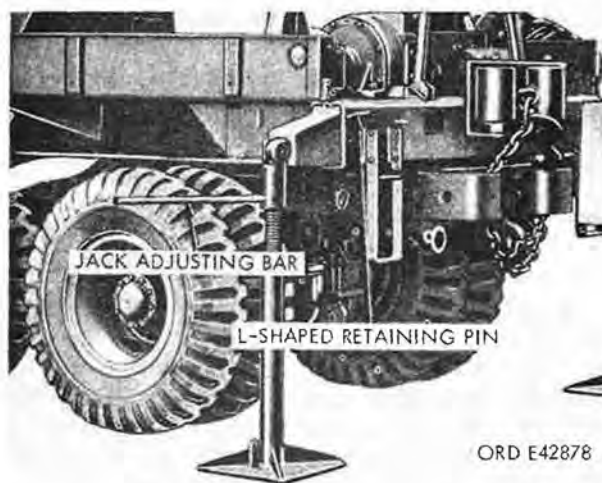
d. Positioning Crane Supports.

**FIGURE 53**  
**POSITIONING CRANE SUPPORTS**  
**Steps 1 through 6**



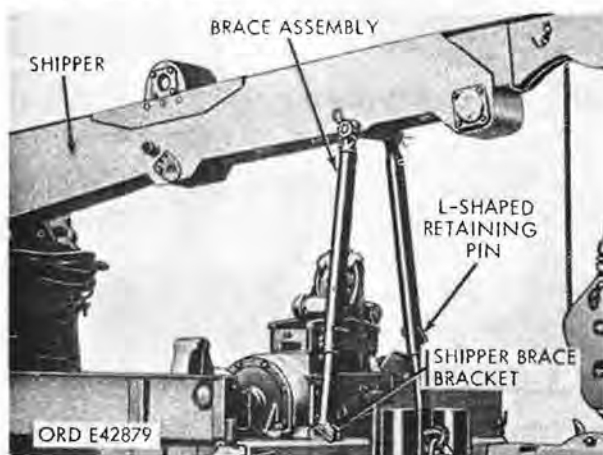
**Step 1.** Remove the L-shaped pin at the end of one outrigger frame tube. Pull out the base until the frame hits the stop.





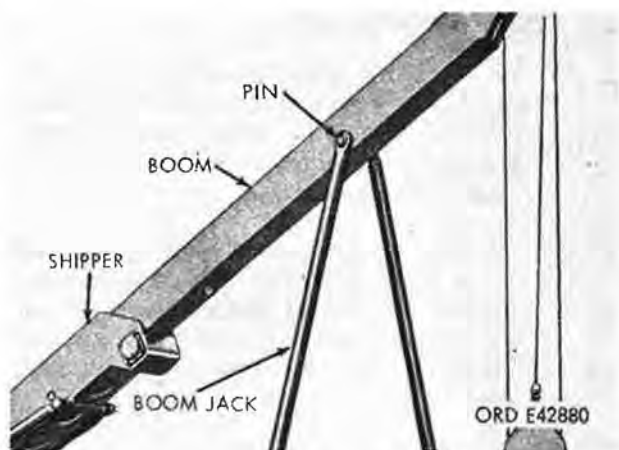
**Step 2.** Lower the outrigger to the vertical position and replace L-shaped retaining pin. Insert jack adjusting bar (in stowage) and turn out the adjusting screw until the base is in firm contact with the ground. Repeat Steps 1 and 2 on the other three outriggers.

**Note.** Outriggers are not positioned while using boom jacks.



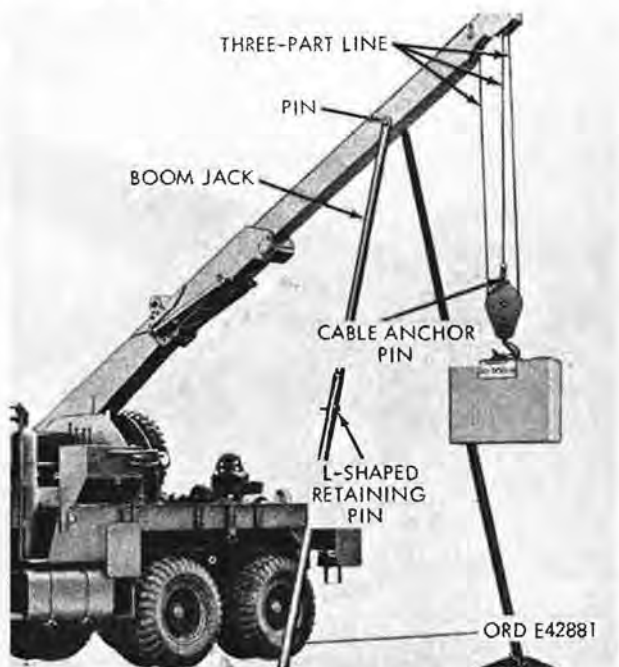
**Step 3.** Remove the L-shaped pins securing the bottom ends of the brace assemblies to the shipper, and the male brace inside the female brace. Position the lower end of braces between the uprights of shipper brace brackets and secure with L-shaped pins.

**Step 4.** Aline retaining holes in the male and female braces and insert L-shaped retaining pins. Lower the shipper slightly to remove load from the boom elevating mechanism.



**Step 5.** To rig boom jacks, lower the boom and extend it to expose the boom jack pin holes. Secure the boom jacks to the boom with the retaining pins provided in stowage.

**Note.** Boom jacks are stowed in stowage box mounted on the crane platform to the left of the pivot post.



**Step 6.** Elevate the boom and aline the holes in the boom jack male and female members. Insert retaining pins. Lower the boom slightly to relieve the load from the boom elevating mechanism.

*Figure 53. Positioning crane supports.*

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e. Rigging Crane Lines.

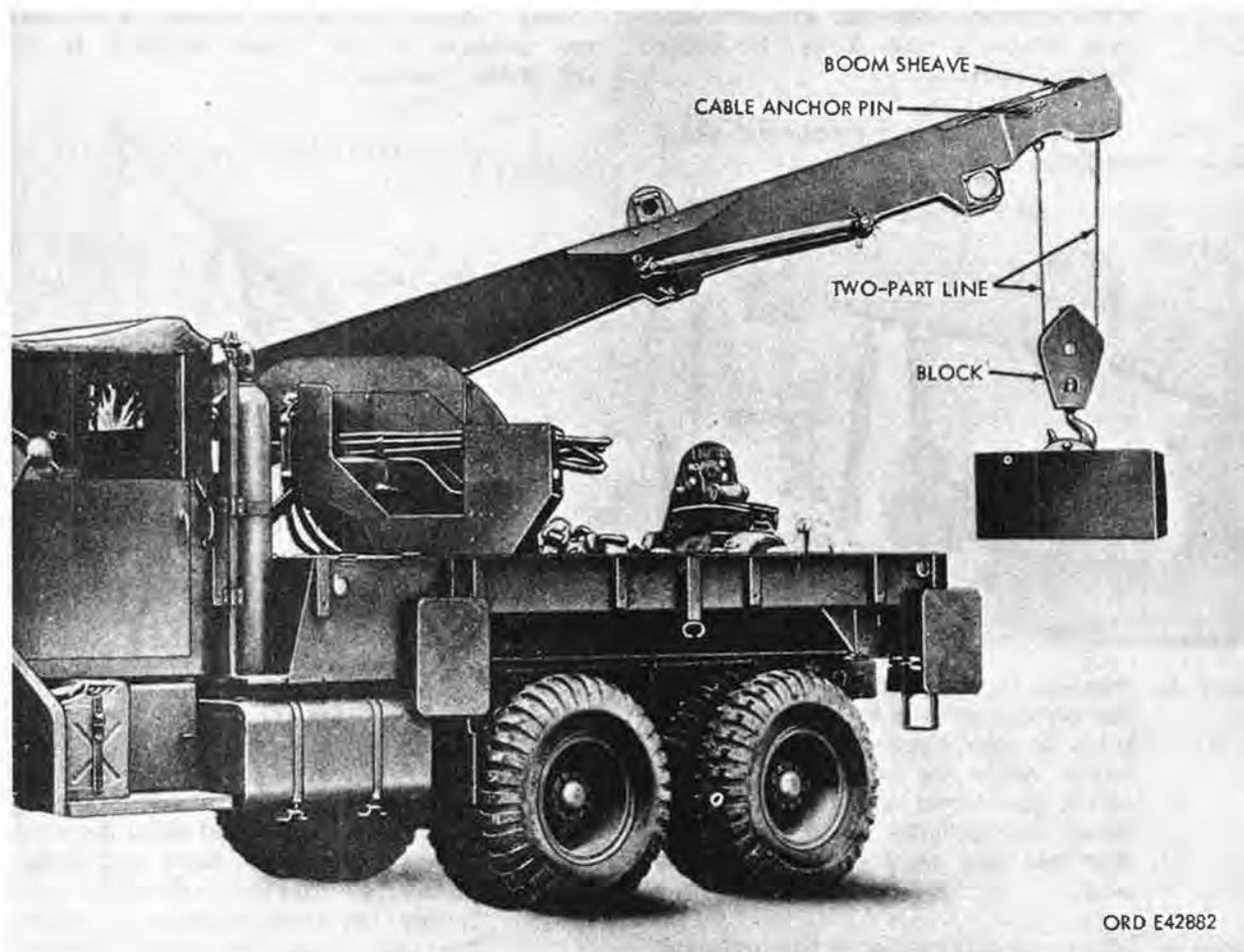
- (1) To rig a two-part line, (fig. 54) pass the crane hoist cable over one boom sheave, around the crane block sheave, and secure the cable end to the boom head with anchor pin.
- (2) To rig a three-part line, pass the crane hoist cable over one boom sheave, around the crane block sheave, over the second boom sheave, and secure the cable end to the crane block with the cable anchor pin.

f. Securing Crane for Traveling. To secure the wrecker crane for traveling, center the shipper and boom horizontally and fully retracted over the rear of the vehicle. Attach the lifting sling (in stowage box) to the cable

hook and to the front outrigger frame tube eyes. Raise the cable hook to remove all slack from the sling. Move the hydraulic pump control lever to DISENGAGE, the clutch control lever to ENGAGE, and the power divider lever to DISENGAGE.

**24. Operation of Wrecker Crane—Tractor Wrecker Truck M246**

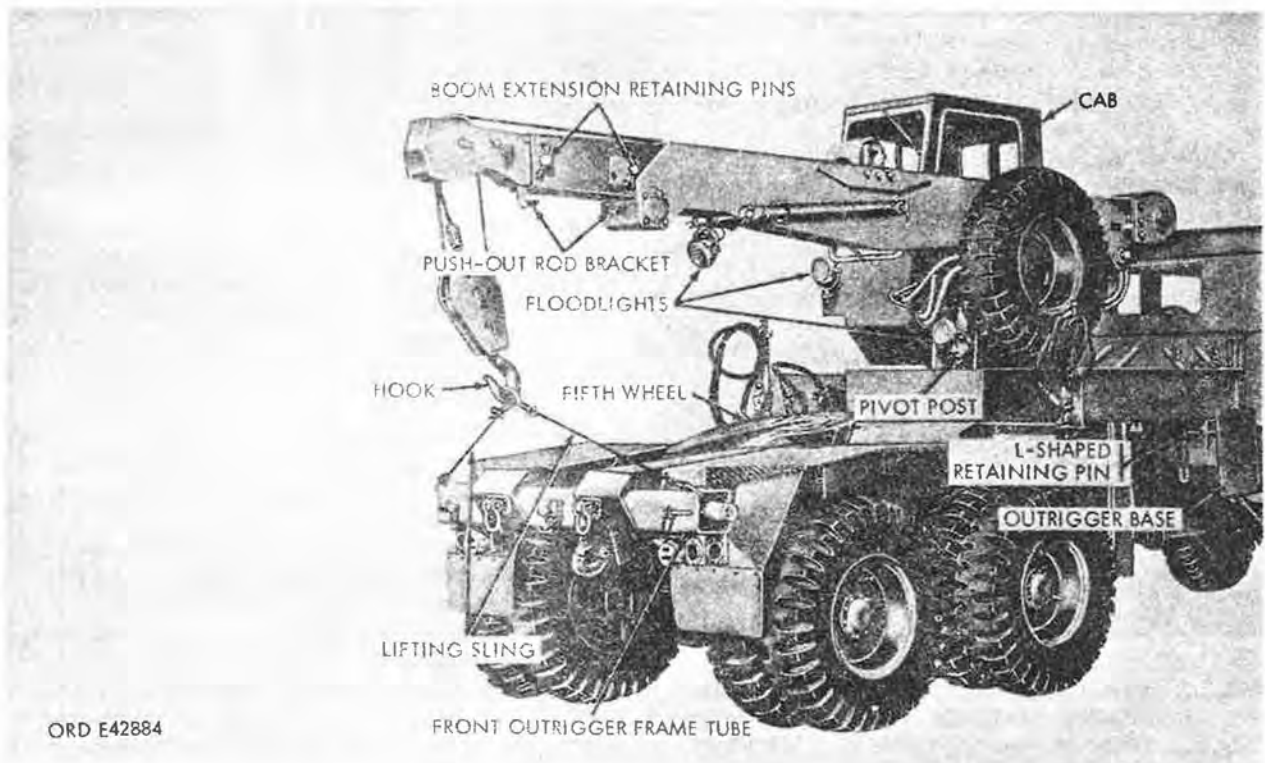
**a. General.** The hydraulically powered, engine-driven crane mounted on the chassis of the M246 wrecker truck, has a three-position extendible boom ranging from 11-1/2 feet to 26 feet. The crane is capable of 360° rotation and approximately 45° elevation. Maximum lifting capacity with outriggers is 10,000 pounds. A safe load data plate is located in the crane operator's cab. Three floodlights are provided for night operation, each equipped with separate switches.



*Figure 54. Crane rigged with two-part line.*



*Figure 55. Securing crane for traveling.*



*Figure 56. Right rear view of crane, tractor wrecker truck, M246.*



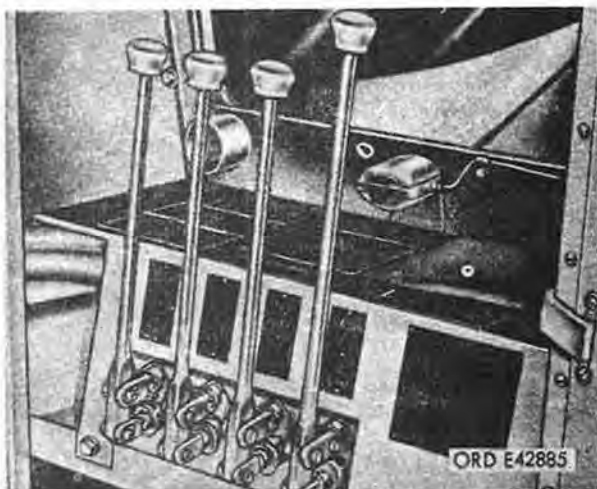
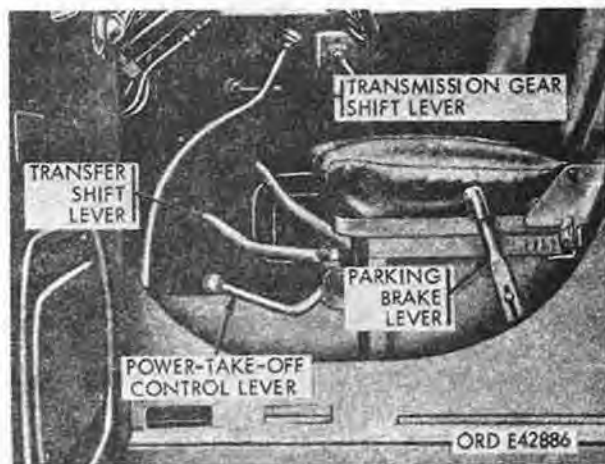


Figure 57. Wrecker crane controls, M246.

**b. Wrecker Crane Controls.** Operation of the crane is controlled by a control valve bank assembly in the operator's cab. The control valve bank is comprised of four hydraulic two-way valves bolted together to form a single unit. Refer to paragraph 23b for functional information.

**c. Operation of the Crane.** Refer to paragraph 23c for preliminary vehicle positioning information.

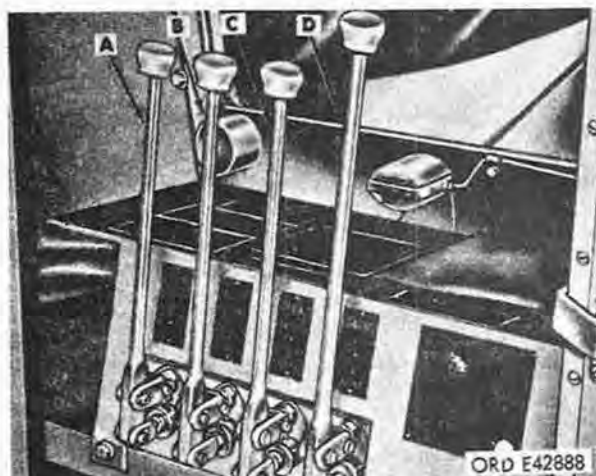
FIGURE 58  
OPERATION OF THE CRANE, M246  
Steps 1 through 3



**Step 1.** Disengage engine clutch, place transmission gearshift lever in "5," set transfer shift lever in NEUTRAL and pull power take-off lever up to ENGAGE. Engage engine clutch.



**Step 2.** Pull out throttle control handle all the way and leave in LOCKED-OUT position.



**Step 3.** Push the hoist control lever (B) forward to unwind cable and lower the cable hook. With the cable hook attached to the load, operate the boom (A), hoist, crowd (C), and swing control (D) levers as necessary to move load.

Figure 58. Operation of the crane (M246).

\* \* \*

**Caution:** Do not pay out cable after hook has reached the load or ground. Continued rotation of the drum will loosen cable from the drum groove. When extending the boom with the crowd control lever, do not jam the crane block into the boom head sheave. Pushing the crowd and hoist control levers simultaneously will eliminate this possibility and will cause the cable hook to maintain a constant distance from the boom head as the boom is extended.

d. Positioning Crane Supports.

- (1) Remove the two front outrigger bases located on each side of the equipment box toward the front of the vehicle. Attach the bases to the left and right front outrigger tubes. Then proceed according to procedure in paragraph 23d.
- (2) To rig the shipper brace assemblies, remove the L-shaped retaining pins securing the bottom end of the brace assemblies to the sides of the shipper. Remove the T-shaped retaining pins securing the male brace inside the female brace. Position the lower ends of the braces between the uprights of the brace brackets attached to the crane body on either side of the fifth wheel assembly. Secure the bottom ends of the braces to the brackets with the L-shaped retaining pins. Aline the retaining pin holes in the male and female braces and insert the T-pins. Lower the boom slightly to remove the load from the boom elevating mechanism.

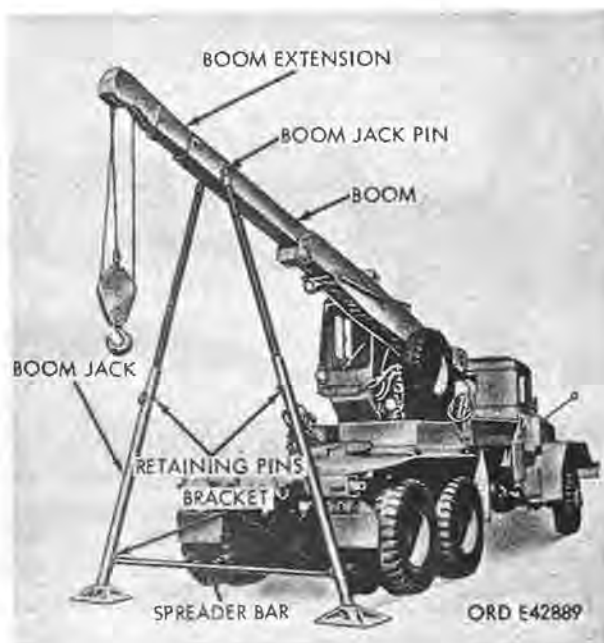


Figure 59. Right rear view of tractor wrecker M246 with boom jacks rigged.

- (3) To rig the boom jacks (in stowage rack), fully lower and extend the boom to expose the boom jack pinholes. Secure

the boom jacks to the boom with the pin provided in stowage.

**Note.** The boom jack pin must go through both the boom and boom extension.

Attach the spreader bar (in stowage) to the brackets at the lower ends of boom jacks and secure with T-shaped retaining pins. Elevate the boom and aline the holes in the boom jack male and female members. Insert retaining pins to maintain extended position of boom jacks. Lower the boom slightly to relieve the load on the boom elevating mechanism.

e. Rigging Crane Lines.

- (1) Two-part line. Refer to paragraph 23e(1).
- (2) Three-part line. Refer to paragraph 23e(2).

f. Extending and Retracting Boom Extension.

- (1) To extend the boom, remove the two boom extension retaining pins securing the boom extension inside the boom. With the crowd control lever (in operator's cab) extend the boom to its maximum length. Remove the three-piece boom extension push-out rod from stowage and assemble. Place the rod between the V-shaped brackets at the ends of shipper and extension. Retract the boom slowly, pushing out the extension, until the pinholes in boom and extension aline. Insert retaining pins and remove the push-out rod.
- (2) To retract the boom extension, remove the two boom extension retaining pins. With the hoist control lever, slowly raise the crane block until it contacts the boom sheave. Hold the hoist control lever in the UP position until the crane cable pulls the boom extension to its fully retracted position. Aline the holes in the boom and extension and replace the boom extension retaining pins.

**Caution:** Extending and retracting of the boom extension should be carefully performed to avoid damage to the crane.

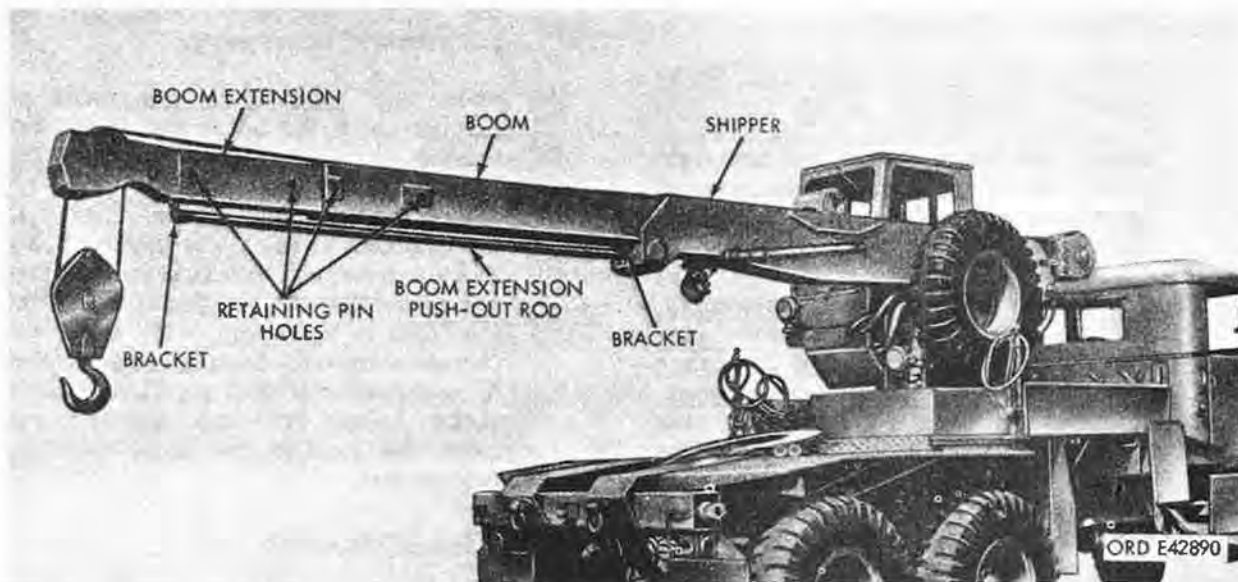


Figure 60. Tractor wrecker truck, M246 with push-out rod in place for extending boom.

g. Securing the Crane for Traveling.

- (1) Without fifth wheel trailer. Center the shipper and boom assembly horizontally and fully retracted over the rear of the vehicle. Insert the pivot post lock-pin to stabilize the crane revolving structure. Attach the lifting sling to the cable hook and to the front outrigger frame tube. Raise the cable hook to remove all slack in the sling. Move the power take-off lever in the vehicle cab to DISENGAGE. Release throttle control.

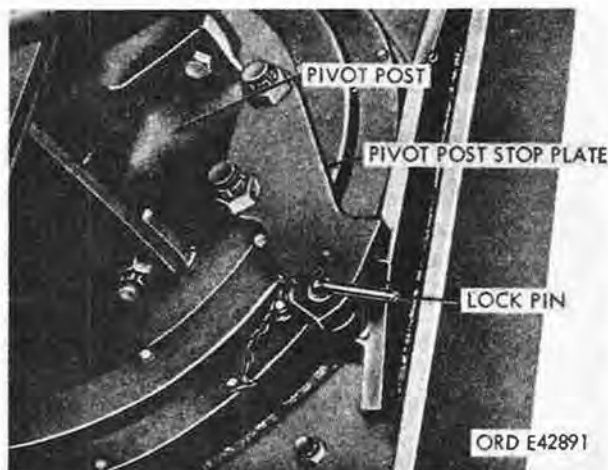


Figure 61. Lower section of crane pivot post and base plate, M246.

- (2) With fifth wheel trailer. Proceed as above (1), but do not stabilize hook with lifting sling. Instead, insert the hook in the eye provided on the side of the shipper.

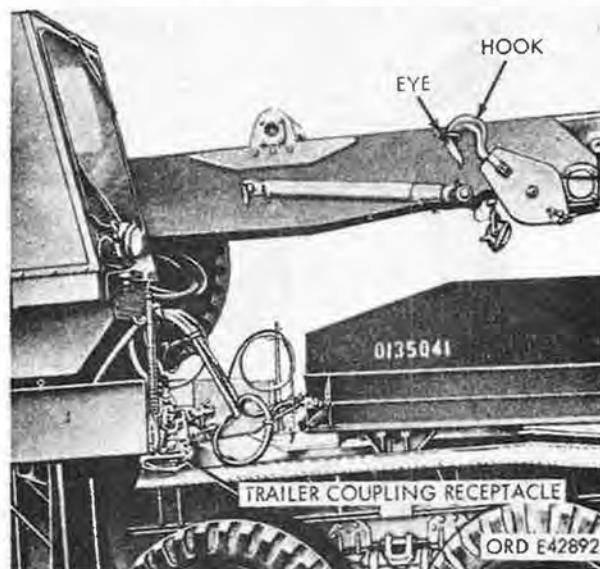


Figure 62. Wrecker crane M246 secured for traveling with fifth wheel trailer.

**25. Preparation for Storage and Shipment—  
Wrecker Cranes M62, M543 and M246**

Before storing or shipping the wrecker cranes, lubricate the units in accordance with

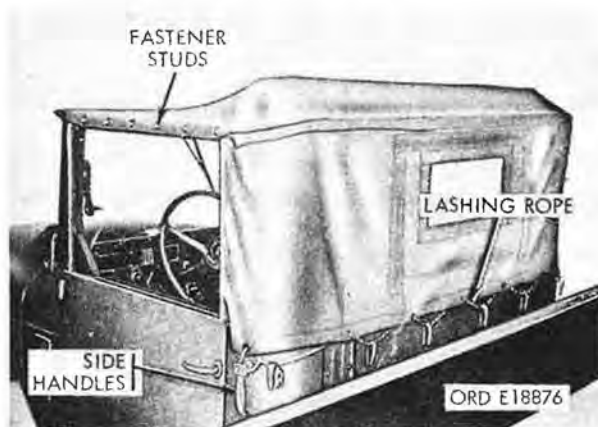


LO 9-2320-211-12. In addition, cover both front and bottom rollers and exposed hydraulic cylinder piston rods with preservative lubricating oil. Do not drain the oil reservoir and hydraulic system unless required for weight reduction or safety regulations.

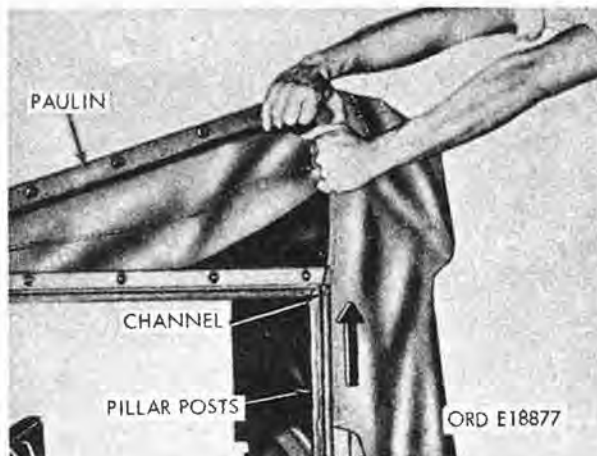
## 26. Miscellaneous Components

### a. Removing Cab Top and Lowering Windshield.

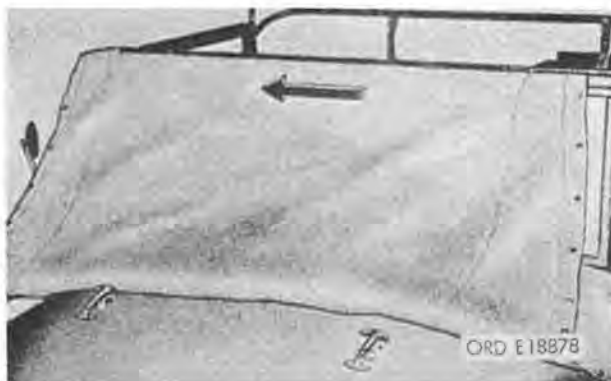
**FIGURE 63**  
**REMOVING CAB TOP AND LOWERING WINDSHIELD**  
Steps 1 through 6



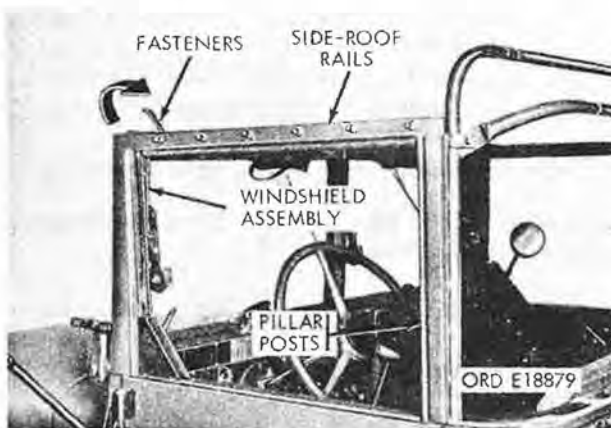
**Step 1.** Release lashing rope from side handles and from hooks at rear of cab. Release seven fasteners securing paulin to left and right side-roof rails.



**Step 2.** Slip paulin from channels in pillar posts.

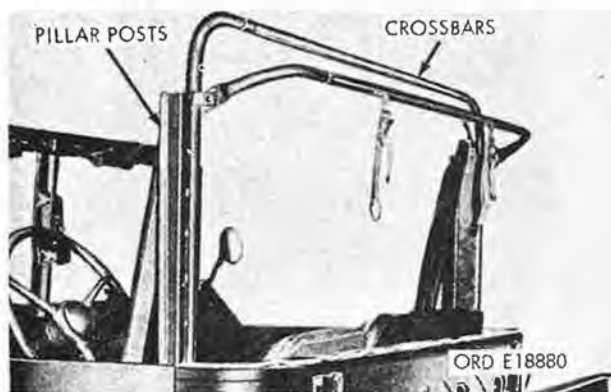


**Step 3.** Throw paulin over windshield and pull paulin edge from channel in windshield.

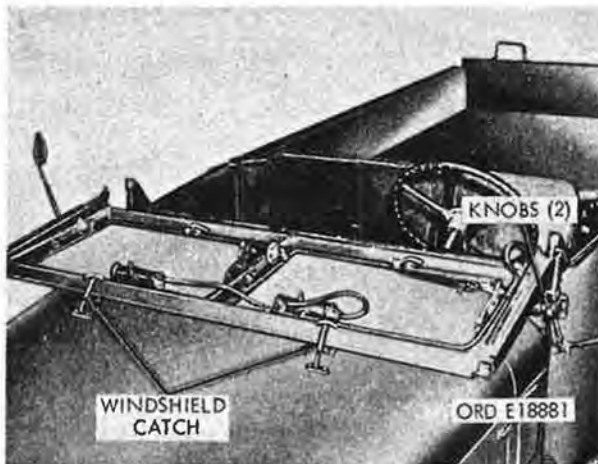


**Step 4.** Disengage side-roof rails from windshield assembly and fold in and down toward pillar posts.

**Note.** Raise fasteners to disengage side-roof rails.



**Step 5.** Remove pillar posts from cab. Disassemble crossbars from pillar posts.



**Step 6.** Loosen two knobs and fold windshield assembly forward. Secure in place with two catches.

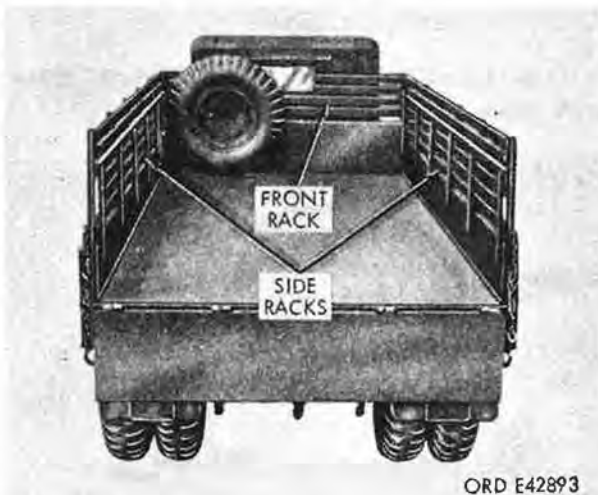
*Figure 63. Removing cab top and lowering windshield.*

\* \* \*

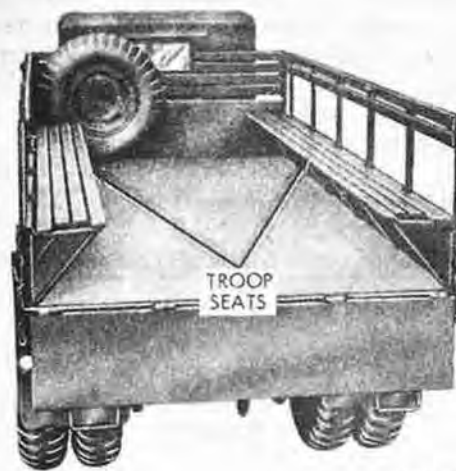
**Caution:** Inner frame must be closed before lowering windshield.

b. Installing Front and Side Racks, and Troop Seats.

**FIGURE 64**  
**INSTALLING FRONT AND SIDE RACK,**  
**AND TROOP SEATS**  
**Steps 1 and 2**



**Step 1.** Position front and side racks in rack sockets and push down to secure in place.



ORD E42894

**Step 2.** Pull troop seat supports forward and lower troop seats into position.

*Figure 64. Installing front and side racks, and troop seats.*

\* \* \*

c. Installing Bows, End Curtains, and Cargo Body Paulin.

**FIGURE 65**  
**INSTALLING BOWS, END CURTAINS**  
**AND CARGO BODY PAULINS**  
**Steps 1 through 3**



ORD E42895

**Step 1.** Position each bow stake in bow stake tubes and push bows down to secure stakes in tubes.



- Step 2.** Place end curtains in position. Aline center of lashing rope with center eyelet in curtains. Wind lashing ropes alternately around bows and through curtain eyelets. Tie ends of lashing ropes to lashing hooks.



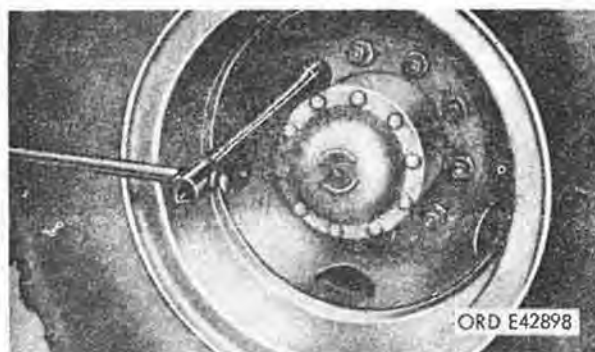
- Step 3.** Place folded paulin across center bows. Locate end marked "front" and position paulin so front end will be at front of body. Unfold paulin and pull tight over bows with front and rear ropes. Tie lashing ropes to lashing hooks on sides and front and ends of body to secure paulin.

*Figure 65. Installing bows, end curtains, and cargo body paulins.*

\* \* \*

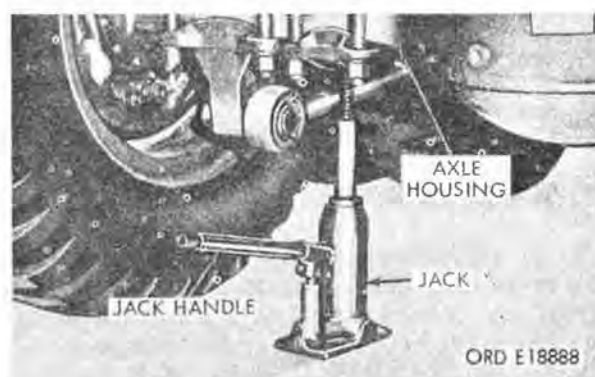
#### d. Wheel and Tire Replacement.

**FIGURE 66**  
**WHEEL AND TIRE REPLACEMENT**  
Steps 1 through 5

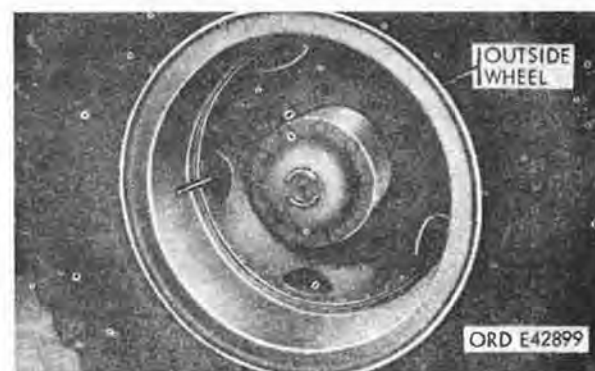


- Step 1.** Set parking brake. Obtain jack and combination jack handle and wheel stud nut wrench from tool compartment. Loosen wheel nuts but do not remove.

**Note.** Left side wheel nuts have left-hand threads; right side wheel nuts have right-hand threads.



- Step 2.** Turn out jack screw to approximate height required. Place jack under axle housing. Insert handle in jack and raise wheel off ground.



- Step 3.** Remove nuts loosened in Step 1 and remove outside wheel.





**Step 4.** Remove special studs holding inner wheel to hub, and remove inner wheel.



**Step 5.** To remove spare wheel and tire assembly, loosen and remove nuts securing wheel to spare-wheel mounting. Install spare wheel in reverse order as shown in Steps 4, 3, 2, and 1. Install unserviceable assembly in spare-wheel mounting.

*Figure 66. Wheel and tire replacement.*

\* \* \*

**Warning:** Use care in replacing wheels and tires to avoid personal injury.

## Section V. MAINTENANCE UNDER UNUSUAL CONDITIONS

### 27. General Conditions

a. In addition to the operating procedures described for usual conditions, special instructions of a technical nature for operating and servicing this vehicle under unusual conditions are contained or referred to herein. In addition to the normal preventive-maintenance service, special care in cleaning and lubrication must be observed where extremes of temperature, humidity, and terrain conditions are present or anticipated. Proper cleaning, lubrication, and storage and handling of fuels and lubricants not only ensure proper operation and functioning, but also guard against excessive wear of the working parts and deterioration of the vehicle.

b. TM 21-300 contains important instructions on driver selection, training, and supervision. TM 21-305 prescribes special driving instructions for operating wheeled vehicles under unusual conditions.

**Caution:** It is imperative that the approved practices and precautions be followed. A detailed study of these technical manuals is

essential to the use of this materiel under unusual conditions.

c. Refer to paragraph 40 for lubrication under unusual conditions, and to Chapter 3, Section III for preventive-maintenance procedures.

d. When chronic failure of the vehicle results from subjection to extreme conditions, report of the condition should be made on DA Form 2407 (par. 3).

### 28. Extreme Cold-Weather Conditions

a. Extensive preparation of materiel scheduled for operation in extreme cold weather is necessary. Generally, extreme cold will cause lubricants to thicken, freeze batteries or prevent them from furnishing sufficient current for cold-weather starting, crack insulation or cause electrical short circuits, and prevent fuel from vaporizing and forming combustible air-fuel mixture for starting. Extreme cold will also cause materials and components to become hard, brittle, and easily damaged.

b. The cooling system should be prepared and protected for temperatures below 32°F., and in accordance with procedures and instructions given in TM 9-207, relative to draining and cleaning the system, and the selection, application, and checking of anti-freeze compounds to meet the anticipated conditions.

c. TM 9-207 also describes the method of correcting the specific gravity (hydrometer) reading when checking batteries exposed to extreme cold.

d. For description of operations in extreme cold, refer to TM 9-207.

**Caution:** It is imperative that the approved practices and precautions be followed. TM 9-207 contains general information which is specifically applicable to this and all other vehicles. Information in TM 9-207 must be considered an essential part of this manual, and not merely an explanatory supplement.

## 29. Extreme Cold-Weather Operation

### a. General.

- (1) The driver must always be on the alert for indications of cold weather on the vehicle.
- (2) The driver must be cautious when starting or driving the vehicle after a shutdown for long periods. Thickened lubricants may cause failure of parts. Tires can become frozen to the ground or frozen in the shape of a flat spot while underinflated. Brakeshoes may be frozen fast. Each condition should be considered by the operator in order to prevent damage to the vehicle. After warming up the vehicle thoroughly, place the transmission in first gear and drive slowly for about 100 yards. This should warm up gears and tires to a point where normal operation can begin.
- (3) The driver should frequently note instrument readings for any indication of malfunction. If any reading consistently deviates from normal, stop the vehicle and investigate the cause.
- (4) The driver should refer to TM 21-305 and FM 31-71 for special instructions on driving hazards in snow, ice and unusual terrain encountered under extreme cold conditions (0° to -65°F.).

### b. At Halt or Parking.

- (1) When halted for short shutdown periods, park the vehicle in a sheltered spot out of the wind. If shelter is unavailable, park the vehicle so that it does not face into the wind. For long shutdown periods, if high dry ground is not available, prepare a footing of planks or brush. Chock in place if necessary.
- (2) When preparing the vehicle for shutdown period, place control levers in the neutral position to prevent them from possible freezing in an engaged position.
- (3) If vehicle is not equipped with a power plant heater, remove batteries and store in a warm place. Draining of engine oil is unnecessary as it will remain fluid even though unheated.
- (4) Refuel immediately in order to reduce condensation in the fuel tanks. Prior to refueling, open fuel tank drains and drain off any accumulated water.
- (5) Check tire inflation pressures to those prescribed in paragraph 7e.

**Note.** When checking tire pressure, do not reduce pressure when tires are hot.

- (6) When drain plugs have been removed or drain cocks opened to remove liquid from the cooling system of any equipment, inspect the drains to be sure none are obstructed. If obstruction by foreign material is present, a soft wire should be used to clear the drain hole. This is particularly important before leaving a vehicle that has had the engine drained to protect the block from freezing. Only drain an engine cooling system when no approved anti-freeze solution is available.

## 30. Extreme Hot-Weather Operation

a. General. Continuous operation of the vehicle at high speeds or under long hard pulls in lower gear ratios on steep grades or in soft terrain may cause the engine to overheat. Avoid the continuous use of low gear ratios whenever possible. Be alert for overheating, and halt the vehicle for a cooling-

off period when necessary and the tactical situation permits. Make frequent inspections and servicing of the cooling system, engine oil filter, and carburetor air cleaner. If the vehicle engine is consistently overheating, look for dust, sand, or insects in radiator fins and blow out any accumulation with compressed air. Flush cooling system if necessary.

**b. At Halt or Parking.**

- (1) Do not park the vehicle in the sun for long periods. Heat and sunlight shorten tire life. When practical, park under cover to protect vehicle from sun, sand, and dust.
- (2) Cover inactive vehicle with paulins if no other suitable shelter is available. Where entire vehicle cannot be covered, protect window glass against etching by sand, and protect engine compartment against entry by sand.
- (3) Correct tire inflation pressures to those specified in paragraph 7e.  
  
**Note.** When checking tire pressure, do not reduce pressure if tires are hot.
- (4) Materiel inactive for long periods in hot, humid weather is subject to rapid rusting and fungus growth. Make frequent inspections and clean and lubricate to prevent excessive deterioration.

**31. Operation On Unusual Terrain**

**a. General.**

- (1) Operation on snow - or ice-covered terrain or in deep mud requires use of tire chains on the driving wheels.

**Caution:** Attempted operation with only one wheel of a driving axle equipped with a tire chain may result in serious damage to the tire and/or power train.

Select a gear ratio low enough to move the vehicle steadily without causing the wheels to spin or the engine to race. Do not allow a wheel or wheels to become mired or buried to the extent that the axle housing rests on the surface of mud, sand, or snow.

- (2) If one or more wheels become mired or begin to spin, it may be necessary for the vehicle to be winched or towed by a companion vehicle, or it may be necessary to jack up the mired wheel and insert planking or matting beneath it. Do not jam sticks or stones under a spinning wheel as this will wear the tire threads unnecessarily.
- (3) Skidding, loss of steering and loss of torque traction are the chief difficulties encountered on icy roads. When rear end skidding occurs, instantly turn front wheels in the direction of skid. Decelerate the engine but do not declutch. Apply brakes very gradually.
- (4) The operator should know at all times the exact direction the front wheels are steering. On ice-covered or slippery terrain, the vehicle may continue in a straight-ahead direction even though the front wheels are turned right or left. The resulting "ploughing" action may cause the vehicle to stall or veer suddenly to the right or left.
- (5) Lowering tire pressure when driving in sand, ice, mud, or snow will help to increase traction if tire chains are not available.

**Note.** Do not lower tire pressure to the extent that damage will result. Reinflate to prescribed pressure after emergency.

- (6) Operation in sand or under dusty conditions requires daily cleaning of air cleaners and fuel and oil filters. Engine vents and other exposed vents should be covered with cloth.
- (7) High altitude operation requires careful maintenance of the cooling system because the boiling point of the coolant drops in proportion to the altitude reached. The pressurized cooling system of the vehicle will operate at a temperature of 220°F. without the loss of coolant if all connections, hoses and the radiator filler cap are maintained in a sealed condition.

**Warning:** Extreme care should be taken when removing radiator filler cap if temperature gage reads above 180°F.



#### b. Recommended Tire Pressures.

- (1) Sand. For emergency operations in beach and desert sand, reduce tire inflation pressure as prescribed in paragraph 7e. When operating in sand terrain, use tires with a plain rib tread and round cross section. Snow tires or tires with a raised flat head will break through a sand crust, dig into the soft sand beneath, and become mired.
- (2) Rocks and boulders. Tires must be correctly inflated as prescribed for cross-country operation (par. 7e). Overinflated tires will result in an increase in the shock transmitted to the vehicle when moving over rough or rocky ground. Underinflated tires will cause internal ruptures of the tire and tube damage.
- (3) Mud and snow. Reduce tire inflation pressure as prescribed in paragraph 7e. Keep tires free from ice.

c. After-Operation Procedures: Remove accumulations of ice, snow and mud from under the fenders and from the wheels, axles, radiator core, engine compartment, steering mechanism, air cleaner intake, and electrical connections.

**Caution:** Use care when removing such accumulations to prevent damage to vehicle components.

d. Fifth Wheel Adjustment. Adjustment of wedges on vehicles equipped with a fifth wheel must be made before and after cross-country operations. For highway operation, adjusting wedges are used in the fully locked position. Wedges are fully withdrawn for cross-country operation.

### **32. Fording Operations**

a. General. In fording, the vehicle may be subjected to water varying in depth from only a few inches to depths sufficient to completely submerge it. Factors to be considered are spray-splashing precautions, normal fording capabilities, and accidental complete submersion.

b. Normal Fording. All critical units of the vehicle are provided at manufacture with waterproofing protection for fording bodies of water to a depth of 30 inches.

#### c. Fording Precautions.

- (1) Be sure engine is operating efficiently before attempting to ford. Do not loosen fan belt.
- (2) Enter the water slowly (3 to 4 mph), with transmission shifted into lowest speed. Increase engine rpm to eliminate possibility of stalling. If engine stalls, start in usual manner.
- (3) Avoid unnecessary use of the clutch.
- (4) Do not rely on brakes after emergence. Applying the brakes a few times after emergence will aid in drying out brake linings.

#### d. Operation After Normal Fording.

- (1) Body. Clean all surfaces that have been exposed to water. Touch up paint where necessary to prevent rusting. Coat unpainted surfaces with preservative lubricating oil.
- (2) Power train. Check lubricants in the engine, transmission, differentials, and transfer case. If water has contaminated any lubricant, drain, flush and refill in accordance with LO 9-2320-211-12.

**Note.** Water found in power train components after fording is generally the result of condensation rather than seepage.

- (3) Suspension. Clean and lubricate all parts as specified in LO 9-2320-211-12.
- (4) Instruments. Most units are sealed, but the sudden cooling of the warm interior air may cause condensation within the instrument cases. Exposure to warm air after fording should eliminate this condition. Cases that can be opened may be uncovered and dried if necessary.

e. Accidental Submersion. If accidental complete submersion of the vehicle occurs, it should be salvaged as soon as possible, temporarily preserved, and then sent to an ordnance maintenance unit for required permanent maintenance.

## CHAPTER 3

### MAINTENANCE INSTRUCTIONS

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#### Section I. PARTS, TOOLS, AND EQUIPMENT

##### 33. General

Tools and equipment issued to the driver are for use in operating and maintaining the vehicle. They are not to be used for purposes other than those prescribed in this manual. When not in use, they should be placed in the canvas bag provided for them and stowed in the driver's tool compartment.

##### 34. Repair Parts

No repair parts are authorized for first-echelon maintenance of these vehicles.

##### 35. Common Tools and Equipment

Standard and commonly used tools and equipment having general application to this vehicle are authorized for issue by tables of allowances, and tables of organization and equipment.

##### 36. Special Tools and Equipment

No special tools and equipment are required for first-echelon maintenance.

#### Section II. LUBRICATION AND PAINTING

##### 37. Lubrication Order

Lubrication Order LO 9-2320-211-12 prescribes cleaning and lubricating procedures as to locations, intervals, and proper materials for these vehicles. This order is issued with each vehicle and is to be carried with it at all times. Lubrication which is to be performed by ordnance maintenance personnel is listed on the lubrication order under Notes.

##### 38. General Lubrication Instructions Under Usual Conditions

a. General. Any special lubricating instructions required for specific mechanisms or parts are covered in the pertinent section.

b. Service Intervals. Service intervals specified on the lubrication order are for

normal operation where moderate temperature, humidity, and atmospheric conditions prevail.

c. Lubrication Equipment. Clean lubrication equipment before and after using. Operate the lubricating guns carefully and in such a manner as to ensure proper distribution of lubricant.

d. Points of Application. Lubrication fittings, level plugs, oilers, and oil holes are shown in figures 73 through 75 and are referenced on the lubrication orders. Wipe these devices and the surrounding surfaces clean before and after lubricant is applied.

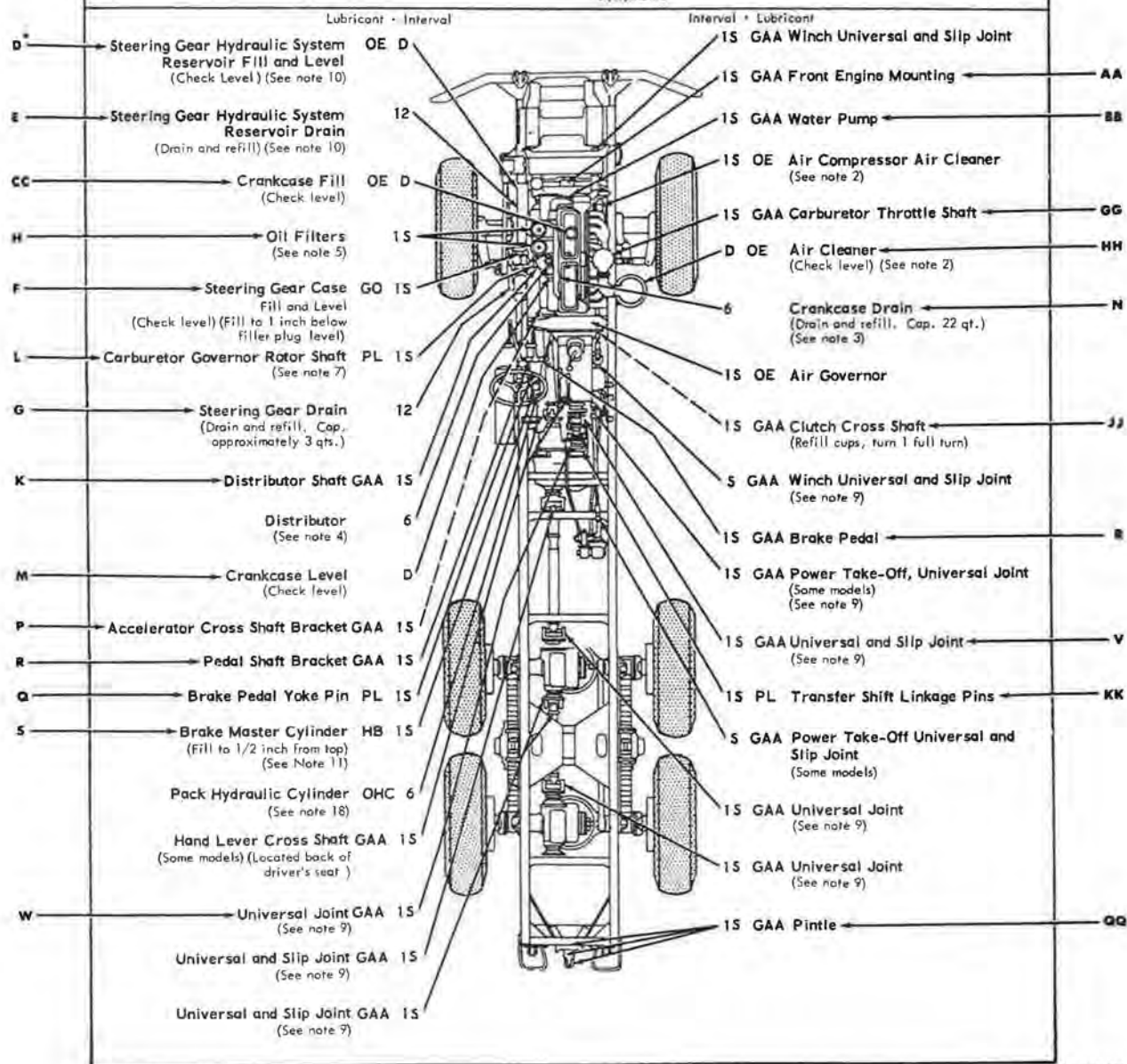
e. Lubrication Records. Maintain a lubrication record on the vehicle on DA Form 2404.

# LUBRICATION CHART

**TRUCK, CHASSIS: 5-TON, 6X6, M39, M40, M40C, M61, M63, M63C, M139, M139C, M139D, M139F; TRUCK, CARGO: 5-TON, 6X6, M41, M54, M54A1, M55; TRUCK, DUMP: 5-TON, 6X6, M51; TRUCK TRACTOR, 5-TON, 6X6, M52, M52A1; TRUCK TRACTOR, WRECKER, MEDIUM, 5-TON, 6X6, M62; TRUCK TRACTOR, WRECKER: M246; TRUCK, WRECKER: MEDIUM, 5-TON, 6X6, M543**

Lubrication will be performed only as prescribed by this chart except as required under unusual conditions as described in this TM.

Clean fittings before lubricating. Clean parts with THINNER, paint, volatile mineral spirits (TPM) or SOLVENT, dry cleaning (SD). Dry before lubricating. Lubricate dotted arrow points on both sides of the equipment.

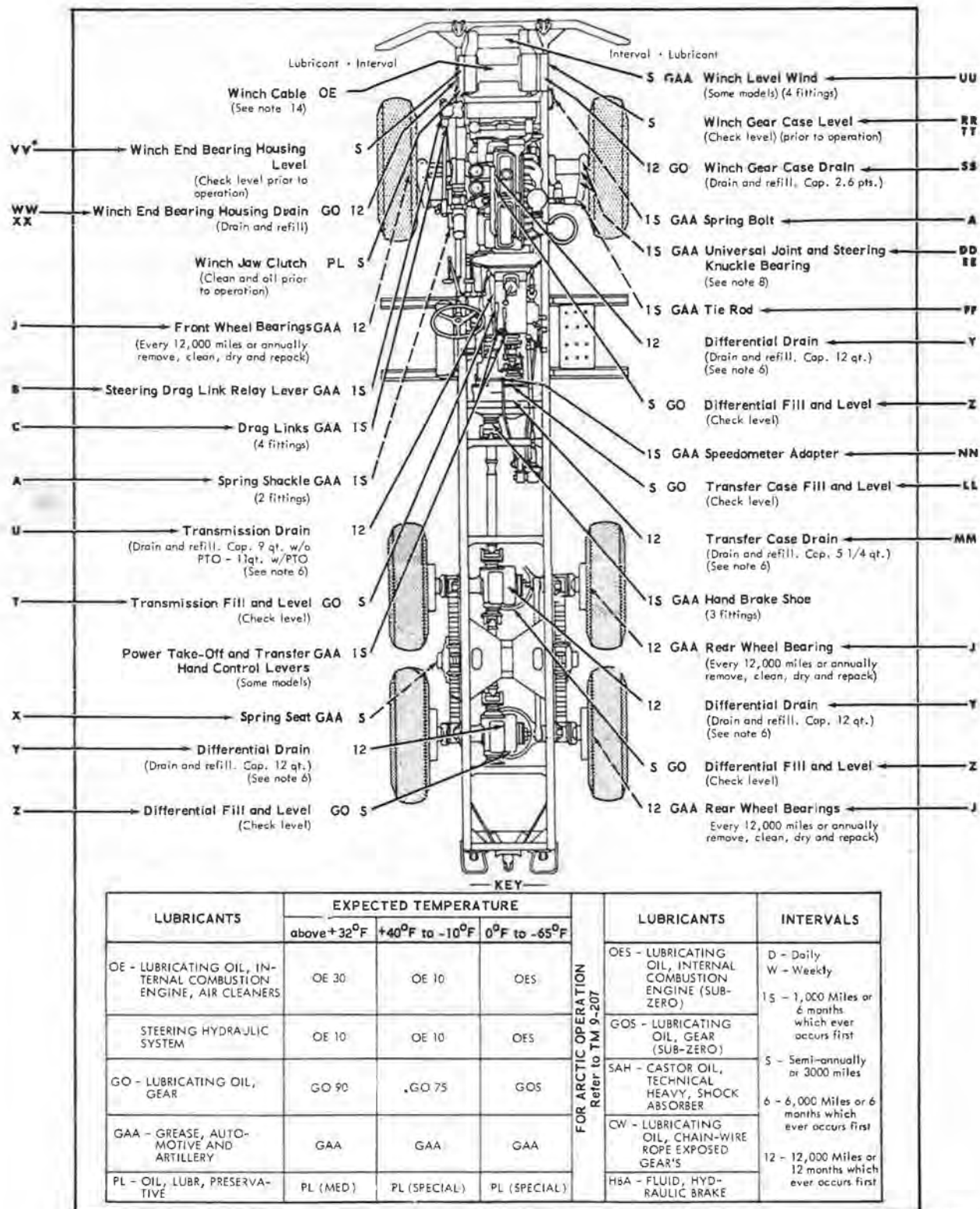


\* all item letters refer to figure 73

ORD E42902

Figure 67. Chassis lubrication chart (with gasoline engine installed).





\* all item letters refer to figure 73

ORD E42903

Figure 68. Chassis lubrication chart.

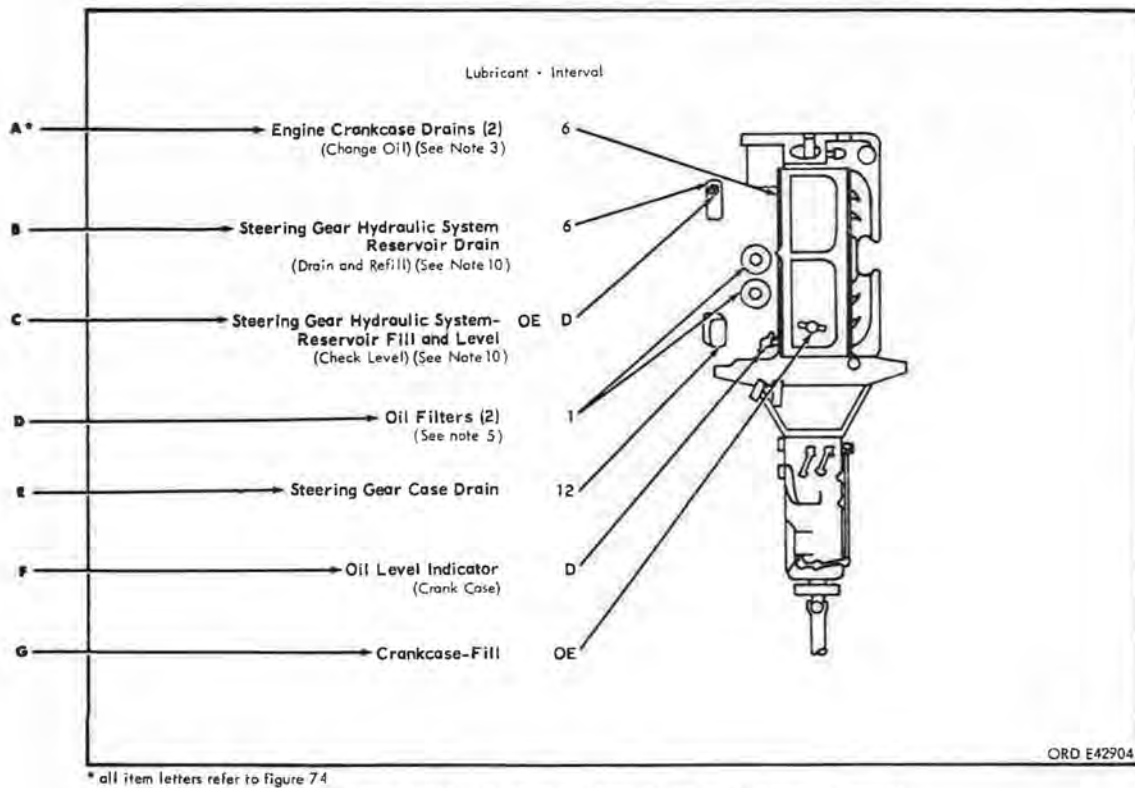


Figure 69. Lubrication chart (diesel engine).

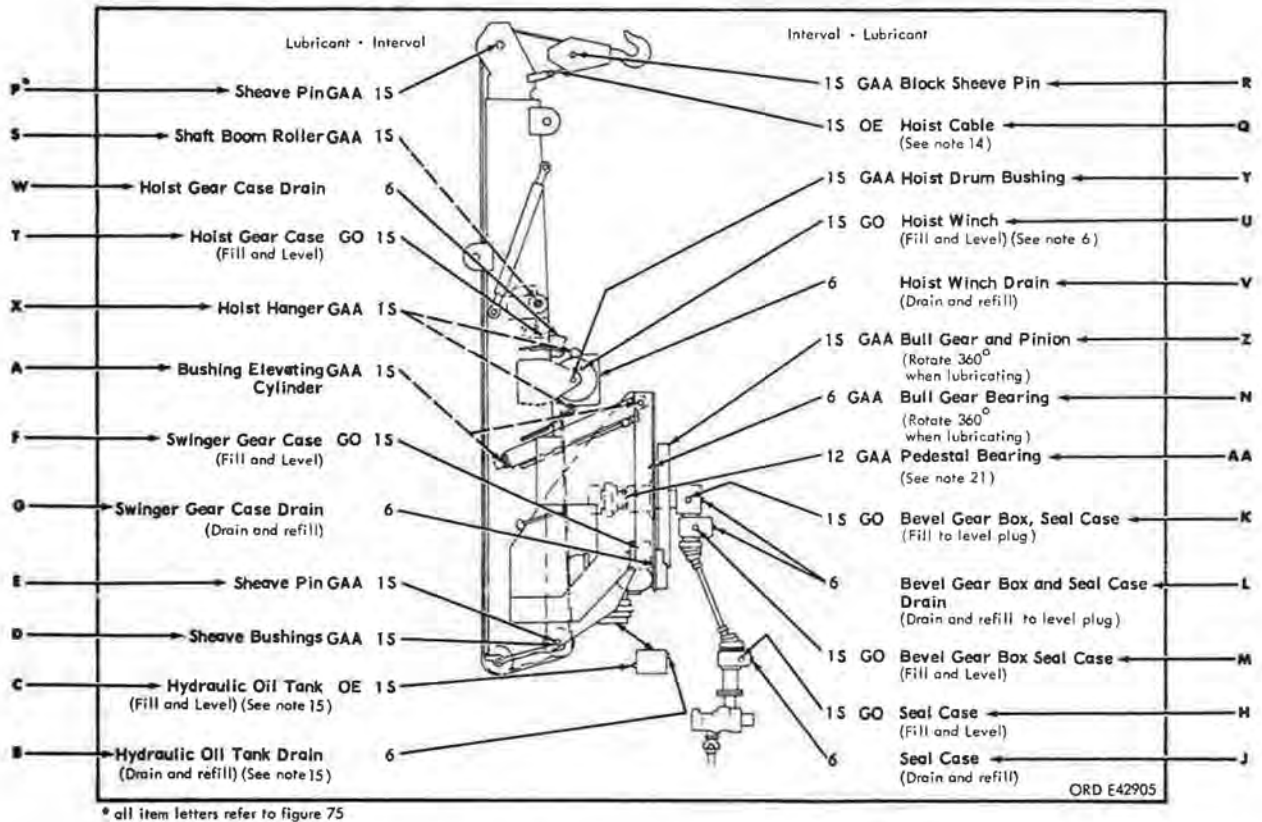


Figure 70. Hydraulic crane lubrication chart - M543.

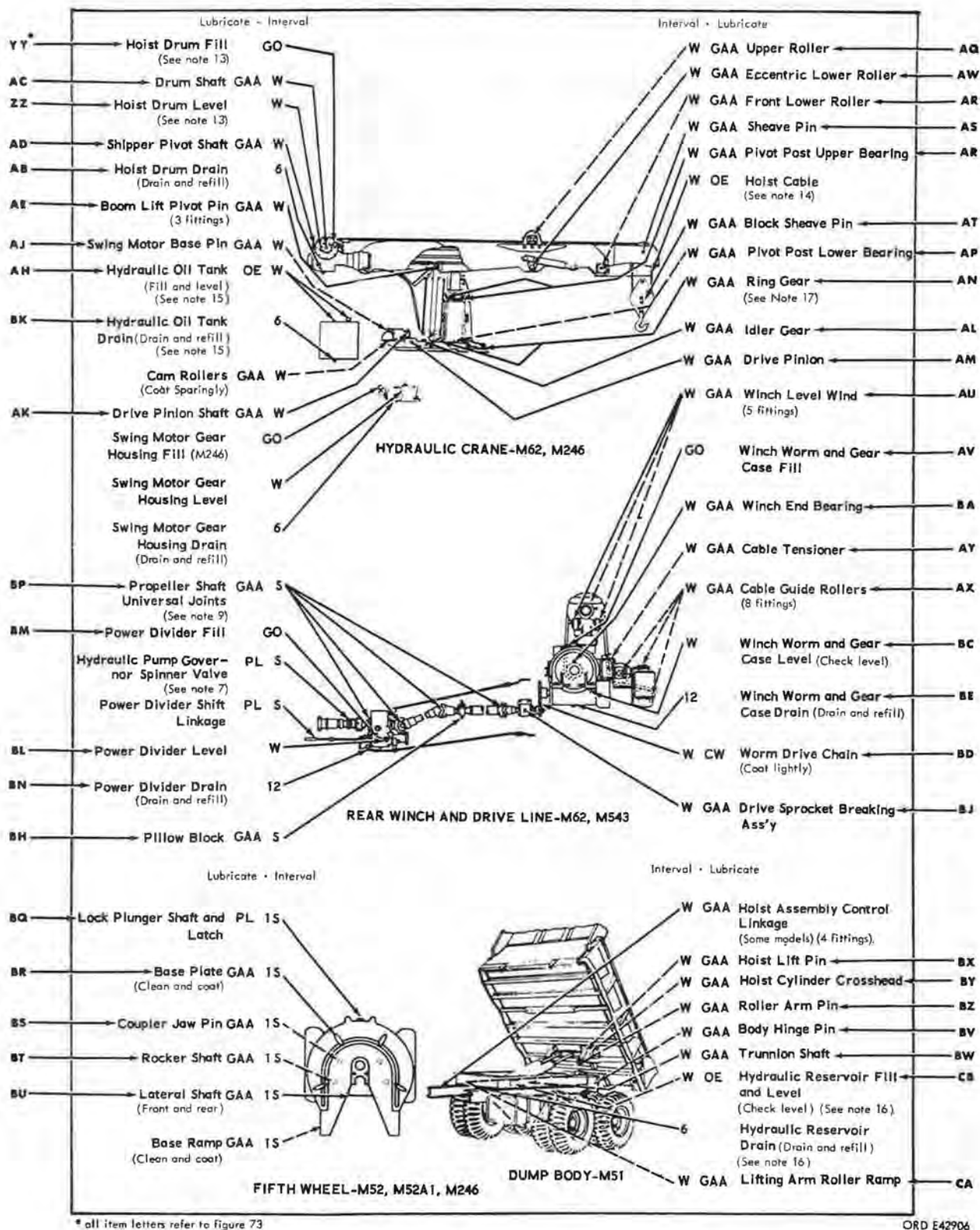


Figure 71. Rear, hydraulic crane, fifth wheel, and dump body lubrication chart.



— NOTES —

**1. INTERVALS**

Points requiring lubrication at 1,000 miles, on vehicles not accumulating 1,000 miles in a 6 month period, will be lubricated at time of semi-annual Preventive Maintenance Service. Points requiring lubrication at 6,000 miles on vehicles not accumulating 6,000 miles in a 6 month period will be lubricated at least once a year. Points requiring lubrication at 12,000 miles on vehicles not accumulating 12,000 miles will be lubricated every 12 months.

**2. AIR CLEANERS AND BREATHERS (OIL BATH TYPES)**

Daily, replenish to head level with OE, crankcase grade. Every 1,000 miles or semi-annually, clean oil reservoir and refill with OE. Disassemble, clean all parts, refill with OE, as above, whenever crankcase oil is changed. For desert or extremely dusty operation, disassemble, clean all parts, refill once every operating day or more frequently, if required.

**3. CRANKCASE**

Drain every 6,000 miles. Drain only when hot after operation. Refill to full mark on gage. Run engine a few minutes and recheck oil level. For proper operation on heavy duty oil, engine thermostat must be functioning properly to maintain engine coolant temperature at 140°F. (minimum). CAUTION: Be sure pressure gage indicates oil is circulating.

**4. DISTRIBUTOR**

Every 6,000 miles or semi-annually, whichever occurs first, remove oil reservoir plug from lower housing and drain. Fill reservoir with OE, clean and install plug. Wipe breaker cam lightly with GAA and lubricate breaker arm pivot and wick under rotor with 1 or 2 drops of OE.

**5. OIL FILTER**

Every 1,000 miles or semi-annually, whichever occurs first, remove plug in bottom of case, drain sediment and install plug. Every 6,000 miles or 6 months, whichever occurs first, while crankcase is being drained, remove drain plugs and elements. Clean inside of cases and install drain plugs and new elements. When filling crankcase add two extra quarts of OE for each filter.

**6. GEAR CASES**

Drain every 12,000 miles or 12 months. Drain only when hot after operation. Remove, clean, inspect and install magnetic plugs and strainer located at bottom of transfer housing. Fill to filler plug level before operation. Clean vents quarterly and after operation in mud or water. For steering gear, fill until lubricant appears through level hole.

**7. CARBURETOR GOVERNOR ROTOR SHAFT**

Remove plug and lubricate felt with several drops of PL.

**8. FRONT WHEEL UNIVERSAL JOINTS AND STEERING KNUCKLE BEARINGS**

Remove plug on universal joint housing, fill to level of plug opening. Install plug. Every 12,000 miles or 12 months, remove, clean, dry and repack. Do not disassemble constant velocity universal joints.

**9. PROPELLER SHAFT UNIVERSAL AND SLIP JOINTS**

Every 1,000 miles, or semi-annually, whichever occurs first, remove filler plug at each joint and install pressure fitting, fill using low pressure gun. Remove fitting and reinstall plug. Every 6,000 miles, whichever occurs first, remove, clean, dry, inspect and refill. Do not overfill.

**10. STEERING HYDRAULIC SYSTEM**

Fill and maintain 3/4 full. Do not fill completely.

**11. BRAKE MASTER CYLINDER**

Use non-petroleum base (HB) hydraulic brake fluid for brake master cylinder. Use of petroleum base fluid will cause brakes to become inoperative.

**12. REAR SPRING SEAT BEARINGS**

Loosen screws on bearing cap, lubricate through fitting until lubricant appears around cap, tighten cap screws.

**13. HOIST DRUM**

Weekly, check level, drain semi-annually. Set boom in horizontal position and remove plug inside of case. Remove breather and fill drum to level of plug hole. Install plug. Clean and install breather.

**14. WINCH AND CRANE HOIST CABLES**

After each operation, clean and oil with used crankcase oil or OE. Semi-annually, if cable is not generally used, unwind entire cable, clean and soak, by means of a brush, with PL (special). Wipe off excess coat cable with CW. Coat winch drum also with CW before rewinding cable on drum.

**15. CRANE HYDRAULIC OIL TANK**

Weekly, with boom in horizontal position, remove plug from top of tank, if level is below bottom mark on gage, replenish to top mark. Six months, remove plug from bottom of tank and drain. To completely drain system, operate crane several times, disconnect hydraulic lines and let drain. Clean and install plug, connect hydraulic lines. Refill tank with 33 gallons of oil, operate crane several times, to completely fill system, check level. Fill to

TOP mark on bayonet-type gage. In temperature of 90°F or above, use OE-30.

**16. DUMP BODY HYDRAULIC RESERVOIR**

Weekly remove filler plug, gage and screen, clean and install screen, replenish with oil to third mark from top on the gage with body down in traveling position. Install gage and plug. Raise and lower body several times slowly and recheck oil. CAUTION: Remove filler plug slowly to release pressure. Do not overfill.

**17. RING GEAR**

Remove pivot post drain plugs located on underside of crane base plate. Remove two pipe plugs on each side of pivot post gear shield and install lubricating fittings. Lubricate through fittings until lubricant appears at underside pivot post drain holes. Install pivot post drain plugs and remove fittings and install pipe plugs.

**18. PACK HYDRAULIC CYLINDER**

Every 6,000 miles or semi-annually, remove pipe plug at rear of cylinder and fill to plug level with OHC.

**19. OIL CAN POINTS**

Every 1,000 miles or monthly, lubricate hinges and latches, carburetor linkage, transfer and power take-off shift linkage, clutch and brake pedal linkage, hand brake control with PL.

**20. DO NOT LUBRICATE**

Springs, clutch release bearing, generator, starter or shock absorbers

**21. LUBRICATED AT TIME OF DISASSEMBLY BY ORDNANCE PERSONNEL**

Clutch pilot bearing, clutch release bearing carrier, speedometer flexible shaft, winch swivel sheave frame bearing and tachometer flexible shaft.

**22. DRIVER PARTICIPATION**

"D" maintenance is performed by the driver. Lubrication intervals marked "S" may be performed by the operator if supervised by qualified personnel.

*Copy of this lubrication order will remain with the equipment at all times; instructions contained herein are mandatory and supersede all conflicting lubrication instruction dated prior to the date of this lubrication order.*

*By Order of the Secretaries of the Army and the Air Force.*

ORD E42907

Figure 72. Lubrication notes.

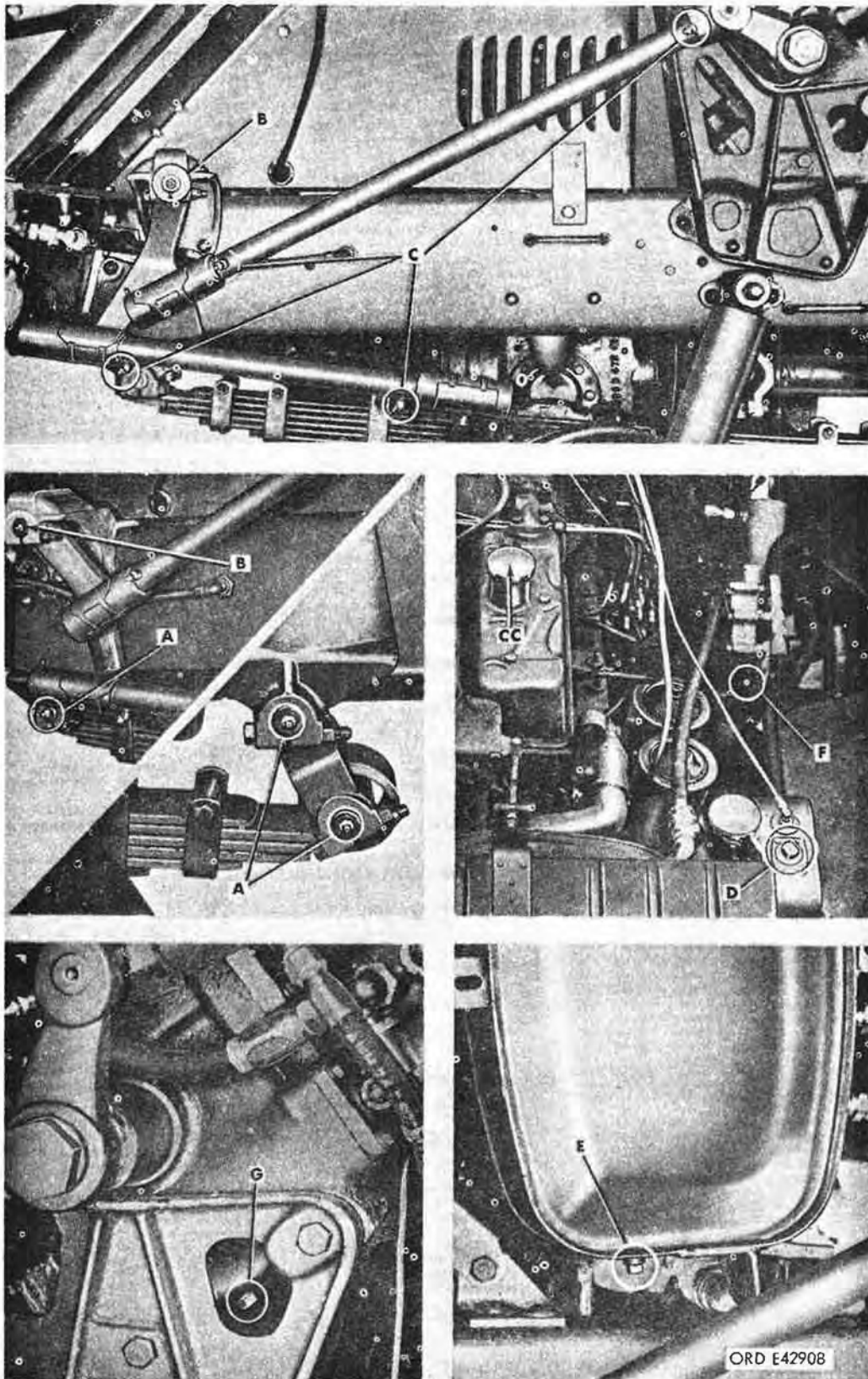
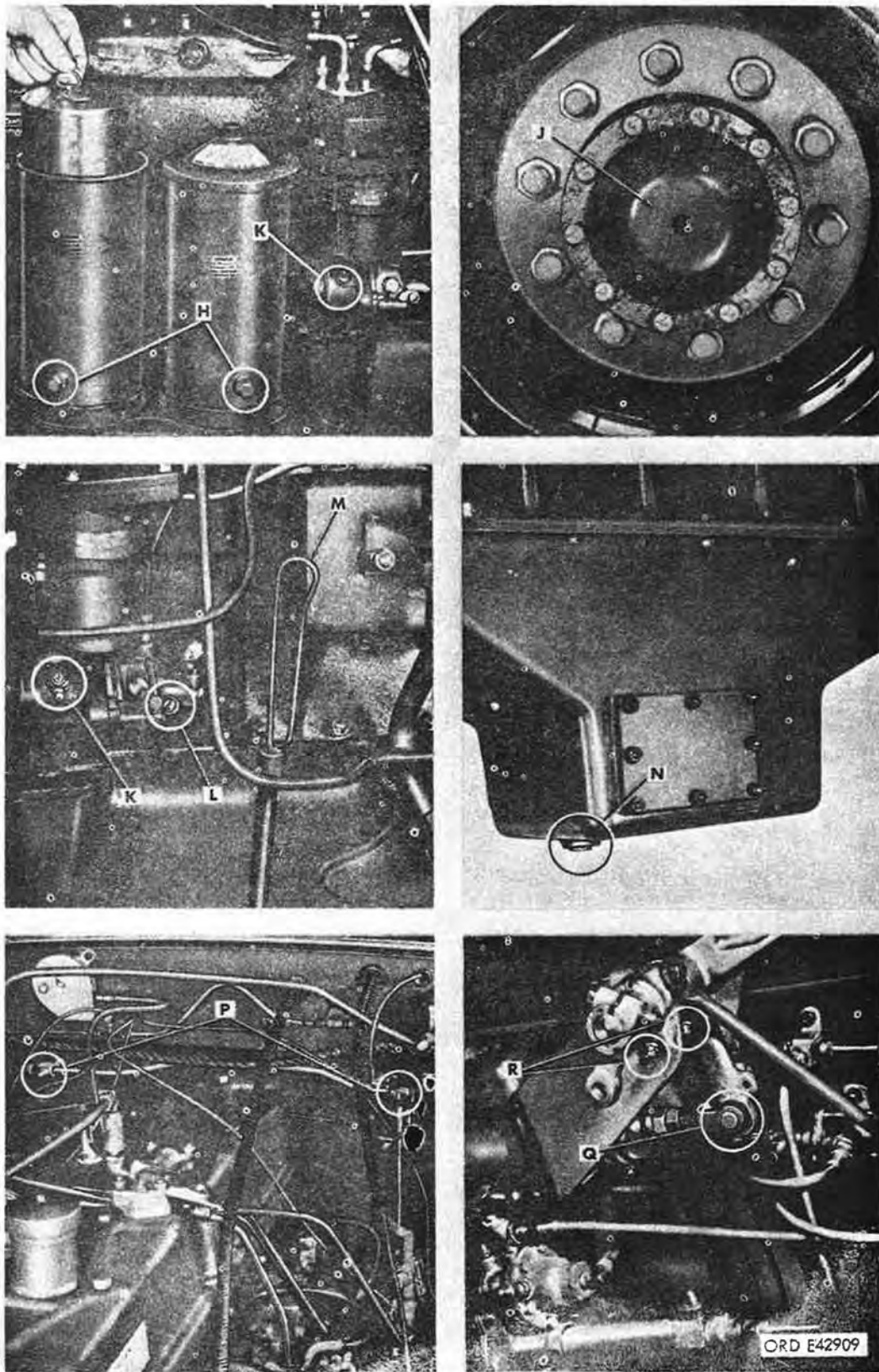


Figure 73. Localized lubrication points (1 of 8).



*Figure 73. Localized lubrication points (2 of 8).*



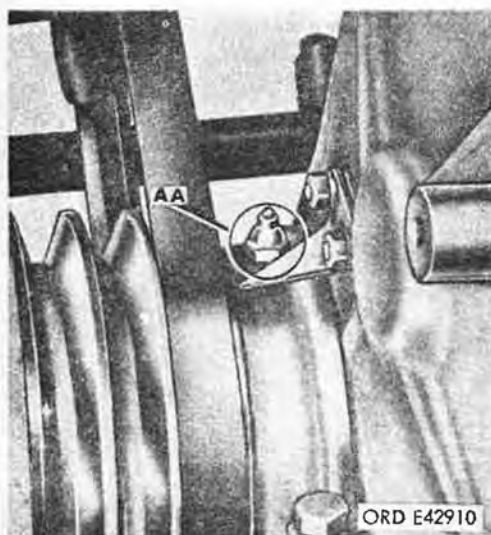
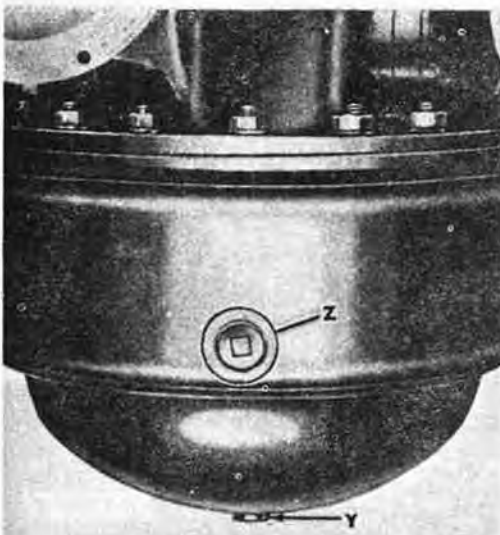
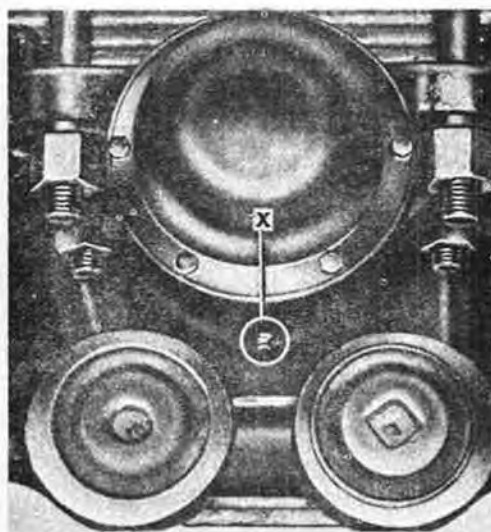
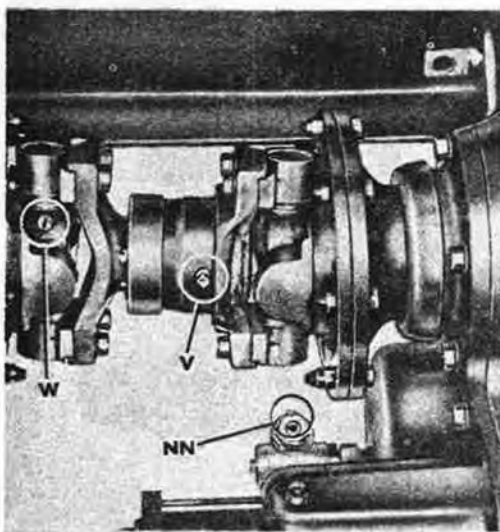
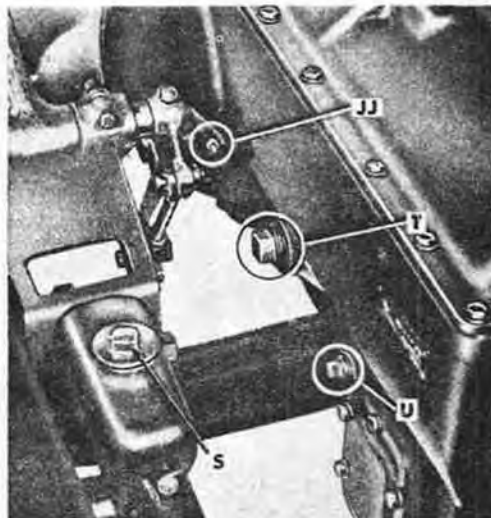
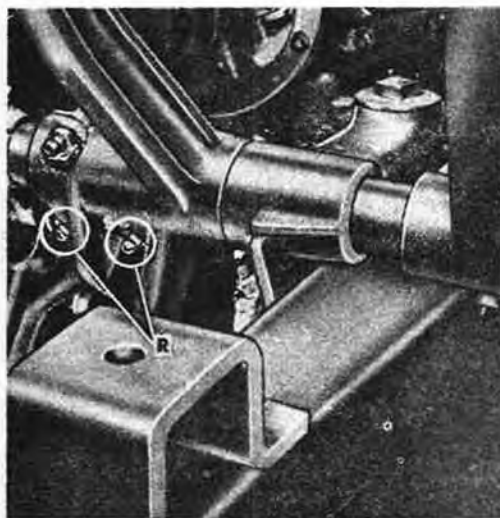


Figure 73. Localized lubrication points (3 of 8).

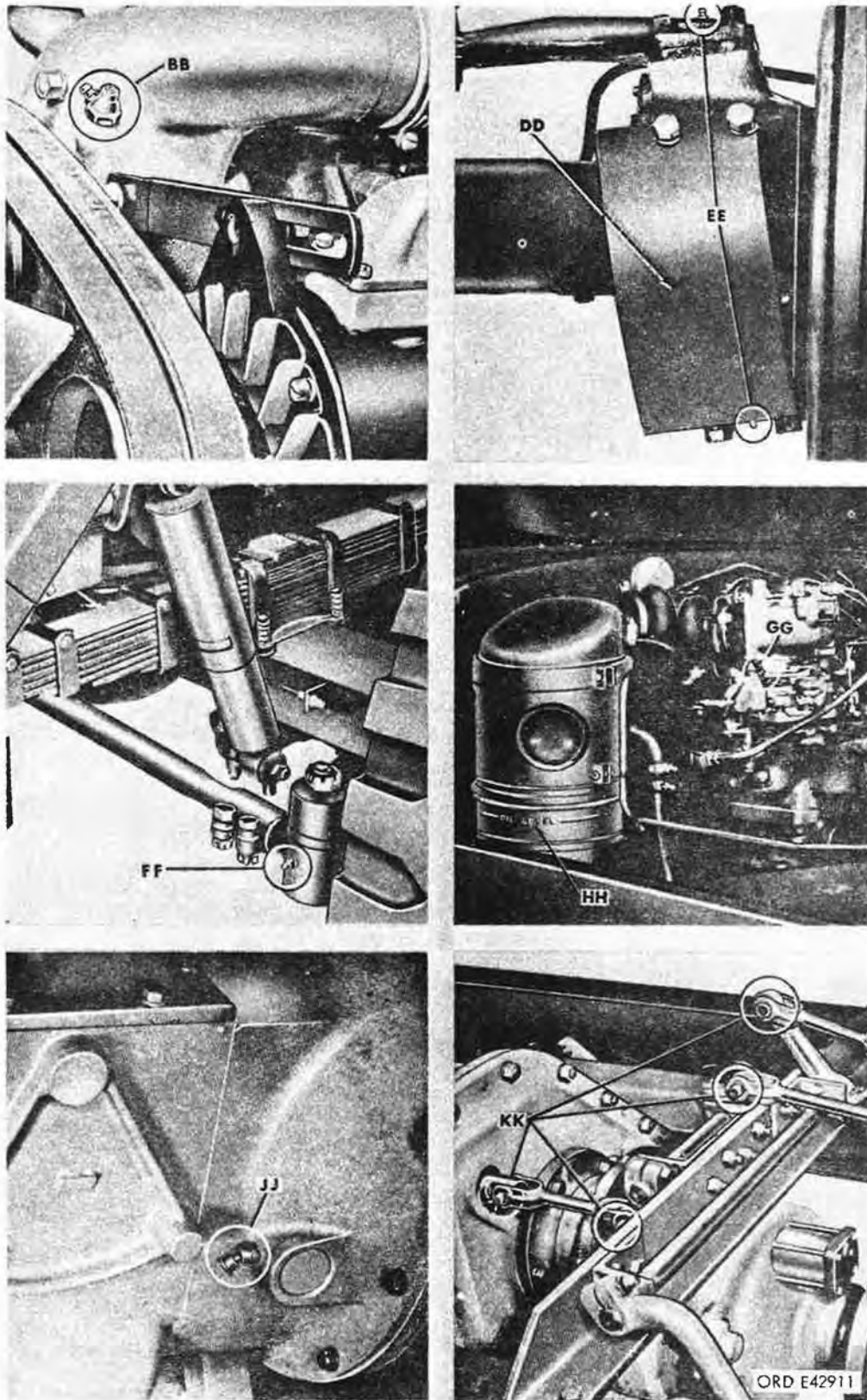
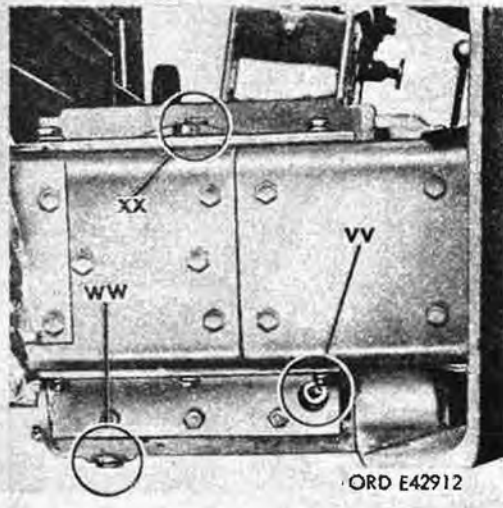
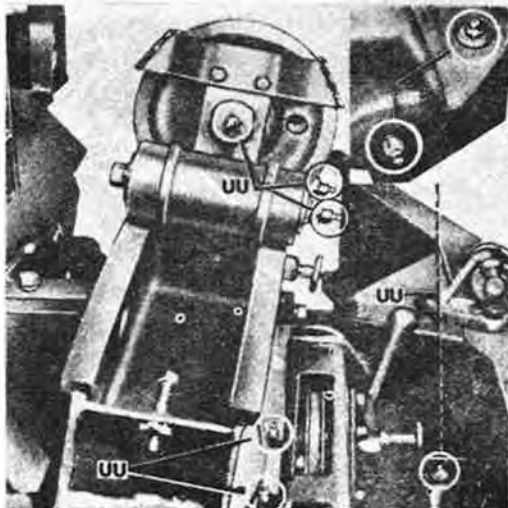
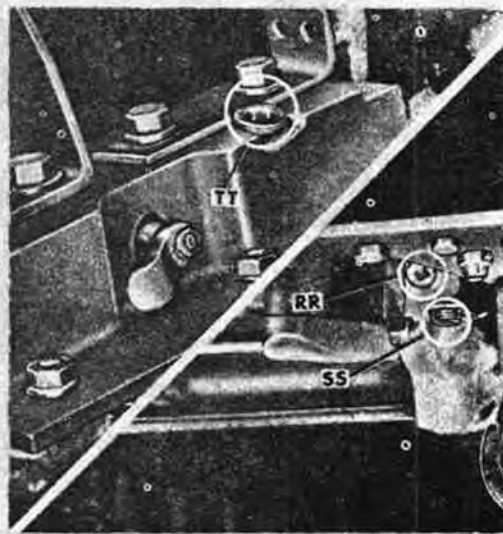
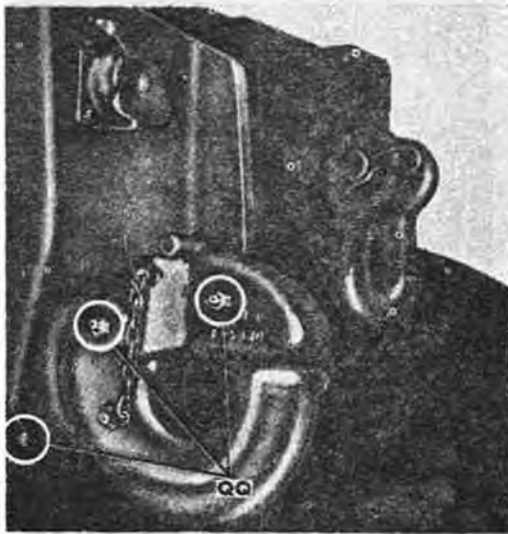
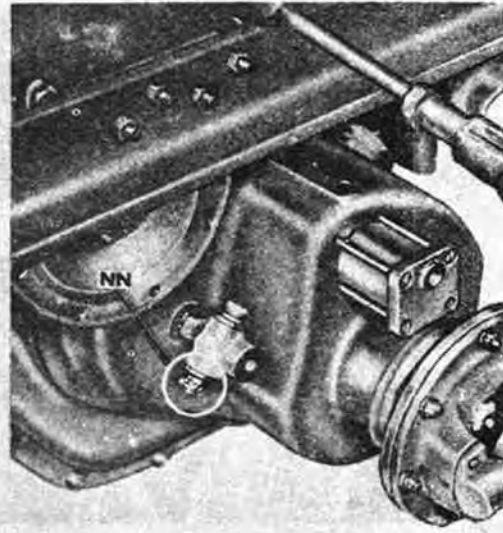
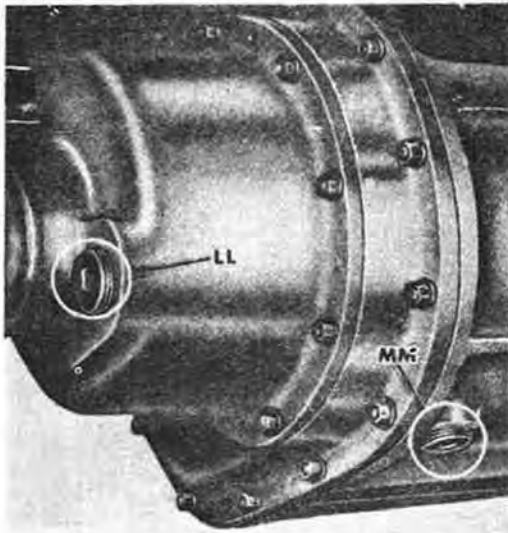


Figure 73. Localized lubrication points (4 of 8).



ORD E42912

Figure 73. Localized lubrication points (5 of 8).



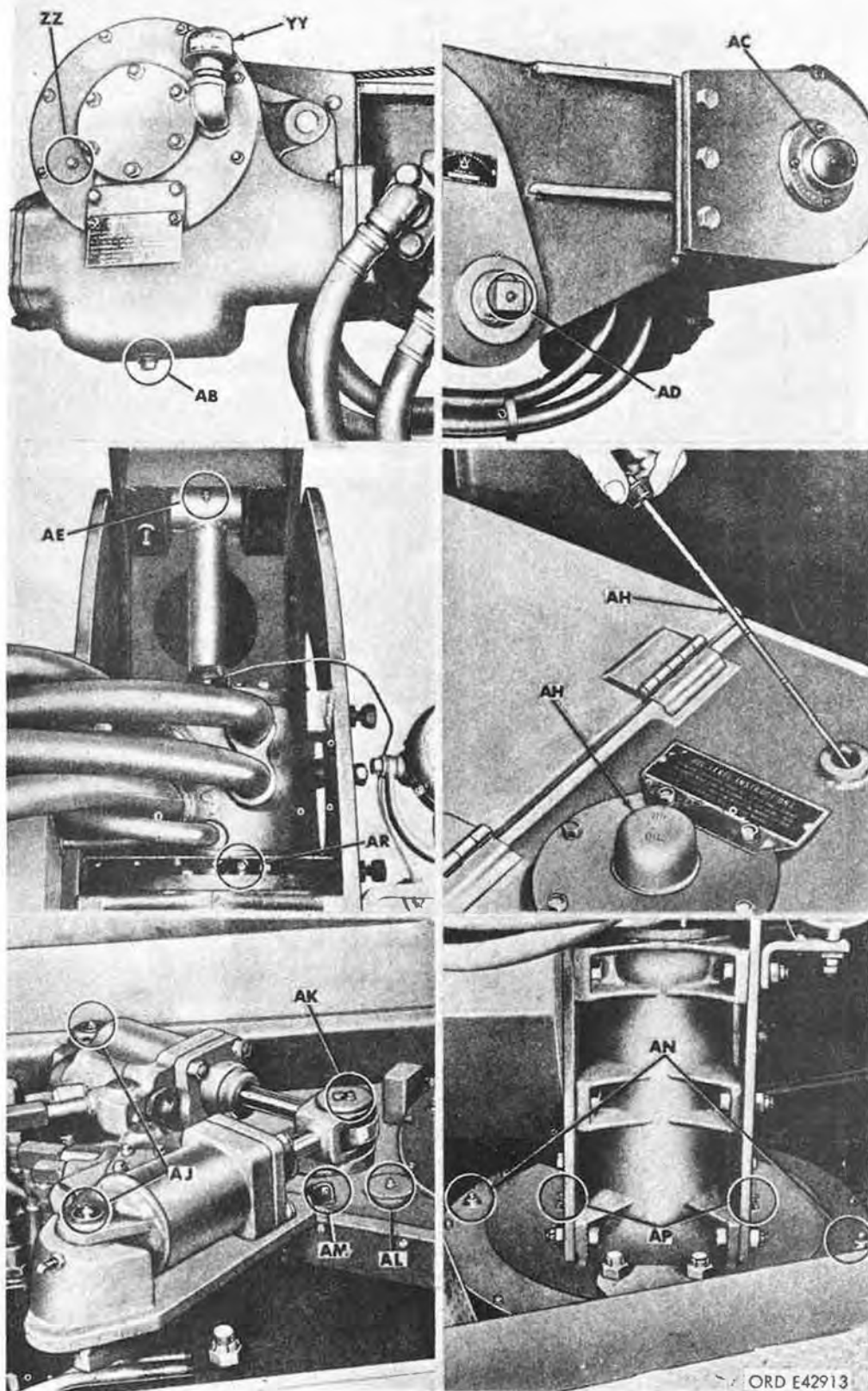


Figure 73. Localized lubrication points (6 of 8).

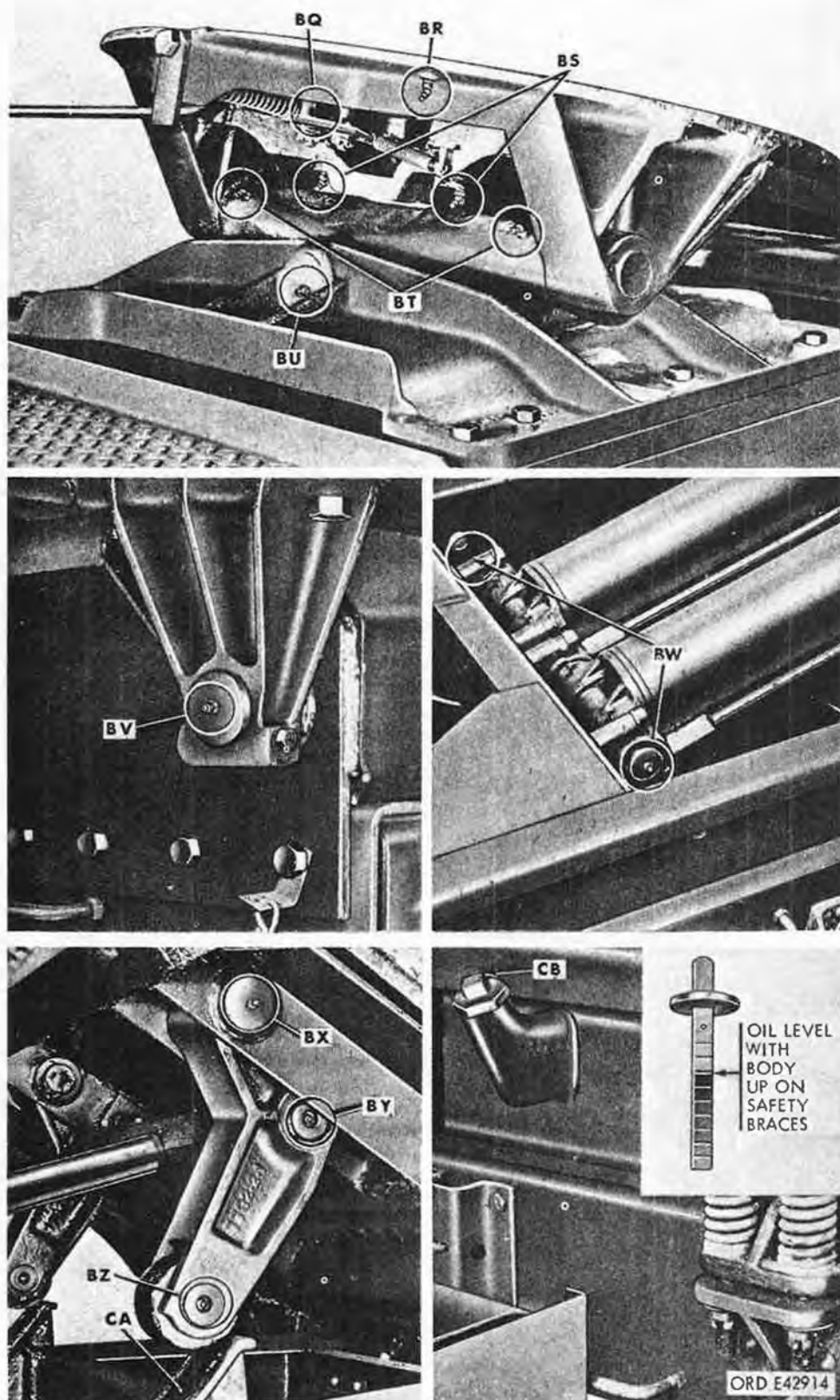


Figure 73. Localized lubrication points (7 of 8).

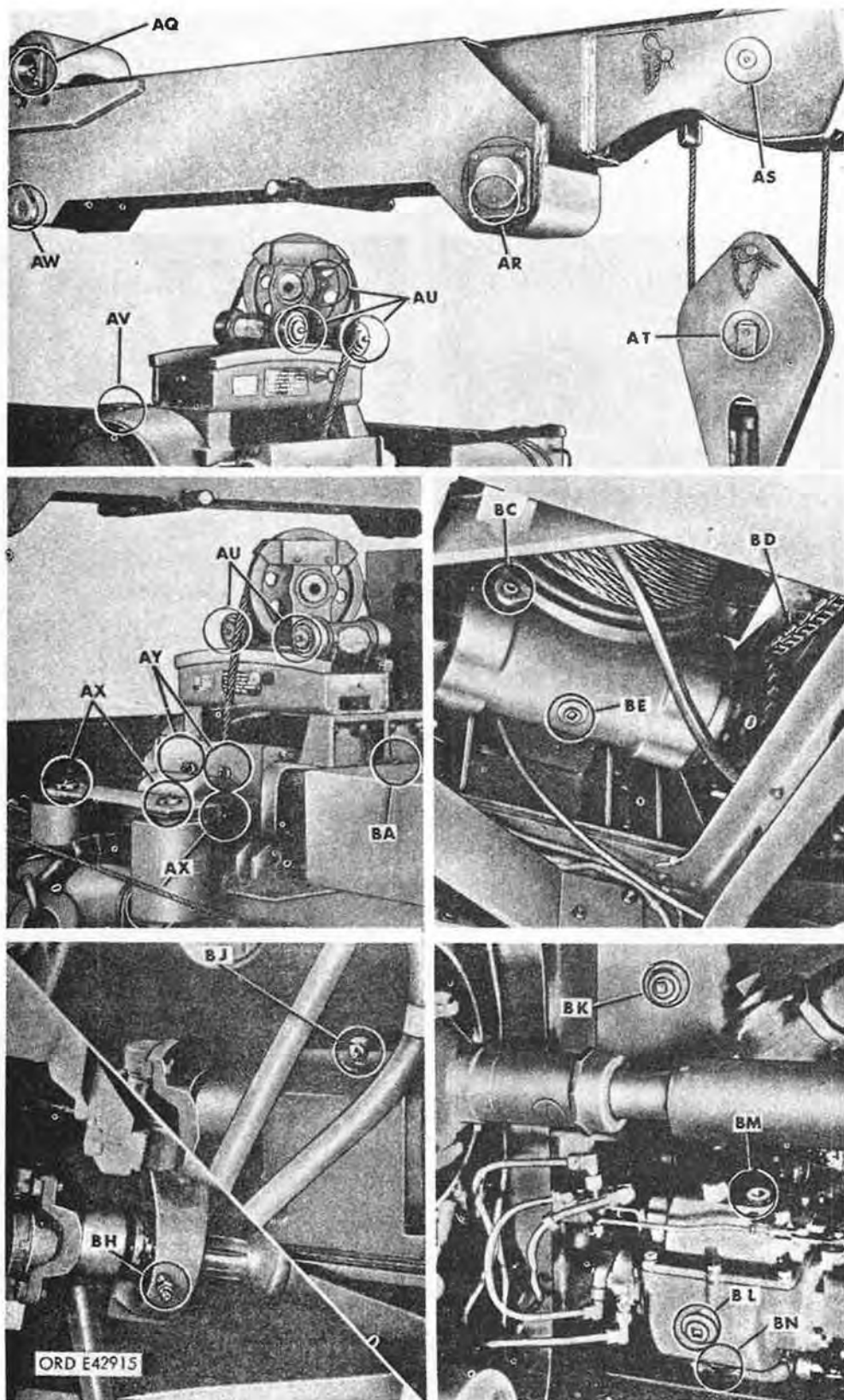
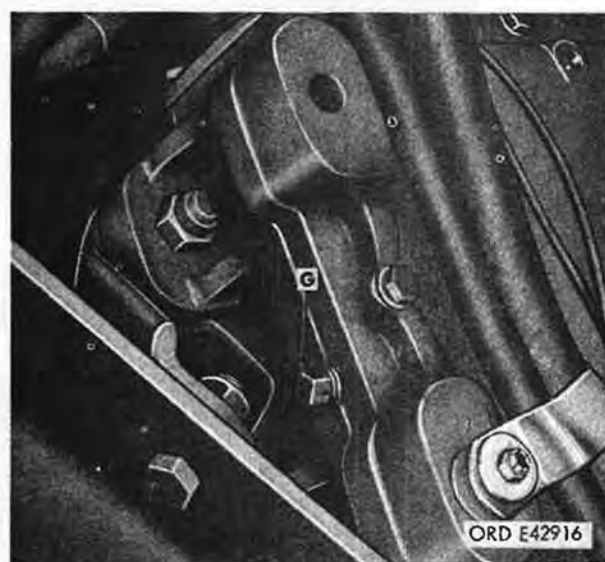
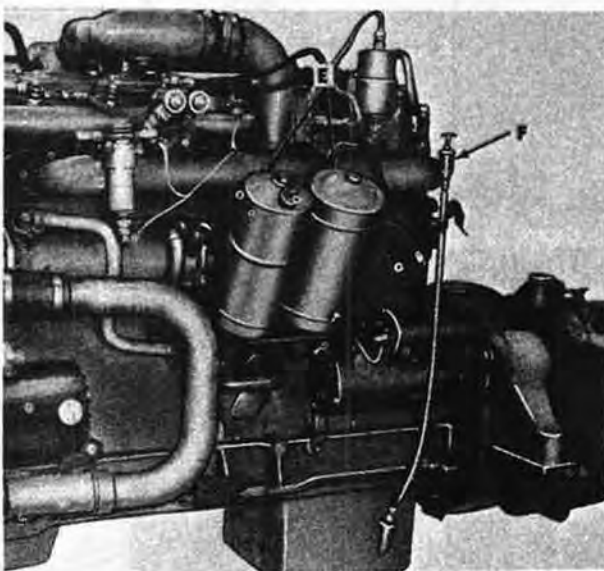
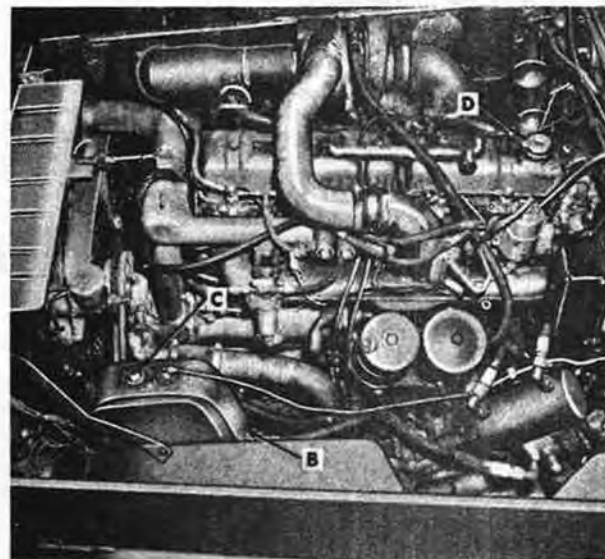
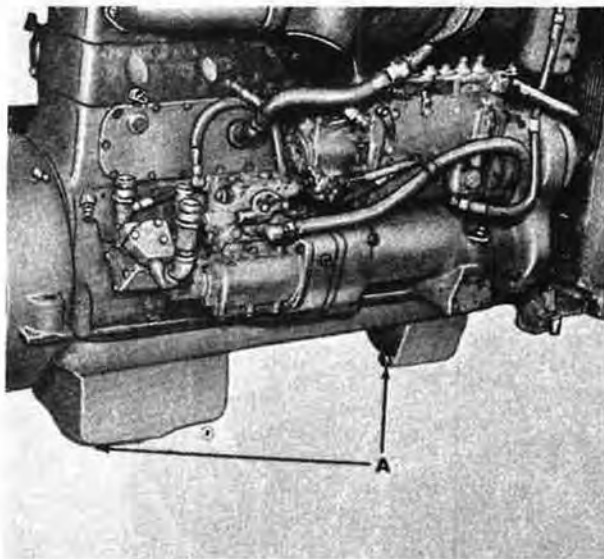
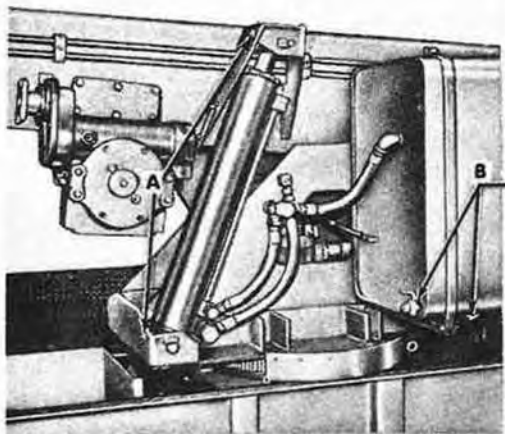


Figure 73. Localized lubrication points (8 of 8).

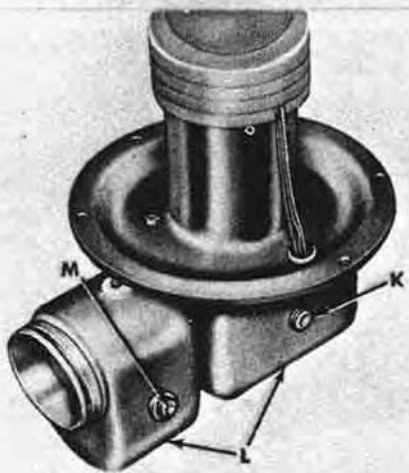
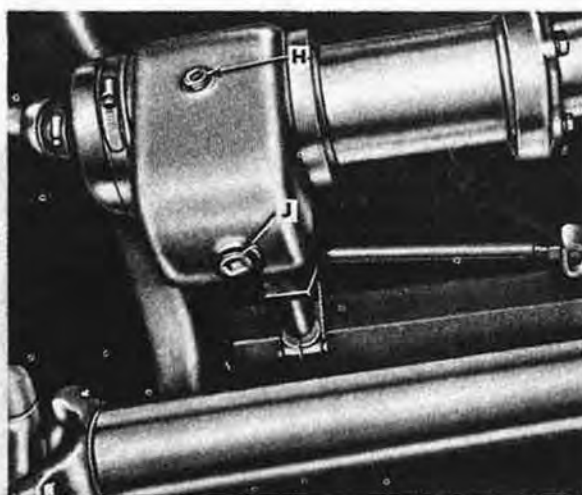
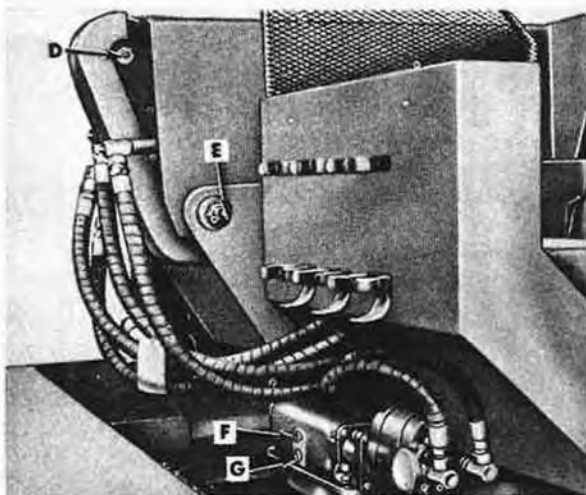
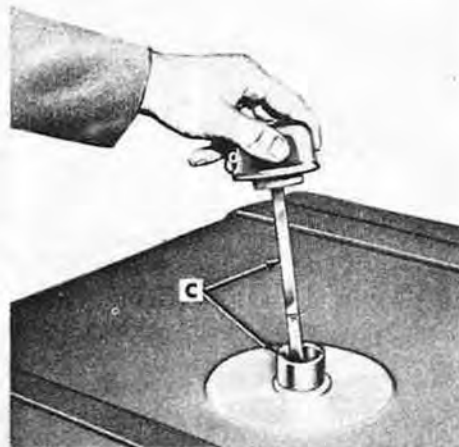




*Figure 74. Localized lubrication points (diesel engine).*



NOTE: TO DRAIN: REMOVE PIPE PLUG FROM DRAIN VALVE AND ATTACH HOSE (FURNISHED WITH MACHINE) AND DRAIN OIL OVERSIDE INTO CONTAINER. REMOVE DRAIN PLUG IN BOTTOM OF TANK TO COMPLETELY DRAIN TANK. ALWAYS REPLACE PLUG IN DRAIN VALVE.



ORD E42917

Figure 75. Localized lubrication points, M543 (1 of 2).

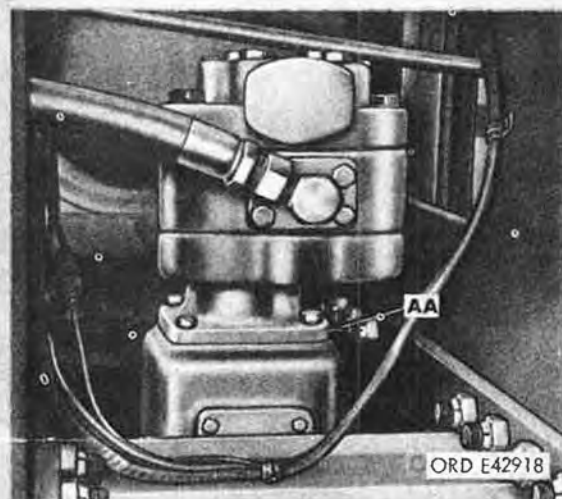
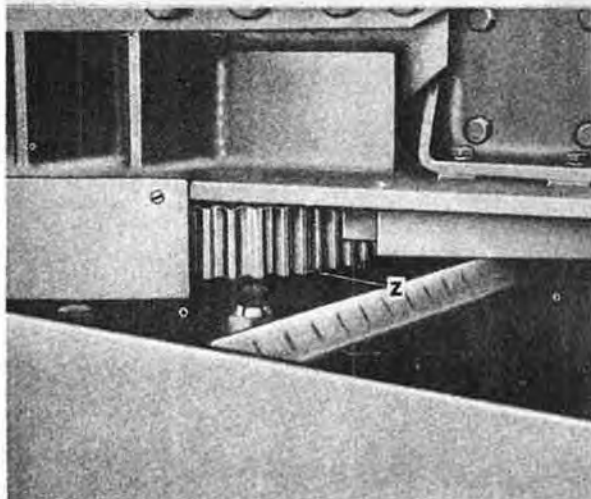
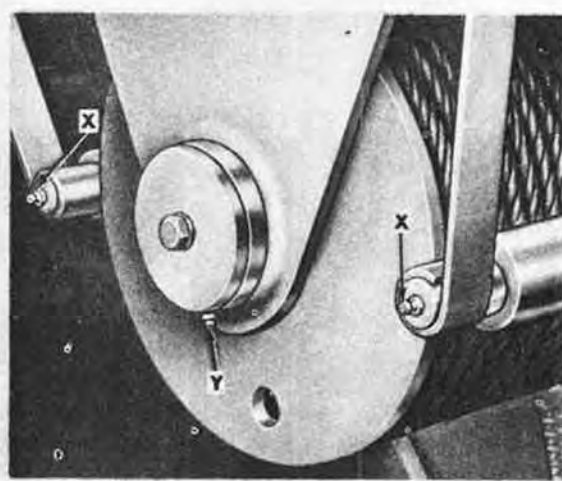
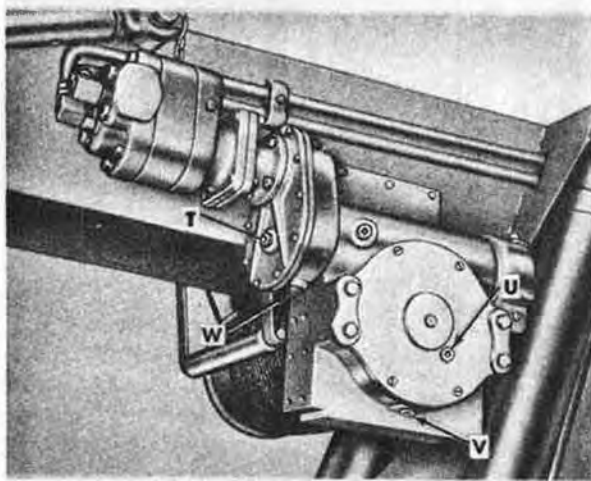
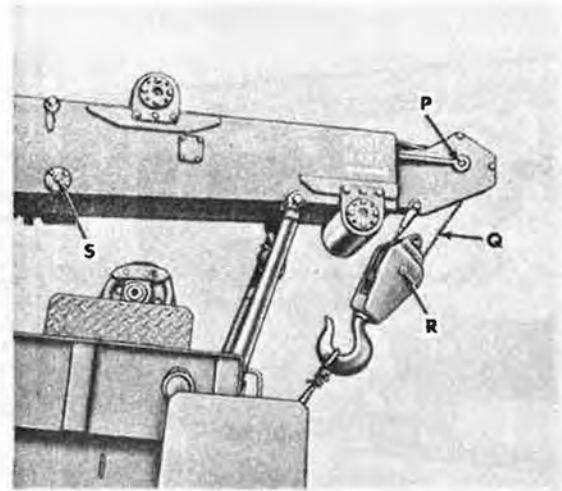
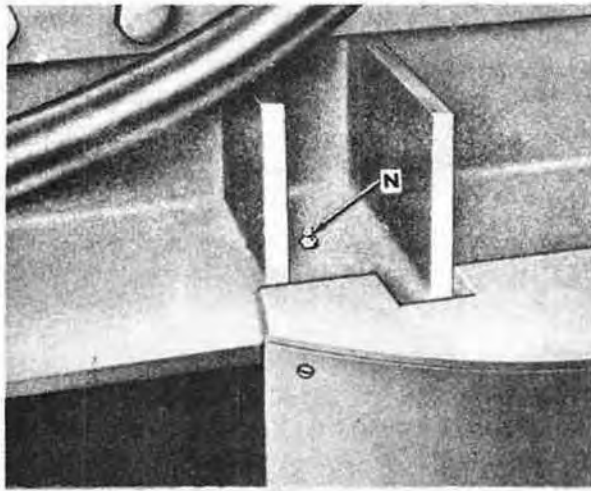


Figure 75. Localized lubrication points, M543 (2 of 2).



### 39. General Lubrication Under Unusual Conditions

a. Service Intervals. Reduce service intervals specified on the lubrication order by lubricating more frequently to compensate for abnormal conditions, extreme temperatures, prolonged periods of high speed operation, continuous operation in sand or dust, immersion in water, or exposure to moisture. Any one of these conditions may cause contamination and destroy the protective qualities of the lubricants.

b. Changing Grades of Lubricants. Lubricants are prescribed according to the following three temperature ranges: above 32°F.; 40°F. to -10°F.; and from 0°F. to -65°F. Change the grade of lubricants whenever weather forecasts indicate air temperatures will be consistently in the next higher or lower temperature range.

c. Maintaining Proper Lubricant Levels. Lubricant levels must be observed closely. Replenish to maintain proper levels whenever necessary.

### 40. Lubrication for Continued Operation Below 0°F.

a. General. Refer to TM 9-207 for necessary special preliminary lubrication of the vehicle.

b. Preparation of Wrecker Crane (M62, M543 and M246) for Subzero Temperatures (Coordinate With Organizational Maintenance).

- (1) Extreme care should be used in preparing the wrecker crane for operation in severe cold weather. Flushing and cleaning of old lubricants from the system is very important.
- (2) Remove the drain plug from bottom of the hydraulic oil reservoir and drain completely. Disconnect all hoses leading to hydraulic and oil motors. The cylinders and motors should then be actuated by external means through a full cycle to void the system of all old oil. Replace and tighten plug in drain valve.
- (3) Remove drain plugs from bottom of the hoist drum worm and drive gear case. On the M62 vehicle, remove drain plugs from the power divider and rear winch assemblies. On the M543 vehicle

remove drain plug from the swinger gear case and bevel gear box assemblies. Drain and flush thoroughly to remove all lubricants from gears and housings.

- (4) On the M62 and M246 vehicles, remove drain plug from bottom of base plate and pivot post ring gear cover plates. Remove all old general purpose grease from drive pinion, idler gears and housings. Flush and clean thoroughly.
- (5) Remove sheaves from boom head and crane block. Flush and clean sheave needle bearings.
- (6) After removing all old lubricants from the crane, install all parts and plugs. Refill entire system with hydraulic oil and lubricants conforming to specifications shown on lubrication order covering temperatures from 0°F. to -65°F.

### 41. Lubrication After Fording Operations (Coordinate With Organizational Maintenance)

a. After Shallow-Water Fording. Lubricate all chassis points to cleanse bearings of water or grit.

b. After Deep-Water Fording. If vehicle has been in deep water for a considerable length of time or was submerged beyond its fording capabilities, precautions should be taken as soon as possible to avoid damage to the engine or other vehicle components as specified below.

- (1) Perform a complete vehicle lubrication in accordance with LO 9-2320-211-12.
- (2) Inspect engine crankcase oil. If water or sludge is found, drain oil and flush the engine with preservative engine oil PE-30. Before refilling with new oil, drain oil filters and install new filter elements.

**Note.** If preservative engine oil is not available, engine lubricating oil OE-30 may be used.

- (3) In order to prevent rusting and corrosion after operation in salt water, it is important that all traces of salt water be washed from every part of the vehicle. Temporary preservation measures should be taken as soon as possible after salt water fording. The

vehicle should then be delivered as soon as practicable to the ordnance maintenance unit.

#### 42. Lubrication After Operation Under Dusty or Sandy Conditions

After operation under dusty or sandy conditions, clean and inspect all lubrication points for fouled lubricants and relubricate as necessary.

**Note.** A lubricant contaminated by dust or sand becomes an abrasive mixture that causes rapid wear of parts.

#### 43. Painting

Refer to TM 9-2851 for instructions pertaining to painting methods and material to be used. Instructions for camouflage painting are contained in FM 5-20B.

### Section III. OPERATION UNDER USUAL CONDITIONS

#### 44. General

The purpose of preventive maintenance services is to detect first signs of electrical and mechanical failures of assemblies in the vehicle and to ensure that corrective action is taken before expensive repairs or replacements are required. The system of preventive maintenance is based on frequent inspections and services performed by the operator and company, battalion, or regimental personnel under active supervision by leaders and commanders.

#### 45. Responsibility

Maintenance performed by the user, operator, or crew of the equipment includes the care, cleaning, preservation and lubrication. These preventive maintenance services are designated as first-echelon maintenance and are shown in Table I.

#### 46. Intervals

To ensure that all important components of the vehicle are checked systematically, two types of recorded preventive maintenance services are specified. The first, covered in this section, is a daily service performed by the operator each day the vehicle is operated. The second type is a Semi-annual or "S" service, which is performed by organizational maintenance (second-echelon) personnel, assisted by the operator.

**a. Daily "A" Services.** Each vehicle will be inspected and serviced by its assigned operator each day it is operated. This service is divided into three parts:

- (1) **Before-operation service.** This is a brief service to determine if the vehicle is ready for operation. Essentially, it is a check to see if con-

ditions affecting the vehicle's readiness have changed since the last after-operation service.

- (2) **During-operation service.** This service consists of observing any unsatisfactory performance. While driving, the operator should be alert for any unusual noises or odors, abnormal instrument readings, steering irregularities, or any other indications of malfunction of the vehicle. All malfunctions detected while driving should be investigated and corrected, if possible, or reported to organizational maintenance personnel.
- (3) **After-operation service.** The purpose of the after-operation service is to prepare the vehicle to operate immediately when its use is required again. This is a basic daily service for all vehicles. After-operation service is particularly important because, at this time, the operator should inspect the vehicle thoroughly to detect any malfunctions that may have developed during operation. Components that require inspection or service, while they are still at operating temperatures, should be checked as soon as possible after parking the vehicle. Operational defects that have occurred during the day must be corrected. Malfunctions which the driver is not authorized to repair must be reported to the squad, section, or platoon leader, or other designated individual.

**Note.** Perform operator's daily "A" preventive-maintenance service according to numbering sequence shown in Table I.

Table I. Daily Preventive Maintenance Service

Before Oper.	During Oper.	After Oper.	Item	Procedure	References	
					Par.	Figure
1		31	<u>Tires</u>	<p><b>Caution:</b> Place all tags describing condition of vehicle in a conspicuous location so they will not be overlooked.</p> <p>Gage tires for correct pressure. Remove penetrating objects such as nails or glass. Check for loss of any apparent air, unusual wear, or missing valve caps.</p>	7e	
2		32	<u>Leaks, General</u>	Look under vehicle for any indication of oil or brake fluid leaks.		
3		33	<u>General Condition</u>	Vehicle, General Condition. Check cab, body, bumper, springs, running gear and shock absorbers for damage. Check complete exterior of vehicle for damage. Clean vehicle as required.		
4		34	<u>Radiator</u>	Check coolant level, fill if required. Check drain valves and cap for tight closure. Check radiator for apparent leaks.		
5		35	<u>Oil Level</u>	Check engine oil level, add oil as required.		LO 9-2320-211-12
6		36	<u>Components</u>	Check belts, connections and linkage for apparent damage. Check generator, and starter for tightness and general condition.		
7			<u>Fuel Filter</u>	Drain water and sediment from fuel filter. Check fuel level, avoid overfilling.	13b	
8	21		<u>Power Steering</u>	Power Steering Reservoir. Check level, add fluid as necessary. Check steering wheel free travel with the vehicle in a straight ahead position. Rotate wheel fully through R and L hand travel ranges. Then rotate steering		LO 9-2320-211-12



Table I. Daily Preventive Maintenance Service - Continued

Before Oper.	During Oper.	After Oper.	Item	Procedure	References	
					Par.	Figure
9		37	<u>Power Steering - Continued</u>	wheel half the number of revolutions counted from the right and left position; wheel should be in the middle of its travel range. A slight drag should be felt when turning the wheel by thumb and forefinger.		
			<u>Battery</u>	Inspect battery cases for cracks and leaks. Inspect cables, terminals, bolts, posts, and holddown frame and water level. Clean and repair as required. Paint metal parts as required.		
			<u>Cab Interior</u>	Check interior of cab for clean condition. Check operation of windows and doors. Check all mirrors for condition. Clean windows.		
			<u>Publications and Forms</u>	Make certain all required manuals, lubrication order, and forms are with vehicle.		
10		38	<u>Lights</u>	Test operation of lights. Clean all vehicle lights prior to operating.	13	24
11		39	<u>Engine</u>	Idle, Acceleration, Power, Noise, Governed Speed. In warming up engine, observe if it starts easily and if action of choke and hand throttle is satisfactory. Notice if idling speed is correct. With engine operating at normal temperature (160° to 180°F), the idle speed should be 400 to 450 rpm for gasoline engine and 550 to 600 rpm for diesel engine. Listen for any unusual noises at idle and high speeds. If engine governed speeds is not within 1950 to 2950 rpm for gasoline and 2100 to 2200 rpm for diesel with no load, listen for any unusual noises when engine is under load. Check instruments, if danger		
12						
13						

Table I. Daily Preventive Maintenance Service - Continued

Before Oper.	During Oper.	After Oper.	Item	Procedure	References	
					Par.	Figure
14	23		<u>Engine - Continued</u>  <u>Instrument Panel</u>	is indicated, stop engine. Report any malfunctions found.  Instrument panel, air pressure gage, ammeter, battery, generator indicator, fuel gage, oil pressure gage and water temperature gage should all show proper readings. Air pressure gage should indicate from 110 to 115 psi. Oil pressure should indicate 15 psi with engine at idle. With engine operating at normal temperature, the temperature gage should read from 160° to 180° F.		
15	24		<u>Clutch</u>	Clutch, Free Travel. See if clutch pedal has at least 2" free travel and if action of pedal return spring is satisfactory. Check for drag, noise, clashing of gears, chatter, grab, and slip. Note whether clutch disengages completely or has a tendency to drag. Observe smoothness of engagement and tendency to chatter, grab, or slip and any unusual noises. With transmission in neutral, depress and release clutch pedal, listening for defective clutch release bearing.		22
16	25		<u>Brakes</u>	Free Travel. See if service brake pedal has not less than 1/4 and not more than 1/2 inch free travel. Check operation of handbrake. Check braking effect, feel, side pull, noise, chatter, hand control (air or electric). Make several stops noting side pull, air-hydraulic cylinder is assisting satisfactorily. Release handbrake and check to see that brake-shoes are free and are completely released from drum. Handbrake is properly ad-		

Table I. Daily Preventive Maintenance Service - Continued

Before Oper.	During Oper.	After Oper.	Item	Procedure	References	
					Par.	Figure
17	26		<u>Brakes - Continued</u>	justed when truck will stop within reasonable distance at 10 mph (60 feet).		21
			<u>Transmission and Transfer</u>	Transmission and Transfer. Check lever action, declutching, vibrations, and noise. Shift transmission and transfer into all speeds, observing any unusual stiffness of shifting levers, tendency to slip out of gear, unusual noise or excessive vibration of shifting levers may indicate loose mountings.		
18	27		<u>Winches</u>	Winches, Power Takeoff. Inspect transmission power takeoff, front winch drum line, drive shaft, and shearpin. Check carefully for broken shearpin. Test operation of front winch. After operating winch, place power takeoff in neutral.		
19	28	40	<u>Crane-Controls</u>	Hydraulic Crane-Controls Valve Bank, Cylinders, Hoist Drum and Worm and Drive Gearset, Hoses, Power Divider, Pump, Governor Control Valve, Shipper and Boom Assembly, Swing Motors, and Drive Shafts. Inspect these items. Look particularly for leaks at hydraulic pump shafts, cylinder piston rods, and hose connections. Observe if governor control valve on power divider (M62) or power takeoff (M246) holds engine at 1,600 rpm. Operate crane through full range of movements, noticing whether pump control linkage and control valve levers operate freely and without sticking. Inspect shipper and boom assembly for bent or broken components. Examine condition of paint and legibility of		



Table I. Daily Preventive Maintenance Service - Continued

Before Oper.	During Oper.	After Oper.	Item	Procedure	References	
					Par.	Figure
20	29	41	<u>Crane-Controls - Continued</u>	markings on identification and caution plates. After operation, place all control levers in neutral.		
			<u>Dump Body</u>	Dump Body and Hoist Assembly-Control Linkage, Cylinders, Drive Shaft, Hoses, Pump Mounting. Inspect these items. Look particularly for leaks at hydraulic pump shaft, cylinder piston rods and hose connections. Operate hoist assembly through full range of movement.		
			<u>Unusual Noises</u>	Check for unusual noises in cab, body, wheels, power train and attachments. When operating vehicle be alert for unusual or excessive noise that may indicate looseness, defects, or deficient lubrication in these areas.		21
			<u>Overheating</u>	Immediately after operating vehicle feel the brakedrums, hubs, axles, transmission, transfer and differential. An overheated wheel hub and brakedrum indicates an improperly adjusted, defective or dry wheel bearing or a dragging brake.		21
		43	<u>Servicing</u>	Clean vehicle, fill fuel tank, and check all lube.		LO 9-2320-211-12

b. Semi-annual "S" Service. Semi-annual "S" service is performed by organizational maintenance personnel. Refer to TM 9-2320-211-20 for complete Semi-annual Service procedures.

#### 47. General Cleaning Instructions

a. General. Instructions and procedures for cleansing the vehicle and its components are as follows:

- (1) Use dry-cleaning solvent or mineral spirits paint thinner to clean or wash grease or oil from all parts of the vehicle.
- (2) A solution of one part grease-cleaning compound to four parts of dry-cleaning solvent or mineral spirits paint thinner may be used for dissolving grease and oil from engine block, chassis and other parts. Use cold water to rinse after cleaning.
- (3) After areas are cleaned and dry, apply a light grade of oil to all polished metal surfaces to prevent rusting.
- (4) When authorized to install new parts, be certain to remove all preservative materials such as rust-preventive compound, protective grease, etc. For parts requiring pre-installation lubrication, apply lubricant as specified in LO 9-2320-211-12.

- (5) Nameplates, caution plates, and instruction plates rust very rapidly. To prevent rusting, clean thoroughly and apply a heavy coating of clear lacquer.

#### b. General Cleaning Precautions.

- (1) Dry-cleaning solvents or mineral spirits paint thinner are flammable and should not be used near an open flame. Use only in well-ventilated places and provide a fire extinguisher when these solutions are used.
- (2) Cleaning solvents evaporate quickly and may have an irritating effect on the skin. Use rubber gloves as a precautionary measure.
- (3) Avoid getting dry-cleaning solvents, mineral spirits paint thinner, or lubricants on rubber parts as they will cause deterioration.
- (4) The use of diesel fuel oil, gasoline or benzene (benzol) for cleaning is prohibited.

#### 48. Operator's Participation in Second-Echelon Preventive Maintenance

The operator should accompany the vehicle and assist organizational maintenance mechanics while periodic organizational preventive-maintenance services are being performed. Ordinarily, the operator should present the vehicle in a reasonably clean condition.

### Section IV. TROUBLESHOOTING

#### 49. Scope

This section contains troubleshooting information for locating and correcting some of the troubles that may develop in the vehicle. Troubleshooting is a systematic isolation of defective components by means of an analysis of trouble symptoms, testing to determine the defective component, and applying remedies. In the majority of instances, the operator can only note trouble symptoms by the detection of strange or unusual noises, odors, or conditions, and reporting these symptoms to organizational maintenance personnel for further action.

#### 50. Troubleshooting Tables

Table II is a troubleshooting chart listing malfunctions of the vehicle chassis components

together with the probable cause and corrective action to be taken by the operator or crew. Table III is a troubleshooting chart listing malfunctions of materiel used in conjunction with the vehicle and includes the front winch, rear winch, hydraulic crane assembly, dump body hoist assembly, and fifth wheel assembly.

Only corrective action that can be taken by the operator or crew is given in these tables. Any malfunction occurring that is not covered herein should be reported immediately to organizational maintenance personnel.

Table II. Troubleshooting

Malfunction	Probable causes	Corrective action
	<b>ENGINE</b>	
1. Engine fails to crank when starter is actuated.	<u>a.</u> Batteries discharged. <u>b.</u> Loose battery cables or wiring connections. <u>c.</u> Mechanical seizure of starter or engine.	<u>a.</u> Notify organizational maintenance. <u>b.</u> Notify organizational maintenance. <u>c.</u> Notify organizational maintenance.
2. Engine cranks but fails to start.	<u>a.</u> Fuel tank empty.  <u>b.</u> Combustion chambers flooded with fuel (gasoline engine.)  <u>c.</u> Spark not reaching spark plugs. <u>d.</u> Insufficient amount of air in delivery system. <u>e.</u> Defective ignition system.	<u>a.</u> Fill fuel tank. Note. Check for visible leaks before filling fuel tank. If fuel leaks are found, notify organizational maintenance. <u>b.</u> Push choke in, open throttle plate, and crank engine to clean out excess fuel. If flooding continues, notify organizational maintenance. <u>c.</u> Notify organizational maintenance. <u>d.</u> Notify organizational maintenance. <u>e.</u> Notify organizational maintenance.
3. Engine cranks but fails to start (gasoline fuel supply and ambient temperature below 20°F. or diesel fuel supply and ambient temperature below 0°F).	<u>a.</u> See probable causes in malfunction 2 above. <u>b.</u> Manifold heater not energized. <u>c.</u> Defective manifold heater operation.	<u>a.</u> See corrective action under 2 above. <u>b.</u> Energize manifold switch. <u>c.</u> Notify organizational maintenance.
4. Engine starts but misfires or does not run smoothly.	<u>a.</u> Defective fuel, ignition, or air delivery system. <u>b.</u> Manifold heater operation required.	<u>a.</u> Notify organizational maintenance. <u>b.</u> Turn on manifold heater switch.
5. Engine will not idle.	<u>a.</u> Carburetor out of adjustment (gasoline engine). <u>b.</u> Defective fuel or air delivery system.	<u>a.</u> Notify organizational maintenance. <u>b.</u> Notify organizational maintenance.
6. Engine overheats as indicated by temperature gage.	<u>a.</u> Low radiator coolant level.	<u>a.</u> Fill radiator with coolant. In freezing weather, add antifreeze. (Refer to TM 9-207.) Check for visible coolant leaks. If detected, notify organizational maintenance.

Table II. Troubleshooting - Continued

Malfunction	Probable causes	Corrective action
	<b>ENGINE—Continued</b>	
7. Engine does not develop full power.	<u>b.</u> Low oil level in engine crankcase. <u>a.</u> Defective fuel, cooling, or air delivery system. <u>b.</u> Brakes not releasing.	<u>b.</u> Add proper grade of oil as specified in LO 9-2320-211-12. <u>a.</u> Notify organizational maintenance. <u>b.</u> Notify organizational maintenance.
8. Low oil pressure.	<u>a.</u> Low engine oil level. <u>b.</u> Incorrect oil viscosity for climate conditions.	<u>a.</u> Add proper grade of oil as specified in LO 9-2320-211-12. <u>b.</u> Change oil to grade specified in LO 9-2320-211-12.
9. Excessive oil consumption.	<u>a.</u> Improper grade of oil in use. <u>b.</u> External oil leaks. <u>c.</u> Worn internal engine parts.	<u>a.</u> Change oil to grade specified in LO 9-2320-211-12. <u>b.</u> Perform visual inspection of engine. If leaks are found, notify organizational maintenance. <u>c.</u> Notify organizational maintenance.
10. Excessive exhaust smoke.	<u>a.</u> Worn internal engine parts. <u>b.</u> One or more cylinders not firing due to restriction in injection nozzles (diesel engine) or intake manifold. <u>c.</u> Partially restricted air cleaner. <u>d.</u> Turbocharger not operating (diesel engine). <u>e.</u> Injector timing is late.	<u>a.</u> Notify organizational maintenance. <u>b.</u> Notify organizational maintenance. <u>c.</u> Notify organizational maintenance. <u>d.</u> Notify organizational maintenance. <u>e.</u> Notify organizational maintenance.
	<b>CLUTCH, TRANSMISSION, AND TRANSFER</b>	
1. Hard or impossible to engage or disengage transmission gears.	<u>a.</u> Clutch not releasing. <u>b.</u> Congealed oil in transmission.	<u>a.</u> Notify organizational maintenance. <u>b.</u> Change oil to grade specified in LO 9-2320-211-12.
2. Transmission jumps out of gear.	<u>a.</u> Power train windup. <u>b.</u> Transfer linkage out of adjustment. <u>c.</u> Defective transmission.	<u>a.</u> Notify organizational maintenance. <u>b.</u> Notify organizational maintenance. <u>c.</u> Notify organizational maintenance.



Table II. Troubleshooting - Continued

Malfunction	Probable causes	Corrective action
	<b>CLUTCH, TRANSMISSION, AND TRANSFER—Continued</b>	
3. Transfer case lever will not shift.	Defective linkage or internal malfunction.	Notify organizational maintenance.
4. Excessive or unusual noises or vibrations while driving or at a stop.	Mechanical defect in power train.	Notify organizational maintenance.
	<b>ELECTRICAL</b>	
1. Instrument panel electrical components inoperative.	Defective electrical system.	Notify organizational maintenance.
2. Generator charge indicator shows low reading.	Defective regulator or generator.	Notify organizational maintenance.
3. Fuel gage fails to register with operating switch on and fuel in tank.	Defective electrical system or fuel level sending unit.	Notify organizational maintenance.
4. Horn does not sound when horn button is pressed.	Loose electrical connection.	Notify organizational maintenance.
5. Vehicle lights do not respond to selection of light switch.	Bulbs burned out, faulty switch, circuit or wiring.	Notify organizational maintenance.
6. Trailer electrical outlet receptacle inoperative.	Defective electrical system or receptacle.	Notify organizational maintenance.
	<b>BRAKES</b>	
1. Parking brake will not hold vehicle on incline up to a 60% grade.	Parking brake not properly adjusted; worn or damaged.	Notify organizational maintenance.
2. Parking brake drags and overheats.	a. Brake partially applied. b. Brake improperly adjusted, worn or damaged parts.	a. Release parking brake lever completely. b. Notify organizational maintenance.
3. Service brakes grab or vehicle pulls to one side when brakes are applied.	Improper brake adjustment, worn or damaged parts.	Notify organizational maintenance.

Table II. Troubleshooting - Continued

Malfunction	Probable causes	Corrective action
<b>BRAKES—Continued</b>		
4. Service brakes fail completely (pedal goes to floor and fails to brake vehicle).	Defective brake system.	Notify organizational maintenance.
5. Brakes fail on first application but function after pumping action.	<u>a.</u> Low brake fluid. <u>b.</u> Worn or defective parts.	<u>a.</u> Notify organizational maintenance. <u>b.</u> Notify organizational maintenance.
6. Brake pedal hard but poor braking action.	Worn or defective parts.	Notify organizational maintenance.
7. Service brakes do not release.	Dirt in cylinders or brake lines, or worn and defective parts.	Notify organizational maintenance.
8. Brakes chatter.	Improperly adjusted or defective parts.	Notify organizational maintenance.
9. Brakes do not hold vehicle on slopes up to 60%.	Defective air-hydraulic brake system.	Notify organizational maintenance.
10. Spongy brake action.	Air in hydraulic system or insufficient amount of hydraulic fluid.	Notify organizational maintenance.
<b>WHEELS, TIRES, AND SUSPENSION</b>		
1. Vehicle wanders or pulls to one side on level pavement. Note. Sloping roads or terrain will cause vehicle to pull to one side.	<u>a.</u> Low (incorrect) air pressure in tires. <u>b.</u> Improper wheel alignment. <u>c.</u> Brakeshoes stuck or dragging.	<u>a.</u> Inflate tires to proper air pressure. <u>b.</u> Notify organizational maintenance. <u>c.</u> Notify organizational maintenance.
2. Tire wear excessive or uneven.	<u>a.</u> Incorrect tire pressure. <u>b.</u> Defective shock absorber, weak or broken spring shackles or wheel loose on spindle or hub. <u>c.</u> Bent wheel. <u>d.</u> Improper wheel alignment (front).	<u>a.</u> Inflate tires to proper air pressure. <u>b.</u> Notify organizational maintenance. <u>c.</u> Replace tire and wheel assembly, and notify organizational maintenance. <u>d.</u> Notify organizational maintenance.

Table II. Troubleshooting - Continued

Malfunction	Probable causes	Corrective action
	<b>WHEELS, TIRES, AND SUSPENSION—Continued</b>	
3. Shimmy at low or high speeds.	Tires out of balance or other mechanical out-of-balance defect.	Notify organizational maintenance.
4. Hot or noisy wheel hubs.	<u>a.</u> Lack of lubrication. <u>b.</u> Defective or damaged bearings.	<u>a.</u> Notify organizational maintenance. <u>b.</u> Notify organizational maintenance.
	<b>CONTROLS AND INSTRUMENTS</b>	
1. Backlash in steering.	Steering mechanism improperly adjusted or worn or defective parts.	Notify organizational maintenance.
2. Vehicle is hard to steer.	<u>a.</u> Front tires are under inflated. <u>b.</u> Lack of lubrication. <u>c.</u> Defective hydraulic power steering system.	<u>a.</u> Inflate tires to proper pressure. <u>b.</u> Notify organizational maintenance. <u>c.</u> Notify organizational maintenance.
3. Steering drive. (Tendency of vehicle, when turned in any direction, to turn more rapidly than normal.)	<u>a.</u> Underinflated tire. <u>b.</u> Flat tire. <u>c.</u> Defective steering system.	<u>a.</u> Inflate tire to proper pressure. <u>b.</u> Replace tire and wheel assembly, and notify organizational maintenance. <u>c.</u> Notify organizational maintenance.
4. Windshield wiper does not work, or operates slowly.	<u>a.</u> Defective windshield wiper motor. <u>b.</u> Leak in air line to motor.	<u>a.</u> Notify organizational maintenance. <u>b.</u> Notify organizational maintenance.
5. Noisy speedometer.	<u>a.</u> Lack of lubrication on flex drive shaft. <u>b.</u> Defective or worn parts.	<u>a.</u> Notify organizational maintenance. <u>b.</u> Notify organizational maintenance.
6. Speedometer inoperative.	Drive shaft broken or worn and damaged parts.	Notify organizational maintenance.

Table III. Troubleshooting - Auxiliary Materiel

Malfunction	Probable causes	Corrective action
<b>FRONT WINCH</b>		
1. Winch drum does not turn.	<u>a.</u> Power take-off not engaged. <u>b.</u> Broken shearpin. <u>c.</u> Faulty drum clutch. <u>d.</u> Improper control linkage adjustment.	<u>a.</u> Engage power take-off. <u>b.</u> Notify organizational maintenance. <u>c.</u> Notify organizational maintenance. <u>d.</u> Notify organizational maintenance.
2. Winch does not sustain load.	Faulty automatic brake.	Notify organizational maintenance.
3. Winch drum spins too fast when unwinding cable.	Faulty drag brake.	Notify organizational maintenance.
<b>REAR WINCH</b>		
1. Winch drum does not turn.	<u>a.</u> Broken shearpin. <u>b.</u> Power divider inoperative.	<u>a.</u> Notify organizational maintenance. <u>b.</u> Notify organizational maintenance.
2. Winch does not sustain load.	Faulty automatic brake.	Notify organizational maintenance.
3. Noisy operation.	Insufficient lubrication.	Add lubricant as specified in LO 9-2320-211-12. If noise persists, notify organizational maintenance.
4. Cable does not wind evenly on drum.	Improperly adjusted cable tensioner.	Notify organizational maintenance.
<b>HYDRAULIC CRANE</b>		
1. Lack of power Note. Be sure transmission is in fifth speed to provide proper pump speed.	<u>a.</u> Oil level low in hydraulic reservoir. <u>b.</u> Oil supply valve not fully open. <u>c.</u> Incorrect governor setting. <u>d.</u> Leaks in hydraulic connections. <u>e.</u> Defective relief valve.	<u>a.</u> Add oil as specified in LO 9-2320-211-12. <u>b.</u> Open oil supply valve completely. <u>c.</u> Notify organizational maintenance. <u>d.</u> Inspect and tighten all hydraulic connections if leaking. <u>e.</u> Notify organizational maintenance.
2. Crane does not lift smoothly.	<u>a.</u> Low oil level in reservoir. <u>b.</u> Air in hydraulic system. <u>c.</u> Defective relief valve.	<u>a.</u> Refer to 1a. <u>b.</u> Operate crane through all movements several times. <u>c.</u> Notify organizational maintenance.
3. Swing motor does not rotate crane smoothly.	Defective valve at control bank.	Notify organizational maintenance.



Table III. Troubleshooting - Continued

Malfunction	Probable causes	Corrective action
<b>HYDRAULIC CRANE—Continued</b>		
4. Engine speed erratic during crane operation.	<u>a.</u> Air leaks in governor lines.	<u>a.</u> Notify organizational maintenance.
	<u>b.</u> Defective governor valve control valve.	<u>b.</u> Notify organizational maintenance.
5. Noisy hydraulic pump.	<u>a.</u> Low oil level in hydraulic oil reservoir.	<u>a.</u> Refer to 1a.
	<u>b.</u> Defective hydraulic pump.	<u>b.</u> Notify organizational maintenance.
6. Failure of levers on control valve bank assembly to return to Neutral after operation.	Defective control valve bank assembly.	Notify organizational maintenance.
<b>DUMP BODY HOIST ASSEMBLY</b>		
1. Hoist assembly does not raise dump body.	<u>a.</u> Low oil level in hydraulic oil reservoir.	<u>a.</u> Add oil as specified in LO 9-2320-211-12.
	<u>b.</u> Leak in hydraulic system.	<u>b.</u> Inspect and tighten all connections as required. If leak persists, notify organizational maintenance.
	<u>c.</u> Power take-off inoperative.	<u>c.</u> Notify organizational maintenance.
	<u>d.</u> Hydraulic pump inoperative.	<u>d.</u> Notify organizational maintenance.
	<u>e.</u> Damaged control linkage.	<u>e.</u> Notify organizational maintenance.
2. Hoist assembly does not raise dump body smoothly.	<u>a.</u> Low oil level in hydraulic reservoir.	<u>a.</u> Refer to 1a.
3. Body raises to full dump but does not power down.	<u>a.</u> Improper control linkage adjustment.	<u>a.</u> Notify organizational maintenance.
	<u>b.</u> Leak in hydraulic system.	<u>b.</u> Refer to 1b.
4. Noisy hydraulic pump.	<u>a.</u> Low oil level in hydraulic oil reservoir.	<u>a.</u> Refer to 1a.
	<u>b.</u> Defective pump.	<u>b.</u> Notify organizational maintenance.
<b>FIFTH WHEEL ASSEMBLY</b>		
Troubleshooting of the fifth wheel assembly consists of visual inspection for cracked or broken components, and to ensure that the unit is securely mounted. If unit is loose, tighten mounting screws. If any components are cracked or broken, or unit does not couple properly notify organizational maintenance personnel.		

## Section V. OPERATION UNDER UNUSUAL CONDITIONS

### 51. Extreme Cold-Weather Maintenance Problems

a. The time required to warm up a vehicle so that it is operable at temperatures as low as  $-50^{\circ}\text{F}$ . may approach two hours. Vehicles in poor mechanical condition probably will not start at all, or only after many hours of laborious maintenance and heating. Complete winterization, diligent maintenance, and well-trained crews are the key to efficient arctic winter operations.

b. Refer to TM 9-207 and TB ORD 193 for general information on extreme cold-weather maintenance procedures.

### 52. Extreme Cold-Weather Maintenance

Refer to TM 9-207 for a general discussion of maintenance problems, the application of antifreeze compounds, and arctic-type lubrication, handling of storage batteries in extreme cold, and de-winterization procedure.

### 53. Extreme Hot-Weather Maintenance Problems

In areas of operation where high temperatures are anticipated, extreme care must be exercised in checking the vehicle's cooling system and battery electrolyte level due to the rapid rate of evaporation. Where the climate is damp, the problem of corrosion of all parts of the vehicle presents itself and is usually indicated by rust, paint blisters, and fungus growth. The deterioration of the insulation on electrical cables and wires also presents a problem because of the existing danger of short circuits.

### 54. Extreme Hot-Weather Maintenance

a. Cooling System. Thoroughly clean and flush the cooling system at frequent intervals. Keep system filled to coolant level cock, with clean water when operating in extremely high temperatures. Formation of scale and rust in the cooling system occurs more rapidly during operation in extremely high temperatures; therefore, corrosion inhibitor compound should always be added to the cooling liquid. Avoid the use of water that contains alkali or other substances which may cause scale and rust formations. Use soft water whenever possible.

### b. Batteries.

- (1) Electrolyte level. In torrid zones, check level of electrolyte in cells daily and replenish, if necessary, with pure distilled water. If this is not available, rain or drinking water may be used. However, continuous use of water with high mineral content will eventually cause damage to batteries and should be avoided.
- (2) Self-discharge. A battery will self-discharge at a greater rate at high temperatures if standing for long periods. This must be considered when operating in torrid zones. If necessary to park for several days, remove batteries and store in a cool place.

**Note.** Do not store acid-type storage batteries near stacks of tires, as the acid fumes have a harmful effect on rubber.

### c. Chassis and Body.

- (1) In hot, dry climates, a careful watch must be kept for evidence of the presence of moths and termites.
- (2) In hot, damp climates, corrosive action will occur on all parts of the vehicle and will be accelerated during the rainy season. Evidence will appear in the form of rust, paint blisters on metal surfaces, and mildew, mold, or fungus growth on fabrics, leather, and glass.
- (3) Protect exterior surfaces from corrosion by touch-up painting and keep a film of engine lubricating oil (OE-10) on unfinished exposed metal surfaces. Cables and terminals should be protected by ignition insulation compound.
- (4) Make frequent inspections of idle, inactive vehicles. Remove corrosion from exterior metal surfaces with abrasive paper or cloth and apply a protective coating of paint, oil, or suitable rust preventive.

## 55. Maintenance After Fording

a. General. Although the vehicle unit housings are sealed to prevent the free flow of water into the housings, it must be realized that, due to the necessary design of these assemblies, some water may enter, especially during submersion. The following services should be accomplished on all the vehicles which have been exposed to some depth of water or completely submerged, especially in salt water. Precautions should be taken as soon as practicable to halt deterioration and avoid damage before the vehicle is driven extensively in regular service.

b. Body and Chassis. Drain and clean out body, engine, and tool compartment. Clean all exposed surfaces and touch up paint where necessary. Coat unpainted metal parts with engine lubricating oil (OE-10). Lubricate the chassis thoroughly as directed in the lubrication order. Do more than the usual lubrication job, making sure the lubricant is forced into each lubrication point to force out any water present.

c. Engine, Transmission, Transfer Case and Axles. Check the lubricant in the engine, transmission, and final drives. Should there be evidence that water has entered, drain, flush, and refill with the correct lubricant. Remove and clean engine and transmission oil filter.

d. Wheels and Brakes. Remove the front wheels and flush out the knuckle housings with a half-and-half mixture of engine lubricating oil (OE-10) and dry-cleaning solvent or mineral spirits paint thinner. Refill to filler plug level with correct lubricant. Remove rear wheels. Wash all wheel bearings thoroughly with dry-cleaning solvent or mineral spirits paint thinner. Then, repack, assemble, and adjust. While the wheels are removed, dry out brake linings and clean rust and scum from brake drum face. Check brake system for presence of water.

e. Batteries. Check the batteries for quantity and specific gravity of electrolyte to be sure no water entered through the vent caps. This is of special importance if the vehicle was submerged in salt water.

f. Steering Gear. Remove and disassemble steering gear. If the lubricant is contaminated, clean the housing thoroughly with a half-and-

half mixture of engine lubricating oil (OE-10) and dry-cleaning solvent or mineral spirits paint thinner. Assemble, refill with correct grade of lubricant, and adjust steering gear.

g. Electrical Connections. Check all electrical connections for corrosion, particularly the bayonet-type connectors.

h. Fuel System. Drain fuel tanks of any accumulated water; clean fuel filter and lines as necessary. If water is found in the air cleaner, clean and refill with oil.

i. Distributor. Remove the distributor cap, and check to see if any water has entered the distributor. If water is present, drain, clean, and lubricate the distributor as required.

j. Condensation. Although most units are sealed, the sudden cooling of the warm interior air upon submersion may cause condensation of moisture within the cases or instruments. A period of exposure to warm air after fording should eliminate this condition. Cases which can be opened may be uncovered and dried.

k. Aluminum or Magnesium Parts. If vehicle remains in salt water for any appreciable length of time, aluminum or magnesium parts which are exposed to the water will probably be unfit for further use and must be replaced.

l. Deep-Water Fording. Refer to TM 9-238 for general deep-water fording information.

## 56. Maintenance After Operation on Unusual Terrain

a. Mud. Thorough cleaning and lubrication of all parts affected must be accomplished as soon as possible after operation in mud. Clean radiator fins and interior of engine compartment. Repack wheel bearings if necessary. Clean, oil, and stow the chains in vehicle.

b. Sand or Dust. Clean engine and engine compartment. Touch up all painted surfaces damaged by sandblasting. Lubricate completely to force out lubricants contaminated by sand or dust. Air cleaners, fuel filters and oil filters must be cleaned daily. Clean radiator fins daily with compressed air. Cover engine grilles and other exposed vents with cloth at all times.



## CHAPTER 4

### MATERIEL USED IN CONJUNCTION WITH MAJOR ITEM

#### 57. Operation of Hot-Water Personnel Heater Kit

The heater blower is controlled by a single-pole, double-throw toggle switch having OFF, LOW, and HIGH positions. Dampers within the heater defroster assembly and the elbow adapter are operated by pulling out the DEFROSTER and AIR knobs. When the defroster knob is pulled all the way out, heated air is deflected onto the windshield. When the knob is pushed all the way in, the heat outlet to the cab is opened and heated air flows directly into the vehicle cab. Intermediate positions of the knob will distribute heated air in varying proportions to both the windshield and cab. The position of the air control knob limits the amount of outside air to the cab.

**Caution:** When the windshield is heavily coated with ice, frost, or snow, and the temperature is 0°F., direct heated air from the defroster into the cab in greater proportion than onto the windshield. This will avoid damage to the glass due to the sudden temperature change.

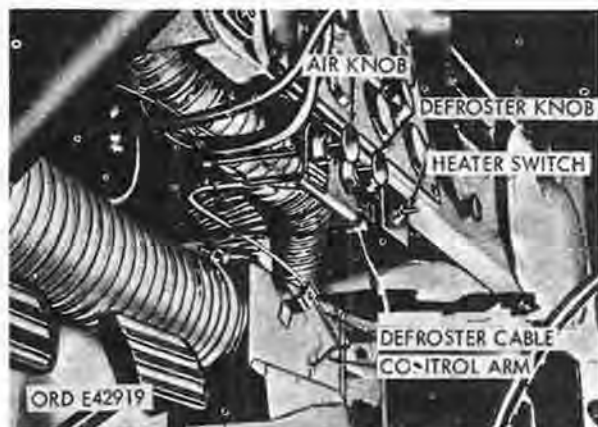


Figure 76. Hot water personnel heater.

#### 58. Operation of Personnel Heater Kit

The flow of heat is controlled by pulling the adapter heat control cable out to the desired position. Heat to the cab and/or defrosters is controlled by pulling the

diverter heat control cable out to suit the desired proportions. To operate the heater, turn the HI-LO switch to HI position. Turn the heater switch to START position and hold in this position until the indicator light glows, then snap the switch to RUN position. Within two minutes, warm air should be felt at the heat diverter outlet.

**Note.** If heater does not ignite after three attempts, notify organizational maintenance. To stop the heater, snap the heater switch to OFF. Burning in the heater will stop within 45 seconds, but the fans will continue to operate for two minutes to cool and purge the heater.

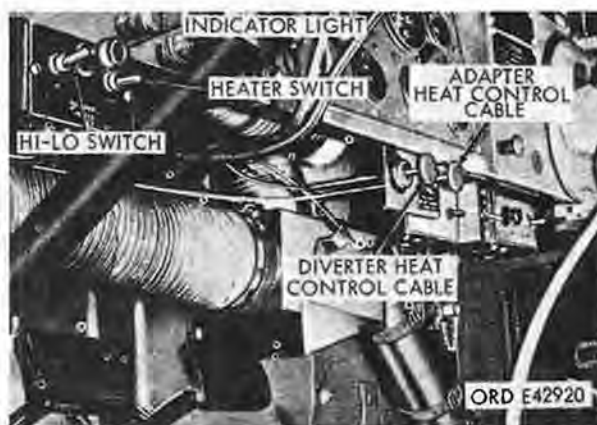


Figure 77. Personnel heater controls.

#### 59. Operation of the Power Plant Heater Kit

a. **Description.** The power plant heater kit is for use only in areas where the normal temperature during the coldest period of the year is -25°F. or lower. The unit consists of two electrically actuated heaters mounted on the frame in the battery compartment of the vehicle. Using gasoline from the vehicle fuel system for operation, the heaters warm the engine coolant to facilitate starting and to maintain near-normal engine operating temperatures during standby periods. In addition, exhaust gases from the front heater warm the crankcase lubricant, while the exhaust gases from the rear heater warm the



transmission lubricant. The heaters should not be used while the vehicle is in motion, but only for overnight or standby heating of the engine coolant, and crankcase and transmission lubricants when the engine is stopped.

**b. Operation.** Each heater is equipped with a separate starting switch. To start either the front or rear heater, proceed as follows:

- (1) Press in circuit breaker reset button.
- (2) Check electrical circuit by pressing knob on indicator light.
- (3) Move fuel pump switch to ON.
- (4) Hold heater switch in START position until indicator light glows.
- (5) Move heater switch to RUN.

**Note.** If either heater fails to start within five minutes, move fuel pump and heater switches to OFF position and notify organizational maintenance.

**c.** To stop either heater, move fuel pump and heater switches to OFF position and wait for indicator light to go out.

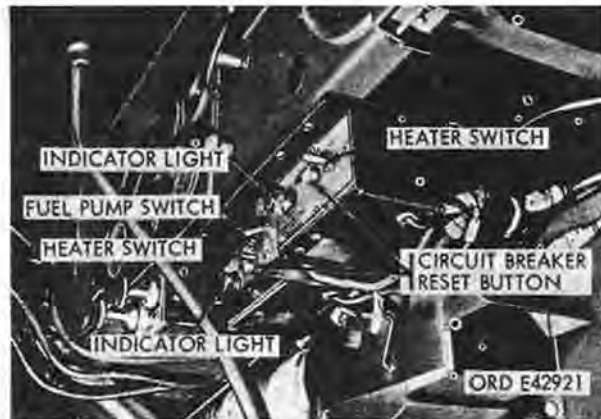


Figure 78. Power plant heater controls.

## 60. Operation of Deep-Water Fording Kit

**a.** The deep-water fording kit is designed for deep-water fording of the vehicles. Fording kits provide for engine air intake and exhaust above expected water level by extensions, ventings, seals and sealants.

**b.** Preparation of the vehicle for deep-water fording should be coordinated with organizational maintenance. Refer to TM 9-238 for general information and methods of use of deep-water fording kits.

**c.** Both the gasoline and diesel engines of the vehicles are equipped with crankcase ventilating shutoff valves. Before entering deep water, the operator must pull out the crankcase ventilating shutoff valves control handle located on the right side of the instrument panel. Immediately on leaving the water, the control must be pushed all the way in. After deep-water fording the operator should inspect, lubricate, and service the vehicle in accordance with paragraphs 41 and 55.



Figure 79. Crankcase ventilating shutoff valves control.

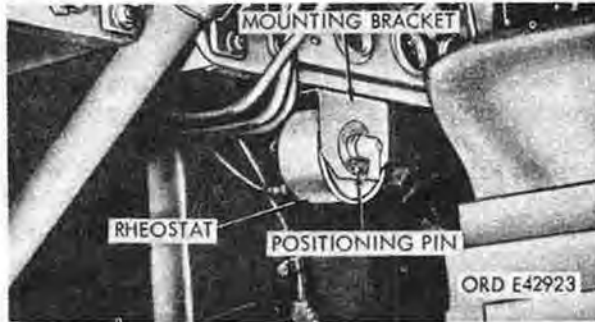
## 61. Operation of Electric Brake Kit

**a. General.** The electric brake kit is designed for use as an accessory on wheeled vehicles utilized as prime movers for trailers or towed artillery equipped with electric brakes. The two main components of the kit are a waterproof, 24-volt, air-operated controller assembly mounted on the left rear cross member of the vehicle, and a 24-volt rheostat, mounted on the instrument panel flange, which regulates current going to the controller. The rheostat setting corresponds to the capacity of the electric brake system on the towed or trailer load.

**b. Operation.** The rheostat setting is directly proportional to the towed load. The

lighter the load, the smaller the numerical rheostat setting required (or less current); the heavier the towed load, the greater the numerical rheostat setting. A precise rheostat setting for a given load is determined through operation experience. Maximum braking effort is obtained with the highest rheostat setting and 61 psi, plus or minus 5 psi, in the compressed air system.

**Note.** The electric brake kit is designed so that the electric brakes on the towed load will operate **ONLY** when the vehicle brake pedal is depressed and not when the rheostat is manipulated.



*Figure 80. Electric brake rheostat installed on flange.*

## CHAPTER 5

### SHIPMENT AND DEMOLITION TO PREVENT ENEMY USE

#### Section I. SHIPMENT

##### 62. Domestic Shipping Instructions

When shipping the 5-ton 6x6 trucks covered in this manual, the officer in charge of preparing shipments will be responsible for a vehicle being shipped in a serviceable condition, and properly processed for shipment, including the preparation of Army shipping documents.

**Note.** Refer to TM 9-2320-211-20 for complete storage and shipment instructions.

##### 63. Loading and Blocking Instructions

The operator, crew, or driver may assist, as required, in the loading and blocking of the material on railroad cars.

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

##### 64. General

a. Destruction of the 5-ton, 6 x 6 trucks, covered in this manual, when subject to capture or abandonment in the combat zone, will be undertaken by the using army only when, in the judgment of the unit commander concerned, such action is necessary in accordance with orders of, or policy established by, the Army commander.

b. The information which follows is for guidance only. Certain of the following procedures require the use of explosives and incendiary grenades which normally may not be authorized items of issue to the using organization. The issue of these, and related materials, and the conditions under which destruction will be effected, are command decisions in each case, according to the tactical situation at hand. Of the several means of destruction, those most generally applicable are --

Mechanical . . . . . Requires axe, pick mattock, sledge, crowbar, or similar implement.

Burning . . . . . Requires gasoline, oil, incendiary grenades, or other flammables.

Demolition . . . . . Requires suitable explosives or ammunition.

Gunfire . . . . . Requires employment of artillery fire, rocket launcher fire, rifle grenade fire, or small arms fire.

c. In general, destruction of essential parts, followed by burning, will usually be sufficient to render the vehicle useless. However, selection of the particular method, or combination of methods for destruction, requires resourcefulness in the utilization of the facilities at hand under existing conditions. Time is usually critical.

d. If destruction to prevent enemy use is resorted to, the vehicle must be so badly damaged that it cannot be restored to a usable condition in the combat zone, either by repair or by cannibalization. Adequate destruction requires that all parts essential to the operation of the materiel, including essential repair parts, be destroyed or damaged beyond repair. For components with security classification, complete destruction beyond any identification is required. However, when lack of time or personnel prevents destruction of all parts, priority must be given to those parts having a security classification, and those parts most difficult to replace. Equally important, the same essential parts must be destroyed on all like materiel, so that the enemy cannot construct one complete unit from several damaged ones.

e. If destruction is directed, due consideration should be given to:

- (1) Selection of a site for destruction which will cause greatest obstruction and danger to enemy movement and also prevent a hazard to friendly troops through fragments or ricocheting projectiles which may occur incidental to the destruction.
- (2) Observance of appropriate safety precautions.

## 65. Destruction of Materiel

### a. Method No. 1 -- By Burning.

- (1) Remove and empty portable fire extinguishers.
- (2) Using an axe, pick-mattock, sledge, or other heavy equipment, smash all vital elements such as generator, fuel pump, fuel injector pump and injector (diesel), air cleaner, lights, instruments, and controls. If time permits, and a sufficiently heavy implement is available, smash the engine cylinder block and head, crankcase, and transmission.
- (3) Slash tires. If tires are inflated, exercise care to prevent injury in case any tire should blow out while being slashed. Whenever time permits, it is preferable that the tires be deflated before being slashed.
- (4) Explosive ammunition, if available nearby, should be removed from packing or other protective material. Place ammunition on and about the vehicle, so that it will be fully exposed to the fire in such locations that the greatest damage will result from its detonation. Remove any safety devices from the ammunition. Place combustibles such as wood, paper, or rags on or about the vehicle.
- (5) Remove the drain plug from the fuel tank, or puncture it as near the bottom as possible. Collect as much of the fuel as possible, to use as prescribed in step (6) below.
- (6) With the hood open to admit air for combustion, pour fuel and oil in and over the entire vehicle. Ignite by means of an incendiary grenade fired

from a safe distance, by a burst from a flame thrower, by a combustible train of suitable length, or by any other safe, appropriate means. Take cover immediately. A hot fire is required to render the vehicle useless.

**Warning:** Cover must be taken without delay since an early explosion of explosive ammunition, if present, can be caused by the fire. Consideration must be given to the highly flammable nature of fuel and its vapor. Carelessness in its use may result in serious injury.

If explosive ammunition is present on the vehicle, the danger zone is approximately 250 yards. Elapsed time: about six minutes.

### b. Method No. 2 -- By Demolition.

- (1) Remove and empty portable fire extinguishers.
- (2) Smash all vital elements as outlined in step (2) of preceding sub-paragraph a.
- (3) Planning for simultaneous detonation, prepare two 2-pound demolition charges, using 1-pound TNT blocks, or equivalent, and the necessary detonating cord to make up each charge. Place the charges as follows:
  - (a) The first charge on top of the transmission case housing.
  - (b) The second charge as low on the left side of the engine as possible.
- (4) Connect the charges for simultaneous detonation with detonating cord.
- (5) Provide for dual priming to minimize the possibility of a misfire. Do not detonate the charges at this time.
- (6) Destroy the tires by placing an incendiary grenade under each tire. The detonation of the demolition charges should be delayed until the incendiary fires are well started. This will prevent the fires from being extinguished by the blast when detonation takes place.



- (7) Detonate the demolition charges. For complete information on the use of demolition materials and methods of priming and detonating charges, refer to FM 5-25. Training and careful planning are essential. The danger zone is approximately 250 yards. Elapsed time: about six minutes.

c. Method No. 3 -- By Gunfire.

- (1) Remove and empty portable fire extinguishers.
- (2) Ordinarily, destruction of the tires is effected incidental to, and in conjunction with, destruction of the vehicle by gunfire. However, if such destruction is not practical, destroy the tires with incendiary grenades as outlined in step (6) of preceding sub-paragraph b.
- (3) Drain or puncture the fuel tank, unless incendiary grenades are to be used to destroy the tires.

- (4) Destroy the vehicle by gunfire, using artillery, machine guns, rifles using rifle grenades, or rocket launchers using antitank rockets. Fire on the vehicle, aiming at the engine, axles, wheels, and chassis, as well as any exposed auxiliary equipment. Although one well-placed direct hit may render the vehicle temporarily useless, several hits are usually required for complete destruction unless an intense fire is started, in which case the vehicle may be considered destroyed.

**Warning:** Firing artillery at ranges of 500 yards or less should be done from cover. Firing of rifle grenades or antitank rockets should also be done from cover.

Elapsed time: about five minutes.

## APPENDIX I

### REFERENCES

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#### 1. Publication Indexes and General References

a. Military Publications Indexes. Indexes should be consulted frequently for latest changes or revisions of references given in this appendix, and for new publications relating to materiel covered in this technical manual.

Dictionary of United States Army Terms (formerly SR 320-5-12) . . . . .	AR 320-5
Authorized Abbreviations and Brevity Codes (formerly SR 320-50-1). . . . .	AR 320-50
Military Training . . . . .	FM 21-5
Techniques of Military Instruction . . . . .	FM 21-6
Military Symbols . . . . .	FM 21-30
Index of Army Motion Pictures, Film Strips, Slides, and Phono Recordings . . . . .	DA PAM 108-1

#### b. General References.

Authorized Abbreviations . . . . .	AR 320-50
Dictionary of United States Army Terms . . . . .	AR 320-5
Military Symbols . . . . .	FM 21-30
Military Training . . . . .	FM 21-5
Techniques of Military Instruction . . . . .	FM 21-6

#### 2. Forms

Refer to DA PAM 310-2 for index of current forms. For use of maintenance forms refer to TM 38-750, the Army Equipment Record Systems and Procedures.

#### 3. Other Publications

Driver's Manual . . . . .	TM 21-305
Driver Selection and Training. . . . .	TM 21-300
Explosives and Demolitions . . . . .	FM 5-25
Operation and Maintenance of Ordnance Materiel in Extreme Cold Weather . . . . .	TM 9-207
Operation in Arctic . . . . .	FM 31-71
Organizational Maintenance . . . . .	TM 9-2320-211-20

## APPENDIX II

### MAINTENANCE ALLOCATION CHART

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The maintenance allocation chart, which lists all maintenance and repair operations	for all echelons of maintenance for this materiel, appears in TM 9-2320-211-20.
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## APPENDIX III

### BASIC ISSUE ITEMS LIST

#### Section I. PREFACE

##### 1. General

a. This appendix contains a listing of all items that are authorized for issue with the Major Items covered in this manual.

b. For prices of items herein, refer to the appropriate SM 9-2 series.

c. Additional applications of the items in this manual are listed in the 9-1 or 9-3 series of supply manuals.

##### 2. Requisition Notes

a. If the item requisitioned is not furnished, or if other action is necessary, the nature of the action taken by the supplying agency will be indicated by standard symbols on prescribed forms.

b. Requisitions for replacement of the items which are the responsibility of technical services other than the Ordnance Corps will be submitted to that technical service indicated.

##### 3. Explanation of Columns

a. Source, Maintenance, and Recoverability which indicates the technical service maintaining control responsibility. If no number appears in this column, the item is the responsibility of the Ordnance Corps.

b. Federal Stock Number. This column lists the 11-digit Federal Stock Number assigned by the Cataloging Division, Office of the Assistant Secretary of Defense (Supply and Logistics).

c. Description. The Federal item name and any additional description required for supply operations are listed in this column.

d. Unit of Issue. The Unit of Issue column lists the unit of issue for each item. This may be in the form of an actual unit of issue, such as "oz," or "lb," or as in the case of most

items, merely by the use of "each" designated by "ea."

e. Expendability. The expendability column indicates whether an item is expendable, or non-expendable. Items marked by the symbol "NX" are non-expendable within the definition of expendable supplies as given in SR 320-5-1 and AR 735-5; items not marked are expendable.

f. Quantity Authorized. This column lists the quantities for the basic issue and miscellaneous items that are required for the operation and first-echelon maintenance of the vehicle.

##### 4. Abbreviations and Symbols

###### a. Abbreviations.

assy	assembly (ies)
dble	double
dia	diameter
ea	each
ft	foot, feet
hex	hexagon
hdl	handle
in.	inch (es)
lg	length
nom	nominal
opng	opening
rd	round
stght	straight
sgle-hd	single head
sq	square
w/	with
w/e	with equipment
w/o	without

b. Symbols - Source, Maintenance, and Recoverability Code - Technical Service Basic Number Code.

10 Quartermaster Corps

12 Adjutant General's Office

NR Indicates an item that is non-expendable and recoverable and is economically repairable.

(1) ILLUST		(2) SOURCE, MAINT AND RECOVERABILITY CODE				(3)  FEDERAL STOCK NO	(4)  DESCRIPTION	(5)  UNIT OF ISSUE	(6)  QTY AUTH
(a) FIG NO	(b) ITEM NO	(a) TECHNICAL SERVICE NO	(b) SOURCE	(c) MAINTENANCE LEVEL	(d) RECOVERABILITY				
							<b>Section II. FIRST ECHELON BASIC ISSUE ITEMS, REPAIR PARTS, AND TOOLS LIST</b>		
							MAJOR ITEMS (WITH EQUIPMENT)		
1						NR 2320-174-1625	CHASSIS, TRUCK: 5-ton, 6 x 6, M39, w/e (8358764)		
						NR 2320-174-1626	CHASSIS, TRUCK: 5-ton, 6 x 6, M39, w/wn, w/e (8358765)		
1						NR 2320-835-8349	CHASSIS, TRUCK: 5-ton, 6 x 6, M40, w/e (8358349)		
						NR 2320-835-8350	CHASSIS, TRUCK: 5-ton, 6 x 6, M40, w/wn (8358350)		
1						NR 2320-219-7332	CHASSIS, TRUCK: 5-ton, 6 x 6, M40C, w/wn		
						NR 2320-835-8332	CHASSIS, TRUCK: 5-ton, 6 x 6, M61, w/e (8358332)		
1						NR 2320-835-8333	CHASSIS, TRUCK: 5-ton, 6 x 6, M61, w/wn, w/e (8358333)		
						NR 2320-835-8330	CHASSIS, TRUCK: 5-ton, 6 x 6, M63, w/e (8358330)		
						NR 2320-835-8331	CHASSIS, TRUCK: 5-ton, 6 x 6, M63, w/wn, w/e (8358331)		
1						NR 2320-835-8347	CHASSIS, TRUCK: 5-ton, 6 x 6, M139, w/wn, w/e (8358347)		
						NR 2320-212-9030	CHASSIS, TRUCK: 5-ton, 6 x 6, M139C, w/wn (8358804)		
						NR 2320-746-6001	CHASSIS, TRUCK: 5-ton, 6 x 6, M139F, w/wn		
						NR 2320-348-7797	CHASSIS, TRUCK: 5-ton, 6 x 6, M139D, w/e (8736013)		
2-3						NR 2320-835-8328	TRUCK, CARGO: 5-ton, 6 x 6, M41, w/e (8358328)		
						NR 2320-835-8327	TRUCK, CARGO: 5-ton, 6 x 6, M41, w/wn, w/e (8358327)		
4-5						NR 2320-835-8348	TRUCK, CARGO: 5-ton, 6 x 6, M54, w/e (8358348)		
4-5						NR 2320-835-8335	TRUCK, CARGO: 5-ton, 6 x 6, M54, w/wn, w/e (8358335)		
6-7						NR 2320-086-7481	TRUCK, CARGO: 5-ton, 6 x 6, M54A1, w/e		
6-7						NR 2320-086-7482	TRUCK, CARGO: 5-ton, 6 x 6, M54A1, w/wn, w/e		
8						NR 2320-200-1878	TRUCK, CARGO: 5-ton, 6 x 6, M55, w/e (8358973)		
						NR 2320-391-0570	TRUCK, CARGO: 5-ton, 6 x 6, M55, w/wn, w/e (8358724)		
9-10						NR 2320-835-8336	TRUCK, DUMP: 5-ton, 6 x 6, M51, w/e (8358336)		
						NR 2320-835-8337	TRUCK, DUMP: 5-ton, 6 x 6, M51, w/wn, w/e (8358337)		
11-12						NR 2320-835-8326	TRUCK, TRACTOR: 5-ton, 6 x 6, M52, w/e (8358326)		
						NR 2320-835-8329	TRUCK, TRACTOR: 5-ton, 6 x 6, M52, w/wn, w/e (8358329)		
13						NR 2320-086-7479	TRUCK, TRACTOR: 5-ton, 6 x 6, M52A1, w/e		
13						NR 2320-086-7480	TRUCK, TRACTOR: 5-ton, 6 x 6, M52A1, w/wn, w/e		
14-15						NR 2320-835-8639	TRUCK, TRACTOR, WRECKER: 5-ton, 6 x 6, M246, w/wn, w/e (8358639)		
16-17						NR 2320-835-8325	TRUCK, WRECKER: medium, 5-ton, 6 x 6, M62, w/wn, w/e (8358325)		
18-19						NR 2320-445-0866	TRUCK, WRECKER: medium, 5-ton, 6 x 6, M543, w/wn, w/e		
							COMPONENTS OF MAJOR ITEMS		
							The following items under the subheading below are INSTALLED IN POSI- TION on the TRUCK prior to the issue of the vehicle to the using troops.		
							REPAIR PARTS FOR VEHICLE		
							WHEEL, w/TIRE and INNER TUBE, assy (spare) (M40, M51, M52, M54, M55, M61, M62, and M63) (components to be requisitioned separately)	ea	1
							Composed of:		
						2610-051-9450	1 INNER TUBE, PNEUMATIC TIRE: truck and bus, 10.50/11.00-20 (no. MT-20 (new) 11.00 x 20) (519450)	ea	
						2610-262-8653	1 TIRE, PNEUMATIC: truck and bus, 12 ply, cross country tread, 11.00-20 (new) (515110)	ea	
						2530-603-5768	1 WHEEL, w/RING, assy (7388820)	ea	
							WHEEL, w/TIRE and INNER TUBE, assy (spare) (M139, M139C, M139D) (components to be requisitioned separately)	ea	1
							Composed of:		
						2610-051-9464	1 INNER TUBE, PNEUMATIC TIRE: truck and bus, 13.50/14.00-20 (no. ST-20) (new) (519464)	ea	
						2610-262-8652	1 TIRE, PNEUMATIC: truck and bus, 12 ply, cross country tread 14.00-20 (new) (515100)	ea	



(1) ILLUST		(2) SOURCE, MAINT AND RECOVERABILITY CODE				(3)  FEDERAL STOCK NO	(4)  DESCRIPTION	(5)  UNIT OF ISSUE	(6)  QTY AUTH
(a) HG NO	(b) ITEM NO	(a) TECHNICAL SERVICE NO	(b) SOURCE	(c) MAINTENANCE LEVEL	(d) RECOVERABILITY				
							REPAIR PARTS FOR VEHICLE - Continued		
						2530-287-5701	1 WHEEL, w/RING, assy (7353762) WHEEL, w/TIRE and INNER TUBE, assy (spare) (M39, M41) (components to be requisitioned separately) (use on early production vehicles, w/combat WHEEL, 2530-707-1003) Composed of:	ea ea	1
						2530-052-0946	1 BEADLOCK: combat tire, hinged type, 10.00 CW-20 rim (for 14.00- 20, 12 ply tires) (520946)	ea	
						2610-051-9464	1 INNER TUBE, PNEUMATIC TIRE: truck and bus, 13.50/14.00-20 (no. ST-20) (new) (519464)	ea	
						2610-262-8652	1 TIRE, PNEUMATIC: truck and bus, 12 ply, cross country tread, 14.00-20 (new) (515100)	ea	
						2530-707-1003	1 WHEEL, w/RING, assy (combat type) (7071003) WHEEL, w/TIRE and INNER TUBE, assy (spare) (M39, M41) (components to be requisitioned separately) Composed of:	ea ea	1
						2610-051-9464	1 INNER TUBE, PNEUMATIC TIRE: truck and bus, 13.50/14.00-20 (no. ST-20) (new) (519464)	ea	
						2610-262-8652	1 TIRE, PNEUMATIC: truck and bus, 12 ply, cross country tread, 14.00-20 (new) (515100)	ea	
						2530-287-5702	1 WHEEL, w/RING, assy (7353765) WHEEL, w/TIRE and INNER TUBE, assy (M246) (components to be requisitioned separately) Composed of:	ea ea	1
						2610-051-9454	1 INNER TUBE, PNEUMATIC TIRE: truck and bus, 11.25/12.00-20 (no. OT-20) (new) (519454)	ea	
						2610-275-7977	1 TIRE, PNEUMATIC: truck and bus, 14 ply, mud and snow tread, 12.00-20 (new) (514720)	ea	
						2530-603-5768	1 WHEEL, w/RING, assy (7388820) WHEEL, w/TIRE and INNER TUBE, assy (spare) (components to be requisitioned separately) (M543) Composed of:	ea ea	1
					NR	2640-052-0944	1 CAP, TIRE VALVE: standard-bore (96906-51375-1)		
					NR	2610-051-9450	1 INNER TUBE, PNEUMATIC TIRE: truck and bus, 11.00 x 20 (w/ valve) (96906-35392-15)		
					NR	2610-262-8653	1 TIRE, PNEUMATIC: truck and bus 11.00 x 20, 12 ply, NDCC- tread, nylon cord (w/flap) (96906-35388-21)		
					NR	2640-050-1229	1 VALVE CORE, PNEUMATIC TIRE: standard-bore (96906-51377-1)		
					R	2530-738-8820	1 WHEEL, w/RING, assy, 20 x 7.5 (7388820)		
							VEHICULAR EQUIPMENT		
					NR	4210-383-7127	BRACKET: fire extinguisher, carbon dioxide, 2-1/2 lb, running board type, wire (M62, M246, M543) (7357009)	ea	3
						4210-223-9910	EXTINGUISHER: fire, carbon dioxide, shatterproof, permanent shut-off, hand, 2-1/2 lb (M62, M246)	ea	3
						4210-383-7128	EXTINGUISHER: fire, hand, carbon dioxide, charged, 2-1/2 lb (M543) (7359137)	ea	3
							COMPONENTS OF MAJOR ITEMS		
							The following items under the subheading below are BOXED AND STOWED on the TRUCK prior to the issue of the vehicle to the using troops.		

(1) ILLUST		(2) SOURCE, MAINT AND RECOVERABILITY CODE				(3)  FEDERAL STOCK NO	(4)  DESCRIPTION	(5)  UNIT OF ISSUE	(6)  QTY AUTH
(a) FIG NO	(b) ITEM NO	(a) TECHNICAL SERVICE NO	(b) SOURCE	(c) MAINTENANCE LEVEL	(d) RECOVERABILITY				
VEHICULAR TOOLS AND EQUIPMENT									
85	1	10				5110-293-2336	AXE: chopping, hdl, sgle bit, 4 lb (M62, M246) -----	ea	1
						NR 5120-242-0762	BAR: wrecking, gooseneck, and pinch point w/claw, 3/4 hex stk 36 lg, (M543)	ea	1
81	1					NR 5140-772-4142	BAG, TOOL, SATCHEL: empty, 20-1/4 in. x 18-1/4 in. to top of flap, open (M62, M246, M543)	ea	1
81	2	10				5120-243-2419	BAR, SOCKET WRENCH HANDLE: 3/4 in. nom dia, 20 in. nom lg over-all	ea	1
82	2	10				5120-293-0665	BAR, WRECKING: claw and pinch pt, gooseneck, 36 in. lg over-all, 3/4 in. dia stk (M62)	ea	1
82	6	10				5110-237-8106	BLADE: hack saw (hand), alloy, all hard, 12 in. lg, 1/2 in. w, 0.025 thk, 24 teeth per in. (M62, M543) (96906-16263-5)	ea	12
		55				3940-334-5193	BLOCK AND TACKLE SET: Organizational Maintenance (2nd echelon), Set no. 4, Block and Tackle (components may be requisitioned separately) (M62, M543) Composed of:	ea	1
82	9	55				3940-223-3821	1 BLOCK, TACKLE: manila rope, S shell, dble bz bushed sheave, loose hook w/BECKET, 1 in. dia rope	ea	
82	11	55				3940-239-0372	1 BLOCK, TACKLE: manila rope, 8 in. S shell, sgle bz sheave, loose hook, w/o BECKET, 1 in. dia rope	ea	
82	7	10				4020-234-8399	1 ROPE: manila, 3-strand, dia 1 in., circum 3 in. (300 ft-lg)	ea	
							BLOCK, SNATCH: wire rope, S shell, sgle-8 in. sheave, w/swivel hook, 5/8 dia rope, 10-ton working load (M543) (8383241)	ea	1
		55				3940-630-9931	BLOCK, TACKLE: front mounted winch (wire rope, S shell, single 8 in. sheave, w/swivel hook, 5/8 in. dia rope, 10-ton capacity) (8337020)	ea	1
		55				1915-661-2110	BLOCK, TACKLE: wire rope, snatch, heavy, steel shell, drop link, steel sheave, w/swivel hook, pressure lubricating bushing, 6 in. sheave, for 1/2 to 3/4 in. wire rope, safe working load 14000 lbs (used on vehicles w/winch)	ea	1
82	10	55				3940-708-0704	BLOCK: tackle, for 7/8 in. dia wire rope, snatch, self-locking, steel shell dble 8 in. steel sheave, bronze bearing, swivel eye and shackle, 32,000 lb safe working load (M62)	ea	2
						NR 4910-347-5494	BRACKET: pioneer tools (M543) (7346922) -----	ea	1
						NR 2590-473-6331	BRACKET, DRUM, INFLAMMABLE LIQUID: S, weld, w/STRAP (M39, M41, M51, M52, M52A1, M54, M54A1, M55, M62, M139C, M139D, M543)	ea	1
							CABLE ASSY: winch, w/clevis and chain (M543) (7308819) ----- Composed of:	ea	1
							1 CHAIN ASSY: winch, 5/8 link x 6 ft lg, w/2-cplg link, w/hook (7717032)		
							1 CLEVIS ASSY: wire rope (7074517)		
							1 ROPE, WIRE: 5/8 dia x 280 ft lg (7699769)		
82	12	10				NR 7240-242-6153	CAN: water, military (M62)	ea	1
	10					N 4010-473-6166	CHAIN ASSEMBLY, SINGLE LEG: 5/8 in. x 16 ft, w/grab hook and pear shaped ring each end	ea	1
82	17	5				NR 6150-378-2055	CORD: light extn, inspection, w/hdl, hook, and lamp shield, sgle-contact plug, 25 ft lg (M62, M543) (17-C-35079-47)	ea	1
82	16	5				6145-732-6618	CORD: light extn, inspection, w/socket and plug, sgle-contact, 25 ft lg (use w/CORD 6150-378-2055 for added lg) (M62)	ea	1
		5				NR 6830-264-6751	CYLINDER, ACETYLENE, TECHNICAL: gas, filled, 225 cu ft (comp w/valve) (M62) (to be refilled locally)	ea	1
		5				NR 6830-292-0129	CYLINDER, OXYGEN, TECHNICAL: gas, filled, 220 cu ft (comp w/valve) (M62) (to be refilled locally)	ea	1
		11				NR 6230-264-8261	FLASHLIGHT: elec, hand, 2 cell, w/lamp, w/o batteries (M62) -----	ea	2
83	3	10				NR 5110-223-4971	FRAME: hacksaw, adj, pistol grip hdl, thumb nut tension style, 8 to 12 in. cap. (M62, M543) (96906-6515-1)	ea	1

(1) ILLUST		(2) SOURCE, MAINT AND RECOVERABILITY CODE				(3)  FEDERAL STOCK NO	(4)  DESCRIPTION	(5)  UNIT OF ISSUE	(6)  QTY AUTH
(a) FIG NO	(b) ITEM NO	(a) TECHNICAL SERVICE NO	(b) SOURCE	(c) MAINTENANCE LEVEL	(d) RECOVERABILITY				
VEHICULAR TOOLS AND EQUIPMENT - Continued									
81	6					5120-357-6106	HANDLE: jack, tubular, 27/32 dia, 20 lg -----	ea	1
						2510-772-8814	HARNESS: wiring, inter-vehicular, assy (M52, M246) (7728814) -----		1
						2520-740-9662	HOSE: air connection, assy (126 in.) (M52, M246) (7954874) -----		2
						2530-741-3037	HOSE: air connection, inter-vehicular, assy (162-1/2 in.) (M52 and M246) (7413037) -----	ea	1
81	7	55			NR	4910-777-2943	GAGE AND HOSE ASSEMBLY: tire inflation, self-contained, lg 30 ft (8742119)	ea	1
					N	5120-222-1310	JACK, HYDRAULIC, HAND: self-contained, 8-ton rated cap., 11 in. closed h, 23-1/4 in. extended h, sgle pump, w/screw extn (M39, M40, M41, M51, M52, M54, M55, M61, M62, M63, M139C, M139D, M246, M543)	ea	1
83	8	10			N	5120-224-7330	JACK, HYDRAULIC: self-contained, 12 ton rated cap., 11-1/4 in. closed h, 16-1/4 in. extended h, sgle pump, w/screw extn (M139)	ea	1
		11				6230-498-9408	LANTERN: hand, elec, 6 volts, w/lamp, w/o battery (M62, M543) (17-L-7552)	ea	1
85	10	10				5120-243-2396	MATTOCK: pick, w/hdl, wt 5 lb (M62, M246) -----	ea	1
		10			NR	5120-254-6618	HANDLE: mattock-pick, railroad, or clay pick, 36 lg (M543) -----	ea	1
81	8	10			NR	5120-243-2395	MATTOCK: pick-type, 5-lb, w/o handle (M543) -----	ea	1
		10			NR	5120-223-7397	PLIERS, SLIP JOINT: stght nose, comb, w/cutters, 8 in. lg -----	ea	1
	5				NR	5120-223-7398	PLIERS: slip-joint, stght-nose, comb, w/cutter, lg (96906-15382-2) -----	ea	1
						9905-449-7161	REFLECTOR KIT, HIGHWAY WARNING: (M62, M246) ----- Composed of: 1 CARRIER: 2 FLAG: red, 12 x 12 in. 1 INSTRUCTION: decal 3 REFLECTORS: w/steel frame and base	ea	2
	10					4020-231-2581	ROPE: manila, 3 strand, dia 3/8 in., circum 1-1/8 in. (50 ft lg) (M62, M543) (21-R-418)	ea	1
					NR	4020-234-8399	ROPE: manila 3 strand, 3/4 dia, 2-1/4 circum, 100 ft lg, 135 lb safe work cap. (M543) (21-R-403)	ea	1
82	7	10			NR	4020-238-7734	ROPE: manila, 3 strand, dia 3/4 in., circum 2-1/4 in. (100 ft lg) (M62, M543) (21-R-373)	ea	1
		10			NR	5110-754-0704	SAW: crosscut, 1-man, 4-1/2 ft blade, 5-ft lg, w/supplementary handle (M543) (96906-16515-2)	ea	1
83	11	10				5110-223-5349	SAW: hand, crosscut, 1 man, 2 cutter to 1 racker tooth, w/supplementary handle, 54 in. blade (M62)	ea	1
		10			NR	5120-234-8913	SCREWDRIVER, CROSS TIP: Phillips type of tip, plastic hdl, no. 2 size tip, 4 in. lg blade (96906-15224-5)	ea	1
	10				NR	5120-234-8912	SCREWDRIVER, CROSS TIP: recessed screw, Phillips no. 3 tip, comm, slow burning plastic hdl, 6 in. blade (96906-15224-6)	ea	1
						5120-277-9491	SCREWDRIVER, FLAT TIP: wood hdl, flared tip, 1/4 in. w, 4 in. lg blade (M246)	ea	1
						5120-815-7493	SCREWDRIVER: flat tip, common, 4 in. blade, 7-5/8 in. lg (99066-15219-1)	ea	1
							SCREWDRIVER: flat tip, extra-hv-duty, 4 in. blade, 9-1/2 lg (96906-16220-5)	ea	1
						5120-293-3347	SCREWDRIVER: recessed screw (Phillips type), 4 in. blade, bit size no. 2 (M246)	ea	1
						5120-293-3346	SCREWDRIVER: recessed screw (Phillips type), 6 in. blade, bit size no. 3 (M246)	ea	1
					NR	5120-222-8852	SCREWDRIVER, FLAT TIP: common, flared sides, plastic hdl, rd-blade, 1/4 w-tip, 4 lg blade, 7-3/4 lg (nom) (M543) (96906-15219-1)	ea	1
					NR	5120-227-7338	SCREWDRIVER, FLAT TIP: hv-duty, flared sides, steel-hdl-w/wood inserts, sq-blade, 1/2 w-tip, 5 lg blade (M543) (96906-15220-5)	ea	1
83	12	55			NR	2540-318-0326	SHACKLE: anchor, rd-pin, iron or S, dia 7/8 in., inside lg 3-1/4 in., dia of pin 1 in. (M62) (80244-12-S-743)	ea	2

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VEHICULAR TOOLS AND EQUIPMENT - Continued									
81	10	10			NR	7240-177-6154	SPOUT: can, flexible, 16 in. lg, 1.238 in. flexible tube, 2-1/4 in. od cam end, w/filter screen (formerly tube)	ea	1
81	12	10			NR	5120-264-3796	WRENCH, OPEN END, ADJUSTABLE: sgld-hd, 12 in. non lg over-all, 1-5/16 in. opng (96906-15461-5)	ea	1
		10				5120-708-3302	WRENCH, PLUG: stght bar, sq, 1/2 in. sq, 2-1/2 in. lg (7083302) -----	ea	1
81	11	10				5120-316-9217	WRENCH, SOCKET: dble-hd socket, hex and sq, 1-1/2 in. hex opng, 13/16 in. sq opng, 18-3/8 in. lg (M40, M51, M52, M54, M55, M61, M62, M63, M139, M139C, M139D, M246) (use on models with wheels other than 2530-707-1003) (41-W-3838-40)	ea	1
81	11	10				5120-449-8261	WRENCH, SOCKET: dble-socket, T-type, removable hdl, furnish w/o hdl, hex-shaped, 1-3/16 in. and 1-1/2 in. size opngs, 19 in. nom lg over-all (Type B) (M39, M41) (use on vehicle, w/WHEEL, 2530-707-1003)	ea	1
SPECIAL PURPOSE TOOLS AND EQUIPMENT FOR WRECKERS (M62, M246, M543)									
82	1				NR	4930-387-9551	ADAPTER: grease gun, rigid, thin-stem, 6 lg (M543) -----	ea	1
						4930-288-1511	ADAPTER, GREASE GUN COUPLING: lubr, flex hose, sleeve type, hyd to hyd, 12 in. lg (M62)	ea	1
					N	3940-347-9703	BAR ASSEMBLY, HOISTING: (M62, M543) (8690061) -----	ea	1
		10				5120-238-8292	BAR, CHISEL: 7/8 in. nom dia of stk, 24 in. lg over-all (M62) -----	ea	2
					N	2540-040-2102	BAR: cranking, outrigger, 1 in. dia, 24 in. lg (M62, M246) (8328453) ---	ea	2
81	2					5120-243-2419	BAR: handle, wheel stud nut wrench, 3/4 x 30 (M246) -----	ea	1
		10				5120-224-1384	BAR, PINCH: bent chisel and taper, 1 in. dia, 26 in. lg (M62, M543) ---	ea	1
82	3					2540-040-2298	BAR: tie boom jack (M62, M543) (8330152) -----	ea	1
						5340-625-6290	BAR: tie, boom jack, w/yoke ends (M246) (8333074) -----	ea	1
					N	4910-735-6056	BAR: tow, motor vehicle, v-type (light-duty) (M543) (8-B-52770) -----	ea	1
82	4				NR	2540-040-2299	BASE: boom jack, assy (M62, M543) (8330155) -----	ea	2
						3830-625-6284	BASE: rear ground outrigger and boom jack (M246) (8333068) -----	ea	2
82	8					3940-630-9932	BLOCK, TACKLE: rear winch (wire rope, S shell, single 10 in. sheave, w/ shackle end, 3/4 in. dia rope, 15-ton capacity) (M62, M543) (8337021)	ea	2
						3830-625-6282	BRACE: stabilizer, lower (male) (M62, M246, M543) (8331882) -----	ea	2
						3830-625-6283	BRACE: stabilizer, upper (female) (M62, M246) (8331883) -----	ea	2
					NR	2590-473-6331	BRACKET, DRUM, INFLAMMABLE LIQUID: S, welded, w/strap (on crane platform) (M62, M543)	ea	1
						2590-473-6331	BRACKET, DRUM, INFLAMMABLE LIQUID: S, welded, w/strap (left running board and body floor) (M246) (80244-42-8-225-90)	ea	2
					NR		CABLE: winch, w/clevis and chain (M543) (10899395) -----	ea	1
							Composed of:		
							1 CHAIN: winch, 3/4 link, 6-ft lg, w/hook (7717033)		
							1 CLEVIS: wire rope (3/4) (7065553)		
							1 ROPE: wire, 3/4 dia x 350 ft lg (wire core) (8741316)		
85	2				N	4910-474-9135	CABLE EXTENSION: ru covered, 2 cond, stranded, w/female plugs at both ends, no. 1 AWG, 20 ft lg (M62, M246) (80244-17-C-568)	ea	1
						4910-473-6166	CHAIN ASSEMBLY, SINGLE LEG: w/grab hook and pear shaped rings, 5/8 in. rod, 16 ft lg	ea	2
					N	4010-449-6573	CHAIN ASSEMBLY, SINGLE LEG: high test S, 3/4 in. rod size, 12 ft lg, pear shaped ring and grab hook (M62, M543) (80244-8-C-4358)	ea	2
82	13					4010-047-3902	CHAIN, TOW: 7/16 in. x 16 ft, w/grab hook and pear shaped link each end (M62) (80244-8-C-4350)	ea	1
82	14	10			NR	5110-221-1075	CHISEL, BLACKSMITH'S: hdl, cold, 1-1/2 in. cut (M62) (80244-41-C-902)	ea	1
82	15					2540-315-2306	CHOCK: field, assy (M62, M543) (8330150) -----	ea	2



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							SPECIAL PURPOSE TOOLS AND EQUIPMENT FOR WRECKERS (M62, M246, M543) - Continued		
						2520-692-6136	CLIP: pin, boom jerk, lower skipper brace, shaft, and pin (M62, M246) (8332593)	ea	6
85	3					2590-740-9782	COLLAR: boom stabilizer tube, cross pin (M62, M246) (7409782) -----	ea	1
83	1	10			NR	5120-224-1390	CROWBAR: pinch pt, 1-1/4 dia, 60 in. lg (M62, M543) (80244-41-B-175)	ea	2
83	2	10			NR	5110-188-2524	CUTTER: bolts, rigid hd cutter, clipper cut (close-cutting), 36 in. lg, 5/8 in. bolt and 1/2 in. rod cap. (M62) (80244-41-C-2283)		
85	4					5340-321-6406	FASTENER: clip pin (M62, M246) (8330327) -----	ea	1
85	4					5340-321-6407	FASTENER: clip pin (M62, M246) (8330328) -----	ea	2
85	4					5340-321-6405	FASTENER: clip pin (M62, M246) (8330246) -----	ea	8
83	4					4930-223-3391	GREASE GUN, HAND: lever operated, 15 oz cap., 7000 psi pressure, extn rigid, bent angle tube type, 6 in. lg, hyd type coupler (M62) (80244-41-C-1344)	ea	1
		10			NR	4930-268-9614	GREASE GUN: hand, lever operated, 15-oz, 7000 psi, w/6 in. extension (M543)	ea	1
85	5					2520-040-2297	GUYLINE: assy (M62, M246) (8330151) -----	ea	1
83	5	10			N	5120-230-7843	HAMMER, HAND: blacksmith's dble face, sledge, 20 lb nom hd wt (M62, M543)	ea	1
					NR	2540-574-3914	HOLDER: oiler (M62, M543) (500883) -----	ea	1
						3432-563-3542	HOSE ASSEMBLY, RUBBER: braided, green, w/rh thd female connections on both ends, attached by crimped on ferrules, 9/16-18 NF-3 thd, 5/16 in. id, 25 ft lg (M62) (80244-33-H-452-25)	ea	1
					NR	2590-899-6721	HOSE: tank drain, hyd oil, 1-3/16 od x 60 lg (M543) (10900093) -----	ea	1
						4310-356-8566	HOSE ASSEMBLY, RUBBER: braided, red, w/lh thd female connections each end attached by br ferrules, 9/16-18NF-3, 5/16 in. id, 25 ft lg (M62) (80244-33-H-402)	ea	1
83	6	10			N	5120-188-1790	JACK, HYDRAULIC, HAND: self-contained, w/hdl, 30 ton rated cap., 11 in. closed h, 17 in. extended h, sgle pump (M62, M543) (80244-41-J-109)	ea	1
83	9	10				4930-272-7968	OILER, HAND: push bottom, S, 8 oz cap., spout 4 in. lg (M62, M543) (80244-13-0-1530)	ea	1
					NR	5340-682-1504	PADLOCK SET: keyed alike, 1-3/4 w/clevis and chain, composed of 5 padlocks and 7 keys (M543) (96906-21313-54)	ea	1
						3830-625-6281	PIN: adjusting, tube, boom stabilizers (M62, M246) (8331881) -----	ea	2
85	6					5315-316-1012	PIN: boom jack, lower shipper brace (M62, M246) (8332455) -----	ea	4
						5315-316-1014	PIN: boom jack, upper (M62, M246) (8333071) -----	ea	1
					NR	5315-854-4431	PIN: inner boom jack, w/lock pins (M543) (10876413)	ea	1
85	9					5315-281-7744	PIN, LOCK: adjusting tube (M62, M246) (7409515)		
85	9					5315-298-0995	PIN, LOCK: boom jack (M62, M246) (8330154) -----	ea	1
85	9					5315-281-7745	PIN, LOCK: boom jack tie bar (M62, M246) (8330153) -----	ea	2
85	8					5315-740-9834	PIN: lock, boom stabilizing tube (M62, M246, M543) (7409834) -----	ea	2
85	7					5315-316-1008	PIN: tie bar yoke, assy (M62, M246, M543) (8327939) -----	ea	2
						3830-625-6285	PIPE: end, shaft tube (M246) (8333069) -----	ea	2
83	10	10				5120-197-9473	PUNCH, BLACKSMITH'S: rd, w/hdl, 1/4 in. dia (M62, M543) (80244-41-P-3115)	ea	1
					N	6680-551-1094	REGULATOR, PRESSURE, COMPRESSED GAS: acetylene, 2 gages, 2-1/2 in. dial, sgle stage, 0 to 30 and 0 to 400 psi range (M62) (80244-45-R-3502)	ea	1
					N	6680-281-8193	REGULATOR, PRESSURE, COMPRESSED GAS: oxygen, 2 gages, 2-1/2 in. dial, 0 to 200 and 0 to 3000 psi range (M62) (80244-45-R-3533)	ea	1
					NR	2540-860-2359	SHAFT: cranking outrigger, 1/2 dia, 12 lg (M543) (10900233) -----	ea	2
						2520-040-2297	SLING: wire rope, dbl-leg, w/ring and 2 hook (M543) (8330151) -----	ea	1
85	11	10			NR	5120-293-3336	SHOVEL: hand, general purpose, rd-pt, open back, rolled shoulder, tubular shk, size no. 2, D-hdl (M62, M246, M543) (96906-17088-1)	ea	1
						5340-505-6340	STRAP: web, 1-1/2 in. w, 24 in. lg (M62, M246) (501267) -----	ea	2

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							SPECIAL PURPOSE TOOLS AND EQUIPMENT FOR WRECKERS (M62, M246, M543) - Continued		
					N	3432-754-0661	TOOL KIT, WELDER'S: (M62) (components may be requisitioned separately) Composed of:	ea	1
84	1					5140-562-8243	1 CHEST, TOOL, METAL: removable tray, S hdl, 7 in. h, 7 in. w, 16 in. lg	ea	
84	2	10				5110-186-7107	1 CHISEL, COLD, HAND: 1/2 in. cut, 5-3/4 in. lg over-all	ea	
84	2	10				5110-236-3272	1 CHISEL, COLD, HAND: 3/4 in. w cut, 7 in. lg over-all	ea	
84	3	10				5110-186-7115	1 CHISEL, DIAMOND POINT, HAND: 1/4 in. cut	ea	
						3432-383-3634	1 CLEANER SET, WELDING AND CUTTER TIPS: 75 to 49 drill sizes, 12 in. mtl case	ea	
						5110-234-6539	1 FILE, HAND: American patt, fl type, 12 in. heel to point, dbl cut, bastard face, sgle cut bastard edges	ea	
84	4					5110-242-5386	1 FILE, HAND: American patt, mill type, 12 in. heel to pt, sgle-cut, sm face, sgle-cut sm edges	ea	
84	5	10				5110-234-6557	1 FILE, HAND: American patt, rd type, 12 in. heel to pt, 1/2 in. dia of largest sec, dble cut bastard face	ea	
					N	8415-268-7859	1 GLOVES: leather, work type, men's gauntlet cuff, cream or light gray, welder's type, size large	ea	
						4240-270-3106	1 GOGGLES: eyecup, protective, over spectacle type, welder's glare, flat lens, w/cover and filter lens (37-4458.660-11)	ea	
84	6	5				4240-288-9123	1 GOGGLES: protective, chippers and grinders, impact resisting flat lens, w/2 extra lens (37-4458.300-10)	ea	
						5120-240-7498	1 HAMMER-BRUSH, WELDER'S: chisel type hd, removable brush (80244-41-A-885)	ea	
84	7	10				5120-224-4047	1 HAMMER, HAND: machinist's, ball pen, 2 lb (80244-41-H-527) --	ea	
						5110-263-0341	3 HANDLE, FILE, WOOD: 5-1/2 in. nom lg over-all, 1-1/2 in. dia over-all (80244-41-H-1115)	ea	
						5120-190-5540	1 IGNITER, FRICTION: oxy-acetylene torch, revolving file type, w/10 extra tips (80244-41-1-50)	ea	
84	8	10				5120-223-7398	1 PLIERS, SLIP JOINT: stght nose, comb, w/cutter, 10 in. lg (80244-41-P-1654)	ea	
						5120-293-3509	1 PUNCH, CENTER, SOLID: 1/8 in. nom dia at top of tapd pt, 3/8 in. nom dia of stk, 4 in. lg over-all (80244-41-P-3185)	ea	
						5120-293-0448	1 PUNCH, DRIFT: 3/16 in. dia pt, 3/8 in. nom dia stk, 10 in. lg over-all (80244-41-P-3756)	ea	
84	9					5120-239-0489	1 RULE, MULTIPLE FOLDING: mtl, 3 ft extended lg, 6 secs, 1/16 in. smallest unit of grad for 2 grade edges (80244-41-R-2751)	ea	
84	10	10				5120-236-2092	1 SCREWDRIVER, FLAT TIP: mtl w/wood inserts hdl, flared tip, 7/16 in. w, 10 in. lg blade (80244-41-S-1078)	ea	
84	11					5120-596-1543	1 SCRIBER, MACHINIST'S: dble pt, 1 stght and 1 reg bent pt, 8 in. to 9 in. lg over-all (80244-41-S-2030)	ea	
84	14	10				5120-184-8679	1 WRENCH, BOX: dble-offset, dble-hd, 12 pt, 45 deg offset, 3/8 in. and 7/16 in. opngs, 4 in. nom lg (80244-41-W-620) Composed of:	ea	
84	14	10				5120-224-3138	1 WRENCH, BOX: dble-hd, 12 pt, 45 deg offset, 5/8 in. and 3/4 in. opngs, 6 in. nom lg over-all (80244-41-WW-625)	ea	
84	14	10				5120-224-3154	1 WRENCH, BOX: dble-offset, dble-hd, 12 pt, 45 deg offset, 1/2 in. and 9/16 in. opngs, 4-3/4 in. nom lg over-all (80244-41-WW-622)	ea	
84	12	10				5120-264-3796	1 WRENCH, OPEN END, ADJUSTABLE: sgle-hd, 12 in. nom lg over-all 0 to 1.322 in. max opng cap. (80244-41-W-488)	ea	
84	12	10				5120-240-5328	1 WRENCH, OPEN END, ADJUSTABLE: sgle-hd, 15/16 in. jaw opng, 8 in. lg (80244-41-W-486)	ea	
84	13	10				5120-187-7124	1 WRENCH, OPEN END, FIXED: dble-hd, 15 deg angle, 1/2 in. and 9/16 in. opngs, 17/64 in. thk, 5-1/2 in. lg over-all (80244-41-W-1002)	ea	

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							<b>SPECIAL PURPOSE TOOLS AND EQUIPMENT FOR WRECKERS (M62, M246, M543) - Continued</b>		
84	13	10				5120-277-2342	1 WRENCH, OPEN END, FIXED: dble-hd, 15 deg angle, spear-hd, alloy-S, 3/8 in. and 7/16 in. opngs (80244-41-W-991)	ea	
84	13	10				5120-277-8301	1 WRENCH, OPEN END, FIXED: dble-hd, 15 deg angle, spear-hd, alloy-S, 5/8 in. and 11/16 in. opngs, 21/64 in. thk, 7 in. nom lg over-all (80244-41-W-1007)	ea	
		10				5120-277-4244	1 WRENCH, PLIER: stght jaw style, 8-1/2 in. nom lg (80244-41-W-460)	ea	
					N	3234-294-6743	TORCH SET, CUTTING AND WELDING: oxy-acetylene, med duty, w/ tools, cutting attachments, and tips (M62) (components may be requisitioned separately) Composed of:	ea	1
					N	3432-391-1215	1 CUTTING ATTACHMENT, WELDING TORCH: angle of hd 75 deg, use w/TORCH HANDLE 3432-391-1217 no. 42527-58CA	ea	
					N	3432-391-1216	1 MIXING HEAD, OXYGEN ACETYLENE WELDING TORCH: for tip size 72 to 31, no. 42527-54-1	ea	
						3432-373-1726	1 TIP, OXYGEN ACETYLENE, CUTTING: drill size 46, no. 42527-250-46	ea	
						3432-373-1727	1 TIP, OXYGEN ACETYLENE, CUTTING: drill size 51, no. 42527-250-51	ea	
						3432-373-1730	1 TIP, OXYGEN ACETYLENE, CUTTING: drill size 56, no. 42527-250-56	ea	
						3432-373-1731	1 TIP, OXYGEN ACETYLENE, WELDING: drill size 42, no. 42527-870-42	ea	
						3432-373-1733	1 TIP, OXYGEN ACETYLENE, WELDING: drill size 50, no. 42427-870-50	ea	
						3432-373-1734	1 TIP, OXYGEN ACETYLENE, WELDING: drill size 53, no. 42527-870-53	ea	
						3432-373-1737	1 TIP, OXYGEN ACETYLENE, WELDING: drill size 58, no. 42527-870-58	ea	
						3432-373-1739	1 TIP, OXYGEN ACETYLENE, WELDING: drill size 62, no. 42527-870-62	ea	
					N	3432-391-1217	1 TORCH HANDLE, WELDING: no. 42527-54	ea	
						3432-391-1218	1 TORCH WRENCH, OXYGEN ACETYLENE: no. 42527-7810	ea	
						5120-277-2694	1 WRENCH, OPEN END, FIXED: 15 deg angle, dble-hd type, spear-hd, alloy-S, 1-1/8 in. and 1-1/4 in. opngs, 1/2 in. nom lg over-all	ea	
					N	3432-294-6743	TORCH SET, CUTTING AND WELDING: oxy-acetylene, med duty, w/ tools, cutting attachments and tips (M62) (components may be requisitioned separately) Composed of:	ea	1
					N	3432-391-1219	1 CUTTING ATTACHMENT, WELDING TORCH: angle of hd 75 deg, no. 63026-C-1450-100, use w/TORCH HANDLE 3432-391-1220	ea	
						3432-373-1729	1 TIP, OXYGEN ACETYLENE, CUTTING: drill size 54, no. 63026-1-3-100	ea	
						3432-373-1728	1 TIP, OXYGEN ACETYLENE, CUTTING: drill size 52, no. 63026-2-3-101	ea	
						3432-373-1725	1 TIP, OXYGEN ACETYLENE, CUTTING: drill size 45, no. 63026-4-3-101	ea	
						3432-373-1740	1 TIP, OXYGEN ACETYLENE, WELDING: drill size 65, no. 63026-0	ea	
						3432-373-1738	1 TIP, OXYGEN ACETYLENE, WELDING: drill size 60, no. 63026-1	ea	
						3432-373-1736	1 TIP, OXYGEN ACETYLENE, WELDING: drill size 56, no. 63026-2	ea	
						3432-373-1735	1 TIP, OXYGEN ACETYLENE, WELDING: drill size 53, no. 63026-3	ea	
						3432-373-1732	1 TIP, OXYGEN ACETYLENE, WELDING: drill size 43, no. 63026-5	ea	
						3432-391-1220	1 TORCH HANDLE, WELDING: no. 63026-100	ea	
						3432-391-1221	1 TORCH WRENCH, WELDING: 4-way, no. 63026-RT-20	ea	

(1) ILLUST		(2) SOURCE, MAINT AND RECOVERABILITY CODE				(3)  FEDERAL STOCK NO	(4)  DESCRIPTION	(5)  UNIT OF ISSUE	(6)  QTY AUTH		
(a) FIG NO	(b) ITEM NO	(a) TECHNICAL SERVICE NO	(b) SOURCE	(c) MAINTENANCE LEVEL	(d) RECOVERABILITY						
83	13				N	4910-735-6056	SPECIAL PURPOSE TOOLS AND EQUIPMENT FOR WRECKERS (M62, M246, M543) - Continued	ea	1		
					NR	3830-625-6286	TOWBAR, MOTOR VEHICLE: "V" universal type (M62) -----	ea	1		
						2540-040-2301	TUBE: boom extension shaft, assy (M246) (8333070)-----	ea	2		
						3830-625-6288	TUBE: boom jack, bottom (M62, M543) (8330158) -----	ea	2		
					NR	2540-040-2300	TUBE: boom jack, bottom (M246) (833073) -----	ea	2		
						3830-625-6287	TUBE: boom jack, top (M62, M543) (8330157) -----	ea	2		
					N	5120-243-9072	TUBE: boom jack, top, assy (M246) (8333072)-----	ea	2		
							WISE, BENCH AND PIPE: swv base, 5 in. stationary jaw w, 1/8 to 4 in. pipe cap.	ea	1		
						5120-264-3793	WRENCH, AUTO, ADJUSTABLE: 0 to 3-5/8 in. min jaw opng, 15 in. lg over-all (M62, M543)	ea	1		
						5120-357-8603	WRENCH, OPEN END, FIXED: 15 deg angle, sgle-hd, carb-S 1-17/32 in. opng 11-1/2 in. lg, no. 04636-HCF299D, or equal (M62, M246)	ea	1		
					NR	5120-277-1244	WRENCH: open end, fixed, sgl-hd, 15 deg hd-angle, 1-5/8 opng, 14-7/8 lg (M543) (96906-16382-2)	ea	1		
					NR	5120-277-1245	WRENCH: open end, fixed, sgl-hd, 15 deg hd-angle, 1-11/16 opng, 14- 7/8 lg (M543) (96906-16382-3)	ea	1		
						5120-357-8605	WRENCH, OPEN END, FIXED: 15 deg angle, sgle-hd, carb-S, 1-3/4 in. opng, 11-1/2 in. lg, no. 04635-HCF-1249A, or equal (M62, M246)	ea	1		
					NR	5120-277-1242	WRENCH: open end, fixed, sgl-hd, 15 deg hd-angle, 1-13/16 opng, 16- 3/8 lg (96906-16382-4)	ea	1		
83	14					5120-277-1461	WRENCH, PIPE: adj, 1 in. to 2 in. pipe cap., 18 in. lg (M62, M543)	ea	1		
						5120-357-8688	WRENCH, OPEN END, FIXED: 15 deg angle, sgle-hd, carb-S, 1-11/16 in. opng, 11-1/2 in. lg, no. 0436-HCF1248A, or equal (M62, M246)	ea	1		
						5120-316-9204	WRENCH, TORCH AND REGULATOR: acetylene tank valve key, no. 00741-110473 or equal (M62, M543)	ea	1		
		EQUIPMENT FOR CRANE CAB (M543)									
					NR	2540-860-2356	BOW: canopy, tubular, steel (front) (M543) (10876566) -----	ea	1		
					NR	2540-860-2357	BOW: canopy, tubular, steel (rear) (M543) (10876565)-----	ea	1		
					NR	2540-860-2355	COVER: fitted, gondola canopy (M543) (10876433) -----	ea	1		
					NR	2540-860-2358	CROSSMEMBER: gondola canopy (M543) (10900249) -----	ea	3		
					NR	5340-543-3034	STRAP: webbing, 1-1/2 w, 24 lg, w/buckle (M543) (8960516)-----	ea	2		
		VEHICULAR EQUIPMENT									
83	7	5				6240-044-6914	LAMP, INCANDESCENT: min, 24-28 v, 32 cp, dble-fil, no. 1683 (sgle- contact cand-bay-base, S-8 bulb, two C-2R fil in series (extn cord) (M62) (446914)	ea	1		
			PUBLICATIONS								
					N	7510-889-3494	LOG BOOK BINDER: ----- (NOTE: Forms and records as prescribed in Appendix II of TM38- 750 will be inserted by the manufacturer in the log book binder, as applicable and placed in the equipment prior to shipment)	ea	1		
					N		MANUAL: technical, 9-2320-211-10 -----	ea	1		
			N		LUBRICATION ORDER: LO 9-2320-211-12 -----	ea	1				
The items listed under the sub-heading below are not issued with the vehicle, but are requisitioned and issued in accordanced with TOE, and TA or as otherwise authorized. The items will be installed on the vehicle by using troops.											



(1) ILLUST		(2) SOURCE, MAINT AND RECOVERABILITY CODE				(3)  FEDERAL STOCK NO	(4)  DESCRIPTION	(5)  UNIT OF ISSUE	(6)  QTY AUTH
(a) FIG NO	(b) ITEM NO	(a) TECHNICAL SERVICE NO	(b) SOURCE	(c) MAINTENANCE LEVEL	(d) RECOVERABILITY				
VEHICULAR EQUIPMENT									
81	4					2540-054-0030	3 pr CHAIN, pneumatic tire, truck, sgle (type TS), 14.00-20 (authorized for issue to meet local weather conditions) (M39, M139, M139C, M139D, M41) (540030)		
81	4					2540-054-0027	3 pr CHAIN, pneumatic tire, truck, sgle (type TS), 11.00-20 (authorized for issue to meet local weather conditions) (M40, M51, M52, M54, M55, M61, M63, M543) (540027)		
81	4					2540-054-0027	3 pr CHAIN ASSEMBLY, TYPE: pneumatic tire, truck, sgle type, TS 11.00-20 (M62) (use on outer dual wheel only)		
		11				6135-050-3280	2 BATTERY: lantern, 6 volt (SC-8A200/U) (M62) (3A-275-200)		
82	5	11			NR	6135-120-1020	4 BATTERY: dry flashlight, 1 cell type, BA-30 (M62) (3A-30) Primary batteries will not be stored, packed or shipped in the equip- ment in which they are used. Because of special handling necessitated by the limited shelf life, primary batteries are not considered part of the equipment but an adjunct used with the equipment. Required primary batteries must be requisitioned separately from the Signal Corps. See SB 11-6 for allowances		
81	3	10			NR	7240-243-3088	1 CAN: gasoline, military		
81	9	10				5120-293-3336	1 SHOVEL: hand, general purpose, round point open back, rolled shoulder, tubular shank, size no. 2, D handle (M39, M40, M41, M51, M52, M54, M55, M61, M63, M139, M139C, M139D)		

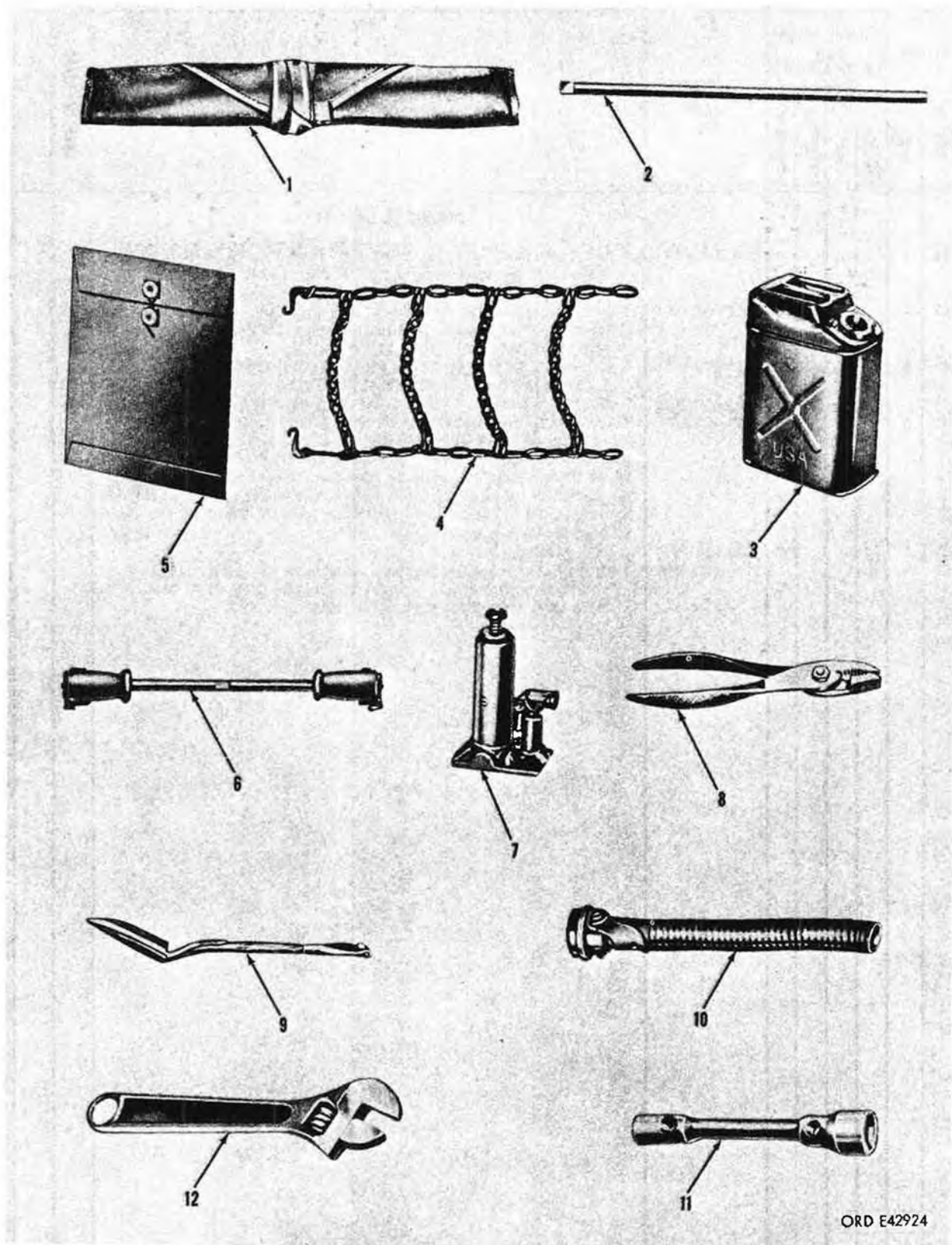
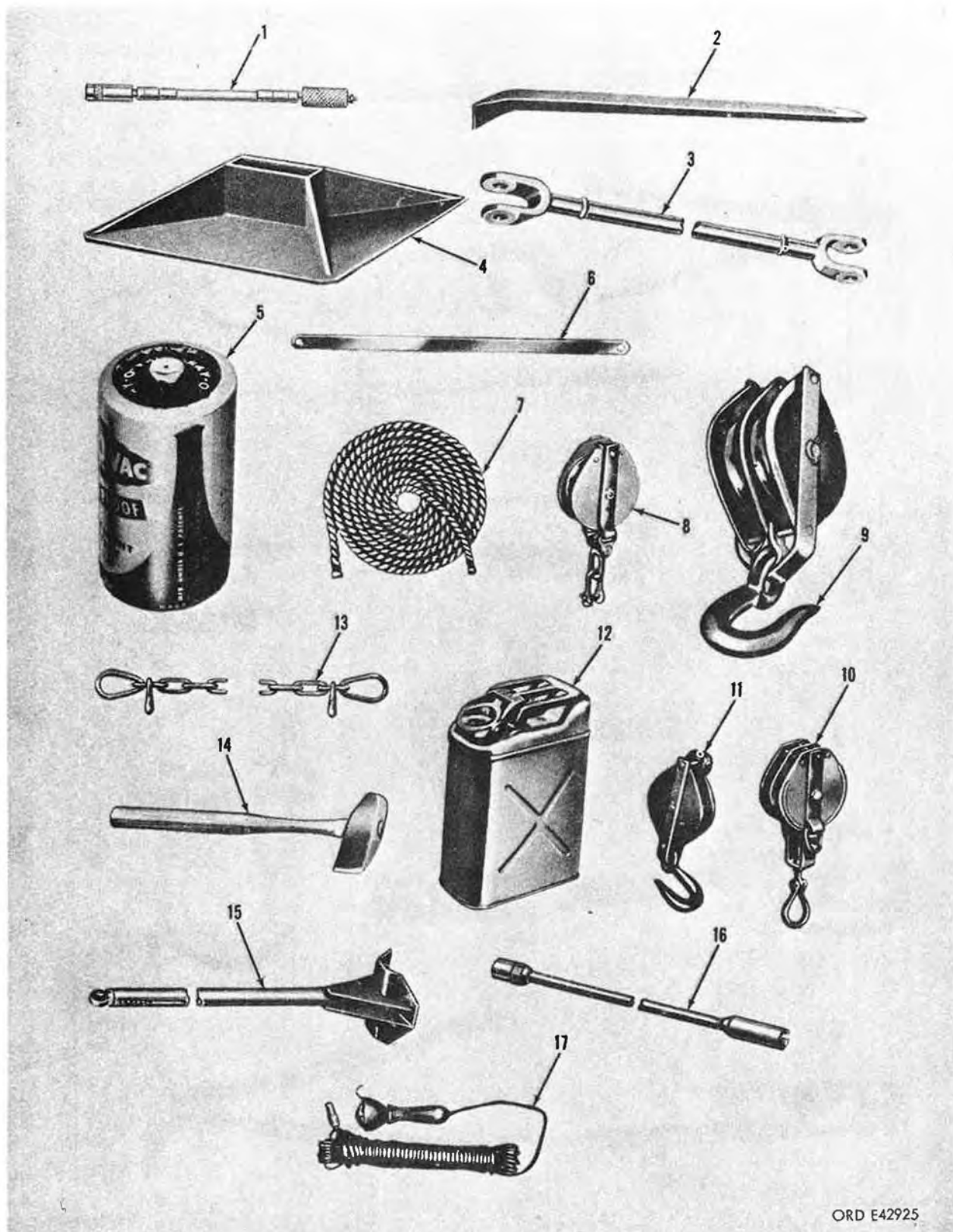
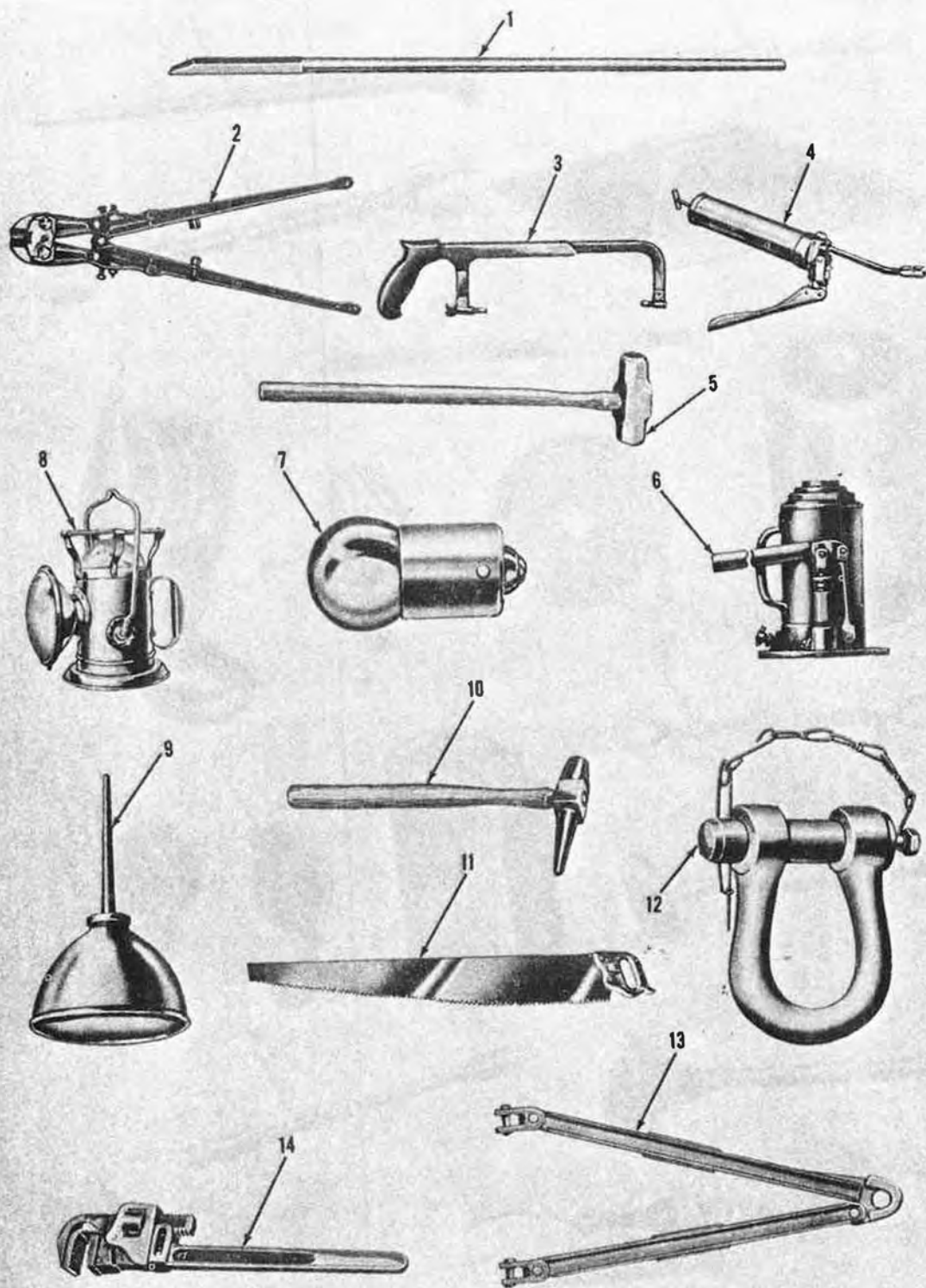


Figure 81. Vehicular tools and equipment.



ORD E42925

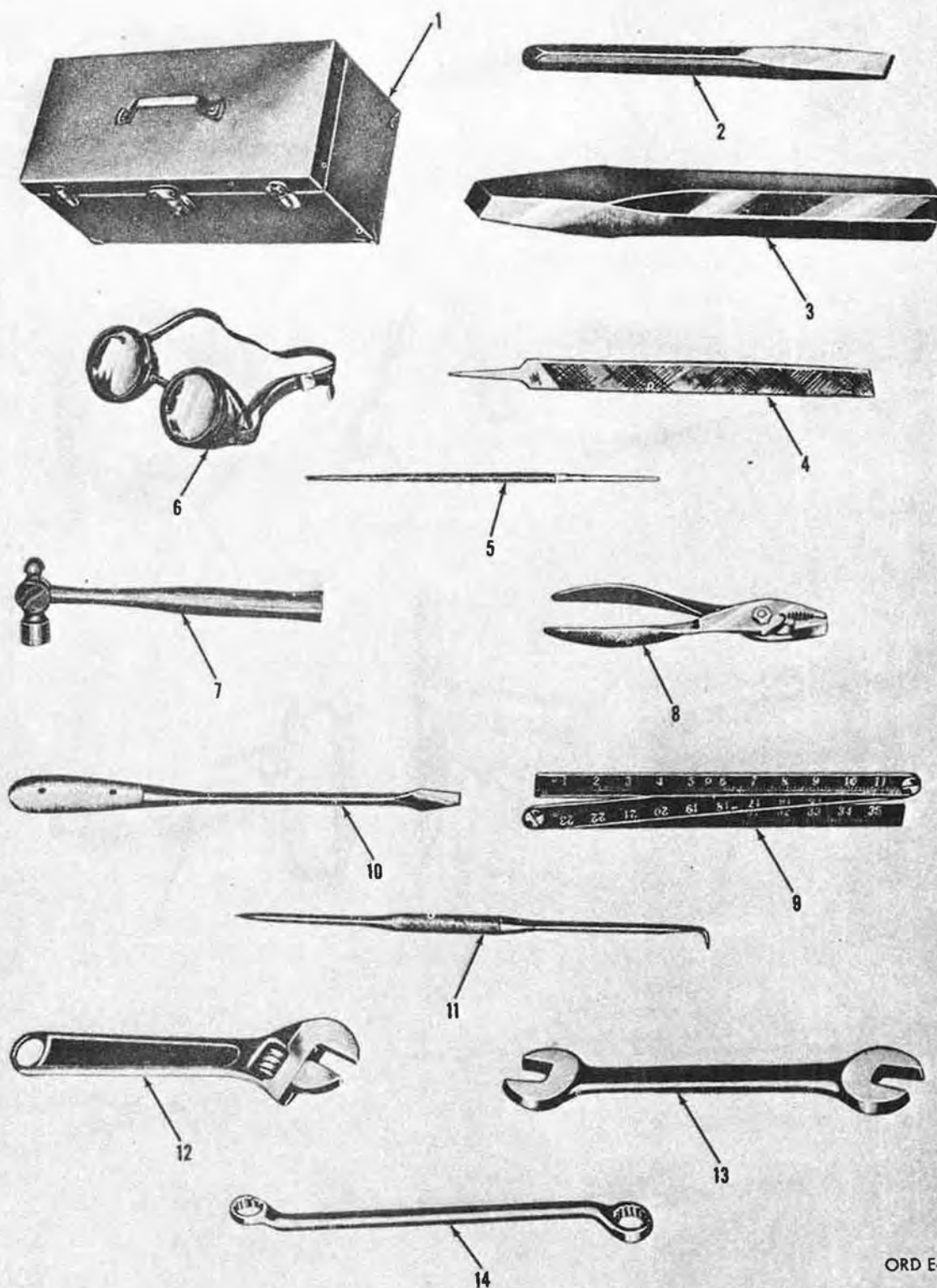
Figure 82. Special purpose tools and equipment for wrecker, M62 and M543.



ORD E42926

Figure 83. Special purpose tools and equipment for wrecker, M62 and M543.





ORD E42927

Figure 84. Welder's tool kit components for wrecker M62 and M543.

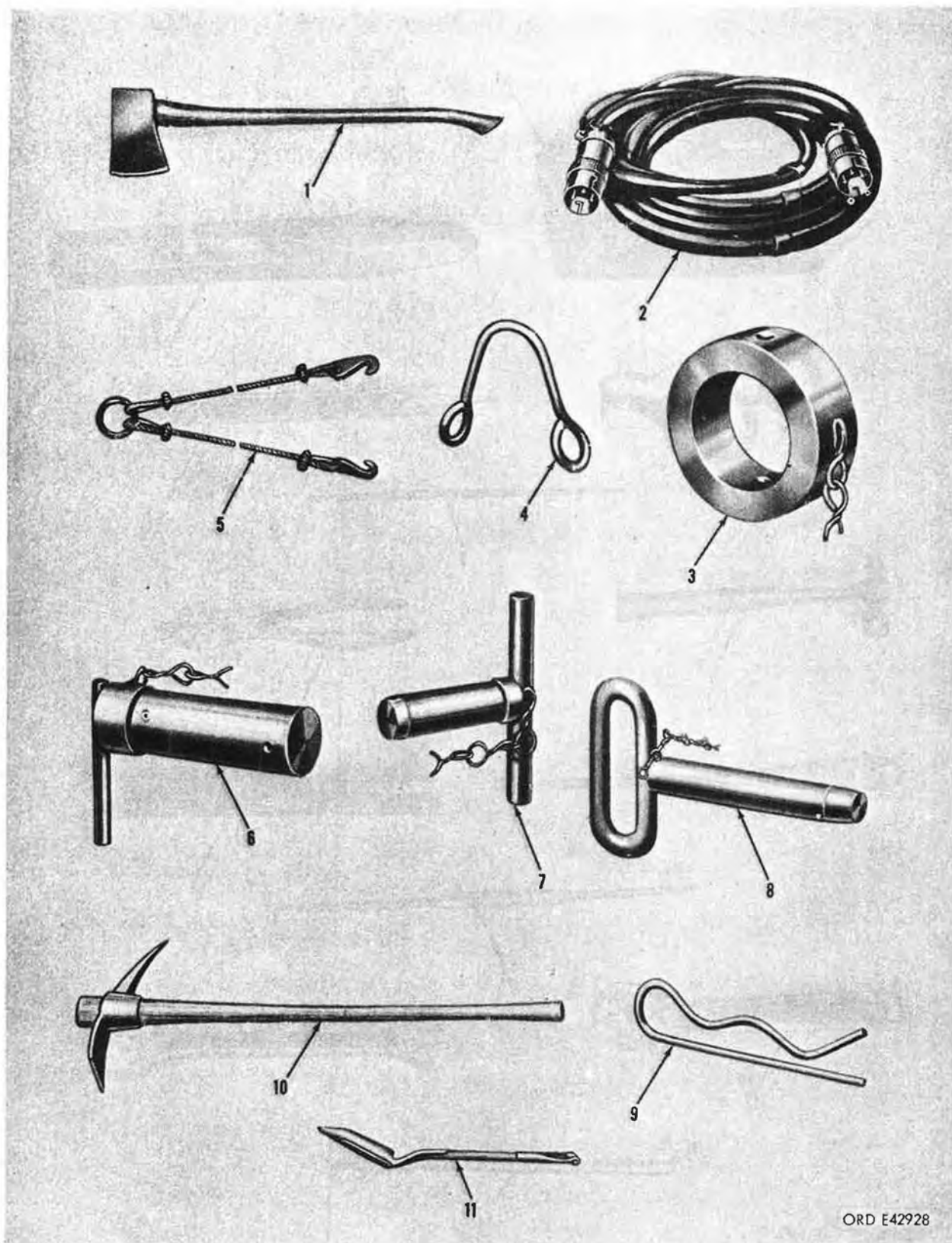


Figure 85. Special purpose tools and equipment for wrecker M62, M543, and M246.

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EARLE G. WHEELER,  
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Major General, United States Army,  
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    Frankford (10)  
    Raritan (10)  
Springfield Armory (1)  
Ord Plants (5) except  
    Kingsbury (none)  
Ord Dist (1) except  
    Cleveland (2)  
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    Philadelphia (4)  
    St Louis (3)  
    Chicago (none)  
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For explanation of abbreviations used see AR 320-50.

OFFICE OF THE SECRETARY OF THE ARMY  
WASHINGTON, D. C. 20315  
JAN 10 1964

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45. [Illegible]





TM9-2320-211-10

5-TON, 6 x 6 TRUCK CHASSIS TRUCK, M39, M40, M40C, M61, M63, M63C M139, M139C, M139D, M139F,  
CARGO TRUCK M41, M54, M54A1, M55; DUMP TRUCK, M51; TRUCK TRACTOR M52, M52A1; TRUCK, WRECKER M62, M246, M543

1963